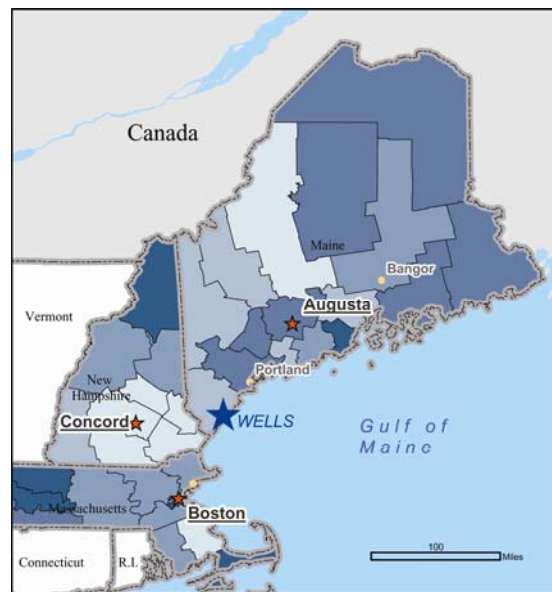


Wells, ME National Estuarine Research Reserve

Community Characterization



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for NOAA Coastal Services Center

Training Workshop
Social Assessment: Tools and Techniques
for Coastal Managers
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A. Introduction

The Wells, ME National Estuarine Research Reserve is located on the coast of southern Maine, in York County (see Figure 1). This site was selected as a case study for this project because it falls along a trajectory from small, rural site to densely populated urban site. In addition, the Wells ME site offers the complexities of home rule, as well as a massive influx of summer residents. This site therefore provides an interesting case study for the examination of complex relationships both within and between human communities and natural systems.

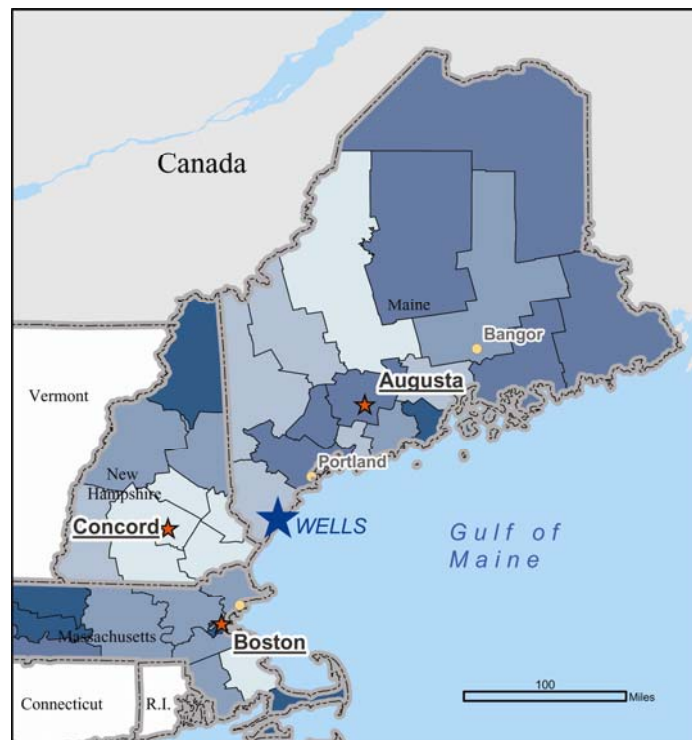


Figure 1. Location of Wells, ME NERR site

B. Site Description and Needs Assessment

On January 20, 2005, an informal focus group was conducted with representatives of the Wells, ME National Estuarine Research Reserve, and several of its partner organizations. This meeting took place at the Wells Reserve, which is located in the town of Wells. Attendees included National Oceanic and Atmospheric Administration staff, as well as staff of local partner organization Laudholm Trust, and the Southern Maine Regional Planning Commission. Combined, this group has been working

on a variety of watershed-scale management projects, and is well aware of the issues faced by the Reserve, and opportunities to address them.

Semi-structured interviews were conducted with the Wells, ME Reserve Manager, and the President of the Laudholm Trust, in one-on-one meetings; and with the staff members working on the Seacoast Watershed Information Manager (SWIM) project.

The Research Reserve at Wells, ME is a truly complex system, both because of the dynamics of the communities in which it is located, and because of the variety of interorganizational arrangements in use to fulfill its mission. A wide range of potential socioeconomic analyses were discussed, which could assist managers and staff in meeting their management, research, and education goals. These are listed below:

1. A perceptions survey to determine whether and to what extent the local residents view the NERR site as part of their town or communities, and whether and how they distinguish between the National Estuarine Research Reserve and Laudholm Trust;
2. A similar survey of summer residents and visitors to ascertain whether and to what extent the NERR site draws them to the area;
3. An organizational network analysis to measure and map the relative position of the NERR among its many partner organizations;
4. A community characterization to assist the NERR in understanding the dynamics of land use change that contribute to increasing E. coli and nutrient loading in the Merriland, Branch, Little and Ogunquit Rivers;
5. An analysis of the policy framework in which land use planning and zoning are carried out in the region;
6. A visual representation of norms at work on the landscape, which vary quite dramatically by town and by relative position within towns.
7. A broad analysis of socioeconomic conditions in the SWIM project's watersheds.

Most of these analyses are well beyond the scope of this project. However, the community characterization can be used as the first step in several of them, including the perceptions surveys, an examination of the socioeconomic drivers of land use change, and the analysis of socioeconomic conditions in the SWIM project's watersheds. The present document can make a contribution to improving understanding of the communities around the Reserve and how they may be interacting with the landscape.

C. Community Characterization

This document characterizes, at a broad scale, socioeconomic conditions of communities around the Wells, ME National Estuarine Research Reserve. Information for these summaries was derived primarily from the 2000 decennial census, which was downloaded and displayed on a series of maps. The maps are included in this community characterization; each sheet includes text interpreting the findings at different scales for the variable it depicts, including state/county, and region/locale around the Reserve.

The maps present data on a subset of variables in the human ecosystem framework (Machlis et al. 1997): under Biophysical Resources, *energy*; under Socioeconomic Resources, *population, labor, and capital*; under Social Cycles, *institutional cycles*; under Social Order, *age, class, power, wealth*. Figure 2, below, shows the indicators selected for each of these variables, as well as the map sheet on which they are represented. Here, synthesis is intended to detect and present relationships among the variables shown on the maps.

Below, the findings in these maps are summarized by variable. The relationships among these variables are also discussed to provide a synthesis of findings. We conclude with suggestions for additional social assessments that might be of use to the managers of this reserve.

Figure 2.

Variable	Indicator and/or Measure	Sheet Number
Population	Number of persons per census geography	One
Population	Number of people per square mile	Two
Population	Percent change in total resident population between 1990 and 2000	Three
Age	Median age of total population	Four
Capital	Median household income	Five
Class	Percent skilled and professional workers	Six
Power	Percent of households with income over \$100,000	Seven
Wealth	Percent persons living below poverty line	Eight
Institutional Cycles	Ratio of population <18 to >64 years of age	Nine
Energy	Time traveled to work	Ten
Informal Norms	Percent of households with own children under 18 years living at home, headed by a single parent (male or female)	Eleven

C-1. Population

Population includes both the number of individuals and the number of social groups and cohorts within a social system. It is an important socioeconomic resource as it determines the consumption impacts of people as well as their creative actions. Because development is an important issue at most NERR sites, three indicators of population were measured and mapped for the community characterizations: absolute population, population density, and county-level change in population between 1990 and 2000.

Maine is among the least populous states in the nation, ranking 40th in the nation in terms of absolute population. However, the distribution of population on the landscape in Maine is quite uneven, and the counties in the vicinity of the Wells Reserve are home to between 200,000 and 500,000 people each. In addition, highly populated regions of Massachusetts and New Hampshire are nearby. These areas, like the counties in the region of the Wells Reserve, experienced population growth between 1990 and 2000 that matched or exceeded the national average of 13.2%.

There are census block groups in the region of the Wells Reserve that are home to upwards of 7,000 people, mostly along the coast to the north and

south. In the locale around the Reserve, however, the population levels taper off by block group to less than 2000 people.

These patterns also persist in terms of population density. The locale around the Reserve itself is home to block groups with population densities ranging from <278.2 -1,261.3 people/square mile. However, there are block groups within 10 miles of the Reserve where population densities reach 3,654.4-9,824.4 people/square mile. These numbers are limited to permanent year-round residents, and do not include summer residents or visitors.

C-2. Age

Age is an important component of social structure for several reasons. Most of human activity is age-dependent. Mining, for example, is an occupation primarily carried out by the young. Certain recreational activities, such as golf, are often associated with the elderly. Age distribution within a community is also an important determinant of social institutions such as education and health care. Likewise, age can be an important factor in political activity and proclivity.

The median age of the people in Maine is 33.9 years, close to the national median of 33.3. This means that half of the people in Maine are older than 33.9 and half are younger. A concentration of counties with younger populations is evident in southern Maine; in the area around the Wells Reserve, the median age ranges from 31.7-39.3 years. In the census blocks in the region around the Reserve, however, the median age is much higher, between 40.9 and over 80 years. This pattern persists throughout the coastal block groups for at least 20 miles in both directions from the Reserve, and extends inland on an east-west axis toward Sanford. There is a large cohort of people in the area who are approaching or at retirement age.

