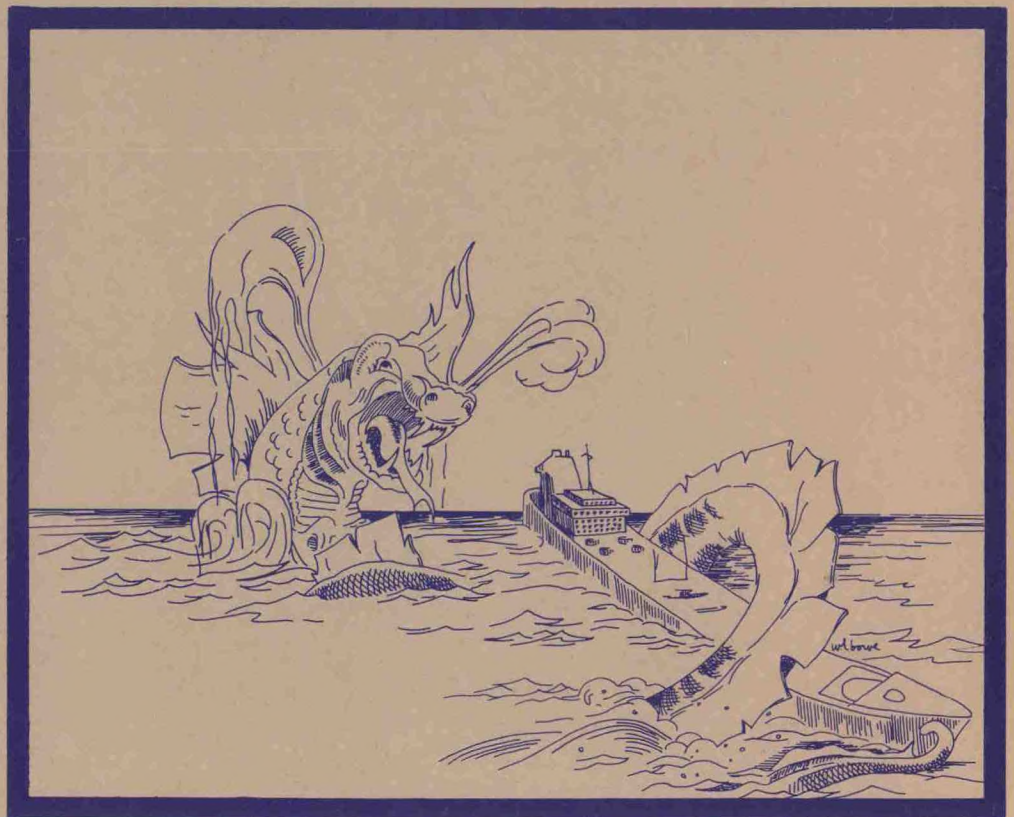


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37.5  
.N38  
1982



# NODC/1982

## National Oceanographic Data Center Annual Report



**U.S. DEPARTMENT OF COMMERCE**  
**National Oceanic and Atmospheric Administration**  
National Environmental Satellite, Data, and Information Service



## Notice

The NOAA National Oceanographic Data Center does not approve, recommend, or endorse any proprietary material mentioned in this publication. No reference shall be made to the NOAA National Oceanographic Data Center, or to this publication, in any advertising or sales promotion that would indicate or imply that the NOAA National Oceanographic Data Center approves, recommends, or endorses any proprietary product or proprietary material mentioned herein.

COVER: For many years the "Monster of the Month" was used by the Mariners Weather Log to symbolize severe storms that took a heavy toll in ship casualties. Although the monster was recently retired to save space, the Log continues to serve the maritime community and in 1982 celebrated its 25th anniversary. See page 6.



# NODC/1982

## National Oceanographic Data Center Annual Report

Washington, D.C.  
July 1983

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1982



**U. S. DEPARTMENT OF COMMERCE**  
Malcolm Baldrige, Secretary

**National Oceanic and Atmospheric Administration**

John V. Byrne, Administrator

National Environmental Satellite, Data, and Information Service

John H. McElroy, Acting Assistant Administrator



# PREFACE

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The National Oceanographic Data Center (NODC) is the United States national facility established to acquire, process, archive, and disseminate global oceanographic data. NODC is one of four data and information centers\* that operate within the National Environmental Satellite, Data, and Information Service (NESDIS) of the National Oceanic and Atmospheric Administration (NOAA), U.S. Department of Commerce.

NODC builds its marine data bases with data collected by Federal, State, and local government agencies; universities and research institutions; and private industry. It also acquires data from foreign sources and operates World Data Center A for Oceanography, a part of the World Data Center system that facilitates international exchange of scientific data.

NODC welcomes inquiries from all potential users. NODC products and services are provided at cost; information about NODC products and services and consultation with NODC services personnel, however, are available without charge or obligation. Users may contact NODC either through the Information Services Division at NODC headquarters in Washington, D.C., or through one of the five regional Liaison Offices.

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National Oceanographic Data Center  
NOAA/NESDIS  
2001 Wisconsin Avenue, N.W.  
Washington, DC 20235

Office of the Director:  
202-634-7232 (commercial)  
FTS 634-7232

User Requests:  
202-634-7500 (commercial)  
202-634-7502 (after-hours message recorder)  
FTS 634-7500

Northeast Liaison Office  
NOAA/NESDIS  
McLean Laboratory  
Woods Hole Oceanographic Institution  
Woods Hole, MA 02543  
617-548-1400, Ext. 2497 (commercial)  
FTS 840-7279

Southeast Liaison Office  
NOAA/NESDIS  
AOML Building  
15 Rickenbacker Causeway  
Miami, FL 33149  
305-361-4305 (commercial)  
FTS 350-1305

Southwest Liaison Office  
NOAA/NESDIS  
8604 La Jolla Shores Drive  
P.O. Box 271  
La Jolla, CA 92037  
714-453-2820 (commercial)  
FTS 893-6204

Northwest Liaison Office  
NOAA/NESDIS  
Bin 15700/Building 264  
7600 Sand Point Way, N.E.  
Seattle, WA 98115  
206-527-6263 (commercial)  
FTS 446-6263

Alaska Liaison Office  
NOAA/NESDIS  
707 A Street  
Anchorage, AK 99501  
907-279-4523, Ext. 46 (commercial)  
FTS 271-4063

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\*Others are the National Climatic Data Center (NCDC), Asheville, N.C.; the National Geophysical Data Center (NGDC), Boulder, Colo.; and the Assessment and Information Services Center (AISC), Washington, D.C.



# HIGHLIGHTS, 1982

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1. NODC undergoes internal reorganization and, following NOAA reorganization, becomes part of new National Environmental Satellite, Data, and Information Service (NESDIS). (pp. 1,19)
2. WDC-A, Oceanography, participates in exhibit marking the 25th anniversary of the World Data Center (WDC) system, which was established during the International Geophysical Year of 1957-58. (pp. 17-18)
3. Mariners Weather Log celebrates 25th anniversary. (p.6)
4. NODC hosts Fourth Session of the Intergovernmental Oceanographic Commission Group of Experts on Responsible National Oceanographic Data Centers (RNODCs). (pp. 14-15)
5. Dr. Marthe Melguen, Head of the Bureau National des Donnees Oceaniques (BNDO), the French counterpart of the U.S. NODC visits to negotiate renewal of the data exchange section of the U.S.-France Cooperative Program in Oceanography. (p. 17)
6. Marine data specialists from India and from the People's Republic of China visit NODC for extended training periods. (p. 16)
7. NODC Systems Analyst Michael McCann named EDIS Outstanding Employee of the Year. (p. 19)
8. Thirty-five Federal representatives attend planning workshop for the Ocean Pollution Data and Information Network (OPDIN). (p. 9)
9. NODC achieves major increases in productivity of processing expendable bathythermograph (XBT) and oceanographic station data. (p. 2)
10. NODC completes installation at its five regional Liaison Offices of workstations that will facilitate rapid exchange of data and information. (p. 12)





