OPA '90 SEC. 4111(b)(7) EVALUATION OF OIL TANKER ROUTING
PART 2 - ATLANTIC & FLORIDA GULF COASTS

EVALUATION OF OIL TANKER ROUTING

per
SECTION 4111 (b)(7)
OIL POLLUTION ACT OF 1990

PART 2 - ATLANTIC & FLORIDA GULF COASTS

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PREFACE

This study is part of a complex decision-making process...

Public demand for protection of sensitive marine resources arose following several major oil spills. This concern generated a number of initiatives including passage of the Oil Pollution Act of 1990 (OPA 90) by Congress. That Act mandated many actions to reduce the risk of oil spills. Section 4111 (b) (7) called for the Secretary of Transportation to "evaluate whether areas...should be designated as zones where the movement of tankers should be limited or prohibited." In response, the Coast Guard/Department of Transportation (CG/DOT) conducted a study to identify marine resource areas that are most sensitive to spilled oil, characterize tanker activity there, and provide information on the protection that could be afforded those areas by keeping tankers farther at sea. The results of this study do not support a recommendation for designating specific areas where the movement of oil tankers should be restricted or prohibited.

This report illuminates the relative importance of tanker routing to the oil pollution issue, but does not specifically address restricting the routing of tankers to protect sensitive marine resources. Data developed in the study are presented in chartlets depicting the following: locations of the most sensitive resources, potential restricted areas around them that could afford 3, 10, or 30 days of oil spill response time prior to first oil contact with those resources, typical tanker traffic patterns, and other relevant vessel traffic information. As such, the report is an important part of a complex decision-making process on the routing of tankers and other vessels.
As mandated by OPA 90, the study addresses only tanker traffic. Barges and large vessels which may carry substantial amounts of bunker fuel (other than tankers) are excluded. Hazardous materials, other than oil, are likewise not addressed.

Furthermore, many practical aspects require consideration in concert with this report:

- Design of TSS's for port access. This report only suggests corridors to minimize effects on sensitive marine resources--local circumstances (e.g., traffic density and navigation safety concerns) must also be considered.

- Examination of tanker and other vessel movements to identify local trips that can not be rerouted.

- Issues regarding navigational safety, such as:

    - Effects on accident and spill probabilities of decreased separation between vessels during both the coastwise and port approach portions of voyages.

    - Accident likelihood given greater sailing distances.

- Potential degradation of emergency response (both towing and spill removal) if an accident occurs farther out to sea because a vessel has avoided a sensitive marine area.

- Ways to minimize detrimental effects of routing restrictions on commerce.

Finally, this report is part two of a two-part report to Congress. It covers the Atlantic and Florida Gulf of Mexico coasts of the United States. Part one reports the results of a similar analysis for the Pacific coast. The two parts encompass all areas under the moratorium on oil and gas development imposed by Congress.

This report is only part of a much larger, complex undertaking; it provides new and essential information important to the decision-making process, but its scope is limited. It locates areas with the most sensitive marine resources and presents a means of defining the protection for them afforded by keeping vessels farther out to sea. It does not investigate safety or economic tradeoffs associated with providing this protection and, therefore, makes no recommendations for specific routing restrictions.

Any action must conform to international law...

Synopsis

A coastal state has the right to regulate the conduct of foreign flag vessels in the territorial sea with regard to navigation safety and environmental protection provided such regulation is consistent with the 1982 United Nations Convention on Law of the Sea (UNCLOS) and other rules of international law. Should a coastal state choose to implement an Exclusive Economic Zone (EEZ) adjacent to its territorial sea, it retains the right to issue environmental protection regulations consistent with generally accepted international rules and standards, and a limited ability to regulate with respect to navigation safety by establishing reasonable "safety zones" around artificial islands, installations, and structures constructed in the EEZ. There is no current jurisdiction or authority that would permit a coastal state to exclude foreign flag vessels from an "exclusion zone" which constitutes denial of the right of innocent passage in the territorial sea or a restriction upon the high seas freedom of navigation.

Discussion

According to the UNCLOS, a coastal state may not "hamper the right of innocent passage of foreign ships through the territorial sea" except in accordance with the Convention. More specifically, a coastal state may not "(a) impose requirements on foreign ships which have the practical effect of denying or impairing the right of innocent passage; or (b) discriminate in form or in fact against ships of any State or against ships carrying cargo to, from, or on behalf of any State."

While a coastal state may not impair or deny innocent passage, it may enact laws to protect its environment and to fulfill its obligations for safe navigation under the UNCLOS. The UNCLOS specifically permits coastal states to establish sea lanes and Traffic Separation Schemes for tankers and ships carrying dangerous materials, taking into consideration the recommendations of the competent international organization, and other factors contained in Article 22, UNCLOS. The Convention (by implication) and subsequent state practice (explicitly) have recognized the International Maritime Organization (IMO) as the international organization with a global mandate to adopt international standards in matters concerning maritime safety, efficiency of navigation and the prevention and control of marine pollution from vessels.

Principles of high seas freedoms apply in the EEZ. Article 58 of the UNCLOS states that all states enjoy the freedom of navigation in the EEZ referred to in Article 87. For the purpose of enforcement in their EEZ, coastal states may adopt laws and regulations for the prevention, reduction, and control of pollution from vessels conforming to generally accepted international rules and standards established through the competent international organization (again the IMO) or general diplomatic conference. There are also procedures for the coastal state, with approval from the IMO, to establish specific regulations where the international standards are inadequate. However, a coastal state has traditionally less power to impose mandatory measures in their EEZ.

With regard to sovereign immunity of public vessels in both the territorial sea and EEZ, the UNCLOS states that the provisions of the Convention regarding the protection and preservation of the marine environment do not apply to any warship, naval auxiliary, other vessels or aircraft owned or operated by a state and used, for the time being, only on government noncommercial service. However, states shall ensure that appropriate measures not impairing operations or operational capabilities of such vessels are adopted in a manner consistent with the UNCLOS.

This report is the product of the collected efforts of the Coast Guard, the Volpe National Transportation Systems Center, Volpe on-site and off-site contractors, and the Department of the Interior, Minerals Management Service.

EXECUTIVE SUMMARY

Public demand for protection of sensitive marine resources was raised following several major oil spills. This concern generated a number of initiatives including passage of the Oil Pollution Act of 1990 (OPA 90) by Congress. That Act mandated several actions directed at reducing the risks associated with oil spills. Section 4111 (b) (7) called for the Secretary of Transportation to "evaluate whether areas...should be designated as zones where the movement of tankers should be limited or prohibited." In response, the Coast Guard (CG), Department of Transportation (DOT) conducted a study to identify marine resources most sensitive to spilled oil, describe tanker traffic patterns, and provide information on the protection that could be afforded those areas by routing tankers and possibly other vessels farther out to sea. The results of this study do not support a recommendation for designating specific areas where the movement of oil tankers should be restricted or prohibited. (Note: This is the second part of a two-part report. Part 1 addressed the Pacific coast, and this Part 2 covers the Atlantic coast and the Gulf coast of Florida.)

Findings for the Atlantic and Florida Gulf Coast

- <u>Nature and Location of Sensitive Marine Resources</u>

Oil sensitivity of various marine species and their habitats, as well as the population densities and life cycle activities of each species were analyzed. The Exclusive Economic Zone (EEZ) was divided into a matrix of cells, measuring 15 minutes of latitude by 15 minutes of longitude. An index was calculated for each cell which reflects the relative sensitivity of the marine resources within that cell to damage by contact with oil. Results showed that significant areas of offshore waters, as well as the entire shoreline, are sensitive to oil.

Offshore areas with the most oil-sensitive resources (10 percent of all indices) are separate and distinct, but are often located such that they must be transited to access ports from coastwise sea lanes.

By including successively less sensitive areas as well (20 percent and 30 percent of all indices), a contiguous zone is formed along most of the Atlantic coast and the Gulf coast of Florida, extending out to 100 nautical miles opposite Long Island, NY and 250 nautical miles off the coast of Maine.

- <u>Hazards Posed by Tankers and Other Vessel Traffic</u>

Analysis of oil shipments and vessel traffic patterns show that oil tankers operate in or near the most sensitive marine resource areas. However, tankers carrying crude oil and petroleum products represent only a small percentage of the deep-draft vessel traffic that pose an oil spill threat to the most sensitive marine resources. In fact, two-thirds of the spills in the Atlantic and Florida Gulf coast EEZ have historically been from vessels other than tankers. Significant volumes of oil also move in tank barges along the coast. Large vessels of all types with bunker fuel stores operate in the same areas, and pose a threat of oil spills. Chemicals and other hazardous materials spills could also damage marine resources.

The number and size of tanker spills projected for the Atlantic and Florida Gulf coasts are estimated to be few (e.g., using historical spill rates, roughly one spill of 10,000 to 100,000 barrels in the sea lanes somewhere between Cape Hatteras and Block Island over a 13-year period). Furthermore, the historical oil tanker spill rates are expected to decline significantly in the future as the effects of OPA 90 initiatives in tanker design, crew performance, and spill response are felt.

The value of rerouting tankers (and perhaps other large vessels) in many cases would be limited because vessels must still transit sensitive areas to access ports along the coast, and port approaches appear to present the greatest risk.

- Protection Afforded by Routing Vessels Farther Offshore

A restricted zone (entry denied to vessels with large quantities of oil as cargo or as bunker fuel) would afford a level of protection to the most sensitive marine resources, if vessels did not require access to ports. Such restricted zones would extend outward from the protected areas to provide a specified amount of time to intercept and remove most or all of a spill before it drifts into the protected area. For example, a restricted zone could be designed to assure that less than 5 percent of drifting oil originating outside the zone would reach the protected area within 3 days. Zones to protect the 10 percent, 20 percent, or 30 percent most sensitive offshore marine resource areas have been generated to illustrate a systematic process for defining acceptable restricted zones.

Boundaries of restricted zones must permit access to ports of call along the coast. Although areas representing the 30 percent most sensitive offshore marine resources form a nearly continuous band along the coast, port access corridors through these resources must be provided for vessels to enter and leave port.

Defining appropriate outer boundaries for these restricted zones is more complicated than simply establishing a fixed distance offshore. Oil-sensitive marine resource areas extend farther out to sea along the northern coast than along the southern coast. So, keeping selected vessels a set distance (e.g., 50 nautical miles) off the entire coast would provide varying levels of protection to any selected level of sensitive resources (e.g., 10 percent, or 20 percent, or 30 percent, etc. most sensitive). If uniform protection is provided to a selected level of the most oil-sensitive areas (e.g., 20 percent), then areas with less sensitive resources generally receive less protection because they are usually located farther from shore. Therefore, it seems that boundaries should generally follow a response-time contour (e.g., 3 days) for the most sensitive areas selected for protection. This varying distance offshore might be fixed between each pair of port access corridors, but the large number of ports along the Atlantic coast presents a very complex pattern of potential restricted area boundaries.

Findings for the Block Island -Montauk Point Channel

1) The Block Island -Montauk Point Channel is commonly referred to as the Southwest Passage. It is one of two alternative routes between the Atlantic Ocean and Long Island Sound.

2) The Southwest Passage is a shorter but shallower route than the route north and east of Block island.

3) The Block Island Southwest Passage is located in a highly sensitive marine resource area east ofMontauk Point, NY.

4) The Southwest Passage is sometimes used by oil tankers and barges, with less that 30 foot draft, calling at Connecticut and Long Island port facilities.

5) The oil spills that have occurred during the last 20 years cannot be linked to the choice between the two alternative routes connecting the Atlantic Ocean with Long Island Sound.

6) Non-tank vessels represent 96 percent of the total transits between the Atlantic Ocean and Long Island Sound of vessels that are capable of using the Southwest Passage.

7) Alternate routing may increase risk of other accidents.

1. INTRODUCTION

1.1 LEGISLATIVE BACKGROUND

Section 4111(b)(7) the Oil Pollution Act of 1990 (OPA 90) - Public Law 101-380 dated August 18, 1990, mandated that the Secretary of Transportation "evaluate whether areas of navigable waters and the exclusive economic zone should be designated as zones where the movement of tankers should be limited or prohibited." This report responds to that OPA 90 evaluation requirement.

The Congressional Record contains language not included in the law, indicating the focus of congressional sponsors of this provision of the law (136 Cong. Rec. H 6270 (Aug. 1, 1989)):

a) Appears to be on "areas where oil and gas leasing, exploration, or development are prohibited by legislative action." The Outer Continental Shelf (OCS) planning areas under congressional moratoria define essentially the entire coastline with the exception of the Central and Western Gulf Coast and Alaska.

b) "The Coast Guard should act expeditiously in evaluating whether tankers should be prohibited from using the channel between Montauk Point, New York, and Block Island, Rhode Island. The channel is extremely narrow and shallow and has been the site of numerous accidents."

c) "For other reasons, the Coast Guard should evaluate the advisability of declaring the Santa Barbara Channel off the coast of California a 'tanker free zone.'"

d) "The Secretary should consider whether a 'tanker free zone' would be consistent with offshore oil and gas development."

Congressional concern may be summarized as follows:

> If oil and gas exploration (to expand domestic sources, increase domestic production, and reduce dependence upon imports) is under moratoria (to avoid oil spill damage to the most sensitive marine resources), should oil spills from vessels be likewise precluded from damaging these same resources by routing oil tankers around these marine resources?

1.2 PURPOSE AND SCOPE

1.2.1 Purpose

This report focuses on presenting information on:

a) the location of sensitive marine resources;

b) their relative sensitivity to oil spills;

c) the existing routing of oil tankers;

d) the relationship between vessel routing and the risk of oil spill contact with the most sensitive marine resources; and

e) defining the boundaries of restricted zones that reduce the risk to the most sensitive marine resource areas.

This report addresses the "Tanker Free Zone" issue of Section 4111(b)(7), but it cannot fully resolve it. This report, therefore, refrains from making specific recommendations for regulatory changes.

1.2.2 Scope

This report identifies the Atlantic and Florida Gulf coasts' most sensitive marine environments by developing a measure of relative sensitivity to oil spills, and by locating and assigning a sensitivity index value to each of four aggregate groupings of marine resources (i.e., sea birds, marine mammals and turtles, fisheries species, and shoreline habitats). It charts these marine resources, within the waters of the OCS planning areas of the Exclusive Economic Zone (EEZ), along the entire Atlantic coast and the Gulf of Mexico coast of Florida. This report charts the typical tanker routes as well as the type and quantity of oil (i.e., persistent oils-- including crude oil and heavy petroleum products, andnonpersistent petroleum products such as gasoline and distillates) that tankers transport along these routes. It estimates the number of vessel trips and the future oil spills that might occur along the dominant routes, based on the current volumes of oil transported in and out of deep draft ports, and the historical rate of tanker oil spills in U.S. waters, which has not been changed to reflect the impact of other OPA 90 initiatives aimed at reducing the risk of spills.

A process for defining boundaries of areas where tanker traffic could be restricted is presented (but no specific zones are recommended). Oil spill contact risk contours are used to define boundaries that could provide specified levels of protection for the most sensitive marine resources. The process requires selection of the most sensitive marine resources for protection, and selection of an acceptable level of risk of contact by a future oil spill and knowledge of the time required to intercept and mitigate contact. Offshore boundaries for tanker routes and port access corridors could thus be defined as potential tanker free zones. This process does not consider response capabilities or Area Contingency Plan requirements. This report makes no attempt to estimate total societal benefits and costs of alternative tanker routing outside these zones.

The report is divided into two parts, bound separately: Part 1 - Pacific coast, and Part 2 - Atlantic and Gulf coasts. Each coast requires a consistent analysis and presentation of the study elements. Coastal geography, waterway geometry, meteorological conditions, weather, ocean currents, seasonal variations, and marine species and habitats, and lastly for each, products transportation patterns also vary. The aggregate effect of all these factors may require different management approaches for each coast.

1.3 APPROACH

Figure 1-1 is a chartlet of the entire Atlantic coast and Gulf coast of Florida showing the EEZ, the OCS planning areas under congressional moratoria (which defines the study area) and existing national marine sanctuaries.

Maritime Overseas Corporation, OMI Bulk Management Co., and Sea River Maritime, (formerly Exxon Shipping Company), identified typical tanker routes in this area using waypoint coordinates from ships' logs of selected typical voyages. Oil tonnage flows were developed from published federal data. Oil tanker trips on key routes were estimated from the total annual oil tons transported and average tons per tanker trip.

The oil tanker traffic patterns were summarized on chartlets indicating the relative locations of:

a) coastal shoreline and islands;

b) deep draft sea ports;

c) dominant tanker routes; and

d) volume of oil traffic.

