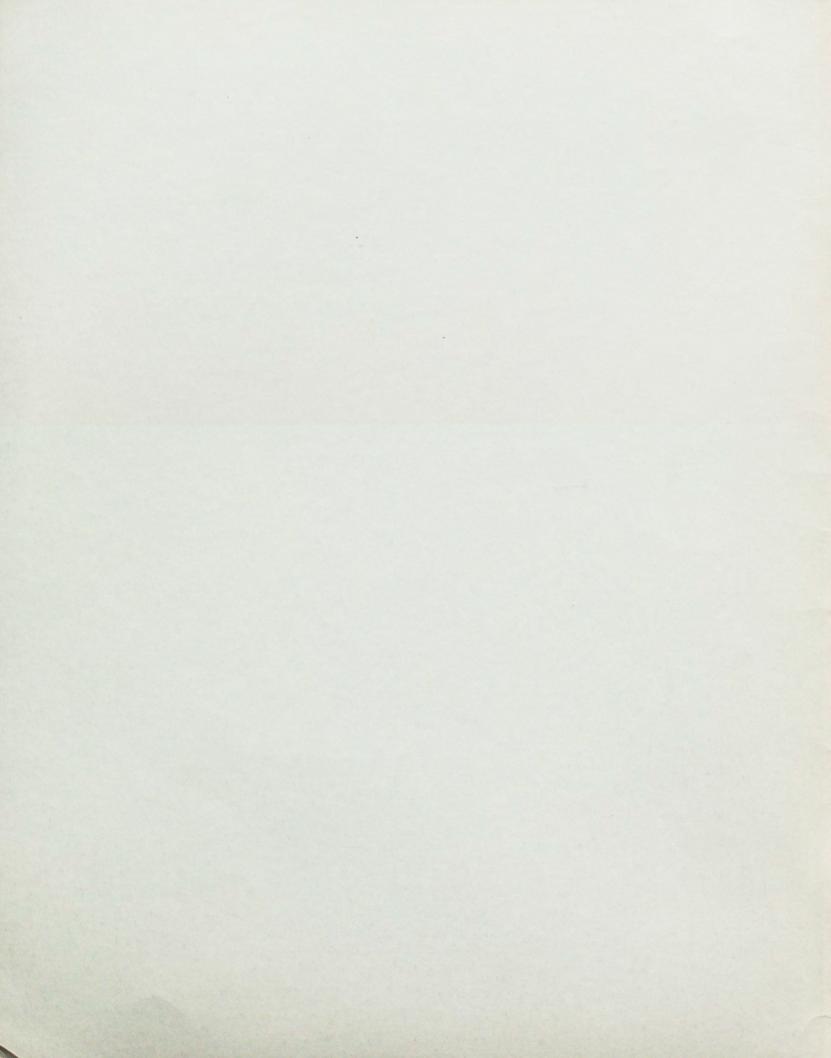
OUTER CONTINENTAL SHELF OIL AND GAS INFORMATION PROGRAM

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Update 1, June 30, 1980
Duter Continental Shelf Oil and Gas Activities
in the Mid-Atlantic and their Onshore Impacts:
A Summary Report, November 1979

Prepared for the U.S. Department of the Interior, Geological Survey, in cooperation with the Council on Environmental Quality



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A Summary Report, November 1979

By Jeffrey L. Deis

Prepared for the U.S. Department of the Interior, Geological Survey, in cooperation with the Bureau of Land Management and the Council on Environmental Quality under Contract No. EQ9AC006, by

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For specific questions regarding the Summary Report Update, contact:

Mr. David A. Nystrom Manager, OCS Oil and Gas Information Program U.S. Geological Survey 750 National Center Reston, VA 22092 (703) 860-7166.

Copies of this Update and the original Summary Report may be obtained from the above address.

COVER.—OCS support base at Davisville, Rhode Island. Photo by Chester Browning, Rhode Island Department of Economic Development.

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## JUNE 30, 1980 UPDATE 1

TO

## OUTER CONTINENTAL SHELF OIL AND GAS ACTIVITIES IN THE MID-ATLANTIC AND THEIR ONSHORE IMPACTS A SUMMARY REPORT, NOVEMBER 1979

#### INTRODUCTION

In November 1979, the U.S. Geological Survey's (USGS) Outer Continental Shelf Oil and Gas Information Program (OCSIP) issued Outer Continental Shelf Oil and Gas Activities in the Mid-Atlantic and their Onshore Impacts: A Summary Report, November 1979. This update to the report presents new information about the Mid-Atlantic outer continental shelf (OCS) for the period from December 1979 through June 1980.

Updates are published approximately every 6 months to provide new and revised information. A new Summary Report will be published only if a significant event occurs in the Region. This update covers new drilling operations in the Lease Sale 40 and 49 areas, information on the status of the upcoming Lease Sale 59, and an update on studies relevant to OCS-related planning activities.

The organization of the update parallels that of the first Mid-Atlantic Summary Report. A copy of the Summary Report (USGS Open-File Report 80-17) can be obtained from the OCSIP. The address is listed on the reverse side of the title page.

# OFFSHORE OIL AND GAS RESOURCES OF THE MID-ATLANTIC REGION

#### Geological Studies

The Conservation Division, Eastern Region, of the USGS is currently preparing a

study entitled Potential Geologic Hazards and Constraints for Blocks in the Proposed Mid-Atlantic OCS Oil and Gas Lease Sale 59. This study covers the tracts tentatively selected for Lease Sale 59, and it includes 23 tracts previously deleted from Lease Sale 49 because of potential hazards from possible sediment slumping. It analyzes the effects of geologic processes such as surface stability, shallow gas, deep geopressures, active faulting, and seismicity on drilling operations. The study is scheduled for completion by March 1981 so that it can be considered in the preparation of the Final Environmental Impact Statement for Lease Sale 59. The study is expected to be available in July 1981 as an open-file report from the USGS Open-File Services Section in Denver, Colo.

In addition, the USGS Office of Marine Geology, in Woods Hole, Mass., is presently conducting a Mid-Atlantic Environmental Assessment. This Assessment is a study of the stability of sea floor sediments and the geomorphology of the continental slope of the Mid-Atlantic. Long-range side-scan sonar data have been collected over the continental slope between the Hudson and Baltimore Canyons. Special attention is being given to the area of the continental slope between Lindenkohl and South Toms Canyon (fig. 1), which is being investigated with high-resolution seismic-reflection profiles on a 900 m by 1700 m The results will be used to survey grid. prepare bathymetric, geologic, and geomorphic maps of the continental slope. Cores collected from the continental slope between Hudson and Baltimore Canyons, with special emphasis on the area between Lindenkohl and South Toms Canyons, are being analyzed for the geotechnical properties of slope sediments.

