

TRENDS IN THE DEMOGRAPHICS OF HUMAN POPULATION & THE MASSACHUSETTS MARINE ECONOMY

1. DEMOGRAPHICS OF HUMAN POPULATION TRENDS

Using the U.S. Census data from 1970 through 2000, we examined three decades of changes in the Massachusetts coastal population. In Massachusetts there are 78 coastal cities and towns located in nine counties and data are summarized for these municipalities. These represent what we mean by the “coastal population.”

The Commonwealth’s population, as a whole, grew by 11.6%, or by 659,927 people in

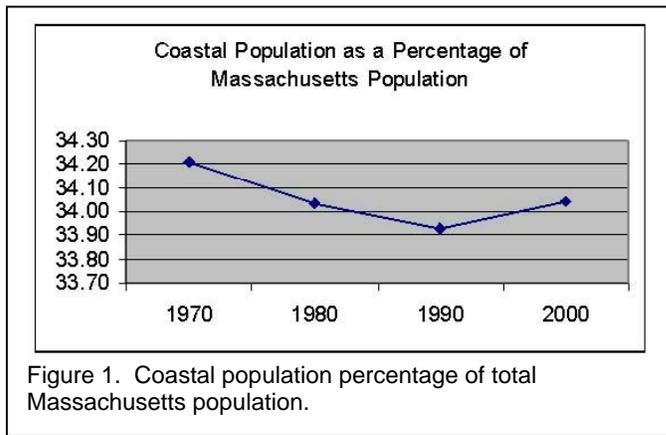


Figure 1. Coastal population percentage of total Massachusetts population.

the thirty-year time frame of 1970-2000. There was minimal growth (0.8%) in the first decade (1970-1980) but in the last two decades, population growth has increased to 4.9% and 5.5%, respectively. The population growth in all coastal communities basically mimicked overall state population increases, growing at slightly slower rates (11.0% in the thirty year period, and 0.3% in the 70s, 4.5% in the 80s, and 5.9% in the 90s).

In Massachusetts, the coastal community population in the year 2000 was a third of the total Massachusetts population over the last three decades this figure has remained constant. (Figure 1).

County	Population Change 1970-2000	Percent Change 1970-2000	Total 2000 population
Suffolk	-45383	-6.2	689,807
Plymouth	80633	56.9	222,430
Norfolk	-2606	-1.2	209,164
Nantucket	5746	152.2	9,520
Middlesex	-4448	-10.5	38,037
Essex	22467	5.6	420,364
Dukes	8870	145.0	14,987
Bristol	24318	7.8	335,003
Barnstable	125574	129.9	222,230
Total Coastal	215171	11.0	2,161,542
Massachusetts	659927	11.6	6,349,097

A more detailed picture emerges by examining the data on a coastal community-by-county basis. In Massachusetts there are nine coastal counties: Barnstable, Bristol, Dukes, Essex, Middlesex, Nantucket, Norfolk, Plymouth and Suffolk with these counties there are 78 coastal cities or towns. Barnstable (15 communities), Dukes (7 communities) Nantucket (1 community) and Suffolk (4 communities) Counties are entirely coastal counties. The remainder, Bristol, Essex, Middlesex, Norfolk and Plymouth, have 13, 19, 15 and 13 coastal communities respectively as

defined by the Massachusetts Coastal Zone Management Plan. In the year 2000, the largest coastal county was Suffolk with 689,807 people and the smallest was Nantucket with 9,520 people. As shown in Table 1, the year 2000 populations of the other coastal counties fall somewhere in between.

In the last thirty years, Nantucket has had the highest growth percentage (152.2%), while Middlesex's coastal community has experienced a decreasing population of -10.5 % (Table 1). Many of the other coastal counties have had different growth experience relative to the average statewide growth of 11% over the 1970-2000 period: Suffolk - 6.2%; Plymouth 56.9%; Norfolk -1.2%; Essex 5.6%; Dukes 145.0%; Bristol 7.8%; and Barnstable 129.9%.