C-3. Capital

In the human ecosystem framework, capital is defined as the economic instruments of production; that is, financial resources (money or credit supply), resource values (such as underground oil), and the human ability to manipulate these (human capital). Capital can be measured in a variety

of ways; for our purposes, median household income is used to measure capital.

In Maine, the median household income is \$37,240, with southernmost counties displaying much higher medians: \$47,875-\$63,432. These include the counties around the Wells Reserve. In the immediate vicinity of the Reserve, however, median incomes are much higher, and in some cases are over \$200,000. The lowest median income in many census block groups in the vicinity of the Reserve is \$65,204. Thus, this is a very affluent area. Exceptions include the inland area near and including Sanford, and the census block containing the Reserve itself where the median household income is at about the State median.

C-4. Class

The term, class, is used in various ways in sociology. It usually implies a group of individuals sharing a common situation within a social structure, usually their shared place in the structure of ownership and control of the means of production (Dictionary of Social Science, <http://bitbucket.icaap.org/dict.pl>).

Class is represented in this work as the percent of the work force who are employed in skilled or professional occupations. These include doctors, lawyers, professors, computer specialists, and so on. In Maine, there is a higher concentration of professionals in southern counties than in northern ones. In the region around the Wells Reserve, in particular to the south, there is a very high concentration of skilled and professional workers. In some cases, 100% of the workers fall into this category; in others the minimum rate is 20% of the workforce.

This pattern persists in the census blocks immediately around the Reserve, Rates remain high in the blocks inland from the Reserve, and taper off about 5 miles inland.

C-5. Power

Power is the ability to alter others' behaviour, either by coercion or deference (Wrong, 1988; Mann, 1984). The powerful, often elites with political or economic power, or both, can have access to resources denied the powerless. Here, we measure power in terms of income, with those

having a household income of \$100,000 or more considered to be more powerful than those with lower incomes.

In Maine, there are very high concentrations of power in the southern counties. In addition counties in Massachusetts and New Hampshire, very close to the state line also exhibit high levels of power. This pattern persists in the region and locale of the Wells Reserve. There are high concentrations of affluence and power, in particular toward the south and along the coast.

C-6. Wealth

Wealth is access to material resources, in the form of natural resources, capital (money) and credit. The distribution of wealth is a central feature of social inequality and has human ecosystem implications: the rich have more life opportunities than the poor. Here, we measure the inverse of wealth by examining poverty rates in the areas around the research reserve sites. The poverty line in the United States is defined as an annual income of \$18,660 or less for a family of four.

In Maine there are many northern counties that exhibit high poverty rates, and very few in the southern parts of the state where the same is true. Rates range from 8.1-9.7% in most counties around the Wells Reserve. A closer look at the census block group level indicates that there are pockets of relatively high poverty rates (upwards of 15% and potentially up to 75% in some cases) in the region of the Wells Reserve, and that these are largely located at a minimum distance of 5 miles from the Reserve. The area immediately surrounding the Reserve has very low poverty rates.

C-7. Institutional Cycles

Time is both a fixed resource and a key organizing tool for human behavior. Some cycles may be physiological (such as diurnal patterns); others institutional (permitted hunting seasons). Social cycles, such as the set of collective rhythms within a community or culture that organize its calendar, festivals, harvests, fishing seasons, business days, and so forth, significantly influence the distribution of critical resources.

Institutional cycles are critical to human ecosystem functioning, for they provide guidance and predictability to the ebb and flow of human action.

Here, we measure institutional cycles in terms of age distribution, since the relative proportion of children to elderly will influence the need for, flow and use of different resources in a community.

In Maine, counties with the highest ratios of children to seniors tend to be those where there are centers of population. In the region around the Wells Reserve, there are many census blocks with very high ratios. However, in the area immediately surrounding the Reserve, the rates tend to be much lower, particularly along the coast.

C-8. Energy

Energy is the ability to do work or create heat. Energy is a critical natural resource and is tremendously influential on social systems. The energy available to humans “limits what we can do, and influences what we will do” (Cottrell, 1955). Here, we have used commuting time as a proxy measure for energy consumption. Analysis of commuting data from the US census indicated that a majority of the 128.3 million commuters in the United States travel alone by car, and travel for between 15 and 45 minutes to get to work. The percentage of commuters traveling 15-45 minutes by census geography was measured to give a sense of relative energy consumption patterns.

In Maine, the percent of commuters falling in this category is higher in coastal and southern counties than in northern or inland ones. In the area around the Wells Reserve, with the exception of coastal block groups which exhibit lower rates, most block groups are home to between 51.2% and 79% of commuters traveling 15-45 minutes to get to work.

C-9. Informal Norms

Informal norms are the unwritten, and sometimes unspoken, rules that govern human behaviour. Informal norms are delivered to children as they are socialized; as we age, we continue to acquire expertise regarding structure and function of our social interactions. We are often unaware of informal norms until they have been violated. Here, we measure informal norms by determining the rate of single-parent households. Most single-parent households are, in fact, single-mother households: “Of all custodial parents, 85% were mothers and 15% were fathers” in 2000 (<http://www.parentswithoutpartners.org/Support1.htm>). Informal norms

around family structure and composition are changing in North American families.

In Maine, the distribution of single-parent households by county ranges from 22%-36.5%. Higher concentrations are distributed throughout the state. In the region and locale around the Reserve, the percentages of single-parent households are quite varied, ranging from 1.5%-69.5%. Higher concentrations are apparent in coastal block groups both north and south of the Reserve, and in centers of population inland.

D. Summary of Findings

The locale and region surrounding the Wells, ME National Estuarine Research Reserve is very complex on a number of different levels. The entire state of Maine is divided into towns (see Figure 2), each of which makes its own zoning rules, and each of which is self-governing through home rule. While this is very democratic approach to governance, it also makes regional planning and management very difficult. Most areas in this system are also on surface water supplies of drinking water. Thus the political structure of the region makes it very difficult to collectively protect drinking water supplies.

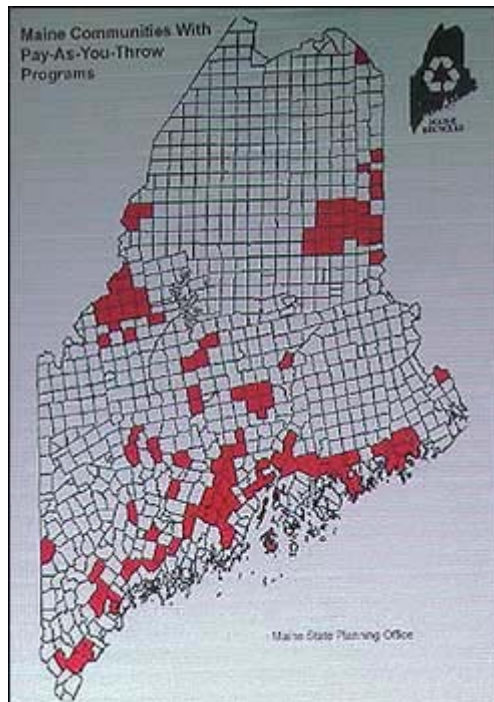


Figure 2. Maine Towns

In addition, the region is differentially inundated by seasonal residents in the summertime, as shown in Figure 3, below. There are a number of effects of this seasonal flux: the transient communities in the summer may or may not be interested in and feel that they have a voice in the management of the natural resources or other collective decisions in the area. Year-round residents may agree. There are also many landowners, according to Wells Reserve staff, who because they own second or summer homes in Maine, do not contribute to the local economy through income taxes. It is difficult to characterize the “community” of this area, as it is likely composed of many distinct and largely disconnected subgroups.

Town	Estimated Year-Round Pop.,2004	Add'l Seasonal Population	Total Population	Percent Seasonal Change
Kennebunk	11120	5600	16720	50.36
Kittery	9950	1620	11570	16.28
Ogunquit	1380	11010	28290	797.83
Wells	10290	24560	34850	238.68
York	13540	17400	30940	128.51

Figure 3. Percent Seasonal Population Change
(Data Source: Southern Maine Regional Planning Commission)

Additionally, the year-round residents are far from homogeneous. There is a wide distribution of wealth and poverty, education, population density, age – virtually all the variables mapped for this project vary widely across the region around the Reserve. However, because there does seem to be a concentration of educated and affluent retirees (or close to it) very near the Reserve, it is likely that the resources this group are or can be harnessed to support the Reserve both financially, and through volunteer activities.

There is no question that the structure of the communities within and between towns, and organizational structure within which this Reserve operates is complex. This community characterization, therefore, identifies

a need to conduct more studies to better understand, at a finer scale, the structure, function, and interaction among these communities.

E. Recommended Future Directions for Related Activities at the Wells, ME National Estuarine Research Reserve

The complexity of this system requires a more detailed look at the community dynamics. Thus, it is recommended here that the original social assessments identified by the NERR Reserve managers, staff, and their partner organizations, be carried out. In particular, the perceptions survey to determine whether and to what extent the local residents view the NERR site as part of their town or communities, and whether and how they distinguish between the National Estuarine Research Reserve and Laudholm Trust is an important next step.

A similar survey of summer residents and visitors to ascertain whether and to what extent the NERR site draws them to the area could also be conducted. This would allow Reserve managers, if desired, to target additional audiences for their education programs. It could be coupled with a visitor survey to determine the existing catchment of the Reserve, and results compared with those of the off-site community surveys.

