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PREFACE

The oceanographic databases described by this atlas series greatly expands on the *World Ocean Database 1998* (WOD98) product. We have expanded these earlier databases to include data from new instrument types such as profiling floats and new variables such as pCO_2 and TCO_2. Previous oceanographic databases including the NODC/WDC profile archives, and products derived from these databases, have proven to be of great utility to the international oceanographic, climate research, and operational environmental forecasting communities. In particular, the objectively analyzed fields of temperature and salinity derived from these databases have been used in a variety of ways. These include use as boundary and/or initial conditions in numerical ocean circulation models, for verification of numerical simulations of the ocean, as a form of "sea truth" for satellite measurements such as altimetric observations of sea surface height, and for planning oceanographic expeditions. Increasingly nutrient fields are being used to initialize and/or verify biogeochemical models of the world ocean. The databases, and products based on these databases, are critical for support of international assessment programs such as the Intergovernmental Program on Climate Change (IPCC) of the United Nations.

It is well known that the amount of carbon dioxide in the earth's atmosphere will most likely double during the next century compared to CO_2 levels that occurred at the beginning of the Industrial Revolution. Regardless of one's scientific and/or political view of a possible "enhanced greenhouse warming" due to the increase of carbon dioxide, it is necessary that the international scientific community have access to the most complete historical oceanographic databases possible in order to study this problem, as well as other scientific and environmental problems.

The production of oceanographic databases is a major undertaking. Such work benefits from the input of many individuals and organizations. We have tried to structure the data sets in such a way as to encourage feedback from experts around the world who have knowledge that can improve the data and metadata contents of the database. It is only with such feedback that high quality global ocean databases can be prepared. Just as with scientific theories and numerical models of the ocean and atmosphere, the development of global ocean databases is not carried out in one giant step, but proceeds in an incremental fashion.

In the acknowledgment section of this publication we have expressed our view that creation of global ocean databases is only possible through the cooperation of scientists, data managers, and scientific administrators throughout the international community. I thank my colleagues at the Ocean Climate Laboratory of NODC for their dedication to the project leading to publication of this atlas series. Their commitment has made this database possible. It is my belief that the development and management of national and international oceanographic data archives is best performed by scientists who are actively working with the data.

Sydney Levitus
National Oceanographic Data Center/World Data Center for Oceanography- Silver Spring
Silver Spring, MD
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This work was made possible by a grant from the NOAA Climate and Global Change Program which enabled the establishment of a research group, the Ocean Climate Laboratory (OCL), at the National Oceanographic Data Center. The purpose of the OCL is to prepare research quality oceanographic databases, as well as to compute objective analyses of, and diagnostic studies based on, these databases.

The data made available as part of this atlas include a part of the oceanographic data archives maintained by NODC/WDC as well as data acquired as a result of the IODE/IOC "Global Oceanographic Data Archaeology and Rescue" (GODAR) project. At NODC/WDC, "data archaeology and rescue" projects are supported with funding from the NOAA Environmental Science Data and Information Management (ESDIM) Program and NOAA Climate and Global Change Program. The majority of funding for these efforts is now provided by the ESDIM program. Support for this work from joint NASA/NOAA and DOE/NOAA Global Change data management programs is appreciated. Support for some of the regional IOC/GODAR meetings was provided by the MAST program of the European Union.

We acknowledge the scientists, technicians, and programmers who have submitted data to national and regional data centers as well as the managers and staff at the various data centers. Our database allows for the storage of metadata including information about Principal Investigators to recognize their efforts.

The OCL expresses thanks to those who provided comments and helped develop an improved *World Ocean Database 2001* (WOD01) product. In particular, Dr. Steve Worley of NCAR, and Steve Hankin of PMEL for testing the CD-ROMs prior to distribution. Roy Lowry (BODC) and Tom Whitworth (TAMU) for suggestions. Any errors in WOD01 are the responsibility of the Ocean Climate Laboratory.

Ervin Godfrey Trammell and Charlotte Sazama of the NODC International Data Exchange Team helped locate data in the WDC archives for digitization. We thank Mike Chepurin, Igor Minin, Dan Smolyar, Alexandra Grodsky, and Carla Forgy of the OCL for their work in data digitization and their assistance in quality control of the data and metadata in WOD01. Renee Tatusko identified many missing metadata. The OCL acknowledges the help received over the last several years from colleagues in other NODC divisions. Francis Mitchell helped with all the code lists and accessions, Melanie Hamilton supplied GTSPP data.

Declassification of naval oceanographic data by various navies is acknowledged. The Intergovernmental Oceanographic Commission has requested such declassification efforts in recent years.

World Ocean Database 2001, Volume 7: Temporal Distribution of Chlorophyll and Plankton Data

T. D. O'Brien, M. E. Conkright, T. P. Boyer, J. I. Antonov, O. K. Baranova, H. E. Garcia, R. Gelfeld, D. Johnson, R. A. Locarnini, P. P. Murphy, I. Smolyar, C. Stephens

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ABSTRACT

This atlas describes a collection of scientifically quality controlled chlorophyll and plankton data. Yearly distributions for individual years of all chlorophyll and plankton data in the database are presented to provide information on the state of ocean OSD profile and surface observations.

1. INTRODUCTION

Ocean Station Data (OSD) has historically referred to measurements made from a stationary research ship using reversing thermometers to measure temperature and making measurements of other variables such as salinity, oxygen, nutrients, chlorophyll, *etc.* on seawater samples gathered using special bottles. Data that are in the OSD files are frequently referred to as "bottle data" and the entire collection of data from these file may be alternatively referred to as the "Bottle Data File". Plankton may also be sampled at or near this station, by bottle or by towing a plankton net. Because of the relationship between the plankton and the other variables measured at a station, all plankton data are included in the "bottle data file". WOD01 includes measurements of temperature, salinity, oxygen, nitrate, phosphate, silicate, pH, alkalinity, chlorophyll and plankton biomass and abundance for various taxonomic groups. Surface-only data are from underway or ship of opportunity.

2. CHLOROPHYLL and PLANKTON DISTRIBUTIONS

Figure 1 shows the number of OSD chlorophyll profiles contained in WOD01 for the world ocean as a function of year. Figures 2 and 3 show the time series of OSD chlorophyll profiles for the southern and northern hemispheres respectively. Figure 4 shows the distribution of OSD chlorophyll profiles contained in WOD01 for the world ocean. There are a total of 128,488 OSD chlorophyll profiles for the entire world ocean with 18,339 profiles (14.3%) measured in the southern hemisphere and 110,149 profiles (85.7%) measured in the northern hemisphere. Table 1 provides the number of OSD chlorophyll profiles included in WOD01 for the world ocean as a function of year. Table 2 and 3 show the number of OSD chlorophyll profiles for the southern and northern hemispheres respectively. The geographic distribution of OSD chlorophyll profiles for individual years for 1900-2000 are shown in Appendix A, Figures A1-A47.

Figure 5 shows the number of Surface-only chlorophyll data contained in WOD01 for the world ocean

as a function of year. Figures 6 and 7 show the time series of Surface-only chlorophyll data for the southern and northern hemispheres respectively. Figure 8 shows the distribution of Surface-only chlorophyll data contained in WOD01 for the world ocean. There are a total of 44,256 Surface chlorophyll data for the entire world ocean with 32,636 profiles (73.7%) measured in the southern hemisphere and 11,620 profiles (26.3%) measured in the northern hemisphere. Table 4 provides the number of Surface-only chlorophyll data included in WOD01 for the world ocean as a function of year. Table 5 and 6 show the number of Surface-only chlorophyll profiles for the southern and northern hemispheres respectively. The geographic distribution of Surface-only chlorophyll data for individual years for 1900-2000 are shown in Appendix B, Figures B1-B16.

Figure 9 shows the number of OSD plankton abundance data contained in WOD01 for the world ocean as a function of year. Figures 10 and 11 show the time series of OSD plankton abundance data for the southern and northern hemispheres respectively. Figure 12 shows the distribution of OSD plankton abundance data contained in WOD01 for the world ocean. There are a total of 100,405 OSD plankton abundance data for the entire world ocean with 5,295 profiles (5.3%) measured in the southern hemisphere and 95,110 profiles (94.7%) measured in the northern hemisphere. Table 7 provides the number of OSD plankton abundance data included in WOD01 for the world ocean as a function of year. Table 8 and 9 show the number of OSD plankton abundance data for the southern and northern hemispheres respectively. The geographic distribution of OSD plankton abundance data for individual years for 1913-1999 are shown in Appendix C, Figures C1-C70.

Figure 13 shows the number of OSD plankton biomass data contained in WOD01 for the world ocean as a function of year. Figures 14 and 15 show the time series of OSD plankton biomass data for the southern and northern hemispheres respectively. Figure 16 shows the distribution of OSD plankton biomass data contained in WOD01 for the world ocean. There are a total of 98,612 OSD plankton biomass data for the entire world ocean with 7,618 profiles (7.7%) measured in the southern hemisphere and 90,994 profiles (92.3%) measured in the northern hemisphere. Table 10 provides the number of OSD plankton biomass data included in WOD01 for the world ocean as a function of year. Table 11 and 12 show the number of OSD plankton biomass data for the southern and northern hemispheres respectively. The geographic distribution of OSD plankton biomass data for individual years for 1949-1999 are shown in Appendix D, Figures D1-D51.

Most profiles have been made in the northern hemisphere, but the southern hemisphere coverage has been increased due to international data archaeology and rescue efforts and the World Ocean Database project (Levitus *et al.* 1994, 2002).

Table 1 The number of OSD chlorophyll profiles in WOD01 as a function of year for the World Ocean. The total number of profiles = 128,488

YEAR	PROFILE	YEAR	PROFILE
1954	98	1978	5551
1955	232	1979	12923
1956	188	1980	4589
1957	436	1981	6519
1958	619	1982	6980
1959	504	1983	3501
1960	572	1984	5087
1961	506	1985	4518
1962	340	1986	5551
1963	810	1987	4666
1964	1208	1988	5041
1965	1187	1989	5667
1966	936	1990	5476
1967	1001	1991	3933
1968	865	1992	4373
1969	1077	1993	4255
1970	670	1994	2804
1971	914	1995	4113
1972	1320	1996	2773
1973	2099	1997	3054
1974	1708	1998	1743
1975	2028	1999	1365
1976	1787	2000	205
1977	2696		

Table 2 The number of OSD chlorophyll profiles in WOD01 as a function of year for the southern hemisphere. The total number of profiles = 18,339

YEAR	PROFILE	YEAR	PROFILE
1955	42	1978	505
1956	0	1979	696
1957	20	1980	413
1958	140	1981	616
1959	43	1982	434
1960	238	1983	751
1961	146	1984	933
1962	184	1985	1266
1963	205	1986	984
1964	232	1987	1318
1965	375	1988	1095
1966	253	1989	406
1967	370	1990	560
1968	270	1991	186
1969	154	1992	1286
1970	56	1993	687
1971	118	1994	103
1972	154	1995	162
1973	252	1996	206
1974	248	1997	356
1975	303	1998	99
1976	668	1999	12
1977	794		

Table 3 The number of OSD chlorophyll profiles in WOD01 as a function of year for the northern hemisphere. The total number of profiles = 110,149

YEAR	PROFILE	YEAR	PROFILE
1954	98	1978	5046
1955	190	1979	12227
1956	188	1980	4176
1957	416	1981	5903
1958	479	1982	6546
1959	461	1983	2750
1960	334	1984	4154
1961	360	1985	3252
1962	156	1986	4567
1963	605	1987	3348
1964	976	1988	3946
1965	812	1989	5261
1966	683	1990	4916
1967	631	1991	3747
1968	595	1992	3087
1969	923	1993	3568
1970	614	1994	2701
1971	796	1995	3951
1972	1166	1996	2567
1973	1847	1997	2698
1974	1460	1998	1644
1975	1725	1999	1353
1976	1119	2000	205
1977	1902		

Table 4 The number of Surface-only data in WOD01 as a function of year for the World Ocean. The total number of observations = 44,256

YEAR	OBSERVATIONS	YEAR	OBSERVATIONS	YEAR	OBSERVATIONS	YEAR	OBSERVATIONS
1978	1605	1984	3304	1989	1792	1994	0
1979	2883	1985	3689	1990	1756	1995	0
1980	4244	1986	3184	1991	561	1996	0
1981	4010	1987	3856	1992	2559	1997	0
1982	4236	1988	1603	1993	0	1998	47
1983	4927						

Table 5 The number of Surface-only data in WOD01 as a function of year for the southern hemisphere. The total number of observations = 32,636

YEAR	OBSERVATIONS	YEAR	OBSERVATIONS	YEAR	OBSERVATIONS	YEAR	OBSERVATIONS
1978	1167	1984	2386	1989	1269	1994	0
1979	2329	1985	2705	1990	1168	1995	0
1980	3285	1986	2274	1991	346	1996	0
1981	3024	1987	3151	1992	1445	1997	0
1982	3279	1988	1223	1993	0	1998	47
1983	3538						

Table 6 The number of Surface-only data in WOD01 as a function of year for the northern hemisphere. The total number of observations = 11,620

YEAR	OBSERVATIONS	YEAR	OBSERVATIONS	YEAR	OBSERVATIONS	YEAR	OBSERVATIONS
1978	438	1984	918	1989	523	1994	0
1979	554	1985	984	1990	588	1995	0
1980	959	1986	910	1991	215	1996	0
1981	986	1987	705	1992	1114	1997	0
1982	957	1988	380	1993	0	1998	0
1983	1389						

Table 7 The number of OSD plankton abundance data in WOD01 as a function of year for the World Ocean. The total number of observations = 100,405

YEAR	OBSERVATIONS	YEAR	OBSERVATIONS	YEAR	OBSERVATIONS	YEAR	OBSERVATIONS
1913	6	1935	0	1957	1812	1979	3048
1914	5	1936	123	1958	1996	1980	2777
1915	9	1937	0	1959	2247	1981	3869
1916	0	1938	6	1960	2324	1982	1988
1917	0	1939	10	1961	1279	1983	1758
1918	0	1940	2	1962	1890	1984	2326
1919	0	1941	0	1963	2403	1985	1858
1920	0	1942	2	1964	2687	1986	1926
1921	17	1943	0	1965	1875	1987	992
1922	0	1944	0	1966	2689	1988	1425
1923	0	1945	0	1967	1224	1989	1339
1924	0	1946	6	1968	901	1990	966
1925	17	1947	24	1969	2038	1991	835
1926	0	1948	0	1970	429	1992	1418
1927	16	1949	0	1971	803	1993	921
1928	2	1950	4	1972	2670	1994	1118
1929	71	1951	1386	1973	1033	1995	2917
1930	46	1952	1650	1974	990	1996	2055
1931	36	1953	2634	1975	2440	1997	3240
1932	18	1954	3296	1976	1700	1998	2884
1933	19	1955	2331	1977	2556	1999	2595
1934	179	1956	1542	1978	6707		

Table 8 The number of OSD plankton abundance data in WOD01 as a function of year for the southern hemisphere. The total number of observations = 5,295

YEAR	OBSERVATIONS	YEAR	OBSERVATIONS	YEAR	OBSERVATIONS	YEAR	OBSERVATIONS
1946	6	1960	183	1974	5	1988	0
1947	24	1961	52	1975	20	1989	0
1948	0	1962	411	1976	0	1990	46
1949	0	1963	571	1977	20	1991	116
1950	0	1964	779	1978	19	1992	547
1951	0	1965	424	1979	147	1993	0
1952	0	1966	425	1980	6	1994	0
1953	0	1967	427	1981	33	1995	0
1954	0	1968	142	1982	15	1996	32
1955	63	1969	46	1983	11	1997	271
1956	0	1970	5	1984	42	1998	144
1957	0	1971	5	1985	8	1999	4
1958	90	1972	132	1986	2		
1959	0	1973	22	1987	0		

Table 9 The number of OSD plankton abundance data in WOD01 as a function of year for the northern hemisphere. The total number of observations = 95,110

YEAR	OBSERVATIONS	YEAR	OBSERVATIONS	YEAR	OBSERVATIONS	YEAR	OBSERVATIONS
1913	6	1935	0	1957	1812	1979	2901
1914	5	1936	123	1958	1906	1980	2771
1915	9	1937	0	1959	2247	1981	3836
1916	0	1938	6	1960	2141	1982	1973
1917	0	1939	10	1961	1227	1983	1747
1918	0	1940	2	1962	1479	1984	2284
1919	0	1941	0	1963	1832	1985	1850
1920	0	1942	2	1964	1908	1986	1924
1921	17	1943	0	1965	1451	1987	992
1922	0	1944	0	1966	2264	1988	1425
1923	0	1945	0	1967	797	1989	1339
1924	0	1946	0	1968	759	1990	920
1925	17	1947	0	1969	1992	1991	719
1926	0	1948	0	1970	424	1992	871
1927	16	1949	0	1971	798	1993	921
1928	2	1950	4	1972	2538	1994	1118
1929	71	1951	1386	1973	1011	1995	2917
1930	46	1952	1650	1974	985	1996	2023
1931	36	1953	2634	1975	2420	1997	2969
1932	18	1954	3296	1976	1700	1998	2740
1933	19	1955	2268	1977	2536	1999	2591
1934	179	1956	1542	1978	6688		

Table 10 The number of OSD plankton biomass data in WOD01 as a function of year for the World Ocean. The total number of observations = 98,612

YEAR	OBSERVATIONS	YEAR	OBSERVATIONS	YEAR	OBSERVATIONS	YEAR	OBSERVATIONS
1949	98	1962	1702	1975	2358	1988	2172
1950	505	1963	2320	1976	1649	1989	775
1951	2073	1964	2330	1977	2216	1990	1144
1952	2116	1965	2356	1978	6072	1991	369
1953	2347	1966	2840	1979	2635	1992	901
1954	2446	1967	4745	1980	2216	1993	307
1955	2838	1968	2090	1981	4508	1994	407
1956	2418	1969	2186	1982	3308	1995	420
1957	2342	1970	676	1983	2295	1996	467
1958	2703	1971	1528	1984	2568	1997	557
1959	3372	1972	2615	1985	2410	1998	205
1960	2317	1973	1421	1986	2022	1999	180
1961	1406	1974	983	1987	1708		

Table 11 The number of OSD plankton biomass data in WOD01 as a function of year for the southern hemisphere. The total number of observations = 7,618

YEAR	OBSERVATIONS	YEAR	OBSERVATIONS	YEAR	OBSERVATIONS	YEAR	OBSERVATIONS
1955	204	1967	1457	1979	201	1991	6
1956	0	1968	666	1980	34	1992	328
1957	13	1969	0	1981	274	1993	16
1958	92	1970	56	1982	38	1994	0
1959	0	1971	315	1983	169	1995	0
1960	14	1972	205	1984	64	1996	38
1961	21	1973	209	1985	448	1997	81
1962	398	1974	130	1986	1	1998	30
1963	496	1975	175	1987	0	1999	2
1964	350	1976	191	1988	0		
1965	569	1977	57	1989	0		
1966	195	1978	75	1990	0		

Table 12 The number of OSD plankton biomass data in WOD01 as a function of year for the northern hemisphere. The total number of observations = 90,994

YEAR	OBSERVATIONS	YEAR	OBSERVATIONS	YEAR	OBSERVATIONS	YEAR	OBSERVATIONS
1949	98	1962	1304	1975	2183	1988	2142
1950	505	1963	1824	1976	1458	1989	775
1951	2073	1964	1980	1977	2159	1990	1144
1952	2116	1965	1787	1978	5997	1991	363
1953	2347	1966	2645	1979	5997	1992	573
1954	2446	1967	3288	1980	2434	1993	291
1955	2634	1968	1424	1981	4234	1994	407
1956	2418	1969	2186	1982	3270	1995	420
1957	2329	1970	620	1983	2126	1996	429
1958	2611	1971	1213	1984	2504	1997	476
1959	3372	1972	2410	1985	1962	1998	175
1960	2303	1973	1212	1986	2021	1999	178
1961	1385	1974	853	1987	1708		

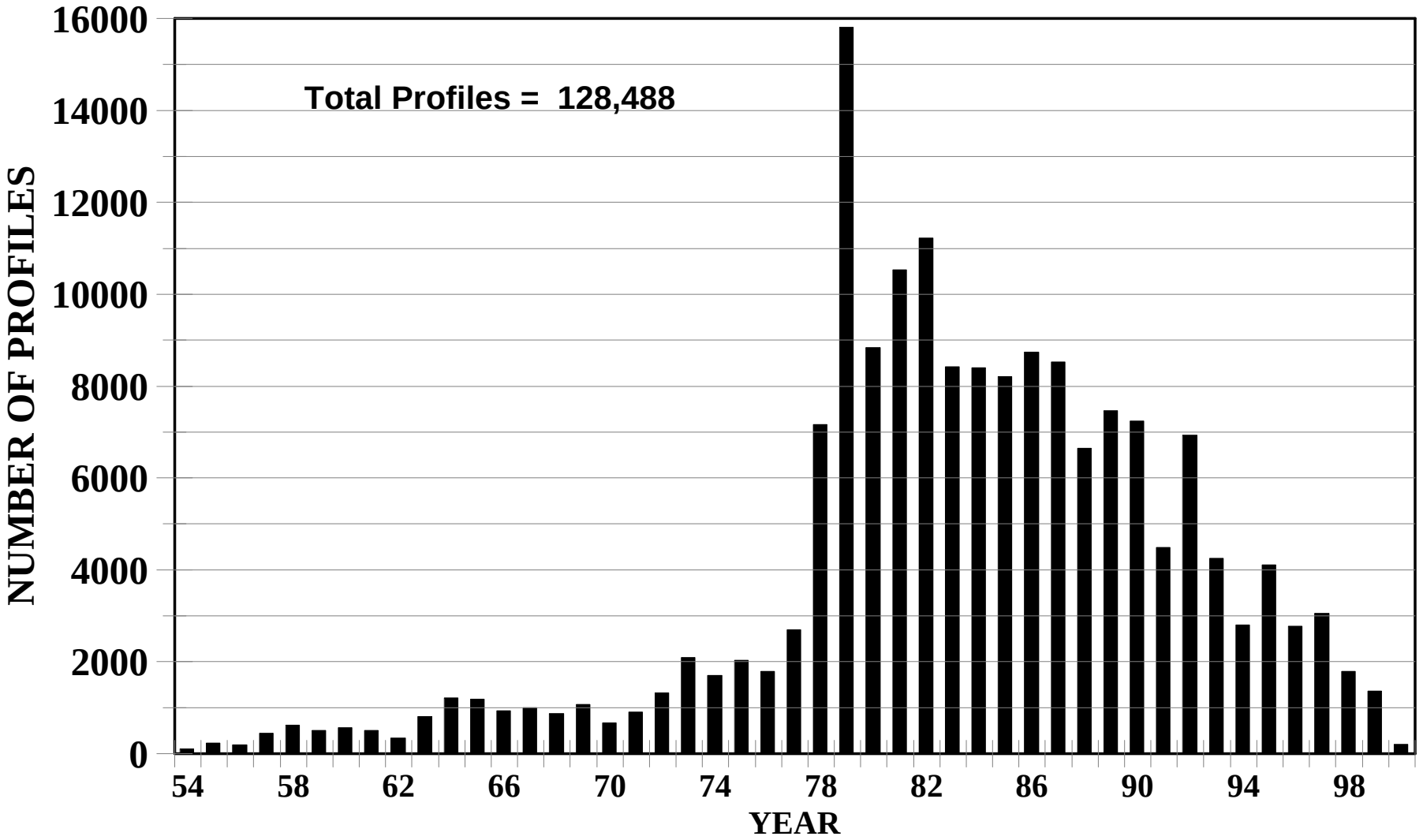

Fig. 1 Time series of Ocean Station Data (OSD) chlorophyll profiles in WOD01 for the world ocean as a function of year.

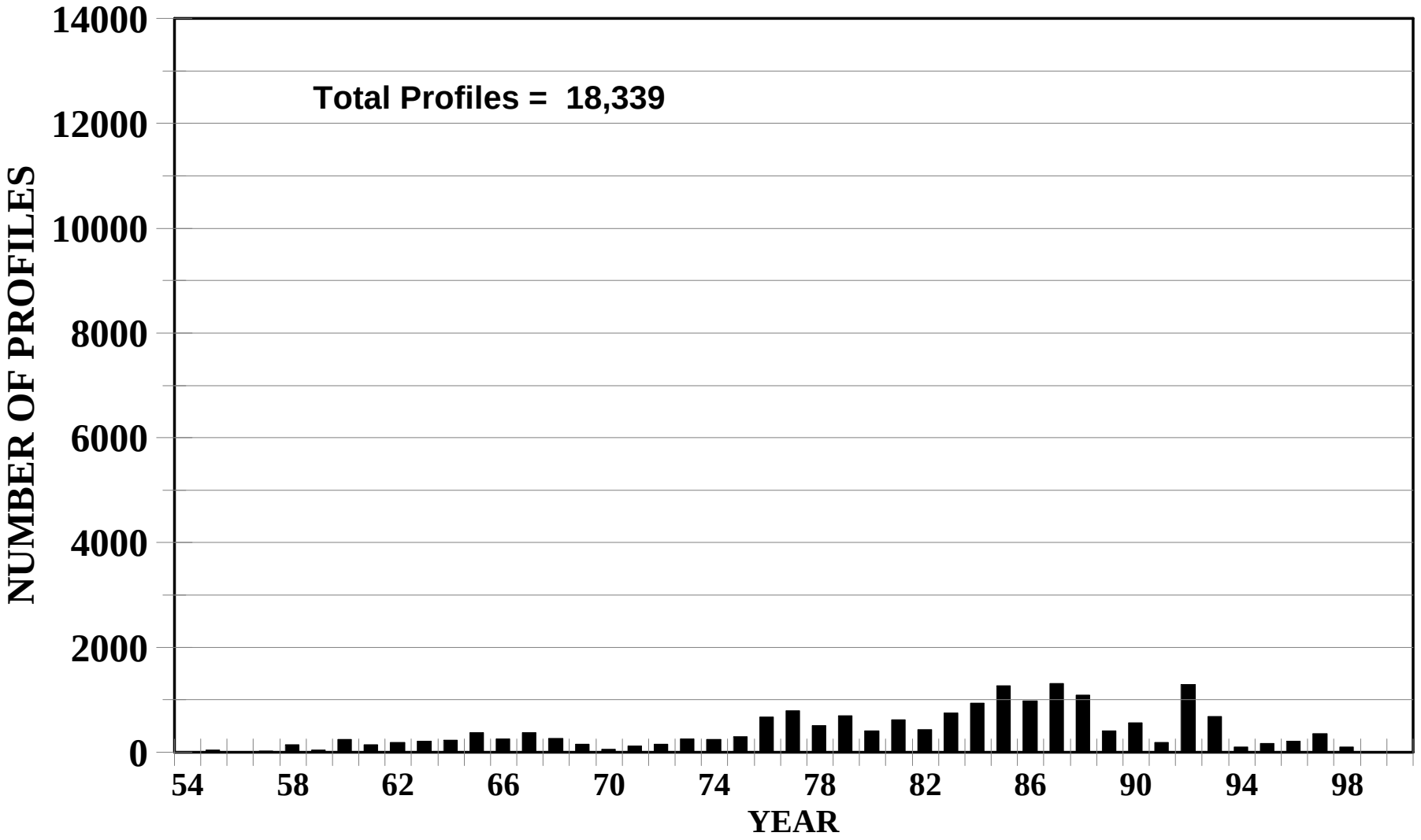

Fig. 2 Time series of Ocean Station Data (OSD) chlorophyll profiles in WOD01 for the southern hemisphere as a function of year.

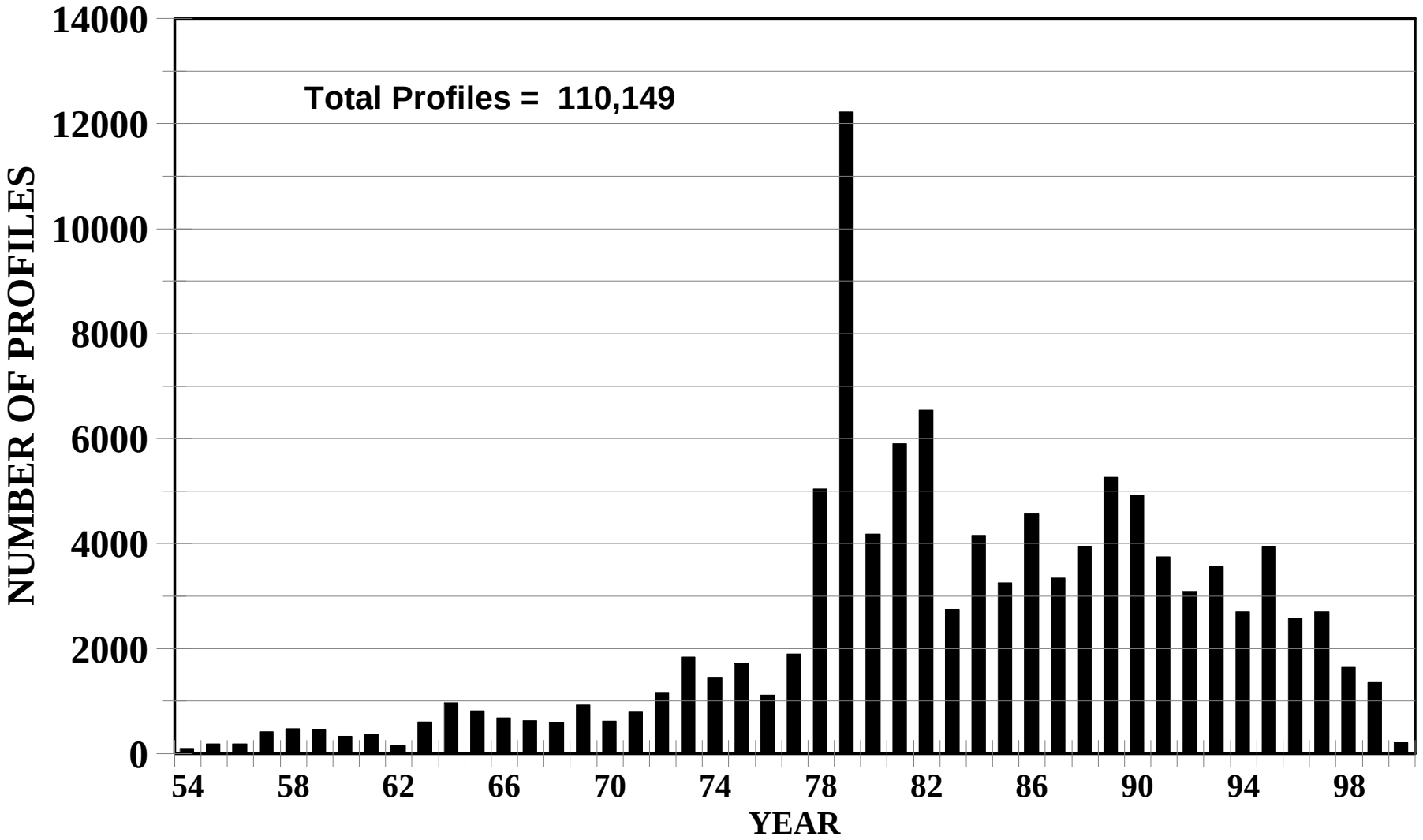

Fig. 3 Time series of Ocean Station Data (OSD) chlorophyll profiles in WOD01 for the northern hemisphere as a function of year.

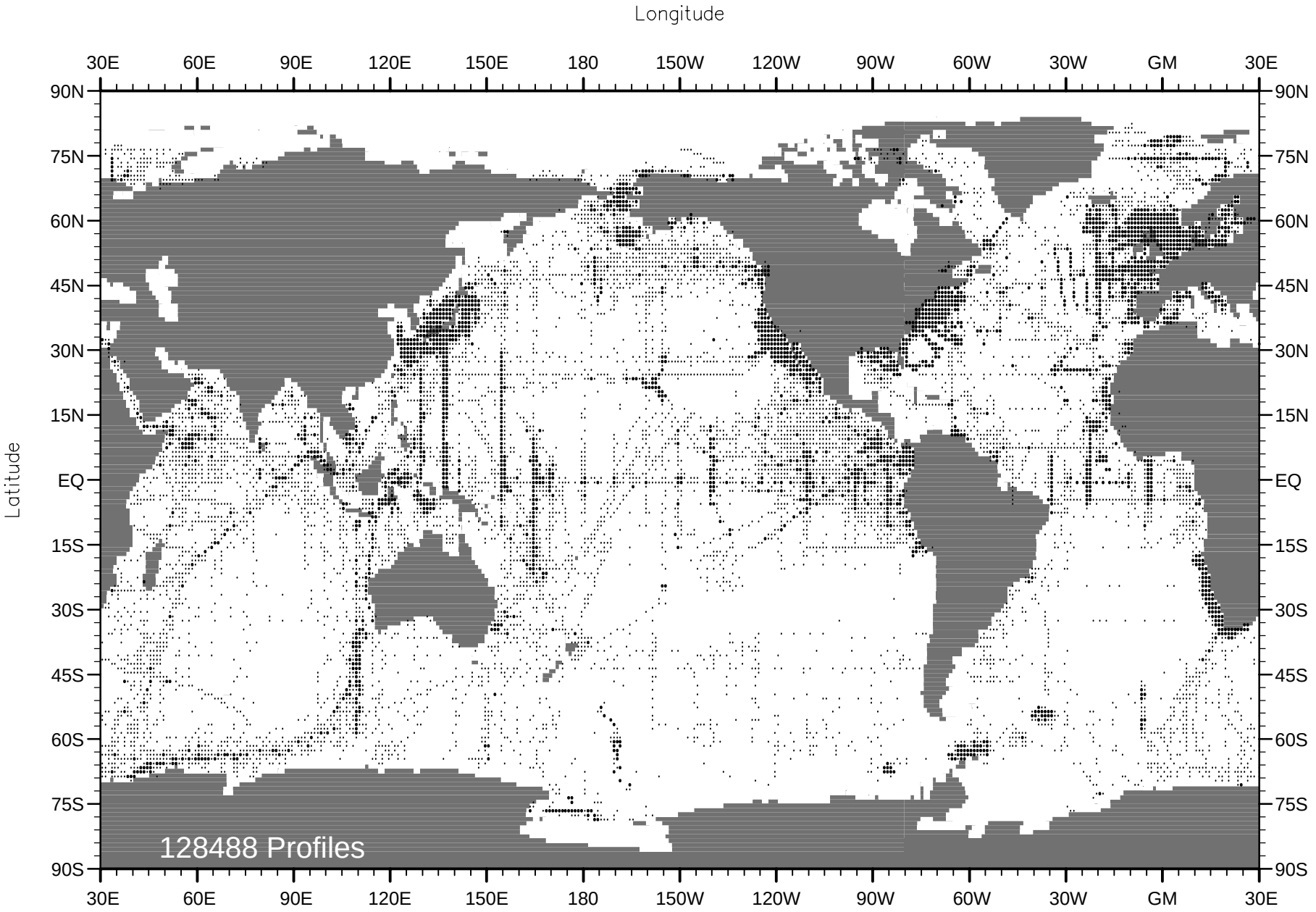

Fig. 4 Distribution of all Ocean Station Data (OSD) chlorophyll profiles in WOD01.
Dots show location of 1-degree squares containing any data.

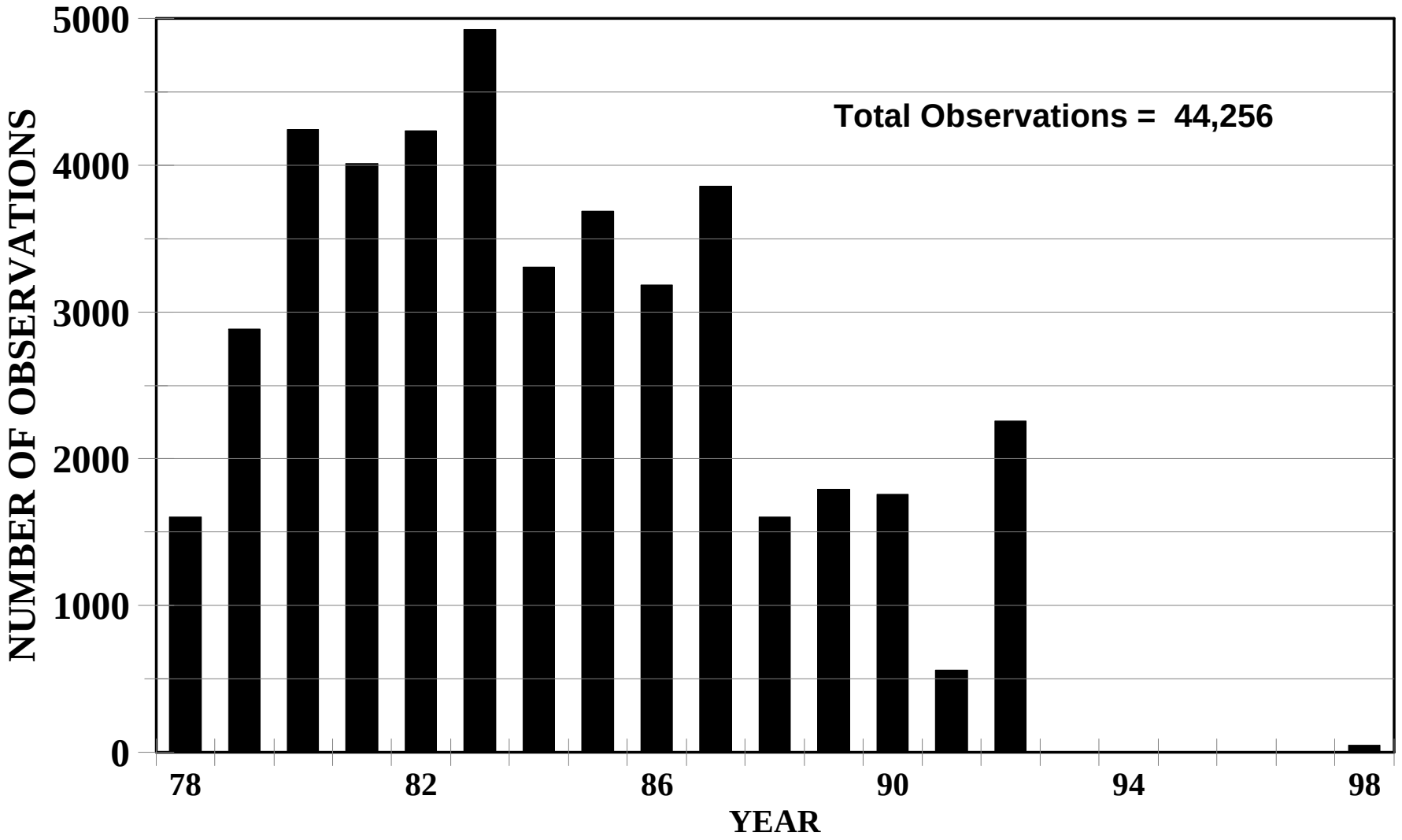

Fig. 5 **Time series of Surface-only (SURF) chlorophyll observations in WOD01 for the world ocean as a function of year.**

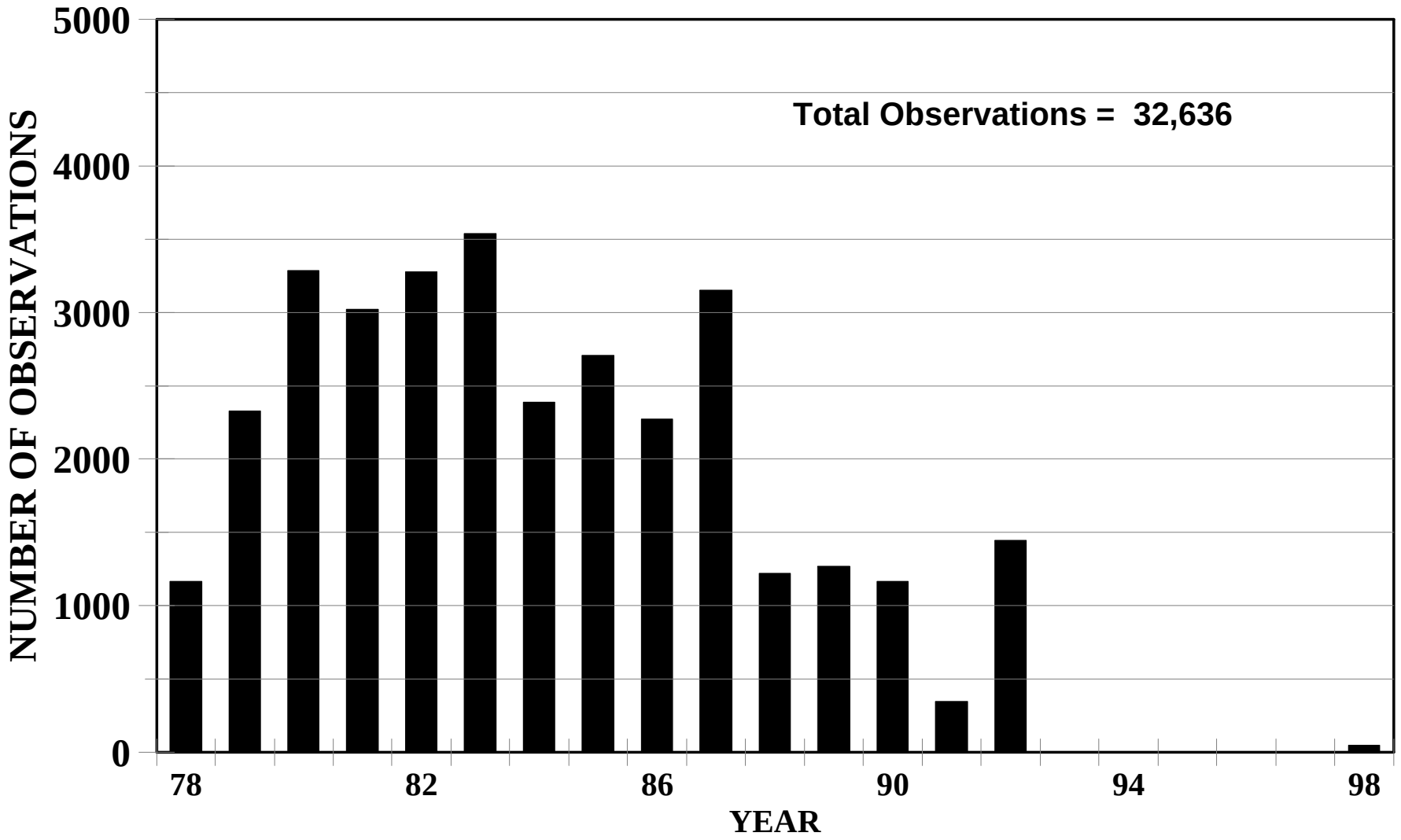

Fig. 6 Time series of Surface-only (SURF) chlorophyll observations in WOD01 for the southern hemisphere as a function of year.

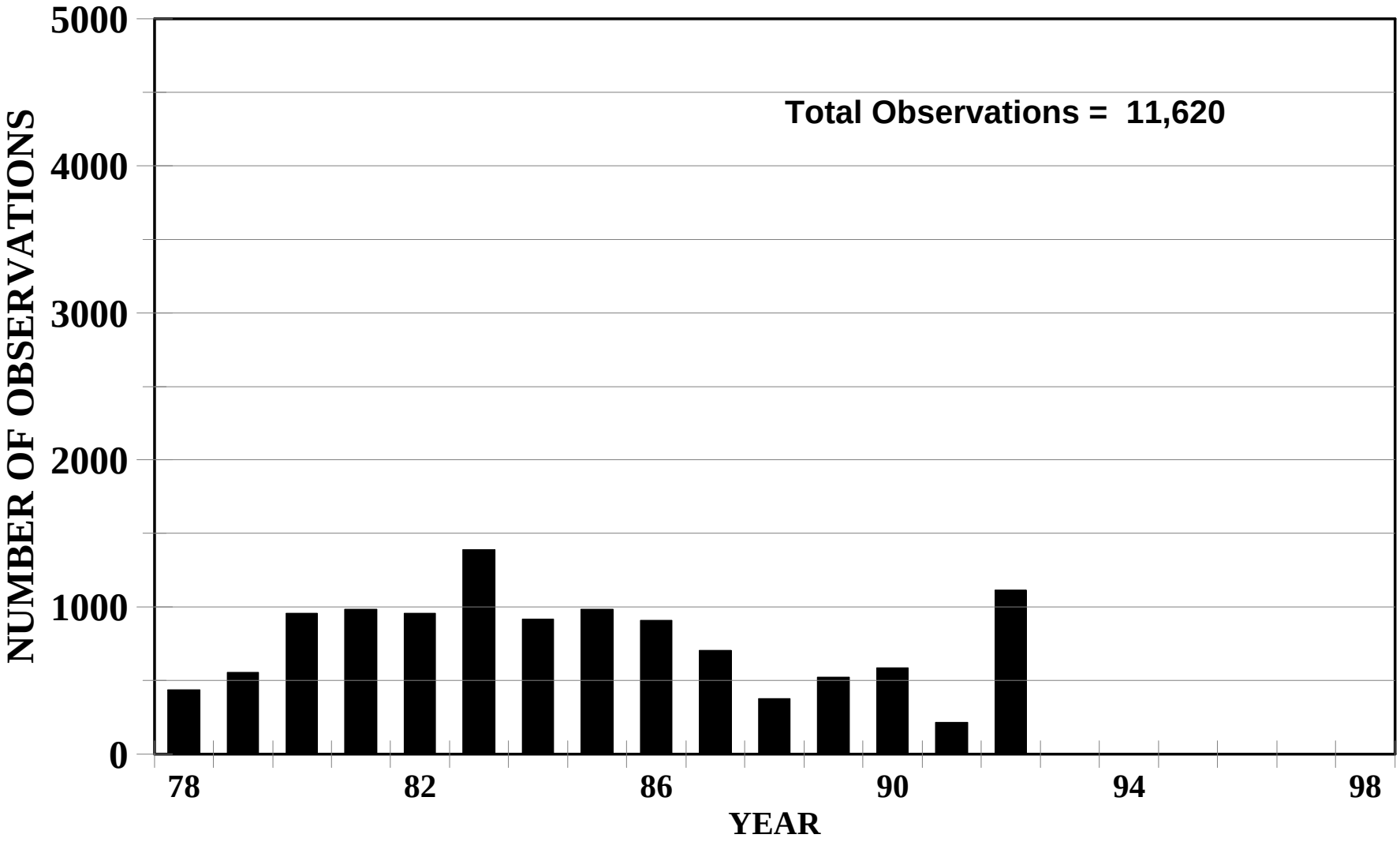

Fig. 7 Time series of Surface-only (SURF) chlorophyll observations in WOD01 for the northern hemisphere as a function of year.

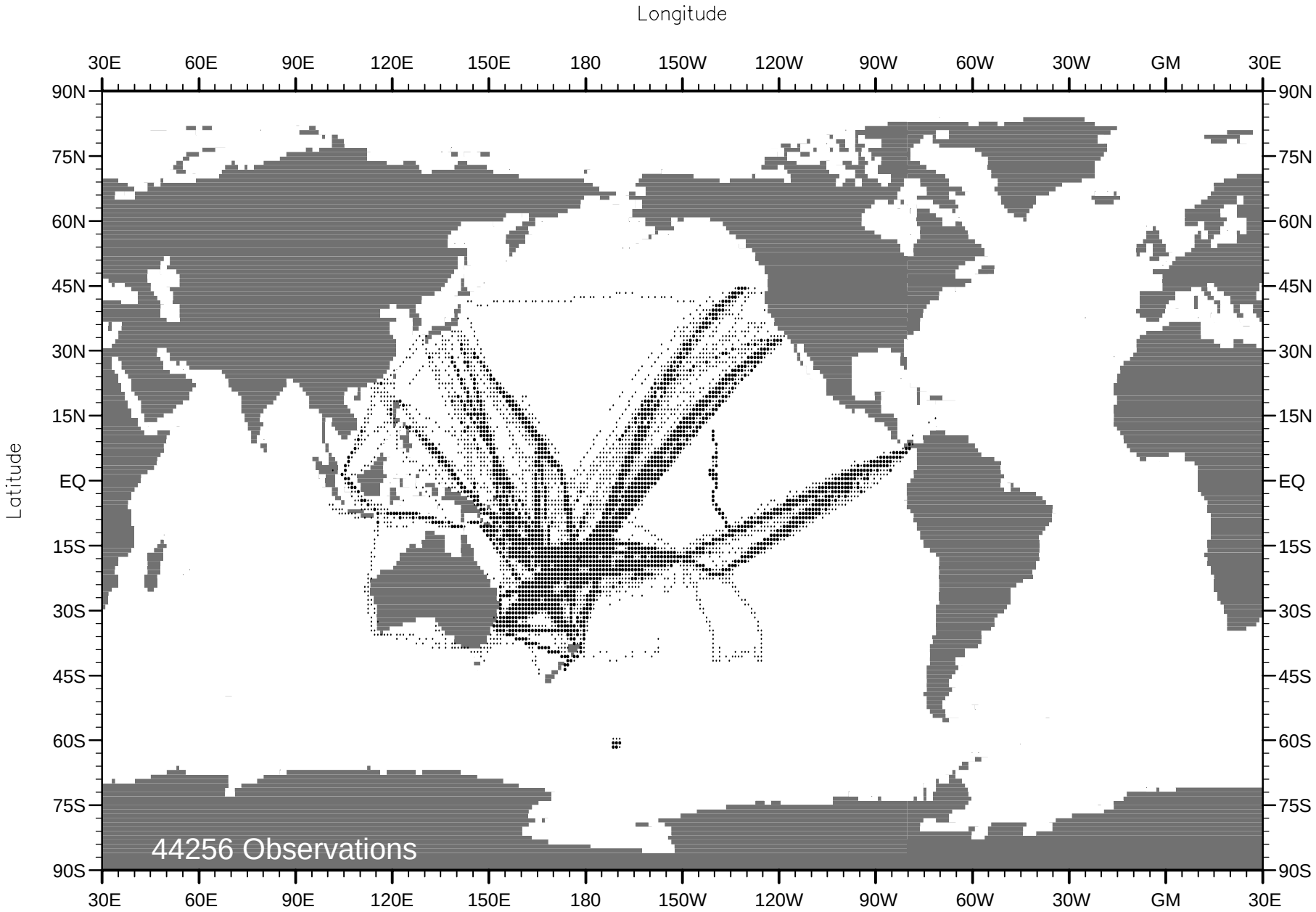

Fig. 8 Distribution of all Surface-only (SURF) chlorophyll observations in WOD01.
Dots show location of 1-degree squares containing any data.

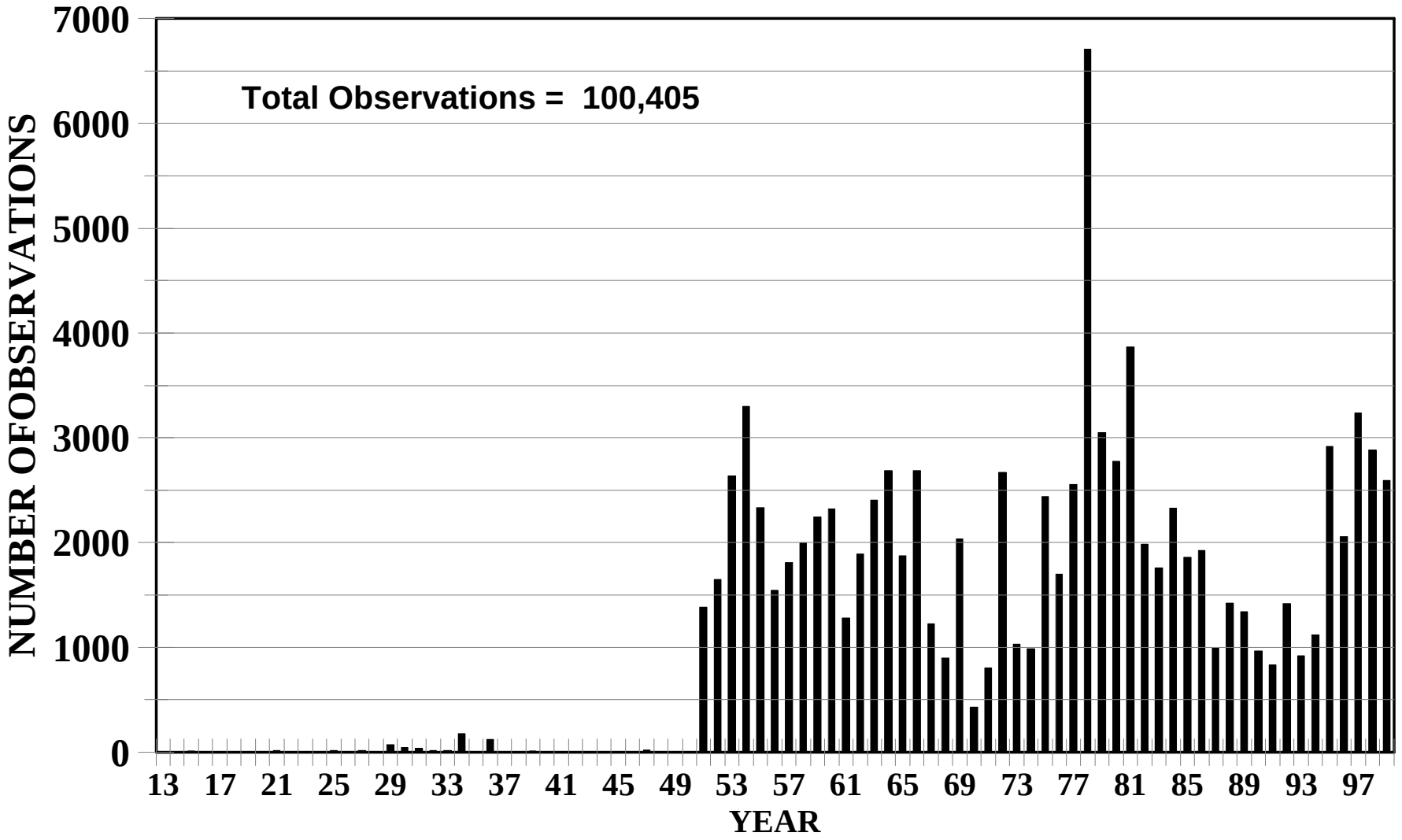

Fig. 9 **Time series of Ocean Station Data (OSD) plankton abundance data in WOD01 for the world ocean as a function of year.**

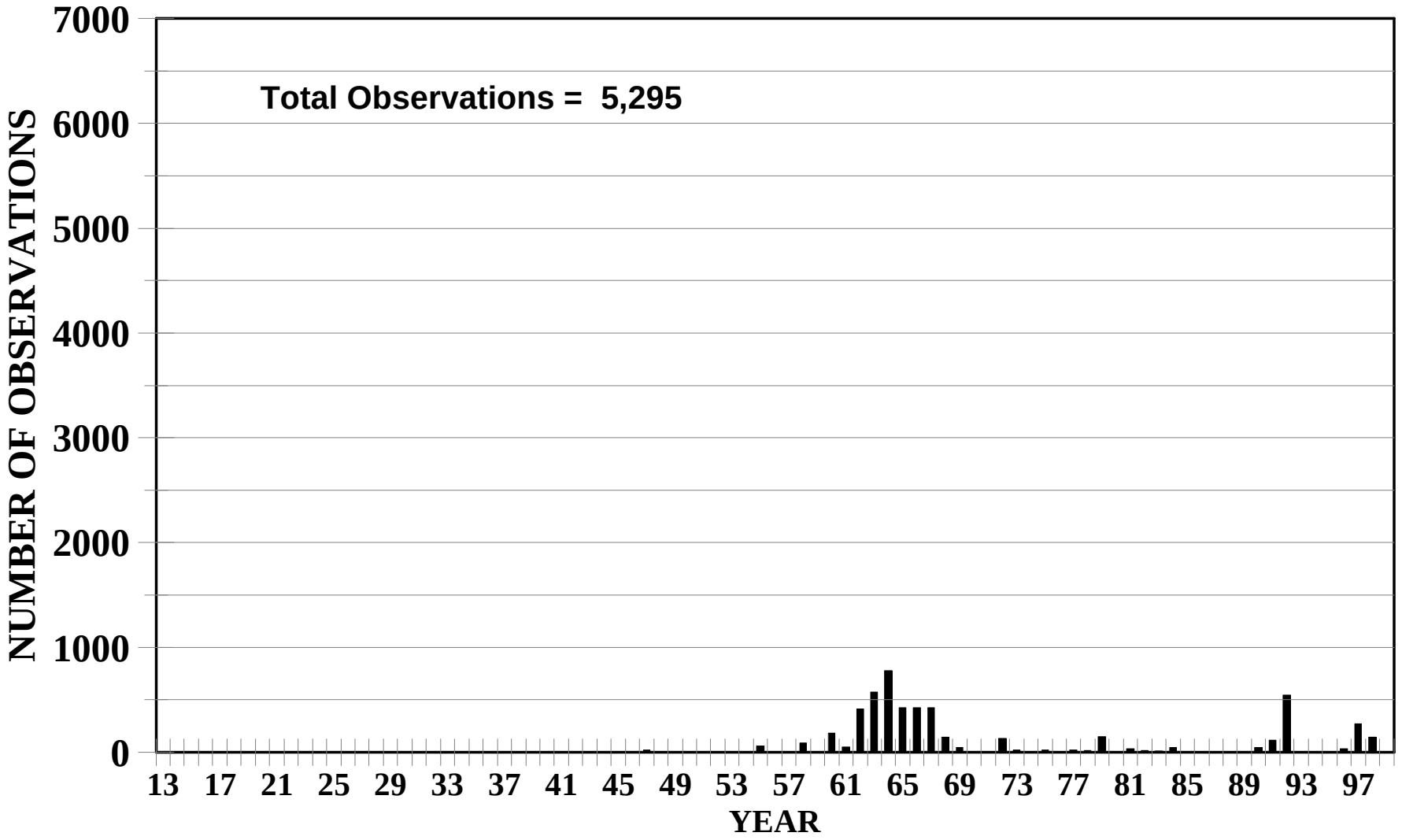

Fig. 10 Time series of Ocean Station Data (OSD) plankton abundance data in WOD01 for the southern hemisphere as a function of year.

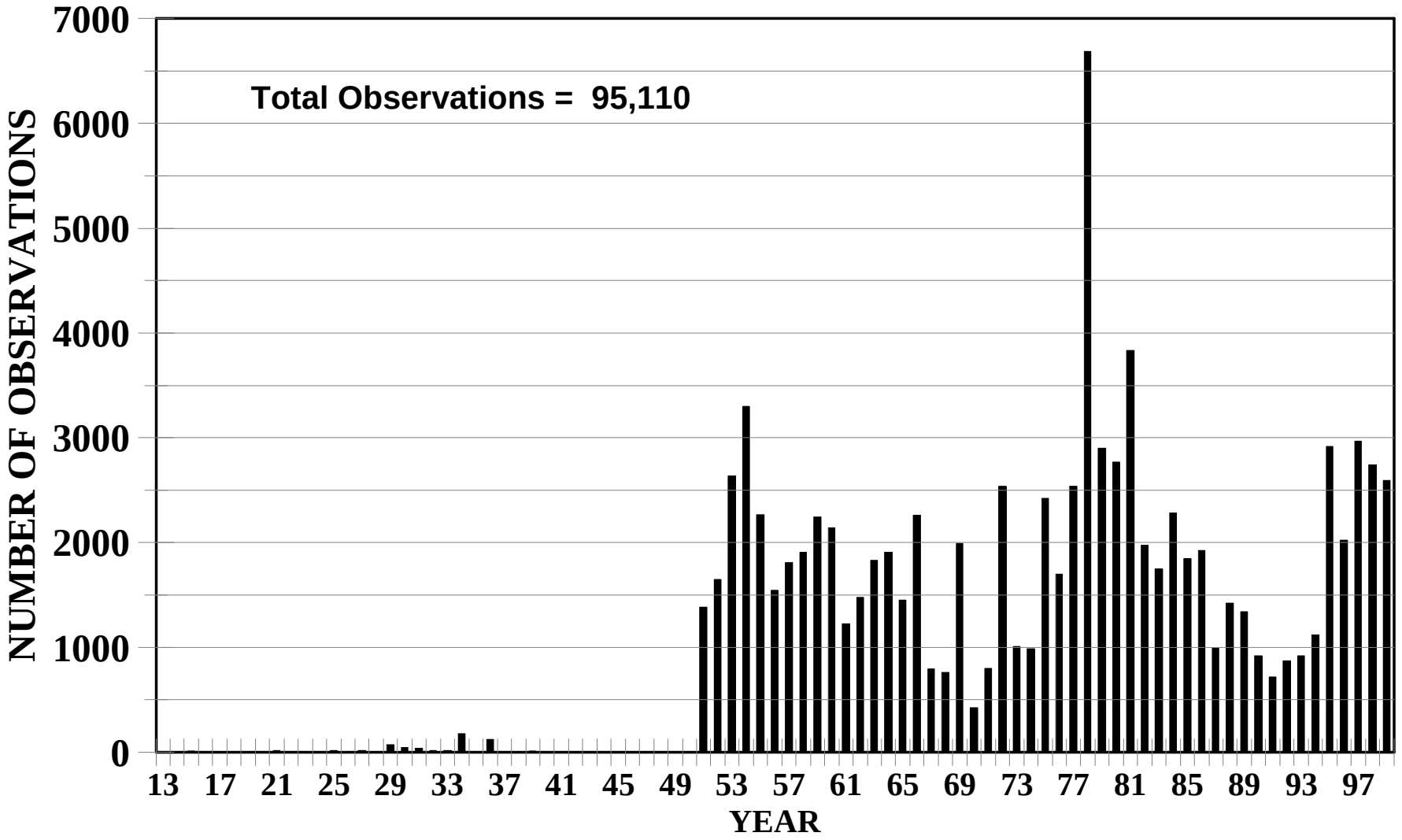

Fig. 11 Time series of Ocean Station Data (OSD) plankton abundance data in WOD01 for the northern hemisphere as a function of year.

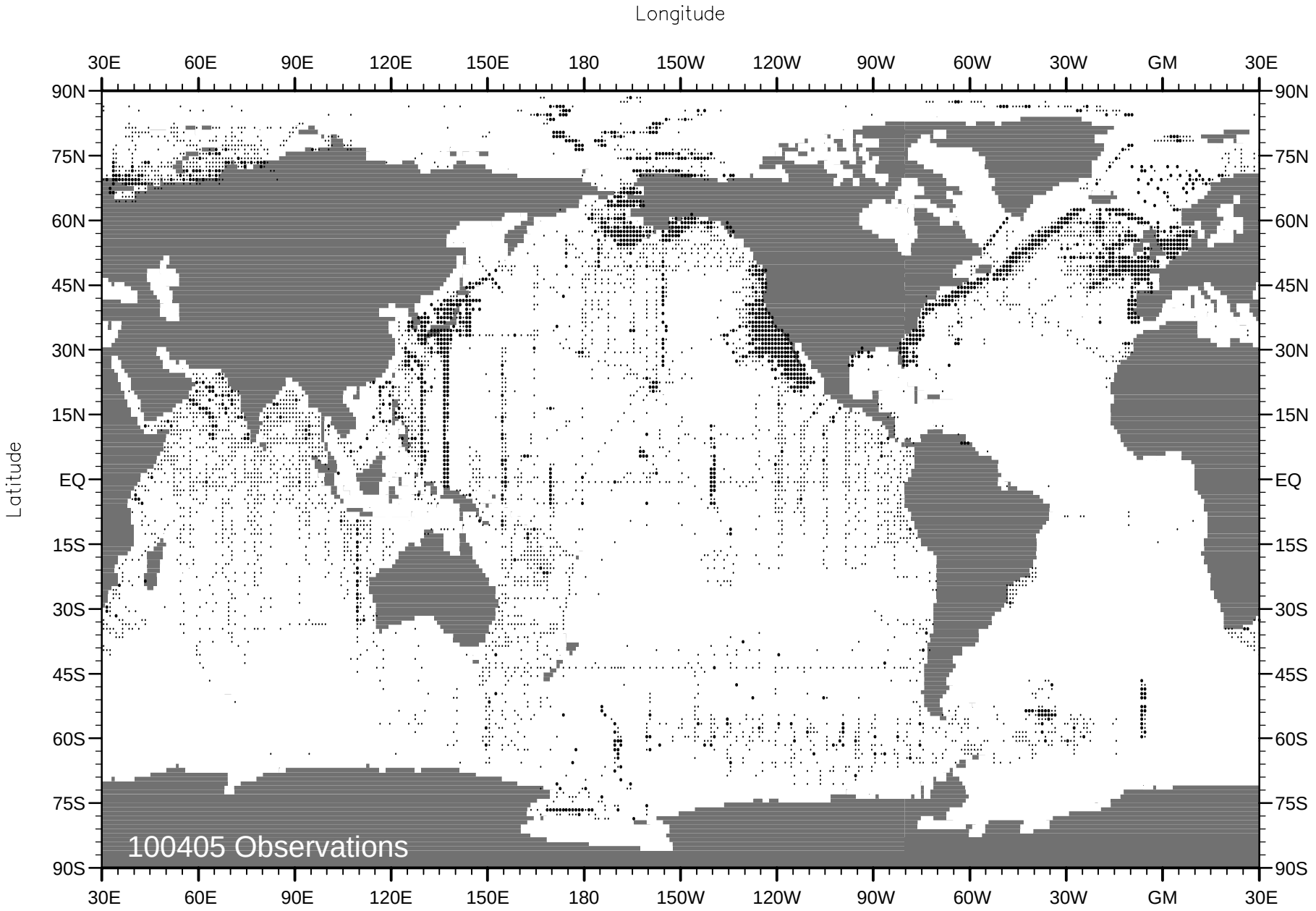

Fig. 12 Distribution of all Ocean Station Data (OSD) plankton abundance data in WOD01.
Dots show location of 1-degree squares containing any data.

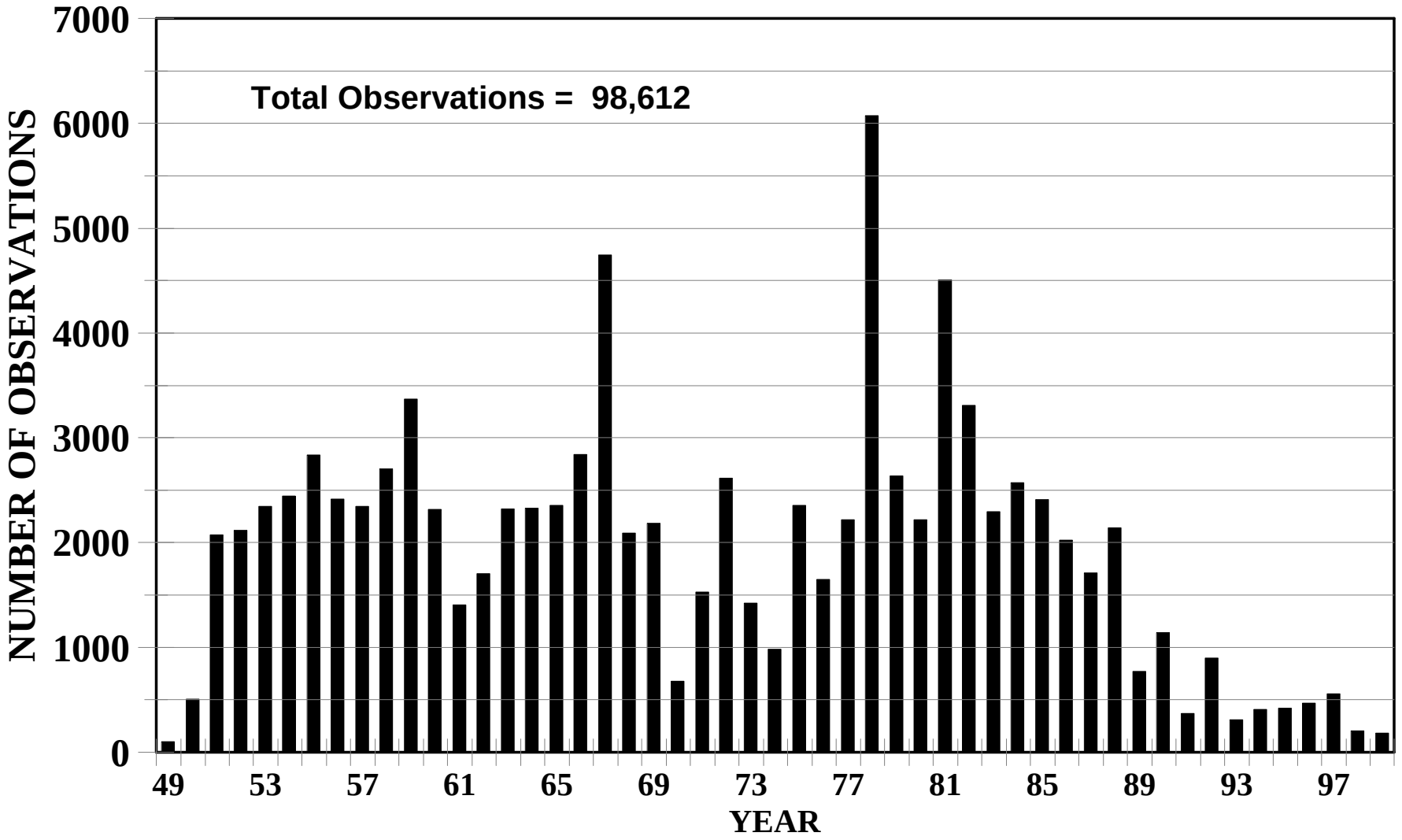

Fig. 13 Time series of Ocean Station Data (OSD) plankton biomass data in WOD01 for the world ocean as a function of year.

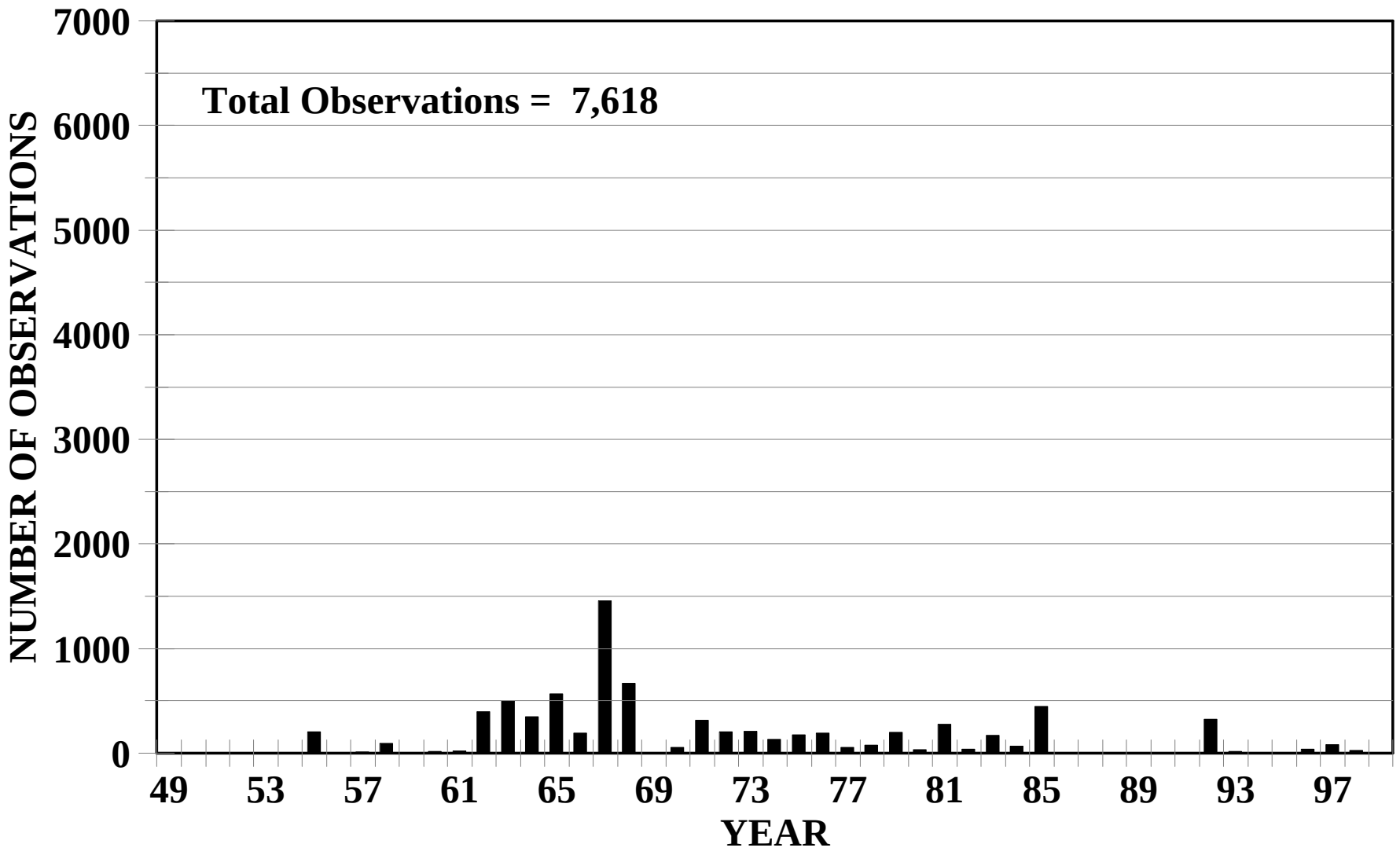

Fig. 14 Time series of Ocean Station Data (OSD) plankton biomass data in WOD01 for the southern hemisphere as a function of year.

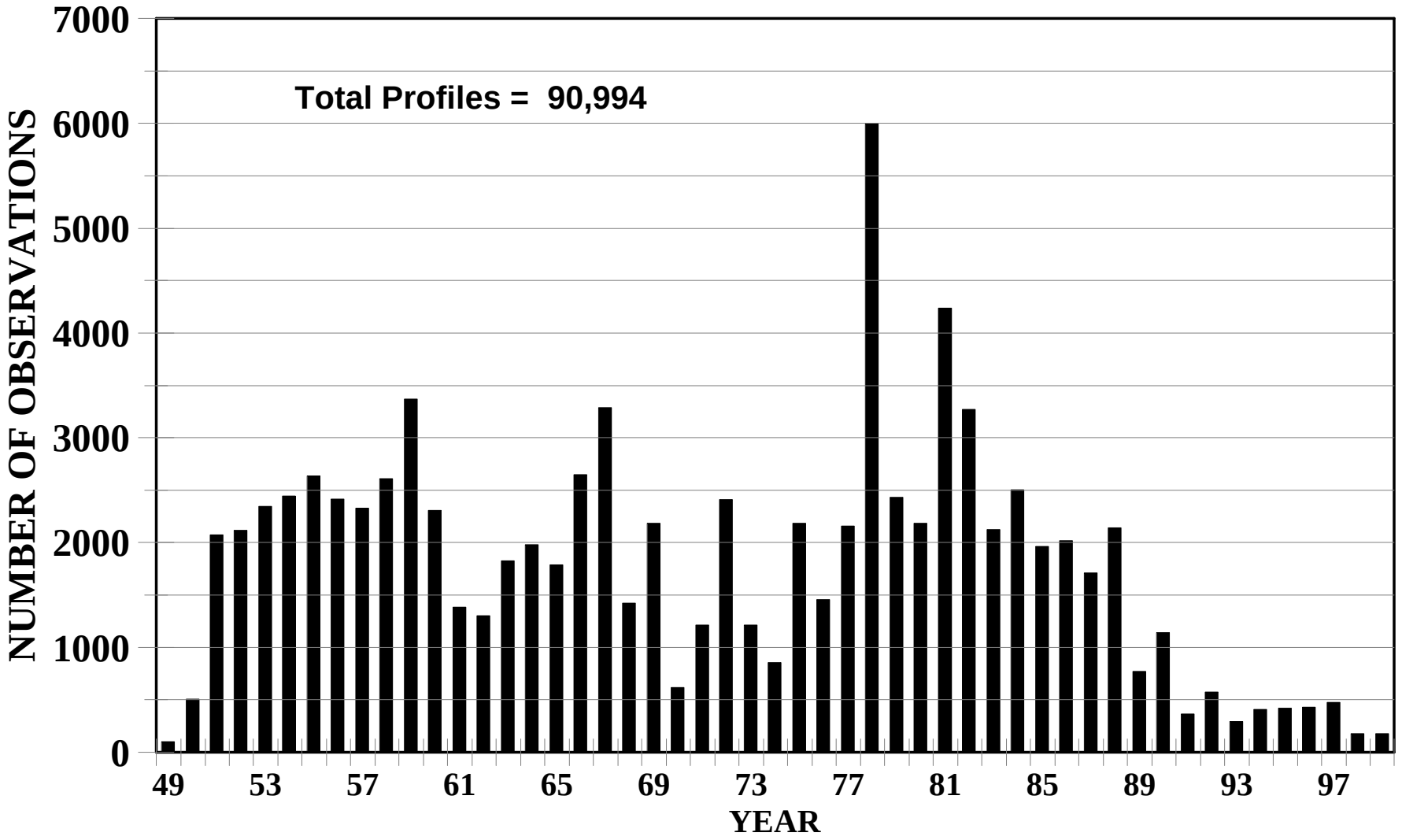

Fig. 15 Time series of Ocean Station Data (OSD) plankton biomass data in WOD01 for the northern hemisphere as a function of year.

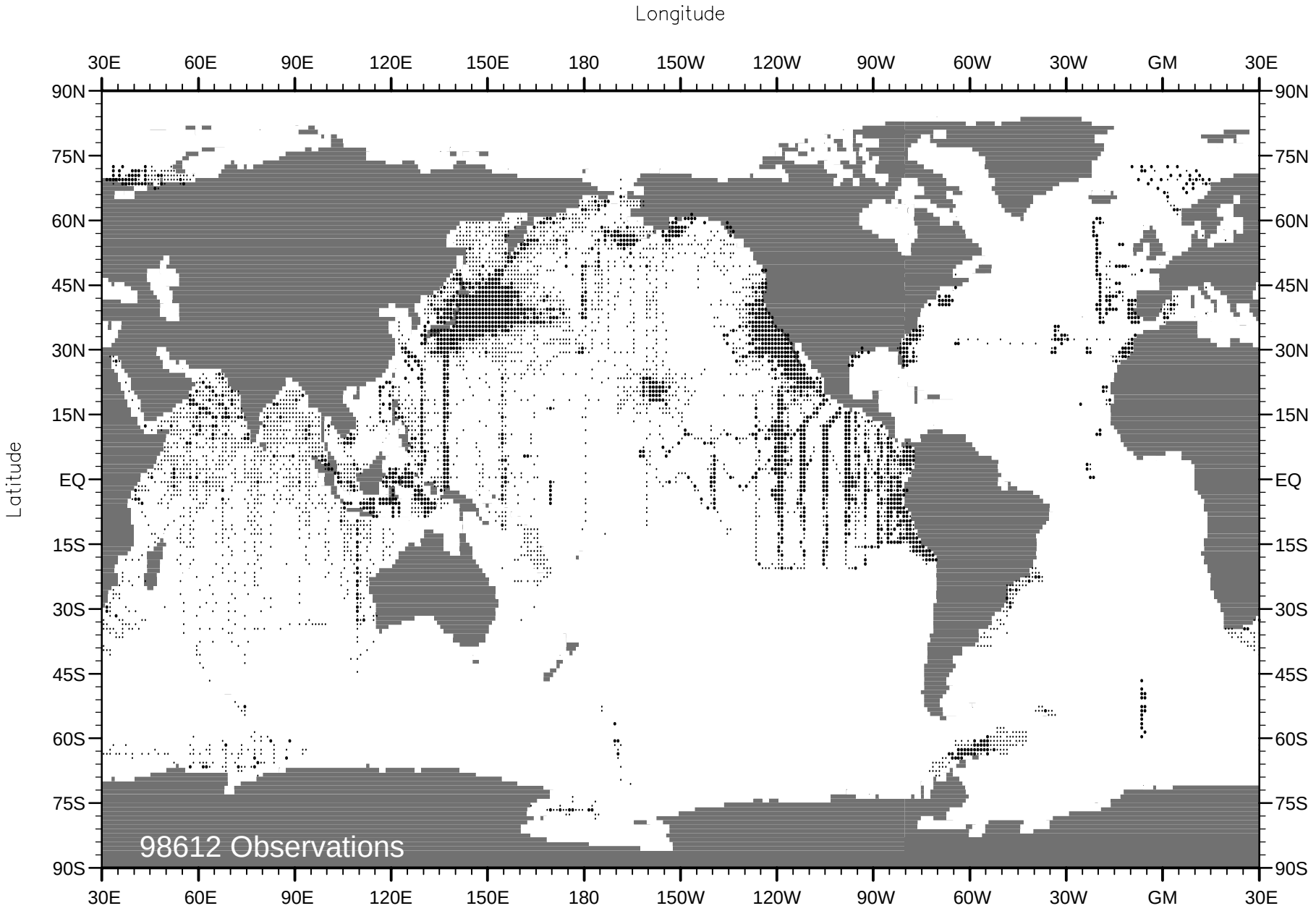

Fig. 16 Distribution of all Ocean Station Data (OSD) plankton biomass data in WOD01.
Dots show location of 1-degree squares containing any data.

3. BIBLIOGRAPHY

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4. APPENDIX A: DISTRIBUTIONS FOR INDIVIDUAL YEARS OF ALL OCEAN STATION DATA (OSD) CHLOROPHYLL PROFILES IN WOD01

This appendix contains yearly distributions of all OSD chlorophyll profiles contained in WOD01. These maps provide some history of the observational progress of the field of oceanography. They also serve as indicators of whether or not a particular data set from a scientist or institution is part of the NODC/WDC-A archive. The exchange of information provided by the publication of such maps has provided us with valuable information about deficiencies in the database. The locations of all WOD01 OSD chlorophyll profiles are plotted including stations that may be erroneously located over land. However, WOD01 contains some stations from various lakes so care should be exercised in the use of these stations and the determination as to whether they represent errors in locations.

For all figures in Appendix A, a small dot indicates a one-degree square containing from one to four stations and a large dot indicates five or more stations.

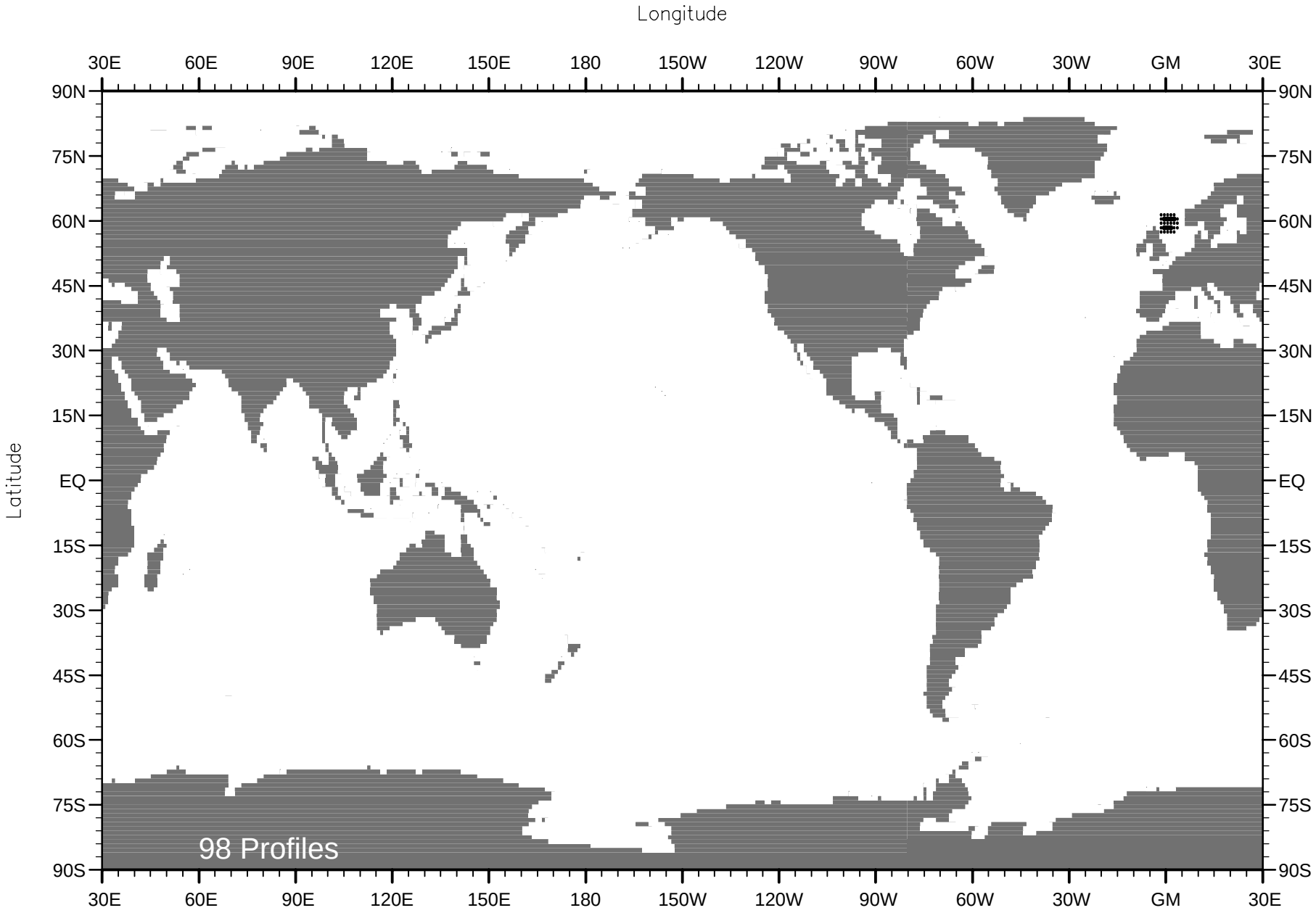


Fig. A1 Distribution of all Ocean Station Data (OSD) chlorophyll profiles in WOD01 for year 1954 .

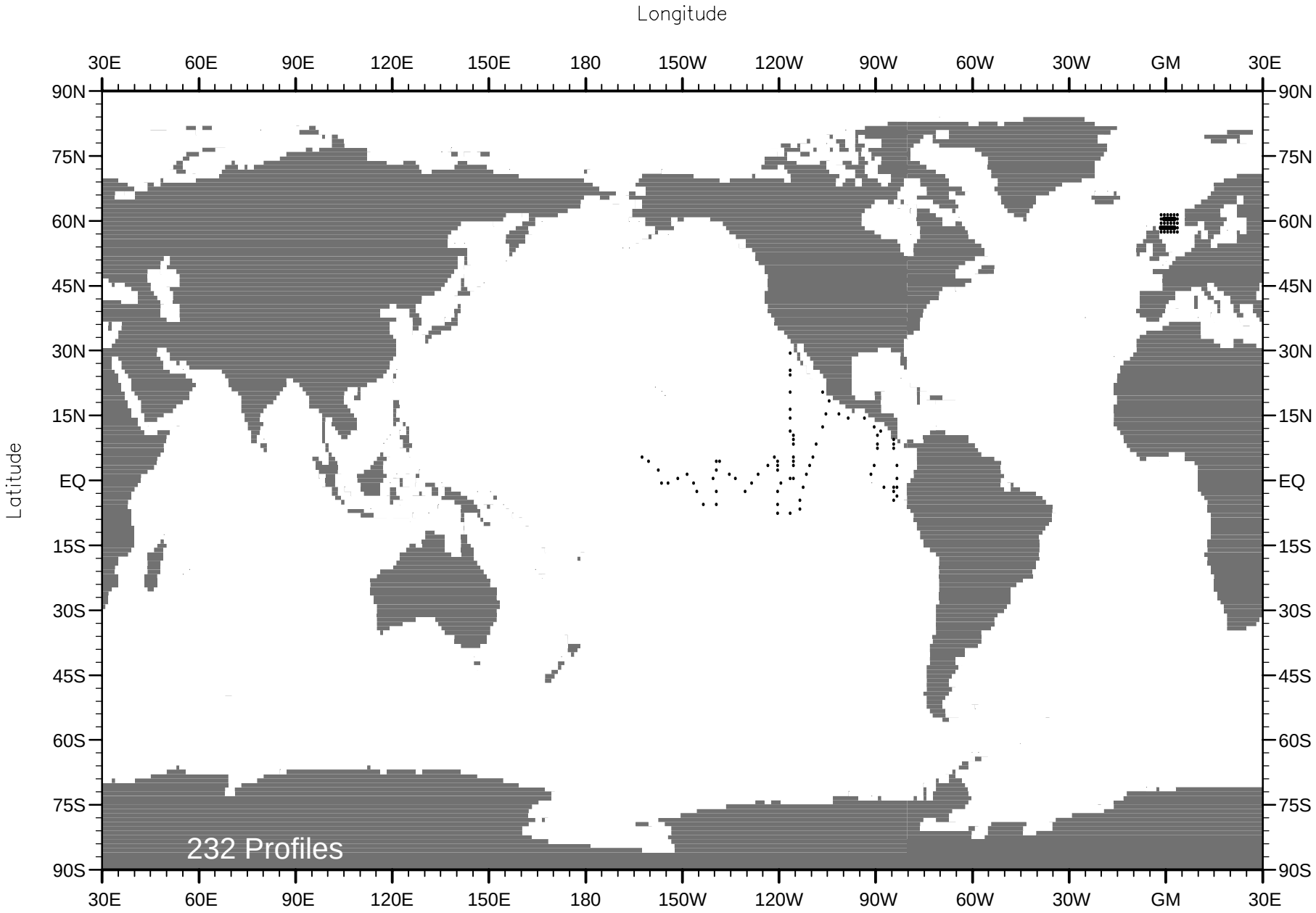


Fig. A2 Distribution of all Ocean Station Data (OSD) chlorophyll profiles in WOD01 for year 1955 .

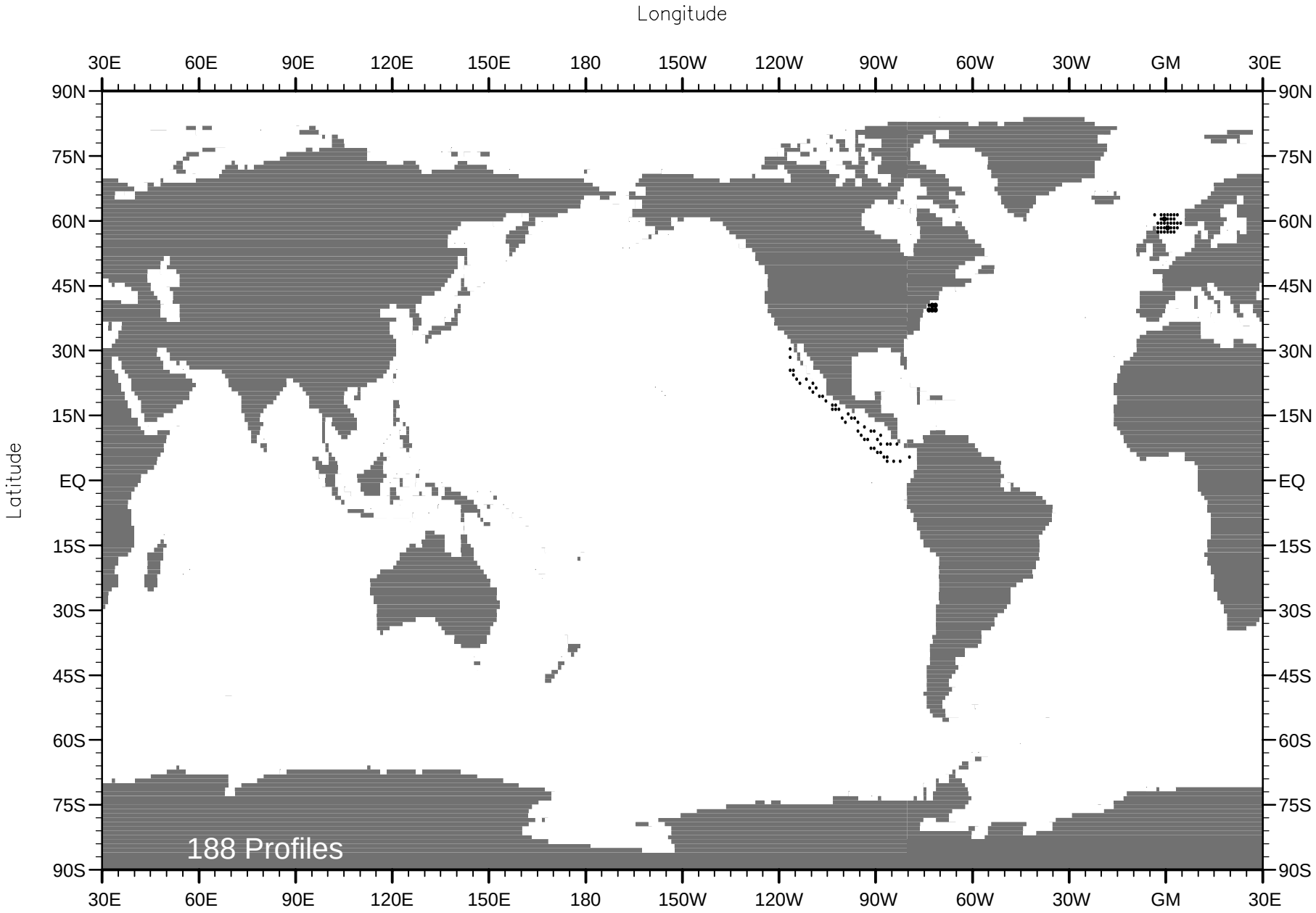


Fig. A3 Distribution of all Ocean Station Data (OSD) chlorophyll profiles in WOD01 for year 1956 .

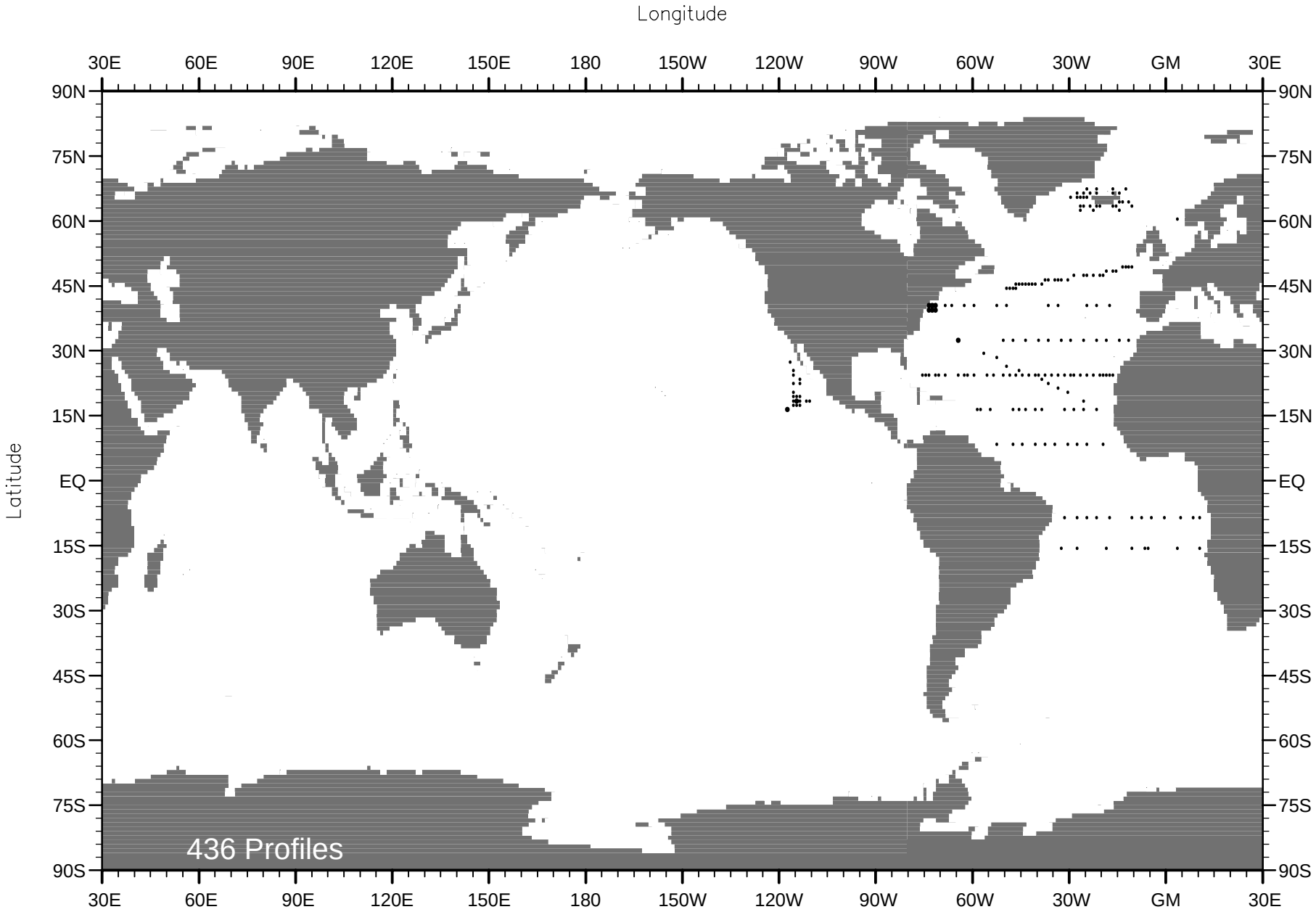


Fig. A4 Distribution of all Ocean Station Data (OSD) chlorophyll profiles in WOD01 for year 1957 .

