OUTER CONTINENTAL SHELF OIL AND GAS INFORMATION PROGRAM

Update 1, April 1982 Outer Continental Shelf Oil and Gas Activities in the North Atlantic and their Onshore Impacts: A Summary Report, July 1981

U.S. Geological Survey Open-File Report 82-16
(Update to Open-File Report 81-601)

For information regarding this summary report update, contact:

Mr. David A. Nystrom
Chief, Office of OCS Information
Minerals Management Service
640 National Center
Reston, Virginia 22091
(703) 860-7166

Copies of this update and the original summary report may be obtained from the above address.

PUBLICATION STATUS OF OCSIP DOCUMENTS

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Summary Report:							
North Atlantic	9/81	6/82	11/82				
Mid-Atlantic	11/79	6/80	2/81	9/81	10/82		
South Atlantic	7/80	2/81	9/81		6/82		
Gulf of Alaska	9/80				8/81	6/82	
Gulf of Mexico	9/80				12/81	9/82	
Pacific (So. Cal.)	5/80				6/82	1/83	
Arctic	12/81	6/82	10/82				
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Atlantic	5/81				10/81	12/82	
Pacific	5/81				10/81	9/82	
Alaska	5/81				5/82		
Gulf of Mexico	5/81				6/82		

Outer Continental Shelf Oil and Gas Information Program

Update 1, April 1982 Outer Continental Shelf Oil and Gas Activities in the North Atlantic and their Onshore Impacts: A Summary Report, July 1981

by Jeffrey L. Deis
and Elizabeth O. Porter

Prepared for the U.S. Department of the Interior,
Minerals Management Service, in cooperation
with the U.S. Geological Survey
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Rogers, Golden & Halpern, Inc.
11872 D Sunrise Valley Drive, Reston, Virginia 22091
1427 Vine Street, Philadelphia, Pennsylvania 19102

U.S. Geological Survey Open-File Report 82-16
(Update to Open-File Report 81-601)

Note to Readers

On January 19, 1982, Secretary of the Interior James G. Watt issued Secretarial Order No. 3071 establishing a Minerals Management Board and a Minerals Management Service (MMS) that would be under the supervision of the Under Secretary. On May 10, 1982, Secretary Watt signed an amendment to Secretarial Order No. 3071. In accordance with the amended order, the Minerals Management Board will continue to be chaired by the Under Secretary, with other members of the Board being the Assistant Secretaries for Energy and Minerals, Land and Water Resources, Indian Affairs, and Policy, Budget, and Administration. The Board will supervise and oversee MMS operations.

The Minerals Management Service will implement new policy and guidance procedures developed by the Minerals Management Board and will be responsible for exercising the following:

- All functions carried out previously by the abolished Conservation Division of the U.S. Geological Survey (USGS);

- Outer Continental Shelf Program support activities, including functions of the Office of OCS Program Coordination; all functions related to the management of offshore energy and minerals administered by the Bureau of Land Management (BLM); all functions that support the OCS program in the Geologic Division and the Office of the Assistant Director for Resource Programs of the U.S. Geological Survey; oil spill trajectory analysis functions of the Office of Earth Science Applications, U.S. Geological Survey; all functions of the Office of Policy Analysis relating to scheduling the sale of leases of OCS lands; and all functions relating to the OCS program transferred from the Department of Energy.

Until further notice, the Minerals Management Service will continue to use administrative support services provided by the U.S. Geological Survey and the Bureau of Land Management, and the Office of OCS Information will continue to use the USGS open-file report numbering system for summary reports and indexes. References to the U.S. Geological Survey and the Bureau of Land Management remain in this document. Future Office of OCS Information publications will report changes in organization as they occur.

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INTRODUCTION

In July 1981, the Office of Outer Continental Shelf Information (OCSI) issued the initial **North Atlantic Summary Report** for the North Atlantic Outer Continental Shelf (OCS) Region. It provided State and local governments with current information about OCS oil and gas resources and related offshore and onshore activities in the North Atlantic Region, from New Jersey to Maine. The report was intended to assist in the planning for the onshore impacts of OCS activities in the North Atlantic States. Updates to summary reports are published approximately every 6 months in order to provide supplemental information to the summary reports. Revisions to summary reports are published only when a new OCS lease sale is held or when a commercial discovery is announced in that OCS region.

The first update to the North Atlantic Summary Report provides additional information about oil and gas activities and their onshore impacts in the North Atlantic Region for the period July 1981 to early April 1982. The report includes a brief summary of oil and gas resources, background information about Lease Sale 42, information about the settlement agreement of Lease Sale 42 litigation, a description of current and anticipated exploratory drilling operations, information on upcoming lease sales, a discussion of the effects of the North Atlantic boundary dispute, oil and gas transportation strategies, onshore support facilities and impacts, and new OCS-related studies. This update is intended to supplement the North Atlantic Summary Report; its organization parallels that of the initial summary report.

The North Atlantic Summary Report is one of a series of regional summary reports for the OCS of the United States, and it is the third summary report to focus on the Atlantic OCS. It was preceded by summary reports for the Mid-Atlantic and South Atlantic Regions. Two updates to the South Atlantic Summary Report have been published, and a revised South Atlantic Summary Report is scheduled to be published in June 1982. Three Mid-Atlantic updates have been published, and a revised Mid-Atlantic Summary Report is scheduled to be published in October 1982. Summary Reports have also been published for the other OCS regions: the Gulf of Mexico, the Pacific (Southern California), the Gulf of Alaska, and the Arctic.

In addition to regional summary reports, indexes of information have been prepared by the Minerals Management Service in conjunction with the Bureau of Land Management to further supplement information available to State and local governments for planning and decisionmaking purposes. The indexes contain information used by the Federal Government in its OCS decisionmaking process. They provide detailed information on the oil and gas lease-sale process, the leasing schedule and sale history, ongoing programs, studies related to the OCS, State and local involvement in the OCS leasing program, and a directory of Federal and State OCS-related agencies. A revised index has been published for the Atlantic (Collignon, 1981, USGS Open-File Report 81-705), as well as the Pacific, Gulf of Mexico, and Alaska areas.

Copies of the initial North Atlantic Summary Report as well as all other summary reports, updates, and indexes may be obtained from the Office of Outer Continental Shelf Information, Minerals Management Service, MS 640 National Center, 12201 Sunrise Valley Drive, Reston, VA 22091. The telephone number is (703) 860-7166.

Minerals Management Service

In January 1982, Department of the Interior (DOI) Secretary James Watt issued an order that separated the Conservation Division from the U.S. Geological Survey and changed

its name to the Minerals Management Service (MMS). The Minerals Management Service is under the supervision of a Minerals Management Board headed by Under Secretary Donald Hodel. The duties of the Minerals Management Service are the same as they were under the U.S. Geological Survey, which include the functions of the Office of OCSI.

Leasing Schedule

The current leasing schedule is the June 1980 oil and gas leasing schedule issued by former Secretary of the Interior, Cecil Andrus. A tentative proposed final leasing program with a revised leasing schedule was issued on March 15, 1982, by DOI Secretary James Watt. Changes in the leasing schedule are authorized by section 18 of the OCS Lands Act Amendments of 1978, which state that the Secretary of the Interior shall annually review and periodically revise the OCS leasing program.

In July 1981, DOI Secretary Watt issued a proposed leasing program that was intended to replace the June 1980 leasing program. Three months later, on October 6, 1981, a three-judge U.S. Court of Appeals in Washington, D.C., unanimously ruled on the **State of California** v. **Andrus** (80-1894) that the current June 1980 leasing program did not meet all the requirements of the OCS Lands Act, as amended. The ruling stated that the June 1980 leasing program failed to (1) identify offshore California Lease Sales 73 and 80 "with greater specificity," (2) "consider the need" enumerated in section 18(a)(2) and (b) to share benefits and risks of the plan among all OCS regions, (3) consider the relative environmental sensitivity of different OCS areas, and (4) "strike a proper balance" required in section 18(a)(3) between environmental factors and economic factors. The court also stated that the proposed leasing program, which would be submitted by DOI Secretary Watt to Congress for approval, would be prepared in accordance with the ruling and that until a new leasing schedule is approved, the June 1980 schedule must be followed.

In a clarification order on January 19, 1982, the appeals court approved a timetable for submission of the proposed leasing program. The court also stated that the Department of the Interior must consider all of the factors in sections 18(a)2 and (a)3 of the OCS Lands Act and must show that new data have been considered as well as the analysis method of incorporating the new data in the development of the proposed leasing program. Following the court's timetable, the Department of the Interior issued a tentative proposed final leasing program on March 15, 1982. In addition, a final supplement to the final environmental impact statement for the proposed leasing program was published in March 1982. Notice of its availability was published in the Federal Register, vol. 47, no. 45, March 8, 1982. In March 1982, the tentative proposed final leasing program was submitted for comments to Congress, the U.S. Attorney General, and to Governors of affected coastal States and was published for public comment in the Federal Register, vol. 47, no. 54, March 19, 1982. Comments and recommendations were due by April 19, 1982. A proposed final program along with the comments and recommendations received will be submitted to the President and Congress in May 1982. Under the timetable, DOI Secretary Watt is expected to approve a final leasing program on or about July 12, 1982, or not less than 60 days after submission of the proposed final leasing program.

At the time of this update's publication, the OCS oil and gas program is operating under the June 1980 leasing schedule, but this will change in July 1982 when the Secretary of the Interior is scheduled to approve a new leasing schedule. The dates of OCS-related lease sale events used in this update indicate dates when the events are likely to occur.

OFFSHORE OIL AND GAS RESOURCES OF THE NORTH ATLANTIC

Geologic Aspects of the North Atlantic Region

A description of the geology of the region was provided in the July 1981 North Atlantic Summary Report (Dorrier, 1981, USGS Open-File Report 81-601, p. 5).

Resource and Reserve Estimates

Since the publication of the initial North Atlantic Summary Report, the estimates of the **risked resources for leased lands** have been changed, using a different methodology. The Department of the Interior's most recent resource and reserve estimates for the North Atlantic Region are presented in table 1. The first part of table 1 presents **undiscovered recoverable resources,** which are unchanged since the publication of the initial summary report. Undiscovered recoverable resources are defined as resources that can be extracted economically under existing technology and price/cost relationships, assuming normal short-term technological growth. These figures do not include estimates for heavy oil deposits, tar deposits, oil shale, impermeable "tight" gas reservoirs, gas occluded in coal, gas in geo-pressured shales and brines, and natural gas hydrates. They are based on geological analysis of individual basins, which includes volumetric yield, analog methods, and structural analysis. Because of uncertainties involved with estimating amounts of undiscovered resources, estimates are reported as a range of values corresponding to different probabilities of occurrence. The mean, or most likely, estimate is provided in table 1.

The second set of estimates, risked resources for leased lands, has been updated, using a different methodology, since the publication of the initial summary report. These estimates are specific to the tracts leased under Lease Sale 42. Figure 1 shows the locations of these leased tracts.

Reserve estimates are based on actual discoveries on existing leases. To date, there have been no discoveries in the North Atlantic OCS; therefore, there are no reserve estimates.

Conditional mean resource estimates have been calculated for proposed OCS Lease Sale 52; they are presented on page 12.

MAGNITUDE AND TIMING OF OFFSHORE DEVELOPMENT

Lease Sale 42

The leasing process for Lease Sale 42, the first sale in the North Atlantic OCS, began in June 1975 with the call for nominations and comments. In January 1976, a draft environmental impact statement (DEIS) studied 206 selected blocks. The sale was originally scheduled for January 1978, but various litigation delayed the sale for 23 months. (A detailed discussion of the sale's litigation history is contained on page 13 of the initial summary report). Prior to the lease sale, 90 blocks were withdrawn from consideration on five separate occasions within the period from December 1976 to September 1979. As a result of border dispute negotiations with Canada, 55 tracts were withdrawn, and 35 tracts were withdrawn to reduce potential conflicts with the commercial fishing activities and to protect lobster and fish at the head of Lydonia Canyon. Lease Sale 42 was held on December 18, 1979, and it offered 116 tracts. Of the 73 high bids, 63 were accepted. Figure 1 shows the 63 leased blocks.

TABLE 1.—North Atlantic OCS oil and gas resource and reserve estimates

	Oil (million barrels)	Gas (billion cubic feet)
Undiscovered recoverable resources (mean estimates)		
North Atlantic Region (including leased lands)		
0 - 200 m water depth	400	2,500
200 - 2,500 m water depth	1,000	3,200
Risked resources for leased lands (mean estimates)		
North Atlantic leased tracts	77.2	263.2
Reserves	0	0

SOURCE: Minerals Management Service, Resource Estimates Section 1982.