Digital files of the Atlantic and Florida Gulf coasts marine resource areas and their relative sensitivities to oil were developed by marine resource experts, Ecological Consulting, Inc. (E.C.I.), under contract with the Volpe Center.[1] Oil spill contact risk contours associated with the most sensitive marine resources were plotted by the Volpe Center from output of a

[1] Relative Sensitivity of U.S. Marine Waters of the Atlantic Ocean and Eastern Gulf of Mexico to Oil Spills, Michael L. Bonnell, R, Glen Ford, and Janet L. Casey, May 1994

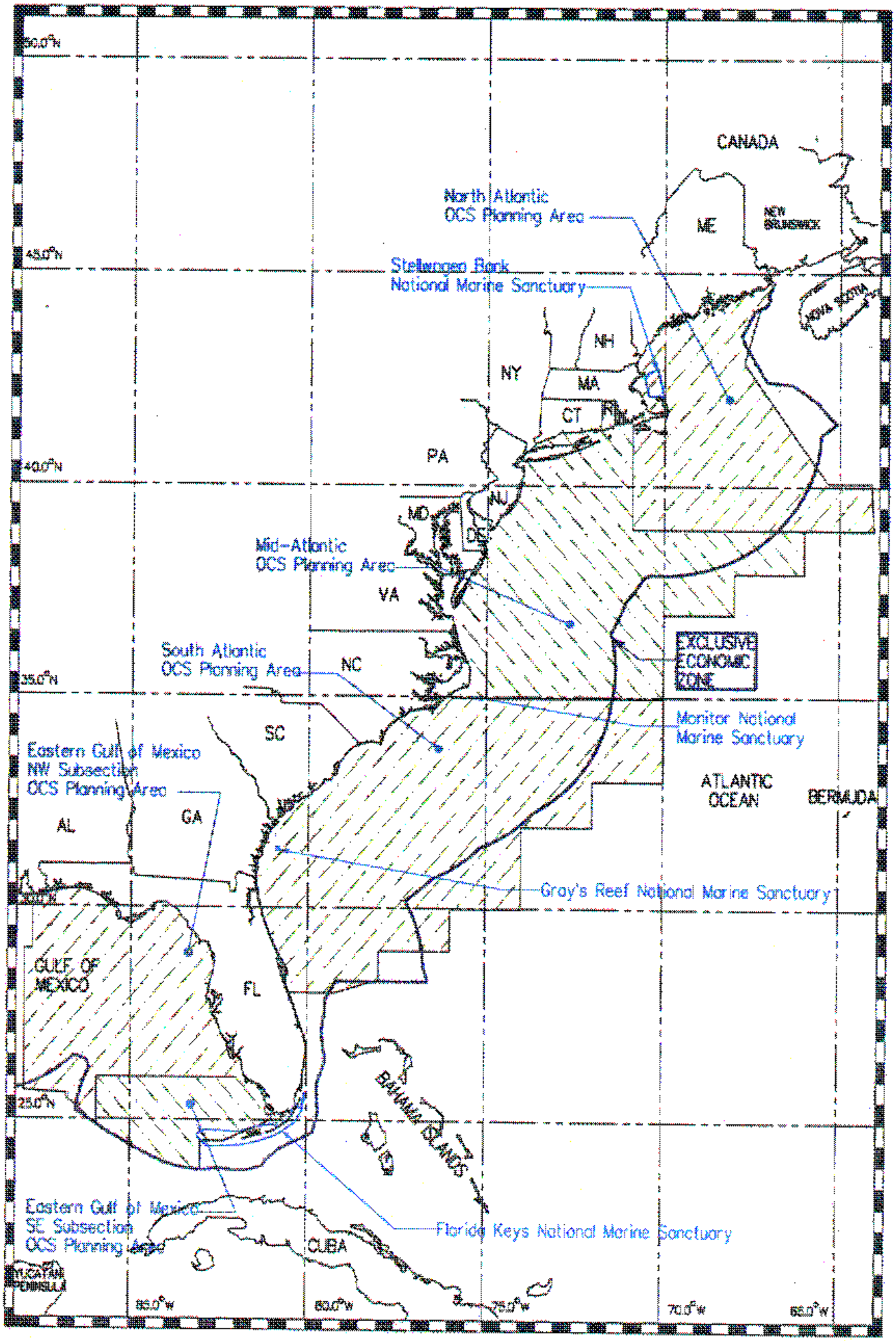

FIGURE 1-1 ATLANTIC AND FLORIDA GULF COAST STUDY AREA

large number of runs of the Department of Interior (DOI), Minerals Management Service (MMS) Oil Spill Risk Analysis (OSRA) model provided by MMS.[2]

The MMS/OSRA oil spill trajectory analysis capability helped define potential buffers around the most sensitive marine resources to protect these marine resources from future oil spills. The MMS/OSRA spill contact risk contours represent hypothetical locations of spills with a probability of contacting the marine resource within a specified number of days (e.g., less than 5 percent chance of contact with the marine resource within 3 days). Given a defined boundary line of a sensitive marine resource (e.g., a shoreline, or an offshore marine habitat), the OSRA trajectory analysis determines the probability that a future spill at the given site will contact the resource area within a selected period of time.

The risk contours suggest potential buffers, or restricted areas, but do not indicate the probability of a spill actually occurring along the contour line. For the latter information, additional factors must be considered, including the volume of oil moved, route of tankers moving oil, risk of vessel casualty, and the associated risk of spill. The oil movement volumes and the approximate routing of tankers within the EEZ were determined and presented in this report. Specific oil spill forecasts for the next ten or twenty years along a specific route are not currently possible.

Estimating the overall risk of future spill incidents within the EEZ is a function of the previously mentioned factors and several others, including navigation variables, vessel age and level of maintenance, hull and cargo hold design, on-board response systems, and crew performance. Although estimating these variables is beyond the scope of this effort, a crude estimate of future oil spills on dominant oil tanker routes was developed for perspective. This report assumes the fundamental issue of the Section 4111(b)(7) can be addressed on the basis of these crude estimates.

This report presents a process for defining restricted areas around the most sensitive marine resources that assure a low level of risk that spilled oil will reach the resources.

The process outlined in this report can provide variable levels of protection (e.g., less than 5 percent or less than 10 percent, etc. probability of contact) in the selected number of days (e.g., 3, 10, or 30) for different levels of resource sensitivity (e.g., 10 percent, 20 percent, 30 percent, etc. most sensitive) within sections of the coast.

A consistent level of protection from offshore spills (e.g., 5 percent in 3 days) may be provided to a selected marine resource along the entire coast by dividing the coast into sections between port access corridors and defining offshore vessel route boundaries for each section that approximate the appropriate contact risk contour. However, the number of ports, the patterns of sensitive resources and risk contours indicate that defining boundaries of restricted areas would be very complex.

[2] Oil spill trajectory analysis, such as that provided by the OSRA model,is recommended for oil spill contingency planning in the Draft Guideline Document For Use in The Preparation of Marine Facility and Vessel Oil Spill Contingency Plans For Natural Resource Protection and Oil Spill Countermeasures, by the Department of Fish and Game, State of California.

2. ATLANTIC AND FLORIDA GULF COAST VESSEL OIL SPILLS

2.1 VESSEL OIL SPILLS HISTORY

Oil spills can result from loss of cargo, from tankers and tank barges, or from loss of fuel from bunkers in any type of large vessel. Vessels other than tankers that carry large quantities of bunker fuel pose a significant threat to the marine environment in the event of a vessel casualty. This section places oil tanker spills and tanker traffic in perspective with spills and traffic of other types of vessels. Factors influencing vessel accidents include: human factors (crew training, qualification, testing, duty standards, literacy and language skills), vessel construction (double versus single hull, redundant propulsion and steering systems), age and maintenance of vessel (flag of registry and classification), and navigational hazards including other traffic.

OPA 90 should reduce the likelihood of vessel spills, the size of those spills that do occur, and the area impacted by any given spill. It requires the evaluation of existing standards for adequacy (e.g. for crewing and training), and increases standards for vessel construction and operations. Increased traffic management (Traffic Separation Schemes and Vessel Traffic Services) lowers the probability of oil spills from collisions and groundings. Deployment of response systems and teams mitigate the severity of any oil spills that do occur. Single hull tankers are gradually being phased out. Between 1980 and 1990 the percentage of the U.S. flag fleet that was double hulled or double sided increased from 10 percent to 30 percent. This trend is expected to continue.[3] At the time of this report, OPA 90 effects could not be evaluated within the scope of this analysis.

During the past 20 years, there have been 20 vessel oil spills greater than 20,000 gallons within the Atlantic and Florida Gulf coasts EEZ and the territorial seas (excluding spills within harbors, bays, rivers, and sounds). The total volume spilled was 11.9 million gallons, estimated to be one hundreth of one percent of the total volume transported in the 20-year period. The 20 spills involved 8 oil tankers, 9 tank barges, and 5 non-tank vessels. Table 2-1 lists these spills and indicates the type of oil spilled, bunker fuel as well as cargo, and the volume of each. Table 2-1 indicates that tankers represent 36 percent of the total number of vessels involved in oil spills, spilling 76 percent of the total volume spilled by all these vessels. Many of these tanker spills have occurred inshore within the approaches to ports as Figure 2-1 indicates. The spill risk associated with the hazards that caused these spills would not have been reduced by offshore routing of oil tankers. One of the two tanker spills offshore (i.e., the Meton spill in July 1981) is listed in the Coast Guard's pollution database as the result of tank cleaning operations; the other (i.e., the Argo Merchant in December 1976) resulted from grounding in Nantucket Shoals, a known navigational hazard given wide berth by alert mariners. The existing traffic separation scheme routes vessels around these shoals.

[3] Mercer Management Consulting, "OPA 90 Tanker Navigation Study: US Fleet Analysis," Lexington, MA, 1993.

TABLE 2-1 ATLANTIC & FLORIDA GULF COAST VESSEL OIL SPILLS			
SPILL DATE	**VESSEL NAME AND TYPE**	**SPILL TYPE**	**VOLUME (Gallons)**
JUN 1973	UNKNOWN: Tanker	#6 Fuel	840,000
DEC 1976	ARGO MERCHANT: Tanker	#6 Fuel	7,500,000
FEB 1978	GLOBAL HOPE: Tanker	Lube & Fuel	153,930
MAR 1978	OCEAN 250: Barge	Gasoline	682,458
DEC 1978	ROBERT L. POLING: Barge	Gasoline	49,980
JAN 1980	NEW YORK: Barge	Gasoline	69,000
NOV 1980	CHRISTIAN F. REINAUER: Tanker	#2 Fuel & Gas	100,000
JAN 1981	CONCHO: Tanker	#6 Fuel	100,000
MAY 1981	UNKNOWN: Freighter	#2D Fuel	130,000
JUL 1981	METON: Tanker	#6 Fuel	45,990
NOV 1985	E-24: Barge	#6 & #2 Fuel	840,000
SEP 1986	ST-85: Barge	Gasoline	119,740
NOV 1986	AMAZON VENTURE: Tanker	#6 Fuel	105,710
FEB 1987	FERN PASSAT: Freighter	Fuel	110,000
JUN 1988	CREST: Industrial Vessel	Diesel Fuel	20,000
SEP 1988	EXXON BARGE #503	#2 Diesel	126,170
JUN 1989	WORLD PRODIGY: Tanker	#2 Fuel	294,000
AUG 1990	OCEAN #192: Barge	Gasoline	152,000
OCT 1992	ROATAN EXPRESS I: Freighter	Diesel Fuel	144,600

Source: Coast Guard's Pollution Database. Includes all vessel oil spills (20,000 gallons or greater) between January 1973 and May 1994 within the EEZ.

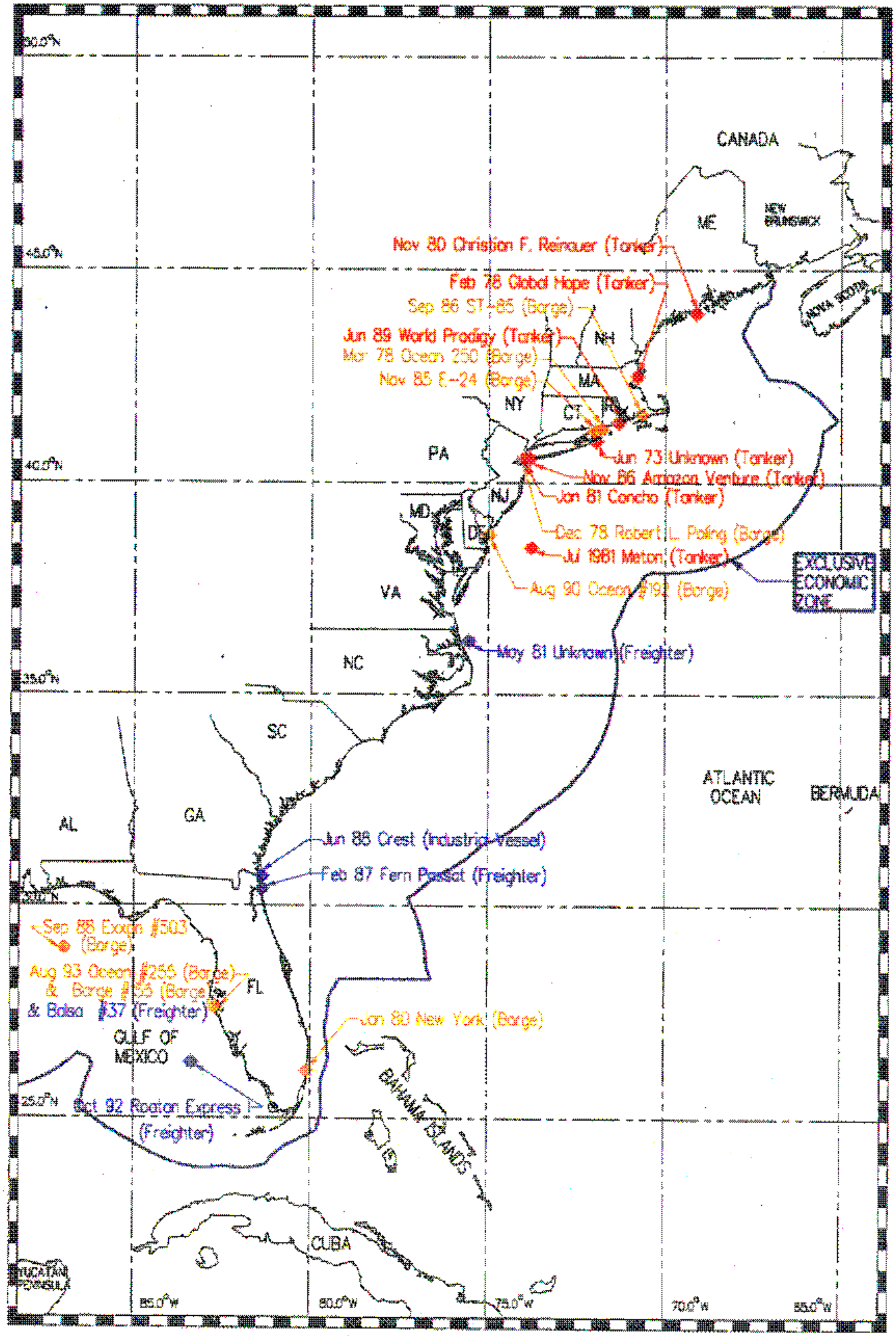

FIGURE 2-1 ATLANTIC & FLORIDA GULF COAST VESSEL OIL SPILLS

2.2 VESSEL TRAFFIC

Figure 2-2 presents the 1989 total vessel traffic to and from each of the ports located within the study area. It excludes U.S. export and import traffic between ports in the western Gulf of Mexico and foreign ports that transit the southern waters of the EEZ. Foreign vessels in innocent passage are also not included as they are not known. It shows the percentage of the vessel transits by oil tankers, oil tank barges, chemical tankers and barges and other cargo vessels that may carry large quantities of persistent bunker fuel.

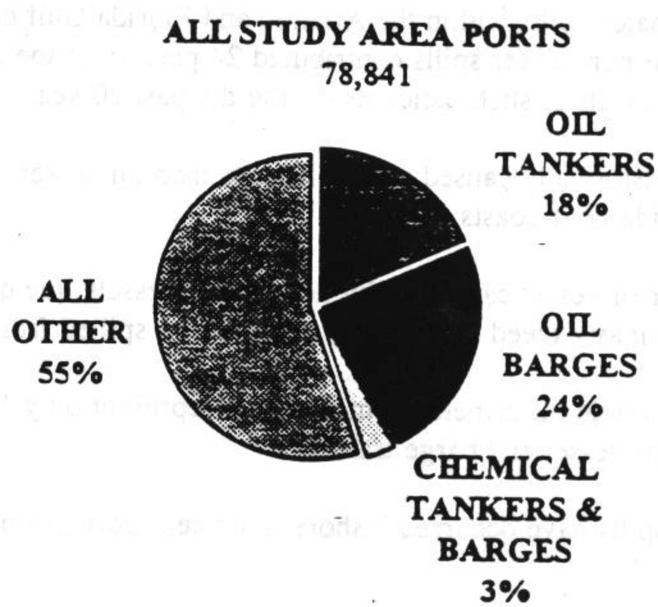

FIGURE 2-2 VESSEL TRANSITS IN ATLANTIC & FLORIDA GULF COASTS OIL TANKER PORTS OF CALL

Figure 2-2 is based on Waterborne Commerce Statistics, excluding all barges of less than 19 feet draft and dry cargo self-propelled vessels of less than 19 feet draft, on the assumption that such vessel transits are mostly local and are not involved in the traffic patterns within the EEZ (i.e., beyond the 3 mile Territorial Limit).

Oil tankers represent 18 percent of the total transits capable of spilling substantial quantities of oil. Oil barges, and chemical tankers and barges are 27 percent of the total. Of the 78,841 deep-draft transits reported for all oil tanker ports of call along the Atlantic and Florida Gulf coasts 55 percent are by vessels other than bulk haulers of oil and chemicals. The data presented in Table 2-1 indicate that oil barges represented approximately 43 percent of the vessels involved in major oil spills, and were responsible for approximately 54 percent of the total quantity of oil spilled in such incidents during the 20-year period. The data presented in Figure 2-2 indicates that oil barges represent 24 percent of the total deep-draft vessel transits making port calls within the EEZ study area. These data suggest that oil barges may be a greater threat to the sensitive marine resources than oil tankers along the Atlantic and Florida Gulf coasts. Any vessel routing schemes should consider all vessels carrying significant quantities of oil or hazardous materials.

2.3 VESSEL OIL SPILL FINDINGS

The findings of Section 2 are:

1) Vessels other than oil tankers have been responsible for 60 percent of oil released during major spills within the Atlantic and Florida Gulf coast EEZ study area. These non-tanker spills contributed 24 percent of the total quantity of oil spilled by vessels in such incidents during the past 20 years.

2) Oil barges have historically caused more oil spills than oil tankers along the Atlantic and Florida Gulf coasts.

3) Given the number of vessel casualties by non-tanker vessels, the quantity of bunker fuel spills may exceed the quantity of oil cargo spilled from oil tankers.

4) Tankers carrying crude oil or petroleum products represent only 18 percent of the total deep-draft vessel and barge transits.

5) Many vessel oil spills have occurred inshore in or near port approaches.

3. SENSITIVE MARINE RESOURCES

3.1 GENERAL DESCRIPTION OF ATLANTIC AND FLORIDA GULF COASTS MARINE RESOURCES

The Atlantic coast and Gulf coast of Florida comprise a rich and diverse marine ecosystem. The entire coast is bordered by marine habitats that contain resident and migratory species. These habitats host a variety of fish, birds, mammals, turtles, shellfish, fauna, plankton and krill. These waters support commercial fishing, sea product industries, and recreation for millions of people. This coast is also home to several endangered and protected species of shellfish, fish, birds, turtles and marine mammals including whales.

The Atlantic and Florida Gulf coasts have four areas designated as national marine sanctuaries (Stellwagon Bank, Gray's reef, Florida Keys, and the tiny Monitor sanctuary).

A body of scientific inquiry has developed around the problems of oil spills and damage to marine resources. Several works of particular note are listed in the appendix of the Ecological Consulting, Inc. (E.C.I.) report, which is Appendix A of this report. These works examine the complexity and interdependency of the many sensitive marine resources within the Atlantic and Florida Gulf coasts EEZ study area. Previous efforts focused on oil's impact on shoreline beaches, estuaries, and discrete ecosystems. Although oil's effects may be most evident along the shoreline; tides, currents, winds, and marine life migration cause damage far beyond the immediate spill site. Oil spills farther offshore can damage the marine resources in offshore waters long before the spill appears on the beach. This report stresses the contiguous nature of these sensitive marine resource areas.

