7921

SEA SURFACE TEMPERATURE ANOMALIES

Douglas R. McLain[1]

Monthly mean sea surface temperatures and their anomalies, or departures from a 20-yr (1948-67) mean, for 1976 have been mapped for the Gulf of Alaska-Bering Sea, the eastern North Pacific, and the western North Atlantic (Appendix 9.1). The western North Atlantic was mapped for 1974 (McLain 1976) and all three areas were mapped for 1975 (McLain 1978). The maps are based on surface marine weather observations made routinely by ships of many nations.[2] The observations are available in near real-time and at low cost, and are used to produce several data products including these monthly mean maps. There are other maps of sea surface temperature available, in particular gulfstream[3] and Fishing Information.[4] The areas covered are distinct and there are a few important processing differences. Fishing Information uses the same 20-yr base period as the present maps. The temperatures and anomalies are contoured and thus reflect analysis; the data are not presented. The gulfstream presents the data and uses a full data set historical mean. The reference period includes years of sparse data, particularly before World War II, and clusters of data from classical research cruises.

Technique

The observations of sea surface temperature were edited through a two-stage filter. In the first stage, all observations <-2.0C or >40C were rejected. In the second stage, observations >8.0C from a reference value were rejected. The reference value was the base period mean for the particular month and the particular

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[1]Pacific Environmental Group, National Marine Fisheries Service, NOAA, Monterey, CA 93940.

[2]The marine weather observations are transmitted worldwide over the GTS network. They are received at the Fleet Numerical Weather Central, U.S. Navy, Monterey, CA 93940.

[3]The gulfstream, Oceanographic Services Branch, National Weather Service, NOAA, Silver Spring, MD 20910.

[4]Fishing Information, Southwest Fisheries Center, NMFS, NOAA, La Jolla, CA 92038.

1-deg square for the first two observations of that month; for later observations the reference value was the current mean for the particular month and 1-deg square.

Saur (1963) and McLain (1976, 1978) discussed sources of error in the observations and in the maps.

LITERATURE CITED

McLAIN, D. R.
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1978. Anomalies of coastal sea surface temperatures along the west coast of North America. In J. R. Goulet, Jr. and E. D. Haynes (editors), Ocean variability: Effects on U.S. marine fishery resources - 1975, p. 127-140. U.S. Dep. Commer., NOAA Tech Rep. NMFS Circ. 416.

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1963. A study of the quality of sea water temperatures reported in logs of ships' weather observations. J. Appl. Meteorol. 2:417-425.

APPENDIX 9.1

The maps present by month and by 1-deg square the mean monthly sea surface temperature, the departure from a 20-yr (1948-67) mean, and the number of accepted observations. The temperatures were not plotted if there were two or fewer observations in that particular 1-deg square. Also, anomalies were not plotted if there were fewer than five years represented in the 20-yr mean. Anomalies of magnitude greater than 1.0C are shaded.

The maps cover the following regions:

Gulf of Alaska and Bering Sea	45N-63N	122W-180W
Eastern North Pacific	25N-50N	110W-150W
Western North Atlantic	20N-46N	60W- 99W

APPENDIX 9.1

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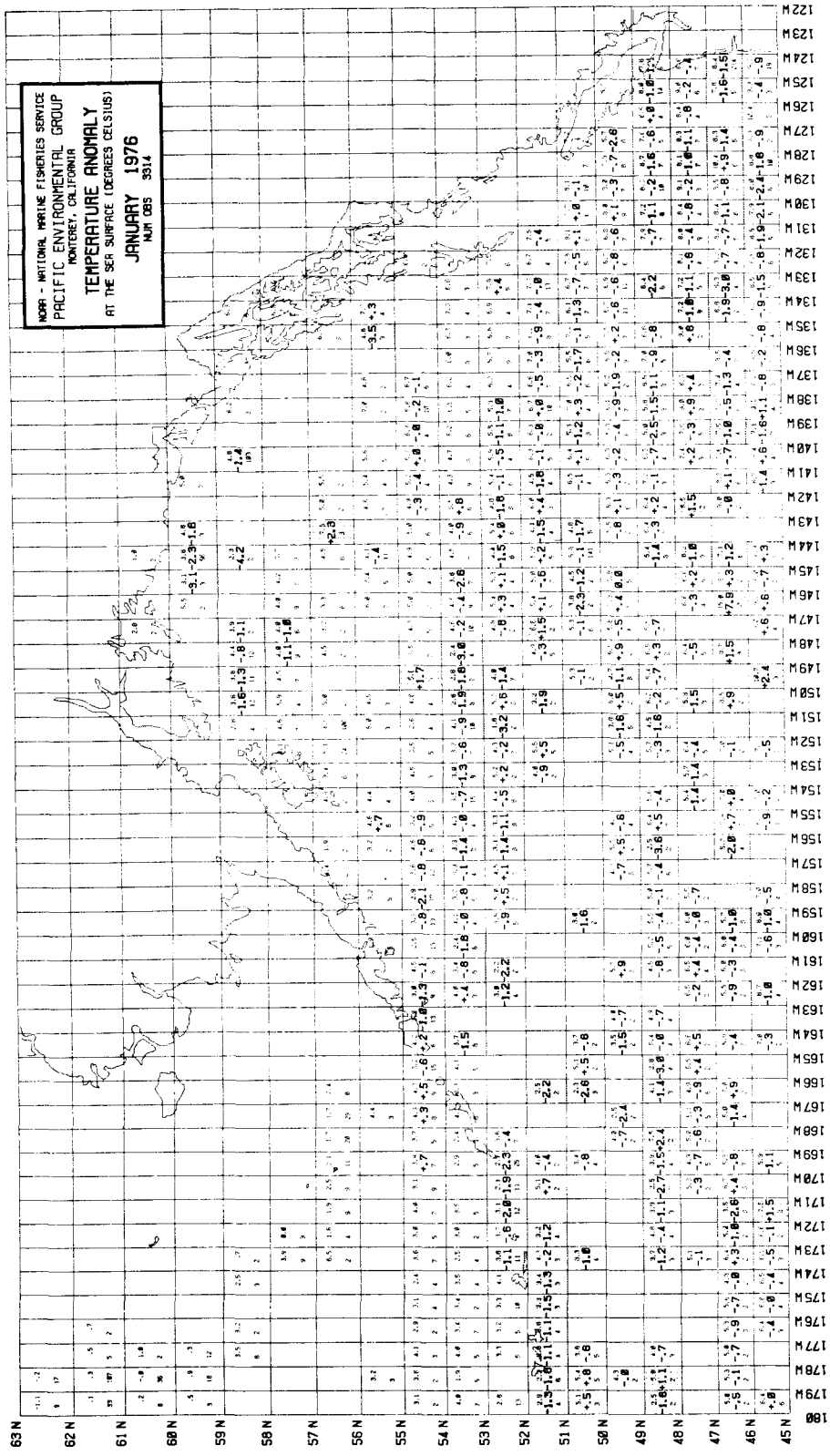
The maps cover the following regions:

Gulf of Alaska and Bering Sea	45N-63N	122W-180W
Eastern North Pacific	25N-50N	110W-150W
Western North Atlantic	20N-46N	60W- 99W


