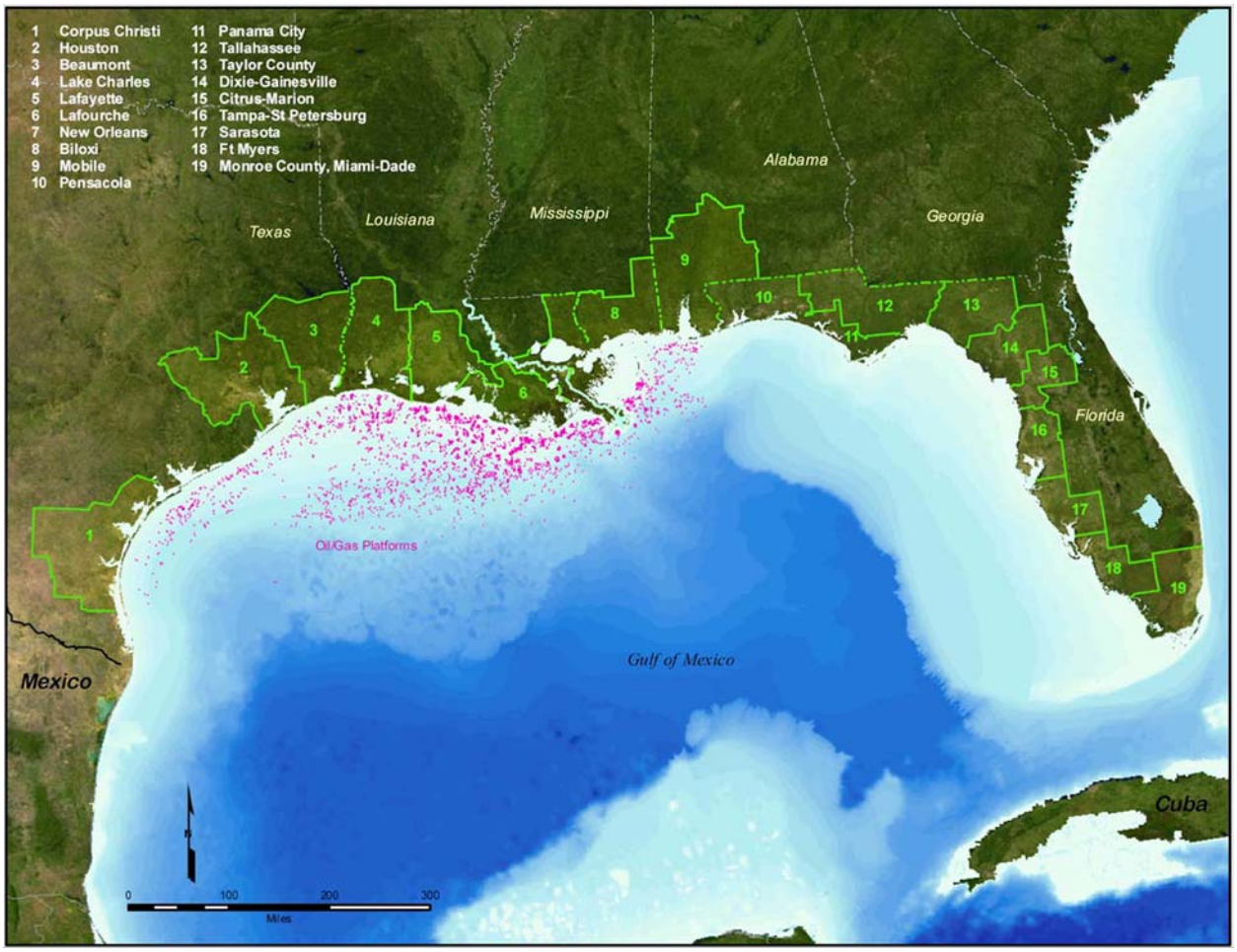
OCS Study
MMS 2008-052

Benefits and Burdens of OCS Activities on States, Labor Market Areas, Coastal Counties, and Selected Communities



MMS U.S. Department of the Interior
Minerals Management Service
Gulf of Mexico OCS Region

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Benefits and Burdens of OCS Activities on States, Labor Market Areas, Coastal Counties, and Selected Communities

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I. INTRODUCTION AND OVERVIEW

A. PURPOSE OF THE STUDY

The Minerals Management Service (MMS) is the agency responsible for managing the mineral resources on the Federal OCS and is obligated under the National Environmental Policy Act of 1969 (NEPA) and the Outer Continental Shelf Lands Act, as amended in 1978 (OCSLA), to assess and monitor the effects of its sale of oil, gas, and mineral leases located on the outer continental shelf.

The outer continental shelf (OCS) extends up to 200 miles off the coast of the U.S. It consists of over 2.75 million square miles, 7,300 active oil and gas leases, on 42 million acres (65,000 square miles) of submerged federally owned lands, and represents the most likely location of undiscovered oil and gas resources in the U.S. It is also the source of roughly one third (32%) of the oil produced in the U.S. (Texas produces 22%, Alaska 20%, and California 14%) – a percentage that is rapidly growing (USDOE, EIA, 2004a).

This study is one of several funded in response to intensification of sale-related activities in the Gulf of Mexico OCS in deeper waters. The study's purpose is to develop reliable and consistent information about past and potential future human effects of OCS development in support of the agency's lease sale and management decision-making process.

B. OBJECTIVES OF THE REPORT

This report represents the culmination of a six-year project designed with four principal objectives: (1) to develop a baseline description of coastal counties/parishes bordering on the Gulf of Mexico; (2) to analyze patterns in the distribution of benefits and burdens for places affected by OCS oil and gas activities (e.g., changes in community demographic structure, industry structure, labor force composition, and social and economic well-being of the population); (3) to examine significant changes in the study areas associated with "deepwater" oil and gas development program; and (4) to comparatively analyze the differential response of two coastal communities in the Florida Panhandle to past and anticipated future oil development associated with MMS OCS activities.

These objectives are addressed at four levels of analysis: (1) at the level of the five Gulf of Mexico coastal states (Texas, Louisiana, Mississippi, Alabama, and Florida); (2) at the level of groups of counties organized by Labor Market Area (LMA)[1]; (3) at the level of the individual counties and parishes bordering on the Gulf of Mexico; and (4) at the level of the community in a comparative case study of two Florida Panhandle communities (Pensacola and Panama City, Florida) differentially affected by past and anticipated offshore oil development (Map 1).

The core analysis of the study effort centers on the analysis of the LMAs that highlights recent changes in local involvement in the OCS oil and gas industry resulting from deepwater

[1] Labor Market Areas are analytic constructs used to describe the economic and demographic characteristics of a cluster of counties or parishes linked by commuting patterns into an economically integrated region surrounding a central city or town. These groupings allow for analysis of larger geographic aggregations of populations associated with regional economic centers in which workers can easily change jobs without changing their place of residence.

developments, the "boom and bust"[2] characteristics, and an examination of the benefits and burdens of OCS activities on public institutions and infrastructure.

This report integrates the results of two MMS projects, BENEFITS AND BURDENS OF OCS ACTIVITIES ON SELECTED COMMUNITIES AND PUBLIC INSTITUTIONS and EFFECTS ON LOCAL HUMAN COMMUNITIES OF OCS MINERAL EXTRACTION IN FRONTIER AREAS carried out by Impact Assessment, Inc., between 1998 and 2004. This period has been one of extremely accelerated deepwater oil and gas development, of substantial reorganization within the oil industry, and of profound change in public perceptions of the role of oil in the world political economy.

C. STUDY BACKGROUND

1. Introduction

The oil and gas industry has operated in Louisiana and Texas for nearly 100 years and has operated in offshore waters for over 50 years. While growth in this industry slowed in the early 1980s through the early 1990s, recent changes reinvigorated the industry and focused many of its new efforts in deepwater (i.e., water depths greater than 300 meters). These changes produce benefits such as increased economic activity and employment, but they also place new demands on local infrastructure and institutions. Since ports with sufficient draft to accommodate deepwater servicing equipment are limited, many onshore effects appear to be increasingly concentrated in a few communities. This contrasts with nearer shore activities, which were supported by innumerable ports and coastal communities.

External events play a role in the pace, location, and scale of onshore impacts of oil development. For example, in the past, long periods of relatively low oil prices resulted in a correspondingly low investment in infrastructure (refineries, pipelines, etc.), exploration, and development. Higher world oil prices have had the opposite effect, and abrupt changes in prices, in turn, have had abrupt impacts on affected communities. This was particularly the case after the OPEC[3] oil embargo of 1973. The embargo and U.S. policy responses ramped up oil prices, U.S. exploration, and infrastructure investment. Then, in the 1980s, abrupt declines in oil prices led to deep declines in infrastructure investment, exploration and development.

2. Early History of Gulf of Mexico Oil Development

The modern oil industry had its origins in early 1901 with the discovery of oil at Spindletop, Texas. This discovery, just south of Beaumont, Texas, occurred atop a small salt

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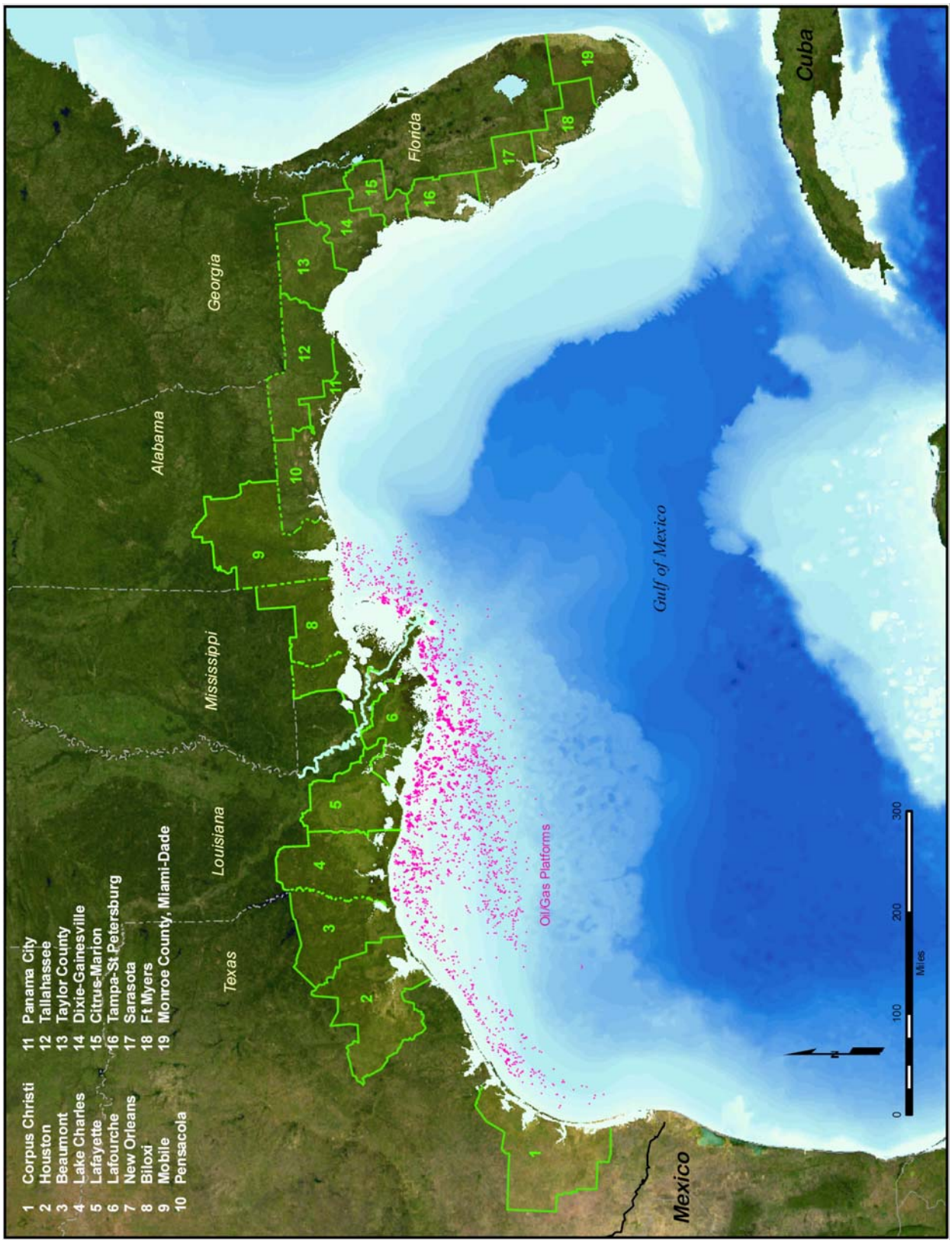
[2] Strictly speaking, there have been many periods of rapid economic expansion and contraction, some more abrupt than others. We use the phrase "boom and bust" to characterize a broad spectrum of these industrial expansions and contractions.

[3] The Organization of the Petroleum Exporting Countries was originally formed in 1960 by five founding members – Iran, Iraq, Kuwait, Saudi Arabia and Venezuela. Despite the formation of this block of oil producers, prices continued to decline until 1971, when six other nations (Qatar [1961], Indonesia [1962], Libya [1962], United Arab Emirates [1967], Algeria and Nigeria [1971]) had eventually joined the group. OPEC's ability to dictate oil prices can be said to date from about this time.



Map 1. Map of Study States and Labor Market Areas (IAI Staff, 2007).

dome at a depth of 1,020 feet. Within a few years, more than 400 wells were erected in the vicinity.

In September of the same year, oil was discovered in Jennings, Louisiana, located approximately 15 miles inland of Lake Arthur, and the Louisiana oil rush was underway with dozens of wells drilled and producing by 1902. Aggressive exploration and development activities between 1901 and the early 1920s led many to conclude that all the "easy finds" had already been made. However, the advent of WW I, and rapidly growing domestic industrial and transportation consumption, fueled an accelerated exploration and development in both Texas and Louisiana.

3. History of Shallow Water OCS Oil Development

The first effort to drill over water was initiated in about 1910 at Caddo Lake, in a well-developed oil region near Shreveport, Louisiana. The first actual attempt to drill in offshore waters did not occur until 1934, when the Texas Company (precursor to Texaco) utilized a barge structure to establish a well one-mile off the coast. This is viewed as the advent of the offshore oil industry in the Gulf of Mexico.

In 1947, the first actual "platform" connected to the ocean floor (in 18 feet of water) was constructed by Kerr-McGee, approximately 12 miles offshore and beyond sight of the coast. By the end of the 1950s, 92 offshore platforms had been constructed, some to a depth of 100 feet. At the end of the 1960s, approximately 500 platforms had been erected – in water up to 350 feet deep. In the 1970s, the pace of development accelerated even more dramatically. By the end of that decade, over 12,500 platforms were producing oil on the continental shelf. An average of 1,000 new platforms had been erected each year of the decade.

4. History of Deepwater OCS Oil Development

The first platform at a water depth of over 1,000 feet occurred in 1979 with erection of Shell Oil's Cognac Platform. The second deepwater discovery occurred five years later, in 1984. Then, between 1984 and 1992, another four deepwater fields were brought into production. In the five years between 1992 and 1997, another 11 producing deepwater developments came on line in the Gulf of Mexico (GOM). In 1997 there were 12 deepwater oil-producing wells and 12,500 shallow-water producing wells; just three years later, oil produced from deepwater wells exceeded the total production of those 12,500 shallow-water wells. By the end of 2001, there were 58 producing deepwater projects, and by the end of 2003, there were 86. A total of 15 new deepwater discoveries in water depths in excess of 1,000 feet were made in 2004 and an additional nine discoveries in 2005.

The water depth at which discoveries were being made also continued to increase dramatically. In 1992, 33 deepwater oil wells were drilled in the Gulf of Mexico, most in waters less than 1,500 feet deep and only 11 in water greater than 1,500 feet. Five years later, in 1997, 174 wells had been drilled in deepwater, 132 of which were in depths between 1,500 and 5,000 feet. Over the five years leading up to 2002, 191 wells were drilled in deepwater, 126 of which were in depths between 1,500 and 5,000 feet, 35 at depths of 5-7,000 feet, 10 in waters 7,500 feet or greater depth. Two wells have now been drilled in water over 10,000 feet deep.

5. Distribution of Onshore Impacts

Oil development in deepwater GOM is concentrated off the coast of Louisiana. The ports and harbors that provide onshore access to these deepwater facilities are concentrated in the eastern coastal regions of Louisiana. The pipelines that will bring the deepwater oil production onshore will tie into the existing network of offshore pipelines already pumping oil to refineries in Louisiana, and back along the coast into Texas (Sabine Pass, Orange, and Beaumont). Considerable effort has been committed to identifying the cause-effect relationship between these activities and economic and demographic changes at the level of the county and labor market area. The majority of the analysis focuses on these impacts, and changes over time in the distribution of benefits and burdens among and between the affected counties, parishes, labor market areas, and coastal states.

It should be noted, however, that the distribution of benefits and burdens of OCS deepwater oil development activities is spread much wider, directly and indirectly affecting the entire state and each of its component parishes, counties, and labor market areas. For example, in 1970, the oil and natural gas industry employed approximately 71,000 full-time workers from coastal communities along the Gulf of Mexico. In 1980, that number had grown to over 145,000, a net increase of 105 percent. This is direct employment; the numbers do not reflect the multiplier effect of employment in such industries as manufacturing of equipment, water transportation, wholesale trade, and general services or the effects of increases in government revenues and consumer demand. Between 1980 and 1990, the total number of workers in the oil and natural gas industries in that region declined 23 percent and, in some coastal counties and parishes, unemployment rates temporarily exceeded 20 percent (Gramling, 1996). Again, this reflected the widespread reach of the industry and its multiplier effects.

Much of the benefit of OCS-related activities comes from increased economic activity. State and local governments benefit from this through increased revenues from income taxes, property taxes, and other fees. Another example concerns the allocation of revenue from OCS lease sale activities (e.g., royalties, rents, bonuses) by the federal government to the affected coastal states. Louisiana, for example, is entitled to 27 percent of the mineral royalties from producing federal offshore tracks adjacent to their seaward boundary. Federal royalty payments to Louisiana range from $30 to $40 million a year. Additional monies derive indirectly to state coffers through the Land and Water Conservation Fund, funded in part by royalty payments to MMS, which are then reallocated to all states (costal and non-coastal).

Finally, industry royalty payments to the federal government are tied to the market price of oil and gas. This means, for example, that the recent increase in the international benchmark price of oil will translate not only into increased revenue for the oil companies, but into increased royalty payments to the federal government and, subsequently, to the affected states as well.

D. STRUCTURE OF THE REPORT

The report is organized into four components. The first consists of this introduction and overview of the study. The second component provides state-level profiles for each of the U.S. states that border the Gulf of Mexico. The need for these state profiles arose because many things that happen at the level of the LMA, or county, or parish, are consistent across all counties of the state, such as bases of taxation, local government structure, revenue sharing procedures, and educational funding and priorities. Thus, it is appropriate to describe these state-based

processes one time at the state level and then use that discussion as a reference for each of the county profiles within that state. The third component consists of selected county or parish profiles. These include all counties or parishes bordering on the Gulf of Mexico, and all counties or parishes that are part of a cluster of counties that make up a coastal Labor Market Area. The fourth component of the study consists of a comparative analysis of two coastal communities that have experienced only very modest effects (primarily anticipatory) effects of OCS oil and gas activities, but that could, under hypothesized scenarios, be expected to experience impacts from future OCS activities. These two communities, Panama City and Pensacola, Florida, represent two very different orientations to development effects and are compared and contrasted with respect to their "pre-adaptation" to potential future OCS-related development. The following discussion provides an overview of the goals, objectives, and methods of each of the four components.

1. State Profiles

Many important components of the analyses are consistent across all counties or parishes in each of the five states (Texas, Louisiana, Mississippi, Alabama, and Florida). All counties of Texas, for example, are organized according to state laws and regulations; educational systems all had the same structure, same funding mechanisms, and basic operating principals. Also, state level decision-making and structural requirements result in differences that are meaningful at the level of the counties (or parishes) and this relationship needs to be explained at the level of the state. State profiles are structured around the same general categories employed in the county-level analyses in order to facilitate understanding of the relationship between, for example, state history and county history, or state level economic trends and county level trends. Each state profile consists of eight sections, including: (1) introduction; (2) built environment; (3) history; (4) demographic characteristics; (5) economy; (6) local government; (7) social context; and (8) issues of concern.

2. Labor Market Analysis

The objectives of this task are to aggregate, integrate, and synthesize the county/parish profile information into a cohesive statistical and analytical summary at the level of the Labor Market Area (LMA). This synthesis was carried out for all LMAs in the five study states (Texas, Louisiana, Mississippi, Alabama, and Florida) containing a minimum of one coastal county or parish. In addition, all Florida LMAs were included in order to provide a broader contextual foundation for discussion, and a comparative basis for analysis.

The LMA analysis consists of three components: (1) development of a short history of the LMA involving the compilation and integration of county/parish level data; (2) aggregation and integration of the county/parish analyses to reflect the overall context of change at the LMA level; and (3) a summary of trends observed at the LMA level in each of the principal domains (i.e., history, geography and environment, demography, economy, infrastructure, and fiscal trends).

3. County and Parish Profiles

This study is organized to provide reliable and consistent information about past and potential human effects of Outer Continental Shelf (OCS) development. In support of the agency's lease sale and management decision-making process, profiles of the 90 counties and parishes bordering on the Gulf of Mexico have been prepared to serve as a baseline for the coastal counties and parishes bordering on the Gulf of Mexico. More specifically, these county/parish profiles support assessments of the distribution of benefits and burdens of OCS oil and gas activities for the counties and parishes within each state (e.g., changes in community demographic structure, industry structure, labor force composition, and social and economic well-being of the population). They additionally examine significant changes in the study areas occurring in association with the MMS "deepwater" oil and gas development program. As such, they provide the basic foundation for the analyses performed at both the Labor Market Area (LMA) and state levels.

However, the overall objective of these baseline profiles is to describe and explain events and trends in order to provide a context for understanding why an event happened at different analytical levels (county/parish) for the study period (1920-present). Using information collected from the counties/parishes, oral histories, unstructured discussions with key informants, and the U.S. Census Bureau's Decennial Census data, we describe *what* happened, *how* it happened as well as *why* it happened.

The profiles developed in this study include all coastal counties/parishes, as well as counties/parishes within coastal or key LMAs, of the five states of Texas, Louisiana, Mississippi, Alabama, and Florida (Table 1). Each profile provides detailed information on the same eight components employed in the state level analyses, including: (1) introduction; (2) built environment; (3) history; (4) population and demography; (5) economy; (6) local government; (7) social context; and (8) issues of concern.

The introduction first locates and describes the general physical features of the study county/parish geological conditions and trends. Notably, it identifies the geological formations and industry trends that have historically supported active onshore and OCS oil and gas exploration, and/or continue to support them.

Following this, the "built environment" section identifies the primary population centers of the study county/parish and describes their transportation and commercial infrastructure. Particular attention is given to the identification of predisposing county/parish characteristics that work to support or underwrite OCS activities, such as the presence of a deepwater port, major transportation routes, rail freight, and available utilities. We also examine the most recent data for toxic air, water, and land releases into the study communities and probe the relationship, and/or perceived relationship, between these environmental releases and local gas and oil activity.

The next section provides the salient history of the study county/parishes' early and late settlement patterns. Besides exploring the major industrial developments within the region, we discuss the overall place of the petroleum industry within these developments. Finally, this section identifies some of the key technological advances within the petroleum industry and resulting social and socioeconomic effects.

Using decennial U.S. Census data, the fourth section identifies demographic trends and their variations within and among the counties between 1920 and 2000. Hence, each county/parish profile identifies and comparatively analyzes both local and regional

socioeconomic trends. For example, in- and out-migrations are described with Census data and other compiled statistics at appropriate levels of aggregation (in a fashion parallel to the discussion of Labor Market Areas).

In section five, we examine correlations between OCS activities and income, poverty, employment and industry trends of the study county/parish. Our focus is on discerning the effects of the periodic expansion and contraction within the oil and gas industries upon the socioeconomic conditions within the study communities.

We next describe the governmental structure of each county/parish included in this report. Examining frameworks for representing local interests, we outline patterns of local political accountability. In particular, we delineate consequent variations in tax rates and the reliance of local government upon distinctive portfolios of taxes.

In section seven, we examine educational and health trends within each study county/parish. We make extensive use of U.S. Decennial Census data from 1940 through 2000 to identify correlations between educational levels/funding and oil and gas related activities in the study counties/parishes. Additionally, we analyze the relative performance of the study county/parish on several key indicators of community health, such as infant mortality and child abuse rates.

Finally, we discuss the most pressing social issues facing the study county/parish in the first half of the 21st century. Notably, we identify concerns that are most likely related to the historic presence of the gas and oil industry and discuss how local civic leaders and community constituents are responding to these needs.

The following table enumerates, for each of the five Gulf Coast states (Texas, Louisiana, Mississippi, Alabama, and Florida), the counties and parishes profiled in this study effort and contained in the attached CD (Table 1).

Table 1

Study County/Parish Communities by State

Alabama	Florida	Louisiana	Mississippi	Texas
Baldwin	Bay	Acadia	George	Aransas
Clarke	Charlotte	Allen	Greene	Austin
Escambia	Citrus	Ascension	Hancock	Brazoria
Mobile	Collier	Assumption	Harrison	Brooks
Washington	Dixie	Beauregard	Jackson	Calhoun
	Escambia	Calcasieu	Pearl River	Cameron
	Franklin	Cameron	Stone	Chambers
	Gulf	E. Baton Rouge		Duval
	Hernando	Evangeline		Fort Bend
	Hillsborough	Iberia		Galveston
	Jefferson	Iberville		Hardin
	Lee	Jeff Davis		Harris
	Levy	Jefferson		Jackson
	Manatee	Lafayette		Jasper
	Monroe	Lafourche		Jefferson
	Okaloosa	Orleans		Jim Wells
	Pasco	Plaquemines		Kenedy
	Pinellas	St. Bernard		Kleberg
	Santa Rosa	St. Charles		Liberty
	Sarasota	St. James		Matagorda
	Taylor	St. Landry		Montgomery
	Wakulla	St. Martin		Newton
	Walton	St. Mary		Nueces
		St. Tammany		Orange
		Terrebonne		Polk
		Vermilion		Refugio
		Vernon		San Jacinto
				San Patricio
				Tyler
				Victoria
				Waller
				Washington
				Willacy

II. TEXAS STATE PROFILE

A. INTRODUCTION

The State of Texas is located in the south central portion of the nation. It is bordered by New Mexico to the west, Oklahoma to the north, and Arkansas and Louisiana to the east. Texas is the second largest state in the United States (Map 2). It encompasses 267,277 square miles of land, 4,959 square miles of inland water, and 404 square miles of coastal water. This state's territory spans northward from the Gulf of Mexico to the high plains in the Texas panhandle, and eastward from the Guadalupe Mountains to the Lower Rio Grande Valley.

Texas has a moderately wet climate. Average annual rainfall ranges from eight inches in west Texas to 48 inches in east Texas. The state experiences average high temperatures of 84° (July) and average lows of 47° (January). Mean elevation is 1,700 feet, but ranges from 500 feet in the Central Lowlands of north-central Texas to 4,000 feet in the High Plains in northern and central Texas (Doughty, 2003).

There are 51 Wildlife Management Areas (WMAs) in Texas (756,464 acres) (Wildlife Management Areas of Texas, 2003). There are also 23 Gulf Ecological Management Sites (GEMS): Anahuac National Wildlife Refuge (34,296 acres), Aransas National Wildlife Refuge (58,982 acres), Armand Bayou Coastal Preserve & Nature Center (2,800 acres), Candy Abshier Wildlife Management Area (209 acres), Christmas Bay Coastal Preserve (4,173 acres), Flower Garden Banks National Marine Sanctuary (acreage not available), Freeport Liberty Ship Reef Complex (one-half square mile), Guadalupe Delta Wildlife Management Area (6,200 acres), Laguna Atascosa National Wildlife Refuge (65,096 acres), Laguna Madre (609 square miles), Lower Rio Grande Valley National Wildlife Refuge (acreage not available), Matagorda Island Wildlife Management Area and State Park (43,893 acres), McFaddin National Wildlife Refuge (56,181 acres), Murphee Wildlife Management Area (12,267 acres), Mustang Island State Park (4,060 acres), North Deer Island Sanctuary (acreage not available), Padre Island National Seashore (133,000 acres), Scenic Galveston Inc., Nature Preserve (2,400 acres), South Bay Coastal Preserve (3,500 acres), Sea Rim State Park (4,141 acres), Shamrock Island Management Complex (374 acres), Texas Point National Wildlife Refuge (8,952 acres), and the Welder Flats Wildlife Management Area (1,480 acres) (Texas Parks and Wildlife, 2003).

The State of Texas's geography is characterized by four distinct regions: the Gulf Coastal Plain (the majority of eastern and southern Texas), the Central Lowland (north-central Texas), the Great Plains (the "panhandle" area in northern Texas), and the Basin and Range province (west Texas) (Doughty, 2003). Contained within these four regions are 254 counties, and 1,510 population centers. Mountains, deserts, low rolling hills, dry and grassy plains, and forests exemplify the characteristic diversity of the Texas topography.

Several large rivers flow across the state. The Rio Grande, the largest of those rivers, runs along the southern border between Texas and Mexico. The Red River serves as a natural boundary between Texas and Oklahoma, while the Sabine River delineates the Texas-Louisiana border. Other principal rivers include the Colorado, Trinity, and Brazos Rivers, which run through the central portion of the state; lesser rivers include the Nueces, the San Antonio, the San Jacinto, the Lavaca, and the Guadalupe (Doughty, 2003).

Texas is geologically complex. The State rests on Precambrian rocks that are more than 600 million years old. The coastal region consists of Quaternary alluvium deposits and the

Beaumont and Lipsic Formations also of the Quaternary epoch. The Catahoula Formation, the Oligocene undivided, the Claiborne Group, and the Wilcox and Midway Group of the Tertiary epoch run in a northeast-southwest direction in the northern part of Texas. The central part of the state consists of the Fredericksburg and Trinity Groups, as well as the Cretaceous undivided of the Cretaceous Mesozoic era, beginning about 245 million years ago.

The state's diverse topography supports a wide range of agricultural products. These products include: wheat, sorghum, rice, citrus fruits, livestock and animal products, corn, dairy products, vegetables, cotton lint, poultry and eggs (Doughty, 2003). In 2000, Texas ranked second in the nation in terms of farm income from sales of all agricultural products.

Texas also produces a wealth of manufacturing products. These include: chemical and allied products, petroleum and coal products, food and kindred products, and transportation equipment. Primary mineral resources include petroleum, natural gas, and condensate (Doughty, 2003). Importantly, Texas is a major center of petroleum refining, with Houston serving as the southern state headquarters for the majority of oil and gas companies in Texas.

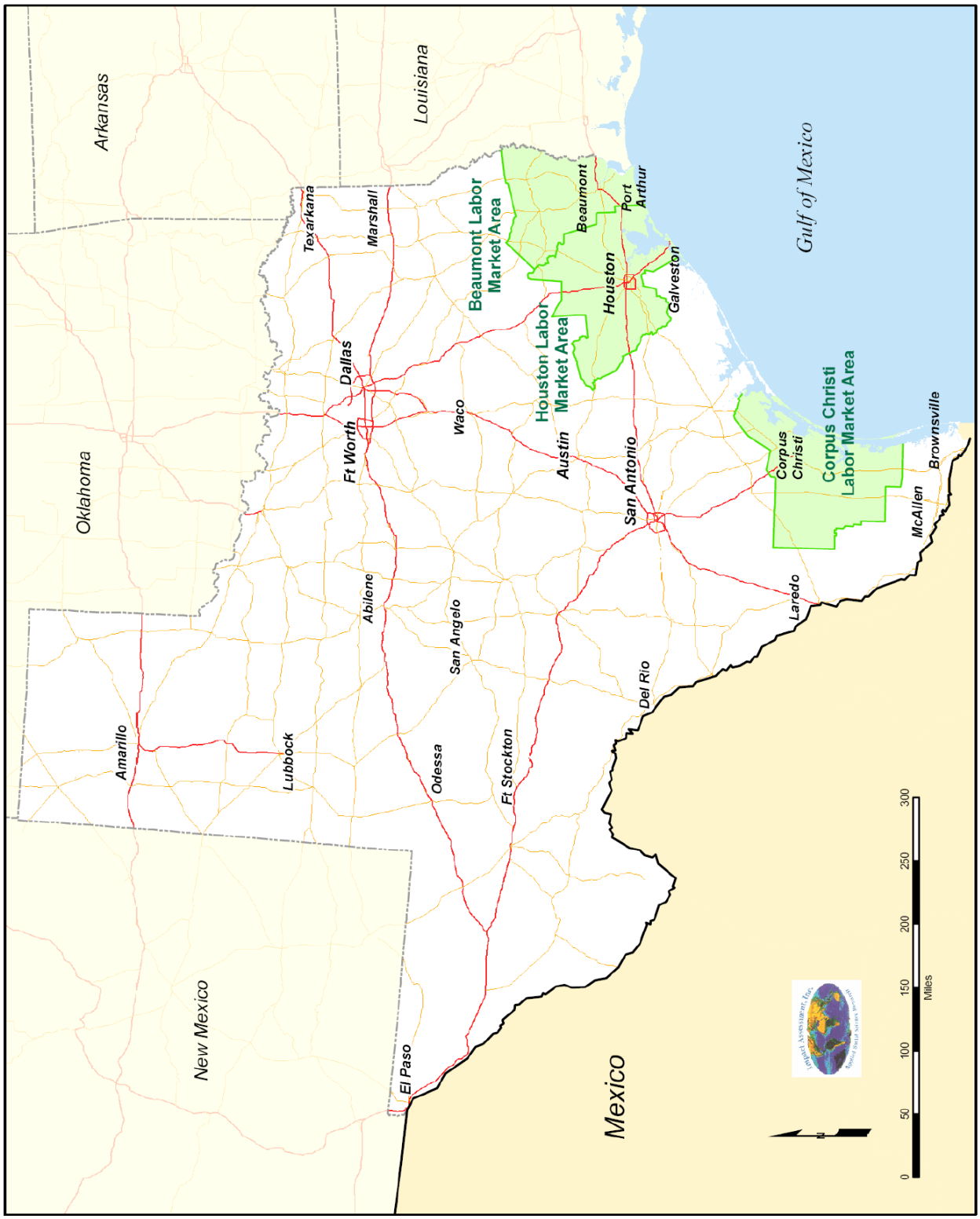
B. BUILT ENVIRONMENT

Human Geography and Population Centers. In the early 1900s, more than 75 percent of this state's population lived in small rural or agricultural communities. By 1970, however, the reverse was true—only 20 percent of state residents were living on farms. This demographic shift reflects in part the rapid growth of industry throughout the 20th century and a concomitant increase in urban employment opportunities (Doughty, 2003).

The State of Texas had a year 2000 population of 20,851,820 persons. The population of Austin, the capital city, was 656,562 persons. Other major population centers, with their year 2000 populations, include: Abilene (115,930), Amarillo (173,627), Arlington (332,969), Beaumont (113,866), Brownsville (139,722), Carrollton (109,576), Corpus Christi (277,454), Dallas (1,188,580), El Paso (563,662), Fort Worth (534,694), Garland (215,768), Grand Prairie (127,427), Houston (1,953,631), Irving (191,615), Laredo (176,576), Lubbock (199,564), McAllen (106,414), Mesquite (124,523), Plano (222,030), San Antonio (1,144,646), Waco (113,726), and Wichita Falls (104,197) (U.S. Census Bureau, 2000b).

The most populous counties in Texas in 2000 include: Bell (237,974), Bexar (1,392,931), Brazoria (241,767), Cameron (335,227), Collin (491,675), Dallas (2,218,899), Denton (432,976), El Paso (679,922), Galveston (250,158), Harris (3,400,578), Hildago (569,463), McLennan (213,517), Montgomery (293,768), Nueces (313,645), Tarrant (1,446,219), and Williamson (249,967) (U.S. Census Bureau, 2000b).

Transportation and Communication. The State of Texas provides a wide range of transportation options. Fifteen Interstate Highways provide Texas travelers with 3,231 miles of transportation infrastructure. Eight of these are major routes: I-10 (runs the entire length of Texas east to west), I-20 (east-west), I-30 (north-south), I-35 (north-south), I-35-E (Dallas), I-35-W (Fort Worth), I-40 (east-west), and I-45 (north-south; Houston to Dallas). Minor routes include: I-27, I-37 (north-south), and I-44. There are also two spurs (I-110; I-345) and four beltways or "loops": I-410 (San Antonio Loop), I-610 (loop), I-635 (east-west loop), and the I-820 (loop). Additionally, approximately 30 U.S. Highways, 300 State Highways, and numerous other business routes, loops and spurs, farm roads, and park/recreation roads provide 1,686 miles



Map 2. State of Texas and Gulf of Mexico Labor Market Areas (and component counties) (IAI Staff, 2007).

of non-interstate travel across Texas (Texas Highway Man Pages, 2001). In total, Texas's highway system includes 296,581 miles of roadway (Doughty, 2003).

With 388 airports, air travel is easily accessible throughout Texas. Commercial airports (27) are located in: Abilene, Amarillo, Austin, Beaumont, Brownsville, Corpus Christi, Dallas, El Paso, Fort Worth, Killeen, Laredo, Longview, Harlington, Houston (3), McAllen, Midland, Lubbock, San Angelo, San Antonio, Texarkana, College Station, Tyler, Victoria, Waco, and Wichita Falls (Texas Department of Transportation, 2007).

Texas's shipping industry also provides the state with a strategically important transportation mode. As of 2002, there are 13 major ports: Port of Brownsville, Port of Isabel, Port Mansfield/Willacy County Navigation District, Port of Corpus Christi Authority, Port Aransas, Port Freeport, Port of Galveston, Port of Texas City, Port of Houston, Port of Sabine Pass, Port of Port Arthur, Port of Beaumont, and the Port of Orange.

The Port of Brownsville is located on the Gulf of Mexico at the southernmost tip of Texas in Cameron County. This 4,200-foot long man-made basin at the western terminus of the Gulf Intracoastal Waterway ranges in width from 400 feet to 1,200 feet. Primary imports and exports include chemicals, clays, liquid petroleum gas, petroleum, grain, agricultural products, sulfur, steel, bulk minerals, ores, fertilizers and aluminum. This Foreign Trade Zone is also home to one of the largest shrimp boat fleets in the world (Port of Brownsville, no date).

The Port Isabel-San Benito Navigation District is located in the southernmost portion of the Texas Gulf Coast in Cameron County. This 726-acre deepwater port houses 27-plus businesses and supplies jobs to an estimated 600 persons (Port Isabel-San Benito Navigation District, 2004).

The Port Mansfield Navigational District is located on the banks of Laguna Madre in Willacy County along the southern Texas Gulf Coast. This port has a channel depth of 18 feet and provides shipping passage from the Laguna Madre through South Padre Island to the Gulf of Mexico. In fact, this port provides the only access to protected waterways between Brownsville and Corpus Christi. Commodities handled by this port include oil and gas production related supplies, and seafood products (Port Mansfield, no date).

The Port of Corpus Christi is located along the east coast of Texas on the Gulf of Mexico in Nueces County. This Foreign Trade Zone (FTZ #122) has a channel depth of 45 feet. In the year 2003, 6,766 vessels moved through this port (906 dry cargo, 1,073 tankers, and 4,787 barges). Total tonnage figures for that year (short tons) summed to 85,131,124. Commodities handled included grain, chemicals, dry bulk, break bulk, liquid bulk, and petroleum. Its top 10 import commodities were: crude oil, gas oil, bauxite ore, feed stock, slop and slurry, fuel oil, condensate, naphtha, reformate, and toluene. Top export products included: crude oil, gasoline, feed stock, gas oil, fuel oil, diesel, bauxite ore, slop and slurry, naphtha, and condensate. Rail service for the port is provided by *Burlington Northern Santa Fe*, the *Texas Mexican Railway Company*, and the *Union Pacific Railroad*. All three of those railroads have direct access to the dock for ease of transportation (Port of Corpus Christi, no date).

The Port of Port Aransas is comparatively small. It is located on Mustang Island in Nueces County between the Intracoastal Waterway and the Gulf of Mexico.

Located on the central Gulf Coast in Brazoria County, Port Freeport is currently the 16th largest port in the nation in terms of foreign tonnage. In 2001, top import products included bananas, fresh fruit, and aggregate; rice and chemicals were the major export commodities. Total tonnage (short tons) for this year equaled 1,263,970. This port has a 45 foot-deep, 400 foot-wide channel, and five operation berths. Port Freeport also provides 30,000 jobs and has a

local economic impact of $7.06 billion annually. Rail service is provided by the *Union Pacific Railroad* (Port Freeport, no date).

The Port of Galveston is located on the upper Texas Gulf Coast in Galveston County. This 38-acre terminal has a channel depth of 40 feet. In addition to being a point of commerce, the Port of Galveston provides *Carnival Cruises* and the *Royal Caribbean* with cruise ship terminals. The Port of Galveston is also a Foreign Trade Zone (#36), handling 3,356,568 total tons of cargo in 2002. The *Galveston Railroad* serves the port with additional connections to the *Burlington Northern Santa Fe Railroad*, and the *Union Pacific Railroad System* (Port of Galveston, no date).

With tonnages that surpass 78 million net tons per year, the Port of Texas is the third largest port in Texas and the eighth largest in the nation. It is located along the central Texas Gulf Coast in Galveston County. The *Texas City Terminal Railway Company*, which links to the *Union Pacific* and the *Burlington Northern Santa Fe*, provides the port with direct rail service (Port of Texas, no date).

The Port of Houston is located along the central Texas Gulf Coast in Harris County. This 25-mile long complex houses the port authority and more than 150 private industrial companies. This Foreign Trade Zone handled an estimated 175 million tons of cargo in 2002, with a total of 6,414 vessels moving through its ship channels. It is ranked first in the nation in terms of foreign tonnage, and second in total tonnage. The Port of Houston also bears the distinction of being the sixth largest port in the world. Top import commodities moving into the port (in terms of tonnage) include: petroleum and petroleum products, crude fertilizers and minerals, iron and steel, organic chemicals, and ceramic products. Petroleum and petroleum products, organic chemicals, cereals and cereal products, plastics, and, animal/vegetable fats and oils are the primary export products. The Port of Houston provides approximately 287,000 direct and indirect jobs throughout the state with an $11 billion economic impact (Port of Houston Authority, no date).

The Port of Sabine Pass is a comparatively small port. It is located in the southeastern-most portion of Jefferson County on the Gulf of Mexico.

The Port of Port Arthur is located along the barge shipping routes of the Intracoastal Waterway in Jefferson County only 19 miles from the Gulf of Mexico. The *Kansas City Southern Railroad* (KCS) is the Port's primary source of rail support. *KCS* connects with *Canadian National*, *Union Pacific*, *Burlington Northern Santa Fe* (BNSF), and *Tex Mex* (Port of Port Arthur, no date).

The Port of Beaumont Navigation District lies along the Sabine-Neches ship channel in Jefferson County. It is located approximately 84 miles east of Houston, 270 miles west of New Orleans, and 42 miles from the Gulf of Mexico. This designated Foreign Trade Zone (FTZ #115) has a channel depth of 40 feet, and is 400 feet wide. The principal commodities moving through this port include: forest products, grains, project cargo, military, bagged goods, aggregate, metals, and wood chips (Port of Beaumont, no date).

The Port of Orange, "The Greatest Small Port in America," is located at the junction of the Sabine River and the Intracoastal Waterway System in Orange County. It has a channel depth of 30 feet. *Union Pacific*, *Sabine River*, and *BNSF* railroads provide rail service (Port of Orange, no date).

In terms of rail transportation, Texas has three Class 1 (*Burlington Northern Santa Fe*, *Kansas City Southern*, and *Union Pacific*) and two Class III rail lines (*South Orient*, and *Texas-Mexican*). These railroads cover 5,544 miles of railway throughout the state (Wilbur Smith

Associates, 2003b). *Amtrak* is the major intercity and interstate passenger rail service provider in Texas. However, private automotive travel remains the most popular mode of intercity travel as many residents find *Amtrak* rail services inconvenient (Texas Department of Transportation, 2002).

Texans enjoy a wide variety and number of media sources, including daily and weekly newspapers (200+), 227 AM and 296 FM radio stations, and 102 television stations (Doughty, 2003; U.S. Newspaper List, no date).

Physical Infrastructure. As of 1999, a total of 159 utility companies provided electricity to 1,395,908 retail customers in the State of Texas (75 cooperative, 74 public, and 10 private sector). The five largest electricity plants by retail sales within Texas, with corresponding megawatt hours, for all sectors were: TXU Electric Company (95,927,336); Reliant Energy HL&P (69,374,552); Central Power & Light Company (21,303,608); San Antonio Public Service Bd., (15,630,348); and Entergy Gulf States, Inc., (14,832,656). These five utilities accounted for 72 percent of all utility sales in Texas in 1999. Retail sales (per 1000 megawatt hours) summed to $25,692 in this year (USDOE, EIA, 2003b).

The largest natural gas suppliers in Texas include: TXU Gas, Southern Union Gas, Energas, Reliant, Energy/Entex, Lone Star Gas, City of Corpus Christi, Enron Corporation, and City Public Service (San Antonio). Water and sewage services are offered primarily through the municipalities (Texas Economic Development, no date).

There are several major telecommunications companies serving Texas. These include Bell System, GTE Southwest, Contel of Texas, Central Telephone Company of Texas, United Telephone Company of Texas, and Lufkin-Conrow Telephone Exchange (Handbook of Texas Online, 2002b).

Interaction of Biophysical and Built Environments. Texas is a comparatively polluted state; it ranked fifth of 56 US states and territories (one being the most polluted) in 2001. In this same year, Texas ranked in the 95th percentile for total environmental releases (235,259,620 pounds) and in the 95th percentile for its air and water cancer risk. However, Texas's total cancer risk scores have decreased 75 percent from 1988 to 2001 (Scorecard, 2003).

Of Texas's total 2001 environmental releases (235,259,620), air releases accounted for 101,707,777 pounds, water releases totaled 26,008,065 pounds, and land releases equaled 29,848,767 pounds. Additionally, off-site transfers in 2001 totaled 410,234,671 pounds, while production related wastes equaled 3,964,757,315 pounds (Scorecard, 2003).

The top 25 (of 100) releasing facilities in Texas in 2001, with releases in pounds in benzene-equivalents, were: BASF Corporation (17,704,256); Solutia Chocolate Bayou (17,585,235); BP Chemicals Green Lake Facility (14,586,843); Du Pont Victoria Plant (9,941,013); DuPont Beaumont Plant (9,331,055); Gibbons Creek Steam Electric Station (8,423,634); TXU Monticello Steam Electric Station & Lignite Mine (5,565,078); BP Texas City Business Unit (5,554,455); Martin Lake Steam Electric Station and Lignite Mine (5,326,491); Lyondell Chemical Company (4,614,120); Eastman Chemical Company Texas Operations (3,943,180); Limestone Electric Generating Station (3,681,386); Du Pont Sabine River Works (3,310,228); Dow Chemical Company Freeport Facility (3,106,102); ISP Tech, Inc., (2,823,113); TM Deer Park Services L.L.C., (2,755,042); Big Brown Steam Electric Station and Lignite Mine (2,715,931); Alcoa (2,405,140); DuPont La Porte Plant (2,242,166); Merisol USA L.L.C., (2,205,550); International Paper Texarkana Mill (2,173,055); Union Carbide Corporation Seadrift Plant (2,153,637); ExxonMobil Oil Beaumont Refinery (2,098,040); W.A. Parish

Electric Generating Station (2,072,004); and Deer Park Refining Limited Partnership (2,021,832) (Scorecard, 2003).

The top 10 chemical releases presenting a cancer risk to Texas residents in 2001, with pounds in benzene-equivalents, included: carbon tetrachloride (43,000,000); arsenic (organic or inorganic) compounds (39,000,000); cadmium compounds (21,000,000); cadmium (7,300,000); chromium compounds (3,800,000); ethylene oxide (2,300,000); lead compounds (2,300,000); benzene (1,900,000); 1,2,3–trichloropropane (1,200,000) and chromium (1,100,000) (Scorecard, 2003).

More positively, Texas is home to 23 Gulf Ecological Management Sites (GEMS), the largest three of which are Laguna Madre (609 sq. miles), Laguna Atascosa (65,096 acres), and Padre Island (133,000 acres). Each of these GEMS attempts to mitigate the impacts of the built environment on the natural environment.

Separating Padre Island from the South Texas coast, the Laguna Madre is a large shallow body of water (average depth is three feet) encompassing 609 square miles of estuarine and coastal marine systems. Its primary geomorphic characteristics include mudflats, barrier islands, sand dunes, spoil islands, saline marsh, and coastal sand plains. Ownership of the Laguna Madre is both public (e.g., Texas General Land Office; Texas Parks and Wildlife) and private (e.g., Audubon Society; King Ranch) (Texas Parks and Wildlife, 2003).

The Laguna Madre is home to several rare and endangered species, and fifteen rookeries. Protected species include Lilia de Los Llanos, Piping Plover, and the Peregrine Falcon. The Laguna Madre also functions as a breeding ground for numerous waterfowl, and brown shrimp. Wintering duck populations (Redheads, Canada Geese, Snow Geese, Canvasbacks, Pintails, Mallards, and Blue-winged Teal) arrive in the thousands to seasonally feast on Laguna Madre's abundant sea grasses, mollusks, and crustaceans (Texas Parks and Wildlife, 2003).

The Laguna Madre offers both recreational (sport fishing) and commercial (petroleum, fishing) use. Commercial fishermen primarily target brown shrimp, while redfish, black drum, and flounder are the preferred catch of sports fishermen (Texas Parks and Wildlife, 2003).

There are four primary threats to the ecological integrity of the Laguna Madre. These include: oil spills from barges, agricultural pesticide runoff from the Arroyo Colorado (an irrigation drainage of the Lower Rio Grande Valley), hydrocarbon extraction, and accidental release of exotic shrimp or effluent by nearby commercial shrimp farms (Texas Parks and Wildlife, 2003).

The Laguna Atascosa National Wildlife Refuge covers 65,096 acres of lower Gulf Coast land in Cameron and Willacy Counties. Founded in 1946, this habitat provides protection for 10 federally endangered/threatened species including: northern aplomado falcon, ocelot, Gulf Coast jaguarondi, brown pelican, hawksbill sea turtle, Kemp's ridley sea turtle, piping plover, American alligator, green sea turtle, and loggerhead sea turtle. A wide variety of migratory birds also use the refuge as a wintering area. Laguna Atascosa additionally bears the distinction of being an archeological site, the southernmost waterfowl refuge in the United States, and having the most bird species (411) of any national wildlife sanctuary (Texas Parks and Wildlife, 2003).

The primary geomorphic characteristics of Laguna Atascosa include resecas (dry oxbow lakes), tidal mud/sand flats, brush-covered sand/clay dunes, coastal prairies, and wetlands. The Laguna is primarily used for educational purposes (e.g., research, student fieldtrips), outdoor recreational activities (e.g., hiking, fishing, hunting, biking, bird watching), and various commercial activities (e.g., exploration, special use). It is owned by the federal government and managed by the U.S. Department of Interior, Fish and Wildlife Service. Threats to the Refuge's

ecological integrity include increased development of the surrounding area, state road expansion (improved roads may lead to increased ocelot mortality), dredging, and disposal of spoil materials on and near the sanctuary from the Gulf Intracoastal Waterway (Texas Parks and Wildlife, 2003).

Spanning more than 133,000 acres of barrier islands, the Padre Island National Seashore (PINS) extends across Kenedy, Kleberg, and Willacy Counties. Established by the federal government in 1962, PINS is composed of wide, clean sandy beaches, a row of sand dunes running parallel to the shore, and grassy flats. It serves as a coastal barrier island system. Rare and endangered species on the island include: peregrine falcon, Texas pipefish, piping plover, loggerhead sea turtle, Kemp's Ridley sea turtle, and seacoast bluestem. Padre Island also serves as a breeding ground for colonial nesting birds such as white pelicans, great blue herons, snowy egrets and laughing gulls, and a variety of shorebirds. One hundred twenty-five migratory species visit the island in the fall and spring, while Sandhill Cranes, herring and ring-billed gulls, peregrine falcons, and ospreys winter here (Texas Parks and Wildlife, 2003).

Padre Island is primarily used educationally, recreationally (e.g., fishing, camping, boating), and privately (mineral rights). The National Park Service is principally responsible for managing the use of the privately held mineral rights and limits commercial use (Texas Parks and Wildlife, 2003).

There are four primary threats to Padre Island's ecological integrity. These include: continued dumping of plastics into the Gulf of Mexico which then wash ashore on the Island; air quality problems from area industries; potential for oil/gas contamination and oil spills; and increased residential and commercial development (Texas Parks and Wildlife, 2003).

C. HISTORY

Settlement. A number of Native American groups inhabited the region of Texas long before European settlement. The Caddoan linguistic group inhabited the eastern part of Texas, along with the neighboring states of Louisiana and Arkansas. These people lived in large, spread-out village farm dwellings between the Neches and Sabine Rivers. By 1500, approximately 200,000 Caddos had organized into three confederacies consisting of the Natchitoches, the Kadohadacho, and the Hasinai. By the 1700s, however, European-borne diseases had eliminated 90 percent of the Caddos (Campbell, 2003).

Other native populations included the Karankawas and the Coahuiltecan. The Karankawas were subsistence fishers, hunters and gatherers who lived along the Gulf Coast. The Coahuiltecan, who lived near the lower Rio Grand, survived on deer, javelina, pecans, mesquite beans, prickly pear cactus, stool plant bulb, lizards, and snakes. The Lipan, a nomadic subgroup of the Apaches, roamed across the eastern part of the state. While they initially fought against intruding American settlers, they became allies in the 19th century. The Mescalero, another Apache subgroup, inhabited the western part of the state. The Tonkawa, who hunted large game, occupied the central part of the state, while the Comanche claimed the north and northwest (Campbell, 2003).

Beginning with Pineda in 1519, many Spanish explorers discovered Texas during the 16th and 17th centuries. Other explorers included Cabeza de Vaca, who shipwrecked on Galveston Island in 1528, and De Coronado, who traveled across Texas between 1540 and 1542. Europeans began settling in the state in 1685 (Yoakum, 1855).

The first European emigrants to come to present-day Texas were Robert Cavalier, and the Sieur de La Salle exploration party. The latter navigated the Mississippi River from Canada and eventually followed the coastline to what is now Matagorda Bay in 1685. Here, he established Fort St. Louis and began a colony. Two years later, La Salle was murdered by his own men (Yoakum, 1855).

While La Salle considered Texas a part of the Louisiana Territory, the Spanish did not. Not surprisingly, escalating tensions contributed to the war between France and Spain. Spain began permanently occupying the territory in 1715, establishing missions throughout Texas. The towns of San Antonio, Adaes, La Bahia, Nacogdoches, Orquisaco, and Mound Prairie were established alongside the Franciscan missions (Yoakum, 1855). Despite the Spanish claim to the land, France and England continued to contest sovereignty.

By 1800, the Spanish colony was increasingly surrounded by non-Spanish inhabitants. Hoping to stave off an attack, the Spanish government gave Anglo-Americans access to the Mississippi while it simultaneously discouraged immigration to Texas; Anglo-Americans who came to the territory were often slain. In 1812, the Republican Army of the North, under the command of William Magee and Bernardo Gutiérrez de Lara, crossed the Sabine River and invaded Texas. After several confrontations and retreats by the Royalist Army, the Republican Army eventually claimed the independence of Texas and drew up a constitution (Campbell, 2003).

Tensions between the Mexican and American governments once again flared when Mexico barred immigration into Texas in 1830. Within two years, escalating tensions culminated in the Battle of Fort Velasco and the Battle of Nacogdoches. After the defeat of the Mexicans, Texans completed their constitution and submitted it to the U.S. government for ratification and, in1836, the Texas Declaration of Independence was signed (Yoakum, 1855).

Nevertheless, the Mexican government continued to contest sovereignty. Indeed, between 1836 and 1846, fierce battles, sieges, and raids waged on both Texas and Mexican soils led to eruption of the Mexican-American War in 1846. By this time, however, President Polk had already admitted Texas as the 28th state in the nation. Boundary disputes would remain unresolved (at least as far as Mexico was concerned) until the Compromise of 1850.

Industrialization. Beginning in the 1820s with the arrival of southern immigrants, the Texas economy developed around the institution of slavery and agricultural production, particularly cotton. At this time, nearly 75 percent of all Texan families were headed by southerners from other states; and, roughly 25 percent of these families owned at least one slave (Campbell, 2003).

Extreme growth characterized Texas's agricultural economy between 1850 and 1860 when acreage in the state increased by 305 percent, corn crops by 187 percent, and cotton crops by 643 percent. However, the state lagged behind others in transportation, manufacturing, and urbanization (Campbell, 2003).

The Civil War had little direct impact on Texas. It did, however, prevent local railroad lines from linking with the national system, thus limiting access to external markets. As late as 1871, Texas had only one interstate rail connection running between East Texas and Shreveport, Louisiana (Pratt, 1980).

Between 1870 and 1900, the state's population flourished, particularly along the coast and the interior areas that were economically and geographically connected to the coast. In 1870, 9,382 persons lived in Houston and in 13,818 in Galveston. By 1900, the population of these cities grew to 44,623 and 37,789, respectively (Pratt, 1980).

After the 1901 discovery of oil at Spindletop in Beaumont (Jefferson County), new economic patterns began to emerge, notably, the development of industry. In this decade, many new manufacturing plants were established, sulfur production quadrupled, meat-packing plants were constructed in Fort Worth and other cities, and public utility companies grew, generating power by burning oil, natural gas, or lignite coal (McKay and Faulk, 1965). Lumber developed as a distinct industry as paper-manufacturing plants proliferated, including the Champion Paper and Fiber Company at Pasadena. At the same time, timber exports declined as local demand for timber increased. The Sabine-Neches region continued as the center of timber activity, and Orange reemerged as a processing and shipping center for lumber (Pratt, 1980).

The shipping industry grew tremendously during the interwar years, in part as a result of the Houston Ship Channel's debut in 1914. Total tonnage at the Port of Houston increased from about one million to nearly 14 million between 1919 and 1929; and, by 1941, this figure had nearly doubled. By 1931, Houston was the sixth largest port in the nation in foreign commerce and third in total exports. Oil and cotton were its chief exports (Pratt, 1980).

The coastal cities of eastern Texas also experienced significant growth during these years of industrial growth. By 1940, Houston was the most populated city in the state and the 21st largest city in the U.S. (Pratt, 1980).

The manufacturing industry developed rapidly during the 1950s. Attracted to the Gulf Coast region's numerous resources, including affordable transportation and easy access to oil and natural gas, many chemical production and manufacturing companies established plants in the area. These plants included Reynolds Aluminum, Dow Chemical, Sinclair Oil, Hughes Tool, Champion Paper, Cameron Iron, Sheffield Steel, Shell Oil, Carbide and Carbon Chemical, American Oil, Humble, DuPont, Gulf Oil, Texaco, and Magnolia Oil. At the same time, Convair, General Motors, and Ford settled in the northern part of the state. By 1947, there were 7,128 manufacturing companies and plants in Texas, with $1.7 billion in value; by 1973, there were 14,431 manufacturing establishments, with $15.2 million in value. Although electronics grew faster than any other industry, oil refining and chemical production were the mainstays of the Texas economy throughout the latter half of the 20th century (Campbell, 2003).

Oil. Sightings of oil seepages in Texas date back to the mid-1500s when Spanish explorers used oil to caulk their ships (Warner, 1966; Olien and Olien, 2002). Later, travelers on the Spanish Trail used oil from ground seepages to lubricate wheels, while Indian, Hispanic, and Anglo settlers found medicinal uses for oil taken from springs (Olien and Olien, 2002).

Albeit on a small scale, crude oil production has existed in Texas throughout the 19th century. Between 1870 and 1890, a number of oil companies drilled wells, though all were shallow and limited in production. By 1890, local demand for oil as a lubricant and boiler fuel prompted the construction of a 15-mile pipeline from Oil Springs to the railroad at Nacogdoches, along with a small refinery near Bayou Vistador (Olien and Olien, 2002). In 1896, the state experienced its first oil boom, occurring at Corsicana. At this site, approximately 300 oil wells produced 800,000 barrels over the next four years (McKay and Faulk, 1965).

The discovery of oil at Spindletop in Beaumont, Texas ushered in a new era for the oil industry at both the state and national level. The Gladys City Oil, Gas, and Manufacturing Company, who had three failures in drilling in Beaumont, eventually found oil at about 1,020 feet in early 1901. This discovery marked the beginning of the first great oil boom in Texas and the start of the "gusher age" (Olien and Olien, 2002).

Small refineries and pipelines followed the discovery of oil. By 1902, one pipeline from Spindletop to the Neches River, two pipelines to Port Arthur, and a fourth pipeline to Sabine had

been laid. Refineries accompanied pipeline development. In 1902, three developers established two refineries in Port Arthur and one in Beaumont: J.S. Cullinan (then called the "Texas Fuel Company"), Guffey and Galey, and the Burt Oil Company. By 1904, over $10 million had been invested in refineries, which were soon competing on the petroleum market (McKay and Faulk, 1965).

By 1903, however, Spindletop production began to suffer from over-drilling and overproduction of the area and, in 1905, production peaked at 28 million barrels. Production further fell to less than 10 million barrels in 1910 (McKay and Faulk, 1965). Consequently, overproduction caused prices to drop severely and "wrecked the market" (Haley, 1993).

To counter this loss, industry leaders buried hundreds of miles of feeder pipelines bringing crude oil directly to the refineries; by 1910, oil production began to increase. Industry investments facilitating financial diversification contributed further to the economic growth of four major companies: Gulf Oil Corporation, the Texas Company, the Magnolia Petroleum Company, and the Humble Oil and Refining Company (McKay and Faulk, 1965).

World War I increased national demand for more oil. "Perfectly timed" oil strikes at Goose Creek in 1916 and 1917, producing 8,000 and 35,000 barrels a day, respectively, turned the sleepy town of Ranger (south of Houston) into a boomtown. Following World War I, oil field discoveries at Mexia (1920), Luling (1922) and Permian Basin (1921) turned these villages, too, into boomtowns practically overnight (Haley, 1993).

Growth in industry technology accompanied these discoveries. Ross Sterling, who bought his first oil well in 1911 and acquired a pipeline to transport petroleum from the Goose Creek field, established the Humble Oil and Refining Company. Other advances include an apparatus that prevented blowouts and steel platforms. By 1925, more than 80 refineries "elevated the state from the colonial status of a raw-materials producer to that of an economic colossus" (Haley 1993, 167).

In 1930, East Texas Field, the largest field in North America, was discovered. Drilling rapidly expanded into five counties and, soon, more than 27,000 wells on 134,000 acres were established. The field "became a giant" with reserves of roughly 6 billion barrels (Hughes 1993, 138).

Beginning in 1930, however, oil from the East Texas field swamped the U.S. crude oil market, driving prices down to levels at which production was no longer profitable. Oilmen lost the hope that they could regulate themselves. Although the Railroad Commission tried to gently correct the market by enforcing production restrictions, Ross Sterling, governor of Texas in 1931, declared a shutdown by martial law and ordered National Guard troops into the East Texas field. The field was temporarily shut down from August 17 to September 5 of 1931, during which time prices rose from 10 to 85 cents a barrel. In 1932, the Railroad Commission issued 19 prorogation orders, all of which were successfully challenged by producers. The battle between producers and regulatory agencies continued. However, a number of independent producers and several "majors," including Humble Oil, organized the Texas Oil and Gas Conservation Association (TOGCA) and, in 1933, TOGCA pushed the Texas Legislature to establish a new oil and gas regulatory agency–the Natural Resources Commission (Olien and Olien, 2002).

While contention defined the oil industry of East Texas during the early 1930s, the industry continued to expand. In 1933, Amerada undertook the first seismic exploration off of Brazoria County, while both the Salt Dome Oil Company and the California Company conducted geophysical studies off of Galveston Bay. The first drilling pier was established in 1935 following the Stanolind Oil and Gas Company's work with area torsion balance and reflection

seismograph. By September 1935, Texas was leasing tracts in and near Turtle Bay to three major oil companies. After the 1938 discovery and development of Creole Field offshore Cameron Parish in Louisiana, more attention was given to the Texas coast. In this same year, Humble drilled off of Jefferson County, but its holes were dry. A year later, another dry hole drilled at Sabine Pass further discouraged geoscientists. Finally, drilling offshore was put to rest for several decades. Nevertheless, technological advances continued including controlled directional drilling, submersible drilling barges, and diesel electric power (Olien and Olien, 2002).

Shipyard development accompanied the growth of the oil industry. Shipyards along the Texas Gulf Coast became more specialized in constructing oil-related marine equipment, including offshore drilling rigs, and in facilitating the large oil companies' private water transportation system (Pratt, 1980). Texaco, one of the first companies in the state to operate a shipbuilding industry, organized the Texas Steamship Company in 1912, but later abandoned this effort in favor of purchasing ships from established eastern shipyards. As Pratt notes:

> The oil-related industrial complex on the Gulf Coast centered around the large refineries; other regions throughout the world benefited more directly from other activities, such as shipbuilding …The glue holding together the various regional economies that performed such oil-related functions was the vertically integrated operations of the largest oil companies (1980, 136).

During World War II, the petrochemical industry expanded along with the oil industry to accommodate the demands of the war. Although offshore oil exploration was well established by this time, production advanced in leaps and bounds following the war. The coast line soon became dotted with oil rigs established by major oil companies.

During the 1950s, eight new gas fields were discovered: Hansford (1953); Emperor (1954); Dora Roberts (1955); Fashing and Halley (1956); Viboras (1957); Thompsonville (1959); and the Massive First and Massive Second Sands of Viboras (1959). While production continued, the domestic market struggled against the inexpensive foreign crude oil market. In 1955, imports increased by over 17 percent, and over the following few years, domestic demand dropped. Consequently, the Railroad Commission reduced producing days to only eight days of the month in 1990. As a result, a number of oil and gas companies were sold (Handbook of Texas Online, 2002a).

In 1964, the Permian Basin Rate Case went to the Supreme Court, which resulted in a ruling of greater jurisdiction by the Federal Power Commission over the production of oil and gas for the interstate market. Oil prices increased as well as activity in the state, and in 1972, Texas oil production peaked at over 1.26 billion barrels; however, oil reserves had been on the decline since 1951, when reserves proved to be 15.6 billion barrels. In 1973, drilling and exploration heightened, and the number of oil rigs established increased 61 percent from 1973 to 1975 (Handbook of Texas Online, 2002a).

The final oil boom in the state occurred in the 1970s and the 1980s. By 1981, however, the bottom of the industry had fallen out. Nevertheless, Texas oil refineries remained the most active in the U.S., processing over 1.6 billion barrels of fluid during 1992 (Handbook of Texas Online, 2002a).

D. DEMOGRAPHIC CHARACTERISTICS

Population and Growth. With the exception of the decade between 1930 and 1940, the state has experienced steady and significant increases in population in every decade since 1940. Particularly increases occurred between 1920 and 30 (25%), 1940 and 1950 (20%), 1950 and 1960 (24%), 1970 and 1980 (27%) and 1990 and 2000 (23%). In all, the population of the State of Texas increased 72 percent, and gained (Table 1) (U.S. Census Bureau, 2000b).

Table 1

Population Changes, Texas State: 1930-2000

Year	Population	Change from Previous Census	Percent Change from Previous Census
2000	20,851,820	3,865,310	22.7
1990	16,986,510	2,757,319	19.4
1980	14,229,191	3,032,461	27.1
1970	11,196,730	1,617,053	16.9
1960	9,579,677	1,868,483	24.2
1950	7,711,194	1,296,370	20.2
1940	6,414,824	590,109	10.1
1930	5,824,715	1,161,487	24.9

Source: U.S. Census Bureau, 2000b.

Ethnicity and Age. The majority of the population in Texas is White; there is also a large Hispanic population. In 2000, the state's population was 71 percent Caucasian or White, 32 percent Hispanic, and 12 percent African-American or Black. American Indians, Asians, and Pacific Islanders comprised only a small percentage of the total population, and nearly 12 percent of the population self-identified as "Other". An additional 3 percent claimed two or more racial identifications (Table 2).

Table 2

Racial and Ethnic Populations, Texas State: 2000

Race/Ethnicity	Population	Percent
White	14,799,505	71.0
African American	2,404,566	11.5
Hispanic*	6,669,666	32.0
American Indian	118,362	0.6
Asian	562,319	2.7
Pacific Islander	14,434	0.1
Other Race	2,438,001	11.7
Two or More Races	514,633	2.5

* Hispanics may be of any race.
Source: U.S. Census Bureau, 2000b.

Texas is a state with a large percentage of persons under the age of 18. In 2000, 10 percent of the population was 65 years of age or older. In this same year, 28 percent of the population was under 18 years of age. The median age of Texan residents was 32.3 in 2000; the national median age was 35.3 (U.S. Census Bureau, 2000b).

E. ECONOMY

Income and Poverty. Indicators of economic health for the State of Texas are mixed. For example, while Texans earned a median family income of $45,861 in 2000, or 91 percent of the national median ($50,046), poverty rates for both individuals (15%) and families (12%) exceed national poverty figures of 12 percent and 9 percent, respectively. Additionally, while single women with minor children headed 7 percent of all Texan households, they accounted for 36 percent of families living in poverty. Nevertheless, poverty rates for this population are lower in Texas than for the nation as a whole, where single women with minor children headed 12 percent of all families, but represented 44 percent of all families living below the poverty threshold. Texan households receiving public assistance in 2000 (3.2%) did so at rates comparable to the nation as a whole (3.2%) (Table 3) (U.S. Census Bureau, 2000b).

Table 3

Income, Poverty and Family Structure, Texas State: 1970-2000

Year	Median Family Income (2000 Constant $)	Change from Previous Census	Ratio to National Median	Persons in Poverty	Households Receiving Public Assistance*	Female-Headed Families with Children
2000	$45,861	$14,308	0.91	15.4%	3.2%	7.6%
1990	$31,553	-$1,320	0.89	18.1%	8.4%	16.1%
1980	$32,873	$6,166	0.98	14.7%	--	--
1970	$26,707	$7,542	0.88	18.8%	--	--

*Prior to the Census 2000, the Decennial Census enumerated "persons" receiving public assistance rather than "households".
Source: U.S. Census Bureau, 2000b.

Employment. Historically, the Texas economy has been based upon agriculture, livestock, and forestry. After the 1901 discovery of oil at Spindletop, the manufacturing industry boomed as oil refining and petrochemical businesses grew. State employment trends reflect this growth. In 1940, the majority of the state's population worked in the agriculture, fishing, and forestry, and manufacturing industries. Over the latter half of the 20th century, however, services came to dominate the state as the primary employment sector. For example, while agriculture declined 29 percent in 1990, services increased 53 percent. This growth trend continued throughout the decade. By 2000, the service sector employed nearly four million people, or 41 percent of the labor force. And, despite a 7 percent decrease in its employment rate, manufacturing remains strong in the economy, employing nearly 12 percent of the state's labor force (Table 4) (U.S. Census Bureau, 2000b).

Table 4

Employment in Major Industrial Sectors, Texas State: 1990-2000

Year	Agric., Fishing & Forestry	Mining	Constr.	Manuf.	Trans., Comm. & Public Util.	Wholesale & Retail Trade	Finance, Insurance & Real Estate	Services	Public Admin
Workers in sector									
2000	150,792	121,524	743,606	1,093,752	535,568	1,470,932	630,133	3,812,328	417,100
1990	212,402	164,571	514,102	1,101,938	580,315	1,707,213	521,461	2,487,488	344,859
Percent of Workers in Sector									
2000	1.6%	1.3%	8.1%	11.8%	5.8%	15.9%	6.8%	41.3%	4.5%
1990	2.8%	2.1%	6.7%	14.4%	7.6%	22.3%	6.8%	32.6%	4.5%
Growth from Previous Census									
2000	-29.0%	-26.1%	44.6%	-7.0%	-7.7%	-13.8%	20.8%	53.2%	20.9%
1990	--	--	--	--	--	--	--	--	--

Source: U.S. Census Bureau, 2000b.

In 2002, the 20 largest employers by total number of employees in Texas were: American Airlines (Dallas/27,000); University of Texas at Austin (Austin/23,787); Dell Inc., (Round Rock/21,000); Kemah Boardwalk (Kemah/20,000); Drivers License Department (San Antonio/15,210); USAA (San Antonio/12,500); MD Anderson Cancer Center (Houston/12,000); University of Texas MD Anderson Center (Houston/11,000); UTMD Anderson Cancer Center (Houston/11,000); Lockheed Martin Corporation (Fort Worth/10,500); Electronic Data Systems Corporation (Plano/10,000); Wilford Hall USAF Hospital (Lackland AFB/8,000); Texas Tech University (Lubbock/8,000); Texas A & M University Newspaper (College Station/7,500); Dow Chemical Company (Freeport/7,500); Bell Helicopter Textron Inc., (Hurst/7,500); Scott & White Hospital (Temple/7,000); Parkland Health & Hospital System (Dallas/6,900); Motorola Semiconductor Products (Austin/6,000); and Methodist Diagnostic Hospital (Houston/6,000) (InfoUSA, 2004).

As of 2005, there were 48 Texas-based companies on the Fortune 500 list (Business and Data Industry Center, 2005), and 94 on the Fortune 1,000 list (Fortune 500, 2005). The top five companies on the list are: Exxon Mobil, Conoco Phillips, Valero Energy, Dell, and Marathon Oil (Fortune 500, 2005).

Industry. While Texas was historically an agricultural and manufacturing center, state earnings increasingly point to the growing importance of the services sector. In fact, "services" is the principle industry sector in the state in terms of workers' earnings, followed by government and manufacturing (Table 5). For example, services accounted for more than 25 percent of workers' earnings ($422 billion) in 1999. Moreover, this reflects an increase of nearly

29 percent in service earnings from 1990. Manufacturing earnings in 1999 amounted to nearly $56 billion, or 13 percent of total earnings, with industrial machinery and equipment manufacturing, and chemical and allied product manufacturing each contributing 2 percent to this total. This sector experienced 11 percent growth from 1990, mostly in these two sub-sectors. Earnings from oil and gas extraction constituted 4 percent of total earnings, or $18 billion in 1999 (Table 5).

In 2002, the top five agricultural commodities in Texas, with their value of receipts in thousands, were: cattle and calves ($5,862,734); greenhouse/nursery ($1,348,136); cotton ($974,367); broilers ($893,327); and dairy products ($680,604). These commodities had a total value of $12,664,912 (U.S. Department of Agriculture, ERC, 2004).

The top five agricultural exports in 2002, with their value in millions, were: live animals and meat ($696); cotton and linters ($426); hides and skins ($284); feeds and fodders ($271); and feed grains and products ($260). Total economic value (in millions) of these products sums to $2,932 (U.S. Department of Agriculture, ERC, 2004).

The top five agricultural counties in terms of 1997 sales, with their percent of the state's total receipts, were: Castro (5%), Deaf Smith (5%), Parmer (4%), Swisher (3%), and Dallam (3%) (U.S. Department of Agriculture, ERC, 2004).

As of June 1999, Texas had 4,620 banking and savings institutions, with deposits totaling over $144.7 billion. It also had 736 savings institutions, with deposits totaling $207 billion. Expenditures in federal funds and grants in this same year totaled $98 billion (U.S. Census Bureau, 2002).

Table 5

Earnings in Major Industry Sectors and Selected Sub-sectors,
Texas State: 1990-1999

Industry	Earnings (Constant 2000 $1000's)		Share of Earnings	Change	Share of Change
	1990	1999	1999	1990-1999	1990-1999
Earnings	$224,613,728	$422,006,707	100.0%	$197,392,979	100.0%
Farm Earnings	$2,713,136	$4,353,527	1.0%	$1,640,391	0.8%
Ag. Services, Forestry, and Fishing	$1,221,896	$2,487,724	0.6%	$1,265,828	0.6%
Fishing	$89,698	$91,498	0.0%	$1,800	0.0%
Mining	$10,886,626	$18,799,695	4.4%	$7,913,069	4.0%
Oil and gas extraction	$10,438,424	$18,136,274	4.3%	$7,697,850	3.9%
Construction	$13,052,816	$27,489,268	6.5%	$1,443,452	0.7%
Special trade contractors	$7,079,508	$16,355,426	3.9%	$9,275,918	4.7%
Manufacturing	$34,450,261	$55,753,761	13.2%	$21,303,500	10.8%
Fabricated metal prods.	$2,564,932	$4,233,729	1.0%	$1,668,797	0.8%
Indust. machine & equip.	$4,337,627	$8,443,702	2.0%	$4,106,075	2.1%
Food and kindred	$2,564,210	$3,483,331	0.8%	$919,121	0.5%
Chemicals and allied	$4,718,260	$7,952,397	1.9%	$3,234,137	1.6%
Petroleum and coal	$1,629,688	$2,004,974	0.5%	$375,286	0.2%
Transportation and Public Utilities	$17,851,374	$38,658,341	9.1%	$20,806,967	10.5%
Trucking & warehousing	$3,160,870	$6,350,399	1.5%	$3,189,529	1.6%
Water transportation	$485,294	$697,347	0.7%	$212,053	0.1%
Transportation by air	$3,045,495	$5,864,995	1.4%	$2,819,500	1.4%
Wholesale Trade	$15,374,575	$30,625,823	7.2%	$15,251,248	7.7%
Retail Trade	$21,233,611	$37,509,519	8.9%	$16,275,908	8.2%

Table 5

Earnings in Major Industry Sectors and Selected Sub-sectors,
Texas State: 1990-1999 (continued)

Eating & drinking places	$4,766,639	$9,147,353	2.2%	$4,380,714	2.2%
Finance, Insurance, and Real Estate	$13,992,269	$33,791,495	8.0%	$19,799,226	10.0%
Services	$54,586,228	$111,568,827	26.4%	$56,982,599	28.8%
Business services	$11,235,877	$31,113,812	7.4%	$19,877,935	10.1%
Health services	$16,169,418	$28,583,862	6.8%	$1,241,444	0.6%
Legal services	$5,658,306	$8,066,697	1.9%	$2,408,391	1.2%
Engineering and management services	$938,856	$2,477,888	0.6%	$1,539,032	0.8%
Government	$39,250,936	$60,968,727	14.4%	$21,717,791	11.0%

Source: U.S. Department of Commerce, Bureau of Economic Analysis, 2000.

Marine-based Activities. Some 2.4 million persons fished recreationally in Texas in 2001 (91% residents; 9% non-residents). These anglers spent $2 billion dollars on fishing-related expenses in Texas in this same year, 45 percent of which was spent on trip-related expenses, 36 percent on equipment, and 20 percent on other fishing-related expenses (U.S. Department of the Interior, Fish and Wildlife Service & U.S. Dept. of Commerce, Census Bureau, 2003).

Saltwater and freshwater commercial and recreational fishing by both residents and non-residents in the State of Texas in 2001 generated a combined total of $1.1 billion dollars in earnings, $125 million in state sales tax revenues, $187 million in federal income taxes, and $2.1 billion in retail sales. A total of 41,313 persons were employed by the recreational and commercial industries in that same year (Southwick and Allen, 2003).

Commercial fishing in Texas centers on salt-water fishing along the Gulf Coastline where shrimp is the primary catch. Other important commercial product includes: crab, oysters, finfish, snapper, black drum and tuna. Brownsville-Port Isabel, Aransas Pass-Rockport and Freeport are the leading centers of commercial fishing in Texas. In 2000, 1,459,843 anglers acquired fishing licenses in the State of Texas (U.S. Department of Fish and Wildlife Service, 2000).

Aransas County relies extensively on shrimping, fishing, and marine-related tourism to support its economy, with shrimping as the top commercial fishing activity. White, brown, and pink shrimp are the primary catches, but the marine industry also supports a large bait shrimp industry. In 2002, the shrimp vessel contribution to the county tax base was 0.43 percent for Aransas County (Texas Parks and Wildlife 2002, 53). Other markets include blue crab, stone crab, commercial fin fishing, black drum, flounder, and snapper.

The Port of Brownsville also supports one of the largest shrimp boat fleets in the world, but, due to overfishing, the state implemented harvest restrictions on the shrimping industry in

1994. In 2002, the shrimp vessel contribution to the county tax base was only 0.11 percent for Cameron County (Texas Parks and Wildlife 2002, 53).

Military Installations. As of August 2001, there were 13 active military installations in Texas. Seven of these installations were Air Force, two were Army, and four were Navy.

Fort Brooks Air Force Base (AFB) is located in southeast San Antonio in Bexar County. It was dedicated in 1917. Fort Brooks is home to the 311th Human Systems Wing whose mission it is to protect and enhance aerospace medicine, crew systems, human resources, and environment, safety, and occupational health (Global Security, 2003; Military.Com, 2000).

Dyess AFB is located in west central Texas in the city of Abilene (Taylor County). This 6,409 acre base is home to the Seventh Bomb Wing and more than 13,000 military and civilian personnel. It was dedicated in 1956. The Bomb Wing develops and maintains operational capacity for 38 B-1B aircraft. It is also responsible for educating and producing combat-ready aircrews. Employing over 5,000 people, Dyess AFB is the single largest employer in Taylor County (Global Security, 2003; Military.Com, 2000).

Goodfellow AFB is located on 1,137 acres of land in west Texas near San Angelo. This base is home to the17th Training Wing, and several tenant organizations. The Wing's primary mission is to provide air education and training to Air Force personnel (Global Security, 2003; Military.Com, 2000).

The 7,000-acre Lackland AFB is located in southwestern San Antonio. It was established in 1942. This base houses the 37th Training Wing whose responsibility it is to provide training to all non-prior service airmen of the regular Air Force, Air National Guard, and Air Force Reserve (Global Security, 2003; Military.Com, 2000).

Laughlin AFB is located in Del Rio, Texas. In operation since 1962, this air education and training command readies undergraduate pilots for service in the United States Air Force (Global Security, 2003; Military.Com, 2000).

Randolph AFB is located in Universal City. It was dedicated in 1930. This base is the headquarters of the Air Education and Training Command. The Air Force Personnel Center, the Air Force Headquarters Recruiting Services, and the 19th Air Force also maintain a presence here. Randolph employs 5,700 military and 6,500 civilians (Global Security, 2003; Military.Com, 2000).

Sheppard AFB is located in Wichita Falls. This training and education center is the largest and most diversified training base. It provides specialty academic training to undergraduate pilots including aircraft maintenance, civil engineering, communications, and comptrolling. Sheppard AFB has been active since 1941 (Global Security, 2003; Military.Com, 2000).

The Fort Bliss Army Base spans more than one million acres in the city of Fort Bliss. It is the Army's second largest base and was established in 1848. Fort Bliss is primarily responsible for air defense artillery training, and contributes more than $1billion dollars to the local economy each year (Global Security, 2003; Military.Com, 2000).

Fort Hood is the largest active duty armored post in the nation (340 square miles). Fort Hood is located in west Texas adjacent to the town of Killeen. The First Cavalry Division, Fourth Infantry Division, Command III Corps (headquarters), Third Personnel Group, Third Signal Brigade, and many other tenet organizations make their home here. Approximately 71,000 persons (42,000 soldiers) are posted at Fort Hood (Global Security, 2003).

The Naval Air Station (NAS) Corpus Christi is located 10 miles southeast of Corpus Christi in southeast Texas. This NAS is home to the Chief of Naval Air Training, Commander,

Mine Warfare Command, Naval Hospital, Training Air Wing Four, VT-27, VT-28, VT-31, Corpus Christi Army Depot, U.S. Customs, and the Coast Guard Air Group/Air Station. The primary responsibilities of the NAS Corpus Christi include instruction on basic flight maneuvering and traffic pattern operations (Global Security, 2003; Military.Com, 2000).

The NAS Joint Reserve Base Fort Worth is responsible for training the Naval Air/Surface Reserve Forces. It is located in the city of Fort Worth and was commissioned in 1994. This base hosts several fighter/attack and airlift units from the reserve components of the Navy, Marine Corps, and Air Force (Global Security, 2003)

Naval Air Station (NAS) Kingsville is located in the city of Kingsville in south Texas near Corpus Christi. Its primary mission is jet aviation training. Kingsville hosts Training Air Wing TWO, and a variety of military and civilian tenant organizations. This base employs 850 military personnel and 625 contract maintenance personnel (Global Security, 2003).

Naval Station Ingleside is in the city of Ingleside in the "Coastal Bend" region of Texas. It was established in 1988. The personnel at this base are responsible for supporting all commands of the "Mine Warfare Center of Excellence." This base is the homeport to 12 Avenger Class mine-countermeasure vessels and 12 Osprey Class coastal mine hunters. Approximately 3,400 Navy personnel are housed at Ingleside (Military.Com, 2000).

Recreation and Tourism. Texas is a state known for its outdoor recreation, including hiking, paddling, biking, fishing, and birding. National parks include Big Bend, Big Thicket, and the Guadalupe Mountains. Angelina, Davey Crockett, Sabine, and Sam Houston are among the national forests located within the state. Popular State Parks include Beaver's Bend, Buescher, Inks Lake, Pedernales Falls, and South Llano River. Texas's National Recreation Areas– Lake Meredith and Padre Island National Recreation Areas– additionally afford ample opportunity for enjoyment. Golf is also an economically important recreational activity within the state.

State festivals include the Houston-Stafford Texas Hot and Spicy Festival, and the Sugarland Children's Festival; the Anahuac Texas Gatorfest; the Hallettsville State Championship Fiddlers Frolics; the Huntsville Sam Houston Folk Festival; the Anhalt Cajun Festival and Gumbo Cookoff; the Houston Seafood Festival, the Houston Soulfood and Comfort Food Festival; the Bedfore Blues Festival and Arts Fair in Dallas; the Unity through Diversity Festival in Amarillo; the Rains County Eagle Festival in Emory; the Miller Fest in Fort Worth; the Texas Butterfly Festival in Mission; the Sahawe Indian Dancers Winter Night Festival; the Glen Rose Fall Bluegrass Festival; the Poteet Strawberry Festival; the Kilgore Shakespeare Festival; the Arlington Feast Fest; the Texas Book Festival in Austin; the Scottish Festival in Arlington; and the Friends of Willis Festival in Willis. Texas also maintains 542 public libraries.

The recreation and tourism industry is vital to the Texas economy. According to the Texas State Senate, only California attracts more visitors than Texas. Visitors from the United States took 116 million leisure trips to Texas in 2000, spending over $110 million each day. In that same year, over one million international tourists spent approximately $4 billion dollars. The travel and tourism industry contributed $40 billion to the Texas economy in 2000. It also employed nearly half of a million people, and produced $2 billion dollars in state revenue taxes (Texas State Senate, 2002).

In 2000, combined city and county local hotel occupancy taxes generated approximately $3 billion in revenue; this reflects a 9 percent increase from 1999. Dallas ($49 million), Houston ($41 million), San Antonio ($34 million) and Austin ($29 million) were the top four revenue-

generating cities in 2000, while the Central Texas region generated the highest amount of per capita municipal hotel tax revenue ($26.35 per capita) (Texas Economic Development, no date).

F. LOCAL GOVERNMENT

Governmental Structure. The Chief Executive of Texas–the Governor– is elected to a four-year term with no term limits. Other elected officials serving in the executive branch include lieutenant governor, attorney general, treasurer, comptroller of public accounts, commissioner of agriculture, and commissioner of general land office. Thirty-one senators (four-year elected terms) and 150 representatives (two-year elected terms) comprise the body of the Texas legislature. At the local level, each of Texas's 254 counties is governed by an elected commissioner's court. Each court consists of a county judge or administrator and four commissioners. The local government structure also includes an elected county attorney, treasurer, sheriff, and assessor-collector of taxes.

Revenues and Taxation. Sales and state income taxes generate 55 percent of Texas's annual tax revenue. In fact, Texas ranks third among the states in personal income taxes (Texas Senate Committee, 2002). Texas imposes neither corporate income taxes nor a state property tax. Sales, and use tax for the state is approximately 6 percent; however, local taxing jurisdictions retain the option of imposing up to an additional 2 percent in sales and use taxes (Texas Comptroller of Public Accounts, 2004).

In the 2001 fiscal year, Texas state and local taxes generated $54 billion in revenue. Of this amount, local property taxes accounted for 23 billion (43%), state sales tax contributed 15 billion (27%), other sales taxes generated 13 billion (23%), and local sales taxes raised 4 billion (7%) (Texas Comptroller of Public Accounts, 2004). Businesses pay an estimated 60 percent of all taxes collected in Texas. The state government absorbs approximately half of all tax revenue, while local governments and school districts receive the remainder (Texas Senate Committee, 2002).

In 2002 total tax revenues for the state of Texas summed to $26,279,102,493. The following revenues contributed to this total: sales tax ($14,516,341,226); motor vehicle sales/rental, manufacturing ($2,949,540,192); motor fuels taxes ($2,833,607,460); franchise tax ($1,935,709,140); insurance occupation ($1,045,710,105); natural gas ($628,496,630); cigarette and tobacco taxes (540,038,314); alcoholic beverages ($560,197,124); oil production tax ($338,661,102); inheritance tax (334,190,915); utility taxes ($311,051,398); hotel and motel tax ($230,909,206); and other taxes (54,649,681) (Texas Comptroller of Public Accounts, 2002).

G. SOCIAL CONTEXT

Education. In the 2000-2001 academic school year, 4,059,619 K-12 students (42% Caucasian; 41% Hispanic; 14% African-American; 3% Asian/Pacific Islander; and less than 1% Native American) were enrolled in the Texas school system. A total of 274,816 teachers served these students. Average student to teacher ration was 15:1. Expenditures for the 2000-2001 school year totaled $13,853,098,768. Per pupil expenditures amounted to $6,638 (Texas Education Agency, 2002). Teachers earned, on average, $38,361 during this school year. The vast majority of these teachers held at least a Bachelor's Degree (75%).

In the 2003-04 school year, the average elementary and secondary school teacher salary for the State of Texas was $39,974; the national average was $45,771. The State of Texas

ranked 31st of 51 states (ranking includes the District of Columbia) in terms of teacher salaries for this year. Teachers in California earned, on average, the highest salary at $55,693 (U.S. Census Bureau, 2005).

The State of Texas maintains 142 public and independent institutions of higher education including: 70 community colleges (in 50 districts), 31 public universities, four public two-year, upper-division universities, four Technical College Systems campuses, three public two-year, lower-division Lamar state colleges, 38 independent four-year colleges and universities, nine public health-related institutions, one independent medical school, and two independent junior colleges. In 2001, approximately 1 million students were enrolled in a Texas public or independent institution of higher education. In 2002, out-of-state enrollments accounted for 28,451 of enrolled students (Texas Education Agency, 2004).

Overall K-12 attendance for the 1999-00 school year was 96 percent, while the dropout rate for grades 7-12 equaled 1 percent. In the 2000-2001 school year, the drop out rate increased to 5 percent, which is just above the national rate of 4.9 percent for this year. In this same school year period, the mean SAT score for Texas high school seniors was 990 while the average ACT score was 20.3. Fifty-four percent of graduating seniors planned to attend college in the 2001-02 school year (Texas Education Agency, 2002).

Regarding the educational attainment levels of adults, Texas approaches national averages in some cases and exceeds others. In 2000, the ratio of high school graduates in Texas to the U.S. was 0.94, while it was 0.93 among college students. In previous years, the ratio of college graduates to the U.S. was 1.00 or greater. In this sense, Texas is unique in that it exceeds national averages for attaining college degrees (Table 6).

Table 6

Adult Educational Attainment (age 25+), Texas State: 1950-2000

Year	High School Diploma or More	State BA/BS or More	Ratio to Nation: High School Diploma or More	Ration to Nation: BA/BS or More
1950	29.9%	6.0%	0.89	1.00
1960	39.5%	8.0%	0.96	1.04
1970	47.4%	10.9%	0.90	1.02
1980	62.6%	16.9%	0.94	1.04
1990	72.1%	20.3%	0.96	1.00
2000	76.8%	23.5%	0.94	0.93

Source: U.S. Census Bureau, 2000b.

Health and Welfare. Health and welfare indicators for the State of Texas are mixed. In 2001, there were 411 general and specialty hospitals in the State of Texas providing 2.6 hospital beds per 1,000 population. In 2002, 1,096 nursing homes offered a total of 106,577 certified facility beds. Total health care employment in this same year equaled 7 percent, which is comparable to the national rate (Kaiser Family Foundation, 2003).

Teen birth and pre-natal care rates in Texas fall below the national average. In 2002, the teen birth rate was 64 per 1,000 live births, as compared to 43 per 1,000 live births at the national level. However, the teen birth rate in Texas has decreased 13 percent between 1991 and 2001. Eighty percent of Texan mothers, regardless of age, began prenatal care in their first trimester (88% Caucasian; 77% African-American; 75% Hispanic), as compared to 84 percent at the national level (89% Caucasian; 75% African-American; 77% Hispanic) in that same year (Kaiser Family Foundation, 2003).

There were also more pre-term born in Texas than in other states in 2001. The overall percentage of pre-term infants in Texas (13%) exceeded that of the nation as a whole in 2001 (12%). Of the pre-term infants born in Texas, 12 percent were to Caucasian mothers, 13 percent to Hispanic mothers, and 18 percent to African-American mothers (Kaiser Family Foundation, 2003). However, the percentage of low-birth weight babies born n Texas hospitals in 2001 was equal to the national rate of 8 percent (7% Caucasian; 13% African-American; 7% Hispanic). Mortality rates for infants per 1,000 live births in that same year (six) is also lower than the national rate (seven per 1,000 live births) (Kaiser Family Foundation, 2003).

In 2000, 4 percent (20,900) of all children in the state of Texas were in foster care; 4 percent were also Temporary Assistance for Needy Families (TANF) recipients. In the same year, 16 percent (994,339) of Texan children were enrolled in Medicaid, while 34 percent (559,493) were Women, Infants, and Children (WIC) recipients. Eight percent of all children in the state were confirmed victims of child abuse in Texas in this year; there were 1,126 child deaths (Kids Count, 2003).

Also in 2000, there were 2,701,500 people enrolled in the Texas State Medicaid program; total spending for the medically needy equaled $123 million, or $3,284 per person. This figure is below the per enrollee national spending average of $3,762. In 2002, total federal and state Medicaid spending reached $13,638,487,484 (Kaiser Family Foundation, 2003).

Religion. In 2000, 55 percent (11,573,549) of Texas residents claimed a religious affiliation: Evangelical Protestant (24%); Mainline Protestant (8%); 4,368,969 Catholic (21%), and 2 percent "other." Forty-five percent (9,278,204) of residents did not claim a religious affiliation in this year (American Religion Data Archive, 2002)

H. ISSUES OF CONCERN

Given the territorial expanse of the state, its diverse population, and the range of industries it supports, it is difficult to narrow the field of concerns facing the state. Nevertheless, three issues stand out: environmental management, economic health, and illegal immigration.

The air quality in Texas is extremely poor. By Environmental Protection Agency (EPA) standards, Texas is the fifth dirtiest state in the country, and 16 of its counties are identified as having unacceptable levels of ozone. These counties are located around the cities of Dallas-Fort Worth, Houston-Galveston, Beaumont-Port Arthur, and El Paso. After the 1997 air standards were established by the EPA, many regions in the state were deemed non-compliant with the Clean Air Act. New proposed water pollution standards also have impacted many regions, notably the urban centers of the state. The state was recently ordered to ameliorate the situation by cleaning up the excessive nitrogen oxides and other pollutants. Continued non-compliance will result in the loss of federal highway funds and other penalties. The State has a plan in place for reducing emissions. For example, because these emissions stem in part from an increase in

urban area automobile travel, the state legislature recently passed a bill raising vehicle registration fees for out-of-state vehicles.

A related concern is the extent to which stricter regulations on industry emissions might affect businesses within the state. Twenty-five of the top releasers in the state are also the major producers of emissions. Many of these are petrochemical industries and other oil and gas related industries. Corpus Christi, for example, depends on refining and petrochemicals. In an effort to manage this problem, the Texas Natural Resource Conservation Commission, an agency that monitors such industries, recently submitted new enforcement rules that potentially eliminate compliance history. These new rules concentrate efforts on agencies with a history of non-compliance while affording "cleaner" companies more self-enforcement measures (Mathieu, 2001). These new regulations are not without objection. Some industry officials, for example, argue that maintaining a compliance history is unfair. State environmentalists are currently considering this contention.

Coastal erosion and degradation is another ongoing state concern, especially during hurricane season. Increased public awareness regarding marine-life quality, and pressure from the fishing and tourist industries keep this issue in the forefront of civic consciousness.

Deregulation of the electricity industry is an additional state concern, particularly in light of the Enron Corporation's collapse. However, conflicted State officials and controversy regarding the Texas Public Utility Commission has slowed the deregulation process (Dyer, 2001; Wolfson, 2001).

Finally, the State is experiencing all of the social ills that typically accompany a rapidly growing population (21 million as of 2000), including an inadequate transportation infrastructure, a dwindling water supply, lack of access to health care for all populations, rising inflation, and substandard living conditions. These ills are exacerbated, in part, by a large illegal immigration population that is second in the nation only to California's. The Migration Policy Institute estimates that illegal immigrants living in Texas numbered more than 1.2 million in 2000. The Immigration and Naturalization Service (INS) estimates that illegal residents account for 35 percent of Texas' 2002 foreign-born population, and 14 percent of the state's total population; the national average was 11 percent for this same year. Texas' booming (legal and illegal) population impacts the environment and quality of life. For example, Kenedy County officials claim that illegal immigration burdens law enforcement and social services resources, especially Medicaid, healthcare, and education resources. Supporting this contention, poverty rates among the 14 Texas-Mexico border counties were 34 percent in 2000, and double the statewide poverty rate of 17 percent (Federation for American Immigration Reform, 2002).

I. TEXAS LABOR MARKET AREA PROFILES

The purpose of this project is to understand how structural changes in industry, particularly oil and gas related industries, impact local communities and public institutions within the Gulf of Mexico Region (GOMR). The task at hand requires that we utilize a variety of data sources and methodologies to provide a more complete narrative of the phenomenon in question. We also utilize a rather unique definition of local communities: Labor Market Areas. Labor Market Areas (LMAs) are defined by patterns of transportation to and from work both within and across county boundaries. Therefore, the areas contained within LMAs better empirically represent local social systems, communities, and economies (Killian and Tolbert,

1993). This section of the report carefully considers the Labor Market Areas in Corpus Christi, Houston, and Beaumont, Texas.

At the heart of this analysis are changes in the industries related to offshore oil and gas exploration and production, particularly the boom and bust periods of the 1970s and 1980s. In the profile that follows, we first present an overview of the significance of the project, followed by a theoretical framework with which to examine the interconnection between industry and local community structural changes.

The analysis itself is divided into three units of time: 1940-1970, 1970-1990, and 1990-2000. The first unit of time presents a brief industry history of the Mobile LMA from 1940 to 1970, followed by a minimalist overview of population changes. In the second unit, we examine all oil and gas and related industries within the LMA for the years between 1970 and 1990, inclusive. We then link industry changes during this period to fluctuations in population structure and dynamics, education, and local government finance. The third unit examines the period between 1990 and 2000 to assess the fallout of the oil and gas industry during the decade immediately following the bust.

Industry Overview. The oil and natural gas industry experienced a "boom" during the 1970s (Gramling, 1996; Seydlitz and Laska, 1994). Rising demands for on-shore domestic supplies of oil, and political instability surrounding OPEC and the Middle East increased offshore oil and natural gas exploration activities in the Gulf of Mexico (Gramling, 1996; Gramling and Freudenburg, 1990). The subsequent "boom" is reflected in the LMA employment data. For example, in 1970, approximately 71,000 workers were directly employed full-time in the oil and natural gas industry in the coastal economies of the Gulf of Mexico. By 1980, that number had grown to over 145,000, reflecting a net increase of 105 percent—and those numbers do not reflect changes in oil and gas multiplier industries such as equipment manufacturing, water transportation, wholesale trade, and general services.

During the early 1980s, however consumption trends began to change and affect employment. First, a gradual drop in demand occurred as substitution effects played-out, with actors reducing their consumption of oil and gas by-products (e.g., buying more fuel efficient cars; see Gramling, 1996). Additionally, the oil and natural gas industries experienced a sharp decline in the mid 1980s brought about largely by overproduction among OPEC members trying to "starve" weapon shipments into warring Iran and Iraq (Heilbroner and Milberg, 1999). Between 1980 and 1990, the total number of workers in the oil and natural gas industries in the coastal economies of the Gulf of Mexico declined from over 145,000 to 112,000, a decrease of 23 percent. The following figure presents the "boom and bust" data as reflected in the price of oil (Figure 1).

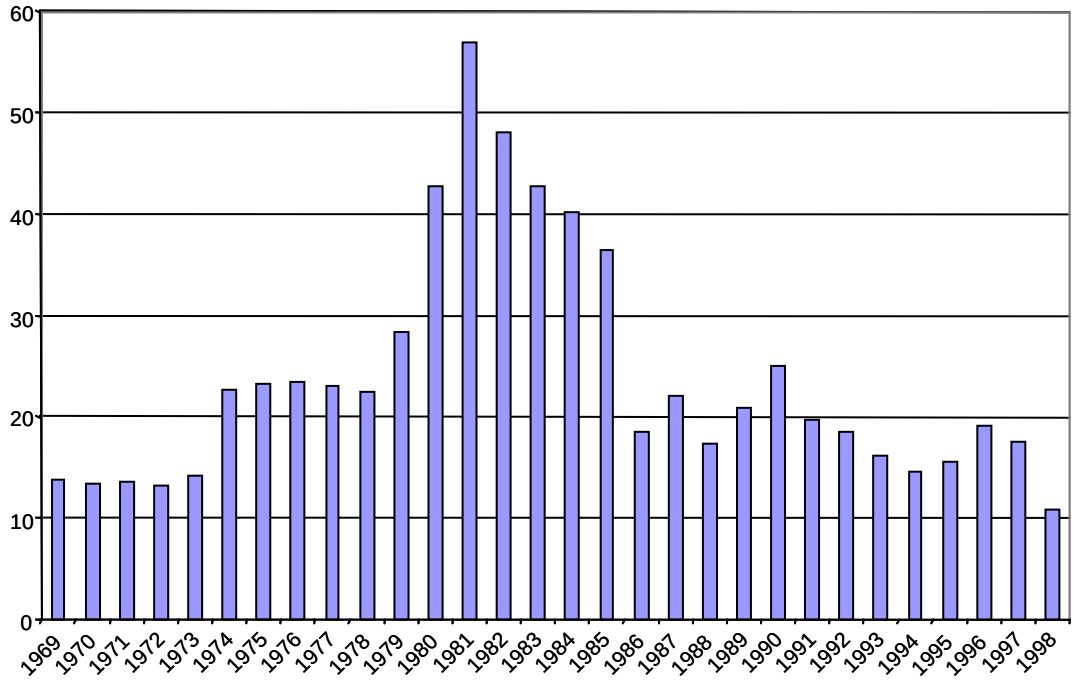


Figure 1. Crude Oil Prices, U.S. Average (price per barrel in 1998 dollars): 1969-1998 (Energy Statistics Sourcebook, 1999).

The coastal economies of some oil dependent LMAs in the Gulf of Mexico were more severely impacted by the oil bust than others. For example, the Lafayette LA economy lost 14,000 jobs in the oil and natural gas extraction industries between 1982 and 1988, a 63 percent loss. Other industries throughout the greater Lafayette area were affected as well, with total employment dropping from 200,000 workers in 1982 to 160,000 workers in 1987.[4] These losses translated into an unemployment rate of more than 16 percent in 1988. However, the Lafayette area was not the hardest hit by the oil bust; unemployment rates exceeded 20 percent in some other coastal communities (Gramling, 1996).

Sociology of Regional Processes. To understand how industries, public institutions, and communities change in response to fluctuations in the oil and gas industries, we draw upon the assumptions of human ecology theory. One of these assumptions is that the range and diversity of community industry functions are important determinants of community size, complexity and organization (see Frisbie and Poston, 1976; Hawley, 1986; Mencken, 1997; Murdock et al., 1993; Nord and Luloff, 1993; Poston, 1984; Frisbie and Poston, 1978). Communities also can be placed along a continuum of industry structures, from less to more diverse. Generalist communities (those with a variety of industries) and specialist communities (those with one or two main industries) both have advantages and disadvantages for growth and social organization at the local level (Poston, 1984).

Generalist communities are larger in size and more complex in structure. Fluctuations in one industry do not reverberate throughout the entire system so long as the other industries upon

[4] Source: U.S. Department of Commerce's Regional Economic Information System of the Bureau of Economic Analysis.

which the community depends for employment are independent of those shocks and remain relatively stable. As a result, generalist systems tend to be more stable over time. This longitudinal stability is important for local public institutions, such as schools and financing of local government services, because it allows administrators to plan for incremental changes in the supply of revenues and the demand for resources. Generalist systems can also support more stable population growth patterns (Frisbie and Poston, 1976, 1978; Micklin and Choldin, 1984; Poston, 1984).

Specialist communities, on the other hand, are primarily dependent upon one or two industries for subsistence. Communities that rely upon natural resource-based industries, such as coal, oil/gas, timber, or fishing, are specialist communities (Gramling and Freudenburg, 1990; Hawley, 1986; Rural Sociological Society Task Force, 1993).

A second assumption of human ecology theory is that significant industry contraction (and expansion) will alter drastically the social organization of the community (England and Albrecht, 1984; Jobes, 1999; Krannich and Grieder, 1984). During industry contraction, jobs are lost, and an out-migration of younger population typically results (RSS, 1993). The negative effects of these cycles, particularly in rural America, manifest in social disorganization, higher crime rates and other social problems (Freudenburg and Jones, 1991; Jobes, 1999).

Third, the human ecological approach assumes that local communities are ecosystems comprised of four basic and interdependent components: population, organization, environment, and technology (Hawley, 1986; Poston, 1984; Micklin and Choldin, 1984). This approach further assumes that changes in one of these four components will create changes throughout the community. For example, changes in the external environment (e.g., oil prices dropping significantly) will affect changes in the other components of the community (jobs and population) that rely upon the oil and gas industry for employment (Gramling, 1996).

Additionally, changes in the technology used in the production of sustenance (e.g., mechanization of coal extraction) will affect the population and organization of the ecosystem (loss of jobs and out-migration), independent of any changes in the external environment. Not surprisingly then, economies that were most involved in the exploration and production of oil and natural gas in the Gulf of Mexico region were also most affected by changes in the oil and gas industry. Those communities that are more concentrated in multiplier industries will also be affected, but not as directly.

In order to establish when, or if, unexpected changes in employment occurred in the Texas LMAs, we performed a time-series forecasting analysis. In our analysis, we employ a moving average forecasting model to locate the years in which shocks occur in the Corpus Christi, Houston, and Beaumont LMAs. The forecasting procedure includes the following. First, three-year moving averages (current plus previous two years) of employment levels are computed. Second, at each year the expected value (three-year moving average) is subtracted from the observed value. Each of these deviations is squared to provide the forecasting error for each year. These squared deviations are summed and averaged across all years in the analysis to compute a mean squared error (MSE). We establish a "shock" for any given year in which the squared deviation for that year is greater than or equal to two times the mean squared error for the industry sector in question (Anderson et al., 1990).

1. Corpus Christi, Texas: Labor Market Area

The Corpus Christi Labor Market Area (LMA) is made up of nine Texas counties: Aransas, Brooks, Duval, Jim Wells, Kenedy, Kleberg, Nueces, Refugio, and San Patricio (Map 3). The year 2000 Census records the total population of these nine counties as 503,493 persons. The Corpus Christi LMA is an interesting case study because of its size and location as a port city along the Gulf of Mexico. This next section will profile the extent to which this LMA was affected by the oil and gas industries' "boom and bust" pattern of the late 1970s and 1980s.

First Unit of Analysis: Corpus Christi LMA Employment, 1940-1970. The following figure presents Decennial Census employment data for 1940-2000 (Figure 1). The Corpus Christi LMA employed over 57,000 people in 1940. Agriculture employed over 28 percent of those workers, while wholesale/retail trade, and services employed more than 50 percent. There is an even distribution of employment among the other key industries. Manufacturing, construction and transportation/communication each represented between 7 and 9 percent of the total labor force. The mining sector employed over 5,000 workers in 1940, or 9.4 percent of the labor force.

Between 1940 and 1950 total employment grew by 40 percent, with total employment in the Corpus Christi LMA approximating 80,000 in 1950. Agriculture lost 3,000 jobs during the 1940s, but still captured 16 percent of the total labor force in 1950. Mining employment grew by 20 percent. Construction (107%), manufacturing (99%), and transportation/communication (60%) were the fast growing industries in the 1940s. Wholesale/retail trade and services employed over 55 percent of the total labor force in 1950.

Between 1950 and 1960, total employment in the Corpus Christi LMA grew by 32 percent, with employment levels exceeding 106,000. In contrast to the growth transportation, construction and mining experienced during the 1940, these three key industry sectors accounted for less than 1,000 new jobs in the 1950s. The major growth sectors were manufacturing (4,000 jobs at a growth rate of 56%), and services (over 15,000 jobs with a growth rate of 119%). The agricultural sector experienced a 16 percent decline in employment.

While the mining sector did not grow during the 1950s, this industry employed almost 6,500 persons in 1960. This level is twice the number of workers in the Beaumont, Texas LMA; a comparably sized LMA in the Gulf of Mexico region.

Total employment in the Corpus Christi LMA grew by 13 percent between 1960 and 1970. In 1970 over 128,000 people were employed throughout the LMA. Services experienced the most employment growth (16,000 jobs; 40% growth rate). Mining added 1,000 jobs, transportation/communication added 900 jobs, while construction added 2,000 jobs. In 1970 these three industries represented about 23 percent of the labor force. Employment in agriculture declined significantly by 38 percent, or 5,000 jobs, dipping below 10 percent.[5]

[5] Natural resource dependency is defined as 10 percent or more employment in agriculture or mining (Rural Sociological Task Force (RSS), 1993).

Map 3. Corpus Christi, Texas Labor Market Area.

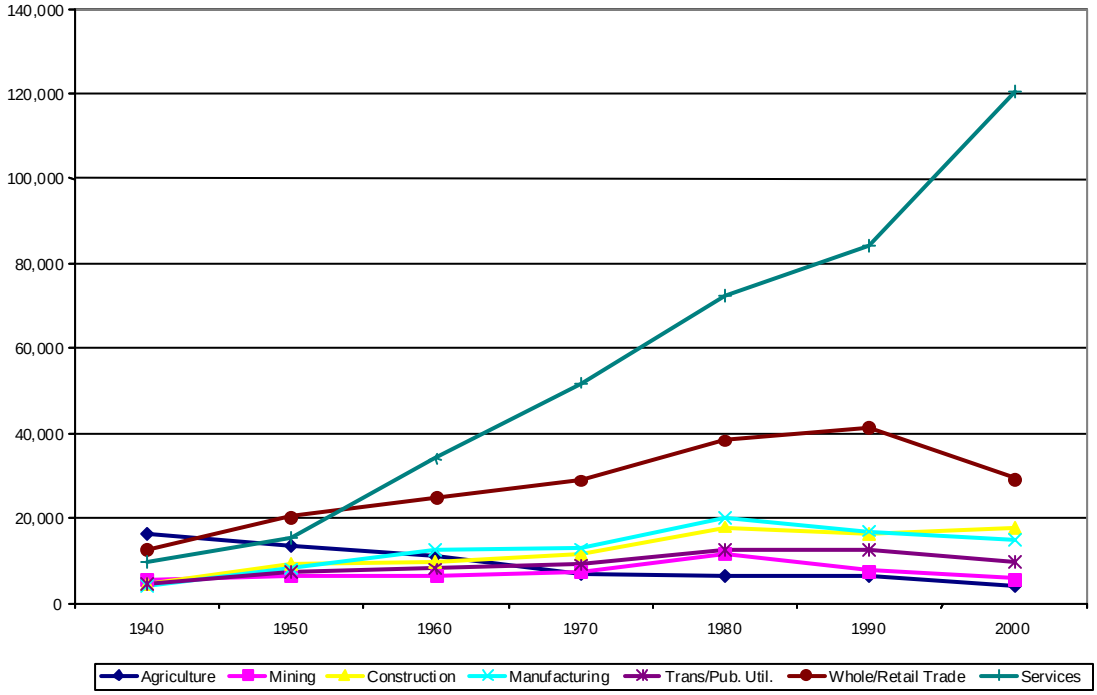


Figure 1. Major Industry Employment, Corpus Christi LMA: 1940-2000 (U.S. Census Bureau, 2000b).

Corpus Christi Demographic Changes: 1940-1970. Total employment in the LMA grew by 124 percent between 1940 and 1970. Agriculture experienced further decline, while mining and manufacturing increased. These changes in employment most likely affected population growth. The Corpus Christi LMA population was 196,594 in 1940. By 1970, the population was over 389,900. In Nueces County, population growth increased by more than 150 percent between 1940 and 1970.

Second Unit of Analysis: Corpus Christi Employment, 1970-1990. The total employment rate in the Corpus Christi LMA grew by 40 percent between 1970 and 1980, with 179,000 workers employed in 1980. The largest growth rates were in mining (54%; 11,000 workers), construction (52%), manufacturing (56%) and transportation/communication (39%). Combined, these four sectors had a net increase of 20,000 jobs between 1970 and 1980. Growth was also substantial in services (20,000 additional jobs) and wholesale/retail trade (10,000 additional jobs) during the 1970s. The growth in mining employment was connected to oil and gas industry activity.

By 1990, however, manufacturing, mining and construction had experienced significant employment losses. The losses were particularly notable in the mining sector, which lost 34 percent, or 4,000 jobs. Manufacturing lost 15 percent of its total 1980 employment, approximately 3,000 jobs. Despite these losses, total employment actually grew in the Corpus Christi LMA by 3.5 percent, with a net gain of 5,000 jobs. Services led employment growth in the 1980s, gaining 12,000 net jobs for a growth rate of 16 percent.

This positive growth sets the Corpus Christi LMA apart from other oil and gas-related Gulf Coast LMAs, many of which experienced a net loss of total employment in the 1980s. The

Corpus Christi LMA data show an economy that experienced some declines in oil and gas related industries. Moreover, the growth of multiplier industries (particularly services) was significantly less during this time period, than in other time periods. In short, these data indicate an LMA with a significant concentration of oil and gas activities spread across a number of industries, such as mining, construction and manufacturing. We turn now to an analysis of annual employment data for the Corpus Christi LMA in order to locate a better understanding of what changes occurred between Census years.

The following displays annual full- and part-time employment for the Corpus Christi LMA (Figure 2). These data show a steady increase in total employment between 1969 and 1982. These data also show a drop in total employment of about 10 percent between 1982 and 1986. However, by 1993, total employment returns to the 1982 level. And, since 1991, employment has grown at a steady pace.

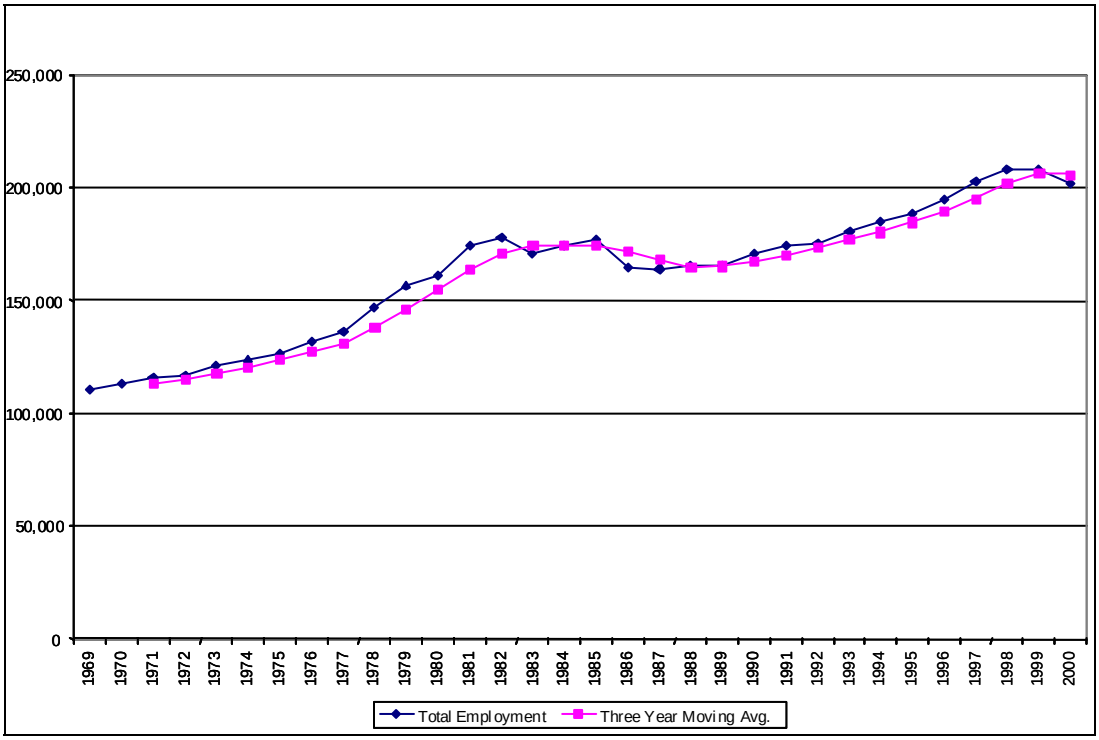


Figure 2. Total Annual Employment and Three-year Moving Averages, Corpus Christi LMA: 1969-2000 (U.S. Dept. of Commerce, Bureau of Economic Analysis, 2000).

In order to establish when, or if, unexpected changes in employment occurred in the Corpus Christi LMA, we performed a time-series forecasting analysis. The results of this effort are reported in the following figures (Figures 3-4). Figure 3 shows the actual employment data charted with the three-year moving employment level average for each year. In Figure 3 we see that in 1978, 1979 and 1981, the observed employment number was significantly greater than expected. This indicates a period of greater than expected employment growth. We also see that the observed employment is significantly less than expected in 1986. This finding signals a point of rapid employment decline, or fewer workers employed than expected. Interestingly, this pattern for the Corpus Christi LMA is slightly different than what is observed in other LMAs in

the GOM region. For example, total employment in the Lafourche and Lake Charles LMAs in Louisiana drops off significantly in 1983. The same pattern is present in Beaumont, Texas. And, unlike other oil and gas LMAs in the GOMR, total employment actually increases in the Corpus Christi LMA between 1983 and 1985. The significant drop-off in total employment in the Corpus Christi LMA comes in 1985 and 1986.

The following figure documents forecasting errors, which occur when the observed employment number in a given year substantially exceeds the expected employment number in that year (based on a three-year moving average) (Figure 3).

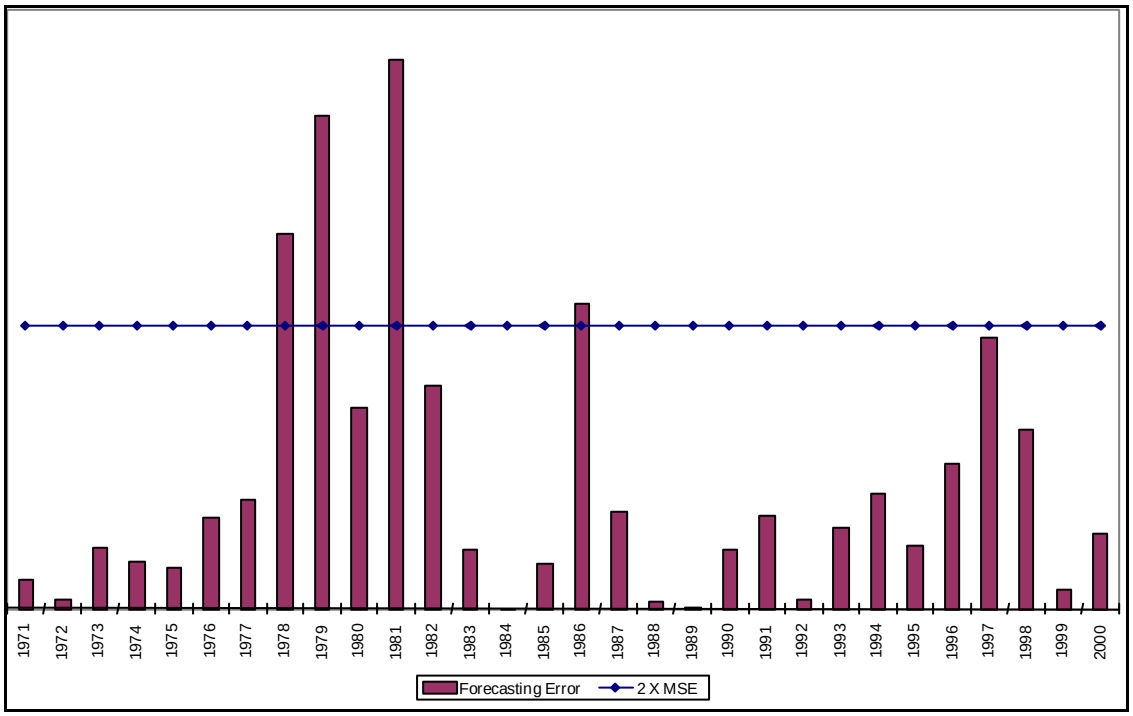


Figure 3. Forecasting Analysis for Total Annual Employment, Corpus Christi LMA: 1971-2000.

With the exception of the 1980s, the growth and decline in total employment in the Corpus Christi LMA's fits the "boom" pattern found throughout most other LMAs in the GOMR. We turn now to an analysis of annual employment data in order to uncover in which industry sectors these "boom and bust" patterns are present in the Corpus Christi LMA.

The next data set displays annual employment data for nine general industry categories for 1969 and 1999 (Figure 4). Construction, manufacturing, and mining grew most rapidly during the late 1970s, growing 50 percent, 30 percent, and 100 percent, respectively. These three industries also led the 1980s decline. By 1986, construction, manufacturing, and mining employment returned to their 1977 levels. Mining employment did not recover until 1999. Transportation in this LMA did not experience a "boom and bust pattern".

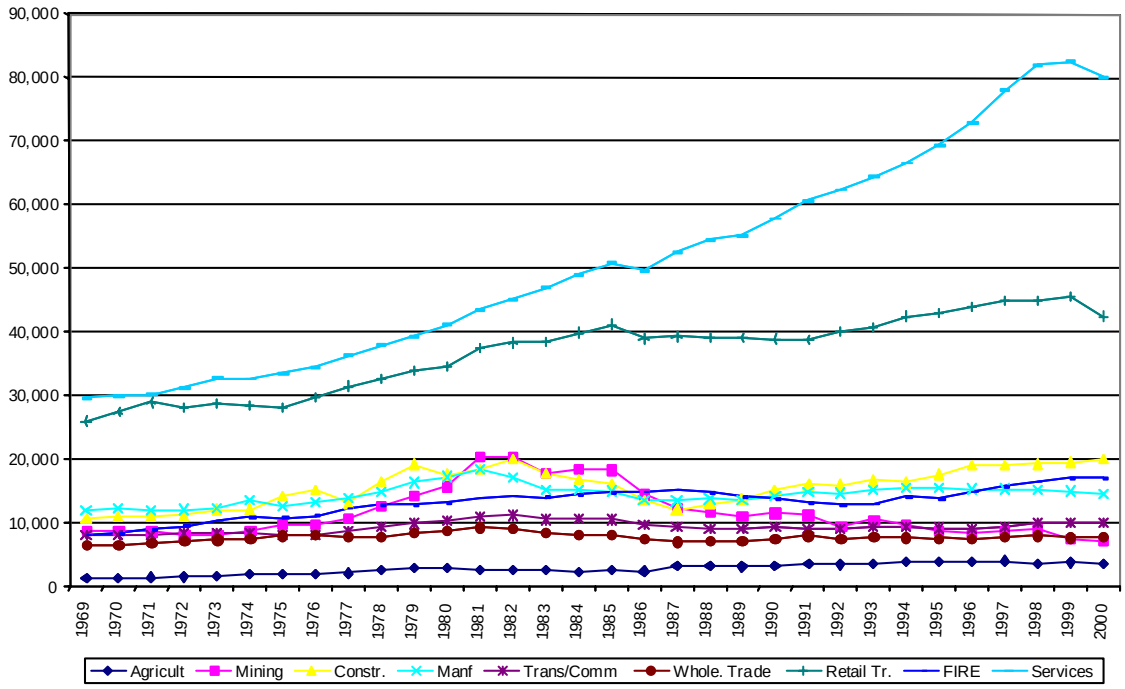


Figure 4. Annual Employment Growth for Major Industry Categories, Corpus Christi LMA: 1969-2000 (U.S. Dept. of Commerce, Bureau of Economic Analysis, 2000).

These data indicate that three industry sectors led the boom and bust of the late 1970s and early 1980s. We perform forecasting analysis on these three sectors to document statistically these trends (Figures 5, 6, and 7). These figures underscore the observations noted above. For mining, there are greater than expected declines in employment in 1986 and 1987. For construction, the downturn appears in 1986. In manufacturing there are declines in 1983 and 1986. The Corpus Christi LMA experienced employment growth in the 1970s and employment decline in the 1980s. However, the forecasting analysis for this LMA indicate fewer "shocks" than experienced in other places of (relatively) similar size, particularly the Beaumont (TX), Lake Charles (LA), and Lafourche (LA) LMAs. The next step is to determine to what extent these changes in major industry employment trends are directly linked to the oil and gas industry.

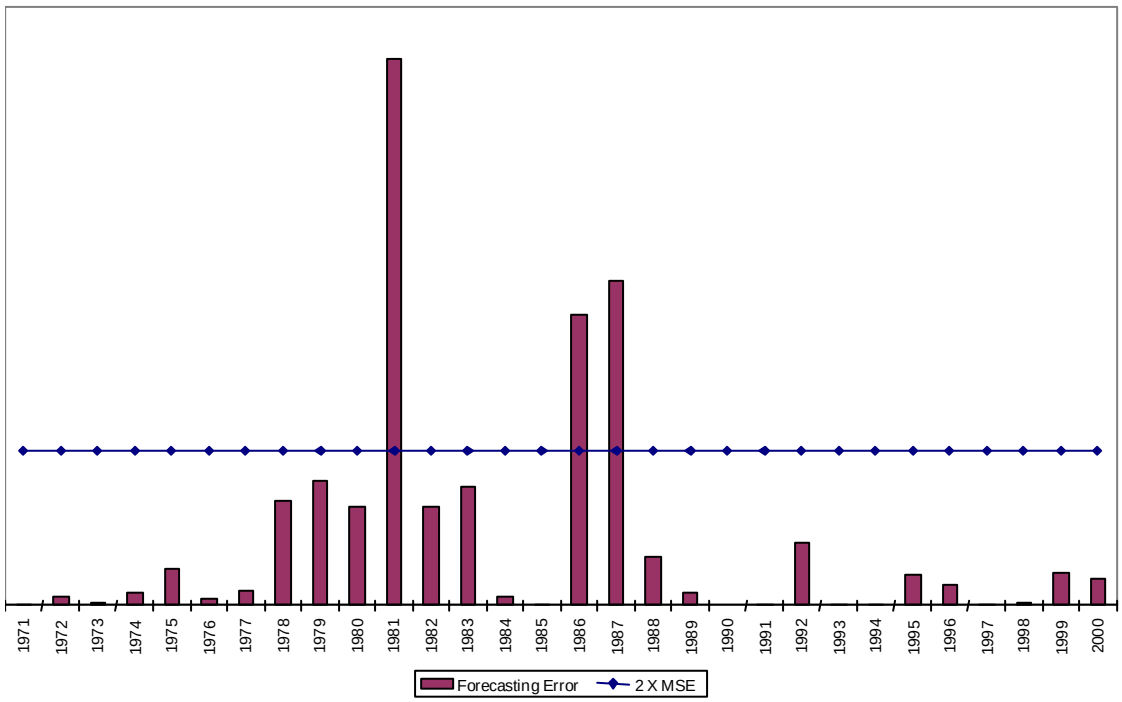


Figure 5. Forecasting Analysis for Annual Mining Employment, Corpus Christi LMA: 1971-2000.

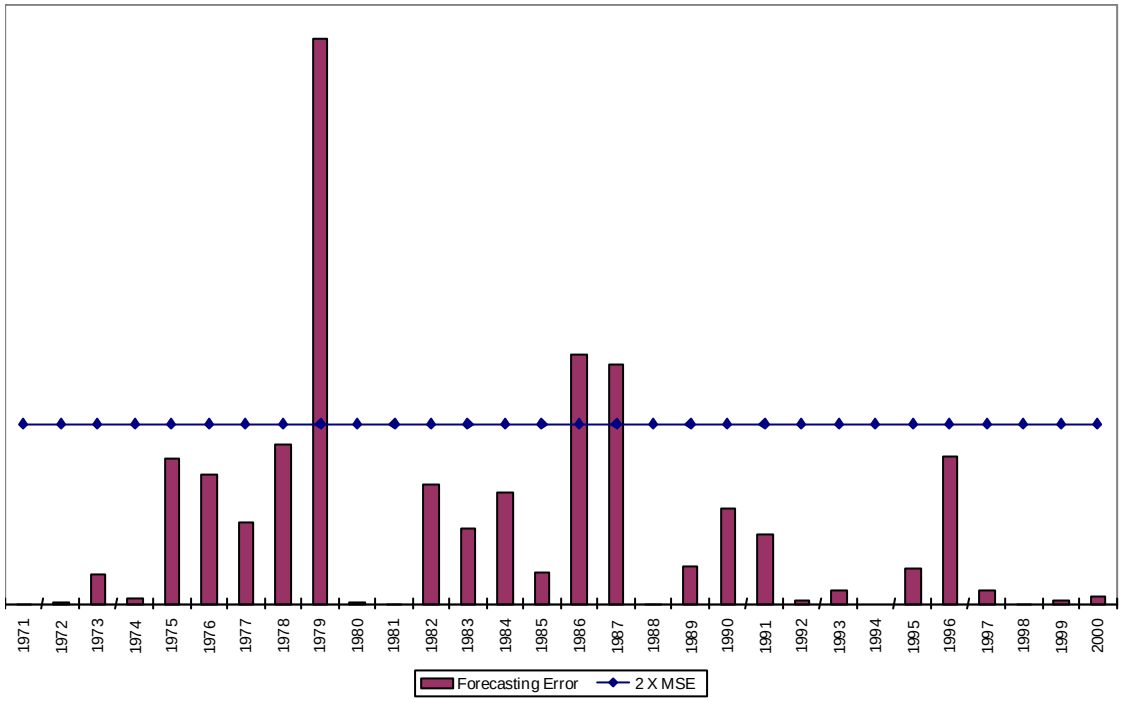


Figure 6. Forecasting Analysis for Annual Construction Employment, Corpus Christi LMA: 1971-2000.

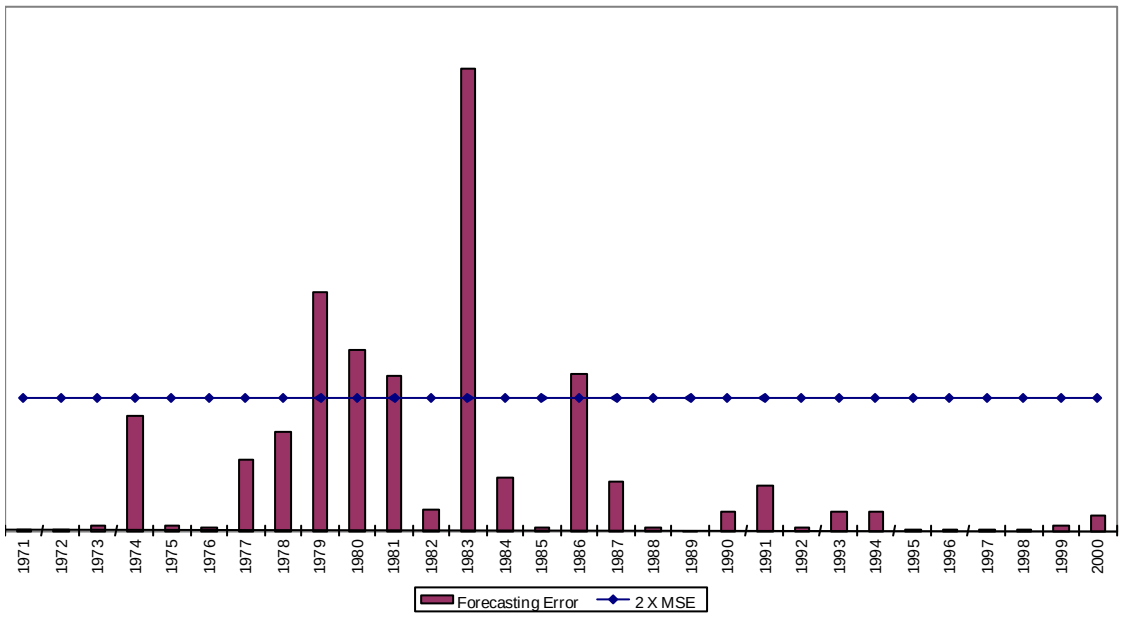


Figure 7. Forecasting Analysis for Annual Manufacturing Employment, Corpus Christi LMA: 1971-2000.

Detailed Industry Analysis. In this next section, we present analyses of industry sector codes for four key industry groups: manufacturing, mining, transportation and wholesale trade (Table 1). We chose those categories based on a) relationship to oil and gas activities, b) employment levels, and c) availability of data in the years we are studying. The manufacturing category includes the sub-categories of fabricated structural metal products, ship and boat building and repair, and oil field machinery. Mining includes drilling oil and gas wells, oil and gas field exploration services, and oil and gas field service, N.E.C. The transportation category focuses exclusively on water. Wholesale trade considers only industrial machinery and equipment.

Table 1

Key Industry Groups and Sectors

Manufacturing		
Fabricated Structural Metal Products (SIC 3440*),* this category includes manufacture of barge sections, ship sections, buoys, and metal plates for gas tanks, gas holders, oil storage tanks, large diameter pipes, pressure valves, storage tanks and also portable building.	***Ship and Boat Building and Repairing*** (SIC 3730), this category includes building and repairing barges, cargo vessels, drilling platforms and dry docks.	***Oil Field Machinery*** (SIC 3533), this category includes bits, rock and oil field tools, derricks for oil and gas fields, drill rigs, drilling tools for gas, oil and water wells.
Mining		
Drilling Oil and Gas Wells (SIC 1381), this category includes, on a contract basis, directional drilling, redrilling, reworking, and "spudding in" of oil and gas wells**.**	***Oil and Gas Field Exploration Services*** (SIC 1382), this category includes, on a fee basis, geophysical exploration, aerial exploration, and seismograph services**.**	***Oil and Gas Field Service N.E.C.*** (SIC 1389) this category includes, on a contract basis, excavating slush pits and cellars, grading and building of foundations, well surveying, running and cutting casings, tubes and rods, cementing and shooting wells, acidizing and chemically treating wells. Operating oil and gas wells for others on a contract basis are also included in this category.
Transportation		
Water Transportation (SIC 4400), this category primarily includes stevedoring.		
Wholesale Trade		
Industrial Machinery and Equipment (SIC 5084), this category includes the wholesale of derricks, oil field tool joints, oil well supply houses, oil well machinery equipment and supplies.		

Corpus Christi LMA Manufacturing. The *Fabricated Structural Metal Products* (SIC 3440) employment data suggest a pattern that is not consistent with the "boom and bust" patterns of the oil and gas industry (Figures 8 and 9). Throughout most of the 1970s and 1980s, this

industry employed less than 600 workers throughout the Corpus Christi LMA. The growth in this industry began in the 1990s (1993, in particular).

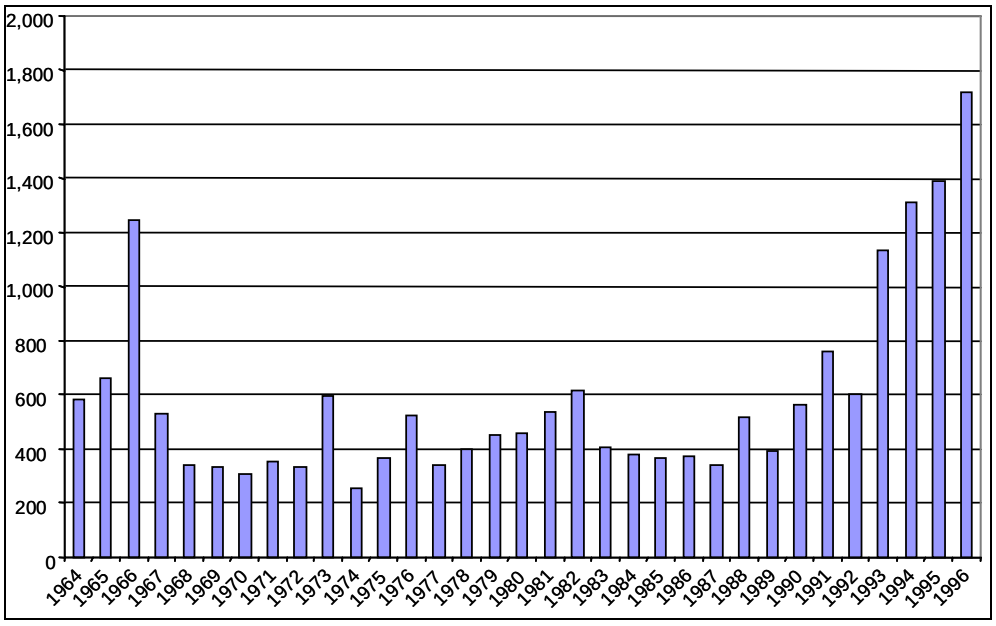


Figure 8. Annual Employment for Fabricated Structural Metal Products, Corpus Christi LMA: 1964-1996 (U.S. Census Bureau, 2000a).

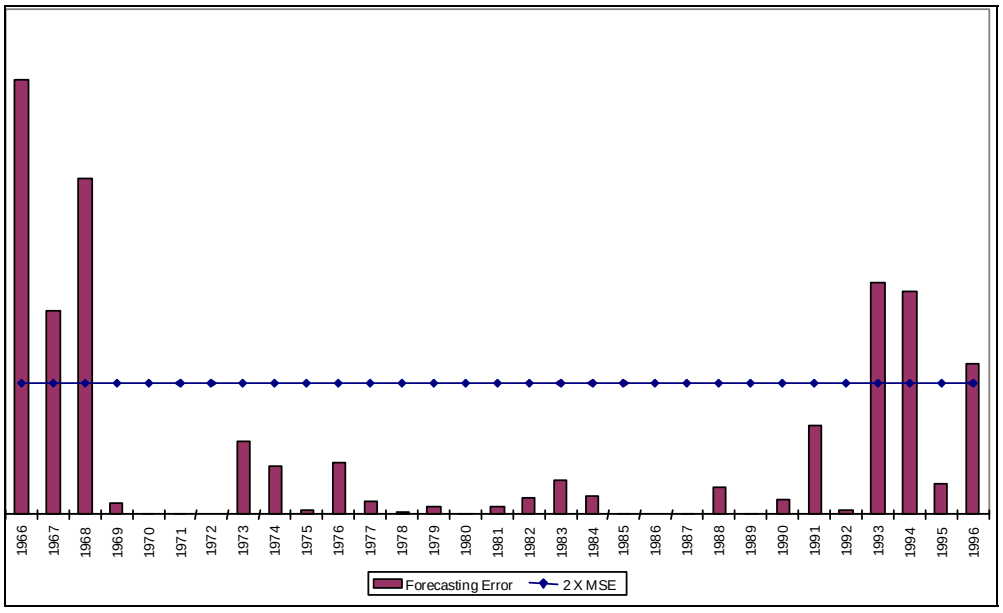


Figure 9. Forecasting Analysis for Fabricated Structural Metal Products, Corpus Christi LMA: 1966-1996.

The next figure shows that *Oil Field Machinery* (SIC 3533) is an industry sector with sparse representation (and not enough data to perform a forecasting analysis) (Figure 10). In

1981 and 1982, this industry employed over 500 people. In most other years, however, employment levels were below 100. There were significant employment gains and losses in manufacturing since 1960. However, the detailed industry data fail to indicate gains and losses in key oil and gas related manufacturing enterprises. Between 1982 and 1985, however, there was a 15 percent drop in real dollar earnings in this sector in Nueces County, TX, the largest county in the Corpus Christi LMA.

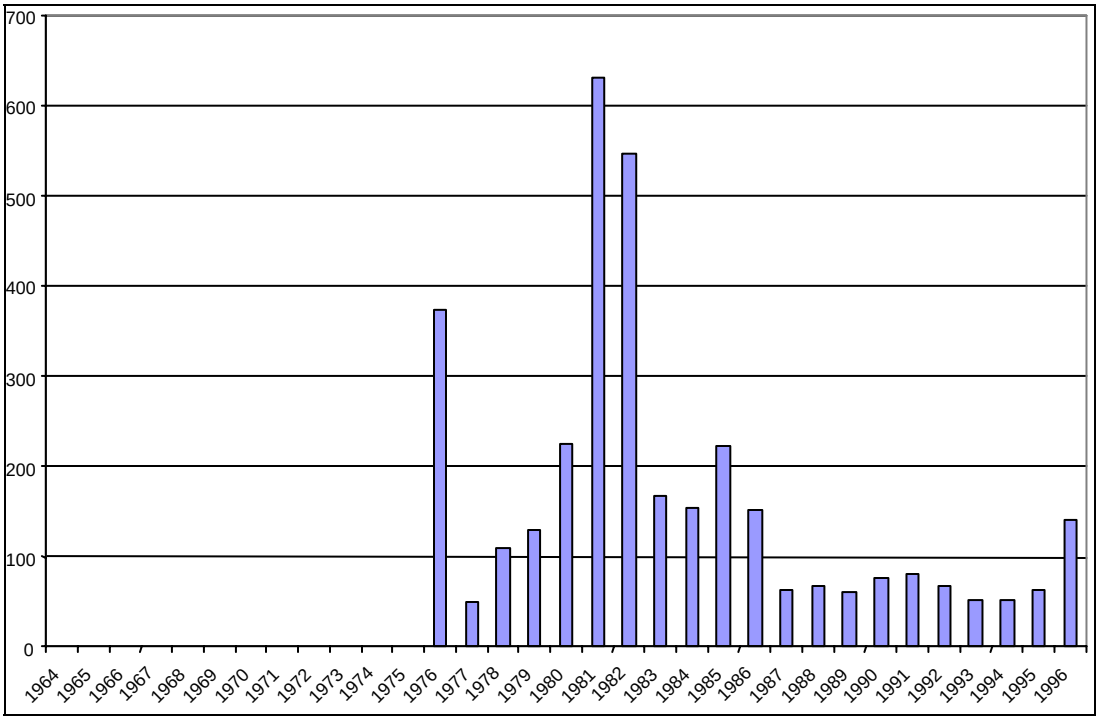


Figure 10. Annual Employment for Oil Field Machinery Manufacturing, Corpus Christi LMA: 1964-1996 (U.S. Census Bureau, 2000a).

The following figure presents the data for *Ship Building and Repairing* (SIC 3731) (Figure 11). *Ship and Boat Building and Repairing* (SIC 3730) was a viable industry in this LMA in the late 1970s and early 1980s. However, employment in this sector was very low compared to other LMAs in the GOM region, peaking between 1979 and 1982 with slightly over 1,200 workers. However, by 1986, employment levels had fallen below 200 workers. Moreover, the employment levels in this LMA pale in comparison to other LMAs in the region. For example, over 5,000 people were employed in *Ship and Boat Building and Repairing* (SIC 3730) in the Beaumont, Texas LMA in 1982.

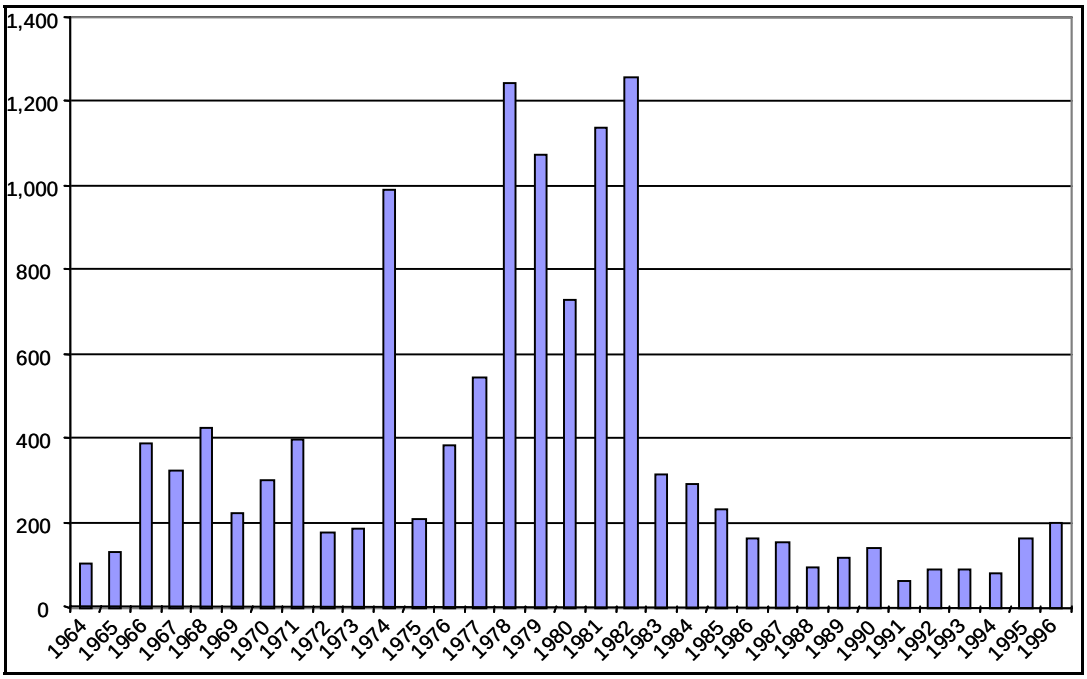


Figure 11. Annual Employment for Ship and Boat Building and Repair, Corpus Christi LMA: 1964-1996 (U.S. Census Bureau, 2000a).

Corpus Christi LMA Mining. The data for *Drilling Oil and Gas Wells (SIC 1381)* depicts strong employment levels during the late 1970s and early 1980s (Figure 12). Between 1976 and 1986, over 2,000 people were employed in this industry throughout the Corpus Christi LMA.

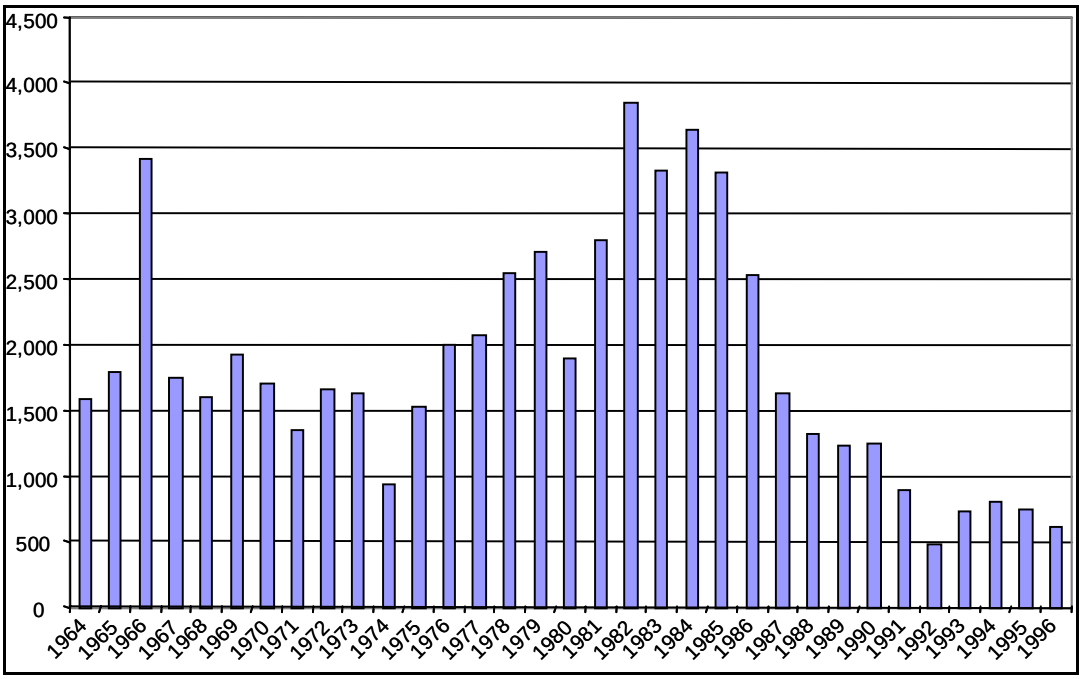


Figure 12. Drilling Oil and Gas Wells, Corpus Christi LMA: 1964-1996 (U.S. Census Bureau, 2000a).

The forecasting analysis for this sector shows that 1982, 1986 and 1987 were key points for this industry (Figure 13). Almost 1,000 jobs were added in 1982. However, almost half of the jobs were lost in this industry sector (1,600) between 1985 and 1987. By the early 1990s, the number of jobs in this industry in the Corpus Christi LMA fell to a 30-year low-point.

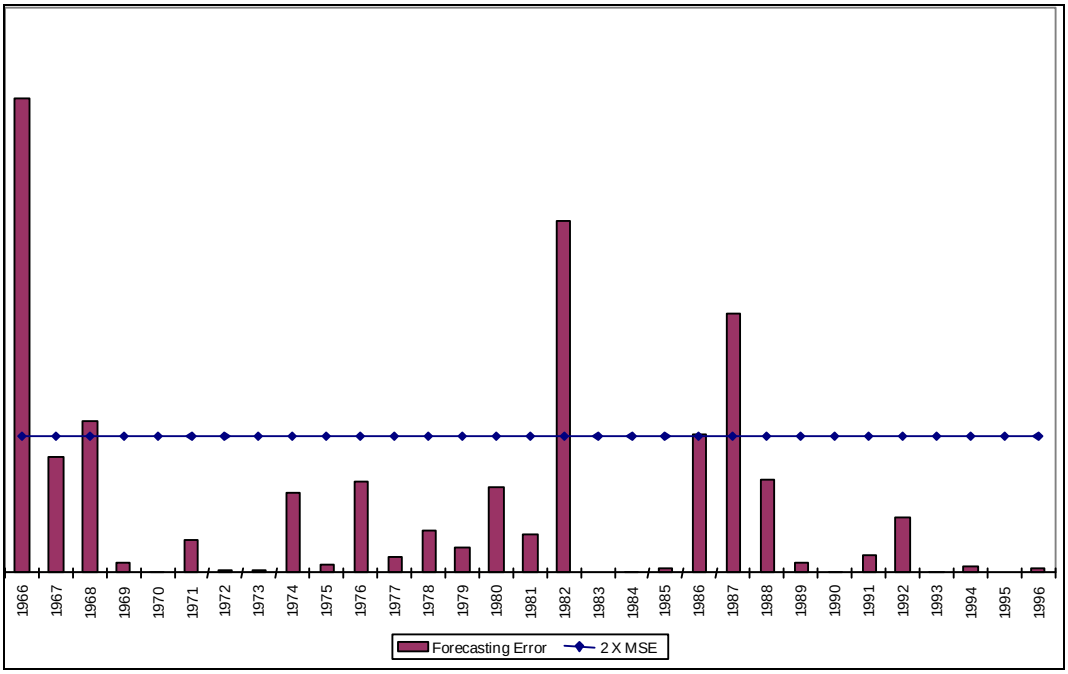


Figure 13. Forecasting Analysis for Drilling Oil and Gas Wells, Corpus Christi LMA: 1966-1996.

Employment data on *Oil and Gas Field Exploration Services* (SIC 1382) is presented next (Figure 14). Employment in this industry peaked in 1981 with approximately 350 workers. By 1984 this number had fallen below 200 workers, and has remained below this number ever since.

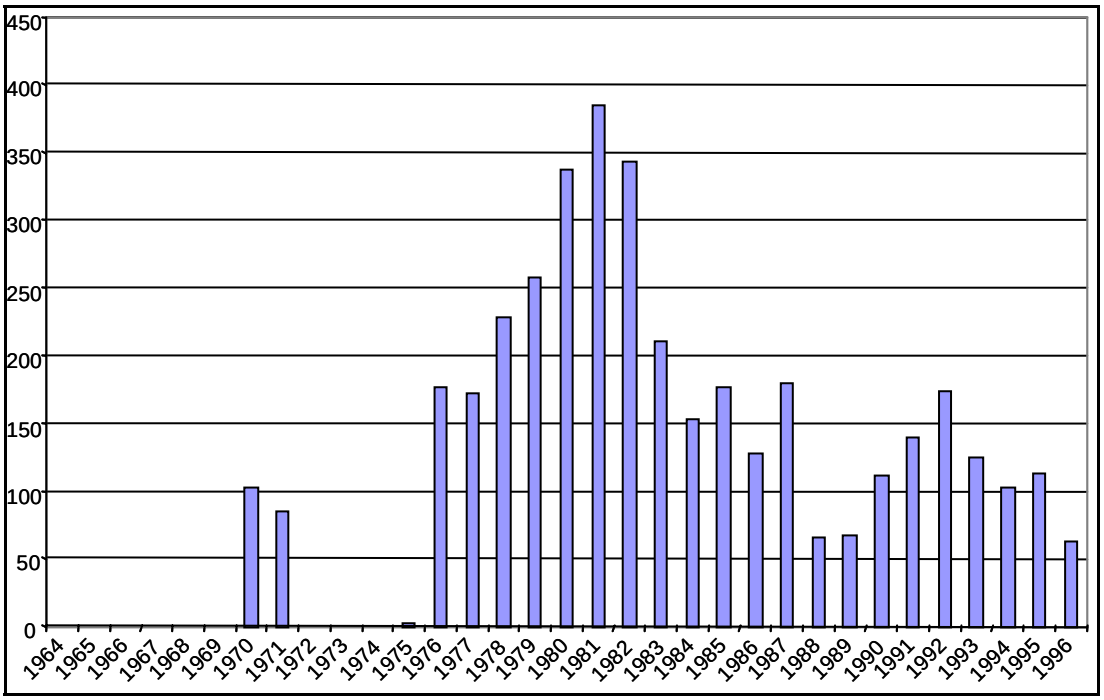


Figure 14. Oil and Gas Field Exploration Services, Corpus Christi LMA: 1964-1996 (U.S. Census Bureau, 2000a).

The following figures display employment trends for *Oil and Gas Field Service N.E.C.* (SIC 1389) (Figures 15-16). These data show a growth and decline pattern from 1975 through the early 1990s. Employment peaks in 1982 at almost 4,400 workers. What we do not see in the Corpus Christi LMA is a "bust" in employment during the 1980s. While half of all jobs in this industry were lost between 1982 and 1992, the decline pattern is much smoother than the fluctuations experienced by other oil and gas LMAs in the GOMR (i.e., Lafayette and Lafourche in Louisiana). In addition, employment levels remain relatively high for this sector throughout the 1990s (almost 2,000 jobs).

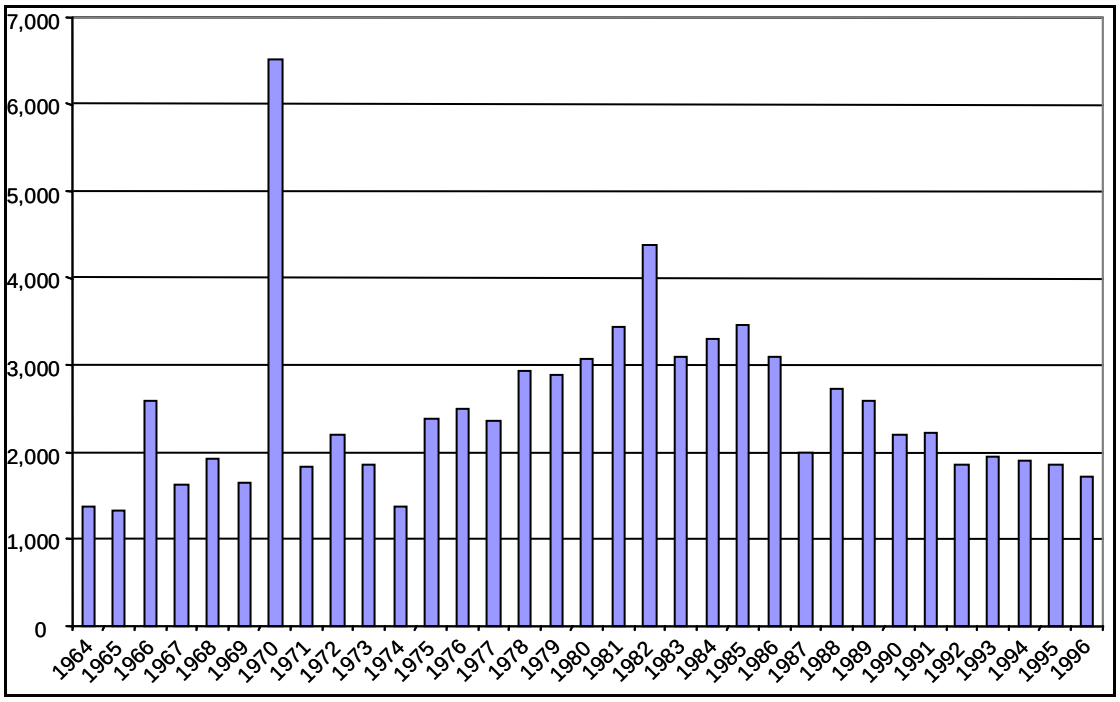


Figure 15. Oil and Gas Field Exploration Services (N.E.C.), Corpus Christi LMA: 1964-1996 (U.S. Census Bureau, 2000a).

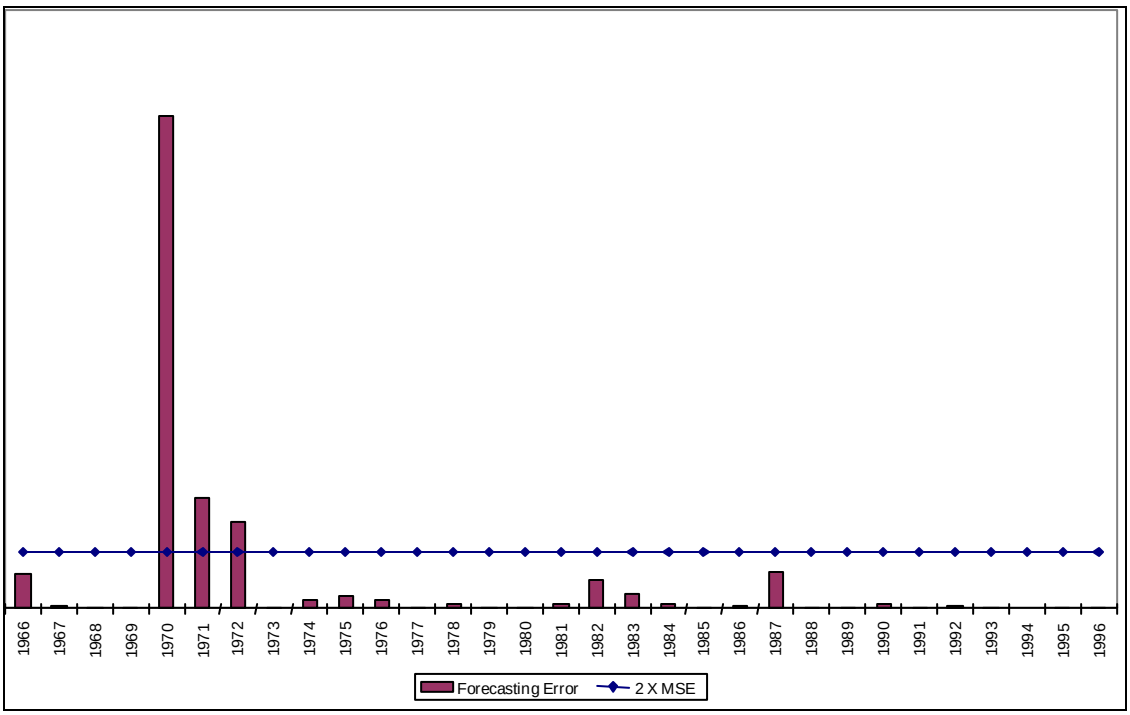


Figure 16. Forecasting Analysis for Oil and Gas Field Services (N.E.C.), Corpus Christi LMA: 1966-1996.

Corpus Christi LMA Water Transportation. Next we present data on *Water Transportation* (SIC 4400) employment (Figures 17 and 18). Unfortunately, there is no category that directly measures water transportation related to offshore oil and gas activities. Furthermore, this is not a large sector in the Corpus Christi LMA. Employment exceeds 1,000 workers in only eight years. While there is a clear "boom and bust" pattern in the late 1980s and early 1990s, it involves only a small number of workers. During the "boom and bust," the industry gained and lost about 700 jobs. Despite being a port and coastal LMA, this is an area with relatively little water transportation employment, especially when compared to other similarly situated LMAs, like the Lafourche LMA in Louisiana, which employed over 10,000 workers in this industry in 1982.

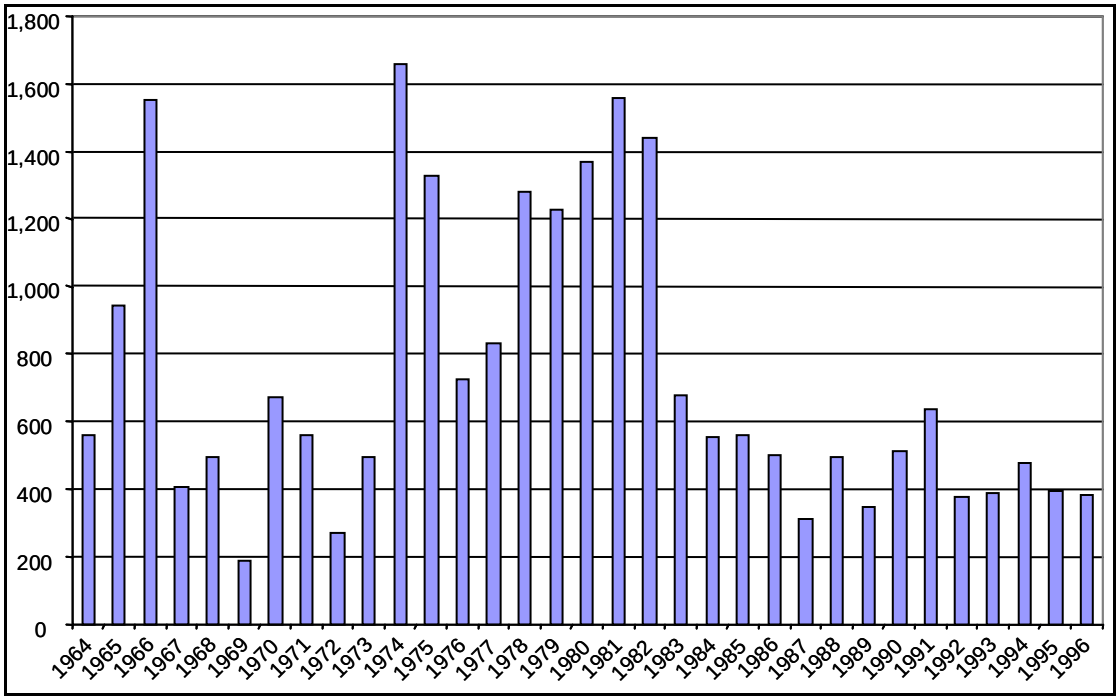


Figure 17. Annual Employment for Water Transportation, Corpus Christi LMA: 1964-1996 (U.S. Census Bureau, 2000a).

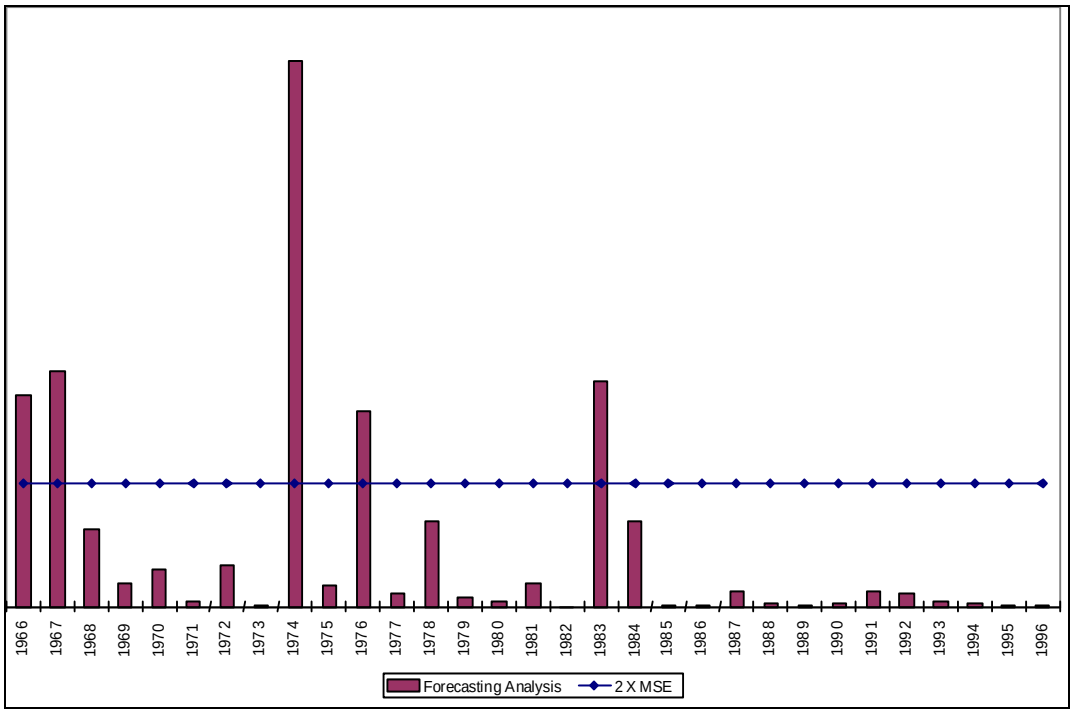


Figure 18. Forecasting Analysis for Water Transportation, Corpus Christi LMA: 1966-1996.

Corpus Christi LMA Wholesale Trade. The *Industrial Machinery and Equipment* (SIC 5084) industry category includes the wholesale marketing of oil well machinery. These data are available only from 1977 to 1996, which does not provide enough years to perform a forecasting analysis. However, the trend line in this Figure shows a sector that experienced growth and decline during the late 1970s and early 1980s. The pattern is familiar. Between 1977 and 1982, the industry doubled in size to almost 1,800 workers. By 1987, however, the industry returned to its 1977 employment level (Figure 19).

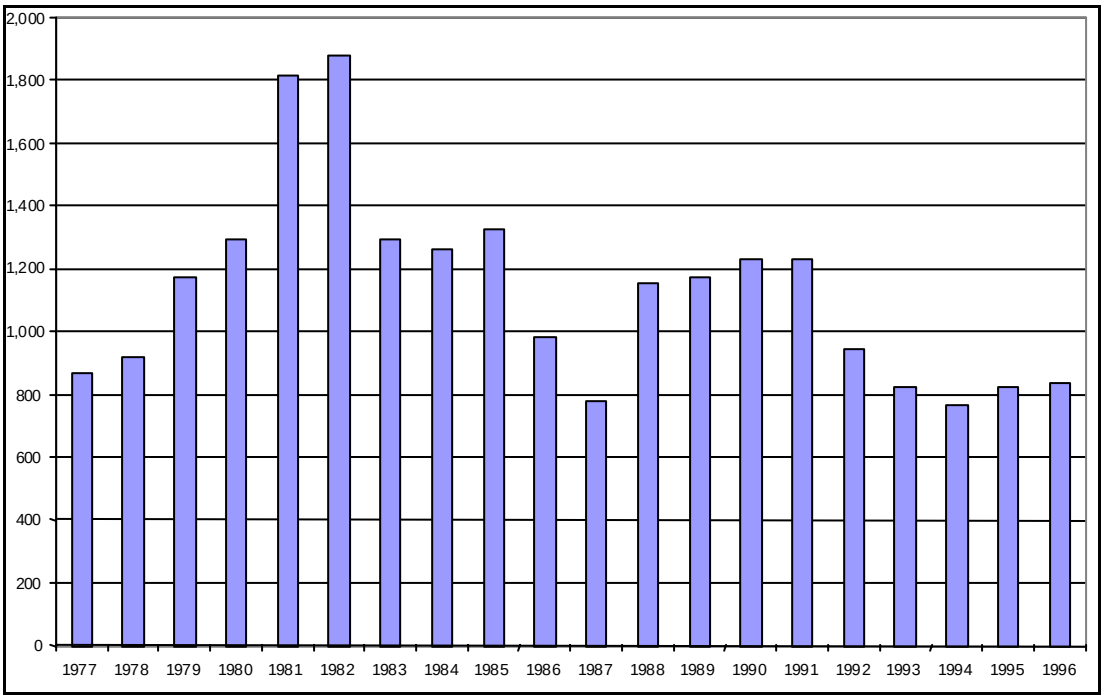


Figure 19. Annual Employment for Wholesale Trade of Industrial Machinery and Equipment, Corpus Christi LMA: 1977-1996 (U.S. Census Bureau, 2000a).

The data presented in the detailed industry analysis show that the Corpus Christi LMA is something of an enigma in the GOM region. The Corpus Christi LMA experienced some major changes in the 1970s and 1980s. However, only two of the mining sectors (*Oil and Gas Field Exploration Services* SIC 1382, and *Oil and Gas Field Service N.E.C.* SIC 1389) –the only industry sectors with significant connections to oil and gas activities– have an important presence in the Corpus Christi LMA. Corpus Christi LMA was not as affected by the "boom and bust" patterns in the oil and natural gas industries as were other LMAs in the GOM region (e.g., Lafayette, Lafourche, New Orleans, and Lake Charles). The trends for the petroleum sector suggest that the Corpus Christi LMA is integrated into the global oil and gas economy primarily (but not exclusively) as a "downstream" industry, refining and transforming the extracted product.

Third Unit of Analysis: Corpus Christi LMA Population, Education, and Local Government, 1970-1990. In this section we examine how industry changes affected population, education and local government issues between 1970 and 1990 in the Corpus Christi LMA. We begin with population.

Population. The following tables present population data for the Corpus Christi LMA (Tables 2-4). Between 1970 and 1980, the population of the Corpus Christi Labor Market Area increased by 13 percent, from 389,905 to 441,121. The 13 percent growth rate for the entire LMA is greater than the national growth rate of 11 percent for the same time period. Within the LMA, the population grew fastest in Aransas County, although only slightly more than in Nueces County. Between 1980 and 1990, the population of the Corpus Christi LMA grew by only 6 percent, a rate that is substantially less than the national growth rate of 10 percent. However, the positive growth rate is inconsistent with the negative growth rates experienced in many of the oil and gas LMAs in neighboring Louisiana for that time period.

The data on racial composition indicate that Caucasians were more affected by the growth and decline of population in the Corpus Christi LMA during the 1970s and 1980s. Between 1970 and 1980, the percent of the African-American population slightly declined from 3.7 percent to 3.5 percent–a trend consistent with most southern labor markets. During the same period the Caucasian population declined from 96 percent to 84 percent. In 1970, Caucasians and African-Americans comprised 99.6 of the Corpus Christi LMA population, combined. By 1980, however, Hispanics accounted for almost 13 percent of the total population. While there was some out-migration, the change in composition represents in-migration of other ethnicities. Many of these changes can probably be attributed to the industry changes during the decade.

Table 2

Total Population, Corpus Christi LMA: 1940-2000

County	1940	1950	1960	1970	1980	1990	2000
Aransas	3,469	4,252	7,006	8,902	24,260	17,892	22,497
Brooks	6,362	9,195	8,609	8,005	8,428	8,204	7,976
Duval	20,565	15,643	13,398	11,722	12,517	12,918	13,120
Jim Wells	20,239	27,991	34,548	33,032	36,798	37,679	39,326
Kenedy	700	632	884	752	543	460	414
Kleberg	13,344	21,991	30,052	33,166	33,358	30,274	31,549
Nueces	92,661	165,471	221,573	237,544	268,215	291,145	313,645
Refugio	10,383	10,113	10,975	9,494	9,289	7,976	7,828
San Patricio	28,871	35,842	45,021	47,288	58,013	58,749	67,138
LMA Total	196,594	291,130	372,066	389,905	441,121	465,297	503,493

Source: U.S. Census Bureau, 2000b.

Table 3

Percent of White Population, Corpus Christi LMA: 1940-2000

County	1940	1950	1960	1970	1980	1990	2000
Aransas	98.0	97.5	95.9	95.9	88.8	85.6	87.4
Brooks	99.4	99.5	99.8	99.9	87.5	82.4	75.8
Duval	99.4	99.8	99.9	99.8	93.5	78.9	80.2
Jim Wells	98.1	98.5	98.8	98.8	86.7	75.5	77.9
Kenedy	100.0	100.0	100.0	99.0	84.5	84.5	64.5
Kleberg	95.9	96.3	96.2	96.1	83.7	68.0	71.9
Nueces	94.1	95.1	95.3	94.9	82.1	75.8	72.0
Refugio	89.3	88.8	90.6	90.4	83.5	78.3	80.2
San Patricio	97.3	98.0	98.1	98.4	86.0	76.6	76.7
LMA %	95.7	96.1	96.2	95.9	84.0	75.9	74.2
LMA Total	188,181	279,810	357,946	374,091	370,746	353,603	373,547

Source: U.S. Census Bureau, 2000b.

Table 4

Percent of Black Population, Corpus Christi LMA: 1940-2000

County	1940	1950	1960	1970	1980	1990	2000
Aransas	1.9	2.5	4.0	4.0	1.7	1.5	1.4
Brooks	0.6	0.4	0.1	0.0	0.0	0.1	0.2
Duval	0.6	0.1	0.0	0.0	0.2	0.0	0.5
Jim Wells	1.8	1.4	1.1	0.9	0.6	0.6	0.6
Kenedy	0.0	0.0	0.0	0.0	0.0	0.0	0.7
Kleberg	4.0	3.7	3.3	3.0	4.0	3.4	3.7
Nueces	5.8	4.8	4.5	4.7	4.5	4.3	4.2
Refugio	10.6	11.1	9.3	9.0	8.0	7.6	6.8
San Patricio	2.6	2.0	1.8	1.4	1.0	1.3	2.8
LMA %	4.2	3.8	3.7	3.7	3.5	3.3	3.5
LMA Total	8,386	11,181	13,664	14,426	15,431	15,555	17,537

Source: U.S. Census Bureau, 2000b.

Education. The Census data on adult educational attainment levels show that the Corpus Christi LMA lagged behind the State of Texas as a whole (Table 5). In 1970, 55 percent of the adults in this LMA had not graduated from high school, compared to 51 percent for the state. By 1980, the percentage of adults not graduating from high school in Corpus Christi dropped to 45 percent, compared to a 34 percent drop for the state. The 1980s saw a continuation of this trend. Between 1980 and 1990, the percentage of adults without a high school education in this LMA dropped from 45 to 35 percent. By 1990, only 15 percent of adults in the LMA held college degrees, a rate significantly lower than the national rate of 21 percent. The Corpus Christi LMA economy was not as information-intensive (as reflected in a large proportion of college graduates) as other LMAs across the nation.

Table 5

Adult Educational Attainment (age 25+), Corpus Christi LMA: 1970-2000

County	0-8 Years	Some High School	High School Diploma	Some College, No Degree	BA/BS or More	Total
1970						
Aransas	33.7%	21.3%	26.1%	13.5%	5.4%	5,251
Brooks	54.6%	14.0%	16.8%	7.8%	6.7%	3,953
Duval	60.0%	15.8%	15.8%	4.2%	4.1%	6,004
Jim Wells	48.1%	18.4%	19.1%	7.8%	6.5%	16,075
Kenedy	71.5%	5.4%	13.2%	3.9%	6.0%	334
Kleberg	35.5%	15.3%	21.3%	12.7%	15.1%	13,318
Nueces	32.8%	18.3%	26.6%	11.9%	10.3%	115,135
Refugio	41.7%	23.4%	23.0%	7.4%	4.5%	5,043
San Patricio	43.8%	17.7%	21.6%	9.2%	7.5%	22,529
LMA Total	37.3%	18.1%	24.2%	10.9%	9.4%	187,642
1980						
Aransas	22.4%	19.6%	31.3%	14.6%	12.0%	8,799
Brooks	49.7%	9.6%	22.0%	9.8%	8.8%	4,594
Duval	46.6%	16.8%	22.8%	6.8%	6.9%	6,757
Jim Wells	39.9%	16.9%	23.6%	10.7%	8.8%	19,263
Kenedy	59.6%	6.4%	13.2%	4.1%	16.6%	295
Kleberg	28.6%	12.5%	23.7%	17.0%	18.1%	16,058
Nueces	25.8%	15.2%	27.3%	17.1%	14.5%	143,878
Refugio	34.5%	21.9%	21.9%	12.2%	9.4%	5,325
San Patricio	32.2%	16.2%	26.9%	13.8%	10.8%	30,272
LMA Total	29.1%	15.5%	26.4%	15.5%	13.3%	235,241
1990						
Aransas	14.2%	18.6%	28.6%	24.1%	14.4%	12,105
Brooks	34.2%	20.2%	21.5%	17.5%	6.6%	4,729
Duval	33.6%	18.5%	27.5%	14.0%	6.4%	7,475
Jim Wells	27.3%	17.4%	26.7%	19.2%	9.3%	21,880
Kenedy	40.5%	16.4%	25.2%	9.9%	7.8%	281
Kleberg	20.9%	15.8%	20.9%	23.5%	18.9%	16,542
Nueces	16.5%	14.5%	24.4%	27.5%	17.0%	174,396
Refugio	20.5%	17.6%	28.3%	22.2%	11.3%	5,067
San Patricio	22.4%	16.9%	26.4%	23.2%	11.0%	34,297
LMA Total	19.1%	15.6%	24.9%	25.2%	15.0%	276,772

Table 5

Adult Educational Attainment (age 25+), Corpus Christi LMA: 1970-2000 (continued)

2000						
Aransas	8.9%	16.3%	29.1%	28.8%	16.7%	15,728
Brooks	29.6%	20.5%	23.3%	19.7%	6.8%	4,717
Duval	22.8%	17.5%	29.7%	21.0%	8.9%	8,042
Jim Wells	17.3%	17.8%	32.3%	21.5%	10.9%	23,525
Kenedy	26.4%	15.7%	21.8%	15.7%	20.3%	261
Kleberg	15.5%	16.2%	23.0%	24.8%	20.4%	17,896
Nueces	12.3%	13.3%	25.0%	30.5%	18.8%	191,848
Refugio	15.3%	16.5%	32.5%	24.0%	11.5%	5,178
San Patricio	14.2%	14.4%	29.8%	28.6%	13.0%	39,551
LMA Total	13.6%	14.4%	26.5%	28.6%	16.8%	306,746

Source: U.S. Census Bureau, 2000b.