3.2 RELATIVE SENSITIVITY OF MARINE RESOURCES

The marine resources discussed above are vulnerable in varying degrees, and at different times of the year, to damage from contact by oil. Tankers transporting crude oil, petroleum products, and other hazardous cargo, and other vessels carrying large quantities of persistent oil as bunker fuel continue to move along the Atlantic and Florida Gulf coasts. Many of these vessels pass through the waters occupied by sensitive marine species as they transit the coast and make port calls. In order to minimize the risk of damage to these sensitive marine resources by any oil spill, the vessels could be carefully routed away from the most sensitive of these marine resource areas between ports of call. Managing vessel routing around and through the most sensitive marine resources would minimize the exposure of these areas to potential spills.

Appropriate vessel routing requires the definition of the most sensitive marine resource areas. A simple yet comprehensive and objective method to consistently define the relative

sensitivity of the many different marine resources along the entire Pacific, Atlantic, and Gulf coasts has been developed by E.C.I.[4, 5]

In summary, index values for the Atlantic and Florida Gulf Coast waters were developed representing the relative oil sensitivity of offshore habitats of four marine species groups, i.e. sea birds, marine mammals and turtles, fisheries species, and shoreline habitats.[6] The sensitivity index reflects the species density and vulnerability of each species to serious damage by oil in the habitat or feeding areas. The water surface of most of the OCS planning area within the EEZ (along the entire Atlantic and Florida Gulf coast) was divided into a matrix grid of cells (each cell bounded by 15 minutes of latitude and 15 minutes of longitude). A sensitivity index value for each species category and a composite index value for all species within each cell was calculated. All cells were ranked in descending order of index value; those cells having the highest index values are the most sensitive to oil.

Because habitats, feeding areas, and seasonal migrations of the species overlap, the composite sensitivity index was selected for this report. Cells of equal index value were connected by lines referred to as isopleths (or contours). Each contour represents the seaward boundary of waters having a sensitivity index greater than the contour value. Figure 3-1 shows the entire Atlantic and Florida Gulf coasts, the EEZ boundary, and habitats having sensitivity index values greater than the 10 percent, 20 percent, 30 percent, etc. most sensitive. Unlike the Pacific coast, where the areas of greatest sensitivity are closest to shore, the north Atlantic coast has large areas of greatest sensitivity well offshore (i.e., Nantucket Shoals, Georges Banks, and the waters east of the entrance to Delaware Bay). Other than these specific areas, the same pattern of decreasing sensitivity as one moves further offshore appears on both the Atlantic and Pacific coasts. The most sensitive marine resource areas extend farther offshore along the north Atlantic than along the south Atlantic coast.

The water area between the 10 percent line and the shoreline contains the most sensitive marine resources. At the 10 percent level of sensitivity the resources appear as discrete areas along the coast. A small percentage of the 10 percent most sensitive areas are within designated sanctuaries (i.e., Stellwagon Bank and the Florida Keys National Marine Sanctuaries). Figure 3-1 shows that most of the sensitive marine resources along the Atlantic

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4 Michael L. Bonnell, R. Glenn Ford, and Janet L. Casey, Sensitivity of Coastal Waters Off California, Oregon, and Washington to Oil Spills, Based on the Distribution of Seabirds, Marine Mammals, and Fisheries, (Volpe National Systems Center, U.S. Department of Transportation), June 1993.

5 Michael L. Bonnell, R. Glen Ford, and Janet L. Casey Relative Sensitivity of U.S. Marine Waters of the Atlantic Ocean and Eastern Gulf of Mexico to Oil Spills, Ecological Consulting, Inc. May 1994 for (Volpe National Transportation Systems Center, U.S. Dept. of Transportation.

6 This relative sensitivity index addresses the waters offshore along the entire coastline, and is designed to be applicable to offshore waters. This relative sensitivity index (developed by E.C.I.) should not be confused with the NOAA Environmental Sensitivity Index (ESI) Atlases and Databases. The ESI is a shoreline type index applied to shoreline beaches, tidal flats, salt marshes, and ocean cliffs, etc. The NOAA ESI Index is not applicable to the offshore waters addressed in this report.

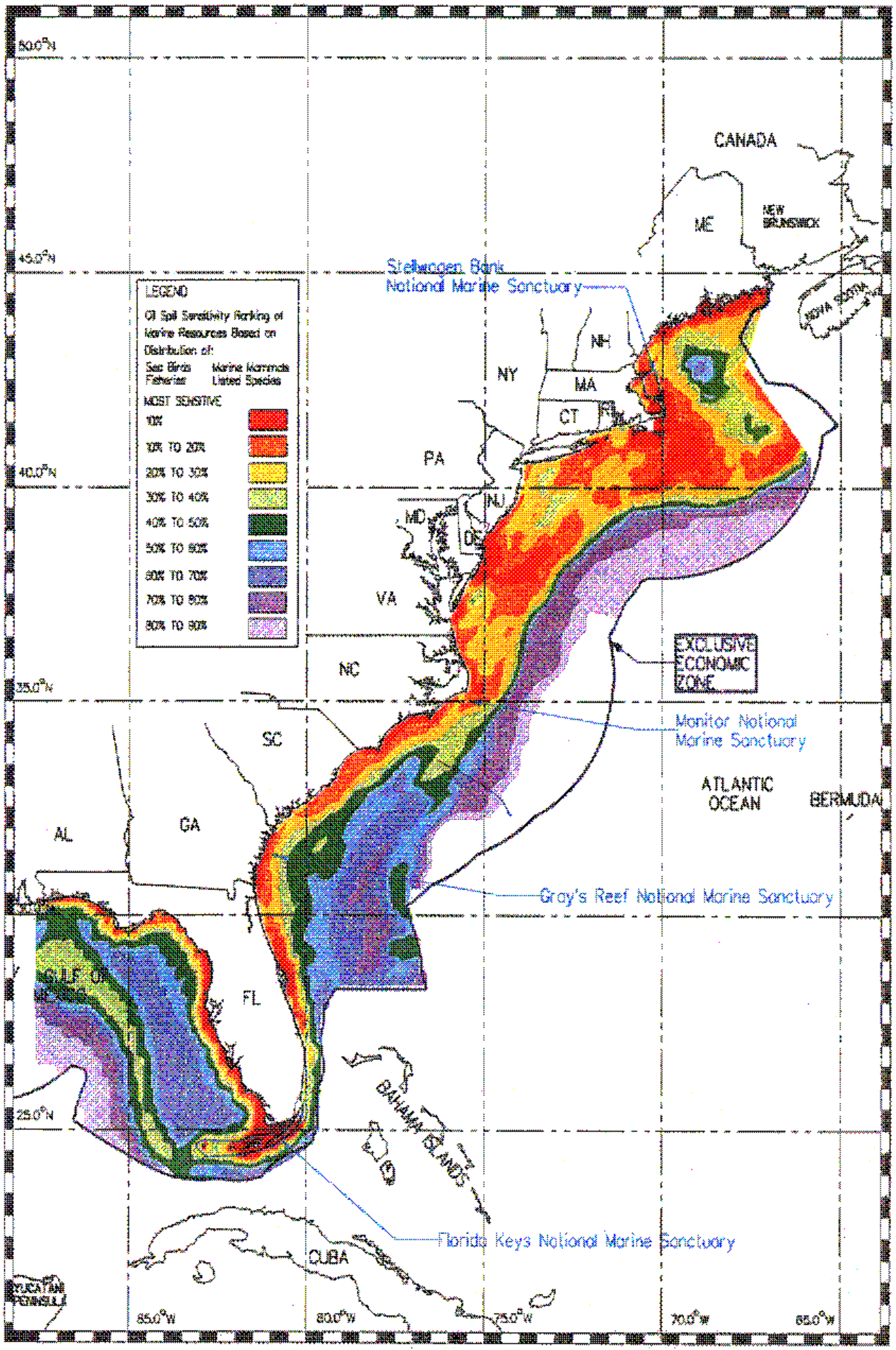

FIGURE 3-1 ATLANTIC AND FLORIDA GULF COASTS MOST SENSITIVE MARINE RESOURCES

and Florida Gulf coasts are unprotected by national marine sanctuaries. The 20 percent most sensitive offshore marine resource areas merge and form several extensive bands along the entire coastline. The most prominent openings between these 20 percent bands are in the south Atlantic coast of Florida, and the approaches to the ports of New York and New Jersey.

Figure 3-1 displays the offshore areas that should be protected from any future oil spill, if the most sensitive marine resources[7] are to avoid damage. If protection from vessel oil spills within these areas is desirable, then any vessel carrying significant quantities of oil should avoid these areas. The farther out to sea the vessel track, the greater the protection offered to the most sensitive areas from potential contact from any future oil spill. Offshore routing along the coast must be accompanied by designated port access corridors that shorten the vessel voyage through the sensitive marine resource areas. Designated port access corridors could be designed to minimize the navigational risks as well as to reduce the exposure of these areas to any potential future spill of cargo from oil tankers, oil barges or bunker fuel from any other large vessel making port calls. Offshore routing and port access corridors are discussed further in Section 5 of this report.

3.3 MARINE RESOURCES FINDINGS

The findings of Section 3 are:

1) The shoreline is not the only sensitive marine resource area threatened by potential future oil tanker spills; some waters many miles offshore are also sensitive to oil.

2) The 10 percent most sensitive offshore marine resources are located within discrete areas along the Atlantic and Florida Gulf coasts. Some areas are well offshore and most are not enclosed within the boundaries of existing national marine sanctuaries.

3) The 10 percent most sensitive offshore marine resources are located in areas often impossible to avoid while making port calls (e.g., accesses to Tampa, Chesapeake, and Delaware Bays).

4) The 20 percent (including the 10 percent) most sensitive offshore marine resources merge into more extensive bands with some gaps along the Atlantic and Florida Gulf coasts.

5) The 30 percent (including the 20 percent) most sensitive marine resources form a more continuous band which extends further offshore along the northern Atlantic coast than along the southern Atlantic coast.

6) Vessels calling from offshore routes cannot avoid transiting the most sensitive offshore marine resource areas (e.g., Delaware Bay approach).

[7] The term "most sensitive offshore marine resource," as used in this report, refers to a consensus determination of either the 10 percent, or the 20 percent, or the 30 percent most sensitive, etc.

4. OIL TANKER TRAFFIC PATTERNS AND OIL SPILLS

Oil tankers are the specific focus of this report, and a comprehensive charting is desirable of all major oil tanker routes within the EEZ, as well as the number of tanker transits; quantity, origin, and destination of their cargoes; vessel size; and flag. Available data sources and study resources will not support such a comprehensive perspective; extensive surveys would be required. This report, however, presents a partial picture of the tanker traffic patterns within the EEZ sufficient to address the issue. The analysis and presentation was limited to data available from government data sources and from a few ad hoc industry inquiries. A systematic analytical process was devised that supports consistent analyses of the Pacific (Part 1), Atlantic, and Gulf (Part 2) EEZs.

4.1 TYPICAL OIL TANKER ROUTES

Typical oil tanker routes along the Atlantic and Florida Gulf coasts within the EEZ are displayed in Figure 4-1. These typical tanker routes are plotted from waypoint coordinates provided by Maritime Overseas Corporation, OMI Bulk Management Company, and Exxon Shipping Company. These routes are typically used by the oil tanker masters unless weather or other considerations result in deviations. The displayed routes are not necessarily the routes of all oil tankers (domestic and foreign flag) serving these markets. However, we believe these plots adequately represent the dominant corridors for oil tanker movements through and near the most sensitive offshore marine resource areas within the EEZ.

The oil tanker traffic patterns within the east coast EEZ study area is much more complex and dispersed than that of the west coast study area. The dominant corridor of tanker routes runs between Gulf of Mexico ports and Atlantic ports following the Gulf Stream along the south Atlantic coast. Other tanker routes pass east of Cuba running direct from each Atlantic port to Caribbean, Central and South American ports. Another tanker corridor runs between several Atlantic ports and Asian and African ports via the south Atlantic Ocean. Additional routes run between north Atlantic ports and European and Mediterranean ports.

Figure 4-1 overlays the typical oil tanker routes on the sensitive marine environments previously presented by Figure 3-1. A close examination indicates that many segments of these routes pass through, or are adjacent to, the waters shown to contain the most sensitive offshore marine resources, particularly along the Florida Keys and the north Atlantic coast.
Any oil spill along these route segments threatens these resources (as will be shown in Section 5) unless the spill can be immediately contained. Obviously, oil tankers must transit through these sensitive waters to make port calls from any offshore route, but rerouting could move much of the threatening traffic further away from the most sensitive marine resource areas.

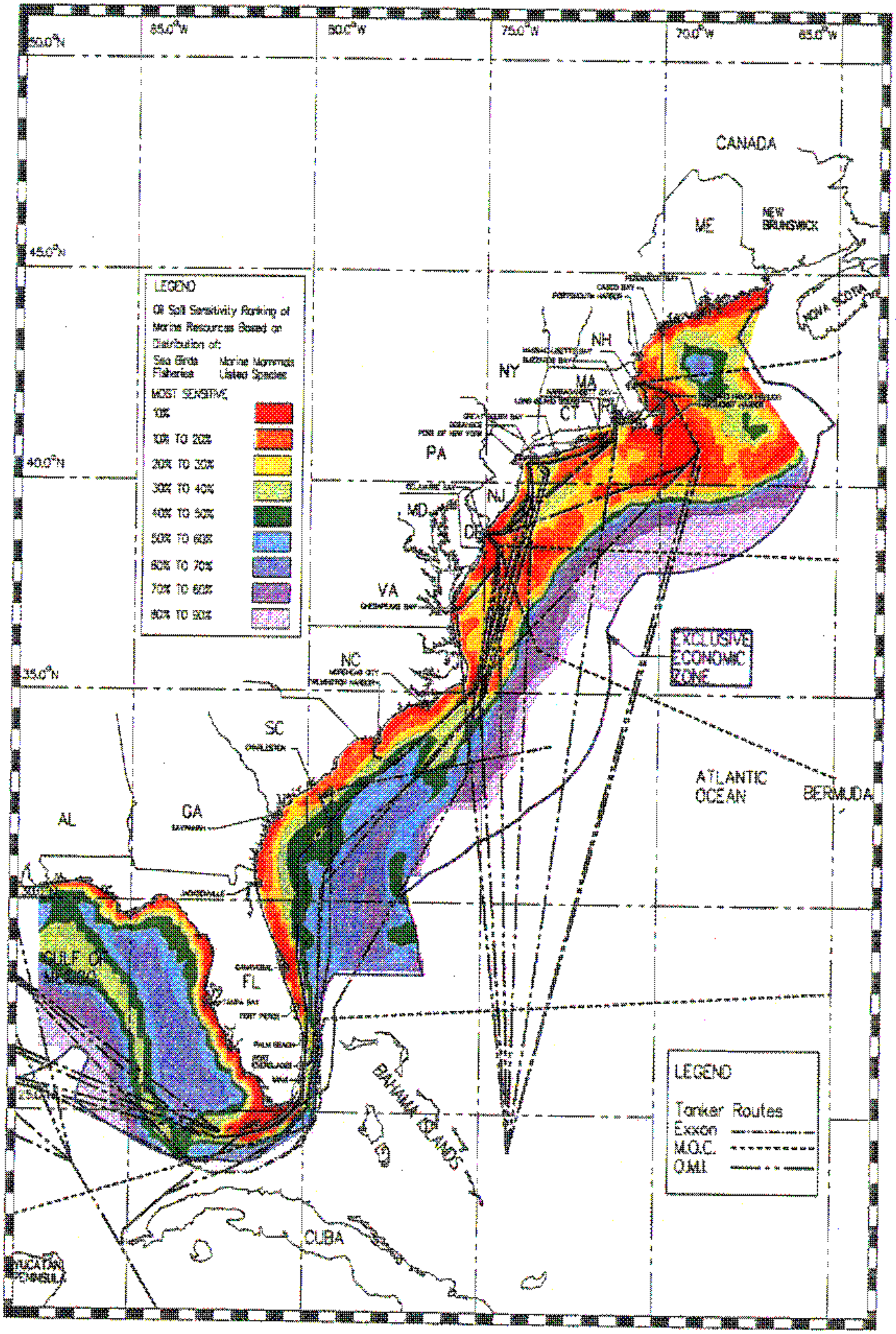

FIGURE 4-1 TYPICAL OIL TANKER ROUTES

4.2 OIL TANKER ACTIVITY IN THE ATLANTIC AND EASTERN GULF OF MEXICO EEZ

No single data source fully describes tanker routing, oil transport activity, and other vessel traffic that contributes to the risk of oil spills within the EEZ. This information must be synthesized from a number of disparate sources.

Figure 4-2 presents the tanker oil shipments along the Atlantic and Florida Gulf coasts. It shows a major coastal corridor between the Gulf of Mexico and Atlantic ports, and a number of widely spaced routes to Europe, Africa, Asia, the Caribbean, Central America and South America. Port access corridors for each port shipping or receiving oil via tankers are also shown. Annual oil shipments among these ports were synthesized from 1989 commodity flow statistics of the U.S. Army Corps of Engineers, Waterborne Commerce of the United States, and the Bureau of the Census, Imports and Exports Statistics. Origin-to-destination shipments of oil tons transported by tankers were inferred from these data and loaded onto an abstract network to show relative volumes by line width. The results provide a perspective of the total annual oil shipments by tanker along the entire Atlantic and Florida Gulf coasts within the EEZ.

The annual tonnage of persistent oils (i.e., crude oil and heavy petroleum products) and non-persistent oils (i.e., light petroleum products) flowing along the entire Atlantic and Florida Gulf coasts is graphically presented in Figures 4-2.1 and 4-2.2. The persistent oils are displayed on Figure 4-2.1, and thenonpersistent oils are displayed on Figure 4-2.2. The aggregate of the annual tons of domestic oil shipments and foreign oil imports and exports are represented.

Each port receiving crude oil and/or shipping petroleum products is shown having an access link to the coastal corridor. All tanker oil movements are represented on the access links, and on the appropriate branch of the coastal corridor. Several ports have additional links representing easterly, southeasterly or southerly routes to and from foreign ports in Europe, Africa, Asia, Central America, and South America.

Figure 4-2 demonstrates that persistent oil and non-persistent oils are about equal in volume along the coastal corridor and the easterly and southern foreign corridors. The oil shipments on the southeasterly foreign corridor are dominated by persistent oils to the Delaware Bay ports.

