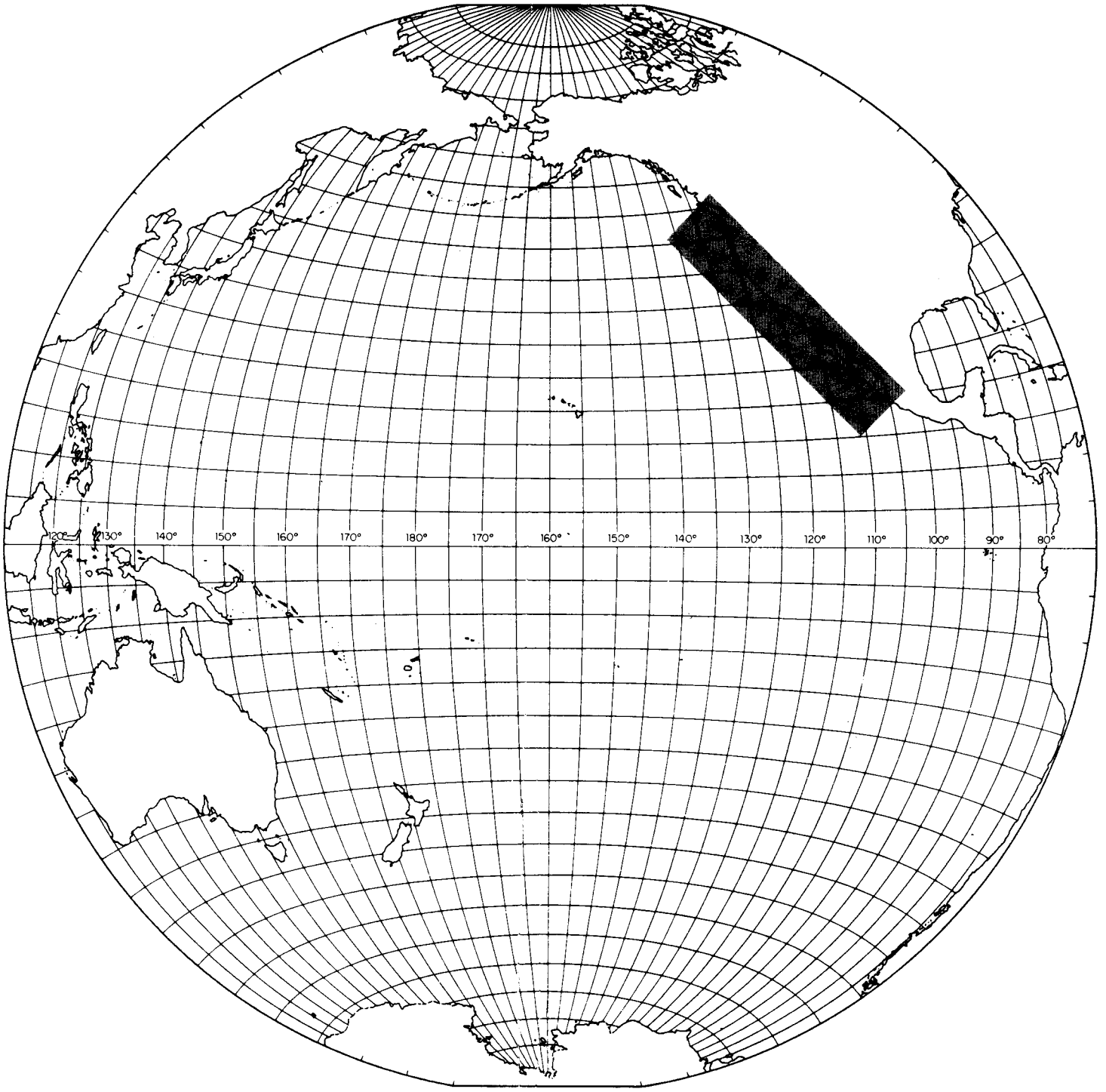
STATE OF CALIFORNIA
MARINE RESEARCH COMMITTEE



CALIFORNIA COOPERATIVE OCEANIC FISHERIES INVESTIGATIONS

ATLAS No. 15

CALIFORNIA COOPERATIVE OCEANIC FISHERIES INVESTIGATIONS

Atlas No. 15

STATE OF CALIFORNIA
MARINE RESEARCH COMMITTEE

Cooperating Agencies:
CALIFORNIA ACADEMY OF SCIENCES
CALIFORNIA DEPARTMENT OF FISH AND GAME
STANFORD UNIVERSITY, HOPKINS MARINE STATION
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, NATIONAL MARINE FISHERIES SERVICE
UNIVERSITY OF CALIFORNIA, SCRIPPS INSTITUTION OF OCEANOGRAPHY

June, 1971

THE CALCOFI ATLAS SERIES

This is the fifteenth in a series of atlases containing data on the hydrography and plankton from the region of the California Current. The field work was carried out by the California Cooperative Oceanic Fisheries Investigations,[1] a program sponsored by the State of California under the direction of the State's Marine Research Committee. The cooperating agencies in the program are:

California Academy of Sciences
California Department of Fish and Game
Stanford University, Hopkins Marine Station
National Oceanic and Atmospheric Administration, National Marine Fisheries Service[2]
University of California, Scripps Institution of Oceanography

CalCOFI atlases[3] are issued as individual units as they become available. They provide processed physical, chemical and biological measurements of the California Current region. Each number may contain one or more contributions. A general description of the CalCOFI program with its objectives appears in the preface of Atlas No. 2.

This atlas was prepared by the Data Collection and Processing Group of the Marine Life Research Program, Scripps Institution of Oceanography.

CalCOFI Atlas Editorial Staff:

Abraham Fleminger and Hans T. Klein, Editors
John G. Wyllie, Cartographer

CalCOFI atlases in this series, through June 1971, are:

No. 1. Anonymous, 1963. CalCOFI atlas of 10-meter temperatures and salinities 1949 through 1959.

No. 2. Fleminger, A., 1964. Distributional atlas of calanoid copepods in the California Current region, Part I.

No. 3. Alvariño, A., 1965. Distributional atlas of Chaetognatha in the California Current region.

No. 4. Wyllie, J. G., 1966. Geostrophic flow of the California Current at the surface and at 200 meters.

No. 5. Brinton, E., 1957. Distributional atlas of Euphausiacea (Crustacea) in the California Current region, Part I.

No. 6. McGowan, J. A., 1967. Distributional atlas of pelagic molluscs in the California Current region.

No. 7. Fleminger, A., 1967. Distributional atlas of calanoid copepods in the California Current region, Part II.

No. 8. Berner, L., 1967. Distributional atlas of Thaliacea in the California Current region.

No. 9. Kramer, D., and E. H. Ahlstrom, 1968. Distributional atlas of fish larvae in the California Current region: Northern Anchovy, *Engraulis mordax* Girard, 1951 through 1965.

No. 10. Isaacs, J. D., A. Fleminger and J. K. Miller, 1969. Distributional atlas of zooplankton biomass in the California Current region: Spring and Fall 1955-1959.

No. 11. Ahlstrom, E. H., 1969. Distributional atlas of fish larvae in the California Current region: jack mackerel, *Trachurus symmetricus,* and Pacific hake, *Merluccius productus,* 1951 through 1966.

No. 12. Kramer, D., 1970. Distributional atlas of fish eggs and larvae in the California Current region: Pacific sardine, *Sardinops caerulea* (Girard), 1951 through 1966.

No. 13. Smith, P. E., 1971. Distributional atlas of zooplankton volume in the California Current region, 1951 through 1966.

No. 14. Isaacs, J. D., A. Fleminger and J. K. Miller, 1969. Distributional atlas of zooplankton biomass in the California Current region: Winter 1955-1959.

No. 15. Wyllie, J. G., and R. J. Lynn, 1971. Distribution of temperature and salinity at 10 meters, 1960-1969 and mean temperature, salinity and oxygen at 150 meters, 1950-1968 in the California Current.

[1]Usually abbreviated CalCOFI, sometimes CALCOFI or CCOFI.
[2]Formerly called U. S. Fish and Wildlife Service, Bureau of Commercial Fisheries.
[3]For citation this issue in the series should be referred to as CalCOFI Atlas No. 15.

Library of Congress Catalog Card Number 67-4238

DISTRIBUTION OF TEMPERATURE AND SALINITY AT 10 METERS, 1960-1969, AND MEAN TEMPERATURE, SALINITY AND OXYGEN AT 150 METERS, 1950-1968, IN THE CALIFORNIA CURRENT

John G. Wyllie and Ronald J. Lynn

CALCOFI ATLAS NO. 15

Data Collection and Processing Group
Marine Life Research Program
Scripps Institution of Oceanography
La Jolla, California

June, 1971

DISTRIBUTION OF TEMPERATURE AND SALINITY AT 10 METERS, 1960-1969, AND MEAN TEMPERATURE, SALINITY AND OXYGEN AT 150 METERS, 1950-1968, IN THE CALIFORNIA CURRENT

John G. Wyllie and Ronald J. Lynn

10-METER TEMPERATURE AND SALINITY

Charts of the temperature and salinity distribution at 10-meters depth for individual CalCOFI cruises are presented for the years 1960 through 1969. These charts continue the 11-year (1949 to 1959) series presented in CalCOFI Atlas No. 1 (Anon., 1963). The presentation used in Atlas No. 1 has been retained. The distributions by month are graphically summarized on Charts 2 and 3.

The 10-meter depth level has been used throughout the CalCOFI program as representative of the surface layer. It was chosen in preference to the sea surface in order to avoid shallow transient conditions.

10-meter Temperature Time Series

The temperature and temperature anomaly time series for selected stations given in Atlas No. 1 are continued in this atlas through 1969 for the same stations. No new monthly mean temperatures have been computed; the monthly means based on the data for 1950 through 1959 have been retained as the reference for computations of anomalies. Selection of the stations used in the time series was based upon the number and the time distribution of the measurements available for a given station. Sampling was approximately monthly during 1960, 1966 and 1969; observed values within these years are connected by a solid line. The years 1961 through 1965 were sampled quarterly; these observed values are connected by a heavy dashed line. The years 1967 and 1968 were infrequently sampled; these observed values are connected by light dashed lines. Positive anomalies from the 1950 to 1959 mean are shown as grey bars and negative anomalies as black bars.

150-METER MONTHLY MEANS

A series of monthly mean distribution charts of temperature, salinity and oxygen at a depth of 150 meters is presented on Charts 132 to 167. The 150-meter level was chosen because it is the standard oceanographic level nearest the maximum depth (140 meters) fished by the standard CalCOFI zooplankton net. The distribution of properties at 150 meters of depth is, therefore, very nearly that which is encountered at the maximum depth of the zooplankton net tow routinely taken at CalCOFI stations.

All available CalCOFI data for the 150-

meter level in the years 1950 through 1968 were used in the preparation of the charts. The data were obtained from the National Oceanographic Data Center, Oceanic Observations of the Pacific (1950-1959) and the Physical and Chemical Data Report series for the years 1960 to 1968, the last two sources being issued by the University of California, Scripps Institution of Oceanography. The 150-meter means also include measurements obtained from acceptable hydrographic bottle casts which malfunctioned and casts requiring extrapolations to the 150-meter level that are not included in the National Oceanographic Data Center files.

Method of Analysis

The monthly mean values were computed by the method of harmonic analysis as given by Lynn (1967). Briefly, the method groups all data from the time series of each station into one 365-day period; i.e., only the month and the day of sampling are considered. A curve formed by the annual and semi-annual harmonics is then fitted to the observations by the method of least squares regression. Monthly means are obtained by selecting mid-month values from the resulting curve; these values were plotted and contoured.

This method of analysis is preferred over computation of arithmetic monthly means because it interpolates in time and thus provides a good estimate for months that were infrequently sampled.

The 19-year Mean and the Standard Error of Estimate

The statistical analysis also furnished an overall mean for the years 1950 through 1968; the contoured distribution of these 19-year means are given in three charts, one each for temperature, salinity and oxygen. The residuals between the fitted curve and the individual datum values are used to compute the standard error of estimate about the curve; the contoured distributions of standard error of estimate, one each for temperature, salinity and oxygen, are presented. Observed temperature records and the fitted curves for two sample stations, 60.60 and 110.80, are plotted in Figure 1. The dashed lines are drawn at plus and minus one standard error of estimate. The regression curve for Station 60.60 provides a reasonable fit to the data. For Station 110.80 the dispersion about the mean is very large and there is no discernible seasonal variation; the resulting curve varies little from the overall mean. In general, only near-shore stations reveal significant seasonal variation. The 150-meter level intersects the thermocline in most offshore stations and this produces the large dispersion seen, for ex-

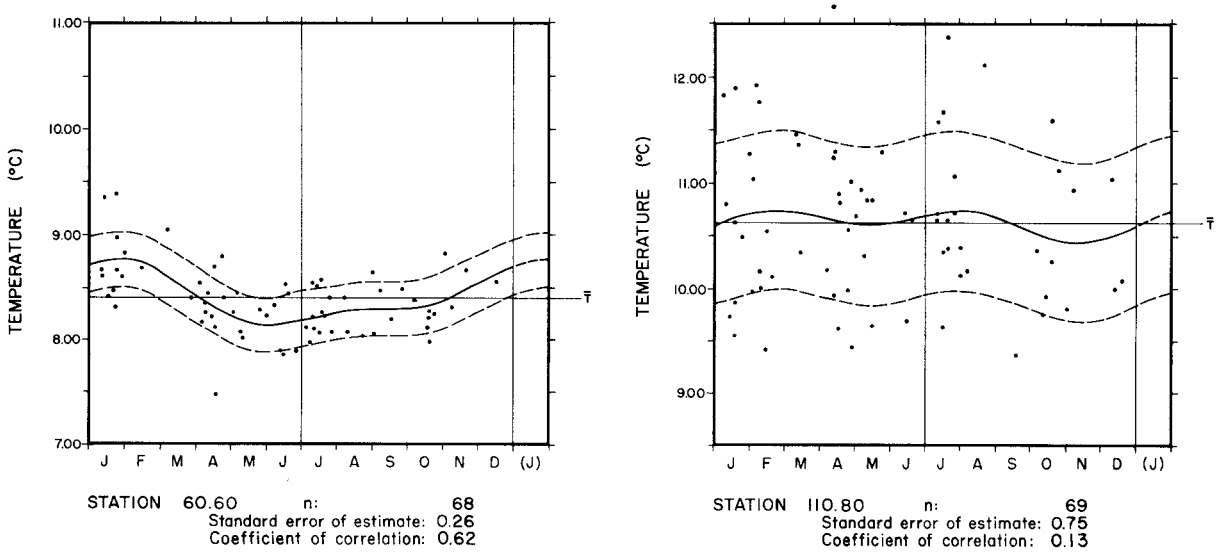


Figure 1. Station regression curves and observations. Horizontal lines are 19-year means. Dashed lines are drawn at plus and minus 1 standard error of estimate.

ample, at Station 110.80. The intersection of the main portion of the thermocline with the 150-meter level is seen as a large lateral gradient in the 150-meter temperature charts.

Arithmetic monthly means were calculated for stations lacking adequate data for harmonic analysis. The contours about these points are dashed.

CONDITIONS BETWEEN THE SEA SURFACE AND 150 METERS

The charts described above characterize conditions in the California Current region at the

the surface layer and the bottom of the tow. The charts and figures discussed below characterize these two features.

Mean Surface-layer Depth

The mean surface-layer depth is presented in a set of monthly charts (Charts 177 to 188). Surface-layer depth is defined here as the depth at which the temperature differs from that at the sea surface by more than 2°F (1.1°C). Thus, the temperature found at 10 meters is representative throughout the layer whose mean thickness is given by these charts. The data

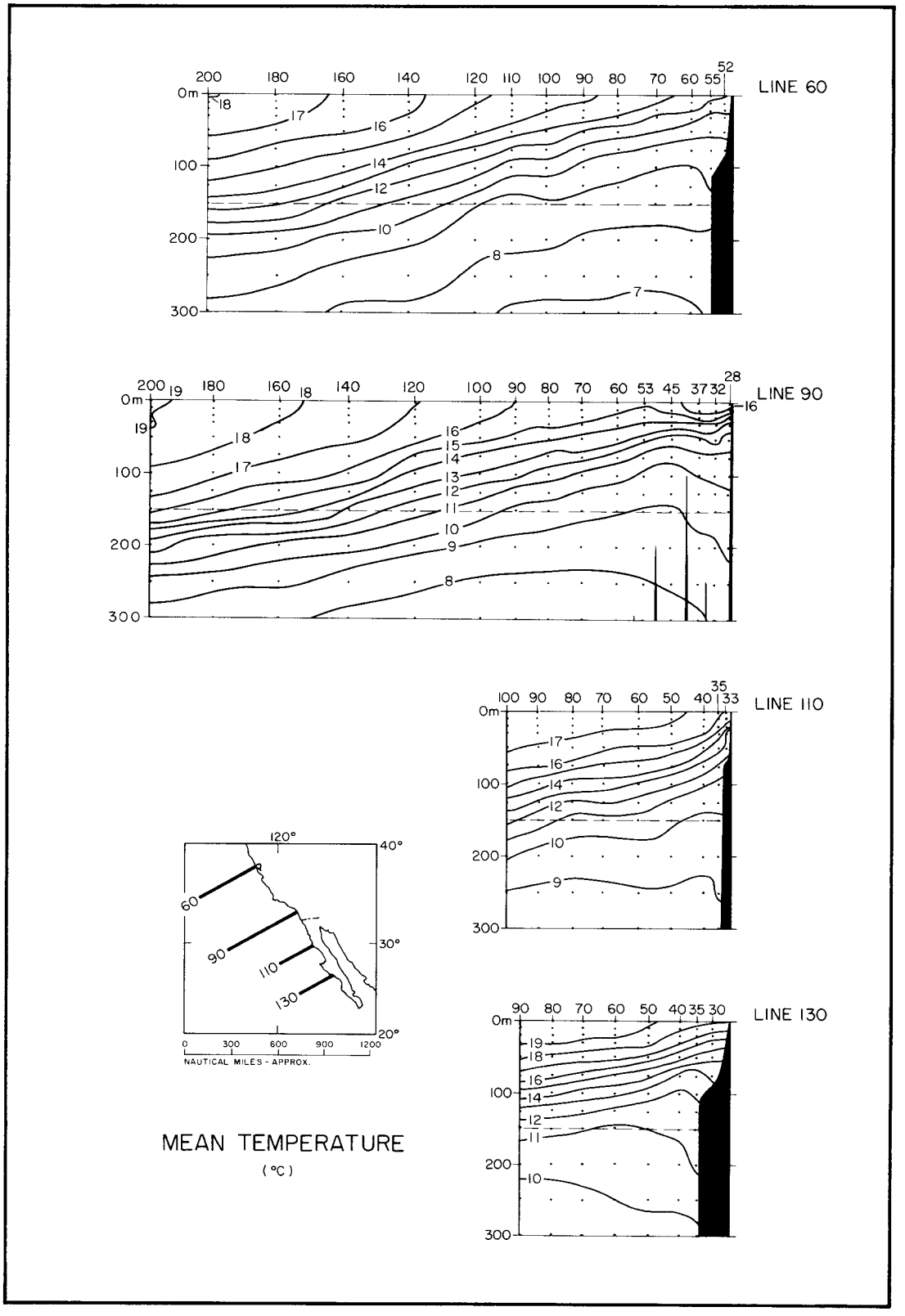


Figure 2. Representative vertical sections of temperature for Lines 60, 90, 110 and 130.

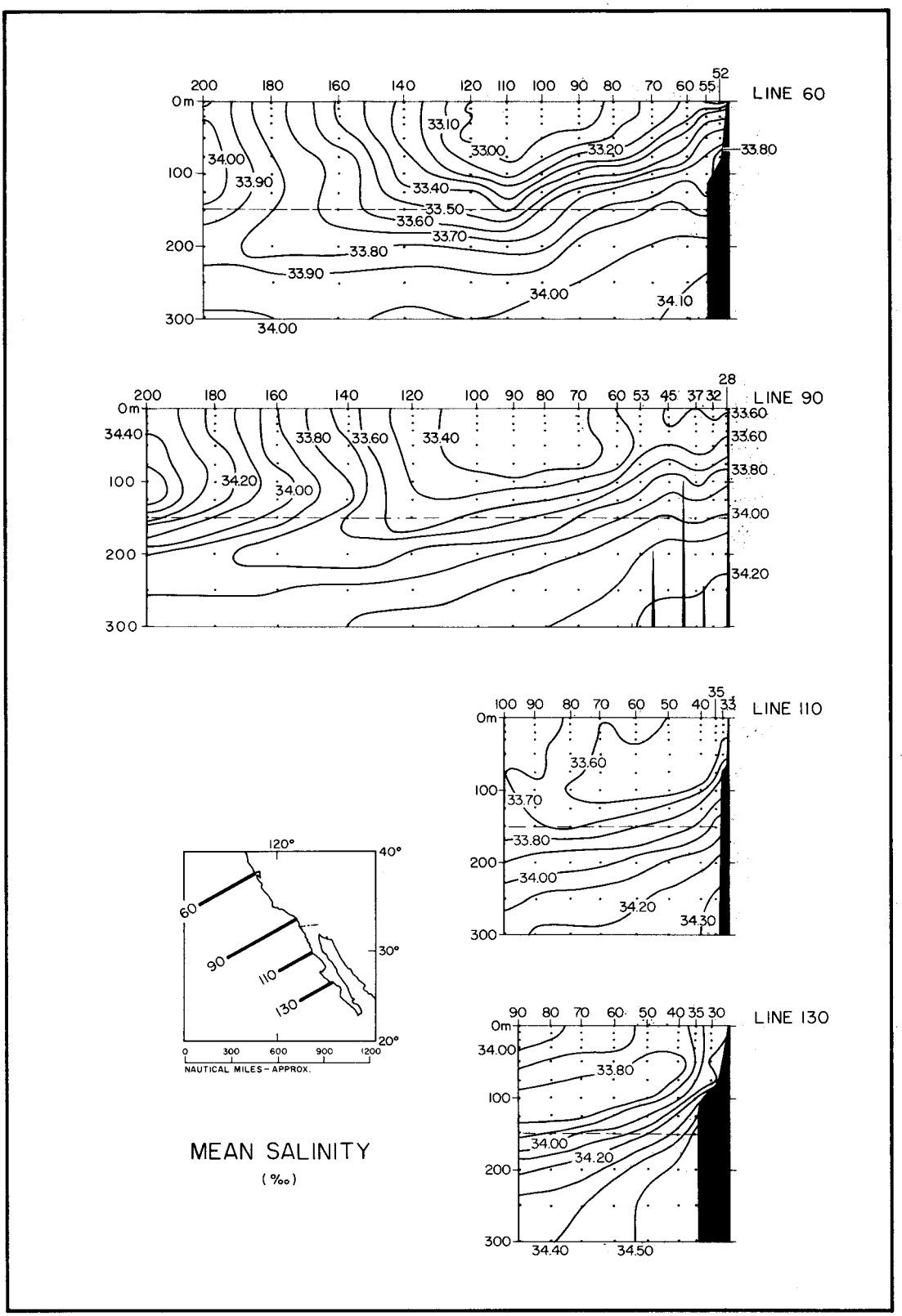


Figure 3. Representative vertical sections of salinity for Lines 60, 90, 110 and 130.

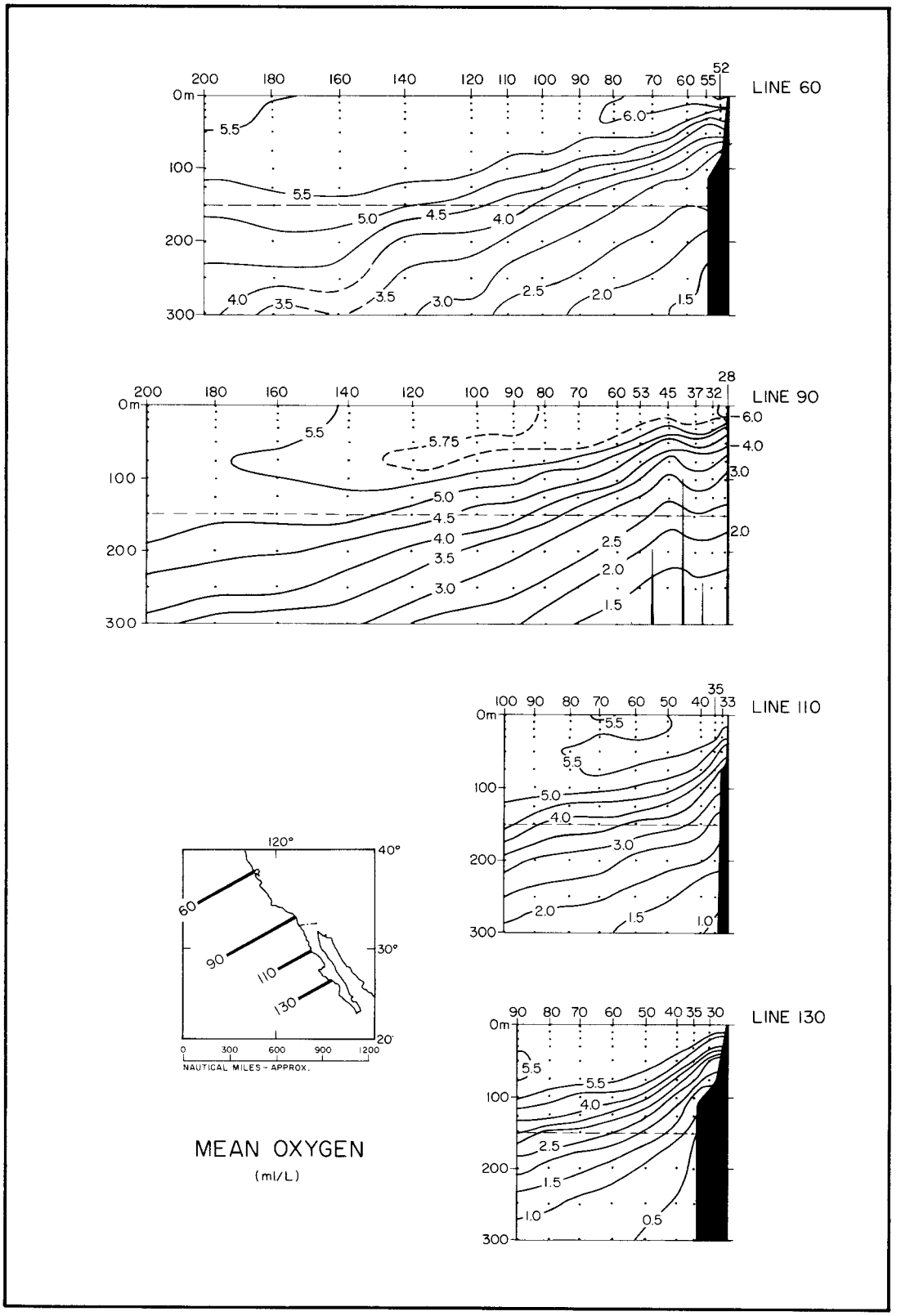


Figure 4. Representative vertical sections of oxygen for Lines 60, 90, 110 and 130.

REFERENCES

Ahlstrom, E. H., 1948. A record of pilchard eggs and larvae collected during surveys made in 1939 to 1941. U.S. Fish and Wildlife Serv., Spec. Sci. Rep., Fish No. 54: 76 pp.

Ahlstrom, E. H., 1952. Pilchard eggs and larvae and other fish larvae, Pacific Coast—1950. U.S. Fish and Wildlife Serv., Spec. Sci. Rep., Fish No. 80: 58 pp.

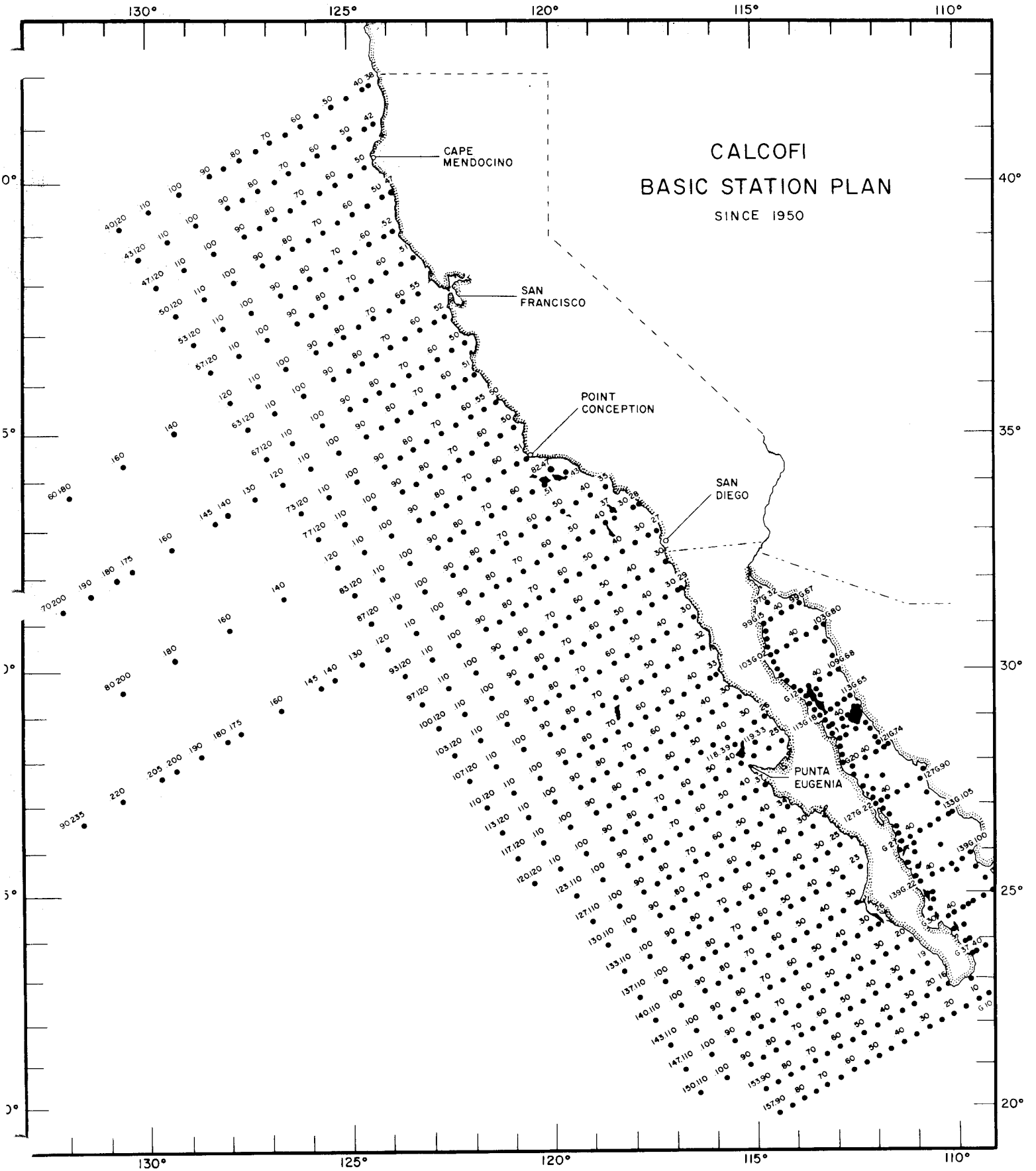
Anonymous, 1963. CalCOFI Atlas of 10-meter temperatures and salinities 1949 through 1959. California Cooperative Fisheries Investigations, Atlas No. 1.

Lynn, R. J., 1967. Seasonal Variation of Temperature and Salinity at 10 Meters in the California Current. California Cooperative Oceanic Fisheries Investigations, Reports Vol. XI.

Smith, P. E., 1971. Distributional Atlas of Zooplankton Volume in the California Current Region, 1951-1966. CalCOFI Atlas No. 13.

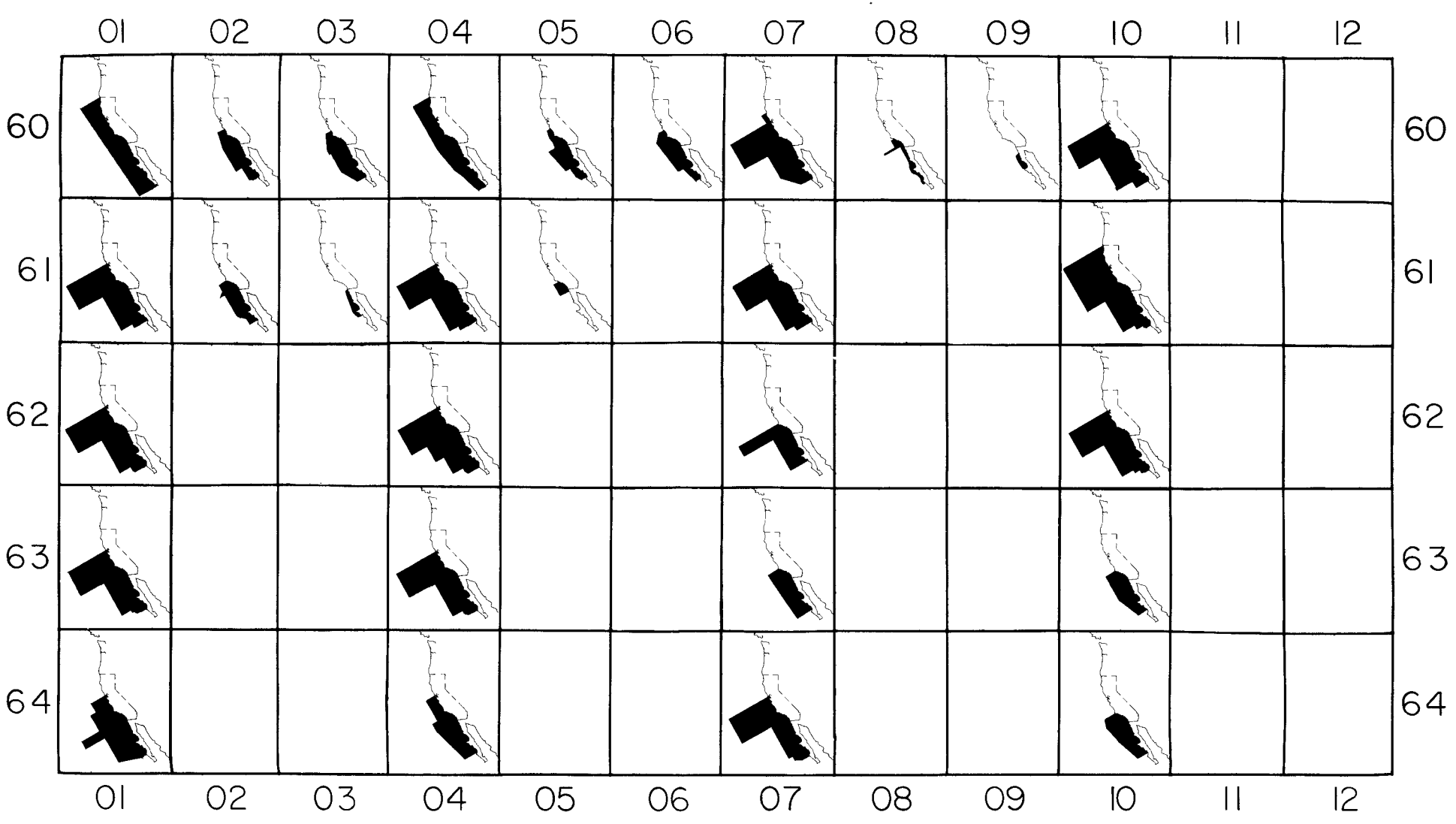
Oceanic Observations of the Pacific: 1950-59. University of California, Scripps Institution of Oceanography. Berkeley and Los Angeles, University of California Press, 1960, 1962, 1963, 1965.

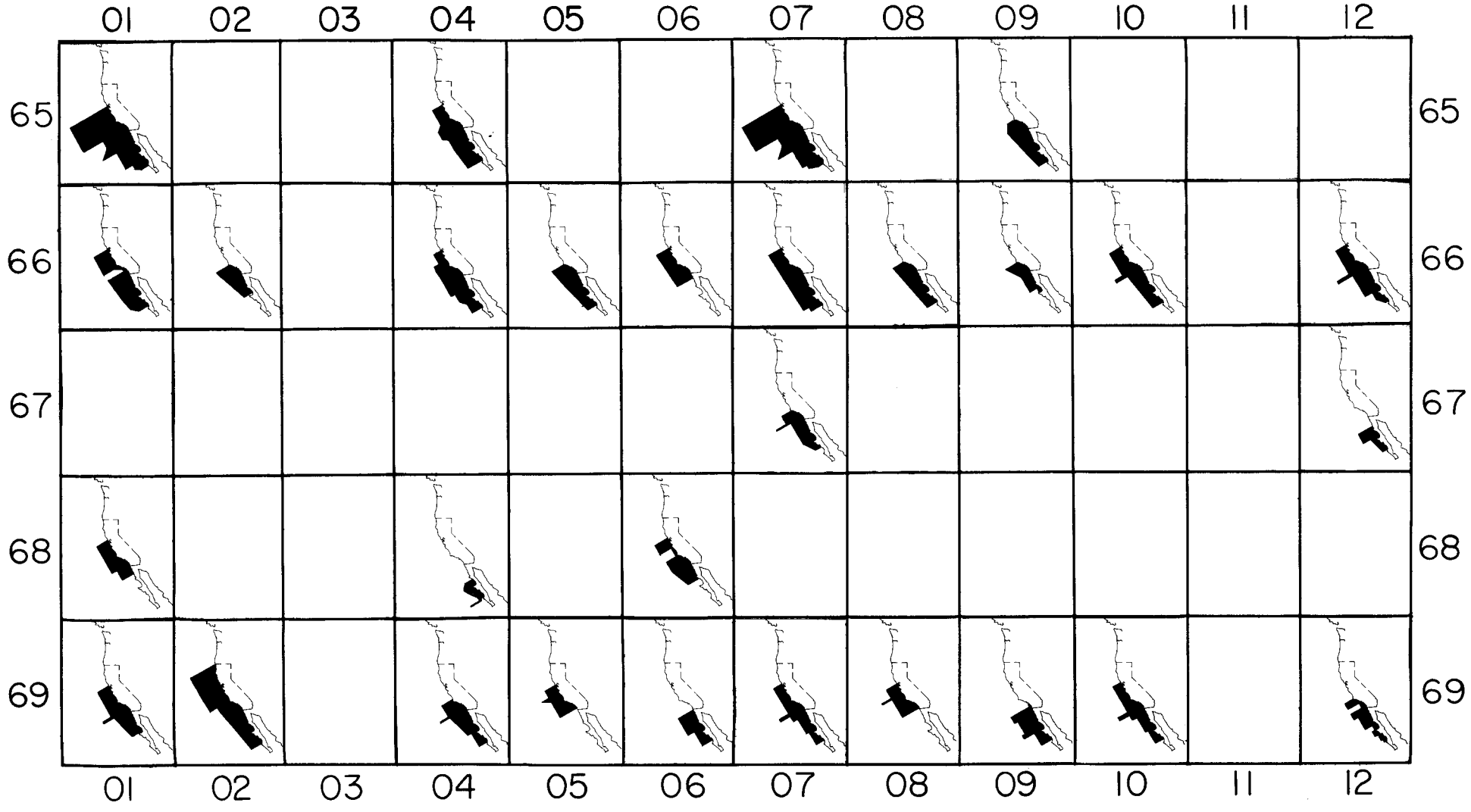
University of California, Scripps Institution of Oceanography. 1961-1971. Data Report: Physical and Chemical Data, CalCOFI Cruises 6001-6806. SIO References, 61-23; 61-24; 62-3; 62-5; 62-6; 62-7; 62-8; 62-9; 62-10; 62-15; 62-16; 62-17; 62-23; 62-26; 63-9; 63-25; 64-2; 64-13; 64-18; 65-1; 65-7; 65-18; 66-4; 66-20; 67-16; 67-17; 68-3; 68-21; 69-2; 69-8; 71-3.