NOAA - NATIONAL MARINE FISHERIES SERVICE
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AT THE SEA SURFACE (DEGREES CELSIUS)
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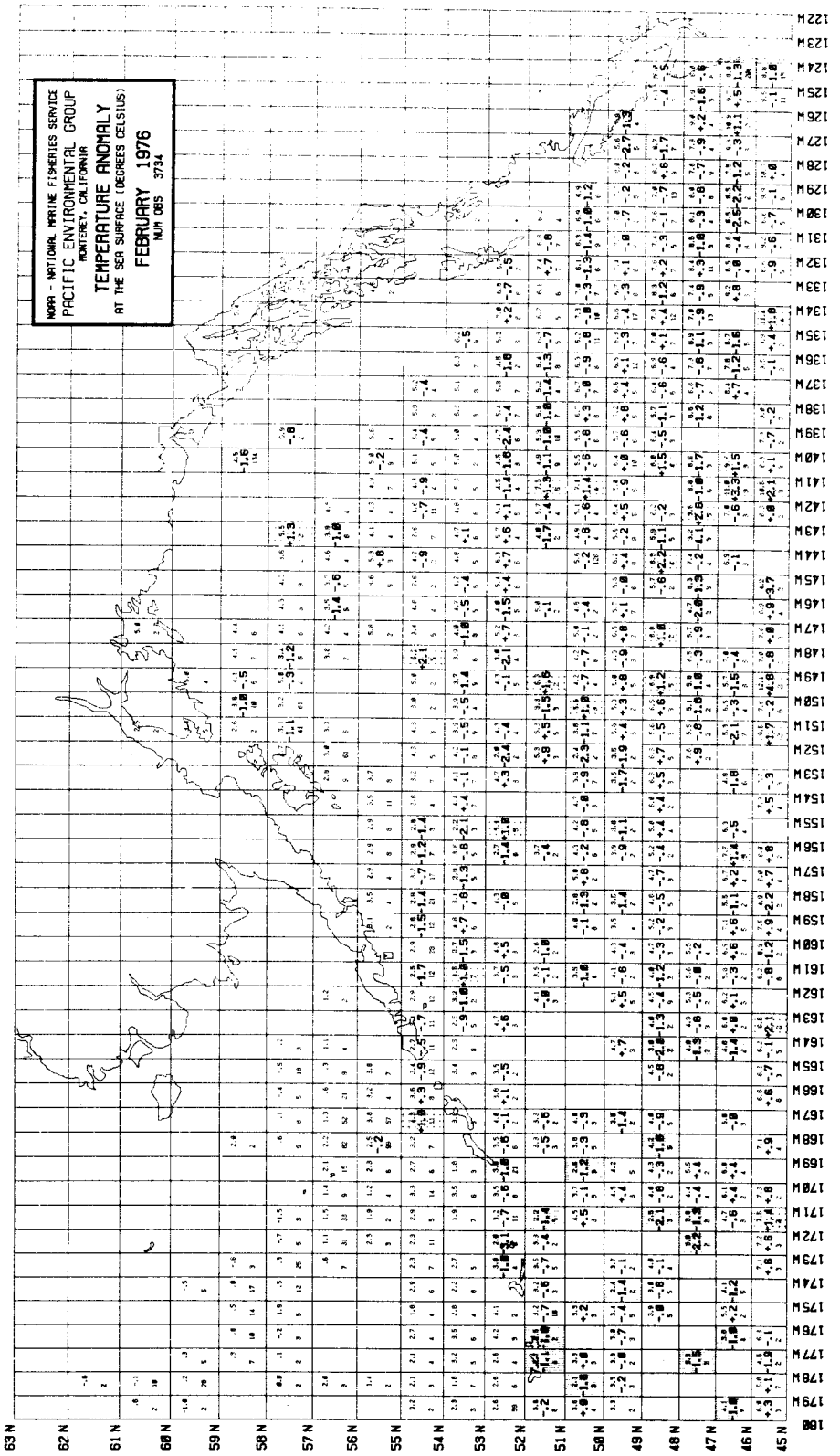
NUM OBS 3314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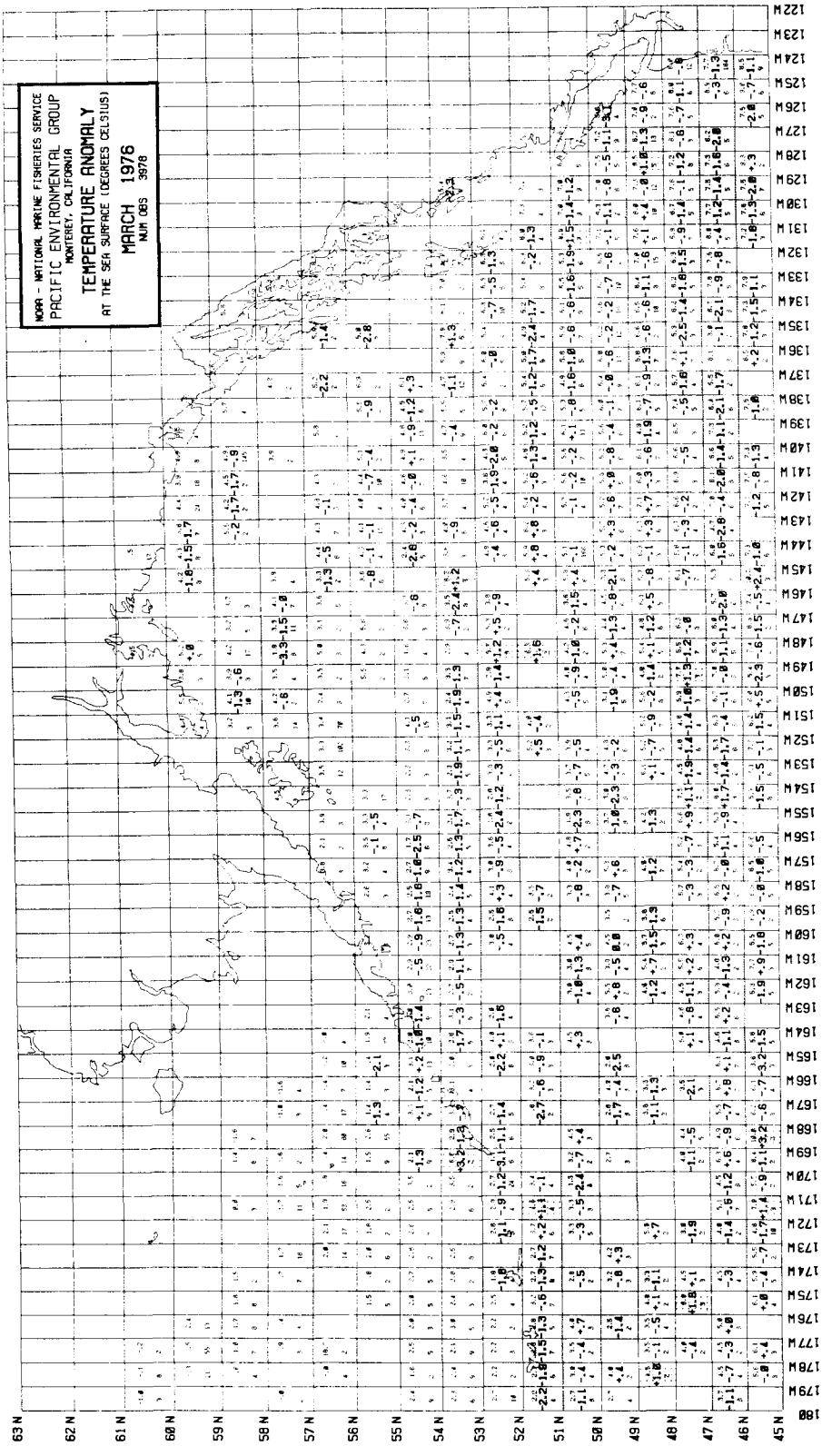
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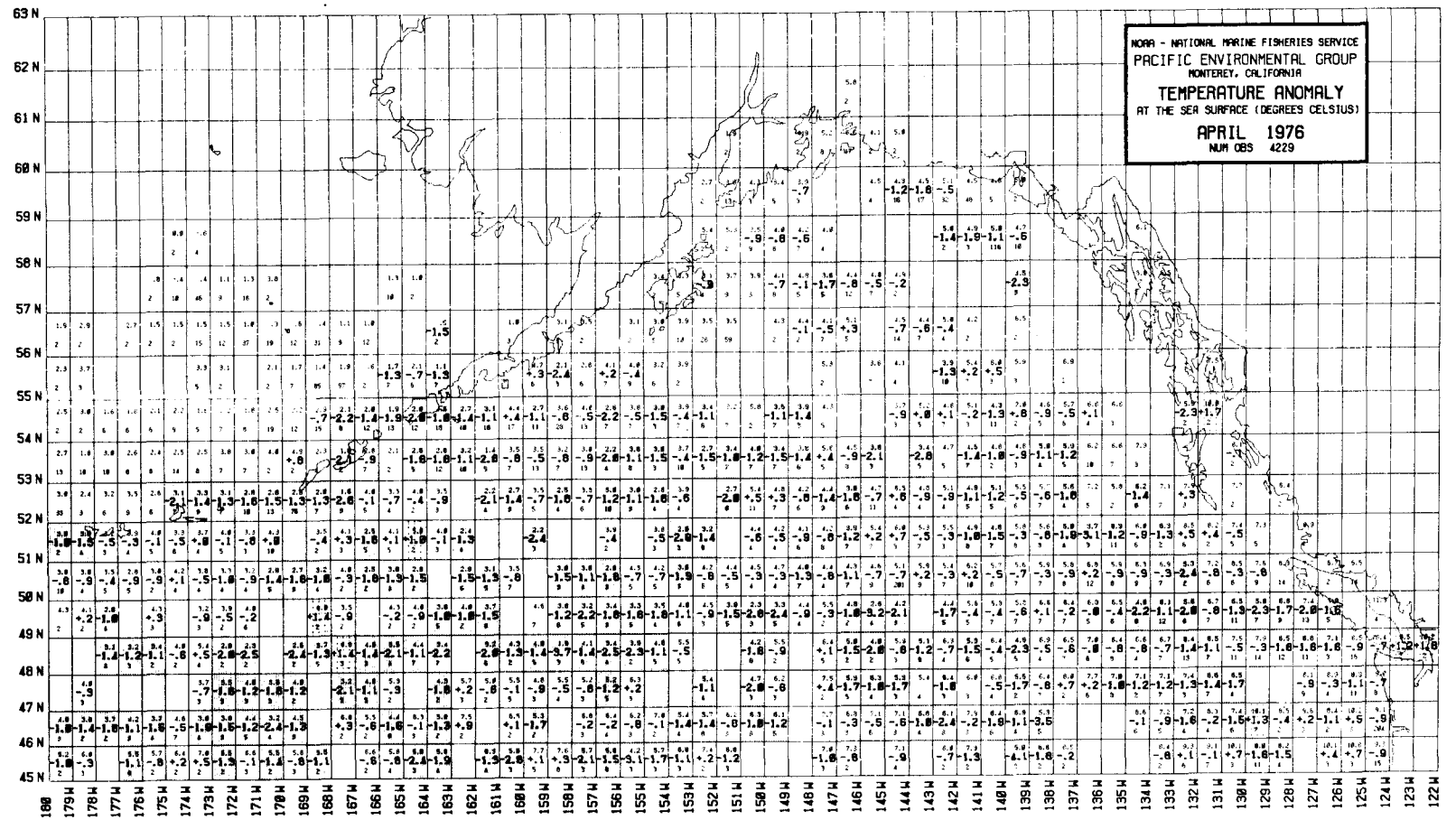
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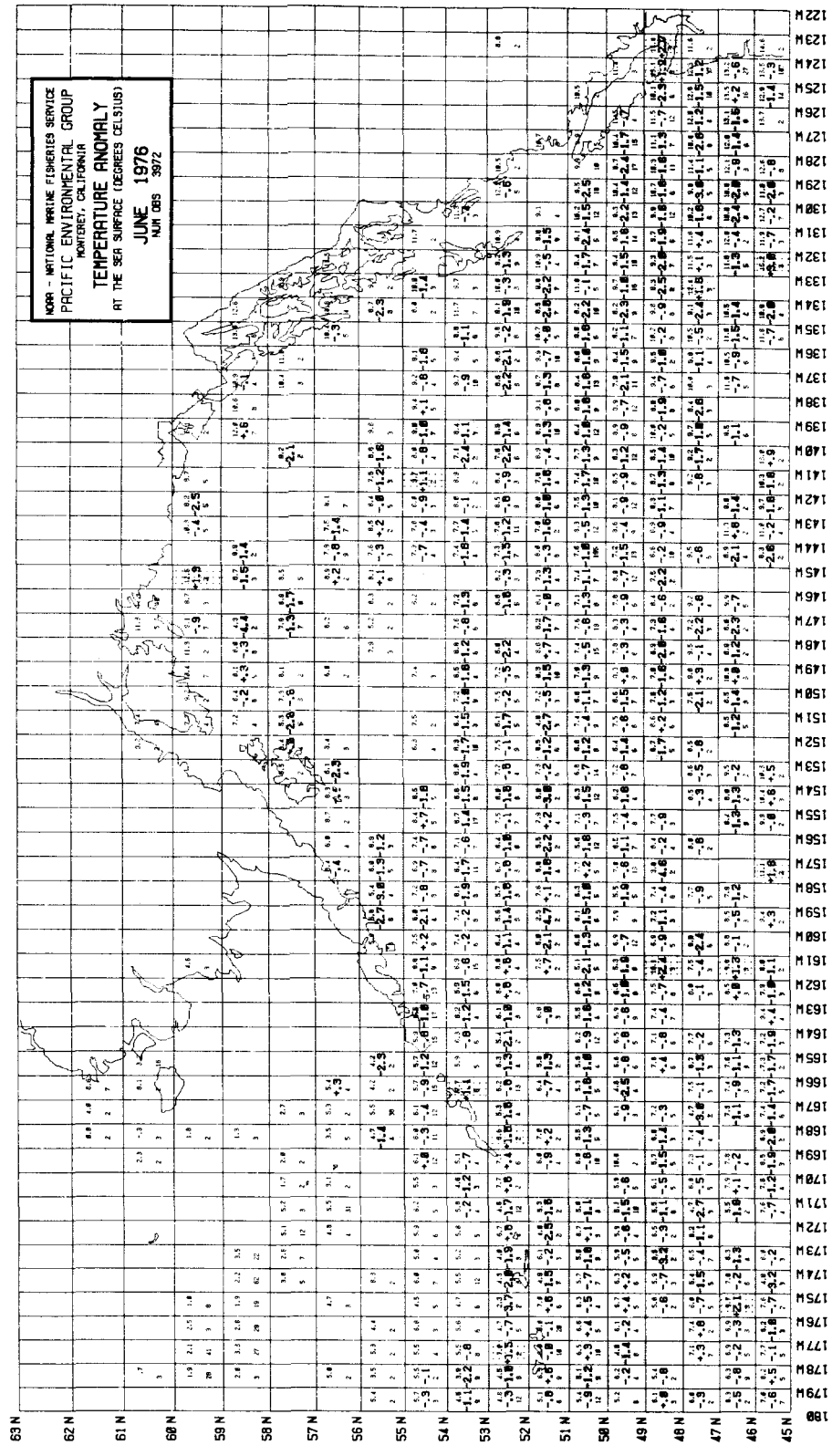