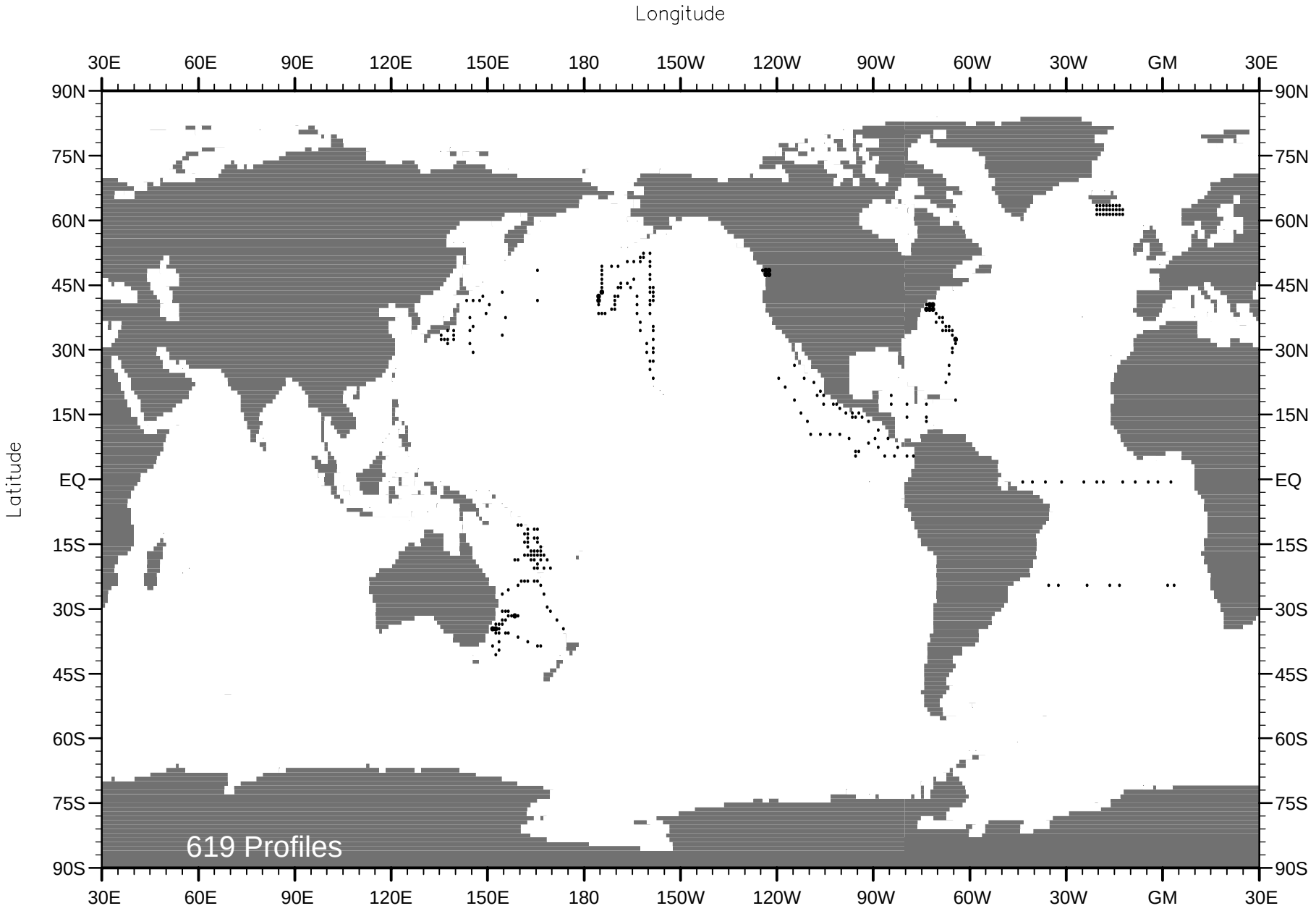


Fig. A5 Distribution of all Ocean Station Data (OSD) chlorophyll profiles in WOD01 for year 1958 .

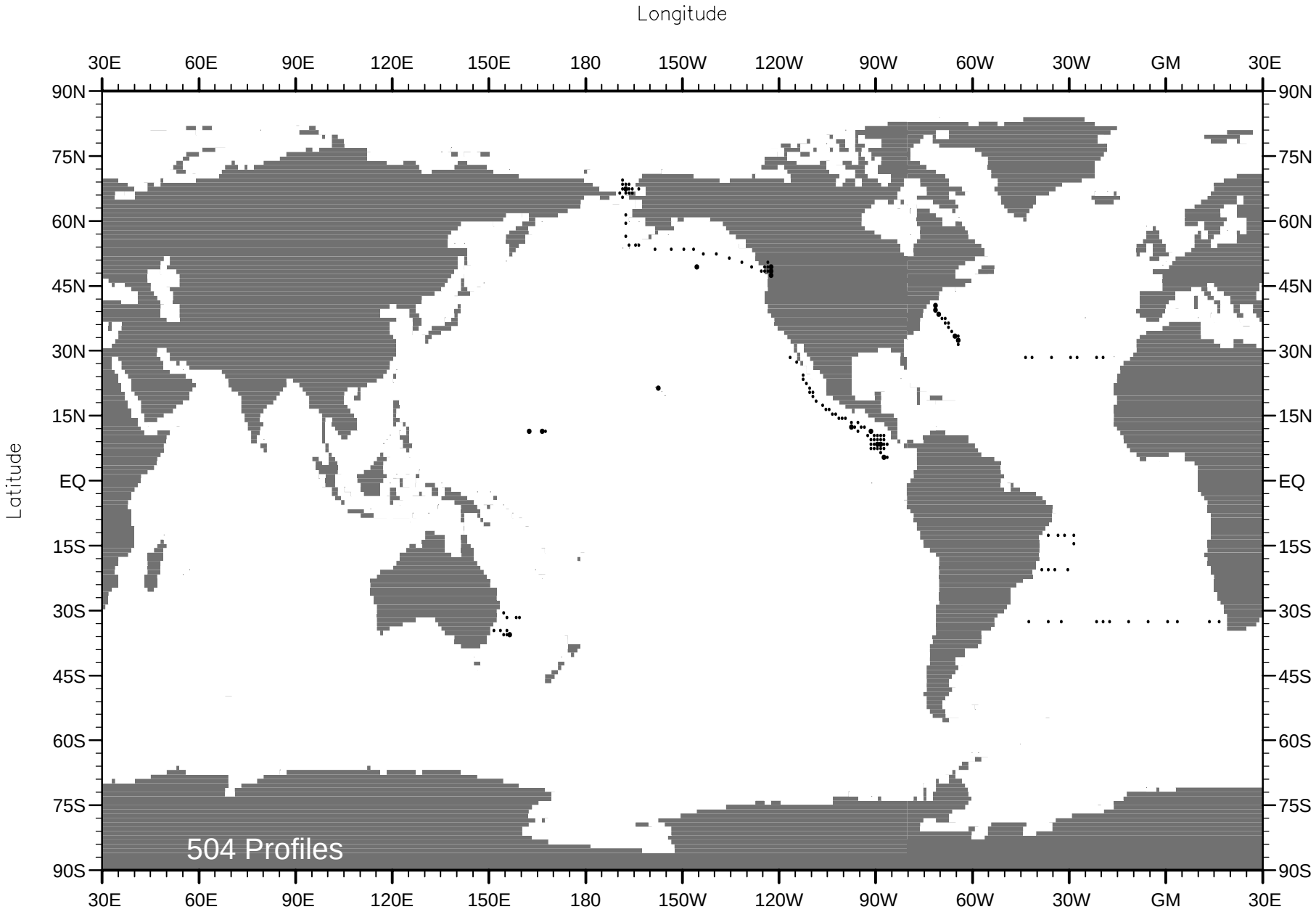


Fig. A6 Distribution of all Ocean Station Data (OSD) chlorophyll profiles in WOD01 for year 1959 .

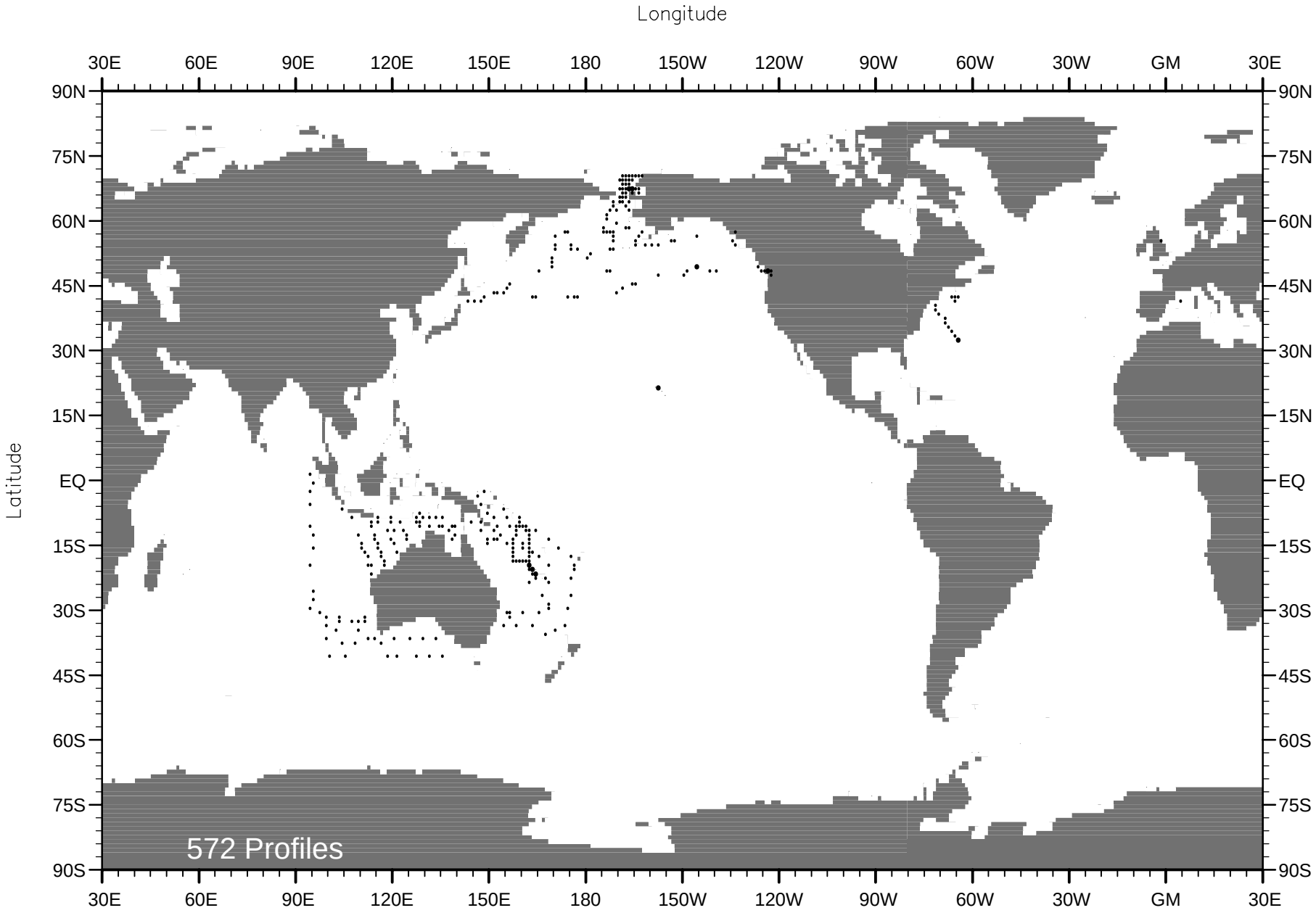


Fig. A7 Distribution of all Ocean Station Data (OSD) chlorophyll profiles in WOD01 for year 1960 .

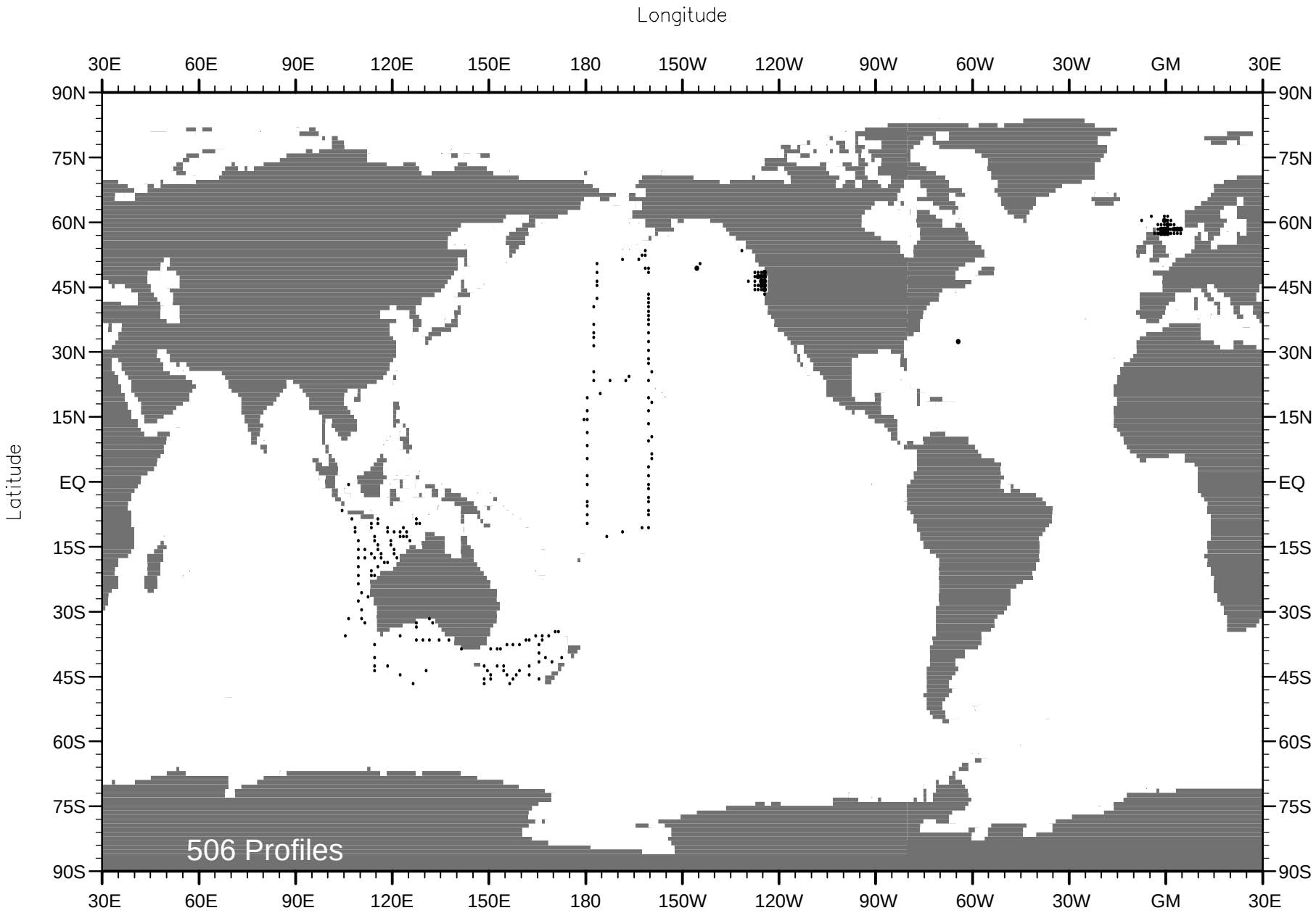


Fig. A8 Distribution of all Ocean Station Data (OSD) chlorophyll profiles in WOD01 for year 1961 .

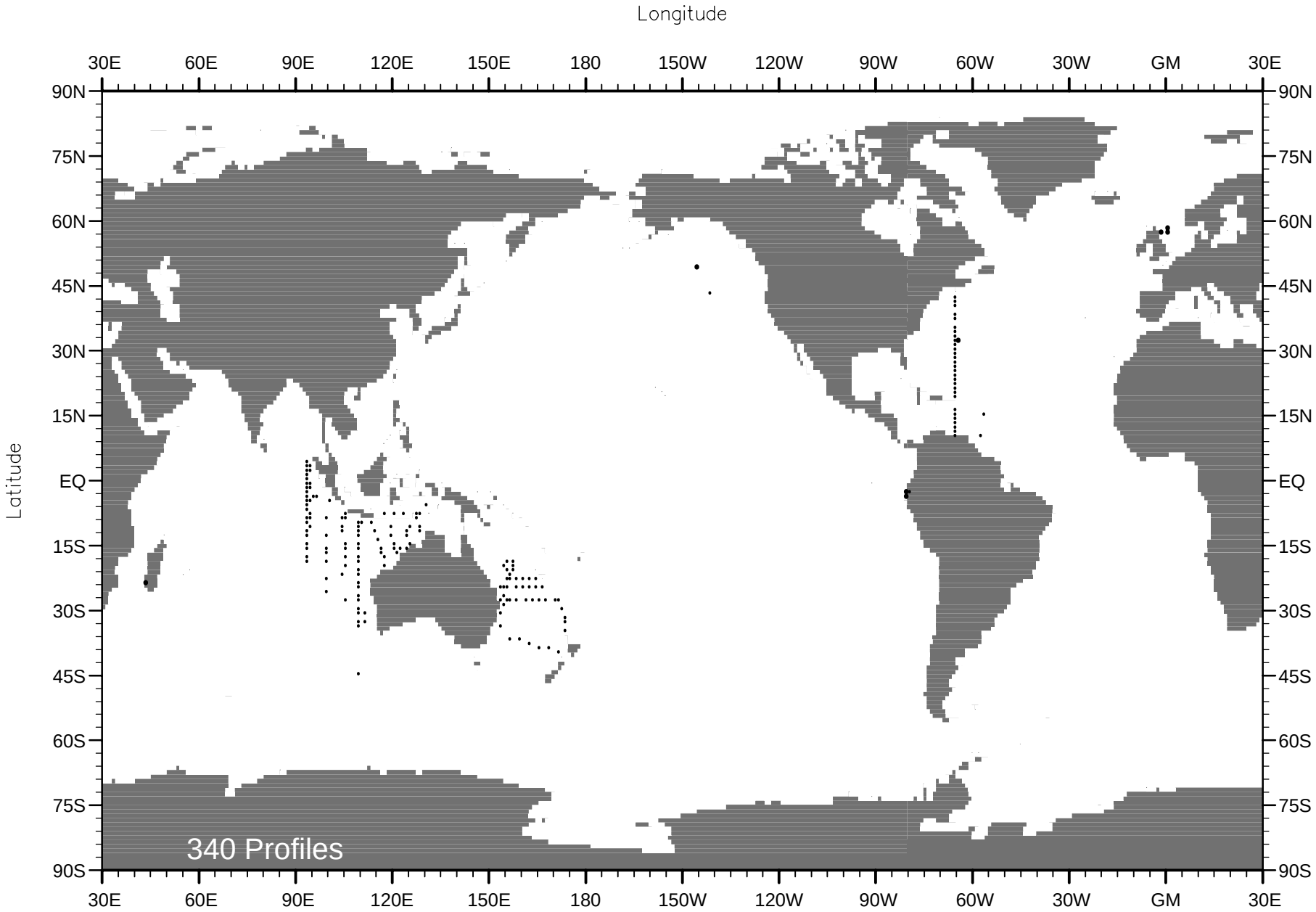


Fig. A9 Distribution of all Ocean Station Data (OSD) chlorophyll profiles in WOD01 for year 1962 .

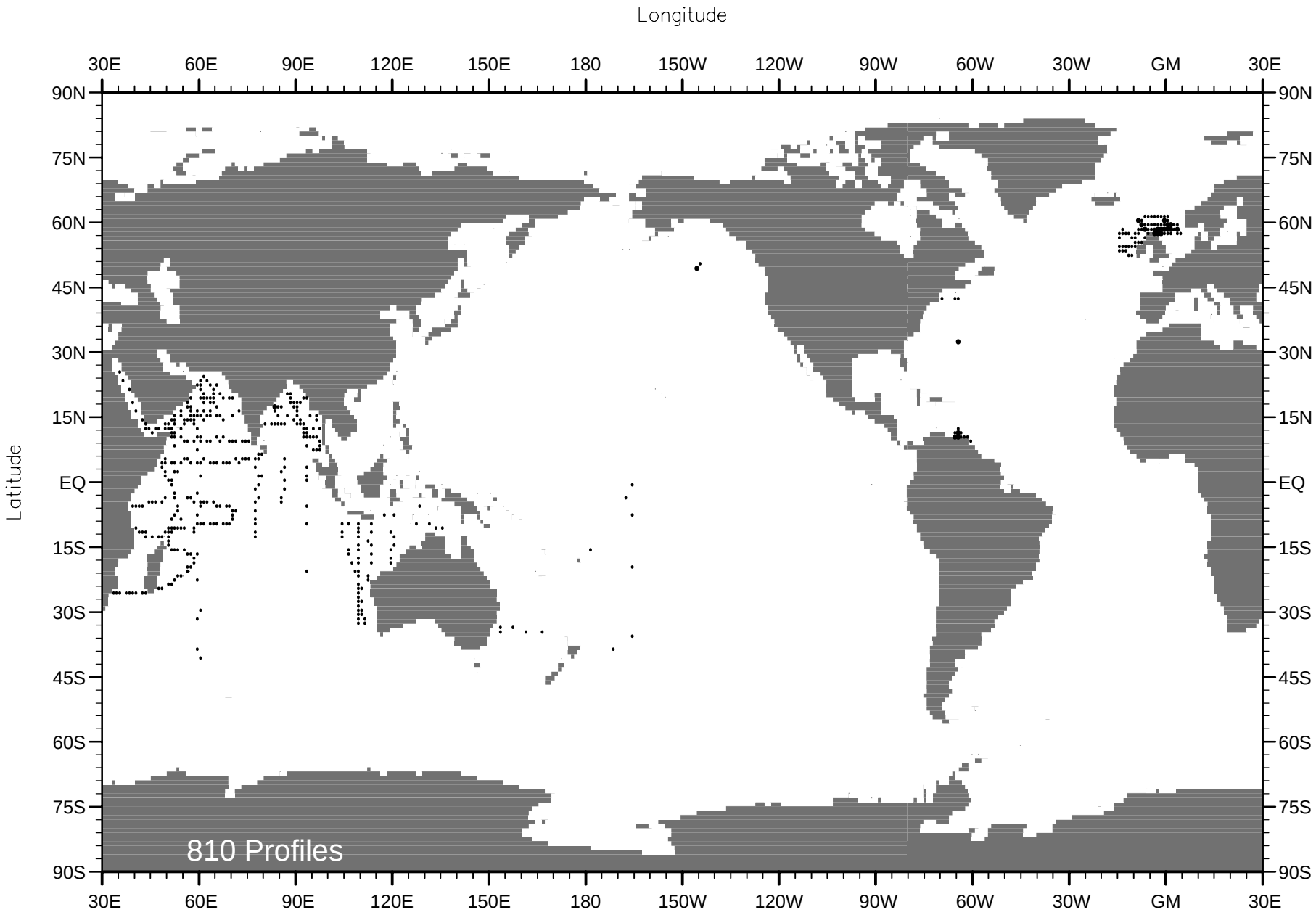


Fig. A10 Distribution of all Ocean Station Data (OSD) chlorophyll profiles in WOD01 for year 1963 .

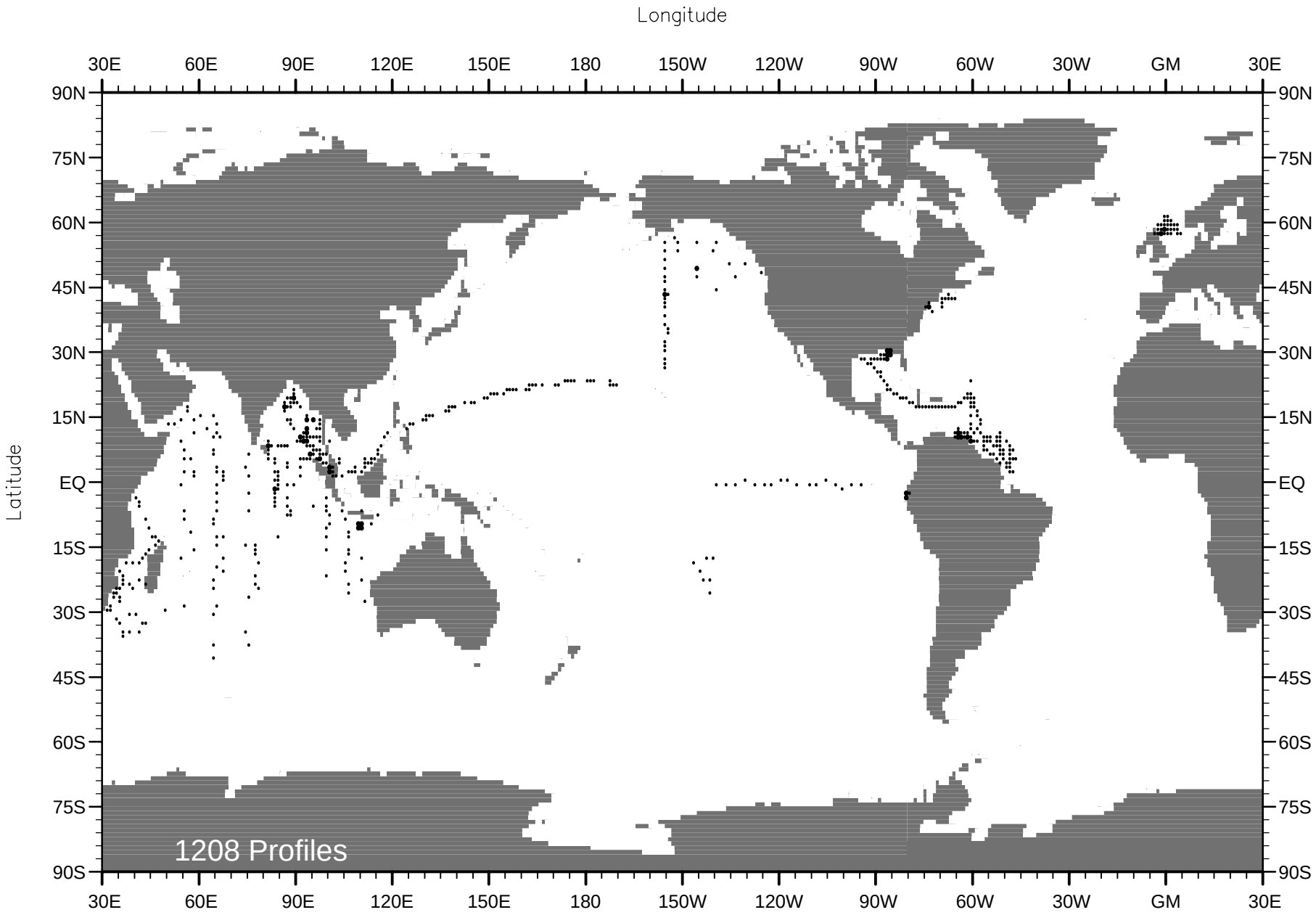


Fig. A11 Distribution of all Ocean Station Data (OSD) chlorophyll profiles in WOD01 for year 1964 .

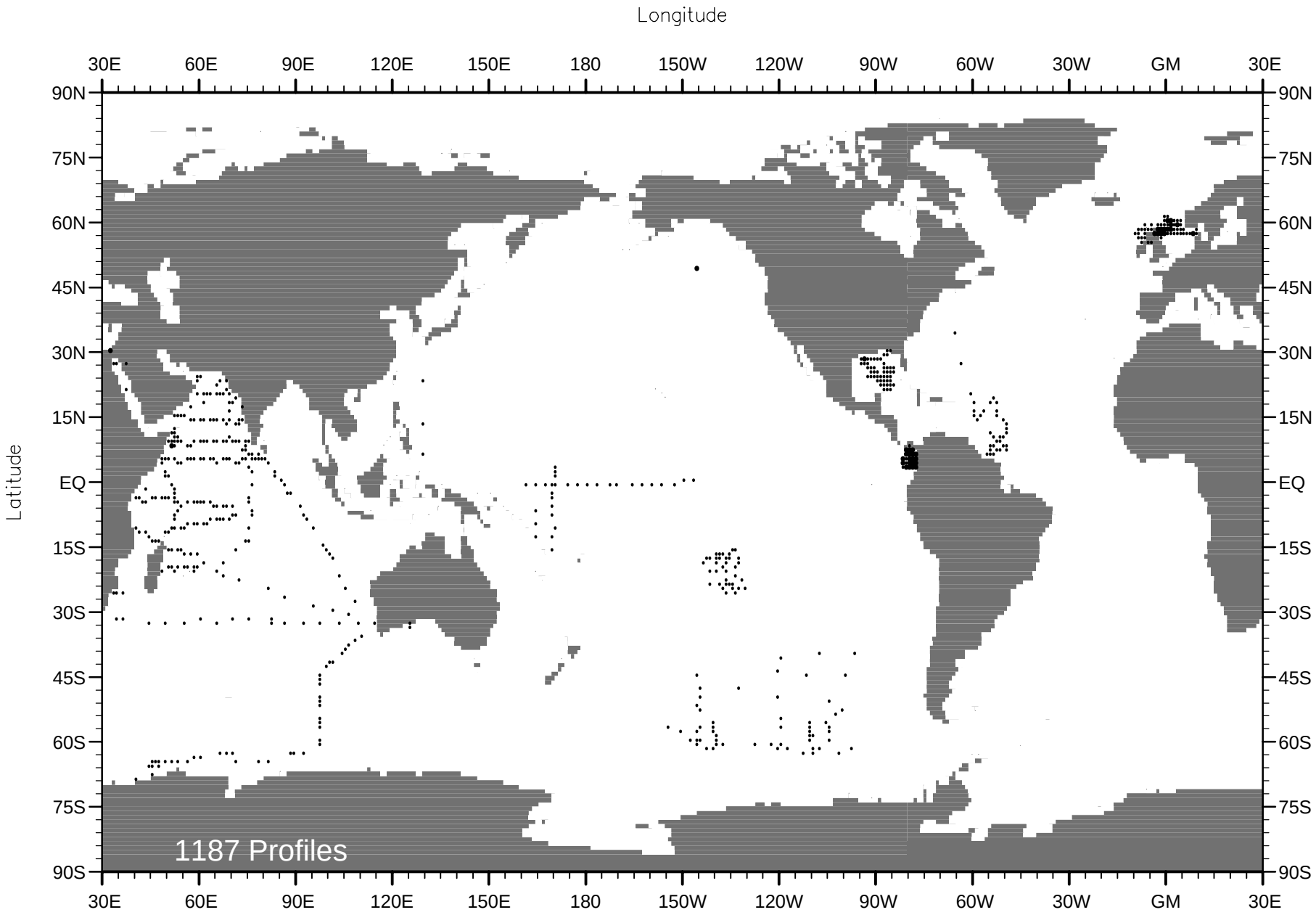


Fig. A12 Distribution of all Ocean Station Data (OSD) chlorophyll profiles in WOD01 for year 1965 .

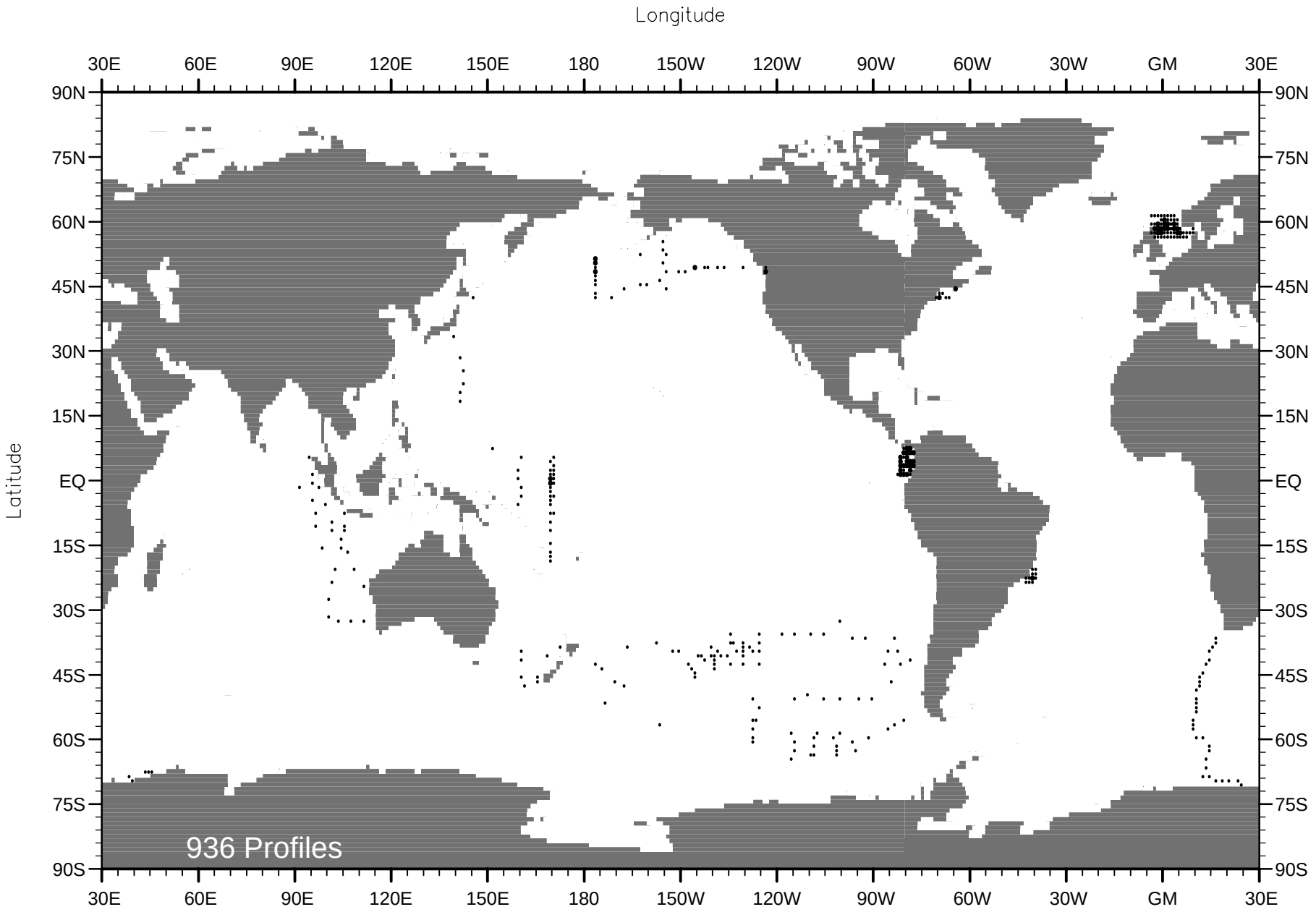


Fig. A13 Distribution of all Ocean Station Data (OSD) chlorophyll profiles in WOD01 for year 1966 .

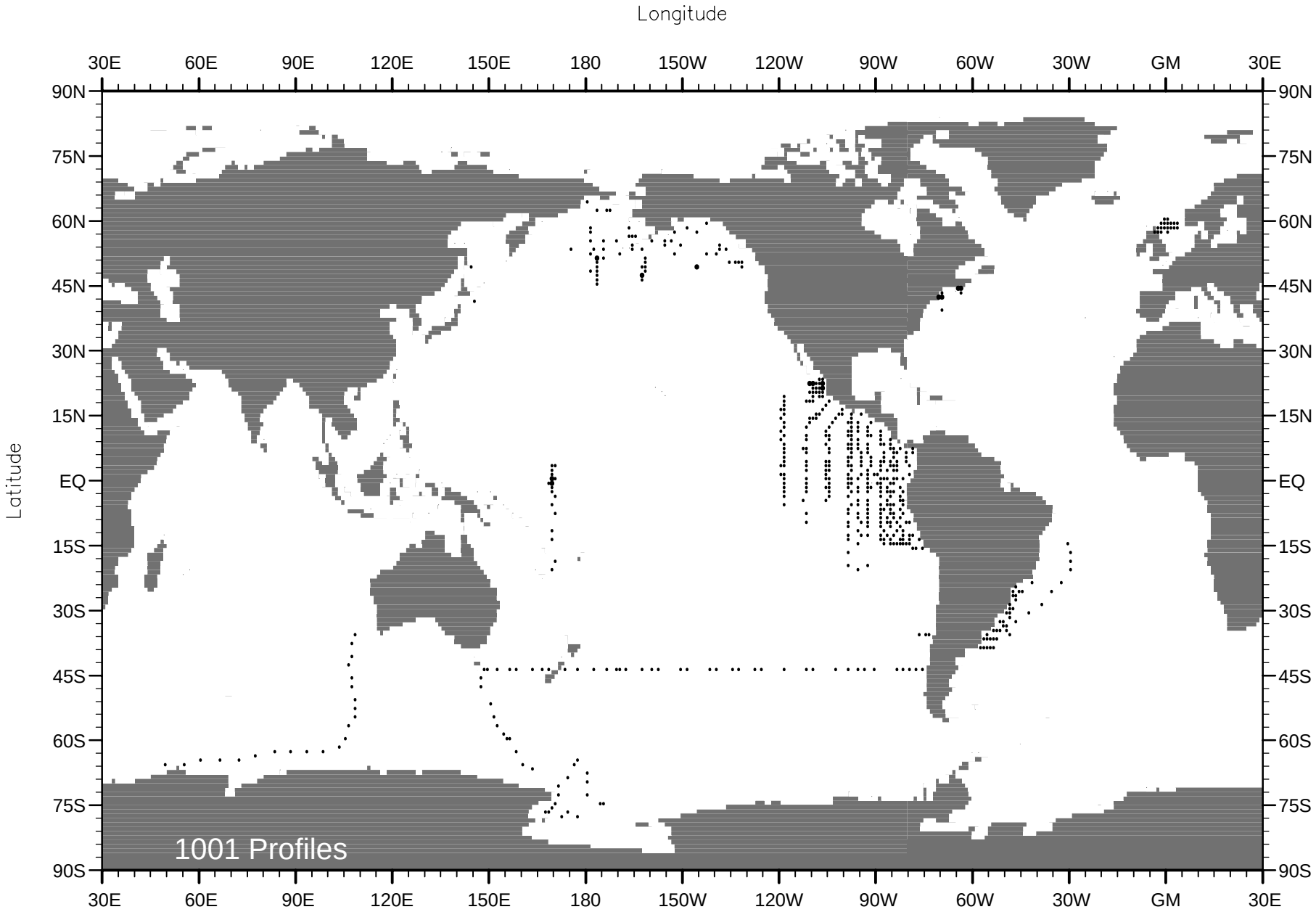


Fig. A14 Distribution of all Ocean Station Data (OSD) chlorophyll profiles in WOD01 for year 1967 .

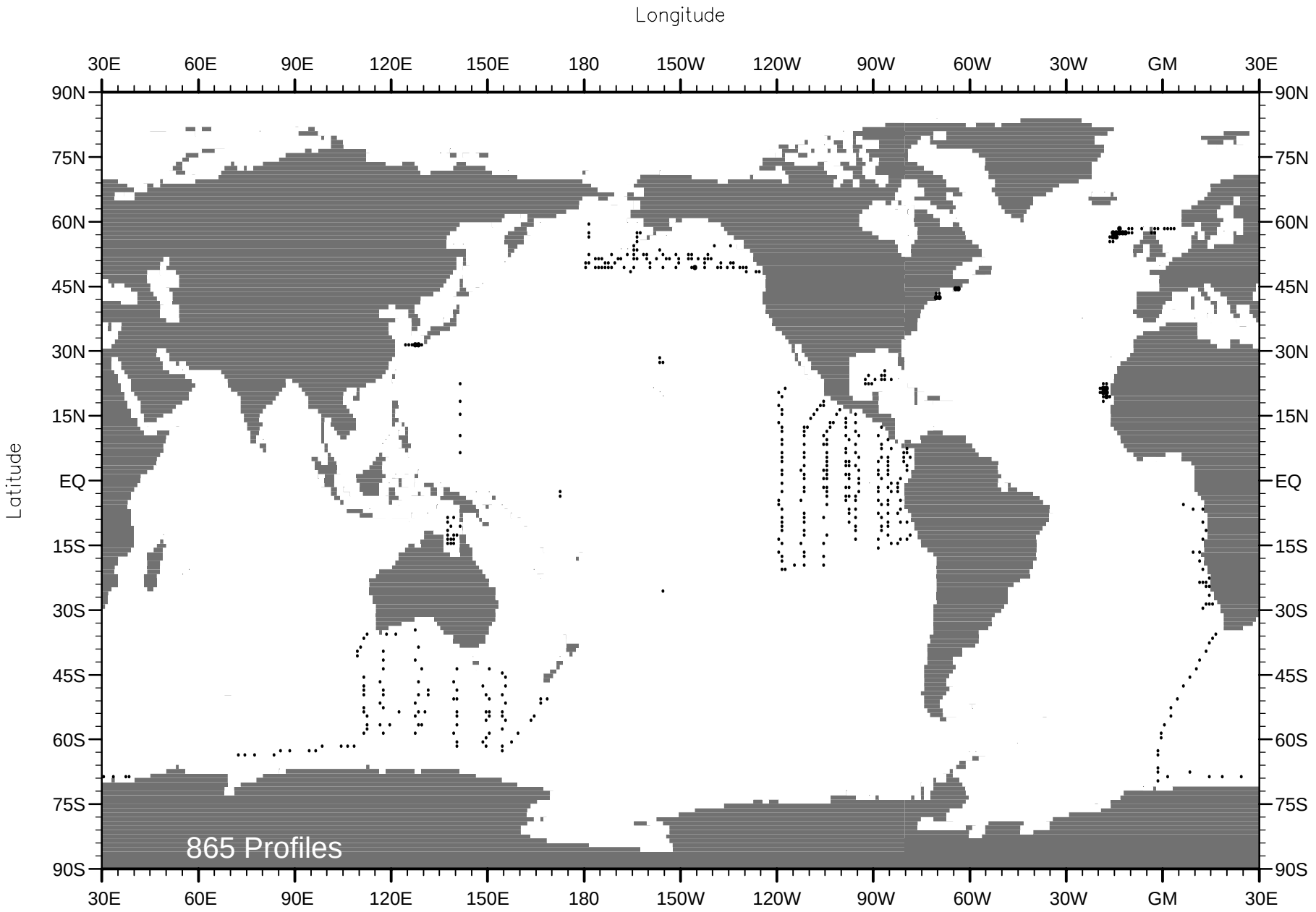


Fig. A15 Distribution of all Ocean Station Data (OSD) chlorophyll profiles in WOD01 for year 1968 .

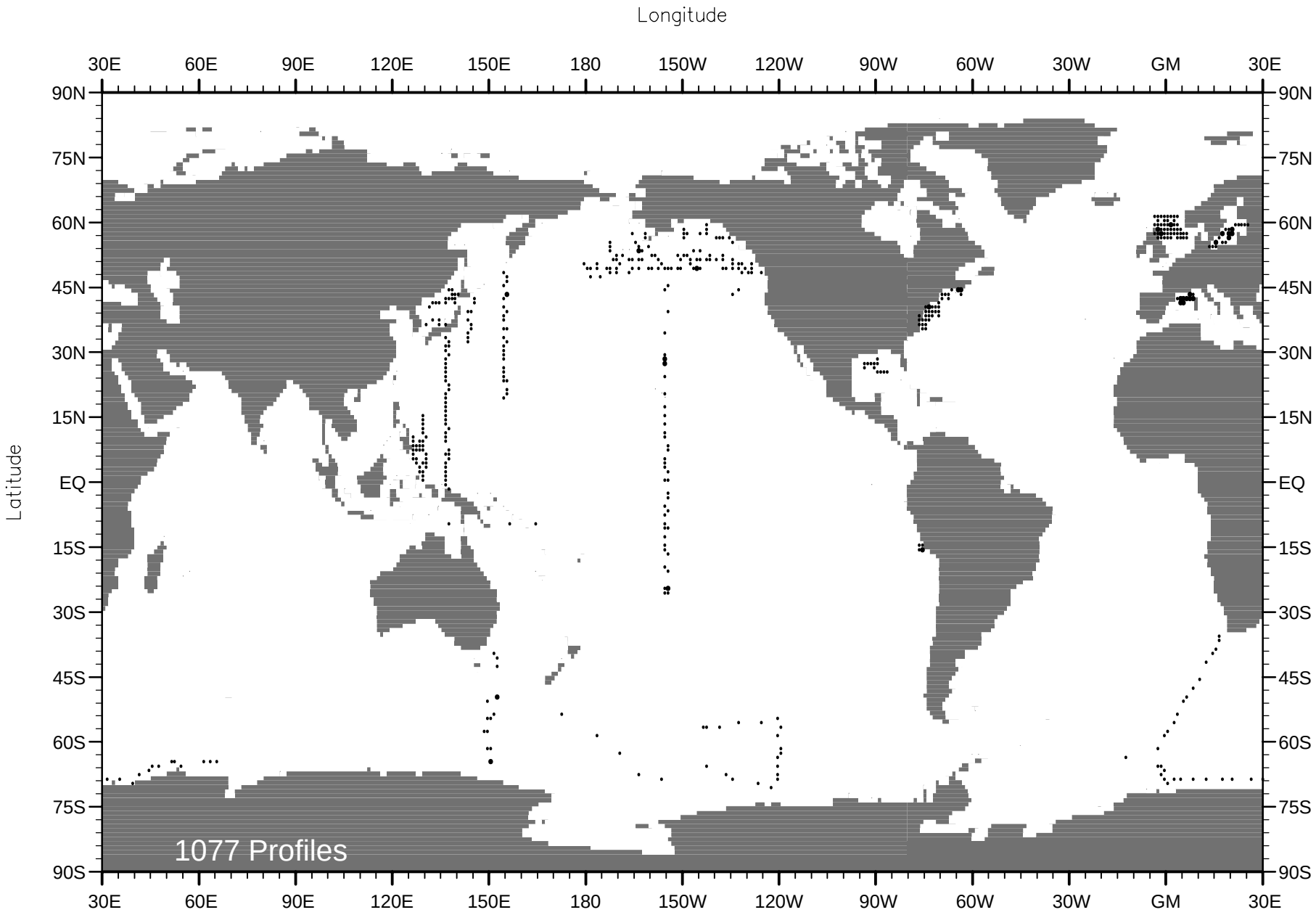


Fig. A16 Distribution of all Ocean Station Data (OSD) chlorophyll profiles in WOD01 for year 1969 .

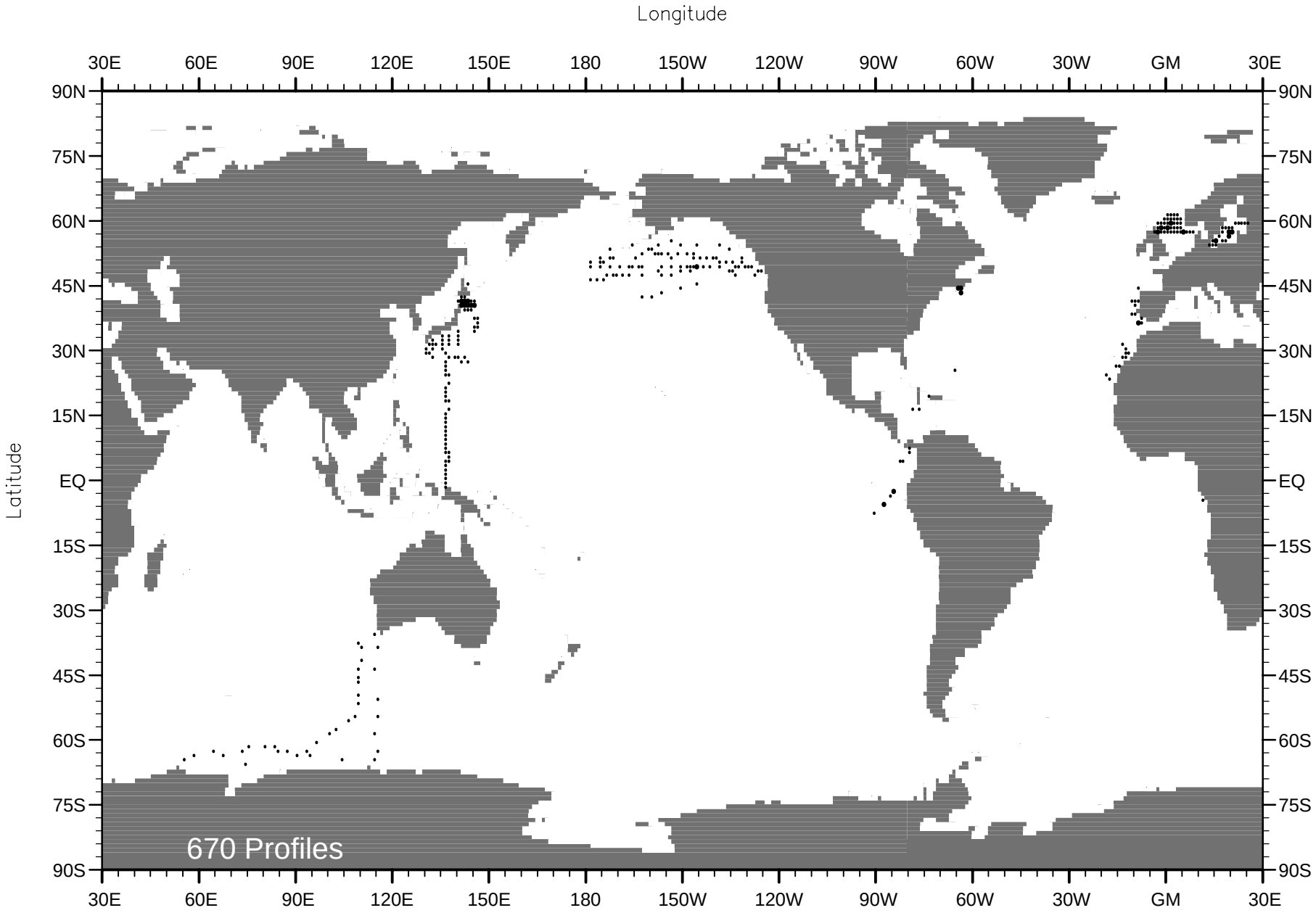


Fig. A17 Distribution of all Ocean Station Data (OSD) chlorophyll profiles in WOD01 for year 1970 .

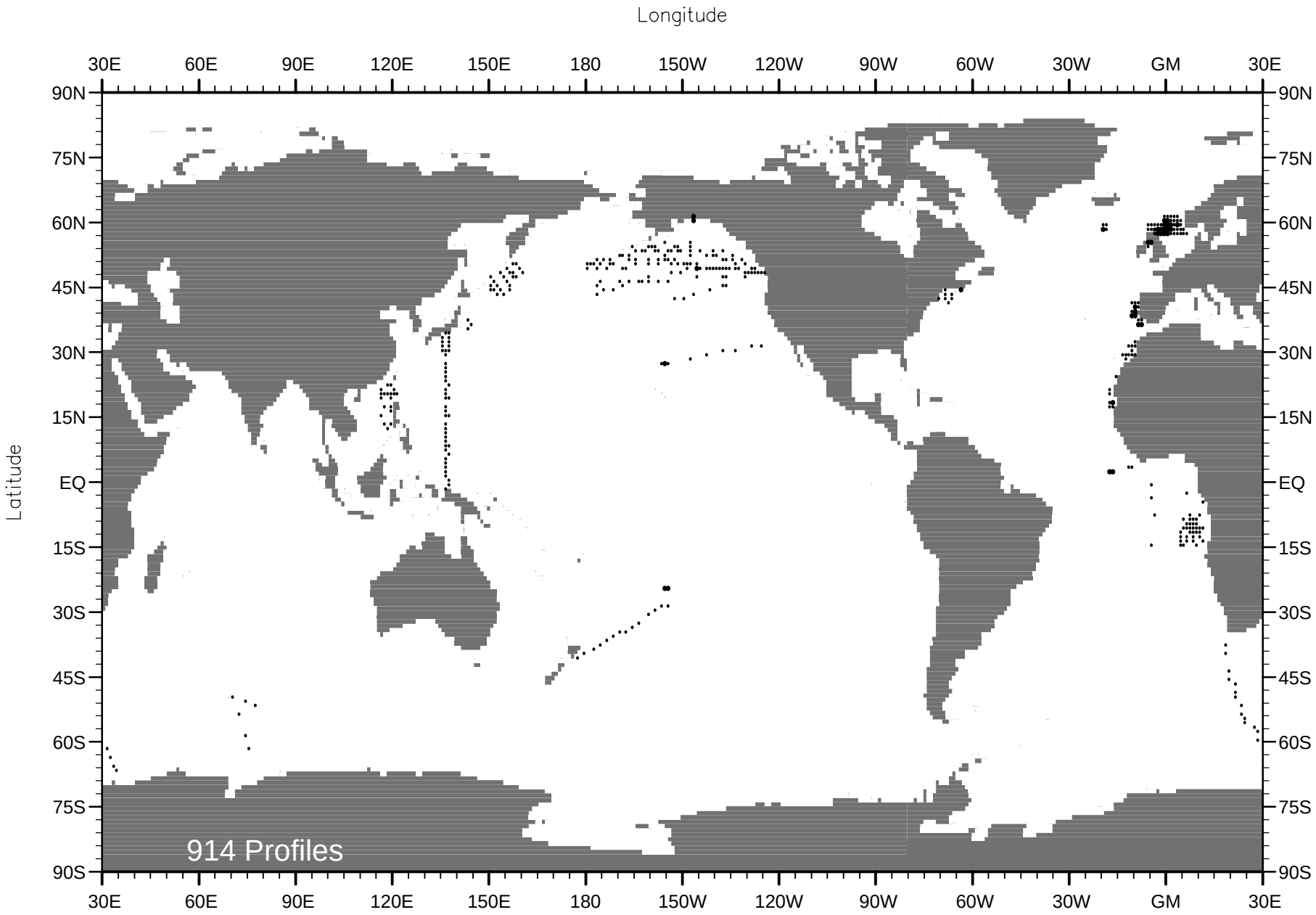


Fig. A18 Distribution of all Ocean Station Data (OSD) chlorophyll profiles in WOD01 for year 1971 .

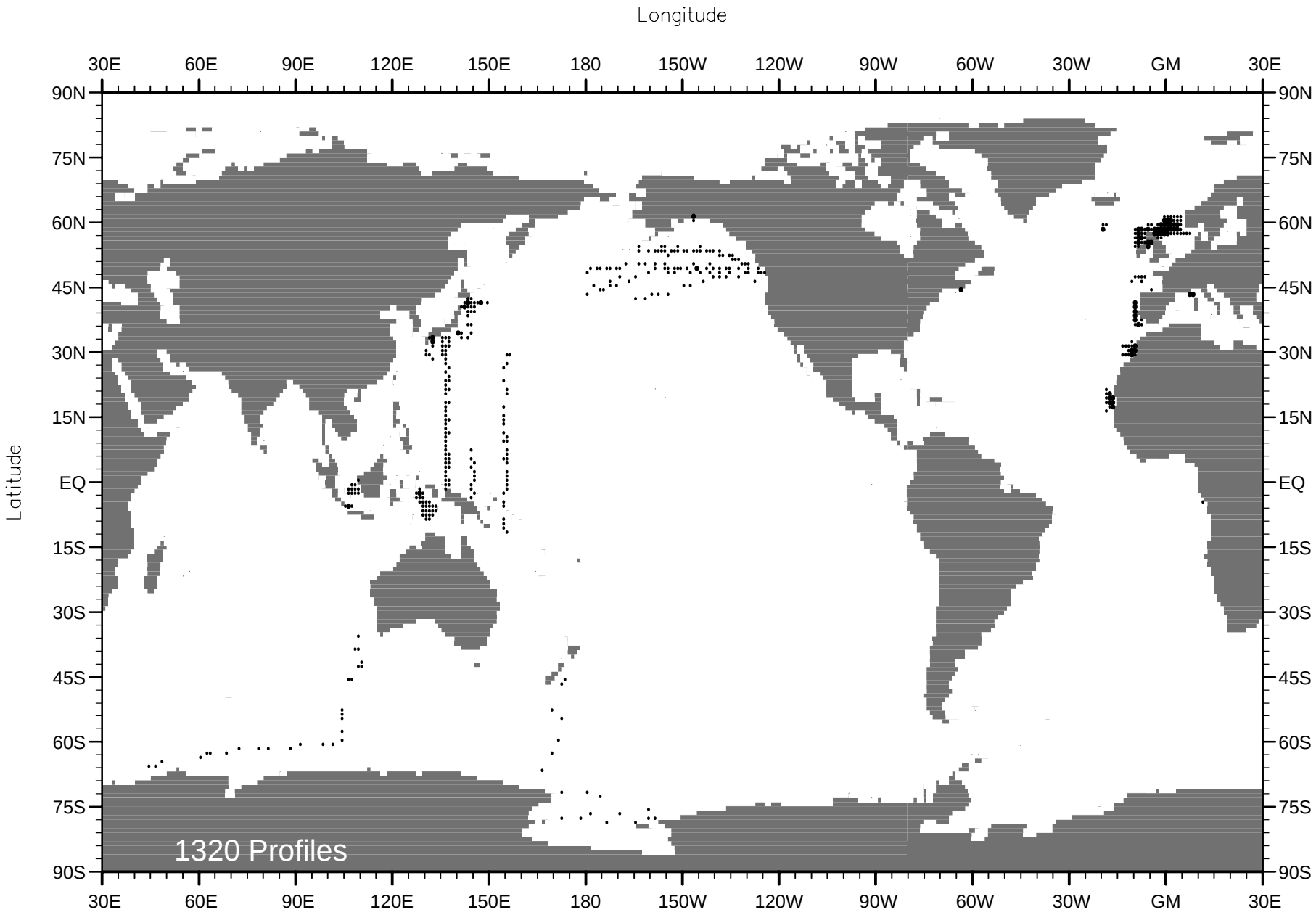


Fig. A19 Distribution of all Ocean Station Data (OSD) chlorophyll profiles in WOD01 for year 1972 .

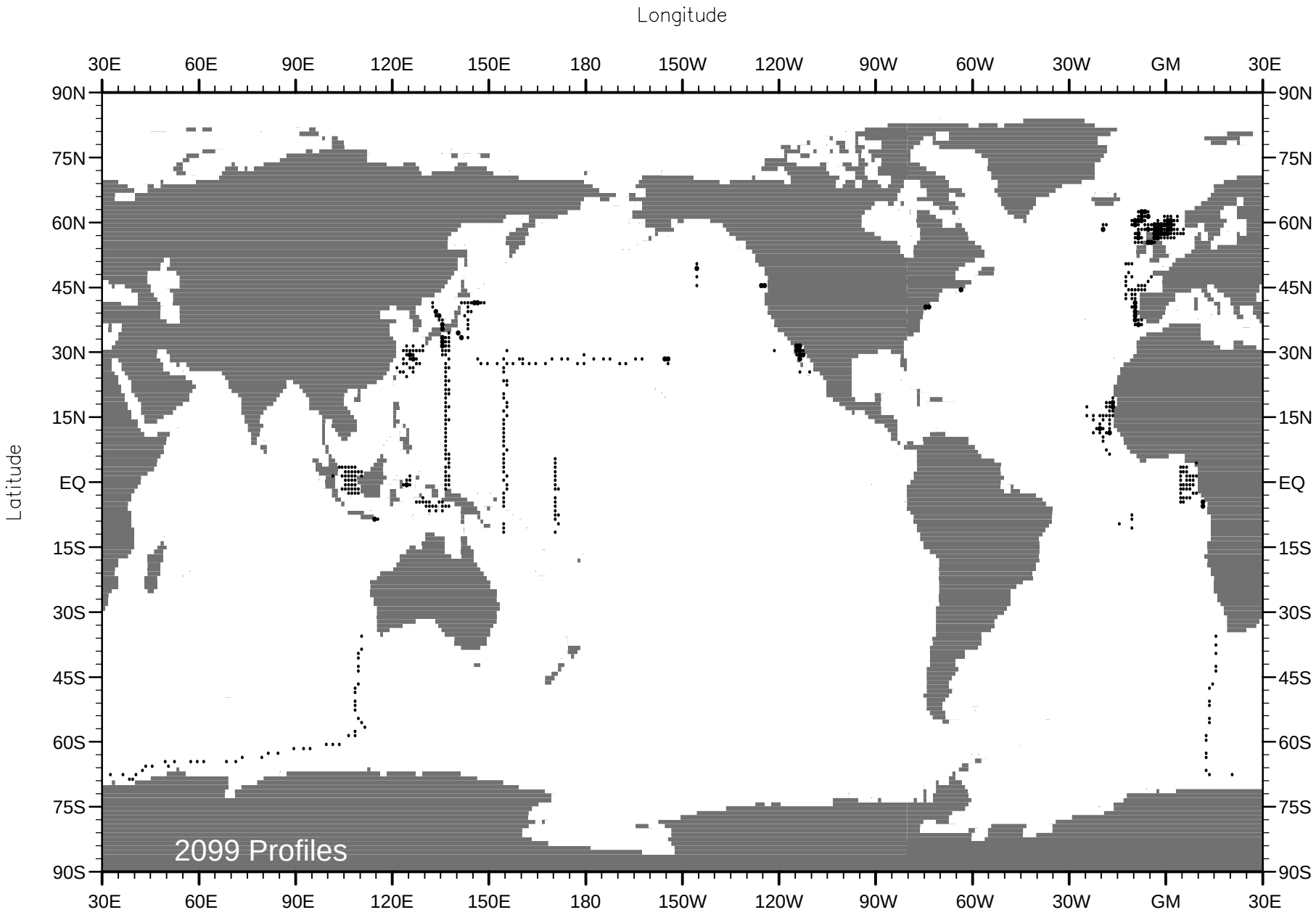


Fig. A20 Distribution of all Ocean Station Data (OSD) chlorophyll profiles in WOD01 for year 1973 .

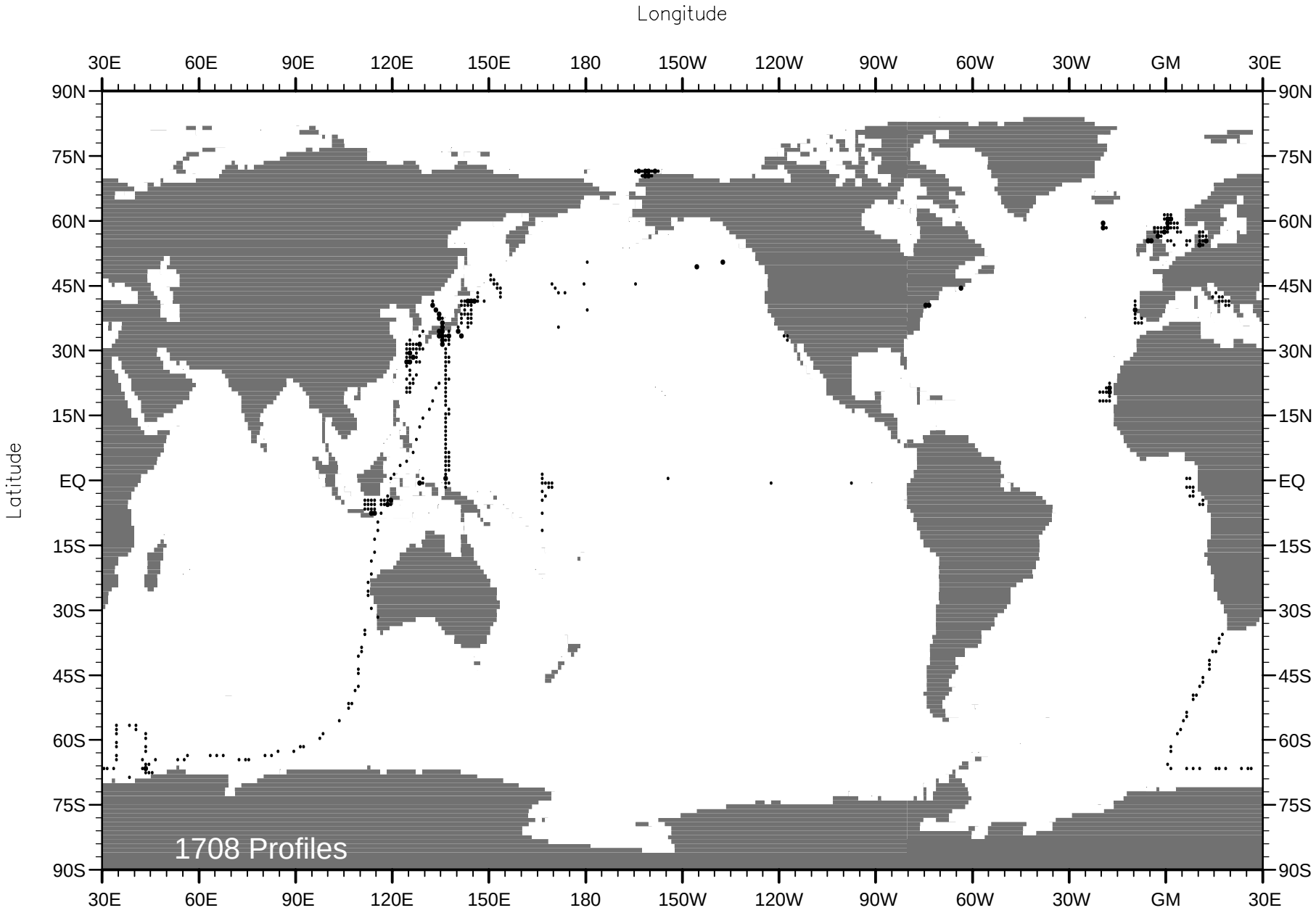


Fig. A21 Distribution of all Ocean Station Data (OSD) chlorophyll profiles in WOD01 for year 1974 .

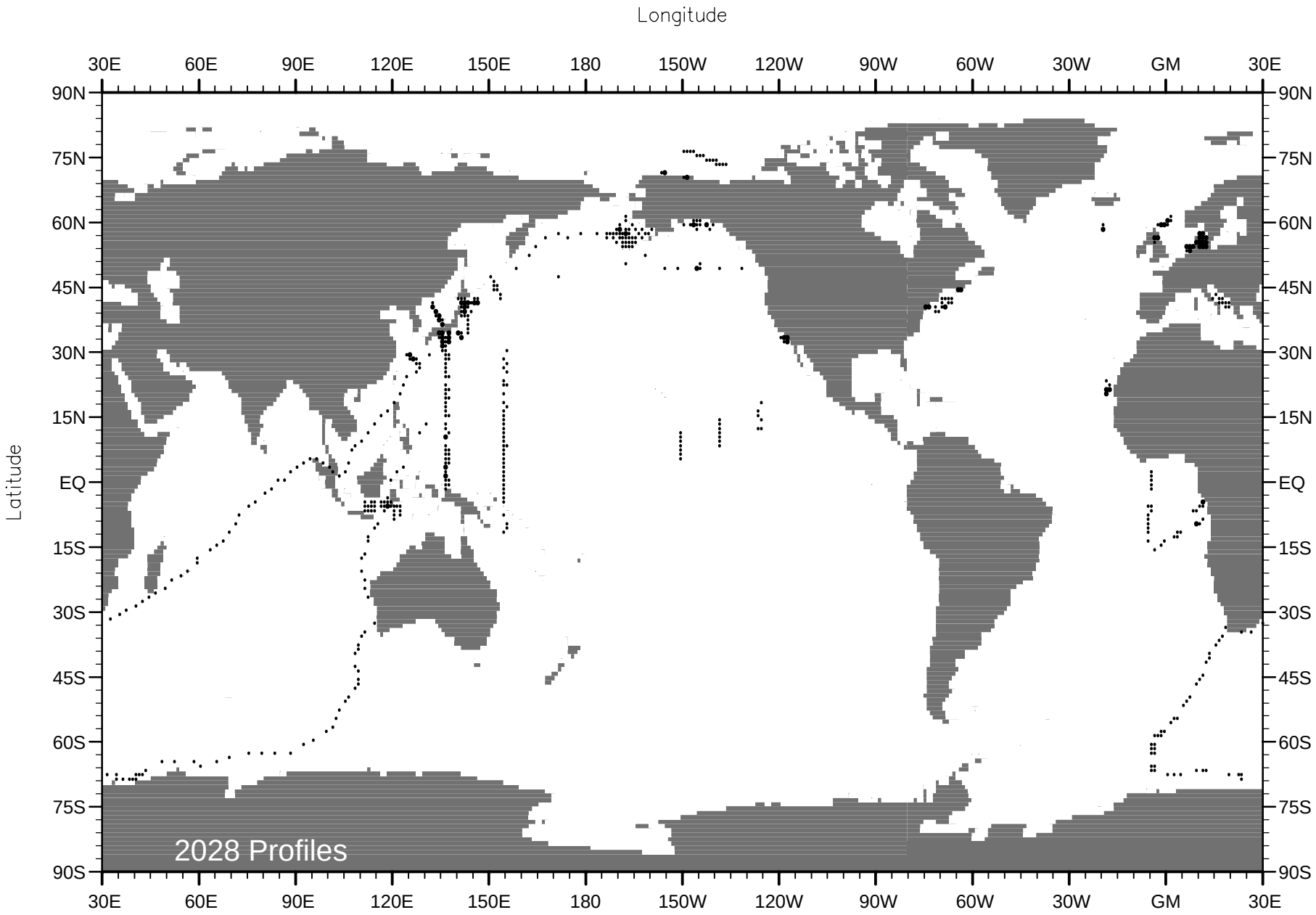


Fig. A22 Distribution of all Ocean Station Data (OSD) chlorophyll profiles in WOD01 for year 1975 .

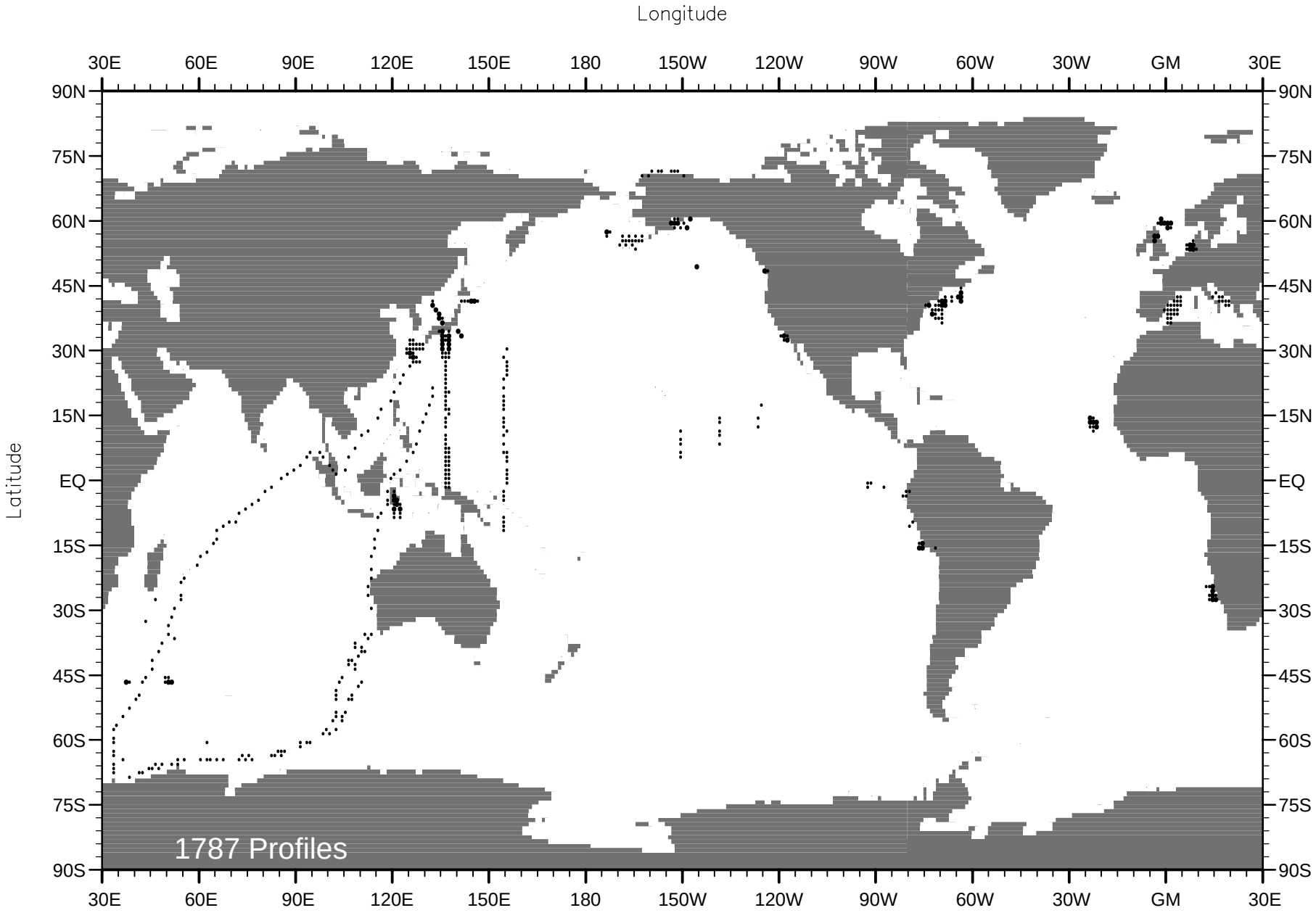


Fig. A23 Distribution of all Ocean Station Data (OSD) chlorophyll profiles in WOD01 for year 1976 .

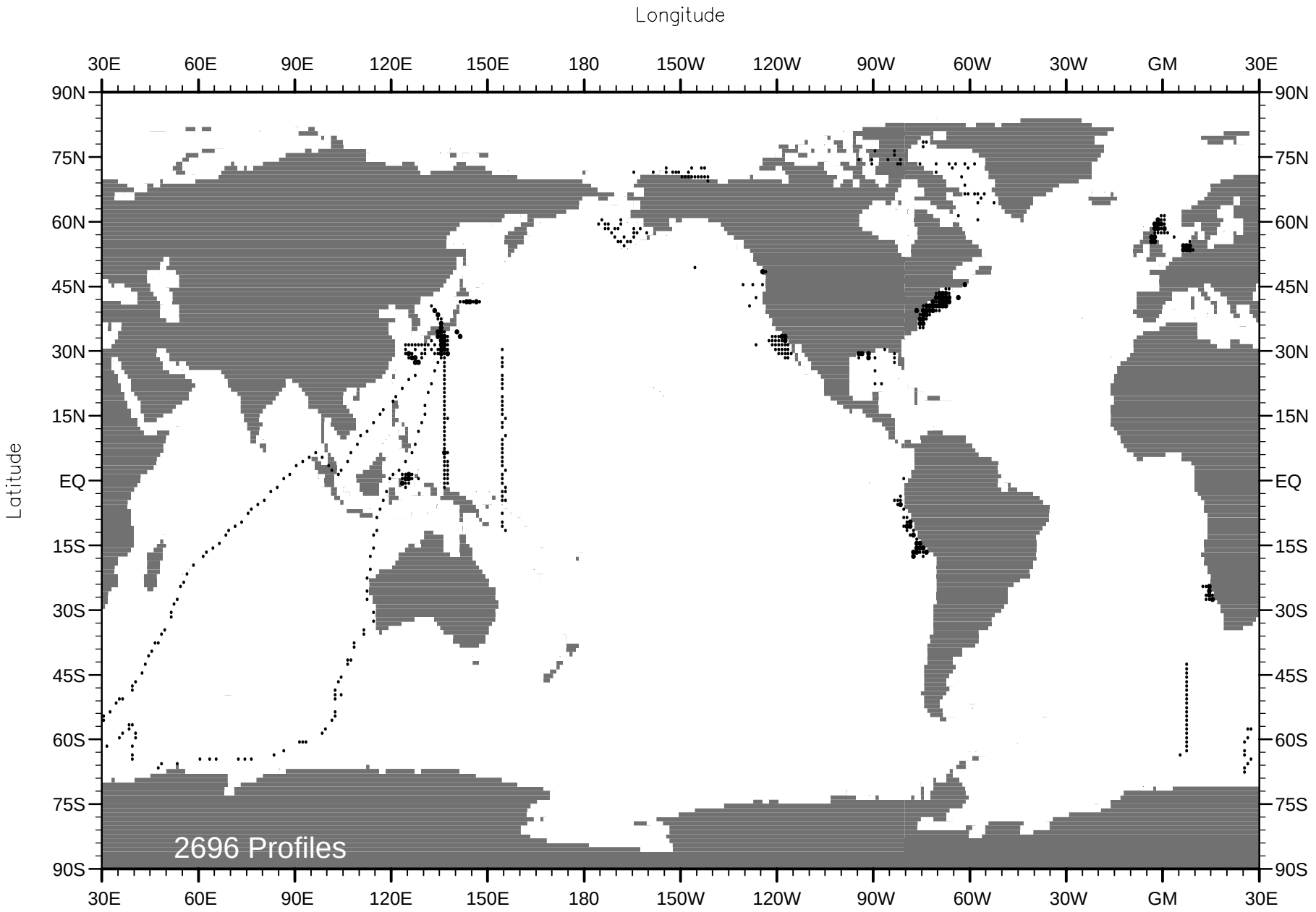


Fig. A24 Distribution of all Ocean Station Data (OSD) chlorophyll profiles in WOD01 for year 1977 .

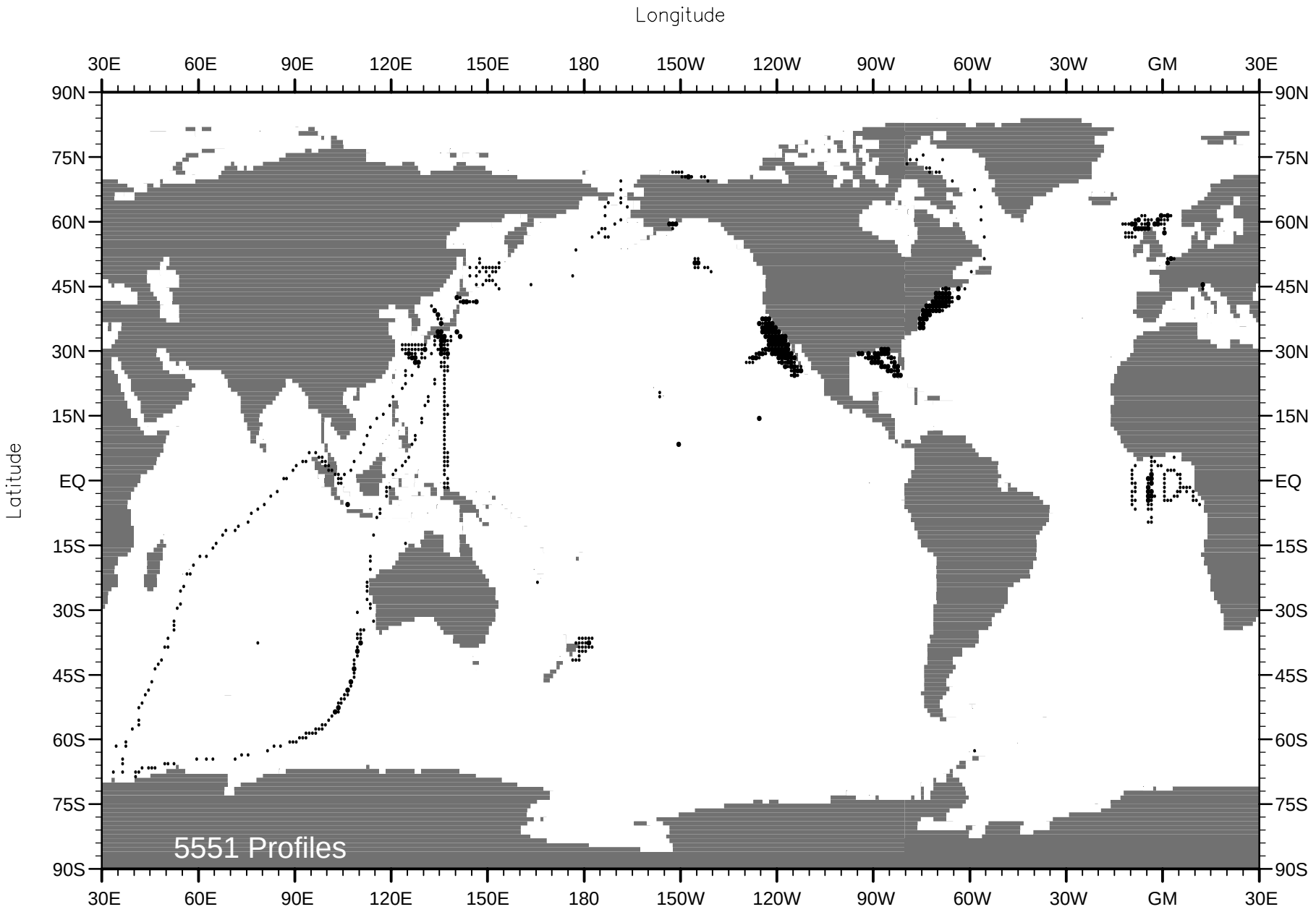


Fig. A25 Distribution of all Ocean Station Data (OSD) chlorophyll profiles in WOD01 for year 1978 .

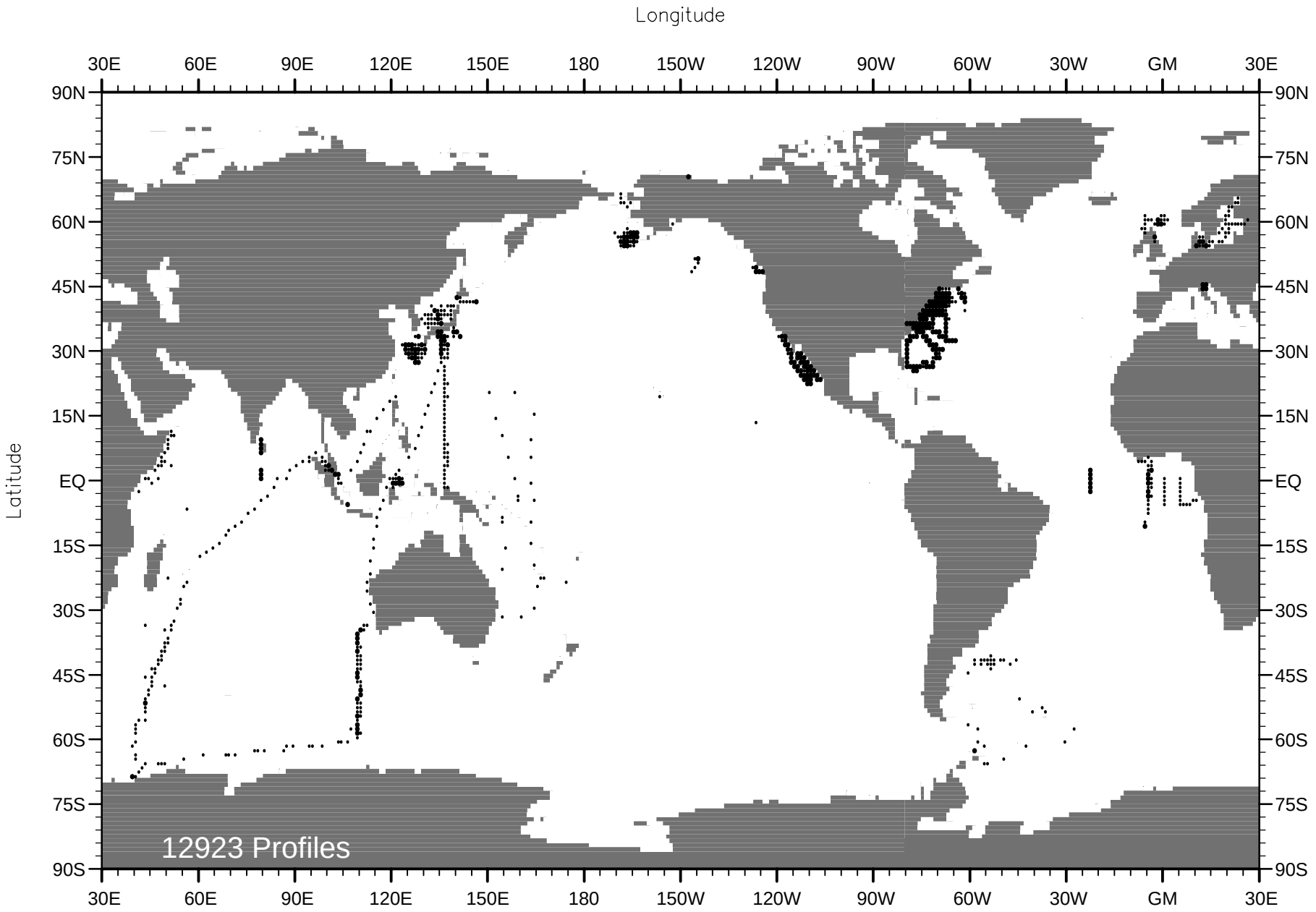


Fig. A26 Distribution of all Ocean Station Data (OSD) chlorophyll profiles in WOD01 for year 1979 .

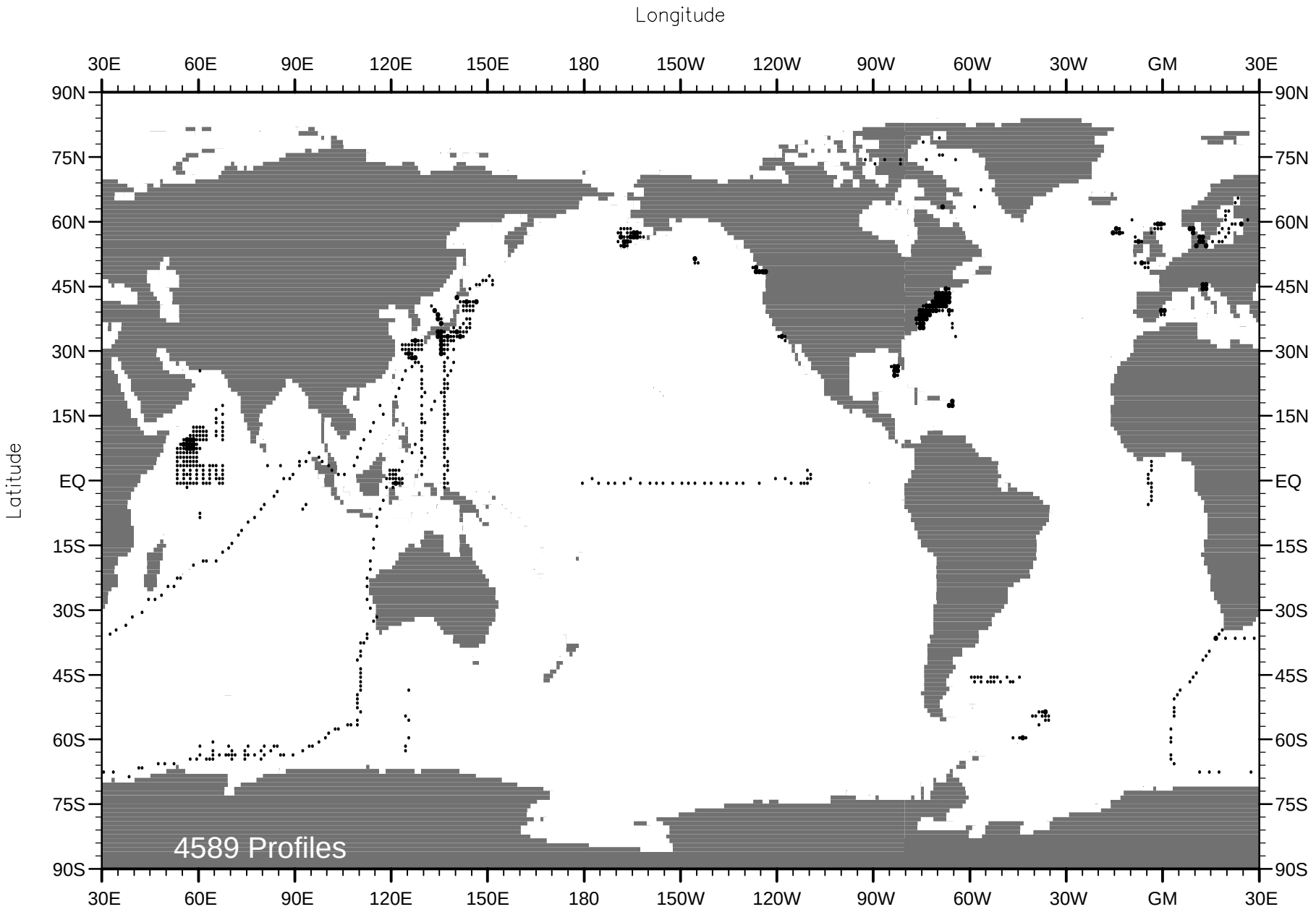


Fig. A27 Distribution of all Ocean Station Data (OSD) chlorophyll profiles in WOD01 for year 1980 .

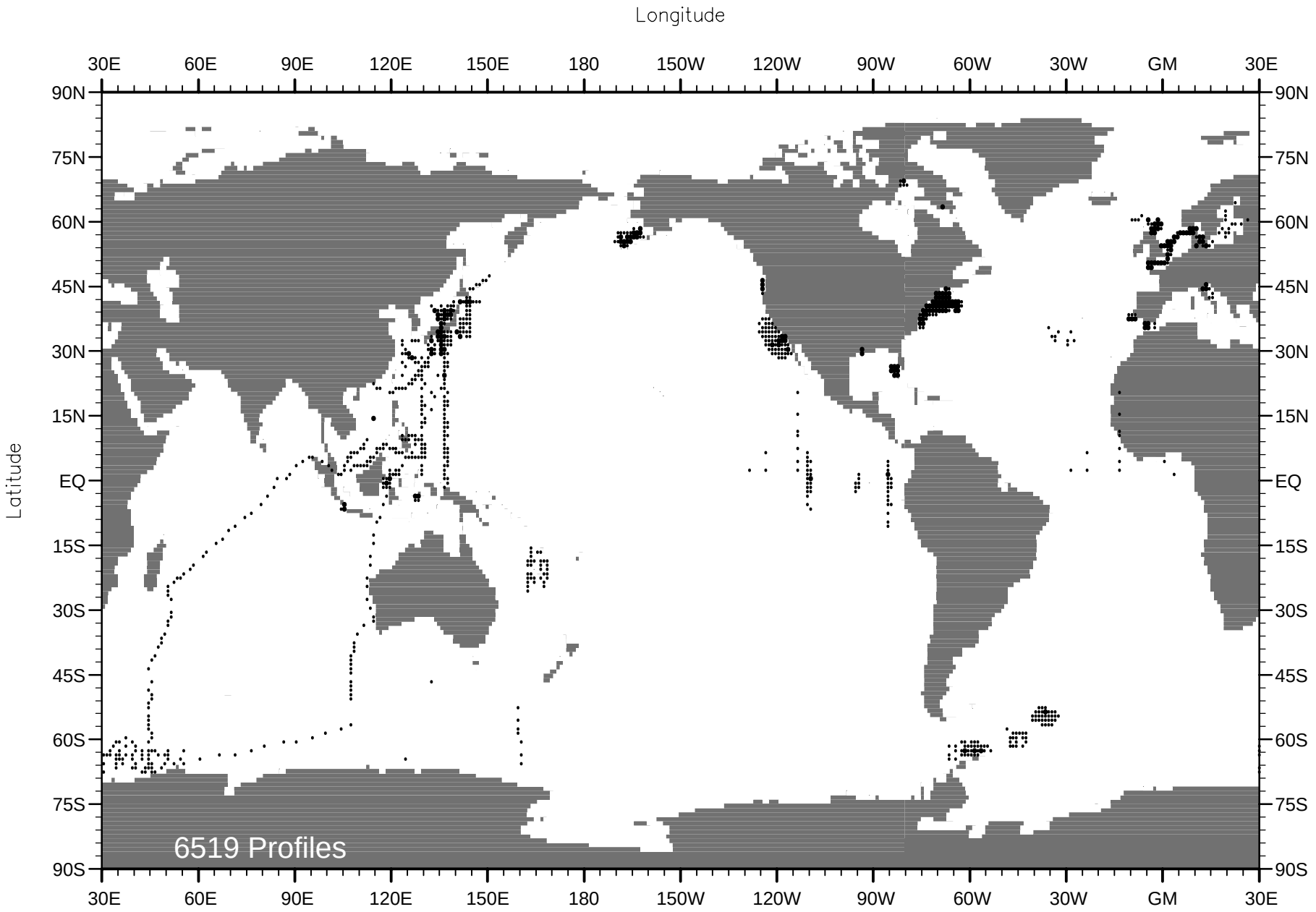


Fig. A28 Distribution of all Ocean Station Data (OSD) chlorophyll profiles in WOD01 for year 1981 .

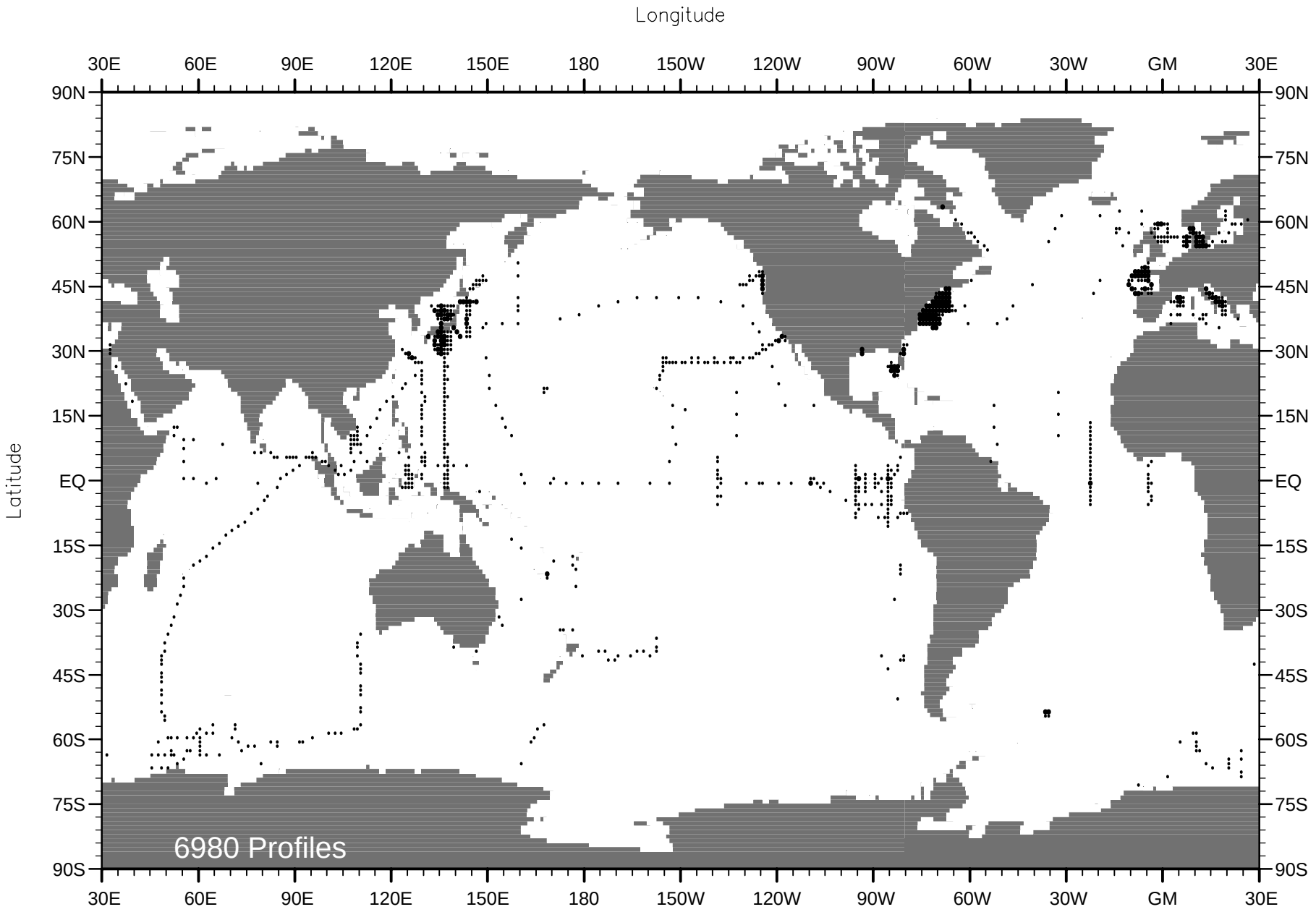


Fig. A29 Distribution of all Ocean Station Data (OSD) chlorophyll profiles in WOD01 for year 1982 .

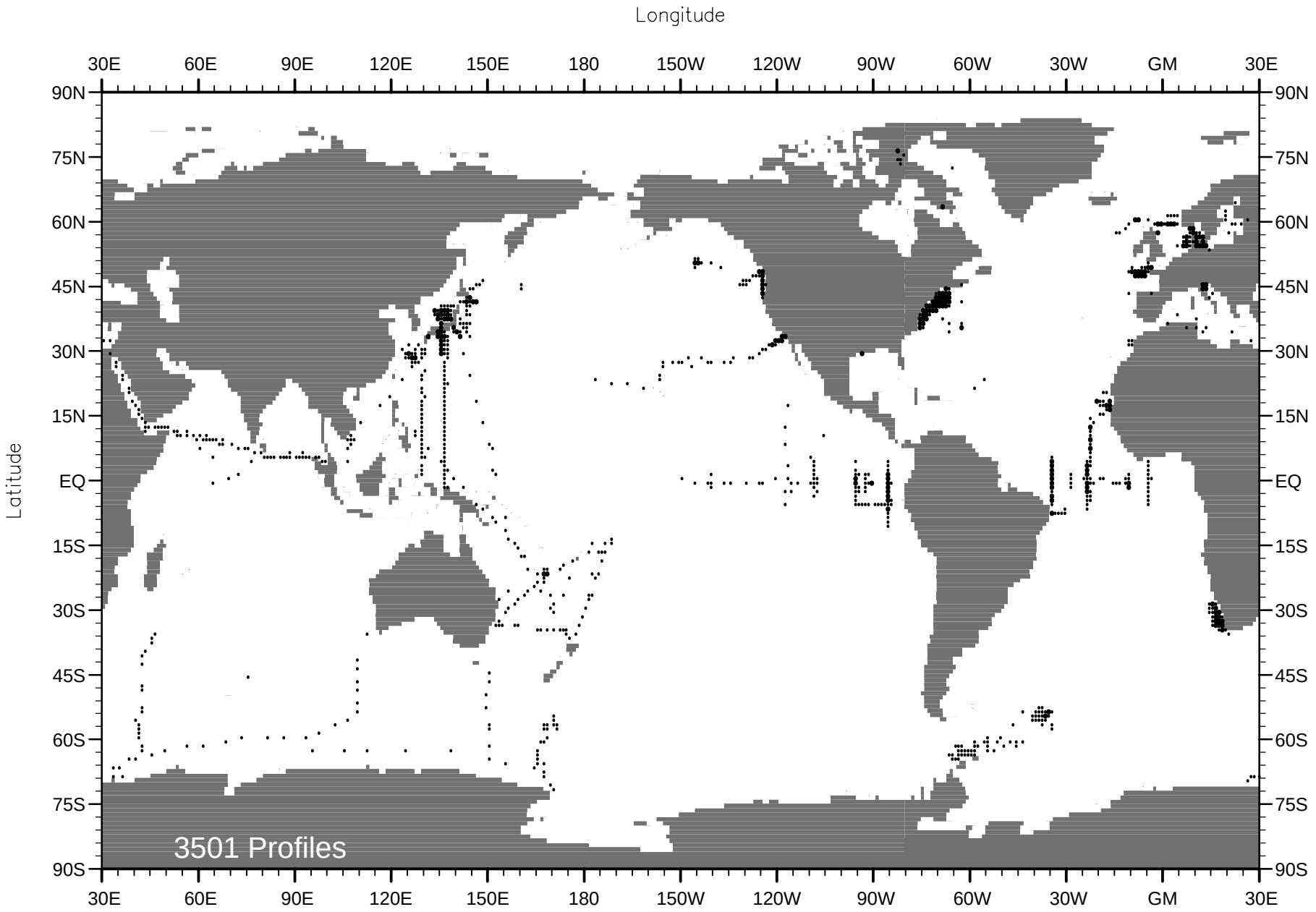


Fig. A30 Distribution of all Ocean Station Data (OSD) chlorophyll profiles in WOD01 for year 1983 .