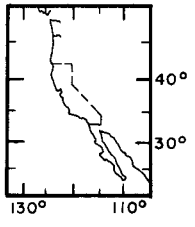
CALCOFI
BASIC STATION PLAN
SINCE 1950

CALCOFI AREA INDEX — 1960 through 1969





MONTHLY 10-METER TEMPERATURE AND SALINITY COVERAGE



10-Meter Temperature Charts

10-Meter Temperature Time Series

10-Meter Salinity Charts

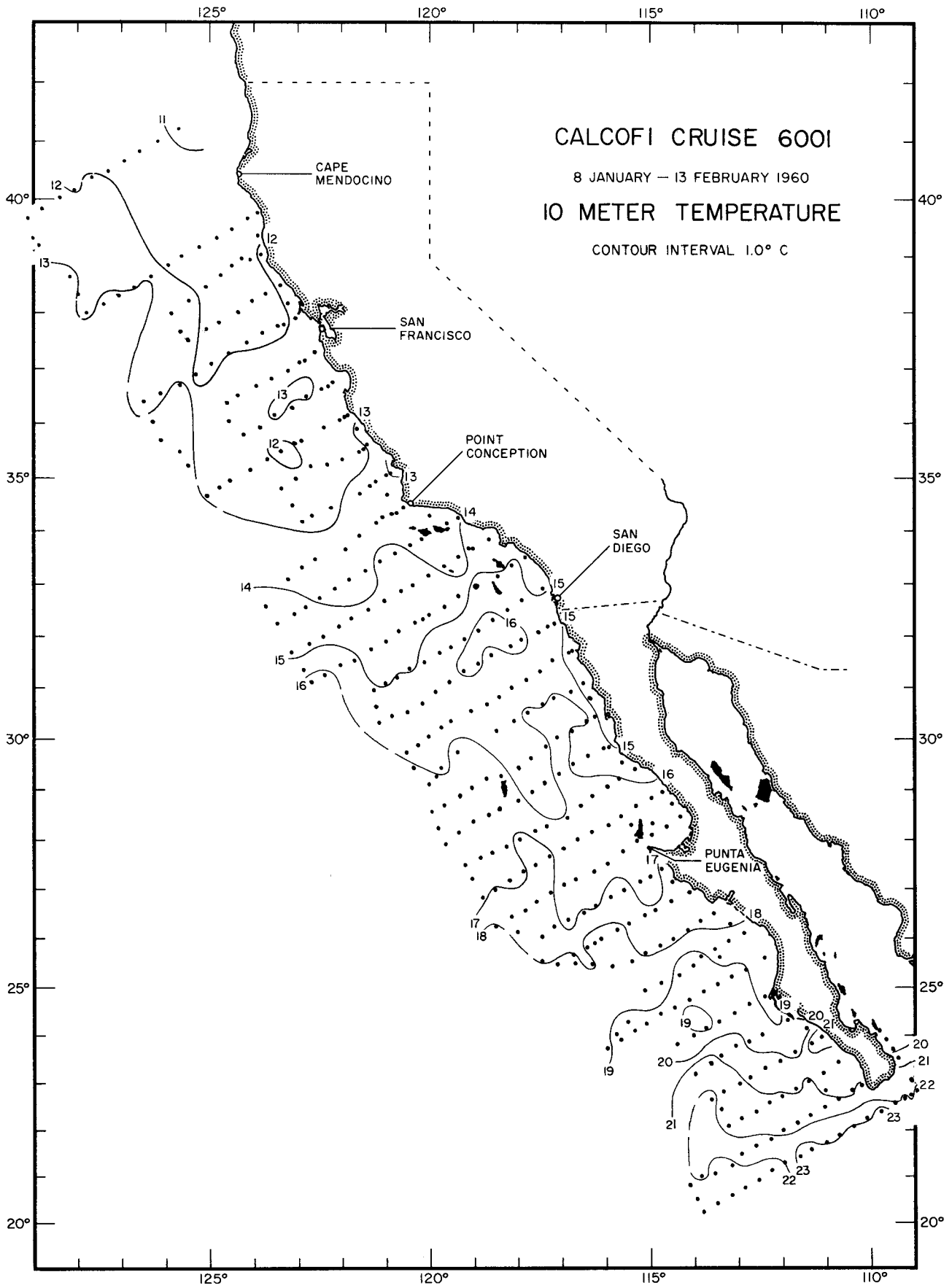
150-Meter Monthly Temperature Regression Mean Charts

150-Meter Monthly Salinity Regression Mean Charts

150-Meter Monthly Oxygen Regression Mean Charts

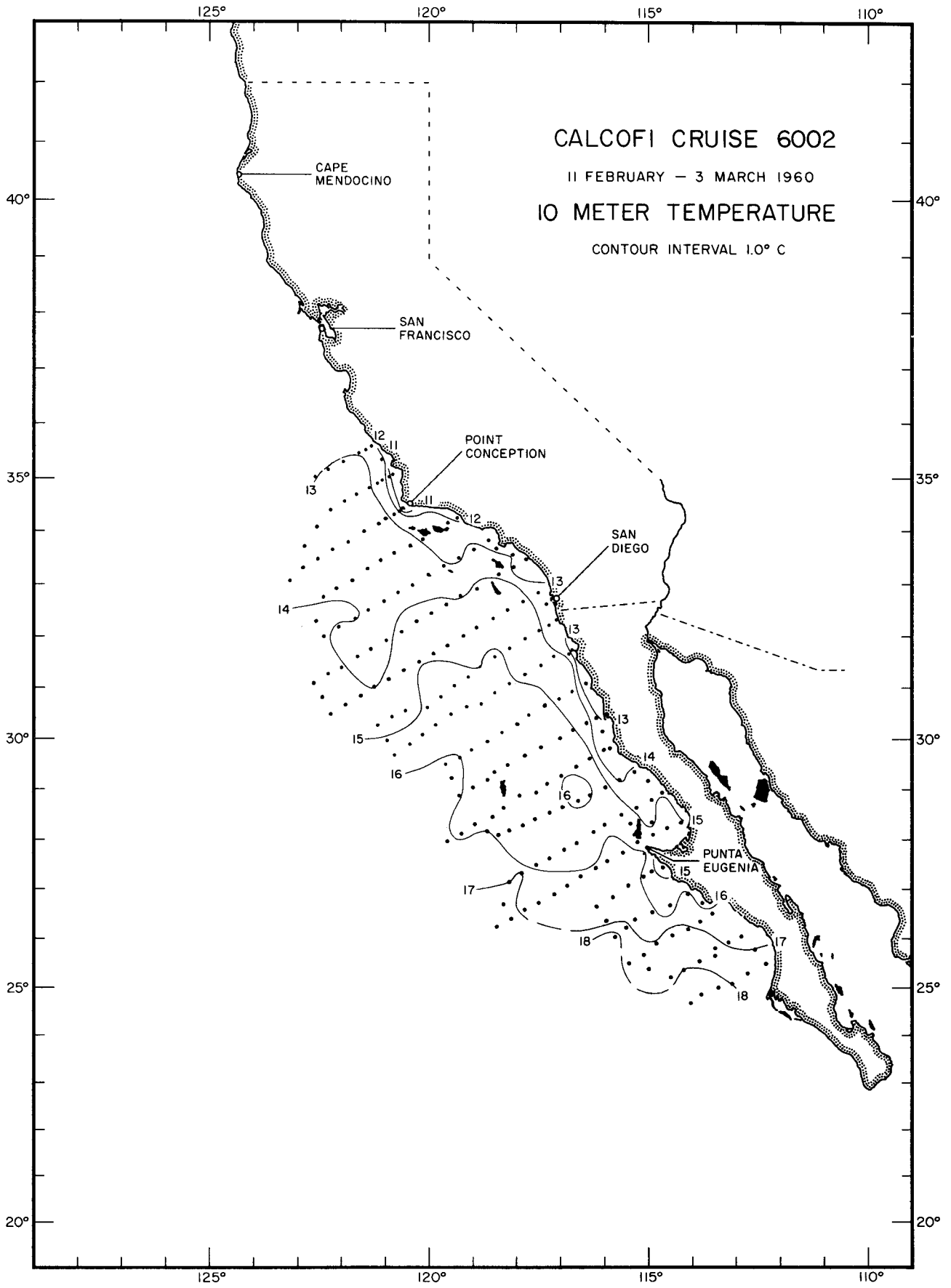
150-Meter: 19-year Regression Mean Charts
150-Meter: Standard Error of Estimate Charts
150-Meter: Total Number of Observations Charts

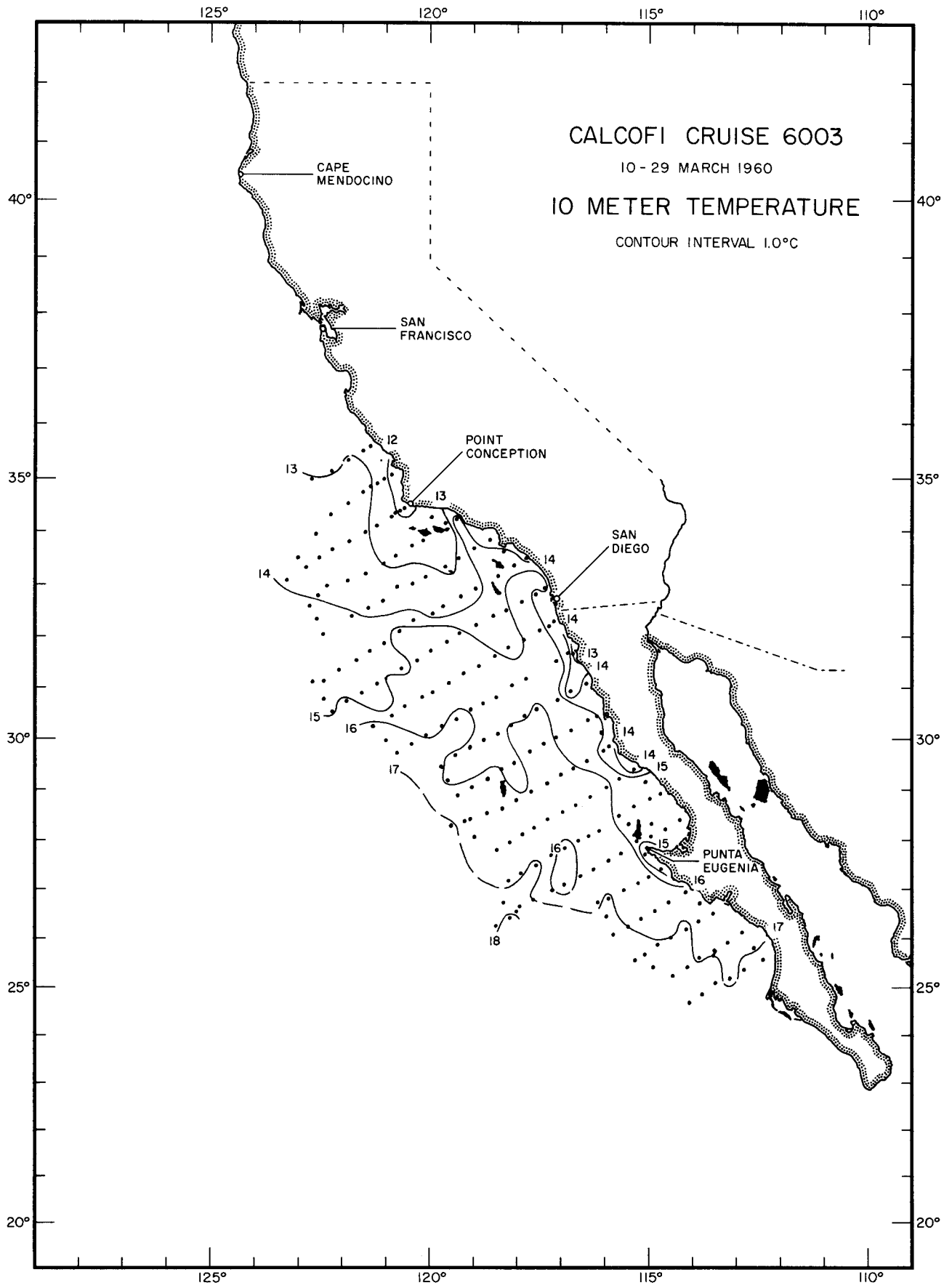
Mean Surface-Layer Depth Charts


CALCOFI CRUISE 6001
8 JANUARY — 13 FEBRUARY 1960
10 METER TEMPERATURE
CONTOUR INTERVAL 1.0° C
CAPE MENDOCINO
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
PUNTA EUGENIA
125°
120°
115°
110°
40°
35°
30°
25°
20°

10m T

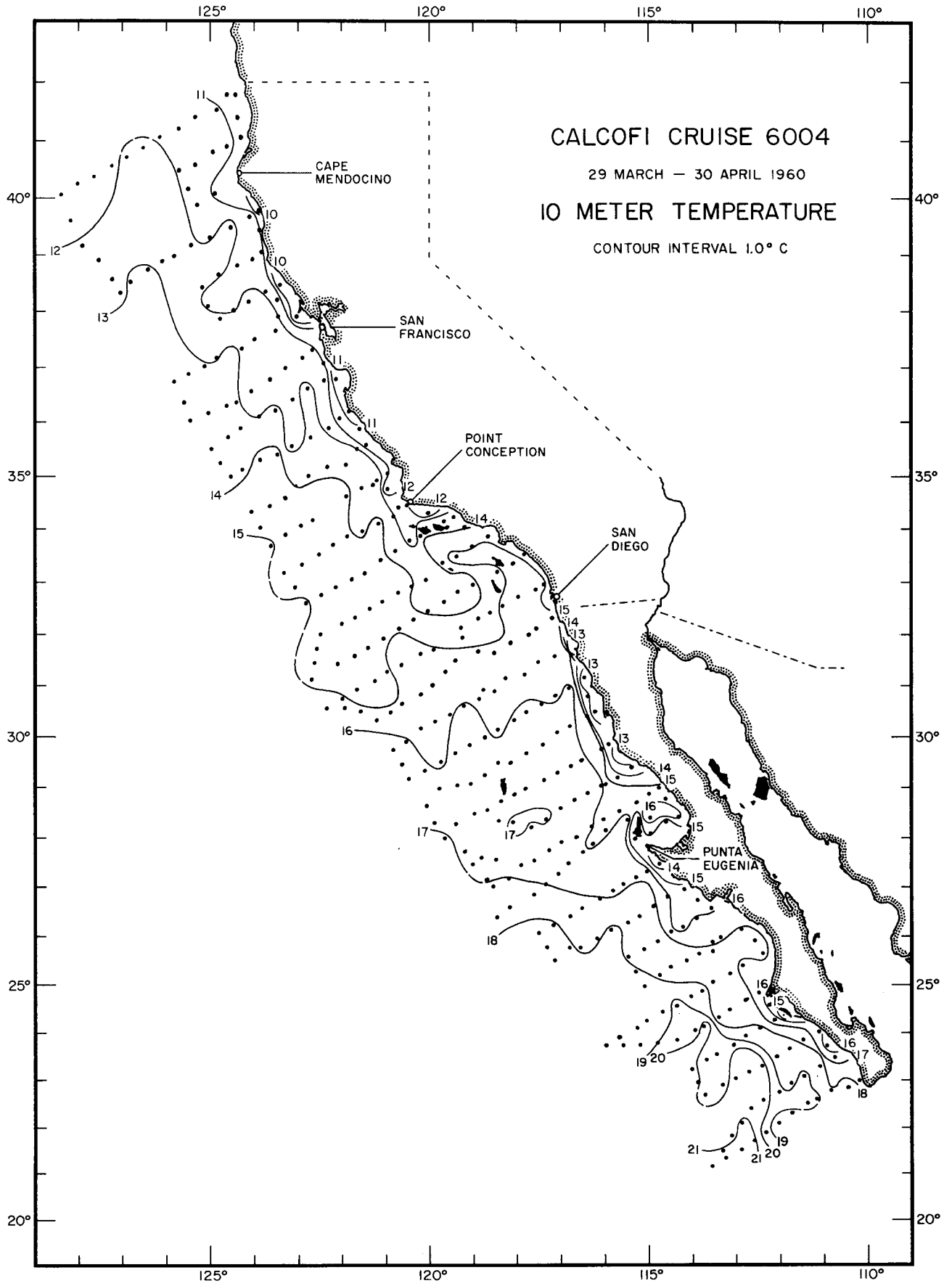
6001


CALCOFI CRUISE 6002
11 FEBRUARY – 3 MARCH 1960
10 METER TEMPERATURE
CONTOUR INTERVAL 1.0° C
CAPE MENDOCINO
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
PUNTA EUGENIA
125°
120°
115°
110°
40°
35°
30°
25°
20°
10m T
6002


CALCOFI CRUISE 6003
10 - 29 MARCH 1960
10 METER TEMPERATURE
CONTOUR INTERVAL 1.0°C
CAPE MENDOCINO
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
PUNTA EUGENIA
125°
120°
115°
110°
40°
35°
30°
25°
20°
12
13
14
15
16
17
18

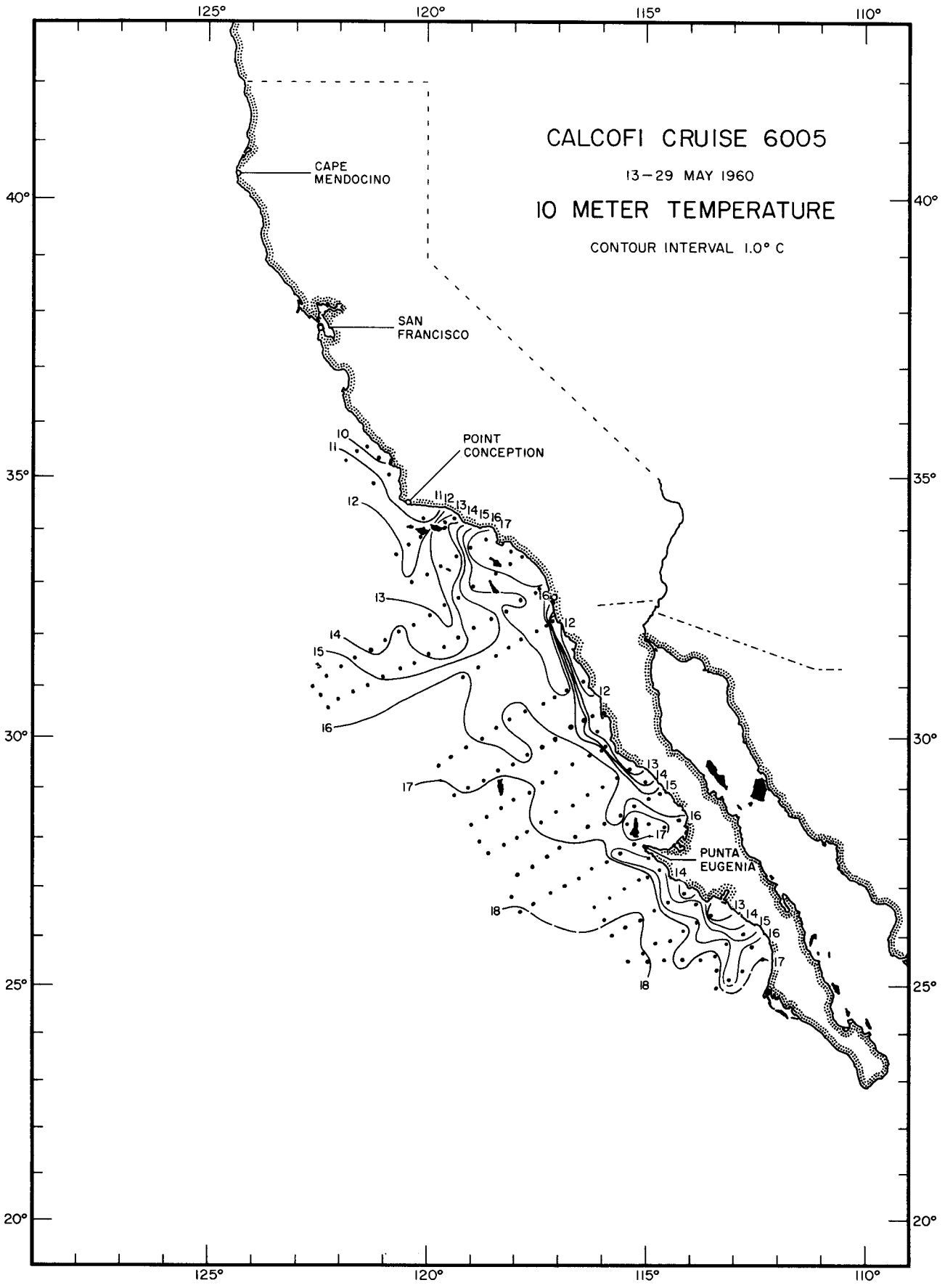
10m T

6003


CALCOFI CRUISE 6004
29 MARCH — 30 APRIL 1960
10 METER TEMPERATURE
CONTOUR INTERVAL 1.0° C
CAPE MENDOCINO
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
PUNTA EUGENIA
125°
120°
115°
110°
40°
35°
30°
25°
20°

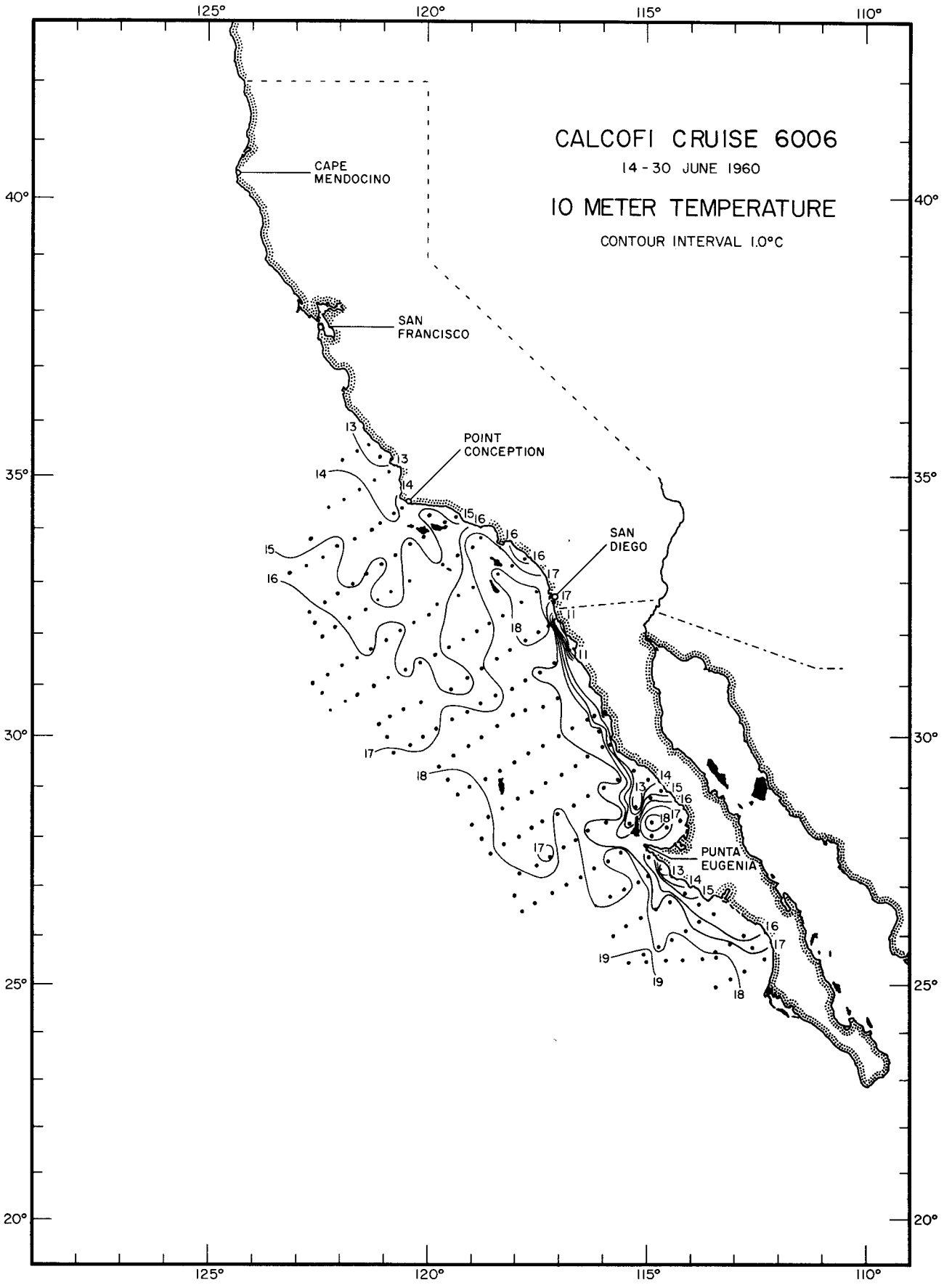
10m T

6004

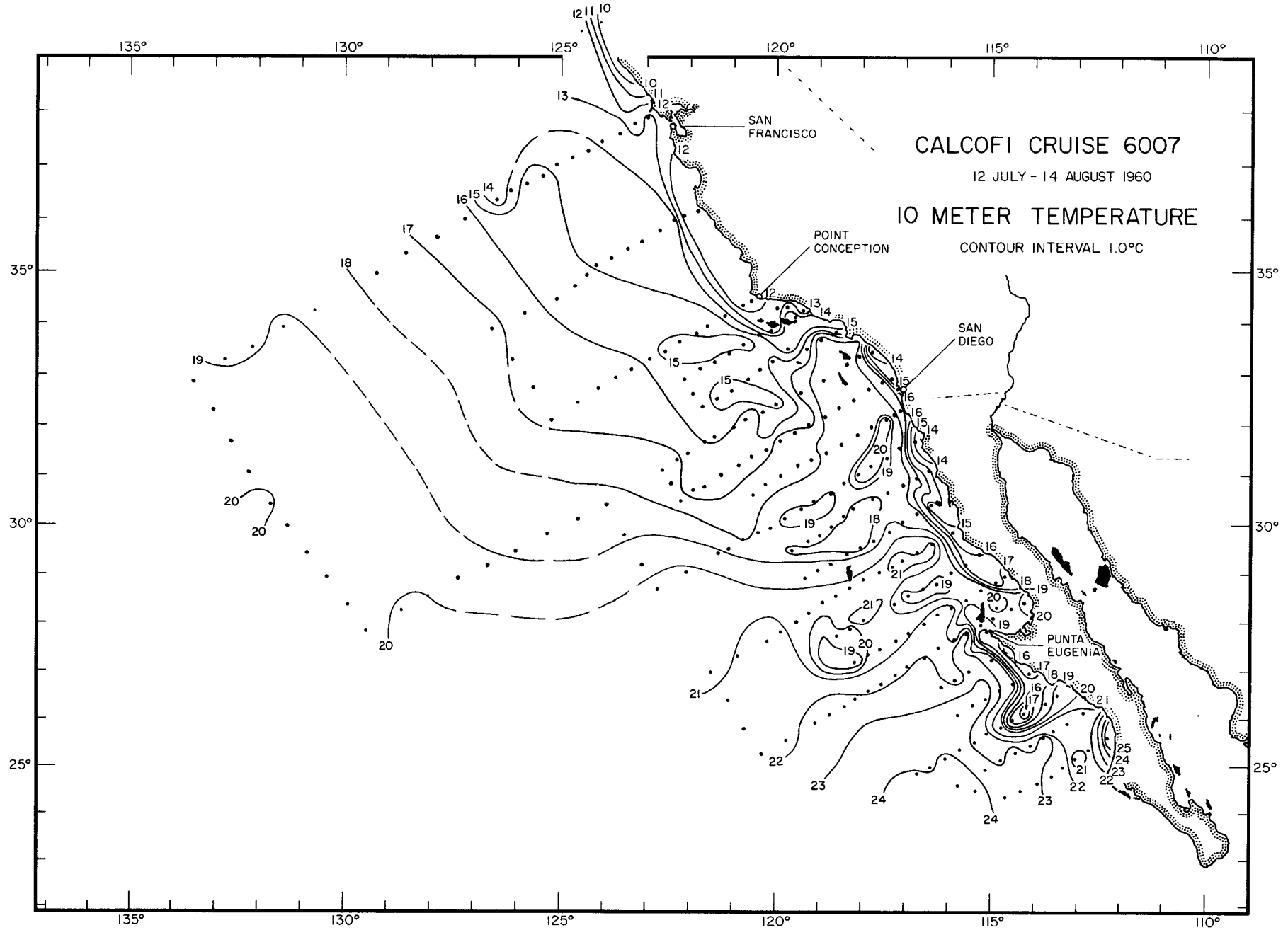

CALCOFI CRUISE 6005
13–29 MAY 1960
10 METER TEMPERATURE
CONTOUR INTERVAL 1.0° C
CAPE MENDOCINO
SAN FRANCISCO
POINT CONCEPTION
PUNTA EUGENIA
125°
120°
115°
110°
40°
35°
30°
25°
20°

10m T

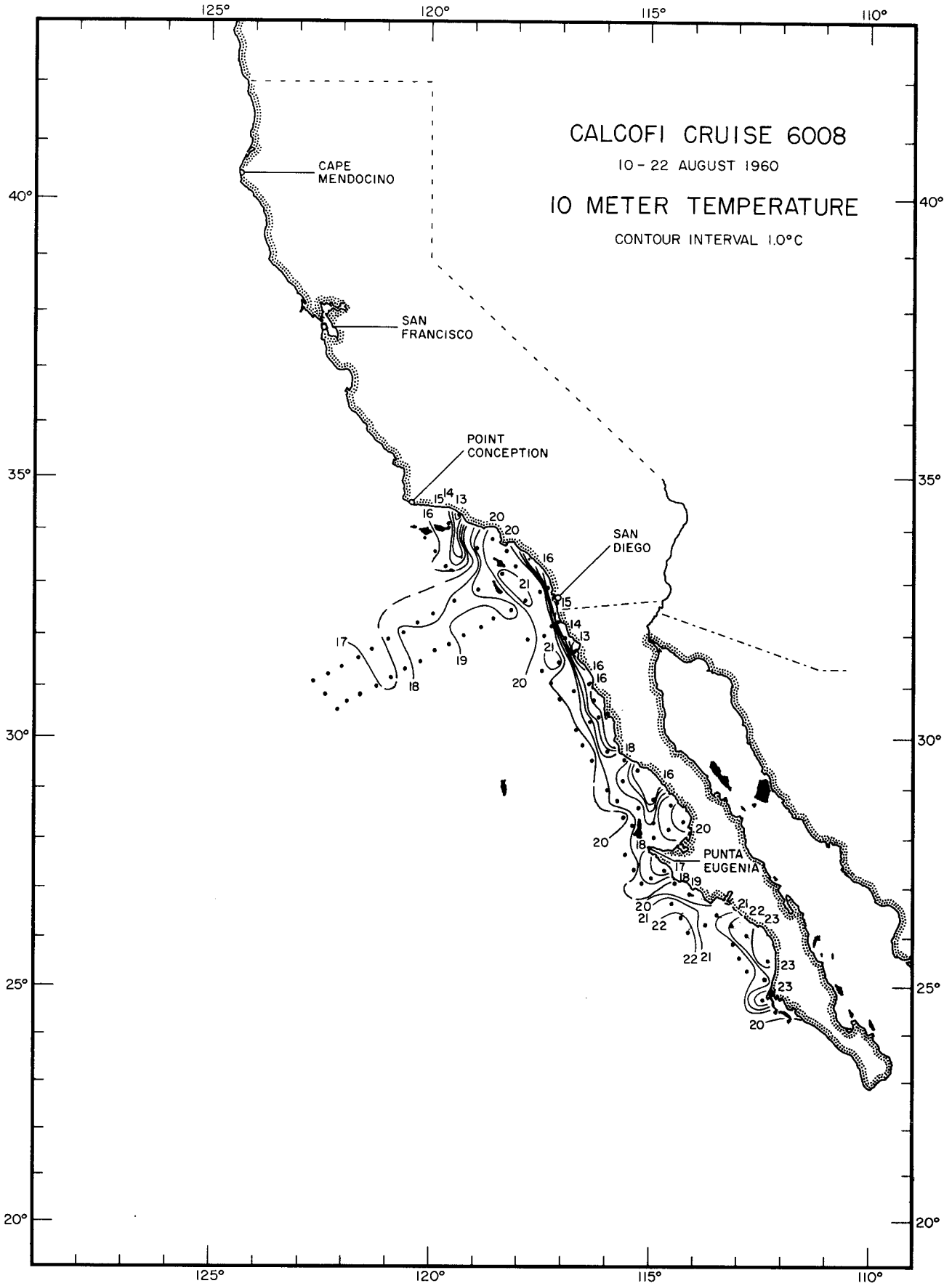
6005


CALCOFI CRUISE 6006
14 - 30 JUNE 1960
10 METER TEMPERATURE
CONTOUR INTERVAL 1.0°C
CAPE MENDOCINO
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
PUNTA EUGENIA
125°
120°
115°
110°
40°
35°
30°
25°
20°

10m T
6006

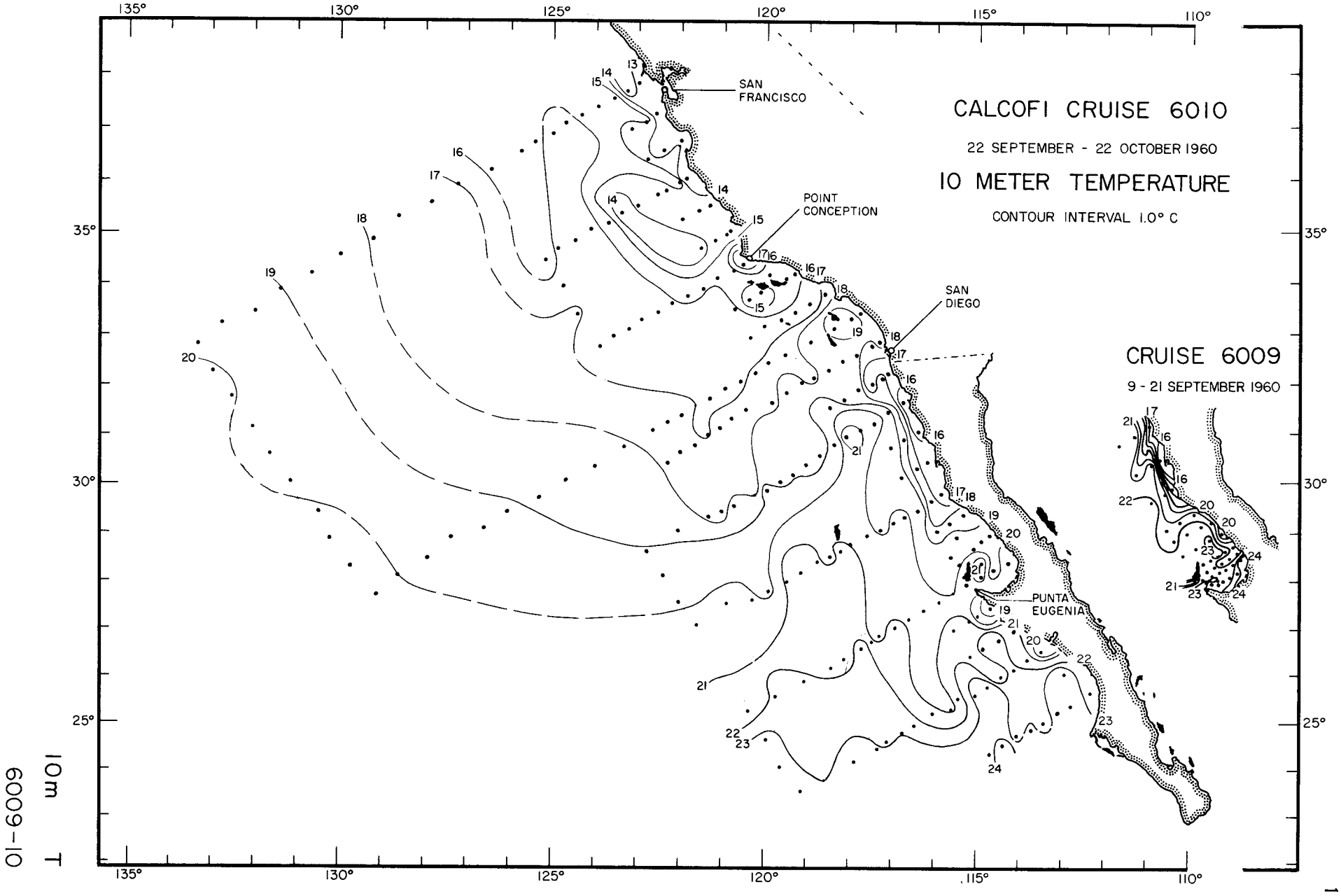

CALCOFI CRUISE 6007
12 JULY - 14 AUGUST 1960
10 METER TEMPERATURE
CONTOUR INTERVAL 1.0°C
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
PUNTA EUGENIA
135°
130°
125°
120°
115°
110°
35°
30°
25°

10 m T 6007

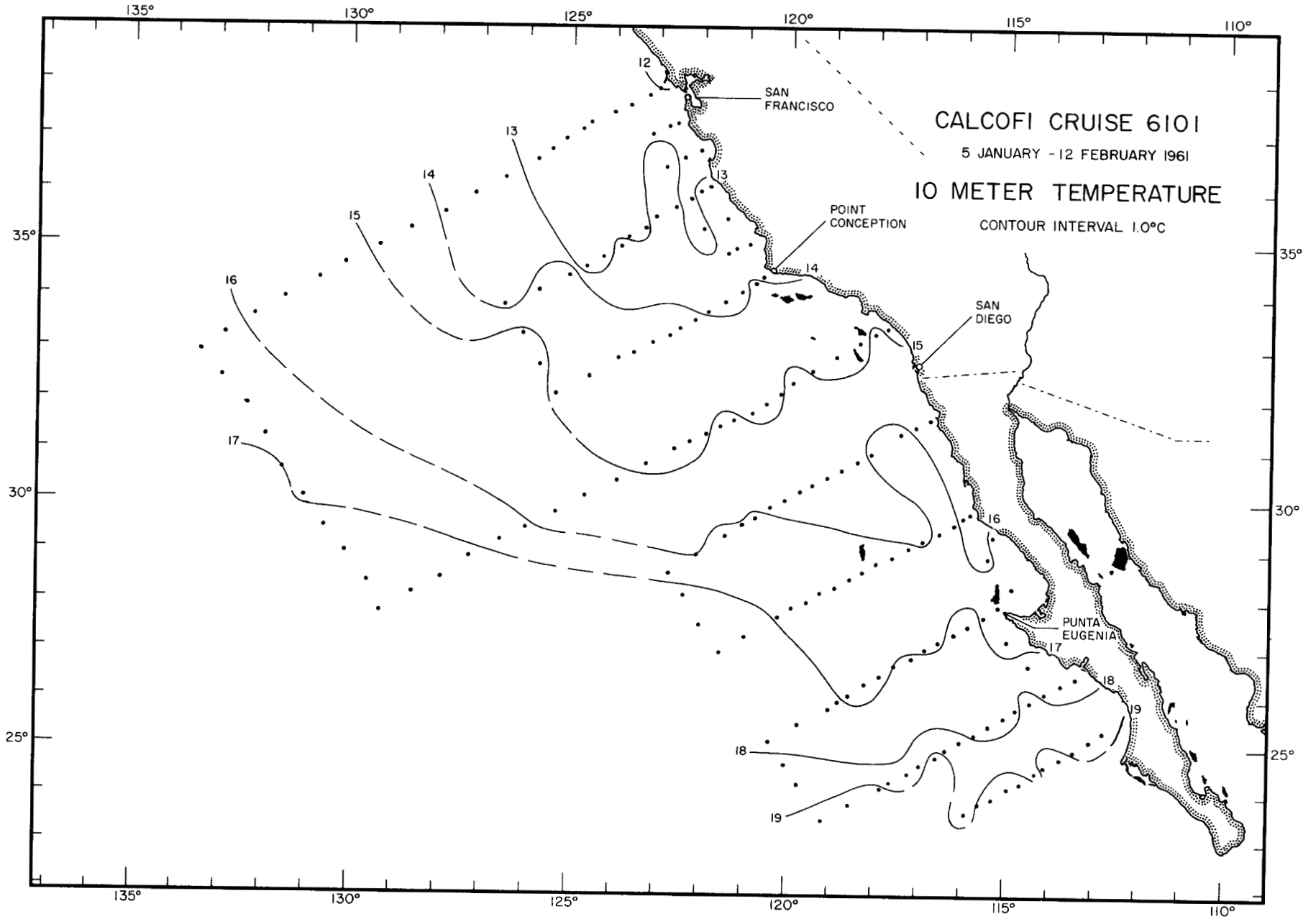

CALCOFI CRUISE 6008
10 - 22 AUGUST 1960
10 METER TEMPERATURE
CONTOUR INTERVAL 1.0°C
CAPE MENDOCINO
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
PUNTA EUGENIA
125°
120°
115°
110°
40°
35°
30°
25°
20°

