

Employment and wages for the U.S. ocean and coastal economy

Quarterly Census of Employment and Wages data provide new industrial and geographic views of the U.S. coastal and ocean economy over the 1990–2001 period

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Although national trends in employment have shown a marked shift away from manufacturing and natural resource extraction over the past 40 years, interest in the economic use of major natural resources remains a matter of substantial concern. This has long been the case with agriculture, where the farm/nonfarm distinction is a staple of employment statistics. It is increasingly true of other resources, including those of the oceans and Great Lakes. A substantial debate about how to manage those resources is about to be engaged, driven in large part by two recent major reports, one from a private foundation and the other from a commission chartered by Congress.¹

The analysis of major natural-resource-oriented economic sectors is relatively straightforward in most cases. Agriculture is well documented; it and minerals both have their own divisions within the Standard Industrial Classification (SIC) system and the North American Industry Classification System (NAICS). Forest products are well defined in SIC 24, 25, and 26, and in several NAICS codes. Moreover, each of these resource industries is usually clearly defined geographically, with well-recognized agricultural, forest products, and mining regions. The analysis of the ocean economy, however, has none of these advantages.

The ocean economy consists of activities measured in a number of industries, though none, with the exception of ship and boat

building, is a measured major industry or sector level. In the SIC codes, all are at the three- or four-digit level, and in the NAICS codes, most are at the six-digit level. The span of industries includes primary production, manufacturing, transportation, retail, and services. Moreover, while the ocean economy is concentrated in the 30 coastal States (including the Great Lakes states), it is found throughout the United States. Seafood stores are found in Nebraska, and North Sails builds the sails for the America's Cup class boats at a sail loft in Nevada. Even within the coastal States, the ocean economy can be found in the largest cities and smallest towns, making it geographically specific, but across a wide range of regional economies.

This article summarizes the results of a preliminary analysis of the coastal and ocean economy of the United States over the 1990–2001 period. The analysis was conducted as part of the National Ocean Economics Project (NOEP), which is funded by the National Oceanic and Atmospheric Administration (NOAA) to develop nationally consistent estimates of both the market-based and nonmarket-based economic values associated with the coasts and oceans. Employment and wage estimates are shown for the United States and the coastal States using the Quarterly Census of Employment and Wages (QCEW) employment series compiled from the BLS Longitudinal Database. A comparison of the ocean economy measured by SIC and NAICS classifications is provided.

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Conclusions and suggestions for further research are presented regarding the use of QCEW data for the measurement of sectors involving complex multi-industry and geographic attributes.

Defining the ocean and coastal economy

In this article, the term “oceans” includes the Atlantic and Pacific Oceans, the Gulf of Mexico, the Great Lakes, and all States bordering these bodies of water. Federal ocean and coastal policies and programs are defined to include the Great Lakes region, so the creation of ocean-related economic data requires that the Great Lakes be included.

There have been several earlier attempts to define an ocean economy, primarily by developing estimates for an ocean-related portion of the gross domestic product (GDP).² The earliest of these efforts occurred in the 1970s, when the U.S. Department of Commerce’s Bureau of Economic Analysis identified the key dimensions for defining the ocean economy: industry and geography. Existing data must be organized using these two criteria while staying within the rules of confidentiality.

A major issue with the level of industrial aggregation in published statistics is that confidentiality protections limit the availability of data for many of the three- and four-digit industries required for analysis of the ocean economy. In order to deal with these issues, establishment-level data must be grouped into new industrial and sectoral definitions, which can also be more descriptive of the ocean. (See exhibit 1.)

Data for the ocean economy need to be referenced to both SIC and NAICS. (See exhibit 2.) Employment and wage data for the ocean economy are measured on a SIC basis for 1990 and 2000. For 2001, data are measured on both a SIC and NAICS basis for comparison purposes.

