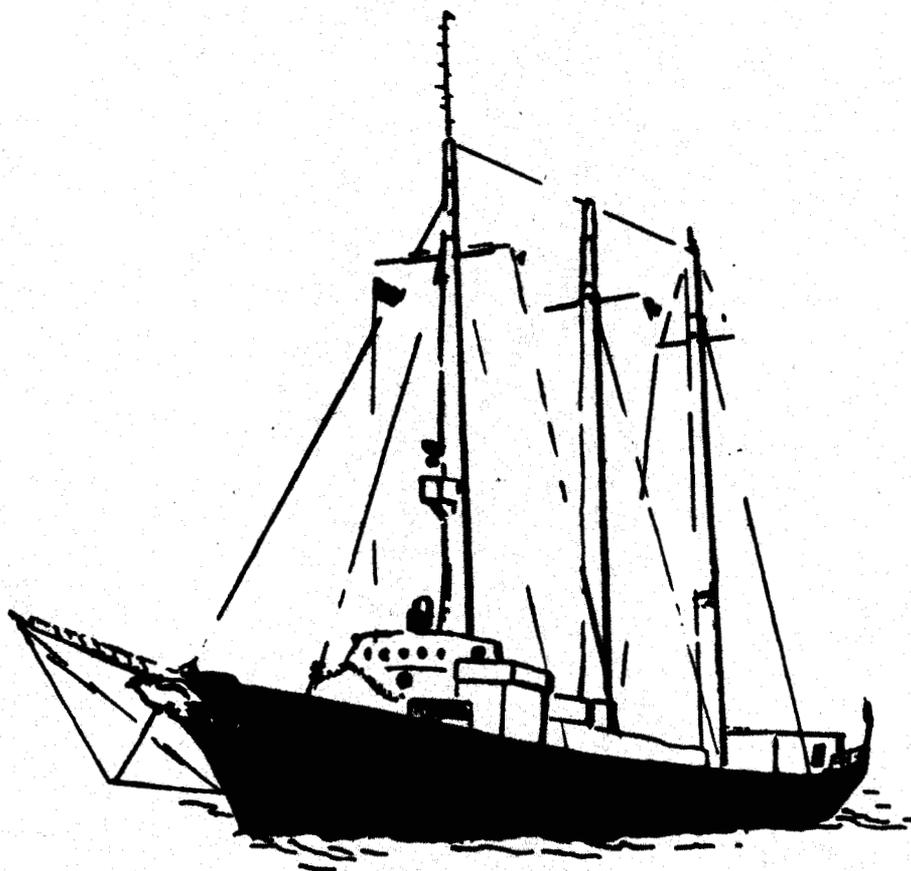


Key to Geophysical Records Documentation No. 14
(REVISED) JANUARY 1984



MARINE GEOLOGY AND GEOPHYSICS DATA SERVICES AND PUBLICATIONS



noaa

**NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL ENVIRONMENTAL SATELLITE, DATA, AND INFORMATION SERVICE
NATIONAL GEOPHYSICAL DATA CENTER**



U.S. DEPARTMENT OF COMMERCE

Malcolm Baldrige, Secretary

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

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**NATIONAL ENVIRONMENTAL SATELLITE, DATA,
AND INFORMATION SERVICE**

John H. McElroy, Assistant Administrator

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INTRODUCTION

The National Oceanic and Atmospheric Administration (NOAA), through its National Environmental Satellite, Data, and Information Service (NESDIS), has the responsibility for the collection, management, and dissemination of many kinds of data resulting from man's inquiry into his environment. The NESDIS data-file holdings range from the Earth's core to the top of the ionosphere, to support research and operations in the disciplines of Solid Earth Geophysics (gravity, magnetism, seismology), Marine Geology and Geophysics (sediment characteristics, gravity and magnetic fields, seismic profiles, bathymetry), Oceanography (temperature, currents, composition, biota), Meteorology (climatology, circulation, support to forecasting), and Solar-Terrestrial Physics (ionospheric activity, solar flares, aurora). Data for these subject areas are collected by public and private institutions worldwide by satellites, aircraft, ships, ground-based instruments, and devices penetrating the Earth's crust. The data are gathered together by NESDIS Data Centers for distribution to data users.

The National Geophysical Data Center (NGDC) is one of the four data-management centers of NESDIS. NGDC also operates World Data Centers A for Solar-Terrestrial Physics, for Solid Earth Geophysics, for Marine Geology and Geophysics, and for Glaciology under the supervision of the Panel on World Data Centers of the International Council of Scientific Unions. This catalog briefly describes NGDC's products and services in marine geology and geophysics.

DATA REPOSITORY

NGDC is the national repository for marine geological, marine geophysical, and related data. Data from domestic and foreign universities, research centers, governmental and other organizations are submitted to NGDC through data exchange or contractual agreements. After these data pass through quality-control measures, processing procedures, and documentation, they are made available in many formats that range from simple paper or film copies to sophisticated computer-produced products.

Programs

NGDC is responsible for acquiring, processing, storing, and disseminating data that result from international and national programs such as the International Decade of Ocean Exploration (IDOE), the Outer Continental Shelf Environmental Assessment Program (OCSEAP), Deep Ocean Mining Environmental Study (DOMES), and the Marine Eco-Systems Analysis program (MESA). NGDC provides timely status information to field operations and makes the data available from such programs to others. NGDC also holds and disseminates data for other government agencies. Examples are data related to hazardous geological structures or other constraints to drilling in OCS

Lease Sale areas and well logs and common depth point (CDP) seismic reflection data collected by the Department of Interior's U.S. Geological Survey and Minerals Management Service and digital hydrographic data collected by the NOAA National Ocean Survey (NOS).

Formats

All aspects of data management, including quality control, processing, documentation, storage, and dissemination, are greatly enhanced by using standard formats for particular kinds of data. Standard computer-compatible formats typically evolve to satisfy national needs. The following are examples of such formats:

Digital Data Formats

Marine Geophysical Data Format:

This format was revised and published in 1977 in The Marine Geophysical Data Exchange Format-MGD77, RGRD-10. The new format, known as MGD77, adds a header structure that documents the data and increases the content and the precision of the data record. A subset (SEISNAV format) is used in seismic data sets to provide digital shot-point navigation.

Marine Geological Data Formats:

- (a) "Index to Marine Geological Samples" (Core Curators' Data Base). This format was developed jointly by NGDC and representatives of the major U.S. Marine Geologic Sample Repositories. The data base includes lithology, age, and collection and storage information for most U.S. marine samples. A complete description of the data base and format is available in Publication 82-MGG-08.

In support of the OCSEAP and MESA programs (multidiscipline scientific inquiries that assess environmental hazards), the following data formats are in use:

- (b) Textural analyses format - results of sediment given in sample weight-percent distribution as a function of particle size and as summary statistics.
- (c) Geotechnical properties format - including liquid and plastic limits, shear strength, Atterberg limits, and auxiliary data such as grain size, carbon content, porosity, and permeability. This format is now being extensively revised; copies of the latest draft are available for review.

Nondigital Data Formats

Nondigital underway geophysical data, such as original fathograms, magnetic and gravity analog records, and seismic reflection or seismic refraction profiles, are generally stored and disseminated on 35-mm microfilm. Seismic reflection data from Lamont-Doherty Geological Observatory are available only as contact prints made from 8 1/2 x 11" negatives. Each negative normally contains about 600 nautical miles of underway seismic reflection data.

Nondigital geological data (geochemistry, paleontology, well log data, sediment descriptions, and other analyses) are stored on microfilm, on microfiche, or as paper copies. Many sets are stored in multiple formats. Computerized geological data are stored in many formats and are available on magnetic tape or as listings on microfilm or computer printouts.

DATA SERVICES

The following sections in this catalog outline certain popular data services offered by NGDC. General facts about information accompanying the data sets, areas of coverage, source of the data sets, and available formats are given. Data inventories or searches are, in general, provided free of charge initially, in anticipation of later purchases or exchanges of data. Inquiries about the data sets and their prices may be made by phone: (303) 497-6338 or FTS 320-6338, or by mail:

National Geophysical Data Center
NOAA E/GC 3
325 Broadway
Boulder, CO 80303

Department of Commerce policies now require prepayment for all non-Federal orders for data. Orders will be expedited if requestors confirm the current prices for data prior to ordering.

When requesting data on magnetic tape, please specify the following parameters (9-track tape is assumed):

Density : 800, 1600, or 6250 BPI
Coding : ASCII or EBCDIC
Blocking: Maximum blocksize possible
is 32768 characters

Seven-track tapes are available, but their use is discouraged. Please do not ask for punched cards.

Remote Computer Access to Data Inventories

Worldwide inventories of marine geological and geophysical data can be accessed by remote data terminals. Included are geological analyses of more than 132,000 seafloor samples and about 8.7 million trackline miles of underway geophysical data (bathymetry, gravity, magnetics, and seismic profiles).

Access to these systems will provide graphical output direct to the user's terminal. The growing menu of programs, now available nearly 24 hours a day, 7 days a week will enable any user to determine the

amount of data pertinent to his interests held by NGDC.

Programs now operational can provide:

- An inventory search of geophysical cruise tracks by institution, ship, area, type of data collected, etc. Results are summarized and files saved for later plotting or for automatically selecting the digital and analog data.
- Plots (in Tektronix-compatible graphical code) of individual cruise tracklines for specific data parameters for cruise ID's selected from the NGDC inventory.
- Composite trackline plots of tracks found by Search . This program can plot portions of the cruise which crossed the selection area and contains the desired data: e.g., the part of the selected trackline containing gravity data.
- MGD77 header information for individual cruises selected from the NGDC inventory, as well as headers found by search.
- Annotated data requests for MGD77 digital cruise data found by search.
- Automatically prepares digital tape copies of the requested data.
- An inventory plus brief lithologic description and age for marine geological samples stored in the major United States core-curating facilities. Searches may be made by institution, ship, area, cruise, date of collection, type of sample, etc. Plots of station locations are also available on hardcopy or microfilm.

Data Announcements

To make marine geological and geophysical data rapidly accessible, NGDC disseminates Announcements of the availability of significant data acquisitions, which contain brief but complete information about specific data sets, including source, description, geographic coverage, and ordering instructions. Names are added to the mailing lists for Announcements on request. A current list of Announcements is given on pp. 15 and 16.

Special Products

The NGDC has the capability to generate special data products tailored to the needs of the user community. For example, custom plots, either on hard copy or microform, can be created displaying data, ship tracks, shorelines, and other features. Plots can also be constructed in varying scales and in many popular map projections.

MARINE GEOPHYSICAL DATA

Data from most geophysical disciplines are represented in the marine geophysical files. They include bathymetry, magnetics, gravity, and seismics in both analog (original records or microfilm) and digital (magnetic tape) formats.

Underway Geophysics

The digital marine geophysical data base contains digitized bathymetric, magnetic, and gravimetric data from port-to-port survey operations. Contributors to this file include domestic and foreign universities, research centers, governmental and other organizations. Each digital record, in general, contains fields for:

- survey identification
- data and time
- position
- bathymetry
- magnetics
- gravity

These data are sent out in the international exchange format MGD77, which contains "Header" information such as instrumentation, reference fields, etc., as well as the data records.

A data base management system called GEODAS (GEOphysical DATA System) has been developed by the Center specifically for marine geophysical data. This is a fully automated system that:

- (a) processes digital underway geophysics data into a data base with a common format (MGD77),
- (b) provides inventory trackline plotting and summary capabilities for both analog and digital data, and
- (c) allows automatic digital and analog data retrieval.

GEODAS is a "user friendly" system which can be easily queried by a non-professional staff as well as outside users. Figure 1 (see centerfold) is a worldwide track chart generated by GEODAS which displays NGDC's entire underway geophysical data holdings, both analog and digital, as of Sept. 1, 1983. Figure 2 is an inventory search summary of these data.

Underway geophysical data collected by the GLOMAR CHALLENGER while enroute between and in the vicinity of DSDP drilling sites are available. Digital bathymetry and magnetics on magnetic tape are in MGD77 format. The analog data are provided as 35-mm film copies of seismic profiling records, magnetic total field analog records, and echo sounder analog records.