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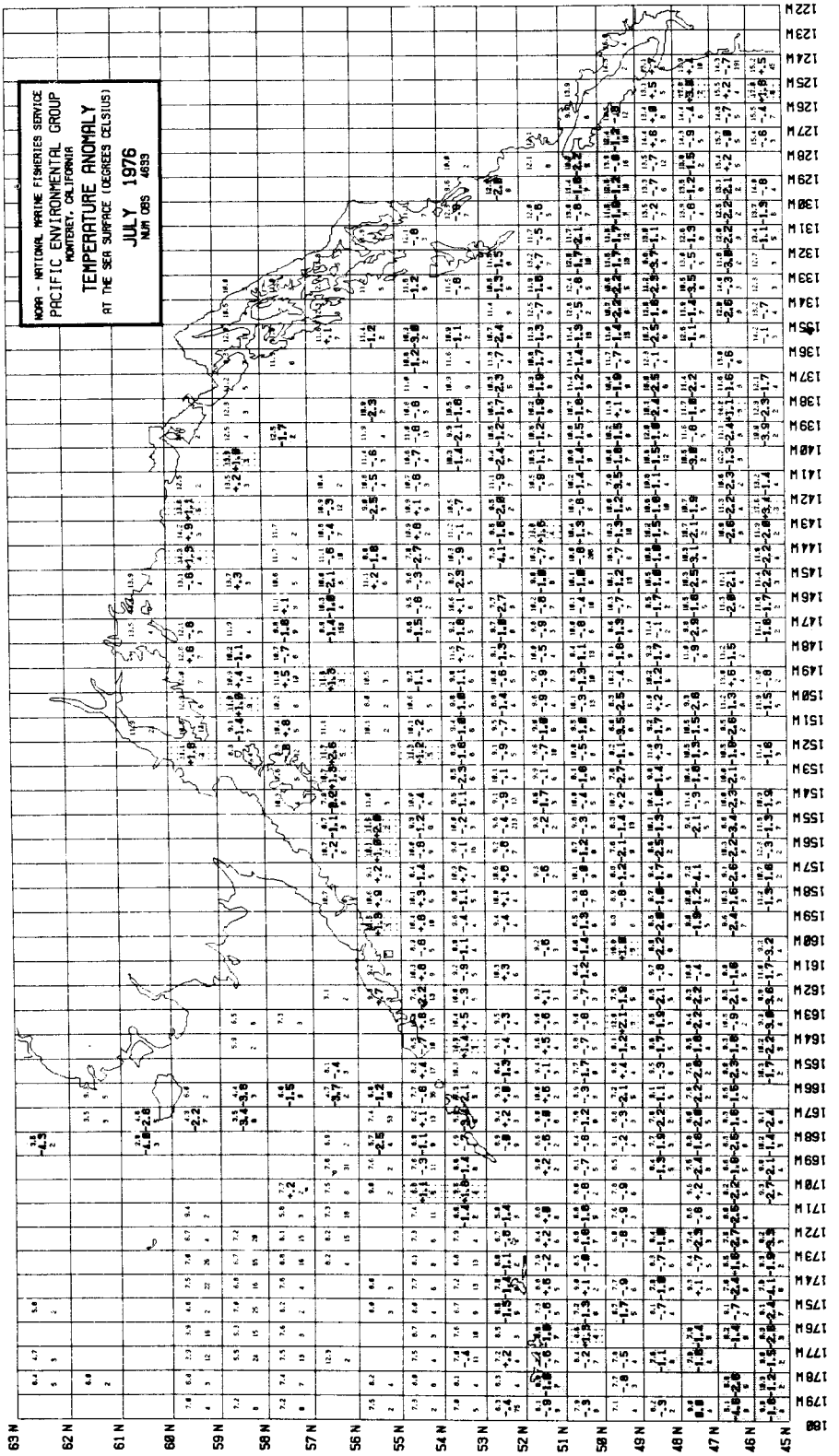
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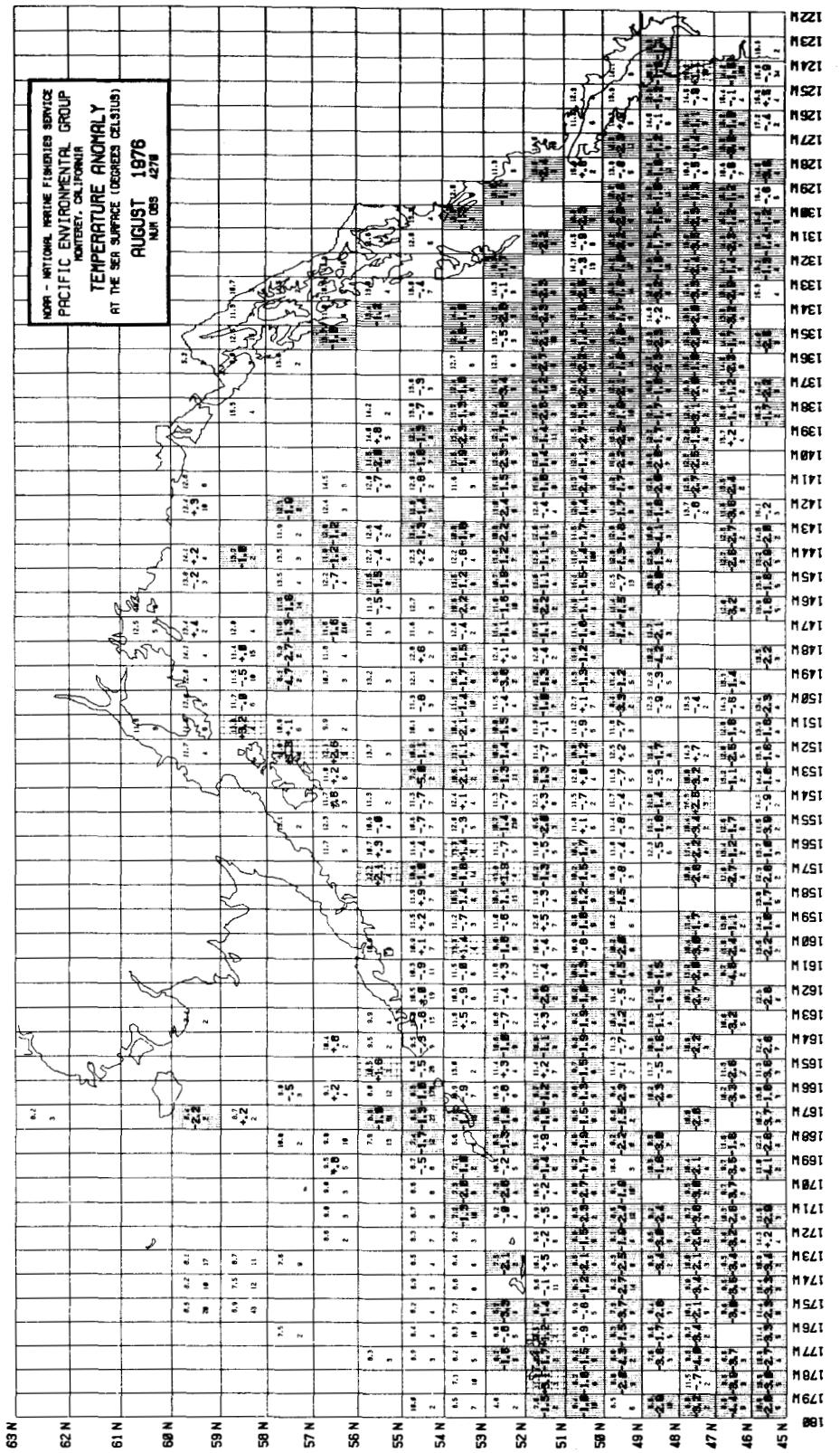
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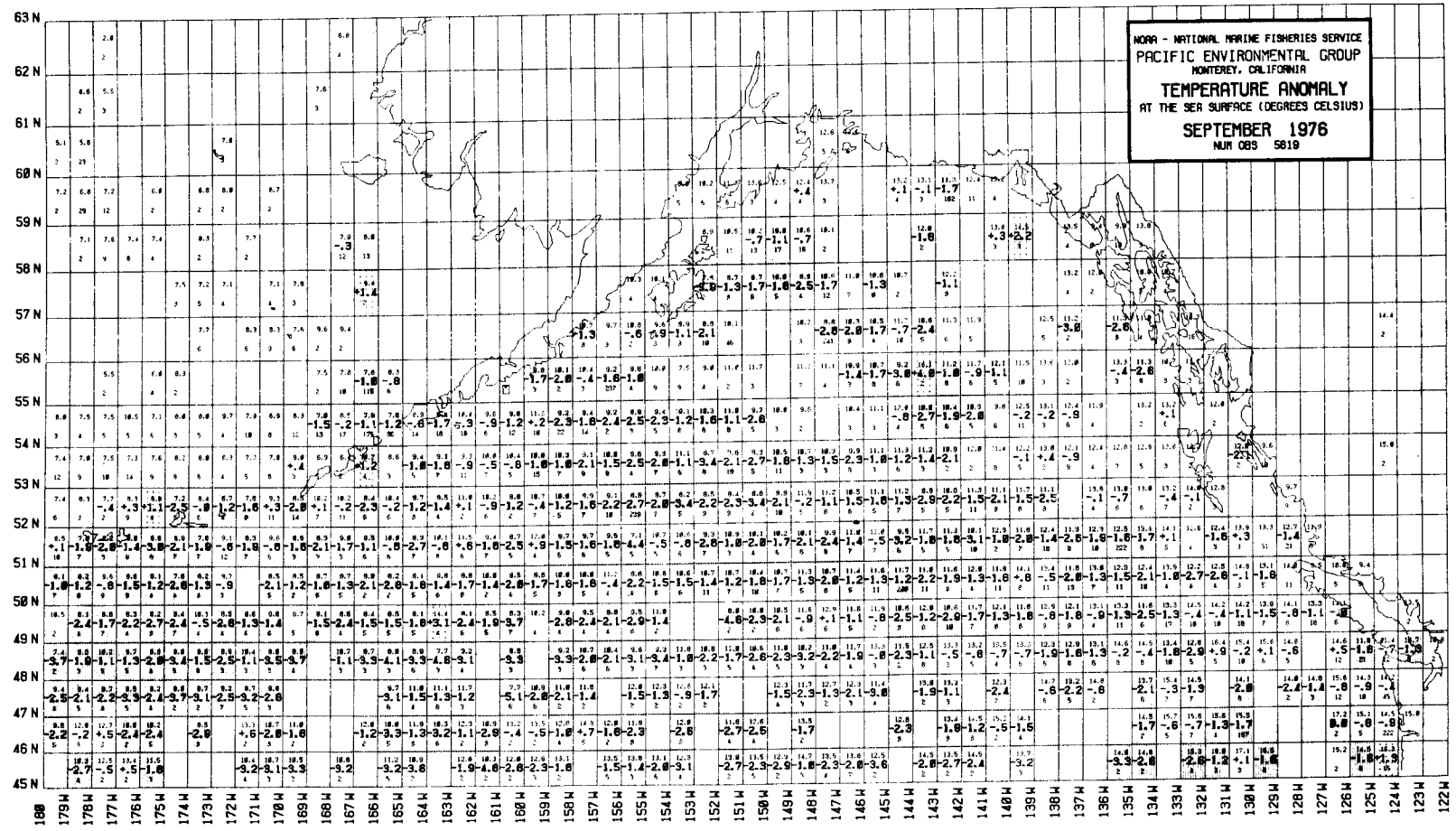
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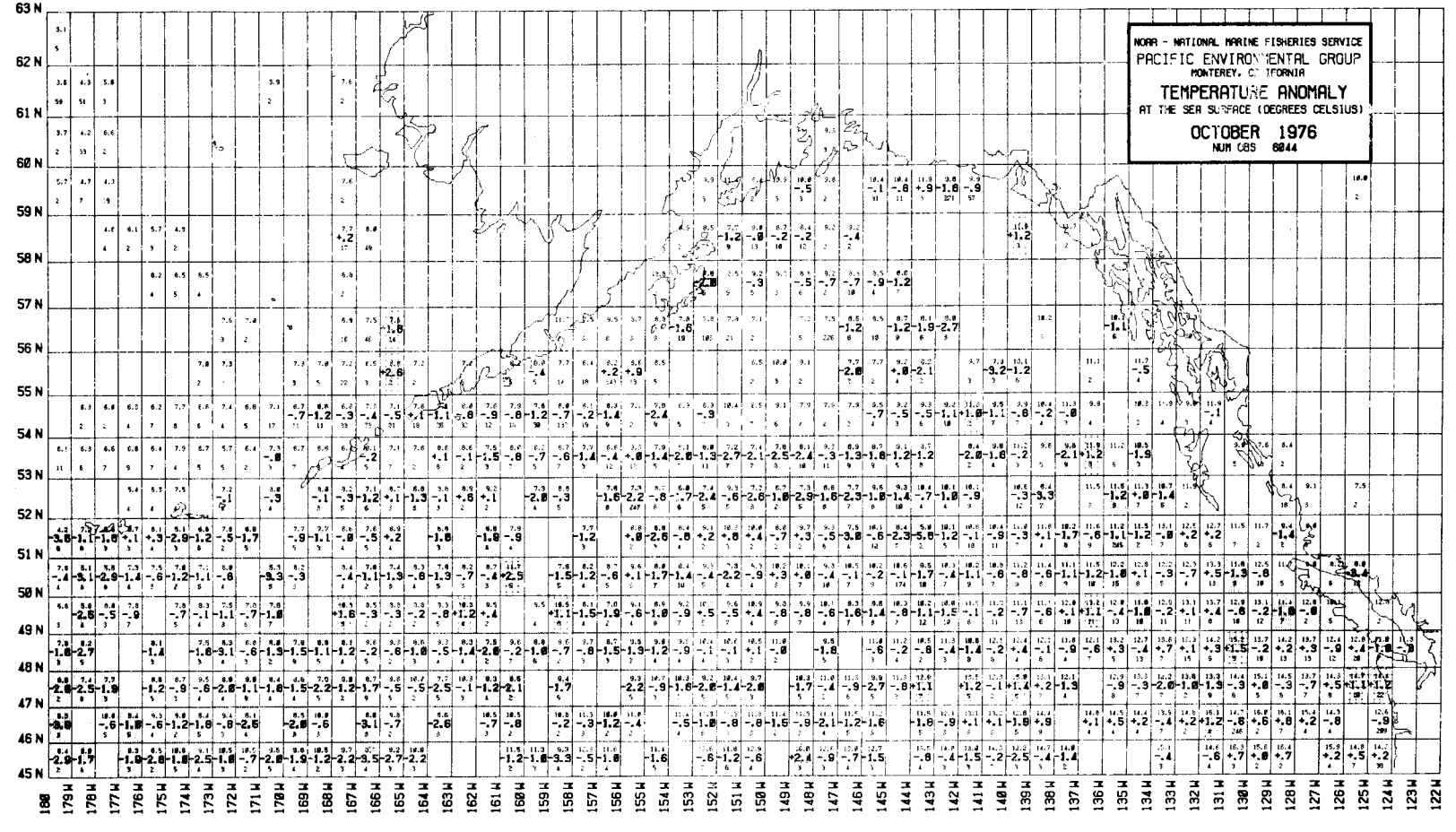
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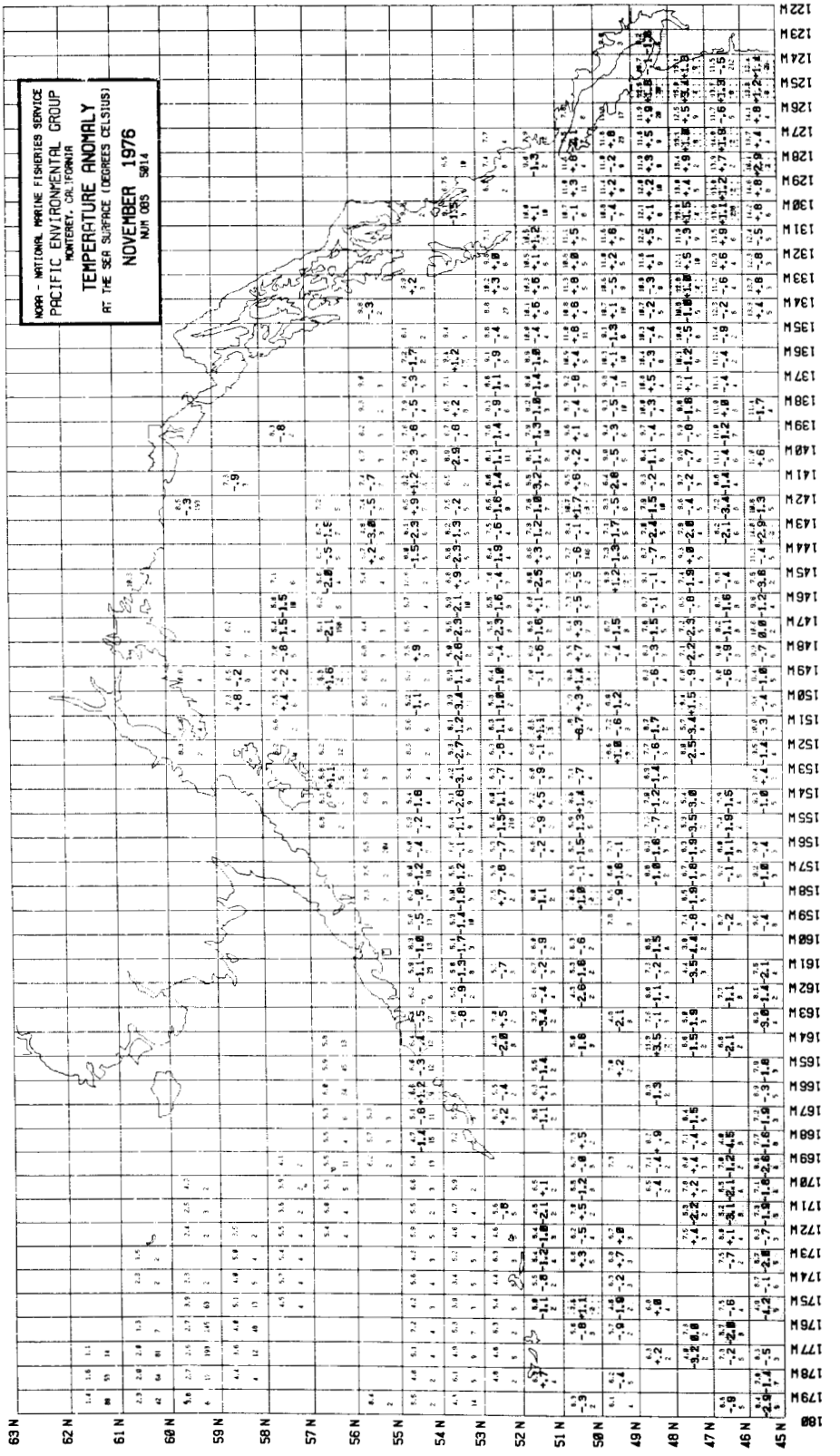
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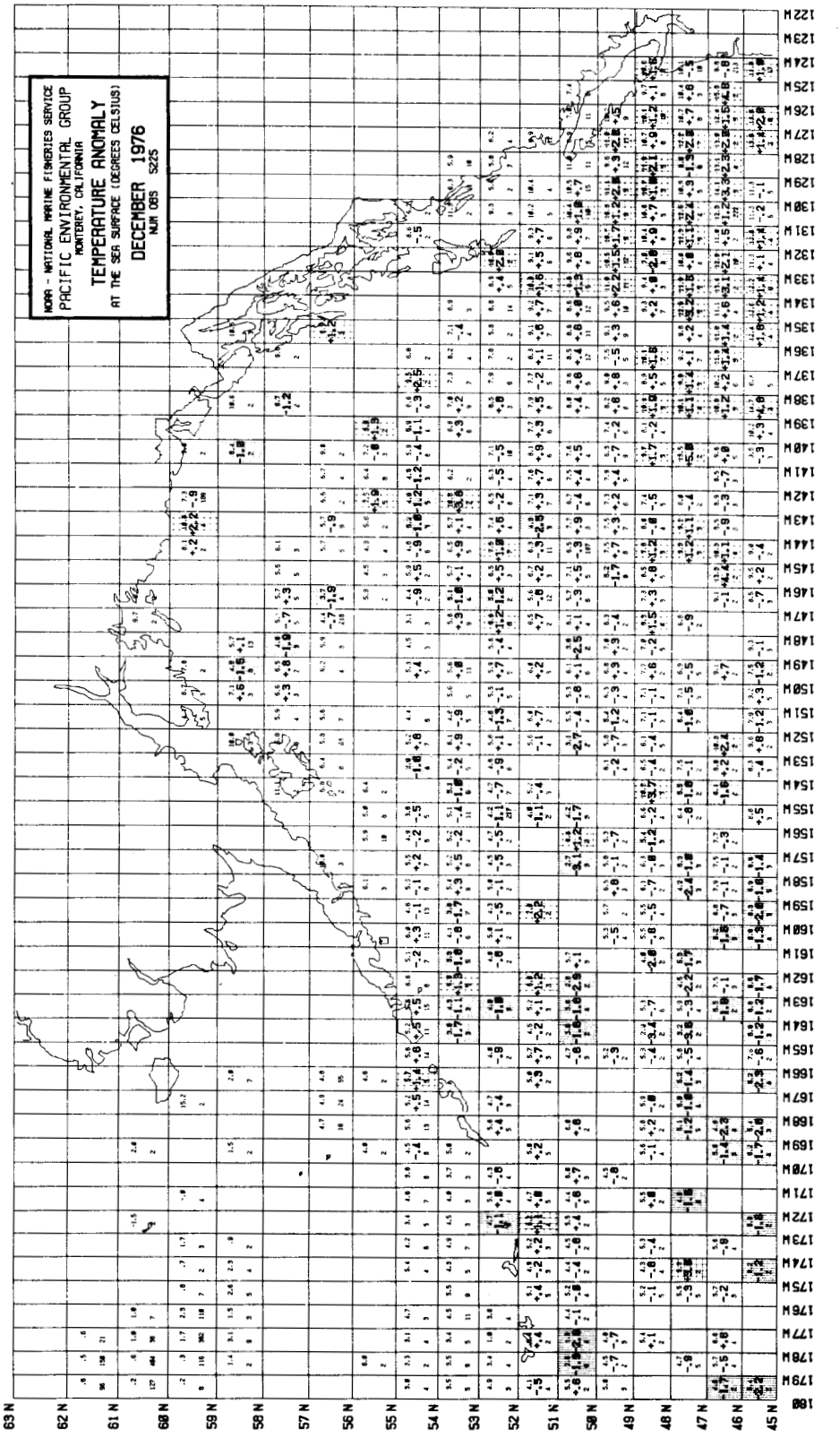