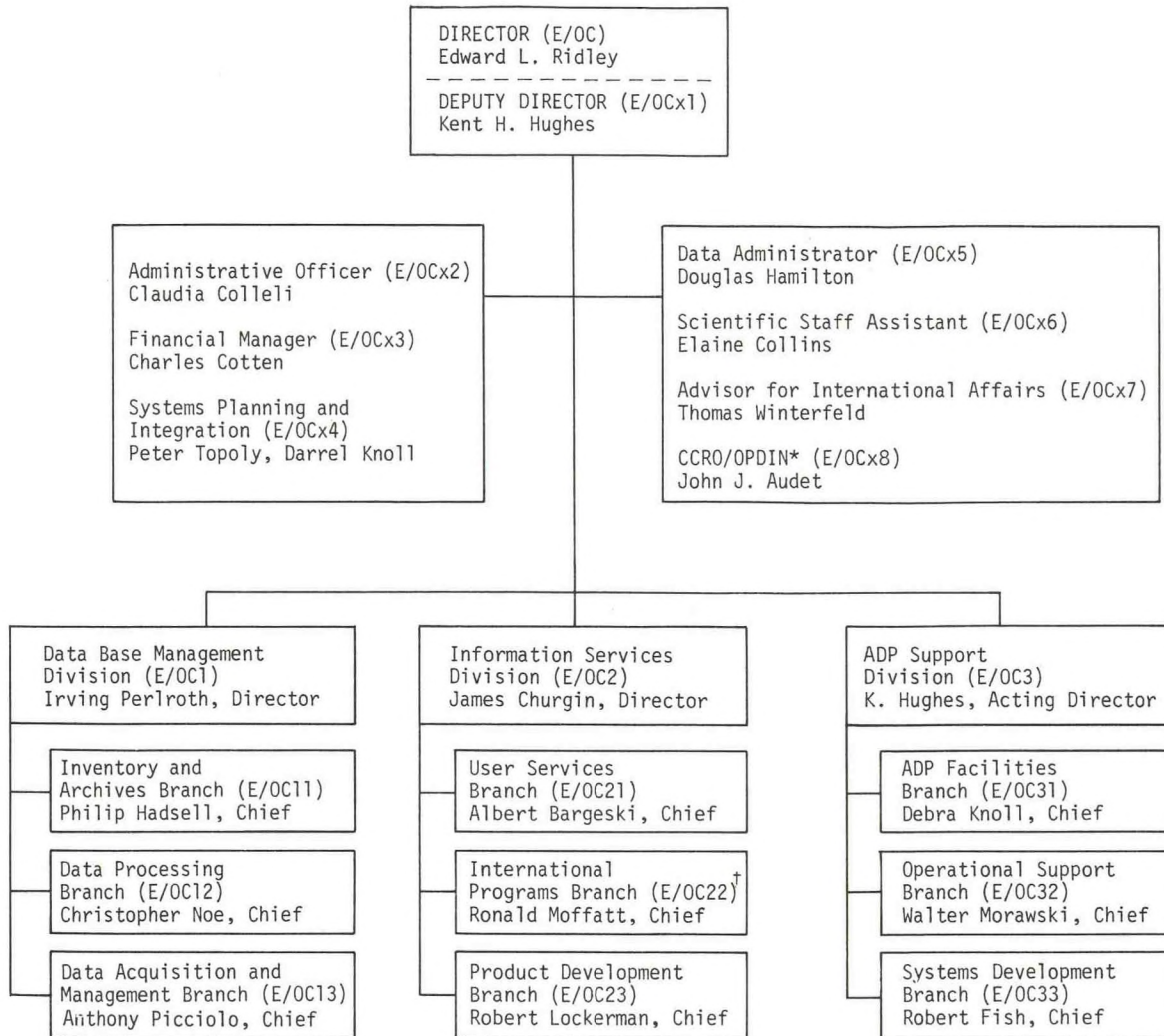
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# NATIONAL OCEANOGRAPHIC DATA CENTER



\*Central Coordination and Referral Office/  
Ocean Pollution Data and Information Network

†World Data Center A for Oceanography  
James Churgin, Director  
Ronald Moffatt, Associate Director



# THE NEW NODC

---

In 1982 the National Oceanographic Data Center (NODC) underwent two significant organizational changes. In March NODC implemented a new internal organizational structure. Then on December 1, following a complete NOAA reorganization initiated by Administrator John V. Byrne, NODC became part of a new NOAA component called the National Environmental Satellite, Data, and Information Service (NESDIS). This office incorporates the predecessor National Earth Satellite Service (NESS) and the Environmental Data and Information Service (EDIS), the previous organizational element that managed NOAA's environmental data archival facilities, including NODC.

NODC's internal restructuring was completed after review of recommendations by a Program Evaluation Team of outside experts that studied NODC operations in 1981. A major goal of the reorganization was to enable NODC to benefit more from modern data base management methods and technology. As its operations have become more complex and more dependent on ADP technology, NODC has had to evolve to meet new challenges and opportunities.

NODC operations are now carried out through the Office of the Director and

three Divisions (see facing page). The new Divisions are: (1) Data Base Management, which accessions, inventories, processes, and archives incoming data; (2) Information Services, which responds to user requests, manages international data exchange programs, and produces NODC publications and data products; and (3) ADP Support, which develops ADP systems and software and operates NODC's minicomputer facility and ancillary ADP equipment.

With its new organization and new operating procedures in place, NODC is devoting increased attention to several projects to improve our service capabilities. Highest priority is being given to development of a new system for processing, archiving, and disseminating data from electronic C/STD (conductivity/salinity-temperature-depth) sensors. This system will be in place and operational in 1983.

I believe that the "new NODC" is better able now than ever before to meet its mission of providing efficient, cost-effective marine environmental data services to its users in industry, government, academia, and the general public.



Edward L. Ridley  
Director

# DATA BASES

NODC's primary data resources are its archive data bases, computerized collections of data covering certain parameters collected by similar instruments or techniques and stored in standard archive formats. The archive data bases present a composite picture of the marine environment based on millions of observations taken on numerous cruises going back to the late 19th century.

## Data Acquisition and Processing

Most of NODC's archive data bases are still growing through the addition of new data each year. After submission to NODC, data suitable for incorporation into one of the archive data bases are processed, quality controlled, inventoried, and merged into the appropriate data base.

In 1982 NODC processed 17,477 oceanographic stations (hydrographic casts); 32,790 expendable bathythermograph (XBT) observations; and 2,316,185 records of physical, chemical, and biological data collected as part of various marine environmental assessment programs. As a result of continuing improvements to data processing systems and practices, data processing productivity increased substantially throughout the year. New

record-high monthly production totals were achieved for both oceanographic station data (3,610 stations) and XBT observations (5,508 observations).

NODC exceeded its goals for XBT data processing in support of the National Climate Program. In 1982 about 15,000 XBT observations were processed with funds specifically earmarked for this program. These observations are mostly from data-sparse areas (including the southern tropical oceans) and are being processed to enhance the national marine data base in these areas. With support from the National Science Foundation, these data were digitized by a private contractor. In 1982 this contract was extended to July 1983 and it is expected that an additional 28,000 XBT strip charts will be digitized for processing by NODC.

NODC processed the first data received from the Gulf Offshore Weather Observing Network (GOWON), a program for collecting and archiving marine data from offshore oil rigs in the Gulf of Mexico. GOWON is being conducted as a cooperative effort between participating oil companies and the National Weather Service, with data management provided by Dr. S. Hsu of Louisiana State University working under contract to NODC.

## NODC Data Acquisitions, 1982

(Number of stations\* received for processing)

Origin	Data Type		
	Physical/Chemical	Biological	Pollutant
United States .....	39,828	6,072	128
Foreign .....	46,953	0	0
Total .....	86,781	6,072	128

\*A station is defined as the collection of data obtained at one location during a discrete time period. In time series data, a station usually is the data collected at one location during one month.



## Data Holdings

The volume of data in NODC's archive data bases at the end of 1982 is summarized in the table on page . Because the Oceanographic Station Data File and the Bathythermograph Data Files were being restructured during the year, new processed data are still being held on update tapes and are not yet added to these data bases. Therefore, data volumes for these two major data bases remain unchanged.

The Multidisciplinary Data Archival and Retrieval System, however, grew by about 50 percent; over 5 million new data records were added to this file. Most of this large increase is attributable to additions of current meter data, automated buoy data, CTD/STD data, marine pollution data, and certain categories of marine biological data.