Multichannel Seismic Reflection Data

NGDC's marine seismic profile holdings include most types of marine seismic profile data collected. These data include single-channel and multichannel reflection data (see fig. 3), as well as seismic refraction data. These data are disseminated in analog format (e.g., 35mm microfilm).

GEOPHYSICAL DATA SUMMARY IN NAUTICAL MILES

INST	CRUISE/LEGS	NAVIGATION	BATHYMETRY	MAGNETICS	GRAVITY	SEISMICS	SSCAN/REFRAC	DIG REC COUNT
LAMONT (LDGO)	514	2211160.0	1995166.0	1806366.0	1597331.0	1652600.0	285335.5	3665661.
WOODS HOLE O.I.	182	785550.6	697312.6	357952.9	326897.4	300667.1	19695.7	1212931.
NOAA	131	778469.4	747142.1	715624.3	530559.4	261514.7	8208.1	783725.
US ARMY	12	3682.2	.0	.0	.0	3682.2	.0	.0
US GEOL. SURVEY	114	159447.5	46638.1	19378.4	18784.9	83623.1	9317.3	306774.
OREGON ST. UNIV	76	166528.9	148317.5	120608.2	108501.3	59145.8	27227.8	328757.
HAWAII INST GEO	99	377194.5	357566.7	254205.9	251928.1	110616.6	64273.4	1634075.
US NAVY	283	1330318.0	877027.6	490174.9	78721.9	913972.0	.0	3341090.
UNIV OF TEXAS	9	28437.7	20634.7	24599.8	.0	21822.2	.0	49121.
CANADA	2	1285.3	1284.4	1247.4	1276.7	.0	.0	13843.
UNIV OF CONN.	5	5321.9	3892.5	.0	5320.4	.0	.0	3436.
U.MIAMI (RSMAS)	31	224588.6	.0	190151.1	.0	129182.7	.0	.0
SCRIPPS INST.OC	427	1544659.0	1401862.0	1170307.0	22973.1	630188.6	.0	2580671.
U RHODE ISLAND	14	81368.8	80679.4	73292.1	.0	23780.5	.0	.0
DUKE UNIVERSITY	1	3381.0	3381.0	.0	.0	.0	.0	.0
UNITED KINGDOM	14	92451.6	89921.9	79348.9	54111.1	.0	.0	192522.
U. WASHINGTON	7	23581.0	378.2	.0	.0	20010.2	.0	.0
WESTERN GEOPHY.	1	440.8	.0	.0	.0	440.8	.0	.0
TEXAS A+M UNIV.	4	3322.7	3322.7	.0	.0	.0	.0	26165.
MONACO	1	5959.3	.0	.0	.0	5959.3	.0	.0
USSR	6	70235.2	52940.5	.0	.0	.0	.0	.0
JAPAN	74	397250.7	340364.2	287643.9	268957.0	.0	.0	312020.
NETHERLANDS	1	715.3	715.3	715.3	715.3	.0	.0	.0
MIN MANAG SERV	20	85231.9	84279.2	.0	.0	85231.9	69438.4	624266.
ISRAEL	1	437.9	.0	.0	.0	437.9	.0	.0
FRANCE	89	176228.8	115989.2	81555.9	42666.9	.0	.0	454991.
SOUTH AFRICA	6	17228.1	16813.1	17031.2	.0	.0	.0	25285.
INT. GRAV. BUR	17	134286.9	127492.9	.0	134270.8	.0	.0	60309.
GRAND TOTALS		8708749.0	7213113.0	5690195.0	3443009.0	4302868.0	483496.1	15615630.

Figure 2. Total marine underway geophysical data holdings.

As part of a program by the U.S. Geological Survey (USGS) to gain a better understanding of the Continental Margin and to help assess its petroleum potential, a number of multichannel common depth point (CDP) seismic reflection lines have been collected from the Atlantic, Pacific, and Alaskan coastal areas (see fig. 4 for portions of the Atlantic OCS). NGDC is the dissemination point when the data are released by USGS.

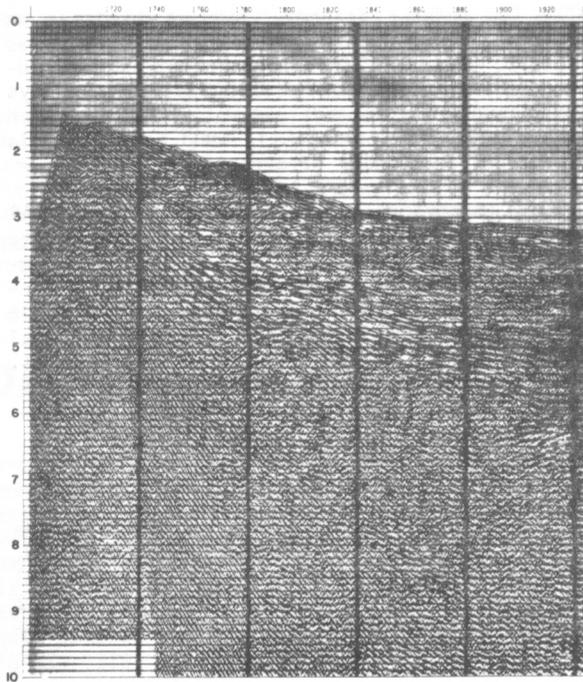


Figure 3. Common Depth Point (CDP) seismic section.

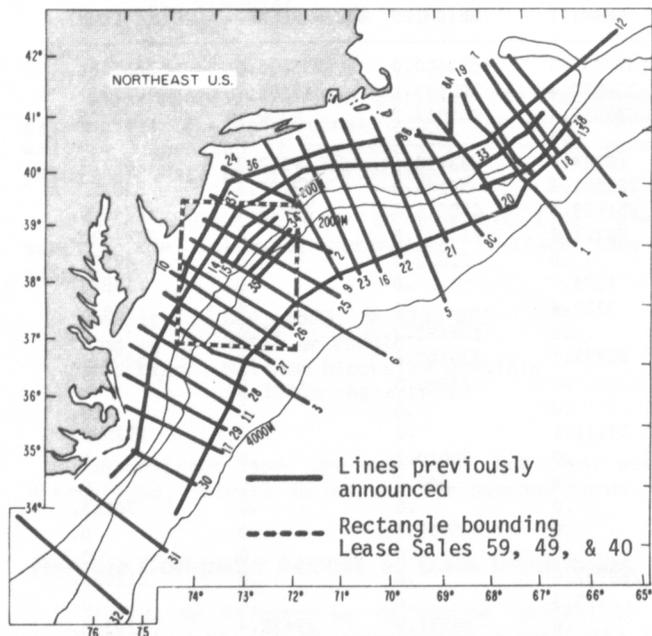


Figure 4. Common Depth Point (CDP) line locations for portions of the Atlantic Continental Shelf.

In addition to CDP sections, field tapes in SEG-Y format are available for some lines.

OCS Lease Sale and Hazards Data

To insure safety and environmental protection in oil and gas operations on the Outer Continental Shelves, the Minerals Management Service has acquired high-resolution seismic data essential to identify regions of geological hazards to construction (i.e., slumping and faulting). The data (on microfilm and magnetic tapes) and their interpretations (in the form of maps; see fig. 5) are disseminated as sets that support specific lease sale areas.

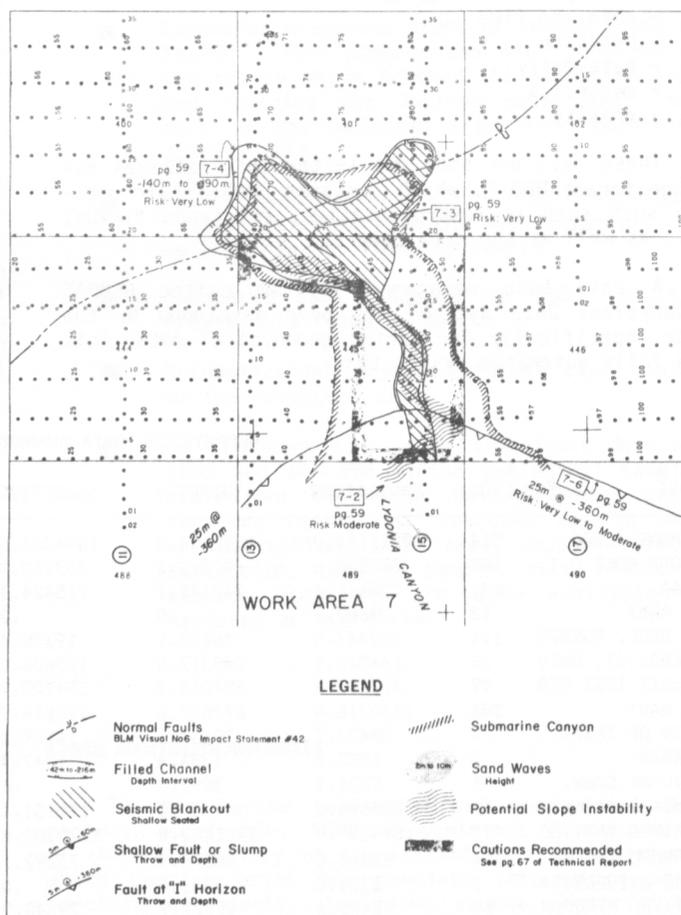


Figure 5. Portion of hazards map of Georges Bank area.

Lease sale data sets are available from Georges Bank, Baltimore Canyon Trough, and other Atlantic Coast OCS areas, Gulf of Mexico, and offshore California and Alaska. Data contain single and multi-channel seismic, bathymetry, including side-scan sonar records, interpretive reports, maps, and navigation plots. Data are available both on paper and microfilm.

Coastal NOS Hydrography

Digital hydrographic data (soundings, bottom characteristics, dangers to navigation) collected by NOAA's National Ocean Survey (NOS) are available. All data collected by NOS between the years 1935 and 1965 are incorporated in the data base (approximately 28 million records). The pre-1965 data were digitized off the hydrographic smooth sheets (plots made to the same scale as the original sheets and are the official permanent record of a hydrographic survey). All digital data collected after 1965 are incorporated in the data base as it is received at NGDC. To date, approximately 4 million post-1965 records have been included in the data base. The data cover all coastal areas of the United States, Alaska, Hawaii, and Puerto Rico.

Soundings

Approximately 97 percent of the hydrographic data records in the data base are soundings; the remainder being bottom characteristics and dangers to navigation. The data records contain the following information: registry number of the survey from which the data were extracted; year and Julian Day of the survey; latitude and longitude to the nearest 0.01 sec; depth; and cartographic code. The cartographic code is a four-character field which gives information on the depth field such as depth units and number of decimal places.

Gridded Average Depth Data

Two types of digital data are available: simple master tape copies and data that have been computer-processed to conform to a uniform map grid. The grid

size and output depth units are variable. A 15-sec gridded data base has been created since this grid size seems to be most popular. Gridded-data depth records include: latitude and longitude; minimum depth; maximum depth; average depth; standard deviation; and number of depths in the grid cell used for the average.

Because of the high data density associated with the raw data, the gridded data have proven to be very useful for contours, modelling, or statistical studies. The illustration in Figure 6 depicts a 10-min square area with average depths plotted on a 10-sec grid.

Special Geophysical Data Bases

Synthetic Bathymetric Profiling System (SYNBAPS)

Digital bathymetric data interpolated onto a 5-min x 5-min latitude/longitude grid are now available for the world oceans with the exception of the Arctic Ocean. The data were compiled by NORDA (Naval Ocean Research and Development Activity) and the Naval Oceanographic Office with support from ONR (Office of Naval Research). The gridded data base was interpolated with digitizations of bathymetric maps available up to 1981. The enlarged global data base is called SYNBAPS II and contains some 7.8 million depth values on the 5-min grid. Depths are given in uncorrected meters based on a 1,500-m/sec sound speed. Figure 7 shows examples of depth contours for the Scotia Arc region. Figure 8 is an artificial perspective representation of the Fiji Plateau region to demonstrate the detail contained in the SYNBAPS II data.