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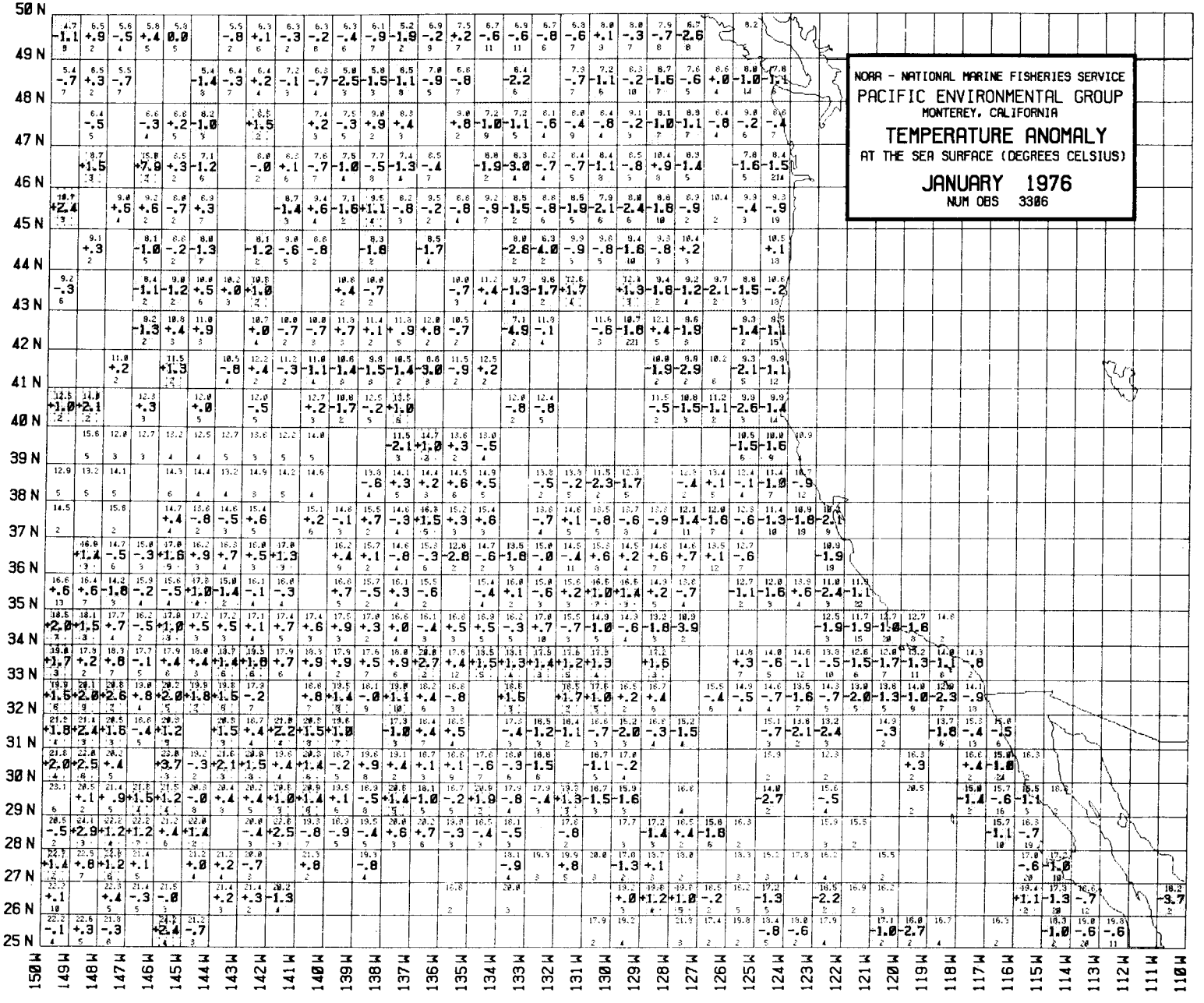
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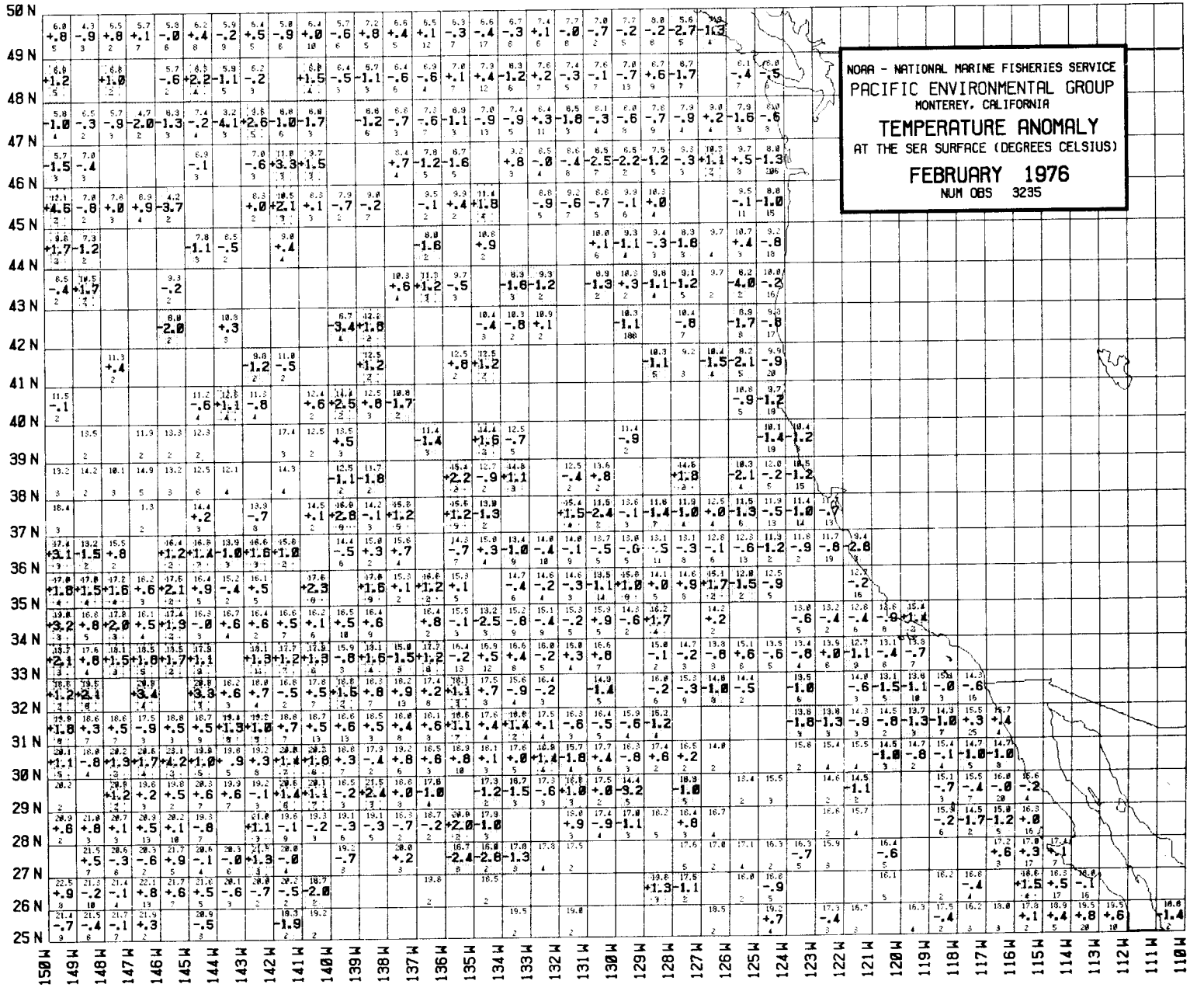
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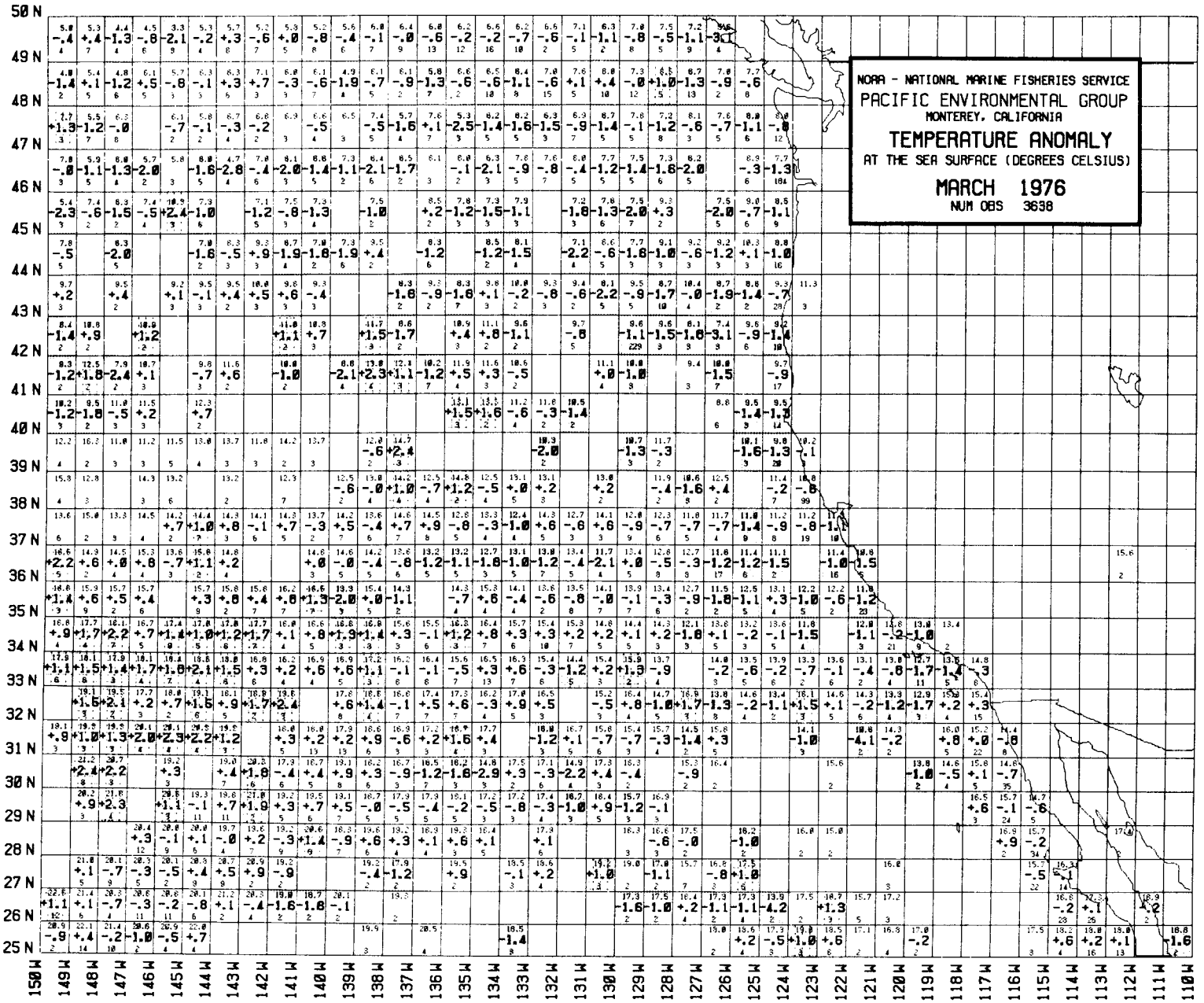
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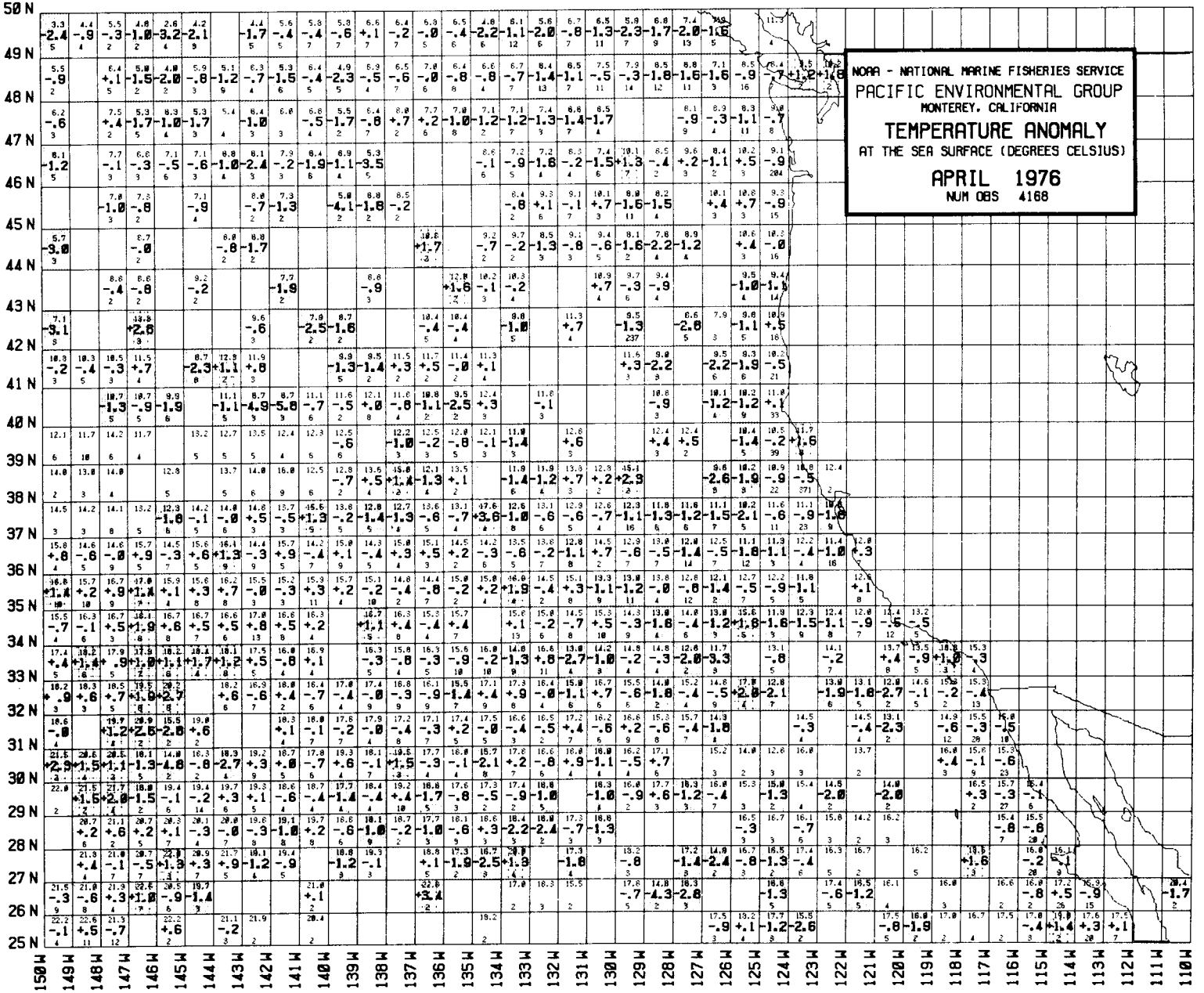
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MONTEREY, CALIFORNIA
TEMPERATURE ANOMALY
AT THE SEA SURFACE (DEGREES CELSIUS)
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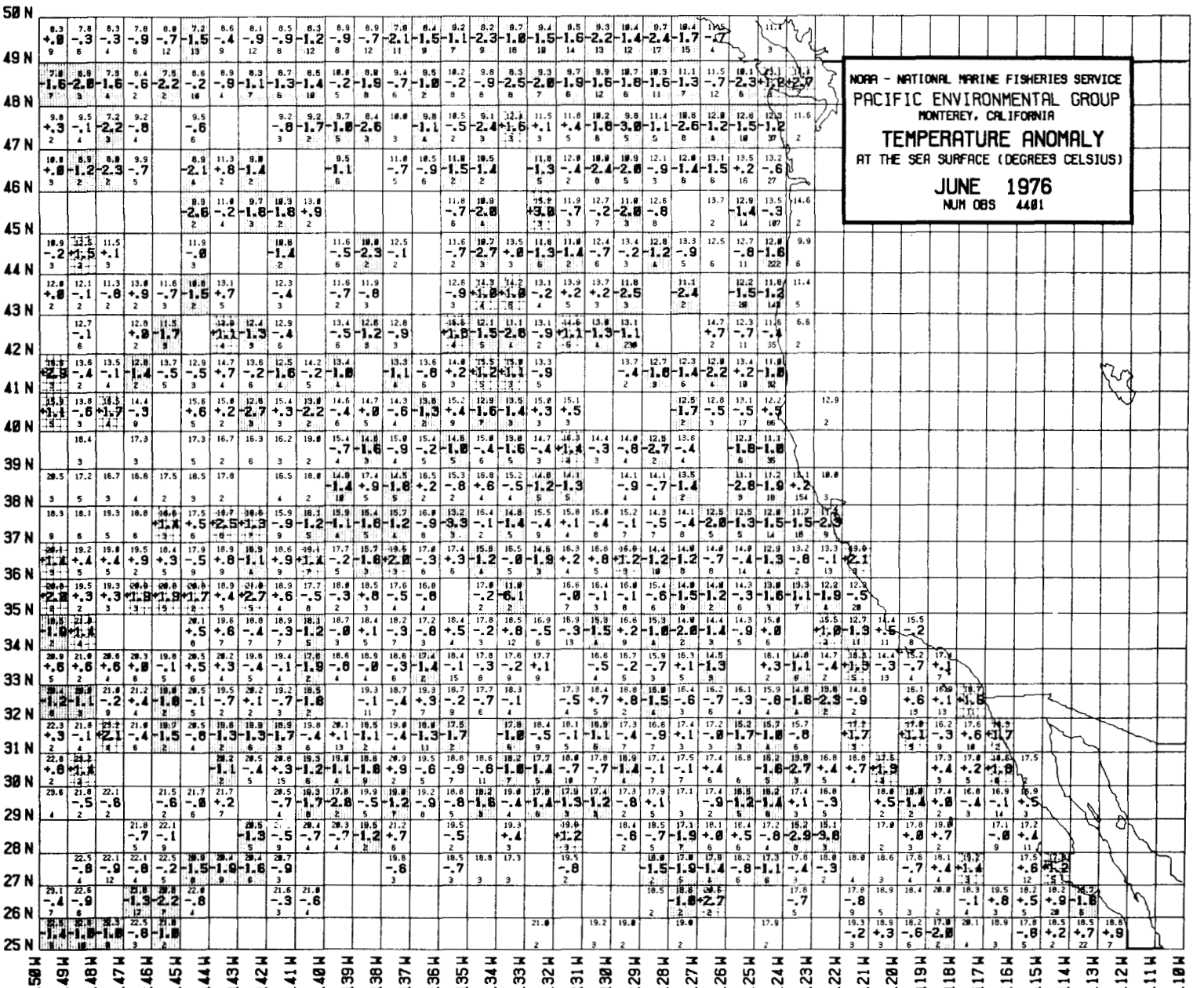