In addition to data incorporated into its archive data bases, NODC also holds one-of-a-kind data sets retained in originator's formats. During 1982 NODC received and announced the availability of two data sets created in conjunction with the preparation of the Southern Ocean Atlas published by Columbia University Press. The atlas data set is a carefully screened and edited set of 6,313 oceanographic stations south of

30°S. The grid point data set was produced by interpolating these data to a uniform rectangular grid system between 30°S and 80°S. The data were provided to NODC by Dr. Arnold Gordon, Professor of Oceanography, Columbia University, who was principal editor of the atlas. A flier describing the data sets was produced and widely disseminated and is available on request from NODC.

NODC Environmental Information Summary No. 82-3

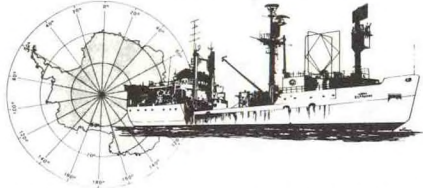
### Data Announcement: Southern Ocean Atlas Data Tapes

The National Oceanographic Data Center (NODC) is pleased to announce the availability of the Atlas Data Set and Grid Point Data Set used in preparation of the Southern Ocean Atlas published by Columbia University Press. The Southern Ocean Atlas was compiled by Arnold Gordon, Professor of Oceanography, Columbia University; E. J. Molinelli, Science Applications Incorporated (now at Planning Systems, Inc.); and T. N. Baker, Research Scientist, Lamont-Doherty Geological Observatory. This project was supported by the National Science Foundation.

To meet the atlas objective of providing a comprehensive, high-quality depiction of present knowledge of the Southern Ocean, the authors assembled a carefully screened and edited set of hydrographic station data, the Atlas Data Set. The first section of the atlas presents interpretive contouring by Gordon and Molinelli of these hydrographic data.



The second section, by Gordon and Baker, presents objective contouring of the same data by a computerized algorithm. As part of this procedure, the hydrographic data were interpolated to a uniform grid system to form the Grid Point Data Set.

The following pages provide further information on the contents, format, and availability of the data tapes. Complete details about the two data sets and their preparation are given in the Southern Ocean Atlas.



Nearly 25 percent of the hydrographic stations in the Atlas Data Set were collected onboard the USNSc ORCANS, the name given to this research vessel after its transfer to Argentina in 1974.

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 U.S. DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration  
Environmental Data and Information Service  
National Oceanographic Data Center  
Washington, D.C. 20235 

November 1982

## Major NODC Data Bases

### OCEANOGRAPHIC STATION DATA (SD) FILE

Data period: 1893 - present  
Size: 689,000 stations

### BATHYTHERMOGRAPH (BT) DATA FILES

Data period: 1941 - present (MBT); 1966 - present (XBT)  
Size: 945,000 (MBT); 357,000 (XBT)

### SURFACE CURRENT DATA SYSTEM (SCUDS)

Data period: 1850s - 1974  
Size: 4,175,000 observations

### MULTIDISCIPLINARY DATA ARCHIVAL AND RETRIEVAL SYSTEM (MULDARS)

Data period: Variable, depends on project; generally mid-1970s to present  
Size: 15,583,000 records\*

<u>MULDARS</u> <u>Data Type</u>	<u>Number of</u> <u>Records*</u>
<u>Physical</u>	
Current meter .....	8,335,000
Automated buoy (winds, waves) .....	3,201,000
CTD/STD .....	1,399,000
Pressure gauge .....	382,000
Other .....	138,000
<u>Chemical</u>	
Ocean chemistry (nutrients) .....	217,000
Pollutants .....	56,000
Other .....	2,000
<u>Biological</u>	
Fish resource assessment .....	526,000
Marine birds .....	504,000
Benthic organisms .....	234,000
Intertidal/subtidal organisms .....	203,000
Marine mammals .....	132,000
Phytoplankton or zooplankton .....	128,000
Primary productivity .....	30,000
Fish or invertebrate pathology .....	18,000
Other .....	9,000

\*A data record consists of an observation or measurement taken at one point in space and time.



# PRODUCTS AND SERVICES

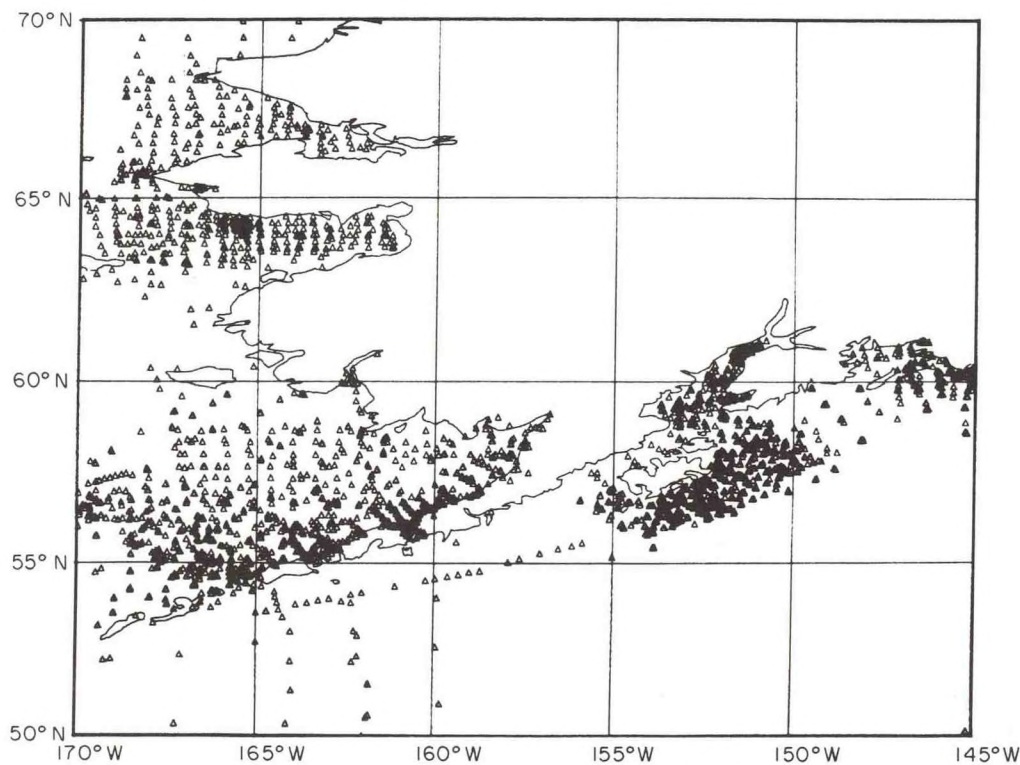
Processing, quality control, and archiving in automated data bases is the first step in making NODC data more accessible and useful. The second step is the production of various formatted data output products. These include computer-generated data summaries and displays and publications. NODC also provides information services by means of a number of ancillary information systems and resources.

## New Data and Information Products

In the wake of major computer conversions in 1980 and 1981, NODC's programming staff has had to devote more attention to ensuring correct operation of old applications programs than to developing new ones. As a result of the conversion process and to meet user needs, however, NODC has continued to modify and enhance many existing appli-

cations programs to provide a greater range of data products.

To help guide users in making data selections, NODC has improved its capabilities to provide inventory information about its holdings of environmental assessment data. For many years, NODC has been able to provide users with graphic data inventories of its Oceanographic Station and Bathythermograph Data Files. These inventories show total amount and distribution of data for selected areas, time periods, and measured parameters. Now NODC is enhancing its ability to provide similar inventories for data in its Multidisciplinary Data Archival and Retrieval System. In 1982 NODC began adapting the proprietary software package called DISSPLA to support production of graphic inventories of marine chemistry and pollution data. The plot below is a sample of one of these inventories.



Location plot of chemical, biological, and pollution data held by NODC around Alaska. This plot shows 5,135 positions of data collected by NOAA; in this area NODC also holds these same kinds of environmental assessment data at 40,830 locations from non-NOAA programs.



## Publications

With its winter 1982 issue, the Mariners Weather Log (which is now on a quarterly publication schedule) celebrated its 25th anniversary. Through regular features such as the "Marine Weather Review," "Tips to the Radio Officer," and "Hints to the Observer," the Log has served as an important link between mariners and meteorologists responsible for marine forecasts. The function of the Log is still accurately summarized by the words of F. W. Reichelderfer, then Chief of the U.S. Weather Bureau, in a foreword to the first issue published in January 1957:

"The Mariners Weather Log ... is published to fill a long recognized need to furnish information to mariners on the weather affecting marine commerce. The weather reports received from vessels at sea have always been essential to the success of our mission of recording, analyzing, forecasting, and summarizing the weather. Without the cooperation of the masters and men of our vast merchant marine in providing regular weather ob-

servations and records our task would be impossible."

