Key to Oceanographic Records Documentation No. 19

Results of the NODC and IOC Oceanographic Data Archaeology and Rescue Projects: Report 1

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National Oceanographic Data Center
Washington, D.C. 20235

January 1994

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

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Ronald H. Brown, Secretary

National Oceanic and Atmospheric Administration
D. James Baker, Under Secretary

National Environmental Satellite, Data, and Information Service
Robert S. Winokur, Assistant Administrator

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1. Introduction

To understand the earth's climate system one must be able to describe both the mean state of the system and its variability, whether natural or anthropogenic. To determine the role of the world ocean as part of the earth's climate system, the international scientific community needs to have access to the most complete databases of historical oceanographic data possible. Many historical oceanographic data are not available to the international community in digital form. This publication describes a project of data archaeology and rescue organized to help alleviate this situation. "Data Archaeology" is the term used to describe the process of seeking out, restoring, evaluating, correcting, and interpreting historical data sets. "Rescue" refers to the effort to save data at risk of being lost to the science community.

Until recently there has been no observational system for the world ocean that even remotely compares to the meteorological observing system. Even now, with ship-of-opportunity programs and drifting buoy programs, the data received in real time and in delayed mode are not sufficient to document the state of large parts of the world ocean. Thus, there is a need for placing all oceanographic data in digital databases.

In addition to scientific curiosity about the role of the world ocean as part of the earth's climate system, there are additional reasons for building the most complete oceanographic data bases possible:

(1) The international scientific community is often called on to advise national and international bodies on such issues as climate change. Hence, the international oceanographic and climate communities should have access to the most complete digital oceanographic databases possible.

(2) Substantial resources have been or may be allocated for national and international ocean and climate programs such as Climate and Global Change, Tropical Ocean and Global Atmosphere (TOGA), World Ocean Circulation Experiment (WOCE), Global Ocean Ecosystems Dynamics (GLOBEC), and Joint Global Ocean Flux Study (JGOFS), and for the establishment of a Global Ocean Observing System (GOOS). Planners of such programs should have access to all historical oceanographic data in order to optimize measurement strategies. Scientists analyzing data from such programs need historical data in order to place new data in perspective.

Based on personal observations and discussions with scientists and data managers from the international community, it is clear that substantial amounts of historical oceanographic data exist only in manuscript or analog form. In addition there are data in digital form that are not available due to neglect or other reasons, for example, data that were used for one purpose by a scientist or institution but never archived at an international data center. Effectively these data are not available to researchers and other users. Whether recorded on paper or magnetic tape, these data are at risk of being lost due to:

- media degradation such as fading ink or magnetic fields,
- environmental catastrophes such as fires and floods,
- simple neglect,
- the retirement of individuals who know how to access these data or know the metadata associated with these data that make them useable to other scientists.

The U.S. National Oceanographic Data Center (NODC)/World Data Center A for Oceanography (WDC-A) has begun a project known as Global Oceanographic Data Archaeology and Rescue (**GODAR**). This project is being organized and conducted in cooperation with UNESCO's Intergovernmental Oceanographic Commission's (IOC) Committee on International Oceanographic Data Exchange (IODE).

The **GODAR** project is focusing on physical, chemical, and biological oceanographic data, as well as surface marine meteorological observations. Initially, most data digitized or otherwise rescued have been physical parameters, particularly temperature data from bathythermograph profiles. Data from the open ocean have been given the highest priority. Time series records longer than ten years have also been accorded high priority.

As part of its commitment to the institutions and countries who have made these data available, NODC/WDC-A will make all these data - plus all the data in the NODC digital profile archives - available as ASCII files on CD-ROM and other electronic media. CD-ROM technology represents the least expensive and simplest way to exchange oceanographic data internationally, particularly to nations without an electronic network system. In accordance with **GODAR** and ICSU/IOC World Data Center principles, the data will be distributed internationally without restriction.

This publication is the second in a series. The first publication, *National Oceanographic Data Center Inventory of Physical Oceanographic Profiles: Global Distributions by Year for All Countries* (Levitus and Gelfeld, 1992), identified the digital data held in the NODC/WDC-A archives. It has played an important role in promoting the discovery and acquisition of historical data. Previous data distribution maps (Wust, 1935, Wyrtki, 1971; Gordon, 1982; Levitus, 1982, 1989) have already proven valuable for these efforts.

Figure 1, which is taken from a paper accepted for publication by the U.S. Academy of Sciences (Levitus *et al.*, 1994) serves as an example of what new science can be learned by compiling digital data sets from data not previously available. The figure shows a time series of annual mean temperature at 100 meters depth at Ocean Weather Station "C," which was located at about 52.75°N, 35.5°W in the North Atlantic. There is clearly a quasi-decadal scale oscillation as well as a linear decrease in temperature over the approximately 40-year period of observation. This figure was made possible thanks to the merging of the historical data from the Soviet Union and United States. It is phenomena such as those documented in Figure 1 that are of great importance to understanding the variability of the ocean, whether natural or anthropogenic.

2. History of NODAR and GODAR

The NODC Oceanographic Data Archaeology and Rescue (**NODAR**) project and IOC/IODE **GODAR** project had their origins at a meeting held at NODC/WDC-A, Washington, D.C., in September 1990. The meeting was supported by the U.S. Climate and Global Change Program. Scientists and data managers from several countries and international centers including the Soviet Union, Korea, Japan, Chile, Australia, United States, and the International Council for the Exploration of the Seas (ICES) met informally to discuss the state of historical oceanographic data - in particular to discuss the loss of data due to media degradation. The results of the meeting led to the establishment of various national projects. These are known generically as "Oceanographic Data Archaeology and Rescue" projects. For example, as a result of this workshop, NODC received funding to begin the **NODAR** project. Similar projects were started at ICES and World Data Centers B and D (WDC-B, WDC-D).

An international meeting known as the "Workshop on Ocean Climate Data" was arranged by the IOC and NOAA at Greenbelt, Maryland, U.S.A (Churgin, 1992). The meeting was sponsored by the Commission of the European Communities (CEC), International Council of Scientific Unions (ICSU), World Meteorological Organization (WMO), ICES, and IOC. As a result of the demonstrated progress of various national data archaeology and rescue projects, the workshop recommended the expansion of these projects to band together under the umbrella of an existing international organization. Such support facilitates the exchange of data internationally.

A proposal for a **GODAR** project was submitted to the Fourteenth Session of the IODE meeting held in Paris, France from 1-9 December 1992. The IODE recommended to the IOC that this project be adopted as an IOC project. During the March 1993 IOC Assembly meeting, the IOC adopted the proposal for a **GODAR** project.

Specifically the **GODAR** project emphasizes:

- Digitization of data now known to exist only in manuscript and/or analog form. This effort will have highest priority of all activities.
- Rescue of digital data that are at risk of being lost due to media decay or neglect.

- Ensuring that all oceanographic data available for international exchange are archived at two or more international data centers in digital form.

- Preparing catalogues (inventories) of:

    - Data now available only in manuscript form;
    - Data now available only in analog form;
    - Digital data not presently available to the international scientific community.

- Performing quality control on all data and making all data accessible on various media including CD-ROMs as well as standard magnetic tape.

The first **GODAR** workshop was held in Obninsk, Russia, during May 1993. This meeting focused on datasets and activities in eastern and northern Europe. This region was chosen in particular because of the real possibility of the loss of substantial data sets due to economic conditions in eastern Europe. The report of the first **GODAR** workshop (IOC, 1993) gives some indication of the amounts of data that exist in manuscript form. The Russian delegation reported the existence of approximately 450,000 Mechanical Bathythermograph (MBT) profiles and 800,000 Oceanographic Station (OSD) profiles in manuscript form. Ukraine has data from at least 100 cruises. It should be noted that the data received at WDC-A from the Russian NODC over the last two years have been of excellent quality.

3. Methods of Investigation

From the inception of the national archaeology and rescue projects at various centers, efforts were coordinated to avoid duplication of effort and to maximize the use of scarce resources. Joint activities include the exchange of data, data distribution plots, catalogue information about data holdings, and the exchange of scientists and data managers between centers. Simultaneous "rescue" and exchange of data was emphasized for two reasons:

- some data are at risk of being lost forever if not saved immediately,
- the international research and administrative communities needed a demonstration of how quickly the project could make previously unavailable data accessible in digital format.

Perhaps the most valuable technique to quickly describe data holdings is to produce data distribution plots and tables of the number of profiles on a year-by-year basis for each major measurement type. Levitus and Gelfeld (1992) have done this for each of the major NODC digital archives. This work showed the distributions of NODC holdings for all countries. NODC/WDC-A has prepared similar plots on a country-by-country basis and distributed such summaries to data centers, scientists, and institutions in approximately 20 countries as of December 1993. These summaries have generated much interest and resulted in the exchange of more information and data. Through the generation of such summaries, the **NODAR/GODAR** project was able to conclude that substantial amounts of Canadian MBT profiles (10,000) that already existed in digital form were not in the NODC/WDC-A files. These profiles have been acquired by NODC/WDC-A and will be distributed as part of the **GODAR** project and incorporated into the NODC/WDC-A archive.

Examination of cruise reports and monographs have also supplied both data and metadata not available in digital form. By examining the report series *"Special Scientific Reports...Fisheries"* of the Fish and Wildlife Service of the Department of Interior, we found chemical and biological data from U.S. research cruises that had never been digitized even though in some instances the physical parameters of these profiles are part of the NODC digital archive. Metadata about these biological and chemical parameters, such as measurement techniques, are available in these reports in detail. We also found observations of surface salinity and phosphate that had been measured at the same time that MBT profiles were made. We have begun digitizing all these data.

One example of a monograph providing substantial information about historical oceanographic observations is the work by Muromtsev (1958). He provides a list of "deep-water" observations made in the Pacific Ocean for the 19th and 20th centuries. In addition, Muromtsev provides a table containing the actual temperature measurements from profiles made in the Pacific Ocean during the period 1804-1873. Although the accuracy of these measurements needs to be examined to determine whether the data are useful, at least the data have been tabulated in a single location with metadata that will allow the determination of the suitability of these data for scientific studies. Another example is the U.S. National Academy of Sciences report by Vaughn (1937). This document contains contributions by Defant, Sverdrup, Helland-Hansen, and Wust who, in total, describe a great deal of profiles made globally up to the date of the report. Some of this material has been published in other reports or atlases (e.g. Wust, 1935). Some of the material describes data not archived at NODC/WDC-A in digital form.

4. Results

Tables 1 and 2 document how successful **NODAR/GODAR** efforts have been. When one considers that the global historical data base of temperature data has increased by more than 1.2 million profiles in the past two years and that the results of the first **GODAR** workshop (IOC, 1993) have identified on the order of another one million profiles that are in manuscript form, it becomes clear that the international scientific community will have access to a much more complete data base than ever thought possible. This includes many MBT profiles that will help determine interannual variability of the upper ocean thermal structure. In addition, numerous Oceanographic Station Profiles that include temperature, salinity, and other parameters are now available.

Figure 2 is an example of data recovered by the U.S. data archaeology and rescue project. This figure shows the distribution of 2,814 MBT profiles observed during 1943 by the U.S. Navy. The digitization of these data was funded by **NODAR** during 1993. When they have been merged with other data from this year (see Levitus and Gelfeld, 1992), scientists will be able to estimate temperature anomalies for a greater area of the Pacific Ocean during 1943 than previously thought possible.

Appendices 1-10 are a collection of tables and data distribution plots illustrating the 1.2 million oceanographic profiles now available to the international research community as a result of the first steps in the **NODAR/GODAR** projects. Individual year plots are available upon request.

5. Future Work

The data sets received so far are being processed at NODC/WDC-A and will be distributed internationally without restriction. Several media will be used for distribution including CD-ROMs. CD-ROMs have several advantages for the distribution of *in situ* oceanographic data:

- there exists an international standard for reading and writing information to CD-ROMs,
- CD-ROMs have relatively large storage capacity for the *in situ* oceanographic data sets we are distributing,
- they are relatively inexpensive to master and duplicate,
- their small size, which makes physical distribution easier as compared with magnetic tapes,
- a relatively small investment is required to obtain a personal computer and CD-ROM drive for accessing these data. Neither mainframes or even minicomputers are required for digital access to large data bases.

While we fully expect the data, and analyses of these data to be made available over an electronic network, we believe that CD-ROM technology best serves the international distribution of these data. Some countries simply do not yet have the required network capability.

Numerous institutions from the international community are now participating in the **GODAR** project. The navies of several countries have been declassifying oceanographic data and making these data available internationally without restriction. For example, the Russian navy is participating in the **GODAR** project by making manuscript data available for digitization and distribution (IOC, 1993). The U.S. Navy has recently declassified approximately 100,000 XBT profiles and made them available for international distribution. These data are now part of the NODC/WDC-A data bases and are in fact available for international distribution.

More comprehensive data bases will lead to a better description of both the mean state and the variability of the world ocean. This will lead to better understanding of the role of the world ocean in the earth's climate system. Such work is international in nature. The recent atlas by Olbers *et al.* (1992) is an excellent example of an analysis of oceanographic data that has benefitted by international cooperation resulting in the exchange of data.

As part of its commitment to the institutions and countries who have made these data available, the NODC/WDCA will make available all the data shown in this publication. These data, plus all the data in the NODC/WDCA digital archives, will be issues as ASCII files on CD-ROM as well as magnetic media. In accordance with **GODAR** and World Data Center principles, the data will be distributed internationally without restriction. In addition, a set of objective analyses of these data has been prepared similar to the work of Levitus (1982). These analyses will also be distributed internationally without restriction, both in digital form and as atlases (Conkright, Levitus and Boyer, 1994; Levitus and Boyer, 1994a, 1994b, 1994c; Levitus, Burgett, and Boyer, 1994). It is our hope that other investigators, research groups, and data centers from all countries with marine research and operational programs will participate in and benefit from this project.

6. Acknowledgements

We acknowledge the contribution of many individuals and organizations to this publication. Scientists and technicians studying the world ocean have undertaken the task of collecting and processing the data. Data centers in China, Japan, South Korea, India, and Russia have been particularly helpful through their participation in **GODAR** and **GODAR** type projects. Hou Wenfeng and Lin Shaohua of WDC-D were instrumental in making data available from China.

Although many data managers and scientists from the international community have been instrumental in building global oceanographic data bases, we would like to thank in particular Harry Dooley, Shin Tani, and Yuri Sychev for their commitment to national and international oceanographic data archaeology and efforts. They were among the founders of international **GODAR** efforts and have continued to play a leading role in these efforts.

The organization of WDC-A data for digitization was due to the efforts of Ron Moffatt, Godfrey Trammell, and Ron Fauquet.

We also appreciate the efforts by navies in the United States and other countries to increase the amount of data available to the research community. While not classified in a formal sense, many data collected by navies around the world were not previously available.

Youri Oliounine of the IOC has provided valuable technical support in the formation and management of the IOC/IODE **GODAR** project. Ron Wilson, Chairman of the International Oceanographic Data Exchange Committee of the IOC and Director of the Canadian Marine Environmental Data Service has provided consistent and strong support for **GODAR**.

The NOAA Climate and Global Change Program and the NOAA Earth Science Data and Information System Management Program have supported the work of the NODC Data Archaeology and Rescue projects. The direct result of these projects is that valuable historical oceanographic data are now available to the international user community.