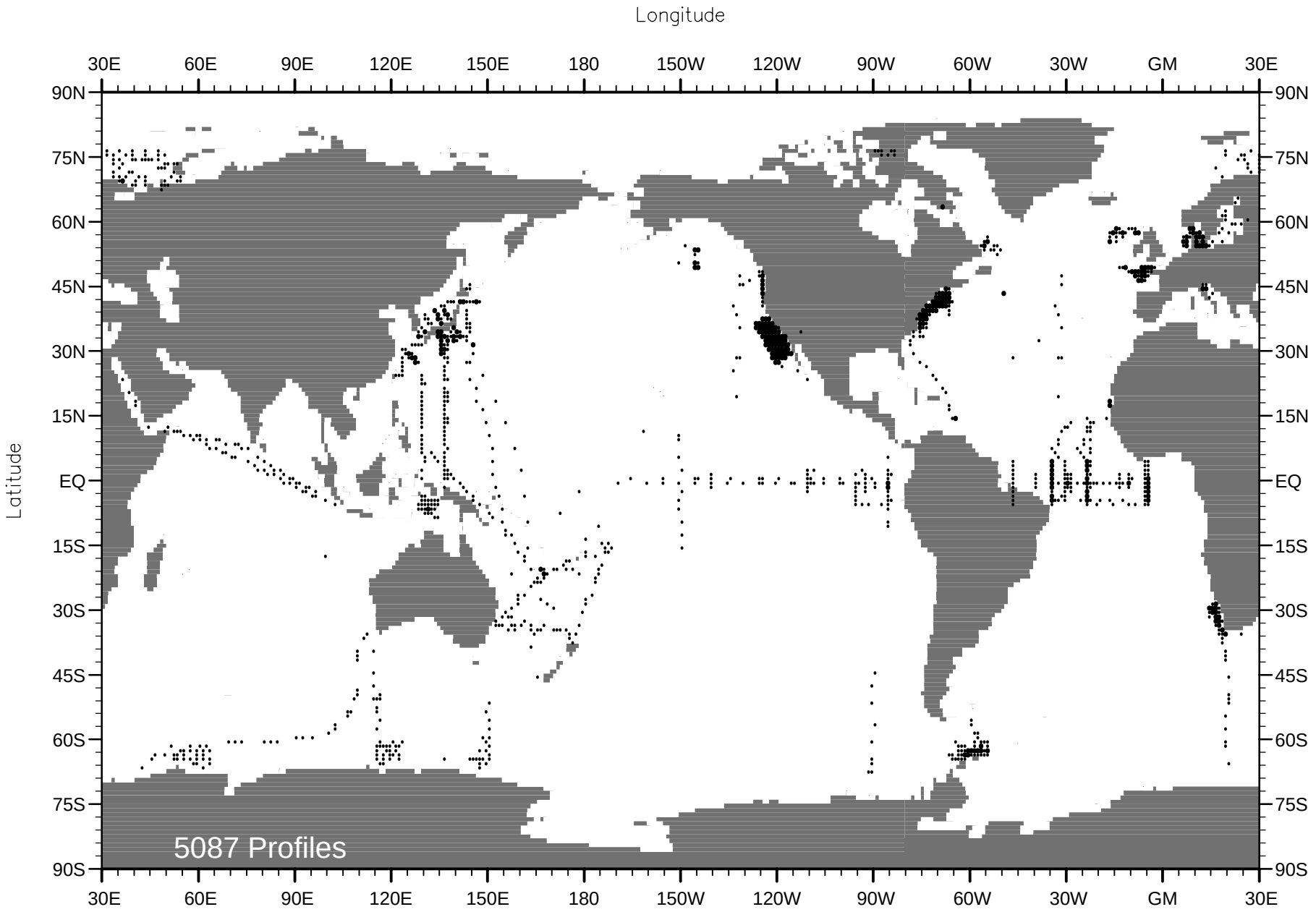


Fig. A31 Distribution of all Ocean Station Data (OSD) chlorophyll profiles in WOD01 for year 1984 .

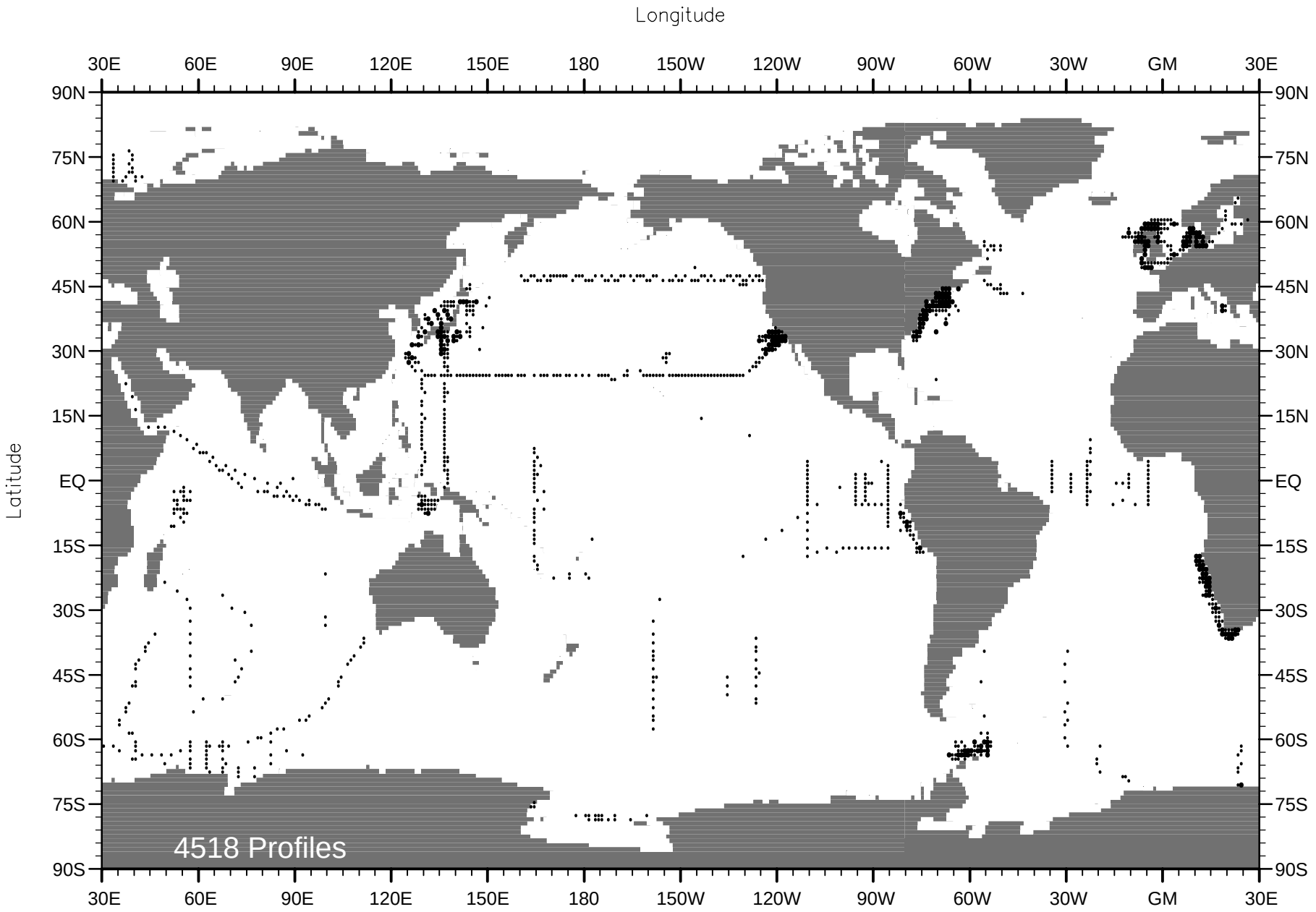


Fig. A32 Distribution of all Ocean Station Data (OSD) chlorophyll profiles in WOD01 for year 1985 .

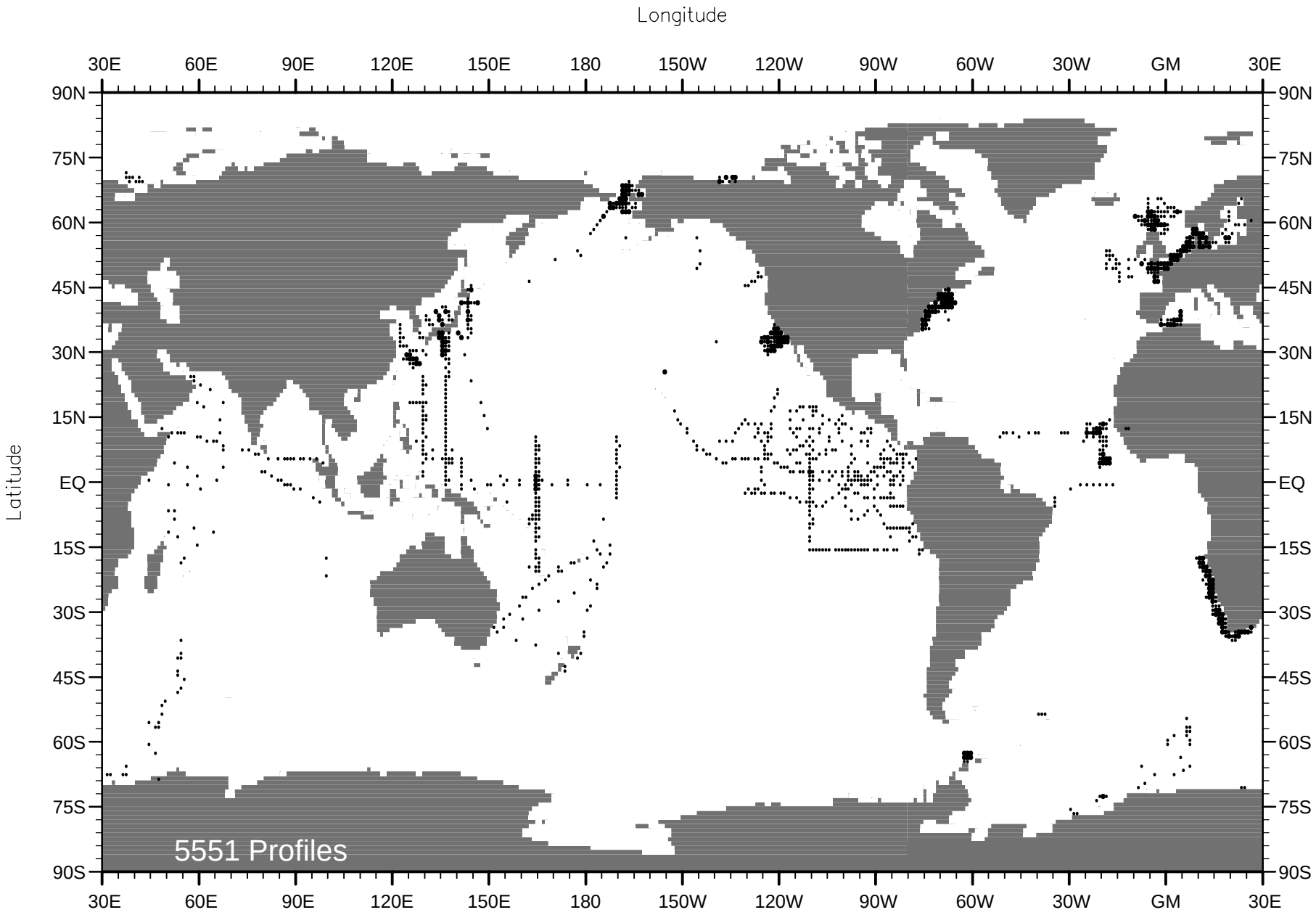


Fig. A33 Distribution of all Ocean Station Data (OSD) chlorophyll profiles in WOD01 for year 1986 .

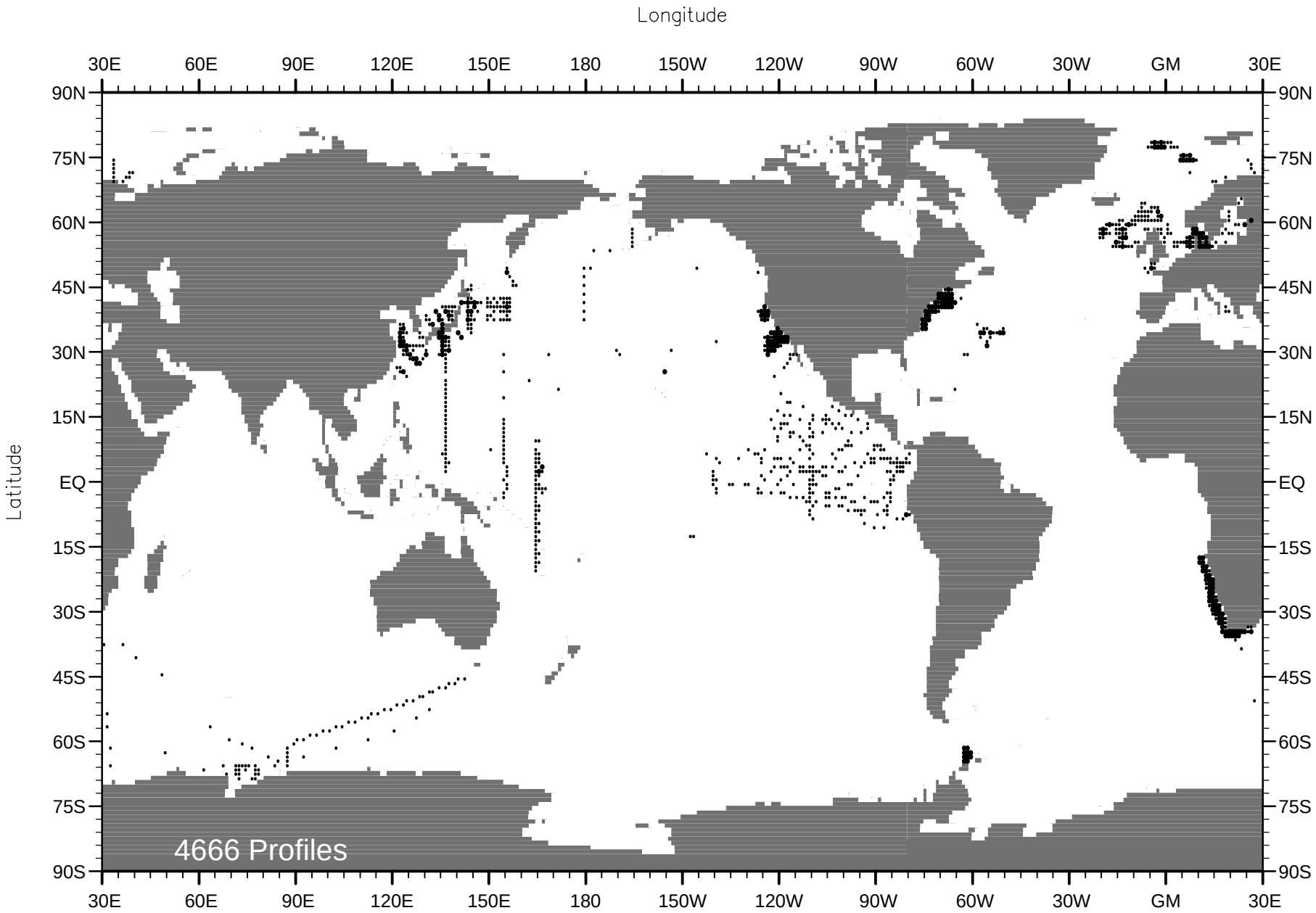


Fig. A34 Distribution of all Ocean Station Data (OSD) chlorophyll profiles in WOD01 for year 1987 .

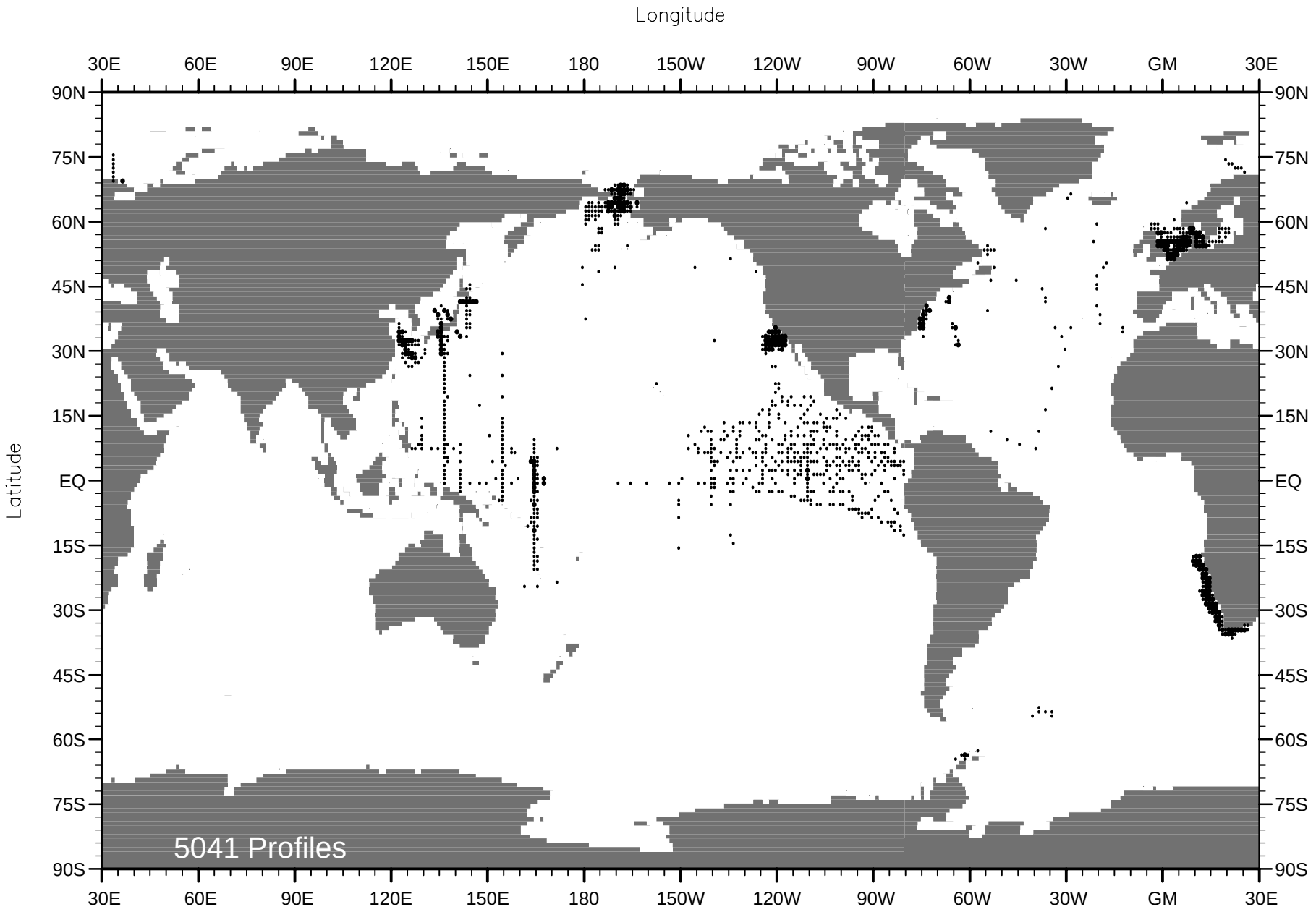


Fig. A35 Distribution of all Ocean Station Data (OSD) chlorophyll profiles in WOD01 for year 1988 .

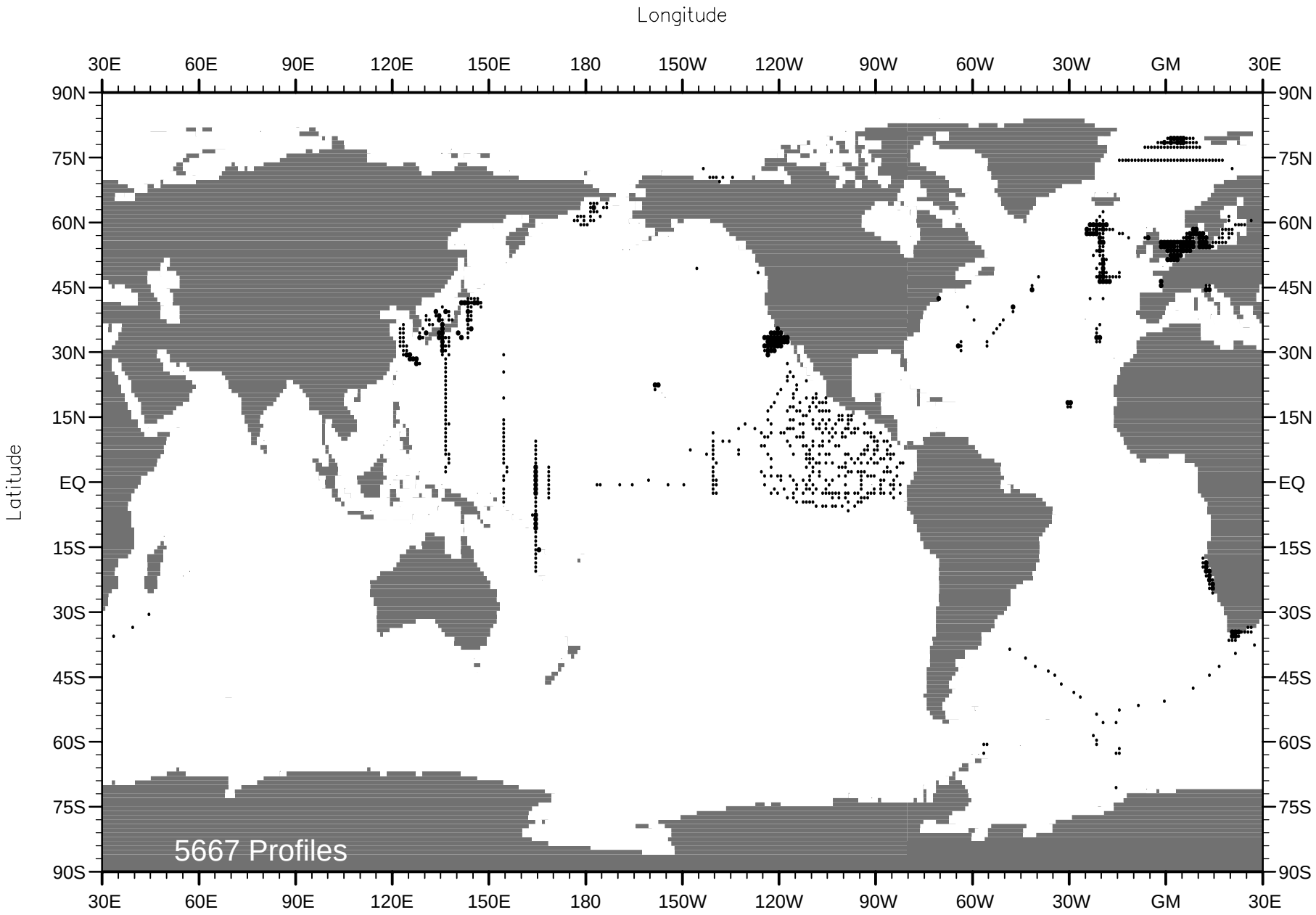


Fig. A36 Distribution of all Ocean Station Data (OSD) chlorophyll profiles in WOD01 for year 1989 .

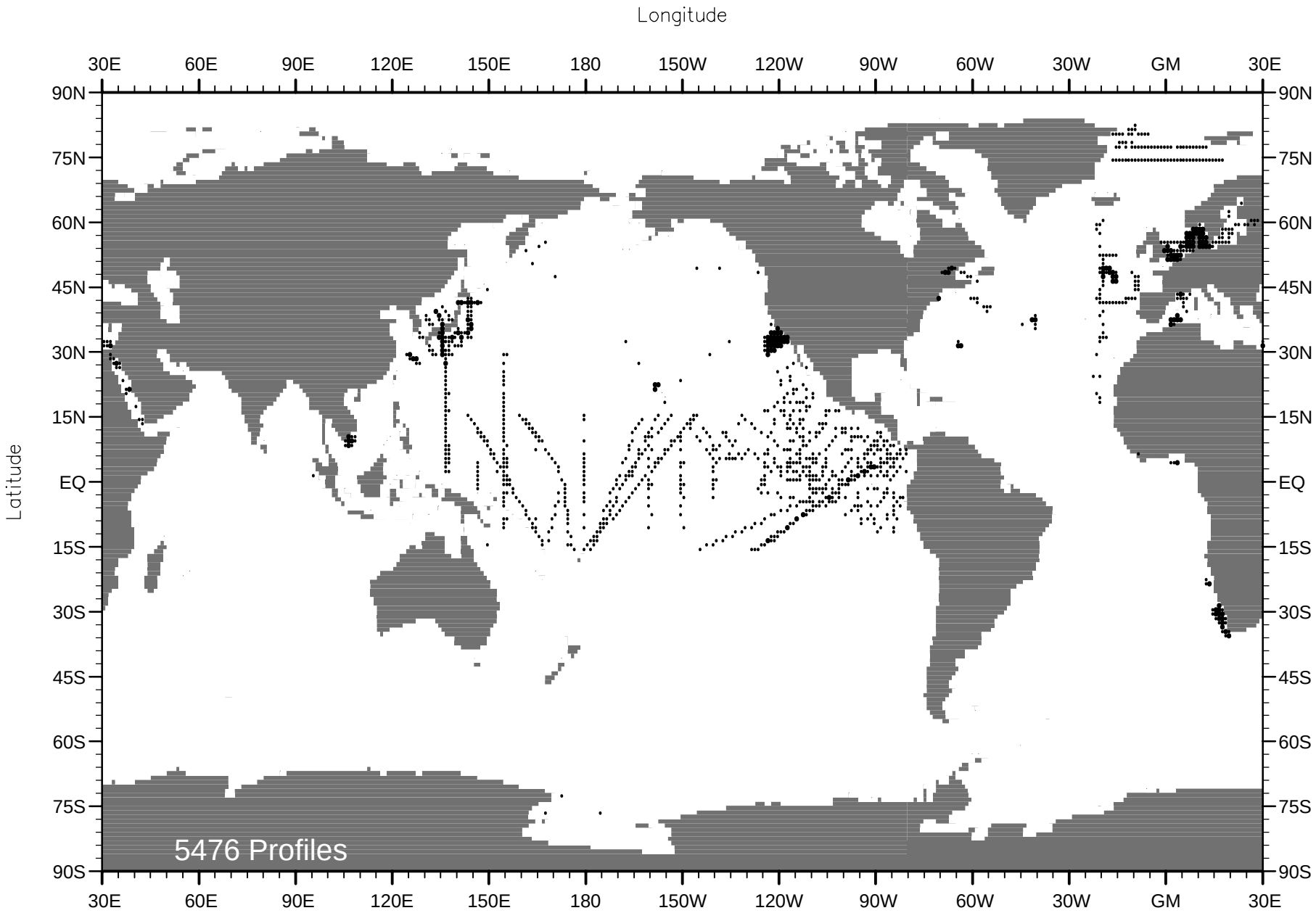


Fig. A37 Distribution of all Ocean Station Data (OSD) chlorophyll profiles in WOD01 for year 1990 .

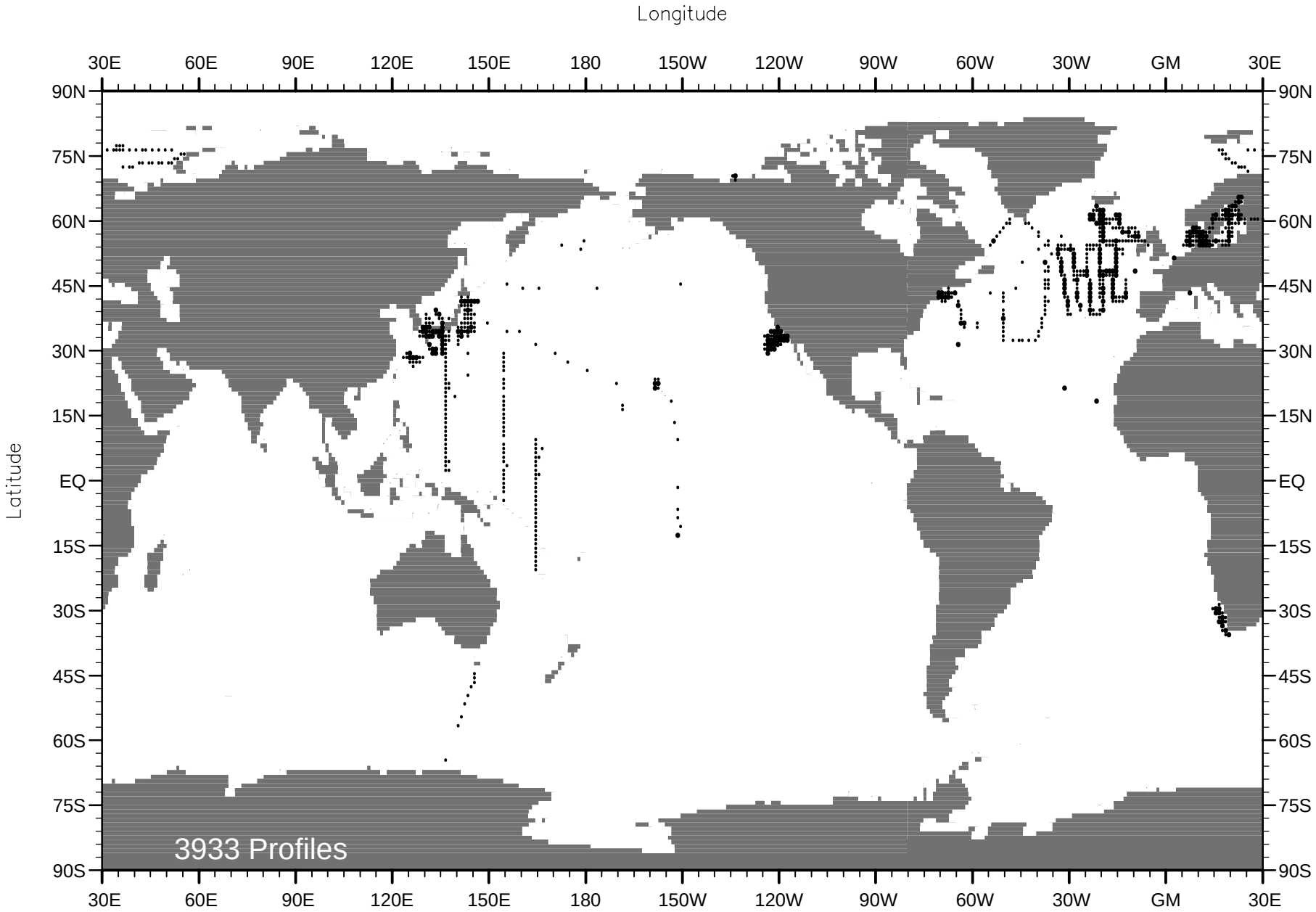


Fig. A38 Distribution of all Ocean Station Data (OSD) chlorophyll profiles in WOD01 for year 1991 .

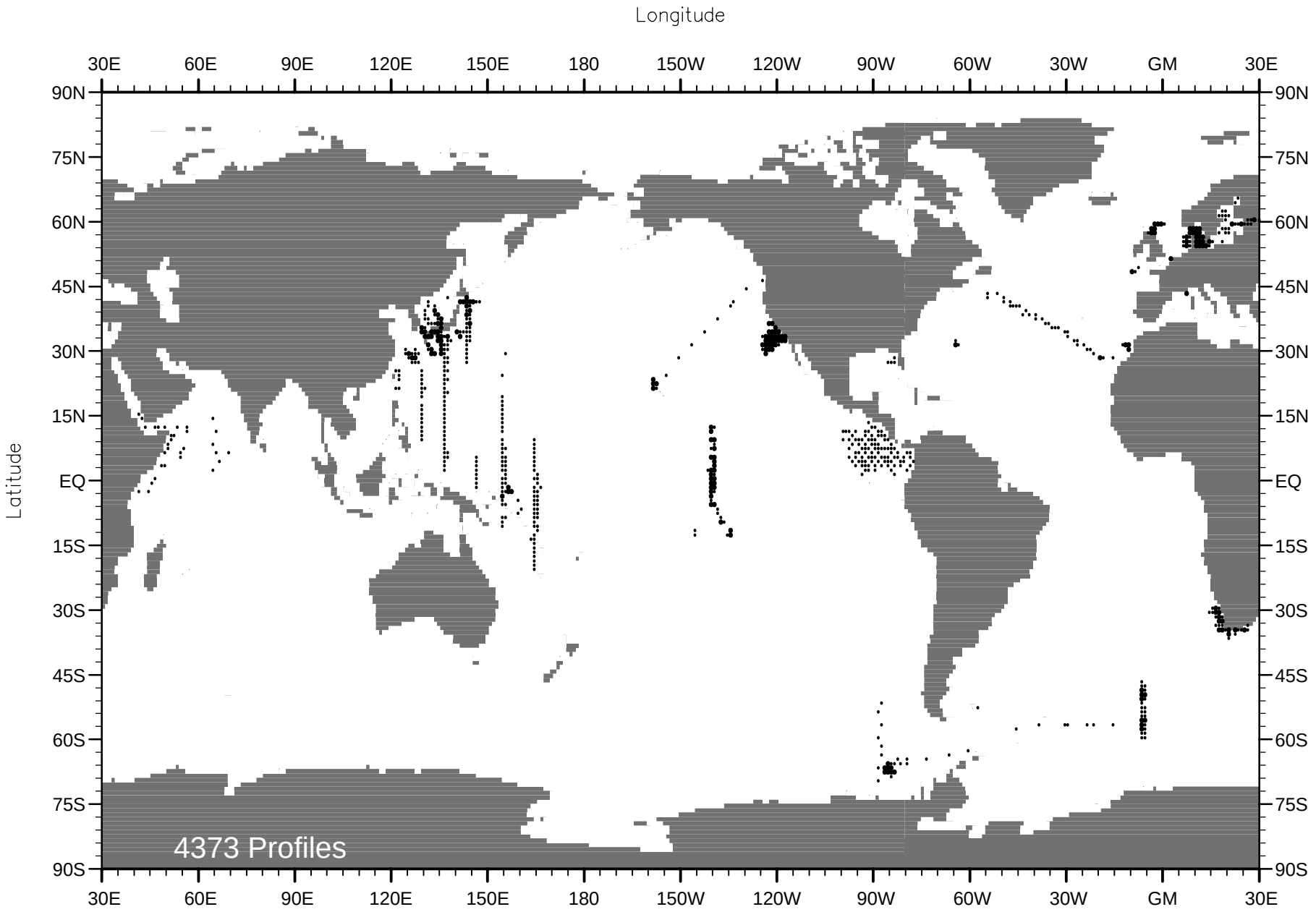


Fig. A39 Distribution of all Ocean Station Data (OSD) chlorophyll profiles in WOD01 for year 1992 .

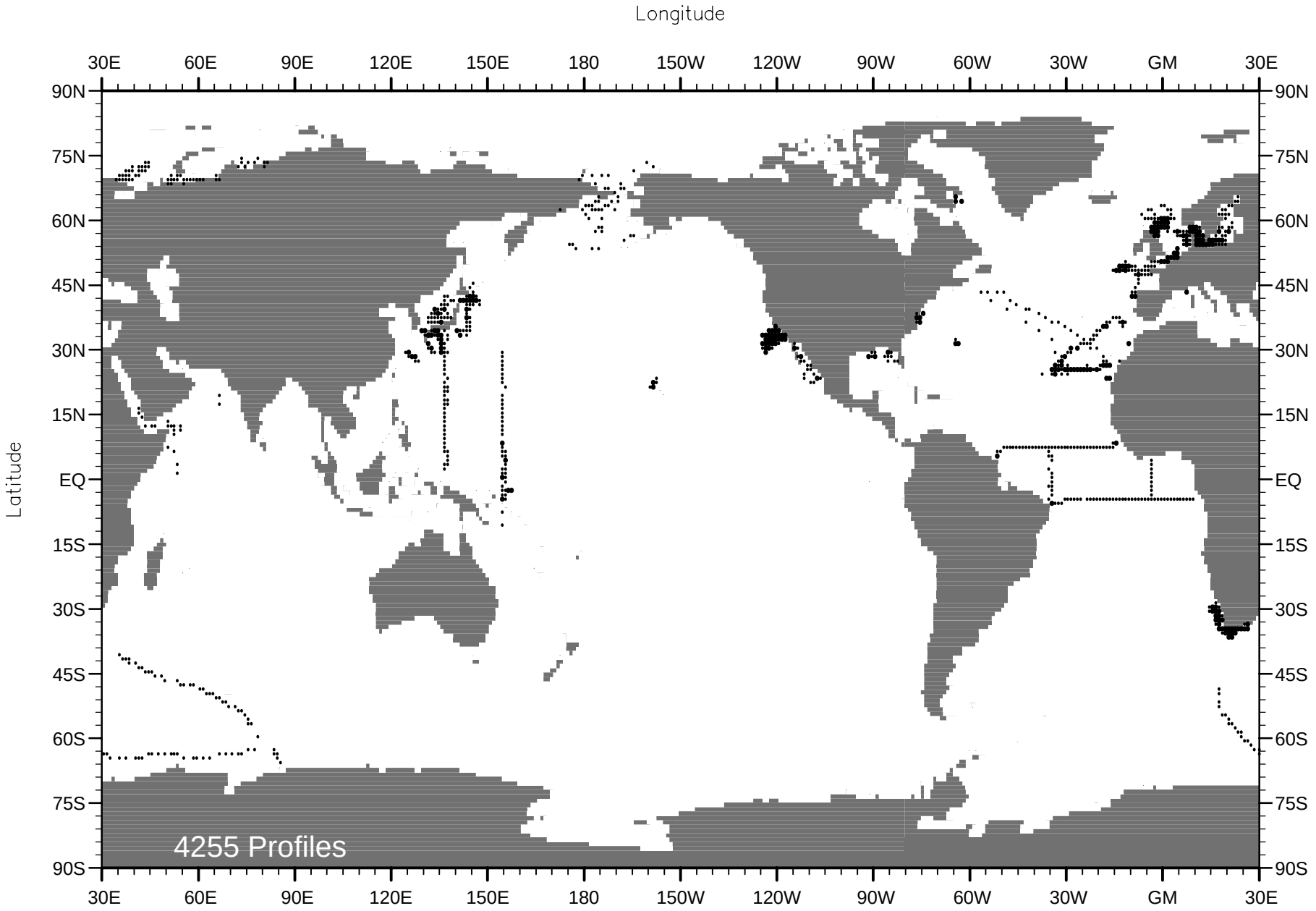


Fig. A40 Distribution of all Ocean Station Data (OSD) chlorophyll profiles in WOD01 for year 1993 .

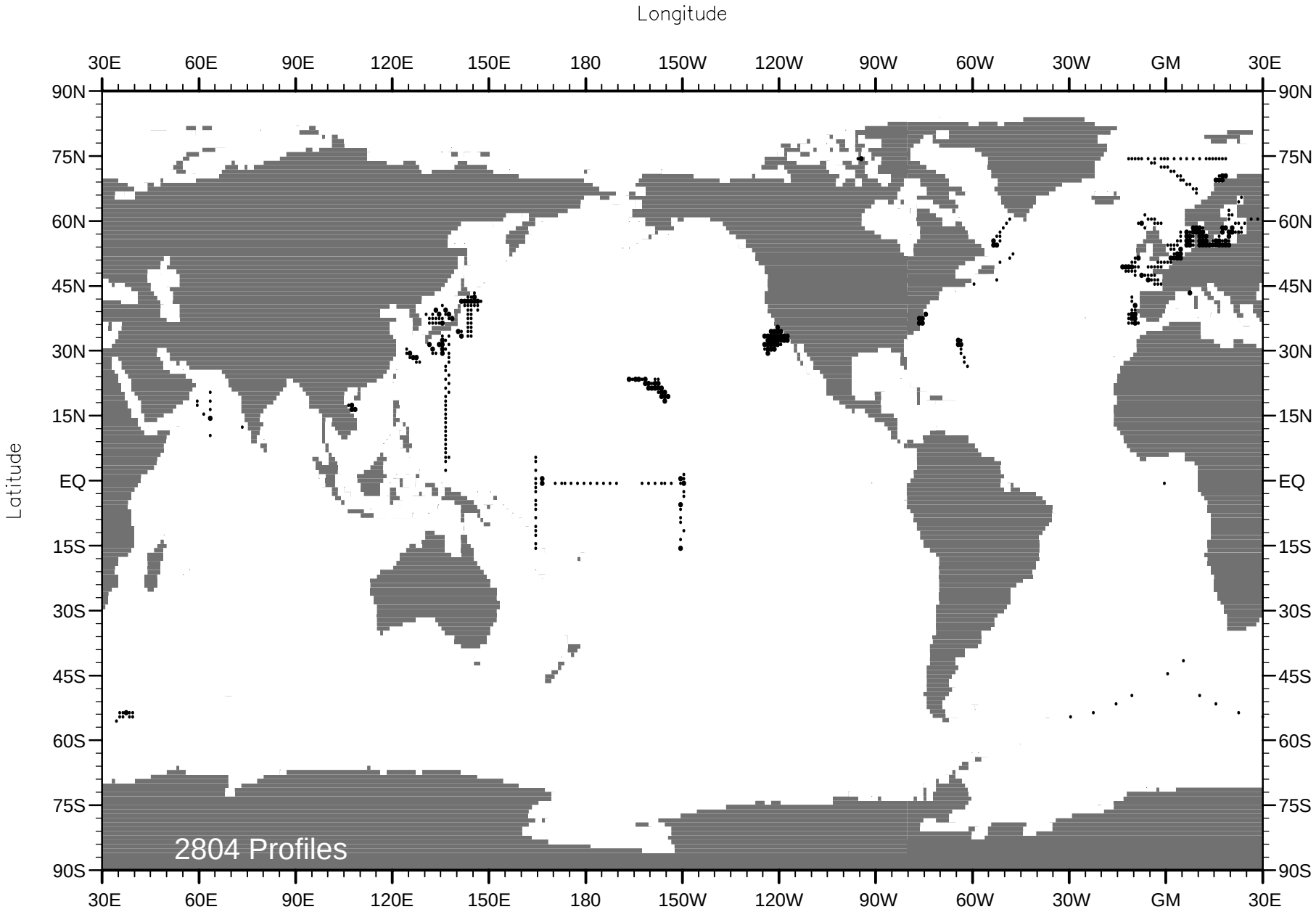


Fig. A41 Distribution of all Ocean Station Data (OSD) chlorophyll profiles in WOD01 for year 1994 .

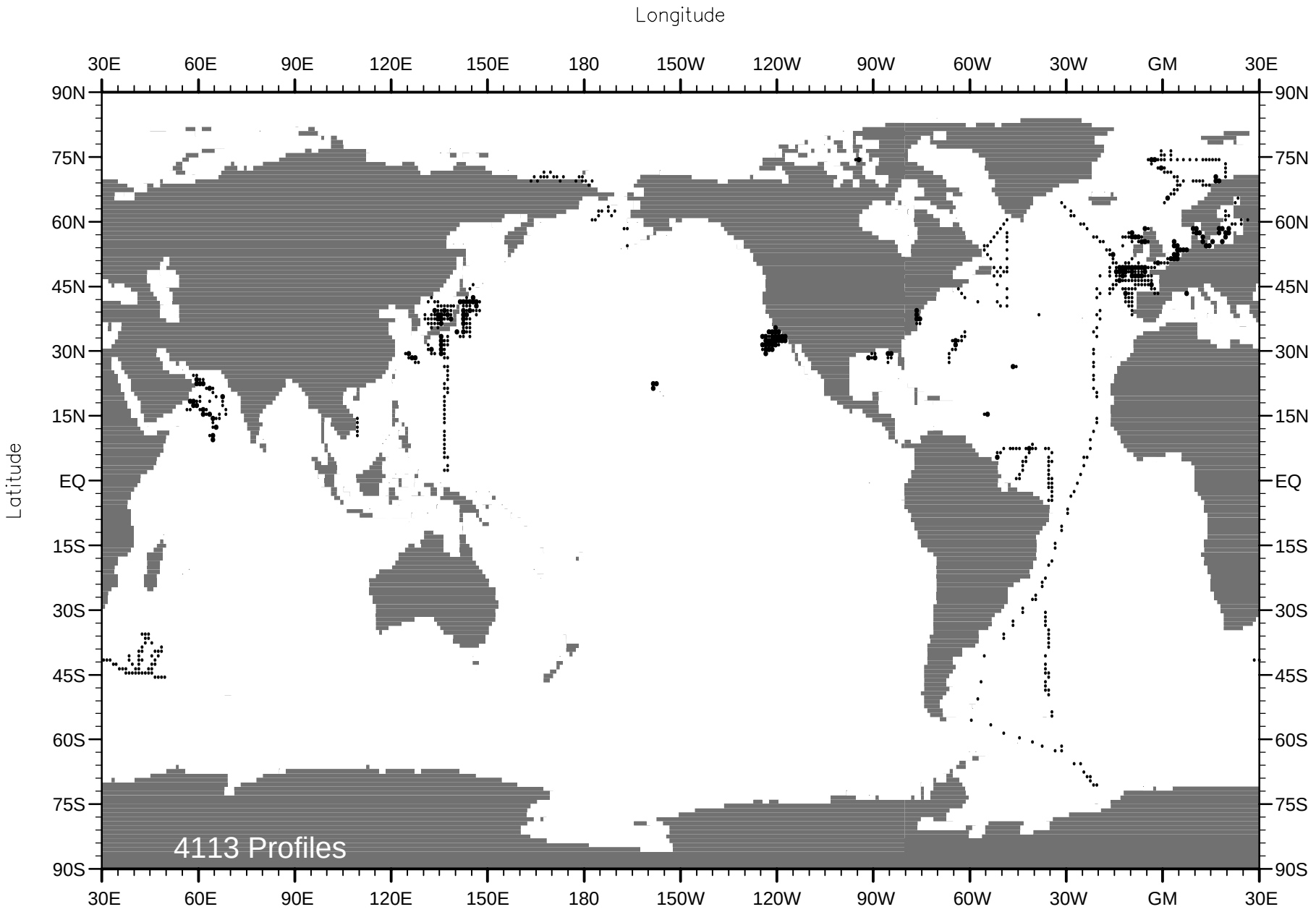


Fig. A42 Distribution of all Ocean Station Data (OSD) chlorophyll profiles in WOD01 for year 1995 .

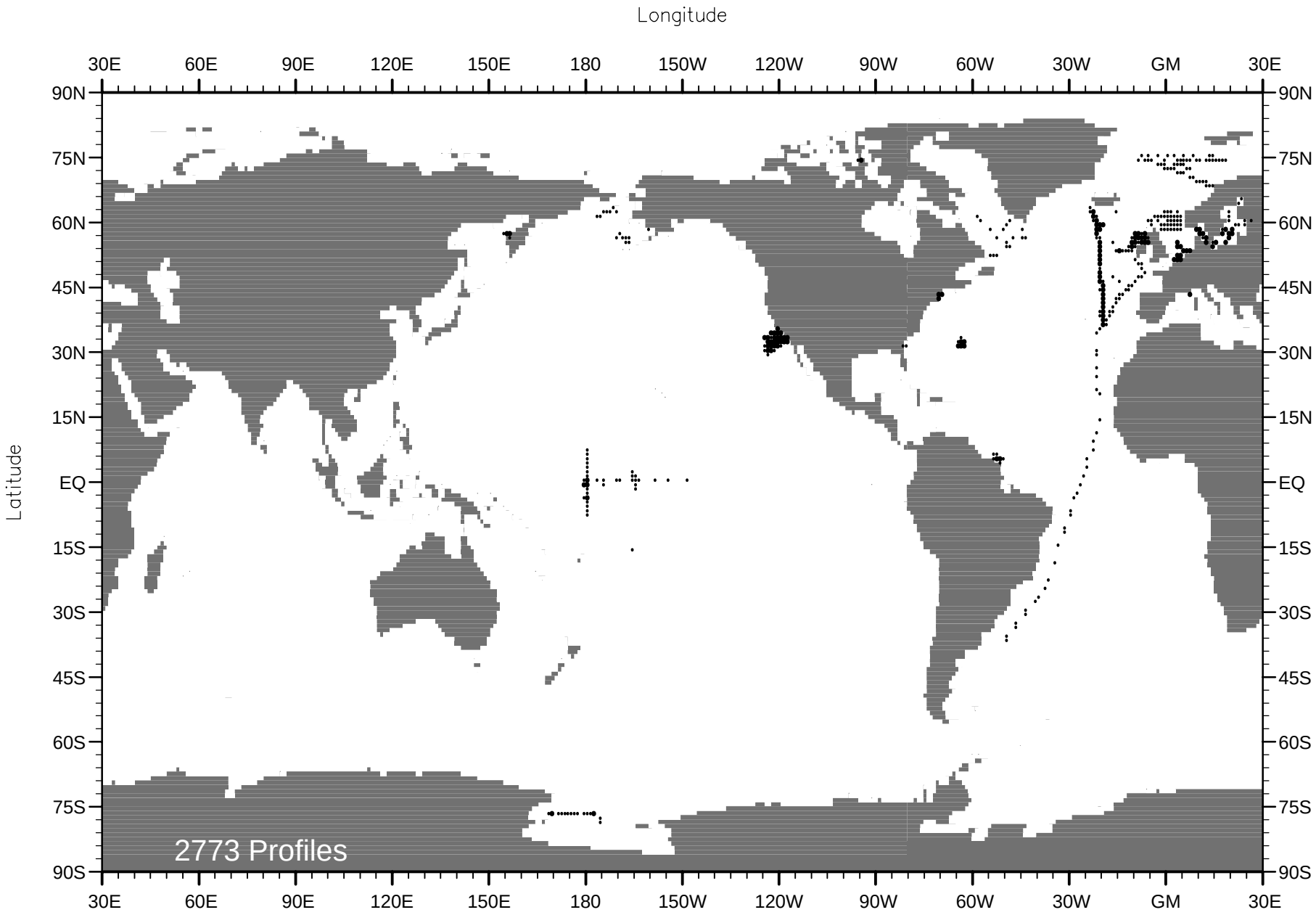


Fig. A43 Distribution of all Ocean Station Data (OSD) chlorophyll profiles in WOD01 for year 1996 .

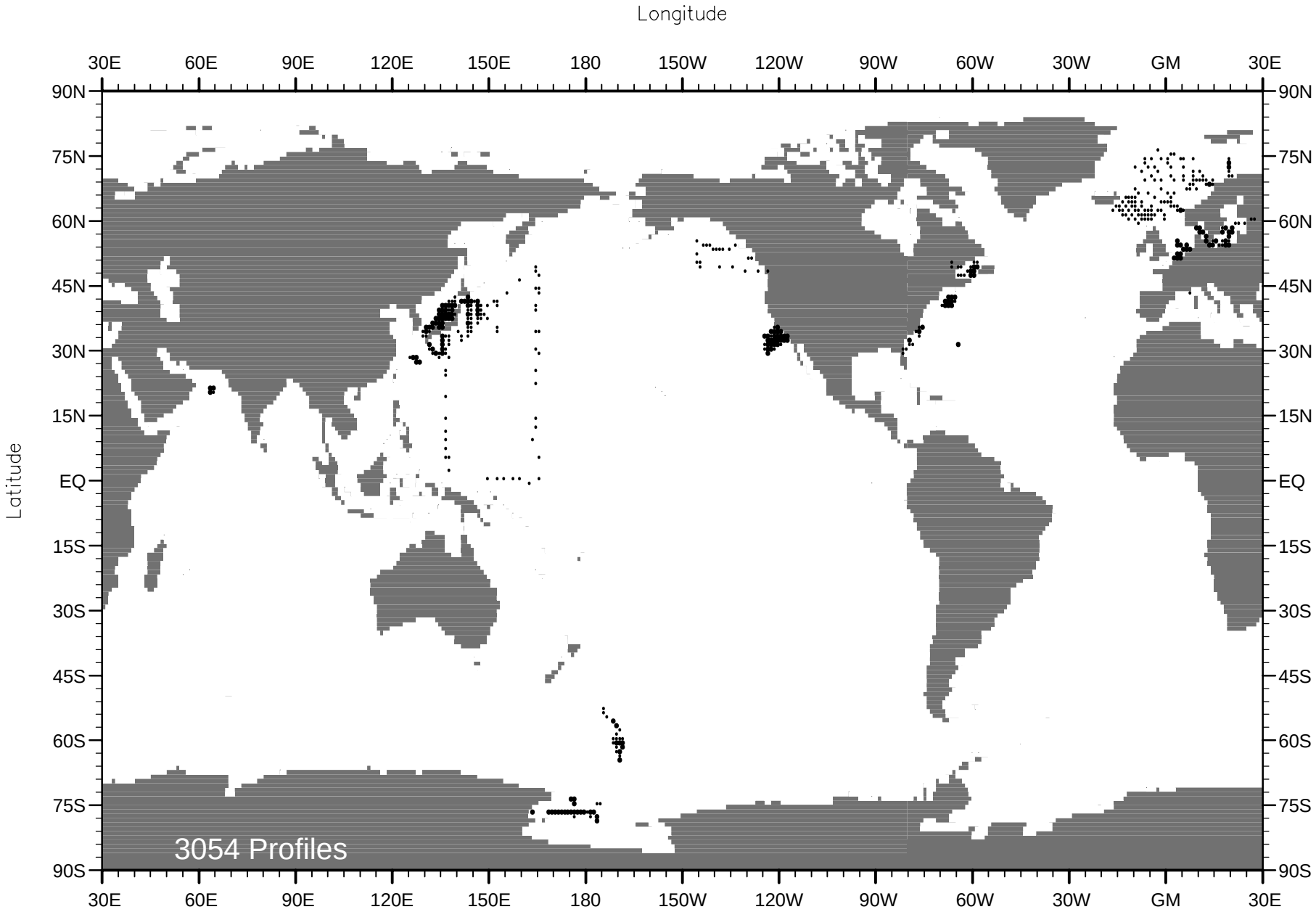


Fig. A44 Distribution of all Ocean Station Data (OSD) chlorophyll profiles in WOD01 for year 1997 .

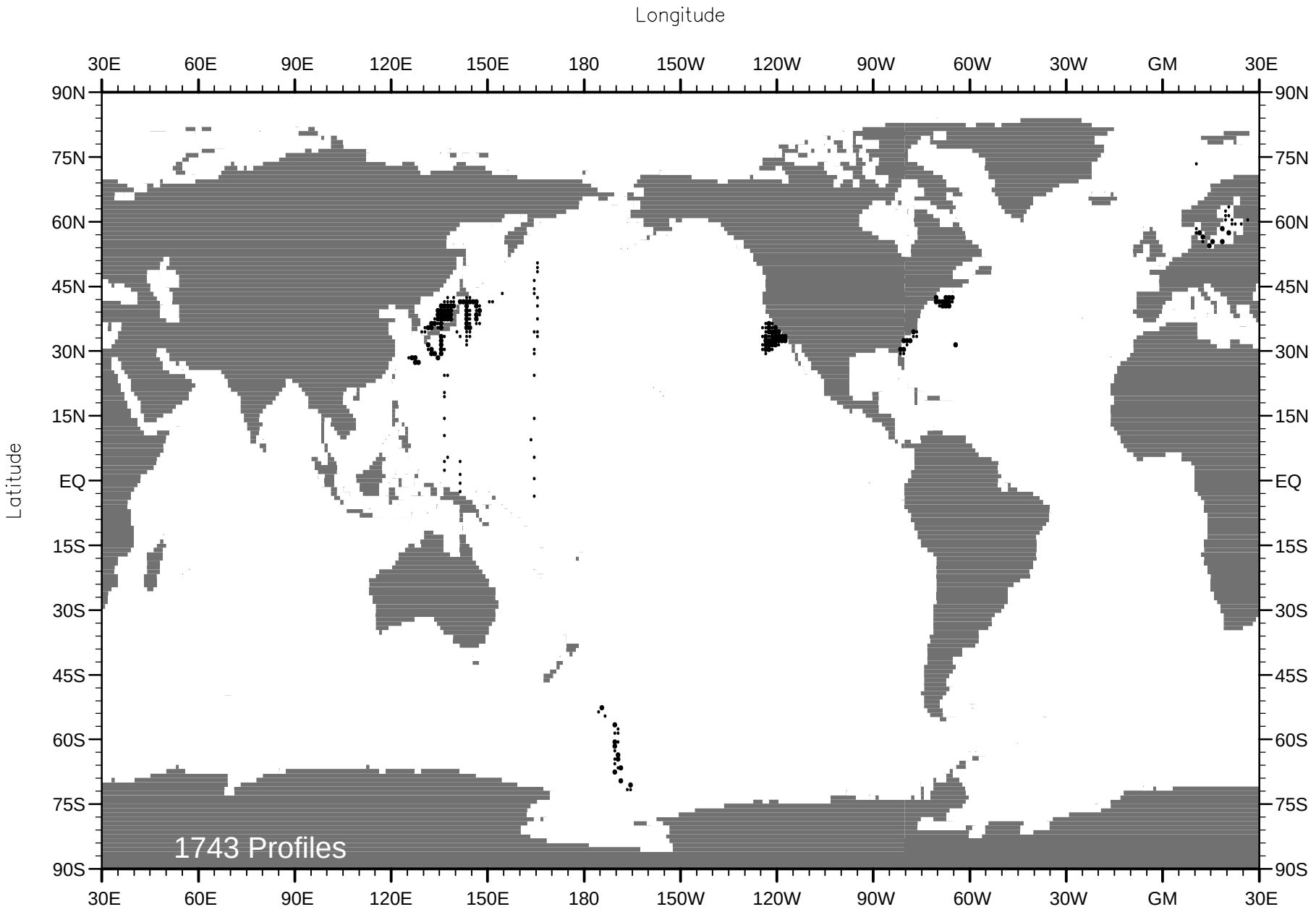


Fig. A45 Distribution of all Ocean Station Data (OSD) chlorophyll profiles in WOD01 for year 1998 .

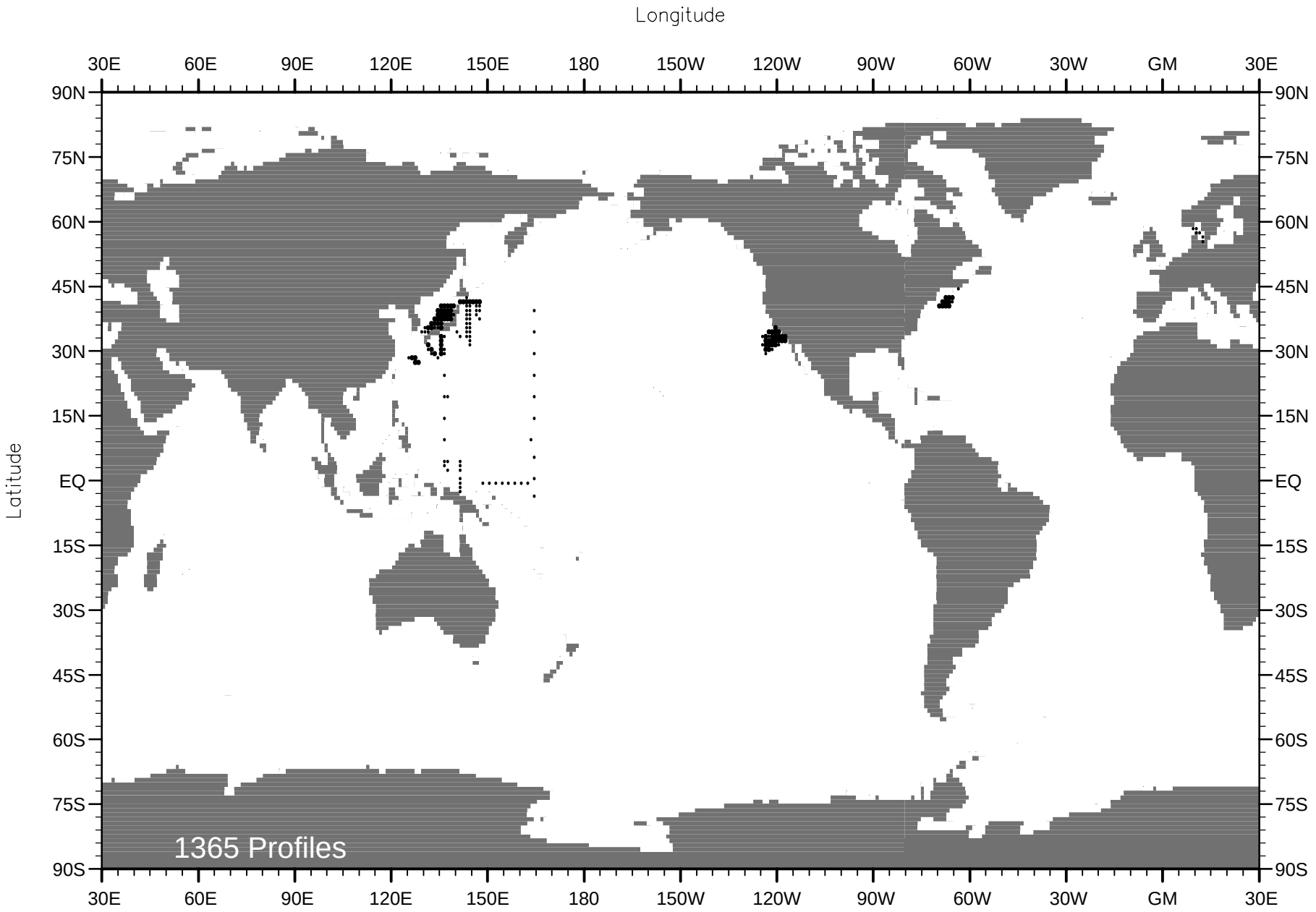


Fig. A46 Distribution of all Ocean Station Data (OSD) chlorophyll profiles in WOD01 for year 1999 .

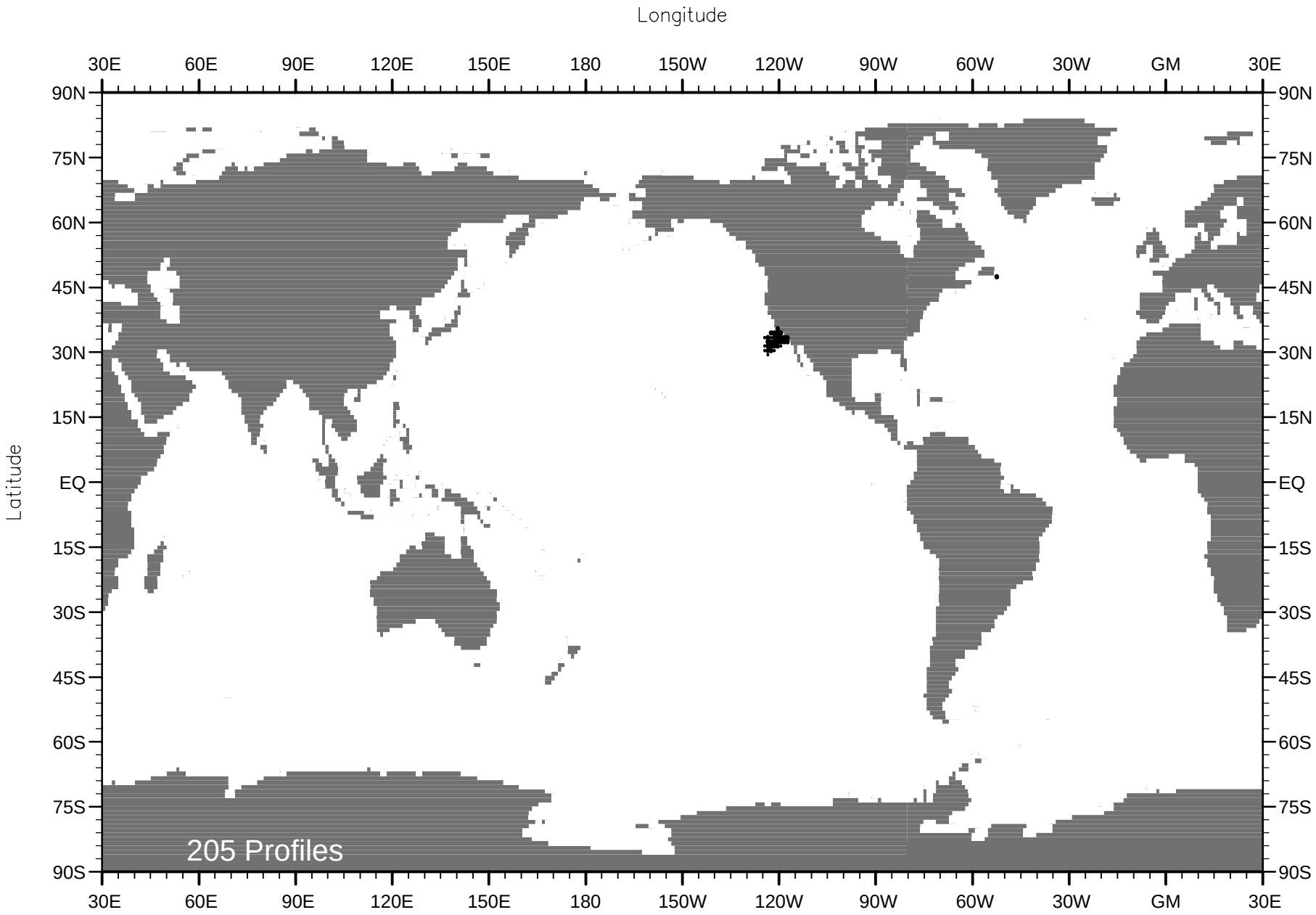


Fig. A47 Distribution of all Ocean Station Data (OSD) chlorophyll profiles in WOD01 for year 2000 .

5. APPENDIX B: DISTRIBUTIONS FOR INDIVIDUAL YEARS OF ALL SURFACE-ONLY CHLOROPHYLL DATA IN WOD01

This appendix contains yearly distributions of all Surface-only chlorophyll data contained in WOD01. These maps provide some history of the observational progress of the field of oceanography. They also serve as indicators of whether or not a particular data set from a scientist or institution is part of the NODC/WDC-A archive. The exchange of information provided by the publication of such maps has provided us with valuable information about deficiencies in the database. The locations of all WOD01 Surface-only chlorophyll data are plotted including stations that may be erroneously located over land. However, WOD01 contains some stations from various lakes so care should be exercised in the use of these stations and the determination as to whether they represent errors in locations.

For all figures in Appendix B, a small dot indicates a one-degree square containing from one to four stations and a large dot indicates five or more stations.

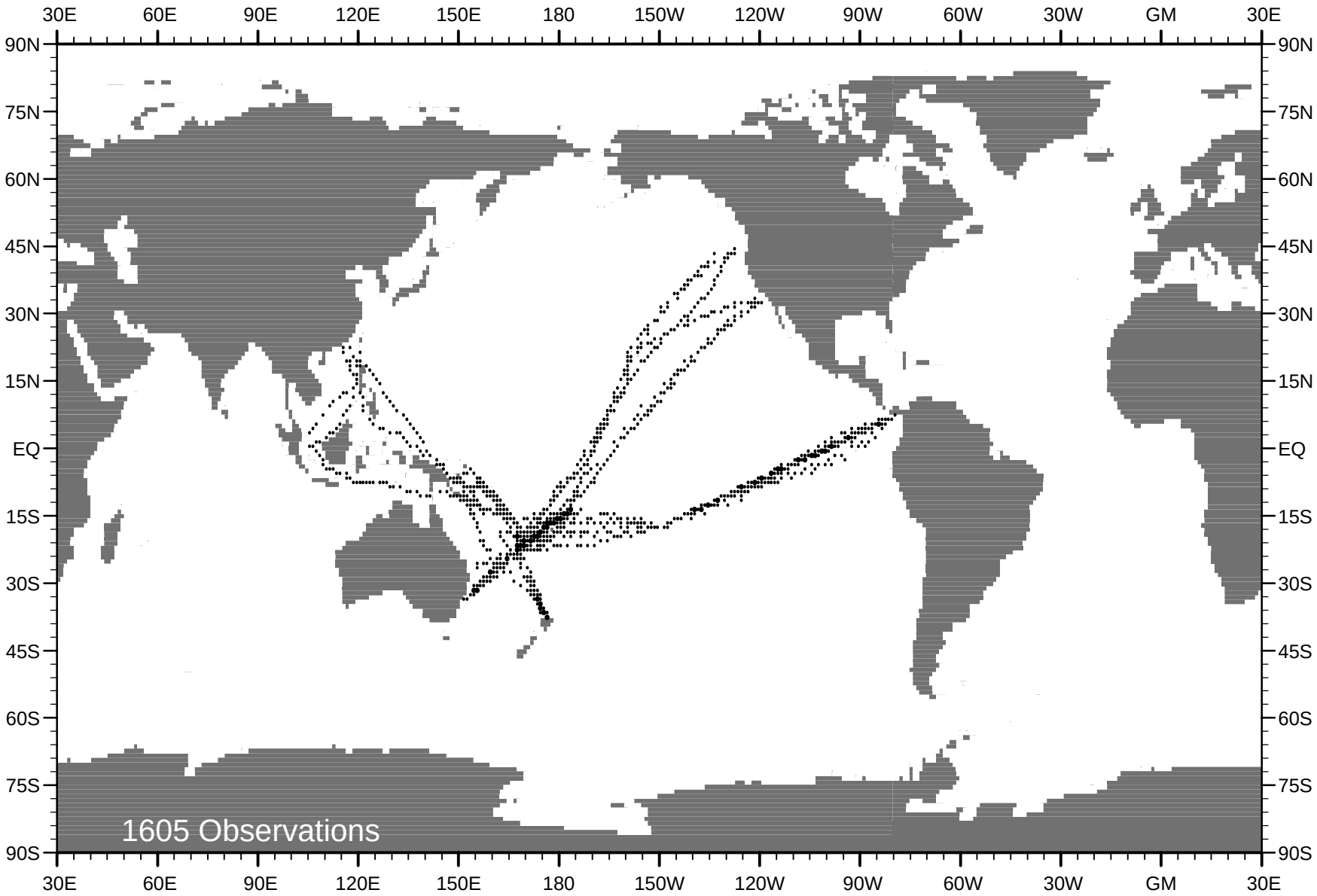


Fig. B1 Distribution of all Surface-only (SURF) chlorophyll data in WOD01 for year 1978 .

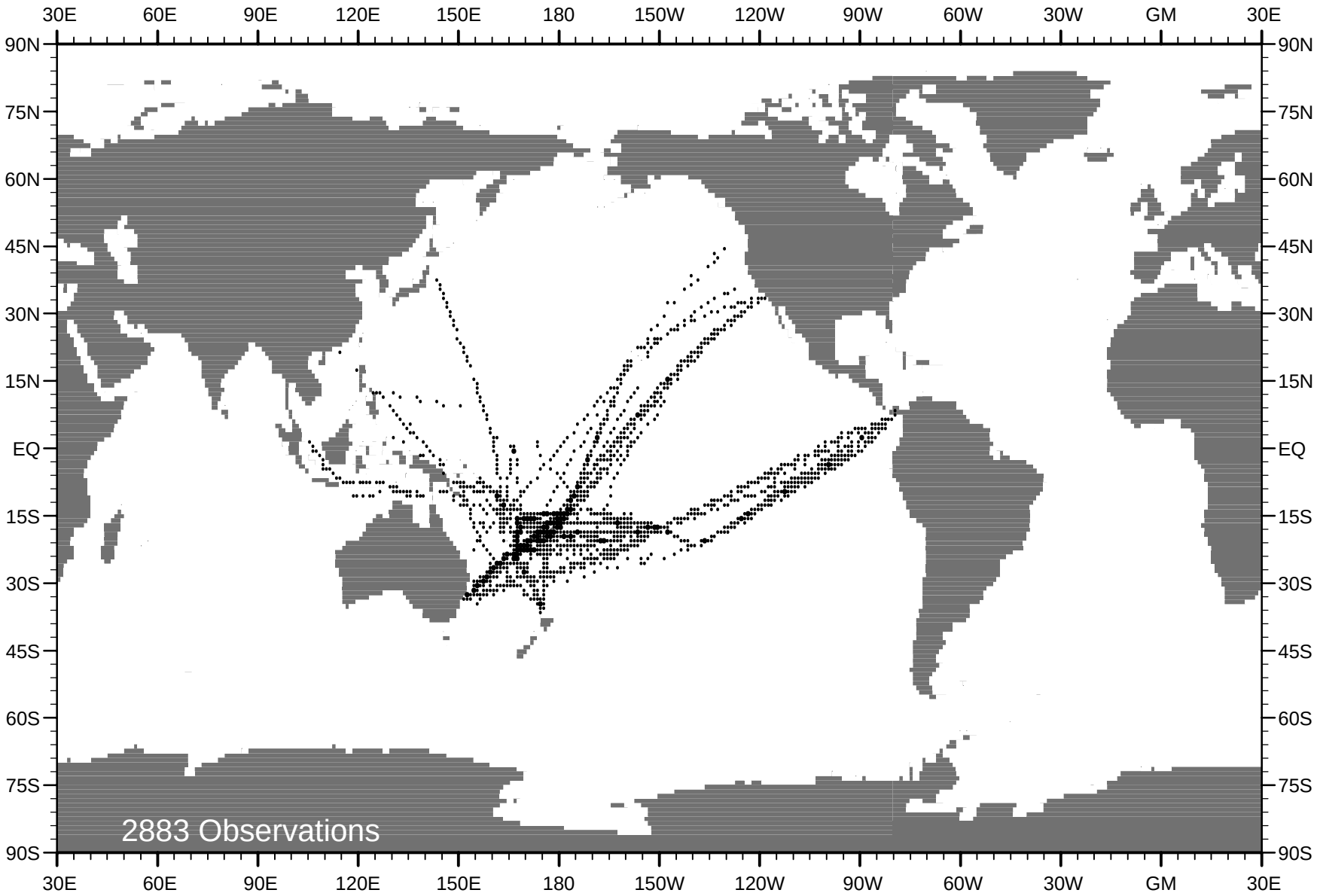


Fig. B2 Distribution of all Surface-only (SURF) chlorophyll data in WOD01 for year 1979 .

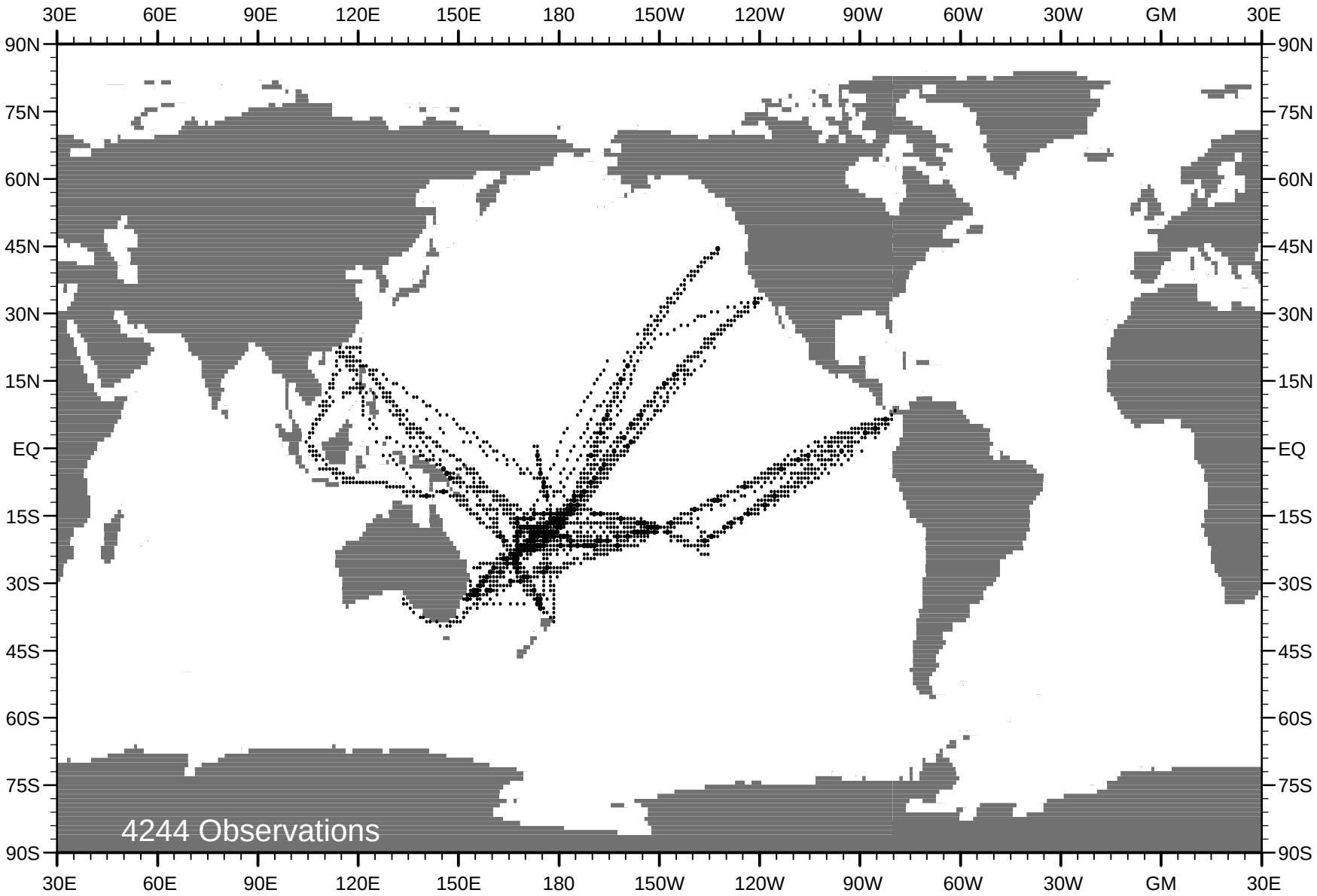


Fig. B3 Distribution of all Surface-only (SURF) chlorophyll data in WOD01 for year 1980 .

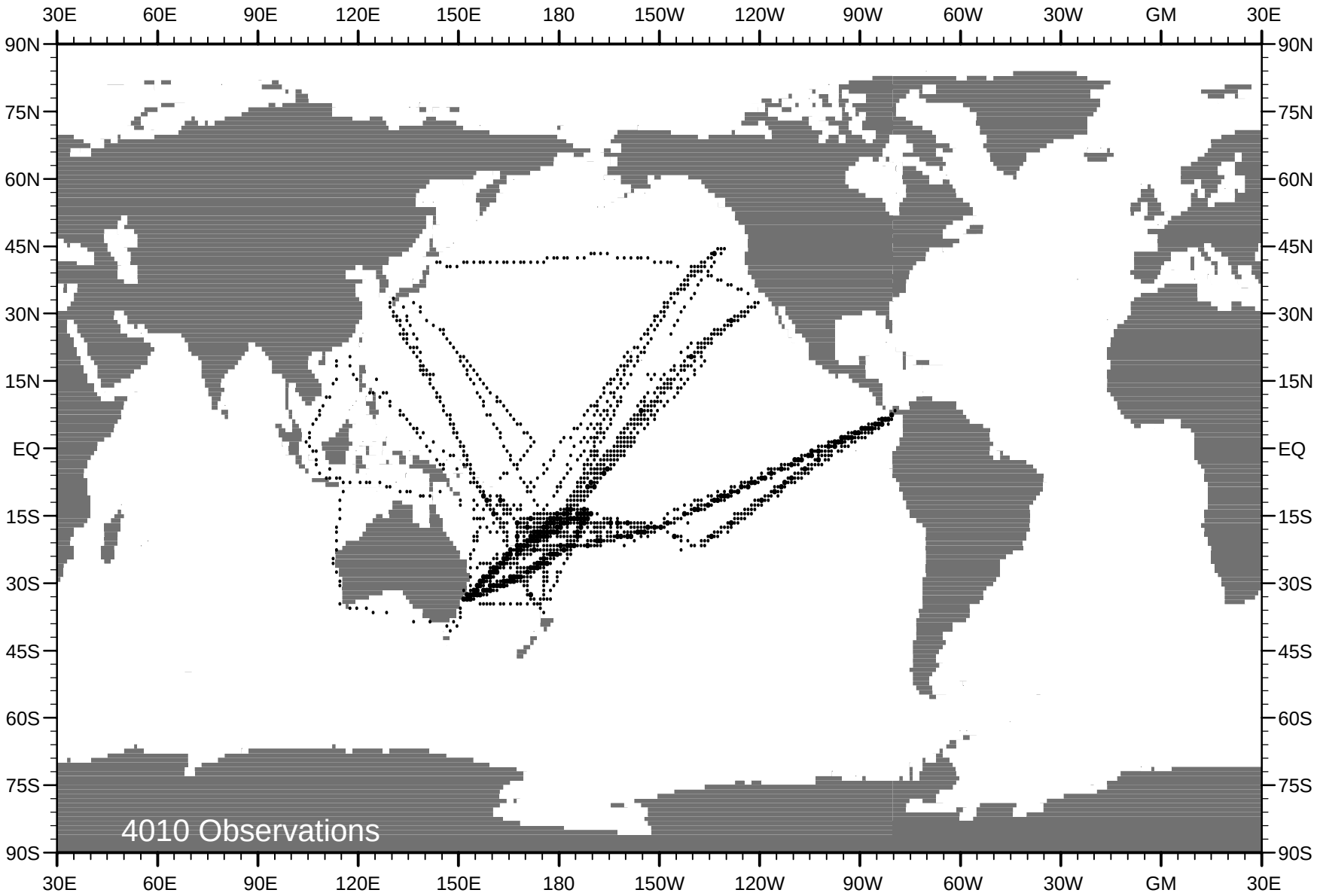


Fig. B4 Distribution of all Surface-only (SURF) chlorophyll data in WOD01 for year 1981 .

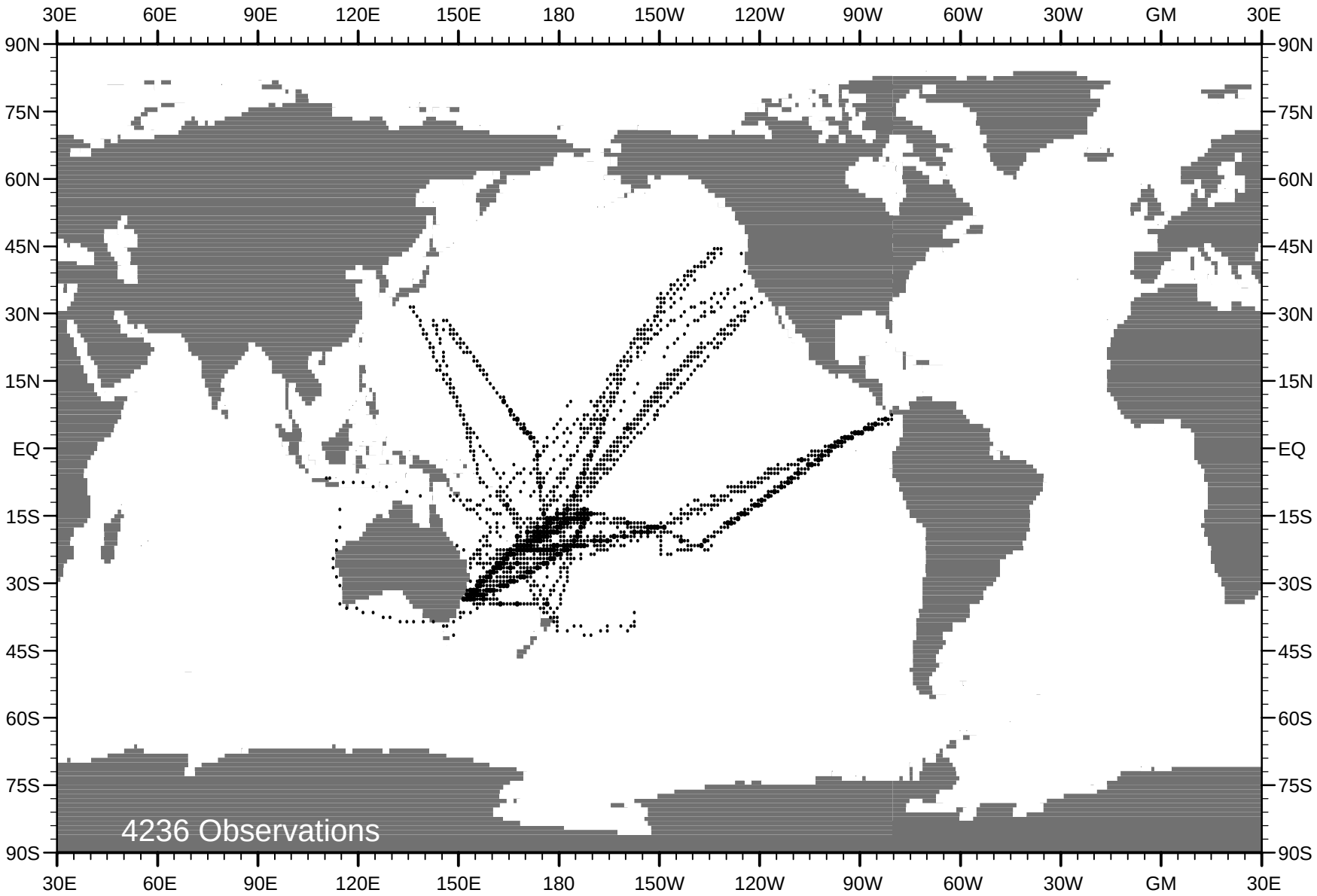


Fig. B5 Distribution of all Surface-only (SURF) chlorophyll data in WOD01 for year 1982 .

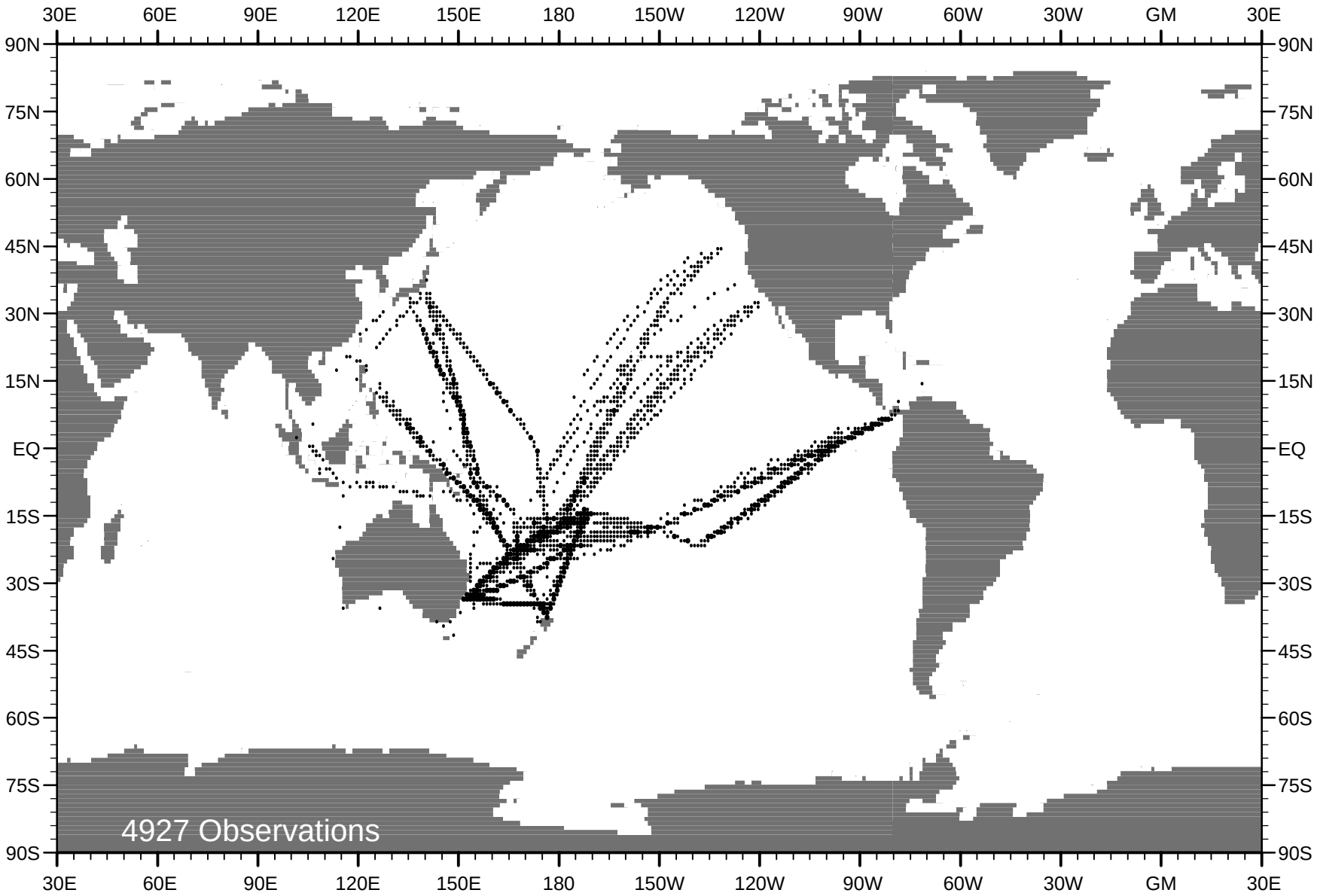


Fig. B6 Distribution of all Surface-only (SURF) chlorophyll data in WOD01 for year 1983 .

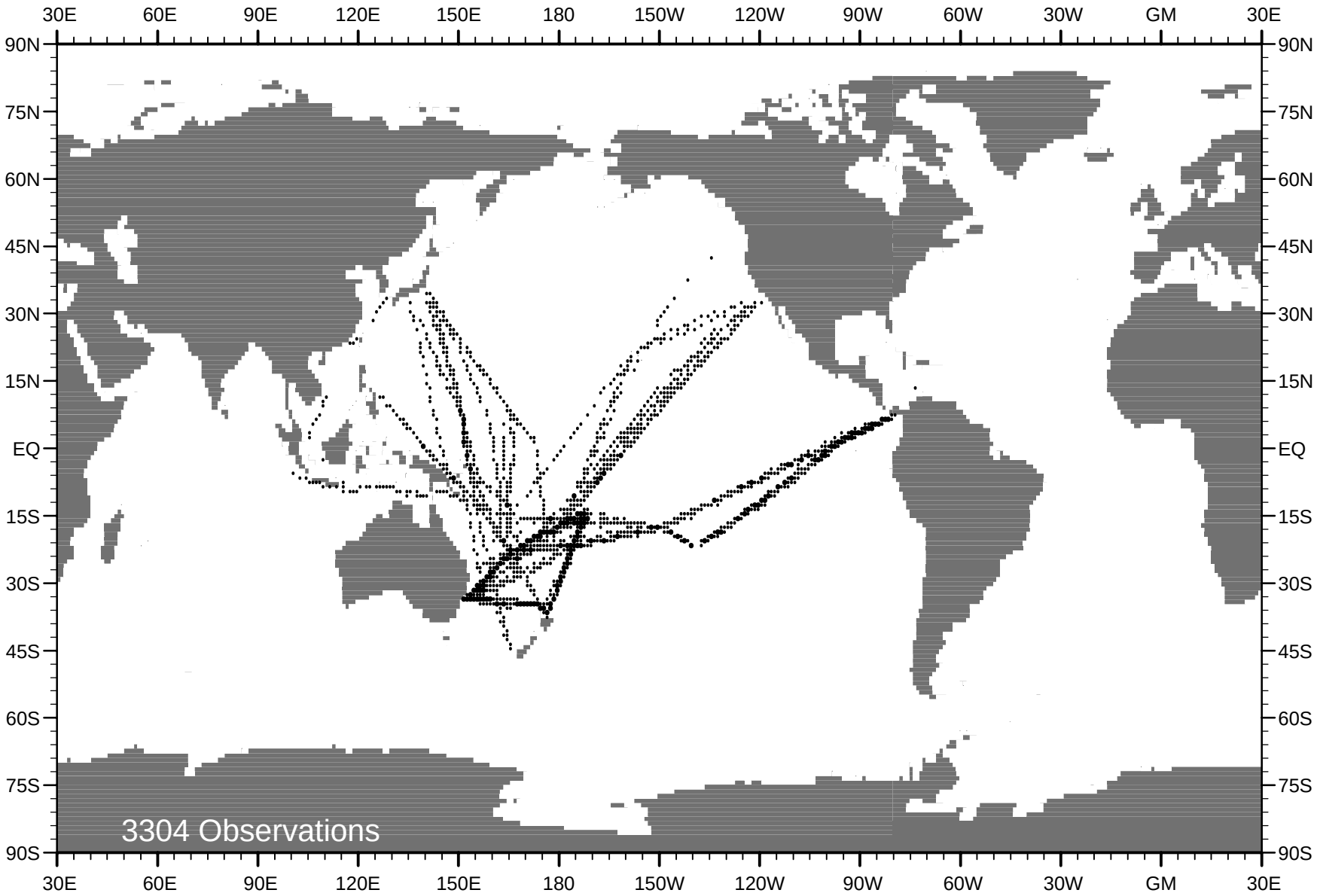


Fig. B7 Distribution of all Surface-only (SURF) chlorophyll data in WOD01 for year 1984 .

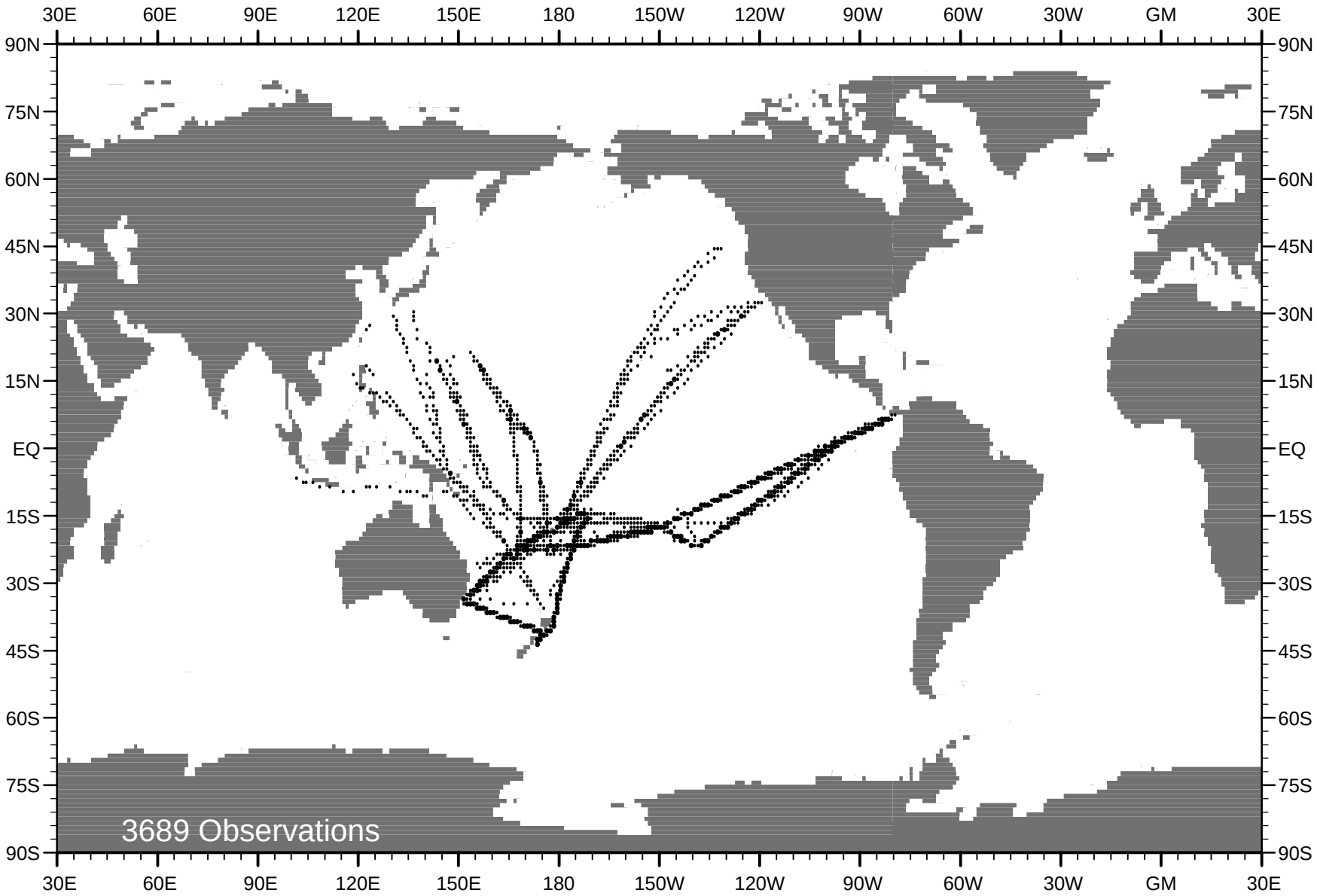


Fig. B8 Distribution of all Surface-only (SURF) chlorophyll data in WOD01 for year 1985 .