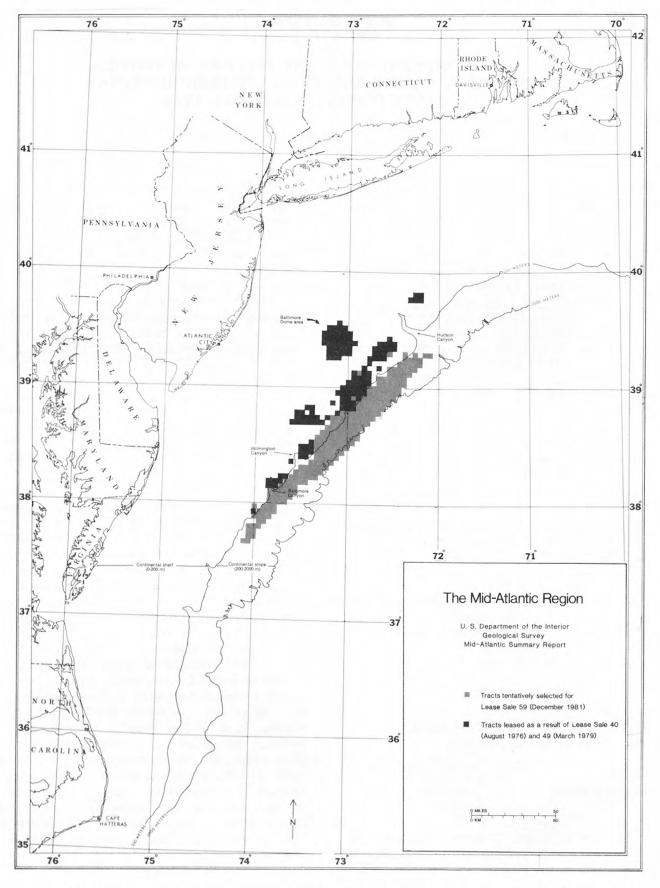


FIGURE 1.—The Mid-Atlantic Region OCS, Lease Sale 40 and 49 tracts and Lease Sale 59 Tentative Tract Selection. (U.S. Geological Survey, 1979. Revised by Rogers, Golden & Halpern, June 1980. Base from Bureau of Land Management.)

#### Resource Estimates

There have been no changes in the risked, economically recoverable resource estimates for the 132 tracts leased as a result of Lease Sales 40 and 49. The estimates presented on page 10 of the 1979 Mid-Atlantic Summary Report remain the same.

For the upcoming Lease Sale 59 area, the Conservation Division of the USGS has prepared conditional resource estimates. These estimates are provided to the Bureau of Land Management (BLM) as part of the USGS's responsibility to evaluate the hydrocarbon potential of areas prior to lease. The calculation method and purpose of the conditional resource estimates differ from those of the risked, economically recoverable resource estimates. Conditional resource estimates reflect the total amount of petroleum resources believed to be contained in tentatively selected tracts proposed for lease sale, without regard to feasibility of recovery. The USGS conditional estimates for Lease Sale 59 range from 360 million barrels to 7.3 billion barrels of oil, and 1.9 trillion cubic feet to 28.5 trillion cubic feet of gas. The mean conditional estimates are 3.4 billion barrels of oil and 14.2 trillion cubic feet of gas. However, it must be stressed that these estimates are not comparable to the risked, economically recoverable resource estimates presented in the Summary Report. Risked, economically recoverable resource estimates reflect the amount of commercially recoverable resources from leased tracts.

# MAGNITUDE AND TIMING OF OFFSHORE DEVELOPMENT

## Offshore Exploration

At the time that the Mid-Atlantic Summary Report was published (November 1979), Texaco, which was drilling well 642-1 on block 642, was the only company drilling in the Mid-Atlantic OCS. Exploratory operations were

completed in November 1979 and a show of gas was reported. Since then, four exploratory wells have been drilled: Texaco spudded (started) well 598-3 in December 1979; Murphy spudded well 106-1 in December 1979; Exxon spudded well 599-1 in April 1980; and Tenneco spudded well 642-3 in May 1980. Operations are complete for Texaco's well 598-3 and Murphy's well 106-1; both wells were reported dry and were plugged and abandoned. Exploratory operations are not complete for the Exxon and Tenneco wells. On June 6, 1980, Exxon publicly reported an "encouraging gas find" on well 599-1 at a depth below 3,750 m (12,300 ft). This statement is based on gas seepage which occurred during drilling; however, flow tests have not been conducted and no official announcement has yet been made to the USGS.

To date, a total of 24 exploratory wells and 2 COST wells have been drilled. One well, Mobil's well 17-1, was abandoned after drilling 366 m (1200 ft) due to problems in the initial drilling stages. Figure 2, which updates figure 7 on page 16 of the 1979 Mid-Atlantic Summary Report, shows the locations of these wells. Twenty wells have been announced dry; the announced results of the other six are presented in table 1.

Two more drilling operations may begin in the near future: Exxon has filed an Application for Permit to Drill (APD) on block 816 and, on July 11, 1980, an APD was received from Texaco to drill a fourth well on block 598.

Figure 3, which updates figure 4 on page 14 of the 1979 Mid-Atlantic Summary Report, shows drilling activity: the rigs, the periods during which they were active, the companies for which they were working, and the wells, identified by well numbers. Figure 4, which updates figure 5 in the 1979 Mid-Atlantic Summary Report, shows the number of active rigs by month from March 1978 to the present and projects exploratory activity for the next 6 months. Unless there is a commercial discovery, there should be no more than two drilling operations at any given time for the near future in the Mid-Atlantic OCS.