Regardless of their location, some industries, such as ship building and seafood processing, are clearly connected to the oceans; others, including all of those in the tourism and recreation sector, are ocean related only if they are located near the shores of the oceans or Great Lakes. Fixing the geographic location of establishments in these industries is thus particularly important. Previous studies have relied primarily on location in shore-bordering counties to define an establishment as ocean related, but counties present some obvious difficulties from the perspective of defining an ocean economy. Counties come in very different sizes, from the relatively compact counties of States like Alabama and Mississippi to the sprawling areas of Los Angeles County or the boroughs of Alaska. Many county boundaries were fixed two or more centuries ago for administrative and political purposes, which may bear little relationship to modern concepts of ecosystem-based regions.

Thus, the problem is to find a level of geography that is

considerably closer to the shoreline than county boundaries, but is also available on establishment records for identification purposes. Ideally, this could be done by choosing an appropriate distance boundary (for example, 5 kilometers) from the shoreline, and then selecting all establishments with street addresses within that distance. The selection of appropriate addresses is a straightforward task using modern Geographic Information Systems (GIS) software; however, establishment data in the QCEW series are not yet coded properly to permit this type of analysis.

An alternative is to use the zip code of the establishment as the defining geography. Again using GIS analysis, zip codes can also be identified by their intersection with appropriate shoreline locations, and they appear on almost all establishment records.³ Additionally, they meet the requirement of being considerably more compact than counties, particularly in large urban settings. Zip codes are increasingly used in the presentation of a variety of socio-economic data. For example, the Census Bureau publishes both population and housing data and employment data in zip code geographies. With the use of zip codes, the ocean economy can be defined by reference to industries whose production processes and products directly involve the use of ocean resources, or to industries that indirectly use ocean inputs by virtue of their physical location in a shore-adjacent zip code.

There are disadvantages to using zip codes. They are fixed by the U.S. Postal Service (USPS) for their administrative convenience, and thus can have some rather odd shapes depending on the particular needs of the USPS. Unlike county boundaries, which are highly stable over time, zip code boundaries change from time to time, with new zip codes added as popu-

Exhibit 1. Ocean economy sectors and industries

Construction Marine construction	<i>Amusement and recreation services not elsewhere classified</i>
Living resources Fish harvesting Aquaculture Seafood processing	<i>Boat dealers</i> <i>Eating and drinking places</i> <i>Hotels and motels</i> <i>Marinas</i> <i>Recreational vehicle parks and campgrounds</i> <i>Sporting goods</i>
Minerals <i>Limestone, sand, and gravel</i> <i>Oil and gas exploration</i> <i>Oil and gas production</i>	Transportation Deep sea freight transportation Marine passenger transportation Marine transportation services Search and navigation equipment Warehousing
Ship and boat building Boat building Ship building	
Tourism and recreation <i>Zoos and aquaria</i>	

NOTE: Industries listed in *italics* are defined as ocean only when an establishment is located in a zip code adjacent to the Atlantic or Pacific Oceans, the Gulf of Mexico, or the Great Lakes.