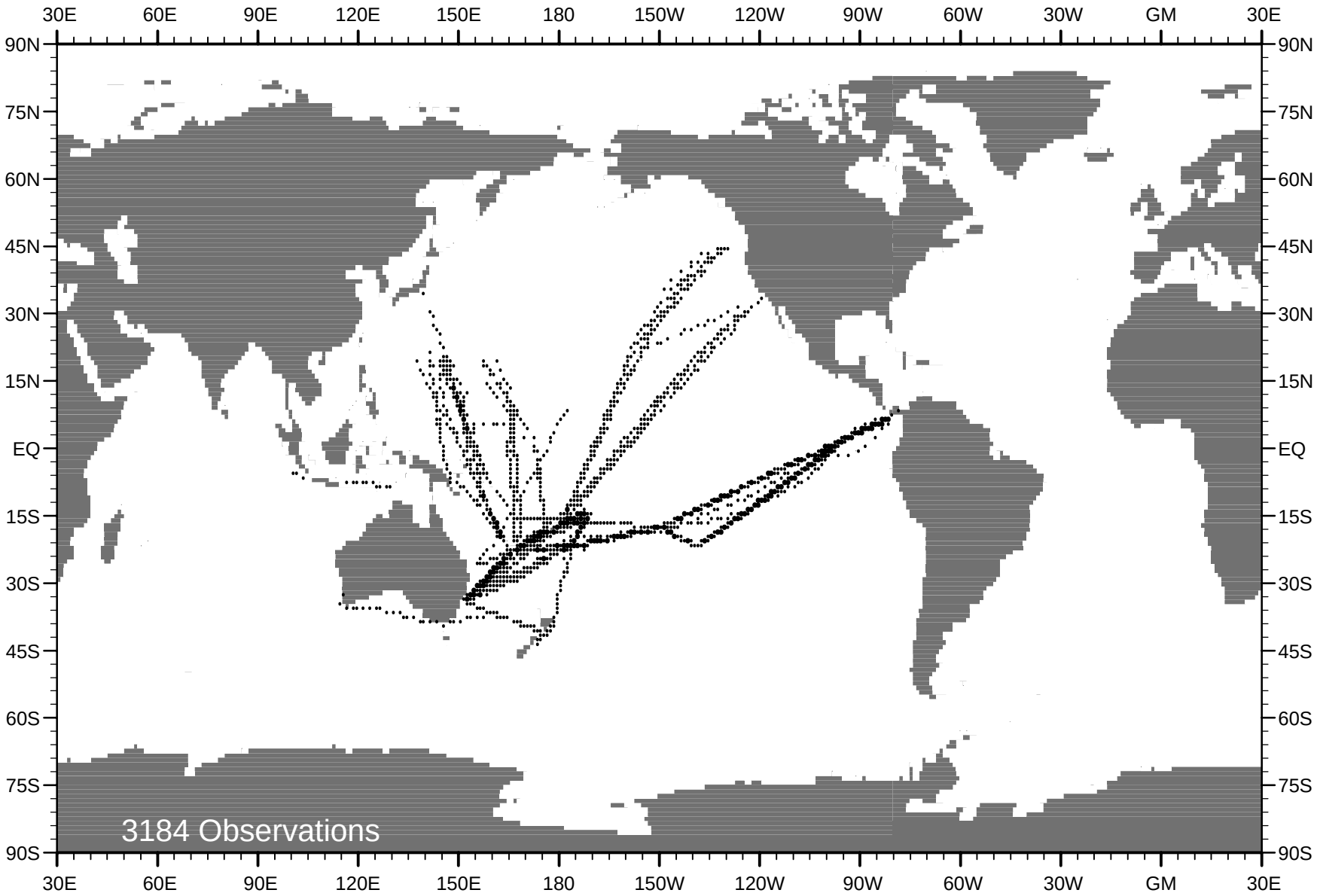


Fig. B9 Distribution of all Surface-only (SURF) chlorophyll data in WOD01 for year 1986 .

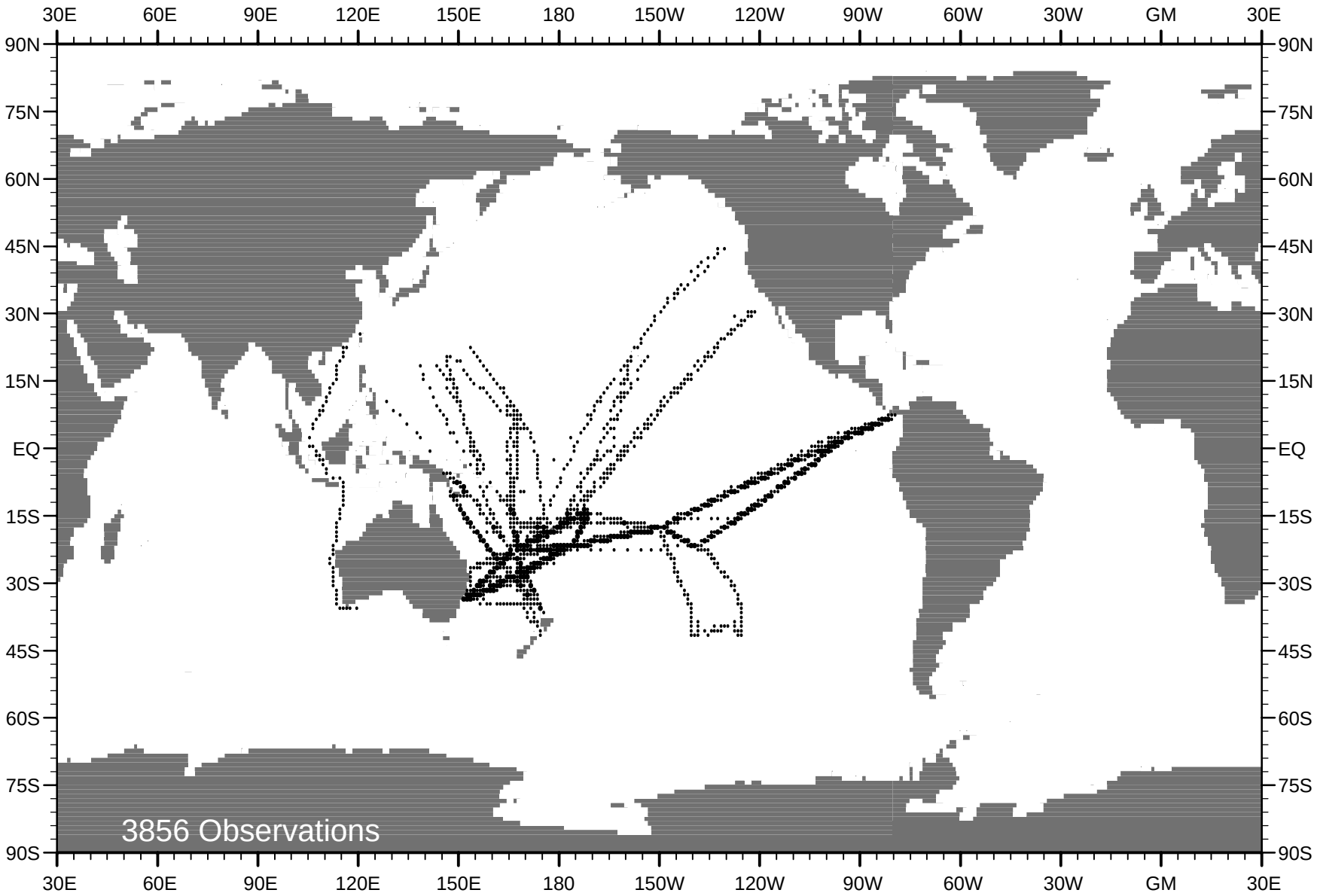


Fig. B10 Distribution of all Surface-only (SURF) chlorophyll data in WOD01 for year 1987 .

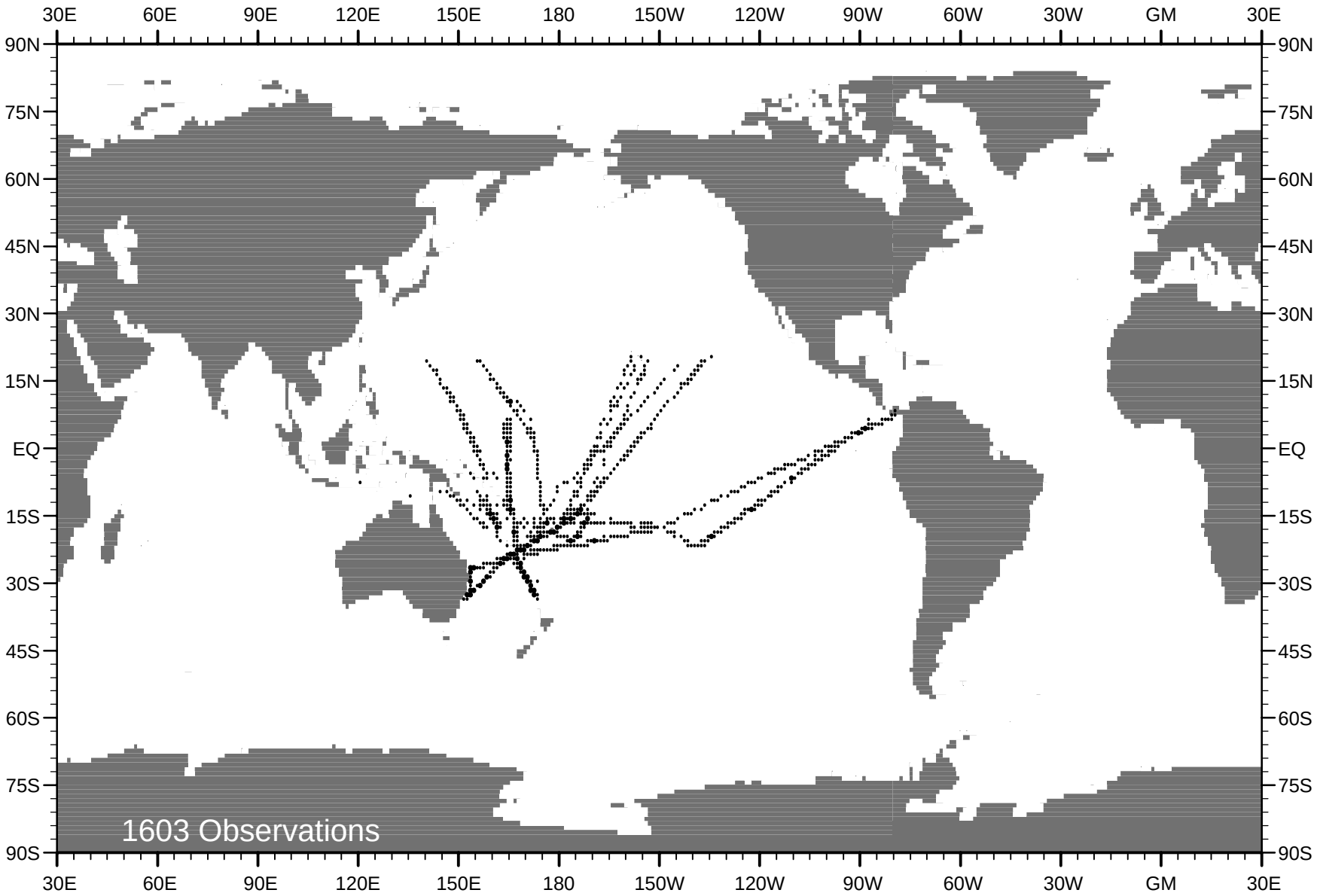


Fig. B11 Distribution of all Surface-only (SURF) chlorophyll data in WOD01 for year 1988 .

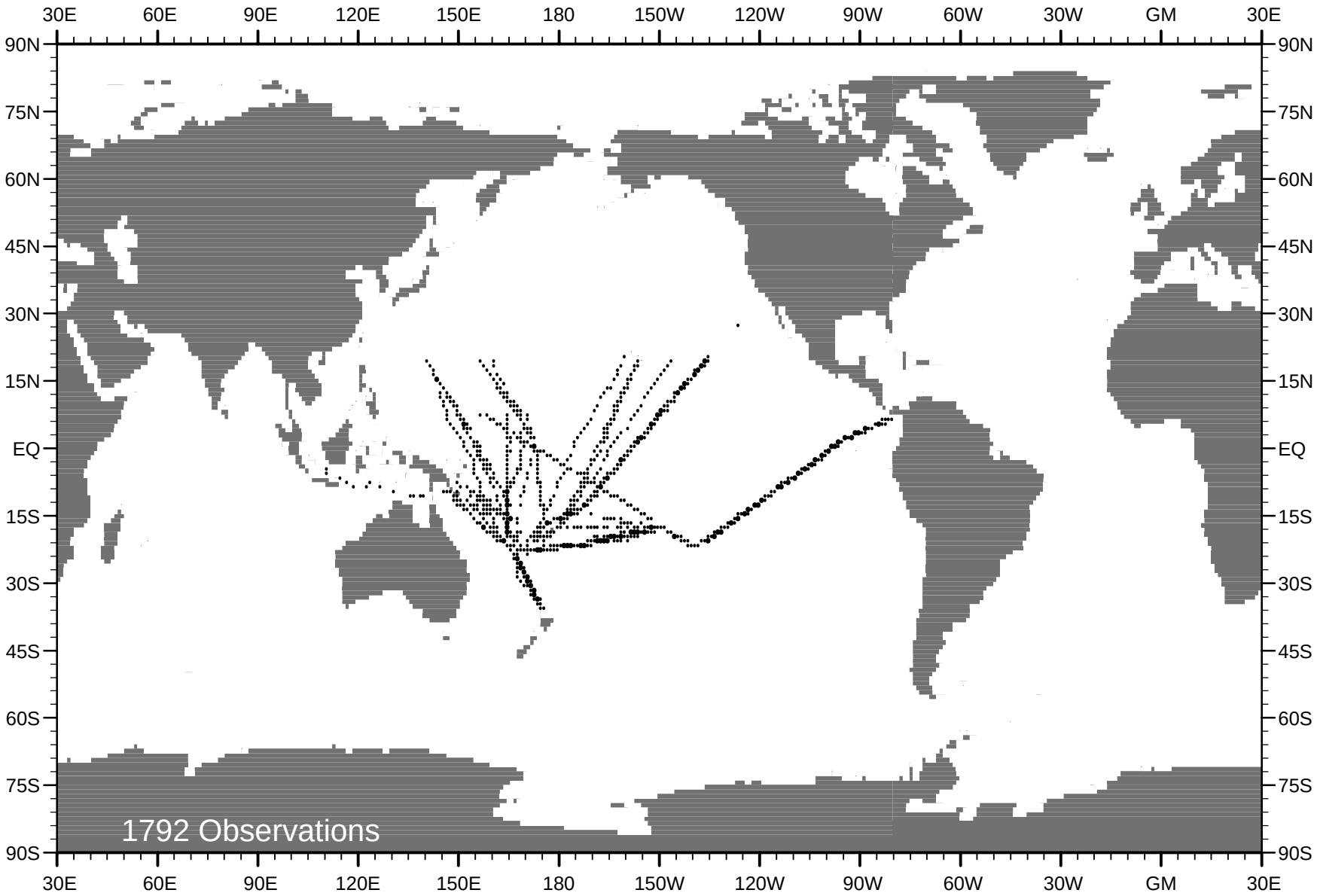


Fig. B12 Distribution of all Surface-only (SURF) chlorophyll data in WOD01 for year 1989 .

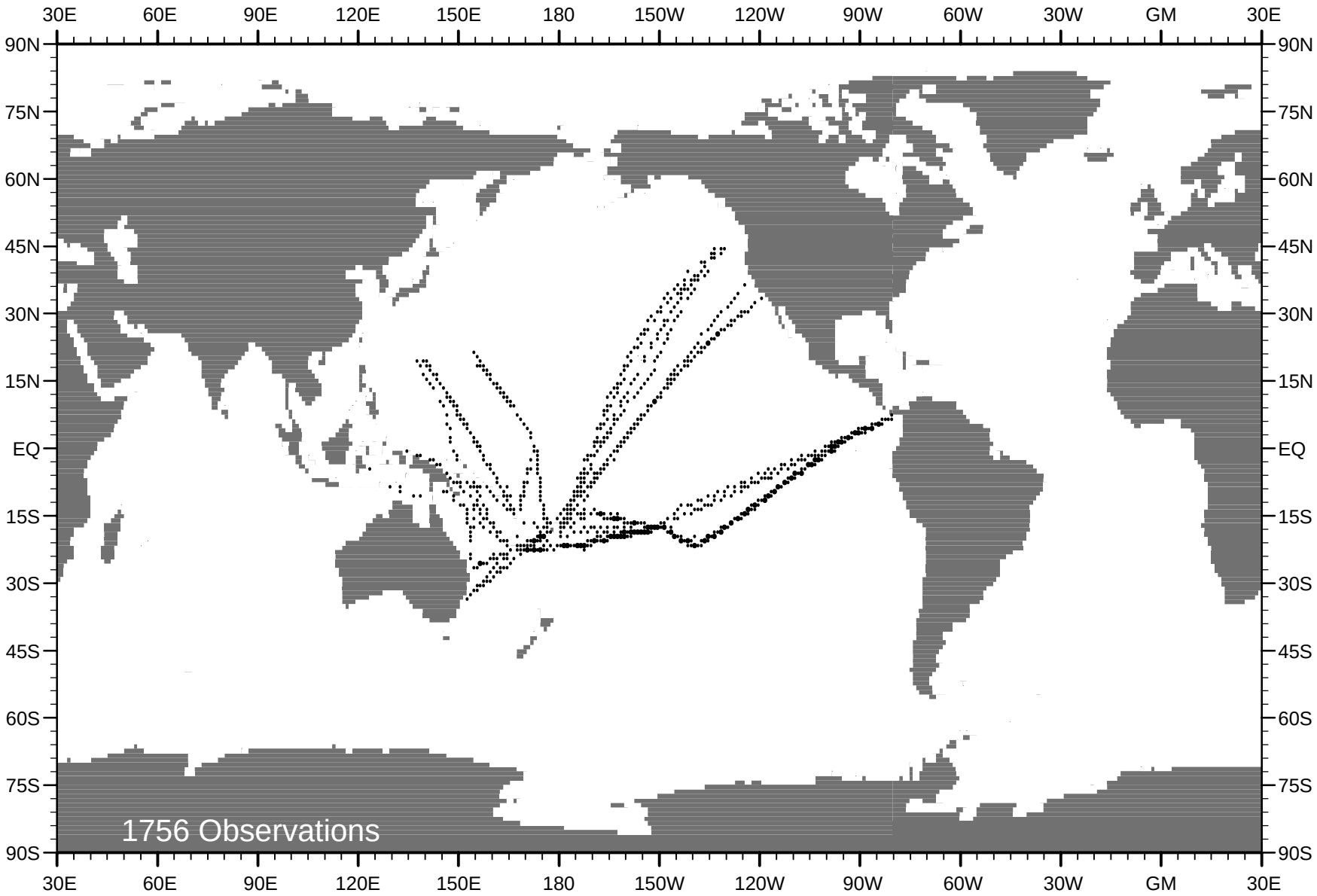


Fig. B13 Distribution of all Surface-only (SURF) chlorophyll data in WOD01 for year 1990 .

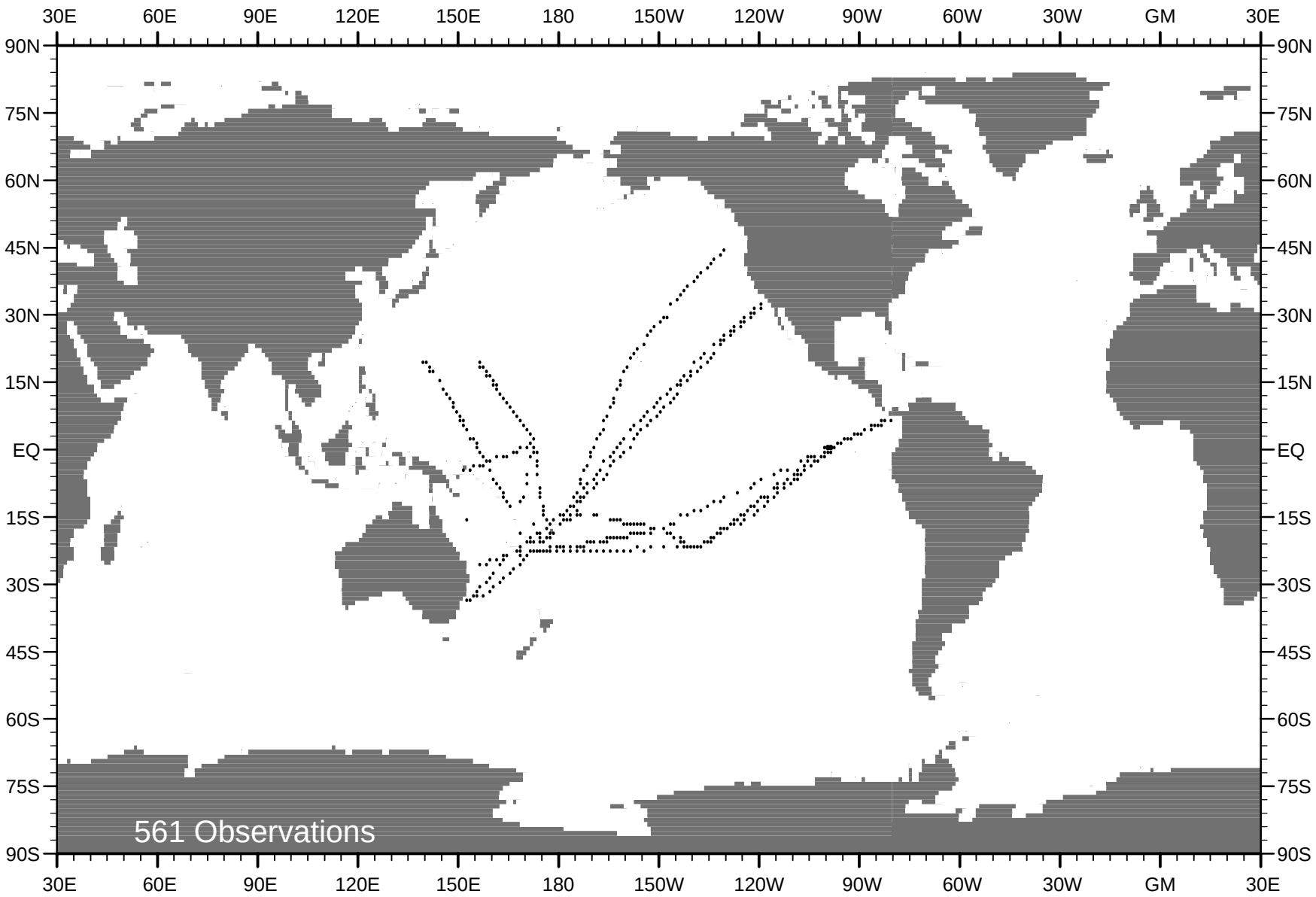


Fig. B14 Distribution of all Surface-only (SURF) chlorophyll data in WOD01 for year 1991 .

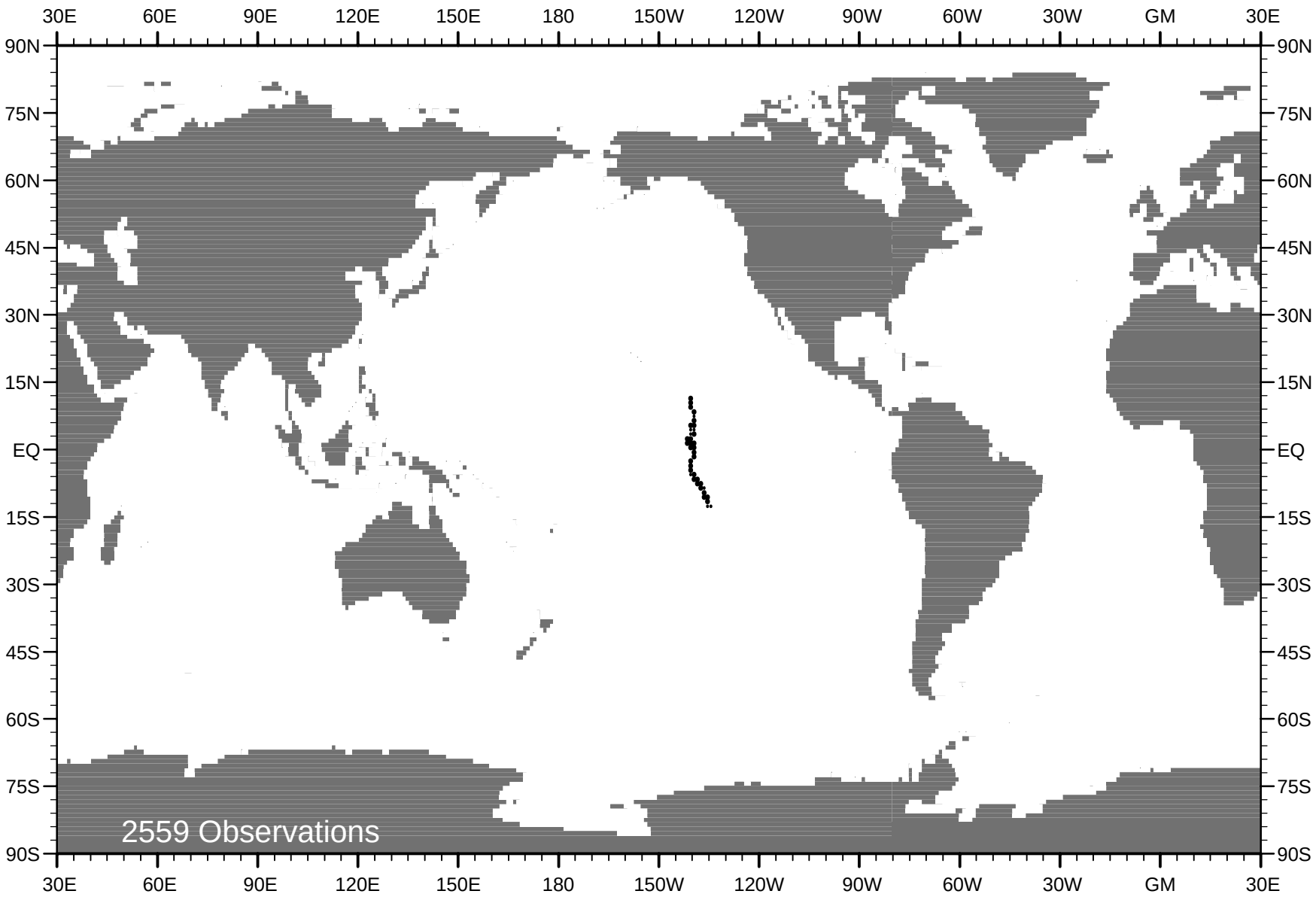


Fig. B15 Distribution of all Surface-only (SURF) chlorophyll data in WOD01 for year 1992 .

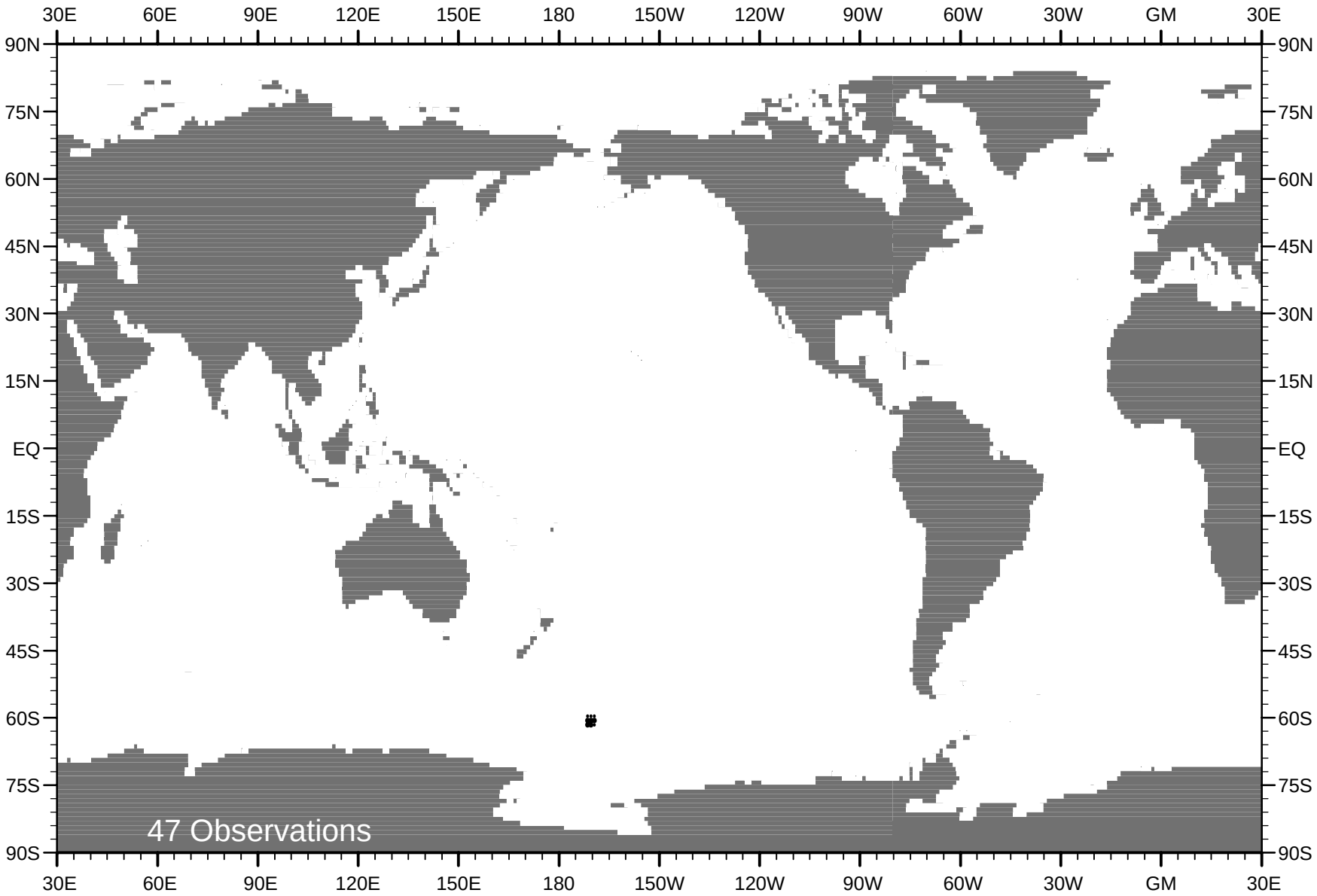


Fig. B16 Distribution of all Surface-only (SURF) chlorophyll data in WOD01 for year 1998 .

6. APPENDIX C: DISTRIBUTIONS FOR INDIVIDUAL YEARS OF ALL OCEAN STATION DATA (OSD) PLANKTON ABUNDANCE DATA IN WOD01

This appendix contains yearly distributions of all OSD plankton abundance data contained in WOD01. These maps provide some history of the observational progress of the field of oceanography. They also serve as indicators of whether or not a particular data set from a scientist or institution is part of the NODC/WDC-A archive. The exchange of information provided by the publication of such maps has provided us with valuable information about deficiencies in the database. The locations of all WOD01 OSD plankton abundance data are plotted including stations that may be erroneously located over land. However, WOD01 contains some stations from various lakes so care should be exercised in the use of these stations and the determination as to whether they represent errors in locations.

For all figures in Appendix C, a small dot indicates a one-degree square containing from one to four stations and a large dot indicates five or more stations.

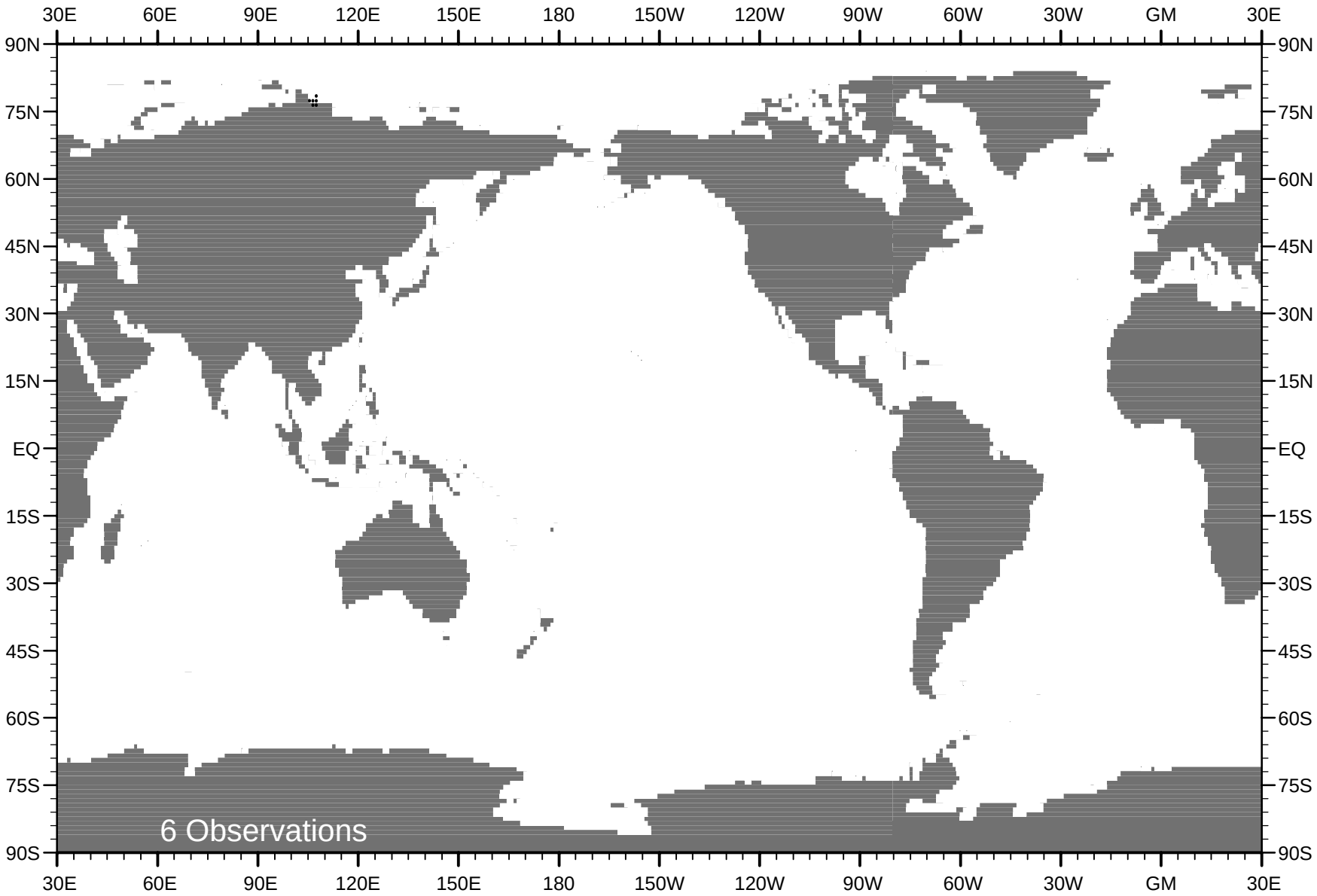


Fig. C1 Distribution of all Ocean Station Data (OSD) plankton abundance data in WOD01 for year 1913 .

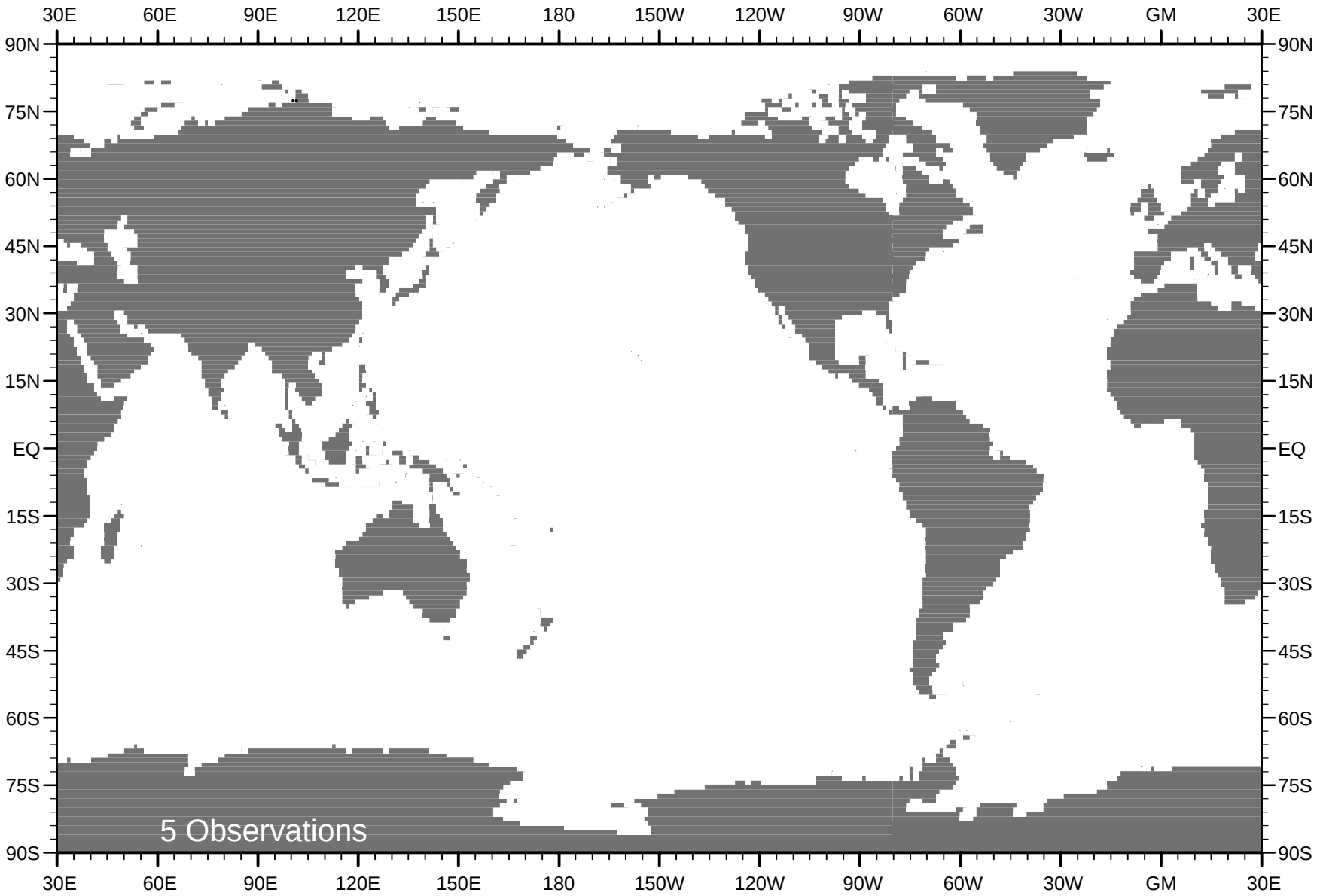


Fig. C2 Distribution of all Ocean Station Data (OSD) plankton abundance data in WOD01 for year 1914 .

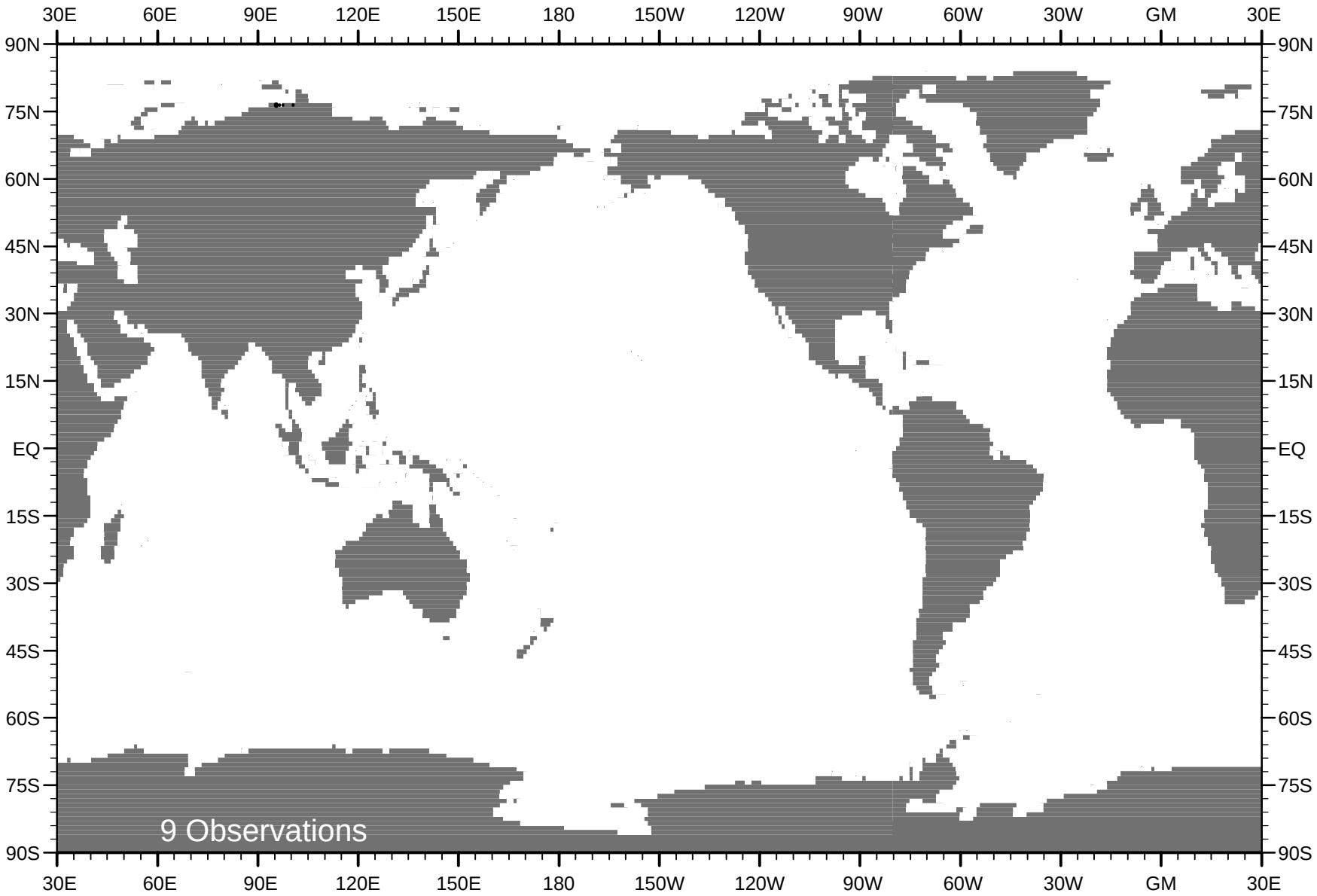


Fig. C3 Distribution of all Ocean Station Data (OSD) plankton abundance data in WOD01 for year 1915 .

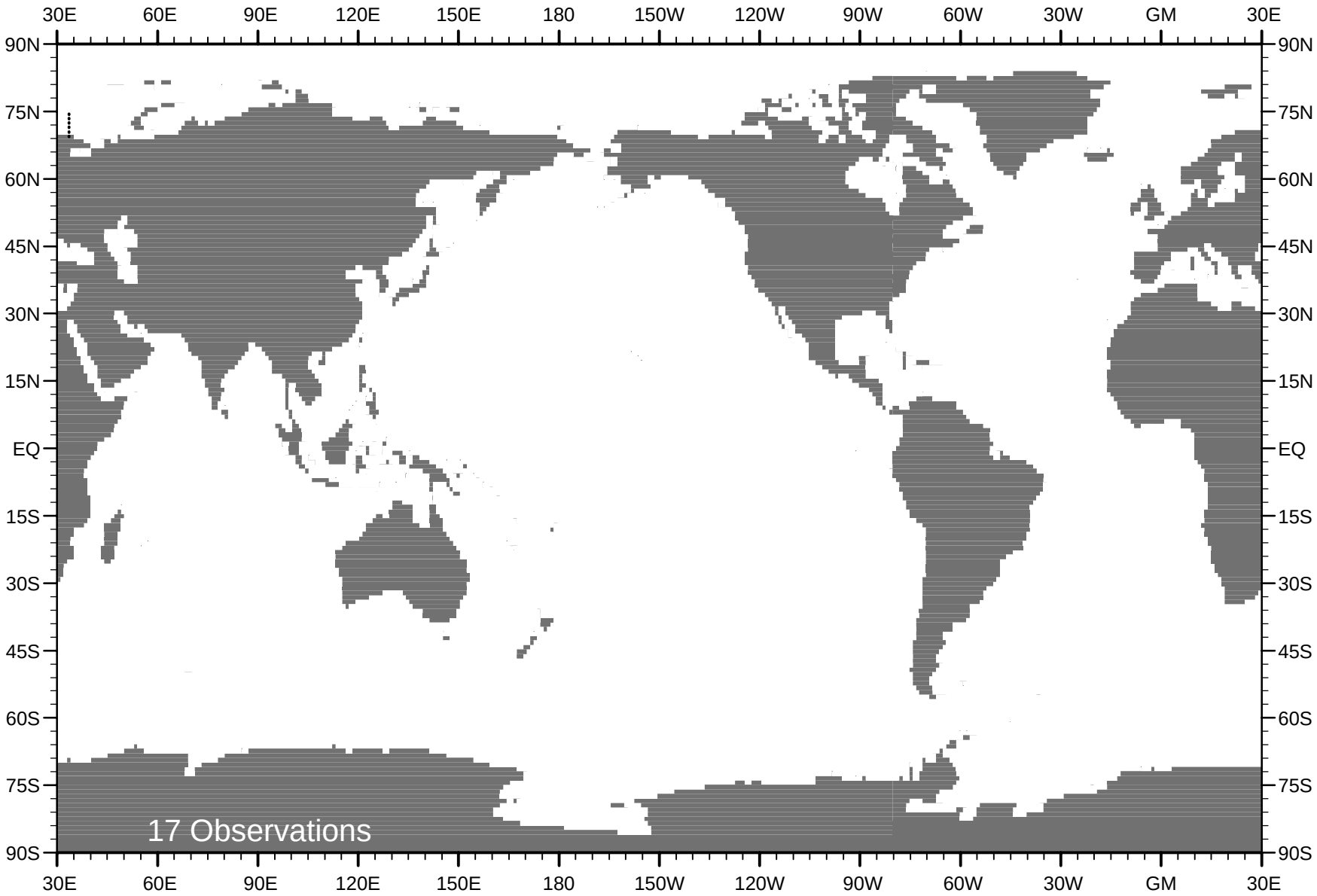


Fig. C4 Distribution of all Ocean Station Data (OSD) plankton abundance data in WOD01 for year 1921 .

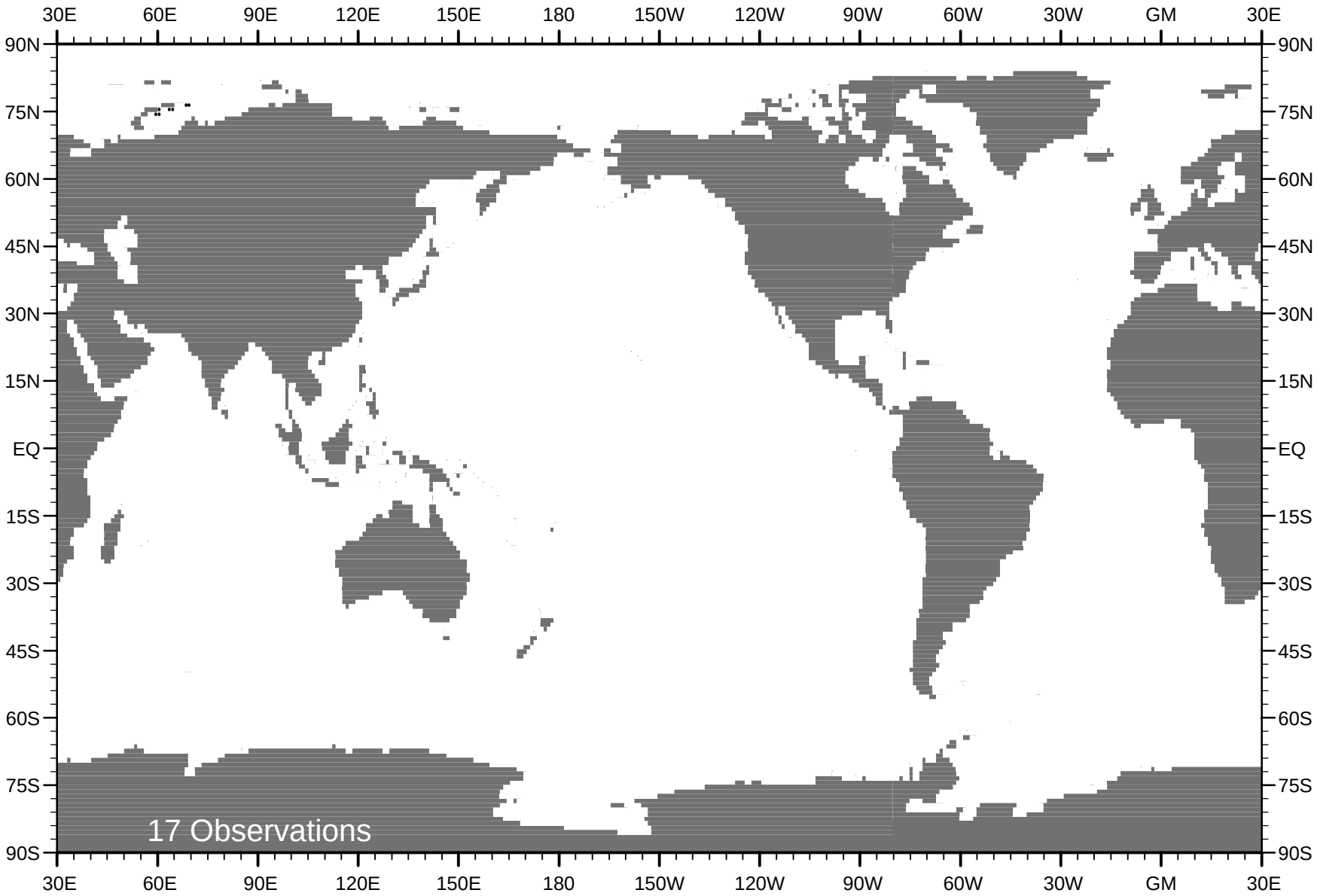


Fig. C5 Distribution of all Ocean Station Data (OSD) plankton abundance data in WOD01 for year 1925 .

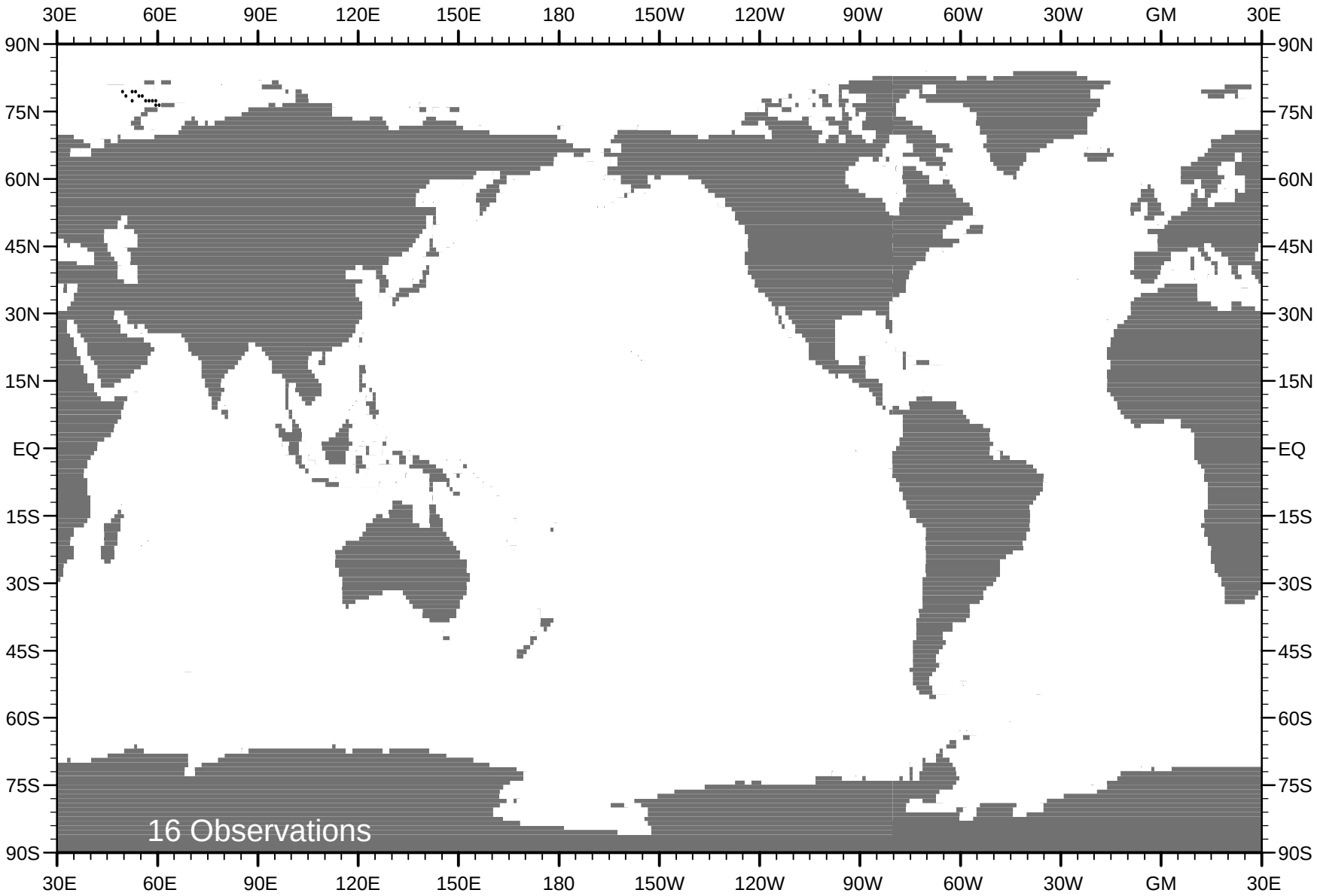


Fig. C6 Distribution of all Ocean Station Data (OSD) plankton abundance data in WOD01 for year 1927 .

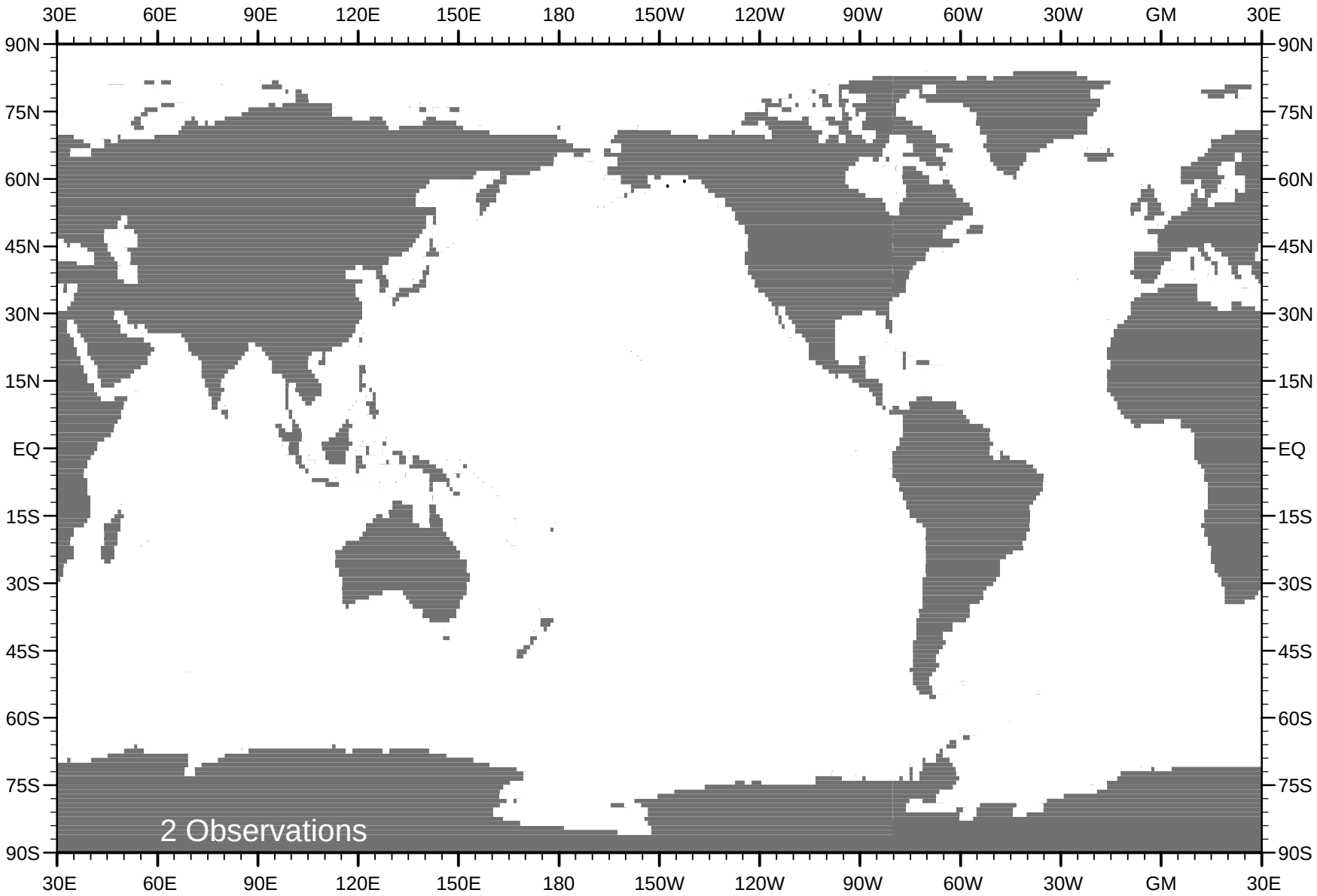


Fig. C7 Distribution of all Ocean Station Data (OSD) plankton abundance data in WOD01 for year 1928 .

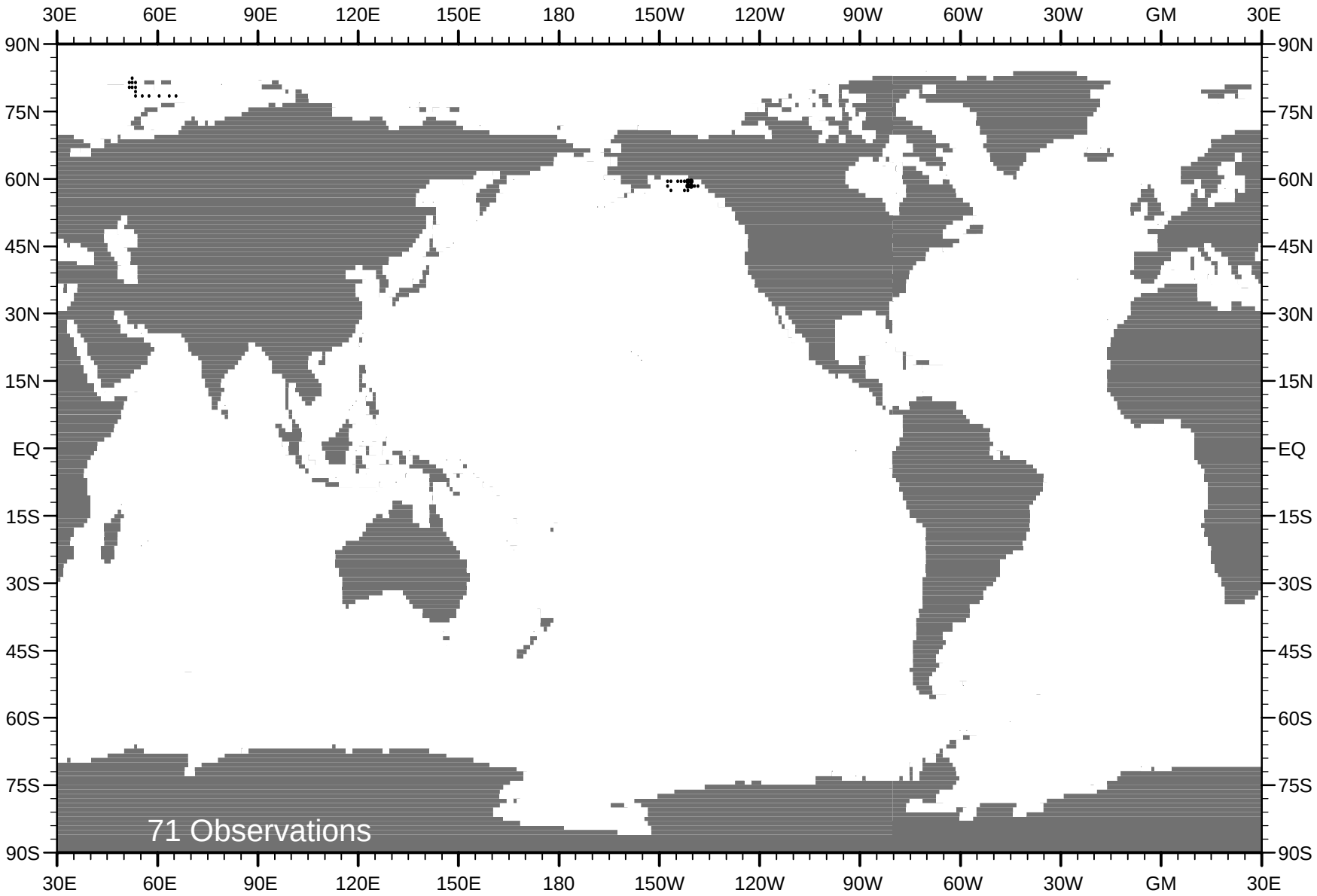


Fig. C8 Distribution of all Ocean Station Data (OSD) plankton abundance data in WOD01 for year 1929 .

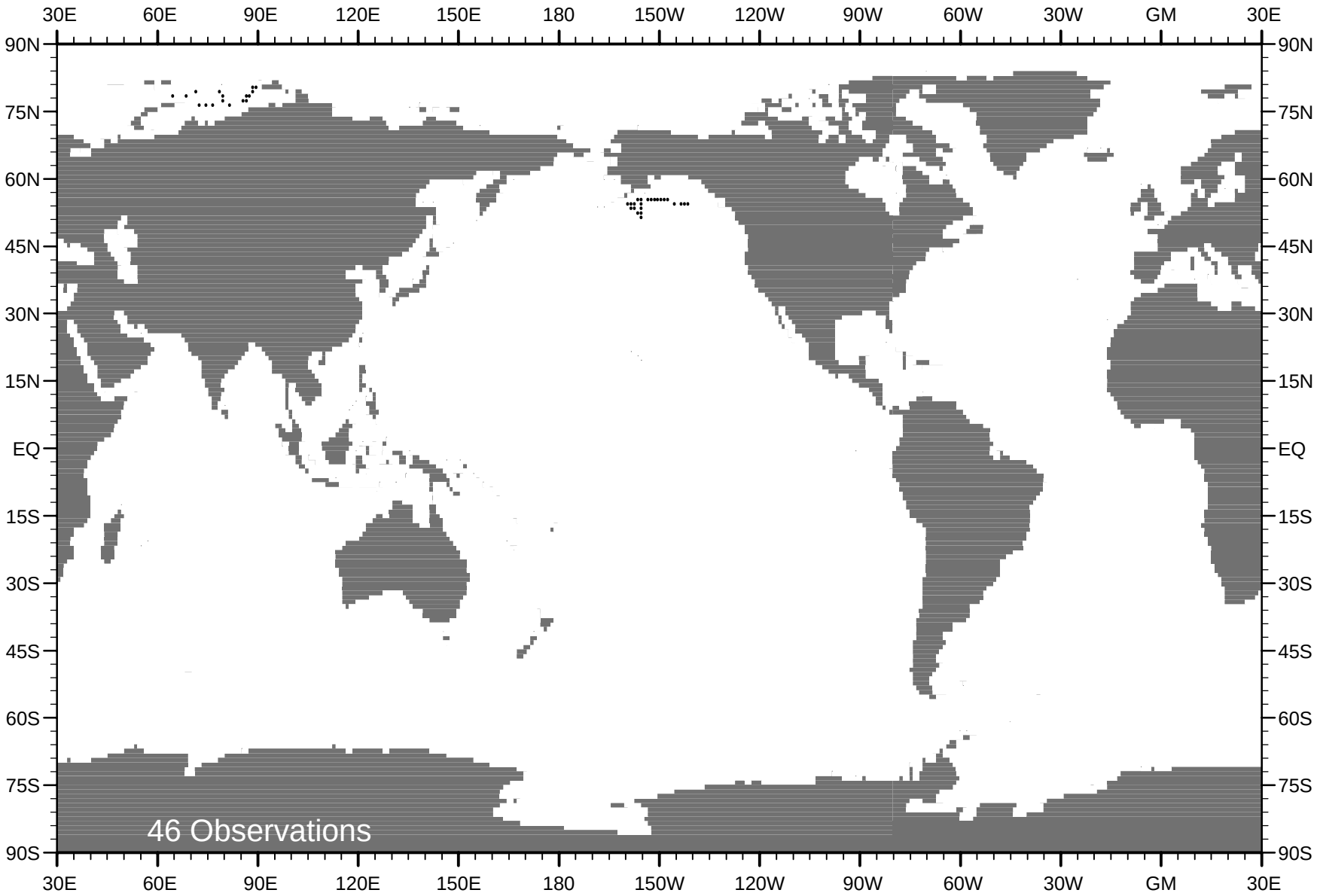


Fig. C9 Distribution of all Ocean Station Data (OSD) plankton abundance data in WOD01 for year 1930 .

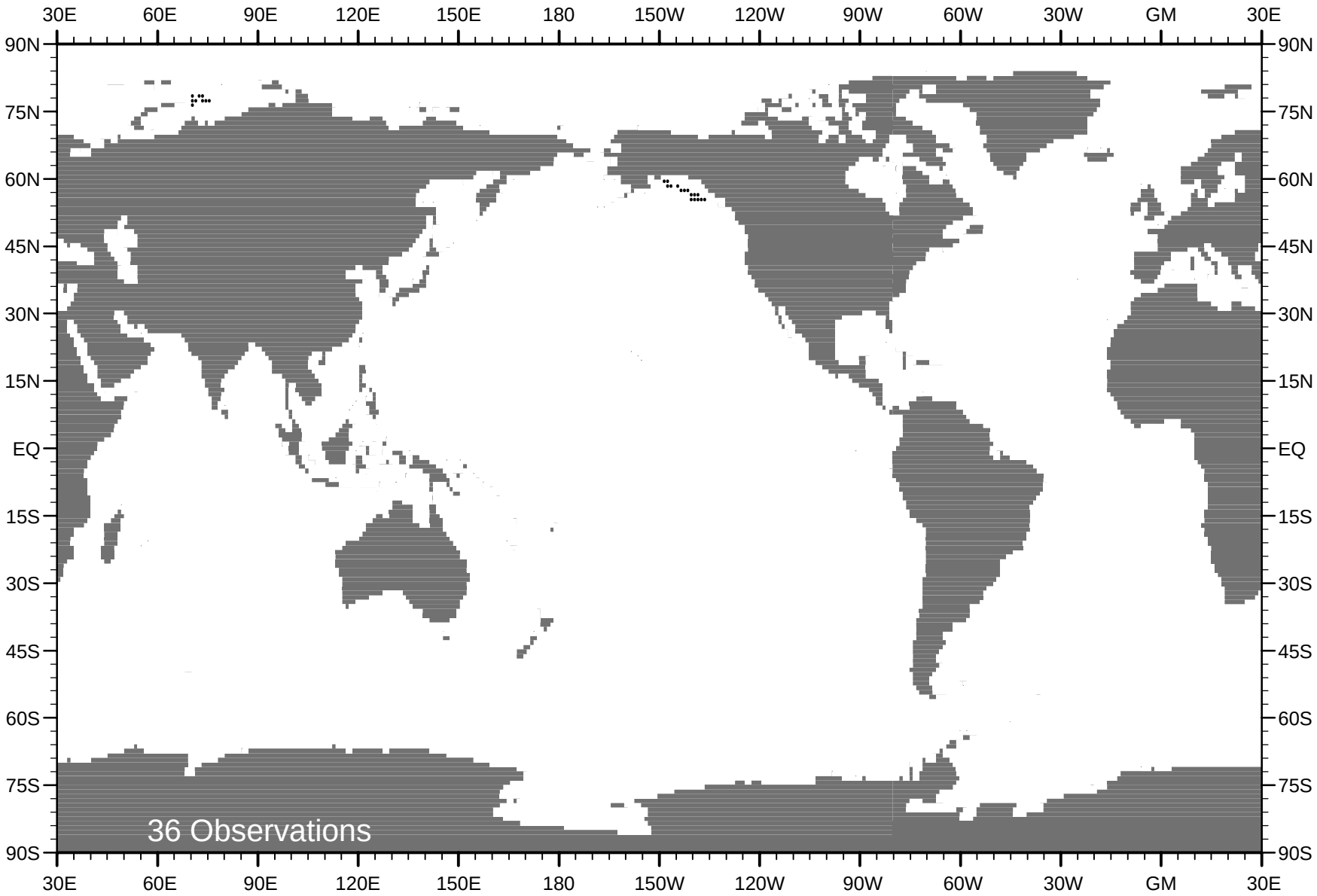


Fig. C10 Distribution of all Ocean Station Data (OSD) plankton abundance data in WOD01 for year 1931 .

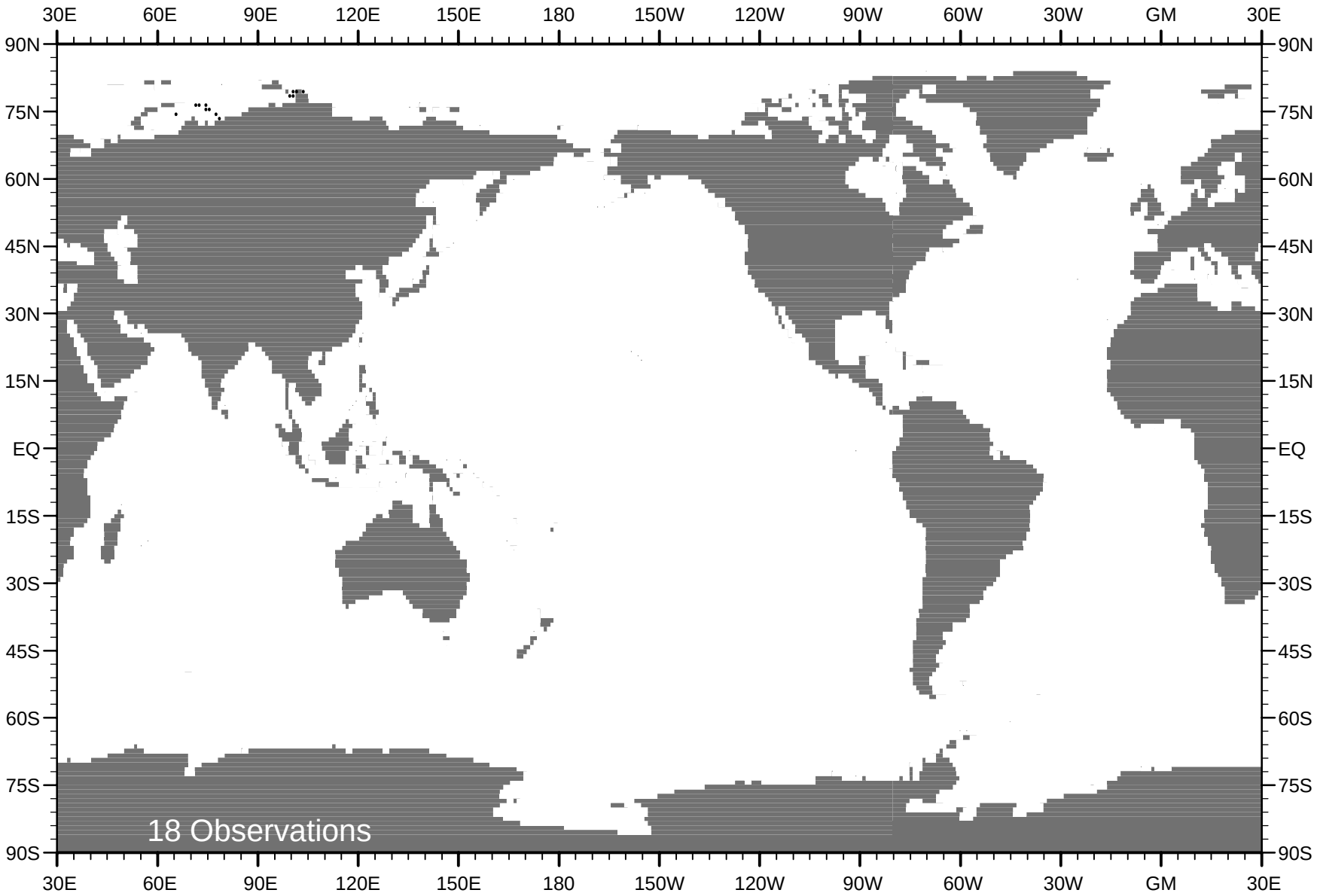


Fig. C11 Distribution of all Ocean Station Data (OSD) plankton abundance data in WOD01 for year 1932 .

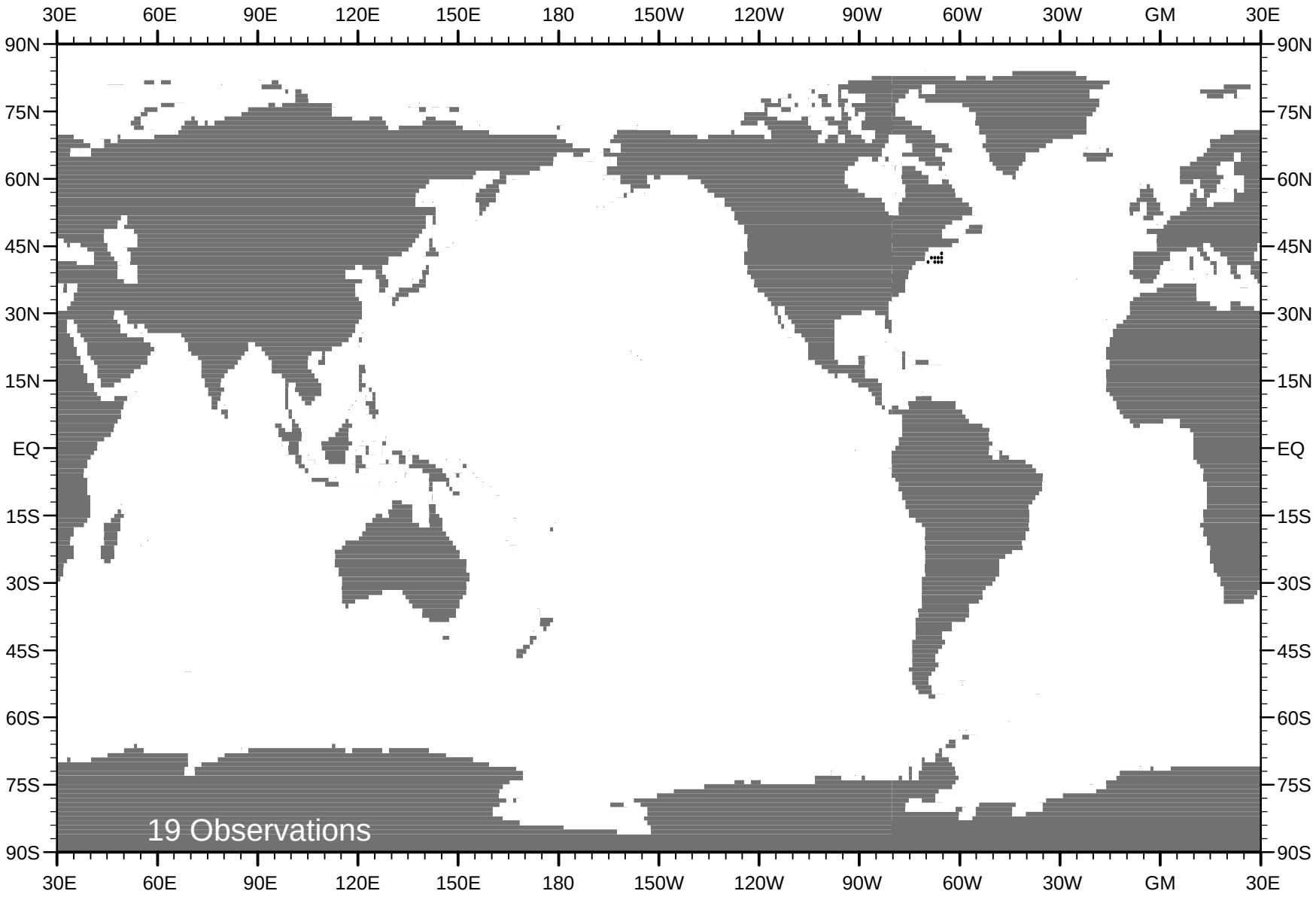


Fig. C12 Distribution of all Ocean Station Data (OSD) plankton abundance data in WOD01 for year 1933 .

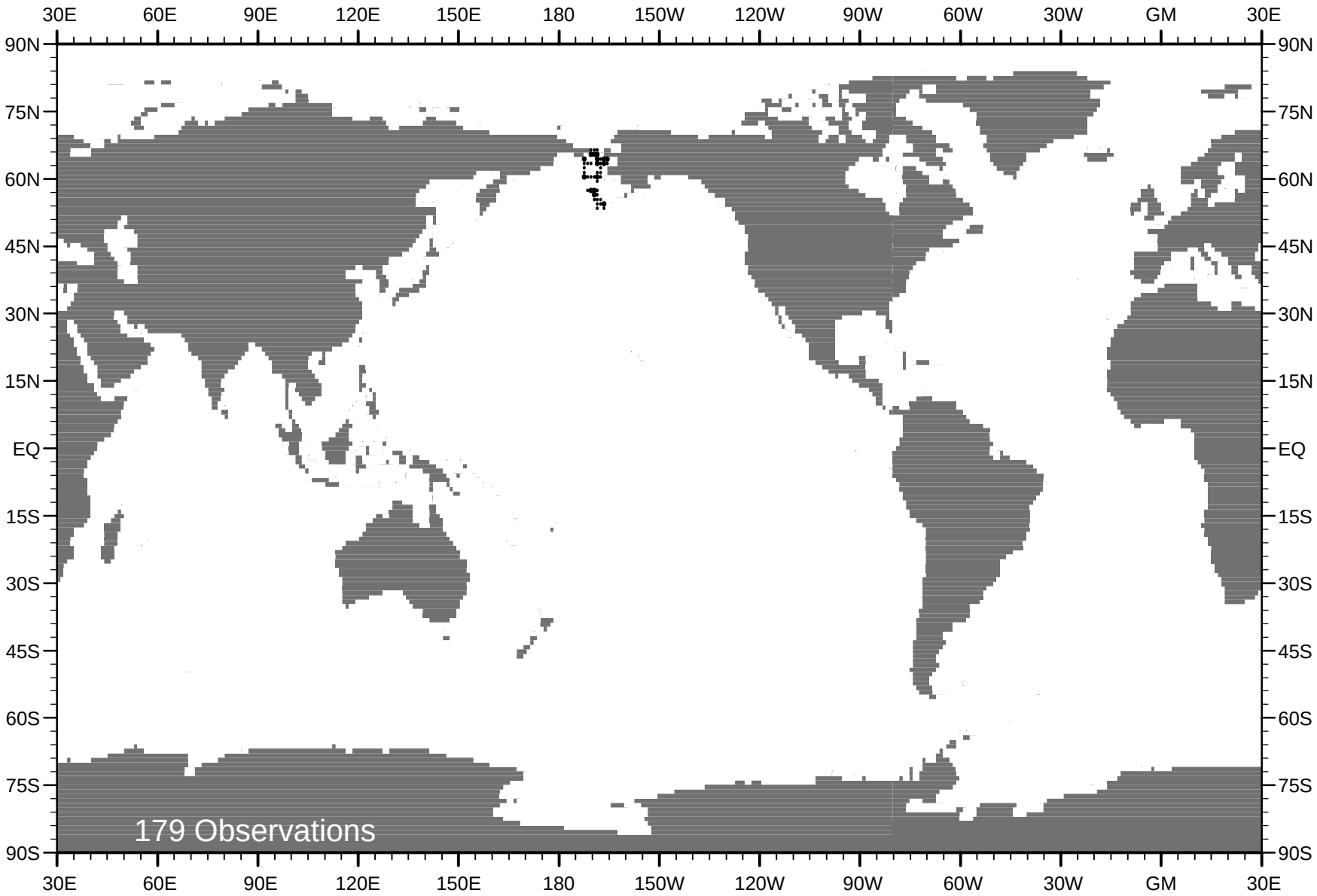


Fig. C13 Distribution of all Ocean Station Data (OSD) plankton abundance data in WOD01 for year 1934 .

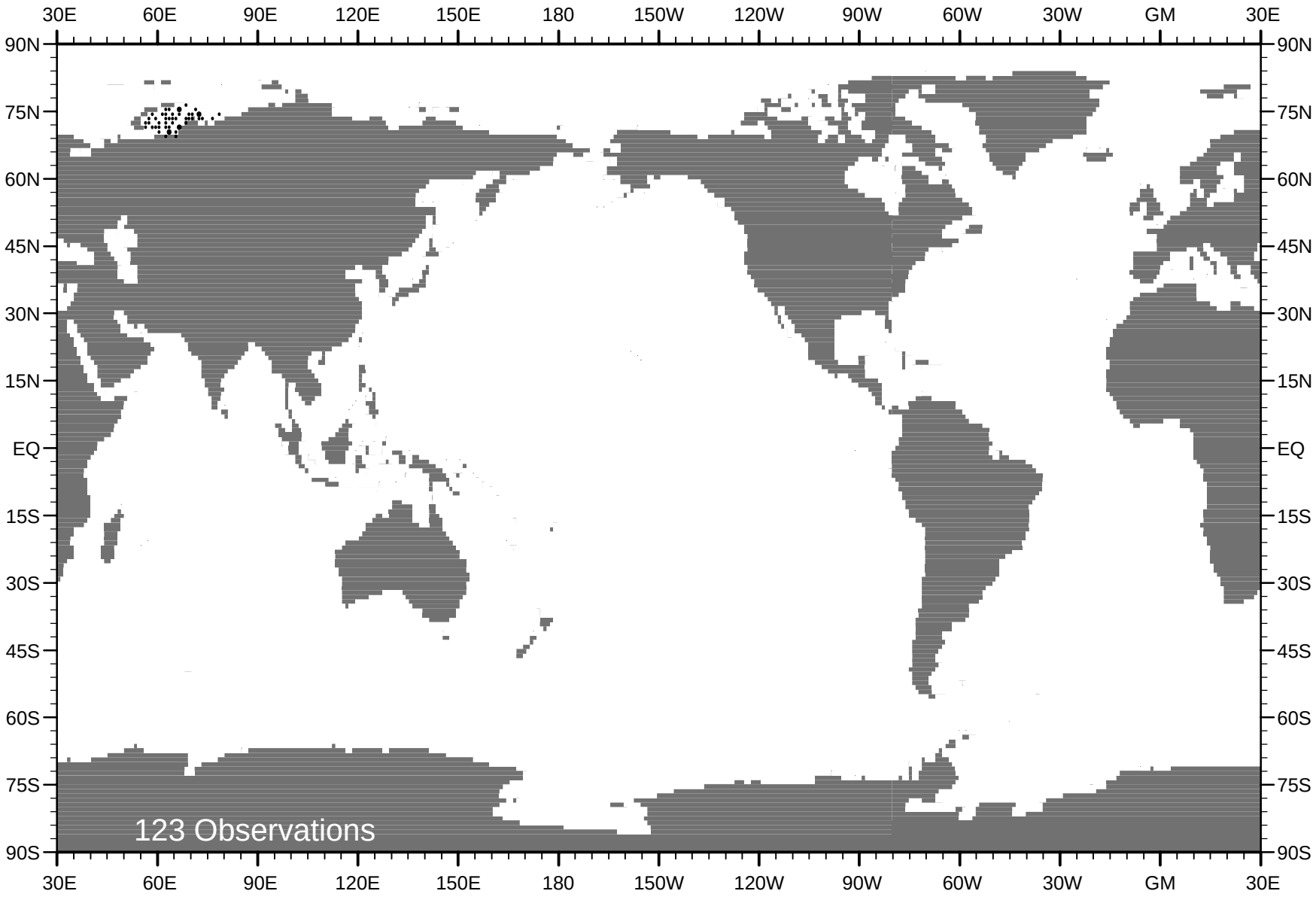


Fig. C14 Distribution of all Ocean Station Data (OSD) plankton abundance data in WOD01 for year 1936 .

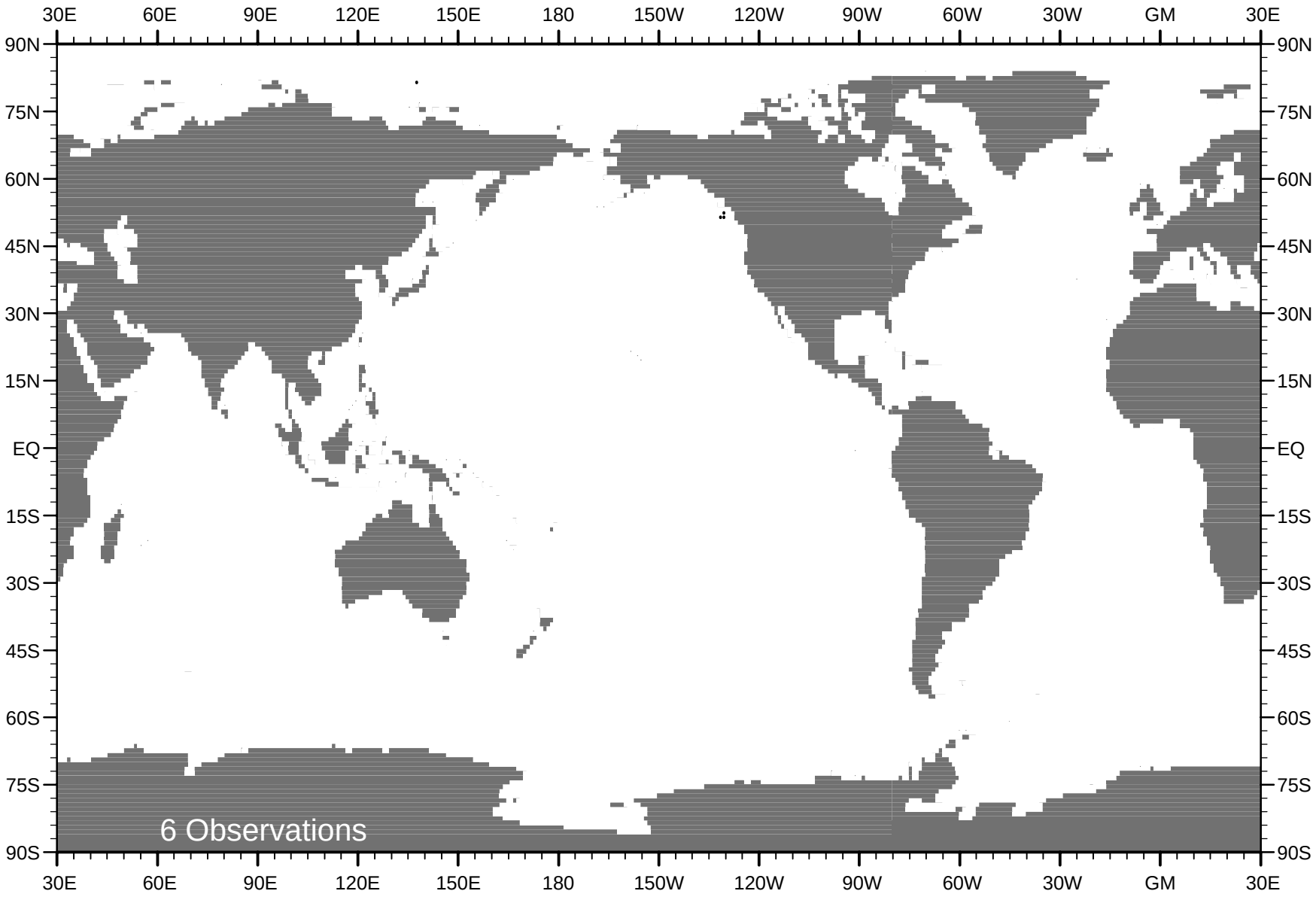


Fig. C15 Distribution of all Ocean Station Data (OSD) plankton abundance data in WOD01 for year 1938 .

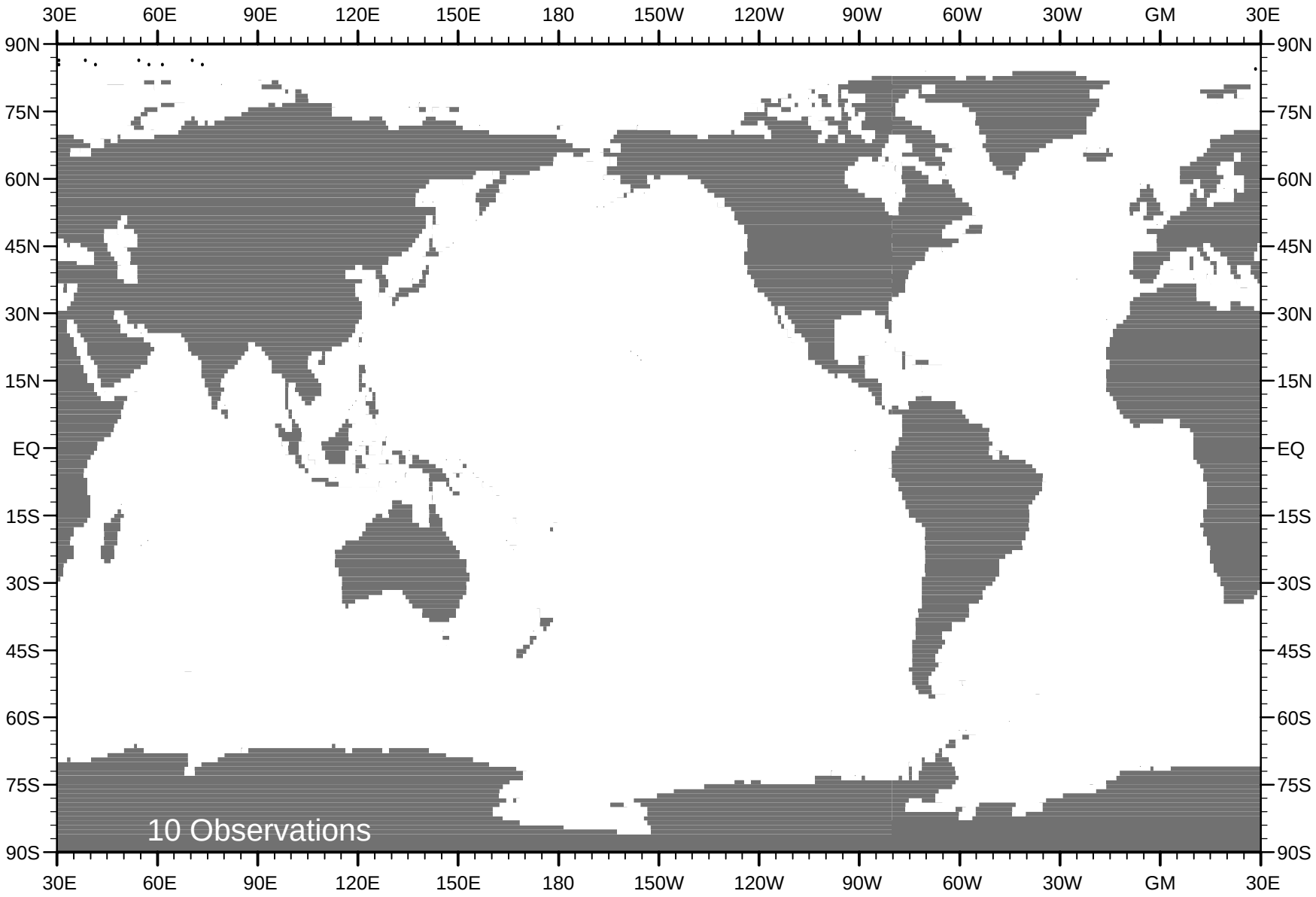


Fig. C16 Distribution of all Ocean Station Data (OSD) plankton abundance data in WOD01 for year 1939 .

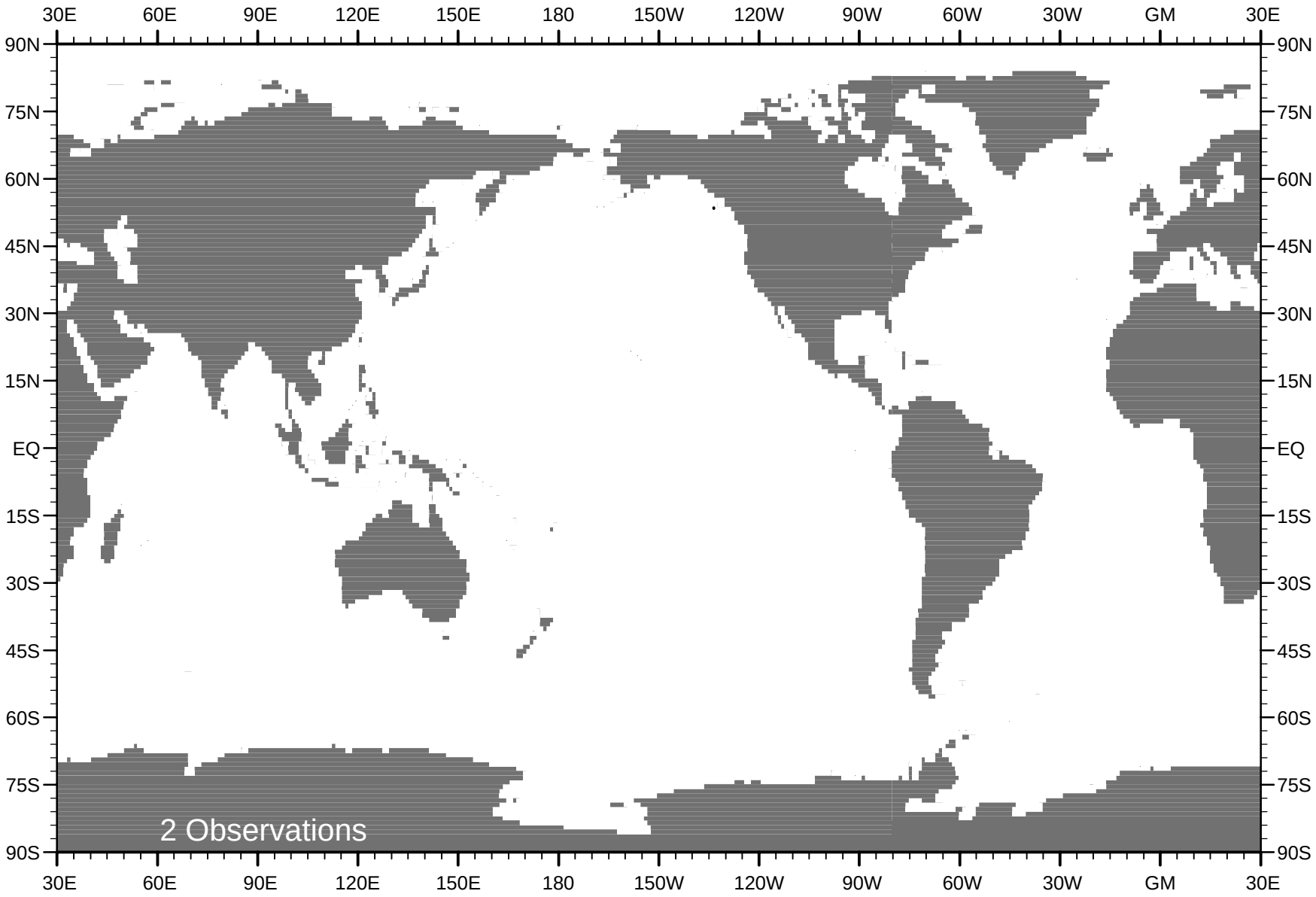


Fig. C17 Distribution of all Ocean Station Data (OSD) plankton abundance data in WOD01 for year 1940 .

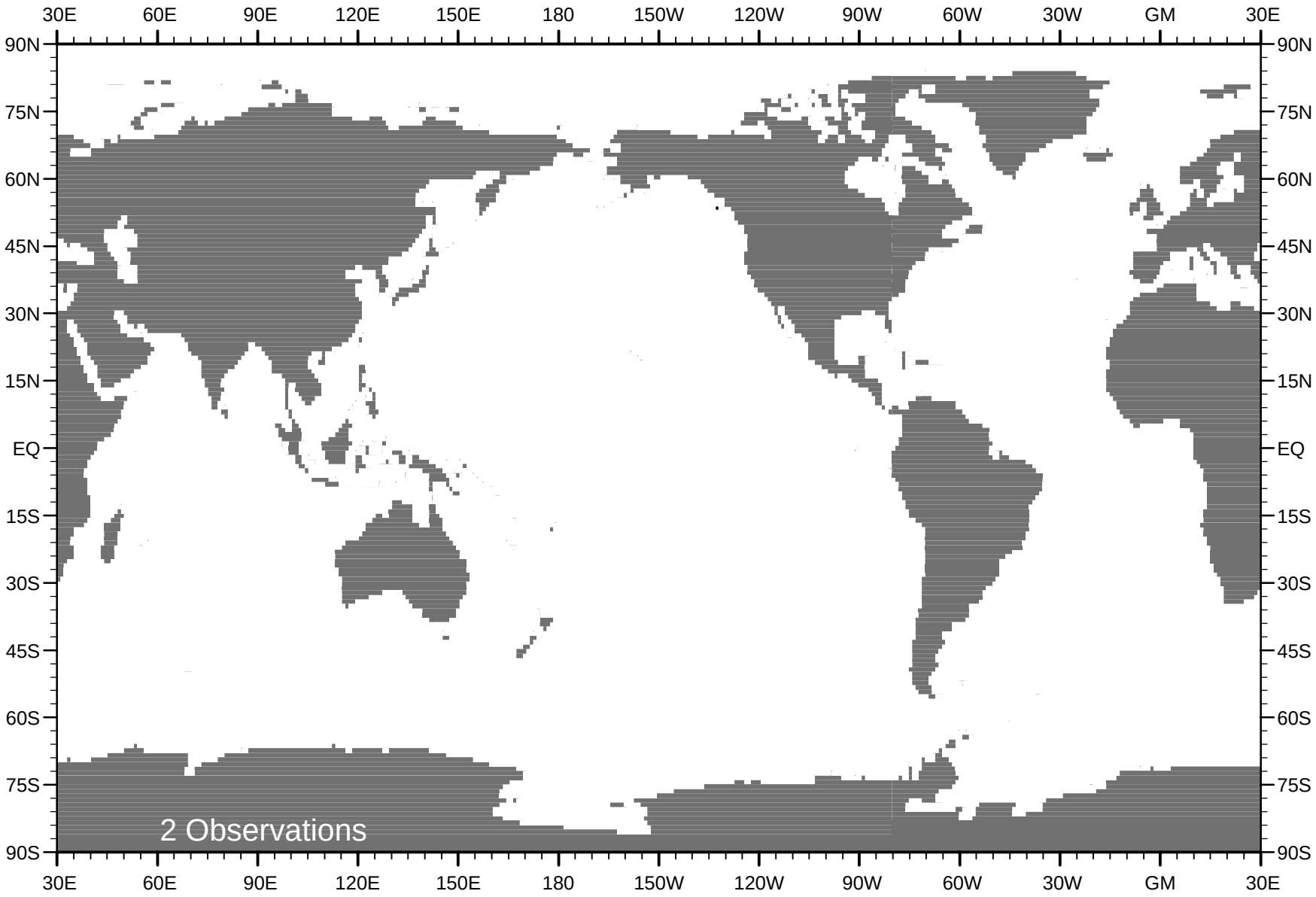


Fig. C18 Distribution of all Ocean Station Data (OSD) plankton abundance data in WOD01 for year 1942 .