10m T

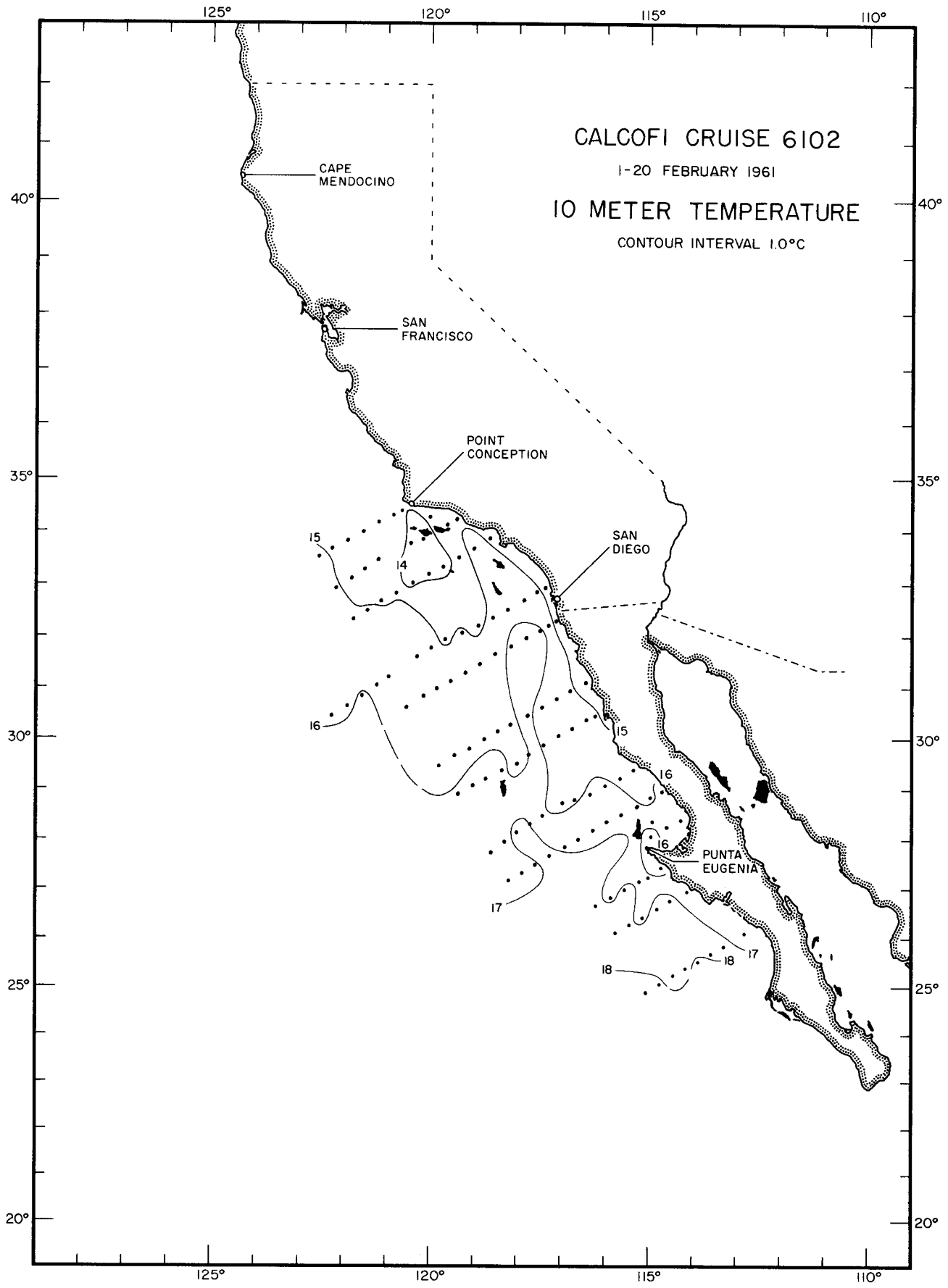
6008



01-6009-10 T 10m

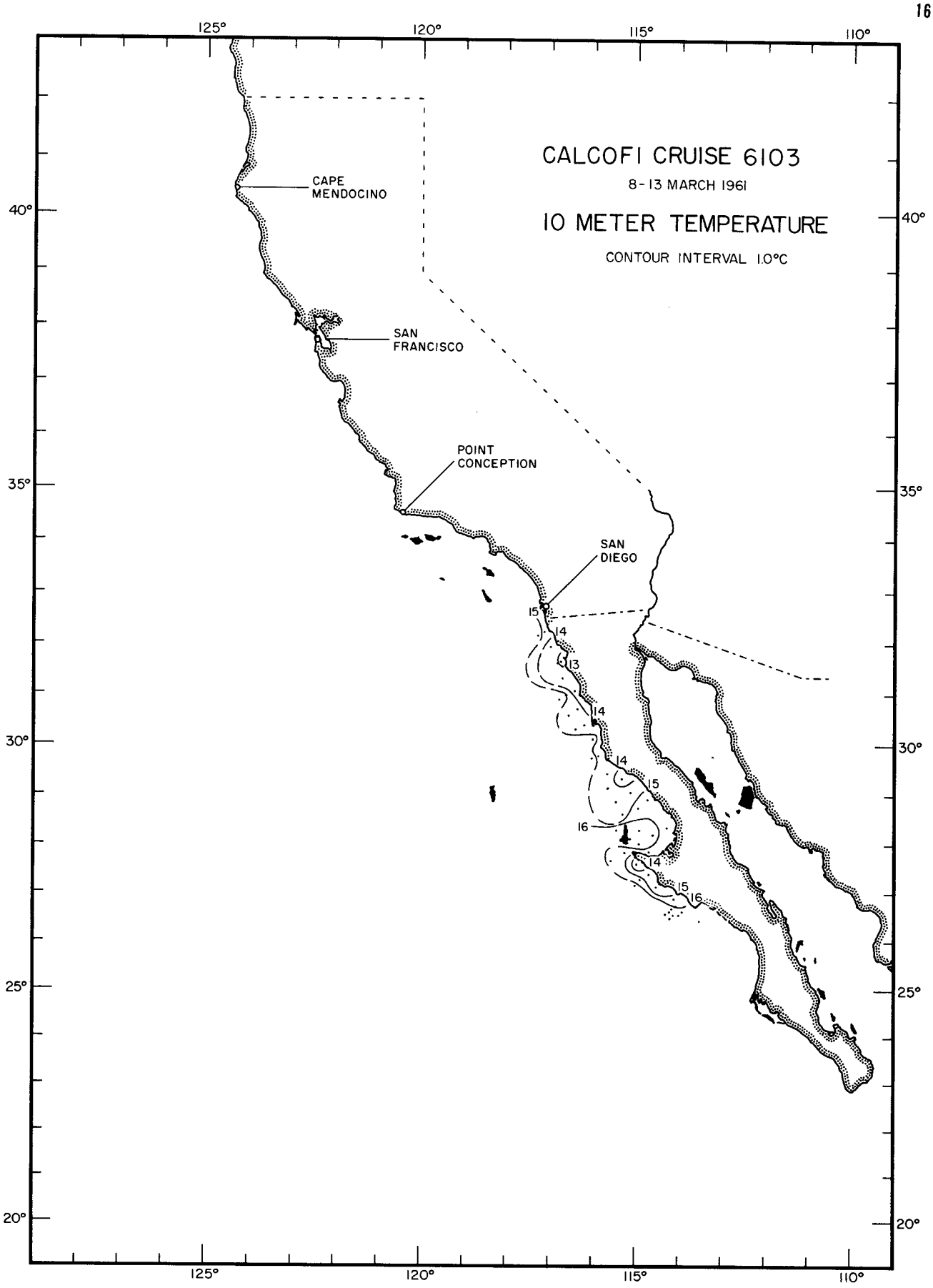

CALCOFI CRUISE 6101
5 JANUARY - 12 FEBRUARY 1961
10 METER TEMPERATURE
CONTOUR INTERVAL 1.0°C
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
PUNTA EUGENIA
135°
130°
125°
120°
115°
110°
35°
30°
25°
12
13
14
15
16
17
18
19

6101 10m T


CALCOFI CRUISE 6102
1-20 FEBRUARY 1961
10 METER TEMPERATURE
CONTOUR INTERVAL 1.0°C
CAPE MENDOCINO
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
PUNTA EUGENIA
125°
120°
115°
110°
40°
35°
30°
25°
20°
14
15
16
17
18

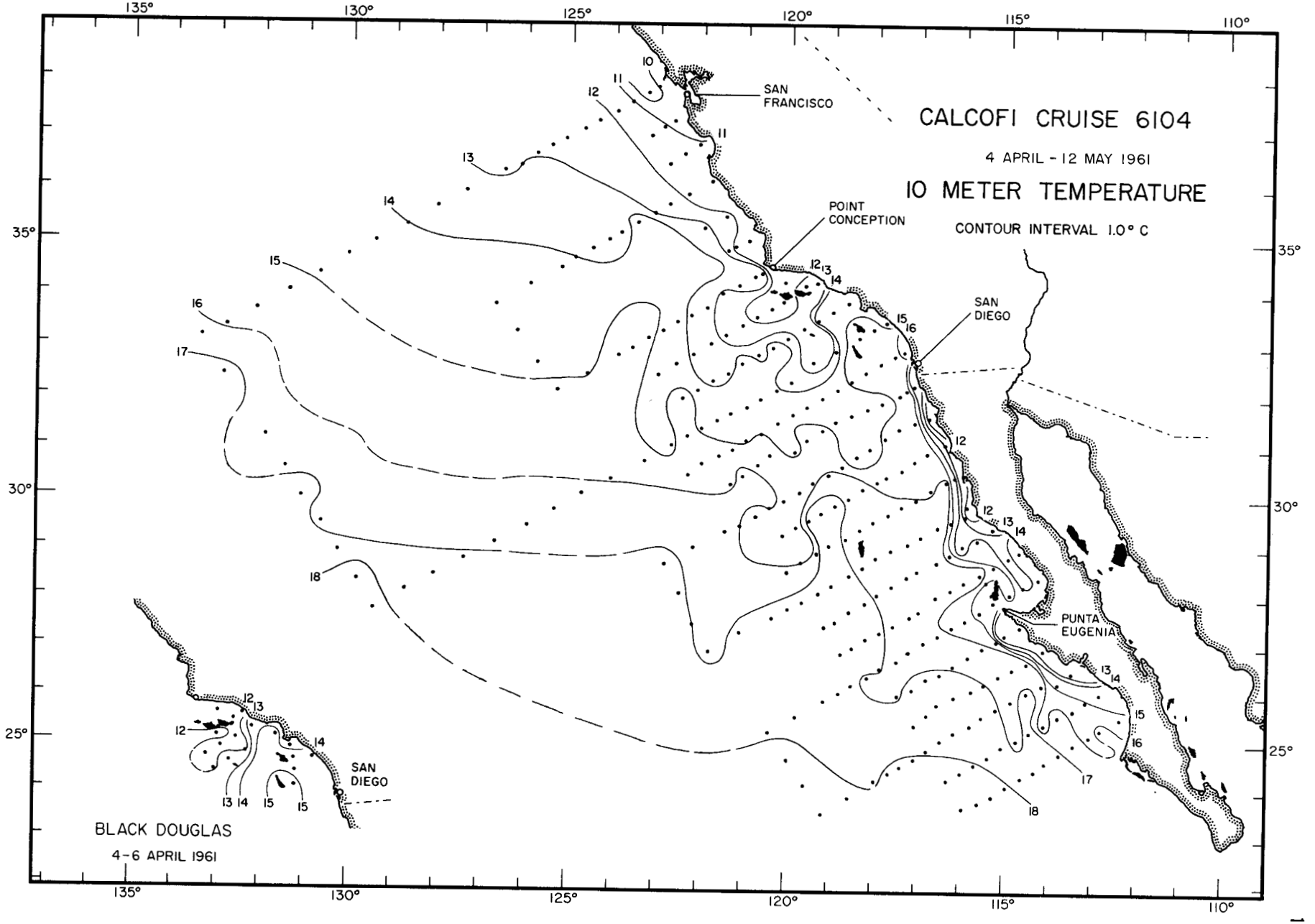
10m T

6102

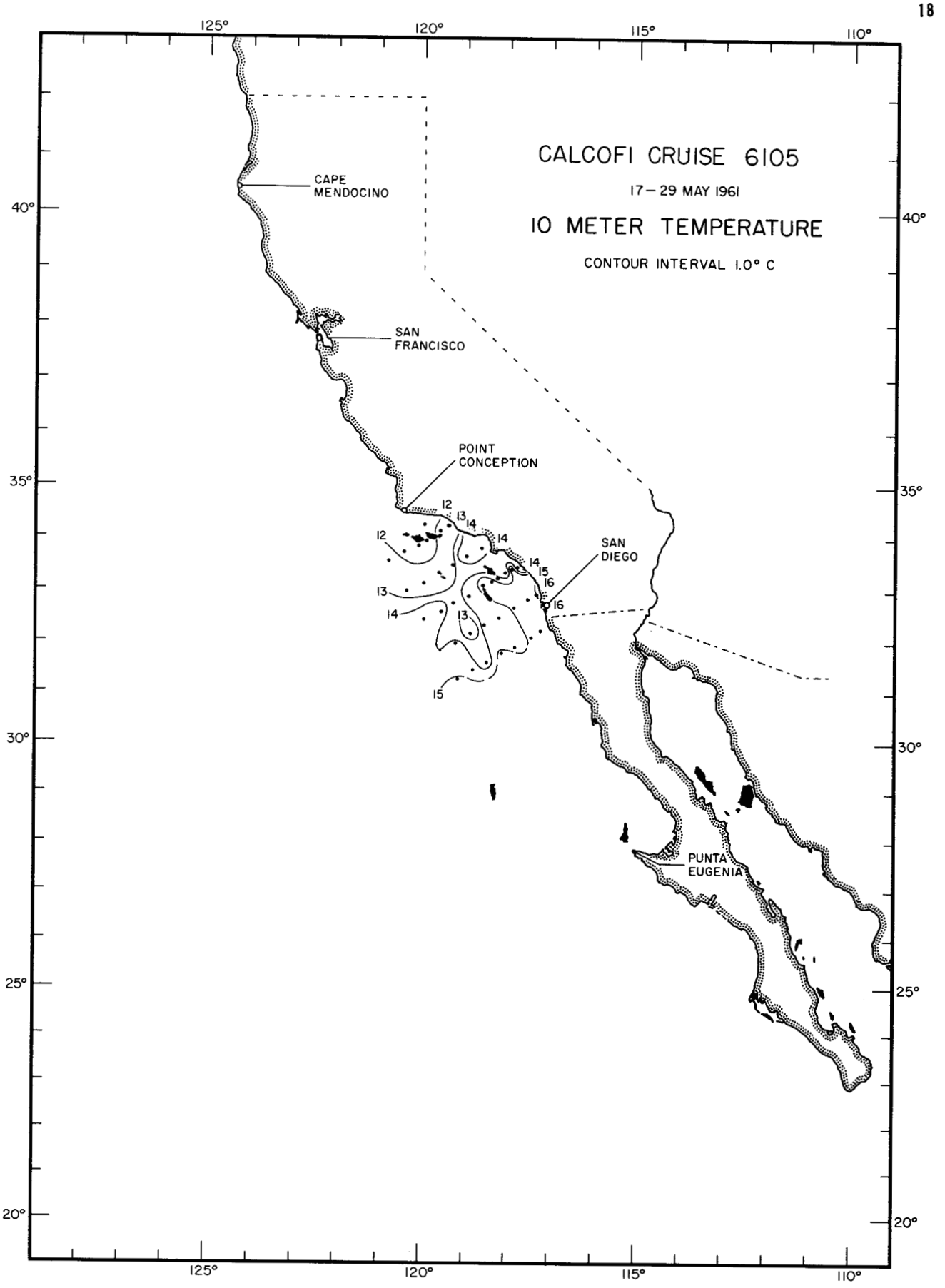

CALCOFI CRUISE 6103
8-13 MARCH 1961
10 METER TEMPERATURE
CONTOUR INTERVAL 1.0°C
CAPE MENDOCINO
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
125°
120°
115°
110°
40°
35°
30°
25°
20°
15
14
13
14
14
15
16
14
15
16

10m T

6103

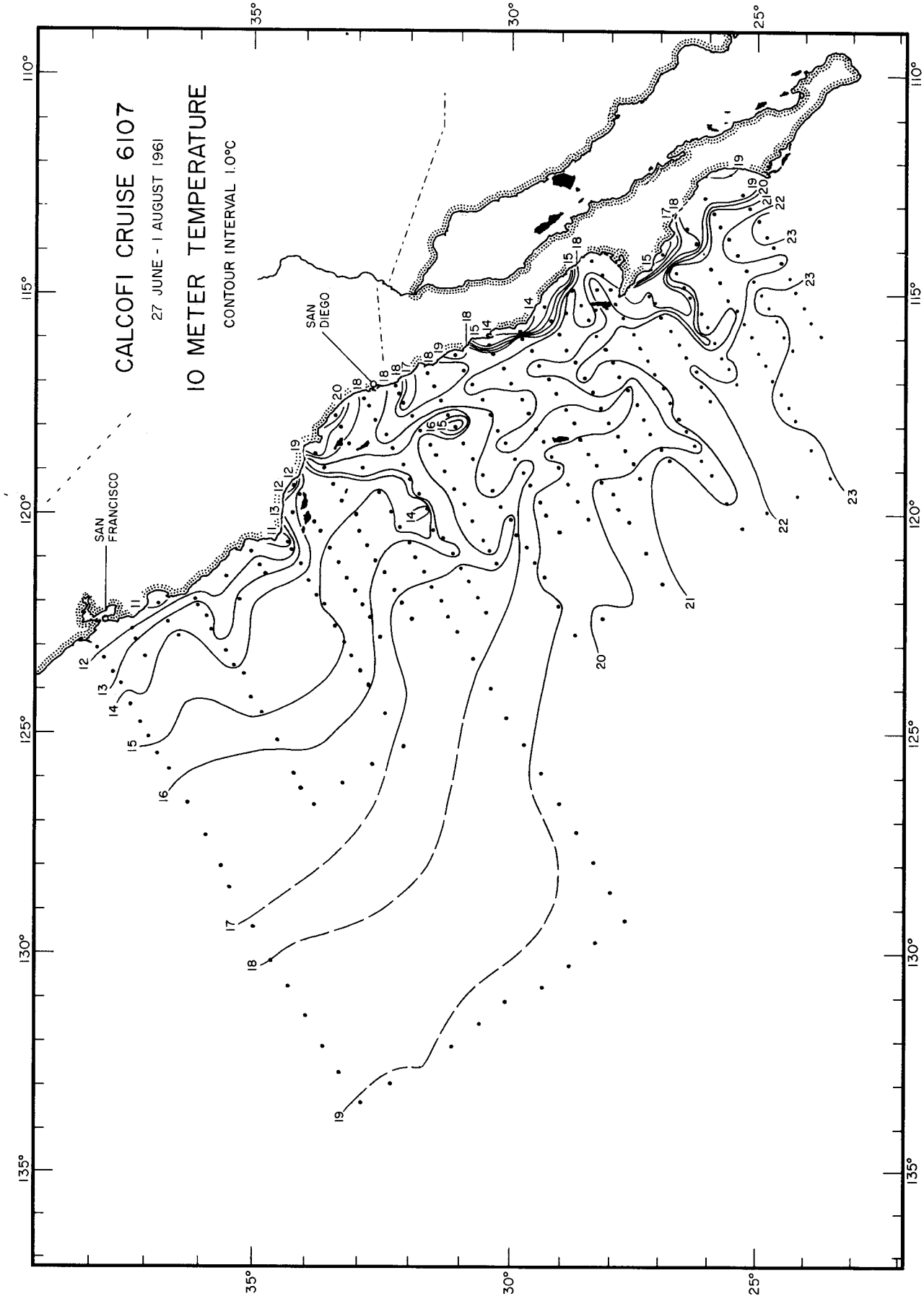

CALCOFI CRUISE 6104
4 APRIL - 12 MAY 1961
10 METER TEMPERATURE
CONTOUR INTERVAL 1.0° C
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
PUNTA EUGENIA
SAN DIEGO
BLACK DOUGLAS
4-6 APRIL 1961
135°
130°
125°
120°
115°
110°
35°
30°
25°

10m T
6104


CALCOFI CRUISE 6105
17 – 29 MAY 1961
10 METER TEMPERATURE
CONTOUR INTERVAL 1.0° C
CAPE MENDOCINO
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
PUNTA EUGENIA
125°
120°
115°
110°
40°
35°
30°
25°
20°
12
13
14
15
16

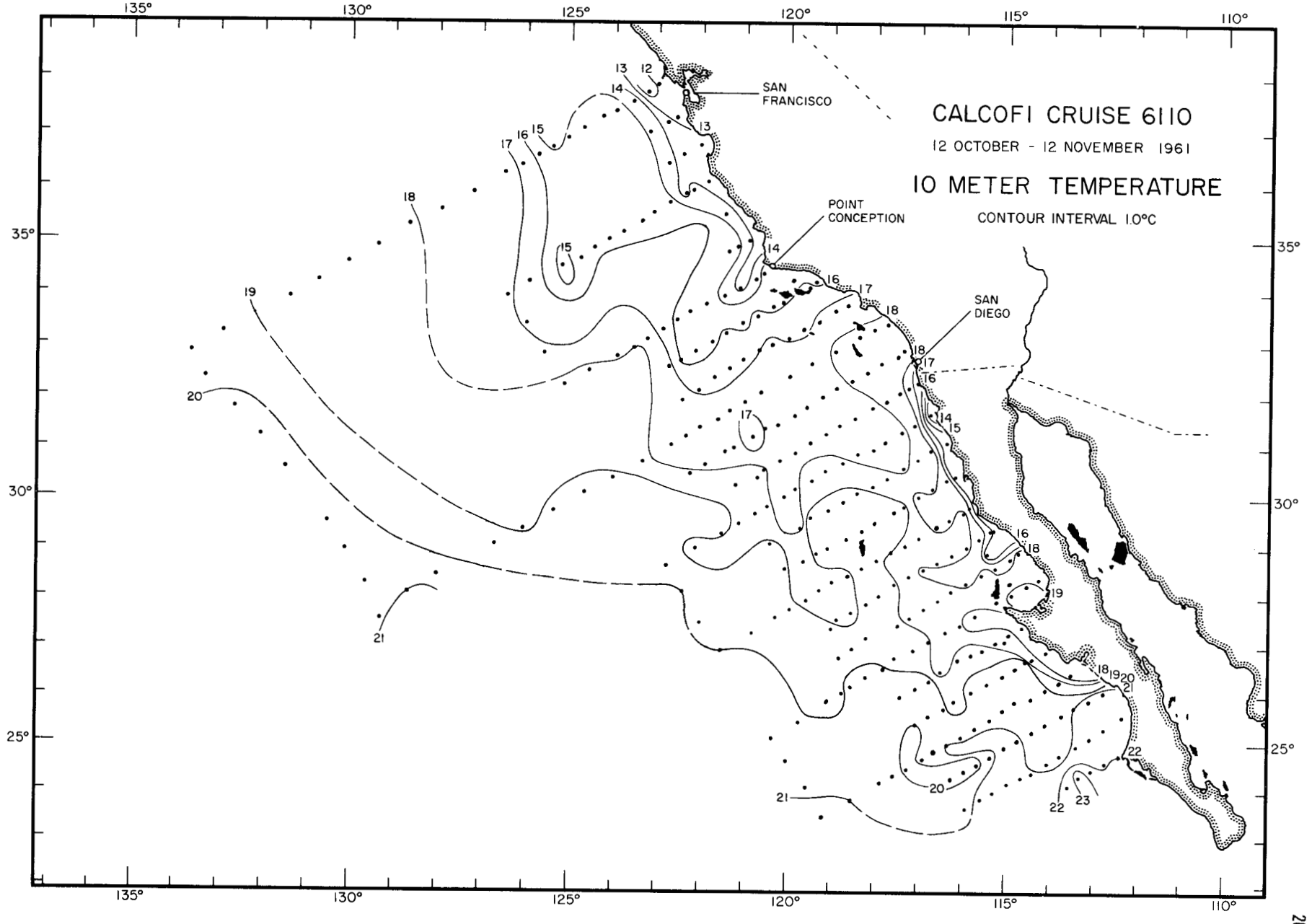
10m T

6105

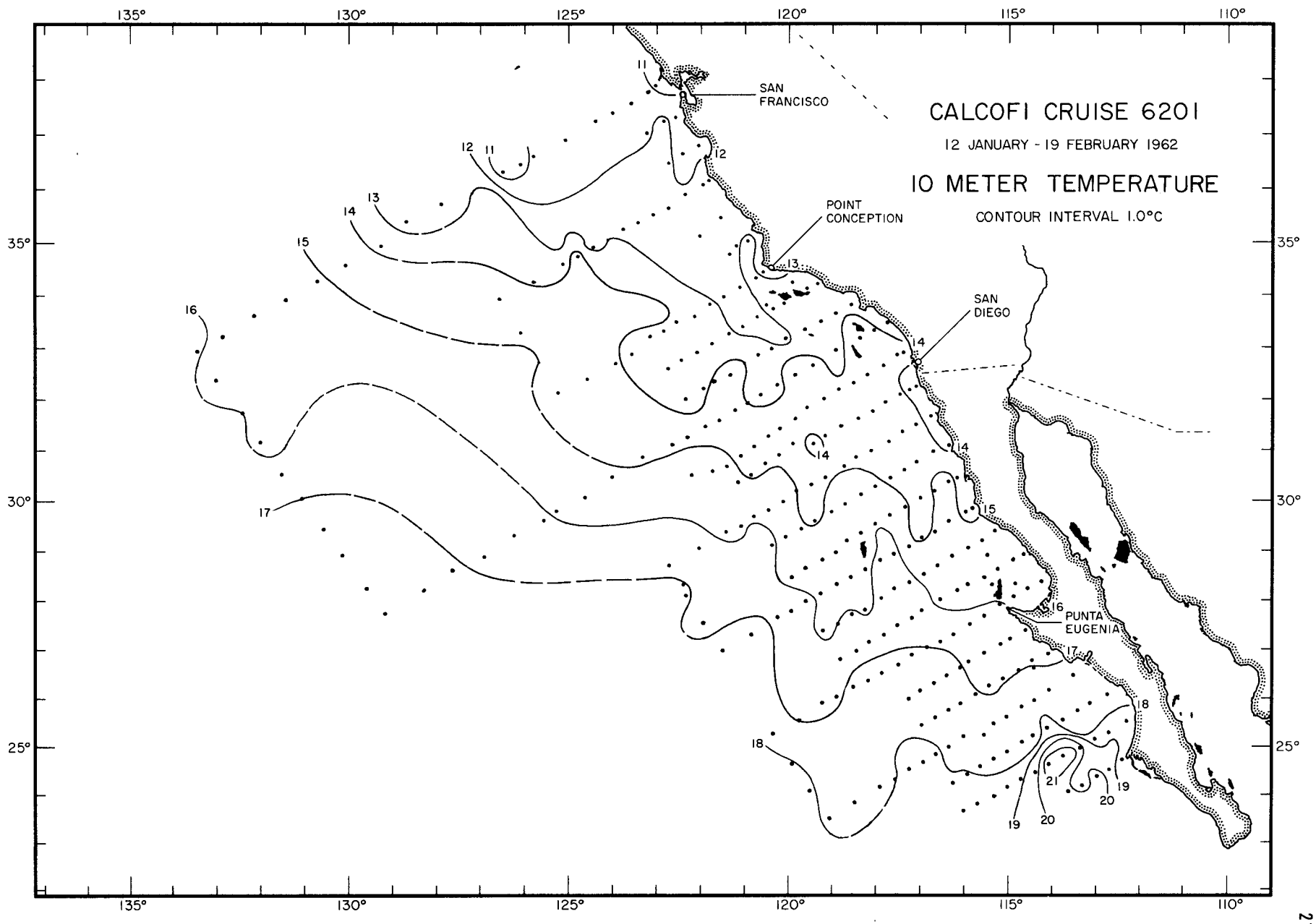

CALCOFI CRUISE 6107
27 JUNE - 1 AUGUST 1961
10 METER TEMPERATURE
CONTOUR INTERVAL 1.0°C
SAN FRANCISCO
SAN DIEGO
35°
30°
25°
110°
115°
120°
125°
130°
135°

10 m T

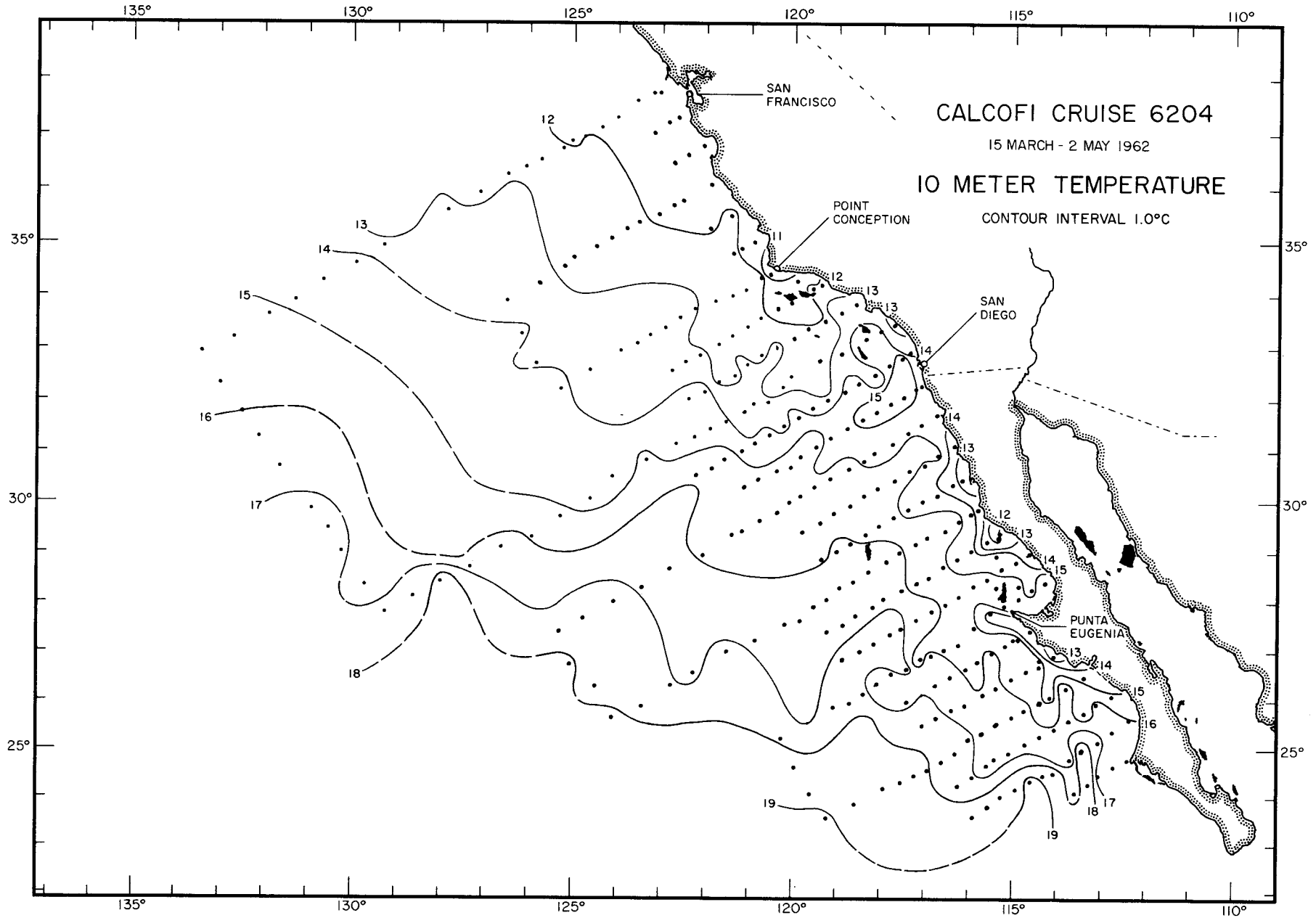
6107


CALCOFI CRUISE 6110
12 OCTOBER - 12 NOVEMBER 1961
10 METER TEMPERATURE
CONTOUR INTERVAL 1.0°C
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
135°
130°
125°
120°
115°
110°
35°
30°
25°

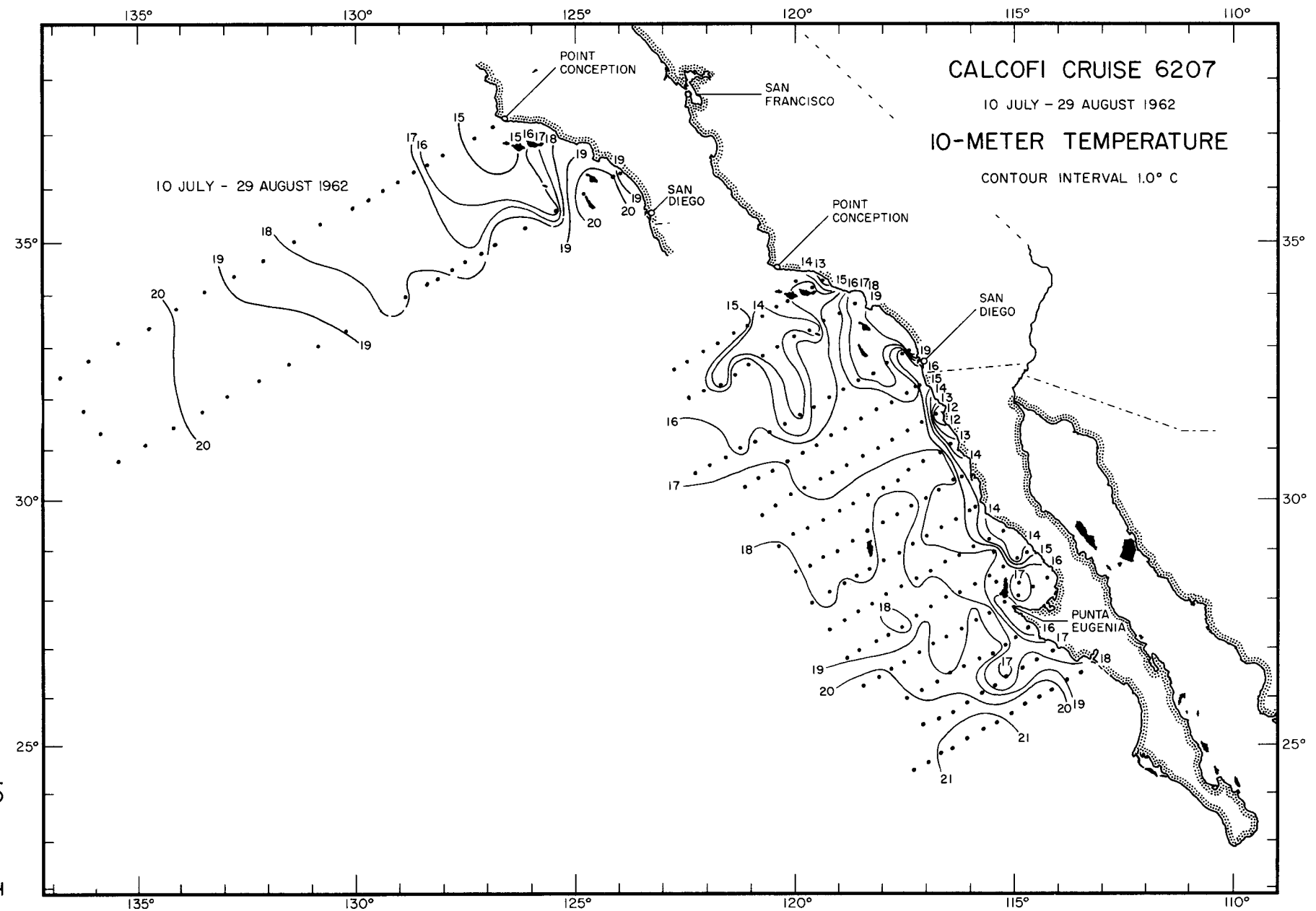
10 m T 6110


CALCOFI CRUISE 6201
12 JANUARY - 19 FEBRUARY 1962
10 METER TEMPERATURE
CONTOUR INTERVAL 1.0°C
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
PUNTA EUGENIA
135°
130°
125°
120°
115°
110°
35°
30°
25°