Examining the number of people gives a slightly different perspective (Table 1). Barnstable County grew by 125,574 people in the last thirty years, and Plymouth County's coastal communities grew by 80,633. Bristol County's coastal communities grew by 24,318 people and Essex County's coastal communities grew by 22,467. Duke and Nantucket Counties grew by 8,870 and 5,746 people, respectively. In the last thirty years, Suffolk, Norfolk and Middlesex Counties' coastal communities all lost population; 45,383; 2,606 and 4,448 respectively.

Table 2. Population change (number and %) by decade for coastal communities of Massachusetts.

County	Population Change 1970-1980	Percent Change 1970-1980	Population Change 1980-1990	Percent Change 1980-1990	Population Change 1990-2000	Percent Change 1990-2000
Suffolk	-85048	-11.57	13764	2.12	25901	3.90
Plymouth	43584	30.74	17041	9.19	20008	9.88
Norfolk	-2064	-0.97	-4037	-1.93	3495	1.70
Nantucket	1313	34.79	925	18.18	3508	58.35
Middlesex	-5290	-12.45	-1484	-3.99	2326	6.51
Essex	-12168	-3.06	11032	2.86	23603	5.95
Dukes	2825	46.18	2697	30.16	3348	28.77
Bristol	11813	3.80	10034	3.11	2471	0.74
Barnstable	51269	53.04	38665	26.14	35640	19.10
Total Coastal	6232	0.32	88637	4.54	120300	5.89
Massachusetts	47923	0.84	279332	4.87	332672	5.53

When population levels are examined by decade, even finer details can be seen (Table 2). From 1970-1980, the urban counties, Suffolk, Norfolk Middlesex and Essex, lost population. Number-wise and percentage-wise, the largest population growth along the coast occurred in Barnstable and Plymouth Counties (51,269, or 53.0%, and 43,584, or 30.7%, respectively). In the eighties, Middlesex and Norfolk lost population, the other counties grew with Dukes County leading the way percentage wise (30.2%) and Barnstable and Plymouth Counties leading the way numerically (38,665 and 17,041). In the nineties, all coastal counties experienced growth. Nantucket and Dukes Counties experiencing the most percentage wise 58.3% and 28.8 %, respectively. Numerically, Barnstable leads the coastal counties with a 35,640-person increase in population, Suffolk

(25,901), Essex (23,603) and Plymouth (20,008) Counties' coastal communities all grew by over 20,000.

SUMMARY

Overall, the population of the Massachusetts coastal zone grew proportional to the Commonwealth's population - the relative percentage of people in coastal communities as compared to the state remained about the same over the last thirty years. In the seventies, the population migrated out of coastal urban areas into rural coastal communities of the Cape, Islands and Plymouth Counties. In the eighties, the migration trend out of urban counties slowed and stopped, but immigration into the rural coastal communities of the Cape, Islands and other coastal counties continued. The nineties saw population growth in urban coastal areas, and immigration into rural coastal communities continued. So while urban coastal populations decreased and then grew anew, rural coastal communities in all coastal communities saw three decades of growth.

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U.S. Department of Census Data. www.census.gov/population/cencounts/ma190090.txt