Finances. The oil and gas industry "boom and bust" of the 1970s and 1980s had an important effect on the financing of local governments in the Corpus Christi LMA. The first table shows that total revenues for local governments increased by 63 percent in constant dollars between 1972 and 1982 (Table 6). State allocation to local governments increased by 20 percent during the same period. In 1972, state allocations accounted for one-third of local government revenue in the Corpus Christi LMA. By 1982, state allocation accounted for only 20 percent of local government revenue (Table 7).

Table 6

Total Revenue, Per Capita (in 1997 adjusted dollars), Corpus Christi LMA: 1972-1997

County	1972	1977	1982	1987	1992	1997
Aransas	$1,006	$1,268	$1,418	$1,848	$1,304	$1,709
Brooks	$1,929	$2,249	$2,668	$2,918	$2,601	$2,029
Duval	$1,936	$2,020	$2,769	$3,716	$2,727	$3,229
Jim Wells	$1,156	$1,609	$1,578	$2,045	$2,042	$1,978
Kenedy	$2,902	$2,827	$3,247	$5,711	$3,372	$6,132
Kleberg	$1,054	$1,683	$1,910	$2,151	$2,235	$2,400
Nueces	$1,344	$2,437	$2,445	$3,141	$2,770	$2,972
Refugio	$1,732	$1,760	$2,663	$3,130	$2,677	$2,980
San Patricio	$1,332	$1,760	$1,819	$2,179	$2,043	$2,088
LMA Total	$1,335	$2,177	$2,233	$2,927	$2,522	$2,680

Source: U.S. Census Bureau, 2000a.

Table 7

Total State Revenue, Per Capita (in 1997 adjusted dollars), Corpus Christi LMA: 1972-1997

County	1972	1977	1982	1987	1992	1997
Aransas	$438	$313	$352	$280	$262	$374
Brooks	$364	$415	$543	$482	$845	$760
Duval	$530	$192	$804	$888	$1,161	$1,114
Jim Wells	$473	$612	$553	$770	$1,068	$1,030
Kenedy	$286	$114	$58	$62	$54	$43
Kleberg	$323	$422	$461	$648	$849	$905
Nueces	$448	$583	$595	$750	$848	$753
Refugio	$239	$271	$291	$357	$479	$595
San Patricio	$460	$571	$598	$789	$975	$796
LMA Total	$436	$542	$572	$724	$860	$780

Source: U.S. Census Bureau, 2000a.

Both total local and state government revenue increased between 1982 and 1987 by 27 percent in constant dollars (Table 8). At the same time, local governments in the Corpus Christi LMA had to incur debt to finance the increased demand for the services that accompanied economic growth from the boom of the 1970s and early 1980s. Between 1982 and 1987, local governments in the Corpus Christi LMA accrued an average increase of 54 percent in debt. The debt load was highest in Nueces County where, in 1987, the total per capita debt exceeded $4,600 in 1997 dollars. By 1992, however, these debt levels had receded. Between 1972 and 1982, local government debt for the entire LMA increased by 4 percent in real dollars. Between 1972 and 1982, per capita local government debt increased by over 27 percent in Nueces County (Table 9).

Table 8

Total Tax Revenue, Per Capita (in 1997 adjusted dollars), Corpus Christi LMA: 1972-1997

County	1972	1977	1982	1987	1992	1997
Aransas	$439	$641	$629	$924	$840	$901
Brooks	$1,199	$1,359	$1,413	$1,569	$1,132	$890
Duval	$1,270	$1,551	$1,461	$2,400	$1,378	$1,031
Jim Wells	$518	$696	$642	$723	$762	$603
Kenedy	$2,306	$2,465	$2,428	$4,215	$3,174	$5,924
Kleberg	$444	$713	$724	$852	$842	$856
Nueces	$501	$776	$760	$992	$1,036	$1,086
Refugio	$1,300	$1,626	$1,797	$2,056	$1,412	$1,488
San Patricio	$506	$708	$676	$801	$733	$795
LMA Total	$555	$806	$786	$1,006	$974	$993

Source: U.S. Census Bureau, 2000a.

Table 9

Total Debt, Per Capita (in 1997 adjusted dollars), Corpus Christi LMA: 1972-1997

County	1972	1977	1982	1987	1992	1997
Aransas	$948	$201	$815	$582	$342	$466
Brooks	$1,550	$727	$690	$1,416	$232	$88
Duval	$4,483	$2,759	$1,137	$399	$176	$371
Jim Wells	$1,681	$1,086	$740	$1,161	$546	$493
Kenedy	$0	$0	$0	$0	$0	$0
Kleberg	$1,057	$1,147	$1,219	$1,726	$1,317	$689
Nueces	$2,044	$1,786	$2,614	$4,191	$3,046	$2,314
Refugio	$275	$336	$292	$221	$113	$266
San Patricio	$1,565	$1,095	$947	$936	$1,181	$669
LMA Total	$1,867	$1,521	$1,946	$2,992	$2,215	$1,648

Source: U.S. Census Bureau, 2000a.

In sum, the 1990s were a continued period of transition for the Corpus Christi LMA, when employment grew by a modest 9 percent. Many industries experienced net job losses, including agriculture, mining, manufacturing, and transportation/public utilities. The employment growth was led by the service sector, which added over 40,000 new jobs during the decade.

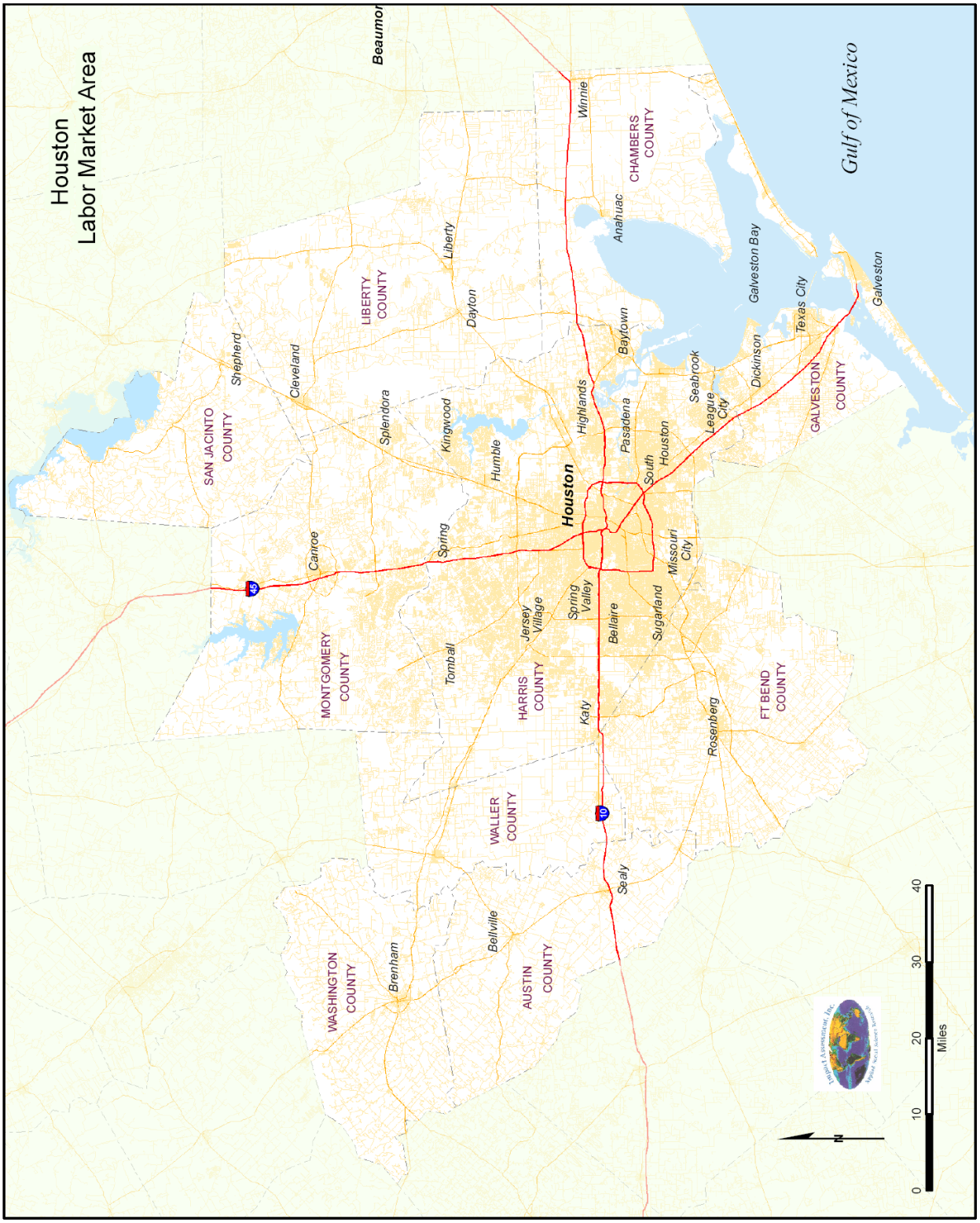
The population of the Corpus Christi LMA increased 8 percent from 465,297 to 503,493 between 1990 and 2000, a rate slightly lower than the national rate of 10 percent. Populations increased in all counties within this LMA except for Brooks, Kenedy, and Refugio Counties, which experienced negative population growth, indicating continued out-migration.

The percentage of adults holding a high school diploma in Corpus Christi LMA reached 26.5 percent in 2000, thus narrowing previous educational gaps comparative to the state. This could be because the "bust" in the oil and gas industry led to an out-migration of people without high school diplomas, chasing labor intensive jobs elsewhere. However, the low growth rate for college graduates (15% to 17%) indicates that the 40,000 service sector jobs were not high end jobs occupied by college graduates.

Total local government revenue increased 6 percent between 1992 and 1997. However, state allocation to local government decreased by 9 percent in the same time period. The continual increase evident in the total local government revenue is reflected in the local government debt numbers. Between 1992 and 1997, local government debt for the entire LMA decreased by 26 percent in real dollars. Most counties in the LMA experienced a decrease in their debt loads.

2. Houston, Texas: Labor Market Area

The Houston Labor Market Area (LMA) is made up of 10 Texas counties: Austin, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, San Jacinto, Waller, and Washington (Map 4).



Map 4. Houston, Texas Labor Market Area.

According to the U.S. Census Bureau, the year 2000 population of those 10 counties approaches 4.5 million persons. The Houston LMA is a major force in offshore oil and gas exploration/production. Unlike other LMAs with specialist economies, the economy in the Houston LMA is very diverse. This diversity may have helped protect its economy from downturns in the oil and gas industry.

First Unit of Analysis: Houston LMA Employment, 1940-1970. Over 250,000 people were employed in the Houston LMA in 1940. During this decade, the wide-ranging economy in the Houston LMA included agriculture (13%), manufacturing (20%), trade (22%), and services (21%). The mining industry, where oil and gas workers are employed, represented a very small portion of the labor force (3%), but a very large number of workers (8,500) (Figure 1). Moreover, more workers were employed in the Houston LMA mining sector in 1940 than in the Lafayette, Lafourche, Lake Charles, and Beaumont LMAs' mining sectors combined.

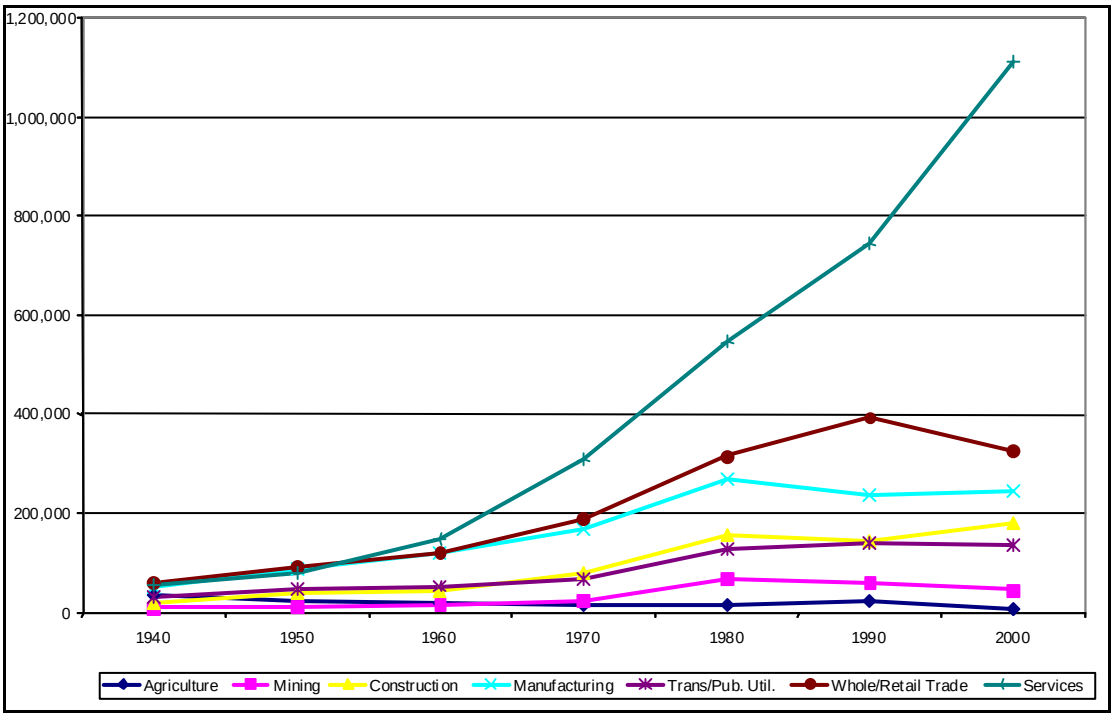


Figure 1. Major Industry Employment, Houston LMA: 1940-2000 (U.S. Census Bureau, 2000b).

Between 1940 and 1950, total employment in the Houston LMA grew by 47 percent (adding over 100,000 workers) to almost 400,000 workers. With the exception of agriculture, which suffered a 36 percent decrease in employment, there was growth in each sector: construction gained 20,000 workers (+106%), manufacturing gained 35,000 workers, and wholesale/retail trade gained 26,000 workers. Mining employment increased by 30 percent between 1940 and 1950, from 8,500 workers to over 11,000 workers. However, in 1950, this sector represented a very small proportion of the total labor force (2.9%).

Total employment in the Houston LMA grew by 36 percent between 1950 and 1960. Every industry sector experienced increases in employment, with the exception of agriculture, which lost 5,000 jobs. The growth leader was services, adding 60,000 jobs and representing 28 percent of the labor force. Manufacturing also experienced growth in the 1950s, adding 30,000

more workers. The mining sector experienced 43 percent growth between 1950 and 1960 and, by 1960, employed 3 percent of the Houston LMA's total labor force. The total number of workers in the Houston LMA grew by 65 percent during the 1960s. By 1970 almost 850,000 workers were employed in the Greater Houston LMA. Growth was greatest in services (109%), construction (83%), mining (46%) and manufacturing (41%). The 65 percent total employment growth rate for the Houston LMA is significantly greater (at least twice) than the growth rate of any other LMA in the region during the 1960s. Mining added 7,000 jobs, manufacturing 50,000 jobs, and construction added 30,000 jobs.

Houston LMA Demographic Changes 1940-1970. Several important industry structure changes occurred in the Houston LMA between 1940 and 1970. First, total employment in the LMA grew by 233 percent between 1940 and 1970. Second, agriculture declined in importance while mining and manufacturing emerged as dominant industries. Population growth within the Houston LMA reflects these employment changes. The Houston LMA had a year 1940 population of approximately 760,000 people. By 1970, the LMA's population was over 2.1 million. In Harris, the LMA's most populous county, the population increased by 226 percent between 1940 and 1970.

Second Unit of Analysis: Houston LMA Employment, 1970-1990. Total employment grew by 76 percent in the Houston LMA between 1970 and 1980. By 1980, there were 1.5 million workers in the Houston LMA. With the exception of agriculture, every sector grew by over 60 percent. The manufacturing sector added almost 100,000 jobs during the 1970s, and over 200,000 jobs were added in services. The mining (180%), construction (99%) and transportation (88%) sectors led this growth. The Houston LMA employed nearly half of all workers (66,000) employed in mining across all of the LMAs in the GOM region (135,000) in 1980.

Employment increased 16 percent in the Houston LMA between 1980 and 1990. This trend is rather unique within the oil and gas Gulf of Mexico region. Indeed, many LMAs had net employment losses during this period (e.g., New Orleans, Lafourche, and Lake Charles in LA, and Beaumont in TX, while others grew at very low rates (e.g., Lafayette, LA and Corpus Christi, TX) during a decade of economic expansion. Predictably, however, employment levels declined in several key sectors: mining (-10%), construction (-7%), and manufacturing (-12%). These three industries mirror the "boom and bust" pattern of the 1970s and 1980s that occurred in other LMAs as well. All total, these three sectors accounted for a net loss of 50,000 jobs during the 1980s. However, mining employment in the Houston LMA remained at almost 60,000 workers in 1990.

Several trends merit further study. First, the Houston LMA is the largest economy in the GOM region, and half of all oil and gas workers employed in the GOM region were employed in Houston LMA. Second, both the growth rates in the 1970s and the job losses in the 1980s were in broad industry sectors that are connected to the oil and gas industry (construction, manufacturing, transportation, and mining). However, the decline in some of the industries, particularly during the 1980s, may not have been directly related to the oil and gas industry, particularly manufacturing. Further analysis of these sectors with annual data is needed in order to locate a better understanding of what changes occurred between Census years. Analysis of Decennial Census data indicates that important changes occurred in the Houston LMA between 1970 and 1980, and again between 1980 and 1990. However, Decennial Census data are not always capable of documenting important short-term trends, such as rapid declines or growth spurts in employment in a given industry. Establishing an accurate time line for major shifts in

employment in key industries is very important for understanding when changes occurred in oil/gas and related industries.

In order to understand the benefits and burdens of certain industries to a system, it is also important to know the timing of the industry shocks. In our analysis, we employ a moving average forecasting model to locate the years that the shocks occur in the Houston LMA. The results of this effort are displayed below (Figures 2 and 3). The data in Figure 2 show the actual employment data charted with the three-year employment moving average for each year from 1969-2000, inclusive. Figure 2 shows that employment grew steadily between 1969 and 1982.

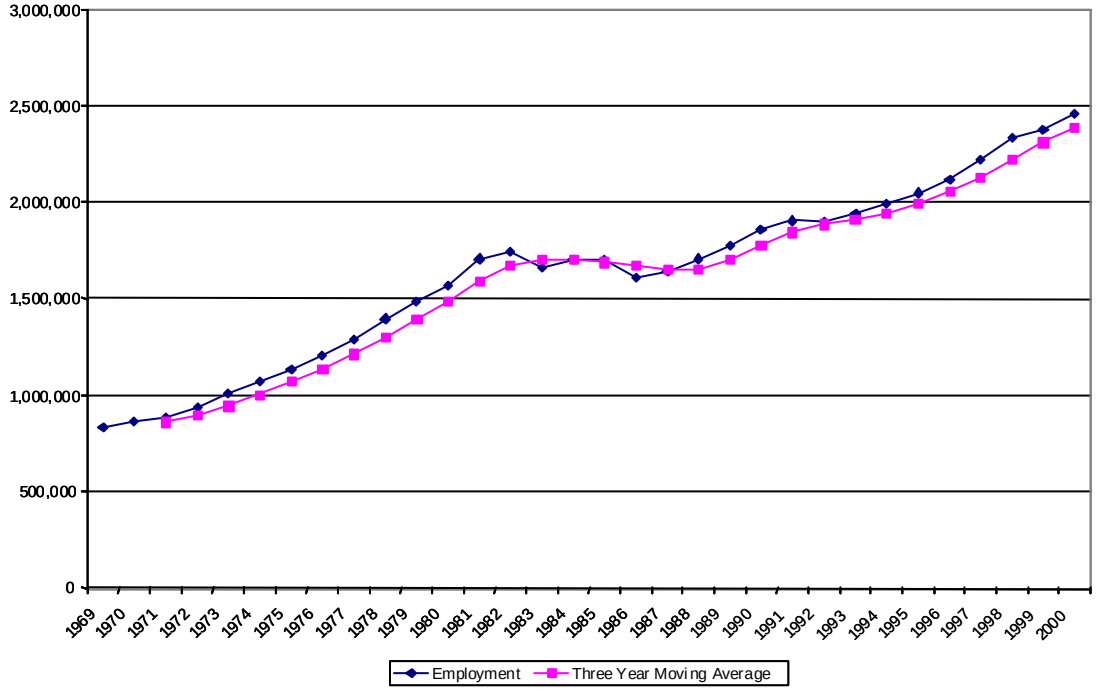


Figure 2. Total Annual Employment and Three-year Moving Averages, Houston LMA: 1969-2000 (U.S. Dept. of Commerce, Bureau of Economic Analysis, 2000).

The forecasting analysis documents forecasting errors, which occur when the observed employment number in a given year substantially exceeds the expected employment number in that year (as based on a three-year moving average) (Figure 3). This data identify 1978 and 1981 as two years of very rapid employment growth. Between 1982 and 1986, however, total employment declined from 1.7 million to 1.6 million. While the Census data analysis indicates that employment grew by 16 percent between 1980 and 1990, these data show a "bust" effect between 1982 and 1986. However, the forecasting analysis fails to reveal sharp drop-offs in employment during this bust. Since 1987, employment growth has increased steadily, with exception of the recession occurring between 1990 and 1992. Between 1987 and 2000, employment in the Houston LMA increased from 1.6 million to over 2.3 million.

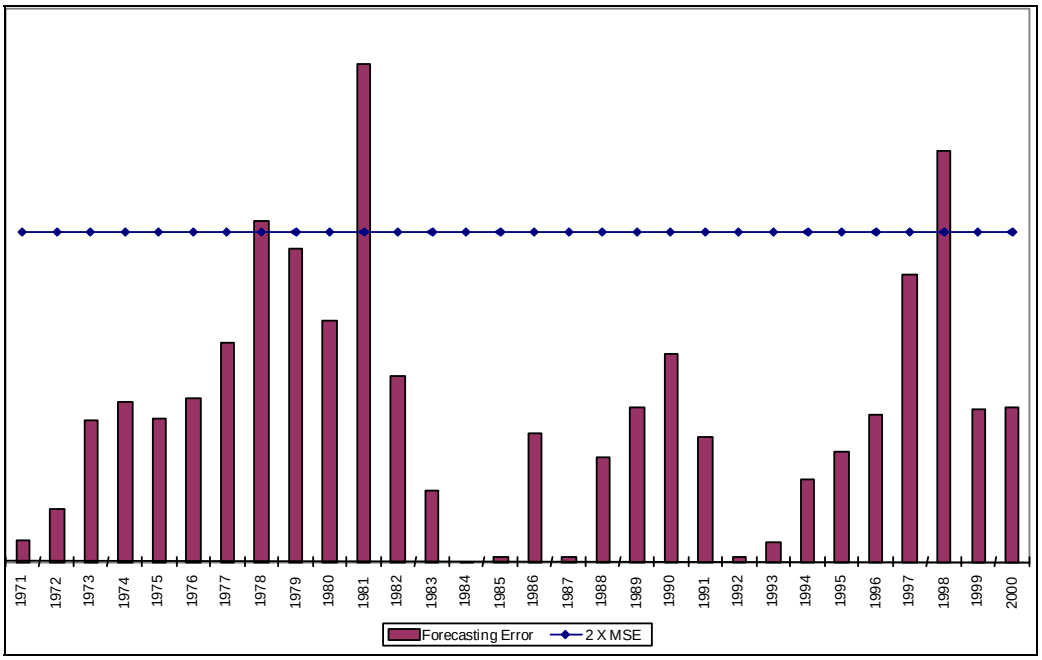


Figure 3. Forecasting Analysis for Total Annual Employment, Houston LMA: 1971-2000.

We turn now to an analysis of annual employment data for specific industry sectors in order to uncover in which industry sectors these "boom and bust" patterns are present in the Houston LMA. Mining, construction, manufacturing and transportation/communication all experienced growth and decline patterns during the late 1970s and 1980s. The forecasting analyses for those four sectors are presented in the following figures (Figures 4-7).

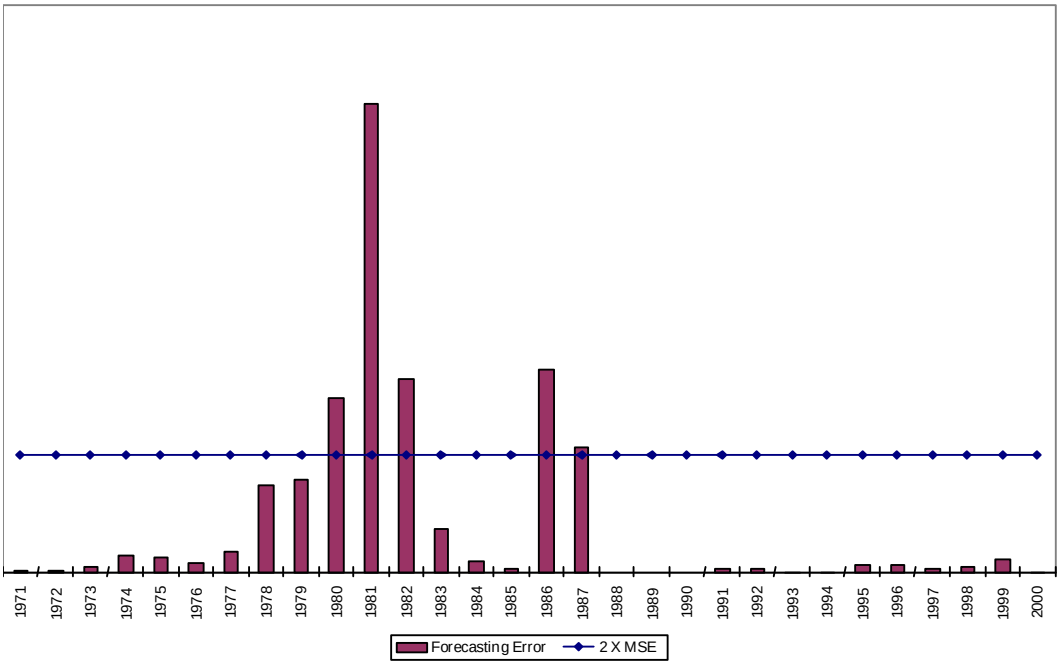


Figure 4. Forecasting Analysis for Annual Mining Employment, Houston LMA: 1971- 2000.

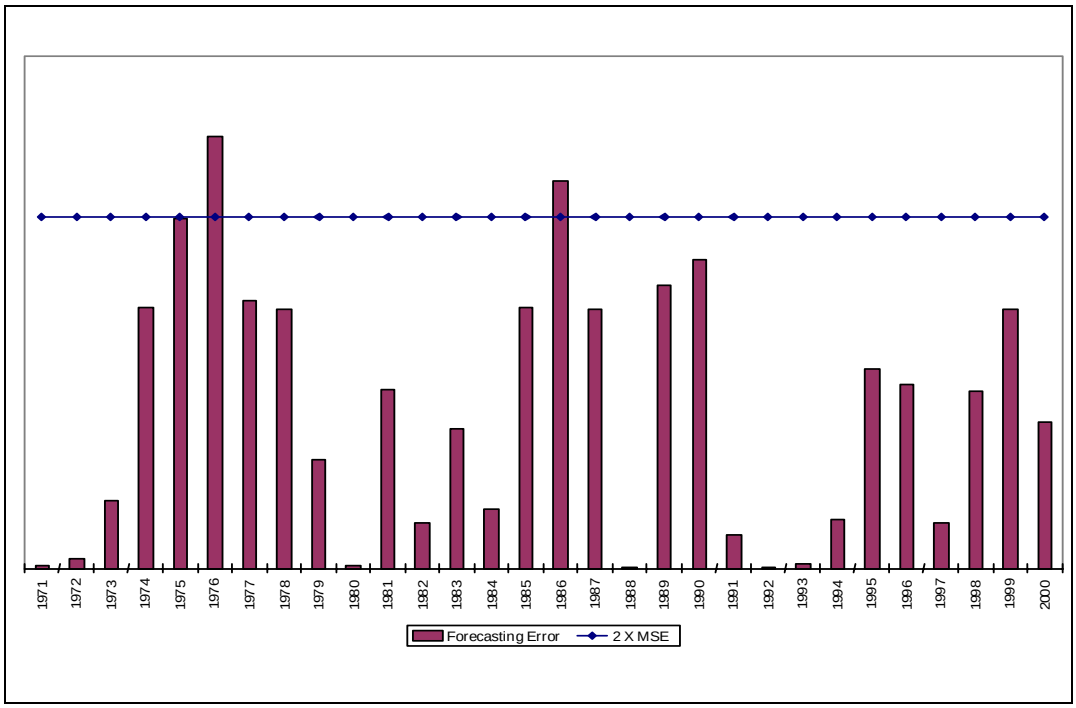


Figure 5. Forecasting Analysis for Annual Construction Employment, Houston LMA: 1971-2000.

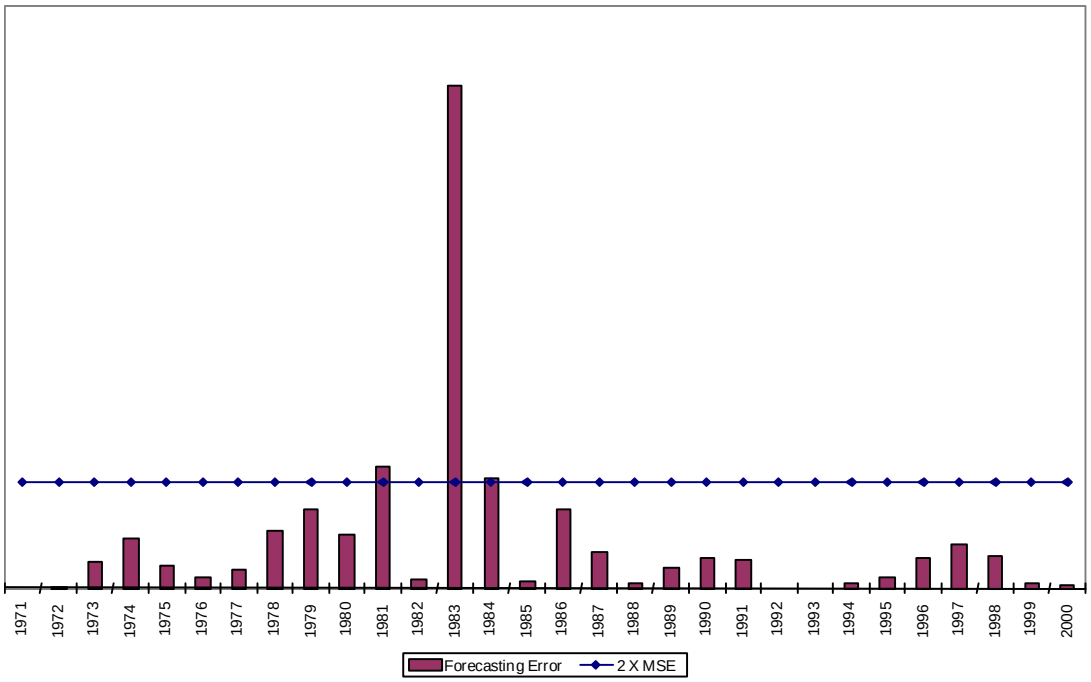


Figure 6. Forecasting Analysis for Annual Manufacturing Employment, Houston LMA: 1971-2000.

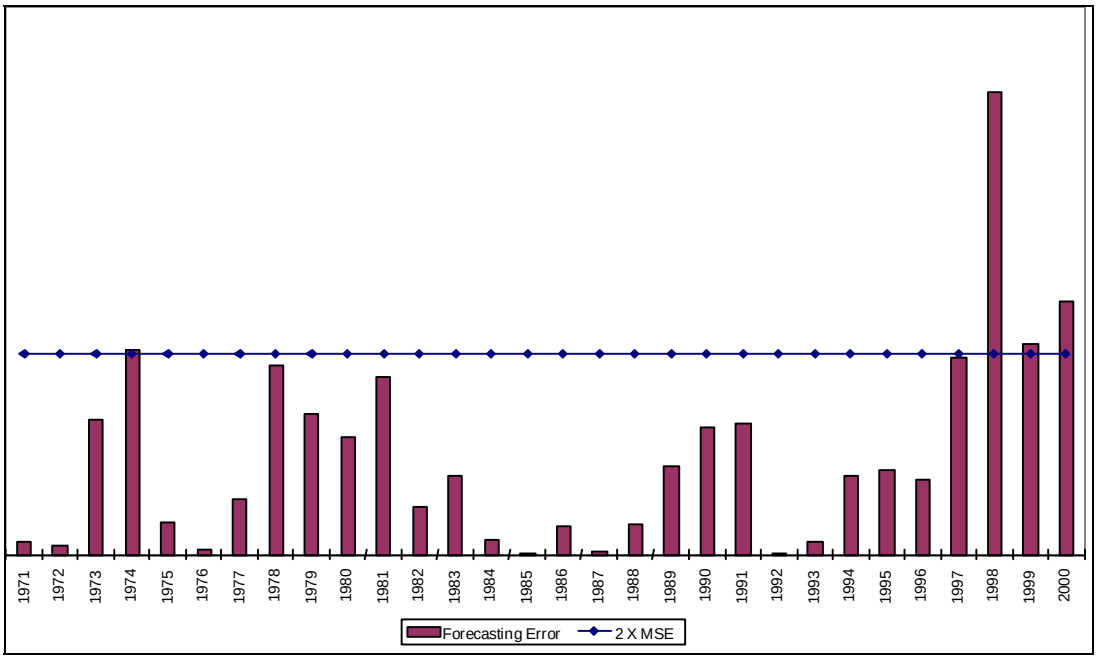


Figure 7. Forecasting Analysis for Annual Transportation, Communication, and Public Utilities Employment, Houston LMA: 1971-2000.

The analysis for mining shows one period of greater than expected employment growth (1980-1982, inclusive). This is followed by a period of unexpected employment declines. In 1986 and 1987, the industry hit a low employment point, losing almost 30,000 jobs in two years. This forecasting pattern is consistent with the "boom and bust" pattern of oil and natural activities. The data for construction employment fit a pattern similar to mining. There is greater than expected growth in the 1970s (1976, in particular). There is a pattern of unexpected decline between 1985 and 1987, during which about 30,000 jobs were lost in this sector. Manufacturing is a sector that experienced a sharp increase and decrease in employment during the 1980s. Between 1978 and 1981, employment grew by 22 percent, adding 50,000 jobs during a period of a national recession. However, between 1981 and 1987, almost 100,000 jobs were lost in this sector, with the sharpest drops in employment occurring in 1983 and 1984. Since 1987, manufacturing employment has grown in the Houston LMA. By 1999, employment levels were at 85 percent of their 1981 levels.

Unlike the other three industries, transportation/communication employment trends are inconsistent with "boom and bust" patterns of the 1970s and 1980s. Employment levels were stable between 1970 and 2000, unlike the employment peaks and valleys that occurred in other sectors. The forecasting analysis in Figure 7 underscores the lack of rapid growth and decline patterns in the Transportation, Communication and Public Utilities sector.

Detailed Industry Code Analyses. The annual employment data show a "boom and bust" pattern beginning in the late 1970s and extending through the later 1980s. The analysis of annual full- and part-time employment data by single-digit industry codes indicate that a number of sectors, including mining, construction, and manufacturing experience this "boom and bust." These data show that the patterns uncovered in the Census data analysis (growth in the 1970s, decline in the 1980s) are consistent with the "boom and bust" pattern in the oil and natural gas industry during this period. Moreover, the annual employment data document a decline during the 1980s that is not present in the Census data. However, using single-digit industry sector data

will not allow us to confirm that these trends are oil and gas related. This is particularly important for the trends in manufacturing employment, a sector that experienced losses nationwide during the 1980s due to globalization. Therefore, we now turn to an analysis of detailed industry codes for four main industry groups: mining, manufacturing, transportation, and wholesale trade (Table 1). We chose these detailed categories based on a) relationship to oil and gas activities, b) employment levels, and c) availability of data in the years we are studying.

Table 1

Key Industry Groups and Sub-Categories

Mining		
Drilling Oil and Gas Wells (SIC 1381), this category includes, on a contract basis, directional drilling, redrilling, reworking, and "spudding in" of oil and gas wells**.**	***Oil and Gas Field Exploration Services*** (SIC 1382), this category includes, on a fee basis, geophysical exploration, aerial exploration, and seismograph services**.**	***Oil and Gas Field Service N.E.C.*** (SIC 1389) this category includes, on a contract basis, excavating slush pits and cellars, grading and building of foundations, well surveying, running and cutting casings, tubes and rods, cementing and shooting wells, acidizing and chemically treating wells. Operating oil and gas wells for others on a contract basis are also included in this category.
Manufacturing		
Fabricated Structural Metal Products (SIC 3440*),* this category includes manufacture of barge sections, ship sections, buoys, and metal plates for gas tanks, gas holders, oil storage tanks, large diameter pipes, pressure valves, storage tanks and also portable building.	***Ship and Boat Building and Repairing*** (SIC 3730), this category includes building and repairing barges, cargo vessels, drilling platforms and dry docks.	***Oil Field Machinery*** (SIC 3533), this category includes bits, rock and oil field tools, derricks for oil and gas fields, drill rigs, drilling tools for gas, oil and water wells.
Transportation		
Water Transportation (SIC 4400), this category primarily includes stevedoring.		
Wholesale Trade		
Industrial Machinery and Equipment (SIC 5084), this category includes the wholesale of derricks, oil field tool joints, oil well supply houses, oil well machinery equipment and supplies.		

Houston LMA Mining. The *Drilling Oil and Gas Wells* (SIC 1381) data show that the Houston LMA is the heart of the oil and gas industry for mining employment (Figures 8 and 9). In 1982, employment peaked in this sector at 15,000 workers. Annual employment data for *Oil and Gas Field Exploration Services* (SIC 1382) display levels that are significantly lower than in the other mining sectors during the late 1970s and early 1980s (Figures 10 and 11). However, these data do show the same trend as is found with *Drilling Oil and Gas Wells* (SIC 1381). Moreover, in terms of the spatial distribution of employment in this sector, the Houston LMA captures the vast share of workers. For example in 1981 over 6,000 workers were employed in Houston LMA, compared to 900 in Lafourche LMA, 1,600 in Lafayette LMA, 200 in Beaumont LMA, and 350 in Corpus Christi LMA. In fact, Houston LMA is the only GOM region LMA with very large numbers of *Oil and Gas Field Exploration Services* (SIC 1382) workers.

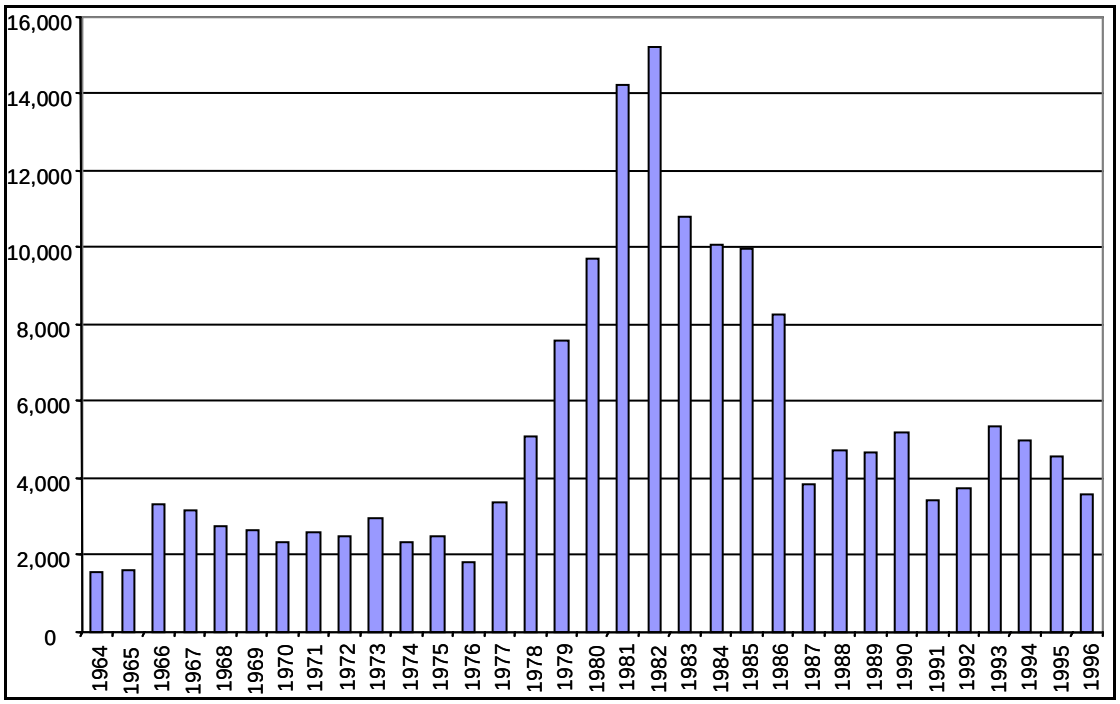


Figure 8. Drilling Oil and Gas Wells, Houston LMA: 1964-1996 (U.S. Census Bureau, 2000a).

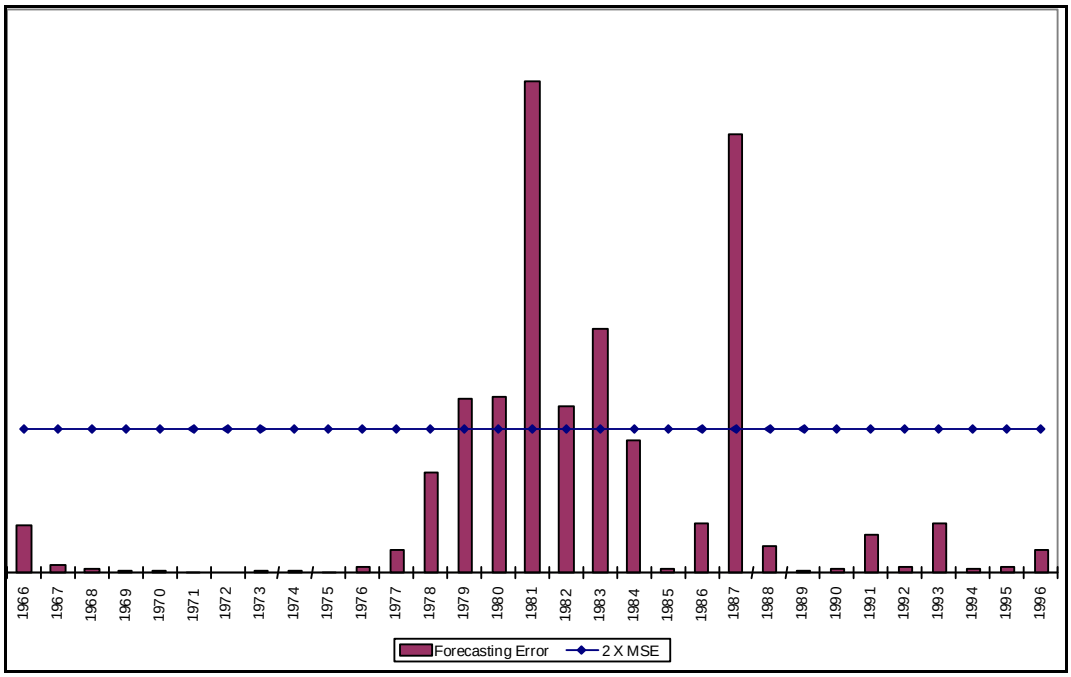


Figure 9. Forecasting Analysis for Drilling Oil and Gas Wells, Houston LMA: 1966-1996.

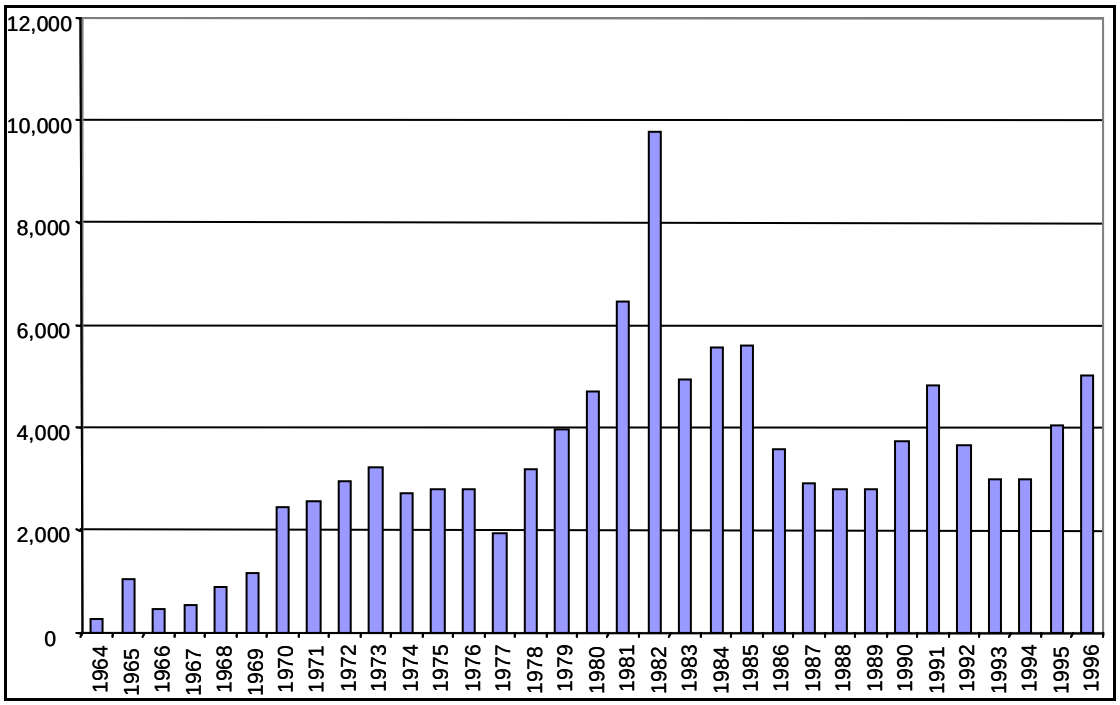


Figure 10. Oil and Gas Field Exploration Services, Houston LMA: 1964-1996 (U.S. Census Bureau, 2000a).

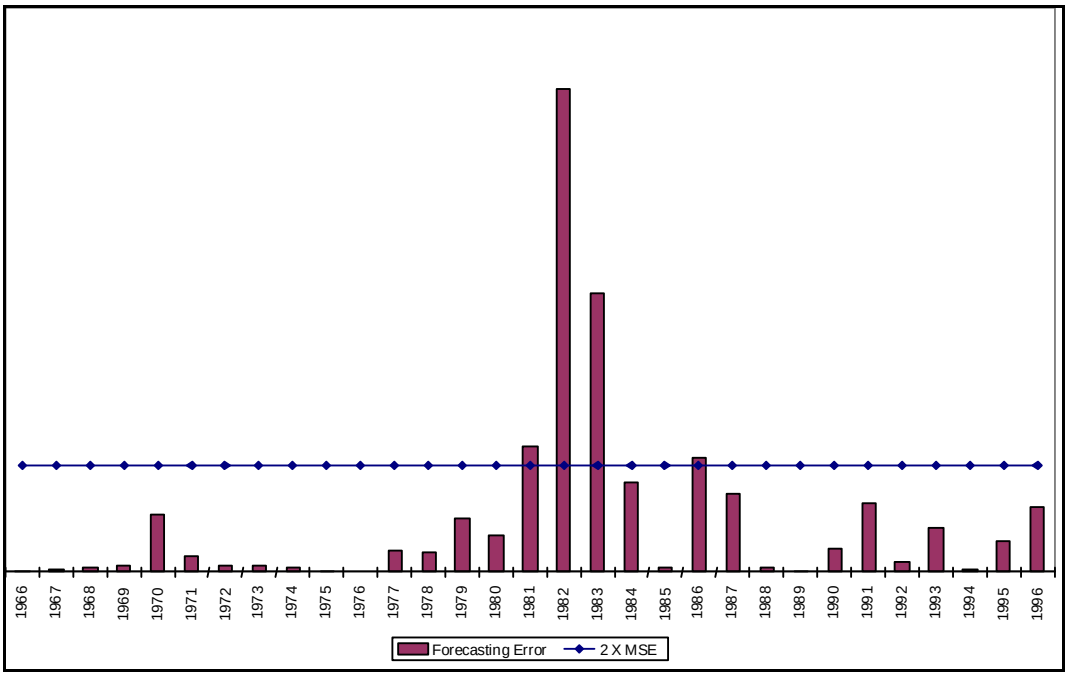


Figure 11. Forecasting Analysis for Oil and Gas Field Exploration Services, Houston LMA: 1966-1996.

The employment data for the *Oil and Gas Field Service N.E.C.* (SIC 1389) sector suggest three important trends (Figures 12 and 13). First, the "boom and bust" pattern is present in this sector. Between 1977 and 1982, employment doubled. By 1988, employment returned to pre-1977 levels. The forecasting analysis in Figure 14 confirms 1982 and 1988 as key employment years. The second important trend is the size of this sector: in 1982, it employed almost 12,000 workers. However, while the Houston LMA was the spatial home of *Oil and Gas Field Exploration Services* (SIC 1382) and *Drilling Oil and Gas Wells* (SIC 1381), it was not spatially dominant in terms of *Oil and Gas Field Service N.E.C.* (SIC 1389).

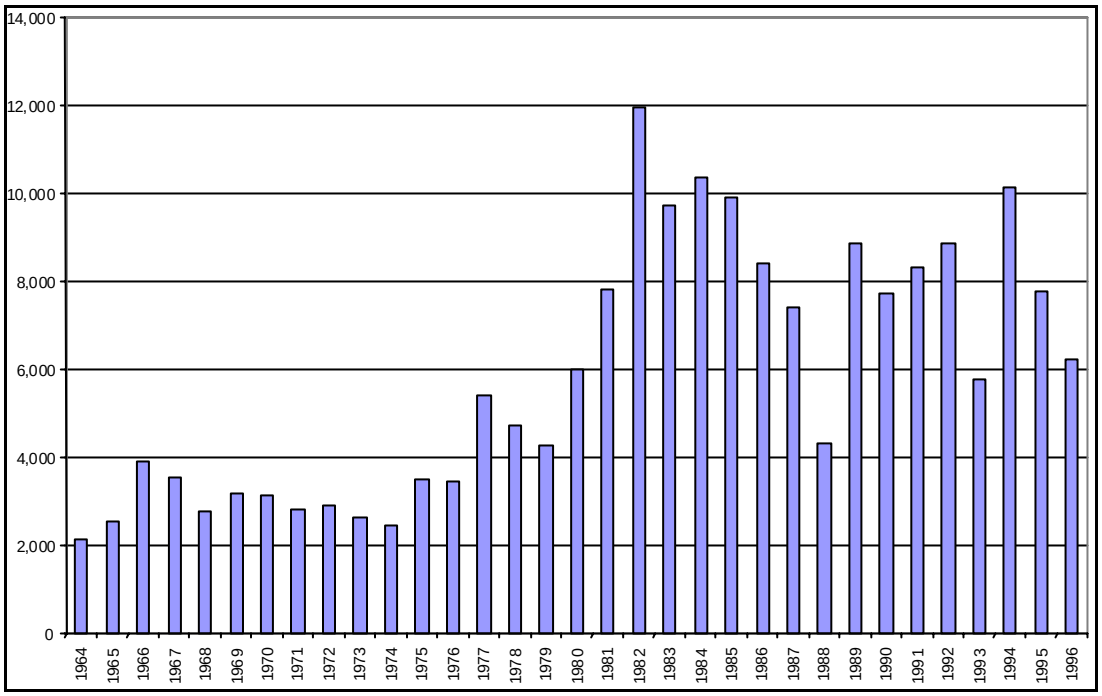


Figure 12. Oil and Gas Field Services, Houston LMA: 1964-1996 (U.S. Census Bureau, 2000a).

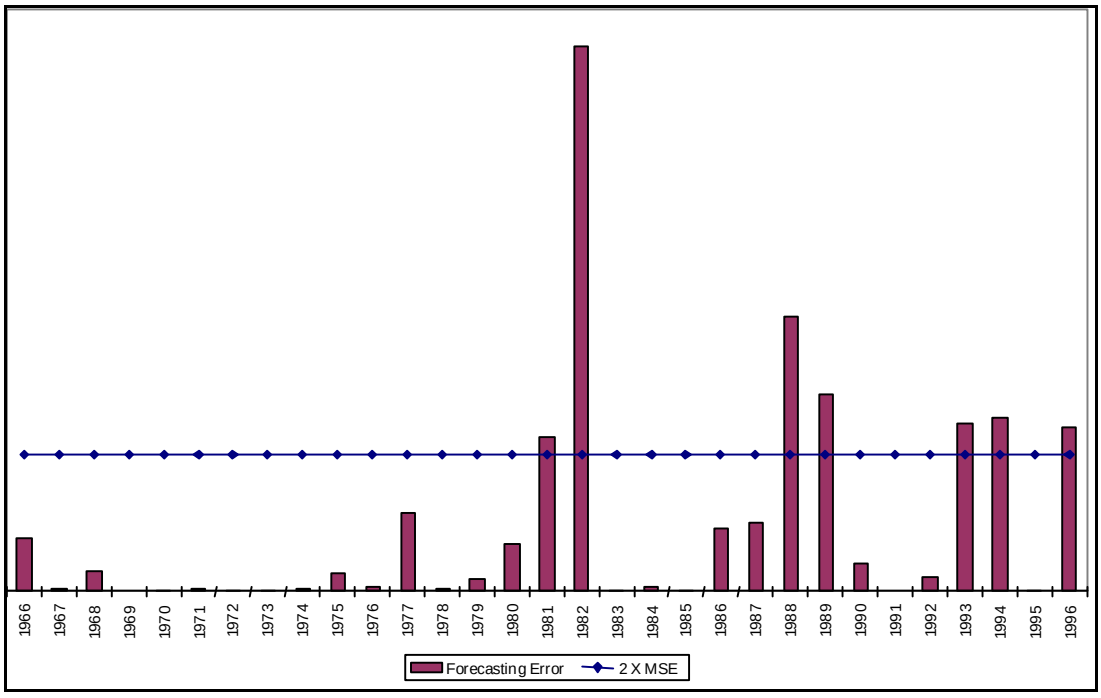


Figure 13. Forecasting Analysis for Oil and Gas Field Services, Houston LMA: 1966-1996.

The third important trend is that there was significant employment in this industry sector beyond the "bust" of the 1980s. We find similar patterns in the Lafourche and Lafayette LMAs in Louisiana. There is still significant employment (and activity) in this sector in key Gulf of Mexico Region LMAs beyond the "oil and gas" bust of the 1980s.

Houston LMA Manufacturing. The data on all of the manufacturing sectors show significant employment and interesting growth patterns in Houston LMA. The data for the *Fabricated Structural Metal Products* (SIC 3440) employment show a sector that employed over 14,000 workers at its peak in the early 1980s, the height of the oil and gas boom (Figures 14 and 15). By 1987, however, employment in this sector declined to less than 8,000 workers. The forecasting model indicates that a sharp decline in this sector occurred in 1983 and 1984. In fact, the 1983 employment levels were only 70 percent of those reported for 1982.

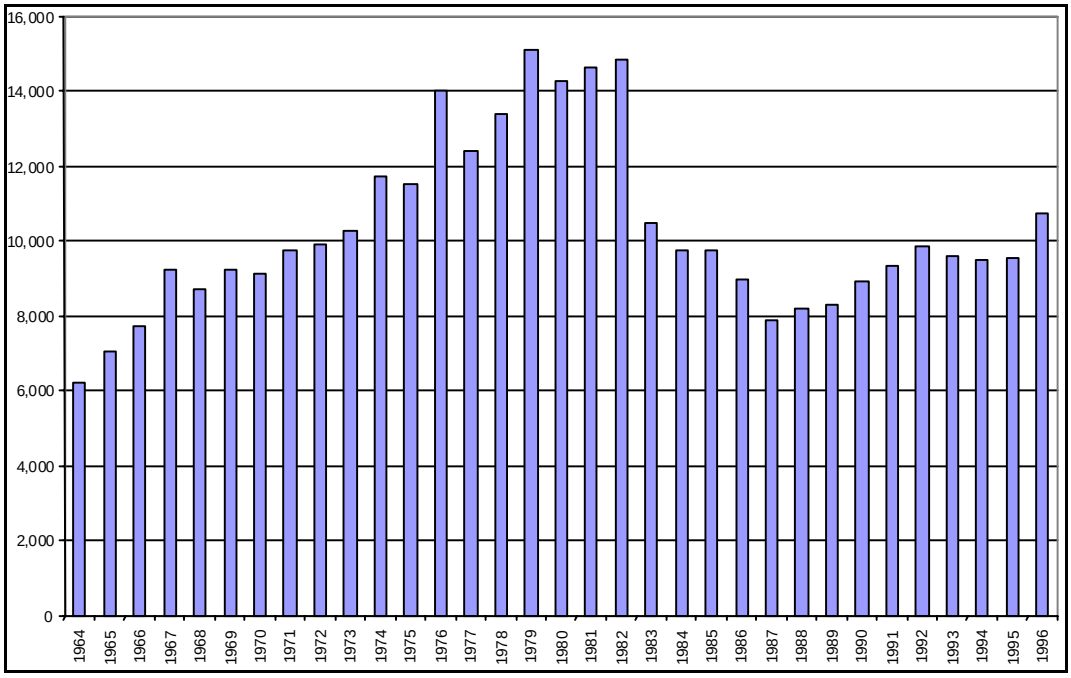


Figure 14. Annual Employment for Fabricated Structural Metal Products, Houston LMA: 1964-1996 (U.S. Census Bureau, 2000a).

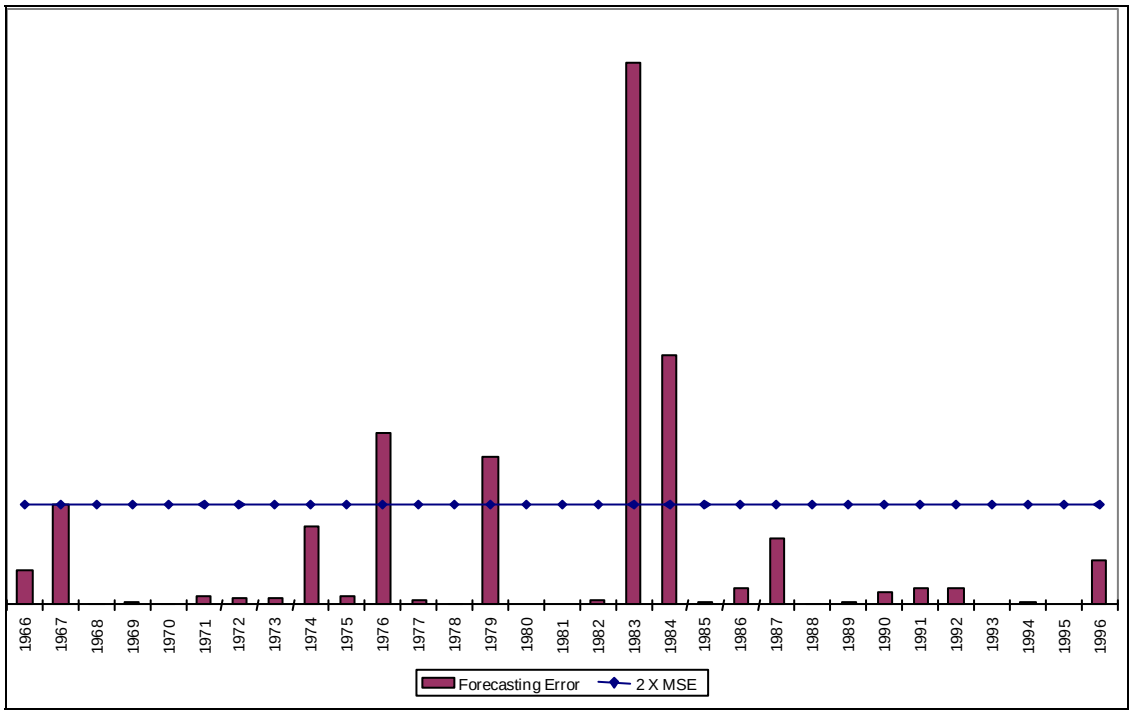


Figure 15. Forecasting Analysis for Fabricated Structural Metal Products, Houston LMA: 1966-1996.

The following data discusses employment data on *Oil Field Machinery* (SIC 3533) manufacturing (Figures 16-17). Notably, this sector employed over 40,000 workers in the Houston LMA in 1982. As with *Fabricated Structural Metal Products* (SIC 3440), 1983 is the key year for sharp declines in employment. Significantly fewer workers were found in that sector in 1983 than expected, as based on trends in previous years. Between 1982 and 1987, 30,000 jobs, or 75 percent of the total labor force, were lost in this sector. Moreover, the vast majority of *Oil Field Machinery* (SIC 3533) were located in the Houston LMA. Sector employment in other GOMR LMAs (e.g., Lafayette, Lafourche, and Beaumont) is a fraction of the levels found in the Houston LMA.

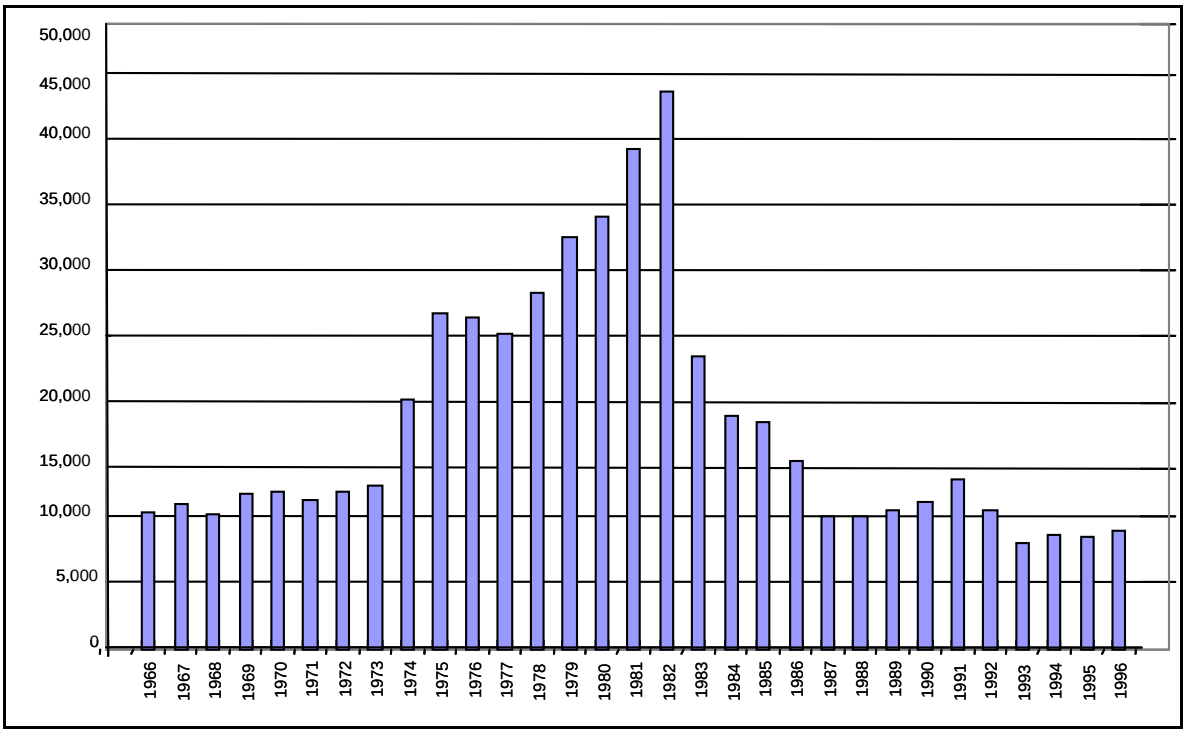


Figure 16. Annual Employment for Manufacture of Oil Field Machinery, Houston LMA: 1966-1996 (U.S. Census Bureau, 2000a).

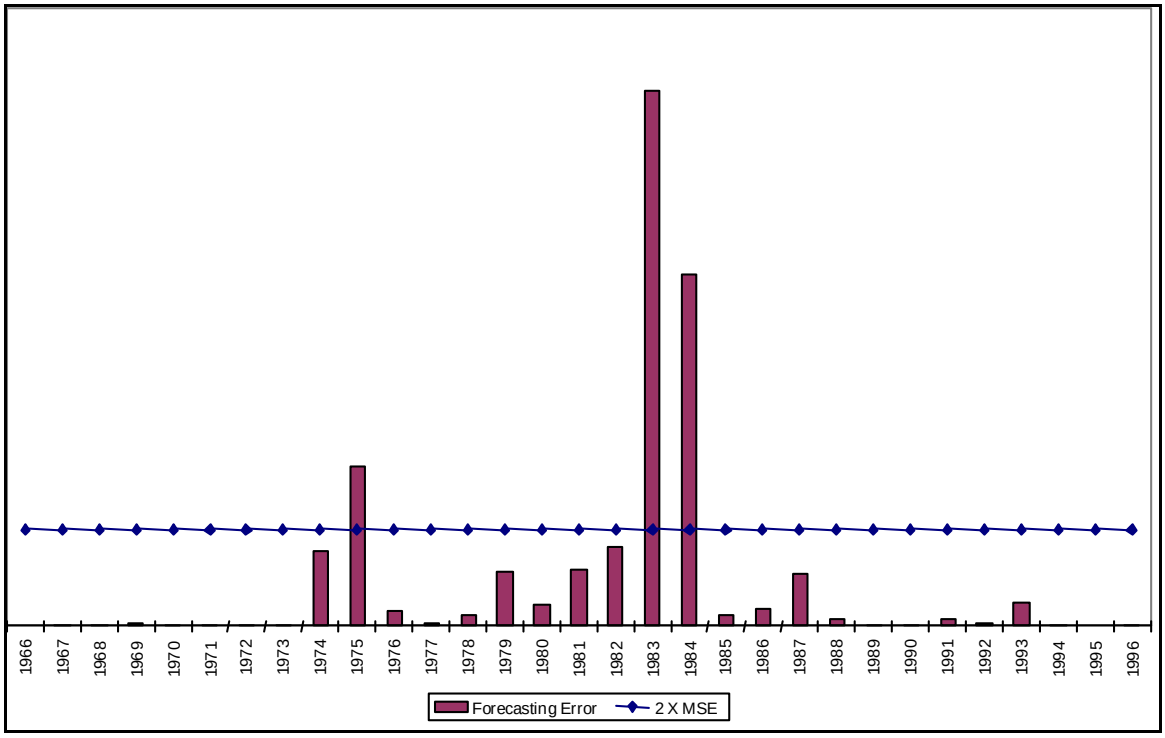


Figure 17. Forecasting Analysis for Manufacture of Oil Field Machinery, Houston LMA: 1966-1996.

The data for *Ship and Boat Building and Repairing* (SIC 3730) are presented below (Figures 18 and 19). This sector is the smallest of the key manufacturing sectors in our study, employing less than 5,000 workers at any point in this time-line. Compare this trend to the New Orleans LMA, where over 14,000 workers were employed in *Ship and Boat Building and Repairing* (SIC 3730) during the early 1980s; the height of the oil and gas boom. The Houston data for *Ship and Boat Building and Repairing* (SIC 3730) indicate increased employment activity in the early 1980s, with over 4,000 workers employed in this industry in 1981. By 1984, employment levels had receded to less than 2,000 workers. The employment levels in this sector are much smaller than what are found in *Oil Field Machinery* (SIC 3533) and *Fabricated Structural Metal Products* (SIC 3440). While the New Orleans LMA is the industry leader in the GOMR, the Houston LMA *Ship and Boat Building and Repairing* (SIC 3730) employment levels are comparable to levels and patterns found in other GOMR LMAs (e.g., Mobile, AL and Beaumont, TX).

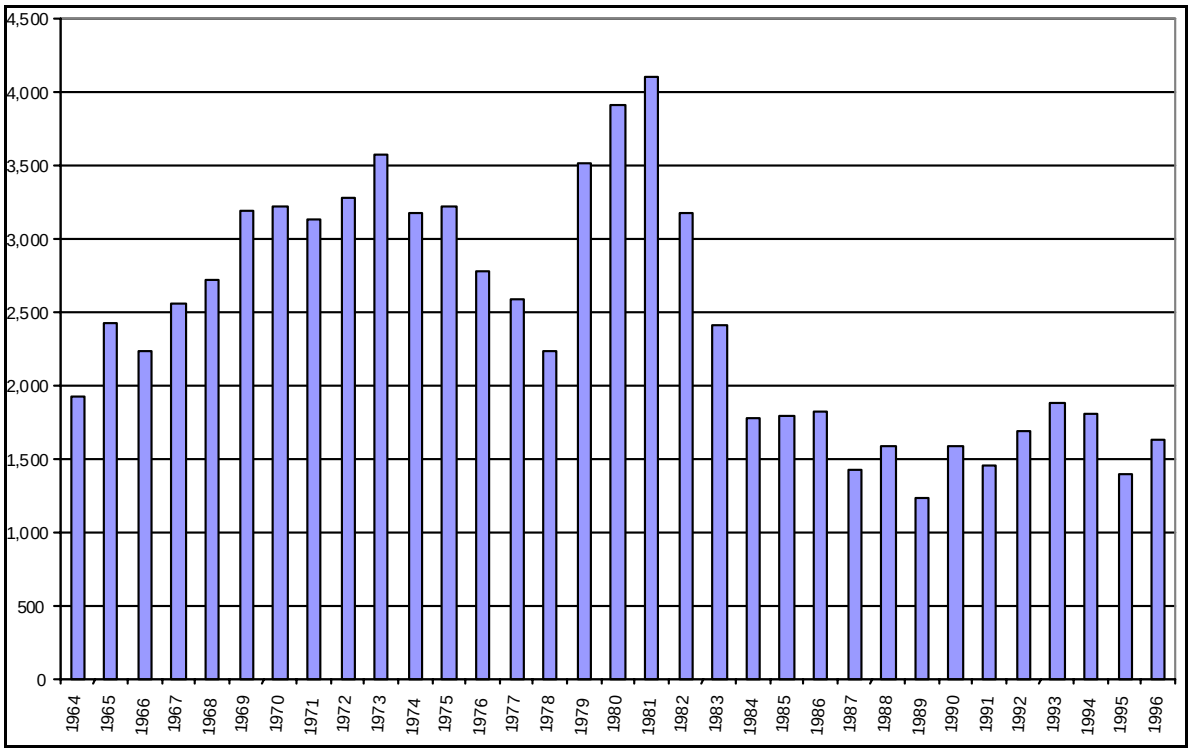


Figure 18. Annual Employment for Ship and Boat Building and Repair, Houston LMA: 1964-1996 (U.S. Census Bureau, 2000a).

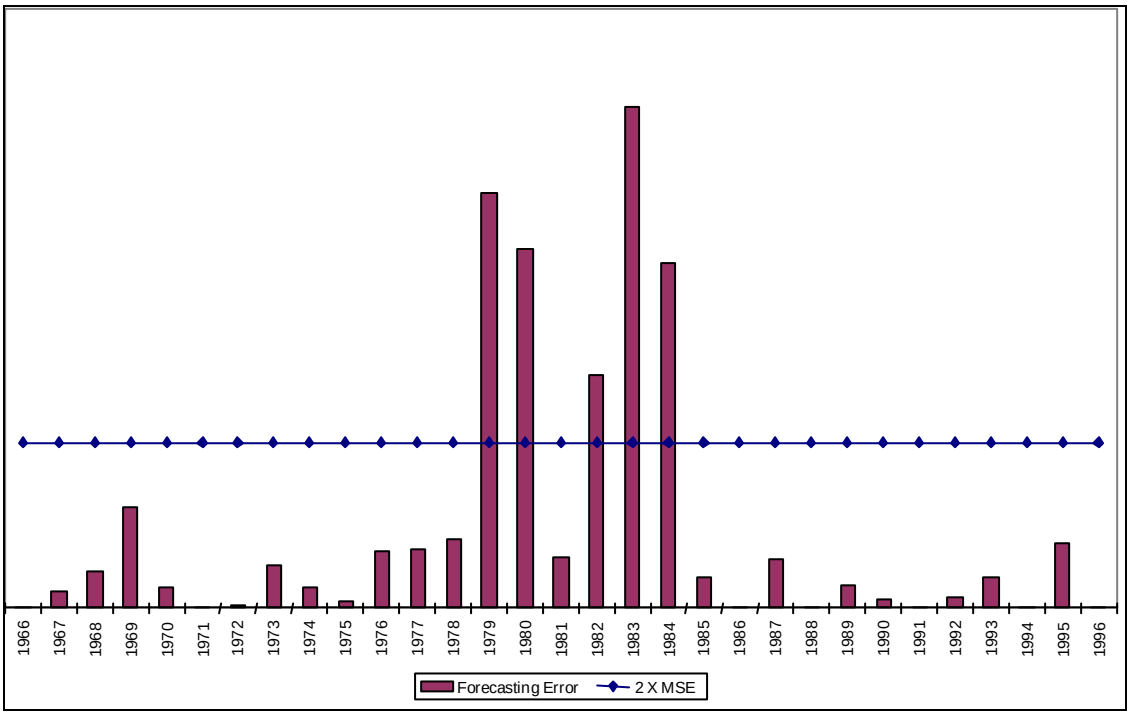


Figure 19. Forecasting Analysis for Ship and Boat Building and Repair, Houston LMA: 1966-1996.

Of the three key manufacturing sectors related to oil and gas activities that we examined in the Houston LMA, *Oil Field Machinery* (SIC 3533) and *Fabricated Structural Metal Products* (SIC 3440) are industry leaders in the GOMR. More workers in these sectors were employed in the Houston LMA during the late 1970s and early 1980s than were employed in any other LMA in the GOMR. The employment patterns are classically consistent with what we know about the industry in this region of the country.

Houston LMA Water Transportation. The following figures present data on *Water Transportation* (SIC 4400) employment (Figures 20 and 21). Unfortunately, there is no category that directly measures water transportation related to offshore oil and gas activities. In the annual employment analysis we did not find a "boom and bust" trend in transportation and public utilities for the Houston LMA that we have found in other LMAs. Nonetheless, we explore this category for the Houston LMA. The data show that employment in this sector grew by 35 percent between 1977 and 1981. However, by 1988, employment had declined to pre-1977 levels. The forecasting analysis in Figure 21 shows that 1986 is the key year when employment began dropping off. Despite being one of the largest port facilities in the world, the "boom and bust" of the oil and natural gas industry took its toll on water transportation employment. The *Water Transportation* (SIC 4400) pattern for the Houston LMA is very similar to the New Orleans LMA. Both are world ports that employed nearly 20,000 workers at the height of the oil and gas boom; both experienced significant declines during the 1980s. However, employment in this sector for both LMAs has remained very stable since the volatile times of the 1980s.

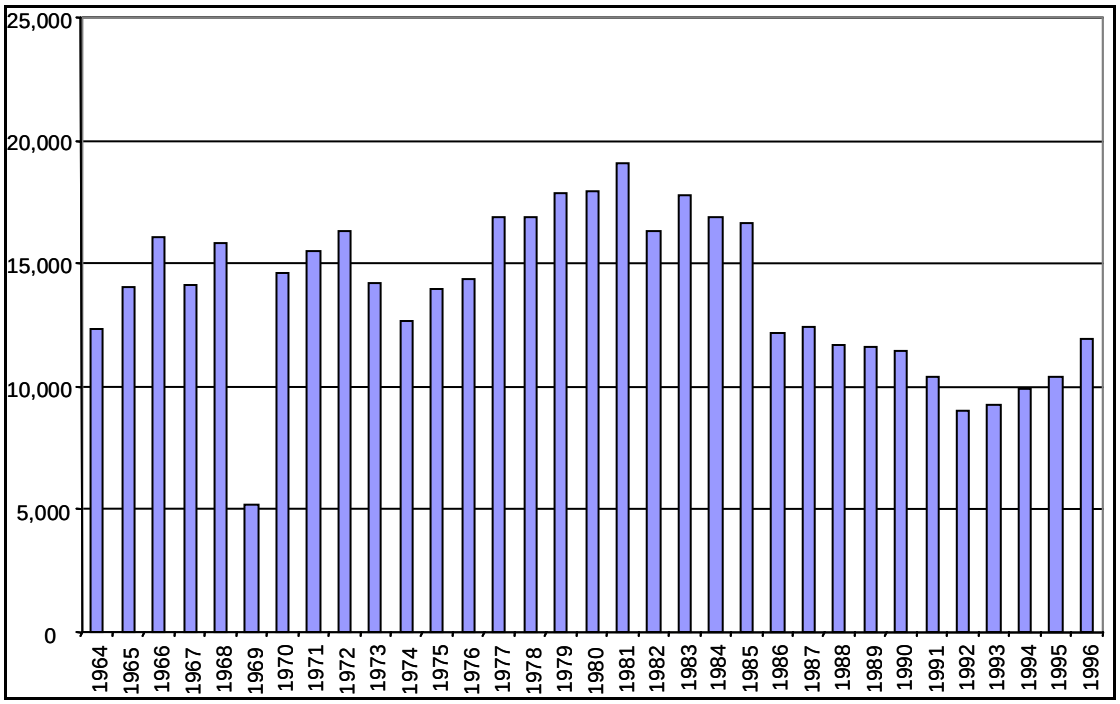


Figure 20. Annual Employment for Water Transportation, Houston LMA: 1964-1996 (U.S. Census Bureau, 2000a).

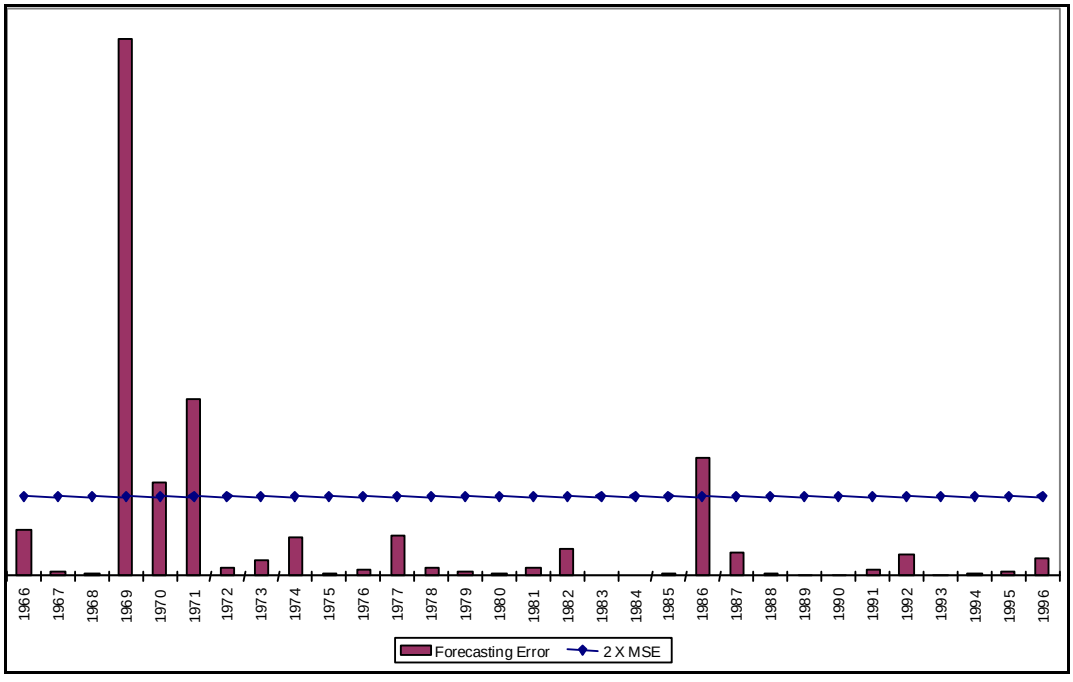


Figure 21. Forecasting Analysis for Water Transportation, Houston LMA: 1966-1996.

Houston LMA Wholesale Trade. The data for *Industrial Machinery and Equipment* (SIC 5084) are presented below (Figure 22). This industry category includes the wholesale marketing of oil well machinery. These data are available only from 1977 to 1996, which does not provide enough years for forecasting analysis. However, the trend line evident in Figure 22 shows the familiar pattern of growth in the 1970s: an apex in the early 1980s (1981; 16,000 workers) and decline throughout the 1980s. In 1987, employment in this sector reached a low-point of 9,000 workers. The "boom and bust" pattern in these data suggest significant wholesale trade of oil well machinery. These data demonstrate, again, the spatial dominance of the Houston LMA and the oil and gas industry in the GOMR. Employment in this sector during the "boom and bust" pattern of the 1970s and 1980s far exceeds that in all other GOMR LMAs.

The detailed industry data show the impact of the "boom and bust" trend in the oil and gas industry in the Houston LMA and other GOMR economies. In those eight detailed categories alone, almost 77,000 jobs were lost between 1982 and 1987 in the Houston LMA. The annual employment analyses above suggest that total employment in the Houston LMA–one of the largest and most complex economies– stagnated between 1982 and 1988. Also in evidence, this analysis locates the Houston LMA as the heart of the oil and natural gas industry in the GOMR. Despite the size and complexity of the Houston LMA ecosystem, exploiting a natural resource niche for sustenance put the ecosystem at risk of contraction.

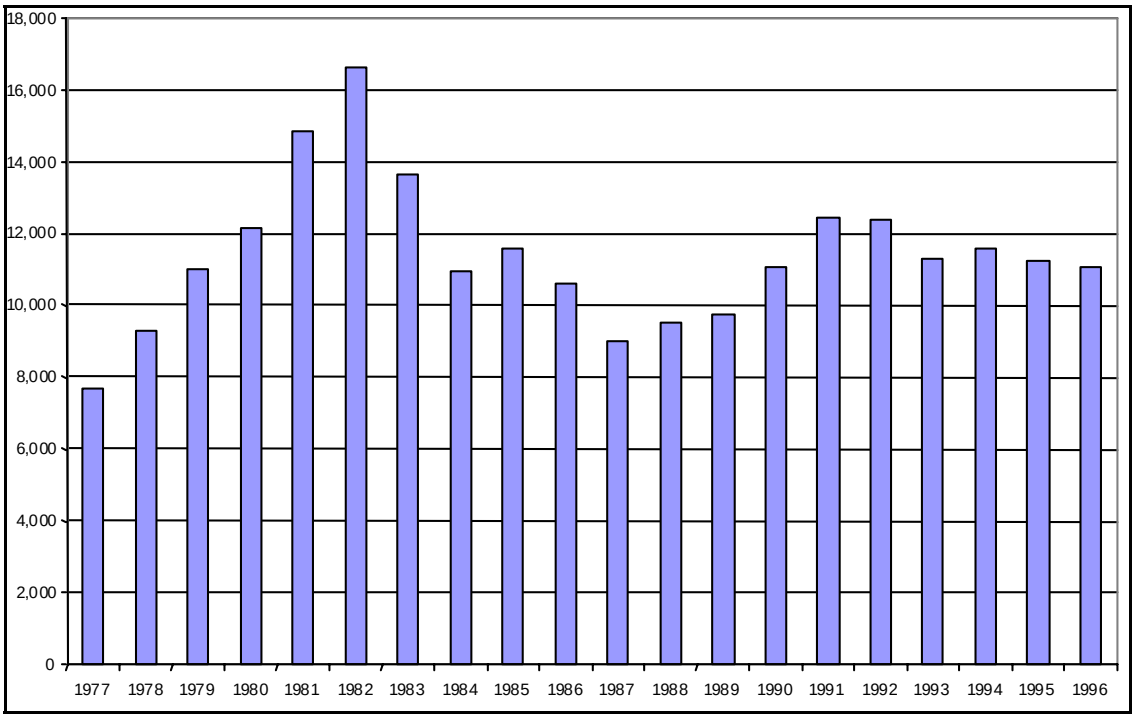


Figure 22. Annual Employment for Wholesale Trade of Industrial Machinery and Equipment, Houston LMA: 1977-1996 (U.S. Census Bureau, 2000a).

Second Unit of Analysis: Houston LMA Population, Education and Local Government, 1970-1990. In this section we examine how industry changes affected population, education and local government issues between 1970 and 1990. We begin with population.

Population. The following tables display the population data for the Houston LMA for the Decennial Census years 1940 through 2000 (Tables 2-4). Between 1970 and 1980, the population of the Houston Labor Market Area increased by 42 percent, from 2.1 million to 3 million residents. The 42 percent growth rate for the entire LMA is significantly greater for than the national growth rate of 11.4 percent for the same time period. Despite having half of all workers in key oil and gas related industries in the 1970s and 1980s, the oil and gas bust of the 1980s did not keep the Houston LMA from steady population growth. Between 1980 and 1990, the population in Houston LMA grew by 600,000 people, or 20 percent. Moreover, not a single county in the greater Houston LMA experienced negative population growth during the 1980s (unlike oil and gas LMAs in Louisiana).

Table 2

Population by County, Houston LMA: 1940-2000

County	1940	1950	1960	1970	1980	1990	2000
Austin	17,384	14,663	13,777	13,831	17,726	19,832	23,590
Chambers	7,511	7,871	10,379	12,187	18,538	20,088	26,031
Ft. Bend	32,963	31,056	40,527	52,268	130,846	225,421	354,452
Galveston	81,173	113,066	140,364	169,812	195,940	217,399	250,158
Harris	528,961	806,701	1,243,158	1,741,912	2,409,547	2,818,199	3,400,578
Liberty	24,541	26,729	31,595	33,014	47,088	52,726	70,154
Montgomery	23,055	24,504	26,839	49,479	128,487	182,201	293,768
San Jacinto	9,056	7,172	6,153	6,702	11,434	16,372	22,246
Waller	10,280	11,961	12,071	14,285	19,798	23,390	32,663
Washington	25,387	20,542	19,145	18,842	21,998	26,154	30,373
LMA	760,311	1,064,265	1,544,088	2,112,332	3,001,402	3,601,782	4,504,013

Source: U.S. Census Bureau, 2000b.

The data on racial composition show similar growth patterns for blacks and whites. Between 1970 and 1990, white population grew by 44 percent and black population by 55 percent. In 1990, the black population represented 18 percent of the total population; the white population 67 percent. The growing Hispanic/Latino population represents the balance of population. Most data indicate that out-migration of black population was the norm for any decade in the 1900s. And, this trend is similarly found in most of the oil and gas LMAs in Louisiana. However, data from the Houston LMA do not show evidence of extensive black out-migration. In fact, the high growth rates (55%), which are significantly greater than would be expected via natural replacement, indicate in-migration into the LMA during that period.

Table 3

Percent of White Population, Houston LMA: 1940-2000

County	1940	1950	1960	1970	1980	1990	2000
Austin	74.7	79.4	78.5	80.5	81.7	66.8	80.2
Chambers	76.8	80.2	77.9	79.0	82.8	83.6	81.9
Ft. Bend	72.3	75.7	80.0	83.0	71.7	62.7	56.9
Galveston	78.1	79.0	78.6	79.8	75.8	75.5	72.7
Harris	80.3	81.3	80.0	79.2	70.9	64.8	58.7
Liberty	75.2	77.2	76.5	79.1	84.5	84.0	78.9
Montgomery	69.0	74.9	77.1	88.0	93.7	91.2	96.4
San Jacinto	47.6	47.5	47.8	57.7	78.3	82.6	83.6
Waller	51.4	47.1	46.3	47.2	55.0	55.5	57.8
Washington	61.9	65.9	68.0	72.5	75.7	76.0	74.7
LMA %	77.6	79.7	79.1	79.2	70.5	67.2	62.1
LMA Total	590,498	848,675	1,221,721	1,673,535	2,177,016	2,421,787	2,795,878

Source: U.S. Census Bureau, 2000a.

Table 4

Percent of Black Population, Houston LMA: 1940-2000

County	1940	1950	1960	1970	1980	1990	2000
Austin	25.3	20.5	21.4	19.4	14.5	13.2	10.6
Chambers	23.2	19.4	22.0	20.4	14.3	12.1	9.7
Ft. Bend	27.6	29.3	20.0	16.9	15.6	20.6	19.8
Galveston	21.8	21.0	21.2	19.6	18.6	17.5	15.4
Harris	19.6	18.5	19.8	20.1	19.6	19.2	18.4
Liberty	24.7	22.7	23.4	20.8	15.5	12.9	12.8
Montgomery	31.0	25.1	22.8	11.7	4.8	4.3	3.5
San Jacinto	52.3	52.5	52.1	42.1	21.0	15.5	12.6
Waller	48.6	52.9	53.5	52.5	42.0	37.5	29.2
Washington	38.0	34.0	31.9	27.4	22.1	20.9	18.6
LMA %	22.2	20.1	20.6	20.1	18.7	18.3	17.3
LMA Total	169,322	214,368	318,844	425,915	563,250	661,549	779,940

Source: U.S. Census Bureau, 2000a.

Houston LMA Education. The data on adult educational attainment show that levels in the Houston LMA were higher than those in some of the oil and gas LMAs in the GOM region (Table 5). This is not a surprising finding for a major metropolitan area that attracts highly educated workers from other regions. In 1990 and 1980, the percentage of adults who had graduated from college in Houston LMA was on par with or exceeded the national rate. This is the only LMA in the GOM region with college education levels as high as the national rates. Within the LMA, college graduates were largely concentrated in Harris County.

One of the concerns about the oil and gas industry is that the labor intensive nature of this employment, coupled with high wages, entices young men to drop out of high school to work in this sector. However, the data show that the percentage of adults without a high school diploma dropped dramatically during the 1970s (from 48% to 31%). This is the period in which employment grew in the oil and gas related industries. Previous models would have predicted an influx of less-educated workers during that period. Our analysis fails to show this trend.

Table 5

Adult Educational Attainment (age 25+), Houston LMA: 1970-2000

County	0-8 Years	Some High School	High School Diploma	Some College, No Degree	BA/BS or More	Total
1970						
Austin	56.1%	16.8%	15.8%	7.1%	4.1%	8,751
Chambers	37.7%	24.6%	22.2%	9.0%	6.4%	6,506
Ft. Bend	45.3%	20.1%	20.7%	7.5%	6.3%	25,446
Galveston	29.6%	24.4%	25.4%	10.1%	10.4%	90,946
Harris	23.9%	23.4%	24.7%	13.1%	14.6%	892,576
Liberty	40.5%	26.3%	20.7%	7.5%	5.0%	18,079
Montgomery	29.6%	26.1%	26.9%	9.0%	8.3%	26,622
San Jacinto	54.6%	23.1%	13.7%	5.0%	3.5%	3,772
Waller	36.9%	20.2%	19.4%	10.0%	13.4%	6,309
Washington	53.5%	15.7%	14.2%	9.7%	6.8%	11,334
LMA Total	26.1%	23.3%	24.4%	12.5%	13.5%	1,090,341
1980						
Austin	35.1%	19.3%	26.2%	11.7%	7.6%	11,046
Chambers	22.0%	20.4%	31.8%	15.6%	10.0%	10,189
Ft. Bend	17.2%	11.1%	26.0%	20.1%	25.5%	71,297
Galveston	17.4%	17.3%	22.2%	17.8%	15.4%	113,085
Harris	14.5%	14.9%	28.7%	18.8%	23.0%	1,342,703
Liberty	25.7%	25.3%	30.1%	11.8%	8.0%	27,027
Montgomery	15.0%	19.2%	33.4%	16.9%	15.4%	71,701
San Jacinto	30.8%	25.2%	29.3%	8.3%	6.3%	6,887
Waller	21.9%	19.9%	27.3%	14.4%	16.3%	9,980
Washington	25.7%	16.0%	22.2%	14.8%	11.3%	13,373
LMA Total	15.5%	15.5%	28.9%	18.4%	21.7%	1,677,288

Table 5

Adult Educational Attainment (age 25+), Houston LMA: 1970-2000 (continued)

1990						
Austin	20.6%	16.8%	28.9%	19.9%	13.7%	13,021
Chambers	12.9%	18.9%	29.5%	27.0%	11.5%	12,406
Ft. Bend	9.1%	9.9%	21.9%	28.7%	30.2%	133,052
Galveston	9.6%	14.6%	27.8%	28.6%	19.2%	138,490
Harris	11.3%	13.7%	23.2%	26.2%	25.4%	1,713,593
Liberty	16.3%	21.2%	33.5%	20.9%	7.9%	32,682
Montgomery	8.1%	16.3%	29.5%	26.6%	19.4%	112,214
San Jacinto	17.0%	24.0%	34.2%	17.0%	7.7%	10,853
Waller	13.6%	16.8%	30.7%	22.7%	16.2%	12,735
Washington	20.1%	16.9%	25.8%	21.9%	15.1%	16,523
LMA Total	11.2%	13.9%	24.1%	26.3%	24.4%	2,195,569
2000						
Austin	12.2%	13.2%	32.3%	24.9%	17.3%	15,280
Chambers	8.5%	14.5%	32.4%	32.4%	12.1%	16,348
Ft. Bend	7.2%	8.5%	19.4%	28.0%	36.9%	214,461
Galveston	6.7%	12.3%	26.4%	31.8%	22.7%	161,503
Harris	12.1%	13.3%	21.6%	26.0%	26.9%	2,067,399
Liberty	10.5%	19.9%	36.1%	25.3%	8.0%	44,206
Montgomery	6.3%	12.1%	27.4%	28.9%	25.3%	183,737
San Jacinto	8.8%	18.5%	38.5%	24.5%	9.6%	15,040
Waller	11.0%	15.1%	31.4%	25.7%	16.7%	18,395
Washington	13.5%	14.4%	28.5%	24.5%	19.0%	19,451
LMA Total	7.3%	12.9%	22.7%	26.7%	26.7%	2,755,820

Source: U.S. Census Bureau, 2000b.

Finances. The Houston LMA was a fast growing region during the 1970s and 1980s. When areas grow quickly, they increase the demand on local government services, particularly education. This trend is reflected in the local government finances of the Houston LMA (Tables 6-9). Revenues grew dramatically through 1987. While taxes accounted for over half of that revenue, with state transfers accounting for some of the difference, these revenue sources grew more slowly. Local governments in the Houston LMA incurred significant debt. Between 1972 and 1982, local government debt grew by 23 percent in real dollars. However, between 1982 and 1987, debt grew by 85 percent in real dollars. To meet simultaneously the demands of growth on local government finances, and stresses of the drop-off in the oil and gas industry, local governments in the Houston LMA engaged in deficit financing. By 1992, debt had fallen to $4,000 per person (in 1997 dollars). However, this per capita debt load is 127 percent higher (in real dollars) than it was in 1982. The economic transformation of the 1980s has meant significantly higher debts for local governments in the Houston LMA.

Table 6

Total Revenue, Per Capita*, Houston LMA: 1972-1997

County	1972	1977	1982	1987	1992	1997
Austin	$977	$1,544	$1,625	$2,180	$2,206	$2,159
Chambers	$2,288	$2,483	$2,808	$2,949	$2,706	$3,154
Fort Bend	$1,178	$1,591	$1,509	$2,120	$1,870	$1,999
Galveston	$1,872	$2,158	$3,098	$2,542	$3,058	$3,178
Harris	$1,015	$1,872	$2,158	$3,098	$2,542	$2,975
Liberty	$1,066	$1,398	$1,454	$1,931	$1,874	$1,799
Montgomery	$1,153	$1,517	$1,521	$1,353	$2,234	$2,020
San Jacinto	$1,039	$1,282	$1,233	$2,444	$1,730	$1,394
Waller	$1,268	$1,787	$1,784	$2,756	$2,107	$2,032
Washington	$1,321	$2,371	$2,304	$2,756	$2,552	$3,097
LMA Total	$1,081	$1,886	$2,114	$2,976	$2,495	$2,822

* In 1997 adjusted dollars.
Source: U.S. Census Bureau, 2000a.

Table 7

Total State Revenue, Per Capita*, Houston LMA: 1972-1997

County	1972	1977	1982	1987	1992	1997
Austin	$396	$395	$436	$2,180	$755	$644
Chambers	$210	$218	$265	$2,949	$379	$469
Fort Bend	$442	$393	$389	$2,120	$561	$501
Galveston	$403	$492	$550	$3,269	$599	$537
Harris	$319	$346	$466	$3,098	$524	$548
Liberty	$403	$454	$495	$1,931	$728	$635
Montgomery	$404	$448	$426	$2,282	$663	$618
San Jacinto	$523	$564	$477	$1,353	$726	$534
Waller	$367	$326	$407	$2,444	$812	$820
Washington	$698	$635	$648	$2,756	$1,120	$1,017
LMA Total	$337	$366	$466	$2,976	$549	$554

* In 1997 adjusted dollars.
Source: U.S. Census Bureau, 2000a.

Table 8

Total Tax Revenue, Per Capita*, Houston LMA: 1972-1997

County	1972	1977	1982	1987	1992	1997
Austin	$414	$626	$666	$867	$839	$873
Chambers	$1,494	$1,645	$1,966	$2,030	$1,895	$2,192
Fort Bend	$548	$861	$802	$1,286	$1,022	$1,106
Galveston	$771	$1,134	$1,050	$1,459	$1,541	$1,643
Harris	$512	$973	$979	$1,402	$1,289	$1,329
Liberty	$472	$584	$618	$689	$859	$697
Montgomery	$488	$718	$730	$1,118	$947	$997
San Jacinto	$365	$533	$516	$690	$815	$662
Waller	$684	$853	$809	$1,270	$882	$912
Washington	$285	$429	$367	$603	$624	$945
LMA Total	$536	$960	$955	$1,365	$1,253	$1,295

* In 1997 adjusted dollars.
Source: U.S. Census Bureau, 2000a.

Table 9

Total Debt, Per Capita*, Houston LMA: 1972-1997

County	1972	1977	1982	1987	1992	1997
Austin	$1,081	$1,295	$1,369	$2,826	$8,881	$1,503
Chambers	$1,067	$1,793	$3,104	$1,971	$1,437	$1,621
Fort Bend	$1,630	$1,841	$2,304	$3,385	$2,318	$2,301
Galveston	$3,322	$2,588	$3,192	$4,727	$4,080	$3,301
Harris	$2,350	$2,613	$2,989	$5,782	$4,519	$5,028
Liberty	$1,393	$1,434	$946	$1,220	$863	$752
Montgomery	$1,670	$1,528	$2,616	$4,260	$3,702	$3,198
San Jacinto	$773	$484	$576	$742	$558	$950
Waller	$1,814	$890	$1,678	$2,305	$1,597	$1,500
Washington	$994	$146	$1,023	$1,921	$1,468	$2,232
LMA Total	$2,334	$2,475	$2,881	$5,327	$4,154	$4,447

* In 1997 adjusted dollars.
Source: U.S. Census Bureau, 2000a.

Employment grew by 17 percent during the 1990s, adding 300,000 new jobs, primarily in the service sector. The employment growth is reflected in the population growth, 25 percent for the entire LMA (more than twice the national growth rate). The white population in the year 2000 comprised 62 percent of the total LMA population, but only 58 percent of the total Harris County population. Blacks and African-Americans comprised 17 percent of the Houston LMA population in 2000, and 18 percent of the total Harris County population. By 2000, Hispanics accounted for 21 percent of the population in Houston LMA – up from 15 percent in 1990.

However, the growth in services appears to have created a demand for both very low-skilled (likely immigrant labor) and high-skilled workers. While the percentage of adults who did not graduate from high school only dropped one point from 25 to 24 percent between 1990 and 2000, 26 percent of adults obtained a college degree during this same period, surpassing national figures for this category. In other GOMR LMAs, the number of high school drop-outs declined between 1990 and 2000. For example, high school drop-outs in the Mobile LMA decreased from 31 percent in 1990 to 23 percent in 2000.

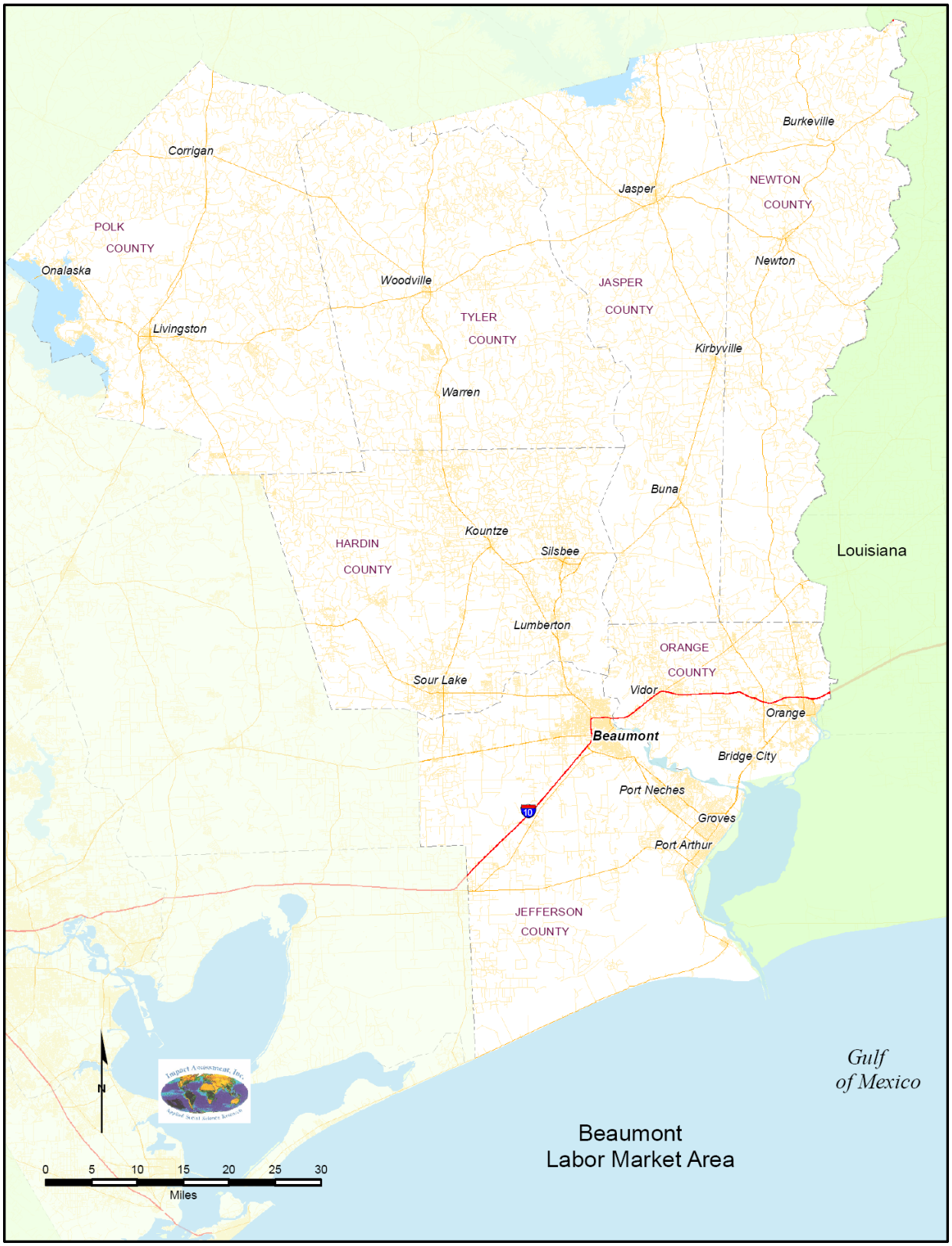
The Houston LMA is the largest port on the Gulf of Mexico, and one of the largest and most economically diverse economies in the nation. Despite the fact that over half of all persons working in oil- and gas-related fields during the 1970s and 1980s were employed in the Houston LMA, the economy, when viewed as an integrated system of counties linked by commuting patterns, did not suffer any net population or employment loss during the crash of the 1980s. Still, between 1980 and 1990, the Houston LMA lost 50,000 jobs in mining, manufacturing, and construction. But, the region remains "the heart" of the oil and gas industry. Although this industry employed over 40,000 people in some form of oil and gas exploration and production (either in the corporate offices or out in the field) in 2000, this industry captured only 1.4 percent of the total labor force, compared to the nearly 5 percent in 1980.

3. Beaumont, Texas: Labor Market Area

The Beaumont Labor Market Area (LMA) is made up of seven counties: Hardin, Jasper, Jefferson, Newton, Orange, Polk, and Tyler (Map 5). The population of this LMA was approximately 498,000 in 2000. The Beaumont LMA is geographically centered in the Gulf of Mexico region between the oil and gas economies of Houston/Galveston, Texas and Lafayette/Lafourche Louisiana.

In this analysis, we examined to what extent industry, population, education and local government changes in the Beaumont LMA over time are connected directly (via oil and gas changes) or indirectly (via upstream or downstream industries) to the changes in the oil and gas industry in the region. Of particular concern are the "boom and bust" periods of the 1970s and 1980s.

First Unit of Analysis: Beaumont LMA Employment: 1940-1970. We next examine the changes in industry for each decade from 1940 to 2000, inclusive (Figure 1). In 1940 manufacturing was the leading industry sector, employing over 20,000 workers and one-third of the Beaumont LMA workforce. Wholesale/retail trade was the second largest category, employing over 13,000 workers. Mining, a key oil and gas related industry, employed less than 2,000 workers throughout the Beaumont LMA in 1940. Moreover, mining employment represented only 3 percent of the total Beaumont LMA workforce for that year.



Map 5. Beaumont, Texas Labor Market Area.

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Between 1940 and 1950, total employment grew by 43 percent. Employment growth rates were high in all sectors, with the exception of agriculture, which saw a 40 percent decline in employment between 1940 and 1950. Construction had the highest growth rate (123%), while manufacturing continued to employ over one-third of the total workforce. Mining employment grew by 40 percent between 1940 and 1950, but still only represented less than 3 percent of the total workforce in 1950.

Total employment grew at 26 percent between 1950 and 1960 in the Beaumont LMA. Services led all sectors with 122 percent growth rate, followed by mining employment growth of 18 percent. In 1960, services and manufacturing shared nearly equal percentages of total employment (30%). Despite losses, manufacturing employment grew by 12 percent in the Beaumont LMA in the 1950s. Mining, despite relatively strong employment growth rates in the 1950s, still employed less than 3 percent of the workforce in 1960. Agricultural employment continued to decline (39%) between 1950 and 1960.

Total employment in the Beaumont LMA grew by 13 percent in the 1960s. "Services" (20%) was the employment growth leader, followed by wholesale and retail trade (14%). Employment growth slowed somewhat in key industries during the 1970s, particularly manufacturing where employment growth was at 9 percent. Furthermore, 1970 is the first year in which manufacturing (29%) is not the largest employment category, having been replaced by services (31%). Mining continued to employ less than 3 percent of the total Beaumont LMA workforce. Agriculture declined by 36 percent during the 1960.

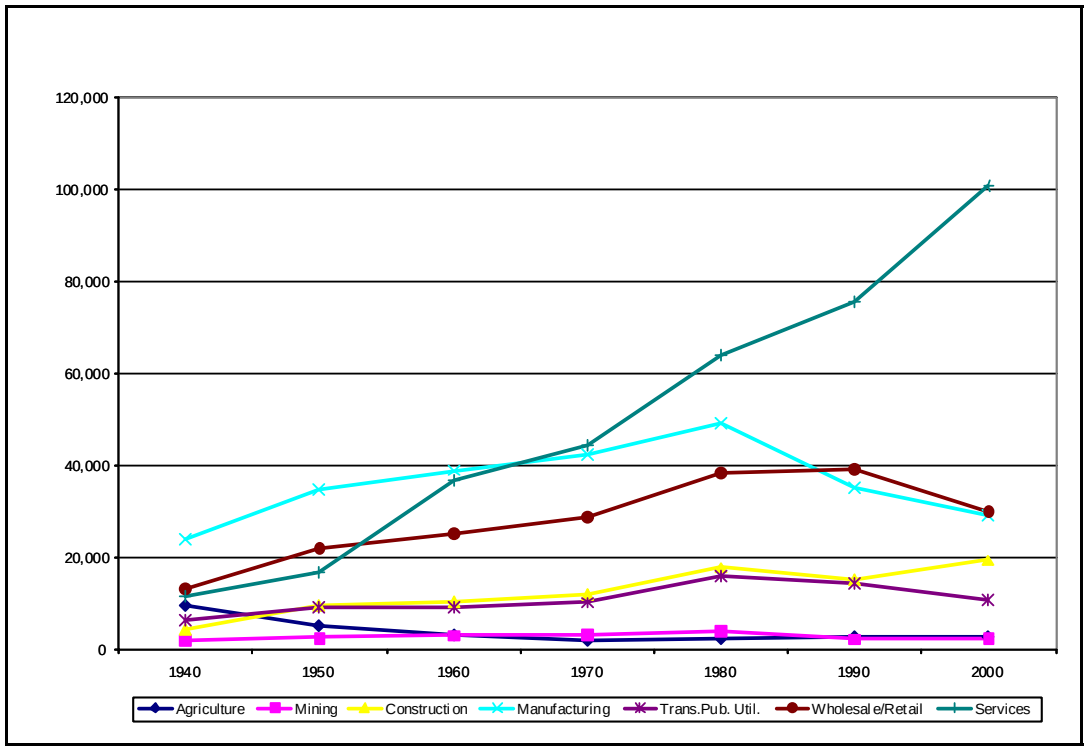


Figure 1. Major Industry Employment, Beaumont LMA: 1940-2000 (U.S. Census Bureau, 2000b).

Beaumont LMA Demographic Changes: 1940-1970. Total employment in the Beaumont LMA grew by 200 percent between 1940 and 1970. Agriculture declined in importance, while the significance of services and manufacturing increased. Prior to 1970, the Beaumont LMA was much more manufacturing-oriented than most of the other LMAs in the Gulf of Mexico Region.

Population growth within this LMA was affected by these employment changes. In 1940, 242,000 people lived in the Beaumont LMA; by 1970, the population was over 400,000. The racial composition of the LMA, however, remained static during these decades.

Second Unit of Analysis: Beaumont LMA Employment: 1970-1990. The oil and gas industries experienced both rapid expansion and decline during the 1970s and 1980s. An examination of oil and gas prices underscores this claim. Crude oil prices (in constant 1998 dollars) began to spike in the 1970s, with a significant drop-off in 1986. The Beaumont LMA was not one of the major economies in the oil and gas exploration and production industries during this period, relative to the Lafayette or Houston LMA (Gramling 1996). However, Beaumont is a heavy manufacturing economy. Changes in the oil and gas industries may have created changes in those industries in the Beaumont LMA that were related to the oil and gas industry. We examine these potential relationships by first assessing the changes in broad industry sectors for the Beaumont LMA.

Total employment in the Beaumont LMA grew by 33 percent between 1970 and 1980. There was positive growth in each industry sector. Growth was strongest in transportation and public utilities (57%), construction (48%), services (43%) and wholesale/retail trade (33%). Employment grew by 20 percent in mining and 15 percent in manufacturing. Thirty-three percent of the workforce was employed in services by 1980, and 25 percent in manufacturing. Despite a 20 percent growth rate during the 1970s, mining employment accounted for only 2 percent of total employment in 1980.

The Beaumont LMA experienced economic stagnation during the 1980s, with employment declining by nearly 4 percent. Mining lost 45 percent of its employment levels, and manufacturing lost 28 percent. Almost 16,000 jobs were lost in these two sectors alone. Manufacturing's share of total employment fell to less than 20 percent in 1990, the lowest level for any period between 1940 and 1990. The downturn of the 1980s spread to other industries. Construction lost 15 percent of total employment, while transportation and public utilities lost 9 percent. By 1990 services employed over 40 percent of the workforce.

By 1990, the economy in the Beaumont LMA had been transformed from one that was manufacturing-oriented to one that was service-based. We next consider whether the decline in manufacturing during the 1980s is linked to changes in the oil and gas industries

The Census data analysis indicates that important changes occurred in the Beaumont LMA between 1970 and 1980 (growth), and again between 1980 and 1990 (decline). However, Decennial Census data are not always capable of documenting important short-term trends, such as rapid declines or growth spurts in employment in a given industry. Establishing an accurate time line for major shifts in employment in key industries is very important for understanding when changes occurred in oil/gas and related industries.

The following figure displays annual full- and part-time employment data for the Beaumont LMA (Figure 2). These data show a steady increase in total employment from 1971 until 1981, followed by a steady decline in full- and part-time employment between 1982 and 1986. Since 1986, employment has increased in the Beaumont LMA. By 1991, these employment levels had surpassed their previous high mark set in 1981.

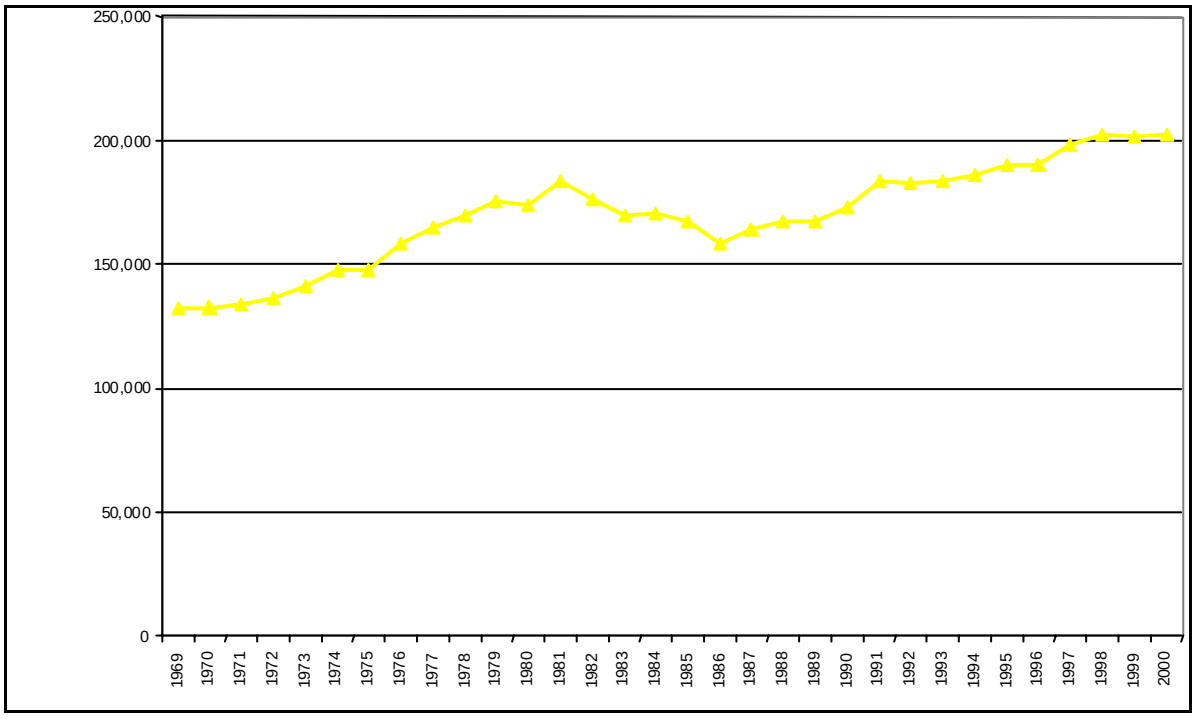


Figure 2. Total Annual Employment, Beaumont LMA: 1969-2000 (U.S. Dept. of Commerce, Bureau of Economic Analysis, 2000).

In order to establish when, or if, unexpected changes in employment occurred in the Beaumont LMA, we performed a time-series forecasting analysis. The results of this effort are displayed below (Figures 3 and 4).

Figure 3 shows the actual employment data charted with the three-year employment moving average for each year. Figure 3 illustrates that, in 1974, 1976, and 1977, the observed employment number was significantly greater than the expected employment number. This indicates a general period in which employment grew at higher than expected rates. In 1983 and 1986, we see that the observed employment number is significantly less than the expected employment number for those respective years. This finding signals a period of general, but not rapid employment decline. We also see a growth spurt in 1991, followed by consistent but slower growth rates throughout the 1990s. Taken together, we see the beginning and the end of a moderate "boom and bust" trend in the total employment data for the Beaumont LMA beginning in the mid-1980s and ending approximately in 1988.

The following figure documents forecasting errors for every year between 1974, 1976, and 1977 and again in 1983, 1986 and 1991 (Figure 4). Forecasting errors occur when the observed employment number in a given year substantially exceeds the expected employment number in that year (based on a three-year moving average).

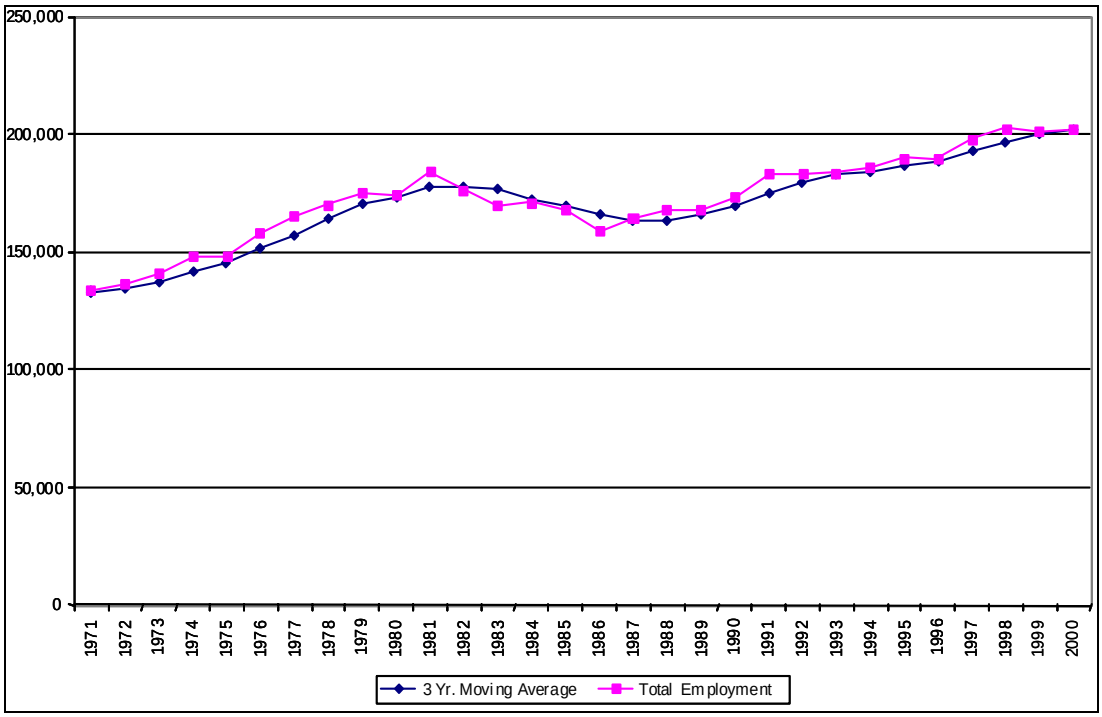


Figure 3. Total Annual Employment and Three-year Moving Averages, Beaumont LMA: 1971-2000 (U.S. Dept. of Commerce, Bureau of Economic Analysis, 2000).

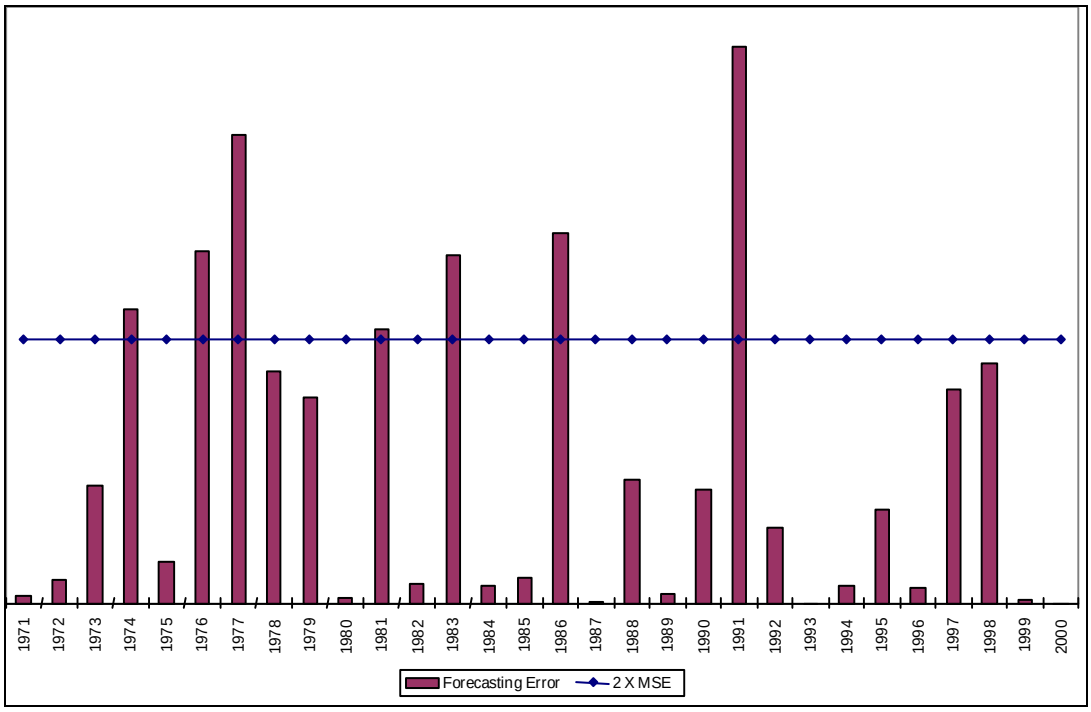


Figure 4. Forecasting Analysis for Total Annual Employment, Beaumont LMA: 1971-2000.

We turn now to an analysis of annual employment data in order to uncover in which industry sectors these boom and bust cycles are present in the Beaumont LMA. The annual employment data for nine general industry categories for 1969 through 2000 are displayed below (Figure 5). Manufacturing experienced the greatest downturn in total employment between 1981 and 1986. During that time period, full-time and part-time employment in that sector decreased by 36 percent, or an estimated 18,000 jobs. No other sector experienced that level of employment decline.

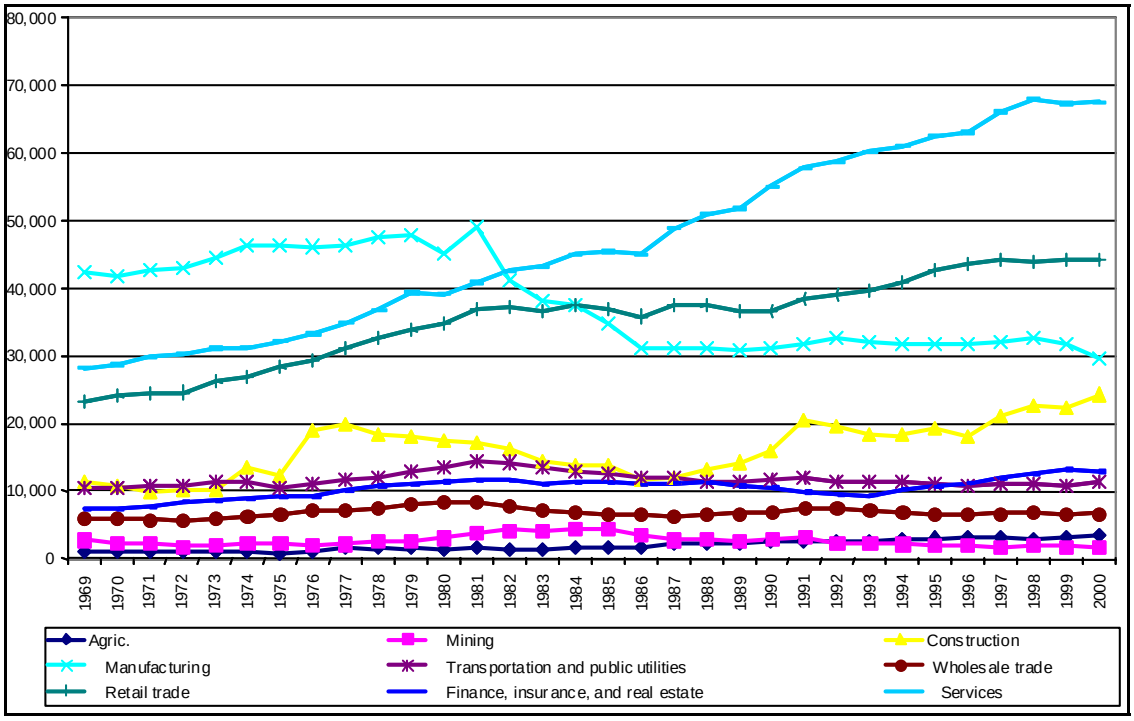


Figure 5. Major Industry Employment Patterns, Beaumont LMA: 1969-2000 (U.S. Dept. of Commerce, Bureau of Economic Analysis, 2000).

The following figure shows the percentage change in full- and part-time employment in each sector for 1981 through 1986, inclusive (Figure 6). Almost all sectors experienced employment loss during that period; with manufacturing, an industry which has historically employed over one-third of the labor force in this LMA, leading the decline. The data in Figure 6 show that services and retail trade led the employment growth cycle of the early 1990s.

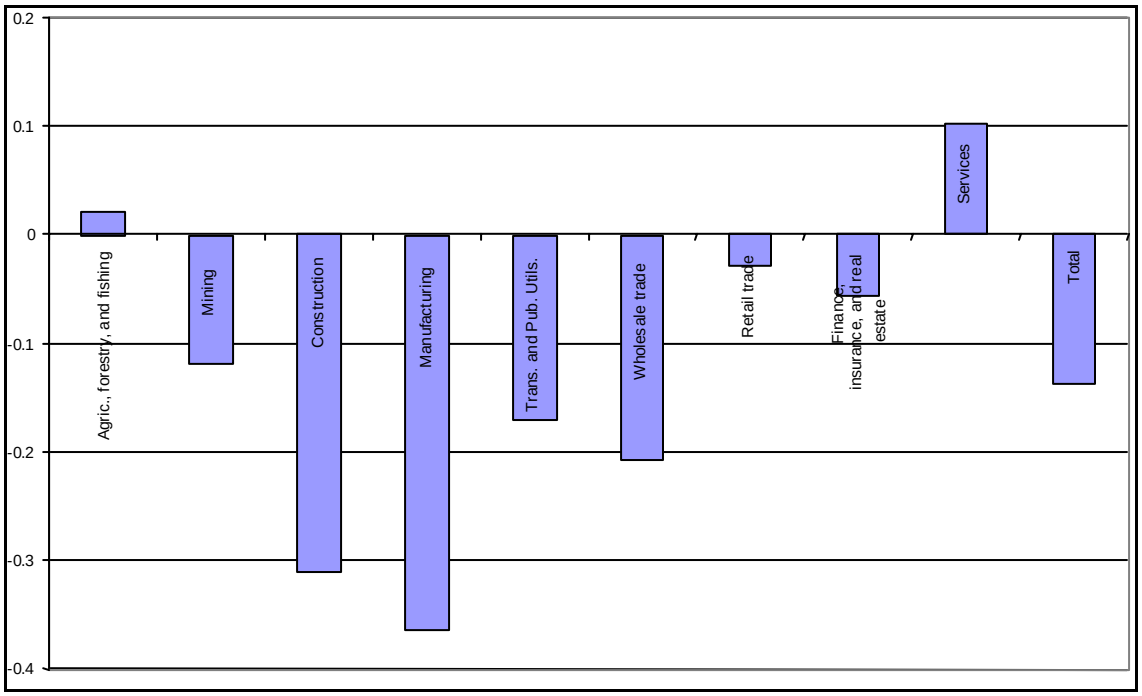


Figure 6. Percent Change in Employment, Beaumont LMA: 1981-1986 (U.S. Dept. of Commerce, Bureau of Economic Analysis, 2000).

These data tell a story about the impact of the oil and gas industry in the Beaumont LMA. The Census data indicate an LMA oriented toward manufacturing employment for most of the years prior to and including 1980. The annual employment data show a moderate boom and bust trend in total employment from the mid-1970s through the mid-1980s. The annual employment data indicate that manufacturing employment drove the employment downturn of the 1981-1986 period; not mining employment like in oil and gas intensive economies (i.e., Lafayette and Houston). These data indicate that further analyses of manufacturing employment trends are warranted.

We next present the time-series forecasting analysis for manufacturing employment in the Beaumont LMA (Figures 7 and 8). Not surprisingly, these data have similarities to the total employment patterns for the 1980s. From 1981 through 1986, employment in manufacturing declined at a faster than expected rate, based on the forecasting model. Furthermore, Figure 8 indicates that in 1982, 1983 and 1986 the number of observed manufacturing workers was significantly less than the number of expected workers, based on previous years.

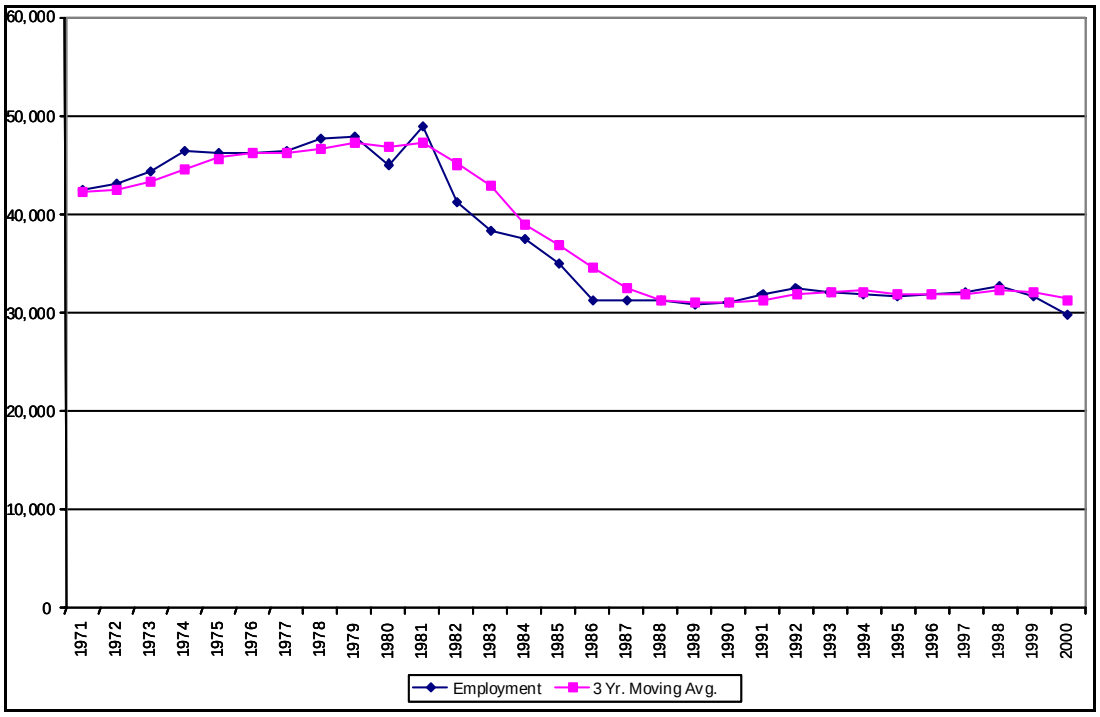


Figure 7. Total Annual Employment and Three-year Moving Averages for Manufacturing, Beaumont LMA: 1971-2000 (U.S. Dept. of Commerce, Bureau of Economic Analysis, 2000).

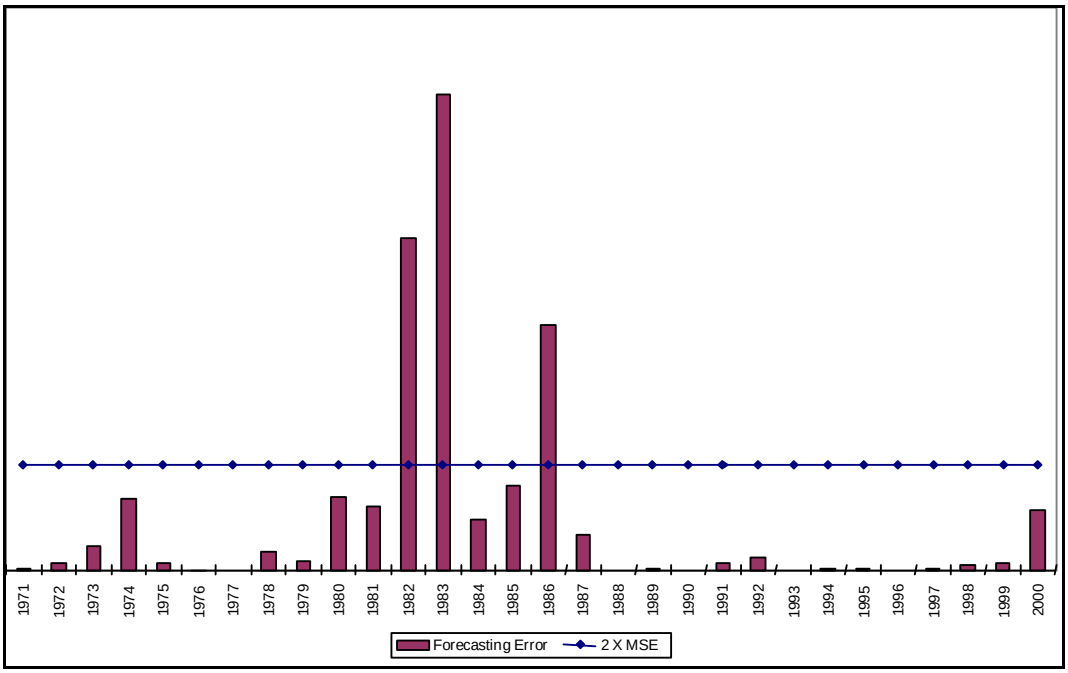


Figure 8. Forecasting Analysis for Manufacturing Employment, Beaumont LMA: 1971-2000.

Employment in the Beaumont LMA mining industry doubled from approximately 2,200 to 4,400 workers between 1977 and 1982, but fell from 4,300 to 2,700 workers between 1985 and 1987 (Figure 9). However, employment in mining is minimal relative to total LMA employment. Furthermore, this industry shows very low levels of concentration compared to other oil and gas intensive LMAs (i.e., Lafayette, Lafourche, and Houston). Between 1977 and 1982, employment in transportation and public utilities (which includes transportation related to the oil and gas industry) grew by 40 percent to over 14,000 workers. However, by 1988 employment levels in this category had declined to pre-1977 levels.

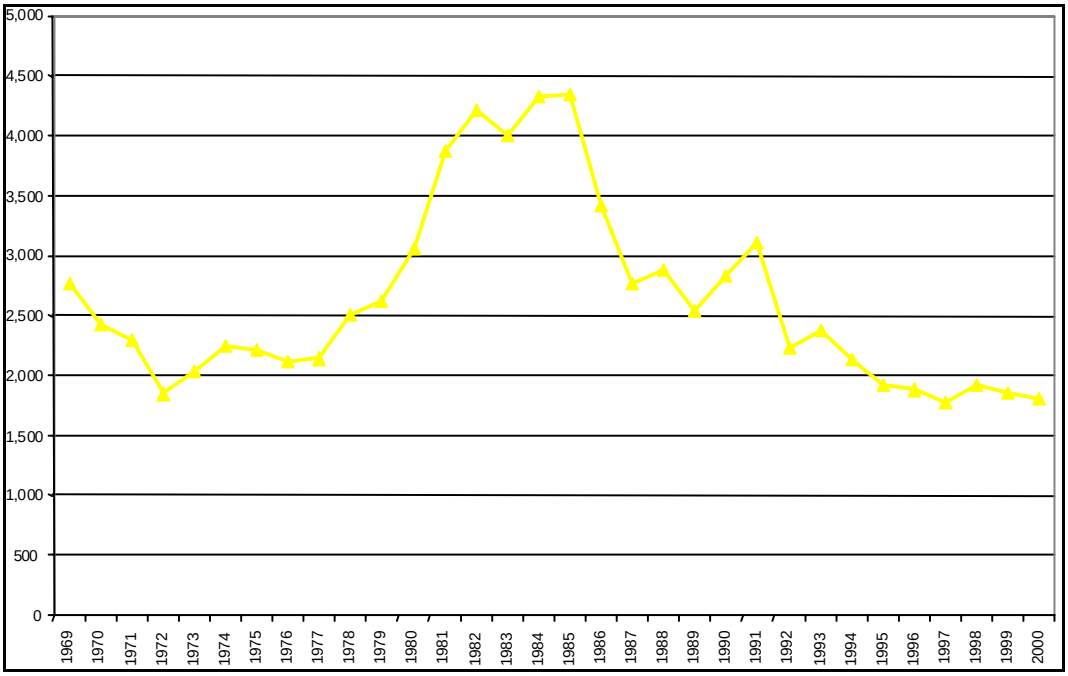


Figure 9. Total Annual Employment for Mining, Beaumont LMA: 1969-2000 (U.S. Dept. of Commerce, Bureau of Economic Analysis, 2000).

While the forecasting analysis shows a growth spurt for overall employment beginning in the mid-1970s, the data shows only a downturn in the 1980s for manufacturing employment. Mining, transportation and public utilities, and construction show a positive growth trend in the late 1970s. These three categories accounted for over 11,600 new jobs between 1975 and 1981 (compared to just 2,700 new manufacturing jobs), or approximately 33 percent of all new jobs created during the 1975-81 period. However, just like manufacturing, these sectors experienced downturns in the 1980s.

The analysis of annual full- and part-time employment data by single-digit industry codes indicate that the transportation and public utilities, construction and manufacturing sectors led the growth from the mid-1970s through early 1980s. Between 1981 and 1986, however, the Beaumont LMA lost an estimated 25,254 full-and part-time jobs. The bust of the 1980s (1981-1986) is led primarily by the decline in the manufacturing industry, which lost an estimated 18,000 full- and part-time jobs during these years.

Detailed Industry Code Analyses. We now turn to an analysis of detailed industry codes for four key industries– manufacturing, mining, transportation and wholesale trade– to further identify and examine trends related to industry changes (Table 1). We chose those detailed

categories based on: a) relationship to oil and gas activities, b) employment levels, and c) availability of data in the years we are studying.

Table 1

Key Industry Groups and Sub-Categories

Manufacturing		
Fabricated Structural Metal Products (SIC 3440*),* this category includes manufacture of barge sections, ship sections, buoys, and metal plates for gas tanks, gas holders, oil storage tanks, large diameter pipes, pressure valves, storage tanks and also portable building.	***Ship and Boat Building and Repairing*** (SIC 3730), this category includes building and repairing barges, cargo vessels, drilling platforms and dry docks.	***Oil Field Machinery*** (SIC 3533), this category includes bits, rock and oil field tools, derricks for oil and gas fields, drill rigs, drilling tools for gas, oil and water wells.
Mining		
Drilling Oil and Gas Wells (SIC 1381), this category includes, on a contract basis, directional drilling, redrilling, reworking, and "spudding in" of oil and gas wells**.**	***Oil and Gas Field Exploration Services*** (SIC 1382), this category includes, on a fee basis, geophysical exploration, aerial exploration, and seismograph services**.**	***Oil and Gas Field Service N.E.C.*** (SIC 1389) this category includes, on a contract basis, excavating slush pits and cellars, grading and building of foundations, well surveying, running and cutting casings, tubes and rods, cementing and shooting wells, acidizing and chemically treating wells. Operating oil and gas wells for others on a contract basis are also included in this category.
Transportation		
Water Transportation (SIC 4400), this category primarily includes stevedoring.		
Wholesale Trade		
Industrial Machinery and Equipment (SIC 5084), this category includes the wholesale of derricks, oil field tool joints, oil well supply houses, oil well machinery equipment and supplies.		

Beaumont LMA Manufacturing. The data for *Fabricated Structural Metal Products* (SIC 3440) employment show very low levels of employment in these industries (Figures 10 and 11). The employment levels peak in 1981 at just over 2,000 workers. Further, the patterns are erratic from year-to-year. The forecasting analysis (Figure 10) shows a number of years where the observed number of workers was significantly different from the expected number of workers in this industry. While every year from 1971 through 1974 shows an important pattern, the patterns are off-setting. For example, in 1971, fewer workers are observed in this sector than are expected, documenting an employment downturn in this industry for that year. However, 1972 and 1973 are years in which a greater number of workers are observed than was expected based on previous year employment levels. This shows a two-year sharp upturn in the industry. However, by 1974, the industry had experienced another significant downturn. By 1986, the industry reached a new employment low-point. Since 1986, employment has continued a slow but steady increase.

The data for *Oil Field Machinery* (SIC 3533) manufacturing also show a manufacturing sector with very modest employment levels (Figures 12 and 13). In 1982 employment exceeded 1,400 workers throughout the Beaumont LMA, the highest level of employment during the period under investigation. The data patterns show consistent employment growth between 1976 and 1982. After 1982, employment in the industry drops considerably. By 1987, the industry has no presence in the Beaumont LMA.

The data for *Ship and Boat Building and Repairing* (SIC 3730) employment suggest important patterns (Figures 14 and 15). First, this is an industry with a substantial presence in the Beaumont LMA. Over 5,000 workers were employed in this industry sector during the late 1970s and early 1980s. Second, these data show a clear boom and bust pattern. There is significant employment growth in this industry in the 1970s followed by a sharp decline in the 1980s. The worst year is 1983, when 4,000 fewer workers were employed than in 1982. By the 1990s, there were fewer than 1,000 workers employed in this sector, or less than 20 percent of employment levels in 1981.

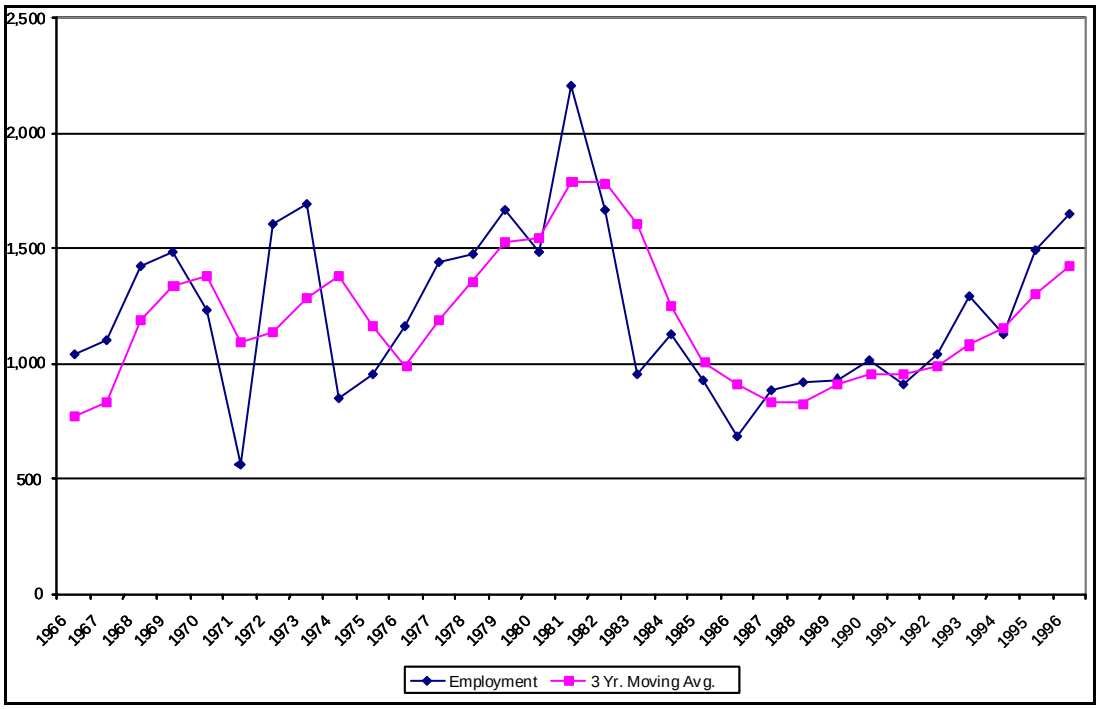


Figure 10. Total Annual Employment and Three-year Moving Averages for Fabricated Structural Metal Products (manufacturing), Beaumont LMA: 1971-2000 (U.S. Census Bureau, 2000a).

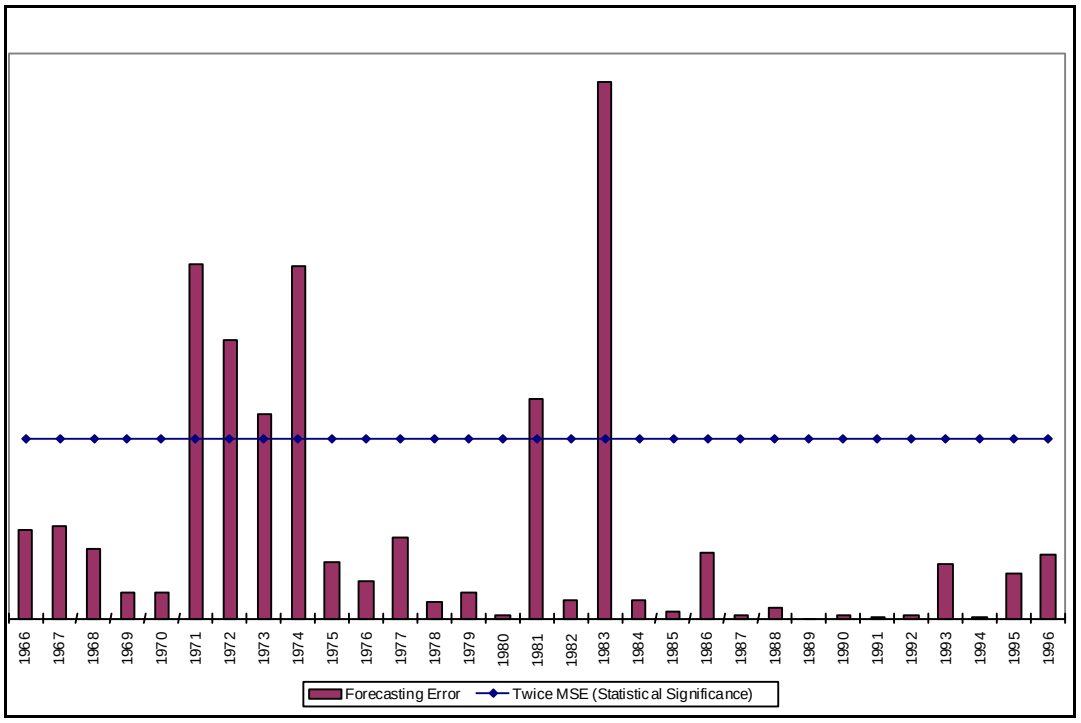


Figure 11. Forecasting Analysis for Fabricated Structural Metal Products (manufacturing), Beaumont LMA: 1966-1996.

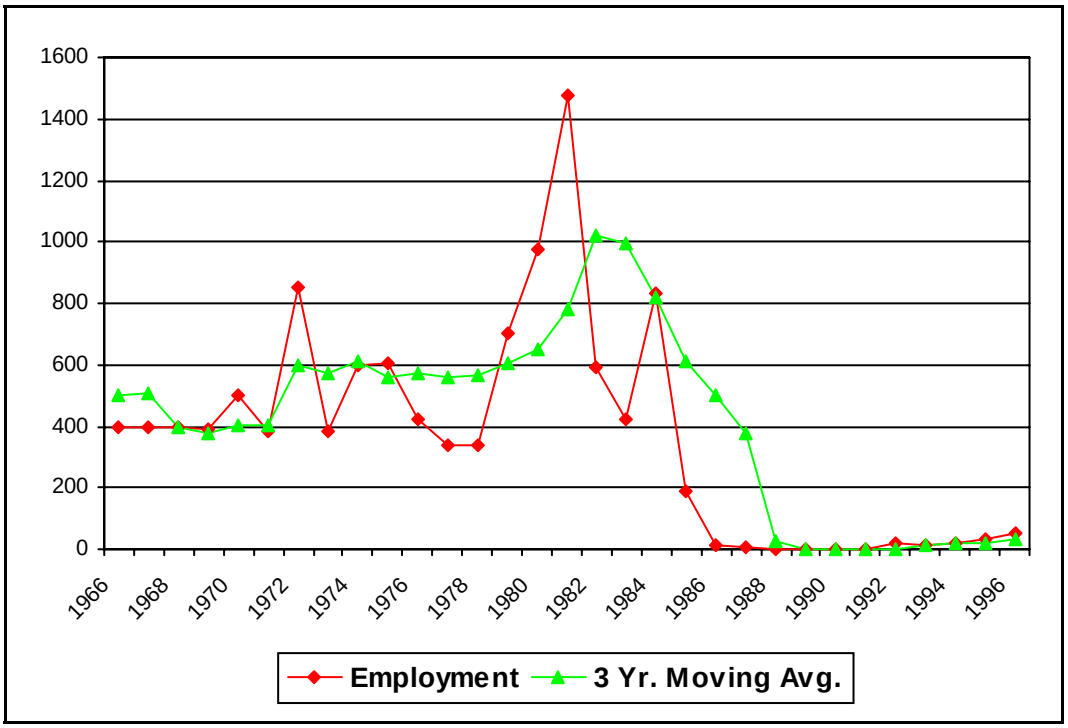


Figure 12. Total Annual Employment and Three-year Moving Averages for Oil Field Machinery (manufacturing), Beaumont LMA: 1971-2000 (U.S. Census Bureau, 2000a).

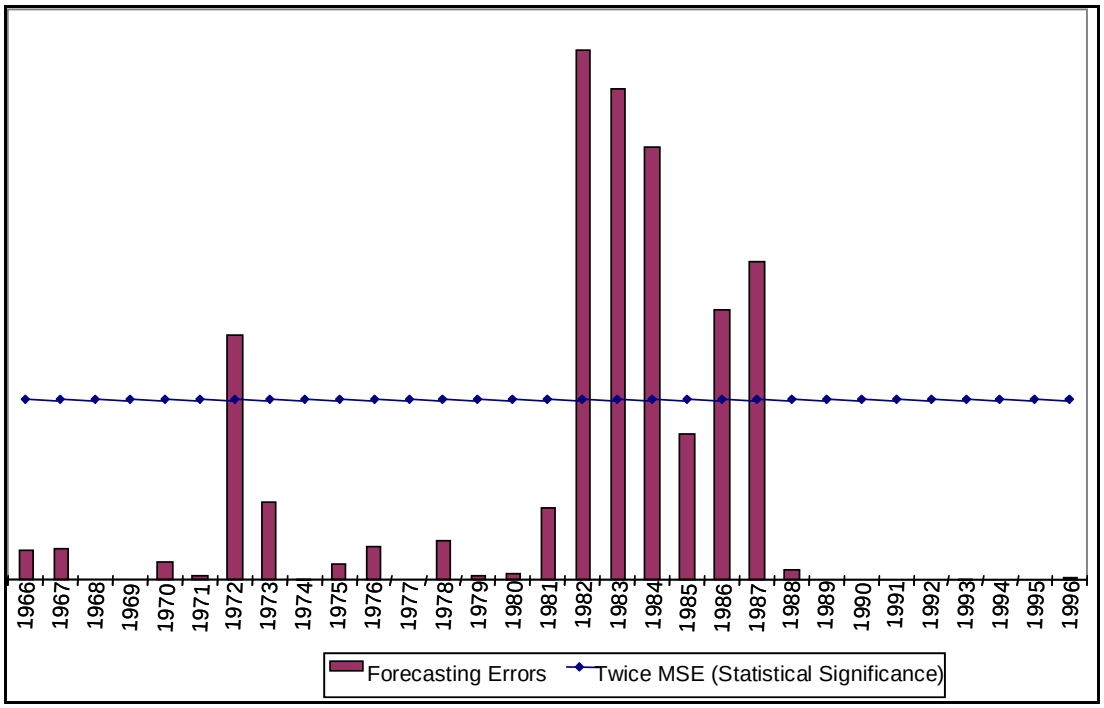


Figure 13. Forecasting Analysis for Oil Field Machinery (manufacturing), Beaumont LMA: 1966-1996.

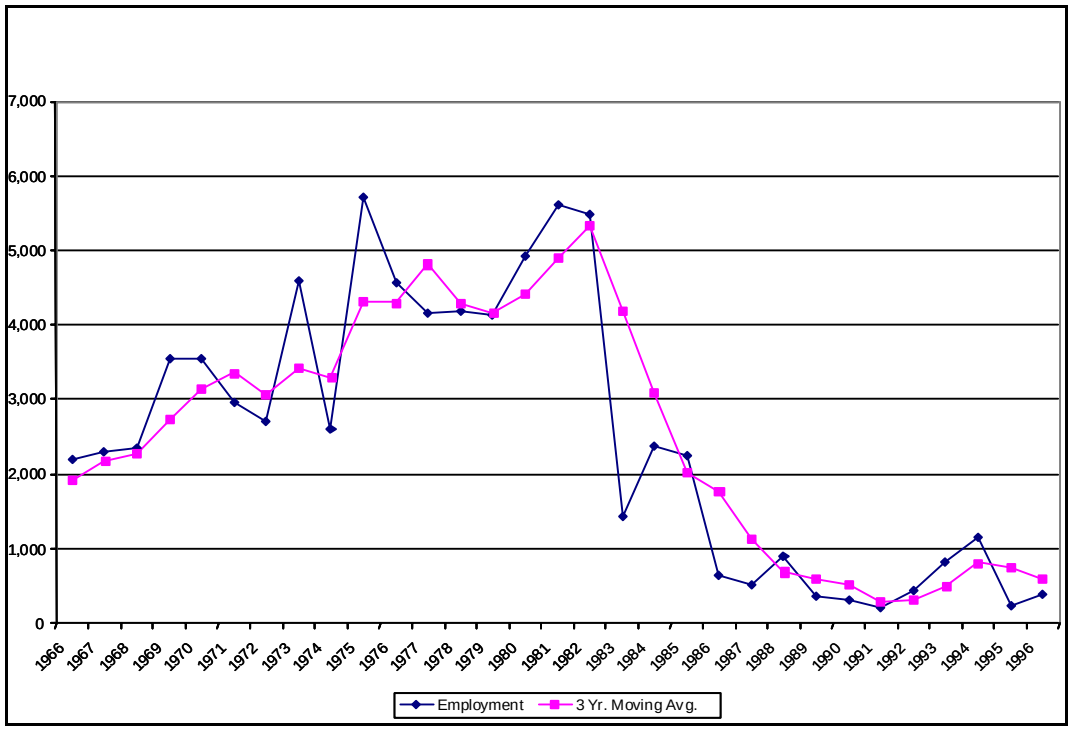


Figure 14. Total Annual Employment and Three-year Moving Averages for Ship and Boat Building and Repair, Beaumont LMA: 1971-2000 (U.S. Census Bureau, 2000a).

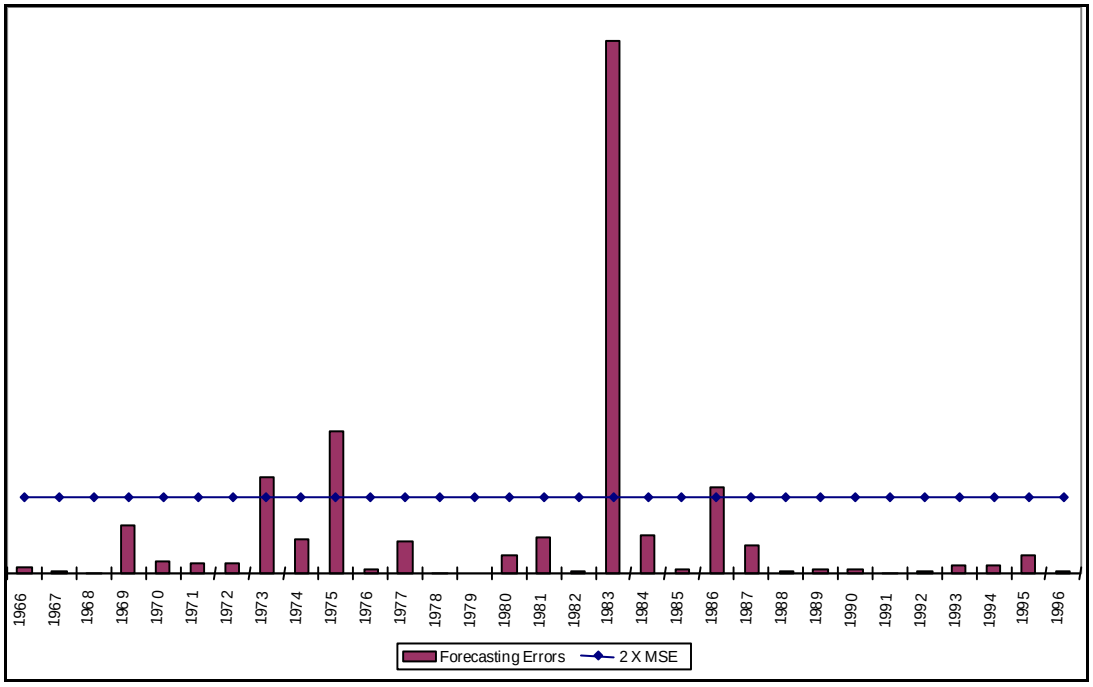


Figure 15. Forecasting Analysis for Ship and Boat Building and Repair, Beaumont LMA: 1966-1996.

The three industries discussed above also have a common thread—all are directly or closely associated with oil and gas activities, including offshore activities. However, only *Ship and Boat Building and Repairing* (SIC 3730) shows substantial employment levels during any period. The major employment downturns we reported above did not come from exclusively from these manufacturing sectors. The employment levels in these sectors are not large enough to have caused trends in total employment levels throughout the Beaumont LMA.

Beaumont LMA Mining. The data for the *Drilling Oil and Gas Wells* (SIC 1381) and *Oil and Gas Field Exploration Services* (SIC 1382) sectors in the Beaumont LMA show that less than 250 are employed in either category in any given year (Figure 16). The trends are not particularly significant because changes in these very small industry sectors could not impact the LMA-wide trends we document above.

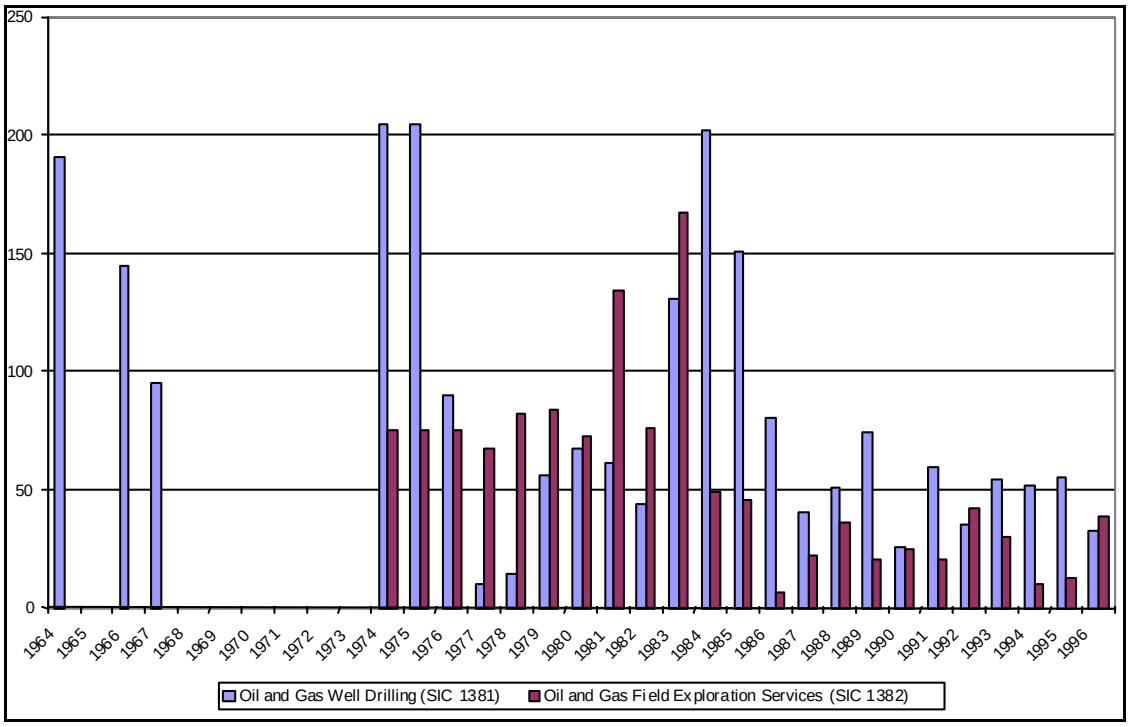


Figure 16. Oil and Gas Well Drilling and Field Exploration Services, Beaumont LMA: 1964-1996 (U.S. Census Bureau, 2000a).

Water Transportation. Above we discuss a "boom and bust" pattern in transportation and public utilities. We suspect that this trend is directly related to offshore oil and gas activities. Unfortunately, there is no category that directly measures the *Water Transportation* (SIC 4400) sector in relation to offshore oil and gas activities. Still, we believe that a direct examination of water transportation earnings will bring us closer to the impact of oil and gas activities (Figures 17 and 18).

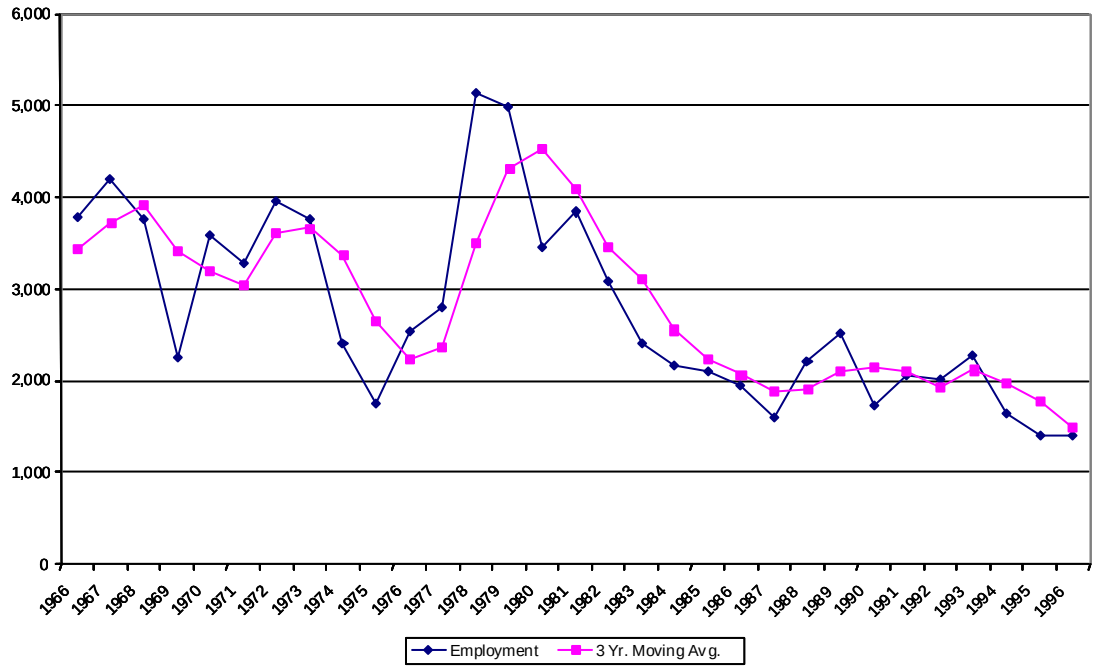


Figure 17. Total Annual Employment and Three-year Moving Averages for Water Transportation, Beaumont LMA: 1966-1996 (U.S. Census Bureau, 2000a).

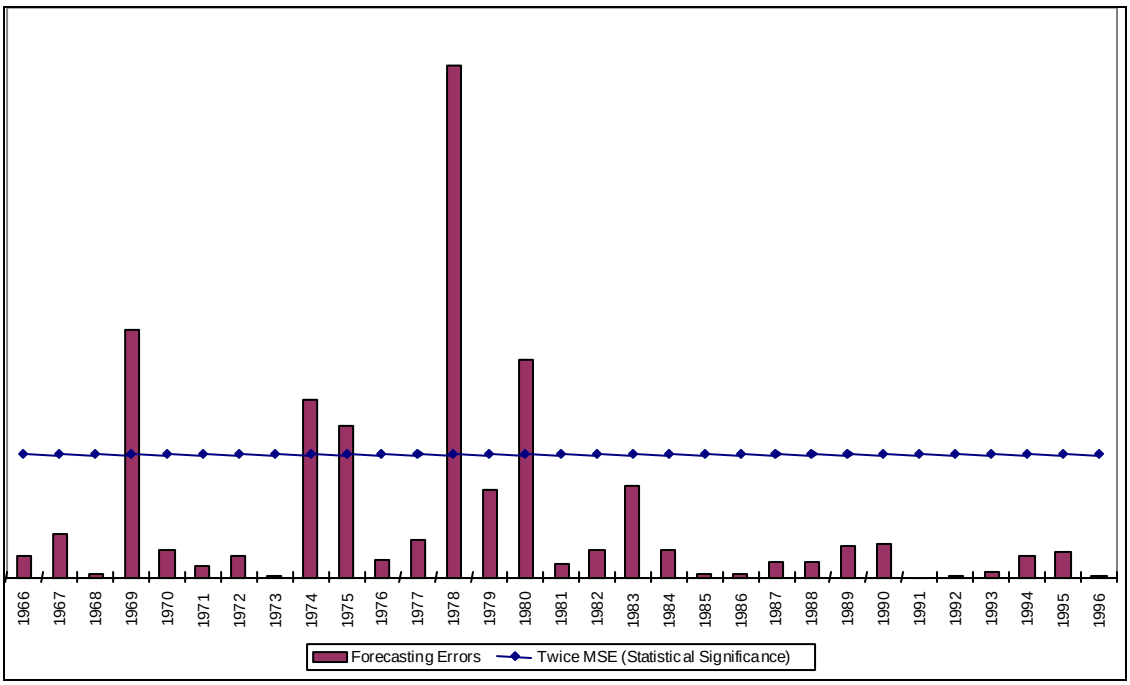


Figure 18. Forecasting Analysis for Water Transportation, Beaumont LMA: 1966-1996.

The above data show a pattern somewhat similar to the other analyses. Employment in *Water Transportation* (SIC 4400) peaked in 1978 and 1979, and declined significantly

afterwards. Between 1978 and 1987, over 3,300 jobs in this industry were lost in the Beaumont LMA. However, the forecasting analysis of this industry does not show any shocks in the employment patterns. The shocks in this industry appear in the 1970s. While the pattern in this industry is consistent with the boom and bust of the oil and gas industry, we maintain that the two-digit codes for water transportation are not adequate to capture fully the effects of offshore activities. Moreover, we know of no SIC code that will allow us to achieve this task. In short, the water transportation data are suggestive of an impact in the Beaumont LMA, but no confirmation can be drawn from this analysis.

Beaumont LMA Wholesale Trade. The data for *Industrial Machinery and Equipment* (SIC 5084) are presented below (Figure 19). This industry category includes the wholesale marketing of oil well machinery. These data are available only from 1977 to 1996, which does not provide enough years for forecasting analysis. However, the trend line in Figure 19 shows the familiar pattern of growth in the 1970s: an apex in the early 1980s followed by decline. In 1987, employment in this sector reached an eight-year low of 418 workers; reflecting a 60 percent decrease since 1982. There has been employment growth in the wholesale marketing of industrial machinery and equipment (including oil well machinery) in the 1990s.

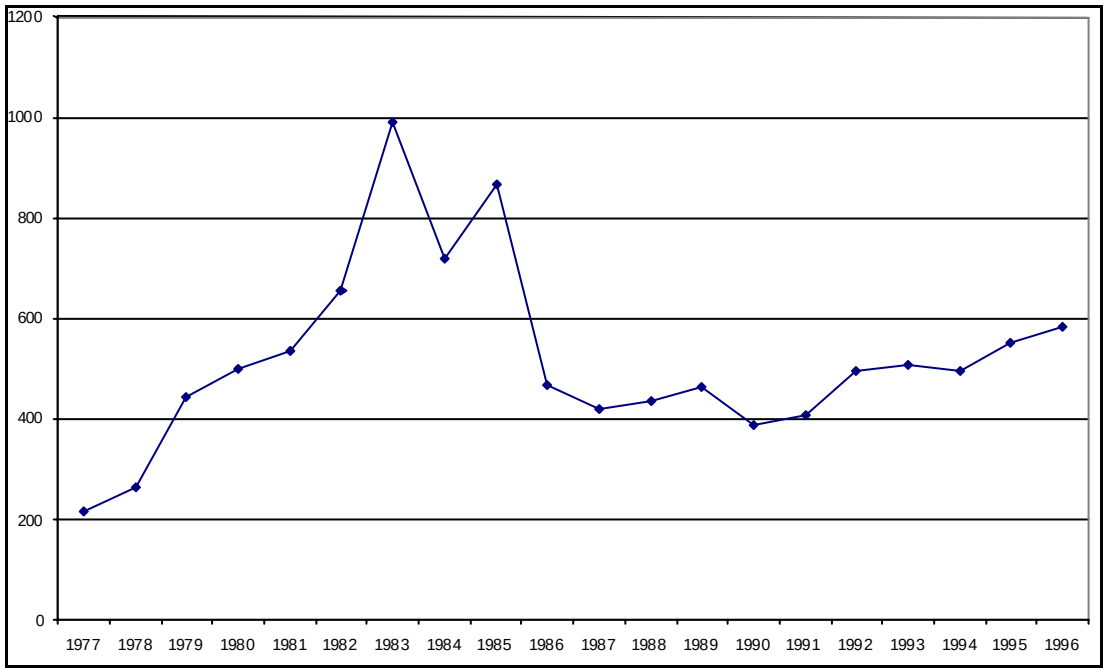


Figure 19. Wholesale Trade of Industrial Machinery and Equipment, Beaumont LMA: 1977-1996 (U.S. Census Bureau, 2000a).

The detailed industry data presented above show the impact of the "boom and bust" cycle in the oil and gas industry across a range of industries in the Beaumont LMA. In these eight categories alone, over 13,000 jobs were lost between 1981 and 1987 in the Beaumont LMA. These data do not include the "ripple" effects of economic shocks throughout the rest of the economy. The data presented above show downturns in other industries that were dependent upon the boom generated in the oil and gas activities, particularly construction, where a significant number of jobs were lost as well.

Total employment declined in the Beaumont LMA during the early 1980s. Analyses of key oil and gas related manufacturing industries in the Beaumont LMA show patterns consistent with this trend. However, the overall volume of jobs lost does not appear to be sufficient to cause the decline in total employment throughout the LMA, especially when the data show that the service and retail trade sectors grew during the 1980s.

When the question of a manufacturing-led decline is further explored, we discover another trend worth noting. Preliminary analyses show that real earnings in petroleum production fell by an estimated 35 percent in the Beaumont LMA between 1981 and 1987. Petroleum production is a major industry in this LMA, employing more people than the oil and gas related manufacturing industries analyzed above. If our preliminary analysis is correct then the bust of the 1980s was led by manufacturing, but it was manufacturing of petroleum products that led the decline. This represents a much further "downstream" effect of the oil and gas industry in the Beaumont LMA.

Beaumont LMA Population, Education, and Local Government: 1970-1990. In this section we examine how the industry changes affected population, education and local government issues between 1970 and 1990 (Tables 2-4).

Population. Between 1970 and 1980, the population of the Beaumont Labor Market Area increased by 12.4 percent, from 409,000 to 460,000. The 12.4 percent growth rate for the entire LMA is on par with the national growth rate of 11.4 percent for the same time period. Within the LMA, the population grew fastest in Polk County (68%). Between 1980 and 1990, the population of the Beaumont LMA declined by 1.5 percent, in comparison to the national growth rate of 9.8 percent. The negative growth rates suggest extensive out-migration. However, unlike in the Lafayette, Louisiana LMA, where out-migration occurred in the most rural parishes, in the Beaumont LMA out-migration occurred in Orange and Jefferson Counties, the most urbanized regions of the LMA.

Table 2

Population by County, Beaumont LMA: 1940-2000

County	1940	1950	1960	1970	1980	1990	2000
Hardin	15,875	19,535	24,629	29,996	40,721	41,320	48,073
Jasper	17,491	20,049	22,100	24,692	30,781	31,102	35,604
Jefferson	145,329	195,083	245,659	244,817	250,938	239,397	252,051
Newton	13,700	10,832	10,372	11,657	13,254	13,569	15,072
Orange	17,382	40,567	60,357	71,226	83,838	80,509	84,966
Polk	20,635	16,194	13,861	14,457	24,407	30,687	41,133
Tyler	11,948	11,292	10,666	12,417	16,223	16,646	20,871
LMA Total	242,360	313,552	387,644	409,262	460,162	453,230	497,770

Source: U.S. Census Bureau, 2000b.

The data on racial composition indicate that Caucasians were more affected by the growth and decline of population in the Beaumont LMA during the 1970s and 1980s. Between 1970 and 1980, the African-American population grew by 11 percent and the Caucasian population by 10 percent. During the same time period the percent of the Caucasian population remained stable at 76 percent. Between 1980 and 1990, the Caucasian population declined by

4.5 percent, while the African-American population increased by about 3 percent. These data indicate that the decline in the manufacturing industry, particularly petro-chemical production, led to an out-migration of Caucasian workers, with less impact on the residential patterns of African-American workers.

Table 3

Percent of White Population, Beaumont LMA: 1940-2000

County	1940	1950	1960	1970	1980	1990	2000
Hardin	83.5	84.2	83.7	86.1	89.5	90.5	90.8
Jasper	71.1	73.5	78.6	76.9	80.2	79.5	78.2
Jefferson	76.7	77.3	76.6	74.9	69.3	64.4	57.2
Newton	59.3	64.7	66.7	71.1	75.5	76.4	75.8
Orange	88.0	91.5	90.0	90.4	90.5	89.8	88.0
Polk	68.9	70.3	67.9	72.7	79.8	82.1	79.6
Tyler	81.5	80.2	78.9	81.9	86.4	87.2	83.8
LMA %	76.1	78.6	78.5	78.6	77.0	74.7	70.7
LMA Total	184,550	246,644	304,572	321,709	354,519	338,740	352,233

Source: U.S. Census Bureau, 2000b.

Table 4

Percent of Black Population, Beaumont LMA: 1940-2000

County	1940	1950	1960	1970	1980	1990	2000
Hardin	16.5	15.7	16.2	13.7	10.0	8.4	6.9
Jasper	28.8	26.4	24.8	22.9	19.3	18.9	17.8
Jefferson	23.2	22.6	23.2	24.8	28.2	31.1	33.7
Newton	40.6	35.3	33.2	28.8	24.0	22.3	20.7
Orange	11.8	10.8	9.8	9.2	8.1	8.3	8.4
Polk	29.4	27.8	29.3	26.4	15.7	12.6	13.1
Tyler	18.4	19.7	20.9	17.9	12.9	11.9	11.9
LMA %	23.6	21.5	21.2	21.1	27.3	21.9	22.6
LMA Total	57,397	67,453	82,373	86,681	96,831	99,474	112,866

Source: U.S. Census Bureau, 2000b.

The population growth rates deviate from the national trends during the period of time between 1980 and1990. Net migration is a useful concept through which to understand the equilibration of employment and population in sub-regions, the adaptation of the ecosystem to changes in its external environment. One important component of the explanation of net migration is the expansion and contraction of employment opportunities in an area (Micklin and Choldin, 1984). Our data show that a decline in the manufacturing sector led to a net out-migration from the Beaumont LMA during the 1980s. This finding is important because without a detailed analysis, one might conclude that the population loss of the 1980s was directly related

to the oil and gas bust in the region. Our analysis indicates that Beaumont LMA losses were, to some extent, independent of that effect.

Education. The adult education data is examined next (Table 5). These data show that, relative to the State of Texas, adult educational attainment levels in the Beaumont LMA are mixed.

In 1970, 56 percent of the adults in the Beaumont LMA had not graduated from high school, compared to 71 percent for the State of Texas. However, by 1980, the percentage of adults who had not graduated from high school in both Texas and the Beaumont LMA had declined to 40 percent. In 1990, 28 percent of the adults in the Beaumont LMA had not graduated from high school, while the State percentage was 36 percent. These statistics are inconsistent with those for the Lafayette LMA in Louisiana, where the actual numbers of non-high school graduates actually increased over between 1970 and 1990. Other studies indicate that natural resource based industries are labor intensive and the jobs do not often require many years of formal education (RSS, 1993). Perhaps the regional differences in industry structure (oil and gas vs. manufacturing) explain part or all of this difference.

Table 5

Adult Educational Attainment (age 25+), Beaumont LMA: 1970-2000

County	0-8 Years	Some High School	High School Diploma	Some College, No Degree	BA/BS or More	Total
1970						
Hardin	33.3%	29.2%	23.7%	7.1%	6.4%	16,119
Jasper	39.2%	27.4%	21.0%	7.0%	5.2%	13,593
Jefferson	28.0%	25.0%	26.6%	10.8%	9.4%	130,981
Newton	41.7%	25.2%	24.6%	3.1%	5.2%	6,278
Orange	28.6%	27.2%	30.0%	7.4%	6.5%	36,033
Polk	46.8%	25.0%	17.5%	5.9%	4.6%	8,327
Tyler	40.7%	27.5%	19.6%	5.5%	6.6%	7,340
LMA Total	30.8%	25.9%	25.9%	0.9%	8.1%	218,671
1980						
Hardin	21.0%	26.0%	38.5%	13.4%	0.9%	21,220
Jasper	26.8%	25.1%	35.8%	11.4%	0.8%	16,688
Jefferson	21.0%	20.6%	37.2%	19.5%	1.5%	127,830
Newton	28.2%	28.6%	33.8%	7.6%	0.4%	7,238
Orange	18.9%	22.2%	41.8%	16.0%	0.9%	42,508
Polk	30.9%	27.9%	28.9%	11.1%	0.9%	13,922
Tyler	28.1%	26.6%	33.9%	10.1%	1.0%	9,215
LMA Total	22.1%	22.5%	37.4%	16.6%	1.3%	238,621

Table 5

Adult Educational Attainment (age 25+), Beaumont LMA: 1970-2000 (continued)

1990						
Hardin	9.8%	19.6%	37.0%	23.8%	9.7%	25,629
Jasper	14.1%	21.4%	38.0%	18.0%	8.3%	19,869
Jefferson	10.5%	15.0%	32.7%	26.2%	15.5%	152,608
Newton	17.0%	23.8%	40.3%	13.3%	5.5%	8,399
Orange	9.1%	18.3%	37.4%	24.8%	10.3%	50,076
Polk	15.5%	24.8%	32.1%	18.9%	8.6%	20,808
Tyler	15.1%	22.6%	36.2%	17.5%	8.4%	11,297
LMA Total	7.3%	17.7%	34.6%	23.9%	12.5%	288,686
2000						
Hardin	6.8%	14.0%	40.2%	26.2%	13.0%	30,747
Jasper	9.4%	17.5%	39.5%	22.9%	10.4%	23,420
Jefferson	7.9%	13.6%	33.1%	29.0%	16.3%	161,261
Newton	10.3%	20.9%	45.4%	17.7%	5.5%	9,738
Orange	6.4%	14.5%	38.7%	29.3%	11.0%	54,229
Polk	9.5%	10.4%	21.0%	23.0%	10.4%	28,453
Tyler	7.5%	20.5%	41.4%	20.7%	9.6%	14,433
LMA Total	7.8%	15.2%	36.2%	27.1%	13.5%	322,281

Source: U.S. Census Bureau, 2000b.