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Figure 1
Annual Mean Temperature at 100m at Ocean Weather Station "C"

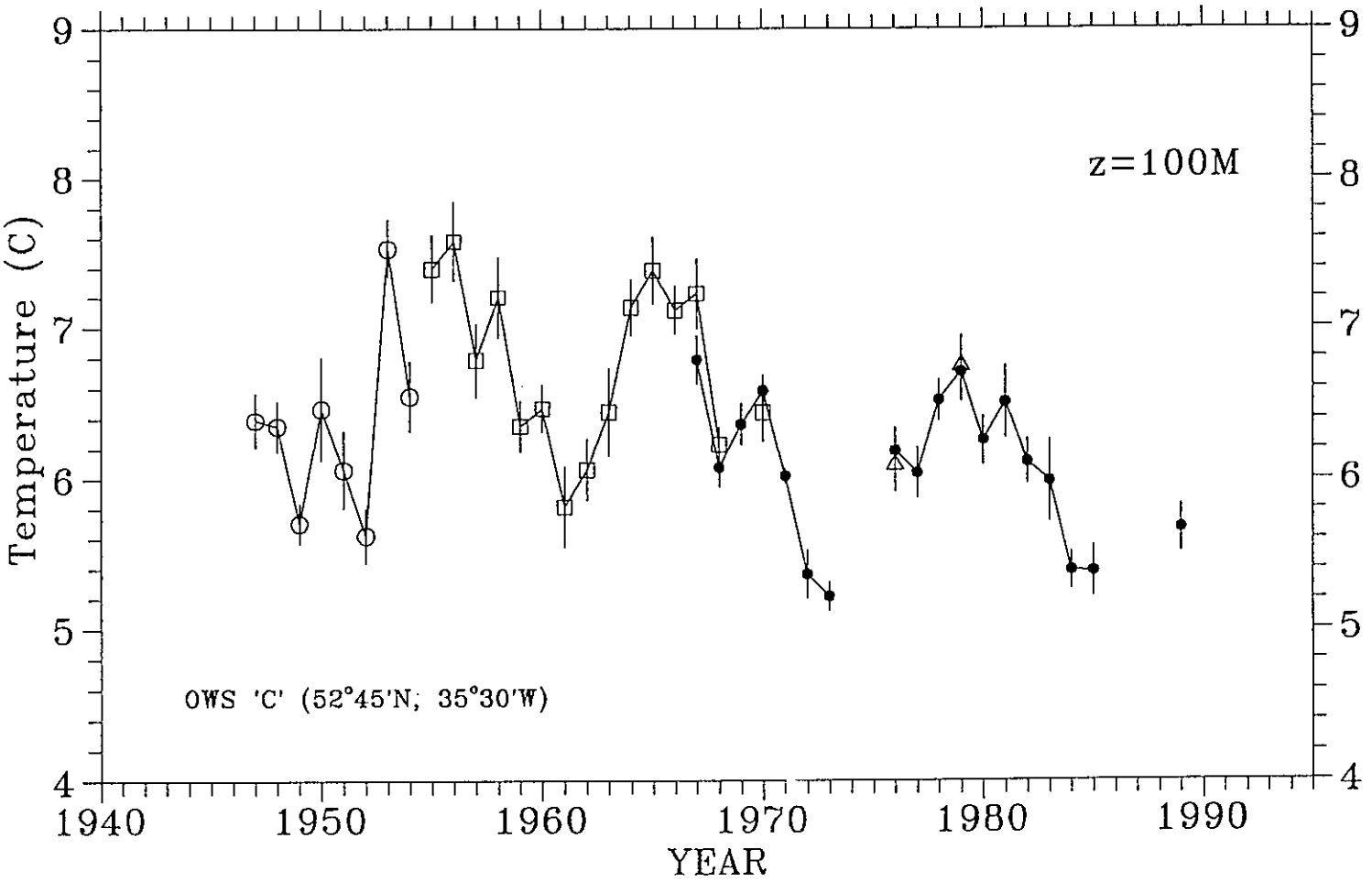


Figure 2
Mechanical Bathythermograph Profiles from Scripps Institution of Oceanography
This plot for year 1943

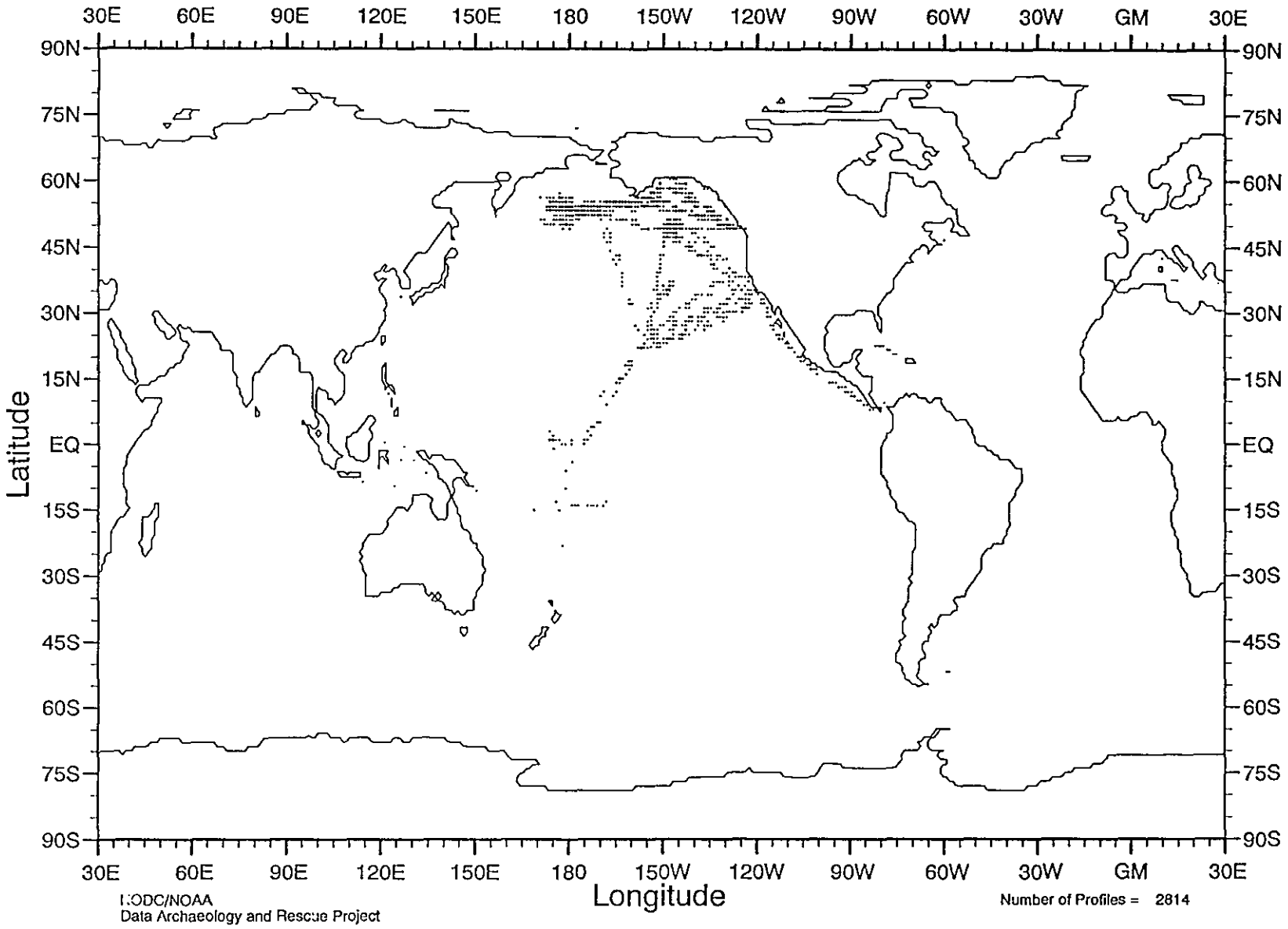


Table 1 - Data sets received through NODC and IOC Data Archaeology and Rescue projects (and presented as distribution plots in this publication)

COUNTRY INST	DATA TYPE	NO. OF PROFILES	PERIOD OF OBS.	REMARKS
AUSTRALIA				
CSIRO	OSD	22,190	1929-1990	
CHINA				
WDC-D	OSD	8,053	1958-1990	
FRANCE	MBT	2,791	1964-1972	MBT and Surface Salinity
ICELAND	OSD	7,311	1938-1988	
ICES	OSD	8,850	1970-1992	DENMARK
INDIA				
INODC	OSD	650	1976-1988	T, S, nutrients
JAPAN				
JODC	OSD	254,846	1965-1990	JAPAN FISH. AG.
	DBT	23,452	1979-1986	JAPAN FISH. AG.
	MBT	60,764	1965-1985	JAPAN FISH. AG.
	XBT	1,774	1979-1985	JAPAN FISH. AG.
RUSSIA				
POI	OSD	5,636	1947-1988	S. CHINA SEA
	CTD	4,249	1981-1989	S. CHINA SEA
WDC-B	MBT	232,793	1940-1990	
	OSD	12,931	1969-1991	N.& S. Atlantic
SOUTH KOREA				
KODC	OSD	30,222	1961-1992	

United States				
SIO	MBT	73,987	1943-1970	North Pacific
WHOI	MBT	242,264	1941-1961	U.S. Navy, Coast Guard, and research ships
WDC-A	OSD	1,169	1958-1978	Digitization of manuscript data held at WDC-A

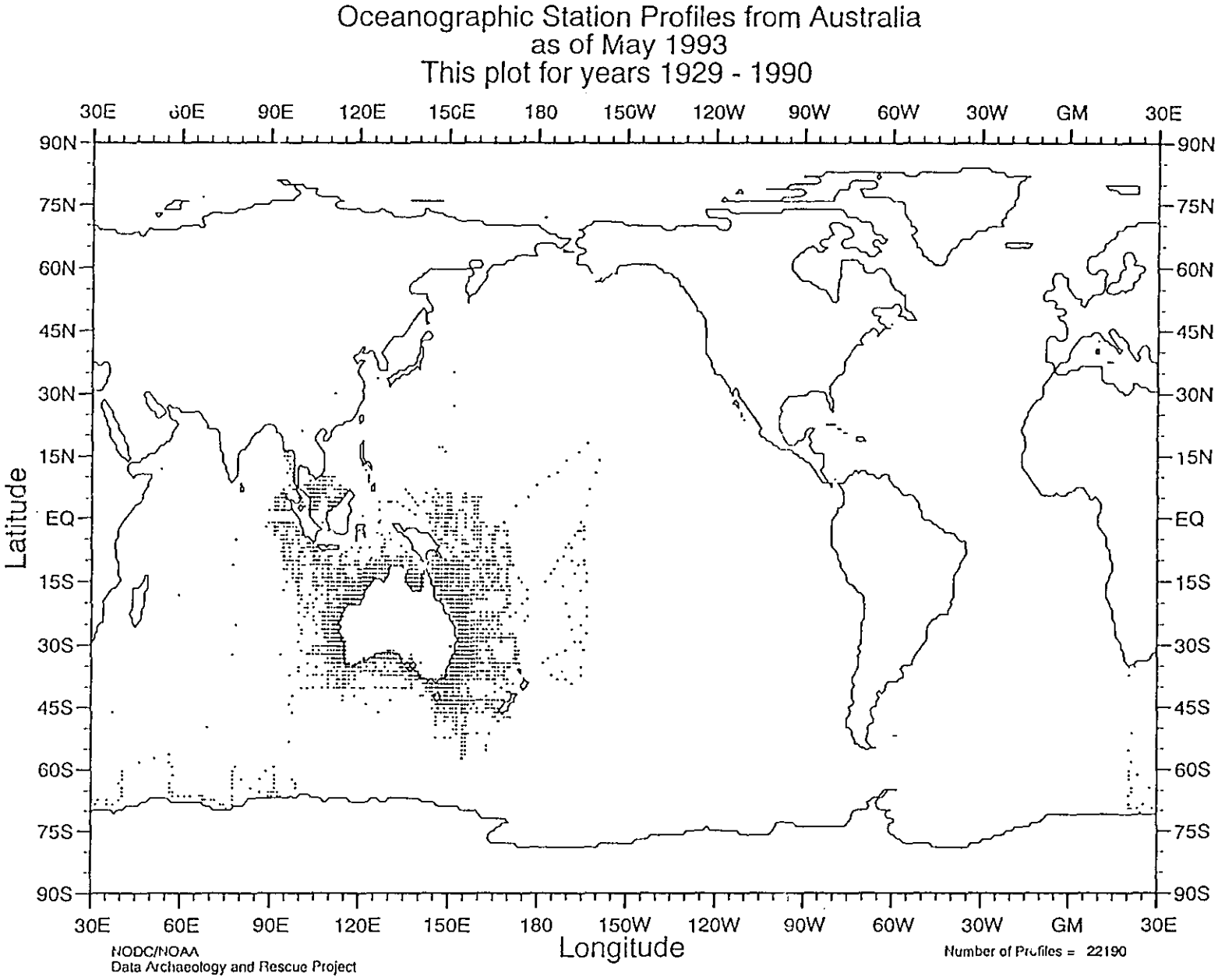
Table 2 - Data sets received through NODC and IOC Data Archaeology and Rescue projects (these data are not presented as distribution plots in this publication)

COUNTRY INST	DATA TYPE	NO. OF PROFILES	PERIOD OF OBS.	REMARKS
CANADA				
MEDS	XBT	46,658	1968-1988	
	DBT	11,563	1982-1981	
	MBT	145,286	1943-1988	Approximately 26,000 of these are new to the NODC/WDC-A archive. The others replace existing profiles because they are digitized at observed levels rather than at 5 m intervals.
ICES	OSD	2,681	1971-1974	CINCECA
	OSD	432	1948-1990	OWS L
	OSD	1,171	1983-1990	OWS C
	OSD	7,989	1948-1988	OWS M
	OSD	245	1925-1930	ATLANTIC SLOPE
JAPAN				
JODC	CURM	28,487	1964-1985	JAPAN FISH. AG.
UNITED KINGDOM				
IOS	OSD	105	1973	R.R.S. SHACKLETON, CRUISE 6, ICES Overflow 73 Expedition. These data were digitized at NODC/WDC-A after receipt of manuscript tables from Mr. Jim Crease (WOCE DMU).
United States				
SIO	OSD	162	1972-1973	TASADAY Legs I-IV, Southtow, Climax
US COAST GUARD	OSD	634	1961	Surface T&S

Appendix 1 - **AUSTRALIA**

Time Series of NODC Oceanographic Station
Profiles for AUSTRALIA as of May 1993
Total Number of Profiles = 22,190