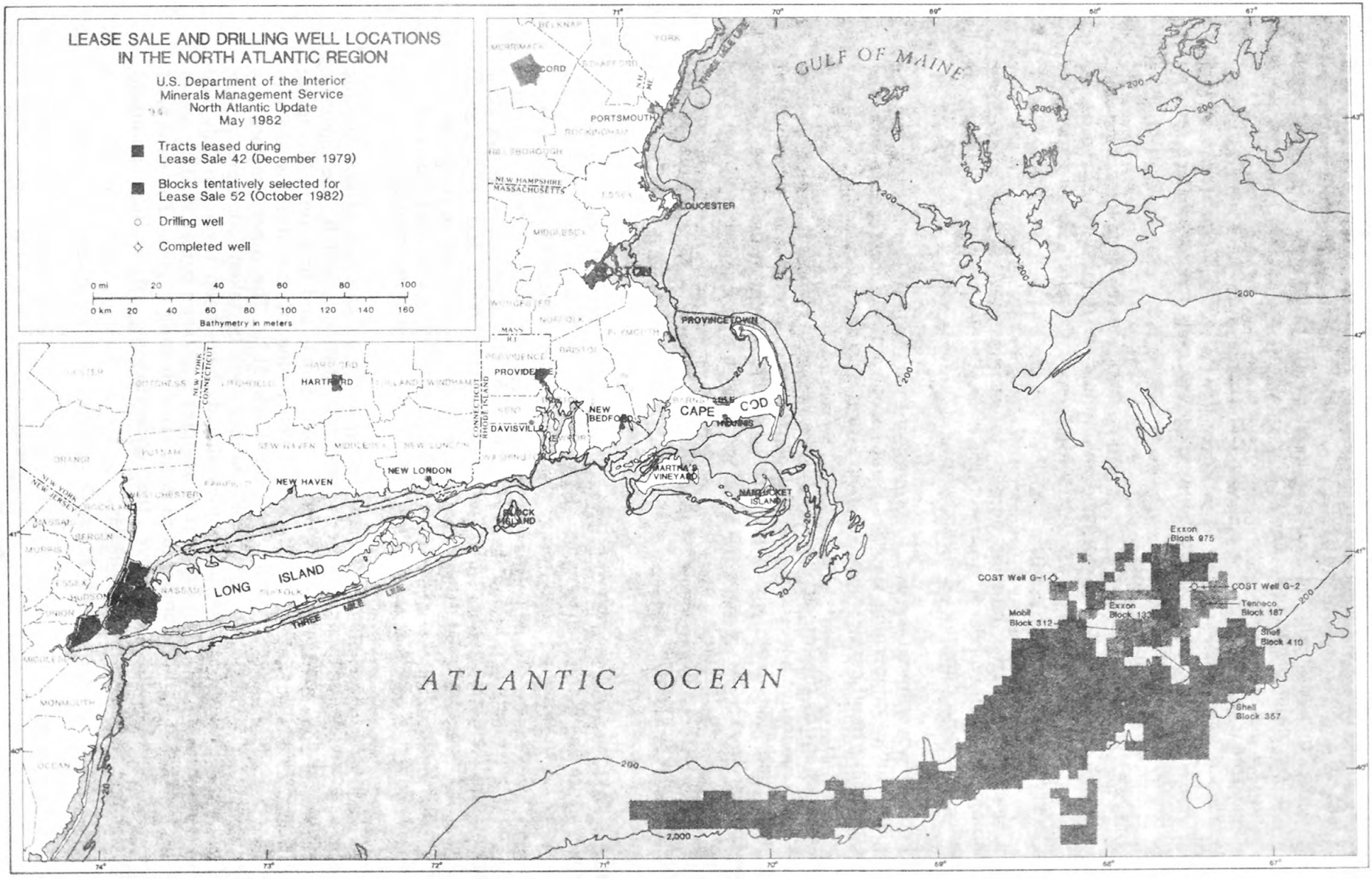

FIGURE 1.—Leased tracts and wells for Lease Sale 42 and tentatively selected blocks for Lease Sale 52. (Adapted from Dorrier, 1981, and Danenberger, 1982, and Roberts, 1982, by Rogers, Golden & Halpern, 1982.)

Lease Sale 42 litigation continued until December 22, 1980, when a settlement agreement was reached between the plaintiffs--the Commonwealth of Massachusetts and the Conservation Law Foundation--and the Department of the Interior. The settlement agreement contained five major provisions:

- The Department of the Interior approved and agreed to fund certain studies recommended by the Biological Task Force (BTF). The Department of the Interior also agreed to consider for approval and funding future studies recommended by the BTF.

- The National Oceanic and Atmospheric Administration (NOAA) agreed to consider whether all or part of Georges Bank should be nominated as an active candidate for marine sanctuary designation. A decision was required by December 1, 1981.

- The Department of the Interior agreed to issue Best Available and Safest Technology (BAST) standards to the extent that they were not already in existence or required by the OCS Lands Act.

- The Federal Government agreed to provide all parties with information on the biological studies concerning Georges Bank. Copies of future reports would be made available to all parties involved in the legal dispute.

- The Department of the Interior agreed to prepare a development and production phase environmental impact statement after receipt of one or more development and production plans from any of the lessees holding tracts in the Lease Sale 42 area.

The following discusses the developments that have occurred as a result of the settlement agreement provisions.

BIOLOGICAL TASK FORCE ACTIVITIES. The December 1980 settlement agreement contained a provision in which the Department of the Interior agreed to fund and support studies recommended by a Biological Task Force, which would be responsible for monitoring the environmental changes from oil and gas activities in Georges Bank and to provide a warning of any adverse effects. In April 1981, the BTF prepared the **Georges Bank Monitoring Program and Related Studies,** which outlined other programs and studies about Georges Bank and described additional studies under the proposed monitoring program. By reviewing existing programs, the BTF designed a monitoring program that focused on research not addressed by other programs and that was specific to drilling activities.

The monitoring program is primarily designed to provide an analysis of the benthic communities and bottom sediments gathered from 41 stations, which are specific coordinates on Georges Bank. The purpose is to detect any short- and long-term biological changes from the discharge of drilling materials. Twenty-nine of the stations are site specific, and they are located around Mobil's well on Block 312. The other stations are spread in a regional array throughout Georges Bank. Samples will be taken four times a year from each of the 41 stations; three sets of samples already have been taken, in July and November 1981, and February 1982. The first set of samples was taken before drilling began to establish baseline data that will be compared to data after drilling begins. The results of the analyses of the samples will improve the understanding of drilling pollutant accumulation and its impact on benthic organisms.

In addition, three current meters are located in the lease sale area to monitor surface, mid-level, and near-bottom current velocity and direction. The data from these measurements will allow simple calculations of dispersal patterns. Rig operators will also provide data to the U.S. Geological Survey and the Environmental Protection Agency on the quantity, physical quality, and chemical composition of discharged drilling muds and cuttings.

The monitoring program will be reviewed and revised as the results of the program, as well as the results of other studies, become available and as industry develops their plans. The BTF's activities complement the work of other studies, which includes studies funded by the National Marine Fisheries Service: the Ocean Pulse/Northeast Monitoring program, the Manned Undersea Research and Technology (MURT) Program, the Gulf and Atlantic Survey (GAS), and the Marine Resources Monitoring, Assessment and Prediction Program (MARMAP), as well as studies conducted by or for the Environmental Protection Agency, the Bureau of Land Management, the Minerals Management Service, and the U.S. Geological Survey. The appendix at the end of this update describes these programs and their studies.

The BTF will advise the MMS District Supervisor about available data and information resulting from the monitoring to help in the supervision of OCS oil and gas activities. The monitoring results will also be made available to the public.

The BTF consists of five members from different Federal agencies; they are presented in table 2. The chairmanship changes annually, and Barry Clark of the Minerals Management Service was elected chairman at the last BTF meeting on January 26, 1982.

CONSIDERATION OF GEORGES BANK AS A MARINE SANCTUARY. The December 1980 settlement agreement also required NOAA to consider whether all or part of Georges Bank should be nominated as an active candidate for marine sanctuary designation by December 1981. On November 30, 1981, NOAA announced that no part of Georges Bank would be currently listed as an active candidate for marine sanctuary designation (Federal Register, vol. 46, no. 229, November 30, 1981).

NOAA's decision was based on the low level of hydrocarbon exploration and was made because the selection process for marine sanctuary designation is being changed. To date, there has been relatively little exploration on Georges Bank, and the drilling that has occurred has been accompanied by monitoring. There is no indication at present that marine resources are being impaired. Therefore, NOAA believes that there is no urgent need to consider a marine sanctuary designation for Georges Bank at this time. These reasons are similar to those used in the withdrawal of Georges Bank from consideration as a marine sanctuary in September 1979. At that time, a compromise was reached between NOAA and the Department of the Interior in which Interior agreed to toughen pollution control regulations, to initiate a monitoring program, and to delete 12 tracts from Lease Sale 42, and NOAA agreed to withdraw Georges Bank from consideration as a marine sanctuary designation.

NOAA is revising its marine sanctuary site-selection process. A new program development plan that outlines the marine sanctuary program's revised procedures was issued in March 1982. It is available from the Sanctuary Program Office, Office of Coastal Zone Management, NOAA, 3300 Whitehaven Street, NW., Washington, DC 20235.

Under the new marine sanctuary site-selection process, the OCS of the United States will be divided into eight regions, each with a Regional Resource Evaluation Team. The Northeast Atlantic region, which includes Georges Bank, extends from Cape Hatteras

TABLE 2. Biological Task Force Members

Member	Affiliation
Ralph Andrews	Fish and Wildlife Service, DOI
William Beller	Environmental Protection Agency
Barry Clark	Minerals Management Service, DOI
Piet deWitt	Bureau of Land Management, DOI
Allen Peterson	National Marine Fisheries Service, NOAA, Dept. of Commerce

northward. Each evaluation team will identify and evaluate three to five priority sites in their region. Public review and comment will follow this initial selection. After public review and additional analysis, each team will submit a final list to NOAA. NOAA will select sites from the eight submitted lists for placement on a site-evaluation list.

The Regional Resource Evaluation Team for the Northeast Atlantic region has been selected, and their first meeting is expected to be held in April 1982. The initial list of selected sites from all of Regional Resource Evaluation Teams should be ready by the fall of 1982. The final list of sites is to be sent to NOAA in early 1982 (Podgorny, 1982, oral commun.).

The new selection process differs from the process used in the past in which any member of the public could nominate marine sanctuary sites. The new process will be formalized, revised guidelines will be used to identify sites, and the identification of sites should be completed within a defined time period. For each site, the evaluation team will look for units with unique or special resource values that lend themselves to management practices. The designated Channel Islands marine sanctuary off California, which is 1,252 square nautical miles, probably represents the upper limits of the size of a marine sanctuary.

There is no indication at this time whether any part of Georges Bank will be included in the three to five sites identified by the evaluation team. The entire Georges Bank is too large for designation; a more likely unit would be a head of a canyon in Georges Bank (Podgorny, 1982, oral commun.).

REMAINING SETTLEMENT PROVISIONS. A North Atlantic Regional Offshore Technology Assessment Committee meets quarterly to ensure that BAST standards are applied. National BAST procedures have been applied, and they are generally viewed as appropriate and comprehensive. However, drilling rig operators are required to perform tasks that are not always found in other regions; for example, reporting the composition and discharge volume of drilling muds and their additives, diluting and shunting wastes below the water surface, performing sidescan sonar over the location of the drilling site once drilling has ceased, and completing tasks to assist in the BTF monitoring program.

Information concerning OCS drilling activities and biological studies are available to all parties involved in the litigation. Exploration plans and their accompanying environmental reports have been made available, and although the samples taken under the monitoring program have not been analyzed yet, the results of the analyses will be available when they are completed.

The Department of the Interior has not prepared a development and production phase environmental impact statement because no development and production plan has been submitted for any of the Lease Sale 42 tracts.

OFFSHORE ACTIVITY IN THE NORTH ATLANTIC. One of the lease requirements for Sale 42 is that a statement of intention or an exploration plan must be filed for each of the 63 blocks by February 1, 1982, 25 months after the leases were granted. This lease requirement has been met for all 63 leased blocks. A statement of intention details geologic and geophysical information about a block and about nearby blocks that may influence drilling decisions, and it summarizes the exploration strategy for that block. An exploration plan, which is more detailed than a statement of intention, must be filed prior to submitting an application for permit to drill (APD) on a block. Exploration plans are reviewed and

either approved or disapproved by the Minerals Management Service. By early April 1982, statements of intention had been filed for 12 blocks, and exploration plans had been filed for the remaining 51 blocks. Of the submitted exploration plans, approval has been received for 40 blocks.

As of early April 1982, 13 APD's had been submitted, of which 11 were considered final submittals and 2 were draft submittals. Of the final submittals, six APD's have resulted in drilled wells. The remaining five final submittals have been submitted by Exxon (2 APD's), Conoco (1 APD), Union (1 APD), and Mobil (1 APD). The two APD's that are draft submittals were submitted by ARCO; they were considered draft APD's because a contracted drilling rig was not identified in the APD submittal.

At the time the initial North Atlantic Summary Report was published, in July 1981, two wells had been completed in the region and two wells were being drilled. Two Continental Offshore Stratigraphic Test (COST) wells were drilled prior to Lease Sale 42, and two exploratory wells had just been spudded. Since the summary report's publication, four other wells have been spudded. Figure 1 shows the location of these wells. Figure 2 charts the drilling time by rig, the company responsible for drilling, and the well number.

Exxon spudded its first well on Block 133 in Lydonia Canyon on July 24, 1981, and drilled to a depth of 14,118 feet (4,235 m) using the Alaskan Star semisubmersible rig. The well produced no announced discovery of hydrocarbons, and it was plugged and abandoned on November 24, 1981. The Alaskan Star moved to Block 975 in Corsair Canyon, and Exxon's second well was spudded on November 25, 1981. Drilling was completed on March 6, 1982, at a depth of 14,605 feet (4,452 m). It produced no announced discovery of hydrocarbons, and was plugged and abandoned on March 10, 1982.

Shell's well on Block 410 was drilled by the Zapata Saratoga semisubmersible rig, which arrived on location on July 10, 1981. Spudding was delayed, and the rig was moved slightly because its eight-anchor system would not hold against a 300,000 pound (136,080 kg) test pull. On July 24, 1981, the well was spudded, but shortly thereafter caving problems imbedded the drill. As a result, Shell moved the rig slightly by loosening and tightening the anchor lines. A second well was spudded on July 27, 1981, but further drilling complications caused another minor move, and a third well was spudded on August 10, 1981. Drilling at this site stopped at a depth of 13,122 feet (4,000 m), when a storm broke an anchor line on the night of November 25, 1981. A second line broke the next morning. Repairs were made at the drill site and after a 2-month delay, drilling resumed to a depth of 15,568 feet (4,745 m). The well was plugged and abandoned on March 31, 1982; it produced no announced discovery of hydrocarbons. In early April, the Zapata Saratoga was moved. As of April 13, 1982, Shell was on location but did not spud due to weather.