Exhibit 2. Ocean economy sectors and industries by SIC and NAICS codes

Sector and industry	NAICS code	NAICS industry (1997 NAICS)	SIC code	SIC industry (1987 SIC)
Construction				
Marine related construction	237120 237990	Oil and gas pipeline and related structures Other heavy and civil engineering construction	1629	Heavy construction, not elsewhere classified
Living resources				
Fish hatcheries and aquaculture	112511 112512	Finfish farming and fish hatcheries Shellfish farming	0273 0921	Animal aquaculture Fish hatcheries and preserves
Fishing	114111 114112	Finfish fishing Shellfish fishing	0912 0913	Finfish fishing Shellfish fishing
Seafood processing	311711 311712	Seafood canning Fresh and frozen seafood processing	2077 2091 2092	Animal and marine fats and oils Canned and cured fish and seafoods Fresh and frozen fish and seafoods
Minerals				
Limestone, sand, and gravel	212321 212322	Construction sand and gravel mining Industrial sand mining	1422 1442	Crushed and broken limestone Construction sand and gravel
Oil and gas exploration and production	211111 213111 213112 541360	Crude petroleum and natural gas extraction Drilling oil and gas wells Support activities for oil and gas operations Geophysical exploration and mapping services	1446 1311 1321 1381 1382 1389	Industrial sand Crude petroleum and natural gas Natural gas liquids Drilling oil and gas wells Oil and gas field exploration services Oil and gas field services, not elsewhere classified
Ship and boat building				
Boat building and repair	336612	Boat building and repair	3732	Boat building and repair
Ship building and repair	336611	Ship building and repair	3731	Ship building and repair
Tourism and recreation				
Boat dealers	441222	Boat dealers	5551	Boat dealers
Eating and drinking places	722110 722211 722212 722213	Full service restaurants Limited service eating places Cafeterias Snack and nonalcoholic beverage bars	5812	Eating places
Hotels and lodging places	721110 721191	Hotels (except casino hotels) and motels Bed and breakfast inns	7011	Hotels and motels
Marinas	713930	Marinas	4493	Marinas
Recreational vehicles, parks, and campsites	721211	RV parks and recreational camps	7033	Recreational vehicles, parks, and campsites
Scenic water tours	487210	Scenic and sightseeing transportation, water		
Sporting goods	339920	Sporting and athletic goods manufacturing	3949	Sporting and athletic goods manufacturing, not elsewhere classified
Amusement and recreation services	487990 611620 532292 713990	Scenic and sightseeing transportation, other Sports and recreation instruction Recreation goods rental Amusement and recreation services, not elsewhere classified	7999	Amusement and recreation services, not elsewhere classified
Zoos and aquaria	712130 712190	Zoos and botanical gardens Nature parks and other similar institutions	8422	Zoos and aquaria
Transportation				
Deep sea freight	483111 483113	Deep sea freight transportation Coastal and Great Lakes freight transportation	4412 4424 4449	Deep sea foreign transportation of freight Deep sea domestic transportation of freight Water transportation of freight, not elsewhere classified
Marine passenger transportation	483112 483114	Deep sea passenger transportation Coastal and Great Lakes passenger transportation	4481 4482 4489	Deep sea transportation of passengers except by ferry Ferries Water transportation of passengers, not elsewhere classified
Marine transportation services	488310 488320 488330 488390	Port and harbor operations Marine cargo handling Navigational services to shipping Other support activities for water transportation	4491 4492 4499	Marine cargo handling Towing and tugboat services Water transportation services, not elsewhere classified
Search and navigation equipment	334511	Search, detection, navigation, guidance, aeronautical and nautical system, and instrument manufacturing	3812	Search, detection, navigation, guidance, aeronautical and nautical system, and instrument manufacturing
Warehousing	493110 493120 493130	General warehousing and storage Refrigerated warehousing and storage Farm product warehousing and storage	4225 4222 4221	General warehousing and storage Refrigerated warehousing and storage Farm product warehousing and storage

lation and economic growth occurs. This implies the need for continual monitoring of the zip code administration process to assure use of appropriately dated codes.

Employment and wages

In total in 1990, the ocean sector employed 1.9 million people in wage and salary employment and grew to 2.3 million in 2000. Two sectors are excluded from the analysis at this time — government and scientific research — because of data limitations.⁴ (See table 1.) This growth in employment of 355,000 over the period, or 18.5 percent, was significant, and actually slightly exceeded the national growth rate of 18.2 percent for wage and salary jobs. Total wages and salaries measured in current dollars grew by 46.3 percent, substantially lagging behind the national growth of 76.2 percent.

The average wages in the ocean sector rose from \$19,784 to \$24,442 per year in nominal dollars. (See table 2.) This growth rate of 23.5 percent also lagged significantly behind the U.S. nominal growth rate in average wages of 48.6 percent. While three of the five ocean economy sectors pay average wages above the national average wage, the overall average wage in the ocean economy lagged the U.S. average wage by more than \$3,500 in 1990 and by more than \$10,000 in 2000.