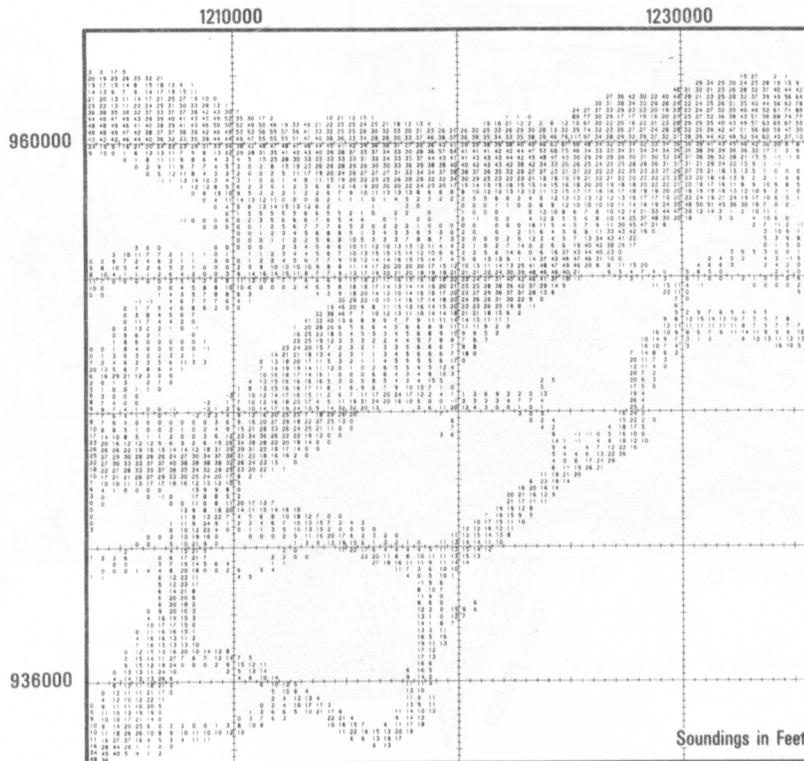
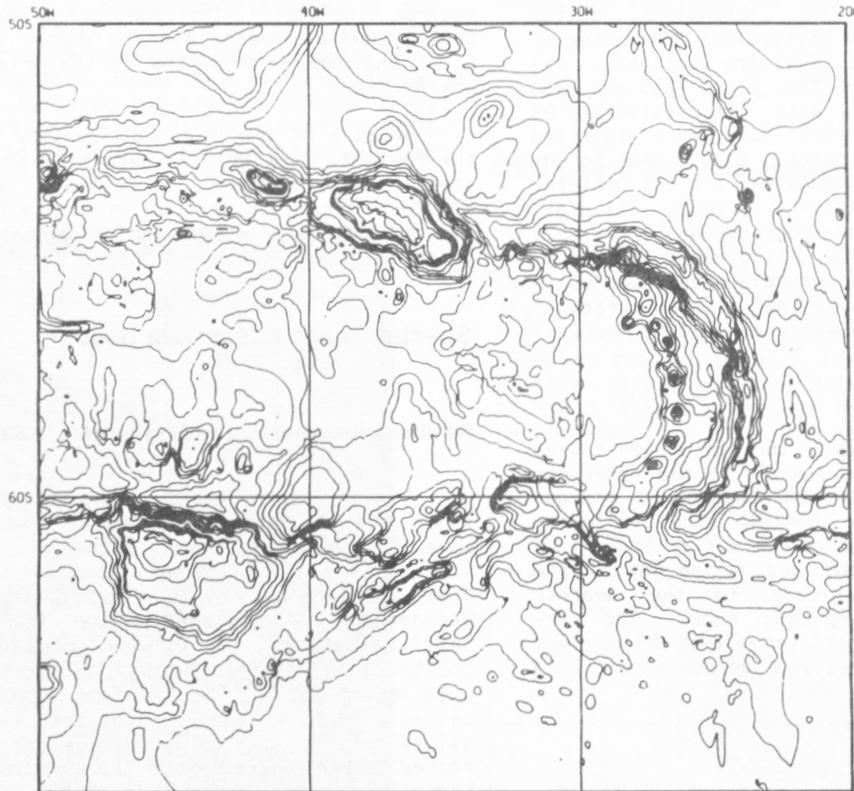


Figure 6. Example of gridded sounding plot (on Oregon State plane coordinate system).



Scotia Arc Area

Figure 7. Depth contours derived from the SYNBAPS II data for the Scotia Arc region (contours at 200 m, 500 m, and every 1,000 m). Tectonic trench and island arc features are clearly depicted.

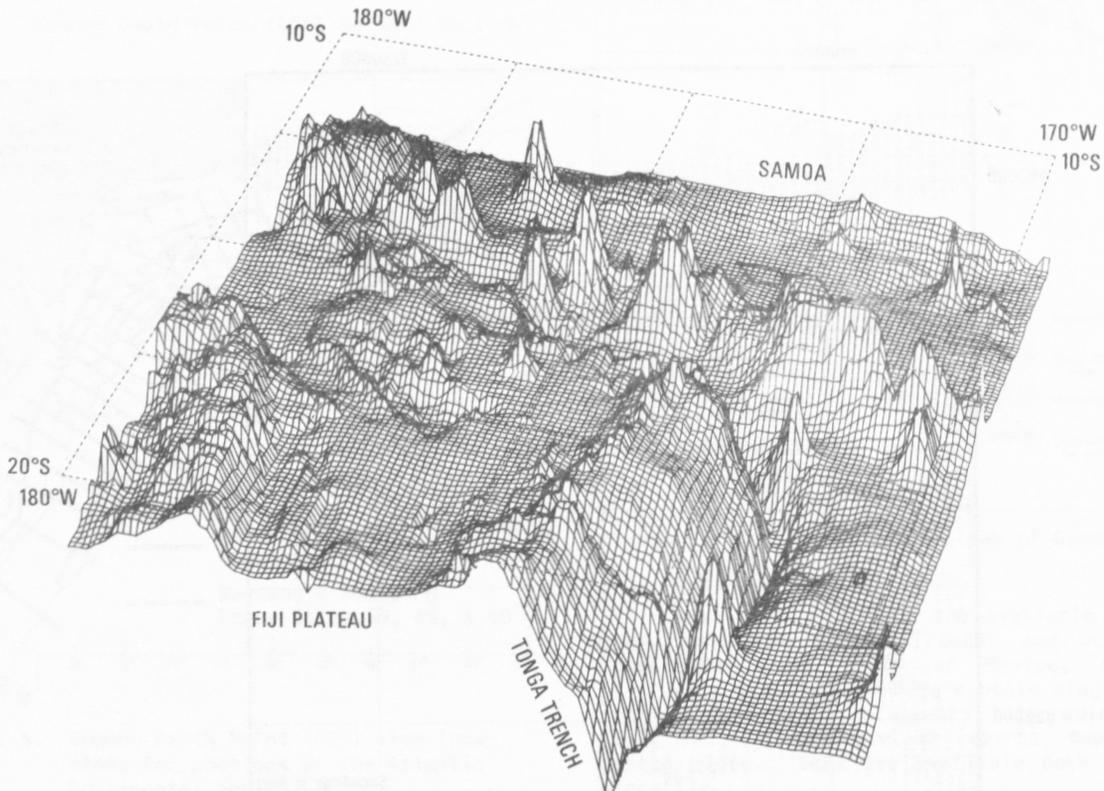


Figure 8. An example of the detail contained in the 5-min data. The area depicted contains Samoa, the Tonga Trench, and the Fiji Plateau in the South Pacific Ocean (10-20 degrees South, 170-180 degrees West). Depths are greatly exaggerated in the illustration to show the contrast between island arcs and their adjacent marginal trenches. The "floating" dashed gridlines represent a 2.5-degree latitude/longitude grid at sea level.

The SYNthetic BATHymetric PROfiling System (SYNBAPS) software is also available as a companion to the data. The SYNBAPS programs are in CDC-compatible FORTRAN and allow the generation of bathymetric profiles along any arbitrary Great Circle path. There is also software to generate a random-access file of the data base on CDC hardware for use by the profile-generating programs. The data base is independent of this software package. The profile-generation programs are offered as a separate item and are not required for access to the gridded data.

Two descriptive manuals (on microform) will be supplied with the data base.

Studies in East Asia Tectonics and Resources (SEATAR)

SEATAR, a comprehensive study of the relationship between the Southeast Asian tectonic framework and the genesis of metalliferous ores and hydrocarbons (see fig. 9), is sponsored by the Committee for Coordination of Joint Prospecting for Mineral Resources in Asian Offshore Areas, Intergovernmental Oceanographic Commission (CCOP/IOC).

Core descriptions, camera station data, paleomagnetic data, heat-flow measurements, and other information are available on magnetic tape; sonobuoy data and locations and water depths are contained on 35-mm microfilm and microfiche.