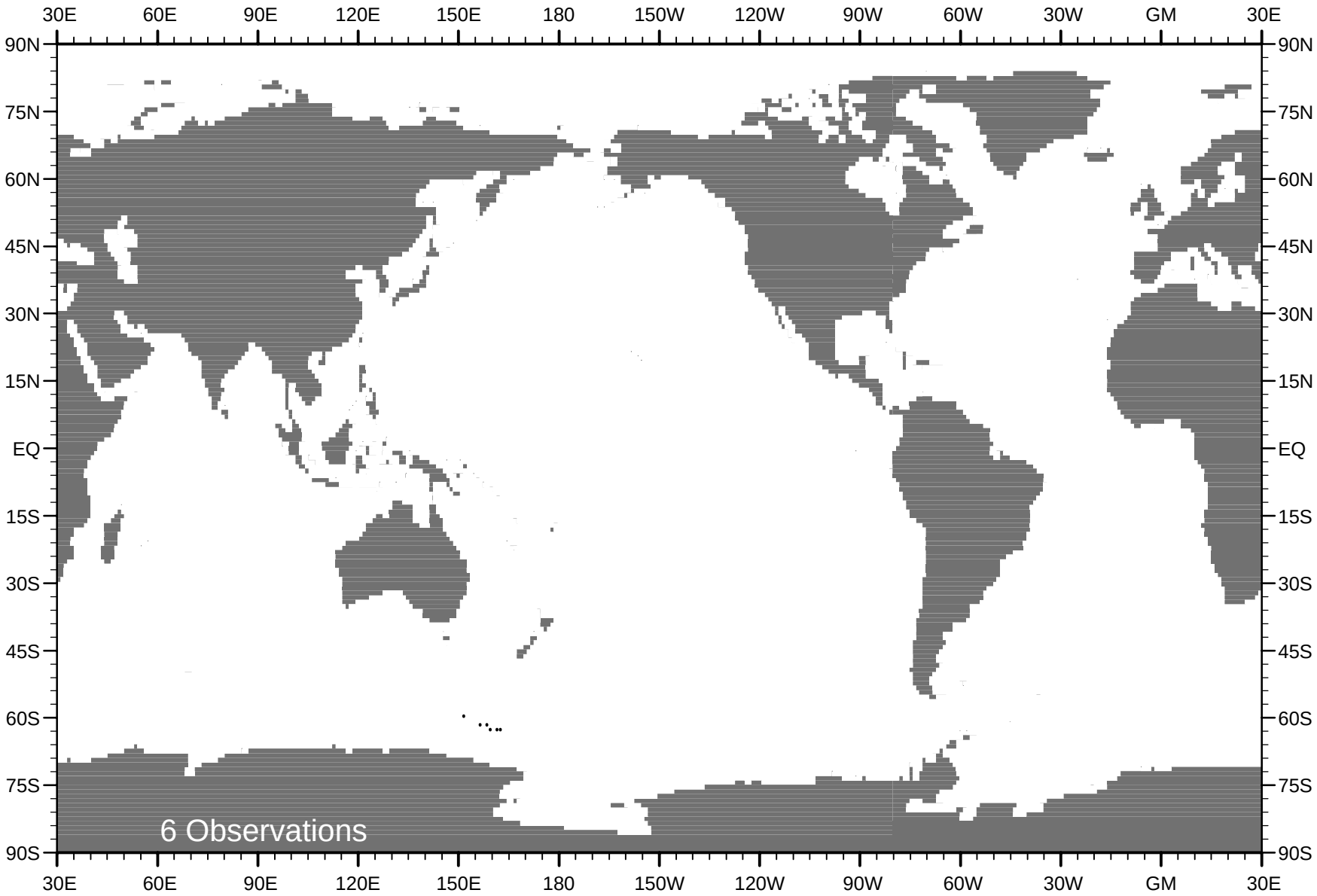


Fig. C19 Distribution of all Ocean Station Data (OSD) plankton abundance data in WOD01 for year 1946 .

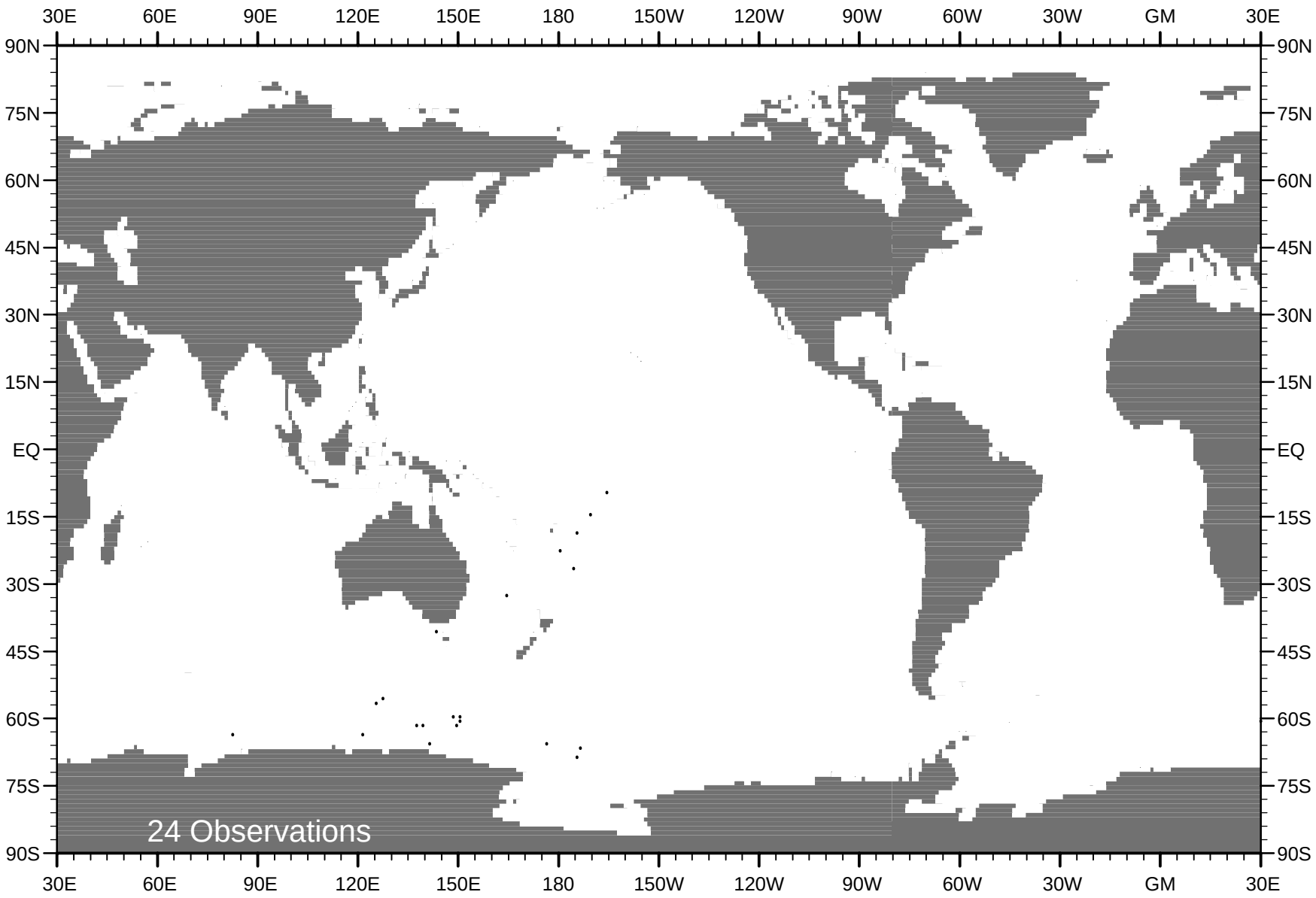


Fig. C20 Distribution of all Ocean Station Data (OSD) plankton abundance data in WOD01 for year 1947 .

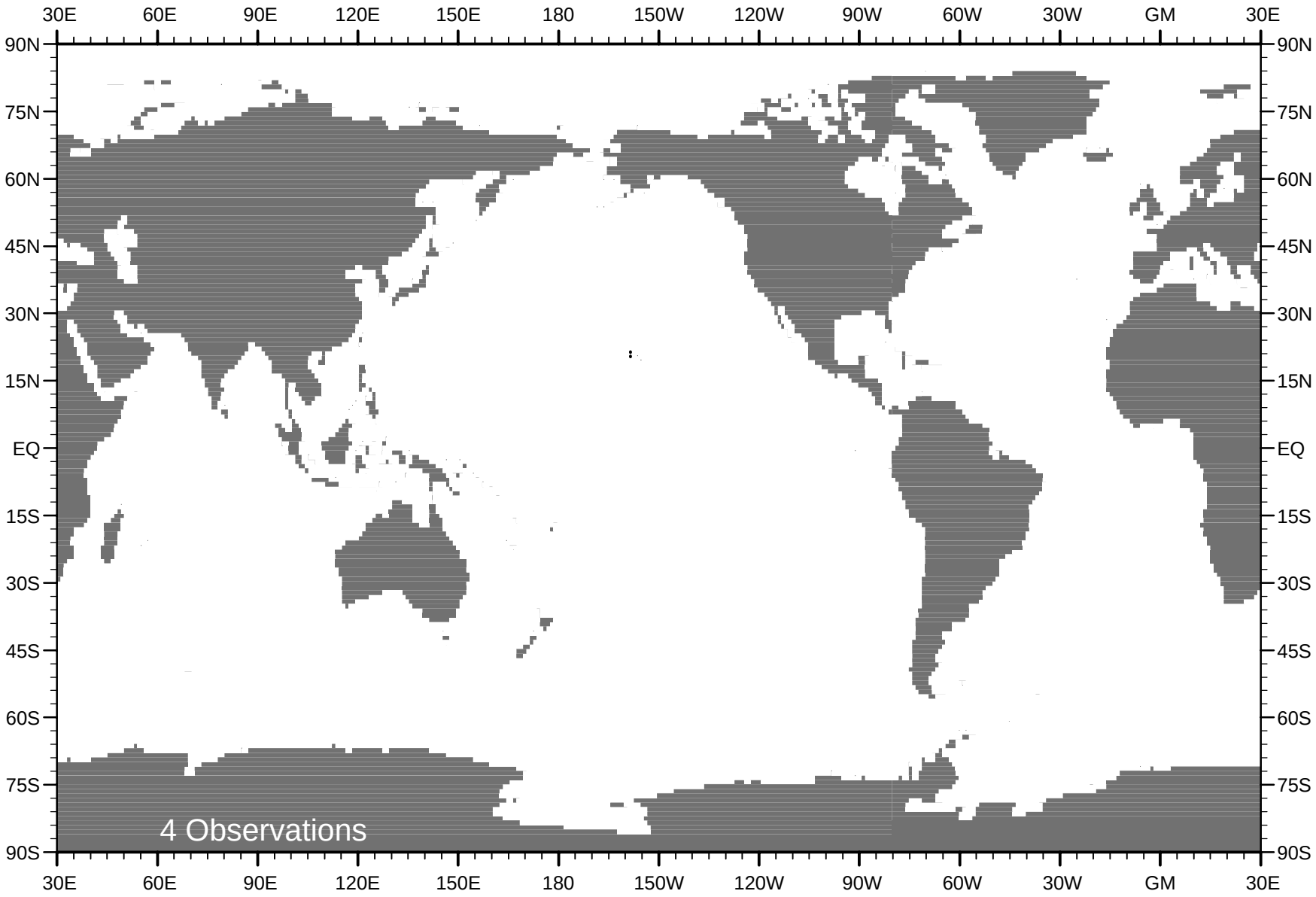


Fig. C21 Distribution of all Ocean Station Data (OSD) plankton abundance data in WOD01 for year 1950 .

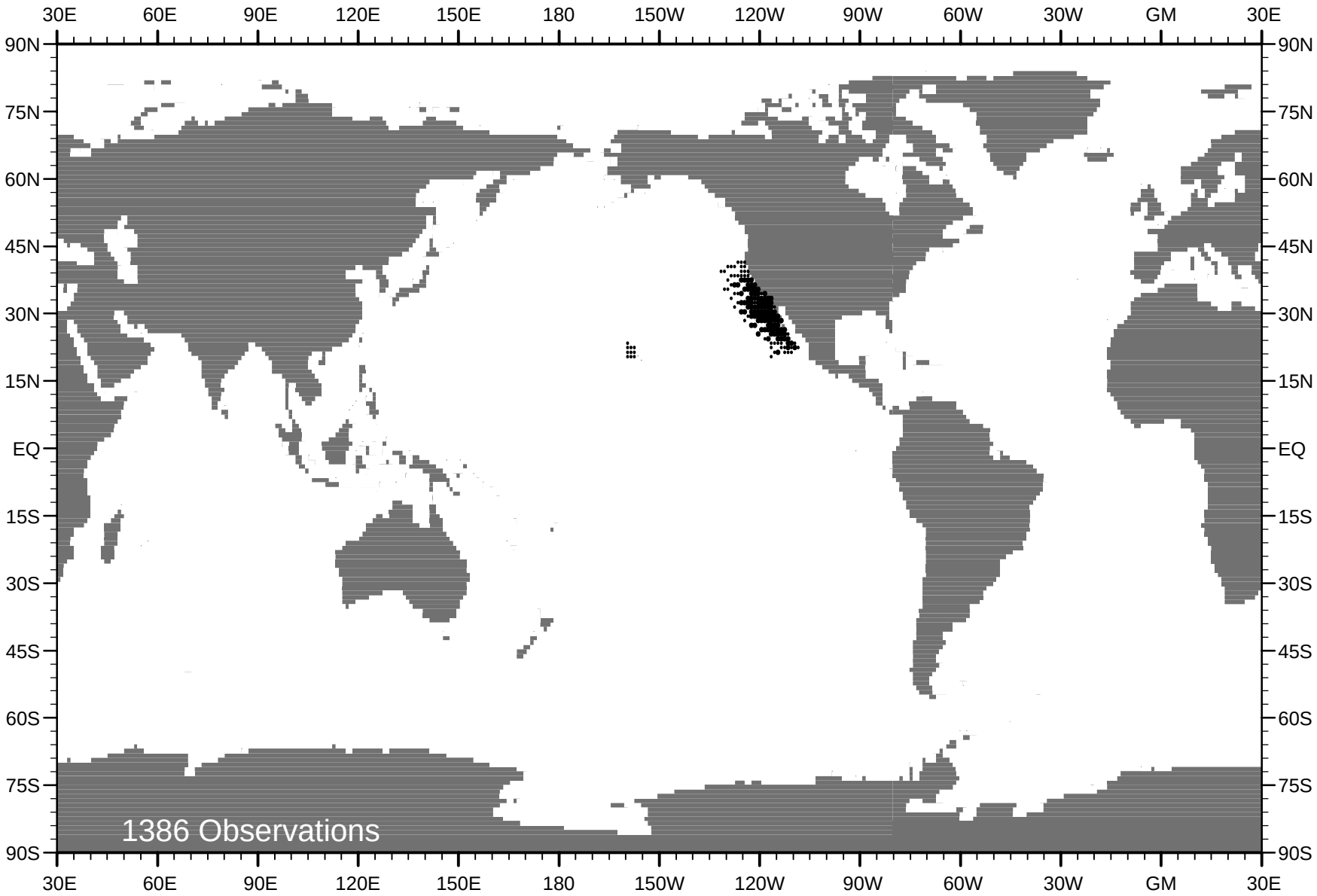


Fig. C22 Distribution of all Ocean Station Data (OSD) plankton abundance data in WOD01 for year 1951 .

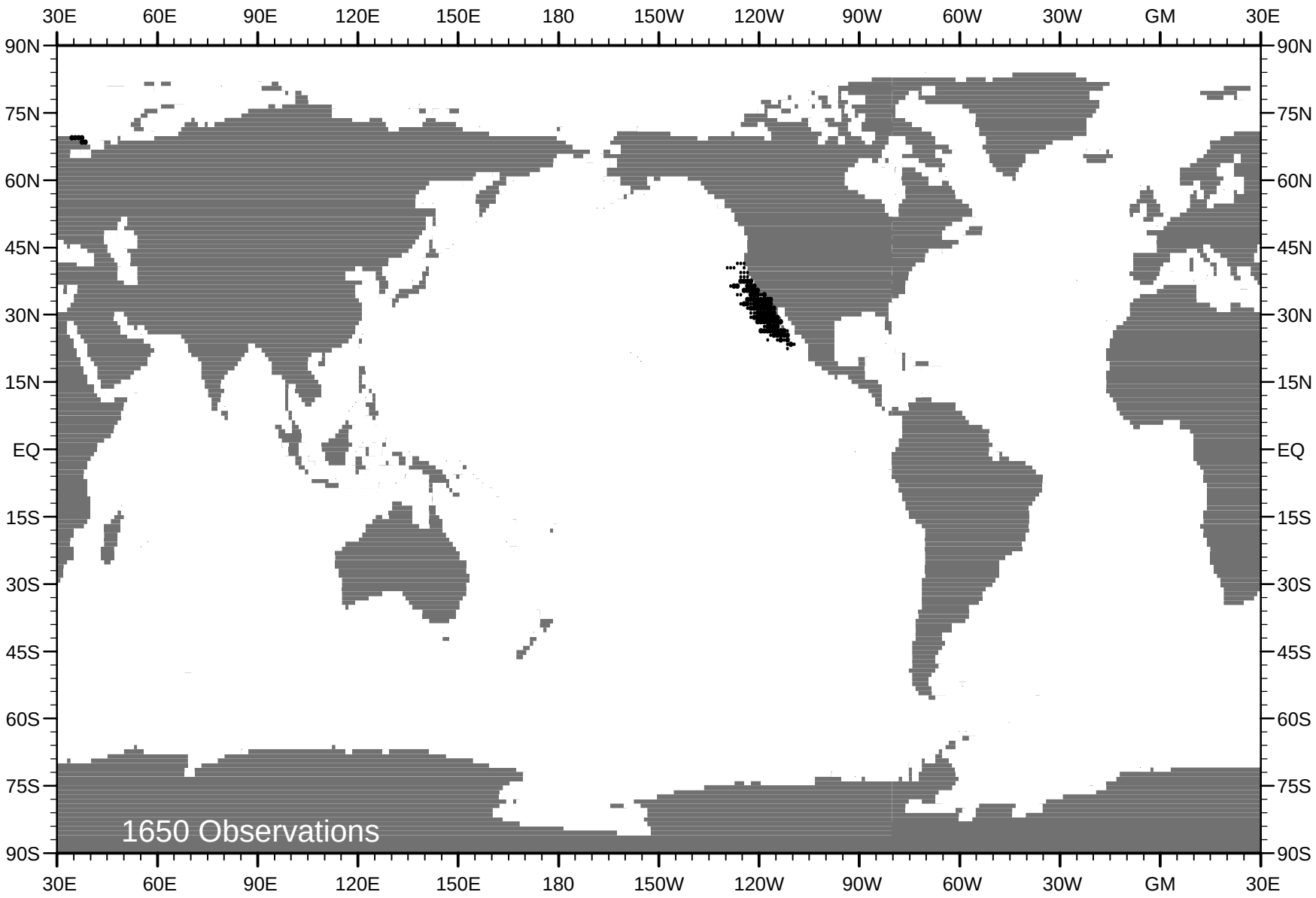


Fig. C23 Distribution of all Ocean Station Data (OSD) plankton abundance data in WOD01 for year 1952 .

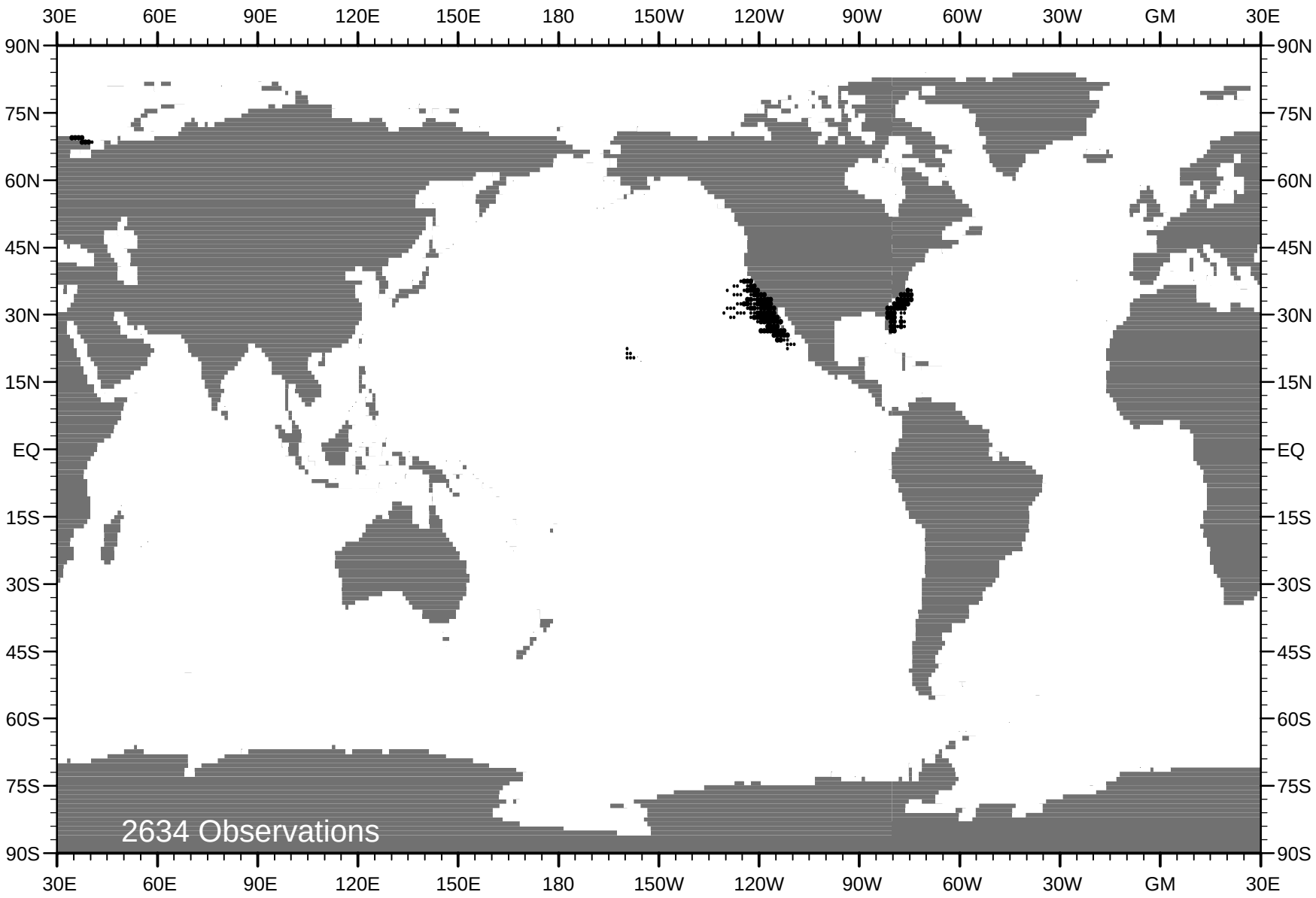


Fig. C24 Distribution of all Ocean Station Data (OSD) plankton abundance data in WOD01 for year 1953 .

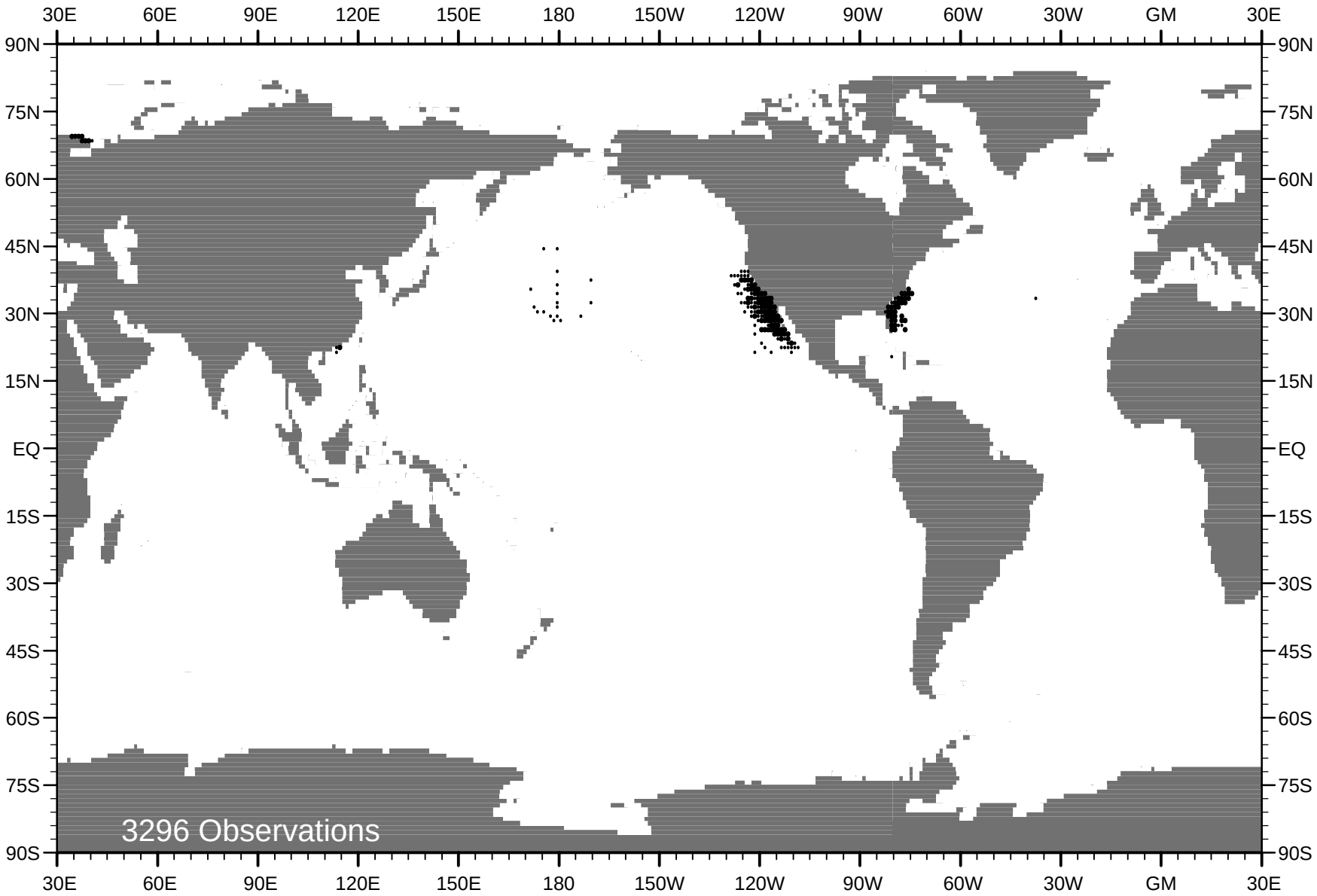


Fig. C25 Distribution of all Ocean Station Data (OSD) plankton abundance data in WOD01 for year 1954 .

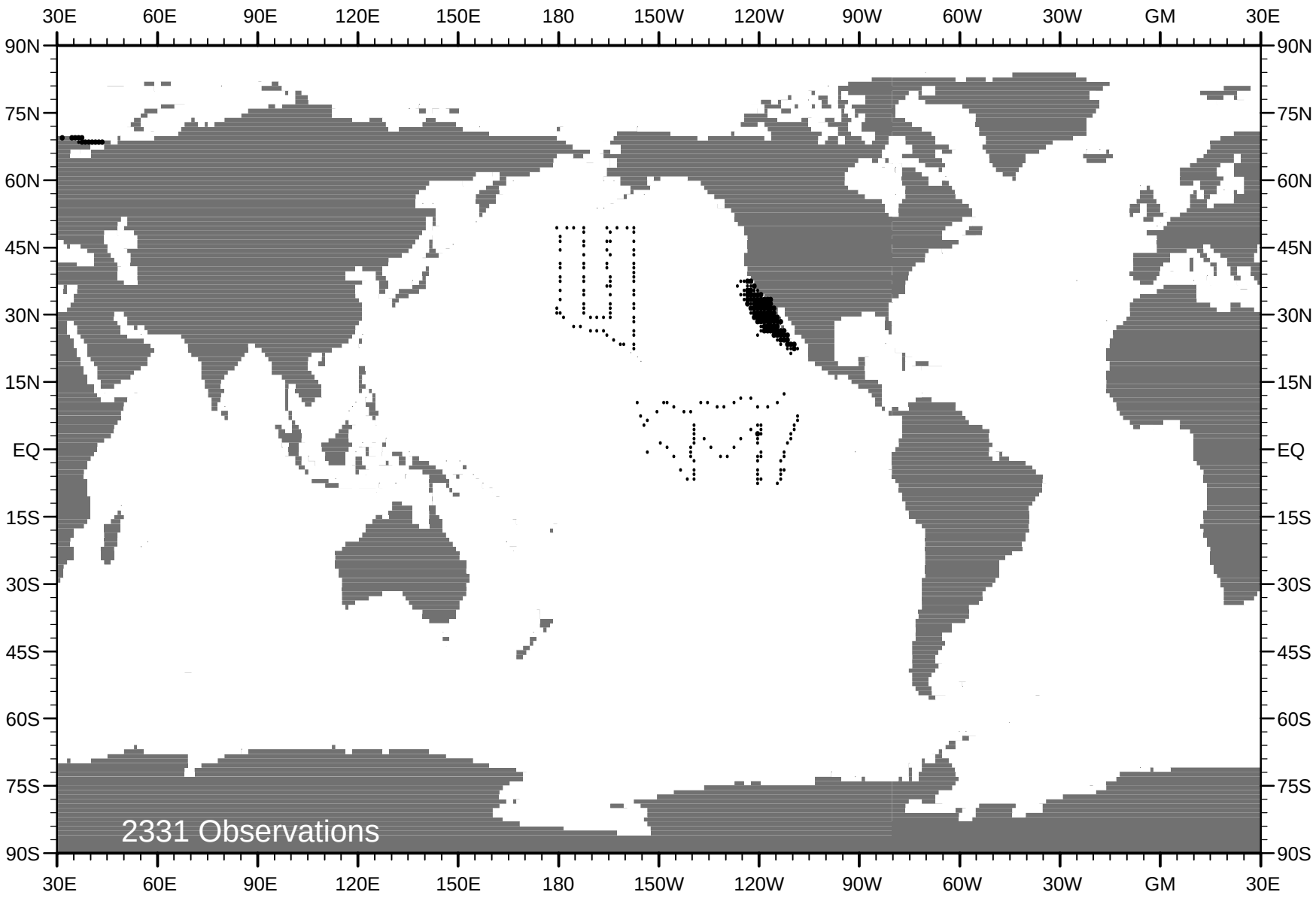


Fig. C26 Distribution of all Ocean Station Data (OSD) plankton abundance data in WOD01 for year 1955 .

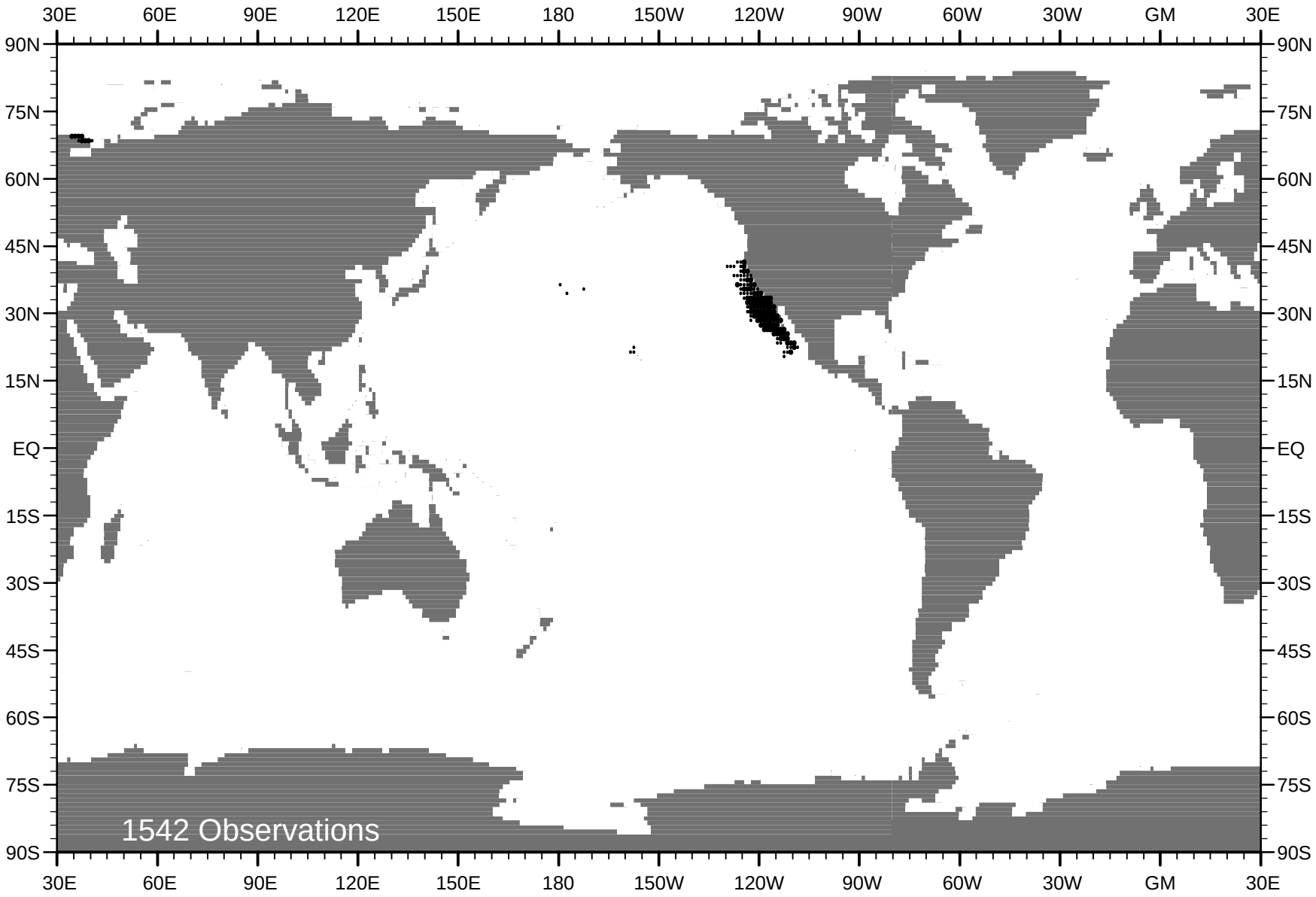


Fig. C27 Distribution of all Ocean Station Data (OSD) plankton abundance data in WOD01 for year 1956 .

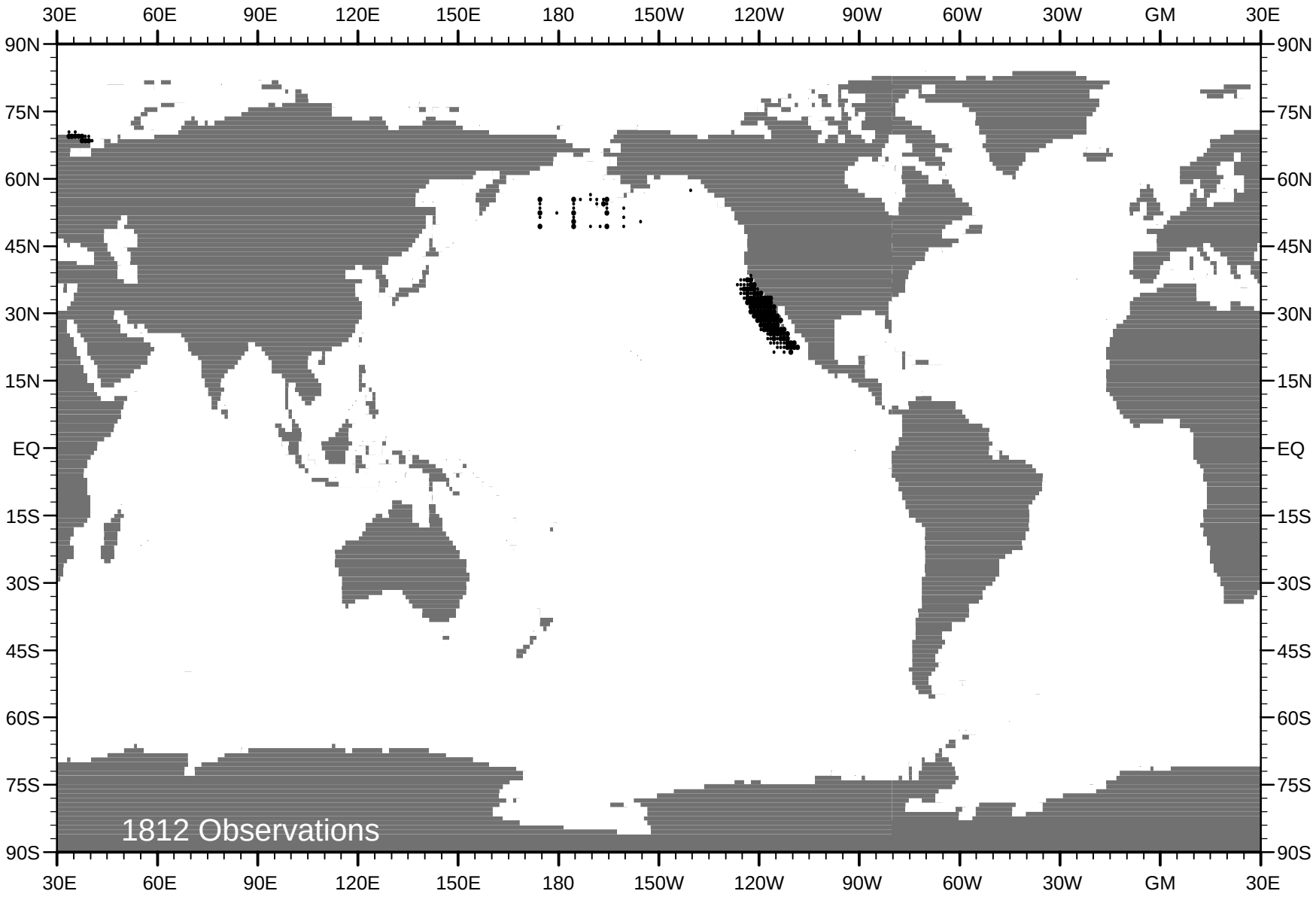


Fig. C28 Distribution of all Ocean Station Data (OSD) plankton abundance data in WOD01 for year 1957 .

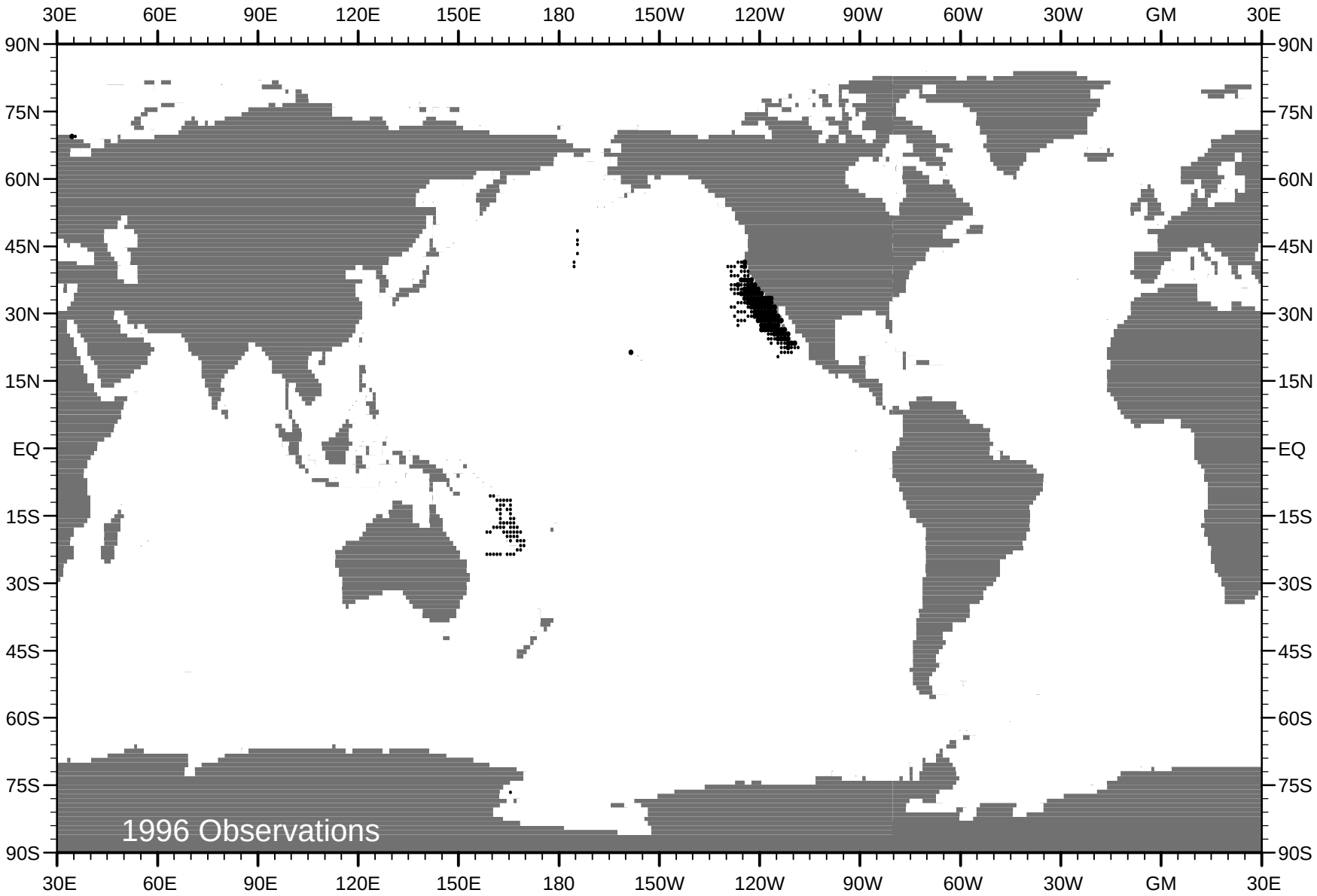


Fig. C29 Distribution of all Ocean Station Data (OSD) plankton abundance data in WOD01 for year 1958 .

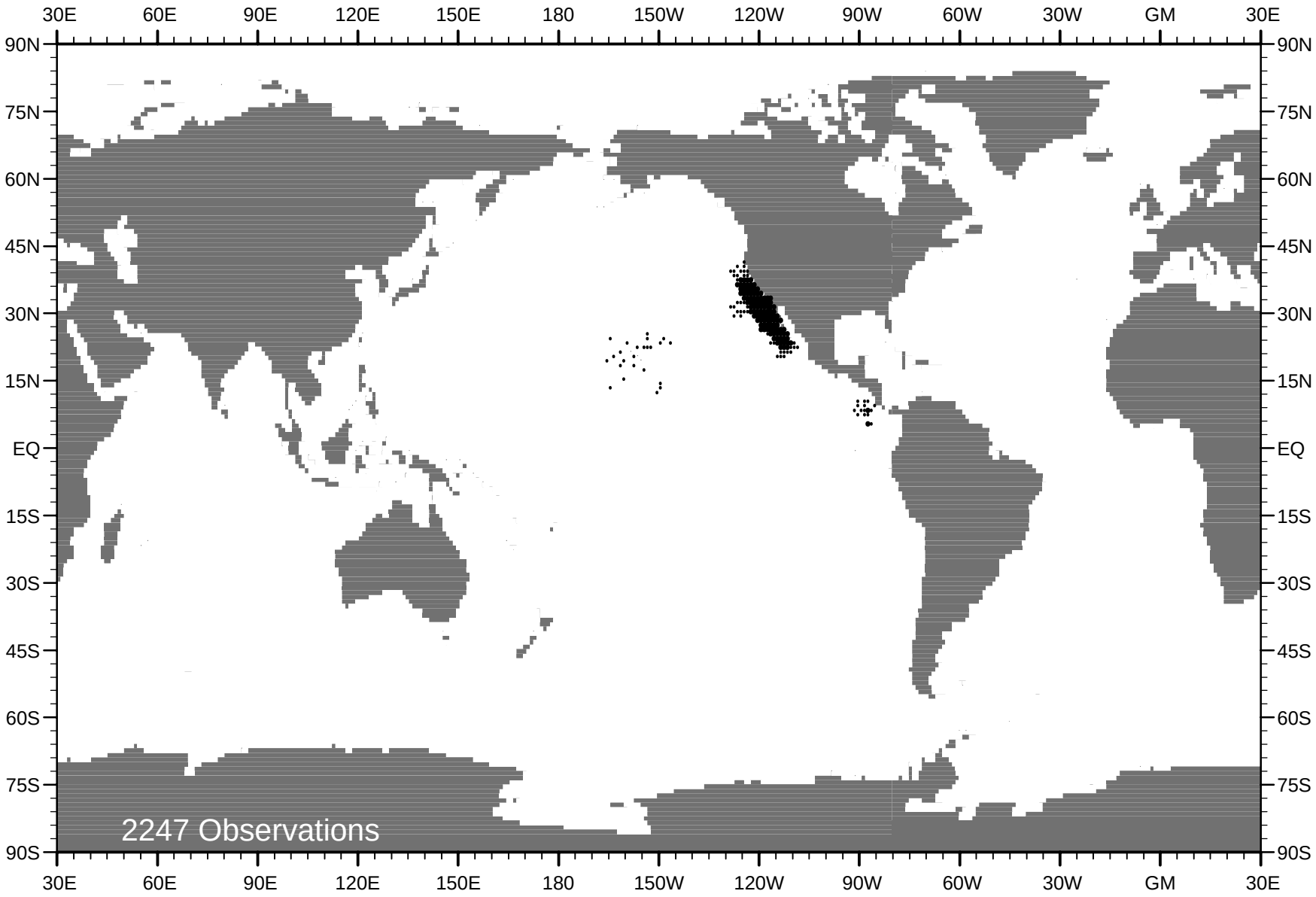


Fig. C30 Distribution of all Ocean Station Data (OSD) plankton abundance data in WOD01 for year 1959 .

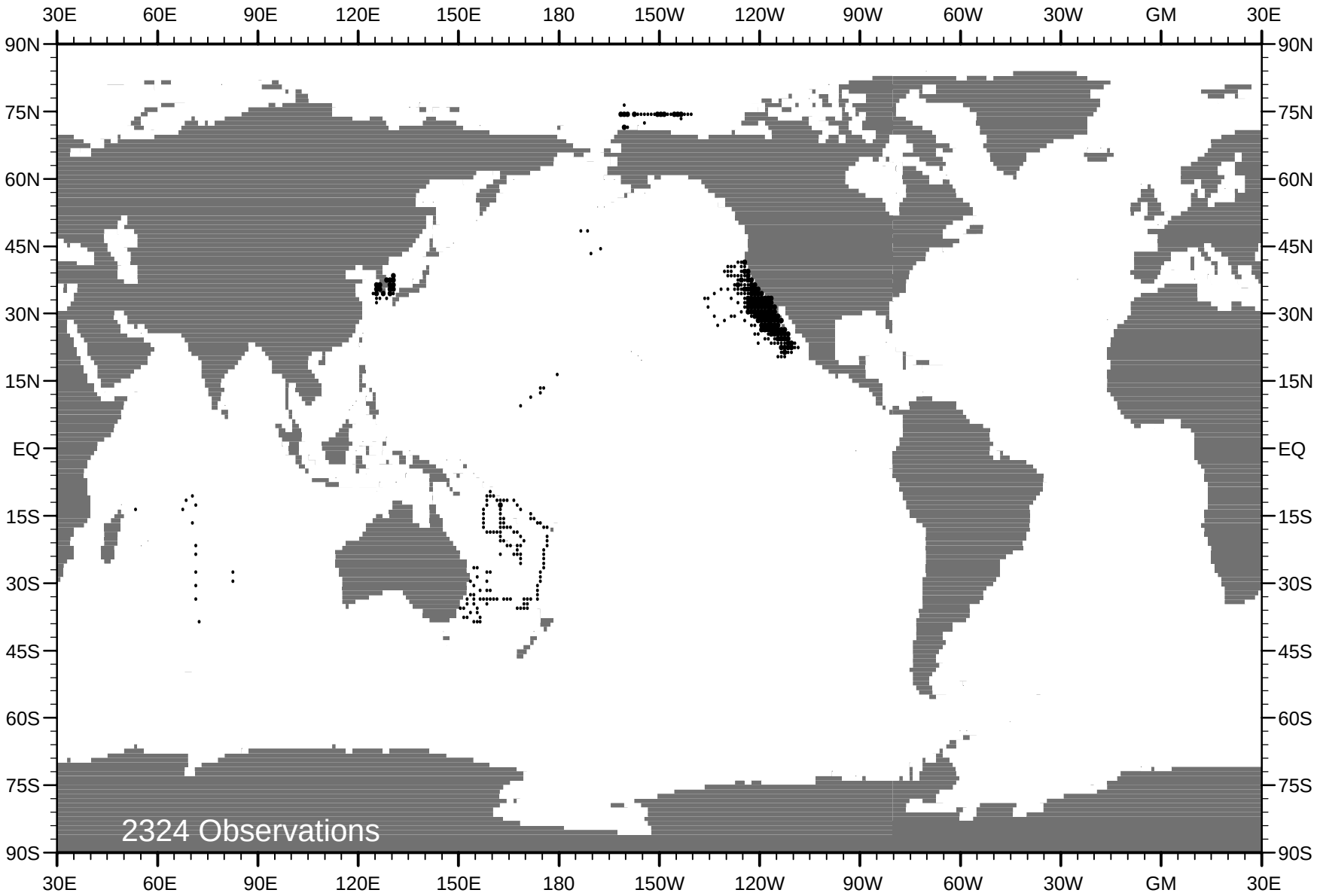


Fig. C31 Distribution of all Ocean Station Data (OSD) plankton abundance data in WOD01 for year 1960 .

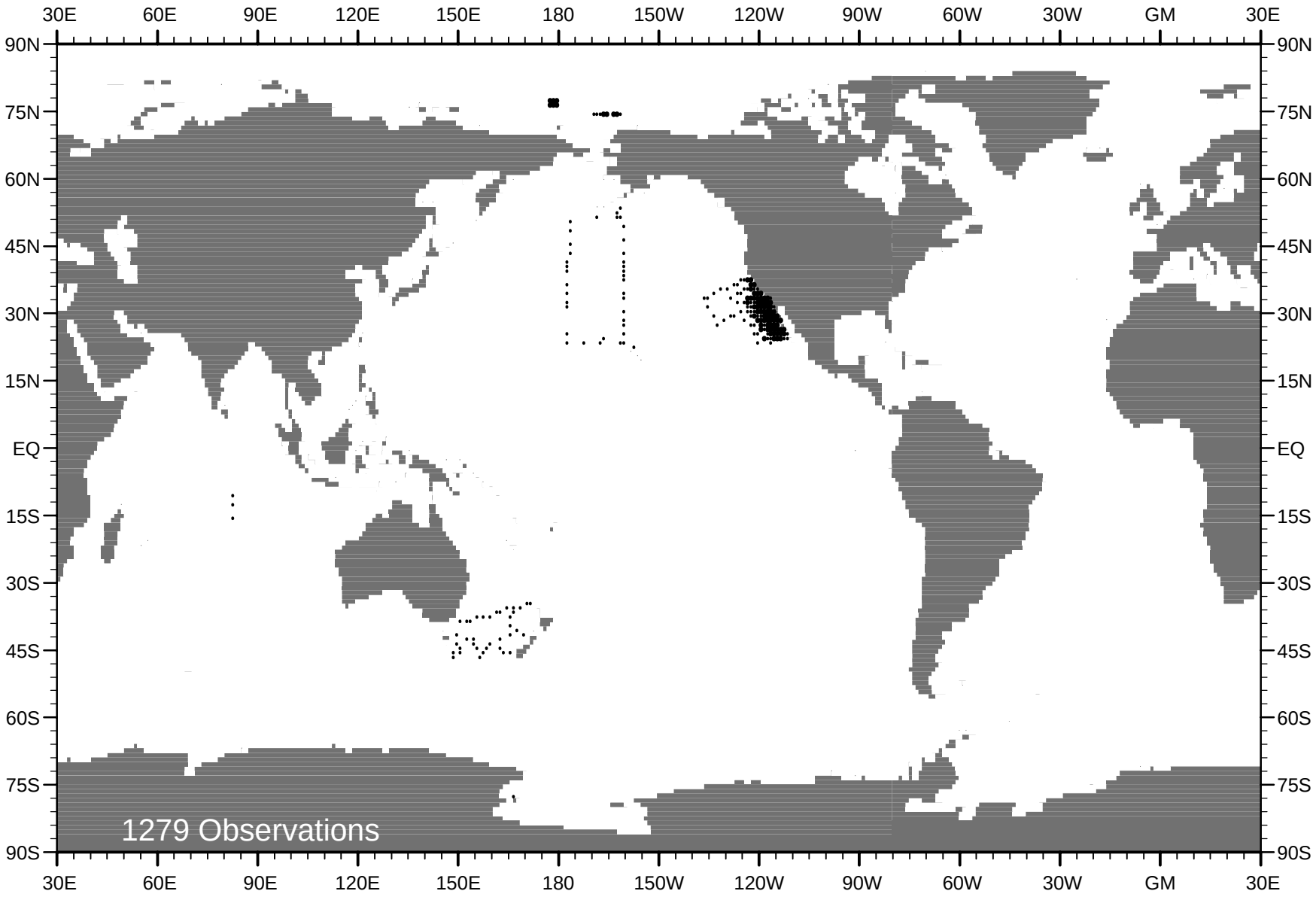


Fig. C32 Distribution of all Ocean Station Data (OSD) plankton abundance data in WOD01 for year 1961 .

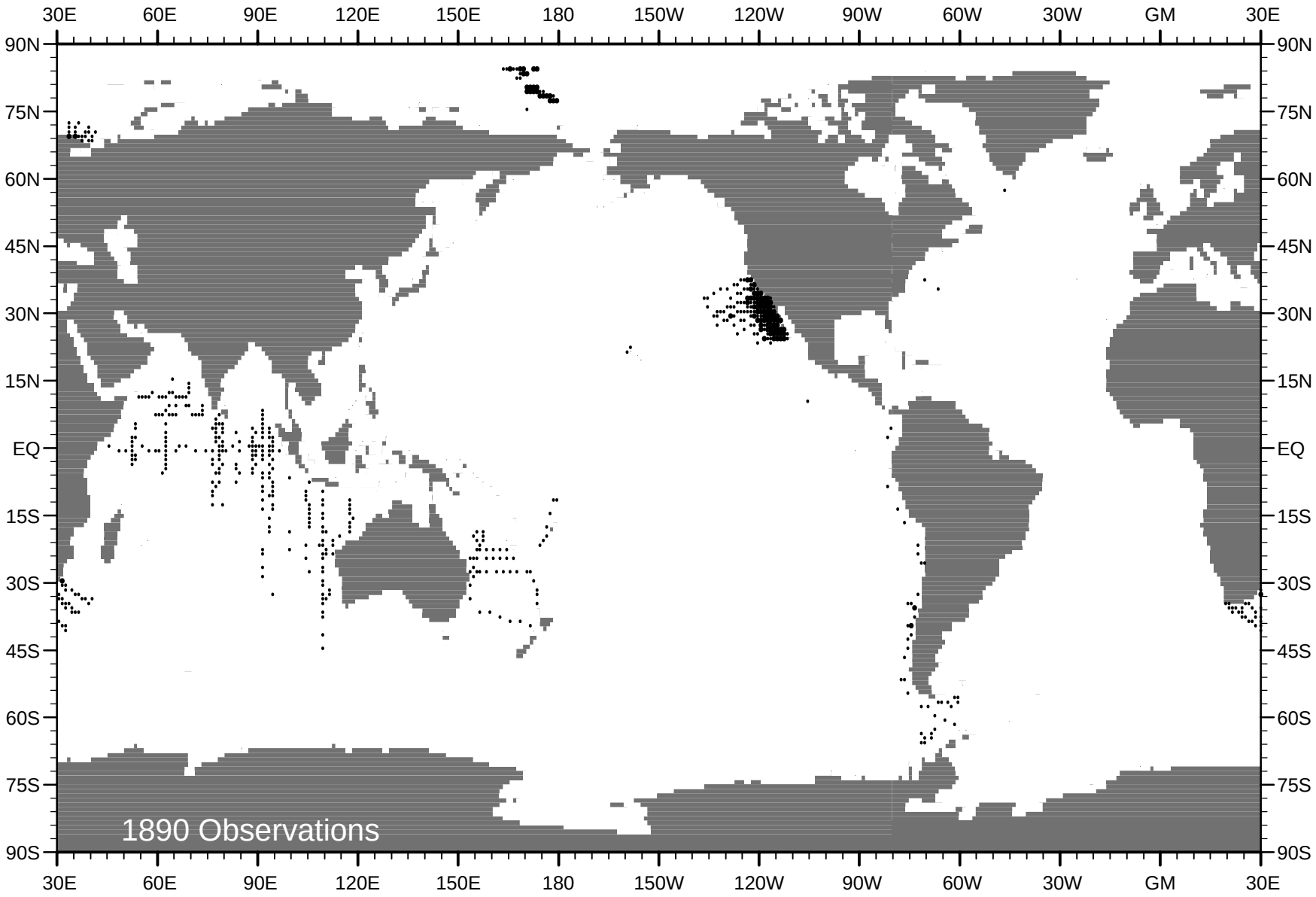


Fig. C33 Distribution of all Ocean Station Data (OSD) plankton abundance data in WOD01 for year 1962 .

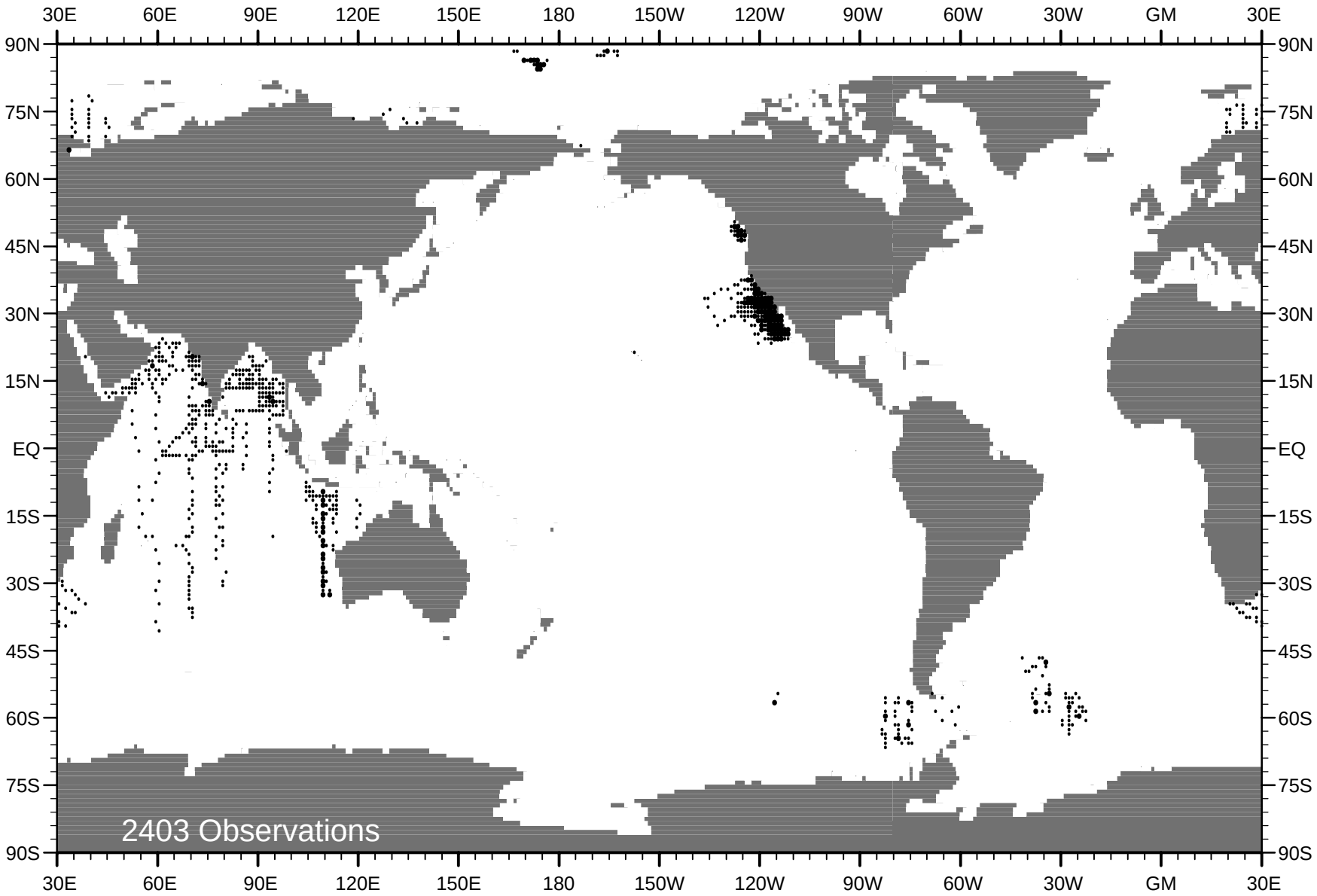


Fig. C34 Distribution of all Ocean Station Data (OSD) plankton abundance data in WOD01 for year 1963 .

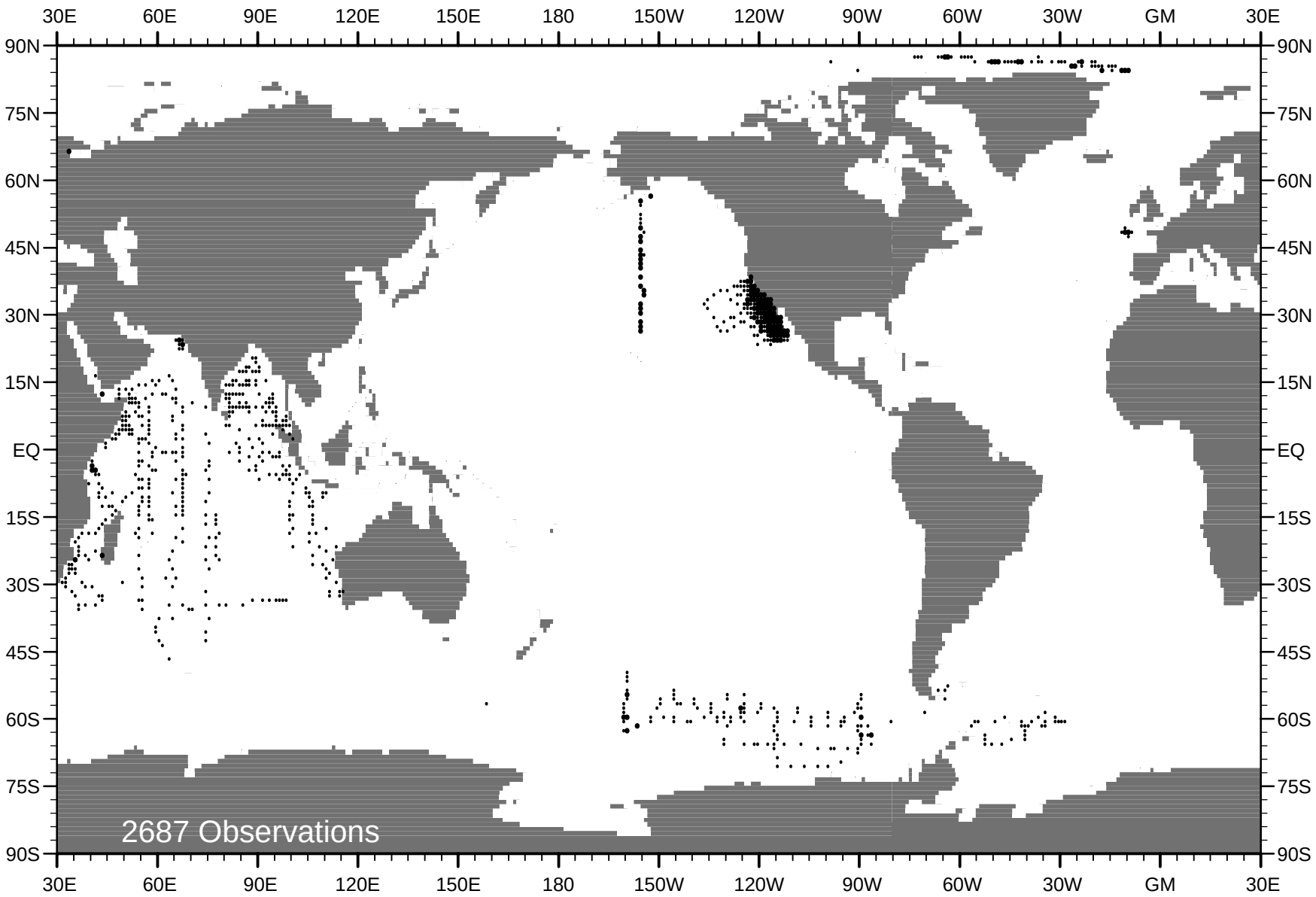


Fig. C35 Distribution of all Ocean Station Data (OSD) plankton abundance data in WOD01 for year 1964 .

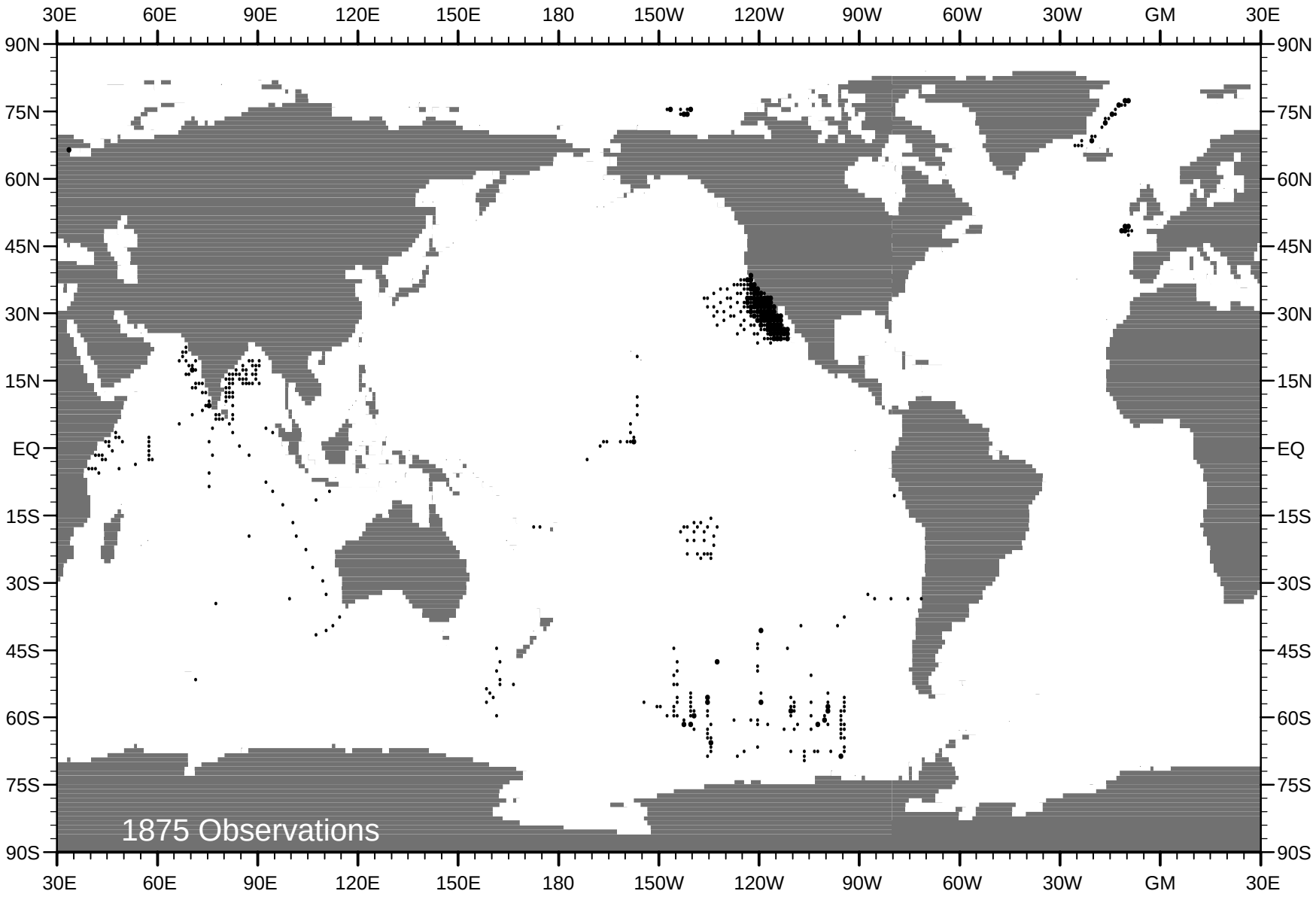


Fig. C36 Distribution of all Ocean Station Data (OSD) plankton abundance data in WOD01 for year 1965 .

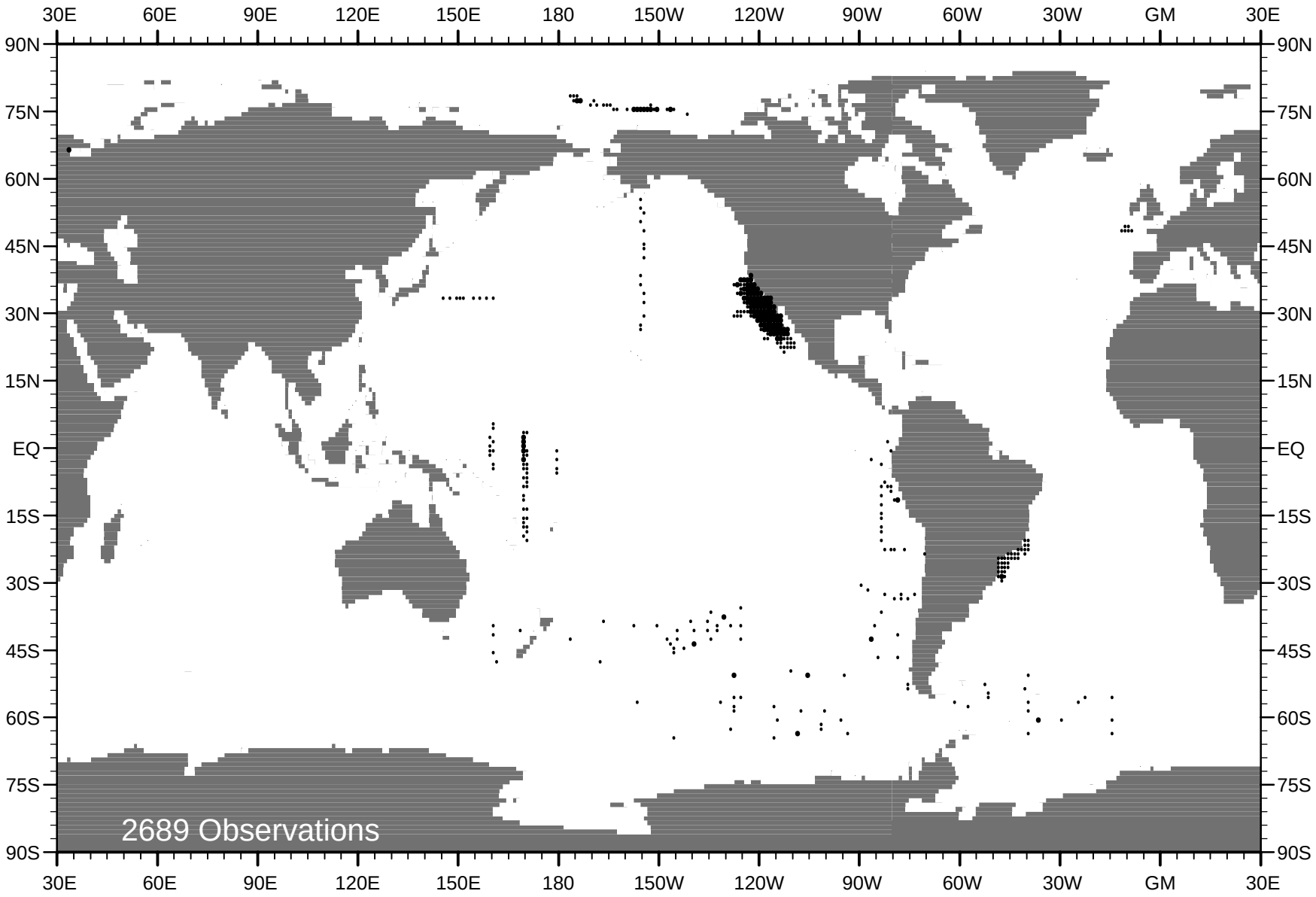


Fig. C37 Distribution of all Ocean Station Data (OSD) plankton abundance data in WOD01 for year 1966 .

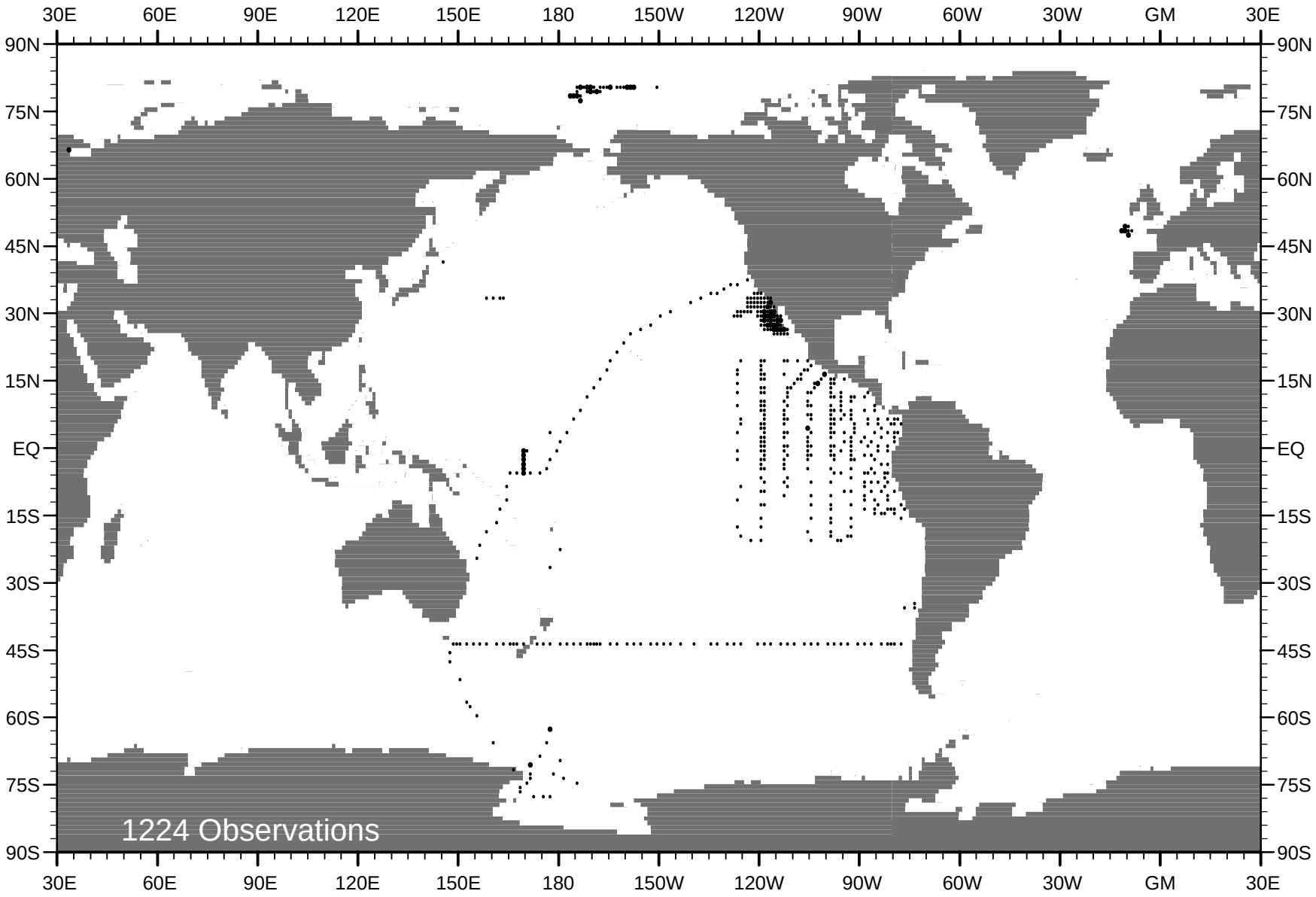


Fig. C38 Distribution of all Ocean Station Data (OSD) plankton abundance data in WOD01 for year 1967 .

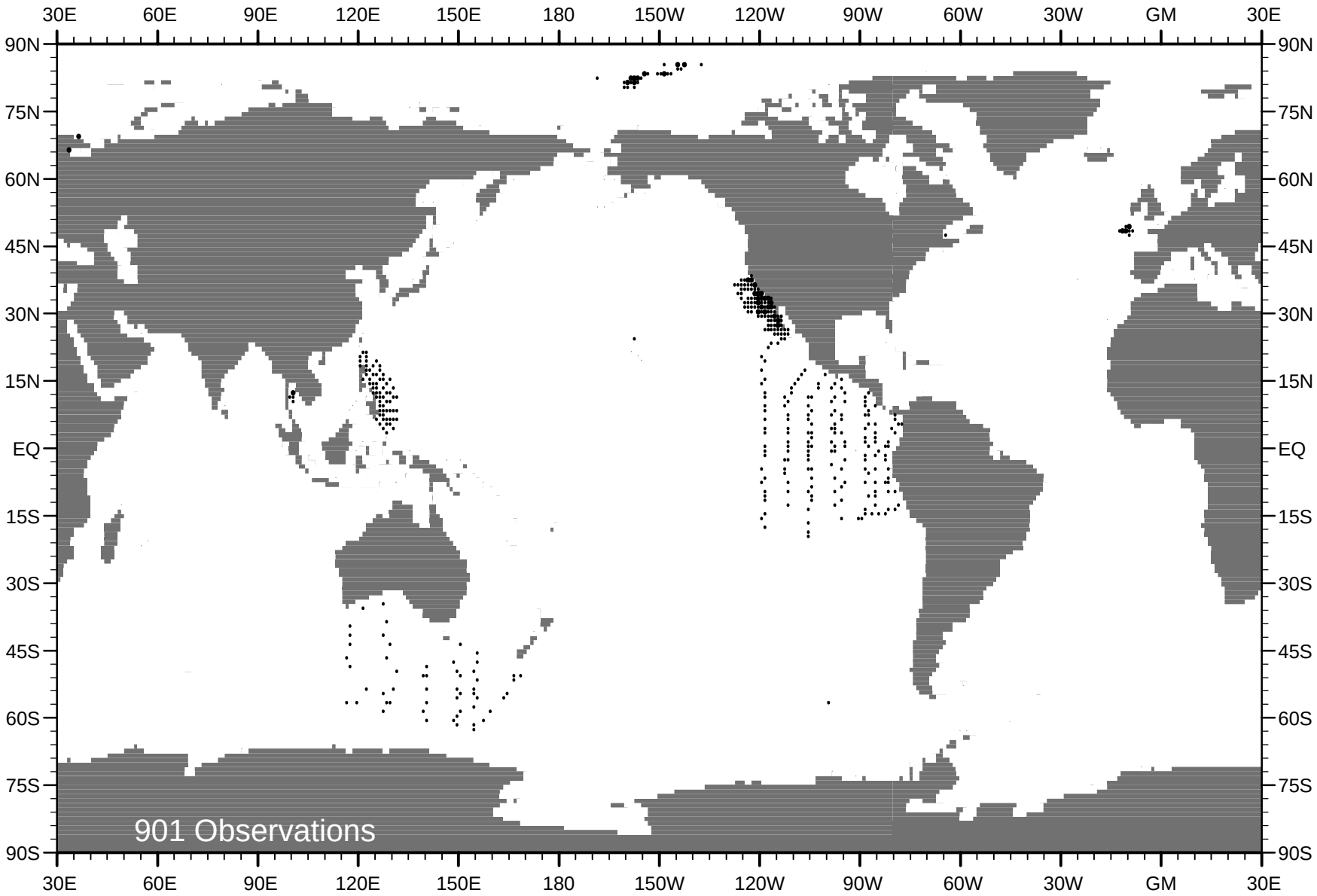


Fig. C39 Distribution of all Ocean Station Data (OSD) plankton abundance data in WOD01 for year 1968 .

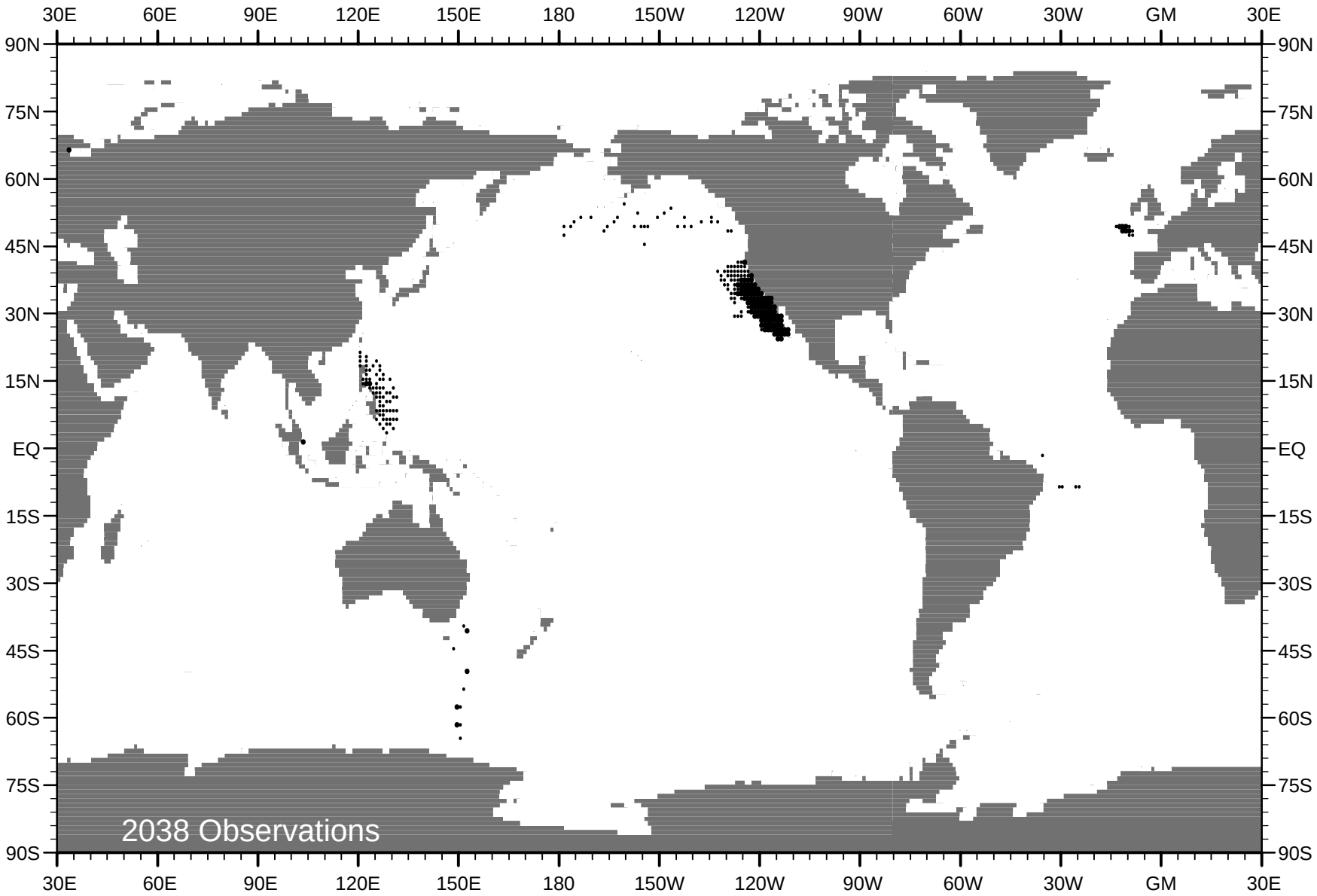


Fig. C40 Distribution of all Ocean Station Data (OSD) plankton abundance data in WOD01 for year 1969 .

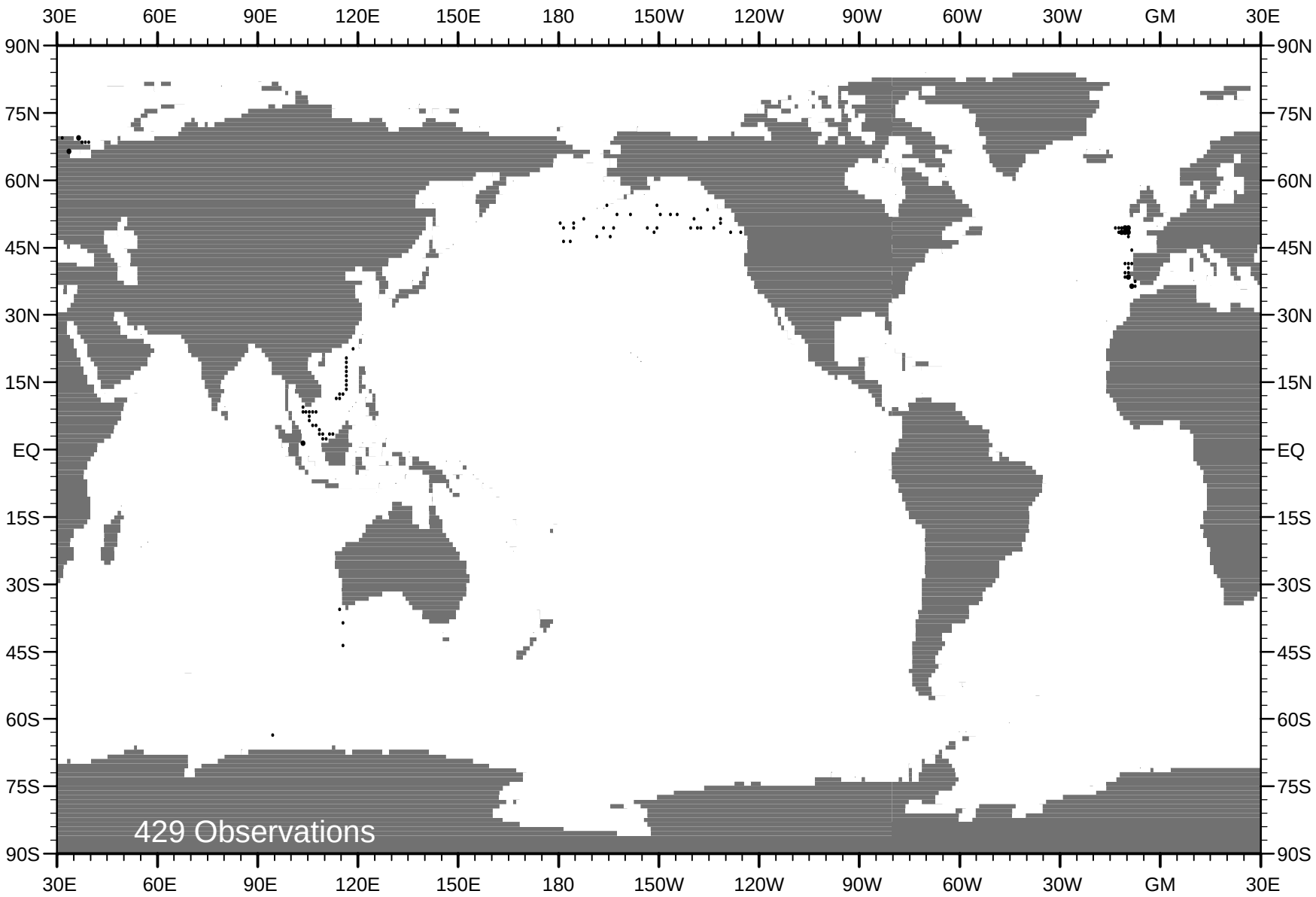


Fig. C41 Distribution of all Ocean Station Data (OSD) plankton abundance data in WOD01 for year 1970 .

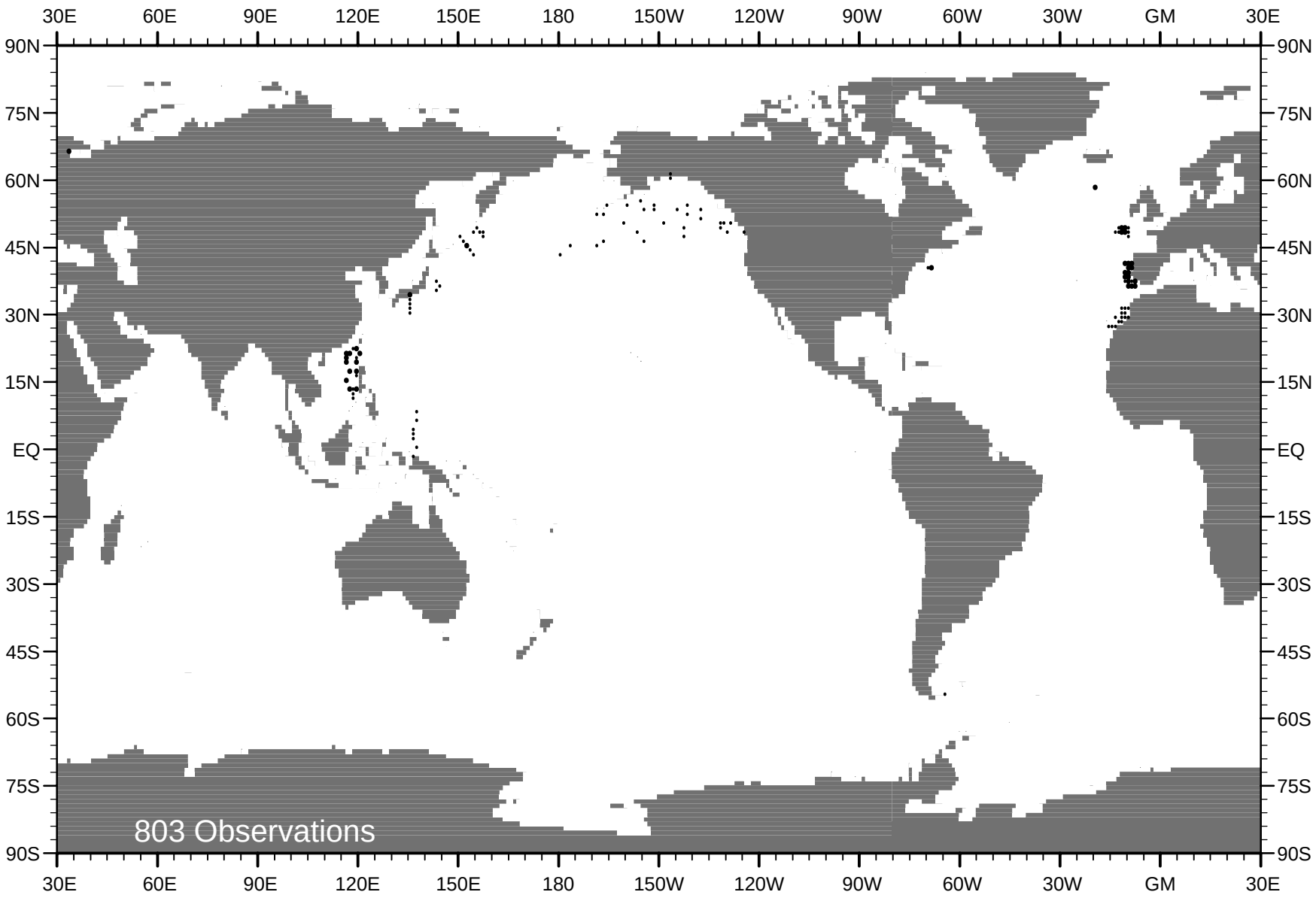


Fig. C42 Distribution of all Ocean Station Data (OSD) plankton abundance data in WOD01 for year 1971 .

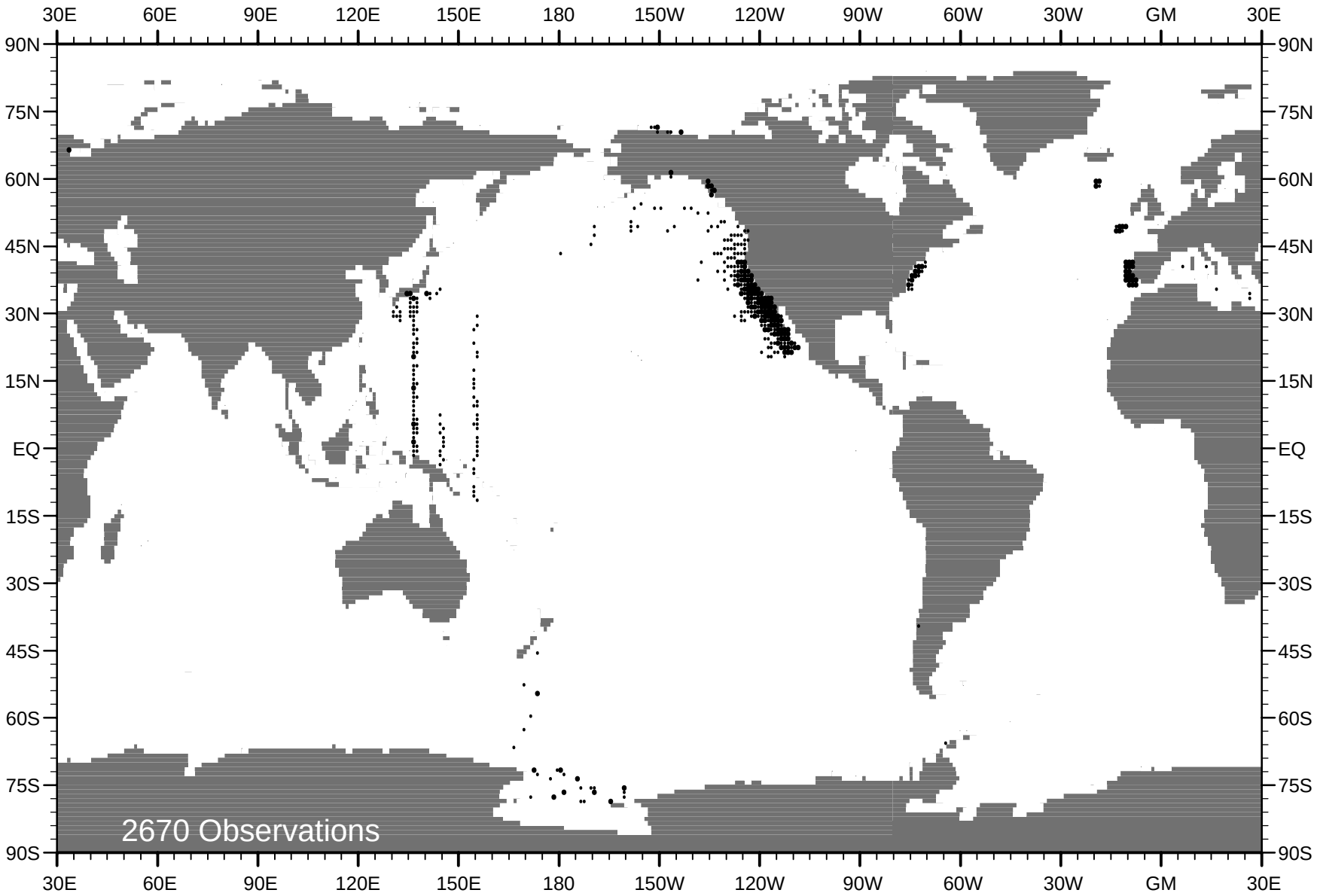


Fig. C43 Distribution of all Ocean Station Data (OSD) plankton abundance data in WOD01 for year 1972 .

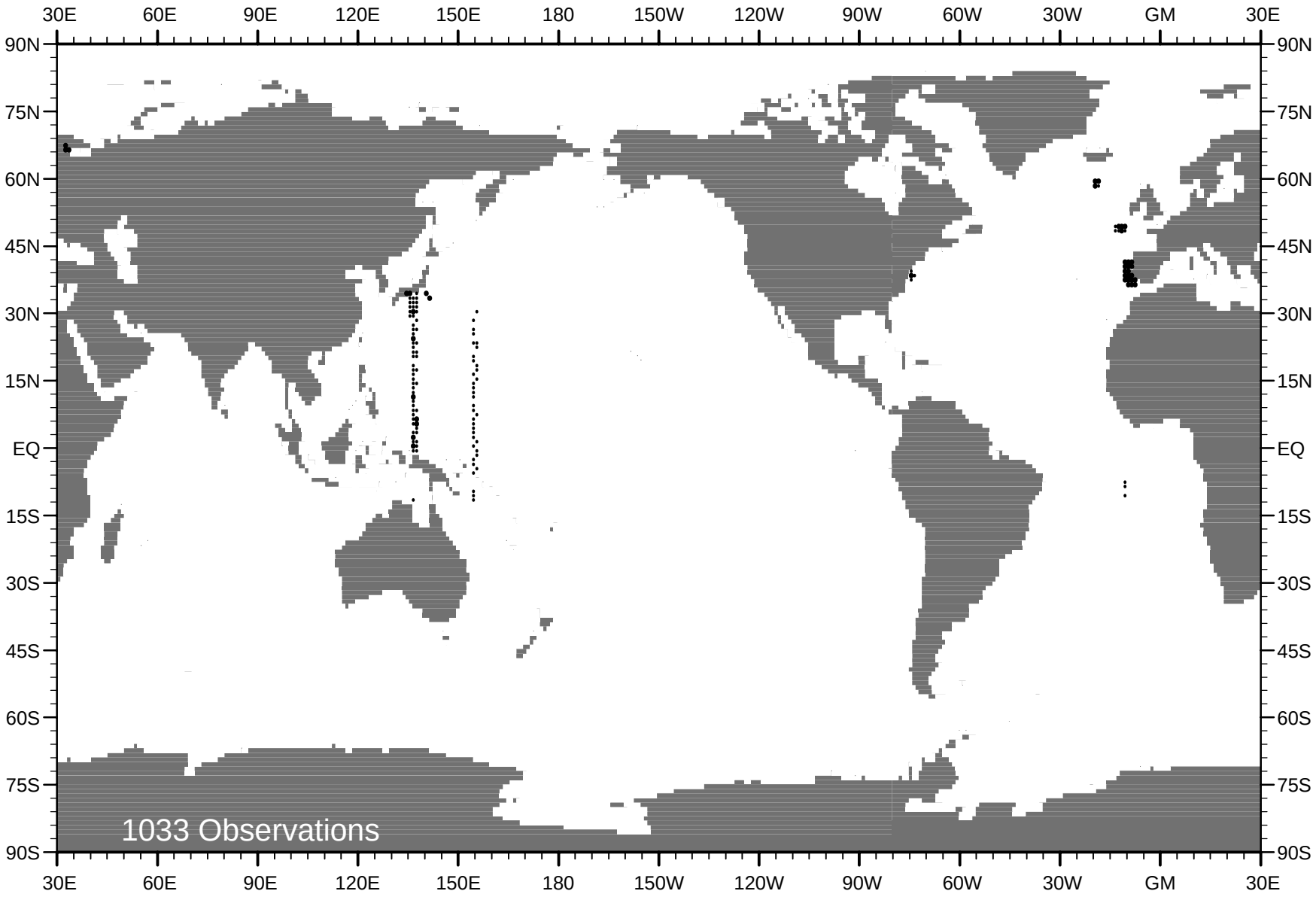


Fig. C44 Distribution of all Ocean Station Data (OSD) plankton abundance data in WOD01 for year 1973 .