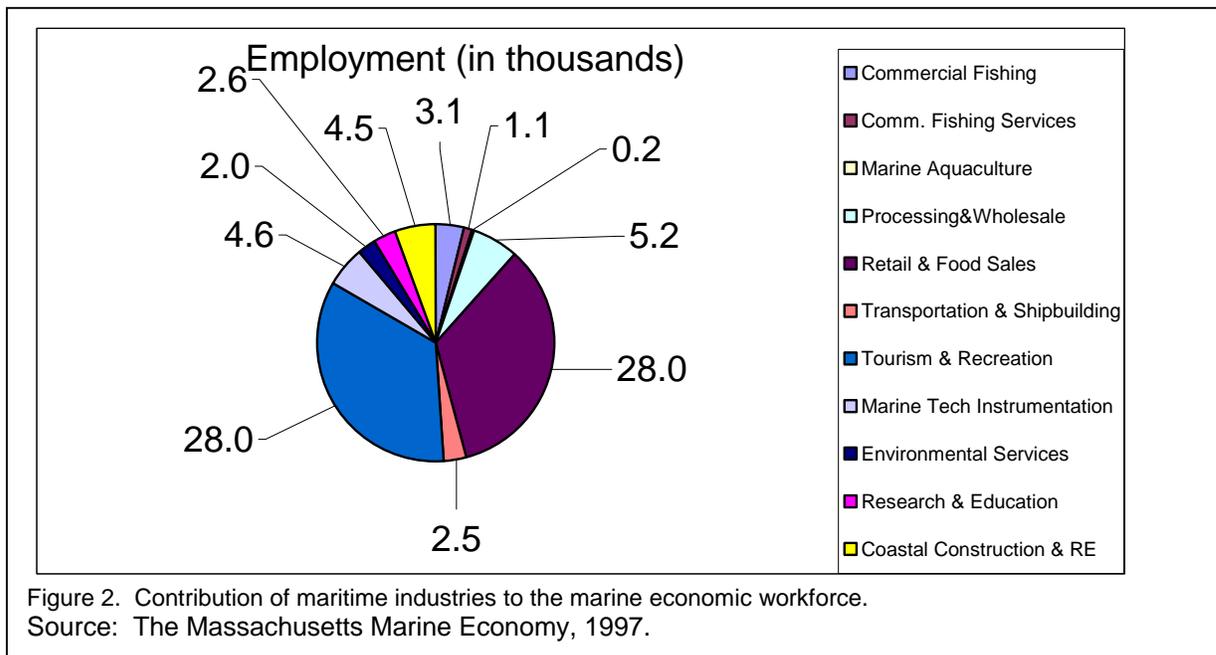
2. THE MASSACHUSETTS MARINE ECONOMY

This section describes the contribution of the maritime industries to the Massachusetts economy. The maritime economy in this state is constantly evolving, as it adapts to the changing demand for products and services and supply of natural resources. This overview provides a 'snap shot' of the current conditions in Massachusetts, in which there is a general transition away from extractive industries to tourism-services throughout Massachusetts. Sources for the statistics mentioned here are located at the end of this section.

A. The Workforce

The Massachusetts marine economy is responsible for approximately 81,808 jobs, or 2.5% of the state's workforce (Figure 2). Maritime businesses have contributed a notable value to the Massachusetts economy, and more significantly to coastal communities (Figures 3, 4 and 5). For these latter areas, there is a strong interest in preserving jobs in the maritime industries, because of both the direct and indirect effect of such on the local economies. These communities also have built an infrastructure base to support the marine-related industries in ways not found in other communities.

Unfortunately, these coastal locations also attract high residential and commercial property values, which are putting increasing pressure on these maritime uses. Residential and commercial development within coastal communities has consistently outgrown the rest of the state and will likely continue. With undeveloped or developable coastal land becoming more rare, developers are eager to find any opportunities that will allow them to utilize soaring coastal valuations. The possible permanent displacement of some maritime jobs and marine-related land uses in Massachusetts is a reality. Demand for maritime goods and services helps maintain maritime jobs, but zoning and port protection policies have prevented large-scale conversion of port infrastructure to other land use (e.g., residential). Despite the zoning and port protection policies, land use change may be possible in particular locations where local municipalities allow it.