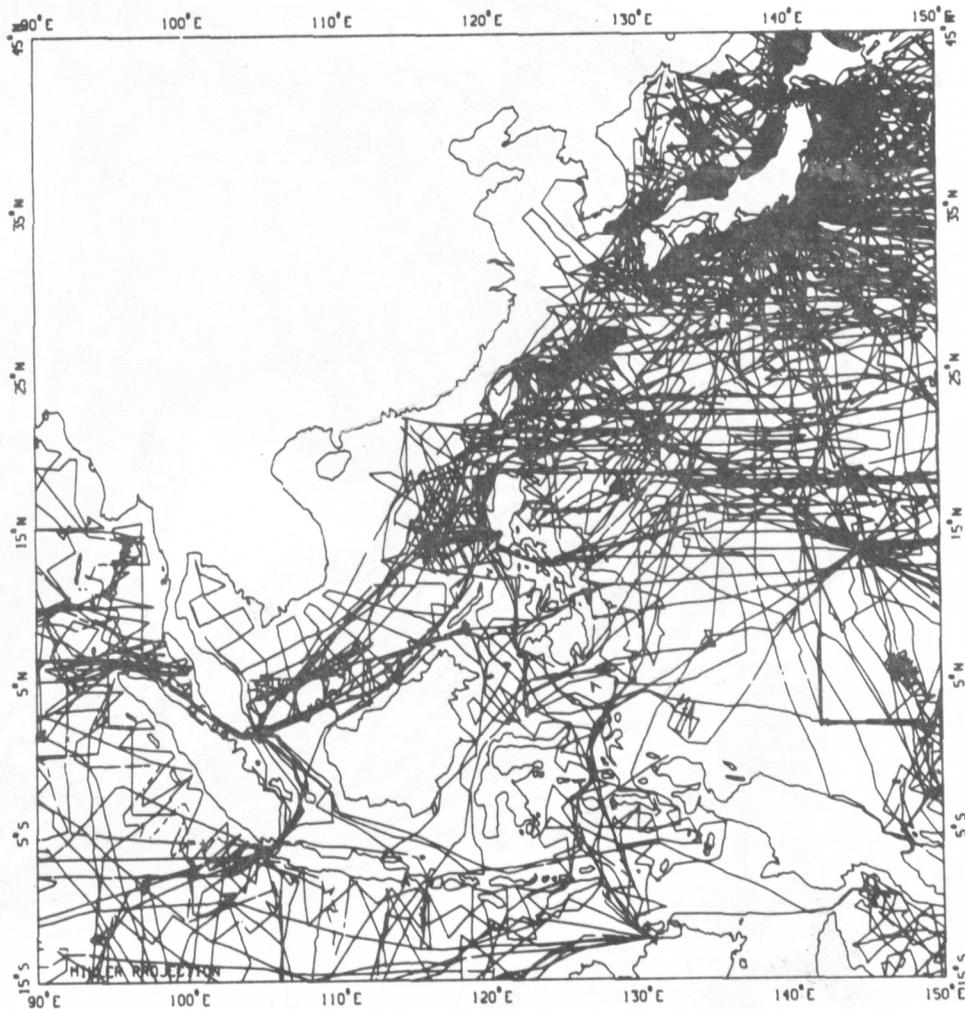
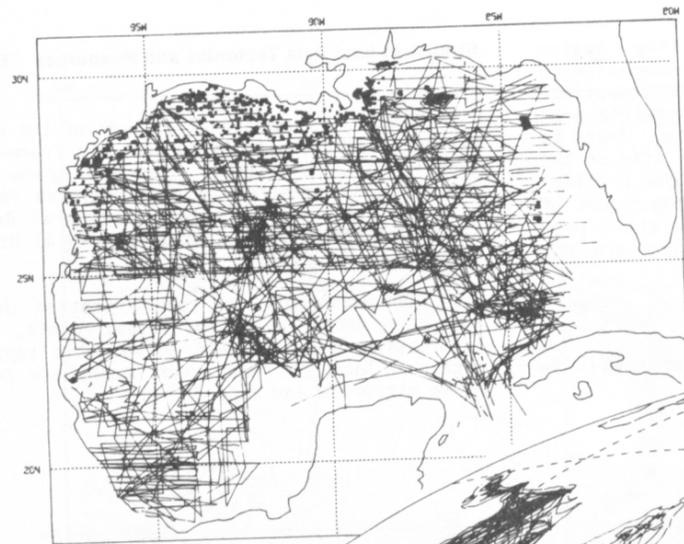
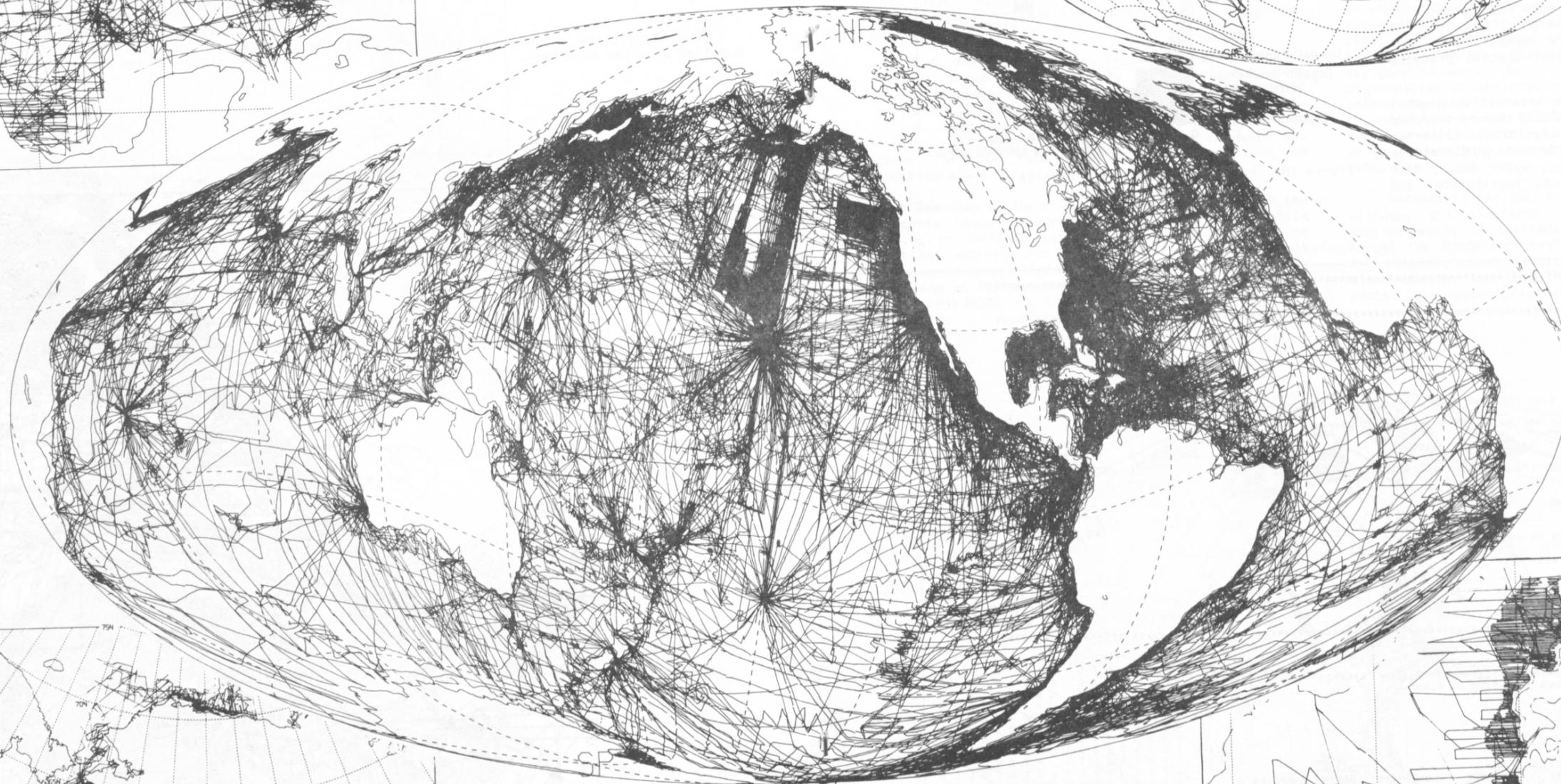
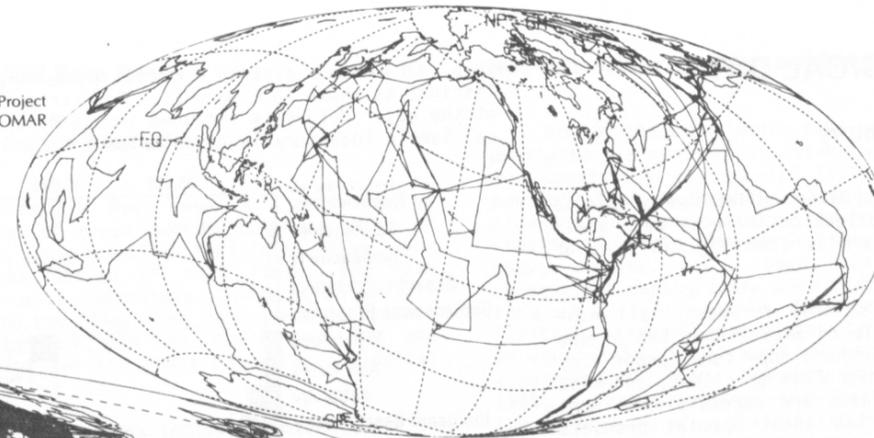


Figure 9. Tracklines of all geophysical data in the SEATAR area.

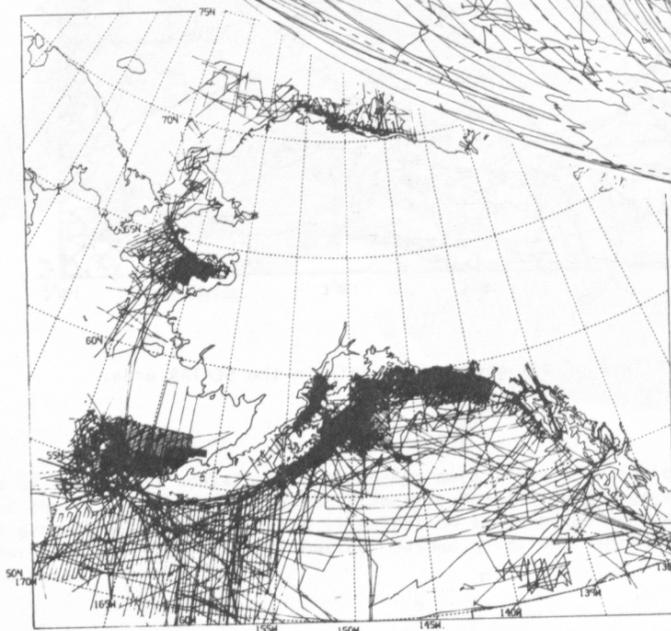


Gulf of Mexico Holdings. Small dark squares are tracklines of intensive high-resolution seismic profiling for lease-sale hazards studies.

Tracklines of Worldwide Deep Sea Drilling Project (DSDP) data collected by Research Vessel GLOMAR CHALLENGER.



Navigation Tracklines for Worldwide NGDC Geophysical Data Holdings.



Offshore Alaska data tracklines including extensive Common Depth Point (CDP) seismic coverage.

Geophysical data in the Sea of Japan obtained from Geological Survey of Japan.

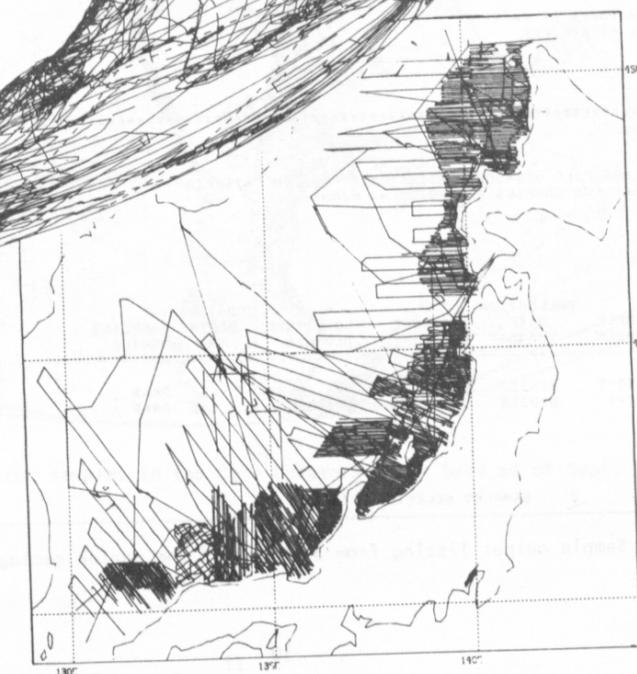


Figure 1.

MARINE GEOLOGICAL DATA

Geological Sample Inventory

NGDC has a rapidly growing collection of marine geological data. This collection includes data analyses from over 132,000 samples (see fig. 10), as of October 1983.

Data are stored in several formats: all non-digital files are available on microfiche; 58% of the files are also available in hard copy form (paper copy or printout); 31% are on microfilm or slides; and 25% on magnetic tape. Some data are accessible in more than one format. Inquiries about special products such as plots are welcome.

Supporting these data is an interactive digital GEOlogical INventory (GEOLIN). GEOLIN may be searched using any combination of the following criteria: location (latitude and longitude or gridlocator), sampling device, type of analysis, water depth, date of collection, funding or project, institution, and

ship, to produce station location plots or inventory listings as shown in Figure 11. A description of some of the major data sets included in the Marine Geological Sample Inventory is given below.

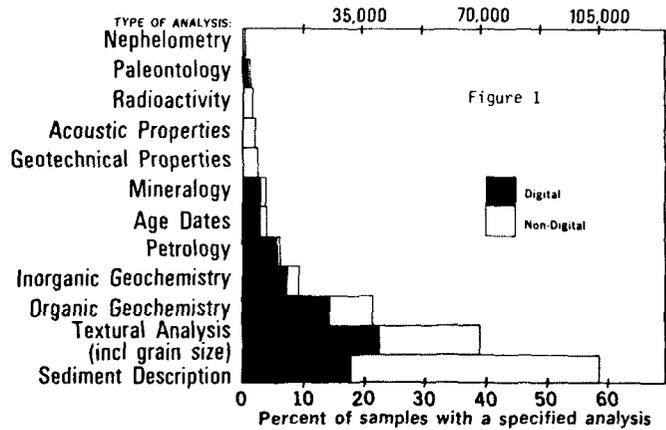


Figure 10. Types of analyses in geological sample inventory.

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*****
MGG FILE NUMBER: 09845003                                     LI 548-1
*****

INSTITUTION: NAVDCEANO                                       FLIER:
SCIENTIST : REYNOLDS                                         FUNDING:
TITLE      :                                                  PROJECT:

LAB ITEM 548-1, A SUMMARY OF SEDIMENT SIZE FROM ONE GRAB SAMPLE FROM TAGRU- MAKASSAR STRAITS, INDONESIA

THIS FILE CONTAINS INFORMATION FROM THE FOLLOWING TYPES OF SAMPLES-ANALYSES:

2 GRAB SAMPLES, 2 TEXTURE (RAW DATA), 2 TEXTURE (STATISTICS)

FOR A TOTAL OF      2 MARINE GEOLOGIC SAMPLES COLLECTED ON CRUISE(S) AMINDO-JAVA
DURING: DECEMBER 17,1980- JANUARY 18,1981
IN THE AREA OF: JAVA SEA
DATE RECEIVED BY NGDC: OCTOBER 25,1982

THIS FILE IS AVAILABLE AS:
ENTIRE SET IS AVAILABLE AS PAPER COPIES OR ON MICROFICHE

                10 PAGES OF PAPER
                 1 MICROFICHE

*****

THE FOLLOWING SAMPLES FROM MGG FILE 09845003 SATISFY YOUR SEARCH CRITERIA:
(ANALYSIS TYPES AVAILABLE FOR SAMPLES ARE NOTED AT RIGHT)

SHIP OR CRUISE COLLECTION LATITUDE LONGITUDE WATER SAMPLING
PLATFORM OR STATION SAMPLE DATE YR MDDA DEG MIN DEG MIN DEPTH (M) DEVICE
NAME NUMBER NUMBER YR MDDA DEG MIN DEG MIN (M) DEVICE
-----
CHAUVENET AMINJAVA CH80-5 801217 02 00.50 S 116 40.00 E 16 GRAB
CHAUVENET AMINJAVA C81-1 810118 02 29 00 S 117 36.00 E 40 GRAB
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Figure 11. Sample output listing from a search of the marine geologic inventory.