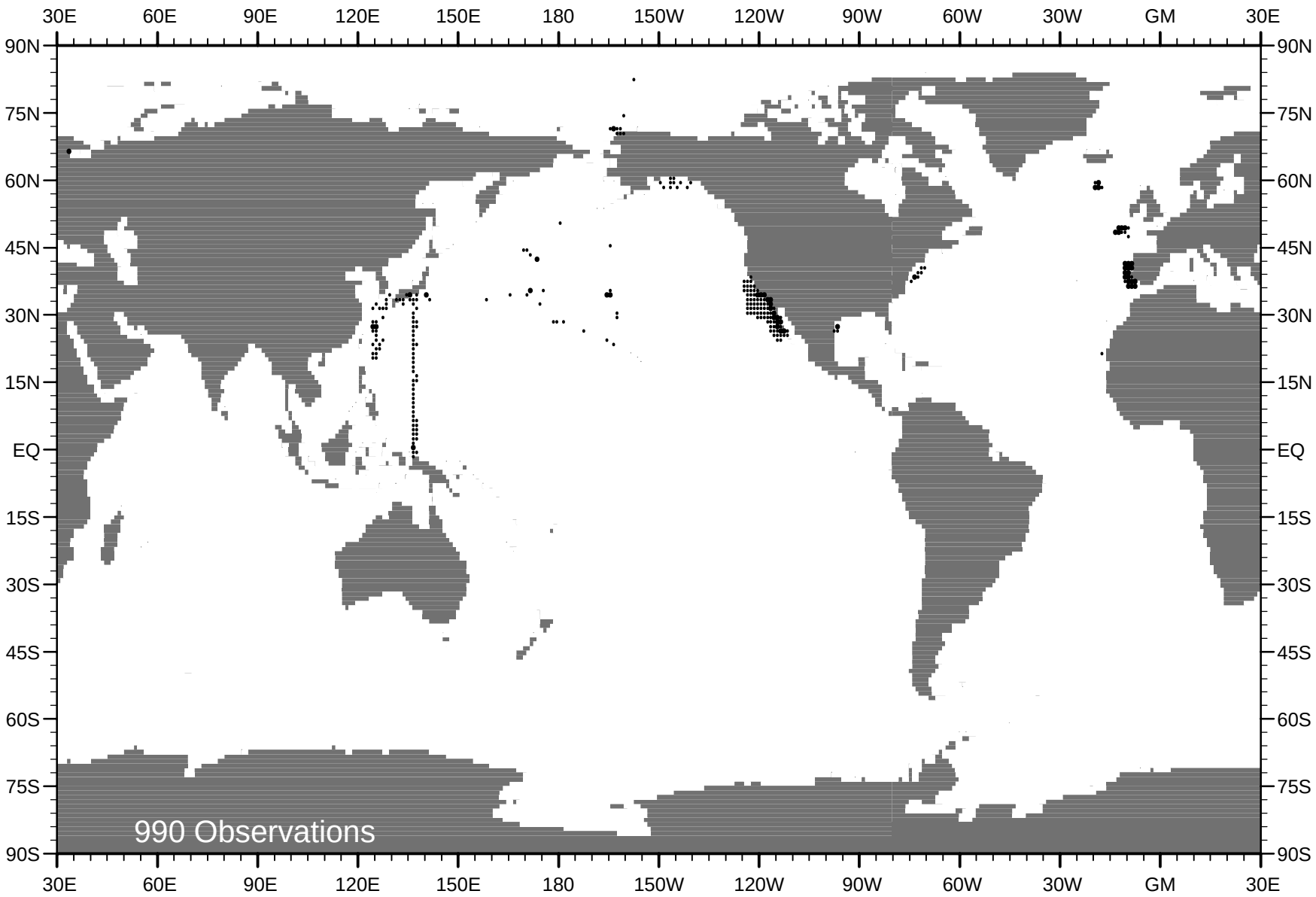


Fig. C45 Distribution of all Ocean Station Data (OSD) plankton abundance data in WOD01 for year 1974 .

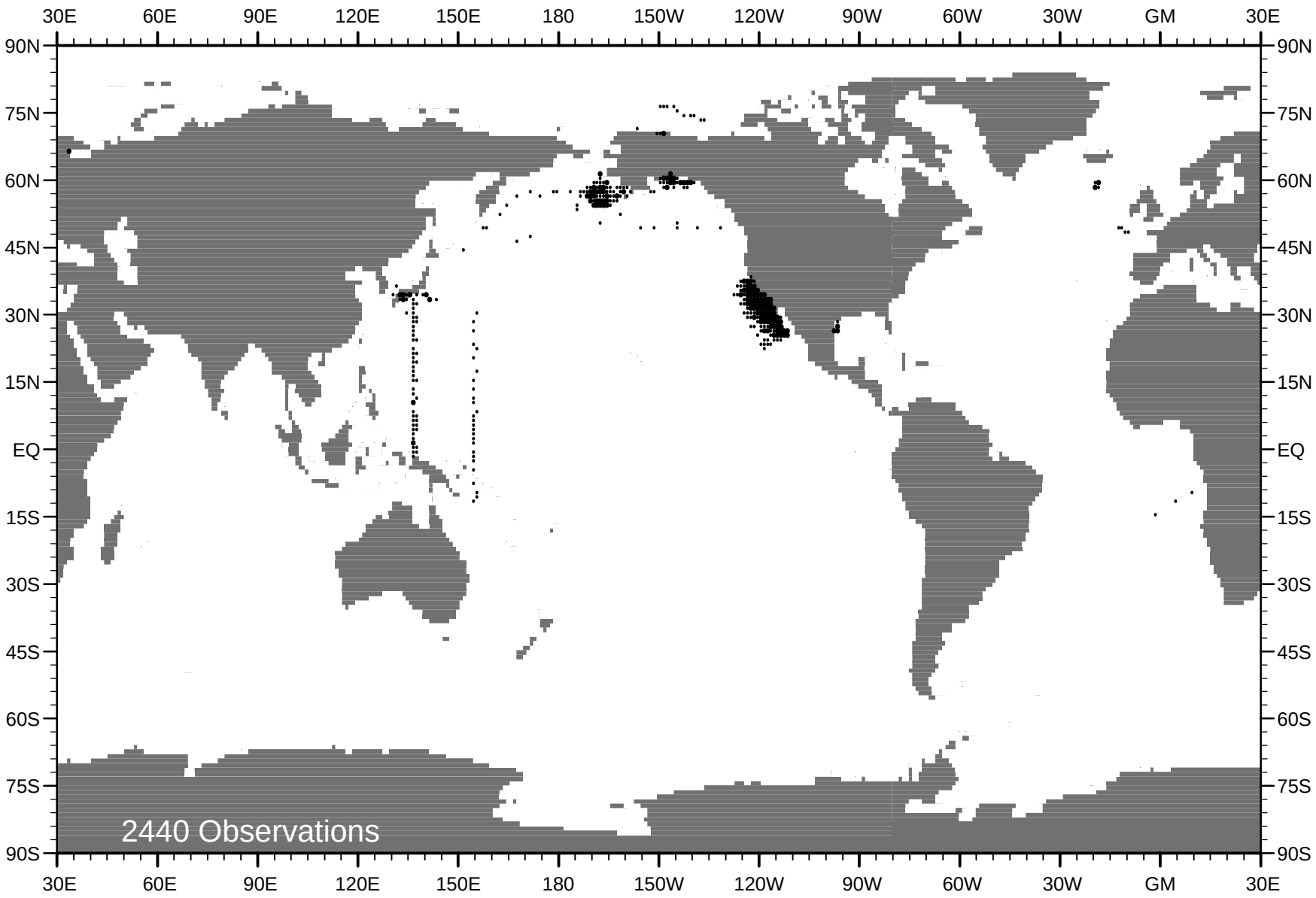


Fig. C46 Distribution of all Ocean Station Data (OSD) plankton abundance data in WOD01 for year 1975 .

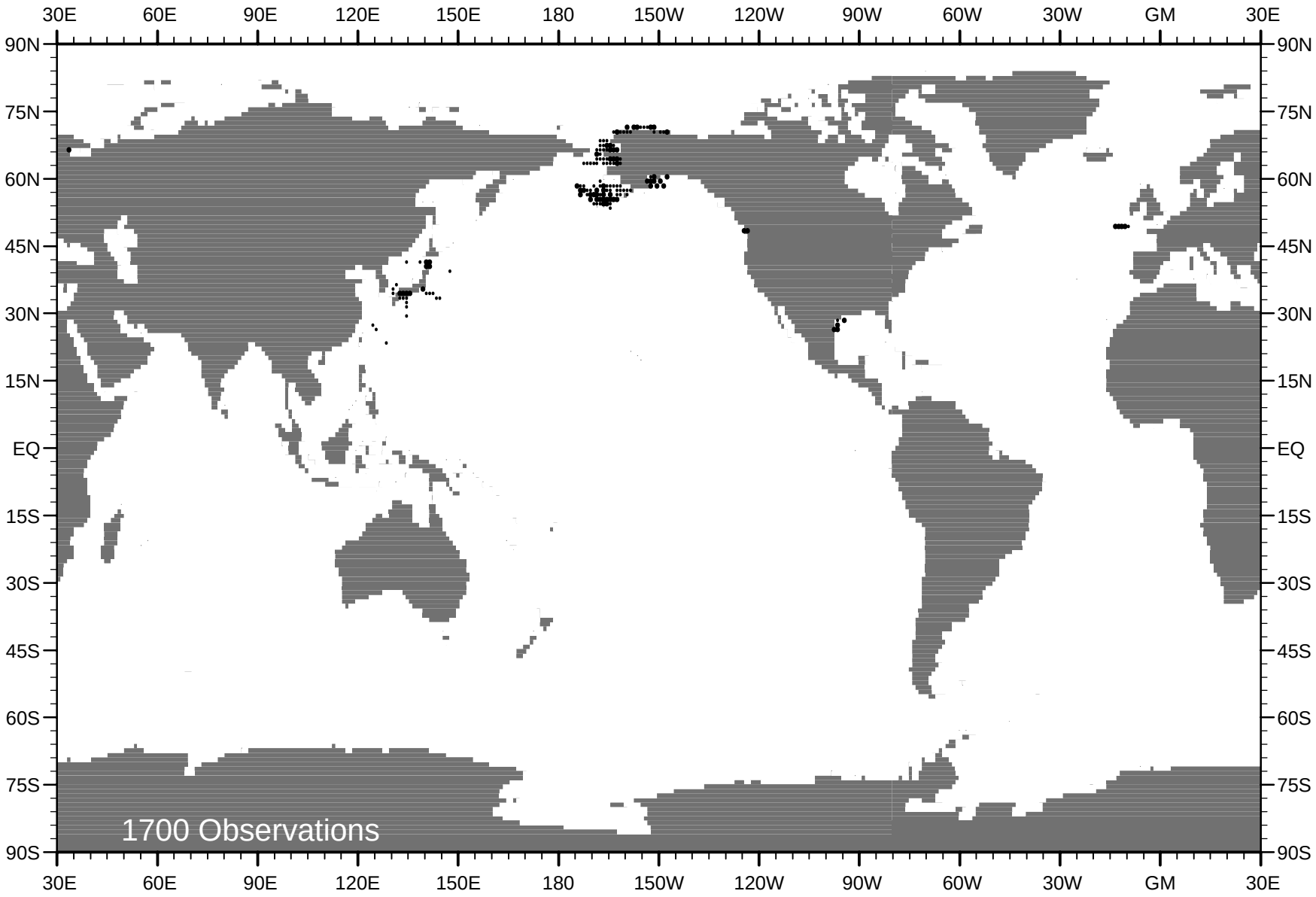


Fig. C47 Distribution of all Ocean Station Data (OSD) plankton abundance data in WOD01 for year 1976 .

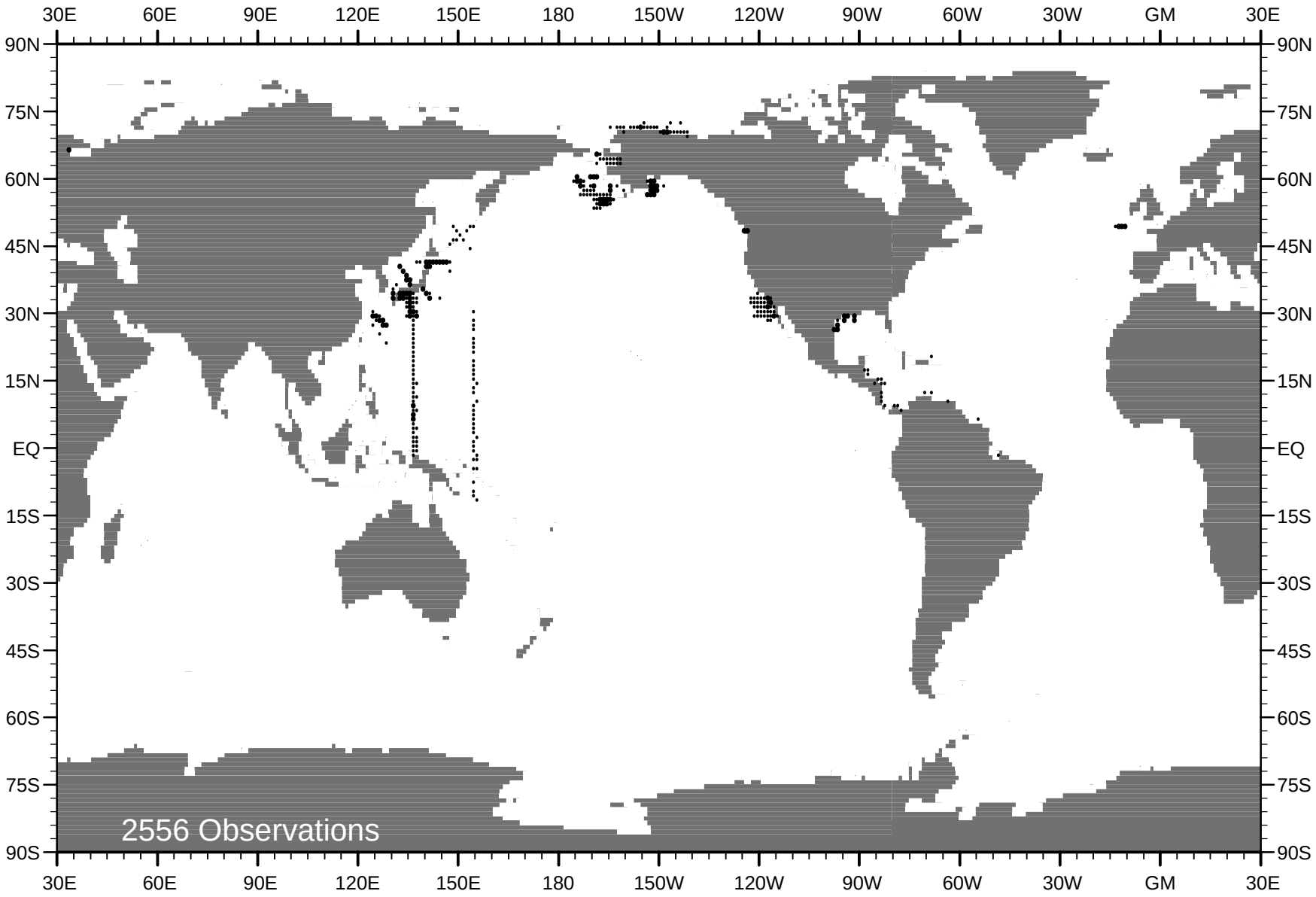


Fig. C48 Distribution of all Ocean Station Data (OSD) plankton abundance data in WOD01 for year 1977 .

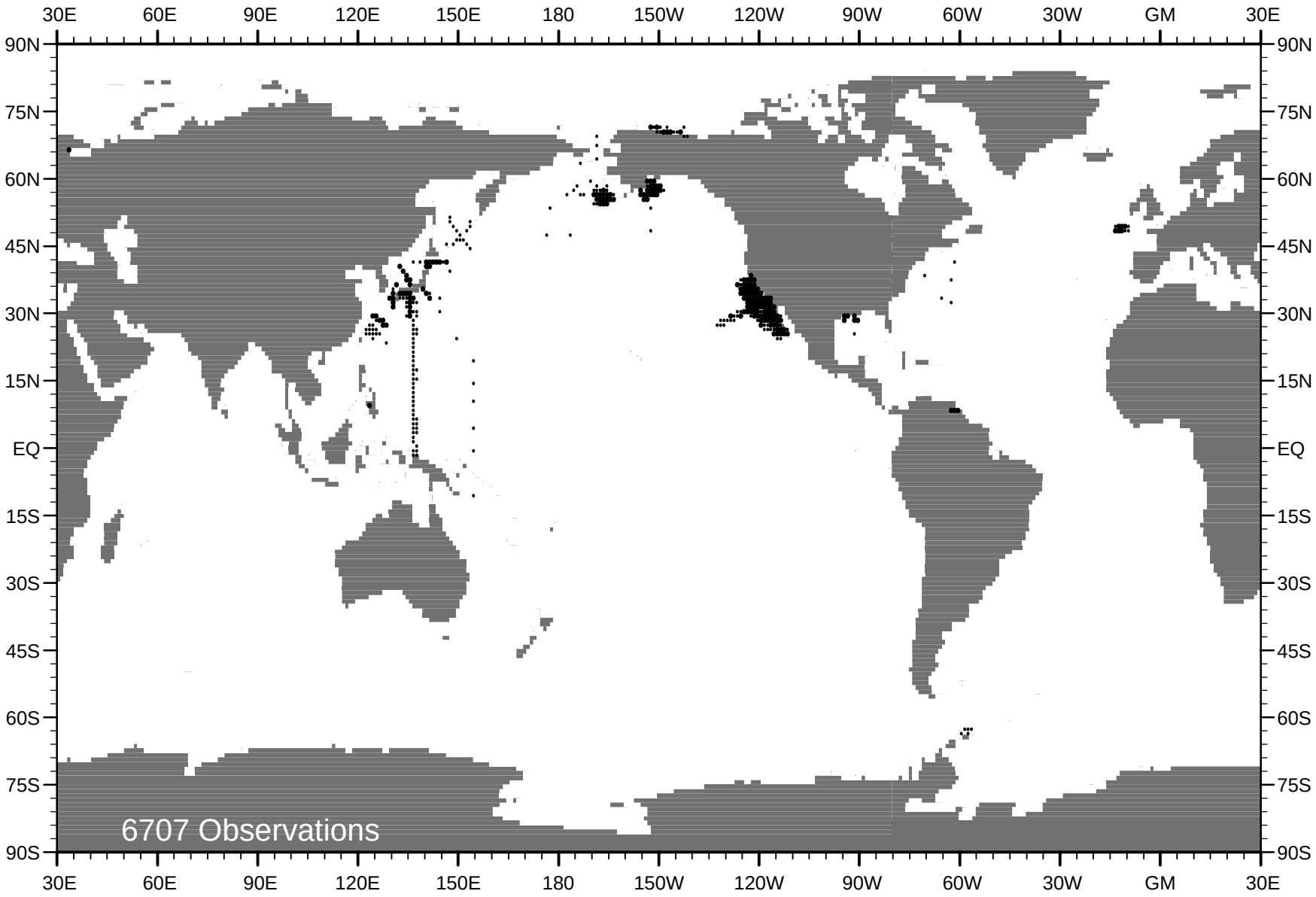


Fig. C49 Distribution of all Ocean Station Data (OSD) plankton abundance data in WOD01 for year 1978 .

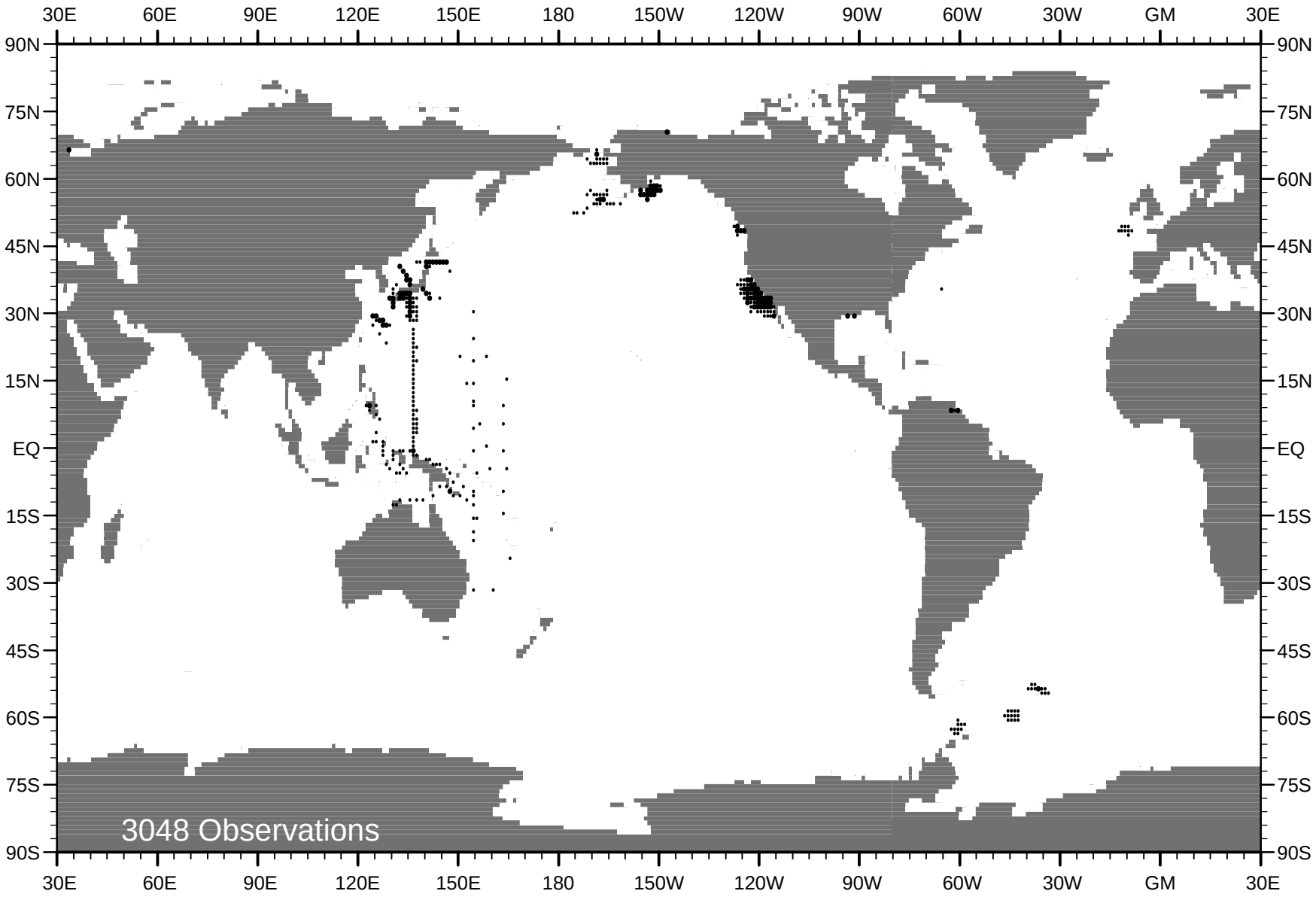


Fig. C50 Distribution of all Ocean Station Data (OSD) plankton abundance data in WOD01 for year 1979 .

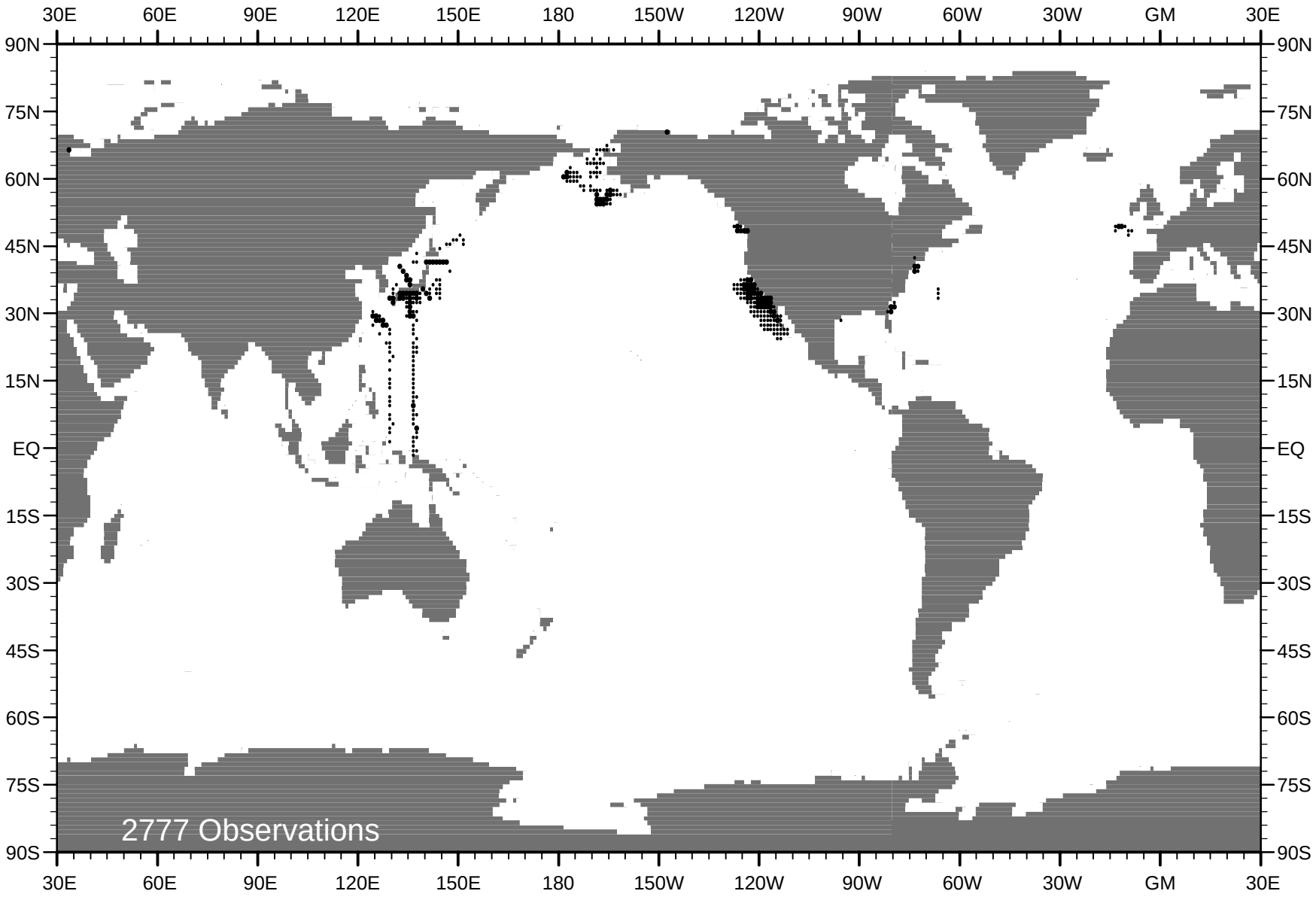


Fig. C51 Distribution of all Ocean Station Data (OSD) plankton abundance data in WOD01 for year 1980 .

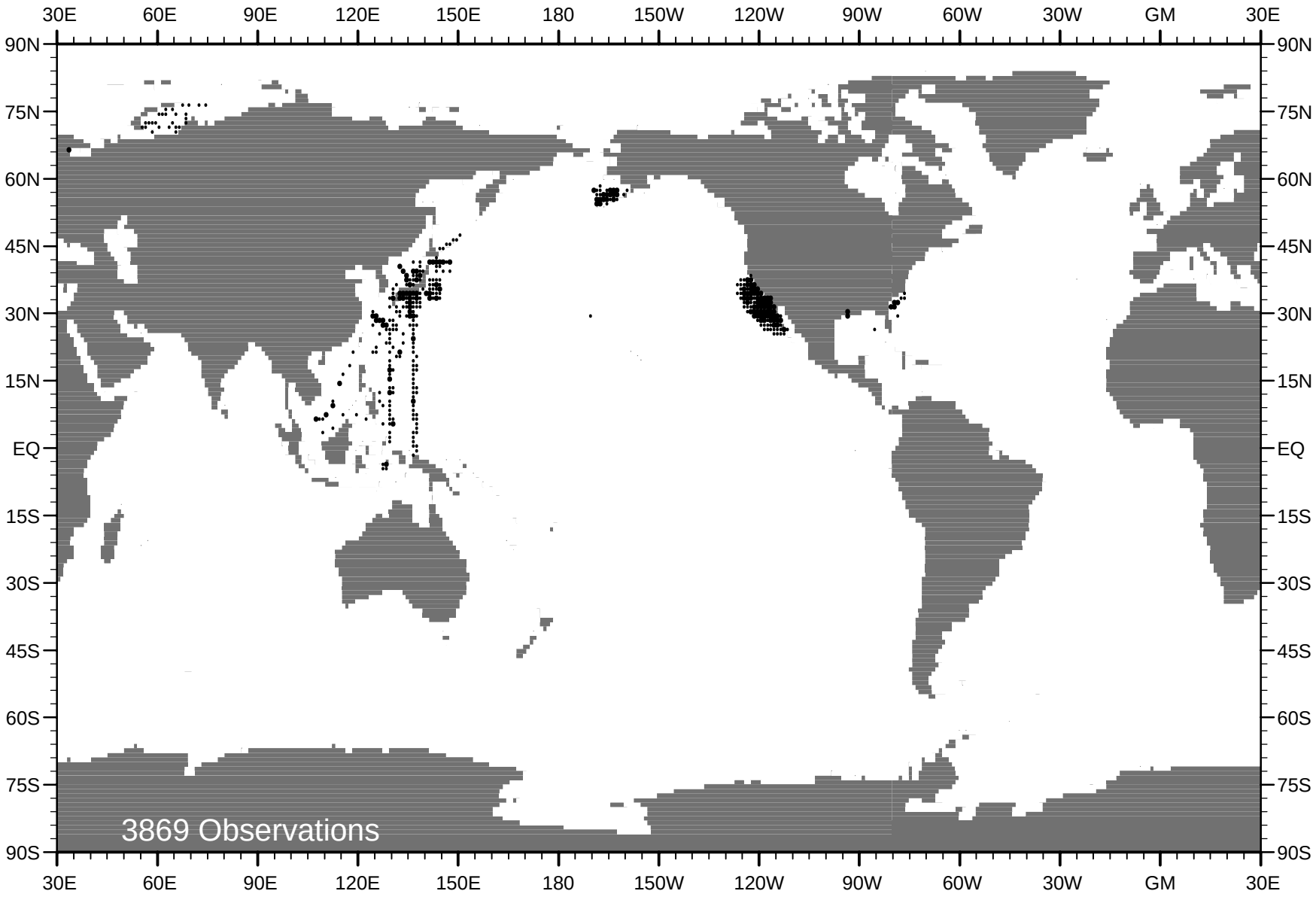


Fig. C52 Distribution of all Ocean Station Data (OSD) plankton abundance data in WOD01 for year 1981 .

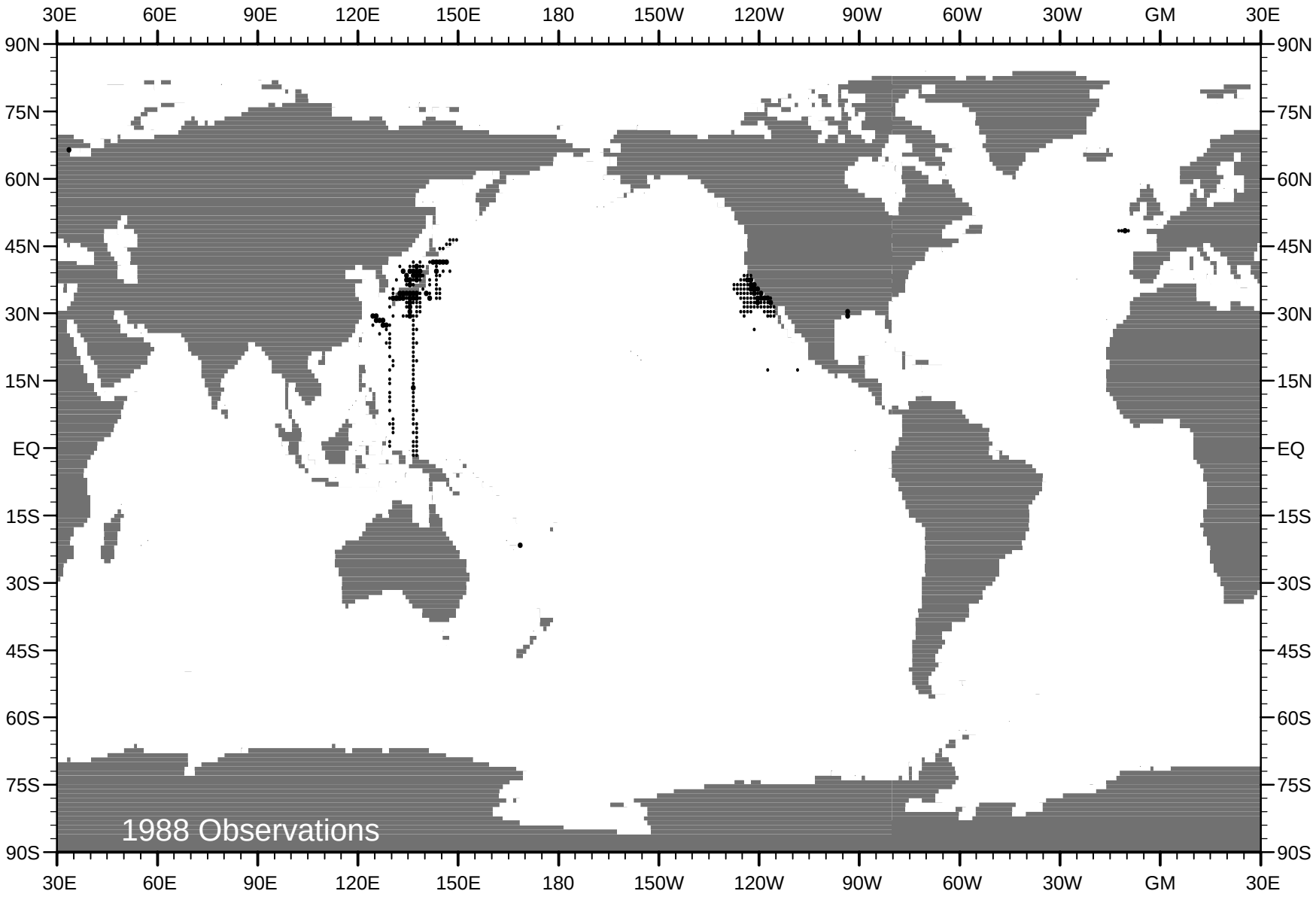


Fig. C53 Distribution of all Ocean Station Data (OSD) plankton abundance data in WOD01 for year 1982 .

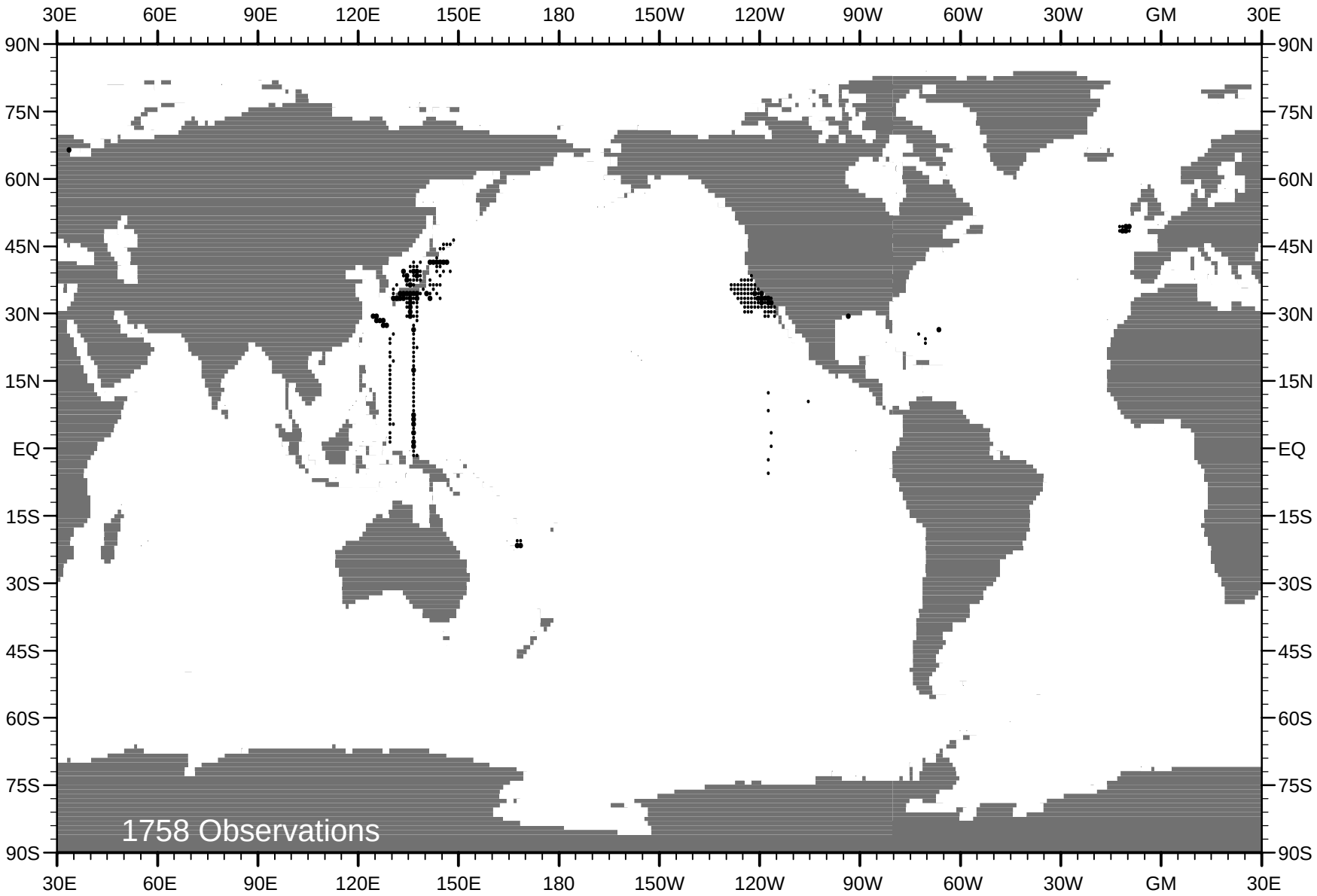


Fig. C54 Distribution of all Ocean Station Data (OSD) plankton abundance data in WOD01 for year 1983 .

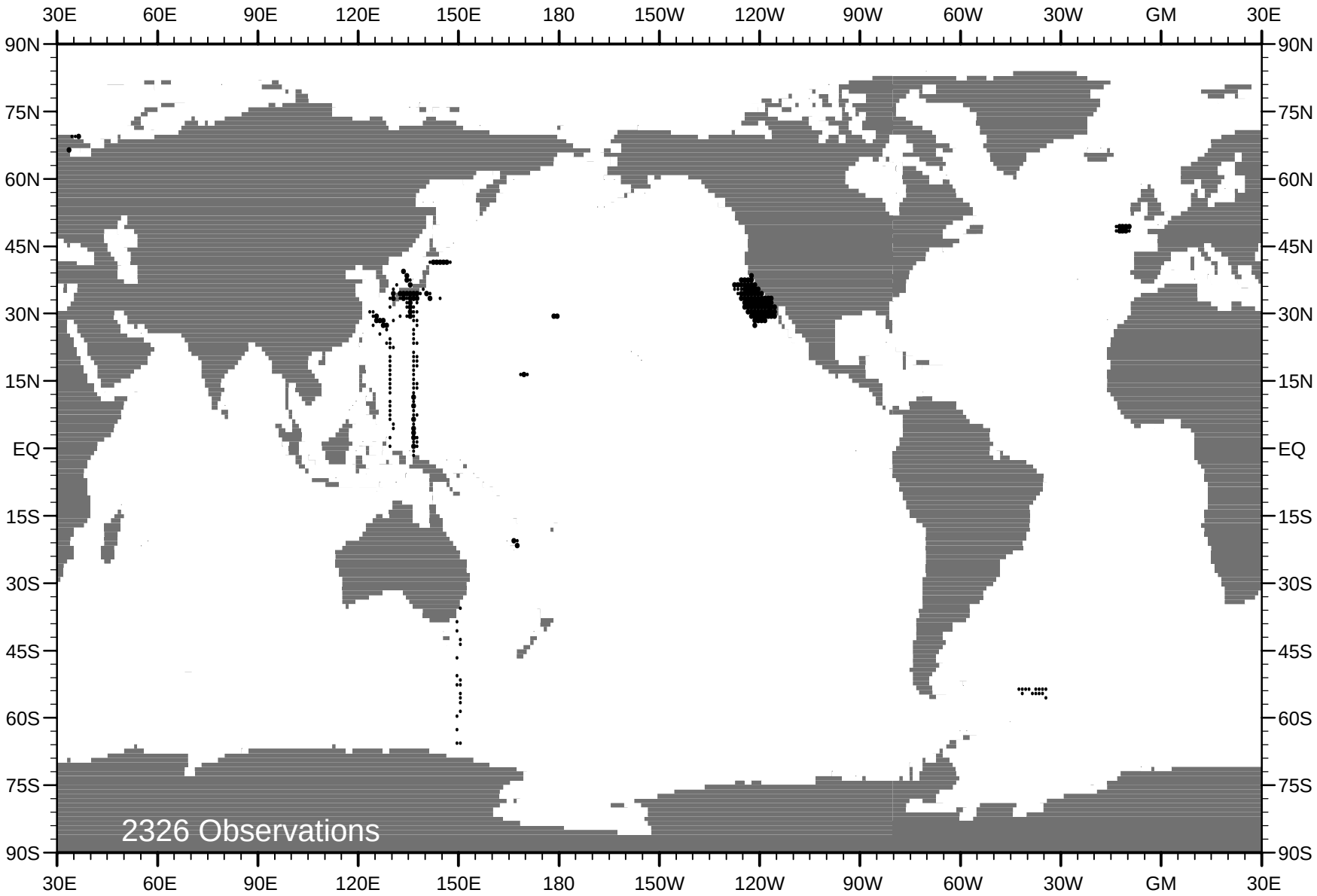


Fig. C55 Distribution of all Ocean Station Data (OSD) plankton abundance data in WOD01 for year 1984 .

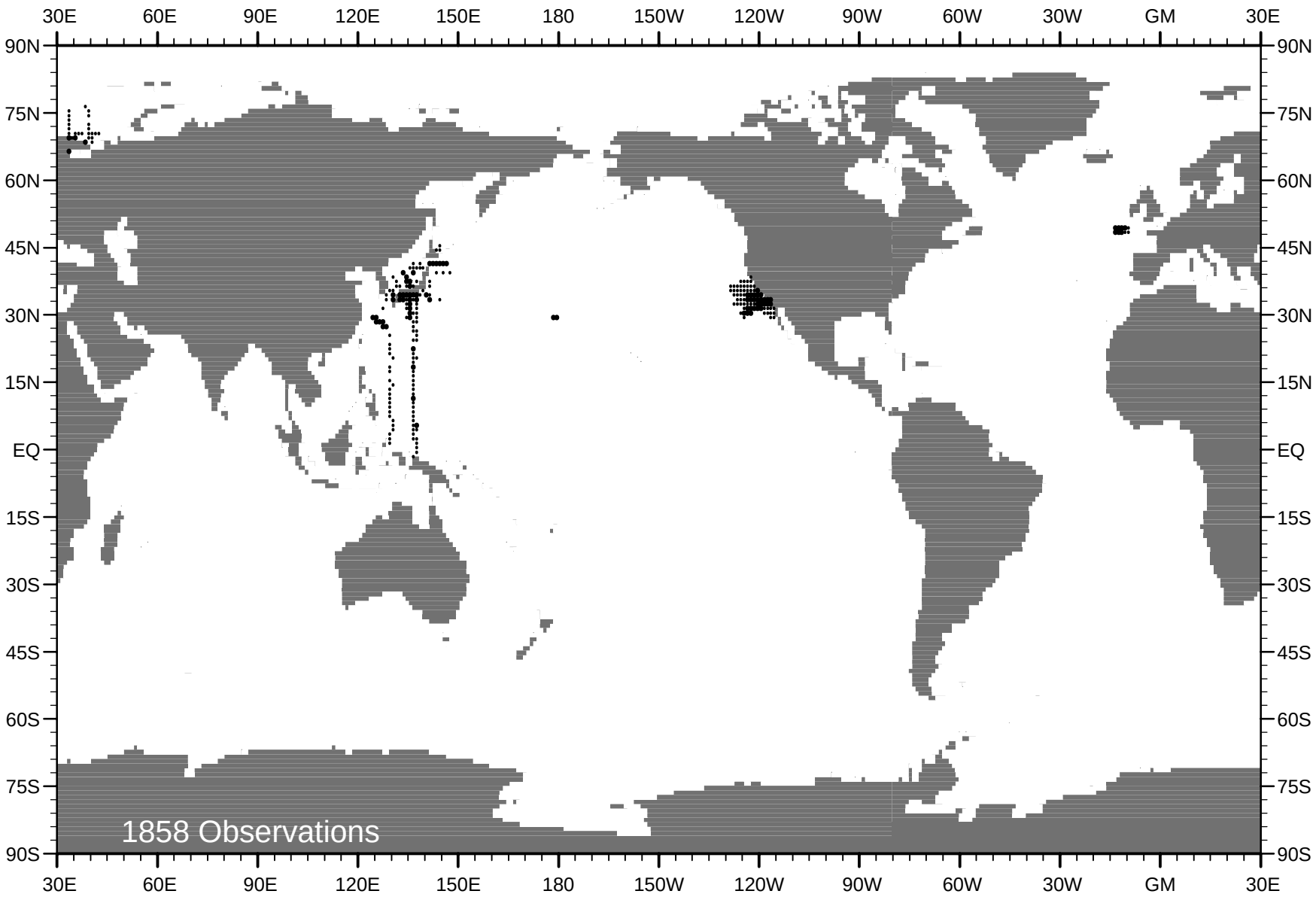


Fig. C56 Distribution of all Ocean Station Data (OSD) plankton abundance data in WOD01 for year 1985 .

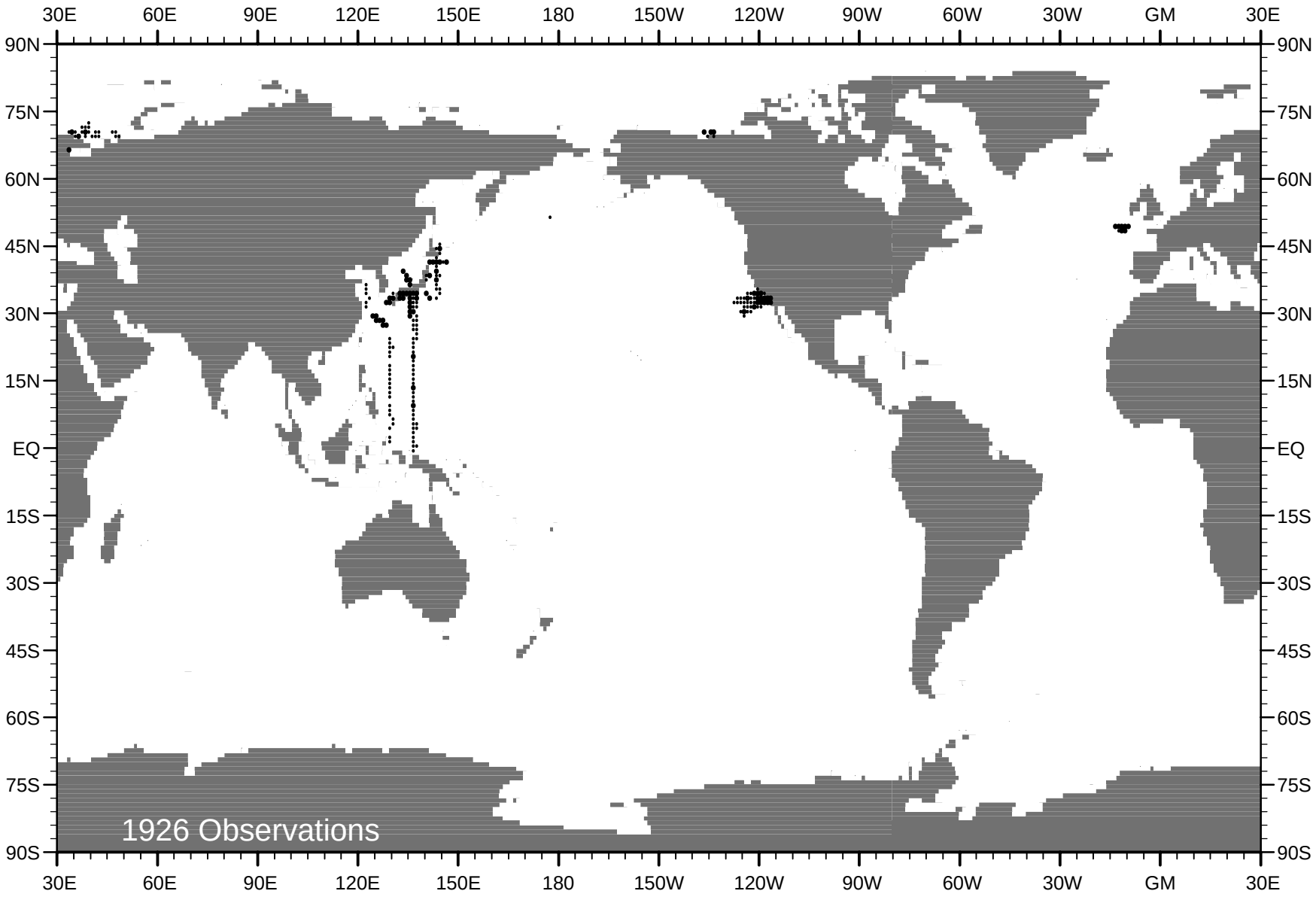


Fig. C57 Distribution of all Ocean Station Data (OSD) plankton abundance data in WOD01 for year 1986 .

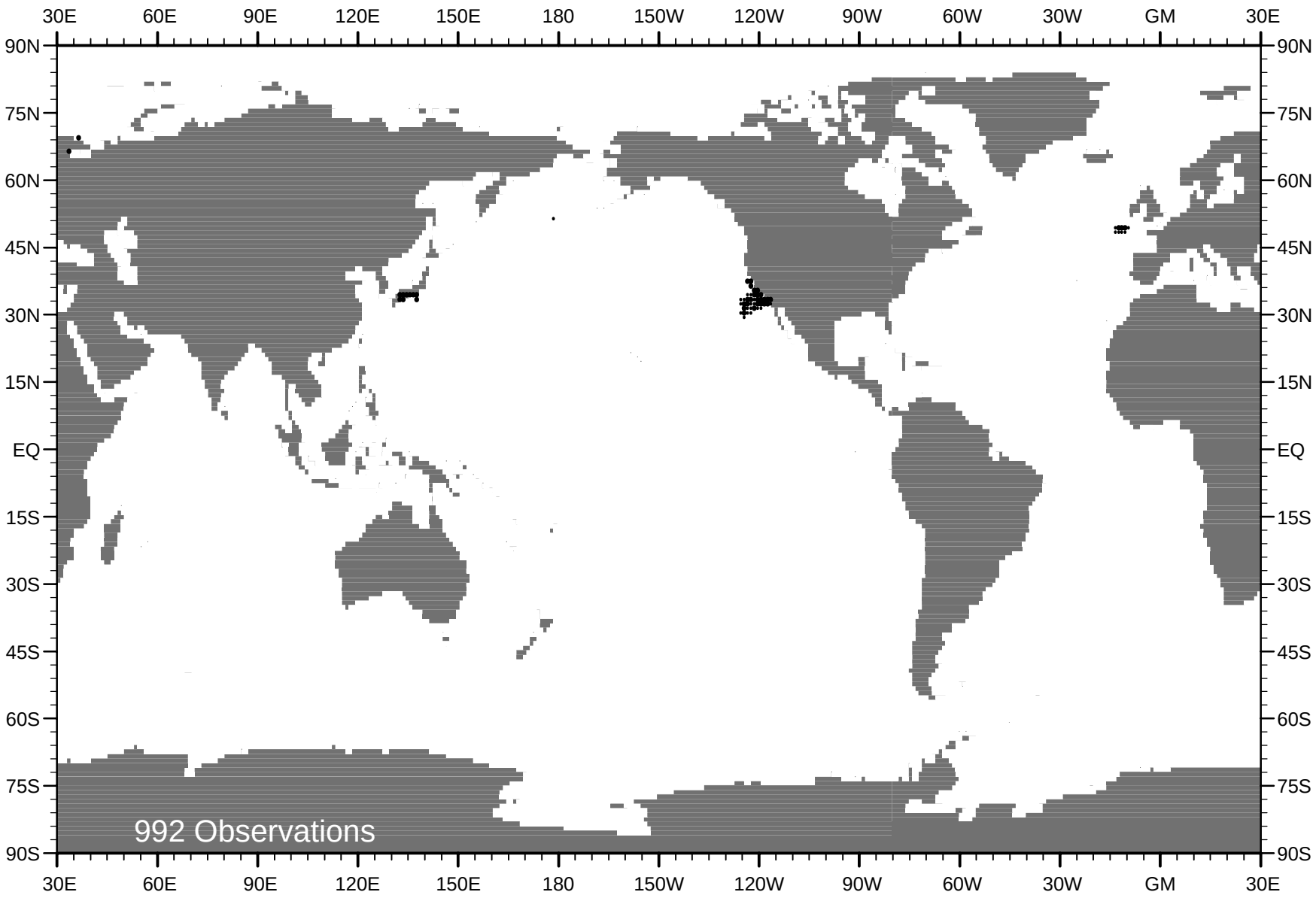


Fig. C58 Distribution of all Ocean Station Data (OSD) plankton abundance data in WOD01 for year 1987 .

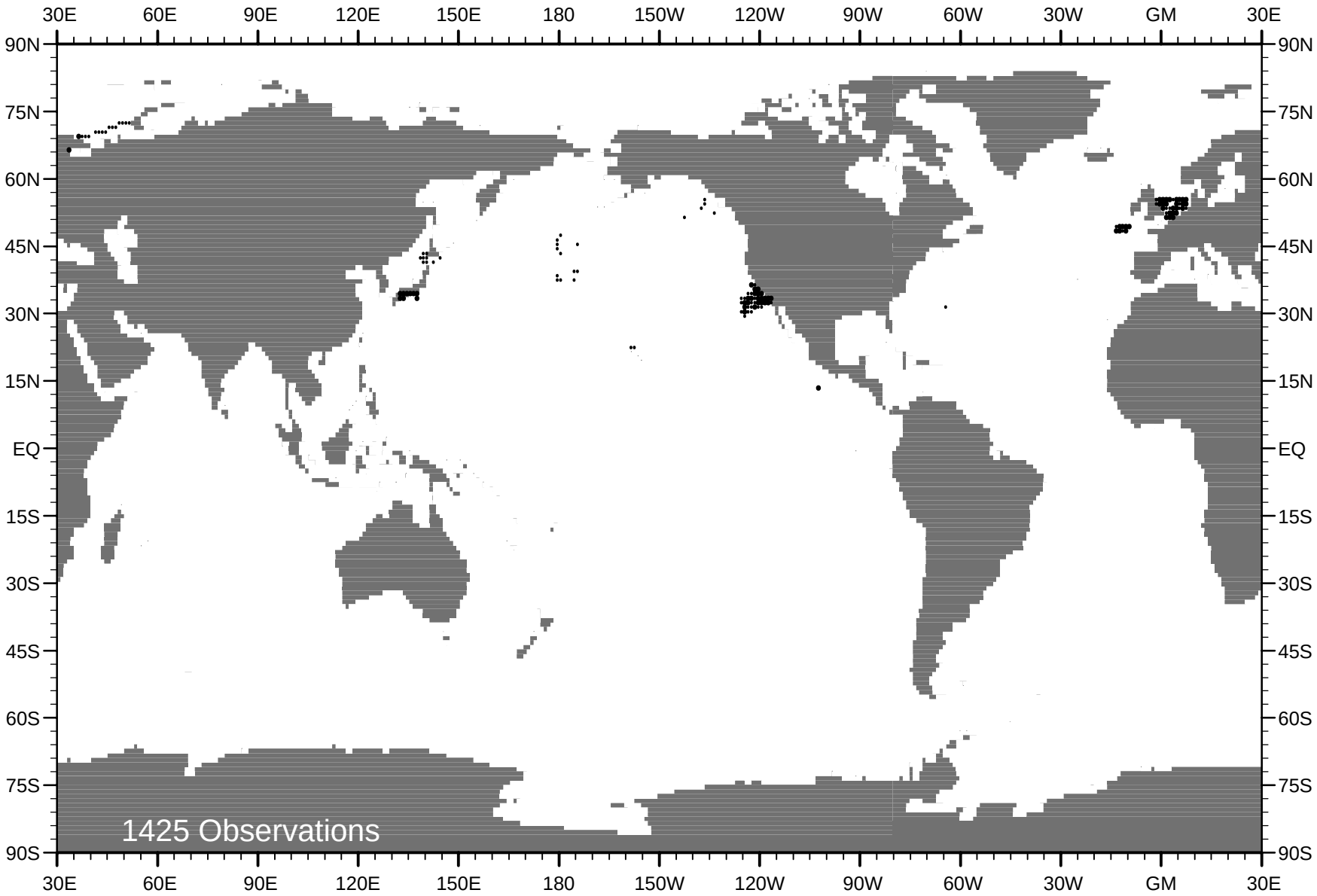


Fig. C59 Distribution of all Ocean Station Data (OSD) plankton abundance data in WOD01 for year 1988 .

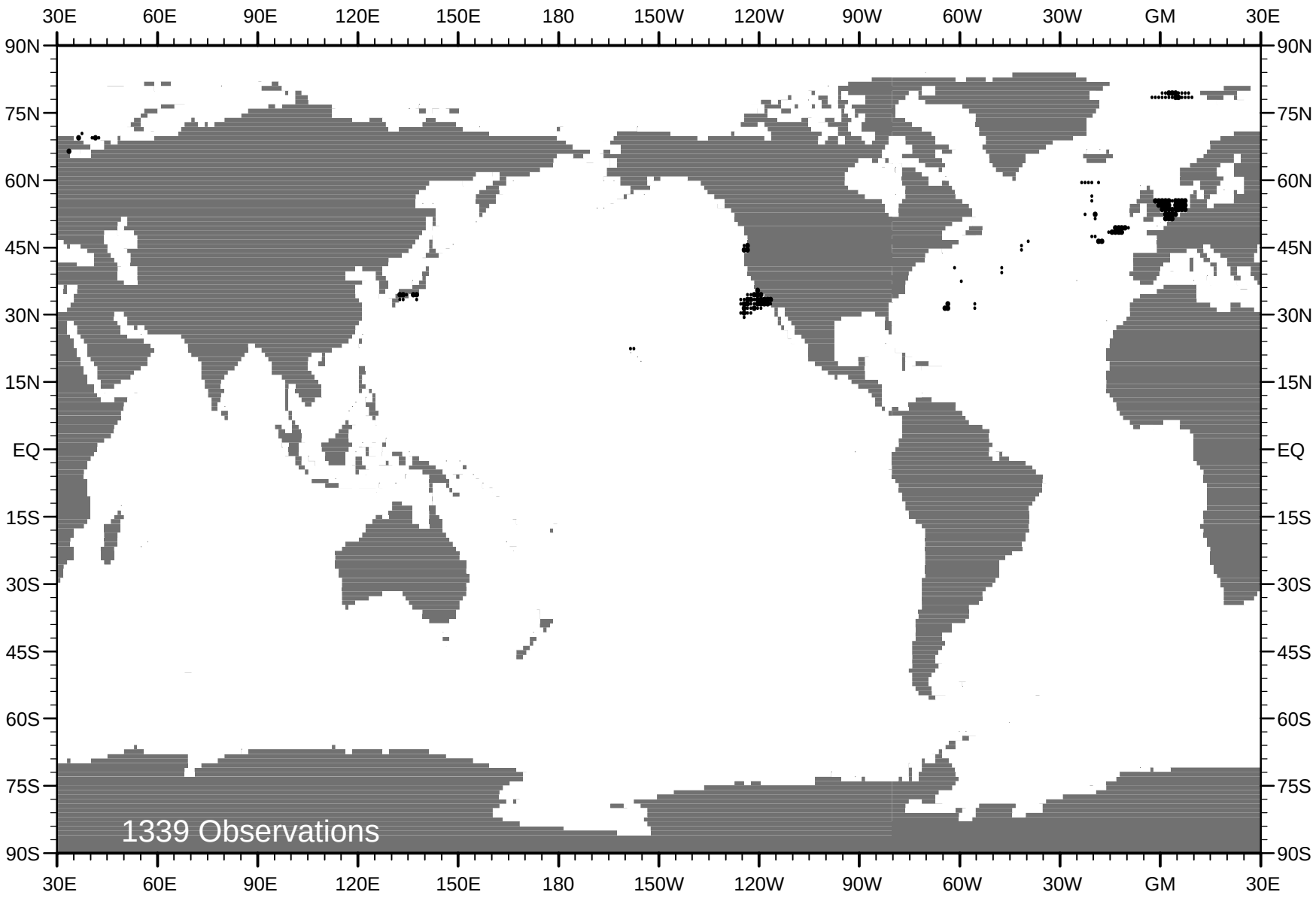


Fig. C60 Distribution of all Ocean Station Data (OSD) plankton abundance data in WOD01 for year 1989 .

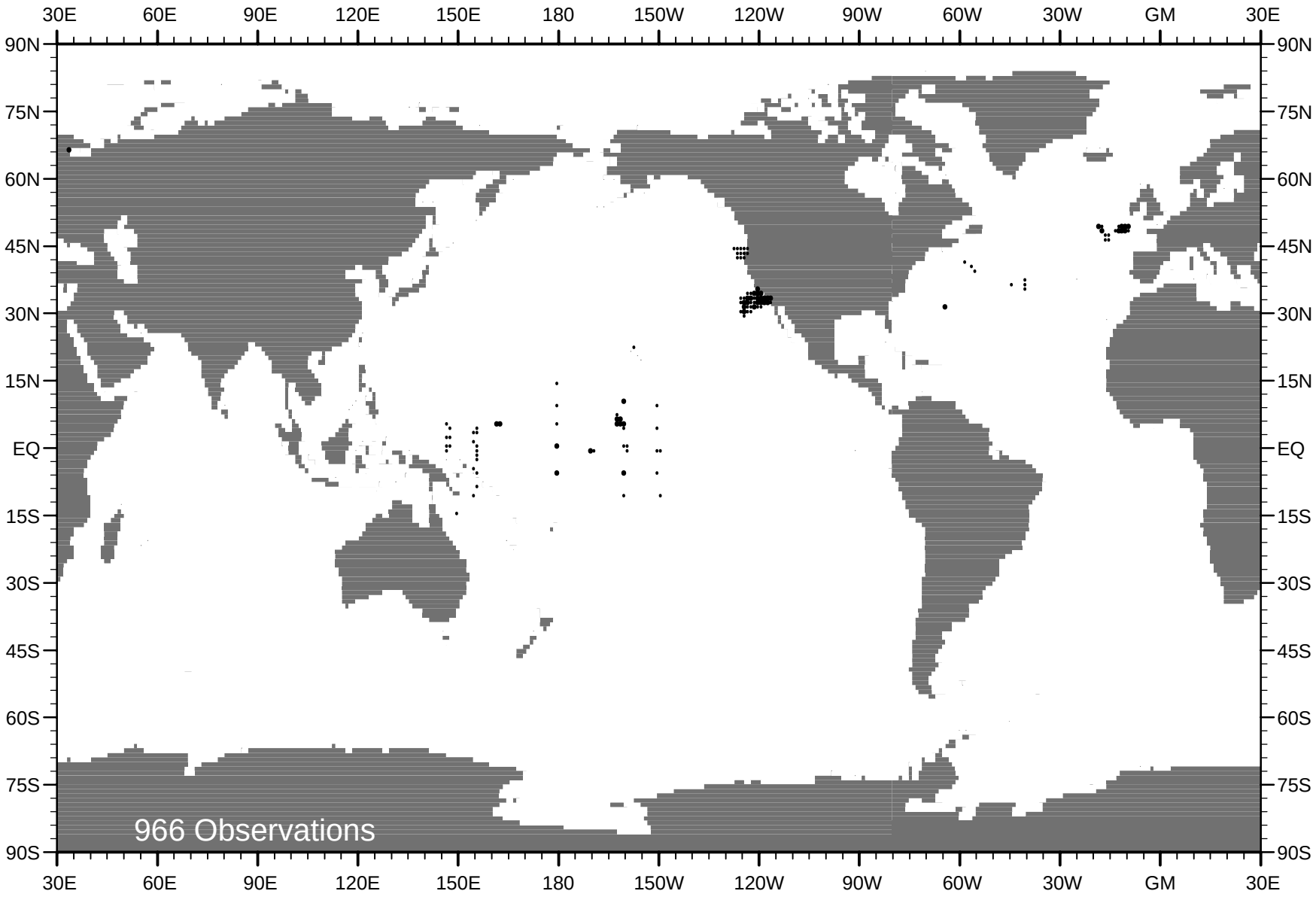


Fig. C61 Distribution of all Ocean Station Data (OSD) plankton abundance data in WOD01 for year 1990 .

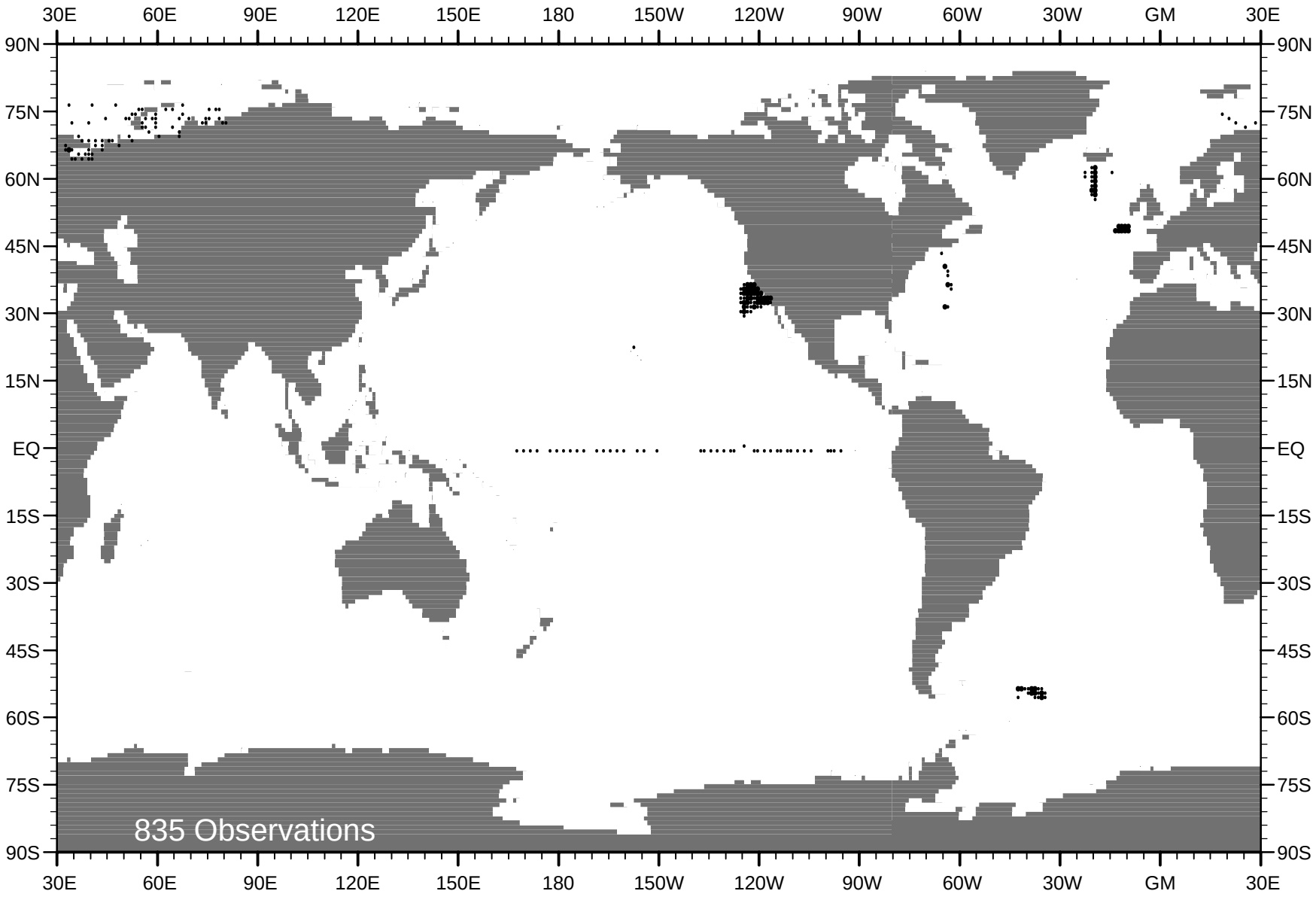


Fig. C62 Distribution of all Ocean Station Data (OSD) plankton abundance data in WOD01 for year 1991 .

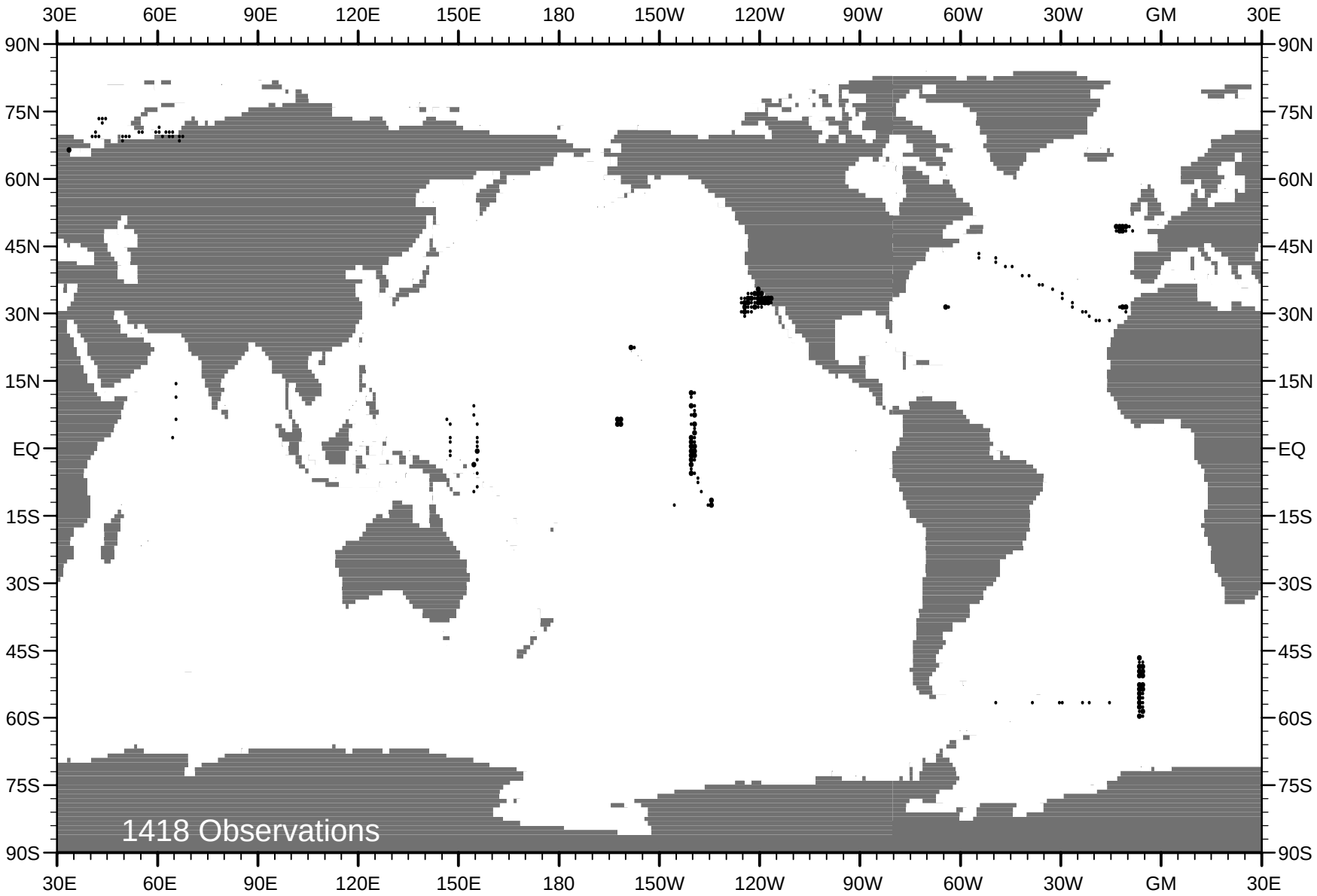


Fig. C63 Distribution of all Ocean Station Data (OSD) plankton abundance data in WOD01 for year 1992 .

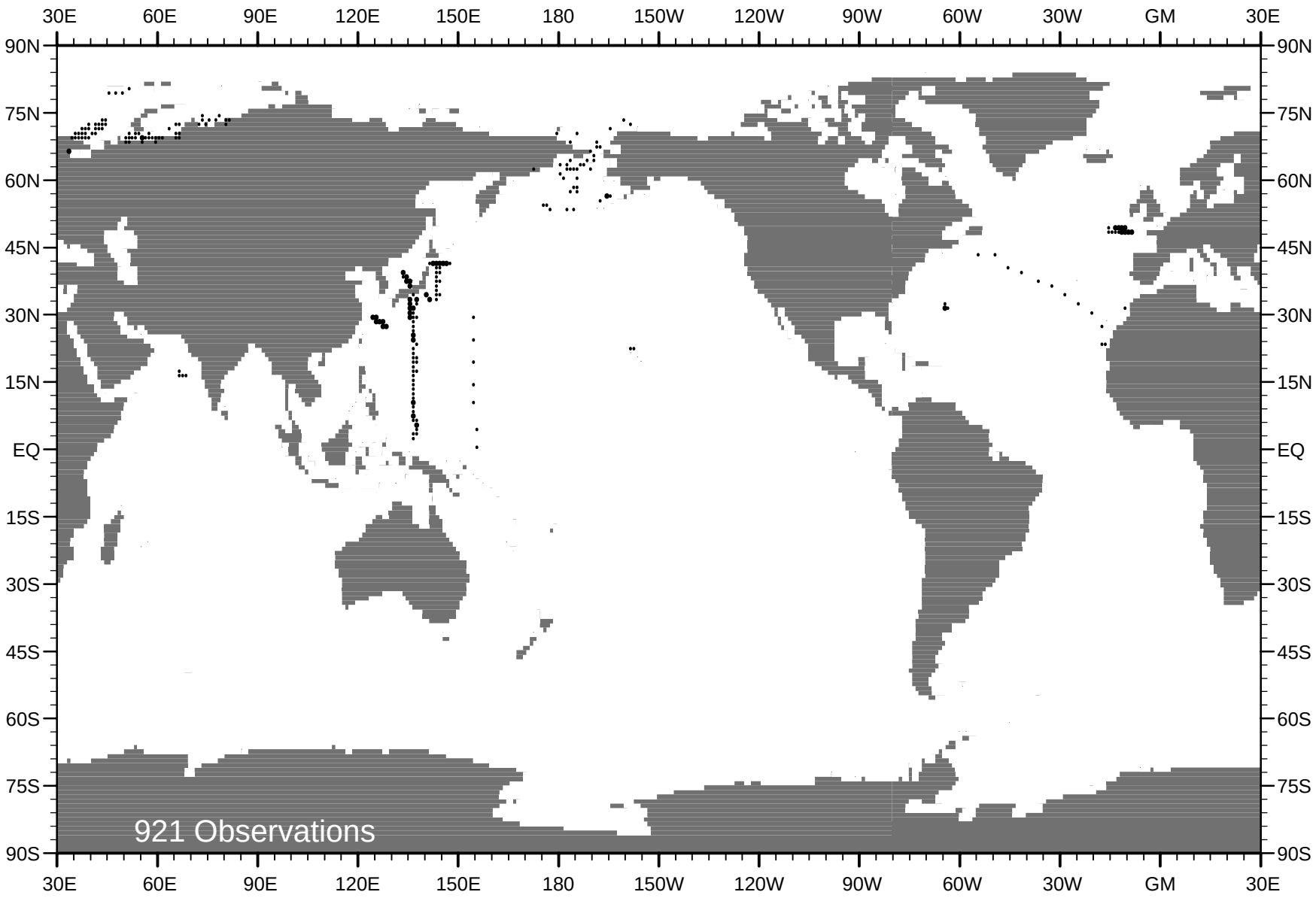


Fig. C64 Distribution of all Ocean Station Data (OSD) plankton abundance data in WOD01 for year 1993 .

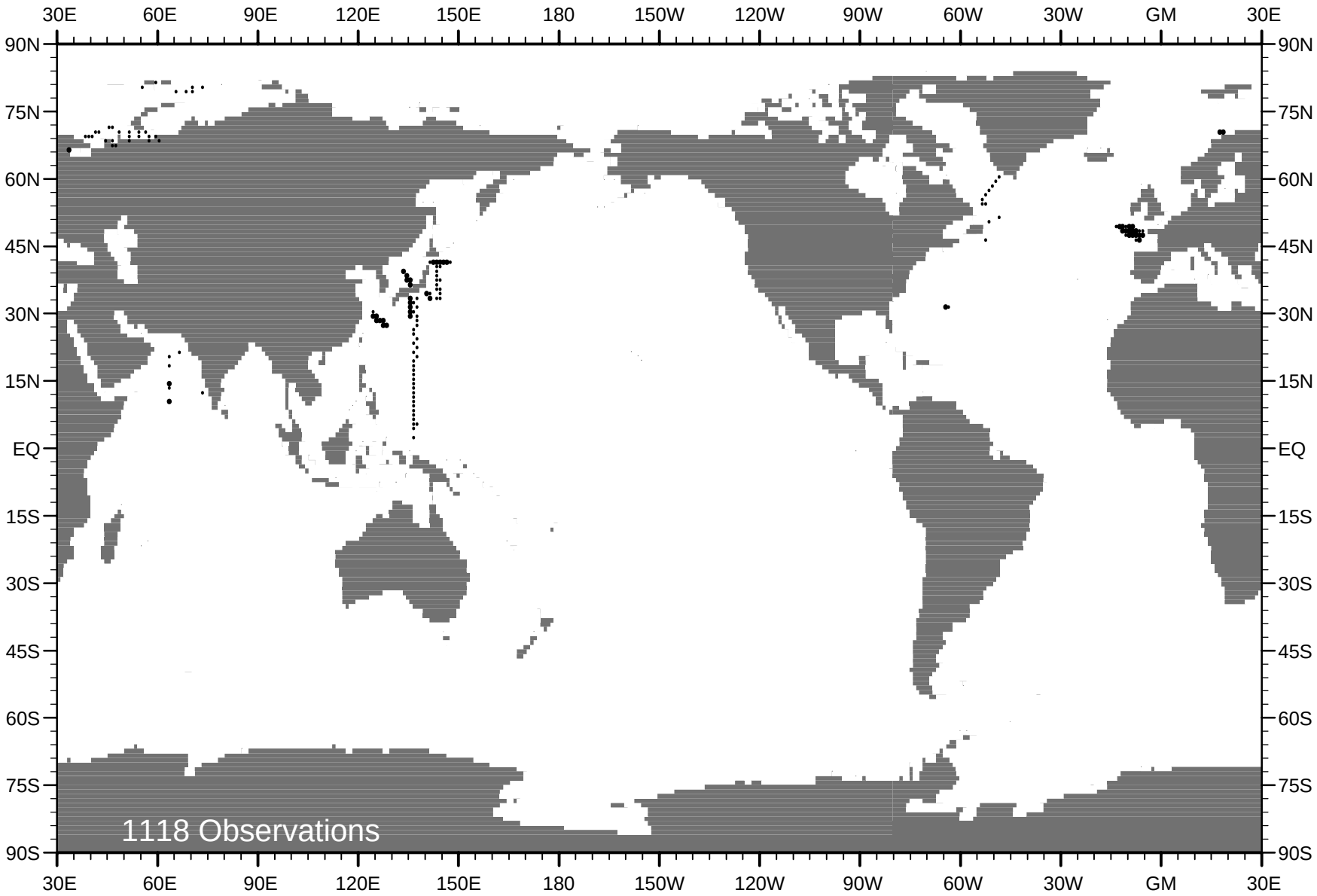


Fig. C65 Distribution of all Ocean Station Data (OSD) plankton abundance data in WOD01 for year 1994 .

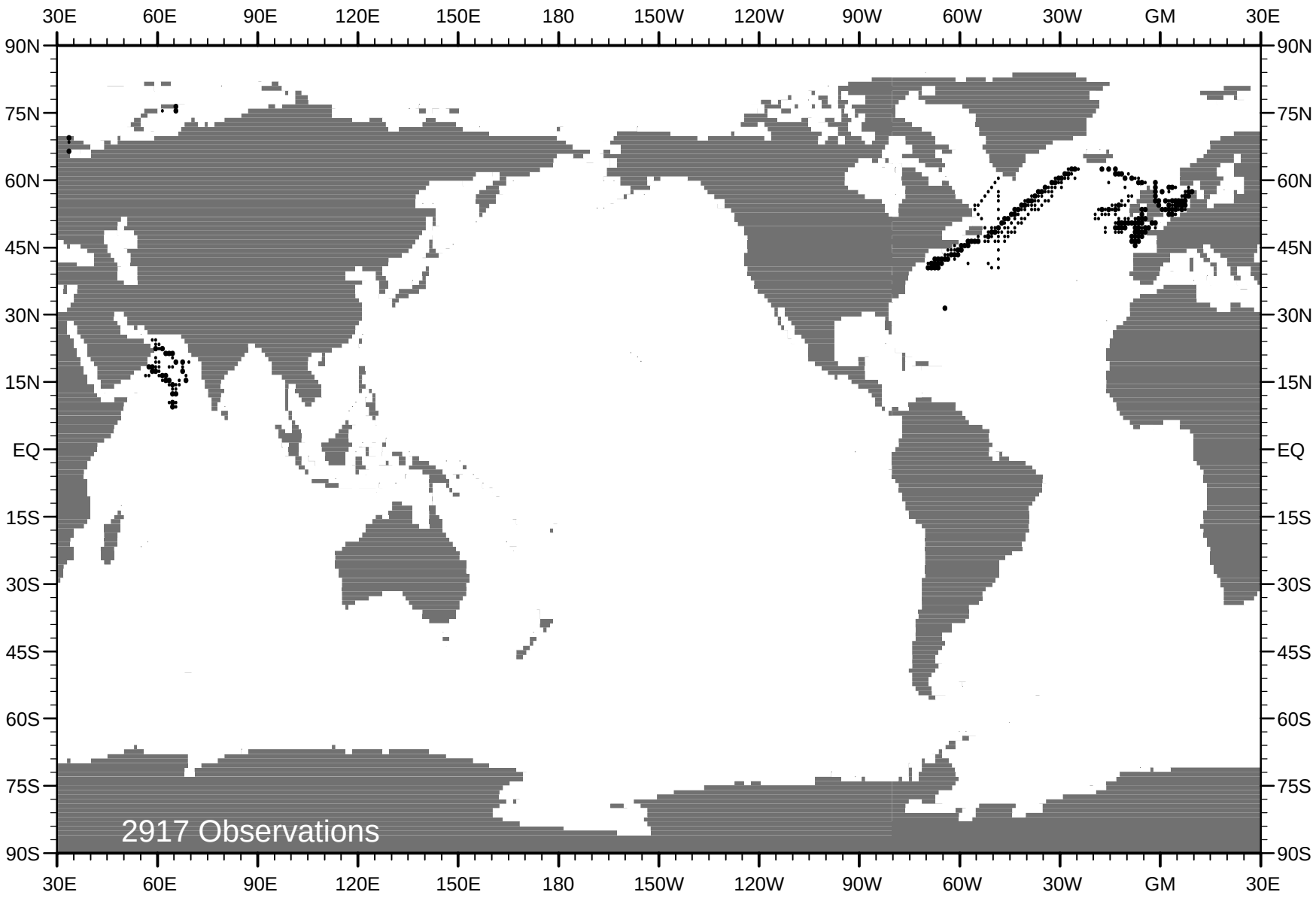


Fig. C66 Distribution of all Ocean Station Data (OSD) plankton abundance data in WOD01 for year 1995 .

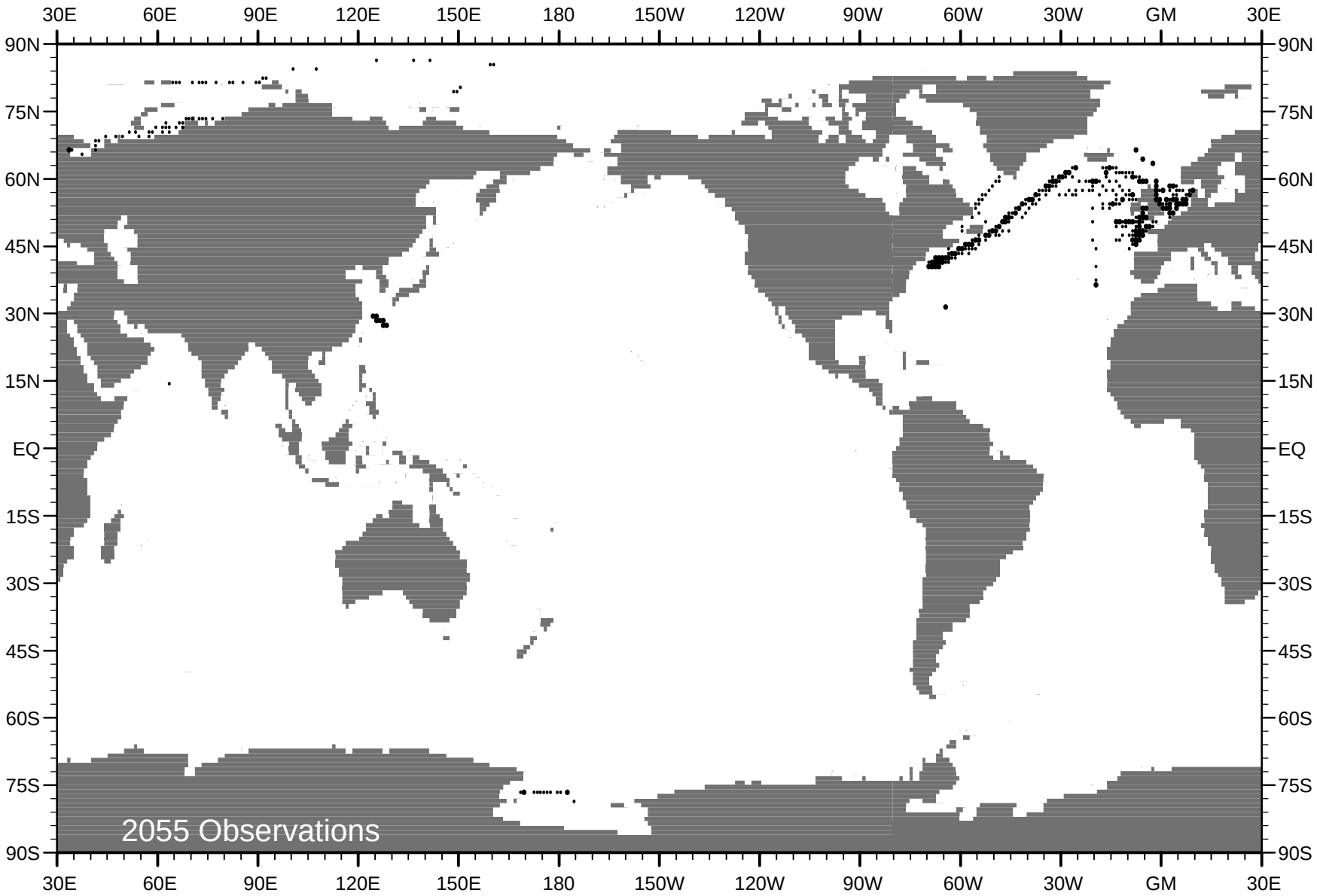


Fig. C67 Distribution of all Ocean Station Data (OSD) plankton abundance data in WOD01 for year 1996 .

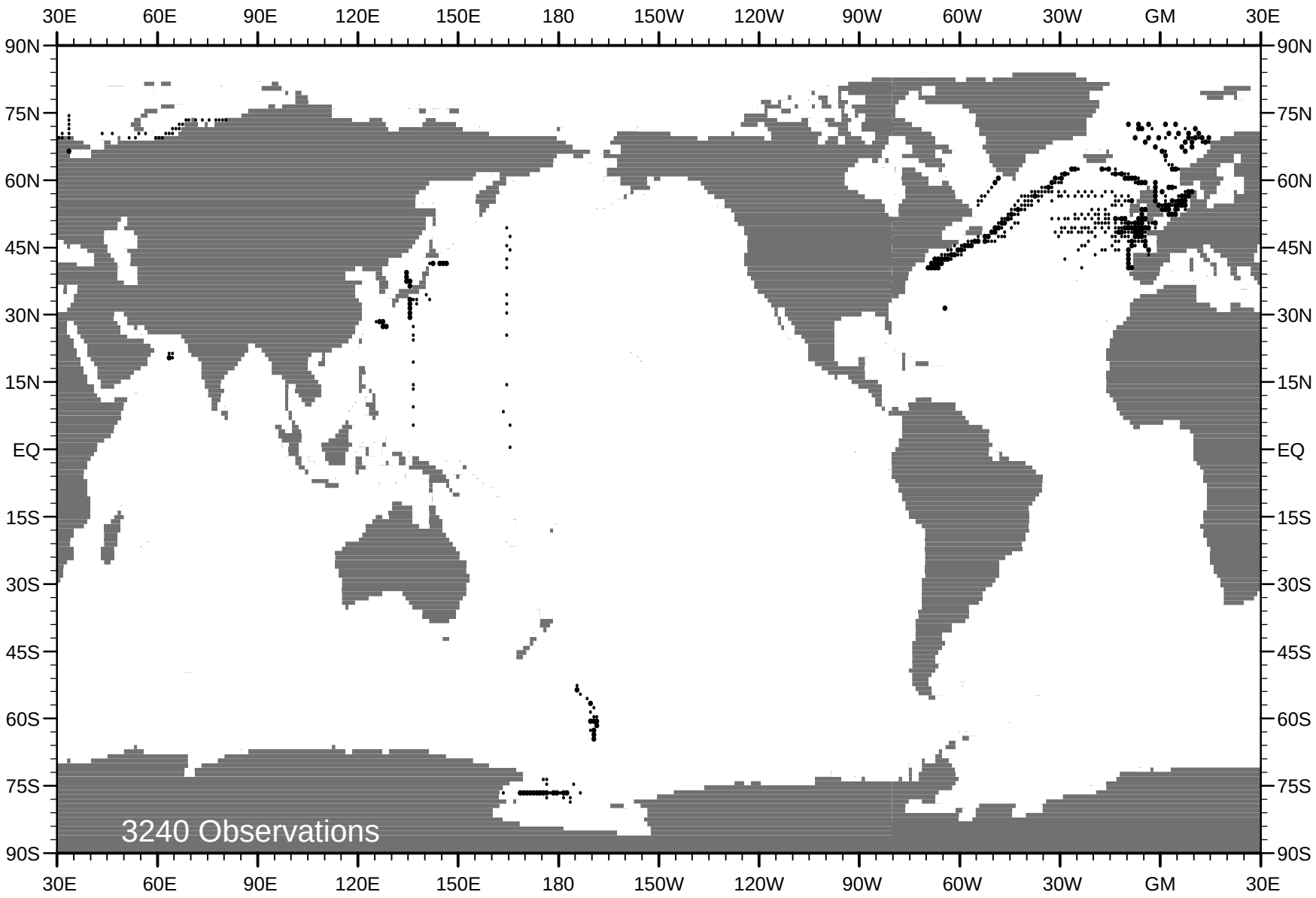


Fig. C68 Distribution of all Ocean Station Data (OSD) plankton abundance data in WOD01 for year 1997 .

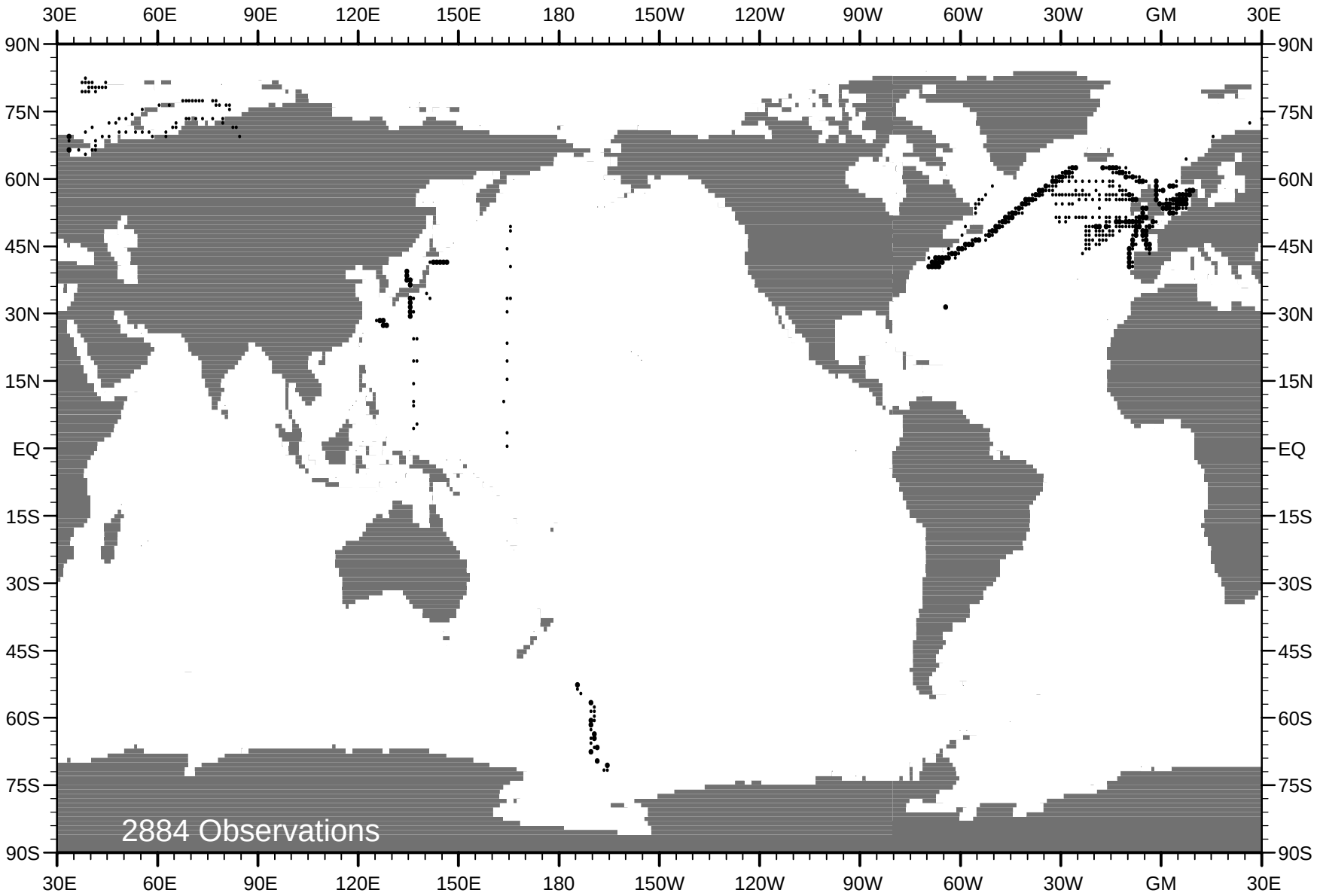


Fig. C69 Distribution of all Ocean Station Data (OSD) plankton abundance data in WOD01 for year 1998 .

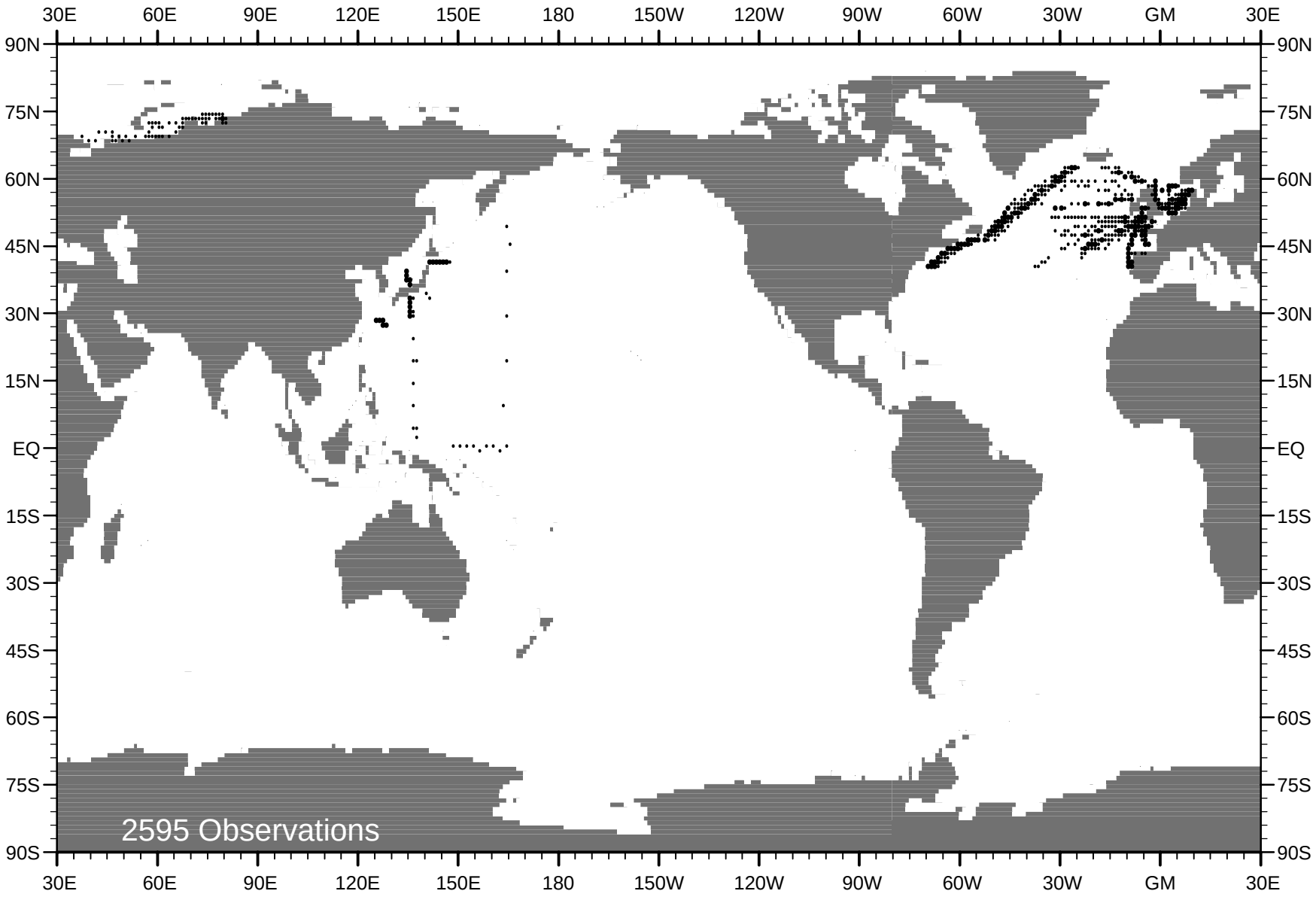


Fig. C70 Distribution of all Ocean Station Data (OSD) plankton abundance data in WOD01 for year 1999 .