As part of its duties as Responsible National Oceanographic Data Center (RNODC) for the FGGE Operational Year, NODC issued a second, expanded version of the Global Ocean Data Inventory. This microfiche publication contains inventory information on 6,242 oceanographic data sets collected (or planned to be collected) during the FGGE (Global Weather Experiment) Operational Year extending from September 1978 through March 1980.

Two new publications were issued in NODC's marine recreation series. Southern New Jersey Recreational Climate: A Guide from Cape May to Pennville is the tenth in a series produced jointly by NODC and the Sea Grant program to provide useful marine environmental data to the general public. NODC's Water Temperature Guide to Atlantic Beaches, a popular brochure published with the same objective in mind, presents monthly (November-March) or biweekly (April-October) average water temperatures at 35 sites from Eastport, Me., to Key West, Fla., and including San Juan, P.R., and Bermuda.

### The Mariners Weather Log

The Mariners Weather Log is a quarterly publication containing articles of interest to the marine community. Each issue includes articles and regular features describing monthly mean weather and severe storms of the North Atlantic and North Pacific. Weather-related ship casualties are listed and, when possible, identified with the storms that caused them. The Log provides complete, comprehensive coverage of tropical cyclones and presents worldwide tropical cyclone track charts. For over 25 years the Log has been a valuable source of information to

shipboard weather observers, merchant seamen, shipping companies, research meteorologists and oceanographers, yachtsmen, and others with maritime interests.

The Mariners Weather Log is produced by the National Oceanographic Data Center. Nonofficial subscribers may obtain the Log from: Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. The subscription fee is \$10.00 in the United States and \$12.50 to foreign addresses. Single copies are \$4.75 each, \$5.95 to foreign addresses.

## NODC Publications, 1982

Global Ocean Data Inventory for the FGGE (Global Weather Experiment) Operational Year, September 1978 through March 1980 (microfiche only)

Revised Data Exchange Formats for the Atlantic Remote Sensing Land Ocean Experiment (ARSLOE)

NODC/1981: National Oceanographic Data Center Annual Report

NODC Environmental Information Summaries

No. 82-1: Announcement of Availability: Global Ocean Data Inventory, September 1978 through March 1980

No. 82-2: Coastal Recreation Brochures

No. 82-3: Data Announcement: Southern Ocean Atlas Data Tapes

Mariners Weather Log, Vol. 26, Nos. 1-4

Southern New Jersey Recreational Climate: A Guide from Cape May to Pennville (jointly with New Jersey Sea Grant Program)

NODC's Water Temperature Guide to Atlantic Beaches

Oceanographic Data Exchange, 1981\*

Supplement No. 14 to the Catalogue of Accessioned Publications, 1981\*

Change Notices Nos. 28 and 29 to the Catalogue of Data\*

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\*World Data Center A for Oceanography

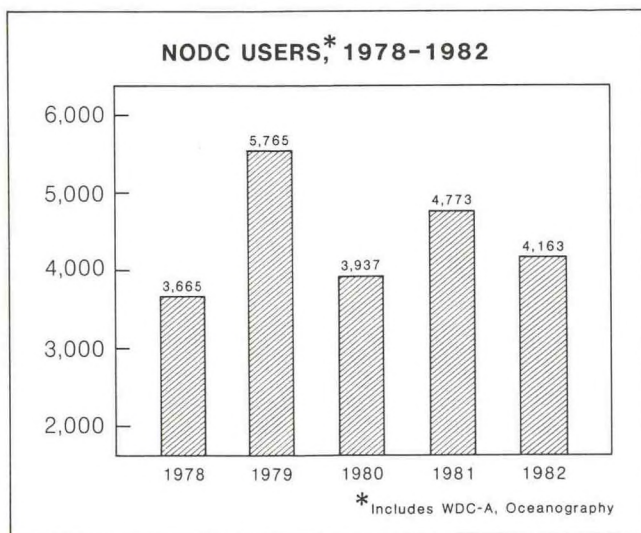
(To request NODC publications, see the Information Request Form on page 22.)



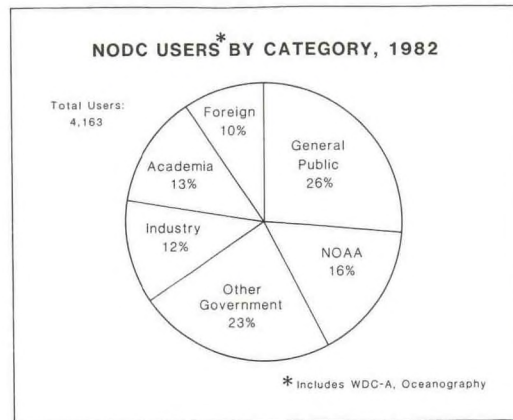
## Users

On October 1, NODC and the other NESDIS data centers began to implement a new system for collecting and compiling information on user requests. This system, which is one module of a developing management information system, is planned to be fully operational in 1983. It will standardize reporting of user statistics among the centers and help in monitoring demand for products and services.

In the last quarter of 1982 NODC user requests showed a sharp decline, resulting in an overall decrease for the year to 4,163 user requests. This decrease is partially an artifact of changes in procedures for counting user requests using the new system, but also appears to reflect both cut-backs in some Government programs and the general state of the economy.



To bring its data products and services to the attention of all potential users, NODC has become more active in exhibiting at marine-related conferences and meetings. In 1982 information about NODC products and services was displayed at the National Maritime Show and at meetings of the Marine Technology Society (Oceans '82), the Coastal Society, the International Association of Marine Science Libraries and Information Centers, and the American Geophysical Union/American Society of Limnology and Oceanography.



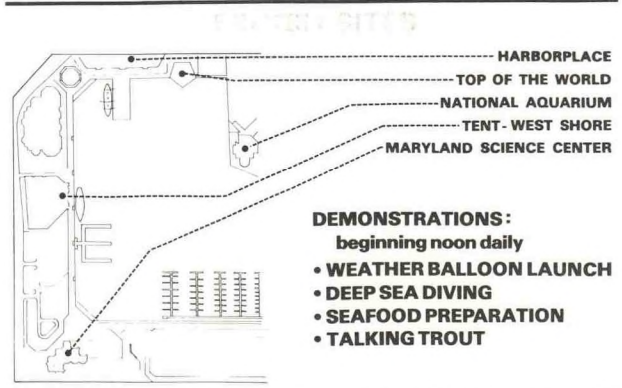
NODC was one of many NOAA elements that participated in a special nine-day exhibit during October 23-31 at the Harborplace development along the waterfront in Baltimore, Md. Organized around the theme "NOAA Serves," the exhibit highlighted the ways in which NOAA products and services support the Nation's vital interests. In addition to activities and displays for the general public, several hundred invited representatives of marine industry participated in a seminar and series of briefings on NOAA's ocean services.



**NOAA  
SERVES**

*America*

WEDNESDAY, OCTOBER 27, 1982  
 WEATHER FORECASTING • SATELLITE PHOTOS  
 SEA AND AIR CHARTS • SEAFOOD IN YOUR LIFE  
 PROTECTING ENDANGERED SPECIES + MORE





# PROGRAMS AND PROJECTS

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NODC provides important services to other agencies and organizations collecting marine data or operating marine data collection programs. These data management services benefit project management by ensuring the rapid processing, ready availability, and physical security of the data. In turn, acquisition of the data by NODC benefits secondary users by increasing the volume and geographic coverage of the national marine data bases. NODC also participates in one legislatively mandated program, the National Marine Pollution Program, which is the coordinating mechanism for ocean pollution activities throughout the Federal structure.

## Ocean Pollution Program

To fulfill its responsibilities to help implement the National Ocean Pollution Planning Act of 1978 (P.L. 95-273), NODC is engaged in a long-term effort to establish an Ocean Pollution Data and Information Network (OPDIN) among participating Federal agencies. In 1982 the pace of this project accelerated and several major milestones were attained:

- o NODC completed the installation at all five of its liaison offices of program-mable workstations. The data communications system provided by these workstations and the workstation at NODC headquarters in Washington, D.C., will provide regional coordination and referral support for the OPDIN as well as enhanced capabilities for data acquisition.