Special Geological Data Bases

The Marine Core Curator's Data Base

The Core Curators' Data Base is a guide to the archival location of ocean bottom samples. Most of the major U.S. core-curating facilities have participated in the design of this format and have contributed, or will contribute, information on all their holdings to the file. The core-curating facilities have designated NGDC as the repository and distribution point for the index to marine geological samples.

Each entry in the index includes a brief description of primary and secondary lithology, first and second subdominant components, and age of the sample or interval. Collection information including institution, ship, cruise number, sampling device, sample dimensions, latitude, longitude, and water depth are given. Archival information on storage condition and location are also included (see fig. 12).

Searches of the file can be made using any of the criteria above. Magnetic tape or 35-mm microfilm copies of listings can also be produced. Plots of station locations for samples selected are available on several projections. Further information on the file and on the services available may be obtained by contacting NGDC.

NOS Bottom Characteristics and Dangers to Navigation

Bottom-characteristic data were collected primarily to aid mariners in determining suitable anchorage conditions and to aid fishermen in determining probable fishing grounds. Samples were collected by clam-shell-snapper-sampler devices. Descriptions consist of one to five words including color, consistency, texture, etc. Each data record contains a three-digit cartographic code that directly correlates to a word. For example, 545 correlates to the word "Gritty", and 582 correlates to the word "Yellow." In earlier data, each word was assigned a position and a cartographic code. However, in data collected after 1965, a common latitude and longitude is assigned to the first word of a description, and no positions are assigned to words that follow. The earlier form of digitization caused problems when trying to plot the bottom characteristics on a small scale. The words of the description would plot nearly on top of each other and were difficult to read. These data are available on magnetic tape, computer plots, or computer printouts.

Dangers-to-navigation data include rocks, pilings, oil platforms, and all other dangers a mariner would be cautious of when navigating. The format for dangers-to-navigation data is the same as for bottom-characteristics data. Dangers-to-navigation data are available on magnetic tapes, computer plots, or computer printouts.

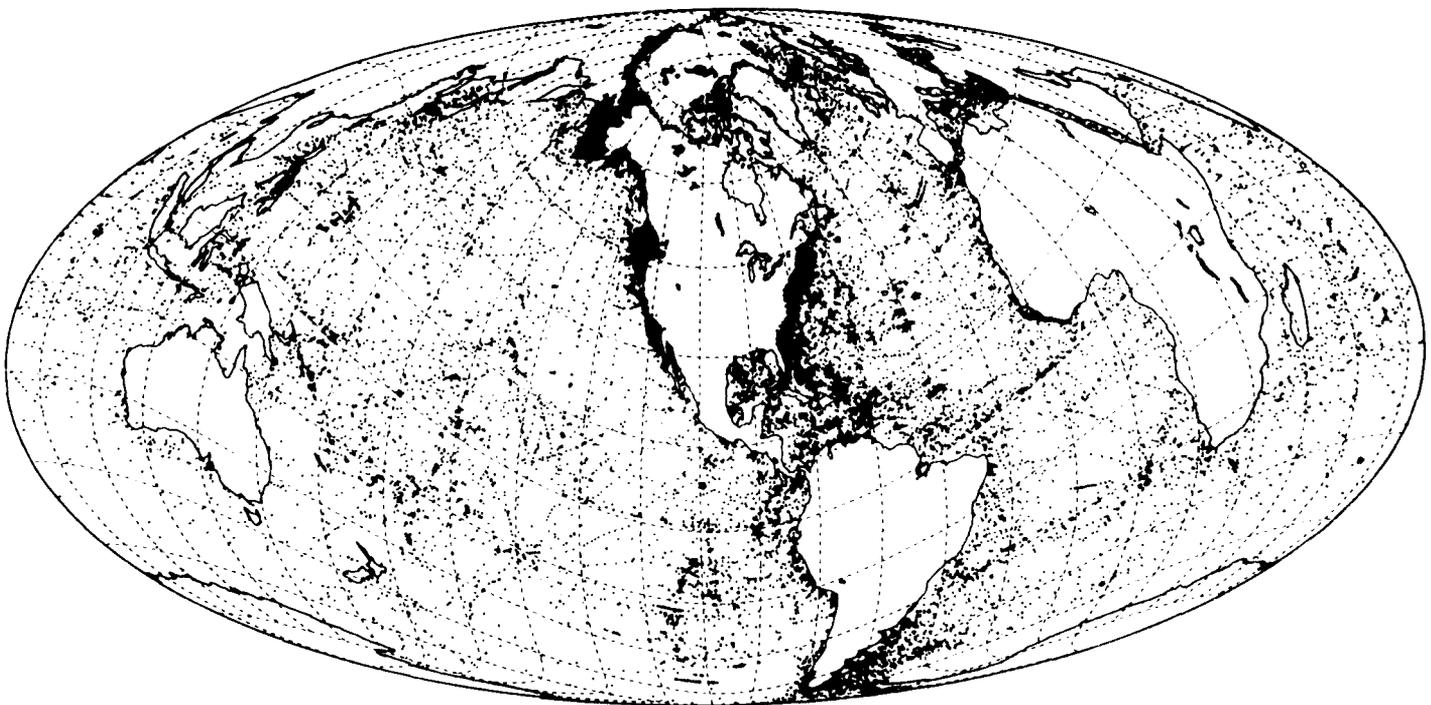


Figure 12. Station locations for samples in the Core Curators' data base as of Sept. 1, 1982.

Digital Grain-Size Analysis Data

NGDC files contain over 60,000 digital analyses for grain-size data. An example is the raw data from standard sieve and pipette analysis as determined from core and grab samples collected on 24 cruises (in the Bering, Chukchi, East Siberian, and Laptev Seas) between August 1959 and September 1970 (see fig. 13). The following information is provided for each sample: position, date of collection, ship and cruise number, water sampling device, and, for core samples, the core length and sample depth within the core. The grain-size data follows, giving the weight of sediment present within quarter-, half-, or full-phi intervals. Sieve analysis was performed on sediment with phi values less than 4.0 and pipette analysis on sediment with phi values greater than 4.0. The requestor should specify geographic area by latitude-longitude boundaries and whether core data or surface sample data only are needed.

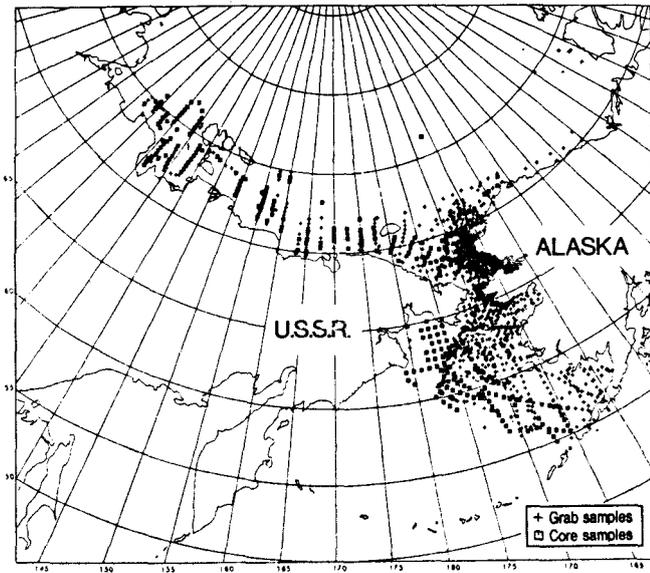


Figure 13. Plot of grain-size analysis data in Alaska-U.S.S.R. area from 24 cruises.

PETROS: Chemical Analyses of Igneous Rocks

PETROS, a major historical data bank of major element chemical analyses of igneous rocks, includes over 34,000 chemical analyses of igneous rocks collected worldwide; comprehensive file updates become available periodically.

Analyses in PETROS include percentages of at least nine of the following major oxides: SiO₂, Al₂O₃, Fe₂O₃, FeO, MnO, CaO, Na₂O, K₂O, H₂O⁺, H₂O⁻, TiO₂, P₂O₅, MgO, ZrO₂, CO₂, SO₃, Cl, F, S, CR₂O₃, NiO, and BaO. Calculated average rock compositions and reference information also are given. PETROS is available on one magnetic tape, which includes a second file called MARTHA. This file contains a description of the organization of PETROS data, a list of sample identification formats and codes, bibliographies of the sources of analyses of each major group in PETROS, and operating instructions. See sample data format in Figure 14.

	a	b	c	d	e	f	g	h	i	j	
BARBERI + (1970) APR. .14 041E PICRITIC BASALT	44.01	13.75	5.42	5.56	10.04	11.53	2.60	0.80	2.57	0.51	2.34
0.48 0.20											
BARBERI + (1970) APR. .14 041E PICRITIC BASALT	48.18	13.20	2.45	0.11	10.13	12.06	2.45	0.35	1.04		1.45
0.24 0.17											
BARBERI + (1970) APR. .14 041E BASALT	46.20	13.35	5.42	9.03	0.81	10.75	2.60	0.43	0.55	0.5E	1.74
0.34 0.15											

Figure 14. PETROS data format.

Geochemical data from PETROS are available on magnetic tape or as a formatted computer listing with an accompanying listing of the MARTHA documentation file. Selections may be made from PETROS using latitude/longitude boundaries or major group codes such as 'O-P' for Pacific Ocean bottom samples. Charges for computer listings vary with the volume of samples selected. Further information on the PETROS data bank is available in NGDC Data Announcement 81-MGG-12.

Megascopic Core Description Data

NGDC maintains nondigital files of core descriptions; one major data set is from Lamont-Doherty Geological Observatory. The following information is given for each core in this set: ship, cruise number, core number, latitude, longitude, corrected depth in meters, uncorrected depth in fathoms, date core taken, date opened, data described, data photographed, person who described core, core length, and the amount of flow-in. A general description is given followed by a description of specific sections of the core. Each section includes information on the general type of sediment, the amount of carbonate, the types of minerals and biogenic components present, and comments on any sedimentary structures (see fig. 15). A total of 6,900 cores are described, which cover 50 cruises of the Research Vessels VEMA, ROBERT CONRAD, ALAMINOS, and YELCHO. Data are available as paper copies or on microfiche. One set of microfiche covers an entire cruise.

Latitude:	31°15.5'N	Longitude:	70°20.5'W
Corr. depth:	5421 m	PDR depth:	2861 fm
Date taken:	21 December 1972	Date opened:	15 October 1973
Date described:	16 October 1973	Date photographed:	15 October 1973
Described by:	J. Rigaud	Station number:	8
Core length:	548 cm	Flow-in:	37 cm
GENERAL:	Interbedded layers of clayey sand, sand, foraminiferal sand, clay and clayey foraminiferal sand. Coarse fractions consist of quartz, mica, dark minerals and igneous rock fragments. Organic elements consist of planktonic foraminifera, echinoid spines, sponge spicules, benthonic foraminifera, pteropods, ostracods and shell fragments. Authigenic elements consist of negligible pyrite concretions.		
0-98 cm	Clayey sand, olive gray (5 Y 4/1), moist and firm. Carbonate content very low. Coarse fraction varies from 50-60%, consisting mainly of abundant small to large angular to subrounded quartz, frequent mica, common dark minerals, occasional igneous rock fragments, planktonic foraminifera, negligible shell fragments, echinoid spines, sponge spicules, benthonic foraminifera, pteropods and ostracods. Authigenic elements consist of negligible pyrite aggregates. Basal contact a sharp change in texture and composition.		
98-117 cm	Sand, very fine grained, grading into foraminiferal sand, medium grained, dark olive gray (5 Y 3/1), moist, firm, compacted to unconsolidated, showing local lamination. Carbonate content low. Coarse fraction varies from 70-95%, consisting mainly of abundant quartz, planktonic foraminifera, frequent mica, occasional echinoid spines, sponge spicules, benthonic foraminifera, shell fragments and traces of ostracods. Basal contact a sharp change in color, texture and composition.		