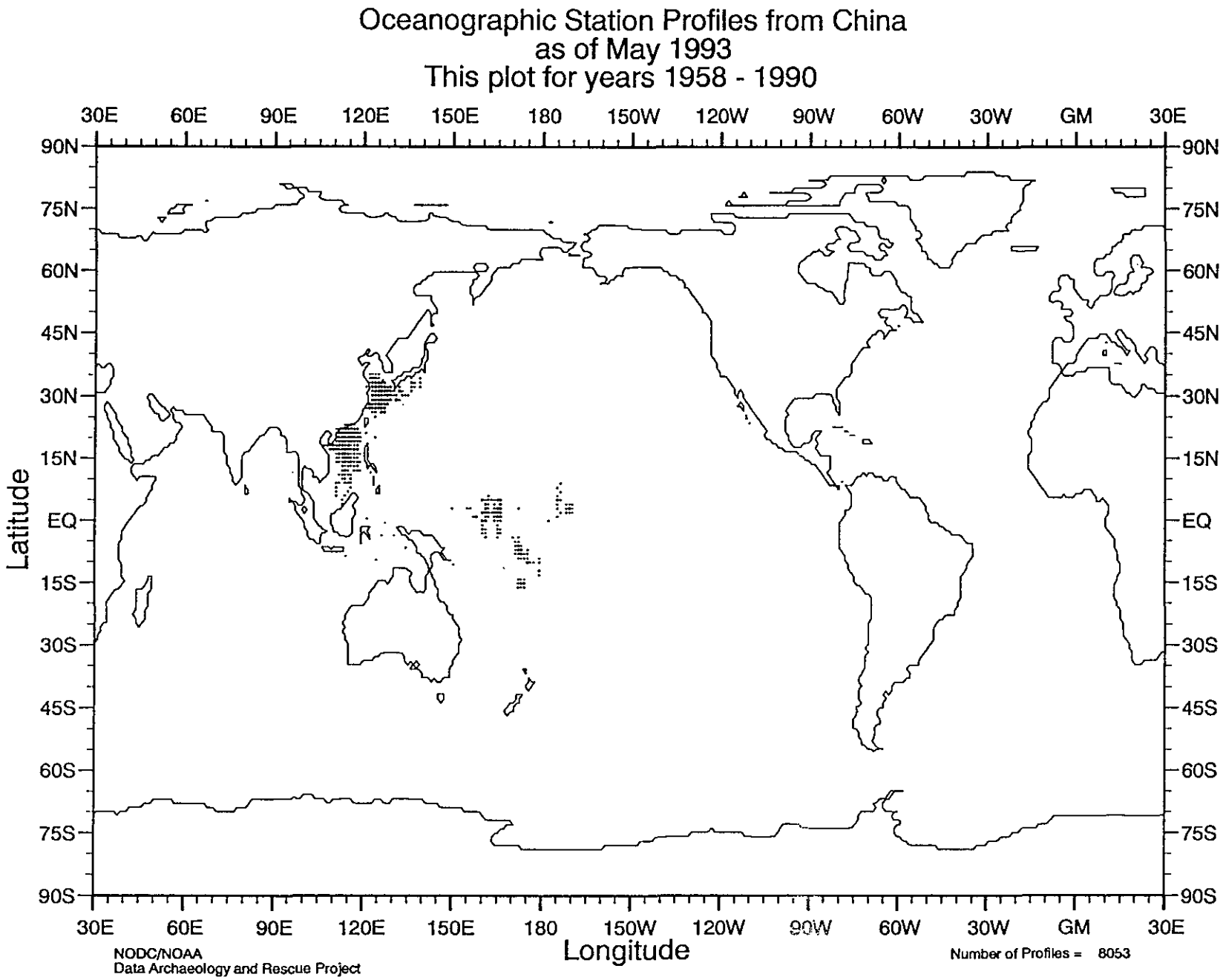
YEAR	NUMBER OF PROFILES	YEAR	NUMBER OF PROFILES	YEAR	NUMBER OF PROFILES
1900	0	1932	3	1964	375
1901	0	1933	0	1965	244
1902	0	1934	0	1966	308
1903	0	1935	0	1967	606
1904	0	1936	2	1968	557
1905	0	1937	0	1969	273
1906	0	1938	0	1970	370
1907	0	1939	0	1971	805
1908	0	1940	0	1972	351
1909	0	1941	0	1973	388
1910	0	1942	2	1974	550
1911	0	1943	34	1975	802
1912	0	1944	52	1976	817
1913	0	1945	58	1977	505
1914	0	1946	67	1978	930
1915	0	1947	50	1979	842
1916	0	1948	80	1980	982
1917	0	1949	73	1981	952
1918	0	1950	88	1982	1028
1919	0	1951	145	1983	1039
1920	0	1952	129	1984	870
1921	0	1953	163	1985	636
1922	0	1954	258	1986	512
1923	0	1955	325	1987	679
1924	0	1956	230	1988	395
1925	0	1957	349	1989	1186
1926	0	1958	468	1990	503
1927	0	1959	220	1991	0
1928	0	1960	180	1992	0
1929	2	1961	516	1993	0
1930	0	1962	573	1994	
1931	0	1963	618	1995	


Oceanographic Station Profiles from Australia
as of May 1993
This plot for years 1929 - 1990
30E 60E 90E 120E 150E 180 150W 120W 90W 60W 30W GM 30E
90N 75N 60N 45N 30N 15N EQ 15S 30S 45S 60S 75S 90S
Latitude
Longitude
NODC/NOAA
Data Archaeology and Rescue Project
Number of Profiles = 22190

Appendix 2 - **CHINA**

Time Series of NODC Oceanographic Station
Profiles for CHINA as of May 1993
Total Number of Profiles = 8,053

YEAR	NUMBER OF PROFILES	YEAR	NUMBER OF PROFILES	YEAR	NUMBER OF PROFILES
1900	0	1932	0	1964	0
1901	0	1933	0	1965	0
1902	0	1934	0	1966	24
1903	0	1935	0	1967	0
1904	0	1936	0	1968	0
1905	0	1937	0	1969	0
1906	0	1938	0	1970	0
1907	0	1939	0	1971	0
1908	0	1940	0	1972	130
1909	0	1941	0	1973	242
1910	0	1942	0	1974	156
1911	0	1943	0	1975	282
1912	0	1944	0	1976	347
1913	0	1945	0	1977	348
1914	0	1946	0	1978	597
1915	0	1947	0	1979	718
1916	0	1948	0	1980	571
1917	0	1949	0	1981	517
1918	0	1950	0	1982	288
1919	0	1951	0	1983	270
1920	0	1952	0	1984	335
1921	0	1953	0	1985	221
1922	0	1954	0	1986	346
1923	0	1955	0	1987	171
1924	0	1956	0	1988	161
1925	0	1957	0	1989	457
1926	0	1958	30	1990	520
1927	0	1959	915	1991	0
1928	0	1960	407	1992	0
1929	0	1961	0	1993	0
1930	0	1962	0	1994	
1931	0	1963	0	1995	


Oceanographic Station Profiles from China
as of May 1993
This plot for years 1958 - 1990
30E 60E 90E 120E 150E 180 150W 120W 90W 60W 30W GM 30E
90N 75N 60N 45N 30N 15N EQ 15S 30S 45S 60S 75S 90S
Latitude
Longitude
NODC/NOAA
Data Archaeology and Rescue Project
Number of Profiles = 8053

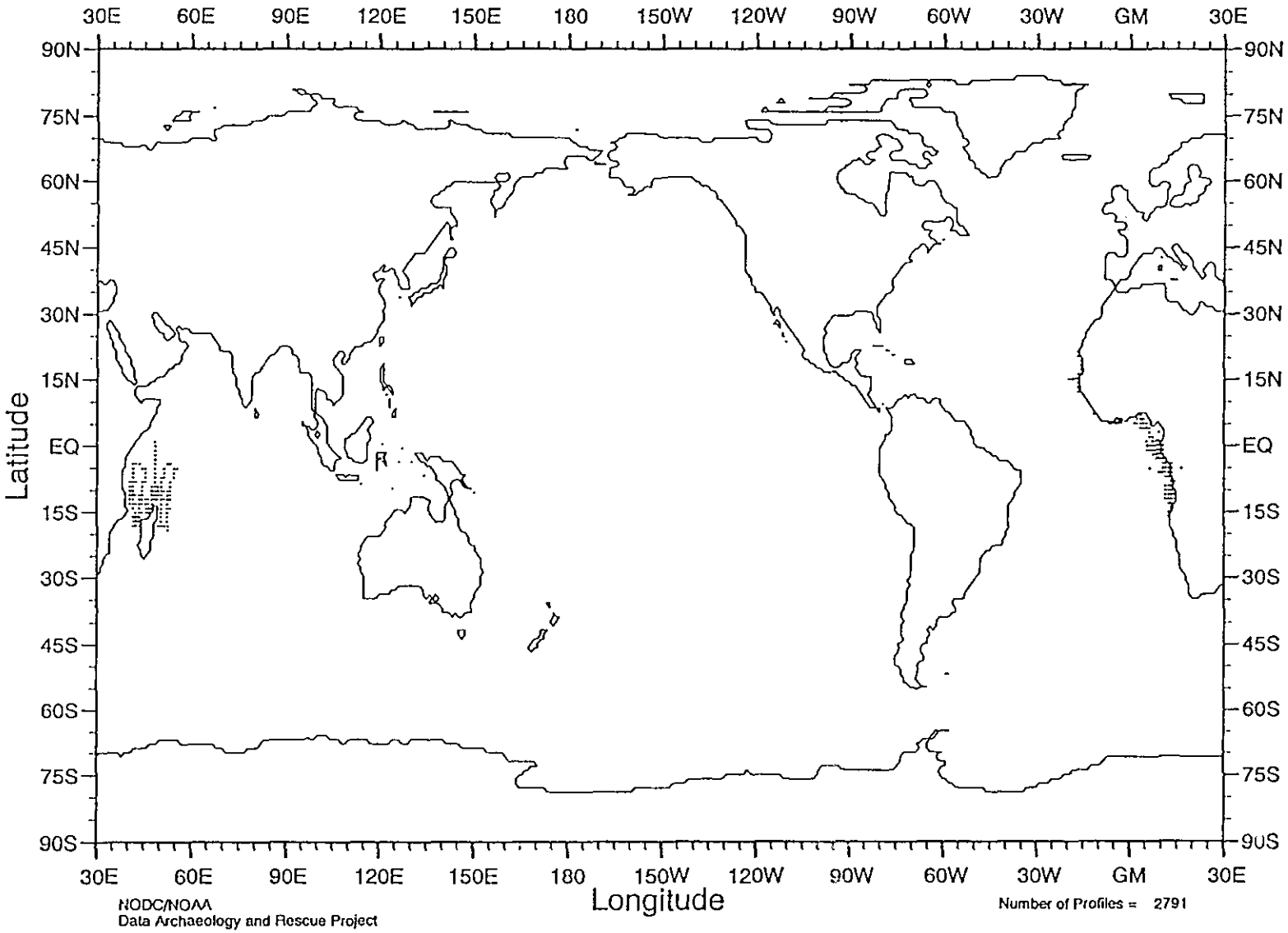
Appendix 3 - **FRANCE**

The table and data distribution plot represents analogue strip charts and data tables submitted by Dr. Jean-Rene Donguy

Time Series of NODC Mechanical Bathythermograph (MBT)
Profiles for FRANCE as of May 1993
Total Number of Profiles = 2,791

YEAR	NUMBER OF PROFILES	YEAR	NUMBER OF PROFILES	YEAR	NUMBER OF PROFILES
1900	0	1932	0	1964	184
1901	0	1933	0	1965	439
1902	0	1934	0	1966	192
1903	0	1935	0	1967	517
1904	0	1936	0	1968	450
1905	0	1937	0	1969	679
1906	0	1938	0	1970	81
1907	0	1939	0	1971	147
1908	0	1940	0	1972	102
1909	0	1941	0	1973	0
1910	0	1942	0	1974	0
1911	0	1943	0	1975	0
1912	0	1944	0	1976	0
1913	0	1945	0	1977	0
1914	0	1946	0	1978	0
1915	0	1947	0	1979	0
1916	0	1948	0	1980	0
1917	0	1949	0	1981	0
1918	0	1950	0	1982	0
1919	0	1951	0	1983	0
1920	0	1952	0	1984	0
1921	0	1953	0	1985	0
1922	0	1954	0	1986	0
1923	0	1955	0	1987	0
1924	0	1956	0	1988	0
1925	0	1957	0	1989	0
1926	0	1958	0	1990	0
1927	0	1959	0	1991	0
1928	0	1960	0	1992	0
1929	0	1961	0	1993	0
1930	0	1962	0	1994	
1931	0	1963	0	1995	

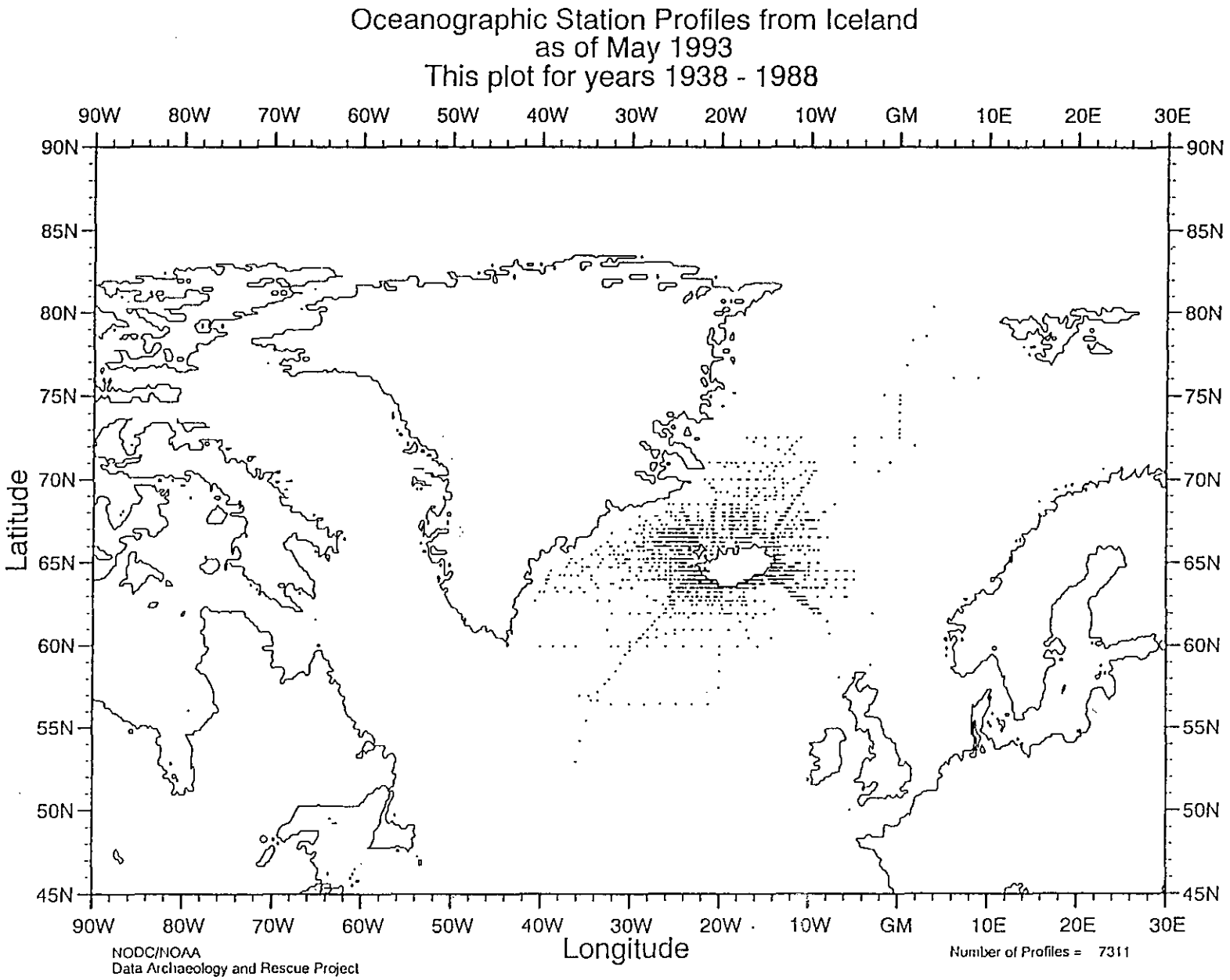
Mechanical Bathythermographs from France
as of May 1993
This plot for years 1964 - 1972



Appendix 4 - **ICELAND**

Time Series of NODC Oceanographic Station
Profiles for ICELAND as of May 1993
Total Number of Profiles = 7,311

YEAR	NUMBER OF PROFILES	YEAR	NUMBER OF PROFILES	YEAR	NUMBER OF PROFILES
1900	0	1932	0	1964	9
1901	0	1933	0	1965	8
1902	0	1934	0	1966	1
1903	0	1935	0	1967	3
1904	0	1936	0	1968	0
1905	0	1937	0	1969	0
1906	0	1938	1	1970	3
1907	0	1939	0	1971	524
1908	0	1940	0	1972	34
1909	0	1941	0	1973	447
1910	0	1942	0	1974	23
1911	0	1943	0	1975	25
1912	0	1944	0	1976	26
1913	0	1945	0	1977	756
1914	0	1946	0	1978	755
1915	0	1947	0	1979	29
1916	0	1948	352	1980	66
1917	0	1949	1	1981	695
1918	0	1950	0	1982	625
1919	0	1951	1	1983	495
1920	0	1952	0	1984	294
1921	0	1953	0	1985	423
1922	0	1954	0	1986	468
1923	0	1955	0	1987	625
1924	0	1956	0	1988	408
1925	0	1957	3	1989	0
1926	0	1958	0	1990	0
1927	0	1959	1	1991	0
1928	0	1960	170	1992	0
1929	0	1961	5	1993	0
1930	0	1962	4	1994	
1931	0	1963	31	1995	