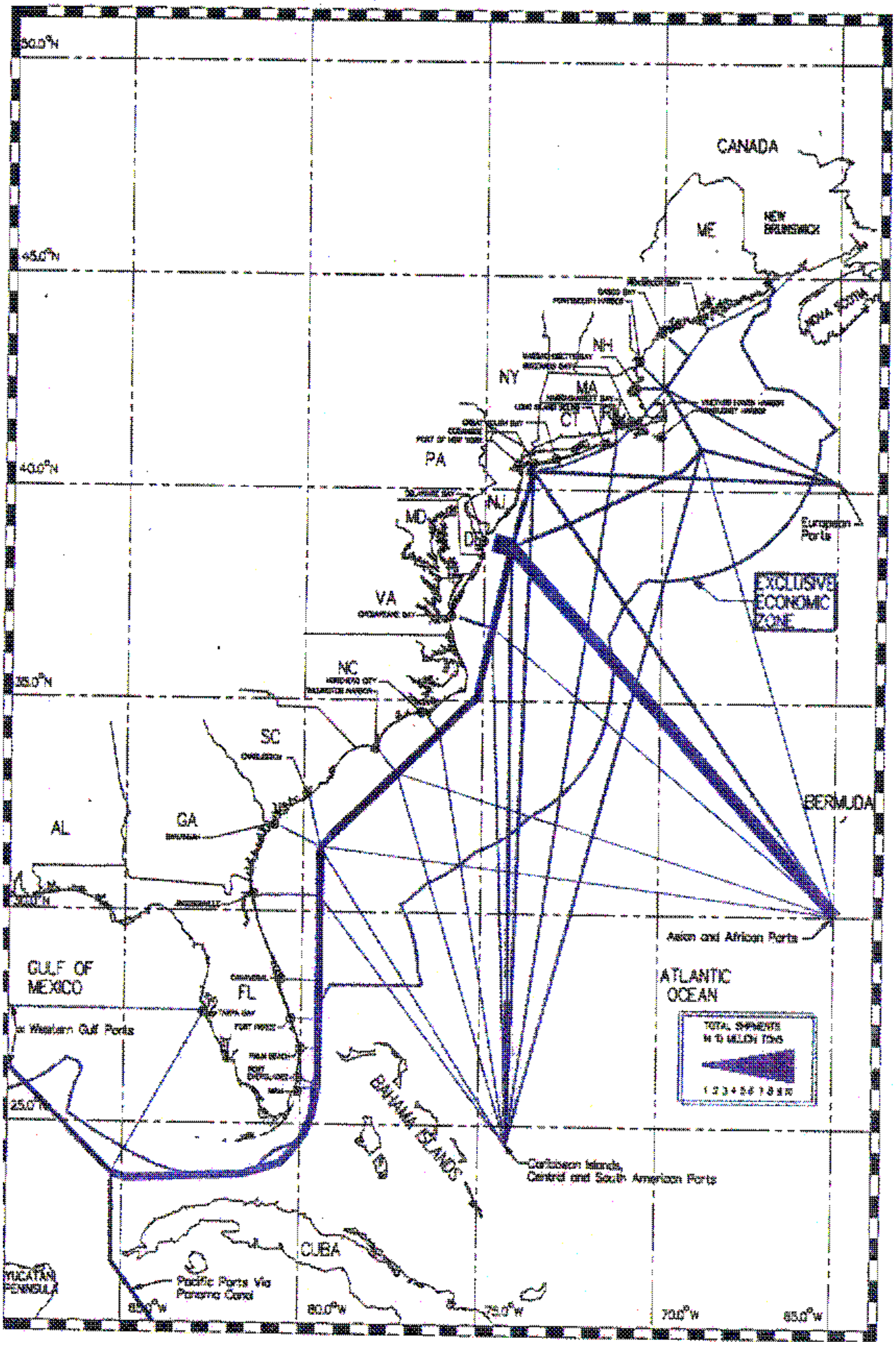

FIGURE 4-2.1 ANNUAL SHIPMENTS BY TANKER - PERSISTENT OILS

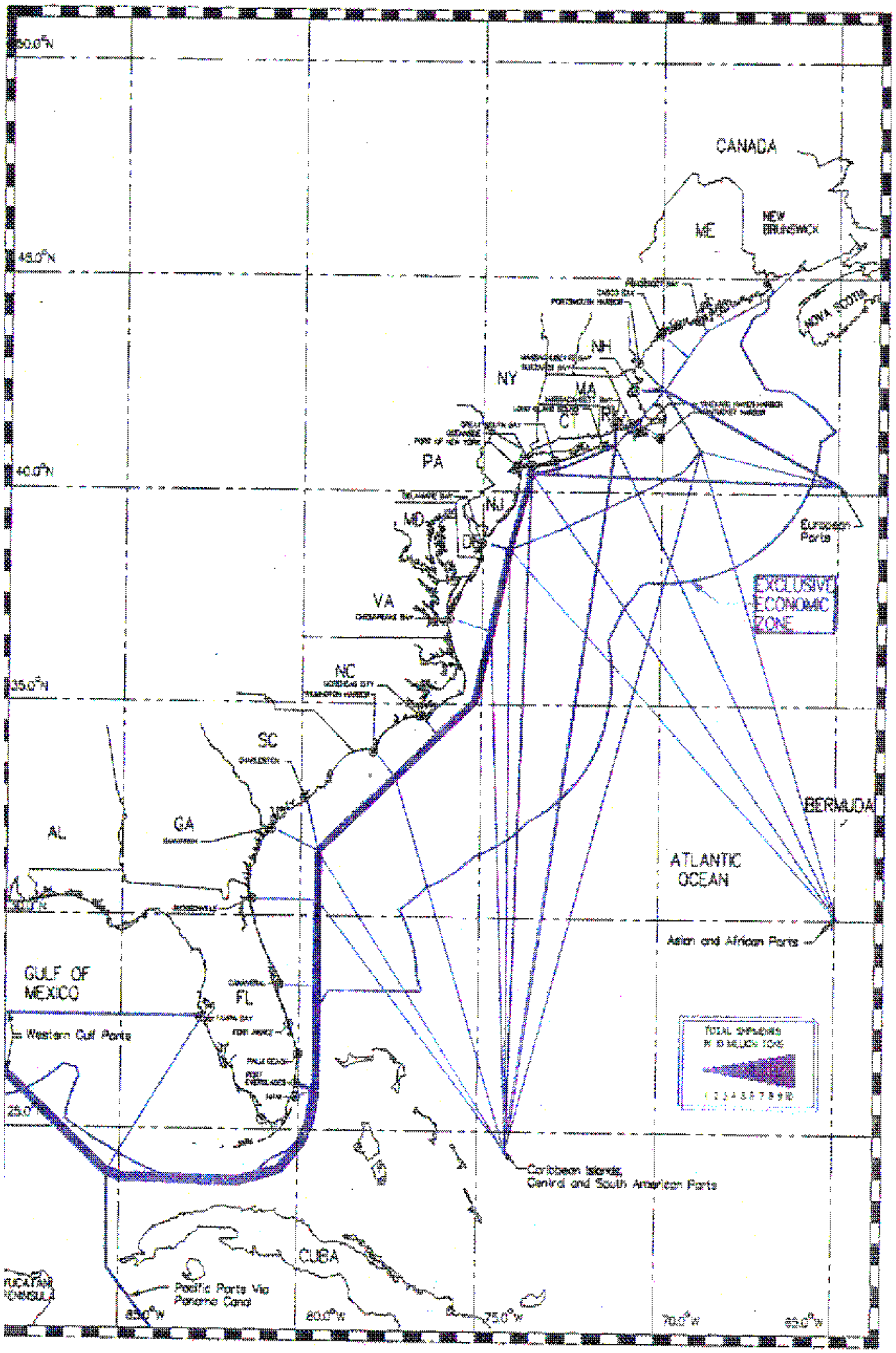

FIGURE 4-2.2 ANNUAL SHIPMENTS BY TANKER - NONPERSISTENT OILS

Although oil shipment tonnage is the primary measure of traffic volume in this study, total oil tonnage can be converted to oil tanker trips, using average tanker loads[8] as a conversion factor, to approximate the actual loaded tanker vessel transits on specific routes. Twenty major tanker routes were selected for detailed characterization (10 among Atlantic ports and 10 between Atlantic and Gulf ports). Table 4-1 displays the route miles, total annual tonnage, average tanker loads and tanker trips estimated for persistent and nonpersistent oils. Table 4-1.1 presents oil tanker traffic among Atlantic coast ports, and Table 4-1.2 presents oil tanker traffic between Atlantic and Gulf of Mexico ports. The later routes dominate the traffic patterns by a large margin in both persistent and non-persistent oils.

Figure 2-2 showed that oil tanker transits in and out of the major Atlantic and Florida coast ports represent about 18 percent of all deep-draft cargo carrying vessels. These traffic data and the history of vessel oil spills discussed in Section 3 indicated that oil tankers do not pose the only risk of future oil spills. On the contrary, oil tankers may represent the lowest probability of a damaging oil spill of all the vessels carrying large quantities of persistent oils, if bunker fuel is considered.

Figure 4-3 displays oil tanker transits as a percentage of all deep-draft vessel transits through the approaches to eight of the largest Atlantic and Florida Gulf coast ports (as reported in the Waterborne Commerce data[9]). These data show that the oil tanker transits vary from a high of 29 percent for Narragansett Bay and Delaware Bay, to a low of 5 percent for the Chesapeake Bay and 2 percent for Miami Harbor. Cargo vessels carrying substantial quantities of persistent bunker fuel through the most sensitive marine resource areas, other than bulk oil and chemical tankers and barges, represent between 23 percent and 89 percent of vessel transits (except for Long Island Sound, where these cargo vessels produce only one percent of the total transits).

[8] The total tanker trips were calculated using average tanker loads estimated from data in the C.O.E. Waterborne Commerce Database.

[9] Figure 4-3 is based on 1989 Waterborne Commerce Statistics, excluding all barges less than 19 ft. draft and dry cargo self-propelled vessels less than 19 ft. draft, on the assumption that such vessel transits are mostly local and are not involved in the traffic patterns within the EEZ.

TABLE 4-1.1 MAJOR OIL TANKER ROUTES & TRAFFIC - AMONG ATLANTIC PORTS[10]

	ROUTE MILES	PERSISTENT OILS			NON-PERSISTENT OILS		
		O-D TONS per YEAR (1,000)	AVE. TONS /TRIP (1,000)	ANNUAL TANKER TRIPS (LOADED)	O-D TONS per YEAR (1,000)	AVE. TONS /TRIP (1,000)	ANNUAL TANKER TRIPS (LOADED)
1. NY/NJ & Tampa Bay	1,703	151	30	5	1,057	14	76
2. NY/NJ & Miami	1,159	439	30	15	3	14	-
3. NY/NJ & Port Everglades	1,157	1,217	30	40	805	14	58
4. NY/NJ & Jacksonville	921	666	30	22	292	14	21
5. NY/NJ & Delaware Bay	178	1,260	22	57	468	9	52
6. NY/NJ & Long Island Sound	153	641	26	24	606	6	101
7. NY/NJ & Massachusetts Bay	289	358	27	13	265	11	24
8. Delaware Bay & Tampa Bay	1,608	259	21	12	253	16	16
9. Delaware Bay & Port Everglades	1,062	385	21	18	198	16	12
10. Delaware Bay & Long Island Sound	314	65	18	4	112	8	14

* O-D = Origin to destination.

[10] Tanker trips estimated from O-D tons per year and average tons per tanker trip. Average tanker tons per trip estimated for each route from C.O.E. Waterborne Commerce data.

TABLE 4-1.2 MAJOR OIL TANKER ROUTES & TRAFFIC - BETWEEN ATLANTIC PORTS & GULF OF MEXICO PORTS

	ROUTE MILES	PERSISTENT OILS			NON-PERSISTENT OILS		
		O-D TONS per YEAR (1,000)	AVE. TONS /TRIP (1,000)	ANNUAL TANKER TRIPS (LOADED)	O-D TONS per YEAR (1,000)	AVE. TONS /TRIP (1,000)	ANNUAL TANKER TRIPS (LOADED)
1. Gulf & Tampa Bay	472	10,180	29	351	8,421	21	401
2. Gulf & Port Everglades	1,130	9,115	29	314	6,643	21	316
3. Gulf & Jacksonville	1,515	1,881	29	65	2,379	21	113
4. Gulf & Charleston	1,574	1,789	29	62	781	21	37
5. Gulf & Wilmington	1,805	1,231	29	42	645	21	31
6. Gulf & Chesapeake Bay	2,025	3,391	14	242	654	9	73
7. Gulf & Delaware Bay	2,132	5,366	14	383	1,186	11	108
8. Gulf & NY/NJ	2,227	5,855	30	195	8,494	7	1,210
9. Gulf & Long Island Sound	2,364	8,227	22	374	3,177	5	635
10. Gulf & Massachusetts Bay	2,572	909	23	40	1,394	15	93

FIGURE 4-3 DEEP-DRAFT VESSEL TRANSITS IN APPROACHES TO ATLANTIC & GULF PORTS OF CALL

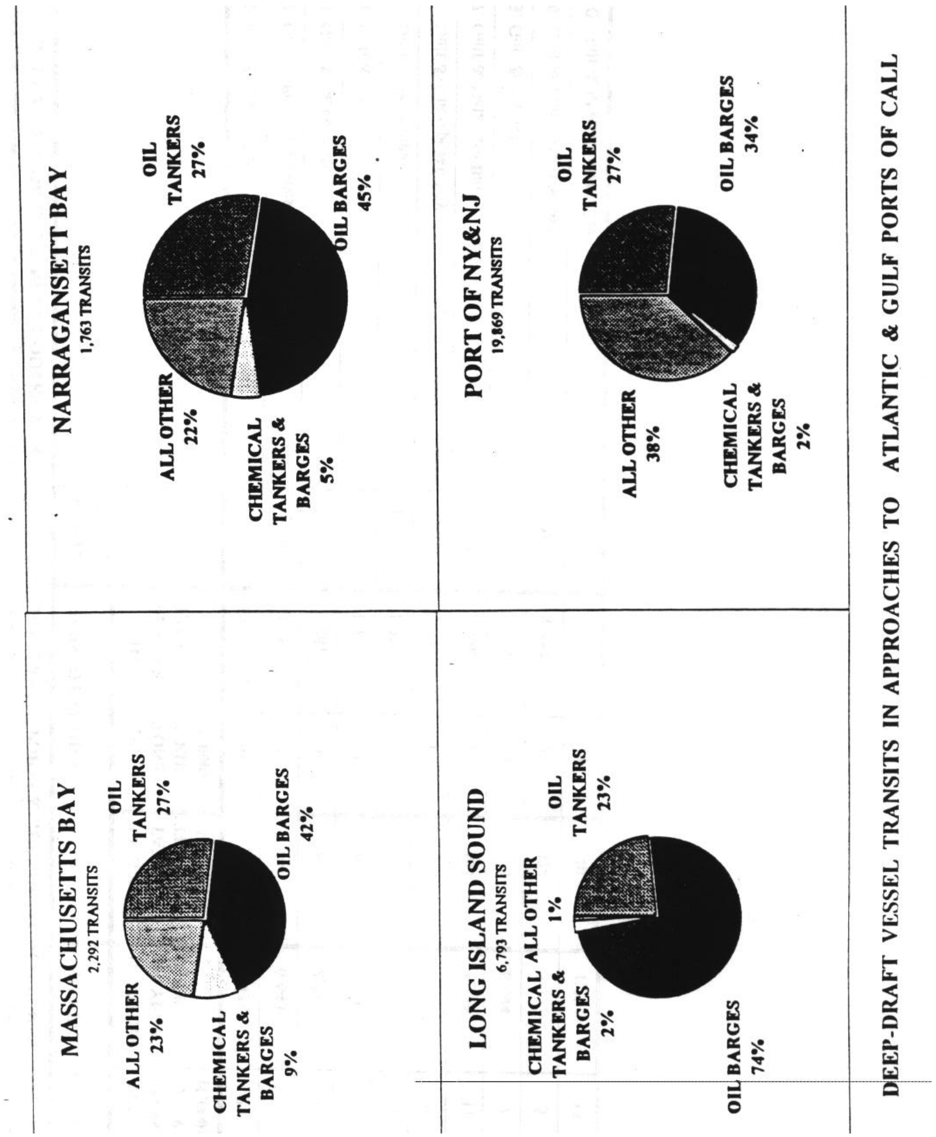

FIGURE 4-3 DEEP-DRAFT VESSEL TRANSITS IN APPROACHES TO ATLANTIC & GULF PORTS OF CALL (Cont.)

4.3 OIL TANKER SPILLS WITHIN THE ATLANTIC AND FLORIDA GULF COAST EEZ

A definitive oil spill estimate (i.e., that accounts for the vessel casualty and spill risk variables relevant to this situation) is well beyond the scope of this report. However, a preliminary estimate has been developed in order to provide some perspective on the maximum number of tanker oil spills that might occur within the EEZ. The volume of oil transported by tankers over a 10-year period (given an average annual flow equivalent to the 1989 volume) for each of the twenty major markets of Table 4-1 was multiplied by an historical average spill rate for each of three sizes of oil spill. These historical spill rates represent the average number of spills at sea (excludes ports and harbors) per billion barrels of oil transported by tanker vessels within U.S. waters.[11] The spill rates used here reflect the combined experience of foreign flag carriers and U.S. flag carriers within U.S. waters only. These spill rates are considerably lower than those estimated for worldwide experience. The result of this calculation is shown in Table 4-2. The projected number of oil spills for the selected markets are individually very low, over a 10-year period, but they are additive along shared segments of the tanker routes. For example, over a 10-year period, 0.745 spills (10-100 thousand barrels) of persistent oils (or one spill in 13 years) could occur somewhere along the 20 major routes. One third of these spills would be along the coastal corridor between Cape Hatteras and Block Island.

These values represent historical experience over a 15-year period prior to enactment of OPA 90. Therefore, the historical spill rates do not reflect ameliorating effects of new regulations directed at vessel structures, improved crew performance, and other spill prevention measures. Implementation of these OPA 90 regulations over the next several years is expected to greatly reduce the probability of vessel casualties and associated oil spills. They will also reduce the damages to the marine resources when spills do occur. For all of the above reasons, the oil spill estimates in Table 4-2, in addition to being preliminary estimates, may also be considered high estimates.

[11] "Comparative Occurrence Rates for Offshore Oil Spills" by Anderson and Labelle, U.S. MMS Spill Science & Technology Bulletin, Vol. 1, No. 2, pp. 131-141, 1994.