Figure 15. Megascopic description of a split core.

CLIMAP: Long-Range Investigation, Mapping, and Prediction

CLIMAP is a part of the International Decade of Ocean Exploration (IDOE) program funded by the National Science Foundation. Collection and analysis of these ocean sediment core data are carried out by several major universities in the U.S. and by institutions in several foreign countries.

Paleontology, geochemistry, stratigraphy, and age data from CLIMAP are available for cores collected at locations distributed globally. About 934 cores are represented, and new data are added to the file periodically. More than one type of data may be reported for a single core.

Data Type	Number of Cores
Chemistry	219
Coccoliths	96
Diatoms	43
Foraminifera	291
Radiolaria	172
Stratigraphy	432
Time	46

Paleontological data include counts of 51 species of diatoms, 44 species of planktonic foraminifera, 21 species of radiolaria, and 75 species of coccoliths. Geochemical data include percentages of opal, quartz, and organic carbon. Percentages of opal and quartz were determined by X-ray diffraction, and carbon analyses were performed on a "Leco" Induction Furnace. A breakdown of the available data appears above.

Stratigraphic data consist of percentages of fine, coarse, and total carbonate, and isotopic analyses for O^{18} and C^{13} . Analyses include a species and a laboratory code. Time data give upper and lower sample depths, technique, and C^{14} dates (total sample, coarse fraction, and fine fraction). Age estimates are given in thousands of years with upper- and lower-age error. In addition, each data record contains station and collection information.

Deep Sea Drilling Project Site Summary File

In cooperation with the Deep Sea Drilling Project (DSDP) office, a set of worldwide summary drilling and geological information for legs 1-91 of the DSDP are now available. Site locations in the North Atlantic are shown in Figure 16. This file is a summary compiled from other, more detailed DSDP data bases and published information. It contains inventory information such as leg, hole, geographic location, water depth, penetration, meters recovered, and coring method or downhole measurements taken. The file also includes basic geologic information such as physiographic features on which the site is located, type of crust, depth to basement, geologic age, brief sediment lithology, and igneous rock description.

Underway geophysical data collected by the GLOMAR CHALLENGER while enroute between and in the vicinity of DSDP drilling sites are available. The data include digital navigation, bathymetry, and magnetics as well as 35-mm film copies of seismic profiling records, magnetic total field analog records, and echo sounder analog records.

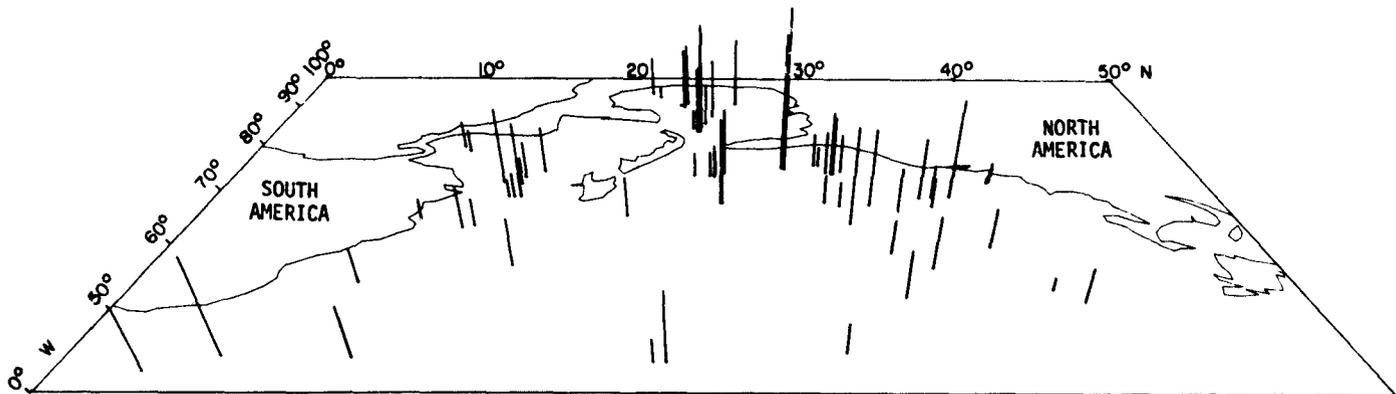


Figure 16. Deep-sea drilling site locations in North Atlantic as viewed from Mid-Atlantic Ridge.

OCS Well Data and Auxiliary Information

NGDC currently disseminates well information from over 3,000 wells drilled on the Atlantic, Gulf, Pacific, and Alaskan Outer Continental Shelves of the U.S. (see figs. 17-21). Data will include over 10,000 well logs and auxiliary information such as interpretive reports, drilling histories, and other downhole analyses such as core descriptions, geochemistry, petrography and micropaleontology. See List of Data Announcements on pp. 15 and 16.

New well information is constantly being received from the Minerals Management Service (MMS) as private leases terminate or expire on exploratory wells, and the data from these wells become part of the public domain. NGDC acts as the public distribution point for all such MMS well data, including information from Continental Offshore Stratigraphic Test (COST) wells. Data are available on 16-mm microfilm, and may include hardcopy maps, and (or) reports on paper or microfiche. NGDC is now also able to provide logs as nearly full-scale copies on request.

A digital inventory of all wells and well information available from NGDC is fully searchable on any combination of the following parameters: state, area, block, lease, well number, operating company, type of logs/auxiliary information available. Custom inventory listings are available on request.

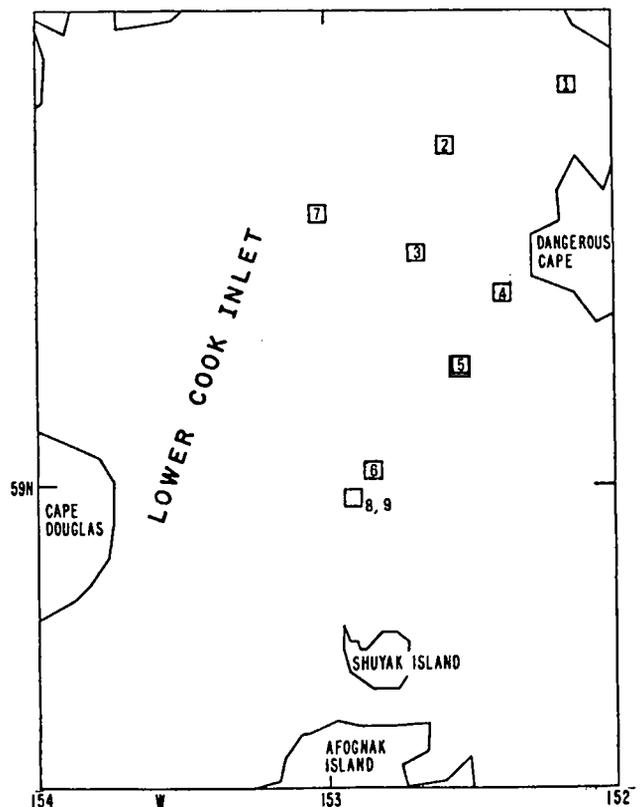


Figure 17. Location of oil and gas wells in the Lower Cook Inlet, AK. See NGDC Data Announcements 81-MGG-09 and 83-MGG-12 for further information.

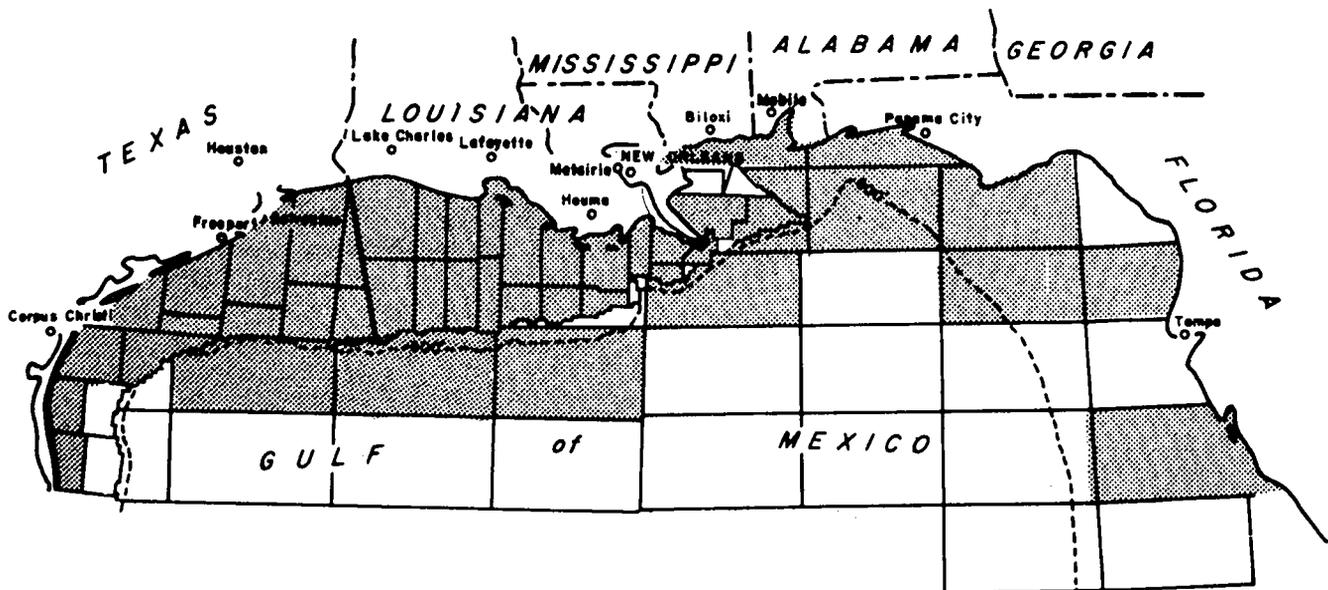


Figure 18. Gulf of Mexico. Shaded areas represent blocks for which NGDC distributes well logs and auxiliary information. See NGDC Data Announcement 82-MGG-06 for further information on well data available for the Gulf of Mexico.

OCS Well Data and Auxiliary Information (contd.)

West Coast Wells

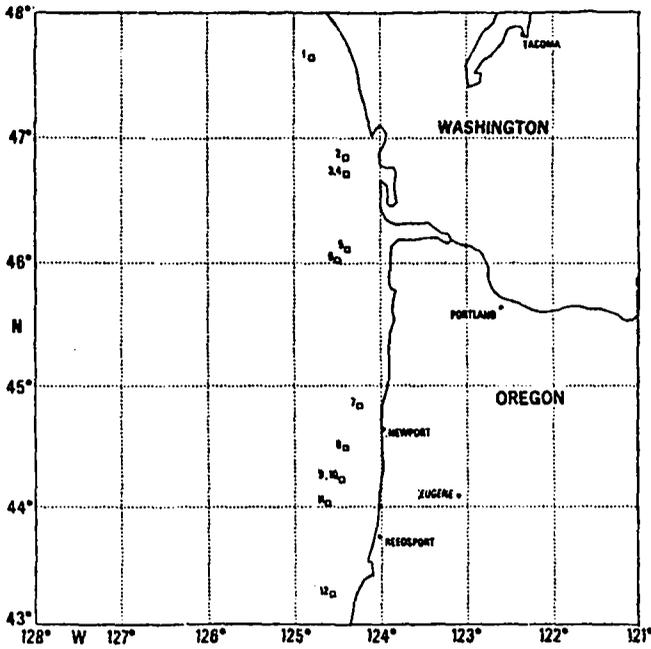


Figure 19. Well locations offshore Oregon and Washington. See NGDC Data Announcement 83-MGG-05 for further information.