On December 8, 1981, Mobil spudded a well using the Rowan Midland semisubmersible rig on Block 312, in Lydonia Canyon. A broken anchor line delayed drilling for 13 days in mid-December. The well's proposed depth is 18,500 feet (5,639 m), and by the end of March 1982, 16,500 feet (5,029 m) had been drilled.

On March 12, 1982, Tenneco spudded a well with the Alaskan Star on Block 187 in 307 feet (94 m) of water. The proposed drilling depth is 21,000 feet (6,401 m).

The Alaskan Star and the Zapata Saratoga have just begun drilling new wells. Although the future plans for the Rowan Midland are not final, it will drill another well for either Mobil on Block 273 or Union on Block 271. Conoco has indicated that it expects to bring the New Era semisubmersible rig to the North Atlantic from the Gulf of Mexico in May 1982. Conoco would drill on Block 145 in 305 feet (93 m) of water. Therefore, three or

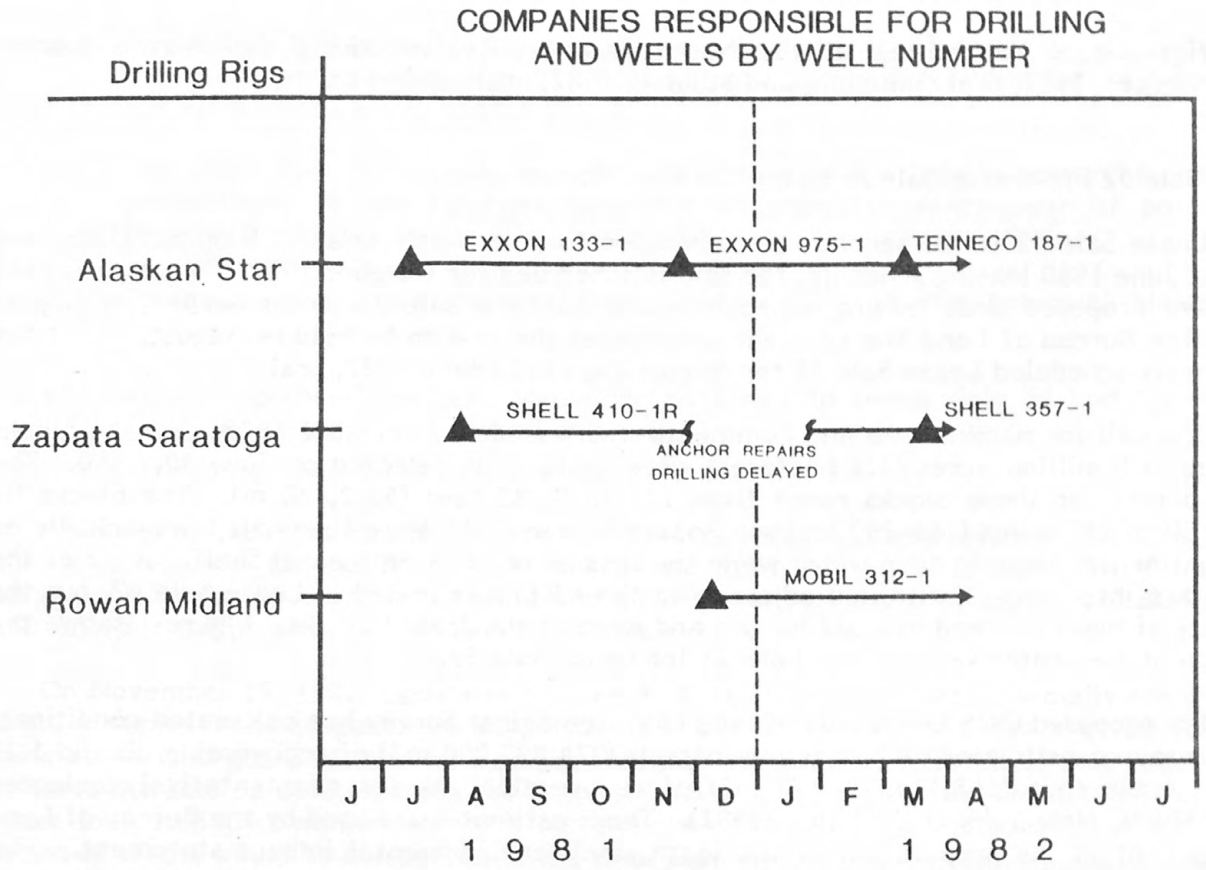

FIGURE 2.—Exploratory drilling in the North Atlantic Region. (Adapted from Roberts, 1982, by Rogers, Golden & Halpern, 1982.)

four rigs should be drilling in the North Atlantic Region during the next 6 months (Danenberger, 1982, oral commun., and Stauble, 1982, oral commun.).

Lease Sale 52 Pre-Lease-Sale Activity

Lease Sale 52 is the second sale scheduled for the North Atlantic Region. Under the current June 1980 leasing schedule, the sale is scheduled for October 1982. The March 1982 tentative proposed final leasing schedule would hold the sale 2 months earlier, in August 1982. The Bureau of Land Management anticipates the sale to be held in August, and it has tentatively scheduled Lease Sale 52 for August 24, 1982 (Ham, 1982, oral commun.).

The call for nominations and comments was issued in December 1979, and 540 blocks covering 3.1 million acres (1.3 hectares) were tentatively selected on June 30, 1980. The water depths for these blocks range from 171 to 9,285 feet (52-2,830 m). The blocks lie from 100 to 180 miles (161-290 km) southeast of Cape Cod. More than half the blocks lie on the Continental Slope in deep water while the rest lie on the Continental Shelf. Some of the blocks are interspersed with and adjacent to the 63 blocks leased in Lease Sale 42, but the majority of blocks extend in a band south and west of the leased blocks. Figure 1 shows the location of the tentatively selected blocks for Lease Sale 52.

For proposed OCS Lease Sale 52, the U.S. Geological Survey has calculated **conditional mean resource estimates** of 1.73 billion barrels (274,897,000 m3) of recoverable oil and 5.25 trillion cubic feet (148,575,000,000 m3) of recoverable gas for the tentatively selected blocks (BLM, New York OCS Office, 1981). These estimates are used by the Bureau of Land Management in the preparation of the lease sale's environmental impact statement. The calculation method and purpose of the conditional resource estimates differ from those of the risked resource estimates, and the two estimates are not comparable. Conditional resource estimates are resources that are expected to be discovered and developed, assuming that economically recoverable hydrocarbon deposits are present.

The Bureau of Land Management held three scoping meetings in North Atlantic States to identify and discuss pertinent issues that should be addressed in the draft environmental impact statement. The DEIS for tentatively selected tracts was published in September 1981 (BLM, New York OCS Office, 1981). It evaluates the possible effects of this sale on air and water quality, rare and endangered species, biological communities, fisheries, coastal vegetation, recreation and tourism, population growth, ports, onshore petroleum facilities, and the economy of the North Atlantic States. Seven alternatives to the proposed sale are examined: they are three tract deletion options to protect biological resources, two tract deletion options for deepwater drilling concerns, delaying the sale, and canceling the sale.

Public hearings on the DEIS were held in Boston on November 19, 1981, and written comments were accepted until November 23, 1981. Many of the comments were similar to those received for Lease Sale 42. The Bureau of Land Management has identified the following as key comments (Wildermann, 1982, written commun.):

- An additional alternative should be examined that would delete the tracts within the 197-foot (60-m) isobath.

- The results of ongoing studies funded by the Bureau of Land Management, including the BTF monitoring program, should be incorporated in the final environmental impact statement, and the consequences of delaying Lease Sale 52 until the studies are complete should be examined.

- Additional tracts should be deleted under alternative 5 (deletion of tracts to protect fisheries and biological resources) and alternative 8 (deletion of tracts in the vicinity of canyon heads).

- The DEIS does not provide enough information on the fishery resources and the productivity of the Georges Bank for an adequate assessment of potential impacts.

- Inadequate consideration was given in the DEIS to the potential biological impacts in canyon areas.

- The authority of the BTF should be extended to Lease Sale 52 and the other future lease sales in Georges Bank.

At present, these comments are being considered in the preparation of the final EIS, which is scheduled for publication in the latter part of April 1982. The Minerals Management Service is expected to complete a report on the potential geologic hazards and constraints for the proposed Lease Sale 52 blocks in June 1982.

On November 18, 1981, Governor Edward J. King of Massachusetts formally requested Secretary James Watt to postpone Lease Sale 52 until December 1982 so that additional studies about Georges Bank can be incorporated into the EIS. The Governor also requested that certain tracts be deleted from the proposed sale. In response, the Department of the Interior indicated that neither the sale nor the final EIS would be postponed, but that the deletion of tracts would be considered in the final EIS.

Other Proposed Lease Sales

Under the tentative proposed final leasing schedule, Lease Sale 82 will be held in February 1984 (Ham, 1982, oral commun.). The Bureau of Land Management expects that the call for information (the first step of the proposed pre-lease-sale steps, which is comparable to the call for nominations and comments) for Lease Sale 82 will be issued in June 1982. Lease Sale 96 is scheduled to be held in February 1986.

North Atlantic Boundary Dispute between the United States and Canada

The call area and some of the initially selected tracts for Lease Sale 42 extended into an area that is claimed by both the United States and Canada. Because the area is subject to boundary negotiations, a total of 55 tentatively selected tracts were deleted on two separate occasions. The disputed area may contain hydrocarbons and it is also valuable for its fisheries resources. As a result of the boundary dispute, the call area for Lease Sale 52 only extended up to the most southern boundary claim made by Canada (Rashkow, 1982, oral commun.). Figure 3 shows the boundaries claimed by both countries, the call areas for the two lease sales, the tentatively selected tracts for Lease Sale 42, and the tracts deleted because of the boundary dispute.

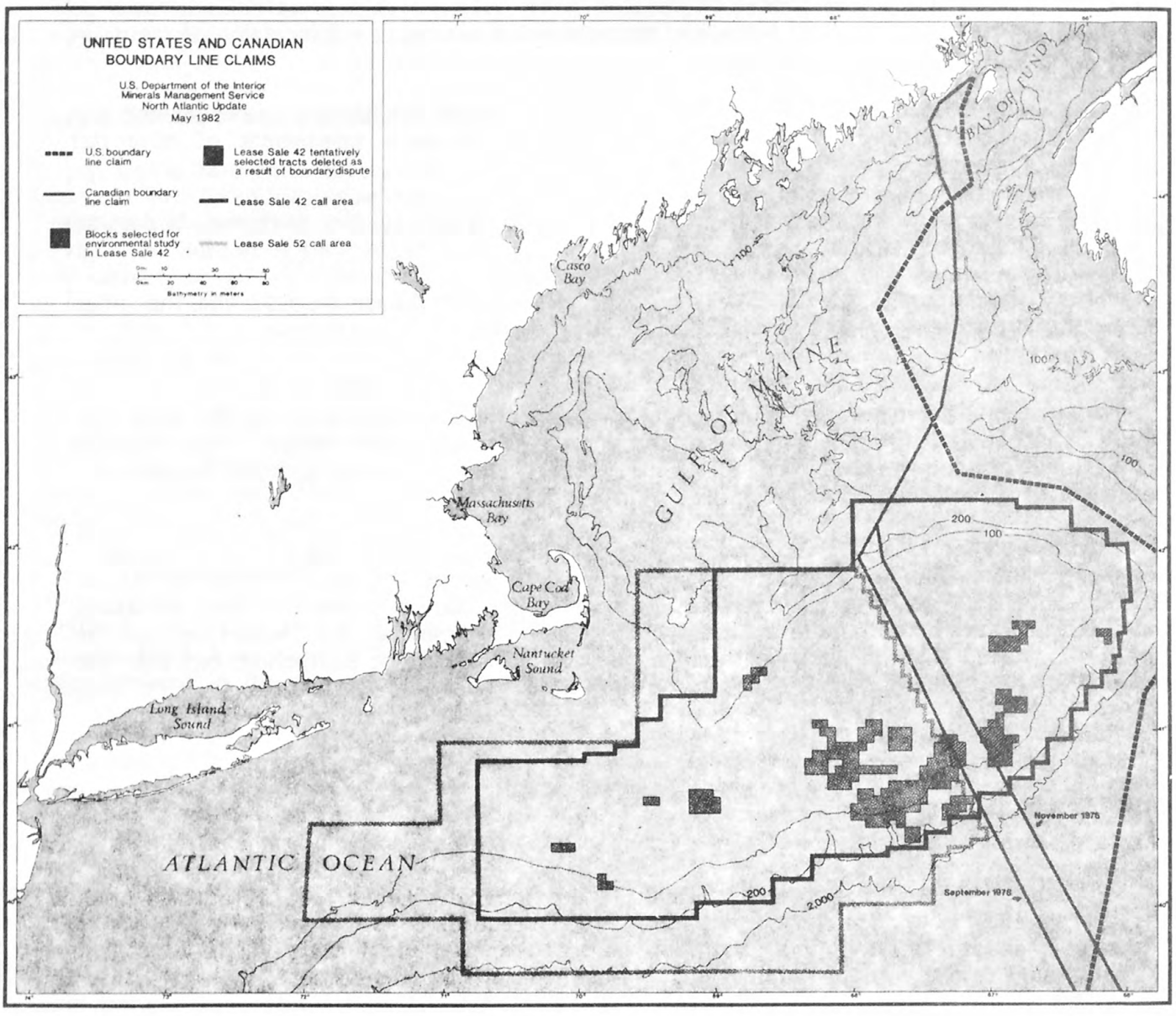

FIGURE 3—United States and Canadian boundary line claims and their effects on lease sales in the North Atlantic Region. (Information from BLM, 1980, and Kaelin, 1981; base redrafted from Dorrier, 1981, by Rogers, Golden & Halpern, 1982.)