An organizational network analysis to measure and map the relative position of the NERR among its many partner organizations would determine whether the Reserve can and/or should work more closely with other actors in the management regime. This would also provide a sense of to what extent formal organizations are working together across jurisdictional boundaries, despite the home rule system of governance.

The network analysis, coupled with an analysis of the policy framework in which land use planning and zoning are carried out in the region, would provide a comprehensive understanding of the complex management structure of the system.

A broad analysis of socioeconomic conditions in the SWIM project's watersheds could be carried out on the same scales as this community characterization. This would provide a broadbrush indication of the comparative demographic and socioeconomic conditions in the region, and could be coupled with biophysical data to detect trends and relationships among these sets of parameters.

F. Maps of Socioeconomic Characteristics: Wells, ME National Estuarine Research Reserve Map 1: Population

Human Ecosystem Framework* Variable: Population

Indicator/Measure: Number of People per Census Geography (Census 2000, 100% sample data)

This set of maps depicts absolute population at each level of geography: nation, state, region, and locale. The area of each circle symbol is proportional to the number of people in each state, county or block group, the absolute number of people represented by each circle differs by map. Maine is among the least populous states in the nation (Census 2000 pop. 1,274,923); however the counties in the vicinity of the Wells NERR are quite populous, and are each home to between 200,000 and 500,000 people. There are several proximate centers with populations of 500,001-1,500,000. Massachusetts and New Hampshire are populous states, and the centers of population in each are located close to the southern region of Maine; hence close to the Wells NERR. In the region around the Reserve, there are higher populations in coastal census block groups than inland ones, as well as a dense concentration of people both on the coast and inland to the south.

Table 1.1 Approximate Distance in Miles

City or Village	Distance from Wells NERR	Population	City or Village	Distance from Wells NERR	Population
Augusta	87	18,960	Kennebunk	5	10,478
Boston	77	596,141	Kittery	21	9,543
Beverly	17	6,353	Rochester	43	41,375
Concord	80	16,993	Sanford	14	20,806

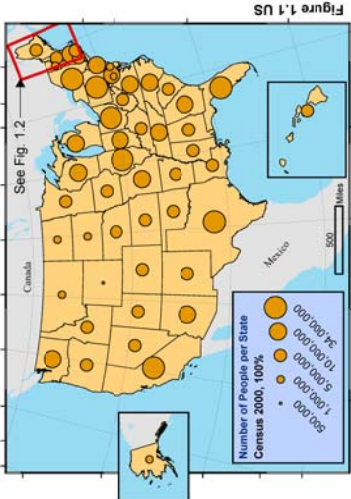


Figure 1.1 US

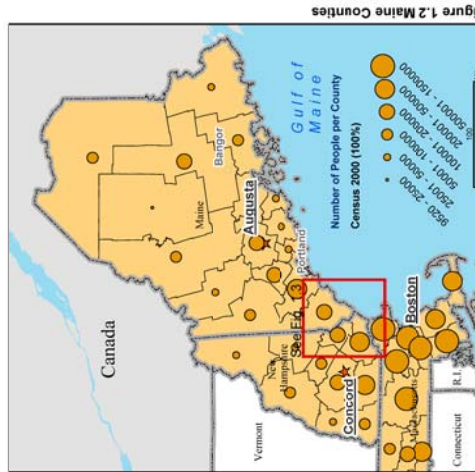


Figure 1.2 Maine Counties

Original maps produced in color by Reed McLean, C-Zone Consulting, Ltd. and Shawn Dalton, GIS 3605 AB, Inc.
 *Maine population data from the U.S. Census Bureau, 2000
 *Maine, U.S. Census Bureau, 2000
 Map projection: Adobe earth area

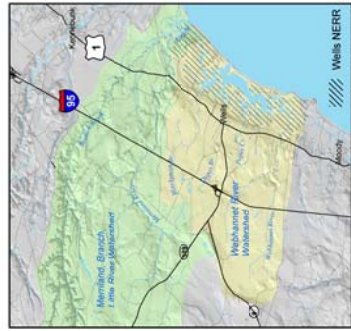


Figure A

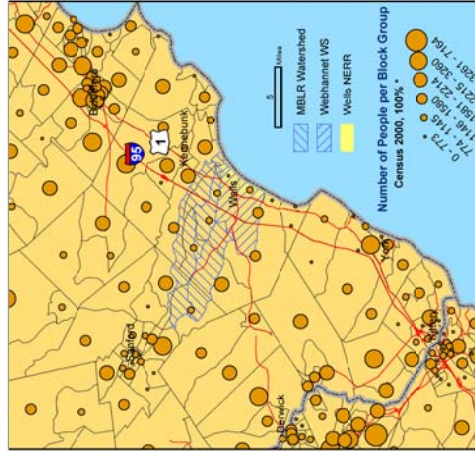


Figure 1.3 Wells NERR Region

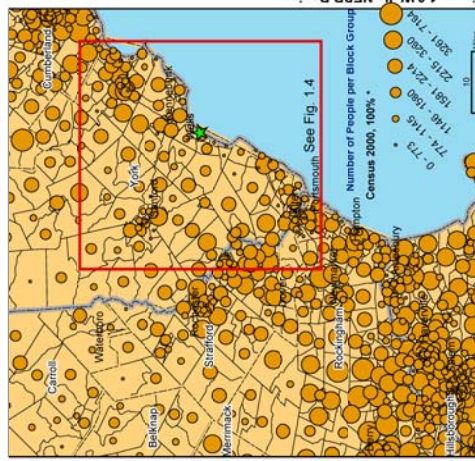
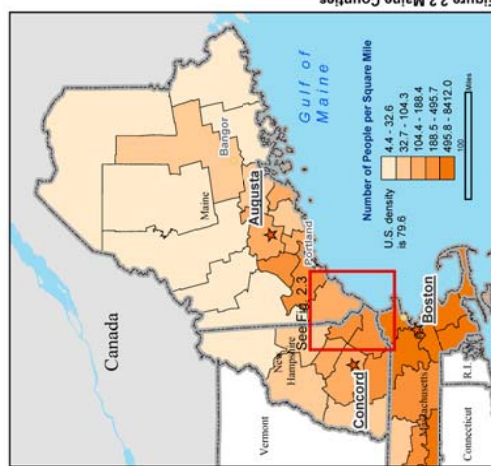
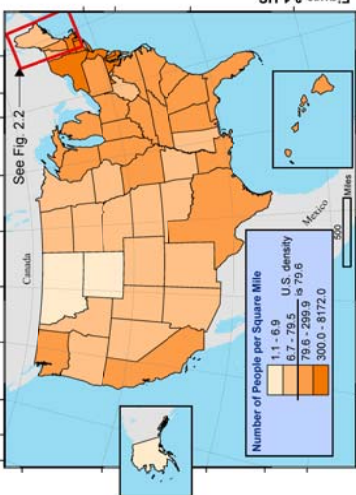


Figure 1.4 Wells NERR Locale

Case Study: Wells NERR, Maine

Map 2: Population Density



Original map produced in color by Reed Malin, C-Store Consulting, Ltd. and Sharm Daboin, ©2000 MB, Inc.
 Data Source: U.S. Census Bureau, Census 2000
 County boundaries from the U.S. Census Bureau
 *Maine, U.S. F-100, U.S. and Bureau, Inc., ©2000
 Map projection: Albers equal area

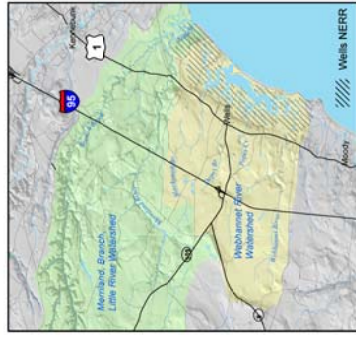
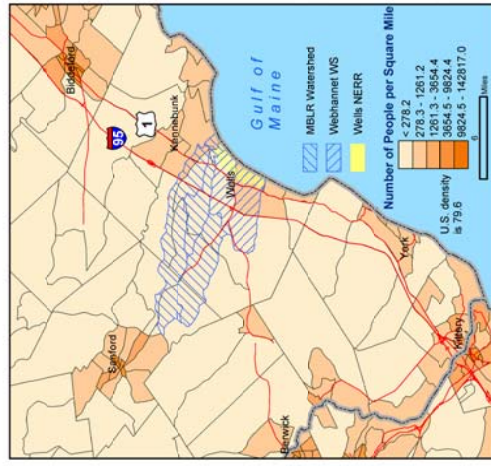
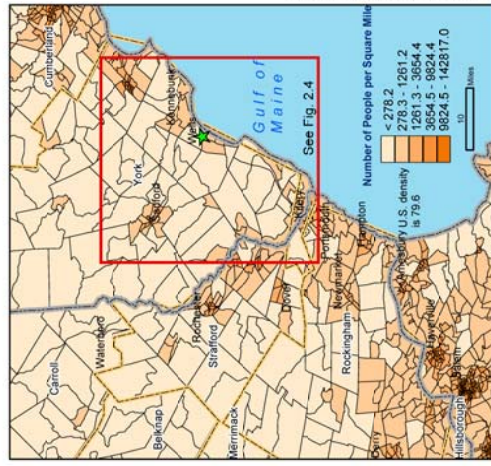
Human Ecosystem Framework* Variable: Population

Indicator: Density

Measure: Number of People per Square Mile (Census 2000, 100% sample data)

The northeastern United States is the most densely populated region in the US, with densities in many cases upwards of 3000 people per square mile. According to 2000 Census statistics, the average population density in Maine was 41.3 people per square mile, or approximately half the national average. However, by county this figure ranges from as low as 4.4 to as high as 8412 people per square mile. In general, population density in Maine is very low in the northwestern counties in the state, and increases in coastal and southern counties.