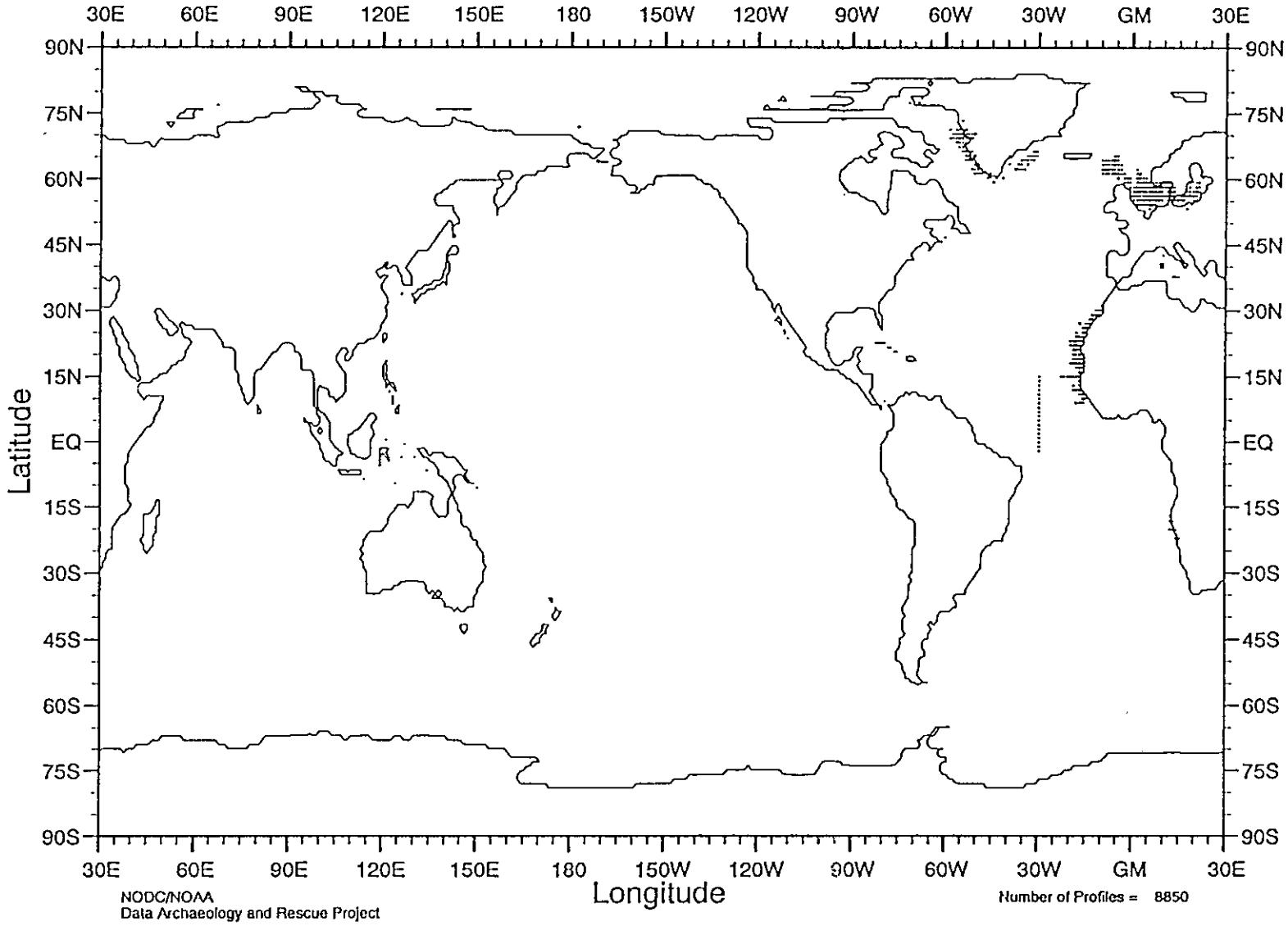

Oceanographic Station Profiles from Iceland
as of May 1993
This plot for years 1938 - 1988
90W 80W 70W 60W 50W 40W 30W 20W 10W GM 10E 20E 30E
90N 85N 80N 75N 70N 65N 60N 55N 50N 45N
Latitude
Longitude
NODC/NOAA
Data Archaeology and Rescue Project
Number of Profiles = 7311

Appendix 5 - **ICES**

Time Series of NODC Oceanographic Station
Profiles from ICES as of May 1993
Total Number of Profiles = 8,850

YEAR	NUMBER OF PROFILES	YEAR	NUMBER OF PROFILES	YEAR	NUMBER OF PROFILES
1900	0	1932	0	1964	0
1901	0	1933	0	1965	0
1902	0	1934	0	1966	0
1903	0	1935	0	1967	0
1904	0	1936	0	1968	0
1905	0	1937	0	1969	0
1906	0	1938	0	1970	167
1907	0	1939	0	1971	481
1908	0	1940	0	1972	580
1909	0	1941	0	1973	812
1910	0	1942	0	1974	608
1911	0	1943	0	1975	116
1912	0	1944	0	1976	977
1913	0	1945	0	1977	396
1914	0	1946	0	1978	165
1915	0	1947	0	1979	2
1916	0	1948	0	1980	18
1917	0	1949	0	1981	32
1918	0	1950	0	1982	154
1919	0	1951	0	1983	118
1920	0	1952	0	1984	320
1921	0	1953	0	1985	375
1922	0	1954	0	1986	114
1923	0	1955	0	1987	244
1924	0	1956	0	1988	703
1925	0	1957	0	1989	612
1926	0	1958	0	1990	1471
1927	0	1959	0	1991	340
1928	0	1960	0	1992	45
1929	0	1961	0	1993	0
1930	0	1962	0	1994	
1931	0	1963	0	1995	

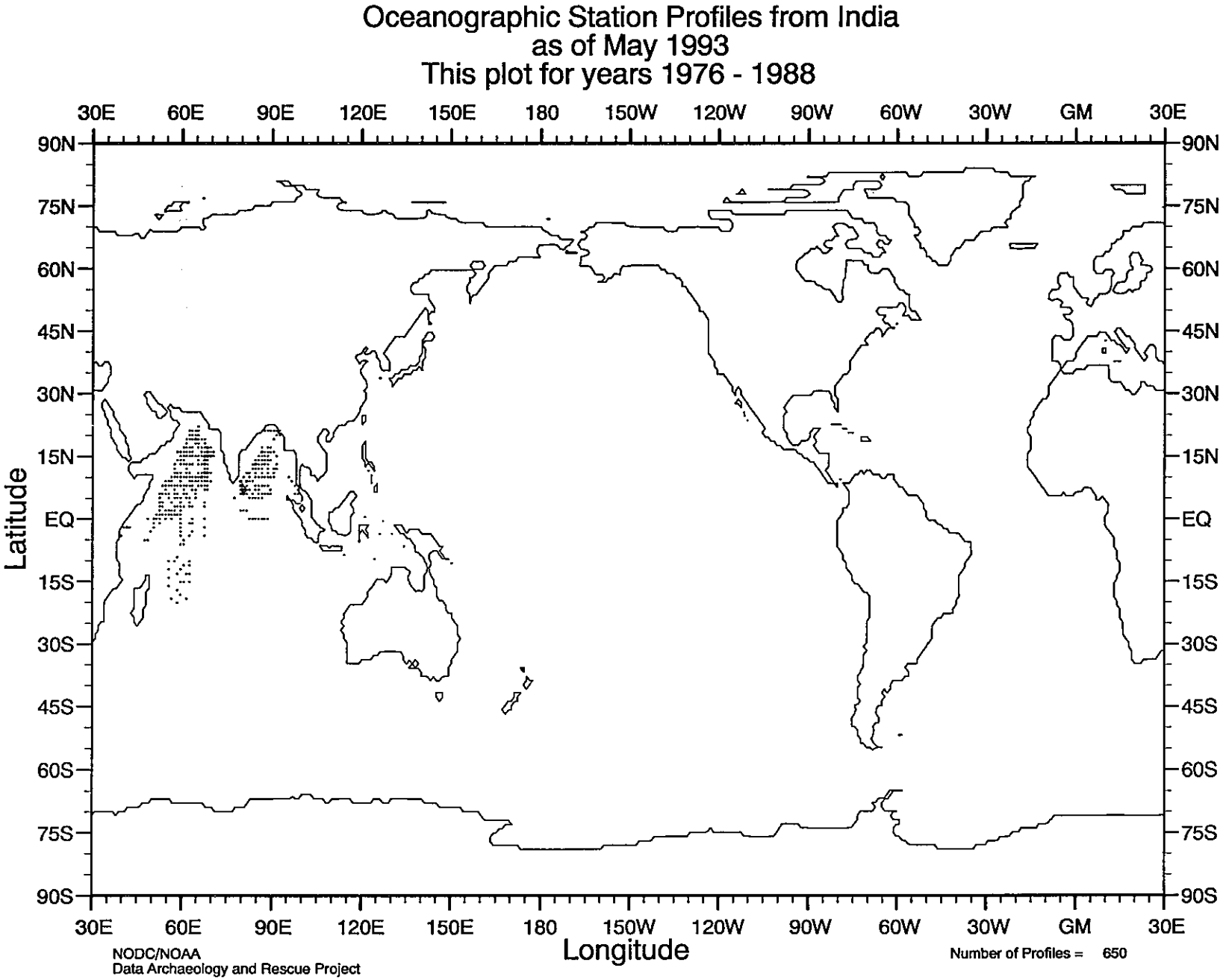
Oceanographic Station Profiles from
The International Council for the Exploration of the Sea (ICES)
This plot for years 1970 - 1992



Appendix 6 - **INDIA**

Time Series of NODC Oceanographic Station
Profiles for INDIA as of May 1993
Total Number of Profiles = 650

YEAR	NUMBER OF PROFILES	YEAR	NUMBER OF PROFILES	YEAR	NUMBER OF PROFILES
1900	0	1932	0	1964	0
1901	0	1933	0	1965	0
1902	0	1934	0	1966	0
1903	0	1935	0	1967	0
1904	0	1936	0	1968	0
1905	0	1937	0	1969	0
1906	0	1938	0	1970	0
1907	0	1939	0	1971	0
1908	0	1940	0	1972	0
1909	0	1941	0	1973	0
1910	0	1942	0	1974	0
1911	0	1943	0	1975	0
1912	0	1944	0	1976	12
1913	0	1945	0	1977	1
1914	0	1946	0	1978	11
1915	0	1947	0	1979	29
1916	0	1948	0	1980	33
1917	0	1949	0	1981	23
1918	0	1950	0	1982	43
1919	0	1951	0	1983	203
1920	0	1952	0	1984	0
1921	0	1953	0	1985	94
1922	0	1954	0	1986	65
1923	0	1955	0	1987	62
1924	0	1956	0	1988	74
1925	0	1957	0	1989	0
1926	0	1958	0	1990	0
1927	0	1959	0	1991	0
1928	0	1960	0	1992	0
1929	0	1961	0	1993	0
1930	0	1962	0	1994	
1931	0	1963	0	1995	

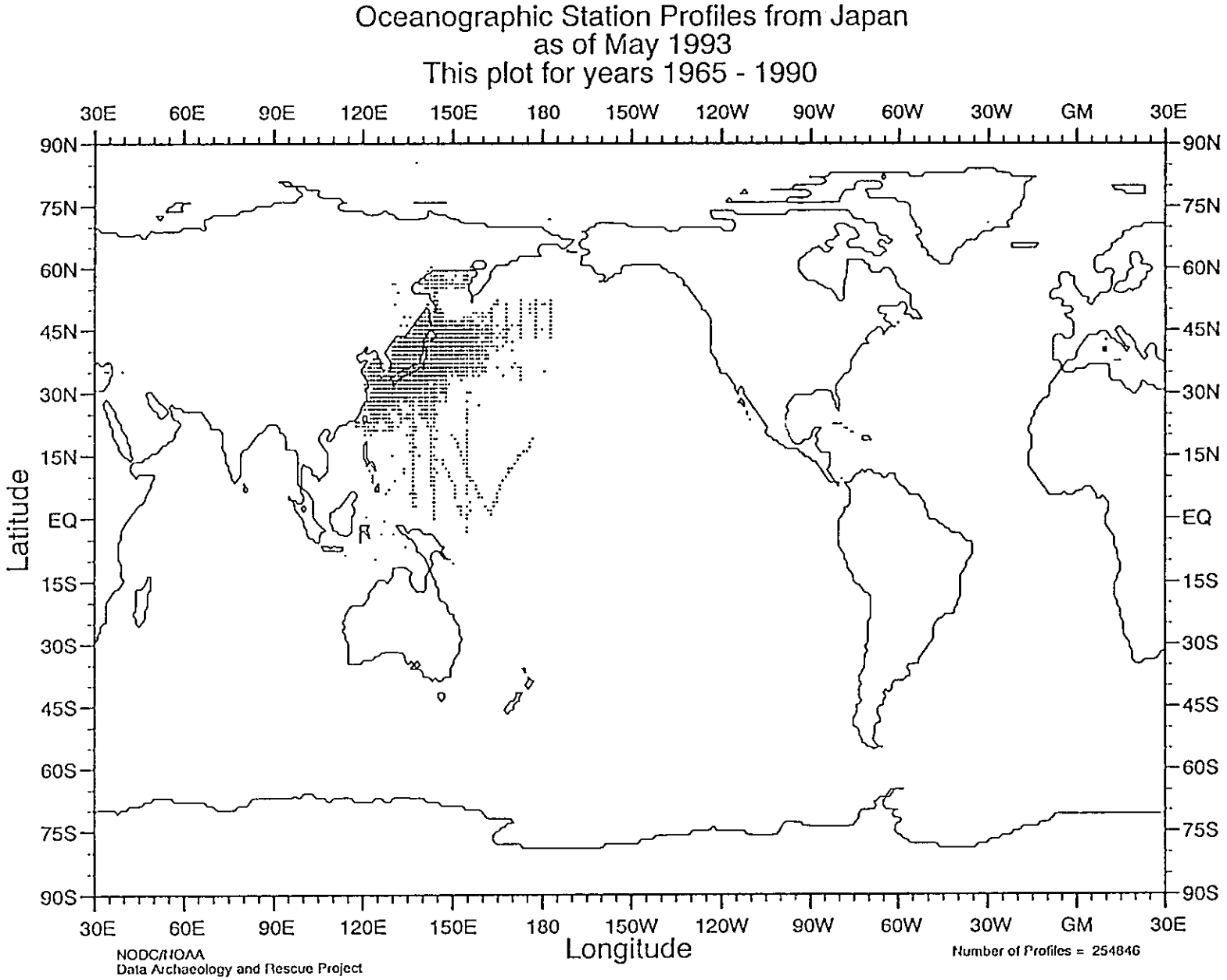

Oceanographic Station Profiles from India
as of May 1993
This plot for years 1976 - 1988
30E 60E 90E 120E 150E 180 150W 120W 90W 60W 30W GM 30E
90N 75N 60N 45N 30N 15N EQ 15S 30S 45S 60S 75S 90S
Latitude
Longitude
NODC/NOAA
Data Archaeology and Rescue Project
Number of Profiles = 650

Appendix 7 - **JAPAN**

The Japanese station data profiles include only temperature and salinity. Additional parameters such as nutrients, chlorophyll, primary productivity and others are not yet available.