10 m T 6201

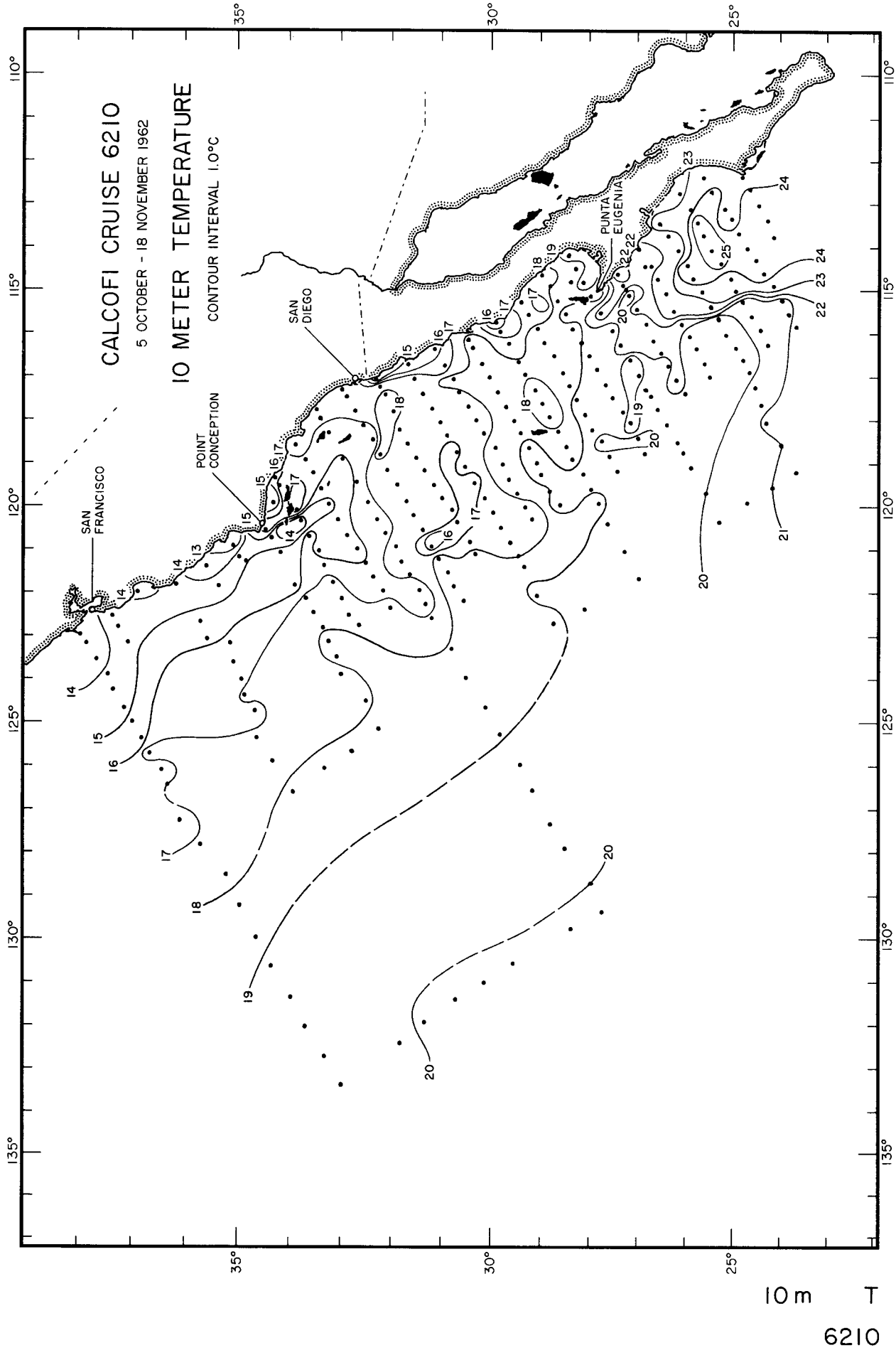

CALCOFI CRUISE 6204
15 MARCH - 2 MAY 1962
10 METER TEMPERATURE
CONTOUR INTERVAL 1.0°C
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
PUNTA EUGENIA
135°
130°
125°
120°
115°
110°
35°
30°
25°

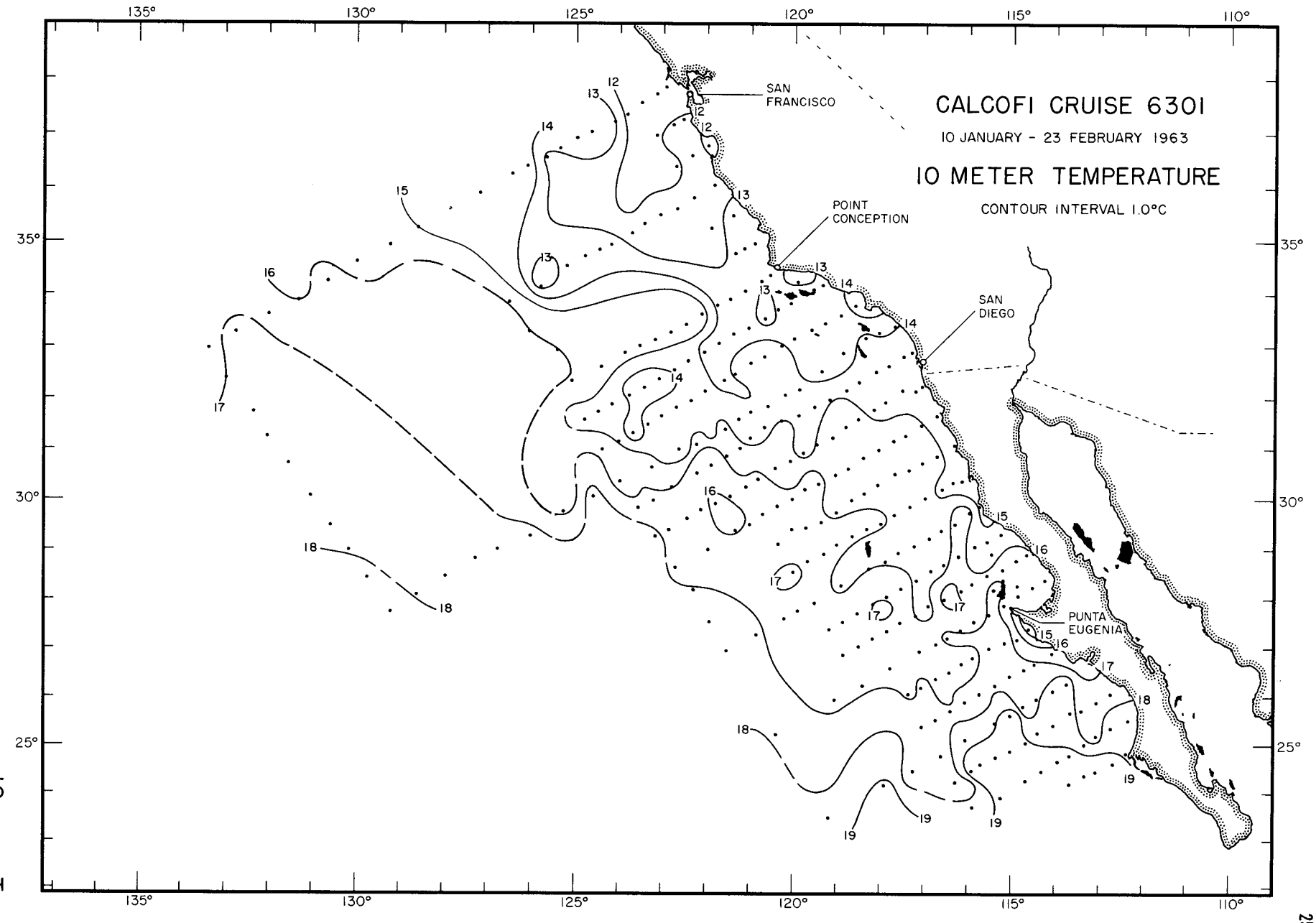
10 m T 6204


CALCOFI CRUISE 6207
10 JULY - 29 AUGUST 1962
10-METER TEMPERATURE
CONTOUR INTERVAL 1.0° C
10 JULY - 29 AUGUST 1962
POINT CONCEPTION
SAN FRANCISCO
SAN DIEGO
POINT CONCEPTION
SAN DIEGO
PUNTA EUGENIA
135°
130°
125°
120°
115°
110°
35°
30°
25°

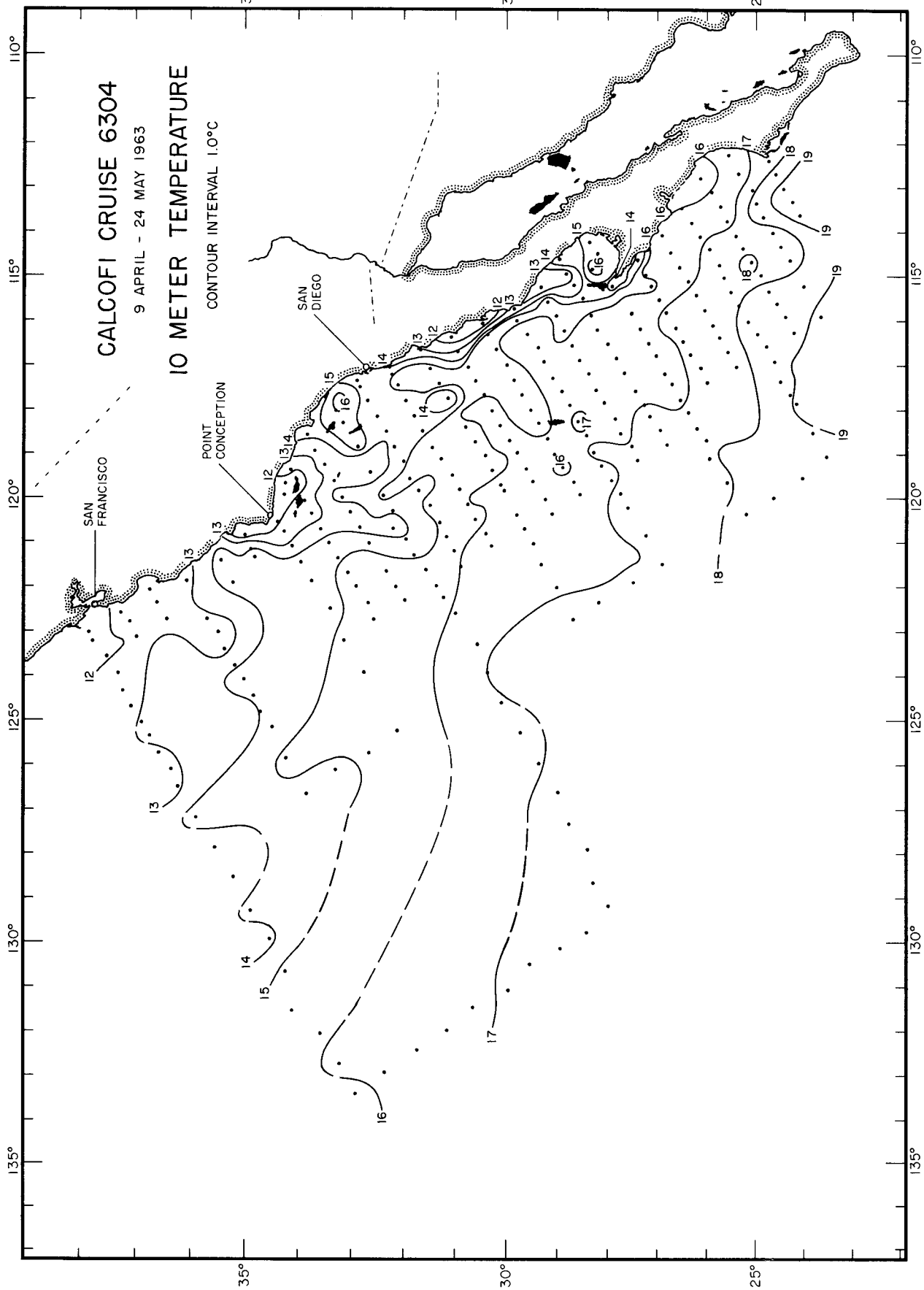
10 m T

6207


CALCOFI CRUISE 6210
5 OCTOBER - 18 NOVEMBER 1962
10 METER TEMPERATURE
CONTOUR INTERVAL 1.0°C
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
PUNTA EUGENIA
35°
30°
25°
110°
115°
120°
125°
130°
135°
10m T
6210

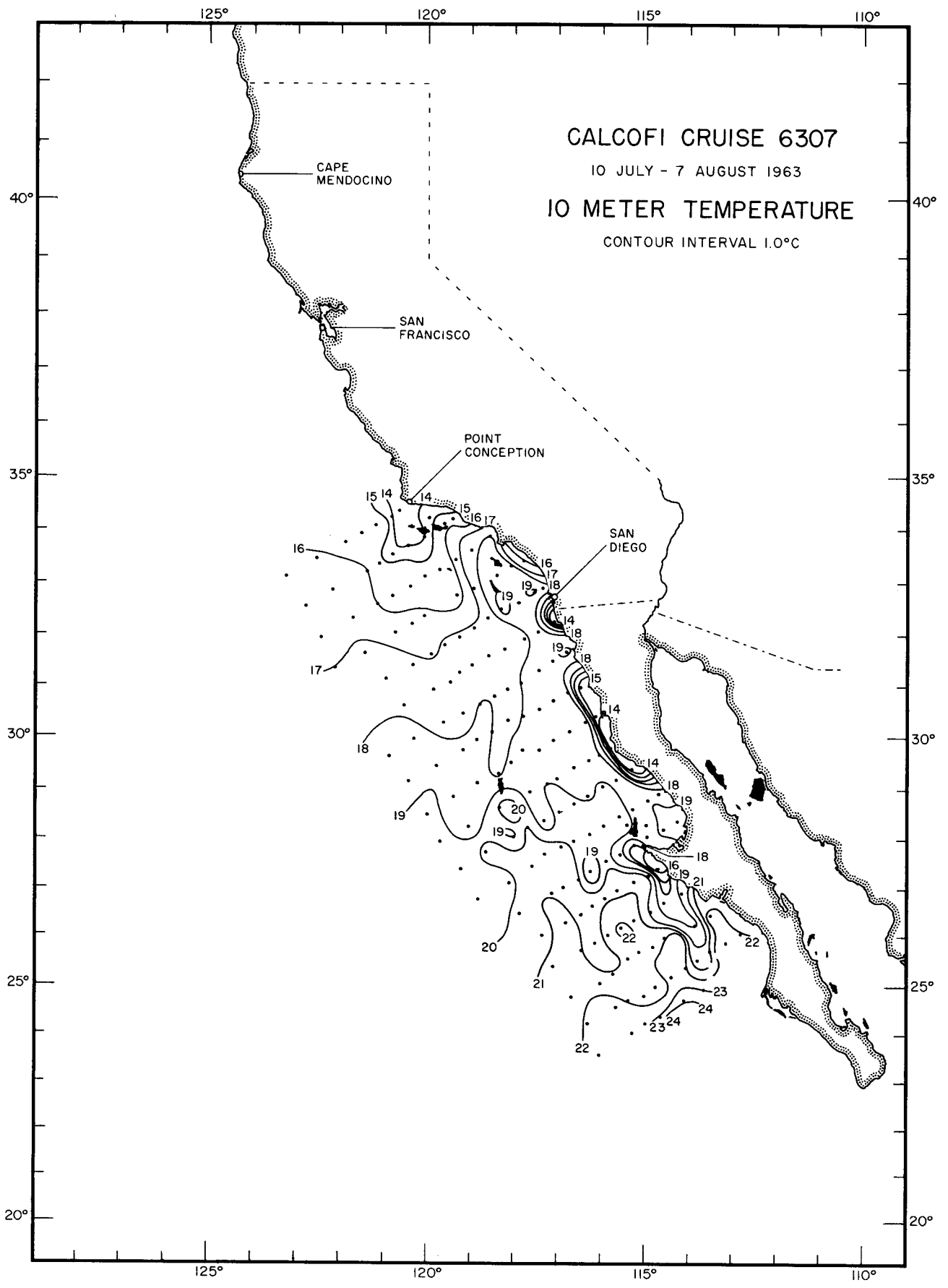

CALCOFI CRUISE 6301
10 JANUARY - 23 FEBRUARY 1963
10 METER TEMPERATURE
CONTOUR INTERVAL 1.0°C
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
PUNTA EUGENIA
135°
130°
125°
120°
115°
110°
35°
30°
25°

10m T 6301


CALCOFI CRUISE 6304
9 APRIL - 24 MAY 1963
10 METER TEMPERATURE
CONTOUR INTERVAL 1.0°C
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
35°
30°
25°
110°
115°
120°
125°
130°
135°

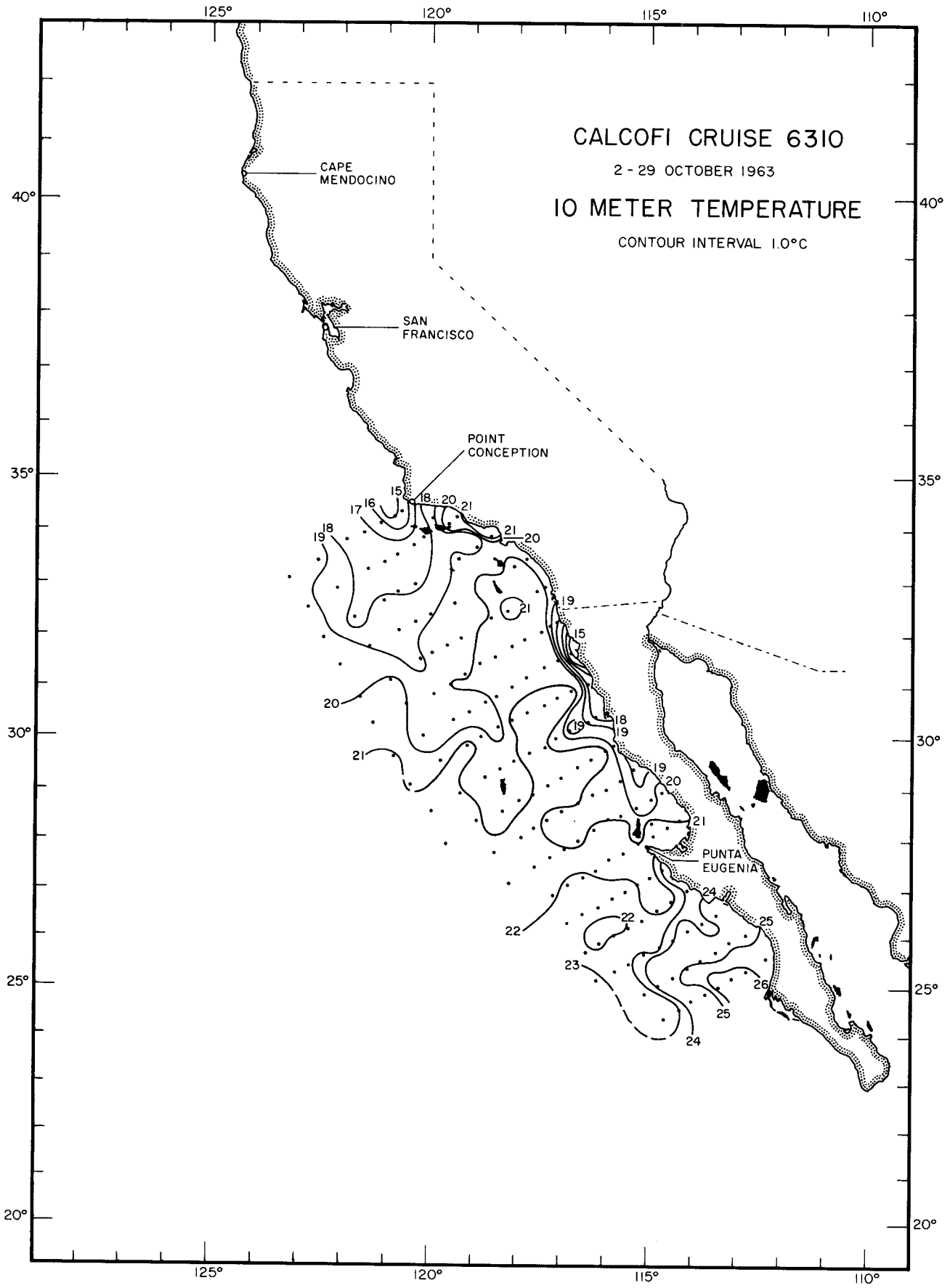
10m T

6304


CALCOFI CRUISE 6307
10 JULY - 7 AUGUST 1963
10 METER TEMPERATURE
CONTOUR INTERVAL 1.0°C
CAPE MENDOCINO
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
125°
120°
115°
110°
40°
35°
30°
25°
20°

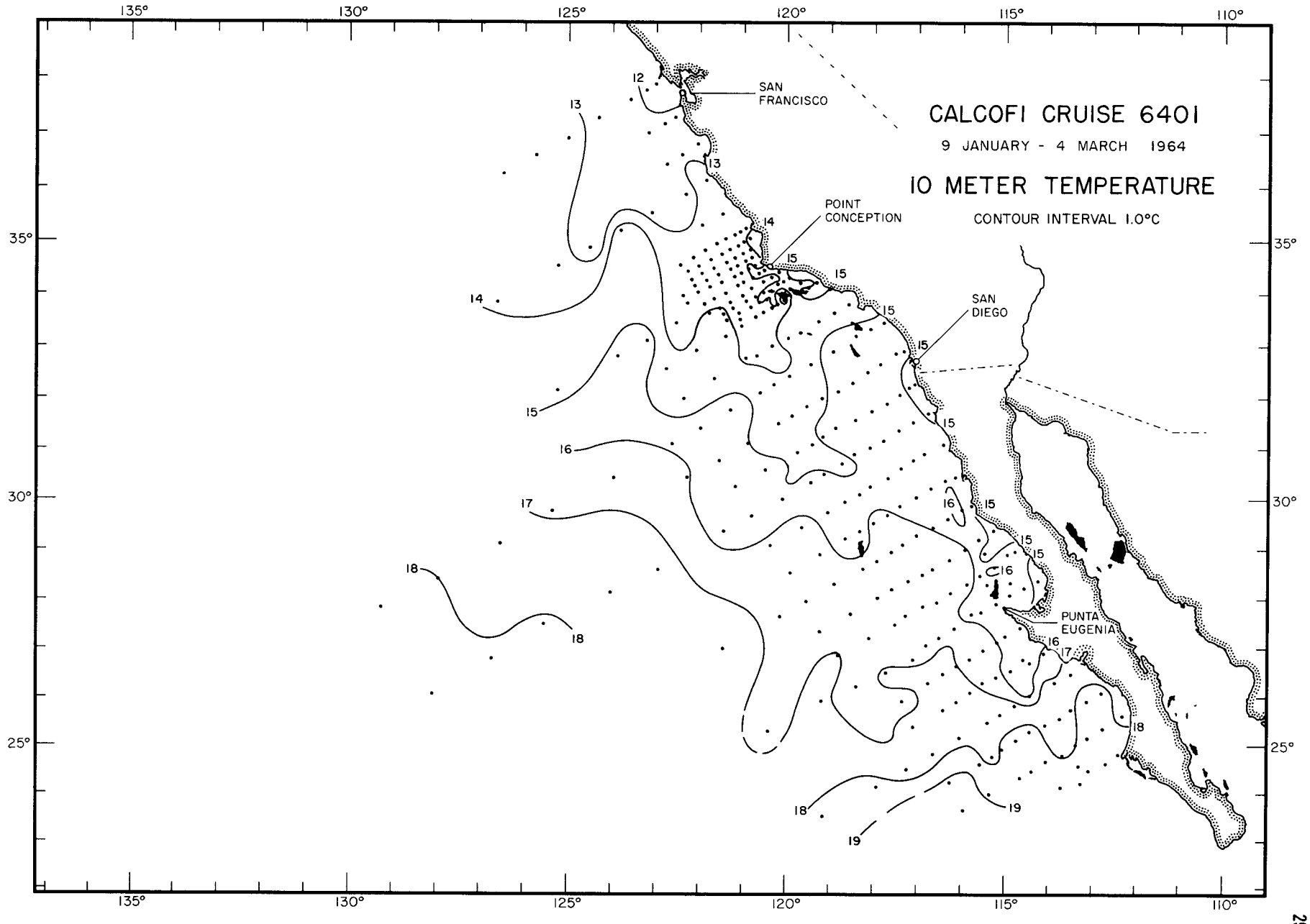
10m T

6307

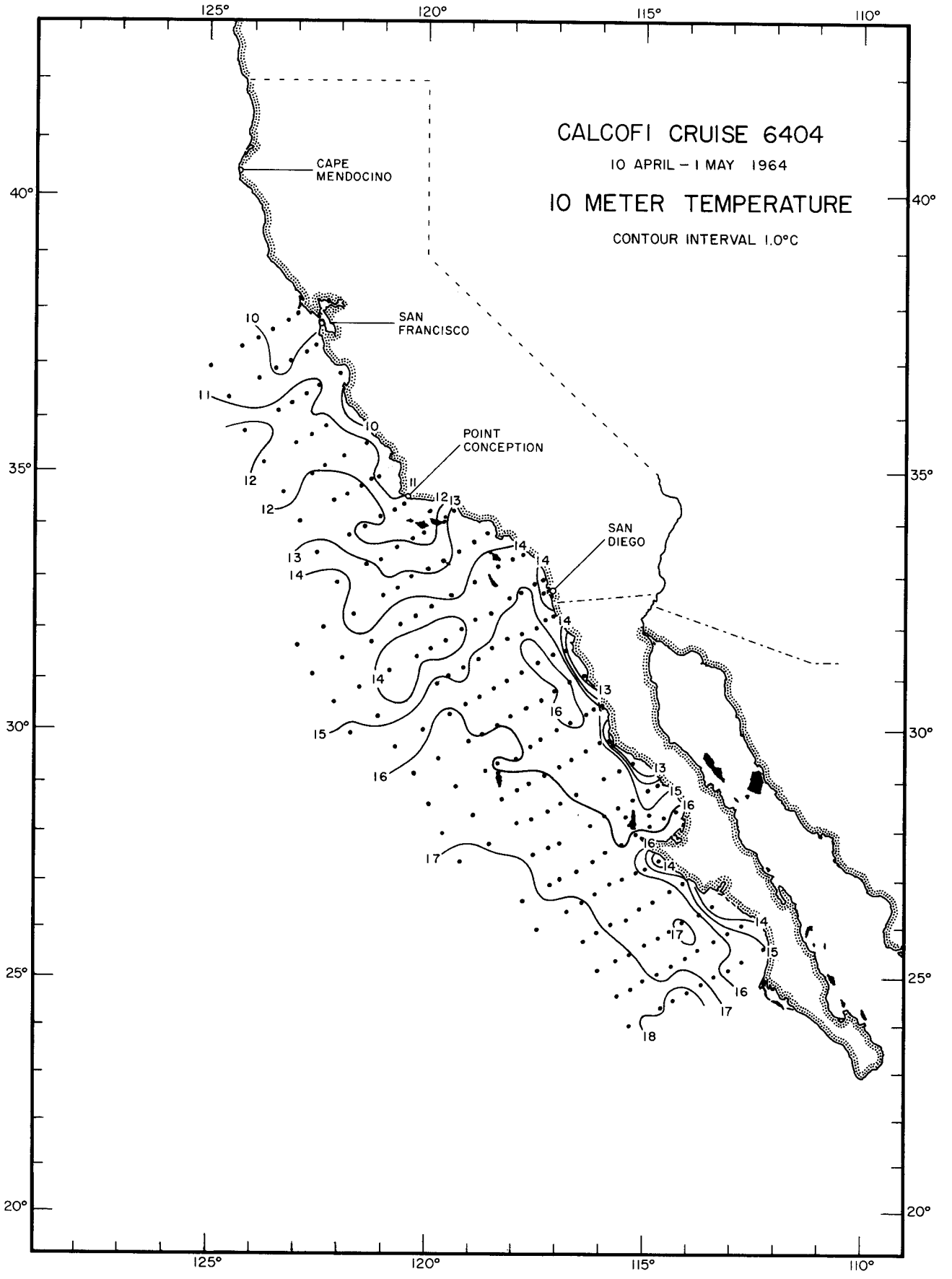

CALCOFI CRUISE 6310
2 - 29 OCTOBER 1963
10 METER TEMPERATURE
CONTOUR INTERVAL 1.0°C
CAPE MENDOCINO
SAN FRANCISCO
POINT CONCEPTION
PUNTA EUGENIA
125°
120°
115°
110°
40°
35°
30°
25°
20°

10m T

6310

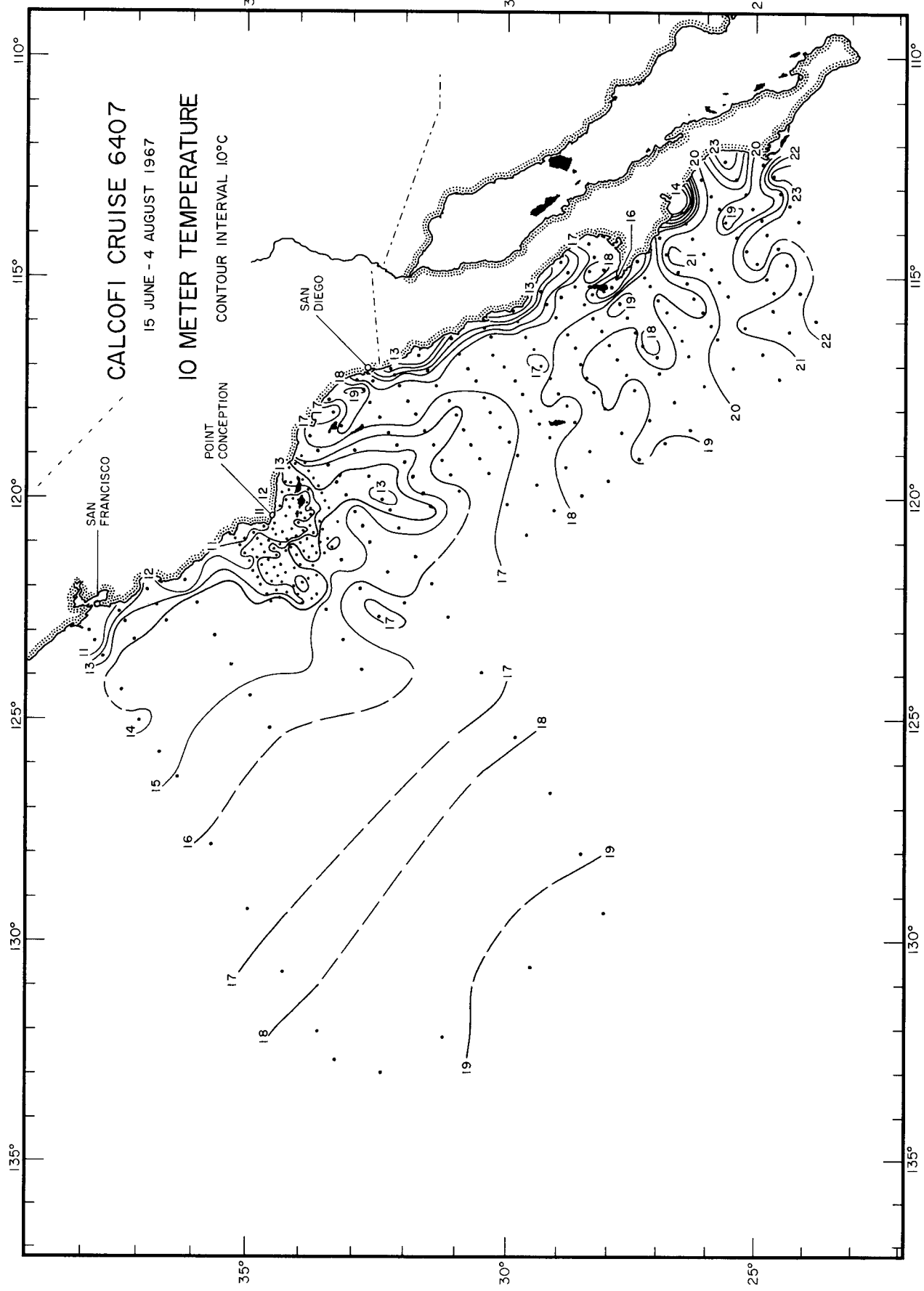

CALCOFI CRUISE 6401
9 JANUARY - 4 MARCH 1964
10 METER TEMPERATURE
CONTOUR INTERVAL 1.0°C
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
PUNTA EUGENIA
135°
130°
125°
120°
115°
110°
35°
30°
25°

10m T 6401


CALCOFI CRUISE 6404
10 APRIL – 1 MAY 1964
10 METER TEMPERATURE
CONTOUR INTERVAL 1.0°C
CAPE MENDOCINO
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
125°
120°
115°
110°
40°
35°
30°
25°
20°

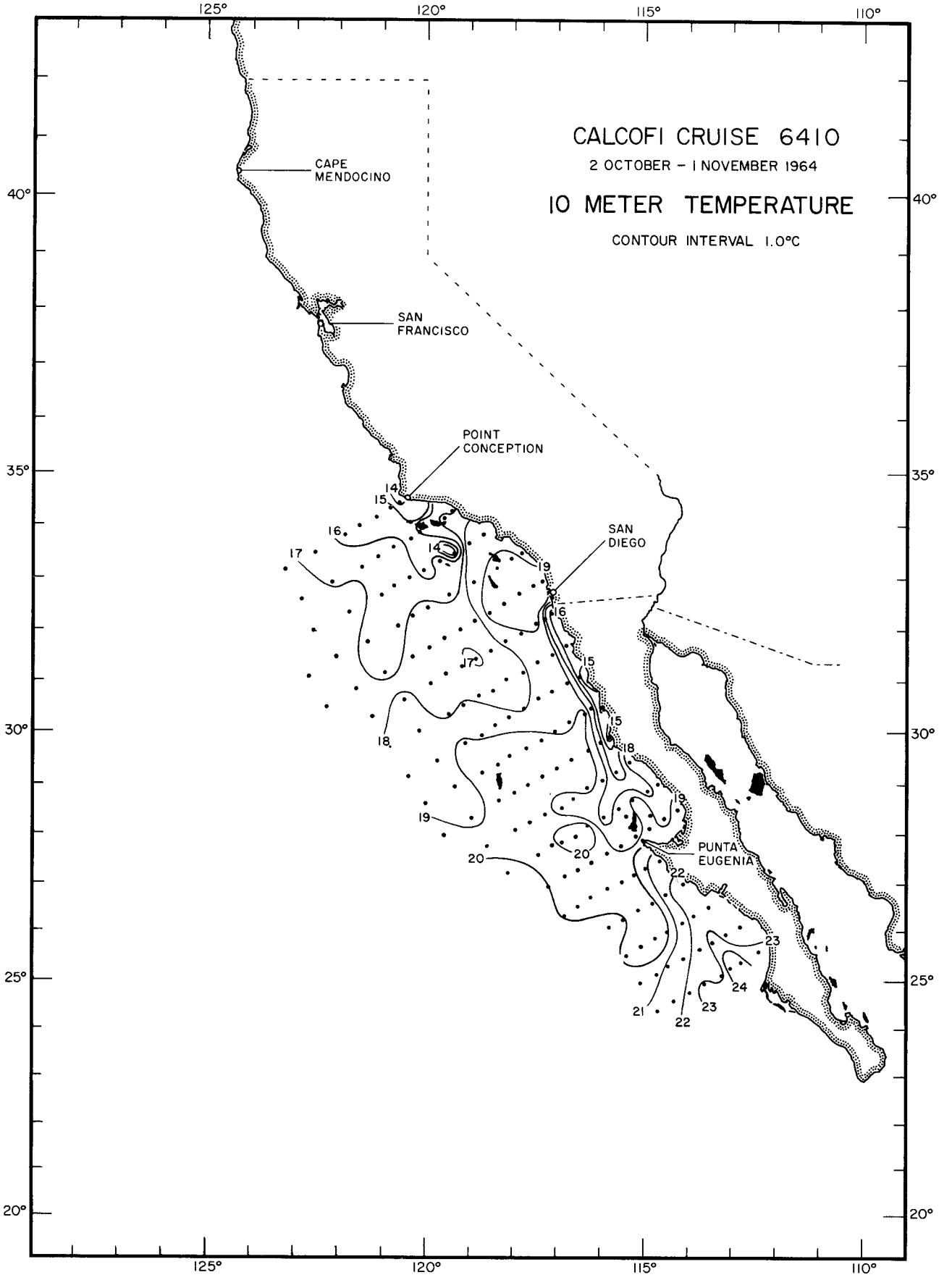
10m T

6404


CALCOFI CRUISE 6407
15 JUNE - 4 AUGUST 1967
10 METER TEMPERATURE
CONTOUR INTERVAL 1.0°C
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
35°
30°
25°
110°
115°
120°
125°
130°
135°