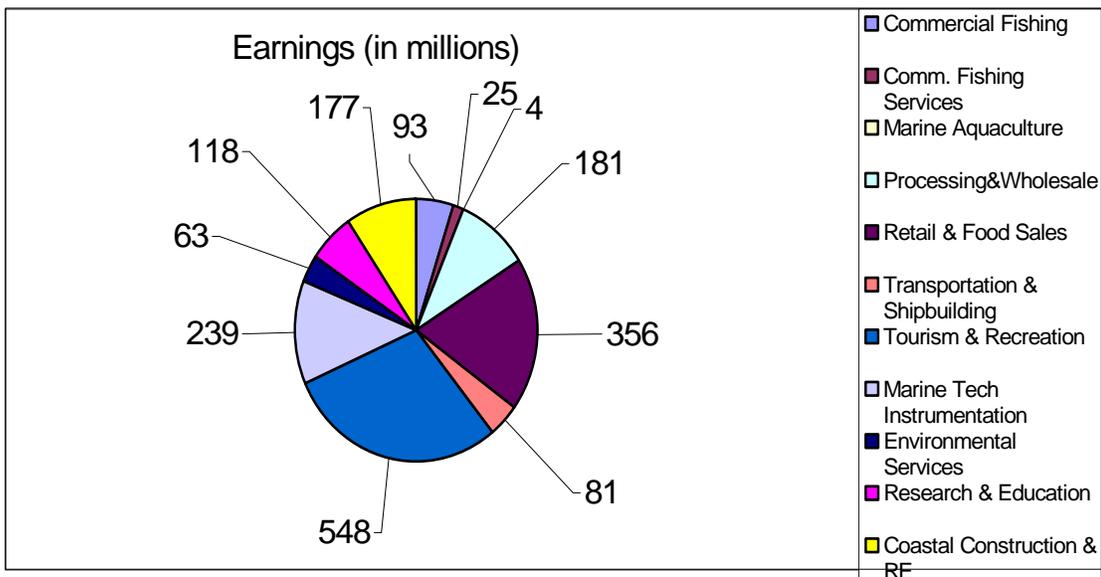


Figure 3. Earnings (\$) from sectors of maritime economy.

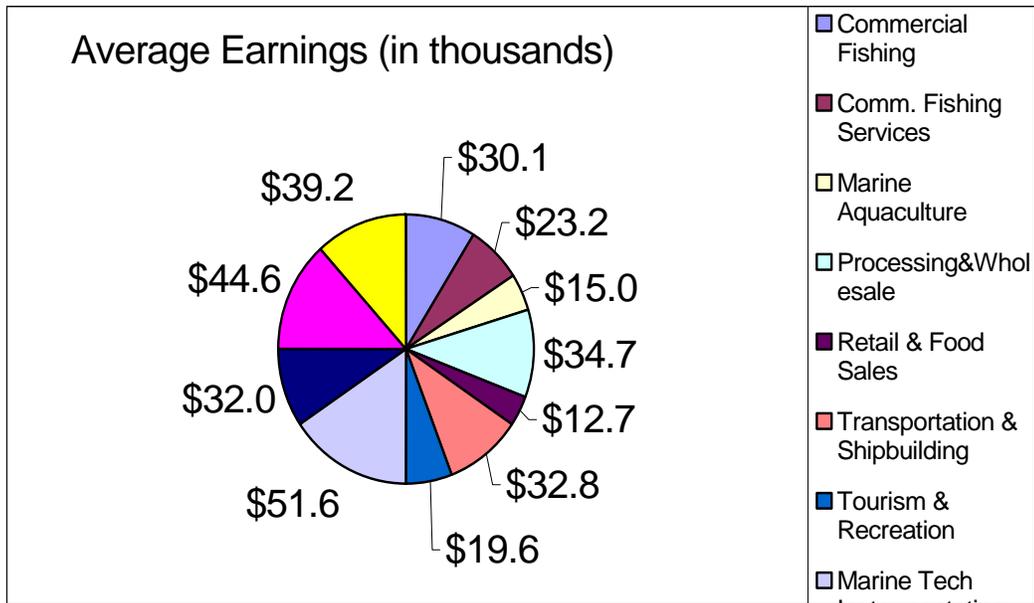


Figure 4. Average yearly earnings (\$) from sectors of maritime economy.
Source: Massachusetts Marine Economy, 1997.