Canada has proposed two boundary lines to establish the lateral limit of its 200-mile (321-km) fishery zone. The first boundary line, which was proposed in November 1976, established the boundary equidistant between the land masses of the two countries. In September 1978, a second boundary was proposed by Canada that also used the equidistant principle but dismissed the coasts of Cape Cod and Nantucket while retaining the coast of Nova Scotia. Both Canadian boundary lines dissect Georges Bank. In November 1976, the United States claimed that Georges Bank is a natural extension of its Continental Shelf and proposed a boundary line that follows the deepest contours through the Gulf of Maine and then follows a line equidistant from the 100-foot (30-m) fathom contours of Continental Shelves of Canada and United States (Kaelin, 1981).

On January 15, 1982, both countries agreed to submit the boundary dispute to a Chamber of the International Court of Justice and to abide by its decision. The judicial panel was constituted at the end of January 1982, and it consists of five members, including a judge from both Canada and the United States. The process is expected to take from 2 to 3 years; therefore, the establishment of the offshore boundary between the two countries should occur in 1984 or 1985. This boundary will be used to limit the areal extent of OCS leasing. In the interim, the most limiting boundary claim by each country will determine the extent of the other country's OCS oil and gas activities, unless an interim mutual agreement is reached. In the absence of an interim agreement, no oil and gas activity is expected to occur within the disputed area until a judicial decision is reached (Rashkow, 1982, oral commun.).

OIL AND GAS TRANSPORTATION STRATEGIES

Commercial quantities of offshore oil and gas must be transported to shore for processing, refining, and distribution. The Bureau of Land Management has the lead role in the transportation planning process for oil and gas discovered on the OCS. This planning process is coordinated through BLM's Intergovernmental Planning Program for OCS Oil and Gas Leasing, Transportation, and Related Facilities. Each of BLM's offshore leasing regions has an advisory committee called the Regional Technical Working Group (RTWG) that is composed of representatives from Federal and State offices, industry, and other special and private interests. Each RTWG meets approximately four times a year to offer advice to the Bureau of Land Management on technical aspects of leasing, transport of oil and gas to shore, and BLM's environmental studies program.

On April 13, 1982, the North and Mid-Atlantic RTWG's were combined into a single RTWG. Table 3 presents a list of the North/Mid-Atlantic RTWG members. Each State from Maine to North Carolina and each Federal agency will have one representative, although a final decision on the members representing three Federal agencies has not been made. The two members from the North and Mid-Atlantic RTWG's are listed for each of the three agencies. In addition, the membership appointment is a 2-year term for members who are not State or Federal representatives. These members are discretionary appointees chosen by the Secretary of the Interior. The terms of some of the discretionary appointees on the North/Mid-Atlantic RTWG have expired and the Department of the Interior is in the process of reviewing these RTWG appointments.

The North Atlantic RTWG met once since the publication of the initial summary report, on October 27 and 28, 1981, in New York City. The meeting was jointly attended by the North Atlantic and Mid-Atlantic RTWG's in anticipation of their unification. The

TABLE 3.—North/Mid-Atlantic Regional Technical Working Group Committee

Member	Affiliation
Mr. Frank Basile	Bureau of Land Management
Mr. Richard Keppler/ Dr. Peter Anderson	Environmental Protection Agency
Mr. Ralph Andrews	Fish and Wildlife Service
Mr. Elmer Danenberger	Minerals Management Service
Ms. Carolyn Griswold/ Dr. Robert Lippson	National Oceaic and Atmospheric Administration
Captain R. Barry Eldridge/ Captain David Linde	U.S. Coast Guard
Mr. Joseph Belanger	State of Connecticut
Dr. Robert Jordan	State of Delaware
Mr. Charles Colgan	State of Maine
Mr. Kenneth Schwarz	State of Maryland
Ms. Patricia Hughes	State of Massachusetts
Mr. Mark Chittom	State of New Hampshire
Dr. Norbert Psuty	State of New Jersey
Mr. John Harmon	State of New York
Mr. Eric A. Vernon	State of North Carolina
Dr. Arthur Socolow	State of Pennsylvania
Mr. Bruce Vild	State of Rhode Island
Mr. Lawrence Minock	State of Virginia
Mr. Carl Sullivan	American Fisheries Society
Mr. Derickson Bennet	American Littoral Society
Dr. Harland Johnson	American Petroleum Institute
Ms. Brend Boleyn	Association for the Preservation of Cape Cod
Mr. Jay Lanzillo	Chatham Seafood Cooperative
Mr. Kevin Donahue	Interstate Natural Gas Association of America
Ms. Germaine Gallagher	League of Women Voters of the United States
Mr. David Keifer	Mid-Atlantic Fisheries Management Council
Mr. Donald Zinn	National Wildlife Federation
Dr. Sarah Richards	New England Fishery Management Council
Mr. Stuart W. Edwards	Private citizen
Dr. Joan Goldstein	Private citizen
Ms. Priscilla Newbury	Private citizen
Mr. John D. Davis	Private consultant

For further information concerning the North Atlantic Regional Technical Working Group Committee, contact Richard Barnett, Bureau of Land Management, New York OCS Office, Jacob K. Javits Federal Building, Suite 32-120, New York, NY 10278 (telephone: (212) 264-1061).

meeting included, in part, an update on the BTF monitoring program and comments by individual representatives on upcoming Lease Sale 52. The RTWG's also recommended the establishment of subcommittees with specific functions to address different topics; for example, reviewing studies or investigating impacts on the fishing industry. The next meeting of the North/Mid-Atlantic RTWG is scheduled to occur in July 1982.

In August 1981, the New England River Basin Commission (NERBC) published **Procedures for Preparing Regional Transportation Management Plans,** which was funded by the Bureau of Land Management. The publication provides guidelines for preparing regional transportation plans for OCS oil and gas production, and it is intended to assist the Bureau of Land Management and RTWG's in their transportation planning functions. Although the publication provides general information, it uses the Georges Bank area as a case study. The North Atlantic RTWG provided assistance in the preparation of this document. The North Atlantic RTWG has also discussed regional transportation planning; however, to date, there has been no work on preparing a regional transportation plan for the North Atlantic Region.

NERBC was disbanded in October 1981; however, many of its OCS functions were transferred to the OCS Information Program of the New England Governors' Conference in Boston, Massachusetts. This program distributes current OCS information to State officials and sends a representative to various OCS-related meetings.

NATURE AND LOCATION OF NEARSHORE AND ONSHORE FACILITIES

Since the publication of the initial North Atlantic Summary Report, the level of activity at onshore support facilities has remained fairly constant. Davisville, Rhode Island, is the principal onshore support facility for both the North and Mid-Atlantic Regions. Each company drilling in the North Atlantic uses three supply boats out of Davisville. About 100 to 125 people at Davisville are employed in jobs that support the OCS exploration activities (Spinnard, 1982, oral commun.).

Petroleum Helicopters, Inc. (PHI) operates out of the Barnstable Airport in Hyannis, Massachusetts. Shell and Tenneco contract PHI to make crew changes on the rigs, and each crew change requires two to three flights. Exxon used PHI during the drilling of its two wells. In addition, the Minerals Management Service has contracted a helicopter from PHI that is on call at all times. Mobil uses Bristow Offshore Helicopter, Inc. for its crew changes. Bristow makes three or four flights per week, and it flies out of T.F. Green State Airport in Warwick, Rhode Island, which is about halfway between Providence and Davisville.

Each oil company drilling in the North Atlantic OCS is directly or indirectly responsible for the employment of approximately 100 people. These individuals work on the rig, the supply boats, or at the company's small onshore office. A variety of suppliers also provide goods for offshore exploration activities, although most suppliers are from outside of the North Atlantic area.

The States of Maine, Massachusetts, Rhode Island, and Connecticut review exploration plans for consistency with their federally approved coastal zone management (CZM) plans. Although New Hampshire reviews exploration plans, the review is not for consistency purposes because the State does not yet have a federally approved CZM plan. New Hampshire has submitted a DEIS/CZM plan, and public hearings were held on February 23, 1982, in Hampton, New Hampshire. Approval is expected by June 1982 (Cousins, 1982, oral commun.).

CONCLUSION

Developments pursuant to the provisions of the settlement agreement of Lease Sale 42 litigation have occurred. The Biological Task Force is functioning, and a monitoring program has been initiated. To date, three sets of samples have been taken in the leased area, but they have not been analyzed yet. NOAA has decided not to actively consider any part of Georges Bank for a marine sanctuary designation at this time; however, a formalized marine sanctuary selection process is being established. It is possible that part of Georges Bank may be considered in the future under this selection process. BAST standards have been applied to drilling operations, and the rig operators are required to perform specific tasks.

The boundary dispute between the United States and Canada has been brought before a Chamber of the International Court of Justice. No OCS oil and gas activity is expected to occur in the disputed area until a decision is reached, which will be in 2 to 3 years.

Three or four semisubmersible rigs should be drilling in the North Atlantic Region in the near future. The main support facility is at Davisville, Rhode Island. The level of onshore impacts and support activities, which is not extensive, is expected to remain fairly constant in the near future.

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Cousins, Kathryn, 1982, North Atlantic Regional Manager, Office of Coastal Zone Management, National Oceanic and Atmospheric Administration, Department of Commerce, oral communication.

Danenberger, Elmer, 1982, District Supervisor, Minerals Management Service, North Atlantic Division, oral communication.

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Rashkow, Bruce C., 1982, Director Canadian Maritime Boundary Adjudication, Canadian Maritime Boundary Adjudication, Legal Department, U.S. Department of State, oral communication.

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Stauble, Richard, 1982, Management, Environmental, and Regulatory Affairs Advisor, Mobil Oil Company, oral communication.

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APPENDIX - OCS-RELATED STUDIES

This appendix is grouped into three study sections: Federal studies, regional studies, and State studies. The agencies included under the Federal studies are the Bureau of Land Management, U.S. Geological Survey, Minerals Management Service, National Oceanic and Atmospheric Administration, and the Environmental Protection Agency. The New England River Basins Commission is the only regional organization, and the North Atlantic coastal States are listed under the State study section.

The studies are organized by the administering organization, and each entry includes a reference citation, information on how the publication can be obtained or where it can be reviewed, and a brief abstract.

Many North Atlantic OCS publications are available at the library maintained by the Woods Hole Oceanographic Institute at Woods Hole, Massachusetts.

FEDERAL STUDIES

U.S. Department of Interior

Bureau of Land Management

The Bureau of Land Management administers studies in the North Atlantic OCS as part of its environmental studies program. The environmental studies program was initiated in 1973 to provide information for making management decisions about resource development on the OCS. The Bureau of Land Management funds studies that are conducted by Federal and State agencies, educational institutions, and private companies to provide information on the environmental and socioeconomic impacts of OCS development and geological hazards and cultural resources of the OCS.

Included in the environmental studies program are studies recommended by the Biological Task Force and included in the Georges Bank Monitoring Program. Studies for the Georges Bank Monitoring Program were initiated in 1981, but results have not yet been published. These studies include an analysis of historic benthic infauna samples awarded in September 1981 to Taxon, Inc.; a benthic infauna monitoring study, awarded in January 1982 to Battelle, Inc.; a trace metal analysis study to be performed on bottom sediment samples and benthic epifaunal organisms, awarded to the U.S. Geological Survey; and a soon-to-be-awarded hydrocarbon analysis study on marine sediments and benthic epifaunal organisms.

Reports generated from the BLM OCS environmental studies program can be reviewed at the BLM New York OCS Office, Jacob K. Javits Federal Building, Suite 32-120, 26 Federal Plaza, New York, N.Y., or at the BLM Offshore Studies Office, 18th and C Streets, NW., Washington, D.C. Most of the reports can be purchased from the National Technical Information Service (NTIS), 5285 Port Royal Road, Springfield, VA 22161.

A number of studies were listed in the initial North Atlantic Summary Report (USGS Open-File Report 81-601). Additional studies as well as more recent reports of previously cited studies, are summarized as follows:

Aaron, John M. (ed.), 1980, Environmental geologic studies in the Georges Bank area, United States Northeastern Atlantic Outer Continental Shelf, 1975-77: prepared by the U.S. Geological Survey for the Bureau of Land Management, Woods Hole, Mass., USGS Open-File Report 80-240. Copies can be reviewed at USGS, Woods Hole, Mass., and can be purchased from the Open-File Services Section, USGS, Box 25425, Federal Center, Denver, CO 80225.

This report summarizes USGS research activities in the Georges Bank area carried out under a memorandum of understanding with the Bureau of Land Management from September 1975 to September 1977. The purpose of these investigations is to provide BLM's OCS environmental studies program with basic geologic and oceanographic data to support management decisions relating to possible OCS oil and gas development. A description of methods, techniques, and instrumentation used to collect the data is contained in the report, along with analytical results and syntheses and interpretations of the data. A microfiche appendix presents the data sets generated by these studies. Original seismic records are on file in the Data Management Section, USGS, Woods Hole, Mass. Microfilm copies of these records can be purchased from the National Geophysical and Solar-Terrestrial Data Center, NOAA, Boulder, CO 80302.