Finances. The 1970s and 1980s were important periods for local government financing in the Beaumont LMA (Tables 6-9). Between 1972 and 1982, total revenues for local governments increased by 98 percent in constant dollars. State allocation to local governments increased by 16 percent during the same period. In 1972, state allocations accounted for almost one-third of local government revenue in the Beaumont LMA. By 1982, state allocations accounted for only 25 percent of local government revenue.

Revenues peaked in 1987 at over $2,000 per capita. This finding indicates that the Beaumont LMA was not affected by the oil and gas boom and bust period like local governments in other economies in the region. In Lafayette LMA state revenues dropped, but in the Beaumont LMA per capita state revenues to local governments increased by 20 percent in real dollars between 1982 and 1987. The data for Beaumont LMA do show, however, that considerable debt was undertaken between 1982 and 1987. During this time period, per capita local government debt grew by 60 percent in constant dollars. Moreover, this appears to be a one-time effect. By 1992, per capita debt levels had returned to 1982 levels (in constant dollars). However, the state did provide significantly more financing to local governments in the Beaumont LMA during the 1987-1992 time period. These data suggest that local governments in the Beaumont LMA borrowed money to finance any short-falls or new projects that were required during the fall-off in the manufacturing sector during that period.

Table 6

Total Revenue, Per Capita (in 1997 adjusted dollars), Beaumont LMA: 1972-1997

County	1972	1977	1982	1987	1992	1997
Hardin	$1,095	$1,515	$1,319	$1,650	$1,651	$1,688
Jasper	$1,125	$1,526	$1,699	$1,838	$2,072	$2,903
Jefferson	$1,084	$1,806	$2,203	$2,664	$2,383	$2,417
Newton	$1,054	$1,387	$1,459	$1,650	$1,935	$1,729
Orange	$1,069	$1,600	$1,893	$2,680	$2,616	$2,566
Polk	$1,016	$1,306	$2,178	$3,118	$1,756	$2,471
Tyler	$1,371	$1,283	$1,410	$1,927	$1,974	$1,735
LMA Total	$1,090	$1,673	$1,984	$2,491	$2,262	$2,361

Source: U.S. Census Bureau, 2000a.

Table 7

Total State Revenue, Per Capita (in 1997 adjusted dollars), Beaumont LMA: 1972-1997

County	1972	1977	1982	1987	1992	1997
Hardin	$457	$529	$561	$708	$960	$865
Jasper	$489	$535	$557	$703	$920	$926
Jefferson	$327	$340	$363	$420	$515	$369
Newton	$517	$652	$598	$758	$1,203	$864
Orange	$403	$430	$460	$557	$632	$578
Polk	$461	$436	$428	$532	$668	$493
Tyler	$505	$486	$550	$682	$935	$741
LMA Total	$376	$403	$428	$517	$651	$533

Source: U.S. Census Bureau, 2000a.

Table 8

Total Tax Revenue, Per Capita (in 1997 adjusted dollars), Beaumont LMA: 1972-1997

County	1972	1977	1982	1987	1992	1997
Hardin	$457	$523	$524	$633	$523	$553
Jasper	$338	$380	$409	$500	$600	$892
Jefferson	$569	$939	$1,045	$1,111	$1,224	$1,364
Newton	$354	$445	$478	$615	$603	$565
Orange	$543	$787	$842	$896	$1,199	$1,010
Polk	$340	$561	$564	$619	$679	$696
Tyler	$549	$556	$546	$588	$620	$546
LMA Total	$527	$795	$859	$922	$1,032	$1,073

Source: U.S. Census Bureau, 2000a.

Table 9

Total Debt, Per Capita (in 1997 adjusted dollars), Beaumont LMA 1972-1997

County	1972	1977	1982	1987	1992	1997
Hardin	$1,222	$1,070	$737	$852	$474	$715
Jasper	$917	$1,089	$665	$704	$468	$814
Jefferson	$2,495	$2,821	$2,163	$4,647	$3,333	$3,190
Newton	$1,056	$534	$1,122	$649	$355	$156
Orange	$1,839	$1,454	$6,287	$9,131	$8,759	$7,539
Polk	$757	$1,202	$11,506	$12,103	$7,750	$5,856
Tyler	$1,303	$1,272	$859	$1,094	$790	$307
LMA Total	$2,041	$2,120	$3,133	$5,063	$3,971	$3,578

Source: U.S. Census Bureau, 2000a.

Following the oil and gas "boom and bust," population in the Beaumont LMA grew by 10 percent, on par with the national growth rate for that period. The service industry led that growth, with 130 percent growth rate occurring between 1990 and 2000. A significant proportion of these jobs appear to be "white collar," as over 40 percent of the adults in the Beaumont LMA in 2000 had at least some formal education beyond high school. On the downside, manufacturing continued to decline in the 1990s, but the negative effects of this appear to have been limited within the LMA.

This LMA did not experience problems to the same degree as other economies in the Gulf of Mexico region; consequently local governments in Beaumont LMA stabilized their finances between 1992 and 1997. Per capita debt declined by 10 percent in real dollars, and revenue streams (as measured in real dollars) were more stable.

Unlike other Gulf of Mexico Region LMAs, the Beaumont LMA did not experience a "boom and bust" pattern. This is largely because mining and related industries were only marginally concentrated in this LMA. Historically, manufacturing was a key industry in the Beaumont LMA. Some of this manufacturing was related to the production of oil and gas related materials (e.g., equipment, shipping components). Yet these enterprises comprised a small portion of the Beaumont LMA manufacturing sector. The industry declined throughout the 1980s and into the 1990s. There was a short-term negative effect of this decline in the 1980s, as population actually declined in the LMA between 1990 and 1980. However, by 2000, population growth rates were on par with national growth trends, and the deleterious effects of the loss of manufacturing jobs appear to have stabilized in the 1990s, particularly post-1992.

III. LOUISIANA STATE PROFILE

A. INTRODUCTION

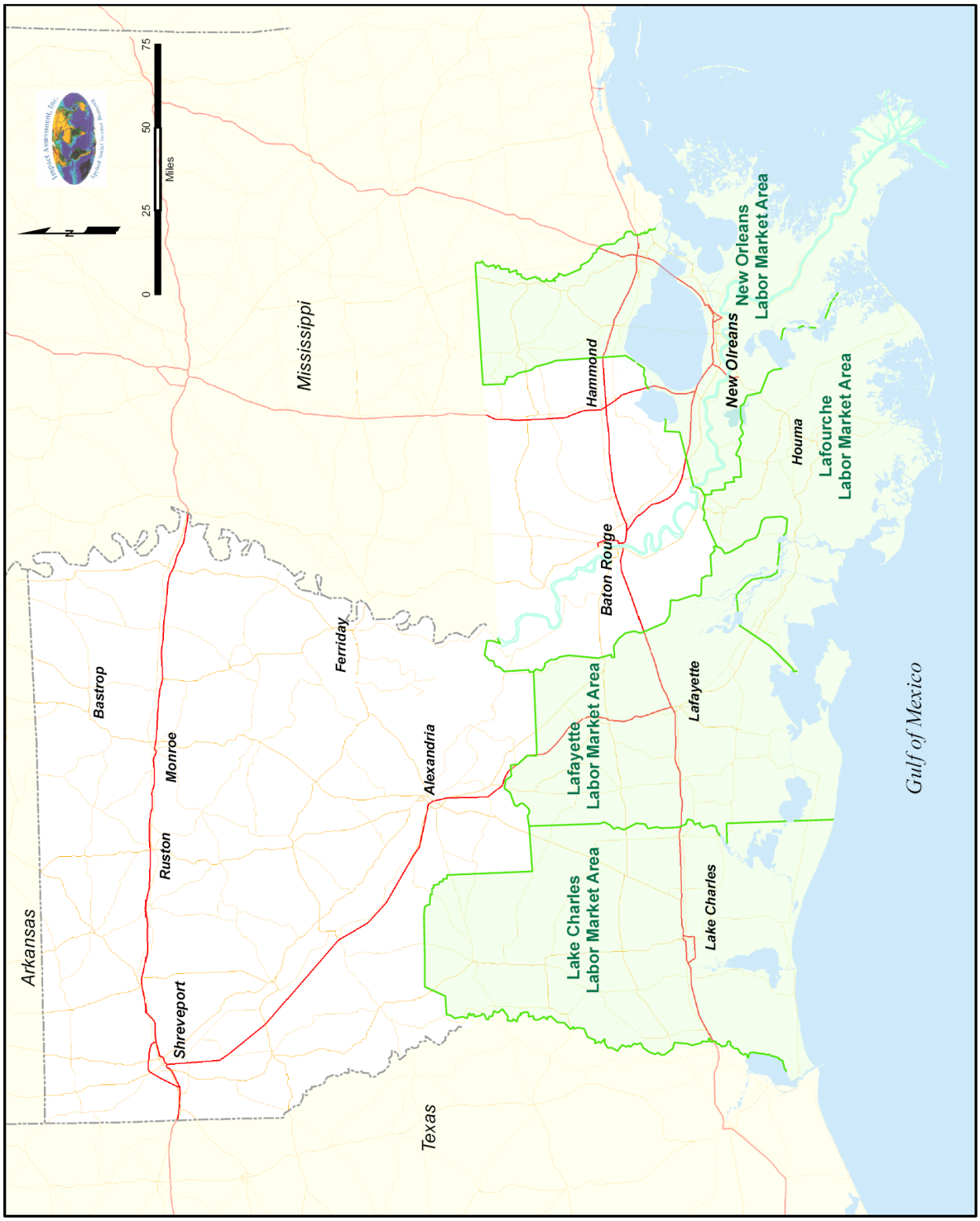
Louisiana sits in the south-central part of the country along the Gulf of Mexico. It is east of Texas, west of Mississippi and south of Arkansas (Map 6). At its widest, the state is approximately 530 km; at its longest it is 450 km. With 123,677 square miles, Louisiana ranks 31st in the nation in terms of land area.

The geography of Louisiana has been described as "rambling" in that it is "neither planned nor systematic, but rather a rambling about from one section or feature to another" (Kniffen 1968, 5). Generally speaking, the state has five natural regions, the southernmost consisting of both fresh and salt water coastal marsh. Moving northward, the elevation gradually rises, forming prairie, flatwood and bluffland terraces. Eventually, these terraces give way to longleaf and short leaf hill country that roll all the way to the northern border of the state. The Red River Valley and the Mississippi Floodplain cut across the state's marshes, terraces and hills with its natural levees, passes and swamps. This Valley and Floodplain sit as two separate arms of a great "Y" in the northern part of the state, conjoining in the central part. The Floodplain widens south of Baton Rouge, running 50 miles wide in most places but expanding to more than twice that when it meets the River Parishes of St. James, St. John, and St. Charles. For the most part, Louisiana is a plain with a total relief of 535 feet that is found near Driskill Mountain (Kniffen, 1968). As much of the coastal plain lies only slightly above sea level, the state's residents have long had to cope with flooding.

The Tensas Basin, formed by the Tensas River running south, lies in the northeastern part of the state. The Atchafalaya Basin, a wide swamp in the south-central part of the state, runs from the Lower Red River to the Gulf and has a number of distributaries and lakes within its area. The Atchafalaya River runs through the Basin, dividing into numerous braided streams at the southern end of the Basin that rejoin in the Lower Atchafalaya near the Gulf (Kniffen, 1968).

Numerous bays and points, islands and inlets create the Louisiana shoreline. While the state's coastline extends for approximately 400 miles, its shoreline spans for almost 1,000 miles (Kniffen, 1968). Coastal erosion, along with the shifting nature of the Mississippi River, whose fringe-like coastline and low lying coastal marshes make for a vulnerable ecological situation, explain much of this discrepancy.

The State is well-endowed with waterways, the most prominent of which is the Mississippi River. The Mississippi runs north to south in the eastern part of the state. Other major rivers include the Sabine along the western border, the Calcasieu River and its tributaries draining the high terraces, Red River cutting across the state in a diagonal northwest-southeast fashion, Ouachita River and Bayou Macon in the north, and the Black and Atchafalaya Rivers. Sabine Lake, Calcasieu Lake, Grand Lake, White Lake, Lake Salvador, Lake Maurepas and Lake Ponchartrain are large bodies of water located in the southern part of the state. Toledo Bend Reservoir sits on the west-central border.



Map 6. State of Louisiana Depicting Gulf of Mexico Labor Market Areas (and component parishes).

The State is also well-endowed with wildlife management areas, waterfowl/game refuges, national forests, and state parks and recreation areas. Poverty Point National Historic Landmark, which is managed by the National Park Service and operates to preserve and interpret an ancient Indian site, is located in the state. Louisiana is also home to the six separate units of Kisatchie National Forest (under U.S. Forest Service management), which were established as a countermove to the first wave of industrial lumbering at the end of the 19th century. Together these six units cover 598,000 acres of land. The Jean Lafitte National Historical Park is located in southern Louisiana in St. Bernard Parish. Thirteen waterfowl/game refuges are found in the northeast and southern part of the state, with the exception of Red Dirt Refuge, which is located in the west-central part of the state. The State also is home to 36 wildlife management areas, 54 state parks and recreation areas and 33 Gulf Ecological Management Sites (GEMS) (Louisiana Department of Natural Resources, 2001b).

The State's economy over the past several decades has relied heavily upon the oil and gas industry. Louisiana contains nearly 10 percent of the U.S. oil reserves and is the nation's third largest producer of petroleum (Louisiana Department of Economic Development, 2002). The first deep-water rig and the first deep-water port were established off of the state's coastal boundary. The manufacturing and refining of oil and oil-related products constitute an economic mainstay for the state. Exxon, Shell, Citgo, Mobil, Marathon, Conoco, BP and STAR are all main producers in the state. The manufacturing of chemicals and allied products are also important.

B. BUILT ENVIRONMENT

Human Geography and Population Centers. The State capital, Baton Rouge, had a year 2000 population of 227,818 persons. Other major population centers, with their year 2000 populations, include: Alexandria (46,342), Bossier City (56,107), Houma (32,393), Lafayette (110,257), Lake Charles (71,757), Monroe (53,107), New Orleans (484,647), and Shreveport (200,145) (U.S. Census Bureau, 2000b).

Transportation and Communication. Louisiana's key transportation arteries include: Interstate Highway 20, running east-west in the northern part of the state and connecting Dallas, Texas to Shreveport; I-10, running east-west in the southern part of the state and connecting Houston, Texas to New Orleans; I-12, running east-west off of Interstate 10 and connecting Baton Rouge to Biloxi, Mississippi; and I-49, running south/north and connecting Shreveport to Lafayette. National Highways include: 71; 220; 80; 167; 165; 90; 171; 190; 51; and 61. State Highways running through the state are: 1; 15; 34; 2; 19; 10; and 25. Nearly two dozen freight rail lines run through Louisiana including: *Acadiana Railway*, *Delta Southern*, *Kansas City Southern, Louisiana and Northwest, Louisiana Southern, North Louisiana and Gulf, Southern Pacific,* and *Union Pacific*. *Amtrak* provides the state with passenger rail service.

Major commercial airports are found in Shreveport, Baton Rouge, Alexandria, Lafayette, Lake Charles, Houma, Morgan City, and New Orleans. General aviation airports are located in a number of smaller communities. New Orleans International Airport is located 13 miles outside the city of New Orleans and offers service from several major airlines. It provides three runways (10,880 feet, 7,000 feet, and 3,576 feet), and averages 449 flights per day. Four miles from New Orleans, the New Orleans Lakefront Airport also provides three runways (6,879 feet, 3,699 feet, and 3,094 feet) (Louisiana Department of Economic Development, 2002).

Louisiana has seven deep water/draft ports: Port of Greater Baton Rouge, Port of New Orleans, Port of Lake Charles, Port of South Louisiana (St. John the Baptist Parish), Plaquemines Parish Port, Harbor and Terminal District, Point Coupee Parish Port and Industrial Park, and St. Bernard Port, Harbor and Terminal District (Port of Greater Baton Rouge, 2002).

Physical Infrastructure. Louisiana produces nearly all of its own energy from hydrocarbons (petroleum and natural gas) mined within the state. Entergy is a major electricity supplier in the state; in 2002, it was the operating company for seven of the 10 largest energy plants (by generating capacity) in the state (USDOE, EIA, 2004b). There are also numerous electric cooperatives. These include: Beauregard Electric Cooperative; Bossier Rural Electric Membership Cooperative Cajun Electric Power Cooperative; Claireborne Electric Cooperative; Concordia Cooperative; Dixie Electric Membership Cooperative Jefferson Davis Electric Cooperative; Northeast Louisiana Power Cooperative; Pointe Coupee Electric Membership Cooperative; South Louisiana Electric Cooperative Association; Southwest Louisiana Electric Membership Cooperative; St. Martinville Electric Cooperative; Teche Electric Cooperative, and Washington/St. Tammany Electric Cooperative. Other companies include Central Louisiana Electric Company, Lafayette Utility System, and Louisiana Energy Power Authority. Some individual municipalities supply their own electricity (Entergy, 2003).

Natural gas is supplied by: Atmos Energy LA, Arkansas LA Gas, Bridgeline Gas Distribution Co., Collins Pipeline Co., Columbia Gulf, Dixie Gas Co., Entergy New Orleans, ENTEX, Evangeline Gas Co., Ferrellgas, Hadson Gas, Herring Gas Co., Iberville Natural Gas, Lake St. John, LA Interstate, LA State Gas, LEDCO, Louisiana Gas Service Co., Louisiana Nevada Transit, Mid-Louisiana Gas Co., Mississippi Gas Corporation, Monterrey Gas Co., Neches Gas Distribution Co., Oceana Heights Gas Co., Primos Production, Reliant Energy, Riverway Gas Pipeline, Sabine Pipeline Co., South Coast Gas Co. Inc., Southern Industrial Gas Co., Southern Natural Gas Co., Starks Water and Gas, Inc., Terrebonne Parish Consolidated Government, Texas Gas and Union Texas Petroleum, Tennessee Gas, Trans LA Gas Co., United Gas Pipeline Co., and Wintershall Pipeline Corporation (Entergy, 2003).

The following entities provide water and sewage services to Louisiana's parishes: Atlanta Water System, Bayou Teche Water Works, Coast Water Works, Corney Water System, Coteau Water System, Crystal Water Co., DOWAS, Louisiana Water Co., People's Water Service Incorporated, Simmon's Water Works, Southside Water Co., and many individual municipalities. BellSouth is the state's primary telephone service provider (Entergy, 2003).

Interaction of Biophysical and Built Environments. Louisiana is a comparatively polluted state. In 2001, it ranked 10th of 50 states and six U.S. provinces (one being the dirtiest). Louisiana also ranked in the 85th percentile for total environmental releases (122,488,319 pounds) and in the 75th percentile for its cancer risk (air and water) (one being the cleanest). However, Louisiana's total cancer risk scores have decreased 81 percent from 1988 to 2001 (Scorecard, 2003).

Of the total 2001 environmental releases in Louisiana, air releases accounted for 57,647,195 pounds, while water and land totaled 11,908,380 and 15,647,195 pounds, respectively. Also in this year, Louisiana's off-site transfers totaled 88,923,335 pounds, while production-related wastes equaled 2,987,730,036 pounds (Scorecard, 2003).

In 2001, Louisiana's top 10 releasing facilities, and their releases with pounds in benzene-equivalents, were: Cytec Industries Inc., Fortier Plant (10,986,025); Monsanto Luling (10,426,296); Rubicon Inc. (5,784,462); CF Industries Inc. (5,469,102); Angus Chemical Co. (5,397,602); International Paper (5,170,024); ExxonMobil Refining and Supply Baton Rouge

Refinery (3,876,334); Louisiana Pigment Co. L.P. (3,635,743); Safety-Kleen (Plaquemine) Inc., (3,635,573); and Chemical Waste Management, Lake Charles Facility (3,358,054) (Scorecard, 2003).

The top 10 chemical releases presenting a cancer risk to Louisiana in 2001, and their pounds in benzene-equivalents, included: carbon tetrachloride (27,000,000); arsenic (organic or inorganic) compounds (3,100,000); hexachlorobenzene (1,400,000); lead compounds (1,000,000); ethylene oxide (810,000); benzene (560,000); 1,2-dichloroethane (420,000); 2-nitropropane (390,000); dichlorobromomethane (260,000); and chromium compounds (240,000) (Scorecard, 2003).

C. HISTORY

Settlement. The first human settlement in Louisiana dates back to the Lithic culture (10,000 B.C. or older), whose sites have been found near streams draining the terraces and on Avery Island. This culture possibly inhabited the floodplains and the Gulf Coast and hunted large game (Kniffen, 1968). The Poverty Point culture (1700 B.C.) is the second oldest in Louisiana. These intensive hunting and fishing people built earthen mounds in the northern part of the state and shell middens in the eastern coastal region (Kniffen, 1968). The prehistoric groups that followed also built mounds, but their architecture as well as their material cultural changed considerably over defined periods of time, and it is these changes that have been used to designate the varying groups: Tchefuncte (200 B.C. to A.D. 400), Marksville (A.D. 100 to A.D. 500), Troyville (A.D. 500 to A.D. 950), Coles Creek (A.D. 950 to A.D. 1300), and the Plaquemine, Caddoan, Mississippian cultures (Kniffen, 1968).

Indians who later settled present-day Louisiana fell under six linguistic groups: Caddoan; Tunican; Natchezan; Muckhogean; Atakapan; and Chitimachan (Kniffen, 1968). Several tribes, or political units, comprised each linguistic group. They settled along the major streams or on high ground at the edge of marshes, as these water bodies were best for fishing. The Caddoan people of the Red River in the northern part of the state engaged in agriculture prior to the arrival of Europeans, after which they took up hunting. The Tunican group in the far northeast and the Muskhogean in the southeast north of Lake Pontchartrain were agriculturalists. The Atakapan ("man-eater") in the southwestern part of the state were so named by the Choctaw because they allegedly engaged in cannibalism after warfare (Swanton, 1911). These hunting and fishing people settled primarily along the Vermilion, the Mermentau, and the Calcasieu Rivers in southern Louisiana, but their territory extended relatively far north (Swanton, 1911).

The first Europeans to come to Louisiana were Spanish explorers sailing the northern coast of the Gulf of Mexico from Florida to Vera Cruz. The Pineda (1519), Narváez and de Vaca (1528), and Moscoso (1542) expeditions all traveled the Louisiana coastline. Following those initial voyages, Spanish interest in the territory waned until the late 17th and early 18th centuries when missionary work began in the region. By that time, a number of French groups had settled along the lower Mississippi.

French explorers, led by La Salle, followed Spanish interests. La Salle descended, opening up fur trade to the area. In 1682, La Salle reached the Gulf and promptly claimed all the land drained by the Mississippi River, and then some. Naming the claim *Louisiane* after King Louis XIV of France, La Salle intended to establish a settlement. In 1684, his campaign for settlement missed the mouth of the Mississippi and landed in Texas (Kniffen, 1968).

Sieur de Iberville followed La Salle in 1699, sailing up the Mississippi. During that expedition, he encountered a British ship in present-day Plaquemine Parish. Iberville pronounced the territory in the name of France and, after a brief skirmish, the English ship turned around. This event marked the founding of Louisiana. Other French expeditions of note include: Tonti (1689); Iberville and Bienville (1700); St. Denis (1714-1716); and La Harpe (1719) (Goins and Caldwell, 1995).

Between 1699 and 1792, Louisiana was under French rule. Nevertheless, in this time, exchanges in portions of the state were made through a series of treaties, to both the British and Spanish governments. Settlements established during that time consisted largely of rice, sugar, and indigo farms, and outposts. Acadian exiles from France and Canada were instrumental in populating the southern part of the state and in cultivating the land (Goins and Caldwell, 1995).

The Louisiana Purchase transferred ownership of Louisiana to the United States in 1803. The Territory of Orleans was then divided into 12 parishes (divisions of land were based on former ecclesiastical units): Acadia, Atakapas, Concordia, German Coast, Iberville, Lafourche, Natchitochees, Opelousas, Orleans, Ouachitta, Pointe-Coupée, and Rapides. These expansive parishes encompassed all of what is today Louisiana. Between 1807 and 1812, seven more parishes were established: Feliciana, East Baton Rouge, St. Helena, St. Tammany, Catahoula, Warren, and St. Mary. In 1812, Louisiana entered the Union with 26 parishes; by 1861 there were 48 parishes in the state (Goins and Caldwell, 1995).

Industrialization. The State's antebellum economy was comprised mostly of plantation-based agriculture and, within the New Orleans region, trade and transportation. The dominance of the plantation economy shaped not only the landscape, which made great use of the French arpent system, but also the socio-political system. Merchants and planters held the majority of power in society through the holding of land, slaves and/or commerce. This group also ran the politics of the state (Goins and Caldwell, 1995).

Louisiana's alluvial-based soils and plentiful rainfall has supported a wide variety of crops throughout its agricultural history. In the 19th century, plantation economy made Louisiana a leading contributor to the nation's total agriculture product. Since the 1950s, however, the number of farms has declined from roughly 150,000 to only 27,350 in 1995 (Goins and Caldwell, 1995).

Because of the strength of agriculture within the state economy, manufacturing did not emerge until the post-Civil War era. At that time manufacturing interests included lumber, flour, cotton, and iron mills, brick and tile kilns, distilleries, and sugar refineries (Goins and Caldwell, 1995).

The Mississippi River, along with its numerous distributaries and other water courses, provided the main means of transportation for the state. Between the Louisiana Purchase in 1803 and the Civil War in 1861, water transportation evolved from the raft, to the flatboat and keelboat, to the steamboat. According to Goins and Caldwell, the state's waterways greatly facilitated trade and commerce, particularly in New Orleans which "hummed with the transshipment of both imports and exports" (1995, 37).

Following the state vote to secede from the Union in 1861, New Orleans quickly fell under the control of Union troops. In 1863, the war was concentrated along the lower Mississippi and the Bayou Teche-Atchafalaya Basin. By the end of 1863, with a lack of men and supplies to fight at sustained levels, the Union Navy cut Louisiana off from the rest of the Confederacy. Nevertheless, one last skirmish—the Red River campaign—was fought on Louisiana soil in the spring of 1864. Throughout the war period, 56,000 men fought in the

Confederacy Army and several thousand free blacks and slaves fought with Union forces (Goins and Caldwell, 1995).

During the Reconstruction and industrialization era, a number of new parishes were formed in the state: Richland (1868), Iberia (1868), Grant (1869), Tangipahoa (1869), Cameron (1870), Webster (1871), Red River (1871), Vernon (1871), Lincoln (1873), Carroll (1877), La Salle (1908), Evangeline (1910), Allen (1912), Beauregard (1912), and Jefferson Davis (1912) (Goins and Caldwell, 1995).

The railroad was slow in coming to Louisiana. There were no major railroads in the state until the 1850s when *The New Orleans, Jackson, and Great Northern; the New Orleans, Opelousas, and Great Western Railroad*; and the *Vicksburg, Shreveport, and Texas Railroad* arrived. During the Civil War, the railroads deteriorated from neglect or were sabotaged by Union and Confederate troops. In 1880, the state had short tracks (652 total rail miles) of 15 lines. The *Louisiana Western*, conjoined with the *Morgan's Louisiana and Texas*, and consequently had the longest track line, running from Algiers to Morgan City, Vermilionville, Lake Charles, and into Texas. The *Chicago, St. Louisa and New Orleans* ran from New Orleans north through Hammond and into Mississippi. The *Vicksburg, Shreveport and Pacific* ran a short distance from Vicksburg to Monroe (Goins and Caldwell, 1995).

After 1880, railroad construction boomed in Louisiana, and the population grew ninefold to 5,728 by 1915 (Goins and Caldwell, 1995). Population centers competed for rail lines, as their economic success depended on them. Indeed, the railroad ushered in a wave of industrialization in the form of clear-cut forestry. Across the state, but particularly in the west, loggers moved into areas of virgin pine growth, clearing the ground and establishing lumber mills. After complete devastation to the land in some areas and a general waning of forest resources by 1920, the large companies who had previously moved into the area migrated to the Pacific Northwest. The state then committed to a program of intense reforestation. The Kisatchie National Forest is a result of this program.

Agriculture and the manufacturing of agricultural products continued to be important to the state, despite a loss of the plantation landscape. With the introduction and modernization of sugar mills, the state became the number one producer of sugar in the nation—a position it maintained until 1959 when it fell to second. In 2000, Louisiana was the second largest producer of sugar in the United States, with 435,000 acres of sugar cane fields producing 1.44 million tons (Sugar Processing Research Institute, 2003).

Rice production has also been important to the state, due to the evolution of the rice mill. In 1890, Louisiana was the nation's largest grower of rice (producing 756,454 tons), and this remained the case through 1950 (10,620,514 tons). In 1982, Louisiana was the fourth largest producer of rice in the nation, producing 23.4 tons that year (Goins and Caldwell, 1995). In 2000, total rice production summed to 24.4 tons, with Acadia, Jefferson Davis, Vermilion, Evangeline, and Morehouse as the top rice producing parishes in the state (Louisiana Agricultural Statistics Service, 2001).

At the same time, Louisiana's expanding production was accompanied by a reduction in the number of farms. Indeed, the "functional landscape" of the state has transformed drastically since Reconstruction, growing all the while more industrial. Nevertheless, Louisiana retained its own form of economy based on family ownership until that very latter part of the 20th century, when it adopted the California model of large-scale agriculture. Now, the "CALA" model, an amalgam of California and Louisiana systems, is used not only in Louisiana, but in other states as well (Rehder, 1993).

Oil. Oil in Louisiana has been exploited since prehistoric Indian times, when these early inhabitants likely skimmed petroleum off of water to make medicine (Kniffen, 1968). But it was not until the 1902 discovery of oil at the Jennings Field in Jefferson-Davis Parish that the oil industry really exploded. Oil-related manufacturing grew along with the production of oil. The first pipeline in the state was built in 1901, and this ran from Jennings to Texas. Eight years later, a major refinery complex in Baton Rouge was established and within a year, two more major pipelines were in existence in the state: a pipeline from Caddo Parish to the Gulf and from southwestern Louisiana to Baton Rouge. By 1916, the state ranked fifth in the nation in production (Kniffen, 1968). The number of refineries continued to increase and, in 1919, the state had 15 refineries. Presently there are 19 refineries in Louisiana (Louisiana Mid-Continent Oil and Gas Association, 2003).

In 1947, Louisiana's first offshore oil well was drilled, opening up the offshore industry to the state. Consequently, the manufacturing of offshore rigs and transportation vehicles became a necessity. The dredging of canals off the coast that were used to transport oil more efficiently also introduced salt water intrusion into freshwater marshes. Through the years, major companies have worked to alleviate environmental impacts while providing positive economic growth. Such growth continued until the national recession in the 1980s and the concomitant drop in oil prices. This drop proved to be economically damaging to the state, as a number of major oil companies pulled out.

In 1978, construction began on the Louisiana Offshore Oil Port (LOOP), located 18 miles offshore in the Gulf of Mexico, under the direction of J. Ray McDermott Co. No such port was needed prior to 1970 because the U.S. was an oil supplier, not an oil customer. LOOP is the United State's first deepwater port capable of unloading crude oil from supertankers.

LOOP's initial construction phase began in the summer 1978 with the financial support of Marathon Pipeline Co., Texaco, Inc., Shell Oil Co., Ashland Oil, Inc., and Murphy Oil Corp., which owned 32 percent, 27 percent, 20 percent, 19 percent, and 3 percent of stock, respectively. It was anticipated that the Superport's first phase of construction would bring in nearly 31,000 jobs. At this point, LOOP's designation as a reception center for foreign crude oil clarified the national role's transition from supplier to customer. This port had the advantage of proximity to a pipeline running from St. James northward to U.S. refineries in the east and mid-west. LOOP is also the only U.S. port large enough to accommodate supertankers over 400 yards long, which is 10 times the size of most U.S. oil tankers. It was projected that LOOP would unload 1.4 million barrels of imported oil on a daily basis, and 3.4 million barrels daily by 1989 (Starr, 1977).

In 1975, the Louisiana state mineral severance tax revenue from oil (excluding OCS activity) was $279 million, with $234 million coming from natural gas, for a total severance tax of $513 million. By 1980, the severance tax from oil increased to $428 million, as compared with $162 million from natural gas. By 1981, the oil severance tax had risen enormously to $815 million, for a year-end total of $979 million. After this year, severance tax revenue from oil began to drop: $766 million in 1982; $662 million in 1983; $599 in 1985; and $296 in 1988. At the same time, however, severance tax revenue from natural gas remained relatively constant throughout this bell-curve in oil severance tax revenue (Louisiana Department of Natural Resources, 1997). At the onset of the 1990s, Louisiana still remained in a recession stage, resulting from a decline in its oil and gas industries.

D. DEMOGRAPHIC CHARACTERISTICS

Population Growth. Louisiana had a population of 4,468,976 persons in 2000. Louisiana had the 24th highest population of any state in the country for that year (Table 1).

Table 1

Population Changes, Louisiana State: 1940 to 2000

Year	Population	Change from Previous Census	Percent Change from Previous Census
2000	4,468,976	249,003	5.9
1990	4,219,973	14,073	0.3
1980	4,205,900	564,594	1.5
1970	3,641,306	384,284	1.1
1960	3,257,022	573,506	2.0
1950	2,683,516	319,636	1.3
1940	2,363,880	262,287	1.2

Source: U.S. Census Bureau, 2000b.

Ethnicity and Age. Historically, Louisiana's population has included a large African-American demographic. In 2000, African-Americans comprised 33 percent of the state's population, and Caucasians accounted for 64 percent (Table 2) (U.S. Census Bureau, 2000b).

The State has a predominantly youthful population. In 2000, 27 percent of residents were less than 18 years of age, and 12 percent were 65 years of age and older. The median resident age was 34.0; the national median age was 35.3 in this same year (U.S. Census Bureau, 2000b).

Table 2

Racial and Ethnic Populations, Louisiana State: 2000

Race/Ethnicity	Population	Percent
White	2,856,161	63.9
African American	1,451,944	32.5
Hispanic*	107,738	2.4
American Indian	25,477	0.6
Asian	54,758	1.2
Pacific Islander	1,240	0.0
Other Race	31,131	0.7
Two or More Races	48,265	1.1

* Hispanics may be of any race.

Source: U.S. Census Bureau, 2000b.

E. ECONOMY

Income and Poverty. Median family income in Louisiana in 2000 was $39,774. In that same year, nearly 16 percent of Louisiana families were living below the poverty threshold. Of that percentage, single females headed some 41 percent of these families (Table 3). Also in 2000, 7 percent of all children in Louisiana under the age of 18, and 2 percent of children less than five years old, were living in poverty (U.S. Census Bureau, 2000b).

Table 3

Income, Poverty and Family Structure, Louisiana State: 1960-2000

Year	Median Family Income (2000 constant $)	Change from Previous Census	Ratio to National Median	Persons in Poverty	Female-Headed Families with Children
2000	$39,774	51.2%	0.79	19.6%	16.6%
1990	$26,313	-13.2%	0.75	23.6%	15.6%
1980	$30,310*	27.9%	0.91	--	--
1970	$23,689*	41.3%	0.78	--	--
1960	$16,764*	--	0.75	--	--

*Constant 1990 dollars.
Source: U.S. Census Bureau, 2000b.

Employment. In terms of employment, Louisiana's economy is dominated by services. In 2000, 44 percent of the state's labor force was employed in services, with education, health, and social services comprising the largest sub-sectors. Tourism, which includes arts, entertainment, recreation, accommodations, and food services, employed 9 percent of the labor force (Table 4) (U.S. Census Bureau, 2000b).

Manufacturing employs a large share of the state's workforce. In 1990, this sector employed nearly 13 percent of the population. Much of this employment was in chemical and allied products manufacturing and in oil and sugar refining. By 2000, this sector employed only 10 percent of the total labor force (U.S. Census Bureau, 2000b).

Employment in the state's wholesale and retail trade sectors is also significant. In 1990, this sector employed 22 percent of the labor force. As with manufacturing, this sector witnessed a substantial decline in employees in 2000, when employment dropped to 15 percent (-43%) of the labor force. Much of this decline may in part be related to the concomitant decline in manufacturing (Louisiana Mid-Continental Oil and Gas, 2003). The mining sector has continually employed 3 percent of the labor force since 1990 (U.S. Census Bureau, 2000b).

In 2004, the 20 largest employers in the State of Louisiana, with their location and corresponding number of employees, are as follows: Mosquito Abatement (Monroe/10,318), Barksdale Air Force Base (Barksdale AFB/10,000), Ochsner Foundation Hospital (Jefferson/6,500), Northrop Grumman Ship Systems (Avondale/6,000), Pediatric Hematology and Oncology (Shreveport/6,000), Charity Hospital (New Orleans/5,500), LSU Medical Center (Shreveport, 5,200), Ochsner Clinic Foundation (Jefferson/5,000), LA State University Medical Center-Charity (New Orleans/5,000), Medical Center of LA (New Orleans/5,000), Tulane University (New Orleans/5,000), University Hospital Occupation (New Orleans/5,000),

Children's Hospital SVC (Shreveport/5,000), LSU School of Medicine (Shreveport/5,000), Willis-Knighton Pierremont (Shreveport/4,001), Our Lady of the Lake Physical (Baton Rouge/4,000), U.S. Post Office (New Orleans/4,000), Charity Hospital of Louisiana (New Orleans/3,900), Willis-Knighton Medical Center (Shreveport/3,900), and Fabrication and Offshore Operations (Morgan City/3,500) (InfoUSA, 2004).

As of 2005, Entergy was the only Louisiana-based company on the *Fortune 500* list. In that year, Entergy ranked 221 of 500 companies, earning $10.1 billion dollars in revenue in 2004 (WABF News Channel, 2005). However, there were five *Fortune 1,000* companies located in Louisiana in 2005: Entergy, Shaw Group, Century Telephone, Freeport-McMoRan Copper and Gold, and the Hibernia Corporation (Fortune 500, 2005).

Table 4

Employment in Major Industrial Sectors, Louisiana State: 1990-2000.

Year	Agric., Fishing & Forestry	Mining	Constr.	Manuf.	Trans., Comm. & Public Util.	Wholesale & Retail Trade	Finance, Insurance & Real Estate	Services	Public Admin.
Workers in Sector									
2000	27,630	50,537	145,850	187,499	135,216	285,590	105,353	807,465	106,637
1990	41,805	52,329	111,181	205,420	128,017	361,074	94,423	563,159	84,206
Percent of Workers in Sector									
2000	1.5%	3.2%	7.9%	10.1%	7.3%	15.4%	5.7%	43.6%	5.8%
1990	2.5%	3.2%	6.7%	12.5%	7.8%	22.0%	5.7%	34.3%	5.1%
Growth from Previous Census									
2000	-33.9%	-3.4%	17.7%	-23.7%	-0.7%	-42.8%	0.0%	27.1%	13.7%

Source: U.S. Census Bureau, 2000b.

***Industry*.** Traditionally, Louisiana's economic base has been rooted in agriculture. Now, in the early 21st century, Louisiana's economy is based on mineral production, especially oil and natural gas, sulphur, lime and salt, petroleum refining, chemical and petrochemical manufacturing, tourism, forestry and forestry-based manufacturing, agriculture, marine-based activities, trade and transportation, shipbuilding, and general manufacturing. In 2003, Louisiana was the third leading producer of natural gas and the fourth leading producer of crude oil in the country. There were 19 active refineries in the state in that same year (Louisiana Mid-Continent Oil and Gas Association, 2003).

The oil and gas industry (onshore and offshore combined) has had a tremendous impact on the Louisiana economy. In 2001, revenues totaled $92.6 billion (Scott, 2002). Further, the industry supports hundreds of thousands of jobs; it supplied approximately 341,569 direct and indirect jobs in 2001. The oil and gas industry also was responsible for more than $12.2 billion in household earnings, and represented 13 percent of the total earnings in Louisiana in 2001 (Louisiana Mid-Continent Oil and Gas Association, 2003). According to Applied Technology Research Inc. (Louisiana Mid-Continent Oil and Gas Association 2003), the offshore industry had a direct impact of $3 billion on the state in 2001, paying more than $500 million in salaries and wages to people working in the Gulf (Table 5).

Table 5

Earnings in Major Industry Sectors and Selected Sub-sectors, Louisiana State: 1990-1999

Industry	Earnings (Constant 2000 1000's $)		Share of Earnings	Change	Share of Change
	1990	1999	1999	1990-1999	1990-1999
Earnings	$64,052,221	$98,199,625	100.0%	$34,417,404	100.0%
Farm Earnings	$380,625	$616,081	0.6%	$235,456	0.7%
Ag. Services, Forestry, and Fishing	$273,972	$476,944	0.5%	$202,972	0.6%
Fishing	$78,296	$73,926	0.0%	-$4,370	0.0%
Mining	$2,748,628	$3,342,437	3.4%	$593,809	1.7%
Oil and gas extraction	$2,654,887	$3,168,410	3.2%	$513,523	1.5%
Construction	$3,150,619	$5,619,490	5.7%	$2,468,871	7.2%
Special trade contractors	$1,405,149	$2,797,143	2.8%	$1,391,994	4.0%
Manufacturing	$6,976,903	$9,773,075	9.9%	$2,796,172	8.1%
Fabricated metal prods.	$459,486	$600,152	0.6%	$200,666	5.8%
Indust. machine & equip.	$401,799	$776,190	0.8%	$374,391	1.1%
Food and kindred	$504,928	$706,722	0.7%	$201,794	0.6%
Chemicals and allied	$2,026,203	$2,722,003	2.8%	$695,800	2.0%
Petroleum and coal	$659,827	$877,370	0.9%	$217,543	0.6%
Transportation and Public Utilities	$3,946,109	$5,606,414	5.7%	$1,660,305	4.8%
Trucking & warehousing	$698,822	$1,138,197	1.1%	$439,375	1.3%
Water transportation	$839,341	$1,176,394	1.2%	$337,053	1.0%
Transportation by air	$273,594	$379,117	0.4%	$105,523	0.3%
Wholesale Trade	$2,636,952	$4,034,553	4.1%	$1,397,601	4.1%
Retail Trade	$4,327,687	$6,671,508	6.8%	$2,343,821	6.8%
Eating & drinking places	$990,163	$1,754,093	1.8%	$763,930	2.2%
Finance, Insurance, and Real Estate	$2,207,790	$4,135,663	4.2%	$1,927,873	5.6%
Services	$11,543,127	$18,480,602	18.8%	$6,937,475	20.1%
Business services	$1,847,837	$2,895,583	2.9%	$1,047,746	3.0%
Health services	$4,009,501	$6,172,363	6.3%	$2,162,862	6.3%
Legal services	$1,409,935	$1,879,644	1.9%	$469,709	1.3%
Engineering and management services	$1,336,550	$1,816,420	1.8%	$479,870	1.4%
Government	$9,221,902	$13,592,547	13.8%	$4,370,645	12.7%

NA = Data not available.

Source: U.S. Department of Commerce, Bureau of Economic Analysis, 2000.

The central manufacturing industries in the state, in terms of dollar value, are chemicals and allied products, petroleum, and food products. The refining segment of the offshore oil

industry alone had an $8 billion impact on Louisiana in 2001, with about $4 billion going toward the purchase of crude oil, and $4 billion going toward salaries, wages, services, and supplies (Louisiana Mid-Continent Oil and Gas Association, 2003).

In June 1999, Louisiana had 1,462 banking and savings institutions, with deposits totaling some $44.7 billion. Expenditures in federal funds and grants in this same year totaled over $24.3 billion (U.S. Census Bureau, 2002).

Marine-based Activities. Louisiana has rich marine-based resources and is renowned for its fishing activities. Home to one of the most diverse aquaculture industries in the U.S., Louisiana is a leader in crawfish, oyster, pet turtle, and alligator sales. Acreage for farm-raised crawfish and alligators fluctuates from season to season, as do harvest and value. In 2002, the state had a reported 1,135 farmed and 1,068 wild crawfish producers. Over 106,650 acres of state land were devoted to production of crawfish, and nearly 74.5 million pounds of crawfish were farmed or caught in 2002, bringing in a gross farm value of over $56.5 million. Catfish production, also important to the state, had a gross farm value of over $38 million, with 67.4 million pounds of farmed and wild catfish being produced. Farmed alligator production, utilizing 202,316 acres, had a gross farm value of $14.2 million. Minnow, fishbait, alligators, oysters, and soft-shell crabs are also farmed; the state's freshwater fisheries produce buffalo and gar. Total aquaculture production in 2002 had a gross farm value of over $123.7 million, with total freshwater fisheries bringing in a gross farm value of over $10.5 million (Louisiana State University, 2002).

Nine marine fisheries are located in the state, producing $161.3 million in gross farm value. In 2002, there were 6,530 commercial shrimpers (full- and part-time) in the state, 2,062 crabbers, 854 finfishers, and 23 menhaden fishers. Shrimp had the largest gross farm value, at $90.6 million; but menhaden ranked first in terms of pounds sold, selling over 747.4 pounds in 2002 (Louisiana State University, 2002).

While Louisiana's total 2002 fish and wildlife production had a gross farm value of over $345.2 million, Louisiana's marine fisheries activities are in decline. Commercial fish landings declined by 26 percent in 2002, largely due to significantly diminished shrimp (-43%) and menhaden (-25%) landings (Louisiana State University, 2002).

Louisiana is also a prime destination for recreational fishermen. In 2001, 775,715 marine anglers caught 27.8 million fish, kept 18.5 million, and released the rest. Nevertheless, this figure is substantially down from 2000 catch levels (Louisiana State University, 2002).

Military Installations. There are several major military installations in Louisiana. These include Barksdale Air Force Base in Bossier City, the Naval Air Station-Joint Reserve Base outside of New Orleans, and Fort Polk in Leesville. England Air Force Base in Alexandria was closed in 1992.

Barksdale Air Force Base, located south of Bossier City, has a long history of training pilots from before WWII, although it has since been enlarged and modernized. It is especially known for its bombing commands. Barksdale has served as a base for almost every type of bomber including the B-17, B-24, B-26, B-45, B-50, and B-52 (Barksdale Air Force Base, 2004).

The Naval Air Station-Joint Reserve Base is located in Belle Chasse near New Orleans. It serves the country through its joint operation of the five branches of the U.S. Armed Forces (Global Security, 2003)

Fort Polk, located in Leesville, is one of the most important training facilities in Louisiana. Established in 1941, the army base trained soldiers for WWII. In 1983, it transitioned into the Joint Readiness Training Center (JRTC), which combines army and air force

training, and has recently seen more involvement from Navy and Marines as well. Fort Polk is considered a major modern facility, having spent over $500 million on the installation. It was named the Forces Command (FORSCOM) representative for the Office of the Secretary of Defense Model Installation Program (MIP) in July 1984 (Global Security, 2003).

Recreation and Tourism. Each parish has its own recreation centers, parks, golf courses, bowling alleys, movie theatres, and museums. Fishing is popular throughout the state, and there are many sport-fishing tournaments. Community life is rich in the smaller population centers, and many communities host their own annual festivals.

Tourist attractions include the New Orleans French Quarter, Acadiana's culture and folk festivals, swampland tours, hiking and camping, canoeing and Mississippi River boat rides. Cruises departing from the Port of New Orleans also bring in a number of tourists.

Louisiana also features numerous festivals throughout the year, the most renowned of which is Mardi Gras. There are also more than one hundred smaller festivals, fairs and activities celebrating Louisiana's culture, food, crops, harvests, fishing legacy and forestry each year including: the Jean Lafitte Pirate Festival, Bastille Day (Kaplan), Acadiana Migratory Bird Day (Lafayette), Alligator Festival (Franklin), American Legion Strawberry Festival (Gonzales), the Amite Oyster Festival (Amite), Andouille Festival (LaPlace), the Angola Spring Rodeo and Arts and Crafts Festival (Angola), the Annual Louisiana Fiddler's Championship (Marthaville), Ark-LA-Tex Jazz and Gumbo Festival (Shreveport), Blueberry Festival (Mansfield), Bluegrass Festival (Anacoco), Br'er Rabbit Folk Festival (Vacherie), the Bucktown Seafood Festival (Metarie), Cajun and Creole Christmas (Lafayette), the Catfish Festival (Washington), Christmas on the Bayou (Iberia), the Cotton Festival (Ville Platte), the Cypress Sawmill Festival (Patterson), the Delcambre Shrimp Festival (Delcambre), Giant Omelet Festival (Abbeville), the Great French Market Tomato Festival (New Orleans), the International Cajun Joke Telling Contest (Opelousas), the International Rice Festival (Baton Rouge), Isleno Festival (St. Bernard), the Louisiana Cattle Festival (Abbeville), Louisiana Snake Festival (Baton Rouge), the New Orleans Wine and Food Experience (New Orleans), Octoberfest (Ponchatoula), the Pecan Festival (Colfax), the Sugar Cane Festival (New Iberia), the Zydeco Extravaganza (Lafayette), the Jazz and Heritage Festival (New Orleans) and many, many others (Center for Cultural and Eco-Tourism, no date).

Tourism has long been important to the economic well-being of the state. In 2000, Louisiana had $7.6 billion in expenditures, representing a 7 percent increase from 1999. In this same year, the state employed 110,000 in the industry (a 3% increase from 1999) with a payroll of $1.7 billion (a 7% increase from 1999). State tax receipts from tourism totaled $351 million and local tax receipts $192 million (Travel Industry Association of America, 2003). The State Department of Culture, Recreation, and Tourism actively promotes tourism-related opportunities in Louisiana.

F. LOCAL GOVERNMENT

Governmental Structure. The State is divided into 64 "parishes." This term derives from the political subdivisions created by the Roman Catholic Church during colonial times. The State government consists of an executive, a legislative, and a judicial branch. The executive branch of the State government consists of 22 branches, with the Governor as the chief executive officer of the state. The Governor is required to submit an operating budget and a capital budget for each fiscal year to the legislature. The legislative branch, consisting of the

Senate and the House of Representatives, was established through the Louisiana Constitution and is responsible for the creation of general legislative policies of the state. The maximum number of senators permitted in the Senate is 39 and the maximum number of members of the House of Representatives is 105. The legislature must convene in the State capitol annually. The State has one Speaker of the House of Representatives, one Speaker Pro Tem, a Clerk of the House, and Sergeant at Arms (Louisiana Legislature, 2004).

Revenues and Taxes. The Louisiana Constitution, Article Seven, provides for governance over taxes. In 1848, taxes were levied on land in proportion to value. In 1864, the State Constitution allowed for the exemption of church, school, and charitable-purpose properties from taxation. In 1921, the Constitution established all taxes to be uniform and levied for public purposes only. In 1916, Louisiana created its Tax Commission to monitor and supervise local tax processes. It is also responsible for assessing all public service properties, including utility companies and oil pipelines (Louisiana Tax Administrator, 2001).

The State levies a 4 percent sales tax, while municipalities levy their own taxes (Entergy, 2003). There is no state property tax in Louisiana; however, city and parish administrations may administer a local property tax ranging from 10 percent for land and residential improvements to 15 percent for commercial buildings to 25 percent for public services. While millage rates vary across parishes, the average statewide rate on property was 1 percent, as of 1999 (Encyclopedia Louisiana, 1999). Total tax collections for the state in 2000 were $10,887 million dollars; total own source revenues were $17,272 million (Louisiana Tax Administrator, 2001).

In the 2003-04 fiscal year, total net collections summed to $6.2 billion dollars; in the 2000-01 fiscal year they totaled $6.0 billion (Louisiana State Department of Revenue, 2004). The 2003-04 revenues emanate from the following tax sources: sales ($2.2 billion), individual income ($2.2 billion), severance ($514 million), corporate franchise ($183 million), corporate income ($233 million), petroleum products ($563 million), liquor/alcohol ($53 million), tobacco ($145 million), and other ($29 million) (Louisiana State Department of Revenue, 2004).

Voter Registration. In the first quarter of 2001, there were 2,728,758 persons registered to vote in the State of Louisiana (68% Caucasian; 29% African-American; 3% "other"). Approximately 60 percent (1,626,084) were registered as Democrats (58% Caucasian; 40% African-American; 2% "other"), and 22 percent registered as Republicans (93% Caucasian; 5% African-American; 3% "other"). An additional 18 percent (492,039) were registered to various third parties (69% Caucasian; 22% African-American; 9% "other") (Louisiana Department of Elections and Registration, 2001).

The State created its first African-American majority district in 1983, after a federal court upheld a voting-rights challenge. The creation of a second African-American majority District incited redistricting in 1992. In 1990, Democrat William J. Jefferson was elected to Congress, the State's first African-American to be elected to a federal position since the Reconstruction era (Louisiana Legislature, 2004).

G. SOCIAL CONTEXT

Education. In the 2001-2002 school year, there were 1,508 K-12 public schools in Louisiana (87 districts), with 49,915 teachers and 731,474 students (Heritage Foundation, 2004). During that school year, the overall teacher to student ratio was 1 to 14.7 (Heritage Foundation, 2004); (the national average was 15.9) (MSN Encarta, 2005). Expenditures in this year were $4.5 billion dollars, with a per pupil expenditure rate of $6,270 dollars; the national average was

$7,898 per pupil. The State of Louisiana received 11.7 percent of its total revenue from the federal government in this year (Heritage Foundation, 2004).

In the 1999-2000 school year, there were 434 private schools with a student enrollment of 138,135 in Louisiana. With 9,206 teachers, these private schools had a teacher to student ratio of 1:15 (Heritage Foundation, 2004).

Over 84 percent of all students in Louisiana attended public schools. In the 2003-04 school year, average daily attendance for Louisiana public school students was 92.6; the national average for this year was 93.7 (National Education Association, 2005). This information is not available regarding private schools.

In the 1999-2000 school year, total revenues equaled $5,231,521,271, while expenditures totaled $5,209,683,037. Instructional purposes accounted for 54 percent of total expenditures in this school year. Per student spending equaled $5,562. In this same school year, 32 percent of all Louisiana school teachers held an advanced degree (21% Master's degree) (Louisiana Department of Economic Development, 2002).

In the 2003-03 school year, the average elementary and secondary school teacher salary in Louisiana was $37,166; the national average was $45,771. The State of Louisiana ranked 44th of 51 states (ranking includes the District of Columbia) in terms of teacher salaries for that year. Teachers in California earned, on average, the highest salary at $55,693 (U.S. Census Bureau, 2005).

In 2000, the combined average composite ACT score for both Louisiana public and nonpublic students was 19.6 out of a possible 36 (the national composite average is 21.0). The average SAT score for college-bound seniors in this year was 558 Math and 562 Verbal. These scores were higher than the national averages of 514 and 505 for Math and Verbal sections, respectively.

There are over 100 campuses offering higher education in Louisiana. Within the University of Louisiana State System (Louisiana's largest university system) there are eight universities: Grambling, Louisiana Tech, McNeese, Nicholls, Northwestern, Southeastern Louisiana, University of Louisiana at Lafayette, and the University of Louisiana at Monroe. This system annually enrolls over 78,000 undergraduate and graduate students, and employs approximately 11,000 full- and part-time faculty and staff members (University of Louisiana System, 2002).

The Louisiana State University System also maintains facilities and/or programs in each of the State's 64 parishes. Louisiana's Southern University System operates five campuses throughout the state: Southern University and A&M College, Southern University at New Orleans, Southern University at Shreveport, Southern University Law Center, and Southern University Agricultural Research and Extension Center. The Louisiana Community and Technical College System maintains 10 campuses: Baton Rouge (two), Bossier City, Delgado, Monroe, Chalmette, Sorrento, Houma, and Lake Charles. Louisiana is also home to the Louisiana Universities Marine Consortium (LUMCOM), which focuses on marine research and education. Finally, there are also 10 independent colleges and universities maintaining 11 campuses located in the state: Centenary College (Shreveport), Dillard University (New Orleans), Louisiana College (Alexandria/Pineville), Loyola University (New Orleans), New Orleans Baptist Theological Seminary (New Orleans), Our Lady of the Holy Cross College (New Orleans), Our Lady of the Lake College (Baton Rouge), Saint Joseph Seminary College (Covington), Tulane University (New Orleans), and Xavier University (New Orleans) (Louisiana Board of Regents, 1996).

Overall, Louisiana's educational attainment and achievement levels are a concern for state and local officials. Louisiana ranks at the bottom of all 50 states in the nation on all key indicators of educational status, including test scores, drop-out rates, and college remediation (Louisiana Department of Economic Development, 2002).

Although both national and state test scores have improved and high school dropout rates have decreased since the 1998-99 school year, Louisiana still ranks low on the following educational indicators: low basic level academic test scores; dropout rates; and "poor" or "failing performances by many of its public middle and high schools. For example, in 2001, only 59 percent of fourth graders and 51 percent of eighth graders scored at or above the "basic" level on the English/Language Arts component of the Louisiana Education Assistance Program (LEAP) test, while only 54 percent of fourth graders and 46 percent of eighth graders passed at or above "basic" levels on the Math component. On the Graduate Exit Exam, 78 percent of high school seniors (class of 2001) passed the English/language Arts section while only 66 percent passed the Math section (Council for a Better Louisiana, 2002).

Further, in the 2001-02 school year, 9.2 percent of secondary school students in Louisiana dropped out of high school; this drop out rate significantly exceeds the national rate of 4.9 percent for that year. Also, in that same year, 65.7 percent of public and nonpublic school graduates were enrolled as first-time college freshmen (Louisiana Department of Economic Development, 2002). And, while the percentage of high school graduates in Louisiana exceeded that of the nation as a whole in both 1990 and 2000, the percentage of Louisiana residents with a BA/BS degree or higher was significantly lower than at the national level for those same years (Table 6) (U.S. Census Bureau, 2000b).

Table 6

Educational Attainment of Adults (age 25+), Louisiana: 1990-2000

Year	Educational Attainment of Adults					Ratio to Nation	
	0-8 Years	Some High School	High School Diploma	Some College, No Degree	BA/BS or More	High School Diploma	BA/BS or More
2000	9.3%	15.9%	32.4%	20.2%	18.7%	1.13	0.77
1990	14.7%	17.0%	31.7%	17.2%	16.1%	1.08	0.79

Source: U.S. Census Bureau, 2000b.

Health and Welfare. Several measures indicate the integrity of Louisiana's health care system. Louisiana ranks ninth in the nation and third in the South for the number of per capita hospital beds. As of 2001, there were 125 hospitals in the State of Louisiana with an equivalent of four hospital beds per 1,000 population, or 342 inpatient beds for every 100,000 persons. This ratio is significantly higher than the national average of 292 beds per 100,000 persons. There are also 322 certified nursing facilities with a total of 36,843 beds (Louisiana Department of Health and Hospitals, 2002).

However, measurements of maternal and infant health in Louisiana are mixed. On the one hand, the percentage of pregnant women in 2001 who began prenatal care during their first trimester in Louisiana (83%) is equivalent to the national percentage (Kaiser Family Foundation, 2003). On the other hand, the overall percentage of low birth weight infants (10%) in Louisiana

in that same year exceeded that of the nation as a whole (8%). Additionally, Louisiana's infant mortality rates (10 per 1,000 live births) for 2001 were also higher than the nation's (7 per 1,000 live births) (Kaiser Family Foundation, 2003).

Louisiana's indicators of youth welfare are also troubling. In 2001, 16 percent of all live births in Louisiana were to teenage girls under the age of 18 (39% Caucasian, 58% African-American). Nationally, 11 percent of all live births were to girls under the age of 18 (43% Caucasian, 25% African-American) (Kaiser Family Foundation, 2003).

Louisiana's health care system in terms of service delivery is a problem. Despite its high number of hospital beds relative to the nation, Louisiana ranked 50th—or last—among all U.S. states in terms of access to primary health care in the 1999 Health Care State Rankings. This ranking is based on a "measure of health care shortage areas and a poor distribution of doctors" (Louisiana Department of Health and Hospitals, 2002). Although the majority of the state's population resides in urban areas where access to health care is reasonable, the state's rural population has tremendous difficulty accessing general health care providers or emergency services. Additionally, 19.8 percent of all residents in the State of Louisiana (57.5% children, 11.6% adults) were Medicaid recipients in 2001; this rate exceeds the national rate of 16.7 percent (49.7% children, 24.5% adults) (Kaiser Family Foundation, 2003).

Religion. Louisiana is characterized as a Catholic state. This religious affiliation stems from colonial times, when the Spanish and French Acadians first settled the area. Catholic churches are found in nearly every community, although other religious denominations are also present. In 2000, 59 percent of Louisiana residents claimed a religious affiliation: Evangelical Protestants (37%), Mainline Protestant (9%), Catholic (53%), and 2 percent "other." An additional 41 percent of residents did not claim a religious affiliation in this year (American Religion Data Archive, 2002).

H. ISSUES OF CONCERN

Louisiana has many pressing state concerns. Most of these concerns constellate around coastal erosion and management, and a poorly educated work force.

Coastal erosion and ecological imbalance have significant concerned both environmentalists and the fishing industry for decades. Both of these interest groups argue that freshwater plant and animal life are being exposed to an environment ill-suited for adaptation. In response to these charges, the state has instituted the Gulf Ecological Management Sites (GEMS) program for coastal restoration. Presently, there are 33 GEMS in the state. Together, the U.S. Army Corps of Engineers, Natural Resources Conservation Service, National Marine Fisheries, the Environmental Protection Agency, the U.S. Fish and Wildlife Service, and the State of Louisiana work to minimize soil erosion in the wetlands and breakdown related to wave and tidal action, to create new and protect existing wetlands, and to control water so that it benefits wetlands growth (Louisiana Department of Natural Resources, 2001a).

Education is also a serious state concern. According to the Louisiana Department of Education, Louisiana ranks at the bottom of all 50 states in the nation on all key indicators of educational status, including test scores, drop-out rates, and college remediation (2002).

According to Bobby Jindal, who was a state gubernatorial candidate in 2003, Louisiana continues to trail behind other southern states in several indicators of student achievement. For example, approximately 50 percent of all fourth graders in the state were reading below the basic level in that year, and 48 percent of all eighth graders in the state lacked basic math skills.

Drawing on statistics provided by the Louisiana Department of Education, Jindal asserts that only 70 percent of public high school freshmen ultimately graduate. Like other states, he further notes, there is also an achievement gap between white and minority students, and low-income and middle and upper income students (Jindal, 2003).

In turn, poor educational attainment levels are linked to state poverty and unemployment rates. For example, Louisiana had a 6.6 percent unemployment rate in 2003 (ranging from 3.9% in the Houma LMA to 7.5% in the Shreveport-Bossier LMA); the national unemployment average was 6 percent. In that same year, the median household income was $33,500, earning the Louisiana the low ranking of 48th among 51 U.S. states and territories on this indicator. The national average for median household income was $43,300 in 2003 (InfoUSA, 2004).

In turn, poverty contributes to Louisiana's low educational attainment levels and a poorly prepared labor force. Births to unwed mothers account for nearly 50 percent of all births in Louisiana, a factor linked to low educational performance. Further, Louisiana has the second highest level of childhood poverty in the U.S. and "roughly 60 percent of all public school children (724,000) are labeled "at-risk" of school failure" (Jindal, 2003).

I. LOUISIANA LABOR MARKET AREA PROFILES

The purpose of this project is to understand how structural changes in industry, particularly oil and gas related industries, impact local communities and public institutions within the Gulf of Mexico Region (GOMR). The task at hand requires that we utilize a variety of data sources and methodologies to provide a more complete narrative of the phenomenon in question. We also utilize a rather unique definition of local communities: Labor Market Areas. Labor Market Areas (LMAs) are defined by patterns of transportation to and from work both within and across county boundaries. Therefore, the areas contained within LMAs better empirically represent local social systems, communities, and economies (Killian and Tolbert, 1993). The following profiles carefully consider the Labor Market Areas in Lake Charles, Lafayette, Lafourche, and New Orleans, Louisiana (Map 6).

At the heart of this analysis are changes in the industries related to offshore oil and gas exploration and production, particularly the boom and bust periods of the 1970s and 1980s. In the profile that follows, we first present an overview of the significance of the project, followed by a theoretical framework with which to examine the interconnection between industry and local community structural changes.

The analysis itself is divided into three units of time: 1940-1970, 1970-1990, and 1990-2000. The first unit of time presents a brief industry history of the Mobile LMA from 1940 to 1970, followed by a minimalist overview of population changes. In the second unit, we examine all oil and gas and related industries within the LMA for the years between 1970 and 1990, inclusive. We then link industry changes during this period to fluctuations in population structure and dynamics, education, and local government finance. The third unit examines the period between 1990 and 2000 to assess the fallout of the oil and gas industry during the decade immediately following the bust.

Industry Overview. The oil and natural gas industry experienced a boom during the 1970s (Gramling, 1996; Seydlitz and Laska, 1994). Rising demands for on-shore domestic supplies of oil, and political instability surrounding OPEC and the Middle East increased offshore oil and natural gas exploration activities in the Gulf of Mexico (Gramling, 1996; Gramling and Freudenburg, 1990). The subsequent "boom" is reflected in the LMA employment data. For example, in 1970, approximately 71,000 workers were directly employed

full-time in the oil and natural gas industry in the coastal economies of the Gulf of Mexico. By 1980, that number had grown to over 145,000, a net increase of 105 percent—and those numbers do not reflect changes in oil and gas multiplier industries such as equipment manufacturing, water transportation, wholesale trade, and general services.

During the early 1980s, however, consumption trends began to change and affect employment. First, a gradual drop in demand occurred as substitution effects played-out, with actors reducing their consumption of oil and gas by-products (e.g., buying more fuel efficient cars; see Gramling, 1996). Additionally, the oil and natural gas industries experienced a sharp decline in the mid 1980s brought about largely by overproduction among OPEC members trying to "starve" weapon shipments into warring Iran and Iraq (Heilbroner and Milberg, 1999). Between 1980 and 1990, the total number of workers in the oil and natural gas industries in the coastal economies of the Gulf of Mexico declined from over 145,000 to 112,000, which is a decrease of 23 percent. The "boom and bust" data, as reflected in the price of oil, is presented below (Figure 1).

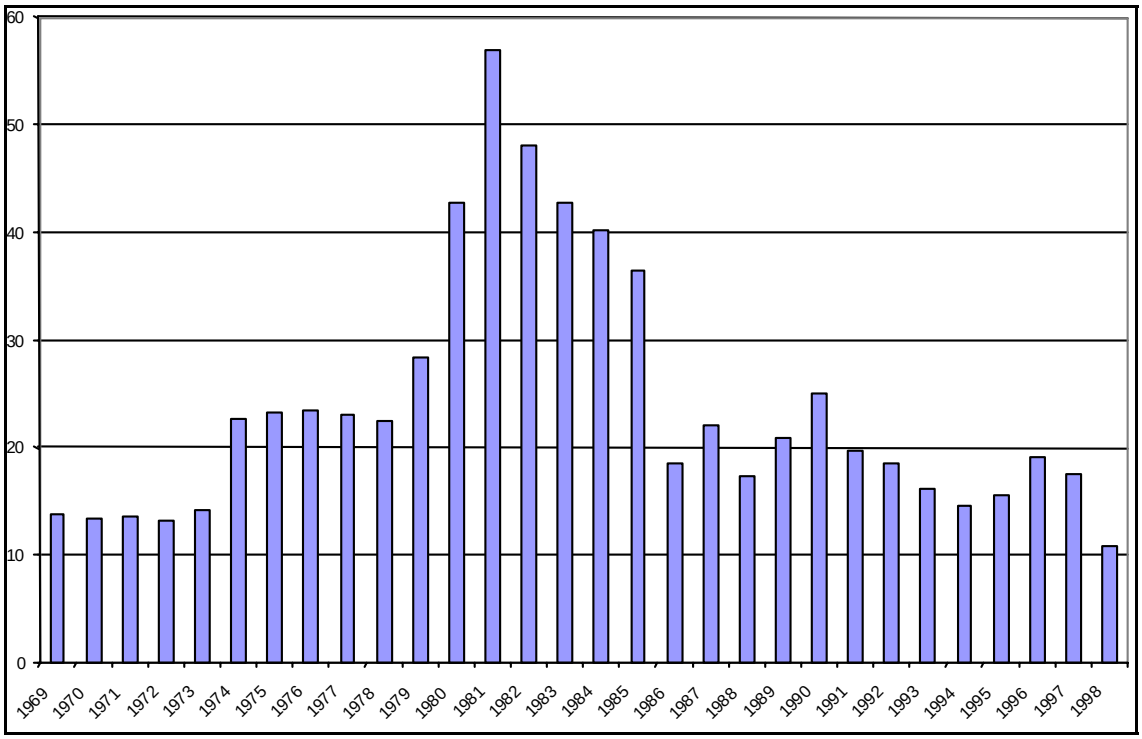


Figure 1. Crude Oil Prices, U.S. Average (price per barrel in 1998 dollars): 1969-1998 (Energy Statistics Sourcebook, 1999).

The coastal economies of some oil dependent LMAs in the Gulf of Mexico were more severely impacted by the oil bust than others. For example, the Lafayette LA economy lost 14,000 jobs in the oil and natural gas extraction industries between 1982 and 1988, a 63 percent loss. Other industries throughout the greater Lafayette area were affected as well, with total employment dropping from 200,000 workers in 1982 to 160,000 workers in 1987.[1] These losses translated into an unemployment rate of more than 16 percent in 1988. However, the Lafayette

[1] Source: U.S. Department of Commerce's Regional Economic Information System of the Bureau of Economic Analysis.

area was not the hardest hit by the oil bust; unemployment rates exceeded 20 percent in some other coastal communities (Gramling, 1996).

Sociology of Regional Processes. To understand how industries, public institutions, and communities change in response to fluctuations in the oil and gas industries, we draw upon the assumptions of human ecology theory. One of these assumptions is that the range and diversity of community industry functions are important determinants of community size, complexity and organization (see Frisbie and Poston, 1976; Hawley, 1986; Mencken, 1997; Murdock et al., 1993; Nord and Luloff, 1993; Poston, 1984; Frisbie and Poston, 1978). Communities also can be placed along a continuum of industry structures, from less to more diverse. Generalist communities (those with a variety of industries) and specialist communities (those with one or two main industries) both have advantages and disadvantages for growth and social organization at the local level (Poston, 1984).

Generalist communities are larger in size and more complex in structure. Fluctuations in one industry do not reverberate throughout the entire system so long as the other industries upon which the community depends for employment are independent of those shocks and remain relatively stable. As a result, generalist systems tend to be more stable over time. This longitudinal stability is important for local public institutions, such as schools and financing of local government services, because it allows administrators to plan for incremental changes in the supply of revenues and the demand for resources. Generalist systems can also support more stable population growth patterns (Frisbie and Poston, 1976, 1978; Micklin and Choldin, 1984; Poston, 1984).

Specialist communities, on the other hand, are primarily dependent upon one or two industries for subsistence. Communities that rely upon natural resource-based industries, such as coal, oil/gas, timber, or fishing, are specialist communities (Gramling and Freudenburg, 1990; Hawley, 1986; Rural Sociological Society Task Force, 1993).

A second assumption of human ecology theory is that significant industry contraction (and expansion) will alter drastically the social organization of the community (England and Albrecht, 1984; Jobes, 1999; Krannich and Grieder, 1984). During industry contraction, jobs are lost, and an out-migration of younger population typically results (RSS, 1993). The negative effects of these cycles, particularly in rural America, manifest in social disorganization, higher crime rates and other social problems (Freudenburg and Jones, 1991; Jobes, 1999).

Third, the human ecological approach assumes that local communities are ecosystems comprised of four basic and interdependent components: population, organization, environment, and technology (Hawley, 1986; Poston, 1984; Micklin and Choldin, 1984). This approach further assumes that changes in one of these four components will create changes throughout the community. For example, changes in the external environment (e.g., oil prices dropping significantly) will affect changes in the other components of the community (jobs and population) that rely upon the oil and gas industry for employment (Gramling, 1996).

Additionally, changes in the technology used in the production of sustenance (e.g., mechanization of coal extraction) will affect the population and organization of the ecosystem (loss of jobs and out-migration), independent of any changes in the external environment. Not surprisingly then, economies that were most involved in the exploration and production of oil and natural gas in the Gulf of Mexico region were also most affected by changes in the oil and gas industry. Those communities that are more concentrated in multiplier industries will also be affected, but not as directly.

In order to establish when, or if, unexpected changes in employment occurred in the Louisiana LMAs, we performed a time-series forecasting analysis. In our analysis, we employ a moving average forecasting model to locate the years in which shocks occur in the Lake Charles, Lafayette, Lafourche, and New Orleans LMAs. The forecasting procedure includes the following. First, three-year moving averages (current plus previous two years) of employment levels are computed. Second, at each year the expected value (three-year moving average) is subtracted from the observed value. Each of these deviations is squared to provide the forecasting error for each year. These squared deviations are summed and averaged across all years in the analysis to compute a mean squared error (MSE). We establish a "shock" for any given year in which the squared deviation for that year is greater than or equal to two times the mean squared error for the industry sector in question (Anderson et al., 1990).

1. Lake Charles, Louisiana: Labor Market Area

The greater Lake Charles LMA is located between the Houston, Texas LMA and the oil and gas LMAs of Louisiana (Lafayette, Lafourche, and New Orleans). The LMA also has water access to the Gulf of Mexico. The Lake Charles Labor Market Area (LMA) is made up of six Louisiana Parishes: Allen, Beauregard, Calcasieu, Cameron, Jefferson Davis, and Vernon (Map 7). The U.S. Census Bureau records the population of these six counties at 335,600 in 2000.

First Unit of Analysis: Lake Charles LMA Employment, 1940-1970. Agriculture was the key industry in the Lake Charles LMA in 1940, employing over 10,000 workers and 35 percent of the workforce. Wholesale and retail trade, the second largest sector, employed 18 percent of the labor force. Manufacturing employed 17 percent of the Lake Charles labor force in 1940; mining (oil and gas) employed 7 percent.

The data from 1950 show the decline of agriculture and the rise of manufacturing. Between 1940 and 1950, the Lake Charles LMA employment in agriculture declined by 3,000 workers. The percentage of workers employed in agriculture declined from 35 percent in 1940 to 22 percent in 1950. At the same time, employment in construction tripled from 5,000 to 15,000 workers, and manufacturing employment more than doubled (from 5,400 to over 11,000). Total employment grew by 31 percent in the Lake Charles LMA during the 1940s.

Total employment grew by 42 percent in the Lake Charles LMA during the 1950s. However, while all other industries experienced growth between 1950 and 1960, agriculture's share of the labor force declined to less than 10 percent. Services experienced the most growth, increasing by 20,000 workers between 1950 and 1960. Mining employed slightly over 6 percent of the total workforce in 1960, while manufacturing employed 24 percent. Although that rate represents a decline in this sector from 1950 (34%), the absolute number of workers in manufacturing was still higher in 1960 than in 1950.

Map 7. Lake Charles, Louisiana Labor Market Area.

Total employment grew by 40 percent in the Lake Charles LMA between 1960 and 1970. Services continued as the leading employment sector in the 1960s, employing 40 percent of the total labor force by 1970. Construction employment doubled during the 1960s to over 11,000 workers. Mining employment grew by 133 percent between 1960 and 1970. Moreover, over 11 percent of the Lake Charles LMA labor force was employed in this sector by 1970.

Lake Charles LMA Demographic Changes 1940-1970. Between 1940 and 1970 several important industry changes occurred in the Lake Charles LMA. First, agriculture declined in importance while mining and manufacturing emerged as the leading industries. Second, total employment in the LMA grew by 61 percent between 1940 and 1970. These employment changes affected population growth between 1940 and 2000. For example, 140,000 people lived in the Lake Charles LMA in 1940; population was over 280,000 by 1970. In Calcasieu Parish, the most populated county in the LMA, population nearly tripled between 1940 and 1970. The racial composition of the LMA also changed between 1940 and 1970 with both Caucasian and African-American populations significantly increasing.

Second Unit of Analysis: Lake Charles LMA Employment, 1970-1990. The total employment rate in the Lake Charles LMA grew by 30 percent between 1970 and 1980. Wholesale/retail trade and services experienced the largest increases. Also notable, employment in manufacturing grew by 43 percent in that same decade. Unlike other LMAs which experienced growth, however, mining employment in the Lake Charles LMA declined. Mining employed less than 7 percent of the total workforce in 1980.

The Lake Charles LMA economy was mostly stagnant during the 1980s. In fact, total employment actually decreased by 1 percent. The mining and construction industries both experienced employment losses in excess of 25 percent between 1980 and 1990; the mining industry employed less than 4 percent of the workforce in 1990. Interestingly, manufacturing, and transportation/public utilities experienced no employment reduction between 1980 and 1990. In 1990, manufacturing employed 19 percent of the total workforce. By 1990, over 60 percent of the Lake Charles LMA workforce worked in either the wholesale/retail or service sector. However, these growth patterns deviate from the decennial models of the neighboring Lafayette and Lafourche LMAs: these economies experienced growth in the 1970s but declined in the 1980s. In the Lake Charles LMA, the growth pattern occurred in the 1960s.

This analysis of census years also indicates some important changes between Census years, particularly in the 1970s and 1980s. Manufacturing grew in the 1970s; mining declined in the 1980s. Additionally, services were the leading employment sector in the 1980s. We turn now to an analysis of annual employment data for the Lake Charles LMA in order to locate a better understanding of what changes occurred between Census years.

The annual full- and part-time employment for the Lake Charles LMA figures, plus three-year moving averages of employment levels, illustrate a steady increase in total employment from 1969 until 1982 (Figure 1). These data also show a drop in total employment of about 10 percent between 1982 and 1987. However, by 1991, total employment returns to the 1982 level, and since 1991, employment has grown at a steady pace.

Figure 1. Total Annual Employment and Three-year Moving Averages, Lake Charles LMA: 1969-2000 (U.S. Dept. of Commerce, Bureau of Economic Analysis, 2000).

In order to establish when, or if, unexpected changes in employment occurred in the Lake Charles LMA, we performed a time-series forecasting analysis. In our analysis, we employ a moving average forecasting model of employment levels to locate the years that the shocks occur in the Lake Charles LMA. These data show the actual employment data charted with the three-year moving average for each year (Figure 2). In Figure 2, we see that in each year between 1977 and 1980, the observed employment number was significantly greater than the expected employment number. This indicates a period of greater than expected employment growth. In 1983, we see that the observed employment is significantly less than the expected employment number. This finding signals a point of rapid employment decline, or fewer workers employed than expected. Taken all together, we see a "boom" cycle in the total employment data for the Lake Charles LMA beginning in 1977, and a slow but steady decline in employment from 1982 until 1987, when employment began to increase again.

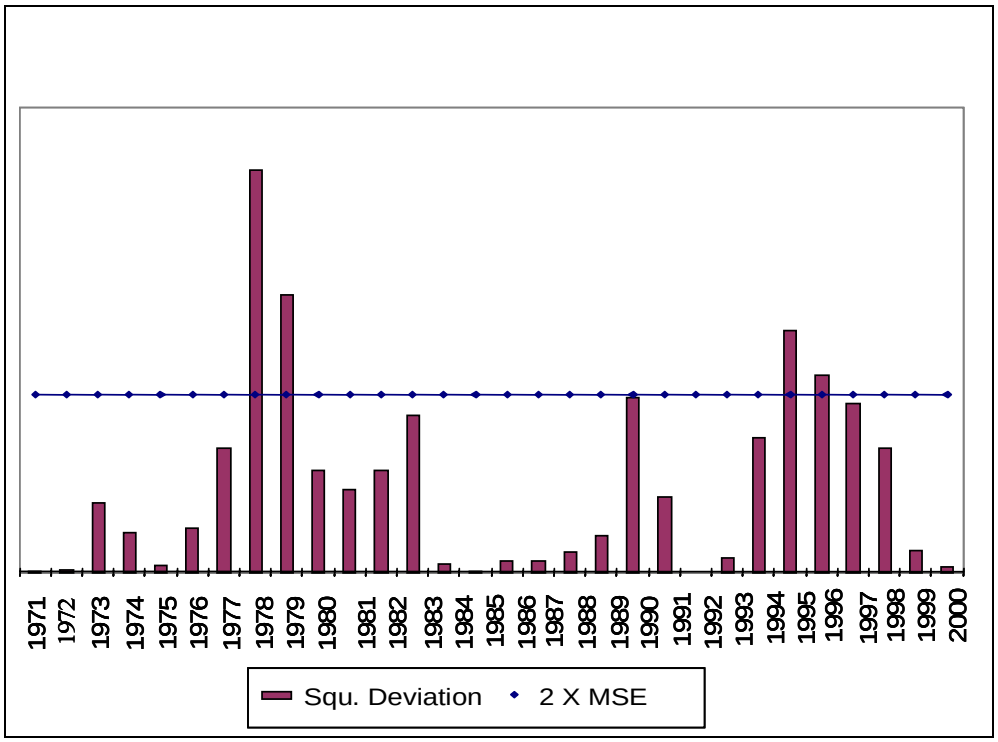


Figure 2. Forecasting Analysis, Lake Charles LMA: 1971-2000.

The above data analysis shows patterns not detected by the decennial Census analysis. For example, the growth and decline in total employment fit the "boom and bust" pattern found throughout other LMAs in the GOMR. However, the census data did not reveal a clear pattern. We turn now to an analysis of annual employment data in order to uncover in which industry sectors these boom and bust pattern are present in the Lake Charles LMA. Annual employment data for nine general industry categories for 1969 through 2000 are presented below (Figure 3).

Construction, manufacturing, and mining also showed signs of rapid growth during the late 1970s (Figure 3). Construction employment grew 63 percent; manufacturing grew 20 percent; and mining employment increased 62 percent between 1977 and 1981. These industries also experienced the most employment loss during the 1980s. While construction and manufacturing recovered many of these jobs during the 1990s, the mining sector's employment levels remained stagnant.

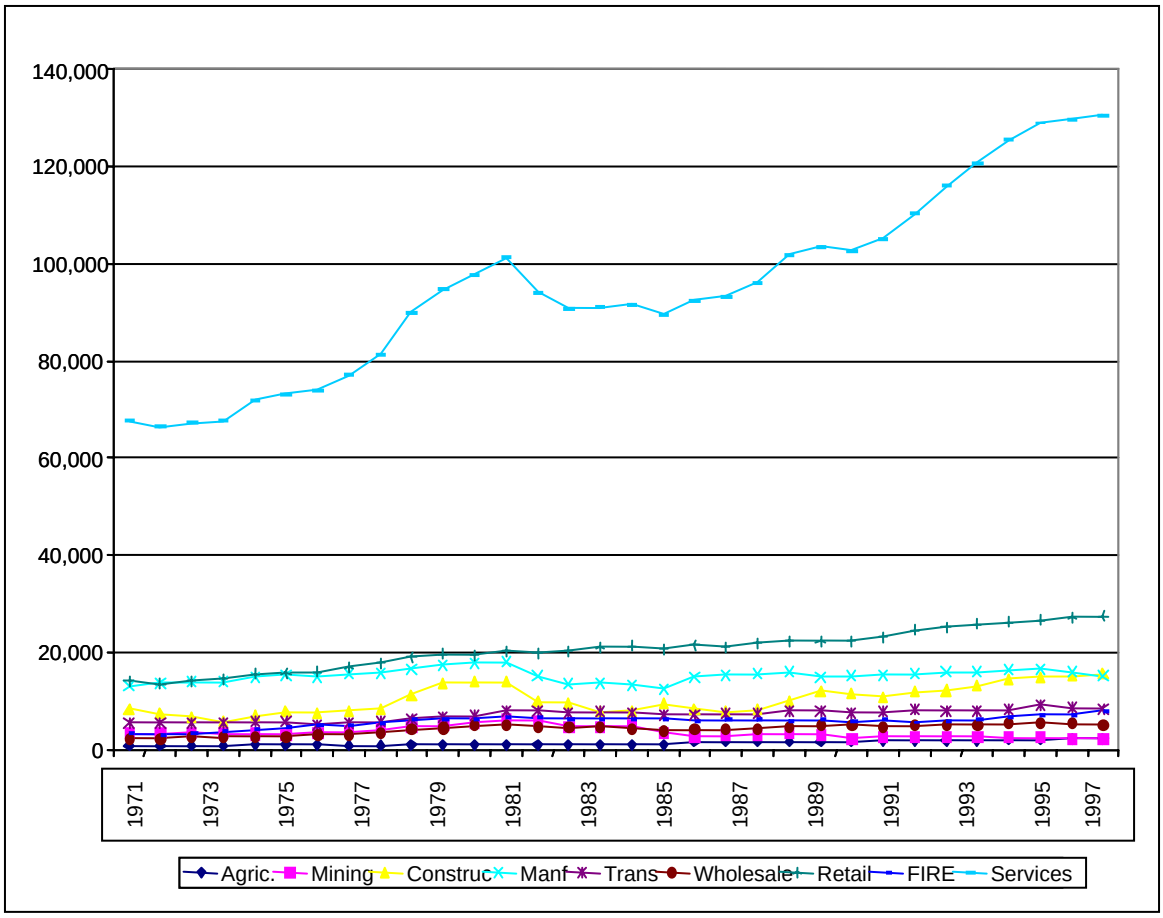


Figure 3. Employment by Major Industry Category, Lake Charles LMA: 1971-1997 (U.S. Dept. of Commerce, Bureau of Economic Analysis, 2000).

The following four figures present the time-series forecasting analysis for employment in the Lake Charles LMA's construction, manufacturing, mining, and transportation sectors (Figures 4-7). Not surprisingly, these data show a pattern similar to the total employment pattern presented in Figure 3; that is, mining experienced greater than expected employment declines in 1983, 1986 and 1987, while construction's downturn appears in 1982, 1983 and 1984. Employment in the manufacturing sector is slightly less volatile. There are declines in 1982 and 1983, but sharp upturns in 1988 and 1989. Transportation employment growth is more stable.

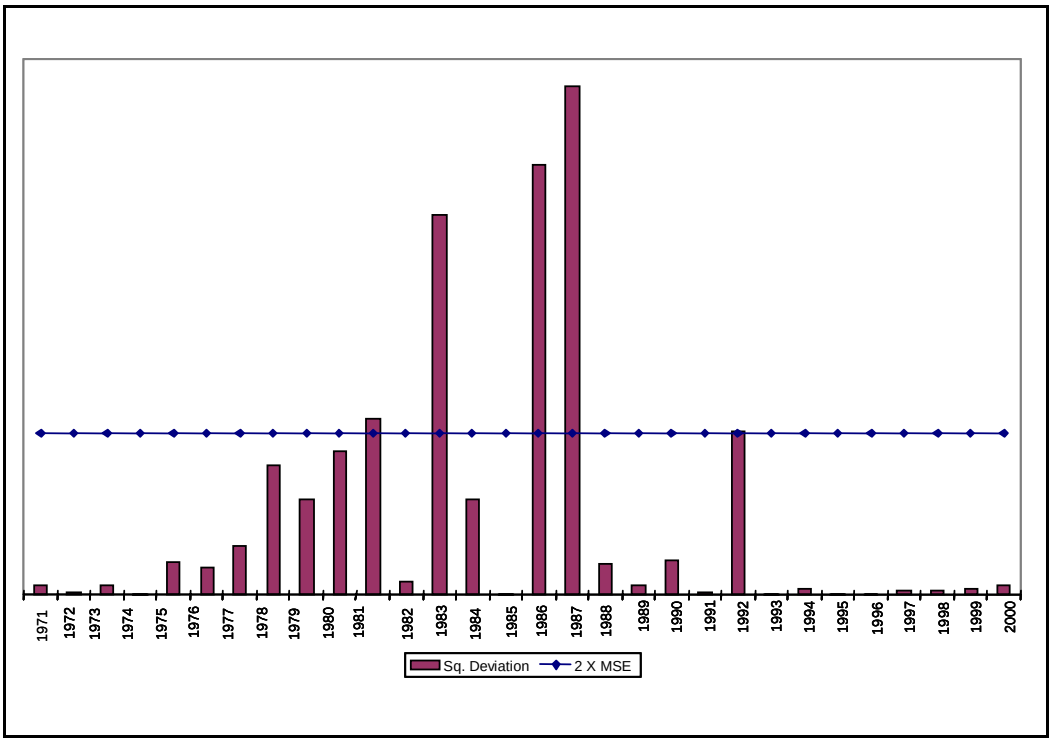


Figure 4. Forecasting Analysis for Mining Employment, Lake Charles LMA: 1971-2000.

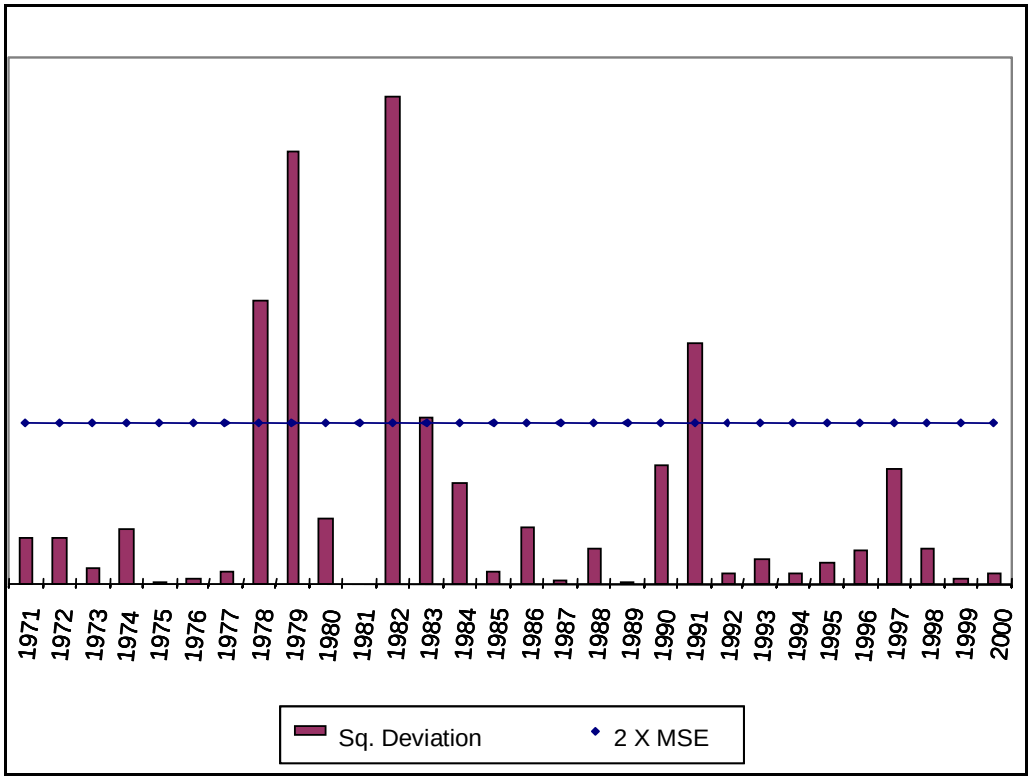


Figure 5. Forecasting Analysis for Construction Employment, Lake Charles LMA: 1971-2000.

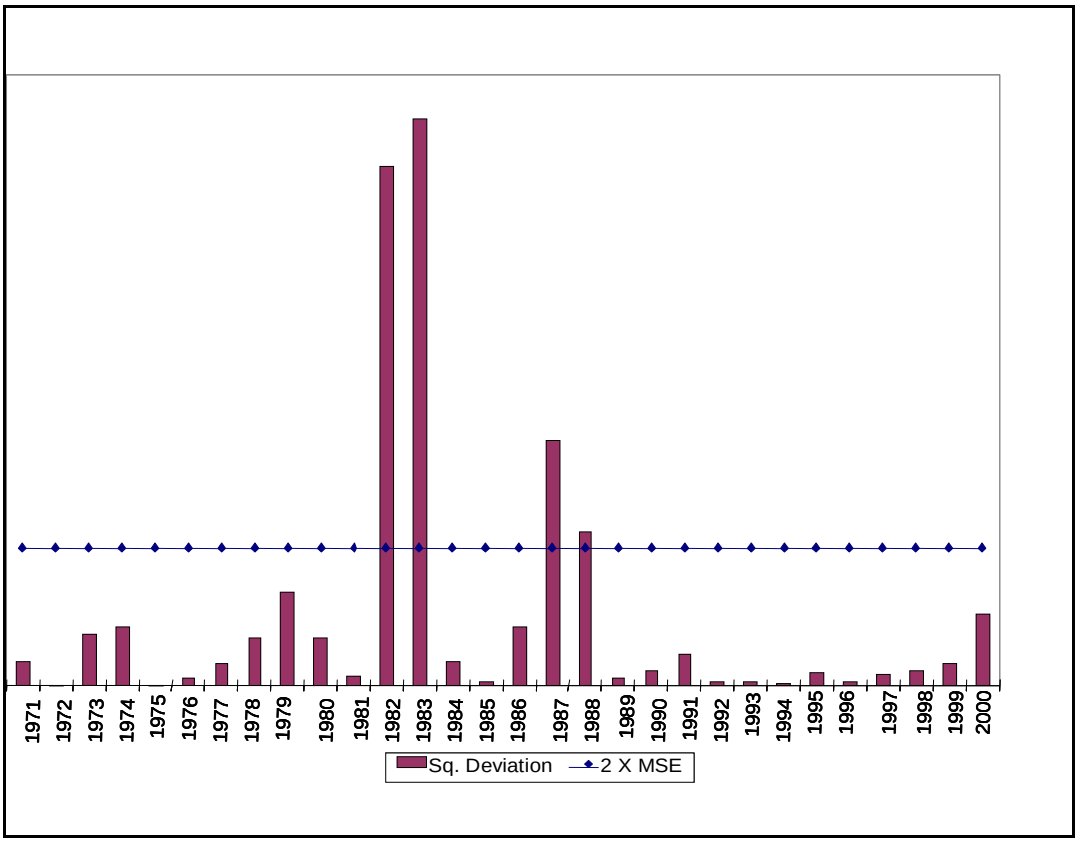


Figure 6. Forecasting Analysis for Manufacturing Employment, Lake Charles LMA: 1971-2000.

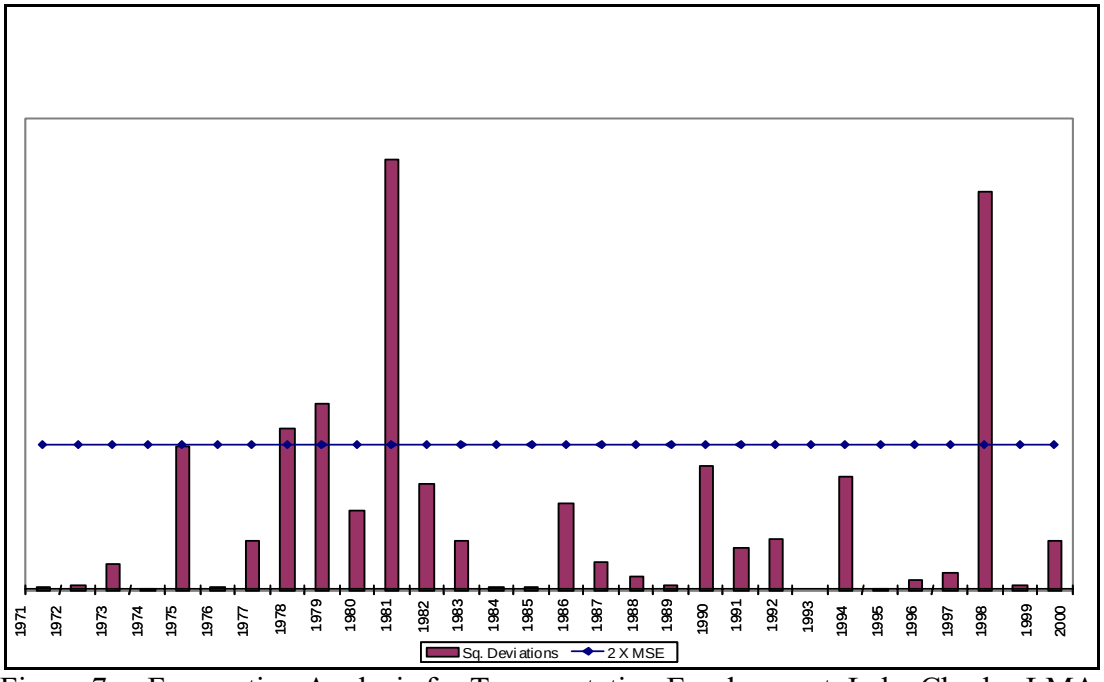


Figure 7. Forecasting Analysis for Transportation Employment, Lake Charles LMA: 1971-2000.

Detailed Industry Code Analyses. In this next section, we present analyses of industry sector codes for four key industry groups: manufacturing, mining, transportation and wholesale trade (Table 1). We chose those categories based on a) relationship to oil and gas activities, b) employment levels, and c) availability of data in the years we are studying. The manufacturing category includes the sub-categories of fabricated structural metal products, ship and boat building and repair, and oil field machinery. Mining includes drilling oil and gas wells, oil and gas field exploration services, and oil and gas field service, N.E.C. The transportation category focuses exclusively on water. Wholesale trade considers only industrial machinery and equipment.

Table 1

Key Industry Groups and Sectors

Manufacturing		
Fabricated Structural Metal Products (SIC 3440*),* this category includes manufacture of barge sections, ship sections, buoys, and metal plates for gas tanks, gas holders, oil storage tanks, large diameter pipes, pressure valves, storage tanks and also portable building.	***Ship and Boat Building and Repairing*** (SIC 3730), this category includes building and repairing barges, cargo vessels, drilling platforms and dry docks.	***Oil Field Machinery*** (SIC 3533), this category includes bits, rock and oil field tools, derricks for oil and gas fields, drill rigs, drilling tools for gas, oil and water wells.
Mining		
Drilling Oil and Gas Wells (SIC 1381), this category includes, on a contract basis, directional drilling, redrilling, reworking, and "spudding in" of oil and gas wells**.**	***Oil and Gas Field Exploration Services*** (SIC 1382), this category includes, on a fee basis, geophysical exploration, aerial exploration, and seismograph services**.**	***Oil and Gas Field Service N.E.C.*** (SIC 1389) this category includes, on a contract basis, excavating slush pits and cellars, grading and building of foundations, well surveying, running and cutting casings, tubes and rods, cementing and shooting wells, acidizing and chemically treating wells. Operating oil and gas wells for others on a contract basis are also included in this category.
Transportation		
Water Transportation (SIC 4400), this category primarily includes stevedoring.		
Wholesale Trade		
Industrial Machinery and Equipment (SIC 5084), this category includes the wholesale of derricks, oil field tool joints, oil well supply houses, oil well machinery equipment and supplies.		

The annual employment data show a "boom and bust" pattern beginning in the late 1970s and extending through the mid-1980s, but with an increase in employment beginning in the late 1980s. This pattern is also present in a number of industry sectors, such as manufacturing, construction and mining.

Lake Charles LMA Manufacturing. Only one of the key oil and gas related manufacturing sectors is present in the Lake Charles LMA: *Ship and Boat Building and Repairing* (SIC 3730). At best, this sector had a minor presence in the Lake Charles LMA, employing a maximum 700 workers in 1982 and declining to 200 workers by 1987 (Figure 8). The forecasting analysis shows that employment was significantly less than expected in 1984 (Figure 9).

While we find no presence for our key industries, the data above show that manufacturing is an important component of the Lake Charles LMA economy. Further analyses of Calcasieu Parish, the largest parish in the Lake Charles LMA, show that chemicals and petroleum production are the key manufacturing industry sectors (Figure 10). Between 1981 and 1986, earnings in the petroleum industry were reduced by 50 percent in the Lake Charles LMA. Furthermore, the rebound in manufacturing in the late 1980s was led by growth in the chemical and allied products industries, and not petroleum production.[2]

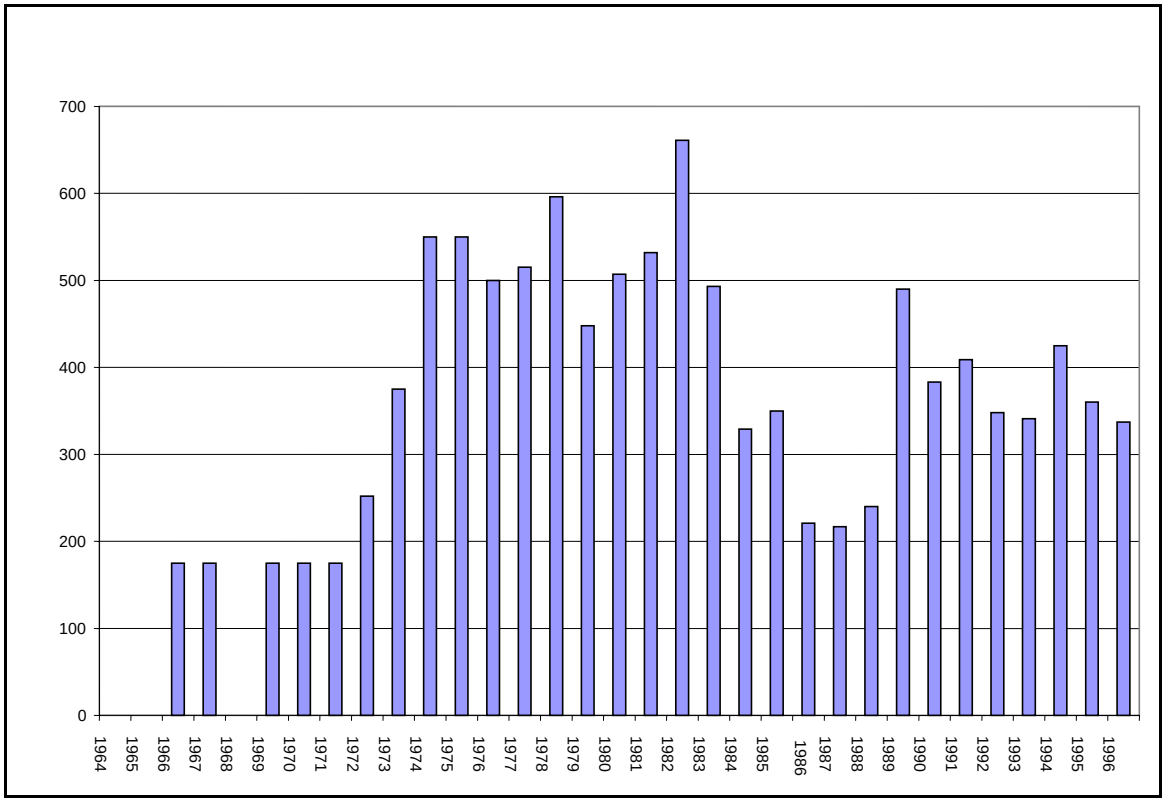


Figure 8. Annual Employment for Ship and Boat Building and Repair (manufacturing), Lake Charles LMA: 1964-1996 (U.S. Census Bureau, 2000a).

[2] We focused on Calcasieu Parish because of data disclosure problems with these two industries in the other parishes within the Lake Charles LMA (U.S. Department of Commerce, Bureau of Economic Analysis, 2000).

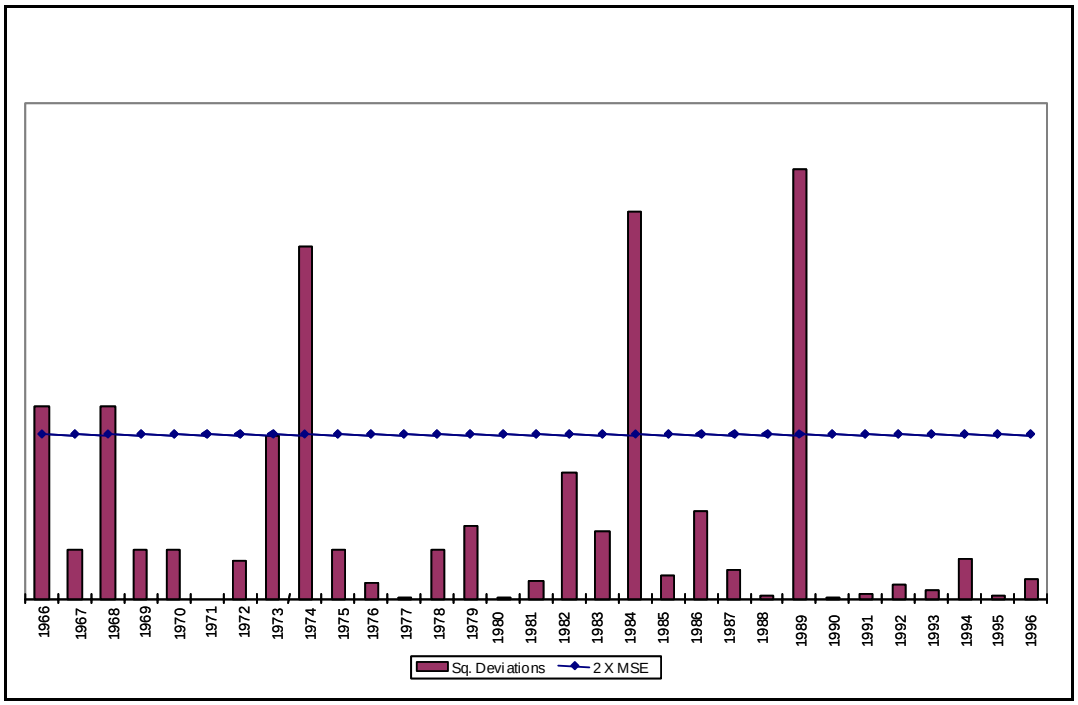


Figure 9. Forecasting Analysis for Ship and Boat Building and Repair (manufacturing), Lake Charles LMA: 1966-1996.

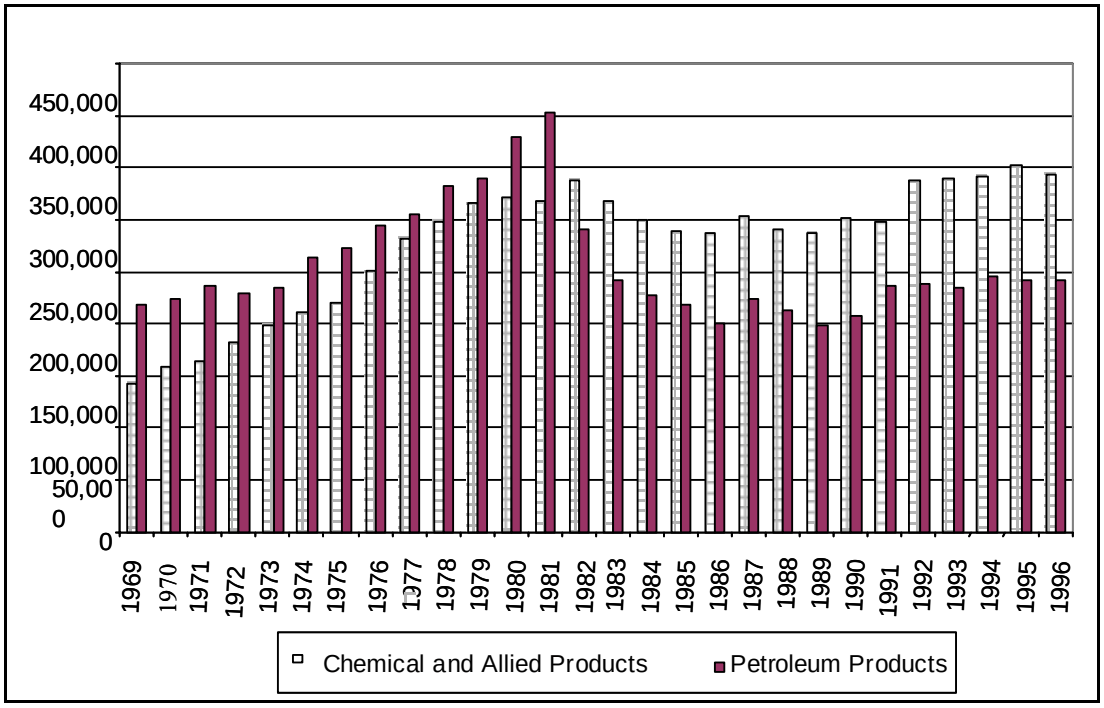


Figure 10. Parish Earnings in Key Nondurable Goods Manufacturing Sectors, Calcasieu Parish: 1969-1996.

Lake Charles LMA Mining. The *Drilling Oil and Gas Wells* (SIC 1381) industry peaked in 1974 with employment levels over 1,000 workers. By 1977, employment had dropped to just over 200. The forecasting analysis does not show any significant growth patterns after 1980 (Figures 11 and 12). There is no employment in *Oil and Gas Field Exploration Services* (SIC 1382).

The *Oil and Gas Field Service N.E.C.* (SIC 1389) data show periods of moderate employment growth and decline in the 1970s and 1980s (Figures 13 and 14). The forecasting analysis indicates that 1979 is the beginning of a strong growth cycle that ends abruptly in 1987. Since 1990, about 400 workers have been employed in this industry throughout the Lake Charles LMA. These findings are important because mining employment patterns here do not fit the "boom and bust" pattern of the late 1970s and 1980s as well as they do in other LMAs. This suggests that mining employment in this LMA may be qualitatively different than that found in other regional economies.

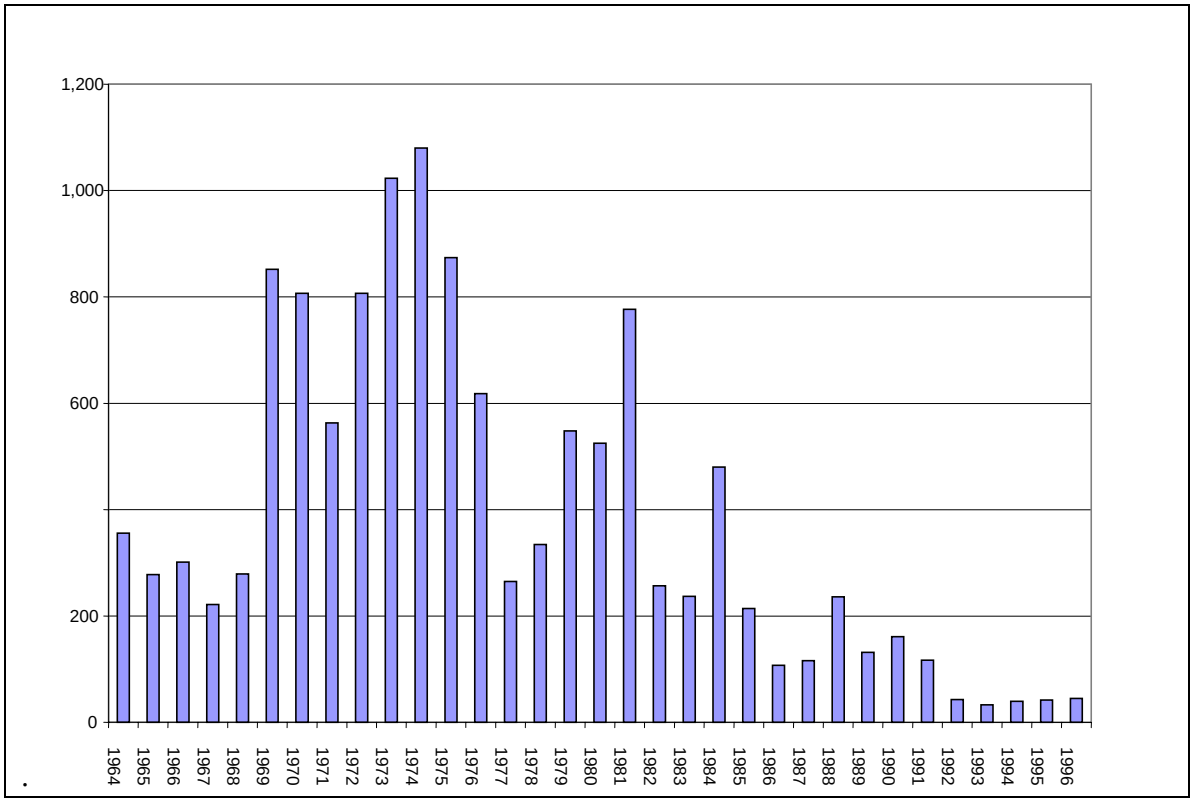


Figure 11. Drilling and Oil Gas Wells, Lake Charles LMA: 1964-1996 (U.S. Census Bureau, 2000a).

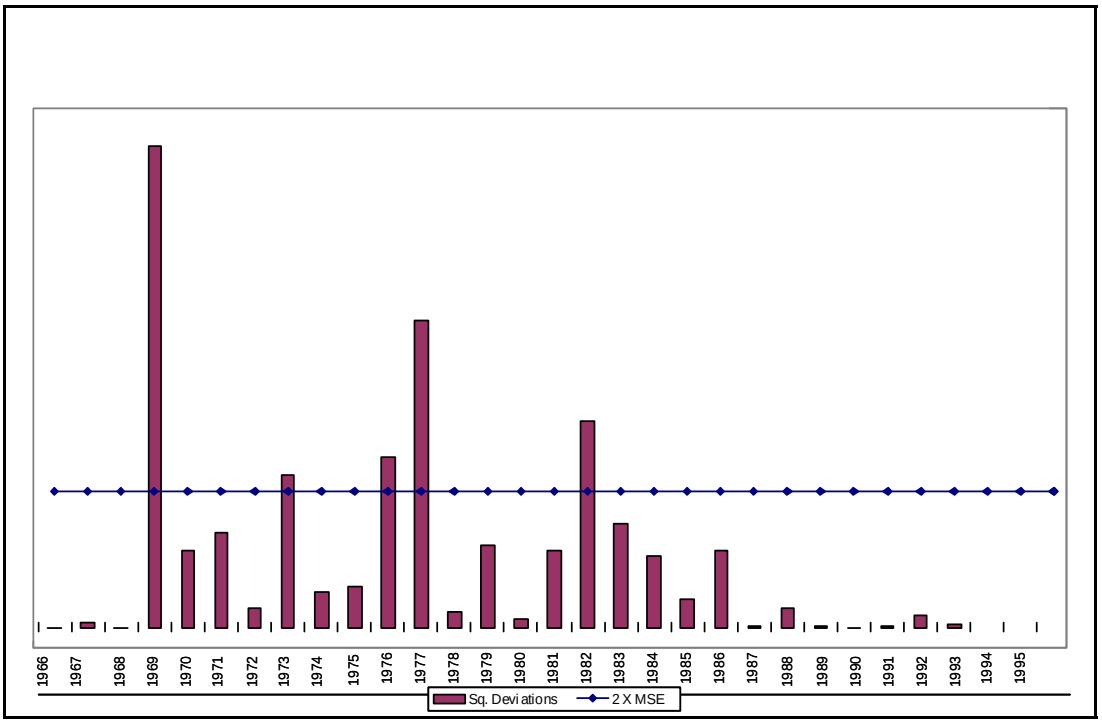


Figure 12. Forecasting Analysis for Drilling Oil and Gas Wells, Lake Charles LMA: 1966-1995.

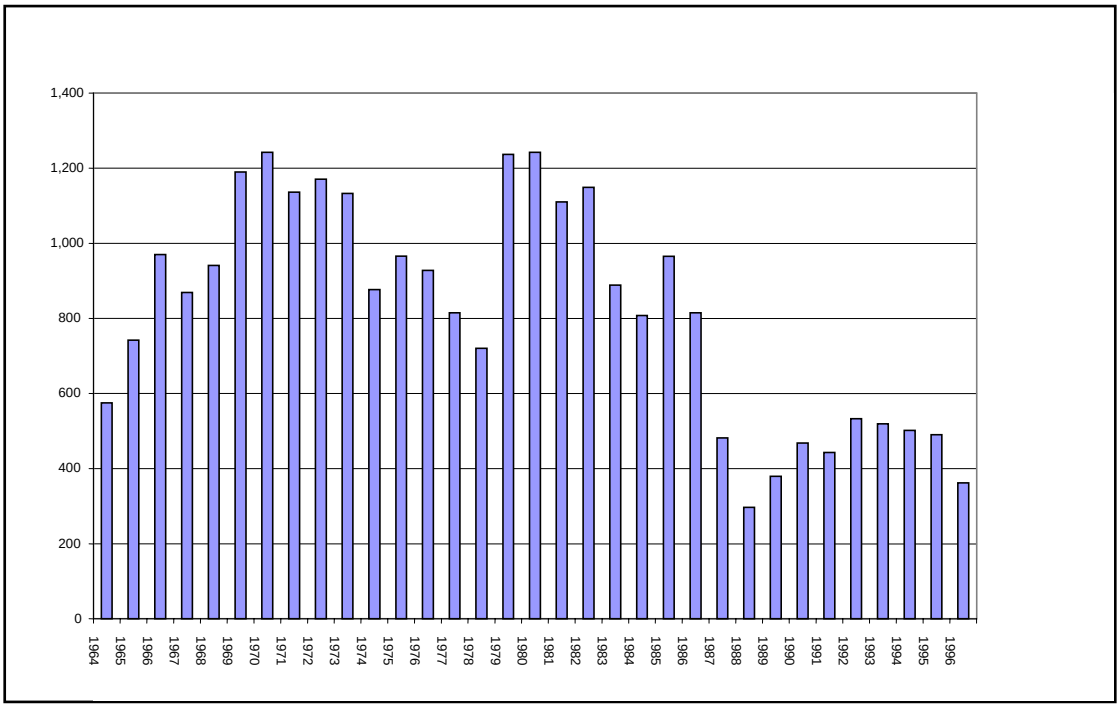


Figure 13. Oil and Gas Field Services, Lake Charles LMA: 1964-1996 (U.S. Dept. of Commerce, Bureau of Economic Analysis, 2000).

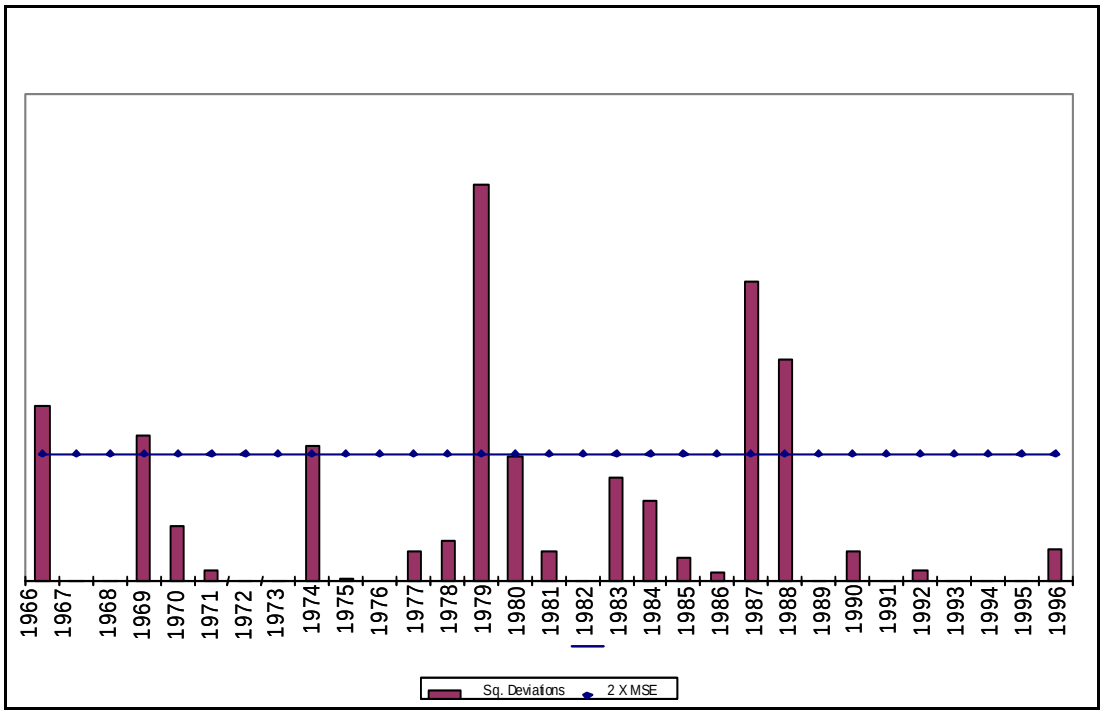


Figure 14. Forecasting Analysis for Oil and Gas Field Services, Lake Charles LMA: 1966-1996.

Lake Charles LMA Water Transportation. The next set of figures present data on *Water Transportation* (SIC 4400) employment (Figures 15 and 16). Unfortunately, there is no category that directly measures offshore oil and gas-related water transportation. However, water transportation is not a large sector in the Lake Charles LMA. In all but three years, there were less than 1,000 workers employed in the entire LMA. However, since only one parish (Cameron) borders the Gulf of Mexico, it is reasonable to assume that employment is concentrated in that parish. Between 1980 and 1983, there were sharp increases in employment in water transportation. This growth could be related to the expansion in the oil and gas sector of this period. However, the geographical configuration of the LMA and the relatively low levels of employment in this sector suggest that any fluctuations in water transportation employment do not significantly impact the Lake Charles LMA.

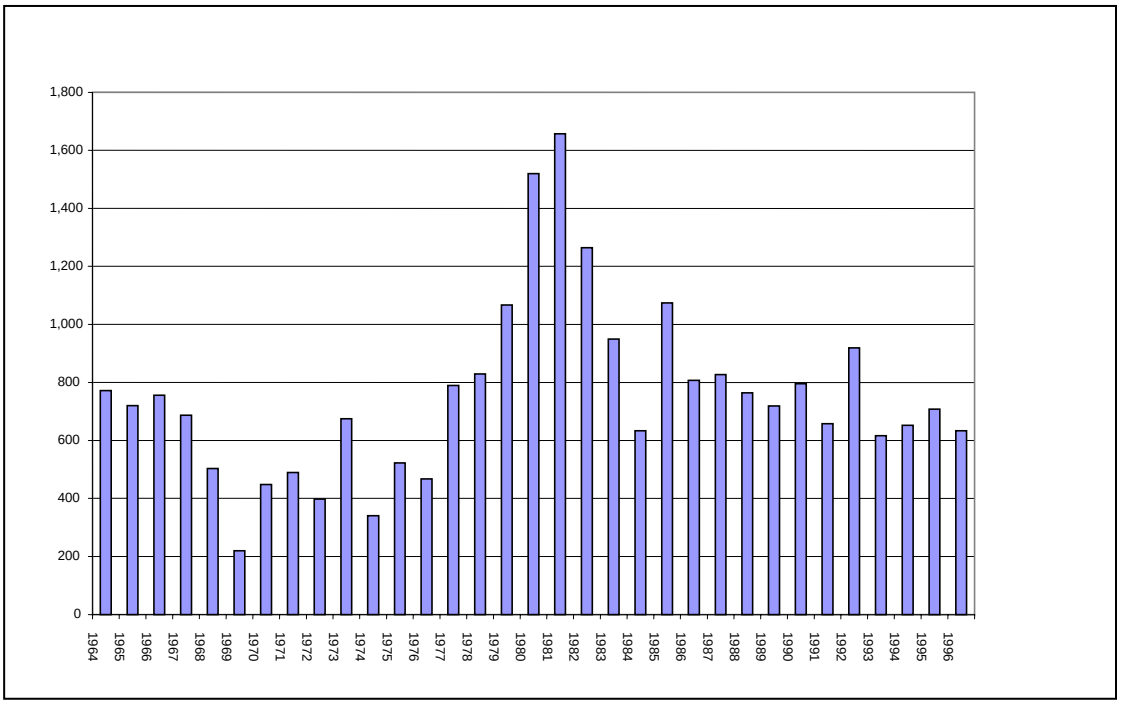


Figure 15. Annual Employment for Water Transportation, Lake Charles LMA: 1964-1996 (U.S. Dept. of Commerce, Bureau of Economic Analysis, 2000).

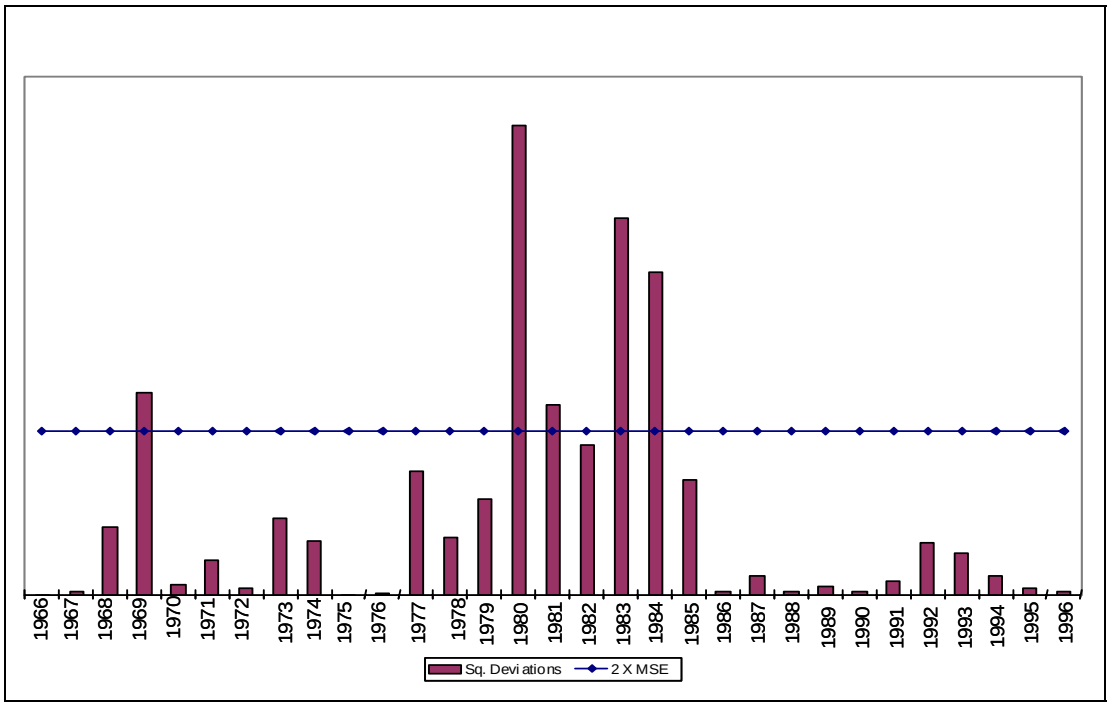


Figure 16. Forecasting Analysis for Water Transportation, Lake Charles LMA: 1966-1996.

Lake Charles LMA Wholesale Trade. The *Industrial Machinery and Equipment* (SIC 5084) category includes the wholesale marketing of oil well machinery. However, these data are available only from 1977 to 1996, which does not provide enough years for conducting a forecasting analysis (Figure 17). The trend line in Figure 17 shows a sector that employs fewer than 600 employees at any time. There was a slight growth pattern in the early 1980s, when employment increased from 400 to 600 workers.

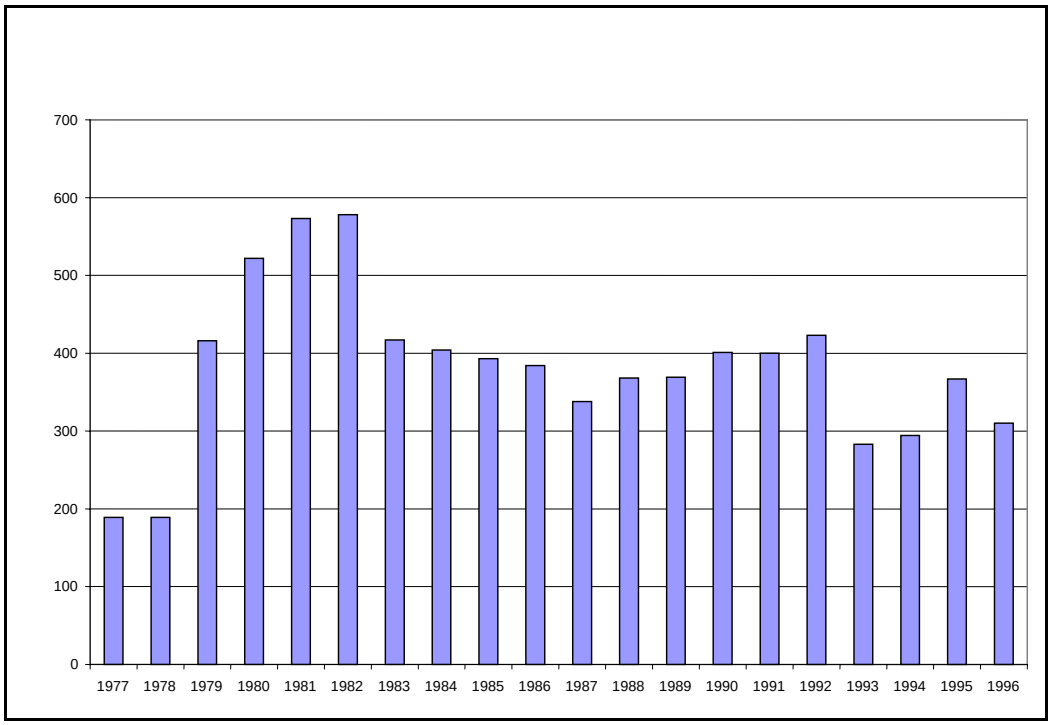


Figure 17. Wholesale Trade of Industrial Machinery and Equipment, Lake Charles LMA: 1977-1996 (U.S. Census Bureau, 2000a).

The detailed industry data show that the Lake Charles LMA is not a major direct participant in the oil and natural gas extraction economy. Employment patterns in the direct sectors are very low or nonexistent. The growth and decline patterns that are there, however, conform to the established patterns for the oil and gas industry in other GOMR LMAs. For the last 30 years the business cycle patterns in the Lake Charles LMA were driven primarily by manufacturing. In 1990 the LMA was still heavily concentrated in manufacturing employment, particularly non-durable goods manufacturing. The two major manufacturing types in the LMA are petroleum and coal products, and allied chemicals. Since the 1980s, earnings in the petroleum sector have been relatively flat, while earnings in the allied chemicals sector have increased. The trends for the petroleum sector suggest that the Lake Charles LMA is integrated into the global oil and gas economy primarily (but not exclusively) as a "downstream" industry, refining and transforming the extracted product.

Lake Charles LMA Population, Education, and Local Government: 1970-1990. In this section we examine how industry changes affected population, education, and local government issues between 1970 and 1990 in the Lake Charles LMA. The following tables present population data for the Lake Charles LMA (Tables 2-4).

Population. The population of the Lake Charles LMA increased 11.6 percent between 1970 and 1980. This growth rate nearly mirrors the national growth rate of 11.4 percent for the same period. Between 1980 and 1990, the population in Lake Charles LMA grew by 2.6 percent, a rate significantly lower than the national growth rate. Three parishes in this LMA experienced negative population growth: Allen, Cameron, and Jefferson Davis. The population loss findings are important because of the perceived effect of the oil and gas bust on out-migration in Louisiana. However, the industry data show very minimal oil and gas mining effects in this LMA. Thus, we conclude that not all out-migration from Louisiana parishes during the 1980s was attributable to direct changes in the oil and gas industry.

Despite assertions that an African-American out-migration was the norm among LMAs involved in oil and gas extraction activities, there is no evidence of this occurring in the Lake Charles LMA. In fact, the African-American population increased 26 percent between 1970 and 1990. This high growth rate, which is significantly greater than would be expected via natural replacement, indicates that in-migration into the LMA occurred during this time.

Table 2

Population by Parish, Lake Charles LMA: 1940-2000

Parish	1940	1950	1960	1970	1980	1990	2000
Allen	17,540	18,835	19,867	20,794	21,390	21,226	25,440
Beauregard	14,847	17,766	19,191	22,888	29,692	30,083	32,986
Calcasieu	56,506	89,635	145,475	145,415	167,223	168,134	183,577
Cameron	7,203	6,244	6,909	8,194	9,336	9,260	9,991
Jeff. Davis	24,191	26,298	29,825	29,554	32,168	30,722	31,435
Vernon	19,142	18,974	18,301	53,794	53,475	61,961	52,531
LMA Total	139,429	177,752	239,568	280,639	313,284	321,386	335,960

Source: U.S. Census Bureau, 2000b.

Table 3

Percent of White Population, Lake Charles LMA: 1940-2000

Parish	1940	1950	1960	1970	1980	1990	2000
Allen	74.0	75.8	75.2	75.3	78.1	75.9	71.9
Beauregard	82.4	82.9	77.5	81.2	83.5	84.0	84.2
Calcasieu	73.5	77.0	79.1	78.2	77.5	76.3	73.6
Cameron	90.7	90.6	93.6	93.3	93.7	93.8	93.6
Jeff. Davis	71.0	78.3	78.7	79.5	80.5	81.0	80.6
Vernon	87.3	88.3	86.6	89.0	77.2	73.8	73.7
LMA %	77.5	79.4	79.6	80.9	78.8	77.5	75.7
LMA Total	108,195	141,099	190,739	227,128	247,121	249,067	254,599

Source: U.S. Census Bureau, 2000b.

Table 4

Percent of Black Population, Lake Charles LMA: 1940-2000

Parish	1940	1950	1960	1970	1980	1990	2000
Allen	25.2	23.2	23.9	23.8	20.5	21.6	24.6
Beauregard	17.4	17.0	22.3	18.6	16.0	14.6	12.9
Calcasieu	26.4	22.9	20.8	21.6	21.7	22.9	24.0
Cameron	9.3	9.3	6.3	6.5	5.6	5.2	3.9
Jeff. Davis	24.8	21.6	21.1	20.4	19.0	18.8	17.8
Vernon	12.6	11.6	13.2	10.3	18.2	20.7	17.1
LMA %	22.2	20.5	20.0	18.8	19.7	20.7	20.6
LMA Total	31,071	36,441	48,454	52,791	61,915	66,596	69,486

Source: U.S. Census Bureau, 2000b.

Education. In 1970, 56 percent of the adults in Lake Charles LMA did not possess a high school diploma (or equivalency). However, by 1990, that percentage had fallen to 31 percent. Nevertheless, the percentage of college graduates within this LMA did not increase significantly during that period. In 1970, only 8 percent of adults held a four-year college degree; by 1990, this had increased to 11 percent (Table 5). These data are consistent with a primarily manufacturing-based economy; many jobs within this sector require a high school diploma for employment. In 1990 over 19 percent of the Lake Charles LMA workforce was employed in manufacturing.

Table 5

Adult Educational Attainment (age 25+), Lake Charles LMA: 1970-2000

Parish	0-8 Years	Some High School	High School Diploma	Some College, No Degree	BA/BS or More	Total
1970						
Allen	49.6%	21.2%	20.9%	4.5%	3.5%	10,640
Beauregard	35.9%	19.8%	29.8%	7.1%	7.3%	11,742
Calcasieu	34.8%	16.9%	29.7%	9.5%	9.0%	71,438
Cameron	47.0%	20.6%	24.9%	3.7%	3.8%	4,103
Jeff. Davis	49.1%	15.4%	24.1%	5.3%	5.9%	14,682
Vernon	29.8%	21.6%	33.7%	6.4%	8.3%	16,033
LMA Total	37.5%	18.0%	28.7%	7.8%	7.8%	128,638

Table 5

Adult Educational Attainment (age 25+), Lake Charles LMA: 1970-2000 (continued)

1980						
Allen	32.5%	21.9%	31.4%	6.7%	7.4%	12,010
Beauregard	24.2%	17.7%	35.0%	11.6%	11.4%	16,162
Calcasieu	22.9%	18.5%	31.8%	13.1%	2.0%	91,089
Cameron	34.9%	20.6%	31.0%	6.4%	6.9%	4,916
Jeff. Davis	34.1%	18.6%	29.2%	9.3%	8.7%	17,152
Vernon	19.7%	17.0%	42.1%	12.6%	8.4%	23,740
LMA Total	24.8%	18.5%	33.3%	11.8%	11.4%	165,069
1990						
Allen	21.7%	21.1%	37.2%	13.1%	6.7%	13,262
Beauregard	12.9%	16.4%	38.5%	19.0%	13.0%	18,301
Calcasieu	14.2%	15.4%	34.2%	21.4%	2.3%	102,341
Cameron	19.4%	19.4%	40.2%	13.0%	7.8%	5,584
Jeff. Davis	21.9%	18.1%	38.1%	13.8%	7.9%	18,517
Vernon	8.6%	14.4%	39.8%	26.6%	10.3%	30,493
LMA Total	14.6%	16.1%	36.3%	20.4%	12.3%	188,498
2000						
Allen	14.4%	22.3%	38.0%	15.9%	9.2%	16,817
Beauregard	9.1%	15.9%	39.5%	21.7%	13.7%	21,036
Calcasieu	8.6%	14.3%	34.6%	25.6%	16.8%	114,563
Cameron	12.9%	18.9%	42.8%	17.4%	7.9%	6,257
Jeff. Davis	13.9%	16.6%	41.1%	18.2%	9.9%	19,352
Vernon	6.0%	13.8%	36.4%	30.1%	13.5%	29,329
LMA Total	9.3%	15.4%	36.4%	24.1%	14.5%	207,354

Source: U.S. Census Bureau, 2000b.

Finances. The Lake Charles LMA did not grow at the same rapid rate as did some neighboring LMAs (Lafayette, Lafourche) during the 1970s and 1980s. This stability is reflected in the local government finances of the Lake Charles LMA (Tables 6-9). Except for the years between 1982 and 1987 when revenues fell by 3 percent per capita in real dollars, revenues remained very stable in real dollars. The drop in finances for 1982-1987, however, was not nearly as dramatic as that seen in other oil and gas LMAs in Louisiana; e.g., the 8 percent drop in per capita revenue in the Lafourche LMA.

In a given year, state revenue accounts for over one-third of all local government revenue. However, the state paid-out significantly less money in 1987 than it did in other years, and Lake Charles LMA was no exception. Between 1982 and 1987, the per capita revenue from the state fell by 13 percent in real dollars. Local governments in the Lake Charles LMA incurred more debt, but not at the same rates as other LMAs in the region. Between 1982 and 1987, local government debt grew by 23 percent in real dollars. Per capita debt also grew between 1987 and 1992. But these growth rates were concentrated largely in Calcasieu Parish. Local governments

in the Lake Charles LMA did not face the same debt and revenue problems crises as did governments in other nearby oil and gas-dependent LMAs.

Table 6

Total Revenue, Per Capita (in 1997 adjusted dollars), Lake Charles LMA: 1972-1997

Parish	1972	1977	1982	1987	1992	1997
Allen	$1,505	$1,722	$1,691	$1,623	$1,280	$1,689
Beauregard	$2,803	$2,282	$2,389	$2,049	$2,417	$2,429
Calcasieu	$1,644	$2,078	$2,154	$2,135	$2,524	$2,781
Cameron	$2,057	$3,161	$4,318	$4,062	$3,488	$3,974
Jeff. Davis	$1,213	$1,489	$1,754	$1,750	$1,743	$2,000
Vernon	$736	$1,039	$907	$946	$1,040	$1,372
LMA Total	$1,545	$1,879	$1,946	$1,888	$2,093	$2,391

Source: U.S. Census Bureau, 2000a.

Table 7

Total State Revenue, Per Capita (in 1997 adjusted dollars), Lake Charles LMA: 1972-1997

Parish	1972	1977	1982	1987	1992	1997
Allen	$751	$894	$881	$701	$751	$799
Beauregard	$712	$738	$826	$649	$761	$706
Calcasieu	$565	$2,632	$617	$569	$693	$595
Cameron	$452	$1,242	$1,534	$1,092	$1,029	$1,219
Jeff. Davis	$647	$755	$742	$701	$849	$878
Vernon	$461	$579	$592	$501	$579	$795
LMA Total	$579	$684	$690	$601	$706	$697

Source: U.S. Census Bureau, 2000a.

Table 8

Total Tax Revenue, Per Capita (in 1997 adjusted dollars), Lake Charles LMA: 1972-1997

Parish	1972	1977	1982	1987	1992	1997
Allen	$362	$260	$227	$231	$400	$430
Beauregard	$442	$268	$222	$398	$747	$779
Calcasieu	$674	$453	$382	$555	$887	$1,333
Cameron	$799	$581	$574	$872	$1,685	$1,935
Jeff. Davis	$377	$256	$244	$473	$598	$598
Vernon	$215	$161	$111	$124	$237	$356
LMA Total	$478	$358	$300	$438	$709	$998

Source: U.S. Census Bureau, 2000a.

Table 9

Total Debt, Per Capita (in 1997 adjusted dollars), Lake Charles LMA: 1972-1997

Parish	1972	1977	1982	1987	1992	1997
Allen	$1,047	$890	$511	$857	$365	$581
Beauregard	$18,642	$9,668	$4,881	$3,363	$1,683	$1,037
Calcasieu	$4,100	$3,575	$3,734	$4,120	$5,231	$3,449
Cameron	$921	$1,034	$1,864	$2,158	$504	$180
Jeff. Davis	$927	$506	$549	$902	$536	$597
Vernon	$476	$578	$271	$595	$278	$552
LMA Total	$4,063	$3,013	$2,631	$2,791	$3,024	$2,168

Source: U.S. Census Bureau, 2000a.

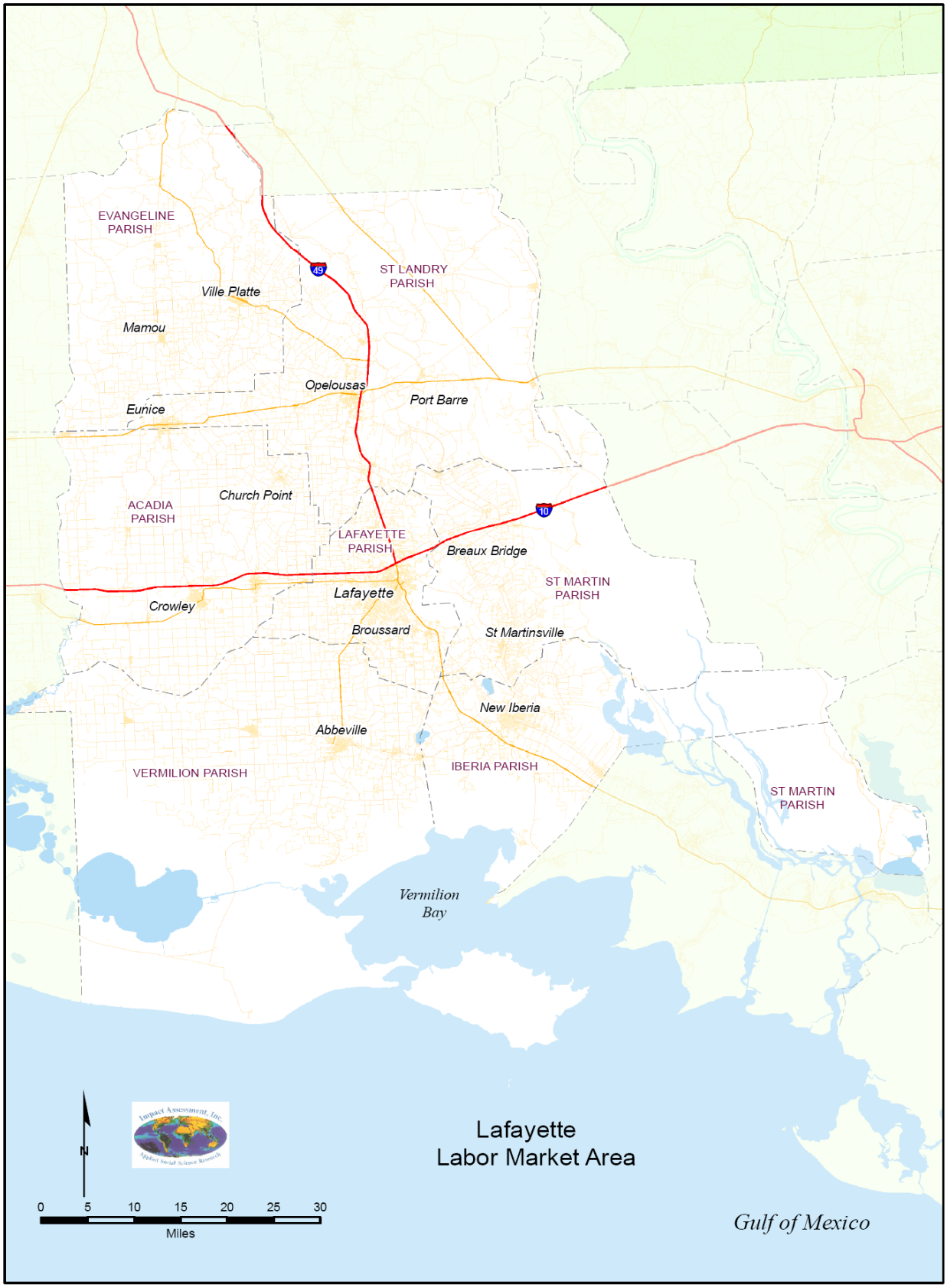
Employment in the Lake Charles LMA grew by 44 percent during the 1990s. During that decade, 1.4 million new jobs were added—1.25 million of which were in the service sector alone. The LMAs population also grew during the 1990s, increasing by 25 percent (which is more than twice the national growth rate). However, this growth reflects a bifurcated education structure in Lake Charles LMA. The growth of services appears to have increased demand for both very low skilled workers (likely immigrant labor) and high skilled workers.

The Lake Charles LMA is the largest port on the Gulf of Mexico. It possesses one of the largest and most economically diverse economies in the nation. Despite the fact that over half of all oil and gas related workers during the 1970s and 1980s were employed in the Lake Charles LMA, the economy, when viewed as an integrated system of counties linked by commuting patterns, did not suffer any net population or employment loss during the crash of the 1980s. This is not to insinuate that jobs were not lost. Between 1980 and 1990, 50,000 mining, manufacturing, and construction jobs were lost in Lake Charles LMA. Nonetheless, the region remains the heart of the oil and gas industry. In 2000, over 40,000 people were still employed in oil and gas exploration and production, either in the corporate offices or out in the field. Yet, this industry captured only 1.4 percent of the total labor force in 2000, compared to nearly 5 percent in 1980.

2. Lafayette, Louisiana: Labor Market Area

The Lafayette Labor Market Area (LMA) is made up of seven Louisiana parishes: Acadia, Evangeline, Iberia, Lafayette, St. Landry, St. Martin, and Vermilion (Map 8). According to the U.S. Census Bureau, the population of these seven parishes was 548,154 in 2000 (2000b).

First Unit of Analysis: Lafayette LMA Employment, 1940-1970. The changes in industry are summarized for each decade. Agriculture was the dominant industry, employing almost 45,000 workers –over 60 percent of the workforce– in 1940. Wholesale and retail trade, the second largest sector, employed 13 percent of all workers. The mining industry (including oil and gas workers) employed only 3 percent of the labor force in 1940.



Map 8. Lafayette, Louisiana Labor Market Area.

Agriculture began to diminish in 1950. Between 1940 and 1950, agriculture lost more than 10,000 workers, reflecting a loss of more than 20 percent of the Lafayette LMA labor force. In contrast, mining and construction both grew by large percentages. Between 1940 and 1950, employment in mining doubled to over 4,000 workers; construction gained 6,000 workers. Total employment grew by 10 percent in the Lafayette LMA in that period.

Between 1950 and 1960, agriculture's share of the total labor force declined to less than 20 percent. By 1960, both wholesale/retail trade and services were employing more workers than agriculture. All other industries experienced employment growth as well. Services experienced the greatest amount of growth, increasing by 111 percent between 1950 and 1960. Mining and manufacturing both employed slightly over 7 percent of the total workforce in 1960. For manufacturing this represents a slight decline in the percentage of workers employed in that industry, but the raw number of workers in manufacturing was larger in 1960 than in 1950. Total employment grew by 26 percent in the Lafayette LMA during the 1950s.

Agriculture employed less than 10 percent of the total workforce by 1970. Between 1940 and 1970 almost 35,000 jobs were lost in the agriculture sector. Services continued as the leading employment sector in the 1960s, employing 35 percent of the total labor force by 1970. Mining employment grew substantially during the 1960s, experiencing a 46 percent growth rate. Moreover, by 1970, almost 10 percent of the Lafayette LMA labor force was employed in this sector. Total employment grew by 12 percent in the Lafayette LMA between 1960 and 1970. Also significant is that the Lafayette LMA economy did not depend on its natural resource base for employment in 1970. The following figure shows general industry trends from 1940-2000 (Figure 1).

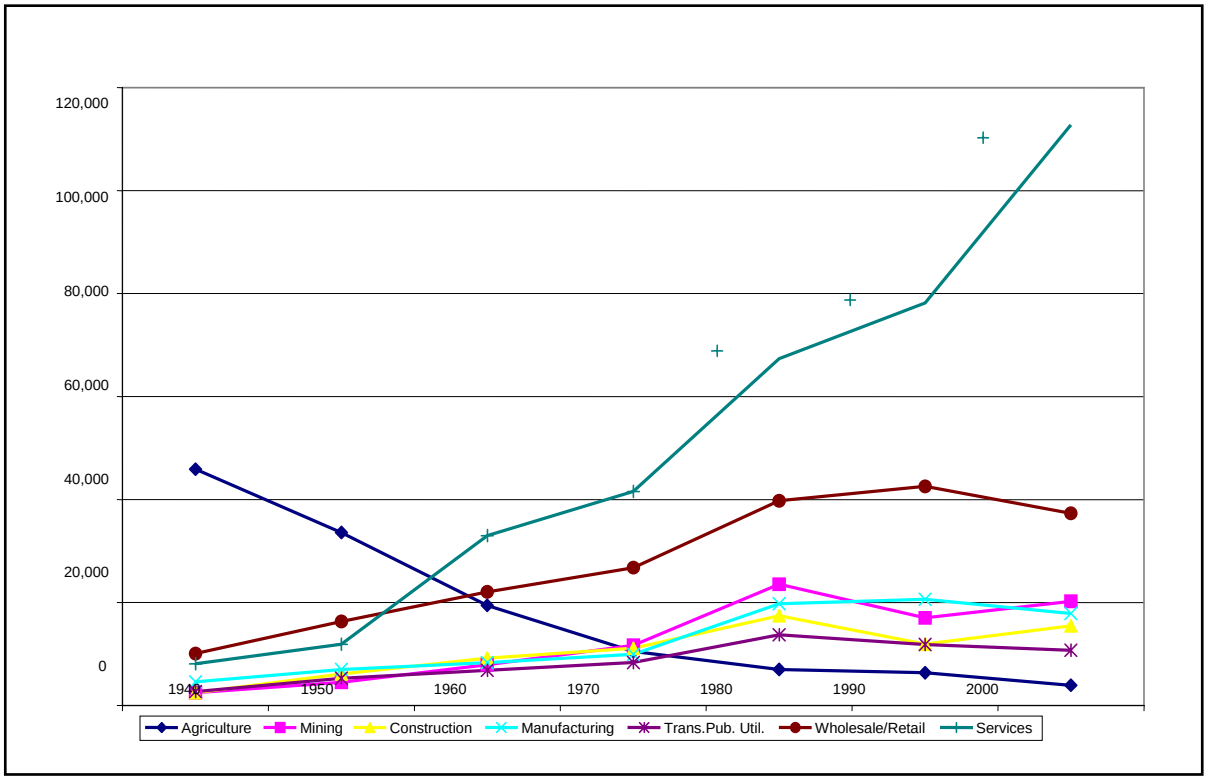


Figure 1. Major Industry Employment, Lafayette LMA: 1940-2000 (U.S. Census Bureau, 2000b).

However, the Lafayette LMA experienced economic stagnation in during the 1980s, when total employment grew less than 0.5 percent. The mining and construction industries both experienced employment losses in excess of 25 percent between 1980 and 1990; the mining industry employed less than 10 percent of the workforce in 1990.

Lafayette LMA Demographic Changes 1940-1970. Total employment in the Lafayette LMA grew by 58 percent between 1940 and 1970. These employment changes affected population growth. In 1940, 293,506 people lived in the Lafayette LMA. By 1970, the population exceeded 400,000. Lafayette Parish experienced the most population growth in the Lafayette LMA, increasing by more than 250 percent between 1940 and 1970.

The ethnic/racial composition of the Lafayette LMA also changed somewhat between 1940 and 1970. African-Americans living in Lafayette declined from 31 percent to 26 percent, while Caucasian residency increased from 69 to 73 percent.

Second Unit of Analysis: Lafayette LMA Employment, 1970-1990. The oil and gas industries underwent both rapid expansion and swift contraction during the 1970s and 1980s. An examination of oil and gas prices underscores this claim. In constant dollars, crude oil prices spiked in the 1970s, but precipitously declined in 1986. The Lafayette LMA was one of the major economies in the oil and gas exploration and production industries at that time (Gramling, 1995). Human ecology theory predicts that the price changes documented in Figure 1 should affect the oil and gas economies of the Gulf of Mexico region. We examine these potential relationships by first assessing the changes in broad industry sectors for the Lafayette LMA.

The Lafayette LMA economy underwent rapid growth between 1970 and 1980 when total employment grew by 57 percent (Figure 1). Employment in both mining and manufacturing doubled between 1970 and 1980; at the same time, employment in services increased by 63 percent and construction employment increased by 54 percent. In 1980 over 12 percent of the workforce was employed in mining, and over 10 percent in manufacturing. This finding is significant it indicates that the entire seven parish Lafayette LMA was mining-dependent in 1980. Atypically, natural resource dependency does not typically apply to such large geographical units. The greater Lafayette area economy benefited from changes in the oil and gas industry, experiencing considerable growth in all its industries during the 1970s.

Transportation and public utilities lost 13 percent of its employees during that same decade. While the service sector experienced a growth rate of 16 percent between 1980 and 1990, this growth rate was significantly lower than in the previous decade (63%). By 1990, the wholesale/retail and service sectors employed over 60 percent of the Lafayette LMA workforce. These Census data show an economy that has transformed over time from being dependent on agriculture, mining, to one that was service-oriented.

The data for 1980 and 1990 paint two different pictures of the Lafayette LMA economy—one that was fast growing, and dependent on its natural resources, and one that was more dependent on services. However, decennial Census data are not always capable of documenting important short-term trends, such as rapid declines or growth spurts in employment, in a given industry.

In order to establish when, or if, unexpected changes in employment occurred in the Lafayette LMA, we performed a time-series forecasting analysis. In our analysis, we employ a moving average forecasting model to locate the years that the shocks occur in the Lafayette LMA. The annual employment data and three-year employment moving averages for the Lafayette LMA are presented below (Figure 2). These data show a steady increase in total employment from 1969 until 1982. These data also show a steady and rapid decline in full- and

part-time employment between 1982 and 1987. Since 1987, employment has increased in the Lafayette LMA, and by 1996, these employment levels had surpassed their previous high mark set in 1982.

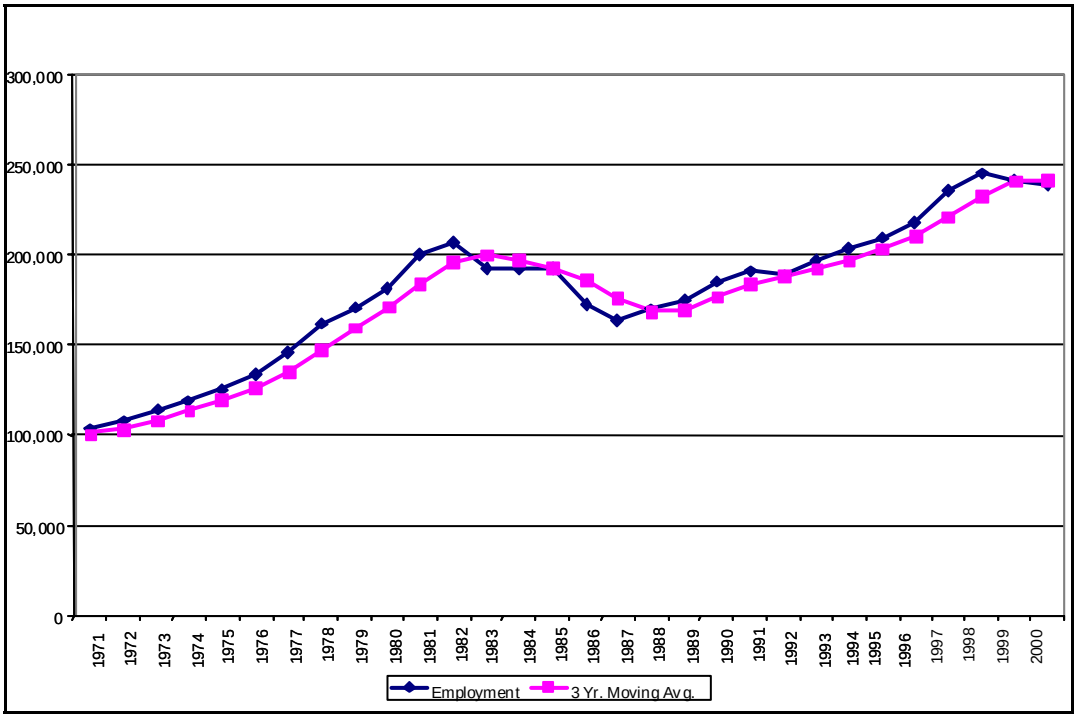


Figure 2. Annual Employment and Three-year Moving Averages, Lafayette LMA: 1971-2000 (U.S. Department of Commerce, Bureau of Economic Analysis, 2000).

Figure 3 documents forecasting errors, which occur when the observed employment number in a given year substantially exceeds the expected employment number in that year (based on a three-year moving average of employment levels). In this case, forecasting errors occur in 1977, 1981, and again in 1986 and 1987 (Figure 3). Referring back to Figure 2, we see that in each year between 1977 and 1982, the observed employment number was greater than the expected employment number. This indicates a four-year period of employment growth accented by significantly greater rates of growth at the beginning (1977) and at the end (1981). In 1986 and 1987, we see that the observed employment number for each year is significantly less than the expected employment number for those respective years. This finding signals a period of rapid employment decline, or fewer workers employed than expected. Taken together, the total employment data for the Lafayette LMA charts a "boom and bust" trend in beginning in 1977 and ending about 1988.

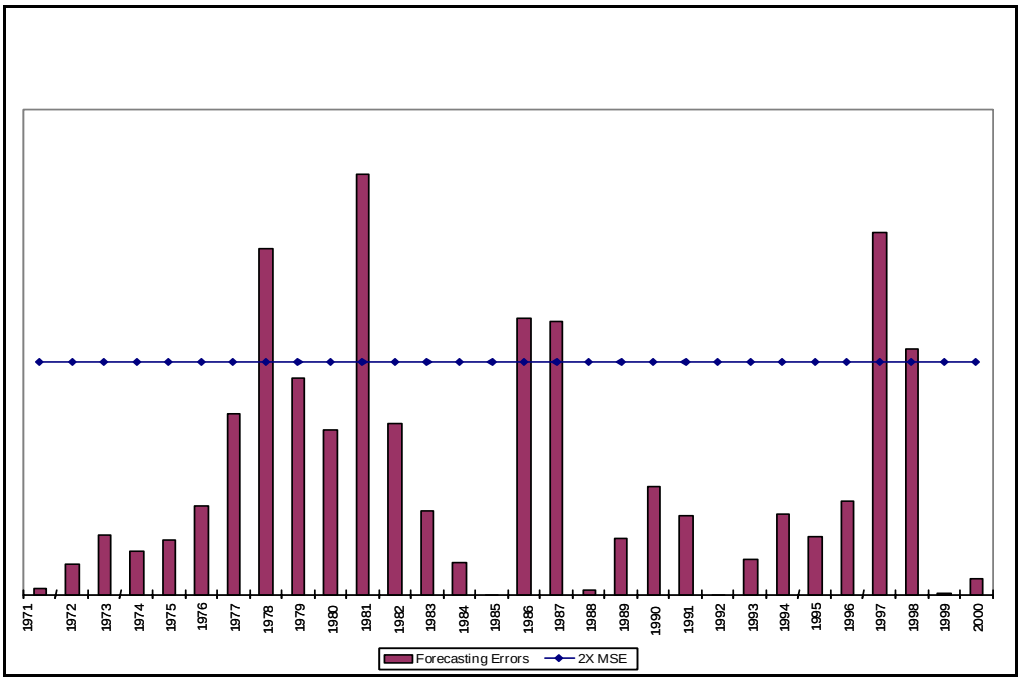


Figure 3. Forecasting Analysis, Lafayette LMA: 1971-2000.

Next, we examine annual employment data to uncover in which of industry sectors these "boom and bust" cycles are present in the Lafayette LMA. The following figure shows annual employment data for nine general industry categories between 1969 and 2000 (Figure 4). Examining this data, we see that the mining sector experienced the greatest downturn in total employment between 1982 and 1988, decreasing by 42 percent, or an estimated 14,000 jobs.

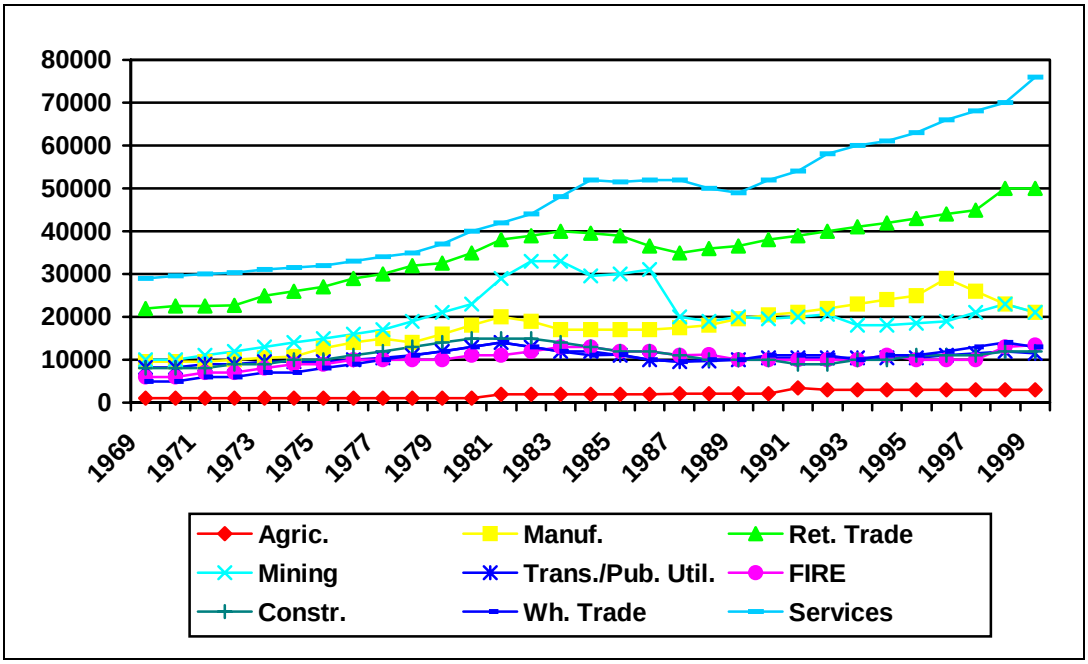


Figure 4. Employment by Industry Sector, Lafayette LMA: 1969-1999 (U.S. Dept. of Commerce, Bureau of Economic Analysis, 2000).

The percentage change in full- and part-time employment in each sector between 1977 and 1982 is illustrated below (Figure 5). Mining employment grew at the fastest rate during that period (83%) and is the category of employment largely responsible for the rapid growth or "boom period" documented in the forecasting analysis.

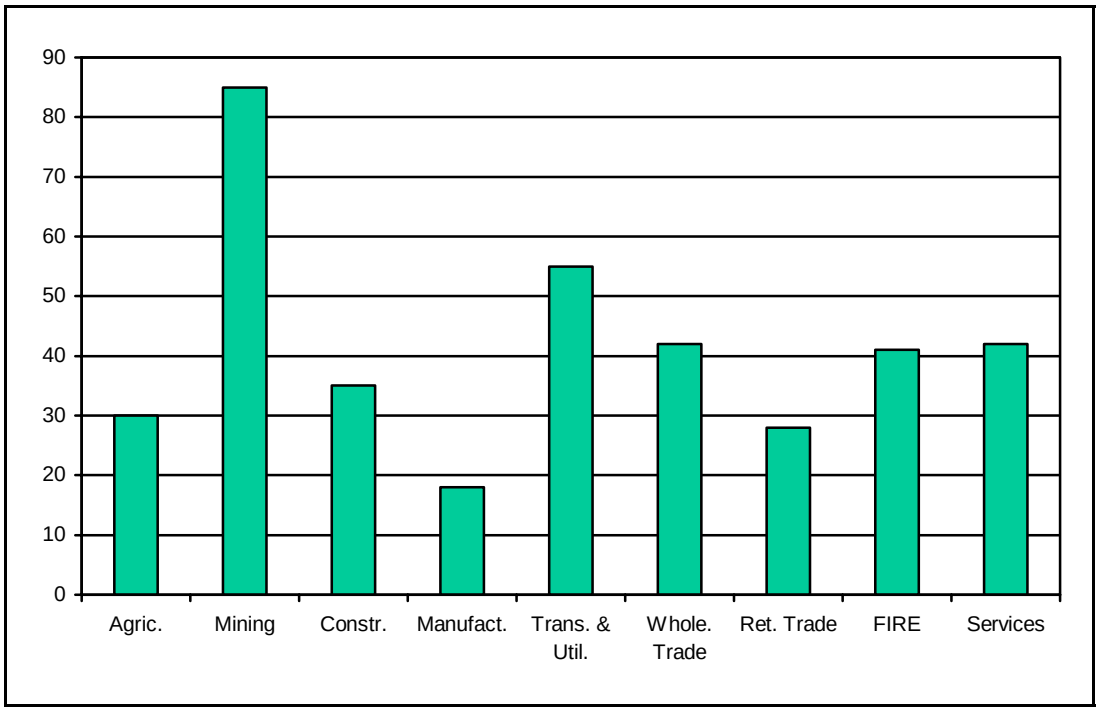


Figure 5. Employment Growth and Percent Change by Industry Sector, Lafayette LMA: 1977-1982, Inclusive (U.S. Dept. of Commerce, Bureau of Economic Analysis, 2000).

Figure 6 shows the percentage change in full-time and part-time employment in each industry sector during the years of 1982-1988, inclusive. The data show employment declines in all industries, with the exception of services. The most dramatic declines are in mining and construction. The mining sector lost the greatest number of jobs, while the construction sector lost the highest percentage of jobs (Figure 6).

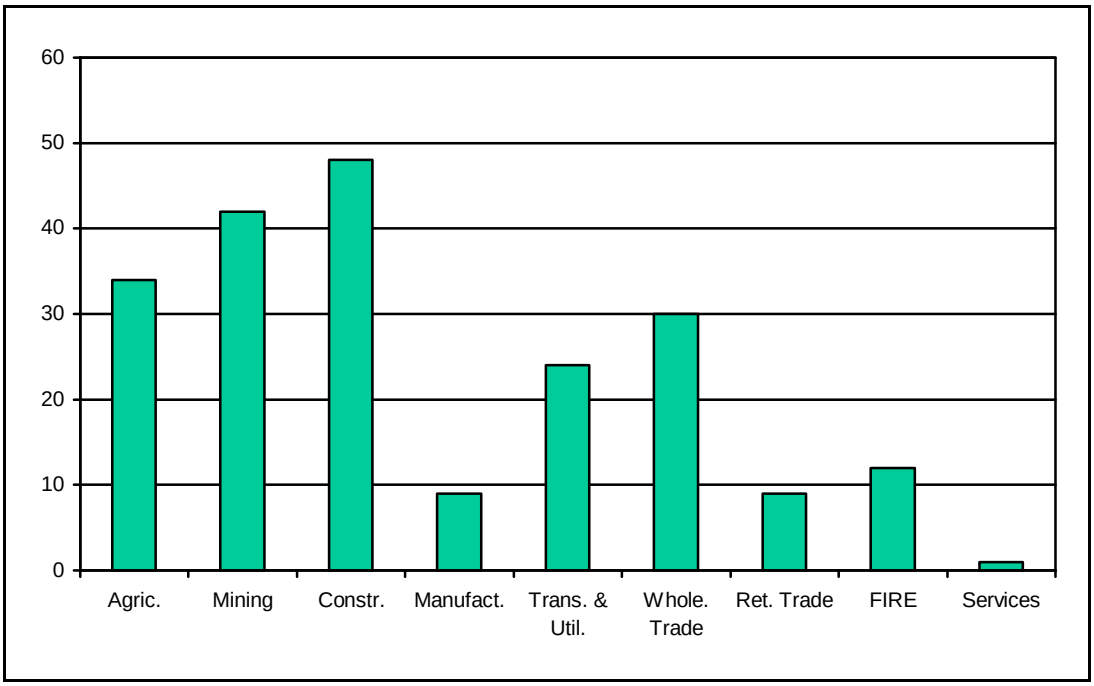


Figure 6. Employment Growth and Percent Change by Industry Sector, Lafayette LMA: 1982-1988, Inclusive (U.S. Dept. of Commerce, Bureau of Economic Analysis, 2000).

These data indicate that further analyses of mining employment trends are warranted. We next present the time-series forecasting analysis for mining employment in the Lafayette LMA (Figures 7 and 8). Not surprisingly, these data show a pattern similar to the total employment pattern presented above. There was strong employment growth in mining from 1978 through 1981, particularly in 1980 and 1981. This growth was followed by sharp drop-offs that were particularly severe in 1986 and 1987, when employment in this sector fell to a 10-year low.

While mining employment is clearly linked to these "boom and bust" growth cycles, other industry sectors are also implicated. The manufacturing employment data indicate higher than expected levels of manufacturing employment in 1977 and 1981 (Figures 9 and 10). In 1983, however, there is a lower than expected manufacturing employment in the Lafayette LMA. Nevertheless, in the late 1980s and early 1990s, manufacturing employment begins to increase. Between 1989 and 1991, manufacturing employment is higher than expected in the Lafayette LMA. Furthermore, manufacturing employment peaks in 1997 at almost 28,000 workers. However, by 2000, this number declines to less than 23,000.

If manufacturing in the Lafayette LMA is unconnected to the oil and gas industry during this period, then there is no reasonable expectation that these "boom and bust" periods will appear in manufacturing employment trends. Yet, the presence of these trends suggests that many of the manufacturing activities in the Lafayette LMA were directly connected to the oil and gas industry. In addition to manufacturing, analyses of other industry sectors show patterns consistent with the boom and bust periods, in particular transportation/public utilities, construction, and wholesale trade.

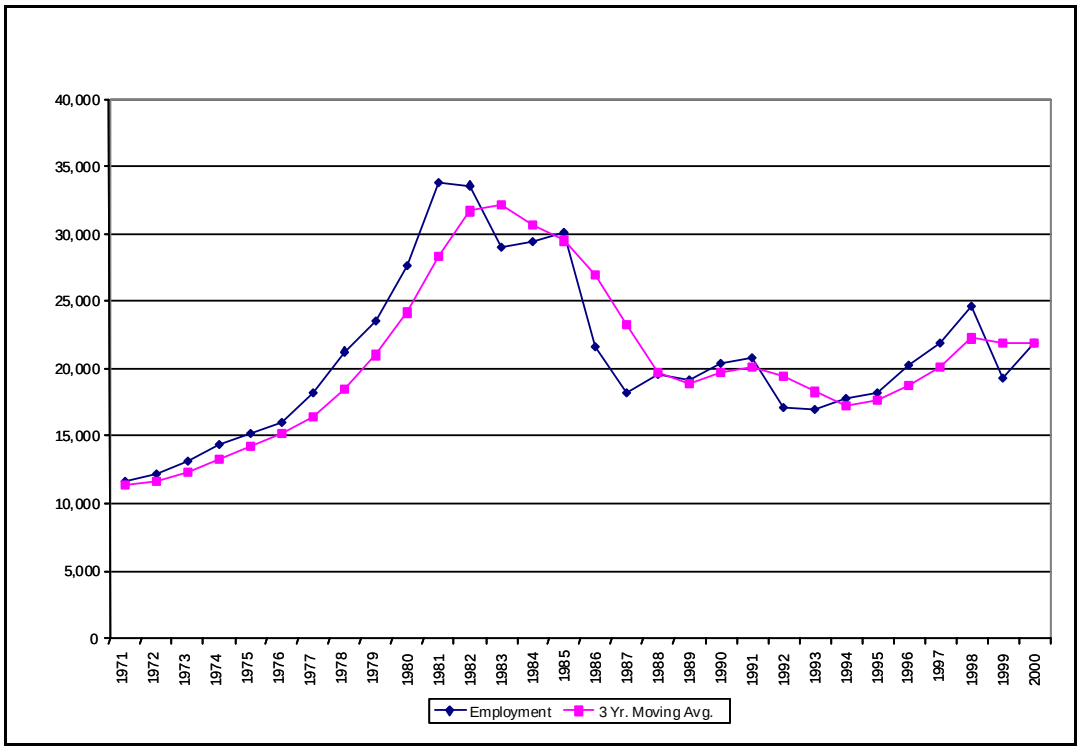


Figure 7. Employment Trends for Mining Employment, Lafayette LMA: 1971-2000 (U.S. Dept. of Commerce, Bureau of Economic Analysis, 2000).

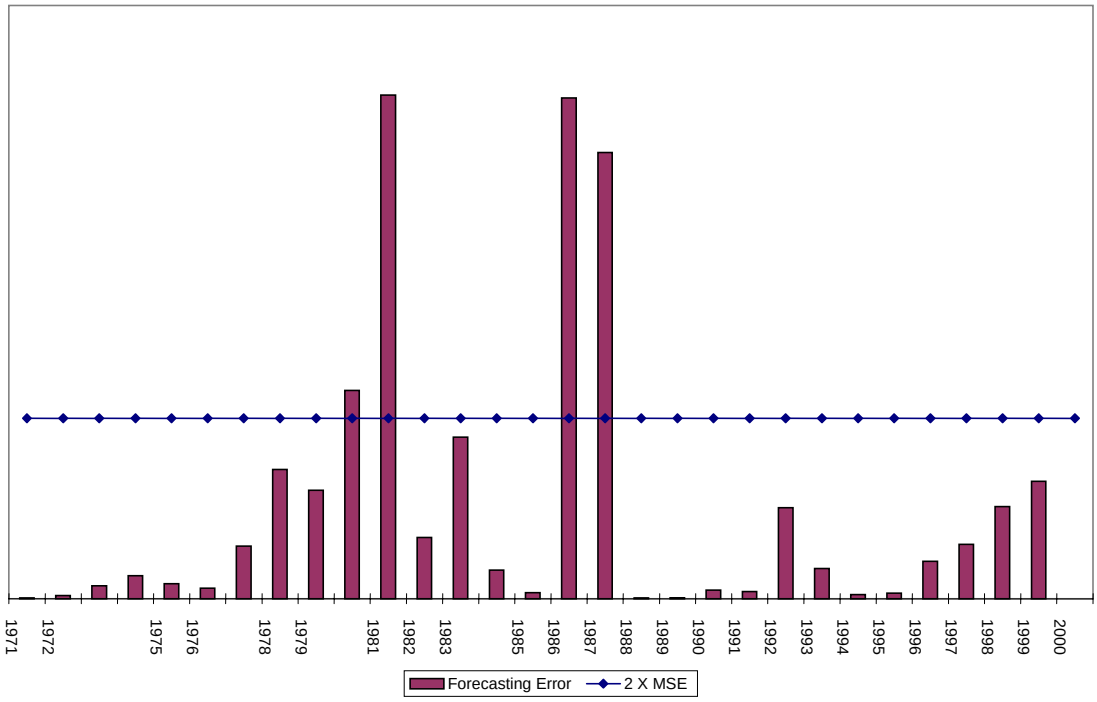


Figure 8. Forecasting Analysis for Mining Employment, Lafayette LMA: 1971-2000.

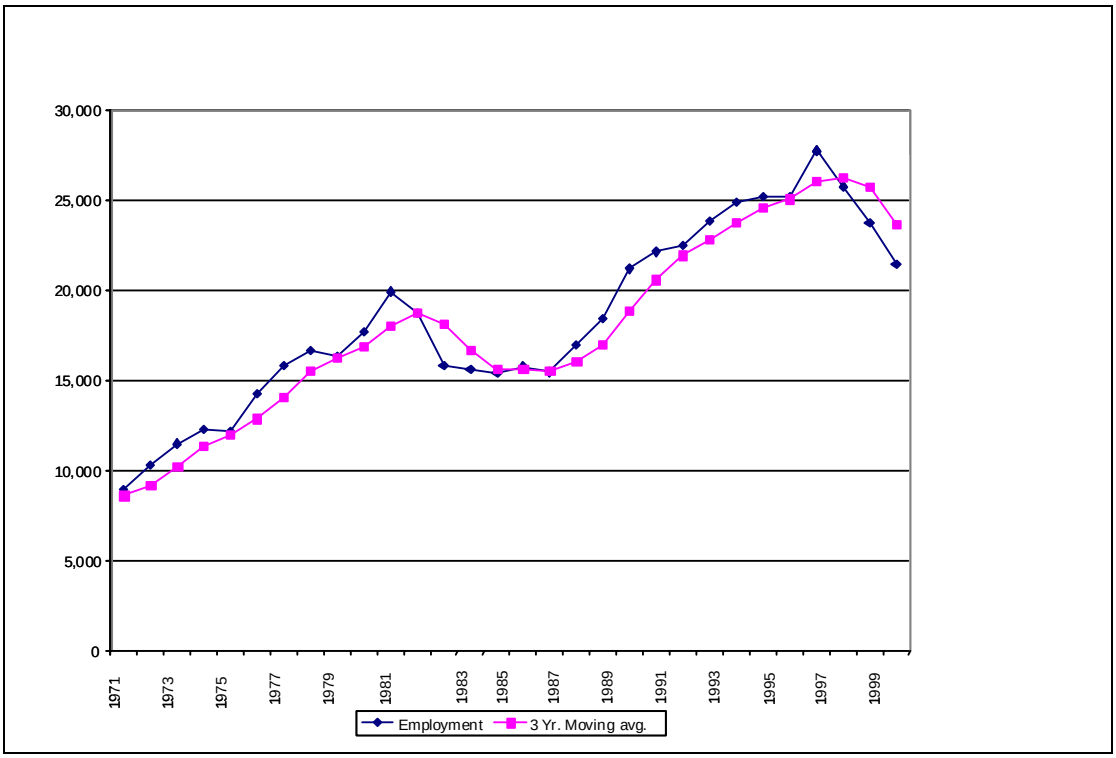


Figure 9. Employment Trends in Manufacturing Employment, Lafayette LMA: 1971-1999 (U.S. Dept. of Commerce, Bureau of Economic Analysis, 2000).