One major trend explains the observed changes in the ocean economy and its relationship to the U.S. economy: the dominance in both size and growth of the tourism and recreation sector. The tourism and recreation sector was the only ocean economy sector to show any significant employment growth over the 1990–2000 period. Aside from a small increase in jobs in the marine construction industry, which is heavily influenced by cyclical factors and the choice of endpoints, the ocean economy lost 136,000 jobs in the nontourism and recreation sectors. There are a number of reasons for these job losses, but three predominate:

- Post-cold-war shifts away from the military, which greatly affected ship building and search and navigation equipment manufacturing.

Table 1. Private ocean economy (sic basis), 1990 and 2000

Ocean economy sector	Establishments	Employment	Wages (millions of current dollars)
1990			
Total	91,203	1,924,014	\$38,064
Construction	2,144	30,198	937
Living resources	5,098	71,819	1,540
Minerals	1,829	45,099	1,860
Ship and boat building	3,192	230,097	6,564
Tourism and recreation	71,958	1,182,809	13,447
Transportation	6,982	363,992	13,716
2000			
Total	116,736	2,279,006	\$55,704
Construction	2,064	31,835	1,364
Living resources	4,580	62,184	1,838
Minerals	1,984	40,097	2,432
Ship and boat building	3,684	176,098	6,952
Tourism and recreation	95,850	1,672,156	27,292
Transportation	8,572	296,634	15,826
	Establishments	Employment	Nominal wages (millions)
Change 1990–2000			
Total	25,533	354,993	\$17,640
Construction	–80	1,638	427
Living resources	–518	–9,636	298
Minerals	155	–5,002	572
Ship and boat building	492	–53,999	388
Tourism and recreation	23,892	489,346	13,845
Transportation	1,590	–67,357	2,110
Percent change 1990–2000			
Total	28.00	18.50	46.30
Construction	–3.70	5.40	45.60
Living resources	–10.20	–13.40	19.30
Minerals	8.50	–11.10	30.80
Ship and boat building	15.40	–23.50	5.90
Tourism and recreation	33.20	41.40	103.00
Transportation	22.80	–18.50	15.40

SOURCES: Bureau of Labor Statistics, Bureau of Economic Analysis, and National Ocean Economics Project.

- Productivity increases in the marine transportation and oil and gas exploration and production industries, in which capital investments resulted in a significantly reduced demand for labor.
- Declines in U.S. fisheries from overfishing pressures.⁵

These large job losses were more than offset, however, by an increase of 438,000 jobs in tourism and recreation, an increase of more than 40 percent during the decade. The leading States in employment growth in tourism and recreation were along the Gulf of Mexico, including Louisiana, Mississippi, and Alabama, with more than 150 percent growth in each State.⁶ It should be noted that this estimate of the growth of ocean tourism and recreation employment is an underestimate of actual growth because it excludes self-employment.

However, ocean tourism and recreation employment growth does not pay the same level of wages as the other sectors. Average annual wages are less than half of the U.S.

Table 2. Average annual wages, 1990 and 2000

Ocean economy sector	1990	2000	Percent change, 1990-2000
Total	\$19,784	\$24,442	23.5
Construction	31,029	42,846	38.1
Living resources	21,443	29,557	37.8
Minerals	41,243	60,653	47.1
Ship and boat building	28,527	39,478	38.4
Tourism and recreation	11,369	16,321	43.6
Transportation	37,682	53,352	41.6
Average U.S. wages	23,322	34,647	48.6

average wage, and are only two-thirds of the average ocean economy annual wage. The dominance of tourism and recreation employment in the ocean economy employment picture accounts for the lower overall wages in the ocean economy compared with the United States as a whole. Of the other ocean economy sectors, only the living resources sector pays below the U.S. average wage.

The average *annual* wage figures shown here do not represent an accurate measure of actual compensation because of the highly seasonal nature of work in the ocean tourism and recreation industry. All States except Florida show peak employment in tourism and recreation in July and August (Florida peaks in March), and on average in 2000, employment was 10 percent in the summer higher than the annual average. In some States, such as Maine, the differential was as high as 35 percent. This high level of seasonal employment naturally results in low annual average salaries. Even taking seasonality into account, the wages and salaries in the tourism and recreation sector are below average and account for the combination of rapid overall employment growth, but much slower overall wage growth.