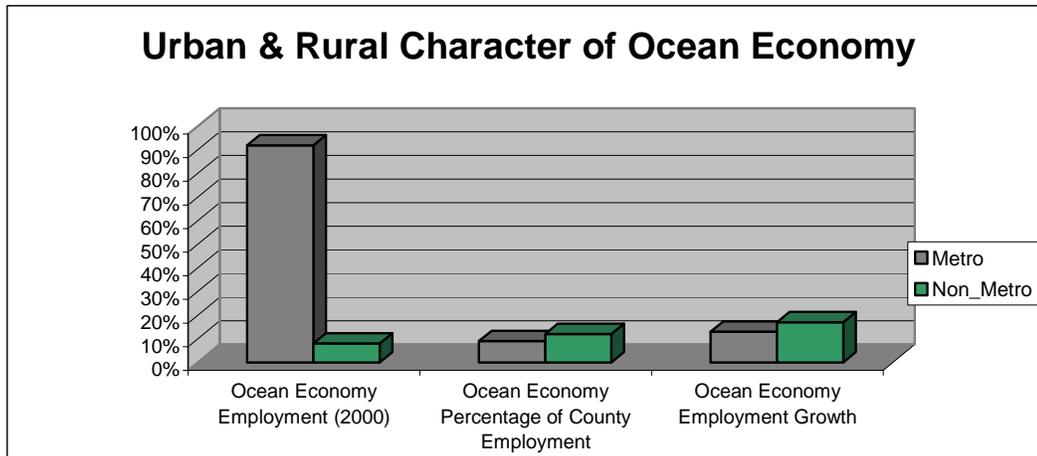


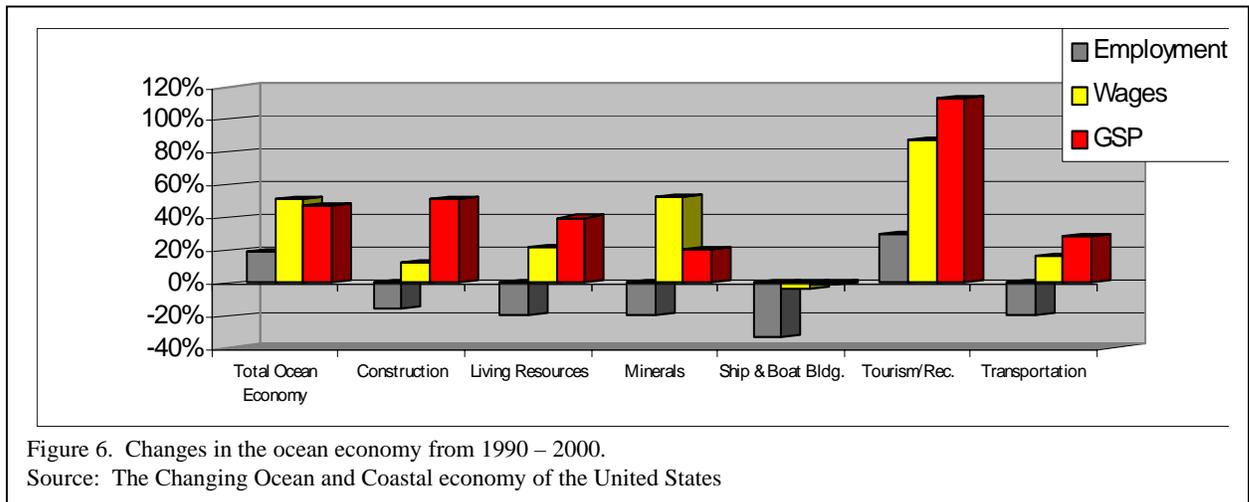
Figure 5. Contribution of urban and rural communities to maritime economy.
Source: The Changing Ocean and Coastal Economy of the United States, 2003.