TABLE 4-2.1 PROJECTED NUMBER OF TEN YEAR TANKER OIL SPILLS ALONG MAJOR OIL TANKER ROUTES WITHIN EEZ[12] AMONG ATLANTIC PORTS

	PERSISTENT OILS			NON-PERSISTENT OILS		
	1,000 - 9,999 bbl[13]	10,000 - 99,999 bbl[14]	>100,000 bbl[15]	1,000 - 9,999 bbl	10,000 - 99,999 bbl	>100,000 bbl
1. NY/NJ & Tampa	.002	.002	.001	.015	.015	.010
2. NY/NJ & Miami	.006	.006	.004	.000	.000	.000
3. NY/NJ & Port Everglades	.017	.017	.012	.011	.011	.008
4. NY/NJ & Jacksonville	.009	.009	.006	.004	.004	.003
5. NY/NJ & Delaware Bay	.018	.018	.012	.007	.007	.004
6. NY/NJ & Long Island Sound	.009	.009	.006	.008	.008	.006
7. NY/NJ & Massachusetts Bay	.005	.005	.003	.004	.004	.003
8. Delaware Bay & Tampa	.004	.004	.002	.004	.004	.002
9. Delaware Bay & Port Everglades	.005	.005	.004	.003	.003	.002
10. Delaware Bay & Long Island Sound	.001	.001	.001	.002	.002	.001

TABLE 4-2.2 PROJECTED NUMBER OF TEN YEAR TANKER OIL SPILLS ALONG MAJOR OIL TANKER ROUTES -

12 Spills estimated from oil volume transported in tankers during the period and historical average tanker spill rates within U.S. waters. "Comparative Occurrence Rates for Offshore Oil Spills" by Anderson and Larselle, U.S. MMS Spill Science & Technology Bulletin, Vol. 1, No. 2, pp. 131-141, 1994.

13 Spill 1,000-9,999 barrels = O-D Tons/Yr x 7.333 barrels/Ton x 10 Yr / 1,000,000,000 barrels x.19 spills/Billion barrels.

14 Spill 10,000-99,999 barrels = O-D Tons/Yr x 7.333 barrels/Ton x 10 Yr / 1,000,000,000 barrels x 0.19 spills/Billion barrels.

15 Spill >=100,000 barrels = O-D Tons/Yr x 7.333 barrels/Ton x 10 Yr / 1,000,000,000 barrels x 0.13 spills/Billion barrels.

BETWEEN GULF OF MEXICO & ATLANTIC PORTS	PERSISTENT OILS			NON-PERSISTENT OILS		
	1,000 - 9,999 bbl	10,000 - 99,999 bbl	>100,000 bbl	1,000 - 9,999 bbl	10,000 - 99,999 bbl	>100,000 bbl
1. Gulf & Tampa	.142	.142	.097	.117	.117	.080
2. Gulf & Port Everglades	.127	.127	.087	.093	.093	.063
3. Gulf & Jacksonville	.026	.026	.018	.033	.033	.023
4. Gulf & Charleston	.025	.025	.017	.011	.011	.007
5. Gulf & Wilmington	.017	.017	.012	.009	.009	.006
6. Gulf & Chesapeake Bay	.047	.047	.032	.009	.009	.006
7. Gulf & Delaware Bay	.075	.075	.051	.017	.017	.011
8. Gulf & NY/NJ	.082	.082	.056	.118	.118	.081
9. Gulf & Long Island Sound	.115	.115	.078	.044	.044	.030
10. Gulf & Massachusetts Bay	.013	.013	.009	.019	.019	.013

4.4 OIL TANKER TRAFFIC PATTERNS AND SPILL ANALYSIS FINDINGS

The findings of Section 4 are:

1) Access to major marine ports (e.g., Delaware Bay) is through some of the most sensitive marine resource areas. Tankers, transporting substantial quantities of oil, must pass through these areas to reach ports on the East Coast.

2) The projected number of oil spills from tankers, over a 10-year period, should decrease as the full effects of other OPA 90 measures are felt.

3) Before restricting vessel routes, the aggregate effects of all OPA 90 initiatives on oil spill risks should be assessed.

4) Cargo and passenger vessels and tank barges, because they also carry large quantities of oil and fuel, potentially hazard the environment as much as tankers. Oil tankers represent only 18 percent of the total deep-draft transits through the most sensitive offshore marine resource areas.

5) Non-tanker vessels accounted for 63 percent of oil spills in the Atlantic and Florida Gulf coast EEZ study area and 77 percent of total oil spilled there during the past 20 years. Therefore, any vessel routing measures should consider all vessels containing petroleum products, be they cargo or bunker fuel.

5. VESSEL ROUTING AND DEFINING RESTRICTED AREAS

The irregularity of the Atlantic coast, the relatively shallow waters of the Atlantic continental shelf, and the effects of the strong Gulf Stream would make protection of sensitive marine resource areas particularly difficult (compared to the Pacific coast).

5.1 OIL SPILL CONTACT RISK CONTOURS

The following chartlets of the Atlantic and Florida Gulf coasts EEZ overlay the most sensitive marine resources with several oil spill contact risk contours. Each chartlet presents risk contours associated with one of the areas containing successively more sensitive resources defined in Section 3. Each of the risk contours represents 5 percent probability of contact by any oil spill originating along that contour line. The risk contours indicate the approximate number of days for a spill on the contour line to drift to the marine resource area identified assuming no mitigation or dispersion occurs. These risk contours, therefore, define time-related buffers around the selected marine resources. The model[16] that generated these risk contours does not differentiate between persistent and nonpersistent oils, but associating these risk contours with either persistent or nonpersistent oil spills was informative in the Pacific coast analysis. For example, if persistent oils require 10 to 30 days to intercept, contain, and dispose of, and nonpersistent oil spills tend to dissipate within a period of 3 to 10 days, then the two types of oil can be considered separately. Vessels carrying either persistent oils or nonpersistent oils could be routed accordingly outside these contour lines. Therefore, the 3-day, 10-day, and 30-day risk contours may be used to help define vessel routes to provide comparable levels of protection (e.g., less than 5 percent chance of contact) from each type of oil spill to any resource area selected for protection.

Routing vessels to avoid the most sensitive marine resources may be defined by three major parameters:

a) the marine resources selected for protection: the shoreline only, or the most sensitive offshore resource areas, e.g.,
   1) the 10 percent most sensitive including the shoreline, or
   2) the 20 percent most sensitive including the 10 percent, or
   3) the 30 percent most sensitive including the 20 percent

b) the level of risk of contact by a future oil spill that is considered acceptable (e.g., less than 5 percent or less than 10 percent, etc. chance of contact), and

c) the time (e.g., 3 days, or 10 days or any time between) required to intercept and deal with any oil spill that may occur.

5.1.1 Coastal Shoreline Protection

[16] U.S. Department of the Interior, Minerals Management Service (MMS) Oil Spill Risk Analysis (OSRA) model.

Figure 5-1 shows 6 contact risk contours representing locations from which a future oil spill would have a 5 percent or a 10 percent chance of contacting the shoreline within 3 days, 10 days, and 30 days after the spill. Spills from sites between these lines have a 5 to 10 percent probability of reaching the shoreline within the period if not intercepted. If the shoreline is to be protected from vessel oil spills, a restricted area that approximates these risk contours should provide enough time to intercept and control any future vessel oil spill.

The two 30-day risk contour lines are approximately 40 to 100 nautical miles offshore along most of the Atlantic coast, and considerably farther out to sea along the Gulf coast of Florida. A spill from a site between these lines has a 5 to 10 percent probability of reaching the shoreline within 30 days if not intercepted. The two 3-day risk contours range between 15 and 50 nautical miles offshore along the Atlantic coast north of New Jersey. South of New Jersey the risk contours converge with the shoreline in several places indicating that a spill very close inshore along these stretches of coastline would take more than 3 days to reach the beach. The 3 day, 10 day and 30 day contours converge off Nantucket Shoals, and the 10 and 30 day contours converge off Cape Hatteras. In areas where the risk contours converge it is uncertain how much time (i.e., between 3 days and 30 days) will elapse before an oil spill along the line reaches the beach.

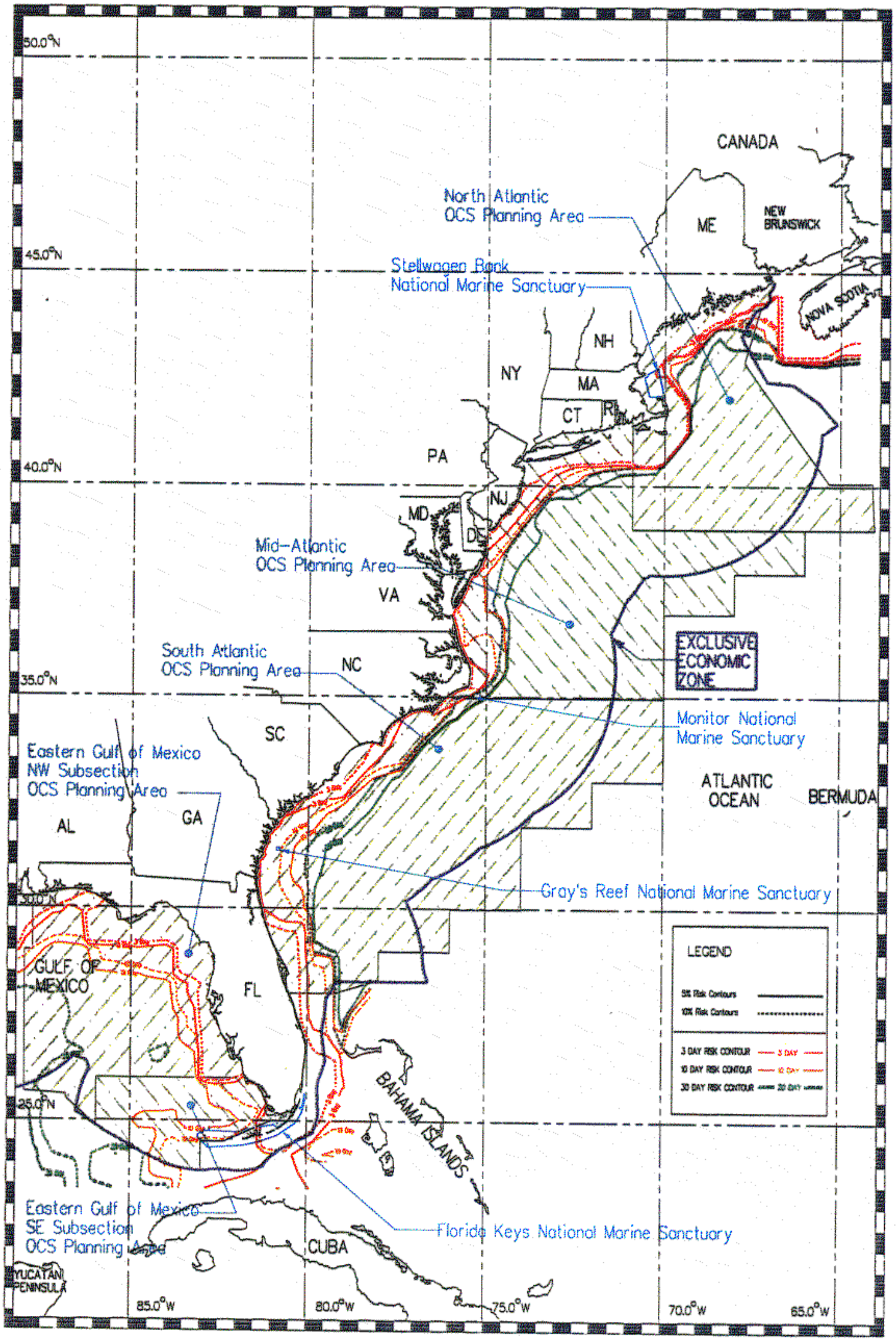

FIGURE 5-1 OIL SPILL CONTACT 5 PERCENT AND 10 PERCENT RISK CONTOURS - COASTAL SHORELINE

5.1.2 Offshore Marine Resource Area Protection

This section focuses on the offshore habitats, feeding areas, and migratory areas of the marine species defined in Section 3.2 and displayed on Figure 3-1. The 10 percent, 20 percent, and 30 percent most sensitive offshore marine resource areas (including the shoreline in each case) are presented here as the "targets" of future spills.[17]

Figure 5-2.1 displays three spill contact risk contours representing locations from which a potential spill would have a 5 percent chance of contacting the seaward edge of the 10 percent most sensitive offshore marine resources within 3, 10, or 30 days. Figure 5-2.2 displays the location of the equivalent risk contours for the seaward edge of the 20 percent most sensitive offshore marine resources. Figure 5-2.3 displays the same information for the 30 percent most sensitive marine resources.

If protection should be provided to the offshore waters of the most sensitive marine resources, then the area to be protected must be selected (e.g., 10 percent, 20 percent or 30 percent most sensitive or other), the level of acceptable risk must be determined (e.g., less than 5 percent or less than 10 percent, or other), and the time required to intercept and control any oil spill must be determined (e.g., 3 days, or 10 days, or other). For example, if 30 percent of the most sensitive marine resources is to be protected with a less than 5 percent probability of contact, and 3 days are required to assure interception under all weather and sea conditions following a spill, then the seaward boundary of any restricted area must approximate the 3-day contour on Figure 5-2.3. Such a restricted area boundary would range between a minimum of 45 nautical miles offshore opposite Apalachicola, FL in the Gulf of Mexico to a maximum of 145 nautical miles offshore opposite Long Island, NY in the Atlantic Ocean. Unlike the Pacific coast, where the 3 day, 10 day and 30 day risk contours appear parallel to each other and are well spaced, the contours along the Atlantic coast are extremely irregular, non-parallel and even converge in several areas. In those areas where the 3, 10, and 30 day risk contours converge or are very close to each other the boundary of a potential restricted area is unambiguous.

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[17] If a consistent level of protection (e.g., less than 5 percent probability of contact within three days by oil spills) is to be provided to these offshore resource areas, then the site of a future spill must be farther out to sea than for protection of the shoreline alone. Risk contours define required time buffers between a future spill site and the seaward edge of an offshore resource area that is selected for protection (e.g., 10 percent, or 20 percent or 30 percent most sensitive resource areas). The choice among the 3-day, 10-day, and 30-day contours depends on the time determined to be required to intercept, contain and dispose of an oil spill (persistent or nonpersistent) before it reaches the designated resource areas.

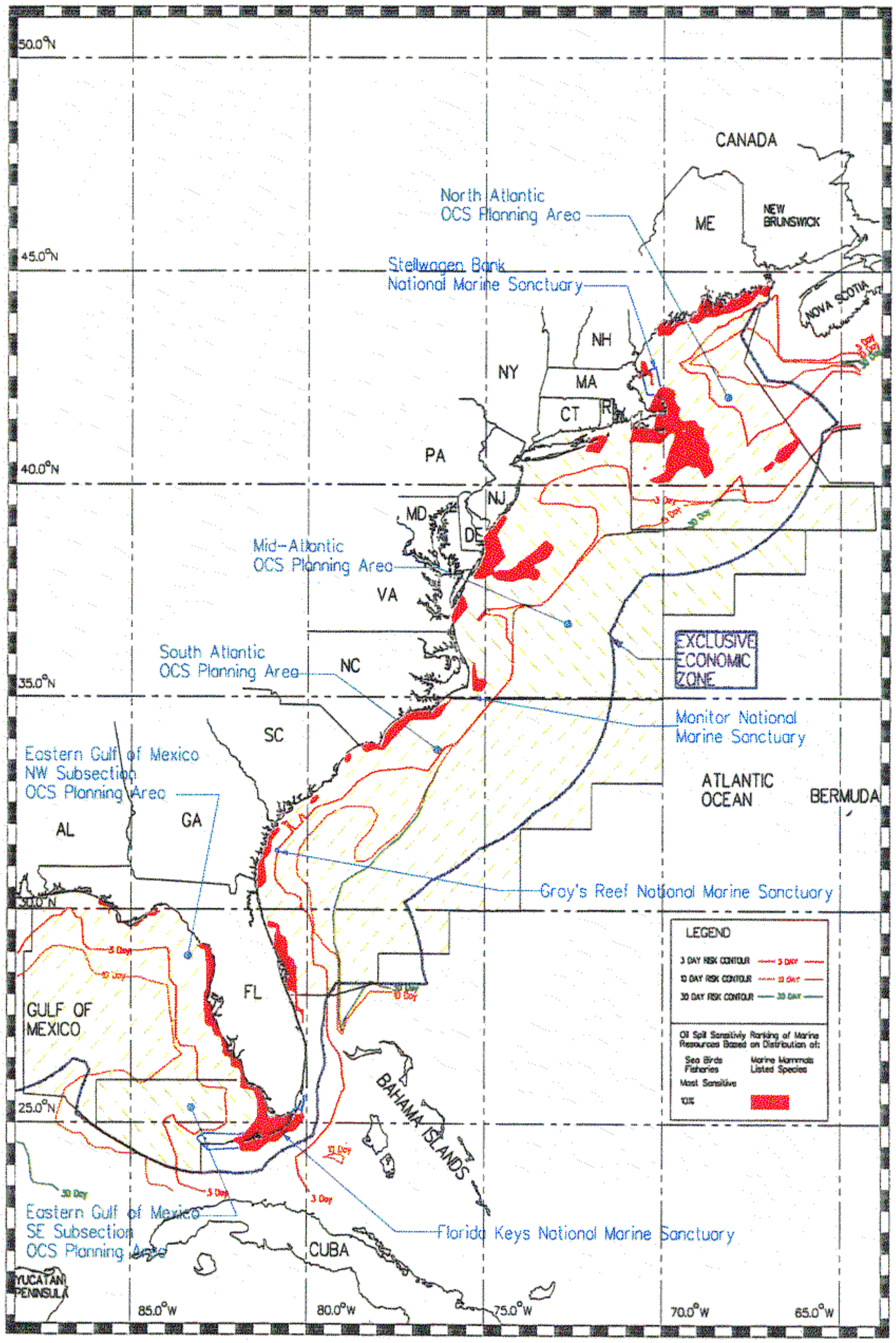

FIGURE 5-2.1 OIL SPILL CONTACT RISK CONTOURS - ATLANTIC & FLORIDA GULF COASTS - 10 PERCENT MOST SENSITIVE OFFSHORE RESOURCES