When measuring the ocean sectors and industries for 2001 under the SIC and NAICS definitions, the ocean economy is smaller by about 400,000 jobs under NAICS. (See table 3.) The principal differences arise in ship and boat building and oil and gas exploration and production, primarily due to the separation of establishments between production-related and service-related functions.

The ocean economy under NAICS is somewhat smaller for several reasons. First, there is increased precision in the industrial definitions of the ocean economy, as illustrated in two areas: hotels and general warehousing. Under NAICS, hotels attached to casinos are now included in their own classification. Although there is significant employment in casinos located near the shore (the largest such area is Atlantic City, NJ), it was decided to exclude these hotels from the ocean sector. Under general warehousing, warehouses in the near shore area are included in the transportation sector as these are usually tied to the movement of freight by water. This classification under SIC also included mini-warehouses

and self-storage facilities that were largely unconnected with marine freight; under NAICS, these facilities can be excluded from the analysis.

NAICS also classifies establishments based on the principal functions of the establishments rather than the firm or parent organization. Thus, in the manufacturing sector, for example, establishments involved in production are classified in manufacturing, and establishments in administration are in services; this reduces the size of manufacturing sectors, and increases the size of service sectors. The manufacturing sectors, such as ship and boat building, are measured under the NAICS-based ocean economy, but administrative establishments in the NAICS professional and business services sector are not included in the ocean economy.

The coastal economy

There is a distinction to be drawn between the ocean and the coastal economy. The former is defined by its use of ocean resources as direct or indirect inputs; the latter is defined purely by geography as the sum of economic activity taking place within the coastal region. However, the term “coastal” is ambiguous. It certainly encompasses the shoreline itself, but how far inland the “coast” extends depends on the purposes for which a definition is being offered. The term “coast” is used variously to describe the actual land-water boundary, the area adjacent to the land-water boundary, the areas surrounding estuaries, the land to the head of tide on some rivers, the land “within a day’s drive” of the shore, or all the land within the watersheds of rivers. By the latter definition, almost the entire land area of the United States, excluding only the Great Basin, could be considered coastal.

Defining the coast necessitates a compromise among political, administrative, and natural boundaries. The approach taken defines the coast as having three tiers:

- Near shore region — This is defined by zip codes adjacent to the shores of the oceans, Great Lakes, and major bays. The selection of these zip codes is discussed in greater detail in the section below on the ocean economy.
- Coastal zone counties — Coastal zone counties are any county that includes in whole or part the area under the jurisdiction of the Coastal Zone Management Act (CZMA) of 1972, as defined for that purpose by each State participating in the program. Four States include the entire State in the coastal zone (Rhode Island, Delaware, Florida, and Hawaii). Nine States (Washington, Alaska, Texas, Louisiana, Georgia, South Carolina, North Carolina, Virginia, and Maryland) define their coastal zones using county or county-equivalent boundaries. Other States use various combinations of political (such as town boundaries) and geographic features (adjacency to tidal waters) to define their coastal zones

Table 3. Comparison of ocean economy sectors and industries measured by SIC and NAICS, 2000