B. Growth & Change

A dramatic reduction in shipbuilding and navigation equipment began in the early 1980s, caused by a number of factors, including the U.S. Navy's reduced demand for vessels after the end of the Cold War, and improvements in the productivity of the offshore oil and gas industry. Marine shipping efficiency and productivity has also increased through the industry's ability to meet cargo demands with fewer larger vessels. These operational improvements have subsequently resulted in a decline in the deep-sea freight handling industry.

Additionally, the U.S. ocean economy leaned away from extractive sectors, such as mineral production and commercial fishing, over the last decades and has instead illustrated its strong potential in the tourism industry (Figure 6).

This pattern has presented coastal states with an economic development challenge, as these growing service industries operate on relatively low average wages. The average wage for the recreation and tourism sector was \$16,320, compared, for example, to the \$60,000 + salary that the minerals sector provides¹. This transition is part of a larger trend, where high-paying jobs, such as those in minerals, are being phased out and replaced by those in tourism and recreation. This change produces a change in the demand for traditional job skills in the marine industries, and a lower overall income and spending power in the local economy, and lower tax-related revenues. On the other hand,



an increase in tourism may provide counter-vailing trends.

The transition from industrial to service industries, and the higher property values in coastal communities may also be increasing pressure on the development of more coastal lands. The potential transition of industries should be analyzed from a macroeconomic perspective to gauge the economic, social, and environmental impacts that a large-scale land use change will have on a coastline as a whole

¹ The Changing Ocean and Coastal Economy of the United States, 2003.

C. Transportation

In 2000, Marine transportation in Massachusetts, including freight and passenger transport, was responsible for the employment of approximately 2,500 people, with cumulative salaries of \$81 million. Approximately one-sixth of this payroll comes from the transportation of passengers aboard commuter boats, taxi boats, etc. Another third of the entire payroll stems from freight transport. Out-of-state transport businesses involved in moving people to and from the Massachusetts coastline are not accounted for in these figures.

D. Tourism

Cape Cod and the Islands welcome 4.7 million domestic visitors, or 19% of all tourist visits to Massachusetts. This is the second most visited region in the state, behind Boston, and maintains a high level of attractiveness largely because of its coastal resources. Cape Cod is a region highly renowned for its vacationing attractions, most notable of which are the beaches and bays. Approximately 48% of visitors participate in beach going while visiting Cape Cod, compared to 40% who participate in. 9.8% of domestic tourists who come to Massachusetts visit the beaches.

E. Recreation

Recreation statistics reveal that Massachusetts citizens highly appreciate and value coastal resources. Out of the 24 coastal states for which comparable survey data are available, Massachusetts ranked 9th in the level of participation in various coastal activities². In terms of the population, 46% of Massachusetts residents, or 2,928,767 participants, visited the coast in 1999. The activities below are a few in which Massachusetts appears to value highly in comparison to other coastal states.

- 34% participation rate in coastal viewing - 2,143,198 3rd/24
only behind California and Florida
- 3% participation rate in coastal diving - 161,768 6th/24
- 19% participation rate in boating - 1,224,969 6th/24
- 44% participation rate in diving/swimming - 2,750,203 8th/24

A special Massachusetts coastal recreational activity is whale watching, which substantially expanded in past decade throughout the state. The Plymouth and Provincetown coastline has long been used for whale watching operations. In 1996, this industry drew in \$21 million in revenue and supports a market for surrounding businesses.

Overall in Massachusetts, there were 30,741 employees in tourism, recreation and transportation, which is 34% of the total marine economy. Coastal tourism supported

² National Survey on Recreation and the Environment, 2000.

23,500 jobs with a payroll of \$400 million³. Additionally, recreational boaters spent \$300 million in 1996 in total boating expenditures⁴.