The county level map shows that the population density around the Wells NERR ranges from 188.5-495.7 people per square mile. However, the regional and locale maps tell a different story, reflecting the concentration of settlement near the coast: the census block groups in the region of the Reserve include densities ranging from 3654 - 8924 people per square mile. Block groups immediately north and south of the Reserve are home to between 278 and 1261 people per square mile. These numbers include only the annual resident population. Population density in this region increases dramatically during the summer months, as tourists and summer residents enter the area.



Sheet Two

Case Study: Wells NERR, Maine

Map 3: Population Change

Human Ecosystem Framework Variable: Population

Indicator: Population Change

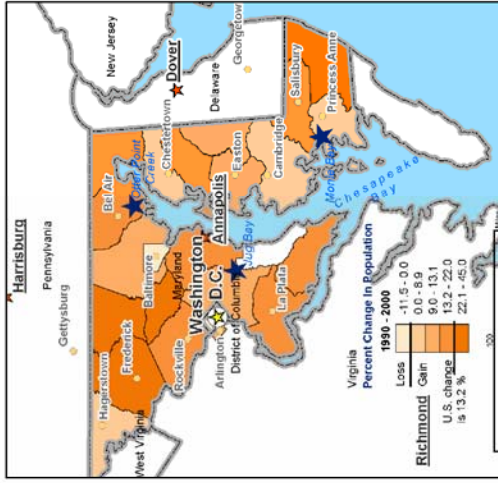
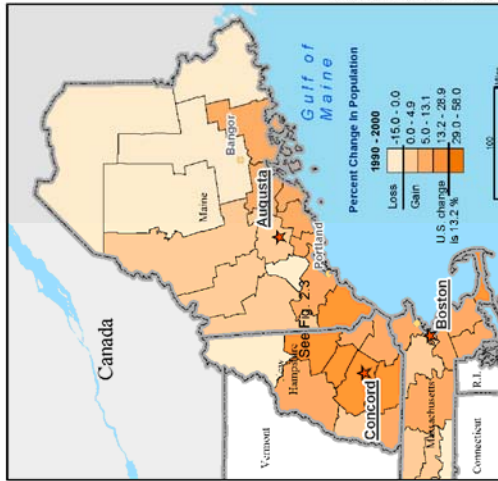
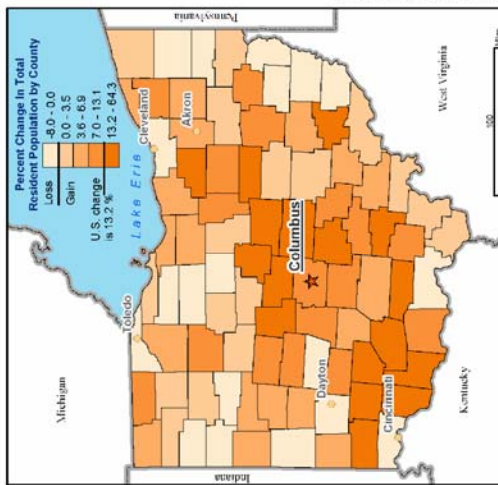
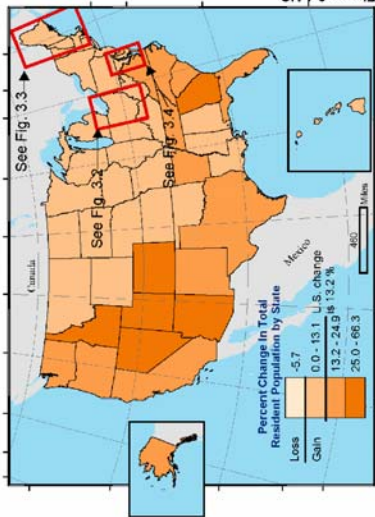
Measure: Percent Change in Total Resident Population by Census Geography, between 1990 and 2000 (Census 1990, Census 2000, 100% sample data)

Change in population at the national level, by state, varies from a net loss of population of 5.7% (District of Columbia) to an increase of as much as 66.3% (Nevada). All states with the exception of the District of Columbia experienced a net increase in population, although in some cases this increase was marginal. The national average is an increase of 13.2%. There is an obvious pattern of higher rates of population increase in the southern and western states, ranging from 13.2% - 66.3%. The northern and central states grew in population less dramatically, between 0.0% and 13.1%.

The population of Ohio grew by 4.7%, Kentucky by 7.7%, Michigan by 6.9%, and West Virginia by 0.8%. In Ohio, counties in the southern and central regions of the state increased in population by between 7.0 and 64.3%. In the counties around the Old Woman Creek NERR site, however, the population actually decreased by 1.3% (Cuyahoga), or grew very little - 3.6% in Erie County, 5.8% in Huron County, and 5.0% in Lorain County.

In Maine, while overall the state experienced an increase in population of 3.8%, there is an obvious decrease in population in the northernmost counties - up to 13% in some cases. The coastal and southern counties in Maine increased in population between 1990 and 2000 by as much as 56.0%. The counties in the vicinity of the Wells NERR are among those with the highest growth rates. The population of York County, where the Wells NERR is located, grew by 13.5%. The population of neighboring Massachusetts increased by 5.8% overall, while New Hampshire grew by 11.4%.

Maryland's population increased by 10.8%, Virginia's by 14.4%, Delaware's by 17.8%, and Pennsylvania's by 3.4%. The increase in population in Maryland, by county, ranged from 0.0% - 45%, with the county where the Jug Bay NERR site is located, Calvert, having the highest growth rate in the state. The populations of nearby Prince George's County grew by 9.9% and Anne Arundel by 14.6%. Baltimore City, near the Otter Point NERR site, lost 11.5% of its population, while surrounding Baltimore County gained 8.9%. Harford County, where the Otter Point Creek site is located, gained 20.0%. The counties in the vicinity of the Monticello Bay NERR site experienced a much broader range in population growth: 5.6% (Somerset); 1.2% (Dorchester); 13.9% (Wicomico); 32.9% (Worcester).



Original maps produced in color by Real Measures, C-Zone Consulting, Ltd. and Storm Data, ©1995-1997, Inc. Digitized and colorized by NOAA Coastal Services Center at http://www.csc.noaa.gov/marine_products/census_data_and_mapping_tool. Map prepared: April 2004

Case Study: National Estuarine Research Reserve

Sheet Three

Map 4: Age

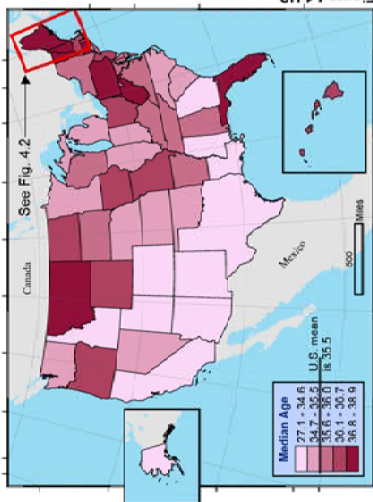


Figure 4.1 US

Human Ecosystem Framework* Variable: Age

Indicator/Measure: Median Age of Total Population (Census 2000, 100% sample data)

The median age of the people in Maine, at 33.9 years, is close to the national median of 33.3 years. This means that half of the people in the state are older than 33.9 years, and half are younger. A concentration of counties with younger populations is evident in the southern portions of the state, where the populations are also denser. Several inland and northern counties, and two coastal counties near Augusta, have populations with a median age markedly higher than both state and national medians, ranging from 39-45.

In the counties near the Wells NERR, the median age ranges from 31.7 - 39.3. However, in the census blocks in the region around the Reserve, the median age is much higher, between 40.9 and over 60. This pattern extends throughout the coastal census block groups for at least 20 miles in both directions from the Reserve. This pattern also extends inland from the Reserve along an east-west axis. This indicates that there is a large cohort of people in the region of the Reserve who are either retired or approaching retirement age.

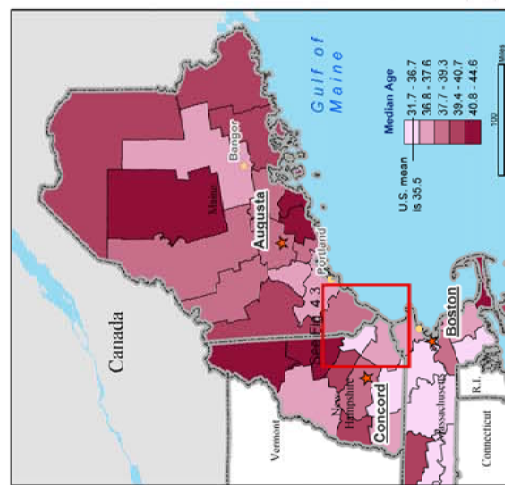


Figure 4.2 Maine Counties



Digital maps produced in cooperation with NOAA Coastal Services Center, 6150 NE 2nd Ave., Miami, FL 33136. Data provided by the U.S. Census Bureau, 445 Michigan Avenue, NE, Atlanta, GA 30333. © 2005 NOAA Coastal Services Center. All rights reserved. NOAA is a registered trademark of the U.S. Department of Commerce. NOAA logo is a registered trademark of the U.S. Department of Commerce. NOAA logo is a registered trademark of the U.S. Department of Commerce. NOAA logo is a registered trademark of the U.S. Department of Commerce.