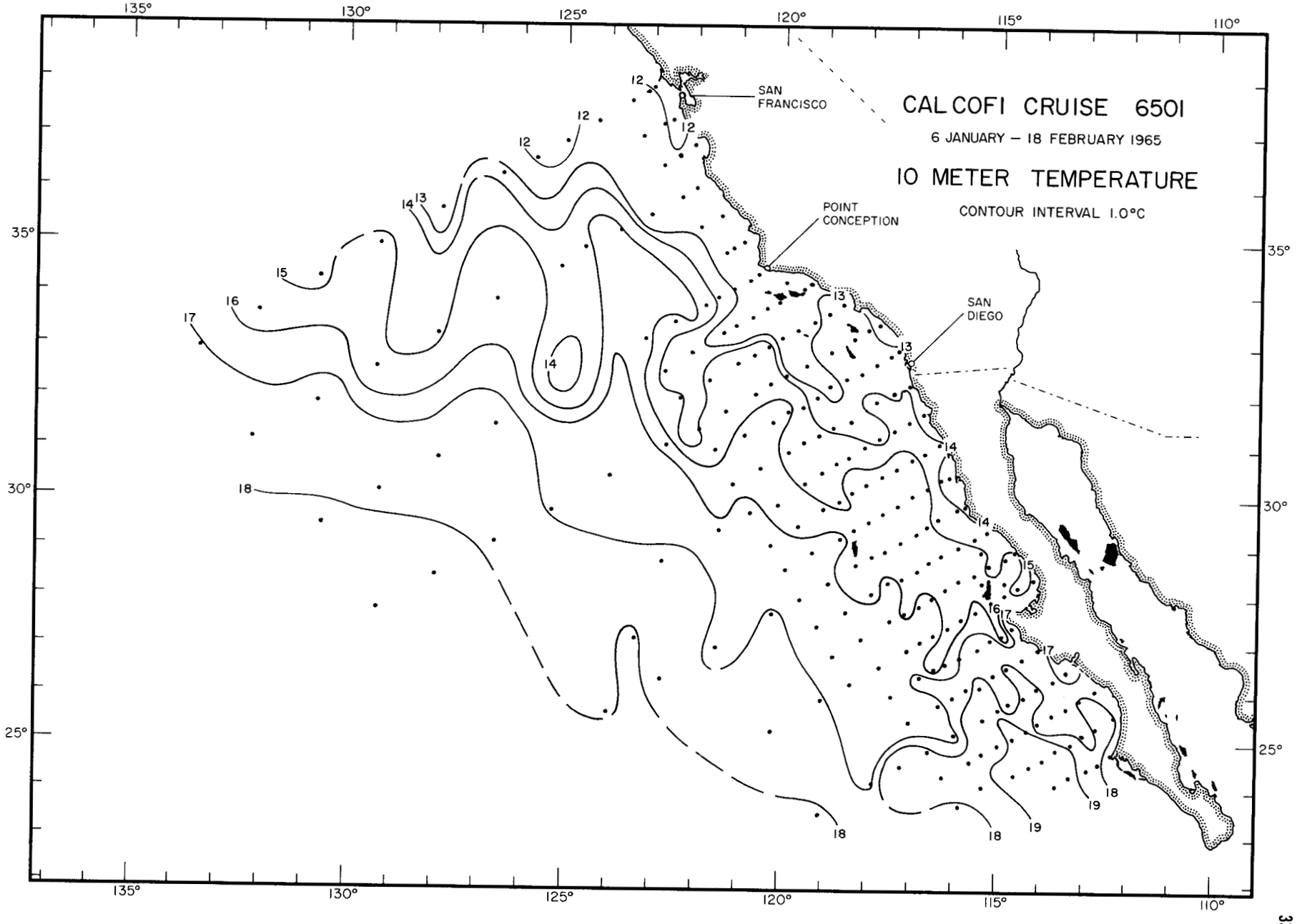
10m T

6407

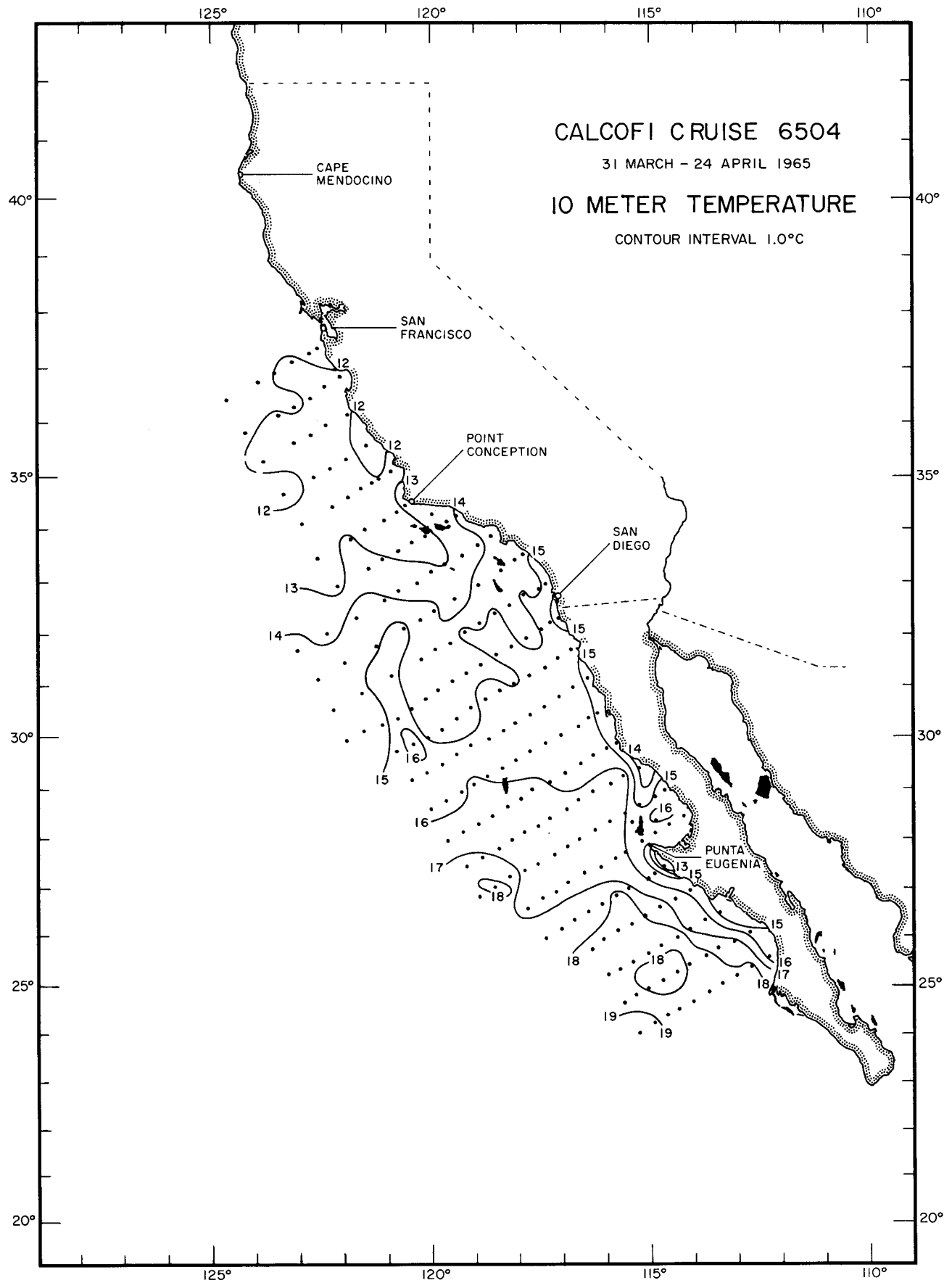

CALCOFI CRUISE 6410
2 OCTOBER – 1 NOVEMBER 1964
10 METER TEMPERATURE
CONTOUR INTERVAL 1.0°C
CAPE MENDOCINO
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
PUNTA EUGENIA
125°
120°
115°
110°
40°
35°
30°
25°
20°

10m T

6410

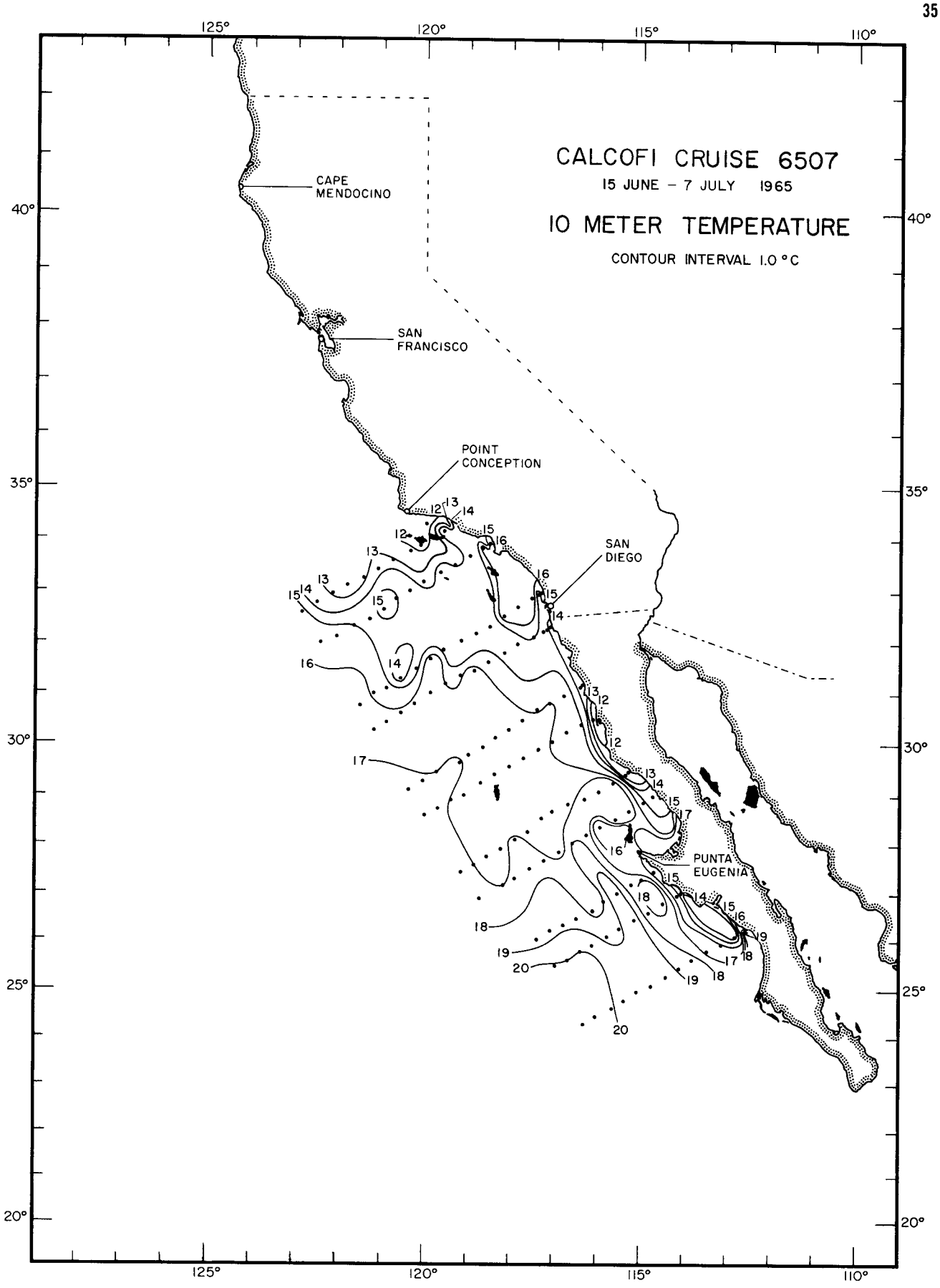

CALCOFI CRUISE 6501
6 JANUARY – 18 FEBRUARY 1965
10 METER TEMPERATURE
CONTOUR INTERVAL 1.0°C
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
135°
130°
125°
120°
115°
110°
35°
30°
25°

10m T 6501


CALCOFI CRUISE 6504
31 MARCH - 24 APRIL 1965
10 METER TEMPERATURE
CONTOUR INTERVAL 1.0°C
CAPE MENDOCINO
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
PUNTA EUGENIA
125°
120°
115°
110°
40°
35°
30°
25°
20°

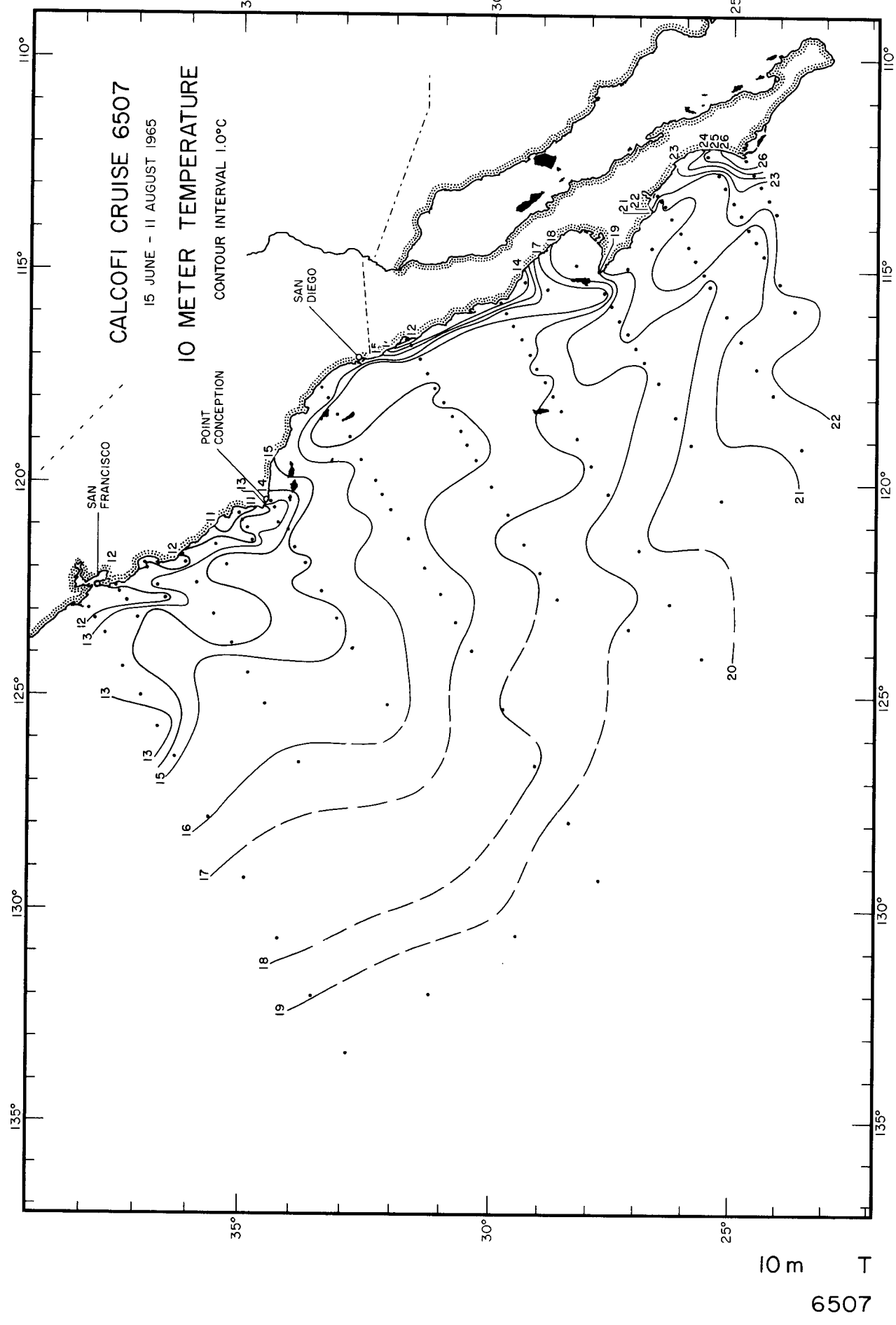
10m T

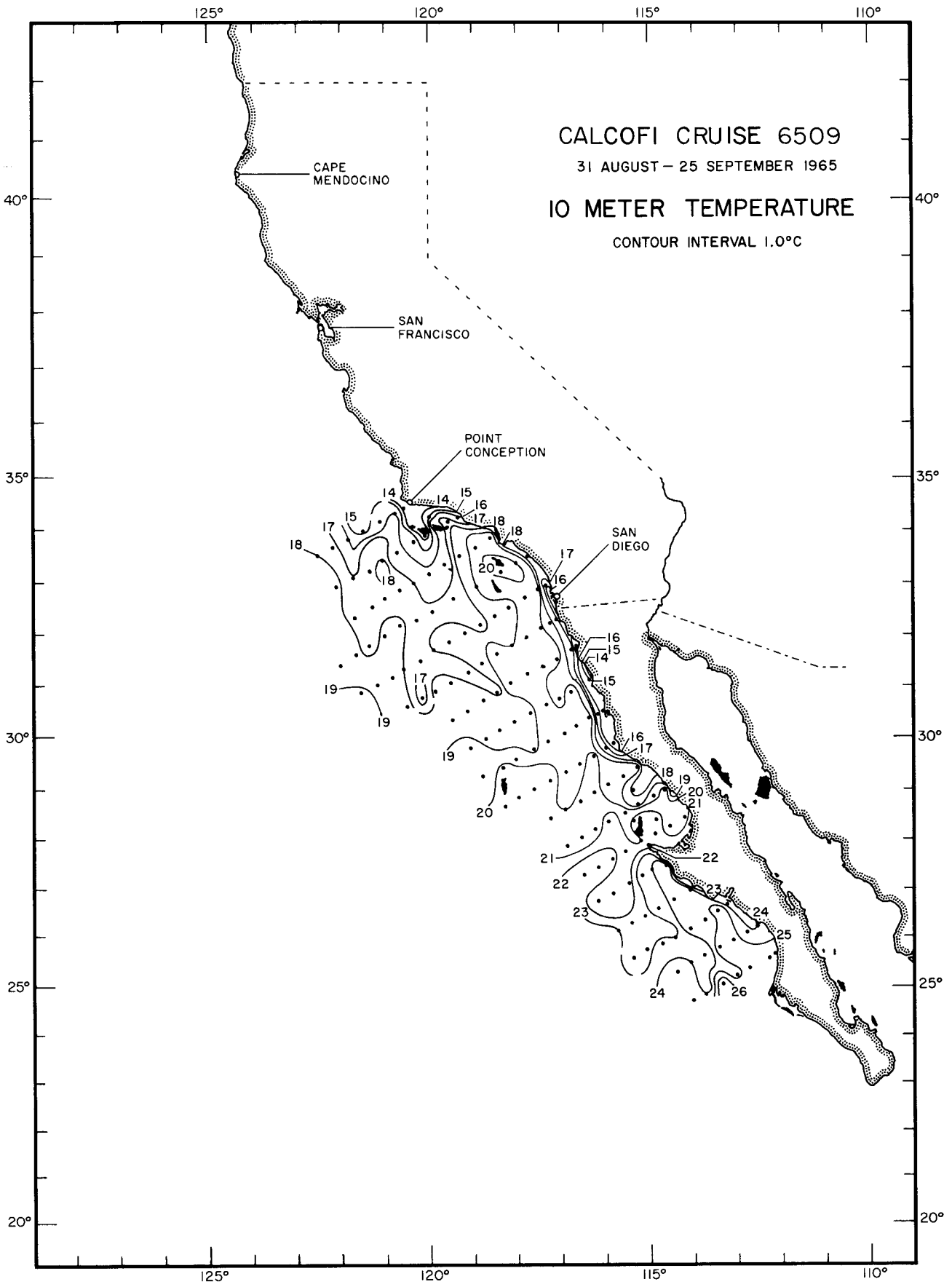
6504


CALCOFI CRUISE 6507
15 JUNE – 7 JULY 1965
10 METER TEMPERATURE
CONTOUR INTERVAL 1.0 °C
CAPE MENDOCINO
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
PUNTA EUGENIA
125°
120°
115°
110°
40°
35°
30°
25°
20°

10 m T

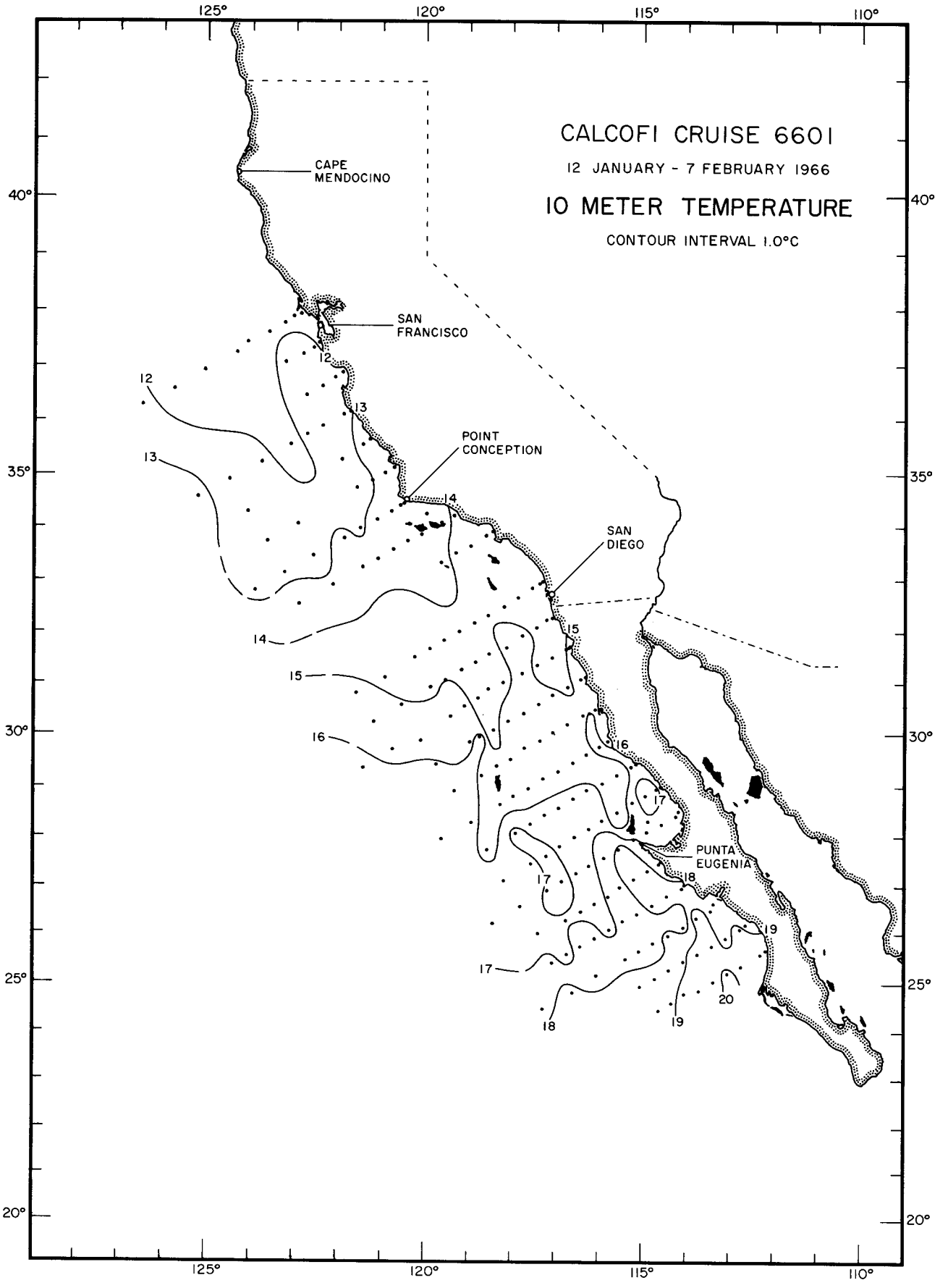
6507


CALCOFI CRUISE 6507
15 JUNE - 11 AUGUST 1965
10 METER TEMPERATURE
CONTOUR INTERVAL 1.0°C
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
35°
30°
25°
110°
115°
120°
125°
130°
135°
10 m T
6507


CALCOFI CRUISE 6509
31 AUGUST – 25 SEPTEMBER 1965
10 METER TEMPERATURE
CONTOUR INTERVAL 1.0°C
CAPE MENDOCINO
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
125°
120°
115°
110°
40°
35°
30°
25°
20°

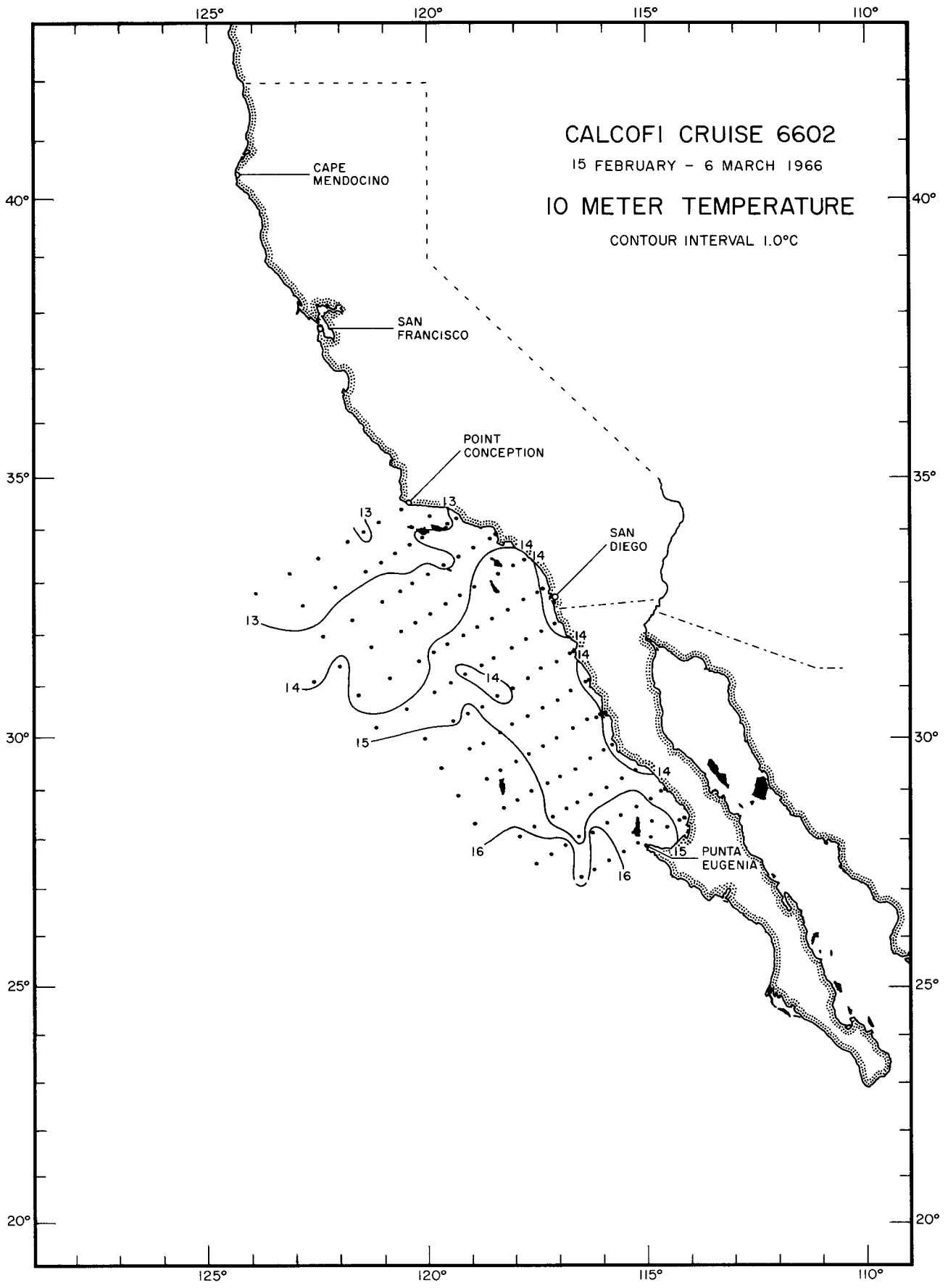
10m T

6509


CALCOFI CRUISE 6601
12 JANUARY - 7 FEBRUARY 1966
10 METER TEMPERATURE
CONTOUR INTERVAL 1.0°C
CAPE MENDOCINO
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
PUNTA EUGENIA
125°
120°
115°
110°
40°
35°
30°
25°
20°
12
13
14
15
16
17
18
19
20

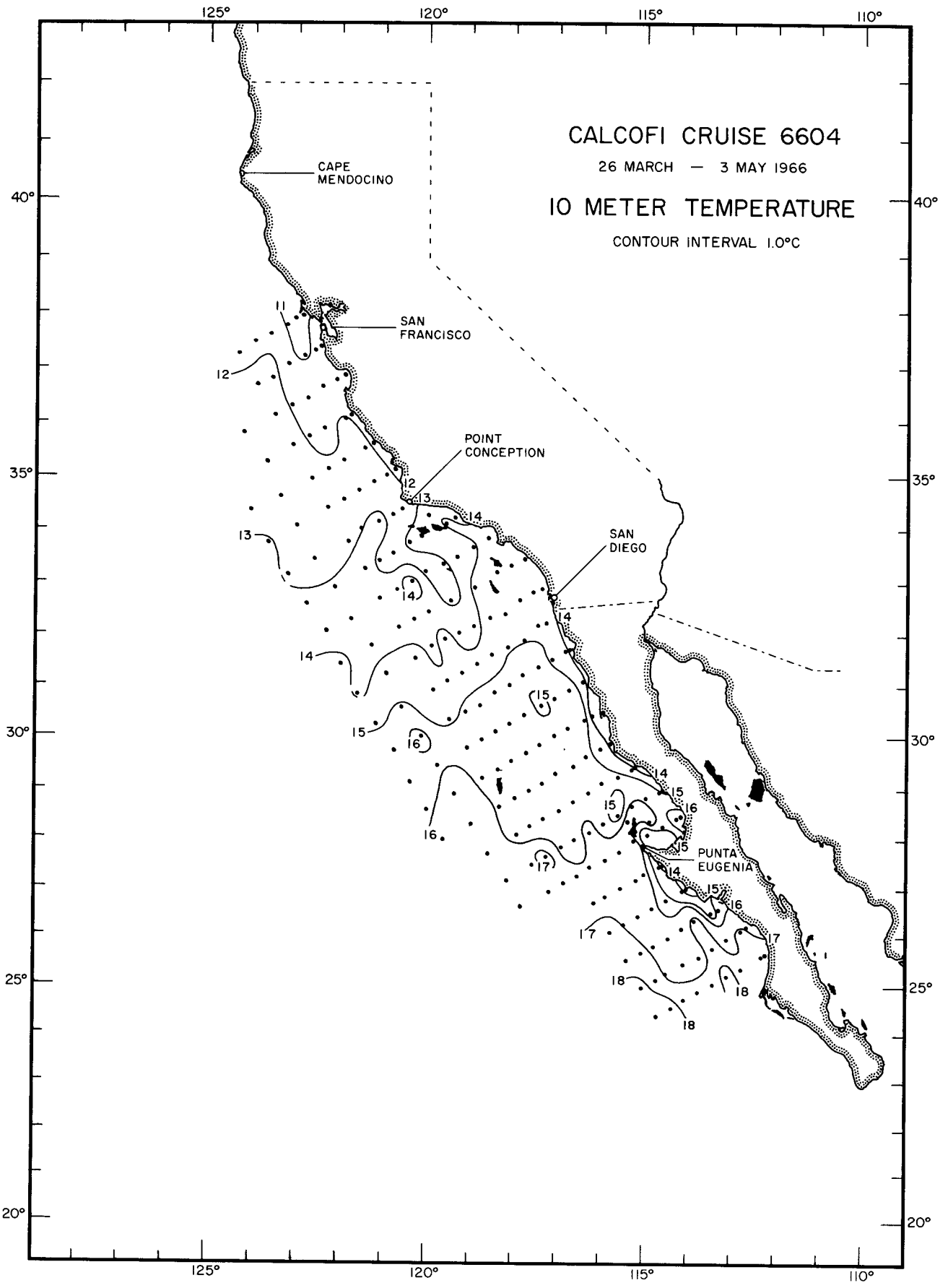
10m T

6601


CALCOFI CRUISE 6602
15 FEBRUARY - 6 MARCH 1966
10 METER TEMPERATURE
CONTOUR INTERVAL 1.0°C
CAPE MENDOCINO
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
PUNTA EUGENIA
125°
120°
115°
110°
40°
35°
30°
25°
20°
13
14
15
16

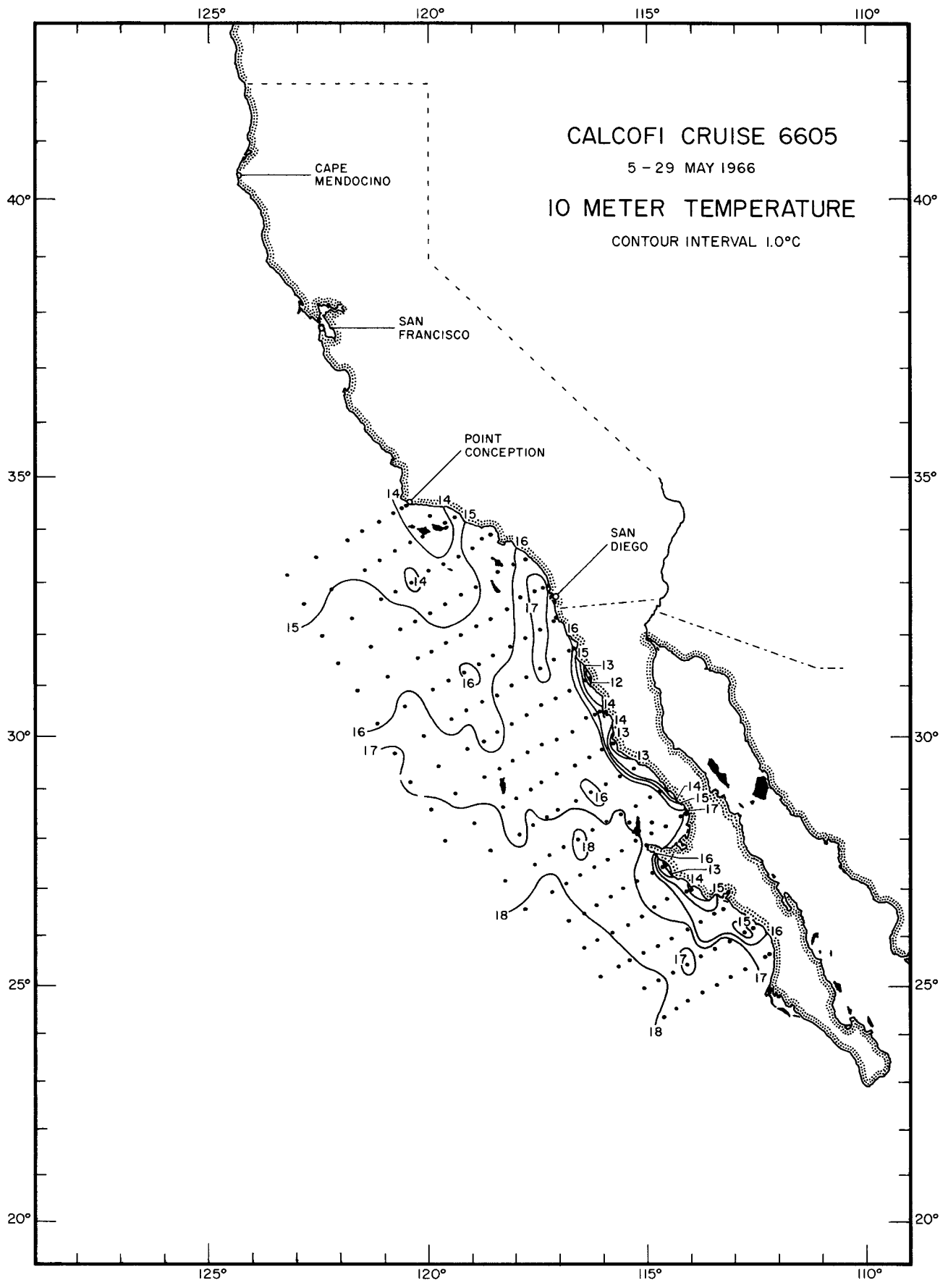
10m T

6602


CALCOFI CRUISE 6604
26 MARCH — 3 MAY 1966
10 METER TEMPERATURE
CONTOUR INTERVAL 1.0°C
CAPE MENDOCINO
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
PUNTA EUGENIA
125°
120°
115°
110°
40°
35°
30°
25°
20°

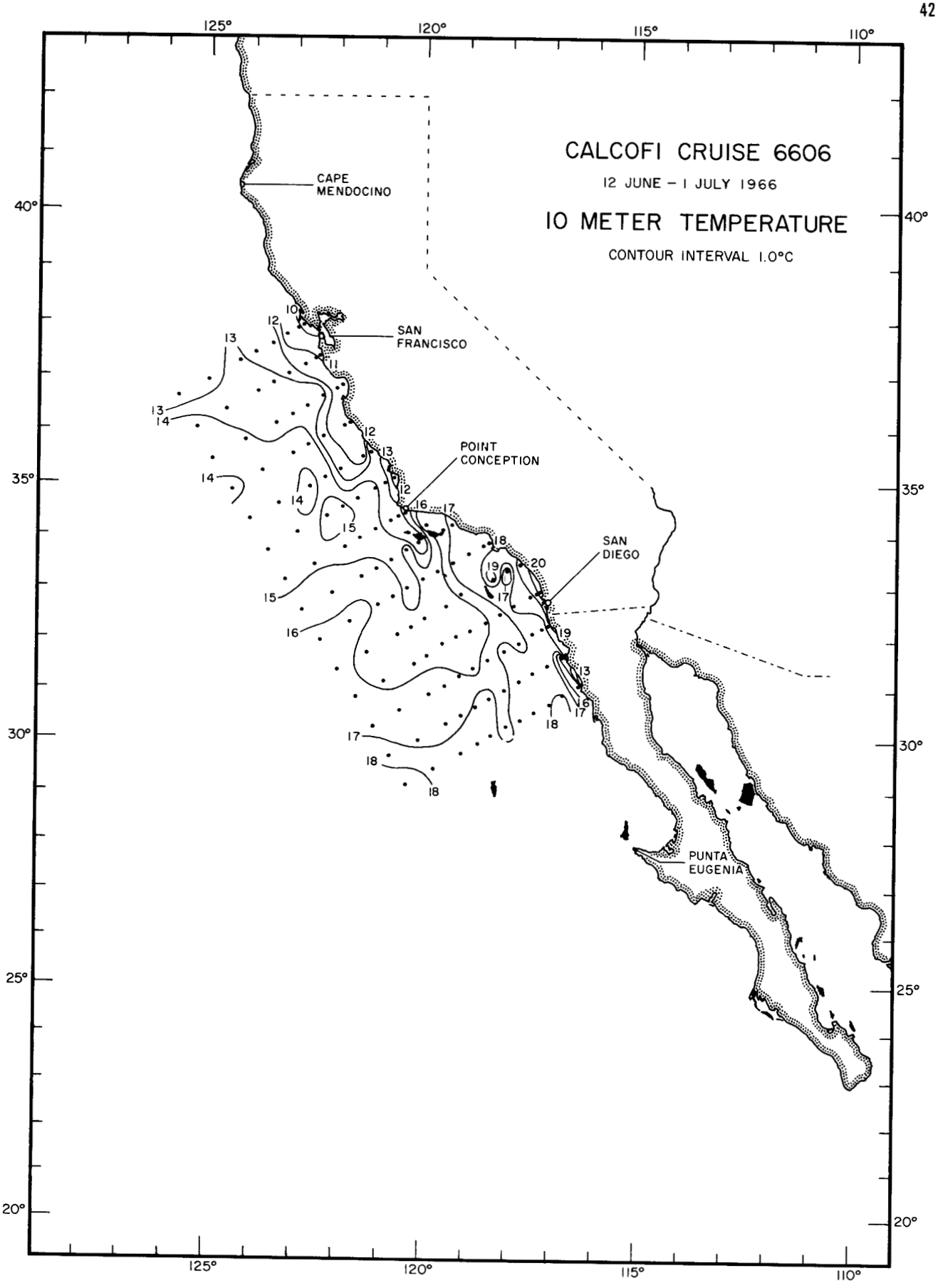
10m T

6604


CALCOFI CRUISE 6605
5 - 29 MAY 1966
10 METER TEMPERATURE
CONTOUR INTERVAL 1.0°C
CAPE MENDOCINO
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
125°
120°
115°
110°
40°
35°
30°
25°
20°

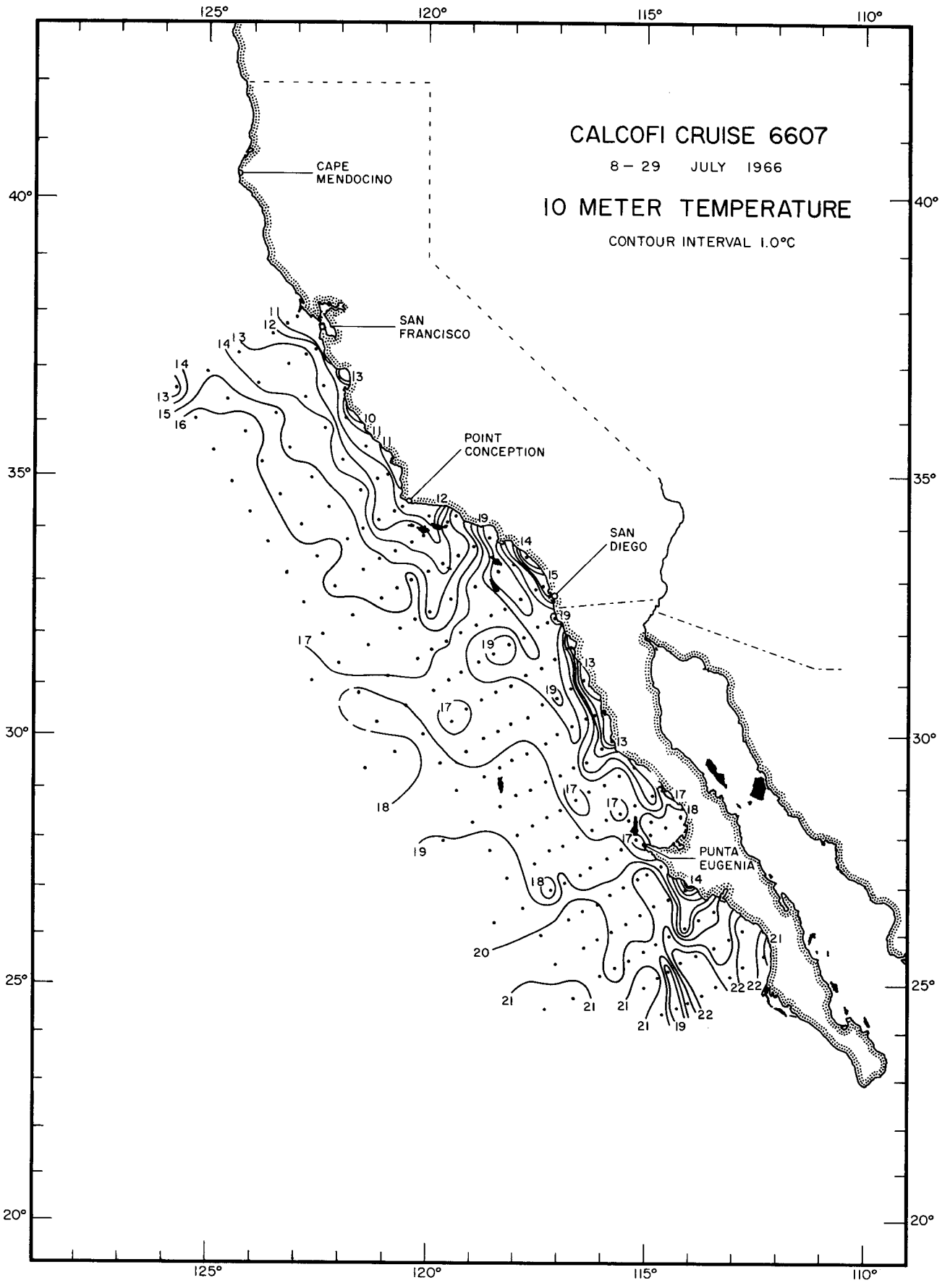
10 m T

6605


CALCOFI CRUISE 6606
12 JUNE – 1 JULY 1966
10 METER TEMPERATURE
CONTOUR INTERVAL 1.0°C
CAPE MENDOCINO
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
PUNTA EUGENIA
125°
120°
115°
110°
40°
35°
30°
25°
20°