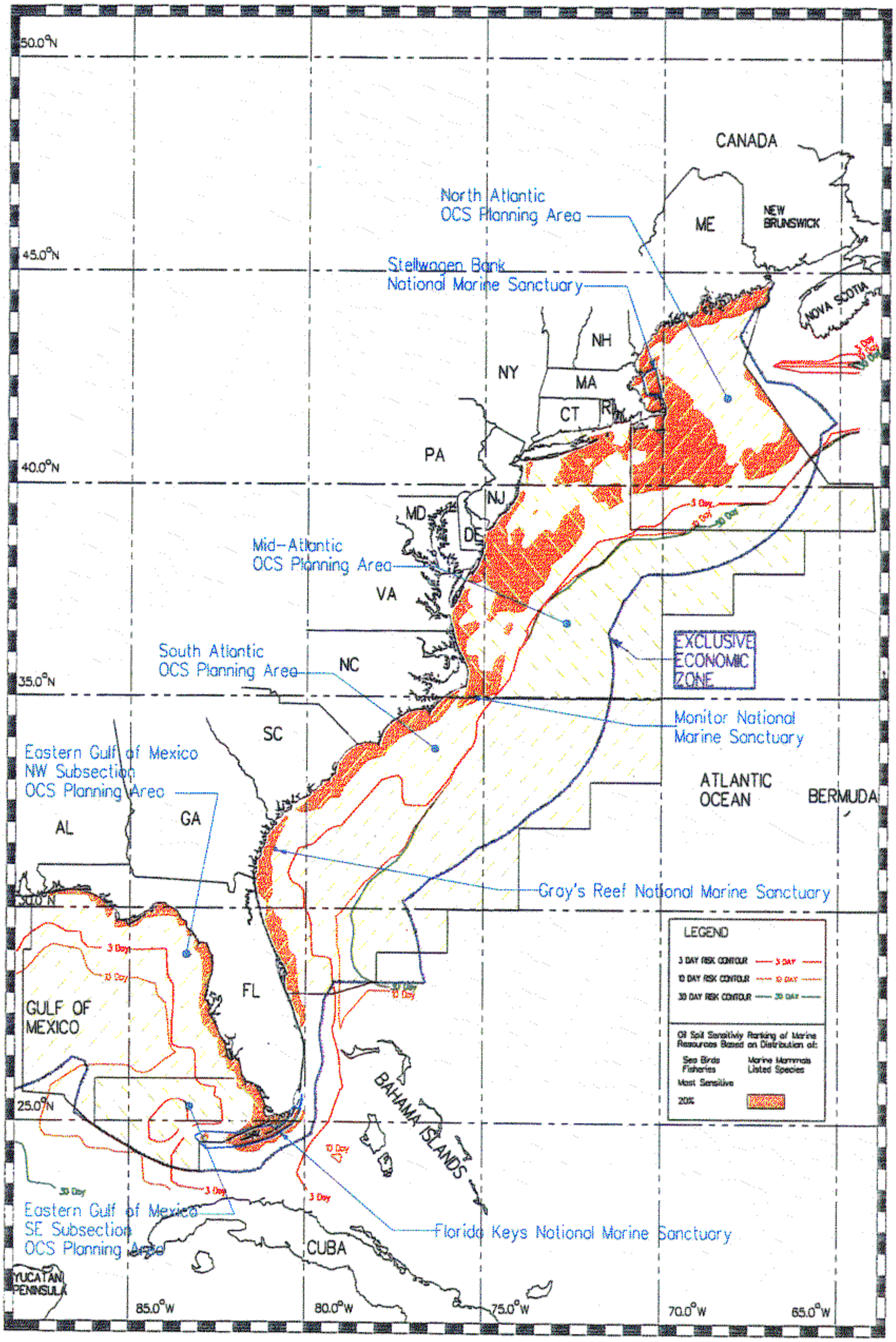

FIGURE 5-2.2 OIL SPILL CONTACT RISK CONTOURS - ATLANTIC AND FLORIDA GULF COASTS - 20 PERCENT MOST SENSITIVE OFFSHORE RESOURCES

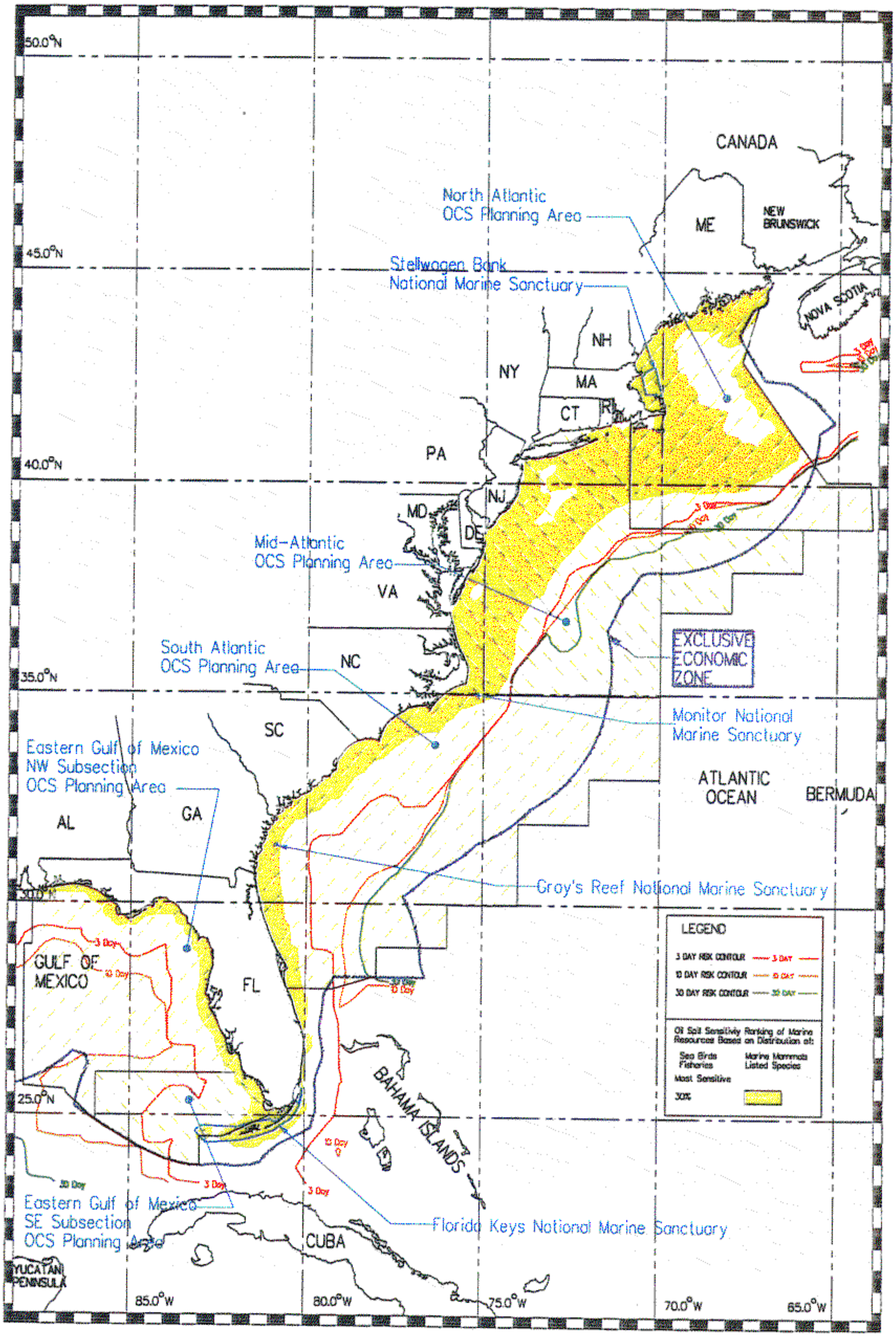

FIGURE 5-2.3 OIL SPILL CONTACT RISK CONTOURS - ATLANTIC AND FLORIDA GULF COASTS - 30 PERCENT MOST SENSITIVE OFFSHORE RESOURCES

5.2 DEFINING RESTRICTED AREAS

Restricted areas to protect sensitive marine resource areas can be designed as shown in the following figures. The access corridors shown here are schematic only, because considerable additional effort is required to investigate and design traffic lanes that will be acceptable to all interested parties. Figure 5-3.1, Figure 5-3.2, Figure 5-3.3, and Figure 5-3.4 respectively present potential restricted areas that protect:

a) the shoreline, or

b) the 10 percent most sensitive offshore marine resource areas in addition to the shoreline, or

c) the 20 percent most sensitive offshore marine resource areas in addition to the shoreline, or

d) the 30 percent most sensitive offshore marine resource areas in addition to the shoreline.

These figures each display a line 50 nautical miles offshore and a line 100 nautical miles offshore (for scale only) superimposed upon the 3-day, 10-day, and 30-day oil spill contact risk contours from Figure 5-2. Any similarly defined boundary line may be used to define restricted areas appropriate to each section of the coast. Figure 5-3.1 shows that the 50-nautical-mile line provides the shoreline with a level of protection consistent with less than 5 percent probability of contact in 3 days. Figures 5-3.2, 5-3.3 and 5-3.4 indicate that as the focus of attention shifts seaward from the shoreline beaches to the 10 percent, 20 percent, and 30 percent most sensitive offshore resources, the 50-nautical-mile line provides an ever decreasing level of protection.

Figure 5-3.2 indicates the 10 percent most sensitive offshore resources are offered 5 percent chance of contact in 3 days protection by the 50-nautical-mile line along the south Atlantic coast and Florida Gulf coast with a few exceptions. The exceptions are the North Carolina south coast and the Florida Keys. Along the north Atlantic, only the Maine coast and Long Island would be so protected by the 50-nautical-mile line.

Figure 5-3.3 indicates that the 20 percent most sensitive offshore resources are not offered any consistent level of protection by the 50-nautical-mile line except along the Gulf coast of Florida. In order to obtain a consistent level (e.g., less than 5 percent probability of contact in 3 days) the seaward boundary would have to vary its distance from shore along the coast ranging from as few as 45 nautical miles opposite Cape Hatteras to as many as 130 nautical miles opposite Long Island.

Figure 5-3.4 shows that for the 30 percent most sensitive offshore resources, the 5 percent in 3-day contour line is very irregular and ranges widely between 45-50 nautical miles for much of the south Atlantic coast and 150 nautical miles off Long Island, NY.

Having classified the marine resource areas by relative sensitivity to oil, the level of sensitivity to be protected and the level of protection to be obtained throughout the EEZ must be selected. Having made these decisions, then it remains to devise a means of providing the desired level of protection for all areas having the selected sensitivity.

5.3 PORT ACCESS CORRIDORS

Regardless of where the seaward boundary for the restricted areas are defined (e.g., 50 nautical miles, or 100 nautical miles, or somewhere in between), access corridors must be defined between the seaward boundary of the restricted area and each port of call of the affected vessels. In some areas, it may be possible to route the access corridor so as to avoid the most sensitive of the marine resource areas (e.g., Ports of New York and New Jersey as shown on Figure 5-3.2). In other areas, the most sensitive resources must be transited to obtain access to the ports. The following enlarged view chartlets illustrate this point. Figure 5-4 is an enlarged view of the Massachusetts Bay approach to Boston, showing that there is no clear track that avoids the most sensitive marine resource areas. Therefore, navigational considerations to minimize potential vessel casualties will determine the access route design through these waters. Figures 5-5, 5-6 and 5-7 are enlarged views of the approaches to Delaware, Chesapeake, and Tampa Bays which show that, in these cases, the most sensitive marine resource areas cannot be avoided.

Vessel routing schemes, although they could reduce the intrusion onto sensitive marine resource areas by potentially hazardous vessel traffic, would concentrate those same vessels into a smaller area and potentially increase the risk of collision. This concern has not been addressed completely by this report.