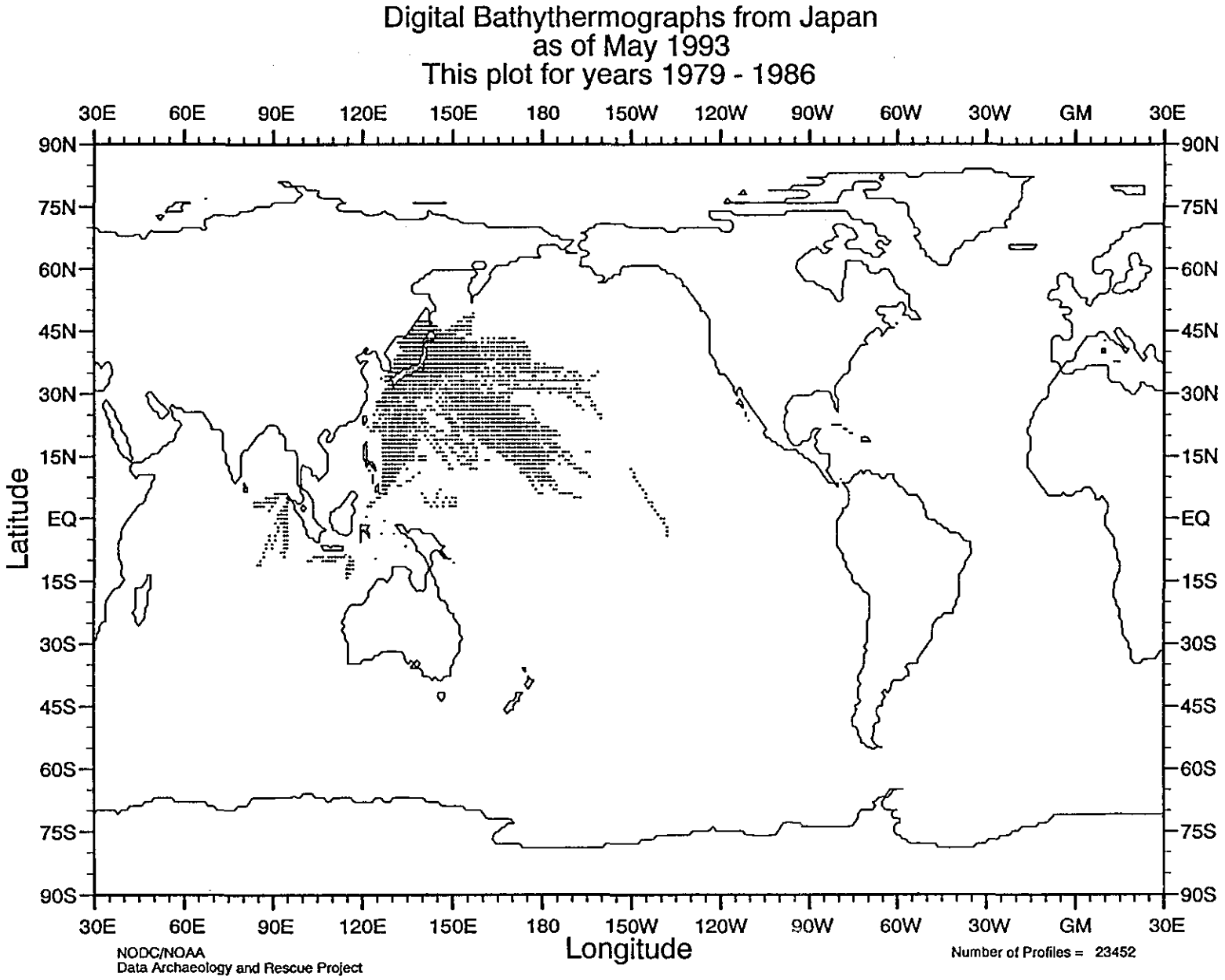
Time Series of NODC Oceanographic Station
Profiles for JAPAN as of May 1993
Total Number of Profiles = 254,846

YEAR	NUMBER OF PROFILES	YEAR	NUMBER OF PROFILES	YEAR	NUMBER OF PROFILES
1900	0	1932	0	1964	0
1901	0	1933	0	1965	12898
1902	0	1934	0	1966	12358
1903	0	1935	0	1967	11217
1904	0	1936	0	1968	10821
1905	0	1937	0	1969	10989
1906	0	1938	0	1970	13364
1907	0	1939	0	1971	11705
1908	0	1940	0	1972	14115
1909	0	1941	0	1973	13425
1910	0	1942	0	1974	12198
1911	0	1943	0	1975	11871
1912	0	1944	0	1976	11638
1913	0	1945	0	1977	11414
1914	0	1946	0	1978	10986
1915	0	1947	0	1979	11002
1916	0	1948	0	1980	10682
1917	0	1949	0	1981	10808
1918	0	1950	0	1982	11587
1919	0	1951	0	1983	12099
1920	0	1952	0	1984	12549
1921	0	1953	0	1985	14516
1922	0	1954	0	1986	0
1923	0	1955	0	1987	0
1924	0	1956	0	1988	0
1925	0	1957	0	1989	0
1926	0	1958	0	1990	2604
1927	0	1959	0	1991	0
1928	0	1960	0	1992	0
1929	0	1961	0	1993	0
1930	0	1962	0	1994	
1931	0	1963	0	1995	


Oceanographic Station Profiles from Japan
as of May 1993
This plot for years 1965 - 1990
30E 60E 90E 120E 150E 180 150W 120W 90W 60W 30W GM 30E
90N 75N 60N 45N 30N 15N EQ 15S 30S 45S 60S 75S 90S
Latitude
Longitude
NODC/NOAA
Data Archaeology and Rescue Project
Number of Profiles = 254846

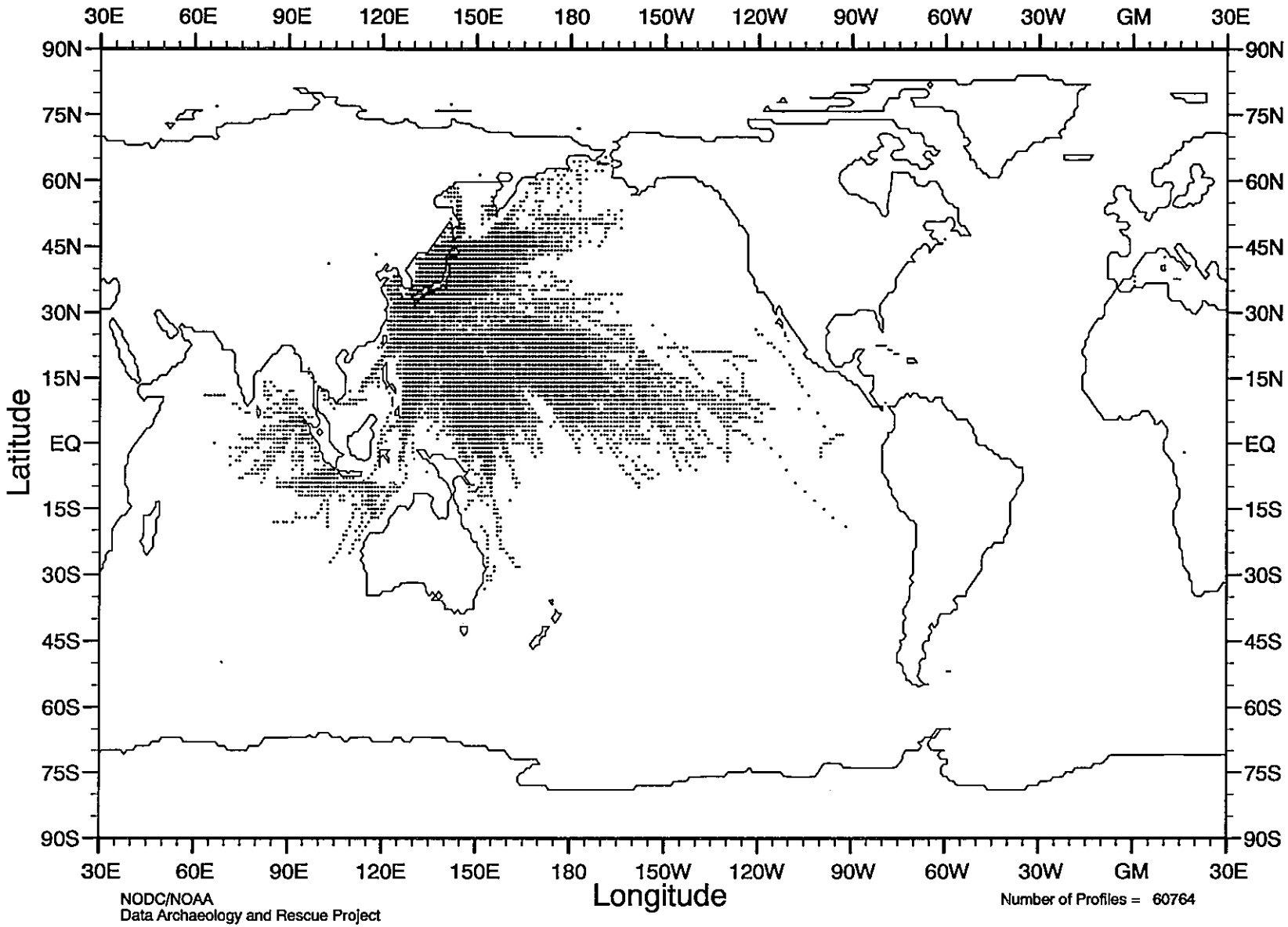
Time Series of NODC Digital Bathythermograph
Profiles for JAPAN as of May 1993
Total Number of Profiles = 23,452

YEAR	NUMBER OF PROFILES	YEAR	NUMBER OF PROFILES	YEAR	NUMBER OF PROFILES
1900	0	1932	0	1964	0
1901	0	1933	0	1965	0
1902	0	1934	0	1966	0
1903	0	1935	0	1967	0
1904	0	1936	0	1968	0
1905	0	1937	0	1969	0
1906	0	1938	0	1970	0
1907	0	1939	0	1971	0
1908	0	1940	0	1972	0
1909	0	1941	0	1973	0
1910	0	1942	0	1974	0
1911	0	1943	0	1975	0
1912	0	1944	0	1976	0
1913	0	1945	0	1977	0
1914	0	1946	0	1978	0
1915	0	1947	0	1979	1301
1916	0	1948	0	1980	2919
1917	0	1949	0	1981	3495
1918	0	1950	0	1982	3559
1919	0	1951	0	1983	4589
1920	0	1952	0	1984	5117
1921	0	1953	0	1985	2470
1922	0	1954	0	1986	2
1923	0	1955	0	1987	0
1924	0	1956	0	1988	0
1925	0	1957	0	1989	0
1926	0	1958	0	1990	0
1927	0	1959	0	1991	0
1928	0	1960	0	1992	0
1929	0	1961	0	1993	0
1930	0	1962	0	1994	
1931	0	1963	0	1995	


Digital Bathythermographs from Japan
as of May 1993
This plot for years 1979 - 1986
30E 60E 90E 120E 150E 180 150W 120W 90W 60W 30W GM 30E
90N 75N 60N 45N 30N 15N EQ 15S 30S 45S 60S 75S 90S
Latitude
Longitude
NODC/NOAA
Data Archaeology and Rescue Project
Number of Profiles = 23452

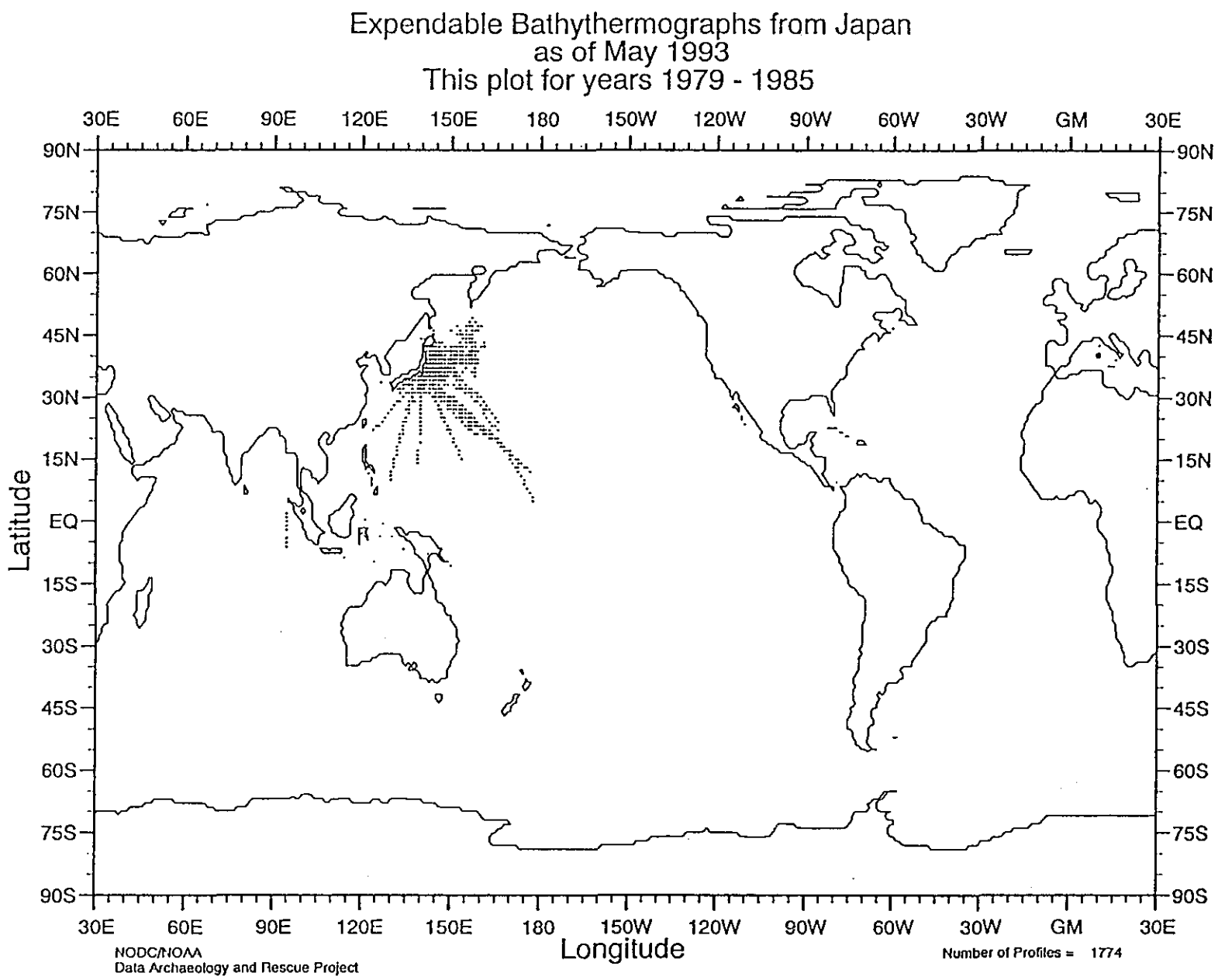
Time Series of NODC Mechanical Bathythermograph (MBT)
Profiles for JAPAN as of May 1993
Total Number of Profiles = 60,764

YEAR	NUMBER OF PROFILES	YEAR	NUMBER OF PROFILES	YEAR	NUMBER OF PROFILES
1900	0	1932	0	1964	0
1901	0	1933	0	1965	1655
1902	0	1934	0	1966	3939
1903	0	1935	0	1967	4513
1904	0	1936	0	1968	3228
1905	0	1937	0	1969	3356
1906	0	1938	0	1970	4233
1907	0	1939	0	1971	5110
1908	0	1940	0	1972	4547
1909	0	1941	0	1973	3427
1910	0	1942	0	1974	2839
1911	0	1943	0	1975	4565
1912	0	1944	0	1976	3946
1913	0	1945	0	1977	4241
1914	0	1946	0	1978	4659
1915	0	1947	0	1979	2301
1916	0	1948	0	1980	1314
1917	0	1949	0	1981	901
1918	0	1950	0	1982	985
1919	0	1951	0	1983	300
1920	0	1952	0	1984	473
1921	0	1953	0	1985	232
1922	0	1954	0	1986	0
1923	0	1955	0	1987	0
1924	0	1956	0	1988	0
1925	0	1957	0	1989	0
1926	0	1958	0	1990	0
1927	0	1959	0	1991	0
1928	0	1960	0	1992	0
1929	0	1961	0	1993	0
1930	0	1962	0	1994	
1931	0	1963	0	1995	