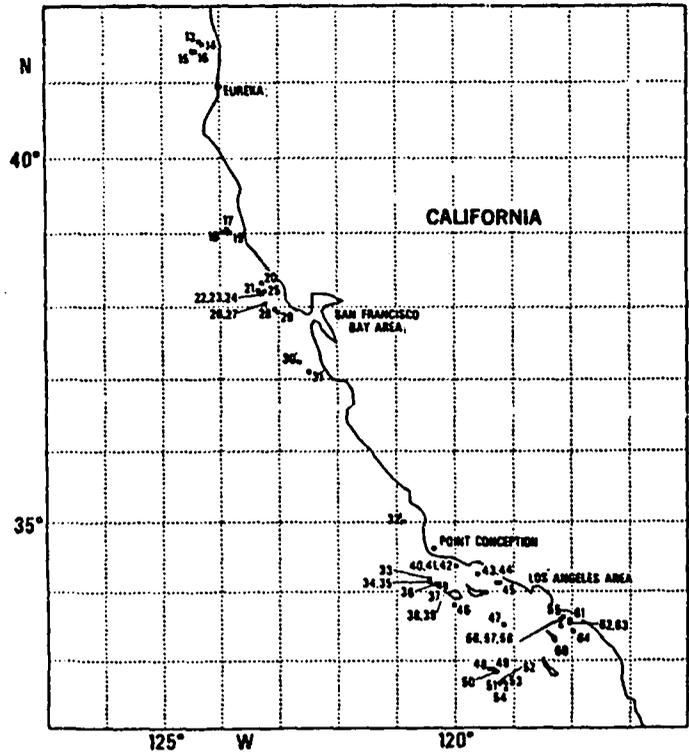


Figure 20. Well locations offshore California. See NGDC Data Announcement 83-MGG-03 for further details.

East Coast Wells

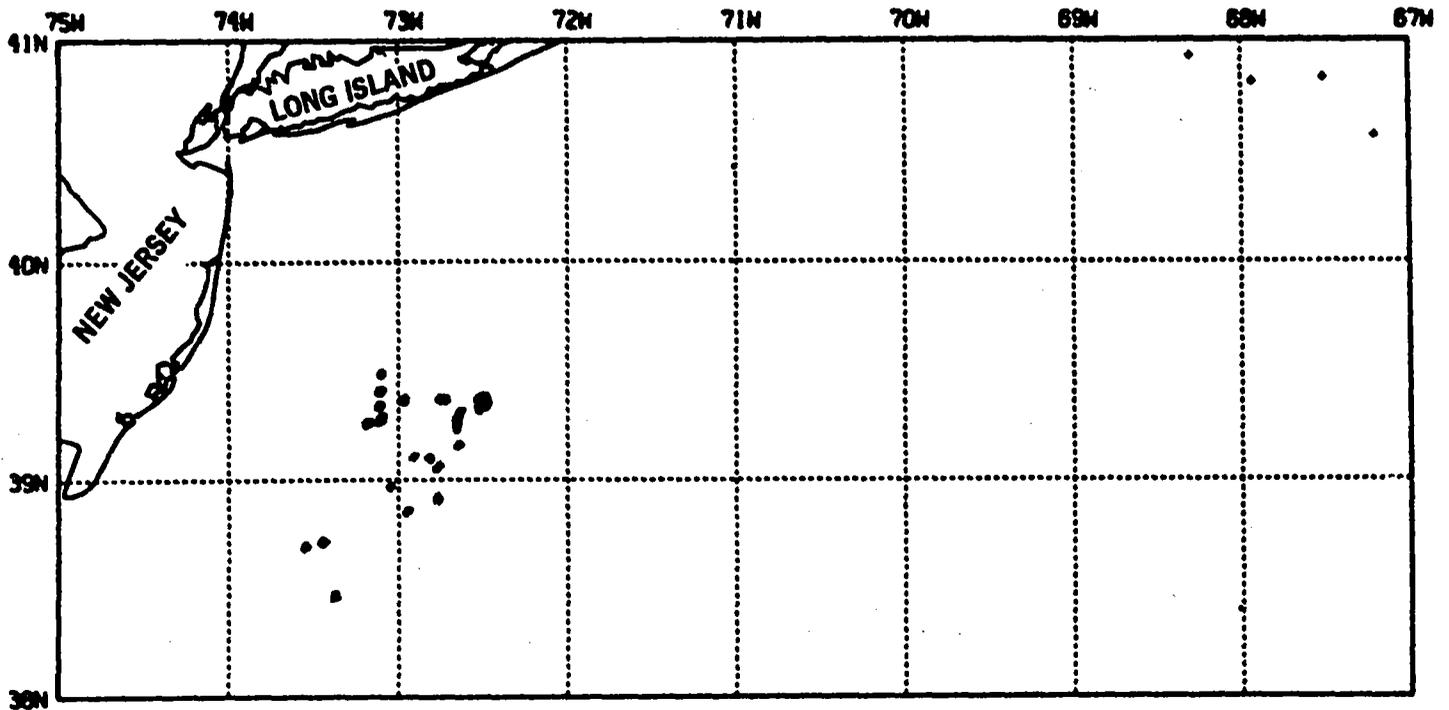


Figure 21. Location of wells offshore Long Island, New York and New Jersey. Information is also available for wells offshore Georgia, Florida, and Massachusetts. For pricing and further details on Atlantic OCS wells, see NGDC Data Announcement Nos. 1978(0-0), 1979(P-P), 1980(SE-AA), 81-MGG-08, 82-MGG-07, 82-MGG-11, 83-MGG-01, and 83-MGG-10.

Marine Minerals Data Base and Comprehensive Bibliography

Because of increased interest in marine mineral resources and the environmental conditions involved in their recovery, a marine minerals data base and on-line computerized bibliography has been developed by NGDC in cooperation with the Ocean Minerals and Energy Division of the National Ocean Service (NOS).

The bibliography contains and the data base will contain information on marine polymetallic sulfide, phosphorite, and manganese deposits. They are comprehensive and worldwide, including previous collections of data and bibliographic references. The entire Scripps Institution of Oceanography Manganese Nodule Analysis File (current through 1979) has already been incorporated into the Marine Minerals Data Base and is now accessible through NGDC. Comparable data for phosphorites and polymetallic sulfides will be added to the Marine Minerals Data Base. A variety of output products are available from the data base including various computerized listings and station location plots. The file is searchable on any combination of parameters including station information and data values. Custom products are available on request.

The comprehensive bibliography is searchable on parameters, including author, date of publication, and several key words identifying the type of article, such as legal, economic, or geochemical study, and will include foreign, as well as U.S. sources.

Two Federally supported programs provided a large amount of the data relating to deep ocean mining of the manganese nodules the Deep Ocean Mining Environmental Study (DOMES) and the International Decade of

Ocean Exploration (IDOE) Manganese Nodule Program funded by the National Science Foundation.

Deep Ocean Mining Environmental Study Data (DOMES). The DOMES Project is concerned with the environmental aspects of anticipated marine mining of manganese nodules. To assess the environmental conditions prior to commercial manganese nodule recovery, scientists involved in the project have been studying three sites in an area (fig. 17) in the east-central Pacific where initial mining operations are expected.

Data from about 12,000 manganese nodule samples (fig. 22), including bottom and sample photographs, are included in the marine geology inventory. A report, Bibliography and Index to Literature on Manganese Nodules (1874-1975), is available on microfiche.

Now available are bottom photographs from four cruises and box core photographs and vane shear data collected from three cruises to the DOMES sites. Photographs are available on 35-mm microfilm; vane shear data are in paper format or as microfiche.

International Decade of Ocean Exploration (IDOE) Data. The distribution and chemistry of marine manganese nodules were investigated through the IDOE Program. Several major research centers were involved in this multidisciplinary program. NGDC now can provide data from about 1,500 samples collected at 800 locations. The data consist of five digital files, which include source, location, sampling method, and depth; nodule type and weight percentages for selected elements; and two files containing bibliographic references to the data.

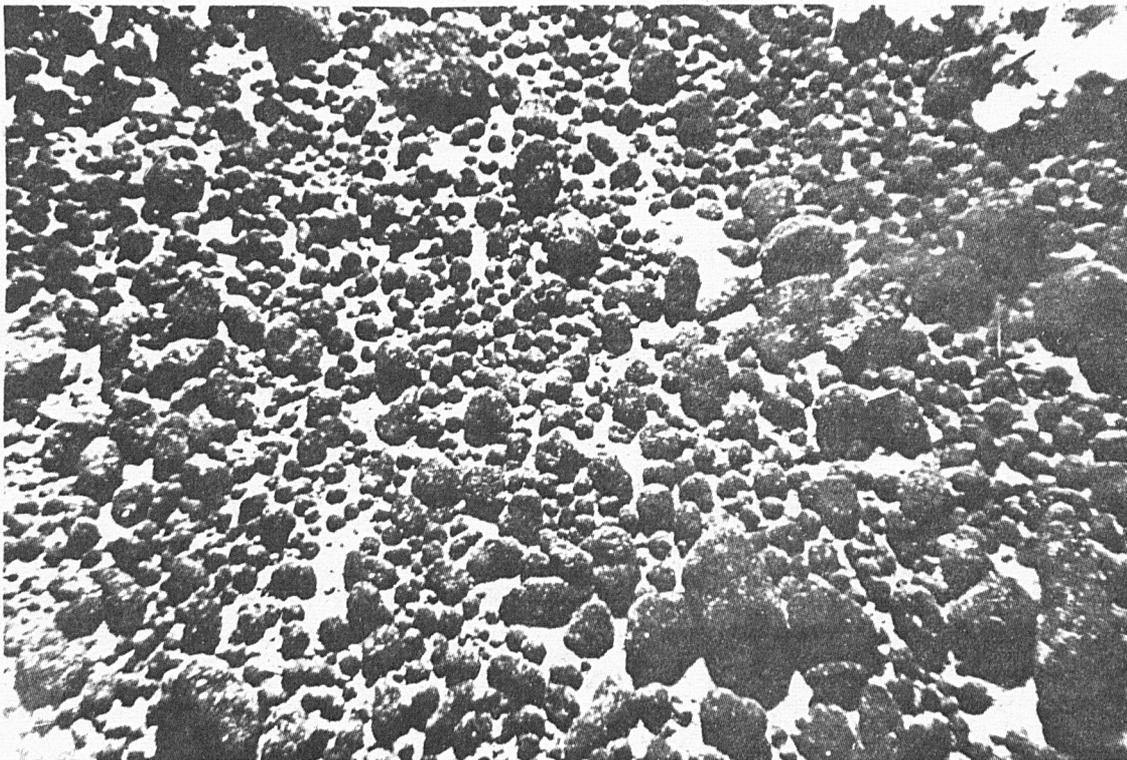


Figure 22. Sample photograph of manganese nodules found in the DOMES area.

MARINE GEOLOGY AND GEOPHYSICS DATA SETS

Listed below are Data Announcements that describe specialized data sets available from the National Geophysical Data Center, NOAA/NGDC, Code E/GC 3, 325 Broadway, Boulder, CO 80303. Check each Data Announcement you would like to receive and mail to NGDC.