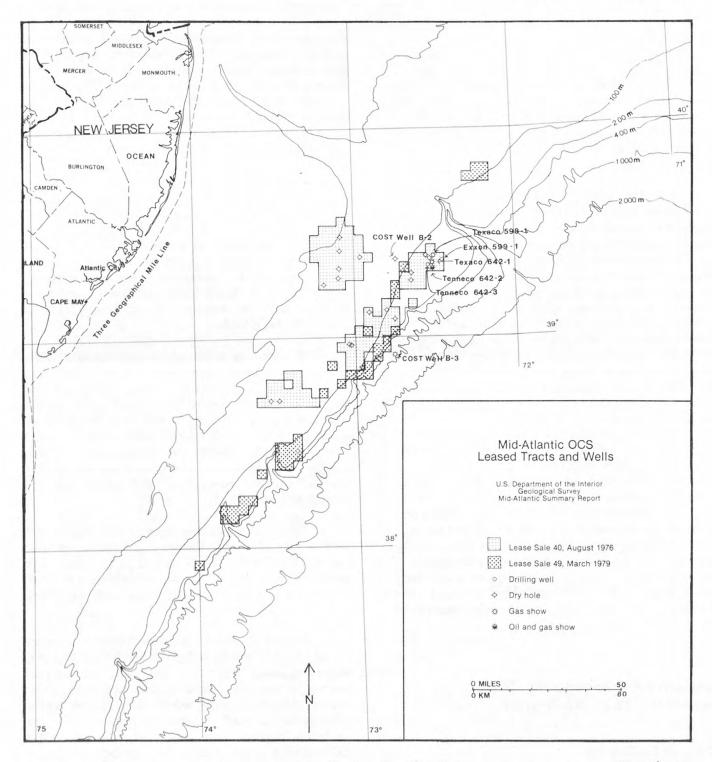


FIGURE 2.—Leased tracts and wells in the Mid-Atlantic Region, June 1980. (U.S. Geological Survey, July 1979. Revised by Rogers, Golden & Halpern, June 1980. Base from Bureau of Land Management, 1978, scale 1:1,000,000, approx.)

Well number	Drilling results	Spud date	Total drilling depth (m/ft)
COST Well B-3	Show of gas	10/09/78	4,822/15,820
Texaco 598-1	Flow of gas	04/16/78	4,580/15,025
Tenneco 642-2	Show of oil and gas	01/19/79	5,608/18,400
Texaco 642-1	Show of gas	03/23/79	4,812/15,786
Exxon 599-1	Operations are ongoing	04/26/80	
Tenneco 642-3	Operations are ongoing	05/27/80	

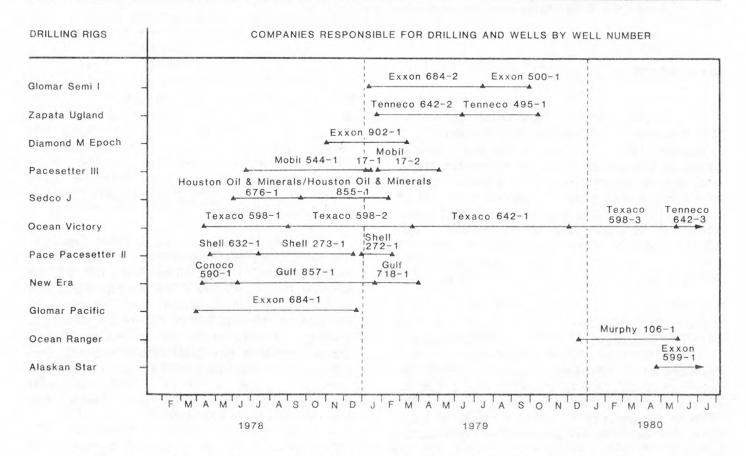


FIGURE 3.—Exploratory drilling in the Mid-Atlantic Region, to date, by rig. (U.S. Geological Survey, Conservation Division, Atlantic Area OCS Well Status Reports, published weekly.)

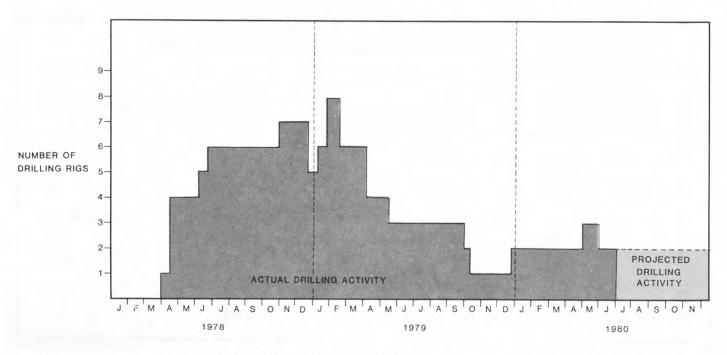


FIGURE 4.—Number of actual and projected exploratory drilling rigs in Mid-Atlantic Region, by month, through November 1980. (U.S. Geological Survey, Conservation Division, Atlantic Area OCS Well Status Reports, published weekly.)

#### Lease Sale 59

Lease Sale 59, the third lease sale in the Mid-Atlantic OCS, is tentatively scheduled for December 1981. Interest in this lease sale is based on the belief that the carbonate fossil reef buried beneath the Mid-Atlantic continental slope may contain hydrocarbons. It is thought that this is a part of a large reef trend which can be traced with only a few gaps from off the coast of Mexico, through the northern Gulf of Mexico, and along the Atlantic continental margin (Schlee and Grow, 1980, p. 148).

A Tentative Tract Selection was announced on December 31, 1979, for Lease Sale 59. The Tentative Tract Selection followed a Call for Nominations and Comments, which provided the petroleum industry with an opportunity to identify tracts it would like to have included in the Lease Sale and the public with an opportunity to identify tracts of concern for environmental or other considerations.

The tentatively selected tracts are presented in figure 1. There are 253 tracts which form a band covering 582,912 hectares (1,440,376 acres) from between 80 and 225 km

(50 and 140 mi) off the coast. This band extends from off Atlantic City, N. J., on the north, to off Assateague Island, Va., on the south. Almost all of the tracts lie in deeper water (70 to 2500 m, or 230 to 8200 ft), seaward from those already leased in Sales 40 and 49, beyond the shelf break on the continental slope. Included in the Tentative Tract Selection are 23 tracts previously deleted from Lease Sale 49.

The BLM is preparing a Final Environmental Impact Statement (EIS) for the tentatively selected tracts. The Draft EIS will be published in November 1980 and the Final EIS in May 1981. In addition, the Conservation Division of the USGS is currently conducting a geologic hazards study to determine if any tracts present a potential safety hazard. Depending on the issues that are identified through analysis in the Final EIS, all tracts included in the Tentative Tract Selection list may not be offered for sale.