Mechanical Bathythermograph Profiles from Japan
as of May 1993
This plot for years 1965 - 1985
30E 60E 90E 120E 150E 180 150W 120W 90W 60W 30W GM 30E
90N 75N 60N 45N 30N 15N EQ 15S 30S 45S 60S 75S 90S
Latitude
Longitude
NODC/NOAA
Data Archaeology and Rescue Project
Number of Profiles = 60764

Time Series of NODC Expendable Bathythermograph
Profiles for JAPAN as of May 1993
Total Number of Profiles = 1,774

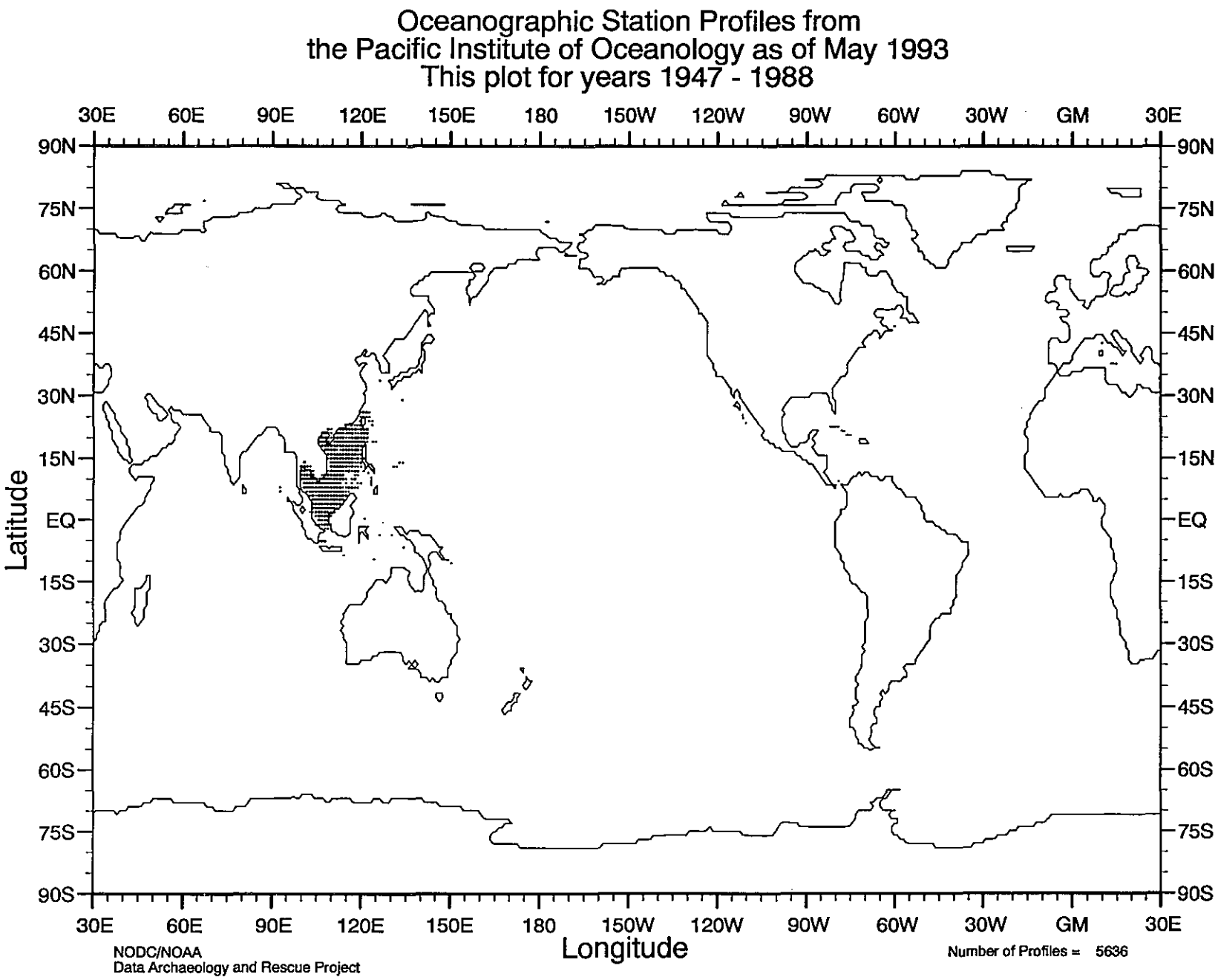
YEAR	NUMBER OF PROFILES	YEAR	NUMBER OF PROFILES	YEAR	NUMBER OF PROFILES
1900	0	1932	0	1964	0
1901	0	1933	0	1965	0
1902	0	1934	0	1966	0
1903	0	1935	0	1967	0
1904	0	1936	0	1968	0
1905	0	1937	0	1969	0
1906	0	1938	0	1970	0
1907	0	1939	0	1971	0
1908	0	1940	0	1972	0
1909	0	1941	0	1973	0
1910	0	1942	0	1974	0
1911	0	1943	0	1975	0
1912	0	1944	0	1976	0
1913	0	1945	0	1977	0
1914	0	1946	0	1978	0
1915	0	1947	0	1979	319
1916	0	1948	0	1980	165
1917	0	1949	0	1981	294
1918	0	1950	0	1982	212
1919	0	1951	0	1983	151
1920	0	1952	0	1984	196
1921	0	1953	0	1985	437
1922	0	1954	0	1986	0
1923	0	1955	0	1987	0
1924	0	1956	0	1988	0
1925	0	1957	0	1989	0
1926	0	1958	0	1990	0
1927	0	1959	0	1991	0
1928	0	1960	0	1992	0
1929	0	1961	0	1993	0
1930	0	1962	0	1994	
1931	0	1963	0	1995	


Expendable Bathythermographs from Japan
as of May 1993
This plot for years 1979 - 1985
30E 60E 90E 120E 150E 180 150W 120W 90W 60W 30W GM 30E
90N 75N 60N 45N 30N 15N EQ 15S 30S 45S 60S 75S 90S
Latitude
Longitude
NODC/NOAA
Data Archaeology and Rescue Project
Number of Profiles = 1774

Appendix 8 - **RUSSIA**

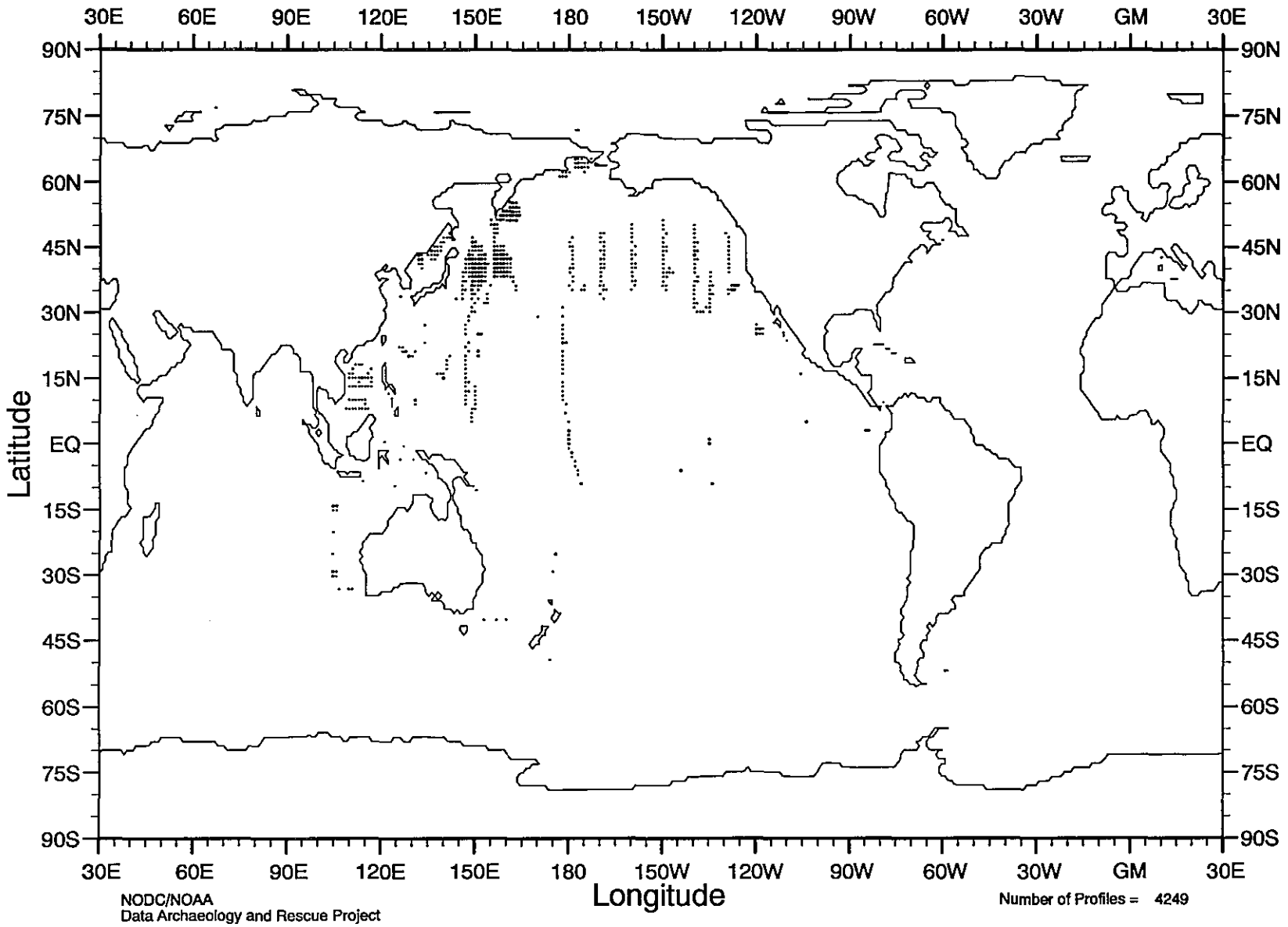
Time Series of NODC Oceanographic Station
Profiles for PIO (Russia) as of May 1993
Total Number of Profiles = 5,636

YEAR	NUMBER OF PROFILES	YEAR	NUMBER OF PROFILES	YEAR	NUMBER OF PROFILES
1900	0	1932	0	1964	0
1901	0	1933	0	1965	41
1902	0	1934	0	1966	171
1903	0	1935	0	1967	546
1904	0	1936	0	1968	455
1905	0	1937	0	1969	398
1906	0	1938	0	1970	445
1907	0	1939	0	1971	288
1908	0	1940	0	1972	36
1909	0	1941	0	1973	199
1910	0	1942	0	1974	47
1911	0	1943	0	1975	91
1912	0	1944	0	1976	72
1913	0	1945	0	1977	91
1914	0	1946	0	1978	36
1915	0	1947	2	1979	87
1916	0	1948	0	1980	194
1917	0	1949	9	1981	318
1918	0	1950	0	1982	82
1919	0	1951	0	1983	553
1920	0	1952	0	1984	175
1921	0	1953	0	1985	339
1922	0	1954	0	1986	161
1923	0	1955	0	1987	286
1924	0	1956	0	1988	77
1925	0	1957	12	1989	0
1926	0	1958	0	1990	0
1927	0	1959	26	1991	0
1928	0	1960	399	1992	0
1929	0	1961	0	1993	0
1930	0	1962	0	1994	
1931	0	1963	0	1995	


Oceanographic Station Profiles from
the Pacific Institute of Oceanology as of May 1993
This plot for years 1947 - 1988
30E 60E 90E 120E 150E 180 150W 120W 90W 60W 30W GM 30E
90N 75N 60N 45N 30N 15N EQ 15S 30S 45S 60S 75S 90S
Latitude
Longitude
NODC/NOAA
Data Archaeology and Rescue Project
Number of Profiles = 5636

Time Series of NODC CTD
Profiles for PIO (Russia) as of May 1993
Total Number of Profiles = 4,249

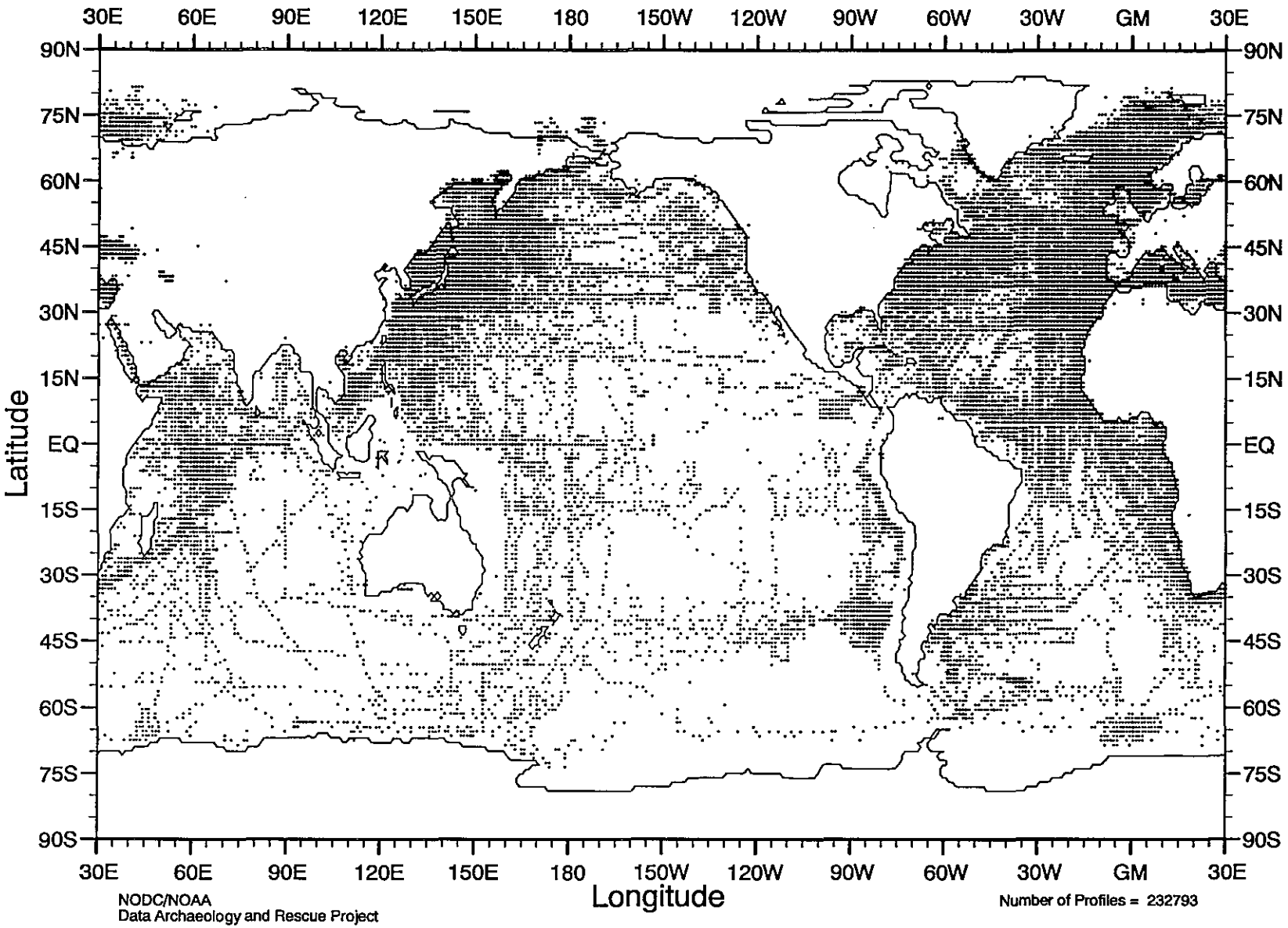
YEAR	NUMBER OF PROFILES	YEAR	NUMBER OF PROFILES	YEAR	NUMBER OF PROFILES
1900	0	1932	0	1964	0
1901	0	1933	0	1965	0
1902	0	1934	0	1966	0
1903	0	1935	0	1967	0
1904	0	1936	0	1968	0
1905	0	1937	0	1969	0
1906	0	1938	0	1970	0
1907	0	1939	0	1971	0
1908	0	1940	0	1972	0
1909	0	1941	0	1973	0
1910	0	1942	0	1974	0
1911	0	1943	0	1975	0
1912	0	1944	0	1976	0
1913	0	1945	0	1977	0
1914	0	1946	0	1978	0
1915	0	1947	0	1979	0
1916	0	1948	0	1980	0
1917	0	1949	0	1981	935
1918	0	1950	0	1982	0
1919	0	1951	0	1983	0
1920	0	1952	0	1984	0
1921	0	1953	0	1985	337
1922	0	1954	0	1986	526
1923	0	1955	0	1987	492
1924	0	1956	0	1988	1611
1925	0	1957	0	1989	348
1926	0	1958	0	1990	0
1927	0	1959	0	1991	0
1928	0	1960	0	1992	0
1929	0	1961	0	1993	0
1930	0	1962	0	1994	
1931	0	1963	0	1995	