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PACIFIC ENVIRONMENTAL GROUP
MONTEREY, CALIFORNIA
TEMPERATURE ANOMALY
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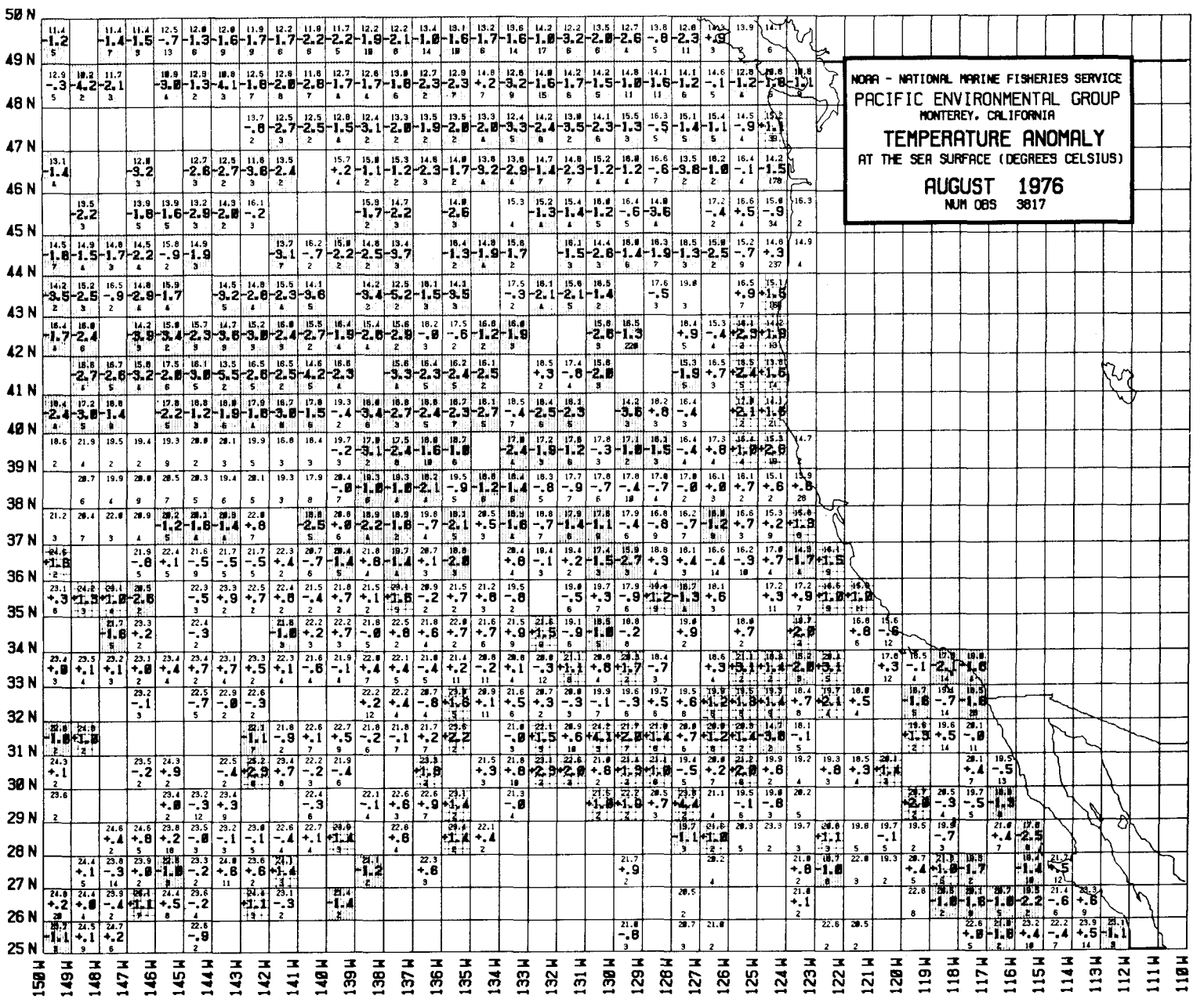
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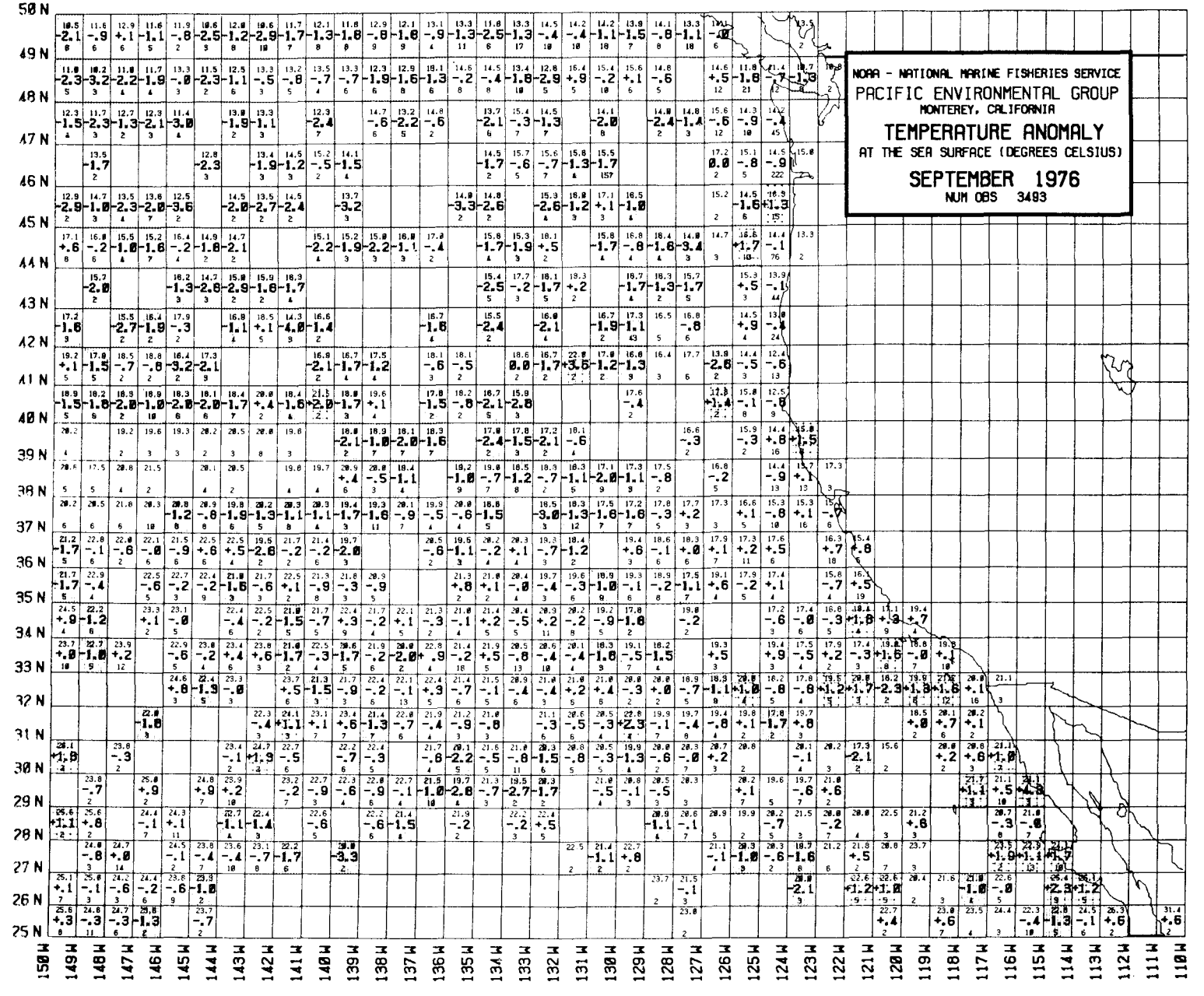
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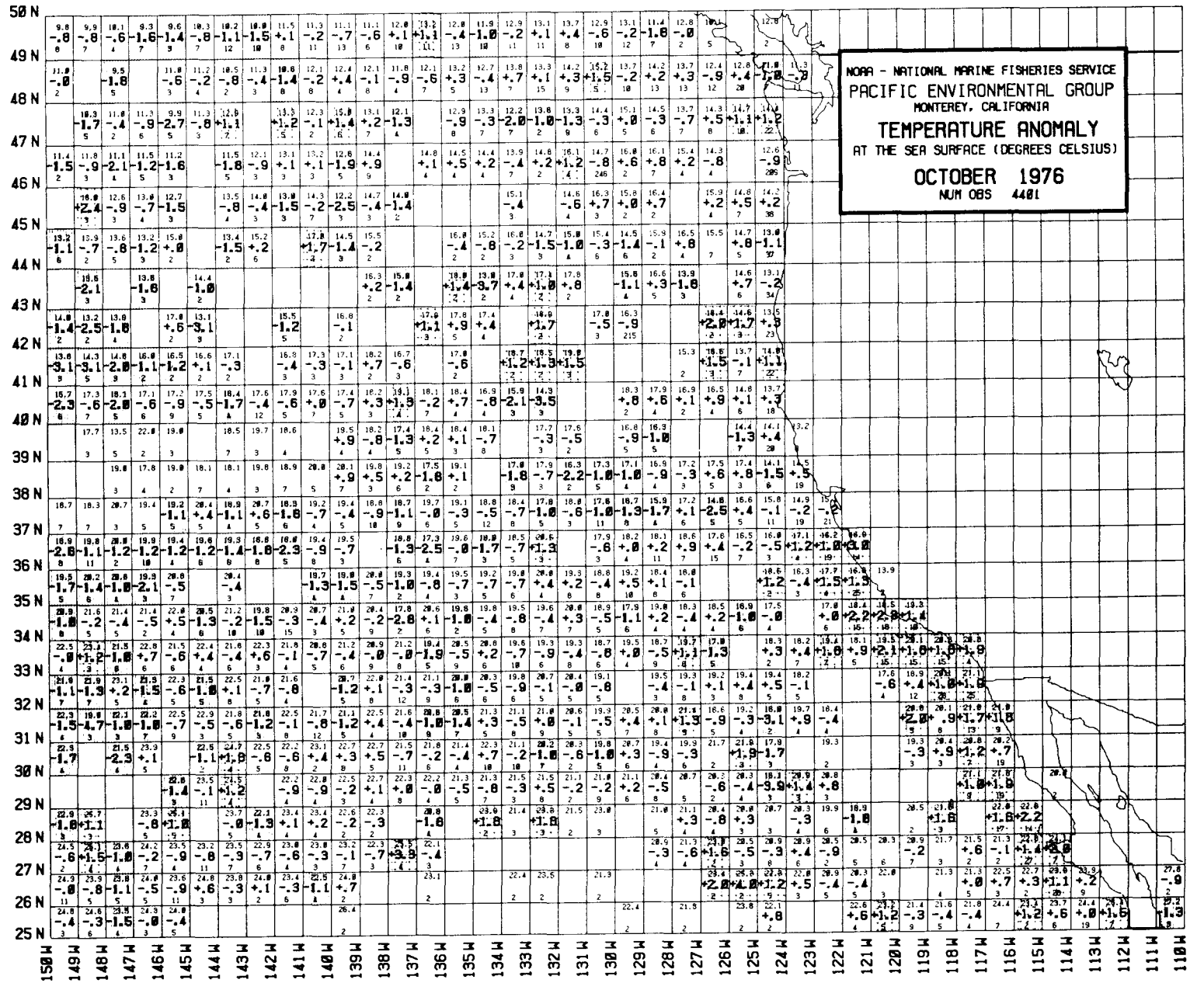
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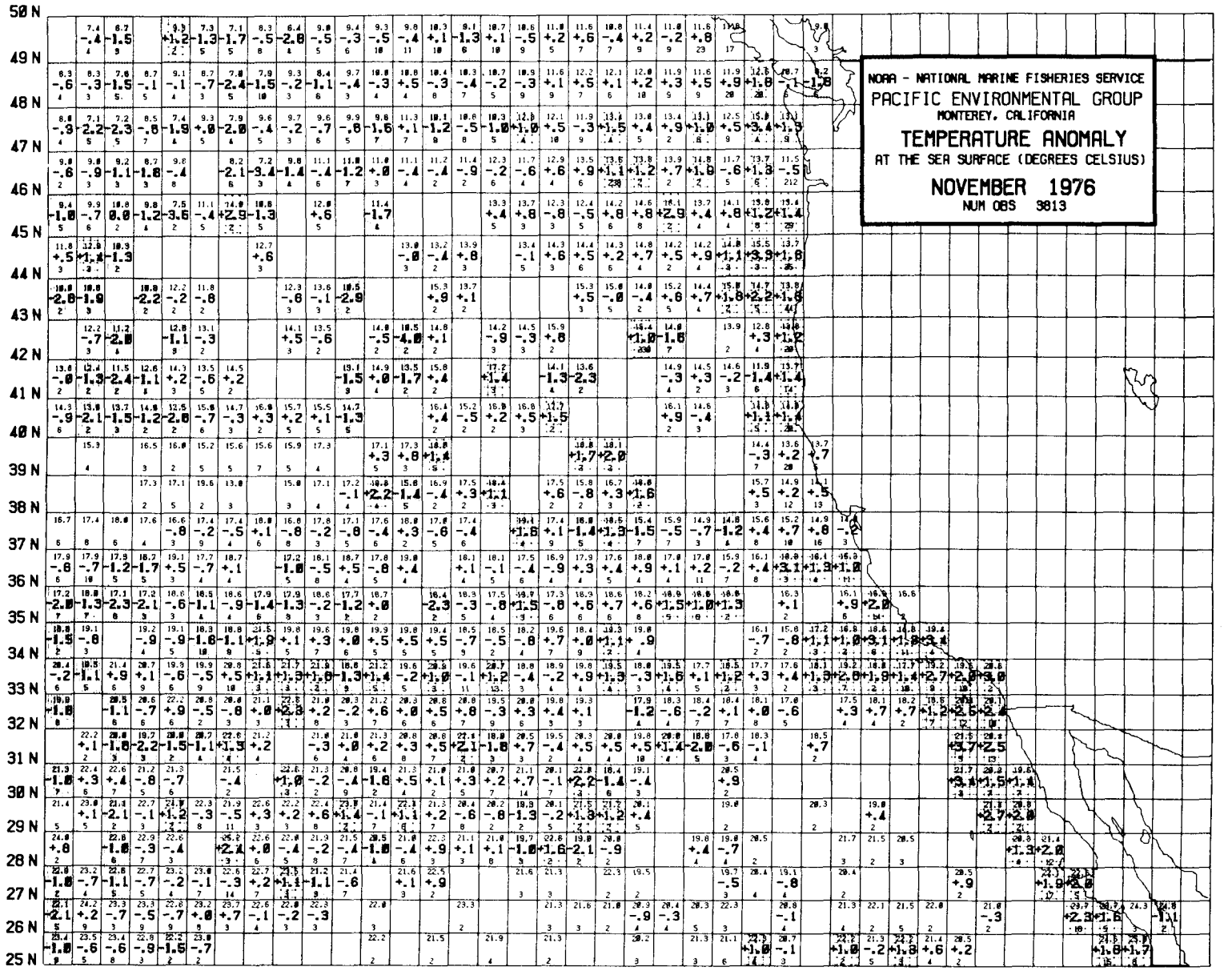