F. Recreational Fishing

Over the past ten years, the state's recreational fishing industry has expanded enormously, and is now ranked as the second most valuable in the United States. The striped bass recreational fishery is widely regarded as the finest in the country, and draws participants from all over the country. Marine recreational anglers in Massachusetts spent about \$850 million pursuing their sport in 1998⁵. Over 900,000 people participated in the marine recreational fishery in 2002, including 560,000 of the Commonwealth's citizens⁶

G. Commercial Fisheries

The Commonwealth of Massachusetts has long supported one of the most valuable commercial fishing industries in the nation. In terms of revenue, the most lucrative fisheries in Massachusetts are scallops, lobster and lastly a variety of groundfish. Together, the commercial and recreational marine economies employ more than 80,000 people in Massachusetts, 40,000 from the seafood industry alone, and contribute close to \$2 billion to the economy. This figure includes \$659 million in fishing and sales, and \$132 million in fishing and support services (e.g., fuel, ice, bait, food, insurance, and mortgage).

In recent decades, the Massachusetts economy has suffered from the combined effects of decreasing fish stocks and fishery restrictions. With the current situation of sparse fisheries, most ports have felt the harsh economic realities over the recent downturn. Ports such as Gloucester, where commercial fishing is the primary operation, were affected the hardest. The changes in the commercial fishing industry affect participating businesses, and this tends to increase the pressure to change the economic base of the community to make it less dependent upon fisheries-related activities and to diversify land use to accommodate supporting sources of income, change operations, or potentially sell land to a more profitable business.

The National Marine Fisheries Service is still in the early stages of much of its research to provide complete profiles for all US fishing-dependent communities in formats to allow easy comparisons across communities and regions. A number of studies and workshops have been proposed or are underway at the present time. Few final reports are as yet available -- especially with regard to social and cultural aspects of communities. http://www.st.nmfs.gov/st1/econ/cia/data_collection.html

³ Massachusetts Travel Industry Report, 2003.

⁴ Massachusetts Marine Economy, 1997.

⁵ Steinbeck & Gertner, 2001.

⁶ Armstrong, personal communication from National Marine Fisheries Service.

H. Aquaculture

The aquaculture industry is responsible for less than 3% of the seafood catch in Massachusetts. The industry is dependent upon hard shell clams and American oysters, while soft-shell “steamer” clam, razor clam, bay scallop, sea scallop, surf clam and blue mussel are gathered to meet a smaller demand. While compared to other states, the Massachusetts aquaculture industry is small, its value in 2002 was \$3.6 million, producing an impact of \$16 million on the state economy (Figure 7). Nearly four-fifths