A summary of this research, available as Open-File Report 80-241, presents a brief summary of the field work, results, significant interpretations, and conclusions contained in the above report.

Bureau of Land Management, 1982, Draft environmental impact statement, proposed 1982 Outer Continental Shelf oil and gas lease sale offshore the north Atlantic States, OCS Sale no. 52: prepared by the BLM New York OCS Office, 323 p. and appendixes. Available from the BLM New York OCS Office.

This report is the draft environmental impact statement for the offering of 540 tracts lying in average water depths of 171 to 9,285 feet (52-2,830 m) off southeast Cape Cod and Nantucket Island, Mass. The seven alternatives considered are delay of sale, cancellation of sale (no action), and five deletion options. The five deletion options are intended to protect fisheries and other biological resources, to protect resources located in canyon heads, to respond to deepwater concerns, to address problems related to sediment slump, and to consider the Georges Bank as a marine sanctuary. Mitigating measures to reduce risks to the environment have been identified.

The final environmental impact statement for proposed Lease Sale 52 is scheduled to be issued by the end of April 1982.

Centaur Associates, Inc., 1981, An assessment of space and use conflicts on the U.S. Outer Continental Shelf between the oil and gas industry and commercial and recreational fishermen: prepared for BLM, Washington, D.C. Available from NTIS, 5285 Port Royal Road, Springfield, VA 22161. (Accession numbers as follows: Set--PB81215956, Vol. I--PB81215964, Vol. II--PB81215972, Vol. III--PB81215980, Vol. IV--PB81215998, Vol. V--PB81216004.)

This study assesses the space and use conflicts between the fishing and oil and gas industries on the Outer Continental Shelf. The objectives were to determine: (1) the probable loss in commercial and sport fishing revenues to be caused by withdrawal

of fishing grounds to be occupied by structures such as rigs, platforms, subsea completions, pipelines, and so on; (2) the probable increase in commercial and sport fishing costs caused by competition for inputs, including labor, boat repair services, fuel, and harbor space; (3) the degree to which the conflicts identified in (1) and (2) above can be mitigated; and (4) cost benefit analyses of possible mitigating measures. The geographic scope includes the following regions: Northern/Central California, Southern California, North Atlantic, Mid-Atlantic, South Atlantic, and Gulf of Mexico. The report is presented in five volumes. Volume I deals with fishing gear currently used, volume II with engineering aspects of the study, volume III with exploring the history of interactions between oil and gas development and fishing, volume IV with the catch loss model, and volume V with findings of 30 site visits.

EG&G (Edgarton, Germeshausen and Grier) Environmental Consultants, Interpretation of physical oceanographic conditions and their application to pollutant transfer in the North Atlantic U.S. Outer Continental Shelf: Waltham, Mass. Final report to the Bureau of Land Management due June 1982.

The objectives of this study are as follow: (1) to develop and refine concepts of the transport, dilution, and dispersion processes acting on the New England OCS, (2) to qualify and quantify the various transport processes such that the fate of OCS oil and gas related discharges released on Georges Bank can be described, (3) to develop a conceptual model of the mean circulation on Georges Bank with a quantitative description of the variability of the circulation and the exchange rates that dominate the movement of pollutants and, (4) to identify source regions for nutrients, geographic areas of high productivity, and residence times on Georges Bank. (See also Magnell and others, 1981, report on preliminary results.)

LaBelle, Robert P., 1981, An oil spill risk analysis for the North Atlantic (Proposed Sale 52) Outer Continental Shelf lease area: 61 p. and appendixes, prepared by the U.S. Geological Survey for the Bureau of Land Management, USGS Open-File Report 81-865. Available from Open-File Services Section, USGS, Box 25425, Federal Center, Denver, CO 80225.

An oil spill risk analysis was conducted to determine the relative environmental hazards of developing oil in different regions of the area offered by proposed Lease Sale 52. The probability of spill occurrences, likely movement of oil slicks, and locations of resources vulnerable to spilled oil were analyzed. The times between spill occurrence and contact with various resources were also estimated. The combined results yielded estimates of the overall risks associated with development of the proposed lease area.

Magnell, Bruce A., Cura, Jerome J., Flagg, Charles N., and Frye, Daniel E., 1981, Interpretation of the physical oceanography of Georges Bank: preliminary results: prepared for the Bureau of Land Management by EG&G, Environmental Consultants, Waltham, Mass. Available for review at the BLM New York OCS Office.

This report presents the preliminary, partial results of analysis of the physical oceanographic conditions of Georges Bank as part of BLM's New England Outer Continental Shelf Physical Oceanography Program. The program seeks to understand the physical mechanisms that govern water motion on Georges Bank in order to predict the fate and effects of materials discharged into the water. This report includes information on residence time of near-surface waters; structure of the cold band and

its interaction with surrounding waters; dispersive processes; and phytoplankton distribution, production, and biomass.

Moody, John A., and Butman, Bradford, 1980, Semidiurnal bottom pressure and tidal currents on Georges Bank and in the Mid-Atlantic Bight: prepared by USGS for the Bureau of Land Management, Woods Hole, Mass., USGS Open-File Report 80-1137. Copies can be reviewed at USGS, Woods Hole, Mass., and can be purchased from the Open-File Services Section, USGS, Box 25425, Federal Center, Denver, CO 80225.

This report summarizes previous studies and presents the results of recent observations of the semidiurnal tidal current, bottom pressure, and coastal sea level from Nova Scotia, Canada, to Cape May, New Jersey, made from 1975 to 1979. One of the major features of the Georges Bank region is the presence of strong rotary semidiurnal tidal currents, which are stronger than currents along the Mid-Atlantic Bight. These strong tides may cause several of the physical, geological, and biological features unique to Georges Bank, such as strong tidal mixing, sand waves and sand ridges, and high biological productivity.

Naval Ocean Systems Center, U.S. Navy, 1982, The effects of sound on marine mammals: prepared for BLM, San Diego, Calif. Final report to BLM was due March 1982.

The Naval Ocean Systems Center conducted field studies in areas off the Alaska, California, Gulf of Mexico, and Atlantic coasts. The objectives were as follow: (1) to determine and characterize the various sounds emitted from OCS oil and gas operations (exploration, development, and production) and from related vessel traffic, (2) to characterize the sounds emitted and perceived by various species of cetaceans, (3) to evaluate the sound spectra created by human activities that could disrupt the behavior or cetaceans, (4) to determine the effects of a physical structure, such as a platform, on cetacean behavior, and (5) to propose a range of measures for eliminating or alleviating the impact(s) of sounds and physical structures from offshore oil and gas operations on cetaceans. Interim reports are available for review in the BLM New York OCS Office.

Rendigs, Richard R., Bothner, Michael H., and Poppe, Lawrence J., 1981, Sediment parameters for a fine-grained sediment deposit on the southeastern New England Continental Shelf: prepared by USGS for the Bureau of Land Management, Woods Hole, Mass., USGS Open-File Report 81-1334. Copies can be reviewed at USGS, Woods Hole, Mass., and can be purchased from the Open-File Services Section, USGS, Box 25425, Federal Center, Denver, CO 80225.

This study analyzes cores from an interpreted as a contemporary deposit area of fine-grained sediments south of Martha's Vineyard, Mass. Textural analysis indicates sandy to clayey silts up to 20 feet (6.1 m) thick overlying a well-sorted relict sand. The mineralogy of the various-sized fractions was determined as well as organic carbon concentrations.

Taxon, Inc., 1982, Analysis of historical benthic infaunal samples from Georges Bank: prepared for the Bureau of Land Management, Salem, Mass. Available for review in BLM New York OCS Office; submitted to NTIS.

This study is part of the Georges Bank Monitoring Program. The objective of this program is to monitor for abnormal changes in the marine benthic environment in and around OCS lease areas and to determine the source of these changes.

Twichell, David C., 1981, Bedform distribution and inferred sand transport on Georges Bank: prepared by USGS for the Bureau of Land Management, Woods Hole, Mass., Open-File Report 81-764. Copies can be reviewed at USGS, Woods Hole, Mass., and can be purchased from the Open-File Services Section, USGS, Box 25425, Federal Center, Denver, CO 80225.

This report discusses four bedform provinces identified on Georges Bank through the use of sidescan sonar and echo-sounding. The four bedform provinces are large sand waves, small sand waves, megaripples, and featureless sea floor. It also infers bedload transport paths on the bank from bedform asymmetry and surface-sediment texture.

Twichell, David C., 1981, Single-channel seismic reflection profiles and sidescan-sonar records collected on Georges Bank: prepared by the U.S. Geological Survey for the Bureau of Land Management, Woods Hole, Mass., USGS Open-File Report 81-438. Copies can be reviewed at USGS, Woods Hole, Mass., and can be purchased from the Open-File Services Section, USGS, Box 25424, Federal Center, Denver, CO 80225.

This report presents subbottom seismic-reflection, echo-sounding, and sidescan-sonar records collected by USGS cruises from March 6-15, 1979, and August 6-13, 1979. The data collected during these two cruises contributed to a study of bedform types and distribution and of sediment transport paths on Georges Bank. The original records can be reviewed at USGS, Woods Hole, Mass. Microfilm copies can be purchased from the National Geophysical and Solar-Terrestrial Data Center, NOAA/EDIS/NGSDC, Code D621, 325 Broadway, Boulder, CO 80303.

Twichell, David, C., 1981, Single-channel seismic reflection profiles and sidescan-sonar records collected by the R/V NEECHO, cruise NE 70-06: prepared by the U.S. Geological Survey for the Bureau of Land Management, Woods Hole, Mass., USGS Open-File Report 81-375. Copies can be reviewed at USGS, Woods Hole, Mass., and can be purchased from the Open-File Services Section, USGS, Box 25425, Federal Center, Denver, CO 80225.

This report presents the results of a survey that collected seismic-reflection profiles and sidescan-sonar records along 95 miles (153 km) of trackline in the nearshore zone east of Cape Cod, Massachusetts, between September 27 and October 3, 1979. The purpose of the study was to map the types and extent of nearshore bedforms and to define the late Pleistocene and Holocene history of the area. The original records can be reviewed at USGS, Woods Hole, Mass. Microfilm copies can be purchased from the National Geophysical and Solar-Terrestrial Data Center, NOAA/EDIS/NGSDC, Code D621, 325 Broadway, Boulder, CO 80303.

University of Guelph, 1982, Study of the effects of oil on marine mammals: prepared for the Bureau of Land Management, Ontario, Canada. Available for review at the BLM New York OCS Office; submitted to NTIS.

The objectives of this study were to determine the ability of cetaceans to detect and avoid an oil slick; to determine the effects of oil on the integument, and the

ocular, respiratory, reproductive, digestive, and excretory systems of cetaceans; to evaluate the long-term impacts of oil on cetacean survival and behavior, such as feeding, breeding, calving, and migration; to analyze the potential for bioaccumulation of petroleum hydrocarbons and metabolites in cetaceans; and to identify a range of measures that would eliminate or alleviate the effects of oil pollution on marine mammals. Interim reports are available for review at the BLM New York OCS Office.

University of Rhode Island, Cetacean and Turtle Assessment Program, 1981, A characterization of marine mammals and turtles in the Mid- and North Atlantic areas of the U.S. Outer Continental Shelf: annual report for 1979: prepared for the Bureau of Land Management, Kingston, R.I. Available for review at the BLM New York OCS Office.

This report is a result of the full-scale field data collection effort begun in January 1979 by the Cetacean and Turtle Assessment Program. The objectives of the program are to determine which species of marine mammals and marine turtles inhabit and/or migrate through the Mid- and North Atlantic areas of the OCS; to identify, delineate, and describe areas of importance for these species for feeding, breeding, and calving; to determine the temporal and spatial distribution of marine mammals and turtles in the study area; and to estimate the size and extent of their populations. Emphasis is given to species classified as threatened or endangered by the Department of the Interior and the Department of Commerce.

University of Rhode Island, Department of Ocean Engineering and Graduate School of Oceanography and Applied Science Associates, Inc., 1982, Assessing the impact of oil spills on a commercial fishery (draft): prepared for the Bureau of Land Management. Available for review at the BLM New York OCS Office.

This is the second interim report of a study of the impacts of oil spills on commercial fishing in the North Atlantic OCS area. The first interim report (July 1981) details a mathematical modeling system incorporating a fishery model, an oil spill fates model, and an ocean transport model to quantify the potential impacts. This second interim report was prepared to document the continuing application studies, sensitivity analyses, and improvements to the oil spill fishery interaction model system for assessing the impact of spills on commercially important fisheries in the Georges Bank/Gulf of Maine study area.

University of Rhode Island, Marine mammal and marine turtle characterization in the north and mid-Atlantic areas--third year: Narragansett, R.I. Final report to the Bureau of Land Management due September 1982.

This study is a followup to the first and second year efforts with the same title. The objectives are as follows: (1) to determine which species of marine mammals and marine turtles inhabit and/or migrate through the Mid- and North Atlantic regions, (2) to identify, delineate, and describe areas of importance (feeding, breeding, calving, etc.) to marine mammals and to marine turtles in the regions, (3) to determine the temporal and spatial distribution of marine mammals and marine turtles in these regions, (4) to determine behavioral characteristics of marine mammals and marine turtles in these regions, (5) to estimate the size of and extent of marine mammal and marine turtle populations in these regions, and (6) to emphasize all items 1 through 5 above for those species classified as threatened or endangered by the Department of

the Interior and Department of Commerce. (See also University of Rhode Island, Cetacean and Turtle Assessment Program, 1981).

Woods Hole Oceanographic Institute, Study of crude oil effects to development stages of the American lobster: Woods Hole, Mass. Final report to the Bureau of Land Management due May 1982.