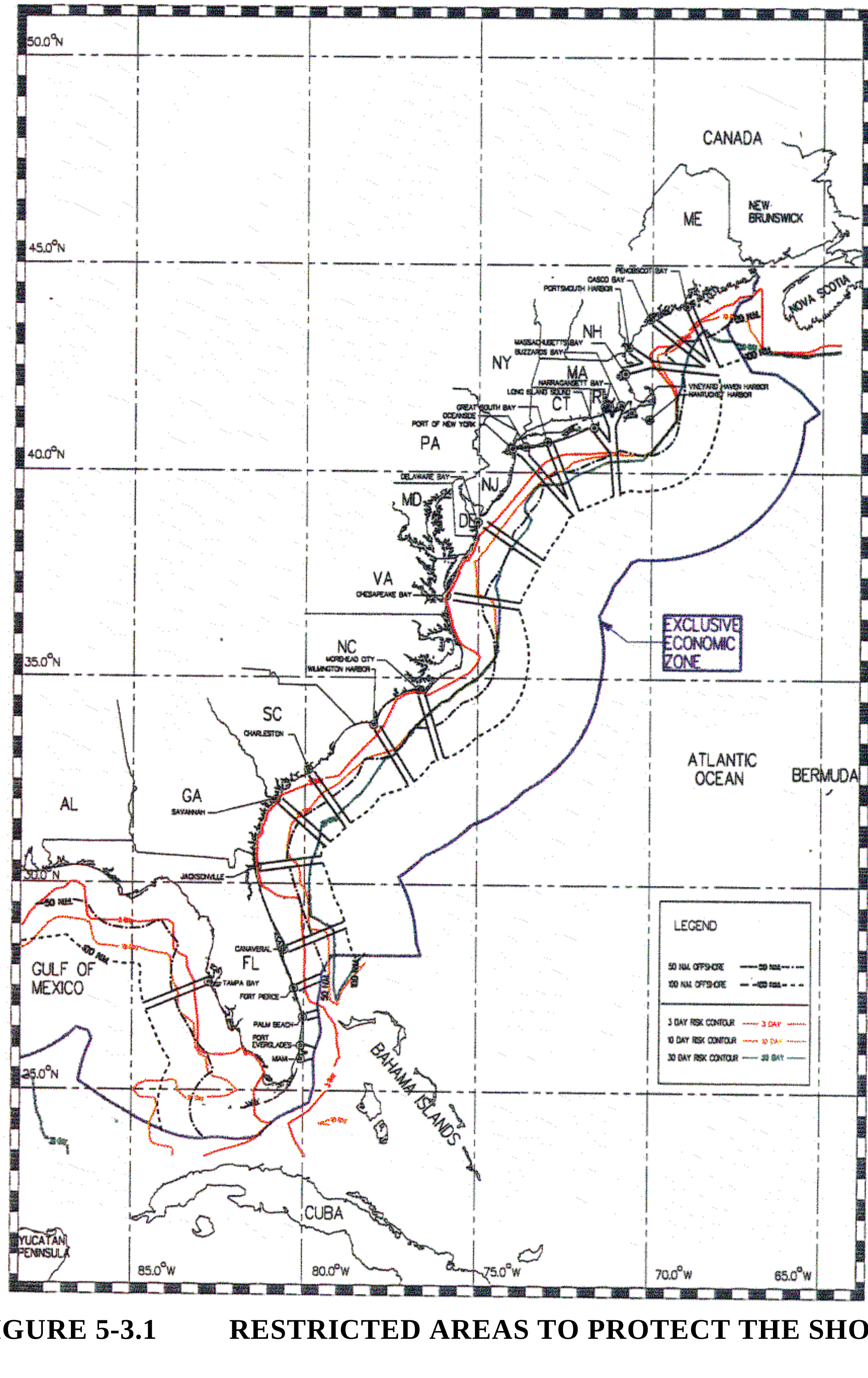

FIGURE 5-3.1 RESTRICTED AREAS TO PROTECT THE SHORELINE

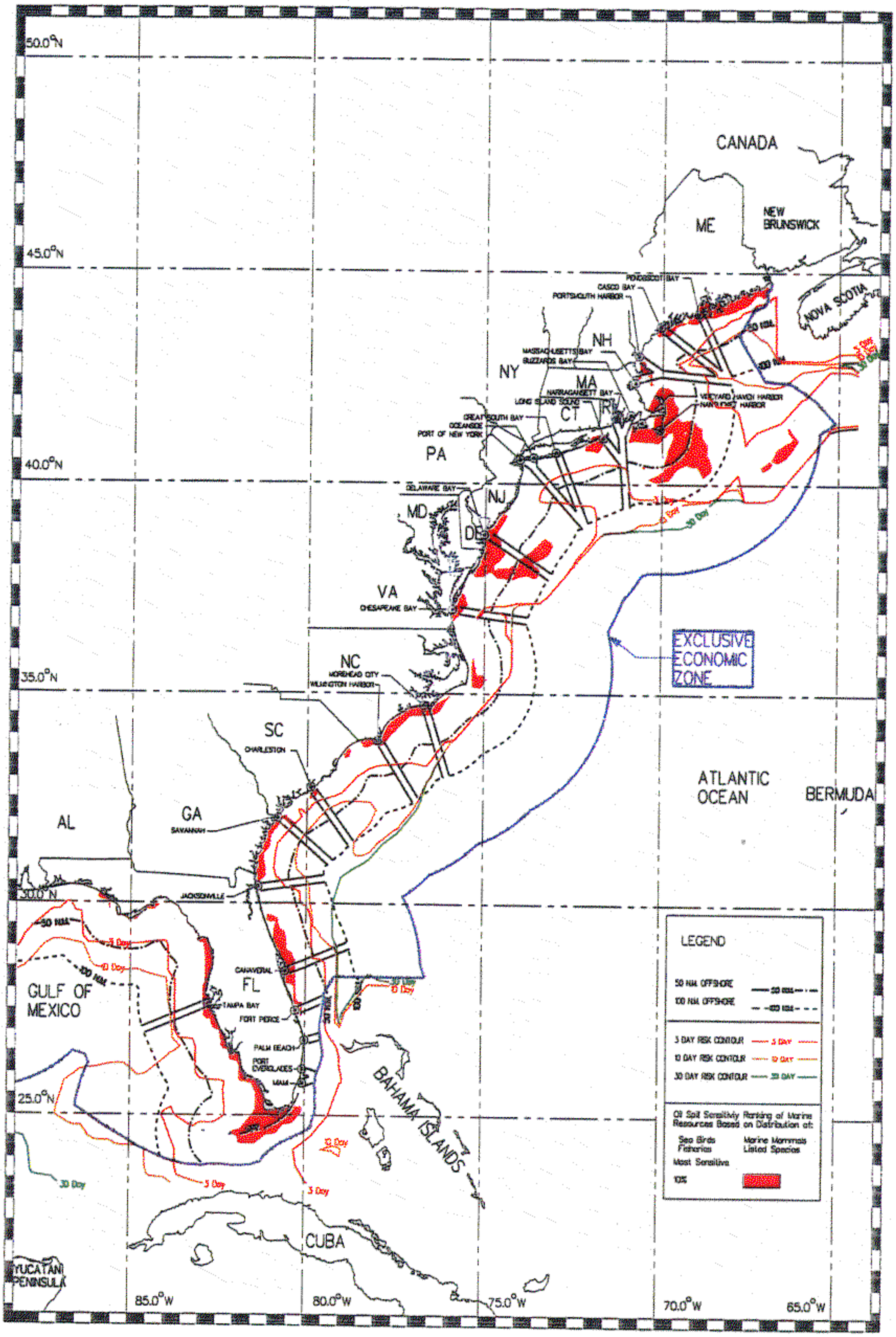

FIGURE 5-3.2 RESTRICTED AREAS TO PROTECT SHORELINE PLUS 10 PERCENT MOST SENSITIVE OFFSHORE RESOURCES

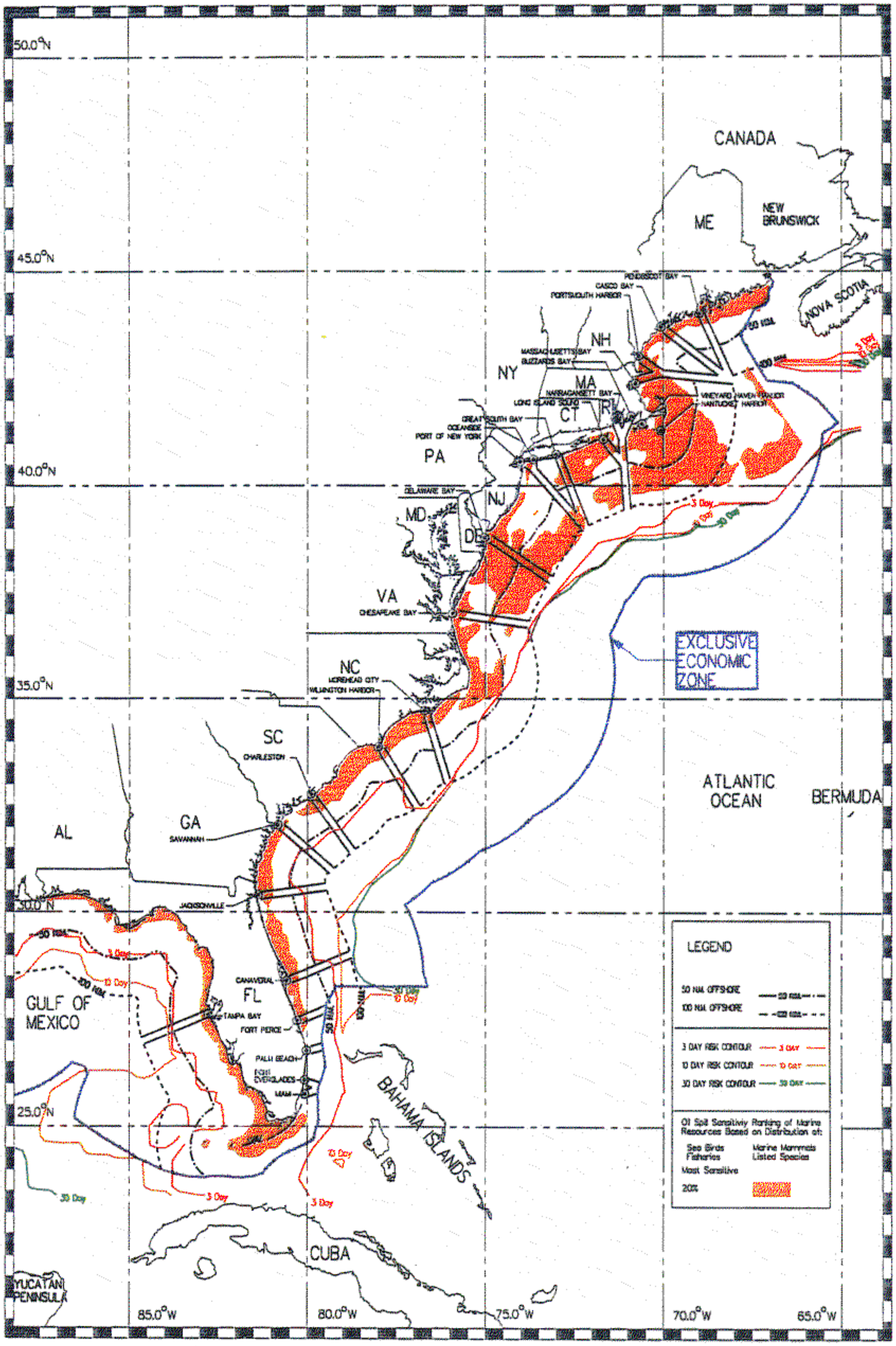

FIGURE 5-3.3 RESTRICTED AREAS TO PROTECT SHORELINE PLUS 20 PERCENT MOST SENSITIVE OFFSHORE RESOURCES

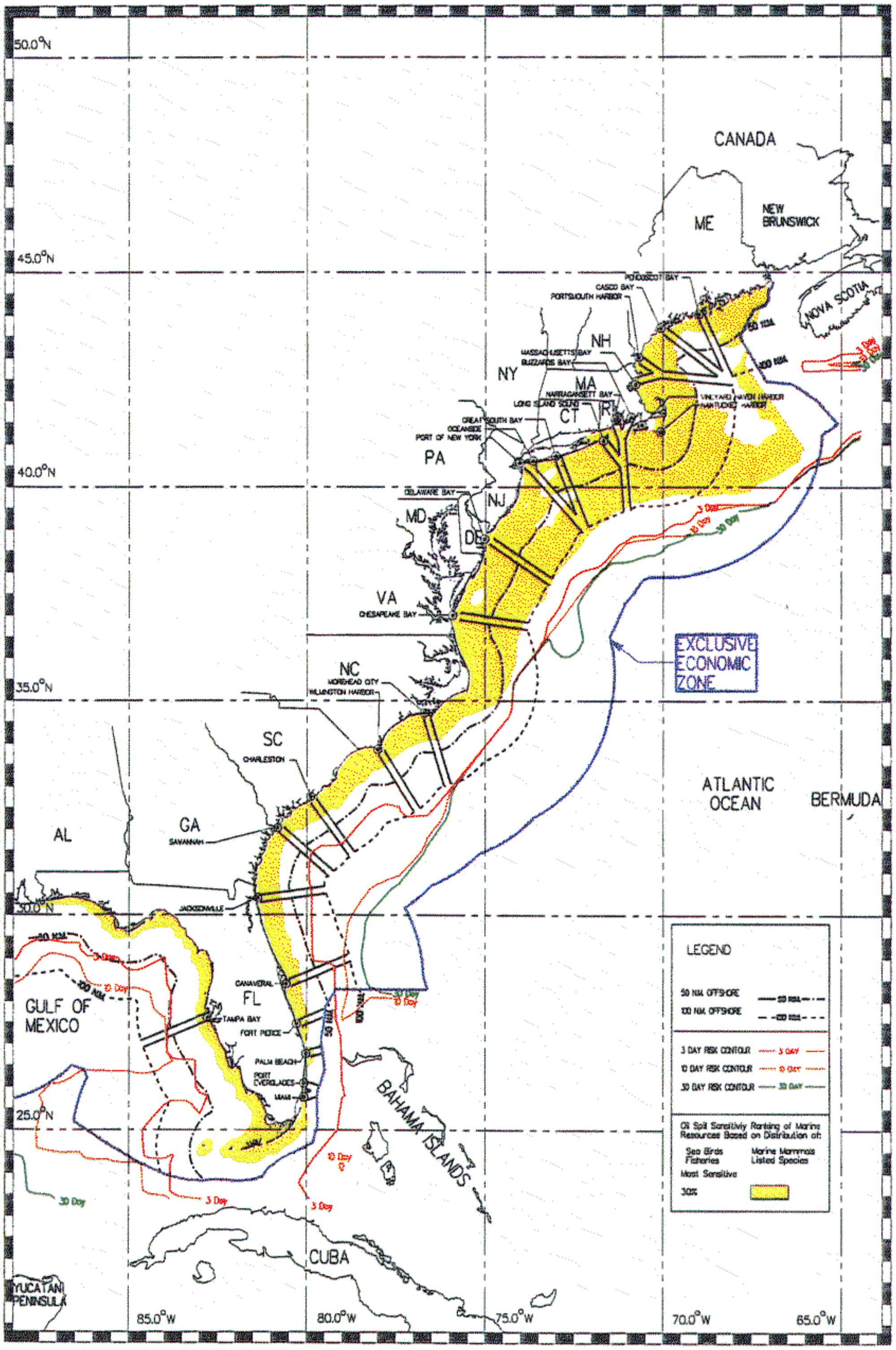

FIGURE 5-3.4 RESTRICTED AREAS TO PROTECT SHORELINE PLUS 30 PERCENT MOST SENSITIVE OFFSHORE RESOURCES

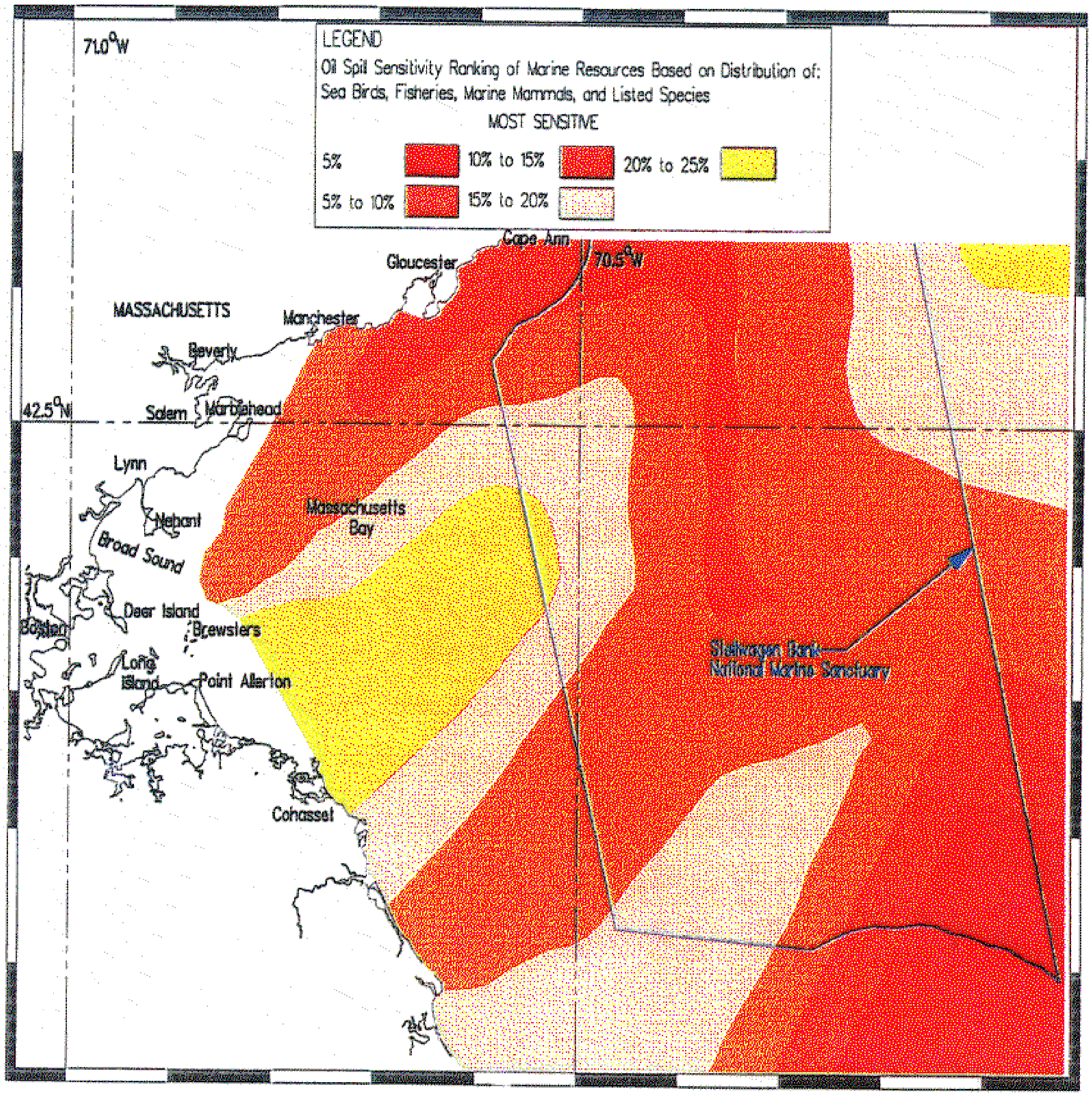

FIGURE 5-4 MASSACHUSETTS BAY APPROACH - (ENLARGED VIEW)

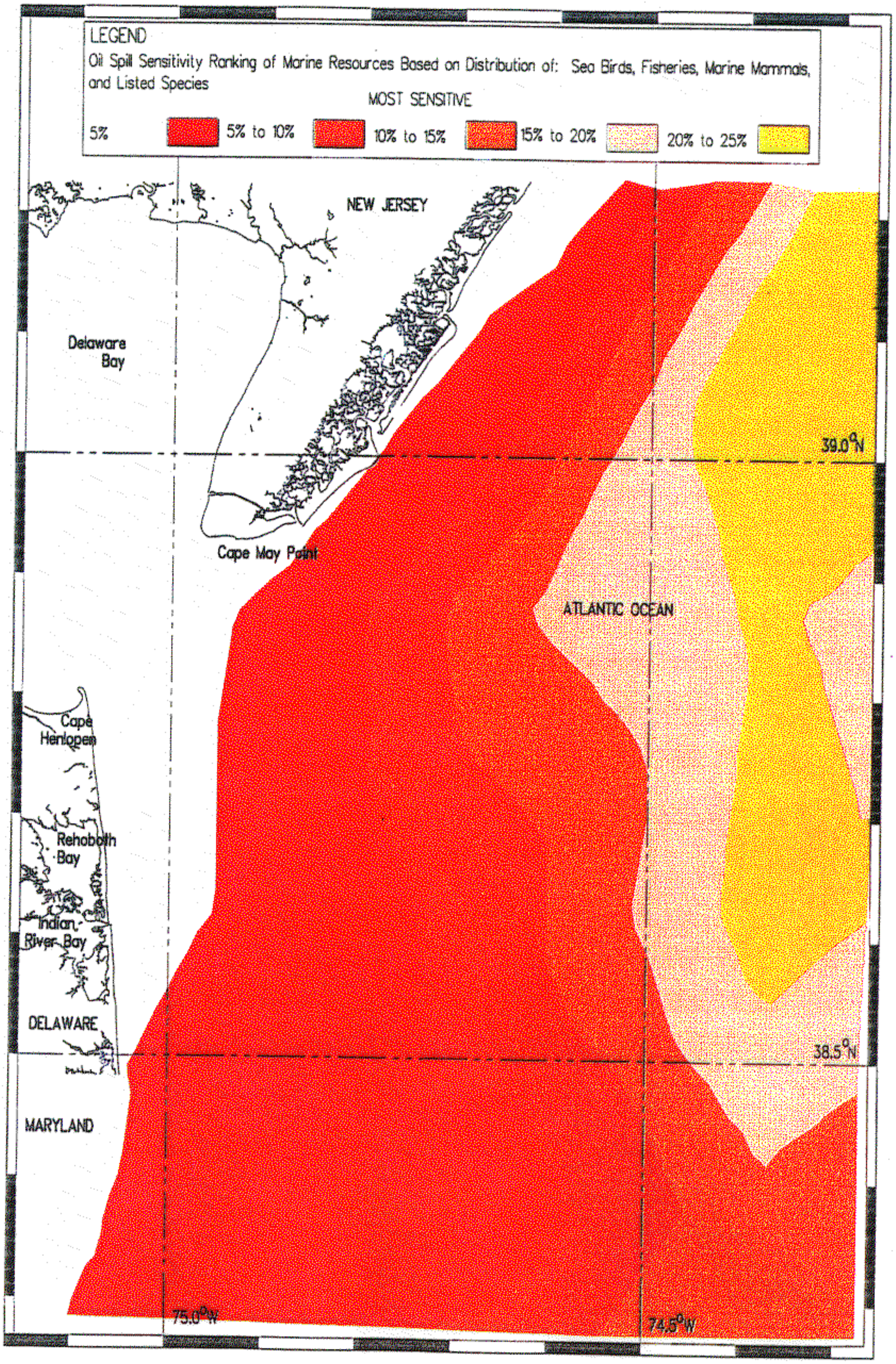

FIGURE 5-5 DELAWARE BAY APPROACH - (ENLARGED VIEW)

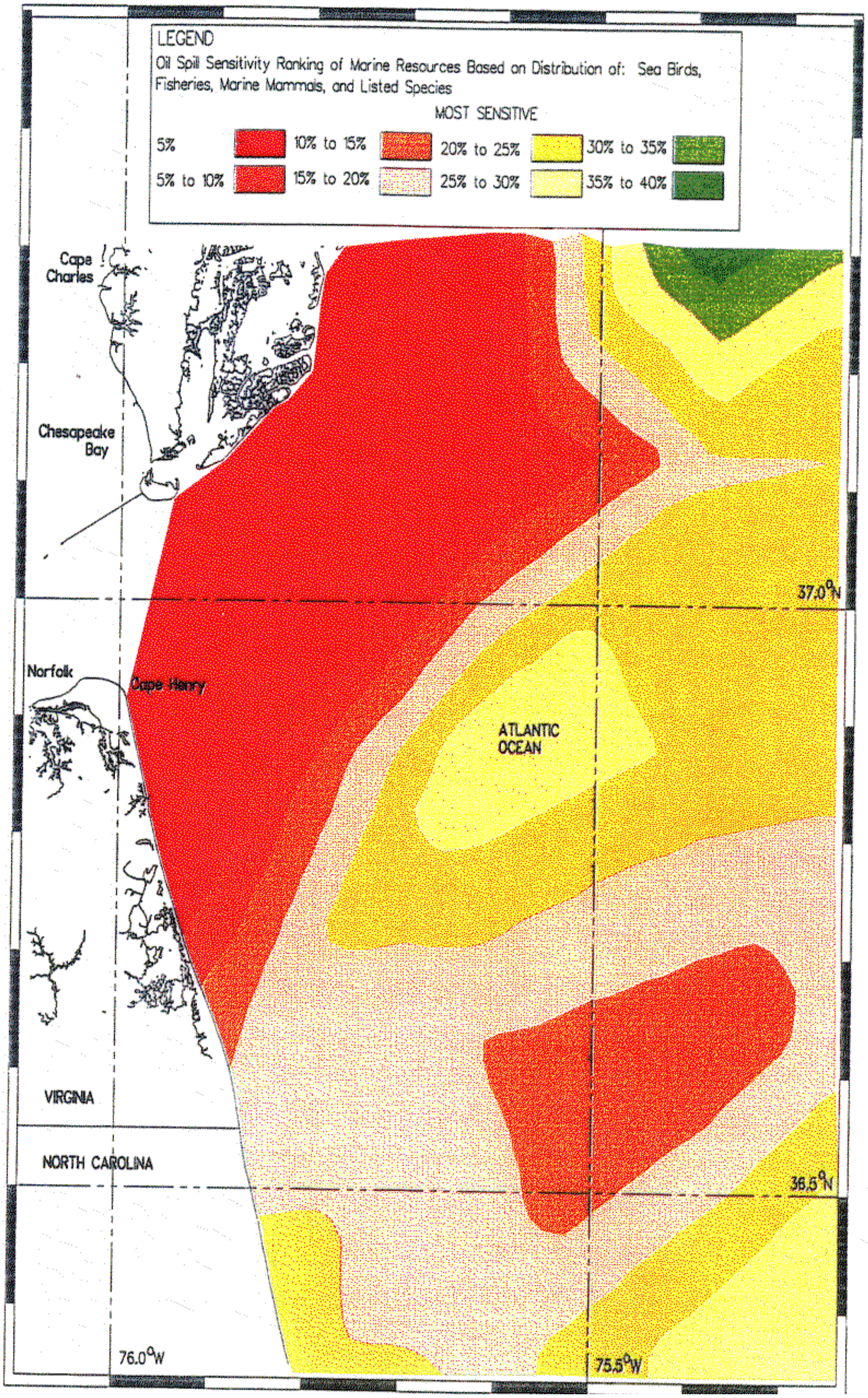

FIGURE 5-6 CHESAPEAKE BAY APPROACH - (ENLARGED VIEW)