## OIL AND GAS TRANSPORTATION STRATEGIES

The BLM has the lead role in the trans-

portation planning process for oil and gas discovered on the OCS. This planning process is organized through BLM's Intergovernmental Planning Program for OCS Oil and Gas Leasing, Transportation and Related Facilities (IPP). Since the Summary Report's publication, IPP's Mid-Atlantic Regional Technical Working Group Committee has met three times. The Committee has made recommendations to the BLM on issues, alternatives, and scenarios for the Lease Sale 59 Draft EIS. The Committee has also discussed transportation planning methods and has been briefed on OCS drilling, production, and pipeline technology. The Committee is currently in the process of developing a transportation management plan for the Hudson Canyon area of the Mid-Atlantic OCS, where gas shows have been announced.

The Mid-Atlantic Regional Technical Working Group Committee (see page 20, 1979 Mid-Atlantic Summary Report) has added a new member, James Smith, representing North Carolina. In addition, three changes in the membership of the Committee have occurred: Dr. Peter Anderson has replaced John Jimenez, Environmental Protection Agency; Dr. Richard Weaver has replaced Richard Hickman, American Petroleum Institute; and Joseph Gilg is the interim replacement for Robert Goff, U.S. Geological Survey.

# NATURE AND LOCATION OF NEARSHORE AND ONSHORE FACILITIES

Since the initial Summary Report, the number of active exploratory drilling rigs has been between two and three and the related onshore activity has remained fairly constant. The level of future onshore support activities is expected to remain the same until exploratory operations resulting from Lease Sale 59 begin, or until a commercial discovery is announced.

Petroleum Helicopters, Inc. (PHI) is the only helicopter service currently supporting Mid-Atlantic drilling rigs. PHI currently supports Exxon's well 599-1 with 2 helicopters based in Atlantic City, N.J. The helicopters make about 12 flights per week. Tenneco's well 642-3 is supported by PHI with one helicopter that makes about 7 flights per week

from Quonset, R.I. PHI's total number of employees in Atlantic City and Quonset is 23 (Burson, 1980).

The support base in Davisville, R. I., provides goods and services to the North and Mid-Atlantic OCS Regions. Presently, about 20 OCS-related firms are active in Davisville, which is about the same number that were active in November 1979. Many companies that are not currently active still maintain office space at Davisville in anticipation of future activity in both the North and Mid-Atlantic OCS. Since November 1979, the average number of employees at Davisville has been 140. The number of supply boats serving Mid-Atlantic operations has been about five, with a total of about 30 trips per month (Dana, 1980, and Spinard, 1980).

## APPENDIXES A, B, C

There have been no changes in these appendixes during the past 6 months.

#### APPENDIX D. OCS-RELATED STUDIES

Appendix D in the Mid-Atlantic Summary Report presented relevant Federal and State OCS-related studies. The following OCS-related studies were obtained by contacting appropriate agencies in the Mid-Atlantic States from North Carolina to New York. In addition, agencies in Connecticut and Rhode Island were contacted; however, studies for these States focus on developments in the North Atlantic OCS and they will be included in the North Atlantic Summary Report. The studies listed below either were not included in the Mid-Atlantic Summary Report or were included, but their status has changed. Studies that are a result of a joint effort by Federal and State agencies are listed under Cooperative Studies.

## FEDERAL STUDIES

U.S. Department of the Interior:

## Bureau of Land Management

The Bureau of Land Management of the U.S. Department of the Interior conducts an Environmental Studies Program. The New York OCS Office of the BLM administers studies approved by the Washington Office for the Mid-Atlantic Region. Appendix C of the Summary Report described this program. Some of the studies were conducted by other agencies within the DOI as a part of the program. Completed studies may be reviewed at the New York OCS Office of the Bureau of Land Management, 26 Federal Plaza, Room 32-120, or at the Washington OCS Office of the Bureau of Land Management, 18th and C Streets, NW, Washington, DC 20240.

Centaur Associates, Assessment of space and use conflicts between the fishing and oil industries: Washington, D.C. Final report due May 1981.

This literature review and field survey will develop general equations for quantifying 1) probable dollar losses to commercial and recreational fishing revenues likely to be sustained through decreased catches or lost or damaged gear when OCS development-related structures either restrict certain areas of the ocean bottom or water column to fishing, or make them hazardous to fishing operations, and 2) probable dollar increases in commercial and recreational fishing operating costs caused by intensified competition for labor, berthing, marine supplies and equipment, boat services, and finances. The study will identify ways in which revenue losses and operating cost increases can be optimally minimized, and to analyze the cost benefit value of proposed mitigating measures.

Geraci, Dr. Joseph, Principal Investigator, Effects of oil on marine mammals: Uni-

versity of Guelph, Ontario, Canada. Final report due April 1983.

The study presents a literature review, laboratory experiments, and field surveys to determine behavioral and physiologic responses of cetaceans with emphasis on 1) the ability of cetaceans to detect and avoid oil slicks; 2) the effect of oil on their integument and on their ocular, respiratory, reproductive, digestive, and excretory systems; 3) the long-term impact of oil effects on cetacean survival and behavior (e.g., feeding, calving, breeding, migration); 4) their potential for bioaccumulation of petroleum hydrocarbons and metabolites, and, practical, determining threshold levels; and 5) identifying mitigating measures.

Knebel, Dr. Harley, Assessment of geohazards and geotechnical properties: U.S. Geological Survey, Marine Geology Office, Woods Hole, Mass. Final report due January 1982.

The study describes a field survey in areas where existing information is insufficient to delineate shelf-edge and upper-middle slope slumping areas. The study will also determine the extent and age of slump activity, and, if there is recent activity, it will quantify sediment movement downslope.

Linder, Dr. Elek, Principal Investigator, Effects of sounds on marine mammáls: Naval Ocean Systems Center, San Diego, Calif. Final report due October 1982.

The study describes laboratory and field efforts to characterize the various sounds emitted by OCS oil and gas development activities and by cetaceans. The study will identify whether noises generated by OCS activities will interfere with cetacean communications, identify cetacean responses to these noises, and identify means of alleviating any deleterious effects of OCS development activities on cetaceans.

Ryan, Dr. William B.F., Principal Investigator, Canyon assessment study in the North and Mid-Atlantic areas: Columbia University--Lamont Doherty Geological Observatory, Palisades, N.Y. Final report due August 1980.