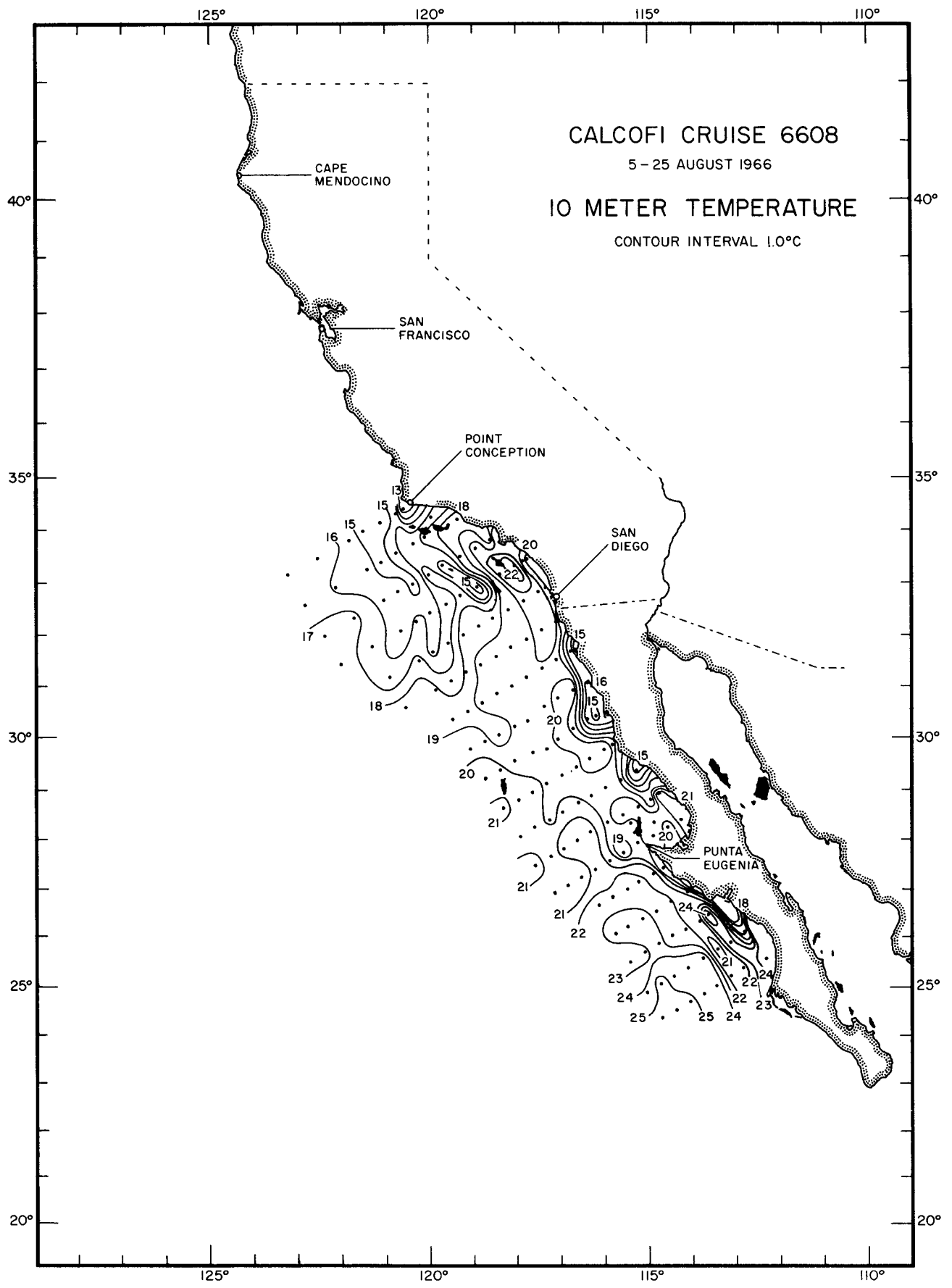
10m T

6606


CALCOFI CRUISE 6607
8 – 29 JULY 1966
10 METER TEMPERATURE
CONTOUR INTERVAL 1.0°C
CAPE MENDOCINO
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
PUNTA EUGENIA
125°
120°
115°
110°
40°
35°
30°
25°
20°

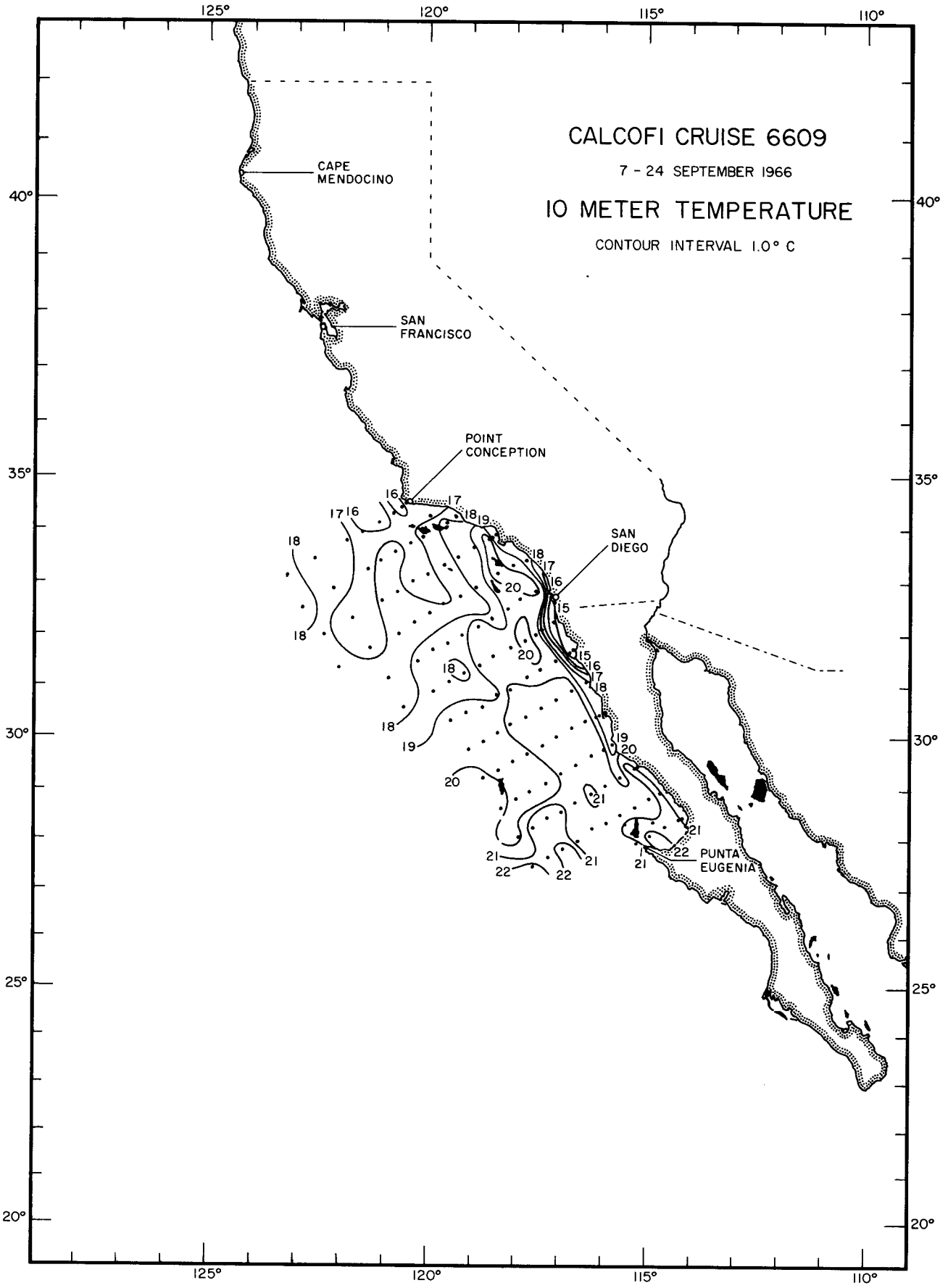
10 m T

6607


CALCOFI CRUISE 6608
5 - 25 AUGUST 1966
10 METER TEMPERATURE
CONTOUR INTERVAL 1.0°C
CAPE MENDOCINO
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
PUNTA EUGENIA
125°
120°
115°
110°
40°
35°
30°
25°
20°

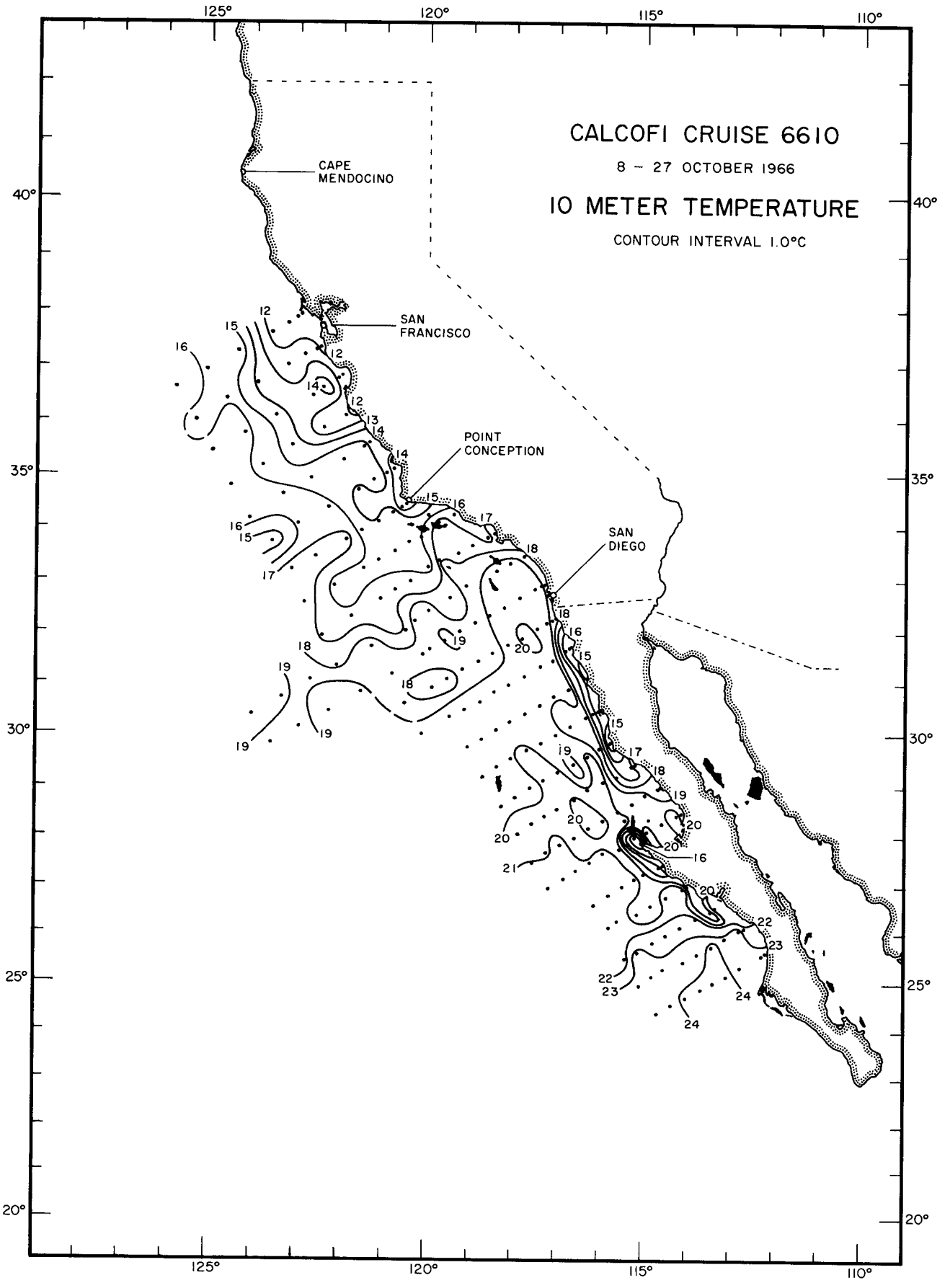
10m T

6608


CALCOFI CRUISE 6609
7 - 24 SEPTEMBER 1966
10 METER TEMPERATURE
CONTOUR INTERVAL 1.0° C
CAPE MENDOCINO
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
PUNTA EUGENIA
125°
120°
115°
110°
40°
35°
30°
25°
20°

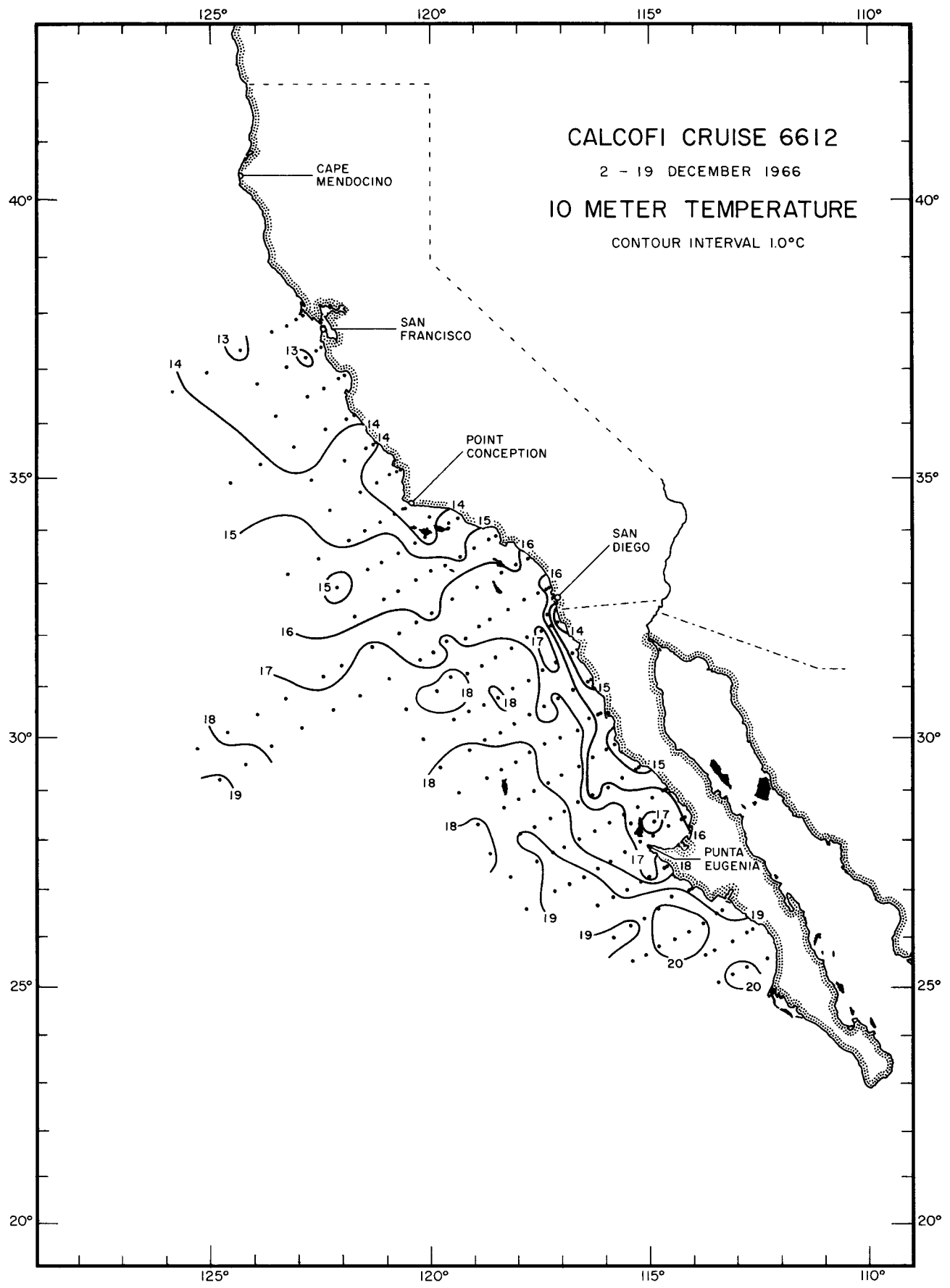
10m T

6609


CALCOFI CRUISE 6610
8 – 27 OCTOBER 1966
10 METER TEMPERATURE
CONTOUR INTERVAL 1.0°C
CAPE MENDOCINO
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
125°
120°
115°
110°
40°
35°
30°
25°
20°

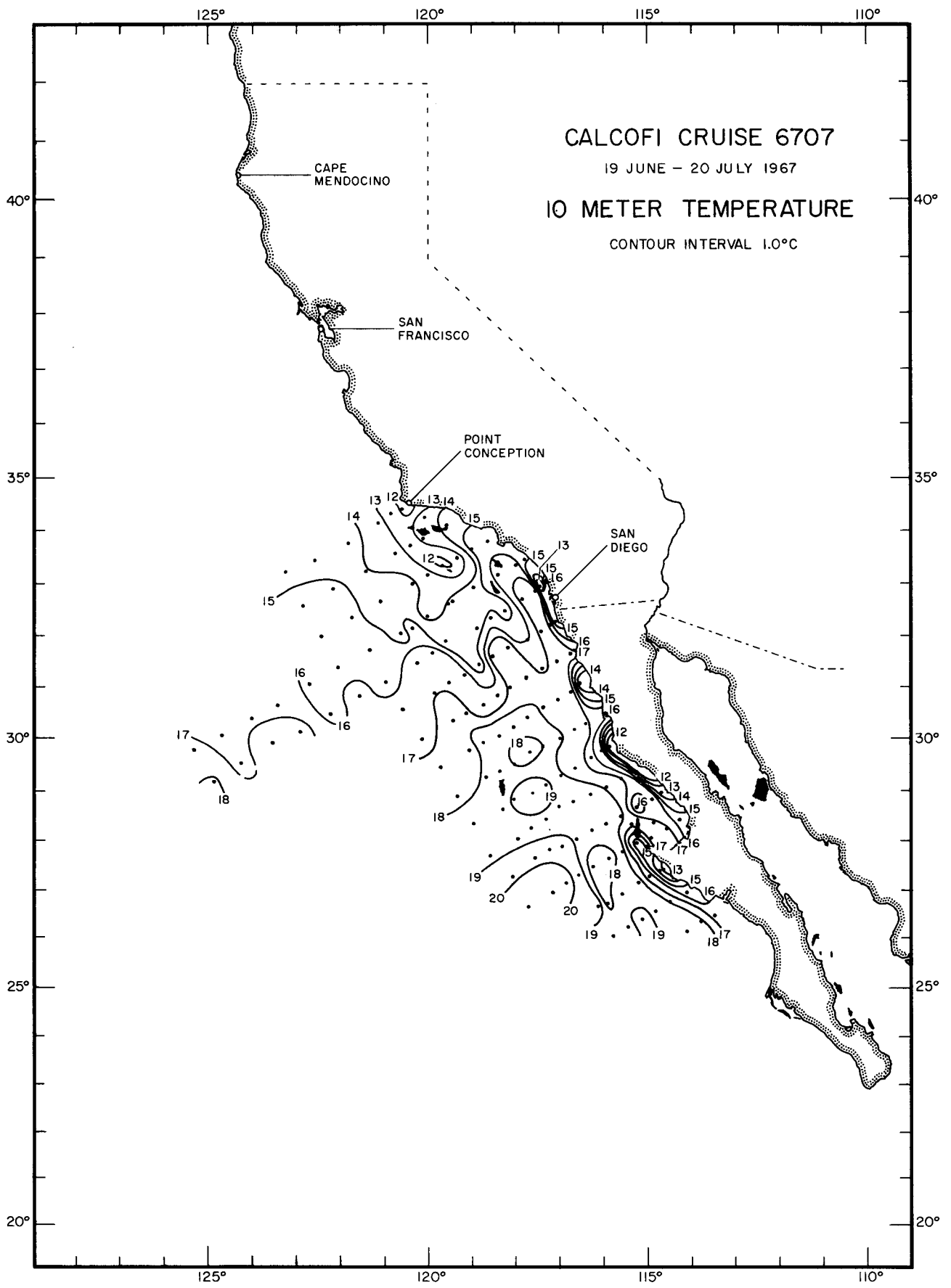
10m T

6610


CALCOFI CRUISE 6612
2 - 19 DECEMBER 1966
10 METER TEMPERATURE
CONTOUR INTERVAL 1.0°C
CAPE MENDOCINO
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
PUNTA EUGENIA
125°
120°
115°
110°
40°
35°
30°
25°
20°

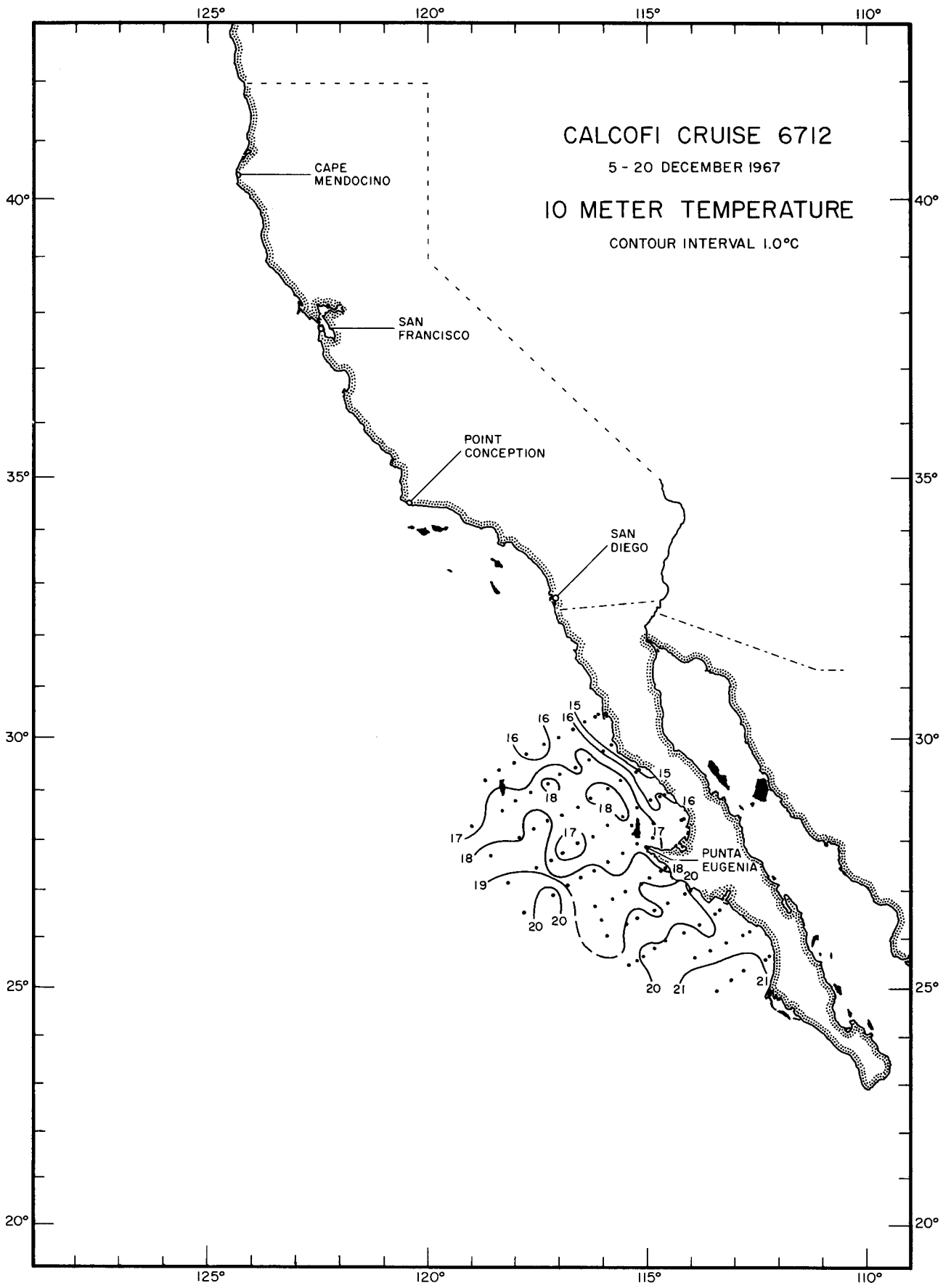
10m T

6612


CALCOFI CRUISE 6707
19 JUNE – 20 JULY 1967
10 METER TEMPERATURE
CONTOUR INTERVAL 1.0°C
CAPE MENDOCINO
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
125°
120°
115°
110°
40°
35°
30°
25°
20°

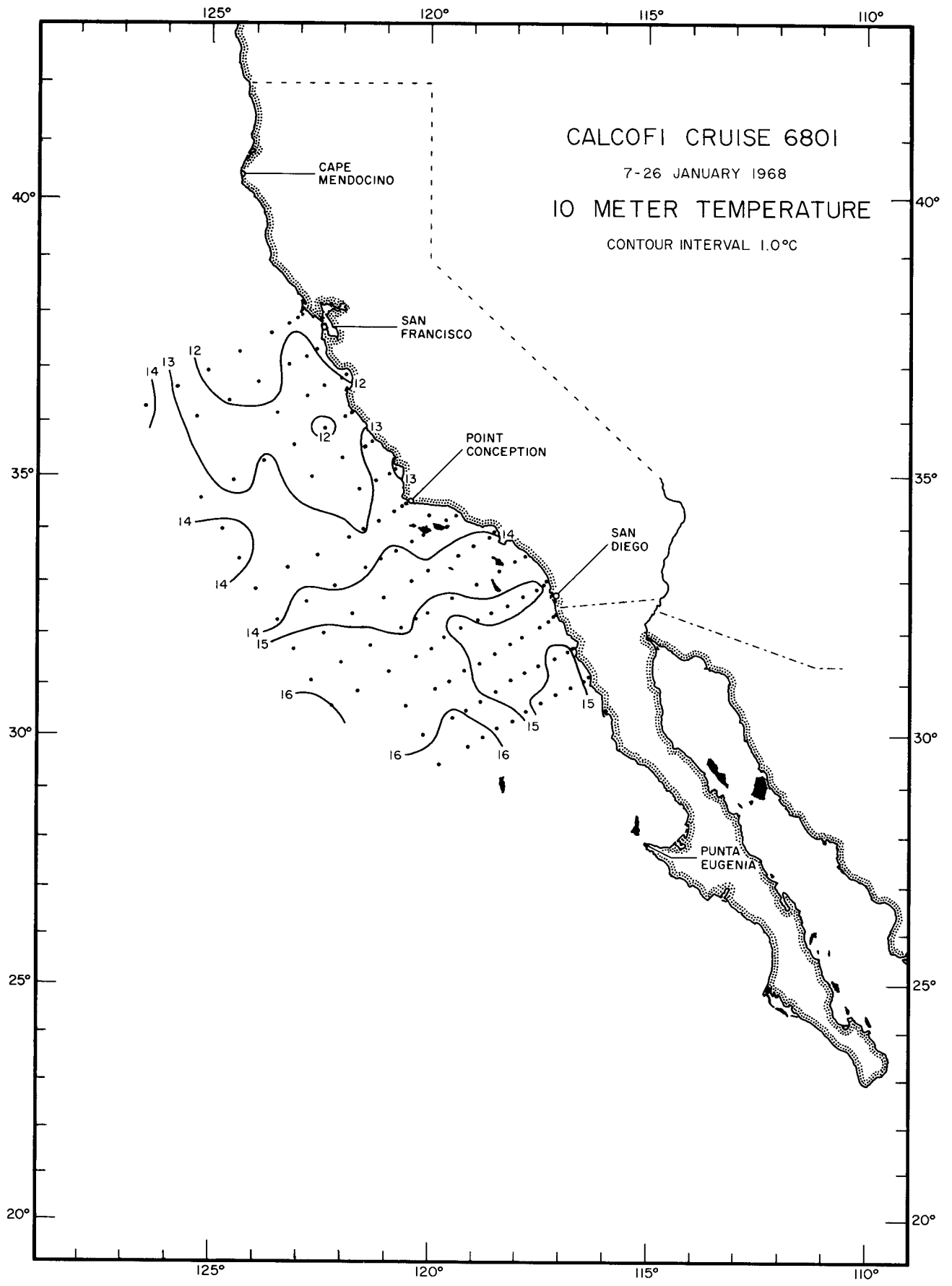
10m T

6707


CALCOFI CRUISE 6712
5 - 20 DECEMBER 1967
10 METER TEMPERATURE
CONTOUR INTERVAL 1.0°C
CAPE MENDOCINO
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
PUNTA EUGENIA
125°
120°
115°
110°
40°
35°
30°
25°
20°

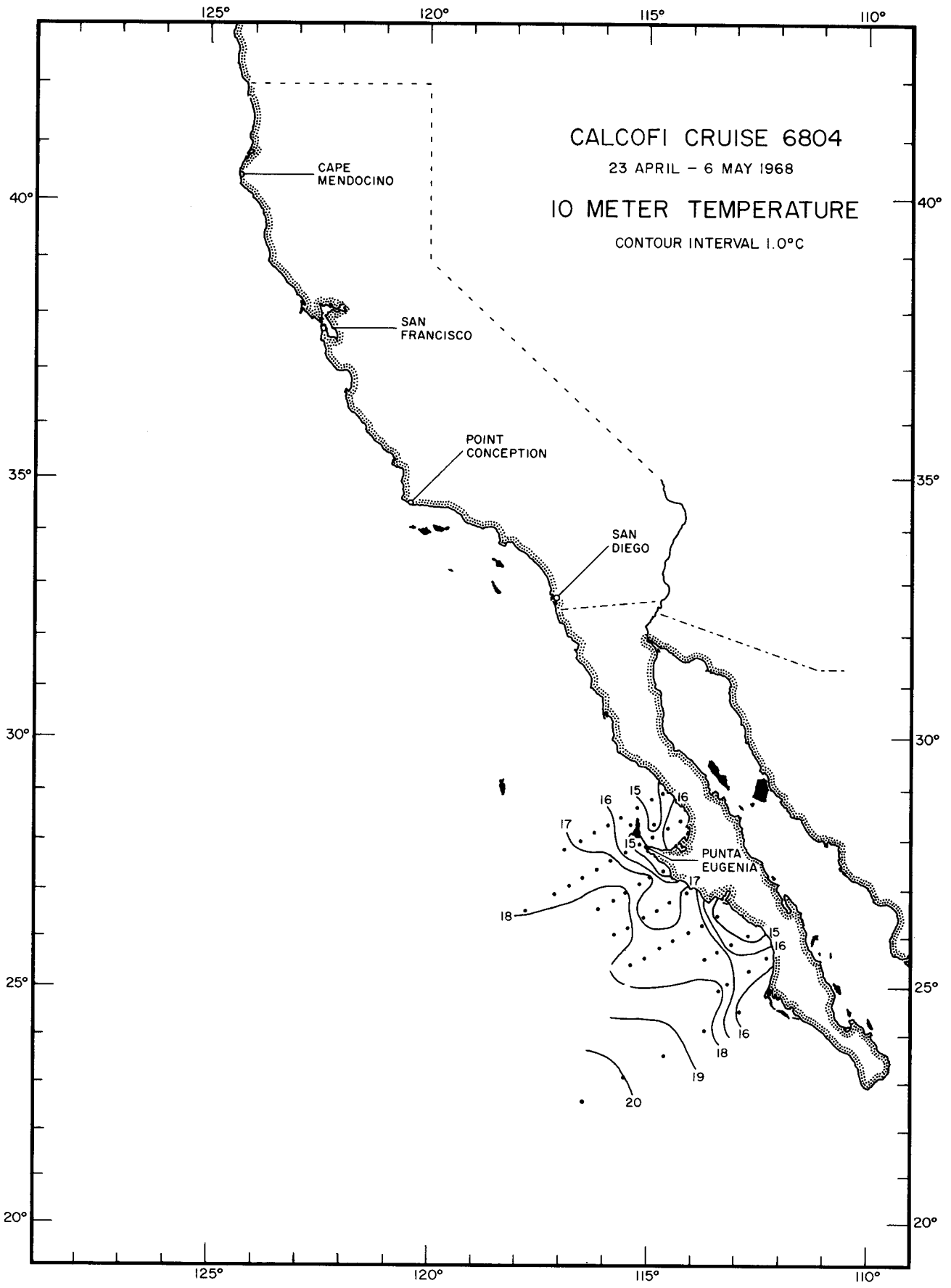
10m T

6712


CALCOFI CRUISE 6801
7-26 JANUARY 1968
10 METER TEMPERATURE
CONTOUR INTERVAL 1.0°C
CAPE MENDOCINO
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
PUNTA EUGENIA
125°
120°
115°
110°
40°
35°
30°
25°
20°
12
13
14
15
16

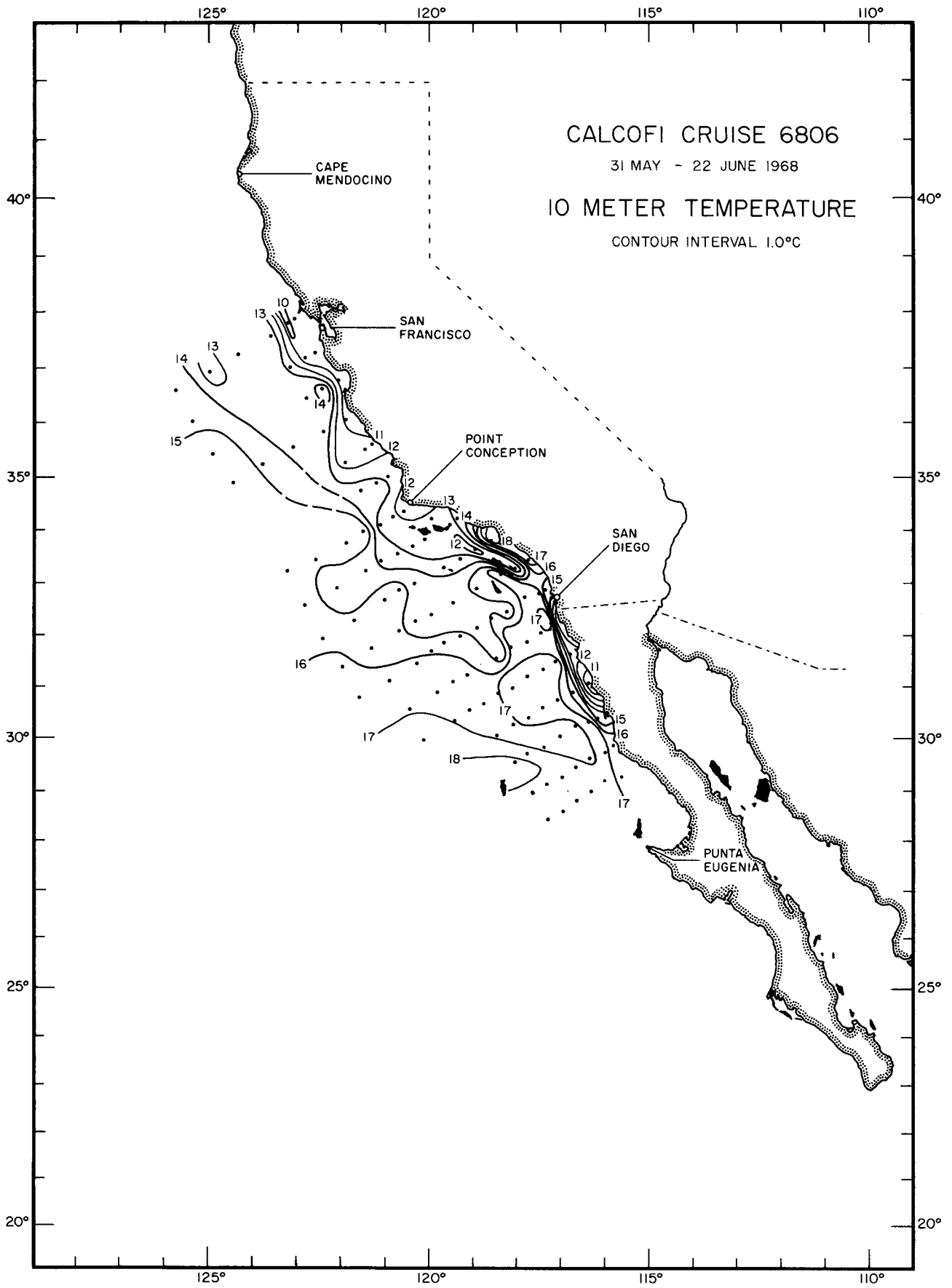
10m T

6801


CALCOFI CRUISE 6804
23 APRIL – 6 MAY 1968
10 METER TEMPERATURE
CONTOUR INTERVAL 1.0°C
CAPE MENDOCINO
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
PUNTA EUGENIA
125°
120°
115°
110°
40°
35°
30°
25°
20°
15
16
17
18
19
20