7. APPENDIX D: DISTRIBUTIONS FOR INDIVIDUAL YEARS OF ALL OCEAN STATION DATA (OSD) PLANKTON BIOMASS DATA IN WOD01

This appendix contains yearly distributions of all OSD plankton biomass data contained in WOD01. These maps provide some history of the observational progress of the field of oceanography. They also serve as indicators of whether or not a particular data set from a scientist or institution is part of the NODC/WDC-A archive. The exchange of information provided by the publication of such maps has provided us with valuable information about deficiencies in the database. The locations of all WOD01 OSD plankton biomass data are plotted including stations that may be erroneously located over land. However, WOD01 contains some stations from various lakes so care should be exercised in the use of these stations and the determination as to whether they represent errors in locations.

For all figures in Appendix D, a small dot indicates a one-degree square containing from one to four stations and a large dot indicates five or more stations.

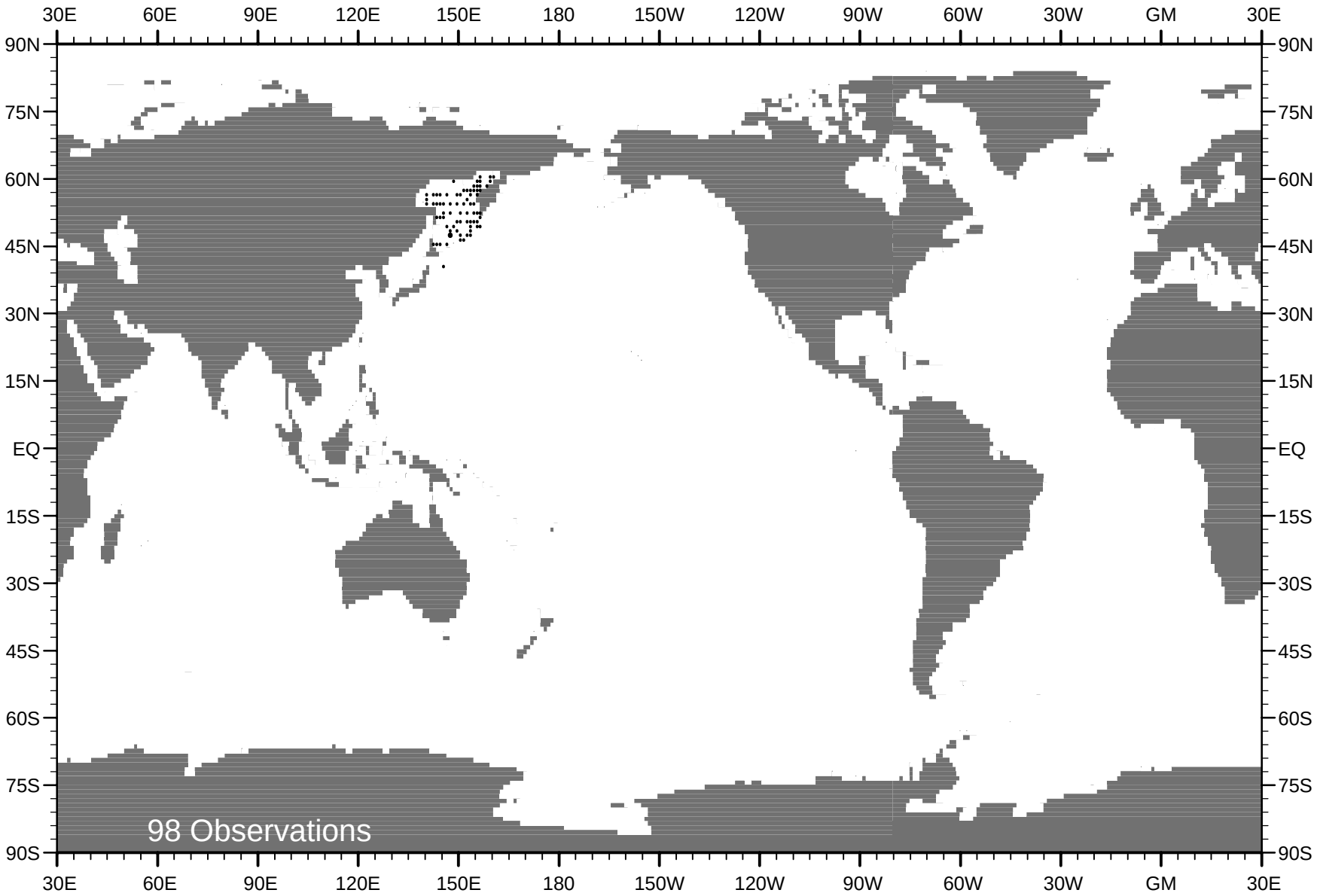


Fig. D1 Distribution of all Ocean Station Data (OSD) plankton biomass data in WOD01 for year 1949 .

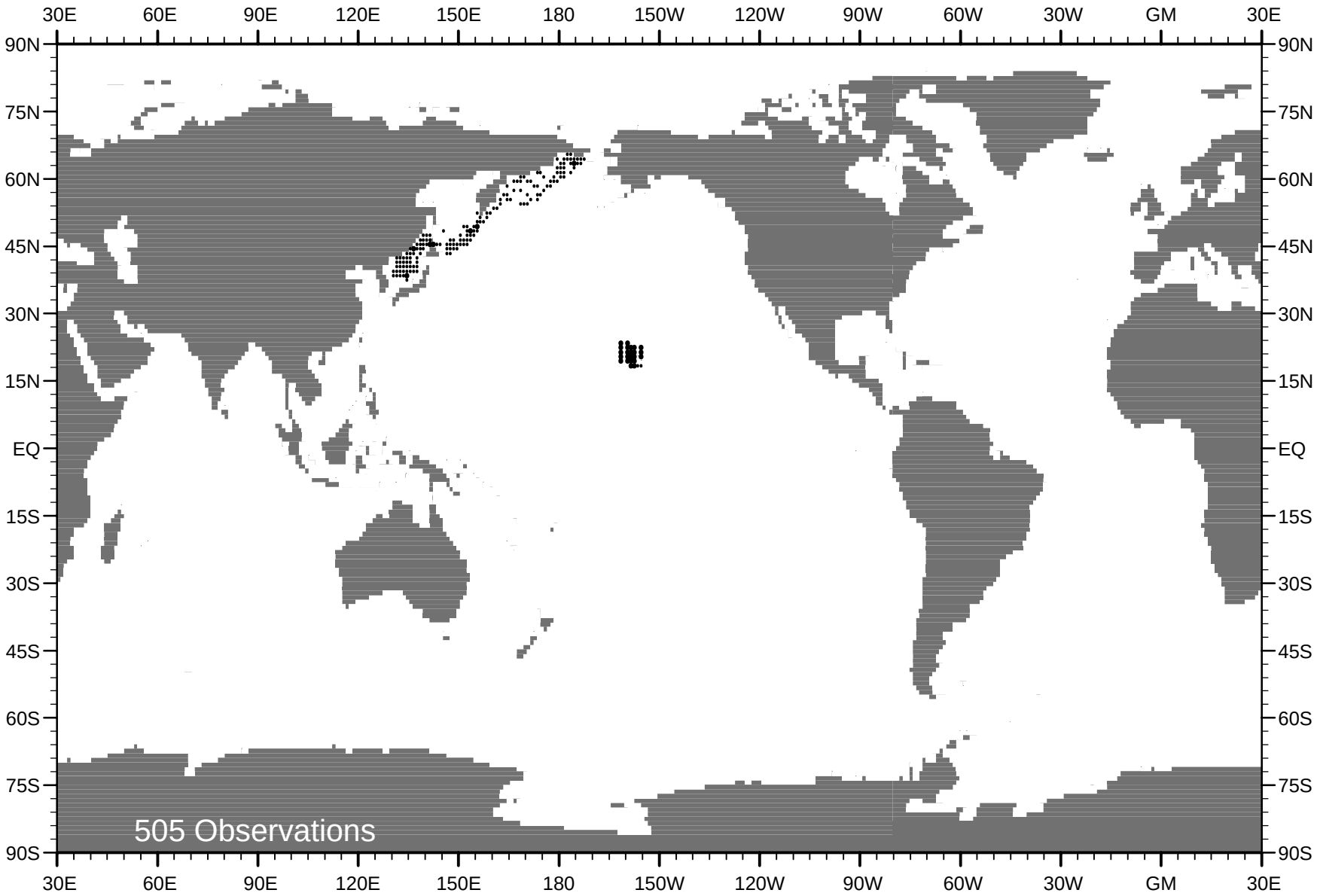


Fig. D2 Distribution of all Ocean Station Data (OSD) plankton biomass data in WOD01 for year 1950 .

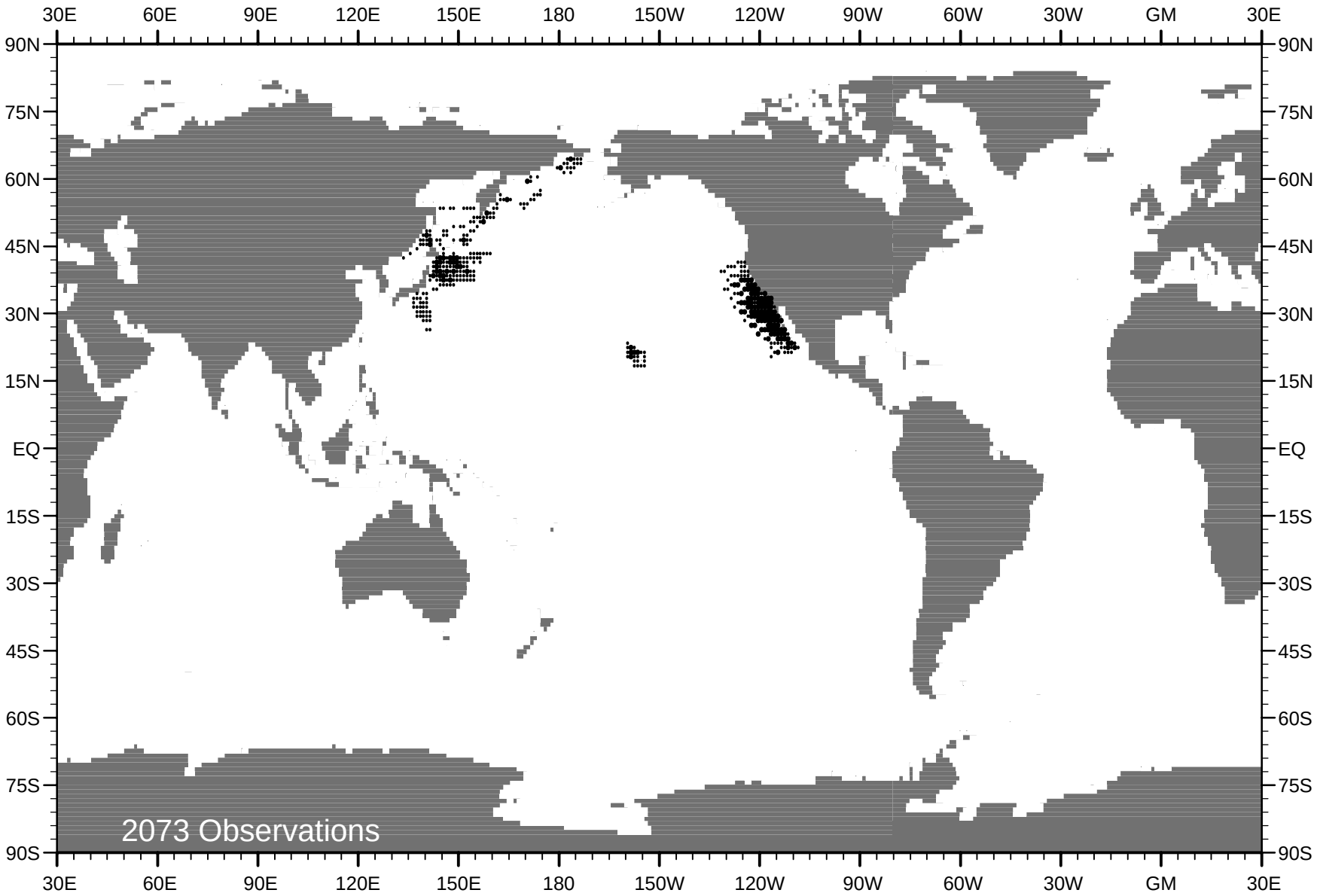


Fig. D3 Distribution of all Ocean Station Data (OSD) plankton biomass data in WOD01 for year 1951 .

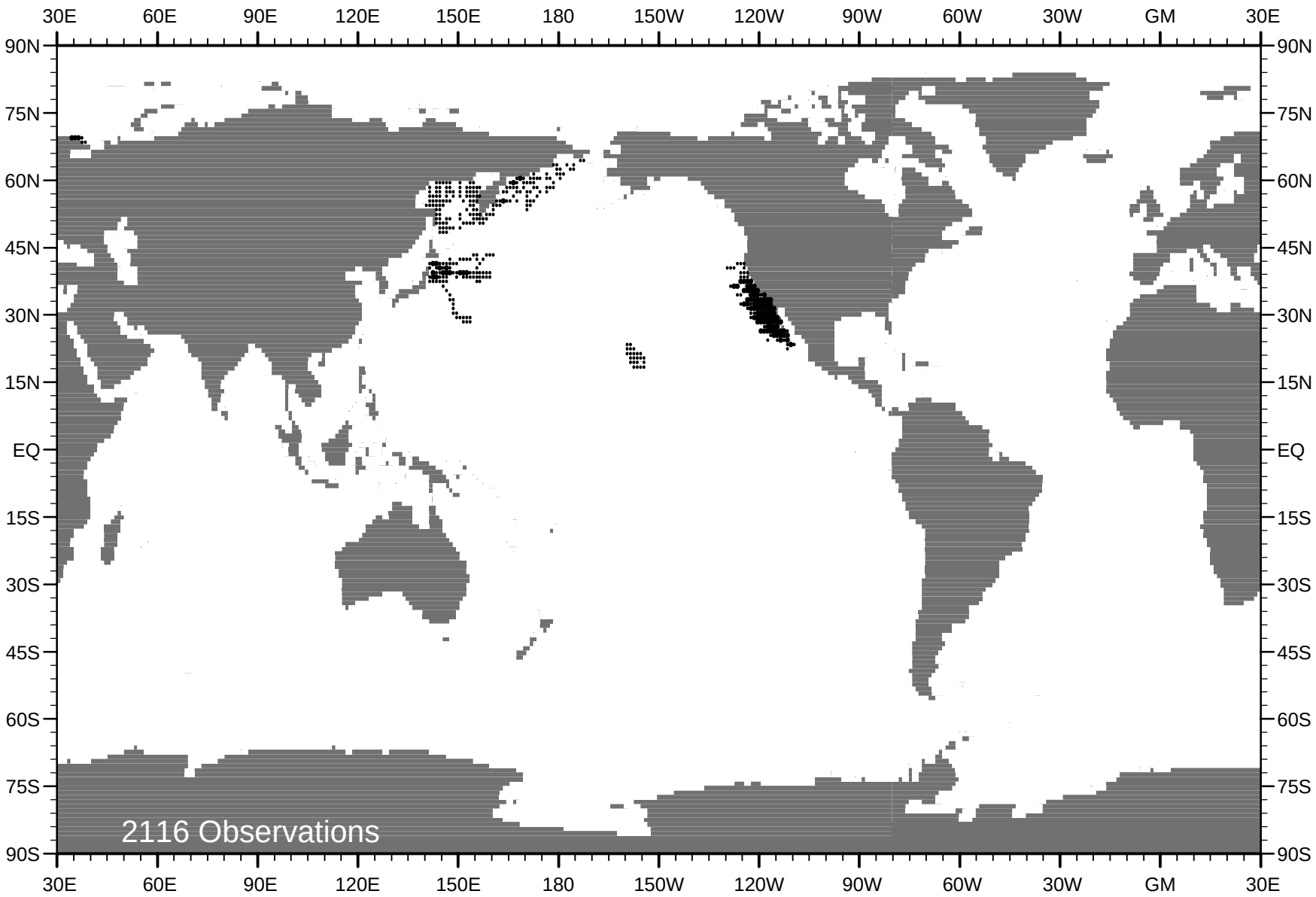


Fig. D4 Distribution of all Ocean Station Data (OSD) plankton biomass data in WOD01 for year 1952 .

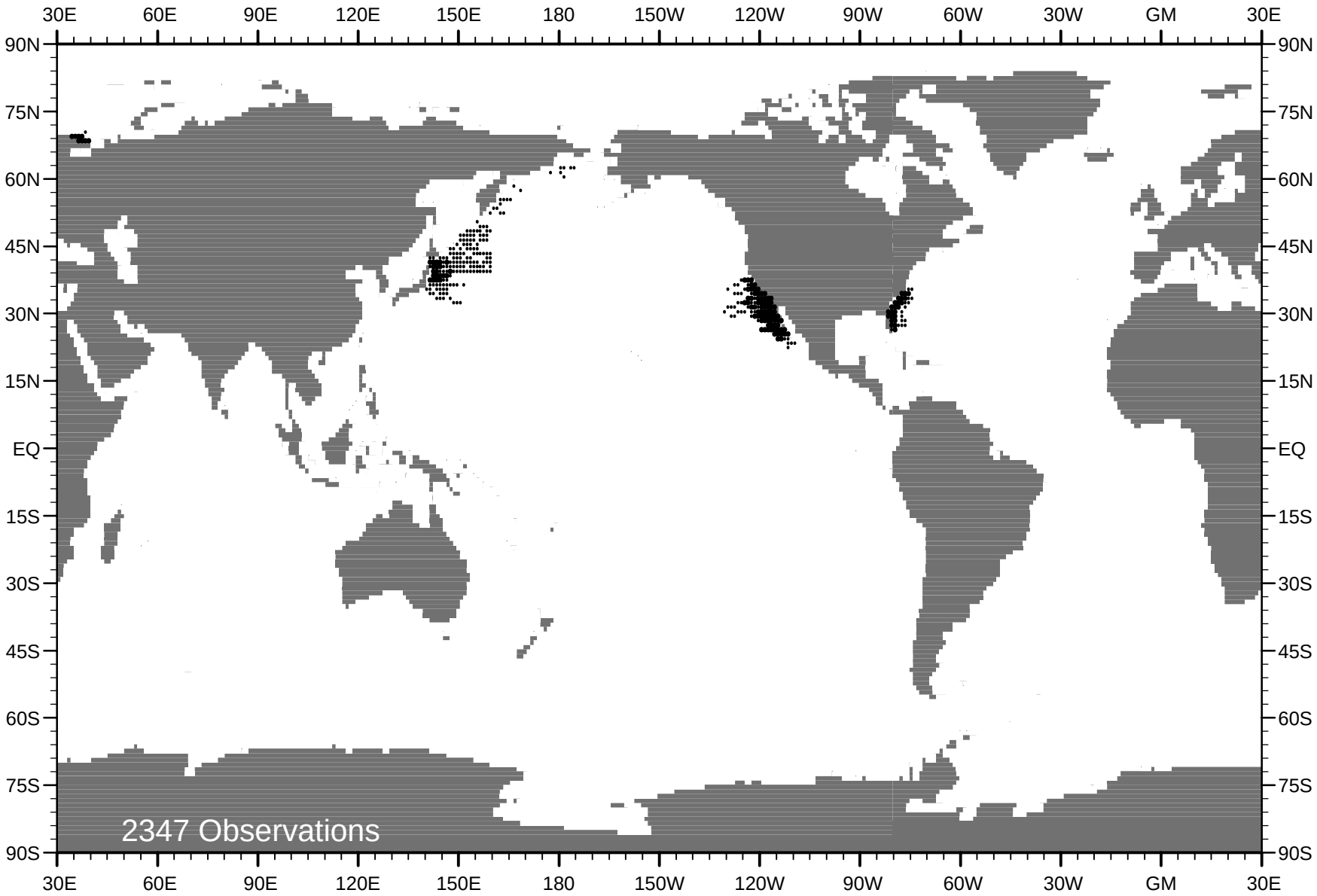


Fig. D5 Distribution of all Ocean Station Data (OSD) plankton biomass data in WOD01 for year 1953 .

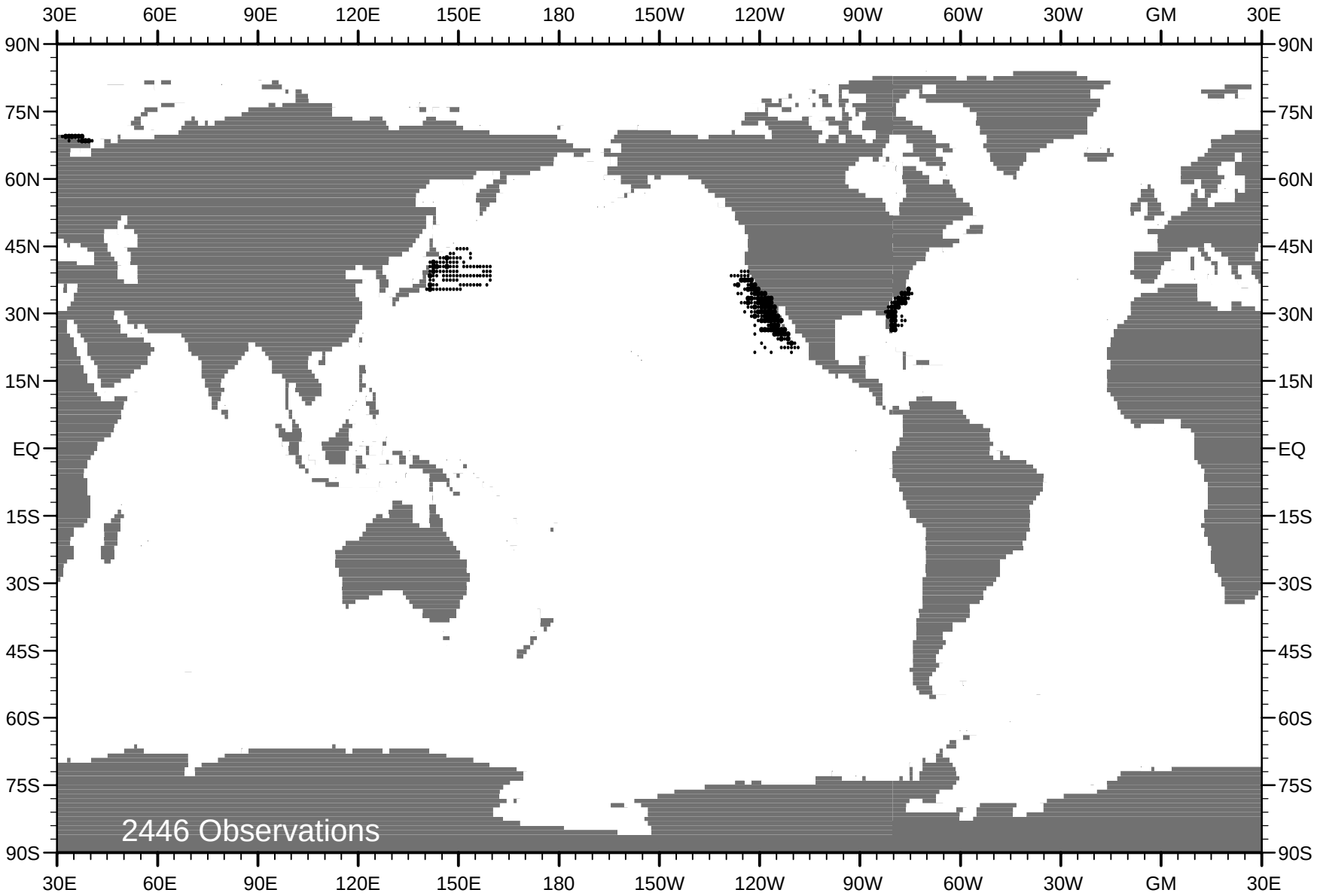


Fig. D6 Distribution of all Ocean Station Data (OSD) plankton biomass data in WOD01 for year 1954 .

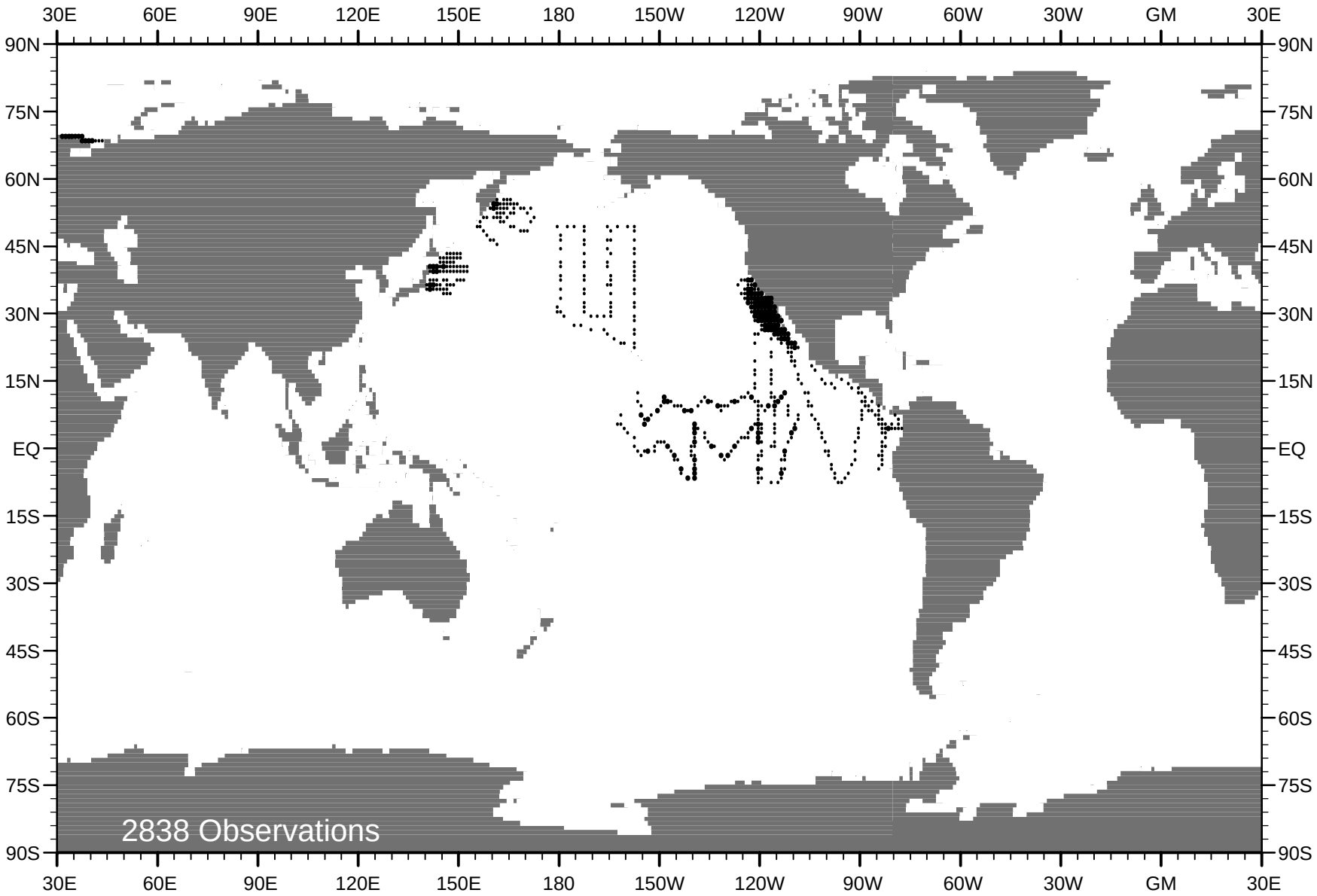


Fig. D7 Distribution of all Ocean Station Data (OSD) plankton biomass data in WOD01 for year 1955 .

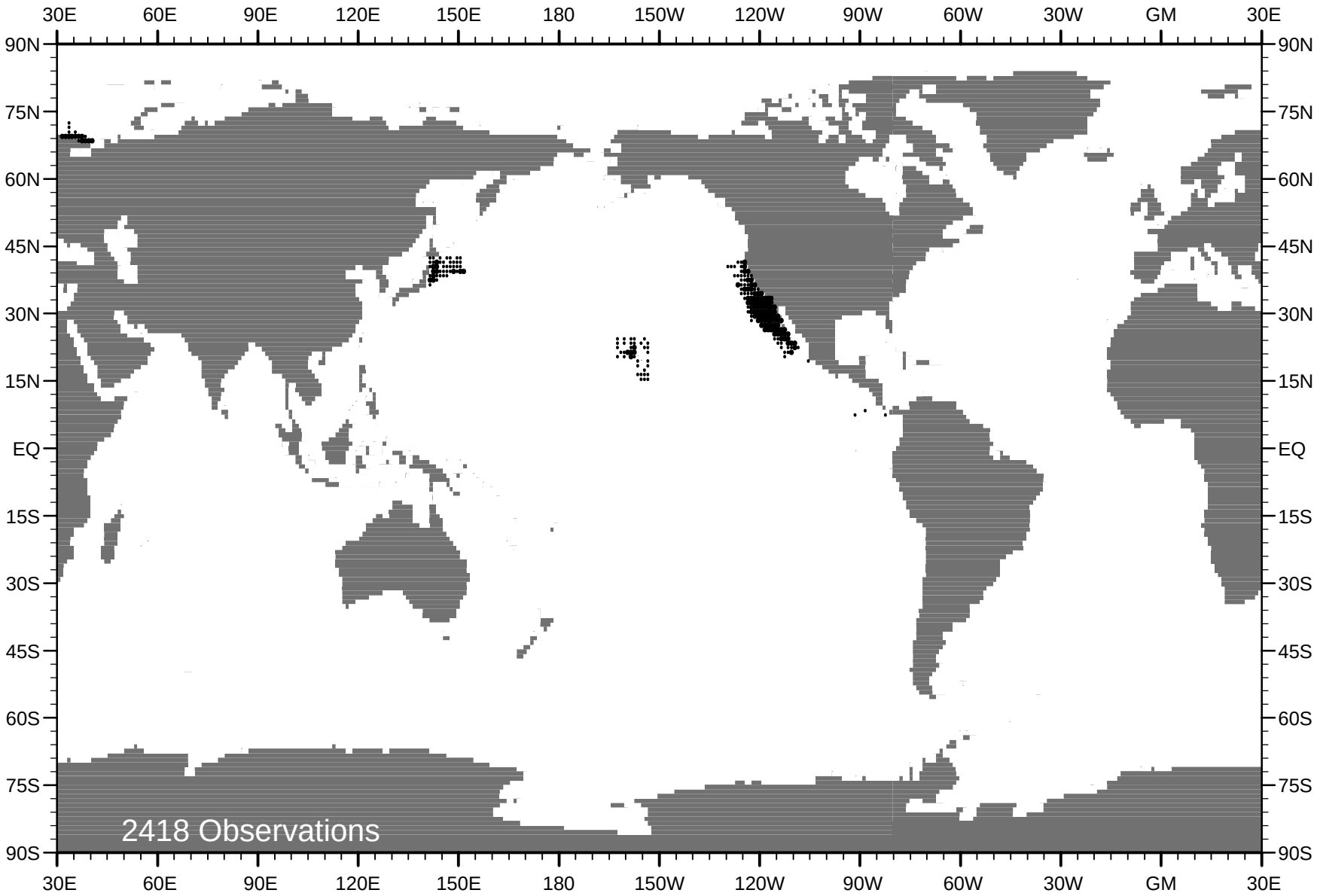


Fig. D8 Distribution of all Ocean Station Data (OSD) plankton biomass data in WOD01 for year 1956 .

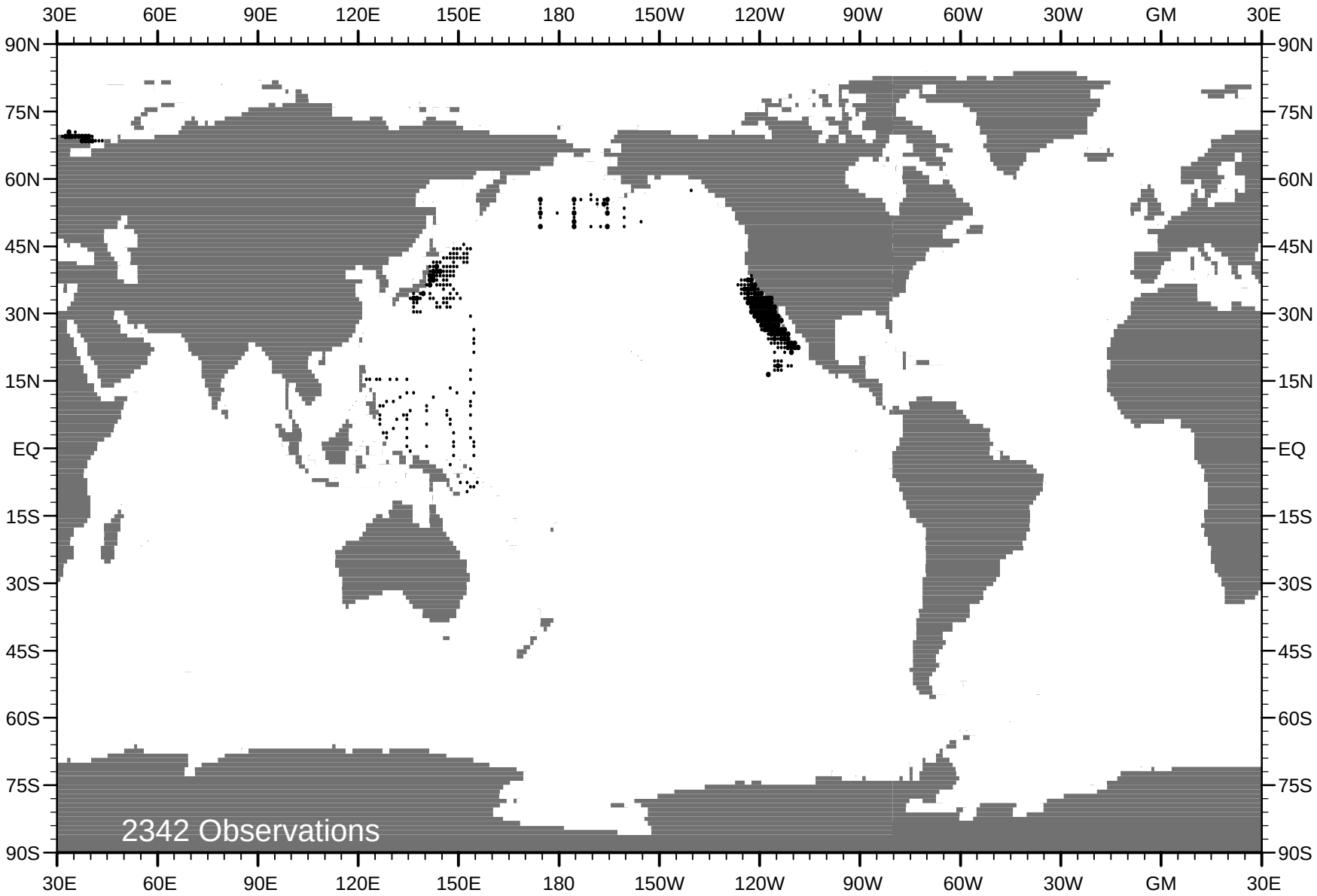


Fig. D9 Distribution of all Ocean Station Data (OSD) plankton biomass data in WOD01 for year 1957 .

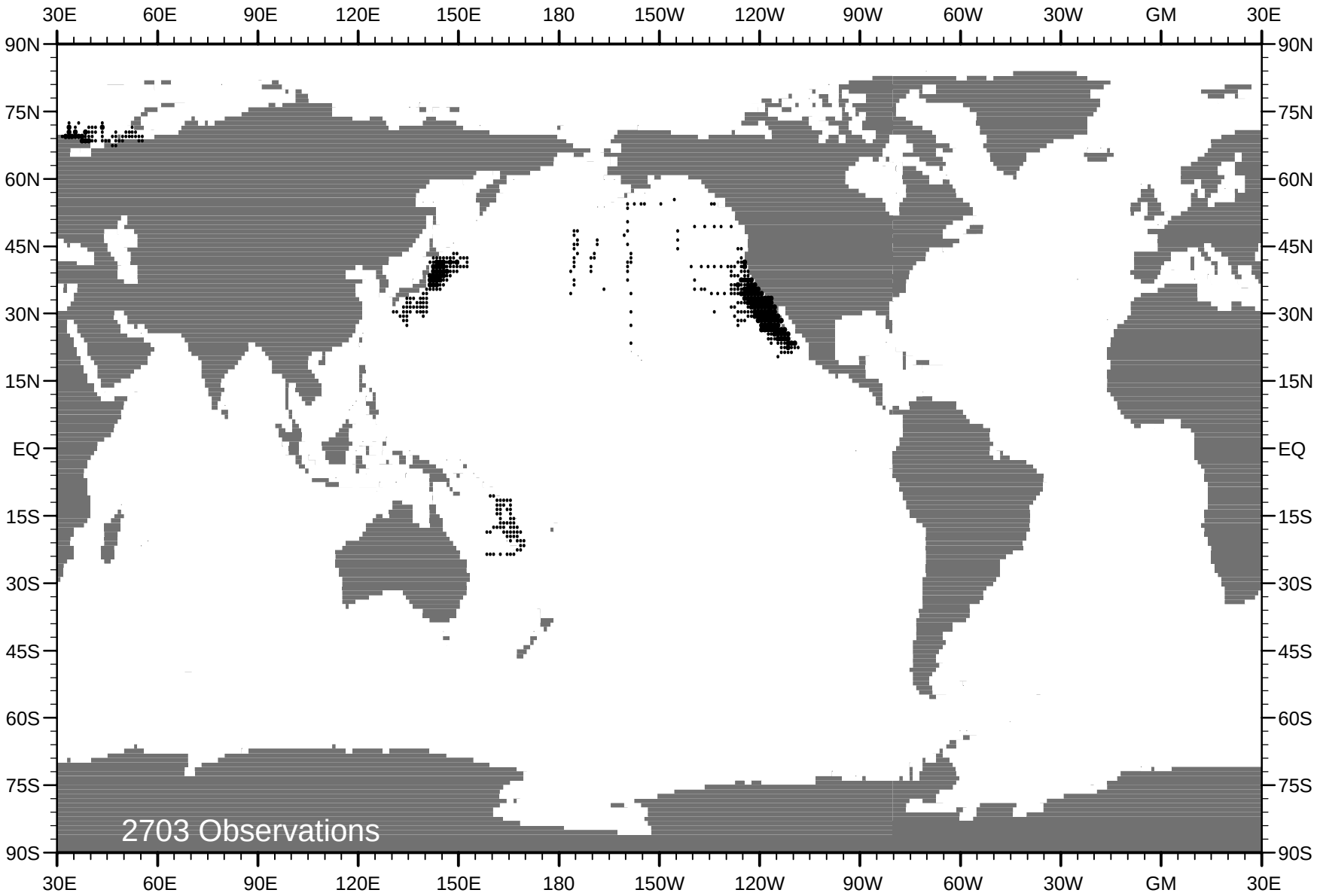


Fig. D10 Distribution of all Ocean Station Data (OSD) plankton biomass data in WOD01 for year 1958 .

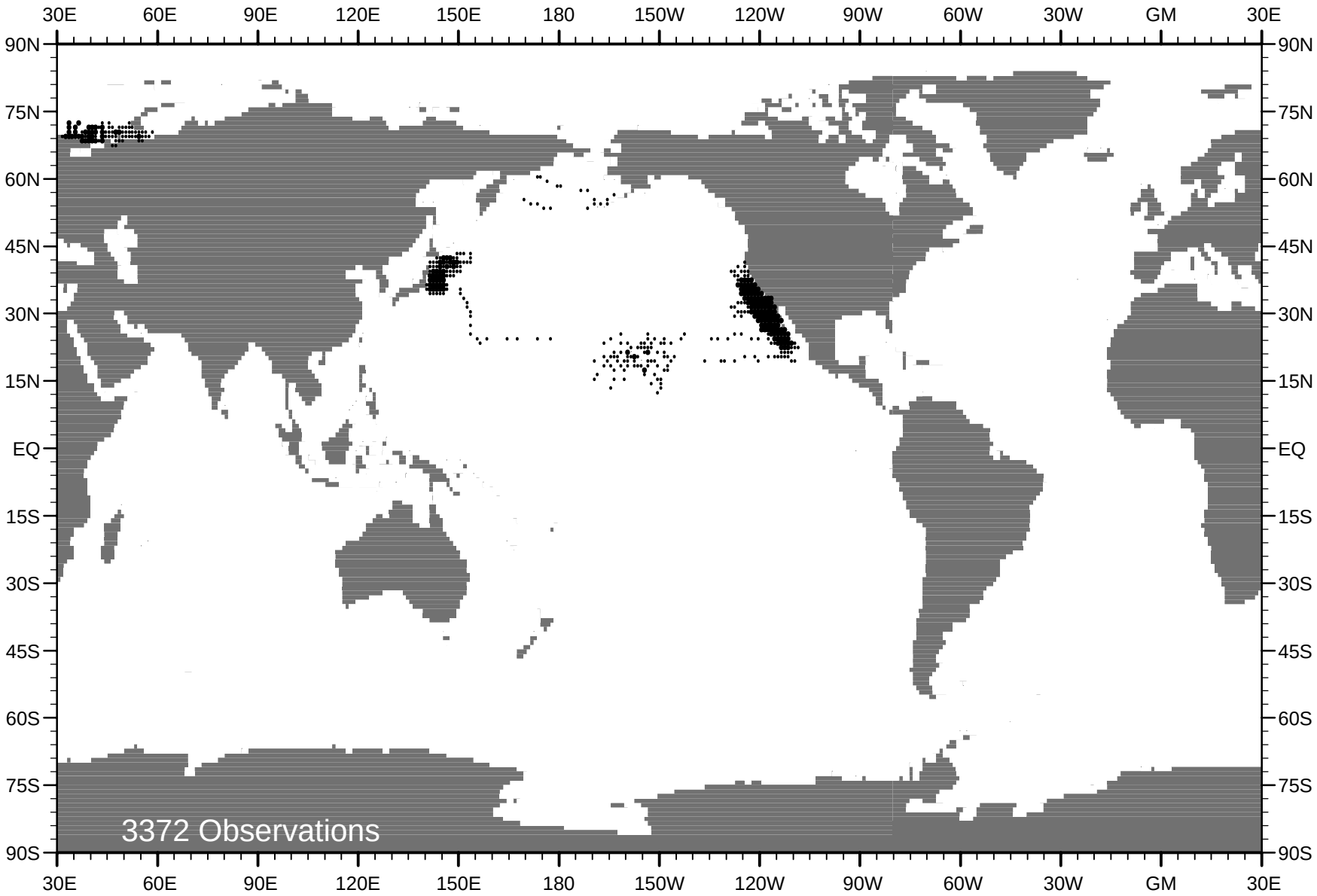
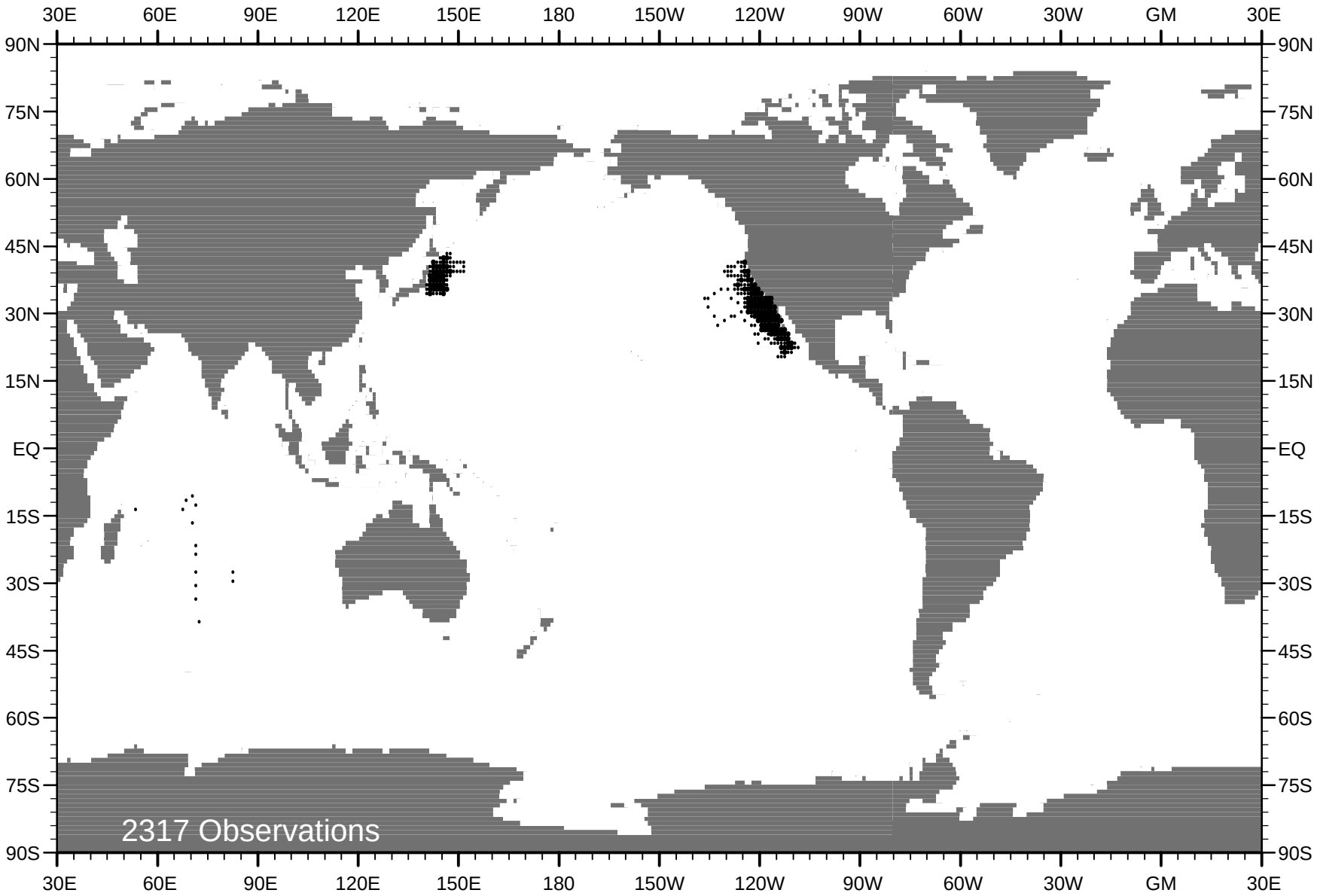


Fig. D11 Distribution of all Ocean Station Data (OSD) plankton biomass data in WOD01 for year 1959 .



180

Fig. D12 Distribution of all Ocean Station Data (OSD) plankton biomass data in WOD01 for year 1960 .

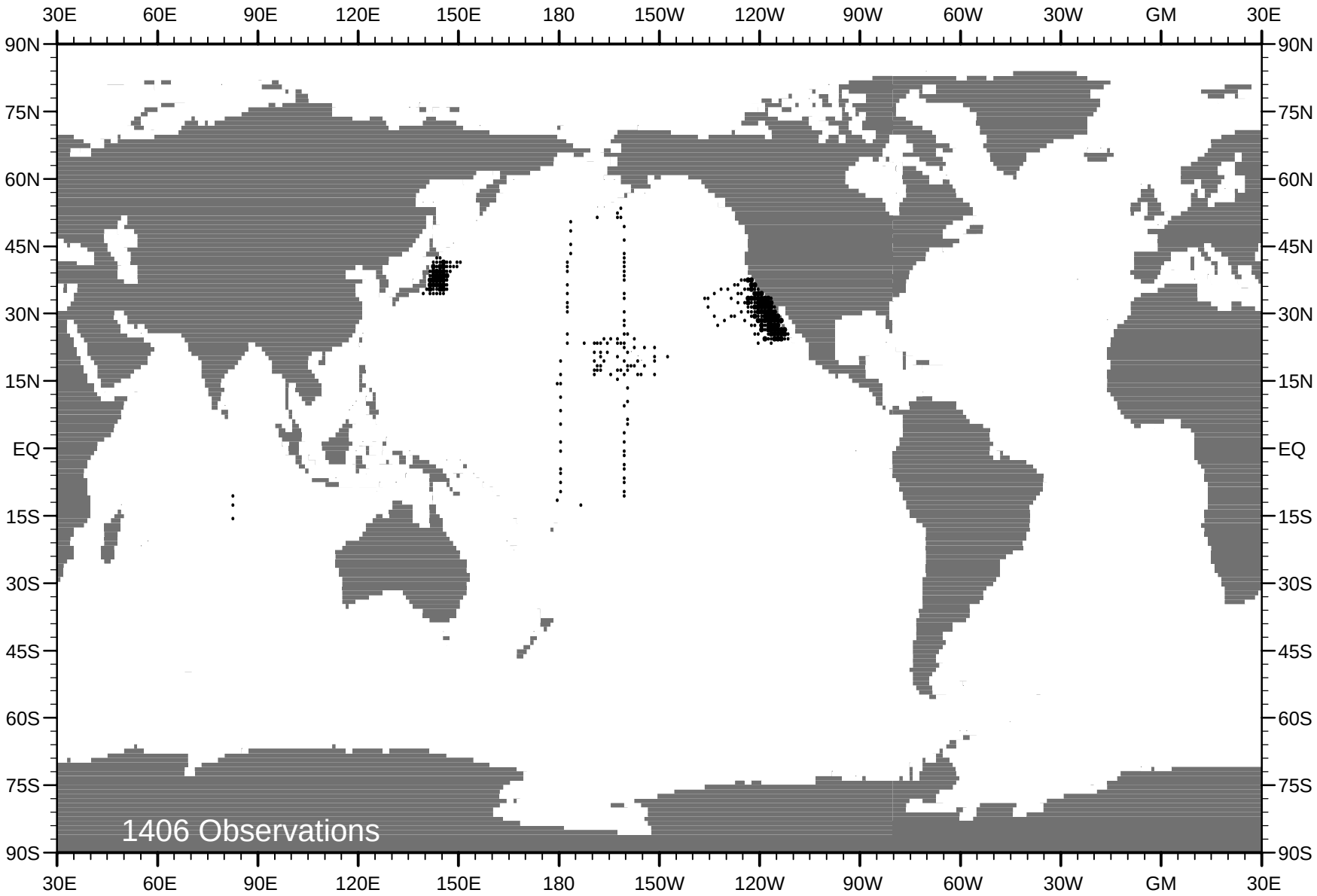


Fig. D13 Distribution of all Ocean Station Data (OSD) plankton biomass data in WOD01 for year 1961 .

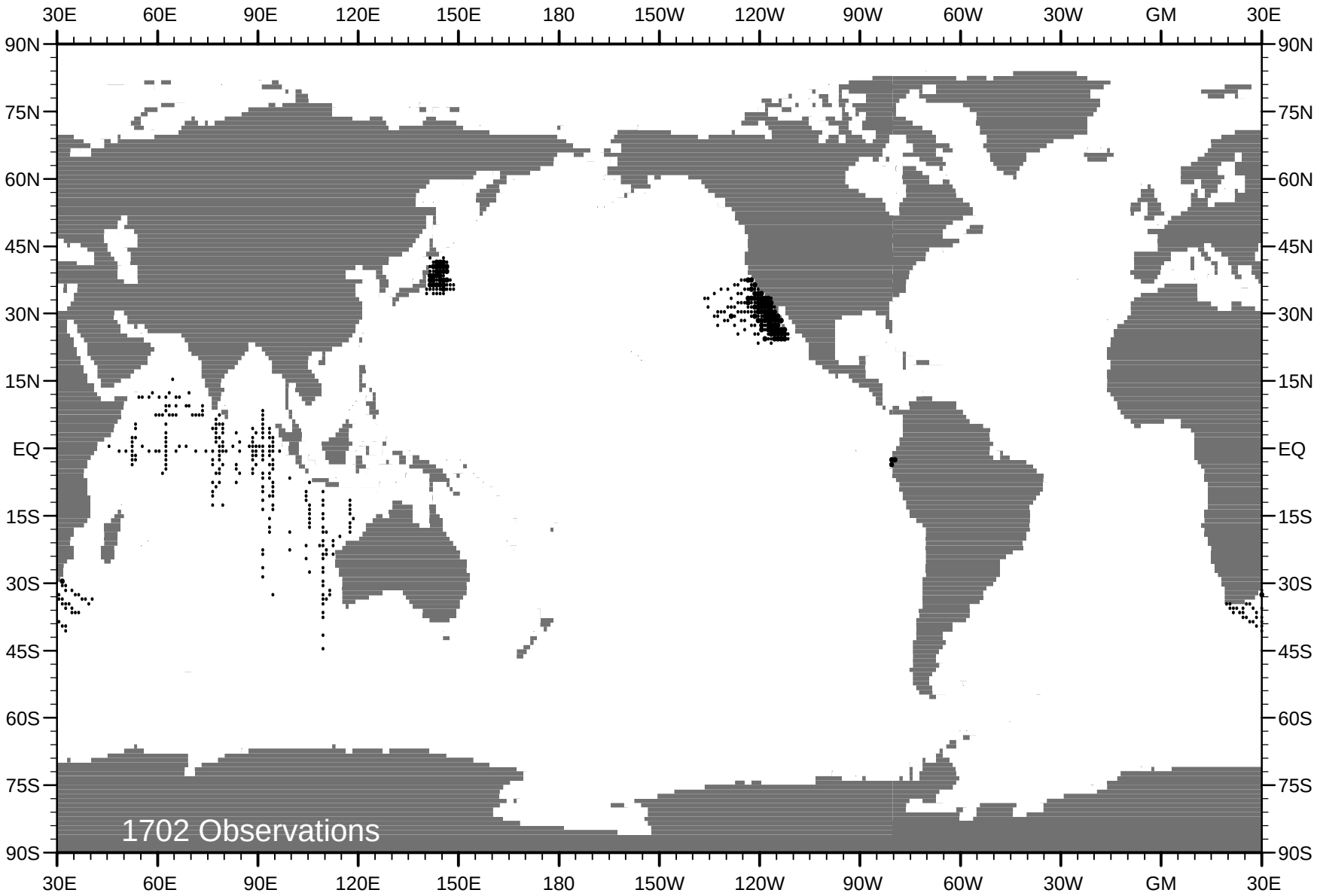


Fig. D14 Distribution of all Ocean Station Data (OSD) plankton biomass data in WOD01 for year 1962 .

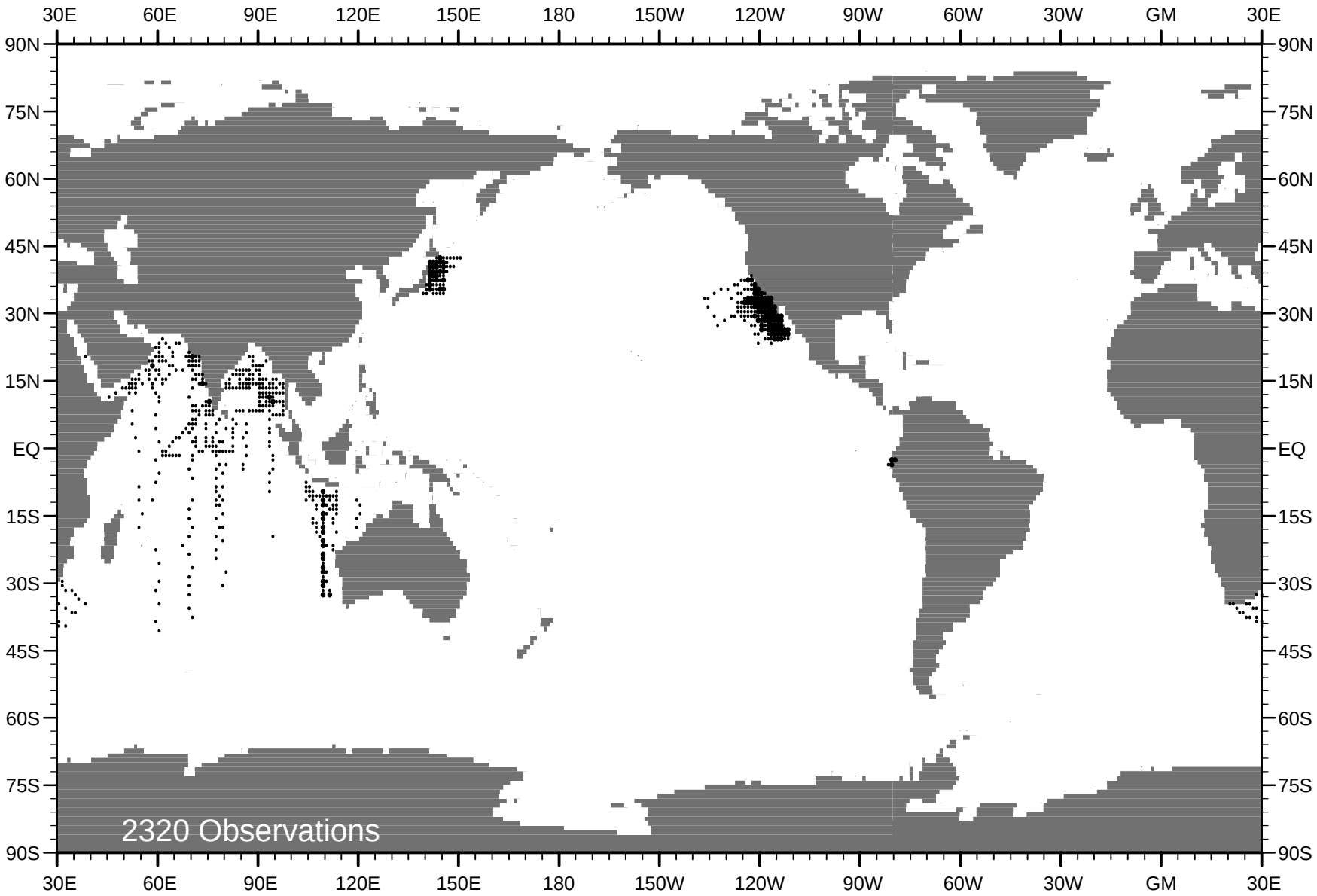


Fig. D15 Distribution of all Ocean Station Data (OSD) plankton biomass data in WOD01 for year 1963 .

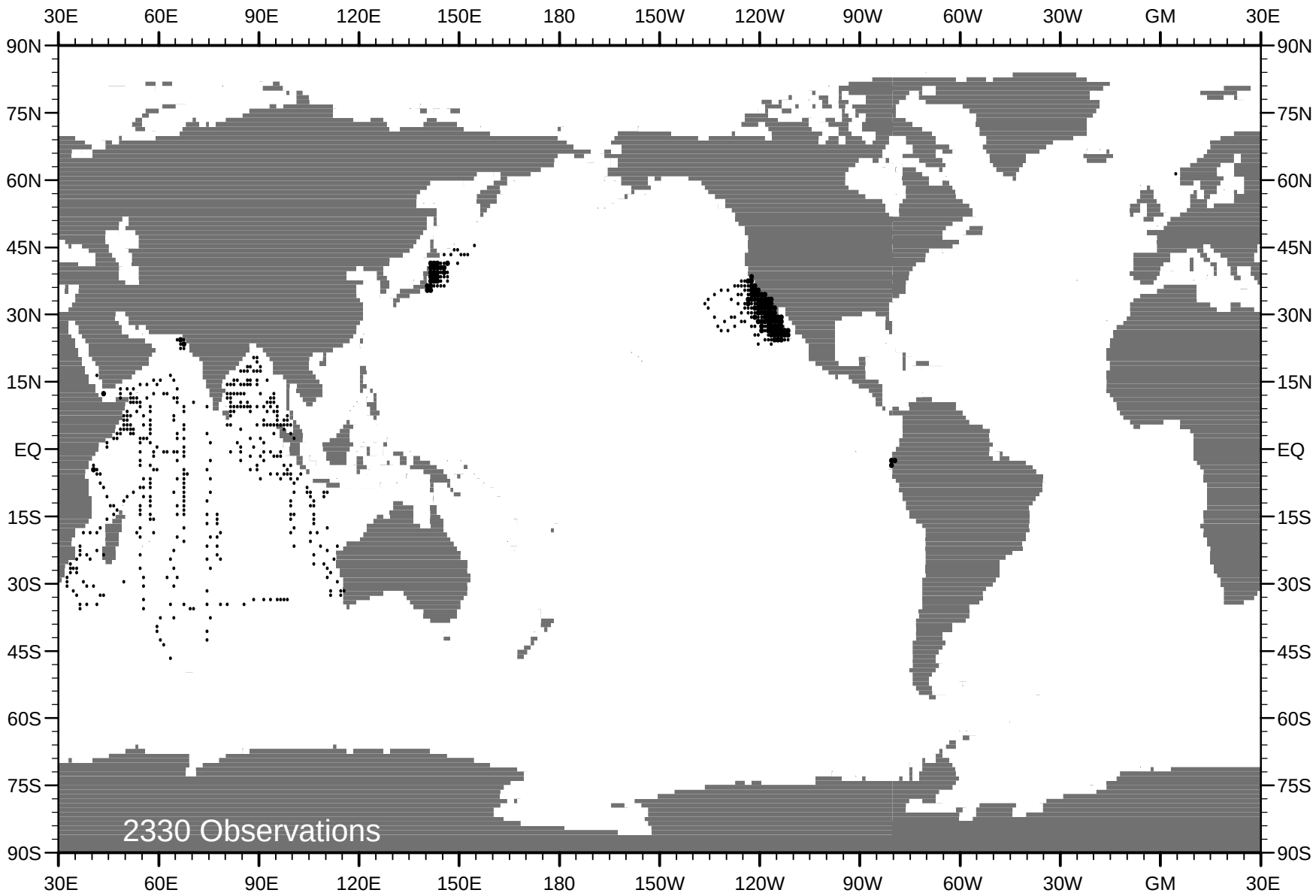


Fig. D16 Distribution of all Ocean Station Data (OSD) plankton biomass data in WOD01 for year 1964 .

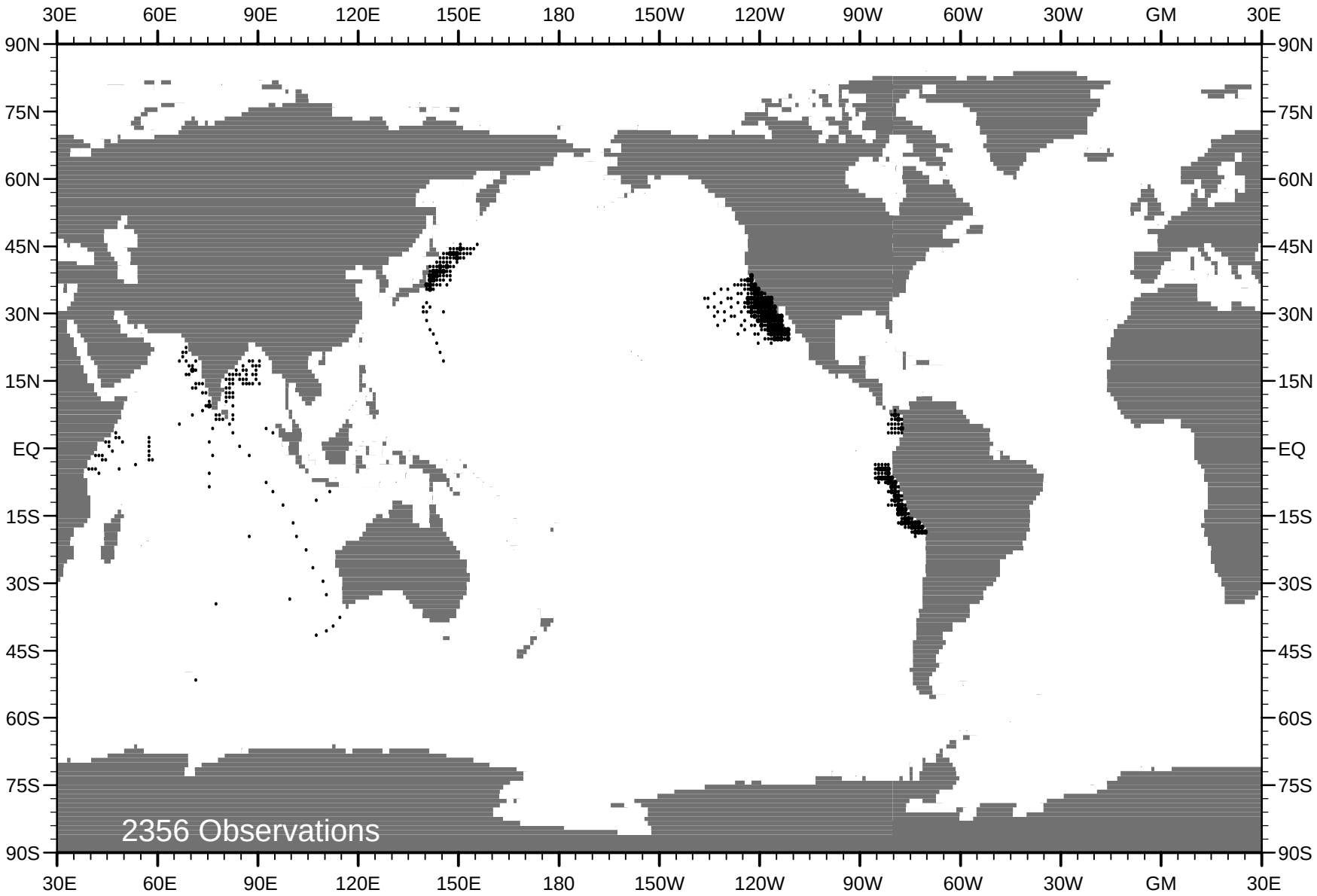


Fig. D17 Distribution of all Ocean Station Data (OSD) plankton biomass data in WOD01 for year 1965 .

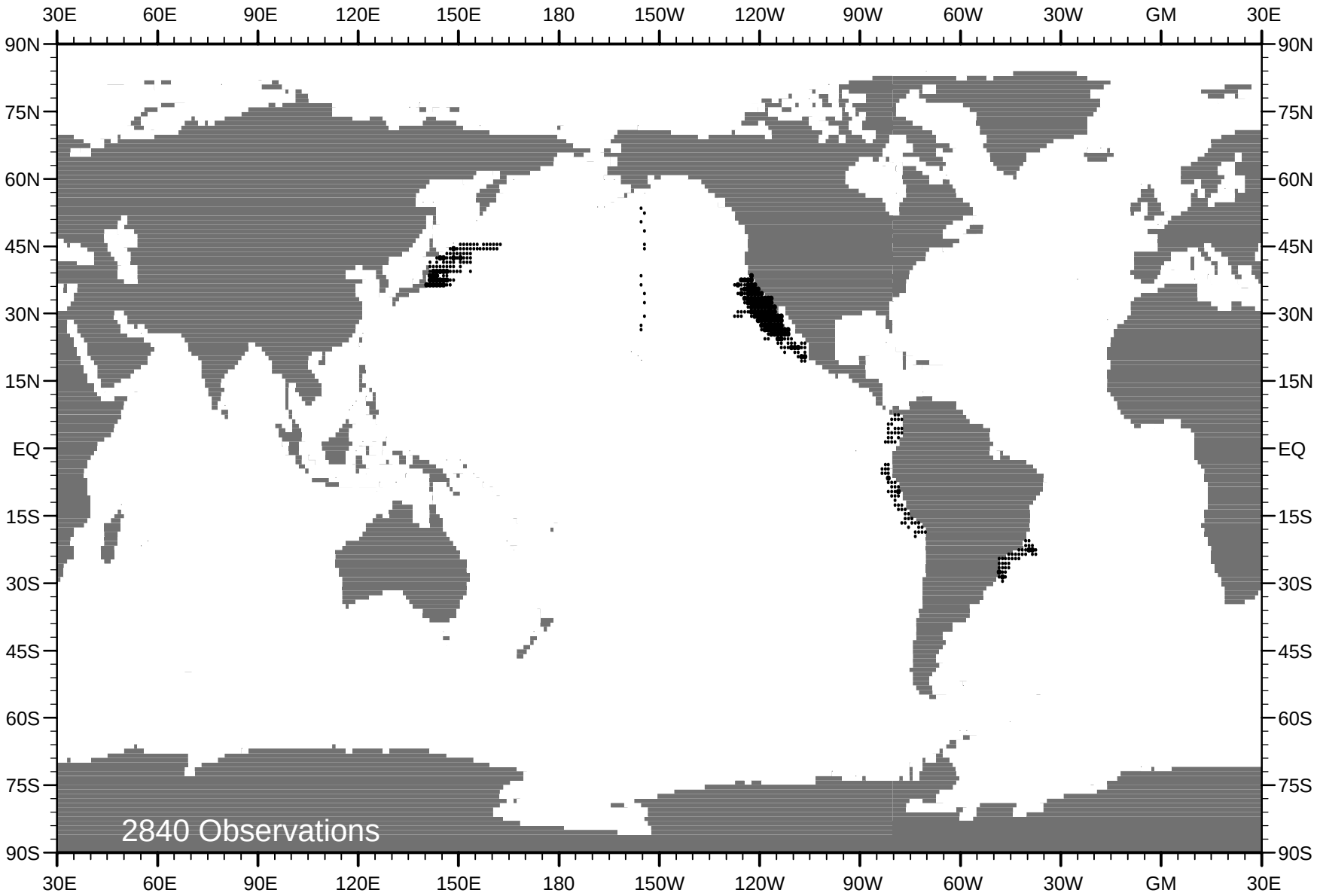


Fig. D18 Distribution of all Ocean Station Data (OSD) plankton biomass data in WOD01 for year 1966 .

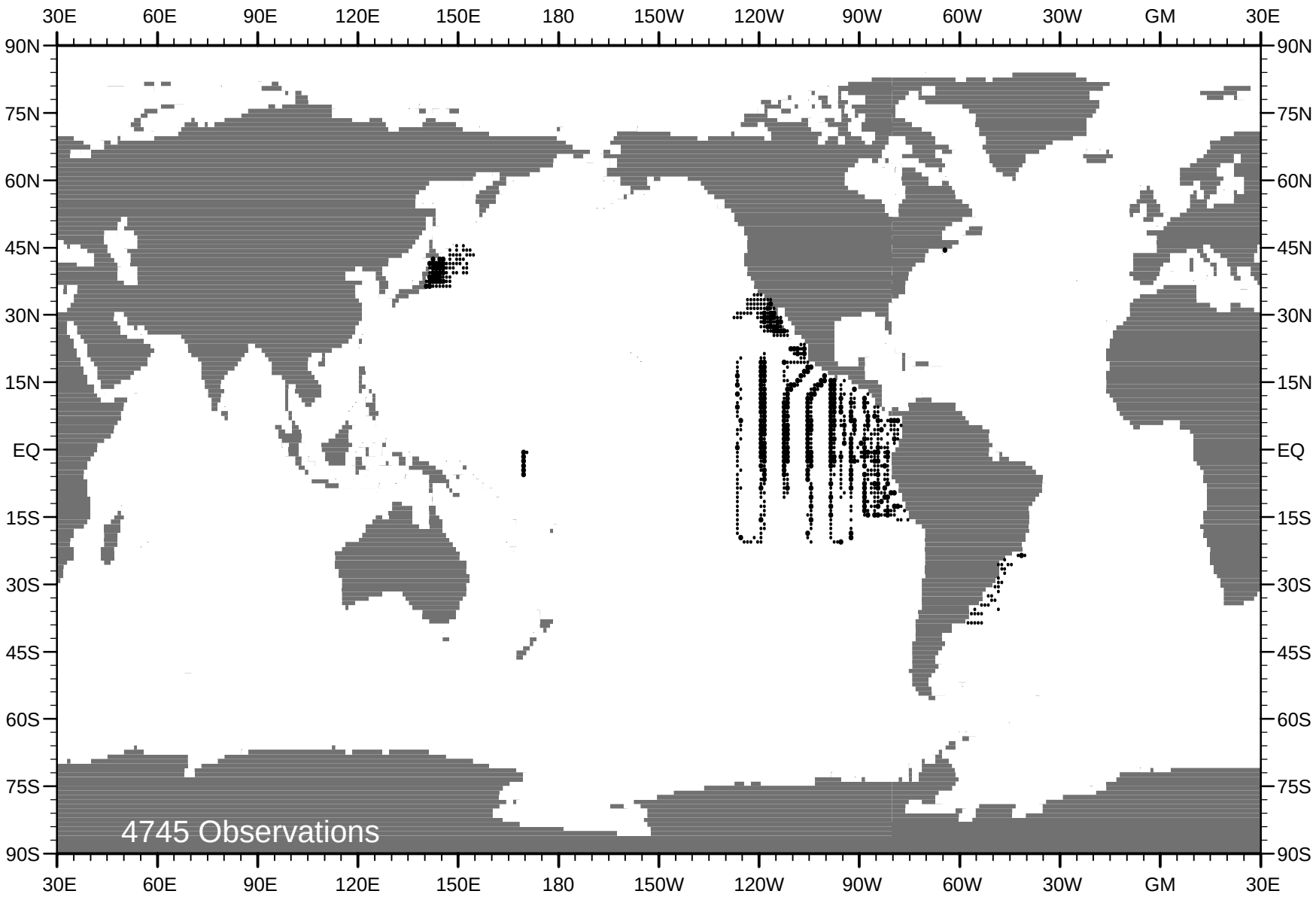


Fig. D19 Distribution of all Ocean Station Data (OSD) plankton biomass data in WOD01 for year 1967 .

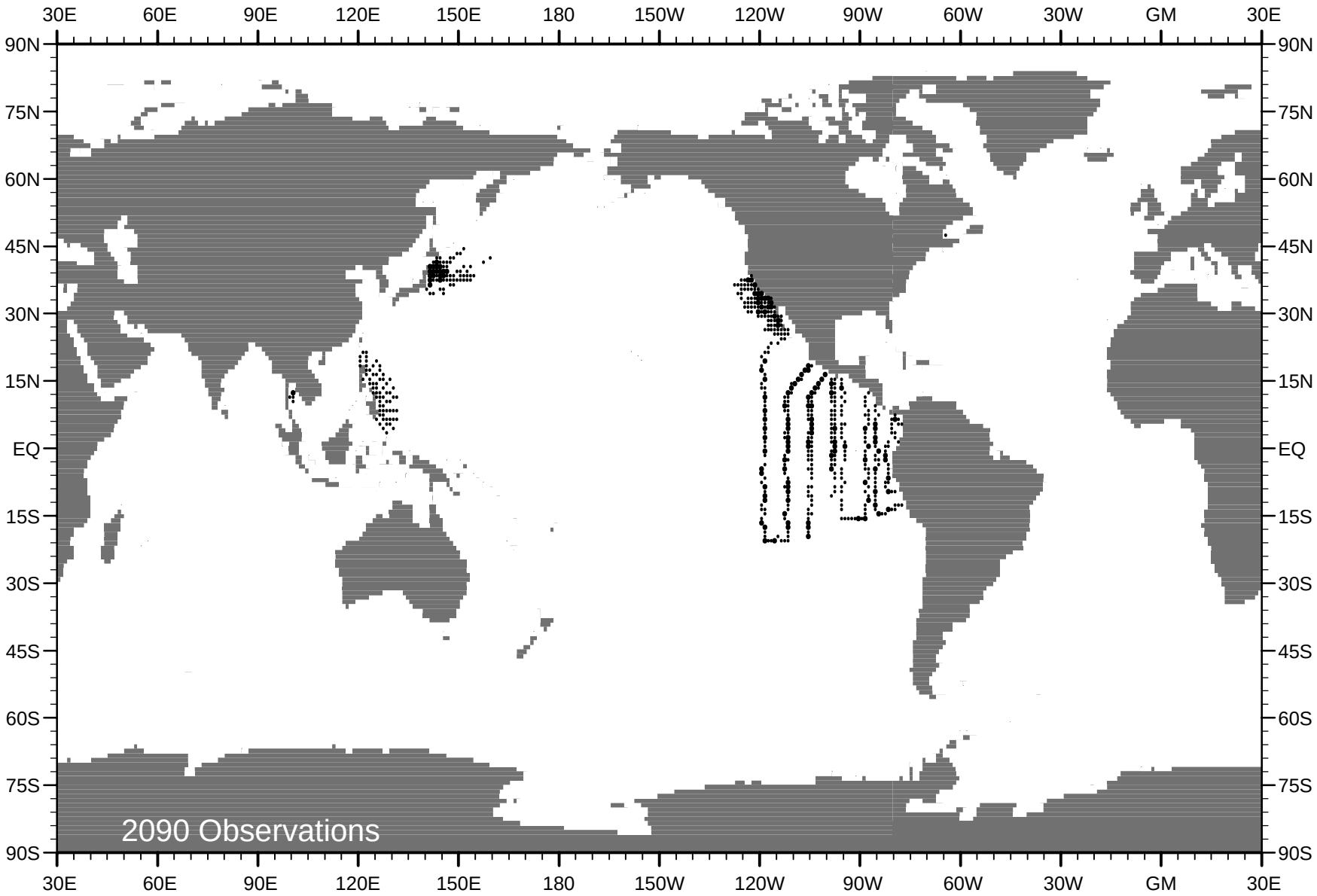


Fig. D20 Distribution of all Ocean Station Data (OSD) plankton biomass data in WOD01 for year 1968 .

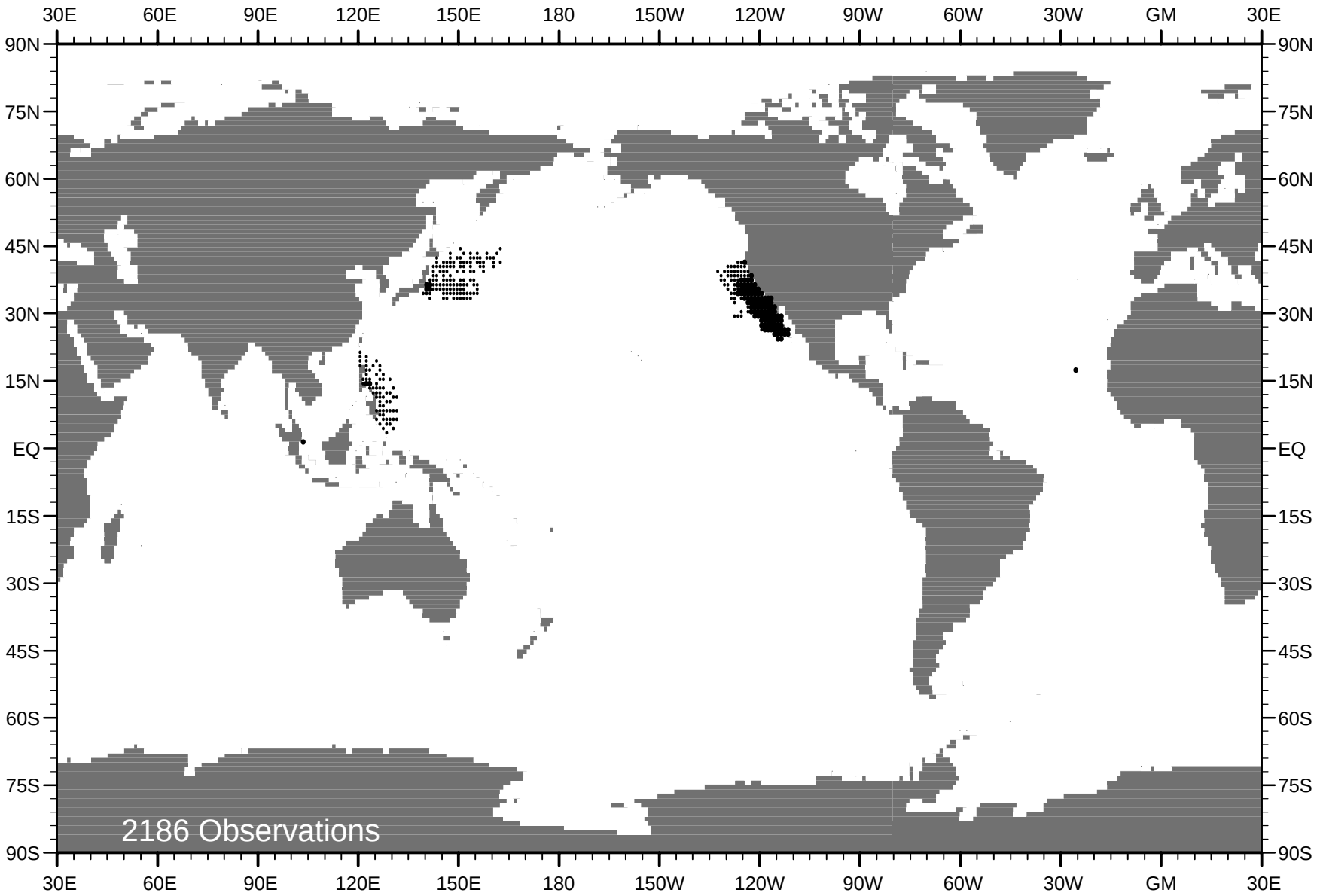


Fig. D21 Distribution of all Ocean Station Data (OSD) plankton biomass data in WOD01 for year 1969 .

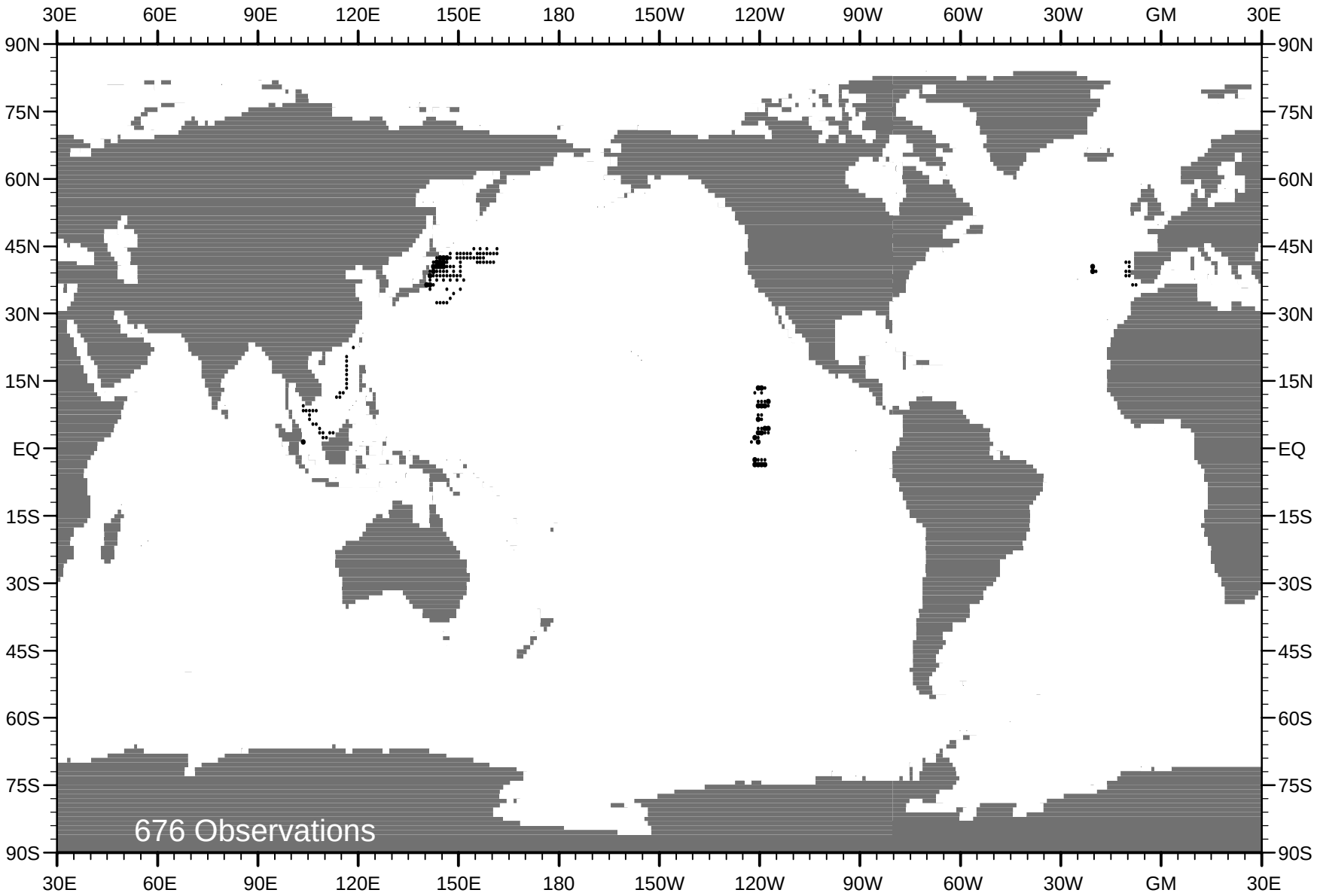


Fig. D22 Distribution of all Ocean Station Data (OSD) plankton biomass data in WOD01 for year 1970 .

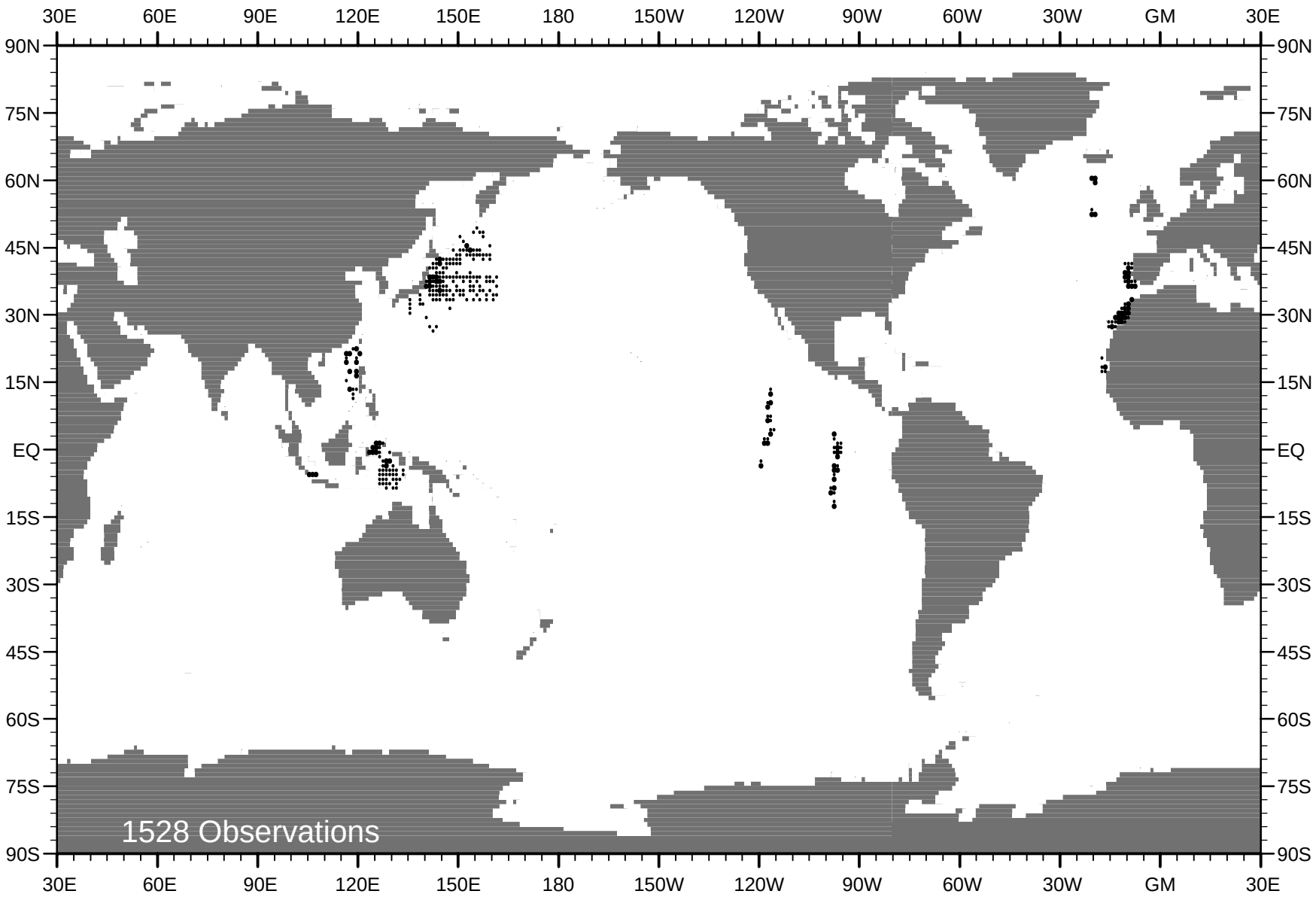


Fig. D23 Distribution of all Ocean Station Data (OSD) plankton biomass data in WOD01 for year 1971 .

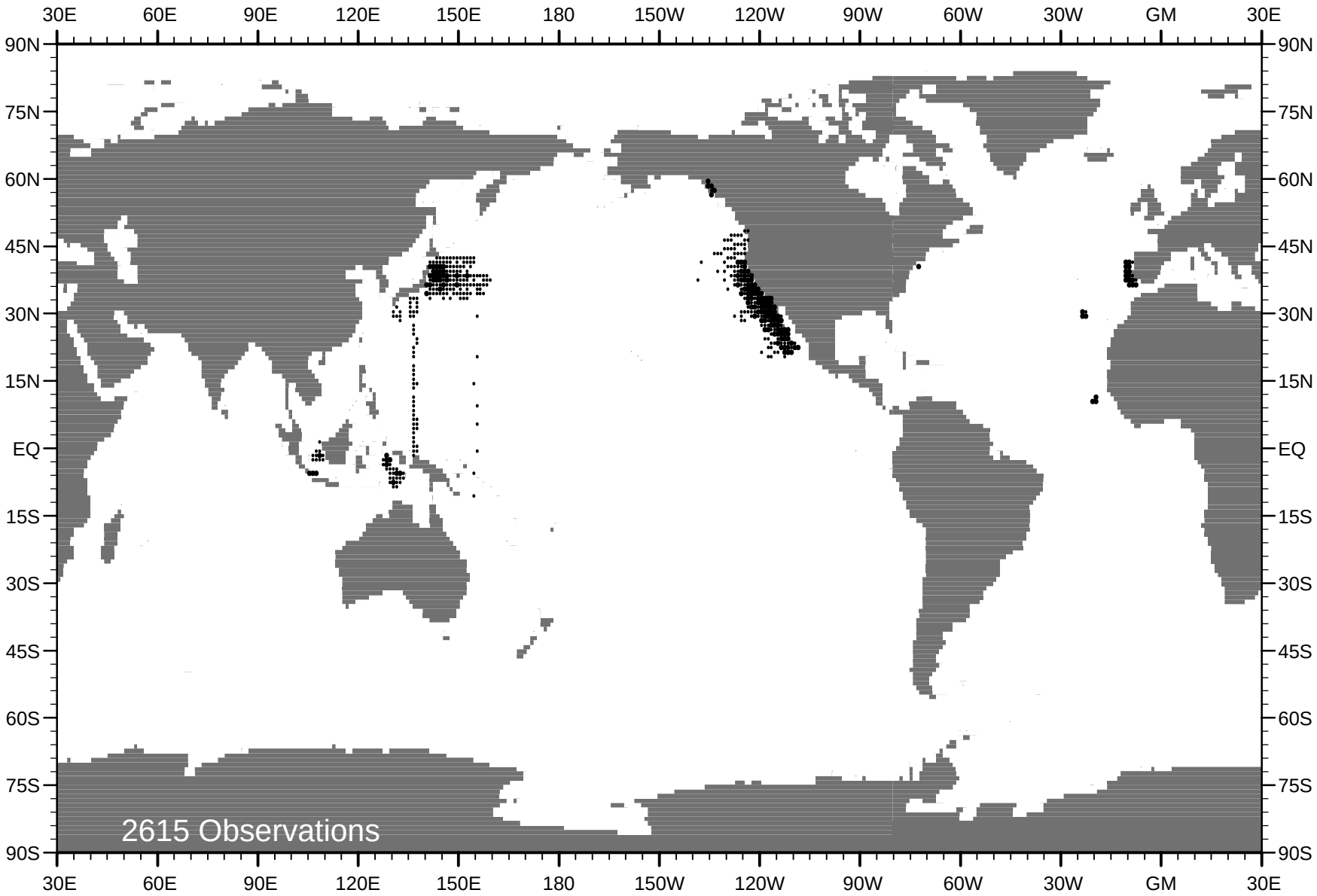


Fig. D24 Distribution of all Ocean Station Data (OSD) plankton biomass data in WOD01 for year 1972 .

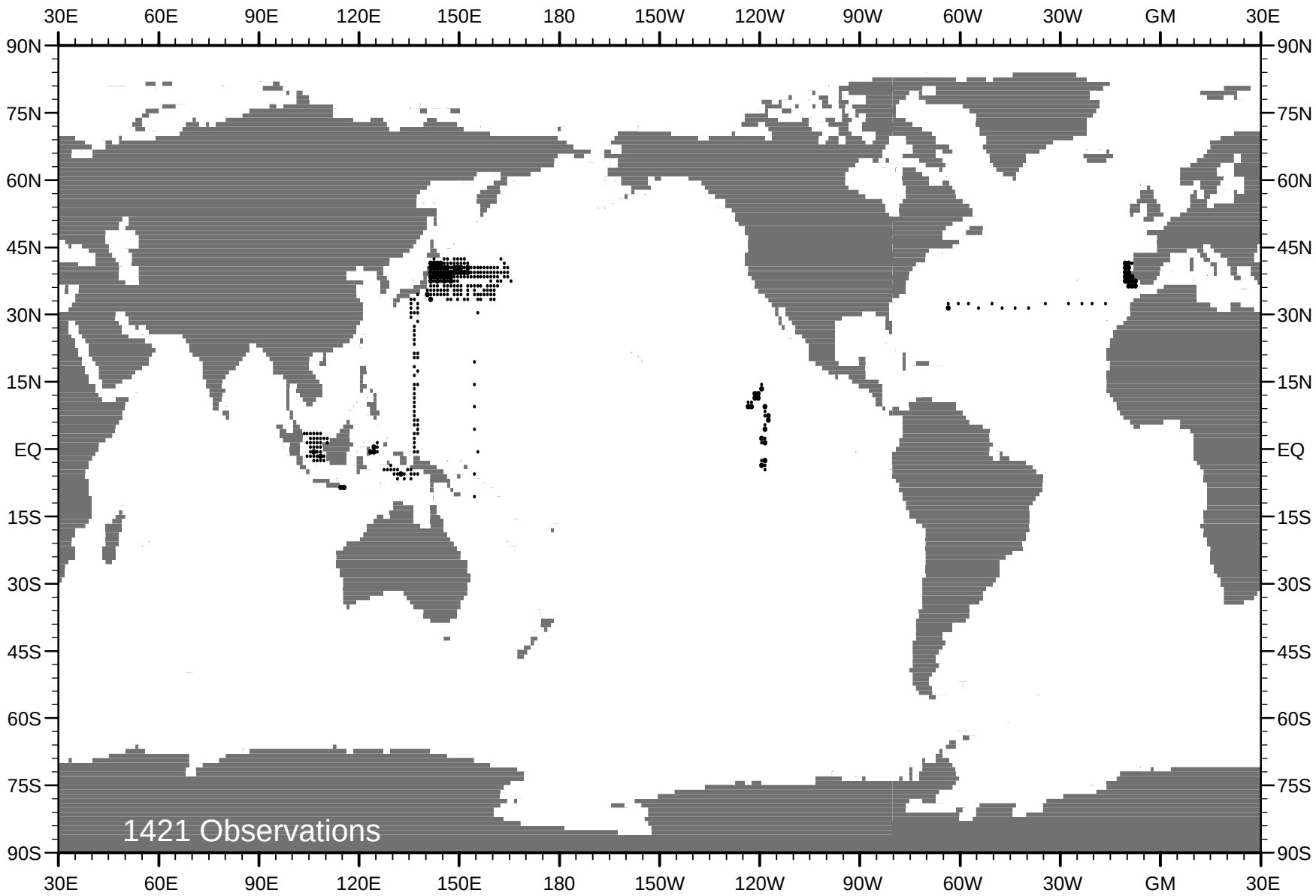


Fig. D25 Distribution of all Ocean Station Data (OSD) plankton biomass data in WOD01 for year 1973 .