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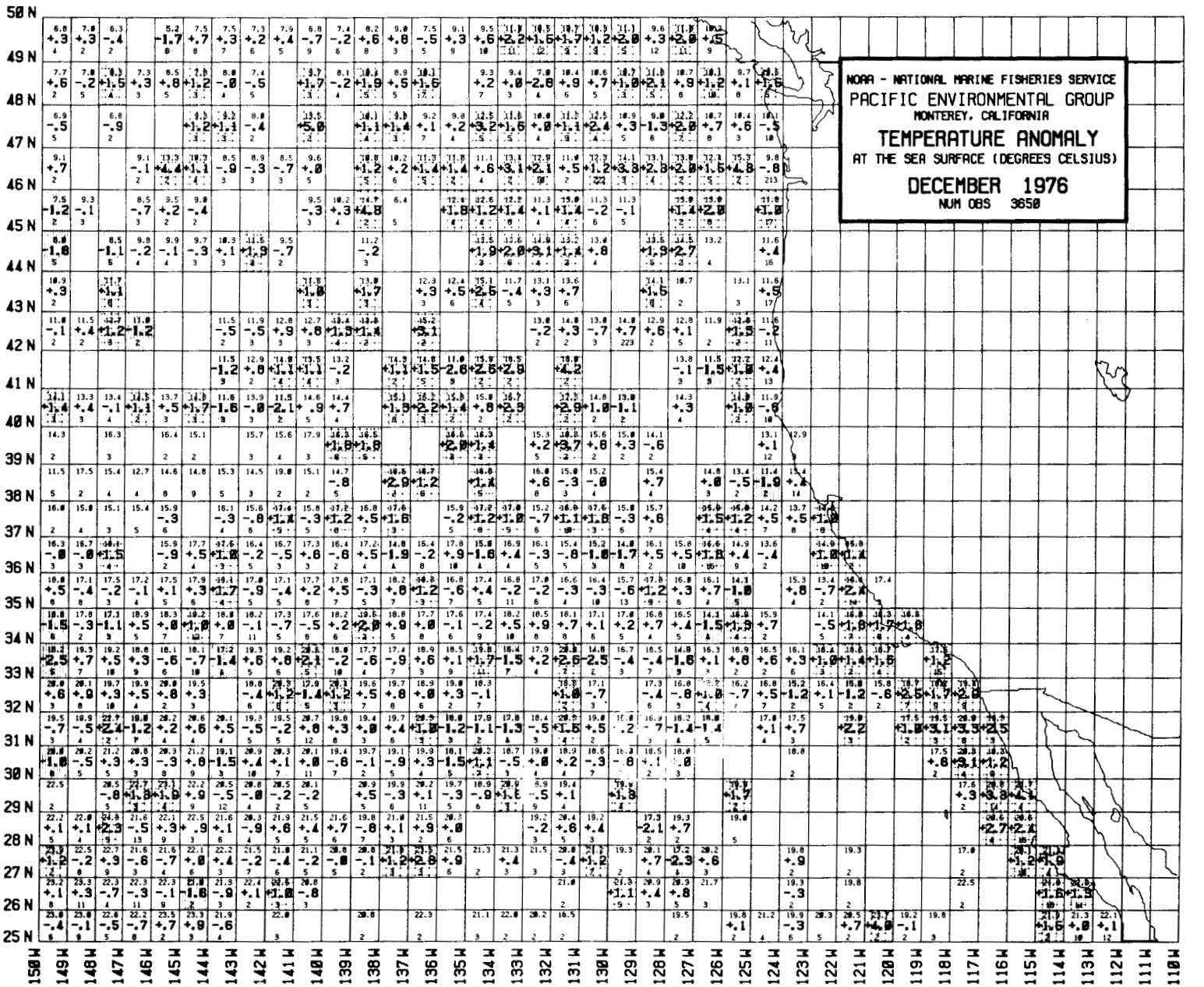
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MONTEREY, CALIFORNIA
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AT THE SEA SURFACE (DEGREES CELSIUS)
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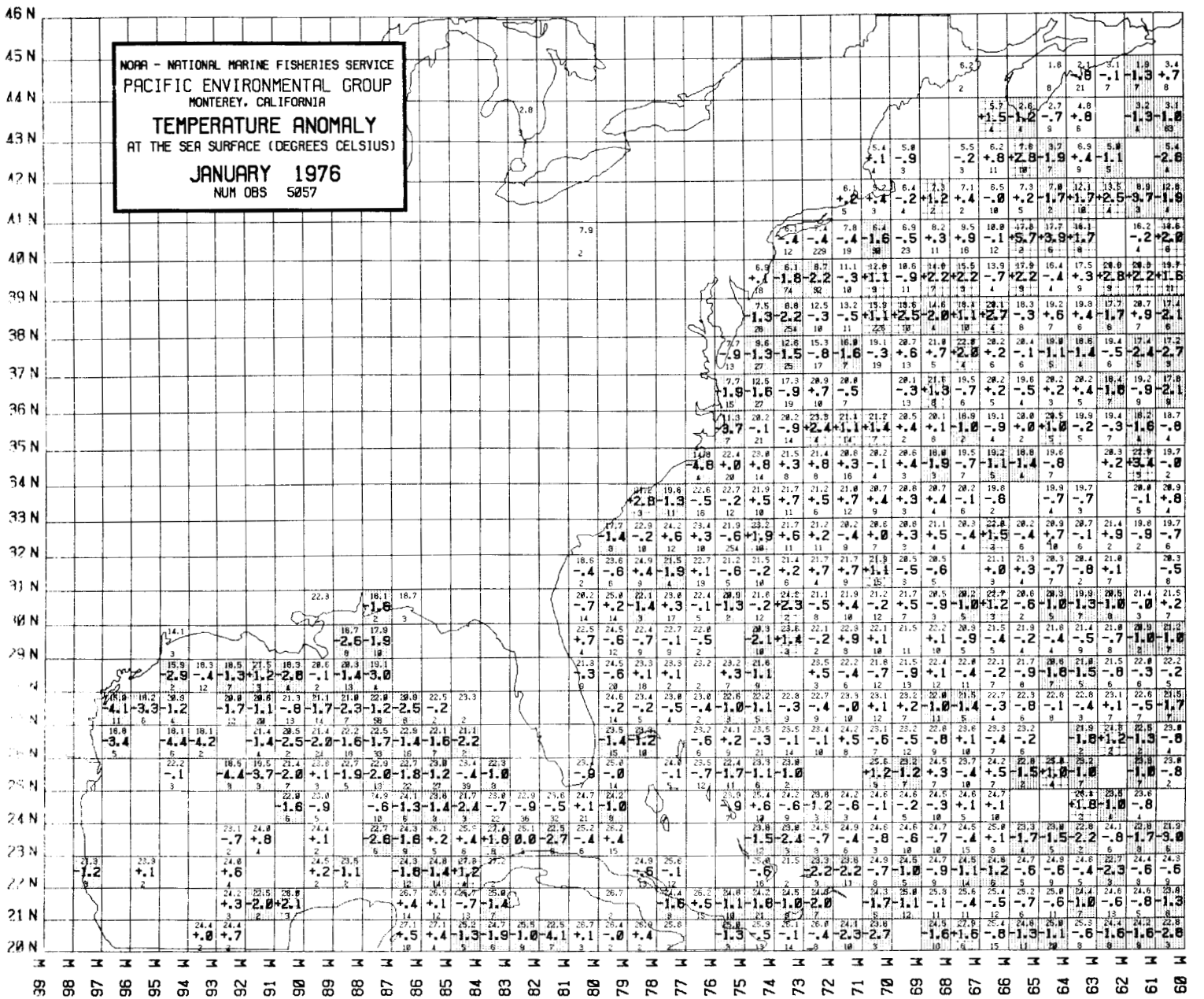
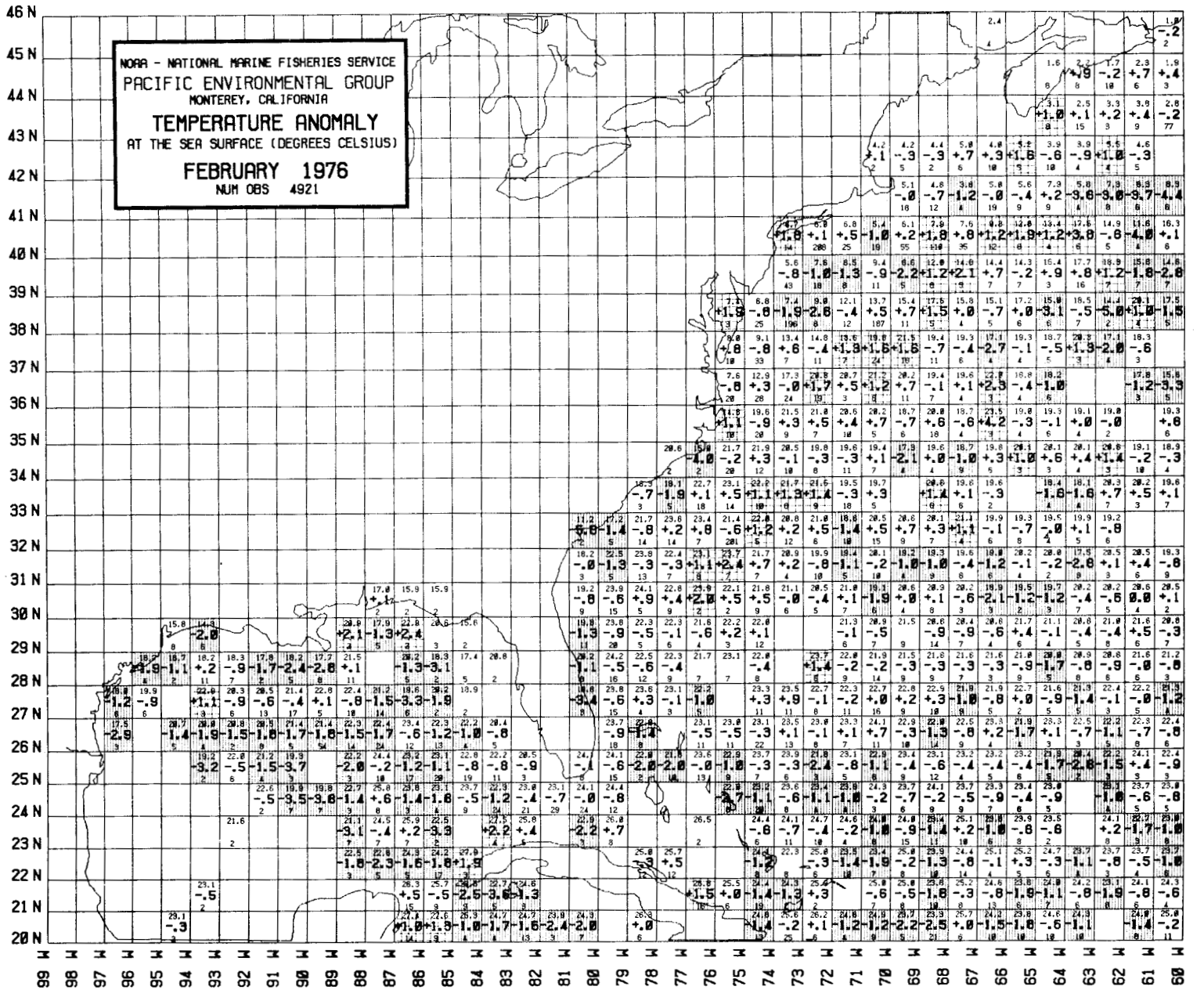
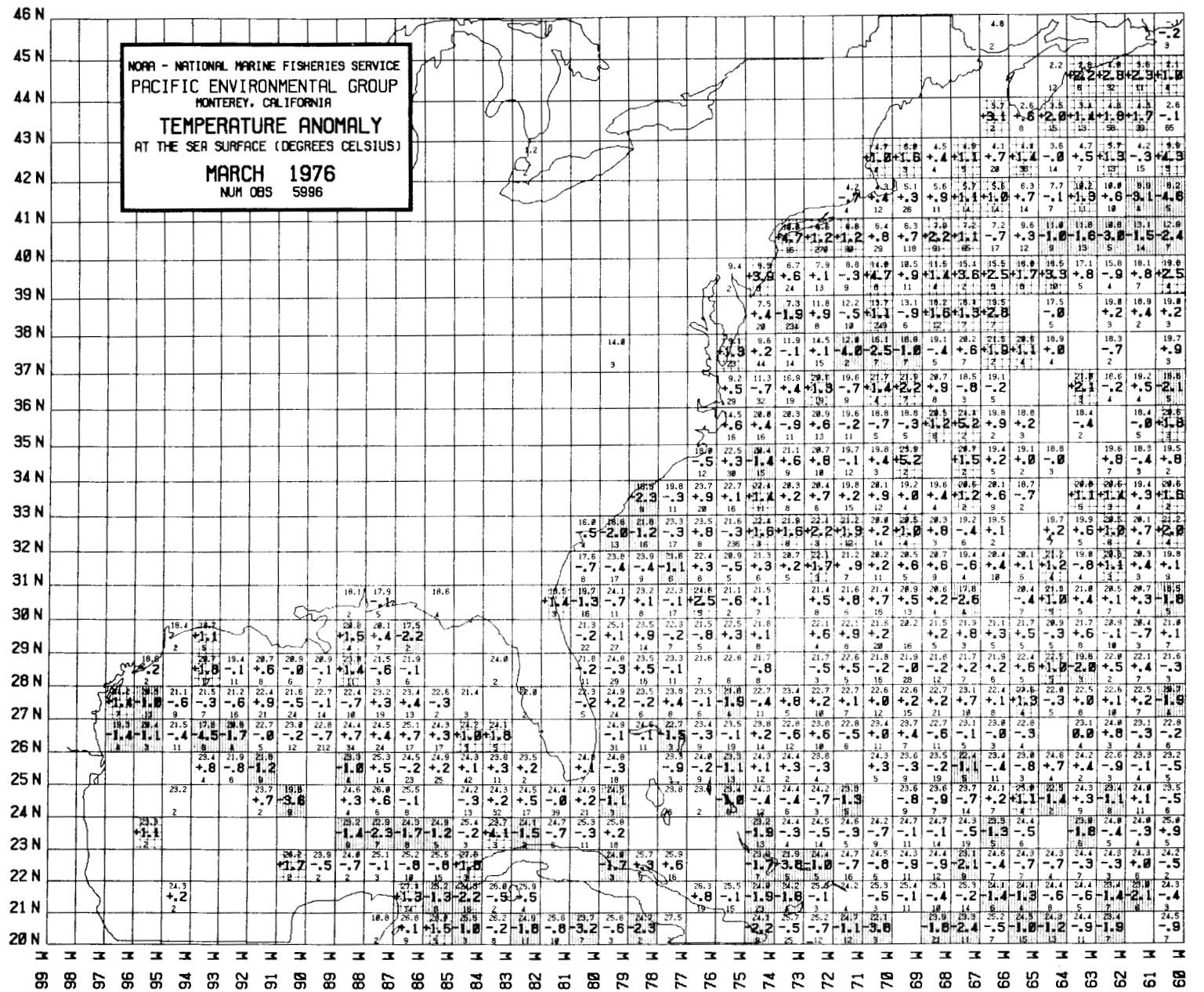
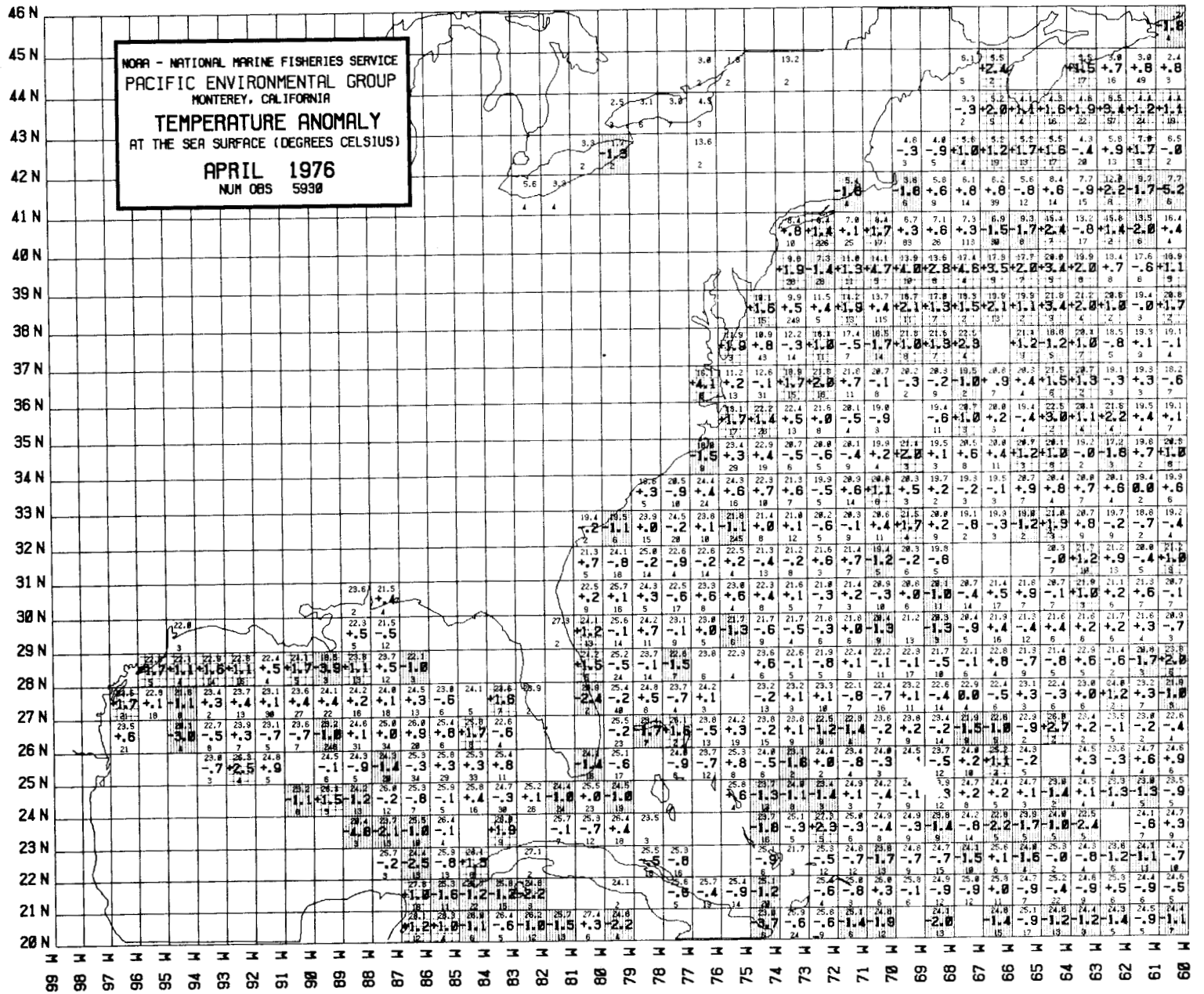
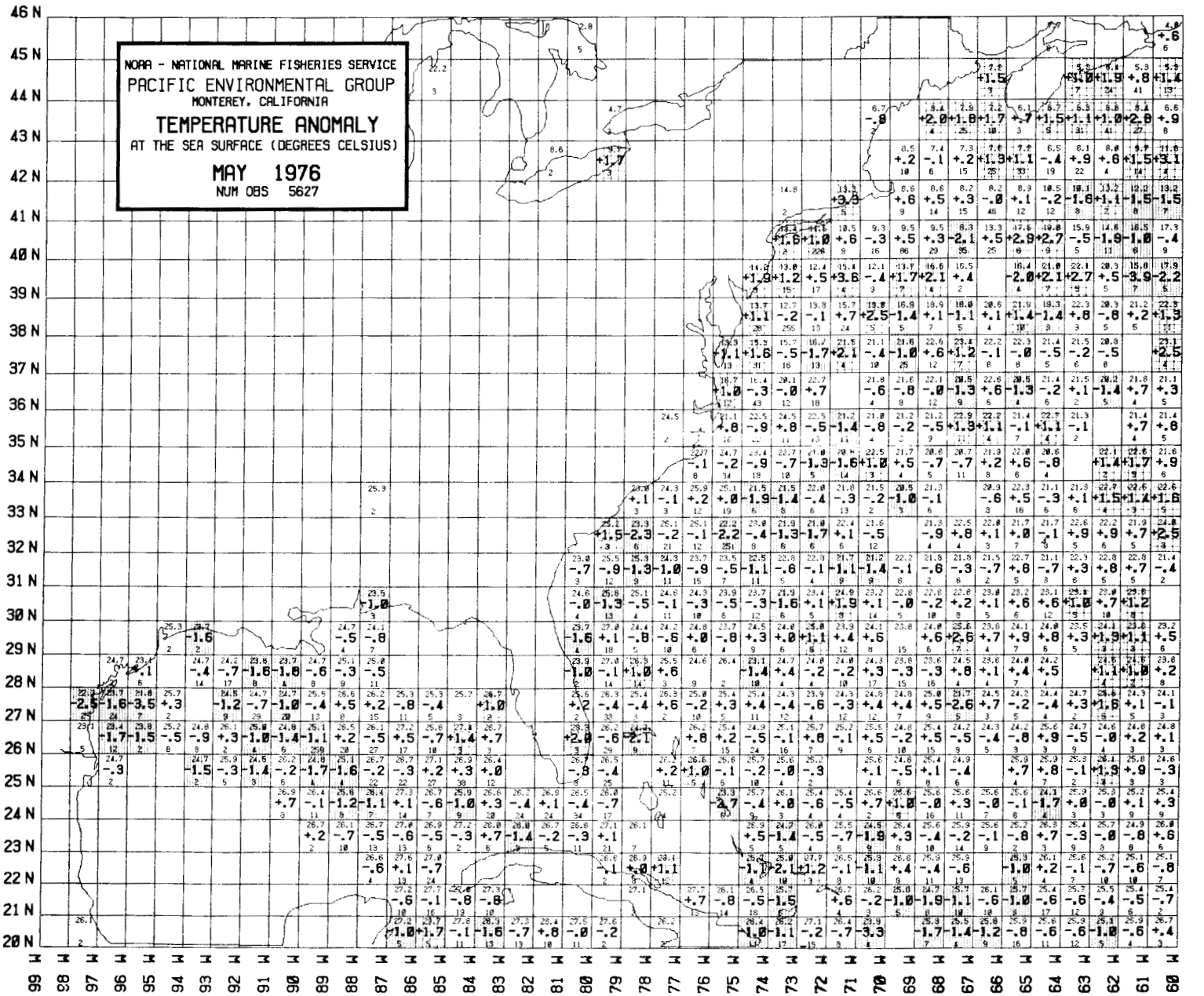
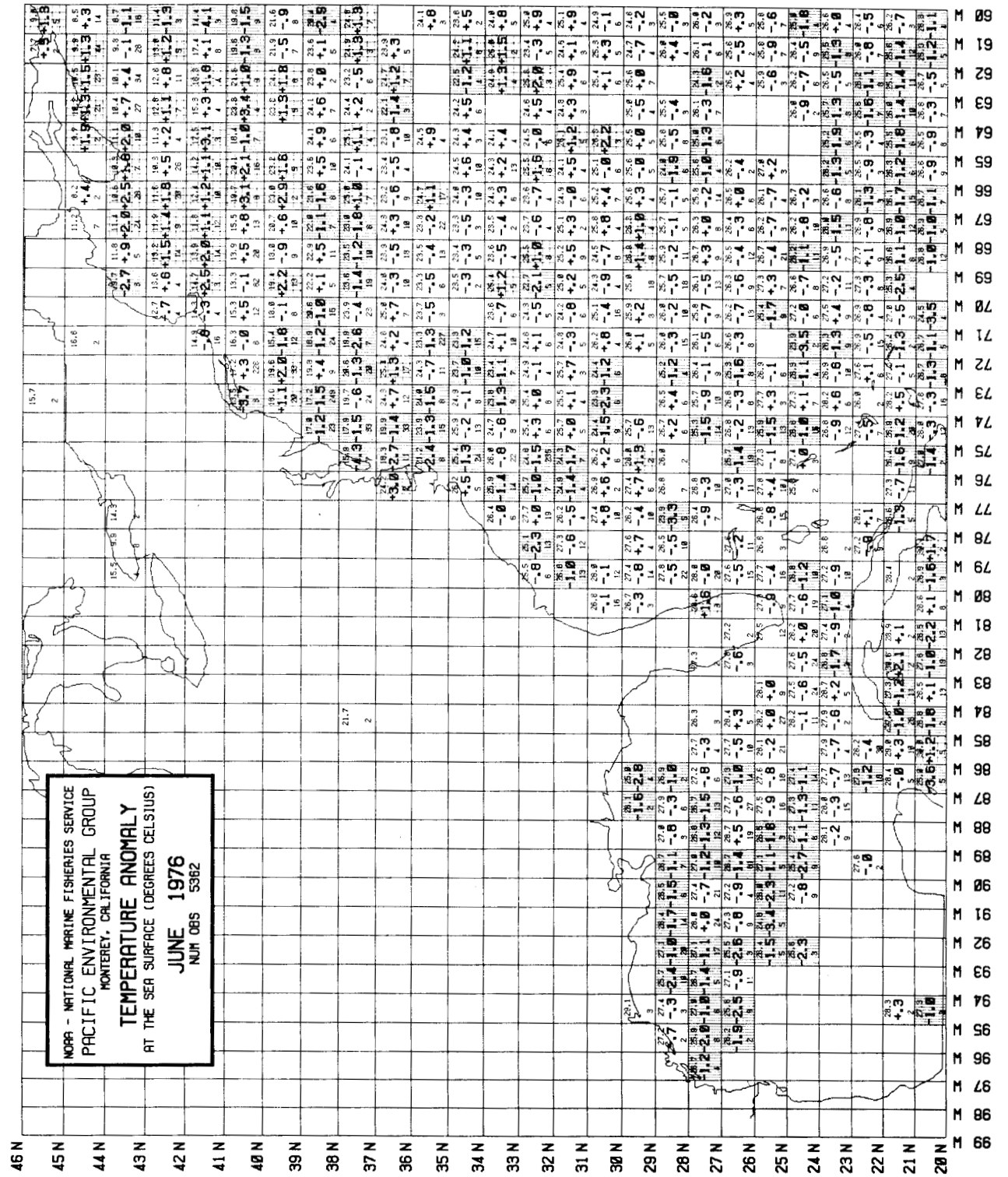