This literature and specimen review and field effort provides information about the distribution and abundance of coral assemblages and epibenthic crustacean communities (lobster, crab, shrimp) within the slope and canyons of the North and Mid-Atlantic hydrocarbon development provinces. The study involves the analysis of photographic records from previous submersible dives and camera tows within canyon areas of interest, analysis of available samples from canyons held in institutional archives, and field surveys of Baltimore, Oceanographer, and Lydonia Canyons to ground-truth hypotheses.

U.S. Geological Survey, Geohazards and their effects on operation safety: Washington, D.C. Completion expected September 1980.

USGS conducted field studies in the Mid-Atlantic Region. The objectives are (1) to estimate the extent and rate of sediment mobility over the sea bed and to monitor resultant changes in bottom morphology and texture, (2) to identify major processes causing sediment movement to assess seasonal variability, and (3) to identify and study the effects of processes and mechanisms contributing to sediment instability in offshore lease areas which may lead to the inception of slumping and sliding.

U.S. Geological Survey, Conservation Division, Eastern Region, Potential geologic hazards and constraints for blocks in the proposed Mid-Atlantic OCS oil and gas lease sale 59. Available to the public July 1981 from USGS Open-File Services Section, Box 25425, Denver, CO 80225.

This study covers the tracts tentatively selected for Lease Sale 59, which include 23 tracts previously deleted from Lease Sale 49. It analyzes the effects of geologic processes such as surface stability, shallow gas, deep geopressures,

active faulting, and seismicity on drilling operations. The study results will be considered in the preparation of the Final Environmental Impact Study for Lease Sale 59.

Woods Hole Oceanographic Institute, Study of crude oil effects on the developmental stages of the American lobster: Woods Hole, Mass. Completion expected December 1980.

> 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 sub-lethal effects of oil exposure on larval and juvenile lobsters, including the effects on feeding and growth energetics.

#### Fish and Wildlife Service

U.S. Fish and Wildflife Service, Atlantic coast ecological inventory: Washington, D.C. Available September 1980. Narrative will be available from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

This study's objective is to produce an inventory, including 31 maps, of those important ecological resources along the Atlantic coast which are potentially vulnerable to coastal siting of oil and gas processing manufacturing facilities and their transportation systems. The study focuses on ecological values subject to the provisions of the Fish and Wildlife Coordination Act, the Endangered Species Act, and related Federal legislation. Special emphasis was given to collecting existing information already compiled by the Atlantic coast states for

use in developing their coastal zone management plans. This is the first time that such a compilation has been undertaken. The inventory compiled information on important fish and wildlife species, especially those with special designations (endangered, migratory, etc.) and those of high commercial, recreational, or aesthetic value; habitats of these species; and special land use designations in coastal areas (e.g., wildlife refuges, national and State parks, State wildlife management areas, etc.).

## U.S. Department of Commerce:

# National Oceanic and Atmospheric Administration

Ehler, Charles N., Basta, Daniel J., Ray, G. Carlton, and Dobbin, James A. Eastern United States coastal and ocean zone resource use mapping project: Office of Ocean Resources Coordination and Assessment, Washington, D.C. In progress.

The project will identify and map five categories of data for the Eastern U.S. coastal and ocean zone: physical environments, living environments, species, economics, and jurisdictions. The study extends from the U.S.-Canada border to the Florida Keys, including all coastal counties and extending seaward to the 200-mile U.S. Fisheries zone. The study will produce over 100 maps with supporting data banks and a final report.

#### STATE STUDIES

### Delaware

Resource Planning Associates., Inc., 1976, Identification and analysis of Mid-Atlantic onshore OCS impacts: Cambridge, Mass., one vol., 80 p. plus appendices. Prepared for the Middle Atlantic Governor's Coastal Resources Council. Available for review at the Office of Management, Budget, and Planning, Dover, DE 19901.

Homer, Jerry W., Esq., 1976, Delaware and outer continental shelf development roles and systems at various levels of government: Dover, Del. Available for review at the Delaware State Planning Office (now the Office of Management, Budget, and Planning), Dover, DE 19901.

Woodruff, Kenneth D., 1977, Preliminary results of seismic and magnetic surveys off Delaware's coast: Newark, Del., Coastal Zone Management Program Open-File Report No. 10, 19 p.

This project mapped the top of the 'basement' surface--crystalline rocks of igneous or metamorphic origin--which lies beneath the rocks of the coastal plain sediments in Southern Delaware. A seismic survey close to the Delaware shore covered a 21-mile course from the Delaware-Maryland boundary to just inside the mouth of the Delaware Bay.

Delaware Coastal Management Program, 1978, The national interest in resources and facilities of the Delaware coastal zone: Dover, Del., Working Paper No. 7. Available for review at the Office of Management, Budget, and Planning, Dover, DE 19901.

Benson, Richard N., 1979, Hydrocarbon resource potential of the Baltimore Canyon Trough: Newark, Del. Report of Investigations No. 31, 45 p.

The study offers tentative conclusions about the hydrocarbon resource potential of the Baltimore Canyon Trough by examining seismic reflection profiles, magnetic and gravity surveys, the results of the COST B-2 well, and nonproprietary exploratory drilling results through 1978.

Olney, Austin P., Esq., 1980, Survey of authorities governing the siting and permitting of natural gas and petroleum pipelines: Dover, Del., one vol., 81 p. plus appendices. Available for review at the Office of Management, Budget, and Planning, Dover, DE 19901.

This study presents a survey and analysis of Federal and State statutes and regulations dealing with siting and regulation of certain pipelines.

## Maryland

St. Mary's County Planning Board, Environmental, social, and economic impacts of existing petroleum storage and terminal facility: Leonardtown, Md. Completion expected September 1980.

The study's scope of work includes 1) a field study to measure and assess the presence of hydrocarbons in bottom sediments, 2) analysis of socio-economic and fiscal impacts of existing petroleum terminal(s) and tankfarm(s) on the surrounding County by utilizing the Maryland facilities impact computer program, and 3) assessment of the effectiveness of local ordinances in relation to identified impacts.

## **New Jersey**

## N.J. Department of Environmental Protection

Dames & Moore, Shore protection master plan and environmental impact assessment: Cranford, N.J., two vols., 650 p. Draft.