The study is a continuation of the research begun by the Westinghouse Ocean Research Laboratory to determine the effects of crude oil on various developmental stages of the American lobster (Homarus americanus). The specific research tasks are: (1) to evaluate the growth and development of lobsters following exposure of the larval stages to crude oil, (2) to determine changes in egg and embryonic development of lobsters following exposure to crude oil, and (3) to determine the sublethal effects of oil exposure on larval and juvenile lobsters, including effects on feeding and growth energetics. Quarterly reports are available for review in the New York OCS Office.

U.S. Geological Survey

The U.S. Geological Survey conducts a number of studies in the North Atlantic. These studies can be divided into two categories: studies supporting resource estimates, and geohazards studies related to resource exploration and development.

Results of USGS studies may appear in the open literature, USGS Open-File Reports, and reports to the funding agency. A list of publications of the U.S. Geological Survey prepared for BLM's environmental studies program for the North Atlantic is available from the USGS Office of Marine Geology, Woods Hole, MA 02543. USGS Open-File Reports are available from Open-File Services Section, Western Distribution Branch, USGS, Box 25425, Federal Mail Center, Denver CO 80225. The BLM New York OCS Office has review copies of reports from studies funded by the Bureau of Land Management; these reports can be purchased from NTIS.

Booth, James S., Farrow, Richard A., and Rice, Thomas L., 1981, Geotechnical properties and slope stability analysis of surficial sediments on the Georges Bank Continental Slope: Woods Hole, Mass., USGS Open-File Report 81-566. Copies can be reviewed at USGS, Woods Hole, Mass. and can be purchased from the Open-File Services Section, USGS, Box 25425, Federal Center, Denver, CO 80225.

This study collected piston core samples on Georges Bank in order to verify the occurrence of past mass movement, to provide quantitative information on slope stability, and to establish the general geotechnical properties of the sediments. Core sample locations included the open slope, possible mass movement scars, and possible mass movement desposits. Although the scope of the investigation was restricted by the shallowness of subbottom penetration of piston coring, data from the surficial sediments are an important part of an overall evaluation of slope stability.

Knebel, Harley J., 1981, Seismic-reflection and sidescan-sonar data collected off eastern Cape Cod, Massachusetts, during April 1979: Woods Hole, Mass., USGS Open-File Report 81-184. Copies can be reviewed at the U.S. Geological Survey, Woods Hole, Mass., and can be purchased from the Open-File Services Section, USGS, Box 25425, Federal Center, Denver, CO 80225.

This report presents the results of an April 1979 USGS survey that collected 98 line kilometers of seismic reflection profiles and sidescan-sonar records over the inner shelf east of Cape Cod, Massachusetts. The survey was carried out in order to study the development of barrier islands, to document the frequency and rate of migration of inlets that breach barrier islands, and to define the characteristics of shoreface ridges and barrier islands. The original records may be examined at the U.S. Geological Survey, Woods Hole, Mass. Microfilm copies of the data are available for purchase from the National Geophysical and Solar-Terrestrial Data Center, NOAA/EDIS/NGSDC, Code D621, 325 Broadway, Boulder, CO 80303.

Lewis, R.S. and Sylvester, R.E., 1980, Shallow sedimentary framework of Georges Bank: Woods Hole, Mass., USGS Open-File Report 76-874. Copies can be reviewed at the U.S. Geological Survey, Woods Hole, Mass., and can be purchased from the Open-File Services Section, USGS, Box 25425, Federal Center, Denver, CO 80225.

This report presents the results of an October 1975 USGS survey of Georges Bank in which 1,802 miles (2,900 km) of seismic reflection data were collected. Several sedimentary features have been observed in the data. Because of the complexity of the bank sediments and the potential geologic hazards with respect to drilling or placement of bottom-supported structures, this report recommends that a detailed seismic reflection program in conjunction with geotechnical analysis of core samples be carried out.

Slater, Richard A., 1981, Submersible observations of the sea floor near the proposed Georges Bank lease sites along the North Atlantic Outer Continental Shelf and upper slope: prepared in cooperation with the Bureau of Land Management, Woods Hole, Mass., USGS Open-File Report 81-742. Copies can be reviewed at the U.S. Geological Survey, Woods Hole, Mass., and can be purchased from the Open-File Services Section, USGS, Box 25425, Federal Center, Denver, CO 80225.

This study documents geological features and processes near future lease sites on Georges Bank and records in detail by verbal description and photography the sea floor condition and biota in areas that could be affected by the release and movement of drill cuttings, drilling muds, and oil from drilling sites. The study carried out in the summer of 1978 employed the deep-diving submersible DIAPHUS in nine dives, during which 540 photographs and 1½ hours of videotape were taken. Three grab samples were taken to help verify submersible observation of the seafloor sediments and to identify the sediment composition. In addition, 32 seismic-reflection lines were collected and interpreted. All seismic records, photographs, and videotape gathered in this study are on file at the U.S. Geological Survey, Woods Hole, Mass.

Minerals Management Service

The Minerals Management Service conducts studies that are used to determine tract-specific resource estimates. The Office of Planning and Assessment within the Minerals Management Service assesses research and development and awards contracts for studies considered to offer improved safety and pollution prevention for OCS oil and gas activities.

Carpenter, George, Cardinel, A., Francois, D., Good, K., and Lewis R., Potential geologic hazards and constraints for blocks in proposed North Atlantic OCS oil and gas Lease Sale 52: prepared for the Minerals Management Service. Final report due June 1982.

Analysis of high-resolution geophysical data collected over 540 blocks tentatively selected for leasing in OCS oil and gas Lease Sale 52 (Georges Bank) revealed a number of potential geologic hazards to oil and gas exploration and development activities, including evidence of mass movements and shallow gas deposits on the Continental Slope. No potential hazards were observed on the Continental Shelf or Rise. Other geology-related problems, termed constraints because they pose a relatively low degree of risk and can be routinely dealt with using existing technology, have been observed on the Continental Shelf. Constraints identified in the sale area are erosion, scour, sand waves, filled channels and deep faults.

U.S. Department of Commerce

National Oceanic and Atmospheric Administration

Several study programs in the North Atlantic are administered by the National Oceanic and Atmospheric Administration (NOAA). Although these programs are not expressly directed at OCS activities, some of the studies deal with hydrocarbon effects or provide baseline information. In 1979, three major NOAA elements combined their marine research and monitoring activities into a single, unified monitoring program called the Northeast Monitoring Program (NEMP). The three elements are the Ocean Pulse program of the National Marine Fisheries Service; programs of the Office of Marine Pollution Assessment; and programs of the Oceanic and Atmospheric Services. Numerous cruises and monitoring studies were initiated in 1980, resulting in a series of reports by over 50 principal investigators. The results of the 1980 studies are summarized in the **Annual NEMP Report on the Health of the Northeast Coastal Waters of the United States, 1980** (summarized below). NEMP includes the Manned Undersea Research and Technology program, which monitors selected animal communities on ocean-floor sites for species diversity, abundance, growth, pollutant accumulations, and physiological parameters that may reflect pollutant-induced stress. Another program under NEMP, the Gulf and Atlantic Survey, conducted fish and shellfish sampling in 1980 in order to establish baseline data for monitoring pollutant loadings in fish. If funding permits, this sampling will be repeated. NEMP reports are listed in the **Annual NEMP Report.** These reports are available from the NEMP Manager, Sandy Hook Laboratory, Highlands, NJ 07732, or they may be reviewed at that location.

Another NOAA program, the NMFS's Marine Resources Monitoring Assessment and Prediction (MARMAP) program, provides forecasts of the variable population levels of fishery resources of the Continental Shelf from the Gulf of Maine to Cape Hatteras, North Carolina. MARMAP prepares summaries of changes in abundance of fish stocks and changes in conditions of the shelf ecosystem. These summaries are distributed through the Northeast Fisheries Center, Woods Hole, Mass. The MARMAP program in the Northeast involves considerable cooperation with other government agencies, universities, private organizations, and scientists from other countries. Survey data are augmented with catch data obtained from major fishing ports. A description of the MARMAP program is contained in **MARMAP Circular 81-01, NOAA's MARMAP Program in the Northeast** (summarized below).

Marshall, Harold G., and Cohn, Myra S., 1981, Phytoplankton community structure in northeastern coastal waters of the United States, I, October 1978: prepared for the Northeast Fisheries Center, National Marine Fisheries Service, Woods Hole, Mass., NOAA Technical Memorandum NMFS-F/NEC-8, 57 p. Available from NTIS, 5285 Port Royal Road, Springfield, VA 22161.

The phytoplankton populations observed in eastern coastal waters between the Delaware Bay and Nova Scotia during an October 1978 cruise are described and discussed in this report. A total of 368 phytoplankton species were observed, with their concentrations noted for nearshore and farshore stations. A major population maximum was recorded outside lower New York Bay dominated by the diatom Skeletonema costatum. The nearshore populations consisted mainly of diatoms, with ultraplanktonic components common. Composition changes and reduced concentrations occurred seaward along the transects. Guidardia flaccida and the dinoflagellate Prorocentrum micans were common throughout the area.

Marshall, Harold G., and Cohn, Myra S., 1981, Phytoplankton community structure in northeastern coastal waters of the United States, II, November 1978: prepared for the Northeast Fisheries Center, National Marine Fisheries Service, Woods Hole, Mass., NOAA Technical Memorandum NMFS-F/NEC-9, 34 p. Available from NTIS.

The phytoplankton populations observed in coastal waters between Narragansett Bay and the Gulf of Maine during a November 1978 cruise are described and discussed in this report. A total of 248 phytoplankton species were observed. Diatoms (43 percent) and dinophyceans (40 percent) composed of the majority of the total species. Diatoms and nannoplankton were more dominant at nearshore stations, while Leptocylindrus danicus and Nitzschia pungens were found in high concentrations over Georges Bank.

National Oceanic and Atmospheric Administration, 1981, NOAA's MARMAP program in the Northeast: prepared by the National Marine Fisheries Service, MARMAP Circular 81-01, 6 p. and maps. Available from the NMFS, RR7-South Ferry Road, Narragansett, RI 02882.

This circular presents a brief but comprehensive summary of the MARMAP program in the Northeast. Topics covered include fish stock forecasts, the scope of the program, variability measurements, and targeted studies of fish and their environment. Data management and technology applications are also discussed, as well as the ways that the program interacts with other agencies and studies. Three maps show the study area and sampling locations.

National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Northeast Fisheries Center, 1981, Annual NEMP report on the health of the northeast coastal waters of the United States, 1980: Woods Hole, Mass., NOAA Technical Memorandum NMFS-F/NEC-10, 79 p. and appendixes. Available from NTIS, 5285 Port Royal Road, Springfield, VA 22161.

This report synthesizes the results of numerous cruises and monitoring studies conducted in 1980 for the Northeast Monitoring Program (NEMP). The report attempts to indicate the general status of the ecological health of the northeastern Continental Shelf of the United States and adjunct estuaries. It includes statements that reference the considerable recommendations that have evolved from the monitoring activities. The NEMP annual report provides a synthesis and assessment based on the various individual reports produced by the program as well as existing literature and serves as a referral to the individual reports and the data that have resulted from these studies.

National Oceanic and Atmospheric Administration, Office of Coastal Zone Management, Sanctuary Programs Office, 1982, National Marine Sanctuary Program, program development plan: Washington, DC, 51 p. and appendixes. Available from NOAA, Sanctuary Program Office, Whitehaven Street, NW., Washington, DC 20235.

The program development plan outlines the revised marine sanctuary site selection process. This revised process calls for the OCS to be divided into eight regions, each with a Regional Resource Evaluation Team. Each team will identify and evaluate three to five priority sites in its region. Following a public review and comment period and additional analysis, a final list will be submitted to the National Oceanic and Atmospheric Administration. The National Oceanic and Atmospheric Administration will select sites from the lists for all eight regions for placement on a site evaluation list.

Price, Richard L., 1981, Georges Bank: an annotated bibliography of atlases, inventories and map series: prepared by Woods Hole Oceanographic Institute for the National Oceanic and Atmospheric Administration, Woods Hole, Mass., WHOI Technical Report 81-46, 75 p. Copies can be reviewed at the Woods Hole Oceanographic Institute, Woods Hole, Mass., and can be purchased from NTIS, 5285 Port Royal Road, Springfield, VA 22161.

This bibliography reviews inventory studies of the Georges Bank region and presents information on the scope of the work, topics treated, and the geographic area of concern. Because the primary purpose was to evaluate the nature and type of maps used in the works reviewed, the entries include the number of maps, their formats and scales, cartographic quality, and base map content.

Ray, G.C., McCormick-Ray, M.G., Dobbin, J.A., Ehler, C.N., and others, 1980, Eastern United States coastal and ocean zone data atlas: prepared for the Council on Environmental Quality and the Office of Coastal Zone Management, Washington, D.C., 125 maps. For information on the availability of the atlas contact the Director, Office of Ocean Resources Coordination and Assessment, Office of Coastal Zone Management, NOAA, Washington, DC 20235.

This atlas is the first product of the East Coast Strategic Assessment Project jointly sponsored by the Office of Coastal Zone Management and the Council on Environmental Quality. The purpose of the project is to develop a comprehensive data base that could be used to identify resource use conflicts and compatibilities in the coastal and ocean zones of the eastern United States, such as areas least suitable for major energy development and areas that should be further analyzed for possible special protection status. The atlas is organized by five categories of data: physical environments, living environments, species, economic activities, and jurisdictions. Over 125 maps at a scale of 1:4,000,000 provide an overview of specific features for the entire coastal area and can be combined to identify temporal and spatial and relationships. The project team is using the atlas to infer the risk to marine living resources of the East Coast from land-based sources of pollution, and to identify specific areas that may be of special biological importance to commercial endangered or ecologically important species. A review and updating of the atlas are planned for 1983. Current plans are to prepare similar atlases and carry out similar analyses for the Gulf of Mexico and the Beaufort, Chukchi, and Bering Seas off Alaska.