- ___ 1976 (R) Multichannel Common Depth Point (CDP) Seismic Reflection Data for Atlantic Survey Lines 1-6
- ___ 1976 (T) Multichannel Common Depth Point (CDP) Seismic Reflection Data for Cook Inlet, Alaska
- ___ 1976 (X) Multichannel Common Depth Point (CDP) Seismic Reflection Data for Blake Plateau, Alaska
Survey Lines FC1-FC10
- ___ 1976 (Y) Climate: Long-Range Investigation, Mapping, and Prediction (CLIMAP) UPDATE2: August 1977
(Ocean Floor Sediment Core Analyses) (Revised)
- ___ 1976 (Z) Grain-Size Analysis Data--Bering, Chukchi, East Siberian, and Laptev Seas
- ___ 1977 (N) Marine Resource Data Base: Manganese Nodules
- ___ 1977 (P) Lease Sale 42. Georges Bank - Geophysical Data for Outer Continental Shelf
- ___ 1977 (Q) Descriptions of Ocean Sediment Cores
- ___ 1977 (U) Multichannel Common Depth Point (CDP) Seismic Reflection Data for Southeast Bering Sea,
Alaska
- ___ 1977 (V) Multichannel Common Depth Point (CDP) Seismic Reflection Data for Southeast Georgia
Embayment
- ___ 1977 (W) Multichannel Common Depth Point (CDP) Seismic Reflection Data for the Gulf of Alaska
- ___ 1977 (Y) Multichannel Common Depth Point (CDP) Seismic Reflection Data for Atlantic Survey Lines 9 & 10
- ___ 1978 (N) Lease Sale 43. Georgia Embayment - Geophysical Data for Outer Continental Shelf
- ___ 1978 (O) Digital Navigation for Common Depth Point (CDP) Data
- ___ 1978 (Q) Multichannel Common Depth Point (CDP) Seismic Reflection Data Lines IPOD, A & B - Cape Hatteras
to the mid-Atlantic Ridge
- ___ 1978 (X) NGDC Geological Sample Inventory
- ___ 1978 (O-O) Well Logs. COST Well GE-1 - Southeast Georgia Embayment
- ___ 1978 (P-P) Lease Sale 49. Baltimore Canyon Trough - Geophysical Data for Outer Continental Shelf;
USGS Data Set AT 16243
- ___ 1979 (P) Lease Sale 48. Offshore Southern California - Geophysical Data for Outer Continental Shelf;
USGS Data Set PA 17200
- ___ 1979 (V) Lease Sale No. 40. Baltimore Canyon Trough - Geophysical Data for Outer Continental Shelf;
USGS Data Set AT 15384
- ___ 1979 (N-N) Multichannel Common Depth Point (CDP) Seismic Reflection Data for Atlantic Survey
Lines 7,8,11,12 & 13
- ___ 1979 (P-P) Well Logs. COST Wells B-2 and B-3 - Baltimore Canyon Outer Continental Shelf
- ___ 1979 (Q-Q) Lease Sale No. 46. Kodiak Shelf - Geophysical Data for Outer Continental Shelf Offshore
Kodiak Island, Alaska, USGS Data Set AK-15945
- ___ 1979 (R-R) Beaufort Sea Corehole Data. Geotechnical, Geological, and Geochemical Data; USGS
Geotechnical Investigation, Beaufort Sea, Alaska-1979; USGS Data Set AK17718
- ___ 1979 (S-S) Lease Sale 49. Geochemical and Grain-Size Data - U.S. Mid-Atlantic Outer Continental Shelf
and Slope; USGS Data Sets AT16293, AT16298
- ___ 1979 (W-W) Lease Sale No. 44. Gulf of Mexico Geophysical Data for Outer Continental Shelf; USGS Data
Set GM-15944
- ___ 1979 (O-O-O) Eastern Gulf of Mexico Marine Habitat Study; BLM Data Set No. AA551-CT-8-22
- ___ 1979 (Q-Q-Q) Lease Sales 51 & 65. Gulf of Mexico Geophysical Data for Outer Continental Shelf;
USGS Data Set GM-16534
- ___ 1980 (SE-D) Bathymetry and Elevations for One-Degree Size Areas
- ___ 1980 (SE-G) Lease Sale 48. Offshore Southern California - Well Log Data for Outer Continental Shelf; USGS
Data Set PA Cost OCS-CAL 78-164, Well No. 1
- ___ 1980 (SE-O) Lease Sale 70. St. George Basin, Bering Sea, Alaska - Geophysical Data for Outer
Continental Shelf; USGS Data Set AK 15947
- ___ 1980 (SE-P) Lease Sale 58 and 58A. Gulf of Mexico. Geophysical Data for Outer Continental Shelf;
USGS Data Set GM-16534
- ___ 1980 (SE-Q) Lease Sale 47. Gulf of Mexico - Geophysical Data for Outer Continental Shelf; USGS Data Set
GM-16458
- ___ 1980 (SE-T) Multichannel Common Depth Point (CDP) Seismic Reflection Data in the Area of OCS Lease
Sales 70 and 75
- ___ 1980 (SE-X) Multichannel Common Depth Point (CDP) Seismic Reflection Data for Atlantic Lines 14-17
- ___ 1980 (SE-Y) Bathymetric and Geodetic Summaries
- ___ 1980 (SE-Z) Lease Sale No. 45. Gulf of Mexico - Geophysical Data for Outer Continental Shelf - USGS Data
Set GM-16497
- ___ 1980 (SE-AA) Well Log Data. COST Wells G-1 & G-2. Nantucket Island, Massachusetts Atlantic Continental
Shelf
- ___ 1980 (SE-BB) Multichannel Common Depth Point (CDP) Seismic Reflection Data for Atlantic Survey Lines 18-38

___ 1980 (SE-II) Lease Sales A62 & 62. Gulf of Mexico - High Resolution Reflection Data for Outer Continental Shelf; USGS Data Set GM-17876
 ___ 1980 (SE-JJ) Lease Sales 55 & 60. Cook Inlet & Eastern Gulf of Alaska - High Resolution Reflection Data; USGS Data Sets AK 18248 A & B
 ___ 1980 (SE-QQ) Lease Sale 56. Southeast Georgia Embayment - High-Resolution Reflection Data for Atlantic Outer Continental Shelf (OCS) USGS Data Set AT 18908
 ___ 81-MGG-04 SEATAR (Studies in East Asia Tectonics and Resources)
 ___ 81-MGG-05 Lease Sale 59. Baltimore Canyon Trough - High-Resolution Seismic Reflection Data for Atlantic Outer Continental Shelf, USGS Data Set AT 18929
 ___ 81-MGG-06 Lease Sale 53. Central and Northern California - High-Resolution Seismic Reflection Data for Outer Continental Shelf, USGS Data Set PA 18254
 ___ 81-MGG-07 Remote Computer Access to NGSDC Geology/Geophysics Data Inventories
 ___ 81-MGG-08 Well Log Data. 4 Exploratory Oil & Gas Wells - Offshore New Jersey and Georgia Outer Continental Shelf
 ___ 81-MGG-09 Well Log Data. COST Well No. 1 - Lower Cook Inlet - South Alaska Outer Continental Shelf
 ___ 81-MGG-10 Lease Sale 71. Beaufort Sea - High-Resolution Seismic Reflection Data for Alaskan Outer Continental Shelf; USGS Data Set AK 19181
 ___ 81-MGG-12 Petros-A Data Bank of Major Element Chemical Analyses of Igneous Rocks
 ___ 81-MGG-13 Atlantic Common Depth Point (CDP) Lines - TD 1-6
 ___ 81-MGG-14 Synthetic Bathymetric Profiling System (SYNBAPS)
 ___ 81-MGG-15 Lease Sale 57. Norton Sound - High-Resolution Seismic Reflection Data for Alaskan Outer Continental Shelf; USGS Data Set AK 19184-57
 ___ 81-MGG-16 Lease Sale 70. St. Georges Basin - High-Resolution Seismic Reflection Data for Alaskan Outer Continental Shelf USGS Data Set AK 19184-70
 ___ 82-MGG-01 Lease Sales A66 & 66. Gulf of Mexico - High-Resolution Seismic Reflection Data for Outer Continental Shelf; USGS Data Set GM 18726
 ___ 82-MGG-02 Lease Sale 68. Offshore Southern California - High-Resolution Seismic Reflection Data for Outer Continental Shelf; USGS Data Set PA 19236
 ___ 82-MGG-03 Lease Sale 52. Georges Bank - High-Resolution Seismic Reflection Data for Atlantic Outer Continental Shelf; MMS Data Sets AT 18984 and AT 19027
 ___ 82-MGG-04 Gridded Bathymetry - Coastal United States Data Base
 ___ 82-MGG-05 Common Depth Point (CDP) Seismic Reflection Data - Summary of available lines for Atlantic Outer Continental Shelf
 ___ 82-MGG-06 Well Log Data. Gulf of Mexico
 ___ 82-MGG-07 Well Log Data. 16 Exploratory Oil & Gas Wells - Offshore New Jersey and Georgia Outer Continental Shelf
 ___ 82-MGG-08 Index to Marine Geological Samples - "The Core Curators' File"
 ___ 82-MGG-09 Lease Sale 92. Bering Sea, Alaska - High-Resolution Seismic Reflection Data for North Aleutian Shelf
 ___ 82-MGG-10 Seismic Data. Beaufort and Chukchi Seas - High-Resolution Seismic Reflection Data for Alaskan Outer Continental Shelf
 ___ 82-MGG-11 Well Log Data. 10 Additional Exploratory Oil & Gas Wells - Offshore New Jersey and Georgia Outer Continental Shelf
 ___ 82-MGG-14 Site Summary Information from the Deep Seas Drilling Project (Legs 1-87)
 ___ 83-MGG-01 Well Log Data. 2 Additional Exploratory Oil & Gas Wells - Offshore New Jersey and Georgia Outer Continental Shelf
 ___ 83-MGG-02 Seismic Data. Multichannel Seismic Reflection Data - North Bering Sea - Gulf of Anadyr
 ___ 83-MGG-03 Well Log Data. 54 Exploratory Oil and Gas Wells - Offshore California Outer Continental Shelf
 ___ 83-MGG-04 Lease Sales 67 & 69. Gulf of Mexico - High-Resolution Seismic Reflection Data for Outer Continental Shelf; MMS Data Set GM-18802
 ___ 83-MGG-05 Well Log Data. 12 Exploratory Oil & Gas Wells - Offshore Oregon and Washington Outer Continental Shelf
 ___ 83-MGG-06 Worldwide Marine Geophysical Data Holdings
 ___ 83-MGG-07 Seismic Data. South Atlantic IPOD Site Surveys - African Margin and Mid-Atlantic Ridge
 ___ 83-MGG-08 Seismic Data. Bering Sea, Alaska - Outer Continental Shelf (USGS Open File Reports)
 ___ 83-MGG-09 Seismic Data. Southwest Atlantic IPOD Site Survey - Offshore Brazil Outer Continental Shelf
 ___ 83-MGG-10 Well Log Data. 3 Additional Oil & Gas Wells - Offshore Massachusetts & New Jersey Outer Continental Shelf
 ___ 83-MGG-11 Global SYNBAPS II (Synthetic Bathymetric Profiling System)
 ___ 83-MGG-12 Well Log Data. 10 Exploratory Oil & Gas Wells - Lower Cook Inlet, Alaska
 ___ 83-MGG-13 Multichannel Seismic Reflection Data - IPOD Site Survey - Nankai Trough, Japan
 ___ 83-MGG-14 Univ. of Texas IPOD Site Survey - Straits of Florida
 ___ 83-MGG-15 UPDATE. Bathymetric Data Bases
 ___ 83-MGG-16 SEISMIC HAZARD MODEL Reports
 ___ 83-MGG-17 Seismic Data. Multichannel Seismic Reflection Data - Atlantic Outer Continental Shelf
 ___ 83-MGG-18 UPDATE. Marine Geological Data - Deep Sea Drilling Project (DSDP)
 ___ 84-MGG-01 Seismic Reflection Data. Multichannel Seismic-Reflection Profiles - Offshore California - Pt. Conception
 ___ 84-MGG-02 Seismic Data. Navarin Basin, No. Bering Sea, Alaska - High Resolution Seismic Reflection Profiles
 ___ 84-MGG-03 Marine Geological Data. Worldwide Marine Geological Data Holdings

MARINE GEOLOGY AND GEOPHYSICS PUBLICATIONS

The publications listed below are available from the National Geophysical Data Center, NOAA/NGDC (E/GC 3), 325 Broadway, Boulder, CO 80303. Place a checkmark on the line at the left of each Report that you would like to receive, and mail to NGDC or give to NGDC representative. Please allow 4 weeks for receipt of the reports.

MARINE GEOLOGY AND GEOPHYSICS

- ___ KGRD 11 Summary of Digital Marine Geophysical Data Holdings (Bathymetric, Gravimetric,
and Magnetic Data), September 1978
- ___ KGRD 14 REVISED 1983. Marine Geology and Geophysics Data Services and Publications

MANGANESE NODULES

- ** KGRD 6 Bibliography and Index to Literature on Manganese Nodules (1874-1975), September 1978,
NTIS No. PB 257218

DATA MANAGEMENT

- ___ KGRD 10 The Marine Geophysical Data Exchange Format - "MGD77," September 1977
- ___ Proceedings of Marine Geology Data Management Workshop, May 22-24, 1978
- ___ Proceedings of Marine Geology and Geophysics Data Workshop, Nov. 5-7, 1980

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