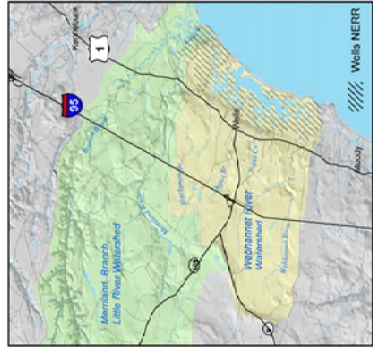


Figure A

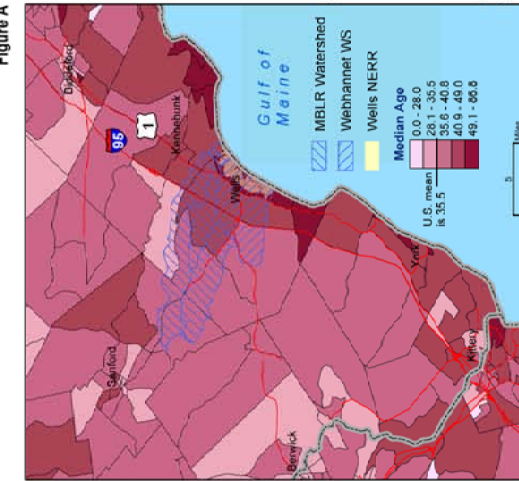


Figure 4.3 Wells NERR Region

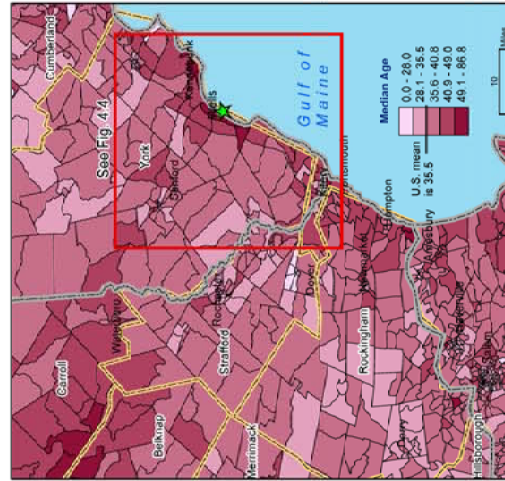


Figure 4.4

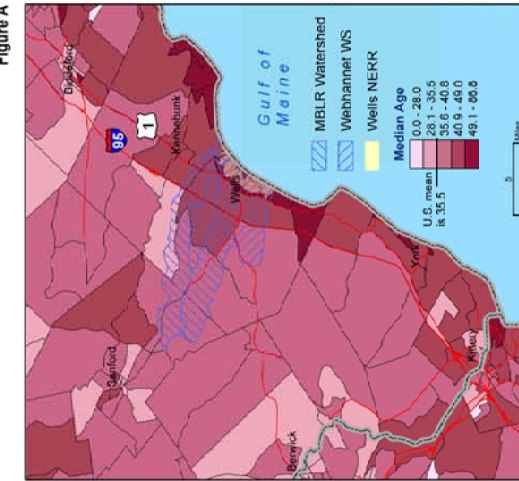
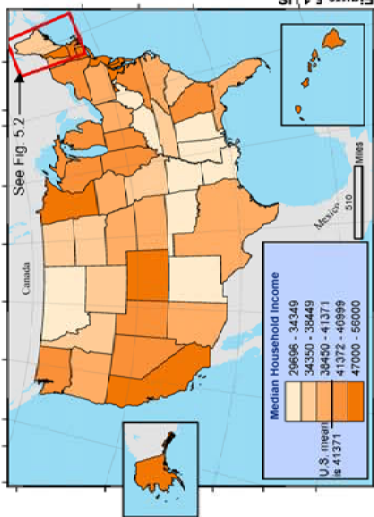


Figure 4.4 Wells NERR Locals

Sheet Four

Case Study: Wells NERR, Maine

Map 5: Capital



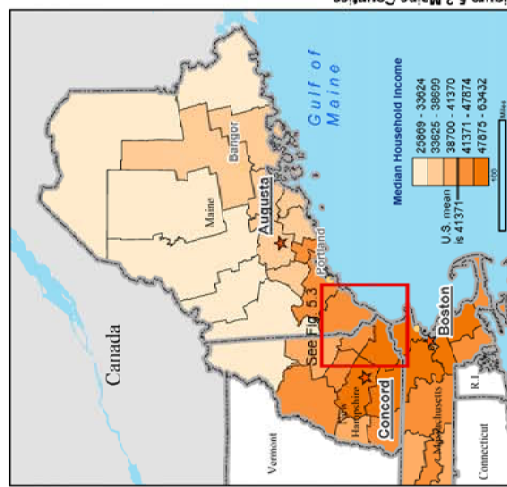
Human Ecosystem Framework* Variable: Capital

Indicator/Measure: Median Household Income (Census 2000, 100% sample data)

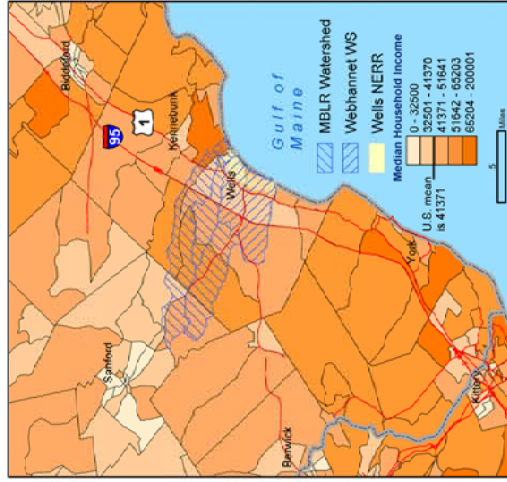
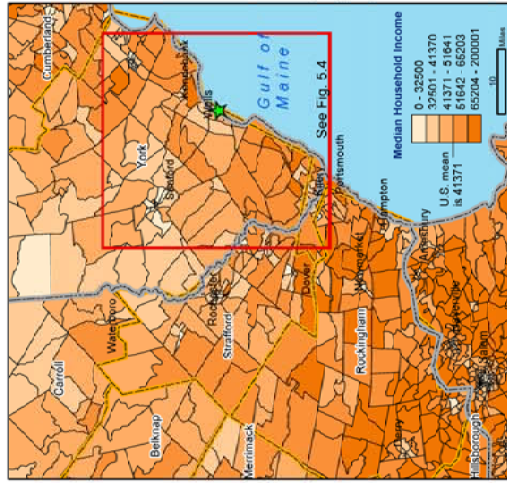
The median household income in the United States is just over \$41,000. This means that half the households in the country earn more than this amount and half less. In many states in the northeastern and southwestern US, the median household income is substantially higher than the national median. In many southern states, the opposite is true.

In Maine, there is a strong pattern of counties with a median household income well above the national median of \$41,371 and the state median of \$37,240 (Census 2000). The southernmost coastal counties have much higher median incomes ranging from \$47,875 - \$63,432, while the northernmost and inland counties generally have lower median incomes.

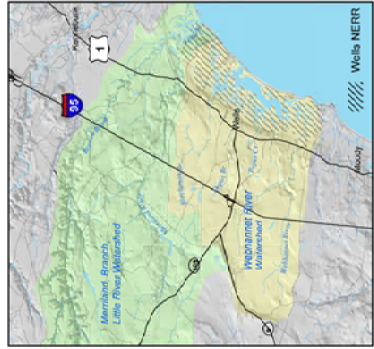
There is a concentration of wealth in the region south of the Wells NERR, as indicated by the density of census block groups with median incomes ranging from \$65,204-\$200,001. In the locale of the Reserve, however, the median incomes are more diverse, and range from below \$32,500 to \$200,001.



