IBA RESEARCH

Oceanography Group:

Fishing Industries of the Azores and Cape Verde

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Oceanography Group

Our focus for MKT 490 this semester was a comparison of the fishing industries in New Bedford, Cape Verde, and the Azores. We began by researching all three areas on the Internet for background information and a general overview of each fishery profile.

We were able to see how the products were sold in each area because of our visit to Cape Verde and the Azores. We noted what products were sold for what prices and how they were promoted in all of the different markets.

The purpose of this research was to see if there is any compatibility between the different areas. Knowing the different types of fish available in each area makes it easy to see if there is a possibility for trade.

Also, certain species of fish have become overexploited. There may be a possibility for the different areas to share research as to not diminish their resources. Fish farming is one such way to produce a steady amount of product without overexploiting different species of fish. Therefore, we also did research about what fish farming is and if it is possible to start such programs in Cape Verde and the Azores.

To aid us in our research we went to the Oceanography school in Faial. We learned about what types of research they had done and if any type of collaboration could be done between their school and the University of Massachusetts Dartmouth. In addition, we also learned about their programs to see if there is any compatibility between their school and UMass. We particularly focused on their course offerings and the possibility for overseas study.

Background Information

Before we could start working on this project, we had to get some basic information about the areas of study for comparison and capability purposes. Information such as the area's history, geography, and economy were researched to better understand that area's way of life. This information can serve as a stepping stone for people who want to pursue a relationship between New Bedford, Cape Verde, and the Azores.

New Bedford, Massachusetts

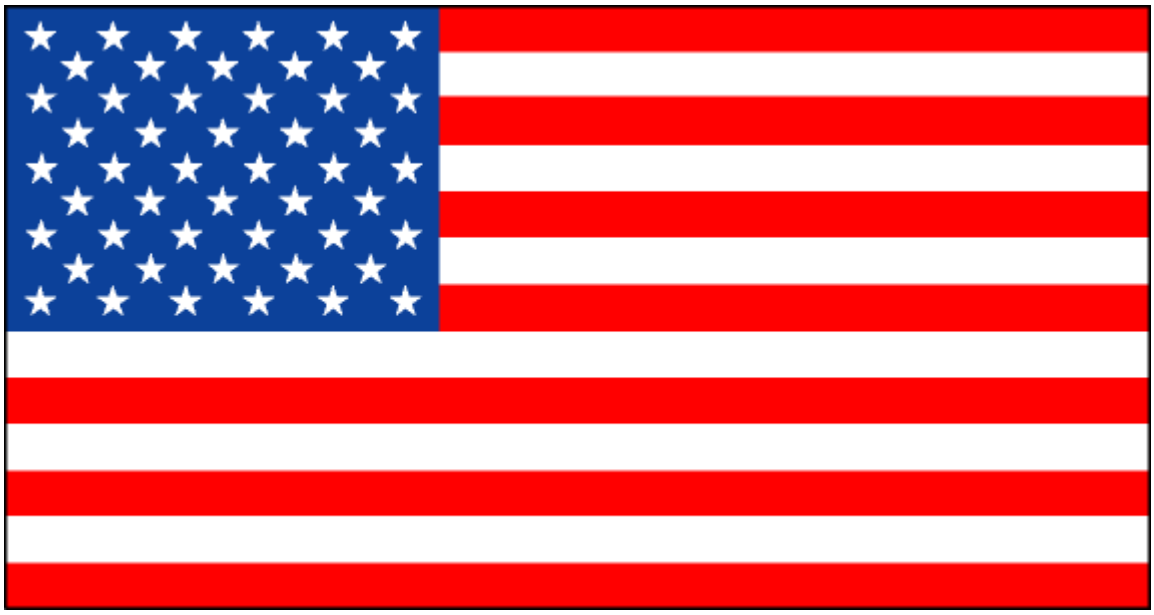
The City of New Bedford is located on the Southeastern shore of Massachusetts with a current population of 99,000 diversified people. The city had its beginnings of a booming economy with the whaling industry in the 18th century. New Bedford was noted as having more whaling vessels registered than any other state in 1857; 429 registered whaling vessels in New Bedford and 271 whaling vessels throughout the United States to be exact.

When the Whaling Industry declined in 1859, and a failed attempt at the Textile Industry in the late 1800's and early 1900's, New Bedford was still able to turn to the ocean to stabilize its economy. In 1997, sixty percent of New Bedford's economy was based on fishing. It was also noted that New Bedford was ranked one of the top ten ports in the United States for its value in landed seafood.

New Bedford maintains a close-knit community feel. Recently named one of the top ten "Green Cities" in the country, New Bedford residents feel that its parks are breathtaking and its beaches gorgeous. Enhanced with festivals and celebrations throughout the year, New Bedford is a wonderful place to visit. The unbeatable quality

of life relished by residents makes New Bedford an even better place to live and raise a family. Its residents see the City of New Bedford as a wonderfully diverse and culturally rich community with a proud past, present and future. The city prides itself on its working waterfront and historic district, as well as its expanding retail and tourist trades.

More information on what was researched can be referenced in the following excerpts.



5.3.1.1. New Bedford

Background

New Bedford gained renown as the whaling capital of the world in the 18th century. As late as 1857 there were 429 registered whaling vessels in New Bedford and only 271 vessels registered elsewhere in the U.S. Reminders of this heritage are graven in the whaling captains' elegant homes, the whaling museum, and various statues scattered about the historic district. The 1996 designation of New Bedford Historic District as the New Bedford Whaling National Historical Park ensures that this history will not quickly be forgotten.[8] With the discovery of petroleum products in 1859 that replaced the demand for sperm oil in oils and lamps, whaling lost its financial viability and declined rapidly. Nevertheless, in the 1890's, New Bedford was the fourth largest cargo terminal in the United States, with whale oil as the largest single volume item.

When the whaling industry declined, the city of New Bedford turned to textiles, an industry
that had been recently transformed by technological innovations.[9] Cotton fabrics, in
particular, led to a boom in manufacturing in New Bedford. Between 1881 and 1915, 32
cotton manufacturing plants, employing 30,000 people were incorporated in New Bedford.
By the 1920's this industry had begun to decline with the movement of manufacturers to the
southeast United States. Drastic wage cuts in 1928 led to a bitter strike of 20,000 workers
that lasted for six months.
New Bedford's maritime tradition again came to the fore. The port boasts a deep- water,
sheltered harbor with depths of over 30 feet and, since 1966, a hurricane barrier. While the
city has consistently made an effort to diversify its economy, the Chamber of Commerce
said in 1997 that 60 percent of the city's economy was based on fishing. New Bedford
generally ranks among the top ten ports in the nation for the value of its landed seafood.
Through the 1980's scallops and yellowtail flounder, which were among two of the highest
valued products landed in the U.S., dominated the landings in New Bedford. In 1998 87.4
million pounds of fish product was landed. The value of these landings was $93.5 million
dollars, second only to Dutch Harbor, Alaska.
Today, New Bedford's waterfront looks like an industrial port. Old textile mills mix with
machine shops, fish processors, frozen fish warehouses, and commercial fishing docks to
give the appearance of bustling industry. The variety of support industries including vessel
maintenance and repair, sales of equipment and provisions such as food, ice, fuel, oils and
many other products have a great impact on the economy of New Bedford, acknowledged
by the City of New Bedford Harbor Development Commission.[10]
The waterfront is divided into three sections: The South Terminal has 25 to 30 acres of
marine industrial land used primarily by fish processing plants. The 1200-foot bulkhead and

[8] http://www.newbedford.com/nbprojabs.html#histpark
[9] For interesting look at cotton manufacturing in Bristol County see http://ccbit.cs.umass.edu/lizzie/images/documents/L0041F03.html
[10] http://www.ci.new-bedford.ma.us/ECONOMIC/ECONOMIC/Harbor.htm

30 feet depths allow offloading of fish and seafood directly into the plants.[11] The Central
Waterfront boasts the State Pier, the Steamship Pier, dockage for most of the fishing fleet as
well as supply houses and marine support services. The State Pier's eight acres include
1800 feet of berthing space, 97,000 square feet of dry storage and 24,000 square feet of
open storage. The North Terminal is a marine industrial area just north of the New Bedford-
Fairhaven Bridge. Maritime Terminal and Frionor, a fish processing plant, occupy some of
the land. North of Frionor is an area with 1200 feet of bulkhead for vessels unloading to

processing plants. Two other parcels (about 36 acres) are being developed for marinerelated and/or compatible mixed use.

In addition to the fishing fleet, the Port of New Bedford each month attracts one or two refrigerated ships averaging 400-500 feet, bringing in 300-400 tons of fruit or frozen fish per trip. About every six weeks, the Portuguese-American Export Line's *Pauline Marie* brings Portuguese specialties to and from Portugal and its islands. The Cape Verdean Warehouse operates the vessel *Jenny* that makes about 10 trips annual to and from Cape Verde Islands.[12] Daily trips to Cuttyhunk Island, 16 miles south of New Bedford's port, are made by the *Alert* and *M/V Schamonchi* makes one to four daily trips to Martha's Vineyard in season.

While diversifying its economy, New Bedford is anticipating growth in tourism through projects capitalizing on its maritime heritage. One project is the New Bedford Aquarium that is currently raising funds to establish an impressive aquarium/oceanarium on the waterfront site of the Comm/Electric Company. High tech, virtual reality and interactive exhibits are planned that will play on New Bedford's history as a whaling and fishing port.

