DATA ANALYSIS PRODUCT

NO. 22

April 13, 1987

EXPENDABLE BATHYTHERMOGRAPH OBSERVATIONS

FROM THE NMFS/MARAD SHIP OF OPPORTUNITY PROGRAM

FOR 1986

by

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Marine Climatology Investigation
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Expendable Bathythermograph Observations from the NMFS/MARAD Ship of Opportunity Program for 1986

Robert L. Benway

ABSTRACT

Results of the 17th year of operation of the NMFS/MARAD Ship of Opportunity Program are presented in the form of sample vertical sections of water column temperature and lists of data available. Operational procedures and data management also are discussed.

INTRODUCTION

In midyear of 1970 a cooperative expendable bathythermograph (XBT) program was initiated between the National Marine Fisheries Service (NMFS) and the Maritime Administration (MARAD) of the U.S. Department of Commerce. The program conducted in support of the MARMAP (Marine Resources Monitoring Assessment and Prediction) Program of NMFS, involved the use of Maritime Cadets from the Kings Point Maritime Academy to gather XBT data on board various merchant ships along the east and Gulf coasts of the United States. The objective of this cooperative program was to identify and describe seasonal and year-to-year variations of temperature and circulation in major currents of the Gulf of Mexico and western North Atlantic, utilizing merchant ships as relatively inexpensive platforms for the collection of data. In the mid-70's the program objectives were revised to concentrate on water

masses and circulation of the Middle Atlantic Bight and eastern Gulf of Mexico with particular interest in the continental shelf and slope waters in the Middle Atlantic Bight.

AREAS OF STUDY

Ship routes (Fig. 1, & 2) were selected to obtain regular sampling in the most dynamic or diagnostic areas. Repeated coverage is important for comparitive analyses, so ships with the most regular schedules have been chosen whenever possible.

OPERATIONAL PROCEDURES

Expendable bathythermograph (XBT) and meteorological data were collected on board the vessels Oleander and Edgar M. Queeny. The Oleander and E.M. Queeny data were handled using the Bathy Systems data acquisition system. This system consists of Sippican XBT probes, a Hewlett Packard desk top computer, a Synergetics Geostationary Operational Environmental Satellite (GOES) data transmitter and antenna, and software from Bathy Systems. The XBT and meteorologic data were sent via GOES transmitter to the Command and Data Acquisition System (CDA) ground station at Wallops Island VA and relayed to the National Environmental Satellite, Data, and Information Service (NESDIS) computer in Washington D.C. for distribution to outside users. Temperature data transmitted via GOES is considered "real time" as it only takes minutes from the time an XBT is launched until the data reach the NESDIS computer for distribution.

The Oleander transits from Newark NJ to Bermuda on a weekly basis, with approximately monthly collections of XBT data from hourly drops between Ambrose Light and the vicinity of the Gulf Stream's North Wall in either an easterly or westerly direction (Fig. 1). Temperature and weather data are transmitted via GOES every three hours for distribution to other users.

The E.M. Queeny collects XBT and weather data on a monthly, or more frequent schedule in the Gulf of Mexico. A usual cruise track is from Dry Tortugas to 90°W longitude (Fig. 2). On occasion this track may be reversed. Probes are launched hourly along this track and the data are sent hourly via GOES.

DATA ACQUISITION AND PROCESSING

At the time of each XBT drop, surface water samples were collected with buckets for later analysis to determine salinity. (An Autosal model 8400 Salinometer was used for salinity determinations.) Temperature/depth data collected on HP 85 casette tapes were processed and quality controlled by NMFS personnel. Sample vertical sections presented in Sections I, and II were produced under contract by Applied Science Associates, Inc. in Wakefield, Rhode Island.

ACKNOWLEDGEMENTS

Appreciation is extended to the Maritime Academy Training Representative in New York, Captain Arthur Finley, for his diligent effort in placing cadets aboard the E.M. Queeny. In addition, thanks to the officers and crews of the Oleander, Bermuda Container Lines, and Edgar M. Queeny, Keystone Shipping Co, for their courteous cooperation in this program, whose success is dependent on them. Support for the Gulf of Mexico SOOP monitoring was provided by the Minerals Management Service, U. S. Department of Interior.