- o With contractor assistance, NODC completed reports that described overall requirements and scope of the OPDIN, reviewed existing Federal marine pollution data and information systems and services, and provided an initial conceptual design for the network.

- o An OPDIN Planning Workshop for invitees from participating Federal agencies was held at NODC in May 1982. The purpose of the workshop was to review the pre-

liminary OPDIN conceptual design and related documents and to make recommendations for completing the detailed system design and implementation of the OPDIN.

- o With assistance of a second contractor, initial steps were taken to carry out the detailed system design tasks (scheduled for completion in 1984).

- o NODC initiated the establishment of an OPDIN "Round Table," an advisory group made up of representatives of participating Federal agencies who will help guide implementation of the network.

- o At the University of Alaska's Arctic Environmental Information Data Center (AEIDC), NODC initiated the "Data Entry Evaluation Project." To be completed in mid-1983, this project is evaluating the efficiency of alternative hardware configurations (terminals, workstations, microcomputers, voice entry equipment) and technical skill levels for converting hard copy marine pollution data into specific NODC digital formats.

- o NODC provided support (with additional funding from the William H. Donner Foundation) for the development of a prototype "coastal information system" that will employ state-of-the-art microcomputers to provide timely and useful information to Federal, State, and regional decision makers. This system is being developed over a two-year period at the Marine Sciences Research Center, State University of New York at Stony Brook under the direction of Dr. Peter Weyl. The Hudson-Raritan estuary is being used as a test area for this project.

In addition the Central Coordination and Referral Office (CCRO) established at NODC to direct the OPDIN coordinated the annual update of the National Marine Pollution Information System (NMPIS). NMPIS inventories approximately 1,000 marine pollution projects conducted or funded by Federal agencies. NMPIS was used to compile the Catalog of Federal



Marine Pollution Programs of Federal Agencies		
(from FY81-85 <u>National Marine Pollution Program Catalog of Federal Projects*</u> )		
Federal Agency	Number of Projects (FY80-83)	FY81 Funds <sup>†</sup> (Thousands of dollars)
Department of Agriculture	10	179
Department of Commerce		
National Bureau of Standards	3	--
National Oceanic and Atmospheric Administration	302	27,326
Department of Defense		
Army Corps of Engineers	55	12,662
Navy	7	4,408
Department of Energy	86	23,119
Department of Health and Human Services		
Food and Drug Administration	12	2,855
National Institute of Environmental Health Services	16	1,613
Department of Interior		
Minerals Management Service <sup>‡</sup>	69	33,380
Fish and Wildlife Service	25	2,657
Geological Survey	110	21,494
Department of Transportation		
Coast Guard	18	3,241
Environmental Protection Agency	339	23,590
National Aeronautics and Space Administration	3	400
National Science Foundation	9	17,735
Nuclear Regulatory Commission	2	1,030
Other Federal Agencies	3	171

\*Prepared from the National Marine Pollution Information System developed and maintained by NODC.

<sup>†</sup>Funding levels may differ from other Federal Plan figures because the primary Federal funder is credited with total project funding and also because of incomplete reporting by some agencies.

<sup>‡</sup>The Minerals Management Service now manages most programs formerly conducted by the Bureau of Land Management.

Projects that appears as Appendix 2 of the Federal Ocean Pollution Plan, 1981-1985.

Continued funding was also provided to partially support publication of Coastal Ocean Pollution Assessment News, a quarterly publication that has become a well-established forum for communication among marine pollution program participants.

## Data Management for Projects

The Alaskan Outer Continental Shelf Environmental Assessment Program (OCSEAP) is the largest and oldest program for which NODC is serving as data manager. NODC has provided support services for OCSEAP since 1975. Formerly operated by

the Department of Interior's Bureau of Land Management, responsibility for this program--and for all offshore oil lease areas--now resides with Interior's new Minerals Management Service (MMS). As a result of this program over 2,200 data sets from Alaskan waters have entered NODC's digital data base.

In 1982 NODC completed processing of most of the data from the Atlantic Remote Sensing Land Ocean Experiment. Wave data from the NOAA Data Buoy Center (formerly the National Data Buoy Office) and the U.S. Army Corps of Engineers Coastal Engineering Research Center (CERC) have been processed and archived and are available for dissemination. Smaller data sets from this program are in processing or not yet received.

## NODC Data Management for Projects

OCSEAP, the Alaska Outer Continental Shelf Environmental Assessment Program, is conducted by NOAA for the Department of Interior. Since the program's initiation in 1975, 2,296 data sets have been received by NODC. During 1982 NODC processed and archived 86 OCSEAP data sets. There are approximately 3.5 million OCSEAP data records in the NODC data base.

MMS/OCS, the Outer Continental Shelf Program of the Department of Interior's Minerals Management Service, sponsors data collection activities designed to establish baseline marine biological and environmental conditions in areas of offshore oil exploration and production. During 1982 NODC processed and archived data from the South Atlantic Benchmark Study, the IXTOC Oil Spill Analysis Study, and the Reef Fish Population Study. During 1983 data are expected from the completed Topographic Features Study and the Southwest Florida Shelf Ecosystem Study, plus new studies in the Gulf of Mexico. Data collected in earlier studies (South Texas Baseline and Mississippi, Alabama, Florida, Louisiana Baseline) are being converted to common MMS/NODC formats. NODC has archived 111 data sets from two other studies: the Southern California Baseline Study (1975-77) and the Ecological Investigations of Petroleum Production Platforms in the Gulf of Mexico (1978-79).

MESA, NOAA's Marine Ecosystems Analysis Program, continued its environmental assessment of the Puget Sound area in 1982, with emphasis on the

sources and effects of toxic chemicals identified in the Sound. At the end of 1982 NODC held 1,034 data sets from the MESA Puget Sound Project and 1,038 data sets from the MESA New York Bight Project.

Strategic Petroleum Reserve/Brine Disposal Program is a NOAA program to provide to the Department of Energy an assessment of the environmental consequences of brine discharge into the Gulf of Mexico and to provide baseline data monitoring at the discharge sites. Since 1977 NODC has archived 1,393 data sets of physical, chemical, and biological data. These data were collected by 10 principal organizations (government, university, and private industry) in the coastal waters of Texas and Louisiana.

GOWON, the Gulf Offshore Weather Observing Network, is a cooperative program between the National Weather Service and participating oil companies to collect marine climatology data (e.g., winds, waves) from offshore oil rigs in the Gulf of Mexico. NODC began receiving and processing these data in 1982.

ARSLOE, the Atlantic Remote Sensing Land Ocean Experiment, was a multinational study of ocean waves and wave-measuring instruments conducted during October and November 1980 off Duck, N.C. Data from the two principal program participants NOAA and the U.S. Army Corps of Engineers, have been received and processed. These data represent wave measurements from 51 stations and include nearly 4 million records.



# DATA SYSTEMS DEVELOPMENTS

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In late 1981 the archive data bases of the National Oceanographic Data Center, the National Geophysical Data Center, and the National Climatic Data Center were installed for the first time on a single computer facility. This computer facility comprises a Univac 1100 series computer and peripheral hardware located at the National Climatic Data Center (NCDC), Asheville, N.C. The Asheville Univac is the central node of a computer and telecommunications network called the Data Archive Management and User Services (DAMUS) system.

The NESDIS data centers began using the DAMUS central computer facility to support their day-to-day operations in early 1982. As the centers become more familiar with this system, their operations will gradually become more adapted to its features and capabilities and their data base management practices more completely integrated. In the long term it is expected that this will provide users more efficient and flexible data access.

## New ADP Facilities

In February NODC began running jobs on the DAMUS central computer to fulfill routine user data requests. By midyear data request operations, archive data base updating, and the bulk of data inventory operations were proceeding normally at the central DAMUS site. Processing of incoming data continues on the NOAA Univac computer in Suitland, Md.