New Bedford Whaling National Park also draws attention to both aspects of New Bedford's historical economy.

New Bedford's harbor planning process involved representatives from the fish-processing sector, harvesting sector and cold storage sector. The group agreed that tourism and recreational fishing should be further developed and that downtown should be more welcoming. They also recognized the need to achieve a balanced waterfront.

Fishing Dependency

In the indices based on infrastructure differentiation, New Bedford ranks first, tied with Portland (Maine) and just ahead of Gloucester (Massachusetts). This high ranking correlates with the value of its landings. New Bedford is consistently numbered among the top ports in the U.S. for the value of its commercial fishery landings. In 1998 and 1999, New Bedford ranked second in the nation for value with 87.4 million pounds worth $98.5 million in 1998 and 86.1 million pounds worth $129.9 million in 1999. Sea scallops are dominant now, though scallops and yellowtail flounder were the high valued species some years ago.

The port profile also describes a community that is characterized by its involvement in the fishing industry. Some efforts to diversify the economy, so that it is not wholly dependent on the fishing industry, are nevertheless related to the cultural capital and social capital associated with the industry. Furthermore, New Bedford provides critical services for the fishing industry in the NRR, services that some small communities are dependent upon.

Governance[13]

New Bedford, incorporated as a city in 1847, has a Mayor and City Council. Of the 38,025 registered voters, 62.9% (23,913) are Democrats; 7.9% (3,021) are Republicans and 29.2% (11,091) are unenrolled.

[11] Information from the City of New Bedford Harbor Development Commission. See http://www.ci.new-bedford.ma.us/ECONOMIC/ECONOMIC/Harbor.htm

[12] http://www.ci.new-bedford.ma.us/ECONOMIC/ECONOMIC/Harbor.htm

[13] http://www.state.ma.us/dhcd/profile/205.HTM#DEMOGRAPHICS

Demography[14]

Population

Approximately 97,000 people in 39,000 households lived in New Bedford in 1996. The 1990 census counted 99,922 people with 53,091 females to 46,831 males.

Age Structure

The 15 to 44 age group formed 43.8% of the population (43,760) according to the 1990 census. The 45-64 and the 65 and over categories each formed about 17.5 % of the population and the under 15 category was about 20%.

Education

According to the 1990 census, 51.7 percent of the population graduated from high school and 9.1 percent has a Bachelor's degree or higher. The total number of students in the 1991-92 school year was 17,285; in 1994-95, the number had dropped to 14,499. The average teacher salary is 12 percent below the state average.

Among the fishermen, the majority of immigrants did not finish high school; many are not fluent in English.[15] Even among those who were born in the U.S., many dropped out of school before high school graduation. A few people have gone on to college and later returned to fishing.

Housing

Of the 38,788 occupied housing units, 43.8% are owner occupied, 56.2% renter occupied. The owner vacancy rate is 1.6%; rental vacancy rate is 6.7%. The median value of owner occupied housing was $115,900 and 57 percent of the housing was built in 1939 or earlier. Both the numbers of home sales and the median sales prices began to descend in 1990, from $105,000 in 1990 to $95,000 in 1991. Then sales increased, but the prices continued to fall to $85,000 in 1993 and 1994.

Racial and Ethnic Composition

According to the 1990 census, 84,286 people (84.4%) were white; 6,653 (6.7%) were Hispanic; and 3,492 (3.5%) were black. Small numbers of American Indians, Eskimos or Aleuts and Asians or Pacific Islanders were identified (.4% each) and 4,727 (4.7%) were categorized as "other."

New Bedford has the largest percentage Portuguese population in the United States. The dragger fleet is predominantly Portuguese. One respondent estimated that "80 to 90 percent of the dragger fishermen were born in Portugal or the Islands (Azores) and are from a fishing background." Until recently New Bedford was considered the Cape Verdean

capital of the U.S.
Respondents noted that the fishing industry also has participants from Norway, Sweden,
Poland, Newfoundland (Canada), Cambodia and Vietnam. Fish processing plants'
employees are from Mexico, Guatemala, Dominica Republic and Columbia (Mayans).

Economic Context

Income
The median household income in 1990 was $22,647 and per capita income was $10,923,
both considerably below the state average. Of the 97,908 people for whom status was
determined, 16,430 (16.8%) were below the poverty level, in contrast to the state's 8.9
percent.
[14] http://www.state.ma.us/dhcd/profile/205.HTM#DEMOGRAPHICS
[15] From key respondent interviews.

Seventy-five percent (28,949) of all households showed earned income. Thirty-five percent
of households receive social security and 17% receive retirement income.
Employment
The 1990 census found 40,185 employed individuals and 12.2 percent unemployed (6.7%
statewide).
In 1993, the largest single employer was Acushnet Rubber Company, employing 1,600
people to make such products as windshield wipers, seals, blades for copy machines, "o"
rings, golf ball cores, and inline skate wheels. In 1999, the company was hiring new
employees.
In 1993, textiles remained a viable industry with Cliftex Corporation employing 1,400
people and Calish Clothing Corporation 750 people. Aerovox, Inc. employed 800 people
in the city making electronic components, such as various capacitors and filters. Polaroid
employed 465 in 1993. AT & T, New England Plastics Corporation, The Standard Times
and the YMCA also employ New Bedford residents.
Retail establishments employed about 5,053 people.
Agriculture, forestry and fisheries employed 1,248 though only 144 households claim
income from farm self-employment. Transportation and communication employs 2,171.
Many of those jobs are directly associated with fishing or fish processing plants.
Besides fishing, a variety of other jobs are associated with use of the port. For example,
jobs are associated with the cargo vessels that bring in primarily fruit and frozen fish,
Portuguese specialties, and Cape Verdean cargo. One vessel makes a daily trip to
Cuttyhunk Island (16 miles south) and another makes one to four trips seasonally to Martha's
Vineyard.[16]
Massachusetts's fishermen are often eligible for unemployment compensation. Boat owners
pay 7.9 percent of their earnings for the unemployment fund.
From the 1990 U.S. Census:[17]
INDUSTRY
Universe: Employed persons 16 years and over

Agriculture, forestry, and fisheries (000-039)... 1248
Mining (040-059)... 23
Construction (060-099)... 2440
Manufacturing, nondurable goods (100-229)... 6143
Manufacturing, durable goods (230-399)... 5014
Transportation (400-439)... 1345
Communications and other public utilities (440-499)... 826
Wholesale trade (500-579)... 1746
Retail trade (580-699)... 6835
Finance, insurance, and real estate (700-720)... 1649
Business and repair services (721-760)... 1257
Personal services (761-799)... 1064
Entertainment and recreation services (800-811)... 270
Professional and related services (812-899):
Health services (812-840)... 3370
Educational services (842-860)... 2813
Other professional and related services (841, 861-899)... 2184
Public administration (900-939)... 1958

[16] *Ibid.*

[17] http://venus.census.gov/cdrom/lookup/
New Bedford 112
OCCUPATION
Universe: Employed persons 16 years and over
Managerial and professional specialty occupations (000-202):
Executive, administrative, and managerial occupations (000-042)... 2809
Professional specialty occupations (043-202)...4014
Technical, sales, and administrative support occupations (203-402):
Technicians and related support occupations (203-242)... 1087
Sales occupations (243-302)... 3682
Administrative support occupations, including clerical (303-402)... 6178
Service occupations (403-472):
Private household occupations (403-412)... 56
Protective service occupations (413-432)... 1033
Service occupations, except protective and household (433-472)... 5105
Farming, forestry, and fishing occupations (473-502)... 1033
Precision production, craft, and repair occupations (503-702)... 4801
Operators, fabricators, and laborers (703-902):
Machine operators, assemblers, and inspectors (703-802)... 6719
Transportation and material moving occupations (803-863)... 1354
Handlers, equipment cleaners, helpers, and laborers (864-902)... 2314

A 1999 report found that the "core seafood industry, comprising harvesting vessels and dealer/processors, contributes nearly $609 million in sales and 2,600 jobs, 90 percent and 70 percent of the respective sales and jobs harborwide."[18] Related services and sales "account for an additional $44 million in sales and about 500 jobs in the local area economy" . . . "Other important waterfront area businesses now contribute an estimated $18 million in sales and nearly 600 jobs."[19]

Transportation and access

New Bedford has a municipal airport, major highways (including Interstate Route 195 and State routes 24 and 140), rail (Conrail for freight service) and bus service, in addition to its port facilities.

A ferry service runs daily between Cuttyhunk and New Bedford. Increased service to Martha's Vineyard has recently been approved.

[18] FXM Associates; Seafood Datasearch; Heaney Edelstein. 1999. New Bedford/Fairhaven Harbor Plan. Technical Memorandum: Expanded Economic Analysis. Prepared for the Harbor Master Plan Committee.