NOAA - NATIONAL MARINE FISHERIES SERVICE
PACIFIC ENVIRONMENTAL GROUP
MONTEREY, CALIFORNIA
TEMPERATURE ANOMALY
AT THE SEA SURFACE (DEGREES CELSIUS)
JANUARY 1976
NUM OBS 5057

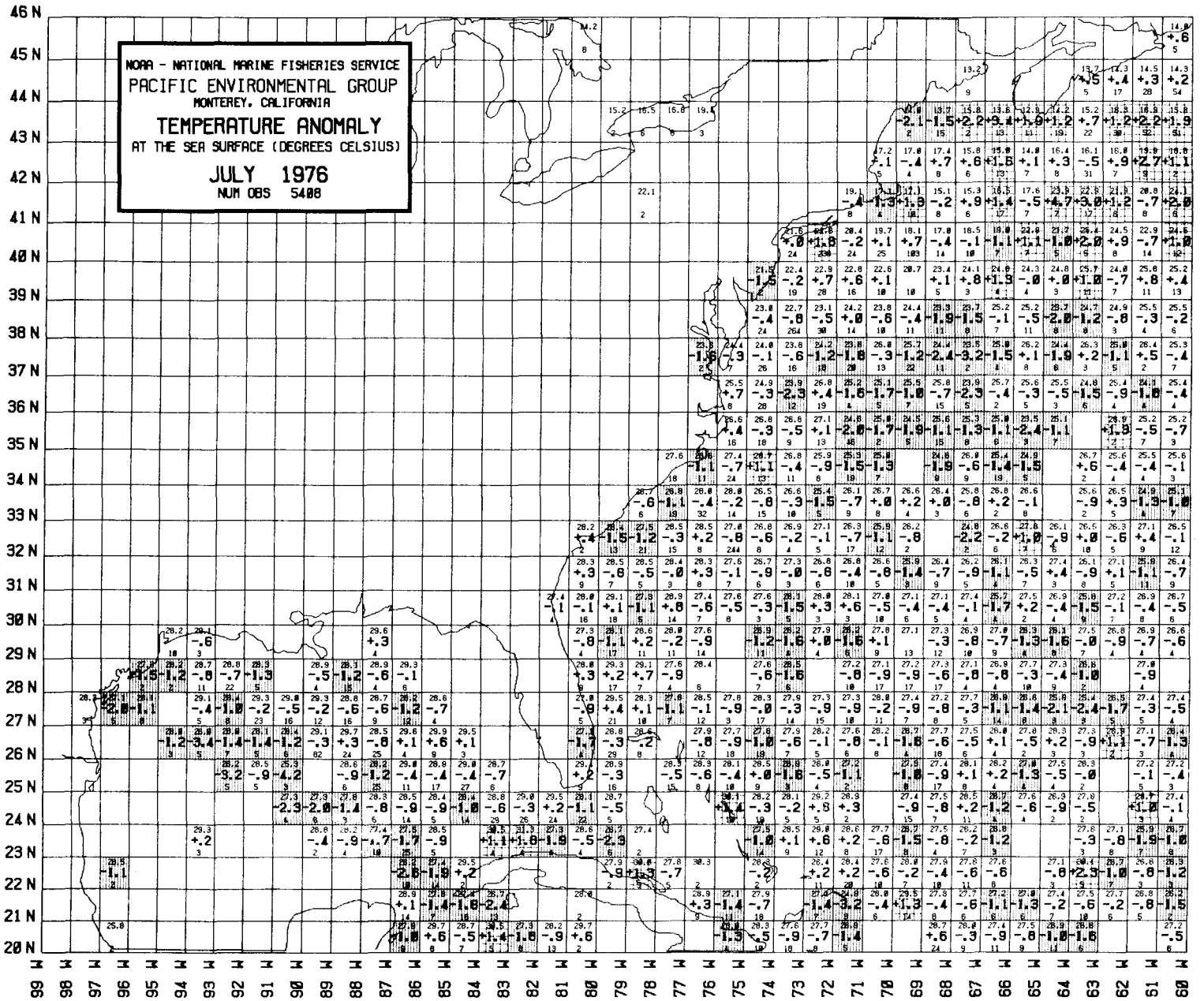

NOAA - NATIONAL MARINE FISHERIES SERVICE
PACIFIC ENVIRONMENTAL GROUP
MONTEREY, CALIFORNIA
TEMPERATURE ANOMALY
AT THE SEA SURFACE (DEGREES CELSIUS)
FEBRUARY 1976
NUM OBS 4921


NOAA - NATIONAL MARINE FISHERIES SERVICE
PACIFIC ENVIRONMENTAL GROUP
MONTEREY, CALIFORNIA
TEMPERATURE ANOMALY
AT THE SEA SURFACE (DEGREES CELSIUS)
MARCH 1976
NUM OBS 5996


NOAA - NATIONAL MARINE FISHERIES SERVICE
PACIFIC ENVIRONMENTAL GROUP
MONTEREY, CALIFORNIA
TEMPERATURE ANOMALY
AT THE SEA SURFACE (DEGREES CELSIUS)
APRIL 1976
NUM OBS 5930


NOAA - NATIONAL MARINE FISHERIES SERVICE
PACIFIC ENVIRONMENTAL GROUP
MONTEREY, CALIFORNIA
TEMPERATURE ANOMALY
AT THE SEA SURFACE (DEGREES CELSIUS)
MAY 1976
NUM OBS 5627


NOAA - NATIONAL MARINE FISHERIES SERVICE
PACIFIC ENVIRONMENTAL GROUP
MONTEREY, CALIFORNIA
TEMPERATURE ANOMALY
AT THE SEA SURFACE (DEGREES CELSIUS)
JUNE 1976
NUM OBS 5362