SECTION

I

NEW YORK BIGHT

Sample vertical section and surface parameter plot of observations made from the Oleander during 1986 are presented. Each transect is identified by a cruise number and date of collection. Data for any transect are available from NODC in a variety of forms. Requests for, or inquiries about Ship of Opportunity XBT data held by NODC, or data products should be directed to:

National Oceanographic Data Center
(D761)
National Environmental Satellite, Data and Information Service, NOAA
Washington, DC 20235

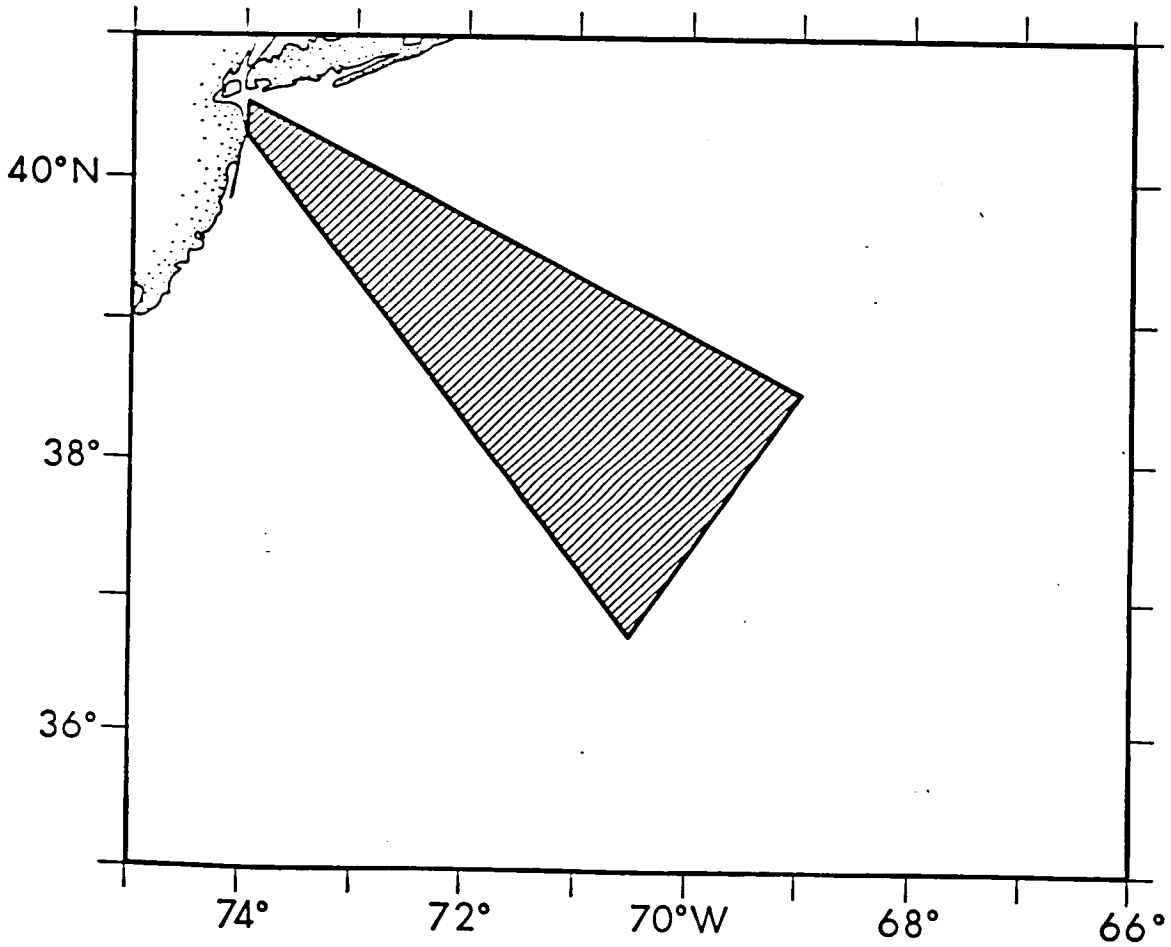
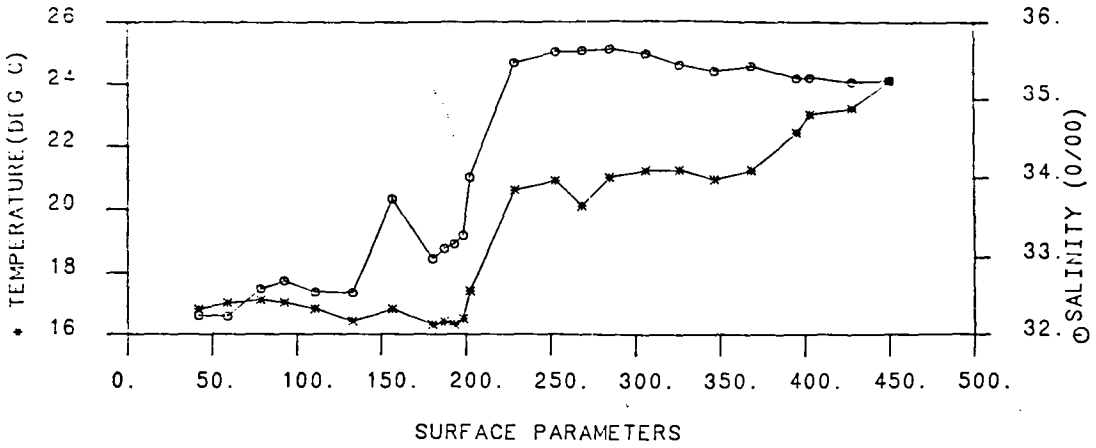
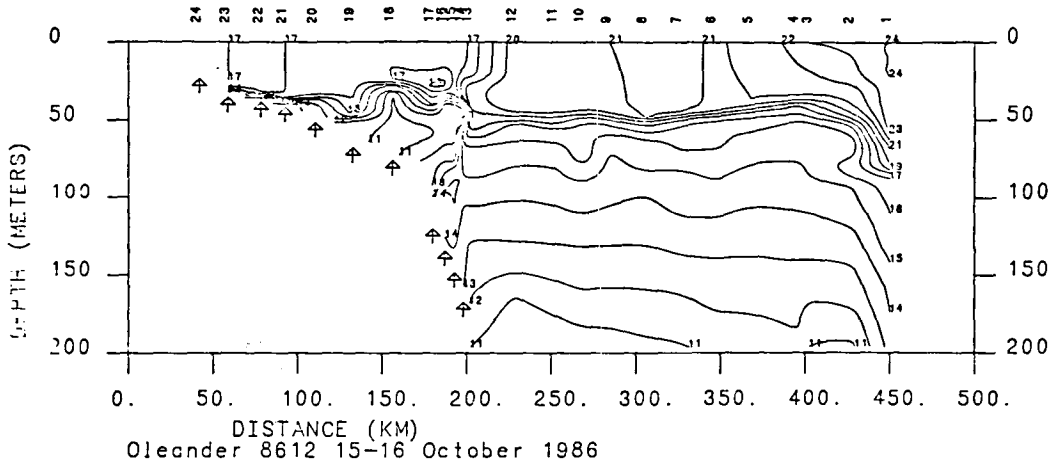
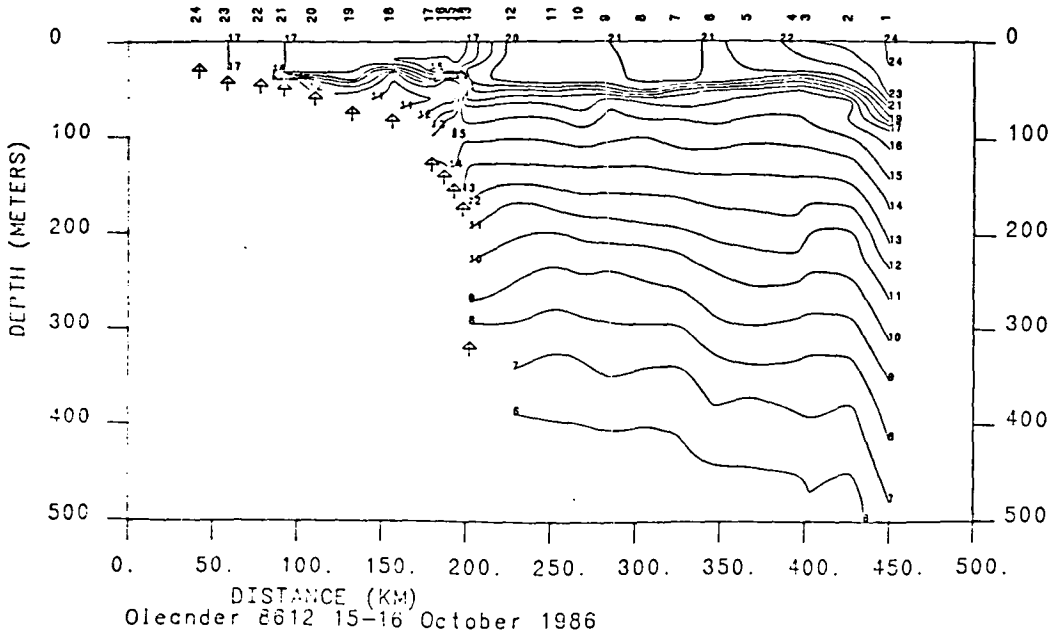


Figure 1. M/V Oleander Transect Envelope for the Ship of Opportunity Ocean Monitoring Program in the New York Bight, 1971 to present.