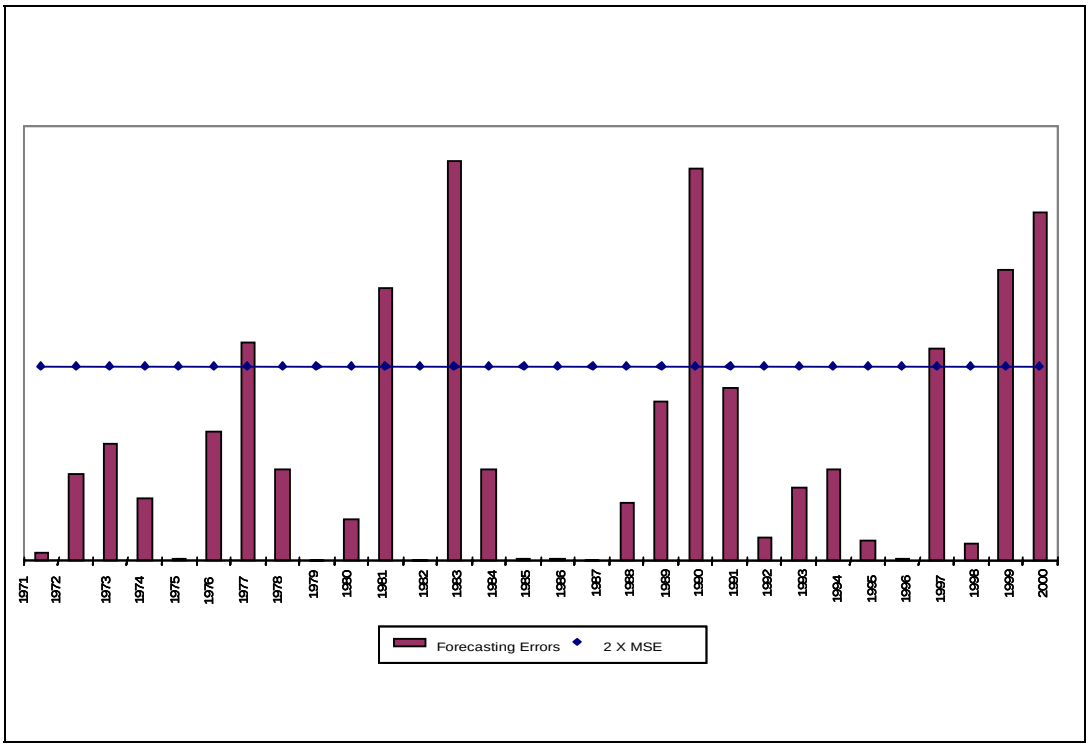


Figure 10. Forecasting Analysis for Manufacturing Employment, Lafayette LMA: 1971-2000.

The above data show a "boom and bust" period beginning in the late 1970s and extending through the later 1980s. The analysis of annual full- and part-time employment data by 1-digit industry codes indicate that these "boom and bust" periods are led by employment changes in the mining sector. However, further analyses show that a number of other industry sectors, such as manufacturing, transportation and public utilities, and wholesale trade, also experience a "boom and bust." An analysis of detailed industry codes within each of these categories may identify a link between these sectors (mining, manufacturing, wholesale trade, transportation/public utilities), changes in employment, and the oil and gas-related "boom and bust" periods.

Detailed Industry Code Analyses. In this next section, we present analyses of industry sector codes for four key industry groups: manufacturing, mining, transportation and wholesale trade (Table 1). We chose those categories based on several factors: a) relationship to oil and gas activities, b) employment levels, and c) availability of data for the years we are studying. The manufacturing category includes the sub-categories of fabricated structural metal products, ship and boat building and repair, and oil field machinery. Mining includes drilling oil and gas wells, oil and gas field exploration services, and oil and gas field service, N.E.C. The transportation category focuses exclusively on water. The wholesale trade group considers only industrial machinery and equipment. The eight detailed categories listed below are either directly or indirectly related to offshore and on-shore oil and gas activities.

Figure 11 displays the trends in *Fabricated Structural Metal Products* (SIC 3440) employment. This data depicts a pattern that is somewhat consistent with the "boom and bust" cycle of the 1970s and 1980s. For example, employment in this industry peaked at approximately 1,200 workers in 1981. In 1988, employment reached a post-1980 low of less than 400 workers. The 1990s witnessed a slight rebound in this industry, with employment levels reaching levels very close to those in 1981. The forecast analysis shows that in 1979, more employment was observed in this industry than was expected based on previous trends. In 1983 and 1984, however, employment in this industry was significantly lower than was expected, based on the forecasting analysis. These trends show growth in this industry throughout the 1970s, culminating in 1981. Shortly after there were significant drops in employment that correspond to drops in employment in other industry sectors.

Table 1

Key Industry Groups and Sub-Categories

Manufacturing		
Fabricated Structural Metal Products (SIC 3440*),* this category includes manufacture of barge sections, ship sections, buoys, and metal plates for gas tanks, gas holders, oil storage tanks, large diameter pipes, pressure valves, storage tanks and also portable building.	***Ship and Boat Building and Repairing*** (SIC 3730), this category includes building and repairing barges, cargo vessels, drilling platforms and dry docks.	***Oil Field Machinery*** (SIC 3533), this category includes bits, rock and oil field tools, derricks for oil and gas fields, drill rigs, drilling tools for gas, oil and water wells.
Mining		
Drilling Oil and Gas Wells (SIC 1381), this category includes, on a contract basis, directional drilling, redrilling, reworking, and "spudding in" of oil and gas wells**.**	***Oil and Gas Field Exploration Services*** (SIC 1382), this category includes, on a fee basis, geophysical exploration, aerial exploration, and seismograph services**.**	***Oil and Gas Field Service N.E.C.*** (SIC 1389) this category includes, on a contract basis, excavating slush pits and cellars, grading and building of foundations, well surveying, running and cutting casings, tubes and rods, cementing and shooting wells, acidizing and chemically treating wells. Operating oil and gas wells for others on a contract basis are also included in this category.
Transportation		
Water Transportation (SIC 4400), this category primarily includes stevedoring.		
Wholesale Trade		
Industrial Machinery and Equipment (SIC 5084), this category includes the wholesale of derricks, oil field tool joints, oil well supply houses, oil well machinery equipment and supplies.		

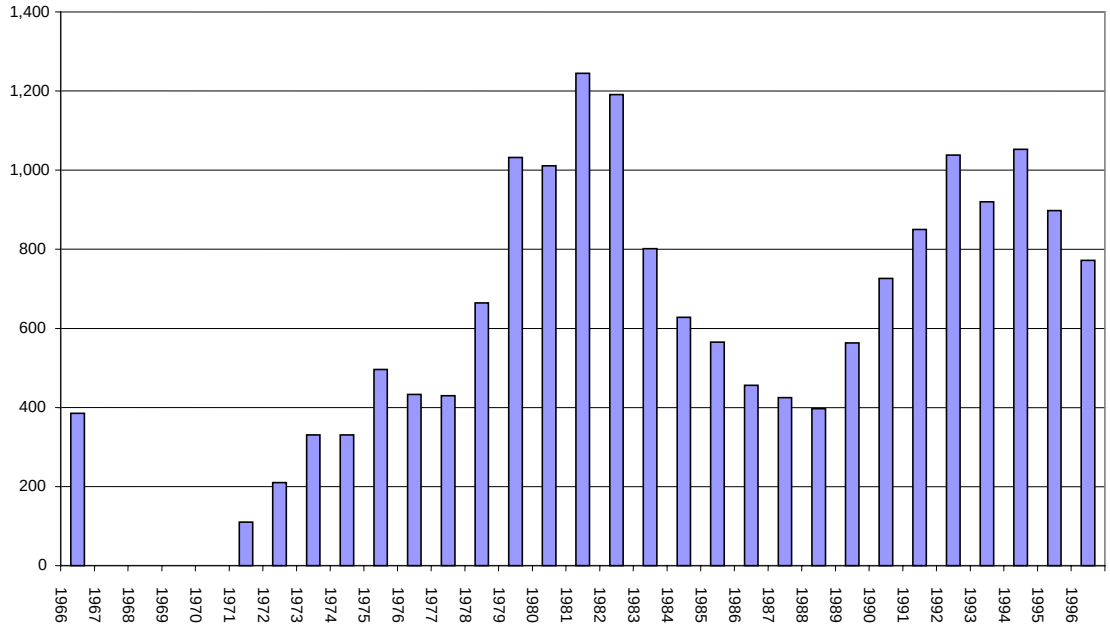


Figure 11. Annual Employment in Fabricated Structural Metal Products, Lafayette LMA: 1966-1996 (U.S. Census Bureau, 2000a).

Figures 12 and 13 present employment data on *Oil Field Machinery* (SIC 3533) manufacturing. These data show a pattern very similar to the pattern for *Fabricated Structural Metal Products* (SIC 3440). Employment growth begins in the early 1970s and extends until 1982, when almost 3,000 workers were employed in this industry in the Lafayette LMA. Following this, employment declines through the later 1980s, grows during the early 1990s, but falls to 1989 levels by 1993. The forecasting analysis in Figure 13 documents four important cycles between 1981 and 1984. In 1981 and 1982, there were significantly more workers employed in *Oil Field Machinery* (SIC 3533) production than expected. However, in 1983 and 1984, there were significantly fewer workers in this industry than expected, based on the forecasting model. During this boom and bust cycle we see sharp increases in oil field equipment manufacturing, followed by sharp declines.

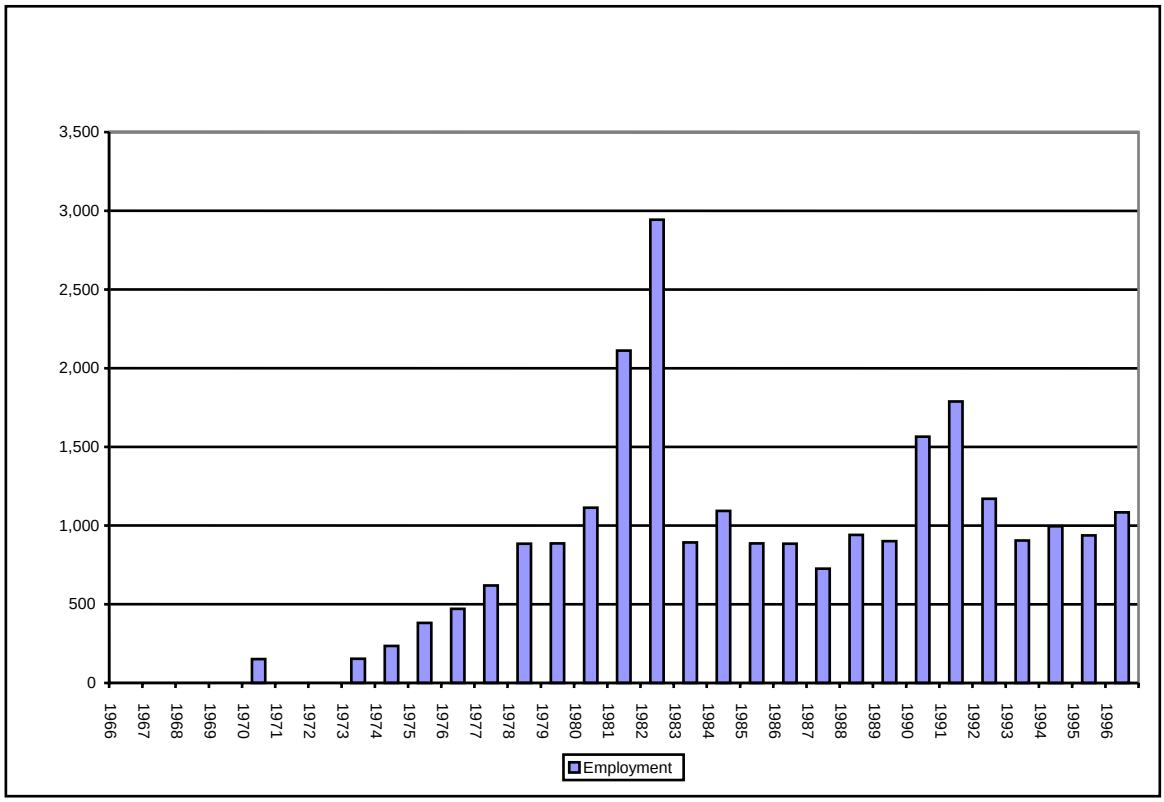


Figure 12. Employment in Oil Machinery (manufacturing), Lafayette LMA: 1966-1996 (U.S. Census Bureau, 2000a).

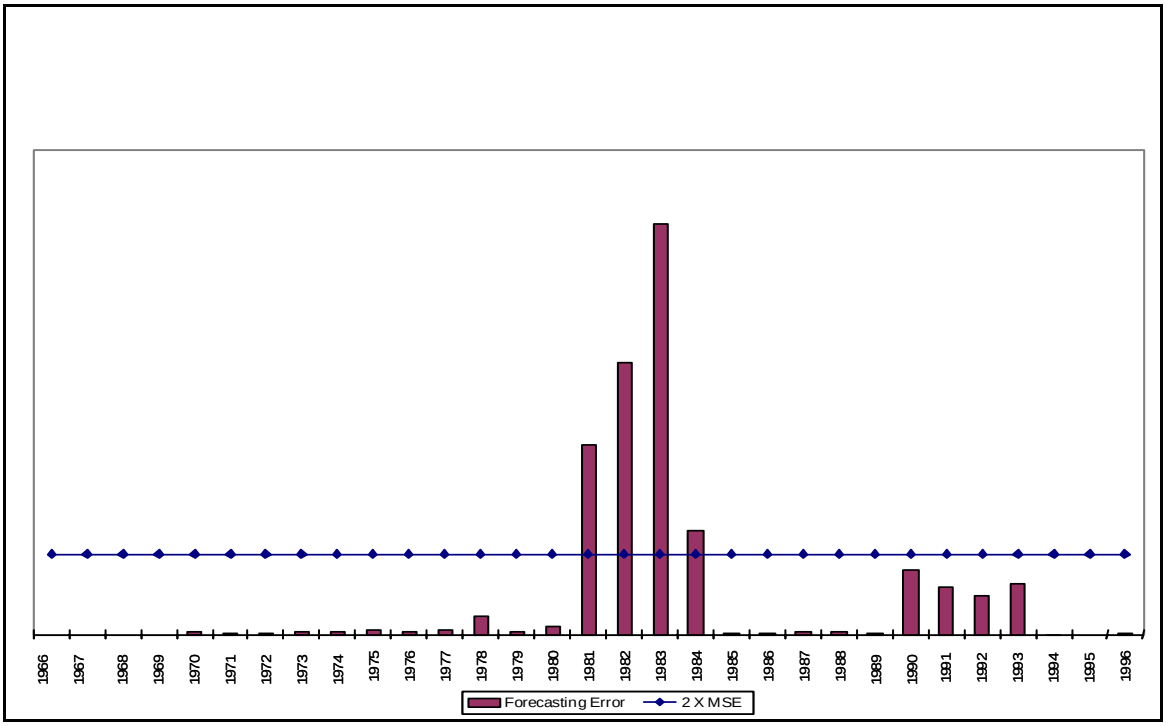


Figure 13. Forecasting Analysis for Oil Field Machinery (manufacturing), Lafayette LMA: 1966-1996.

The employment data for *Ship and Boat Building and Repairing* (SIC 3730) show the same "boom and bust" pattern as the other two detailed manufacturing sectors: significant growth in the 1970s, peaking in the early 1980s, followed by rapid declines in the mid- to late 1980s (Figures 14 and 15). Those three industries are also all directly or closely associated with oil and gas activities, including offshore activities. Thus, we conclude, downturns in these manufacturing industries in the 1980s are attributable directly to the downturn in the oil and gas industry.

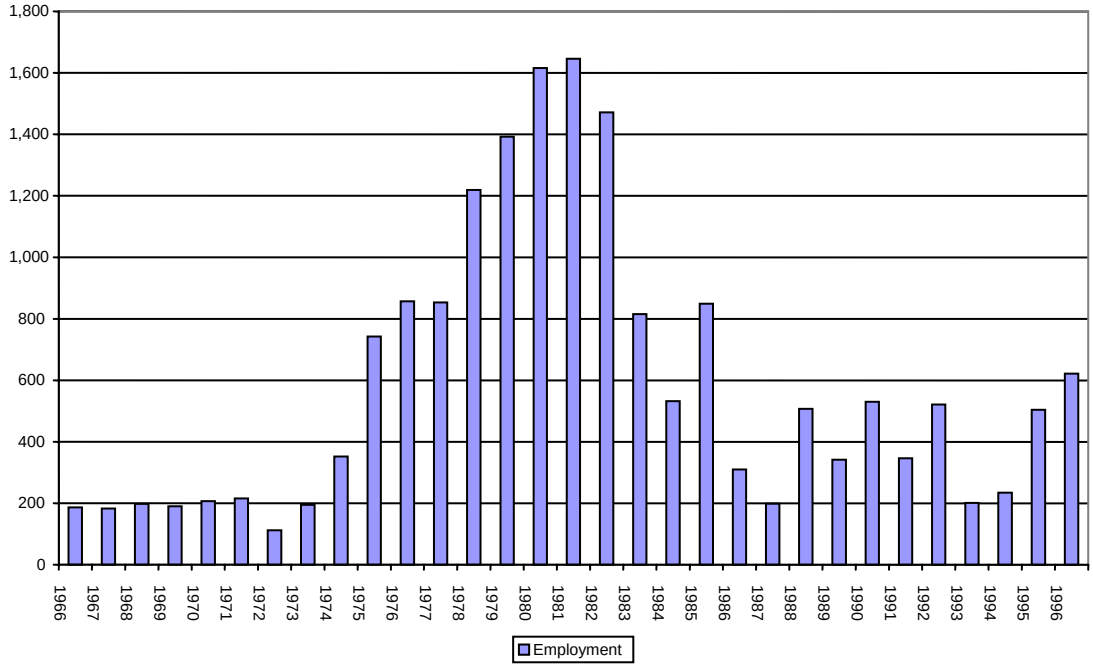


Figure 14. Annual Employment for Ship and Boat Building and Repair, Lafayette LMA: 1966-1996 (U.S. Census Bureau, 2000a).

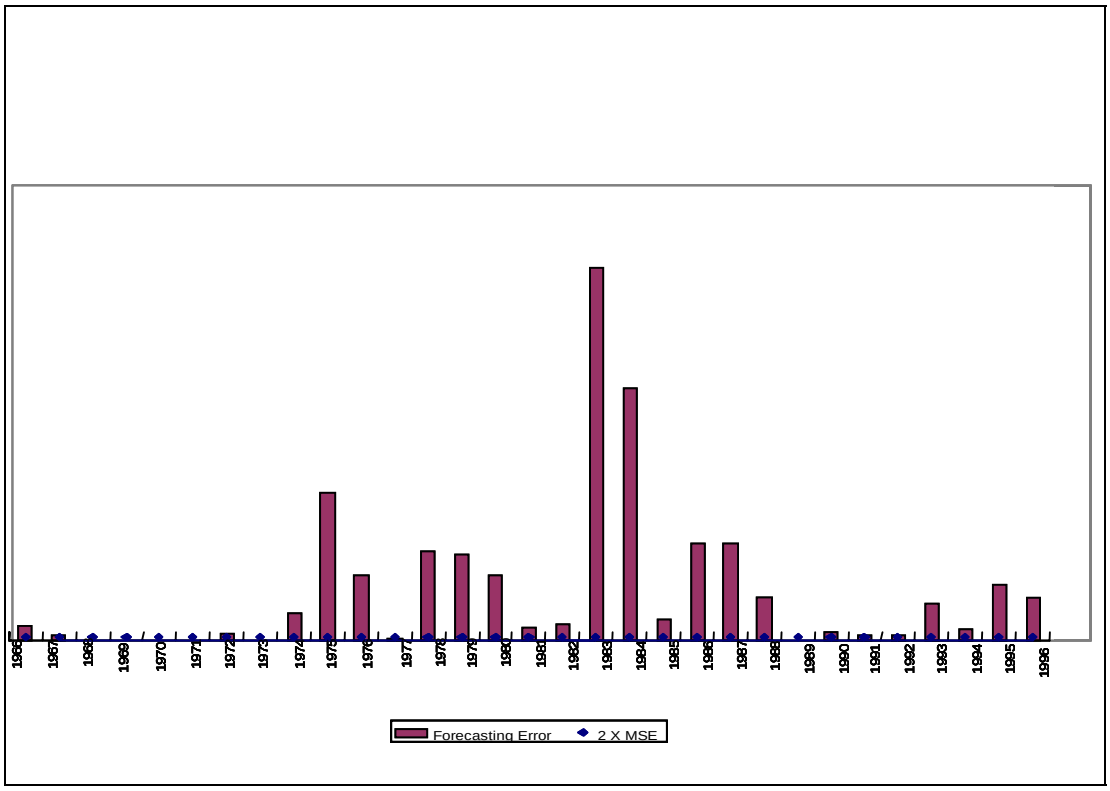


Figure 15. Forecasting Analysis for Ship and Boat Building and Repair, Lafayette LMA: 1966-1996.

Lafayette LMA Mining. The forecasting analysis for *Drilling Oil and Gas Wells* (SIC 1381) (not shown here) indicates that, in 1978 and 1979, this industry employed more workers than expected, with greater than average employment growth. However, 1983 and 1987 represent points of significant decline in this industry. During these two years this industry employed significantly fewer workers than expected under the assumptions of the forecasting model. The data show an industry that peaked in 1982 with employment levels over 6,000. By 1987, employment had dropped to 1,600. Since 1987 employment in this industry has been rather sporadic. Furthermore, 1993 is also a year where fewer workers were employed in this industry than expected.

The *Oil and Gas Field Exploration Services* (SIC 1382) data show a very familiar pattern: rapid growth in the late 1970s and early 1980s, followed by rapid declines in employment throughout the 1980s (Figures 16 and 17). As with other industry sectors, this cycle also ends in 1987. Following 1987, employment in this industry is volatile from year-to-year, very similar to the pattern discovered with *Drilling Oil and Gas Wells* (SIC 1381). The forecasting analysis shows that 1981 through 1984 are the crucial years for this industry. The data for 1981 and 1982 show greater than expected employment levels; the data for 1983 and 1984 show lower than expected employment levels.

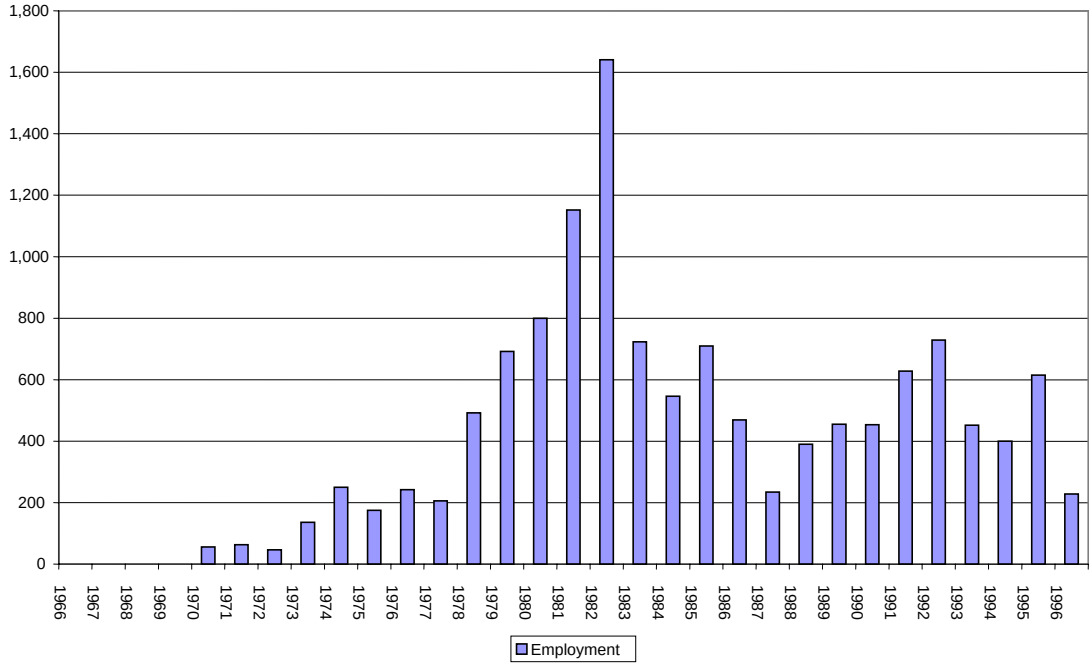


Figure 16. Annual Employment for Oil and Gas Exploration Services, Lafayette LMA: 1966-1996 (U.S. Census Bureau, 2000a).

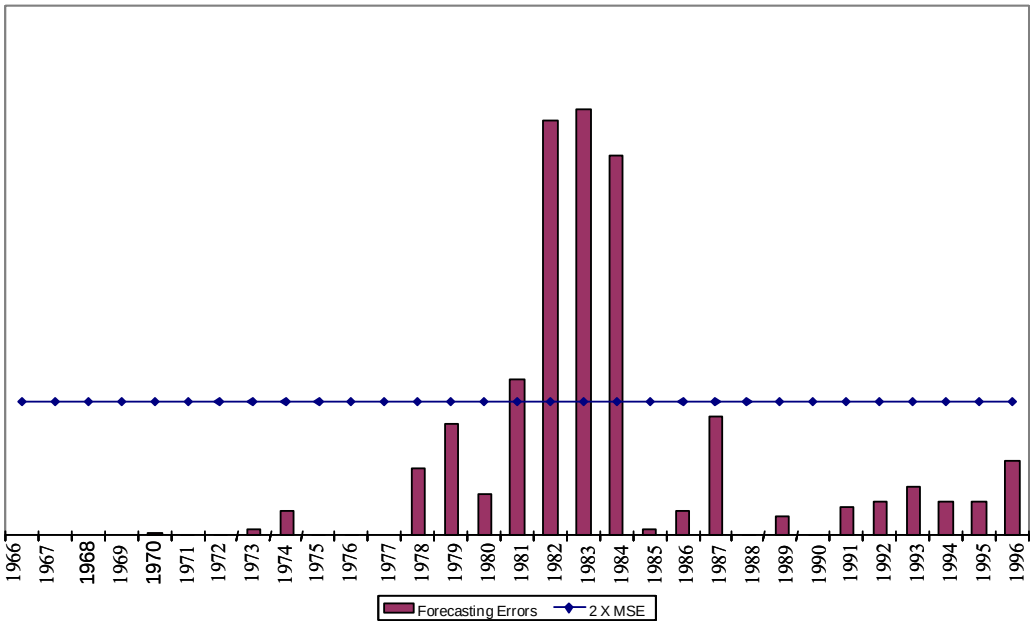


Figure 17. Forecasting Analysis for Oil and Gas Exploration Field Services, Lafayette LMA: 1966-1996.

The following figures present the employment trends for the *Oil and Gas Field Service N.E.C.* (SIC 1389) (Figures 18 and 19). This industry shows patterns both similar to, and slightly different, from the other mining categories. The similarities are present for the "boom and bust" time period. By 1982, employment in this industry sector exceeded 12,000 workers. By 1987, however, employment in that sector decreased by more than 50 percent. The forecasting analysis shows several key years in the data trends: 1981, 1982, 1983, 1984 and 1987. In 1981 and 1982, considerably more people were employed in this sector than were expected. In 1983 and 1984, however, significantly fewer workers were employed in this sector than expected based on the forecasting model. In fact, between 1982 and 1983, more than 4,000 workers were dislocated from this industry. Between 1986 and 1987, an additional 2,000 jobs were lost. However, this industry made something of a comeback in the 1990s. Between 1992 and 1996, employment in this industry grew by almost 200 percent. In 1996, over 8,000 workers were employed in this industry, putting the *Oil and Gas Field Service N.E.C.* (SIC 1389) at 75 percent of its 1982 high employment mark.

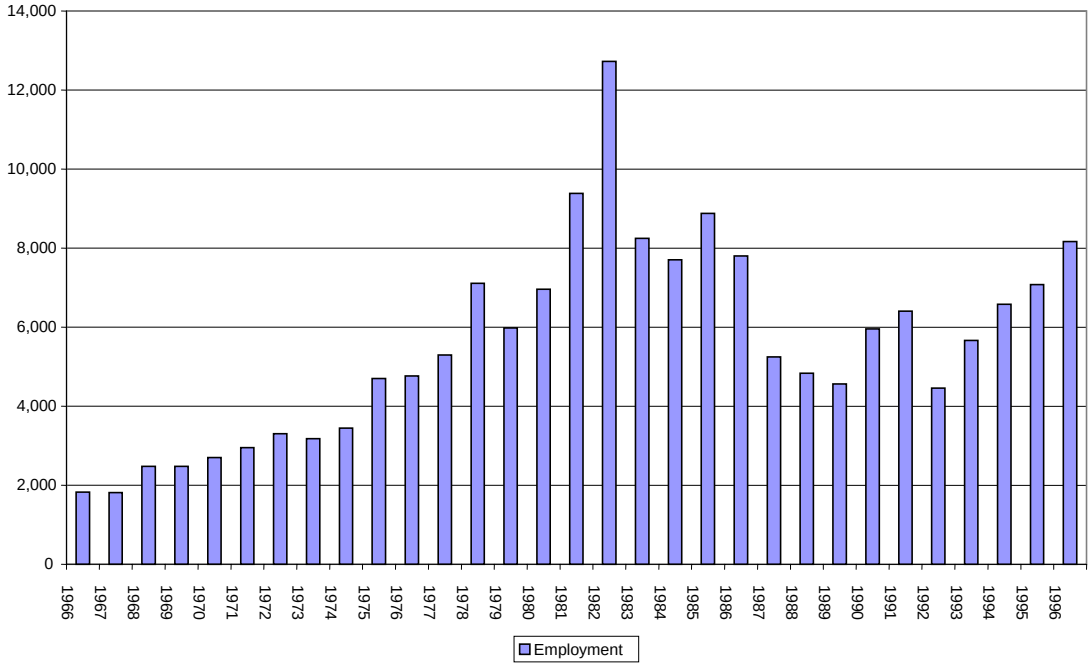


Figure 18. Annual Employment for Oil and Gas Field Services, Lafayette LMA: 1966-1996 (U.S. Census Bureau, 2000a).

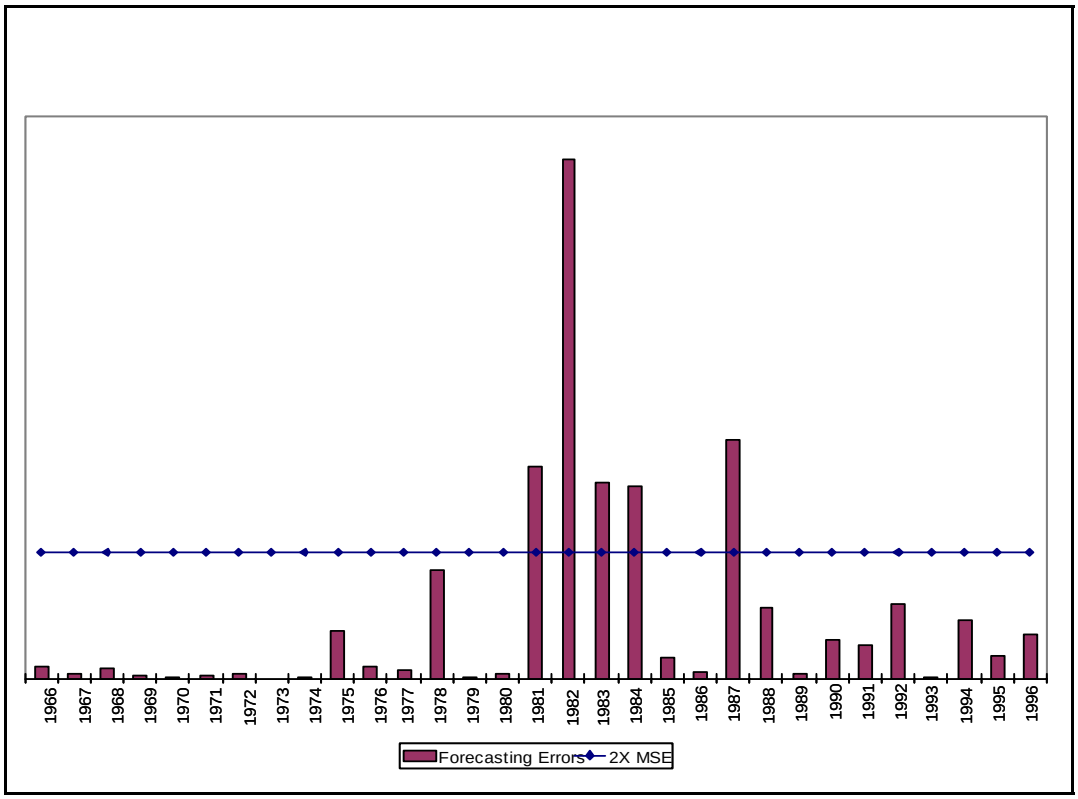


Figure 19. Forecasting Analysis for Oil and Gas Field Services, Lafayette LMA: 1966-1996.

Lafayette LMA Water Transportation. Figures 20 and 21 present data on *Water Transportation* (SIC 4400) employment. Unfortunately, there is no category that directly measures water transportation related to offshore oil and gas activities. Previously, we found a "boom and bust" trend in transportation and public utilities. We suspect that this trend is directly related to offshore oil and gas activities. We believe that a direct examination of water transportation earnings will reveal the impact of oil and gas activities. Employment in *Water Transportation* (SIC 4400) peaked in 1981 and 1982, and declined significantly after that period. Between 1982 1987, over half of all jobs in this industry were lost in the Lafayette LMA. Since 1993, this industry has grown slowly.

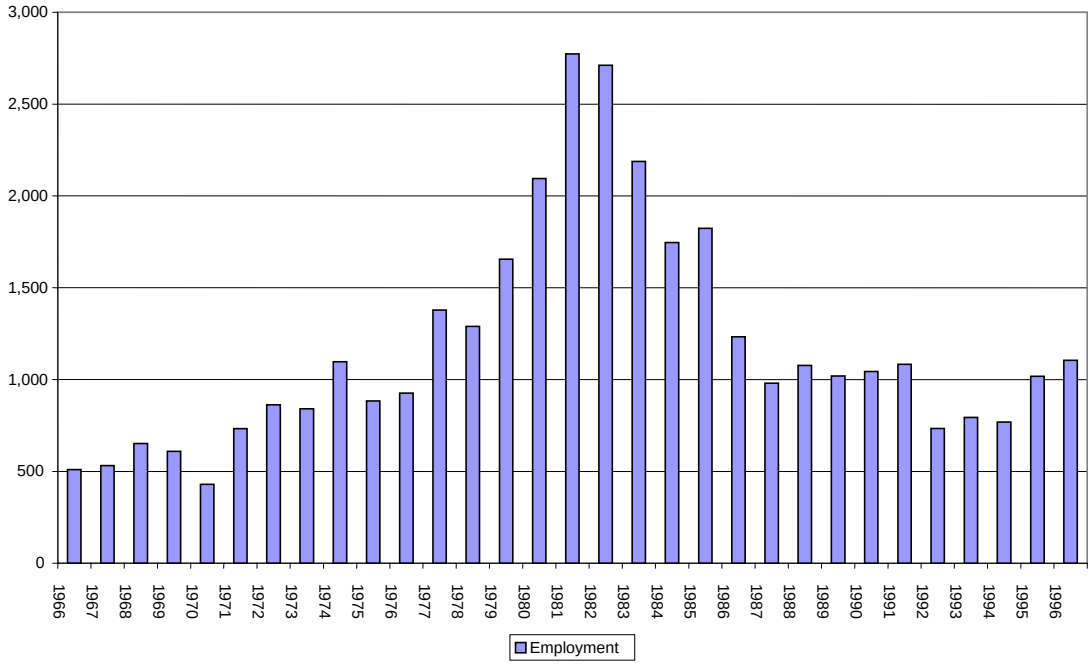


Figure 20. Annual Employment for Water Transportation, Lafayette LMA: 1966-1996 (U.S. Census Bureau, 2000a).

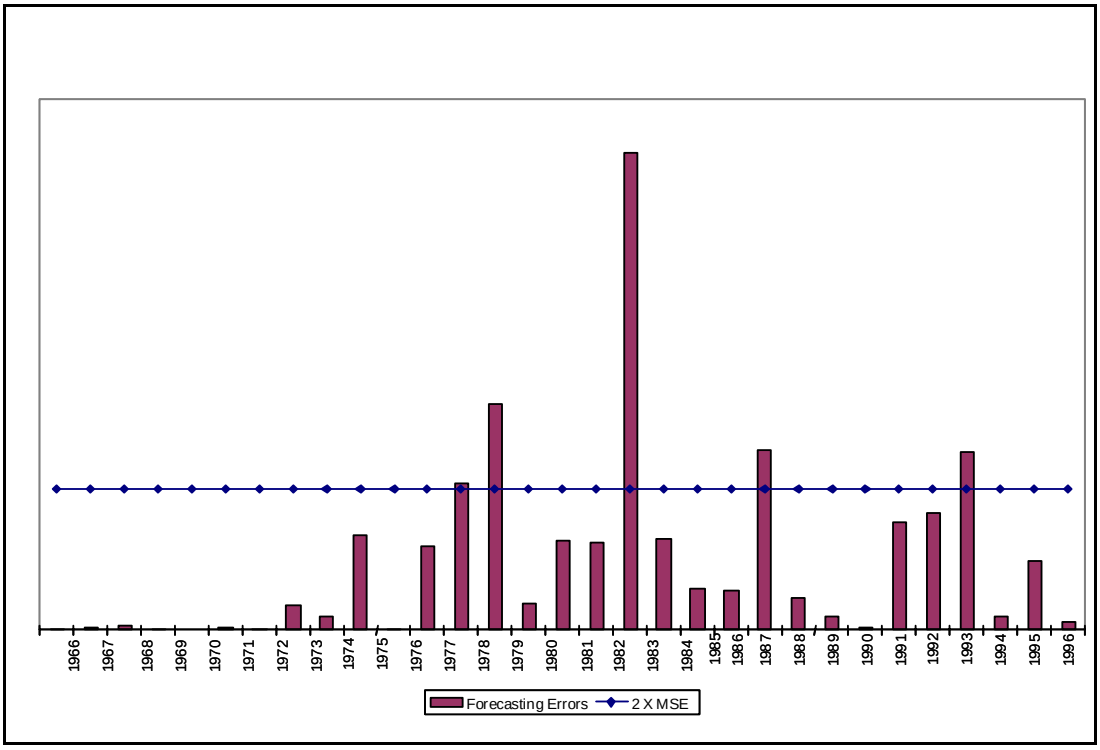


Figure 21. Forecasting Error Analysis for Water Transportation, Lafayette LMA: 1966-1996.

Lafayette LMA Wholesale Trade. Figure 22 presents the data for *Industrial Machinery and Equipment* (SIC 5084). This industry category includes the wholesale marketing of oil well machinery. These data are available only from 1977 to 1996, which does not provide enough years for forecasting analysis. However, the trend line shows the familiar pattern of growth in the 1970s: an apex in the 1981, followed by subsequent decline throughout the 1980s. In 1987, employment in this sector reached a low-point of 1,200 workers. This trend is of interest because employment in this industry has increased in an almost linear fashion since 1987. In 1996, 1,000 more workers were employed in this industry than were in 1987. There also has been employment growth in the wholesale marketing of industrial machinery and equipment (including oil well machinery) in the 1990s.

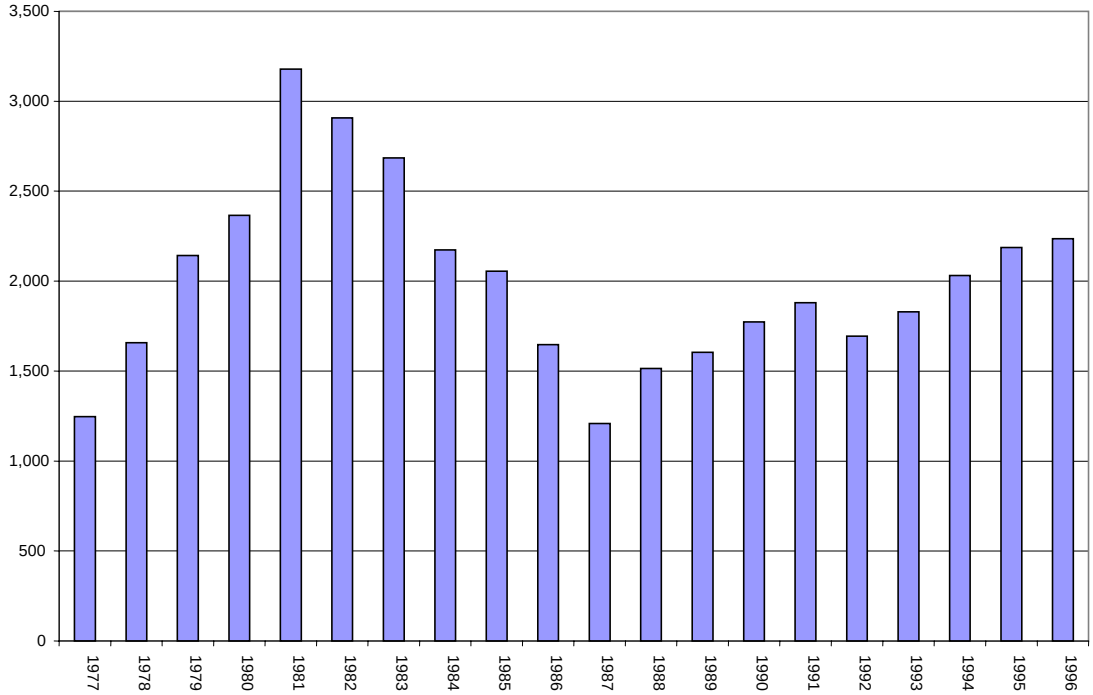


Figure 22. Annual Employment for Wholesale Trade of Industrial Machinery and Equipment, Lafayette LMA: 1977-1996 (U.S. Census Bureau, 2000a).

Lafayette LMA Population, Education, and Local Government: 1970-1990. In this section we examine how industry changes affected population, education and local government issues between 1970 and 1990.

Population. The population of the Lafayette Labor Market Area rose 17 percent between 1970 and 1980, increasing from 406,000 to 476,000 persons. The 17 percent growth rate for the entire LMA is significantly greater than for the national growth rate of 11.4 percent for the same period. Within the LMA, the population grew fastest in Lafayette Parish. Between 1980 and 1990, the population of the Lafayette LMA grew by only 4 percent, a rate less than half of the national growth rate of 9.8 percent (Table 2). Furthermore, many parishes experienced negative population growth, indicating extensive out-migration, particularly in the most rural parishes (St. Landry, Evangeline, and Acadia).

Arguably, the data on racial composition indicate that whites were more affected than blacks by the growth and decline of population in the Lafayette LMA during the 1970s and 1980s. Between 1970 and 1980, the percent of the population black declined from 26.7 percent to 24.9 percent. During the same time period the Caucasian population increased slightly from 73 percent to 74.8 percent. Between 1980 and 1990, the African-American population increased from 24.9 to 26.1 percent, while the Caucasian population decreased to 72.7 percent (Tables 3 and 4). These patterns indicate that the changes in Lafayette LMA industries affected white population growth and decline, suggesting that the job growth in the 1970s was skewed toward whites (Olien and Olien, 1982).

Table 2

Total Population by Parish, Lafayette LMA: 1940-2000

Parish	1940	1950	1960	1970	1980	1990	2000
Acadia	46,260	47,050	49,931	52,109	56,427	55,882	58,861
Evangeline	30,497	31,629	31,639	31,932	33,343	33,274	35,434
Iberia	37,183	40,059	51,657	57,397	63,752	68,297	73,266
Lafayette	43,941	57,743	84,656	109,716	150,017	164,762	190,503
St. Landry	71,481	78,476	81,493	80,364	84,128	80,331	87,700
St. Martin	26,394	26,353	29,063	32,453	40,214	43,978	48,583
Vermilion	37,750	36,929	38,855	43,071	48,458	50,055	53,807
LMA Total	293,506	318,239	367,294	407,042	476,339	496,579	548,154

Source: U.S. Census Bureau, 2000b.

Table 3

Percent of White Population, Lafayette LMA: 1940-2000

Parish	1940	1950	1960	1970	1980	1990	2000
Acadia	82.0	80.8	80.3	80.0	82.3	81.2	80.1
Evangeline	77.0	76.1	73.2	72.8	75.8	73.4	69.8
Iberia	63.8	67.6	71.3	72.1	71.8	68.8	64.3
Lafayette	67.9	72.7	76.0	78.0	78.7	76.0	72.3
St. Landry	52.6	55.3	57.0	58.5	61.7	59.3	56.0
St. Martin	63.4	63.0	62.7	65.0	66.6	65.5	65.5
Vermilion	86.6	87.2	87.1	86.3	86.1	84.4	81.8
LMA %	68.8	70.2	71.6	73.0	74.7	72.6	69.6
LMA Total	202,121	223,518	262,949	297,505	356,191	360,844	381,763

Source: U.S. Census Bureau, 2000b.

Table 4

Percent of Black Population, Lafayette LMA: 1940-2000

Parish	1940	1950	1960	1970	1980	1990	2000
Acadia	18.0	19.1	19.6	19.9	17.5	18.3	18.2
Evangeline	22.9	23.8	26.8	27.0	24.0	26.0	28.3
Iberia	30.6	32.3	28.6	27.8	27.7	29.4	30.6
Lafayette	32.1	27.2	24.0	21.7	20.2	22.3	23.7
St. Landry	47.3	44.6	42.9	41.3	37.9	40.2	41.9
St. Martin	36.5	36.9	37.2	34.8	32.8	33.0	31.8
Vermilion	13.3	12.7	12.9	13.4	13.2	13.9	14.0
LMA %	31.1	29.7	28.3	26.8	24.6	26.1	27.0
LMA Total	91,372	94,680	104,226	109,092	117,441	129,662	148,099

Source: U.S. Census Bureau, 2000b.

The population growth rates deviate from the national trends during the 1970-1980 period. Deviation comes from two sources: natural increase and migration. Rapid growth or decline comes almost exclusively from migration. Net migration is a useful concept through which to view the equilibration of employment and population in sub-regions, and the adaptation of the ecosystem to changes in its external environment. One important component of the explanation of net migration is the expansion and contraction of employment opportunities within a particular area (Micklin and Choldin, 1984). More specifically, "boom and bust" patterns in extractive industries in non-metropolitan settings can be expected to produce rapid shifts in the direction of net migration because industry-specific employment fluctuations may be large relative to total employment in an area (Rural Sociological Society Task Force, 1993; Beard, 1988; Frey and Speare, 1988). Periods of rapid employment growth will attract workers (and possibly dependent household members) from outside the region. Periods of employment decline can lead to compensating out-migration flows.

Education. Educational attainment levels in the Lafayette LMA lagged behind those for the State of Louisiana as a whole (Table 5). In 1970, 33 percent of the adults in the Lafayette LMA were high school graduates, compared to 43 percent for the state. By 1980, 50 percent of adults in the Lafayette LMA were high school graduates, compared to 59 percent in the State of Louisiana. This may be due in part to the fact that many jobs in natural resource based industries are labor intensive and do not typically require many years of formal education (Rural Sociological Society Task Force, 1993). Additionally, the number of adults who attended but did not complete high school actually increased in the Lafayette LMA between 1970 and 1980 (by over 9,000). In contrast, the percentage of adults without a high school education dropped from 50 percent in 1980 to 40 percent in 1990. Moreover, by 1990, the percent of adults without a high school diploma in the State of Louisiana reached 32 percent, narrowing the education gap between the state and the Lafayette LMA. This could be because the bust in the oil and gas industry led to an out-migration of people without high school diplomas, chasing labor intensive jobs elsewhere.

Table 5

Adult Educational Attainment (age 25+), Lafayette LMA: 1970-2000

Parish	0-8 Years	Some High School	High School Diploma	Some College, No Degree	BA/BS or More	Total
1970						
Acadia	55.9%	15.1%	19.3%	4.7%	4.8%	26,165
Evangeline	60.7%	15.2%	17.2%	3.4%	3.3%	16,186
Iberia	47.8%	18.3%	22.1%	5.9%	5.7%	27,368
Lafayette	36.5%	15.1%	23.3%	11.5%	13.5%	50,227
St. Landry	59.1%	13.9%	17.2%	4.4%	5.2%	38,415
St. Martin	62.6%	14.8%	15.4%	3.4%	3.6%	14,839
Vermilion	55.7%	16.7%	18.5%	4.6%	4.3%	22,434
LMA Total	51.3%	15.5%	19.8%	6.3%	7.0%	195,634
1980						
Acadia	41.5%	18.3%	25.9%	6.9%	7.3%	29,922
Evangeline	44.8%	17.9%	23.9%	6.7%	6.6%	17,948
Iberia	32.8%	17.5%	30.3%	9.5%	9.7%	32,841
Lafayette	22.3%	13.4%	27.4%	16.2%	20.5%	77,495
St. Landry	43.4%	15.5%	25.1%	7.7%	8.3%	44,327
St. Martin	44.7%	15.9%	26.4%	6.2%	6.7%	20,076
Vermilion	37.8%	18.6%	27.3%	8.2%	8.0%	26,373
LMA Total	34.8%	16.0%	26.8%	10.4%	11.9%	248,982
1990						
Acadia	27.6%	18.8%	34.3%	10.6%	8.6%	32,178
Evangeline	34.0%	16.6%	28.6%	9.1%	8.6%	19,014
Iberia	22.9%	18.6%	37.0%	12.1%	9.2%	38,499
Lafayette	13.5%	14.2%	29.0%	19.8%	23.3%	93,383
St. Landry	28.6%	17.2%	33.3%	10.9%	9.9%	46,211
St. Martin	27.4%	19.9%	34.7%	11.0%	6.8%	24,616
Vermilion	25.1%	17.6%	36.4%	11.8%	9.0%	29,543
LMA Total	22.6%	17.1%	32.6%	14.0%	13.6%	283,444
2000						
Acadia	17.4%	18.1%	38.0%	17.2%	9.4%	35,573
Evangeline	21.8%	22.7%	30.6%	15.3%	9.4%	21,511
Iberia	15.2%	17.8%	38.5%	17.2%	11.1%	43,965
Lafayette	8.1%	12.0%	29.0%	25.3%	25.4%	116,183
St. Landry	20.0%	17.9%	33.2%	18.0%	10.7%	53,592
St. Martin	19.0%	18.1%	37.8%	16.5%	8.5%	29,617
Vermilion	15.9%	18.4%	38.0%	16.9%	10.7%	33,616
LMA Total	14.6%	16.2%	33.6%	20.0%	15.5%	334,057

Source: U.S. Census Bureau, 2000b.

Finances. The oil and gas industry "boom and bust" of the 1970s and 1980s had an important effect on the financing of local governments in the Lafayette LMA. The local government finance data show that total revenues for local governments increased by 46 percent in constant dollars between 1972 and 1982. State allocation to local governments increased by 13 percent during the same period. In 1972, state allocations accounted for almost half of local government revenue in the Lafayette LMA. By 1982, state allocation accounted for only one-third of local government revenue (Tables 6-9).

Local governments in the Lafayette LMA had to incur debt to finance the increased demand for services that came with economic growth during the boom of the 1970s and early 1980s. Between 1972 and 1982, local government debt for the entire LMA increased by 63 percent in real dollars. Between 1977 and 1982, per capita local government debt increased by over 200 percent in Lafayette Parish. In 1982, local government debt was over $3,000 per person in 1982 dollars (over $5,000 in 1997 dollars) in Lafayette Parish.

Between 1982 and 1987, total local government revenue grew by a modest amount (12% in constant dollars) in the Lafayette LMA. However, state revenue actually fell during that period by 15 percent in constant dollars. The drop off in state revenue was recaptured through increased local government debt. Between 1982 and 1987, local governments in the Lafayette LMA accrued, on average, an increase in debt of 15 percent. The debt load was highest in Lafayette Parish. In 1987, the total debt per person exceeded $4,600 per person in current (1987) dollars.

The boom and bust periods in the oil and gas industry impacted a wide range of industries in the Lafayette LMA. In particular, the 1980s were a period of economic downturn and transition. In the eight categories discussed in this report, the Lafayette LMA lost over 21,500 jobs between 1982 and 1987— and this does not include the jobs lost in other supporting industries due to the "ripple" effects of economic shock. For example, downturns occurred in other oil and gas dependent industries, such as construction and retail trade. When people lose their jobs they do not build and they do not purchase as many goods and services.

The 1990s ushered in an era of recovery for the Lafayette LMA. During that decade, population growth within the Lafayette LMA exceeded 8 percent, while total employment grew by 16 percent. The service sector, which grew by 43 percent, supplied many new jobs within this LMA. However, the percentage of adults with a college degree in the Lafayette LMA continued to lag behind national averages. In 2000, only 15 percent of adults in the Lafayette LMA had a college degree, compared to 26 percent for the nation. This indicates that the service sector job growth that occurred during the 1990s did not contain as many positions requiring a college degree as did the service sector in other LMAs within the region, such as Houston.

While state revenues to local governments did not increase during the 1990s, the debt load for local governments declined between 1992 and 1997. For the entire Lafayette LMA, local debt decreased by 26 percent, on a per capita basis. And, also in Lafayette Parish, where per capita debt had reached $4,000 (in 1997 dollars) in 1992, the per capita debt load had decreased 33 percent by 1997. Between 1992 and 1997, total revenues for local governments increased by 12 percent. However, revenues from taxes and the state did not increase. This suggests that local economic activity was generating other sources of revenue for local governments, a sign that the Lafayette LMA economy was recovering from the "bust" of the 1980s.

Table 6

Total Revenue, Per Capita (in 1997 adjusted dollars), Lafayette LMA: 1972-1997

County	1972	1977	1982	1987	1992	1997
Acadia	$199	$1,528	$1,507	$1,582	$1,297	$1,469
Evangeline	$504	$1,541	$1,592	$1,414	$2,059	$1,457
Iberia	$411	$1,777	$2,066	$1,918	$2,440	$2,166
Lafayette	$329	$1,756	$2,422	$3,452	$1,740	$2,421
St. Landry	$1,723	$1,871	$2,111	$1,864	$2,090	$2,003
St. Martin	$1,060	$1,724	$1,473	$1,494	$1,831	$1,639
Vermilion	$7,734	$1,919	$2,677	$2,429	$1,935	$2,900
LMA Total	$1,108	$1,751	$2,104	$2,358	$1,892	$2,131

Source: U.S. Census Bureau, 2000a.

Table 7

Total State Revenue, Per Capita (in 1997 adjusted dollars), Lafayette LMA: 1972-1997

County	1972	1977	1982	1987	1992	1997
Acadia	$546	$704	$644	$552	$671	$716
Evangeline	$668	$808	$837	$677	$822	$841
Iberia	$621	$831	$869	$717	$863	$897
Lafayette	$611	$549	$536	$450	$578	$505
St. Landry	$751	$811	$877	$801	$984	$855
St. Martin	$595	$819	$772	$664	$692	$792
Vermilion	$604	$710	$807	$644	$716	$757
LMA Total	$634	$711	$719	$609	$732	$709

Source: U.S. Census Bureau, 2000a.

Table 8

Total Tax Revenue, Per Capita (in 1997 adjusted dollars), Lafayette LMA: 1972-1997

County	1972	1977	1982	1987	1992	1997
Acadia	$354	$368	$366	$414	$415	$427
Evangeline	$261	$276	$269	$326	$422	$363
Iberia	$453	$464	$546	$594	$570	$624
Lafayette	$424	$462	$619	$664	$679	$668
St. Landry	$378	$310	$349	$366	$460	$417
St. Martin	$346	$314	$343	$368	$369	$408
Vermilion	$420	$459	$662	$581	$493	$653
LMA Total	$391	$398	$491	$520	$537	$552

Source: U.S. Census Bureau, 2000a.

Table 9

Total Debt, Per Capita (in 1997 adjusted dollars), Lafayette LMA: 1972-1997

County	1972	1977	1982	1987	1992	1997
Acadia	$1,319	$1,129	$1,033	$694	$493	$538
Evangeline	$867	$482	$395	$1,227	$718	$423
Iberia	$1,210	$1,028	$1,472	$1,794	$1,398	$1,018
Lafayette	$2,170	$1,848	$5,371	$6,613	$4,325	$2,898
St. Landry	$1,540	$1,048	$699	$814	$814	$730
St. Martin	$1,518	$756	$998	$1,234	$726	$999
Vermilion	$1,442	$1,022	$1,706	$1,495	$1,036	$736
LMA Total	$,1581	$1,233	$2,468	$2,982	$2,052	$1,502

Source: U.S. Census Bureau, 2000a.

Discussion of the impact of the oil and gas extraction industry on southern Louisiana has frequently invoked a broader framework of industry "boom and bust" that is said to be common for extractive industries more generally. Our analysis confirms that pattern in certain respects for the Lafayette LMA. The data show an entire labor market area caught in a market contraction in a natural resource industry during the 1980s. However, the historical data for the Lafayette LMA suggest two important trends to keep in mind.

First, this cycle is unique to the time period (1978-1987). While off-shore drilling has occurred in the Gulf of Mexico since the 1940s, we do not find any other "boom or bust" cycles for oil and gas related industries in years prior to the 1970s. The expansion of the oil and gas industry in the LMA that was particularly associated with the move off-shore after 1947 surely had profound effects on the Lafayette LMA. For example, the emergence of this industry helped provide the LMA with a base industry to substitute for the rapidly declining agricultural sector. As the preceding analysis of population changes showed, the rise of the oil and gas industry did not (except for the 1970s) make the LMA a net in-migration area. Rather, the emergence of this labor market as a center of oil and gas extraction activity lessened the degree of out-migration experienced by other agriculturally-dependent areas of Louisiana. The growth of the manufacturing in the Lafayette LMA was in large measure a by-product of oil and gas extraction activities in the area. The area's other principal manufacturing industry–textiles–would almost certainly not have offset the incidence of out-migration.

The second important trend is that, in terms of employment, the greater Lafayette LMA recovered in the 1990s from the economic downturns of the 1980s. By 1996 total employment levels surpassed those set at the height of the 1982 oil and gas "boom." Furthermore, the wholesale trade of oil field machinery and oil field services experienced some post-bust growth. As in most other labor market areas, the industrial structure of the Lafayette LMA diversified during the 1990s. This diversification is particularly visible in the growth of service industries such as health care that are only indirectly related to the presence of oil and gas extraction activities in the region.

On-going restructuring in the oil and gas industry make it doubtful that employment levels in oil and gas related industries will return to those at the height of the oil and gas boom of the early 1980s. It is also doubtful that the Lafayette LMA will experience an oil and gas boom and bust cycle like that of the late 1970s and early 1980s. The move to deepwater oil and gas

extraction industries during the post-1987 recovery has been accompanied by growing capital intensity in the industry and by a less volatile reaction by industry investors to short-term fluctuations in the market price of oil and gas.

3. Lafourche, Louisiana: Labor Market Area

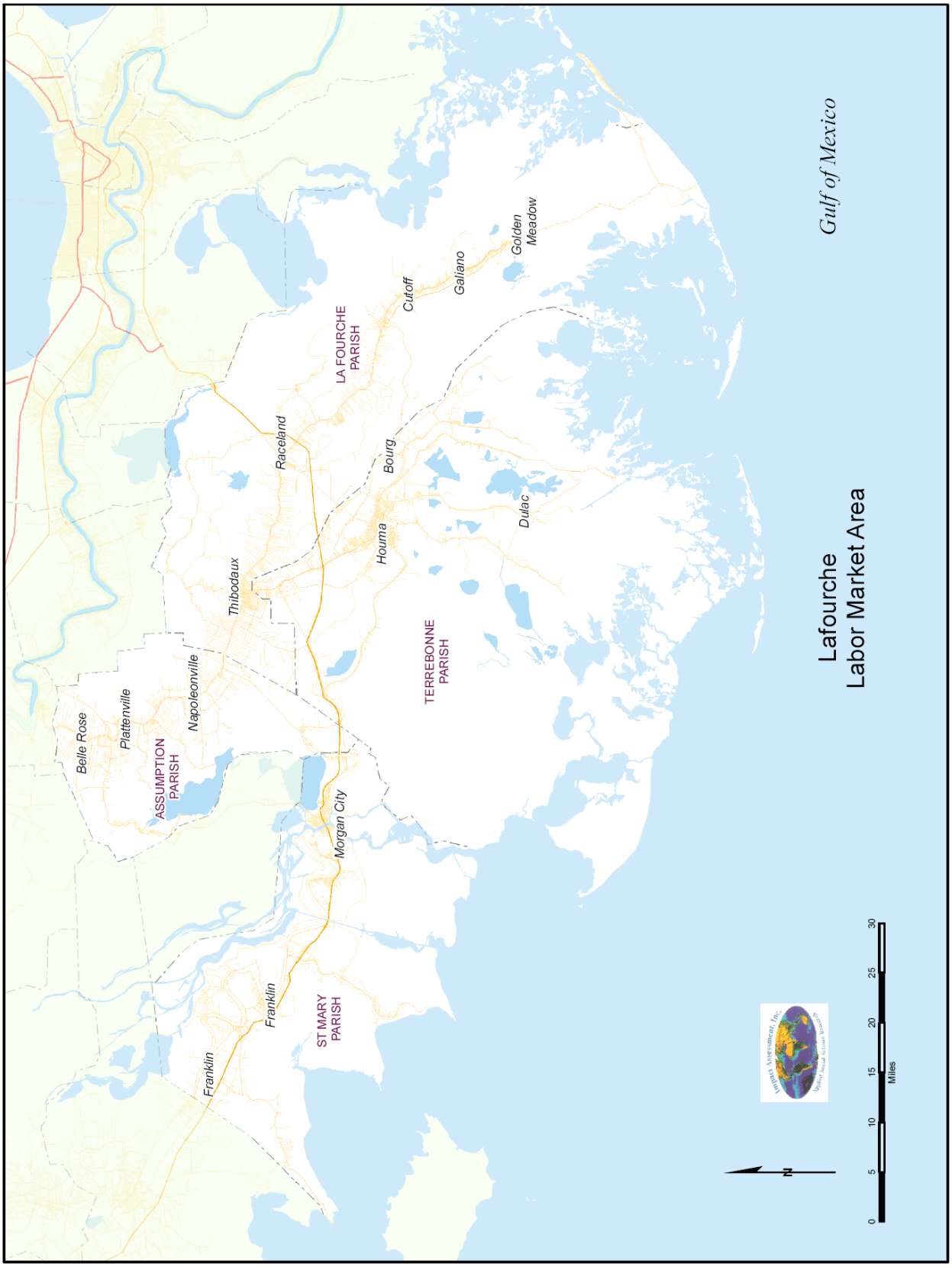
Four Louisiana parishes comprise the Lafourche Labor Market Area (LMA): Assumption, Lafourche, St. Mary, and Terrebonne (Map 9). The Census Bureau estimates the year 2000 population of these four parishes at 271,365.

First Unit of Analysis: Lafourche LMA Employment, 1940-1970. Agriculture was the dominant industry in 1940, employing over 45 percent (14,000) of the workforce. Wholesale and retail trade, and manufacturing each employed over 13 percent. The mining industry, including oil and gas workers, employed only 6 percent (approximately 2,000) of the workforce.

Total employment grew by 11 percent in the Lafourche LMA during the 1940s. And, although agriculture was still the largest employer of workers in the LMA (26%), employment in this sector still declined by almost 40 percent (losing 5,500 workers) between 1940 and 1950. Employment doubled in both mining and construction during the 1940s. These industries represented 11 percent and 9 percent of the total labor force, respectively. This is an important finding because it defines the LMA's economy as dependent on its natural resources. In addition, the manufacturing sector grew by 30 percent during this period.

Total employment in the Lafourche LMA grew by over 50 percent between 1950 and 1960. This growth was concentrated in mining (102%), transportation/public utilities (102%), and services (125%). In 1960 the mining sector represented almost 15 percent of the total labor force. In comparison, the Lafayette LMA's mining sector employed only 7 percent of the work force in 1960. Agriculture's share of the total labor force declined to less than 13 percent by the beginning of this decade.

Employment trends in the 1970s were similar to the 1960s. Employment for the entire LMA grew at 30 percent. The growth rates were strongest in wholesale/retail trade and services (over 50% for both). However, manufacturing also grew by 35 percent, as did transportation and public utilities. In 1970, transportation and public utilities employment comprised over 10 percent of the Lafourche LMA labor force. Figure 1 displays decennial employment data for 1940-2000.



Map 9. Lafourche, Louisiana Labor Market Area.

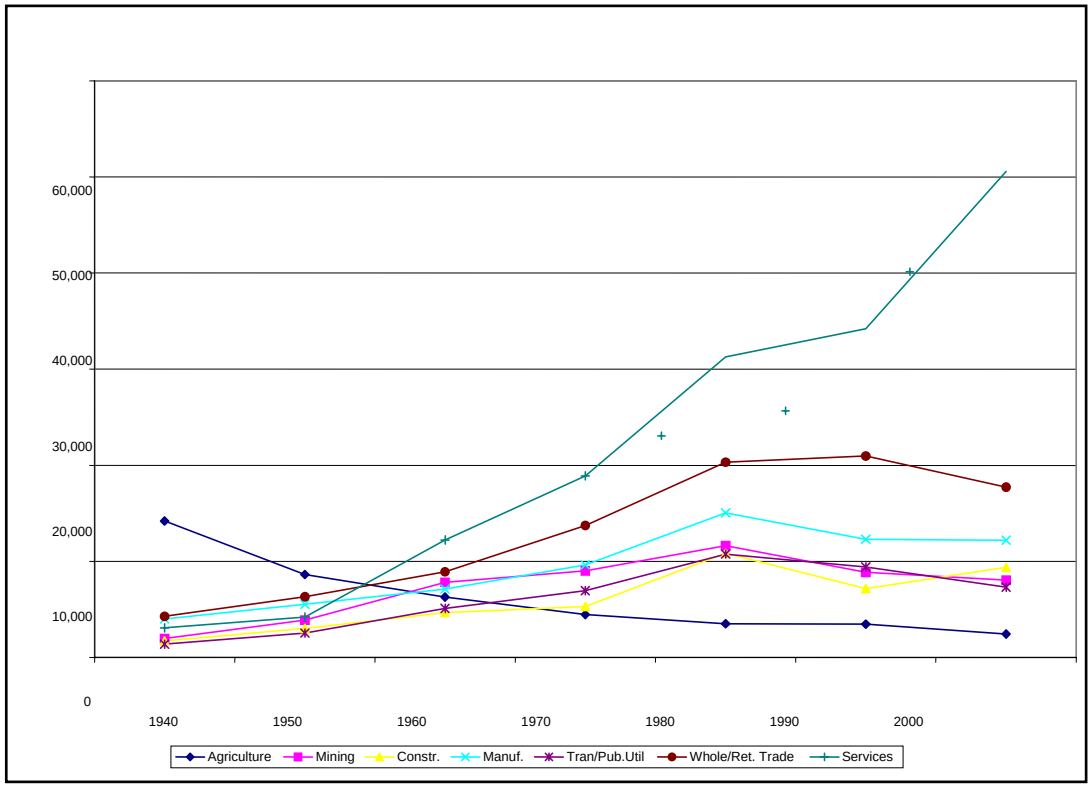


Figure 1. Major Industry Employment, Lafourche LMA: 1940-2000 (U.S. Census Bureau, 2000b).

Lafourche LMA Demographic Changes: 1940-1970. Total employment in the Lafourche LMA grew by 127 percent between 1940 and 1970. Population growth also increased (80%) during that period. Between 1940 and 1970, the LMA's African-American population dropped down to 19 percent from 29 percent, while the Caucasian population increased to 80 percent from 70 percent (U.S. Census Bureau, 2000b).

Second Unit of Analysis: Lafourche LMA Employment, 1970-1990. The oil and gas industries experienced both rapid expansion and contraction during the 1970s and 1980s. An examination of oil and gas prices underscores this claim. In constant dollars, crude oil prices began to spike in the 1970s, with a significant drop-off in 1986. Oil and gas activity was particularly prolific within the Lafourche LMA (Gramling, 1996). Human ecology theory predicts that the price change should affect the oil and gas economies of the Gulf of Mexico region. We examine these potential relationships by first assessing the broad industry sector changes within the Lafourche LMA.

Employment grew rapidly between 1970 and 1980, increasing by 52 percent. Mining employment increased by 29 percent, while manufacturing, and transportation and public utilities both grew by over 50 percent. In 1980, mining, manufacturing, construction and the transportation and public utilities industry sectors each employed between 10 and 14 percent of the workforce. To the extent that these industries were oil and gas dependent, the entire Lafourche LMA was at risk of niche contraction.

Employment within the Lafourche LMA declined during the 1980s, losing over 7,000 jobs, or 6 percent of the workforce. The industries hit the hardest include: construction (-3,600 jobs), mining (-2,700 jobs), manufacturing (-2,700 jobs) and transportation/public utilities (-1,300 jobs). These losses were offset somewhat by a net gain of almost 3,000 new service sector jobs; however these jobs are typically low-paying and do not contribute to the gross national product. Despite that downturn, almost 9,000 people remained employed in mining, 7,000 in construction, and 12,000 in manufacturing in 1990.

The data for 1980 and 1990 paint two different pictures of the Lafourche LMA—one of a fast growing —and rapidly contracting— oil and gas related economy, and one of an emerging service sector economy. We turn now to an analysis of annual employment data for the Lafourche LMA in order to locate a better understanding of what changes occurred between Census years.

The annual full- and part-time employment data for the Lafourche LMA show a steady increase in total employment from 1969 until 1981 (Figure 2). During that period total employment grew 83 percent. These data also show a swift decline in overall employment of 30 percent between 1982 and 1987. However, by 1996, employment levels had reached 87 percent of the high mark set in 1981.

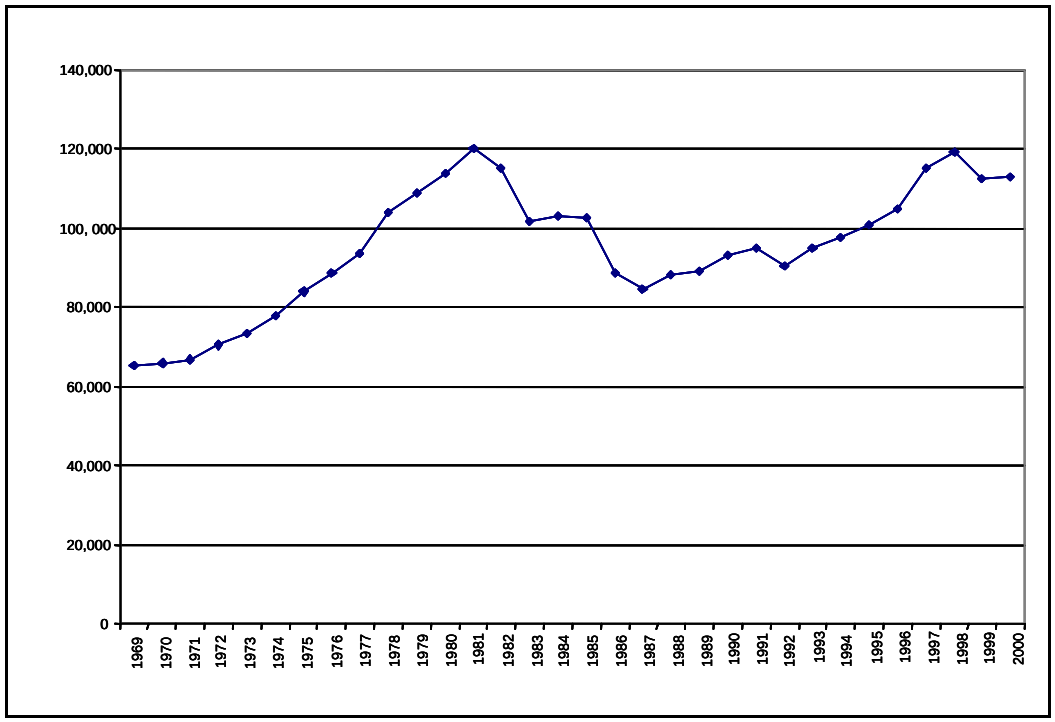


Figure 2. Total Annual Employment, Lafourche LMA: 1969-2000 (U.S. Dept. of Commerce, Bureau of Economic Analysis, 2000).

In order to establish when, or if, unexpected changes in employment occurred in the Lafourche LMA, we performed a time-series forecasting analysis. In this analysis, we employed a moving average forecasting model to locate the years that the shocks occur in the Lafourche LMA (Figures 3 and 4). The data in Figure 3 show the actual employment data charted with the three-year moving average of employment levels for each year. Figure 4 documents forecasting

errors, which occur when the observed employment number in a given year substantially exceeds the expected employment number in that year (based on a three-year moving average).

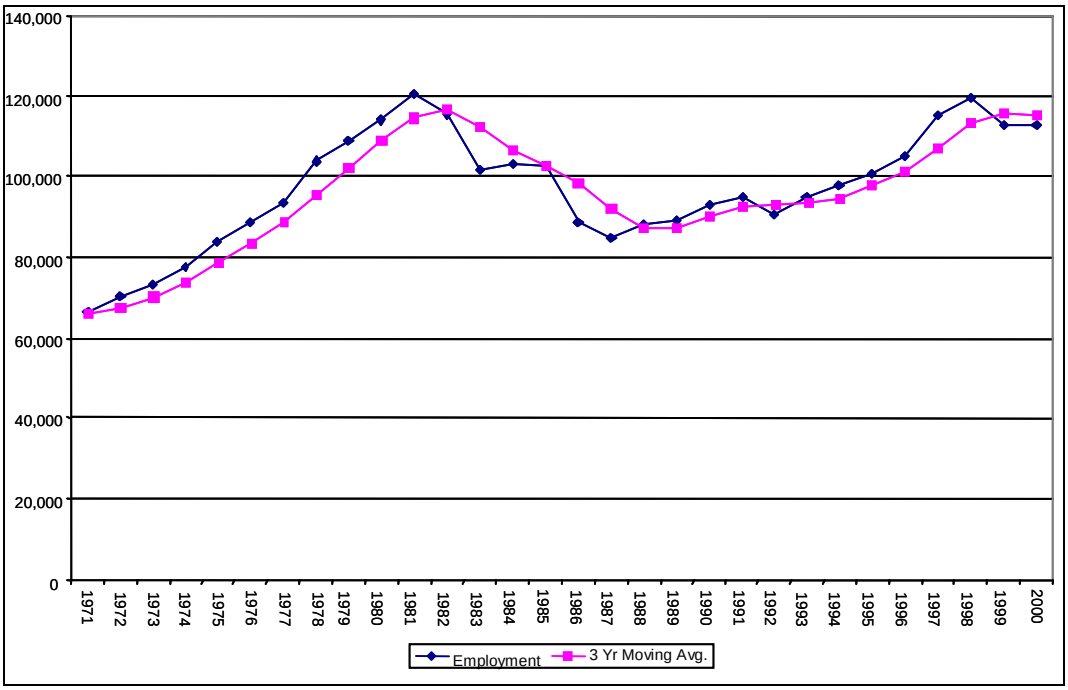


Figure 3. Total Employment and Three-year Moving Average, Lafourche LMA: 1971-2000 (U.S. Dept. of Commerce, Bureau of Economic Analysis, 2000).

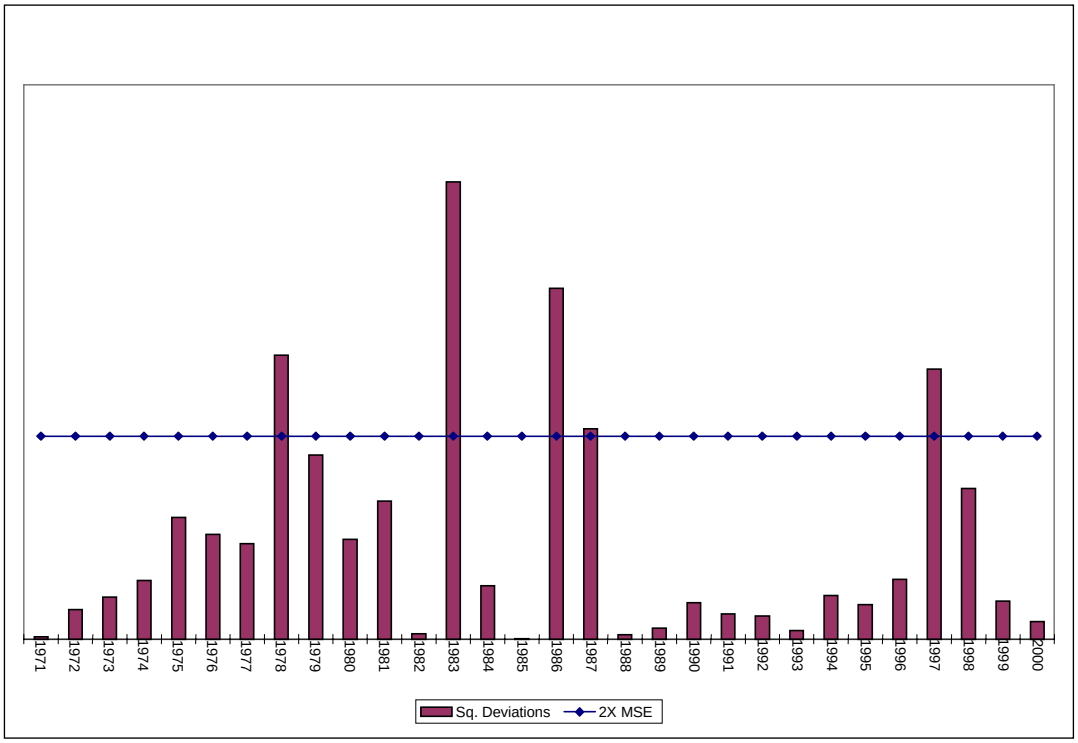


Figure 4. Forecasting Analysis for Annual Employment, Lafourche LMA: 1971-2000.

Total employment in the Lafourche LMA exceeded expectations in 1978. However, the data also show sharp declines in 1983, 1986, and 1987. In that period, observed employment was significantly lower than expected. Furthermore, the pattern of declines that occurred between 1983 and 1987 fits the general "bust" pattern in the oil and gas industry.

We turn now to an analysis of annual employment data in order to uncover in which industry sectors "boom and bust" patterns were present in the Lafourche LMA. Figure 5 shows annual employment data for nine general industry categories for 1969 through 2000. That data indicates that the mining, manufacturing, transportation/public utilities and construction sectors experienced the greatest employment upturns during the late 1970s and early 1980s, accounting for over 30,000 new jobs between 1969 and 1981. Those industry sectors also led the downturn in the 1980s. By 1987, these industries lost almost 30,000 jobs. The period following 1987 shows slow and steady growth in employment. But among those four industry sectors, only manufacturing shows any appreciable growth during that period. The majority of new jobs were in the service and related trade sectors.

Our data indicate that four industry sectors led the boom and bust of the late 1970s and early 1980s. We performed forecasting analysis on these four sectors to document statistically those trends. These forecasts are presented below and underscore the observations noted above (Figures 6-8).

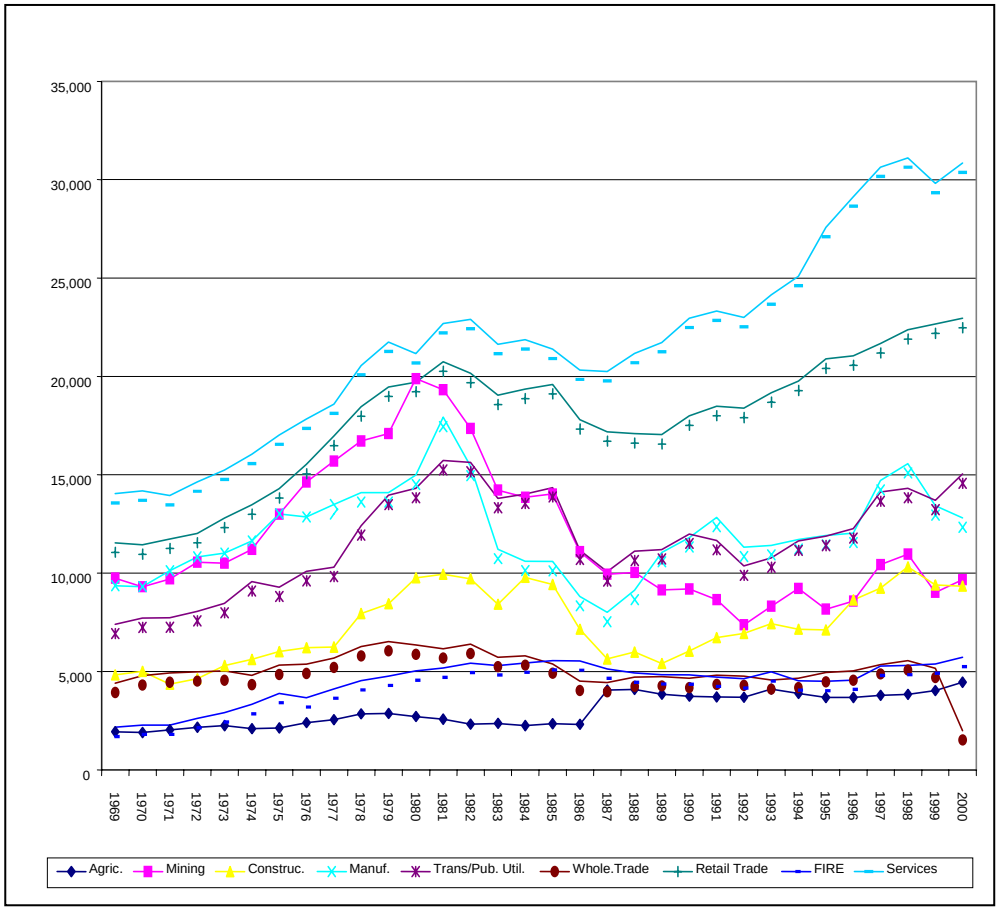


Figure 5. Major Industry Employment Patterns, Lafourche LMA: 1969-2000 (U.S. Dept. of Commerce, Bureau of Economic Analysis, 2000).

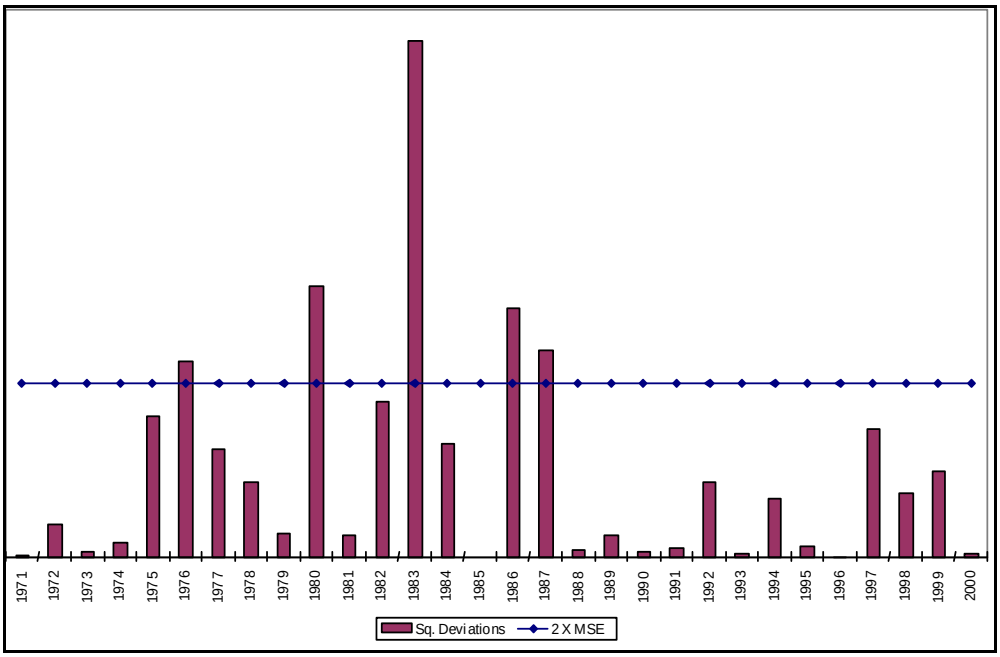


Figure 6. Forecasting Analysis for Mining Employment, Lafourche LMA: 1971-2000.

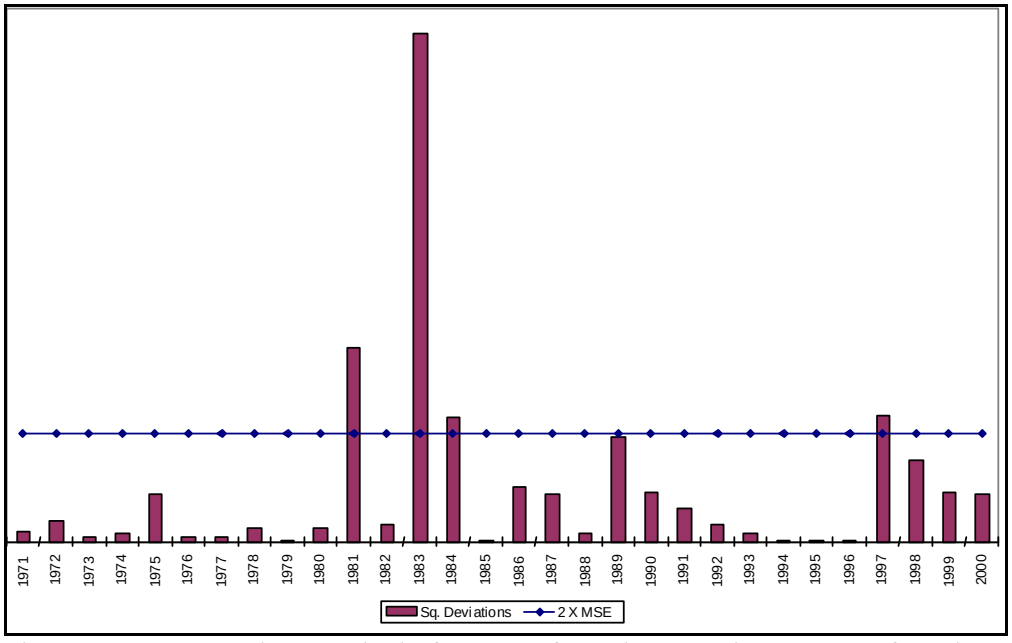


Figure 7. Forecasting Analysis for Manufacturing Employment, Lafourche LMA: 1971-2000.

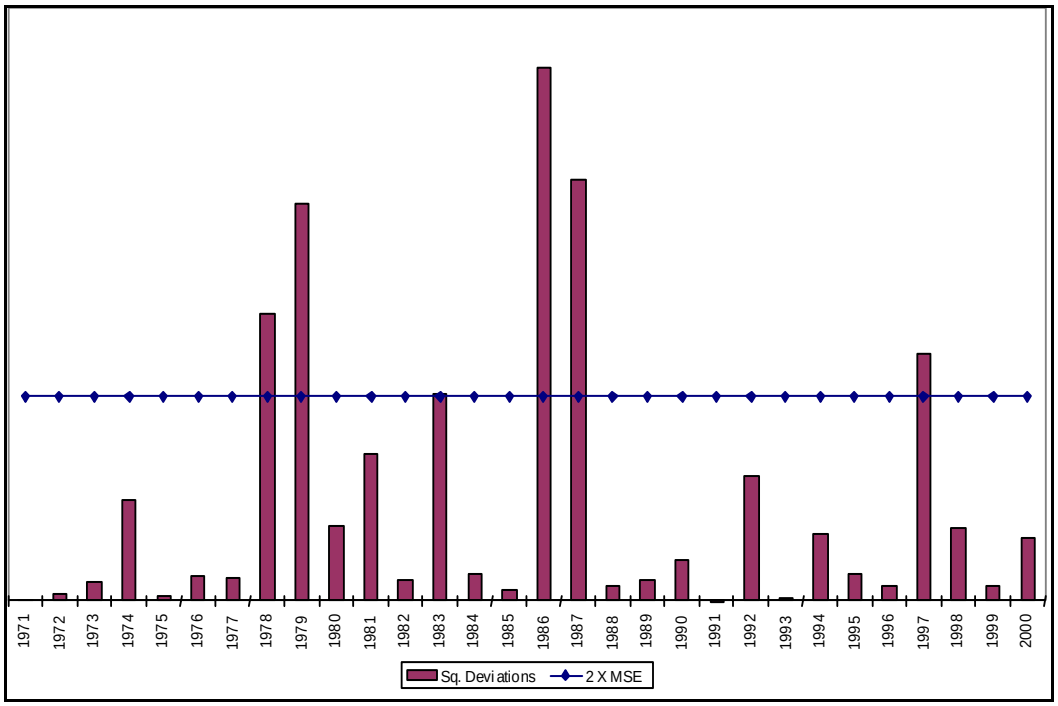


Figure 8. Forecasting Analysis for Transportation and Utilities Employment, Lafourche LMA: 1971-2000.

The forecasting analysis suggests that there were periods of rapid growth in the late 1970s, followed by periods of rapid contraction in the early 1980s. Little unexpected change occurred after 1987. We now turn to an analysis of detailed industry codes within each of these categories to determine how these changes in major industry employment trends are directly linked to the oil and gas industry.

Detailed Industry Code Analysis. In this next section, we present analyses of industry sector codes for four key industry groups: manufacturing, mining, transportation and wholesale trade (Table 1). We chose those categories based on a) relationship to oil and gas activities, b) employment levels, and c) availability of data in the years we are studying. The manufacturing category includes the sub-categories of fabricated structural metal products, ship and boat building and repair, and oil field machinery. Mining includes drilling oil and gas wells, oil and gas field exploration services, and oil and gas field service, N.E.C. The transportation category focuses exclusively on water. Wholesale trade considers only industrial machinery and equipment.

Table 1

Key Industry Groups and Sub-Categories

Manufacturing		
Fabricated Structural Metal Products (SIC 3440), this category includes manufacture of barge sections, ship sections, buoys, and metal plates for gas tanks, gas holders, oil storage tanks, large diameter pipes, pressure valves, storage tanks and also portable building.	***Ship and Boat Building and Repairing*** (SIC 3730), this category includes building and repairing barges, cargo vessels, drilling platforms and dry docks.	***Oil Field Machinery*** (SIC 3533), this category includes bits, rock and oil field tools, derricks for oil and gas fields, drill rigs, drilling tools for gas, oil and water wells.
Mining		
Drilling Oil and Gas Wells (SIC 1381), this category includes, on a contract basis, directional drilling, redrilling, reworking, and "spudding in" of oil and gas wells**.**	***Oil and Gas Field Exploration Services*** (SIC 1382), this category includes, on a fee basis, geophysical exploration, aerial exploration, and seismograph services**.**	***Oil and Gas Field Service N.E.C.*** (SIC 1389) this category includes, on a contract basis, excavating slush pits and cellars, grading and building of foundations, well surveying, running and cutting casings, tubes and rods, cementing and shooting wells, acidizing and chemically treating wells. Operating oil and gas wells for others on a contract basis are also included in this category.
Transportation		
Water Transportation (SIC 4400), this category primarily includes stevedoring.		
Wholesale Trade		
Industrial Machinery and Equipment (SIC 5084), this category includes the wholesale of derricks, oil field tool joints, oil well supply houses, oil well machinery equipment and supplies.		

Lafourche LMA Manufacturing. The *Fabricated Structural Metal Products* (SIC 3440) employment data show a pattern that is consistent with the "boom and bust" pattern of the 1970s and 1980s, with employment peaking in 1981 at over 5,000 workers (Figures 9 and 10). In 1987, employment reached a post-1980 low of less than 650 workers. The 1990s witnessed a slight rebound in this industry, with employment levels reaching levels very close to those in 1981. The forecast analysis shows that in 1981 and 1982 more employment was observed in this industry than was expected based on previous trends. From 1983 through 1987, however, employment in this industry was significantly lower than was expected, based on the forecasting analysis.

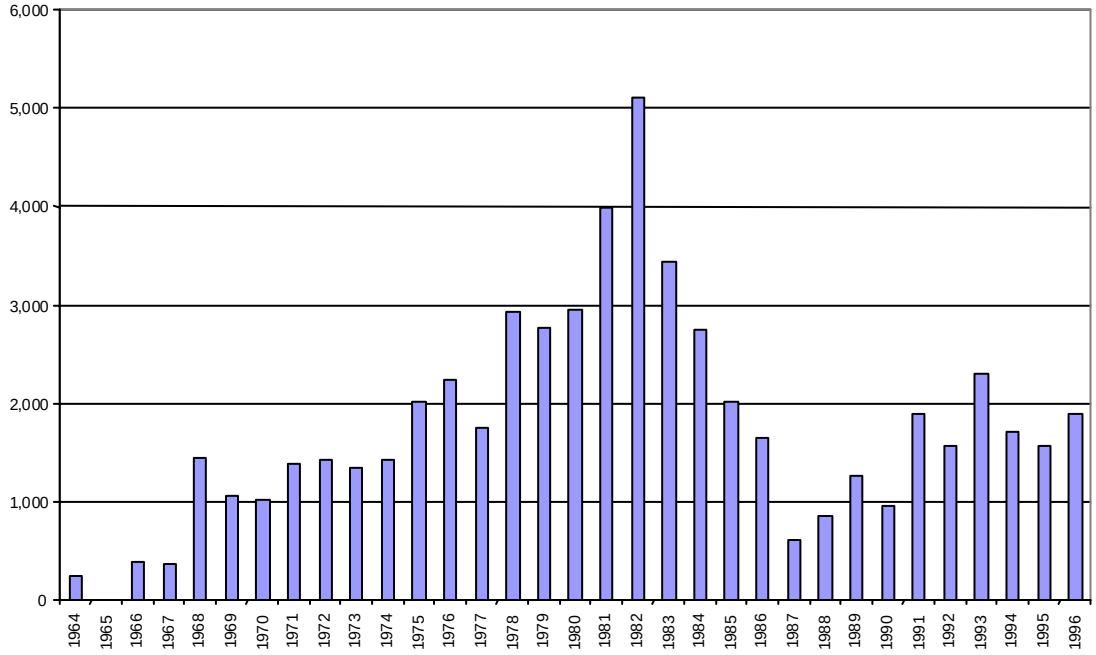


Figure 9. Annual Employment in Fabricated Structural Metal Products (manufacturing), Lafourche LMA: 1964-1996 (U.S. Census Bureau, 2000a).

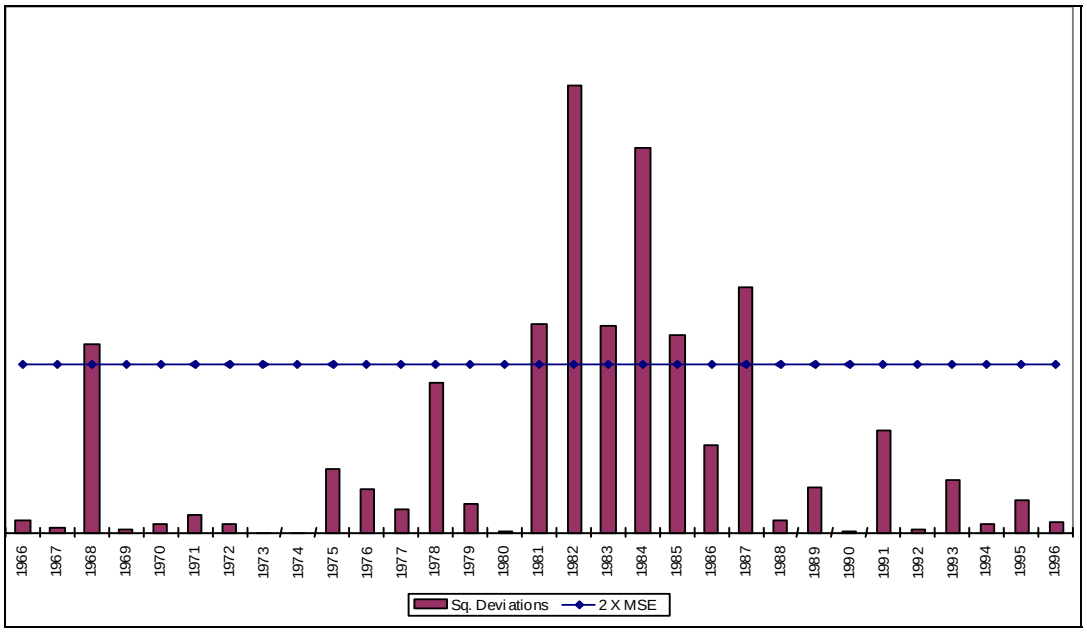


Figure 10. Forecasting Analysis for Fabricated Structural Metal Products (manufacturing), Lafourche LMA: 1966-1996.

The employment data for *Oil Field Machinery* (SIC 3533) manufacturing show two key periods in this elastic industry: the early 1970s and the early 1980s (Figures 11 and 12). During both periods employment grew at significant growth rates. Following a sharp decline in 1974,

employment resumed climbing through 1982, when another industry decline occurred. The second growth-decline pattern is consistent with the pattern for *Fabricated Structural Metal Products* (SIC 3440); however, the pattern for the early 1970s, with the sharp drop off in 1974, is not.

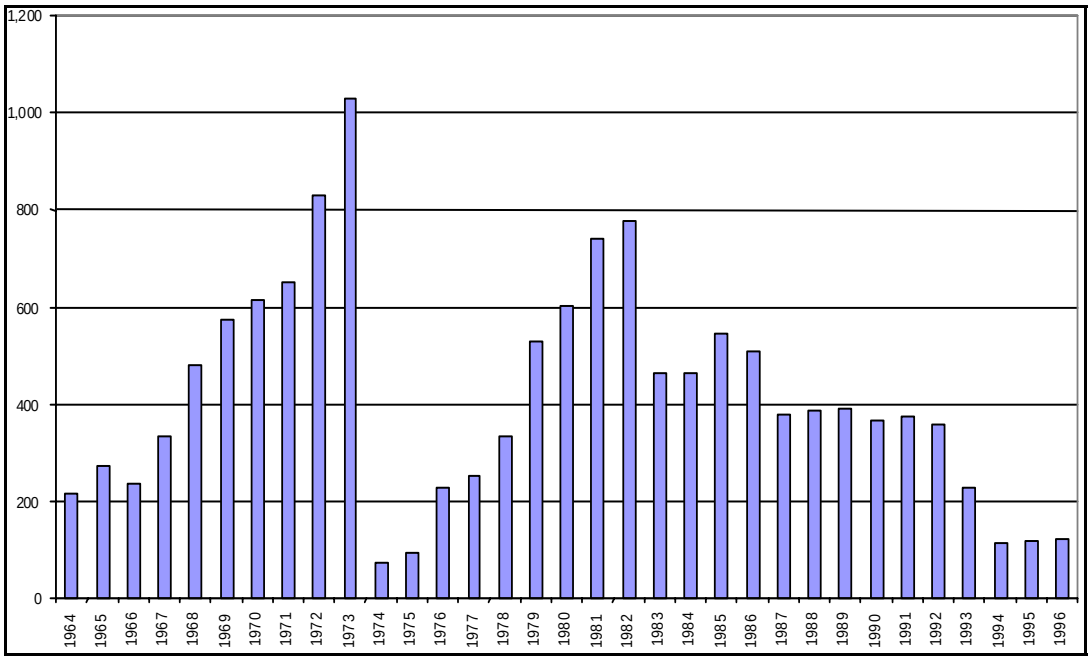


Figure 11. Annual Employment in Oil Field Machinery (manufacturing), Lafourche LMA: 1964-1996 (U.S. Census Bureau, 2000a).

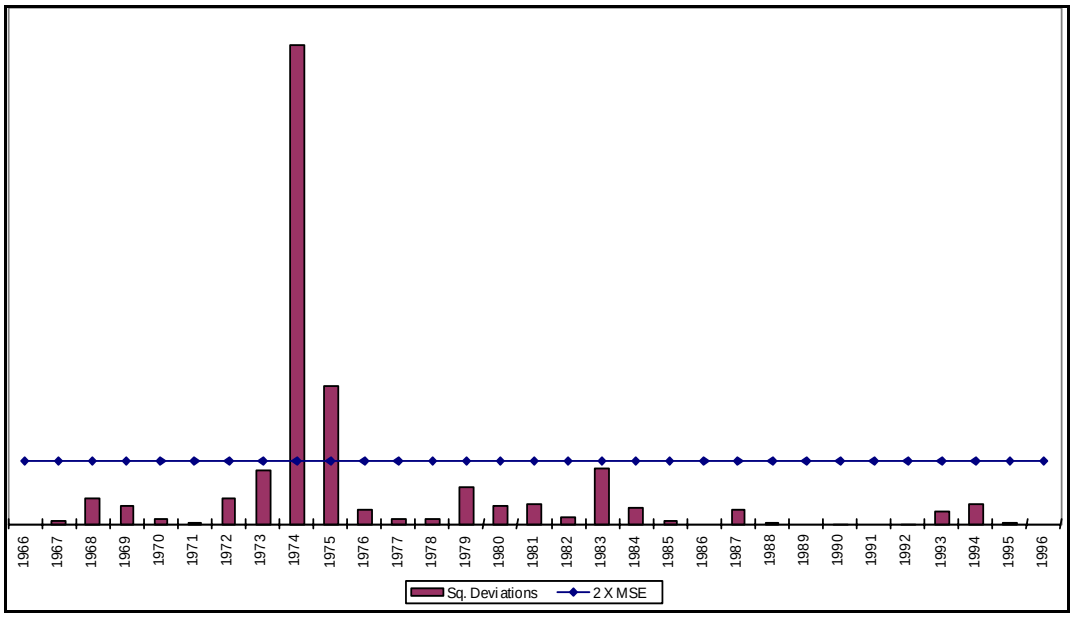


Figure 12. Forecasting Analysis for Oil Field Machinery (manufacturing), Lafourche LMA: 1966-1996.

Similar to the other two categories, the employment data for *Ship Building and Repair* (SIC 3731) show significant growth in the 1970s that peaked in the early 1980s when this industry employed over 5,700 workers (Figures 13 and 14). This period is followed by a decline that lasted until the late 1980s, when employment levels dropped to about half of the 1981 level. Throughout the late 1980s and 1990s employment levels remained above 2,000 workers.

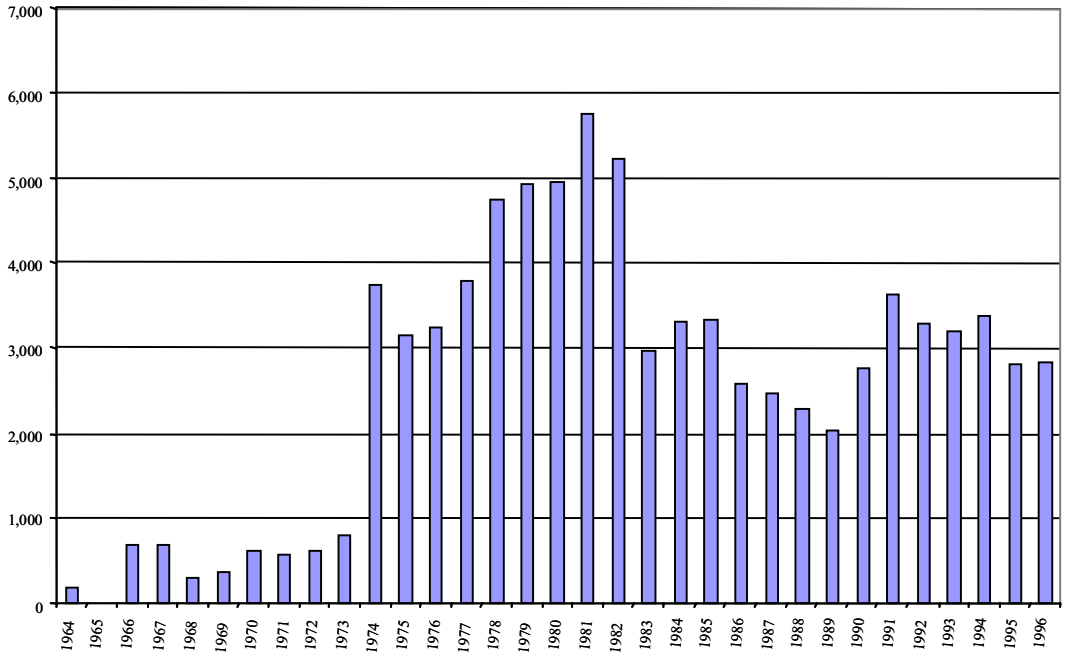


Figure 13. Annual Employment for Ship and Boat Building and Repair, Lafourche LMA: 1964-1996 (U.S. Census Bureau, 2000a).

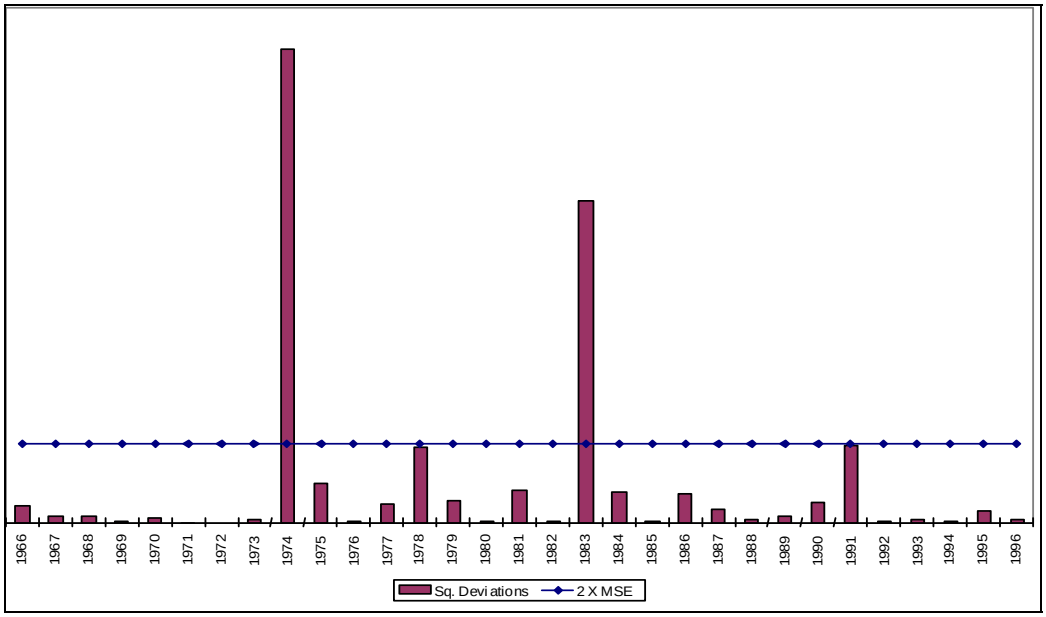


Figure 14. Forecasting Analysis for Ship and Boat Building and Repair, Lafourche LMA: 1966-1996.

Lafourche LMA Mining. The *Drilling Oil and Gas Wells* (SIC 1381) data show an industry that peaked in the early 1970s (Figures 15 and 16). Employment in this industry has been rather sporadic from year to year, employing little more than 1,000 people throughout the entire period. The forecasting analysis indicates sharp increases in employment in 1970, 1984 and 1994, and sharp declines in 1974 and 1986. This industry is not as clearly linked to the oil/gas "boom and bust" patterns as other key industries.

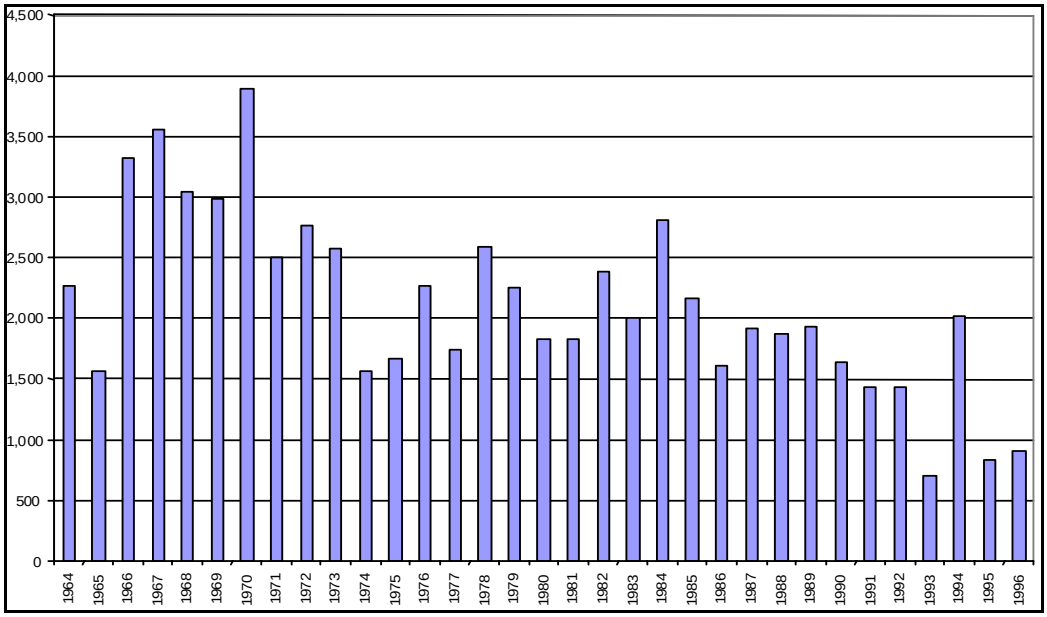


Figure 15. Annual Employment in Drilling Oil and Gas Wells, Lafourche LMA: 1964-1996 (U.S. Census Bureau, 2000a).

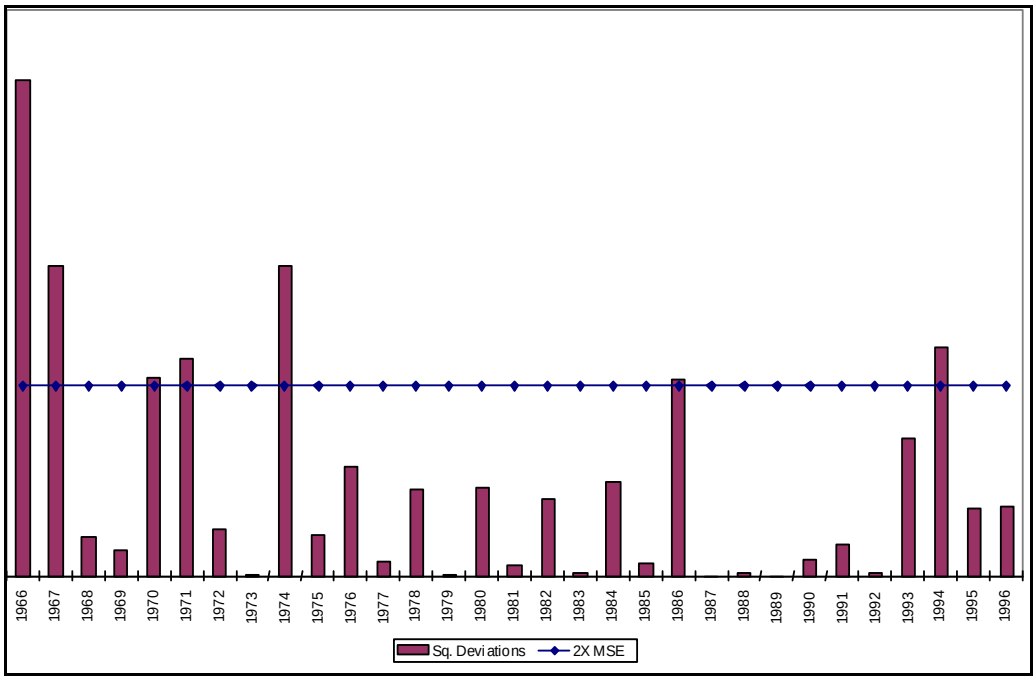


Figure 16. Forecasting Analysis for Drilling Oil and Gas Wells, Lafourche LMA: 1966-1996.

The data on *Oil and Gas Field Exploration Services* (SIC 1382) show a temporary industry in the Lafourche LMA (Figure 17). In the late 1970s and early 1980s there were short periods of significant employment in that industry but, after 1982, employment is negligible (i.e., 200 workers).

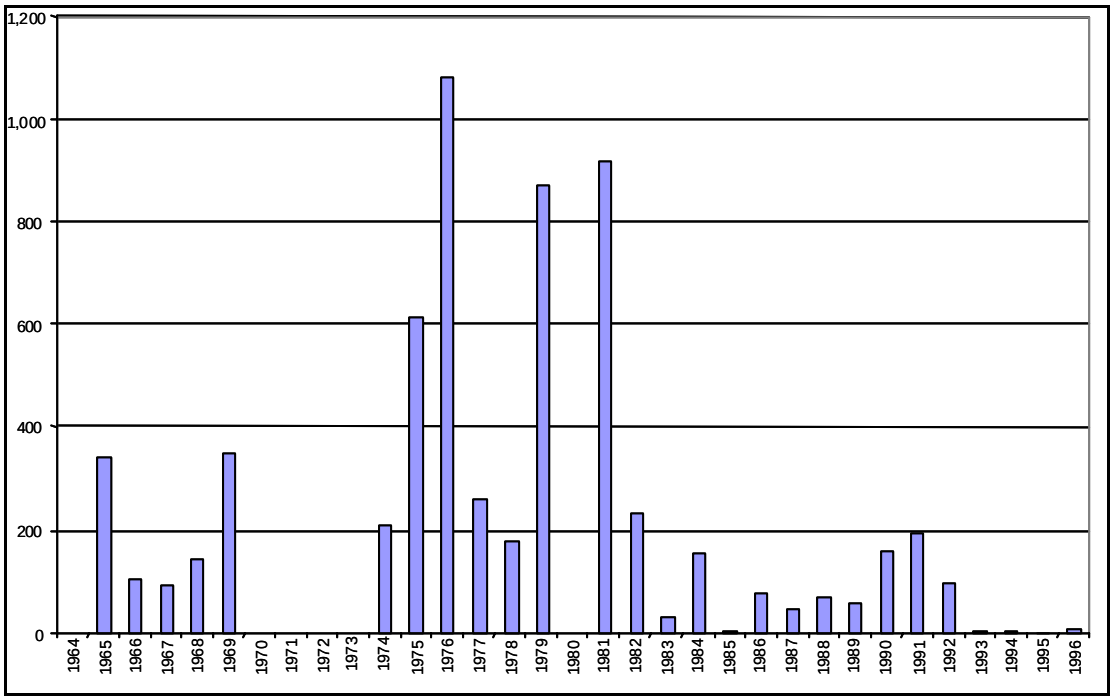


Figure 17. Annual Employment in Oil and Gas Field Exploration Services, Lafourche LMA: 1964-1996 (U.S. Census Bureau, 2000a).

The employment data for the *Oil and Gas Field Service N.E.C.* (SIC 1389) industry show a general boom and bust pattern beginning in the mid-1970s with employment peaking in 1982 at nearly 5,000 workers (Figures 18 and 19). By 1987, employment levels were roughly half of what they were in the early 1980s. The forecasting analysis shows that the years 1982 and 1983 represent the transition point for this industry. In 1983, employment fell significantly short of expectations. Employment fell significantly short again in 1987. This industry did not disappear in the wake of the bust, however. Over 2,000 workers remained employed in this industry during most of the 1990s. Interestingly, in 1996, over 4,000 workers were employed in this industry, putting *Oil and Gas Field Service N.E.C.* (SIC 1389) at approximately 80 percent of its 1982 employment high mark in the Lafourche LMA. Furthermore, this finding is similar to that for the neighboring Lafayette LMA. The 1996 data indicate a potential comeback for the industry.

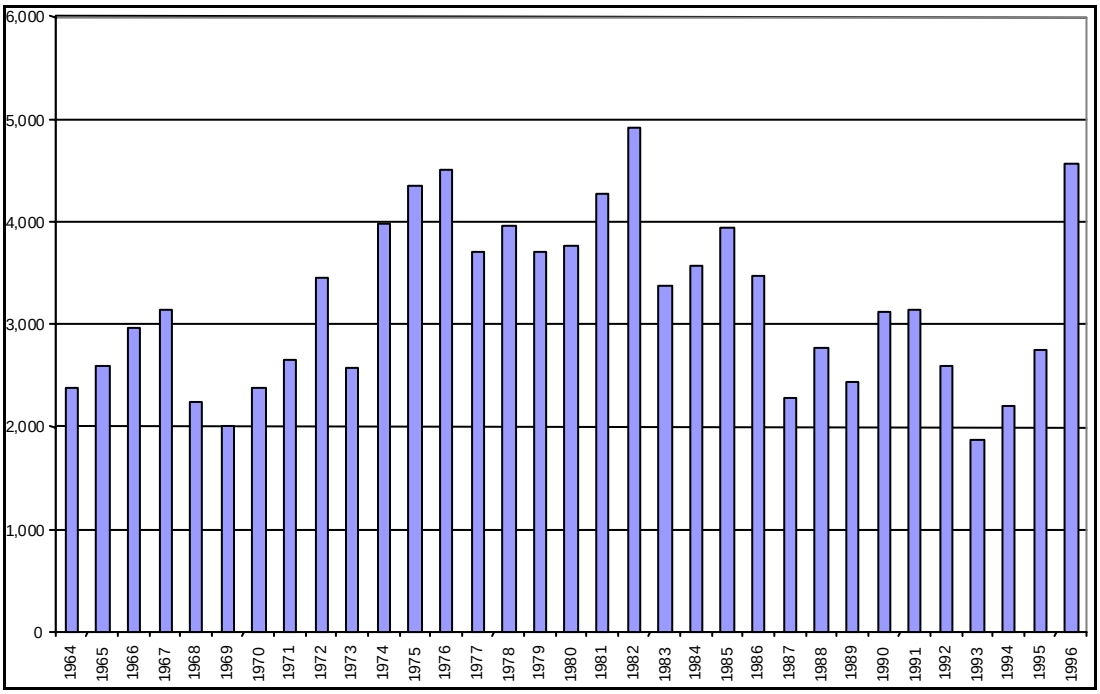


Figure 18. Annual Employment in Oil and Gas Field Services, Lafourche LMA: 1964-1996 (U.S. Census Bureau, 2000a).

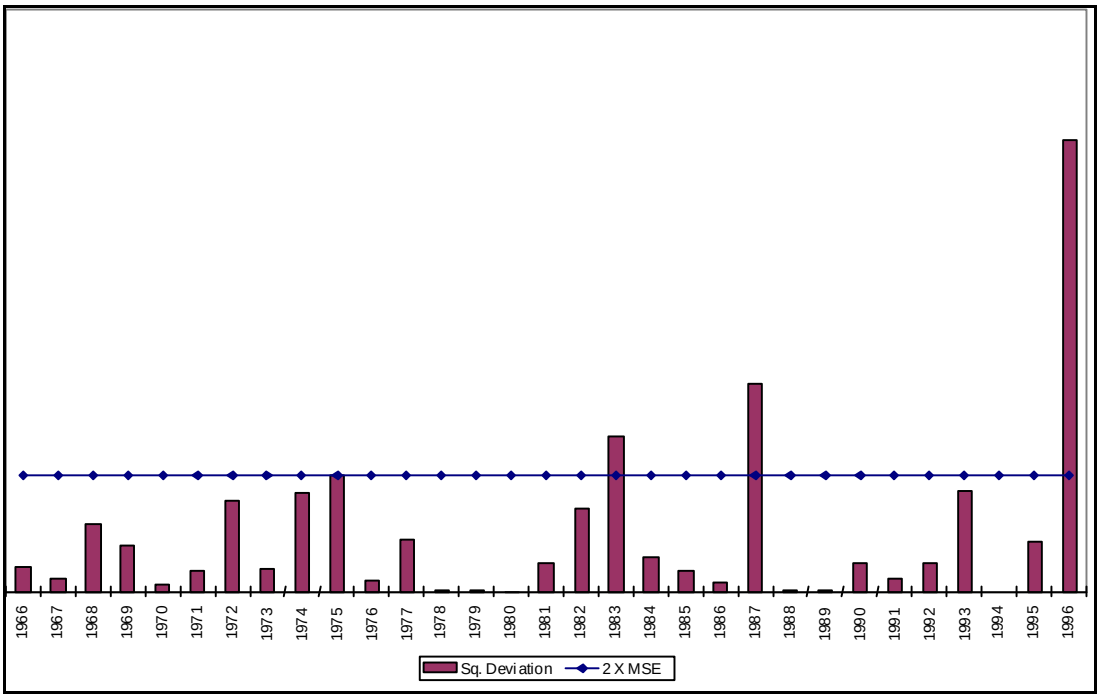


Figure 19. Forecasting Analysis for Oil and Gas Field Services, Lafourche LMA: 1966-1996.

Lafourche LMA Water Transportation. Figures 20 and 21 present data on *Water Transportation* (SIC 4400) employment. Unfortunately, there is no category that directly measures water transportation related to offshore oil and gas activities. However, this is a significant industry in the Lafourche LMA, employing almost 5,000 workers in the worst part of the downturn (1987). Earlier we found a "boom and bust" trend in transportation and public utilities. We suspect that this trend is directly related to offshore oil and gas activities. We believe that a direct examination of water transportation earnings will bring us closer to understanding the impact of oil and gas activities. The County Business Pattern data show a similar pattern.

Employment in *Water Transportation* (SIC 4400) peaked in 1981 and 1982, and declined significantly after that time period. Between 1982 and 1987, over 60 percent of all jobs in this industry were lost in the Lafourche LMA. The forecasting analysis bears out the boom and bust pattern, which began in the late 1970s (see 1978 in the forecasting figure) and ended in the late 1980s (1987).

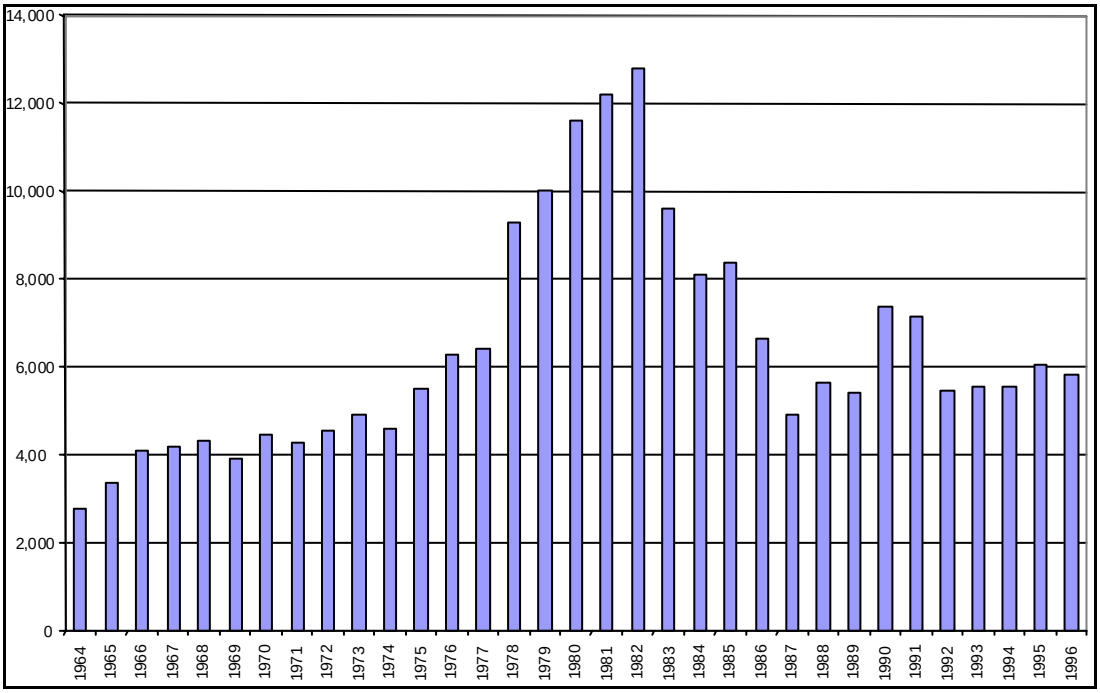


Figure 20. Annual Employment for Water Transportation, Lafourche LMA: 1964-1996 (U.S. Census Bureau, 2000a).

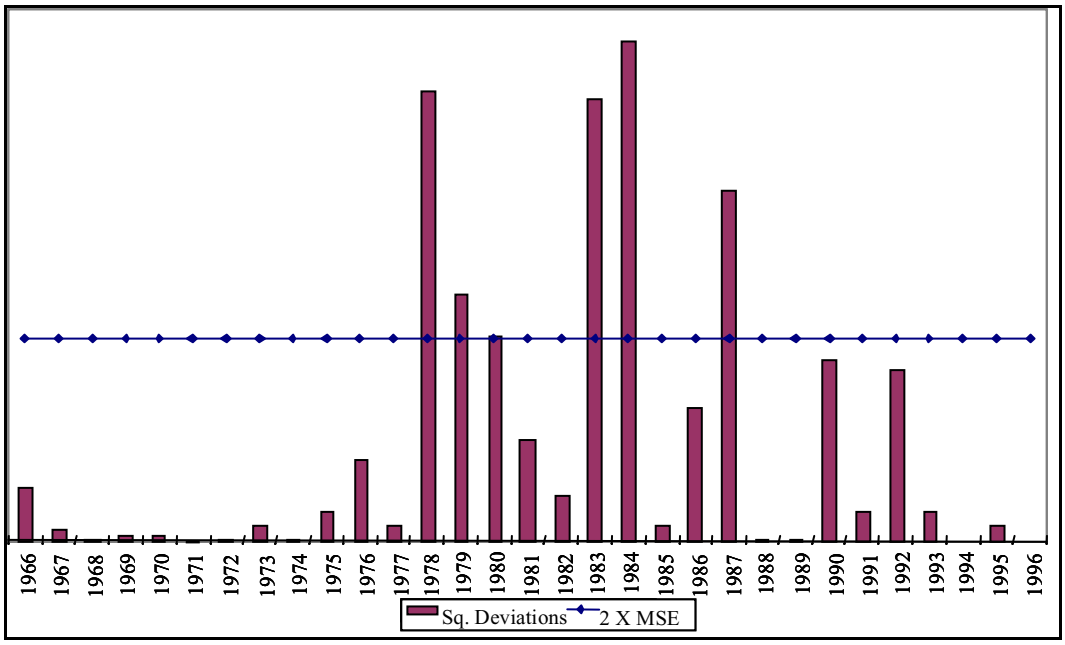


Figure 21. Forecasting Analysis for Water Transportation, Lafourche LMA: 1966-1996.

Lafourche LMA Wholesale Trade. The data for *Industrial Machinery and Equipment* (SIC 5084) are presented below (Figure 22). This industry category includes the wholesale marketing of oil well machinery.

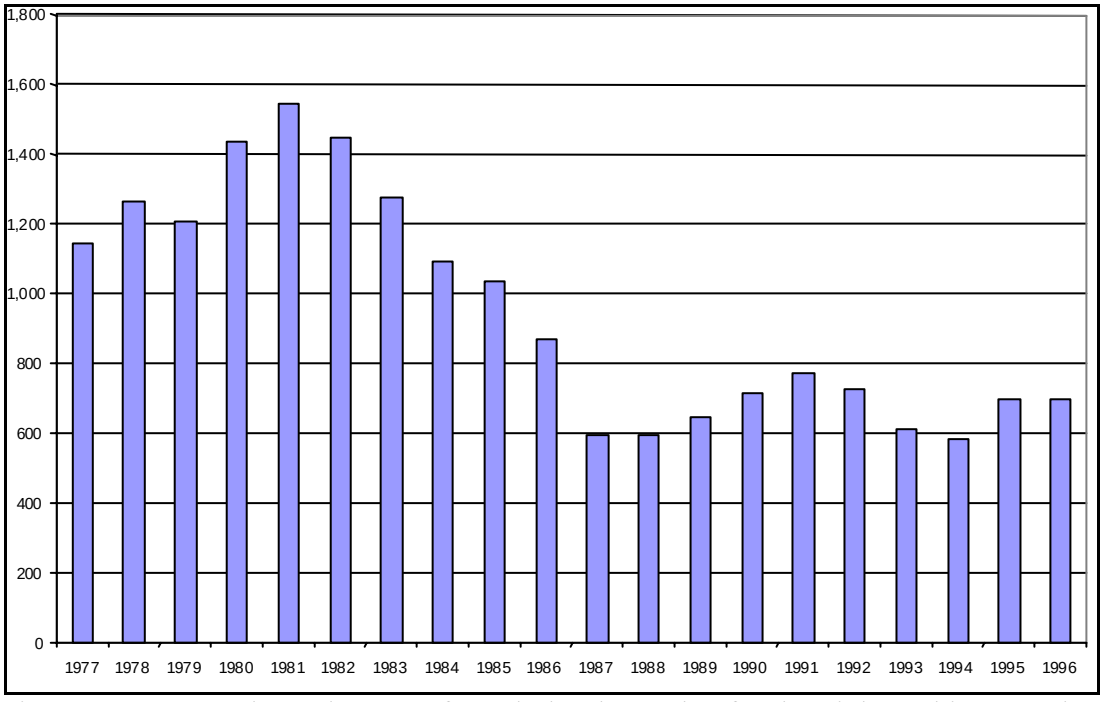


Figure 22. Annual Employment for Wholesale Trade of Industrial Machinery and Equipment, Lafourche LMA: 1977-1996 (U.S. Census Bureau, 2000a).

Because these data are available only from 1977 to 1996, there are not enough years to conduct a forecasting analysis. However, the trend line shows the familiar pattern of growth in the 1970s, an apex in 1981, and decline throughout the rest of the 1980s. Employment in this sector reached a low point in 1987 at 600 workers. Interestingly, while employment in this industry has increased in an almost linear fashion in the Lafayette LMA since 1987, we fail to document such a trend in the Lafourche LMA.

Summary of Industry Impact Analysis. The analysis of changes in detailed industry show the impact of the "boom and bust" periods in the oil and gas industry across a wide range of industries in the Lafourche LMA. In these eight categories alone, over 19,000 jobs were lost between 1982 and 1987 in the Lafourche LMA. These data do not include the "ripple" effects of economic shocks throughout the rest of the economy. The data presented in the analysis of annual industry changes in broad single-digit SIC industries show downturns in other industries that were dependent upon the boom generated in the oil and gas activities, such as construction and retail trade. When people lose their jobs, they do not build and they do not purchase as many goods and services.

Discussion of the impact of the oil and gas extraction industry on southern Louisiana has frequently invoked a broader framework of industry boom and bust that is said to be common to extractive industries more generally. Our analysis confirms that pattern in some respects for the Lafourche LMA. The data show an entire labor market area caught in a market contraction in a natural resource industry during the 1980s.

However, the historical data for the Lafourche LMA suggest two important trends. First, this pattern is unique to the period (1978-1987). While off-shore drilling has been present in the Gulf of Mexico since the 1940s, we do not find any other boom or bust patterns for oil and gas related industries in years prior to the 1970s. The expansion of the oil and gas industry, particularly following its move off-shore after 1947, surely had profound effects on the Lafourche LMA. In particular, the emergence of this industry to some extent helped to provide the LMA with a base industry to substitute for the rapidly agricultural sector. As the preceding analysis of population changes showed, the rise of this industry did not (except for the 1970s) make the LMA a net in-migration area. Rather the emergence of this labor market as a center of oil and gas extraction activity lessened the degree of decline that was experienced by other areas of Louisiana that were historically dependent on agriculture.

The second important trend to recognize is that, despite the hard economic times of the 1980s, the greater Lafourche LMA has recovered, at least in terms of employment, during the subsequent decade. The Lafourche LMA added over 20,000 jobs during the 1990s, but these jobs were mostly in the lower-paying service sector. The LMA did not add high-end service sector jobs (those requiring a college education) in significant numbers, as reflected in the education data that show only 11 percent of adults in the LMA with a college degree in 2000 (compared to 26% nationally).

Although almost 10,000 workers were still employed in mining and oil and gas industries in 2000, the on-going restructuring in the oil and gas industry make it doubtful that employment levels in oil and gas related industries will return to those at the height of the oil and gas boom of the early 1980s. It is also doubtful that the Lafourche LMA will experience an oil and gas "boom and bust" pattern like that experienced in the late 1970s and early 1980s. The move to deepwater oil and gas extraction industries during the post-1987 recovery has been accompanied by growing capital intensity in the industry and also by a lesser degree of responsiveness of industry investments to short-term fluctuations in the market price of oil and gas.

Third Unit of Analysis: Lafourche LMA Population, Education, and Local Government, 1970-1990. In this section we examine how industry changes affected population growth, educational attainment, and local government revenues between 1970 and 1990. Between 1970 and 1980, the population of the Lafourche Labor Market Area increased by 17 percent, from 225,396 to 263,213 (Tables 2-4).

Population. The population growth rate for the Lafourche LMA is significantly greater than the national growth rate of approximately 11 percent for the same period. Between 1980 and 1990, however, the population of the Lafourche LMA grew by only 0.2 percent, a rate that is substantially less than the national growth rate of 10 percent. Furthermore, one parish, St. Mary, experienced negative population growth, indicating extensive out-migration of approximately 6,000 white residents. Based on previous analyses, these are most likely oil and gas workers seeking other job opportunities.

The Lafourche LMA population grew modestly (3%) between 1990 and 2000 from 263,681 to 271,365. This growth rate is significantly lower than the national rate of 10 percent for the same time period. All parishes within the LMA showed some amount of increase in population, except for St. Mary Parish which experienced negative population growth, indicating continued out-migration of nearly 4,000 Caucasian residents and 1,000 African-American residents.

Table 2

Population by Parish, Lafourche LMA: 1940-2000

Parish	1940	1950	1960	1970	1980	1990	2000
Assumption	18,541	17,278	17,991	19,654	22,084	22,753	23,388
Lafourche	38,615	42,209	55,381	68,941	82,483	85,860	89,974
St. Mary	31,458	35,848	48,833	60,752	64,253	58,086	53,500
Terrebonne	35,880	43,328	60,771	76,049	94,393	96,082	104,503
LMA Total	124,494	138,663	182,976	225,396	263,213	263,681	271,365

Source: U.S. Census Bureau, 2000b.

Between 1970 and 1980, the African-American population declined from 19.3 percent to 18.7 percent – a trend consistent with most southern labor markets. During the same period, the Caucasian population decreased only slightly from 79.6 percent to 79 percent. Between 1980 and 1990, the African-American population increased from 18.7 percent to 19.7 percent, while the Caucasian population decreased from 79 percent to 76.3 percent. The African-American population also increased between 1990 and 2000 from 19.7 percent to 20 percent, while the Caucasian population decreased further to 74.1 percent.

Table 3

Percent of White Population, Lafourche LMA: 1940-2000

Parish	1940	1950	1960	1970	1980	1990	2000
Assumption	59.4	58.1	58.7	62.6	68.1	67.3	67.1
Lafourche	84.5	86.5	87.8	88.6	87.2	84.6	82.8
St. Mary	54.5	61.6	69.1	71.5	69.7	65.0	62.8
Terrebonne	72.4	75.3	79.5	82.2	80.7	78.4	74.0
LMA %	69.7	73.0	77.2	79.6	79.0	76.2	74.1
LMA Total	86,818	101,342	141,275	179,440	207,982	201,131	201,246

Source: U.S. Census Bureau, 2000b.

Table 4

Percent of Black Population, Lafourche LMA: 1940-2000

Parish	1940	1950	1960	1970	1980	1990	2000
Assumption	40.6	41.8	41.2	37.2	31.6	32.4	31.5
Lafourche	14.6	12.4	11.7	11.2	11.1	12.3	12.6
St. Mary	45.2	38.0	30.6	28.0	28.7	31.2	31.8
Terrebonne	24.6	20.3	17.1	15.0	15.4	16.5	17.8
LMA %	29.1	24.7	21.4	19.3	18.7	19.7	20.0
LMA Total	36,230	34,927	39,281	43,531	49,281	52,004	54,323

Source: U.S. Census Bureau, 2000b.

The population growth rates deviate from national trends during this period. Deviation comes from two sources: natural increase and migration. Rapid growth or decline comes almost exclusively from migration. Net migration is a useful concept through which to understand the equilibration of employment and population in sub-regions, and the adaptation of the ecosystem to changes in its external environment. One important component of the explanation of net migration is the expansion and contraction of employment opportunities in an area (Micklin and Choldin, 1984). In particular, "boom and bust" patterns in extractive industries in non-metropolitan settings can be expected to produce rapid shifts in the direction of net migration, because industry-specific employment fluctuations may be large relative to total employment in an area (Rural Sociological Society Task Force, 1993; Beard, 1988; Frey and Speare, 1988). Periods of rapid employment growth will attract workers (and possibly dependent household members) from outside the region. Periods of employment decline can lead to compensating out-migration flows.

Education. Adult educational attainment levels in the Lafourche LMA significantly lagged behind those for the State of Louisiana as a whole (Table 5). In 1970, 22 percent of the adults in the Lafourche LMA were high school graduates, compared to 43 percent for Louisiana. By 1980, 33 percent of adults in the Lafourche LMA were high school graduates, compared to 59 percent in the State of Louisiana. And, the number of adults who attended but did not complete high school actually increased in the Lafourche LMA between 1970 and 1980 (by close

to 5,000). This is interesting because we see this pattern in the oil and gas economies of the Louisiana LMAs, but not in the other LMAs of GOM region.

However, this pattern began to change for the better during the 1980s. Between 1980 and 1990, the percentage of adults without a high school education dropped from 56 percent in 1980 to 43 percent in 1990. In comparison, adults without a high school diploma in the State of Louisiana dropped to 32 percent. By 2000, the percentage of adults holding a high school diploma in Lafourche LMA climbed to 37 percent. This could be because the bust in the oil and gas industry led to an out-migration of people without high school diplomas who were chasing labor intensive jobs elsewhere. However, the percentage of adults with a college degree reached only 11 percent by 2000, which is less than half of the national rate of 26 percent.

Table 5

Adult Educational Attainment (age 25+), Lafourche LMA: 1970-2000

Parish	0-8 Years	Some High School	High School Diploma	Some College, No Degree	BA/BS or More	Total
1970						
Assumption	63.1%	14.2%	15.2%	3.7%	3.6%	8,948
Lafourche	54.0%	14.6%	20.7%	4.9%	5.7%	31,221
St. Mary	44.5%	18.1%	24.8%	6.7%	5.8%	27,644
Terrebonne	46.7%	17.7%	23.8%	6.0%	5.7%	33,600
LMA Total	49.8%	16.5%	22.3%	5.7%	5.6%	101,413
1980						
Assumption	49.2%	16.5%	27.7%	5.8%	0.7%	10,321
Lafourche	42.3%	16.7%	30.5%	9.2%	1.0%	37,992
St. Mary	34.3%	20.0%	34.1%	10.4%	1.0%	29,782
Terrebonne	33.7%	18.2%	35.7%	11.3%	1.0%	42,736
LMA Total	37.9%	18.0%	33.0%	9.9%	1.0%	120,831
1990						
Assumption	28.9%	20.6%	32.3%	11.4%	6.7%	13,152
Lafourche	26.9%	16.9%	33.3%	12.8%	10.0%	49,724
St. Mary	22.2%	19.7%	35.2%	14.5%	8.3%	33,562
Terrebonne	22.0%	18.3%	34.9%	15.3%	9.4%	55,636
LMA Total	24.2%	18.3%	34.2%	13.9%	9.1%	152,074
2000						
Assumption	21.0%	19.6%	36.9%	12.6%	7.4%	14,411
Lafourche	17.6%	16.0%	38.0%	13.3%	12.4%	55,891
St. Mary	14.0%	20.1%	38.3%	15.7%	9.4%	33,158
Terrebonne	15.2%	17.8%	35.8%	16.0%	12.3%	63,271
LMA Total	16.2%	17.8%	37.1%	17.5%	11.3%	166,731

Source: U.S. Census Bureau, 2000b.

Finances. The oil and gas industry "boom and bust" of the 1970s and 1980s had an important effect on the financing of local governments in the Lafourche LMA. Between 1972 and 1982, total revenues for local governments increased by 63 percent in constant dollars. State allocation to local governments increased by 20 percent during the same period. In 1972, state allocations accounted for more than half of local government revenue in the Lafourche LMA. By 1982, state allocations accounted for only one-third of local government revenue.

During the boom of the 1970s and early 1980s, local governments in the Lafourche LMA had to incur debt to finance the increased demand for services that came with economic growth. Between 1972 and 1982, local government debt for the entire LMA increased by 27 percent in real dollars. Between 1972 and 1982, per capita local government debt increased by over 105 percent in Terrebonne Parish. In 1982, local government debt exceeded $3,000 per person in 1982 dollars (over $5,000 in 1997 dollars) in Lafourche Parish.

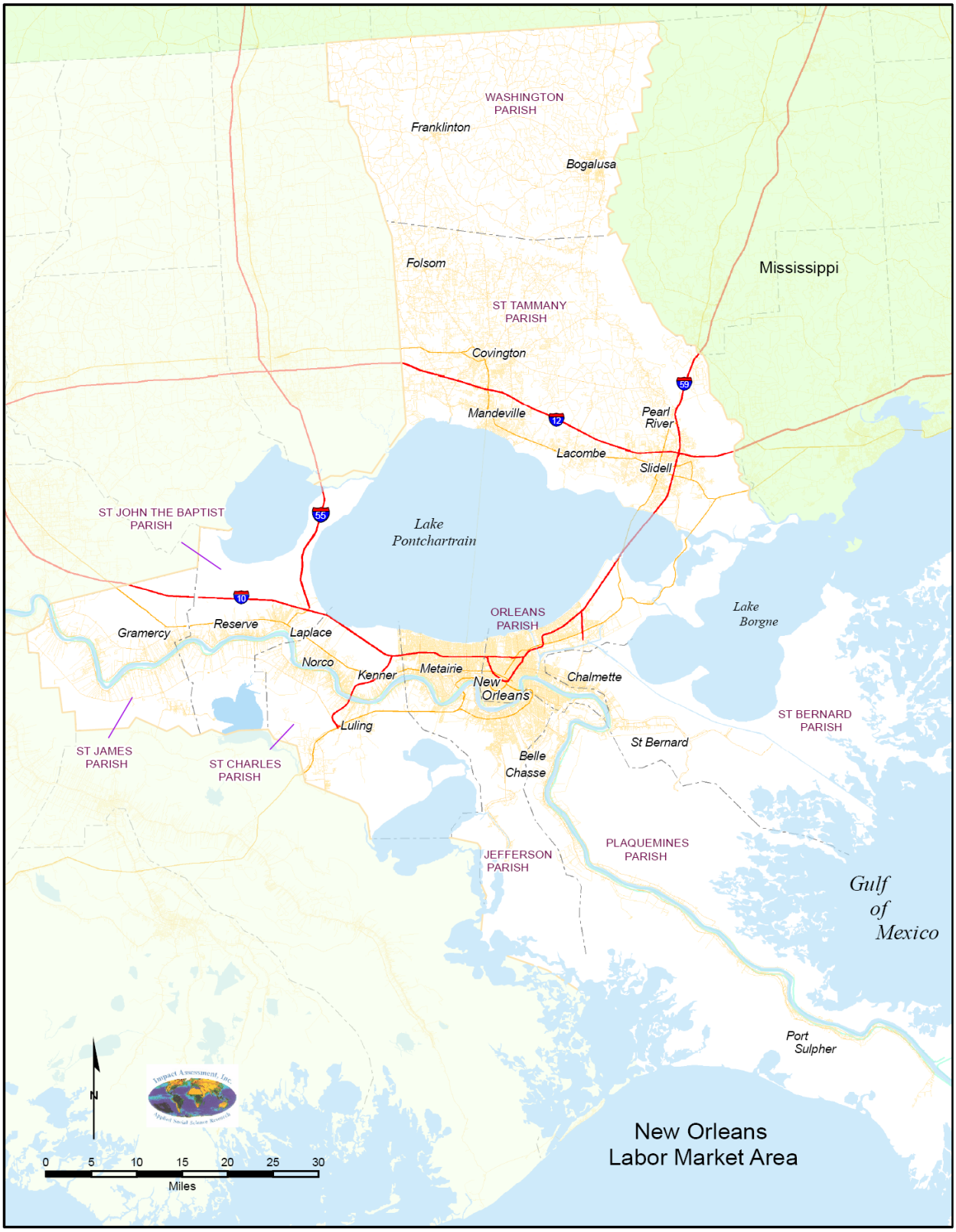
Total local government revenue decreased by a modest amount between 1982 and 1987 (8% in constant dollars) in the Lafourche LMA. In addition, state revenue fell sharply during that period (by 16% in constant dollars). The drop off in state revenue was recaptured through increased local government debt. Between 1982 and 1987, local governments in the Lafourche LMA accrued, on average, a decrease in debt of 14 percent. The debt load was highest in Lafourche Parish. In 1987, the total debt per person exceeded $4,600 per person in 1987 dollars. The oil and gas industry put stress on local government finances during the 1970s and 1980s. The influx of new residents required more services, particularly schools (the majority of local government spending). Declining revenues (from taxes and the state) mean that local governments have to finance spending.

Total local government revenue rebounded with an increase of 13.7 percent between 1992 and 1997. In addition, state allocation to local government increased by 5.2 percent in the same time period. The increase evident in the total local revenue and the increase in state allocation to local governments are reflected in the local government debt numbers. Between 1992 and 1997, local government debt for the entire LMA decreased by 18.8 percent in real dollars; all four parishes in the LMA experienced a decrease in their debt loads.

4. New Orleans, Louisiana: Labor Market Area

New Orleans is one of the major ports in the study region (see also Houston and Mobile). It is a port that is spatially close to many oil and gas communities and a prime location for corporate interests in the oil and gas business. Many other upstream (shipbuilding) and downstream (oil and gas refinery) industries are located here as well. With all that industrial activity, changes in the oil and gas industry could potentially have a far-reaching effect on the New Orleans LMA. The New Orleans Labor Market Area (LMA) is made up of nine Louisiana parishes: Jefferson, Orleans, Plaquemines, St. Bernard, St. Charles, St. James, St. John the Baptist, St. Tammany, and Washington (Map 10). In 2000, this LMA had a combined total population of 1,381,652 (U.S. Census Bureau 2000b). In the analysis that follows we provide an examination of the evolution of this LMA.

First Unit of Analysis: New Orleans LMA Employment, 1940-1970. In 1940, this LMA had a diversified economy with agriculture (7%), manufacturing (21%), trade (25%), and services (24%) employing less than 200,000 people. The mining industry, where oil and gas workers are employed, represented a very small portion of the labor force in 1940: 1,100 workers, or less than 1 percent of the labor force.



Map 10. New Orleans, Louisiana Labor Market Area.

Between 1940 and 1950, total employment in the New Orleans LMA grew by 30 percent (by over 60,000 workers). With the exception of agriculture (-33%), each sector experienced growth. Employment in construction grew by over 8,000 workers, or 66 percent. Manufacturing gained 6,000 workers. The largest sector in 1950 was wholesale/retail trade, which grew by 20,000 workers between 1940 and 1950 to represent 28 percent of the labor force in 1950. Mining employment more than doubled between 1940 and 1950, from 1,150 workers to over 3,000 workers. However, in 1950, this sector still represented a very small proportion of the labor force (about 1%). In 1950 the New Orleans LMA workforce was three times larger than the Lafayette LMA workforce, but there were fewer workers in the mining sector in the New Orleans LMA.

Between 1950 and 1960, total employment in the New Orleans LMA grew by 25 percent. Every industry sector experienced increases in employment, with the exception of agriculture, which lost 2,700 jobs. The growth leader was services, adding 43,000 jobs and representing 32 percent of a labor force that was in excess of 300,000 workers. Manufacturing also experienced growth in the 1950s, adding 11,000 more workers. The mining sector added over 4,000 jobs to represent nearly 3 percent of the total labor force in 1960. Moreover, in 1960, more workers were employed in the mining sector than were employed in agriculture. Roughly the same number of workers was employed in the mining sector in the New Orleans (7,800) and Lafayette (7,900) LMAs.

During the 1960s, the total number of workers in the New Orleans LMA grew by 30 percent, employing more than 400,000 workers by 1970. The major job growth was in the service sector (60,000 jobs) and trade sector (19,000 jobs). These two broad sectors employed over 60 percent of the labor force in 1970. Growth in manufacturing was limited to 3,000 jobs, or five percent. However, mining experienced 46 percent growth, and construction added jobs at a rate of 25 percent. Mining employed over 11,000 workers in 1970, and these two sectors combined to employ 10 percent of the labor force in the New Orleans LMA. The data presented below illustrate the decennial trends in industry employment from 1940 to 2000 (Figure 1).

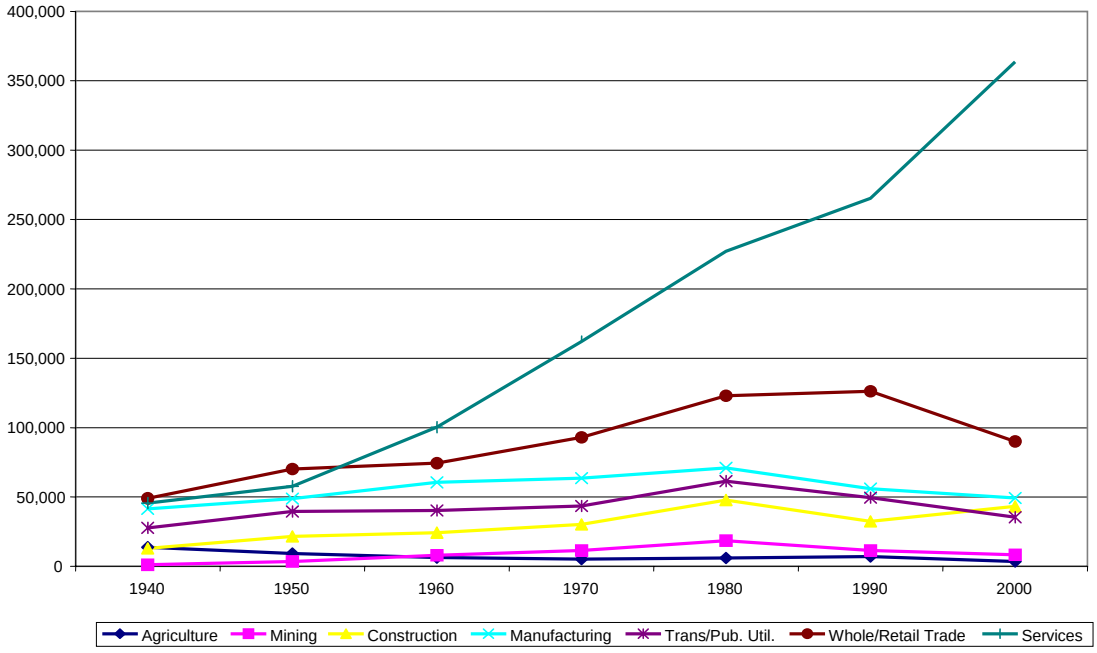


Figure 1. Major Industry Employment, New Orleans LMA: 1940-2000 (U.S. Census Bureau, 2000b).

New Orleans LMA Demographic Changes: 1940-1970. Between 1940 and 1970, total employment in the LMA grew by 114 percent. Also during that period, agriculture declined in importance, while mining and manufacturing increased. By 1970, over 11,000 workers were employed in the mining sector. Population growth was affected by these employment changes. In 1940 666,312 people lived in the New Orleans LMA; by 1970, the population was over 1,186,000. In Bernard Parish, the population growth grew by more than 600 percent between 1940 and 1970.

Between 1940 and 1970, the ethnic demographics of the LMA changed slightly. The percent of African-Americans increased from 30 percent to 31 percent, while the Caucasian population decreased from 70 percent to 68 percent. This is an interesting find because, during the same period, the number of mining sector workers (where oil and gas workers are found) increased significantly to over 11,000. However, unlike in the Lafayette LMA where the increase in mining workers created significant shifts in the racial profile of the LMA, no discernible changes are noted for New Orleans LMA.

Second Unit of Analysis: New Orleans LMA Employment, 1970-1990. The oil and gas industries experienced both rapid expansion and decline during the 1970s and 1980s. An examination of oil and gas prices underscores this claim. In 1998 constant dollars, crude oil prices began to spike in the 1970s, with a significant drop-off in 1986. The New Orleans LMA was one of the major economies in the oil and gas exploration and production industries during this period (Gramling, 1996). Human ecology theory predicts that the price change should affect the oil and gas economies of the Gulf of Mexico region. We examine these potential relationships by first assessing the broad industry sector changes within the New Orleans LMA.

Between 1970 and 1980, total employment grew by 36 percent in the New Orleans LMA. Services and trade were still the dominant industries, employing a combined total of 62 percent of the labor force in 1980. Moreover, between 1970 and 1980, these sectors added almost 100,000 jobs. However, there are other noteworthy trends that occurred during the 1970s. Transportation and public utilities grew by 18,000 jobs, construction by 18,000 jobs, and mining by 7,500 jobs. Together, these industries represented over 20 percent of the labor force in the Greater New Orleans LMA in 1980. The data from these sectors indicate a connection to the expansion of oil and gas activity (exploration, extraction, etc.) during the late 1970s.

The data for 1990 confirm the connection to the oil and gas "boom and bust" pattern, showing economic stagnation in the New Orleans LMA during the 1980s. Total employment declined by 1 percent. The mining and construction industries both experienced employment losses in excess of 30 percent between 1980 and 1990. By 1990, employment in both of these industries returned to their 1970 levels. Transportation and public utilities experienced an employment reduction of 19 percent between 1980 and 1990. Manufacturing lost 15,000 jobs, but analysis of more detailed industry codes are needed to confirm a connection to oil and gas activity. The service sector experienced a growth rate of 17 percent between 1980 and 1990, but this growth rate was significantly lower than the service sector growth rate for the previous decade (40%) in the New Orleans LMA. By 1990, over 70 percent of the New Orleans LMA workforce worked either in the wholesale/retail or service sector.

The decennial data indicate some important changes between Census years, particularly in the 1970s and 1980s. The data for 1980 and 1990 paint two different pictures of the New Orleans LMA—one of a fast-growing, relatively diversified economy across a range of sectors (manufacturing, transportation/public utilities, construction, trade and services), and one of a declining and largely service sector economy. We turn now to an analysis of annual employment data for the New Orleans LMA in order to locate a better understanding of what changes occurred between Census years.

In order to establish when, or if, unexpected changes in employment occurred in the New Orleans LMA, we performed a time-series forecasting analysis. The results of this effort are reported below (Figures 2 and 3). Figure 2 depicts the actual employment data charted with the three-year moving average for each year from 1969-2000, inclusive. Figure 3 documents forecasting errors, which occur when the observed employment number in a given year substantially exceeds the expected employment number in that year (based on a three-year moving average). This data identifies trends in forecasting errors for every year between 1973 and 1981, with significant values in 1973, 1977 and 1978. For each of these years there was significantly more employment than predicted. The New Orleans LMA experienced significant employment growth during the 1970s. The forecasting analysis shows this pattern beginning in 1973. While the bust of the 1980s is not as prominent in the New Orleans LMA as it is in other places (e.g., Lafayette and Lafourche), there was a steady drop-off in employment in the 1980s. The worst period was 1985-86, when over 20,000 jobs were lost in one year. From 1980 to 1987, over 40,000 jobs were lost in the New Orleans LMA, reflecting a net loss of almost 7 percent.

Interestingly, the total employment data show growth in the New Orleans LMA in the late 1990s. From 1995 through 1998, employment grew, but not at rates significantly greater than expected. And, by 1994, employment levels in the New Orleans LMA had surpassed those in 1980, at the height of the oil boom.

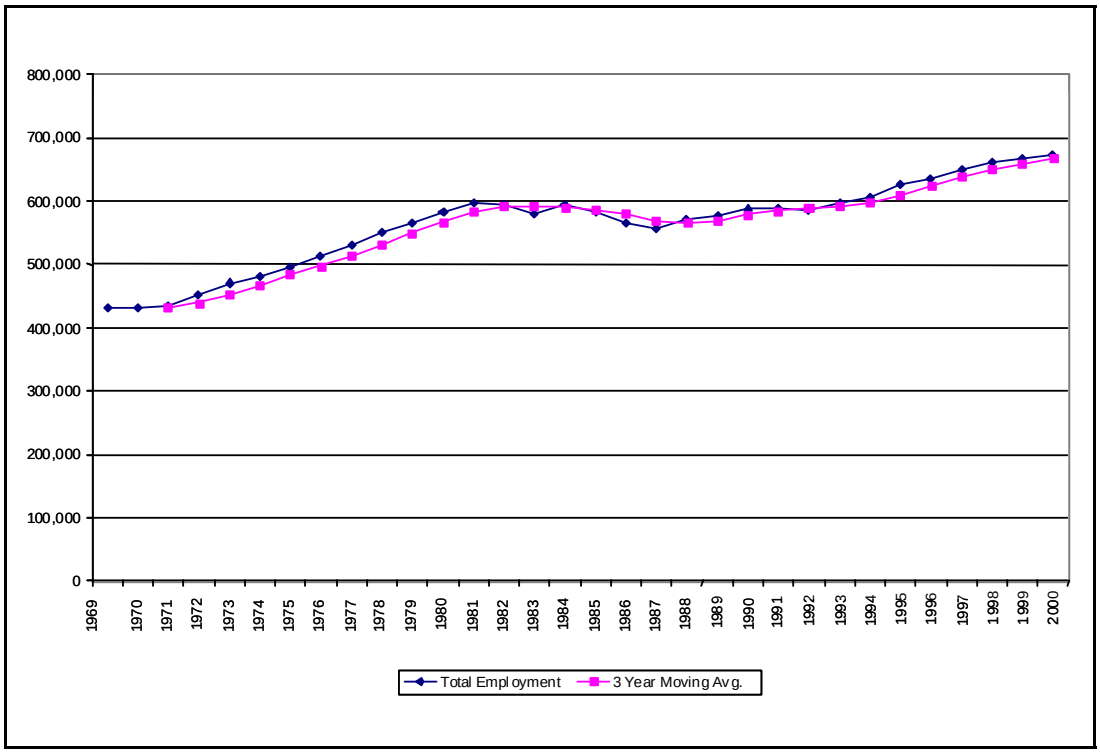


Figure 2. Total Annual Employment Trends and Three-year Moving Averages, New Orleans LMA: 1969-2000 (U.S. Dept. of Commerce, Bureau of Economic Analysis, 2000).

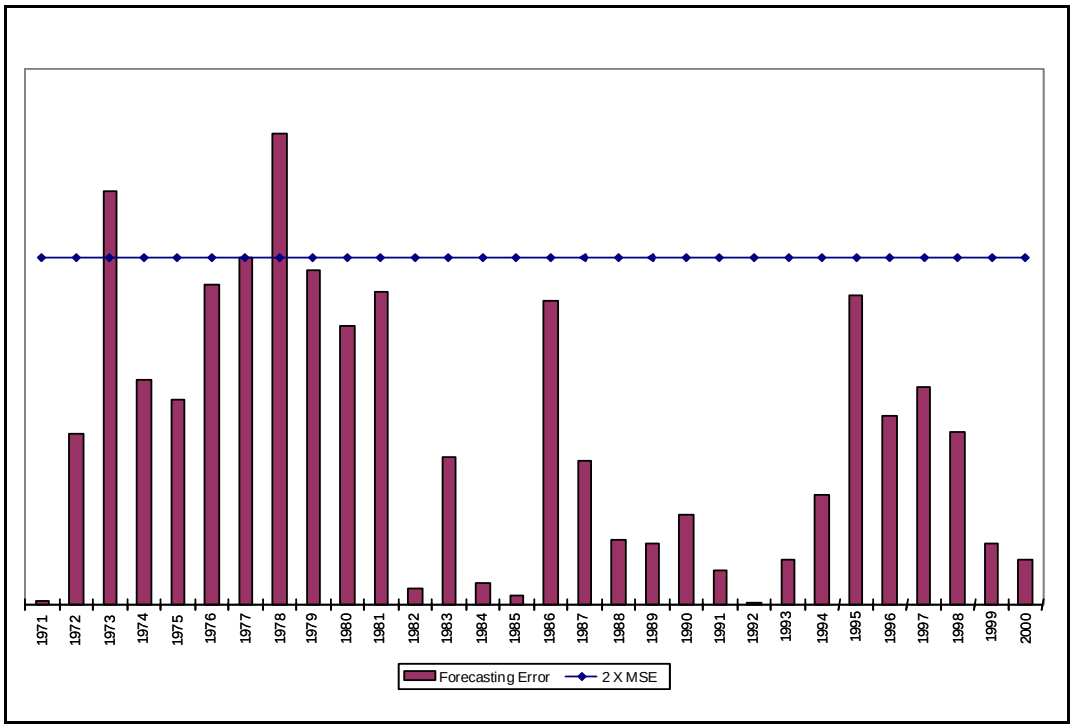


Figure 3. Forecasting Analysis for Total Employment, New Orleans LMA: 1971-2000.

We turn now to an analysis of annual employment data in order to uncover in which industry sectors these "boom and bust" patterns are present in the New Orleans LMA. Figure 4 shows annual employment data for nine general industry categories for the years between 1969 and 1996, inclusive. Examining this data, we see that mining, construction, manufacturing and transportation/communication all experienced patterns of growth and decline during the 1980s. The forecasting analyses for these sectors are presented below (Figures 5-7). The analysis for mining shows one period of greater than expected employment growth (1980-1981). This is followed by two periods of unexpected declines in employment. In 1986 and 1987, the industry hit a low employment point, losing almost 7,000 jobs in two years. This forecasting pattern is consistent with the "boom and bust" patterns of oil and natural activities. Furthermore, there is a second significant dip in employment between 1992 and 1993. By 1993, an additional 5,000 jobs had been lost in this sector throughout the New Orleans LMA.

The data for construction employment fit a pattern similar to mining. There was greater than expected growth in the 1970s (i.e., 1976). There was a pattern of unexpected decline between 1985 and 1987. During that decline about 12,000 jobs were lost in this sector.

Transportation/communication shows a trend consistent with "boom and bust" patterns of the 1970s and 1980s. Between 1978 and 1981, there was significant growth in this industry (over 10,000 jobs in a 10-year period). However, starting in 1982 there was a severe downturn in this industry. By 1987, over 13,000 jobs had been lost. Losses in this sector are significant because water transportation is necessary for offshore exploration and production. Since the late 1980s, employment in this sector has remained relatively stable.

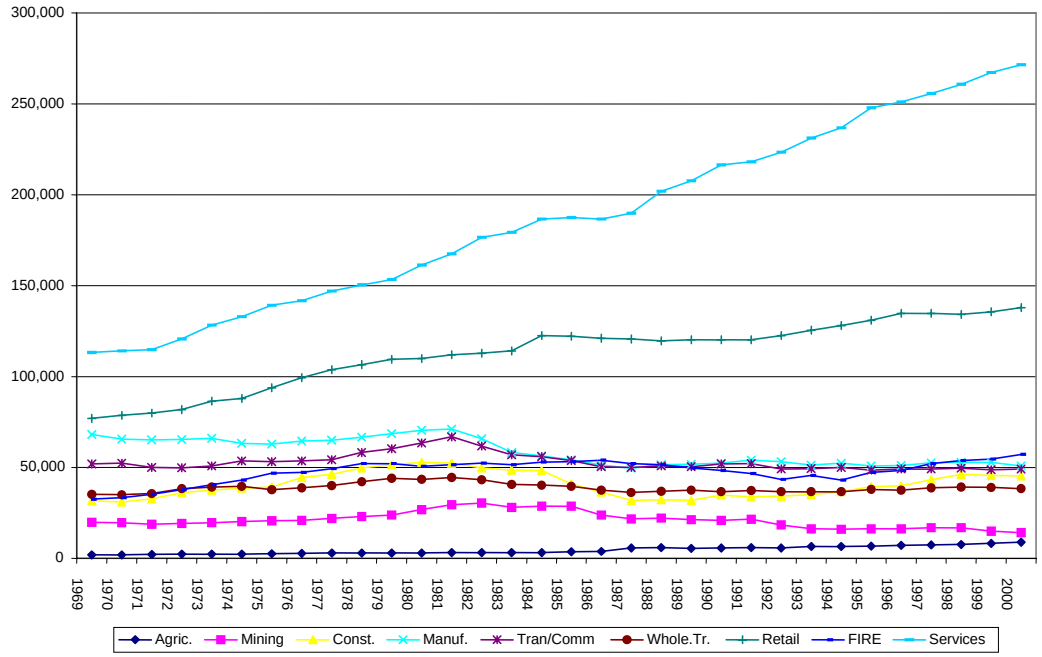


Figure 4. Major Industry Annual Employment, New Orleans LMA: 1969-2000 (U.S. Dept. of Commerce, Bureau of Economic Analysis, 2000).

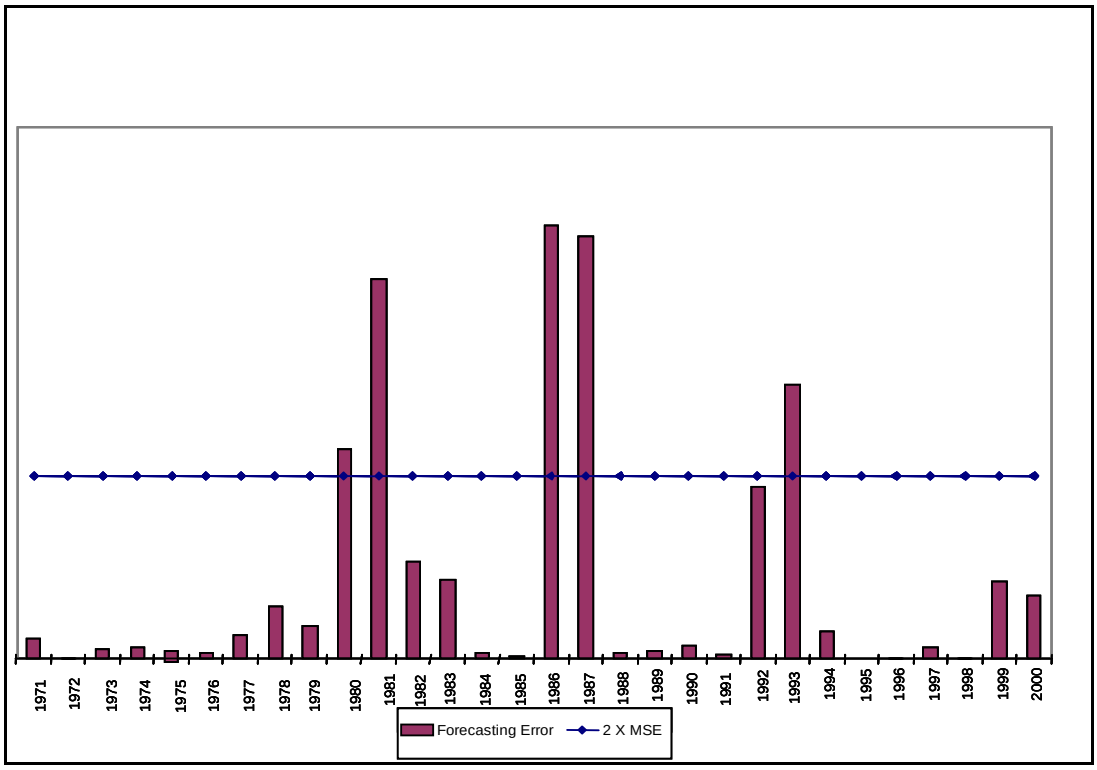


Figure 5. Forecasting Analysis for Mining Employment, New Orleans LMA: 1971-2000.

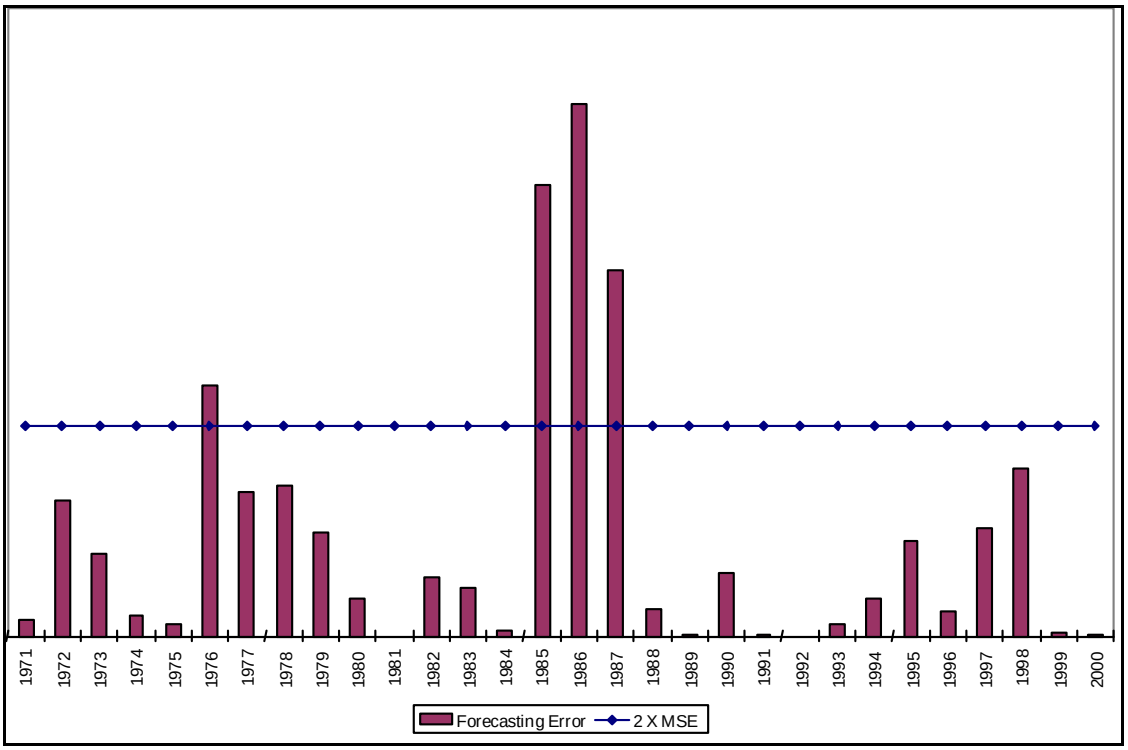


Figure 6. Forecasting Analysis for Construction, New Orleans LMA: 1971-2000.

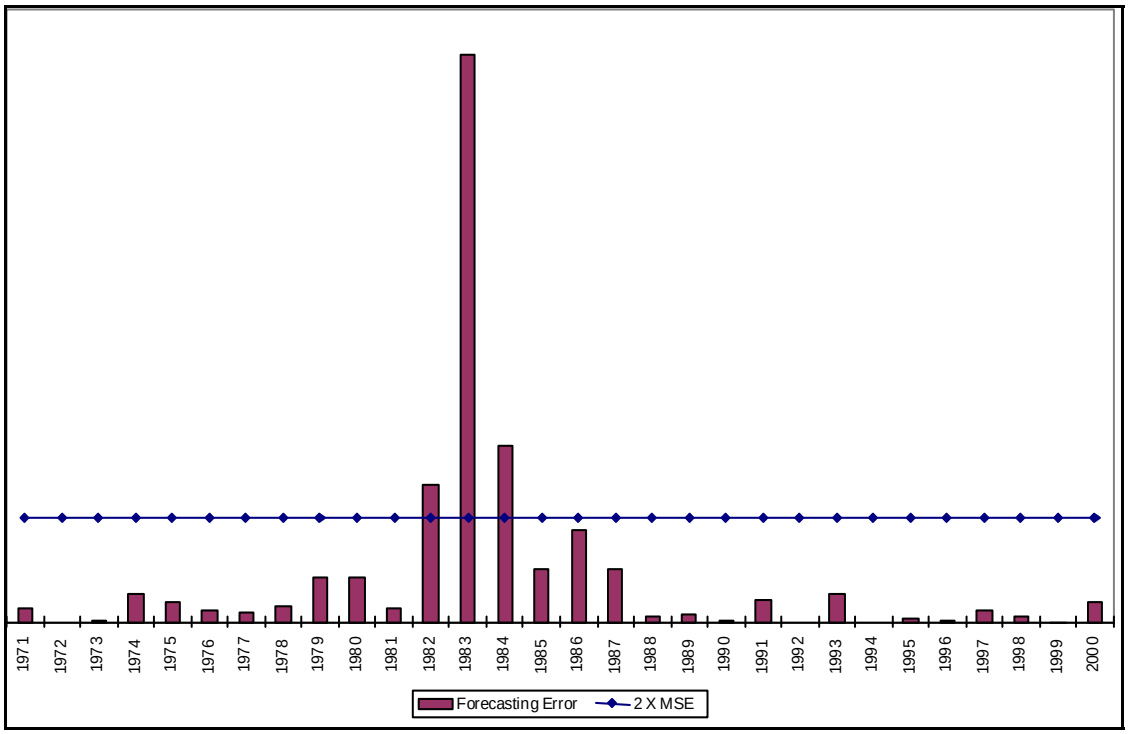


Figure 7. Forecasting Analysis for Manufacturing, New Orleans LMA: 1971-2000.

Manufacturing is a sector that experienced rapid decline in 1980s. There were significant declines in employment between 1982 and 1984. Almost 20,000 jobs were lost in this sector between 1982 and 1986. Since then, employment in this sector has remained relatively stable. Of course, the 1980s were a period of instability for the manufacturing sector, with increasing pressures from foreign labor markets. Therefore, an analysis of detailed manufacturing sector codes is needed to establish a direct relationship between these trends and the "booms and busts" of the oil and gas industry.

The annual employment data show a boom and bust pattern beginning in the late 1970s and extending through the later 1980s. The analysis of annual full- and part-time employment data by single-digit industry codes indicates that this pattern is experienced by a number of sectors, including mining, construction, manufacturing and transportation. These data show that the patterns uncovered in the decennial analysis (growth in the 1970s, decline in the 1980s) are consistent with the boom and bust patterns in the oil and natural gas industry during this period. However, using single-digit industry sector data will not allow us to confirm this finding. Therefore, we turn to an analysis of detailed industry codes within each of these categories.

Detailed Industry Code Analyses. In this next section, we present analyses of industry sector codes for four key industry groups: manufacturing, mining, transportation and wholesale trade (Table 1). We chose those categories based on a) relationship to oil and gas activities, b) employment levels, and c) availability of data in the years we are studying. The manufacturing category includes the sub-categories of fabricated structural metal products, ship and boat building and repair, and oil field machinery. Mining includes drilling oil and gas wells, oil and gas field exploration services, and oil and gas field service, N.E.C. The transportation category focuses exclusively on water. Wholesale trade considers only industrial machinery and equipment.

Table 1

Key Industry Groups and Sub-Categories

Manufacturing		
Fabricated Structural Metal Products (SIC 3440*),* this category includes manufacture of barge sections, ship sections, buoys, and metal plates for gas tanks, gas holders, oil storage tanks, large diameter pipes, pressure valves, storage tanks and also portable building.	***Ship and Boat Building and Repairing*** (SIC 3730), this category includes building and repairing barges, cargo vessels, drilling platforms and dry docks.	***Oil Field Machinery*** (SIC 3533), this category includes bits, rock and oil field tools, derricks for oil and gas fields, drill rigs, drilling tools for gas, oil and water wells.
Mining		
Drilling Oil and Gas Wells (SIC 1381), this category includes, on a contract basis, directional drilling, redrilling, reworking, and "spudding in" of oil and gas wells**.**	***Oil and Gas Field Exploration Services*** (SIC 1382), this category includes, on a fee basis, geophysical exploration, aerial exploration, and seismograph services**.**	***Oil and Gas Field Service N.E.C.*** (SIC 1389) this category includes, on a contract basis, excavating slush pits and cellars, grading and building of foundations, well surveying, running and cutting casings, tubes and rods, cementing and shooting wells, acidizing and chemically treating wells. Operating oil and gas wells for others on a contract basis are also included in this category.
Transportation		
Water Transportation (SIC 4400), this category primarily includes stevedoring.		
Wholesale Trade		
Industrial Machinery and Equipment (SIC 5084), this category includes the wholesale of derricks, oil field tool joints, oil well supply houses, oil well machinery equipment and supplies.		

New Orleans LMA Manufacturing. The employment data for the *Fabricated Structural Metal Products* (SIC 3440) show that this sector did not employ large number of workers (less than 1,800 in any given year) (Figures 8 and 9). The employment pattern that is somewhat consistent with the "boom and bust" pattern of the 1970s and 1980s. There is a rise in employment beginning in the early 1980s and a sharp decline between 1982 and 1988. There was a slight rebound in this industry in the 1990s, with employment levels reaching levels very close to those in 1981. The forecast analysis shows that in 1981, more employment was observed in this industry than was expected based on previous trends. In 1983 and 1984, however, employment in this industry was significantly lower than was expected, based on the

forecasting analysis. While the trends are consistent with the oil and gas "boom and bust" patterns, this is not an industry sector with substantial employment in the New Orleans LMA.

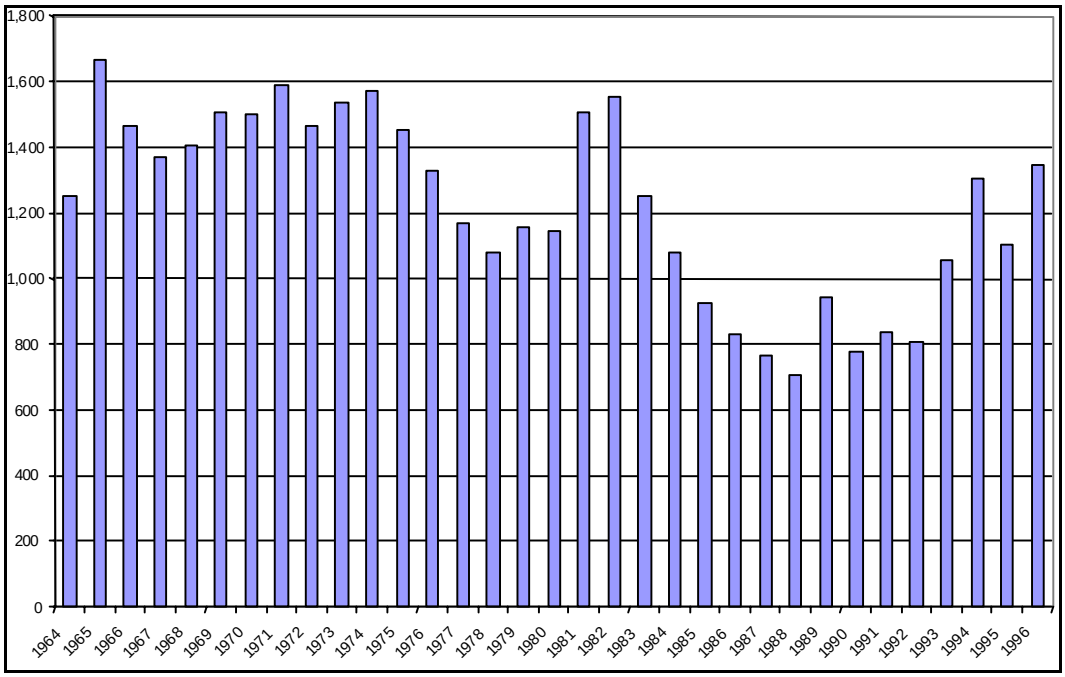


Figure 8. Annual Employment for Fabricated Structural Metal Products, New Orleans LMA: 1964-1996 (U.S. Census Bureau, 2000a).