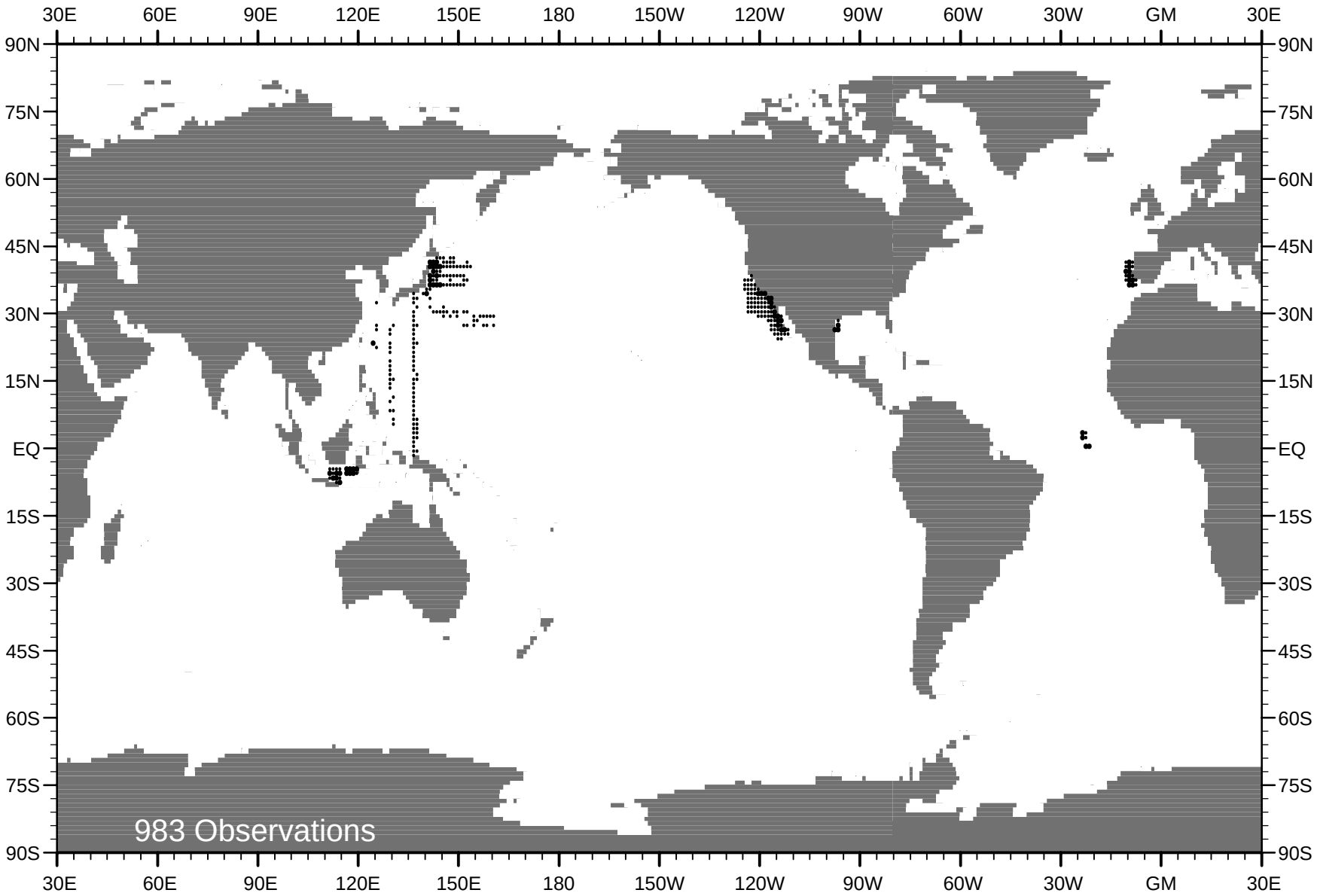


Fig. D26 Distribution of all Ocean Station Data (OSD) plankton biomass data in WOD01 for year 1974 .

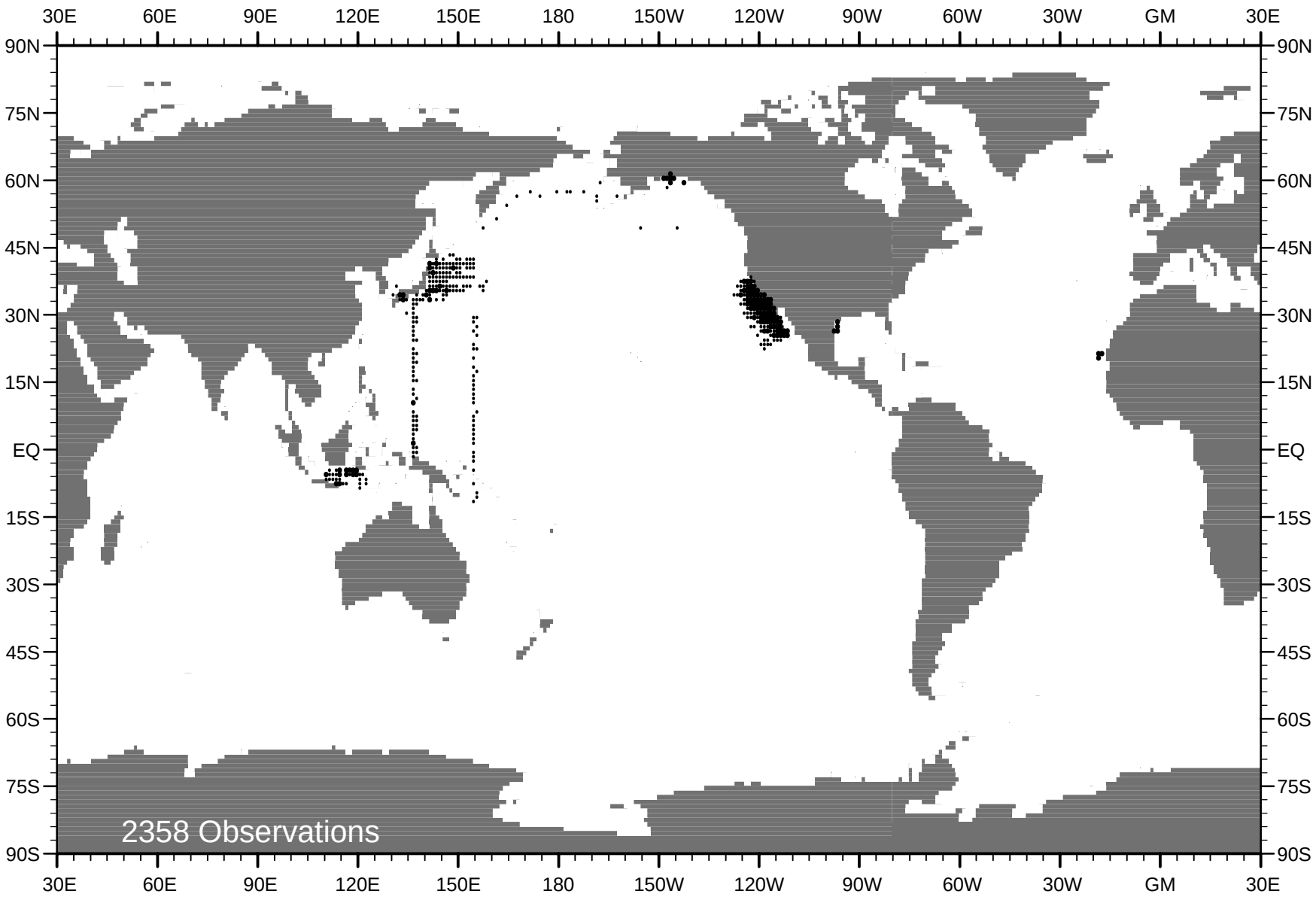


Fig. D27 Distribution of all Ocean Station Data (OSD) plankton biomass data in WOD01 for year 1975 .

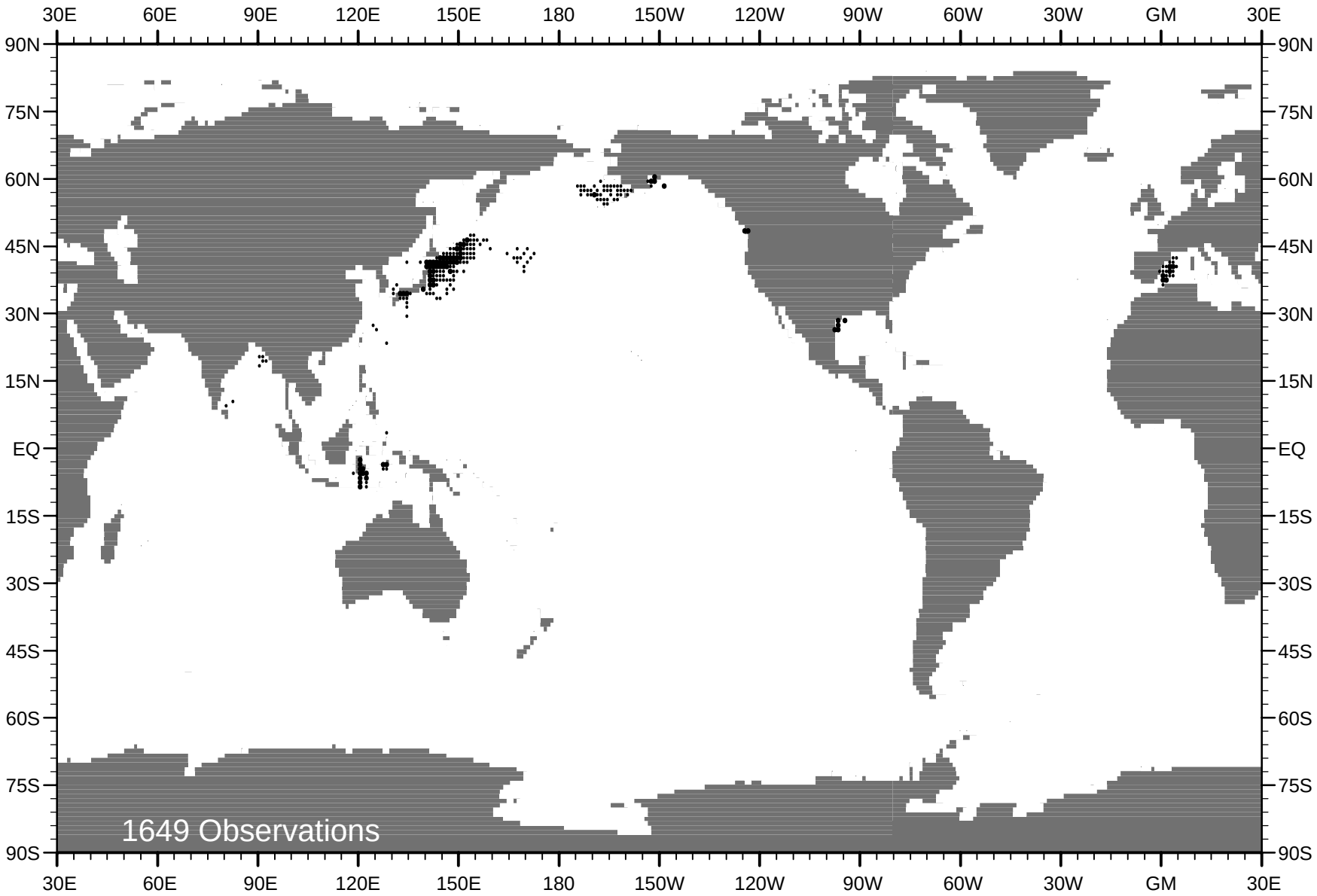


Fig. D28 Distribution of all Ocean Station Data (OSD) plankton biomass data in WOD01 for year 1976 .

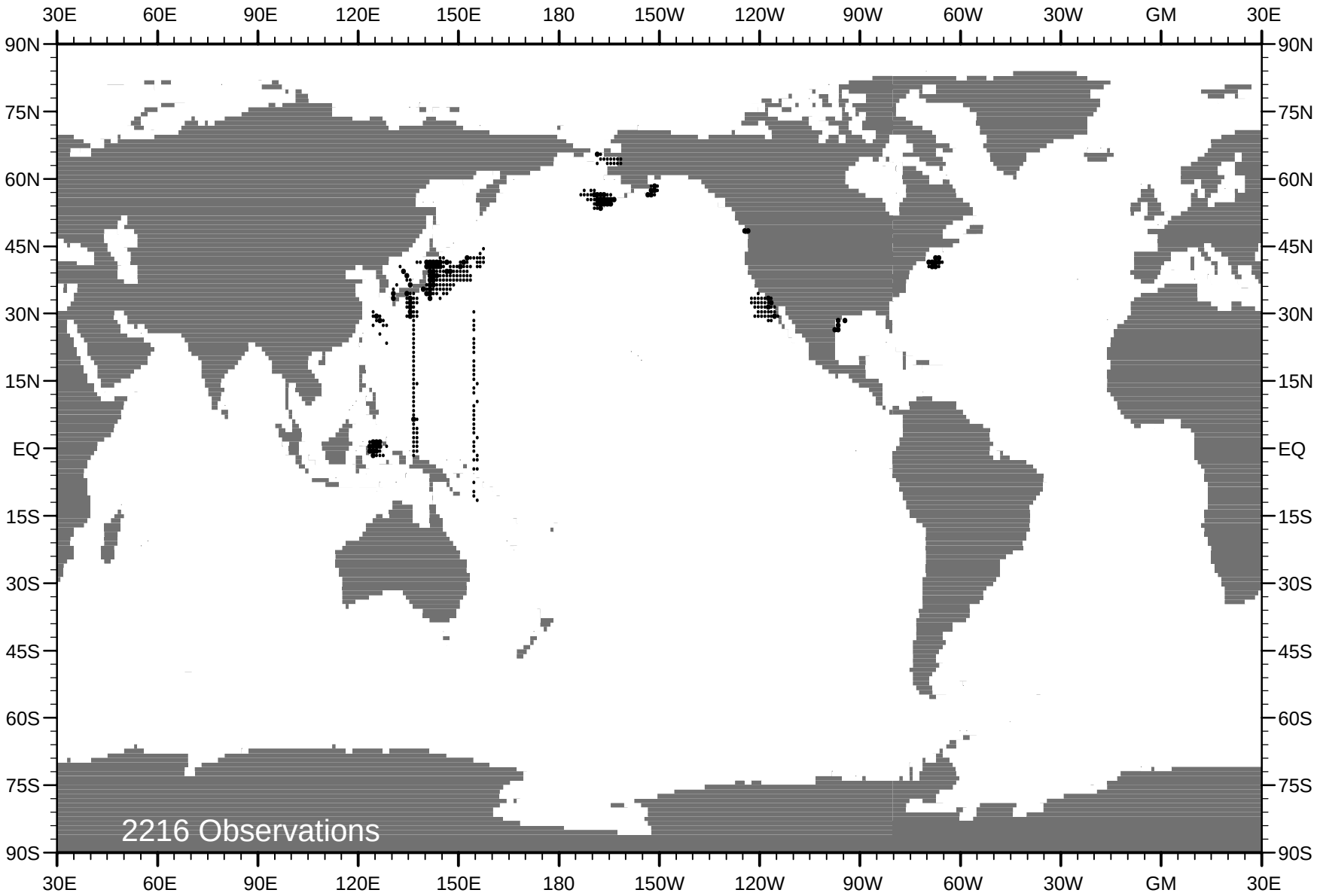


Fig. D29 Distribution of all Ocean Station Data (OSD) plankton biomass data in WOD01 for year 1977 .

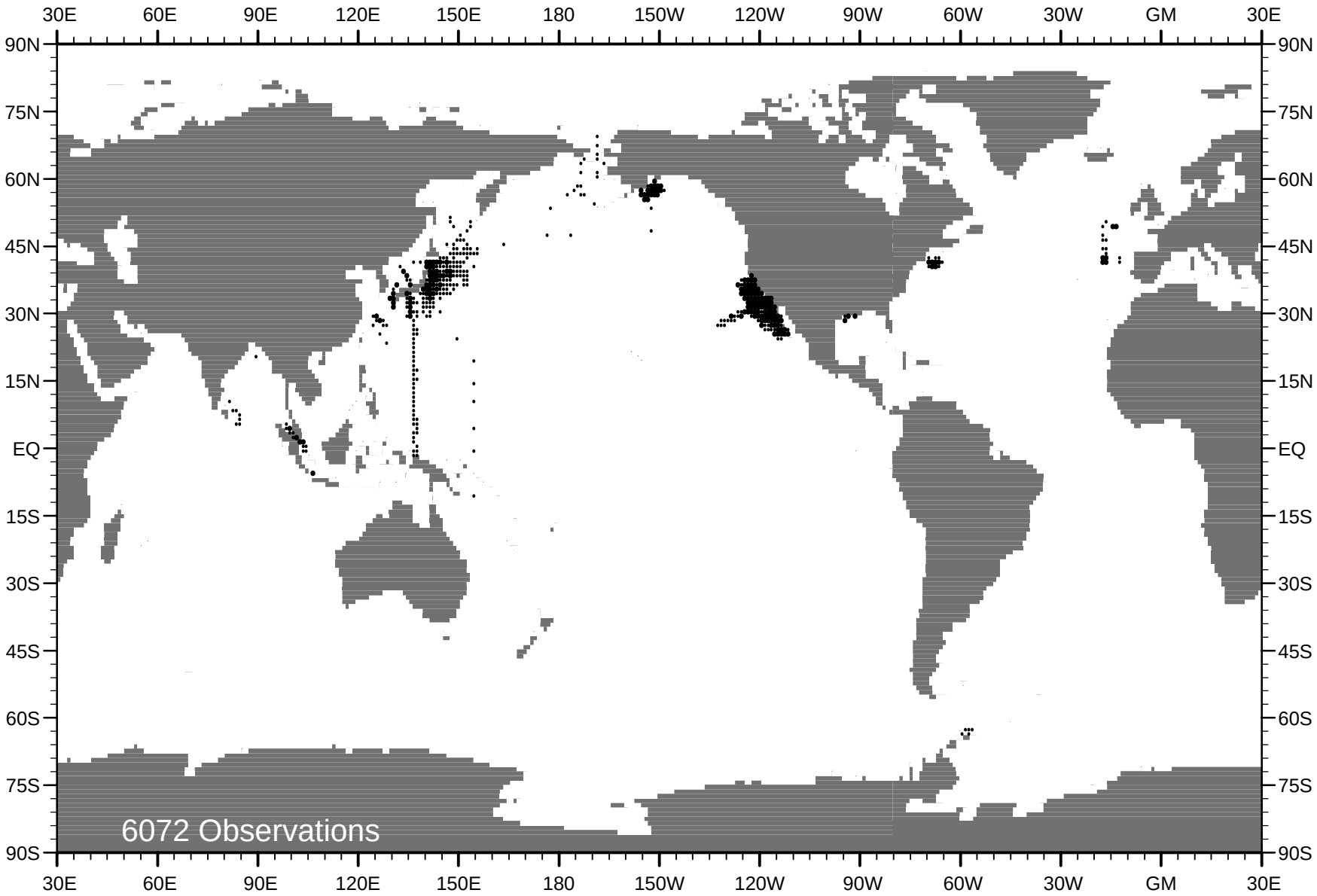


Fig. D30 Distribution of all Ocean Station Data (OSD) plankton biomass data in WOD01 for year 1978 .

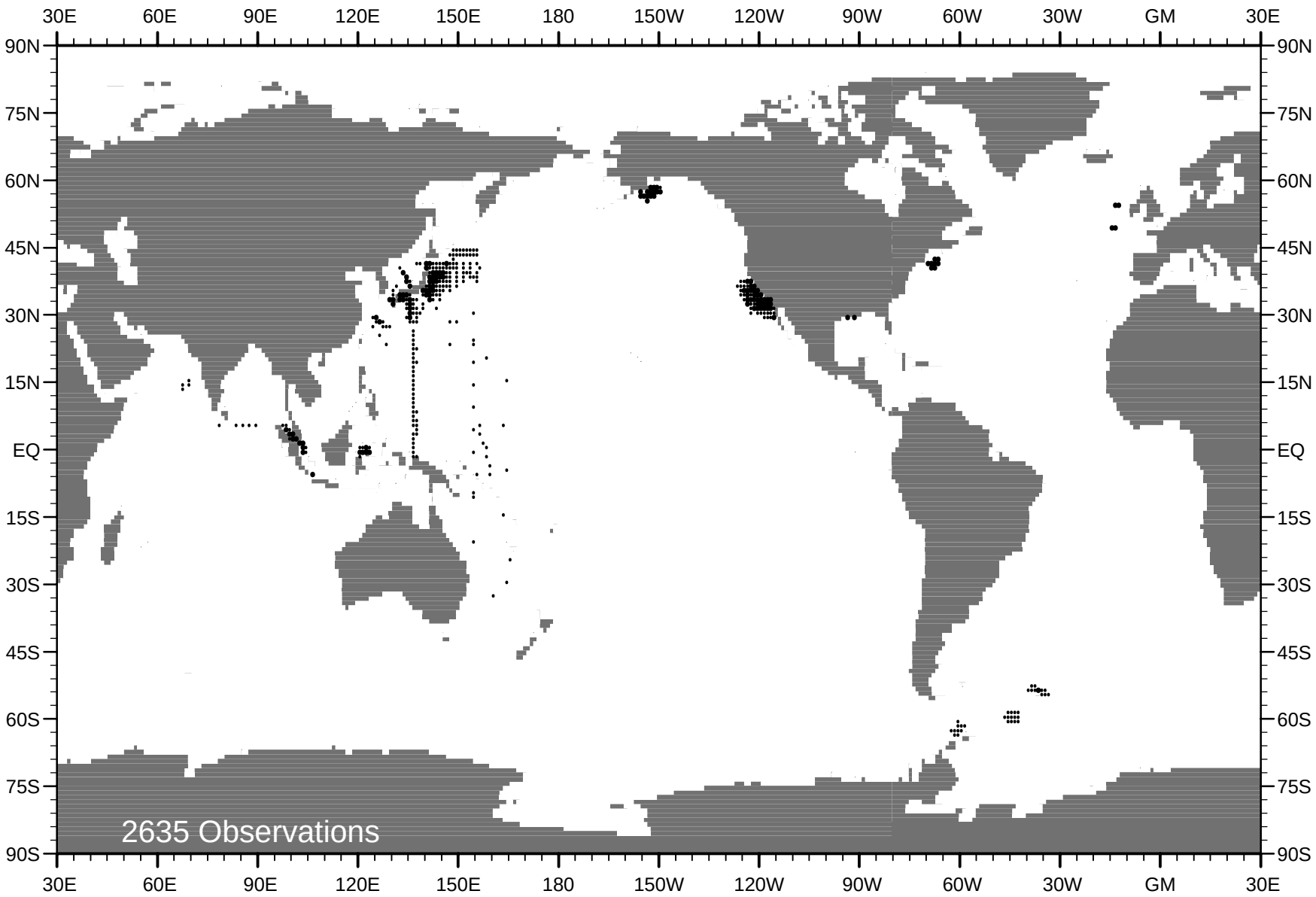


Fig. D31 Distribution of all Ocean Station Data (OSD) plankton biomass data in WOD01 for year 1979 .

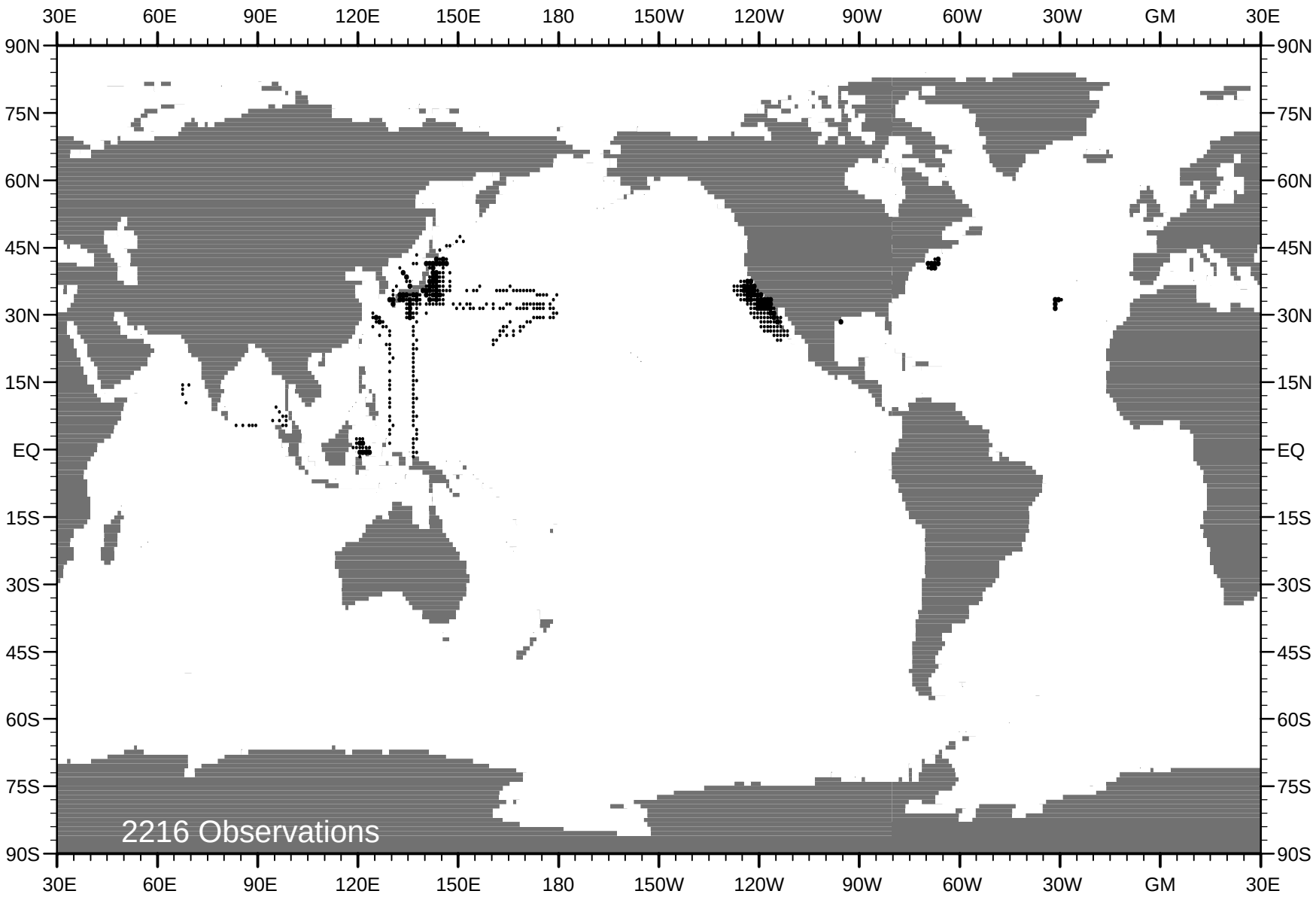


Fig. D32 Distribution of all Ocean Station Data (OSD) plankton biomass data in WOD01 for year 1980 .

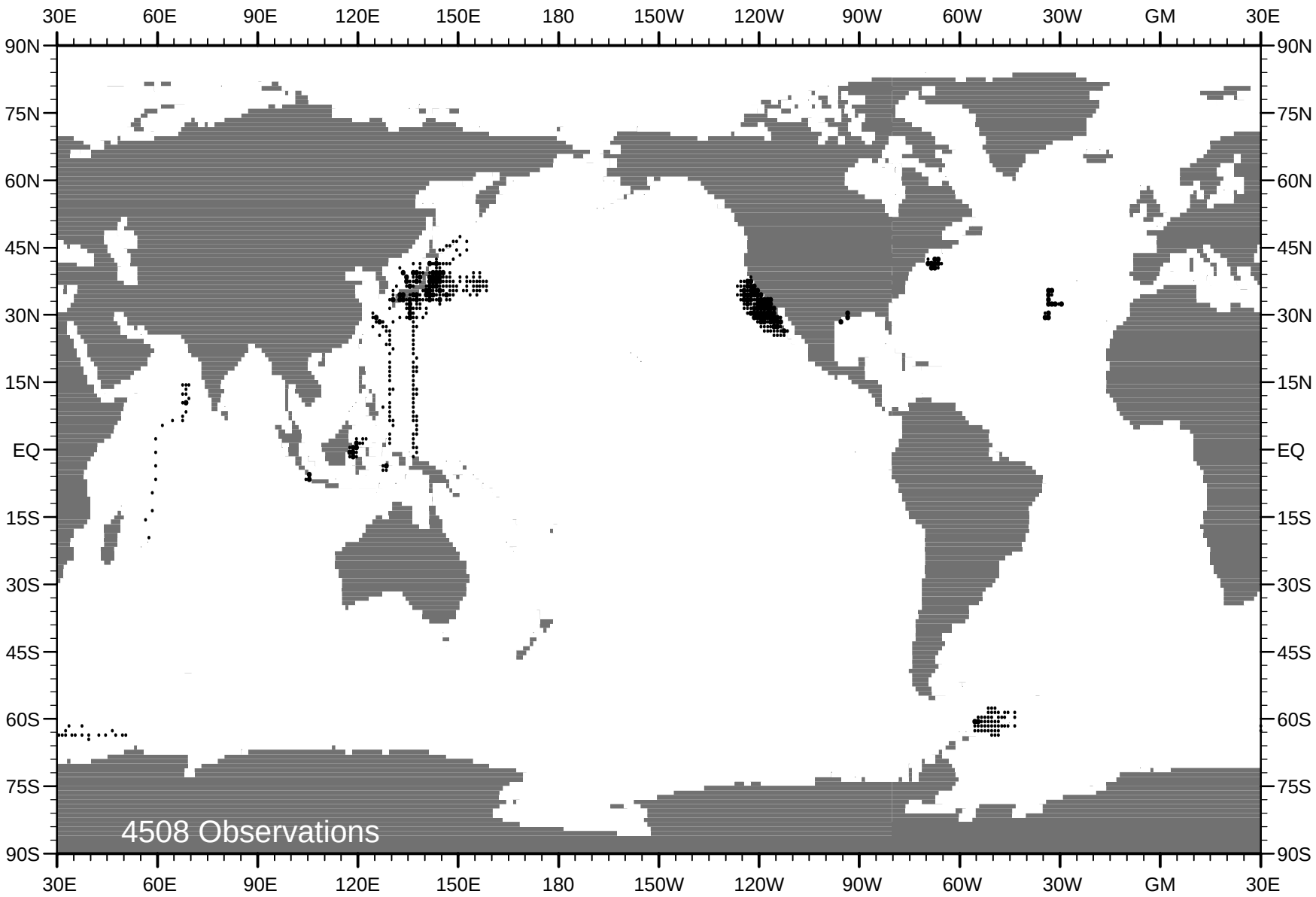


Fig. D33 Distribution of all Ocean Station Data (OSD) plankton biomass data in WOD01 for year 1981 .

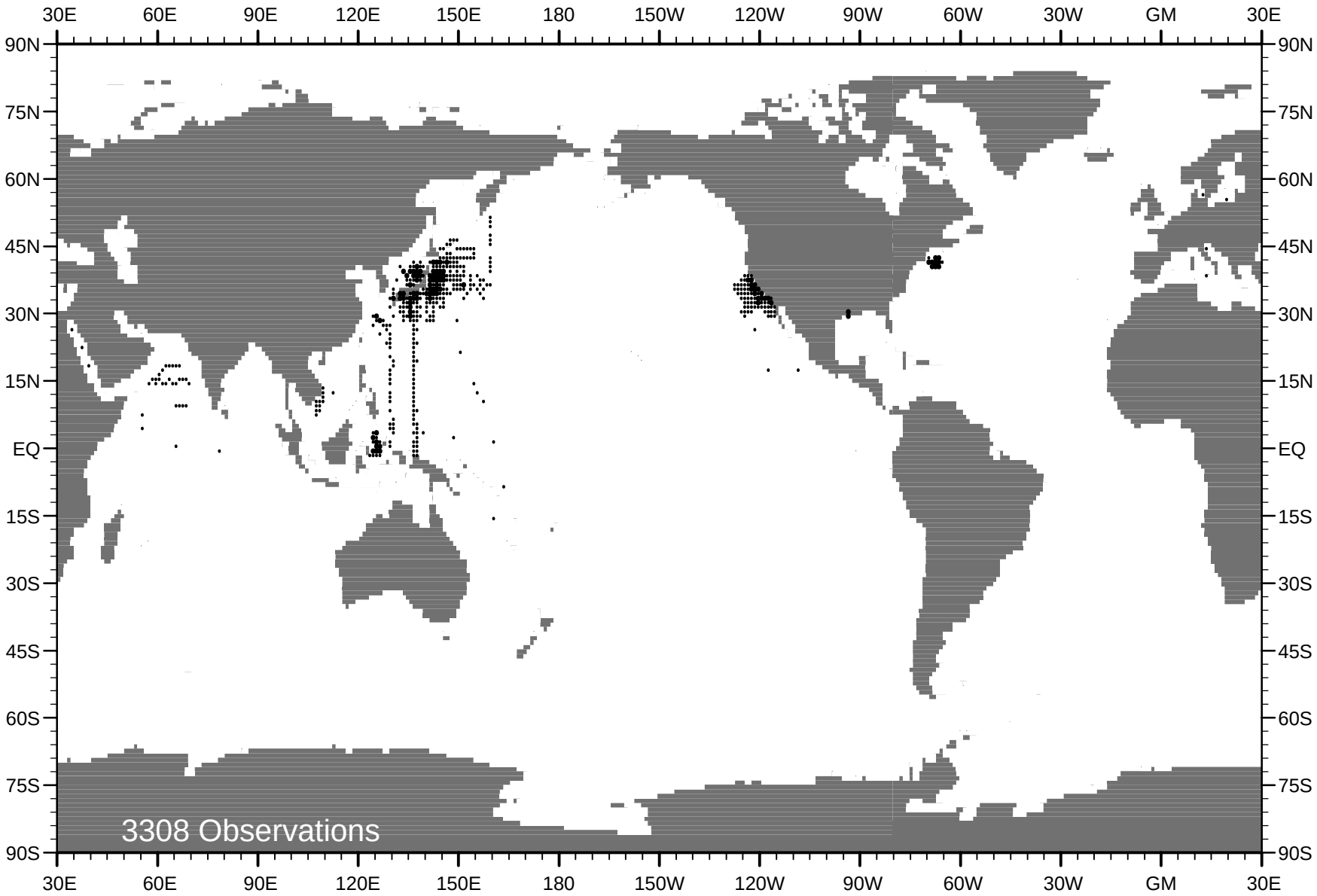


Fig. D34 Distribution of all Ocean Station Data (OSD) plankton biomass data in WOD01 for year 1982 .

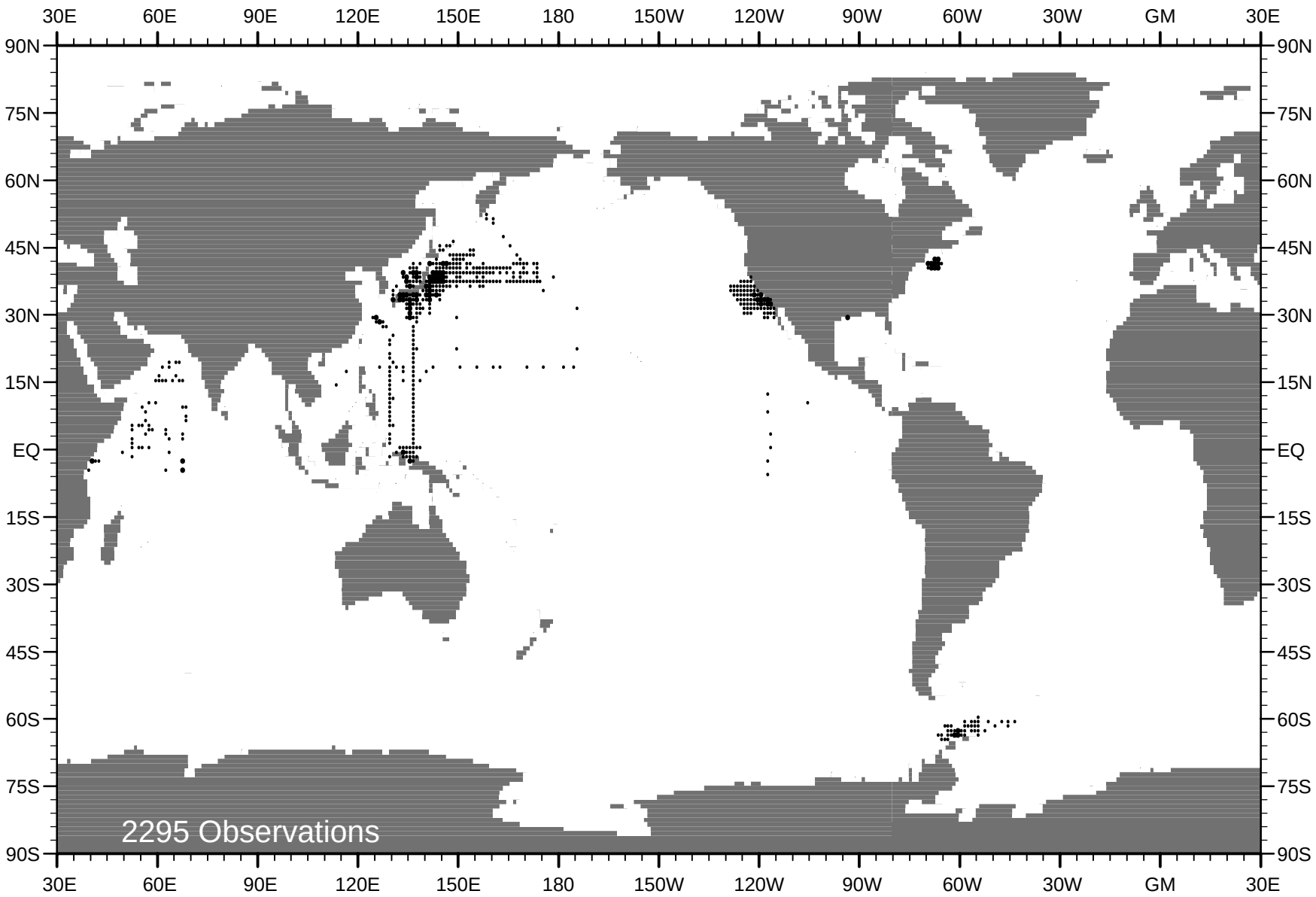


Fig. D35 Distribution of all Ocean Station Data (OSD) plankton biomass data in WOD01 for year 1983 .

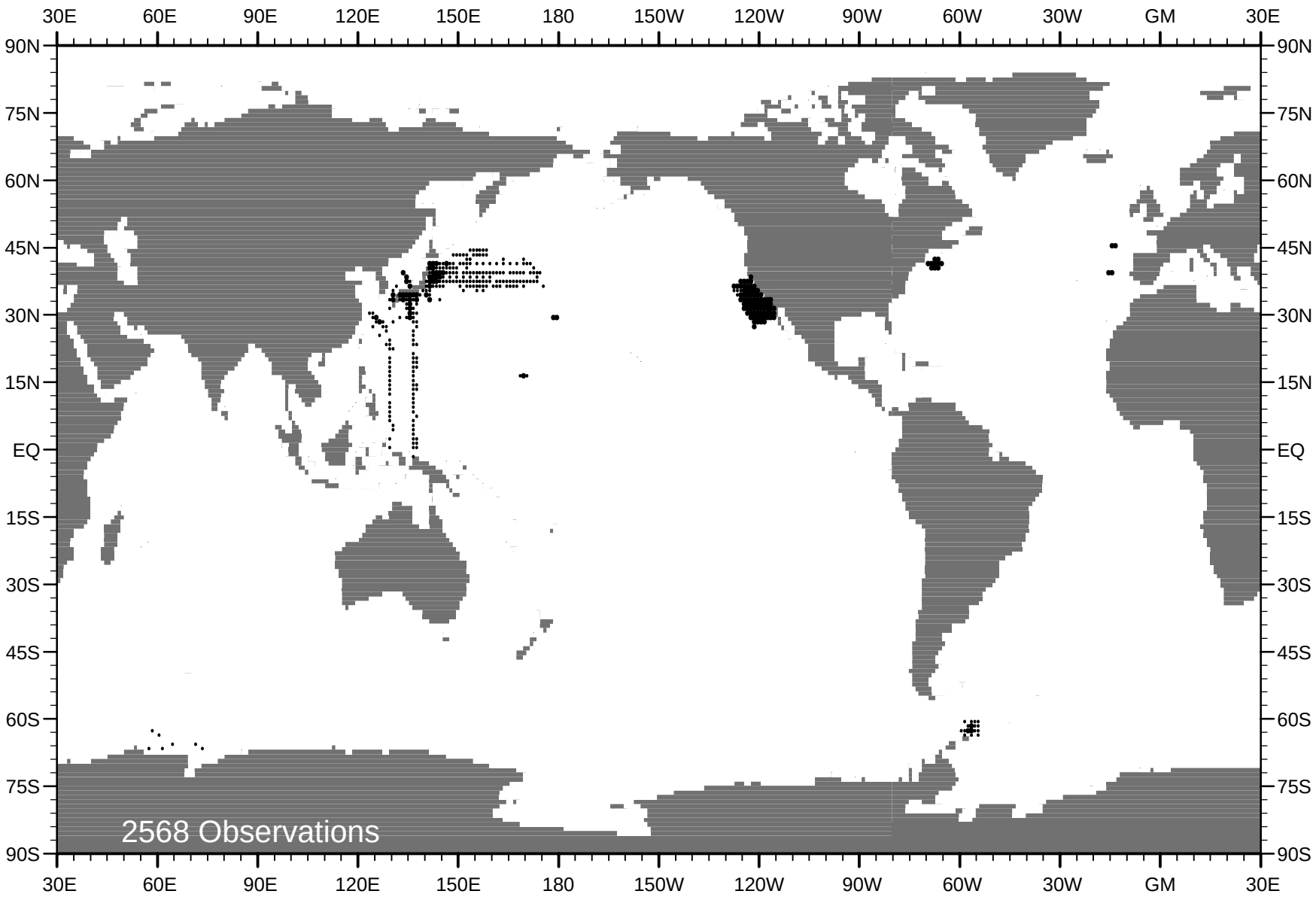


Fig. D36 Distribution of all Ocean Station Data (OSD) plankton biomass data in WOD01 for year 1984 .

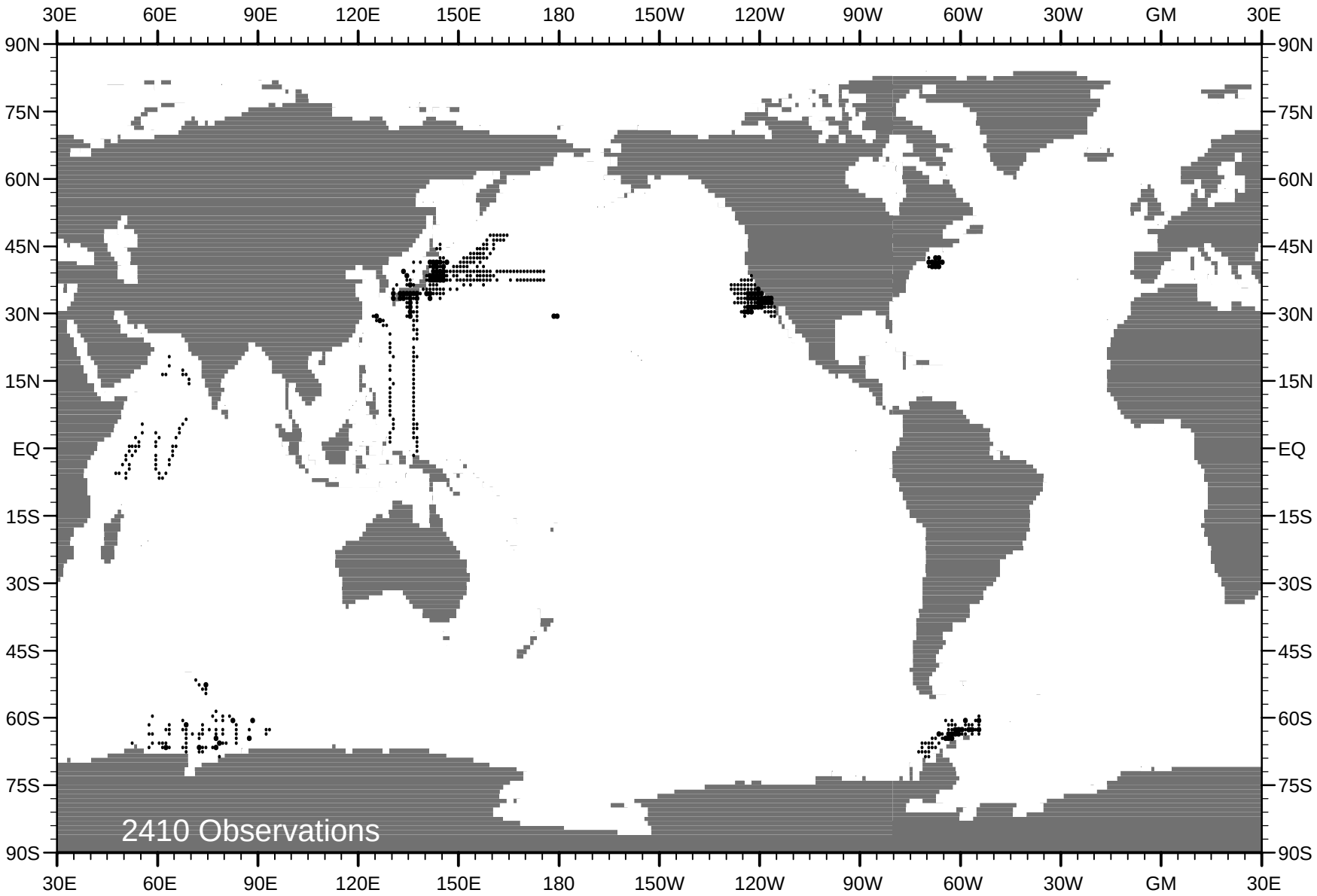


Fig. D37 Distribution of all Ocean Station Data (OSD) plankton biomass data in WOD01 for year 1985 .

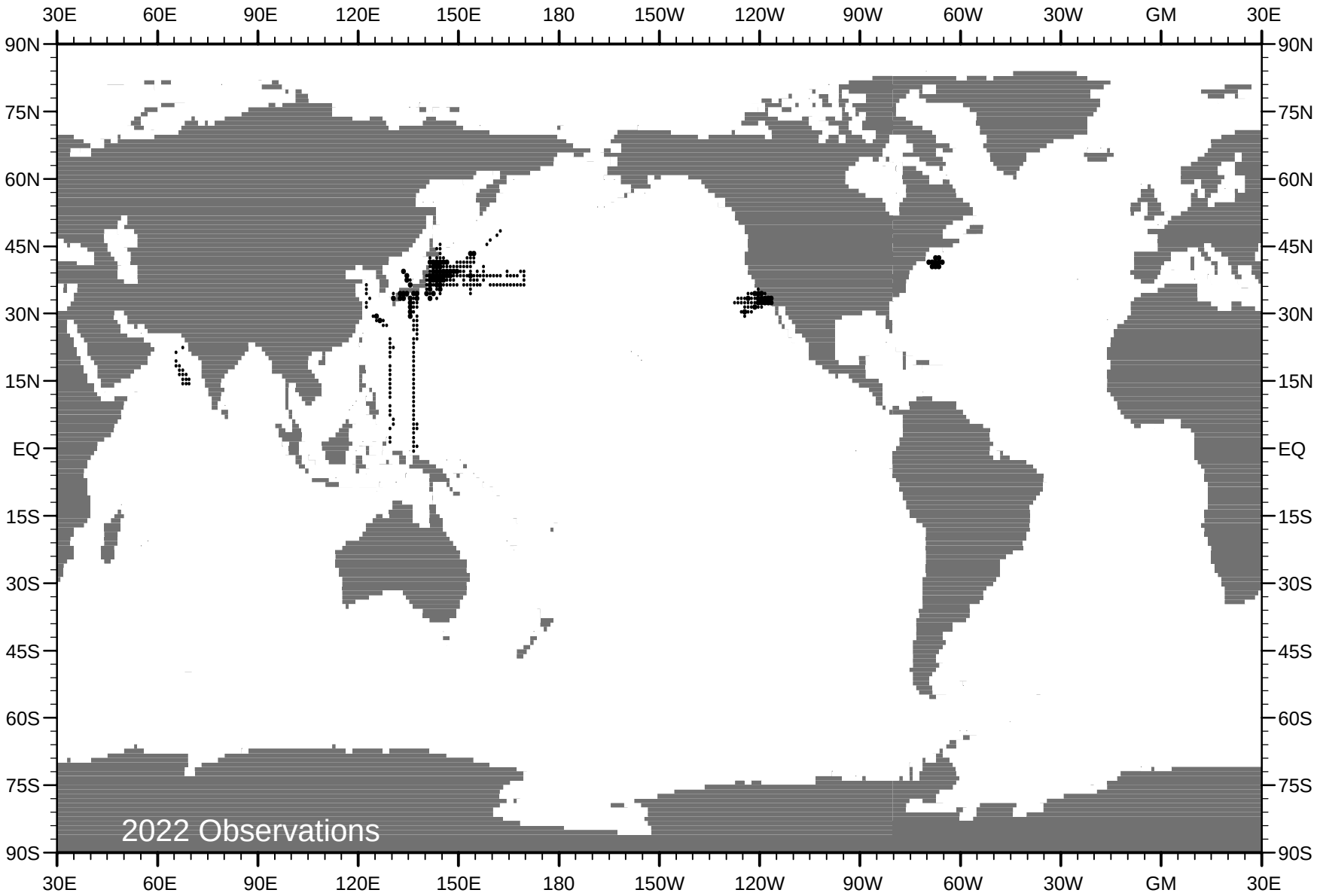


Fig. D38 Distribution of all Ocean Station Data (OSD) plankton biomass data in WOD01 for year 1986 .

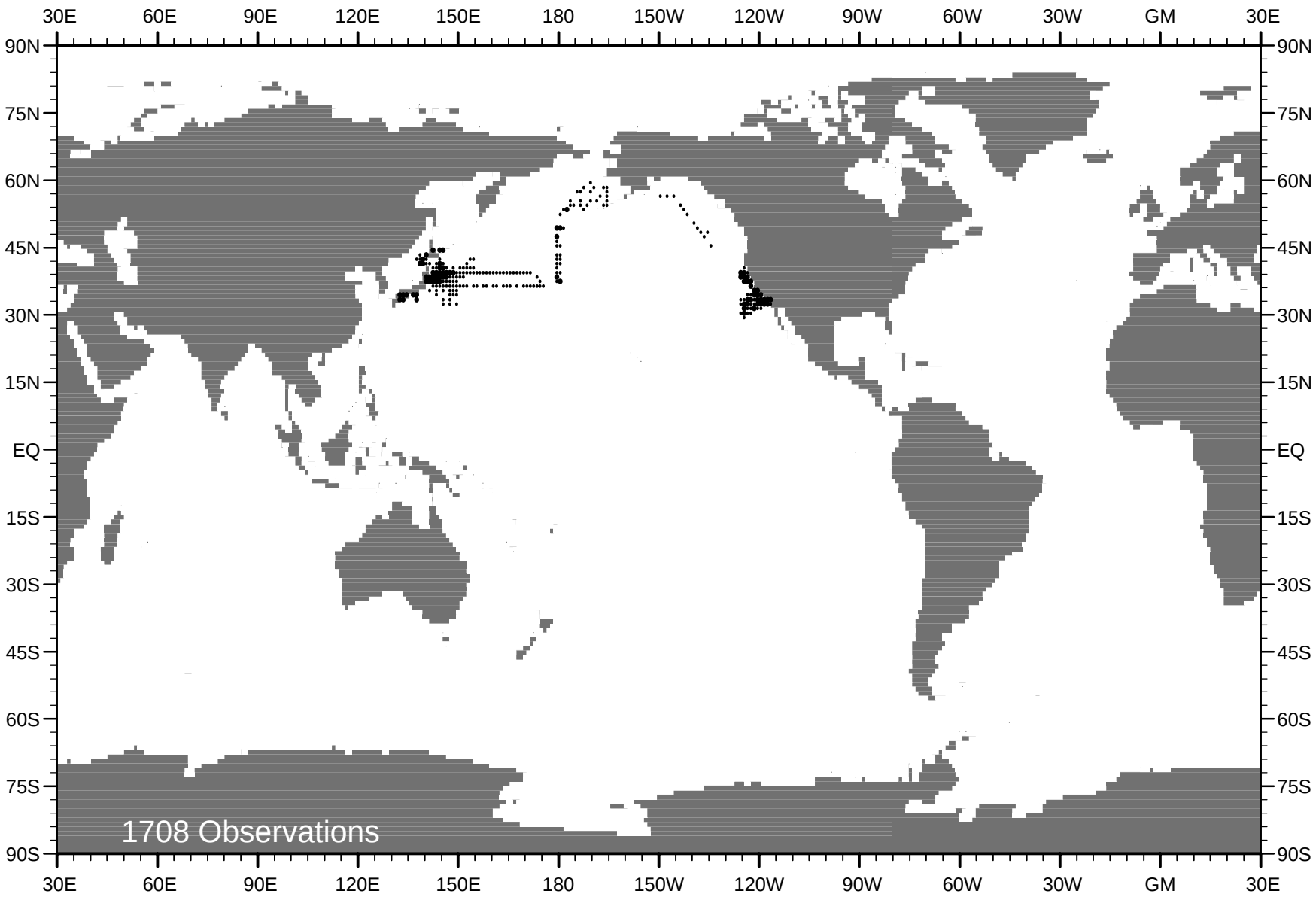


Fig. D39 Distribution of all Ocean Station Data (OSD) plankton biomass data in WOD01 for year 1987 .

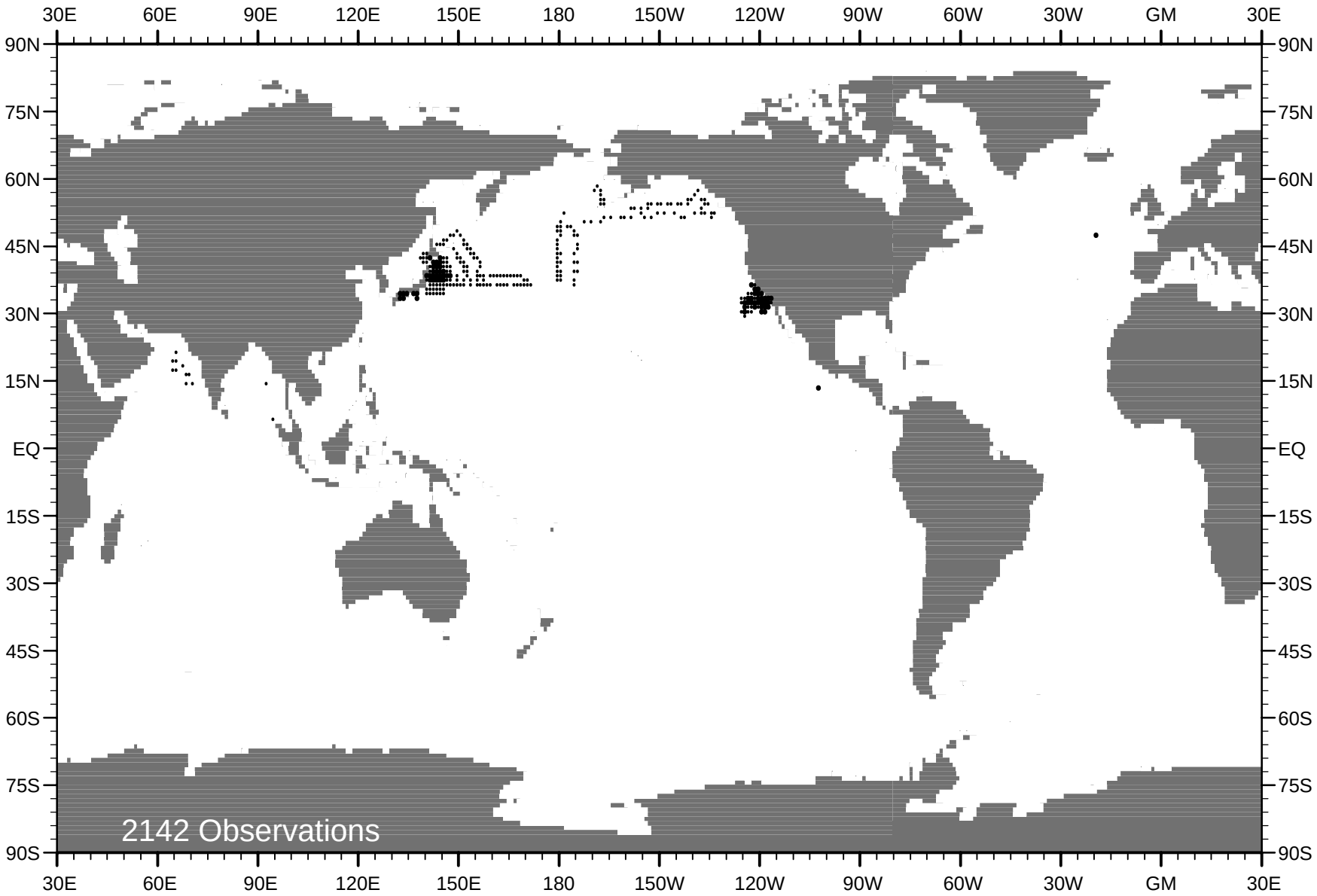


Fig. D40 Distribution of all Ocean Station Data (OSD) plankton biomass data in WOD01 for year 1988 .

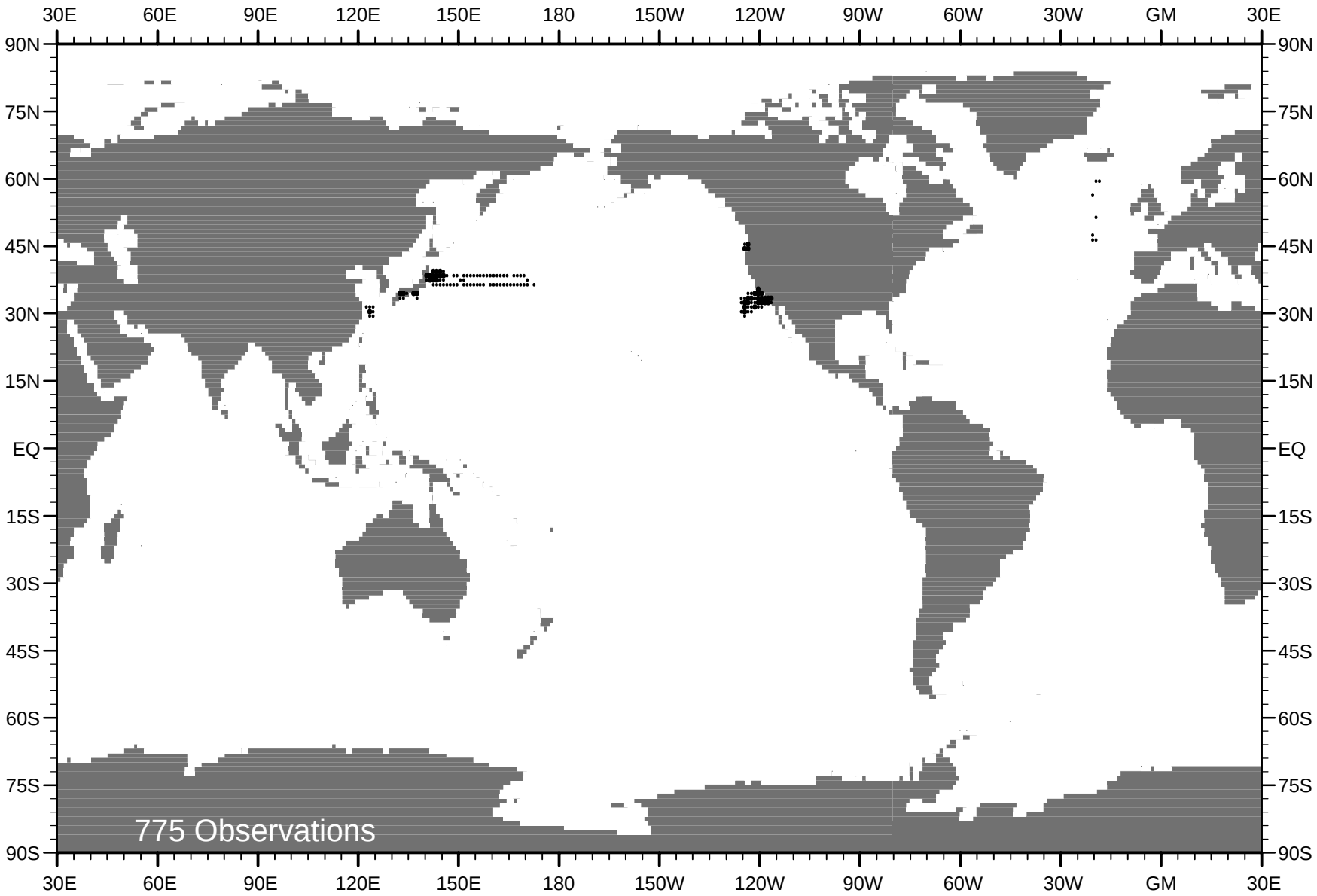


Fig. D41 Distribution of all Ocean Station Data (OSD) plankton biomass data in WOD01 for year 1989 .

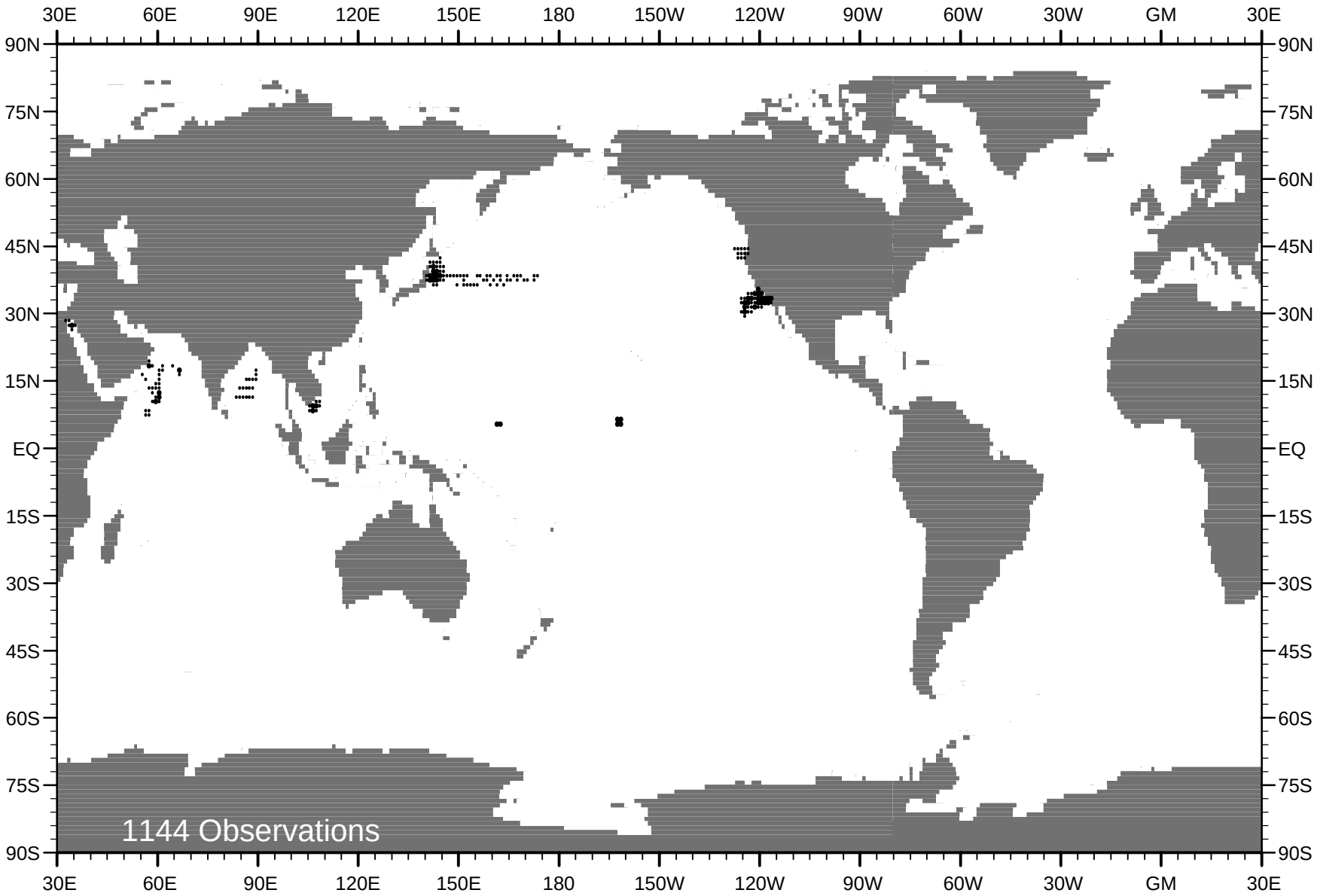


Fig. D42 Distribution of all Ocean Station Data (OSD) plankton biomass data in WOD01 for year 1990 .

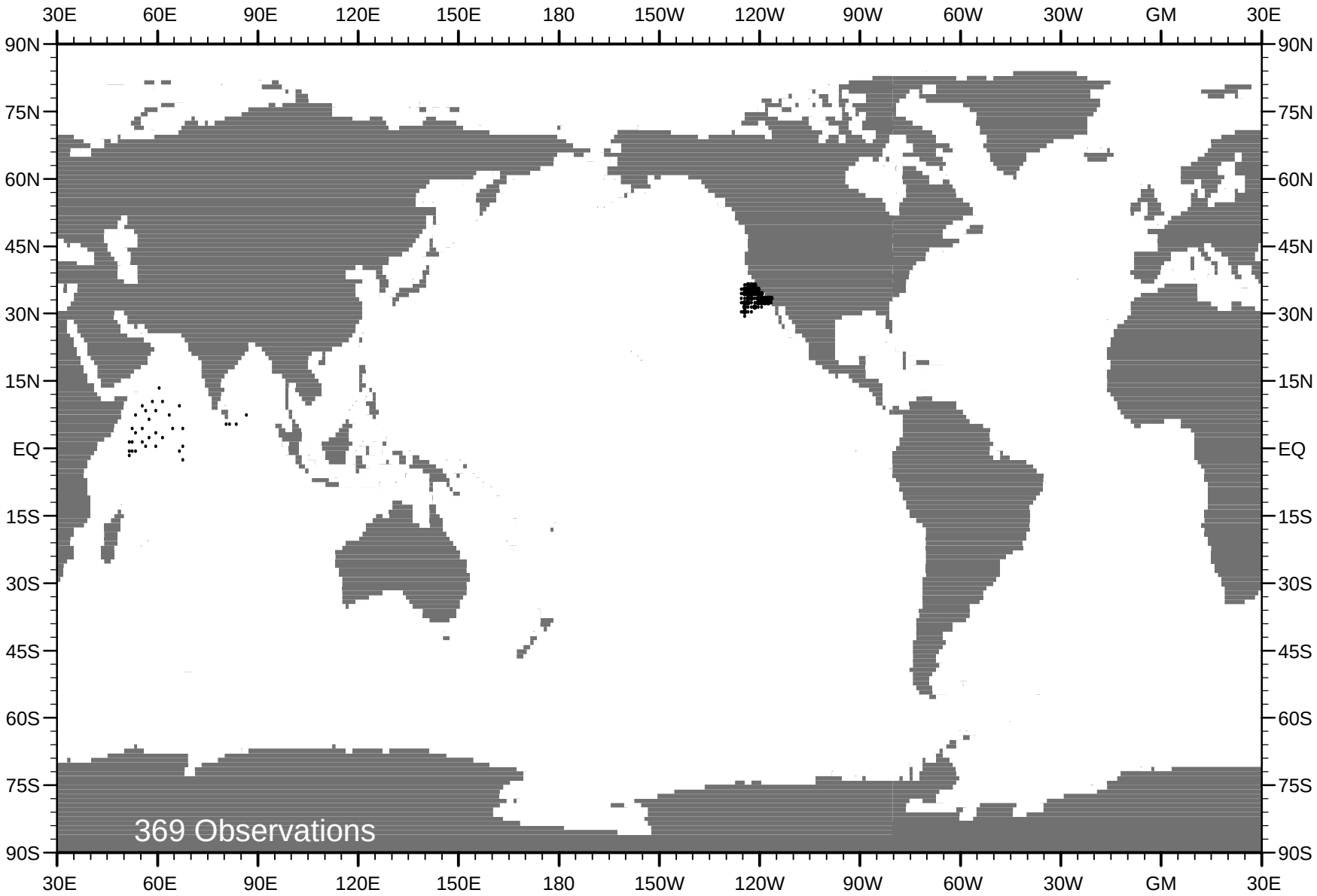


Fig. D43 Distribution of all Ocean Station Data (OSD) plankton biomass data in WOD01 for year 1991 .

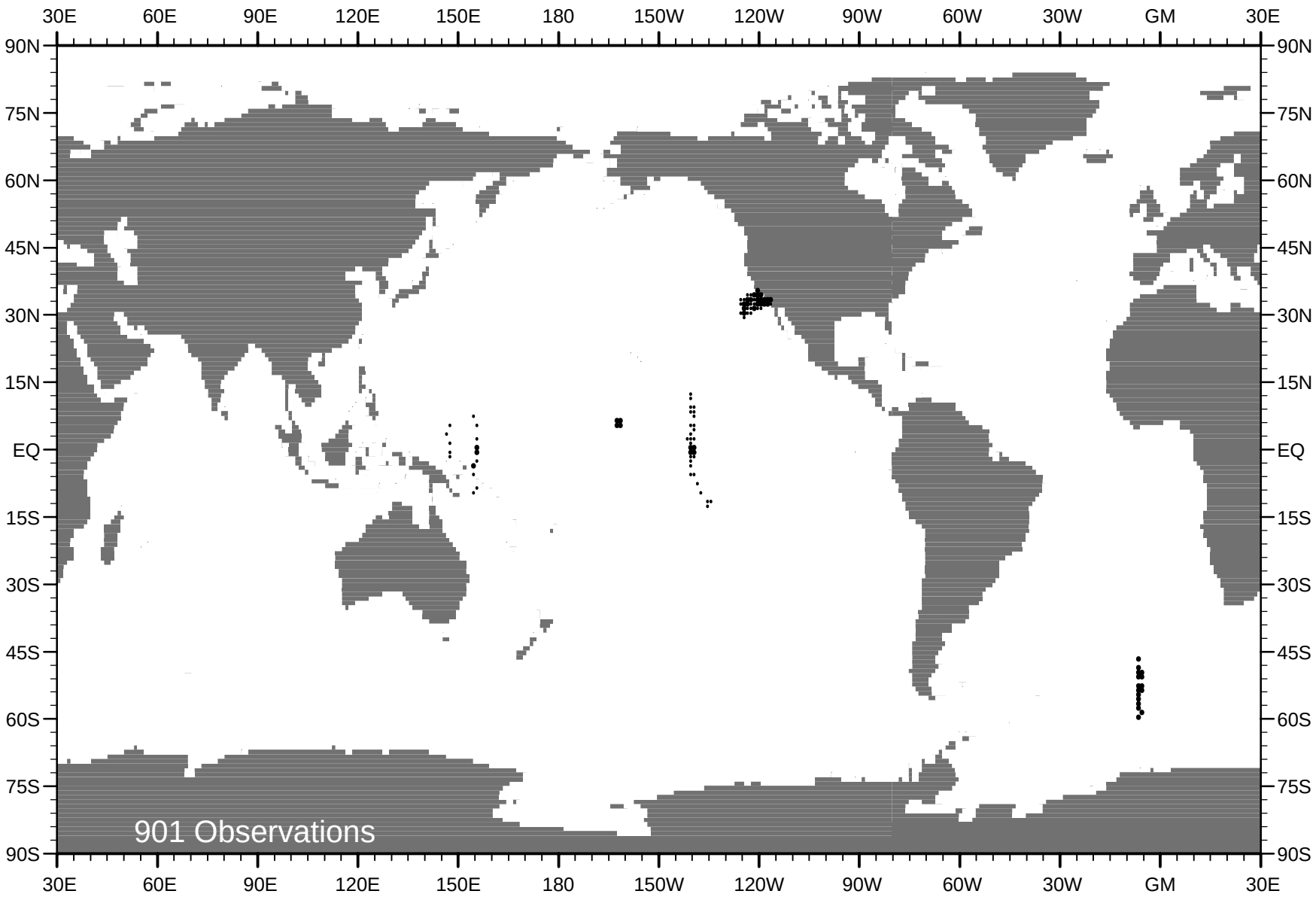


Fig. D44 Distribution of all Ocean Station Data (OSD) plankton biomass data in WOD01 for year 1992 .

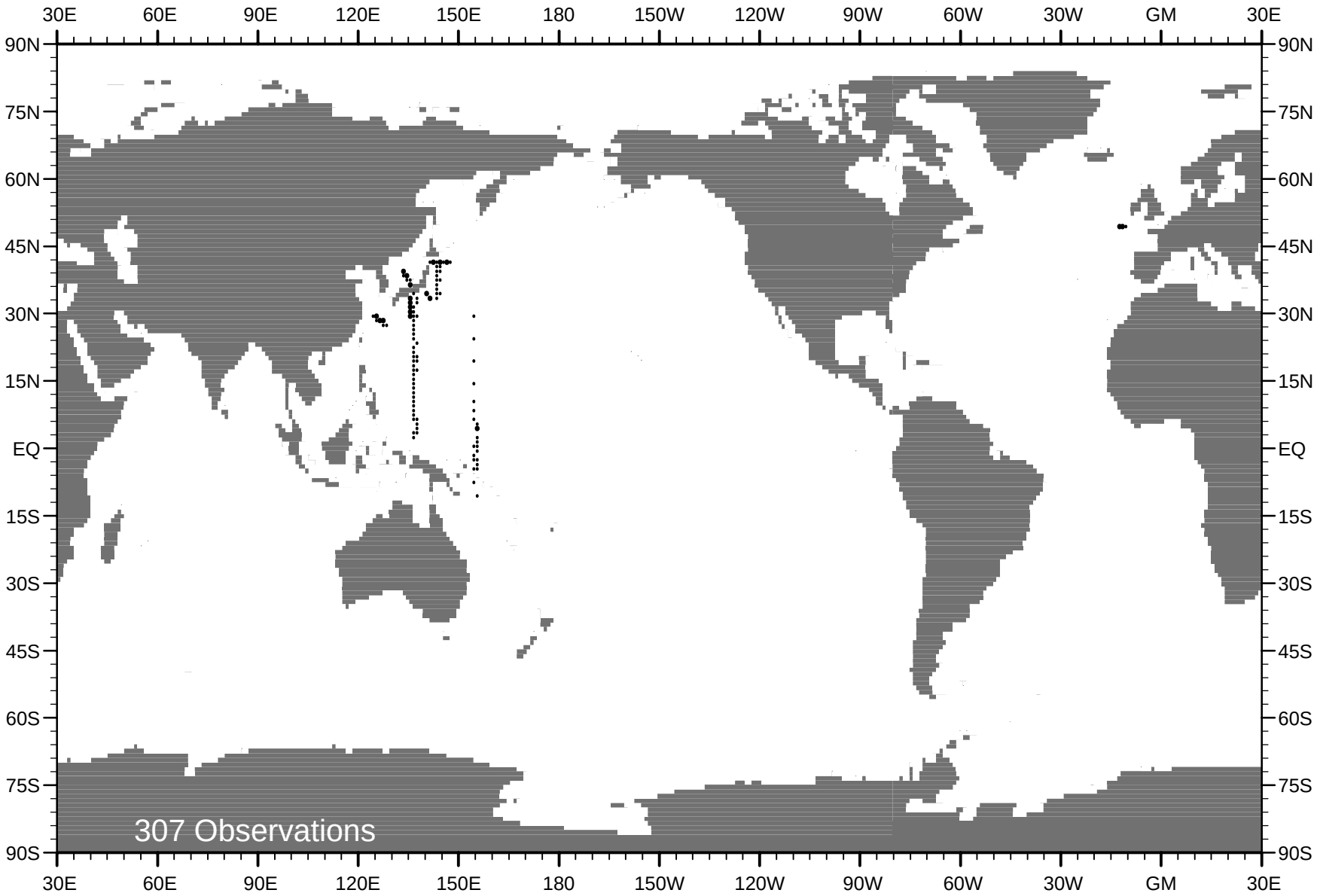


Fig. D45 Distribution of all Ocean Station Data (OSD) plankton biomass data in WOD01 for year 1993 .

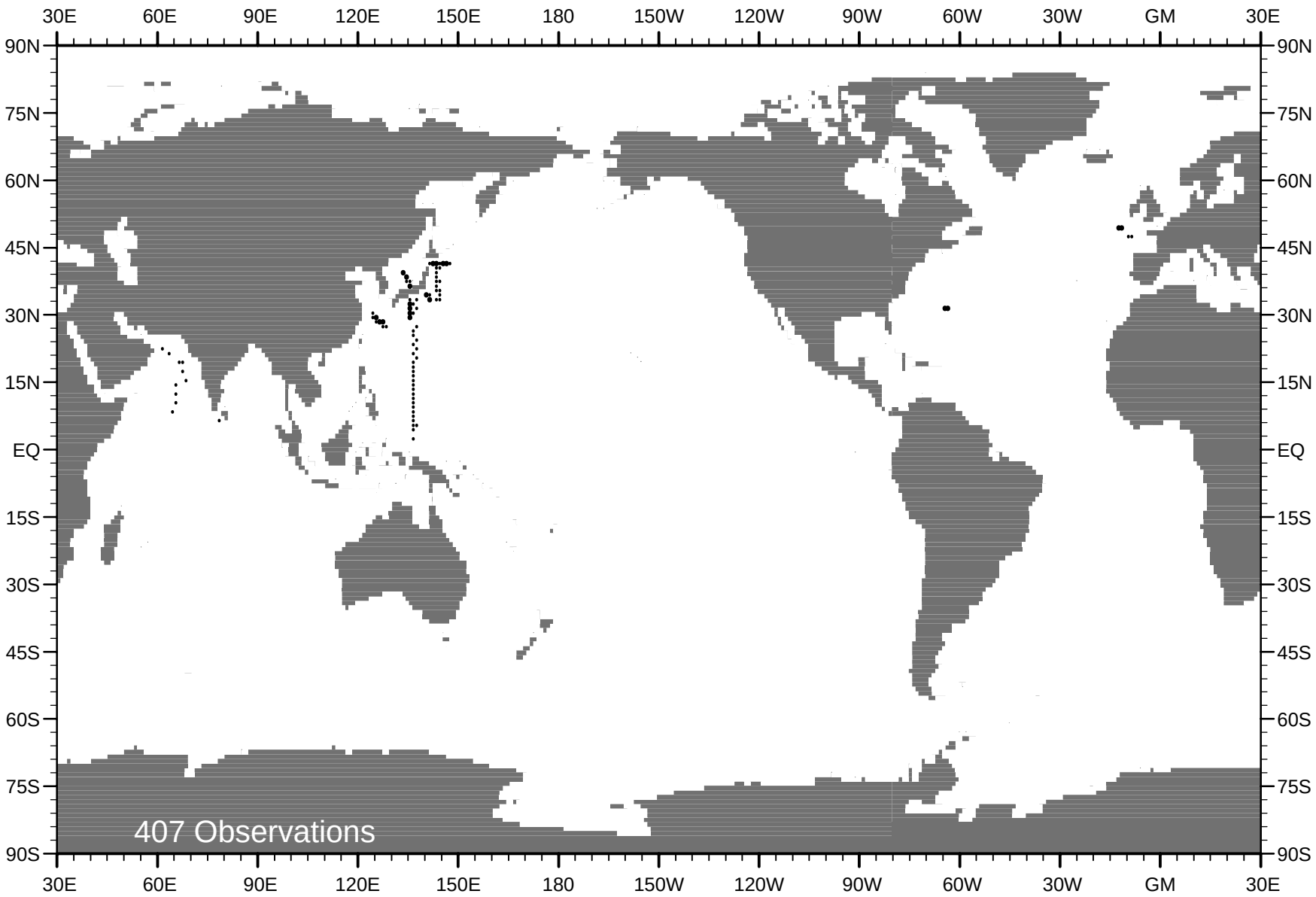


Fig. D46 Distribution of all Ocean Station Data (OSD) plankton biomass data in WOD01 for year 1994 .

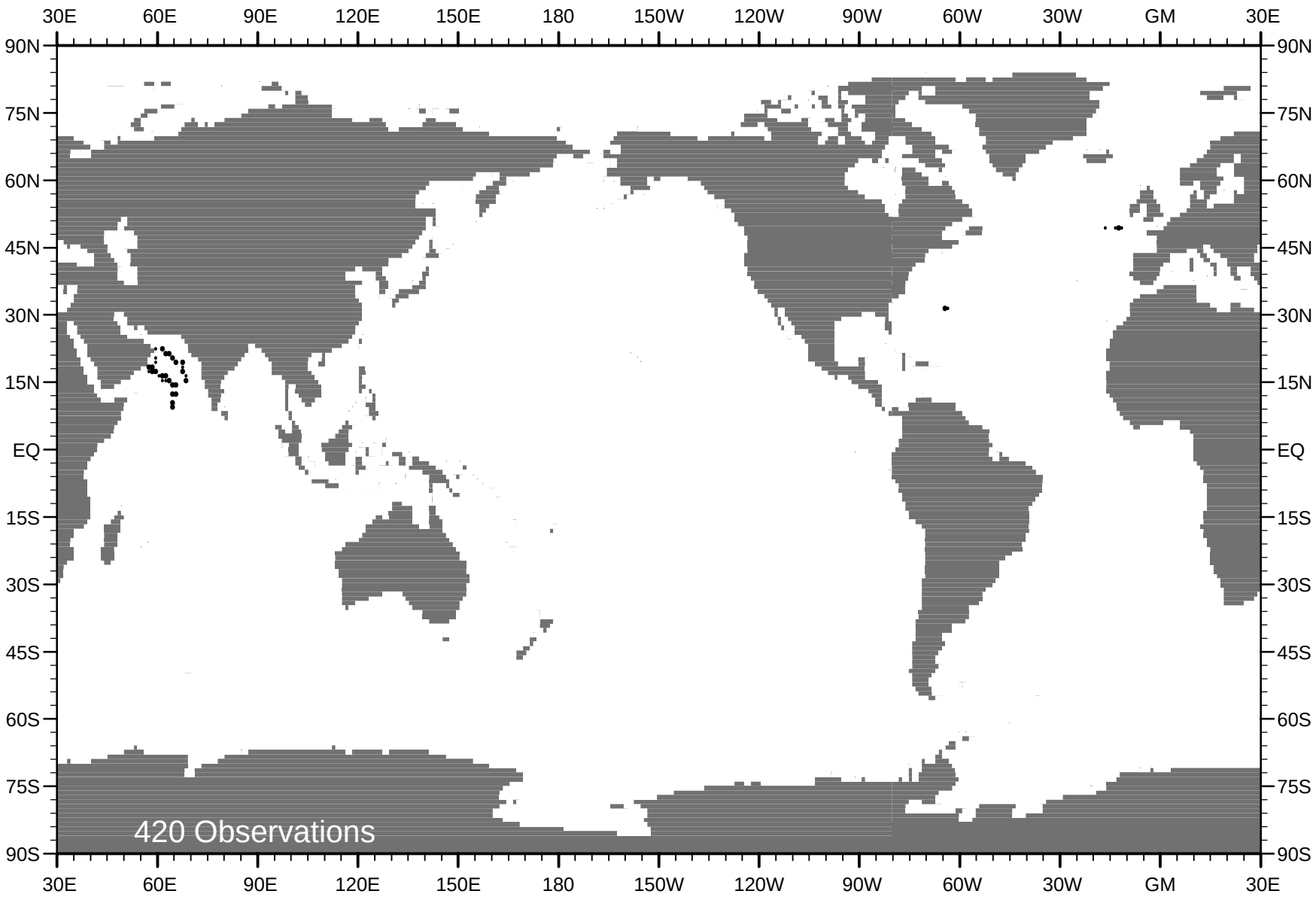


Fig. D47 Distribution of all Ocean Station Data (OSD) plankton biomass data in WOD01 for year 1995 .

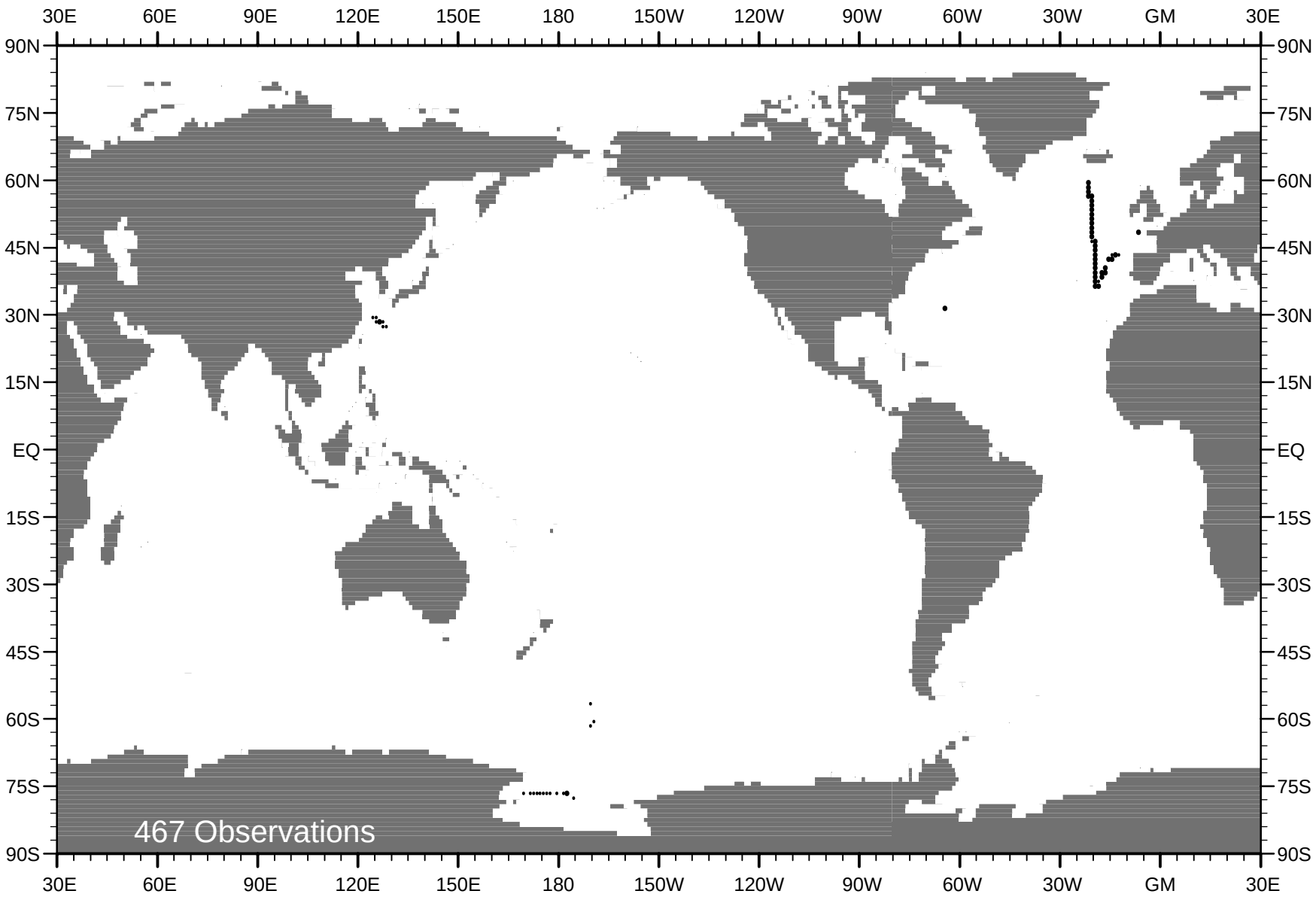


Fig. D48 Distribution of all Ocean Station Data (OSD) plankton biomass data in WOD01 for year 1996 .

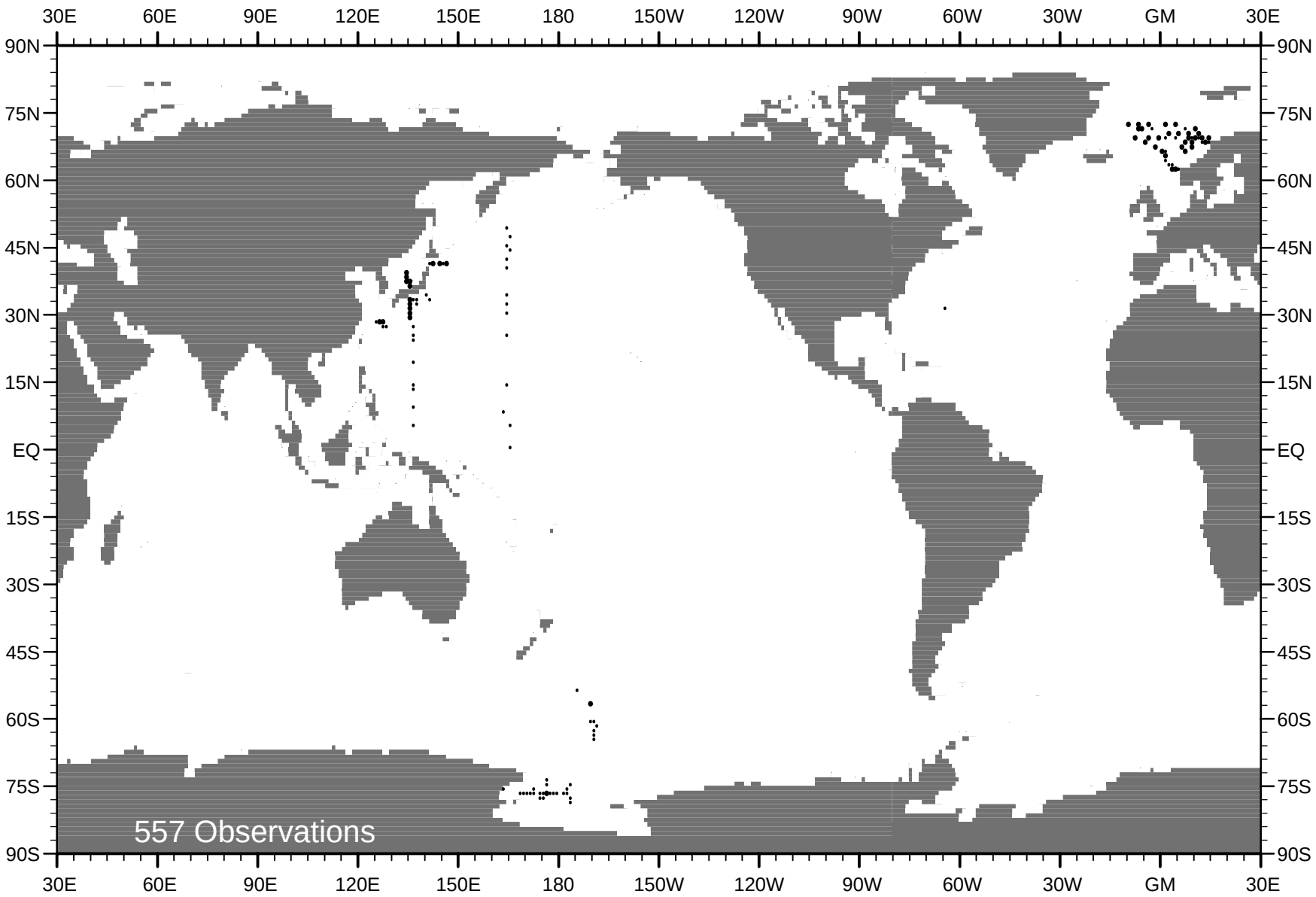


Fig. D49 Distribution of all Ocean Station Data (OSD) plankton biomass data in WOD01 for year 1997 .

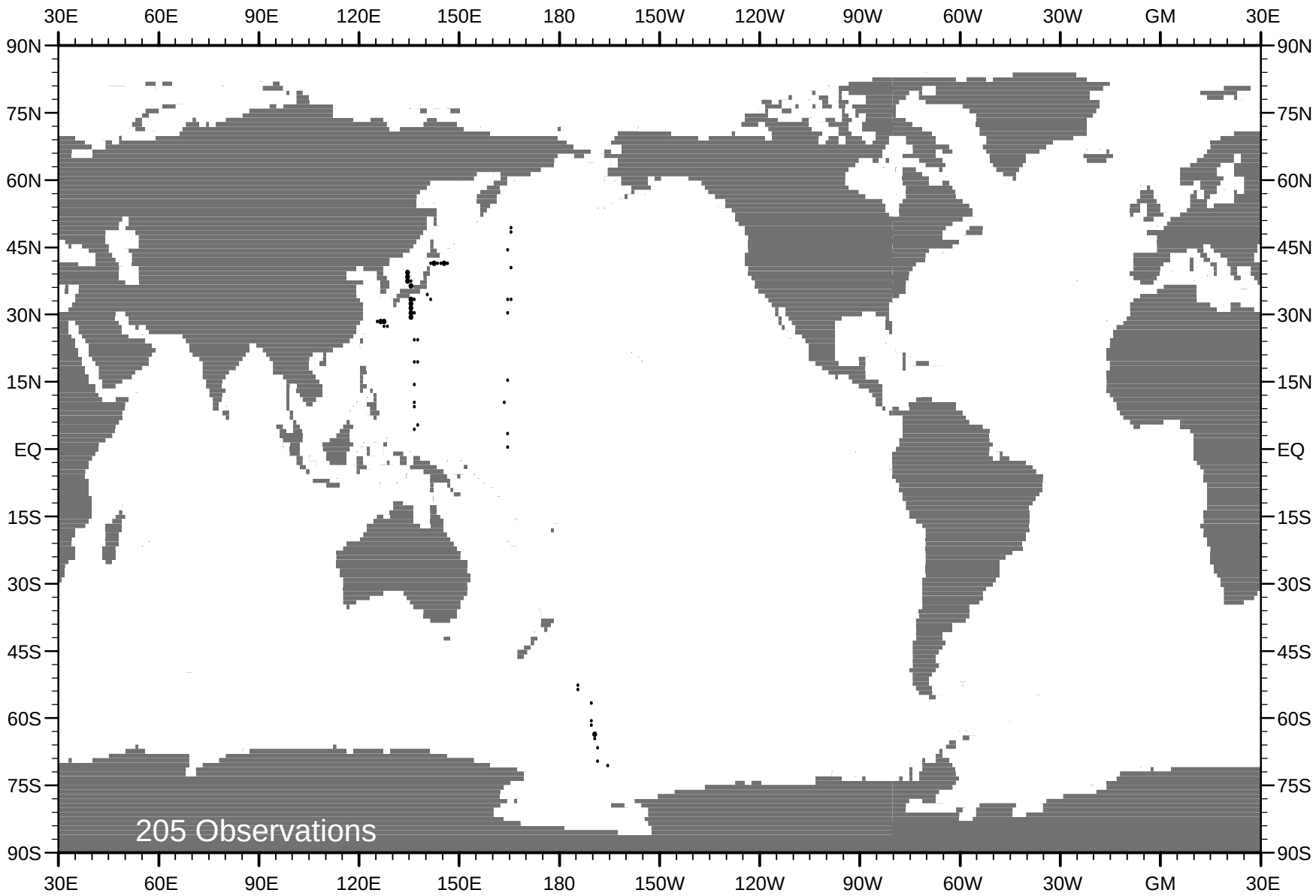


Fig. D50 Distribution of all Ocean Station Data (OSD) plankton biomass data in WOD01 for year 1998 .

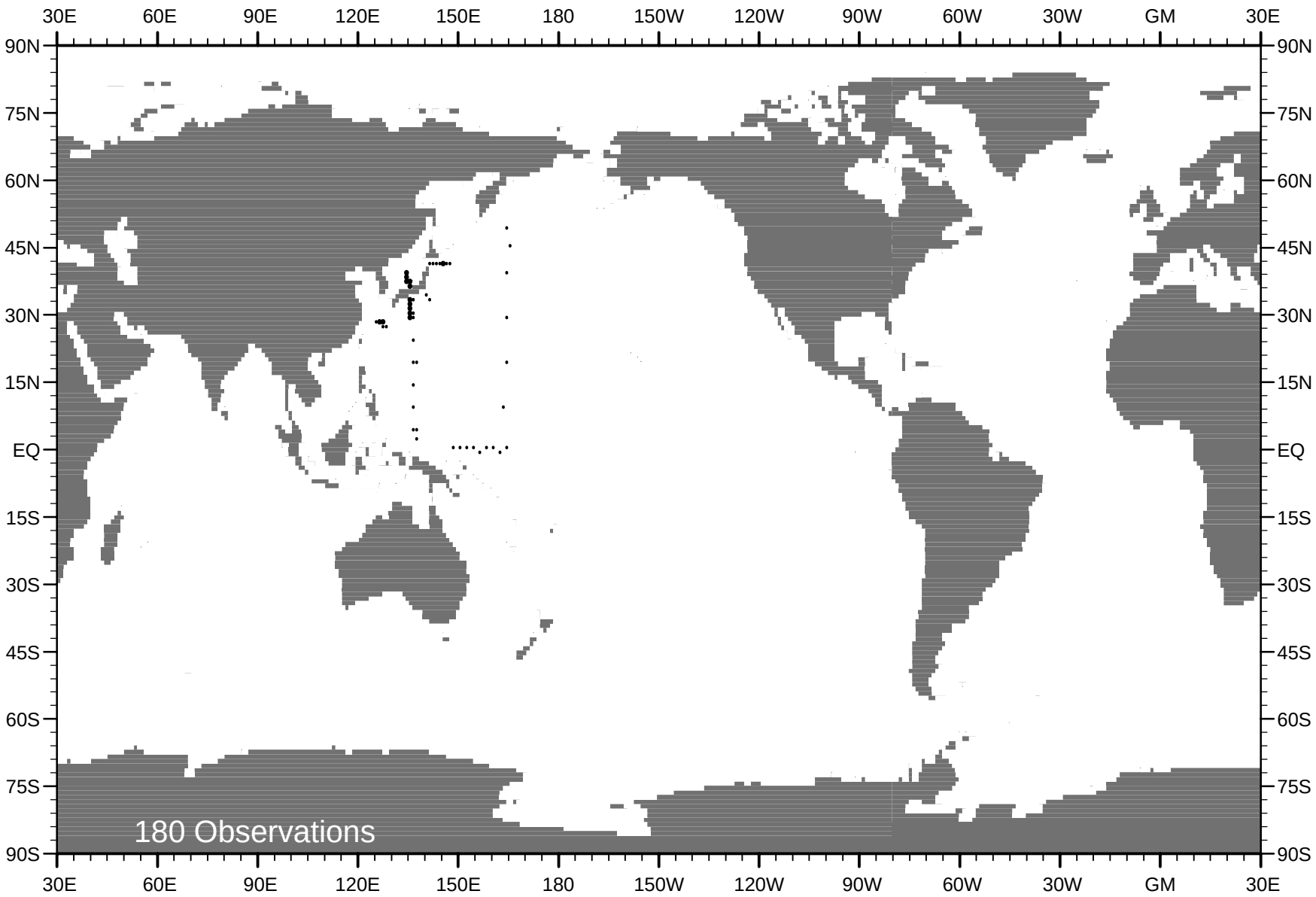


Fig. D51 Distribution of all Ocean Station Data (OSD) plankton biomass data in WOD01 for year 1999 .