System 2000 was selected as the data base management system for use on the DAMUS central computer. Because NODC's Data Inventory Data Base (DINDB) was previously managed using the DMS 1100 data base management system, a major conversion effort was required to install DINDB on the DAMUS computer. The operation of unloading the data base from the Suitland Univac and reloading it on DAMUS under System 2000 was com-

pleted in January. The task of converting the update, search, and report software was carried on in the following months. As part of the conversion process, the capabilities of the earlier Parameter Inventory Display System, which provided detailed information on NODC's bathythermograph and oceanographic station data holdings, was incorporated into DINDB to yield a unified NODC data inventory system.

With the delivery and installation in September of IBM 5285 workstations at the Woods Hole and La Jolla Liaison Offices, all five of NODC's regional field offices and NODC headquarters are now equipped with these devices. One of the first applications planned for this system is entry of marine pollution data being collected by nations participating in the CARIPOL project, a regional marine pollution monitoring program being conducted under the auspices of the Intergovernmental Oceanographic Commission Association for the Caribbean and Adjacent Regions (IOCARIBE). This task is underway in cooperation with NOAA's Atlantic Oceanographic and Meteorological Laboratory, Miami, Fla.



Judi Saunders of the Data Acquisition and Management Branch uses a programmable workstation to maintain an information file on data from the Strategic Petroleum Reserve/Brine Disposal Project.



## Distributed Access System

NODC's Distributed Access System (DAS) was initiated in 1979 as a project to investigate how microcomputers could be applied to the task of providing direct remote access to NODC's archive data bases. The development of a prototype DAS reached a new plateau during the past year as three major subtasks begun in 1981 were brought to a successful conclusion. Plans were also formulated for steps to be taken in 1983 that will advance DAS closer to fully operational status.

DAS provides access to NODC data bases through a networking arrangement of micro- and mainframe computers. A user at his or her personal microcomputer (user station) submits requests and receives data from the NODC data archive computer (presently a Univac computer located in Asheville, N.C.) via a microcomputer that handles messages and data transfer functions (distribution station).

By the end of February NODC had completed a pilot test of data inventory capabilities for DAS. Software was written and tested to access NODC's oceanographic station data inventory file and display information at the DAS user station. Graphic inventory displays were generated that showed counts of stations meeting specified selection criteria by one-, two-, five-, and ten-degree squares. In a fully operational system this capability will be important to guide users in making data selections.

Timing tests were conducted to compare efficiency of data access from normal and compressed versions of NODC's oceanographic station data file. Preliminary results indicate that data selections can be made more economically from the compressed file and that these economies derive principally from easier file management for the compressed file.

In 1982 NODC also completed the initial phase of work on a DAS subsystem

for accessing the many kinds of environmental assessment data that now form a large and rapidly growing part of NODC's data holdings. A dictionary-driven system was developed for accessing data on benthic organisms (in the NODC File Type 032 format). The tests showed that if the required dictionaries were created, the general software developed could access these kinds of data that are held in several dozen different archive formats.

The DAS concept made its public debut in October at the "NOAA Serves" exhibit and conference at Baltimore's Harborplace. For NODC's contribution to this exhibit, the DAS system was modified to allow presentation of a special display of surface water temperature in Chesapeake Bay. In this modification two Apple microcomputers were used. One served as the user station for submitting requests and displaying selected data, and the other, which contained the data set on diskette, emulated the distribution station. The display presented graphic plots showing surface temperature values at the locations at which they were taken or color-coded squares keyed to ranges of temperature values.

Two major milestones in DAS development are anticipated in 1983. Procurement action will be initiated to obtain a 16-bit microcomputer to serve as a prototype DAS distribution station. In all DAS testing to date (with the exception of the "quasi-DAS" display in Baltimore), the functions of the distribution station have been emulated on the DAMUS central computer. Plans are also underway for DAS to be used in-house by personnel in NODC's User Services Branch. In this first live test of DAS capabilities, cost and time comparisons will be made as actual user data requests are satisfied using DAS versus current data request procedures. This test will be the first time that DAS data selection and data product generation capabilities will be used in an operational mode and not just for demonstration.



# INTERNATIONAL ACTIVITIES

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NODC participates in international marine science activities in two ways: (1) it conducts data exchange and related programs under the terms of bilateral and multilateral agreements with other nations, and (2) it works for multinational cooperation through established scientific organizations. The two leading international marine science organizations are the:

- o Intergovernmental Oceanographic Commission (IOC), a subsidiary body of the United Nations Educational, Scientific, and Cultural Organization (UNESCO), and the
- o International Council for the Exploration of the Sea (ICES), an independent intergovernmental organization.

NODC cooperates with these organizations by sharing in the work of their subsidiary bodies, especially the IOC Working Committee of International Oceanographic Data Exchange (WC/IODE) and the Working Group on Marine Data Management of the ICES Hydrography Committee.

## International Organizations

Among the principal international meetings and consultations in which NODC participated in 1982 were:

- o Fourth Session of the Working Committee for the Global Investigation of Pollution in the Marine Environment (GIPME). GIPME-IV was held at United Nations headquarters in New York in January. NODC Deputy Director Kent Hughes served as a U.S. delegate; Thomas Winterfeld of NODC represented the IOC/IODE. At this session the status of regional programs and of the Marine Pollution Monitoring (MARPOLMON) program were reviewed. The U.S. NODC volunteered to serve temporarily, and on a limited basis, as the Responsible National Oceanographic Data Center (RNODC) for the MARPOLMON petroleum project (MARPOLMON-P) and also to provide training in marine pollution data processing to candidates from other IOC Member States.

- o Fifteenth Session of the IOC Executive Council. NODC Director Edward Ridley participated in this meeting in his capacity as Vice Chairman of the Working Committee on International Oceanographic Data Exchange. Among the resolutions passed at this session, the Council accepted the Summary Report of GIPME-IV and approved the establishment within GIPME of a Group of Experts on the Effects of Pollutants. The Council also recommended to the IOC Assembly the adoption of a comprehensive plan of assistance to enhance the marine science capabilities of developing countries.

- o IODE Consultation and Meeting of the ICES Working Group on Marine Data Management. In May NODC Data Administrator Douglas Hamilton, U.S. representative on the IOC/IODE Group of Experts on Format Development, met with the chairman of the Group to discuss data exchange format cooperation. This was followed by a meeting in Copenhagen, Denmark, of the ICES Working Group on Marine Data Management. The Working Group produced guidelines for exchanging CTD and current meter data and also developed forms for the ICES Environment Officer to use for submitting to the ICES Secretariat data on contaminants in fish and shellfish.

- o CCCO Workshop on Sea Level Data for Climate Studies. Sponsored by the Committee on Climate Changes and the Oceans (CCCO), a joint committee of the IOC and the Scientific Committee on Ocean Research (SCOR), the workshop addressed the question of present availability and future needs for sea level data to support climate studies. A number of recommendations were discussed relating to data needs, including processing, data frequency, archival requirements, and speed of dissemination.

- o Fourth Session of the IOC Group of Experts on Responsible National Oceanographic Data Centers (RNODCs). NODC hosted this meeting in September. Chairman of the Group is NODC Deputy Director Kent Hughes. At the meeting experts re-



## NODC Representation on International Organizations, 1982

E. Ridley	Vice-chairman, IOC Working Committee on IODE U.S. National Coordinator for IODE U.S. Data Coordinator for the North Atlantic Fisheries Organization (NAFO)
K. Hughes	Chairman, IOC/IODE Group of Experts on Responsible National Oceanographic Data Centers (RNODCs) Executive Secretary, U.S. Subpanel for the IOC Global Investigation of Pollution in the Marine Environment (IOC/GIPME)
J. Churgin	Chairman, IOC/IODE Group of Experts on the Marine Environmental Data Information (MEDI) Referral System Member, IOC/IODE Task Team on Ocean Data Manage- ment for Climate Studies and Applications Member, POLYMODE Executive Committee and POLYMODE Atlas Editorial Board
T. Winterfeld	IOC/IODE Rapporteur on IGOSS Data Archiving and Exchange Data Coordinator for IOCARIBE Member, IOC/IODE Task Team on Review of DNP/NOP Announcement
R. Lockerman	Chairman, IOC/IODE Task Team on Development of IODE Data Center Services
M. Christman	Member, IOC/IODE Task Team on Marine Biological Data
E. Collins	Member, ICES Working Group on Marine Data Manage- ment
R. Cuzon du Rest	Member, IOC/IODE Task Team on Marine Pollution Data Exchange
P. Hadsell	Member, IOC/IODE Task Team on Measured Wave Data Management
D. Hamilton	Member, IOC/IODE Group of Experts on Format Development Member, ICES Working Group on Marine Data Manage- ment
I. Perlroth	Member, IOC/IODE Task Team on Standard Criteria for Physical Oceanographic Data

presenting three countries and three United Nations agencies discussed progress since the previous meeting (Paris, January 1981) and plans for future activities. Particular consideration was given to the evolution of the Pilot Program for RNODCs into an operational program and the changing nature and responsibilities of the Group of Experts. Reports were received from the World Data Center System and from the existing worldwide network of RNODCs. Final corrections were applied and preparations made for the translation, printing, and dissemination of the Guide for RNODCs (which is now available through IOC/UNESCO, Paris).