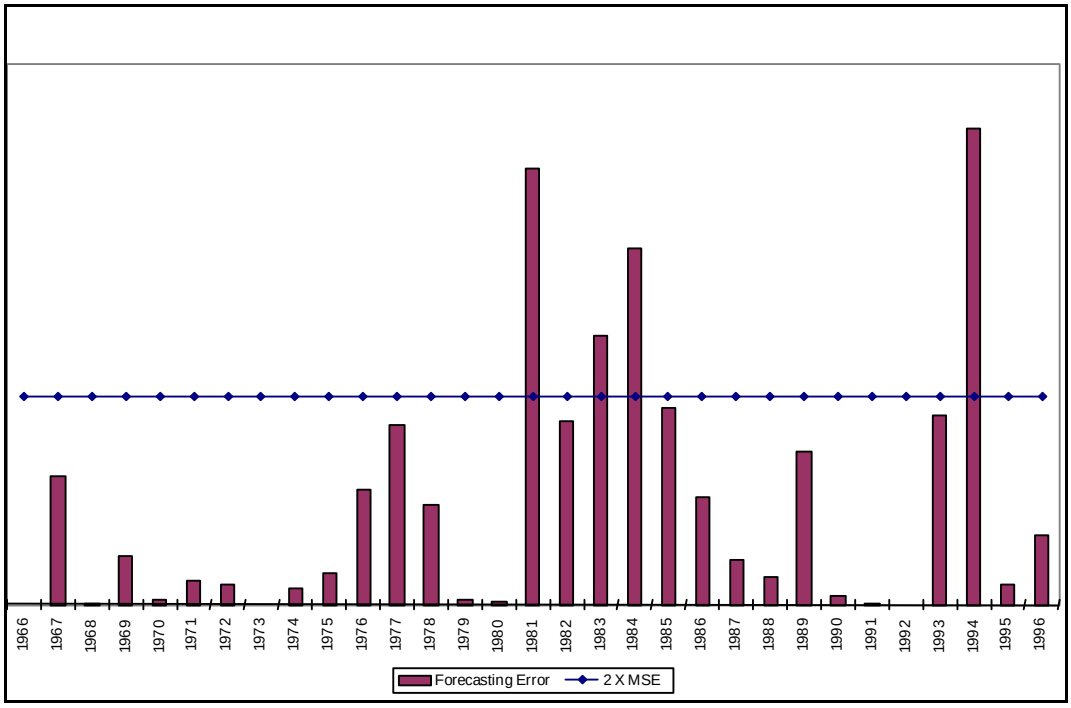


Figure 9. Forecasting Analysis for Fabricated Structural Metal Products, New Orleans LMA: 1966-1996.

The employment data on *Oil Field Machinery* (SIC 3533) manufacturing show a pattern very similar to the pattern for *Fabricated Structural Metal Products* (SIC 3440) (Figures 10 and 11). There are very low levels of employment, less than 500 workers in most years. The trends are sporadic and rather volatile. Employment growth begins in the mid-1970s and extends until 1982, but with a significant dip in 1977. The early 1980s are followed by a decline in employment that continues through the late 1980s. The forecasting analysis documents the sporadic nature of this industry in the New Orleans LMA. In 1974 and 1975 there was significantly more employment than expected. However, in 1977 there was a sharp drop off in employment. From 1978 to 1982, growth was relatively stable, but by 1983 there was another sharp drop-off from which the industry has not recovered. The patterns are consistent with the oil and gas boom and bust patterns of the period, but the limited levels of employment suggest that this industry did not have a major impact on the Greater New Orleans LMA economy.

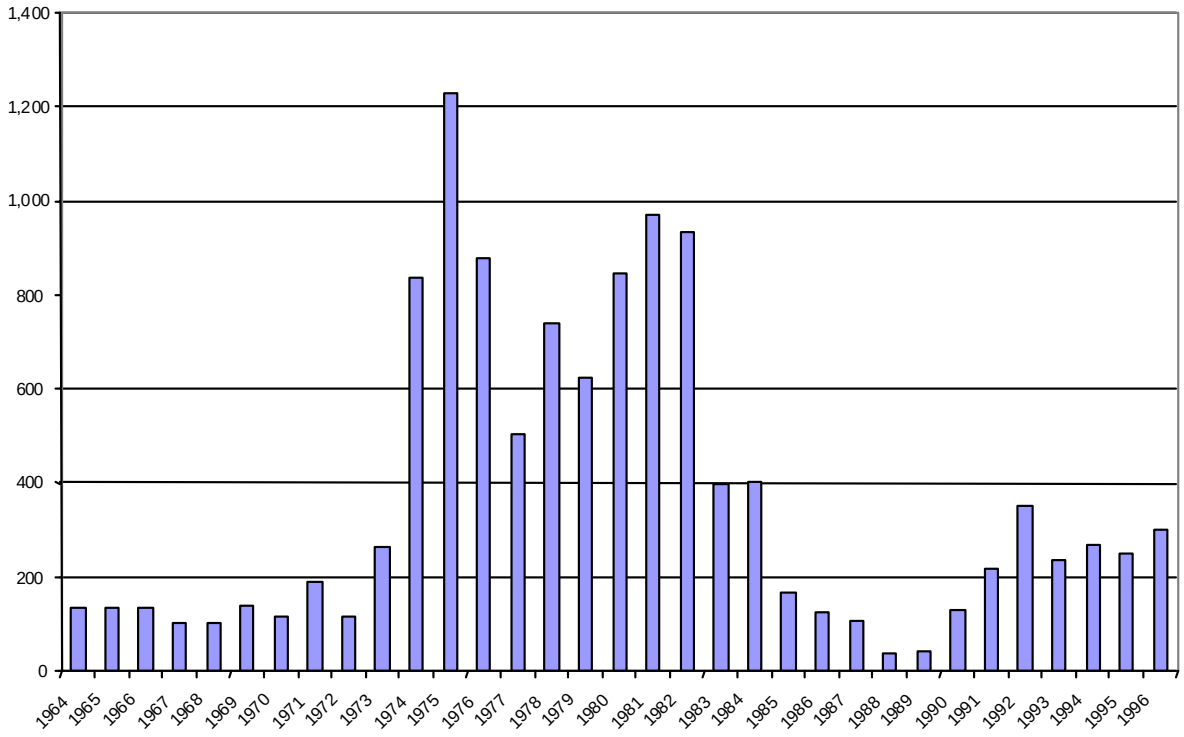


Figure 10. Annual Employment for Oil Field Machinery, New Orleans LMA: 1964-1996 (U.S. Census Bureau, 2000a).

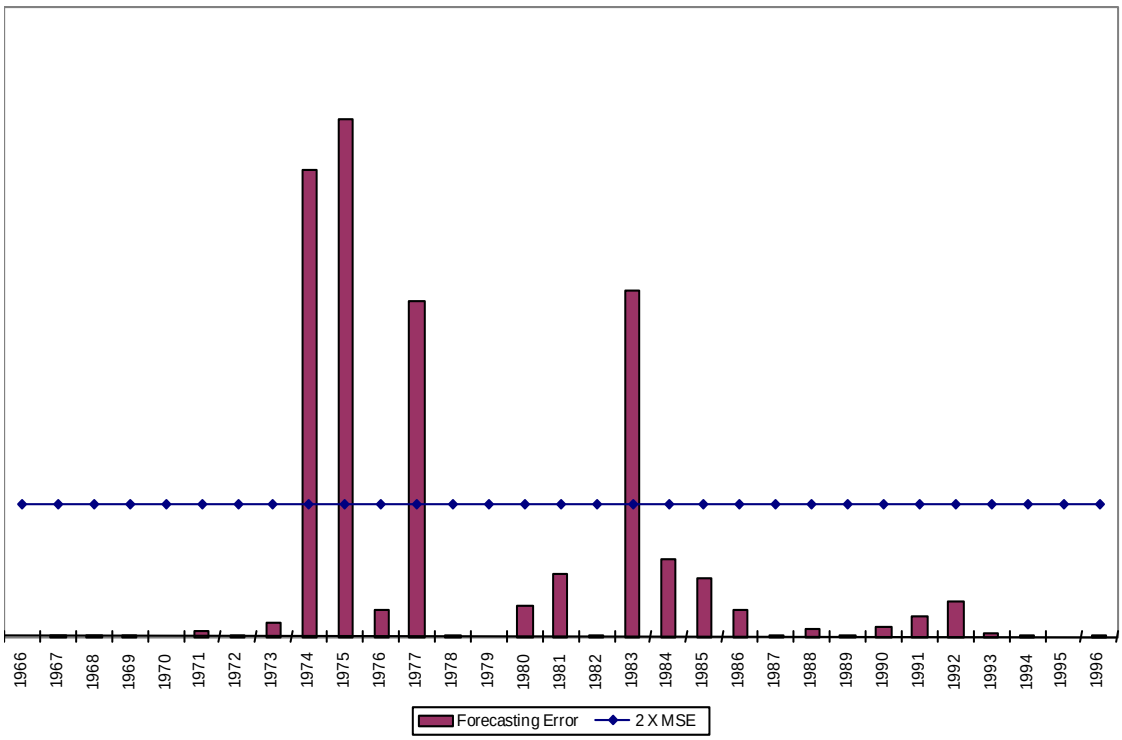


Figure 11. Forecasting Analysis for Oil Field Machinery, New Orleans LMA: 1966-1996.

The *Ship and Boat Building and Repair* (SIC 3730) sector is the largest of the key manufacturing sectors in our study; it employed more than 15,000 workers at one point in this time-line. The employment data show a clear "boom and bust" pattern in the 1970s and early 1980s (Figure 12). Between 1973 and 1981, employment in this sector grew by 172 percent. However, by 1986, employment in this sector had declined by 43 percent. This pattern is followed by a growth pattern in this industry in the early 1990s. The forecasting analysis supports the boom and bust patterns. In 1974 and 1977 there was significantly greater employment observed than was expected, based on three-year moving employment averages. In 1983 and 1984, there was significantly less employment observed in this sector than was expected. What growth and decline there is in the late 1980s and early 1990s does not fit a statistical "boom and bust" pattern, based on this forecasting analysis.

Of the three key manufacturing sectors related to oil and gas activities that we examined in the New Orleans LMA, "ship and boat building and repairing" is the most significant in both size and history. This industry employed over 15,000 workers at the height of the boom. The employment patterns are classically consistent with what we know about the industry in this region of the country.

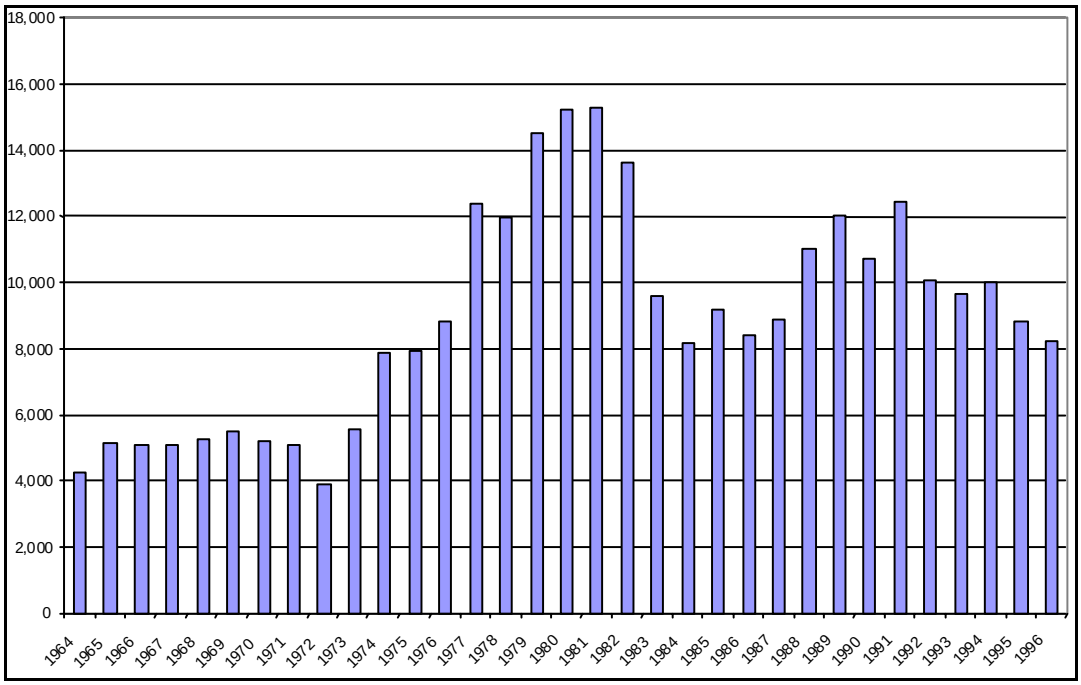


Figure 12. Annual Employment for Ship and Boat Building and Repair, New Orleans LMA: 1964-1996 (U.S. Census Bureau, 2000a).

New Orleans LMA Mining. The data on *Drilling Oil and Gas Wells* does not fit the classic "boom and bust" pattern that we see in other LMAs in the GOMR. Mining employment peaked in 1974 at over 3,500 workers (Figure 13). According to our forecasting analysis (not shown here), growth began in 1974 but had reduced dramatically by 1977. There was a slight one-year bump in employment in 1990, but it quickly dissipated.

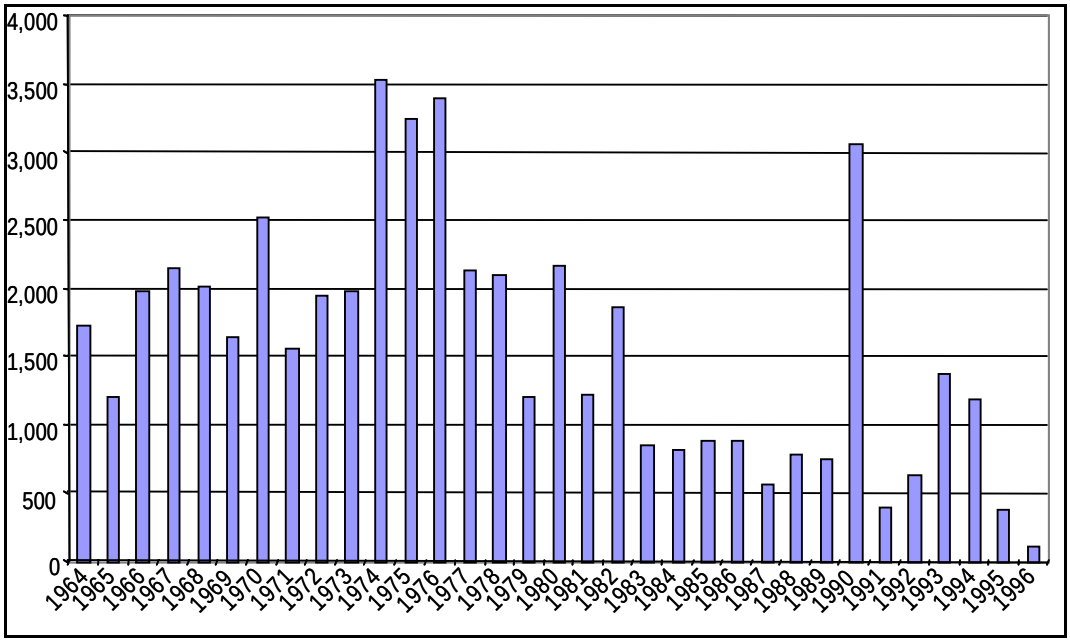


Figure 13. Annual Employment for Drilling Oil and Gas Wells, New Orleans LMA: 1964-1996 (U.S. Census Bureau, 2000a).

The *Oil and Gas Field Exploration Services* (SIC 1382) industry has very little presence in the New Orleans LMA (Figures 14 and 15).

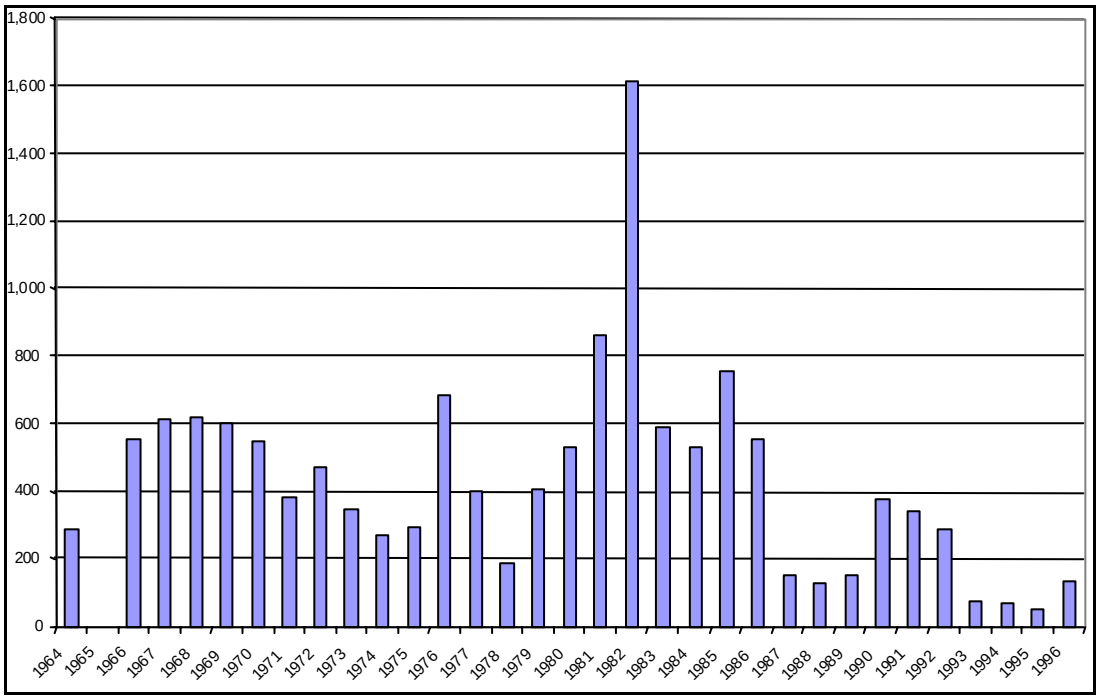


Figure 14. Annual Employment for Oil and Gas Field Services, New Orleans LMA: 1964-1996 (U.S. Census Bureau, 2000a).

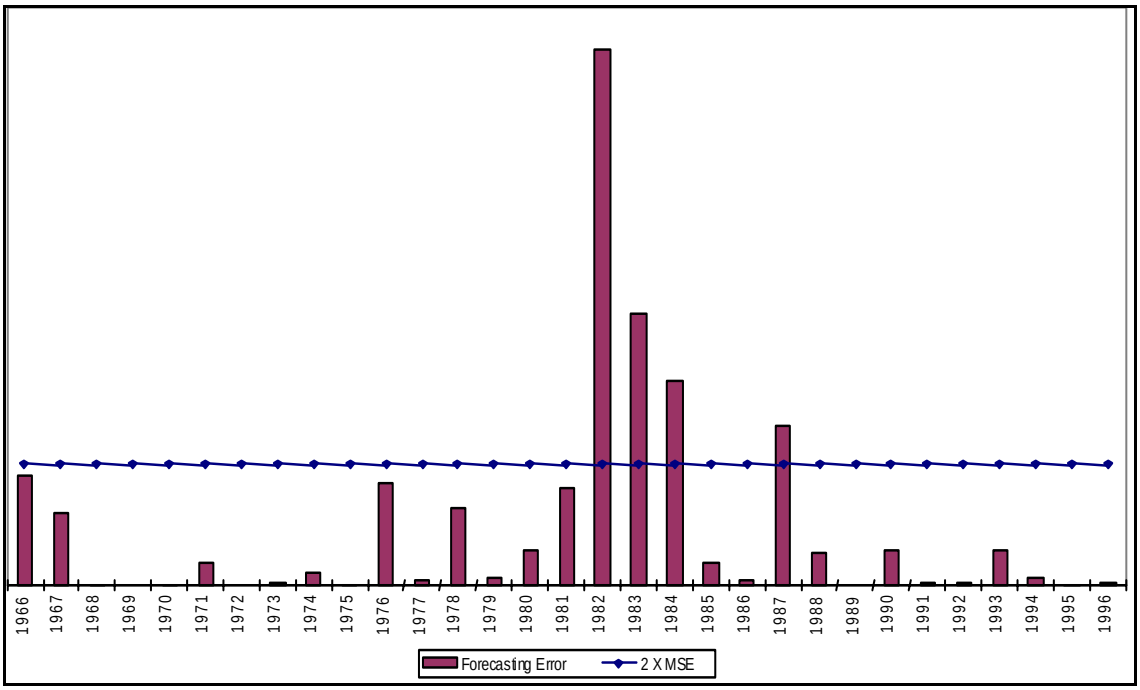


Figure 15. Forecasting Analysis for Oil and Gas Field Services, New Orleans LMA: 1966-1996.

With the exception of 1982, the *Oil and Gas Field Exploration Services* sector has never employed more than 1,000 workers. The forecasting analysis shows a one-year spike in employment (1982) followed by a sharp drop-off (1983 and 1984).

However, employment levels in the Oil a*nd Gas Field Service N.E.C.* (SIC 1389) category are much more significant (Figures 16 and 17). In 1982 over 6,600 workers were employed in this industry. The employment patterns show that this sector has had a major presence in the New Orleans LMA since the 1960s. Employment levels exceeded 3,000 workers for 20 years, beginning in 1966. Employment peaked in 1982 at 6,600 workers. The forecasting analysis shows that the permanent downsizing of this industry sector began in 1985. Within two years, employment levels had decreased by 60 percent, to less than 2,000 workers. Data for 1996 show a sharp increase in employment.

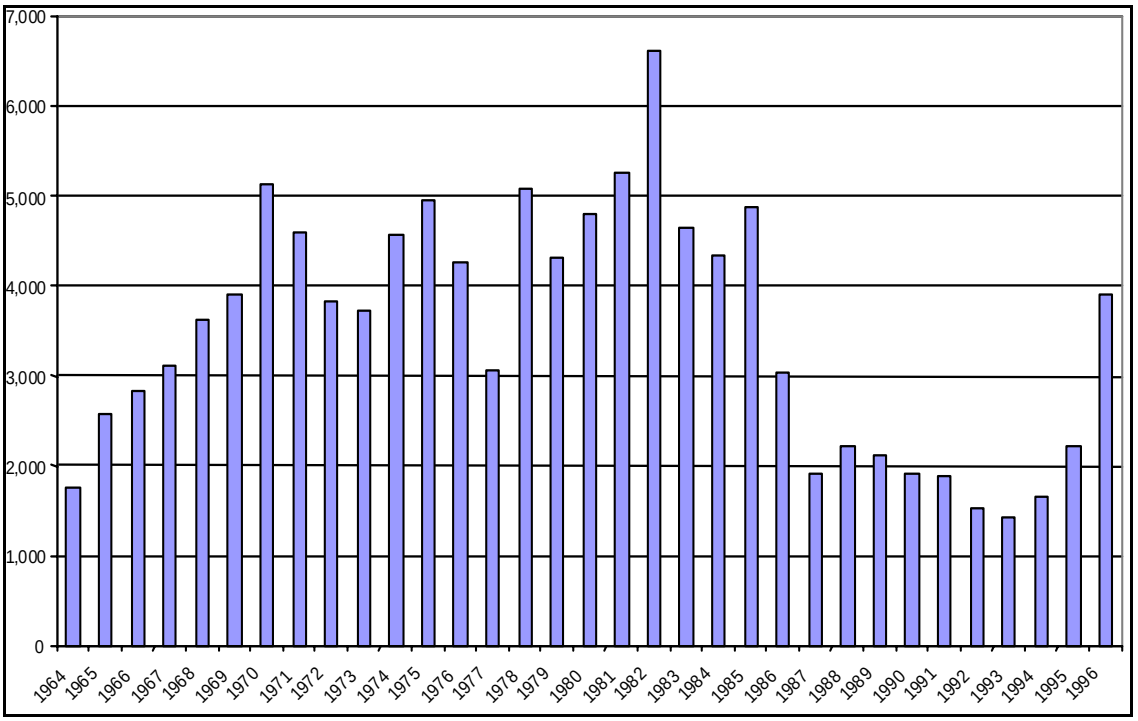


Figure 16. Annual Employment for Oil and Gas Field Services-NEC, New Orleans LMA: 1964-1996 (U.S. Census Bureau, 2000a).

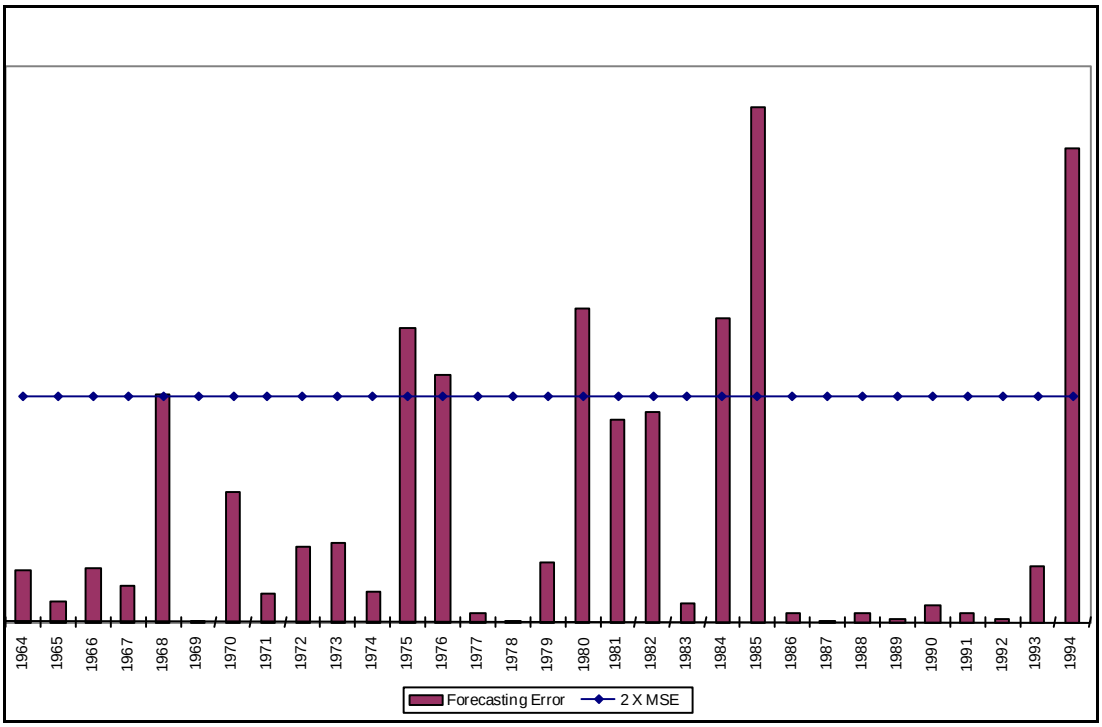


Figure 17. Forecasting Analysis for Oil and Gas Field Services-NEC, New Orleans LMA: 1964-1994.

New Orleans LMA Water Transportation. The following figures present data on *Water Transportation* (SIC 4400) employment (Figures 18 and 19). Unfortunately, there is no category that directly measures water transportation related to offshore oil and gas activities. However, we did find a "boom and bust" trend in transportation and public utilities. We suspect that this trend is directly related to offshore oil and gas activities. We believe that a direct examination of water transportation earnings will bring us closer to the impact of oil and gas activities.

The data show that *Water Transportation* is a significant industry in the New Orleans LMA, employing over 20,000 workers in the early 1980s. The level of employment in this sector is expected. New Orleans is one of the world's leading port cities. However, the pattern of employment is similar to the other oil and gas sectors. Employment in *Water Transportation* (SIC 4400) peaked in 1981 and 1982, and declined significantly after that period. Between 1980 and 1987, over half of all jobs in this industry were lost in the New Orleans LMA. Since 1993, employment has been relatively stable. The forecasting analysis shows that in both 1983 and 1987, there were significantly fewer workers employed in this industry than were expected. Moreover, the pre- and post-pattern data show employment levels in water transportation at about 10,000 workers. At the height of the boom (1982) employment reached over 20,000 workers. We estimate that approximately 10,000 workers in this industry were affected by the "boom and bust" patterns of the oil and natural gas industry in the New Orleans LMA.

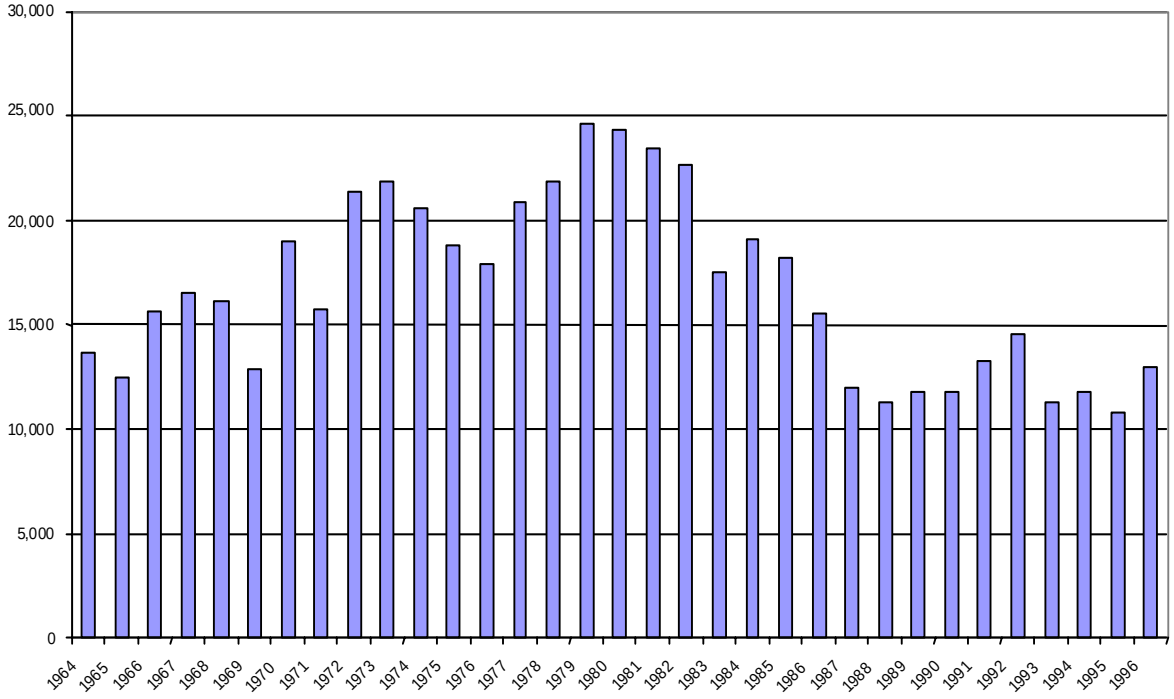


Figure 18. Annual Employment for Water Transportation, New Orleans LMA: 1964-1996 (U.S. Census Bureau, 2000a).

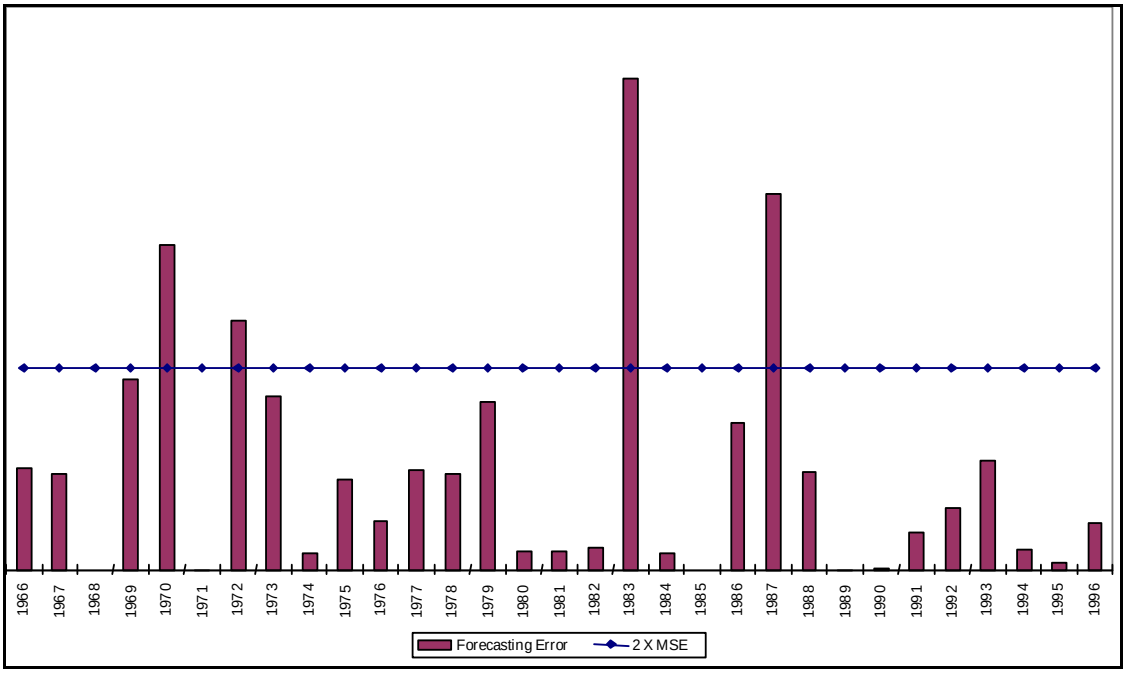


Figure 19. Forecasting Analysis for Water Transportation, New Orleans LMA: 1966-1996.

New Orleans LMA Wholesale Trade. The data for *Industrial Machinery and Equipment* (SIC 5084) are presented below (Figure 20). This industry category includes the wholesale marketing of oil well machinery. These data are available only from 1977 to 1996, which does not provide enough years to perform a forecasting analysis. However, the trend line in Figure 20 shows the familiar pattern of growth in the 1970s: an apex in the early 1980s (1981; 4,000 plus workers), followed by a decline. In 1987, employment in this sector reached a low-point of 2,400 workers. Since 1987 employment in this industry has fluctuated between 2,000 and 3,000 workers.

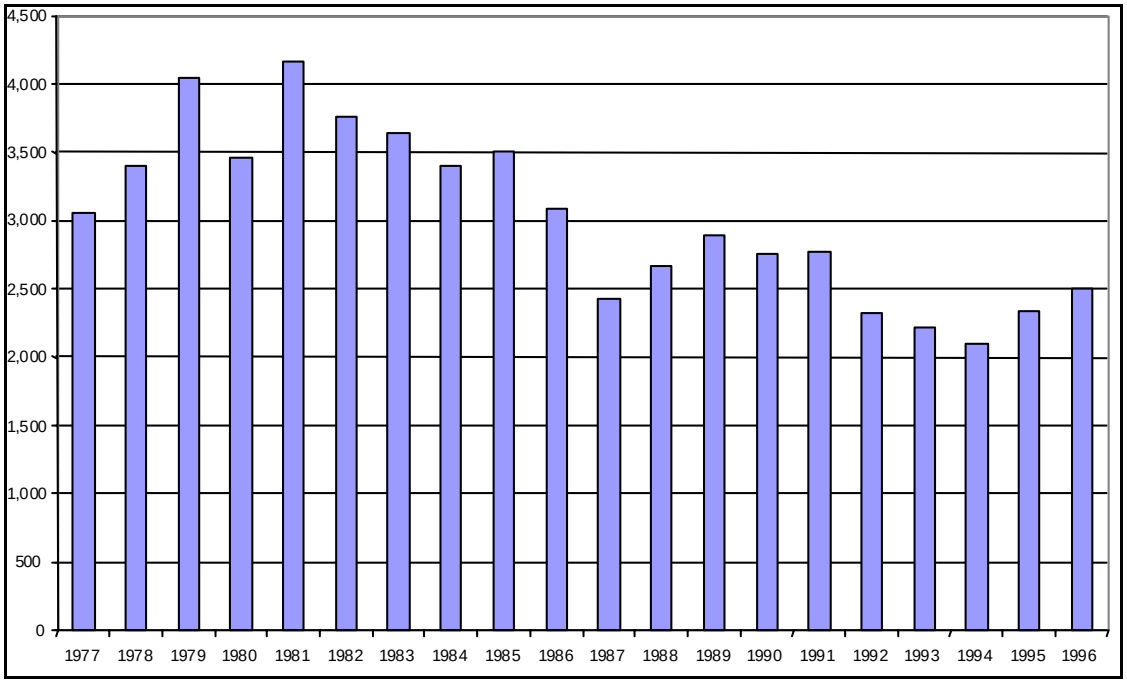


Figure 20. Annual Employment for Wholesale Trade of Industrial Machinery and Equipment, New Orleans LMA: 1964-1996 (U.S. Census Bureau, 2000a).

The detailed employment data show the impact of the "boom and bust" patterns on the oil and gas and related industries in the New Orleans LMA. In those eight detailed categories alone, almost 24,000 jobs were lost between 1982 and 1987 in the New Orleans LMA. Three main industry sectors were impacted: water transportation, ship building and repairing, and oil and gas field services, NEC. These data do not include the "ripple" effects of economic shocks throughout the rest of the economy. The annual employment data show downturns in other industries that were dependent upon the boom generated in the oil and gas activities, such as construction and retail trade. When people lose their jobs they do not build nor do they purchase as many goods and services.

While the data show an entire labor market area caught in a market contraction (in a natural resource industry) during the 1980s, the historical data for the New Orleans LMA suggest two important trends. First, this pattern is unique to this period (1978-1987). While off-shore drilling has been present in the Gulf of Mexico since the 1940s, we do not find any other "boom or bust" patterns for oil and gas related industries in years prior to the 1970s. Second, despite the hard economic times of the 1980s, the greater New Orleans LMA has recovered, at least in terms of employment, during the period following the oil industry. Data on total employment

presented above shows that by 1996 total employment levels had surpassed those set at the height of the oil and gas boom (1982); a pattern similar to that for Lafayette LMA.

New Orleans LMA Population, Education, and Local Government: 1970-1990. Population data for the New Orleans LMA is presented below (Tables 2-4). Between 1970 and 1980, the population of the New Orleans Labor Market Area increased by 14 percent, from 1,186,117 to 1,348,007. The 14 percent growth rate for the entire LMA is significantly greater than the national growth rate of 11 percent for the same time period. Within the LMA, however, the population grew fastest in St. Tammany Parish, a suburb of New Orleans across Lake Pontchartrain. Between 1980 and 1990, the population of the New Orleans LMA decreased by nearly 2 percent, indicating extensive out-migration, specifically in Jefferson, Orleans, Plaquemines, St. James, and Washington Parishes.

The racial composition of the LMA also shifted. Between 1970 and 1980, the African-American population increased from 31 percent to 33 percent. During the same time period, the Caucasian population decreased from 68 percent to 66 percent. Between 1980 and 1990, the African-American population increased from 33 percent to 35 percent, while the Caucasian population decreased to 62 percent.

The population growth rates deviate from the national trends during this period. Deviation comes from two sources: natural increase and migration. Rapid growth or decline comes almost exclusively from migration. Net migration is a useful concept through which to understand the equilibration of employment and population in sub-regions, the adaptation of the ecosystem to changes in its external environment. One important component of the explanation of net migration is the expansion and contraction of employment opportunities in an area (Micklin and Choldin, 1984). In particular, "boom and bust" patterns in extractive industries in non-metropolitan settings can be expected to produce rapid shifts in the direction of net migration, because industry-specific employment fluctuations may be large relative to total employment in an area (Rural Sociological Society Task Force, 1993; Beard, 1988; Frey and Speare, 1988). Periods of rapid employment growth will attract workers (and possibly dependent household members) from outside the region. Periods of employment decline can lead to compensating out-migration flows.

Table 2

Population by Parish, New Orleans LMA: 1940-2000

Parish	1940	1950	1960	1970	1980	1990	2000
Jefferson	50,427	103,873	208,769	337,568	454,592	448,306	455,466
Orleans	494,537	570,445	627,525	593,471	557,515	496,938	484,674
Plaquem.	12,318	14,239	22,545	25,225	26,049	25,575	26,757
St. Bern.	7,280	11,087	32,186	51,185	64,097	66,631	67,229
St. Charles	12,321	13,363	21,219	29,550	37,259	42,437	48,072
St. James	16,596	15,334	18,369	19,733	21,495	20,879	21,216
St. John	14,766	14,861	18,439	23,813	31,924	29,996	43,044
St. Tamm.	23,624	26,988	38,643	63,585	110,869	144,508	191,268
Washing.	34,443	38,371	44,015	41,987	44,207	43,185	43,926
Total	666,312	808,561	1,031,710	1,186,117	1,348,007	1,328,455	1,381,652

Source: U.S. Census Bureau, 2000b.

Table 3

Percent of White Population, New Orleans LMA: 1940-2000

Parish	1940	1950	1960	1970	1980	1990	2000
Jefferson	82.9	84.3	84.7	87.3	83.7	78.3	69.8
Orleans	69.7	68.0	62.5	54.6	42.7	34.8	28.0
Plaquemines	55.7	61.3	71.1	75.8	76.8	72.4	69.7
St. Bernard	80.4	85.3	92.4	94.4	95.1	93.5	88.3
St. Charles	68.2	67.3	72.9	73.5	73.8	74.8	72.4
St. James	50.4	49.7	50.7	52.7	52.6	50.0	50.0
St. John	53.4	50.1	48.4	53.4	61.4	83.5	52.6
St. Tammany	69.0	70.6	72.5	81.2	86.6	87.7	87.0
Washington	68.6	68.5	66.1	67.6	69.5	68.6	67.4
LMA %	69.6	69.6	68.4	68.3	65.6	62.4	57.6
LMA Total	463,939	563,049	706,094	811,289	885,082	828,984	796,096

Source: U.S. Census Bureau, 2000b.

Table 4

Percent of Black Population, New Orleans LMA: 1940-2000

Parish	1940	1950	1960	1970	1980	1990	2000
Jefferson	16.8	15.5	15.1	12.4	13.9	17.6	22.8
Orleans	30.1	31.8	37.2	45.0	55.2	62.0	67.2
Plaquemines	43.9	38.3	28.1	22.9	21.1	23.2	23.4
St. Bernard	19.3	14.5	7.2	5.3	3.7	4.6	7.6
St. Charles	31.7	32.5	27.0	26.3	25.5	24.2	25.2
St. James	49.5	50.2	49.2	47.2	47.2	49.5	49.3
St. John	46.5	50.0	51.6	46.3	38.1	47.9	44.7
St. Tammany	30.9	29.3	27.2	18.6	12.4	11.0	9.9
Washington	31.4	31.4	33.8	32.1	30.1	30.8	31.5
LMA %	30.2	30.2	31.3	31.3	32.4	34.6	37.3
LMA Total	201,454	244,441	323,532	371,393	438,044	460,483	516,102

Source: U.S. Census Bureau, 2000b.

Education. Adult educational attainment levels in the New Orleans LMA were higher than those for the State of Louisiana as a whole (Table 5). In 1970, 55 percent of the adults in the New Orleans LMA had not graduated from high school, compared to 57 percent for the State of Louisiana. By 1980, the percentage of adults who had not graduated from high school in the New Orleans LMA had declined to 38 percent, compared 41 percent for the State. However, the raw numbers for the LMA show that the number of adults who attended but did not complete high school actually increased in the New Orleans LMA between 1970 and 1980 (by over 1,000). By 1990, the percentage of high school graduates in the New Orleans LMA dropped from 38 in 1980 to 29. While the New Orleans LMA faired better than other Louisiana oil and

gas LMAs (particularly Lafayette and Lafourche) in terms of educational attainment, there are still trends present in this LMA (notably the rise in the actual number of adults who did not finish high school) that we do not find in LMAs outside of Louisiana.

Table 5

Adult Educational Attainment (25+), New Orleans LMA: 1970-2000

Parish	0-8 Years	Some High School	High School Diploma	Some College, No Degree	BA/BS or More	Total
1970						
Jefferson	28.0%	19.3%	30.6%	10.9%	11.0%	167,297
Orleans	38.0%	19.7%	22.8%	8.6%	10.8%	318,872
Plaquemines	44.7%	19.6%	25.0%	5.9%	4.7%	11,505
St. Bernard	34.9%	22.6%	32.3%	6.4%	3.7%	24,968
St. Charles	37.9%	18.8%	30.0%	7.3%	5.9%	13,305
St. James	46.5%	17.2%	26.0%	11.4%	5.6%	8,481
St. John	44.8%	16.7%	29.8%	4.7%	3.8%	10,759
St. Tammany	30.8%	20.0%	27.5%	10.2%	11.2%	31,781
Washington	40.5%	21.2%	25.5%	6.3%	6.4%	22,013
LMA Total	35.2%	19.7%	26.0%	8.9%	10.0%	608,981
1980						
Jefferson	19.2%	14.2%	35.9%	16.3%	16.2%	253,666
Orleans	24.1%	16.7%	27.0%	14.2%	17.7%	318,566
Plaquemines	30.6%	19.0%	34.6%	10.0%	5.7%	13,220
St. Bernard	25.3%	17.0%	42.0%	9.9%	5.6%	35,894
St. Charles	23.1%	18.0%	36.9%	11.6%	10.3%	19,126
St. James	29.6%	19.3%	34.4%	8.3%	8.2%	10,669
St. John	25.1%	17.1%	36.0%	11.8%	9.8%	15,973
St. Tammany	17.1%	15.0%	32.1%	15.7%	20.0%	61,713
Washington	28.0%	22.6%	31.5%	9.1%	8.6%	25,135
LMA Total	21.6%	16.1%	32.1%	14.4%	15.8%	753,962
1990						
Jefferson	10.5%	13.4%	31.8%	25.3%	18.7%	283,003
Orleans	13.2%	18.6%	23.5%	22.1%	22.4%	305,065
Plaquemines	22.3%	19.7%	32.2%	18.2%	7.6%	14,888
St. Bernard	12.2%	18.2%	39.2%	20.7%	7.2%	41,894
St. Charles	10.6%	15.3%	35.8%	23.4%	14.7%	25,442
St. James	17.2%	21.6%	38.9%	13.9%	8.1%	12,019
St. John	12.5%	15.9%	38.5%	21.6%	11.4%	22,773
St. Tammany	8.7%	14.4%	28.4%	25.4%	23.0%	89,425
Washington	16.8%	21.7%	37.7%	15.0%	8.6%	27,176
LMA Total	12.1%	16.3%	29.3%	23.1%	18.9%	821,685

Table 5

Adult Educational Attainment (25+), New Orleans LMA: 1970-2000 (continued)

2000						
Jefferson	7.0%	13.6%	30.0%	27.8%	21.5%	298,761
Orleans	8.0%	17.2%	23.4%	25.5%	25.7%	300,568
Plaquemines	14.6%	16.6%	34.2%	23.6%	10.8%	16,448
St. Bernard	9.9%	16.9%	37.9%	26.2%	8.9%	44,127
St. Charles	7.0%	13.0%	36.0%	26.4%	17.5%	29,551
St. James	9.2%	16.8%	45.1%	18.7%	10.0%	12,840
St. John	7.4%	15.7%	38.9%	25.0%	21.9%	25,377
St. Tammany	4.7%	11.3%	26.5%	29.0%	28.3%	122,959
Washington	10.8%	21.0%	40.1%	17.1%	10.9%	27,954
LMA Total	7.5%	15.1%	28.7%	26.4%	22.1%	878,585

Source: U.S. Census Bureau, 2000b.

Finances. The data for local government financing show that the oil and gas industry "boom and bust" of the 1970s and 1980s had an important effect on the financing of local governments in the New Orleans LMA. The data below show that, between 1972 and 1982, total revenues for local governments increased by 41 percent in constant dollars (Tables 6-9). State allocation to local governments increased by 14 percent during the same period. In 1972, state allocations accounted for more than one-third of local government revenue in the New Orleans LMA. By 1982, state allocation accounted for only 20 percent of local government revenue.

The data on local government debt show that during the boom of the 1970s and early 1980s, local governments in the New Orleans LMA had to incur debt to finance the increased demand for services that came with economic growth. However, between 1972 and 1982, local government debt for the entire LMA decreased by nearly 9 percent in real dollars. Yet, between 1977 and 1982, per capita local government debt increased by over 11 percent in the New Orleans LMA as a whole, with St. John the Baptist Parish incurring the largest increase in debt (171 percent). In 1982, local government debt was over $3,000 per person in 1982 dollars (over $5,000 in 1997 dollars) in New Orleans Parish.

The data for the 1980s show that, between 1982 and 1987, total local government revenue grew by a modest amount (about 7% in constant dollars) in the New Orleans LMA. However, state revenue actually fell during that period by 18 percent in constant dollars– a pattern common to Louisiana LMAs between 1982 and 1987. The drop off in state revenue was recaptured through increased local government debt. Between 1982 and 1987, local governments in the New Orleans LMA accrued, on average, an increase in debt of 43 percent. The debt load was highest in St. James Parish. In 1987, the total debt per person exceeded $4,600 per person in current (1987) dollars. However, the increase in debt for New Orleans LMA during the 1980s was significantly less than in Lafayette LMA. By 1992, the per capita local government debt was $1,000 per capita less for the New Orleans LMA than for the Lafayette LMA.

Table 6

Total Revenue, Per Capita (in 1997 adjusted dollars), New Orleans LMA: 1972-1997

Parish	1972	1977	1982	1987	1992	1997
Jefferson	$1,519	$1,685	$1,987	$2,222	$2,602	$2,815
Orleans	$1,545	$1,896	$2,364	$2,585	$2,557	$2,906
Plaquemines	$3,076	$3,616	$4,298	$3,614	$3,237	$3,664
St. Bernard	$1,149	$1,543	$1,530	$1,559	$1,820	$1,355
St. Charles	$1,387	$2,016	$2,992	$2,615	$3,447	$3,815
St. James	$1,198	$2,447	$2,981	$3,962	$3,402	$3,585
St. John	$1,161	$1,310	$1,520	$1,407	$1,644	$1,701
St. Tammany	$1,422	$1,499	$1,490	$1,631	$2,080	$2,357
Washington	$1,335	$1,698	$1,782	$1,579	$1,739	$1,905
LMA Total	$1,520	$1,809	$2,144	$2,290	$2,482	$2,714

Source: U.S. Census Bureau, 2000a.

Table 7

Total State Revenue, Per Capita (in 1997 adjusted dollars), New Orleans LMA: 1972-1997

Parish	1972	1977	1982	1987	1992	1997
Jefferson	$456	$439	$425	$360	$443	$432
Orleans	$470	$537	$594	$507	$595	$757
Plaquemines	$1,017	$1,835	$1,344	$947	$978	$957
St. Bernard	$539	$601	$658	$491	$641	$501
St. Charles	$627	$717	$807	$619	$713	$645
St. James	$255	$885	$868	$718	$790	$845
St. John	$600	$627	$569	$453	$557	$579
St. Tammany	$570	$555	$539	$442	$552	$648
Washington	$723	$812	$829	$637	$838	$850
LMA Total	$498	$556	$567	$468	$561	$620

Source: U.S. Census Bureau, 2000a.

Table 8

Total Tax Revenue, Per Capita (in 1997 adjusted dollars), New Orleans LMA: 1972-1997

Parish	1972	1977	1982	1987	1992	1997
Jefferson	$588	$636	$768	$866	$1,145	$1,184
Orleans	$655	$697	$801	$937	$1,079	$1,071
Plaquemines	$571	$512	$1,031	$1,018	$1,007	$1,481
St. Bernard	$529	$523	$520	$502	$553	$548
St. Charles	$475	$860	$1,220	$1,137	$1,509	$2,048
St. James	$448	$675	$1,041	$985	$1,353	$1,410
St. John	$301	$402	$513	$615	$766	$778
St. Tammany	$449	$367	$371	$564	$683	$804
Washington	$383	$448	$417	$437	$428	$551
LMA Total	$592	$632	$739	$836	$1,016	$1,069

Source: U.S. Census Bureau, 2000a.

Table 9

Total Debt, Per Capita (in 1997 adjusted dollars), New Orleans LMA: 1972-1997

Parish	1972	1977	1982	1987	1992	1997
Jefferson	$3,089	$2,069	$2,223	$3,465	$2,860	$2,847
Orleans	$2,226	$1,691	$1,814	$2,801	$3,117	$3,459
Plaquemines	$2,011	$1,958	$368	$422	$6,238	$4,475
St. Bernard	$2,208	$3,117	$2,282	$2,979	$2,567	$1,859
St. Charles	$1,393	$2,673	$6,498	$5,845	$3,551	$5,710
St. James	$4,137	$6,595	$5,060	$15,139	$11,146	$8,507
St. John	$2,529	$1,229	$3,334	$3,100	$2,887	$2,304
St. Tammany	$1,108	$1,388	$2,159	$1,710	$2,593	$1,642
Washington	$712	$1,464	$942	$731	$606	$248
LMA Total	$2,380	$1,955	$2,173	$3,103	$2,935	$2,973

Source: U.S. Census Bureau, 2000a.

The New Orleans LMA was intricately linked to the oil and gas industry during the "boom and bust" of the 1970s and 1980s. Over 20,000 jobs were lost in core industries during the 1980s. Negative population growth between 1980 and 1990, and an increase in debt incurred by local governments to keep essential functions running are linked to this bust. In those decades, New Orleans had a robust economy serving over one million people, with a vibrant tourist trade. What happened to the economy after the oil bust?

Total employment in the New Orleans LMA grew by 9 percent during the 1990s. However, three sectors declined during the 1990s: mining (-3,000 jobs); manufacturing (-6,000 jobs) and wholesale/retail trade (-25,000 jobs). The service sector led growth, adding almost 100,000 jobs during the 1990s.

Between 1990 and 2000, the New Orleans LMA population increased modestly (4%) from 1,328,455 to 1,381,652. This growth rate is significantly lower than the national rate of 10 percent for the same time period. All parishes within the LMA showed some amount of increase in population, except for the New Orleans Parish, which experienced negative population growth. This suggests continued out-migration to the suburb parishes. This pattern is similar for the 1990 to 2000 period. The African-American population increased from 35 percent to 37 percent, while the Caucasian population decreased to 58 percent in 2000. These patterns indicate "white flight" to surrounding suburban areas. In addition, the percentage of adults with college degrees reached 22 percent, compared to 26 percent for the nation as a whole.

For the 1990s, the data show that total local government revenue continued to increase by 9.4 percent between 1992 and 1997. In addition, state allocation to local government increased by 10 percent in the same time period. Even though total local government and state allocation to local governments increased during the period between 1992 and 1997, local government debt for the entire LMA increased slightly by about 1 percent in real dollars. However, six of the parishes in the LMA experienced a decrease in their debt loads.

New Orleans was the second largest city in the Gulf of Mexico region through 2000. Unlike Houston, however, the New Orleans economy actually contracted during the oil bust of the 1980s, with the LMA as a whole experiencing negative population growth during that decade. Moreover, the 4 percent population growth rate during the 1990s is far behind the 25 percent growth rate experienced by the Greater Houston LMA region during the 1990s. The 1980s were a transitional period for those two cities and their surrounding economies. Houston weathered the bust very well and expanded its economy beyond the national growth rates during the 1990s. New Orleans recovered from the effects of the oil and gas bust with local government debts declining and employment growing. Still, New Orleans fell further behind Houston during the decade after the bust.

IV. MISSISSIPPI STATE PROFILE

A. INTRODUCTION

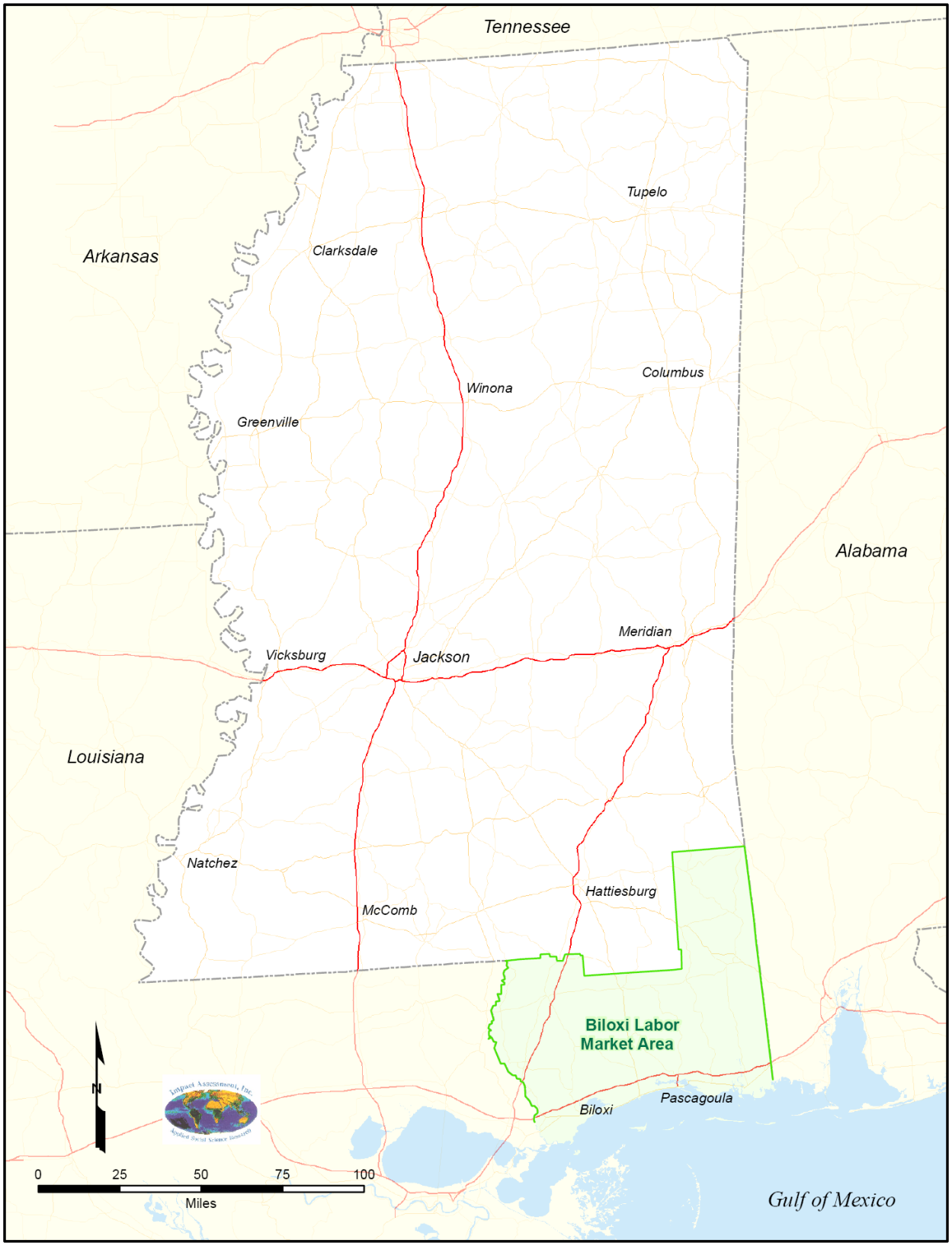
The State of Mississippi is bordered by Louisiana and Arkansas to the west, Alabama to the east, Tennessee to the north, and the Gulf of Mexico to the south (Map 11). Mississippi encompasses a total of 48,434 square miles, 1,520 of which are water. With an average annual temperature of 65° (42° January; 81° July) and 52 inches of rain, Mississippi enjoys a temperate, if moderately wet, climate. However, the Mississippi Coastal region along the Gulf of Mexico receives 62 inches of rain each year and is vulnerable to flooding and hurricane damage (Mississippi Development Authority, 2002).

Mississippi has a diverse terrain that ranges from rolling hills and flatlands, to sandy beaches and forests. The state is topographically divided into five general regions: the Capital River region (southwest), the Hills region (north), the Delta region (northwest), the Pines region (east), and the Coastal region (south).

Dense forestry is one of the state's defining characteristics. Bienville, Delta, Desoto, Holly Springs, Homochitto and Tombigbee National Forests are all located within the state. These forests occupy one million acres and encompass over 2,000 acres of lakes and 600 miles of streams. The State also operates 14 wildlife management areas (WMAs) and 21 Gulf Ecological Management sites (GEMS). These sites include Bayou La Croix, Bayou Portage, Bellefontaine Marsh, Biloxi River Marshes, Cat Island, Davis Bayou, Deer Island, Escatawpa River, Grand Bay, Grand Bayou, Hancock County, Horn Island, Jourdan River, Old Fort Bayou, Pascagoula River, Petit Bois, Round Island, Sandhill Crane Refuge, Ship Island, and Wolf River.

The state's foundation is shaped by a deep trough in the continent called the Mississippi Embayment. Many of its sedimentary rock formations date to the Paleozoic and Quaternary epochs. The northeast corner of the state, for example, rests upon the Mississippian Devonian formation of the Paleozoic. From here, various band-like formations run in a northwest-southeast pattern. These formations include: the Eutaw, Tuscaloosa, and Selma Groups of the Cretaceous epoch; the Midway, Wilcox, Claiborne, Jackson, and Vicksburg Groups, and the Catahoula formation of the Tertiary epoch. The Citronelle formation is found in the southern part of the state along with the Pascagoula and Hattiesburg formations. Coastal deposits dating to the Quaternary epoch are located along the Gulf Coast, while alluvium deposits from this same epoch comprise a large section of the western part of the state along the Mississippi Delta (Dockery, 1997).

Once relying almost entirely upon cotton and timber, Mississippi's economy is much more diversified and features manufacturing, oil production, services, the military, and agriculture. Agricultural products presently include: cotton, cattle, poultry, catfish, soybeans, dairy products, and rice. Apparel, furniture, lumber and wood products, electrical machinery, and transportation equipment are the state's main manufactured goods. Mississippi is also home to Northrop Grumman Ship Systems, DuPont and Kerr-McGee Chemical, a Chevron oil refinery, and Keesler Air Force Base. Offshore oil activities also feature prominently in the Mississippi state economy. Despite its investment in oil production, however, the state attempts to strike a balance between developing these interests and attending to environmental concerns.



Map 11. State of Mississippi Depicting Gulf of Mexico Labor Market Area (and component counties).

B. BUILT ENVIRONMENT

Human Geography and Population Centers. Mississippi had a year 2000 population of 2,844,658 persons. The population of Jackson, the state capital, was 184,256 persons. Mississippi hosts many large population centers. These include: Biloxi (50,644), Columbus (25,944), Greenville (41,633), Gulfport (71,127), Hattiesburg (44,779), Meridian (39,968), Natchez (18,464), Pascagoula (26,200), Pearl (21,961), Ridgeland (20,173), Starkville (21,869), Tupelo (34,211), and Vicksburg (26,407) (U.S. Census Bureau, 2000b).

Transportation and Communication. The State of Mississippi features a well-integrated public highway system. This infrastructure includes 14 federal highways (covering 738 miles), and six interstate highways (extending 685 miles). Mississippi residents and visitors enjoy easy access to the rest of the United States via Interstate Highways 10, 20, 55, 59, 110, and 220. Currently, this infrastructure does not suffer from traffic congestion, thus facilitating tourism, quality of life, and industry shipments (Mississippi Development Authority, 2002).

Mississippi's railway infrastructure also supports a very competitive shipping industry. This infrastructure allows a single rail network to transport shipment throughout the United States (Mississippi Development Authority, 2002). In fact, the *Kansas City Southern*, *I & M Rail Link*, and the *Canadian National Railroad* together form the NAFTA Railway– a system that extends from Canada to Mexico. Twenty rail systems and 3,391 miles of track facilitate this industry's continued economic growth. Five of these railroads are Class 1: *Canadian National-Illinois Central*, *Burlington Northern and Santa Fe*, *Norfolk Southern*, *Kansas City Southern*, and *CRX Transportation* (Wilbur Smith Associates 2002b). *Amtrak* is the state's primary passenger rail service provider (Mississippi Development Authority, 2002).

Mississippi also supports 76 publicly owned and four privately owned airports. Of these, seven provide commercial service: Tupelo Regional Municipal Airport (Lee County), Mid-Delta Regional Airport (Washington County), Jackson International Airport (Rankin County), Golden Triangle Regional Airport (Lowndes County), Key Field-Meridian Regional Airport (Lauderdale County), Hattiesburg/Laurel Regional Airport (Jones County), and the Gulfport-Biloxi International Airport (Harrison County). Gulfport-Biloxi and Jackson International are the largest commercial airports.

Conveniently located just off I-10 in Gulfport, the Gulfport-Biloxi Regional Airport (GBR) offers both passenger and commercial service. Five major airlines providing 23 daily departures fly out of GBR: AirTrans Airways, Delta, Continental Express, Northwest Airlines, and Southeast Airlines. This airport features two runways: a 9,000 foot all-weather jet runway and a 5,000 foot general aviation runway (City of Biloxi, 2004).

The number of passengers carried at the Gulfport-Biloxi Regional Airport has increased over 217 percent during the 1990s. The airport handled nearly 380,000 persons in 1998 and approximately 669,000 in 2000. This increase in passenger service is linked to a 60 percent increase in airplane seats that premiered in 1999. In anticipation of this increase, the terminal was expanded by 130 percent, and over $22 million dollars have been invested in improvements since 1993 (Gulfport-Biloxi International Airport, no date).

The Jackson International Airport is served by 10 major commercial airlines: ASA, Comair, Continental, Delta, Northwest Airlines, Northwest Airlink, American Eagle, Skywest, Southwest, and USAir Express. This airport has two 8,500-foot runways, and offers 46 daily outgoing flights (Jackson International Airport, no date).

Two deepwater ports located on the Gulf of Mexico serve Mississippi's shipping needs: the Port of Pascagoula and the Mississippi State Port at Gulfport. Pascagoula (Jackson County) is the largest port in Mississippi and the 16th largest in the nation. The Port was developed and is currently managed by the Jackson County Port Authority. During the 1800s, cargo was largely cotton and lumber. By the 1940s, private industry realized the development potential of the port and its even greater asset– the Gulf of Mexico–and development rapidly ensued (Mississippi State Port Authority, 2000).

The Port of Pascagoula is 11 miles, or two hours pilotage, to the cargo berths from Gulf Shipping Lanes. The Horn Island Sea Pass Buoy marks the entrance to the Port Harbor between Horn Island and Petit Bois Island in the Mississippi Sound. After clearing Horn Island Pass, the Port features a channel depth of 38 feet (Mississippi State Port Authority, 2000).

The Port of Pascagoula features two harbors: the Pascagoula River Harbor or West Harbor, and the Bayou Casotte Harbor or East Harbor. The West Harbor is 13 miles from the buoy, with 350 foot-wide channels and a turning basis of 950 feet. The Pascagoula Harbor provides cold storage and four berths. Rail service is available at all terminals. A Port Authority locomotive shifts rail cars on port grounds. Ingalls Shipbuilding is adjacent to the Harbor (Mississippi State Port Authority, 2000).

The East Harbor (Bayou Casotte) lies 11 miles from the buoy. This harbor's channels range from 225 to 300 feet in width. Its south and north turning basins are 1,150 and 950 feet, respectively. East Harbor contains terminals and docks owned by the Port as well as several privately owned docks. One of the docks in this terminal is equipped with two chemical pipelines to handle offloading of liquid chemicals. A local towing company operates a barge in this Harbor, and two locomotives are available for moving rail cars on port property. In addition, Chevron USA Inc. operates three dock facilities specializing in petroleum products (Mississippi State Port Authority, 2000).

Overall, the Port provides over 800,000 square feet of dockside transit warehouse space, 1.5 million cubic feet in cold storage, and 10 general cargo berths. The major imports entering this port include: chemicals, forest products, bulk fish, and crude oil. Exports include: forest/paper products, frozen foods, general and project cargo, bulk and bagged grains, machinery, vehicles, fertilizer, and petroleum products. The Port's on-site services include: bunkers, complete full-service ship repair, major drill rig conversion, repair facilities, fresh water, electricity, telephone, natural gas, waste disposal, and full-time security (Mississippi State Port Authority, 2000).

Also designated as a Navy Homeport, the Port of Pascagoula is equipped to support the nation's defense efforts. Six vessels are currently stationed at Naval Station Pascagoula located on Singing River Island, which is about one mile south of Ingalls Shipbuilding (Mississippi State Port Authority, 2000).

The Mississippi State Port at Gulfport is located in Harrison County. This Foreign Trade Zone (#92) is a 184-acre public complex located on the Gulf of Mexico. Established around the turn of the 20th century, this port became a state-owned facility in 1961. The Port of Gulfport is a component of the Mississippi State Port Authority (Mississippi State Port Authority, 2000).

The Port's channel is approximately 250 feet-wide, with an average depth of 36 feet. The North and South Harbors, turning basins and berths range from 32 to 36 feet in depth. Carriers gain port access via a shipping channel that runs from the Ship Island sea buoys to the Gulfport piers (Mississippi State Port Authority, 2000).

The Mississippi State Port has long been known as a tropical fruit port. Indeed, bananas (Chiquita and Dole) are the Port's primary import products, while frozen poultry is its primary export. In 2000, Mississippi State Port's total tonnage (foreign and domestic) equaled 1,982,071 (Comprehensive Transportation Options, 2003).

The Port operates nine public berths: two container, two breakbulk/frozen cargo, one breakbulk/refrigerated cargo, one bulk, and three general cargo berths. These range from 525 to 750 feet in length. Additionally, there are many privately operated berths. Total port storage is 500,000 square feet covered dry, 100,000 sq. ft. refrigerated, and 93,000 sq. ft. frozen. Port operations annually generate $98 million in income, $463 million in sales, and $64 million in tax revenue for the State of Mississippi (Comprehensive Transportation Options, 2003).

Cargo at the port is moved from vessel-to-vessel, vessel-to-rail, and vessel-to truck. The Gulf Coast Waterway provides for shipping through the southern and eastern US, and is located about five miles offshore. I-10 is approximately seven miles from the port. *CSX Transportation*, *Kansas City Southern*, and *Canadian National Railway* all provide both on- and near-port rail services.

Printed and audiovisual media options are plentiful in Mississippi. Indeed, over 120 AM/FM radio stations and 18 television stations –Biloxi (one), Columbus (one), Greenville (two), Gulfport (one), Hattiesburg (two), Jackson (five), Meridian (three), Natchez (one), and Tupelo (two)– broadcast from this state (Gebbie Press, 2001a; Gebbie Press, 2001b).

While there are many newspapers in Mississippi, the most widely circulated daily papers include: the *Sun Herald* (Biloxi), *Daily Leader* (Brookhaven), *Clarksdale Press Register* (Clarksdale), *Bolivar Commercial* (Cleveland), *Commercial Dispatch* (Columbus), *Daily Corinthian* (Corinth), *Delta Democrat Times* (Greenville), *Greenwood Commonwealth* (Greenwood), *Daily Sentinel Star* (Grenada), *Hattiesburg American* (Hattiesburg), *Clarion-Ledger* (Jackson), *Laurel Leader-Call* (Laurel), *Enterprise-Journal* (McComb), *Meridian Star* (Meridian), *Natchez Democrat* (Natchez), *Oxford Eagle* (Oxford), *Mississippi Press* (Pascagoula), *Picayune Item* (Picayune), *DeSoto Times Today* (Southaven), *NE Mississippi Daily Journal* (Tupelo), *Vicksburg Post* (Vicksburg), and the *Daily Times Leader* (West Point) (Gebbie Press, 2001d). Additionally, there are 27 weekly newspapers distributed throughout Mississippi (Gebbie Press, 2001c).

Physical Infrastructure. Major electricity suppliers in Mississippi include: Entergy Mississippi (Entergy Corporation), Mississippi Power Company (Southern Company), Coast EPA, Dixie EPA, Southern Pine EPA, Pearl River Valley EPA, Twin County EPA, and the Tennessee Valley Authority. Additionally, there are numerous private electric power association cooperatives that serve the state's many municipalities (Mississippi Development Authority, 2002).

Twelve private distribution natural gas companies, six private direct sales natural gas companies, and 48 municipal natural gas systems supply Mississippi's natural gas needs (Mississippi Development Authority 2002). Major distributors include: Mississippi Valley Gas, Mid-Louisiana Gas Company, Union Gas Company, Entex, and Willmut Gas and Oil Company (Mississippi Development Authority, 2002).

The municipalities primarily provide water and sewage services. These include: Natchez Water Works, Corinth Gas and Water, Centreville Water Department, Town of Gloster, Town of Liberty, Aberdeen water and Light, Vaiden Public Utilities, City of Houston, City of Okalona, Town of Ackerman, Port Gibson Water Works, City of Quitman, Stonewall Water Department, West Point Water Department, Clarksdale Public Utility Commission, Town of Friars Point,

Town of Jonestown, Crystal Springs Water Department, Hazelhurst Municipal Water System, Wesson Water Department, City of Southaven, City of Hattiesburg, Town of Leakesville, City of Granada, Bay St. Louis Water Company, City of Biloxi, City of D'Iberville Water and Sewage, City of Gulfport, City of Long Beach, City of Pass Christian, City of Clinton, City of Lexington, City of Pascagoula, Bay Springs Water Department, City of Laurel, Oxford Water Department, City of Purvis, City of Meridian, Tupelo Water and Light Company, Greenwood Utilities, Columbus Light and Water, City of Madison, City of Holly Springs, Philadelphia Utilities, Decatur Water Works, Starkeville Electric and Water Company, City of Batesville, City of Picayune, City of McComb, City of Forest, Raleigh Water Works, City of New Albany, Vicksburg Gas and Water Administration, City of Greensville, and Louisville Utilities (Mississippi Development Authority, 2002).

Bell South is the state's primary telecommunications provider. AT&T and Sprint are the major companies offering long-distance service (Mississippi Development Authority, 2002).

Interaction of Biophysical and Built Environments. Mississippi's pollution levels are moderate, relative to the other 49 U.S. states and six territories. In 2001, it ranked 23rd of 56 (one being the dirtiest). In this same year, Mississippi ranked in the 65th percentile for total environmental releases (69,195,152 pounds) and in the 25th percentile for its cancer risk (air and water) (one being the cleanest). Mississippi's total cancer risk scores have actually decreased 59 percent between 1988 and 2001 (Scorecard, 2003).

Of Mississippi's total 2001 environmental releases (69,195,152), air releases accounted for 37,063,726 pounds, water releases totaled 12,964,677 pounds, and land releases equaled 8,119,848 pounds. Also in this year, Mississippi's off-site transfers totaled 36,749,590 pounds, while production-related wastes equaled 418,770,633 pounds (Scorecard, 2003).

In 2001, Mississippi's top 25 (of 100) releasing facilities, with their releases in pounds in benzene-equivalents, were: Du Pont-Delisle Plant (13,863,356); Vicksburg Chemical Company (5,752,145); Mississippi Power Company, Plant Watson (3,984,106); Kerr-McGee Chemical L.L.C. Pigment Plant (3,292,931); Georgia-Pacific Corporation (2,700,835); Mississippi Power Company Plant Daniel (2,674,050); Misschem Nitrogen L.L.C.(1,916,949); Leaf River Forest Products (1,663,598); Central Industries, Incorporated (1,656,774); International Paper-Natchez (1,642,314); Chevron Products Company, Pascagoula Refinery (1,594,010); Choctaw Maid Farms Carthage Plant (1,470,037); Columbus Pulp & Paper Complex (1,435,470); Quebecor World Incorporated, Corinth Division (1,429,125); International Paper, Vicksburg Mill (1,347,062); Entergy Baxter Wilson Generating Plant (1,338,414); Mississippi Phosphates Corporation (1,278,523); Entergy Gerald Andrus Plant (1,277,207); Kerr-McGee Chemical L.L.C. Hamilton Electrolyte Plant (1,203,586); Howard Industries Incorporated (1,000,011); R.D. Morrow Sr. Generating Plant (999,750); Sanderson Plumbing Products Incorporated (999,571); Sanderson Farms Incorporated (947,000); Bunge N.A. Incorporated (761,600); and Vitafoam Incorporated (754,635) (Scorecard, 2003).

The top 10 chemical releases presenting a cancer risk to the residents of Mississippi in 2001, with pounds in benzene-equivalents, included: arsenic (organic or inorganic) compounds (1,700,000); chromium compounds (470,000); chromium (370,000); lead compounds (310,000); dichloromethane (260,000); carbon tetrachloride (140,000); chloroform (110,000); ethylene oxide (100,000); nickel compounds (70,000) and benzene (68,000) (Scorecard, 2003).

In theory, the state's involvement in the Gulf Ecological Management Sites (GEMS) program counter-balances the negative impacts of state industry. Mississippi is home to 21 GEMS.

C. HISTORY

Settlement. The Paleo-Indians are the first known inhabitants of the Mississippi area. Early Archaic materials have been found in the Yazoo Basin; however materials from the middle and late Archaic period are the most widely documented items in Mississippi archaeology. The hunters and gatherers of the Poverty Point culture followed the late Archaic period. The largest number of Poverty Point culture sites resides in Biloxi Bay (McNutt, 1996).

The Tchula or Tchefuncte culture is an extension of the Poverty Point culture; they also inhabited present-day Harrison County. This culture engaged in shellfish gathering and some basic forms of agriculture. The Tchefuncte culture dispersed northward up the Mississippi valley (McNutt, 1996).

Other early Native American groups inhabiting the Mississippi include the Chickasaws in the north and northeast, the Tunica in the northwest, the Natchez on the Mississippi River, the Chakchiuma, Choula, Houma, Ibitoupa, Koroa, Taposa, Tiou, and Yazoo on the Yazoo River, the Choctaw in the state's interior center and south, and the Acolapissa, Bayogoula, Biloxi, and Pascagoula along the Gulf Coast. The Choctaw, with 20,000 people, and the Chickasaws and Natchez with approximately 4,500 people each were among the most influential tribes (McNutt, 1996). Deer, bear, onions, grapes, plums, persimmons, berries, nuts and honey served as important dietary staples for these Native Americans, but corn production was also important (Adair, 1930). By the latter part of the 18th century, disease, warfare, and the federal policy for Indian removal had decimated Mississippi's Indian population (McNutt, 1996).

Spanish and French explorers first arrived in Mississippi region in the 16th century. DeSoto arrived during his wanders between Florida and Texas. Although in search of riches, the introduction of swine was De Soto's most notable accomplishment in this region (McNutt, 1996).

In 1682, 150 years after De Soto's departure, La Salle ventured down the Mississippi River. French adventurers, Iberville, Bienville, and Tonty, also explored the Mississippi River. Claiming present-day Mississippi as part of Louisiana for the Crown, Iberville established a small colony at Biloxi.

Following England's victory over France in the Seven Years' War, the 1763 Treaty of Paris ceded France's North American holdings to England. Together with land ceded to England from Spain in 1775, these holdings became the Territory of Mississippi. The Territory stretched from Tennessee to the 31st parallel and from the Mississippi River to the Chattahoochee River. Only two settlements existed in the territory at this time: the Natchez District along the Mississippi River and St. Stephens on the Tombigbee River. In 1817, Mississippi became the 29th state admitted to the Union.

Industrialization. Settled primarily by farmers, Mississippi's early economy relied heavily upon agriculture. Cotton production dominated the state and, in 1839, Mississippi led the nation in seed cotton production, harvesting 193 million pounds. A decade later, Mississippi harvested 484,292 bales of ginned cotton. Mississippi once again led the nation in 1859, producing one million bales of ginned cotton (Lowry and McCardle, 1978).

Mississippi's agrarian economy boomed during the 1840s and 1850s. To meet growing demands for cotton, Mississippi's plantation economy became increasingly reliant on slave labor. Consequently, the state's slave population rapidly increased. In 1820, 32,814 slaves were recorded in Mississippi; by 1830, that figure had doubled. In the early 1840s, slaves numbered

436,631. The highest concentration of slaves resided in Issaquena and Washington Counties, where blacks outnumbered whites by more than nine to one (Lowry and McCardle, 1978).

In January 1861, Mississippi seceded from the Union. By the end of the war, hundreds of battles had been fought on Mississippi soil, and an estimated 60,000 Mississippians were lost to the service (Bearss, 1973).

Despite state imposed restrictions on corporate development, railroad enterprises expanded in the 1880s, opening up the great forests of the south. In early 1880, the state had 295 sawmills with total investments of less than $1 million dollars. By 1910, investments stood at $39 million with production at $43 million. At this point, Mississippi ranked third in the nation in lumber production. The *Illinois Central*, the *New Orleans and Northeastern*, and *the Mobile and Ohio* railroads all transported lumber through the state (Hickman, 1973).

At the same time, Mississippi's agricultural production also increased. Between 1890 and 1930, the number of farms in the state increased from 144,318 to 312,663. President F.D. Roosevelt inaugurated several federal programs aimed at increasing agricultural development. These programs included the Agricultural Adjustment Administration, Soil Erosion Service, and the Civilian Conservation Corps. However, while the advent of farm machinery resulted in increased production, it also decreased human employment opportunities. Between 1940 and 1950, machines replaced more than 80,000 farm employees (Lowry and McCardle, 1978).

Manufacturing dominated the state's economy after the turn of the 20th century. Between 1880 and 1900 alone, the value of manufactured products rose over $33 million. Nevertheless, many major industrial companies were reluctant to establish themselves in Mississippi because the state's resources were primarily extractive; readily available sources of energy, like coal and hydro-electric power, were lacking (Lowry and McCardle, 1978).

Along with increased production of cotton, textiles, wood products, World War II brought a number of military concentrations to Mississippi. In particular, the International Shipbuilding Company's operations boomed. By 1940, the shipyard was in the process of ramping up for the production of nuclear submarines and other military equipment.

The 1950s ushered in an era of civil rights in Mississippi. Despite social and legal resistance, the state's African-American population became increasingly active in civil rights attainment throughout the 1960s.

Mississippi's urban development really took off in the latter half of the 20th century. In 1970, the state had two "Standard Metropolitan Areas (SMA)": the Jackson, SMA (258,906 residents) and the Biloxi-Gulfport SMA (134,582 residents). Combined, the population of the state's urban areas totaled 986,642, representing a gain of 165,839 residents (17%) since 1960 (Burrus, 1973).

Oil. The petroleum industry in Mississippi moved the state's economy forward in leaps and bounds. Although state geologists reported on the Jackson Dome in 1860, oil drilling did not occur until after the turn of the 20th century. In 1903, the state's first well was drilled in Clarke County, but was abandoned at a depth of 1,842 feet. In the years following this financial fiasco, only a few wells were drilled, but all were dry. By 1925, approximately 53 wells had been drilled, but none produced. In 1926, however, the Amory Petroleum Company made the first oil discovery at 2,404 feet, and drilling renewed in earnest (Hughes, 1993).

In 1928, Robert Steffey established a scouting service in Mississippi. Following, Steffey's report on oil activity in Mississippi and Alabama, oil companies began flocking to the area. Indeed, Ohio Oil, Gulf Refining, Sun, Louisiana Oil Refinery, Pure Oil, Texas Company, Carter Oil, and Shell Oil all began sending their own geologists and scouts to Mississippi. By

the late 1920s, Gulf, Sun, Lion, Louisiana Oil Refining and Magnolia also began doing surface work, leasing, and drilling in the area. In early January 1930, the Mayes "No. 1" in Jackson blew gas, producing between 2 and 6 million cubic feet of gas per day. After oil was discovered at a second Rainey well, scouts, geologists and landsmen leased every available tract in and around Jackson. Drilling atop this anticline, however, led to commercial production of gas rather than oil (Hughes, 1993).

In Hinds and Rankin Counties, 31 wells in the Jackson Gas Field produced 586,634 mcfs. of gas. By 1934, the field had 113 gas wells producing over 9,000,000 mcfs. of gas. This production increased each year, peaking in 1939 at 15,100,000 mcfs. By 1954, however, all wells had stopped producing commercially. Nevertheless, the Jackson Gas Field contributed to the building of a major pipeline network in south Mississippi and Alabama, western Florida, and eastern Louisiana (Hughes, 1993).

Following the Jackson Gas Field's prolific success, state drilling operations increased. Sixteen wildcat wells were drilled in 1939 and, by 1940, 57 geophysical crews engaged in seismographic research. Further, 35 new companies had been granted business charters for Mississippi. According to Hughes (1993), the 1940s was the golden age of petroleum in Mississippi. Indeed, over half the oil and gas ever to be discovered in the state occurred during this time, much of it as a result of the Tinsley Oil Field in 1939. Following this discovery, Union Producing settled just north of Jackson. The Union Producing Company's "G.C. Woodruff No. 1 Well was drilled to a depth of 4,560 feet, after which 235 barrels of oil flowed per day. By 1940, the field held 49 producers, bringing in 7,350 barrels of oil a day. In some respects, the discovery of the Tinsley Oil Field was the most significant event to occur in the southeast, as the Mississippi River barrier had finally been broken. Until 1989, Tinsley Field produced 219,494,277 barrels of oil and was Mississippi's second largest field (Hughes, 1993).

Offshore oil exploration in Mississippi also began in earnest in 1939. In this year, the Phillips Petroleum Company leased roughly 700,000 acres in the Mississippi and began conducting seismographic research. However, despite coverage of 236 miles, no structures were found and the project was abandoned (Hughes, 1993).

During the 1940s, the largest gas field (Gwinville in Jefferson Davis County), and the largest oil field (Baxterville in Lamar and Marion Counties) were discovered. The Gulf Refining Company drilled the first well, which produced low gravity oil, and Superior Oil drilled the second well, which produced 582 barrels of oil a day. By the end of the year, Gulf, Sun, and Texaco had established 16 wells. The field was redrilled in the 1970s. By 1990, more than 250 wells had produced nearly 250 million barrels of oil and more than 400 billion cubic feet of gas (Hughes, 1993).

After the oil and gas discoveries at Tinsley and Baxterville, drilling, transporting, and refining oil increasingly served as new sources of income for state residents. In 1970, Mississippi ranked ninth in the U.S. in oil value and production, and 10th in natural gas production. By the early 1970s, half of the state's counties produced oil, gas, or both, with oil production rising to over 180,000 barrels a day and creating a labor force of over 14,000 people (Hughes, 1993).

D. DEMOGRAPHIC CHARACTERISTICS

Population Growth. In 2000, the population of Mississippi was 2,844,658 persons. This figure represents an increase of nearly one million residents since 1920. The State's greatest amount of growth occurred in the 1970s, when the population grew by nearly 14 percent (Table 1) (U.S. Census Bureau, 2000b).

Table 1

Population Changes, Mississippi State: 1920-2000

Year	Population	Change from Previous Census	Percent Change from Previous Census
1920	1,790,618	--	--
1930	2,009,821	219,203	12.2
1940	2,183,796	173,975	8.7
1950	2,178,914	-4,882	-0.2
1960	2,178,141	-773	0.0
1970	2,216,994	38,853	1.8
1980	2,520,638	303,644	13.7
1990	2,573,216	52,578	2.1
2000	2,844,658	271,442	10.5

Source: U.S. Census Bureau, 2000b.

Ethnicity and Age. In 2000, Caucasians and African-Americans comprised 61 percent and 36 percent of Mississippi's population, respectively (Table 2). In that same year, 27 percent of Mississippians were under 18 years old, and 12 percent were 65 years of age and up. These figures are comparable to national figures where 26 percent of the population is less than 18 years of age, and 12 percent are 65 and over. The median age of all Mississippi residents was 33.8 in that year; the national median age was 35.3 (U.S. Census Bureau, 2000b).

Table 2

Racial and Ethnic Populations, Mississippi State: 2000

Race/Ethnicity	Population	Percent
White	1,746,099	61.4
African American	1,033,809	36.3
Hispanic	39,569	1.4
American Indian	11,652	0.4
Asian	18,626	0.7
Pacific Islander	667	0.0
Other Race	13,784	0.5
Two or More Races	20,021	0.7

Source: U.S. Census Bureau, 2000b.

E. ECONOMY

Income and Poverty. Compared to the U.S. as a whole, Mississippi is a relatively impoverished state. In 1999, the median family income was $37,406, or 75 percent of the national median ($50,046) (Table 3). Also in 1999, 20 percent of all Mississippians and 16 percent of all families lived below the poverty threshold. In comparison, only 12 percent of all individuals and 9 percent of families were living below the poverty threshold at the national level. Further, single females with minor children headed 17 percent of all Mississippi families, representing 52 percent of all families living in poverty. At the national level, however, this same population headed 12 percent of all families, but represented only 44 percent of families in poverty. Public assistance rates, however, were comparable at both state and national levels (U.S. Census Bureau, 2000).

Table 3

Income, Poverty and Family Structure, Mississippi State: 1960-2000

Year	Median Family Income (2000 Constant $)	Change from Previous Census	Persons in Poverty	Female-Headed Families with Children
1960*	$2,884	134.8%	54.5%	--
1970*	$6,068	110.4%	35.4%	--
1980*	$9,999	64.8%	23.9%	--
1990	$24,448	144.5%	25.2%	20.9%
2000	$37,406	53.0%	19.9%	17.2%

* Actual dollars.

Source: U.S. Census Bureau, 2000b.

Employment. Mississippi's economic roots are planted firmly in agriculture. In 1940, more persons in Mississippi were employed in agriculture (58%) than in any other state. By 2000, however, state agricultural employment figures had fallen to 29,800 and employed only about 3 percent of the labor force (U.S. Census Bureau, 2000b).

Services now replace agriculture as Mississippi's leading employment sector. By 2000, services employed 450,850 persons, or more than 38 percent of the labor force (U.S. Census Bureau, 2000b). The continuing development of the casino industry along the coast, coupled with educational and health services throughout the state, provide constituents with a large number of employment opportunities.

Chemical, lumber, and apparel manufacturing also grew tremendously after WWII. However, many apparel manufacturing plants subsequently relocated to Mexico following the North American Free Trade Agreement (NAFTA). In 2000, this sector's employment rates reflect a decline of nearly 12 percent since 1990. Nevertheless, manufacturing still employs over 18 percent of the labor force (Table 4) (U.S. Census Bureau, 2000b).

As of April 2003, the 20 largest employers in south Mississippi, with their number of employees, were: Keesler Air Force Base, Biloxi (15,674); Northrop Grumman Ship Systems, Pascagoula (10,839); Grand Casino/Park Place Entertainment, Biloxi-Gulfport (5,460); Beau Rivage, Biloxi (4,150); Stennis Space Center (4,514); Naval Station, Pascagoula (2,100);

Memorial Hospital, Gulfport (2,200); Singing River Hospital, Pascagoula (2,100); President Casino, Biloxi (1,911); Harrison County School District, Gulfport (1,625); Gulf Coast Veterans Health Care System, Biloxi (1,500); Imperial Palace, Biloxi (1,500); Casino Magic Corporation, Biloxi; Bay St. Louis (1,360); Treasure Bay Casino, Biloxi (1,200); Chevron USA, Inc., Pascagoula (1,200); Pascagoula Public Schools, Pascagoula (1,152); Hancock Bank (1,138); MS Gulf Coast Community College, Biloxi-Gulfport (1,100) and the Isle of Capri Casino, Biloxi (1,077) (Mississippi Coast, 2003). As of 2005, there were no "*Fortune 1,000*" companies in Mississippi (Fortune 500, 2005).

Table 4

Employment in Major Industrial Sectors, Mississippi State: 1990-2000

Year	Agric., Fishing & Forestry	Mining	Constr.	Manuf.	Trans., Comm. & Public Util.	Wholesale & Retail Trade	Finance, Insurance & Real Estate	Services	Public Admin.
Workers in Sector									
1990	37,314	10,552	65,847	240,947	67,857	204,822	48,149	303,545	49,770
2000	29,787	9,686	88,818	215,203	63,189	178,363	55,774	450,852	60,223
Percent of Workers in Sector									
1990	3.6%	1.0%	6.4%	23.4%	6.6%	20.0%	4.7%	29.5%	4.8%
2000	2.5%	0.8%	7.6%	18.3%	5.4%	15.2%	4.8%	38.4%	5.1%
Growth from Previous Census									
2000	-25.2%	-8.9%	34.9%	-11.9%	-7.4%	-14.8%	15.8%	48.5%	21.0%

Source: U.S. Census Bureau, 2000b.

Industry. "Services," followed closely by the government and manufacturing sectors, provide the mainstay of Mississippi's economy. In 1999, workers' earnings topped $38.4 million, reflecting an increase of almost $15.7 million since 1990. Nearly a quarter of these earnings came from the services sector alone. Further, since 1990, earnings in this sector increased by $4.8 million, or 30 percent of the total change during these years. "Health" is the primary service sub-sector in terms of earnings, constituting 8 percent of total earnings in 1999. In 1999, earnings from the government totaled over $8.2 million, or 21 percent of total earnings. Earnings in this sector increased over $2.9 million from 1990, reflecting an increase of almost 19 percent. In this same year, manufacturing brought in $7.65 million, or 20 percent, in workers' earnings. Earnings in this sector increased by nearly $2 million, and accounted for 13 percent of total change. Meanwhile, earnings in oil and gas extraction accounted for less than 1 percent of total earnings (Table 5) (U.S. Department of Commerce, Bureau of Economic Analysis, 2000).

In June 1999, there were 1,101 banking and savings institutions in Mississippi, with deposits totaling over $19.2 billion. Expenditures in federal funds and grants in this same year totaled over $16.4 billion (U.S. Census Bureau, 2002).

Table 5

Earnings in Major Industry Sectors and Selected Sub-sectors,
Mississippi State: 1990-1999

Industry	Earnings (Constant 2000 $1000's)		Share of Earnings	Change	Share of Change
	1990	1999	1999	1990-1999	1990-1999
Earnings	$22,749,767	$38,423,554	100.0%	$15,673,787	100.0%
Farm Earnings	$329,014	$865,390	2.3%	$536,376	3.4%
Ag. Services, Forestry, and Fishing	$161,123	$334,363	0.9%	$173,240	1.1%
Fishing	$20,743	$17,503	0.0%	-$3,240	-0.0%
Mining	$201,967	$313,888	0.8%	$111,921	0.7%
Oil and gas extraction	$185,758	$273,665	0.7%	$87,907	0.6%
Construction	$1,161,329	$2,390,111	6.2%	$1,228,782	7.8%
Special trade contractors	$618,726	$1,394,547	3.6%	$775,821	4.9%
Manufacturing	$5,652,720	$7,650,875	19.9%	$1,998,155	12.7%
Fabricated metal prods.	$351,613	$444,081	1.2%	$92,468	0.6%
Indust. machine & equip.	$382,239	$656,158	1.7%	$273,919	1.7%
Food and kindred	$481,956	$653,974	1.7%	$172,018	1.1%
Chemicals and allied	$219,386	$371,892	1.0%	$152,506	1.0%
Petroleum and coal	$100,774	$142,664	0.4%	$41,890	0.3%
Transportation and Public Utilities	$1,526,479	$2,395,343	6.2%	$868,864	5.5%
Trucking & warehousing	$513,338	$914,243	2.4%	$400,905	2.6%
Water transportation	$66,529	$60,550	0.2%	-$5,979	-0.0%
Transportation by air	$104,467	$183,392	0.5%	$78,925	0.5%
Wholesale Trade	$1,107,906	$1,802,216	4.7%	$694,310	4.4%
Retail Trade	$2,258,265	$3,783,270	9.8%	$1,525,005	9.7%
Eating & drinking places	$392,275	$756,832	2.0%	$364,557	2.3%
Finance, Insurance, and Real Estate	$1,011,659	$1,782,402	4.6%	$770,743	4.9%
Services	$4,037,169	$8,866,529	23.1%	$4,829,360	30.8%
Business services	$484,944	$1,062,867	2.8%	$577,923	3.7%
Health services	$1,594,659	$3,094,201	8.1%	$1,499,542	9.6%
Legal services	$342,645	$648,268	1.7%	$305,623	1.9%
Engineering and management services	$316,218	$636,943	1.7%	$320,725	2.0%
Government	$5,302,136	$8,239,185	21.4%	$2,937,049	18.7%

Source: U.S. Department of Commerce, Bureau of Economic Analysis, 2000.

Marine-based Activities. While the commercial fishing industry has declined in terms of overall employment and growth since the last decade, it still remains a strong contributor to the Mississippi economy. The commercial fishing industry contributed $17.5 million in workers' earnings in 1999, representing a decrease of $3.2 million from the 1990 figure of $20.7 million (Mississippi Department of Marine Resources, no date). In 2002, the State of Mississippi landed some 16.7 million pounds of shrimp, with a total dockside value of $29.8 million dollars. Wholesale shrimp prices have decreased over the last few years due to a flood of foreign shrimp imports and rising operating costs. In order to aid the hard hit shrimping industry, Congress appropriated $35 million in February 2003 for allotment to the states that produced the highest volume of shrimp. The Gulf of Mexico states received $17.5 million, with the State of Mississippi receiving $1 million. Approximately $900,000 was distributed directly to commercial shrimpers, with $20,000 going to shrimpers with a demonstrated record of compliance with the Turtle Excluding Devices (TEDS), and $80,000 to the Mississippi Seafood Marketing Program for promoting shrimp caught in Mississippi waters (Mississippi Department of Marine Resources, no date).

Recreational fishing is also a strong contributor to state economy. The State hosts approximately 18 saltwater fishing tournaments between May and November each year (Mississippi Department of Marine Resources, no date). In 2004, 379,260 licensed recreational fishery participants (315,610 residents; 63,650 non-residents) spent approximately $210 million dollars on fishing-related products and services in Mississippi. They also generated a total economic impact of nearly $1.3 billion dollars in this same year (Mississippi Department of Fisheries, Wildlife and Parks, 2005).

In 1992, the Wetlands Protection Act instigated the development of the Mississippi Department of Marine Resources' Coastal Preserves Program. This department manages the state's coastal wetland ecosystems. Mississippi has 21 coastal preserve sites, encompassing 30,000 acres of coastal wetland habitat (Mississippi Department of Marine Resources, no date).

Mississippi also shares a Sea Grant Consortium with its neighbor, Alabama. The Mississippi-Alabama Sea Grant Consortium was established in 1972 and consists of nine universities and laboratories: Auburn University, Dauphin Island Sea Lab, Jackson State University, Mississippi State University, University of Alabama, University of Alabama at Birmingham, University of Mississippi, University of Southern Mississippi, and University of South Alabama (Mississippi-Alabama Sea Grant Consortium, 2004). It also consists of two marine extension offices (the Auburn Marine Extension and Research in Mobile, and the Mississippi State University Cooperative Extension Service in Biloxi) and the Mississippi-Alabama Sea Grant Legal Program in Oxford. This team works toward the sustainable development of both coastal and marine resources in these two states, including 3,200 square miles of inland water and 966 miles of estuarine shoreline (Mississippi Department of Marine Resources, no date).

Military Installations. Mississippi is home to five major military installations: Keesler Air Force Base (AFB), Columbus Air Force Base, Naval Air Station Meridian, Naval Station Pascagoula, and the Naval Construction Battalion Center. Mississippi's military bases directly employ approximately 36,000 people and have an annual payroll of more than $1.2 billion (NGA Center for Best Practices, 2004).

Keesler AFB is located in Biloxi on the Gulf Coast of Mississippi. This base is home to the second largest medical center in the Air Force. Additionally, the 81st Medical Group is

stationed at Keesler. Over 26,500 military personnel, civilians, contract workers, and family members live on base (Mississippi Development Authority, 2002).

Columbus AFB is home to over 6,200 military personnel, contract workers, family members, and civilians. It is located in Columbus, Mississippi (Lowndes County). Originally an Army Air Force flying school and home to the Strategic Air Command's B-52s, the base is now a training center for over 25 percent of Air Force pilots (Mississippi Development Authority, 2002).

Naval Station Meridian provides jobs to and houses over 4,000 military personnel and civilians. This unit provides operational support for Training Air Wings ONE. This base has the distinction of being the first unit to use the "single base" method to train jet pilots. Nearby communities include Kipling (Kemper County) and the town of Marion (Lauderdale County) (Mississippi Development Authority, 2002).

Naval Station Pascagoula is located in Jackson County on the mainland side of the Mississippi Sound in the northeast portion of the Gulf of Mexico. This 187-acre base is the homeport for six Navy ships, and employs and houses over 2,000 active duty military and 200 civilians (Mississippi Development Authority, 2002). An additional 4,100 dependents, 850 reservists and 4,000 retirees live in Jackson County (Naval Station Pascagoula). Total economic impact of this base on the local economy is estimated at $100 million, and includes payrolls, contracts, goods and services (Naval Station Pascagoula, 2000). Communities within 10 miles of Naval Station Pascagoula include Escatawpa, the City of Gautier, the City of Moss Point, and the City of Pascagoula.

The Naval Construction Battalion Center, "Home of the Atlantic Fleet Seabees," is located in Gulfport. It was established in 1942. This base employs approximately 4,000 military personnel and 800 civilians (Mississippi Development Authority, 2002). Biloxi, D'Iberville, Gulfport, and Ocean Springs are all located within 10 miles of the Center.

Recreation and Tourism. Mississippi offers a wide range of tourist attractions and recreational activities. Antebellum architecture, historic Civil War sites, and Shiloh State Park define the Hills Region in northern Mississippi. The Delta Region in the northwest and the Pines Region in the east provide championship golf courses, while the Capital River Region in the south west offers riverboat gambling. Additionally, there are two Indian gaming casinos in the Pines region. Finally, tourists and residents alike enjoy the Coastal Region's beautiful white, sandy beaches, casinos, festivals, and historic re-enactments. Indeed, this region is known as the "playground of the South" (Mississippi Government, no date).

Hunting and fishing are popular recreational activities for both residents and tourists. Public hunting is available at 31 state wildlife management areas and seven National Wildlife Refuges. Recreational fishing opportunities are numerous as well. In addition to the Mississippi Gulf Coast, there are some 14,000 miles of streams, 345,000 acres of ponds and 295,000 acres of lakes and reservoirs from which to fish (Forest and Wildlife Research Center, 1998). Freshwater fish include bass, bluegill, crappie and catfish. Saltwater fish include shark, Spanish mackerel, king mackerel, redfish, speckled trout, flounder, shrimp, oysters, and crabs (Mississippi Development Authority, 2002).

There are six national parks in Mississippi: the Gulf Island National Seashore, Jeff Busby, Natchez National Park, Rocky Springs, Tupelo National Battlefield Park, and the Vicksburg National Military Park. Mississippi also features 28 state parks, 15 boatway parks (Pearl River), 6 National Forest recreation areas, and 10 Corps of Engineers recreation areas (Mississippi Government, no date).

Gaming is particularly important to Mississippi's economy. Indeed, "tourism and recreation" is the second largest service sector in the state, and seven of the 20 largest employers in Mississippi are gaming casinos. Significantly, casinos provided 35,206 jobs in 2000, and contributed $2.6 billion (43%) in statewide income. Further, $209.5 million in gaming-related general fund tax revenues comprised 43 percent of all tourism and recreation general fund tax revenues in the fiscal year 2000 (Mississippi Gaming Association, no date). Importantly, 25 percent of all gaming revenue goes to the Mississippi Department of Transportation annually (Mississippi Gaming Association, no date).

In 1999, 32 million tourists visited Mississippi; daily overnight visitor expenditures averaged $92.00–which is $3.00 more than the national average of $89.00. Also in 1999, tourism employed 89,600 workers, while, in 2000, it provided 94,100 jobs. Additionally, tourism and recreation generated $5.6 billion in statewide income in 1999, and $6.1 billion in 2000. Finally, the Tourism and Recreation General Fund state tax revenue totaled $444.8 million in 1999, and $482.3 million in 2000 (Mississippi Development Authority, 2002).

F. LOCAL GOVERNMENT

Governmental Structure. Mississippi is governed according to the articles of its 1890 State Constitution. The state entertains a tripartite governmental structure with Executive, Judicial and Legislative branches. The governor, who is elected to a four-year term, is the state's chief executive. Other elected executive positions include: lieutenant governor, secretary of state, treasurer, auditor of public accounts, attorney general, commissioner of agriculture and commerce, and the commissioner of insurance. A 52 member Senate and 122 member House of Representatives comprise the legislative branch of the Mississippi government. Nine justices preside over Mississippi's Supreme Court. Each popularly elected justice serves an eight-year term. Seventy-nine popularly elected justices also serve in Mississippi's chancery and circuit courts (Mississippi Lawyers, 1996). Administration of local government in Mississippi's 82 counties is attended to by an elected five-member board of supervisors (Mississippi Lawyers, 1996).

Revenues and Taxation. For the fiscal year ending June 30, 2000, Mississippi's tax commission receipts equaled $3,284,945,805. The following tax bases contributed to this total: sales tax ($1,371,104,397); individual income tax ($1,005,035,455); corporate tax ($295,735,006); use tax ($158,938,305); gaming fees and taxes ($158,227,572); insurance premium tax ($96,272,925); tobacco tax ($56,384,540); alcoholic beverage tax ($42,384,613); beer and wine tax ($30,801,274); estate tax ($21,960,435); oil severance tax ($10,185,324); auto tag fees ($10,276,195); installment loan tax ($8,043,793); casual auto sales ($7,001,149); gas severance tax ($4,814,674); title fees ($3,856,232); petroleum tax ($0); miscellaneous tax ($2,723,916); nuclear in lieu ($1,200,000); and other collections ($0) (Mississippi State Tax Commission, no date).

G. SOCIAL CONTEXT

Education. As of 2000, there were 153 school districts in Mississippi and 874 public schools: 435 elementary, 172 middle schools, 182 high schools, 63 combination schools, 207 private schools, and 22 "other" schools, and (U.S. Department of Education, 2002b).

In the 2001-2002 school year, 491,686 public students and 51,369 private students were enrolled in Mississippi K-12 schools. In that year, public schools employed 30,051 faculty members, 31 percent of which held advanced degrees. Private schools employed 3,884 teachers, with a per student ratio of 1:7 (Heritage Foundation, 2004). During this school year, the overall public student to teacher ratio was 16:1. Per capita public student expenditures totaled $4,777; attendance rate was 97 percent (Office of Accountability, 2000).

Teacher's salaries in Mississippi have been consistently lower than that of their peers in other states. In the 1999-00 school year, the average teacher's salary was $31,897. That compensation was equivalent to 76 percent of the national average (EducationAmerica.Net, 2003). In the 2001-02 school year, the average teacher salary equaled $33,295; or 75 percent of the national average ($44,367). In that year, Mississippi ranked 48th in the nation in terms of salary for public school teachers; it also ranked the lowest for all the southeastern states (EducationAmerica.Net, 2003). By the 2003-04 school year, the average elementary and secondary school teacher salary was $34,555. This compares to the national average of $45,771. The State of Mississippi again ranked 48th of 51 states (ranking includes the District of Columbia) in terms of teacher salaries for that year. California offered the highest teacher's salary for that year, paying, on average, $55,693 (U.S. Census Bureau, 2005).

Students in Mississippi elementary and middle schools are falling below national reading and math proficiency levels. For example, in the 1998-99 school year, only 46 percent of all fourth graders and 51 percent of all eighth graders met state proficiency levels in reading/language arts, while only 50 percent of all fourth graders and 48 percent of all eighth graders met state proficiency levels for mathematics. Also in the 1998-99 school year, high school seniors in Mississippi averaged 19.9 on the ACT; a score which falls below the national average of 21.0 (U.S. Department of Education, 2002b).

At the same time, the high school dropout rate for the State of Mississippi in the 2000-2001 school year (4.9%) parallels the national high school dropout rate. The percentage of Mississippi high school graduates planning to attend college in the 2001-2002 school year (73%) also matched the national level (73%) (Table 6) (U.S. Department of Education, 2002a).

There are nine state-supported four-year universities (2002 enrollment = 66,016), eight independent non-profit four-year colleges (11,030), five sectarian institutions of higher education (984), 15 community colleges (123,601), and three independent, non-profit, two-year colleges (779). In total, 202,410 students were enrolled in Mississippi's institutions of higher education in the 2002 school year (Mississippi Development Authority, 2004).

Table 6

Educational Attainment of Adults (age 25+), Mississippi State: 1990-2000

Year	Educational Attainment of Adults					Ratio to Nation	
	0-8 Years	Some High School	High School Diploma	Some College, No Degree	BA/BS or More	High School Diploma	BA/BS or More
1990	15.6%	20.1%	27.5%	16.8%	14.7%	0.92	0.72
2000	9.6%	17.5%	29.4%	20.9%	16.9%	1.03	0.69

Source: U.S. Census Bureau, 2000b.

Health and Welfare. As of 2001, Mississippi had 96 hospitals with 4.8 beds for every 1,000 persons. There were also 185 certified nursing facilities with a total of 16,008 beds. Average facility occupancy rate for certified nursing facilities was 89 percent. Overall, the health care industry employs 8 percent (86,310) of the Mississippian workforce, which is slightly higher than the national rate of 7 percent (Kaiser Family Foundation, 2003).

Mississippi has a higher teen birth rate comparative to the national rate. In 2001, 7,370 (17%) of all live births were to teenage mothers (38% Caucasian, 59% African-American, 4% Hispanic). At the national level, teenage mothers accounted for 11 percent (445,944) of all live births (43% Caucasian, 25% African-American, and 29% Hispanic). Regardless of age, 83 percent of mothers began prenatal care during their first trimester in Mississippi, which is comparable to the national rate (Kaiser Family Foundation, 2003).

Regarding youth welfare, Mississippi did not perform well compared to national averages. In 2001, 11 percent (4,505) of infants born in Mississippi were low-birth weight compared to 8 percent at the national level. Infant mortality (deaths per 1,000 live births) is also much higher in Mississippi (11) than at the national level (7). Additionally, nearly 44 percent of all children in Mississippi lived in high poverty neighborhoods in 2000, compared to only 20 percent nationwide (Kids Count, 2000). In that same year, nearly 12 percent of all Mississippians between the ages of 16 and 19 were neither in school nor working, compared to 9 percent nationwide.

Religion. In 2000, 55 percent of Mississippi state residents claimed a religious affiliation. Forty percent identified as Evangelical Protestant, 10 percent as Mainline Protestant, 4 percent as Catholic, and 1 percent "other." Forty-five percent of residents did not claim a religious affiliation in that year (American Religion Data Archive, 2002).

H. ISSUES OF CONCERN

According to a state official, the State of Mississippi's greatest concerns include a relatively weak economy, educational shortcomings, infrastructure inadequacies, and a health care system that cannot accommodate its growing population. High poverty and crime rates are ancillary concerns.

Education is seen as key to the state's future. An educated work force will attract new businesses and industry. Yet, the state's Department of Education cannot attract a sufficient number of qualified educators and superintendents, especially in light of federal desegregation demands. Hence, low salaries and high discipline problems in the public school system discourage more highly qualified applicants. Recruiting a more ethnically diverse upper-administrative staff and faculty is also a significant challenge.

Developing an infrastructure that will support rapid population increases is also a state challenge. Heavy traffic and congestion burden the coastal regions and other urban areas of Mississippi. However, limited local and state funds undermine development. Recently, the Senate passed a bill allowing local governments or partnerships to provide funds for highway improvement, while promising reimbursement when money became available.

State officials are additionally concerned with a healthcare system that cannot meet the needs of its growing constituency. This lack is especially dire in the State's more rural areas.

I. BILOXI, MISSISSIPPI: LABOR MARKET AREA

Introduction. The purpose of this project is to understand how structural changes in industry, particularly oil and gas related industries, impact local communities and public institutions within the Gulf of Mexico region. The task at hand requires that we utilize a variety of data sources and methodologies to provide a more complete narrative of the phenomenon in question. We also utilize a rather unique definition of local communities: Labor Market Areas. Labor Market Areas (LMAs) are defined by patterns of transportation to and from work both within and across county boundaries. Therefore, the areas contained within LMAs better empirically represent local social systems, communities, and economies (Killian and Tolbert, 1993). In this section, we provide a historical profile of the Biloxi LMA. In particular, we examine the inter-connection between industry structure change, population and social organization dynamics (growth, composition, educational attainment), and local public finances.

Located along the Gulf of Mexico, the greater Biloxi Labor Market Area (LMA) is centered between two major ports: New Orleans in Louisiana and Mobile in Alabama. It encompasses seven Mississippi Counties: George, Greene, Hancock, Harrison, Jackson, Pearl River, and Stone (Map 12). The U.S. Census Bureau estimates the year 2000 population of these seven counties at 463,150.

The Biloxi economy has been a combination of recreation and manufacturing related to the shipyards in Pascagoula, Mississippi. More recently the economy has added casino gambling, particularly along the coast in Harrison County. In the analysis that follows, we explore historical industry changes in the Biloxi LMA and how these changes affected other socioeconomic characteristics, such as population, education, and local government finances.

At the heart of this analysis are changes in the industries related to offshore oil and gas exploration and production, particularly the boom and bust periods of the 1970s and 1980s. In the profile that follows, we first present an overview of the significance of the project, followed by a theoretical framework with which to examine the interconnection between industry and local community structural changes.

The analysis itself is divided into three units of time: 1940-1970, 1970-1990, and 1990-2000. The first unit of time presents a brief industry history of the Mobile LMA from 1940 to 1970, followed by a minimalist overview of population changes. In the second unit, we examine all oil and gas and related industries within the LMA for the years between 1970 and 1990, inclusive. We then link industry changes during this period to fluctuations in population structure and dynamics, education, and local government finance. The third unit examines the period between 1990 and 2000 to assess the fallout of the oil and gas industry during the decade immediately following the bust.

Industry Overview. The oil and natural gas industry experienced a boom during the 1970s (Gramling, 1996; Seydlitz and Laska, 1994). Rising demands for on-shore domestic supplies of oil, and political instability surrounding OPEC and the Middle East increased offshore oil and natural gas exploration activities in the Gulf of Mexico (Gramling, 1996; Gramling and Freudenburg, 1990). The subsequent "boom" is reflected in the LMA employment data. For example, in 1970, approximately 71,000 workers were directly employed full-time in the oil and natural gas industry in the coastal economies of the Gulf of Mexico. By 1980, that number had grown to over 145,000, a net increase of 105 percent—and those numbers do not reflect changes in oil and gas multiplier industries such as equipment manufacturing, water transportation, wholesale trade, and general services.

Map 12. Biloxi, Mississippi Labor Market Area.

During the early 1980s, however consumption trends began to change and affect employment. First, a gradual drop in demand occurred as substitution effects played-out, with actors reducing their consumption of oil and gas by-products (e.g., buying more fuel efficient cars; see Gramling, 1996). Additionally, the oil and natural gas industries experienced a sharp decline in the mid 1980s brought about largely by overproduction among OPEC members trying to "starve" weapon shipments into warring Iran and Iraq (Heilbroner and Milberg, 1999). Between 1980 and 1990, the total number of workers in the oil and natural gas industries in the coastal economies of the Gulf of Mexico declined from over 145,000 to 112,000, a decrease of 23 percent. These patterns are reflected in the price of oil over that period (prices per barrel are based on 1998 adjusted dollars) (Figure 1).

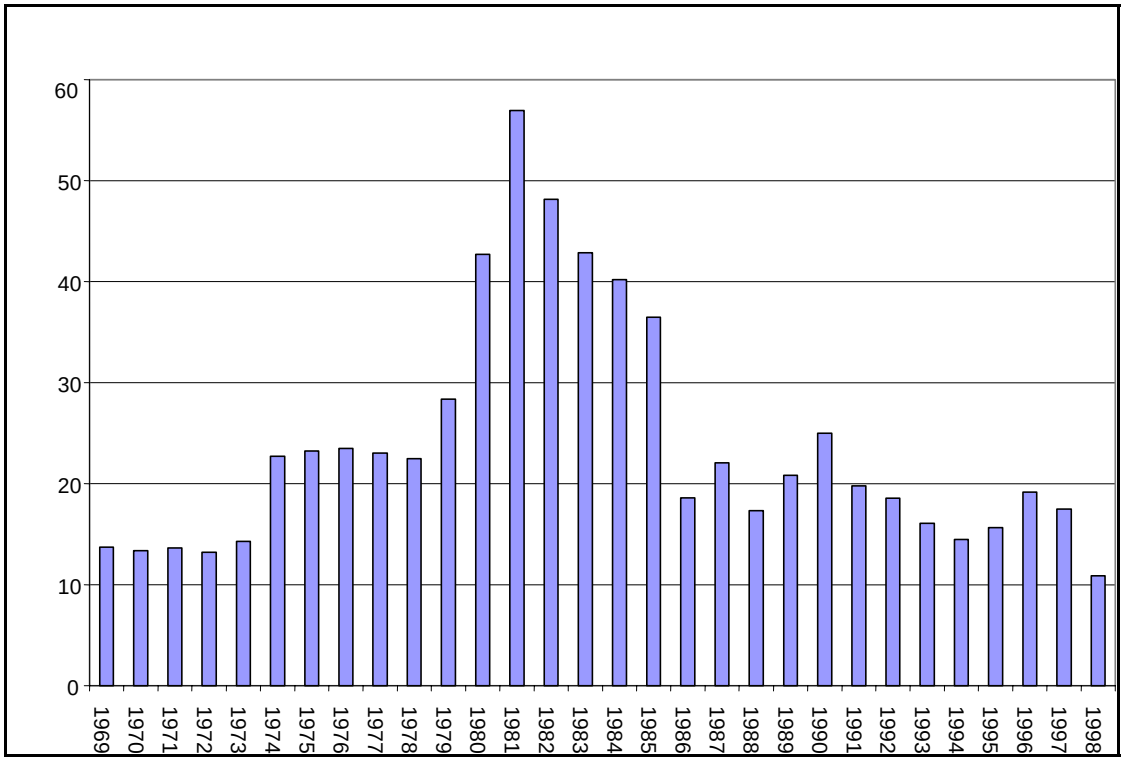


Figure 1. Crude Oil Prices, U.S. Average: 1969-1998 (Energy Statistics Source Book, 1999).

The coastal economies of some oil dependent LMAs in the Gulf of Mexico were more severely impacted by the oil bust than others. For example, the Lafayette LA economy lost 14,000 jobs in the oil and natural gas extraction industries between 1982 and 1988, a 63 percent loss. Other industries throughout the greater Lafayette area were affected as well, with total employment dropping from 200,000 workers in 1982 to 160,000 workers in 1987.[1] These losses translated into an unemployment rate of more than 16 percent in 1988. However, the Lafayette area was not the hardest hit by the oil bust; unemployment rates exceeded 20 percent in some other coastal communities (Gramling, 1996).

[1] Source: U.S. Department of Commerce's Regional Economic Information System of the Bureau of Economic Analysis.

Sociology of Regional Processes. To understand how industries, public institutions, and communities change in response to fluctuations in the oil and gas industries, we draw upon the assumptions of human ecology theory. One of these assumptions is that the range and diversity of community industry functions are important determinants of community size, complexity and organization (see Frisbie and Poston, 1976; Hawley, 1986; Mencken, 1997; Murdock et al., 1993; Nord and Luloff, 1993; Poston, 1984; Frisbie and Poston, 1978). Communities also can be placed along a continuum of industry structures, from less to more diverse. Generalist communities (those with a variety of industries) and specialist communities (those with one or two main industries) both have advantages and disadvantages for growth and social organization at the local level (Poston, 1984).

Generalist communities are larger in size and more complex in structure. Fluctuations in one industry do not reverberate throughout the entire system so long as the other industries upon which the community depends for employment are independent of those shocks and remain relatively stable. As a result, generalist systems tend to be more stable over time. This longitudinal stability is important for local public institutions, such as schools and financing of local government services, because it allows administrators to plan for incremental changes in the supply of revenues and the demand for resources. Generalist systems can also support more stable population growth patterns (Frisbie and Poston, 1976, 1978; Micklin and Choldin, 1984; Poston, 1984).

Specialist communities, on the other hand, are primarily dependent upon one or two industries for subsistence. Communities that rely upon natural resource-based industries, such as coal, oil/gas, timber, or fishing, are specialist communities (Gramling and Freudenburg, 1990; Hawley, 1986; Rural Sociological Society Task Force, 1993).

A second assumption of human ecology theory is that significant industry contraction (and expansion) will alter drastically the social organization of the community (England and Albrecht, 1984; Jobes, 1999; Krannich and Grieder, 1984). During industry contraction, jobs are lost, and an out-migration of younger population typically results (RSS, 1993). The negative effects of these cycles, particularly in rural America, manifest in social disorganization, higher crime rates and other social problems (Freudenburg and Jones, 1991; Jobes, 1999).

Third, the human ecological approach assumes that local communities are ecosystems comprised of four basic and interdependent components: population, organization, environment, and technology (Hawley, 1986; Poston, 1984; Micklin and Choldin, 1984). This approach further assumes that changes in one of these four components will create changes throughout the community. For example, changes in the external environment (e.g., oil prices dropping significantly) will affect changes in the other components of the community (jobs and population) that rely upon the oil and gas industry for employment (Gramling, 1996). Additionally, changes in the technology used in the production of sustenance (e.g., mechanization of coal extraction) will affect the population and organization of the ecosystem (loss of jobs and out-migration), independent of any changes in the external environment. Not surprisingly then, economies that were most involved in the exploration and production of oil and natural gas in the Gulf of Mexico region were also most affected by changes in the oil and gas industry. Those communities that are more concentrated in multiplier industries will also be affected, but not as directly.

First Unit of Analysis: Biloxi LMA Employment, 1940-1970. General industry trends are illustrated for the decades between 1940 and 1970, inclusive (Figure 2). Total employment in the Biloxi LMA remained relatively flat between 1940 and 1950. In 1940, manufacturing was

the dominant industry, employing 32 percent of the workforce (10,000 workers). Agriculture (19%), services (19%) and wholesale/retail trade (15%) lagged behind manufacturing. The mining industry, where oil and gas workers are employed, represented less than 2 percent of the labor force from 1940 through 1970, and 2000 as well.

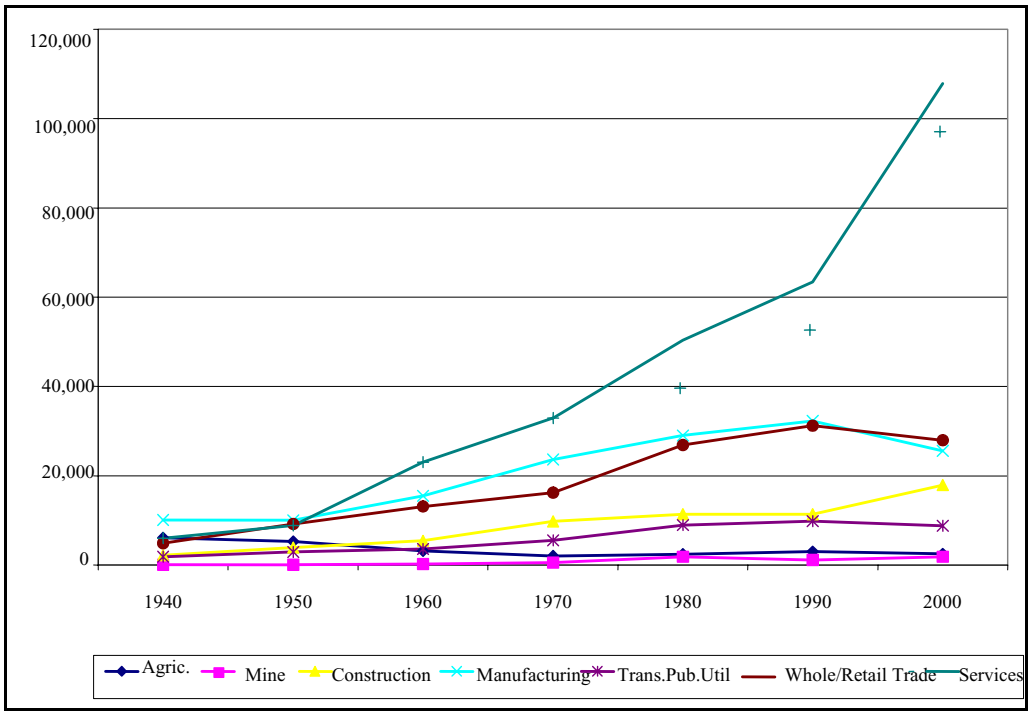


Figure 2. Major Industry Employment, Biloxi LMA: 1940-2000 (U.S. Census Bureau 2000b).

Total employment in the Biloxi LMA economy grew by 60 percent between 1950 and 1960. Services led that growth rate, increasing 158 percent over the course of the decade. And, for the first time, manufacturing was not the largest employer in the Biloxi LMA. Services employed 36 percent of the total employment, compared to 24 percent for manufacturing. Agriculture's share of the total labor force declined to less than 5 percent by 1960.

The data for 1970 show the same distribution of workers as in 1960. Employment in the Biloxi LMA grew at 40 percent between 1960 and 1970, with near equal percentage increases across all categories. Services continued as the largest employment sector with 36 percent of the total labor force. Employment in the manufacturing sector increased slightly by 2 percent to 26 percent in 1970.

Biloxi LMA Demographic Changes: 1940-1970. Several important structural industry changes occurred in the Biloxi LMA between 1940 and 1970. Agriculture and manufacturing declined in importance, while trade and services increased. Total employment in the LMA also grew by 190 percent between 1940 and 1970. Population growth during that period reflects those structural changes. In 1940 126,224 people lived in the Biloxi LMA. By 1970, population in the LMA was over 463,000. The population in Harrison County, the LMA's most populated county, grew by more than 160 percent between 1940 and 1970. At the same time, the Census data show that the racial composition of the LMA changed slightly. The black population declined from 19 percent to 17 percent, while the white population increased from 79 percent to

83 percent. This trend is consistent with the racial composition changes in most southern labor markets during the latter half of the 20th century.

Second Unit of Analysis: Biloxi LMA Employment, 1970-1990. Between 1970 and 1980, employment in the Biloxi LMA grew by 40 percent. Growth was greatest in services (53%), manufacturing (23%) and wholesale/retail trade (65%). Mining experienced some growth in the 1970s, but employed only 2 percent of the total Biloxi LMA workforce in 1980. In 1990, mining employment again dropped below 1 percent.

During the 1980s, total employment in the Biloxi LMA grew by 16 percent. Growth continued growth in the manufacturing, services and wholesale/retail trade sectors. The service sector employed the majority of the workforce (41%). This trend is inconsistent with employment trends that occurred in other LMAs in the GOM region, particularly those connected to the oil and gas industry (e.g., Lafayette and Lafourche) where employment growth rates were negative or very small.

Although manufacturing declined between 1940 and 1990, this industry continued to employ a significant segment (over 20%) of the labor force in 1990. At the same time, services gradually emerged as the dominant service sector, as it did in many other LMAs. We next analyze the Biloxi LMA employment data in order to better understand local employment patterns between Census years.

The annual full- and part-time employment data for the Biloxi LMA show a steady increase in total employment from 1969 until 1977 (Figure 3). These data also show that employment levels fluctuated modestly at the 1977 level until the mid-1980s when employment began to grow again.

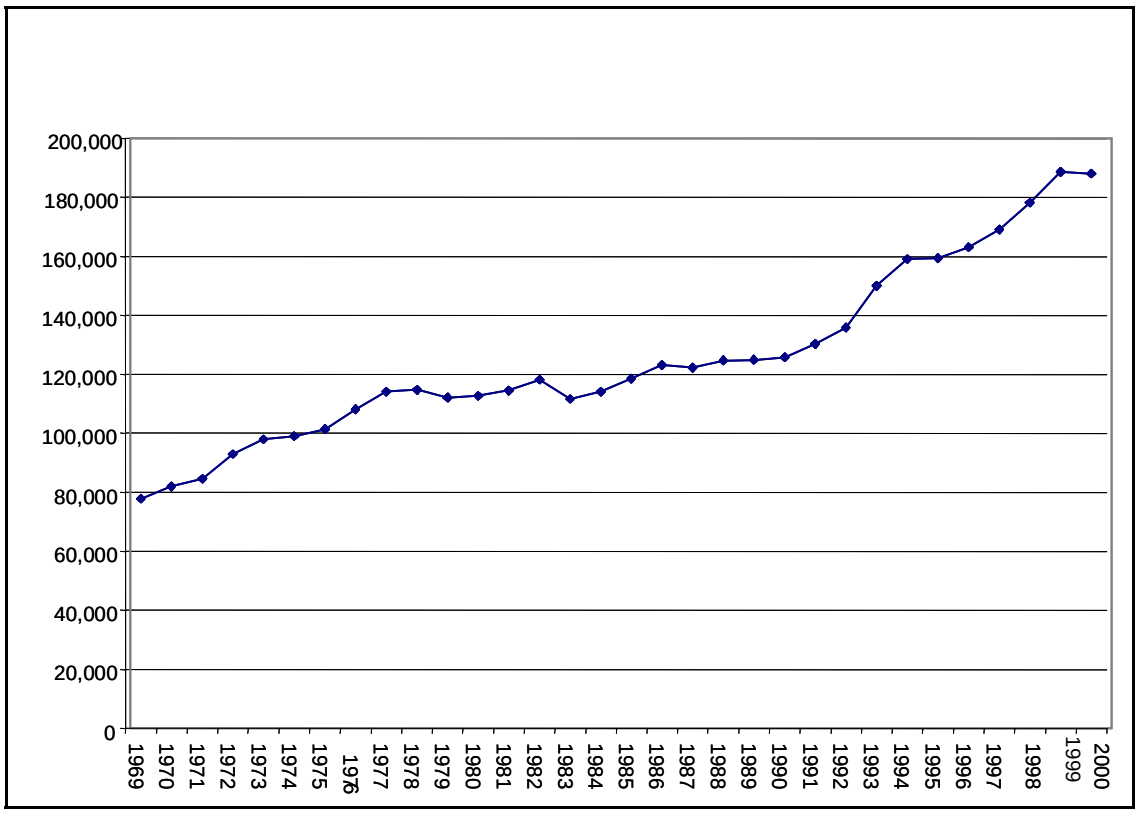


Figure 3. Annual Employment, Biloxi LMA: 1969-2000 (U.S. Dept. of Commerce, Bureau of Economic Analysis, 2000).

In order to establish when, or if, unexpected changes in employment occurred in the Biloxi LMA, we performed a time-series forecasting analysis. First, three-year moving averages (current plus previous two years) of employment levels are computed. Second, at each year the expected value (three-year moving average) is subtracted from the observed value. Each of these deviations is squared to provide the forecasting error for each year. These squared deviations are summed and averaged across all years in the analysis to compute a mean squared error (MSE). We establish a "shock" for any given year in which the squared deviation for that year is greater than or equal to two times the mean squared error for the industry sector in question (Anderson et al., 1990). The following figure illustrates the actual employment data charted with the three-year employment moving average for each year (Figures 4). The data in Figure 4 show sustained employment growth throughout the 1990s, with employment levels exceeding expectations in 1993, 1994, 1998, and 1999.

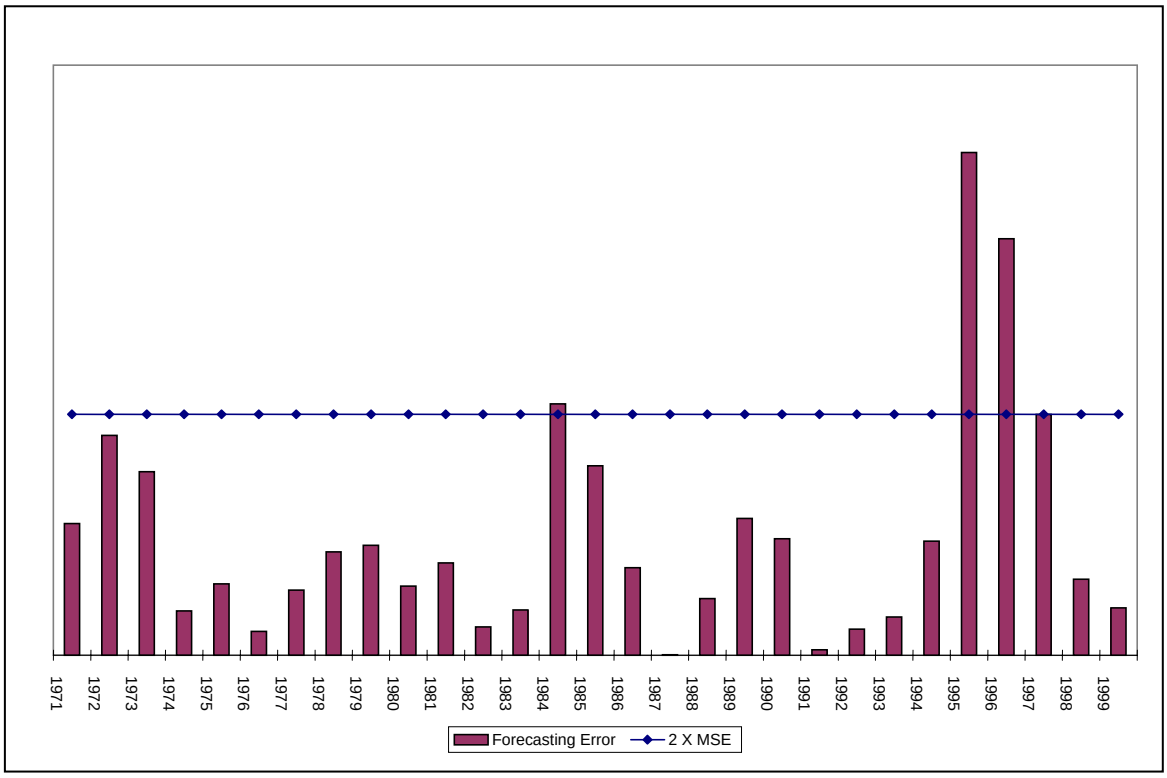


Figure 4. Forecasting Analysis for Employment, Biloxi LMA: 1971-1999.

We turn now to an analysis of annual employment data in order to uncover in which industry sectors these cycles are present in the Biloxi LMA. The figure below shows annual employment data for nine general industry categories for the years between 1969 and 2000, inclusive (Figure 5). Manufacturing and services are the key sectors of interest. Our forecasting analysis on manufacturing employment shows that 1972, 1979, 1980, and 1983 are crucial years for manufacturing. In 1972, manufacturing employment was greater than expected, while in 1979 and 1980 manufacturing employment dropped-off considerably. There was a further drop in employment in 1983. These findings reflect what we would expect given the business cycles of the 1970s and 1980s (recession 1979-1982). However, the Biloxi LMA is embedded in the Gulf of Mexico region which was largely immune from the detrimental effects of this recession

because of the simultaneous boom in the domestic oil and gas industry. Analyses of employment trends in oil and gas LMAs (e.g., Lafayette, Lafourche) show just the opposite effect.

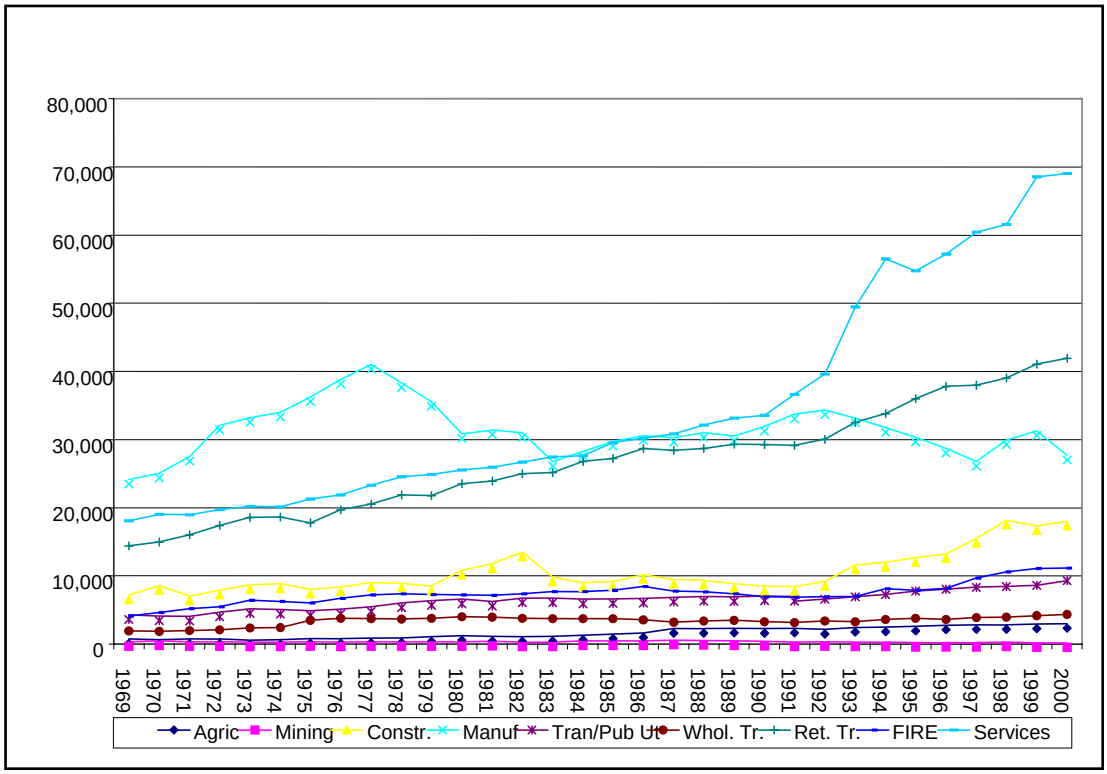


Figure 5. Total Employment by Major Industry Categories, Biloxi LMA: 1969-1999 (U.S. Dept. of Commerce, Bureau of Economic Analysis, 2000).

While, at first glance, these findings suggest that the Biloxi LMA is not integrated into the oil and gas industry, we must examine the nature of manufacturing growth during this period. Therefore, we now turn to an analysis of detailed industry codes within each of these categories.

Detailed Industry Code Analyses. In this next section, we present analyses of industry sector codes for three key industry groups: manufacturing, transportation and wholesale trade (Table 1). We chose those categories based on a) relationship to oil and gas activities, b) employment levels, and c) availability of data in the years we are studying. The manufacturing category includes the sub-categories of fabricated structural metal products, ship and boat building and repair, and oil field machinery. The transportation category focuses exclusively on water. Wholesale trade considers only industrial machinery and equipment.

Table 1

Key Industry Groups and Sectors

Manufacturing		
Fabricated Structural Metal Products (SIC 3440*),* this category includes manufacture of barge sections, ship sections, buoys, and metal plates for gas tanks, gas holders, oil storage tanks, large diameter pipes, pressure valves, storage tanks and also portable building.	***Ship and Boat Building and Repairing*** (SIC 3730), this category includes building and repairing barges, cargo vessels, drilling platforms and dry docks.	***Oil Field Machinery*** (SIC 3533), this category includes bits, rock and oil field tools, derricks for oil and gas fields, drill rigs, drilling tools for gas, oil and water wells.
Transportation		
Water Transportation (SIC 4400), this category primarily includes stevedoring.		
Wholesale Trade		
Industrial Machinery and Equipment (SIC 5084), this category includes the wholesale of derricks, oil field tool joints, oil well supply houses, oil well machinery equipment and supplies.		

Biloxi LMA Manufacturing. The *Fabricated Structural Metal Products* (SIC 3440) sector minimally impacts the Biloxi LMA economy. Employment in this sector exceeded 700 workers in only one year (1985) between 1964 and 1996. Moreover, the patterns in the data are not consistent with oil and gas boom and bust cycles of the 1970s and 1980s (Figure 6).

The annual employment data for *Ship and Boat Building and Repair* (SIC 3730) is presented below (Figure 7). Because of data disclosure issues, we were not able to calculate an accurate measure of employment for the years prior to 1977. Therefore we limit our analysis to the years between 1977 and 1996, inclusive. These data identify *Ship and Boat Building and Repair* as a major industry in the Biloxi LMA. The data also indicate a rapid drop-off in employment from the late 1970s through the early 1980s. This cycle is counter to the oil and gas boom pattern discovered in other LMAs in the region. Indeed, it is more consistent with the national recession pattern.

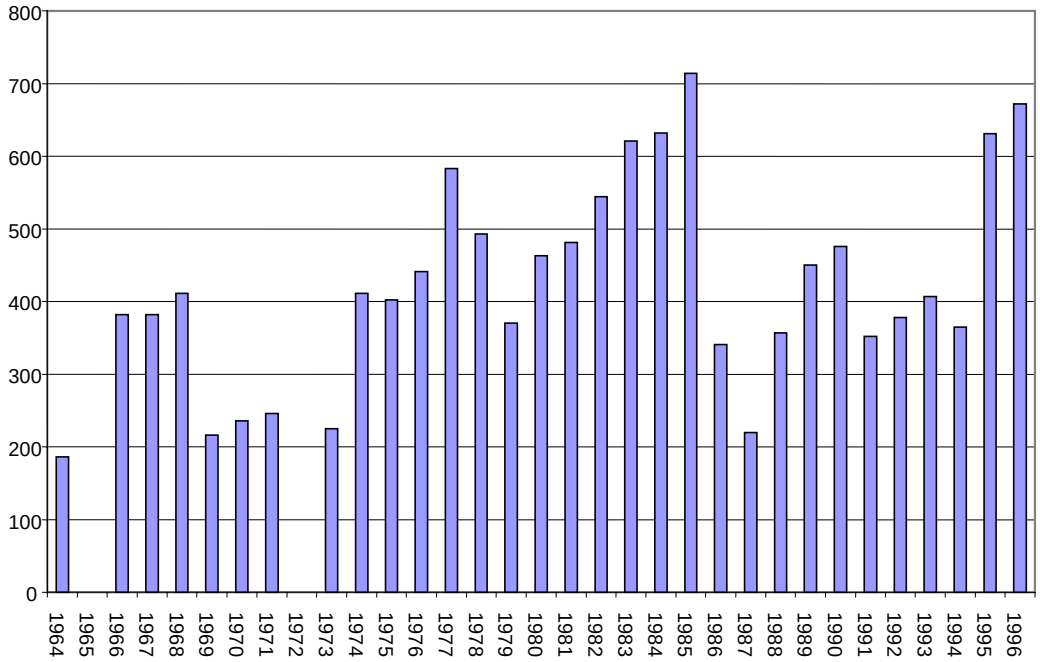


Figure 6. Annual Employment for Fabricated Structural Metal Products, Biloxi LMA: 1964-1996 (U.S. Census Bureau, 2000a).

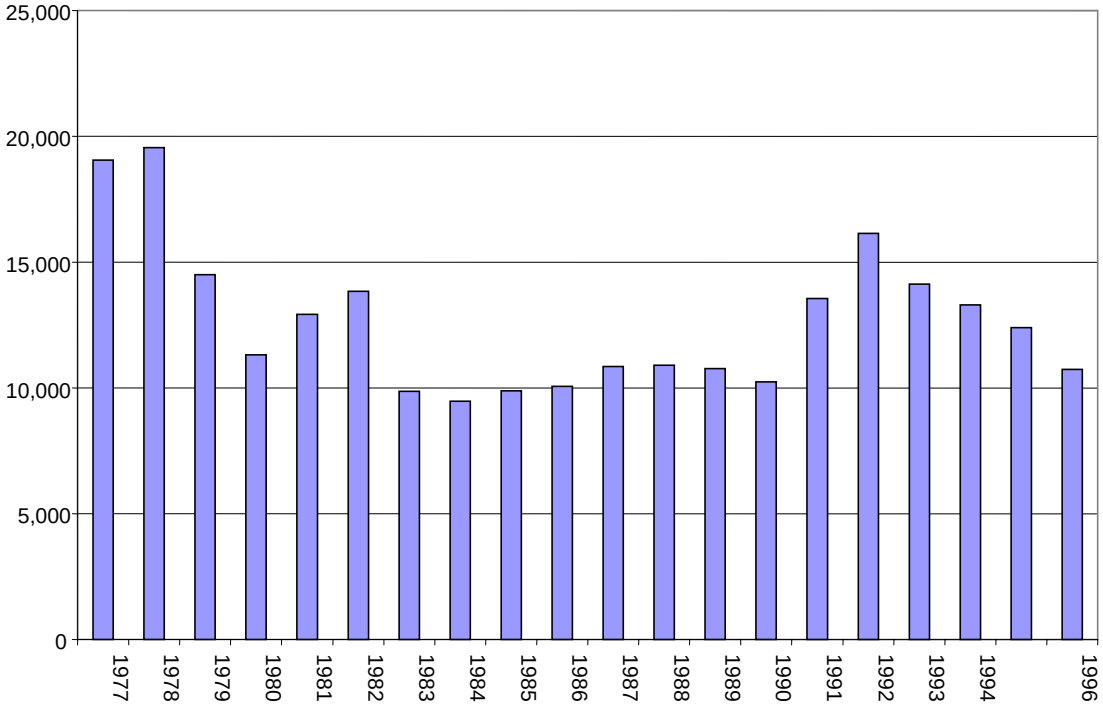


Figure 7. Annual Employment for Ship and Boat Building and Repair, Biloxi LMA: 1977-1996 (U.S. Census Bureau, 2000a).

The annual employment data for the *Oil Field Machinery* (SIC 3533) manufacturing sector show some activity in the late 1970s and early 1980s that is consistent with the oil and gas boom and bust cycle. However, the data indicate a negligible impact on the Biloxi LMA economy because employment levels are very low and there was basically no production after 1982 (Figure 8).

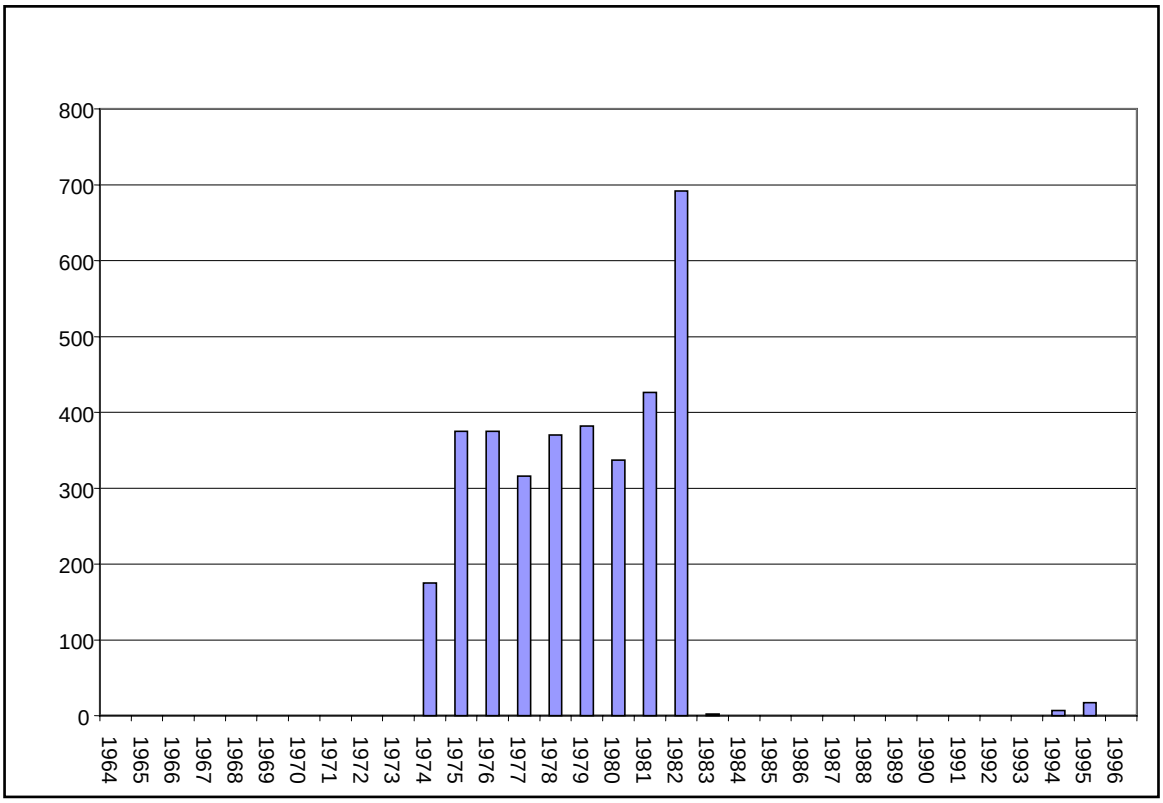


Figure 8. Annual Employment for Oil Field Machinery, Biloxi LMA: 1964-1996 (U.S. Census Bureau, 2000a).

Biloxi LMA Water Transportation. The annual employment data on *Water Transportation* (SIC 4400) employment is displayed below (Figure 9). Unfortunately, there is no category that directly measures water transportation related to offshore oil and gas activities. Examination of more detailed industry codes (4-digit) reveals that the vast majority of employment was in stevedoring.

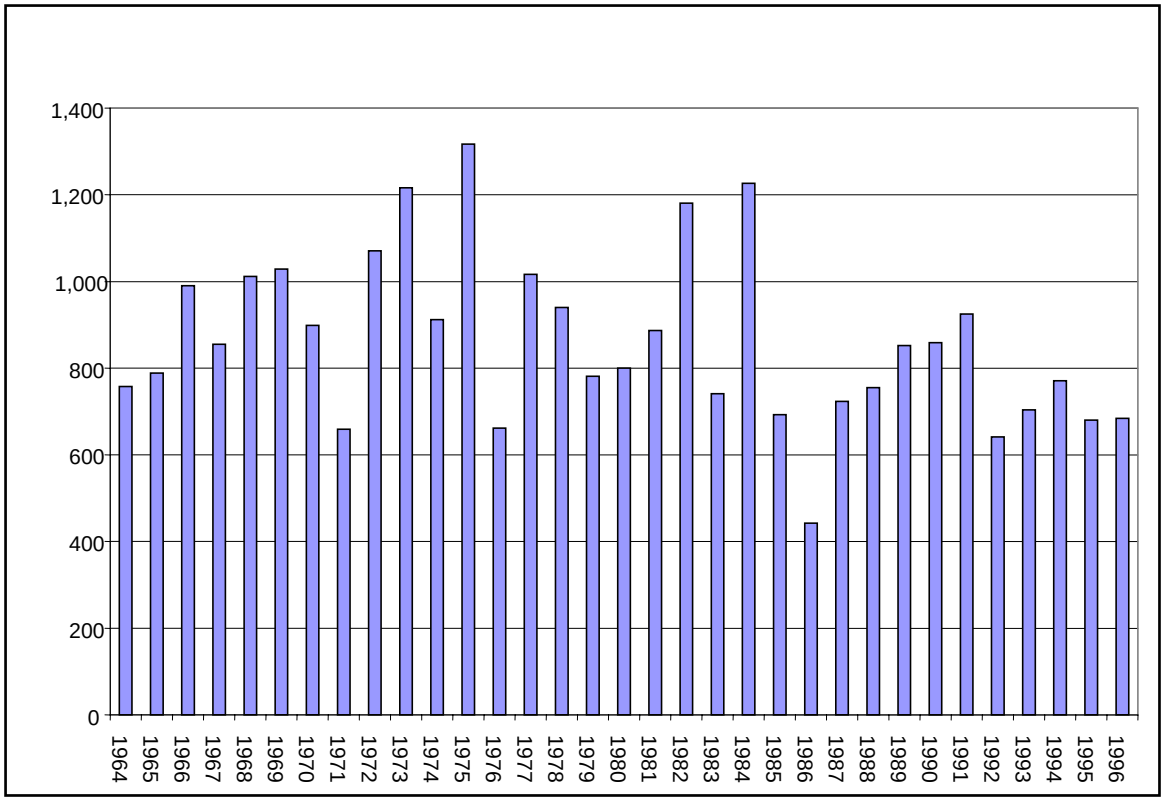


Figure 9. Annual Employment for Water Transportation, Biloxi LMA: 1964-1996 (U.S. Census Bureau, 2000a).

Biloxi LMA Wholesale Trade. The annual employment data for *Industrial Machinery and Equipment* (SIC 5084) are presented below (Figure 10). This industry category includes the wholesale marketing of oil well machinery (but not exclusively). These data are available only from 1977 to 1996, which does not provide enough data to conduct a forecasting analysis. However, the employment levels in this industry, less than 150 workers in any year, indicate very little Industrial Machinery and Equipment activity in the Biloxi LMA.

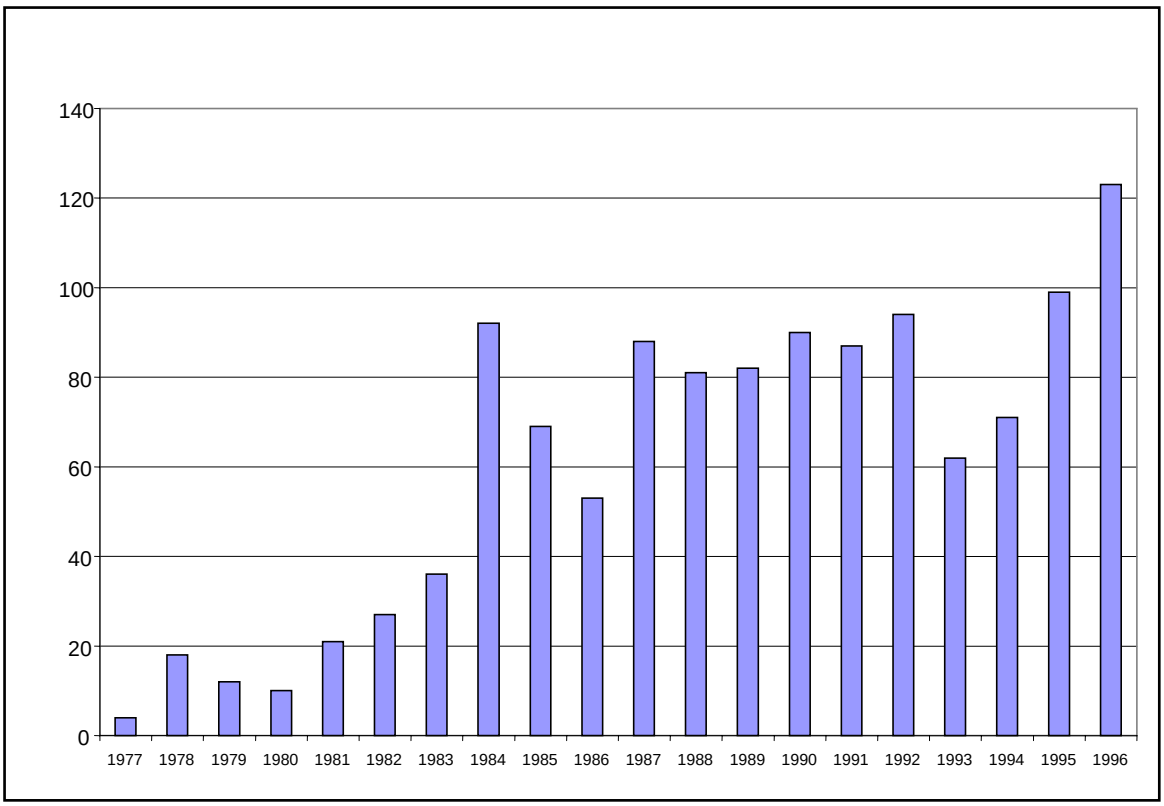


Figure 10. Annual Employment for Wholesale Trade of Industrial Machinery and Equipment, Biloxi LMA: 1977-1996 (U.S. Census Bureau, 2000a).

This analysis indicates that the economic structure of the Biloxi LMA is for the most part disconnected from the oil and gas industry. Moreover, the Biloxi LMA shows business cycle patterns consistent with the national patterns of recession and growth for the 1970s and 1980s. In contrast, LMAs with higher concentrations of oil and gas activities suggest patterns counter to the national cycle.

Biloxi LMA Population, Education, and Local Government: 1970-1990. Between 1970 and 1980, the population of the Biloxi Labor Market Area increased by 24 percent, from 369,000 to 389,000. This is significantly greater than the national growth rate of 11.4 percent for the same period. Within the Biloxi LMA, the population grew most rapidly in Hancock, Harrison, and Jackson Counties. Between 1980 and 1990, however, the population of the Biloxi LMA grew by only a modest 5.4 percent, a rate that is almost half of the national growth rate of 9.8 percent. Furthermore, Jackson County experienced negative population growth during this period. The population data for the Biloxi LMA is presented below (Tables 2-4).

The data on racial composition show similar growth patterns for blacks and whites. Between 1970 and 1980, the white population grew by 21 percent and the black population by 31 percent. Between 1980 and 1990, the black population grew by 7 percent and the white population by 5 percent. The trends for the black population are counter-intuitive to southern labor markets. Most data indicate that out-migration of the black population was the norm for any decade in the 1900s–especially within oil and gas industry-dependent LMAs. However, this was not the case within the Biloxi LMA where the increases in the black population growth rate are significantly greater than would be expected via natural replacement.

Table 2

Population by County, Biloxi LMA: 1940-2000

County	1940	1950	1960	1970	1980	1990	2000
George	87,044	10,012	11,098	12,459	15,297	16,773	19,582
Greene	9,512	8,215	8,366	8,545	9,827	10,220	13,376
Hancock	11,328	11,891	14,039	17,387	24,537	31,760	44,031
Harrison	50,799	84,073	119,489	134,582	157,665	165,365	189,409
Jackson	20,601	31,401	55,522	87,975	118,015	115,243	132,823
Pearl River	19,125	20,641	22,411	27,802	33,795	38,714	49,969
Stone	61,555	62,644	70,133	81,011	97,166	10,750	13,960
LMA Total	126,224	172,497	237,938	296,851	368,852	388,725	463,150

Source: U.S. Census Bureau, 2000b.

Table 3

Percent of White Population, Biloxi LMA: 1940-2000

County	1940	1950	1960	1970	1980	1990	2000
George	85.7	87.7	88.4	88.2	90.3	89.4	87.1
Greene	79.1	81.7	77.0	77.8	79.8	78.1	72.8
Hancock	79.0	82.8	83.9	85.7	89.2	89.8	90.2
Harrison	80.2	84.0	83.9	82.7	78.7	77.2	73.1
Jackson	78.7	78.5	80.4	83.7	80.0	78.3	75.4
Pearl River	78.3	78.2	76.8	81.5	84.8	84.7	85.5
Stone	74.1	78.2	75.6	76.8	76.6	77.7	79.4
LMA % Total	79.6	82.1	82.1	83.0	80.9	79.9	77.6
LMA Total	100,438	141,707	195,452	246,421	298,446	310,722	359,424

Source: U.S. Census Bureau, 2000b.

Table 4

Percent of Black Population, Biloxi LMA: 1940-2000

County	1940	1950	1960	1970	1980	1990	2000
George	14.2	12.3	11.5	11.6	9.3	9.3	8.8
Greene	20.8	18.3	23.0	21.9	20.0	21.4	26.2
Hancock	20.7	17.1	16.0	14.2	9.9	9.1	6.8
Harrison	19.7	15.9	16.0	16.9	19.2	19.6	21.1
Jackson	20.2	21.4	19.5	16.1	18.6	20.4	20.9
Pearl River	21.7	21.7	23.1	18.4	14.8	14.2	12.2
Stone	25.9	21.7	24.3	23.0	22.6	21.8	19.2
LMA % Total	20.2	21.6	17.7	16.7	17.7	18.1	18.2
LMA Total	25,526	30,716	42,214	49,748	65,393	70,560	84,723

Source: U.S. Census Bureau, 2000b.

Education. Education levels were generally higher in the Biloxi LMA than in several other oil and gas LMAs in the GOM region (Table 5). For example, in 1970, 48 percent of adults in the Biloxi LMA but 67 percent in the Lafayette LMA had not graduated from high school. By 1980, the percentage of adults who had not graduated from high school declined to 35 percent, and to 27 percent by 1990. The number of adults attending but not completing high school also increased in the Biloxi LMA between 1970 and 1990.

Table 5

Adult Educational Attainment (age 25+), Biloxi LMA: 1970-2000

County	0-8 Years	Some High School	High School Diploma	Some College, No Degree	BA/BS or More	Total
1970						
George	36.8%	25.5%	24.9%	7.1%	5.5%	6,301
Greene	42.1%	20.7%	24.4%	8.1%	4.6%	4,322
Hancock	33.5%	20.0%	27.8%	9.8%	8.8%	9,105
Harrison	25.8%	19.4%	33.7%	11.4%	9.5%	62,734
Jackson	23.3%	21.2%	34.9%	11.6%	8.8%	41,505
Pearl River	31.3%	22.4%	27.5%	11.6%	7.0%	14,019
Stone	29.6%	28.7%	26.5%	8.8%	6.2%	4,069
LMA Total	38,686	29,637	45,783	15,695	12,254	142,055
1980						
George	26.7%	21.9%	40.1%	10.5%	6.9%	7,752
Greene	30.3%	23.2%	36.9%	8.9%	7.6%	4,937
Hancock	25.5%	20.4%	38.2%	14.6%	12.0%	12,586
Harrison	19.6%	17.2%	41.0%	20.4%	15.9%	73,175
Jackson	17.4%	18.7%	43.6%	18.9%	12.6%	55,527
Pearl River	25.8%	19.8%	39.4%	13.9%	10.3%	17,033
Stone	22.4%	23.6%	37.4%	15.3%	12.7%	4,632
LMA Total	36,287	32,909	72,444	31,664	23,413	196,717
1990						
George	17.7%	23.4%	34.0%	16.4%	8.3%	9,846
Greene	17.2%	20.4%	39.4%	16.9%	6.0%	6,137
Hancock	12.9%	19.1%	28.9%	24.8%	14.2%	20,398
Harrison	9.6%	15.6%	29.5%	28.9%	16.3%	99,878
Jackson	9.2%	16.4%	32.7%	27.2%	14.4%	69,935
Pearl River	12.6%	19.0%	31.6%	25.3%	11.4%	23,589
Stone	12.1%	19.7%	28.9%	26.8%	12.4%	6,324
LMA Total	23,223	40,282	73,371	63,306	33,925	234,107
2000						
George	9.5%	20.6%	38.6%	21.9%	9.1%	11,838
Greene	9.7%	22.9%	38.0%	21.4%	7.9%	8,352
Hancock	7.8%	14.3%	29.3%	31.3%	17.2%	28,840
Harrison	6.2%	13.5%	28.3%	33.5%	18.4%	119,169
Jackson	4.8%	14.1%	32.1%	32.4%	16.4%	82,818
Pearl River	8.6%	16.7%	31.2%	29.5%	13.8%	30,940
Stone	8.3%	16.8%	30.1%	32.2%	12.4%	8,258
LMA Total	19,057	42,848	88,737	91,993	47,580	290,215

Source: U.S. Census Bureau, 2000b.

Finances. As illustrated by the local government finance data, the Biloxi LMA grew rapidly during the 1970s (Tables 6-9). This growth also increased the demand on local government services, particularly education. Steadily increasing local government finances and more slowly increasing state revenues reflect this trend. Local governments in the Biloxi LMA also incurred more debt during this period. Between 1982 and 1987, debt grew by 66 percent in real dollars. The recession of the early 1990s was particularly taxing on local government finances.

Table 6

Total Revenue, Per Capita (in 1997 adjusted dollars), Biloxi LMA: 1972-1997

County	1972	1977	1982	1987	1992	1997
George	$1,170	$1,160	$1,117	$1,106	$1,074	$1,120
Greene	$1,166	$1,256	$1,502	$1,535	$1,232	$1,117
Hancock	$1,479	$1,425	$1,254	$1,439	$2,089	$2,238
Harrison	$1,320	$1,711	$1,478	$1,903	$2,276	$2,840
Jackson	$1,450	$1,870	$2,075	$4,875	$275	$3,088
Pearl River	$1,345	$1,514	$1,573	$1,610	$1,560	$1,705
Stone	$3,562	$6,011	$4,366	$5,090	$5,857	$5,793
LMA Total	$1,420	$1,807	$1,723	$2,778	$1,609	$2,709

Source: U.S. Census Bureau, 2000a.

Table 7

Total State Revenue, Per Capita (in 1997 adjusted dollars), Biloxi LMA: 1972-1997

County	1972	1977	1982	1987	1992	1997
George	$558	$609	$574	$658	$641	$721
Greene	$728	$798	$823	$894	$776	$708
Hancock	$562	$513	$496	$525	$502	$587
Harrison	$478	$523	$457	$589	$561	$778
Jackson	$487	$538	$532	$637	$591	$673
Pearl River	$630	$723	$721	$792	$793	$935
Stone	$1,510	$1,903	$2,071	$2,260	$2,402	$2,824
LMA Total	$537	$593	$564	$674	$648	$802

Source: U.S. Census Bureau, 2000a.

Table 8

Total Tax Revenue, Per Capita (in 1997 adjusted dollars), Biloxi LMA: 1972-1997

County	1972	1977	1982	1987	1992	1997
George	$179	$175	$168	$205	$359	$286
Greene	$213	$187	$165	$205	$309	$270
Hancock	$390	$425	$293	$362	$497	$274
Harrison	$408	$452	$382	$498	$586	$108
Jackson	$397	$547	$450	$605	$762	$1,061
Pearl River	$345	$275	$247	$309	$408	$388
Stone	$969	$1,058	$568	$1,022	$1,094	$1,239
LMA Total	$398	$463	$376	$496	$611	$481

Source: U.S. Census Bureau, 2000a.

Table 9

Total Debt, Per Capita (in 1997 adjusted dollars), Biloxi LMA: 1972-1997

County	1972	1977	1982	1987	1992	1997
George	$182	$338	$217	$128	$110	$411
Greene	$455	$240	$191	$589	$639	$529
Hancock	$1,992	$1,156	$627	$561	$6,131	$1,382
Harrison	$2,153	$2,063	$2,174	$2,769	$2,360	$2,036
Jackson	$539	$2,148	$2,704	$2,704	$4,683	$5,345
Pearl River	$632	$270	$190	$190	$549	$523
Stone	$3,838	$2,277	$301	$301	$942	$684
LMA Total	$1,427	$1,764	$1,873	$1,873	$3,009	$2,656

Source: U.S. Census Bureau, 2000a.

Employment in the Biloxi LMA grew by 26 percent during the 1990s. Its population also increased during that time by 19 percent (almost twice the national rate). That growth was facilitated in part by the growing employment opportunities—including an influx of casino gambling. Harrison County (38%), where the majority of the casinos are located, incurred the greatest amount of growth during the 1990s. Services (70%) and construction employment (55%) also increased significantly in that decade. Such growth helped return tax revenues to their pre-recession levels (in real dollars) and greatly reduce the per capita debt load. However, the educational structure in the Biloxi LMA did not benefit from that growth. In 1990, only 13 percent of adults in the Biloxi LMA were college graduates. That rate is much below the national rate of 21 percent. The percentage of adults with four-year college degrees had increased somewhat to 16 percent in 2000. However, that rate was still considerably below the national rate of 26 percent.

The tourist trade along the Gulf Coast of Mississippi is linked to the economy of nearby regions. However, the employment data for this LMA indicate that the boom and bust patterns of the 1970s and 1980s did not affect the Biloxi region. The 1990s were a period of economic

expansion and recreational economies, such as casino gambling, are naturally subject to declines during economic recessions. Thus said, it is reasonable to expect that the Biloxi LMA has experienced some economic decline since 2000.

V. ALABAMA STATE PROFILE

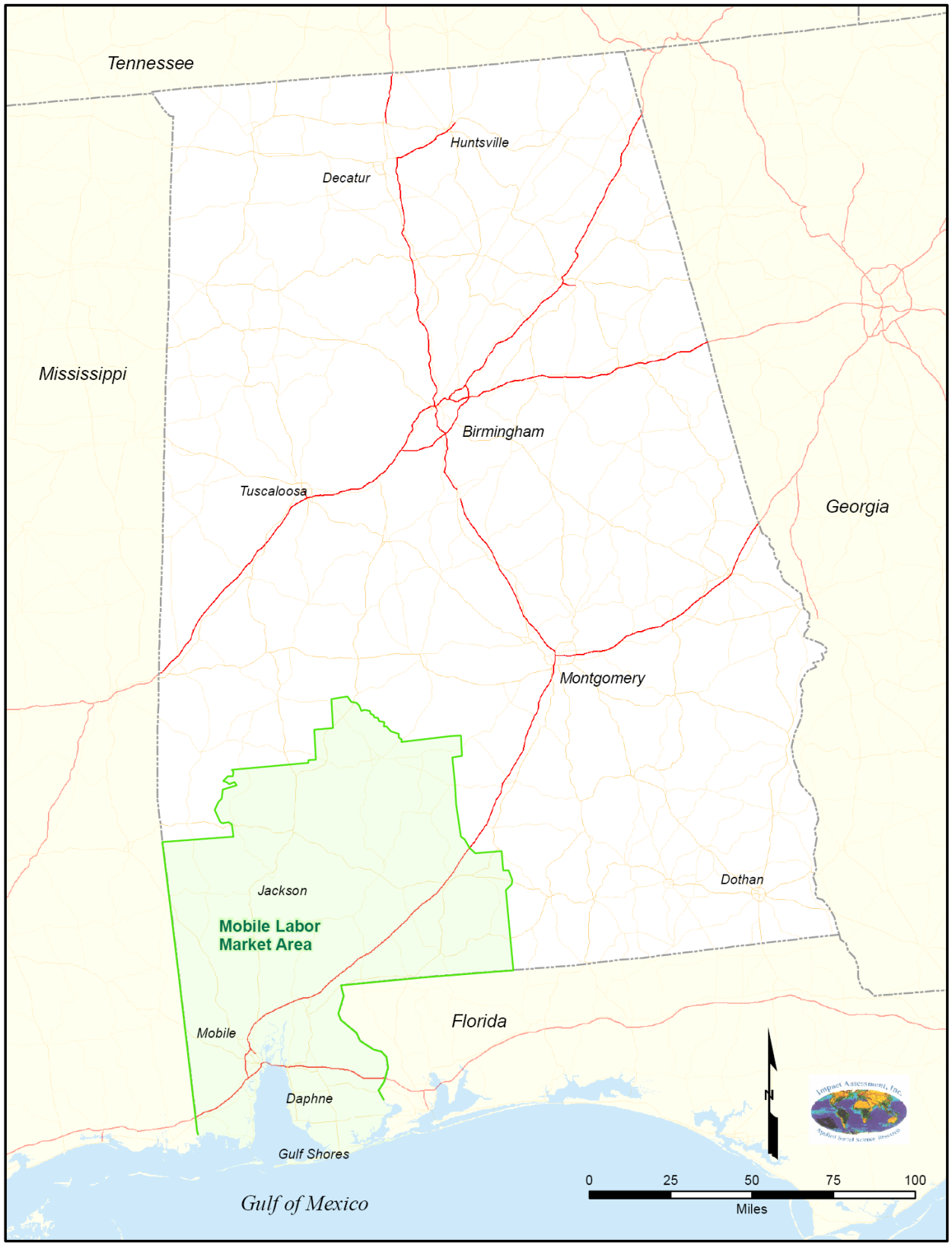
A. INTRODUCTION

Located in the "deep south," the State of Alabama is bordered by Tennessee to the north, Mississippi to the west, Georgia to the east, and Florida and the Gulf of Mexico to the south (Map 13). Montgomery, the state capital, is geographically located at 32.35°N latitude and 86.28°W longitude. This state covers 50,744 square miles of U.S. territory. Approximately 3 percent of the state's total area is water; nearly 40 major rivers flow through it. These rivers include the Alabama, the Chattahoochee, the Escambia, the Mobile, the Perdido, and the Tombigbee. The state derives its tremendous transportation power from those natural water lines. The Bay of Mobile, home to the Port of Mobile, is one of Alabama's major transportation hubs. This port handles roughly 16 million tons of cargo annually.

Alabama's climate is temperate, with average highs of 82° in July and lows of 46° in January. The state receives an average of 53.4 inches of precipitation per year. Alabama's wet, warm climate and rich, fecund soil support a robust agricultural industry. Its major agricultural products include: cotton, poultry and eggs, cattle, nursery stock, peanuts, vegetables, milk, and soybeans. Additionally, the state harbors a wealth of mineral resources, notably coal. Iron beds are also extensive in Alabama, lying between Tuscaloosa and DeKalb Counties. Other minerals and substances found in the state include gold, copper, marble, marl, greensand, limestone, gas, millstone, and petroleum. U.S. Steel and American Cast Iron Pipe Company are located in the state. Alabama is also noted for its timber and extractive industries. Its primary manufactured products include paper, lumber and wood, rubber and plastics, transportation equipment, and apparel.

There are three Gulf Ecological Management Sites (GEMS) in Alabama: the Weeks Bay National Estuarine Research Reserve (Baldwin County), the Mobile-Tensaw River Delta (Baldwin, Mobile, and Washington Counties), and the Orange Beach Maritime Forest (Baldwin County). Each GEM is a geographic area that represents unique habitats, or that has special ecological significance to the continued production of fish, wildlife and other natural resources (South Alabama Regional Planning Commission, 2002).

The State of Alabama manages the 6,000-acre Weeks Bay National Estuarine Research Reserve (WBNERR) through the Department of Conservation and Natural Resources, and the National Oceanic and Atmospheric Administration's (NOAA's) Estuarine Reserves Division. The WBNERR, located in Baldwin County, provides a habitat for a wide variety of species including: saltmarsh, freshwater marsh, estuarine benthos, tidal flats, swamp, bogs, pine savannah, upland forest, sawgrass marsh, and riverine. It is also home to many rare and endangered species such as West Indian Manatee, Marsh Rabbit, Eastern Fox Squirrel, Bald Eagle, Wood Stork, Alabama Red-Bellied Turtle, American Alligator, and Alabama Sturgeon. Additionally, WBNERR provides both freshwater and brackish water breeding grounds for many species, including: shrimp, Brown Pelican, Osprey, Great Blue Heron, Water Moccasin, Largemouth Bass, and Mullet. Threats to the ecological integrity of the Weeks Reserve include fecal coliform bacteria from poorly operating septic tanks, and sedimentation from urban, commercial, and residential area development (South Alabama Regional Planning Commission, 2002).



Map 13. State of Alabama Depicting Gulf of Mexico Labor Market Areas (and component counties).

Spanning three counties (Baldwin, Mobile, and Washington), the Mobile-Tensaw River Delta is an immense 185,000-acre wetland ecosystem. This ecosystem is a habitat for swamp forest and seasonally flooded bottomland hardwoods, and provides a nesting ground for 110 species of birds. Comprised of numerous streams, bayous, and creeks, this river delta originates near the confluence of the Alabama and Tombigbee rivers and runs southward 35 miles to Mobile Bay. Over 300 species of birds have been linked to this region. Rare and endangered species include the American Alligator, the Swallow Tailed Kite, the Mississippi Kite, the Mottled Duck, beaver, river otter, and bear. Ownership of these lands is shared by the Army Corps of Engineers (federal), Division of Lands (state), and private entities. Current threats to its ecological integrity include expanded oil and gas activities, and the cumulative impact of local residential and commercial development, including heavy traffic through the area (South Alabama Regional Planning Commission, 2002).

The 588-acre Orange Beach Maritime Forest in Baldwin County is owned by the City of Orange Beach. It borders the Gulf State Park to the north for two miles. The forest features a wide variety of habitats including: maritime forest, cypress swamp, wetlands, and an extensive pitcher plant bog. It is also home to many rare and endangered species including: Gopher Tortoise, Eastern Indigo Snake, American Alligator, Jagarundi, Florida Pine Snake, Bobcat, and Long-Leaved Jointweed. Additionally, the Mississippi Sandhill Crane and Northern Sandhill Crane use the forest as a breeding ground. Threats to its environmental integrity include fire suppression activities and area development (South Alabama Regional Planning Commission, 2002).

The state also is home to four national forests: Bankhead (located in the northwestern corner of the state), Conecuh (located along the southern border), Talladega (located in the northeast), and Tuskegee National Forest (in the west-central part). Two of these areas support three wilderness areas: the 25,000-acre Sipsey Wilderness Area in Bankhead National Forest, and the 7,245-acrea Cheaha Wilderness Area and Dugger Mountain in the Talladega National Forest. Total wilderness acreage for the state amounts to over 41,000. These forests provide habitats for approximately 900 species, including white-tailed deer, quail, squirrel, turkey, rabbit, and waterfowl. Endangered species include the Gopher Tortoise, Flattened Musk Turtle and the Red-cockaded Woodpecker (U.S. Department of Agriculture, Forest Service, 2004).

B. BUILT ENVIRONMENT

Human Geography and Population Centers. The population of Montgomery, the state capital, was 201,568 persons in 2000. Montgomery's population is second only to Birmingham's (242,820). Other large centers, with their corresponding year 2000 populations, are: Mobile (198,915), Huntsville (158,216), Tuscaloosa (77,906), Hoover (62,742), Dothan (57,737), Decatur (53,929), Auburn (42,987), and Gadsden (38,978) (U.S. Census Bureau, 2000b).

Transportation and Communication. Alabama features 905 miles of interstate highways, six commercial airports, five Class 1 railroads, a deep-water port, ten inland ports, and the second largest inland waterway system in the nation (Economic Development Partnership of Alabama, 2004). Alabama's five Interstate Highways are: I-10 (through Mobile), I-20 (east-west through Birmingham), I-59 (Birmingham to Chattanooga), I-65 (connecting Nashville and Mobile via Montgomery), and I-85 (linking Charlotte, Atlanta, and Montgomery) (Wilber Smith

Associates, 2003a). Additionally, numerous state highways crisscross through Alabama (Economic Development Partnership of Alabama, 2004).

There are six major commercial airports, 214 general aviation and/or commuter airports, and 55 heliports in Alabama. Of these 78 are publicly owned and open for public use; the remainder are military and private airports. Alabama's major commercial airports are located in: Birmingham, Dothan, Huntsville, Mobile, Montgomery, and Tuscaloosa (Economic Development Partnership of Alabama, 2004).

The Birmingham International Airport has been Alabama's largest airport since 1931. It is conveniently located some five miles from Birmingham's downtown area. Eight major airlines–American, Continental, Delta, Delta Connection/Comair, Northwest, Southwest, United Express, and US Airways–provide 77 daily departures and arrivals. Birmingham International Airport's longest runway is 2,000 feet. It is currently being expanded to 12,000 feet (Birmingham International Airport, no date).

The Dothan Regional Airport (DRA) is located in Dale County approximately seven miles from Dothan's downtown business center. Established in 1965, this airport is available to Fort Rucker for training purposes and the general population. Atlantic Southeast Airlines is the only commercial airline flying out of Dothan Airport. It offers five flights daily to Atlanta. DRA's longest runway is 8,500 feet. This airport is entirely self-supporting, and receives no tax dollars for its operations (Dothan Regional Airport, no date).

The Port of Huntsville is an inland port that combines the Huntsville International Airport, the International Intermodal Center, and the Jetplex Industrial Park. The Port of Huntsville has an 18-county service region that extends through North Alabama and South Central Tennessee. It also has the distinction of being a Foreign Trade Zone (#83). Nine major commercial airlines offering more than 85 daily flights service the airport: American Airlines, American Eagle, Atlantic Southeast Airlines, Comair, Continental Express, Delta Air Lines, Northwest Airlink, and US Airways Express. Its longest runway is 10,006 feet (Port of Huntsville, 1999).

The Mobile Regional Airport (MRA) is located only minutes from downtown Mobile in southwestern Alabama. Six major airlines fly out of MRA: Atlantic Southeast Airlines, Continental Express, Delta Air Lines, Northwest Airlink, SkyWest, and US Airways. Providing international as well as domestic air travel, the Mobile Regional Airport connects to six major hubs in Atlanta, Dallas, Houston, Memphis, Orlando, and Charlotte (Mobile Regional Airport, 2004).

The Montgomery Regional Airport is located six miles southwest of Alabama's state capital. It has three major airlines: Atlantic Southeast Airlines/Delta, Northwest Airlink, and US Airways Express. There are two runways at Montgomery Regional, the longest of which is 9,010 feet. This airport is part of a foreign trade zone (Montgomery Airport Authority, 2003).

The Tuscaloosa Municipal Airport was dedicated in 1939; passenger service began in 1949. It has two runways, the longest of which is 6,499 feet (Economic Development Partnership of Alabama, 2004).