Sector and industry	Establishments		Employment		Wages (millions)	
	SIC	NAICS	SIC	NAICS	SIC	NAICS
Total ocean economy	118,451	102,305	2,208,861	1,866,355	\$59,165.5	\$43,165.9
Construction						
Total	1,919	1,702	30,992	24,304	1,421.9	1,149.6
Marine related construction	1,919	1,702	30,992	24,304	1,421.9	1,149.6
Living resources						
Total	4,177	4,009	60,492	53,573	1,754.5	1,455.1
Fish hatcheries and aquaculture	601	658	4,756	5,044	117.4	123.1
Fishing	2,304	2,290	6,175	5,779	240.8	221.2
Seafood processing	1,272	1,061	49,562	42,751	1,396.2	1,110.7
Minerals						
Total	6,404	1,217	111,839	24,493	10,450.0	1,612.4
Limestone, sand, and gravel	280	276	4,883	4,744	218.4	212.4
Oil and gas exploration and production	6,124	941	106,957	19,749	10,231.6	1,399.9
Ship and boat building						
Total	3,759	1,942	168,146	154,504	6,987.8	6,522.3
Boat building and repair	2,954	1,303	51,886	43,284	1,592.0	1,329.5
Ship building and repair	805	639	116,260	111,220	5,395.8	5,192.7
Tourism and recreation						
Total	93,189	87,818	1,602,614	1,415,635	26,831.1	22,284.0
Amusement and recreation services	6,578	4,747	114,175	44,399	2,648.4	874.8
Boat dealers	2,032	2,029	15,395	15,390	498.9	498.4
Eating and drinking places	70,825	65,990	1,084,479	1,012,925	14,824.7	13,421.9
Hotels and lodging places	10,599	10,520	353,472	299,624	7,853.6	6,240.7
Marinas	1,947	1,944	13,944	13,869	386.8	385.4
Recreational vehicles, parks, and campsites	643	642	4,762	4,747	84.7	83.9
Sporting goods	402	417	8,472	8,363	350.4	342.0
Zoos and aquaria	163	162	7,914	8,194	183.6	262.1
Scenic tours	—	1,367	—	8,124	.0	174.8
Transportation						
Total	9,003	5,617	234,778	193,847	11,720.3	10,142.6
Deep sea freight	935	625	33,756	20,313	2,055.0	1,348.3
Marine passenger transportation	997	212	25,715	13,155	886.5	559.5
Marine transportation services	3,638	3,205	95,005	91,217	4,470.4	4,235.8
Search and navigation equipment	174	165	34,564	34,453	2,869.8	2,861.0
Warehousing	3,259	1,410	45,738	34,709	1,438.6	1,137.9

NOTE: Data exclude Massachusetts, which does not permit access to their establishment level data. Dash indicates data not available.

for purposes of the CZMA. All counties that, in such circumstances, include territory defined as the coastal zone are included in this category. Coastal zone counties were identified using GIS. Data showing the boundaries of each State's coastal zone were obtained from NOAA's Office of Coastal Resource Management and overlaid on Census Bureau county boundary data to determine the intersection. In the case of Illinois, which does not participate in the CZMA program, Cook County was included to provide for nationally consistent totals.

- Coastal watershed counties — These are defined by the U.S. Geological Survey (USGS) as the coastal zone counties plus counties that include the headwaters of coastal rivers. This definition excludes major continental river systems such as the Mississippi-Missouri-Ohio system.⁷

When analyzing employment growth over the 1990–2000 period in these three tiers of the coastal economy plus the coastal States, population growth is included for comparison because it is traditionally the principle variable employed when discussing socio-economic change within the coastal region.⁸ (See table 4.)

Table 4 shows that employment growth was faster than population growth in the country as a whole, but the differential was larger in the coastal areas, however defined. The difference was largest in the near shore area, where employment growth was more than three times faster than population growth. In fact, while the near shore areas showed the slowest population growth, they showed the fastest employment growth.

This is an important finding, because most of the discussion about socio-economic change in coastal areas focuses

exclusively on population growth. The addition of employment growth to the picture of economic growth in the coast shifts attention away from the effects of population growth alone to the effects of economic growth as a whole.

Another important characteristic of the coastal economy, as distinct from the ocean economy, is that it is a high value economy. (See table 5.) Not surprisingly, the near shore area is the densest in terms of employment and establishments. However, it also pays the highest wages per acre, in fact more than twice the U.S. average wage per acre, and 80 percent higher than the total wages per acre in the coastal States. This makes the near shore region one of the most valuable economic regions per acre in the United States.