Original map produced in color by Bob McLean, C.Z. McLean Consulting, Ltd. and Sharon Dalton, ©1995/98, Inc.
Data Source: U.S. Census Data Bank, Census 2000
Geography: NOAA Coastal Services Center at <http://www.coast.noaa.gov/geospatial> provides services and mapping tools.
Map projection: Albers equal area



Case Study: Wells NERR, Maine



Sheet Five

Map 6: Class

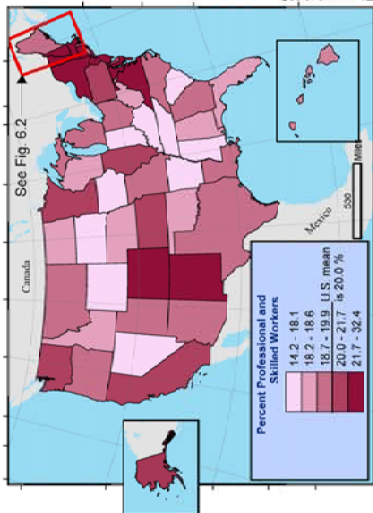


Figure 6.1 US

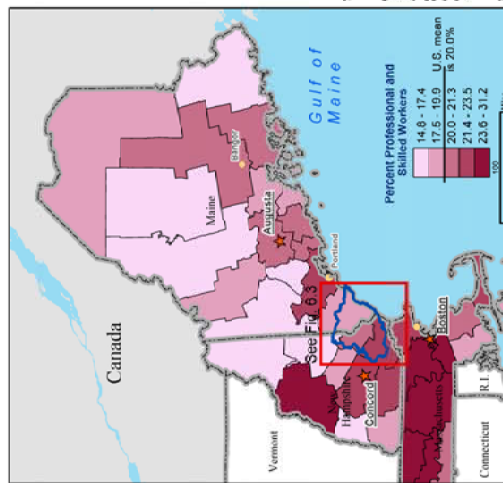


Figure 6.2 Maine Counties



Digital maps produced in cooperation with NOAA Coastal Services Center and the Maine State Office of Information Technology. Data provided by the U.S. Census Bureau, U.S. Department of Commerce, Bureau of Economic Analysis, and the U.S. Department of Labor, Bureau of Labor Statistics. © 2005 NOAA Coastal Services Center. All rights reserved. NOAA is a registered trademark of the U.S. Department of Commerce. NOAA logo is a registered trademark of the U.S. Department of Commerce. NOAA text is a registered trademark of the U.S. Department of Commerce. NOAA logo and text are registered trademarks of the U.S. Department of Commerce. NOAA logo and text are registered trademarks of the U.S. Department of Commerce.

Human Ecosystem Framework* Variable: Class

Indicator: Percent Professional and Skilled Workers (Census 2000, 100% sample data)
Measure: Percent Population Age 15 - 65 Working in Professional or Skilled Jobs

This set of maps depicts the percentage of people in the workforce who are employed in professional or skilled occupations. Broadly, these include doctors, lawyers, professors, computer specialists, etc. In the United States, between 14.2-32.3% of the workforce by state is employed in professional/skilled occupations, with most states on the higher end close to 25%, and an overall national average of 19.9%.

In Maine, these percentages range from 14.8% - 31.2%, with a concentration of professional and skilled workers in coastal counties. These coincide with concentration of population in some cases, but not in others. In the region and locale around the Wells NERR, there is a concentration of skilled and professional workers to the south of the Reserve, as well as immediately surrounding it. The concentration of skilled and professional workers diminishes in the census block groups just inland of the Reserve.



Figure A

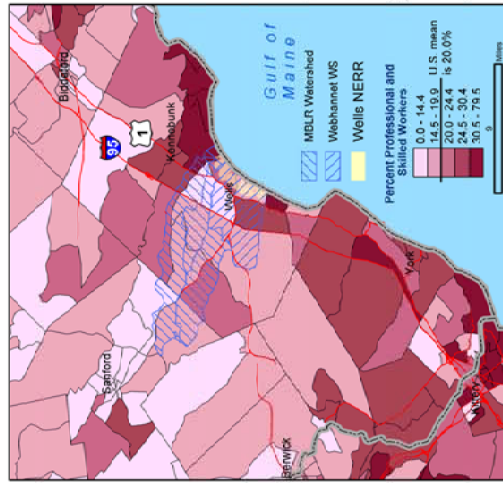


Figure 5 Wells NERR Locale

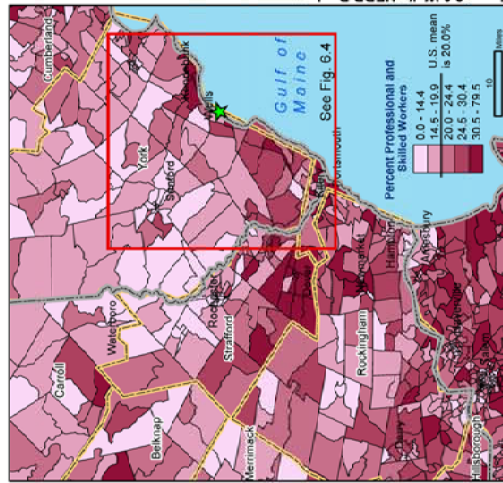
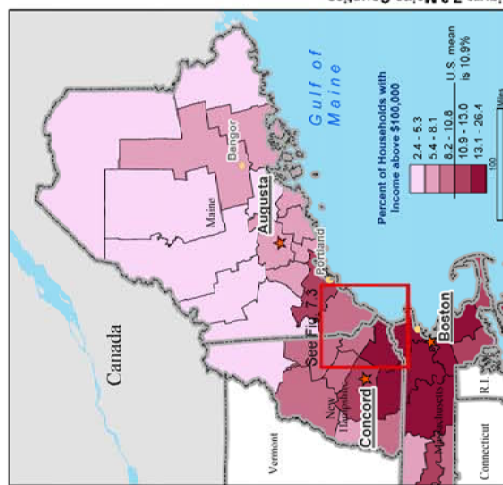
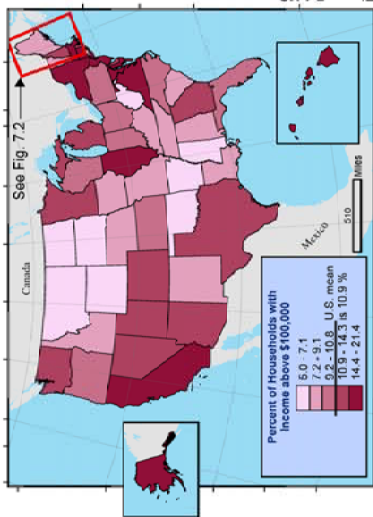


Figure 5 Wells NERR Region

Map 7: Power



Original maps produced in collaboration by Reed Kukner, C3One Consulting, Ltd. and Sherril Dalton, ©1995 NBI, Inc. Geospatial data provided by NOAA Coastal Services Center at <http://www.csc.noaa.gov/arcgis> provides census data and mapping tools. Map projection: Albers equal area.

Human Ecosystem Framework* Variable: Power
Indicator/Measure: Percent of Households with Income over \$100,000 (Census 2000, 100% sample data)

Power can be defined as the ability to influence the allocation and distribution of resources, and is often associated with one's financial status. In these maps, power is displayed as a function of income, with those households earning \$100,000 per year or more considered to be more influential than those of lower income. At the national level, power is concentrated on our coasts, in particular the northeast. The national average is 10.9% of households in this annual income range.

In Maine, the concentration of households by county with this income level displays a wider range (2.4-26.5%) than the national data (5.0-21.5%), with a pattern of higher concentration of power in the centers of population in the southern counties of the state.

In the region around the Wells NERR, there are substantially higher concentrations of households with income levels of \$100,000 – up to 100% in some cases. Census block groups inland of the reserve have somewhat lower concentrations of this income bracket, however, those along the coast, and to the south are more likely to have between 20.1% and 100% of households with an income of \$100,000 or more. The map of the Reserve locale displays the same pattern.

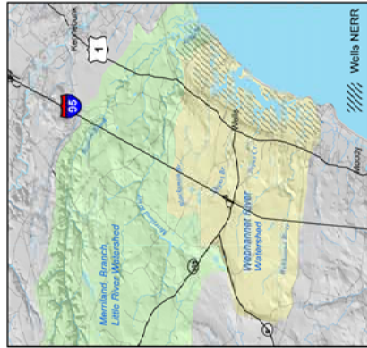


Figure 7.3 Wells NERR Region

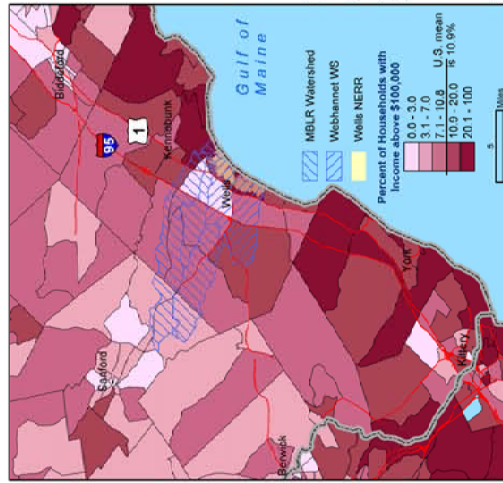


Figure 7.4 Wells NERR Locale

Case Study: Wells NERR, Maine

Map 8: Wealth

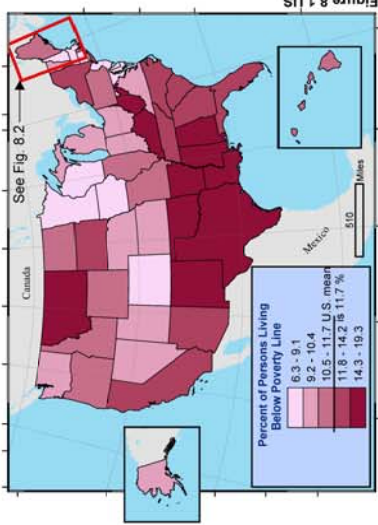


Figure 8.1 US

Human Ecosystem Framework* Variable: Wealth

Indicator/Measure: Percent Persons Living Below Poverty Line (Census 2000, 100% sample data)

Nearly 36 million people in the United States are living below the poverty line, defined as an annual income of \$18,660 or less for a family of four. In most of the southern states, 14.3-19.3% of the population is living below the official poverty line. In Maine, there is a clear pattern of high poverty counties in the northern part of the state, where most counties have poverty rates ranging from 11.7% - 19.5%.