CTD Profiles from the Pacific Institute of Oceanology
as of May 1993
This plot for years 1981 - 1989
30E 60E 90E 120E 150E 180 150W 120W 90W 60W 30W GM 30E
90N 75N 60N 45N 30N 15N EQ 15S 30S 45S 60S 75S 90S
Latitude
Longitude
NODC/NOAA
Data Archaeology and Rescue Project
Number of Profiles = 4249

Time Series of NODC Mechanical Bathythermograph
Profiles for RUSSIA NODC as of May 1993
Total Number of Profiles = 232,793

YEAR	NUMBER OF PROFILES	YEAR	NUMBER OF PROFILES	YEAR	NUMBER OF PROFILES
1900	0	1932	0	1964	6631
1901	0	1933	0	1965	8876
1902	0	1934	0	1966	8004
1903	0	1935	0	1967	11015
1904	0	1936	0	1968	11250
1905	0	1937	0	1969	10115
1906	0	1938	0	1970	8549
1907	0	1939	0	1971	7889
1908	0	1940	58	1972	11663
1909	0	1941	16	1973	6290
1910	0	1942	15	1974	3701
1911	0	1943	195	1975	2195
1912	0	1944	0	1976	7856
1913	0	1945	0	1977	6959
1914	0	1946	7	1978	5937
1915	0	1947	61	1979	13524
1916	0	1948	32	1980	8042
1917	0	1949	119	1981	6230
1918	0	1950	80	1982	3802
1919	0	1951	48	1983	3878
1920	0	1952	91	1984	12107
1921	0	1953	158	1985	6106
1922	0	1954	239	1986	7783
1923	0	1955	644	1987	9530
1924	0	1956	696	1988	11527
1925	0	1957	2027	1989	2167
1926	0	1958	3786	1990	511
1927	0	1959	2020	1991	0
1928	0	1960	4524	1992	0
1929	0	1961	4411	1993	0
1930	0	1962	5286	1994	
1931	0	1963	6143	1995	

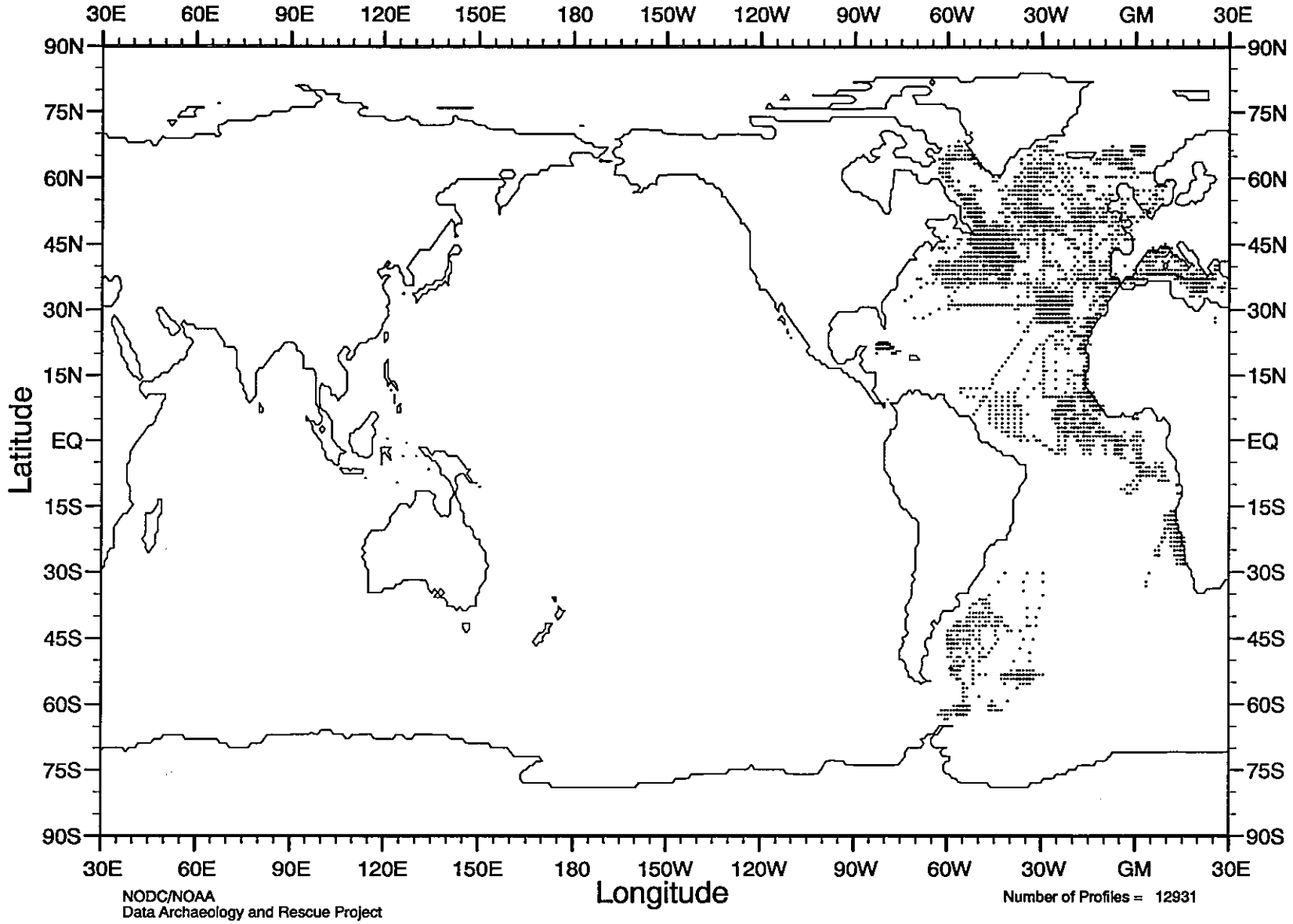
Mechanical Bathythermograph Profiles from Russia
as of May 1993
This plot for years 1940 - 1990



Time Series of NODC Oceanographic Station
Profiles for RUSSIA NODC as of May 1993
Total Number of Profiles = 12,931

YEAR	NUMBER OF PROFILES	YEAR	NUMBER OF PROFILES	YEAR	NUMBER OF PROFILES
1900	0	1932	0	1964	0
1901	0	1933	0	1965	0
1902	0	1934	0	1966	0
1903	0	1935	0	1967	0
1904	0	1936	0	1968	0
1905	0	1937	0	1969	163
1906	0	1938	0	1970	23
1907	0	1939	0	1971	269
1908	0	1940	0	1972	387
1909	0	1941	0	1973	101
1910	0	1942	0	1974	0
1911	0	1943	0	1975	39
1912	0	1944	0	1976	64
1913	0	1945	0	1977	17
1914	0	1946	0	1978	0
1915	0	1947	0	1979	422
1916	0	1948	0	1980	0
1917	0	1949	0	1981	0
1918	0	1950	0	1982	0
1919	0	1951	0	1983	0
1920	0	1952	0	1984	1084
1921	0	1953	0	1985	1938
1922	0	1954	0	1986	723
1923	0	1955	0	1987	859
1924	0	1956	0	1988	2693
1925	0	1957	0	1989	1973
1926	0	1958	0	1990	1568
1927	0	1959	0	1991	508
1928	0	1960	0	1992	0
1929	0	1961	0	1993	0
1930	0	1962	0	1994	
1931	0	1963	0	1995	

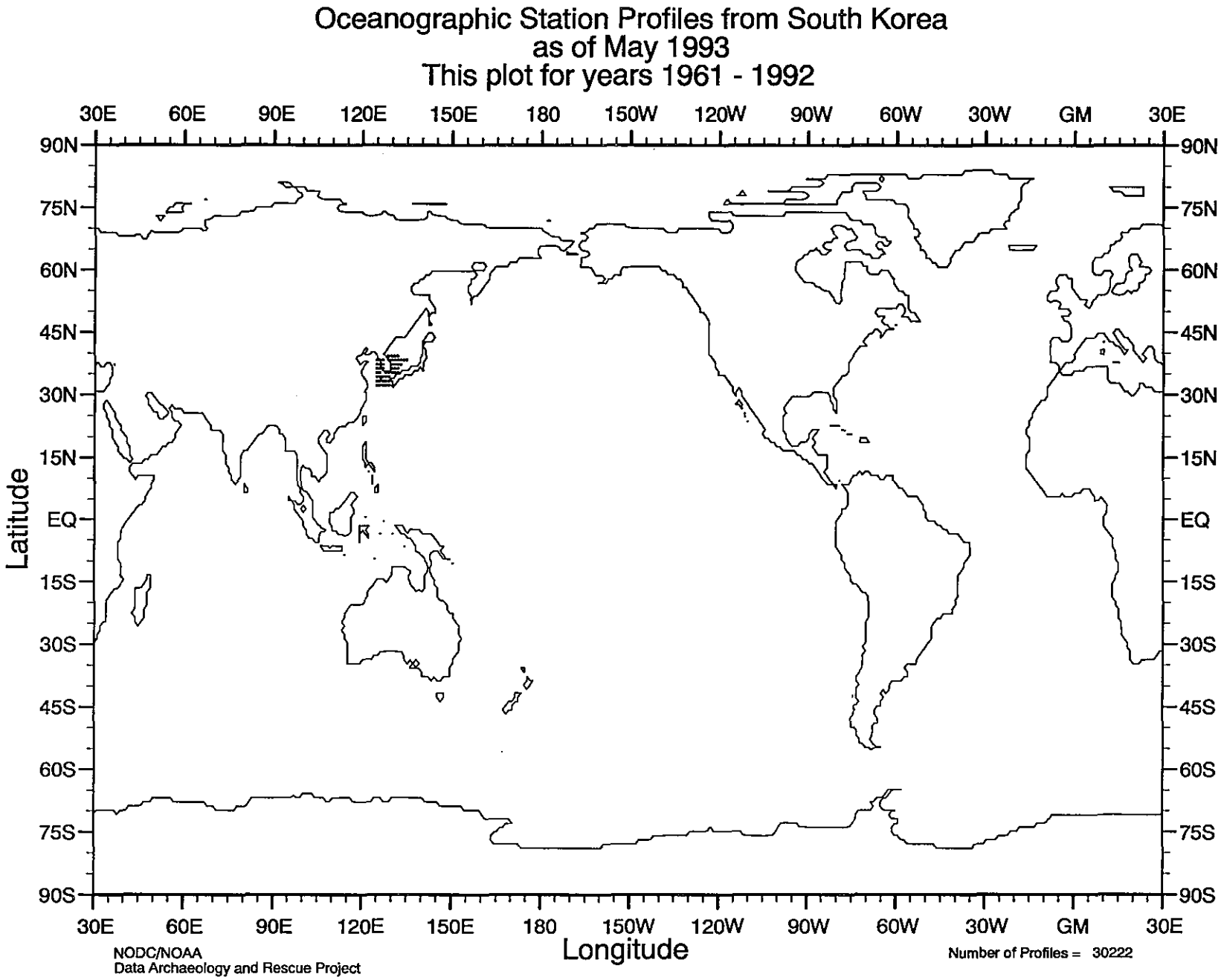
Oceanographic Station Profiles from Russia
as of May 1993
This plot for years 1969 - 1991



Appendix 9 - **SOUTH KOREA**

Time Series of NODC Oceanographic Station
Profiles for SOUTH KOREA as of May 1993
Total Number of Profiles = 30,222

YEAR	NUMBER OF PROFILES	YEAR	NUMBER OF PROFILES	YEAR	NUMBER OF PROFILES
1900	0	1932	0	1964	508
1901	0	1933	0	1965	734
1902	0	1934	0	1966	749
1903	0	1935	0	1967	1061
1904	0	1936	0	1968	1317
1905	0	1937	0	1969	1708
1906	0	1938	0	1970	1353
1907	0	1939	0	1971	1198
1908	0	1940	0	1972	1055
1909	0	1941	0	1973	1078
1910	0	1942	0	1974	1110
1911	0	1943	0	1975	1058
1912	0	1944	0	1976	1143
1913	0	1945	0	1977	1159
1914	0	1946	0	1978	1205
1915	0	1947	0	1979	1095
1916	0	1948	0	1980	1073
1917	0	1949	0	1981	1008
1918	0	1950	0	1982	1048
1919	0	1951	0	1983	1084
1920	0	1952	0	1984	1011
1921	0	1953	0	1985	1065
1922	0	1954	0	1986	1068
1923	0	1955	0	1987	1059
1924	0	1956	0	1988	1016
1925	0	1957	0	1989	967
1926	0	1958	0	1990	1007
1927	0	1959	0	1991	0
1928	0	1960	0	1992	1
1929	0	1961	439	1993	0
1930	0	1962	499	1994	
1931	0	1963	346	1995	


Oceanographic Station Profiles from South Korea
as of May 1993
This plot for years 1961 - 1992
30E 60E 90E 120E 150E 180 150W 120W 90W 60W 30W GM 30E
90N 75N 60N 45N 30N 15N EQ 15S 30S 45S 60S 75S 90S
Latitude
Longitude
NODC/NOAA
Data Archaeology and Rescue Project
Number of Profiles = 30222

Appendix 10 - **UNITED STATES**

The distribution plots show:

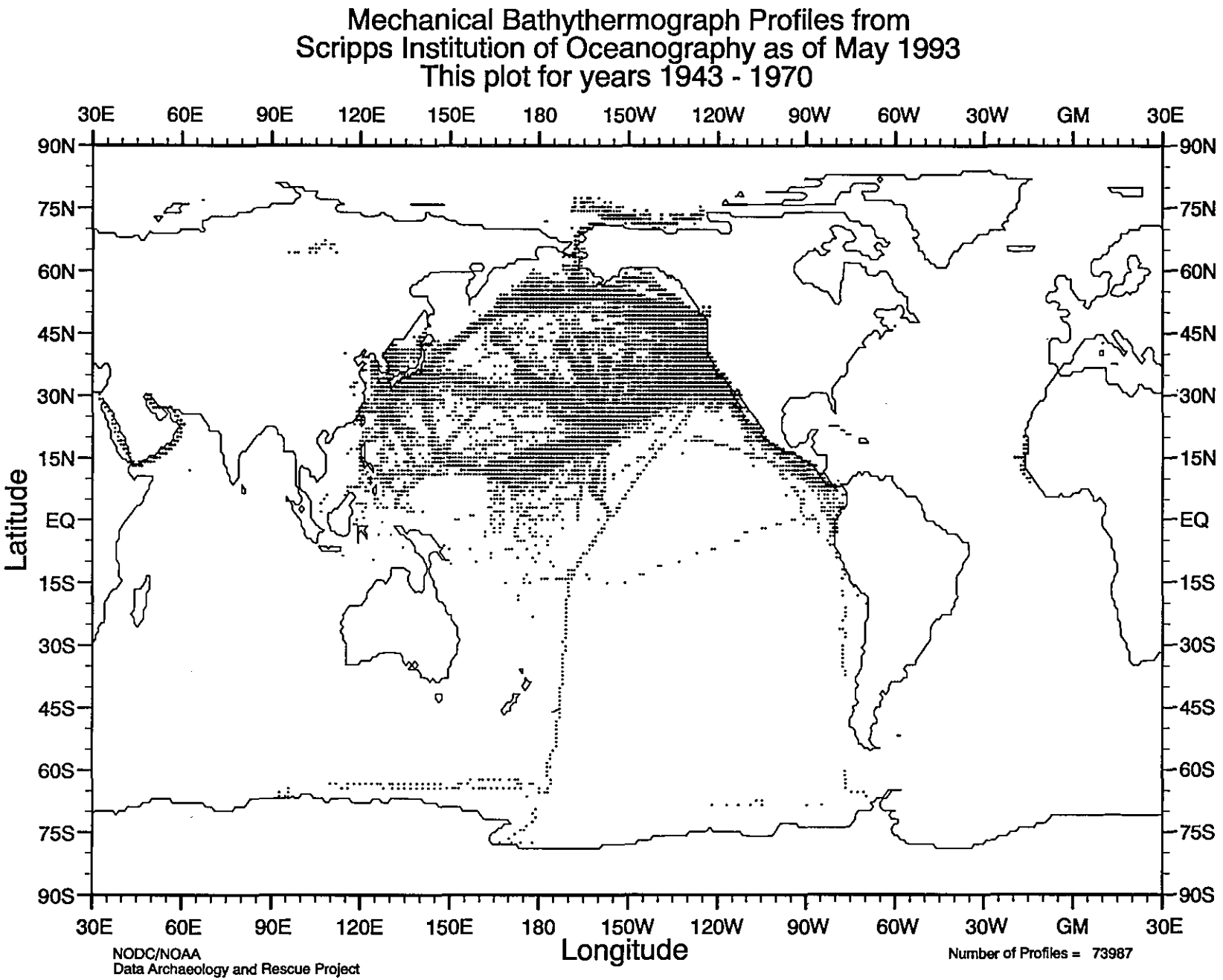
- WHOI MBT data were maintained by Elizabeth Schroeder (Schroeder, 1965; Robinson *et al.*, 1979) and includes U.S. Navy data from World War II as well as data from U.S. Ocean Weather Stations. WHOI data digitization was supported by the National Science Foundation.