Alabama's rail transportation system provides the state with another important economic link. There are over 4,728 miles of rail track and 25 freight railroad companies running through 450 communities. Five of these companies are Class 1 railroads: *Burlington Northern Santa Fe*, *Canadian National/Illinois Central Railroad Company*, *CSX Transportation*, *Kansas City Southern Railway*, and *Norfolk Southern Corporation* (Economic Development Partnership of

Alabama, 2004). Five *Amtrak* stations (Mobile, Atmore, Montgomery, Tuscaloosa, Birmingham, and Anniston) provide the state with passenger rail service (Amtrak, 2004).

The Port of Mobile is Alabama's only deep-water port. Dedicated in 1928, this 4,000 acre district is the terminus of the 45-foot deep Mobile Ship Channel. It possesses 37 berths, 376 inland docks, and one of the deepest channels of any Gulf state. One hundred overseas shipping lines, 12 towing companies, 65 truck lines, and 5 major railroads service this international port. Notably, its docks handle more wood pulp than any other American facility. In addition to wood pulp, the port's primary import products in 2002 were: coal, aluminum, iron, steel, lumber, and chemicals. In that same year, this port exported coal, forest products, iron, steel, and chemicals. In all, the port handled 24.3 million short domestic tons in 2006; revenues for that year were $89.5 million (Alabama State Port Authority, 2006). The port's Terminal Railway, which connects to four mainline railroads, is the main artery for all of this activity. Currently, a $300 million program is underway to modernize the port (Economic Development Partnership of Alabama, 2004).

Extending for nearly 1,500 miles, the nation's second longest waterway system is found in Alabama. Six navigable waterways form this system: the Alabama-Coosa Waterway, Chattahoochee-Apalachicola Waterway, Tennessee Waterway, Warrior-Tombigbee Waterway, Tennessee-Tombigbee Waterway, and the Gulf Intracoastal Waterway (Economic Development Partnership of Alabama, 2004).

A wide range of audio-visual media are available throughout the state. These resources include: 49 newspapers; 94 radio stations (AM/FM) offering many listening options; and 31 television broadcast stations (10 in Birmingham, 3 in Dothan, 1 in Florence, 5 in Huntsville, 5 in Mobile, 4 in Montgomery, 1 in Sheffield, 1 in Troy, and 1 in Tuscaloosa).

Physical Infrastructure. Five electricity plants accounted for 79 percent of all utility sales in Alabama in 1999 (USDOE, EIA, 2003a). These five plants and their corresponding megawatt hours for all sectors were: Alabama Power Company (50,157,204); Tennessee Valley Authority (6,083,059); City of Huntsville (4,244,441); Decatur Utilities (1,523,766); and the City of Florence (1,131,276). Alagasco, Mobile Gas Company, Southeast Alabama Gas District, and Huntsville Utilities supply Alabama's natural gas; Huntsville Utilities and Tennessee Valley Authority provide its water and sewer services. BellSouth and Verizon are the state's primary telecommunications providers (Economic Development Partnership of Alabama, 2004).

Interaction of Biophysical and Built Environments. Of the 50 states and six U.S. territories, Alabama is among one of the most environmentally compromised. In 2001, it ranked eleventh of 56 (one = dirtiest). In that same year, Alabama ranked in the 85th percentile for total environmental releases (121,341,325 pounds), and in the 95th percentile for its cancer risk (air and water) (one=cleanest). Between 1988 and 2001, however, Alabama's total cancer risk scores have decreased 57 percent (Scorecard, 2003).

Of Alabama's total 2001 environmental releases (121,341,325), air releases accounted for 74,757,988 pounds, water releases totaled 4,713,394 pounds, and land releases equaled 41,777,031 pounds. Additionally, Alabama off-site transfers totaled 97,094,428 pounds in that year, while production related wastes equaled 1,326,601,714 pounds (Scorecard, 2003).

In 2001, Alabama's top 25 (of 100) releasing facilities, in terms of benzene-equivalent pounds, were: Alabama Power Company, Greene County Steam Plant (10,021,936); Alabama Power Company, Gaston Steam Plant (9,160,580); Kerr McGee Chemical LTD., Liability Corporation (8,113,412); U.S. TVA Colbert Fossil Plant (7,696,343); Chemical Waste Management (7,086,123); Southern Company, Barry Steam Plant (6,953,486); USS Fairfield

Works (6,800,740); US TVA Widows Creek Fossil Plant (6,168,865); Alabama Power Company, Gorgas Steam Plant (5,307,729); Acordis Cellulosic Fibers Incorporated (3,888,500); Wise Alloys L.L.C. Alloys Plant (3,312,318); Alabama Power Company, Miller Steam Plant (2,27275,105); Mead Coated Board Incorporated (2,772,319); Alabama River Pulp Company Incorporated (2,381,238); International Paper (2,042,798); International Paper, Courtland Mill (1,855,328); Solutia Incorporated, Decatur Alabama (1,835,984); Weyerhaeuser USA Incorporated, Pine Hill Operations (1,810,935); BP Amoco Chemicals (1,479,908); Bowater Newsprint, Coosa Pines Operations (1,444,135); JSC Brewton Incorporated (1,441,508); Fort James Operating Company (1,239,567); International Paper Riverdale Mill (1,184,161); Charles R. Lowman Power Plant (1,166,388); and CIBA Specialty Chemical Corporation (1,067,592) (Scorecard, 2003).

The top 10 chemical releases presenting a cancer risk to Alabama in 2001, with pounds in benzene-equivalents, included: arsenic (organic or inorganic) compounds (39,000,000); cadmium compounds (20,000,000); cadmium (15,000,000); chromium compounds (2,900,000); arsenic (2,100,000); acrylonitrile (1,300,000); lead compounds (860,000); chromium (570,000); lead (330,000); and benzene (190,000) (Scorecard, 2003).

C. HISTORY

Settlement. The Mississippian, or "temple mound," people resided in the Mississippi floodplain from about 850 A.D. until DeSoto's expeditions of 1539-1543 (Griffith, 1972). Remnants of their mounds are found in Mobile County (Rogers et al., 1994).

By the 17th century, four major Native American nations were living in present-day Alabama: Creek, Cherokee, Chickasaw, and Choctaw. The Creeks inhabited the majority of the state, living along the banks of the state's numerous creeks and rivers. The Cherokees also occupied a vast territory covering the mountainous regions of eastern Tennessee, northern Georgia, and northeastern Alabama. The agrarian Chickasaws' territory covered parts of Tennessee, Kentucky, Mississippi, and the northwest portion of Alabama. The Choctaws' territory primarily spanned central Mississippi, but also extended into southwestern Alabama. The historic Choctaws were primarily farmers, who grew beans, squash, melons, and corn; they also hunted, fished, and gathered wild plants (Rogers et al., 1994).

Under DeSoto's command during a 1540 expedition, the Spanish were among the very first Europeans to arrive in Alabama. The French arrived in 1699 under Iberville's and Bienville's command. Three years later, Bienville founded a settlement on Massacre Island. At this time, he also built the *Fort St. Louis de la Mobile* at the mouth of Dog River (the original site of Mobile). In 1711, Bienville established the site of present-day Mobile.

Relations between the Native Americans and European settlers remained relatively hospitable until the number of European settlers significantly increased in the early 1800s. At that time, the American efforts toward Indian removal gained more force. The Creeks and the Americans fought many battles before an 1814 peace treaty was signed. In 1817, the Alabama Territory was carved from Mississippi, with St. Stephens serving as the territory's seat (Griffith, 1972).

Industrialization. Plantation agriculture, particularly cotton, dominated Alabama's early economy. While farms far outnumbered plantations, plantations provided the social, economic, and political backbone of the state. The coke industry in northern Alabama and the timber industry in the south were also prosperous. Improved transportation facilitated commerce and

industry within the state. The Natchez Trace, the state's first federally funded road, was constructed in 1801. The steamboat's introduction in the early 1800s also greatly increased the state's ability to transport cotton. Alabama's first rail line, the *Tuscumbia Railway* opened in 1830 (Griffith, 1972).

In favor of slavery and against the Civil War, Alabama seceded from the U.S in January 1861. Two months later, in March, the state joined the Confederate States after Jefferson-Davis' inauguration as Confederate President. Although hard hit, Alabama "was spared many of the horrors of war" as no major land battles were fought on this soil (Griffith, 1972). Reconstruction was difficult for Alabama nevertheless, as soldiers returned home to destroyed fields, worthless currency, and a rogue state government. The Reconstruction Act of 1867 prevented much of Alabama's population from voting. Consequently, "the state government was handed over to carpetbaggers (individuals from outside the state, financially reduced by the war) and scalawags (destitute individuals) who added to the financial anxiety of the state" (Griffith 1972, 470).

State commerce and transportation both improved under the direction of Democrat Governor George Smith Houston in 1874. While only 743 miles of rail had been laid by 1869, Alabama had 3,422 miles of track by 1890, and 4,226 miles by 1900. In 1892, the state had 43 different lines, all of which eventually consolidated into two larger systems: the *Louisville and Nashville* running north to south, and the *Southern Railway*, expanding Alabama's connection to other states. The railroads also brought new growth to the state's cities and towns, especially Birmingham (Griffith, 1972).

Oil. Alabama was the first of the southeastern states to drill for petroleum. Following several geological publications about the Hatchetigbee Anticline in southern Choctaw County, Alabama emerged as a potential source of petroleum. Alabama's first well was drilled along this anticline in 1884 at Bladen Springs in Choctaw County. However, this well (Trowbridge No. 1) was dry (Alabama Oil and Gas Board, 2003).

In 1902, the New York-Alabama Oil Company drilled the first producing gas well in northern Alabama near Huntsville in Madison County at a depth of less than 300 feet. The Huntsville Gas Field was the first commercial gas well in the southeastern United States. In 1926, oil exploration activities began in earnest. Most drilling activity was initially undertaken by small promoters who relied on local money. By 1945, however, Alabama had 283 wells drilled, although only 15 of these produced oil and 40 produced gas (Hughes, 1993).

Since 1945, over 13,400 wells have been permitted in Alabama; with over 9,400 of these since 1980. The production of gas and liquid hydrocarbons has been particularly prominent in the state. In 1985, the state ranked 16th in the U.S. for such production, and, in 2000, ranked ninth in gas production and 15th in liquid hydrocarbon production (Alabama Oil and Gas Board, 2003).

Alabama's offshore production is also prolific, having produced over 200 billion cubic feet of gas; this amount is equal to roughly 53 percent of the state's total gas production (Alabama Oil and Gas Board, 2003). Offshore oil exploration began when the Gulf Refining Company drilled their first two exploratory wells in Mobile Bay in 1951 and 1952. However, because these wells were found dry at 10,000 and 11,000 feet, another test well was not drilled until 1978. In this year, Mobil Oil Corporation was permitted to drill a 21,500-foot test well at the mouth of the Mobile Bay in order to test potential reservoirs of Jurassic age. One year later, Mobil Oil Corporation's newly discovered Norphlet Formation was producing 12.2 million cubic feet of gas per day at 21,113 feet. Since 1978, 77 wells have been drilled off of Alabama's coast,

46 of which were drilled at the Norphlet Formation. A total of 37 Norphlet wells and 25 Miocene wells have been tested for gas (Alabama Oil and Gas Board, 2003).

The federal government began leasing large tracts off of the Alabama coastline during the 1980s. In March 1981, Alabama received $449 million dollars in bids for the rights to develop 13 offshore tracts. These tracts totaled 55,054 acres in size. In 1982, the U.S. government leased 17 tracts off of Alabama's coast with oil and gas rights for a sum of nearly $219 million. A year later, another federal lease sale of 13 tracts totaled nearly $41 million. In 1984, Alabama earned over $347 million from leases on 19 offshore tracts (Alabama Oil and Gas Board, 2003).

In 1982 and 1985, the Constitutional Amendment created two special trust funds (the Alabama Heritage Trust Fund and the Alabama Trust Fund) from income generated by the leasing of and production from Alabama's offshore tracts. These funds now total more than $2.2 billion (Alabama Oil and Gas Board, 2003).

Currently, 45 offshore platforms produce 203 billion cubic feet of gas each year. Each well produces up to 110 cubic feet per day, pushing Alabama into the list of the top 10 states in the nation for gas production (Alabama Oil and Gas Board, 2003).

D. DEMOGRAPHIC CHARACTERISTICS

Population Growth. Alabama had a year 2000 population of 4,447,100 persons; this figure reflects a population change of 10 percent from 1990. Growth in Alabama has been less rapid than in other southern states. Alabama's greatest growth occurred in 1970 when the population increased by 13 percent (Table 1) (U.S. Census Bureau, 2000b).

Table 1

Population Changes, Alabama State: 1920-2000

Year	Population	Change from Previous Census	Percent Change from Previous Census	Net Migration Since Previous Census
2000	4,447,100	406,513	10.1	209,792
1990	4,040,587	146,699	3.8	-89,120
1980	3,893,888	449,723	13.0	115,014
1970	3,444,165	177,425	5.4	-229,681
1960	3,266,740	204,997	6.7	-368,151
1950	3,061,743	228,782	8.1	-301,376
1940	2,832,961	186,713	7.0	-184,614
1930	2,646,248	298,074	12.7	-212,231
1920	2,348,174	--	--	-149,272

Source: U.S. Census Bureau, 2000b.

Ethnicity and Age. In 1880, the population of Alabama was nearly half white and half black (Berney, 1975). Since this time, the population has adjusted to the present distribution of 71 percent Caucasian and 26 percent African-American (Table 2) (U.S. Census Bureau, 2000b).

Table 2

Racial and Ethnic Populations, Alabama State: 2000

Race/Ethnicity	Population	Percent
White	3,162,808	71.1
African American	1,155,930	26.0
Hispanic*	75,830	1.7
American Indian	22,430	0.5
Asian	31,346	0.7
Pacific Islander	1,409	0.0
Other Race	28,998	0.7
Two or More Races	44,179	1.0

* Hispanics may be of any race.
Source: U.S. Census Bureau, 2000b.

In 2000, 25 percent of Alabama State residents were less than 18 years of age, and 13 percent were 65 years of age and older. The majority of residents—62 percent—were between 18 and 64. The median resident age was 35.8, which is slightly above the national median age of 35.3 (U.S. Census Bureau, 2000b).

E. ECONOMY

Income and Poverty. Compared to the United States as a whole, Alabama is a relatively impoverished state. In 1999, Alabama's median family income was $41,657 or 83 percent of the national median ($50,046). Also in 1999, 16 percent of all residents and 13 percent of all families in Alabama lived below the poverty threshold. In comparison, 12 percent of all individuals and 9 percent of families at the national level were living below the poverty threshold. Further, while single females with minor children headed 14 percent of all Alabama families, they comprised 48 percent of all families living in poverty. At the national level, however, this same population headed 12 percent of all families, and represented 44 percent of all families living in poverty. Despite this disparity, only 2 percent of Alabama households were receiving public assistance in 1999, compared to 3 percent at the national level (Table 3) (U.S. Census Bureau, 2000b).

Table 3

Income, Poverty and Family Structure, Alabama State: 1960-2000

Year	Median Family Income (2000 Constant $)	Change from Previous Census	Ratio to National Median	Persons in Poverty	Households Receiving Public Assistance*	Female-Headed Families with Children
2000	$41,657	45.0%	0.83	16.1%	2.2%	13.5%
1990	$28,688	4.7%	0.81	18.3%	8.7%	17.5%
1980	$27,392	19.7%	0.82	18.9%	--	--
1970	$22,868	48.0%	0.64	25.4%	--	--
1960	$15,449	--	0.69	--	--	--

* The 2000 Census enumerated "households" rather than "persons" receiving public assistance.
Source: U.S. Census Bureau, 2000b.

Employment. Over the last century, Alabama's economic base has shifted from primarily agriculture, forestry, and fishing to one largely reliant on its service and manufacturing sectors. In 2000, only 2 percent of the labor force remained employed in the agriculture, forestry, and fisheries sector. In comparison, services employed nearly 38 percent of the work force in 2000, with manufacturing employing slightly more than 18 percent (Table 4). In part, the increase in services employment reflects a growing number of hospitals and educational facilities in recent decades (U.S Census Bureau, 2000b).

In 2004, Alabama's 20 largest employers were: University of Alabama (Birmingham/10,000 employees), Auburn University (9,000 employees), Russell Corp. (Alexander City/8,000 employees), Mortgage Source (Alabaster/6,000 employees), UAB Healthfinder (Birmingham/5,520 employees), Alabama Power Company (Birmingham/5,000 employees), Huntsville Hospital (Huntsville/5,000 employees), Integrated Systems Management (Mobile/5,000 employees), Mobile Infirmary Medical Center (Mobile/4,500 employees), University of Alabama (Tuscaloosa/3,857 employees), General Motors Corp.(Tanner/3,200 employees), Blue Cross and Blue Shield (Birmingham/3,000 employees), Southeast Alabama Medical Center (Dothan/3,000 employees), Intergraph Computer Systems (Huntsville/3,000 employees), DCH Health System (Tuscaloosa/3,000 employees), Boeing (Huntsville/2,700 employees), Providence Hospital (Mobile/2,700 employees), American Cast Iron Pipe Company (Birmingham/2,500 employees), American Steel Pipe (Birmingham/2,500 employees) and Brookwood Medical Center (Birmingham/2,500 employees) (CareerOneStop, 2004).

As of 2005, there were seven Fortune 1,000 companies in the Alabama. The top five companies in that year were: Saks, Regions Financial, AmSouth Bancorp, Vulcan Materials, and Torchmark (Fortune 500, 2005).

Table 4

Employment in Major Industrial Sectors, Alabama State: 1990-2000

Year	Agric., Fishing & Forestry	Mining	Constr.	Manuf.	Trans., Comm. & Public Util.	Wholesale & Retail Trade	Finance, Insurance & Real Estate	Services	Public Admin.
Workers in Sector									
2000	29,266	8,044	145,809	352,566	101,588	303,797	110,743	726,707	98,915
1990	40,489	12,265	123,538	398,449	121,985	354,106	86,817	511,394	92,751
Percent of Workers in Sector									
2000	1.5%	0.4%	7.6%	18.4%	4.4%	15.8%	5.8%	37.8%	5.2%
1990	2.3%	0.7%	7.1%	22.8%	7.0%	20.3%	5.0%	29.3%	5.3%
Growth from Previous Census									
2000	-38.0%	-52.5%	18.0%	-13.0%	-20.0%	-16.6%	27.5%	42.1%	6.6%

Source: U.S. Census Bureau, 2000b.

Industry. As of 2000, Alabama's leading industry was services (Table 5). In 1999, workers' primarily derived their earnings from the service sector (24%) and secondarily from government employment (20%) and manufacturing of durable goods, lumber and wood products, and metal products (20%) (U.S. Department of Commerce, Bureau of Economic Analysis, 2000).

In June 1999, there were 1,419 banking and savings institutions in Alabama. These institutions had deposits totaling $52.7 billion. Expenditures in federal funds and grants in that same year totaled $26.7 billion (U.S. Census Bureau, 2002).

Table 5

Earnings in Major Industry Sectors and Selected Sub-sectors, Alabama State: 1990-1999

Industry	Earnings (Constant 2000 $1000's)		Share of Earnings	Change	Share of Change
	1990	1999	1999	1990-1999	1990-1999
Earnings	$45,311,126	$70,020,269	100.0%	$24,709,143	100.0%
Farm Earnings	$828,362	$1,295,174	1.8%	-$466,812	-1.8%
Ag. Services, Forestry, and Fishing	$232,256	$476,689	0.7%	-$244,433	-1.0%
Fishing	$17,231	$12,296	0.0%	$4,935	0.0%
Mining	$588,288	$655,024	0.9%	$66,736	0.3%
Oil and gas extraction	NA	$147,907	0.2%	NA	NA
Construction	$2,680,069	$4,500,190	6.4%	$1,820,121	7.4%
Special trade contractors	$1,453,194	$2,716,294	3.9%	$1,263,100	5.1%
Manufacturing	$10,499,548	$13,680,326	19.5%	$3,180,778	12.9%
Fabricated metal products	$671,845	$886,415	1.3%	$214,570	0.9%
Indust. machine & equip.	$849,002	$1,140,811	1.6%	$291,809	1.0%
Food and kindred	$688,597	$971,245	1.4%	$282,648	1.0%
Chemicals and allied	$547,439	$785,953	1.1%	$238,514	1.0%
Petroleum and coal	NA	$69,536	0.1%	NA	NA
Transportation and Public Utilities	$3,060,764	$4,533,166	6.5%	$1,472,402	6.0%
Trucking & warehousing	$845,523	$1,530,813	2.2%	$685,290	2.8%
Water transportation	NA	$74,205	0.1%	NA	NA
Transportation by air	$138,407	$274,290	0.4%	$135,883	0.5%
Wholesale Trade	$2,503,912	$4,060,560	5.8%	$1,556,648	6.3%
Retail Trade	$4,015,851	$6,474,470	9.2%	$2,458,610	10.0%
Eating & drinking places	$803,096	$1,463,442	2.1%	$660,346	2.8%
Finance, Insurance, and Real Estate	$2,046,921	$4,145,639	5.9%	$2,098,718	8.5%
Services	$8,948,184	$16,439,160	23.5%	$7,490,976	30.3%
Business services	$1,223,025	$3,091,849	4.4%	$1,868,824	7.6%
Health services	$3,299,567	$5,840,544	8.3%	$2,540,977	10.3%
Legal services	$662,139	$1,199,793	1.7%	$537,654	2.2%
Engineering and management services	$1,336,790	$2,237,206	3.2%	$900,416	3.6%
Government	$9,906,971	$13,759,871	19.7%	$3,852,900	15.6%

NA = Data not available.

Source: U.S. Department of Commerce, Bureau of Economic Analysis, 2000.

Marine-based Activities. In 1995, more red snapper was harvested in Alabama than in any other state. In that year, over 1.3 million pounds of red snapper was harvested, while 265,000 fish were caught and released. Other large harvests included 621,000 pounds of sand seatrout (151,000 releases), 706,000 pounds of sheepshead (22,000 releases), vermilion snapper (514,000 pounds) and Spanish mackerel (258,000 pounds) (Gulf States Marine Fisheries Commission, 1998).

With 500,000 acres of lakes and the largest river system in the United States, Alabama offers a year-round fishing season. Its close proximity to the Gulf of Mexico only enhances the state's desirability as a destination for sports and recreational fishermen.

Military Installations. There are three military bases in Alabama. These are Fort Rucker (Dale County), Maxwell-Gunter Air Force Base (Montgomery County), and Redstone Arsenal (Madison County).

Fort Rucker is located in the southeast corner of Alabama in Dale County. It lies 80 miles south of Montgomery and 20 miles northeast of Dothan (Global Security, 2002c). This 645,000-acre post was named in honor of Colonel Edmund W. Rucker, a Civil War Confederate officer. The Army Aviation Training Center at Fort Rucker serves as both a basic and advanced training camp for the U.S. Aviation Force. All Army Aviation flight training was consolidated at Fort Rucker in 1973. The Cairns Army Airfield, Hanchey Army Heliport, Hunt Army Heliport, Lowe Army Heliport, Knox Army Heliport, Shell Army Heliport, and 13 Fort Rucker stage fields service the Training Center (Global Security, 2002c).

In 2000, Fort Rucker had a daytime resident population of approximately 14,000 persons (5,100 service members, 6,400 civilian and contract employees, 3,200 military family members). Additionally, Fort Rucker is home to approximately 14,500 retirees (Global Security, 2002c).

Located in Montgomery, Maxwell Air Force Base and Gunter Annex are home to the Air University. The primary mission of the Air University is to provide professional military education and to train "airmen on the capabilities of air and space power and its role in national security" (Global Security, 2002f). The Base and Annex also host the 42nd Air Base Wing, the 908th Airlift Wing, and many other ancillary organizations. The 42nd Air Base Wing provides the infrastructure and logistical support for the Air University's training operations. The 908th Airlift Wing recruits, organizes and prepares Air Force reservists for active duty. The majority of the University's programs are at Maxwell AFB in Montgomery, Alabama. It also has an annex at the Wright-Patterson AFB in Ohio (Global Security, 2002f).

The population of the Maxwell-Gunter AFB approximates 15,000 persons. This count includes the Air University, the 42nd Air Base Wing, and civilian and contract employees. The total military population is more than 25,500, with military retirees adding another 9,000 plus. The bases provide the community with approximately 7,155 secondary jobs (Global Security, 2002f).

Redstone Arsenal is located in north central Alabama near Huntsville. This 40,000 acre facility has been the Army's center for missile and rocket programs since the early 1960s. In 1941, Redstone Arsenal served as a chemical warfare manufacturing and storage facility. Today, its primary mission is to research, develop, test, purchase, repair, and maintain missiles and other high technology military weapons. In 1997, the US Army Missile Command at Redstone Arsenal merged with the US Army Aviation and Missile Command (AMCOM). In 2000, Redstone Arsenal had a population of approximately 17,000 government and contract workers.

Recreation and Tourism. There are eight national and 24 state parks in Alabama. The National Parks are: Horseshoe Bend National Military Park, Little River Canyon National

Preserve, Natchez Trace Parkway, Russell Cave National Monument, Selma to Montgomery National Historic Trail, Trail of Tears National Historic Trail, Tuskegee Airmen National Historic Site, and the Tuskegee Institute National Historic Site (HM USA Travel and Tourism Guide, 2004).

Alabama is a popular destination for golfers. Alabama's golf vacations have been rated as among the best in the world by Golf Digest (Alabama Bureau of Travel and Tourism, 2004). Other tourist activities include fishing, hunting, biking, canoeing, boating, sailing, water skiing, diving, snorkeling, camping, rock climbing, wildlife watching, and birding. Popular attractions include the Birmingham Zoo, the U.S. Space and Rocket Center, Adventure Island, Adventureland Theme Park, the AL Holmes Wildlife Museum, the Alabama Civil Rights Freedom Farm Museum, Alabama Constitution Village, the Alabama Jazz Hall of Fame, the Alabama River Heritage Museum, the Alabama War Memorial and Wall of Honor, The American Village (Alabama's attraction of the year), and numerous others (Alabama Bureau of Tourism and Travel 2004). Additionally, Mobile is home to the country's oldest Mardi Gras celebration (Economic Development Partnership of Alabama, 2004). Other popular festivals include the National Shrimp Festival (Gulf Shores), the Alabama Blueberry Festival (Brewton), the Tale Tellin' Festival (Selma), and the Azalea Train Festival (Mobile) (Economic Development Partnership of Alabama, 2004).

In 1999, travel expenditures in Alabama totaled over $5 billion dollars; expenditures increased to nearly $6 billion dollars in 2000. In 2002, 18 million visitors to Alabama spent over $6.5 billion dollars, a 7 percent increase from 2001. Also in 2002, travel industry expenditures constituted roughly 3 percent of the gross state product, and created nearly 140,000 direct and indirect jobs. In total, the economic impact of tourism and travel in Alabama topped $3 billion dollars, while state and local tax revenues approached $417 million. Baldwin County has the largest travel-related earnings in the state (Alabama Travel Industry, 2003).

F. LOCAL GOVERMENT

Governmental Structure. The State of Alabama has a tripartite governmental structure with Executive, Judicial and Legislative branches. It is governed according to the articles of its State Constitution. The governor, who is elected to a four-year term, is the state's chief executive. Two successive terms may also be served, subject to re-election. Other elected executive positions include: Lieutenant Governor, Secretary of State, Treasurer, Attorney General, Commissioner of Agriculture and Commerce, and the Commissioner of Insurance.

Revenues and Taxation. Alabama imposes a statewide tax of 6.5 mills. Alabama's property taxes are among the lowest in the United States (Economic Development Partnership of Alabama, 2004). As per the Alabama State laws and constitution, homesteads are exempt from all state ad valorem taxes. However, certain restrictions apply depending on age, assessed value of property, and gross adjusted income (Alabama Department of Revenue, 2003).

Alabama state tax revenues for the 2002-03 fiscal year totaled $6.1 billion dollars; up from $6.0 billion (0.9%) in the 2001-02 fiscal year. Net taxable assessed valuation for all counties, combined, totaled $35.5 billion dollars in 2002. Property tax collections for this year totaled $1.75 billion dollars and derive from the following sources: $233 million, state net taxes; $470 million, county net taxes; $676 million, school net taxes; and $371 municipal net taxes. Total income tax collections (individual and corporate) equaled $2.7 billion; refunds amounted to $438 million dollars. State sales tax collections summed to $1.5 billion dollars; state use tax

collections were $174 million dollars, and state lodgings tax totaled $31 million dollars (Alabama Department of Revenue, 2003).

G. SOCIAL CONTEXT

Education. As of 2000, there were 128 school districts in Alabama, with 1,367 public schools: 700 elementary, 235 middle schools, 269 high schools, and 157 combination schools. There were also 601 private schools (390 K-8 and 211 high schools). There were no charter schools. A total of 729,988 students attended those public schools, served by 46,929 faculty members, in the 1999-2000 school year. In that same year, per student expenditures totaled $5,188 (U.S. Department of Education, 2002a). In 2001, the average teacher salary in Alabama equaled $37,206 or 84 percent of the national average of $44,327 (Education America.Net, 2003).

Alabama's indicators of educational health are mostly promising. For example, in the 1999-2000 school year, 82 percent of all fourth graders were reading above the basic level, while 85 percent were performing above the basic level in mathematics. Also in this school year, 64 percent of all middle school students in the state were reading at a proficient level or higher, while 72 percent were at least proficient in mathematics. Additionally, Alabama's high school dropout rate of 4 percent was lower than the national rate of 5 percent. In that same year, however, only 64 percent of Alabama high school graduates enrolled in college compared to 73 percent at the national level. While the percentage of high school graduates in the State of Alabama was above par relative to the nation, the percentage of four-year college graduates in Alabama is substantially below national levels (Table 6) (U.S. Department of Education, 2002a).

In 2000, there were 61 institutions of higher education spread out across the State of Alabama. Of these, 16 were public four-year universities, 28 were public two-year universities, 16 were private four-year colleges, and one was a private two-year college (Alabama Commission on Higher Education, no date).

Table 6

Educational Attainment of Adults (age 25+), Alabama State: 1990-2000

Year	Educational Attainment of Adults					Ratio to Nation	
	0-8 Years	Some High School	High School Diploma	Some College, No Degree	BA/BS or More	High School Diploma	BA/BS or More
2000	8.3%	16.4%	30.4%	20.5%	19.0%	1.06	0.77
1990	13.7%	19.4%	29.4%	16.7%	15.7%	0.82	0.64

Source: U.S. Census Bureau, 2000b.

Health and Welfare. The availability of healthcare in Alabama exceeds the national average. In 2001, there were 107 county hospitals and 218 nursing homes in Alabama. These institutions averaged 3.2 hospital beds per 1,000 population (American Hospital Association, 2003). Alabama ranks 12th among U.S. states in terms of available hospital beds (one being the hospital with the highest number of beds per 1,000 population); the national average is 2.9. There are also 84 federally qualified health centers and 60 rural health clinics in the state. In that

year, the health care industry employed 8 percent of Alabama's workforce, compared to 7 percent nationally (Kaiser Family Foundation, 2003).

Although welfare reform has reduced the number of children receiving welfare in Alabama in recent years, 24 percent of children less than 18 years old, and 28 percent less than five years old still were living below the poverty threshold in 2000[1]. However, the poverty burden is disproportionately borne by African-American children. African-American children comprised 22 percent of Alabama's total child population in 2000, but accounted for 79 percent of child welfare recipients in that year. In comparison, Caucasian children comprised 65 percent of Alabama's child population, but accounted for only 22 percent of child welfare recipients. Additionally, 14 percent of Alabama families in 2000 also were receiving food stamps. These statistics suggest that while welfare reform has reduced the number of families receiving welfare, their conditions of poverty have not been significantly improved (Alabama Welfare Report, 2000).

Other aspects of Alabama's child welfare are also in need of improvement. In 2000, 10 percent of babies born in Alabama were low birth-weight, compared to almost 8 percent at the national level. Infant mortality in this year was also higher in Alabama (nine per 1,000 live births) than at the national level (seven per 1,000 births) (Alabama State Data Center, 2000). The rate of births to teenage mother is also higher in Alabama (15%) than at the national level (11%). For example, in 2001, 60,454 babies were born in Alabama. Of those births, 8,820 were to teenage mothers (51% Caucasian, 44 % African-American, 4% Hispanic, and >1% "other") (Kaiser Family Foundation, 2003).

Religion. In 2000, 55 percent of Alabama State residents claimed a religious affiliation. Of these respondents, 42 percent identified as Evangelical Protestant, 9 percent as Mainline Protestant, 3 percent as Catholic, and 1 percent as "other". Forty-five percent of residents did not claim a religious affiliation in that year (American Religion Data Archive, 2002).

H. ISSUES OF CONCERN

Despite the significant revenues oil production provides to the state's coffers, Alabama's economic development, on the whole, is troubled. Alabama residents suffer lower than average income levels and higher than average poverty and unemployment rates. For example, in 2000, the median family income in the State of Alabama ($41,657) was only 83 percent of the national median ($50,046). Additionally, 16 percent of residents in Alabama were living below the poverty threshold; this rate is 4 percent above the national rate of 12 percent. In 2000, only 59.7 percent of adults 16 and older were part of the state's civilian labor force, compared to 63.9 percent at the national level. Unemployment rates are also higher in Alabama (6.2%) than for the nation as a whole (5.8%). In part, Alabama's unemployment and poverty woes are linked to its general lack of higher-skilled workers with advanced degrees. While the percentage of high school graduates residing in Alabama increased significantly between 1990 and 2000, only 19 percent of residents possessed a BA/BS degree or higher, which is only 0.77 percent of the national rate (24.4%). Indeed, unable to fill their demand for skilled labor at the local level, Singapore Technologies Aerospace, a parent company of Mobile Aerospace Engineering, subsequently relocated their operations outside of Mobile in 2000.

[1] In 2000, children less than 18 years of age accounted for 25 percent (1,123,422) of Alabama's total population (4,447,100).

I. MOBILE, ALABAMA: LABOR MARKET AREA

Introduction. The purpose of this project is to understand how structural changes in industry, particularly oil and gas related industries, impact local communities and public institutions within the Gulf of Mexico Region (GOMR). The task at hand requires that we utilize a variety of data sources and methodologies to provide a more complete narrative of the phenomenon in question. We also utilize a rather unique definition of local communities: Labor Market Areas. Labor Market Areas (LMAs) are defined by patterns of transportation to and from work both within and across county boundaries. Therefore, the areas contained within LMAs better empirically represent local social systems, communities, and economies (Killian and Tolbert, 1993).

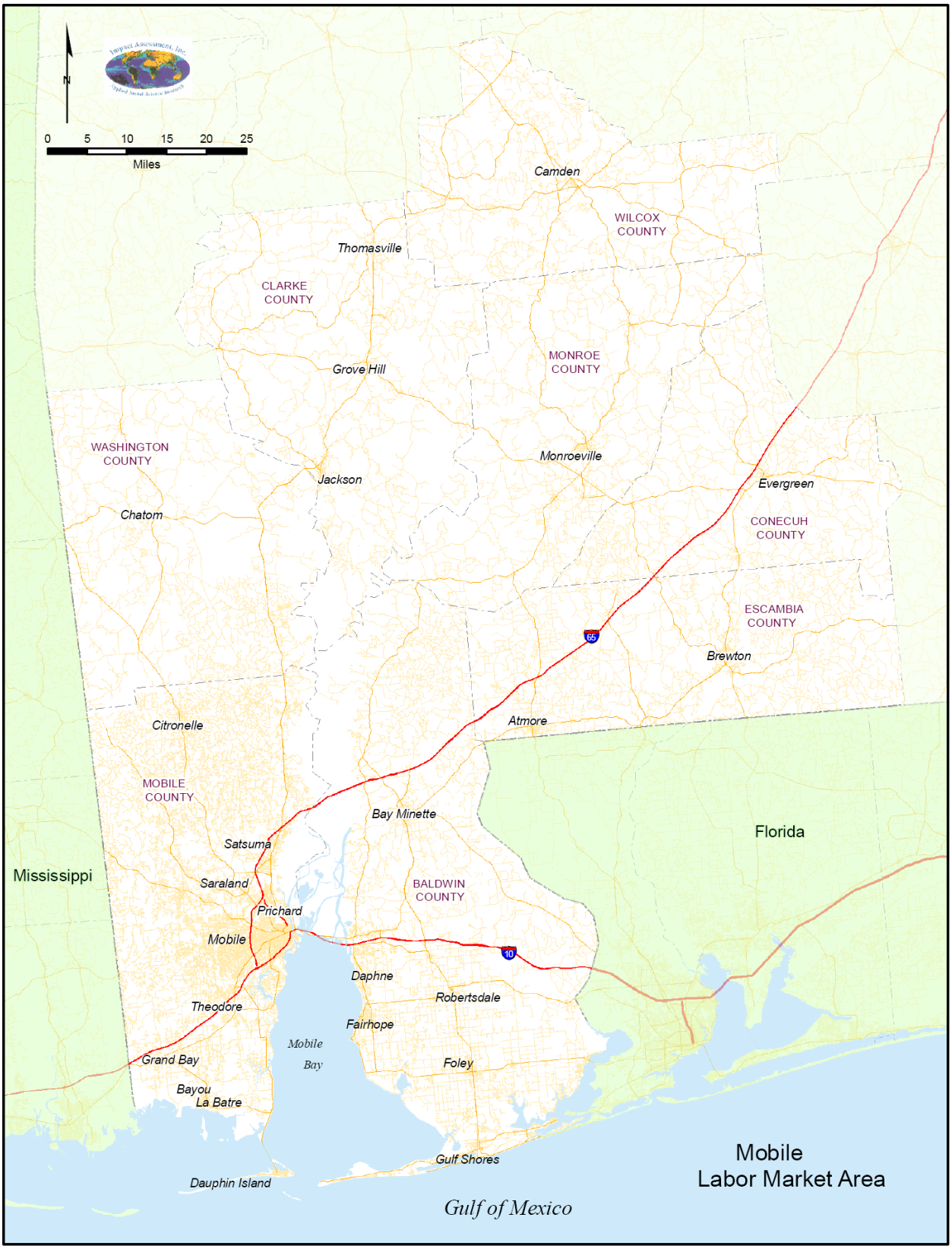
The greater Mobile LMA is located along the Gulf of Mexico and is centered between two major ports along the Gulf of Mexico: New Orleans and Mobile. It is made up of eight Alabama counties: Baldwin, Clarke, Conecuh, Escambia, Mobile, Monroe, Washington, and Wilcox (Map 14). In 2000, these eight counties had a combined population of 675,250 persons (U.S. Census Bureau, 2000b).

At the heart of this analysis are changes in the industries related to offshore oil and gas exploration and production, particularly the boom and bust periods of the 1970s and 1980s. In the profile that follows, we first present an overview of the significance of the project, followed by a theoretical framework with which to examine the interconnection between industry and local community structural changes.

The analysis itself is divided into three units of time: 1940-1970, 1970-1990, and 1990-2000. The first unit of time presents a brief industry history of the Mobile LMA from 1940 to 1970, followed by a minimalist overview of population changes. In the second unit, we examine all oil and gas and related industries within the LMA for the years between 1970 and 1990, inclusive. We then link industry changes during this period to fluctuations in population structure and dynamics, education, and local government finance. The third unit examines the period between 1990 and 2000 to assess the fallout of the oil and gas industry during the decade immediately following the bust.

Industry Overview. The oil and natural gas industry experienced a boom during the 1970s (Gramling, 1996; Seydlitz and Laska, 1994). Rising demands for on-shore domestic supplies of oil, and political instability surrounding OPEC and the Middle East increased offshore oil and natural gas exploration activities in the Gulf of Mexico (Gramling, 1996; Gramling and Freudenburg, 1990). The subsequent "boom" is reflected in the LMA employment data. For example, in 1970, approximately 71,000 workers were directly employed full-time in the oil and natural gas industry in the coastal economies of the Gulf of Mexico. By 1980, that number had grown to over 145,000, a net increase of 105 percent—and those numbers do not reflect changes in oil and gas multiplier industries such as equipment manufacturing, water transportation, wholesale trade, and general services.

During the early 1980s, however consumption trends began to change and affect employment. First, a gradual drop in demand occurred as substitution effects played-out, with actors reducing their consumption of oil and gas by-products (e.g., buying more fuel efficient cars; see Gramling, 1996). Additionally, the oil and natural gas industries experienced a sharp decline in the mid 1980s brought about largely by overproduction among OPEC members trying to "starve" weapon shipments into warring Iran and Iraq (Heilbroner and Milberg, 1999).



Map 14. Mobile, Alabama Labor Market Area.

Between 1980 and 1990, the total number of workers in the oil and natural gas industries in the coastal economies of the Gulf of Mexico declined from over 145,000 to 112,000, a decrease of 23 percent. Figure 1 presents the "boom and bust" data as reflected in the price of oil.

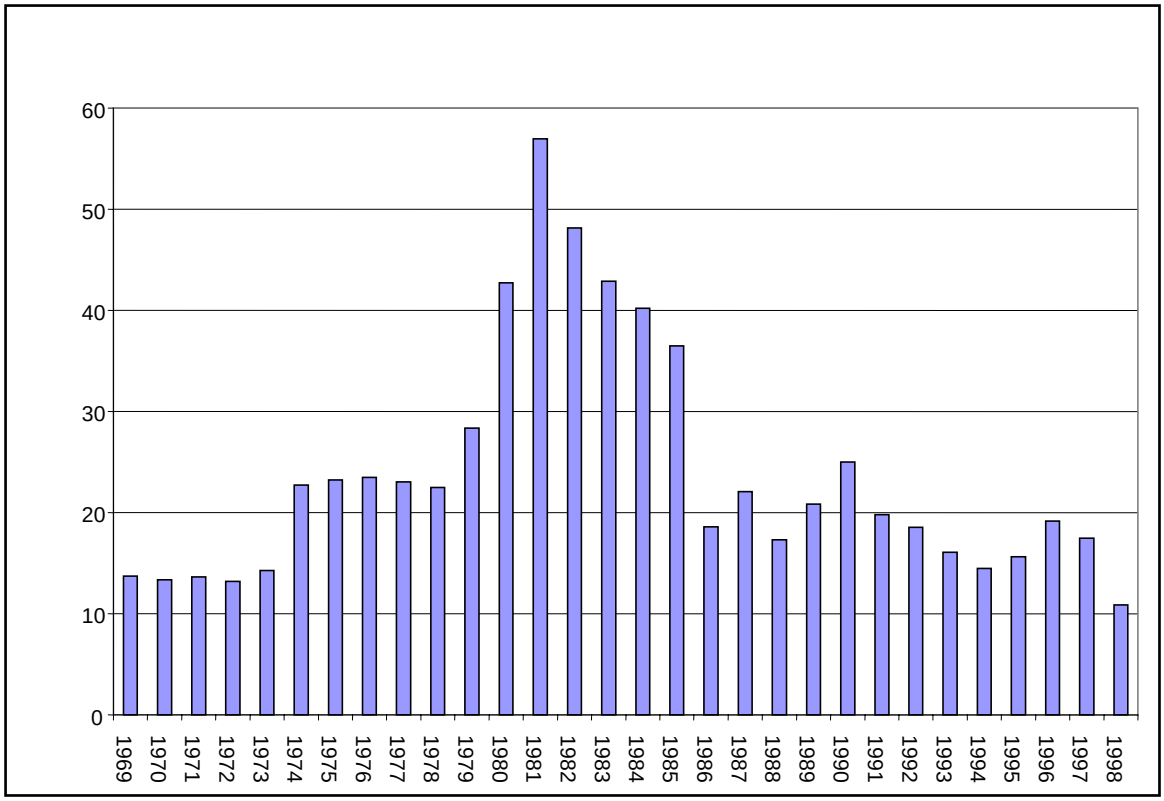


Figure 1. Crude Oil Prices, U.S. Average: 1969-1998 (Energy Statistics Sourcebook, 1999).

The coastal economies of some oil dependent LMAs in the Gulf of Mexico were more severely impacted by the oil bust than others. For example, the Lafayette LA economy lost 14,000 jobs in the oil and natural gas extraction industries between 1982 and 1988, a 63 percent loss. Other industries throughout the greater Lafayette area were affected as well, with total employment dropping from 200,000 workers in 1982 to 160,000 workers in 1987.[2] These losses translated into an unemployment rate of more than 16 percent in 1988. However, the Lafayette area was not the hardest hit by the oil bust; unemployment rates exceeded 20 percent in some other coastal communities (Gramling, 1996).

Sociology of Regional Processes. To understand how industries, public institutions, and communities change in response to fluctuations in the oil and gas industries, we draw upon the assumptions of human ecology theory. One of these assumptions is that the range and diversity of community industry functions are important determinants of community size, complexity and organization (see Frisbie and Poston, 1976; Hawley, 1986; Mencken, 1997; Murdock et al.,

[2] Source: U.S. Department of Commerce's Regional Economic Information System of the Bureau of Economic Analysis.

1993; Nord and Luloff, 1993; Poston, 1984; Frisbie and Poston, 1978). Communities also can be placed along a continuum of industry structures, from less to more diverse. Generalist communities (those with a variety of industries) and specialist communities (those with one or two main industries) both have advantages and disadvantages for growth and social organization at the local level (Poston, 1984).

Generalist communities are larger in size and more complex in structure. Fluctuations in one industry do not reverberate throughout the entire system so long as the other industries upon which the community depends for employment are independent of those shocks and remain relatively stable. As a result, generalist systems tend to be more stable over time. This longitudinal stability is important for local public institutions, such as schools and financing of local government services, because it allows administrators to plan for incremental changes in the supply of revenues and the demand for resources. Generalist systems can also support more stable population growth patterns (Frisbie and Poston, 1976, 1978; Micklin and Choldin, 1984; Poston, 1984).

Specialist communities, on the other hand, are primarily dependent upon one or two industries for subsistence. Communities that rely upon natural resource-based industries, such as coal, oil/gas, timber, or fishing, are specialist communities (Gramling and Freudenburg, 1990; Hawley, 1986; Rural Sociological Society Task Force, 1993).

A second assumption of human ecology theory is that significant industry contraction (and expansion) will alter drastically the social organization of the community (England and Albrecht, 1984; Jobes, 1999; Krannich and Grieder, 1984). During industry contraction, jobs are lost, and an out-migration of younger population typically results (RSS, 1993). The negative effects of these cycles, particularly in rural America, manifest in social disorganization, higher crime rates and other social problems (Freudenburg and Jones, 1991; Jobes, 1999).

Third, the human ecological approach assumes that local communities are ecosystems comprised of four basic and interdependent components: population, organization, environment, and technology (Hawley, 1986; Poston, 1984; Micklin and Choldin, 1984). This approach further assumes that changes in one of these four components will create changes throughout the community. For example, changes in the external environment (e.g., oil prices dropping significantly) will affect changes in the other components of the community (jobs and population) that rely upon the oil and gas industry for employment (Gramling, 1996). Additionally, changes in the technology used in the production of sustenance (e.g., mechanization of coal extraction) will affect the population and organization of the ecosystem (loss of jobs and out-migration), independent of any changes in the external environment. Not surprisingly then, economies that were most involved in the exploration and production of oil and natural gas in the Gulf of Mexico region were also most affected by changes in the oil and gas industry. Those communities that are more concentrated in multiplier industries will also be affected, but not as directly.

First Unit of Analysis: Mobile LMA Employment, 1940-1970. Much like the Beaumont LMA in Texas, the Mobile LMA economy is heavily concentrated in manufacturing employment, while mining employment is minimal. The data show that, between 1940 and 1970, the major connection between the Mobile LMA and the oil and gas industry was indirect, or upstream, through manufacturing. Prior to 1973, manufacturing employment provided much grater stability than oil and gas work.

Between 1940 and 1970, total employment in the Mobile LMA grew by 83 percent. The service industry dominated that growth (Figure 2). In 1940, however, the agricultural sector was the LMA's primary employer, employing nearly one-third of Mobile's entire workforce.

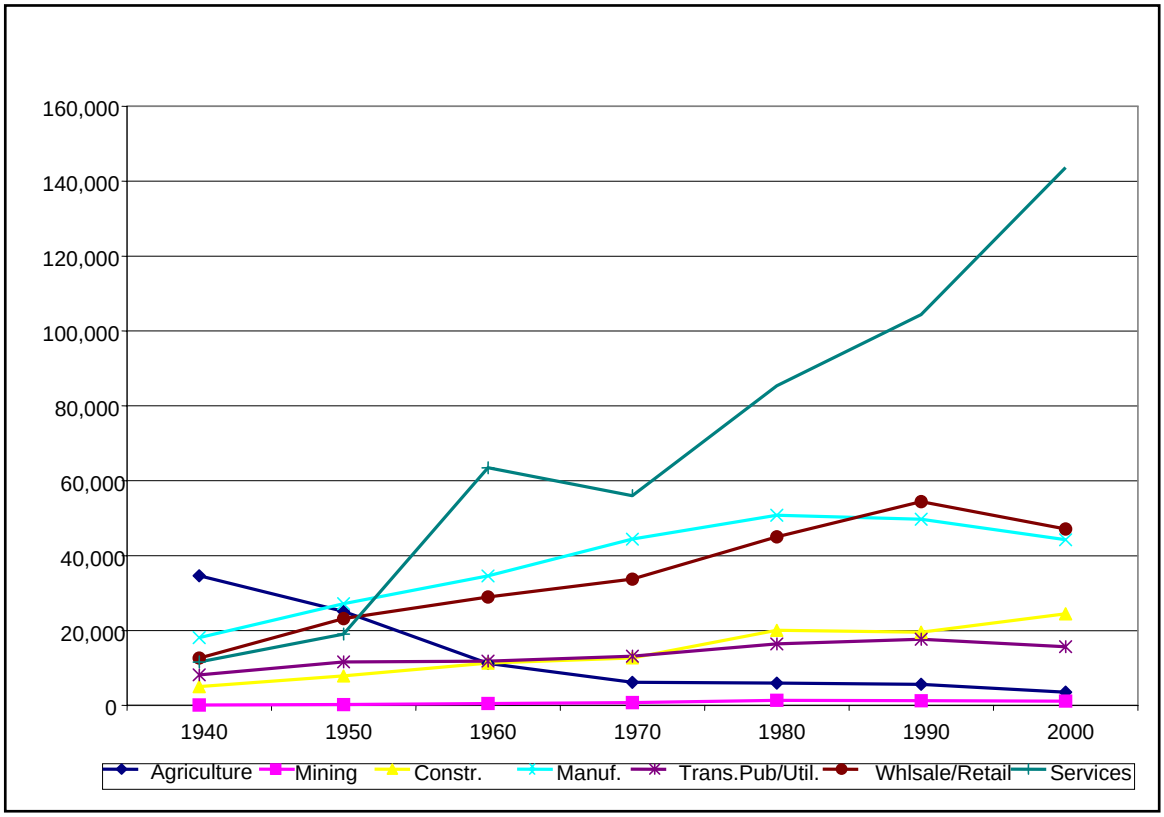


Figure 2. Major Industry Employment, Mobile LMA: 1940-2000 (U.S. Census Bureau, 2000b).

Manufacturing was the second largest industry, employing over 18,000 workers and almost 20 percent of the workforce. Mining, a key oil and gas related industry, employed less than 200 workers, or 1 percent of the workforce, throughout the Mobile LMA.

Growth continued throughout the 1940s in the Mobile LMA. Between 1940 and 1950, total employment grew by 26 percent, adding 24,000 jobs. With the exception of agriculture (-27%), employment growth rates were high in all sectors. Employment growth was strongest in services and wholesale/retail trade, where over 20,000 jobs were added. Manufacturing employment grew by over 50 percent, adding almost 9,000 jobs.

Industry expansion continued throughout the 1950s. During that decade, total employment grew 41 percent. Services led all sectors with a skyrocketing 233 percent growth rate. Construction employment grew by 42 percent, adding 4,000 new construction jobs. By 1960, services employed 38 percent of the total workforce and manufacturing employed 21 percent. However, agricultural employment continued a downward trend, declining by 55 percent. Mining employment remained steady at less than 1 percent.

The employment boom in the Mobile LMA slowed dramatically between 1960 and 1970. In that decade, total employment in the Mobile LMA grew by only 3 percent. Moreover, one of its most dynamic industries—services—began to contract. The already diminishing agriculture

industry declined even further by 45 percent. Despite these negative growth trends, manufacturing employment increased by 26 percent, adding 10,000 new jobs between 1960 and 1970. By 1970, manufacturing employed 26 percent of the labor force, while services employment dropped to 33 percent. And, although the mining industry experienced a 633 percent growth rate between 1940 and 1970, it still employed less than 1 percent of the total Mobile LMA workforce.

Mobile LMA Demographic Changes: 1940-1970. In 1940, 330,026 people lived in the Mobile LMA. By 1970, the population had grown by 51% to 507,392.

Second Unit of Analysis: Mobile LMA Employment, 1970-1990. Total employment in the Mobile LMA increased throughout most of the 1970s, 1980s, and 1990s. Moreover, there were no appreciable downturns in total employment during that time (Figure 3).

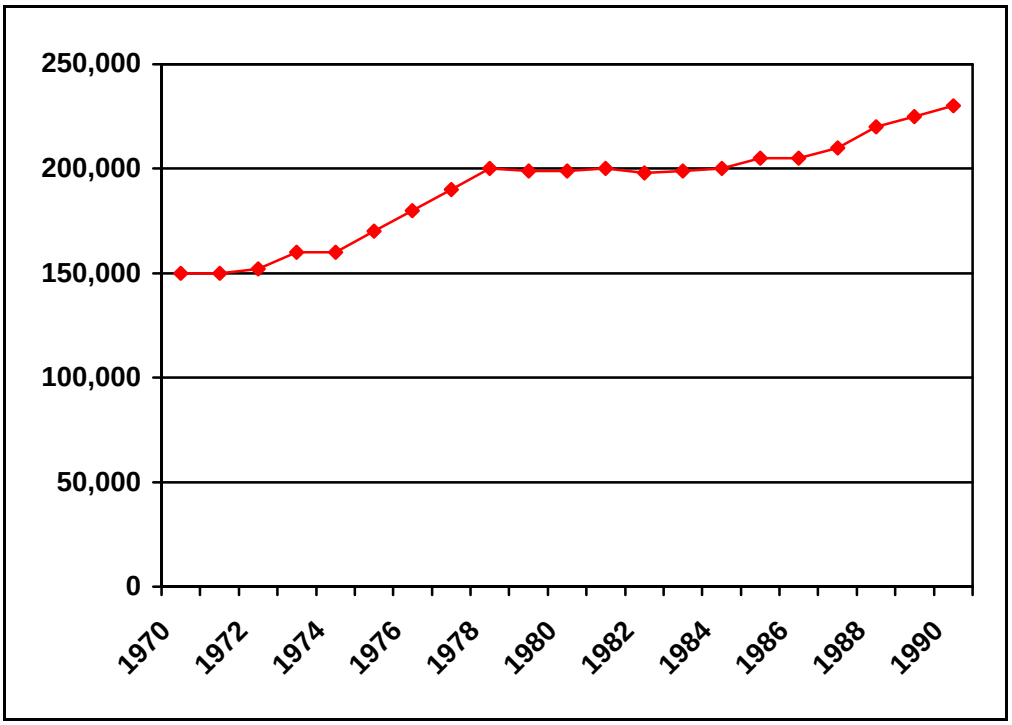


Figure 3. Total Annual Employment, Mobile LMA: 1970-1990 (U.S. Dept. of Commerce, Bureau of Economic Analysis, 2000).

During the 1970s, each industry sector within the Mobile LMA reflected positive growth (except for agriculture). Growth was strongest in services (52%) and construction (59%). Manufacturing employment grew by 14 percent, employing over 50,000 workers by 1980. And, while mining experienced an 80 percent growth during the 1970s, it still employed less than 1 percent of the Mobile LMA workforce.

While employment beginning to plateau in the late 1970s, it demonstrated a renewed trend of steady growth during the 1980s. Between 1980 and 1990, employment in the Mobile LMA increased 35 percent. Nonetheless, there were losses in several sectors. Services grew by 22 percent, and accounted for 40 percent of all employment. At the same time, manufacturing (-2%), mining (-7%), construction (-2%), and agriculture (-5%) all suffered losses. Still, the overall losses were not comparable to the employment losses suffered in other Gulf of Mexico LMAs.

Mobile LMA Demographic Changes: 1970-1990. In 1970, 507,392 people lived in the Mobile LMA. By 1990, the population had grown by 20%, increasing to 607,965.

Third Unit of Analysis: Mobile LMA Employment, 1990-2000. The 1990s were a period of economic growth in the Mobile LMA, with employment growing by 10 percent. Services led this growth, experiencing a 38 percent increase. However, manufacturing lost 5,000 jobs. The employment growth is reflected in the population growth, which was 11 percent for the entire LMA. This growth rate is on par with the national growth rate, but is only half of the population growth experienced in the adjacent Biloxi LMA in Mississippi. It is likely that the loss of manufacturing jobs kept growth rates from exceeding national growth rates during the 1990s.

Mobile LMA Demographic Changes: 1970-1990. In 1990, 607,965 people lived in the Mobile LMA. By 2000, the population had grown by 11%, increasing to 675,250.

Forecasting Analysis. Between 1970 and 1990, the Mobile LMA economy transformed from one that was primarily manufacturing-oriented to one that was service-based. However, the Census data for this period do not tell a complete story of the changes that occurred in the Mobile LMA over this time period. We now turn to an analysis of annual employment data for the Mobile LMA in order to better understand the changes that occurred between Census years.

In order to establish when, or if, unexpected changes in employment occurred in the Mobile LMA, we performed a time-series forecasting analysis. In our analysis, we employ a moving average forecasting model to locate the years that the shocks occur in the Mobile LMA. The forecasting procedure includes the following. First, three-year employment moving averages (current plus previous two years) of employment levels are computed. Second, at each year the expected value (three-year moving average) is subtracted from the observed value. Each of these deviations is squared to provide the forecasting error for each year. These squared deviations are summed and averaged across all years in the analysis to compute a mean squared error (MSE). We then establish a "shock" for any given year in which the squared deviation for that year is greater than or equal to two times the mean squared error for the industry sector in question (Anderson et al., 1990).

The results of this effort are reported in Figures 4 and 5. The data in Figure 4 show the actual employment data charted with the three-year employment moving average for each year. Figure 5 documents forecasting errors, which occur when the observed employment number in a given year substantially exceeds the expected employment number in that year (based on a three-year moving average). This data highlights the forecasting errors for four years: 1977, 1978, 1993, and 1998. The data from Figure 4 illustrate significantly greater employment was observed in these four years than was expected as based on the forecasting analysis. Furthermore, we find no statistically significant declines in employment for any year between 1969 and 2000.

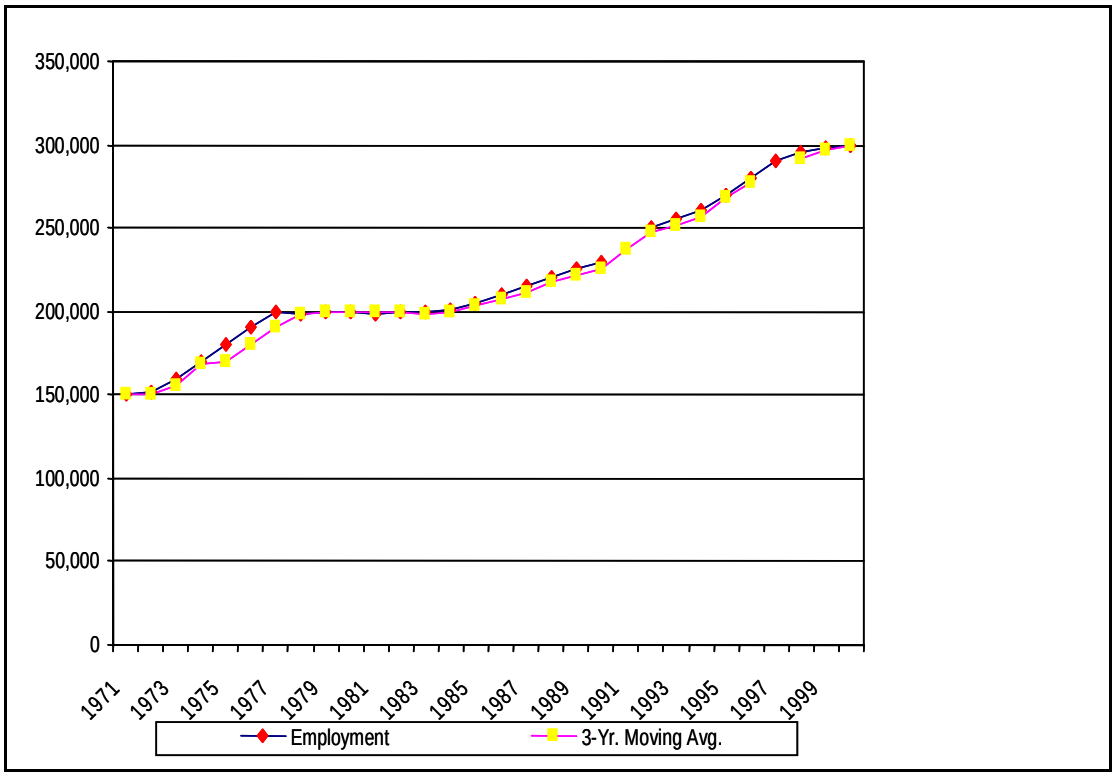


Figure 4. Total Annual Employment and Three-year Moving Averages, Mobile LMA: 1971-2000 (U.S. Dept. of Commerce, Bureau of Economic Analysis, 2000).

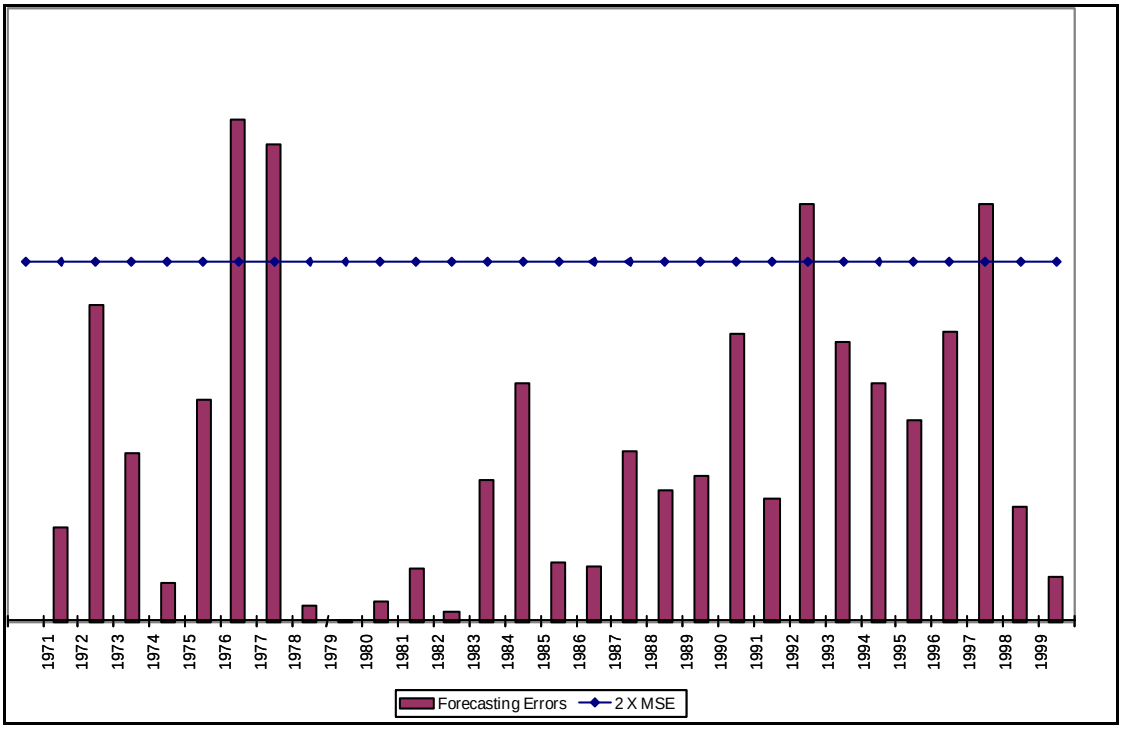


Figure 5. Forecasting Analysis for Employment, Mobile LMA: 1971-1999.

Figure 6 shows annual employment data for nine general industry categories from 1969 to 2000. These data will show the years and specific industries in which employment declined. While the total employment analysis shows no significant downturn, the Census data show four industry sectors that lost employment during the 1980s. One of those industries was manufacturing, a key employer in the Mobile LMA. Manufacturing lost 6,000 jobs between 1982 and 1984.

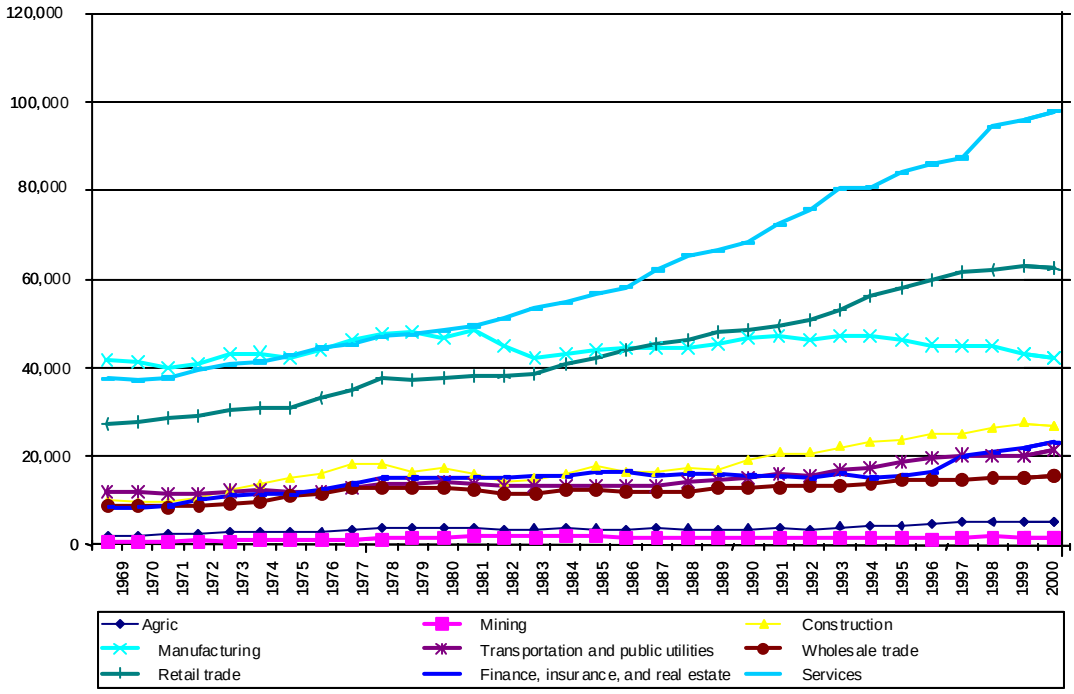


Figure 6. Employment Growth by Industry, Mobile LMA: 1969-2000.

Figures 7 and 8 display the forecasting analyses for manufacturing employment between 1971 and 1999. These data identify 1973, 1977, 1978, 1982, and 1983 as important transitional years. As evident in Figure 8, the 1970s were a period of exceptional growth in manufacturing employment in the Mobile LMA. However, manufacturing also experienced significant declines in the 1980s. Manufacturing lost 12.5 percent of jobs in the Mobile LMA between 1981 and 1983, which is a greater loss the forecasting analysis would expect. Because the level of employment in the mining sector was continually low (less than 1%), the impact on the Mobile LMA's overall performance was negligible.

The annual Census data indicate the Mobile LMA was oriented toward manufacturing employment for most years prior to and including 1982. Manufacturing was a key performing industry, generating over 8,000 new jobs in the Mobile LMA between 1971 and 1983. However, manufacturing employment also experienced a sharp downturn in 1983 and did not rebound to previous levels of employment through 1999. Overall, though, total employment levels did not drop significantly during the same period. This is most likely because employment losses in the manufacturing sector were offset by employment gains in services and wholesale/retail trade. However, it may be that the timing of the manufacturing losses in the Mobile LMA was linked to the oil and gas industry.

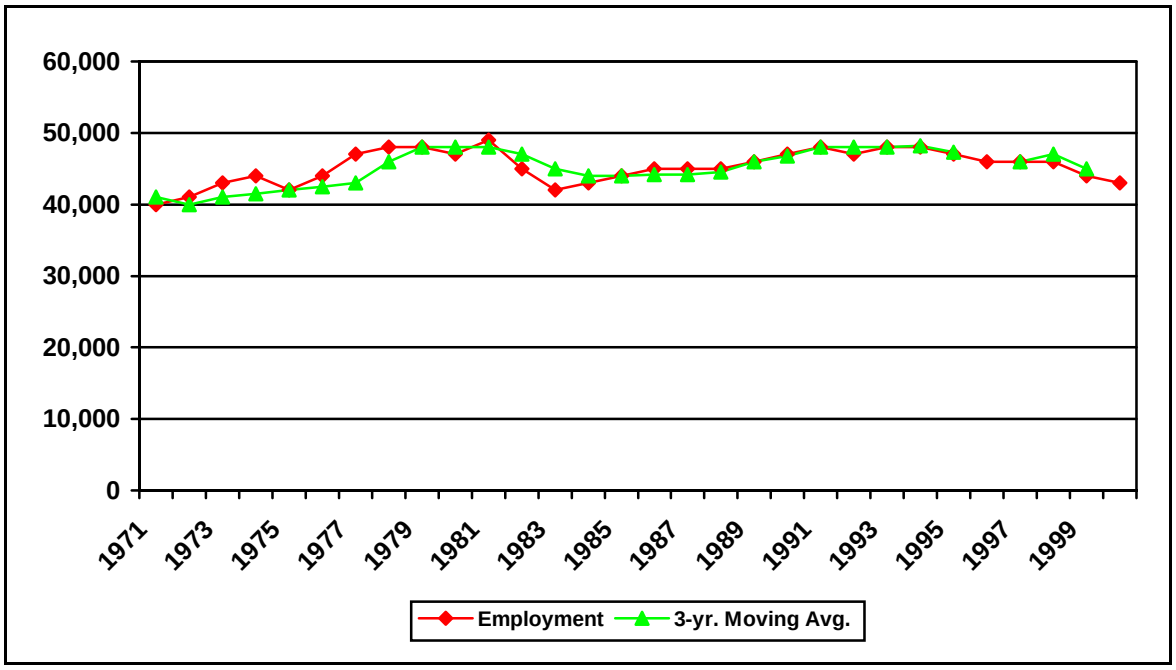


Figure 7. Total Annual Employment and Three-year Moving Averages, Mobile LMA: 1971-2000 (U.S. Dept. of Commerce, Bureau of Economic Analysis, 2000).

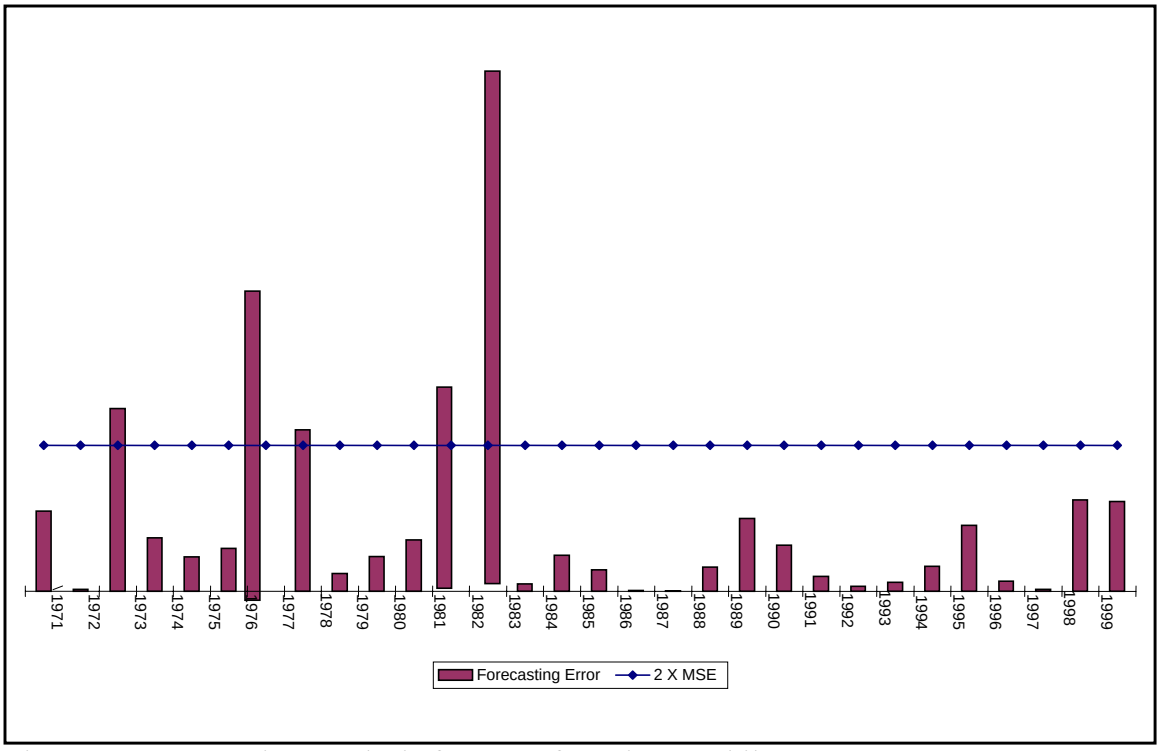


Figure 8. Forecasting Analysis for Manufacturing, Mobile LMA: 1971-1999.

Detailed Industry Code Analysis. In this next section, we present analyses of industry sector codes for four key industry groups: manufacturing, mining, transportation and wholesale trade (Table 1).

Table 1

Key Industry Groups and Sectors

Manufacturing		
Fabricated Structural Metal Products (SIC 3440), this category includes manufacture of barge sections, ship sections, buoys, and metal plates for gas tanks, gas holders, oil storage tanks, large diameter pipes, pressure valves, storage tanks and also portable building.	***Ship and Boat Building and Repairing*** (SIC 3730), this category includes building and repairing barges, cargo vessels, drilling platforms and dry docks.	***Oil Field Machinery*** (SIC 3533), this category includes bits, rock and oil field tools, derricks for oil and gas fields, drill rigs, drilling tools for gas, oil and water wells.
Mining		
Drilling Oil and Gas Wells (SIC 1381), this category includes, on a contract basis, directional drilling, redrilling, reworking, and "spudding in" of oil and gas wells**.**	***Oil and Gas Field Exploration Services*** (SIC 1382), this category includes, on a fee basis, geophysical exploration, aerial exploration, and seismograph services**.**	***Oil and Gas Field Service N.E.C.*** (SIC 1389) this category includes, on a contract basis, excavating slush pits and cellars, grading and building of foundations, well surveying, running and cutting casings, tubes and rods, cementing and shooting wells, acidizing and chemically treating wells. Operating oil and gas wells for others on a contract basis are also included in this category.
Transportation		
Water Transportation (SIC 4400), this category primarily includes stevedoring.		
Wholesale Trade		
Industrial Machinery and Equipment (SIC 5084), this category includes the wholesale of derricks, oil field tool joints, oil well supply houses, oil well machinery equipment and supplies.		

Those eight detailed categories are all directly related to offshore and on-shore oil and gas activities. We chose those categories based on a) relationship to oil and gas activities, b) employment levels, and c) availability of data in the years we are studying. The manufacturing category includes the sub-categories of fabricated structural metal products, ship and boat building and repair, and oil field machinery. Mining includes drilling oil and gas wells, oil and gas field exploration services, and oil and gas field service, N.E.C. The transportation category focuses exclusively on water. Wholesale trade considers only industrial machinery and equipment. Analyses of these trends will show the extent to which oil and gas activities affected the "boom" in total employment and the "bust" in manufacturing employment in the Mobile LMA.

Manufacturing. The *Fabricated Structural Metal Products* (SIC 3440) employment data show illustrate important periods for this industry (Figures 9 and 10). First, there was steady, significant growth between 1973 and 1978. Employment levels reached 1,500 workers in 1978. Following that growth, there was a sharp drop-off in the early 1980s. Employment fell to approximately 500 workers in 1982. However, another significant growth pattern follows that oil and gas "bust". By 1996, employment in this industry had reached a 30-year high of 2,000 workers.

Another key industry sector, *Oil Field Machinery* manufacturing (SIC 3533), is not present in the Mobile LMA. No workers were employed in this sector.

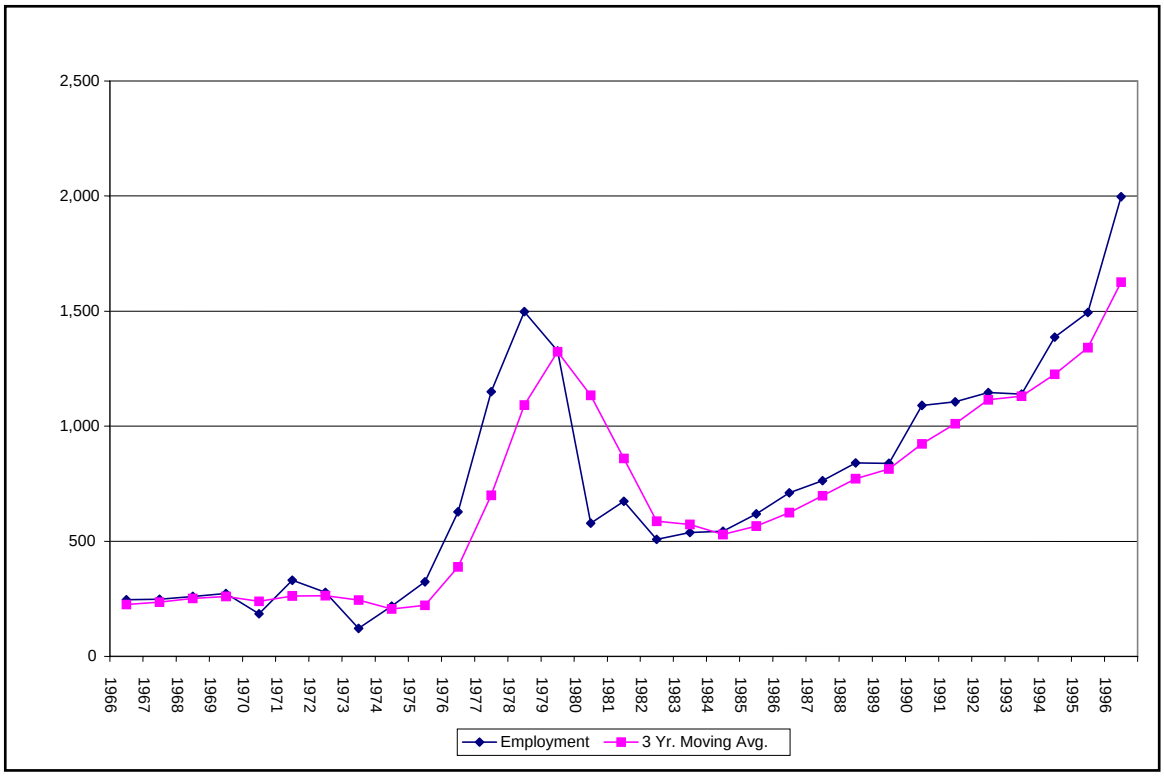


Figure 9. Annual Employment for Fabricated Structural Metal Products, Mobile LMA: 1966-1996 (U.S. Census Bureau, 2000a).

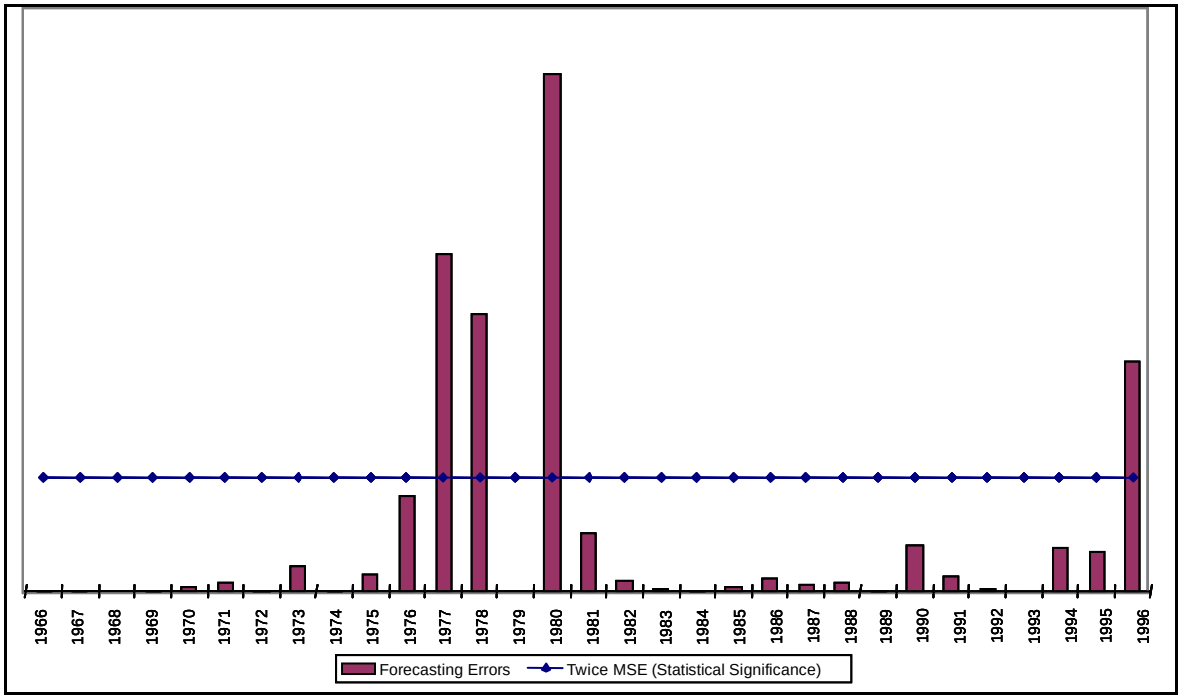


Figure 10. Forecasting Analysis for Fabricated Structural Metal Product (manufacturing), Mobile LMA: 1966-1996.

In contrast, the *Ship and Boat Building and Repairing* (SIC 3730) sector has a strong presence in the Mobile LMA. The employment data for this industry sector suggest two important patterns (Figures 11 and 12). First, the data show steady growth beginning in the mid-1970s and continuing through 1982; this industry sector employed over 5,000 workers during that period. Second, that growth period was followed by sharp declines beginning in 1982. Almost 4,200 jobs were lost in this industry sector between 1982 and 1983 alone. This downward trend continued through 1985. Significantly, the years of the "boom and bust" for the *Ship and Boat Building and Repairing* industry in the Mobile LMA correspond to the general "boom and bust" pattern in the oil and gas industry. These data show that the Mobile LMA was not fully insulated from direct changes in the oil and gas industry. Furthermore, these data indicate that the majority of manufacturing jobs lost in the early 1980s in the Mobile LMA were from this sector.

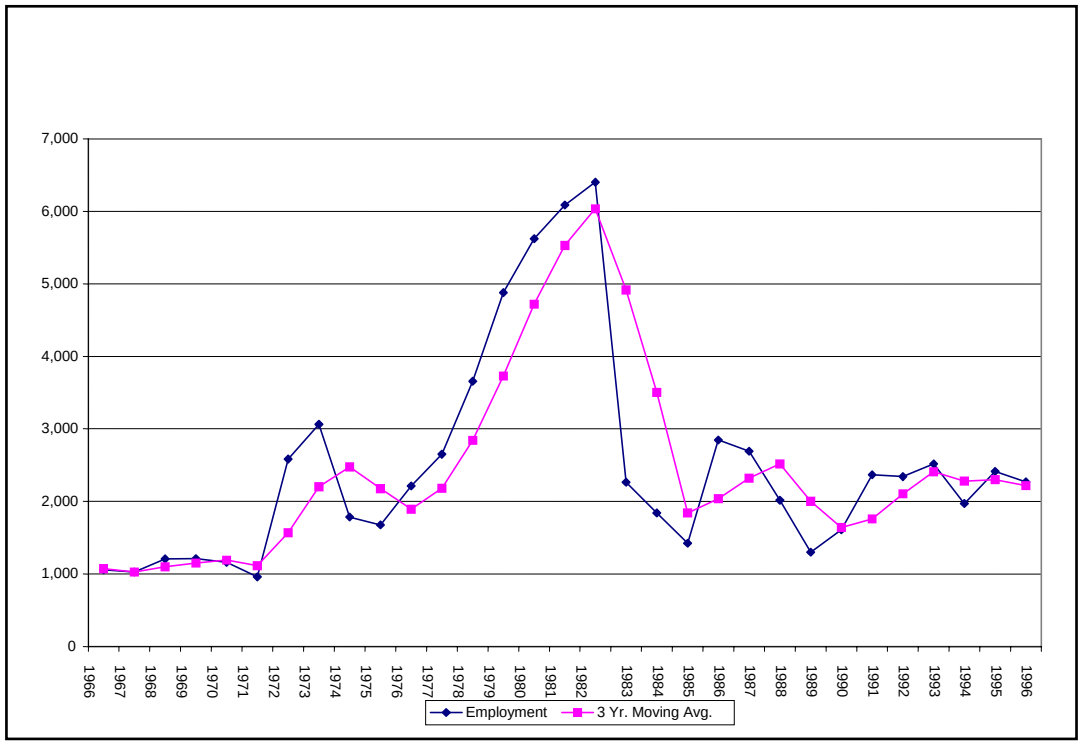


Figure 11. Annual Employment for Ship and Boat Building and Repair (manufacturing), Mobile LMA: 1966-1996 (U.S. Census Bureau, 2000a).

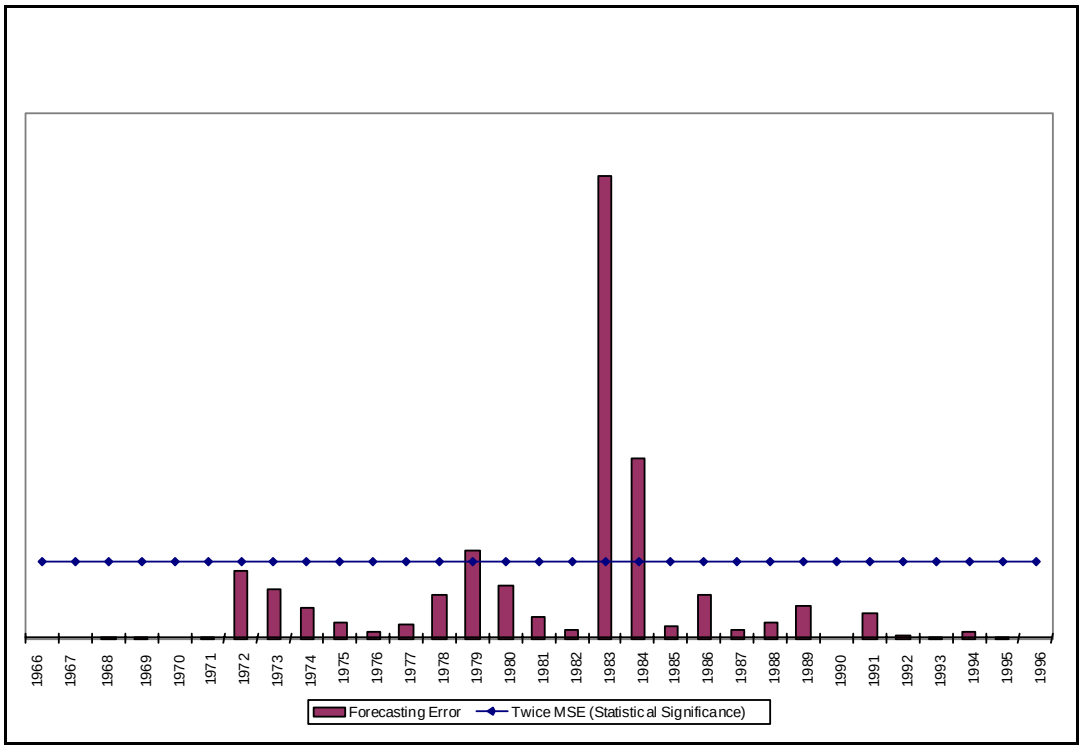


Figure 12. Forecasting Analysis for Ship and Boat Building and Repair (manufacturing), Mobile LMA: 1966-1996.

Mobile LMA Mining. Employment in the *Drilling Oil and Gas Wells* (SIC 1381), *Oil and Gas Field Exploration Services* (SIC 1382) and *Oil and Gas Field Service N.E.C.* (SIC 1389) sectors in the Mobile LMA is negligible. All together, they represent less than 400 workers in any given year under consideration (Figure 13). Employment in mining generally has represented less than 1 percent of the workforce in the Mobile LMA, and is very small in comparison to other LMAs in the GOMR (e.g., Lafayette, Louisiana).

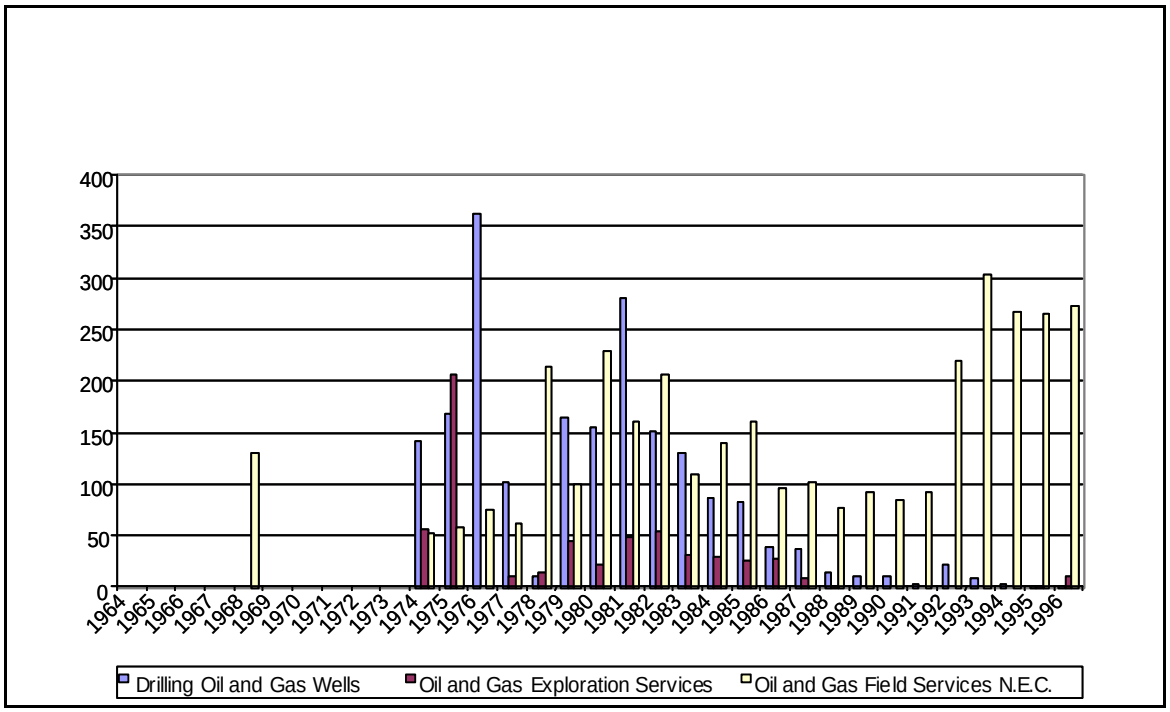


Figure 13. Detailed Mining Categories, Mobile LMA: 1964-1996 (U.S. Dept. of Commerce, Bureau of Economic Analysis, 2000).

Mobile LMA Water Transportation. Employment in *Water Transportation* (SIC 4400) peaked sharply in 1979 at almost 9,000 workers. By 1981 employment fell to 3,600 workers. An additional 800 jobs were lost between 1981 and 1984. The forecasting analysis of this industry confirms that 1979 and 1981 were the key years for this industry. While the pattern in this industry is consistent with the "boom and bust" patterns of the oil and gas industry, we maintain that the two-digit codes for water transportation are not adequate to capture fully the effects of offshore activities. Unfortunately, there is no category that measures water transportation directly related to offshore oil and gas activities. Moreover, we know of no SIC code that will allow us to achieve this task. In short, the water transportation data are suggestive of an impact in the Mobile LMA, but no conclusion can be drawn from this analysis.

Mobile LMA Wholesale Trade. The *Industrial Machinery and Equipment* (SIC 5084) category includes the wholesale marketing of oil well machinery and gas equipment. These data are available only from 1977 to 1996, which does not provide enough data to perform a forecasting analysis. However, this industry grew significantly between the 1985 and 1996. In fact, this industry employed over 1,000 workers in 1996, which is a 20-year high. While this sector does not represent major employment levels, it does show that some post-bust oil and gas activities were located in the Mobile LMA.

The detailed industry analysis shows that the impact of the "boom and bust" pattern in the oil and gas industry affected only a small number of industries in the Mobile LMA. Furthermore, unlike other LMAs in the Gulf of Mexico region, the Mobile LMA did not experience a significant downturn in total employment during the 1980s. However, there was a sharp drop-off in employment in the ship and boat building and repairing sector. Other than this industry, the Mobile LMA was not significantly affected by the downturn in the oil and gas industry. The loss of manufacturing jobs in the 1980s was offset by an increase in service and retail trade employment. However, to the extent that the service sector jobs were generally low-paying, entry-level positions, growth in this sector is not a strong substitute for losses in high-paying manufacturing jobs. Therefore, while the impact of the downturn in the manufacturing sector did not manifest in significant losses in total employment, the downturn may have had a negative impact on other socio-economic indicators. Overall, the employment data for this LMA indicate that the "boom and bust" patterns of the 1970s and 1980s did not affect the Mobile region with the exception of decline in shipbuilding and repairing.

Mobile LMA Population, Education, and Local Government: 1940-2000. The Mobile LMA population has grown steadily between 1940 and 2000 (Table 2). Between 1970 and 1990, the population of the Mobile Labor Market Area increased by approximately 100,000, or 20 percent. Mobile County was the fastest growing area, increasing in population by 55 percent between 1940 and 2000. Baldwin County (a rural county in transition) was the second fastest growing area, increasing by 30 percent in that same period. Between 1940 and 2000, the Mobile LMA population grew by 104 percent. However, between 1980 and 1990, the population of the Mobile LMA grew by only 5 percent; a rate less than half of the national growth rate of 10 percent. Still, this slow growth trend mirrors growth trends in the neighboring Biloxi LMA in Mississippi.

Table 2

Population by County, Mobile LMA: 1940-2000

County	1940	1950	1960	1970	1980	1990	2000
Baldwin	32,324	40,997	49,088	59,382	78,556	98,280	140,415
Clarke	27,636	26,548	25,738	26,724	27,702	27,240	27,867
Conecuh	25,489	21,776	17,762	15,645	15,884	14,054	13,839
Escambia	30,671	31,443	33,511	34,906	38,440	35,518	38,181
Mobile	141,974	231,105	314,301	317,308	364,980	378,643	399,773
Monroe	29,465	25,732	22,372	20,883	22,651	23,968	24,177
Washington	16,188	15,612	15,372	16,241	16,821	16,694	17,868
Wilcox	26,279	23,476	18,739	16,303	13,568	13,568	13,130
LMA Total	330,026	416,689	496,883	507,392	578,602	607,965	675,250

Source: U.S. Census Bureau, 2000b.

The data on racial composition show different growth patterns for African-Americans and Caucasians between 1970 and 1990. Between 1970 and 1980, the Caucasian population grew by 16 percent and the African-American population by 8 percent. Between 1980 and 1990, the African-American population grew by 29 percent, while the Caucasian population increased

by 6 percent. The trends for the Caucasian population suggest some minor out-migration that resulted from the loss of manufacturing jobs in the LMA. Furthermore, the trends for the African-American population growth are counter-intuitive to southern labor markets. Most data indicate that out-migration of black population was the norm for any decade in the 1900s. Further, this trend is found in most of the oil and gas LMAs in the region. However, data for Mobile do not suggest extensive African-American out-migration. In fact, the high growth rates are significantly greater than would be expected via natural replacement (Tables 3 and 4).

Table 3

Percent of White Population, Mobile LMA: 1940-2000

County	1940	1950	1960	1970	1980	1990	2000
Baldwin	75.0	77.5	78.9	81.6	83.9	86.0	87.1
Clarke	47.8	50.2	50.4	56.1	56.9	56.8	55.9
Conecuh	55.4	54.6	54.4	55.3	58.7	57.6	55.4
Escambia	66.8	66.4	65.8	62.6	67.7	68.5	64.4
Mobile	63.6	66.2	67.7	67.4	67.5	67.2	63.1
Monroe	47.0	48.8	49.3	54.2	56.4	59.5	57.7
Washington	61.9	60.6	65.4	69.7	67.6	65.9	65.0
Wilcox	21.7	20.9	22.1	31.5	33.7	31.0	27.5
LMA % Total	58.1	61.9	64.7	66.5	67.8	68.5	66.8

Source: U.S. Census Bureau, 2000b.

Table 4

Percent of Black Population, Mobile LMA: 1940-2000

County	1940	1950	1960	1970	1980	1990	2000
Baldwin	24.9	22.4	21.0	17.8	15.3	14.1	10.3
Clarke	52.1	49.7	49.5	43.8	42.7	42.8	43.0
Conecuh	44.5	45.3	45.4	44.6	41.1	42.2	43.6
Escambia	32.1	32.5	32.7	30.3	29.6	28.1	30.8
Mobile	45.1	33.5	32.1	32.2	31.5	31.1	33.4
Monroe	52.9	51.1	50.6	45.5	43.0	39.0	40.0
Washington	38.1	31.9	32.6	30.0	28.1	27.7	26.9
Wilcox	78.2	79.0	77.8	68.4	74.8	68.9	71.9
LMA % Total	41.7	38.0	35.0	27.1	31.3	38.6	29.9

Source: U.S. Census Bureau, 2000b.

Education. The data in Table 5 show that education levels in the Mobile LMA for 1970 through 2000. The economic growth that occurred during those decades did not result in a higher percentage of college graduates in the LMA. Only 14 percent of the adult population had graduated from college in 1990, which is significantly less than the national rate of 21 percent.

In 2000, the educational attainment gap widened further, with only 18 percent of Mobile LMA adults graduating from college, compared to 26 percent nationwide.

Table 5

Adult Educational Attainment (25+), Mobile LMA: 1970-2000

County	0-8 Years	Some High School	High School Diploma	Some College, No Degree	BA/BS or More	Total
1970						
Baldwin	36.2%	23.1%	26.7%	7.4%	6.4%	31,524
Clarke	40.9%	21.8%	25.8%	5.9%	5.4%	13,482
Conecuh	50.6%	20.6%	20.6%	4.0%	4.1%	8,272
Escambia	41.2%	24.2%	25.3%	4.5%	4.7%	18,648
Mobile	33.7%	23.6%	27.2%	7.8%	7.5%	160,718
Monroe	46.4%	20.9%	21.8%	5.1%	5.7%	10,599
Washington	49.0%	21.4%	22.9%	3.0%	3.6%	7,674
Wilcox	51.6%	18.0%	19.4%	4.6%	6.2%	7,554
LMA Total	36.9%	23.0%	26.1%	7.0%	6.7%	258,471
1980						
Baldwin	24.1%	20.4%	37.8%	16.2%	13.5%	40,656
Clarke	30.9%	24.0%	33.1%	10.9%	9.7%	13,867
Conecuh	38.9%	22.0%	30.1%	8.3%	6.5%	8,535
Escambia	31.7%	20.9%	35.2%	11.5%	7.7%	20,595
Mobile	21.9%	21.2%	39.1%	16.3%	13.9%	178,484
Monroe	34.1%	19.4%	35.7%	9.7%	9.4%	11,352
Washington	35.6%	20.6%	35.6%	7.5%	5.7%	8,530
Wilcox	44.1%	19.7%	26.7%	8.4%	10.3%	6,928
LMA Total	22.7%	18.9%	33.7%	13.2%	11.2%	321,518
1990						
Baldwin	9.9%	16.9%	31.8%	24.6%	16.8%	64,623
Clarke	17.6%	22.1%	33.4%	16.0%	66.7%	16,285
Conecuh	23.9%	23.4%	32.6%	13.6%	6.4%	8,962
Escambia	17.5%	22.6%	34.8%	17.5%	7.6%	22,527
Mobile	10.8%	19.0%	32.3%	22.2%	15.5%	232,254
1990						
Monroe	17.5%	23.2%	31.4%	17.0%	10.8%	14,228
Washington	20.5%	21.3%	37.0%	14.3%	6.7%	9,960
Wilcox	25.7%	23.1%	39.5%	14.1%	10.3%	7,715
LMA Total	12.4%	19.4%	32.4%	21.3%	14.3%	376,554

Table 5

Adult Educational Attainment (25+), Mobile LMA: 1970-2000 (continued)

2000						
Baldwin	4.3%	13.6%	29.6%	29.3%	23.0%	96,010
Clarke	10.1%	20.1%	39.0%	21.8%	12.5%	17,072
Conecuh	12.2%	20.0%	38.1%	20.3%	9.2%	9,230
Escambia	10.0%	21.4%	34.7%	23.2%	10.5%	25,510
Mobile	6.7%	16.6%	31.9%	26.1%	18.6%	250,122
Monroe	11.1%	20.9%	34.3%	21.7%	11.8%	15,378
Washington	10.8%	16.9%	43.6%	20.0%	8.6%	11,240
Wilcox	13.7%	26.7%	30.2%	19.1%	10.1%	7,979
LMA Total	7.0%	16.7%	32.2%	25.9%	18.0%	433,171

Source: U.S. Census Bureau, 2000b.

Finances. The population of the Mobile LMA increased more quickly than the national growth rate during the 1970s. However, population growth was sluggish in the 1990s due to the loss of some key manufacturing jobs in the 1980s. Despite that economic setback, the local government financial data show that the Mobile LMA remained fiscally stable after the "bust"—especially when compared to other LMAs in the region (e.g., Lafayette, LA) (Tables 6-9). Total revenues increased (in real dollars) between 1972 and 1997. Total debt per capita also increased between 1972 and 1997, most likely to support the strong population growth of the 1970s. Therefore, it appears that the Mobile LMA local government did not face the financial stresses as did local governments in other oil and gas LMAs in neighboring Louisiana.

Tax revenues and debt remained very stable in real dollars throughout the 1990s. We find none of the "ups and downs" in the Mobile LMA that we find in other LMAs in the region. The Mobile LMA economy was much more stable than other oil and gas LMAs in the GOM region.

Table 6

Total Revenue, Per Capita (in 1997 adjusted dollars), Mobile LMA: 1972-1997

County	1972	1977	1982	1987	1992	1997
Baldwin	$1,058	$1,426	$1,639	$2,061	$1,651	$2,843
Clarke	$934	$1,556	$2,235	$2,671	$1,447	$1,876
Conecuh	$984	$1,371	$1,276	$1,355	$992	$1,656
Escambia	$1,081	$1,414	$1,418	$1,666	$1,407	$2,391
Mobile	$1,254	$1,362	$1,245	$1,525	$1,615	$2,014
Monroe	$1,207	$1,689	$1,597	$1,506	$1,651	$1,786
Washington	$923	$1,015	$1,202	$1,578	$1,661	$2,060
Wilcox	$994	$1,133	$1,903	$2,287	$1,987	$2,776
LMA Total	$1,173	$1,380	$1,390	$1,676	$1,595	$2,186

Source: U.S. Census Bureau, 2000a.

Table 7

Total State Revenue, Per Capita (in 1997 adjusted dollars), Mobile LMA: 1972-1997

County	1972	1977	1982	1987	1992	1997
Baldwin	$1,058	$408	$428	$471	$503	$697
Clarke	$934	$669	$583	$676	$779	$962
Conecuh	$984	$723	$667	$775	$657	$813
Escambia	$1,081	$547	$562	$693	$628	$916
Mobile	$1,254	$421	$434	$483	$552	$726
Monroe	$1,207	$674	$667	$704	$869	$1,198
Washington	$923	$667	$735	$811	$968	$988
Wilcox	$994	$885	$795	$799	$840	$1,185
LMA Total	$1,173	$478	$481	$536	$590	$777

Source: U.S. Census Bureau, 2000a.

Table 8

Total Tax Revenue, Per Capita (in 1997 adjusted dollars), Mobile LMA: 1972-1997

County	1972	1977	1982	1987	1992	1997
Baldwin	$191	$155	$175	$373	$389	$583
Clarke	$204	$196	$203	$268	$347	$423
Conecuh	$121	$160	$172	$226	$220	$228
Escambia	$213	$215	$224	$268	$303	$331
Mobile	$438	$443	$403	$523	$624	$704
Monroe	$176	$156	$198	$226	$190	$287
Washington	$133	$186	$287	$294	$317	$418
Wilcox	$98	$126	$116	$200	$168	$250
LMA Total	$341	$343	$325	$440	$509	$606

Source: U.S. Census Bureau, 2000a.

Table 9

Total Debt, Per Capita (in 1997 adjusted dollars), Mobile LMA: 1972-1997

County	1972	1977	1982	1987	1992	1997
Baldwin	$191	$155	$175	$373	$389	$583
Clarke	$204	$196	$203	$268	$347	$423
Conecuh	$121	$160	$172	$226	$220	$228
Escambia	$213	$215	$224	$268	$303	$331
Mobile	$438	$443	$403	$523	$624	$704
Monroe	$176	$156	$198	$226	$190	$287
Washington	$133	$186	$287	$294	$317	$418
Wilcox	$98	$126	$116	$200	$168	$250
LMA Total	$341	$343	$325	$440	$509	$606

Source: U.S. Census Bureau, 2000a.

VI. FLORIDA STATE PROFILE

A. INTRODUCTION

Florida is located in the most southeastern portion of the United States. It is bordered by the State of Georgia to the north, Alabama to the west, the Gulf of Mexico to the south, and the Atlantic Ocean to the east (Map 15). This state encompasses a total of 59,909 square miles (53,926 land; 5,983 water). Known for its hot summers and mild winters, Florida's average annual temperatures are 81° (North Florida) and 83° (South Florida) in July, and 53° (North Florida) and 69° (South Florida) in January. The highest elevation in the state is 345 feet, while the lowest is at sea-level; the mean elevation is 100 feet. Florida had a year 2000 population of 15,982,378 persons (U.S. Census Bureau, 2000b).

In addition to maintaining several large metropolitan areas, the State of Florida oversees approximately 11 million acres of protected state lands, more than 7,000 lakes, and 4,510 islands of 10 acres or more in size. The Division of State Lands provides oversight for these protected areas (Florida Department of Environmental Protection, 2003). Pine, oak, and mixed forests comprise the northern part of the state, and decorate the landscape all the way down the peninsula to the south-central portion. One finds southern floodplain forests in the northern regions as well. Eight highly diverse regions comprise Florida: the Northwest, North Central, Northeast, Central/Space Coast, Tampa Bay, Heartland, Southwest, and Southeast regions (Enterprise Florida, 2002).

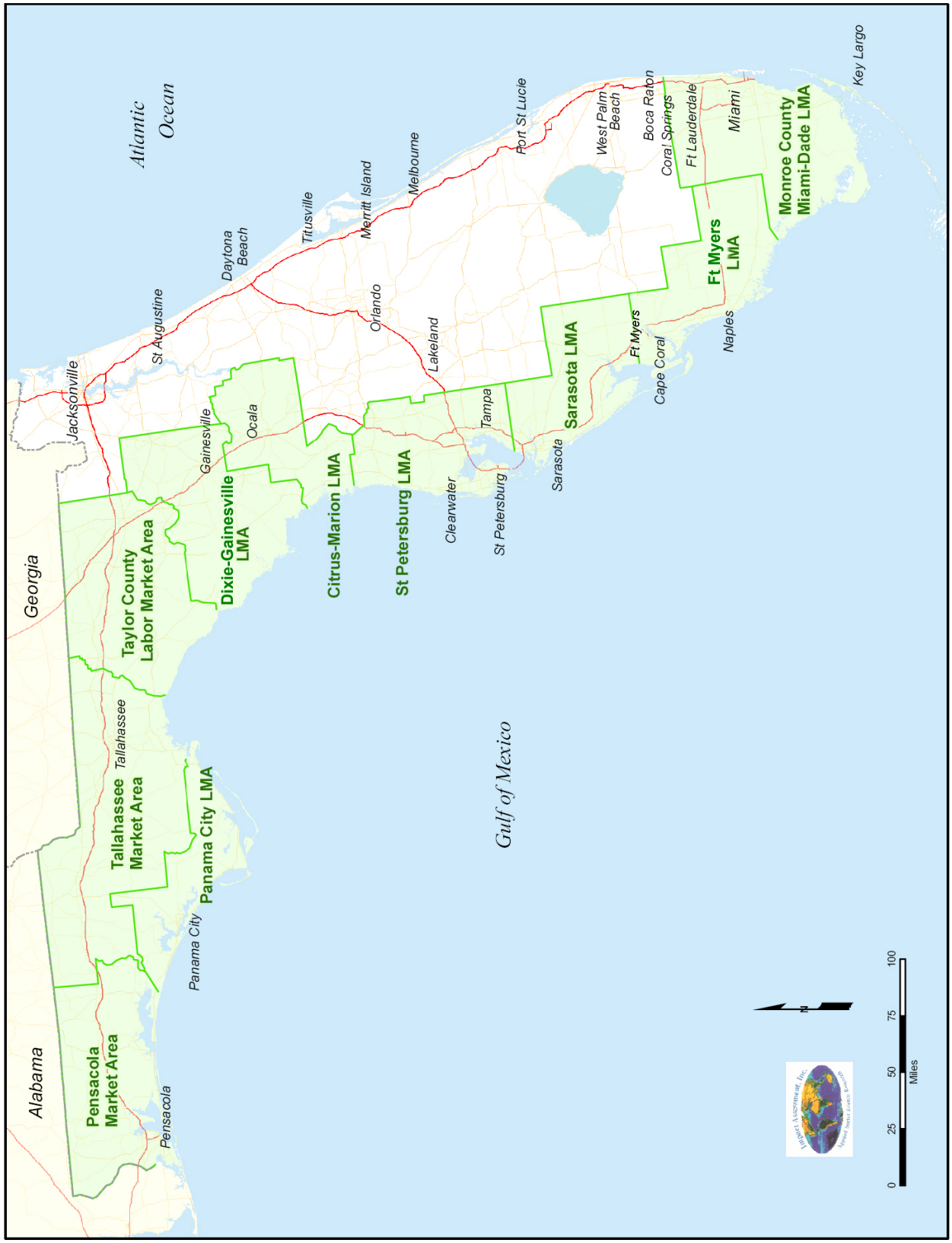
The Northwest region has a strong government and military presence. This presence has, in turn, shaped the development of the key industries in this region: aviation/aerospace/defense, semiconductor production, and information technology (Enterprise Florida, 2002). Tallahassee, the state capital, is located here.

The North Central region is home to the University of Florida, as well as several community colleges and vocational schools. This area's key growth industries are: manufacturing, distribution, forestry, and health care. Four railroads and two commercial airports facilitate its transportation services (Enterprise Florida, 2002).

There is also a strong military influence in the Northeast region of the state. The well-disciplined workforce in this region attracts many high-tech contractors. Additionally, the biomedical industry is a strong contributor to this regional economy. Both the Mayo Clinic and Shands Jacksonville Medical Center are located here (Enterprise Florida, 2002).

The Central/Space Coast region combines two Florida areas: Central and Space. Home to over 50 percent of Florida's high-tech companies, these areas are part of the "high-tech corridor" that spans the peninsula from Daytona Beach, Orlando, Melbourne, and on to Tampa. The Space portion features NASA's Kennedy Space Center, the Spaceport Technology Center, and several aeronautic service providers (Enterprise Florida, 2002).

The Tampa Bay region is home to two of Florida's most populous cities–Tampa and St. Petersburg. It is also part of the "high-tech corridor" discussed above. The University of South Florida is located here (Enterprise Florida, 2002).



Map 15. State of Florida Depicting Gulf of Mexico Labor Market Areas (and component counties).

Over 600 technology-related businesses are established in the Southwest region. Its renowned beaches and resort islands also make the Southwest a popular tourist destination (Enterprise Florida, 2002). Florida Gulf Coast University and the Southwest Florida International Airport are located here.

The relatively rural Heartland region provides easy access to several deepwater ports and international airports. Additionally, the Heartland's designation as an "Area of Critical Economic Concern" provides many incentives to prospective businesses, including local tax abatements, free education, and training and job placement for employers. The Heartland is only an hour's drive from many of Florida's urban areas (Enterprise Florida, 2002).

The Southeast is located along the Atlantic Coast. Easy access to multiple transportation routes has transformed this region into a natural headquarters for several Latin American companies. Indeed, Miami is recognized as "the business capital of Latin America." Additionally, the Southeast region is home to the University of Miami, Florida International University, and Florida Atlantic University (Enterprise Florida, 2002).

Florida has 67 counties, only five of which produce oil: Collier, Lee, Hendry, Escambia, and Santa Rosa. The state's cumulative crude oil wellhead value in 2000 was nearly $9.4 million. Opposition to offshore oil production has effectively minimized oil and gas activities in the state. Consequently, the state has no refineries. Recently, however, the state approved Lease Sale 181 located 100 miles off of the Florida coast in Outer Continental Shelf (OCS) waters.

Because of Florida's limited involvement in OCS activity to date, the oil and gas industry has neither significantly benefited nor burdened the state. Additionally, resource experts and oil companies continue to disagree about the potential impact of OCS activity in Florida waters. For example, during the Department of Interior's 1991 hearings on offshore oil production, several agencies representing the state's natural resource departments testified that drilling would prove detrimental to the environment. In contrast, oil companies emphasized the numerous financial and strategic gains that could result from OCS drilling. In the final analysis, however, short-term benefits did not appear to outweigh long-term burdens.

B. BUILT ENVIRONMENT

Human Geography and Population Centers. Tallahassee, the state capital, had a year 2000 population of 150,624 residents. Florida's largest population centers include: Fort Lauderdale (152,397), Hialeah (226,419), Hollywood (139,357), Jacksonville (20,990), Miami (362,470), Orlando (185,951), Pembroke Pines (137,427), St. Petersburg (248,232), and Tampa (303,447) (U.S. Census Bureau, 2000b).

Transportation and Communication. Florida's major interstate highways include: Interstate 10 running east-west across the Panhandle in northern Florida (363 miles); I-95 traveling north-south through Florida's east coast (382 miles); I-4 routing east-west through the state's center (132 miles); and I-75 running north-south on Florida's west coast (472 miles). Minor interstate highways include the I-110 (Pensacola/six miles); I-275 (Tampa, St. Petersburg, Bradenton/60 miles); I-375 (St. Petersburg/two miles); I-195 (Miami/4 miles); I-295 (Jacksonville/35 miles); I-395 (Miami/two miles); and I-595 (Ft. Lauderdale/13 miles) (Trip, 2006). Twenty state roads also facilitate travel across Florida's terrain.

There are 14 commercial/international airports in Florida: St. Petersburg-Clearwater, Daytona Beach, Fort Lauderdale-Hollywood, Southwest Florida, Panama City/Bay County,

Jacksonville, Key West, Miami, Orlando, Palm Beach, Sarasota/Brandenton, Tampa, Melbourne, and Orlando Sanford (Florida Department of Transportation, no date).

The St. Petersburg-Clearwater Airport is located on Tampa Bay's western shoreline, just north of Petersburg. This 2,000-acre airport has three runways, the longest of which is 8,500 feet. Eight commercial airliners service this location: American Trans Air, Southeast, USA 3000, TransMeridian, Air Transat, CanJet, Fly ConQuest, and SeaCoast Airlines (St. Petersburg-Clearwater International Airport, no date). This airport is also home to a Coast Guard Air Station.

The Daytona Beach International Airport is located in Volusia County three miles southwest of Daytona Beach. Four commercial airlines serve this location: Delta, Comair, Continental, and Vintage. This airport has three runways, the longest of which is 10,500 feet (Daytona Beach International Airport, 2001).

The Fort Lauderdale-Hollywood International Airport is located in Broward County. There are 28 scheduled commercial airlines, eight commuter airlines, seven charter airlines, and six cargo carriers that fly out of this site. In 2000, this airport facilitated a combined total of 15,860,004 domestic and international flights (Fort Lauderdale-Hollywood International Airport, no date).

The Southwest Florida International Airport – "the Gateway to Ft. Myers and Florida's Gulf Coast"– is located in Lee County. Twenty-four commercial airlines serve this airport. In 2000, 4,897,253 passengers (2,632,093 enplanements, and 2,575,119 deplanements) moved through this transportation hub (Southwest Florida International Airport, no date).

The Panama City-Bay County International Airport has three runways, the longest of which is 6,308 feet. Five major airline companies—Delta, Northwest, U.S. Airways, Comair, and Skywest—service this airport (Enterprise Florida, 2002).

The Jacksonville International Airport is part of the Jacksonville Airport System. This system includes the Craig Airport, Herlong Airport, and Cecil Field (Jackson Airport Authority, no date).

The Key West International Airport has three major air carriers: US Airways, Delta, and American Eagle Airlines. All of this small airport's international flights and many of its major flights are routed through the larger Miami International Airport (Key West Airport, 2004).

The Miami International Airport (MIA) is served by most domestic and many international carriers. Over 100 airlines serve MIA and fly to more than 150 worldwide destinations. This airport provides the county with 241,021 jobs, $18.6 billion in business revenue, $8 billion dollars in wages and salaries, three billion dollars in local purchases, $735 million in state, county, and municipal taxes, and $495 million of federal aviation tax revenue (Miami International Airport, no date).

The Orlando International Airport (OIA) sits on 23 square miles (14,672 acres) of land. OIA is served by 47 commercial airlines and handles 26,700,000 passengers annually. This airport has two 12,000 foot runways and one 10,000 runway (Greater Orlando Aviation Authority, no date).

The Palm Beach International Airport (Palm Beach County) serves almost 6 million passengers annually. Fifteen commercial airlines fly out of this 560,000 square foot terminal (Palm Beach International Airport, 2000).

The Sarasota Bradenton is an international airport. It is served by six major air carriers and two commuter airlines (Sarasota Bradenton International Airport, 2002).

The Tampa International Airport is located in Hillsborough County. It hosts 17 commercial airlines (Tampa International Airport, 2003).

The Melbourne International Airport's main runway is currently 10,200 feet, but plans to extend it to 11,600 feet are in the works. This airport is served by four commercial airlines: Delta, Delta Connection, Southeast Vacations, and Vintage Props and Jets, which offers flights to the Bahamas (Melbourne International Airport, 2002).

The 2,000-acre Orlando Sanford International Airport is located in the City of Sanford in Seminole County. This airport features four runways, the longest of which is 9,600 feet. Five domestic carriers and nine international charters service this airport (Orlando Sanford International Airport, no date).

There are also five regional commercial airports in Florida: Pensacola, Tallahassee, Okaloosa/Eglin AFB, Gainesville, and Naples, and seven general aviation and/or commercial charter airports: the Sebring Regional Airport (Highlands County), Fernandina Beach Municipal Airport (Nassau County), Boca Raton (Southern Palm Beach County), Space Coast Regional Airport, Merritt Island Airport, Arthur Dunn Airpark (Brevard County), Destin Airport (Okaloosa County), Craig Air Center (Duval County), and LaBelle Municipal Airport (Hendry County) (Florida Department of Transportation, no date).

There are 14 deepwater ports in Florida: Port of Pensacola, Port of Panama City, Port St. Joe, Port of Tampa, Port of St. Petersburg, Port of Manatee, Port Fernandina, Port of Jacksonville, Port Canaveral, Port of Fort Pierce, Port of Palm Beach, Port Everglades, Port of Miami, and the Port of Key West. Port St. Joe (Gulf County) is temporarily inactive while it redevelops its infrastructure (Florida Ports Council, 2001).

Between January 2001 and September 2001, the total dollar value of all exports ($13,799,421,885) and imports ($19,638,826,168) at these ports (combined) equaled $33,438,248,053 (Florida Ports Council, 2001). Total tonnage for the 2000-01 fiscal year amounted to 111,378,473 (22,640,484 exports; 33,656,597 imports; 55,081,392 domestic) (Florida Ports Council, 2001).

The Port of Pensacola is located in Escambia County in Pensacola Bay. Regarded as northwest Florida's leading deep-water port, the Port of Pensacola can accommodate ships with drafts of up to 33 feet. This Foreign Trade Zone has eight deep-draft berths, 432,000 square feet of covered storage, and 250,000 square feet of outdoor storage. Its leading commodities include: agricultural products, forest products, asphalt, sulphur, lime, mineral aggregates, steel products, and automobiles. *Burlington Northern Railroad, CSX Transportation*, and *Rail America* service this Port (Port of Pensacola, no date).

Between January 2001 and September 2001, the total dollar value of all exports ($103,613,123) and imports ($2,946,958) at the Port of Pensacola equaled $106,560,081 (Florida Ports Council, 2001). Total tonnage for the 2000-01 fiscal year amounted to 628,603 (236,560 export; 99,499 import; 292,544 domestic) (Florida Ports Council, 2001).

The Port of Panama City is a recognized international "manufacturing" Foreign Trade Zone and a catalyst for industrial development in Northwest Florida. It was established in 1967. Located in St. Andrew Bay in Bay County, this port's deepwater terminal has an average depth of 32 feet. It features six transit sheds totaling 470,000 square feet, a 30,000 square foot bulk warehouse, and 300,000 square feet of paved open storage (Port of Panama City, no date). The Port of Panama City's primary import products include: steel plate, steel coils, lumber, and liquid bulk; major export products are: linerboard, wood pulp, machinery, and miscellaneous general cargo. It handled 0.9 million tons of cargo in 1997. The *Bay Line Railroad* provides rail freight

service to the Port, and connects with both the *CSX* and *Norfolk Southern* railroads (City of Panama City, 2006). States served by this port include: Florida, Alabama, Georgia, Mississippi, Tennessee, North Carolina, and Virginia (Port of Panama City, no date).

Between January 2001 and September 2001, the total dollar value of all exports ($109,012,420) and imports ($115,314,630) at the Port of Panama City equaled $224,324,050 (Florida Ports Council, 2001). Total tonnage for the 2000-01 fiscal year amounted to 906,372 (352,344 export; 506,365 import; 47,663 domestic) (Florida Ports Council, 2001).

The Port of Tampa (Hillsborough County) is the largest of Florida ports in terms of total annual tonnage, handling almost half of all seaward cargo passing through the state (Tampa Port Authority, no date). The main products shipped at this port include: phosphate rock, sulphur, fertilizer products, petroleum, coal, and general cargo. It is also one of Florida's primary cruise ship ports.

Between January 2001 and September 2001, the total dollar value of all exports ($971,335,729) and imports ($812,742,976) at the Port of Tampa equaled $1,784,078,705 (Florida Ports Council, 2001). Total tonnage for the 2000-01 fiscal year amounted to 46,110,473 (7,640,643 export; 7,863,880 import; 30,605,950 domestic) (Florida Ports Council, 2001).

Located in Pinellas County, the Port of St. Petersburg specializes in one-day recreational and diving cruises. Between January 2001 and September 2001, the total dollar value of all exports ($17,940,250) and imports ($48,211,640) at the Port of St. Petersburg equaled $66,151,890 (Florida Ports Council, 2001).

Among Florida's largest deepwater seaports, the Port of Manatee (Manatee County) is not only a full service cargo port, but is one of the state's primary seasonal cruise ship ports. The Port of Manatee also ranks first among Florida's west coast ports in container movements. Additionally, it is the Southeast's leading forestry product import facility, and is Del Monte's second largest U.S. port facility. Port Manatee sits on 1,098 acres of land with 6,984 dedicated feet of dock space. It has a channel depth of 40 feet, and a length of three miles. Additionally, this port provides 721,000 square feet of warehouse space, 172,000 square feet of chill space, and 30,000 square feet of frozen space. Port Manatee has a significant economic impact on its surrounding community. It employs 60 full-time workers, and supports an additional 22,484 county jobs. In 2002, Port Manatee's total economic impact on the county equaled two billion dollars (Port Manatee, 2003).

Between January 2001 and September 2001, the total dollar value of all exports ($31,942,904) and imports ($298,749,383) at Port Manatee equaled $330,692,287 (Florida Ports Council, 2001). Total tonnage for the 2000-01 fiscal year amounted to 5,200,230 (975,284 export; 4,224,946 import) (Florida Ports Council, 2001).

Located in Florida's northeastern Nassau County, Port Fernandina serves the Southeastern United States. It primarily handles breakbulk (forest products) and containerized cargo (Florida Ports Council, 2001). Between January 2001 and September 2001, the total dollar value of all exports ($166,235,197) and imports ($90,558,734) at Port Fernandina equaled $256,793,931 (Florida Ports Council, 2001). Total tonnage for the 2000-01 fiscal year amounted to 541,000 (423,695 export; 117,305 import) (Florida Ports Council, 2001).

Also located along Florida's north Atlantic coast, the Jacksonville Port Authority is a full-service international trade seaport, and employs 150 workers. Handling 7,301,016 tons of cargo in 2003, Jacksonville ranked third of Florida's 14 deepwater ports in this year. Major import products include: gasoline and aviation fuel, coal and coke, gypsum, limestone chips, automobiles, granite, and steel wire rods, crude minerals, and wood pulp. Primary export

products include: poultry, grocery products, automobiles, beer and ale, paper, dextrose and glucose, meat, vegetables, non alcoholic beverages, milk, eggs, dairy products, and auto parts (Jacksonville Port Authority, 2006). The *CSX Railroad* and *Norfolk Southern* serve this port.

Between January 2001 and September 2001, the total dollar value of all exports ($1,492,360,728) and imports ($6,468,296,824) at Jacksonville Port Authority equaled $7,960,657,552 (Florida Ports Council, 2001). Total tonnage for the 2000-01 fiscal year amounted to 18,041,000 (947,000 export; 6,953,000 import; 10,141,000 domestic) (Florida Ports Council, 2001).

Port Canaveral is located on the mid-Atlantic coast. It accommodates both cargo and cruise ships. This Foreign Trade Zone offers "quadramodal transportation" (sea, air, land, and space) and is the leading export port in terms of dollar value (Florida Ports Council, 2001). Primary cargos at Port Canaveral include: cement, petroleum, aggregate, fresh produce, perishables, frozen food, juice (both single-strength and concentrate), milled lumber, steel, newsprint, and special project cargo (Port Canaveral, 2004). This port has no rail service.

Between January 2001 and September 2001, the total dollar value of all exports ($116,041,114) and imports ($301,843,120) at Port Canaveral equaled $417,884,234 (Florida Ports Council, 2001). Total tonnage for the 2000-01 fiscal year amounted to 4,555,479 (1,033,028 export; 3,489,451 import) (Florida Ports Council, 2001).

Located in St. Lucie County between Canaveral and Palm Beach, the Port of Fort Pierce primarily exports grapefruits, while it imports cement and aragonite (Florida Ports Council, 2001). Between January 2001 and September 2001, the total dollar value of all exports ($5,886,077) and imports ($15,999,153) at the Port Fort Pierce equaled $21,885,230 (Florida Ports Council, 2001). Total tonnage for the 2000-01 fiscal year amounted to 81,700 (5,000 export; 56,700 import; 20,000 domestic) (Florida Ports Council, 2001).

Eighty miles north of Miami in Palm Beach County, the Port of Palm Beach District serves primarily as a transshipment distribution center for cargo shipped through Florida's larger ports to smaller foreign ports throughout the Caribbean and Central America (Florida Ports Council, 2001). A sub-division of the State of Florida, this Foreign Trade Zone (#135) is considered an independent special taxing district (an autonomous port). It has a draft of thirty-two feet. Primary export products include: sugar, molasses, cement, utility fuels, water, produce, and breakbulk products. The Port of Palm Beach is regarded as the fourth busiest container port in Florida and the 18th busiest in the continental United States (Port of Palm Beach, no date).

Between January 2001 and September 2001, the total dollar value of all exports ($643,442,156) and imports ($613,138,623) at the Port of Palm Beach equaled $1,256,580,779 (Florida Ports Council, 2001). Total tonnage for the 2000-01 fiscal year amounted to 3,222,792 (1,173,598 export; 374,959 import; 1,774,235 domestic) (Florida Ports Council, 2001).

Encompassing 2,190 acres, the Port of Everglades spans three population centers in Broward County: Fort Lauderdale, Hollywood, and Dania. It ranks as one of the nation's leading container and cruise ports. Indeed, with more than 30 cruise ships, this port is the second busiest cruise port in the world (Florida Ports Council, 2001). With a channel depth of 43 feet, Port Everglades also boasts the deepest harbor in the State of Florida. The Port of Everglades' cargo includes petroleum, aggregate, cement, scrap metal, tallow, gypsum, steel/coils/rebar, lumber, particle board, and plywood (Broward County Florida, no date).

Between January 2001 and September 2001, the total dollar value of all exports ($3,364,349,369) and imports ($301,843,120) at Port Everglades equaled $7,837,211,538

(Florida Ports Council, 2001). Total tonnage for the 2000-01 fiscal year amounted to 23,743,820 (6,200,000 export; 5,343,820 import; 12,200,000 domestic) (Florida Ports Council, 2001).

Located in Dade County, the Port of Miami-Dade is the world's busiest cruise port. In fiscal year 2000, the Port of Miami-Dade economically impacted Dade County in excess of eight billion dollars and supplied approximately 45,000 jobs. Top import products at this port include: tiles, refrigerated fruits and vegetables, alcoholic and non-alcoholic beverages, apparel, lumber products, paper, iron, steel, and fabricated wood products. Primary export commodities include: textiles, trucks and buses, newsprint, towels, non-refrigerated food products, spare parts, iron, steel, plastic, rubber goods, electrical machinery and equipment, and office equipment and supplies (Port of Miami, 2004).

Between January 2001 and September 2001, the total dollar value of all exports ($6,737,557,934) and imports ($6,397,065,624) at the Port of Miami-Dade equaled $13,134,623,558 (Florida Ports Council, 2001). Total tonnage for the 2000-01 fiscal year amounted to 8,247,004 (3,620,332 export; 4,626,672 import) (Florida Ports Council, 2001).

The Port Operations for the City of Key West is primarily a port-of-call for a growing number of cruise ships. Between January 2001 and September 2001, the total dollar value of all exports ($39,704,884) and imports ($1,096,334) at the Port of Key West equaled $40,801,218 (Florida Ports Council, 2001).

The State of Florida also has a strong railway infrastructure. It is part of the Latin American Trade and Transportation Study (LATTS) Strategic Rail System. LATTS was formed in 1996 for purposes of "identifying trade opportunities with Latin America, evaluating infrastructure investments needed to support growth in international trade, and developing strategies to guide infrastructure investments" (Wilbur Smith Associates, 2002a). There are 1,548 miles of track in the Florida portion of the Strategic Rail System.

Florida is served by two Class 1 railroads: *CSX Transportation*, which extends west to New Orleans and north to all the major eastern cities, and the *Norfolk Southern*. Additionally, the *Florida East Coast* runs between Jacksonville and Miami, while the *Bay Line* serves the Port of Panama. In 1996, these railroads transported a total of 2,454,103 tons within and through Florida. Commodities shipped include: chemicals, farm products, pulp and paper, nonmetallic minerals, waste and scrap (Wilber Smith Associates, 2002a). *Amtrak* is the state's primary passenger rail service provider.

Media and broadcasting operations in Florida provide a wide variety of venues for receiving news, information, weather, and entertainment. For example, 64 television stations broadcast out of Florida. The most active broadcast sites are located in Leon County (five); Lee County (five); Palm County (six); Hillsborough County (ten); Miami-Dade County (eleven); and Orange County (eleven) (Florida Smart, 2000a). There are also approximately 140 AM/FM radio stations broadcasting throughout Florida. These channels offer a wide range of musical and informational options in both English and Spanish (Florida Smart, 2000c. Additionally, numerous daily and weekly newspapers in both English and Spanish are distributed throughout Florida: 21 in the southeast region, nine in the southwest, four in the Florida Keys, eight in the central-east, eight in central Florida, 13 in the central-west, 14 in the northeast, and 15 in the northwest. Additionally, there are several on-line, specialty, and school newspapers in circulation (Florida Smart, 2000b).

Physical Infrastructure. There are 56 regulated electric utility companies supplying Florida's electricity. These include: the Florida Public Utilities Company; Florida Power and Light; Tampa Electric Company; Florida Solar Energy Center; FPL Group; Florida Progress

Corporation; Synergy Network; Choctawhatchee Electric Cooperative, Incorporated (CELCO); Southern Company; Alabama Electric Cooperative; Central Florida Electric Cooperative, Incorporated; Clay Electric Cooperative, Incorporated; Escambia River Electric Cooperative, Incorporated; Florida Keys Electric Cooperative Association, Incorporated; Glades Electric Cooperative, Incorporated; Gulf Coast Electric Cooperative, Incorporated; Gulf Power Company; Jacksonville Beach Electric; JEA; Keys Energy Services; Kissimmee Utility Authority; Lee County Electric Cooperative, Incorporated; Moore Haven Municipal Light Department; Okefenoke Rural Electric Membership Corporation; Orlando Utilities Commission; Peace River Electric Cooperative, Incorporated; Progress Energy Florida, Incorporated; Reedy Creek Improvement District-Utilities Division; Seminole Electric Cooperative, Incorporated; Sumter Electric Cooperative, Incorporated; Suwannee Valley Electric Cooperative, Incorporated; Talquin Electric Cooperative, Incorporated; Tri-County Electric Cooperative, Incorporated; West Florida Electric Cooperative Association, Incorporated; and the Withlacoochee River Electric Cooperative, Incorporated. Additionally, 23 municipalities supply their own electricity (Florida Public Service Commission, 2002a).

Seven regulated gas utilities meet Florida's natural gas needs: City Gas Company of Florida; Florida Division of Chesapeake Utilities Corporation; the Florida Public Utilities Company; Indiantown Gas Company; Peoples Gas System; Sebring Gas System, Incorporated; and the St. Joe Natural Gas Company (Florida Public Service Commission, 2002b).

There are 177 companies serving Florida's water and sewer needs in the state of Florida. In addition to the individual municipalities, these suppliers include: Escambia County Utilities Authority; Regional Utilities; Bay County Water and Sewer Department; Water Management District of N/W Florida; Liberty County; Franklin County; Talquin Electric Cooperative, Inc.; City of Tallahassee Utilities; Wakulla County Sewer System; Suwannee River Water Management District; Gainesville Regional Utilities; Florida Public Utilities; JEA; Florida Water Services; Clay County Utility Authority; St. Johns County Utilities; North Beach Utilities; Sunshine Utilities; Marion County; Ocala Oaks Utilities, Inc., Southern States Utilities; Hernando County Utilities; Pasco County Utilities; Southwest Florida Water Management District; Tampa Bay Water District; Pinellas County Utilities; Bradenton Public Works; Palmetto Public Works; Manatee County Public Works; Sarasota County; Charlotte County Utilities; Englewood Water District; Gulf Utilities; Bonita Springs Utilities; Collier County Public Works Division; Port LaBelle Utilities; Okeechobee Utility Authority; County of Okeechobee; Ft. Pierce Utilities Authority; St. Lucie County Utilities; Hobe Sound Water Company; Hydratech Utilities; Miami-Dade Water & Sewer Authority; and Florida Keys Aqueduct Authority (Enterprise Florida, 2002).

Floridians have a wide variety of telecommunications companies at their disposal. As of 2002, there were 1,668 telecommunications companies serving the state (Florida Public Service Commission, 2002c).

Interaction of Biophysical and Built Environments. Florida is a relatively polluted state. In 2001, it ranked 13th of 56 U.S. states and territories in terms of total environmental releases (one being the most polluted). In this same year, Florida ranked in the 75th percentile for total environmental releases (118,403,222 pounds) and in the 65th percentile for cancer risk (air and water) (one being the cleanest). Additionally, Florida's total cancer risk scores have increased 24 percent from 1988 to 2001 (Scorecard, 2003).

Of Florida's total 2001 environmental releases (118,403,222), air releases accounted for 83,411,201 pounds, while water and land releases totaled 1,590,342 and 9,604,573 pounds,

respectively. Additionally Florida's 2001 off-site transfers totaled 37,861,061 pounds, while production related wastes equaled 407,417,985 pounds (Scorecard, 2003).

In 2001, Florida's top 25 (of 100) releasing facilities, with their releases in pounds in benzene-equivalents, were: Solutia Inc., (24,079,894); Progress Energy Crystal River Energy Complex (11,562,052); Gulf Power Co. Plant (11,512,067); Tampa Electric Company Gannon Station (9,824,781); JEA St. John's River Power Park/Northside Generating Station (7,787,772); Seminole Generating Station (4,525,886); International Paper (3,158,257); Jefferson Smurfit Corporation (2,581,609); Stone Container Corporation (2,075,194); Buckeye Florida L.P. (1,966,746); Gainesville Regional Utilities Deerhaven Generating Station (1,861,294); Georgia-Pacific Corporation Paper Mill (1,784,648); C.D. McIntosh Jr. Power Plant (1,779,465); Stanton Energy Complex (1,330,755); Rayonier Incorporated (1,305,978); FPL Manatee Power Plant (1,298,410); Cargill Fertilizer Incorporated Riverview (1,264,685); Cedar bay Generating Company (1,210,120); Gulf Power Company Plant Lansing Smith (1,096,121); Tampa Electric Company Big Bend Station (1,064,366); Farmland Hydro L.P. (993,445); Gold Kist Live Oak Processing Plant (968,146); IMC-Phosphates Company New Wales Plant (936,181); U.S. Sugar Corporation Bryant Mill (902,208); and Progress Energy Florida Anclote Power Plant (756,239) (Scorecard, 2003).

The top 14 (of 28) chemical releases most presenting a cancer risk to Florida in 2001, with pounds in benzene-equivalents, included: cadium compounds (13,000,000); arsenic (organic or inorganic) compounds (11,000,000); chromium compounds (800,000); lead compounds (640,000); nickel compounds (490,000); benzene (380,000); chromium (230,000); chloroform (190,000); dichloromethane (170,000); lead (80,000); acrylonitrile (65,000); tetrachloroethylene (65,000); chloromethane (22,000); and beryllium (15,000) (Scorecard, 2003).

C. HISTORY

Settlement. The Paleo-Indians, who came into the region approximately 10,000 B.C.E, were the first people to inhabit present-day Florida. These nomads crossed the Bering Strait and eventually occupied much of the modern day United States. In Florida, these inhabitants settled along the St. Johns River, the Atlantic coast, the Hillsborough River drainage, and interior northern Florida. By the late Archaic, several groups inhabited the coastal areas, developing new forms of fired clay pottery (Milanich, 1996).

About 300 A.D., the Weeden Island culture thrived in present-day Sarasota County and stretched along the Gulf Coast to Alabama. In approximately 800 A.D., however, the Alachua culture migrating from Georgia began to replace the Weeden Island culture in northern Florida. The Potanos (descendants of the Alachua people), the Calusa, and the Timucan peoples followed the Alachua (Milanich, 1996).

At the time of European exploration and colonization, fish was the primary source of food along the Gulf Coast. The non-agrarian Calusas, Ais, and Tequestas, who occupied southern Florida, subsisted entirely on fish, shellfish, and wild food gathering (Hudson, 1976).

Timucuans and Apalachees inhabited the northern areas of Florida. While the Huguenots attempts to convert the Timucuans failed, Menéndez de Avilés, sent from Catholic Spain to suppress the Protestant French in 1565, successfully recruited Timucuan allies and attacked the French (Hudson, 1976).

The Seminole people also inhabited Florida during the colonial era. The Creek people moved into Florida in the 18th and 19th century after earlier Native Americans inhabitants were killed or assimilated. The Creeks began using the Apalachee region as a winter hunting ground

in the 1740s, later establishing a number of permanent towns in north Florida. Gathering activities dominated their subsistence (Hudson, 1976).

In 1957, the Seminole people organized the Seminole Tribe of Florida. By the latter part of the 20th century, these people were working on commercial vegetable farms or cattle ranches. While the Seminoles are still subsistence hunters, they supplement their income with tourist-targeted handicrafts. In 1961, a faction of the Seminole people living along the Tamiami Trail organized themselves to form the Miccosukee Tribe. In 1967, there were 1,000 Seminole people, 150 Miccosukee people and 200 Trail Mikasuki people in Florida. Two federal reservations, Brighton Reservation and the Big Cypress Reservation are located in the south of Florida (Hudson, 1976).

Spanish explorers such as Ponce de León, de Narváez, Cabeza de Vaca, de Soto, and Luna were the first Europeans to arrive to the region of present-day Florida. The years between 1567 and 1705 constituted Florida's "mission era," resulting in the establishment of 32 missions serving over 200 settlements comprised largely of soldiers. These missions were built from St. Augustine north along the coast and west to the state's inland region (Hann, 1996).

During the 17th century, the arrival of French, English, and Dutch explorers went unchallenged until the English established the colony of Carolina. As a result, the 18th century saw a number of wars between the French, English, and Spanish. The English gained rule in 1763 (Arnade, 1996).

Following this period, the urban centers of Mobile, Baton Rouge, Natchez, and Pensacola grew rapidly as a result of land grants offered by the English crown. Pensacola, the territory's capital, grew from 3,660 in 1785 to 8,390 in 1795 (Coker and Parker, 1996).

In 1784, Spain officially regained rule over Florida. Quarrels with the U.S. territories over land boundaries continued through the Creek War and the War of 1812. In 1819, however, Spain signed a treaty ceding East Florida to the U.S. (Coker and Parker, 1996). In 1845, Florida became the 27th state to join the Union.

Industrialization. Antebellum Florida's economy was largely based on agriculture. Its key products were cotton, corn, vegetables, and some sugarcane (Proctor, 1996). By the 1850s, cotton processing recorded at an all-time high, slave prices doubled, and lumber mills proliferated. The trans-peninsular *Florida Railroad*, between Ferdinanda and Cedar Keys, and the *Florida, Atlantic and Gulf Central Railroad,* between Jacksonville and Lake City, also began construction during this era. Benefiting from the newly established rail service, Jacksonville became a hub for the lumber industry, while Apalachicola served the cotton industry. At the same time, Pensacola and Key West served as military and shipping centers, and both Tampa and Fort Meade were centers for the cattle industry. Nevertheless, Florida remained a predominantly frontier state until well after the Civil War (Brown, 1996).

At the outbreak of the Civil War, Florida was the smallest state (in terms of population) and one of the poorest to secede. Nearly half of its 140,000 inhabitants were either free blacks or slaves; most lived in rural settings. While many skirmishes took place in Florida, only one major battle was fought. In 1864, the Confederate army won the Battle of Olustee, despite many injuries and deaths. Nevertheless, fifteen days after Robert E. Lee's surrender at Appomattox, Florida surrendered under Sam Jones, commander of the District of Florida (Brown, 1996).

Following Reconstruction and upon gaining home rule in 1877, Governor George Drew and his Democratic cabinet promised to restore peace to Florida. Henry Morrison Flagler helped restore Florida's railway infrastructure with the development of the *Jacksonville, St. Augustine,*

and Halifax River Railroad into the Florida East Coast System, which eventually extended to Miami and, later, to Key West (Proctor, 1996).

The 20th century saw a dramatic rise in its urban population. In 1880, only 10 percent of Florida's inhabitants were urban dwellers; by 1980, however, 90 percent of the state's residents lived in cities. Miami's, Tampa's, and Jacksonville's population increased the most, followed by Fort Pierce, Fort Myers, Bradenton, and Sarasota. In-migration, as opposed to a high birth-rate, largely accounts for this rapid population growth (Mohl and Mormino, 1996).

Development of the state's infrastructure boomed in the 1950s and 1960s. During this time, the Sunshine State Parkway and Florida's interstate highway system were established (Mohl and Mormino, 1996). At the same time, however, the 1950s was also an era of "deindustrialization" and initiated the start of a postindustrial economy – "the high-tech, computerized information businesses and the more fully developed (and low-paying) service economy" (Mohl and Mormino, 1996: 439). This economy centered on governmental, health, educational, financial services, travel, entertainment, and retailing. Climate controlled homes prompted further development, particularly in the 1960s. In 1970, 60 percent of homes had climate control, a giant leap from 18 percent in 1960 (Mohl and Mormino, 1996).

The same period also saw an increase in civil rights activism. The Ku Klux Klan maintained a strong presence in the Miami area following World War II, terrorizing citizens and killing the National Association for the Advancement of Colored People's (NAACP) leader, Harry Moore, in a dynamite blast to his home in 1951. A bus boycott in Tallahassee in 1956 highlighted the intrinsic segregation in the capital. In 1959, Miami lunch-counter sit-ins facilitated the desegregation of Miami's public accommodations and schools and, by the 1960s, brought Florida's African-American population in line with national freedom activities. Like many other areas across the nation, however, racial conflict continued in the decades that followed. In 1980, for example, Miami's Liberty City Riot occurred as a result of police violence in a predominantly African-American neighborhood, and racial tensions between the Miami and Tampa area police and local residents were commonplace (Mohl and Mormino, 1996).

Following Castro's rise to power in the 1960s, Cuban exiles initiated a trend of economic, political, and social change in south Florida, notably Miami. Regarded as well-educated and quick to assimilate, Cubans soon defined ethnic politics in the state. By 1990, 45 percent of Dade County's population was foreign born; nearly half of that population was Hispanic, while 53 percent spoke a language other than English at home. Beginning in the 1970s, Florida's immigrant population included a growing number of Haitians and Nicaraguans. Political organization among these groups has remained strong and served to maintain cultural and ethnic identity (Mohl and Pozzetta, 1996).

A rapidly aging population also characterized Florida in the 1970s and 1980s as more deaths than births were recorded. Pinellas, Sarasota, Charlotte and Pasco Counties recorded the highest death rates (Mohl and Pozzetta, 1996). According to Mohl and Pozzetta, "the positioning of Florida as home to large numbers of elderly Americans stemmed from several political, social, and economic developments: improved medical care, a national Medicare program, Social Security, improved pension plans, and air-conditioning" (1996: 423).

Oil. Florida's first oil well was drilled in Gadsden County. In 1892, the Owl Commercial Oil Company drilled two wildcat wells, reaching depths of 1,000 and 1,750 feet. Between 1901 and 1925, 27 more wildcat wells were drilled, the deepest of which (4,912 feet) was located in Washington County. None, however, produced oil. In addition to its barren

wells, Florida suffered several infrastructure limitations, including long distances to major pipelines, refineries and oil markets, and few industrial centers. Consequently, major oil companies did not consider Florida a viable location for development (Hughes, 1993). The U.S. Geological Survey, in fact, defined Florida as lying outside the area of an oil-bearing formation.

Nevertheless, drilling continued between 1926 and 1938. One 4,010 foot well at Cedar Key burned gas at the casing head for a few months. In 1928 oil scout Robert Steffey issued a report on a Polk County well at Kissengaen Springs drilled to 4,545 feet, and another well, drilled by the Ocala Oil Corporation, which set the state record in terms of depth at 6,180 feet (Hughes, 1993). Steffey also reported on the Gulf Refining Company, employing 12 magnetometer men at De Funiak Springs east of Pensacola. Steffey's reports subsequently invited renewed interest in Florida as a potential site for gas and oil development. In 1931, Ray Eastbrook drilled the Oil City Corporation No. 1 on 182,000 acres across the Choctawhatchee Bay. The state then leased 70,000 acres of the Choctawhatchee Bay to Islands, Inc., Miami, and 1.3 million acres to Island Inc., covering all lands from high tide to a mean depth of 12 feet. These state leases specified that a well must be started within one year and drilled to a depth of more than 5,000 feet (Hughes, 1993).

In 1932, five wells were drilled in the state and initiated the first involved exploration of the Florida peninsula. Also in 1933, an extensive reflection seismographic survey conducted between Ocala and Monticello concluded with a "comprehensive drilling campaign" (Hughes, 1993: 130). During this campaign, the newly established Oil Development Company of Florida and the Florida Oil League commenced drilling of the South Lake Well in Lake County in 1935. Drilled to a depth of over 6,000 feet, this well provided geologists with invaluable core samples. In the mid 1930s, the Humble Oil and Refining Company also asserted an interest in Florida activities (Hughes, 1993).

In the 1940s, rising oil consumption by the U.S. Atlantic states, World War II industrial demands, and the loss of domestic tankers to German submarines around Floridian peninsulas spurred the completion of the "Big Inch" and "Little Inch" pipelines in southeastern and northern Florida. These pipelines helped clean up Florida's perpetually oil flooded beaches (Hughes, 1993).

Oil was at last discovered in October 1943. A year later, the State of Florida offered a $50,000 "finder's fee" to whoever discovered the state's first significantly producing well. Humble Oil and Refining Company's discovery of a well that consistently produced 125 barrels of oil and roughly 450 barrels of water per day for many months entitled them to claim the reward. In 1945, the No. 4 Gulf Coast Realty well in Sunniland Field became the state's second highest producing well. By the end of 1945, this field had produced 43,254 barrels of oil (Hughes, 1993).

Although Florida's deepest well (18,670 feet) was completed in 1975, the state's oil production did not peak until 1978, when 47.5 million barrels of oil were produced (Independent Petroleum Association of America, 2004). In 1990, Florida was the 19th largest crude petroleum producer in the U.S., bringing in 6 million barrels. In 2000, however, Florida produced only 5 million barrels of oil; its ranking subsequently fell to 20th in that year (U.S. Census Bureau, 2002).

The first lease sale of OCS territory in waters off of the Florida coast occurred in 1959. Since 1969, 10 lease sales, with 500 tracts, were held in the eastern Gulf of Mexico Area, but drilling was limited. In the 1980s, offshore oil and gas exploration began, with particular attention to the Jurassic Norphlet Formation off of the Panhandle, a formation that has proven

profitable to neighboring Alabama. Between 1974 and 1994, 29 wells were drilled in the Pensacola and Destin Dome Blocks, but only six produced natural gas. In 1987, 1989, and 1995, Chevron drilled three exploration wells in this region. A year after the last well was drilled, Chevron, along with Murphy and Conoco, submitted a plan to develop 11 lease blocks for natural gas in the Destin Dome area. This plan was rejected by the State of Florida in 1998, the same year that a congressional act halted federal OCS leasing activity. Currently, there are no active leases off of Florida's Atlantic coast, yet there are approximately 150 active leases in the eastern Gulf of Mexico in the Panhandle region.

Offshore oil exploration off Florida's coast in the latter part of the 20th century fueled debates regarding the environmental and socioeconomic impact of such activity. In 1989, concerns over a lease sale in Florida prompted President George H.W. Bush to announce the establishment of a cabinet-level task force to study the environmental effects of this development. Subsequently, a hearing before the Subcommittee on Water, Power and Offshore Energy Resources of the House of Representatives explored the possibility of a permanent ban on oil and gas leases on certain portions of Florida's OCS.

Currently, neither refineries nor rotary rigs operate in the state. There are, however, 73 producing wells as of 2002. Major pipelines include the Genesis, Sunniland, the Everglades, and Enterprise Pipelines. Crude oil proved reserves totaled 75 million barrels in 2001, ranking 15th in the nation. This figure accounts for less than one percent of total U.S. crude oil production. In contrast, the year 2000 oil rate per well was 175 barrels a day, while, in 1994, the oil rate per well was 188 barrels per day (USDOE, EIA, 2004a).

D. DEMOGRAPHIC CHARACTERISTICS

Population Growth. Throughout the 20th century, Florida has experienced rapid population growth. Immigration has been particularly high in this state, as has emigration from other U.S. states. The largest population increase occurred in the 1920s and 1950s as thousands of Georgians and Caribbean immigrants flooded the state (Mohl and Mormino, 1996). In 2000, the population of Florida was nearly 16 million, making it the fourth most populous state in the nation and reflecting a growth rate of nearly 24 percent since 1990 (Table 1) (U.S. Census Bureau, 2000b).

Table 1

Population Changes, Florida State: 1920 to 2000

Year	Population	Change from Previous Census	Percent Change from Previous Census
2000	15,982,378	3,044,307	23.5
1990	12,938,071	3,190,965	32.7
1980	9,746,961	2,955,543	43.5
1970	6,791,418	1,839,858	37.1
1960	4,951,560	2,180,255	78.7
1950	2,771,305	873,891	46.1
1940	1,897,414	429,203	29.2
1930	1,468,211	499,741	51.6
1920	968,470	215,851	28.7

Source: U.S. Census Bureau, 2000b.

Ethnicity and Age. In 1920, African-Americans comprised 34 percent of Florida's population. This figure steadily declined to 29 percent in 1930; 27 percent in 1940; 21 percent in 1950; and 18 percent in 1960 as the Caucasian population increased. While Hispanics have always figured prominently in Florida's population count, the proportion of Hispanics to non-Hispanics increased significantly after the Cuban refugee exodus in the 1970s and 1980s (U.S. Census Bureau, 2000b). More recently, the state accommodated an influx of Nicaraguan refugees, Mexicans, and Puerto Ricans (Mohl and Mormino, 1996). The Census records the 2000 population as 78 percent White, 15 percent African-American or Black, 17 percent Hispanic, 2 percent Asian, 0.3 percent American Indian, and 5 percent "other" (Table 2).

Table 2

Racial and Ethnic Populations, Florida State: 2000

Race/Ethnicity	Population	Percent
White	12,465,029	78.0
African American	2,335,505	14.6
Hispanic*	2,682,715	16.8
American Indian	53,541	0.3
Asian	266,256	1.7
Pacific Islander	8,625	0.0
Other Race	477,107	3.0
Two or More Races	376,315	2.3

* Hispanics may be of any race

Source: U.S. Census Bureau, 2000b.

In 2000, 23 percent of Florida's residents were less than 18 years old, while 18 percent were 65 years of age and older. The median resident age was 38.7 years old, which falls above the national median age of 35.3 (U.S. Census Bureau, 2000b).

E. ECONOMY

Income and Poverty. In some respects, Florida is less well off economically than other southern states; in others, however, Florida is either comparable to, or better off than, the nation as a whole (Table 3). For example, the 1999 median family income in Florida was $45,625; or 91 percent of the national median ($50,046), but Florida's poverty rates for both individuals (13%) and families (9%) are comparable to national rates. Still, single women with minor children are the least advantaged population at both the state and national level. In Florida, single females with minor children headed only 10 percent of all Florida families but accounted for 33 percent of all families living in poverty. In comparison, single females with minor children headed 12 percent of all families at the national level, while they represented 44 percent of all families living below the poverty threshold. Florida households also relied slightly less on public assistance (2.8%) in 1999 than did the nation as a whole (3.4%) (U.S. Census Bureau, 2000b).

Table 3

Income, Poverty and Family Structure, Florida State: 1970-2000

Year	Median Family Income	Change from Previous Census	Ratio to National Median	Persons in Poverty	Households Receiving Public Assistance*	Female-Headed Families with Children
2000	$45,625	$13,413	0.91	12.5%	2.8%	10.4%
1990	$32,212	$3,256	0.91	12.7%	5.8%	9.7%
1980	$28,956	$2,957	--	13.4%	--	--
1970	$25,999	$7,470	--	16.4%	--	--

*Prior to the Census 2000, the Decennial Census enumerated "persons" receiving public assistance rather than "households".

Source: U.S. Census Bureau, 2000b).

Employment. Historically, agriculture, fishing, and forestry comprised Florida's economic backbone. Its rich forests, its wealth of salt and fresh water bodies, and its agricultural base of cotton and livestock all provided ample employment opportunities. Demographic changes throughout the 20th century, however, led to the decline of employment in these sectors. By 1940, the agricultural sector employed only 116,799 individuals, compared to the wholesale and retail trade sector with 139,166 employees, and the services sector with 130,703 employees. Retail and wholesale trade, in fact, maintained a stronghold on the state's economy throughout the 20th century. By 2000, well over 1 million people were employed in trade, representing 18 percent of the labor force. Nevertheless, this figure represents a decline from 1990, when employment in this sector peaked at 1.4 million employees, or 24 percent of the labor force. As of the year 2000, Florida's services sector employed 44 percent of the labor force, while mining employed less than 1 percent (Table 4) (U.S. Census Bureau, 2000b).

Table 4

Employment in Major Industrial Sectors, Florida State: 1990-2000

Year	Agric., Fishing & Forestry	Mining	Constr.	Manuf.	Trans., Comm. & Public Util.	Wholesale & Retail Trade	Finance, Insurance & Real Estate	Services	Public Admin.
Workers in Sector									
1990	167,418	11,095	450,503	608,821	444,762	1,405,861	468,324	1,962,616	291,067
2000	72,578	65,576	562,111	507,870	374,179	1,221,809	563,552	11,096,366	360,910
Percent of Workers in Sector									
1990	2.9%	0.2%	7.7%	10.5%	7.6%	24.2%	8.1%	33.8%	5.0%
2000	1.0%	0.9%	8.0%	7.3%	5.3%	17.5%	8.1%	44.3%	5.2%
Growth from Previous Census									
2000	-130.7%	491.0%	24.8%	-19.9%	-18.9%	-15.1%	20.3%	465.4%	24.0%

Source: U.S. Census Bureau, 2000b.

The 20 largest employers in the State of Florida in 2004, with their corresponding location and number of employees, were: Hulett Environmental (Orlando/25,407), University of Florida (Gainesville/18,000), Pensacola NAS (Pensacola/15,000), Florida Hospital (Orlando/14,000), Convergys Corp. (Jacksonville/10,000), Shands Hospital (Gainesville/7,000), Arnold Palmer Hospital-Children (Orlando/7,000), Lee Memorial Health System (Ft. Myers/6,000), Florida Hospital (Orlando/6,000), Jackson Memorial Hospital (Miami/5,674), Revenue Dept. (Tallahassee/5,500), Dade County Police-Recruitment (Doral/5,300), Metro Dade County Police Dept. (Doral/5,300), St. Joseph Hospital (Tampa/5,200), Mease Hospitals (Dunedin/5,000), Baptist Hospital of Miami (Miami/5,000), NCH Health Care System (Naples/5,000), Miami Studio Rentals (North Miami/5,000), and Baptist Health Care (Pensacola/5,000) (InfoUSA, 2004).

There were 33 companies listed among the *Fortune 1,000* in 2005. The top five are: Tech Data, Auto Nation, Publix Super Markets, Office Depot, and the Winn-Dixie stores (Fortune 500, 2005).

Industry. Manufacturing remains important to Florida's economy. Of durable goods ($10.8 billion in earnings), non-motor vehicle transportation equipment was the most important industry in 1990, bringing in $2.4 billion. Electronics and electrical equipment brought in $2.2 billion. Of nondurable goods ($6.4 billion in earnings), printing and publishing was the key industry, bringing in nearly $2 billion in workers' earnings in 1990. By 1999, electronics and electrical equipment replaced non-motor vehicle transportation as the leading durable goods manufacturing industry in terms of workers' earnings. In this year, electronics brought in nearly $3.5 billion of the $14.2 billion in workers' earning in the durable goods sub-sector, while "other" transportation equipment brought in $2.4 billion. Of the non-durable goods sub-sector, printing and publishing brought in $2.8 billion in workers' earnings in 1999 (Table 5) (U.S. Department of Commerce, Bureau of Economic Analysis, 2000).

Table 5

Earnings in Major Industry Sectors and Selected Sub-sectors, Florida State: 1990-1999

Industry	Earnings (Constant 2000 $1000's)		Share of Earnings	Change	Share of Change
	1990	1999	1999	1990-1999	1990-1999
Earnings	$162,440,858	$280,483,977	100.0%	$118,043,119	100.0%
Farm Earnings	$2,079,204	$2,928,117	1.0%	$848,913	0.7%
Ag. Services, Forestry, and Fishing	$1,675,986	$2,794,741	1.0%	$1,118,755	0.9%
Fishing	$118,336	$90,630	0.0%	-$27,706	-0.02%
Mining	$389,191	$429,259	0.2%	$40,068	0.03%
Oil and gas extraction	$68,829	$60,689	0.0%	-$8,140	0.0%
Construction	$10,981,246	$16,644,953	5.9%	$5,663,707	4.8%
Special trade contractors	$6,873,324	$10,695,772	3.8%	$3,822,448	3.2%
Manufacturing	$17,140,850	$22,517,927	8.0%	$5,377,077	4.5%
Fabricated metal prods.	$1,003,217	$1,349,550	0.5%	$346,333	0.3%
Indust. machine & equip.	$1,631,975	$1,773,876	0.6%	$141,901	0.1%
Food and kindred	$1,457,247	$1,798,951	0.6%	$341,704	0.3%
Chemicals and allied	$1,052,166	$1,394,755	0.5%	$342,589	0.3%
Petroleum and coal	$72,528	$106,371	0.0%	$33,843	0.0%
Transportation and Public Utilities	$10,346,319	$17,929,606	6.4%	$7,583,287	6.4%
Trucking & warehousing	$1,903,539	$3,294,117	1.2%	$1,390,578	1.2%
Water transportation	$524,410	$943,598	0.3%	$419,188	0.0%
Transportation by air	$1,866,907	$3,328,625	1.2%	$1,461,718	1.2%
Wholesale Trade	$10,360,217	$18,450,819	6.6%	$8,090,602	7.0%
Retail Trade	$19,191,128	$30,616,733	10.9%	$11,425,605	10.0%
Eating & drinking places	$4,712,842	$7,648,530	2.7%	$2,935,688	2.5%
Finance, Insurance, and Real Estate	$11,506,720	$29,080,317	10.4%	$17,573,597	15.0%
Services	$47,416,370	$93,107,232	33.2%	$45,690,862	39.0%
Business services	$7,729,185	$24,100,577	8.6%	$16,371,392	13.8%
Health services	$16,061,610	$25,616,642	9.1%	$9,555,032	8.0%
Legal services	$3,996,834	$6,203,501	2.2%	$2,206,667	2.0%
Engineering and management services	$5,363,570	$11,096,928	4.0%	$5,733,358	4.9%
Government	$31,343,627	$45,984,273	16.4%	$14,640,646	12.4%

Source: U.S. Department of Commerce, Bureau of Economic Analysis, 2000.

The government sector also contributes greatly to the state's economy. In 1999, state and local government offices contributed over $33.7 billion of the $46 billion in government and government enterprises. Local government positions brought in $25.6 billion. By contrast, military earnings were less than $4.5 billion (U.S. Department of Commerce, Bureau of Economic Analysis, 2000).

In June 1999, Florida had 4,509 banking and savings institutions, with deposits totaling $200 billion. Expenditures in federal funds and grants in this same year totaled $87.2 billion (U.S. Census Bureau, 2002).

Marine-based Activities. Florida has a wealth of marine-based activities feeding its tourism and retirement industries. As a result, the state's economy is heavily reliant upon such activities.

Florida is among the top 12 states in terms of seafood production. In 2003, approximately 99 million pounds of seafood with a dockside value of over $172 million dollars were harvested. Tropical fish were the top commodity, accounting for $47 million in sales in this same year (Florida Department of Agriculture and Consumer Services, 2004). Other targeted species include shrimp, stone crab, spiny lobster, oysters, scallops, shark, mackerel, snapper, grouper, mullet and farm-raised catfish.

Florida has a recent history of involvement in the Rigs-to-Reef program. The recycling of retired oil platforms from Louisiana and Texas and their transformation into artificial reefs has proven advantageous to fishery management. The first conversion of an oil structure took place in 1979, when Exxon relocated a decommissioned sub-sea template from offshore Louisiana to offshore Franklin County, Florida. In 1982, Tenneco deployed a platform jacket and deck offshore in Escambia County; in 1985 it deployed five platform jackets in two reefs offshore in Dade County. Most recently Chevron deployed two platform jackets offshore in Escambia County. These five reefs structures are only a handful of the 1,650 total public reef sites in the state, but they enhance fishery resources in the marine environment (U.S. Department of the Interior, Minerals Management Services, 2003).

Military Installations. There are presently 21 active military installations in the State of Florida. These installations include seven Air Force bases, two Army bases, 11 Navy facilities, and one Coast Guard facility.

Located in Okaloosa County in northwestern Florida, Eglin Air Force Base (AFB) was established in the 1930s as a bombing and gunnery base. During World War II, Eglin Field served as an important armaments testing facility for the Army Air Force (Global Security, 2002b). This base now occupies 724 square miles of land (50% of Okaloosa County), and is the largest AFB in the western democracies. Additionally, the base's dominion includes 101,000 square miles of air space that extends over the eastern third of the Gulf of Mexico, while its Gulf Test Range (98,000 square miles) spans much of the Gulf. Eglin AFB also owns land in neighboring Santa Rosa and Walton counties in Northwest Florida (Eglin Air Force Base, 2000). Eglin AFB employs approximately 10,000 military and 10,000 civilian personnel, and contributes a payroll of $635 million per year (Global Security, 2002b).

Eglin AFB is also home to the 39th Bomb Wing, the 4135th Strategic Wing, and the Air Armament Center. The Air Armament Center has the primary responsibility of developing, testing, and acquiring all air force non-nuclear weapons systems. Additionally, Elgin maintains an army training area in Fort Walton Beach (Eglin Air Force Base, 2000).

Formerly an auxiliary of Eglin, and also located in Okaloosa County, Hurlburt Field is now home to the Air Force Special Operations Command and the 16th Special Operations Wing.

Hurlburt Field houses 8,200 military personnel and civilians, and contributes $394 million to the local economy (Global Security, 2002b).

The Avon Park Air Force Base was transferred to the control of MacDill Air Force Base in 1962, and today is known as MacDill AFB Auxiliary Field. Used for official military business only, this airfield is located eight miles northeast of Avon Park in Tampa. MacDill has two runways, the longest of which is 8,000 feet.

The 125th Fighter Wing of the Florida Air National Guard is located at Jacksonville International Airport. This 325,000 square foot installation is used to train personnel to protect life and property in times of peace (state) and war (federal). On a daily basis, the 125th Fighter Wing (FW) is in charge of maintaining a NORAD Air Defense Alert site at the Homestead Air Force Base. In this capacity, the 125th FW provides armed F-15 aircraft "capable of intercepting, identifying, and, if necessary, destroying unknown aircraft which penetrate sovereign U.S. airspace" (Florida Air National Guard, 2003; Global Security, 2002e).

The Homestead Joint Air Reserve Base (JARB) is home to the 482nd Fighter Wing, Air Force Reserve. Its purpose is to maintain and operate the Homestead Air Reserve Base, located about 25 miles south of Miami in the southern end of the Florida peninsula. This combat-ready unit employs more than 1,500 military personnel, 950 part-time reservists, and 250 full-time reservists. Combat units from all over the world come to Homestead to train with its state-of-the-art Air Combat Maneuvering Instrumentation (Global Security, 2002d).

Tyndall Air Force Base is located in the southeast portion of Bay County. This base covers 29,000 acres, and is home to the 325th Fighter Wing, Headquarters 1st Air Force, the 475th Weapons Evaluation Group and various support groups.

Located on Florida's east coast on a barrier island in Brevard County, the Cape Canaveral Air Station was renamed the "Cape Canaveral Air Force Station" in 2000. This 16,000 acre station is home to the 45th Space Wing Command, and employs approximately 1,000 military personnel and 7,500 civilian contractors. Its primary function is to launch rockets for the military, private companies and NASA's space shuttle program (Florida Today Space Online, 2002).

Patrick Air Force Base is located in Cocoa Beach. This 2,100-acre base is home to the 920th Air Force Reserve Rescue Group, employing approximately 1,350 military personnel and 1,000 civilian contractors (Florida Today Space Online, 2002).

Camp Blanding is the Florida Army National Guard's primary training area. This 73,000 square acre installation is located near Jacksonville on the shores of Kingsley Lake.

Escambia County's Naval Technical Training Center (NATTC) Corry Field is located in Pensacola. Today, the primary mission of NATTC Corry Field is to provide technical and military training in cryptology, information operations, electronic warfare, instructor training, and information systems (Global Security, 2002j).

Naval Air Station, Jacksonville is the third largest naval installation in the United States. It houses a large population of active duty as well as retired military personnel and their families. Naval Air Station, Jacksonville also employs more than 23,000 active duty military and civilian personnel. It is estimated that this installation contributes $2 billion to the local community per year. This 3,896-acre Navy installation is located in St. John County along the St. John River. A multi-mission base, this station is home to the Patrol Wing Eleven, the southern component of the Atlantic Fleet P-3C force, and VP-30, the Fleet Replacement Squadron for that aircraft. The Sea Control Wing Atlantic and its five squadrons of S-3B aircraft, and the Helicopter Antisubmarine Wing Atlantic also make their home in Jacksonville. In 1999, 17,200 acres of the

formerly active Cecil Field were transferred to Naval Air Station, Jacksonville. As directed by Congress in defense Base Realignment and Closure (BRAC) 1993 and BRAC 1995, Cecil Field ceased military operations in late 1999 (Global Security, 2002e).

The Naval Aviation Depot (NADEP), Jacksonville is also located on the Naval Air Station Jacksonville base. It is primarily an industrial facility that repairs or modifies aircraft, engines, and aeronautical components. This depot sits on 100 acres and employs over 2,500 personnel (Global Security, 2002i).

The Navy Coastal Systems Station encompasses 648 acres of land along St. Andrew Bay in Panama City, Florida. The Coastal Systems Station trains personnel and conducts research on expeditionary maneuver warfare, coastal operations, diving and life support systems, mine warfare, naval special warfare and littoral science and technology. A United States Coast Guard Station is located within the Coastal Systems Station's facilities. It employs approximately 2,000 military and civilian personnel, and has an annual payroll of about $117 million (Global Security, 2002a).

The Naval Air Station, Key West is located in the southernmost portion of Florida on Boca Chica Key. The Gulf of Mexico and the Atlantic Ocean border this Key. Effective 2001, the Naval Air Station was redesignated as a "Naval Air Facility". This airfield has three asphalt runways and is the Navy's premier pilot training facility for transient tactical aviation squadrons. This Naval Air Station employs 1,650 active duty, and 35 reserve members. Additionally, 2,507 family members and 1,312 civilians live on the Key (Global Security, 2002h).

Mayport Naval Station Jacksonville, Florida is home to approximately 28 ships, including Aegis guided-missile cruisers, destroyers, and guided-missile frigates. In addition to being a seaport, Mayport is also an air facility, employing over 14,000 active-duty military and 1,400 civilian personnel. This 3,409-acre station is the third largest naval facility in the United States. Mayport is located in northeast Florida near the Port of Jacksonville on St. John's River (Global Security, 2002g).

Naval Air Station Pensacola is located in Florida's extreme northwest. Although primarily situated in Escambia County, operations extend into neighboring Santa Rosa County as well. This station is considered the "Cradle of Naval Aviation" as every Naval Aviator, Naval Flight Officer, and Enlisted Aircrewman receives his or her training here. Training Wing Six is its primary flying unit, which is co-directed by the Air Force. Additionally, this station is the primary practice location of the Blue Angels–the Navy's Flight Demonstration Squadron. Naval Air Station Pensacola employs more than 9,600 military and 6,800 civilian personnel (Global Security, 2002j).

The Navy's Saufley Field is located in Escambia County approximately 10 miles north of Naval Air Station Pensacola. This field is primarily used for practice landings and take-offs. It features two runways and over 34,425 square feet of hangar space. Saufley Field is also home to the Naval Education and Training Professional Development and Technology Center. Over 1,000 military personnel make their home at this base (Global Security, 2002k).

While located in Milton, Naval Air Station Whiting Field primarily conducts its operations in nearby Pensacola. Established in 1943, it is regarded as the busiest Naval Air Station in the world. More than 1,200 aviators complete their essential flight training at Whiting Field each year. Whiting Field is home to Training Air Wing 5, Training Squadrons 2, 3, and 6, and Helicopter Training Squadrons 8 and 18 (Global Security, 2002l).

The NavAir Training Systems Division is located in Orlando, Florida. Their mission focuses on the research, development, testing, evaluation, acquisition and product support of

training systems. NavAir also provides intra-service coordination and training support for the Army and Air Force (Naval Air Warfare Center, no date).

The Coast Guard Air Station in Clearwater, Florida is the Coast Guard's largest and busiest Air Station. It employs over 500 assigned personnel. The "war on drugs" is the Air Station's primary mission. Indeed, this station is responsible for many drug seizures and arrests every year, and is part of a multi-national, multi-agency effort drug program that operates throughout the Bahamas and the Caribbean. Air Station personnel also fly an average of 400 Search and Rescue missions each year.

Recreation and Tourism. Numerous recreational opportunities and festive events attract millions of tourists to Florida each year. For instance, outdoors enthusiasts can enjoy golfing, hiking, biking, hang gliding, SCUBA diving, horseback riding, canoeing, kayaking, camping, fishing, biking, bird watching, river tubing, and wildlife viewing at Florida's 157 state parks (Florida Department of Environmental Protection, 2004). Florida's other general attractions include zoos and aquariums, historical homes and estates, art museums, historical museums, music venues, professional sports events, and botanical gardens (Finding Florida, 2003).

Florida also boasts more theme parks than any other state in the United States. Major theme parks include: Walt Disney World, Epcot, Disney's Animal Kingdom, Disney-MGM Studios, Magic Kingdom, Busch Gardens, Sea World, Universal Studios, Splendid China, and The Holy Land Experience. Florida's major amusement parks include Fun Spot Action Park (Orlando), Miracle Strip Park (Panama City), Old Town (Kissimmee) and Sam's Fun City (Pensacola) (Finding Florida, 2003).

Water Parks are also popular tourist destinations in Florida. Among the most frequented are: Walt Disney World Water Parks (Orlando), Busch Water Parks (Tampa), Rapids Water Park (West Palm Beach), Shipwreck Island (Panama City), Water Mania (Kissimmee), Weeki Wachee Springs Waterpark (Spring Hill), Wet 'N Wild (Orlando), and Wild Waters Water Park (Ocala) (Finding Florida, 2003).

Florida's festivals and events are additionally huge tourist draws and include the Gasparilla Pirate Festival (Tampa/January); Fiesta Day (Tampa/February); the Florida State Fair (St. Petersburg/Tampa area/February); Hoggetowne Medieval Faire (Gainesville/February); Florida Renaissance Festival (Deerfield Beach/February); Florida Strawberry Festival (Plant City/February-March); Bike Week (Daytona Beach/March); the Chasco Fiesta (New Port Richey/March); Red Belly Day (Fanning Springs-Chiefland/May); Guavaween (Tampa/October); and the Florida Seafood Festival (Apalachicola/November) (Finding Florida, 2003).

Tourism and recreation are vital to Florida's economy. In 2001, Florida's tourism industry employed 870,100 persons and contributed $51 billion to the state's economy. Restaurants and lunchrooms ($19,549,925,733) and hotels/apartment houses ($11,721,811,499) generated the most revenue of any single sales category in this year. The Orlando, Tampa, and Miami Metropolitan Statistical Areas (MSAs) typically generate 43 percent of Florida's total tourism and recreation taxable sales in an average year, while Orange, Hillsborough, Monroe and Santa Rosa Counties usually contribute approximately one-third of Florida's total bed tax collections (Visit Florida, 2001). Florida's major tourist attractions include several theme parks, cruise ships, water parks, zoos and aquariums, beaches, fishing, hunting, and world-class golf accommodations. In fact, revenues from just Florida's golf courses (and its ancillary support services) equaled $4.44 billion in 2000 (Haydu and Hodges, 2002).

Florida's economic dependence on tourism has shaped the state's receptiveness to offshore oil drilling. Indeed, since oil exploration in Florida began in the early 1940s, Floridians have alternated between pro-oil and anti-drilling positions. For example, in the 1960s, Escambia County community leaders favored oil drilling along the region's Outer Continental Shelf (OCS) as a lucrative source of income for the local economy. Support was particularly strong among Floridians who favored offshore drilling in response to the mid-1970s energy crisis. However, as Florida's beach and water-related tourism experienced unprecedented growth—especially in Pensacola—public opinion shifted. Responding to the potential threat OCS presented to its "clean" image, regional leaders consistently opposed oil and gas production off Florida's coast through administrative deferrals, congressional moratoria and citizen awareness groups.

In large part, the prevailing anti-offshore oil drilling position espoused by civic leaders in Florida's coastal counties is driven by the state's economic dependence on tourism. The state's beaches, fisheries, and wildlife bring millions of visitors annually, supplying millions of jobs across the state and generating billions of dollars each year. The visible presence of offshore drilling platforms, opponents argue, would diminish the coastline's aesthetic value and discourage tourists who come to coastal Florida to experience its pristine beaches and stunning ocean views. Additionally, opponents contend, offshore drilling would endanger the regions southern reef systems and rich estuarine systems, whose brackish waters feed mangrove forests and seagrass beds that, in turn, provide a habitat for many species. According to Florida State Representative Porter J. Goss, onshore support bases could alter "the character of the Florida coast" by polluting the environment and threatening tourism and real estate industries (U.S. Congress, 1999). Further, "a major blowout/oil spill" in Lee County would potentially incur a loss of $590 million in revenue and 12,300 jobs (U.S. Congress, 1999).

Concerns about the effects of offshore oil drilling to Florida's tourism-based economy also come from environmental groups, such as the Sierra Club. The Senior Regional Representative of the Sierra Club provided the following view in a testimony to the U.S. Commission on Ocean Policy:

> Any such damage to the Florida coast would also have disastrous consequences for an economy dependent upon tourism, fishing, and water recreation. A number of Panhandle beaches are ranked in the top 10 U.S. beaches, and many of visitors to these beaches are fleeing the spoiled beaches of Louisiana and Texas. Florida's tourism industry generates $91.4 million per day in Florida and the commercial fishing industry $5-6 billion a year. In comparison, less than 1 percent of drilling jobs will go to Floridians, and virtually no income will be generated for the state (2002).

F. LOCAL GOVERNMENT

Governmental Structure. Florida's governmental body consists of three branches: executive, legislative, and judicial. The Governor heads the executive branch and is the acting CEO of the state. This elected personage serves a four-year term and is assisted by three elected cabinet members–an Attorney General, a Chief Financial Officer, and a Commissioner of Agriculture. The law making branch–the legislative–consists of a Senate (40 members) and a House of Representatives (120 members). There are also 25 congressional districts in the state. The judicial branch, which interprets Florida's laws as outlined in the State Constitution,

includes the Supreme Court, the District Court of Appeals, the Circuit Court, and the County Court. Seven governor-appointed justices preside over the Supreme Court (My Florida, 2004).

Revenues and Taxation. Florida imposes a state and use tax of 6 percent each. Retail sales tax is also 6 percent while corporate income tax is set at 5.5 percent. Additionally, Florida levies an intangible tax (per $1,000) of $1-$1.50. Florida does not assess personal income, inheritance, or gift taxes (State of Florida Department of Revenue, 2002). Other major taxes levied in Florida include: ad valorem tax, homestead and personal exemptions, cigarette tax, other tobacco tax, tangible property tax, documentary stamps, estate tax, alcohol tax, gasoline tax, tourist tax, and a water management district tax (My Florida, 2004).

In the fiscal year 2000, total state ($22,684,557,720) and local ($1,552,913,405) taxes for the State of Florida amounted to $24,237,471,125. Sales and use tax accounted for $14,933,807,686 (62% of the total) (State of Florida Department of Revenue, 2002).