Sample of XBT computer generated transect-plot graphic.

Table 1. 1986 NMFS/SOOP XBT New York Bight Transect Data available at NODC.

NAME OF SHIP: Oleander

Cruise Number	Dates
86-01	January 10 - 11
86-02	February 07
86-03	March 07
86-05	April 04
86-06	May 02
86-07	June 05
86-08	July 04 - 05
86-09	August 08 - 09
86-10	September 19
86-11	October 10
86-12	October 15 - 16
86-13	November 07 - 08
86-14	November 12 - 13
86-16	December 10 - 11

SECTION

II

GULF OF MEXICO

Sample vertical section and surface parameter plot of observations made from the Edgar M. Queeny during 1986 are presented. Each transect is identified by a cruise number and date of collection. Data for any transect are available from NODC in a variety of forms. Requests for, or inquiries about Ship of Opportunity XBT data held by NODC or data products should be directed to:

National Oceanographic Data Center
(D761)
Environmental Data
and Information Servcice, NOAA
Washington, DC 20235

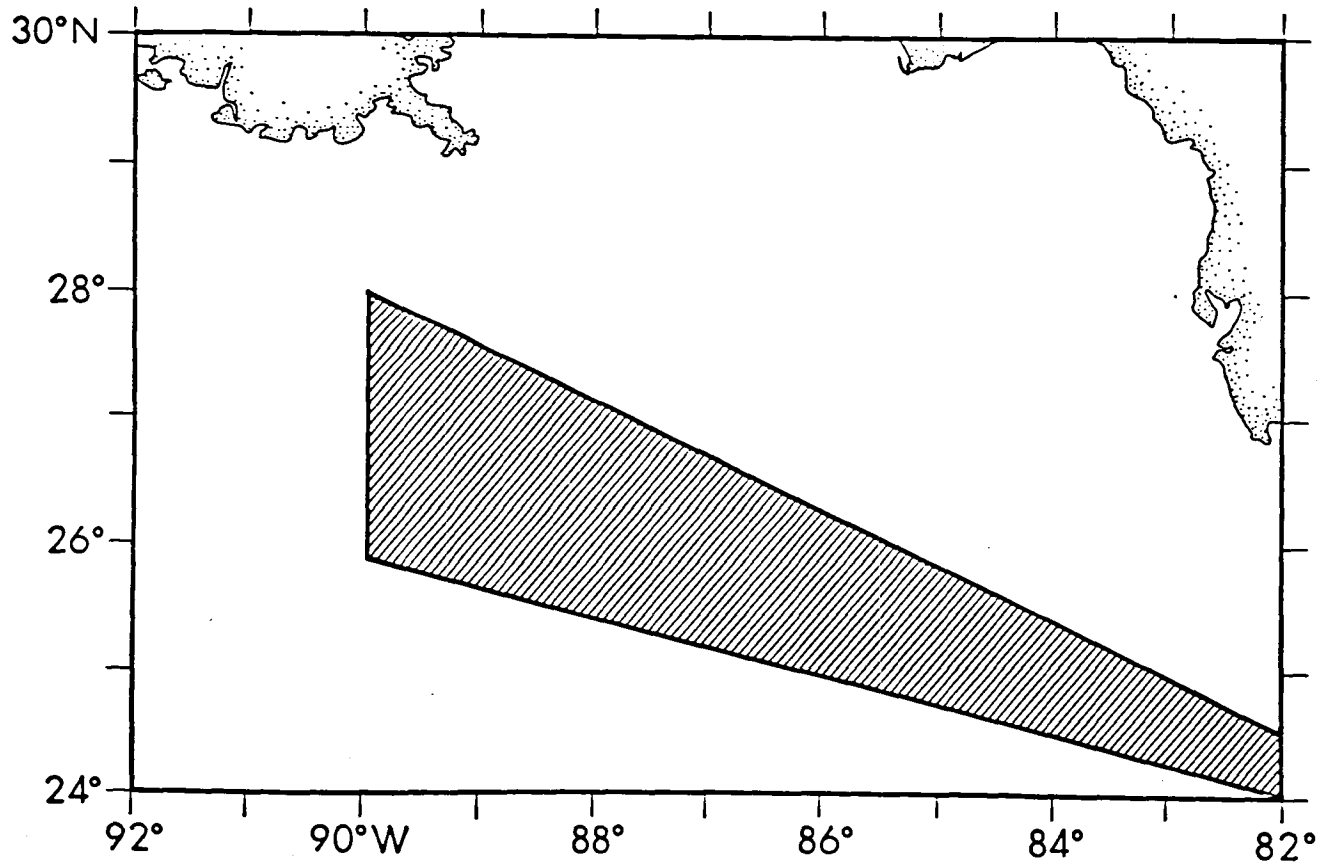
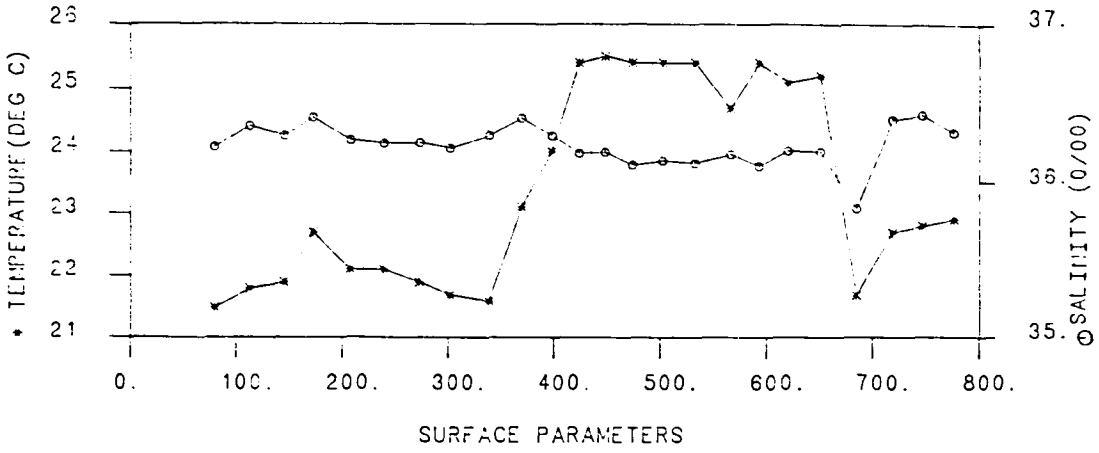
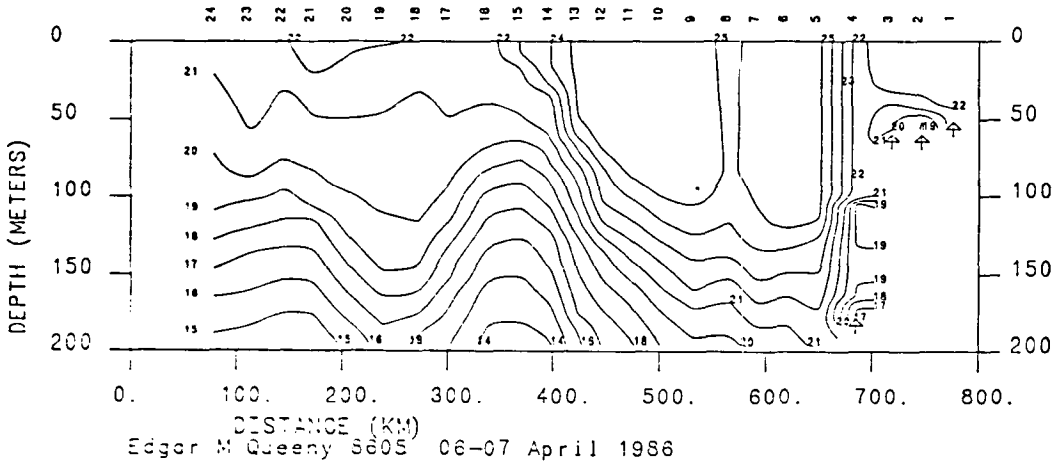
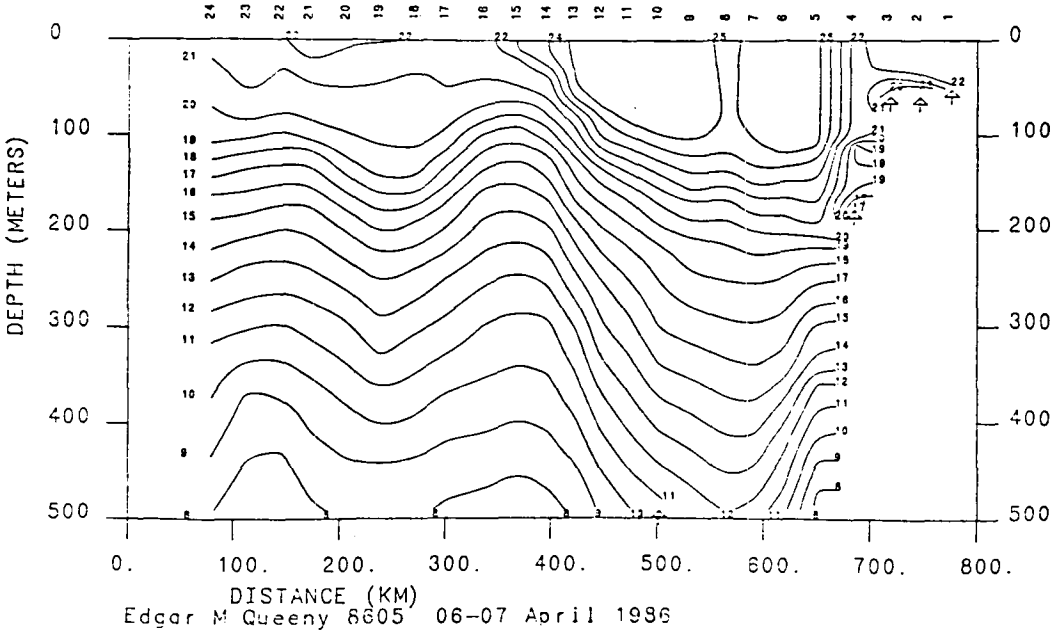