THIS USE OF QCEW DATA provides two different views of the national economy that have not been available before. One is industrial, based on the ocean economy and its resources. While estimates of the ocean economy have been available previously, the use of the QCEW data provides both a more complete picture of the ocean economy by extending the measurement to employment and wages, and also allows State and even sub-State views of employment and wages in this sector. The data reveal a natural resource economy in the midst of substantial changes, which amplify larger trends in the economy. The measurement of the ocean economy under both SIC and NAICS also demonstrates the increased precision available under NAICS, as well as some of the drawbacks of all economic taxonomies.

The other new view is geographic, showing both the rapid growth and the economic importance, which has not been visible heretofore, of the near shore area. This use of the

Notes

¹ See *America's Living Oceans: Charting a Course for Sea Change* (Washington, Pew Oceans Commission, May 2003) and *An Ocean Blueprint for the 21st Century: Report of the U.S. Commission on Ocean Policy* (U.S. Commission on Ocean Policy, September 2004), on the Internet at www.oceancommission.gov

² See *Gross Product Originating from Ocean-Related Activities* (Bureau of Economic Analysis, 1974); G. Pontecorvo and others, "Contribution of the Ocean Sector to the U.S. Economy," *Science* 208, May 30, 1980, pp. 1000-06; and *Gross Product Originating from Ocean Related Activities: 1972* (Bureau of Economic Analysis, 1972).

³ Three addresses appear on each QCEW record: a physical address, a mailing address (often a post office box), and an unemployment insurance address, which is used when another party (for example, a corporate headquarters or payroll service) files the required employment reports. While a physical address is required, it is not always present on the record filed by employers. In such cases, the mailing address is used, and if that is absent, the unemployment insurance address.

⁴ The problem with both sectors is that ocean-related activities are embedded within larger organizations and the specific ocean-related components cannot easily be separated from those organizations. At the federal level, it is relatively easy to identify the Navy, Coast Guard, or NOAA, but other agencies are much more difficult. Both the Environmental Protection Agency and Army Corps of Engineers have substantial programs

Table 4. Population and employment change in coastal regions, 1990-2000

[Percent]		
Regions	Population	Wage and salary employment
United States	13.2	20.8
Coastal States	12.3	31.3
Coastal watershed counties	11.2	23.7
Coastal zone counties	11.5	22.8
Near shore	10.9	35.1

Table 5. Economic activity per acre in coastal regions, 2000

Regions	Establishments	Employment	Wages (millions)
Total United States ...	—	14.4	\$0.53
Total coastal States ..	1.25	19.4	.70
Coastal watershed counties	1.70	26.9	1.03
Coastal zone counties	1.69	26.0	.99
Near shore	2.51	34.3	1.26

NOTE: Acreage data are from the Census Bureau and reflect acres of land, excluding water bodies and wetlands. Dash indicates data not available.

QCEW data demonstrates clearly what will undoubtedly be a growing trend in the use of labor statistics over the next decade: the integration of economic data into new geographic datasets required as Geographic Information Systems technologies become more widespread. This will present those involved with the collection and distribution of economic data with new challenges to provide meaningful data while still meeting the strict standards of confidentiality required of all federal statistics programs. □

that are ocean and coastal related, and the standard budget reporting does not permit these to be easily identified. The problem is greatly magnified at the State and local government levels. Most scientific research on the ocean takes place within universities, which do not necessarily separate ocean from nonocean research in their reporting. Development of specific employment and related data for this sector will require a significant investment in research in individual programs.

⁵ The QCEW data series does not contain data for employment in the fisheries harvesting sector, because firms in this sector are excluded by law from the unemployment insurance system. Such firms operate on a "lay," or share of catch payment system, rather than traditional wages.

⁶ Mississippi's high rate of growth owed much to the establishment of a number of casinos in the coastal region over the 1990s. As noted in the discussion on the distinction between the SIC and NAICS codes, the SIC definition of hotels included casinos, while the NAICS definition permits casino hotels to be separated from other hotels. The high rate of growth in Mississippi ocean tourism and recreation is thus somewhat ambiguous.

⁷ There are 412 coastal zone counties and 669 counties. Lists of these counties are on the Internet at www.oceanconomics.org

⁸ Data exclude Massachusetts, which does not permit access to their establishment level data.