Environmental Protection Agency

The Environmental Protection Agency (EPA) is responsible for issuing permits for discharge of drilling muds under the National Pollutant Discharge Elimination System (NPDES). In order to provide a data base for determining permit restrictions, the Environmental Protection Agency conducts research on drilling fluids under the Drilling Fluid Hazard Assessment Program. Most of the studies carried out by the Environmental Protection Agency under this program are related to effects of drilling muds, especially on commercially important species. Exposure and effects studies are being carried out in Georges Bank. EPA research also includes studies of the movement and behavior of drilling muds in the marine environment (transport, transportation, and fates studies), and studies to establish the characteristics of drilling muds. Funding for most of the EPA studies has been terminated; however, a final report will be produced at the end of this year.

Information on EPA permits and backup documents can be obtained from EPA, Region I, JFK Federal Building, Room 2203, Boston, MA 02203. Toxicity and chemical studies can be reviewed at the EPA Environmental Research Lab, South Ferry Road, Narragansett, R.I., while studies on general effects of drilling muds can be reviewed at the EPA Environmental Research Lab, Sabine Island, Gulf Breeze, Fla.

Environmental Protection Agency, Office of Research and Development, 1981, Summary of the Drilling Fluid Hazard Assessment Program of the U.S. Environmental Protection Agency: prepared with the assistance of the MITRE Corporation, McLean, Va., 51 p. and appendixes. Inquiries on availability should be directed to Office of Research and Development, EPA, Washington, DC 20460.

The purpose of this report is to provide an overview of the Drilling Fluids Hazard Assessment Program being carried out by the Office of Research and Development of the U.S. Environmental Protection Agency. The rest of the program summary is organized into four sections. Section 1.0 is an introduction. EPA responsibilities as provided in the Clean Water Act and the Outer Continental Shelf Land Act Amendments are contained in section 2.0. A discussion of program goals and objectives, the research approach, and the research program is presented in section 3.0. A brief overview of research findings at the present time is contained in section 4.0. The direction of research in the final year of the program is outlined in section 5.0.

REGIONAL STUDIES

New England River Basins Commission

The New England River Basins Commission (NERBC) has served as the principal coordinator of interagency and intergovernmental water and land resource planning and management in the New England/New York region. It was created under the Water Resource Planning Act of 1965; however, its funding was terminated on September 30, 1981. Among other activities, the Commission has conducted studies related to OCS oil and gas activities through the Offshore Oil and Gas Information and Planning Program, a cooperative program with the U.S. Geological Survey. Another cooperative program was the NERBC/BLM transportation study. An offshore pipeline study was conducted under an interagency agreement with the Environmental Protection Agency. Some of these studies were summarized in the initial North Atlantic Summary Report. Summaries of additional

reports are included below. Questions about the NERBC, its work, and its publications should be referred to the New England Governor's Conference, 156 State Street, 4th Floor, Boston, MA 02109. NERBC publications are available for review at the Technical Library, U.S. Army Corps of Engineers, New England Division, 424 Trapelo Road, Waltham, Mass. Many of the publications are available through the National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161.

New England River Basins Commission, 1981, A deepwater oil and gas technology assessment: prepared under agreement with the U.S. Geological Survey, Resource Planning and Analysis Program, Boston, Mass., 240 p. Available from NTIS, 5285 Port Royal Road, Springfield, VA 22161 (PB 81-242950).

This report assesses the technology currently available for deepwater oil gas development. It also suggests several areas for further research regarding the onshore impacts of such development.

New England River Basins Commission, 1976, Onshore facilities related to offshore oil and gas development: factbook: prepared under agreement with the U.S. Geological Survey, Resource and Land Investigations Program, Boston, Mass., 758 p. Available from NTIS, 5285 Port Royal Road, Springfield, VA 22161 (PB 296837/AS).

This report is an encyclopedic reference work on the principal onshore facilities related to offshore oil and gas development. Facilities covered include the following:

- service bases,
- repair and maintenance yards,
- transportation facilities (pipelines and marine terminals),
- partial processing plants,
- refineries,
- petrochemical plants,
- platform fabrication yards,
- pipe coating yards,
- ancillary industries, and
- district offices.

Each facility chapter has three sections: (1) description of facility, (2) timing, trends, and options in facility siting, and (3) characteristics, requirements, and impacts.

New England River Basins Commission, 1978, Onshore facilities related to offshore oil and gas development: methodologies for OCS-related facilities planning: prepared under agreement with the U.S. Geological Survey, Resource and Land Investigations Program, Boston, Mass., 151 p. Available from NTIS, 5285 Port Royal Road, Springfield, VA 22161 (PB 297852/AS).

This report presents a suggested systematic approach to (1) estimating levels of offshore exploration and development activity, (2) estimating the number and kinds of onshore support facilities required, and (3) identifying and assessing the impacts of alternative sites for facilities.

New England River Basins Commission, 1981, Procedures for preparing regional transportation management plans: prepared for the Bureau of Land Management, Boston, Mass.,

170 p. Available from NTIS, 5285 Port Royal Road, Springfield, VA 22161 (PB 82-106162).

This report presents a set of procedures designed to provide the Regional Technical Working Groups with a working framework for preparing regional transportation management plans. Part I of the report is divided into three sections. The first section presents siting criteria and mapping procedures to point out areas where more detailed analysis will be required in the development of the final transportation management plan. The second section describes procedures to be used in recognizing information gaps and for recommending more specific studies to fill these gaps. The last section describes the development and application of final siting criteria to the selection of final transportation corridors. Part II of the report is an application of the methodology to the Georges Bank region of the North Atlantic.

New England River Basins Commission, 1980, State participation in OCS development and production decisions, staff draft: prepared under agreement with the U.S. Geological Survey, Resource Planning and Analysis Program, Boston, Mass., 69 p. Available from NTIS, 5285 Port Royal Road, Springfield, VA 22161 (PB 81-239527).

This draft report is the second in a series of four technical reports dealing with State participation in OCS exploration, development and production, transportation, and onshore facilities decisionmaking processes. The report describes the opportunities for State participation in the development and production phase and outlines the way three States coordinate their participation.

New England River Basins Commission, 1981, State participation in Outer Continental Shelf transportation decisions: prepared under agreement with the U.S. Geological Survey, Resource Planning and Analysis Program, Boston, Mass., 185 p. Available from NTIS, 5285 Port Royal Road, Springfield, VA 22161 (PB 82-242992).

This report is the third in a series of four technical reports dealing with State participation in the OCS exploration, development and production, transportation, and onshore facilities decisionmaking processes. The report outlines the opportunities for State participation in the transportation phase and describes the way that three States coordinate their responses to federally authorized transportation activities.

New England River Basins Commission, 1979, Strategies for State participation in OCS exploration decisions: conference proceedings, March 22, 1979: prepared under agreement with the U.S. Geological Survey, Resource and Land Investigations Program, Boston, Mass., 119 p. Available from NTIS, 5285 Port Royal Road, Springfield, VA 22161.

This report consists of conference presentations outlining the procedures for Outer Continental Shelf oil and gas exploration decisionmaking, identifying opportunities for State involvement, and discussing the evolution of the New England region's approach to OCS exploration decisions. The purpose was to develop strategies for States to participate effectively in decisions that must be made, first during exploration and later in more complicated series of decisions attendant to the development and transportation of offshore hydrocarbons.

STATE STUDIES

Connecticut

Connecticut Department of Agriculture, Aquaculture Division, Baseline Shellfish data: ongoing project funded under the Coastal Energy Impact Program, National Oceanic and Atmospheric Administration, Milford, Conn. Funded through April 1983.

This project is a baseline study that is collecting shellfish data for use in assessing potential environmental impacts associated with energy activity in Connecticut's coastal zone.

Connecticut Department of Environmental Protection, Oil spill contingency guide: ongoing project funded under the Coastal Energy Impact Program, National Oceanic and Atmospheric Administration, Hartford, Conn. Funded through September 1983.

This project is being undertaken to develop an oil spill contingency guide for critical environmental areas in Long Island Sound.

Connecticut Department of Environmental Protection, Oil spill protection plan: ongoing project funded under the Coastal Energy Impact Program, National Oceanic and Atmospheric Administration, Hartford, Conn. Funded through September 1982.

This project is being carried out to establish a plan for protecting critical environmental areas in Long Island Sound from oil spill contamination.

New Haven City Plan Department, 1980, Petroleum storage for New Haven harbor: waterfront vs. inland: prepared under a grant from the Coastal Energy Impact Program, National Oceanic and Atmospheric Administration, New Haven, Conn. Available from the Office of Downtown and Harbor Development, 157 Church Street, 12th floor, New Haven, CT 06510.

This study examined the feasibility of locating new petroleum tank farms or relocating existing waterfront tank farms to inland sites to free valuable waterfront land for more intensive uses. While both relocation of old and location of new facilities are technically feasible, relocation would be an extremely expensive undertaking. In addition, an analysis of potential sites showed that few were suitable.

Southeastern Connecticut Regional Planning Agency, Energy impact mitigation study: ongoing project funded under the Coastal Energy Impact Program, National Oceanic and Atmospheric Administration. Funded through January 1983.

This study is developing model zoning and subdivision regulations for coastal communities in order to mitigate the adverse impacts of new and expanded energy activities in the coastal zone.

Valley Regional Planning Agency, Fuel transportation impact study: ongoing study funded under the Coastal Energy Impact Program, National Oceanic and Atmospheric Administration. Funded through September 1982.

This study is assessing the impacts of increased transportation, transfer, and storage of oil and coal on the Housatonic River.

Maine

Gerber, R.P., Gilfillan, E.S., Page, B.T., Page, D.S., and others, 1980, Short- and long-term effects of used drilling fluids on marine organisms: presented at the Research on Environmental Fate and Effects of Drilling Fluids and Cuttings Conference held in Buena Vista, Florida, January 21-24.

In this study, 96-hour static bioassays were used to determine the relative toxicity of five used drilling fluids, collected from offshore drilling rigs, and various components of these fluids, to cold water marine animals. Organisms that survived these tests were then assayed for levels of cellular enzyme activities, and changes in the rates of respiration, excretion, and ingestion were determined as indications of sublethal stress. With few exceptions the adult animals when exposed for 96 hours to the various fractions of the drilling fluids exhibited little mortality. Whole muds were slightly more toxic to most organisms than the mud aqueous fractions but were especially toxic to deposit feeding organisms, and larvae were more sensitive than adults. The study concluded that these drilling muds are most toxic to larval marine organisms and though much less toxic to adults, sublethal stress was evident. Long-term effects were demonstrated by reduced growth rates in mussels.

Gilfillan, E.S., and Page, D.S., Environmental impact of nearshore oil spill dispersant use: ongoing study funded by the American Petroleum Institute and prepared by the Hydrocarbon Research Center, Bowdoin College, Brunswick, Me.

Two nearshore test spills were conducted over intertidal benthic sampling plots. One spill consisted of 250 gallons (946 l) of untreated Murban crude oil and the second consisted of 250 gallons (946 l) of Murban crude plus 25 gallons (95 l) of Corexit 9527 oil-spill dispersant. The test plots and an untreated reference plot were subjected to a 1-year baseline chemical and biological study program prior to the spill and will be studied through September 1982. The results of the project will provide valuable information on the environmental risks to the benthos associated with oil-spill dispersal in shallow waters compared with an untreated nearshore spill allowed to affect a shore in the usual manner.

Page, D.C., Page, B.T., Hotham, J.R., Gilfillan, E.S., and others, 1980, Bioavailability of toxic constituents of used drilling muds: presented at Research on Environmental Fate and Effects of Drilling Fluids and Cuttings Conference held in Buena Vista, Florida, January 21-24.

Four used drilling muds were analyzed for chromium, cadmium, lead, and petroleum residues to document potentially toxic substances present in the muds. The presence of these constituents to varying degrees shows that these should be factors included in the chemical characterization of a used mud. The release of chromium into the aqueous phase from one of these muds was studied as a function of pH using repetitive extractions. In addition, the uptake of chromium by Mytilus edulis from several test solutions was studied at pH 7.8. The results show that the form of chromium available has a major effects on its uptake by organisms and should be taken into account in assessing potentially harmful effects of discharges of used drilling muds at sea.

New Hampshire

Environmental Engineers, Incorporated, 1979, A planning study/report concerning the potential impact of Outer Continental Shelf (OCS) oil/gas development on the city of Portsmouth, New Hampshire, and its immediate environs, final report: prepared under a grant from the Coastal Energy Impact Program, National Oceanic and Atmospheric Administration, and sponsored by the Planning Department of the City of Portsmouth, 113 p. For information on availability of copies, contact Portsmouth Planning Department, City of Portsmouth, 126 Daniel Street, Portsmouth, NH 03801.

This study examines Portsmouth as a potential service-base location within the context of exploration in the Mid- and North Atlantic OCS lease areas. Three alternate discovery scenarios--low, medium, and high--are postulated, and the medium and high discovery scenarios are examined. A site selection analysis was made for a temporary service base that had sufficient area to be expanded into a permanent service base should discovery occur. Three sites were examined, and an analytical model was developed and used to examine the range of possible fiscal impacts. With the exercise of the overall fiscal model, it was concluded that for fiscal reasons there is little likelihood that a permanent service base would be attracted to Portsmouth.