The New Jersey Shore Protection Master Plan is intended to provide guidance in the management of coastal erosion. The document outlines all possible responses to coastal erosion and evaluates the cost effectiveness of each, as well as potential problems, such as beach

access and recreational use, which may result.

New Jersey Department of Environmental Protection, New Jersey natural gas pipeline siting study: Cranford, N.J. In process.

The objectives of the study are: 1) to identify siting considerations and develop locational criteria that are pertinent to the Mid-Atlantic region, 2) to identify and assemble the best available data for use in pipline siting and note data limitations, 3) to delineate pipeline corridors that are likely to embody acceptable routes (first phase), and 4) to identify potential constraints which may require mitigation and indicate policy areas which should be addressed.

## N.J. Department of Energy (DOE)

Rutgers University, Center for Coastal and Environmental Studies and New Jersey's Department of Energy, 1980, OCS natural gas pipelines: an analysis of routing issues: New Brunswick, N.J., 432 p. Limited number of copies available for review at N.J. Department of Energy, 101 Commerce Street, Newark, NJ 07 102.

The study identifies the issues and potential impacts which may arise from the construction of a pipeline in New Jersey to transport OCS natural gas. The study also describes the pipe laying techniques available for placing a pipeline in the various environments in New Jersey which may be traversed, including ocean bottom, barrier beach, bays, wetlands, and uplands.

Johns Hopkins University, Department of Geography and Environmental Engineering, A study to identify corridors for a gas pipeline system, from landfall to junction with the interstate trunk system, in the southern half of New Jersey, Phase 2: Baltimore, Md. In progress. This study is the second phase of a three-phase study. The study is developing a multi-objective model based on a linear programming trans-shipment model. This phase is more site-specific than the first phase, and focuses on the implications of siting onshore OCS-associated and -ancillary facilities, including separation/dehydration plants, gas processing plants, and gathering systems from production platform to trunk lines.

## N.J. Coastal Energy Impact Program of DOE

Engineering Computer Optecnomics, Inc., 1980, Methodology for evaluating the Outer Continental Shelf Lands Act Amendment requirement for best available and safest technology economically feasible: Annapolis, Md., 117 p. Limited number of copies available for review at N.J. Department of Energy, Coastal Energy Impact Program, 101 Commerce St., Newark, NJ 07102.

This study provides a methodology to assess the adequacy of existing and proposed regulations in implementing the Outer Continental Shelf Lands Act Amendment requirement for the use of the Best Available and Safest Technology (BAST) economically feasible in offshore oil and gas activities.

John J. McMullen Associates, Inc., Study of impacts from an offshore supply base in Perth Amboy: New York, N.Y., one vol. In progress. Will be available from N.J. Department of Energy, Coastal Energy Impact Program, 101 Commerce Street, Newark, NJ 07 102.

This study will evaluate existing facilities along the Perth Amboy water-front from the point of view of the specific requirements of the offshore industry, and will identify the type and approximate cost of needed improvements. Estimates of the potential fiscal, economic, and environmental impacts associated with a supply base will be

prepared and mitigating measures identified.

Middlesex County Planning Board, A water supply study for projected OCS-related energy facilities in Middlesex County, New Jersey: New Brunswick, N.J., interim report, 247 p. In progress. Will be available from N.J. Department of Energy, Coastal Energy Impact Program, 101 Commerce St., Newark, NJ 07 102.

This report provides an analysis of future water supply demands for Middle-sex County, including the requirements and impacts of likely energy development. The advantages and disadvantages of potential supply sources are discussed. Interconnections are proposed to bring water from the supply sources to the areas of demand.

OECS Corporation, An analysis of the potential environmental and socioeconomic impacts related to Mid-Atlantic outer continental shelf activities in Atlantic County, New Jersey: Lafayette, La., one vol. In progress. Will be available from N.J. Department of Energy, Coastal Energy Impact Program, 101 Commerce St., Newark, NJ 07 102.

This study presents an inventory of existing environmental and socioeconomic factors which are, or may be, affected by OCS activity will be undertaken. Present and potential impacts resulting from current and future levels of OCS activity will be evaluated. Measures to mitigate OCS impacts will be developed.

### New York

Koppelman, Dr. Lee, 1976, Analysis of potential oil spill impacts in the Nassau-Suffolk coastal zone: Hauppauge, N.Y., 147 p. Limited number of copies available from Long Island Regional Planning Board, Suffolk County Center, Hauppauge, NY 11787.

This report identifies habitats and special features of the coastal areas of Nassau and Suffolk Counties, establishes an analytical framework for biological population responses to oil spills and assesses the recovery of habitats from spills.

Glaeser, J. Douglas, and Smith, Philip C., 1977, Assessment of the geologic information of New York State's coastal zone and continental shelf and its significance to petroleum exploration and development: Albany, N.Y., 261 p. Limited number of copies available from the NYS Department of Environmental Conservation, 50 Wolf Road, Albany, NY 12233.

The report reviews information on nearshore and offshore geology adjacent to New York State, emphasizing implications for Outer Continental Shelf oil and gas exploration and development.

Hartmann, Ronald, 1977, Federal and State coastal boundaries and jurisdictions in New York marine district: Stony Brook, N.Y., 5 p. Limited number of copies available from NYS Department of Environmental Conservation, 50 Wolf Road, Albany, NY 12233.

This report describes status of federal and state boundaries and jurisdictions in the Marine District of New York State. This report and its accompanying maps are part of a series of reports identifying boundaries and jurisdictions of underwater lands in the marine areas of New York State. Each report cites relevant federal and state laws, judicial decisions and intergovernmental agreements that have established present boundaries, jurisdictions and ownership of underwater lands. The reports also identify conflicting jurisdictions and problems with boundaries.

Hartmann, Ronald, 1977, State, county and town boundaries, jurisdictions, and ownerships for lands underwater in the marine district of New York State: Stony Brook, N.Y., 30 p. Limited number of copies available from NYS Department

of Environmental Conservation, 50 Wolf Road, Albany, NY 12233.

This report describes the status of state, county and town boundaries, jurisdictions and ownership for underwater lands in the Marine District of New York State (Long Island and New York State). This report and its accompanying maps are part of a series of reports identifying boundaries and jurisdictions of underwater lands in the marine areas of New York State. Each report cites relevant federal and state laws, judicial decisions and intergovernmental agreements that have established present boundaries, jurisdictions and ownership of underwater lands. The reports also identify conflicting jurisdictions and problems with boundaries.