[19] Ibid.
[20] http://www.state.ma.us/dhcd/profile/205.HTM#DEMOGRAPHICS
[21] http://www.rixsan.com/nbvisit/attract/nblibry.htm

New Bedford Whaling Museum recently completed assembly of a 66-foot rare male blue whale skeleton. In addition, the museum's *Lagoda* is thought to be the largest ship model in the world. America's last coastal steamship, SS Nobska, was donated to the museum and is being restored with the support of the New England Steamship Foundation. The museum is said to have the most comprehensive collection of whaling artifacts in the world; extensive collections of paintings, prints, drawings, furniture, and original photographs and negatives and a research library that emphasizes local, maritime, and whaling history.[22]

"The Seamen's Bethel was immortalized as the 'Whaleman's Chapel' by Herman Melville in his classic novel Moby Dick. Built between 1831 and 1832, the Bethel continues to this day as a house of prayer and standing memorial to those New Bedford whalemen, and now fishermen, who have lost their lives at sea."[23]

The Rotch-Jones-Duff House & Garden Museum is the only historic whaling merchant's home on the East Coast that is open to the public.[24] The home is a 1834 Greek revival mansion designed by Richard Upjohn, founder of the American Institute of Architects. Only three families lived in the mansion throughout its history. The museum gets its name from the three families: William Rotch, Jr., a prominent whaling merchant, built the mansion and lived there until 1850. Edward Coffin Jones, a whaling merchant moved in in 1850. His daughter Amelia, a philanthropist, continued living in the mansion until 1935. Mark M. Duff, businessman lived in the house until 1981. In 1985, it was bought by WHALE and incorporated as a museum.

New Bedford Whaling National Historical Park was designated in November 1999.[25] The park's 20 acres include the 14 block National Landmark Waterfront Historic District. In addition, the National Landmark Schooner *Ernestina*, the area south of the State Pier known as Waterfront Park, the Rotch-Jones-Duff House and Garden Museum, the Wharfinger Building on Piers 3 and 4 and the Bourne Counting House on Merrill's Wharf are incorporated into the park. The primary theme will focus on New Bedford's role as the 19th century capital of the world's whaling industry. The park will celebrate New Bedford's cultural diversity including Native Americans' role in the development of whaling; immigration of the Portuguese and Cape Verdeans; the influence of Quakers in the community; the Abolitionist Movement and Underground Railroad, as well as the connections with Japan and Alaska. There is now a "formal link between New Bedford's Park and the North Slope Borough Cultural Center in Barrow, Alaska."

Funds are being raised and plans made to develop a New Bedford Aquarium. Waterfront property formerly used by the Comm/Electric Company is the likely site. High tech, virtual reality and interactive exhibits are planned for the aquarium/oceanarium that will focus on New Bedford's history as a whaling and fishing port.[26] The U.S. Custom House, built between 1834 and 1836, continues to serve its original mission. "It is the oldest continuously operating Custom house in the nation. Where whaling masters registered their ships and cargo more than a hundred years ago, today's commercial fishing and cargo ships continue to log duties and tariffs. The building is still home to the New Bedford office of the U.S. Custom Service as well as offices of the National Marine Fisheries Service and the National Park Service. The first Post Office in New Bedford was originally located here."[27]

[22] http://www.whalingmuseum.org/
[23] http://www.rixsan.com/nbvisit/attract/bethel1.htm
[24] http://www.rixsan.com/nbvisit/attract/rjdhouse.htm
[25] http://www.newbedford.com/nbprojabs.html#histpark
[26] http://www.newbedfordaquarium.org/News0624991.htm
[27] http://www.rixsan.com/nbvisit/attract/uscustom.htm

The Republic of Cape Verde

Cape Verde is an archipelago in the Atlantic Ocean located off the Northwest coast of Africa, specifically the country of Senegal. Cape Verde is presently used as an important communications station as well as a sea and air-refueling site. The Cape Verdean culture is a mixture of African and Portuguese, having once been the trading center for African slaves. In 1975, Cape Verde was able to establish its independence from Portugal.

Currently, the estimated total population of the Islands is 408,760 people. The fishing industry only accounts for 1.5% the country's 11% agriculture. Lobster and tuna is Cape Verde's main fishing potential, which is not fully exploited. More information on what was researched can be found in the following excerpts.

Introduction **Cape Verde** Top of Page

Background:

The uninhabited islands were discovered and colonized by the Portuguese in the 15th century; they subsequently became a trading center for African slaves and later an important coaling and resupply stop for whaling and transatlantic shipping. Most Cape Verdeans have both African and Portuguese antecedents. Independence was achieved in 1975.

Geography **Cape Verde** Top of Page

Location:

Western Africa, group of islands in the North Atlantic Ocean, west of Senegal

Geographic coordinates:
16 00 N, 24 00 W

Map references:
Political Map of the World

Area:
total: 4,033 sq km
water: 0 sq km
land: 4,033 sq km

Area - comparative:
slightly larger than Rhode Island

Land boundaries:
0 km

Coastline:
965 km

Maritime claims:
measured from claimed archipelagic baselines
territorial sea: 12 NM
exclusive economic zone: 200 NM
contiguous zone: 24 NM

Climate:
temperate; warm, dry summer; precipitation meager and very erratic

Terrain:
steep, rugged, rocky, volcanic

Elevation extremes:
lowest point: Atlantic Ocean 0 m
highest point: Mt. Fogo 2,829 m (a volcano on Fogo Island)

Natural resources:
salt, basalt rock, limestone, kaolin, fish

Land use:
arable land: 9.68%
permanent crops: 0.5%
other: 89.82% (1998 est.)

Irrigated land:
30 sq km (1998 est.)

Natural hazards:
prolonged droughts; seasonal harmattan wind produces obscuring dust; volcanically and seismically active

Environment -

current issues: soil erosion; demand for wood used as fuel has resulted in deforestation; desertification; environmental damage has threatened several species of birds and reptiles; illegal beach sand extraction; overfishing

Environment - international agreements:
party to: Biodiversity, Climate Change, Desertification, Environmental Modification, Hazardous Wastes, Law of the Sea, Marine Dumping, Ozone Layer Protection
signed, but not ratified: none of the selected agreements

Geography - note: strategic location 500 km from west coast of Africa near major north-south sea routes; important communications station; important sea and air refueling site

People — Cape Verde

Top of Page

Population: 408,760 (July 2002 est.)

Age structure:
0-14 years: 41.9% (male 86,466; female 84,918)
15-64 years: 51.5% (male 100,684; female 109,841)
65 years and over: 6.6% (male 10,363; female 16,488) (2002 est.)

Population growth rate: 0.85% (2002 est.)

Birth rate: 27.81 births/1,000 population (2002 est.)

Death rate: 7.01 deaths/1,000 population (2002 est.)

Net migration rate: -12.26 migrant(s)/1,000 population (2002 est.)

Sex ratio:
at birth: 1.03 male(s)/female
under 15 years: 1.02 male(s)/female
15-64 years: 0.92 male(s)/female
65 years and over: 0.63 male(s)/female
total population: 0.94 male(s)/female (2002 est.)

Infant mortality rate: 51.86 deaths/1,000 live births (2002 est.)

Life expectancy

at birth: *total population:* 69.52 years
female: 72.91 years (2002 est.)
male: 66.23 years

Total fertility rate: 3.91 children born/woman (2002 est.)

HIV/AIDS - adult prevalence rate: 0.04% (2001 est.)

HIV/AIDS - people living with HIV/AIDS: 775 (2001)

HIV/AIDS - deaths: 225 (as of 2001)

Nationality: *noun:* Cape Verdean(s)
adjective: Cape Verdean

Ethnic groups: Creole (mulatto) 71%, African 28%, European 1%

Religions: Roman Catholic (infused with indigenous beliefs); Protestant (mostly Church of the Nazarene)

Languages: Portuguese, Crioulo (a blend of Portuguese and West African words)

Literacy: *definition:* age 15 and over can read and write
total population: 71.6%
male: 81.4%
female: 63.8% (1995 est.)

Government — Cape Verde

Top of Page

Country name: *conventional long form:* Republic of Cape Verde
conventional short form: Cape Verde
local short form: Cabo Verde
local long form: Republica de Cabo Verde

Government type: republic

Capital: Praia

Administrative

divisions: 17 districts (concelhos, singular - concelho); Boa Vista, Brava, Calheta, Maio, Mosteiros, Paul, Praia, Porto Novo, Ribeira Grande, Sal, Santa Catarina, Santa Cruz, Sao Domingos, Sao Nicolau, Sao Filipe, Sao Vicente, Tarrafal

Independence:
5 July 1975 (from Portugal)

National holiday:
Independence Day, 5 July (1975)

Constitution:
new constitution came into force 25 September 1992; underwent a major revision on 23 November 1995, substantially increasing the powers of the president, and a further revision in 1999, to create the position of national ombudsman (Provedor de Justica)

Legal system:
derived from the legal system of Portugal

Suffrage:
18 years of age; universal

Executive branch:
chief of state: President Pedro PIRES (since 22 March 2001)
head of government: Prime Minister Jose Maria Pereira NEVES (since 1 February 2001)
cabinet: Council of Ministers appointed by the president on the recommendation of the prime minister
elections: president elected by popular vote for a five-year term; election last held 11 and 25 February 2001 (next to be held NA February 2006); prime minister nominated by the National Assembly and appointed by the president
election results: Pedro PIRES elected president; percent of vote - Pedro PIRES (PAICV) 49.43%, Carlos VIEGA (MPD) 49.42%; note - the election was won by only twelve votes

Legislative branch:
unicameral National Assembly or Assembleia Nacional (72 seats; members are elected by popular vote to serve five-year terms)
elections: last held 14 January 2001 (next to be held NA December 2005)
election results: percent of vote by party - PAICV 47.3%, MPD 39.8%, ADM 6%, other 6.9%; seats by party - PAICV 40, MPD 30, ADM 2