o Twelfth Session of the IOC Assembly. The future of ocean research was a major theme of this biennial meeting of the IOC Assembly held in November. The Assembly noted the completion of a draft report on "Ocean Sciences for the Year 2000", which was finalized following a meeting in April 1982 at Villefranche-sur-Mer, France. This theme was highlighted by the Anton Bruun Memorial Lectures that covered the four major areas of the report: the ocean floor and what lies beneath it; biological oceanography; ocean chemistry; and physical oceanography and climate. Following the recommendations of IOC advisory groups, two new IOC scientific programs were adopted: Ocean Science in Relation to Living Resources (OSLR) and Ocean Science in Relation to Non-Living Resources (OSNLR). The Assembly also urged Member States to be more timely in their data exchanges in order to accelerate data flow into the IOC network.

## Foreign Assistance

J. S. Sarupria of the India National Oceanographic Data Center, Goa, India, visited NODC for a four-week training period in September and October. His visit was supported in part by funds from the Intergovernmental Oceanographic Commission as part of a continuing cooperative program with NODC. Mr. Sarupria, who is in charge of computer software development at his home institution,

studied data format development, automated data quality control, and international data exchange practices and procedures at NODC. Before returning to India, Mr. Sarupria also visited both the Marine Environmental Data Service (MEDS), Ottawa, Canada, and the Marine Information and Advisory Service (MIAS), Bidston, United Kingdom.

In October four marine data specialists from the People's Republic of China (PRC) arrived for a six-month period of on-the-job training in the United States. Messrs. Hou Wenfeng, Guo Fengyi, and Wang Deyuan will spend this time at the NODC. After a brief orientation period at NODC, Mr. Shan Yichun traveled to Boulder, Colo., where he will complete his training at the National Geophysical Data Center (NGDC). The visitors are affiliated with the Institute of Marine Scientific and Technological Information, National Bureau of Oceanography, Tianjin, PRC. This program of mutual exchange, under which NODC is assisting in the development of the National Oceanographic Data Center in China, is being conducted as part of activities covered by a bilateral agreement between NOAA and the PRC National Bureau of Oceanography

## Foreign Visitors

In addition to trainees from foreign institutions, NODC welcomed many other distinguished visitors in 1982. Among these were the directors of four foreign national oceanographic data centers.

In March a group of attendees at the Joint IOC/WMO Group of Experts on Quality Control of IGOSS Data toured NODC. IGOSS, the Integrated Global Ocean Station System, is a worldwide ocean services program established to coordinate the international machinery needed for timely acquisition and exchange of ocean data, particularly oceanographic analysis and prediction products. The group was briefed on NODC processing and quality control procedures for XBT and hydrocast data. In addition to U.S. representatives, the group included:

o V. Demin, State Central Committee for Science and Technology, USSR;



- o Lin Huiyong, Institute of Oceanographic Instrumentation, National Bureau of Oceanography, People's Republic of China;
- o Koichi Nagasaka, Marine Department, Japan Meteorological Agency, Tokyo, Japan; and
- o Miguel Rebolledo, National Meteorological Service, Buenos Aires, Argentina.

The following visited NODC as participants in the Fourth Meeting of the Group of Experts on RNODCs:

- o Dr. Yoshio Iwabuchi, Director, Japan National Oceanographic Data Center, Japan;
- o Carlos Lopez Lozano, Director, Colombia National Oceanographic Data Center, Colombia; and
- o Dr. Iouri Oliouline, Assistant Secretary, Intergovernmental Oceanographic Commission, Paris, France.

In December we received a visit from:

- o Dr. Marthe Melguen, Head of the Bureau National des Donnees Oceaniques (BNDO, the French National Oceanographic Data Center), Brest, France,

who negotiated renewal of a marine data exchange agreement with the U.S. NODC. The agreement was originally signed in 1976 and revised in 1977. The agreement was updated in 1982 as part of the broader U.S.-France Cooperative Program in Oceanography. Besides data exchange and servicing of requests, the BNDO cooperated with NODC in carrying out many of the duties of the RNODC for the FGGE Operational Year. Future cooperation between the two centers will also include exchange of graphic data inventories and development of a system for processing and archiving data from electronic profiling instruments such as CTDs.

Others who visited NODC during the year included:

- o Thomas Dalzell, Chief of the Marine Science Branch, Office of the Hydrographer of the Navy, United Kingdom;
- o Laurie Davidson, Seaconsult Ltd., St. John's, Newfoundland, Canada;

- o Menachem Dishon, an Israeli scientist currently working at NASA's Institute of Space Studies;

- o Charles Glennie and Henry Jones, Marine Environmental Data Service, Department of Fisheries and Oceans, Ottawa, Canada;

- o Maximiliano Gutierrez, Eduardo Carrasco, and Guillermo Rios, fisheries experts and economists from Chile;

- o Dr. Habibe, Minister of State for Research and Technology, Indonesia;

- o Reidar Leinebø, Director, Norwegian Oceanographic Data Center, Norway;

- o Nur Mohammad, World Meteorological Organization/United Nations Development Program Fellow, Bangladesh;

- o Irfan Sahin, Director-General for Fisheries, Turkey;

- o T. Sivagnenam, Economic Minister, Embassy of Sri Lanka;

- o Chris Synman, South African Data Center for Oceanography, Republic of South Africa;

- o Steve Tibbitt, Intergovernmental Oceanographic Commission, Paris, France;

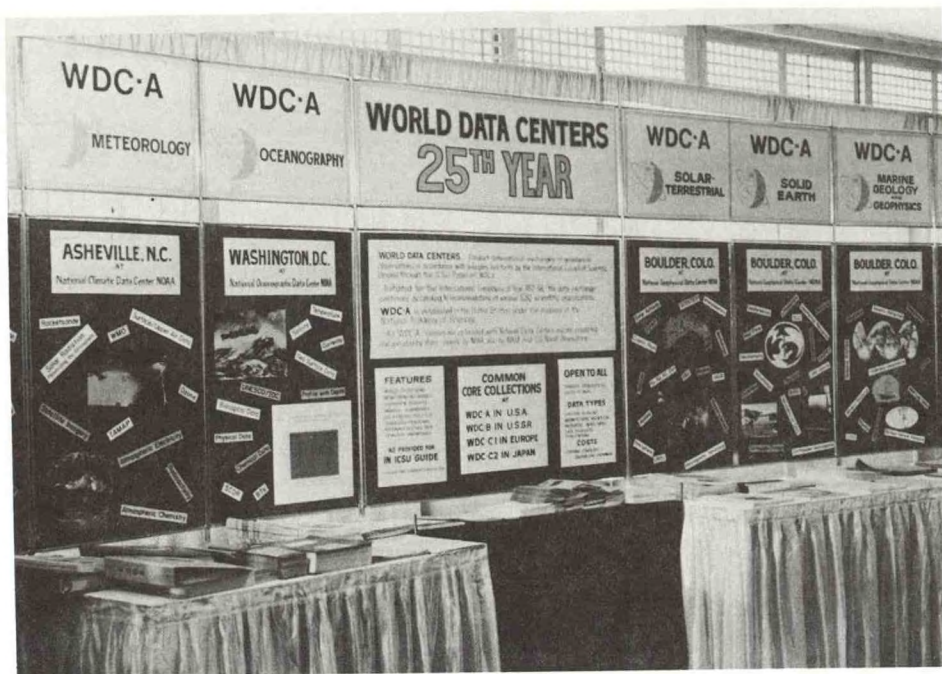
- o Dr. Klaus Tietze, Federal Institute for Geosciences and Natural Resources, Hannover, Federal Republic of Germany; and

- o Zulma de Valenzuela and A. Ugolve, National Research Council of Costa Rica, Costa Rica.