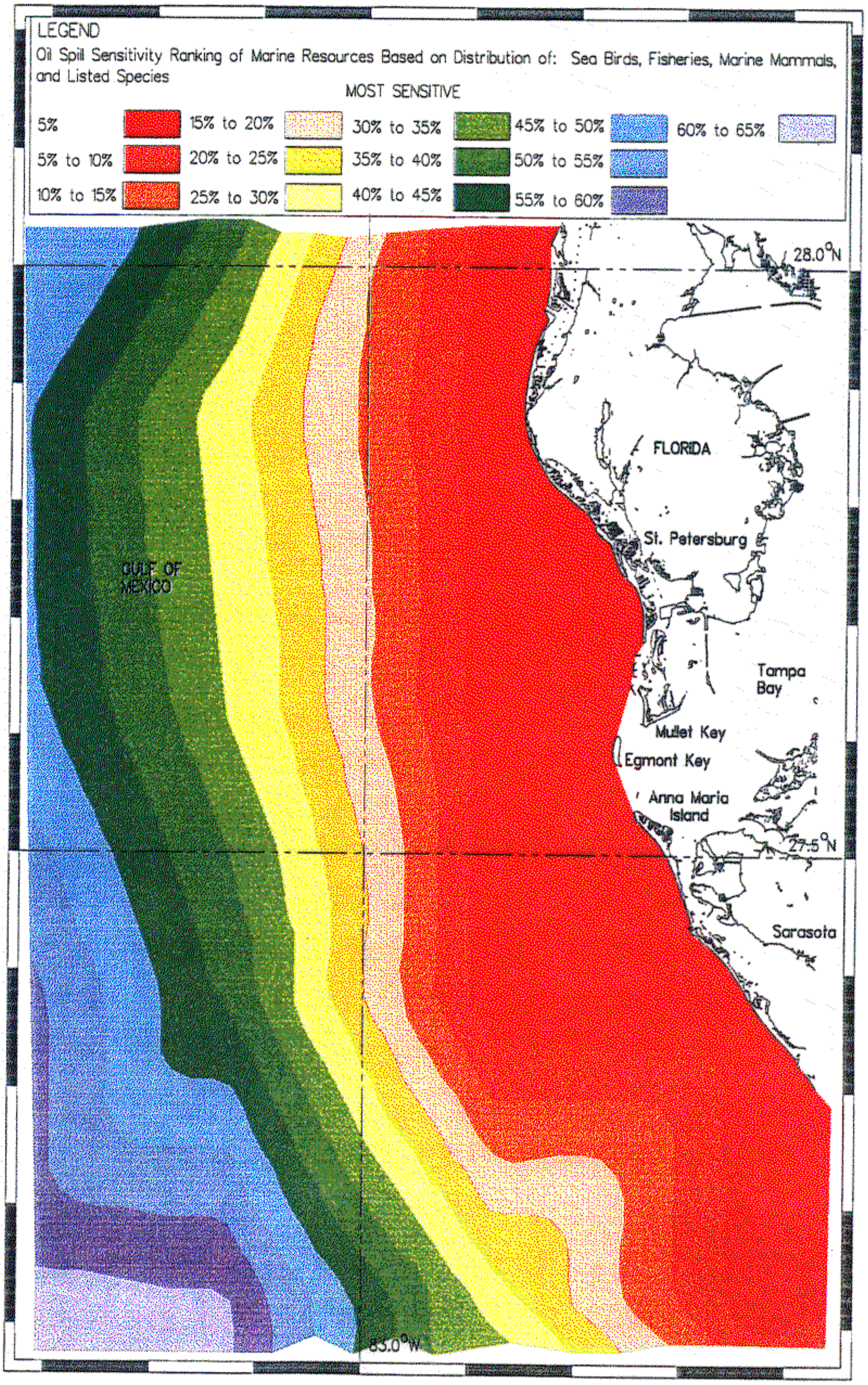

FIGURE 5-7 TAMPA BAY APPROACH - (ENLARGED VIEW)

5.4 TANKER ROUTING AND RESTRICTED AREA FINDINGS

The findings of Section 5 are:

1) Restricted areas might be defined around the most sensitive marine resources to allow time to deal with the spill before it contacts the marine resource.

2) Port access corridors will inevitably compromise the overall level of protection that can be provided by any defined restricted area. Access to some ports may present only a slight compromise (e.g., Ports of New York and New Jersey approach) and others will present an unavoidably large compromise (e.g., Delaware Bay, Chesapeake Bay, and Tampa Bay approaches).

3) An offshore vessel route that is fixed at a single distance (e.g., 50 nautical miles) along the entire coast will not provide the same level of oil spill protection for the most sensitive marine resources along the entire Atlantic and Florida Gulf coasts. A complex restricted area boundary might provide a level of protection to sensitive marine resource areas.

4) Although tanker routing schemes may appear to provide increased protection for sensitive marine resource areas, there are several drawbacks and other factors that have not been fully evaluated. Increased traffic density, the need to address all vessels that carry significant quantities of oil or hazardous materials, commercial access to fishing grounds, and port competition concerns all weigh heavily in vessel routing schemes. These factors must be considered.

6. MONTAUK POINT - BLOCK ISLAND SOUTHWEST PASSAGE

6.1 INTRODUCTION

The eastern approach to Long Island Sound is through Block Island Sound. Vessels moving to and from points east of Block Island Sound (e.g., Narragansett Bay or Buzzards Bay) transit the waterway between Block Island, RI and Point Judith, RI. Deep draft vessels moving between Long Island Sound and the Atlantic Ocean have two choices. The most direct route is the channel between Block Island and Montauk Point, NY. The alternative route involves a dog-leg around Block Island via the Traffic Separation Scheme (TSS) east of Block Island and a sharp turn around the north end of Block Island. The Southwest route is approximately 2 miles wide with a minimum chartered depth of 40 feet, whereas the Northeast route is 6 miles wide and over 100 feet deep. The Congressional Record associated with Section 4111(b)(7) of OPA 90 (136 Cong.Rec. H 6270 (Aug 1, 1989)) directs the Coast Guard to evaluate whether tankers should be prohibited from using the channel between Montauk Point, NY and Block Island, RI. "The channel is extremely narrow and shallow and has been the site of numerous accidents."

6.2 SOUTHWEST PASSAGE DESCRIPTION

The channel in question is used as the southern entrance to Block Island Sound, which in turn is the eastern approach to Long Island Sound. The channel lies within the waterway locally referred to as the "Montauk-Block Island Passage", or the "Montauk Passage", or the "West Passage", or the "Southwest Passage". The passage for vessels of less than 30 foot draft is approximately 10 nautical miles wide between the Great Eastern Rock bell buoy east of Montauk Point and the whistle buoy off the south west corner of Block Island. Deep draft vessels are most likely to use the five mile wide section between the Endeavor Shoals Gong buoy and the Southwest Ledges Bell buoy. "The deepest passage in the southern entrance to Block Island Sound is just westward of Southwest Ledge and has a width of over 2 miles; this is the best passage for deep-draft vessels."[18] Another channel between the whistle buoy and the Southwest Ledges is 1.3 miles wide with a depth of 34 feet; "it is not advisable to use this passage during heavy weather."

There are two offshore oil transfer facilities within Long Island Sound that handle approximately 50 transfers per year from deep draft tankers (40 - 50 foot draft). These tankers typically enter Long Island Sound through The Race between Fishers Island and Little Gull Island and transit Block Island Sound using the eastern approach around the north and east of Block Island, exiting Rhode Island Sound via the TSS lanes.

Only vessels of less than 30 foot draft can use the Southwest Passage to Block Island Sound, and only in good weather. The Congressional concern appears directed at the choice between routing tankers (i.e, those less than 30 foot draft moving in good weather only) calling at Long Island Sound ports around the north of Block Island via the TSS versus the more direct route through

[18] United States Coast Pilot #2, 1994, U.S. Department of Commerce, National Ocean Services, p 140.

the passage southwest of Block Island. Such vessels are already advised to avoid the Southwest Passage during heavy weather. The additional 10 nautical miles in vessel route that these vessel transits incur by the track east of Block Island would be exchanged for reduced risk of a vessel accident in the Southwest Passage.

6.3 SOUTHWEST PASSAGE VESSEL NAVIGATION

The effect of strong winds, in combination with the regular tidal action, may at times cause the water to fall several feet below or rise the same amount above the plane of reference of the chart. The water depths within the Sounds are adequate for deep draft vessels, except for the shoals and rocks that constrict routes by which these vessels must transit to enter and exit. These shoals and rocks are well marked and well known to mariners, but vessel accidents have occurred in heavy weather and poor visibility. The tidal currents throughout Block Island Sound have considerable velocity. "In the middle of the passage between Block Island and Montauk Point the velocity is 1.5 knots on the flood and 1.9 knots on the ebb."[19]

In Block Island Sound and in the eastern part of Long Island Sound, fogs are generally heaviest with southeast winds. In these waters the usual duration of a fog is 4-12 hours, but periods of fog from 4-6 days have been known with very short clear intervals. The waters of Block Island Sound are considered to be open, because they experience similar weather patterns to the nearby ocean. Winds from all directions have ample time to increase in strength; and the waters of the Sound can be as turbulent as the open ocean. In winter, average wind speeds of 16-17 knots are common; gales occur up to 5 percent of the time, and seas of 10 feet or more are likely 5-7 percent of the time. Because of relatively cold water, summer fog occurs two or three times more often than in either Narragansett or Buzzards Bays. In June visibility drops below 1/2 mile nearly 9 percent of the time.

To the east of Block Island Sound is Rhode Island Sound, which must be transited to access Narragansett Bay, Buzzards Bay and the Cape Cod Canal. The entrance to Rhode Island Sound is managed by a Precautionary Area southeast of Block Island which terminates two pairs of TSS traffic lanes - one pair each for Narragansett Bay and Buzzards Bay. The Precautionary Area is managed by long distance VHF operated by the State of Rhode Island. This vessel traffic management system vectors approaching vessels and arranges pilot boarding rendezvous. The Southwest Passage (the channel in question) is currently without positive vessel traffic management. Vessels approaching from the south must board pilots at a point approximately 4 nautical miles southwest of Montauk Point. If the pilot boarded is licensed in New York or Rhode Island, the Southwest Passage will not be used to enter Long Island sound. If the pilot is licensed in Connecticut, the Southwest Passage may be used for vessels with less than 30 foot draft.

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19 United States Coast Pilot

6.4 MARINE RESOURCES OF THE SOUNDS

6.4.1 Ecological Resources of The Sounds

The Long Island and Block Island Sounds contain critical estuaries for the New York and southern New England region. The coasts of the sound vary from rocky and broken with short beaches, to moderate stretches of sand beaches, tidal flats, shellfish beds and underwater reefs. The sounds are delineated by barrier islands, shoals and submerged rocks. The sounds are productive bodies of water, despite the pressures of recreational use, marine harvests and pollution. The sounds are home to at least 13 endangered species, including four types of whales, the Bald Eagle, Perigrine Falcon, Roseate Tern, three species of turtle, the Shortnose Sturgeon, the Burying Beetle, and the Sandplain Gerardia.[20]

Commercial fishing has declined, both in numbers of boats fishing and tonnage landed. This has been due to a variety of reasons, including the declining populations of fish available as well as the economics of small boat fishing. The combined 1992 commercial fleets of Connecticut, New York, and Rhode Island total 7,197, reflecting a gradual, but persistent, decline over the last several decades. The catch in 1993 totaled over 125 million pounds, valued at nearly $118 million. These catches include commercial shell fish, which is an important industry with harvests of both wild and cultivated shellfish. Most of the cultivated shell fish are concentrated along the northern shore of Long Island Sound. The wild shellfish are harvested from both the northern and southern shores.

6.4.2 Use of The Sounds

The sounds have been described as the nation's most important and threatened estuary.[21] Over five million people live within 15 miles of the sounds, and over 10 percent of the U.S. population lives within 50 miles. The role of the sounds as estuaries supporting marshes and wetlands that are vital to the area's water supply. The sounds also provide recreation to millions of people that live or vacation along the shores. Over 200,000 pleasure boats use Long Island Sound in any given year, and the vast majority are moored in its waters. Tourism has become increasingly more important to the region in the last decade, and the sounds are increasingly popular vacation and recreation destinations. The tourist industry on Long Island alone is employs 10 percent of the local population, and has an estimated value of $7 billion, 60 percent of which is related to the Sound.

[20] U.S. Department of Commerce, National Oceanic and Atmospheric Administration. Estuaries of the United States Vital Statistics of a National Resource, Rockville, MD, 1990.

[21] U.S. Environmental Protection Agency. The Long Island Sound Study Comprehensive Conservation and Management Plan, 1993

6.5 OIL SPILL HISTORY

The focus of this section is on the potential for oil spills from vessels while transiting either to the east and north of Block Island or transiting the Southwest Passage into Block Island Sound. Any spill that occurred during a flood tide coupled with a strong southeasterly wind could drift very quickly into the western part of Block Island Sound and through the Race or Plum Gut into the eastern end of Long Island Sound. However, the risk of oil spill from vessels transiting the waters immediately beyond the junctions of these two alternative vessel tracks will not be effected by a choice of either route.

A review of the Coast Guard's pollution database reveals that no oil spills (greater than 20,000 gallons) occurred between 1975 and 1995 within 12 nautical miles of the Southwest Passage. Four spills did occur nearby. The barge Ocean 250 spilled off Watch Hill Point in March 1978, and Barge E-24 spilled off Fishers Island in November 1985. Also, an unnamed tanker spilled off Montauk Beach in the Atlantic Ocean in June 1973, and the tanker World Prodigy spilled off Brenton Point on Newport Neck at the entrance to Narragansett Bay in June 1989. There is no reason to believe that the choice of either of the two alternative routes into Block Island Sound could have been a contributing cause of either of the barge spills; and it is unlikely that loaded deep draft tankers would have chosen the Southwest Passage.

6.6 OIL TANKER TRAFFIC

Tankers generally navigate Long Island and Block Island Sound in one of two patterns. Virtually all refined petroleum originates south of New York. Tankers and tank barges from terminals in New Jersey will typically continue up the East River, into Long Island Sound, and continue along the coast of Connecticut through Block Island and Rhode Island Sounds through Buzzards Bay and the Cape Cod Canal to Boston, Portsmouth, NH and Portland, ME. Ships northbound from south of New Jersey, and crossing the Atlantic from Europe and Africa will generally approach Long Island Sound terminals from the east entrance, either via the Block Island Southwest Passage or via the TSS east and north of Block Island. There is no data on the traffic split between the two alternative routes. The following analysis provides some perspective of the traffic situation in this area using what data does exist.

Of the 16,932 vessel transits in 1993 between Long Island Sound and the Atlantic Ocean, 99 percent drew less than 30 feet of water and could have used the Southwest Passage, but only 246 (1.5 percent) of these were tankers and 375 (2.2 percent) were tank barges. Of the 246 tankers, 159 were calling at Connecticut facilities and 9 were calling at Long Island, NY facilities.[22] Of the 375 barges, 154 were calling at Connecticut and 82 were calling at Long Island, NY facilities.[23]

[22] Based on 1993 data from the Waterborne Commerce database of the U.S. Army Corp of Engineers, Navigation Data Center.

[23] The remainder of the transits (both tanker and barge) appear to be calling at other New York and New Jersey ports.

6.7 GOVERNMENT REGULATION

To date, most of the regulation effecting the sounds region has dealt with land use and control of pollution from land based sources. The land use regulation has largely addressed shorefront and tidal property development to minimize erosion and mitigate wetland loss. Pollution control in New York and Connecticut has dealt primarily with control of nitrogen inflows, both from municipal and industrial sources. Vessel traffic is regulated by the New York, Connecticut, and Rhode Island pilots moving traffic in and out of Long Island Sound via the Precautionary Zone south east of Block Island and the TSS lanes to Narragansett Bay and Buzzards Bay through Rhode Island Sound, or through the Southwest Passage.

6.7.1 Federal and State Regulation

Regulation of land use environmental protection of the sounds has been focused on water quality, not vessel navigation. The major regulatory acts governing the sounds are:

Oil Pollution Act of 1990, Public Law 101-380

Outer Continental Shelf Lands Act Amendments of 1978, Public Law 95-372

Comprehensive Environmental Response Compensation and Liability Act (CERCLA) of 1980 Public Law 96-510

Federal Clean Water Act

Connecticut-DeLauro-Lowey Water Pollution Control and Estuary Restoration Financing Act

6.7.2 Local Regulation

Local regulation has centered on shoreside development and use. Other than prudent restrictions of vessel drafts and anchorages in port areas, there has been no regulation that has actively restricted oil tankers or their navigation on the sounds.

6.7.3 "Quasi-Regulatory" Activity

The most disagreements over navigational issues in the sounds have been among the Pilot Organizations. The pilots from New York and Rhode Island have been instructed by their respective organizations not to transit the Southwest Passage with vessels in excess of 30 foot draft.

6.8 MONTAUK POINT - BLOCK ISLAND SOUTHWEST PASSAGE FINDINGS

The findings of Section 6 are:

1) The Block Island -Montauk Point Channel is commonly referred to as the Southwest Passage. It is one of three alternative routes between the Atlantic Ocean and Long Island Sound.

2) The Southwest Passage is a shorter but shallower route than the route north and east of Block Island, RI.

3) The Block Island Southwest Passage is located in a sensitive marine resource area east of Montauk Point, NY.

4) The Southwest Passage is sometimes used by oil tankers and barges, with less than 30 foot draft, calling at Connecticut, Long Island, and New York/New Jersey port facilities.

5) The oil spills that have occurred during the last 20 years cannot be linked to the choice between the two alternative routes connecting the Atlantic Ocean with Long Island Sound.

6) Non-tanker vessels represent 96 percent of the total vessel transits between the Atlantic Ocean and Long Island Sound of vessels that are capable of using the Southwest Passage.

APPENDIX A Relative Sensitivity of U.S. Marine Waters of the Atlantic Ocean and Eastern Gulf of Mexico to Oil Spills, May 1994, Ecological Consulting, Inc.