Judicial branch:
Supreme Tribunal of Justice or Supremo Tribunal de Justia

Political parties

and leaders: African Party for Independence of Cape Verde or PAICV [Jose Maria Pereira NEVES, chairman]; Democratic Alliance for Change or ADM [Dr. Eurico MONTEIRO] (a coalition of PCD, PTS, and UCID); Democratic Christian Party or PDC [Manuel RODRIGUES, chairman]; Democratic Renovation Party or PRD [Jacinto SANTOS, president]; Movement for Democracy or MPD [Agostinho LOPES, president]; Party for Democratic Convergence or PCD [Dr. Eurico MONTEIRO, president]; Party of Work and Solidarity or PTS [Anibal MEDINA, president]; Social Democratic Party or PSD [Joao ALEM, president]

Political pressure groups and leaders:
NA

International organization participation:
ACCT, ACP, AfDB, CCC, ECA, ECOWAS, FAO, G-77, IBRD, ICAO, ICFTU, ICRM, IDA, IFAD, IFC, IFRCS, ILO, IMF, IMO, Interpol, IOC, IOM, IOM (observer), ITU, NAM, OAU, OPCW (signatory), UN, UNCTAD, UNESCO, UNIDO, UPU, WHO, WIPO, WMO, WTrO (observer)

Diplomatic representation in the US:
chief of mission: Ambassador Jose BRITO
consulate(s) general: Boston
FAX: [1] (202) 965-1207
telephone: [1] (202) 965-6820
chancery: 3415 Massachusetts Avenue NW, Washington, DC 20007

Diplomatic representation from the US:
chief of mission: Ambassador Donald C. JOHNSON
embassy: Rua Abilio m. Macedo 81, Praia
mailing address: C. P. 201, Praia
telephone: [238] 61 56 16, 61 56 17
FAX: [238] 61 13 55

Flag description:
three horizontal bands of light blue (top, double width), white (with a horizontal red stripe in the middle third), and light blue; a circle of 10 yellow five-pointed stars is centered on the hoist end of the red stripe and extends into the upper and lower blue bands

Economy — Cape Verde

Top of Page

Economy - overview:
Cape Verde suffers from a poor natural resource base, including serious water shortages exacerbated by cycles of long-term drought. The economy is service-oriented, with commerce, transport, and public services accounting for 70% of GDP. Although nearly 70% of

the population lives in rural areas, the share of agriculture in GDP in 2001 was only 11%, of which fishing accounts for 1.5%. About 82% of food must be imported. The fishing potential, mostly lobster and tuna, is not fully exploited. Cape Verde annually runs a high trade deficit, financed by foreign aid and remittances from emigrants; remittances supplement GDP by more than 20%. Economic reforms, launched by the new democratic government in 1991, are aimed at developing the private sector and attracting foreign investment to diversify the economy. Prospects for 2002 depend heavily on the maintenance of aid flows, remittances, and the momentum of the government's development program.

GDP:
purchasing power parity - $600 million (2001 est.)

GDP - real growth rate:
3% (2001 est.)

GDP - per capita:
purchasing power parity - $1,500 (2001 est.)

GDP - composition by sector:
agriculture: 11%
industry: 17%
services: 72% (2001)

Population below poverty line:
30% (2000)

Household income or consumption by percentage share:
lowest 10%: NA%
highest 10%: NA%

Inflation rate (consumer prices):
3% (2001)

Labor force:
NA

Unemployment rate:
21% (2000 est.)

Budget:
revenues: $112 million
expenditures: $198 million, including capital expenditures of $NA (2000)

Industries:

food and beverages, fish processing, shoes and garments, salt mining, ship repair

Industrial production growth rate:
NA%

Electricity - production:
41 million kWh (2000)

Electricity - production by source:
fossil fuel: 100%
hydro: 0%
other: 0% (2000)
nuclear: 0%

Electricity - consumption:
38.13 million kWh (2000)

Electricity - exports:
0 kWh (2000)

Electricity - imports:
0 kWh (2000)

Agriculture - products:
bananas, corn, beans, sweet potatoes, sugarcane, coffee, peanuts; fish

Exports:
$27.3 million f.o.b. (2001 est.)

Exports - commodities:
fuel, shoes, garments, fish, hides

Exports - partners:
Portugal 45%, UK 20%, Germany 20%, Guinea-Bissau 5% (1999)

Imports:
$218 million f.o.b. (2001 est.)

Imports - commodities:
foodstuffs, industrial products, transport equipment, fuels

Imports - partners:
Portugal 52%, Germany 7%, France 4%, UK 3% (1999)

Debt - external:
$301 million (2000)

Economic aid - recipient:
$136 million (1999)

Currency:

Cape Verdean escudo (CVE)

Currency code:
CVE

Exchange rates:
Cape Verdean escudos per US dollar - 123.556 (January 2002), 115.877 (2000), 102.700 (1999), 98.158 (1998), 93.177 (1997)

Fiscal year:
calendar year

Communications Cape Verde

Top of Page

Telephones - main lines in use:
60,935 (2002)

Telephones - mobile cellular:
28,119 (2002)

Telephone system:
general assessment: effective system, being improved
domestic: interisland microwave radio relay system with both analog and digital exchanges; work is in progress on a submarine fiber-optic cable system which is scheduled for completion in 2003
international: 2 coaxial submarine cables; HF radiotelephone to Senegal and Guinea-Bissau; satellite earth station - 1 Intelsat (Atlantic Ocean)

Radio broadcast stations:
AM 0, FM 15 (and 17 repeaters), shortwave 0 (2002)

Radios:
100,000 (2002 est.)

Television broadcast stations:
1 (and 7 repeaters) (2002)

Televisions:
15,000 (2002 est.)

Internet country code:
.cv

Internet Service Providers (ISPs):
1 (2002)

Internet users:
12,000 (2002)

Transportation Cape Verde

Top of Page

Railways:
0 km

Highways:
total: 1,100 km
paved: 858 km
unpaved: 242 km (1996)

Waterways:
none

Ports and harbors:
Mindelo, Praia, Tarrafal

Merchant marine:
total: 4 ships (1,000 GRT or over) totaling 5,395 GRT/6,614 DWT
ships by type: cargo 3, chemical tanker 1
note: includes a foreign-owned ship registered here as a flag of convenience: United Kingdom 1 (2002 est.)

Airports:
9
note: 3 airports are reported to be nonoperational (2001)

Airports - with paved runways:
total: 6 3
over 3,047 m: 1 1
914 to 1,523 m: 2 (2002)

Airports - with unpaved runways:
total: 3
914 to 1,523 m: 3 (2002)

The Azores

The Azores is an archipelago located in the Atlantic Ocean of the West coast of Portugal. The Azores is part of the country, Portugal, with the same government. The

islands are part of Portugal and should not be perceived as a separate entity. Hence, when trying to understand the context of the economy and government the whole of Portugal must be considered. There is, however, a slight difference in the language as far as accents. The culture of the Azores is mainly comprised of small villages like communities with the exception of Ponta Delgada, in Sao Miguel.

Introduction **Portugal** Top of Page

Background:

Following its heyday as a world power during the 15th and 16th centuries, Portugal lost much of its wealth and status with the destruction of Lisbon in a 1755 earthquake, occupation during the Napoleonic Wars, and the independence in 1822 of Brazil as a colony. A 1910 revolution deposed the monarchy; for most of the next six decades repressive governments ran the country. In 1974, a left-wing military coup installed broad democratic reforms. The following year Portugal granted independence to all of its African colonies. Portugal entered the EC (now the EU) in 1985.

Geography — Portugal

Top of Page

Location:
Southwestern Europe, bordering the North Atlantic Ocean, west of Spain

Geographic coordinates:
39 30 N, 8 00 W

Map references:
Europe

Area:
total: 92,391 sq km
land: 91,951 sq km
note: includes Azores and Madeira Islands
water: 440 sq km

Area - comparative:
slightly smaller than Indiana

Land boundaries:
total: 1,214 km
border countries: Spain 1,214 km

Coastline:
1,793 km

Maritime claims:
contiguous zone: 24 NM
territorial sea: 12 NM
continental shelf: 200-m depth or to the depth of exploitation
exclusive economic zone: 200 NM

Climate:
maritime temperate; cool and rainy in north, warmer and drier in south

Terrain:
mountainous north of the Tagus River, rolling plains in south

Elevation extremes:
lowest point: Atlantic Ocean 0 m
highest point: Ponta do Pico (Pico or Pico Alto) on Ilha do Pico in the Azores 2,351 m

Natural resources:
fish, forests (cork), tungsten, iron ore, uranium ore, marble, arable land, hydropower

Land use:
arable land: 20.57%

permanent crops: 7.74%
other: 71.69% (1999 est.)

Irrigated land:
6,320 sq km (1998 est.)

Natural hazards:
Azores subject to severe earthquakes

Environment - current issues:
soil erosion; air pollution caused by industrial and vehicle emissions; water pollution, especially in coastal areas

Environment - international agreements:
party to: Air Pollution, Biodiversity, Climate Change, Climate Change-Kyoto Protocol, Desertification, Endangered Species, Hazardous Wastes, Law of the Sea, Marine Dumping, Marine Life Conservation, Ozone Layer Protection, Ship Pollution, Tropical Timber 83, Tropical Timber 94, Wetlands
signed, but not ratified: Air Pollution-Persistent Organic Pollutants, Air Pollution-Volatile Organic Compounds, Environmental Modification, Nuclear Test Ban

Geography - note:
Azores and Madeira Islands occupy strategic locations along western sea approaches to Strait of Gibraltar

People — Portugal

Top of Page

Population:
10,084,245 (July 2002 est.)