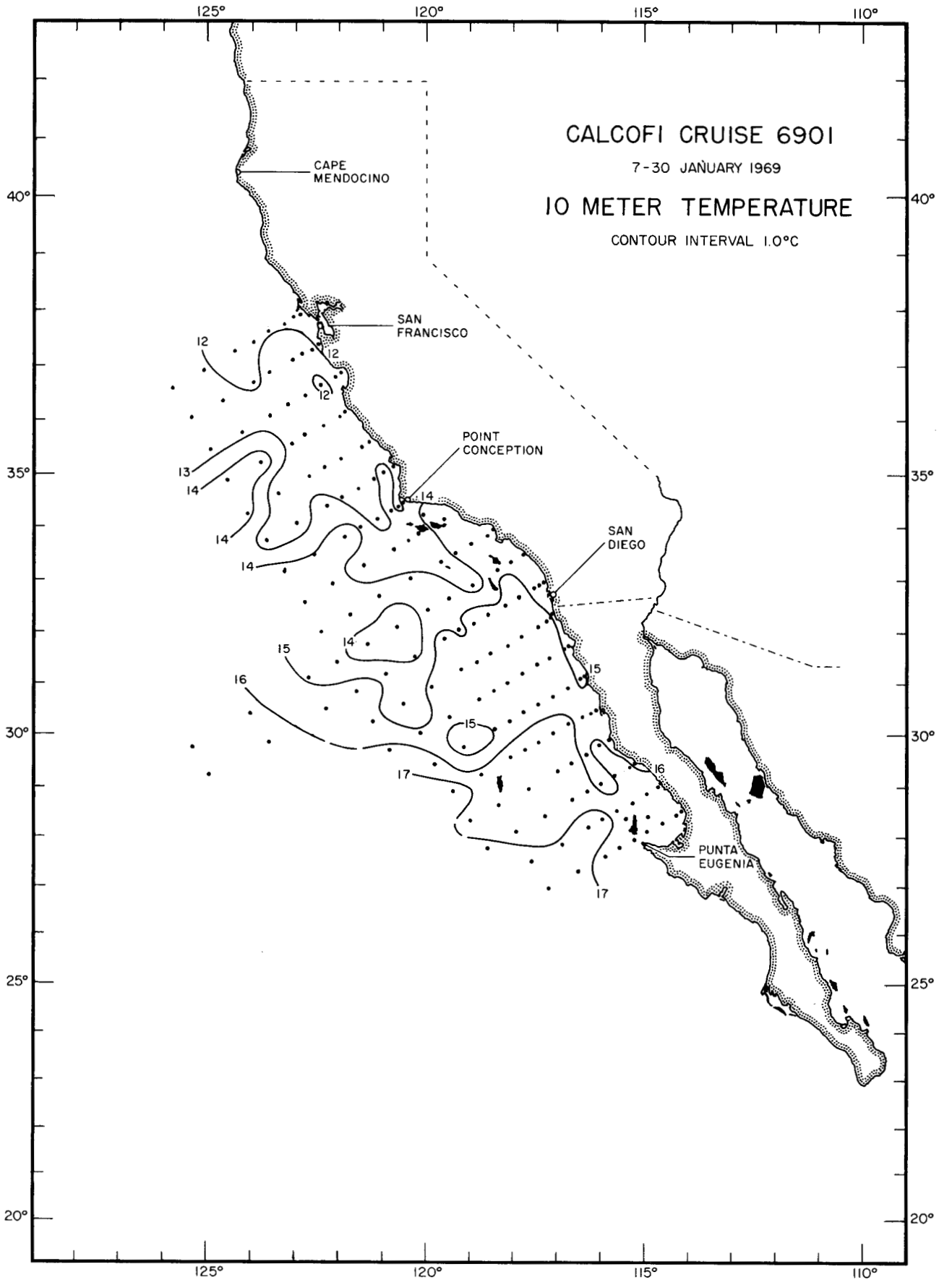
10m T

6804


CALCOFI CRUISE 6806
31 MAY - 22 JUNE 1968
10 METER TEMPERATURE
CONTOUR INTERVAL 1.0°C
CAPE MENDOCINO
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
PUNTA EUGENIA
125°
120°
115°
110°
40°
35°
30°
25°
20°

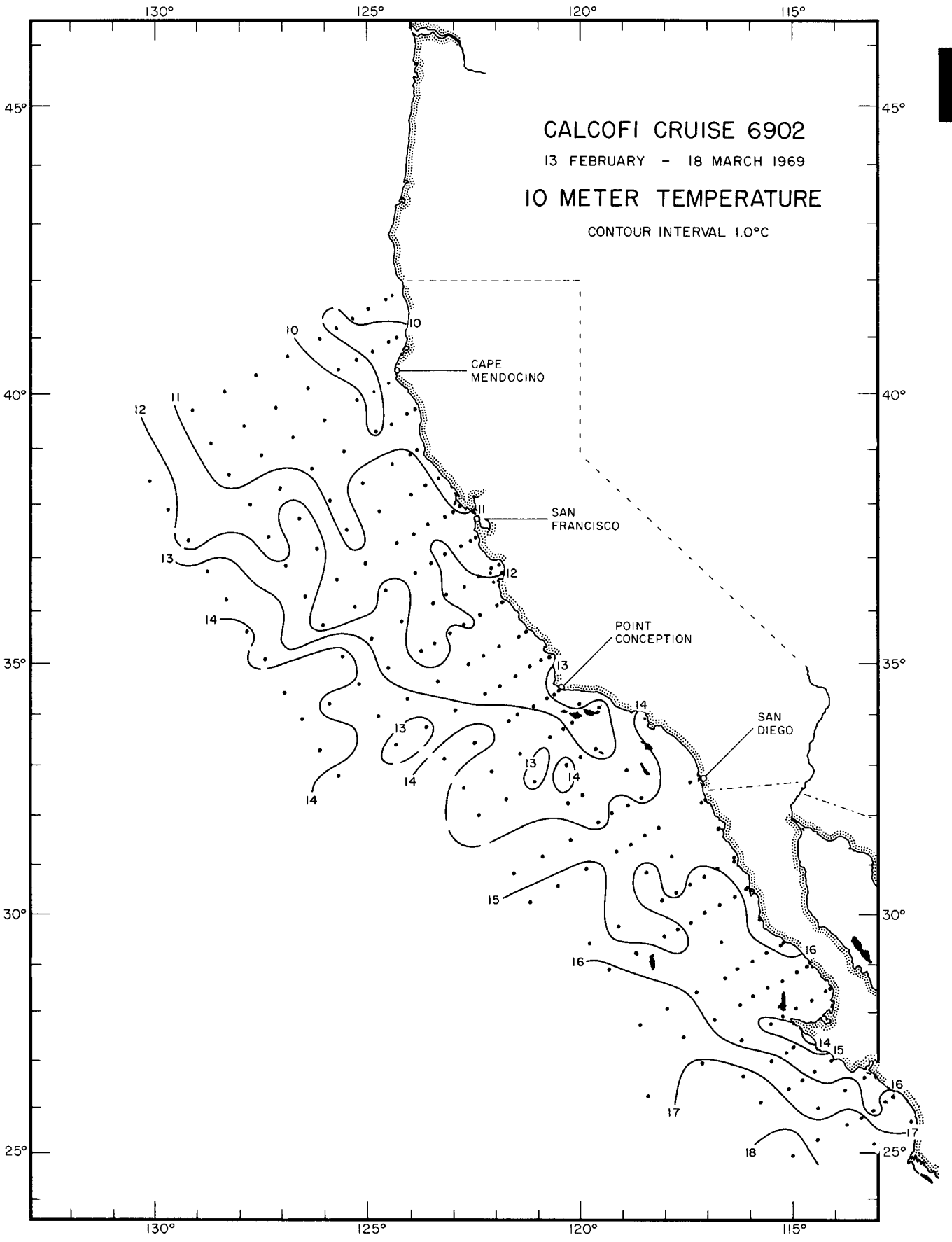
10m T

6806


CALCOFI CRUISE 6901
7-30 JANUARY 1969
10 METER TEMPERATURE
CONTOUR INTERVAL 1.0°C
CAPE MENDOCINO
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
PUNTA EUGENIA
125°
120°
115°
110°
40°
35°
30°
25°
20°
12
13
14
15
16
17

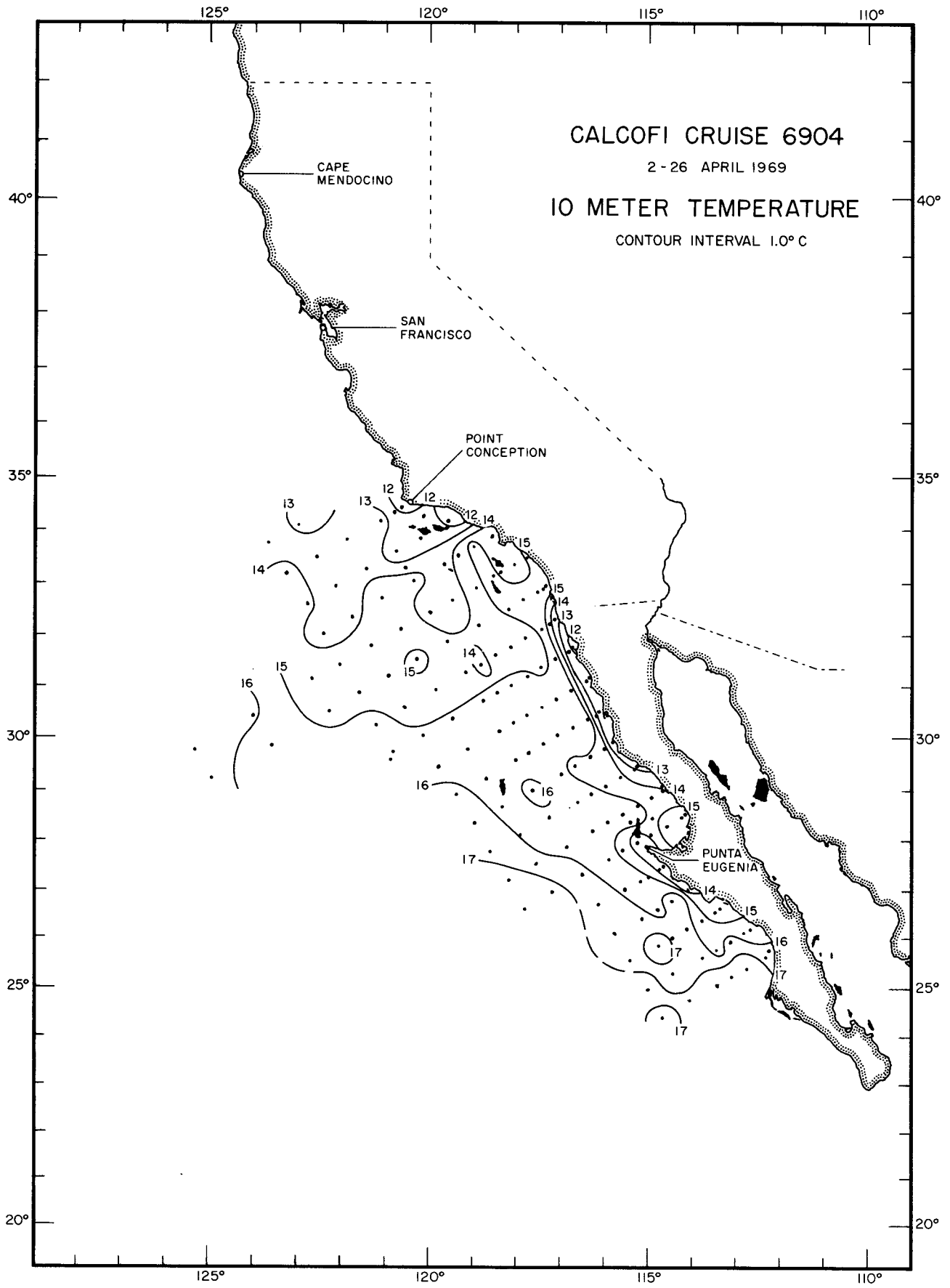
10m T

6901


CALCOFI CRUISE 6902
13 FEBRUARY - 18 MARCH 1969
10 METER TEMPERATURE
CONTOUR INTERVAL 1.0°C
CAPE MENDOCINO
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
130°
125°
120°
115°
45°
40°
35°
30°
25°
10
11
12
13
14
15
16
17
18

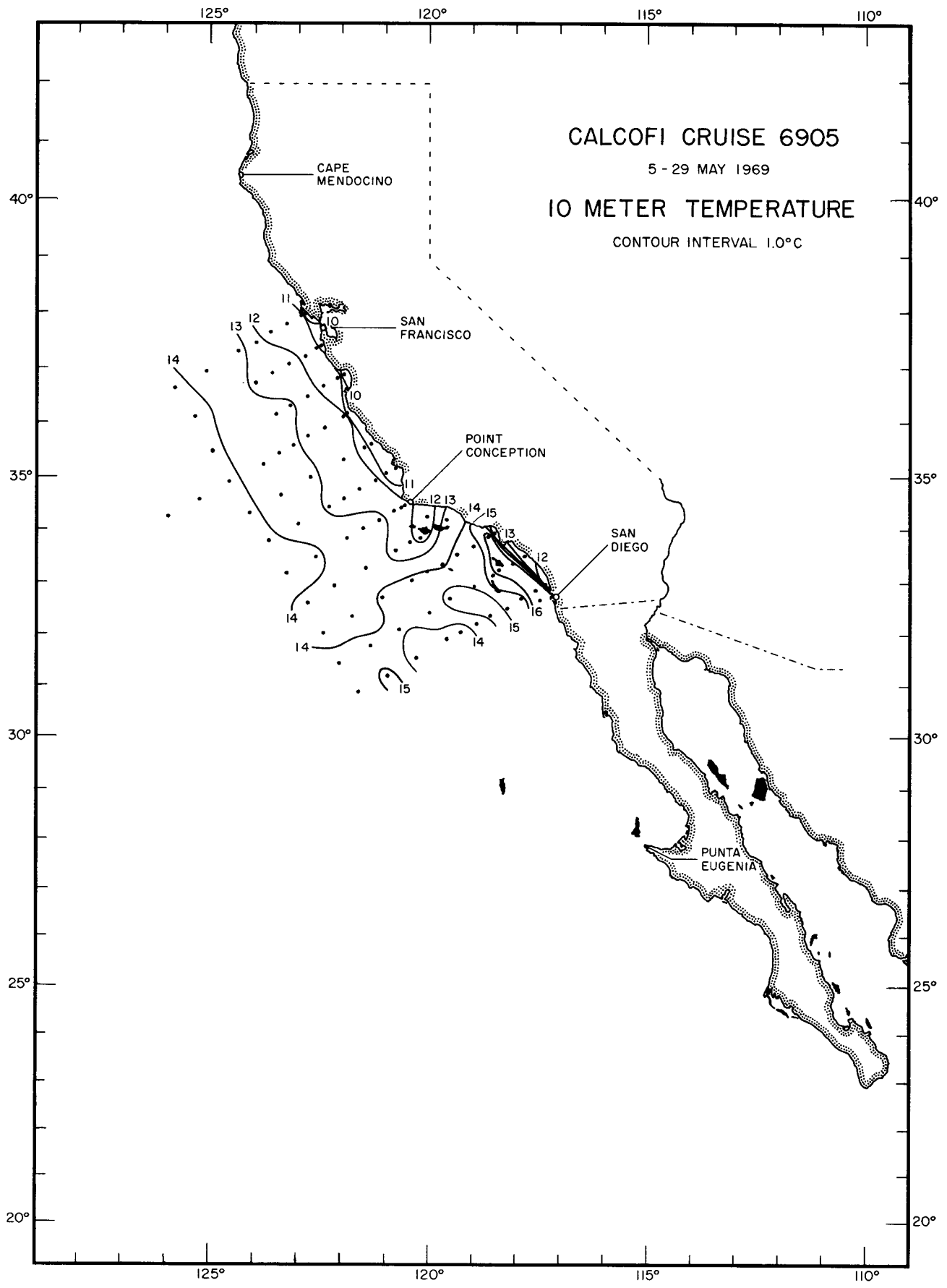
10m T

6902


CALCOFI CRUISE 6904
2 - 26 APRIL 1969
10 METER TEMPERATURE
CONTOUR INTERVAL 1.0° C
CAPE MENDOCINO
SAN FRANCISCO
POINT CONCEPTION
PUNTA EUGENIA
125°
120°
115°
110°
40°
35°
30°
25°
20°

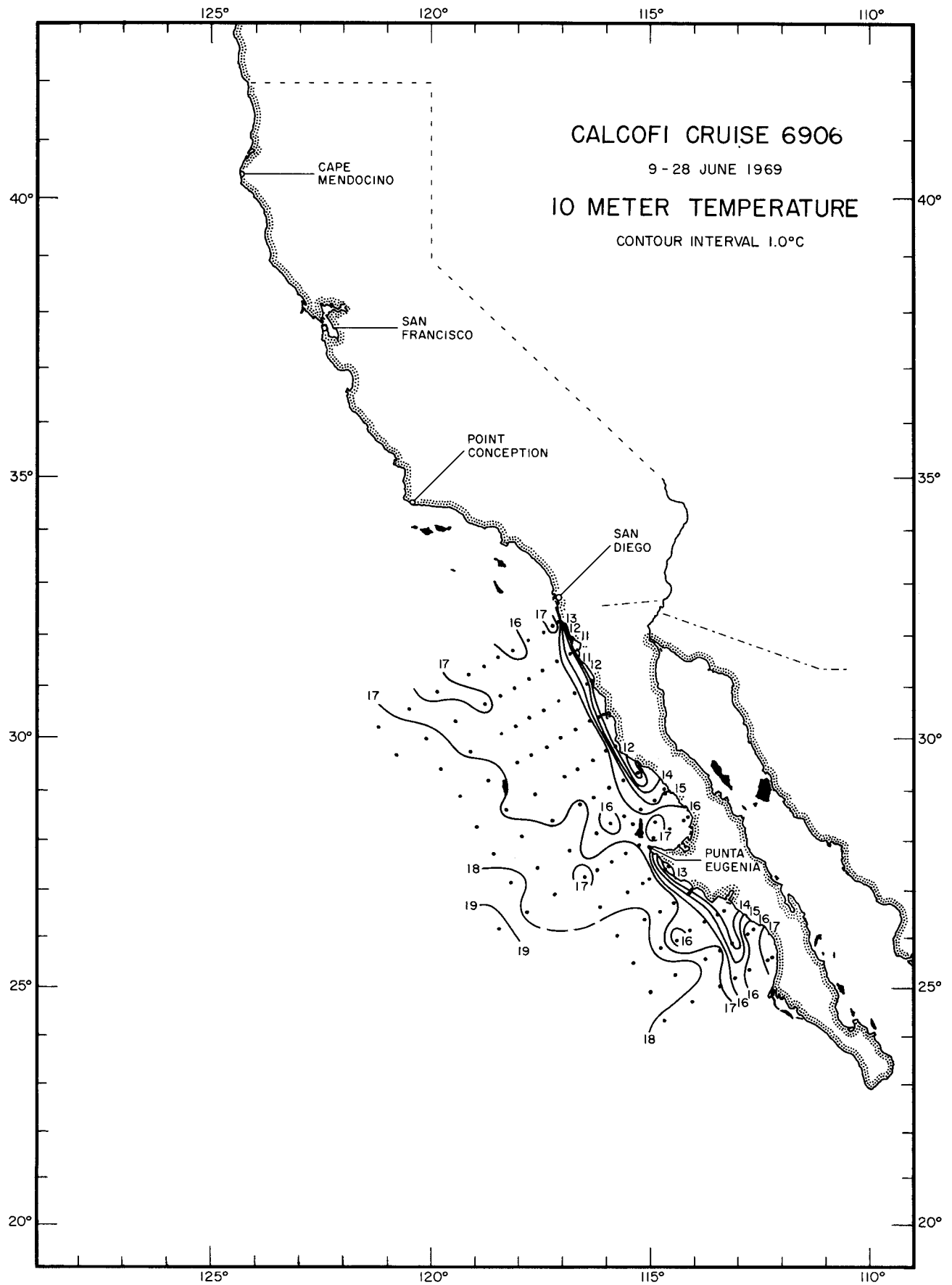
10m T

6904


CALCOFI CRUISE 6905
5 - 29 MAY 1969
10 METER TEMPERATURE
CONTOUR INTERVAL 1.0°C
CAPE MENDOCINO
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
PUNTA EUGENIA
125°
120°
115°
110°
40°
35°
30°
25°
20°

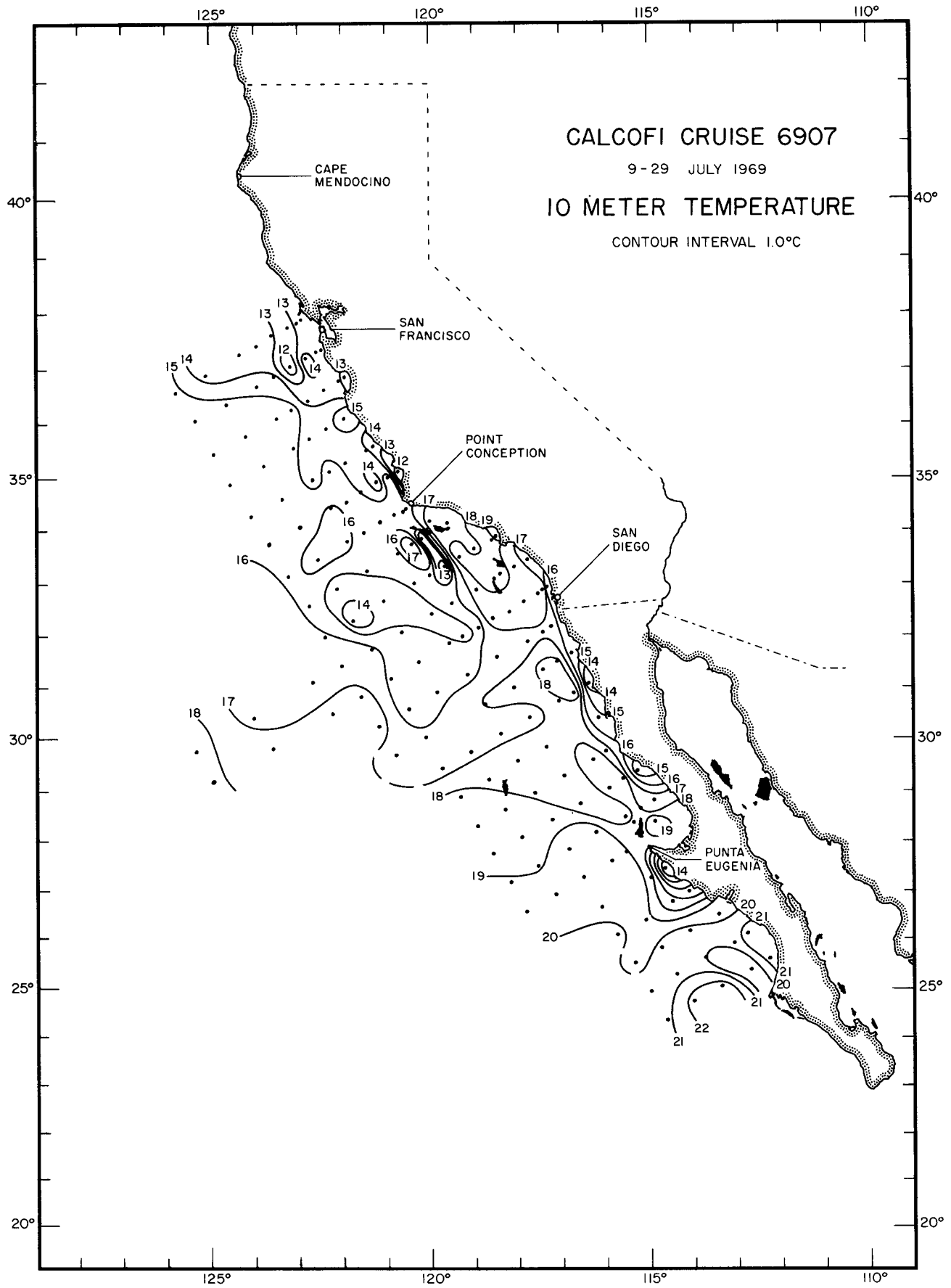
10m T

6905


CALCOFI CRUISE 6906
9 - 28 JUNE 1969
10 METER TEMPERATURE
CONTOUR INTERVAL 1.0°C
CAPE MENDOCINO
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
PUNTA EUGENIA
125°
120°
115°
110°
40°
35°
30°
25°
20°

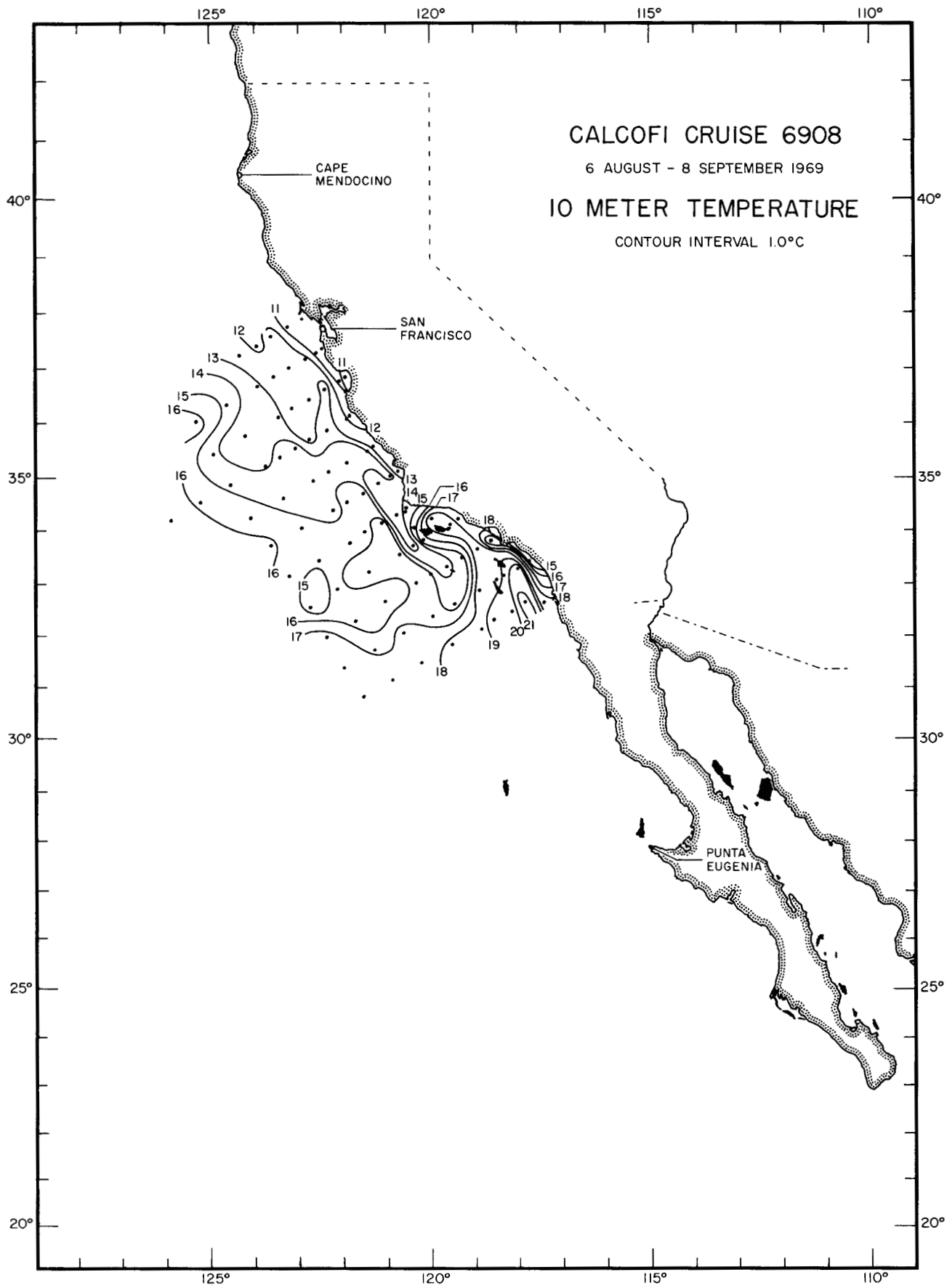
10m T

6906


CALCOFI CRUISE 6907
9-29 JULY 1969
10 METER TEMPERATURE
CONTOUR INTERVAL 1.0°C
CAPE MENDOCINO
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
PUNTA EUGENIA
125°
120°
115°
110°
40°
35°
30°
25°
20°

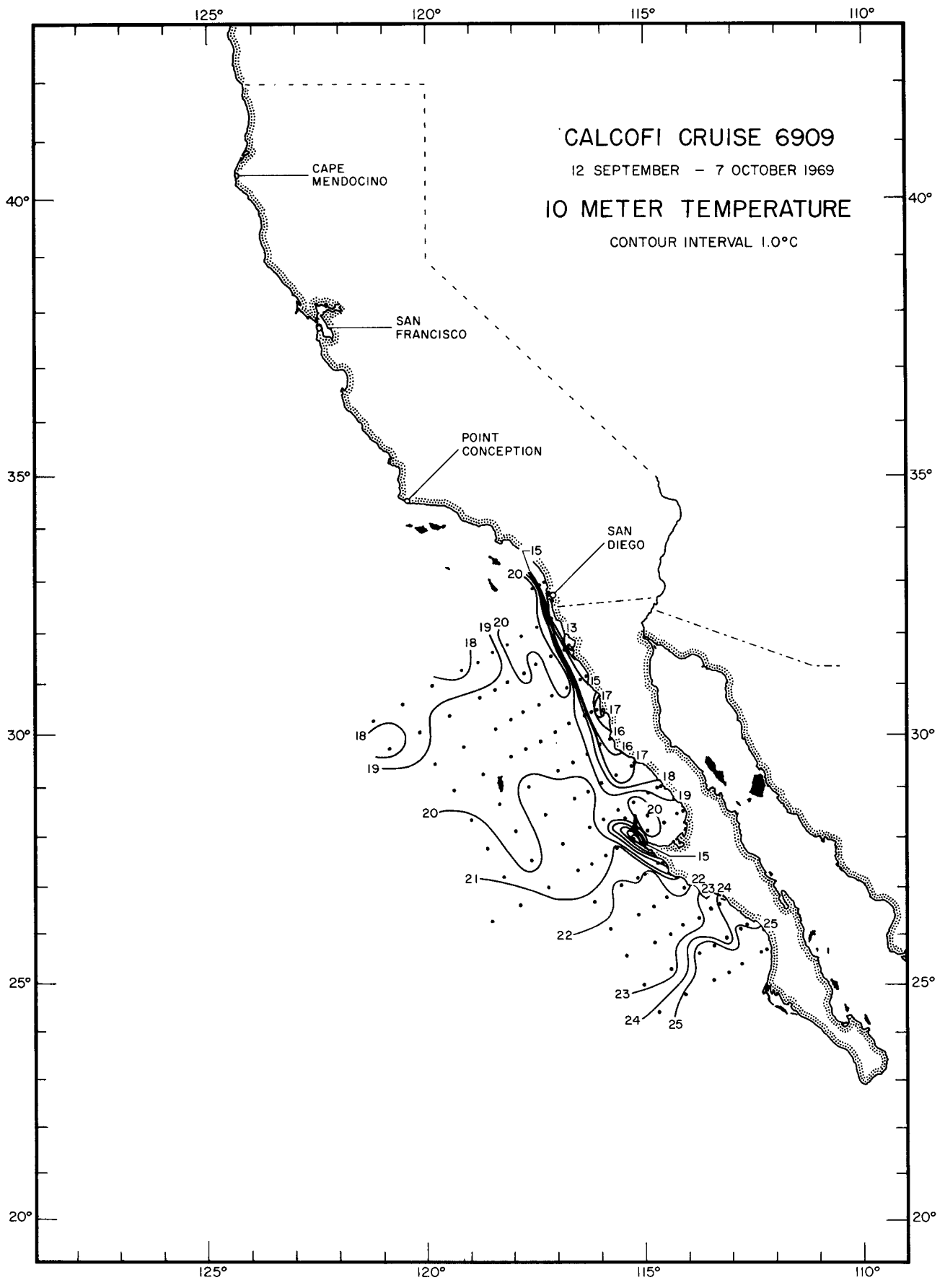
10m T

6907


CALCOFI CRUISE 6908
6 AUGUST - 8 SEPTEMBER 1969
10 METER TEMPERATURE
CONTOUR INTERVAL 1.0°C
CAPE MENDOCINO
SAN FRANCISCO
PUNTA EUGENIA
125°
120°
115°
110°
40°
35°
30°
25°
20°

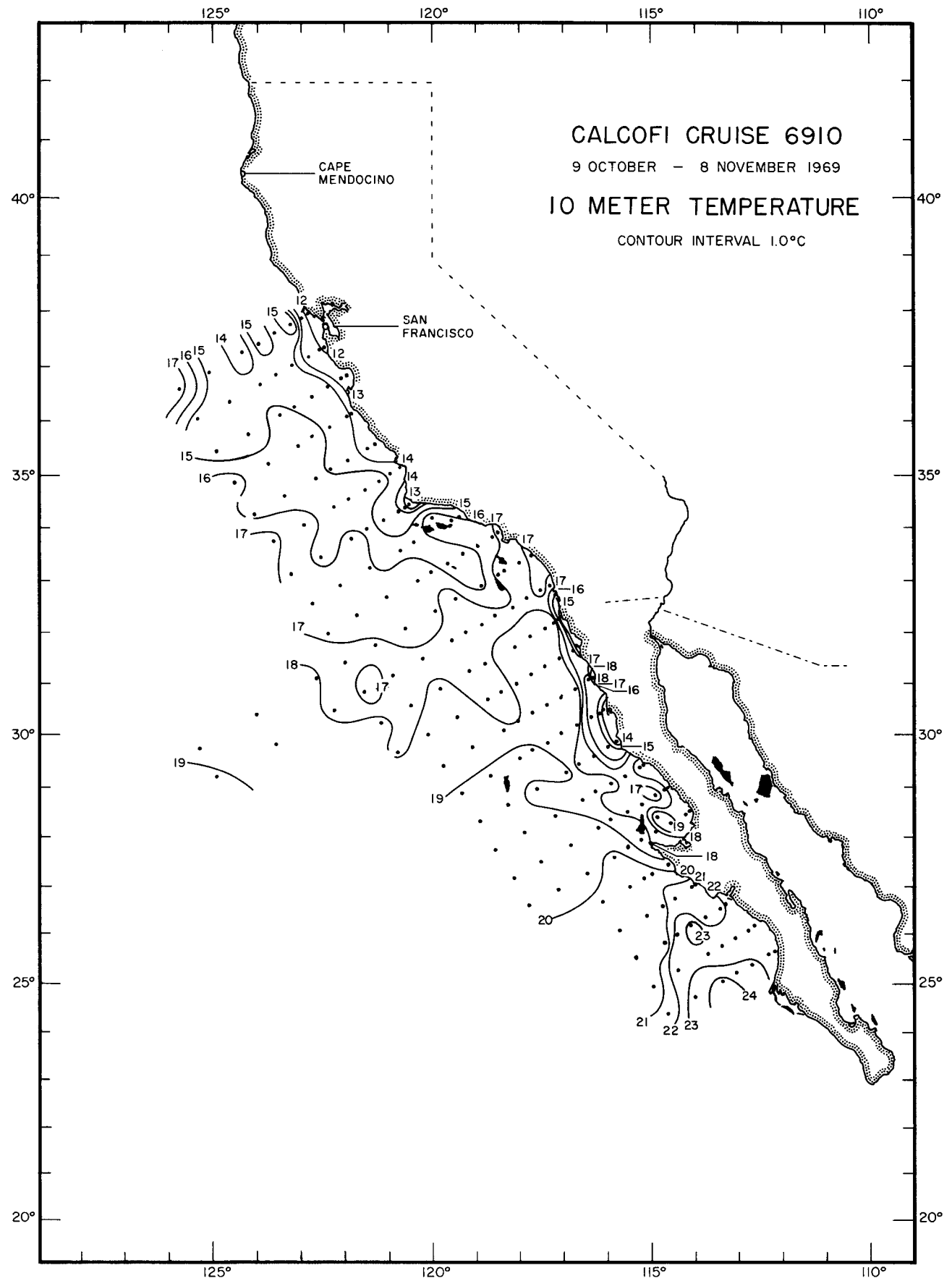
10 m T

6908


CALCOFI CRUISE 6909
12 SEPTEMBER – 7 OCTOBER 1969
10 METER TEMPERATURE
CONTOUR INTERVAL 1.0°C
CAPE MENDOCINO
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
125°
120°
115°
110°
40°
35°
30°
25°
20°

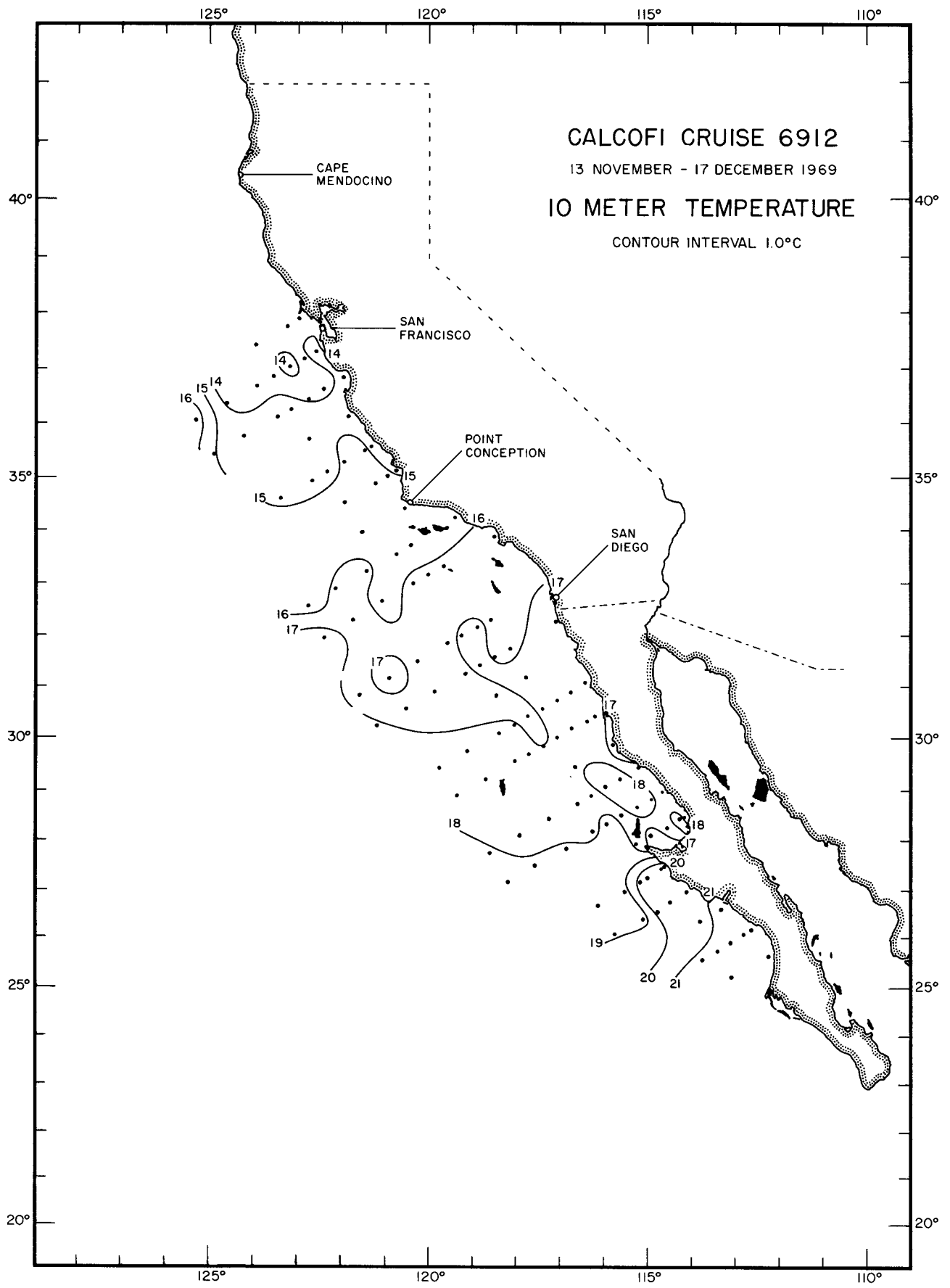
10m T

6909


CALCOFI CRUISE 6910
9 OCTOBER – 8 NOVEMBER 1969
10 METER TEMPERATURE
CONTOUR INTERVAL 1.0°C
CAPE MENDOCINO
SAN FRANCISCO
125°
120°
115°
110°
40°
35°
30°
25°
20°