Figure 2. M/V Edgar M. Queeny Transect Envelope for the Ship of Opportunity Ocean Monitoring Program in the Gulf of Mexico, 1980 to present.







Sample of XBT computer generated transect-plot graphic.

Table 2. 1986 NMFS/SOOP XBT Gulf of Mexico Transect Data available at NODC.

NAME OF SHIP: Edgar M Queeny

Cruise Number	Dates
86-01	January 04 - 05
86 02	January 11 - 12
86-03	February 04 - 05
86-04	February 20 - 21
86-05	April 06 - 07
86-06	April 12 - 13
86-07	May 03 - 04
86-08	May 16 - 17
86-09	June 07 - 08
86-10	June 25 - 26
86-11	July 17 - 18
86-12	August 07 - 08
86-13	September 01 - 02
86-14	September 21 - 22
86-15	October 26 - 27
86-16	November 02 - 03
86-17	November 23 - 24

The Department of the Interior Mission

As the Nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering sound use of our land and water resources; protecting our fish, wildlife, and biological diversity; preserving the environmental and cultural values of our national parks and historical places; and providing for the enjoyment of life through outdoor recreation. The Department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people by encouraging stewardship and citizen participation in their care. The Department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.

The Minerals Management Service Mission

As a bureau of the Department of the Interior, the Minerals Management Service's (MMS) primary responsibilities are to manage the mineral resources located on the Nation's Outer Continental Shelf (OCS), collect revenue from the Federal OCS and onshore Federal and Indian lands, and distribute those revenues.

Moreover, in working to meet its responsibilities, the **Offshore Minerals Management Program** administers the OCS competitive leasing program and oversees the safe and environmentally sound exploration and production of our Nation's offshore natural gas, oil and other mineral resources. The MMS **Minerals Revenue Management** meets its responsibilities by ensuring the efficient, timely and accurate collection and disbursement of revenue from mineral leasing and production due to Indian tribes and allottees, States and the U.S. Treasury.

The MMS strives to fulfill its responsibilities through the general guiding principles of: (1) being responsive to the public's concerns and interests by maintaining a dialogue with all potentially affected parties and (2) carrying out its programs with an emphasis on working to enhance the quality of life for all Americans by lending MMS assistance and expertise to economic development and environmental protection.