NOAA - NATIONAL MARINE FISHERIES SERVICE
PACIFIC ENVIRONMENTAL GROUP
MONTEREY, CALIFORNIA
TEMPERATURE ANOMALY
AT THE SEA SURFACE (DEGREES CELSIUS)
JULY 1976
NUM OBS 5408
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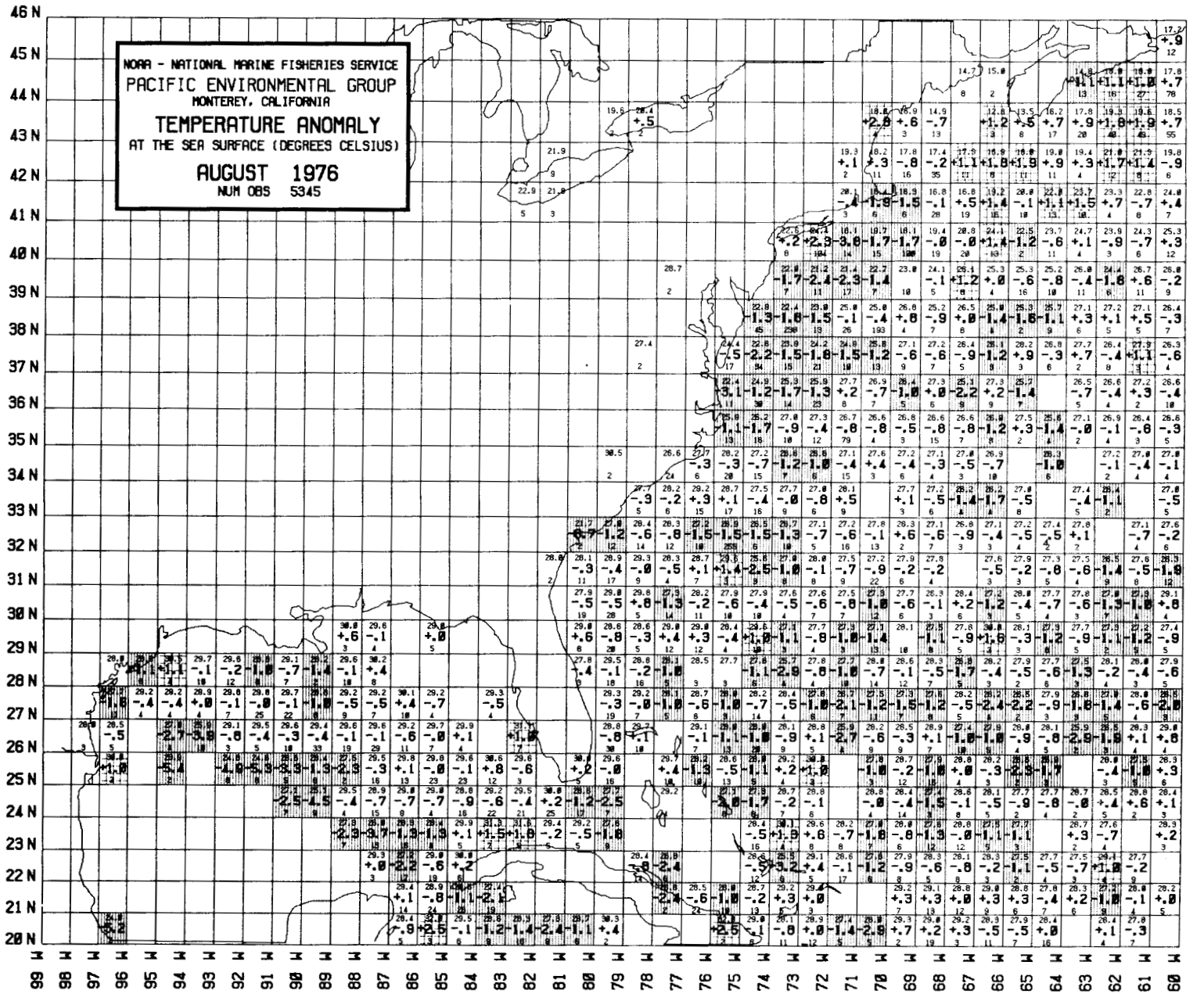
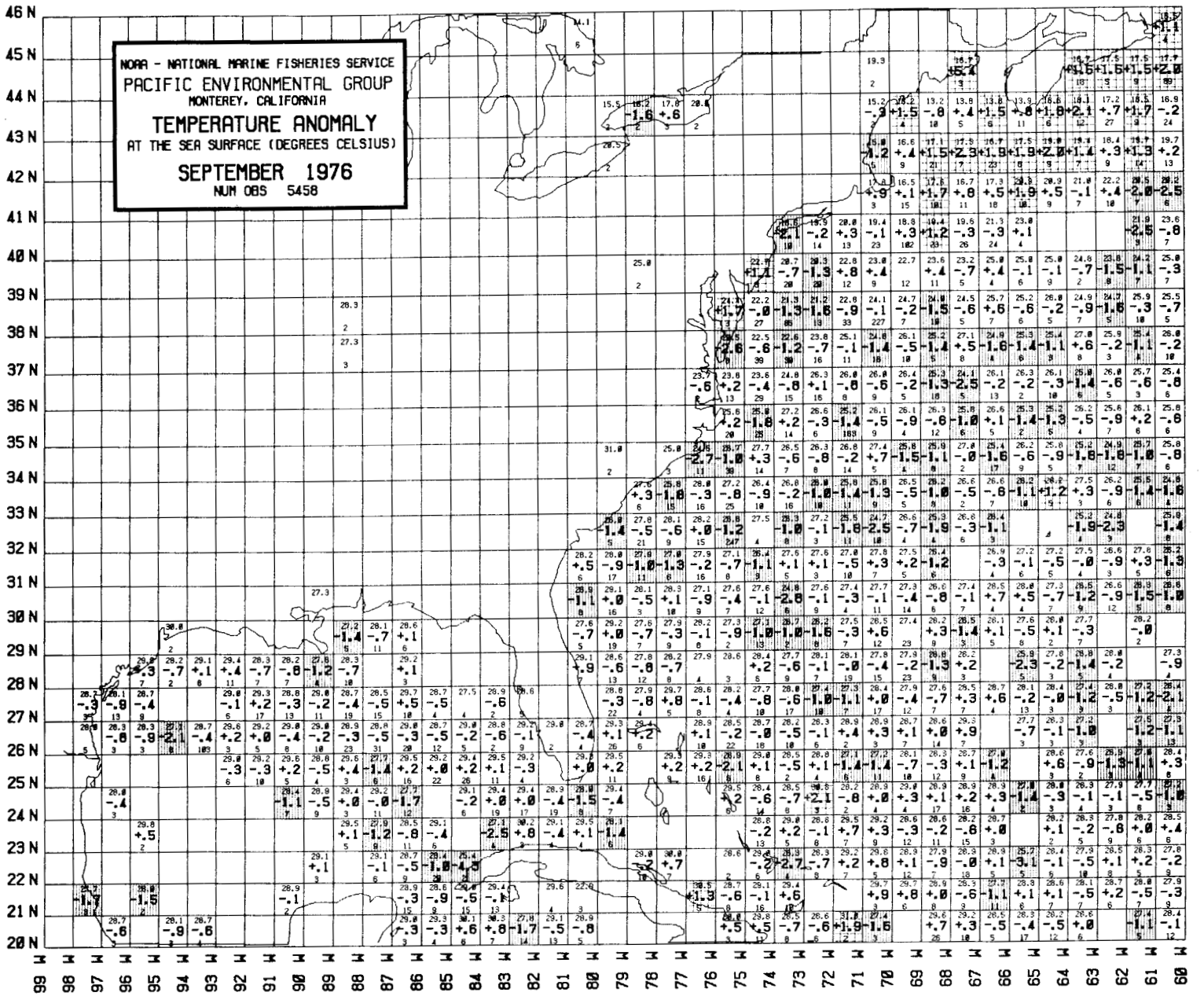
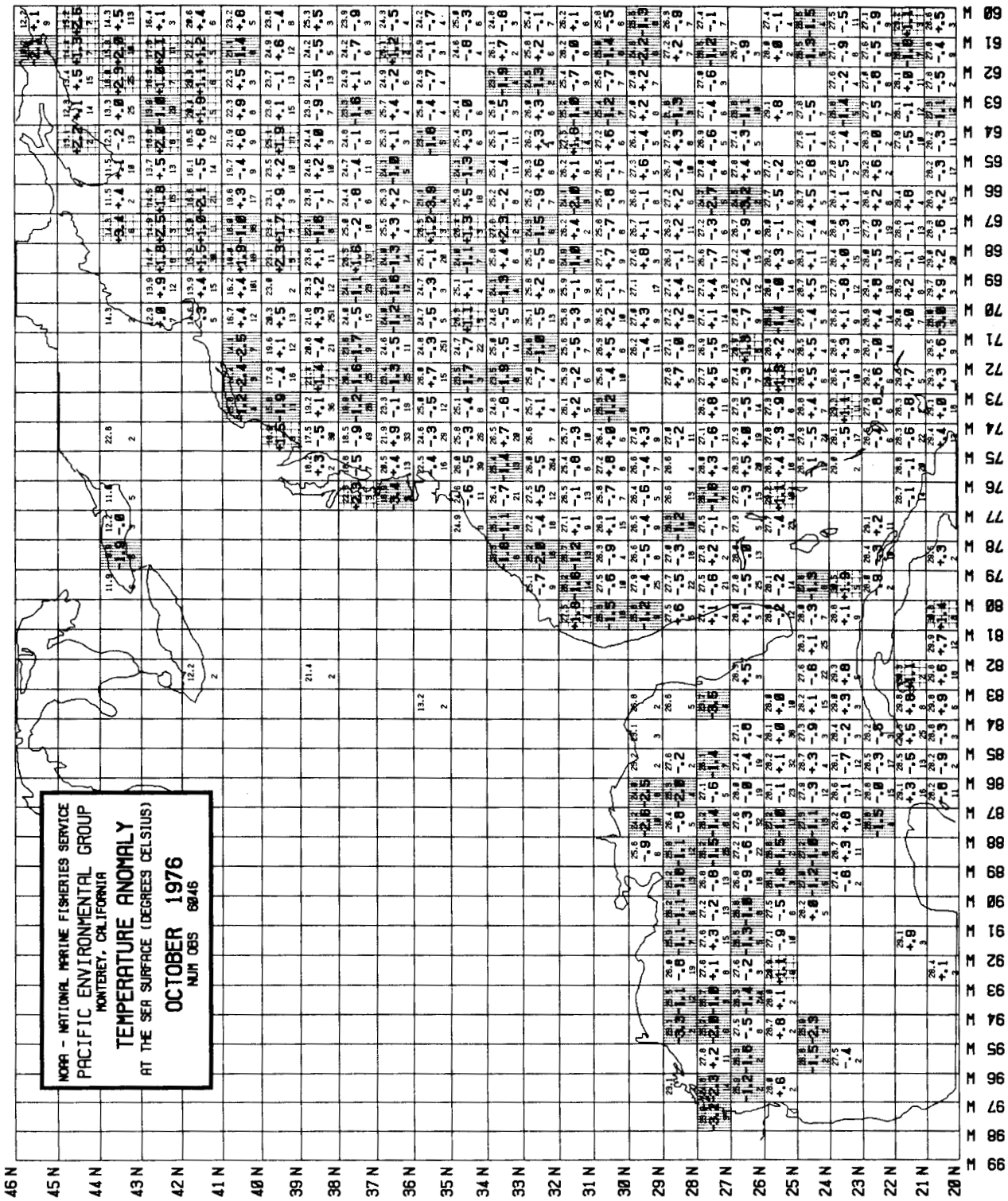
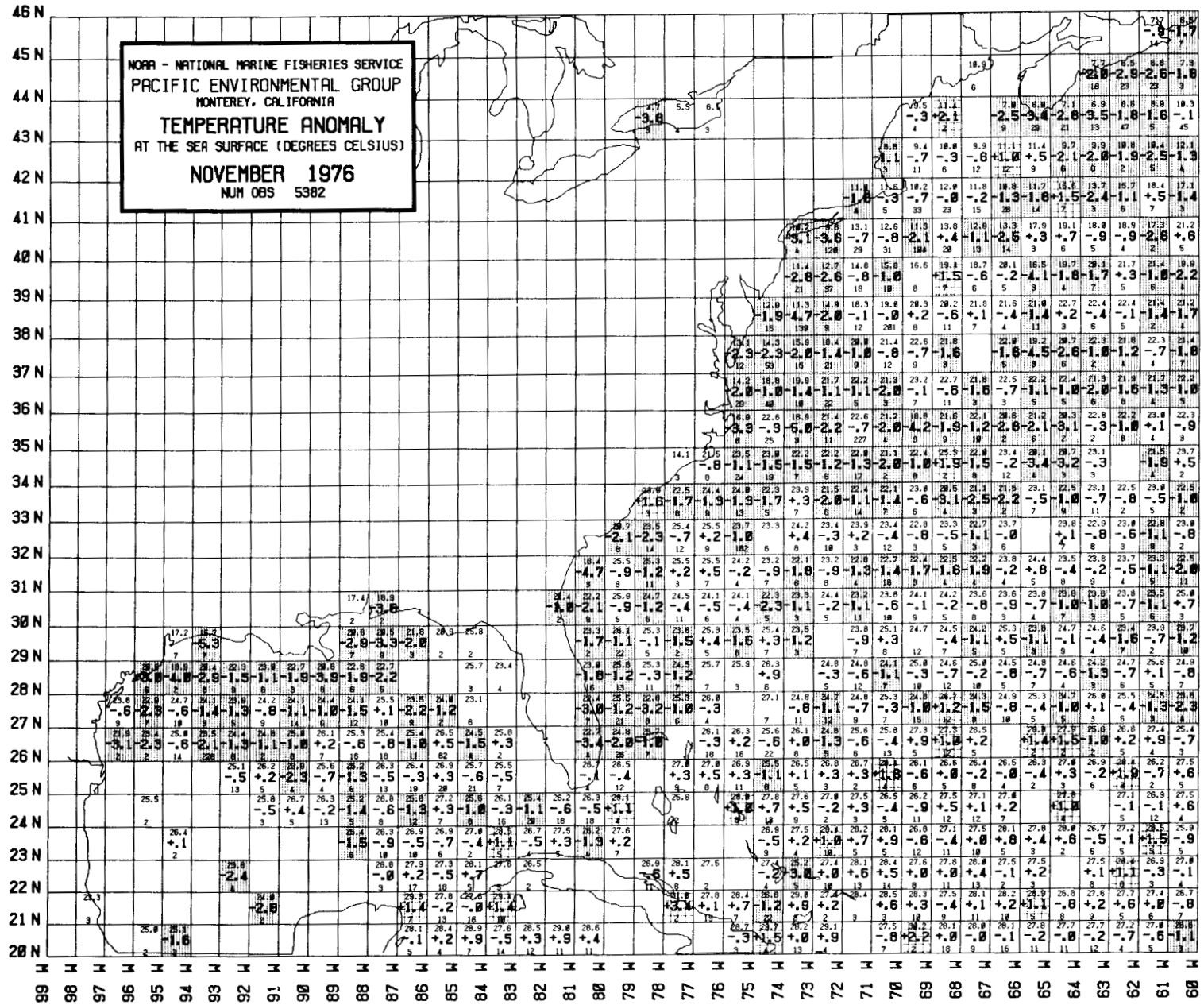
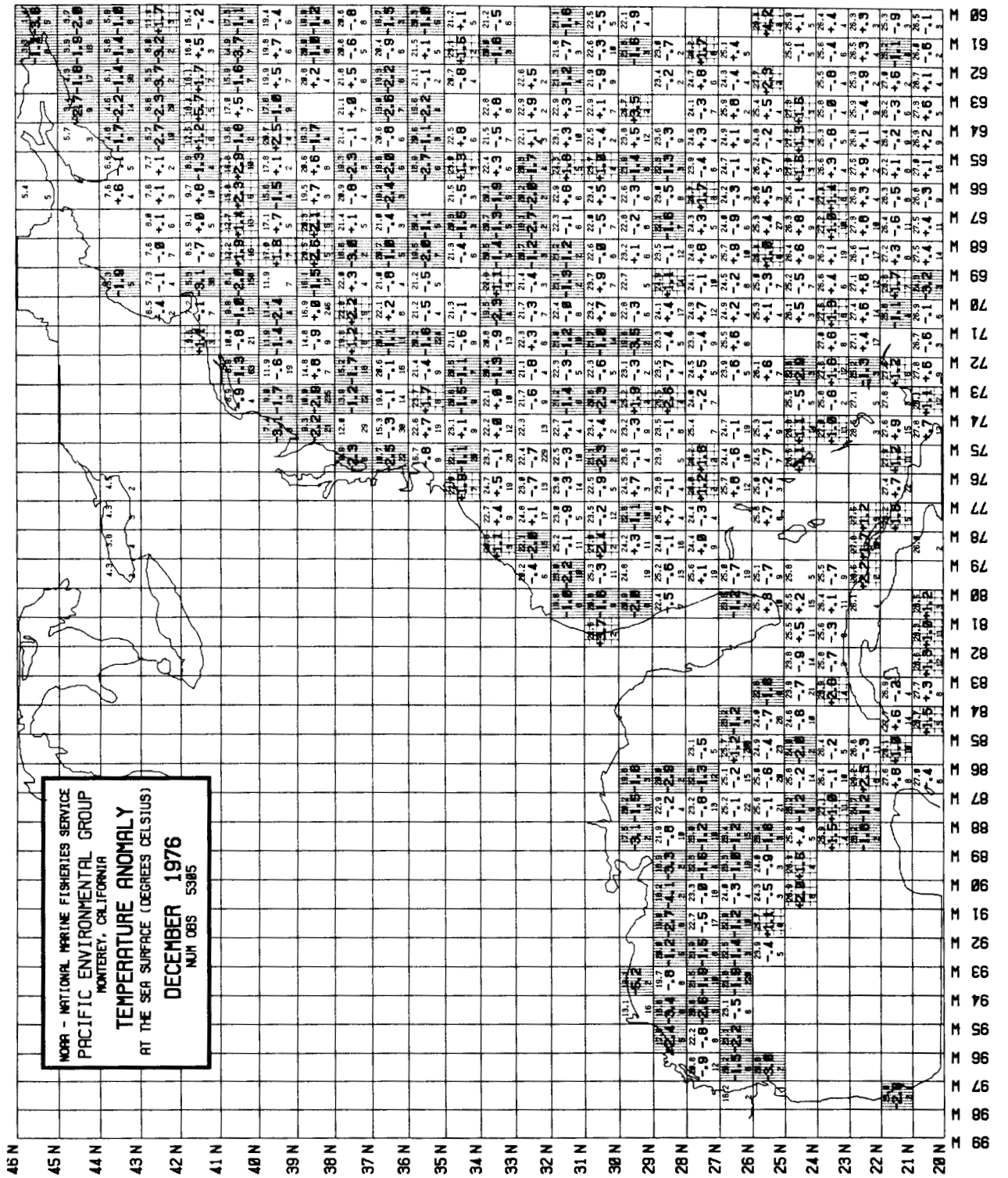

NOAA - NATIONAL MARINE FISHERIES SERVICE
PACIFIC ENVIRONMENTAL GROUP
MONTEREY, CALIFORNIA
TEMPERATURE ANOMALY
AT THE SEA SURFACE (DEGREES CELSIUS)
AUGUST 1976
NUM OBS 5345


NOAA - NATIONAL MARINE FISHERIES SERVICE
PACIFIC ENVIRONMENTAL GROUP
MONTEREY, CALIFORNIA
TEMPERATURE ANOMALY
AT THE SEA SURFACE (DEGREES CELSIUS)
SEPTEMBER 1976
NUM OBS 5458


NOAA - NATIONAL MARINE FISHERIES SERVICE
PACIFIC ENVIRONMENTAL GROUP
MONTEREY, CALIFORNIA
TEMPERATURE ANOMALY
AT THE SEA SURFACE (DEGREES CELSIUS)
OCTOBER 1976
NUM OBS 6846


NOAA - NATIONAL MARINE FISHERIES SERVICE
PACIFIC ENVIRONMENTAL GROUP
MONTEREY, CALIFORNIA
TEMPERATURE ANOMALY
AT THE SEA SURFACE (DEGREES CELSIUS)
NOVEMBER 1976
NUM OBS 5382


NOAA - NATIONAL MARINE FISHERIES SERVICE
PACIFIC ENVIRONMENTAL GROUP
MONTEREY, CALIFORNIA
TEMPERATURE ANOMALY
AT THE SEA SURFACE (DEGREES CELSIUS)
DECEMBER 1976
NUM OBS 5305