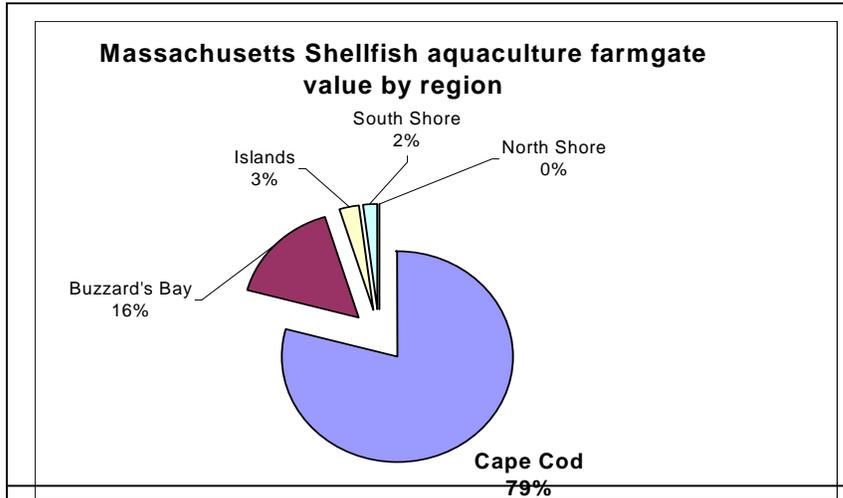
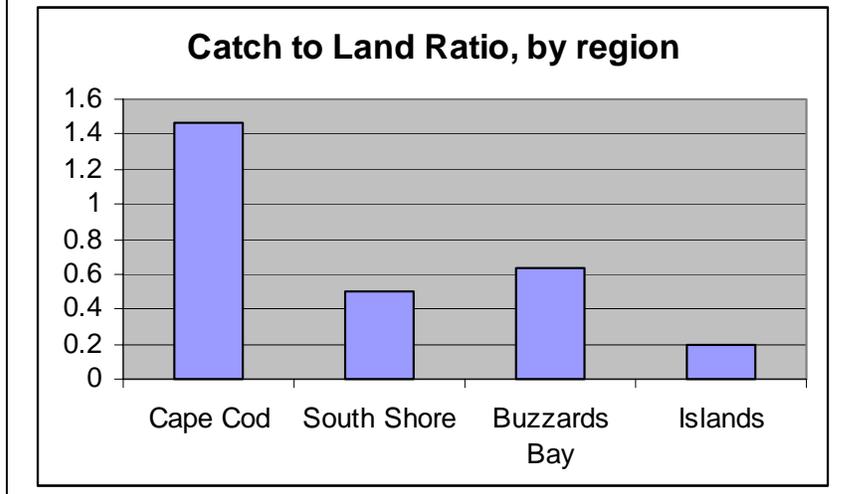
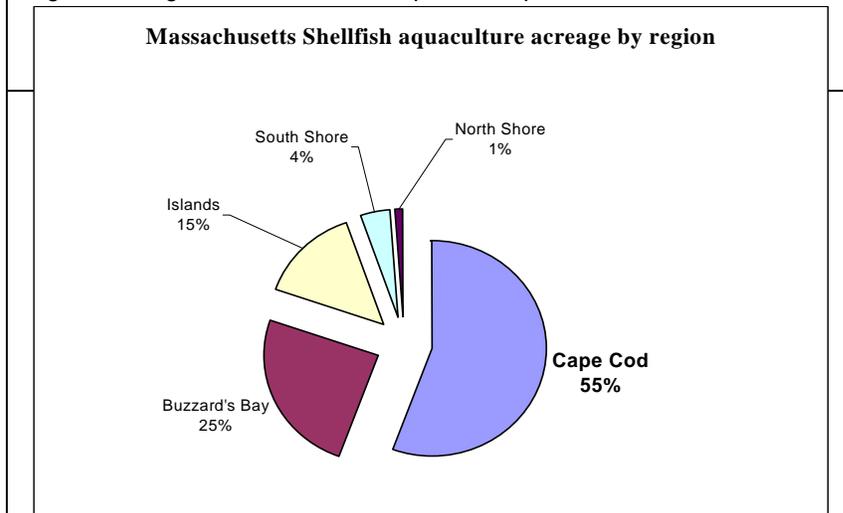


Figure 7. Regional contribution to aquaculture production.



of the aquaculture industry’s cultivation is located on Cape Cod, with the Buzzards Bay, Islands, South Shore, and North Shore culture being proportionately smaller than their harvestable area allows (Figure 8). The South Shore and North Shore regions have experienced the most growth over the past five years. Overall, the Massachusetts aquaculture industry sits third in size in New England behind Maine (\$90 million market) and Connecticut (\$13.2 million market).

I. Marine Technology

Marine Technology in Massachusetts, (including marine instrumentation, environmental services and research), is estimated to have employed 9,420 people, who earned \$420 million, in 1997. Marine technology is applied in projects like mapping, monitoring weather and environmental quality and surveying for oil and gas deposits. Users of marine technology are quite expansive, including commercial fishing, maritime transportation and shipbuilding, marine environmental services, research and education⁷.

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⁷ Economic Impacts of the Marine Economy in Massachusetts, 2000.