NYS Department of Environmental Conservation, 1977, An analysis of Federal roles related to OCS development and coastal zone management: Albany, N.Y., 50 p. Limited number of copies available from NYS Department of Environmental Conservation, 50 Wolf Road, Albany, NY 12233.

> This report reviews and analyzes the roles of federal agencies in OCS leasing, exploration and development process, and identifies gaps in federal authority.

NYS Department of Environmental Conservation, 1977, Applicability of the State Environmental Quality Review Act to outer continental shelf activities: Albany, N.Y., 61 p. Limited number of copies available from NYS Department of Environmental Conservation, 50 Wolf Road, Albany, NY 12233.

> This report analyzes the implications of the State Environmental Quality Review Act for potential OCS-related activities in New York State.

NYS Department of Environmental Conservation, 1977, Attracting OCS-related onshore facilities and activities: An assessment of prospects for New York State and their economic benefits: Albany, N.Y., 32 p. Limited number of copies available from NYS Department of Environmental Conservation, 50 Wolf Road, Albany, NY 12233.

This report assesses prospects for location of OCS related onshore facilities in New York State, based on hypothetical OCS resource find scenarios, and analyzes potential economic benefits.

NYS Department of Environmental Conservation, 1977, Inventory and analysis of New York State legislation and regulations related to OCS development: Albany, N.Y., 98 p. Limited number of copies available from NYS Department of Environmental Conservation, 50 Wolf Road, Albany, NY 12233.

This report reviews and analyzes New York State legislation and regulations that would affect OCS-related development in New York State, including roles of New York State agencies in permitting process.

NYS Department of Environmental Conservation, 1977, Marine related activities: An assessment of the economic impacts of OCS energy development: Albany, N.Y., 72 p. Limited number of copies available from NYS Department of Environmental Conservation, 50 Wolf Road, Albany, NY 12233.

This report examines potential impacts of OCS energy development on the New York State marine tourism and recreation industry and the recreational and commercial fishing industries, including potential losses from oil spills.

NYS Department of Environmental Conservation, 1977, New York State and outer continental shelf development—an assessment of impacts: Albany, N.Y., 178 p. Available from NYS Department of Environmental Conservation, 50 Wolf Road, Albany, NY 12233.

This report assesses the potential

environmental, economic, energy and institutional implications of offshore oil and gas activity on New York State, based on hypothetical scenarios of OCS development. The report reviews historical background of federal OCS program; presents three scenarios of OCS activity in the Mid and North Atlantic; assesses the natural and man-made environments surrounding exploration, development and recovery of OCS energy; and analyzes the environmental, energy, economic, siting and institutional implications of the OCS scenarios.

NYS Department of Environmental Conservation, 1977, Potential impact of OCS oil and gas on New York State and New York metropolitan area energy requirements: Albany, N.Y., 75 p. Limited number of copies available from NYS Department of Environmental Conservation, 50 Wolf Road, Albany, NY 12233.

This report analyzes potential impacts of OCS oil and gas production on energy requirements in New York Metropolitan Area, based on existing and projected consumption figures and on hypothetical OCS resource find scenarios.

Port Authority of New York and New Jersey, 1977, Support bases for off shore drilling: the port of New York potential: New York, N.Y., 129 p. Limited number of copies available from NYS Department of Environmental Conservation, 50 Wolf Road, Albany, NY 12233.

This report reviews potential locations for on-shore OCS support bases in the Port of New York and New Jersey, utilizing industry siting criteria.

Long Island Regional Planning Board, 1979, Oil spill response actions in Fire Island Inlet: Hauppauge, N.Y., 103 p. Limited number of copies available from Long Island Regional Planning Board, Suffolk County Center, Hauppauge, NY 11787.

This report presents detailed oil spill cleanup strategies for the Fire Is-

land Inlet region, including information on how and where available oil spill containment/cleanup equipment can be most effectively deployed in an initial response effort, utilizing a hydrographic survey of Fire Island Inlet and several alternative spill scenarios.

- Babylon Town Environmental Control Department, Oil spill contingency plan for the Town of Babylon, N.Y. In progress.
- Long Island RPB, Oil spill contingency plans for Jones Inlet and Shinnecock Inlet, Long Island, N.Y. In progress.
- St. Lawrence Eastern Ontario Commission, Oil spill response manual. Completion expected September 1980.

### North Carolina

Brunswick County Planning Department & Kenneth Creveling Association, Oil spill effects on beach community recreation resources: Brunswick, N.C. Completion expected January 1981.

This study will delineate what effects oil spills and increased tanker traffic will have on recreational resources of the Brunswick County beach community. It will focus on what measure can be taken to reduce the negative effects of oil transportation on coastal recreational resources. Quantification of components contributions to recreation income will be part of product.

Costlow, John, and Street, Michael W., Newport River dye study: Duke University, Durham, N.C., Marine Laboratory and North Carolina Department of Natural Resources and Community Development, Division of Marine Fisheries. Final report due October 1981.

The proposed dye study of the Newport River (Carteret County) is to obtain a better understanding of water flow patterns in the Newport River, sup-

plementing rather limited data available from drogue studies by Hyle (1976). The project would assist in deliberations on the siting, construction, operation, or expansion of industrial facilities planned for the Newport River by applying information which indicates the extent to which discharges into the estuary may be distributed in adjacent shrimp nursery areas, oyster and clam leases, and commercial fishing areas. The information would be essential in developing longrange planning for the siting of shoreline facilities, an understanding of potential erosion patterns, and designing emergency measures dealing with potential oil spills.

The general plan is to complete a series of dye-tracer experiments in which a non-toxic dye will be released into the river, recording dye concentration, current rate, and tide and wind conditions. The movement and dilution of the released dye will be determined by spectrophotometric equipment on the boat as well as by aerial photography.

Hauser, E.W., Comparative impacts of alternate transportation modes for shipping energy feed stocks and products with emphasis on the transport of OCS gas and oil. In progress.

This project will begin to identify and assess the potential impacts of transportation investments that will be necessary to support OCS and other energy activities in the North Carolina coastal zone. Highways, railroads, barges, and pipelines will be studied. Project also will include the major state inventory of public services and facilities to support OCS shorebases.