## World Data Center A, Oceanography

In 1982 the scientific community celebrated the 25th anniversary of three landmark events in the history of the earth sciences: the International Geophysical Year (IGY) of 1957-58; the launching of the first artificial earth satellite; and the establishment of the World Data Center (WDC) System. IGY was the largest international scientific project conducted up to its time, and it created a spirit of international cooperation that continues to this day. By fostering rapid adoption of newly developed technology for data acquisition





World Data Center A exhibit marking the 25th anniversary of the World Data Center system. This exhibit and special commemorative programs were featured at the 1982 fall meeting of the American Geophysical Union.

such as earth satellites, it also engendered a step increase in the amount of environmental data being collected worldwide.

The WDC system was the mechanism established to ensure the physical security, rapid exchange, and easy accessibility of this wealth of new data. Although originally planned to last only until its IGY task was completed, the WDC system was so successful in fulfilling its functions that its operation was continued under the auspices of the International Council of Scientific Unions. To help commemorate this anniversary, the National Oceanographic Data Center, as the operating facility for World Data Center A for Oceanography, shared in sponsoring a special exhibit booth at the fall meeting of the American Geophysical Union held in San Francisco, December 7-15. The exhibit highlighted products and services available from the WDC discipline subcenters operated by NOAA and other U.S. agencies.

During the 25-year period since its inception, WDC-A, Oceanography, has built an international data base containing more than 1,680,00 marine scientific observations. The data base in-

cludes data from 730,000 oceanographic stations, as well as collections of bathythermograph data, biological observations, and current measurement data.

During 1982 WDC-A, Oceanography, received data for 80,000 marine scientific observations, including data from 35,000 oceanographic stations. All data held by the Center are described in Change Notices to the Catalogue of Data.

Data inventory forms such as the Report of Observations/Samples Collected by Oceanographic Programs (ROSCOP) provide WDC-A, Oceanography, and other centers with a means of determining the availability of internationally exchangeable data in advance of the actual receipt and cataloging of the data by the Data Center. During 1982 a total of 883 ROSCOP forms describing oceanographic cruises were received by WDC-A. The total number now on hand is 12,946.

WDC-A, Oceanography, also received 1,350 marine scientific publications and articles from 36 nations and 8 international organizations. These documents are listed and indexed in yearly Supplements to the Catalogue of Accessioned Publications.



# ORGANIZATIONAL AFFAIRS

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Both NODC and its parent agency, the National Oceanic and Atmospheric Administration (NOAA), were reorganized in 1982. These changes were made to improve operating efficiency and to provide the organizational connections and interrelations that would strengthen both organizations' abilities to meet user needs.

## New NOAA and NODC Structures

The new NOAA structure includes five major line organizations: the National Ocean Service (NOS); the National Weather Service (NWS); the National Marine Fisheries Service (NMFS); the National Environmental Satellite, Data, and Information Service (NESDIS); and the Office of Oceanic and Atmospheric Research (OAR). The reorganization primarily involved ocean programs, satellite programs, and NOAA's data centers. The NODC and the other environmental data centers are now united with the satellite offices in NESDIS.

NODC's new internal structure became effective in March. Two major objectives of the NODC reorganization were consolidation of ADP activities and creation of a single organizational focus for international programs. The elements established to meet these objectives are the ADP Support Division and the International Programs Branch in the Information Services Division. In addition two new positions were created in the Office of the Director: Staff Assistant for Science and Data Administrator.

## NODC People

As a result of the NODC reorganization, a number of managers were reassigned to new positions or continued to head units that were renamed to reflect new functions. Elaine Collins, formerly Director of the Data Acquisition and Monitoring Division, was named Staff Assistant for Science; Douglas Hamilton, formerly

Chief of the Data Processing Branch, became NODC Data Administrator. Ronald Moffatt, Associate Director of World Data Center A for Oceanography, is now also Chief of the International Programs Branch. Two new Branch Chiefs were appointed to positions in the ADP Support Division. Debra Knoll is now Chief of the ADP Facilities Branch and Walter Morawski heads the Operations Support Branch.

In September NODC computer systems analyst Michael McCann was named EDIS Outstanding Employee of the Year. This award was presented to Mike for his achievements in converting NODC programs from the DMS 1100 to System 2000 data base management systems. Mike also developed procedures to streamline NODC oceanographic station data processing. His efforts resulted in a savings in computer operating costs of 45 percent over previous methods.

In a continuing effort to bring career opportunities in the marine sciences to the attention of women and minorities, NODC employees during the year participated in a number of conferences and college job fairs. NODC representatives attended meetings of the National Association for the Advancement of Colored People (NAACP), National Urban League, Federally Employed Women (FEW), Incorporated Mexican American Government Employees (IMAGE), and National Association for Equal Opportunity in Higher Education. NODC volunteers also participated in career related programs at American University, Washington, D.C.; Prince George's Community College, Largo, Md.; Morgan State University, Baltimore, Md.; St. Paul's College, Laurenceville, Va.; and Howard University, Washington, D.C.

NODC also helped support production of a special issue of Current: The Journal of Marine Education that was devoted to "Minorities in Marine Education." Current is published quarterly by the National Marine Education Association.

## PREVIEW, 1983

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A concerted effort to simplify and modernize data processing operations in 1982 yielded new record highs for the total volume of data processed by NODC in a year. More importantly unit costs for data processing have been significantly reduced. Further improvements in operating efficiency and in user services are anticipated in 1983 as a direct result of actions taken in 1982.

In November 1982, after a period of adjustment to the new organizational structure, NODC managers participated in a three-day retreat. During this time an intensive program review was conducted to identify and to develop action plans for dealing with NODC's most pressing operational problems. Milestone charts for about a dozen priority projects map out NODC's principal tasks for 1983. Among these are:

- o implementing a system for processing and archiving data from electronic CTD/STD profiling instruments;
- o continuing development and testing of the pilot Distributed Access System (DAS) and extending DAS to handle more types of data;
- o improving the speed and efficiency of NODC's data inventory system;

- o developing procedures and software for handling data in the General Format 3 (GF-3) international data exchange format; and
- o completing delayed updates of major NODC archive data bases.

This agenda for enhancing NODC's capabilities is being addressed in the context of a major NOAA initiative to improve ocean services. This theme was heralded in 1982 in messages delivered by NOAA Administrator John V. Byrne at marine-related conferences and meetings in Boston, Baltimore, and Washington, D.C.

The principal expression of this renewed focus on ocean services will be the establishment in Seattle in late 1983 of the NOAA Northwest Regional Ocean Services Center. This will be the first in a series of such ocean services centers planned for coastal regions of the United States. A complete range of ocean products and services--nautical charts, historical data, satellite data and imagery, fisheries information, and ocean forecasts--will be available through this system that is being created to foster a "whole NOAA" approach to ocean services.



## **For Further Information . . .**

To obtain further information about NODC data products and services, please complete and send to NODC the Information Request Form on the following page.

# NODC Information Request Form

FROM: (Name) \_\_\_\_\_  
(Organization) \_\_\_\_\_  
(Address) \_\_\_\_\_  
(City) \_\_\_\_\_ (State) \_\_\_\_\_ (Zip) \_\_\_\_\_

- Please send NODC User's Guide and other general information about NODC data products and services.
- Please send specific information about following product or service:  
\_\_\_\_\_
- Please send copy (if free) or price information on the following NODC publication(s):  
\_\_\_\_\_  
\_\_\_\_\_
- Please send data inventory for:  
Data type and/or parameter (e.g., BT, Nansen cast, salinity):  
\_\_\_\_\_  
Project, if applicable (e.g., OCSEAP, MESA, OTEC):  
\_\_\_\_\_  
Geographic area (by latitude/longitude):  
\_\_\_\_\_  
Time period (specify all available data, or ranges of months/years):  
\_\_\_\_\_  
Depth criteria, if any (e.g., observations deeper than 1,000 m):  
\_\_\_\_\_  
(Note: User telephone number required for data inventory requests)
- Other: \_\_\_\_\_  
\_\_\_\_\_

Mail this form to: National Oceanographic Data Center  
User Services Branch  
NOAA/NESDIS E/OC21  
Washington, DC 20235



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