The counties around the Wells NERR have relatively low average poverty rates; most range from 2.5% - 11.5%. The block groups immediately adjacent to the reserve mimic this county level pattern. There are a few census tracts with higher rates of poverty (15% - 75%) inland, and to the north and south of the reserve.

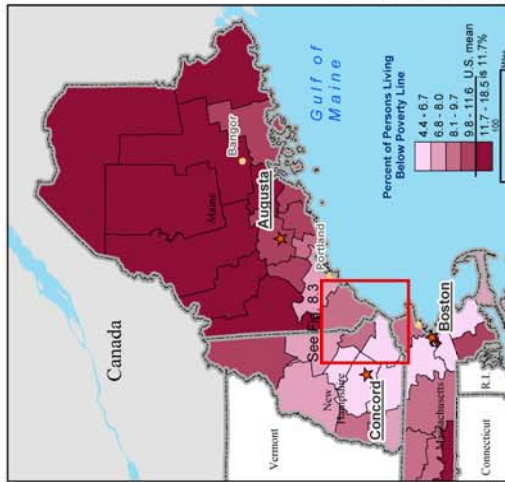


Figure 8.2 Maine Counties

Original maps produced in color by Reed McLean, C-Zone Consulting, Ltd. and Sharan Dalton, © 2005 NEI, Inc.
 Data Source: U.S. Census Bureau, Census 2000
 *Maple, G.E., Fone, J.E. and Borch, Wm. R., Jr. (2004).
 Map projection: Albers equal area



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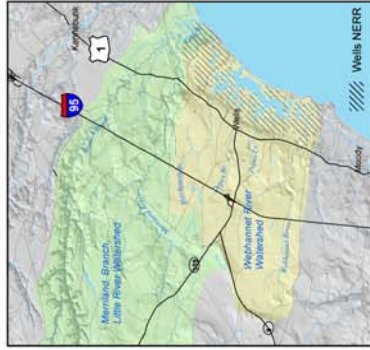


Figure A

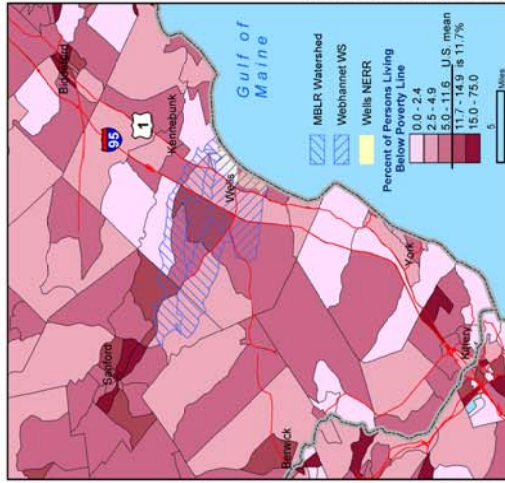


Figure 8.4 Wells NERR Locale

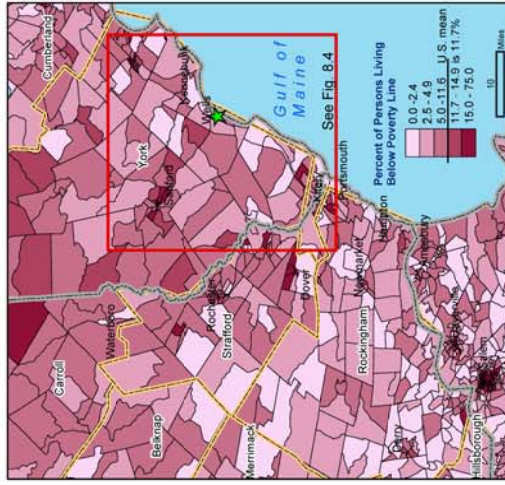


Figure 8.3 Wells NERR Region

Map 9: Institutional Cycles

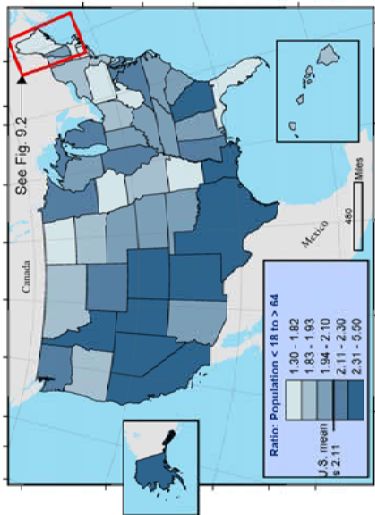


Figure 9.1 US

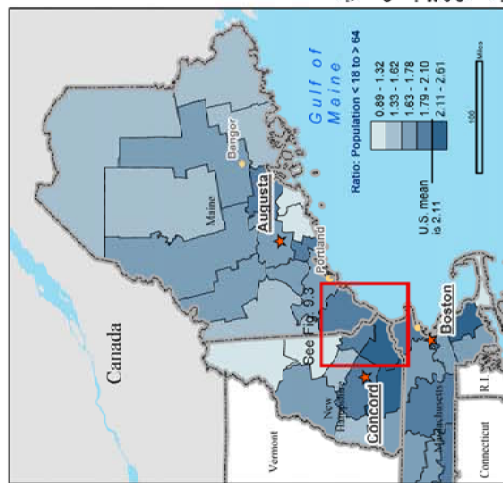


Figure 9.2 Maine Counties

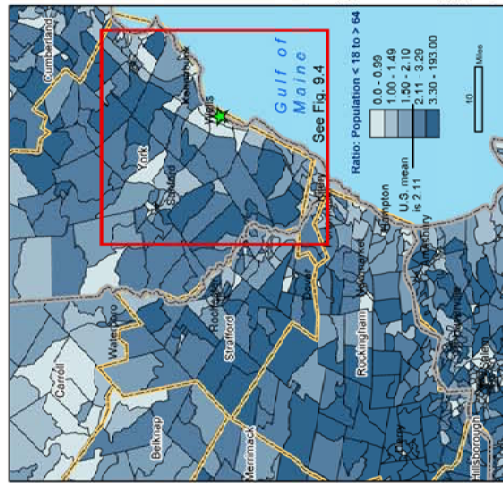


Figure 9.3 Wells NERR Region

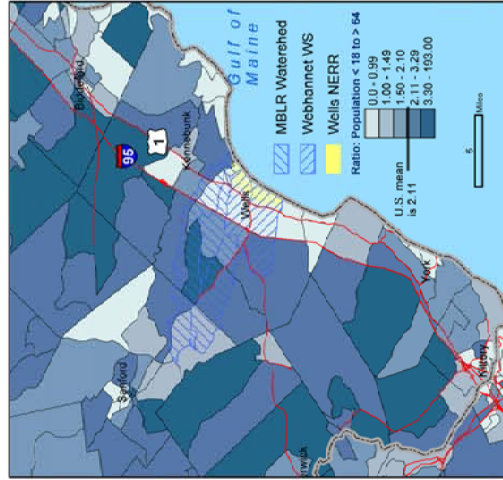


Figure 9.4 Wells Watershed Locale

Human Ecosystem Framework* Variable: Institutional Cycles

Indicator: Age Distribution
Measure: Ratio of population age <18 to age > 64 (Census 2000, 100% sample data)
 Institutional cycles are influenced by the relative distribution of age within a population. These maps display the ratio of young persons (age <18) to the elderly (age >64) by census geography. In the southwest United States, there is a relatively high ratio of young people to older people, ranging from 2.31 - 5.5; in the northeast and central states, the ratio is lower, ranging from 1.3 - 1.93. The national average is 2.11.
 In Maine, counties with the highest ratios tend to be those containing centers of population, where the range in ratios is 2.11-2.61. Exceptions to this pattern are the coastal counties near Augusta, where the ratios are 0.89-1.32 and inland counties northwest of Portland.

In the census block groups in the region of the Wells NERR, there are much higher ratios, ranging from 1.5-193.00, particularly in the centers of population to the south. Along the coast and along an east-west axis directly inland of the reserve, however, the ratios are lower, from 0.00-1.49.
 The census block groups in which the Wells Reserve is located is among those with the lowest ratio of children to elderly.

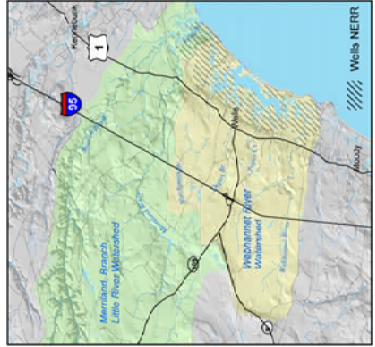


Figure 9A

Sheet Nine

Digital maps produced in 2005 by Reed Moulton, CZone Consulting, Ltd. and Stuart Dixon, ©2005 NRI, Inc. Geographical Accuracy: NOAA Coastal Services Center. Census data from the U.S. Census Bureau. NOAA Geographic Information System. NOAA Coastal Services Center. All other names, logos, and trademarks are the property of their respective owners. *Maple, G.E. Fries, J.E. and Bush, W.R., Jr. (2005). High population. *Adapted from* [unclear]

Map 10: Energy

Human Ecosystem Framework* Variable: Energy

Indicator: Time travelled to work
Measure: Percent Commuters Traveling 15-44min to Work (Census 2000, 20% sample data)
 Every day in the United States, approximately 128.3 million people get up and go to work. Some (3.3%) work at home; the vast majority, however, drive to work alone (76%). The time travelled to work varies within and between regions. In many eastern and southern states, 15-25% of commuters drive over 45 minutes to get to work. National data indicate that in the Midwest and central northern states, 37-56% of commuters drive less than 15 minutes to get to work. Most commonly, however, Americans drive between 15 and 45 minutes to reach their place of employment; by state, the national average percent of commuters driving 15-45 minutes to work is 51.2%.