Priddy, Loie J., and Carraway, R., Mapping of submerged grass beds in and adjacent to the Newport River, Carteret County, N.C., for mitigation of refinery-related impacts. Final report due May 1982.

Submerged marine grass beds of Eelgrass (Zostera marina) and Shoalgrass (Halodule wrightii) are necessary to the

survival of several commercially and ecologically important species of marine life in the Newport River Basin and adjacent waters. These grass beds are fragile and sensitive to the silting and excavation activities associated with construction and maintenance of submerged pipelines. Oil spills or pipeline leakage present a great hazard to these grass beds and to the marine life which inhabits them. The mapping of these unique biological areas will provide an accurate up-to-date base to allow mitigation of damage to them from siltation, excavation, or oil spillage. Having precise locations of these beds will allow the erection of physical barriers (silt screens, containment apparatus, etc.) to reduce or block the flow of silt, sediment, or spilled oil into them. maps, when used with wind, tide, and current data, will aid in plans for quick response to oil spills by identifying those areas which should be given protection priority. Pipeline routes may be alined or realined to mitigate damage to these beds by construction, maintenance, or by accidental leakage or rupture.

Queen, William H., and Brown, Charles Q., Environmental geologic atlas of the North Carolina coastal zone. Final report due January 1982.

An environmental geologic atlas will be prepared for Hyde, Tyrrell, Dare and Washington counties which contain North Carolina's most accessible major peat deposits. The atlas will contain information deemed needed by state operation for these four counties. Also, the atlas will be designed to serve as a model to be used for the other 16 coastal counties in future years' CEIP grants. This project promises to tie together most of the other environmental CEIP grants and to provide a single repository for their results.

Roe, Charles, Natural areas inventory for coastal energy impact counties. In progress.

This project will conduct systema-

tic surveys of coastal counties to identify and map natural areas possessing ecological resources of national, state, or regional importance. Rare species habitats will be identified. All results will be compiled in standardized format and will be available to all local and state agencies. The work will not repeat work already done for land use planning but will go beyond it. All 20 counties will eventually be done, but first year work will be in Brunswick, Carteret, and Tyrrell Counties. Year two will be done in Pender, Craven, and Gates counties.

Sorrell, Dr. Yates, Impact of offshore pipeline corridors and landfalls in coastal North Carolina. In progress.

This project will evaluate the impact of pipeline corridors on North Carolina's coastal zone. Funded 1979-1982.

Street, Michael W., Impacts of coastal energy development on fisheries of the Albermarle-Pamlico Peninsula. Final report due January 1982; OCS survey due May 1981.

The objectives of this study are to prepare a report defining environmentally-sensitive areas, locations and seasonality of major fishing activities, and vulnerability of the various resources to impacts likely to come from peat mining, gas pipelines, and barge transport of energy commodities, and to develop a database consisting of all DMF research and monitoring data from 1973 to 1979.

### COOPERATIVE STUDIES

New England River Basins Commission/U.S. Geological Survey, 1976, Onshore facilities associated with OCS development: Factbook: Boston, Mass., 758 p. Available from NTIS.

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

- service bases
- repair and maintenance yards
- transportation facilities (pipelines and marine terminals)
- partial processing plants
- gas processing plants
- refineries
- petrochemical plants
- platform fabrication yards
- pipe coating yards
- ancillary industries
- 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/U.S. Geological Survey, 1978, Case Studies OCS planning: Boston, Mass., 92 p. Available from Resource Planning Analysis Office, U.S. Geological Survey, 750 National Center, Reston, VA 22092.

This report evaluates how New York, Rhode Island, Maine, and Massachusetts applied methodologies and information developed for their own OCS planning programs.

New England River Basins Commission/U.S. Geological Survey, 1978, Methodologies for OCS-related facilities planning: Boston, Mass., 149 p. Available from Resource Planning Analysis Office, U.S. Geological Survey, 750 National Center, Reston, VA 22092.

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.

Gowen, N.M., Goetz, M.J., and Waitsman, I.M., 1980, Choosing offshore pipeline

routes—problems and solutions: New England River Basins Commission and Environmental Protection Agency, May 1980, EPA-600-7-80-114, 92 p. Available from Industrial Environmental Research Laboratories, Office of Research and Development, USEPA, Cincinnati, OH 45268.

This report presents environmental and fisheries problems associated with offshore pipelines.

New England River Basins Commission/U.S. Geological Survey, 1980, State participation in OCS development and production decisions: Boston, Mass., 69 p. Available from Resource Planning Analysis Office, U.S. Geological Survey, 750 National Center, Reston, VA 22092.

This draft technical report is the second in a series of four 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 stage and outlines the way three States coordinate their participation.

New England River Basins Commission/U.S. Geological Survey, 1980, Strategies for State participation in OCS exploration decisions: Boston, Mass., 115 p., plus appendices. Available from Resource Planning Analysis Office, U.S. Geological Survey, 750 National Center, Reston, VA 22092.

This report discusses the many consultation documents the states will receive in the course of the OCS Exploration decision-making process. It also outlines planning needs, strategies for promoting state policies, and institutional and organizational options for effective participation in decision-making.

Northdurft, W.E., 1980, North Sea pipelines—a survey of technology, regulation, and use conflicts in oil and gas pipeline operation: New England River Basin Commission and Environmental Protection Agency, Feb. 1980, EPA-600-7-80-023, 68 p. Available from Industrial Environmental Research Laboratories, Office of Research and Development, USEPA, Cincinnati, OH 45268.

## REFERENCES

- Burson, Keith, A., Petroleum Helicopters, Inc., 1980, oral communication.
- Dana, John, Rhode Island Port Authority and Economic Development Corporation, 1980, oral communication.
- Schlee, John, and Grow, John, 1980, Buried carbonate shelf edge beneath the Atlantic continental slope: in Oil and Gas Journal, v. 78, no. 8, February 25, 1980, p. 148-156.
- Spinard, Edward, Rhode Island Department of Economic Development, 1980, oral communication.
- U.S. Bureau of Land Management, 1978, Outer continental shelf, Mid-Atlantic Region, visual no. 1: lease status, recreation and open space resources, potential hazards, in U.S. Bureau of Land Management, 1978, Final environmental impact statement: proposed 1979 OCS oil and gas lease sale offshore the Mid-Atlantic States, OCS Sale No. 49: New York, N.Y., Outer Continental Shelf Office, scale 1:1,000,000 (approx.).