Durgin, Owen B., and Veazie, Carl E., 1978, Assessment of potential impact of Outer Continental Shelf energy activity on the northern New England coast: prepared for the Attorneys General of New Hampshire and Maine under a grant from the Coastal Energy Impact Program, National Oceanic and Atmospheric Administration, 70 p. For information on and review of this document contact Mark Chittum, Office of State Planning, 2½ Beacon Street, Concord, NH 03301.

The purpose of this study is to develop information in support of the claims by Maine and New Hampshire that they are entitled to delimited lateral seaward boundaries that intersect the leased acreage on Georges Bank, thereby entitling each State to a share of the formula grants. This study is intended to address strictly the question of whether or not any economic or social impacts will be generated. The study evaluates the potential of all ports along the coast adjacent to the Georges Bank lease sale area for involvement in OCS energy-related activity. Several of these ports have the possibility of being selected as sites for supply bases, and other varieties of involvement may be possible.

Gilman, George and Allen, Charles, 1975, Impact of offshore oil: New Hampshire and the North Sea experience: Concord, N.H., 97 p. For information on and review of this document contact Mark Chittum, Office of State Planning, 2½ Beacon Street, Concord, NH 03301.

The central theme of this report is the analogy of the Scottish experience in Outer Continental Shelf development with that anticipated in New England. Examples of the Scottish experience are included as illustrations of the activities and impacts to be expected if development proceeds. This report, like its predecessor, **Impact of Oil Refinery Location in New Hampshire,** is intended to familiarize the reader with some of the vocabulary and engineering involved in developing petroleum reserves under the sea, to present specific shoreside impacts, to compare economic benefits and social costs, and to stimulate greater interest in this subject.

Strafford Rockingham Regional Council, 1978, Hypothetical economic impact of selected Georges Bank oil related development on New Hampshire: Exeter, N.H., 39 p. For information on and limited copies contact Mark Chittum, Office of State Planning, 2½ Beacon Street, Concord NH 03301.

The objective of this report is to assess the potential economic impact on the local economy resulting from the location in the New Hampshire seacoast area of onshore facilities supporting offshore oil development on Georges Bank. The onshore facilities considered most likely are temporary and permanent service bases. Whether or not petroleum support facilities locate on the New Hampshire seacoast depends largely upon the availability of other New England locations that are inherently more suitable for development. This project uses the Seacoast Input-Output model, developed by the Resources Development Center and the University of New Hampshire, to measure the probable annual economic impact on the local economy if onshore facilities supporting offshore oil development locate in the New Hampshire seacoast, and to measure the impact of the petroleum industry on the regional economy as compared to the impact of the other industries already present in the region. A theoretical discussion of input-output models can be found in appendix B of this report. The information derived from the analysis should be of use to planners, businessmen, public officials, and other interested persons.

Strafford Rockingham Regional Council, 1977, Site suitability study for onshore oil- and gas-related facilities for the New Hampshire coastal zone: Exeter, N.H., approximately 400 p. For information on and review of this document contact Mark Chittum, Office of State Planning, 2½ Beacon Street, Concord, NH 03301.

This study is intended to provide a data base to be used in planning for onshore development that may result from offshore oil and gas exploration, development, and production. A systematic approach has been taken to gathering information about the availability of services and land suitable for development within the coastal municipalities. This information will be used by the State to identify the local impacts that will occur if private industry proposes a specific OCS-related development in New Hampshire's coastal zone.

New Jersey

Brosius, James, and Psuty, Norbert P., 1982, Geologic features and conditions on the Mid-Atlantic Outer Continental Shelf: factors affecting pipeline placement, construction, and operation: Prepared for the New Jersey Department of Energy, 44 p. Limited distribution through the New Jersey Department of Energy, Office of Planning and Policy Analysis, 101 Commerce Street, Newark, NJ 07102.

Chizuko, Walter, Brosius, James, Psuty, Norbert P., and Starcher, Robert, 1982, Assessment of Environmental impacts from a proposed crude oil transfer facility in Delaware Bay: prepared for the Port Authority of New York and New Jersey, 67 p. Limited distribution through the Port Authority of New York and New Jersey, Office of Energy, One World Trade Center, 64E, New York, NY 10048.

This report examines the impacts of a bulk crude-oil transfer facility on the biological communities of the Delaware Bay estuary. Oil spill scenarios are used to indicate possible problem areas and to identify areas that are potentially at risk.

Chronic low level spills and episodic, large spills were considered. A proposed onshore pipeline was reviewed to identify the conflicts that may be encountered. Alternate routing alignments are presented that demonstrate the trade-offs available to pipeline planners to mitigate conflicts that may arise.

This project represents the first product of an effort to collect and document information on factors that constrain the siting of an Outer Continental Shelf gas pipeline. This report details the constraining geologic factors in the Mid-Atlantic region. The study area ranges from Montauk Point, New York, to Cape Hatteras, North Carolina, with a concentration on those areas adjacent to New Jersey.

Golden, Robert J., Hoff, Bruce H., and Linky, Edward J., 1980, OCS natural gas pipelines: an analysis of routing issues: prepared by the Center for Coastal and Environmental Studies, Rutgers University, New Jersey, under a grant from the Coastal Energy Impact Program, National Oceanic and Atmospheric Administration, for the New Jersey Department of Energy, Office of Planning and Policy Analysis, New Brunswick, N.J., 356 p. and appendixes. Available from the New Jersey Department of Energy, 101 Commerce Street, Newark, NJ 07102.

This study examines pipeline construction technologies, their potential impacts, and the policy issues associated with constructing a large-diameter natural gas pipeline from offshore to an onshore terminus. The study was a planning effort aimed at anticipating and planning for OCS-related natural gas development. State-of-the-art pipeline construction technologies were examined and their potential impacts were identified. An impact assessment was conducted for three routing scenarios, and mitigating measures were discussed, including preferred construction technologies.

Hoff, Bruce H., 1981, New Jersey OCS handbook: prepared for the New Jersey Department of Energy under a grant from the Coastal Energy Impact Program, National Oceanic and Atmospheric Administration, Newark, N.J., 48 p. and appendixes. Available from the New Jersey Department of Energy, Office of Planning and Policy Analysis, 101 Commerce Street, Newark, NJ 07102.

This handbook presents an overview of OCS oil and gas development, including the identification of Federal and State agencies that are actively involved in monitoring and planning for such development should it occur. Where possible, individuals at each of these agencies are noted so that local planning officials can make appropriate contacts. In addition, Federal and State planning initiatives are noted and explained. The handbook also addresses offshore development and onshore facilities that may be required to develop natural gas. A number of onshore sales gas conditioning facilities are discussed so that their siting requirements and their physical operation as well as how each fits into the overall development scheme are understood. The handbook provides sources of additional information and contacts in government agencies and industry.

John J. McMullen Associates, Inc., 1981, An offshore supply base in the City of Perth Amboy, final report: prepared for the City of Perth Amboy, New York, N.Y., under a grant from the Coastal Energy Impact Program, National Oceanic and Atmospheric Administration, 39 p. and appendixes. Available from the New Jersey Department of Energy, Office of Planning and Policy Analysis, 101 Commerce Street, Newark, NJ 07102.

The purpose of the study was to evaluate the feasibility of developing an offshore supply base on a disused industrial site located on the Arthur Kill in Perth Amboy. The study estimated the potential requirements for ongoing support facilities in the period 1980-90. Design criteria were developed from discussions with offshore industry representatives, and alternative waterfront designs were developed to a level of detail sufficient to permit preliminary cost estimation. The study concluded that the site is constrained by its relatively short water frontage but that a 9-berth facility is operationally feasible and could be developed at reasonable capital cost. A 9-berth supply base, however, the report noted, would not be capable of supporting all of the Mid-Atlantic exploration and development activity that could potentially occur by 1990. It is recommended that the City of Perth Amboy make the offshore industry aware of the advantages of the site and Perth Amboy in general as a supply base location.

Kantor, Richard, 1981, Biological resources of New Jersey's offshore submarine canyons--literature review: prepared for the New Jersey Department of Environmental Protection, Division of Coastal Resources, Trenton, N.J., 15 p., table and maps. Available from NJDEP, Division of Coastal Resources, CN 401, Trenton, NJ 08625.

This literature review contains abstracts of reports and papers on the biological resources of New Jersey's offshore submarine canyons. This report is divided into sections by topic, including corals, finfish, marine turtles, pelagic birds, marine mammals, and lobsters, as well as a general category. An addendum contains several additional study abstracts. Also included are a table and numerous maps that present information from the abstracted reports. This document does not cover physical and chemical water conditions, currents, phytoplankton and zooplankton resources, and fisheries landing information.

Rogers, Golden & Halpern, 1981, New Jersey energy facility development potential study: prepared for the New Jersey Department of Environmental Protection, Division of Coastal Resources, under a grant from the Coastal Energy Impact Program, National Oceanic and Atmospheric Administration, Philadelphia, Pa., 214 p. and appendixes. Copies are available from NJDEP, Division of Coastal Resources, CN401, Trenton, NJ 08625.

The objective of this study is to provide the New Jersey Department of Environmental Protection with the capability of evaluating the feasibility of energy facility development at locations within New Jersey's coastal plain, coastal zone, and territorial waters. This objective encompasses both the identification of suitable areas for specific energy facility types and a comparison of development feasibility among alternative locations for a given facility type. The study is part of a more comprehensive methodology being developed by the Department of Environmental Protection to assess the suitability of locations for development as any one of a number of land uses, by a procedure known as the Coastal Location Acceptability Method (CLAM). Other components of CLAM include an environmental sensitivity analysis and a socioeconomic sensitivity analysis.

Stern, David A. and Weiner, Jay, 1980, New Jersey Outer Continental Shelf natural gas pipeline siting study, phase 1: corridor identification, a staff report: prepared by the New Jersey Department of Environmental Protection, Division of Coastal Resources, Bureau of Coastal Planning and Development, Trenton, N.J., 36 p. Available from the NJDEP, Division of Coastal Resources CN 401, Trenton, NJ 08265.

This report describes the first phase of a two-phase study that will assist in determining the best route to transport possible discoveries of natural gas from offshore New Jersey to existing onshore distribution facilities. A manual overlay mapping technique was used to identify potential pipeline corridors that will be further evaluated in the second phase of the study. The corridors were identified through the systematic application of screening criteria that reflect a consideration of both environmental sensitivity and development potential factors.

Rhode Island

Coalition of Coastal Communities, 1982, Study of the regional onshore impacts from offshore oil and natural gas drilling support facility development in the State of Rhode Island **and** Executive Summary: prepared under a grant from the Coastal Energy Impact Program, National Oceanic and Atmospheric Administration for the Governor's Energy Office, Providence, R.I. Inquiries regarding availability should be directed to the Coalition of Coastal Communities, 128 North Main Street, Providence, RI 02903.

This study examines the potential regional impacts of OCS onshore development at Quonset Point and Davisville, Rhode Island, on the region's municipal services, water quality management, population and housing control, and transportation and land use planning. Due to the low level of OCS support activity currently in Rhode Island and the uncertainty of future development, this study identifies regional trends and problems that already exist within these communities and that could be further affected by significant future OCS support development.

Coalition of Coastal Communities and Regional Energy Project, Coastal community assistance project--implementation of the regional onshore impact study findings: prepared under a grant from the Coastal Energy Impact Program, National Oceanic and Atmospheric Administration. Final report is due October 1, 1982. Inquiries regarding availability should be directed to the Coalition of Coastal Communities, 128 North Main Street, Providence, RI 02903.

This study is a continuation of the regional onshore impact study summarized above. It will update the earlier work and will develop ways to mitigate impacts identified in that study. The study will also investigate ways to maximize benefits to local communities. Recreational, historic, and energy impacts, not addressed in the earlier study, will be assessed.

Kumekawa, Glen, Peterson, Alan, and Dixon, Brian, The OCS: development of State policy of coastal impact: in preparation by the Intergovernmental Policy and Analysis Program, University of Rhode Island, for the Governor's Energy Office, Providence, R.I. Final report due September 30, 1982.

This study will assess, validate, and provide policy options for the process of developing oil and natural gas in Georges Bank and the Outer Continental Shelf area. Phase I of the study will analyze and identify the "vital interests" of the State of Rhode Island. Through a process of examination and analysis, phase II will derive the economic and environmental benefit/cost to the State. The final product, phase III of the study, will be a policy document that is essentially an institutional analysis. Recommendations will be made regarding OCS-related State policy formulation.

Rhode Island Department of Environmental Management, 1982, Oil spill contingency plan--oil spill response maps: prepared under a grant from the Coastal Energy Impact Program, National Oceanic and Atmospheric Administration, Providence, R.I., 4 p., tables, and maps. Available upon request from State of Rhode Island, Department of Environmental Management, 83 Park Street, Providence, RI 02903.

This project mapped information to be used by the U.S. Coast Guard, Department of Environmental Management water resources personnel, and others in the event of an oil spill. The 18 maps, produced on modified U.S. Geological Survey quadrangles, show the locations of saltwater intakes, vulnerable natural features, aquaculture projects, bathing beaches, and marinas. The accompanying text provides instructions for using the mapped information.

University of Rhode Island, Department of Environmental Management and Coastal Resources Center, 1981, State of Rhode Island oil spill contingency guide--protection strategies for vulnerable coastal features: prepared under a grant from the Coastal Energy Impact Program, National Oceanic and Atmospheric Administration, Providence, R.I., 15 p., maps, and map summaries. Available upon request to State of Rhode Island, Department of Environmental Management, 83 Park Street, Providence, RI 02903.

This report identifies 94 coastal features vulnerable to oil spills and provides site plans for 57 of the sites. The site plans identify access points and outline containment strategies for use by on-site Department of Environmental Management water resources personnel and the U.S. Coast Guard.

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