- SIO MBT file contains from 50,00 to 75,000 additional profiles that are being digitized. SIO data includes U.S. Navy and Coast Guard data from World War II but some profile locations are only accurate to the nearest degree of latitude and longitude. The file includes data from the Bureau of Commercial Fisheries, U. of Washington, Oregon State University, Oregon Fish Commission, College of the Pacific, University of Southern California, Scripps Institution of Oceanography, U.S. Navy Sound School-San Diego, Pacific Ocean Fisheries Group (Nanaimo, Canada), Inter-American Tropical Tuna Commission.

- WDC-A manuscript data digitized from WDC-A Archives.

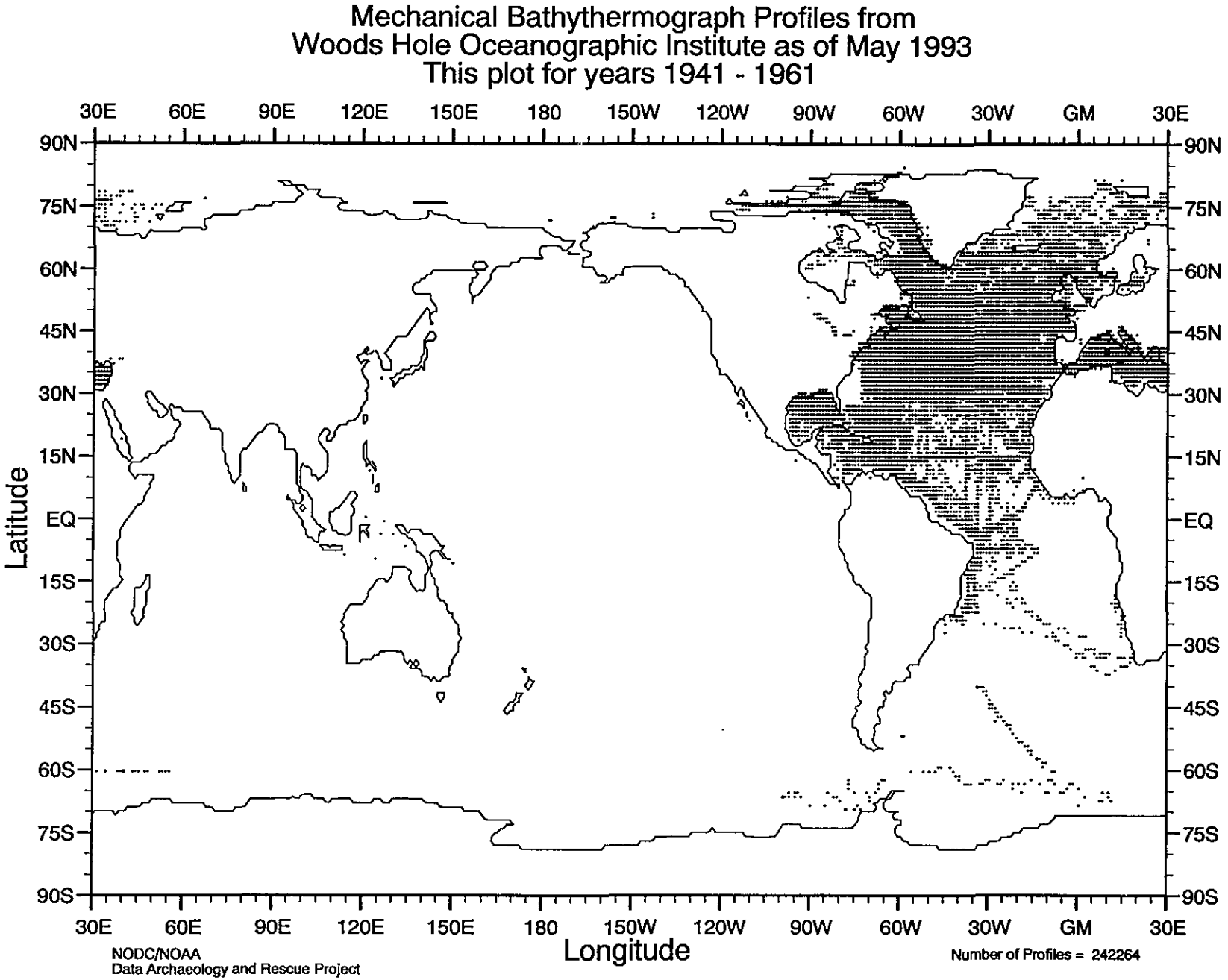
Time Series of NODC Mechanical Bathythermograph (MBT)
Profiles for SIO as of May 1993
Total Number of Profiles = 73,987

YEAR	NUMBER OF PROFILES	YEAR	NUMBER OF PROFILES	YEAR	NUMBER OF PROFILES
1900	0	1932	0	1964	25
1901	0	1933	0	1965	0
1902	0	1934	0	1966	0
1903	0	1935	0	1967	0
1904	0	1936	0	1968	0
1905	0	1937	0	1969	0
1906	0	1938	0	1970	282
1907	0	1939	0	1971	0
1908	0	1940	0	1972	0
1909	0	1941	0	1973	0
1910	0	1942	0	1974	0
1911	0	1943	2814	1975	0
1912	0	1944	6037	1976	0
1913	0	1945	5910	1977	0
1914	0	1946	8795	1978	0
1915	0	1947	6440	1979	0
1916	0	1948	3801	1980	0
1917	0	1949	3375	1981	0
1918	0	1950	4029	1982	0
1919	0	1951	7502	1983	0
1920	0	1952	6995	1984	0
1921	0	1953	7560	1985	0
1922	0	1954	4003	1986	0
1923	0	1955	903	1987	0
1924	0	1956	224	1988	0
1925	0	1957	390	1989	0
1926	0	1958	232	1990	0
1927	0	1959	494	1991	0
1928	0	1960	697	1992	0
1929	0	1961	882	1993	0
1930	0	1962	1171	1994	
1931	0	1963	1426	1995	


Mechanical Bathythermograph Profiles from
Scripps Institution of Oceanography as of May 1993
This plot for years 1943 - 1970
30E 60E 90E 120E 150E 180 150W 120W 90W 60W 30W GM 30E
90N 75N 60N 45N 30N 15N EQ 15S 30S 45S 60S 75S 90S
Latitude
Longitude
NODC/NOAA
Data Archaeology and Rescue Project
Number of Profiles = 73987

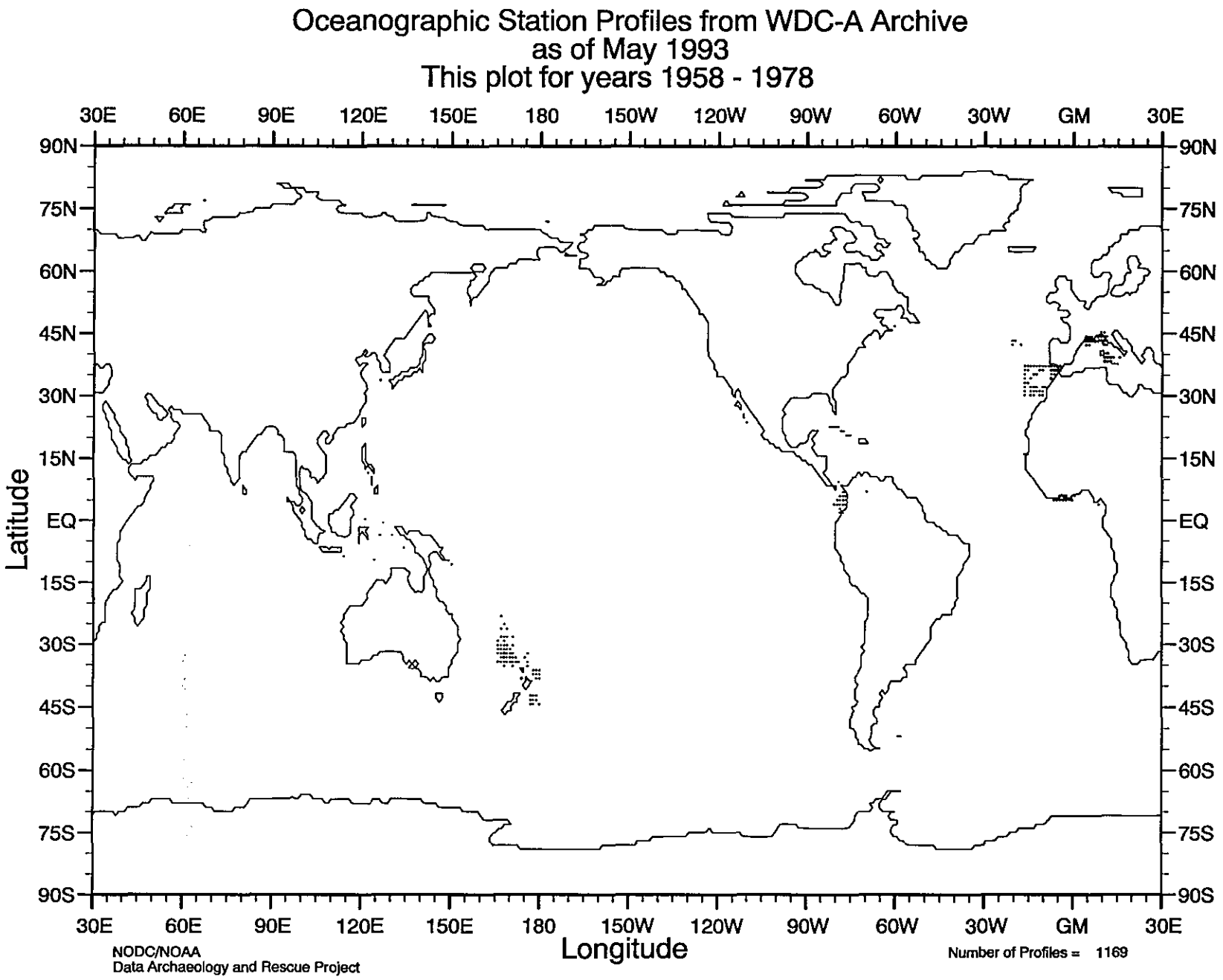
Time Series of NODC Mechanical Bathythermograph (MBT)
Profiles for WHOI as of May 1993
Total Number of Profiles = 242,264

YEAR	NUMBER OF PROFILES	YEAR	NUMBER OF PROFILES	YEAR	NUMBER OF PROFILES
1900	0	1932	0	1964	0
1901	0	1933	0	1965	0
1902	0	1934	0	1966	0
1903	0	1935	0	1967	0
1904	0	1936	0	1968	0
1905	0	1937	0	1969	0
1906	0	1938	0	1970	0
1907	0	1939	0	1971	0
1908	0	1940	0	1972	0
1909	0	1941	7597	1973	0
1910	0	1942	3385	1974	0
1911	0	1943	6526	1975	0
1912	0	1944	14097	1976	0
1913	0	1945	16262	1977	0
1914	0	1946	11195	1978	0
1915	0	1947	14256	1979	0
1916	0	1948	20199	1980	0
1917	0	1949	21942	1981	0
1918	0	1950	28275	1982	0
1919	0	1951	28634	1983	0
1920	0	1952	30962	1984	0
1921	0	1953	19701	1985	0
1922	0	1954	19040	1986	0
1923	0	1955	130	1987	0
1924	0	1956	14	1988	0
1925	0	1957	5	1989	0
1926	0	1958	29	1990	0
1927	0	1959	7	1991	0
1928	0	1960	1	1992	0
1929	0	1961	7	1993	0
1930	0	1962	0	1994	
1931	0	1963	0	1995	


Mechanical Bathythermograph Profiles from
Woods Hole Oceanographic Institute as of May 1993
This plot for years 1941 - 1961
30E 60E 90E 120E 150E 180 150W 120W 90W 60W 30W GM 30E
90N 75N 60N 45N 30N 15N EQ 15S 30S 45S 60S 75S 90S
Latitude
Longitude
NODC/NOAA
Data Archaeology and Rescue Project
Number of Profiles = 242264

Time Series of NODC Oceanographic Station
Profiles for World Data Center-A Archive as of May 1993
Total Number of Profiles = 1,169

YEAR	NUMBER OF PROFILES	YEAR	NUMBER OF PROFILES	YEAR	NUMBER OF PROFILES
1900	0	1932	0	1964	39
1901	0	1933	0	1965	165
1902	0	1934	0	1966	335
1903	0	1935	0	1967	173
1904	0	1936	0	1968	25
1905	0	1937	0	1969	0
1906	0	1938	0	1970	9
1907	0	1939	0	1971	0
1908	0	1940	0	1972	0
1909	0	1941	0	1973	33
1910	0	1942	0	1974	0
1911	0	1943	0	1975	29
1912	0	1944	0	1976	49
1913	0	1945	0	1977	5
1914	0	1946	0	1978	26
1915	0	1947	0	1979	0
1916	0	1948	0	1980	0
1917	0	1949	0	1981	0
1918	0	1950	0	1982	0
1919	0	1951	0	1983	0
1920	0	1952	0	1984	0
1921	0	1953	0	1985	0
1922	0	1954	0	1986	0
1923	0	1955	0	1987	0
1924	0	1956	0	1988	0
1925	0	1957	0	1989	0
1926	0	1958	105	1990	0
1927	0	1959	76	1991	0
1928	0	1960	44	1992	0
1929	0	1961	0	1993	0
1930	0	1962	0	1994	
1931	0	1963	56	1995	


Oceanographic Station Profiles from WDC-A Archive
as of May 1993
This plot for years 1958 - 1978
30E 60E 90E 120E 150E 180 150W 120W 90W 60W 30W GM 30E
90N 75N 60N 45N 30N 15N EQ 15S 30S 45S 60S 75S 90S
Latitude
Longitude
NODC/NOAA
Data Archaeology and Rescue Project
Number of Profiles = 1169


NOAA
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
U.S. DEPARTMENT OF COMMERCE