Combined the average percentage of commuters travelling 15-25 minutes to work in Maine, Massachusetts, and New Hampshire, is 46.8%. The Wells NERR is within a 45 minute drive of some area in each of these states. In the region of the Reserve, 51% of commuters drive 15-45 minutes to work. Again, these numbers include commuters in Maine, New Hampshire, and Massachusetts. However, as many as 79% of commuters in the region around the Reserve travel for this amount of time to get to work.

In the locale of the Reserve itself, a higher proportion of census tracts are home to commuters travelling 15-45 minutes to get to work. Most of this area fall within the 61-79% quantile. In fact, in the density populated areas as well to the south of the Reserve, up to 44% of commuters travel over 45 minutes to get to work (data not shown).

Means of Transportation		United States	Maine	Means of Transportation	United States	Maine
Drive alone	76%	78.60%	Walk	3.30%	4.00%	0.00%
Carpool	12%	11.30%	Other	1.20%	0.70%	0.70%
Public transportation	4.70%	0.90%	Worked at home	3.30%	4.40%	4.40%

Table 10.1 Means of Transportation

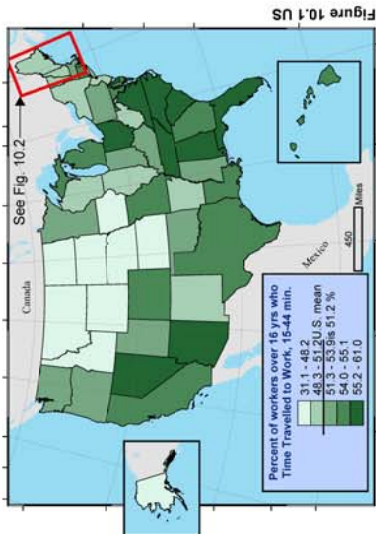


Figure 10.1 US

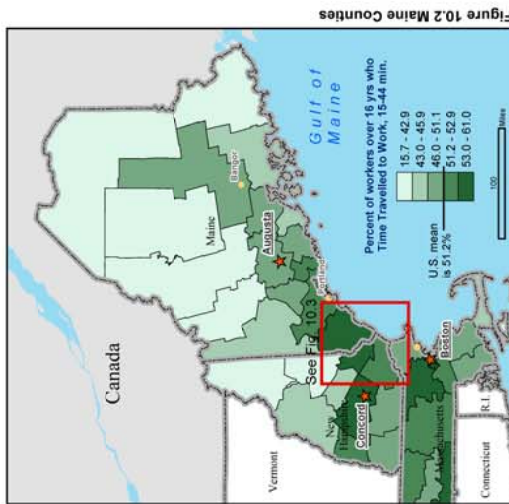


Figure 10.2 Maine Counties

Original maps produced in color by Reid McKean, C-Zone Consulting, Ltd. and Shawn Dixon, ©1995 NB, Inc.
 Data Source: U.S. Census Bureau, Census 2000
 *Maine, O.E. Focke, J.E. and Burch, Wm. R., Jr. (2004)
 Map projection: Albers equal area

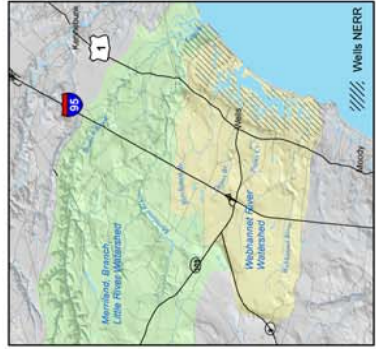


Figure 10.3 Wells NERR Region

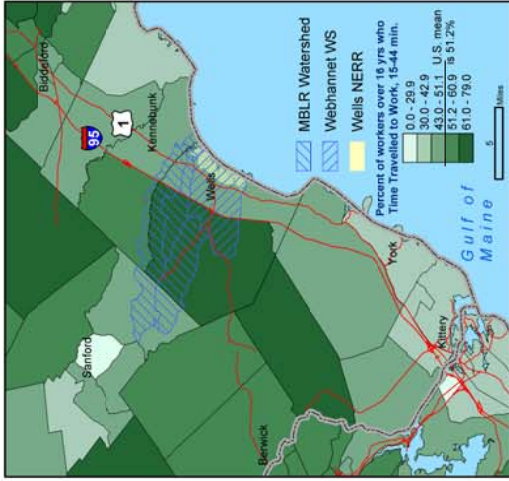
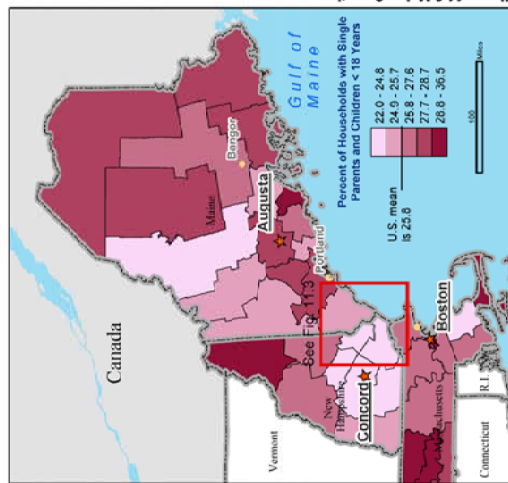
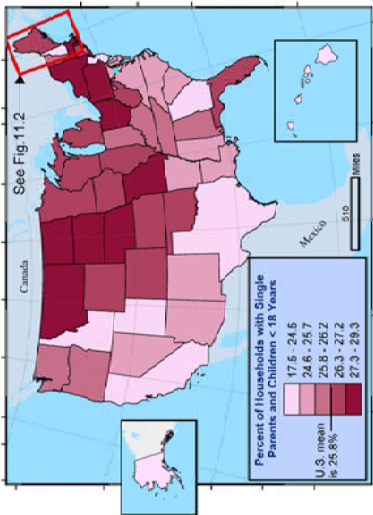


Figure 10.4 Wells NERR Locale

Case Study: Wells NERR, Maine

Map 11: Informal Norms



Human Ecosystem Framework® Variable: Informal Norms

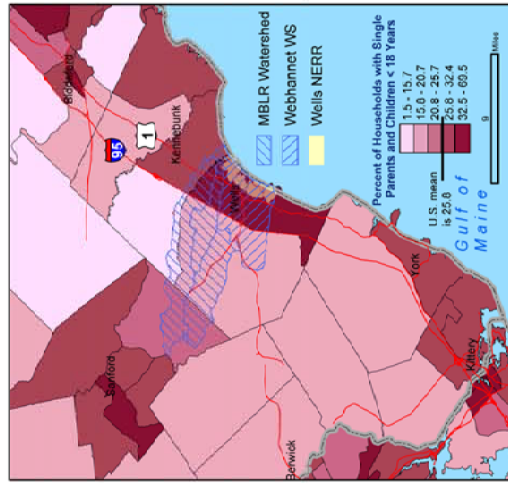
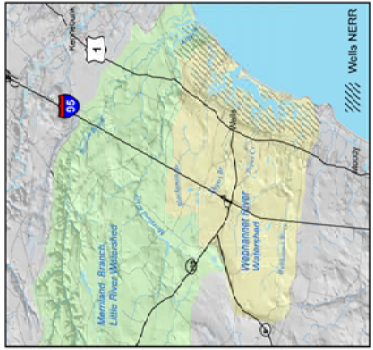
Indicator: Percent Single-Parent Household

Measure: Percent of households with own children under 18 years living at home, headed by single parent (male or female)

In the United States, 25.8% of households with children under 18 years old living at home are headed by single parents. These include not only divorced parents, but also those who were never married, as well as widowed persons. There is a higher concentration of single-parent-headed households in the north central and northeastern states, ranging from 25.8% to 29.3%, than in the south and west (with the exception of Florida), ranging from 17.5% to 23.7%.

In Maine, these overall rates are somewhat higher, by county, ranging from a low of 22% to a high of over 36%, and there is no clear spatial pattern to these numbers. There is a higher concentration of single-parent-headed households in the coastal counties mid-State, and in the northern counties.

In the region and locale around the Wells NERR, these percentages are more varied, ranging from 1.5% to 69.5% per census tract. No clear spatial pattern emerges at the regional or local level in these percentages, with the exception of a relatively high density of 32.5% to 69.5% directly along the coastline, (including the census tract containing the Reserve) and lower rates immediately inland.



Sheet Eleven

Digital maps produced in color by Reed Mullan, CZone Consulting, Ltd. and Sharm Dalton, ©2000 NEI, Inc.
 Geographical data provided by NOAA Coastal Services Center at http://www.noaa.gov/ncsc provides census data and mapping tools.
 *Madden, G.E. Fines, J.E. and Bush, W.R., Jr. (2004).
 Map projection: Albers equal area



Case Study: Wells NERR, Maine

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