G. SOCIAL CONTEXT

Education. There are 2,508 public K-12 schools in the State of Florida: 1,647 elementary, 463 middle and junior high schools, and 398 senior high schools (Florida Department of Education, 2001). There are also 11 public and 28 private or independent universities. These include: Florida Agricultural and Mechanical University, Florida Atlantic University, Florida Gulf Coast University, Florida International University, Florida State University, New College of Florida, University of Central Florida, University of Florida, University of North Florida, University of South Florida, and University of West Florida. In total, there were 251,984 undergraduate and graduate students enrolled in Florida's state university system at the start of the 2001 school year (Florida Department of Education, 2003).

On average, Florida's public classrooms (K-12) have the highest enrollment in the nation. In the 1999-00 school year, Florida averaged 768 pupils per elementary school compared to the national average of 488. Also in this school year, Florida's secondary schools averaged 1,396 students per school–almost 50 percent higher than the national average of 706 (Florida Department of Education 2003). In the 2000-01 school year, a total of 2,431,521 students were enrolled in Florida's K-12 public schools (53% Caucasian, 25% African-American, 19% Hispanic, 4% "other").

In the 2000-01 school year, there were 150,551 public K-12 teachers with a classroom teacher to pupil ration of 1:18. Sixty-one percent of these teachers held Bachelor's degrees, while 39 percent possessed degrees beyond the Bachelor's level (Florida Department of Education, 1998). Regardless of degree, the average teacher salary in this year was $38,717 in this year (Florida Department of Education, 2001). In the 2003-03 school year, the average elementary and secondary school teacher salary was $40,281; the national average was $45,771. The State of Florida ranked 29th of 51 states (ranking includes the District of Columbia) in terms of teacher salaries for this year. Teachers in California earned, on average, the highest salary at $55,693 (U.S. Census Bureau, 2005).

In the 2001-02, statewide dropout rates for grades 9-12 totaled 11,509, or 3 percent; this rate falls below the national drop out rate of 4.9 percent for this year (Bureau of Education Information and Accountability Services, 2003). In this same year, 59 percent of graduating high school seniors planned to enter college (Florida Department of Education, 2001).

In 1997, Florida's high school seniors' SAT scores averaged 998 points. This falls below the national average of 1,016. Florida's average ACT scores for this year (20.7) also fall a bit short of the national average (21.0) (Florida Department of Education, 1998).

Regarding adult educational attainment levels, the number of high school graduates residing in the State of Florida matches national rates. However, the number of residents possessing a four-year college degree or more is somewhat lower in Florida than in the nation as a whole (Table 6).

Table 6

Educational Attainment of Adults (age 25+), Florida State: 1990-2000

Year	Educational Attainment of Adults					Ratio to Nation	
	0-8 Years	Some High School	High School Diploma	Some College, No Degree	BA/BS or More	High School Diploma	BA/BS or More
1990	9.4%	16.1%	30.1%	19.4%	18.3%	1.00	0.90
2000	6.7%	13.4%	28.7%	22.4%	22.3%	1.00	0.91

Source: U.S. Census Bureau, 2000b.

Health and Welfare. As of 2001, Florida provides 202 hospitals with 3.2 beds for every 1,000 persons. This exceeds the national rate of 2.9 hospital beds for every 1,000 persons. There are also 661 certified nursing facilities with a total of 75,331 beds, and an average occupancy rate of 84 percent. Average occupancy rate is 83 percent at the national level. Overall, the health care industry employs 8 percent (561,360) of Floridians; slightly more than the national rate of 7 percent (Kaiser Family Foundation, 2003).

In 2001, there were 205,793 live births in Florida. Of those, 24,217 (12%) were born to teenage mothers between the ages of 15 and 19 (40% Caucasian, 36% African-American, 24% Hispanic). At the national level, teenage mothers accounted for 11 percent (445,944) of all live births (4,025,933) (43% Caucasian, 25% African-American, 29% Hispanic). Regardless of age, 84 percent of mothers began prenatal care in their first trimester in Florida, as compared to 83 percent of mothers at the national level (Kaiser Family Foundation, 2003).

In 2001, 8 percent (16,776) of infants were low-birth weight in Florida; this rate is nearly comparable to the national statistic for this indicator. Infant mortality (deaths per 1,000 live births) is somewhat higher in Florida (7.3) than in the nation (6.8) (Kaiser Family Foundation, 2003).

In Florida, in 2000, 2,237,600 people were enrolled in Medicaid. Total spending for the medically needy was $169.6 million, or $3,131 per enrollee. In 2001, 15.4 percent of all residents in the State of Florida (50% children, 20.4% adults), and 16.7 percent in the U.S. (49.7% children, 24.5% adults) were Medicaid recipients (Kaiser Family Foundation, 2003). Total federal and state Medicaid spending for 2001 was $9,997,762,890 (Kaiser Family Foundation, 2003).

In 2000, there were 3,646,340 children in Florida. Of this population, 2.6 percent were victims of child abuse, 0.9 percent was in foster care, and 0.1 percent of juveniles were in residential placement (Childwelfare.com, no date).

Religion. In 2000, 41 percent of Florida residents claimed a religious affiliation: Evangelical Protestant (14%), Mainline Protestant (6%), Catholic (16%), and 5 percent "other". Fifty-nine percent of residents did not claim a religious affiliation in that year (American Religion Data Archive, 2002).

H. ISSUES OF CONCERN

Civic officials in the State of Florida are concerned with the impact of pollution and offshore oil activity on the environment, overcrowding in its K-12 educational system, and illegal immigration.

The environmental safety of offshore oil activity is a source of concern and contested debate. In particular, the pending "Destin Dome" dispute and the existing "Lease Sale 181" are hot topics. At present, a federal moratorium prohibits drilling off of the Florida coast. Thus, even existing leases are not eligible for activation. Consequently, Chevron's plan to drill 21 offshore natural gas wells in the Destin Dome, located 25 miles south of Pensacola in the Gulf of Mexico, raises serious concerns. The state asserts that offshore drilling violates coastal management responsibilities. Chevron disputes this contention. It is likely that disputes over future leases in Florida's Gulf Coast will continue.

Likewise, controversy continues regarding "Lease Sale 181". This lease area covers six million acres in the Eastern Gulf of Mexico off the Florida and Alabama coasts. Despite the fact that the lease lies in federal waters 100 miles off the coast, oil spills still threaten Florida's famed white sand beaches and disturb marine life. Arguably, such impacts drastically affect the tourism industry along the coast.

The tremendous population growth in the state, particularly in the urban centers along the coast, is also a source of state concern. Over-development of the coastal regions has destroyed much of the tropical habitat, thus leaving the region more vulnerable to hurricane damage. Additionally, development near the Everglades increasingly threatens the underground aquifer that provides water for a large portion of the state's population (Mohl and Mormino, 1996).

The number of foreign-born students entering Florida's K-12 educational system has steadily increased since 1980. In 1993, education costs for both legal and illegal immigrants approached $517.6 million; education costs for illegal immigrants totaled $180.4 million. In this same year, the State of Florida spent $254 million dollars on English for Speakers of Other Languages (ESOL) program. In 1995, 4,418 Cuban students, 1,606 Nicaraguan students, 1,405 Haitian students, 2,980 Columbian students, and 1,058 Venezuelan students entered Florida's public school system, further contributing to K-12 overcrowding. Civic leaders assert that, in addition to the education system, Florida's rapidly rising population of both legal and illegal immigrants is over-taxing state health and welfare services (Federation for American Immigration Reform, 2002).

I. FLORIDA: LABOR MARKET AREA PROFILES

1. Introduction

The Florida Gulf of Mexico Region extends from Escambia County in the Northwest Panhandle to Key West in Monroe County. This area covers over 800 miles of coastline. Currently, almost 10 million people live in the labor market areas of this region. The region is both ethnically and racially diverse, with 14 percent of the population African-American and 21 percent Hispanic in 2000. It is also a haven for retirees, with some counties along the coast exceeding 30 percent of the retirement-aged population. This report profiles 10 Labor Market Areas along the Florida Gulf of Mexico in order to explore and ultimately better understand the spatial diversity of industry, employment, demographic, and local public institutions in the

region. The Florida Gulf LMAs are: Pensacola (LMA 109), Panama City (LMA 100), Tallahassee (LMA 099), Taylor County Area (LMA 077), Dixie County Area and Gainesville (LMA 079), Citrus-Marion (LMA 078), Tampa Bay-St. Petersburg (LMA 067), Sarasota (LMA 069), Ft. Myers (LMA 072), and Miami Dade (LMA 070) (Figure 1).

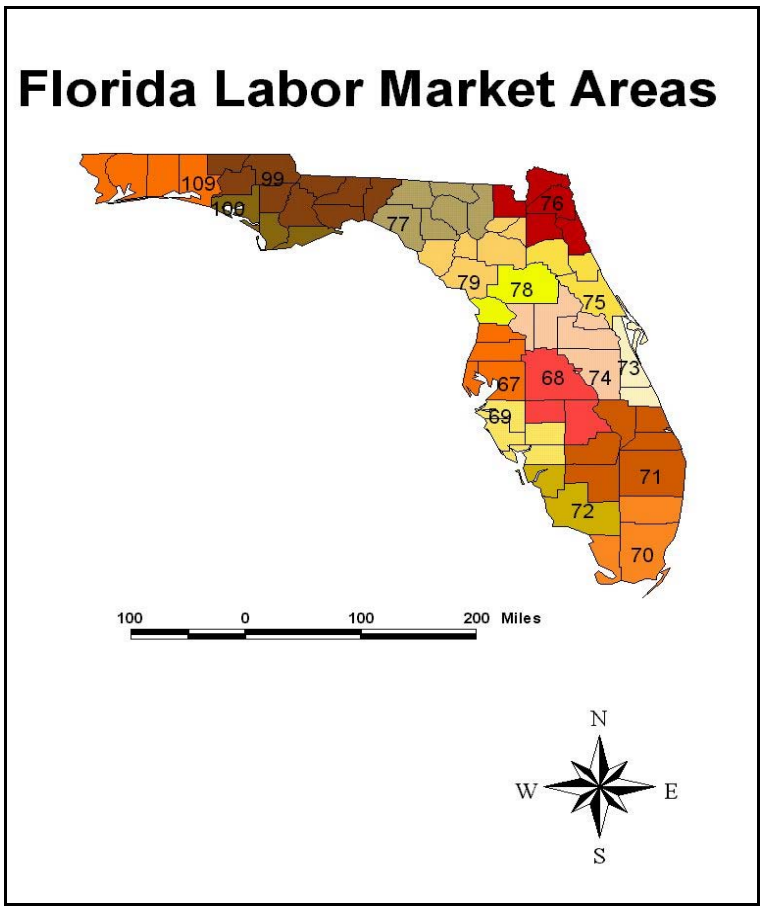


Figure 1. Florida Labor Market Areas.

Overview of Structural Processes. Since 1970, the United States' economy has experienced several recessions: in the wake of the oil embargo and the energy crisis (1973-1976); following the high interest rates resulting from rapid inflation growth during the late 1970s; and between 1989 and 1992 (Heilbroner and Milberg, 1999; Mencken and Singelmann, 1998). According to ecological theory, recessions represent a contraction in resources for, or inputs into, local economies. As a result, local social systems and economies may contract (see Hawley, 1986; Kasarda and Irwin, 1991; Mencken and Singelmann, 1998; Singelmann, et al., 1993).

However, recessions do not affect all economies uniformly. Local economies can be characterized along a continuum from less to more diverse industry structures (see Frisbie and Poston, 1976, 1978; Hawley, 1986; Mencken, 1997; Murdock et al., 1993; Nord and Luloff, 1993; Poston, 1984). Generalist communities (those with a variety of industries) and specialist communities (those with one or two main industries, such as tourism) both present advantages and disadvantages for growth and social organization (Poston, 1984).

Generalist communities are larger in size and more complex in structure. Fluctuations in one industry do not reverberate throughout the entire system so long as the other industries upon which the community depends for employment are independent of these shocks and remain relatively stable. As a result, generalist systems tend to be more stable over time. This longitudinal stability is important for local public institutions, such as schools and financing of local government services, because it allows administrators to plan for incremental changes in the supply of revenues and the demand for resources. Generalist systems also experience more stable population growth and change patterns (Frisbie and Poston, 1976, 1978; Micklin and Choldin, 1984; Poston, 1984).

Specialist communities, on the other hand, are dependent upon one or two industries for subsistence, and communities that rely upon natural resource-based industries (e.g., coal, oil/gas, timber, fishing) fit this characterization best (Freudenburg and Gramling, 1992; Gramling and Freudenburg, 1990; Hawley, 1986; Rural Sociological Society Task Force, 1993).

The region is by no means monolithic in its concentration of industries. Among the Florida Gulf of Mexico LMAs there are two major state Carnegie Foundation Research I universities, a major military base (Naval Air Station Pensacola) with associated defense manufacturing facilities, a state capitol, and several agricultural areas connected to the citrus industry. Florida is also one of the most recreation-centered and tourist intensive states in the nation. Even the major urbanized areas in Florida (Tampa Bay-St. Petersburg, Miami, and Jacksonville) offer popular tourist attractions including: beach communities, theme parks, recreational fishing areas, historical sites, and state parks.

Between 1940 and 1990, the Florida Gulf of Mexico LMAs added a total of 1.8 million new jobs, the majority of which (51%) were in the service sector. An additional 461,000 jobs were added in the wholesale/retail trade sectors (25%), while the manufacturing sector added 164,000 jobs (8% growth). Other growth multiplier industries, such as construction and transportation/public utilities, grew at similar rates. These are jobs that are generally created by growth in other industries to build new houses, highways, and provide public services to more people. For the entire Florida Gulf of Mexico LMA region, agricultural employment actually experienced a net gain in employment between 1940 and 1990 (3,500 jobs). However, in other southern states, agricultural employment declined drastically during that same period.

While these growth themes provide an overall snapshot of the Florida LMAs, there is also considerable spatial variation in industry growth rates within this region. For example, the greatest growth rates for many of the Florida Gulf of Mexico LMAs (e.g., Sarasota, Ft. Myers, and Pensacola) occurred during the 1950s when total employment growth rates exceeded 100 percent.

The 1970s were also a period of rapid employment growth, particularly for the Sarasota, Ft. Myers, and Citrus-Marion LMAs. In these LMAs, however, manufacturing employment growth was as strong as or stronger than service growth during the 1970s. Furthermore, growth in this sector continued through the 1980s when those three LMAs added an additional 24,000 manufacturing jobs, representing 15 percent of all manufacturing jobs added in the Florida Gulf of Mexico LMAs between 1940 and 1990. It is likely that several of those LMAs benefited from the "rustbelt to sunbelt" industrial transformation– the movement of manufacturing jobs from outdated plants in the Midwest and Northeast to the South and West–that occurred during the 1970s.

Agriculture is another industry sector that shows considerable spatial variation in employment patterns. While many Florida Gulf of Mexico LMAs lost agricultural jobs between

1940 and 1990 (e.g., the Taylor LMA lost 7,000 jobs, the Dixie-Gainesville LMA 4,000 jobs, and the Tallahassee LMA 13,000 jobs), several LMAs experienced significant growth in this sector. For example, the Tampa-St. Petersburg LMA added 13,000 jobs, the Sarasota LMA 4,000 jobs, and the Ft. Myers LMA 8,000 jobs.

Moreover, the growth and decline of agriculture happened at two different time points. With the exception of the Tallahassee LMA, the decline in agricultural employment happened prior to 1970 (Tallahassee LMA lost 29% of its agricultural jobs during the 1970s). However, agricultural growth for the Tampa-St. Petersburg LMA occurred after 1970; indeed, it more than doubled between 1970 and 1990. In that case, the recent agricultural growth was due primarily to increased production in Florida's citrus industry.

While the service sector accounted for half of all jobs added in the Florida Gulf of Mexico LMAs, there is some spatial variation in that sector's dominance. In two LMAs (Tallahassee and Dixie-Gainesville), the service sector alone (excluding retail/wholesale trade) accounted for more than one-half of all jobs added between 1970 and 1990. In no other LMA did employment in this one sector ever exceed 50 percent. What the Tallahassee and Dixie-Gainesville LMAs have in common are large state government institutions (i.e., the Capitol), and large state universities. At the other extreme, employment in the service sector (excluding retail/wholesale trade) never exceeds 40 percent in two other more rural and agriculture-based LMAs. These service data illustrate further the diversity of economic activities in the Florida Gulf of Mexico LMAs.

During the 1990s, employment growth in the Florida Gulf of Mexico region increased by 743,000 jobs, a growth rate of 30 percent. As a whole, the total employment growth rate for the Florida Gulf of Mexico Region was 1.8 times greater than the growth rate for the entire United States (17%) between 1990 and 2000. Furthermore, every LMA within the Florida Gulf of Mexico region experienced a total employment growth greater than the U.S. rate of 17 percent.

Several themes emerge from this historical analysis. First, the region grew quite substantially between 1940 and 1990 (1.6 million jobs; 700% growth rate). However, that growth was not evenly distributed among the decades in question. Overall growth rates were highest in the 1950s and 1970s. Second, the region was much more service-oriented during the 1950s and 1960s than the rest of the nation. In the 1950s and 1960s, nearly half of all jobs in the U.S. were in manufacturing. However, this is not the case throughout the entire Florida Gulf of Mexico region. In the 1970s and 1980s, three LMAs (Sarasota, Ft. Myers, and Citrus-Marion) had relatively high concentrations of manufacturing employment. Finally, although agriculture is a sector where less than 2 percent of all workers are typically employed at the national level, agricultural employment in several Florida LMAs has been at least twice the national rate.

2. Recent Trends

In this phase of the analysis, we examined employment trends from 1990 to 2000 for the Florida Gulf of Mexico region. Total employment growth for this region increased by 743,000 jobs or 30 percent during the 1990s. That rate of growth was 1.8 times greater than for the entire United States (17%) in that period.

Within the individual LMAs, there was considerable variation in total employment growth rates. The Sarasota LMA had the highest growth rate (40%), followed by the Ft. Myers (36%) and Citrus-Marion (33%) LMAs. In terms of overall employment growth, the Tampa-St. Petersburg LMA led the way with 318,000 new jobs, followed by the Miami-Dade LMA with

195,000 new jobs. Notable growth also occurred in the Sarasota (119,000 new jobs), and Pensacola (73,500 new jobs) LMAs.

Services led all sectors in total employment growth. Service sector employment in all of the Florida GOM LMAs exceeded 40 percent in 2000—the national rate was 32 percent. In the Tampa-St. Petersburg and Sarasota LMAs, employment in the services surpassed 60 percent. In those two LMAs, almost 280,000 new service sector jobs were added between 1990 and 2000. By 2000, 49 percent of the total workforce (1.2 million workers) was employed in the service sector in the Florida LMAs.

Agriculture also has an interesting employment history in the Florida Gulf of Mexico region. Agricultural employment includes citrus, forestry and fishing. However, the citrus industry was the only agricultural sub-sector that experienced growth during the 1990s. Between 1990 and 2000, Florida's citrus production increased by 46 percent. In 2000, the citrus industry was a $3 billion dollar enterprise for the state.

The following figures provide annual employment data by industry for each of the LMAs in the Florida Gulf of Mexico region for 1969 through 2000. The Tampa Bay-St. Petersburg LMA, however, displays data only for 1970 through 2000 (Figures 2-11).

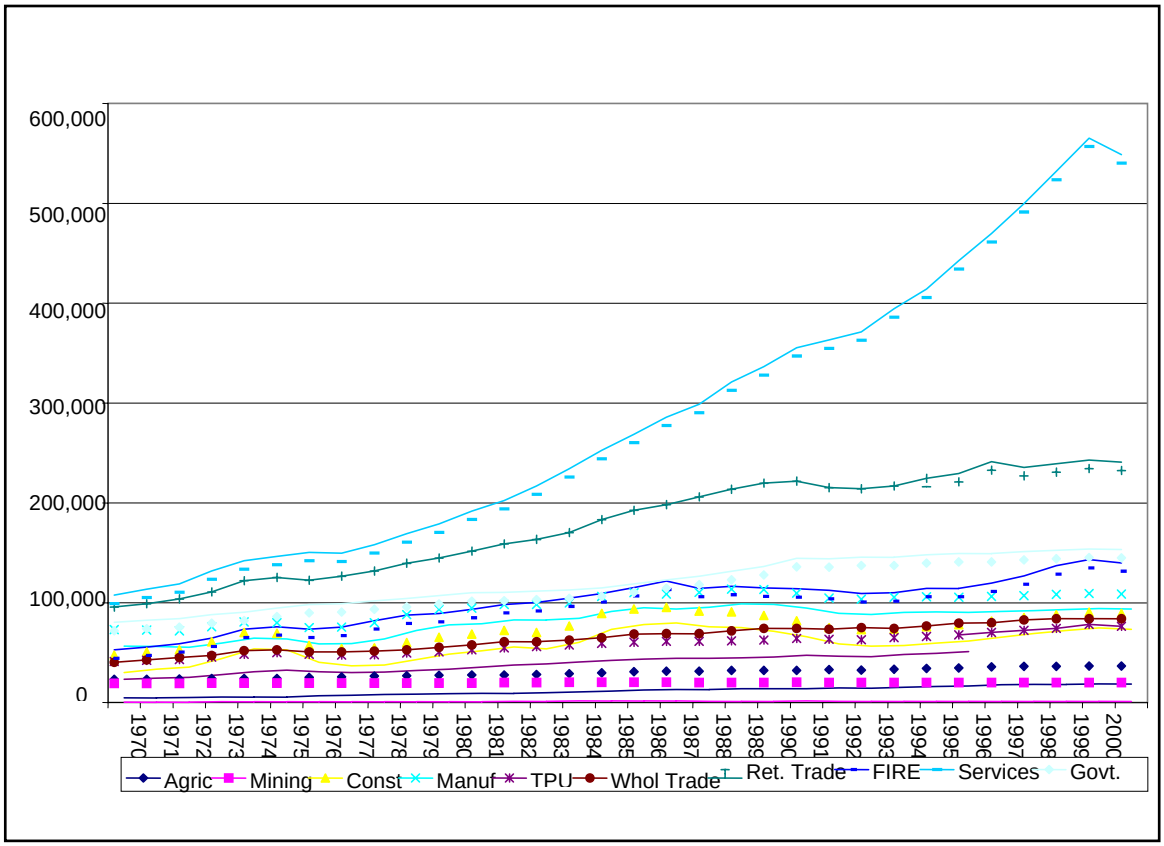


Figure 2. Annual Employment, Tampa-St. Petersburg LMA: 1970-2000 (U.S. Dept. of Commerce, Bureau of Economic Analysis, 2000).

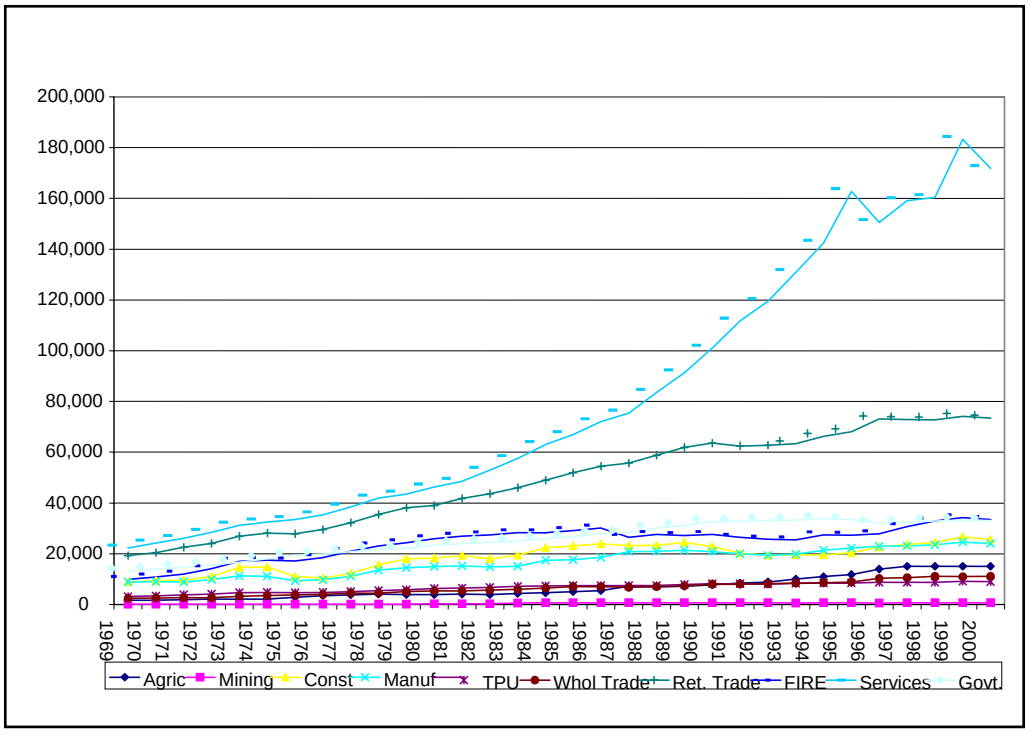


Figure 3. Annual Employment, Sarasota LMA: 1969-2000 (U.S. Dept. of Commerce, Bureau of Economic Analysis, 2000).

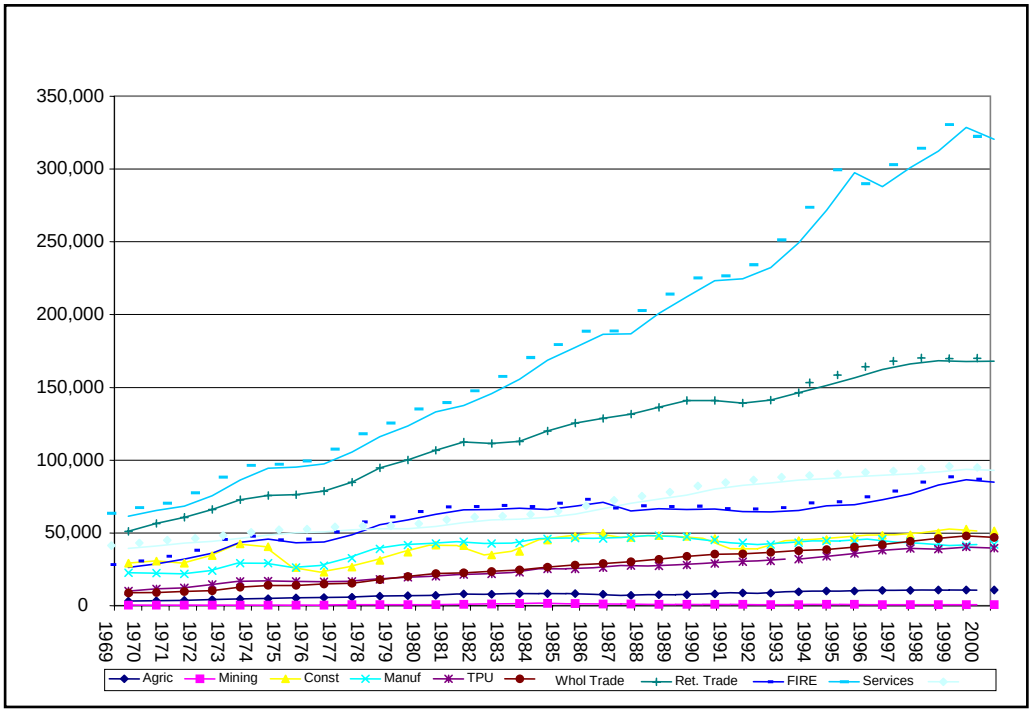


Figure 4. Annual Employment, Miami-Dade LMA: 1969-2000 (U.S. Dept. of Commerce, Bureau of Economic Analysis, 2000).

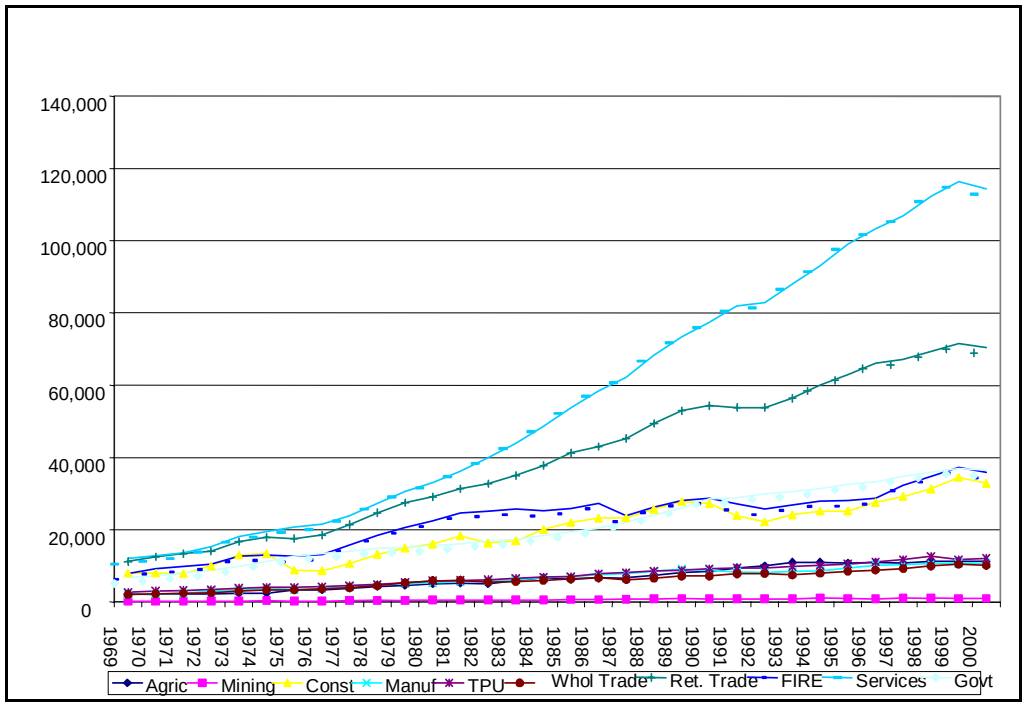


Figure 5. Annual Employment, Ft. Myers LMA: 1969-2000 (U.S. Dept. of Commerce, Bureau of Economic Analysis, 2000).

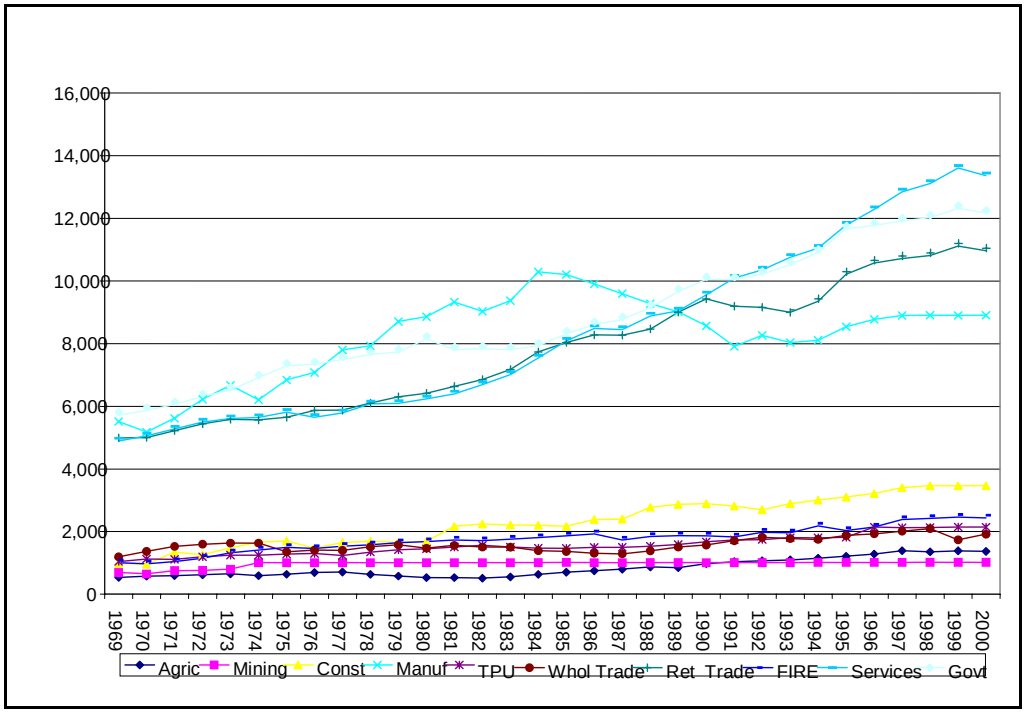


Figure 6. Annual Employment, Taylor LMA: 1969-2000 (U.S. Dept. of Commerce, Bureau of Economic Analysis, 2000).

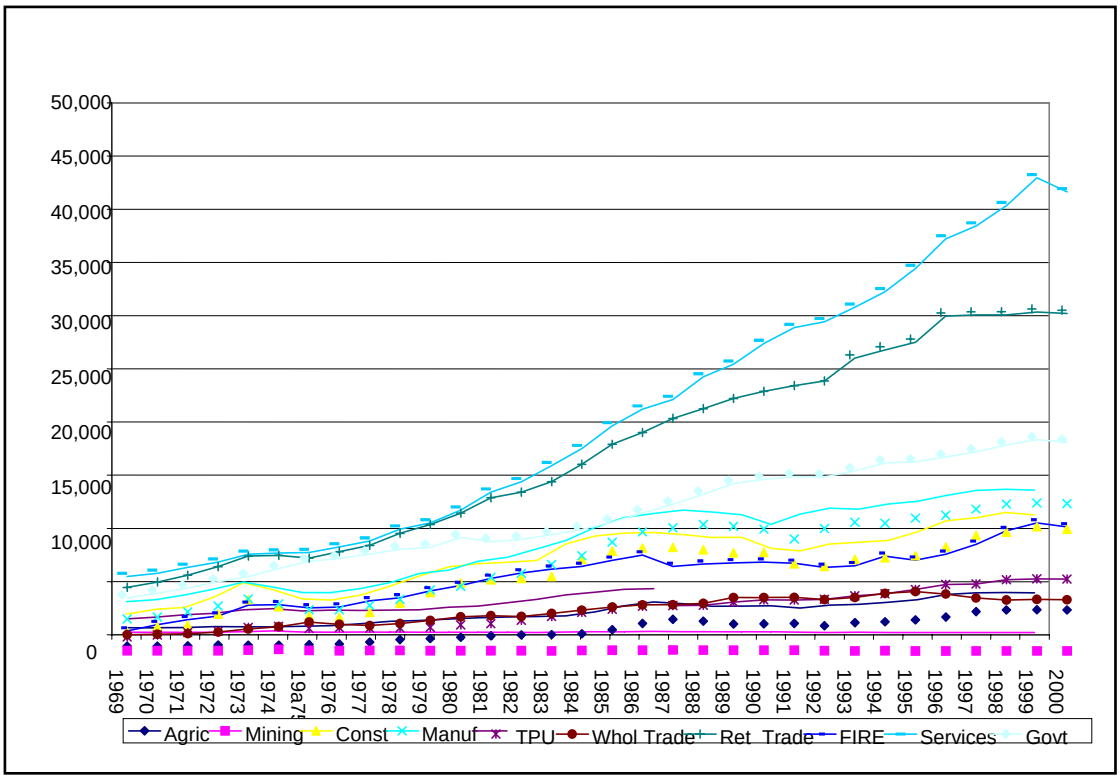


Figure 7. Annual Employment, Citrus-Marion LMA: 1969-2000 (U.S. Dept. of Commerce, Bureau of Economic Analysis, 2000).

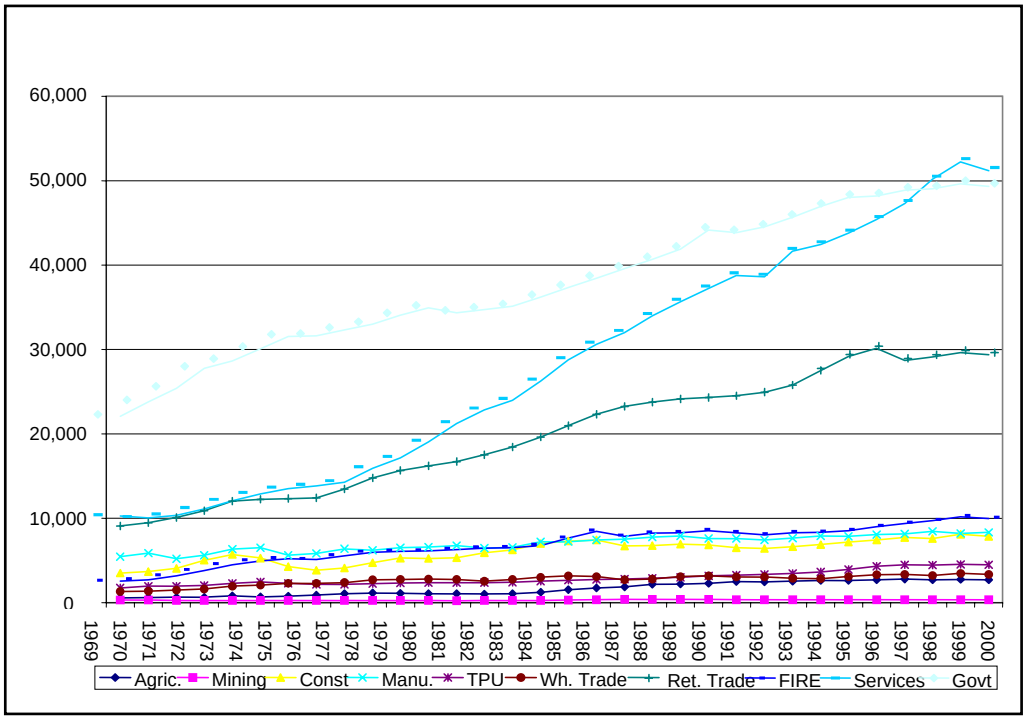


Figure 8. Annual Employment, Dixie-Gainesville LMA: 1969-2000 (U.S. Dept. of Commerce, Bureau of Economic Analysis, 2000).

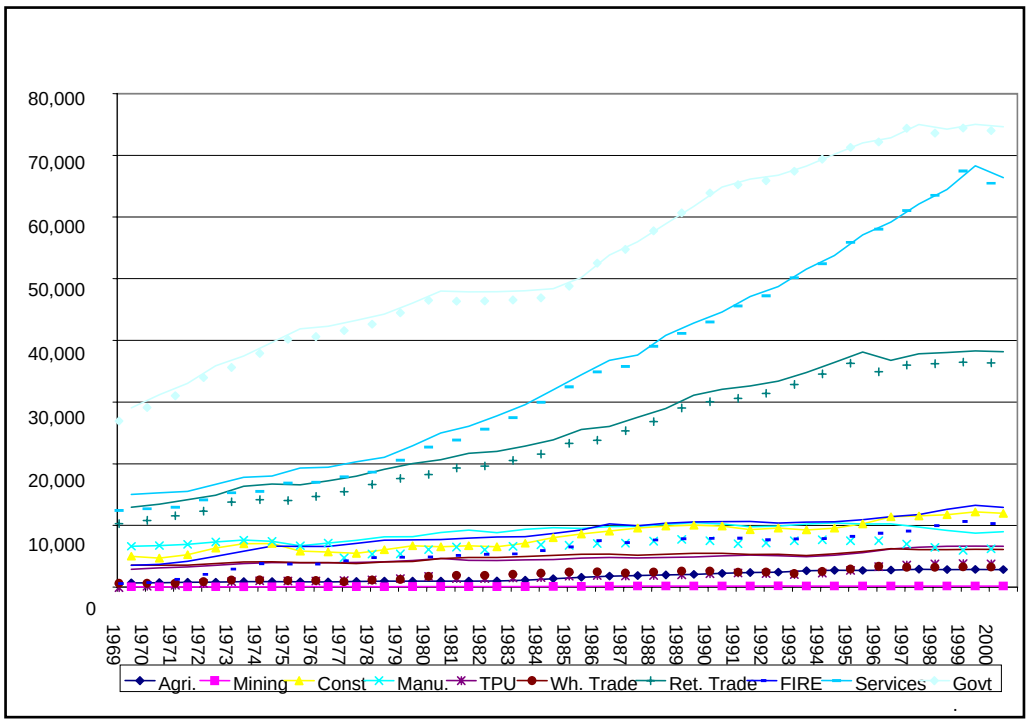


Figure 9. Annual Employment, Tallahassee LMA: 1969-2000 (U.S. Dept. of Commerce, Bureau of Economic Analysis, 2000).

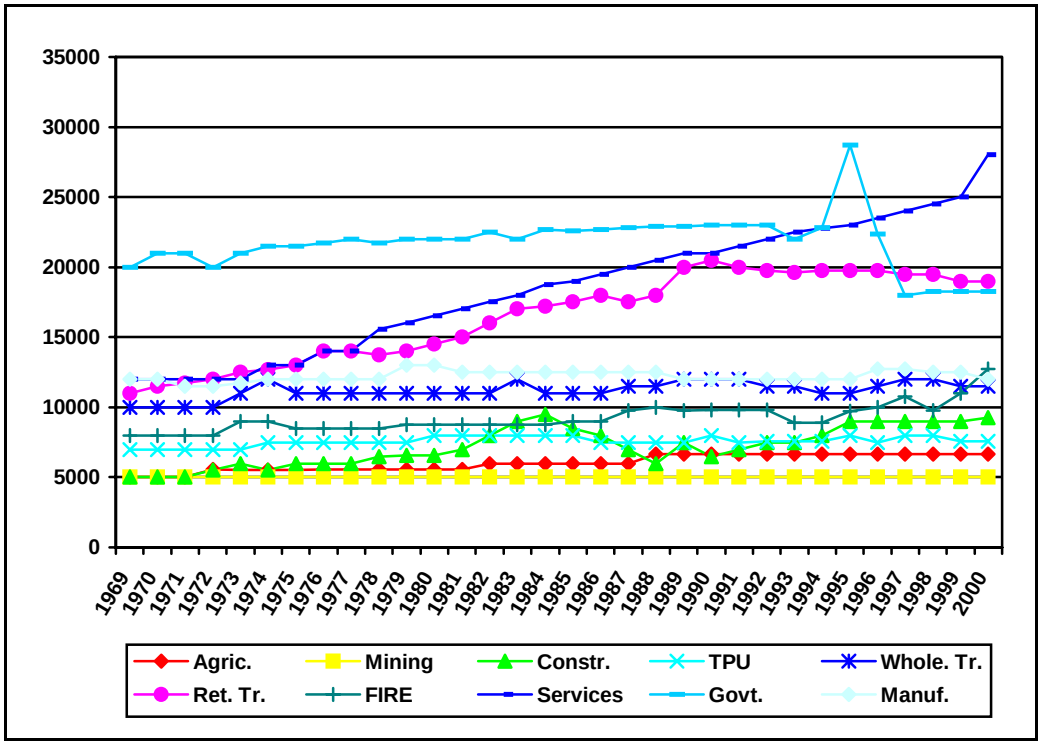


Figure 10. Annual Employment, Panama City LMA: 1969-2000 (U.S. Dept. of Commerce, Bureau of Economic Analysis, 2000).

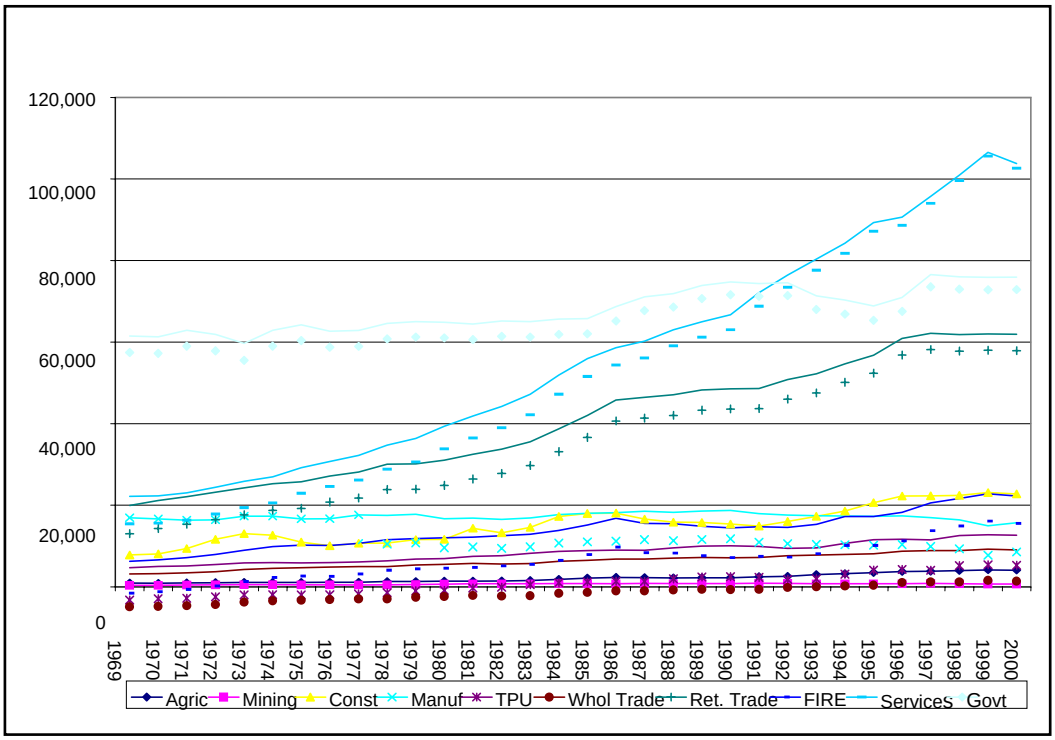


Figure 11. Annual Employment, Pensacola LMA: 1969-2000 (U.S. Dept. of Commerce, Bureau of Economic Analysis, 2000).

As expected, there is considerable spatial variation in agricultural employment growth within Florida's LMAs. In terms of percentage change, the Sarasota (93%) and Pensacola (86%) LMAs led the way in agricultural employment growth. In terms of total agricultural job growth, however, the Sarasota LMA led the way with 7,000 new jobs, followed by the Tampa-St. Petersburg LMA with 4,500 new jobs. The Sarasota LMA is part of the citrus growing region of Florida; indeed, the southern region of the state accounts for 69 percent of the citrus production in Florida (Hodges et al., 2001).

The Taylor and Citrus-Marion LMAs also demonstrated significant growth. In the Taylor LMA region, agricultural employment increased by over 100 percent between 1980 and 2000. By 2000, the Citrus-Marion LMA employed almost 4,000 agricultural workers. However, despite those positive growth trends in agricultural employment, neither LMA shows employment levels in this industry (slightly over 2% in each) that are substantially higher than the national average of 1.8 percent. Of course, these employment numbers may not accurately reflect seasonal and migrant labor, but the lack of stronger employment effects in the Florida Gulf of Mexico region stem from the industry's spatial division of labor within the state. According to Hodges et al. (2001), the industry and its multipliers (processing/manufacturing, suppliers, and transportation jobs connected to the industry) represent almost 90,000 jobs in the state, and add another billion dollars in output value beyond the direct value of the citrus industry, itself. Production facilities (where oranges are converted to pulp, concentrate, packaged orange juice, etc.) are located primarily in the southeastern coast of Florida.

Performance in the manufacturing industry also varied within the Florida LMAs during the 1990s. While manufacturing employment decreased by 2 percent at the national level, Florida LMAs experienced declines ranging from 1 percent (Tampa-St. Petersburg LMA) to 20

percent (Pensacola LMA). Combined, the Tallahassee, Panama City, and Pensacola LMAs lost a total of 7,200 manufacturing jobs (-4,000 in the Pensacola LMA alone) between 1990 and 2000.

Despite the general decline in manufacturing jobs during the 1990s, several other LMAs in the Florida GOM region actually gained manufacturing jobs. For example, the following LMAs all experienced high manufacturing employment growth rates during the 1990s: Sarasota (18% growth, 4,000 new jobs), Ft. Myers (22% growth, 2,000 new jobs) and Citrus-Marion (21% growth, 2,000 new jobs). Thus, on balance, the Florida GOM region deviated from the national trend of 2 percent employment loss for a net gain of about 3,000 manufacturing jobs during the 1990s. However, by the end of the 1990s, the rate of manufacturing employment within Florida LMAs (8%) fell below the national rate (12%).

While none of the Florida LMAs were manufacturing-intensive, several of the more urbanized LMAs had high levels of employment in manufacturing. For example, in 2000, the Sarasota LMA employed over 20,000 workers, and the Pensacola LMA employed more than 15,000 workers. In the Sarasota LMA, manufacturing facilities for electrical appliances and transportation vehicle parts were at the forefront of production while more than 50 percent of all manufacturing facilities in Pensacola provided shipbuilding and repairing services.[1] Also, in that same year, the Tampa Bay-St. Petersburg LMA employed almost 90,000 manufacturing workers.

The Tampa Bay-St. Petersburg LMA currently includes a very diverse representation of manufacturing facilities, including 117 food processing/manufacturing establishments, 109 chemical producing facilities, 76 wood products manufacturing facilities, 126 plastics manufacturers, 32 primary metal plants, 377 fabricated structural metal facilities, 208 machine manufacturing plants, 147 computer and machine manufacturing establishments, 108 transportation equipment manufacturing establishments (including 38 shipbuilding/repairing establishments), and over 300 medical and laboratory equipment manufacturing plants.[2]

Finally, we examined changes in government employment (local, state, federal) during the 1990s. Nationally, the government employment growth rate was 5 percent during the 1990s, employing 14 percent of all workers. This percentage was slightly higher (19%) within the Florida Gulf of Mexico LMAs. However, as with other indicators, there is considerable spatial variation in government employment among the LMAs. For example, the Pensacola (1%) and Sarasota (2%) LMAs both experienced government employment growth rates lower than the national rate of 5 percent. Moreover, the Panama City LMA experienced negative government employment growth (-10%). However, Ft. Myers (29%), and several of the more rural LMAs (Taylor, Citrus-Marion, Dixie-Gainesville) experienced growth rates in excess of 10 percent, or at least twice the national growth rate.

Three LMAs show substantial concentrations of government employment. In 2000, the Pensacola, Dixie-Gainesville, and Tallahassee LMAs employed 23 percent, 29 percent, and 32 percent, respectively, in federal, state, or local government organizations. In the Tallahassee LMA, government employment exceeds services employment. These findings are not surprising: there is a major naval air station in Pensacola (Naval Air Station Pensacola); a Carnegie Foundation Research I Extensive university (the University of Florida) in Gainesville; and Tallahassee is home to the state capitol, and two major universities (Florida State University and Florida A&M University).

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[1] See www.cbred.uwf.edu.

[2] Data are from County Business Patterns, U.S. Bureau of the Census (www.censtats.census.gov).

In sum, recent employment data for the Florida LMAs identifies some important trends. First, there are two large, diverse urbanized economies in the region: the Tampa Bay-St. Petersburg and Miami-Dade LMAs. Both of these LMAs have employment distribution patterns that show representation in non-service industries, such as manufacturing, construction, and transportation/public utilities. Three other LMAs show substantial concentration of government employment: the Pensacola, Dixie-Gainesville, and Tallahassee LMAs. Still another three LMAs show recent growth in agricultural employment: the Sarasota, Citrus-Marion, and Taylor LMAs. Those three LMAs are in a key citrus producing region of the state (Hodges et al., 2001). However, the agricultural employment concentrations in those LMAs did not reach a level in 2000 that would qualify the southeastern area as a natural resource dependent region (Rural Sociological Society Task Force, 1993).

3. Tourism and Retirement Age Population Concentration in the Florida Gulf of Mexico LMAs

We maintain that the tourism impact will be readily identifiable in the coastal counties along the Gulf of Mexico. Table 1 presents an employment breakdown by percentage in tourism-related categories for the Florida Gulf Coast counties.

The data show that two counties stand out as significant tourism centers: Walton, in the Panhandle Region, and Monroe County, home of the Florida Keys and Key West. In both counties, over 18 percent of the workforce in the year 2000 was employed in hotel accommodations. Okaloosa county, adjacent to Walton county and the home of Ft. Walton Beach, has the third highest concentration of tourist-related industries in Florida. These counties are dependent upon tourism for employment.

From a socio-ecological perspective, downturns in the tourist trade will have the most significant negative impacts in specialist economies. For example, specialist economies typically suffer during recessions when people do not have as much money to spend on vacations and travel. However, because this analysis is performed at the LMA level–which is a measure of local economies based on commute to work patterns–any downturns in tourist-related industries may not be reflected in the larger LMAs in which these counties are embedded (Killian and Tolbert, 1993). For instance, Okaloosa and Walton Counties are in the Pensacola LMA, while Monroe County is in the Miami-Dade LMA. Given that Miami is a major metropolitan area, discernible effects of economic recessions on the tourist industry may not be as readily detectable in this LMA. A third LMA in this region– the Panama City LMA comprising Bay, Franklin, and Gulf Counties–also has a large concentration of tourism-based employment. In this rural LMA, accommodation and food service employment is greater than in most other counties along the Florida Gulf coast.

The data on tourism in counties along the Florida Gulf of Mexico identifies the Panama City LMA as a tourist-based LMA (Table 1). While tourism also is an important component of the Miami-Dade LMA (a major metropolitan area), its diversified economy employs over 850,000 workers. Additionally, the Pensacola LMA economy is government-based and thus is more sensitive to changes in federal policies.

Table 1

Total Employment in Tourism Related Industries,
Florida Gulf Coast Counties: 2000

County	Total Employment	Food/Service Employment	Amusement Employment*	Accommodation Employment
Bay	54,230	13.0%	1.9%	4.9%
Charlotte	30,868	9.7%	2.6%	1.6%
Citrus	22,282	8.9%	3.4%	1.7%
Collier	82,383	9.4%	4.1%	4.7%
Dixie	1,341	4.4%	4.4%	4.4%
Escambia	107,234	8.7%	0.9%	0.9%
Franklin	1,910	9.8%	1.4%	6.9%
Gulf	2,408	7.2%	2.8%	2.5%
Hernando	23,665	11.4%	1.6%	0.7%
Hillsborough	493,710	5.8%	1.5%	1.2%
Jefferson	1,685	6.8%	1.1%	1.7%
Lee	134,701	9.1%	1.8%	4.1%
Levy	5,704	10.6%	1.2%	1.6%
Manatee	106,663	5.4%	0.8%	0.7%
Monroe	32,132	18.2%	4.1%	15.8%
Okaloosa	55,450	13.7%	1.5%	2.1%
Pasco	63,316	9.6%	1.5%	1.8%
Pinellas	396,192	6.7%	1.2%	2.0%
Santa Rosa	18,733	10.2%	1.6%	0.4%
Sarasota	132,105	8.1%	20.1%	1.7%
Taylor	4,836	6.5%	0.2%	1.3%
Wakulla	2,362	9.4%	3.3%	1.7%
Walton	9,208	19.0%	2.0%	19.0%

*Amusement includes all tourist activities such as scenic tours, visits to historical sites, gambling, and recreation (U.S. Census Bureau, 2000a).

Retirement Population. In 2000, 12 percent of the total national population was age 65 and older. Three LMAs in the Florida Gulf of Mexico region had populations 65 and older that were at least twice the national rate: the Citrus-Marion, Sarasota, and Taylor LMAs. In addition, the Tampa Bay-St. Petersburg LMA had a population aged 65 and older at a rate 50 percent greater than the national figure, while three of the counties within that LMA (Hernando, Pasco, Pinellas) had a 65 and older population at least twice the national rate of 12 percent. These trends are not new; for those LMAs, the percentage of residents aged 65 and older has significantly exceeded the national rates since the 1960s. The other LMAs in the Florida GOM region show patterns more consistent with the national figures (Tables 2-11).

Table 2

Percent Population Over 65, Sarasota LMA: 1950-2000

County	1950	1960	1970	1980	1990	2000
Charlotte	14.7	20.8	35.0	33.9	33.8	34.7
DeSoto	10.3	14.7	15.6	16.1	19.2	19.4
Manatee	13.6	21.9	30.3	27.0	28.0	24.9
Sarasota	11.9	18.3	28.6	29.9	32.2	31.4
LMA Total	12.6	19.7	29.2	28.8	30.5	29.2

Source: U.S. Census Bureau, 2000b.

Table 3

Percent Population Over 65, Dixie-Gainesville LMA: 1950-2000

County	1950	1960	1970	1980	1990	2000
Alachua	6.0	6.3	6.3	7.0	7.4	9.5
Bradford	7.0	8.4	8.5	10.4	12.0	12.9
Dixie	7.0	7.9	8.7	12.1	17.5	17.0
Gilchrist	7.0	10.1	11.2	10.8	13.9	13.5
Levy	9.4	12.2	13.3	15.6	18.9	17.9
Union	4.4	6.9	6.6	5.8	7.3	7.2
LMA Total	7.1	9.8	10.4	12.0	15.6	15.0

Source: U.S. Census Bureau, 2000b.

Table 4

Percent Population Over 65, Ft. Myers LMA: 1950-2000

County	1950	1960	1970	1980	1990	2000
Collier	4.9	8.2	14.0	19.0	15.7	24.4
Lee	9.9	12.7	18.8	22.3	24.8	25.4
LMA Total	8.8	11.7	17.5	21.3	21.9	25.0

Source: U.S. Census Bureau, 2000b.

Table 5

Percent Population Over 65, Citrus-Marion LMA: 1950-2000

County	1950	1960	1970	1980	1990	2000
Citrus	11.4	16.9	26.0	29.0	31.3	32.2
Marion	8.9	10.5	13.1	17.0	22.1	24.5
LMA Total	9.2	11.5	15.9	20.7	25.1	26.9

Source: U.S. Census Bureau, 2000b.

Table 6

Percent Population Over 65, Tallahassee LMA: 1950-2000

County	1950	1960	1970	1980	1990	2000
Calhoun	6.9	9.0	10.9	15.4	14.3	13.8
Gadsden	8.2	9.4	11.9	12.0	11.9	12.2
Holmes	7.3	11.9	14.5	14.3	15.4	14.7
Jackson	7.8	8.6	11.0	13.7	15.0	14.6
Jefferson	10.7	10.7	12.0	13.2	14.8	14.5
Leon	5.3	5.2	5.4	6.5	8.1	8.3
Liberty	7.7	8.9	11.1	12.1	11.2	10.3
Wakulla	7.6	9.1	10.8	11.0	11.2	10.1
Washington	8.5	11.0	13.0	15.5	17.1	15.2
LMA Total	7.3	7.9	8.9	9.9	10.7	10.5

Source: U.S. Census Bureau, 2000b.

Table 7

Percent Population Over 65, Miami-Dade LMA: 1950-2000

County	1950	1960	1970	1980	1990	2000
Broward	7.5	11.4	19.7	21.9	20.7	16.0
Dade	7.6	10.0	13.6	15.6	9.8	13.3
Monroe	4.9	5.5	8.5	13.9	15.7	14.5
LMA Total	7.4	10.2	14.9	17.9	14.1	14.4

Source: U.S. Census Bureau, 2000b.

Table 8

Percent Population Over 65, Taylor LMA: 1950-2000

County	1950	1960	1970	1980	1990	2000
Columbia	7.5	8.6	9.0	10.1	13.3	14.0
Hamilton	7.8	10.2	12.0	13.2	11.3	10.9
Lafayette	7.4	11.7	13.6	12.1	10.7	12.1
Madison	8.1	9.5	12.1	14.2	14.1	14.5
Suwannee	7.8	10.7	11.9	13.9	16.8	16.9
Taylor	8.0	8.0	9.8	12.8	13.1	13.7
LMA Total	7.8	9.4	10.7	12.3	13.9	14.3

Source: U.S. Census Bureau, 2000b.

Table 9

Percent Population Over 65, Panama City LMA: 1950-2000

Area	1950	1960	1970	1980	1990	2000
Bay County	4.5	5.1	7.1	9.4	12.0	13.3
Franklin County	8.5	13.3	15.7	14.9	18.0	15.9
Gulf County	4.6	5.1	8.2	10.9	15.2	16.3
LMA Total	5.9	7.9	10.3	11.8	15.1	15.2

Source: U.S. Census Bureau, 2000b.

Table 10

Percent Population Over 65, Pensacola LMA: 1950-2000

Area	1950	1960	1970	1980	1990	2000
Escambia County	5.1	5.2	6.4	8.8	12.0	13.3
Okaloosa County	4.1	3.2	3.3	5.8	9.3	11.9
Santa Rosa County	6.7	5.5	6.0	7.2	9.4	11.0
Walton County	8.7	10.7	13.2	16.0	16.8	15.8
LMA Total	5.0	5.0	6.0	8.0	11.0	13.0

Source: U.S. Census Bureau, 2000b.

Table 11

Percent Population Over 65, Tampa Bay-St. Petersburg LMA: 1950-2000

Area	1950	1960	1970	1980	1990	2000
Hernando County	14.6	14.1	26.9	25.4	30.7	29.8
Hillsborough County	12.7	9.8	14.3	12.3	12.2	11.6
Pasco County	19.6	20.0	40.7	32.2	32.3	26.8
Pinellas County	30.5	24.9	41.2	30.3	26.0	22.6
LMA Total	20.0	17.0	29.0	23.0	22.0	19.0

Source: U.S. Census Bureau, 2000b.

The following reports individually discuss the economic effects of industry, employment, and demographic changes–especially those related to the oil and gas industries– within each of the 10 LMAs under consideration here. First, we explore historical patterns in industry employment between 1940 and 1990. Second, we profile recent (1990s) industry and employment concentrations in all of the LMAs along the Florida Gulf of Mexico in order to determine what industry and employment patterns currently distinguish them. Finally, we examine spatial patterns in two socioeconomic and demographic characteristics that are relatively unique to Florida: tourism and the spatial concentration of retirement-aged population.

4. Pensacola, Florida: Labor Market Area

a. Introduction

This analysis examines historical and current industry and socio-demographic patterns in the Pensacola LMA. The analysis is divided into several phases. Phase I provides a general overview of broad (single-digit) industry patterns in this LMA for decennial census years 1940 to 1990 using Census data. Phase II shows employment patterns in broad (single-digit) industry categories for all years between 1969 and 2000 using REIS data from the Bureau of Economic Analysis. Phase III examines the impact of economic recessions on employment levels during the last 30 years. Phase IV is a socio-demographic analysis of the LMA.

b. Setting

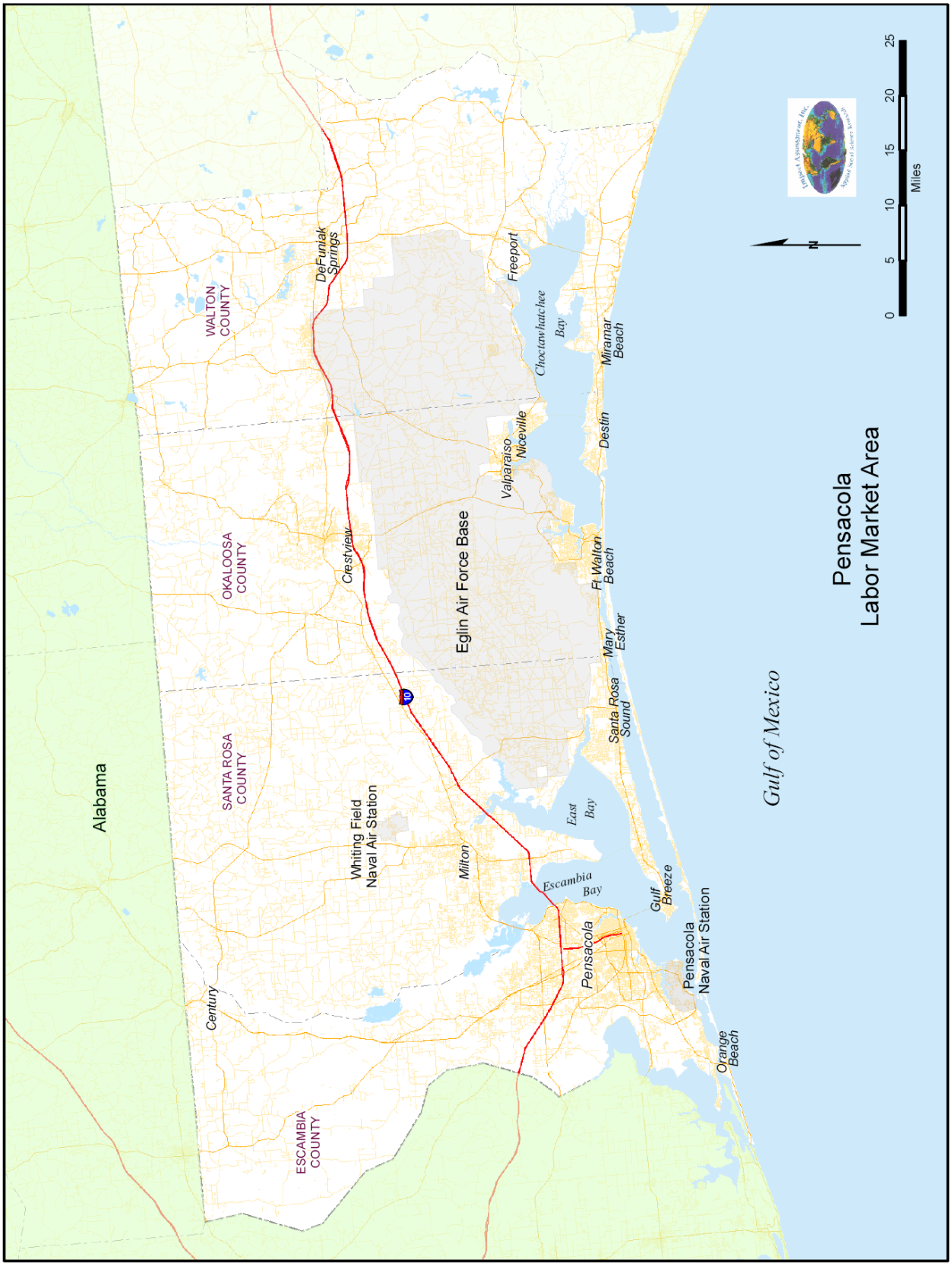
The Pensacola LMA is located in the western Florida Panhandle (Map 16). It is home to the Pensacola Naval Air Station, as well as to Ft. Walton Beach, a major tourist location. The LMA is comprised of the following counties: Escambia, Okaloosa, Santa Rosa, and Walton. Over 600,000 people resided in the Pensacola LMA in 2000; nearly half . With 294,000 people in 2000, Escambia is the LMA's largest county. African-Americans are represented in the LMA proportional to the national representation (13.8% in 2000). In 2000, 80 percent of the population in the LMA was white, a percentage that has been consistent over time. In 2000, only 3 percent of the LMA's population was Hispanic, and this percentage is significantly lower than the national rate of 12 percent. However, the Hispanic population grew by almost 9,000 people during the 1990s. Between 1990 and 2000, the Pensacola LMA population grew by more than 21 percent, vastly exceeding the national growth rate of 9 percent.

c. Unit of Analysis

Labor Market Areas (LMAs) are the geographical units of analysis in this report. Labor Market Areas are defined by patterns of transportation to and from work within and across county boundaries. Labor Market Areas better represent local social systems and, empirically, local economies (Killian and Tolbert, 1993).

Phase I: General Historical Industry Trends. The general historical industry trends for Pensacola LMA are discussed next. The data are analyzed both cross-sectionally and longitudinally in order to gain a full understanding of both the structure of changes in the LMA's primary industries over time (Figure 1).

Year 1940. In 1940, 21,687 people were employed in the Pensacola LMA. Employment was diversified among manufacturing (19%), agriculture (20%), construction (10%) and transportation/public utilities (9%) in the non-service sectors. Wholesale/retail trade, and services account for 39 percent of employment in the Pensacola LMA in this same year, while the mining sector employed only 20 workers (less than 1%).



Map 16. Pensacola, Florida Labor Market Area.

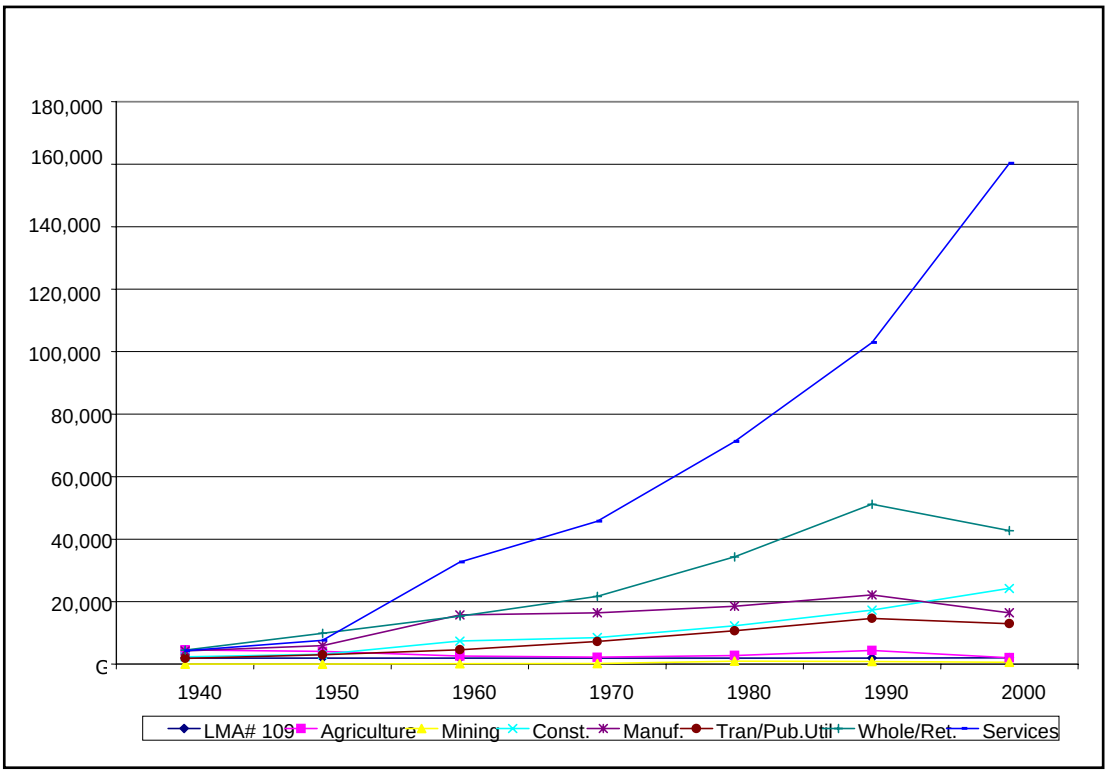


Figure 1. Major Industry Employment, Pensacola LMA: 1940-2000 (U.S. Census Bureau, 2000b).

Year 1950. In 1950, there were approximately 34,000 workers employed in the Pensacola LMA, reflecting a 55 percent growth rate from 1940. The combined share of total employment for services and wholesale/retail trade was 51 percent in 1950. Moreover, those industry sectors combined to create 8,000 new jobs between 1940 and 1950 in the Pensacola LMA. Manufacturing, construction, and transportation/public utilities all experienced growth rates in excess of 30 percent. Agriculture lost 500 jobs and retained a 12 percent share of the Pensacola LMA labor force in 1950.

Year 1960. Between 1950 and 1960, total employment grew by 132 percent, with a total of 78,000 workers employed in 1960. In terms of the number of jobs, employment growth was most substantial in services where 25,000 new jobs were added. By 1960, services and wholesale/retail trade employment accounted for 60 percent of total employment in the Pensacola LMA. Manufacturing employed almost 20 percent of the labor force in 1960, adding almost 10,000 jobs since 1950. Construction added 4,000 new jobs (5.1%), and transportation/public utilities added 3,000 new jobs (3.8%). Agriculture's share of the labor force fell to 3 percent in 1960, while mining employed only 104 workers (0.1%).

Year 1970. Total employment in the Pensacola LMA grew by 29 percent between 1960 and 1970, employing over 100,000 people in 1970. In non-service sectors, transportation/public utilities (59%) accounted for the largest amount of growth. Manufacturing grew at 4 percent, significantly less than the growth rates for this time period in other Florida LMAs. Services generated 12,000 new jobs. By 1970, 65 percent of all employment in the Pensacola LMA was concentrated in services and wholesale/retail trade. Mining employed less than 1 percent of the labor force.

Year 1980. The total employment rate grew by 47 percent between 1970 and 1980, with 150,798 workers employed in 1980. Of the nearly 50,000 new jobs added, approximately 75 percent were in the service and wholesale/retail trade sectors. Together, those sectors employed over 100,000 workers, or 69 percent of the labor force. Construction, manufacturing, and transportation and public utilities combined to add almost 10,000 new jobs. In that same year, 977 people were employed in mining (0.6%), up from 167 (0.1%) in 1970. That jump in employment suggests that the Pensacola LMA may have been affected by the boom in oil and gas employment in the late 1970s.

Year 1990. Between 1980 and 1990, the Pensacola LMA experienced a 41 percent increase in employment. In 1990, employment levels exceeded 210,000 workers. Services and wholesale/retail trade combined to add 37,000 new jobs. By 1990, manufacturing employed over 22,000 workers (10.5%), and the construction industry employed 17,316 (8.2%). By 1990, 71 percent of all jobs in the Pensacola LMA were in services or wholesale/retail trade. Mining employment levels dropped 15 percent to 835 workers in 1990 employing 0.4 percent of the labor force.

Phase II: Recent Industry Analysis. The historical Census data show that the Pensacola LMA was a diversified, but relatively slow-growing LMA until 1960. There were no hints of an economic downturn in any of these data. However, the 10-year Census data may not have fully captured cycles that occurred between census years. This section more carefully considers annual employment data from 1969 to 2000 to explore that possibility (Figure 2).

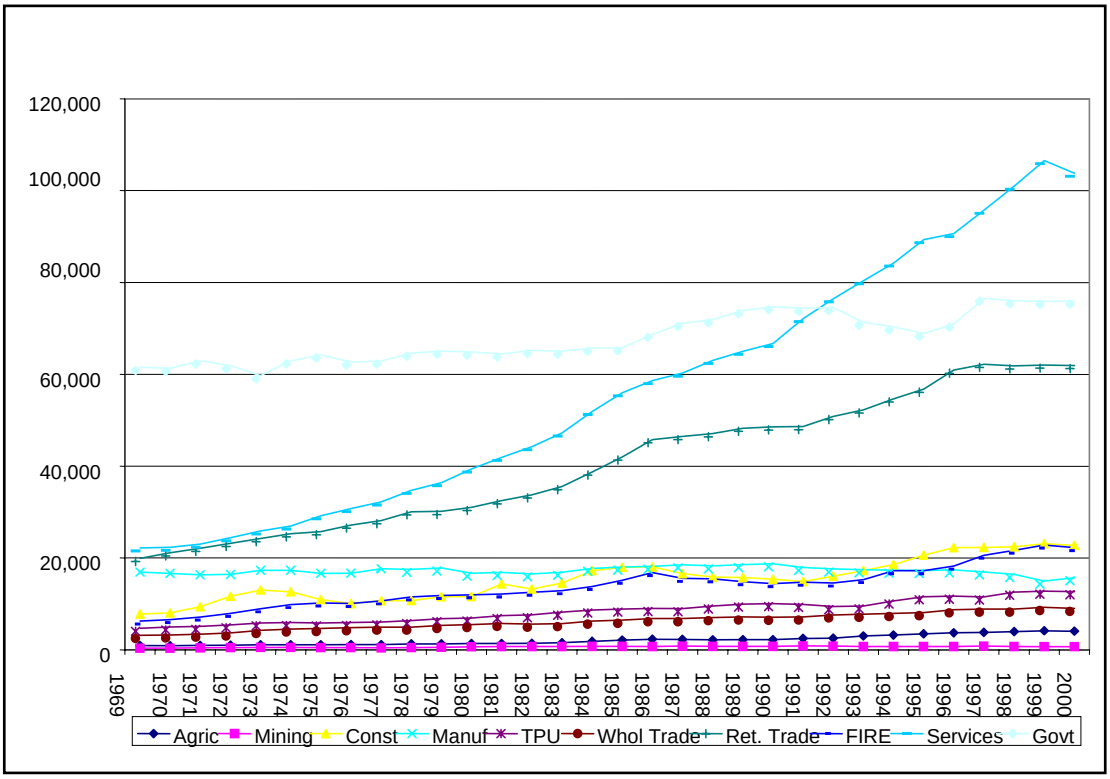


Figure 2. Annual Employment, Pensacola LMA: 1969-2000 (U.S. Dept. of Commerce, Bureau of Economic Analysis, 2000).

While employment grew by 22 percent in the Pensacola LMA in 1990, only services and construction had positive growth rates; manufacturing lost 25 percent (or about 4,000 jobs). The REIS data for 2000 show that government accounts for 22.4 percent of all employment, falling behind services (30.6%). The Pensacola LMA is below national percentages on most other industry measures (Table 1).

Table 1

Employment by Sector, Pensacola LMA: 2000

Industry	Percent
Agriculture	1.2
Mining	0.2
Construction	6.7
Manufacturing	4.6
Transportation/Public Utilities	3.7
Wholesale Trade	2.6
Retail Trade	18.3
Finances, Insurance & Real Estate	6.6
Services	30.6
Government	22.4

Source: U.S. Census Bureau, 2000b.

The Pensacola LMA is more government intensive than other LMAs in the region. For the nation in 2000, the government employed 14 percent of all workers. In comparison, the Florida Gulf of Mexico LMAs employed 19 percent. However, as with other indicators, there is considerable spatial variation in government employment among the LMAs. For example, the government employment growth rates in the Pensacola LMA (1%), and Sarasota LMA (1.5%) were lower than the national growth rate of 5 percent in 2000. Moreover, there was negative government employment growth (-10%) in the Panama City LMA. However, Ft. Myers (29%), and several of the more rural LMAs (Taylor, Citrus-Marion) experienced growth rates in excess of 10 percent, or at least twice the national growth rate.

Three LMAs show substantial concentration of government employment. In 2000, federal, state, or local government organizations employed 22.4 percent of the Pensacola LMA, 29 percent of the Dixie-Gainesville LMA, and 32 percent of the Tallahassee LMA labor forces. In comparison, the Tampa Bay-St. Petersburg LMA government sector employs only 10 percent of the work force. These findings are not surprising, however. The Pensacola LMA is home to a major naval air station (Naval Air Station Pensacola); the University of Florida, a Carnegie Foundation Research I Extensive university, is located in Gainesville; and, Tallahassee, the state capitol, boasts two major universities (Florida State University and Florida A&M University). These three government-intensive LMAs are all located along the Florida Gulf Coast.

Phase III: Recession Analysis. To test the effects of business cycle recessions on the Pensacola LMA economy during the last 30 years we examined the annual trends in employment. The total annual employment figures, plus three-year moving averages data show a linear growth pattern (Figure 3). In most years the actual employment levels were greater than expected, as based on the employment levels in the previous three years. However, we see some

convergence in these lines for the three major recessions of the time period: the mid-1970s, the late 1980s, and the early 1990s. Observed employment levels during each of these periods were not greater than predicted employment levels. However, in all other years, growth exceeded expectations. One possible explanation, particularly for the late 1980s and early 1990s, may be linked to the effects of slowdowns in the defense industry following the end of the Cold War.

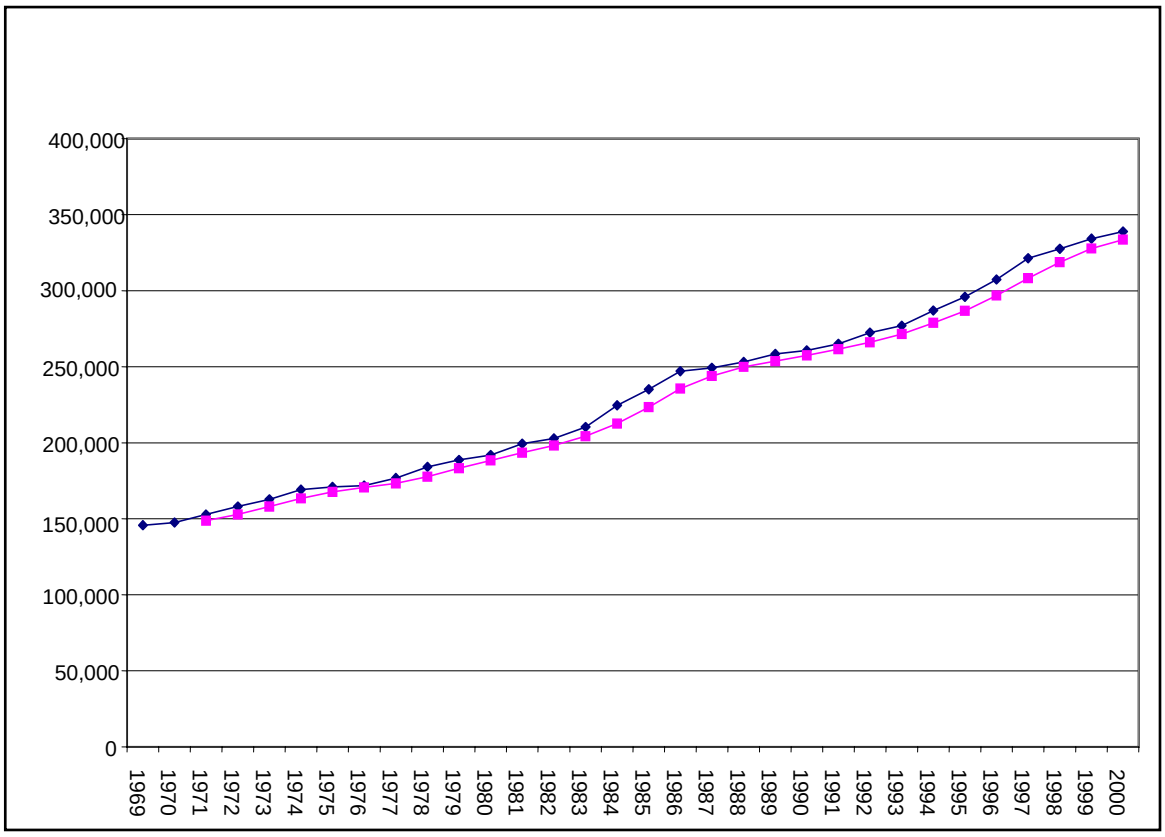


Figure 3. Total Employment and Three-year Moving Averages, Pensacola LMA: 1969-2000 (U.S. Dept. of Commerce, Bureau of Economic Analysis, 2000).

In a systems approach to local economic organization, one issue of particular importance is the impact of "shocks" on a social system. Slow, gradual growth and/or decline are not as problematic for a social system as are shocks. Shocks come when systems experience unanticipated growth (such as "boomtowns") or decline. Gradual growth and/or decline allow equilibrium-seeking social systems to absorb the changes, to reallocate and redistribute resources and population. Shocks, on the other hand, create disruptions in a social system. These disruptions can manifest in a number of local fiscal and social problems.

In order to understand the benefits and burdens of certain industries to a system, it is important to know the timing of the industry shocks. In our analysis, we employ a moving average forecasting model to locate the years that the shocks occur in the Pensacola LMA. The forecasting procedure includes the following. First, three-year moving averages (current plus previous two years) of employment levels are computed. Second, at each year the expected value (three-year moving average) is subtracted from the observed value. Each of these deviations is squared to provide the forecasting error for each year. These squared deviations are

summed and averaged across all years in the analysis to compute a mean squared error (MSE). We establish a "shock" for any given year in which the squared deviation for that year is greater than or equal to two times the mean squared error for the industry sector in question (Anderson et al., 1990).

The forecasting analysis data show that, after 1970, the employment growth rates in the Pensacola LMA were greatest (i.e., exceeded expectations) in the economic booms of the 1980s and 1990s (Figure 4). However, several caveats accompany this conclusion. First, the boom during the 1980s may reflect increased defense spending during that time period. Also, the forecasting analysis fails to detect significant drop-offs in employment during any of the recession periods over the period in question. One reason for the lack of downturn may stem from the concentration of government employment in the Pensacola LMA, which, unlike the private sector, is more recession-proof.

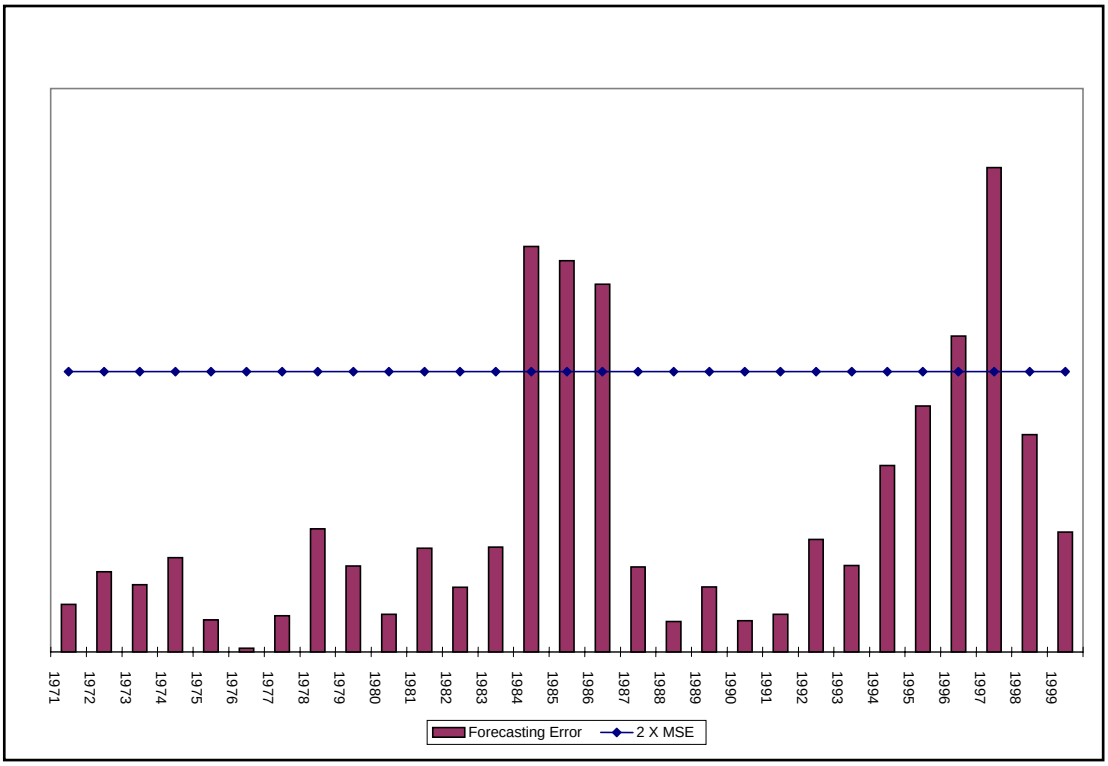


Figure 4. Employment Forecasting Analysis, Pensacola LMA: 1971-1999.

Phase IV: Socio-Demographic Analysis. The population data show that the Pensacola LMA has grown faster than the national rates since 1960, averaging growth rates of 22 percent per decade since 1960 (Tables 2-5). While these growth rates are substantially lower than those found in other LMAs along the Gulf of Mexico in Florida, they are significantly higher than the national growth rates between 1960 and 2000. In 2000, African-Americans comprise 14 percent of the Pensacola LMA population and Caucasians account for 80 percent. Of the Florida Gulf of Mexico LMAs, the racial composition percentages for the Pensacola LMA have been the most stable over time. Although Hispanics only comprised 3 percent of the LMA's population in 1990, their representation doubled between 1990 and 2000.

Table 2

Population by County, Pensacola LMA: 1940-2000

County	1940	1950	1960	1970	1980	1990	2000
Escambia	74,667	112,706	173,829	205,334	233,794	262,798	294,410
Okaloosa	12,900	33,626	61,175	88,187	109,920	143,776	170,498
Santa Rosa	16,085	18,554	29,547	37,741	55,988	81,608	117,743
Walton	14,246	14,725	15,576	16,087	21,300	27,760	40,601
LMA Total	117,898	179,611	280,127	347,349	421,002	515,942	623,252

Source: U.S. Census Bureau, 2000b.

Table 3

Percent of White Population, Pensacola LMA: 1940-2000

County	1940	1950	1960	1970	1980	1990	2000
Escambia	76.4	77.7	79.0	79.3	77.5	76.6	72.3
Okaloosa	91.1	93.5	93.1	92.2	88.6	87.0	83.4
Santa Rosa	87.9	91.4	92.6	94.0	95.0	93.5	90.7
Walton	86.0	86.7	86.4	88.6	88.8	91.3	88.4
LMA %	80.7	79.4	83.9	76.0	83.3	82.9	80.2
LMA Total	95,177	142,655	235,249	264,035	350,796	428,190	499,965

Source: U.S. Census Bureau, 2000b.

Table 4

Percent of Black Population, Pensacola LMA: 1940-2000

County	1940	1950	1960	1970	1980	1990	2000
Escambia	23.5	22.1	20.6	19.6	19.6	20.0	21.4
Okaloosa	8.8	8.0	6.5	7.2	8.5	9.0	9.1
Santa Rosa	12.1	8.5	6.8	5.2	4.6	4.0	4.2
Walton	14.0	13.3	13.5	11.1	9.7	6.5	7.0
LMA %	19.2	17.1	15.6	14.5	14.2	13.7	13.8
LMA Total	22,651	30,718	43,953	50,474	59,865	70,744	86,350

Source: U.S. Census Bureau, 2000b.

Table 5

Percent of Hispanic Population*, Pensacola LMA: 1970-2000

County	1970	1980	1990	2000
Escambia	1.5	1.6	1.8	2.7
Okaloosa	2.1	2.3	2.9	4.3
Santa Rosa	0.6	1.2	1.7	2.5
Walton	0.8	0.5	1.2	2.1
LMA %	1.6	1.7	2.1	3.1
LMA Total	5,510	7,323	10,739	19,085

* County-level Census data for Hispanic populations are not available before 1970.
Source: U.S. Census Bureau, 2000b.

Retirement Age Population. Although the State of Florida has a large retirement age population, only 13 percent of the Pensacola LMA was over the age of 65 in 2000; the national rate was 12 percent. Moreover, within the LMA, there is little variation and no county has a percent 65 and older that deviates significantly from the national rate (Table 6). The one possible exception is the least populated Walton County, which had a 15.8 percent retirement age population in 2000.

Table 6

Percent of Population Over 65, Pensacola LMA: 1950-2000

County	1950	1960	1970	1980	1990	2000
Escambia	5.1	5.2	6.4	8.8	12.0	13.3
Okaloosa	4.1	3.2	3.3	5.8	9.3	11.9
Santa Rosa	6.7	5.5	6.0	7.2	9.4	11.0
Walton	8.7	10.7	13.2	16.0	16.8	15.8
LMA Total	5.0	5.0	6.0	8.0	11.0	13.0

Source: U.S. Census Bureau, 2000b.

Education. In 2000, 21 percent of adults in the Pensacola LMA held at least a Bachelor's degree (compared to a national rate of 24%). However, the spatial distribution of educational attainment is skewed. Walton County, the home of Ft. Walton Beach, had fewer college graduates (16%) than all other Pensacola LMA counties (22%). In 2000, the percent of adults who did not earn a high school diploma was lowest in Okaloosa County (8.3%) (Table 7).

Table 7

Adult Educational Attainment (age 25+), Pensacola LMA: 1970-2000

County	0-8 Years	Some High School	High School Diploma	Some College, No Degree	BA/BS or More
1970					
Escambia	28.1%	21.6%	31.5%	9.7%	9.1%
Okaloosa	17.1%	15.8%	40.8%	13.0%	13.2%
Santa Rosa	26.1%	19.0%	34.0%	11.0%	9.8%
Walton	41.2%	21.2%	25.0%	5.8%	6.7%
LMA Total	26.0%	19.9%	33.6%	10.4%	10.1%
1980					
Escambia	16.1%	16.6%	36.3%	16.8%	14.1%
Okaloosa	11.3%	11.2%	41.4%	19.5%	16.6%
Santa Rosa	16.0%	14.4%	38.9%	16.2%	14.4%
Walton	28.9%	20.3%	30.4%	10.8%	9.5%
LMA Total	15.6%	15.2%	37.6%	17.1%	14.5%
1990					
Escambia	8.0%	15.8%	28.5%	29.5%	18.2%
Okaloosa	5.7%	10.5%	28.8%	34.0%	21.0%
Santa Rosa	7.7%	13.8%	28.8%	31.0%	18.6%
Walton	13.6%	19.8%	31.1%	23.6%	11.9%
LMA Total	7.6%	14.8%	28.6%	30.5%	18.5%
2000					
Escambia	5.0%	12.9%	28.3%	32.7%	21.0%
Okaloosa	3.7%	8.3%	27.1%	36.6%	24.2%
Santa Rosa	4.0%	10.6%	29.2%	33.3%	22.9%
Walton	7.3%	16.7%	32.3%	27.4%	16.2%
LMA Total	4.6%	11.4%	28.4%	33.5%	21.9%

Source: U.S. Census Bureau, 2000b.

Finances. The local government finance data for the Pensacola LMA show that this region only experienced slight growth in the 1980s. Moreover, per capita revenues fall off slightly in 1987. This drop is not due to an actual dollar decline in revenues or transfers, but from a jump in the denominator: the population of the Pensacola LMA. During the same year, per capita debt increases to $2,610 from $1,980 in 1982. By 1992, the per capita debt drops to $2,260 dollars (Tables 8-11).

However, within the Pensacola LMA there is considerable variation. Walton County shows low levels of debt, but revenue levels comparable to other counties. This is the most tourist intensive county in the Pensacola LMA and this activity may generate enough revenues to handle expenditures. Escambia County, on the other hand, has revenue levels comparable to the other counties in the LMA, but debt levels about twice the average LMA rate since 1987. This is the most populated county and revenues are not sufficient to meet expenditure demands, thus more debt is incurred. In fact, debt increased by over $900 per capita between 1992 and 1997.

Table 8

Total Revenue, Per Capita (in 1997 adjusted dollars), Pensacola LMA: 1972-1997

County	1972	1977	1982	1987	1992	1997
Escambia	$1,464	$1,890	$2,212	$2,303	$2,292	$2,689
Okaloosa	$1,668	$1,800	$17,443	$1,860	$1,925	$2,363
Santa Rosa	$1,634	$1,783	$1,889	$1,578	$1,624	$1,957
Walton	$1,356	$1,465	$1,529	$1,870	$2,256	$2,401
LMA Total	$800	$1,833	$2,630	$2,050	$2,070	$2,444

Source: U.S. Census Bureau, 2000a.

Table 9

Total State Revenue, Per Capita (in 1997 adjusted dollars), Pensacola LMA: 1972-1997

County	1972	1977	1982	1987	1992	1997
Escambia	$620	$782	$758	$2,303	$1,016	$963
Okaloosa	$715	$869	$7,830	$1,860	$908	$894
Santa Rosa	$610	$863	$744	$1,578	$843	$871
Walton	$667	$646	$611	$1,870	$744	$574
LMA Total	$646	$808	$988	$860	$942	$903

Source: U.S. Census Bureau, 2000a.

Table 10

Total Tax Revenue, Per Capita (in 1997 adjusted dollars), Pensacola LMA: 1972-1997

County	1972	1977	1982	1987	1992	1997
Escambia	$396	$353	$348	$403	$487	$644
Okaloosa	$541	$301	$2,719	$373	$486	$653
Santa Rosa	$306	$249	$394	$355	$463	$547
Walton	$340	$417	$376	$833	$946	$1,190
LMA Total	$420	$329	$432	$414	$507	$662

Source: U.S. Census Bureau, 2000a.

Table 11

Total Debt, Per Capita (in 1997 adjusted dollars), Pensacola LMA: 1972-1997

County	1972	1977	1982	1987	1992	1997
Escambia	$684	$1,621	$2,198	$4,058	$3,183	$4,005
Okaloosa	$1,082	$869	$6,457	$1,021	$1,644	$937
Santa Rosa	$789	$1,184	$686	$1,230	$959	$1,246
Walton	$726	$753	$836	$495	$970	$695
LMA Total	$800	$1,328	$1,981	$2,610	$2,260	$2,431

Source: U.S. Census Bureau, 2000a.

5. Panama City, Florida: Labor Market Area

a. Introduction

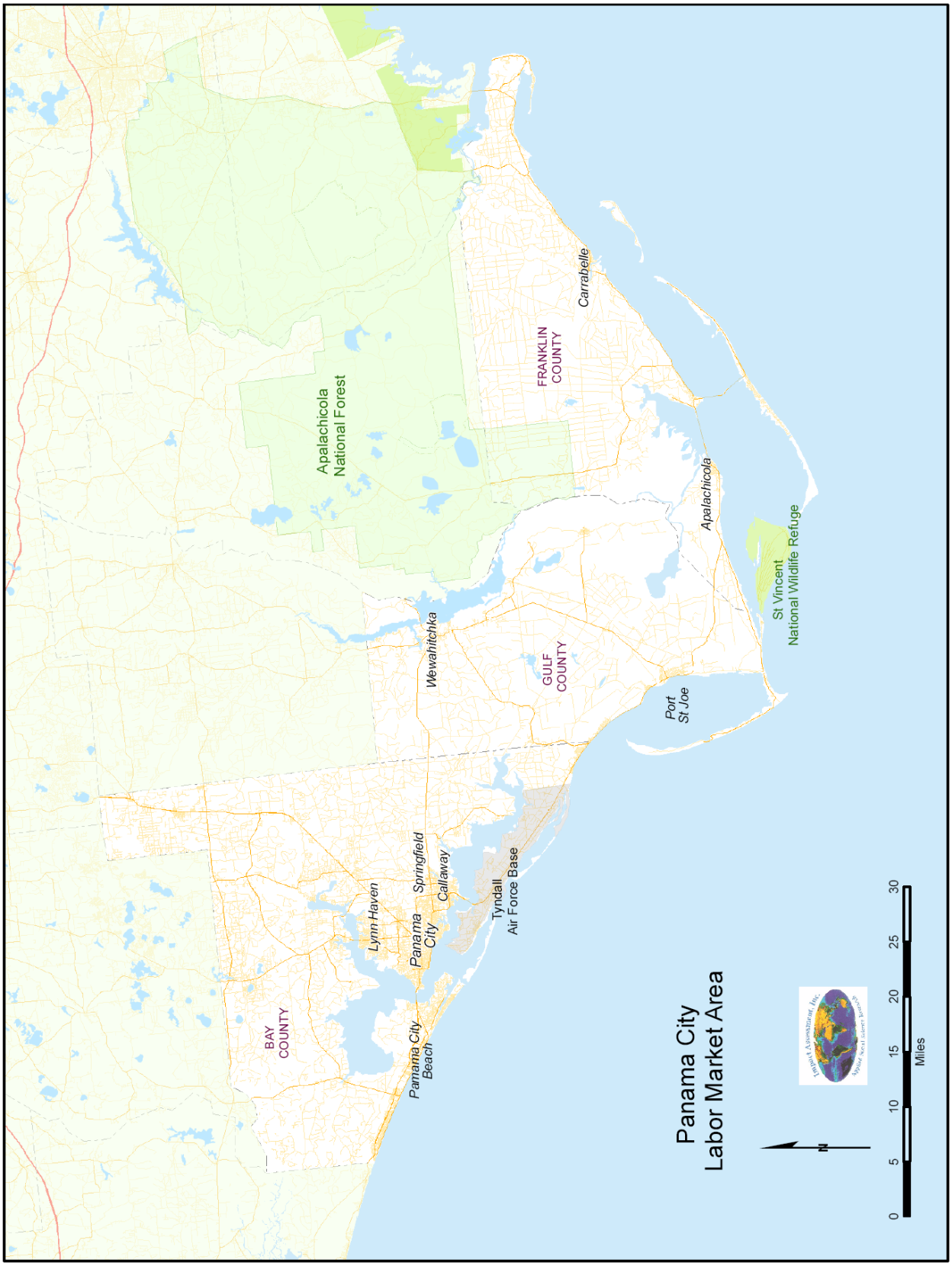
This analysis examines historical and current industry and socio-demographic patterns in LMA 100: Panama City. The analysis is divided into several phases. Phase I provides a general overview of broad (single-digit) industry patterns in this LMA for decennial census years from 1940 to 1990 using Census data. Phase II shows employment patterns in broad (single-digit) industry categories for all years between 1969 and 2000 using Regional Economic Information Systems (REIS) data from the Bureau of Economic Analysis. Phase III examines the impact of economic recessions on employment levels during the last 30 years. Phase IV is a socio-demographic analysis of the LMA.

b. Setting

The Panama City LMA is south of the Tallahassee LMA in the Florida Panhandle. The LMA is comprised of the following counties: Bay, Franklin, and Gulf (Map 17). Approximately 170,000 people resided in this LMA in 2000, making it one of the least populous LMAs in the Florida Gulf of Mexico Region (GOMR). With 140,000 residents, Bay was the most populous county in the Panama City LMA in that year. Caucasians comprise the vast majority of residents in this LMA (83% in 2000), and have been the dominant population since 1950. In 2000, 11 percent of its population was African-American, and 3 percent was Hispanic. During the 1990s this LMA's population grew by 17 percent. While this growth rate was almost twice the national rate of 9 percent, it was still the slowest growth rate among the Florida Gulf Coast LMAs.

c. Unit of Analysis

Labor Market Areas (LMAs) are the geographical units of analysis in this report. Labor Market Areas are defined by patterns of transportation to and from work within and across county boundaries. Labor Market Areas better represent local social systems and, empirically, local economies (Killian and Tolbert, 1993).



Map 17. Panama City, Florida Labor Market Area.

Phase I: General Historical Industry Trends. This section considers the general historical industry trends for Panama City LMA (Figure 1). The data are analyzed both cross-sectionally and longitudinally in order to gain a more complete understanding of both the structure of and the resulting changes to the Panama City LMA's primary industries over time.

Year 1940. In 1940, only 7,821 people were employed in the Panama City LMA. Manufacturing (40%) was the dominant non-service sector. Wholesale/retail trade, and services employed 38 percent of the Panama City LMA labor force. The mining sector employed no workers in 1940.

Year 1950. Between 1940 and 1950, the Panama City LMA total employment grew by 67 percent, employing approximately 13,000 workers. In 1950, services and wholesale/retail trade employed a combined total of 49 percent of the labor force. Manufacturing employed 25 percent of workers. Construction was the only other non-service industry sector in which employment concentration was at least 10 percent in 1950, employing 1,500 people in 1950.

Year 1960. Between 1950 and 1960, total employment grew by 76 percent, employing in excess of 23,000 workers in 1960. In terms of number of jobs, employment growth was most substantial in services where 3,000 new jobs were added. By 1960, services and wholesale/retail trade employed 60 percent of the Panama City LMA workforce. Manufacturing employed almost 20 percent of the labor force. In 1960, mining employed 42 workers.

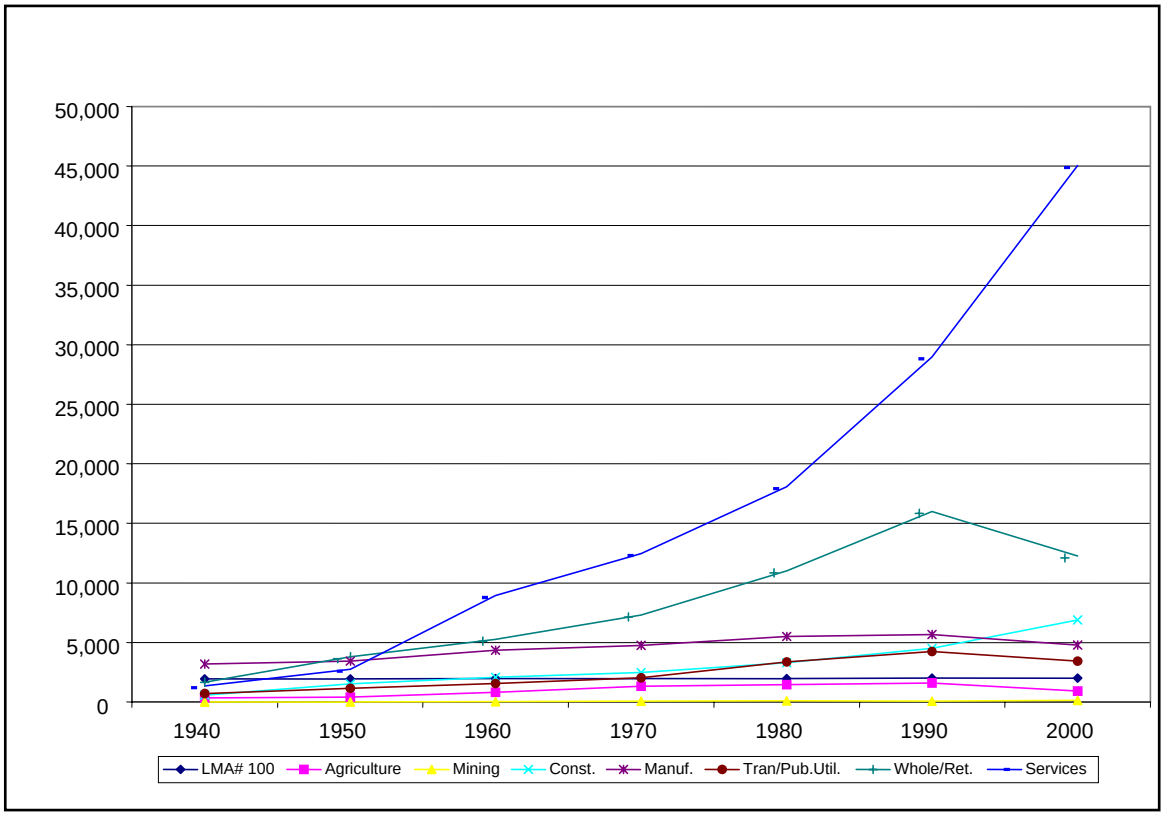


Figure 1. Major Industry Employment, Panama City LMA: 1940-2000 (U.S. Census Bureau, 2000b).

Year 1970. Total employment in the Panama City LMA grew by 31 percent between 1960 and 1970, employing nearly 31,000 people by 1970. In non-service sectors, growth was

greatest in transportation/public utilities (29%). Manufacturing grew at 9 percent, significantly less than the growth rates for this period in other Florida LMAs. Services generated 3,000 new jobs. By 1970, 64 percent of all employment in the Panama City LMA was concentrated in services and wholesale/retail trade.

Year 1980. Between 1970 and 1980, the total employment rate in the Panama City LMA grew by 40 percent, employing 42,780 workers in 1980. Construction, manufacturing, and transportation and public utilities combined to add less than 3,000 total new jobs to the LMA. Of the nearly 12,000 new jobs added in the Panama City LMA, approximately 75 percent were added in the combined service and wholesale/retail trade sectors, which employed almost 28,000 workers in 1980, or 67 percent of the labor force.

Year 1990. Between 1980 and 1990, the Panama City LMA experienced a 43 percent increase in employment. In 1990, employment levels exceeded 61,000 workers in Panama City LMA. Services and wholesale/retail trade combined to add 16,000 new jobs. By 1990, manufacturing employed over 5,000 workers, and the construction industry employed 4,500. By 1990 73 percent of all jobs in the Panama City LMA were in services or wholesale/retail trade.

Phase II: Recent Industry Analysis. The historical Census data show that the Panama City LMA grew relatively slowly throughout the period (Figure 2). What distinguishes the Panama City LMA from other slower growing Florida LMAs is its lack of dependence on agriculture during any period. While growth rates were slower and employment levels very low, there were no hints of an economic downturn.

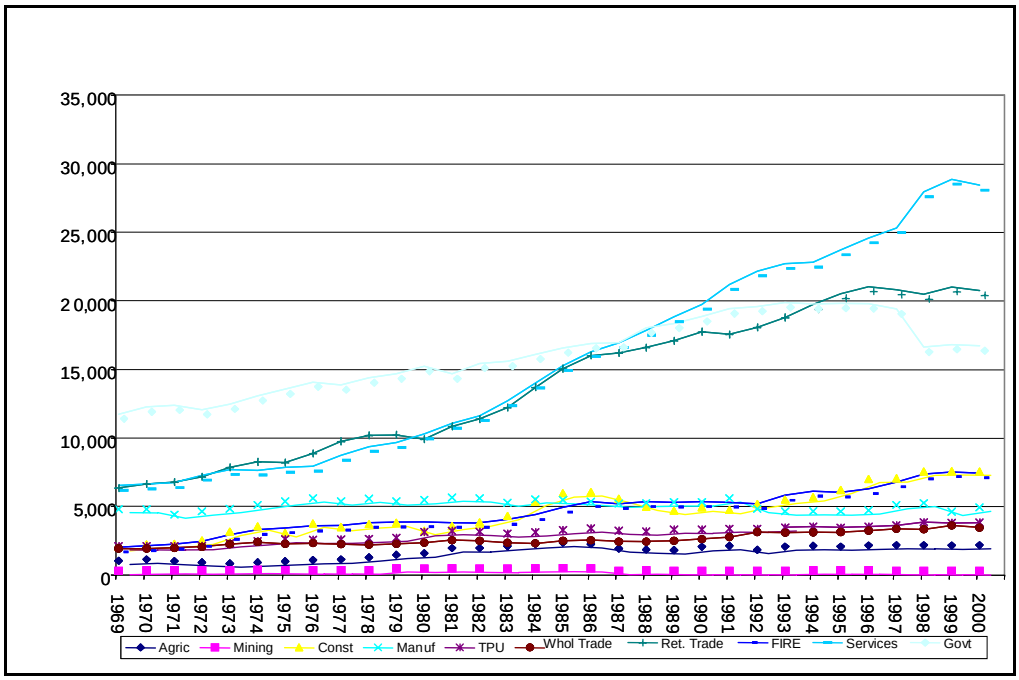


Figure 2. Annual Employment, Panama City LMA: 1969-2000 (U.S. Dept. of Commerce, Bureau of Economic Analysis, 2000).

The REIS data show that the Panama City LMA had high concentrations of employment in retail trade (21%), services (29%) and government (17%) in 2000 (Table 1). The Panama City LMA's economy is largely tourist-based. It employs more accommodation and food service workers than do most other LMAs along the Florida Gulf Coast. Because the Panama City LMA

has a tourist-based economy, however, it is vulnerable to significant downturns during national recessions. Since 1970, the United States' economy has experienced several recessions: following the oil embargo and the energy crises (1973-1976); following the high interest rates that followed rapid inflation growth (1980-1982); and (1989-1992).[3]

Table 1

Employment by Sector, Panama City LMA: 2000

Industry	Percent
Agriculture	1.9
Mining	0.3
Construction	7.4
Manufacturing	4.7
Transportation/Public Utilities	3.6
Wholesale Trade	3.2
Retail Trade	20.9
Finances, Insurance & Real Estate	7.3
Services	28.8
Government	16.8

Source: U.S. Census Bureau, 2000b.

Phase III: Recession Analysis. To test the effects of business cycle recessions on the Panama City economy during the last 30 years, we examined the annual trends in employment. Total annual employment figures, plus three-year employment moving averages, for Panama City LMA data show positive growth patterns without the presence of downturns in the economy (Figure 3). In almost every year the actual employment levels were slightly higher than expected, based on the employment levels in the previous three years. Two exceptions occurred in early 1970s and late 1980s. These are recession periods, but even the expected employment levels never exceeded the observed employment levels. Moreover, we fail to see declines in actual employment that were present in other Gulf of Mexico LMAs in the oil and natural gas regions of Louisiana; LMAs that largely had specialist economies.

In a systems approach to local economic organization, one issue that is particularly important is the impact of "shocks" on a social system. Slow, gradual growth and/or decline are not as problematic for a social system as are shocks. Shocks come when systems experience unanticipated growth (such as "boomtowns") or decline. Gradual growth and/or decline allow equilibrium-seeking social systems to absorb the changes, to reallocate and redistribute resources and population. Shocks, on the other hand, create disruptions in a social system. These disruptions can manifest in a number of local fiscal and social problems.

In order to understand the benefits and burdens of certain industries to a system, it is important to know the timing of the industry shocks. In our analysis, we employ a moving average forecasting model to locate the years that the shocks occur in the Panama City LMA.

The forecasting procedure includes the following. First, three-year moving averages (current plus previous two years) of employment levels are computed. Second, at each year the

[3] Heilbroner and Milberg, 1999; Mencken and Singelmann, 1998.

expected value (three-year moving average) is subtracted from the observed value. Each of these deviations is squared to provide the forecasting error for each year. These squared deviations are summed and averaged across all years in the analysis to compute a mean squared error (MSE). We establish a "shock" for any given year in which the squared deviation for that year is greater than or equal to two times the mean squared error for the industry sector in question (Anderson et al., 1990).

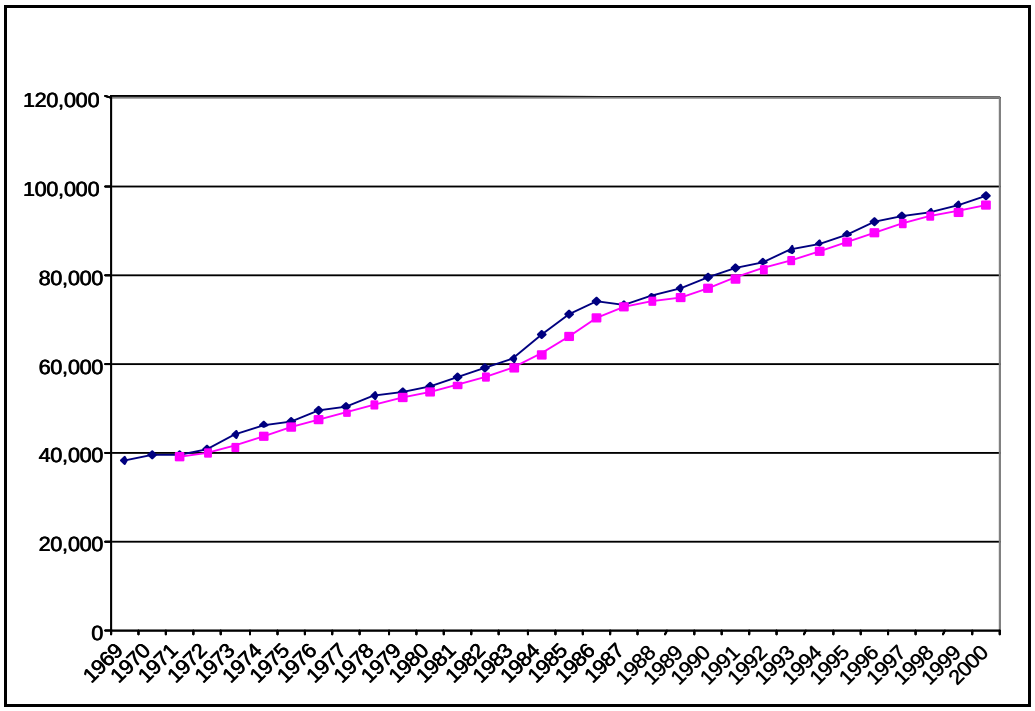


Figure 3. Total Employment and Three-year Moving Averages, Panama City LMA: 1969-2000 (U.S. Dept. of Commerce, Bureau of Economic Analysis, 2000).

Since at least 1970, employment growth rates were greatest during the "boom" of the 1980s (Figure 4). Also, the forecasting analysis fails to detect significant drop-offs in employment during any of the recession periods over the period in question.

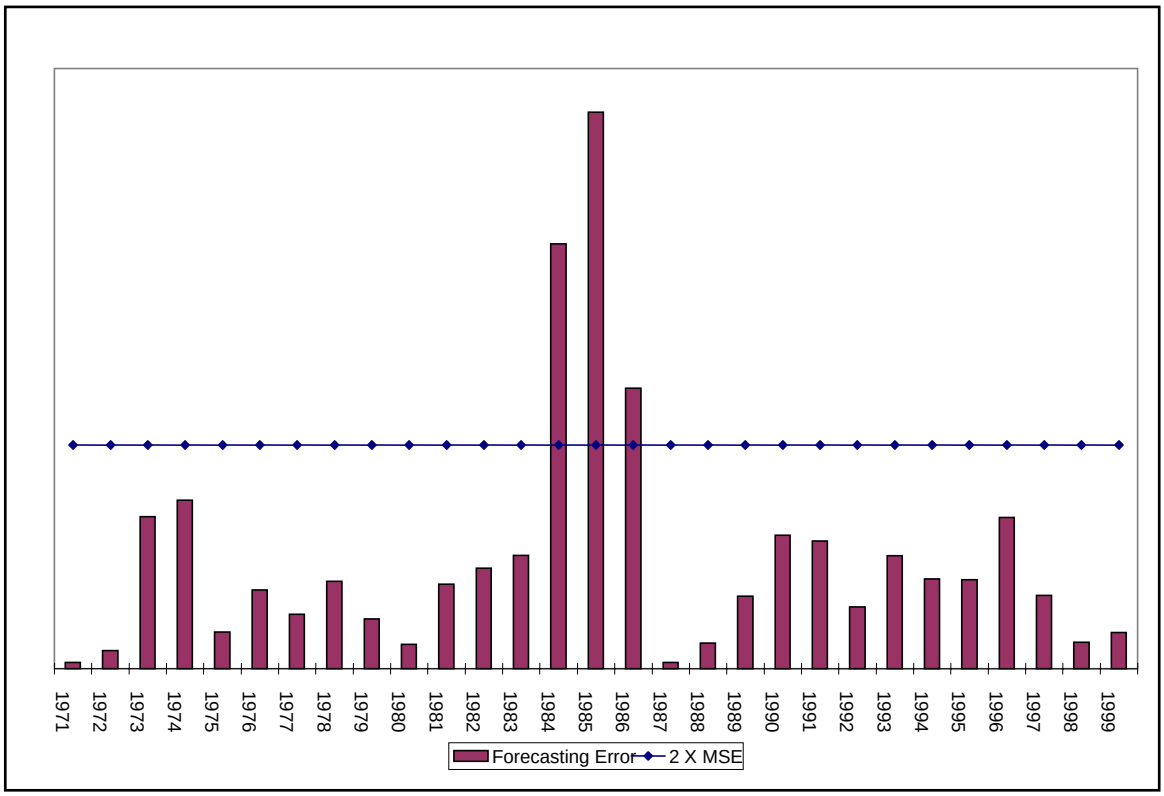


Figure 4. Employment Forecasting Analysis, Panama City LMA: 1971-1999.

Phase IV: Socio-Demographic Analysis. The historical and current population data for the Panama City LMA show that this has been one of the slowest growing LMAs in the nation since the 1950s (Tables 2-4). Although the population has averaged almost 20 percent growth rates for the last three decades, these numbers are significantly lower than other growth rates in the Florida Gulf of Mexico LMAs. However, the growth rate was almost twice the national average during the 1990s, despite being the slowest growing LMA in the Florida GOMR.

The Panama City LMA has also been the most stable in terms of racial and ethnic composition. Since 1950, the vast majority of the population has been white (80%). This is also one of the few Florida GOMR LMAs without a growing Hispanic population.

Table 2

Percent of White Population, Panama City LMA: 1940-2000

County	1940	1950	1960	1970	1980	1990	2000
Bay	79.6	83.2	85.2	85.5	86.2	87.4	86.5
Franklin	66.6	74.2	78.8	79.0	83.8	86.4	81.3
Gulf	65.7	73.2	76.0	75.5	78.7	80.9	80.6
LMA Total	25,025	45,295	69,810	78,798	98,678	126,849	142,022

Source: U.S. Census Bureau, 2000b.

Table 3

Percent of Black Population, Panama City LMA: 1940-2000

County	1940	1950	1960	1970	1980	1990	2000
Bay	20.4	16.7	14.7	12.6	12.0	10.6	10.9
Franklin	33.3	25.7	21.1	23.0	14.1	12.5	16.2
Gulf	34.3	26.8	24.0	23.3	19.8	18.8	17.3
LMA Total	8,601	10,631	13,670	13,343	14,945	16,657	19,535

Source: U.S. Census Bureau, 2000b.

Table 4

Percent of Hispanic Population*, Panama City LMA: 1970-2000

County	1970	1980	1990	2000
Bay	1.9	1.6	1.9	2.5
Franklin	0.0	2.0	1.0	2.4
Gulf	1.1	1.4	0.3	2.1
LMA Total	1,571	1,966	2,539	4,129

*County-level Census data for Hispanic populations are not available before 1970.
Source: U.S. Census Bureau, 2000b.

Retirement Age Population. The State of Florida has a large retirement age population. In some counties, the percent of the population 65 and older exceeds the national rate of 12 percent by more than 200 percent. The Panama City LMA, however, does not qualify as one of those retirement-age intensive LMAs. Still, 16 percent of the population in the Panama City LMA was over the age of 65 in 2000 (Table 5).

Table 5

Percent Population Over 65, Panama City LMA: 1950-2000

County	1950	1960	1970	1980	1990	2000
Bay	4.5	5.1	7.1	9.4	12.0	13.3
Franklin	8.5	13.3	15.7	14.9	18.0	15.9
Gulf	4.6	5.1	8.2	10.9	15.2	16.3
LMA Total	5.9	7.9	10.3	11.8	15.1	15.2

Source: U.S. Census Bureau, 2000b.

Education. In 2000, the percentage of adults with a college degree (17%) in this LMA was significantly lower than the national rate (24%). It also had one of the lowest college graduate rates in the greater Florida GOM Region. However, it is typical to find lower rates of college graduates in tourist-intensive areas where many jobs do not require high-level skill sets. Within the LMA, Bay County has the highest percentage of college graduates (18%), but does

not approach the national average of 24 percent. Despite having low levels of college graduates, the Panama City LMA had significantly fewer non-high school graduates (20%) in 2000 than did the nearby Taylor LMA (29%) (Table 6).

Table 6

Adult Educational Attainment (+25), Panama City: 1970-2000

County	0-8 Years	Some High School	High School Diploma	Some College, No Degree	BA/BS or More	Total
1970						
Bay	28.1%	20.9%	31.5%	10.2%	9.2%	38,673
Franklin	43.8%	20.9%	24.3%	6.4%	4.6%	3,980
Gulf	37.6%	20.1%	30.2%	6.4%	5.6%	5,274
LMA Total	30.5%	20.7%	30.7%	9.4%	8.4%	47,927
1980						
Bay	18.4%	15.8%	35.7%	16.9%	13.2%	56,053
Franklin	33.2%	22.7%	27.1%	7.8%	9.0%	4,501
Gulf	23.1%	18.2%	42.5%	9.3%	6.7%	6,182
LMA Total	19.8%	16.4%	35.7%	15.5%	12.3%	66,736
1990						
Bay	9.1%	16.2%	30.6%	28.3%	15.7%	82,448
Franklin	17.4%	23.0%	30.6%	16.5%	12.4%	6,107
Gulf	12.8%	20.7%	36.8%	20.3%	9.1%	7,641
LMA Total	9.9%	17.0%	31.1%	26.9%	14.9%	96,196
2000						
Bay	5.0%	14.0%	30.6%	32.7%	17.6%	99,771
Franklin	9.2%	13.0%	41.4%	22.2%	14.1%	7,202
Gulf	8.6%	18.8%	37.1%	25.3%	10.1%	9,527
LMA Total	5.5%	14.3%	31.8%	31.4%	16.8%	116,500

Source: U.S. Census Bureau, 2000b.

Finances. The Panama City LMA's focus on tourism could have extensive implications for local government finances. The government financial data show higher levels of per capita revenues in 1997 than for the largest LMAs in the region. For example, in 1997, per capita revenues in the Sarasota LMA were $2,943, and $2,818 in Tampa Bay-St. Petersburg. However, in Panama City LMA, the rate is $3,286 per capita. In 1997, the per capita local government debt was $1,500, compared to $4,500 per capita in the Ft. Myers LMA during the same year (Tables 7-10).

Table 7

Total Revenue, Per Capita (in 1997 adjusted dollars), Panama City LMA: 1972-1997

County	1972	1977	1982	1987	1992	1997
Bay	$2,036	$2,807	$2,515	$2,925	$3,492	$3,414
Franklin	$1,558	$1,813	$2,273	$2,588	$2,288	$2,397
Gulf	$1,576	$1,897	$2,423	$2,559	$2,645	$2,592
LMA Total	$1,878	$2,460	$2,492	$2,875	$3,356	$3,286

Source: U.S. Census Bureau, 2000a.

Table 8

Total State Revenue, Per Capita (in 1997 adjusted dollars), Panama City LMA: 1972-1997

County	1972	1977	1982	1987	1992	1997
Bay	$610	$1,024	$801	$921	$990	$940
Franklin	$1,111	$1,151	$989	$1,045	$1,075	$757
Gulf	$849	$1,070	$942	$1,017	$1,064	$850
LMA Total	$672	$1,036	$825	$936	$1,001	$922

Source: U.S. Census Bureau, 2000a.

Table 9

Total Tax Revenue, Per Capita (in 1997 adjusted dollars), Panama City LMA: 1972-1997

County	1972	1977	1982	1987	1992	1997
Bay	$635	$449	$410	$520	$664	$747
Franklin	$254	$459	$464	$717	$758	$1,070
Gulf	$688	$463	$459	$676	$886	$873
LMA Total	$613	$451	$418	$545	$686	$777

Source: U.S. Census Bureau, 2000a.

Table 10

Total Debt, Per Capita (in 1997 adjusted dollars), Panama City LMA: 1972-1997

County	1972	1977	1982	1987	1992	1997
Bay	$1,516	$1,503	$1,019	$1,686	$1,164	$1,711
Franklin	$631	$1,513	$1,567	$1,284	$910	$382
Gulf	$1,744	$1,267	$2,609	$420	$653	$982
LMA Total	$1,474	$1,482	$1,194	$1,560	$1,110	$1,572

Source: U.S. Census Bureau, 2000a.

6. Tallahassee, Florida: Labor Market Area

a. Introduction

This analysis examines the historical and current industry and socio-demographic patterns in LMA 099: Tallahassee. The analysis is divided into several phases. Phase I provides a general overview of broad (single-digit) industry patterns in this LMA for decennial census years from 1940 to 1990 using Census data. Phase II shows employment patterns in broad (single-digit) industry categories for all years between 1969 and 2000 using regional employment and industry statistics (REIS) data from the Bureau of Economic Analysis. Phase III examines the impact of economic recessions on employment levels during the last 30 years. Phase IV is a socio-demographic analysis of the LMA.

b. Setting

The Tallahassee LMA is located in the Florida Panhandle (Map 18). It is the state capitol, and home to two state universities (Florida State University, and Florida A&M University). This LMA is comprised of the following counties: Calhoun, Gadsden, Holmes, Jackson, Leon, Liberty, Wakulla, and Washington. Over 425,000 people resided in the LMA in 2000, with 150,000 residing in Leon, the largest county. In 2000, the LMA population was 65 percent Caucasian, 29 percent African-American, and 3 percent Hispanic. During the 1990s the population of the LMA grew by more than 22 percent, vastly exceeding the national growth rate of 9 percent.

c. Unit of Analysis

Labor Market Areas (LMAs) are the geographical units of analysis in this report. Labor Market Areas are defined by patterns of transportation to and from work within and across county boundaries. Labor Market Areas better represent local social systems and, empirically, local economies (Killian and Tolbert, 1993).

Phase I: General Historical Industry Trends. This section considers general historical industry trends for the Tallahassee LMA (Figure 1). These data are analyzed both cross-sectionally and longitudinally in order to gain a more complete understanding of both the structure of and the resulting changes to the Tampa-St. Petersburg LMA's primary industries over time.

Year 1940. In 1940, 37,867 people were employed in the Tallahassee LMA. The leading non-service sectors, agriculture and manufacturing, employed 50 percent and 13 percent of the LMA labor force, respectively. Wholesale/retail trade, and services employed 27 percent of the workforce. The mining sector employed 128 workers in 1940.

Year 1950. Between 1940 and 1950, total employment in Tallahassee LMA grew by 31 percent, employing approximately 50,000 workers by 1950. Services and wholesale/retail trade employed 37 percent of the workforce, while agriculture employed approximately 33 percent. Manufacturing was the other non-service industry sector employing at least 10 percent of the labor force, employing 6,000 people in 1950.

Map 18. Tallahassee, Florida Labor Market Area.

Year 1960. Between 1950 and 1960, total employment grew by 31 percent, employing some 65,000 workers in 1960. In terms of number of jobs, employment growth was most substantial in services where 17,000 new jobs were added. By 1960, services and wholesale/retail trade employed 59 percent of the Tallahassee LMA workforce, but accounted for less than 25,000 jobs. Agriculture lost jobs during the 1950s (-9,000), but still employed 17 percent of all workers in 1960. In 1960, mining employed 173 workers.

Year 1970. Total employment in Tallahassee LMA grew by 26 percent between 1960 and 1970, with nearly 83,000 people employed in 1970. In non-service sectors, growth was greatest in transportation/public utilities (43%). Manufacturing grew at 6 percent, significantly less than other Florida LMA growth rates for this same period. Services generated 15,000 new jobs. By 1970, 69 percent of all employment in Tallahassee LMA was concentrated in services and wholesale/retail trade. Agriculture employed less than 10 percent of the total work force in 1970, down from 17 percent in 1960.

Year 1980. The total Tallahassee LMA employment rate grew by 51 percent between 1970 and 1980, employing 125,497 workers in 1980. Over 2,600 jobs were added in construction, 3,000 added in manufacturing, and 2,500 in transportation and public utilities. Services and wholesale/retail trade (combined) added almost 27,000 jobs, and employed almost 85,000 workers or 74 percent of the labor force in 1990. Employment in the agricultural sector declined by 29 percent between 1970 and 1980, and employed only 4 percent of the labor force by 1980.

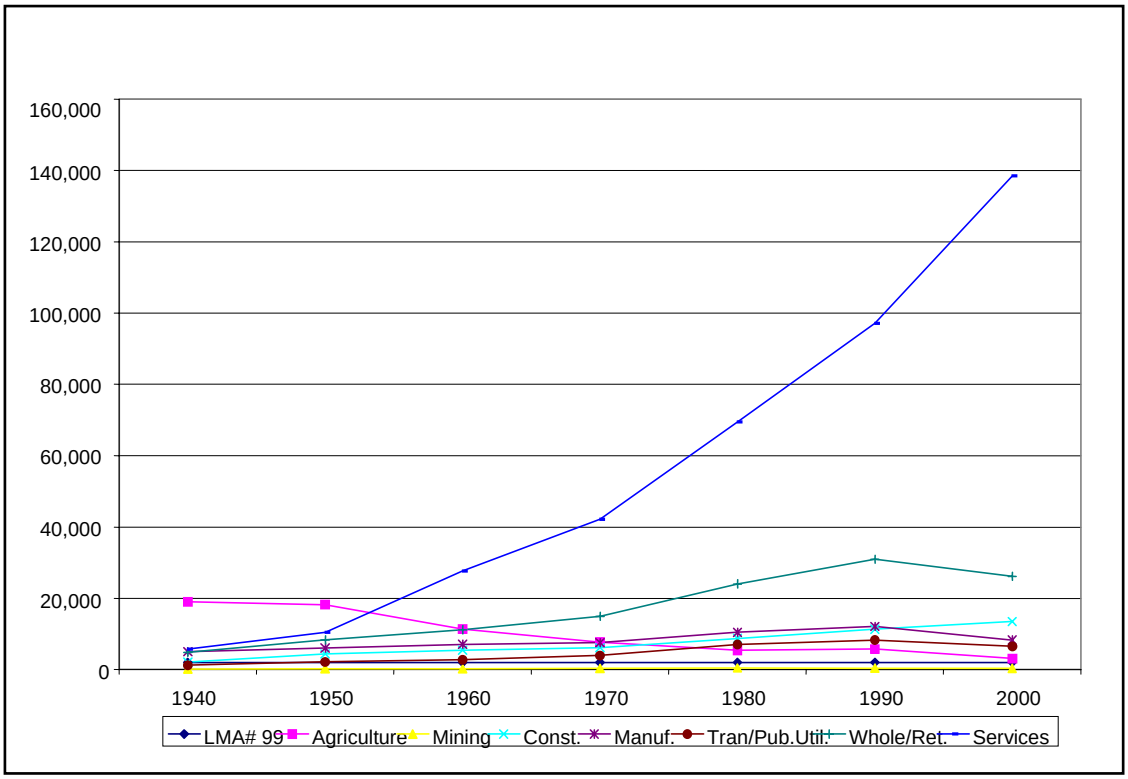


Figure 1. Major Industry Employment, Tallahassee LMA: 1940-2000 (U.S. Census Bureau, 2000b).

Year 1990. Between 1980 and 1990, employment in the Tallahassee LMA increased 32 percent, employing almost 165,000 workers in 1990. Services and wholesale/retail trade (combined) added 33,000 new jobs. By 1990, manufacturing employed over 12,000 workers, and the construction industry employed almost as many. By 1990, 76 percent of all jobs in the Tallahassee LMA were in services or wholesale/retail trade. Agricultural employment leveled off at approximately 5,000 workers in 1990.

Phase II: Recent Industry Analysis. The Tallahassee LMA was relatively slow-growing and agricultural-dependent until 1970, with no hints of an economic downturn. After 1970, its industry growth rates began to mirror those in other Florida LMAs (Figure 2).

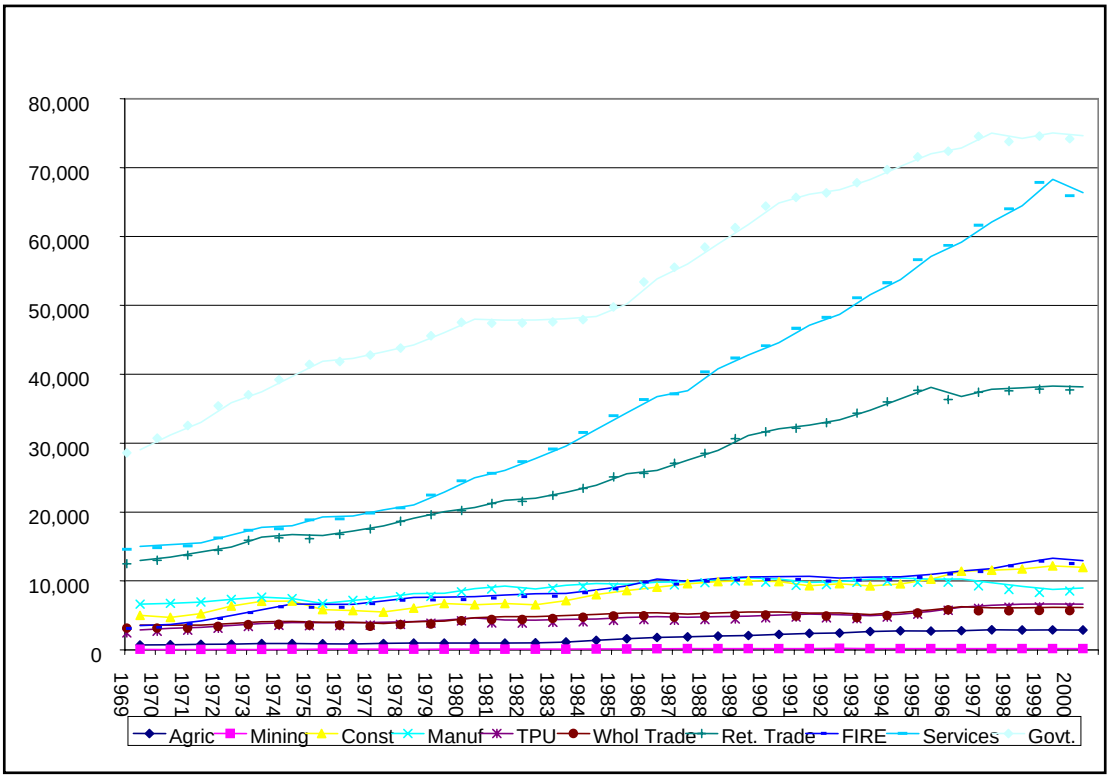


Figure 2. Annual Employment, Tallahassee LMA: 1969-2000 (U.S. Dept. of Commerce, Bureau of Economic Analysis, 2000).

Employment grew by 18 percent in the Tallahassee LMA during the 1990s; services, construction, and government account for all of this growth (Table1). Home to the state capitol, Tallahassee is one of the most government intensive LMAs in the nation. Government employment accounted for 31 percent of all employment in 2000. During the 1990s, government employment in the nation grew 5 percent, employing 14 percent of the workforce in 2000. In 2000, government employment within the Florida Gulf of Mexico LMAs was 19 percent. Of course, government employment is not uniform across LMAs. For example, both the Pensacola LMA (1%), and the Sarasota LMA (2%) had government employment growth rates that were lower than the national rate of 5 percent, while the Panama City LMA's government employment declined (-10%). However, the Ft. Myers (29%), and several of the more rural LMAs (e.g., Taylor, Citrus-Marion, Tallahassee) experienced growth rates in excess of 10 percent, or at least twice the national growth rate.

Table 1

Employment by Sector, Tallahassee LMA: 2000

Industry	Percent
Agriculture	1.2
Mining	0.1
Construction	5.0
Manufacturing	3.8
Transportation/Public Utilities	2.8
Wholesale Trade	2.6
Retail Trade	16.0
Finances, Insurance & Real Estate	5.4
Services	27.8
Government	31.2

Source: U.S. Census Bureau, 2000b.

In 2000, the Pensacola LMA (23%), the Dixie-Gainesville LMA (29%), and the Tallahassee LMA (32%) had high levels of government employment. The Naval Air Station Pensacola, located in Pensacola; the University of Florida, in Gainesville; and, the state capitol, in Tallahassee account for these high levels of government employment. Clearly, those three LMAs along the Florida Gulf Coast are government-intensive.

Phase III: Recession Analysis. To test the effects of business cycle recessions on the Tallahassee LMA economy since 1970, we examined the annual trends in employment. The total annual employment data for the Tallahassee LMA, together with the three-year employment moving averages illustrate a linear growth pattern (Figure 3). In most years the actual employment levels were greater than expected, based on the employment levels in the previous three years. However, we see some convergence in these lines for the three major recessions of the time period: the mid-1970s, the early 1980s, and the early 1990s. During each of these years observed employment levels were not greater than predicted employment levels. However, in all other years growth exceeded expectations.

In a systems approach to local economic organization, one issue that is particularly important is the impact of "shocks" on a social system. Slow, gradual growth and/or decline are not as problematic for a social system as are shocks. Shocks come when systems experience unanticipated growth (such as "boomtowns") or decline. Gradual growth and/or decline allow equilibrium-seeking social systems to absorb the changes, to reallocate and redistribute resources and population. Shocks, on the other hand, create disruptions in a social system. These disruptions can manifest in a number of local fiscal and social problems.

In order to understand the benefits and burdens of certain industries to a system, it is important to know the timing of the industry shocks. In our analysis, we employ a moving average forecasting model to locate the years that the shocks occur in the Tallahassee LMA. The forecasting procedure includes the following. First, three-year employment moving averages (current plus previous two years) are computed. Second, at each year the expected value (three-year moving average) is subtracted from the observed value. Each of these deviations is squared to provide the forecasting error for each year. These squared deviations are summed and averaged across all years in the analysis to compute a mean squared error (MSE). We establish a

"shock" for any given year in which the squared deviation for that year is greater than or equal to two times the mean squared error for the industry sector in question (Anderson et al., 1990).

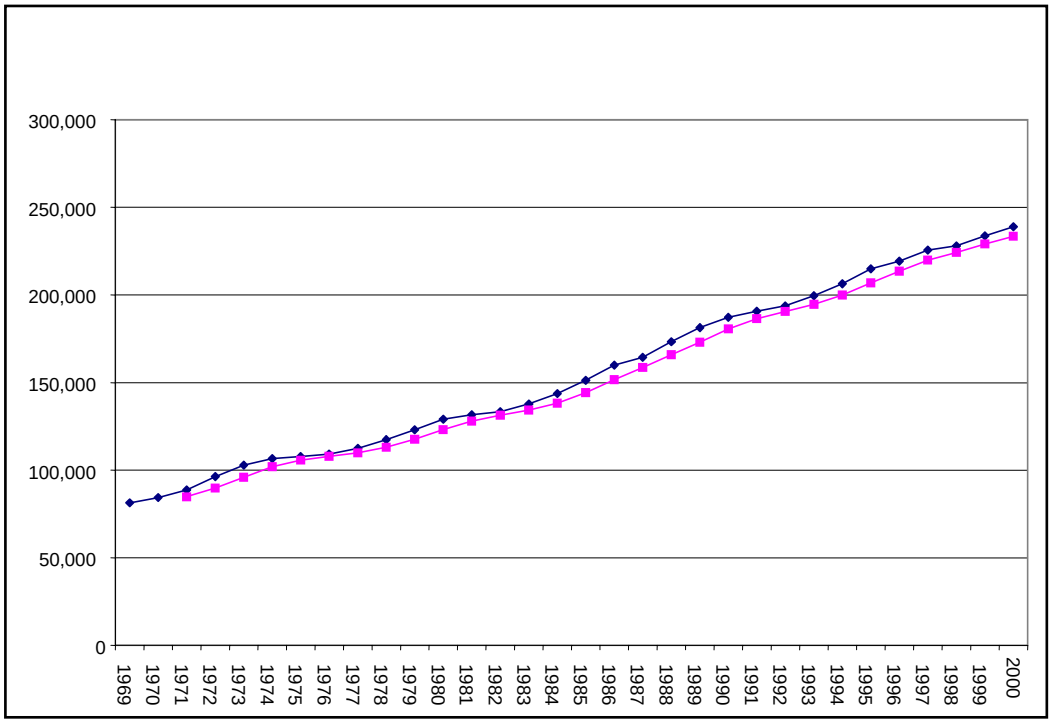


Figure 3. Total Employment and Three-year Moving Averages, Tallahassee LMA: 1969-2000 (U.S. Dept. of Commerce, Bureau of Economic Analysis, 2000).

The employment and three-year moving averages data show that over the last 30 years, the employment growth rates were greatest (i.e., exceeded expectations) in the economic booms of the 1980s and the 1990s. Also, the forecasting analysis fails to detect significant drop-offs in employment during any of the recession periods over the period in question. One reason for the lack of downturn may stem from the concentration of government employment in the LMA, which, unlike the private sector, is more recession-proof (Figure 4).

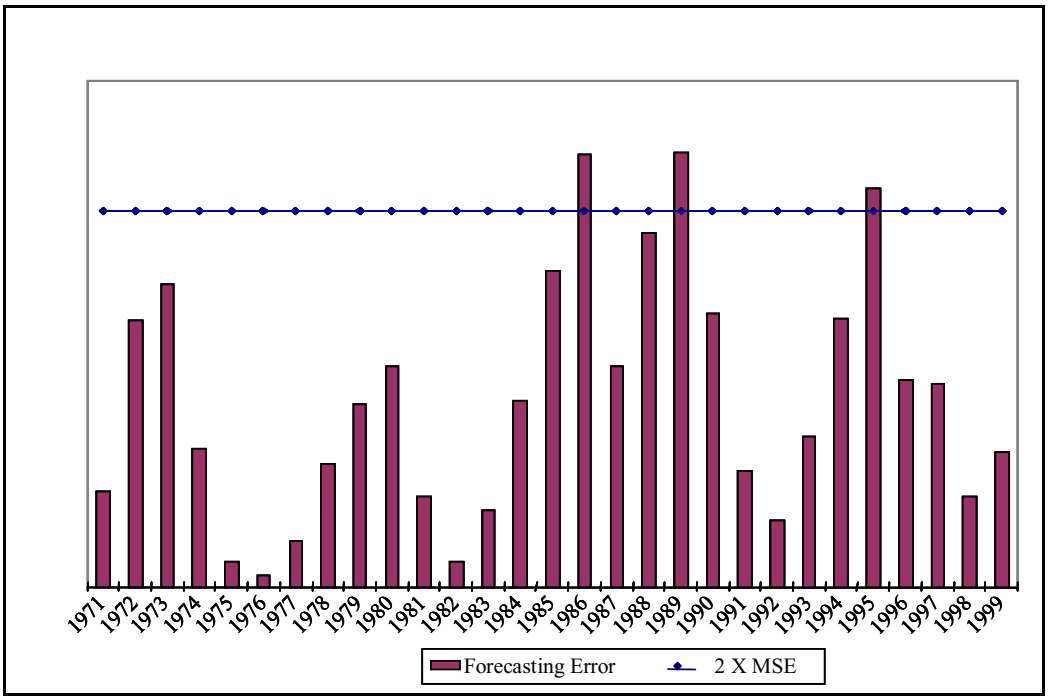


Figure 4. Employment Forecasting Analysis, Tallahassee LMA: 1971-1999.

Phase IV: Socio-Demographic Analysis. In 2000, Caucasians comprised 65 percent of the Tallahassee population. In that same year, African-Americans comprised 29 percent, and Hispanics accounted for 4 percent of the population. The historical and current population data for the Tallahassee LMA show that growth rates in this LMA have exceeded national growth rates since 1940 (Tables 2-5). In particular, the LMA experienced rapid growth in the 1970s (30%), the 1980s (19%) and the 1990s (22%). While these growth rates are substantially lower than those found in other LMAs along the Florida GOM, they are significantly higher than the national growth rates for those years.

Table 2

Population by County, Tallahassee LMA: 1940-2000

County	1940	1950	1960	1970	1980	1990	2000
Calhoun	8,218	7,922	7,422	7,624	9,294	11,011	13,017
Gadsden	31,450	36,457	41,989	39,184	41,565	41,105	45,087
Holmes	15,447	13,988	10,844	10,720	14,723	15,778	18,564
Jackson	46,755	41,375	39,154	34,434	36,208	34,645	34,428
Jefferson	12,032	10,413	9,543	8,788	10,703	11,296	12,902
Leon	31,646	51,590	74,225	103,047	148,655	191,493	239,452
Liberty	3,752	3,182	3,138	3,379	4,260	5,569	7,021
Wakulla	5,461	5,258	5,255	6,308	5,257	5,258	5,463
Washington	20,973	16,919	14,509	11,453	14,273	16,485	19,704
LMA Total	175,734	187,104	206,079	224,927	284,938	332,640	395,638

Source: U.S. Census Bureau, 2000b.

Table 3

Percent of White Population, Tallahassee LMA: 1940-2000

County	1940	1950	1960	1970	1980	1990	2000
Calhoun	84.8	86.3	83.9	85.1	86.9	83.1	77.6
Gadsden	44.3	43.8	40.5	43.5	39.6	40.6	35.8
Holmes	95.0	95.6	95.8	96.9	97.3	93.1	88.9
Jackson	47.1	55.7	63.7	71.0	79.2	86.7	93.2
Jefferson	33.4	37.4	40.8	44.1	51.6	55.9	58.3
Leon	49.1	60.5	67.1	74.3	73.9	74.0	64.1
Liberty	75.3	81.7	84.7	85.6	89.2	82.0	74.5
Wakulla	66.2	69.0	71.4	75.8	81.4	65.0	52.6
Washington	47.8	57.7	62.5	79.8	84.4	84.9	85.6
LMA %	53.2	59.0	62.0	68.7	70.9	72.3	65.9
LMA Total	93,660	110,392	127,829	154,531	202,248	240,605	260,848

Source: U.S. Census Bureau, 2000b.

Table 4

Percent of Black Population, Tallahassee LMA: 1940-2000

County	1940	1950	1960	1970	1980	1990	2000
Calhoun	15.1	14.1	16.0	14.8	12.1	15.1	15.5
Gadsden	55.6	56.1	59.4	59.3	59.9	58.1	56.8
Holmes	4.9	4.3	4.2	3.0	1.9	4.8	6.4
Jackson	26.5	27.8	28.6	28.9	28.2	31.2	35.6
Jefferson	66.5	62.5	59.1	55.7	47.7	42.9	38.0
Leon	50.9	39.5	32.7	25.2	24.7	24.3	28.8
Liberty	24.6	18.2	15.0	14.3	10.7	17.0	18.2
Wakulla	33.7	30.9	28.5	24.1	33.9	34.9	47.3
Washington	10.8	12.5	15.0	20.1	15.6	15.1	14.3
LMA %	34.7	34.7	34.8	31.0	29.0	28.2	30.7
LMA Total	61,066	64,936	71,893	69,865	82,821	93,807	121,765

Source: U.S. Census Bureau, 2000b.

Table 5

Percent of Hispanic Population*, Tallahassee LMA: 1970-2000

County	1970	1980	1990	2000
Calhoun	0.0	0.4	1.9	3.8
Gadsden	0.3	1.2	1.8	6.1
Holmes	0.1	0.4	1.3	1.9
Jackson	0.4	0.8	2.7	3.9
Jefferson	0.9	0.2	1.5	2.2
Leon	1.6	1.5	2.6	3.5
Liberty	0.0	0.1	1.3	4.5
Wakulla	0.4	2.3	1.7	8.1
Washington	0.0	0.6	0.8	2.4
LMA %	0.9	1.2	2.3	3.8
LMA Total	2,069	3,489	7,627	14,932

*County-level Census data for Hispanic populations are not available prior to 1970.
Source: U.S. Census Bureau, 2000b.

Retirement Age Population. The State of Florida has a large retirement age population. In some counties, the 65 and older population exceeds the national rate of 12 percent by more than 200 percent. However, Tallahassee is not a retirement age LMA. In 2000, only 11 percent of the population was age 65 and older. Moreover, there is little variation within this LMA and none of the counties retirement age population deviates significantly from the national rate (Table 6).

Table 6

Percent of Population Over 65, Tallahassee LMA: 1950-2000

County	1950	1960	1970	1980	1990	2000
Calhoun	6.9	9.0	10.9	15.4	14.3	13.8
Gadsden	8.2	9.4	11.9	12.0	11.9	12.2
Holmes	7.3	11.9	14.5	14.3	15.4	14.7
Jackson	7.8	8.6	11.0	13.7	15.0	14.6
Jefferson	10.7	10.7	12.0	13.2	14.8	14.5
Leon	5.3	5.2	5.4	6.5	8.1	8.3
Liberty	7.7	8.9	11.1	12.1	11.2	10.3
Wakulla	7.6	9.1	10.8	11.0	11.2	10.1
Washington	8.5	11.0	13.0	15.5	17.1	15.2
LMA Total	7.3	7.9	8.9	9.9	10.7	10.5

Source: U.S. Census Bureau, 2000b.

Education. In 2000, 28 percent of adults in the Tallahassee LMA had earned at least a college degree (compared to a national rate of 24%). The presence of large state universities likely accounts for this larger than average rate of college graduates. By far, the greatest number of persons with college degrees within the LMA resides in Leon County, where the state capitol and two major universities are located.

The data for non-high school completion shows a skewed pattern, as well. In 2000, the LMA had a high school non-completion percentage of 20 percent. However, in Calhoun, Gadsden, Holmes, Jackson, Jefferson, Liberty, and Washington Counties, that rate was greater than 30 percent. It is also worth noting that this pattern is historical. In 1970, approximately 70 percent of the adults in these same counties had not finished high school (Table 7).

Table 7

Adult Educational Attainment (25+), Tallahassee LMA: 1970-2000

County	0-8 Years	Some High School	High School Diploma	Some College, No Degree	BA/BS or More	Total
1970						
Calhoun	50.8%	18.5%	21.8%	2.8%	6.0%	4,131
Gadsden	51.5%	17.8%	20.0%	6.1%	4.6%	20,855
Holmes	51.2%	20.3%	21.6%	3.4%	3.3%	6,288
Jackson	45.9%	17.7%	23.7%	6.2%	6.3%	18,215
Jefferson	51.7%	14.2%	20.7%	7.2%	6.1%	4,411
Leon	20.9%	14.6%	26.2%	14.0%	24.1%	46,458
Liberty	61.3%	13.8%	21.8%	2.7%	5.8%	1,819
Wakulla	48.7%	19.7%	23.9%	5.7%	1.8%	3,340
Washington	50.8%	17.1%	22.6%	5.4%	4.0%	6,370
LMA Total	37.8%	16.4%	23.6%	9.1%	12.9%	111,887
1980						
Calhoun	36.3%	16.6%	30.2%	9.8%	6.9%	5,491
Gadsden	36.1%	16.7%	29.4%	9.0%	8.6%	22,658
Holmes	38.4%	17.8%	30.6%	7.2%	5.9%	8,852
Jackson	32.6%	16.2%	32.1%	10.8%	8.1%	22,492
Jefferson	33.7%	14.5%	30.1%	10.2%	11.3%	5,985
Leon	11.0%	10.2%	27.5%	19.2%	32.0%	77,259
Liberty	37.7%	14.6%	33.4%	6.1%	8.0%	2,477
Wakulla	25.9%	17.4%	38.9%	9.3%	8.4%	6,268
Washington	32.2%	16.7%	35.7%	9.0%	6.2%	8,827
LMA Total	23.0%	13.5%	29.7%	14.1%	19.6%	160,309

Table 7

Adult Educational Attainment (25+), Tallahassee LMA: 1970-2000 (continued)

County	0-8 Years	Some High School	High School Diploma	Some College, No Degree	BA/BS or More	Total
1990						
Calhoun	19.3%	24.7%	30.3%	17.4%	8.2%	7,005
Gadsden	19.0%	21.1%	27.0%	18.2%	11.2%	24,654
Holmes	20.2%	22.7%	33.7%	15.9%	7.3%	10,389
Jackson	19.4%	18.9%	30.8%	19.8%	10.9%	26,740
Jefferson	17.8%	18.0%	31.3%	18.0%	14.7%	7,054
Leon	5.5%	9.6%	21.6%	26.2%	37.0%	110,187
Liberty	18.0%	25.2%	32.8%	16.5%	7.3%	3,598
Wakulla	11.3%	17.0%	39.0%	22.4%	10.1%	9,050
Washington	17.3%	21.8%	37.3%	16.1%	7.4%	11,210
LMA Total	11.5%	14.8%	26.8%	22.5%	24.2%	209,887
2000						
Calhoun	12.8%	18.0%	38.5%	22.8%	7.7%	8,884
Gadsden	11.2%	18.1%	35.9%	21.8%	12.9%	28,932
Holmes	11.9%	22.9%	37.7%	18.6%	8.8%	12,659
Jackson	11.2%	19.7%	32.7%	23.6%	12.8%	31,771
Jefferson	10.4%	16.4%	32.2%	24.0%	16.9%	8,911
Leon	3.0%	7.8%	18.8%	28.5%	41.7%	137,537
Liberty	9.8%	24.5%	40.4%	17.7%	7.3%	4,828
Wakulla	6.3%	15.2%	34.9%	27.7%	15.7%	15,211
Washington	12.0%	16.7%	38.8%	23.2%	9.2%	14,338
LMA Total	6.7%	12.9%	26.8%	25.8%	27.6%	263,071

Source: U.S. Census Bureau, 2000b.

Finances. The local government finance data for the Tallahassee LMA suggest several trends. First, in 1987 revenues and debts peaked in 1997 dollars, on a per capita basis, most likely because of the extensive growth documented in the forecasting analysis. Since 1987, however, revenue and debt levels have declined (Tables 8-10).

Regarding debt, with the exception of Leon County, no county in this LMA had a per capita debt load greater than $1,000 in 1997 (Table 11). In contrast, Leon County had a debt load of greater than $5,000 per person. Since most local government spending is used to fund area schools, these data suggest that Leon County's local government were raising resources for district schools while surrounding counties in the LMA did not.

Table 8

Total Revenue, Per Capita (in 1997 adjusted dollars), Tallahassee LMA: 1972-1997

County	1972	1977	1982	1987	1992	1997
Calhoun	$1,496	$2,498	$2,252	$1,975	$1,746	$2,108
Gadsden	$1,344	$1,760	$1,781	$2,246	$1,904	$2,298
Holmes	$1,602	$1,806	$1,478	$2,147	$1,849	$1,965
Jackson	$1,504	$1,757	$1,724	$2,214	$2,709	$2,888
Jefferson	$1,560	$1,538	$1,586	$1,892	$2,196	$1,853
Leon	$2,034	$3,026	$2,831	$4,185	$2,612	$3,953
Liberty	$1,858	$1,791	$1,794	$2,194	$1,947	$1,894
Wakulla	$1,513	$1,518	$1,600	$1,746	$2,245	$2,241
Washington	$1,839	$2,706	$2,931	$2,639	$2,764	$3,279
LMA Total	$1,760	$2,437	$2,358	$3,252	$2,448	$3,279

Source: U.S. Census Bureau, 2000a.

Table 9

Total State Revenue, Per Capita (in 1997 adjusted dollars),
Tallahassee LMA: 1972-1997

County	1972	1977	1982	1987	1992	1997
Calhoun	$1,080	$1,045	$971	$1,026	$1,145	$1,022
Gadsden	$645	$905	$872	$1,158	$1,212	$989
Holmes	$1,059	$864	$890	$1,547	$1,231	$1,086
Jackson	$849	$940	$911	$1,092	$1,363	$1,216
Jefferson	$1,197	$1,071	$1,054	$1,106	$1,197	$1,058
Leon	$493	$691	$622	$883	$994	$848
Liberty	$1,417	$1,387	$1,341	$1,264	$1,442	$1,169
Wakulla	$1,173	$1,080	$1,003	$1,102	$1,376	$1,332
Washington	$1,056	$1,284	$1,331	$1,493	$1,522	$1,253
LMA Total	$705	$846	$793	$1,030	$1,105	$977

Source: U.S. Census Bureau, 2000a.

Table 10

Total Tax Revenue, Per Capita (in 1997 adjusted dollars), Tallahassee LMA: 1972-1997

County	1972	1977	1982	1987	1992	1997
Calhoun	$211	$299	$217	$217	$252	$354
Gadsden	$326	$184	$153	$208	$283	$362
Holmes	$185	$283	$179	$202	$226	$280
Jackson	$226	$194	$193	$239	$369	$418
Jefferson	$213	$279	$222	$309	$438	$462
Leon	$418	$449	$405	$518	$739	$886
Liberty	$175	$191	$128	$225	$252	$350
Wakulla	$224	$250	$247	$373	$455	$451
Washington	$235	$247	$244	$307	$332	$424
LMA Total	$331	$333	$302	$393	$557	$663

Source: U.S. Census Bureau, 2000a.

Table 11

Total Debt, Per Capita (in 1997 adjusted dollars), Tallahassee LMA: 1972-1997

County	1972	1977	1982	1987	1992	1997
Calhoun	$1,179	$576	$313	$255	$66	$58
Gadsden	$459	$363	$824	$961	$1,071	$561
Holmes	$1,968	$987	$889	$697	$224	$138
Jackson	$524	$1,222	$1,223	$671	$769	$480
Jefferson	$548	$614	$222	$1,075	$55	$134
Leon	$1,050	$1,243	$2,935	$7,330	$6,272	$5,604
Liberty	$486	$315	$1,810	$2,028	$573	$126
Wakulla	$847	$483	$748	$395	$669	$847
Washington	$461	$115	$865	$475	$930	$997
LMA Total	$862	$955	$1,930	$4,287	$3,788	$3,300

Source: U.S. Census Bureau, 2000a.

7. Taylor, Florida: Labor Market Area

a. Introduction

This analysis examines historical and current industry and socio-demographic patterns in the Taylor LMA 077. The analysis is divided into several phases. Phase I provides a general overview of broad (single-digit) industry patterns in this LMA from 1940 to 1990 for decennial census years using Census data. Phase II shows employment patterns in broad (single-digit) industry categories for all years between 1969 and 2000 using Regional Economic Information Systems (REIS) data from the Bureau of Economic Analysis. Phase III examines the impact of economic recessions on employment levels during the last 30 years. Phase IV is a socio-demographic analysis of the LMA.

b. Setting

The geographically large (but rural) Taylor LMA is located in northern Florida, to the east of the Panama City and Tallahassee LMAs. The Taylor LMA is comprised of the following counties: Columbia, Hamilton, Lafayette, Madison, Suwannee, and Taylor (Map 19). Almost 150,000 people resided in this LMA in 2000. The largest county is Columbia, with 56,000 people in 2000. This LMA has a large African-American contingent, representing 20 percent of the total year 2000 population. During the 1990s the population of the LMA grew by more than 20 percent, vastly exceeding the national growth rate of 9 percent.

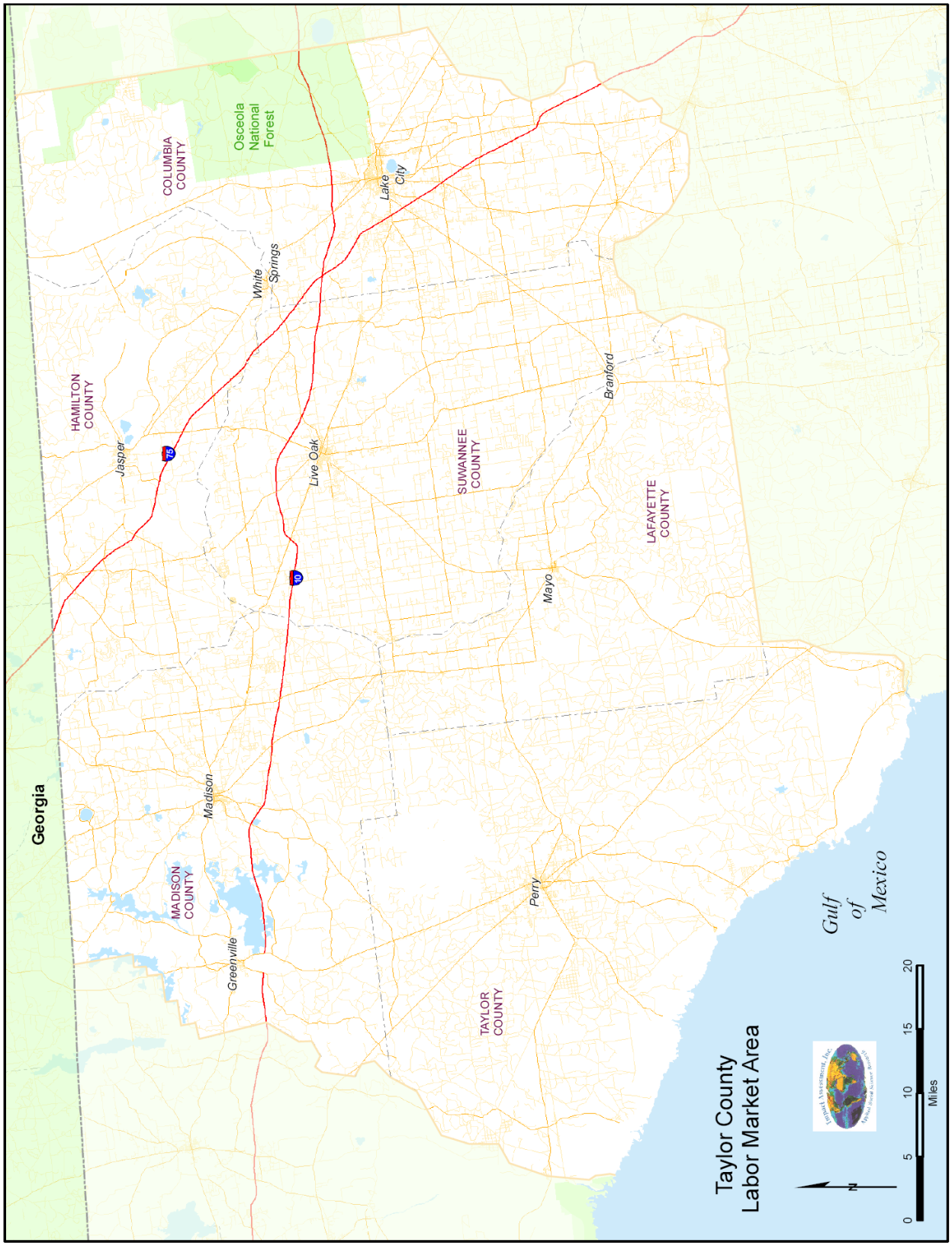
c. Unit of Analysis

Labor Market Areas (LMAs) are the geographical units of analysis in this report. Labor Market Areas are defined by patterns of transportation to and from work within and across county boundaries. Labor Market Areas better represent local social systems and, empirically, local economies (Killian and Tolbert, 1993).

Phase I: General Historical Industry Trends. This section considers general historical industry trends for the Taylor LMA (Figure 1). These data are analyzed both cross-sectionally and longitudinally in order to gain a more complete understanding of both the structure of and the resulting changes to the Taylor LMA's primary industries over time.

Year 1940. In 1940, 20,211 people were employed in the Taylor LMA. Agriculture (52%) was the dominant industry (10,000 plus workers). Manufacturing employed 17 percent of the workforce. Wholesale/retail trade, and services accounted for 21 percent of employment, and mining employed 10 workers in 1940.

Year 1950. Between 1940 and 1950 total employment in the Taylor LMA grew by only 4 percent, employing 21,000 workers in 1950. Services and wholesale/retail trade employed a combined total of 27 percent of the workforce, about half of other Florida LMAs. Agriculture employed 44 percent of the total workforce, and manufacturing employed 19 percent.



Map 19. Taylor County, Florida Labor Market Area.

Year 1960. Between 1950 and 1960, total employment grew by 15 percent, employing more than 24,000 workers in 1960. During this time, manufacturing employment grew by 17 percent, while construction employment grew by 60 percent, adding 700 new jobs. Services added over 4,000 jobs, while agriculture employment declined by 39 percent. In 1960, services (28%) surpassed agriculture (23%) as the leading industry.

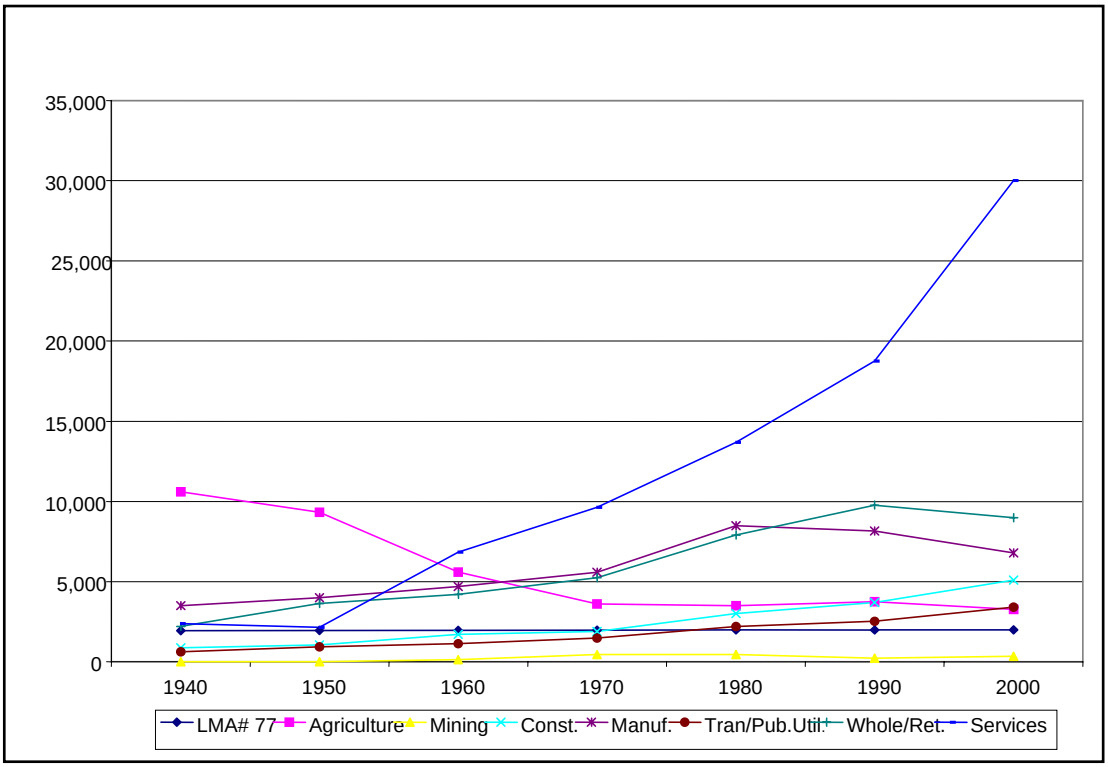


Figure 1. Major Industry Employment, Taylor LMA: 1940-2000 (U.S. Census Bureau, 2000b).

Year 1970. Between 1960 and 1970, total employment in the Taylor LMA grew by 14 percent, employing almost 28,000 people by 1970. Growth was greatest in mining (202%) and services (40%). By 1970, mining employed 445 workers, while agriculture declined 35 percent and employed only 12 percent of the workforce. By 1970, 52 percent of the Taylor LMA was concentrated in services and wholesale/retail trade.

Year 1980. Between 1970 and 1980, the total employment rate in the Taylor LMA grew by 40 percent, employing 39,233 workers in 1980. Construction added over 1,000 jobs, manufacturing added 3,000 jobs, and the service and wholesale/retail trade sectors added over 5,000 jobs, combined. Services and wholesale/retail trade, combined, employed over 20,000 workers in 1980, or 54 percent of the labor force. Agriculture employed 3,495 workers in 1980, or 9 percent of the labor force.

Year 1990. Between 1980 and 1990, the Taylor LMA experienced a 19 percent increase in employment, employing nearly 46,000 workers. Services and wholesale/retail trade, combined, added 7,000 new jobs. By 1990, manufacturing employed over 8,000 workers, and construction almost 4,000. Agriculture continued to employ 8 percent of the total workforce. By 1990, 59 percent of all jobs in the Taylor LMA were in services or wholesale/retail trade. The

Decennial Census data show that the Taylor LMA had one of the slowest growing economies between 1940 and 1990. Moreover, this is one of the most agricultural dependent LMAs in Florida. This dependence on agriculture may explain its lack of growth, relative to other Florida LMAs.

Phase II. Recent Industry Analysis. In this section we explore employment trends in the LMA since 1990 (Figure 2).

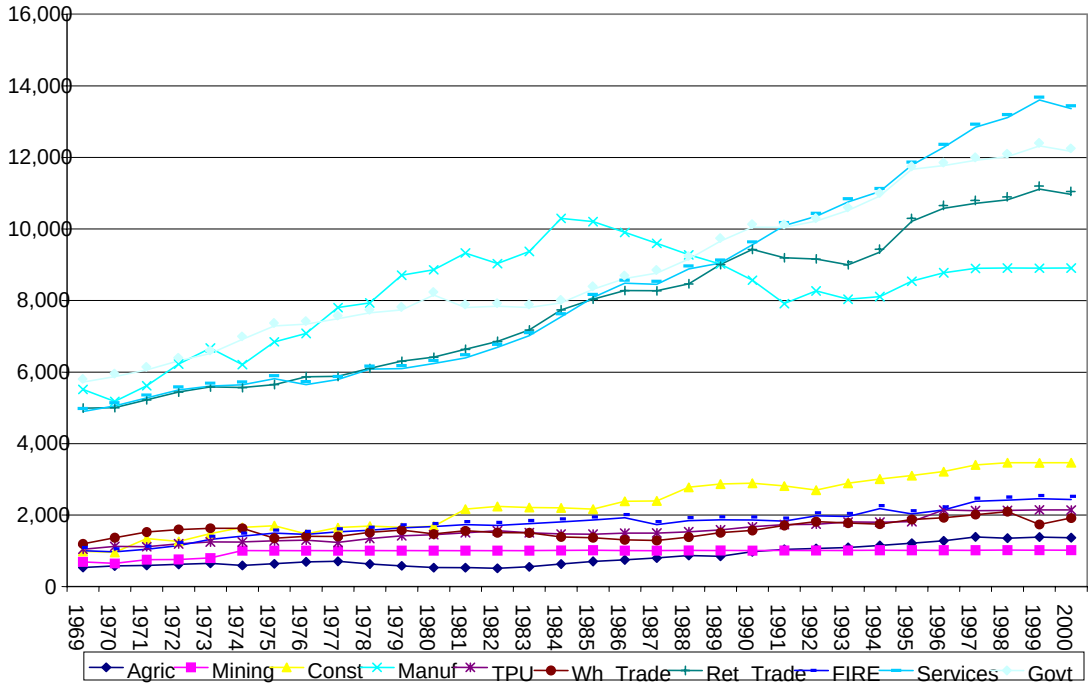


Figure 2. Annual Employment, Taylor LMA: 1969-2000 (U.S. Dept. of Commerce, Bureau of Economic Analysis, 2000).

The REIS data show that, in 2000, the Taylor LMA was less diversified across all industry sectors than most LMAs in Florida. Services accounted for 21 percent of all employment, followed by retail trade and government (20%). The government employment rate is twice the national rate of 10 percent. Interestingly, manufacturing accounts for 14 percent of employment, representing over 8,000 workers (Table1). The manufacturing industries found in this LMA include plastics manufacturers, wood products, textiles, food and animal processing, and agricultural machinery.

Table 1

Employment by Sector, Taylor LMA: 2000

Industry	Percent
Agriculture	2.2
Mining	1.6
Construction	5.6
Manufacturing	14.4
Transportation/Public Utilities	3.5
Wholesale Trade	3.1
Retail Trade	17.7
Finances, Insurance & Real Estate	3.9
Services	21.6
Government	19.7

Source: U.S. Census Bureau, 2000b.

Phase III: Recession Analysis. To test the effects of business cycle recessions on the Taylor LMA economy during the last 30 years, we examine the annual trends in employment. The growth rates for the Taylor LMA are not comparable to other LMAs in the south Florida Gulf of Mexico Region (i.e., the Sarasota and Ft. Myers LMAs). In most years the actual employment levels were greater than expected, based on the employment levels in the previous three years. However, we see some convergence in these lines for the recession periods in the mid-1970s, and the early 1980s and 1990s. Moreover, growth slowed down in the mid-to-late 1980s, a period in which other LMAs along the Florida Gulf of Mexico experienced significant growth.

In a systems approach to local economic organization, one issue that is particularly important is the impact of "shocks" on a social system. Slow, gradual growth and/or decline are not as problematic for a social system as are shocks. Shocks come when systems experience unanticipated growth (such as "boomtowns") or decline. Gradual growth and/or decline allow equilibrium-seeking social systems to absorb the changes, to reallocate and redistribute resources and population. Shocks, on the other hand, create disruptions in a social system. These disruptions can manifest in a number of local fiscal and social problems.

In order to understand the benefits and burdens of certain industries to a system, it is important to know the timing of the industry shocks. In our analysis, we employ a moving average forecasting model to locate the years that the shocks occur in the Taylor LMA. The forecasting procedure includes the following. First, three-year employment moving averages (current plus previous two years) are computed. Second, at each year the expected value (three-year moving average) is subtracted from the observed value. Each of these deviations is squared to provide the forecasting error for each year. These squared deviations are summed and averaged across all years in the analysis to compute a mean squared error (MSE). We establish a 'shock' for any given year in which the squared deviation for that year is greater than or equal to two times the mean squared error for the industry sector in question (Anderson et al., 1990).

The forecasting analysis for the Taylor LMA shows that, in the last 30 years, the employment growth rates were greatest (i.e., exceeded expectations) in the economic boom of the 1990s (Figure 3). Also, despite a lack of economic diversification in the LMA, this analysis

fails to detect significant drop-offs in employment during any of the recession periods during that period in question.

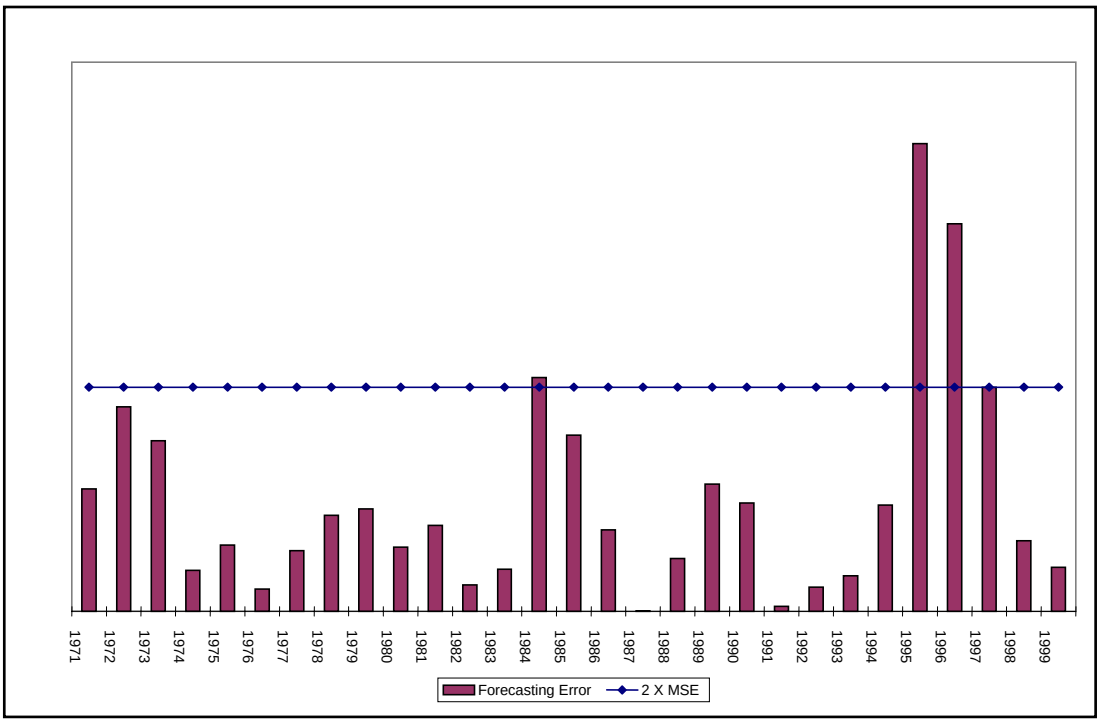


Figure 3. Employment Forecasting Analysis, Taylor LMA: 1971-1999.

Phase IV: Socio-Demographic Analysis. The historical and current population data for Taylor LMA show that this LMA has grown faster than the national rates since 1970 (Tables 2-5). That growth rate includes a 25 percent growth rate in the 1990s that was greater than twice the national growth rate. In 2000, Caucasians accounted for almost 75 percent of the total population, while African-Americans represented 20 percent, and Hispanics comprised less than 4 percent.

Table 2

Population by County, Taylor LMA: 1940-2000

County	1940	1950	1960	1970	1980	1990	2000
Columbia	16,859	18,216	20,077	25,250	35,399	42,613	56,513
Hamilton	9,778	8,981	7,705	7,787	8,761	10,930	13,327
Lafayette	4,405	3,440	2,889	2,892	4,035	5,578	7,022
Madison	16,190	14,197	14,154	13,481	14,894	16,569	18,733
Suwannee	17,073	16,986	14,961	15,559	22,287	26,780	34,844
Taylor	11,565	10,416	13,168	13,641	16,532	17,111	19,256
LMA Total	75,870	72,236	72,954	78,610	101,908	119,581	149,695

Source: U.S. Census Bureau, 2000b.

Table 3

Percent of White Population, Taylor LMA: 1940-2000

County	1940	1950	1960	1970	1980	1990	2000
Columbia	62.4	66.4	69.7	74.9	80.0	80.5	77.9
Hamilton	57.8	57.8	55.4	60.3	61.6	59.4	55.0
Lafayette	90.1	90.5	88.0	88.4	92.5	83.0	75.2
Madison	52.2	54.3	52.5	56.2	57.1	57.5	55.4
Suwannee	67.8	70.6	72.7	76.4	81.7	83.5	81.1
Taylor	68.1	69.4	75.4	77.4	78.0	80.5	76.9
LMA %	63.1	65.5	67.2	71.5	75.6	76.2	73.5
LMA Total	47,908	47,354	49,062	56,207	77,084	91,125	110,137

Source: U.S. Census Bureau, 2000b.