Age structure:
0-14 years: 16.9% (male 875,485; female 827,670)
15-64 years: 67.3% (male 3,324,215; female 3,463,301)
65 years and over: 15.8% (male 644,761; female 948,813) (2002 est.)

Population growth rate:
0.18% (2002 est.)

Birth rate:
11.5 births/1,000 population (2002 est.)

Death rate:
10.21 deaths/1,000 population (2002 est.)

Net migration rate:
0.5 migrant(s)/1,000 population (2002 est.)

Sex ratio:
at birth: 1.07 male(s)/female

under 15 years: 1.06 male(s)/female
15-64 years: 0.96 male(s)/female
65 years and over: 0.68 male(s)/female
total population: 0.93 male(s)/female (2002 est.)

Infant mortality rate:
5.84 deaths/1,000 live births (2002 est.)

Life expectancy at birth:
total population: 76.14 years
female: 79.87 years (2002 est.)
male: 72.65 years

Total fertility rate:
1.48 children born/woman (2002 est.)

HIV/AIDS - adult prevalence rate:
0.74% (1999 est.)

HIV/AIDS - people living with HIV/AIDS:
36,000 (1999 est.)

HIV/AIDS - deaths:
280 (1999 est.)

Nationality:
noun: Portuguese (singular and plural)
adjective: Portuguese

Ethnic groups:
Homogeneous Mediterranean stock; citizens of black African descent who immigrated to mainland during decolonization number less than 100,000; since 1990 East Europeans have entered Portugal

Religions:
Roman Catholic 94%, Protestant (1995)

Languages:
Portuguese

Literacy:
definition: age 15 and over can read and write
total population: 87.4%
male: NA%
female: NA%

Government — Portugal

Top of Page

Country name:
conventional long form: Portuguese Republic

conventional short form: Portugal
local long form: Republica Portuguesa
local short form: Portugal

Government type:
Parliamentary democracy

Capital:
Lisbon

Administrative divisions:
18 districts (distritos, singular - distrito) and 2 autonomous regions* (regioes autonomas, singular - regiao autonoma); Aveiro, Acores (Azores)*, Beja, Braga, Braganca, Castelo Branco, Coimbra, Evora, Faro, Guarda, Leiria, Lisboa, Madeira*, Portalegre, Porto, Santarem, Setubal, Viana do Castelo, Vila Real, Viseu

Independence:
1143 (independent republic proclaimed 5 October 1910)

National holiday:
Portugal Day, 10 June (1580)

Constitution:
25 April 1976, revised 30 October 1982, 1 June 1989, 5 November 1992, and 3 September 1997

Legal system:
Civil law system; the Constitutional Tribunal reviews the constitutionality of legislation; accepts compulsory ICJ jurisdiction, with reservations

Suffrage:
18 years of age; universal

Executive branch:
Chief of state: President Jorge SAMPAIO (since 9 March 1996)
note: there is also a Council of State that acts as a consultative body to the president
head of government: Prime Minister Jose Manuel DURAO Barroso (since 6 April 2002)
cabinet: Council of Ministers appointed by the president on the recommendation of the prime minister
elections: president elected by popular vote for a five-year term; election last held 14 January 2001 (next to be held NA January 2006); following legislative elections, the leader of the majority party or leader of a majority coalition is usually appointed prime minister by the president
election results: Jorge SAMPAIO reelected president; percent of vote - Jorge SAMPAIO (Socialist) 55.8%, Joaquim FERREIRA Do Amaral

(Social Democrat) 34.5%, Antonio ABREU (Communist) 5.1%

Legislative branch:

Unicameral Assembly of the Republic or Assembleia da Republica (230 seats; members are elected by popular vote to serve four-year terms)
elections: last held 17 March 2002 (next to be held NA 2006)
election results: percent of vote by party - PSD 40.1%, PS 37.8%, PP 8.7%, PCP/PEV 6.9%, The Left Bloc 2.7%; seats by party - PSD 105, PS 96, PP 14, PCP/PEV 12, The Left Bloc 3

Judicial branch:

Supreme Court or Supremo Tribunal de Justica (judges appointed for life by the Conselho Superior da Magistratura)

Political parties and leaders:

The Greens or PEV [no leader]; Popular Party or PP [Paulo PORTAS]; Portuguese Communist Party/The Greens or PCP/PEV [Carlos CARVALHAS]; Portuguese Socialist Party or PS [Eduardo Ferro RODRIGUES]; Social Democratic Party or PSD [Jose Manuel DURAO Barroso]; United Democratic Coalition or CDU [leader NA]; The Left Bloc [no leader]

Political pressure groups and leaders:

NA

International organization participation:

AfDB, Australia Group, BIS, CCC, CE, CERN, EAPC, EBRD, ECE, ECLAC, EIB, EMU, ESA, EU, FAO, IADB, IAEA, IBRD, ICAO, ICC, ICFTU, ICRM, IDA, IEA, IFAD, IFC, IFRCS, IHO, ILO, IMF, IMO, Interpol, IOC, IOM, ISO, ITU, LAIA (observer), MINURSO, NAM (guest), NATO, NEA, NSG, OAS (observer), OECD, OPCW, OSCE, PCA, UN, UNCTAD, UNESCO, UNIDO, UNMIBH, UNMIK, UNMOP, UNTAET, UPU, WCL, WEU, WFTU, WHO, WIPO, WMO, WToO, WTrO, ZC

Diplomatic representation in the US:

Chief of mission: Ambassador Pedro Manuel Dos Reis Alves CATARINO
consulate(s): Los Angeles, New Bedford (Massachusetts), Providence (Rhode Island)
consulate(s) general: Boston, New York, Newark (New Jersey), and San Francisco
FAX: [1] (202) 462-3726
telephone: [1] (202) 328-8610
chancery: 2125 Kalorama Road NW, Washington, DC 20008

Diplomatic representation

Chief of mission: Ambassador John N. PALMER

from the US: *Chief of mission:* Ambassador John N. PALMER
embassy: Avenida das Forcas Armadas, 1600-081 Lisbon, Apartado 4258, 1507 Lisboa CODEX
mailing address: PSC 83, APO AE 09726
telephone: [351] (21) 727-3300
FAX: [351] (21) 727-9109
consulate(s): Ponta Delgada (Azores)

Flag description: Two vertical bands of green (hoist side, two-fifths) and red (three-fifths) with the Portuguese coat of arms centered on the dividing line

Economy — Portugal

Top of Page

Economy - overview: Portugal has become a diversified and increasingly service-based economy since joining the European Community in 1986. Over the past decade, successive governments have privatized many state-controlled firms and liberalized key areas of the economy, including the financial and telecommunications sectors. The country qualified for the European Monetary Union (EMU) in 1998 and began circulating its new currency, the euro, on 1 January 2002 along with 11 other EU member economies. Economic growth has been above the EU average for much of the past decade, but fell back in 2001-02. GDP per capita stands at 75% of that of the leading EU economies. A poor educational system, in particular, has been an obstacle to greater productivity and growth. Portugal has been increasingly overshadowed by lower-cost producers in Central Europe and Asia as a target for foreign direct investment. The new coalition government faces tough choices in its attempts to boost Portugal's economic competitiveness and to keep the budget deficit within the 3% EU ceiling.

GDP: Purchasing power parity - $182 billion (2002 est.)

GDP - real growth rate: 0.8% (2002 est.)

GDP - per capita: Purchasing power parity - $18,000 (2002 est.)

GDP - composition by sector:
Agriculture: 4%
industry: 29%
services: 68% (2001)

Population below poverty line: NA%

Household income or consumption by percentage share:
Lowest 10%: 3%
highest 10%: 28% (1995 est.)

Distribution of family income - Gini index:
36 (1994-95)

Inflation rate (consumer prices):
3.7% (2002 est.)

Labor force:
5.1 million (2000)

Labor force - by occupation:
Services 60%, industry 30%, agriculture 10% (1999 est.)

Unemployment rate:
4.7% (2002 est.)

Budget:
Revenues: $45 billion
expenditures: $48 billion, including capital expenditures of $NA (2001 est.)

Industries:
Textiles and footwear; wood pulp, paper, and cork; metalworking; oil refining; chemicals; fish canning; wine; tourism

Industrial production growth rate:
1.5% (2002 est.)

Electricity - production:
43.242 billion kWh (2000)

Electricity - production by source:
Fossil fuel: 70%
hydro: 26%
other: 4% (2000)
nuclear: 0%

Electricity - consumption:
41.146 billion kWh (2000)

Electricity - exports:
3.767 billion kWh (2000)

Electricity - imports:
4.698 billion kWh (2000)

Agriculture - products: Grain, potatoes, olives, grapes; sheep, cattle, goats, poultry, beef, dairy products

Exports: $25.9 billion f.o.b. (2001)

Exports - commodities: Clothing and footwear, machinery, chemicals, cork and paper products, hides

Exports - partners: EU 79.7% (Germany 19.2%, Spain 18.6%, France 12.6%, UK 10.3%, Benelux 5.4%), US 5.8% (2001)

Imports: $39 billion f.o.b. (2001)

Imports - commodities: Machinery and transport equipment, chemicals, petroleum, textiles, agricultural products

Imports - partners: EU 74.2% (Spain 26.5%, Germany 13.9%, France 10.3%, Italy 6.7%, UK 5.0%), US 3.8%, Japan 1.9% (2001)

Debt - external: $13.1 billion (1997 est.)