Table 4

Percent of Black Population, Taylor LMA: 1940-2000

County	1940	1950	1960	1970	1980	1990	2000
Columbia	38.6	33.5	30.2	25.0	19.3	18.1	16.8
Hamilton	42.1	42.2	44.4	39.6	37.7	38.9	37.2
Lafayette	9.8	10.4	11.9	11.4	7.2	14.1	14.1
Madison	47.7	45.6	47.5	43.7	42.5	41.8	40.0
Suwannee	32.1	29.3	27.1	23.5	17.6	14.8	12.0
Taylor	31.8	30.5	24.5	22.5	21.3	17.8	18.9
LMA %	36.8	34.4	32.7	28.4	23.7	22.3	20.5
LMA Total	27,961	24,861	23,860	22,353	24,227	26,695	30,770

Source: U.S. Census Bureau, 2000b.

Table 5

Percent of Hispanic Population, Taylor LMA: 1970-2000

County	1970	1980	1990	2000
Columbia	0.3	1.0	1.1	2.7
Hamilton	1.2	0.3	2.4	6.3
Lafayette	0.4	0.8	4.1	9.1
Madison	0.2	1.0	0.8	3.2
Suwannee	0.4	1.1	1.9	4.9
Taylor	0.2	0.4	0.4	1.5
LMA %	0.4	0.9	1.4	3.7
LMA Total	318	898	1,724	5,633

Source: U.S. Census Bureau, 2000b.

Retirement Age Population. The State of Florida has a large retirement age population. In some counties, the percent of the population 65 and older exceeds the national rate of 12 percent by more than 200 percent. The Taylor LMA is not a retirement age intensive LMA. In 2000, 14 percent of the Taylor LMA population was over the age of 65, compared to the national rate of 12 percent (Table 6).

Table 6

Percent of Population Over 65, Taylor LMA: 1950-2000

County	1950	1960	1970	1980	1990	2000
Columbia	7.5	8.7	9.1	10.2	13.3	14.0
Hamilton	7.8	10.2	12.0	13.2	11.4	11.0
Lafayette	7.5	11.7	13.6	12.1	10.7	12.1
Madison	8.1	9.5	21.1	14.2	14.1	14.6
Suwannee	7.8	10.7	12.0	13.3	16.9	16.9
Taylor	8.0	8.0	9.9	12.8	13.1	13.7
LMA Total	7.8	9.4	10.8	12.3	13.9	14.3

Source: U.S. Census Bureau, 2000b.

Education. The rural nature of this LMA likely affects educational levels in this area. There is not a high-end service sector to attract highly educated workers, who tend to migrate to urban areas (Rural Sociological Society Task Force, 1993). In 2000, only 10 percent of this LMA's adult population had graduated from college, with no changes between 1990 and 2000. Moreover, in 2000, only 71 percent of the adult population had graduated from high school, which is considerably fewer than in other southern Florida Gulf of Mexico Region LMAs (Table 7).

Table 7

Adult Educational Attainment (age 25+), Taylor LMA: 1970-2000

County	0-8 Years	Some High School	High School Diploma	Some College, No Degree	BA/BS or More	Total
1970						
Columbia	36.9%	19.6%	27.6%	7.6%	8.2%	13,031
Hamilton	52.3%	15.9%	22.7%	4.1%	5.5%	3,985
Lafayette	52.6%	14.6%	23.2%	4.7%	4.7%	1,616
Madison	49.7%	20.1%	18.1%	5.0%	6.9%	6,995
Suwannee	45.5%	20.8%	22.9%	5.1%	5.5%	8,450
Taylor	42.9%	20.6%	25.0%	4.9%	6.4%	7,158
LMA Total	46.0%	20.5%	22.1%	5.0%	6.2%	22,603
1980						
Columbia	23.2%	17.9%	34.3%	15.2%	9.2%	19,917
Hamilton	31.6%	19.0%	36.1%	7.4%	5.9%	4,733
Lafayette	34.2%	11.8%	33.6%	11.8%	8.4%	2,307
Madison	35.4%	21.0%	25.9%	9.3%	8.2%	8,359
Suwannee	29.5%	17.1%	36.1%	10.6%	6.5%	13,109
Taylor	29.1%	18.3%	34.0%	10.0%	8.5%	9,608
LMA Total	31.0%	18.5%	32.7%	10.0%	7.6%	31,076
1990						
Columbia	11.9%	19.2%	33.4%	24.5%	11.0%	26,839
Hamilton	18.3%	23.3%	37.7%	13.6%	7.0%	6,562
Lafayette	20.0%	21.8%	37.4%	15.5%	5.2%	3,595
Madison	18.9%	24.5%	29.3%	17.5%	9.7%	10,244
Suwannee	15.5%	20.6%	37.6%	17.9%	8.2%	17,444
Taylor	15.1%	22.8%	36.2%	15.9%	9.8%	10,865
LMA Total	16.3%	22.2%	35.0%	17.2%	9.1%	38,553
2000						
Columbia	6.7%	18.5%	34.9%	28.8%	10.9%	36,880
Hamilton	10.5%	26.6%	35.1%	20.5%	7.2%	8,758
Lafayette	12.6%	19.1%	40.1%	20.9%	7.1%	4,745
Madison	10.1%	22.4%	34.2%	23.0%	10.2%	12,254
Suwannee	8.6%	18.1%	38.8%	22.6%	10.5%	23,492
Taylor	8.9%	21.0%	40.9%	20.2%	8.8%	12,914
LMA Total	8.5%	19.9%	36.8%	24.7%	9.9%	99,043

Source: U.S. Census Bureau, 2000b.

Finances. Rural governments face special challenges in meeting the demand for local services (Johnson et al., 1995). The local government finance data show lower levels of revenue in the Taylor LMA than for the more urbanized LMAs to the south (e.g., Tampa Bay-St. Petersburg and Sarasota). The data also show no real fluctuations in revenues, taxes, state

transfers from year to year. In addition, the level of per capita debt for local government is very low ($1,100 per capita in 1997) and consistent over time (Tables 8-11).

Table 8

Total Revenue, Per Capita (in 1997 adjusted dollars), Taylor LMA: 1972-1997

County	1972	1977	1982	1987	1992	1997
Columbia	$1,848	$2,389	$2,037	$2,515	$2,212	$2,467
Hamilton	$2,077	$2,180	$2,715	$3,796	$3,978	$4,748
Lafayette	$1,706	$2,008	$2,072	$1,757	$2,973	$2,061
Madison	$1,987	$2,074	$1,922	$2,375	$3,181	$2,658
Suwannee	$1,686	$1,905	$1,530	$1,737	$1,903	$1,935
Taylor	$1,804	$2,295	$2,143	$2,189	$3,125	$2,605
LMA Total	$1,499	$2,185	$1,868	$2,371	$2,666	$2,578

Source: U.S. Census Bureau, 2000a.

Table 9

Total State Revenue, Per Capita (in 1997 adjusted dollars), Taylor LMA: 1972-1997

County	1972	1977	1982	1987	1992	1997
Columbia	$930	$1,068	$967	$1,084	$1,215	$1,221
Hamilton	$1,174	$1,203	$1,248	$2,116	$1,690	$1,205
Lafayette	$1,184	$1,237	$1,118	$1,181	$2,374	$1,410
Madison	$1,206	$1,156	$1,125	$1,273	$1,525	$1,449
Suwannee	$852	$878	$819	$994	$1,142	$1,053
Taylor	$844	$1,142	$841	$1,065	$1,820	$1,062
LMA Total	$980	$1,070	$967	$1,182	$795	$1,198

Source: U.S. Census Bureau, 2000a.

Table 10

Total Tax Revenue, Per Capita (in 1997 adjusted dollars), Taylor LMA: 1972-1997

County	1972	1977	1982	1987	1992	1997
Columbia	$469	$321	$278	$397	$463	$543
Hamilton	$491	$457	$542	$556	$1,115	$2,265
Lafayette	$345	$282	$325	$345	$318	$372
Madison	$284	$240	$221	$250	$384	$435
Suwannee	$381	$351	$297	$325	$421	$474
Taylor	$463	$375	$358	$531	$774	$896
LMA Total	$416	$335	$312	$392	$539	$710

Source: U.S. Census Bureau, 2000a.

Table 11

Total Debt, Per Capita (in 1997 adjusted dollars), Taylor LMA: 1972-1997

County	1972	1977	1982	1987	1992	1997
Columbia	$839	$801	$593	$657	$988	$1,000
Hamilton	$2,893	$1,458	$892	$2,039	$3,219	$1,671
Lafayette	$660	$430	$1,303	$522	$220	$65
Madison	$142	$245	$927	$1,382	$965	$774
Suwannee	$508	$549	$277	$617	$328	$695
Taylor	$1,076	$653	$4,452	$3,710	$1,645	$2,308
LMA Total	$879	$681	$1,236	$1,318	$1,093	$3,161

Source: U.S. Census Bureau, 2000a.

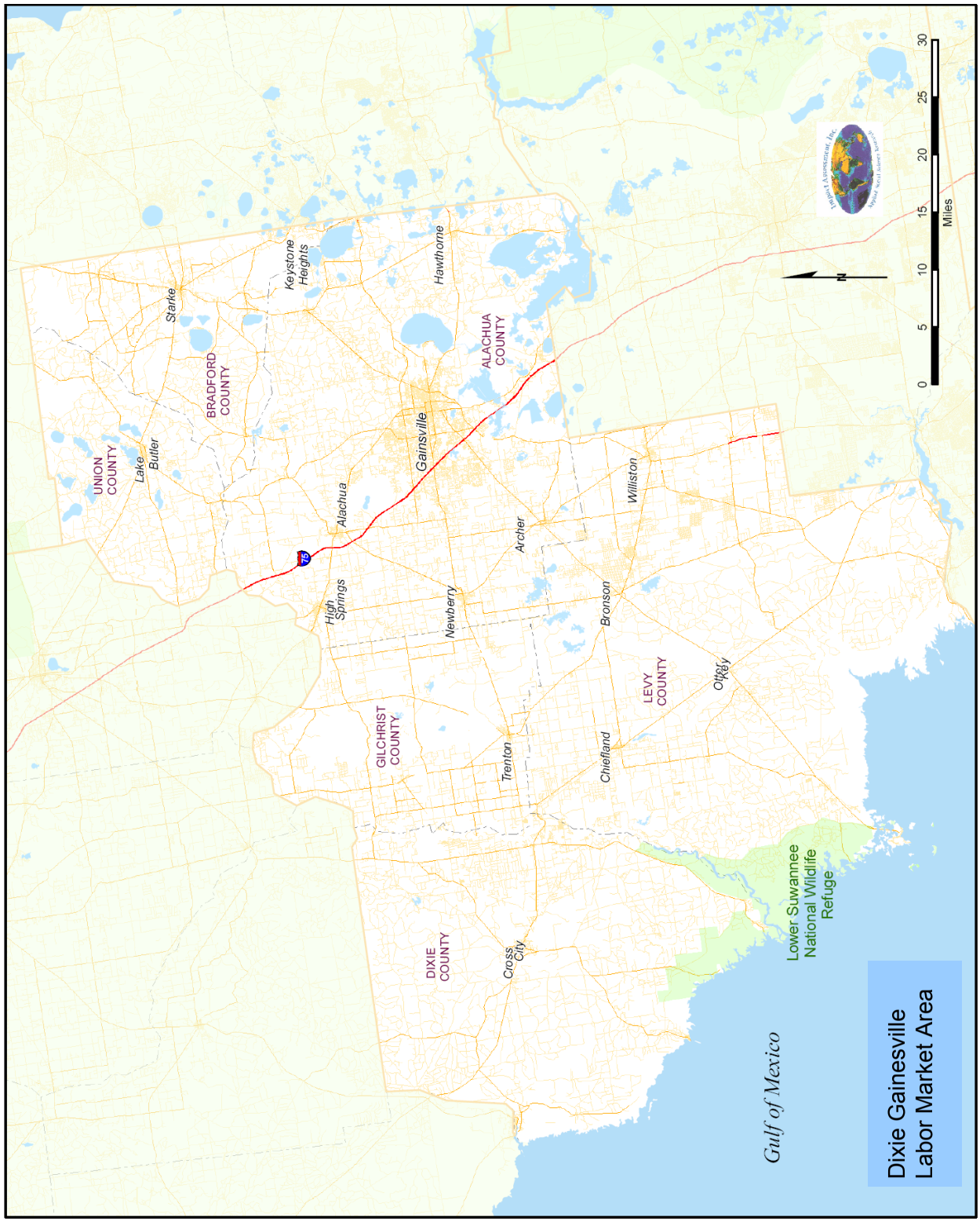
8. Dixie-Gainesville, Florida: Labor Market Area

a. Introduction

This analysis examines historical and current industry and socio-demographic patterns in the Dixie-Gainesville LMA. The analysis is divided into several phases. Phase I provides a general overview of broad (single-digit) industry patterns in this LMA for decennial census years from 1940 to 1990 using Census data. Phase II shows employment patterns in broad (single-digit) industry categories for all years between 1969 and 2000 using Regional Economic Information Systems (REIS) data from the Bureau of Economic Analysis. Phase III examines the impact of economic recessions on employment levels during the last 30 years. Phase IV is a socio-demographic analysis of the LMA.

b. Setting

The Dixie-Gainesville is located north of the Tampa Bay-St. Petersburg LMA in the Florida Gulf of Mexico region. The LMA is comprised of the following counties: Alachua, Bradford, Dixie, Gilchrist, Levy, and Union (Map 20). Over 320,000 people resided in this LMA in 2000. With a year 2000 population of 218,000, Alachua was the most populated county in that year. The racial composition of the Dixie-Gainesville LMA is proportional to the national representation for Caucasians (73%) in 2000; African-Americans represented nearly 18 percent of the population, which is significantly greater than the national rate of 12 percent. Although Hispanics only accounted for 4 percent of the population in 2000, their representation in the LMA has doubled since 1990. During the 1990s the population of the LMA grew by more than 23 percent, vastly exceeding the national growth rate of 9 percent.



Map 20. Dixie-Gainesville, Florida Labor Market Area.

c. Unit of Analysis

Labor Market Areas (LMAs) are the geographical units of analysis in this report. Labor Market Areas are defined by patterns of transportation to and from work within and across county boundaries. Labor Market Areas better represent local social systems and, empirically, local economies (Killian and Tolbert, 1993).

Phase I: General Historical Industry Trends. This section considers general historical industry trends for the Dixie-Gainesville LMA (Figure 1). These data are analyzed both cross-sectionally and longitudinally in order to gain a full understanding of both the structure of and the resulting changes to the Dixie-Gainesville LMA's primary industries over time.

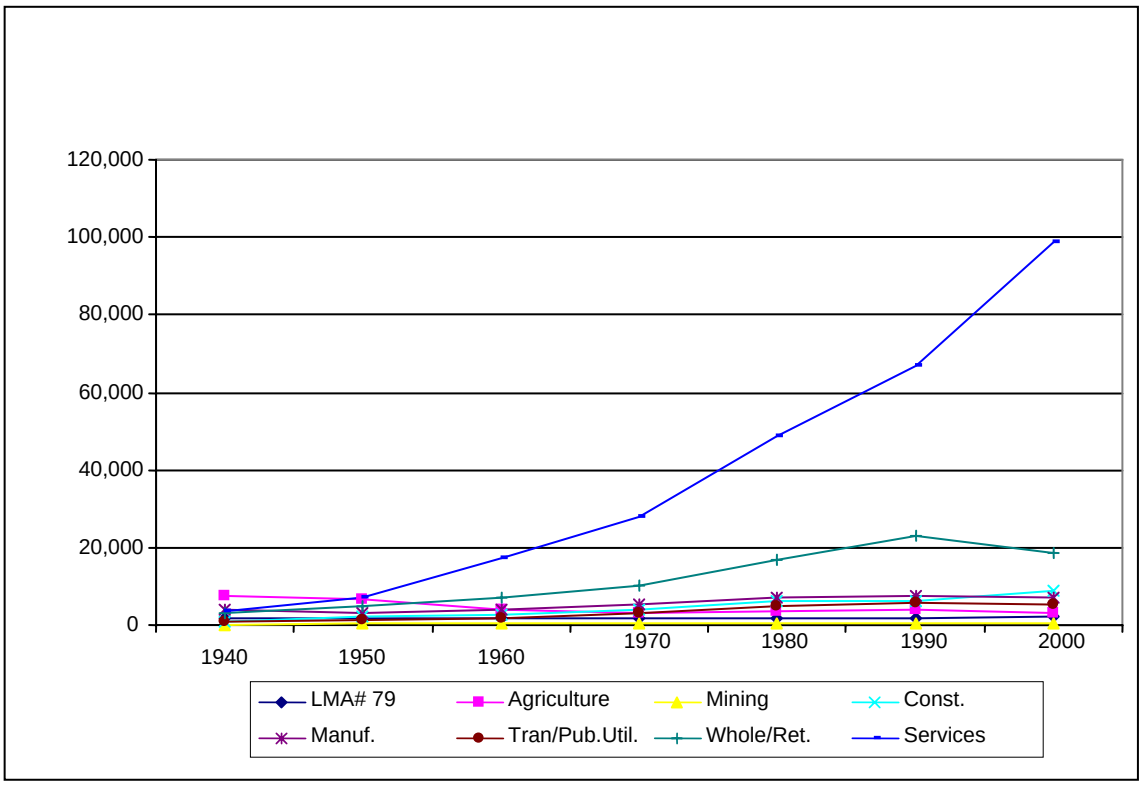


Figure 1. Major Industry Employment, Dixie-Gainesville LMA: 1940-2000 (U.S. Census Bureau, 2000b).

Year 1940. In 1940, 20,384 people were employed in Dixie-Gainesville LMA. Agriculture (37%) and manufacturing (20%) were the leading non-service sectors. Wholesale/retail trade, and services accounted for 31 percent of employment in the Dixie-Gainesville LMA; mining employed 157 workers.

Year 1950. Between 1940 and 1950, total employment in the Dixie-Gainesville LMA grew by 26 percent, employing approximately 26,000 workers by 1950. Services and wholesale/retail trade employed 45 percent of the workforce, combined; agriculture employed 25 percent. Manufacturing employed 3,000 people in 1950.

Year 1960. Between 1950 and 1960, total employment grew by 44 percent, employing 36,875 workers by 1960. In terms of number of jobs, employment growth was not substantial in

any industry sector, with the exception of services where 10,000 new jobs were added. By 1960, services and wholesale/retail trade employed 65 percent of the Dixie-Gainesville LMA workforce. Agriculture employed 10 percent of all workers; mining employed 437 workers.

Year 1970. Total employment in Dixie-Gainesville LMA grew by 62 percent between 1960 and 1970, employing almost 54,000 people by 1960. Transportation/public utilities (63%), construction (45%), and manufacturing (36%) experienced the most growth. Yet, these three industry sectors combined to generate less than 5,000 new jobs. Services generated 10,000 new jobs. By 1970, 70 percent of all employment in Dixie-Gainesville was concentrated in services and wholesale/retail trade. Agriculture employed less than 6 percent of the total work force in 1970.

Year 1980. Between 1970 and 1980, the Dixie-Gainesville LMA employment rate grew by 62 percent, employing 87,382 workers by 1980. Over 2,000 jobs were added in construction, 3,000 in manufacturing, and 1,500 in transportation and public utilities. Services and wholesale/retail trade, combined, employed nearly 74 percent of the workforce in 1980, adding almost 27,000 new jobs. While employment in agriculture grew by 22 percent between 1970 and 1980, its share of the labor force declined to 4 percent in 1980.

Year 1990. Between 1980 and 1990, the Dixie-Gainesville LMA experienced a 30 percent increase in employment, employing almost 110,000 workers by 1990. Services and wholesale/retail trade combined to add 24,000 new jobs. By 1990, manufacturing employed over 7,500 workers, and the construction industry employed almost 6,400. By 1990, 78 percent of all jobs in Dixie-Gainesville LMA were in services or wholesale/retail trade. Agricultural employment was somewhat higher in 1990 (3,855 workers) than in 1980 (3,603 workers).

Phase II: Recent Industry Analysis. The Dixie-Gainesville LMA was slow-growing and dependent on agriculture through 1970. Growth rates increased during the 1980s but at a slower pace than other Florida LMAs. In the 1990s, however, the Dixie-Gainesville LMA was one of the fastest growing LMAs in the Florida Gulf of Mexico region. In this section we explore employment trends from1969-2000, with Table 1 showing the concentration of employment in year 2000. Employment grew by 25 percent during the 1990s, but only services, construction, and government employment had positive growth rates (Figure 2).

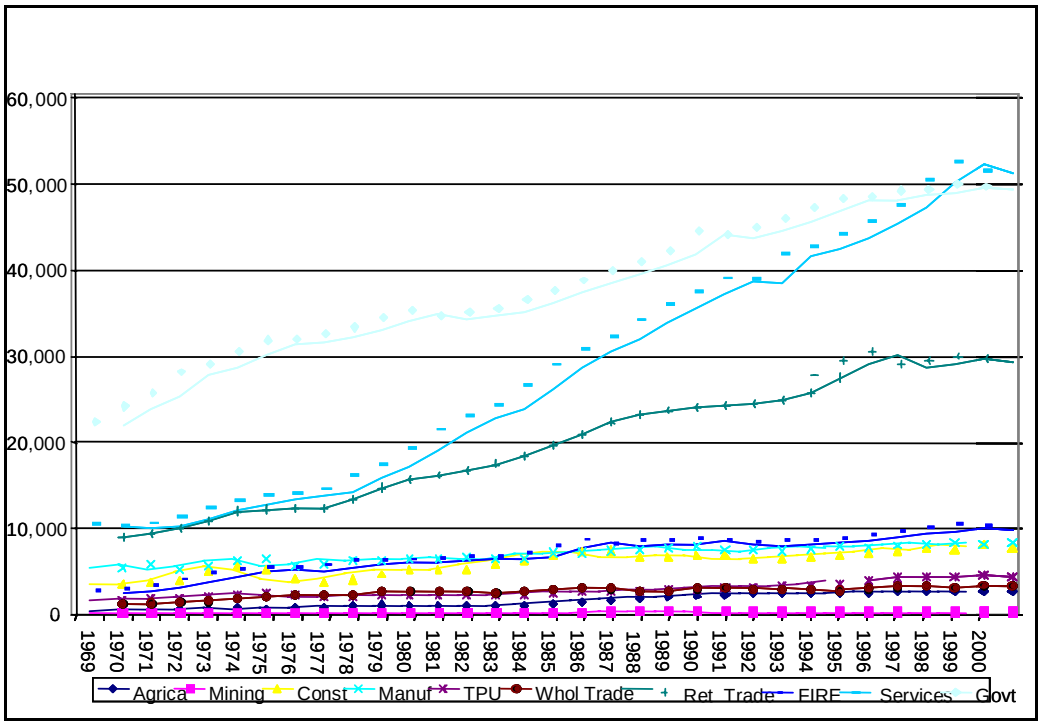


Figure 2. Annual Employment, Dixie-Gainesville LMA: 1969-2000 (U.S. Dept. of Commerce, Bureau of Economic Analysis, 2000).

In 2000, services and government each accounted for 28 percent of all employment. However, the Dixie-Gainesville LMA falls below national percentages on most other industry measures e.g., agriculture, manufacturing, construction (Table 1).

Table 1

Employment by Sector, Dixie-Gainesville LMA: 2000

Industry	Percent
Agriculture	1.5
Mining	0.2
Construction	4.4
Manufacturing	4.6
Transportation/Public Utilities	2.5
Wholesale Trade	1.9
Retail Trade	16.4
Finances, Insurance & Real Estate	5.5
Services	28.6
Government	27.6

Source: U.S. Census Bureau, 2000b.

During the 1990s, the United States government employed 5 percent of the national workforce. By 2000, 14 percent of the workforce was employed in some level of government

work. For the Florida Gulf of Mexico LMAs, this percentage was slightly higher—19 percent. However, as with other indicators, there is considerable spatial variation in government employment among the LMAs. For example, the Pensacola LMA (1%), and the Sarasota LMA (1.5%) experienced government employment growth rates lower than the national rate of 5 percent, while the Panama City LMA experienced a loss of 10 percent. However, Ft. Myers (29%), and several of the more rural LMAs (Taylor, Citrus-Marion, and Dixie-Gainesville) experienced growth rates in excess of 10 percent, or at least twice the national growth rate.

Three LMAs show substantial concentration of government employment. In 2000, 23 percent of the Pensacola LMA, 29 percent of the Dixie-Gainesville LMA, and 32 percent of the Tallahassee LMA were employed in federal, state, or local government organizations. In Tallahassee LMA, government employment exceeds services employment. These findings are not surprising, however. The Pensacola LMA is home to a major naval air station (Naval Air Station Pensacola); the University of Florida, a Carnegie Foundation Research I Extensive university, is located in Gainesville; and, Tallahassee, the state capitol, boasts two major universities (Florida State University and Florida A&M University). These three government-intensive LMAs are all located along the Florida Gulf Coast.

Phase III: Recession Analysis. To test the effects of business cycle recessions on the Dixie-Gainesville LMA economy during the last 30 years, we examine the annual trends in employment. The total annual employment figure, plus the three-year employment moving averages, for the Dixie-Gainesville LMA show a linear growth pattern (Figure 3). In most years the actual employment levels were greater than expected, based on the employment levels in the previous three years. However, we see some convergence in these lines for two recession periods: the mid-1970s and early 1990s.

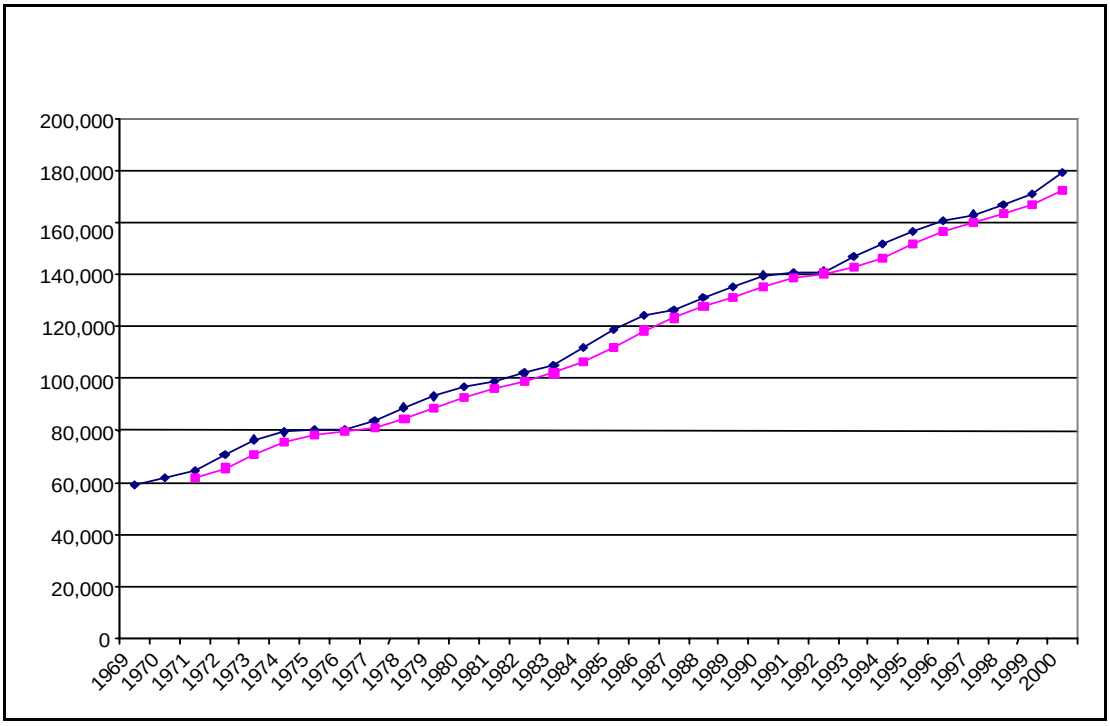


Figure 3. Total Employment and Three-year Moving Averages, Dixie-Gainesville LMA: 1969-2000 (U.S. Dept. of Commerce, Bureau of Economic Analysis, 2000).

In a systems approach to local economic organization, one issue of particular importance is the impact of "shocks" on a social system. Slow, gradual growth and/or decline are not as problematic for a social system as are shocks. Shocks come when systems experience unanticipated growth (such as "boomtowns") or decline. Gradual growth and/or decline allow equilibrium-seeking social systems to absorb the changes, to reallocate and redistribute resources and population. Shocks, on the other hand, create disruptions in a social system. These disruptions can manifest in a number of local fiscal and social problems.

In order to understand the benefits and burdens of certain industries to a system, it is important to know the timing of the industry shocks. In our analysis, we employed a moving average forecasting model to locate the years that the shocks occur in the Dixie-Gainesville LMA. The forecasting procedure includes the following. First, three-year moving averages (current plus previous two years) of employment levels are computed. Second, at each year the expected value (three-year moving average) is subtracted from the observed value. Each of these deviations is squared to provide the forecasting error for each year. These squared deviations are summed and averaged across all years in the analysis to compute a mean squared error (MSE). We establish a "shock" for any given year in which the squared deviation for that year is greater than or equal to two times the mean squared error for the industry sector in question (Anderson et al., 1990).

The forecasting analysis for the Dixie-Gainesville LMA shows that, over the last 30 years, employment growth rates were greatest (i.e., exceeded expectations) during the economic booms of the 1980s (Figure 4). Also, the forecasting analysis fails to detect significant drop-offs in employment during any of the recession periods over the period in question. One reason for the lack of downturn may stem from the concentration of government employment in the LMA, which, unlike the private sector, is more recession-proof.

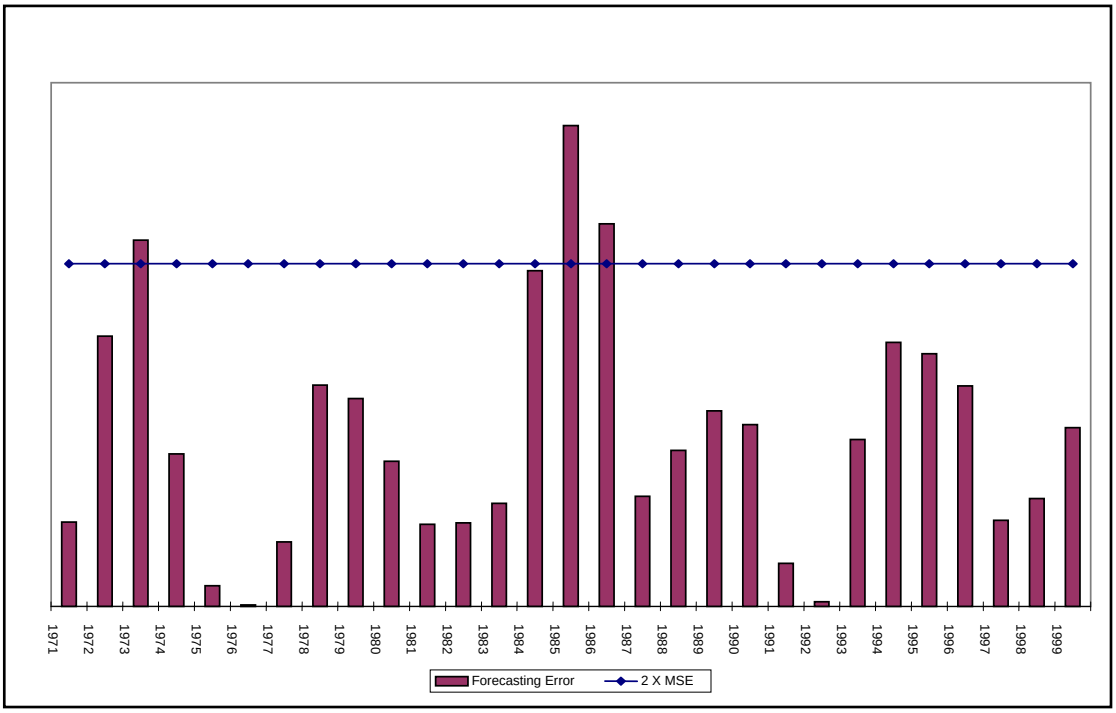


Figure 4. Employment Forecasting Analysis, Dixie-Gainesville LMA.

Phase IV: Socio-Demographic Analysis. The population data for the Dixie-Gainesville LMA show that this region has grown faster than the national rate since 1940 (Tables 2-5). Growth rates were particularly pronounced in the 1990s (23%), the 1980s (21%), and the 1970s (24%). While those growth rates are substantially lower than those found in other LMAs along the Gulf of Mexico in Florida, they are significantly higher than the corresponding national growth rates.

Table 2

Population by County, Dixie-Gainesville LMA: 1940-2000

County	1940	1950	1960	1970	1980	1990	2000
Alachua	38,607	57,026	74,074	104,764	151,348	181,596	217,955
Bradford	8,717	11,457	12,446	14,625	20,023	22,515	26,088
Dixie	4,277	3,928	4,479	5,480	7,751	10,585	13,827
Gilchrist	4,250	3,499	2,868	3,551	5,767	9,667	14,437
Levy	12,550	10,367	10,364	12,756	19,870	25,923	34,450
Union	7,094	8,906	6,043	8,112	10,166	10,252	13,442
LMA Total	75,495	95,453	110,274	149,288	214,925	260,538	320,199

Source: U.S. Census Bureau, 2000b.

Table 3

Percent of White Population, Dixie-Gainesville LMA: 1940-2000

County	1940	1950	1960	1970	1980	1990	2000
Alachua	58.5	70.9	73.5	79.0	78.8	77.6	69.6
Bradford	74.4	75.5	76.9	76.5	73.5	78.7	74.9
Dixie	92.8	85.7	85.5	83.1	88.1	90.9	87.7
Gilchrist	85.0	90.1	88.3	91.9	93.2	91.0	88.7
Levy	61.5	67.8	69.7	74.8	83.3	86.5	83.1
Union	70.9	63.7	73.2	71.0	69.3	75.5	71.8
LMA %	65.4	71.6	74.4	78.4	79.5	79.5	73.2
LMA Total	49,446	68,360	82,055	117,085	170,885	207,240	234,633

Source: U.S. Census Bureau, 2000b.

Table 4

Percent of Black Population, Dixie-Gainesville LMA: 1940-2000

County	1940	1950	1960	1970	1980	1990	2000
Alachua	41.4	29.0	26.2	20.6	19.1	19.0	19.1
Bradford	25.5	24.4	23.1	23.3	20.3	20.3	20.5
Dixie	7.1	14.3	14.4	16.9	11.6	8.7	8.9
Gilchrist	15.0	9.6	11.4	8.1	6.6	8.4	6.9
Levy	38.5	34.7	30.2	25.1	16.0	12.3	10.8
Union	29.1	36.2	26.7	28.4	29.1	23.2	22.6
LMA %	38.1	28.3	25.4	21.2	18.7	17.8	17.4
LMA Total	28,789	27,057	28,012	31,698	40,377	46,447	55,963

Source: U.S. Census Bureau, 2000b.

Table 5

Percent of Hispanic Population*, Dixie-Gainesville LMA: 1970-2000

County	1970	1980	1990	2000
Alachua	2.1	3.3	3.6	5.7
Bradford	1.3	1.1	1.3	2.4
Dixie	1.1	0.6	0.7	1.8
Gilchrist	0.3	1.4	1.6	2.8
Levy	0.1	1.4	1.0	0.3
Union	5.9	2.8	3.1	1.1
LMA %	3.7	3.4	2.3	0.9
LMA Total	5,584	7,947	5,956	3,076

* County-level Census data for Hispanic populations are not available prior to 1970.
Source: U.S. Census Bureau, 2000b.

Retirement Age Population. The State of Florida has a large retirement age population. In some counties, the percent of the population 65 and older exceeds the national rate of 12 percent by more than 200 percent. The Dixie-Gainesville LMA has a higher retirement population than average. In 2000, 15 percent of the population in the Dixie-Gainesville LMA was over the age of 65, while the national rate was 12 percent. Two counties, Dixie (a coastal county) and Levy both had county age retirement populations of 17 percent each (Table 6).

Table 6

Percent of Population Over 65, Dixie-Gainesville LMA: 1950-2000

County	1950	1960	1970	1980	1990	2000
Alachua	6.0	6.3	6.3	7.0	7.4	9.5
Bradford	7.0	8.4	8.5	10.4	12.0	12.9
Dixie	7.0	7.9	8.7	12.1	17.5	17.0
Gilchrist	7.0	10.1	11.2	10.8	13.9	13.6
Levy	9.4	12.2	13.3	15.6	18.9	17.9
Union	4.4	6.9	6.6	5.9	7.3	7.2
LMA Total	7.1	9.8	10.4	12.1	15.7	15.0

Source: U.S. Census Bureau, 2000b.

Education. The notable concentration of retirement age population (Dixie and Levy Counties) and the presence of a large state flagship university (University of Florida) likely affect educational levels within the LMA. In 2000, 28 percent of the adults in this LMA had earned at least a college degree (the national rate was 24%). Moreover, the percent of the adults with a college degree was significantly higher than the national rate for all census years. This high rate of education attainment most likely reflects the influence of a large land grant university in the LMA (Table 7).

Table 7

Adult Educational Attainment, Taylor LMA: 1970-2000

County	0-8 Years	Some High School	High School Diploma	Some College, No Degree	BA/BS or More	Total
1970						
Alachua	24.3%	15.8%	24.5%	12.2%	23.1%	46,861
Bradford	39.4%	24.1%	25.7%	6.3%	4.4%	7,837
Dixie	47.2%	18.4%	24.9%	3.7%	5.6%	2,779
Gilchrist	49.5%	18.9%	23.4%	5.4%	2.7%	1,975
Levy	43.7%	21.8%	23.7%	5.5%	5.1%	7,148
Union	40.2%	25.8%	24.6%	5.9%	3.3%	4,708
LMA Total	30.6%	18.1%	24.5%	9.9%	16.6%	71,308
1980						
Alachua	13.2%	11.2%	26.3%	19.8%	29.4%	75,817
Bradford	25.8%	20.6%	33.7%	12.2%	7.6%	12,048
Dixie	29.6%	20.9%	35.3%	9.1%	4.9%	4,675
Gilchrist	26.0%	17.4%	36.1%	13.3%	7.1%	3,337
Levy	25.1%	21.0%	34.9%	11.1%	7.7%	12,391
Union	22.0%	21.0%	32.8%	18.2%	5.8%	6,371
LMA Total	17.3%	14.4%	29.0%	17.3%	21.8%	114,639

Table 7

Adult Educational Attainment, Taylor LMA: 1970-2000 (continued)

1990						
Alachua	6.0%	11.2%	21.7%	26.4%	34.6%	102,647
Bradford	14.3%	20.7%	36.8%	20.0%	8.0%	15,088
Dixie	16.8%	25.4%	33.0%	18.5%	6.1%	7,175
Gilchrist	15.8%	21.2%	33.6%	21.9%	7.4%	5,956
Levy	14.1%	23.0%	35.0%	19.5%	8.2%	17,612
Union	11.6%	20.6%	35.9%	23.8%	7.9%	6,701
LMA Total	8.8%	14.9%	26.2%	24.3%	25.5%	155,179
2000						
Alachua	3.7%	8.2%	20.2%	19.3%	38.7%	123,524
Bradford	7.2%	18.5%	40.1%	25.6%	8.4%	17,883
Dixie	11.2%	22.8%	39.4%	19.7%	6.7%	9,643
Gilchrist	7.8%	19.7%	36.0%	26.9%	9.4%	8,866
Levy	7.2%	18.8%	38.2%	25.0%	10.6%	24,030
Union	7.4%	20.0%	38.8%	26.1%	7.5%	9,363
LMA Total	5.2%	12.3%	26.9%	27.5%	27.9%	193,309

Source: U.S. Census Bureau, 2000b.

Finances. The local government finance data for the Dixie-Gainesville LMA indicate two important trends (Tables 8-11). First, revenues and debt have increased steadily (in real dollars) since 1972. For the LMA as a whole, the per capita local government debt load in 1997 exceeded $3,000 per capita. This is comparable for the per capita debt load in Tampa Bay-St. Petersburg. However, one county had a debt load significantly higher than all other counties in the LMA — Alachua, home to the University of Florida. We expect that the higher debt and revenues reflect spending on local schools (which represents the vast majority of local government spending).

Table 8

Total Revenue, Per Capita (in 1997 adjusted dollars),
Dixie-Gainesville LMA: 1972-1997

County	1972	1977	1982	1987	1992	1997
Alachua	$2,036	$2,807	$2,575	$2,927	$2,410	$3,338
Bradford	$1,558	$1,813	$1,781	$1,700	$1,619	$2,367
Dixie	$1,576	$1,897	$1,536	$1,629	$1,822	$2,055
Gilchrist	$2,069	$1,945	$1,426	$1,675	$1,788	$2,200
Levy	$1,400	$1,719	$1,532	$1,915	$2,104	$2,146
Union	$1,878	$2,460	$2,248	$2,561	$2,230	$2,981

Source: U.S. Census Bureau, 2000a.

Table 9

Total State Revenue, Per Capita (in 1997 adjusted dollars),
Dixie-Gainesville LMA: 1972-1997

County	1972	1977	1982	1987	1992	1997
Alachua	$602	$758	$677	$832	$907	$868
Bradford	$869	$843	$769	$912	$1,018	$1,256
Dixie	$1,058	$1,237	$1,016	$1,046	$1,084	$1,142
Gilchrist	$1,484	$1,398	$932	$1,067	$1,163	$1,126
Levy	$722	$829	$724	$950	$1,221	$1,009
Union	$742	$637	$578	$935	$1,126	$1,697
LMA Total	$681	$800	$706	$871	$973	$974

Source: U.S. Census Bureau, 2000a.

Table 10

Total Tax Revenue, Per Capita (in 1997 adjusted dollars),
Dixie-Gainesville LMA: 1972-1997

County	1972	1977	1982	1987	1992	1997
Alachua	$462	$427	$438	$540	$654	$690
Bradford	$328	$256	$197	$233	$311	$377
Dixie	$351	$312	$315	$329	$458	$428
Gilchrist	$375	$336	$273	$323	$347	$390
Levy	$436	$363	$296	$439	$501	$593
Union	$138	$123	$136	$199	$229	$230
LMA Total	$425	$382	$378	$472	$573	$609

Source: U.S. Census Bureau, 2000a.

Table 11

Total Debt, Per Capita (in 1997 adjusted dollars),
Dixie-Gainesville LMA: 1972-1997

County	1972	1977	1982	1987	1992	1997
Alachua	$1,788	$2,161	$3,567	$4,415	$5,344	$5,208
Bradford	$1,137	$767	$1,758	$801	$760	$726
Dixie	$1,179	$440	$383	$409	$68	$90
Gilchrist	$676	$576	$188	$156	$197	$296
Levy	$913	$914	$618	$325	$427	$564
Union	$650	$860	$565	$293	$186	$291
LMA Total	$1,545	$1,746	$2,754	$3,220	$3,847	$3,696

Source: U.S. Census Bureau, 2000a.

9. Citrus-Marion, Florida: Labor Market Area

a. Introduction

This analysis examines historical and current industry patterns in the Citrus-Marion LMA (078). The analysis is divided into several phases. Phase I provides a general overview of broad (single-digit) industry patterns in this LMA for decennial census years from 1940 to 1990 using Census data. Phase II shows employment patterns in broad (single-digit) industry categories for all years between 1969 and 2000 using Regional Economic Information Systems (REIS) data from the Bureau of Economic Analysis. Phase III examines the impact of economic recessions on employment levels during the last 30 years. Phase IV is a socio-demographic analysis of the LMA.

b. Setting

The Citrus-Marion LMA is located north of Tampa Bay-St. Petersburg LMA in the Florida Gulf of Mexico region. It is comprised of Citrus County, Marion County, and the City of Ocala (Map 21). Over 375,000 people resided in this LMA in 2000. The largest county, Marion, had a year 2000 population of 258,000 residents; the vast majority of these residents are Caucasian (84% in 2000). African-Americans represented 8 percent of the population in 2000; Hispanics 5 percent. The population of the Citrus-Marion LMA grew by more than 30 percent in 1990, vastly exceeding the national growth rate of 9 percent.

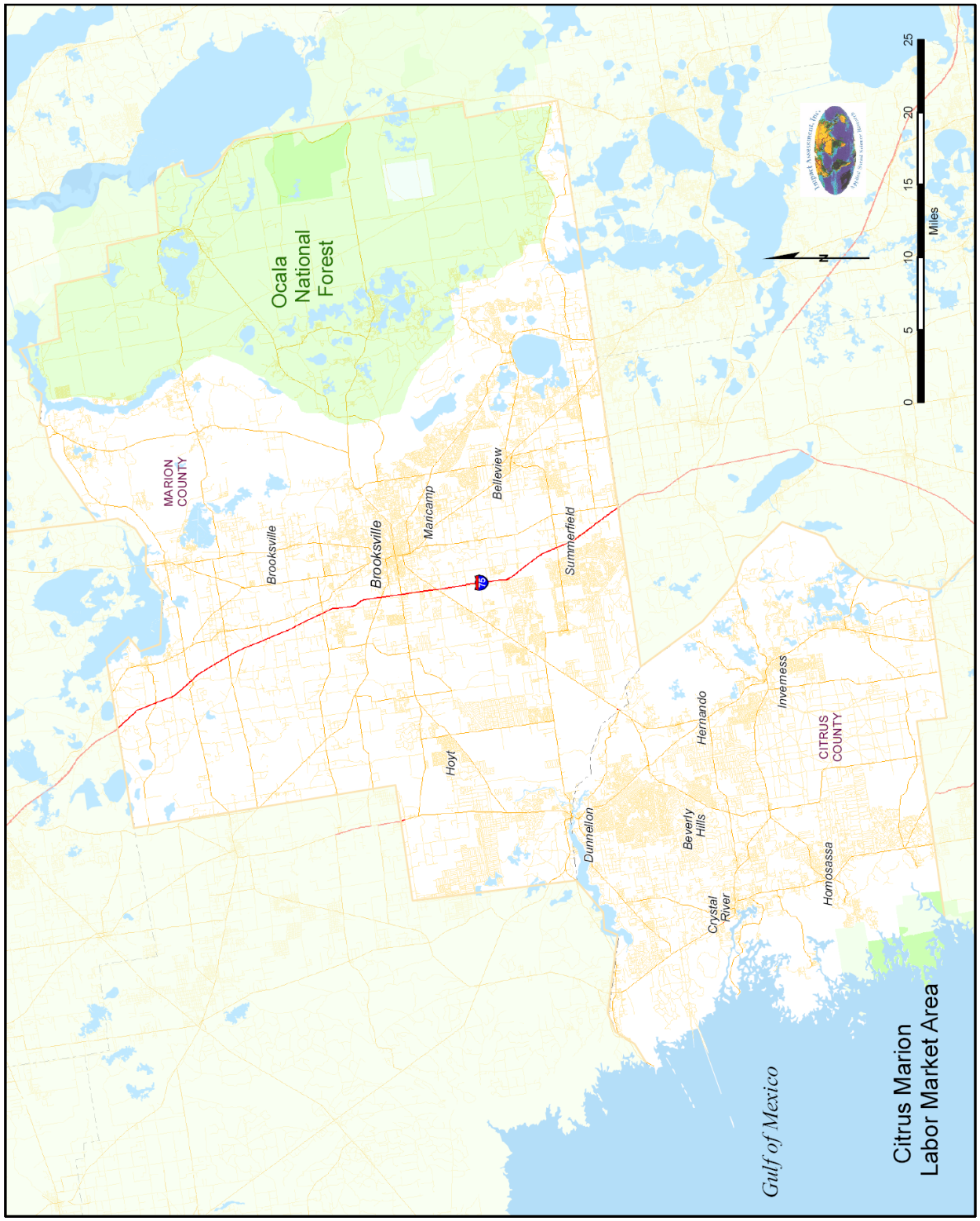
c. Unit of Analysis

Labor Market Areas (LMAs) are the geographical units of analysis in this report. Labor Market Areas are defined by patterns of transportation to and from work within and across county boundaries. Labor Market Areas better represent local social systems and, empirically, local economies (Killian and Tolbert, 1993).

Phase I. General Historical Industry Trends. The following section explores general historical industry trends for the Citrus-Marion LMA (Figure 1). These data are analyzed both cross-sectionally and longitudinally in order to gain a full understanding of both the structure of the Citrus-Marion LMA at different points in time and the changes in the LMA's primary industries over time.

Year 1940. In 1940, 10,170 people were employed in the Citrus-Marion LMA. Agriculture (38%) and manufacturing (11%) were the leading non-service sectors. Services and wholesale/retail trade accounted for 38 percent of employment in the Citrus-Marion LMA in 1940. The mining sector employed 258 workers.

Year 1950. Between 1940 and 1950 total employment grew by 34 percent in the Citrus-Marion LMA, employing approximately 14,000 workers in 1950. The combined share of total employment for services and wholesale/retail trade was 43 percent; agriculture accounted for twenty-five percent of employment. Manufacturing employed 1,785 people.



Map 21. Citrus-Marion, Florida Labor Market Area.

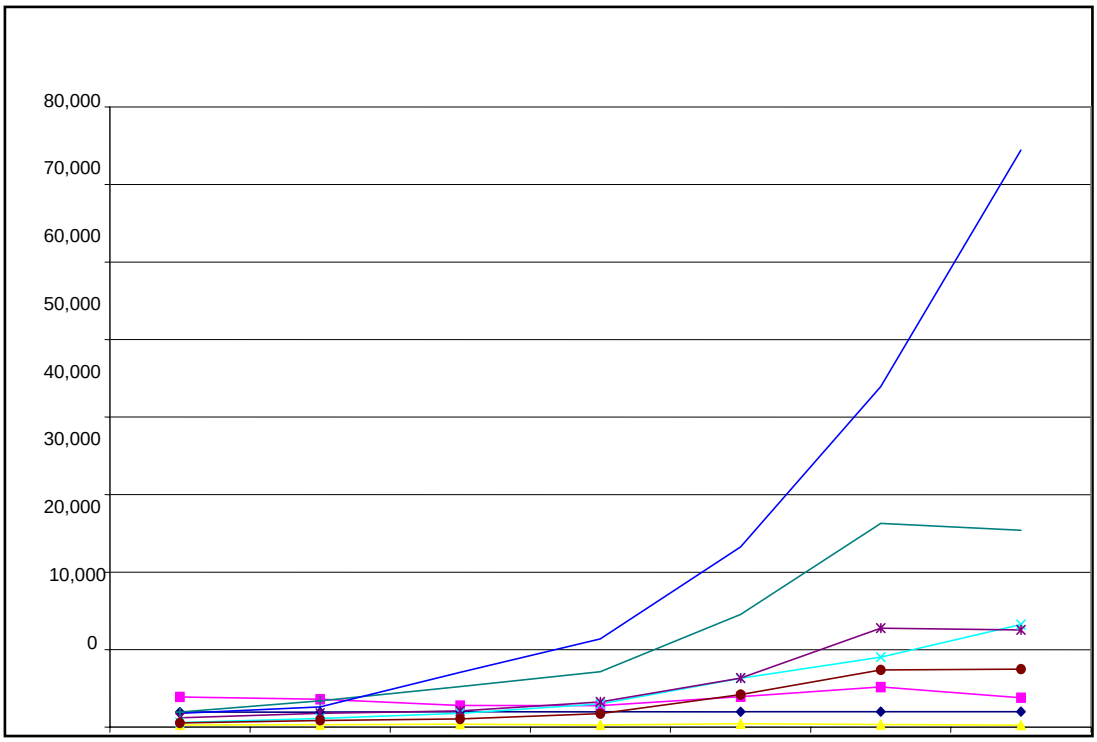


Figure 1. Major Industry Employment, Citrus-Marion LMA: 1940-2000 (U.S. Census Bureau, 2000b).

Year 1960. Between 1950 and 1960, total employment within the LMA grew by 49 percent, and levels of total employment were greater than 20,334 workers in 1960. In terms of number of jobs, employment growth was not substantial in any industry sector. By 1960, the services and wholesale/retail trade sectors employed 59 percent of the Citrus-Marion LMA workforce, but these sectors accounted for less than 13,000 jobs. While agriculture lost 800 jobs during the 1950s, it employed 13 percent of all workers in 1960. Mining employed 371 workers.

Year 1970. Total employment in Citrus-Marion LMA grew by 45 percent between 1960 and 1970, employing almost 30,000 people by 1970. Growth was greatest in construction (68%), transportation/public utilities (65%), and manufacturing (57%). Yet despite impressive growth, these three industry sectors generated less than 5,000 new jobs, combined. By 1970, 62 percent of all employment in the Citrus-Marion LMA was concentrated in services and wholesale/retail trade. Agriculture still employed almost 10 percent of the total work force.

Year 1980. Between 1970 and 1980, the Citrus-Marion LMA total employment rate grew by 99 percent, employing 58,958 workers by 1980. Over 3,000 jobs were added in construction, 3,000 in manufacturing, and 3,000 in transportation and public utilities. The service and wholesale/retail trade sectors added almost 20,000 jobs in 1980, employing nearly 40,000 workers, or 63 percent of the labor force. While employment in agriculture grew by 42 percent between 1970 and 1980, agriculture's share of the labor force declined to 7 percent in 1980.

Year 1990. Between 1980 and 1990, the Citrus-Marion LMA experienced a 78 percent increase in employment, employing nearly 100,000 workers in 1990. Wholesale/retail trade and services combined added 320,000 new jobs. By 1990, manufacturing employed over 12,000 workers, and the construction industry employed almost 10,000. By 1990, 66 percent of all jobs

in Citrus-Marion LMA were in services or wholesale/retail trade. Agricultural employment increased in 1990 (5,162 workers) from 1980 (3,916 workers).

Phase II: Recent Industry Analysis. The historical Census data show that the Citrus-Marion LMA was agriculturally-based until 1970 (Figure 2). In the 1990s, employment in the Citrus-Marion LMA grew by 33 percent. It was one of the fastest growing LMAs in the Florida Gulf of Mexico region in that decade.

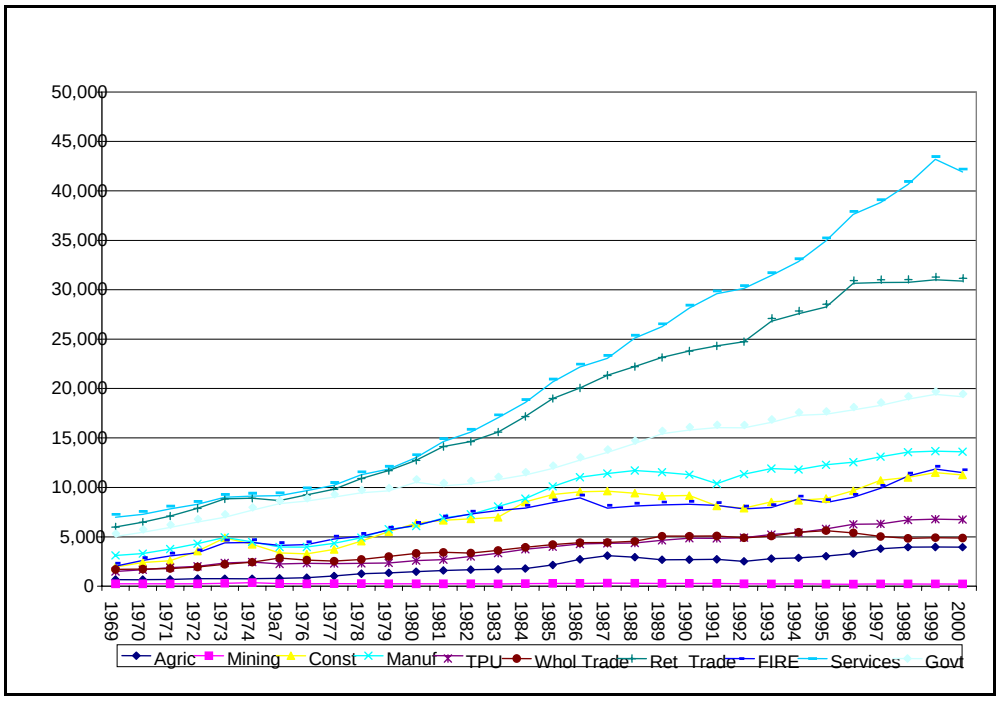


Figure 2. Annual Employment, Citrus-Marion LMA: 1969-2000 (U.S. Dept. of Commerce, Bureau of Economic Analysis, 2000).

Services accounted for 27 percent of all employment, and retail trade employed 20 percent of the LMA workforce in 2000 (Table 1). Interestingly, manufacturing accounts for nearly 9 percent of LMA employment, employing over 13,000 workers. There were 237 manufacturing establishments in Marion County in 2000. These establishments include food processors, textile manufacturing plants, and wood products production (including furniture). In addition, the county also has six mobile home manufacturing establishments, three paper manufacturing facilities, eight chemical plants, and 36 fabricated metal products manufacturing operations.

Table 1

Employment by Sector, Citrus-Marion LMA: 2000

Industry	Percent
Agriculture	2.6
Mining	0.2
Construction	7.3
Manufacturing	8.8
Transportation/Public Utilities	4.4
Wholesale Trade	3.1
Retail Trade	20.0
Finances, Insurance & Real Estate	7.5
Services	27.2
Government	12.4

Source: U.S. Census Bureau, 2000b.

Phase III: Recession Analysis. To test the effects of business cycle recessions on the Citrus-Marion LMA economy since 1970, we examined the annual trends in employment. The total annual employment data for the Citrus-Marion LMA, together with the three-year employment moving averages, show a linear growth pattern (Figure 3). In most years the actual employment levels were greater than the expected employment levels, based on the employment levels in the previous three years. However, we see some convergence in these lines for two recession periods: the mid-1970s and early 1990s. While some LMAs in Florida experienced a slow-down in growth during the 1980-1982 recession years, the Citrus-Marion LMA appears to have not suffered that fate.

In a systems approach to local economic organization, one issue of particular importance is the impact of "shocks" on a social system. Slow, gradual growth and/or decline are not as problematic for a social system as are shocks. Shocks come when systems experience unanticipated growth (such as "boomtowns") or decline. Gradual growth and/or decline allow equilibrium-seeking social systems to absorb the changes, to reallocate and redistribute resources and population. Shocks, on the other hand, create disruptions in a social system. These disruptions can manifest in a number of local fiscal and social problems.

In order to understand the benefits and burdens of certain industries to a system, it is important to know when the shocks come in these industries. We employed a moving average forecasting model to locate the years that the shocks occur in Citrus-Marion LMA. The forecasting procedure includes the following. First, three-year moving averages (current plus previous two years) are computed. Second, at each year the expected value (three-year moving average) is subtracted from the observed value. Each of these deviations is squared to provide the forecasting error for each year. These squared deviations are summed and averaged across all years in the analysis to compute a mean squared error (MSE). We establish a 'shock' for any given year in which the squared deviation for that year is greater than or equal to two times the mean squared error for the industry sector in question (Anderson et al., 1990).

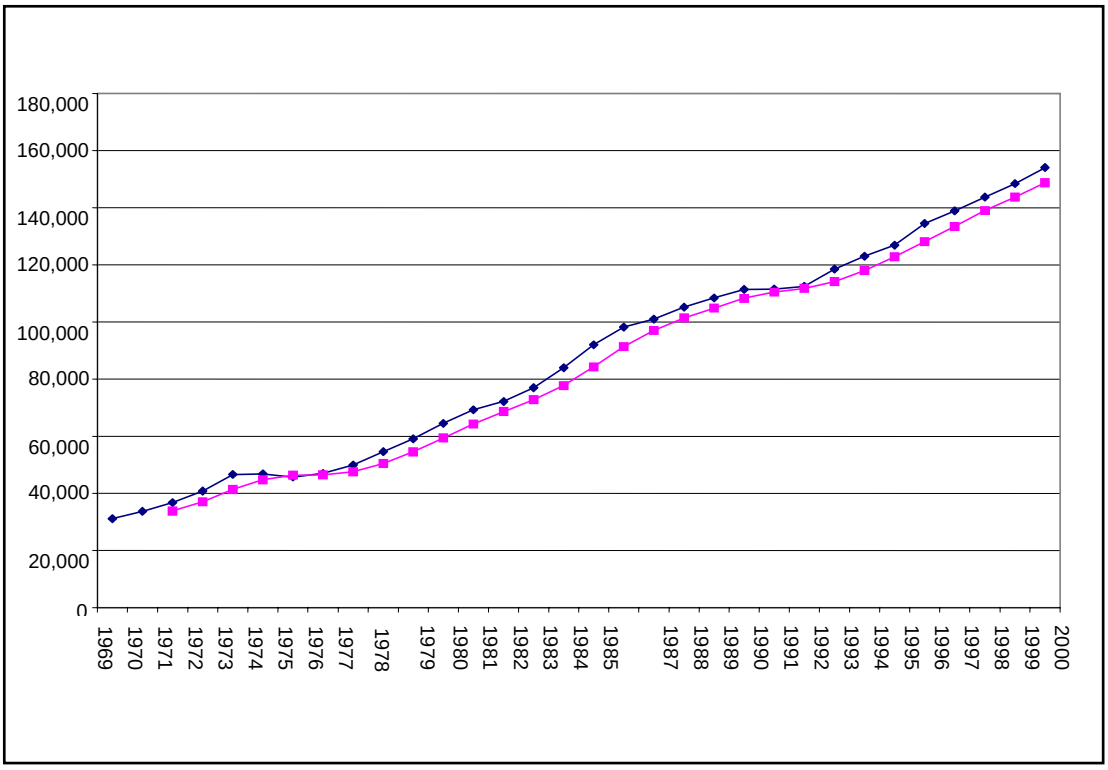


Figure 3. Total Employment and Three-year Moving Averages, Citrus-Marion LMA: 1969-2000 (U.S. Dept. of Commerce, Bureau of Economic Analysis, 2000).

The forecasting analysis shows that, since 1970, employment growth rates were greatest (i.e., exceeded expectations) in the economic booms of the 1980s and 1990s (Figure 4). It also failed to detect significant drop-offs in employment during any of the recession periods over the period in question.

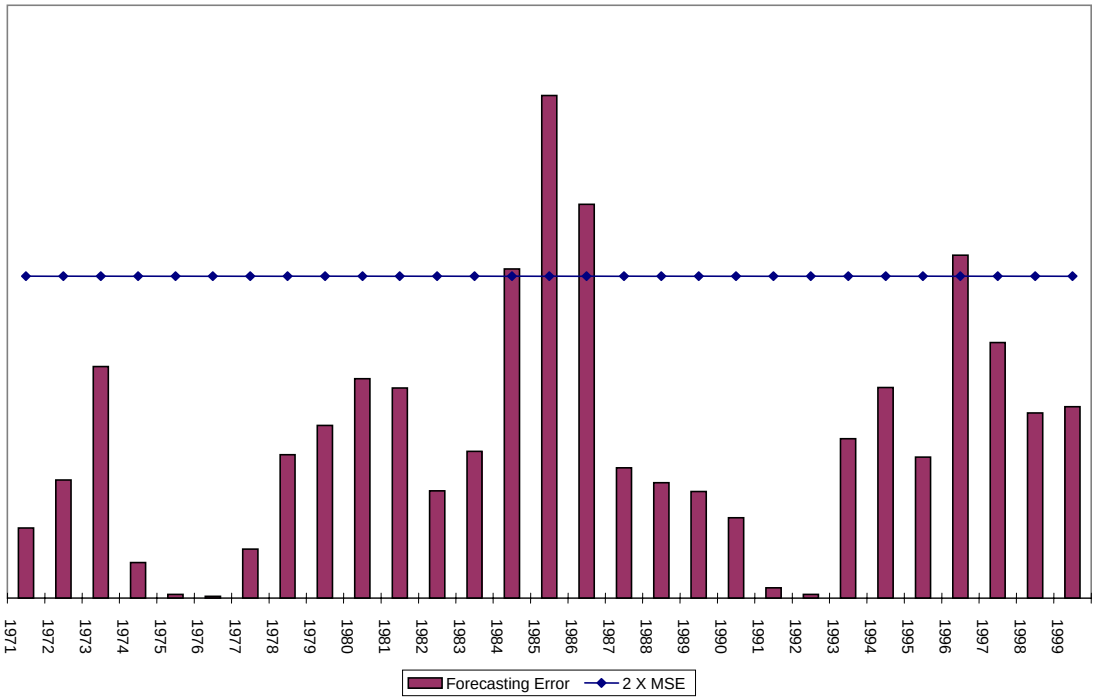


Figure 4. Employment Forecasting Analysis, Citrus-Marion LMA: 1971-1999.

Phase IV: Socio-Demographic Analysis. The historical and current population data for the Citrus-Marion LMA indicates that this region grew at rates faster than the nation since 1940 (Tables 2-5). Particularly rapid growth occurred during the 1970s (100%), the 1980s (63%), the 1990s (30%).

In 2000, the Citrus-Marion LMA population was 85 percent white, 8 percent African-Americans and less than 5 percent Hispanic. However, this most recent enumeration represents a notable shift in this LMA's racial composition. Between 1940 and 1970, African-Americans represented between 41 and 23 percent of the LMA population. Between 1980 and 1990, however, the African-American population represented less than 12 percent of the total and declined to 9 percent in 2000. Given the extraordinary growth rates for this LMA, this profile change is most likely the result of massive in-migration of Caucasians. Furthermore, while the Hispanic population currently comprises only 5 percent of the population, it reflects a significant growth rate since 1990 (160% growth).

Table 2

Population by County, Citrus-Marion LMA: 1940-2000

County	1940	1950	1960	1970	1980	1990	2000
Citrus	5,846	6,111	9,268	19,196	54,703	93,515	118,085
Marion	31,243	38,187	51,616	69,030	122,488	194,833	258,916
LMA Total	37,089	44,298	60,884	88,226	177,191	288,348	377,001

Source: U.S. Census Bureau, 2000b.

Table 3

Percent of White Population, Citrus-Marion LMA: 1940-2000

County	1940	1950	1960	1970	1980	1990	2000
Citrus	70.9	74.5	82.1	90.4	96.0	96.4	93.0
Marion	56.8	61.8	65.0	73.7	82.6	85.6	80.4
LMA %	58.5	63.5	67.6	77.3	86.7	89.0	84.3
LMA Total	21,721	28,149	41,200	68,278	153,751	256,913	318,060

Source: U.S. Census Bureau, 2000b.

Table 4

Percent of Black Population, Citrus-Marion LMA: 1940-2000

County	1940	1950	1960	1970	1980	1990	2000
Citrus	29.0	25.4	17.7	9.5	3.2	2.1	2.3
Marion	43.7	38.2	34.8	26.1	16.6	12.7	11.3
LMA %	41.4	36.4	32.2	22.5	12.4	9.3	8.5
LMA Total	15,368	16,143	19,648	19,892	22,124	26,906	32,082

Source: U.S. Census Bureau, 2000b.

Table 5

Percent of Hispanic Population*, Citrus-Marion LMA: 1970-2000

County	1970	1980	1990	2000
Citrus	0.9	1.4	1.5	2.6
Marion	1.2	2.0	2.9	6.0
LMA %	1.2	1.8	2.5	5.0
LMA Total	1,052	3,190	7,170	18,757

* County-level Census data for Hispanics are not available before 1970.
Source: U.S. Census Bureau, 2000b.

Retirement Age Population. The Citrus-Marion LMA is a retirement age intensive LMA. In 2000, 27 percent of its population was over the age of 65, which is twice the national rate of 12 percent (Table 6). The coastal community of Citrus County had a particularly high rate of retirees (33%). Since 1960, this county has had high rates of retirement age persons. This sub-population has contributed significantly to the LMA's high growth rates.

Table 6

Percent of Population Over 65, Citrus-Marion LMA: 1950-2000

County	1950	1960	1970	1980	1990	2000
Citrus	11.5	16.9	26.0	29.0	31.4	32.2
Marion	8.9	10.6	13.1	17.0	22.1	24.5
LMA Total	9.3	11.5	15.9	20.7	25.1	27.0

Source: U.S. Census Bureau, 2000b.

Education. The large concentration of retirees may explain the lower level of educational attainment in the LMA. Older peoples generally tend to have less education because labor market entry requirements, once at a minimum, have been increasing steadily over time. Only 14 percent of the adults in the Citrus-Marion LMA had earned a college degree in 2000 (Table 7). This attainment level is significantly less than the national rate of 24 percent. The LMA also has lagged behind on high school graduation rates in recent years. In 2000, 22 percent of the LMA had not graduated from high school.

Table 7

Adult Educational Attainment (age 25+), Citrus-Marion LMA: 1970-2000

County	0-8 Years	Some High School	High School Diploma	Some College, No Degree	BA/BS or More	Total
1970						
Citrus	35.9%	21.6%	27.1%	9.3%	6.0%	13,289
Marion	31.9%	20.8%	29.5%	10.3%	7.3%	39,099
LMA Total	32.9%	21.0%	28.9%	10.0%	7.0%	52,388
1980						
Citrus	21.9%	22.8%	36.6%	11.5%	7.0%	40,583
Marion	20.7%	19.8%	36.3%	13.6%	3.6%	78,617
LMA Total	21.1%	20.8%	36.4%	12.9%	8.7%	119,200
1990						
Citrus	10.0%	21.4%	36.6%	21.5%	10.4%	72,054
Marion	9.9%	20.4%	34.6%	23.4%	11.5%	137,001
LMA Total	9.9%	20.1%	35.3%	22.7%	11.1%	209,055
2000						
Citrus	5.4%	16.3%	38.0%	27.1%	13.1%	92,594
Marion	6.1%	15.7%	35.9%	28.5%	13.7%	187,187
LMA Total	5.8%	15.9%	36.6%	28.0%	13.5%	279,781

Source: U.S. Census Bureau, 2000b.

Finances. The Citrus-Marion LMA has two trends that could create pressures for local governments: a retirement age population, and an expanding manufacturing sector (Johnson et al., 1995). The local government finance data indicate very similar levels of per capita revenues

and debts as the Tampa Bay-St. Petersburg and Sarasota LMAs (Tables 8-11). For example, in 1997, per capita revenues in the Sarasota LMA were $2,943. In Tampa Bay-St. Petersburg, the corresponding figure is $2,818. In the Citrus-Marion LMA it was $2,087. The real difference is the effect of the growth during the 1980s. Recall from the forecasting analysis that two years stand out as very rapid growth: 1985 and 1986. The local government data in Tables 8-11 show that revenues increased, both from the state and tax receipts. In addition, per capita local government debt increased to over $5,000 per capita (in 1997 dollars). This rapid shift in local government finances is not seen in most of the other Florida Gulf of Mexico LMAs, and reminds one of the effects in Louisiana oil and gas LMAs (particularly Lafayette). However, the effect was short-lived. By 1992 (and again in 1997) per capita debt levels were cut in half.

Table 8

Total Revenue, Per Capita (in 1997 adjusted dollars),
Citrus-Marion LMA: 1972-1997

County	1972	1977	1982	1987	1992	1997
Citrus	$1,292	$1,498	$1,478	$2,093	$1,751	$1,829
Marion	$1,935	$2,019	$2,068	$2,055	$1,856	$2,204
LMA Total	$1,775	$1,866	$1,883	$5,316	$1,822	$2,083

Source: U.S. Census Bureau, 2000a.

Table 9

Total State Revenue, Per Capita (in 1997 adjusted dollars),
Citrus-Marion LMA: 1972-1997

County	1972	1977	1982	1987	1992	1997
Citrus	$487	$660	$454	$484	$523	$487
Marion	$704	$669	$710	$7,503	$816	$815
LMA Total	$650	$667	$630	$1,710	$721	$709

Source: U.S. Census Bureau, 2000a.

Table 10

Total Tax Revenue, Per Capita (in 1997 adjusted dollars),
Citrus-Marion LMA: 1972-1997

County	1972	1977	1982	1987	1992	1997
Citrus	$428	$437	$509	$606	$768	$762
Marion	$414	$392	$322	$4,210	$536	$521
LMA Total	$418	$405	$381	$1,235	$612	$598

Source: U.S. Census Bureau, 2000a.

Table 11

Total Debt, Per Capita (in 1997 adjusted dollars), Citrus-Marion LMA: 1972-1997

County	1972	1977	1982	1987	1992	1997
Citrus	$661	$744	$2,955	$4,280	$2,809	$3,725
Marion	$423	$520	$517	$11,863	$1,872	$1,451
LMA Total	$482	$586	$1,281	$5,604	$2,177	$2,184

Source: U.S. Census Bureau, 2000a.

10. Tampa Bay-St. Petersburg, Florida: Labor Market Area

a. Introduction

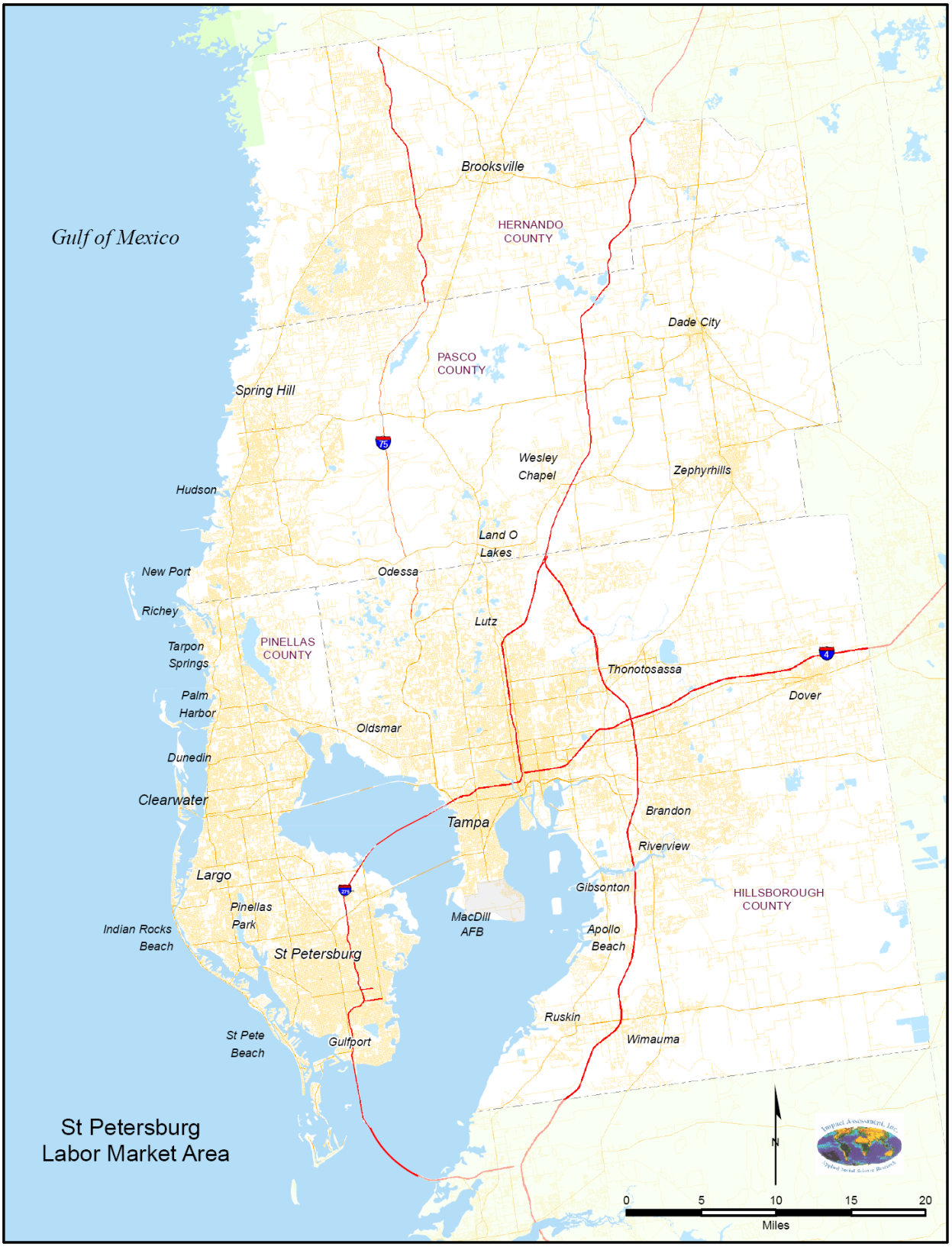
This analysis examines historical and current industry and socio-demographic patterns in LMA 067: Tampa Bay-St. Petersburg. The analysis is divided into several phases. Phase I provides a general overview of broad (single-digit) industry patterns in this LMA for decennial census years from 1940 to 1990 using Census data. Phase II shows employment patterns in broad (single-digit) industry categories for all years between 1969 and 2000 using Regional Economic Information Systems (REIS) data from the Bureau of Economic Analysis. Phase III examines the impact of economic recessions on employment levels during the last thirty years. Phase IV is a socio-demographic analysis of the LMA.

b. Setting

Tampa-St. Petersburg is the largest metropolitan region along the Florida Gulf of Mexico LMAs. It is comprised of the following counties: Hernando, Hillsborough, Pasco, and Pinellas (Map 22). As of the year 2000, over 2 million people resided in this LMA, with almost 1 million people residing in Hillsborough. The Tampa-St. Petersburg LMA population is predominantly Caucasian (81%), with African-Americans and Hispanics comprising approximately 10 percent, each. During the 1990s this LMA's population grew 16 percent, exceeding the national growth rate of 9 percent.

c. Unit of Analysis

Labor Market Areas (LMAs) are the geographical units of analysis in this report. Labor Market Areas are defined by patterns of transportation to and from work within and across county boundaries. Labor Market Areas better represent local social systems and, empirically, local economies (Killian and Tolbert, 1993).



Map 22. Tampa Bay-St. Petersburg, Florida Labor Market Area.

Phase I: General Historical Industry Trends. The general historical industry trends for the Tampa-St. Petersburg LMA are discussed next (Figure 1). These data are analyzed both cross-sectionally and longitudinally in order to gain a more complete understanding of both the structure of and the resulting changes to the Tampa-St. Petersburg LMA's primary industries over time.

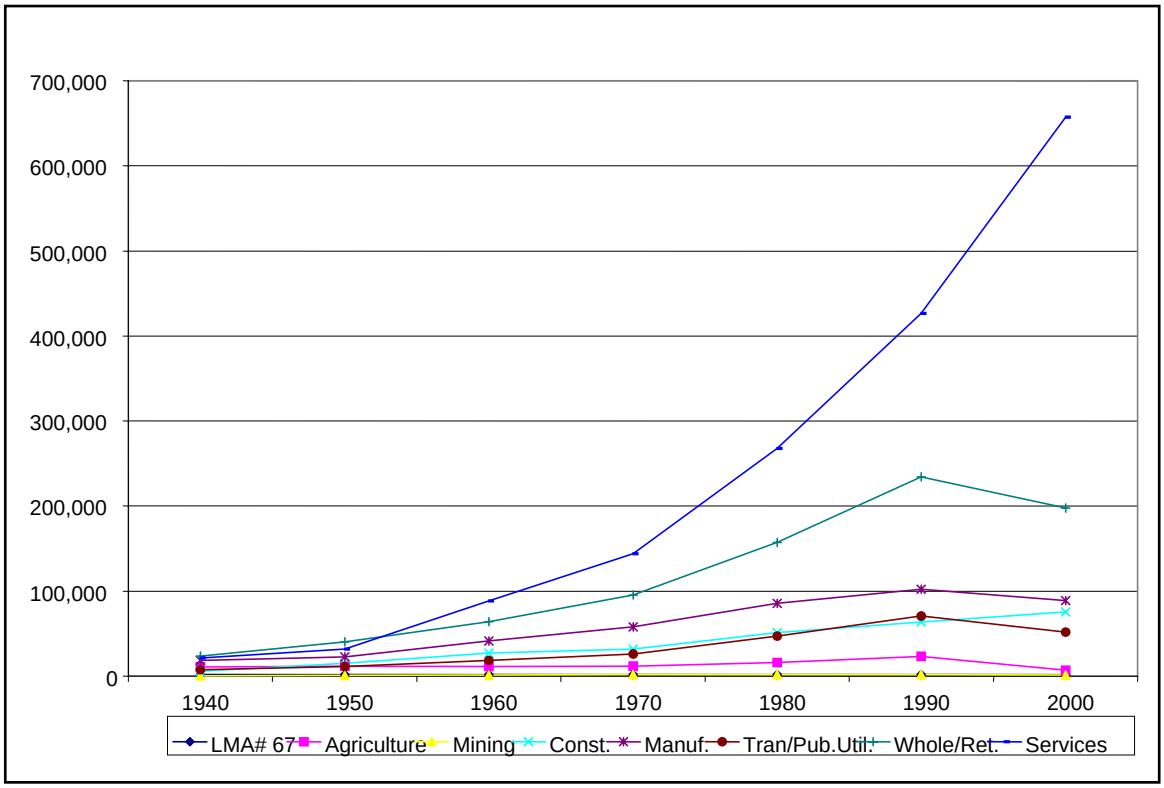


Figure 1. Major Industry Employment, Tampa Bay-St. Petersburg LMA: 1940- 2000 (U.S. Census Bureau, 2000b).

Year 1940. In 1940, the Tampa-St. Petersburg LMA employed over 88,000 people. Approximately 12 percent were employed in agriculture, and 21 percent were employed in manufacturing. Wholesale/retail trade, and services employed over 50 percent of the Tampa-St. Petersburg LMA labor force. The mining sector employed 344 workers in 1940.

Year 1950. Between 1940 and 1950 total employment in the Tampa-St. Petersburg LMA grew by 51 percent, employing approximately 134,000 workers by 1950. Agriculture employment levels remained steady between 1940 and 1950, but its share of the total labor force fell to 8 percent. Construction experienced the greatest relative growth in the 1940s, increasing 153 percent from 6,000 workers in 1940 to almost 15,000 workers in 1950. Furthermore, in 1950, construction employed over 11 percent of the total labor force, compared to 6 percent in 1940. There was considerable employment growth in wholesale/retail trade (16,000 new jobs) and services (10,000 new jobs) between 1940 and 1950, but the relative share of total employment for these sectors remained relatively stable at 53 percent.

Year 1960. Between 1950 and 1960, total employment in this LMA grew by 88 percent, employing about 253,000 workers in 1960. Construction (81% growth) and manufacturing (81%

growth) were two major growth categories. The 1950s also witnessed the emergence of services and wholesale/retail trade as the leading industries, with these two industries employing 60 percent of the Tampa-St. Petersburg LMA workforce in 1960.

Year 1970. Between 1960 and 1970, total employment in the Tampa-St. Petersburg LMA grew by 46 percent, employing some 360,000 in 1970. Agricultural employment remained steady at nearly 12,000 workers, while mining employment reached 2,000 workers in 1970. The greatest growth was in services (63%), where 60,000 new jobs were added. All other industries added jobs during the 1960s, but two stand out: manufacturing (16,000 new jobs) and transportation/communication/public utilities (8,000 new jobs).

Year 1980. Between 1970 and 1980, the total employment rate in the Tampa-St. Petersburg LMA grew by 70 percent, employing 627,449 workers in 1980. The largest growth rates were in services (85%), transportation/public utilities (80%), wholesale/retail trade (65%) and construction (60%). Agriculture grew by 35 percent in the 1970s, increasing its share of total employment to 3 percent. By 1980, two-thirds of all jobs in the Tampa-St. Petersburg LMA were in services and wholesale/retail trade. However, there was still a substantial manufacturing presence in 1980, with 14 percent of the labor force employed in 86,000 manufacturing jobs.

Year 1990. The Tampa-St. Petersburg LMA experienced some of the national economic growth characteristic of the 1980s. Between 1980 and 1990, its total employment grew by 47 percent (+300,000 new jobs), employing some 900,000 people by 1990. Each industry sector experienced growth during the 1980s, and all but mining experienced growth rates of over 10 percent. Services (59%), wholesale/retail trade (49%), transportation/public utilities (49%), and agriculture (45%) led the way. Unlike other GOMR LMAs with oil and gas related economies that experienced contractions during the 1980s (e.g., Beaumont, Lafayette), manufacturing employment in the Tampa-St. Petersburg LMA expanded by 19 percent.

Phase II: Recent Industry Analysis. In the second phase of the industry analysis we examine recent employment trends in this LMA. The historical Census data show that Tampa-St. Petersburg LMA grew substantially from 1940 to 1990 (Figure 2).

In 2000, the REIS data show that this LMA is diversified across all industry sectors, with the service sector employing the majority of workers (39%). Government and manufacturing both employed slightly less than 7 percent of the labor force. Still, among the Florida Gulf of Mexico LMAs, total manufacturing employment is greatest in the Tampa Bay-St. Petersburg LMA, employing almost 90,000 workers in 2000 (Table 1). This LMA currently includes a very diverse representation of manufacturing facilities, including 117 food processing/manufacturing establishments, 109 chemical producing facilities, 76 wood products manufacturing facilities, 126 plastics manufacturers, 32 primary metal plants, 377 fabricated structural metal facilities, 208 machine manufacturing plants, 147 computer and machine manufacturing establishments, 108 transportation equipment manufacturing establishments (including 38 shipbuilding/repairing establishments), and over 300 medical/laboratory equipment manufacturing plants (U.S. Census Bureau, 2000a). Since 1970, the United States' economy has experienced several recessions: following the oil embargo and the energy crises (1973-1976); following the high interest rates that followed rapid inflation growth (1980-1982); and (1989-1992) (Heilbroner and Milberg, 1999; Mencken and Singelmann, 1998).

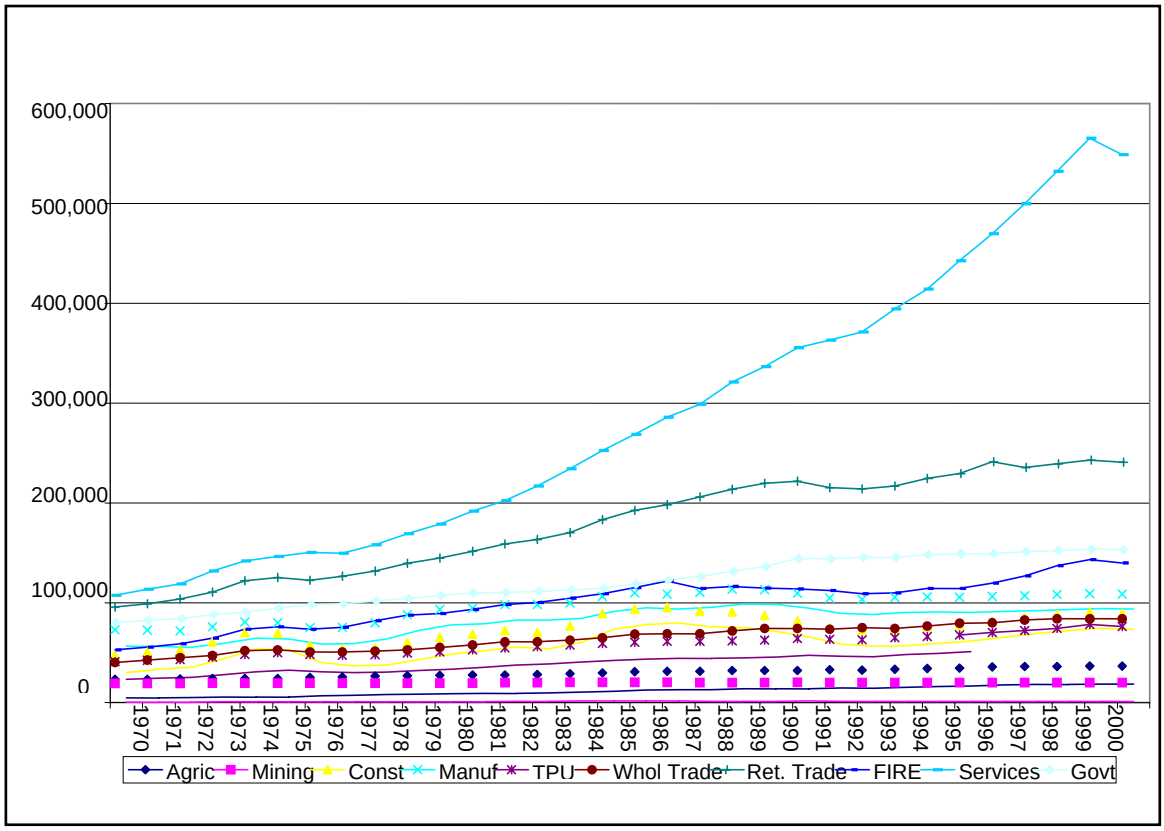


Figure 2. Annual Employment, Tampa-St. Petersburg LMA: 1970-2000 (U.S. Dept. of Commerce, Bureau of Economic Analysis, 2000).

Table 1

Employment by Sector, Tampa Bay-St. Petersburg LMA: 2000

Industry	Percent
Agriculture	1.3
Mining	1.0
Construction	5.2
Manufacturing	6.6
Transportation/Public Utilities	4.2
Wholesale Trade	4.7
Retail Trade	16.2
Finances, Insurance & Real Estate	8.8
Services	38.7
Government	9.8

Source: U.S. Census Bureau, 2000b.

Phase III: Recession Analysis. We examined annual employment trends in the Tampa Bay-St. Petersburg economy. The total annual employment data, together with the three-year employment moving averages, show remarkable growth patterns for this LMA (Figure 3). With two notable exceptions (1974 and 1991), actual employment levels were greater than expected, as based on the employment levels in the previous three years. 1974 and 1991 were recession years. However, even during those periods, the expected employment levels never exceeded the observed employment levels.

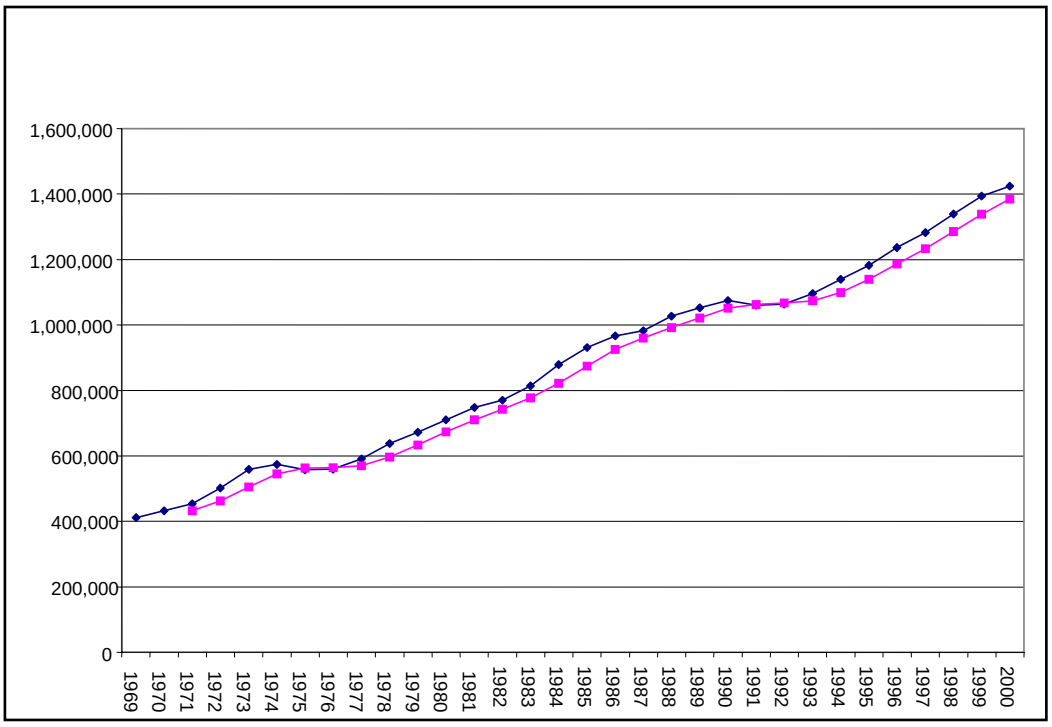


Figure 3. Total Employment and Three-year Moving Averages, Tampa Bay-St. Petersburg LMA: 1969-2000 (U.S. Dept. of Commerce, Bureau of Economic Analysis, 2000).

In a systems approach to local economic organization, one issue that is particularly important is the impact of "shocks" on a social system. Slow, gradual growth and/or decline are not as problematic for a social system as are shocks. Shocks come when systems experience unanticipated growth (such as "boomtowns") or decline. Gradual growth and/or decline allow equilibrium-seeking social systems to absorb the changes, to reallocate and redistribute resources and population. Shocks, on the other hand, create disruptions in a social system. These disruptions can manifest in a number of local fiscal and social problems.

In order to understand the benefits and burdens of certain industries to a system, it is important to know the timing of the industry shocks. In our analysis, we employed a moving average forecasting model to locate the years that the shocks occur in the Tampa-St. Petersburg LMA. The forecasting procedure includes the following. First, three-year employment moving averages (current plus previous two years) are computed. Second, at each year the expected value (three-year moving average) is subtracted from the observed value. Each of these deviations is squared to provide the forecasting error for each year. These squared deviations are summed and averaged across all years in the analysis to compute a mean squared error (MSE).

We establish a "shock" for any given year in which the squared deviation for that year is greater than or equal to two times the mean squared error for the industry sector in question (Anderson et al., 1990).

Our forecasting analysis demonstrated that the employment growth rates within the Tampa Bay-St. Petersburg LMA (for the period between 1970 and 2000) were highest in the mid-1980s during a period of national economic expansion. Also, the forecasting analysis (not shown here) fails to detect significant drop-offs in employment during any of the recession periods over the period in question. We maintain that the highly diversified and generally healthy nature of the Tampa Bay-St. Petersburg LMA economy makes it relatively recession proof, at least to the point where one would expect significant downturns in employment.

Phase IV: Socio-Demographic Analysis. Historically, Caucasians have been over-represented in the Tampa Bay-St. Petersburg LMA. Indeed, Caucasians have comprised nearly 90 percent of the LMA's total population since 1960 (Tables 2-5). In 1990, Caucasians comprised 88 percent of the Tampa Bay-St. Petersburg LMA, while comprising 75 percent on a national level. This small decline is attributable to an increase in the Hispanic population, which grew from 6 percent of the population to 10 percent in one decade (+87%). During this same decade, the African-American population increased 33 percent. While African-Americans outnumbered Hispanics by almost 30,000 in 1990, there were more Hispanics in the LMA than African-Americans by 2000. The number of Hispanics increased in all Florida GOMR LMAs between 1990 and 2000 (data not available).

Table 2

Population by County, Tampa Bay-St. Petersburg LMA: 1940-2000

County	1940	1950	1960	1970	1980	1990	2000
Hernando	5,641	6,693	11,205	17,004	44,469	101,115	130,802
Hillsboro.	180,148	249,894	397,788	490,265	646,960	834,054	998,948
Pasco	13,981	20,529	36,785	75,955	193,643	281,131	344,765
Pinellas	91,852	159,246	374,665	522,329	728,531	851,659	921,482
LMA Total	291,622	436,362	820,443	1,105,553	1,613,603	2,067,959	2,395,997

Source: U.S. Census Bureau, 2000b.

Table 3

Percent of White Population, Tampa Bay-St. Petersburg LMA: 1940-2000

County	1940	1950	1960	1970	1980	1990	2000
Hernando	71.7	77.0	79.0	85.8	93.1	94.9	92.8
Hillsboro.	82.4	84.6	85.9	86.1	84.8	82.8	75.1
Pasco	83.7	86.4	88.9	94.9	96.6	96.2	93.7
Pinellas	82.4	88.2	91.1	91.6	91.5	90.5	85.8
LMA %	82.2	85.9	88.3	89.3	89.5	88.4	82.9
LMA Total	239,949	375,023	724,862	987,359	1,444,283	1,828,737	1,986,503

Source: U.S. Census Bureau, 2000b.

Table 4

Percent of Black Population, Tampa Bay-St. Petersburg LMA: 1940-2000

County	1940	1950	1960	1970	1980	1990	2000
Hernando	28.3	22.9	20.1	14.1	6.3	3.8	4.0
Hillsboro.	17.5	15.3	13.9	13.6	13.3	13.1	14.9
Pasco	16.2	13.5	11.0	4.9	2.0	1.9	2.0
Pinellas	17.5	11.7	8.8	8.1	7.5	7.6	8.9
LMA %	17.6	14.0	11.5	10.4	9.1	8.9	10.2
LMA Total	51,583	61,204	95,003	115,589	148,058	184,087	244,457

Source: U.S. Census Bureau, 2000b.

Retirement Age Population. The Tampa Bay-St. Petersburg is a retirement age-intensive LMA. In 2000, 19 percent of the Tampa Bay-St. Petersburg LMA population was over the age of 65. Nevertheless, there was considerable variation in this percentage within the LMA. Only Hillsborough County (11%) had a retirement age rate on par with the national rate (12%), while three other counties had retirement age rates at least twice the national rate (Table 5).

Table 5

Percent of Population Over 65, Tampa Bay-St. Petersburg LMA: 1950-2000

County	1950	1960	1970	1980	1990	2000
Hernando	14.6	14.1	26.9	25.4	30.7	29.8
Hillsboro.	12.7	9.8	14.3	12.3	12.2	11.6
Pasco	19.6	20.0	40.7	32.2	32.3	26.8
Pinellas	30.5	24.9	41.2	30.3	26.0	22.6
LMA Total	20.0	17.0	29.0	23.0	22.0	19.0

Source: U.S. Census Bureau, 2000b.

Education. In general, the Tampa Bay-St. Petersburg LMA population has near average educational attainment levels. In 2000, the percentage of adults in this LMA who had earned a college degree (22%) was close to the national rate of 24 percent. Within the LMA, Hillsborough County (25%) leads the way in terms of college graduates, while Hernando County (12.7%) and Pasco County (13%) lag behind (Table 6). The Tampa Bay-St. Petersburg LMA also had more high school graduates (81.5%) in 2000 than most other Florida Gulf of Mexico Region LMAs.

Table 6

Adult Educational Attainment (age 25+), Tampa Bay-St. Petersburg LMA: 1970-2000

County	0-8 Years	Some High School	High School Diploma	Some College, No Degree	BA/BS or More	Total
1970						
Hernando	37.2%	21.9%	26.5%	8.2%	6.0%	10,606
Hillsboro.	28.9%	21.8%	30.4%	10.1%	8.6%	268,178
Pasco	35.3%	22.4%	28.3%	8.9%	4.9%	54,475
Pinellas	26.5%	20.4%	30.3%	12.6%	10.0%	365,274
LMA Total	28.2%	21.1%	30.1%	11.3%	9.0%	698,533
1980						
Hernando	19.5%	20.5%	37.8%	13.5%	8.6%	31,629
Hillsboro.	17.2%	16.9%	35.0%	16.3%	14.5%	384,098
Pasco	22.2%	21.9%	36.8%	12.1%	6.8%	143,523
Pinellas	15.4%	16.3%	36.0%	17.6%	14.6%	524,492
LMA Total	17.0%	17.4%	35.8%	16.3%	13.3%	1,083,742
1990						
Hernando	8.5%	21.0%	37.3%	18.1%	9.7%	76,525
Hillsboro.	8.8%	15.5%	28.8%	19.4%	20.2%	545,020
Pasco	10.5%	22.5%	35.9%	16.9%	9.1%	212,612
Pinellas	6.5%	15.3%	31.6%	21.1%	18.5%	637,871
LMA Total	8.0%	16.7%	31.5%	19.7%	17.3%	1,472,028
2000						
Hernando	5.3%	16.2%	37.7%	28.0%	12.7%	99,082
Hillsboro.	6.3%	12.9%	26.6%	29.0%	25.1%	653,841
Pasco	5.9%	16.5%	36.7%	27.6%	13.1%	255,472
Pinellas	3.4%	12.0%	29.6%	31.4%	22.9%	686,094
LMA Total	5.2%	13.3%	30.0%	29.7%	21.6%	1,694,489

Source: U.S. Census Bureau, 2000b.

Finances. The local government financial data show that, in terms of general revenue, per capita levels increase from 1972 to 1997 (Tables 7-10). However, tax revenues fell off in 1992, possibly due to the recession. The most notable trend at the LMA level is that per capita debt for local government finance doubled (in real dollars) between 1982 and 1987, and remained at those levels through 1997. Within the LMA, Hernando County has incurred more debt between 1980 and 2000 than its neighbors.

Table 7

Total Revenue, Per Capita (in 1997 adjusted dollars),
Tampa Bay-St. Petersburg LMA: 1972-1997

County	1972	1977	1982	1987	1992	1997
Hernando	$1,492	$2,775	$2,542	$2,083	$3,605	$2,648
Hillsboro.	$1,835	$2,256	$2,117	$2,867	$3,906	$3,282
Pasco	$751	$1,221	$1,170	$1,315	$1,863	$1,830
Pinellas	$1,328	$1,695	$1,796	$2,260	$2,415	$2,718
LMA Total	$1,499	$1,899	$1,868	$2,371	$2,666	$2,818

Source: U.S. Census Bureau 2000a.

Table 8

Total State Revenue, Per Capita (in 1997 adjusted dollars),
Tampa Bay-St. Petersburg LMA: 1972-1997

County	1972	1977	1982	1987	1992	1997
Hernando	$544	$628	$487	$2,083	$3,605	$761
Hillsboro.	$508	$706	$645	$2,867	$1,008	$999
Pasco	$361	$484	$448	$1,315	$694	$676
Pinellas	$388	$491	$451	$2,260	$594	$596
LMA Total	$440	$582	$529	$640	$795	$781

Source: U.S. Census Bureau, 2000a.

Table 9

Total Tax Revenue, Per Capita (in 1997 adjusted dollars),
Tampa Bay-St. Petersburg LMA: 1972-1997

County	1972	1977	1982	1987	1992	1997
Hernando	$400	$1,090	$734	$700	$1,627	$1,100
Hillsboro.	$636	$557	$551	$719	$991	$949
Pasco	$256	$372	$337	$422	$671	$561
Pinellas	$548	$574	$569	$770	$102	$1,020
LMA Total	$558	$557	$538	$701	$599	$931

Source: U.S. Census Bureau, 2000a.

Table 10

Total Debt, Per Capita (in 1997 adjusted dollars),
Tampa Bay-St. Petersburg LMA: 1972-1997

County	1972	1977	1982	1987	1992	1997
Hernando	$639	$549	$393	$11,340	$10,858	$5,994
Hillsboro.	$1,759	$1,994	$1,829	$4,624	$4,432	$3,923
Pasco	$202	$681	$1,006	$1,453	$2,443	$1,887
Pinellas	$843	$946	$1,453	$2,709	$2,676	$2,436
LMA Total	$1,176	$1,339	$1,512	$3,683	$3,702	$3,161

Source: U.S. Census Bureau, 2000a.

11. Sarasota, Florida: Labor Market Area

a. Introduction

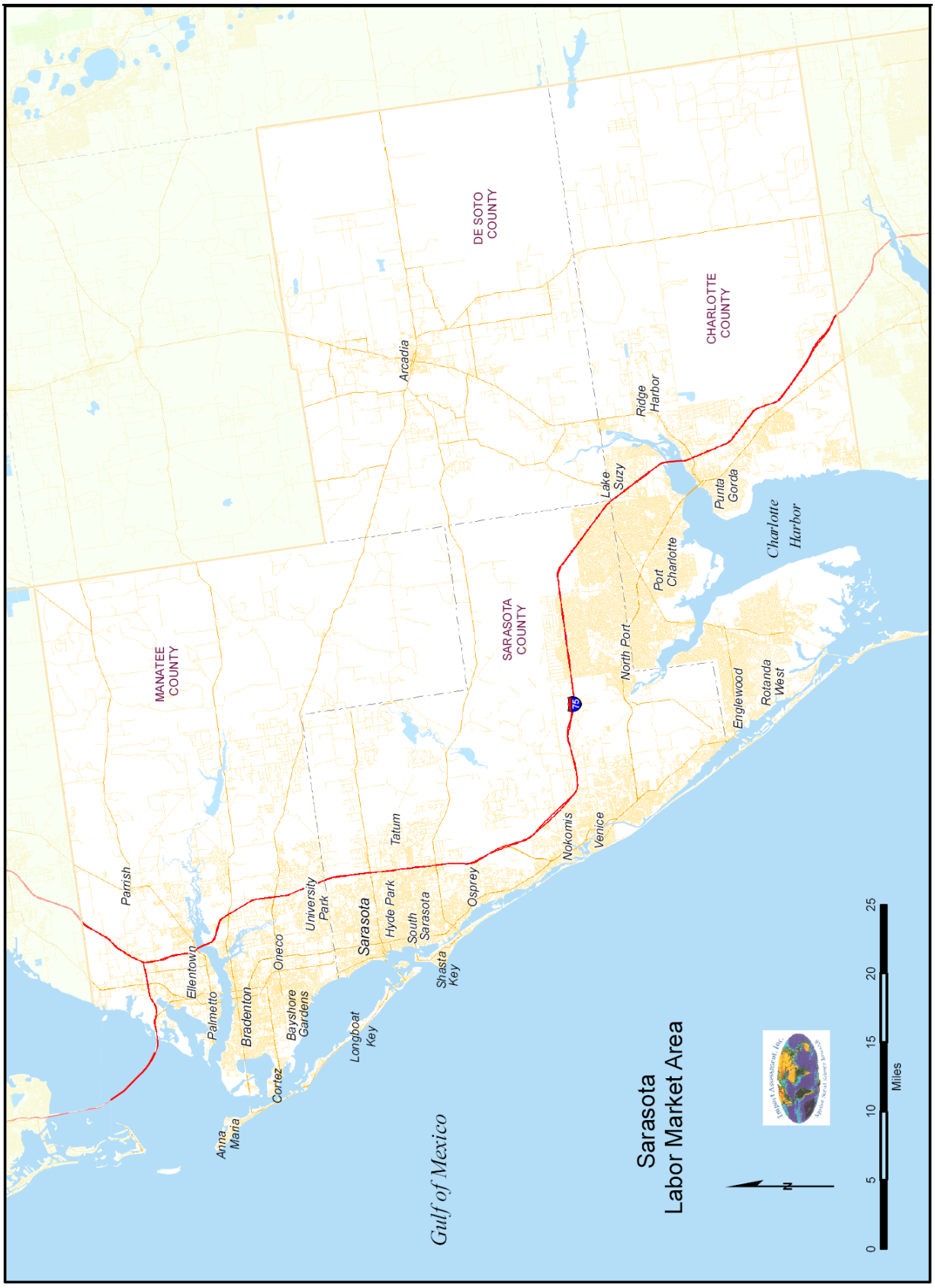
This analysis examines historical and current industry and socio-demographic patterns in LMA 069: Sarasota. The analysis is divided into several phases. Phase I provides a general overview of broad (single-digit) industry patterns in this LMA for decennial census years from 1940 to 1990 using Census data. Phase II shows employment patterns in broad (single-digit) industry categories for all years between 1969 and 2000 using REIS data from the Bureau of Economic Analysis. Phase III examines the impact of economic recessions on employment levels during the last 30 years. Phase IV is a socio-demographic analysis of the LMA.

b. Setting

This LMA is south of Tampa Bay-St. Petersburg along the Florida Gulf of Mexico. The Sarasota LMA is comprised of the following counties: Charlotte, DeSoto, Manatee and Sarasota (Map 23). Over 760,000 people resided in the LMA in 2000. Sarasota, the largest county in this LMA, had a year 2000 population of 300,000 people. The racial composition was predominantly Caucasian (85%) in 2000, with Hispanics comprising 6 percent and African-Americans 5 percent of the total 2000 population. This LMA's population grew by 22 percent during the 1990s, exceeding the national growth rate of 9 percent.

c. Unit of Analysis

Labor Market Areas (LMAs) are the geographical units of analysis in this report. Labor Market Areas are defined by patterns of transportation to and from work within and across county boundaries. Labor Market Areas better represent local social systems and, empirically, local economies (Killian and Tolbert, 1993).



Map 23. Sarasota, Florida Labor Market Area.

Phase I: General Historical Industry Trends. These data should be analyzed both cross-sectionally and longitudinally in order to gain a more complete understanding of both the structure of and the resulting changes to the Sarasota LMA's primary industries over time (Figure 1).

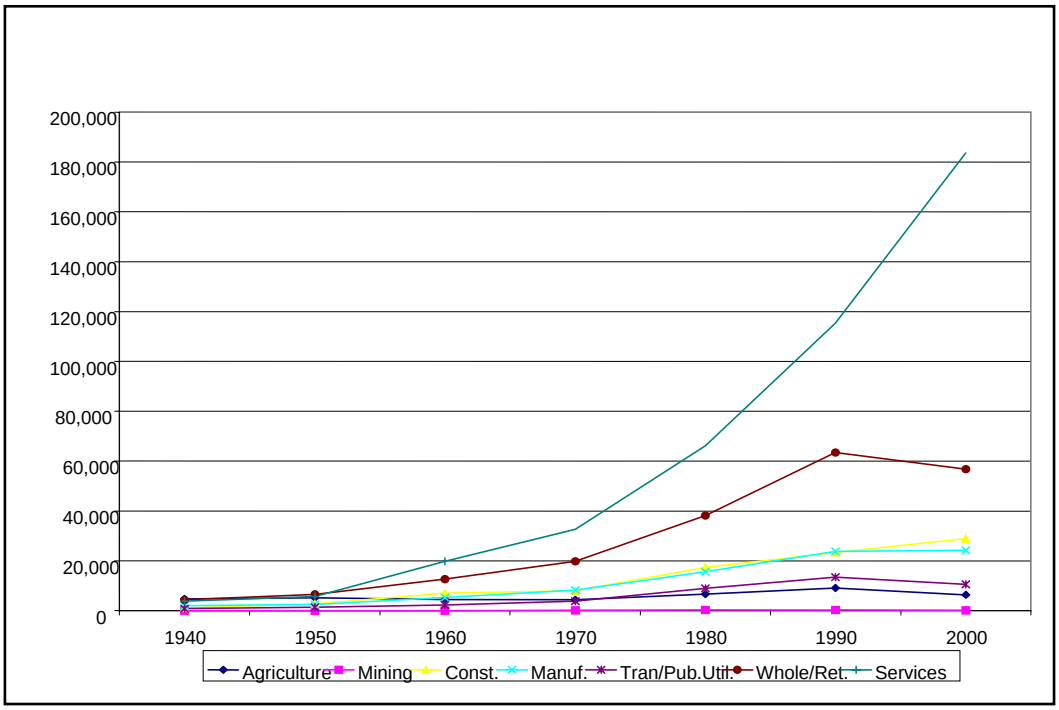


Figure 1. Major Industry Employment, Sarasota LMA: 1940-2000 (U.S. Census Bureau, 2000b).

Year 1940. In 1940, the Sarasota LMA employed over 16,825 people. Agriculture (28%) and manufacturing (12%) were the leading non-service sectors. Wholesale/retail trade, and services accounted for 48 percent of employment. The mining sector employed 26 workers in 1940.

Year 1950. Between 1940 and 1950, total employment in the Sarasota LMA grew by 42 percent, employing 23,900 workers in 1950. Agriculture employment levels grew by 10 percent, but agriculture's share of the total labor force fell to 21 percent. Construction had growth rates in excess of 100 percent, with a relative share of total employment of 11 percent in 1950. Transportation/public utilities had a growth rate in excess of 60 percent, with 500 new jobs added in this sector between 1940 and 1950. Services and wholesale/retail trade both grew by 40 percent in the 1940s, with a combined share of total employment of 50 percent in 1950.

Year 1960. Between 1950 and 1960, total employment grew by 115 percent, employing upward of 51,000 workers in 1960. Agricultural employment levels declined 14 percent, with its relative share falling to 8 percent. Services (247%), construction (161% growth), and manufacturing (118% growth) were three major growth categories, with a combined net increase of 23,000 jobs. By 1960, services and wholesale/retail trade employed 63 percent of the Sarasota LMA workforce.

Year 1970. Between 1960 and 1970, total employment in the Sarasota LMA grew by 49 percent, employing 76,000 people by 1970. Agricultural employment declined by 2 percent, and

agriculture's share of the total labor force was less than 6 percent. Growth was very evenly distributed among transportation/public utilities (69%), manufacturing (56%), services (65%) and wholesale/retail trade (56%). Manufacturing added 3,000 new jobs during the 1960s.

Year 1980. Between 1970 and 1980, the Sarasota LMA total employment rate grew by 98 percent, employing 153,029 workers in 1980. Every sector experienced employment growth greater than 20 percent. The leaders were: construction (116%), services (102%), wholesale/retail trade (93%), transportation/public utilities (134%), and manufacturing (89%). In 1980, manufacturing employed over 15,000 workers; construction employed 17,000.

Year 1990. Between 1980 and 1990, the Sarasota LMA experienced a 62 percent increase in employment, employing almost 250,000 in 1990. Growth was evenly distributed among a variety of categories: manufacturing (53%), construction (35%), wholesale/retail trade (66%), transportation/public utilities (50%), and services (74%). By 1990, 71 percent of total employment was concentrated in services and wholesale/retail trade. However, manufacturing employment grew by 52 percent between 1980 and 1990, employing over 23,000 workers by 1990.

Phase II: Recent Industry Analysis. The historical Census data show that the Sarasota LMA grew substantially between 1940 and 1990. There were no hints of an economic downturn in any of these data (Figure 2).

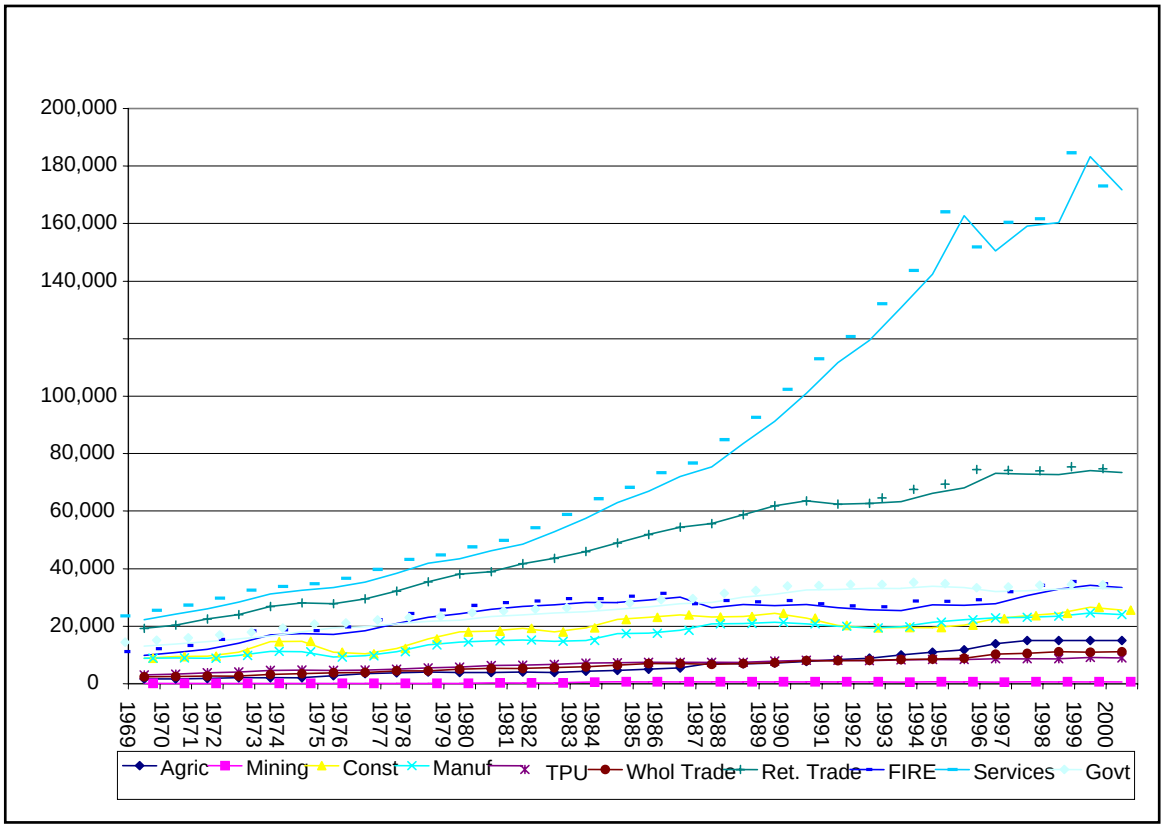


Figure 2. Annual Employment, Sarasota LMA: 1969-2000 (U.S. Dept. of Commerce Bureau of Economic Analysis, 2000).

However, because the Decennial Census data may not capture fully any cycles between Census years, we further explore Florida GOM employment trends from 1990 to 2000.

In 2000, the REIS data show that the Sarasota LMA is diversified across all industry sectors, with the service sector employing the majority of workers (42%) (Table 1). Government and manufacturing employment is about one-half the national figure of 14 percent. Nevertheless, the Sarasota LMA's manufacturing industry grew by 18 percent and added 4,000 new jobs between 1990 and 2000. By 2000, that industry employed more than 20,000 workers. The agricultural industry also experienced growth between 1990 and 2000, increasing by 93 percent and adding 7,000 new jobs (Hodges et al., 2001).

Table 1

Employment by Sector, Sarasota LMA: 2000

Industry	Percent
Agriculture	3.6
Mining	0.2
Construction	6.1
Manufacturing	5.8
Transportation/Public Utilities	2.1
Wholesale Trade	2.6
Retail Trade	17.5
Finances, Insurance & Real Estate	8.0
Services	41.1
Government	7.9

Source: U.S. Census Bureau, 2000b.

Phase III: Recession Analysis. Since 1970, the United States' economy has experienced several recessions: following the oil embargo and the energy crises (1973-1976); following the high interest rates that followed rapid inflation growth (1980-1982); and (1989-1992) (Heilbroner and Milberg, 1999; Mencken and Singelmann, 1998). According to ecological theory, recessions represent a contraction in resources for, or inputs into, local economies (see Kasarda and Irwin, 1991; Mencken and Singelmann, 1998; Singelmann et al., 1993; and Hawley, 1986)

To test the effects of business cycle recessions on the Sarasota LMA economy since 1970, we examined the annual trends in employment. The total annual employment figures for the Sarasota LMA, combined with three-year employment moving averages, reveal remarkable growth patterns (Figure 3). In almost every year the actual employment levels were greater than expected, based on the employment levels in the previous three years. There was one exception: 1974-1975. That was a recession period, but even the expected employment levels never exceeded the observed employment levels.

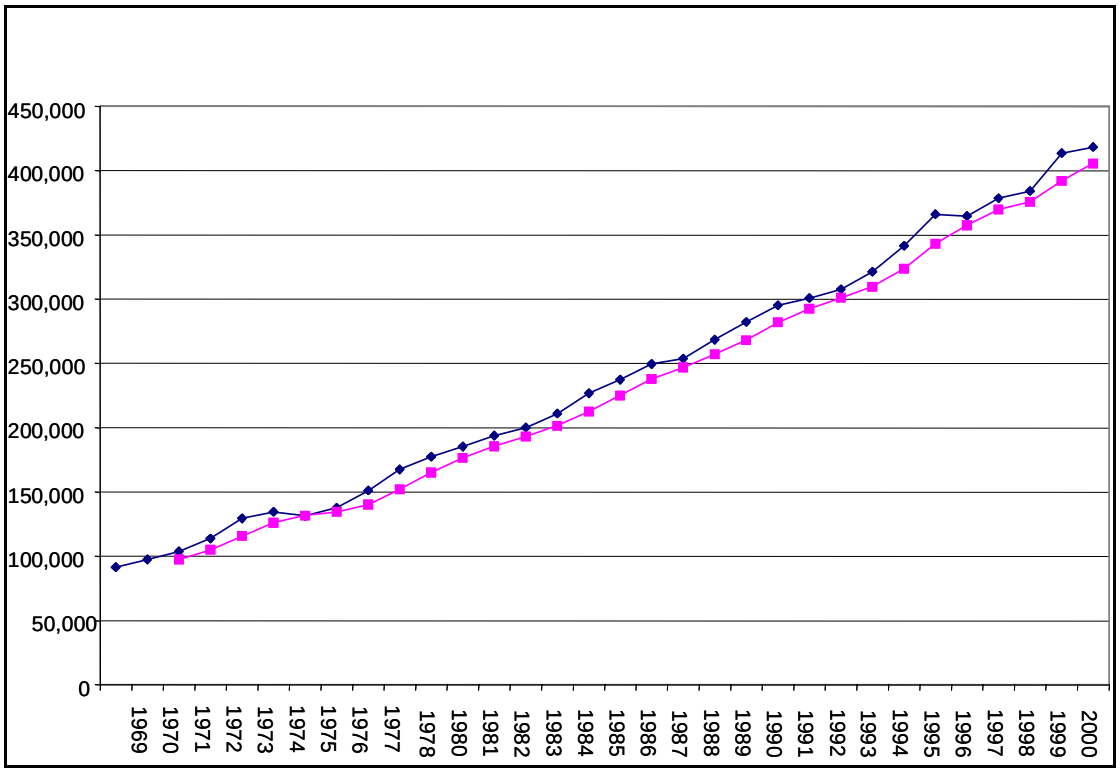


Figure 3. Total Employment and Three-year Moving Averages, Sarasota LMA: 1969-2000 (U.S. Dept. of Commerce, Bureau of Economic Analysis, 2000).

In a systems approach to local economic organization, one issue that is particularly important is the impact of "shocks" on a social system. Slow, gradual growth and/or decline are not as problematic for a social system as are shocks. Shocks come when systems experience unanticipated growth (such as "boomtowns") or decline. Gradual growth and/or decline allow equilibrium-seeking social systems to absorb the changes, to reallocate and redistribute resources and population. Shocks, on the other hand, create disruptions in a social system. These disruptions can manifest in a number of local fiscal and social problems.

In order to understand the benefits and burdens of certain industries to a system, it is important to know the timing of the industry shocks. In our analysis, we employed a moving average forecasting model to locate the years that the shocks occur in the Sarasota LMA. The forecasting procedure includes the following. First, three-year moving averages (current plus previous two years) of employment levels are computed. Second, at each year the expected value (three-year moving average) is subtracted from the observed value. Each of these deviations is squared to provide the forecasting error for each year. These squared deviations are summed and averaged across all years in the analysis to compute a mean squared error (MSE). We establish a "shock" for any given year in which the squared deviation for that year is greater than or equal to two times the mean squared error for the industry sector in question (Anderson et al., 1990).

These data show that, since 1970, employment growth rates were highest in the mid-1990s, a period of national economic expansion. Also, the forecasting analysis fails to detect significant drop-offs in employment during any of the recession periods over the period in question. We maintain that the highly diversified and generally large nature of the Sarasota

LMA economy makes it relatively recession proof (despite a presence of agricultural employment), at least to the point where one would expect significant downturns in employment (Figure 4).

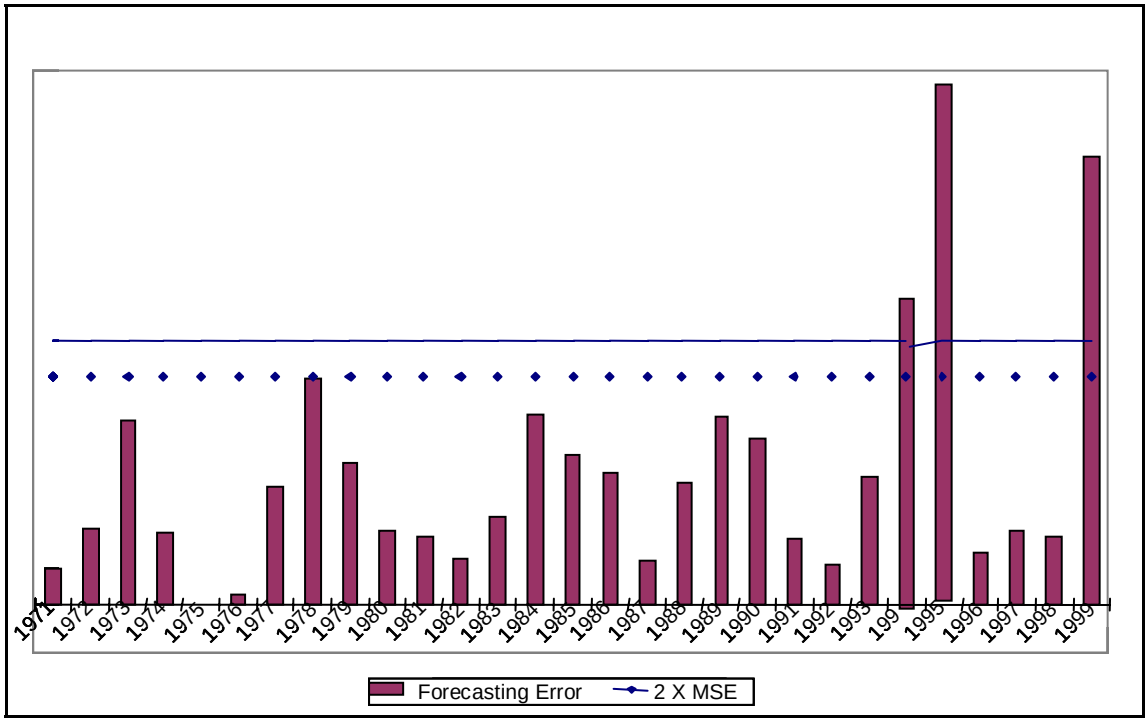


Figure 4. Employment Forecasting Analysis, Sarasota LMA: 1971-1999.

Phase IV: Socio-Demographic Analysis. Sarasota was one of the fastest growing LMAs in the nation between 1950 and 2000. Between 1970 and 1980, its population grew at 65 percent; during the 1980s, it grew 45 percent. Growth rates of this magnitude indicate extensive immigration into the LMA. Yet despite immigration, Sarasota is one of the least ethnically diverse LMAs in the southern region of Florida. In 2000, 86 percent of the total population was white; Blacks and Hispanics represent only about 6 percent, or half of the national rate of 12 percent (Tables 2-5).

Table 2

Population by County, Sarasota LMA: 1940-2000

County	1940	1950	1960	1970	1980	1990	2000
Charlotte	3,663	4,286	12,594	27,559	58,460	110,975	141,627
DeSoto	7,792	9,242	11,683	13,060	19,039	23,865	32,209
Manatee	26,098	34,704	69,168	97,115	148,442	211,707	264,002
Sarasota	16,106	28,827	76,895	120,413	202,251	277,776	325,957
LMA Total	53,659	77,059	170,340	258,147	428,192	624,323	763,795

Source: U.S. Census Bureau, 2000b.

Table 3

Percent of White Population, Sarasota LMA: 1940-2000

County	1940	1950	1960	1970	1980	1990	2000
Charlotte	81.6	84.3	94.2	97.0	97.2	94.9	90.4
DeSoto	79.5	78.3	78.2	79.5	79.1	80.1	62.6
Manatee	73.6	77.1	84.8	88.0	89.8	89.8	80.5
Sarasota	77.7	84.0	90.2	93.1	94.0	94.6	89.7
LMA %	76.2	80.3	87.5	90.9	92.3	92.5	85.4
LMA Total	40,923	61,858	149,080	234,790	395,346	577,663	653,034

Source: U.S. Census Bureau, 2000b.

Table 4

Percent of Black Population, Sarasota LMA: 1940-2000

County	1940	1950	1960	1970	1980	1990	2000
Charlotte	18.3	15.4	5.7	2.7	1.8	3.7	4.2
DeSoto	20.4	21.6	21.6	20.0	18.7	15.7	12.5
Manatee	26.4	22.7	15.1	11.7	9.0	7.8	8.0
Sarasota	22.2	15.9	9.3	6.7	5.1	4.3	4.0
LMA %	23.7	19.6	12.4	8.8	6.6	5.8	5.8
LMA Total	12,725	15,163	21,113	22,873	28,382	36,307	44,413

Source: U.S. Census Bureau, 2000b.

Table 5

Percent of Hispanic Population*, Sarasota LMA: 1970-2000

County	1970	1980	1990	2000
Charlotte	1.6	1.2	2.1	3.3
DeSoto	1.3	3.0	8.0	25.0
Manatee	1.4	2.1	4.4	9.3
Sarasota	1.6	1.4	2.1	4.3
LMA %	1.5	1.7	3.1	6.7
LMA Total	3,855	7,352	19,502	51,368

* County-level Census data for Hispanic populations are not available prior to 1970.
Source: U.S. Census Bureau, 2000b.

Retirement Age Population. The State of Florida has a large retirement age population. In some counties, the percent of the population 65 and older exceeds the national rate of 12 percent by more than 200 percent. Sarasota is a retirement age-intensive LMAs. In 2000, 30 percent of its population was over the age of 65 (Table 6). Moreover, within the LMA, there was

little variation in these numbers. Each county had higher percentages of retirement age population than existed at the state level. This high rate of retirement age population extends back to 1960. Part of the great in-migration to the Sarasota LMA has been among predominantly Caucasian retirement age persons.

Table 6

Percent of Population Over 65, Sarasota LMA: 1950-2000

County	1950	1960	1970	1980	1990	2000
Charlotte	14.7	20.8	35.0	33.9	33.8	34.7
DeSoto	10.3	14.8	15.7	16.1	19.3	19.4
Manatee	13.6	21.9	30.3	27.0	28.0	24.9
Sarasota	11.9	18.3	28.6	30.0	32.2	31.4
LMA Total	12.6	19.7	29.7	28.9	30.6	29.3

Source: U.S. Census Bureau, 2000b.

Education. The number of college educated persons within this LMA matches the national trends for most Census years. In 2000, 24 percent of the adults in Sarasota LMA had a college degree, as did the U.S. population. Moreover, in 2000, 83 percent of the adult population had graduated from high school (Table 7). The data for education show that Sarasota LMA is on par with national attainment trends, and is even slightly higher than other LMAs in the Gulf of Mexico region.

Table 7

Adult Educational Attainment (age 25+), Sarasota LMA: 1970-2000

County	0-8 Years	Some High School	High School Diploma	Some College, No Degree	BA/BS or More	Total
1970						
Charlotte	26.3%	20.7%	32.9%	11.3%	8.8%	21,152
DeSoto	42.5%	21.5%	24.6%	6.4%	4.8%	7,923
Manatee	28.1%	19.2%	30.5%	12.4%	9.6%	67,482
Sarasota	19.6%	16.5%	34.0%	15.5%	14.2%	85,551
LMA Total	24.5%	18.2%	32.2%	13.5%	11.4%	182,108
1980						
Charlotte	15.3%	17.9%	38.3%	15.6%	12.7%	45,574
DeSoto	27.4%	22.0%	33.1%	9.3%	8.2%	11,517
Manatee	16.5%	16.9%	38.0%	16.0%	12.4%	104,102
Sarasota	12.5%	14.0%	36.7%	18.9%	17.7%	150,154
LMA Total	14.8%	15.9%	37.2%	17.1%	14.8%	311,347

Table 7

Adult Educational Attainment (age 25+), Sarasota LMA: 1970-2000 (continued)

1990						
Charlotte	7.0%	17.2%	37.9%	18.7%	13.4%	87,427
DeSoto	18.8%	26.7%	30.7%	12.4%	7.5%	16,171
Manatee	8.1%	16.3%	34.6%	19.4%	15.4%	156,377
Sarasota	5.6 %	13.1%	31.7%	21.2%	21.9%	217,375
LMA Total	7.1%	15.3%	33.8%	19.9%	17.8%	477,310
2000						
Charlotte	4.1%	13.7%	35.6%	28.9%	17.5%	113,071
DeSoto	19.9%	17.0%	35.3%	19.8%	8.4%	21,222
Manatee	5.6%	12.9%	31.9%	28.7%	20.7%	192,789
Sarasota	3.3%	9.5%	30.1%	29.5%	27.4%	256,802
LMA Total	5.2%	12.7%	34.6%	22.9%	24.5%	539,242

Source: U.S. Census Bureau, 2000b.

Finances. The retirement age population may have extensive implications for local government finances, particularly since the vast majority of local government revenues are for school funding. The local government finance data for Sarasota are very similar to the levels of per capita revenues and debts as Tampa Bay-St. Petersburg (Tables 8-11). For example, in 1997, per capita revenues in Sarasota LMA were $2,943. In Tampa Bay-St. Petersburg the corresponding figure was $2,818. There is also very little fluctuation over time. The retirement concentration effect predicted by some (Johnson et al., 1995) is not found in these data.

Table 8

Total Revenue, Per Capita (in 1997 adjusted dollars), Sarasota LMA: 1972-1997

County	1972	1977	1982	1987	1992	1997
Charlotte	$1,130	$1,378	$1,335	$1,594	$1,978	$2,248
DeSoto	$1,379	$2,156	$1,895	$2,046	$2,067	$2,176
Manatee	$1,676	$2,232	$2,211	$2,451	$2,340	$2,376
Sarasota	$1,755	$1,890	$1,857	$2,415	$2,978	$3,524
LMA Total	$1,638	$1,959	$1,906	$2,277	$2,543	$2,943

Source: U.S. Census Bureau, 2000a.

Table 9

Total State Revenue, Per Capita (in 1997 adjusted dollars), Sarasota LMA: 1972-1997

County	1972	1977	1982	1987	1992	1997
Charlotte	$496	$279	$308	$316	$377	$400
DeSoto	$599	$1,190	$735	$1,118	$1,045	$1,021
Manatee	$544	$586	$578	$604	$604	$689
Sarasota	$337	$376	$299	$385	$389	$364
LMA Total	$443	$477	$415	$477	$484	$505

Source: U.S. Census Bureau, 2000a.

Table 10

Total Tax Revenue, Per Capita (in 1997 adjusted dollars), Sarasota LMA: 1972-1997

County	1972	1977	1982	1987	1992	1997
Charlotte	$455	$735	$624	$703	$950	$1,008
DeSoto	$404	$435	$388	$467	$591	$606
Manatee	$480	$525	$565	$763	$895	$959
Sarasota	$687	$697	$625	$846	$1,023	$1,108
LMA Total	$572	$629	$606	$779	$950	$1,020

Source: U.S. Census Bureau, 2000a.

Table 11

Total Debt, Per Capita (in 1997 adjusted dollars), Sarasota LMA: 1972-1997

County	1972	1977	1982	1987	1992	1997
Charlotte	$1,620	$912	$444	$1,697	$2,380	$2,800
DeSoto	$769	$971	$717	$483	$237	$346
Manatee	$1,846	$2,185	$2,522	$5,299	$3,335	$2,820
Sarasota	$1,298	$869	$901	$2,335	$2,787	$2,886
LMA Total	$1,507	$1,346	$1,389	$3,165	$2,801	$2,754

Source: U.S. Census Bureau, 2000a.

12. Ft. Myers, Florida: Labor Market Area

a. Introduction

This analysis examines historical and current industry and socio-demographic patterns in the Ft. Myers LMA. The analysis is divided into several phases. Phase I provides a general overview of broad (single-digit) industry patterns in this LMA from 1940 to 1990 for decennial census years using Census data. Phase II shows employment patterns in broad (single-digit) industry categories for all years between 1969 and 2000 using REIS data from the Bureau of Economic Analysis. Phase III examines the impact of economic recessions on employment levels during the last 30 years. Phase IV is a socio-demographic analysis of the LMA.

b. Setting

The Ft. Myers LMA is south of the Tampa Bay-St. Petersburg and Sarasota LMAs along the Florida Gulf of Mexico. The Ft. Myers LMA contains Collier and Lee Counties (Map 24). Over 625,000 people resided in the LMA in 2000. Lee was the largest county, with over 400,000 residents. The racial composition of the LMA is largely Caucasian (79% in 2000). However, there are more than twice as many Hispanics (13%) as African-Americans (5%) in 2000. During the 1990s the population of the LMA grew by more than 40 percent, vastly exceeding the national growth rate of 9 percent.

c. Unit of Analysis

Labor Market Areas (LMAs) are the geographical units of analysis in this report. Labor Market Areas are defined by patterns of transportation to and from work within and across county boundaries. Labor Market Areas better represent local social systems and, empirically, local economies (Killian and Tolbert, 1993).

Phase I: General Historical Industry Trends. The following section explores general historical industry trends for the Ft. Myers LMA (Figure 1). These data are analyzed both cross-sectionally and longitudinally in order to gain a more complete understanding of both the structure of and the resulting changes to the Ft. Myers LMA's primary industries over time.

Year 1940. In 1940, only 6,700 people were employed in the Ft. Myers LMA. Agriculture (22%) was the dominant non-service sectors, followed by manufacturing (17%). Wholesale/retail trade, and services accounted for 45 percent of employment in the Ft. Myers LMA. The mining sector employed four workers in 1940.

Year 1950. Between 1940 and 1950, total employment in the Ft. Myers LMA grew by 43 percent, with 9,600 employed in 1950. Agriculture employment levels grew by 29 percent, but the relative share of employment in this sector declined to 34 percent. Several sectors had very high growth rates, including construction (99%) and wholesale/retail trade (68%). Agriculture was the dominant non-service/trade industry with 21 percent of total employment. The combined share of total employment for services and wholesale/retail trade was 57 percent in 1950.

Map 24. Ft. Myers, Florida Labor Market Area.

Year 1960. Between 1950 and 1960, total employment grew by 154 percent, with roughly 24,000 workers employed in 1960. Agricultural employment levels increased by 79 percent, but relative shares of total employment fell further to 15 percent. Services (309%), transportation/public utilities (121% growth), and construction (233%) were three major growth categories, with a combined net increase of almost 9,000 jobs. By 1960, services and wholesale/retail trade sectors employed 56 percent of the Ft. Myers LMA workforce.

Year 1970. Total employment in the Ft. Myers LMA grew by 103 percent between 1960 and 1970, employing 50,000 people in 1970. Agricultural employment increased by 10 percent, but the relative share of total employment fell to 8 percent. Growth was substantial in a number of sectors: services (144%), construction (109%), transportation/public utilities (131%), and wholesale/retail trade (120%) all experienced significant job increases. By 1970, 63 percent of all employment in the Ft. Myers LMA was concentrated in services and wholesale/retail trade.

Year 1980. Total employment grew by 127 percent between 1970 and 1980, employing some 113,000 workers in 1980. Manufacturing (183%), transportation/public utilities (113%), services (134%), and construction (105%) all experienced tremendous growth rates. Eight thousand jobs were added in construction, and 27,000 jobs were added in the service sector. In 1980, over 5 percent of the Ft. Myers LMA's total work force was employed in agriculture, making it one of the most agricultural intensive LMAs in Florida. Services and wholesale/retail trade combined to employ almost 70,000 workers in 1980, or 67 percent of the labor force.

Year 1990. The Ft. Myers LMA experienced an 87 percent increase in employment between 1980 and 1990, employing nearly 200,000 workers in 1990. Services and wholesale/retail trade combined to add 70,000 new jobs. By 1990, manufacturing employed over 12,000 workers, and the construction industry employed over 25,000. In addition, in 1990, agriculture employed 5 percent of the total labor force in Ft. Myers LMA, while services or wholesale/retail trade employed 70 percent.

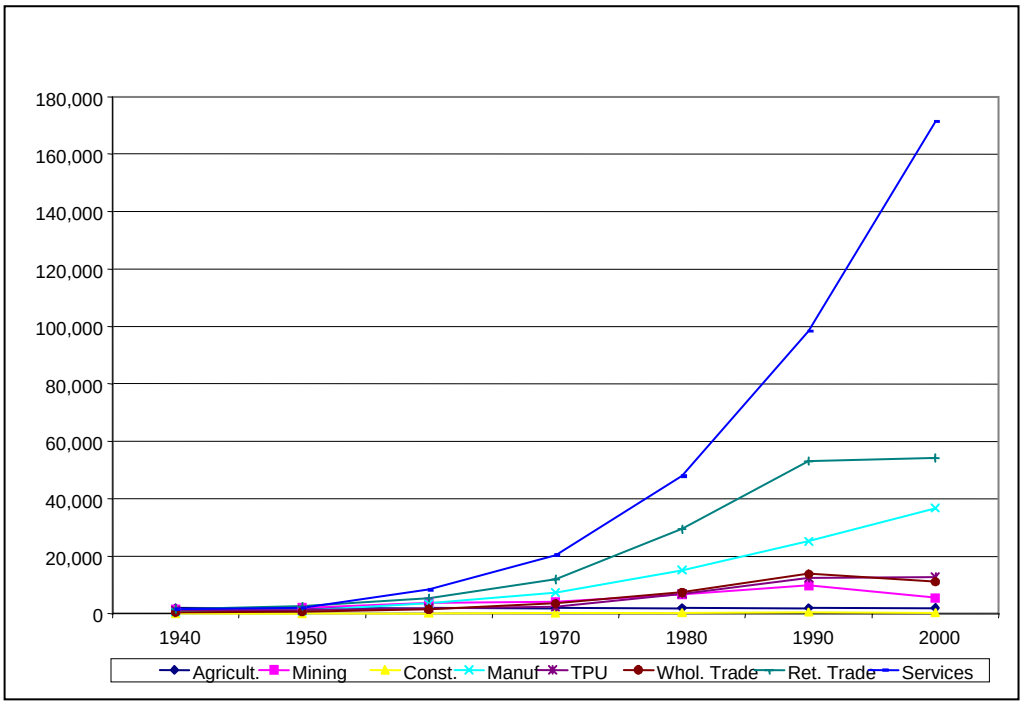


Figure 1. Major Industry Employment, Ft. Myers LMA: 1940-2000 (U.S. Census Bureau, 2000b).

Phase II: Recent Industry Analysis. In 2000, the REIS data show that the Ft. Myers LMA is less diversified across all industry sectors than either the Sarasota or Tampa Bay-St. Petersburg LMAs. While there are comparatively fewer workers employed in services (33%) in Ft. Myers than other LMAs, the representation of employment in other key industry sectors, particularly manufacturing (3%) make the LMA more dependent upon services and related industries (retail trade, finance, insurance and real estate). Manufacturing employment is relatively new to the Ft. Myers LMA, which accounts for the 22 percent growth (2,000 new manufacturing jobs) the region experienced during the 1990s (Figure 2).

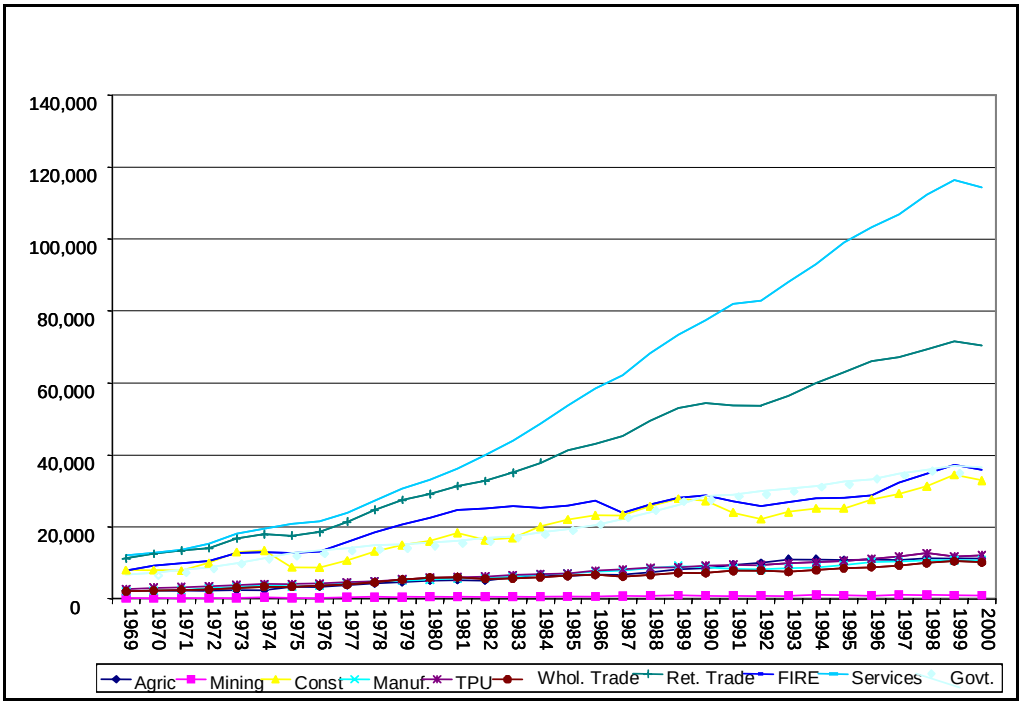


Figure 2. Annual Employment, Ft. Myers LMA: 1969-2000 (U.S. Dept. of Commerce, Bureau of Economic Analysis, 2000).

Agriculture employment expanded in the Ft. Myers LMA. In 2000, agriculture employed slightly more of the labor market than did manufacturing (Table 1).

Table 1

Employment by Sector, Ft. Myers LMA: 2000

Industry	Percent
Agriculture	3.2
Mining	0.3
Construction	9.4
Manufacturing	3.1
Transportation/Public Utilities	3.5
Wholesale Trade	2.9
Retail Trade	20.2
Finances, Insurance & Real Estate	10.3
Services	32.9
Government	10.5

Source: U.S. Census Bureau, 2000b.

Phase III: Recession Analysis. The total annual total employment figures for the Ft. Myers LMA, combined with three-year employment moving averages, show remarkable growth patterns (Figure 3). In almost every year the actual employment levels were greater than expected, based on the employment levels in the previous three years. There are two exceptions: 1974-1975 and 1991-1992. These are recession periods, but even the expected employment levels never exceeded the observed employment levels. Moreover, we fail to see declines in actual employment that are present in other Gulf of Mexico LMAs, and in Louisiana's oil and natural gas regions.

In a systems approach to local economic organization, one issue of particular importance is the impact of "shocks" on a social system. Slow, gradual growth and/or decline are not as problematic for a social system as are shocks. Shocks come when systems experience unanticipated growth (such as "boomtowns") or decline. Gradual growth and/or decline allow equilibrium-seeking social systems to absorb the changes, to reallocate and redistribute resources and population. Shocks, on the other hand, create disruptions in a social system. These disruptions can manifest in a number of local fiscal and social problems.

In order to understand the benefits and burdens of certain industries to a system, it is important to know the timing of the industry shocks. In our analysis, we employed a moving average forecasting model to locate the years that the shocks occur in the Ft. Myers LMA. The forecasting procedure includes the following. First, three-year moving averages (current plus previous two years) of employment levels are computed. Second, at each year the expected value (three-year moving average) is subtracted from the observed value. Each of these deviations is squared to provide the forecasting error for each year. These squared deviations are summed and averaged across all years in the analysis to compute a mean squared error (MSE). We establish a "shock" for any given year in which the squared deviation for that year is greater than or equal to two times the mean squared error for the industry sector in question (Anderson et al., 1990).

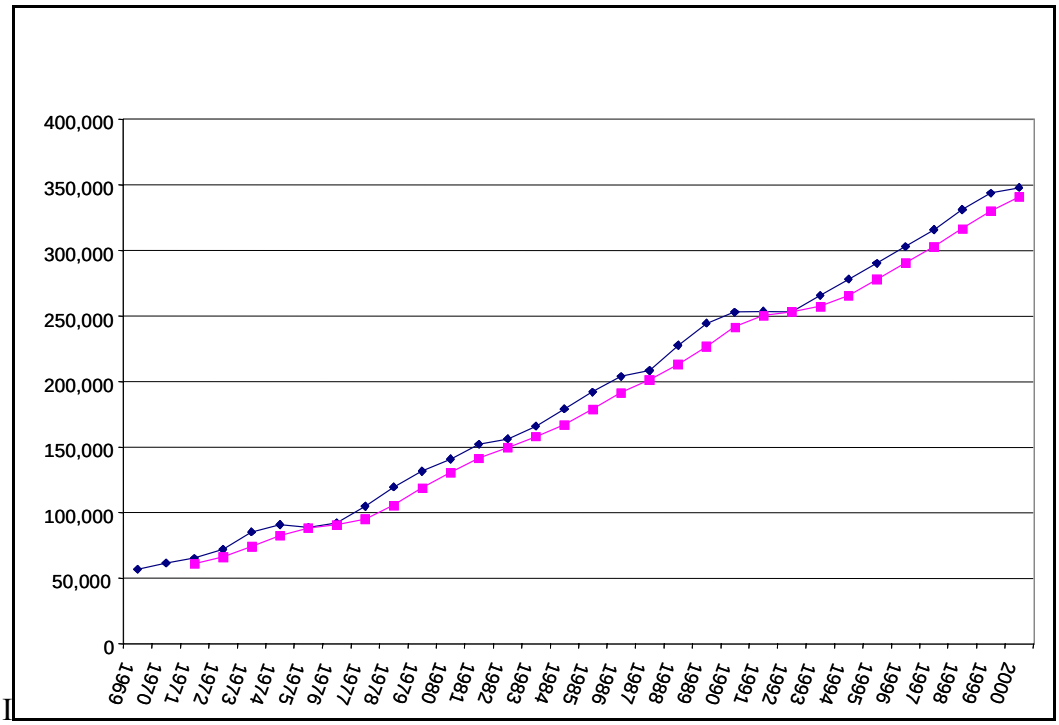


Figure 3. Total Employment and Three-year Moving Averages, Ft. Myers LMA: 1969-2000 (U.S. Dept. of Commerce, Bureau of Economic Analysis, 2000).

These data show that, between 1970 and 2000, employment growth rates were highest in the late 1980s, at the end of a national economic expansion. Also, the forecasting analysis fails to detect significant drop-offs in employment during any of the recession periods over the period in question. We maintain that the highly diversified and generally large nature of the Ft. Myers LMA make the economy relatively recession proof (despite a presence of agricultural employment), at least to the point where one would expect significant downturns in employment.

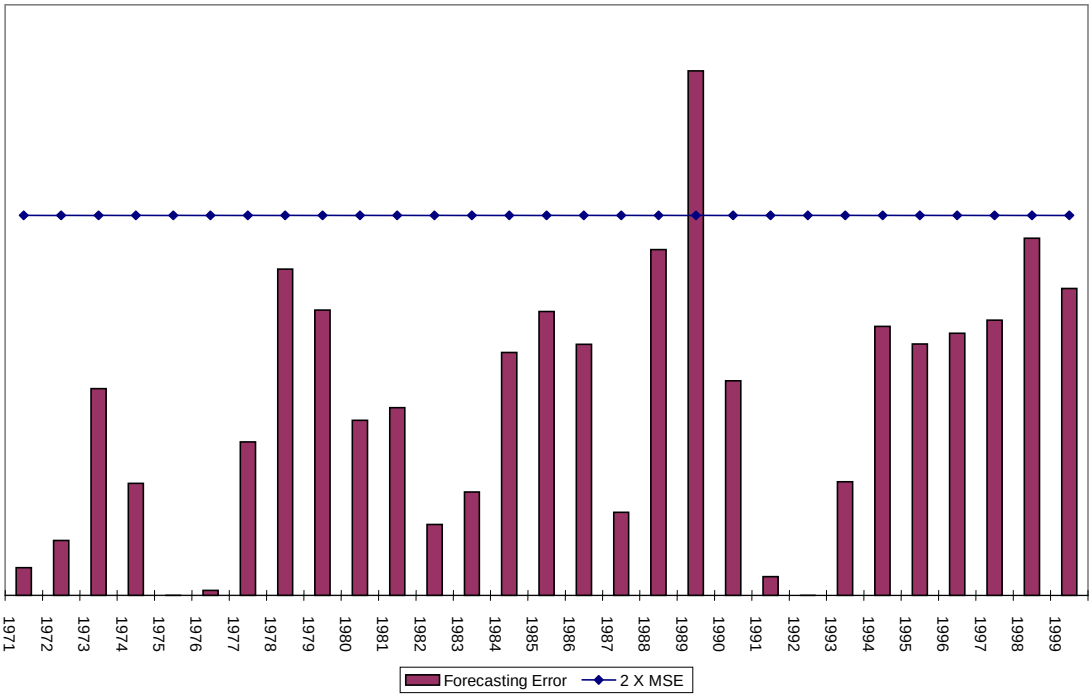


Figure 4. Employment Forecasting Analysis, Ft. Myers LMA: 1971-1999.

Phase IV: Socio-Demographic Analysis. The population data show that Ft. Myers was one of the fastest growing LMAs in the nation since 1950 (Tables 2-5). Between 1970 and 1980, population grew 103 percent, and, between 1980 and 1990, it grew 67 percent. During the 1990s, the growth rate was four times the national growth rate. Large growth rates imply extensive in-migration.

In 2000, Caucasians accounted for almost 80 percent of the total Ft. Myers population, while African-Americans represented about 6 percent, or half of the national rate. In this same year, Hispanics comprised 13 percent of the LMA population. The data in Table 5 show that the Hispanic population increased significantly from 1970 to 2000, suggesting that a portion of the population growth documented in Table 2 came from this group.

Table 2

Population by County, Ft. Myers LMA: 1940-2000

County	1940	1950	1960	1970	1980	1990	2000
Collier	5,102	6,488	15,753	38,040	85,971	152,099	251,377
Lee	17,488	23,404	54,539	105,216	205,266	335,113	440,888
LMA Total	22,590	29,892	70,292	143,256	291,237	487,212	692,265

Source: U.S. Census Bureau, 2000b.

Table 3

Percent of White Population, Ft. Myers LMA: 1940-2000

County	1940	1950	1960	1970	1980	1990	2000
Collier	64.2	69.4	84.4	91.4	87.8	91.5	73.8
Lee	77.3	79.9	84.2	88.3	90.5	91.3	81.9
LMA %	74.4	77.6	84.3	89.1	89.7	91.3	79.0
LMA Total	16,809	23,212	59,259	127,691	261,422	445,178	546,956

Source: U.S. Census Bureau, 2000b.

Table 4

Percent of Black Population, Ft. Myers LMA: 1940-2000

County	1940	1950	1960	1970	1980	1990	2000
Collier	31.9	27.9	14.7	8.3	5.1	4.5	4.3
Lee	22.6	25.0	15.6	11.5	7.9	6.5	6.3
LMA %	24.7	21.7	15.3	10.7	7.1	5.9	5.6
LMA Total	5,584	6,500	10,820	15,329	20,712	28,969	39,019

Source: U.S. Census Bureau, 2000b.

Table 5

Percent of Hispanic Population, Ft. Myers LMA: 1970-2000

County	1970	1980	1990	2000
Collier	9.6	10.7	13.2	19.6
Lee	2.1	2.8	4.4	9.5
LMA %	4.1	5.2	7.2	13.2
LMA Total	5,889	15,111	35,000	91,338

*County-level Census data for Hispanic populations are not available prior to 1970.

Source: U.S. Census Bureau, 2000b.

Retirement Age Population. The Ft. Myers LMA is a retirement age intensive LMA. In 2000, 25 percent of the population in the Ft. Myers LMA was over the age of 65 (twice the national rate), and both Lee and Collier Counties had higher than average percentages of retirement age population (Table 6). The Ft. Myers LMA has experienced a high rate of in-migration of retirement age populations since 1970. The extensive retirement age population could have important implications for local government finances, particularly since the vast majority of local government revenues go toward school funding.

Table 6

Percent of Population Over 65, Ft. Myers LMA: 1950-2000

County	1950	1960	1970	1980	1990	2000
Collier	5	8	14	19	16	24
Lee	10	13	19	22	25	25
LMA Total	9	12	17	21	22	25

Source: U.S. Census Bureau, 2000b.

Education. Table 7 shows the educational attainment data for the Ft. Myers LMA. These data show that the figures for persons with some college or more within the Ft. Myers LMA match the national trends for most Census years. In 2000, 24 percent of the adults in the Ft. Myers LMA held college degrees; the same percentage as the U.S. population. Moreover, in 2000, high school graduates equaled 82 percent of the adult population; this percentage is slightly higher than is found in the other LMAs in this region.

Table 7

Educational Attainment of Adults (age 25+), Ft. Myers LMA: 1970-2000

County	0-8 Years	Some High School	High School Diploma	Some College, No Degree	BA/BS or More
1970					
Collier	25.3%	16.3%	30.3%	12.6%	15.5%
Lee	25.6%	20.3%	32.1%	12.0%	10.0%
LMA Total	25.5%	19.3%	31.6%	12.2%	11.3%
1980					
Collier	14.9%	13.9%	35.5%	17.2%	18.4%
Lee	15.4%	17.3%	37.6%	13.3%	13.3%
LMA Total	15.2%	16.3%	37.0%	16.6%	14.8%
1990					
Collier	8.0%	12.6%	30.1%	26.5%	22.3%
Lee	7.1%	15.9%	33.8%	26.7%	16.4%
LMA Total	7.5%	14.9%	32.6%	26.6%	18.3%
2000					
Collier	8.0%	10.0%	26.2%	27.6%	27.9%
Lee	5.0%	12.7%	32.5%	28.6%	21.1%
LMA Total	6.1%	11.8%	30.2%	28.2%	23.5%

Source: U.S. Census Bureau, 2000b.

Finances. The local government finances data show slightly higher levels of per capita revenues and debts than the Tampa Bay-St. Petersburg and Sarasota LMAs (Table 8-11). For example, the 1997 per capita revenues were $2,943 and $2,818 in the Sarasota and Tampa Bay-St. Petersburg LMAs, respectively. However, in the Ft. Myers LMA the rate was $3,740 per capita, with local government at $4,500 per capita. These debts had been increasing steadily since 1987. The rapid growth in the Ft. Myers LMA appears to have put more strain on its local government finances than it did on the local government of other nearby LMAs.

Table 8

Total Revenue, Per Capita (in 1997 adjusted dollars),
Ft. Myers LMA: 1972-1997

County	1972	1977	1982	1987	1992	1997
Collier	$1,709	$2,063	$1,974	$2,279	$2,576	$2,905
Lee	$1,486	$2,102	$2,130	$2,477	$3,154	$4,153
LMA Total	$1,548	$2,091	$2,091	$2,416	$2,970	$3,740

Source: U.S. Census Bureau, 2000a.

Table 9

Total State Revenue, Per Capita (in 1997 adjusted dollars),
Ft. Myers LMA: 1972-1997

County	1972	1977	1982	1987	1992	1997
Collier	$483	$516	$440	$371	$406	$454
Lee	$448	$553	$450	$492	$505	$599
LMA Total	$458	$542	$447	$455	$474	$551

Source: U.S. Census Bureau, 2000a.

Table 10

Total Tax Revenue, Per Capita (in 1997 adjusted dollars),
Ft. Myers LMA: 1972-1997

County	1972	1977	1982	1987	1992	1997
Collier	$908	$1,091	$960	$1,136	$1,456	$1,517
Lee	$545	$620	$711	$885	$1,153	$1,206
LMA Total	$645	$754	$787	$961	$1,250	$1,309

Source: U.S. Census Bureau, 2000a.

Table 11

Total Debt, Per Capita (in 1997 adjusted dollars),
Ft. Myers LMA: 1972-1997

County	1972	1977	1982	1987	1992	1997
Collier	$755	$1,585	$190	$5,407	$2,610	$2,973
Lee	$1,263	$936	$2,256	$3,274	$5,049	$5,348
LMA Total	$1,122	$1,121	$1,629	$3,927	$4,271	$4,561

Source: U.S. Census Bureau, 2000a.

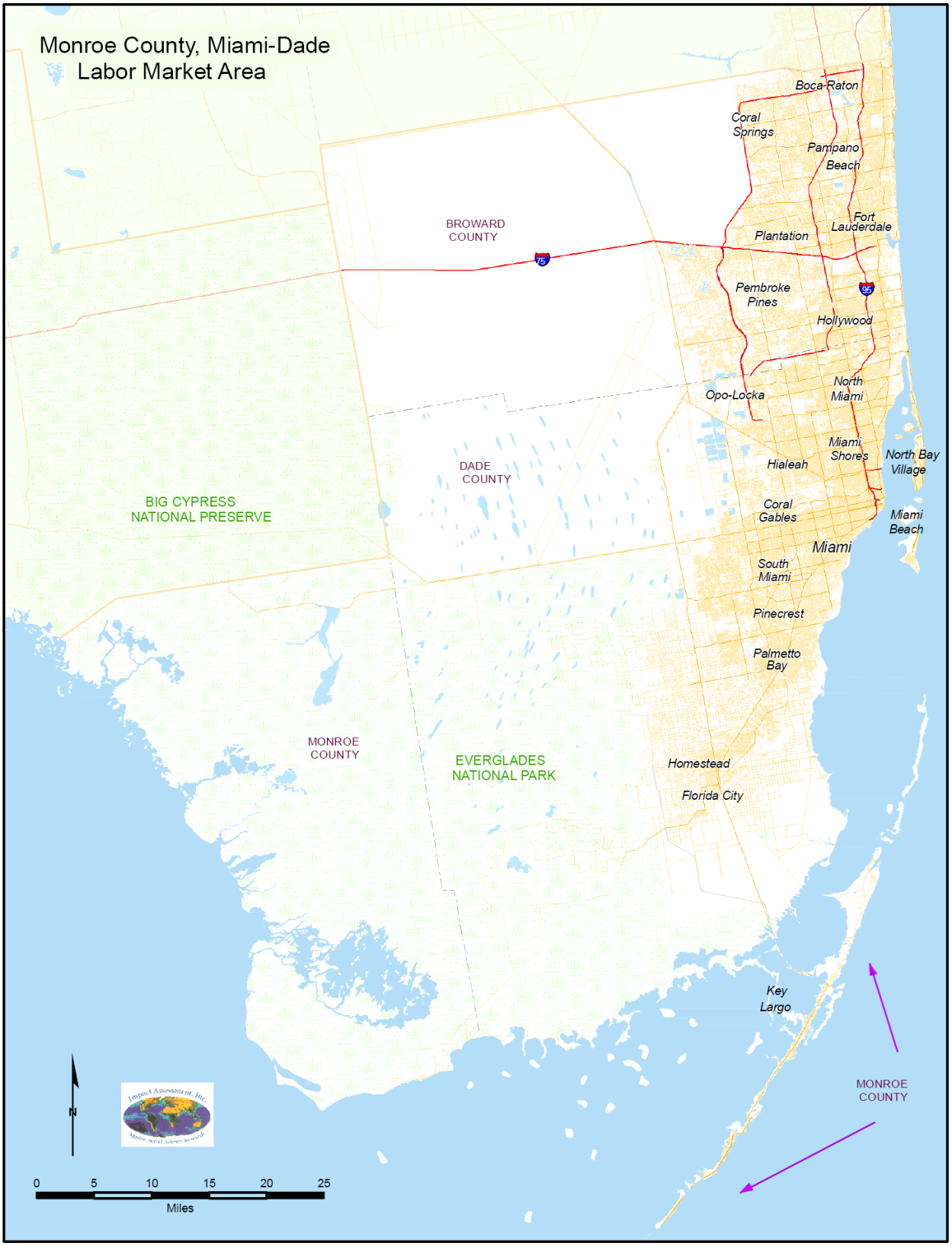
13. Monroe County, Florida: Miami-Dade Labor Market Area

a. Introduction

This analysis examines historical and current industry and socio-demographic patterns in Monroe County, which is part of the Miami-Dade LMA. The analysis is divided into two phases. Phase I shows employment patterns in broad (single-digit) industry categories for all years between 1969 and 2000 using REIS data from the Bureau of Economic Analysis. Phase II is a socio-demographic analysis of the LMA. We examine this county instead of the LMA, because Monroe County is on the Gulf of Mexico (the others in the LMA are not). Moreover, because Monroe County comprised only 2 percent of the Miami-Dade LMA in 2000, any trends in that county will be absorbed by the effects in Miami-Dade and Broward Counties (the combined populations of which were over 3 million in 2000). Therefore, unlike for the previous LMA analyses, we do not explore historical trends, nor perform forecasting analyses. For this particular region, employment data was extrapolated for several years because it was not fully available for all industry sectors. Therefore, we present very general trends and avoid making specific statements about employment levels within this county.

b. Setting

The Miami-Dade LMA is comprised of Monroe, Broward, and Miami-Dade Counties (Map 25). Only Monroe County is located on the Gulf. Almost four million people resided in this LMA in 2000. The largest county, Miami-Dade, had a year 2000 population of roughly two million residents; Broward County had over one million people. In contrast, Monroe County had only 80,000 residents in 2000. The racial composition of Monroe County is largely Caucasian (77% in 2000). That composition reflects a decrease of 14 percent since 1990, when Caucasians accounted for 91 percent of the county population. This decrease may be due to the expanded Hispanic category in the Decennial Census. In 1990, there were slightly over 9,000 Hispanics in Monroe County; by 2000, there were over 15,000. During the 1990s, Monroe County's population grew by only 2 percent, slightly over 1,000 people.



Map 25. Monroe County, Florida Miami-Dade Labor Market Area.

c. Unit of Analysis

Labor Market Areas (LMAs) are the geographical units of analysis in this report. Labor Market Areas are defined by patterns of transportation to and from work within and across county boundaries. Labor Market Areas better represent local social systems and, empirically, local economies (Killian and Tolbert, 1993).

Phase I: General Historical Industry Trends. The following section explores general historical industry trends for Monroe County (Figure 1). These data are analyzed both cross-sectionally and longitudinally in order to gain a more complete understanding of both the structure of and the resulting changes to the primary industries in Monroe County over time.

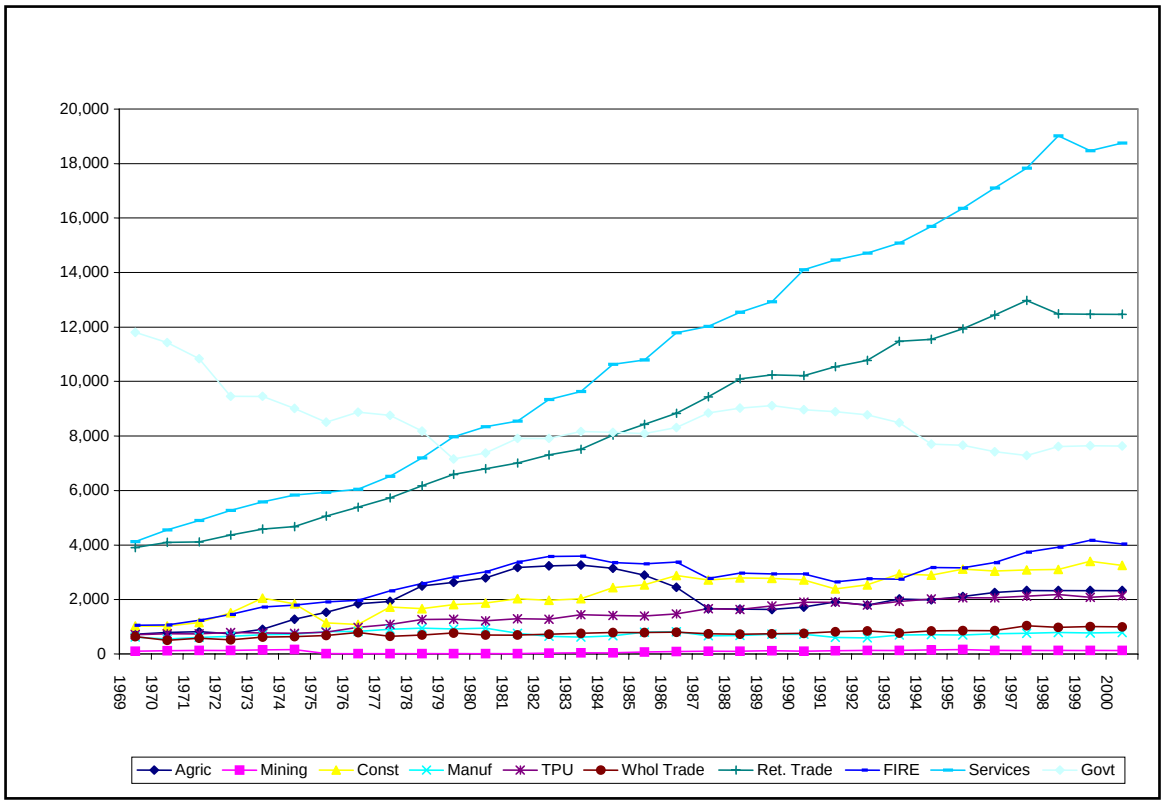


Figure 1. Annual Employment, Monroe County: 1969-2000 (U.S. Dept. of Commerce, Bureau of Economic Analysis, 2000).

According to REIS data for the year 2000, the Miami-Dade LMA's economy is very concentrated in services (36%) and retail trade (24%). Government employment is on par with the national figure of 14 percent. Agriculture had a high level of employment concentration (over 4%) (Table 1). This could represent employment in both the citrus and the sugar cane industry. Monroe County's economy is largely tourist-based.

Table 1

Employment by Sector, Monroe County: 2000

Industry	Percent
Agriculture	4.4
Mining	0.3
Construction	6.2
Manufacturing	1.5
Transportation/Public Utilities	4.0
Wholesale Trade	1.9
Retail Trade	23.8
Finances, Insurance & Real Estate	7.7
Services	35.7
Government	14.5

Source: U.S. Census Bureau, 2000b.

The following table presents the spatial distribution of three key employment activities associated with tourism: accommodation, amusement (tourism, recreation, scenic tours, gambling and all other forms of recreation), and food/beverage services. The data show that tourism is significant in two counties: Monroe and Walton (located in the Panhandle region). In both counties, over 18 percent of the year 2000 workforce was employed in hotel accommodations. Okaloosa County, which is adjacent to Walton County and the home of Fort Walton Beach, had the third highest concentration of tourist-related industries and employment. While tourism is an important component of the Miami-Dade economy, its year 2000 economy was diversified with over 850,000 workers (Table 2).

Monroe, Walton, and Okaloosa Counties are largely dependent upon tourism for employment. From a sociological ecological perspective, downturns in the tourist trade will have the most significant negative impacts in these places. Tourism is very sensitive to business-cycles. During recessions people do not have as much money to spend on vacations and travel; therefore, these economies may suffer.

However, this analysis is performed at the LMA level, which is a measure of local economies based on commute to work patterns (Killian and Tolbert, 1993). Therefore, any downturns in tourist-related industries may not be reflected in the larger LMAs in which these counties are embedded. Okaloosa and Walton Counties are in the Pensacola LMA, while Monroe County is in the Miami-Dade LMA. Given that Miami is a major metropolitan area, discernible effects of economic recessions on the tourist industry may not be as readily detectable in this LMA.

Table 2

Total Employment in Tourism-Related Industries, Florida Gulf Coast Counties: 2000

County	Total Employment	Food/Service Employment	Amusement Employment*	Accommodation Employment
Bay	54,230	13.0%	1.9%	4.9%
Charlotte	30,868	9.7%	2.6%	1.6%
Citrus	22,282	8.9%	3.4%	1.7%
Collier	82,383	9.4%	4.1%	4.7%
Dixie	1,341	4.4%	4.4%	4.4%
Escambia	107,234	8.7%	0.9%	0.9%
Franklin	1,910	9.8%	1.4%	6.9%
Gulf	2,408	7.2%	2.8%	2.5%
Hernando	23,665	11.4%	1.6%	0.7%
Hillsborough	493,710	5.8%	1.5%	1.2%
Jefferson	1,685	6.8%	1.1%	1.7%
Lee	134,701	9.1%	1.8%	4.1%
Levy	5,704	10.6%	1.2%	1.6%
Manatee	106,663	5.4%	0.8%	0.7%
Monroe	32,132	18.2%	4.1%	15.8%
Okaloosa	55,450	13.7%	1.5%	2.1%
Pasco	63,316	9.6%	1.5%	1.8%
Pinellas	396,192	6.7%	1.2%	2.0%
Santa Rosa	18,733	10.2%	1.6%	0.4%
Sarasota	132,105	8.1%	20.1%	1.7%
Taylor	4,836	6.5%	0.2%	1.3%
Wakulla	2,362	9.4%	3.3%	1.7%
Walton	9,208	19.0%	2.0%	19.0%

*Amusement includes all tourist activities such as scenic tours, visits to historical sites, gambling, and recreation (U.S. Census Bureau, 2000a).

To test the effects of business cycle recessions on the Monroe County economy since 1970, we examined the annual trends in employment. The total annual employment for Monroe County, together with three-year employment moving averages, show positive growth (Figure 2). In almost every year the actual employment levels were greater than expected, based on the employment levels in the previous three years. However, these data also show that this county was sensitive to the business cycles. For each recession cycle, there was a lag in that employment growth did not exceed expectations, as based on three-year employment moving averages.

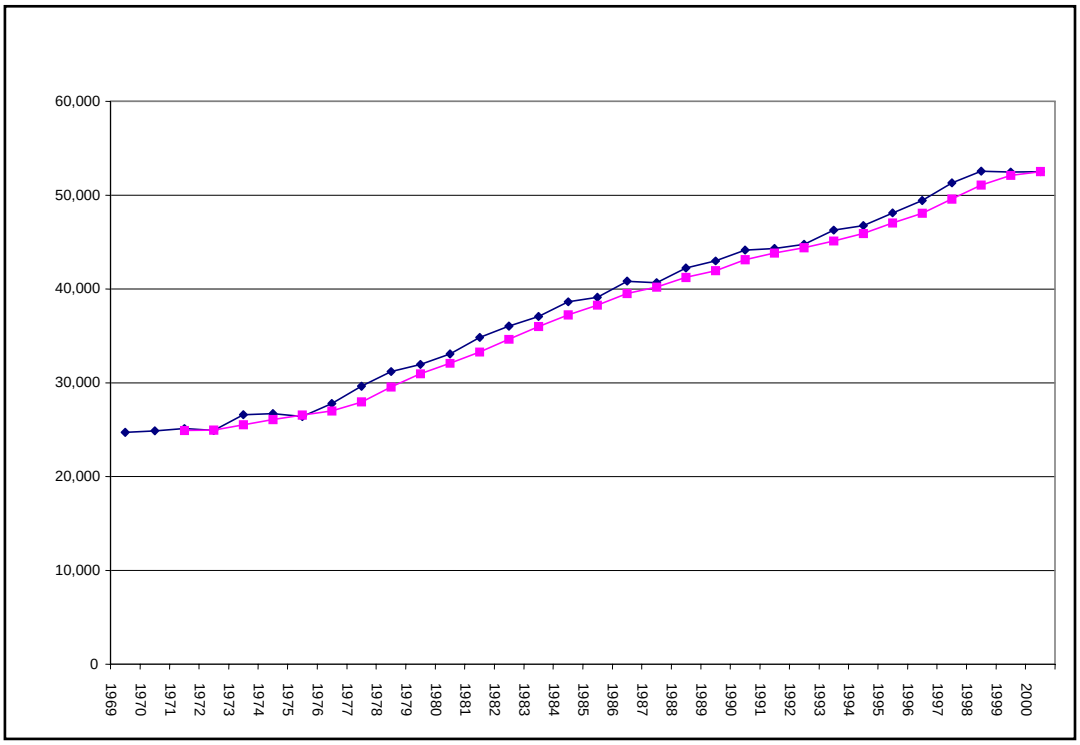


Figure 2. Total Employment and Three-year Moving Averages, Monroe County: 1969-2000 (U.S. Dept. of Commerce, Bureau of Economic Analysis, 2000).

Phase II: Socio-Demographic Analysis. The historic and current population data for Monroe County show steady growth. This growth slowed considerably between 1990 and 2000 (Table 3).

Table 3

Total Population by Percent, Monroe County: 1940-2000

	1940	1950	1960	1970	1980	1990	2000
White	81.8	89.2	89.6	91.1	91.2	91.5	77.2
Black	18.0	10.5	9.9	8.0	6.1	5.5%	4.5
Hispanic*	NA	NA	NA	14.9	11.4	11.9%	15.7
Total Pop.	14,078	29,957	47,921	52,586	63,188	78,024	79,589

NA = Data not available.

* "Hispanic" was not a Census-defined racial category prior to 1970.

Source: U.S. Census Bureau, 2000b.

Retirement Age Population. Monroe County is a retirement-age intensive county. In 2000, 14 percent of the population in Monroe County was over the age of 65; the national rate was 12 percent (Table 4).

Table 4

Percent Population Over 65, Monroe County: 1950-2000

County	1950	1960	1970	1980	1990	2000
Monroe	4.9	5.5	8.5	13.9	15.7	14.5

Source: U.S. Census Bureau, 2000b.

Education. Given Monroe County's emphasis on tourism, very high levels of education attainment were not expected. To the contrary, 25 percent of the county's adult population held college degrees in 2000; this figure is on par with the national figure. Moreover, this finding holds for other Census years dating back to 1970. However, only 15 percent of adults in Monroe County did not possess a high school diploma in 2000; this rate was one of the lowest for all Florida counties along the Gulf of Mexico (Table 5).

Table 5

Adult Educational Attainment (age 25+), Monroe County: 1970-2000

Year	0-8 Years	Some High School	High School Diploma	Some College, No Degree	BA/BS or More	Total
1970	23.5%	20.5%	36.0%	10.8%	9.1%	28,085
1980	12.8%	14.8%	36.5%	20.0%	15.9%	43,005
1990	7.6%	12.6%	29.1%	30.2%	20.3%	58,585
2000	4.6%	10.4%	28.9%	30.5%	25.4%	61,161

Source: U.S. Census Bureau, 2000b.

Finances. Between 1987 and 1997, per capita revenues in Monroe County increased by almost $1,000 per capita in real dollars. The most notable trend is that per capita debt for local government finance almost doubled (in real dollars) between 1982 and 1987. In 1987, local government debt increased to almost $4,500 per person in 1997 dollars. In 1997, that debt burden had decreased to $3,100 per person, a drop of 45 percent in real dollars (Table 6).

Table 6

Per Capita (in 1997 adjusted dollars), Government Finances,
Monroe County: 1972-1997

Finances	1972	1977	1982	1987	1992	1997
Total Revenue	$2,170	$2,883	$2,959	$3,685	$3,228	$4,800
State Revenue	$569	$709	$427	$444	$460	$533
Tax Revenue	$474	$680	$617	$1,181	$1,628	$1,749
Total Debt	$1,052	$952	$2,717	$4,487	$2,982	$3,107

Source: U.S. Census Bureau, 2000a.

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The Department of the Interior Mission

As the Nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering sound use of our land and water resources; protecting our fish, wildlife, and biological diversity; preserving the environmental and cultural values of our national parks and historical places; and providing for the enjoyment of life through outdoor recreation. The Department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people by encouraging stewardship and citizen participation in their care. The Department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.

The Minerals Management Service Mission

As a bureau of the Department of the Interior, the Minerals Management Service's (MMS) primary responsibilities are to manage the mineral resources located on the Nation's Outer Continental Shelf (OCS), collect revenue from the Federal OCS and onshore Federal and Indian lands, and distribute those revenues.

Moreover, in working to meet its responsibilities, the **Offshore Minerals Management Program** administers the OCS competitive leasing program and oversees the safe and environmentally sound exploration and production of our Nation's offshore natural gas, oil and other mineral resources. The MMS **Minerals Revenue Management** meets its responsibilities by ensuring the efficient, timely and accurate collection and disbursement of revenue from mineral leasing and production due to Indian tribes and allottees, States and the U.S. Treasury.

The MMS strives to fulfill its responsibilities through the general guiding principles of: (1) being responsive to the public's concerns and interests by maintaining a dialogue with all potentially affected parties and (2) carrying out its programs with an emphasis on working to enhance the quality of life for all Americans by lending MMS assistance and expertise to economic development and environmental protection.