Economic aid - donor: ODA, $271 million (1995) (1995)

Currency: Euro (EUR); Portuguese escudo (PTE)
note: on 1 January 1999, the European Monetary Union introduced the euro as a common currency to be used by financial institutions of member countries; on 1 January 2002, the euro became the sole currency for everyday transactions within the member countries

Currency code: EUR; PTE

Exchange rates: Euros per US dollar - 1.1324 (January 2002), 1.1175 (2001), 1.0854 (2000), 0.9386 (1999); Portuguese escudos per US dollar - 180.10 (1998), 175.31 (1997)

Fiscal year: Calendar year

Communications Portugal

Top of Page

Telephones - main lines in use:
5.3 million (yearend 1998)

Telephones - mobile cellular:
3,074,194 (1999)

Telephone system:
General assessment: undergoing rapid development in recent years, Portugal's telephone system, by the end of 1998, achieved a state-of-the-art network with broadband, high-speed capabilities and a main line telephone density of 53%
domestic: integrated network of coaxial cables, open wire, microwave radio relay, and domestic satellite earth stations
international: 6 submarine cables; satellite earth stations - 3 Intelsat (2 Atlantic Ocean and 1 Indian Ocean), NA Eutelsat; tropospheric scatter to Azores; note - an earth station for Inmarsat (Atlantic Ocean region) is planned

Radio broadcast stations:
AM 47, FM 172 (many are repeaters), shortwave 2 (1998)

Radios:
3.02 million (1997)

Television broadcast stations:
62 (plus 166 repeaters)
note: includes Azores and Madeira Islands (1995)

Televisions:
3.31 million (1997)

Internet country code:
.pt

Internet Service Providers (ISPs):
16 (2000)

Internet users:
4.4 million (2002)

Transportation Portugal

Top of Page

Railways:
Total: 2,850 km
broad gauge: 2,576 km 1.668-m gauge (623 km electrified; 426 km double-tracked)
narrow gauge: 274 km 1.000-m gauge (2001)

Highways:

Total: 68,732 km
paved: 59,110 km (including 797 km of expressways)
unpaved: 9,622 km (1999)

Waterways:
820 km
note: relatively unimportant to national economy, used by shallow-draft craft limited to 300 metric-ton or less cargo capacity

Pipelines:
Crude oil 22 km; petroleum products 58 km; natural gas 700 km
note: the secondary lines for the natural gas pipeline that will be 300 km long have not yet been built

Ports and harbors:
Aveiro, Funchal (Madeira Islands), Horta (Azores), Leixoes, Lisbon, Porto, Ponta Delgada (Azores), Praia da Vitoria (Azores), Setubal, Viana do Castelo

Merchant marine:
Total: 140 ships (1,000 GRT or over) totaling 1,001,440 GRT/1,519,701 DWT
ships by type: bulk 10, cargo 71, chemical tanker 17, container 10, liquefied gas 8, multi-functional large-load carrier 1, petroleum tanker 10, refrigerated cargo 1, roll on/roll off 6, short-sea passenger 4, vehicle carrier 2
note: includes some foreign-owned ships registered here as a flag of convenience: Belgium 1, British Virgin Islands 1, Cyprus 1, Denmark 6, Germany 20, Greece 1, Iceland 1, Italy 16, Lebanon 1, Liberia 1, Monaco 2, Norway 5, Panama 5, Spain 22, Switzerland 8, United Kingdom 1, Virgin Islands (UK) 1 (2002 est.)

Airports:
67 (2001)

Airports - with paved runways:
Total: 40
over 3,047 m: 5
2,438 to 3,047 m: 9
1,524 to 2,437 m: 4
914 to 1,523 m: 15
under 914 m: 7 (2002)

Airports - with unpaved runways:
Total: 26
914 to 1,523 m: 1
under 914 m: 25 (2002)

Fishery Profiles

Each area of interest is located in different parts of the world, thus providing specific species to each area respectfully. This next section will provide information about what types of fish are caught in a day's work.

New Bedford, Massachusetts

New Bedford was once considered the major scallop port in the United States during the 1950's and 1960's. There are approximately 82 scallopers and 183 draggers to date. The types of fish that are in demand are cod, haddock, flounders, Pollack, and hake. The fisherman of New Bedford try to diversify their catch, and if they obtain what is not in high demand in the New Bedford area, for instance squid, they will dock in Rhode Island where they can get more money for their catch.

Fisheries profile

When fishermen caught sea scallops in their otter trawls before the 1930's, they would save them for local consumption, as there was little market for them.[28] New Bedford buyer and processor, Linus Eldridge, eventually developed a demand for scallops by selling them in New York at the Fulton Fish Market. As demand grew, the fishermen developed dredges and New Bedford became the major scallop port in the U.S. For fifteen years, from 1950 to 1965, scallop landings hovered around 10,000 metric tons, about 70 percent of all scallop landings in the U.S. By the mid-60's however landings began to drop and vessels switched to ground fish. Only 43 scallop vessels remained in 1971.

When the scallop industry was developing, the majority of the vessel owners and crew were Norwegian. Initially, they moved to New Bedford from Brooklyn, later they were joined by immigrants from Karmoy (near Bergen), Norway.[29]

Along with scallops, ground fish are the fleet's primary target species. Of all major

Ground fishing ports in the eastern United States, the wider community of New Bedford has the most developed infrastructure for fishing and ranks as the top port in New England for total landings and value of landings.

Using the dependency ratios, New Bedford ranks 5th overall. This may be misleading since the ranking is skewed by the diversity of other labor sectors that contribute to the ratio. For example, Down east Maine, with fewer actual numbers in fishing and less regional infrastructure, ranks higher in regional dependency (Rank of 1st), due in part to a lack of economic diversity. Between five and eight percent of the people in the New Bedford SMSA—far higher when we include members of their families—receives its livelihood primarily from fishing. Even a conservative estimate, assuming two other individuals supported by each fisherman and fishing-related worker employed places the proportion of the population dependent on fishing between 11 and 18 percent.

New Bedford has the most total capital invested in the fishing industry. It ranks at the top of the infrastructure scale with Portland and Chatham, and has the largest fleet of any port.

There are a total of 1,131 crew manning 265 vessels. Of these, 82 are scallopers and 183 draggers.[30]

The ground fish fleet boats have 88 days to fish for cod, flounders (winter, fluke, dabs, yellowtail), haddock, Pollock, and hake. Most of the ground fish boats try to diversify, catching fish not bound by the ground fish regulations. Some vessels travel south seeking fluke or squid. Others look for baitfish such as small skates to sell to the lobster fishermen.

Prior to Amendment 5 (to the Multispecies FMP), the Portuguese and American ground fish fishermen targeted different species and organized their trips differently. The Portuguese tended to target yellowtail flounder, making 10-day trips with 5-day layovers. The Americans tended to fish the hard bottom, catching cod and flounders in the channel, making 5-day trips with 2-day layovers.

There has not been a market for "soft" fish such as whiting in New Bedford, but in the search for diversity some vessels are going for whiting and squid. If they catch a significant amount, however, they may land in Rhode Island where the prices tend to be higher for those species. Herring boats occasionally come into New Bedford, but are not home-based in New Bedford. Crab is a by catch for the lobster boats. New Bedford vessels catch swordfish and tuna. Dogfish has a decent market in New Bedford because there are 3

[28] Georgiana, Daniel, Alan Cass and Peter Amaral. 1999. The Cost of Fishing for Sea Scallops in Northeastern United States. North Dartmouth: University of Massachusetts Dartmouth.

[29] *Ibid*.

[30] FXM Associates; Seafood Data search; Heaney Edelstein. 1999. New Bedford/Fairhaven Harbor

Plan. Technical Memorandum: Expanded Economic Analysis. Prepared for the Harbor Master Plan Committee.

New Bedford 115

dogfish processing plants in the city.[31] Monkfish is very important to both the scallop vessels and draggers. A few lobster boats switched over to gillnetting for monkfish as well. It was promoted as an "alternative" fishery to seek when vessels were out of their days-at-sea allocation.

Niche fisheries include clam digging (hard shell), a summer conch fishery, and a pot fishery for scup and sea bass.

Commercial fishing and fishing-related employment

Harvesting structure

New Bedford was the leading port in fishing employment in Massachusetts in 1997.[32] Approximately 250 fishing vessels (trip boats) operate out of New Bedford Harbor. Of these, close to 100 are scallop vessels, typically with 7 member crews.[33] The majority of the rest are ground fish boats with an average crew size of 4. In addition there are some dayboats that go lobstering or clamming. Transient boats land in New Bedford from time to time.

In 1998, 48 out of 183 dragggers (26 percent) were over 80 feet in length, 5 of these were over 100 feet. There were also 49 scallopers over 80 feet, and of these six were over 100 feet.

Estimates of the numbers of fishermen ranged from 1,800 to 3,000 for the area. Crew sizes on scallop and ground fish vessels have diminished in the past few years, partly due to regulations (e.g., scallop boats are restricted to 7 crewmembers). To accommodate family members or long-term crewmembers, some captains and boat owners have adopted crew rotation schedules, a variant of job sharing, instead of laying off crew. Shore-side services or related employment is thought by some respondents to be at least 4,000. Consultants in a 1999 harbor planning process identified 2,600 jobs and $609 million in sales directly attributable to the core seafood industry. Another 500 jobs were indirectly related, as was about $44 million in sales.[34]

Ninety-five scallopers and ground fish boats that carried 448 crewmembers left fishing between 1994 and 2000. Of these, 26 vessels were in the Federal government's buyback program, 26 were sold out of the fishery, 16 were scrapped, four had permit violations/sanctions and 23 either burned or sank.[35]

The majority of ground fish boats are owner-operated, or perhaps more accurately, family operated. Sometimes, a corporation is formed among two or three people to own two or three vessels, each one taking one of the boats to operate themselves or by their sons, cousins, brothers. There are several scallop boat owners who own small fleets of 5 to 7 vessels.

There is a contingent of vessel owners within the New Bedford fishery that are not themselves fishermen. These individuals set some of the rules that govern labor relations throughout New Bedford, negotiating vessel shares and hiring practices. Union representatives reported that payment systems and crew-captain relations vary widely from vessel to vessel. In the late 1980s, boat owners who fell into this category numbered 32;

[31] Recent regulations that eliminate dogfish as a target species will severely affect portions of the New Bedford fleet and the processing plants.

[32] Georgiana, Daniel. 2000. The Massachusetts Marine Economy. Dartmouth, MA: University of Massachusetts Donahue Institute.

[33] Respondents estimated 100 scallop boats, but Georgiana et al. counted 77. The 1997 federal permit files list 162 vessels with New Bedford "hcity," 74 vessels with Fairhaven as "hcity," and 12 vessels with Fall River as "hcity." One respondent noted that there are 290 fulltime scallop boats on the East Coast (South Carolina to Maine).

[34] FXM Associates; Seafood Data search; Heaney Edelstein. 1999. New Bedford/Fairhaven Harbor Plan. Technical Memorandum: Expanded Economic Analysis. Prepared for the Harbor Master Plan Committee.

[35] Data collected and prepared by Rodney Avila (dated 11/8/00).

typically, these owners owned anywhere from one or two to six or seven vessels. During the strike of 1986 the union argued for a 42%-58% split of the proceeds, with 42% going to the owners and owners desired a 49%-51% split. A decade after the strike, the split on union vessels was 46%-54%, with the owners receiving 46%.

Processing structure

In addition to boat owners, captains, and crew, the full New Bedford/ Fairhaven fleet generates business for around 75 seafood processors and wholesale fish dealers and 200 other shore side industries. Together, these businesses provide employment for around 6,000 to 8,000 additional workers.

The above figures, of course, include only those individuals employed directly in fishing and fishing-related industries; missing from these numbers are the health providers, real estate companies, banks, insurance agencies, and small business people who rely on the families of fishing industry employees for a percentage of their business. Even without considering these individuals, between five and eight percent of the people in New Bedford derive their income primarily from the fishing industry. Even a conservative estimate, assuming two other individuals supported by each fisherman and fishing-related worker, places the proportion of the population dependent on fishing somewhere between 11% and 18%.

The majority of the processing sector of New Bedford follows the pattern typical of New England in which "individual dealer/processors have remained relatively small in scale to

avoid the risks of overcapitalization (too high fixed costs, or underutilized production capacity) in the face of variable raw material supplies."[36] While this is considered an appropriate business strategy given the "erratic volumes" available for processing, the small scale does leave the individual processors "vulnerable to price and volume sensitivity of major buyers which, in turn, has contributed to the competitiveness between dealer/processors throughout New England."[37]

As ground fish landings fell in the 1990's, shortages of raw material for fresh fish processing increased prices and "substantial new investment in both equipment and training was necessary to conform to new health regulations. Prices at the retail level, however, did not rise as much; competition from substitutes such as chicken severely limited price increases for fishery products."[38]

To stay in business, firms "intensified buying within New England to maintain their share of dwindling landings. They went farther a field from their home port to establish new buying relationships."[39] For example, when New Bedford boats caught fluke and steamed to Virginia, North and South Carolina or Georgia to unload, sometimes one of the local fish processors would be down there to buy it and then they'd truck it up to Massachusetts for processing.[40] According to one report, this is less common now. "New Bedford processors, who used to truck whole fish into the city from other ports, now process only the fish that is landed locally."[41] However, some consultants predicted in 1999 that in the following five to eight years the processing/wholesale sector would continue to diversify by sourcing fish from

[36] Francis X. Mahady. 1983. "The Coordinated Marketing of New England Seafood: Opportunities and Constraints." Report prepared for The National Marine Fisheries Service and The New England Fishing Steering Committee.

[37] Ibid.

[38] Daniel Georgiana. 2000. The Massachusetts Marine Economy. Dartmouth, MA: University of Massachusetts Center for Policy Analysis.

[39] Ibid.

[40] Key respondent interview.

[41] Daniel Georgiana. 2000. The Massachusetts Marine Economy. Dartmouth, MA: University of Massachusetts Center for Policy Analysis.

other regions.[42] The processors who are bringing in frozen fish, "refreshing it," cutting, processing and selling it to supermarkets, are expanding.[43]

In addition to finfish processing, surf clams and scallop plants are part of the processing sector of New Bedford. In 2000, three dogfish plants were facing the future with trepidation since imminent dogfish regulations were to allow only minimal catch of dogfish (as bycatch rather than targeted species).

Cape Verde

The major species of fish that are caught around the Cape Verde Islands are yellow fin tuna, skipjack, and sailfish. Fishing vessels originating from Cape Verde do have several restrictions. For example, fishing for marine mammals, marine turtles, and using explosives for fishing is prohibited. Non-nationals also have restriction on fishing such as bottom trawling is prohibited and only nationals can fish for lobster. Fishing is one of the main sources of commerce and done widely over all the islands.

CAPE VERDE: FISHERY PROFILE

The following information was prepared for a conference in 1993 with the cooperation of the Embassy of Cape Verde in Washington, DC and includes data gleaned from USAID/Project Monitor FDSS, and FAO Fisheries Circulars #314, #810, and #815. As soon as more recent information becomes available it will be posted.

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FEATURES

Land Area: 4,033 km2
Continental Shelf Area: 10,150 km2
Length of Coastline: 2,000 km
Territorial Seas: 12 nautical miles
Inland Waters: 0
Exclusive Economic Zone (EEZ): 200km
EEZ Area: (estimated) 734,265 km2
EEZ a % of Land Area: 18,220%

MACRO-ECONOMIC INDICATORS

Languages: Portuguese and Cape Verdean Kriolu
Population: (July 1990) - 374,984
Population Growth Rate - 3.0%
Labor Force (1985 est.) - 102,000
Agricultural Population (1985) 138,149
Literacy - 48%
GDP (Curent Prices -1987) - $458 million
Per Capita GDP (1987 est.) $494.
Real Growth Rate (1987) - 6.1%
Inflation Rate (Consumer Prices-1987) - 3.8%
Agricultural GDP (1985 estimate) - $58,140
Fishery in Agricultural GDP (1985) - 15%
% Fishermen in Agricultural Population - 6.5%
% Fishermen in Labor Force - 3.7%

INDUSTRY INDICATORS

No. of Non-Decked Vessels:
(Small Scale Artisanal boats - 1985) - 1,173
% Motorized - 32%

No. of Decked Vessels (Industrial) :
Trawler - 0
Purse Seiner - 0
Multipurpose - 67
Other - 8

No. of Fishermen: 3,730
Artisanal: 2,600
Industrial: 300
Part-Time: 830

Storage Capacity on Land: Cold Store - 14,000 m3
Freezing - 80 t/d
Ice Plant - 20 t/d
Present Capacity Utilization of Cold Storage: Less than 20%

FISHERY RESOURCES

Estimated Potential: Marine - 41,300 (mt/y)
Domestic Production: Marine 5,372 (mt/y)
% Produced : 22%
Major Species & Share of Domestic Production -
Yellowfin Tuna 33%, Sailfish 32%, Skipjack 27%
Gross Value of Fishery Products - $3.8 million (1988)
Imports: Quantity - 85 (mt/y)
Exports: Quantity - 1,124 (mt/y)
Fish Supply /Consumption (1988) - 4,333 mt
Per Capita Fish Supply (1988) 11.6 kg
Fish Trade Balance (1988) - $1.6 million
Fish as a % of Animal Protein Supply - 43.7%
Fish as a % of Total Protein Supply - 43.0%
Estimate Post Harvest Loss - 25% of total catch
Fish for non-food uses - 0

RESTRICTIONS

- Use of explosives for fishing is prohibited.

- Fishing for marine mammals is prohibited.
- Fishing for marine turtles is prohibited.
- Fishing for lobster is reserved to Cape Verdean nationals.
- Bottom trawling by non-nationals is prohibited.

EXISTING FREIGHT SERVICE (1994)

Air Freight:

Amilcar Cabral International Airport (code = SID)
Ilha do Sal, Cape Verde

South African Airways service to JFK, New York

TAP (Portuguese Airways) and TACV (Cape Verde Airways) service to Lisbon, Portugal

TACV service to Amsterdam

TACV, the national carrier, will be expanding its international service in 1996.

Ocean Freight:

LINMAC Ltd. regular monthly cargo service from Ports of Mindelo and Praia to New Bedford, Mass. (Service will be expanded in 1995). Tel: (508) 992-6310 FAX: (508) 992-4771

The Azores

Fishermen from the Azores catch a lot of tuna, horse mackerel, conger eel, and black and white scabbard fish. There is no bacalhau establishment on the Azores unlike the Mainland where bacalhau drying is the dominant activity. The main activity on more than one island in the Azores is tuna canning. Sao Miguel and the Island of Tereceira are the most important islands for fisheries. Presently there are no inland fisheries and there are two families run trout farms on Madeira.

Portugal P18 islands Socio-economic Profile

1 Portugal Islands: P2
1.1 Overview

The area defined as Portugal Islands P2 covers the Azores Islands and Madeira. In 1996 there were 2,273 vessels in P2. The majority is located in the Azores (1,739 of which 445 are without a motor). There are a further 534 based in Madeira of which 289 were without a motor. Multi-purpose vessels predominate in both locations. Most are small with an average size of 6.9 GRt and a power of 26.2 kW. They operate exclusively in coastal waters. In

addition to the multi-purpose vessels there are 6 medium sized seiners (43 GRT and 182KW) operating out of Madeira and targeting pelagic, mainly horse mackerel and mackerel. There are also 7 distant water vessels (average 469 GRT and 805 kW) believed to be mainly fishing for large pelagic (tuna and swordfish). They fish under third country agreements and land their catches outside of the islands.

In the Azores in 1996 there were 17,215 tons of fish landed, of which about 54%, by weight, and 32%, by value, was tuna. Other species caught are horse mackerel, conger eel and white scabbard fish. Total landings in Madeira were 11,726 tons. The total value of the catches in the P2 area is estimated at 31,800,000 ECU. Again tuna landings predominate with 54% (by weight) and 52% by value. Other species of economic value were black scabbard fish, accounting for nearly 30% of the value.

The pattern of processing in the autonomous regions differs significantly from Portugal Mainland, which is dominated by bacalhau drying. On the islands there are no bacalhau drying establishments, and the dominant activity is tuna canning utilizing the local landings of tuna and imported raw material. There is also some processing and packing of fresh and frozen fish, along with some fresh fish merchants who undertake primary processing

There are no inland fisheries

1.2 Coastal Fishing Employment

The numbers of registered fishers is considered to be an accurate representation of the extent of activity since case study evidence suggests that fishers in the Azores and Madeira do not participate in other economic activities. The poor quality of data means that there were no desegregations into Full Time / Part Time, % self-employment or degree of pluri- activity.

Azores
There are 3,897 registered fishers in the Azores in 1997 of which 2,311 were registered on the island of Sao Miguel, 367 on the Island of Terceira, 321 on the island on Pico and 86 on the island of Flores. Whilst the most important islands from the point of view of fisheries are São Miguel and Terceira, the most dependent communities are the smaller islands of Pico and Flores.

Madeira
Maderia has a total of 1,325 fishers, mostly located on the island of Madeira. The two NUTS 4 areas of Machico and Camara de Lobos account for 85% of the fishers.

1.3 Processing Employment

There are a total of 1,416 people employed in processing, 1,021 of these in the Azores and 395 of these in Madeira. The largest centers for processing in the Azores are at Ponta Delgada on São Miguel and Horta on Faial where there are tuna canneries. Approximately 40 of the processing persons employed in the Azores are in the fish-freezing sector.

In Madeira there were 395 persons employed in processing, mainly in Funchal and Machico where the principal tuna canning activities are located. Only 52 of these persons employed were in the fish freezing sector and commercialization sectors.

1.4 Vessel Construction and Repair

Employment in Azores was of 48 people in vessel construction and repair, 31 in Ponta Delgada on S.Miguel and 17 in Pico. Boatyards are relatively small and rely extensively on the fishery sector for their income.

1.5 Marine Aquaculture Employment

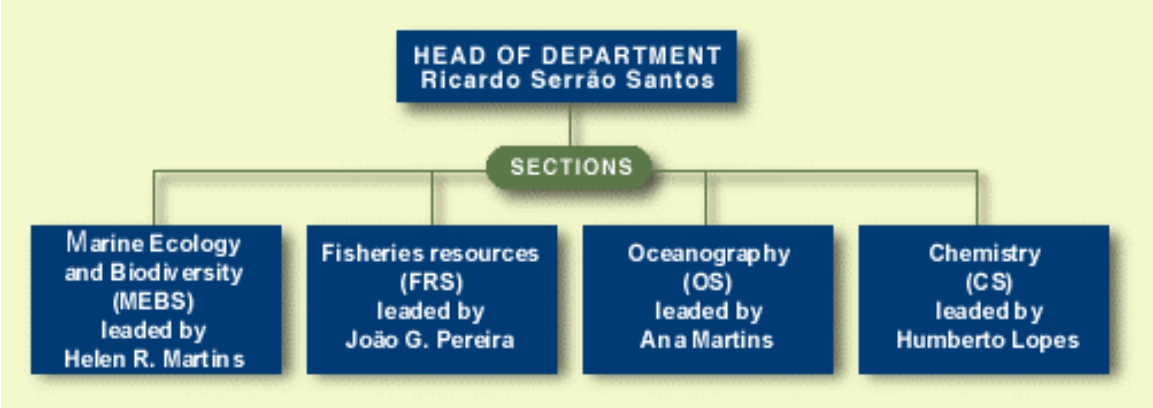
Employment in marine aquaculture is estimated to be less than 5 people in a developmental sea bream production unit located in Madeira.

1.6 Inland Aquaculture Employment

There are two families run trout farms in Madeira. Total number of people employed is 6.

Department of Oceanography and Fisheries

The Department Council (DC) of DOP is made up of all Ph.D. members of DOP. Each section has its leaders, two research assistants and by one administrative officer. The Department stands for the Department of Oceanography and Fisheries. The head of the department was Dr. Ricardo Serrão Santos. We met with him and he gave us a Power Point Presentation on two projects that they have conducted in the summer of 2002. They plan on doing more projects, but the school lacks funding from the government. Illustrated below is the layout of DOP:



- **Marine Ecology and Biodiversity (MEBS)**
- **Oceanography (OS)**
- **Fisheries Resources (FRS)**
- **Chemistry (CS)**

So as you can see they have strong international interest for oceanographic, fisheries and biodiversity studies. The Department of Oceanography and Fisheries from the University of the Azores is located on the island of Faial and they are also involved in research activities related to the marine sciences. Main research programs deal with the description, experiment and modeling of oceanic ecosystems, within the areas of Ecology, Marine Biology, Physical and Chemical Oceanography, and Fisheries. We asked Mr. Santos if they were interested in Aquaculture, and he claimed that he was, but the problem is with the funding. As for in the future, he looks forward to collaborating with the University of Massachusetts Dartmouth sometime in the near future.

The University is small in size, and composed of many different laboratories that they use for their related projects. Many projects are also delayed in their area, because of the changes of weather, not throughout the year, but within one day.

The School for Marine Science and Technology, University of Massachusetts Dartmouth

The School for Marine Science & Technology is located in New Bedford, MA. It was designed by Tsoi-Kobus Architects. It incorporates a 300 gallon/minute flow-

through sea water system which provides ambient Buzzards Bay sea water to the labs. All of the facilities are listed below and are part of SMAST:

- ***Acousto-optic Test Tank:***
- ***R/V Lucky Lady,***
- ***Stable Isotope Biogeochemistry Laboratory.***
- ***Analytical Laboratories for Coastal Systems.***
- ***Aquaculture Systems:***
- ***Sea-water tank room***
- ***Greenhouse***
- ***Computer Laboratory***
- ***Dock***
- ***Multi-media conference room***
- ***Library/Chart Room***
- ***Machine Shop/Electronic Fabrication Shop***

We were interested mainly in there Aquaculture System, in order for us to set a connection between these two Universities. The Aquaculture System SMAST works to promote an understanding of the complexity of the marine environment. They are currently planning the construction of a demonstration display of aquaculture recirculation technology and the construction of a display tank for local marine flora and fauna - .

Analysis

New Bedford, Cape Verde, and the Azores all have good locations for fishing and have a diverse product market. In each area fishing is very important to the economy and the diet of the people. There is also no cultural barrier between the three groups of people as many of the inhabitants of New Bedford are of Cape Verdean or Portuguese decent.

There does exist a possibility for trade and combined research programs. From an economic standpoint there are different types of fish in each of the three regions and it may be possible to bring these popular products to a new market. Because all three regions are very similar, if the products could be transported then they will surely sell.

If a long-standing relationship could be built then both the Azores and the Cape Verde Islands would need assistance in expanding their operations. Docks need to be lengthened and fishing techniques need to be improved upon. They both are currently in the process of attempting to expand their respective fishing markets.

A major issue in both the Azores and the Cape Verde islands is the overexploitation of the marine life. Certain species are found less frequently and they do not have the technology to understand why. They do not have the use of such instruments as a submersible to see what is going on with one of their most important resources. This is technology that we possess and could help them to understand and prepare for the future of their fishing industry.

One way in which they might be able to prepare for the future of their fishing industry is to consider fish farming. Fish farming sets up certain areas where the fish can be protected and maintained for later consumption. It is efficient and once implemented it is also easily maintained. This may help to solve problems of overexploitation and shortages.

A problem with this idea is if the people would accept this. Research would have to be conducted to know if fish consumption would maintain the same level if the people knew that their fish were farmed instead of caught. Even if the people did maintain the same level of consumption, to initiate such a project would require assistance from the

governments of Portugal and Cape Verde. This is a possible solution to their problem, but if the plan could actually be implemented is not likely at this time.

Government intervention and regulation is a barrier to combined research. Funding comes from the government and is very difficult to attain. Projects need to be able to show immediate results in order to get funding. Therefore, if any relationship was to be implemented between New Bedford, Cape Verde, and the Azores, it would have to be established and accepted through the governments of each area.

Therefore, the possibilities for establishing a relationship are very unlikely at this time even though it would be helpful and profitable for each area. However, the possibility does exist and will become more likely in the future as the markets in the Azores and in Cape Verde are now expanding.