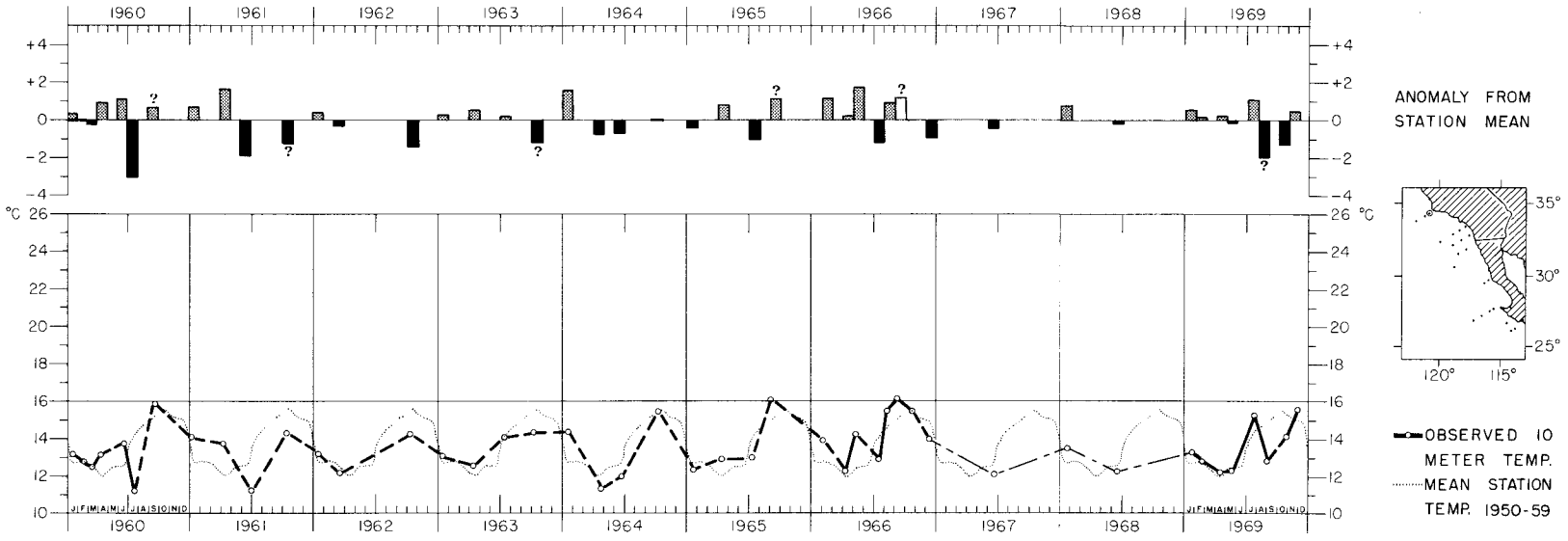
10m T

6910


CALCOFI CRUISE 6912
13 NOVEMBER - 17 DECEMBER 1969
10 METER TEMPERATURE
CONTOUR INTERVAL 1.0°C
CAPE MENDOCINO
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
125°
120°
115°
110°
40°
35°
30°
25°
20°

10m T

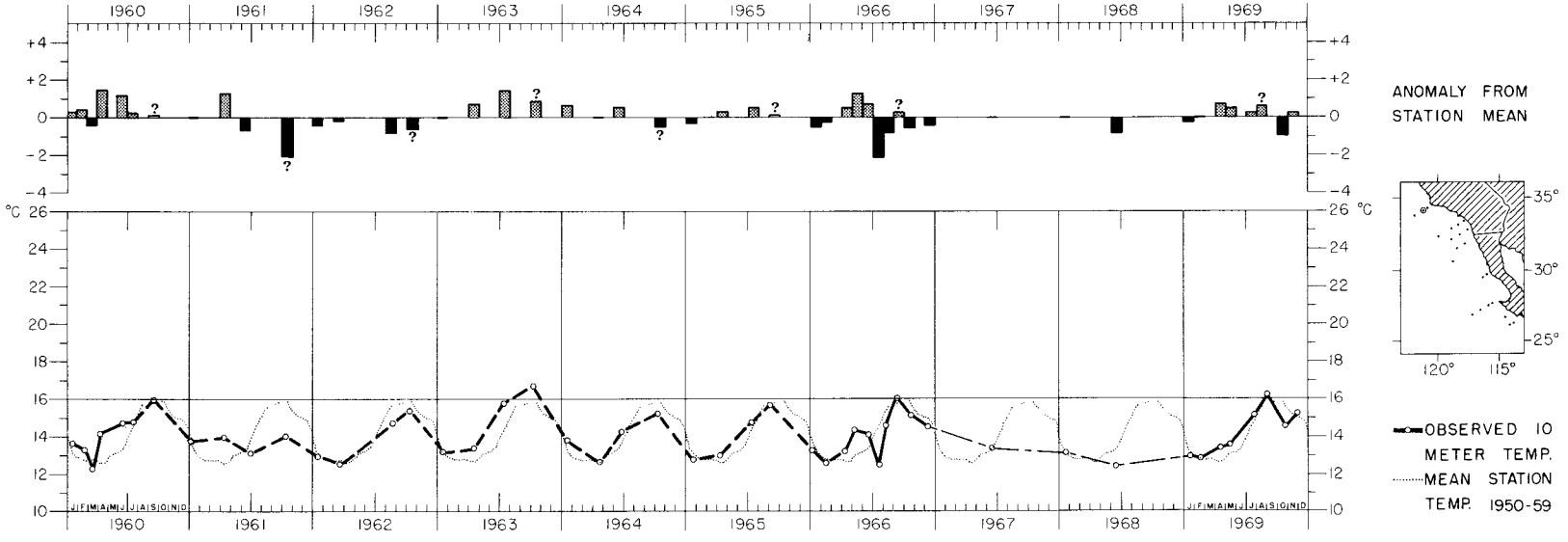
6912



10 METER TEMPERATURE

DCPG 1971

CALCOFI STATION 80.55

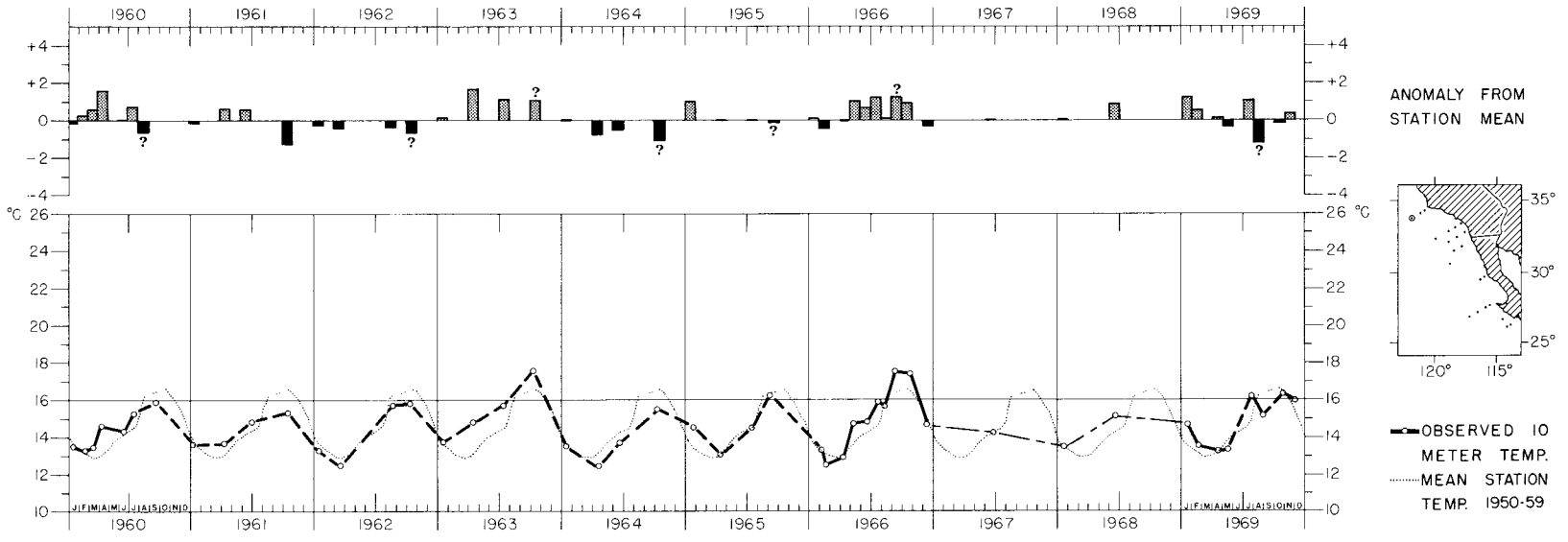


10 METER TEMPERATURE

DCPG 1971

CALCOFI STATION 80.60

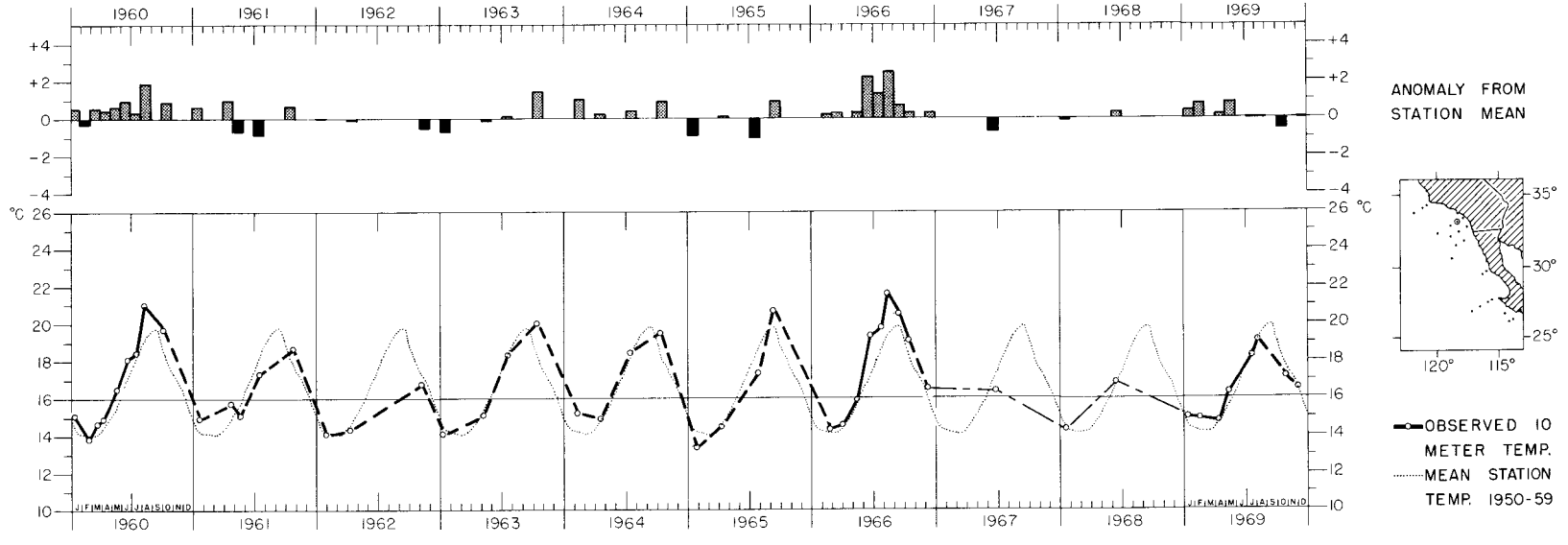
10m T
80.55
80.60



10 METER TEMPERATURE

DCPG 1971

CALCOFI STATION 80.70

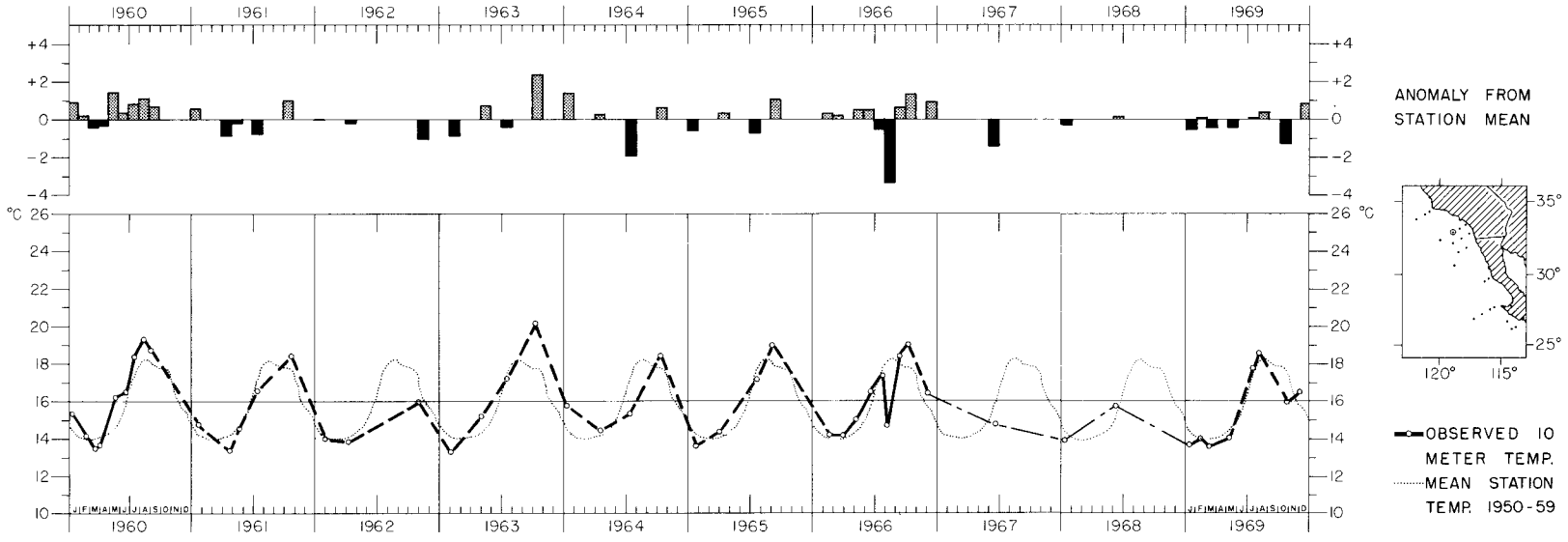


10 METER TEMPERATURE

DCPG 1971

CALCOFI STATION 90.37

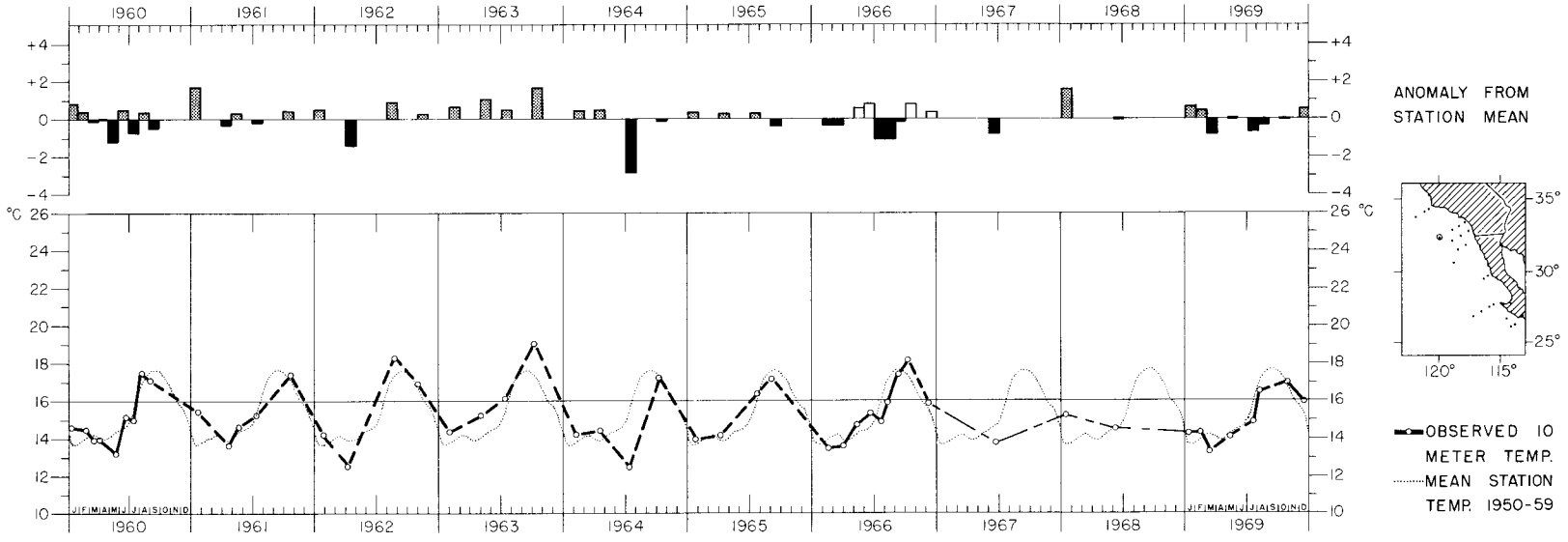
80.70 T 10m
90.37



10 METER TEMPERATURE

DCPG 1971

CALCOFI STATION 90.45



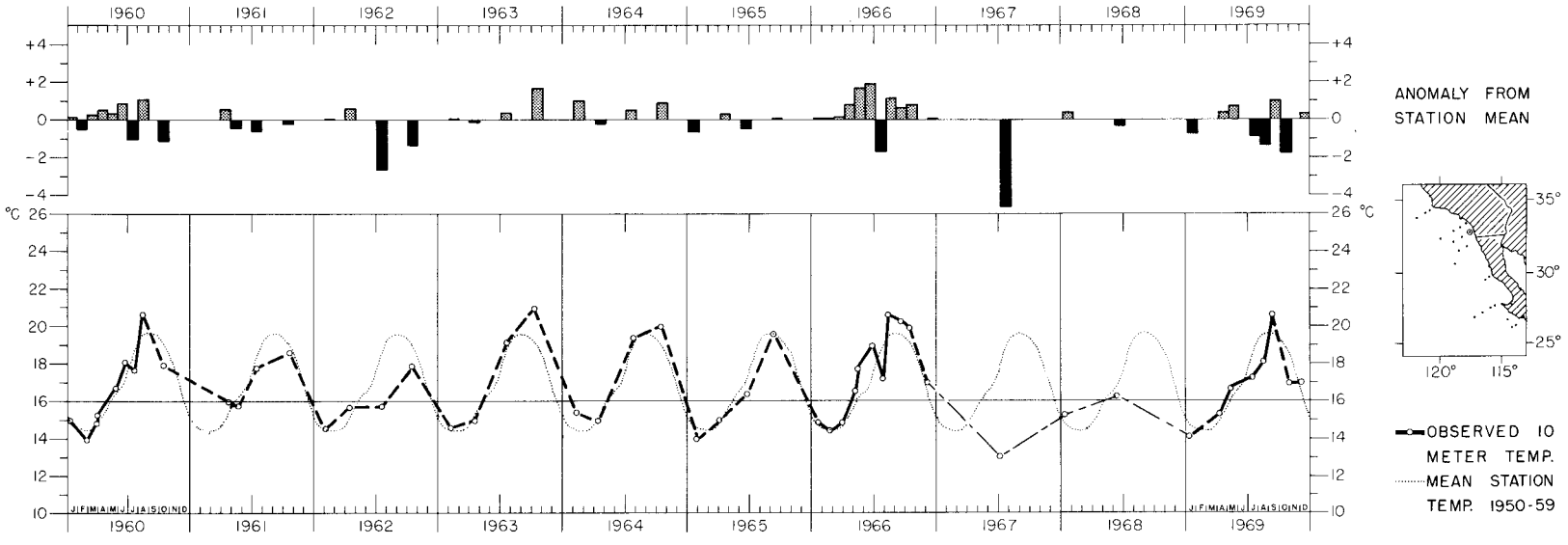
10m T

90.45
90.60

10 METER TEMPERATURE

DCPG 1971

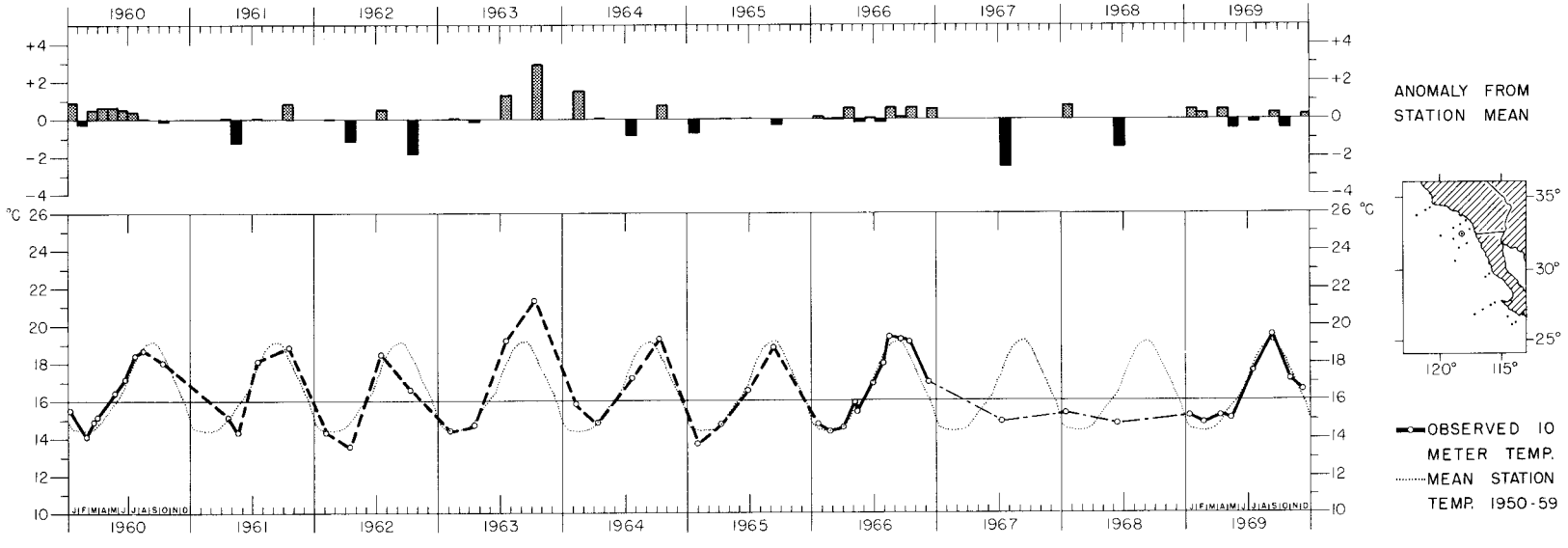
CALCOFI STATION 90.60



10 METER TEMPERATURE

DCPG 1971

CALCOFI STATION 93.30



10 METER TEMPERATURE

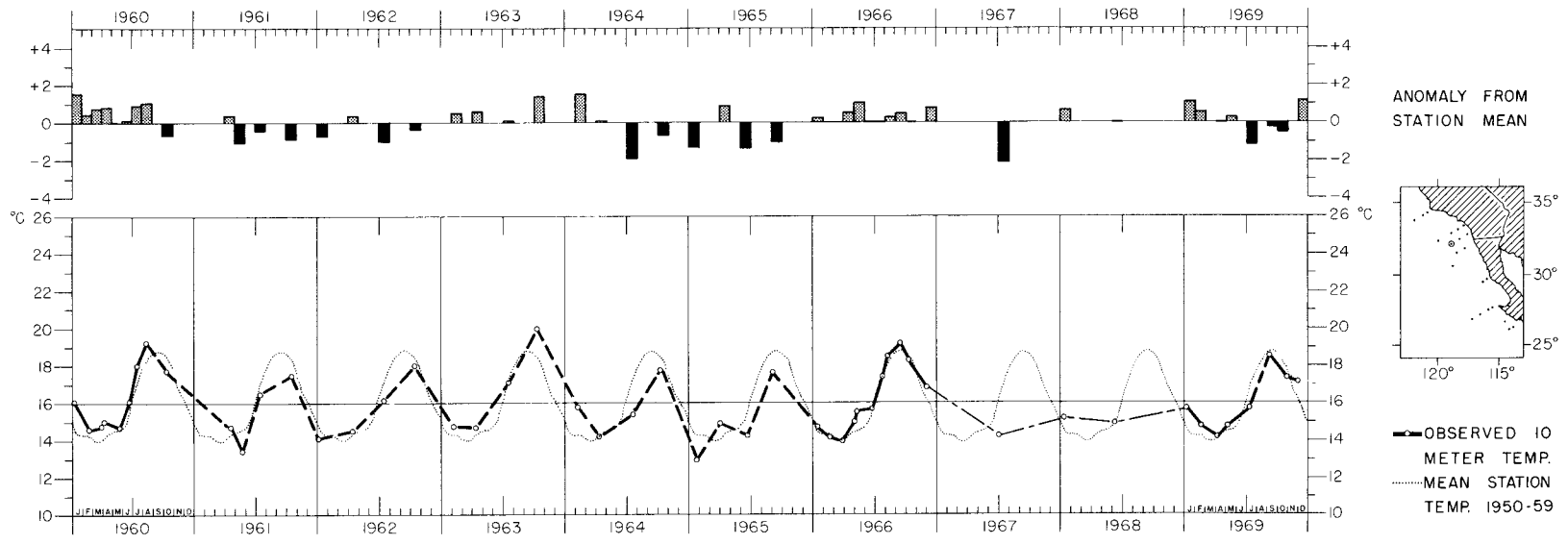
DCPG 1971

CALCOFI STATION 93.40

10m T

93.30

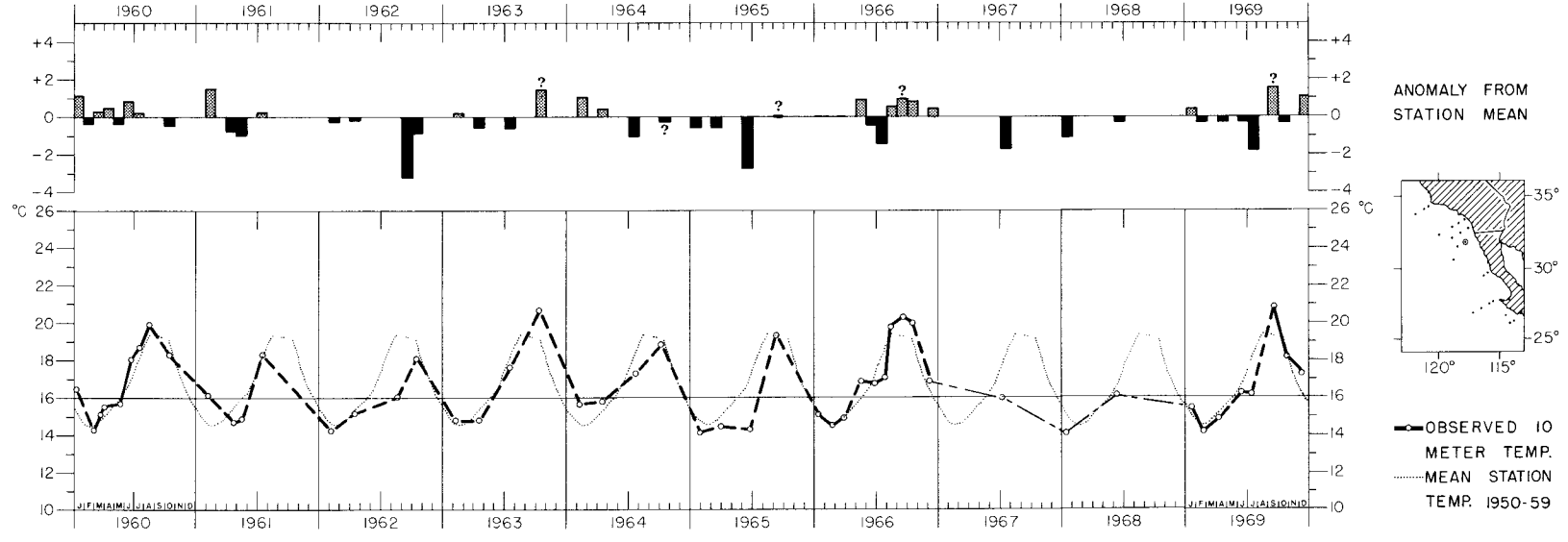
93.40



10 METER TEMPERATURE

DCPG 1971

CALCOFI STATION 93.50

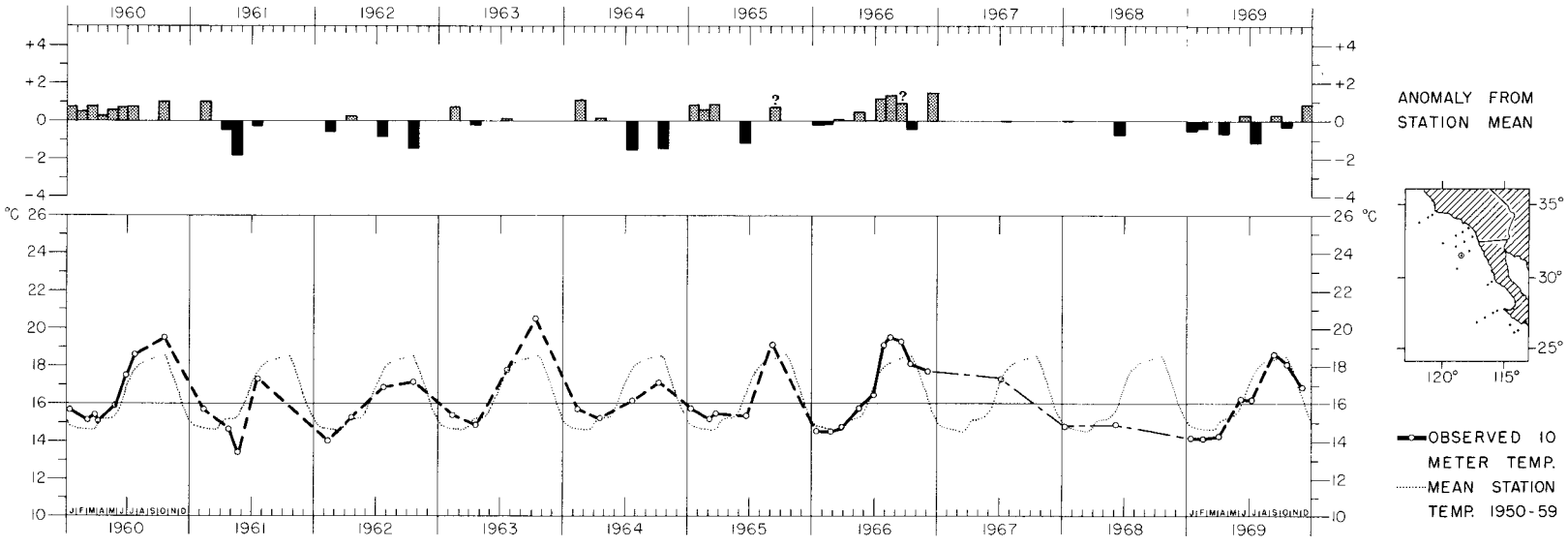


10 METER TEMPERATURE

DCPG 1971

CALCOFI STATION 97.40

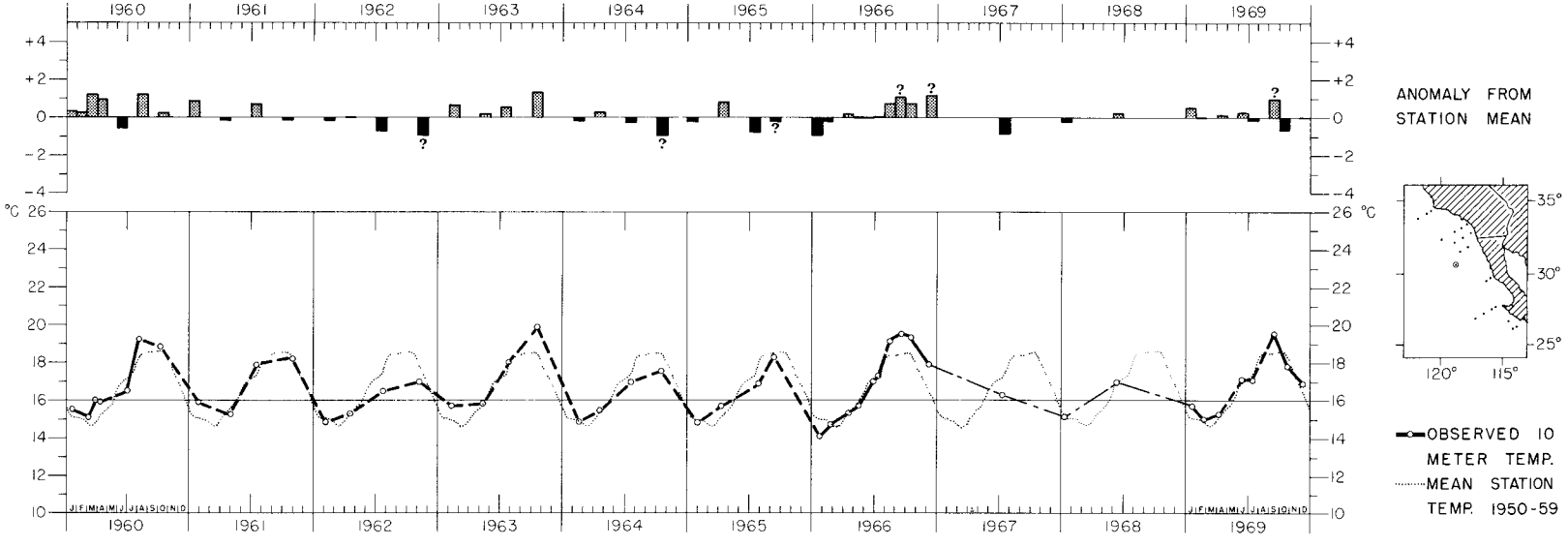
10m T
93.50
97.40



10 METER TEMPERATURE

DCPG 1971

CALCOFI STATION 97.50

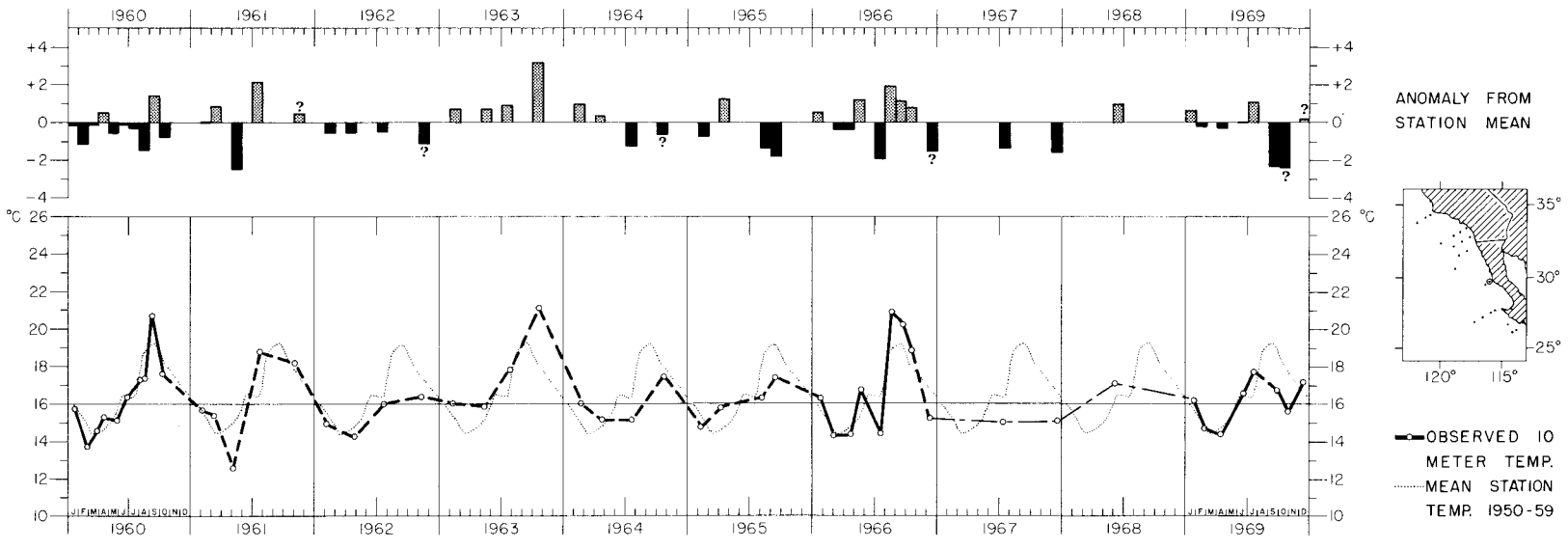


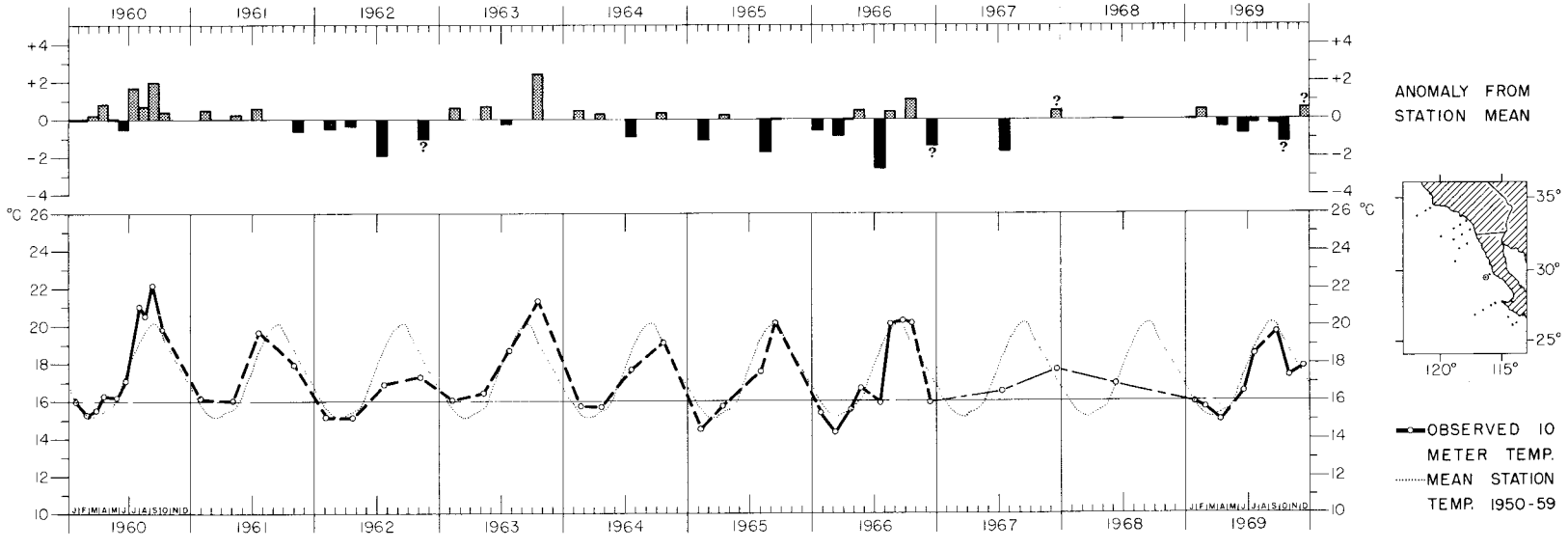
10 METER TEMPERATURE

DCPG 1971

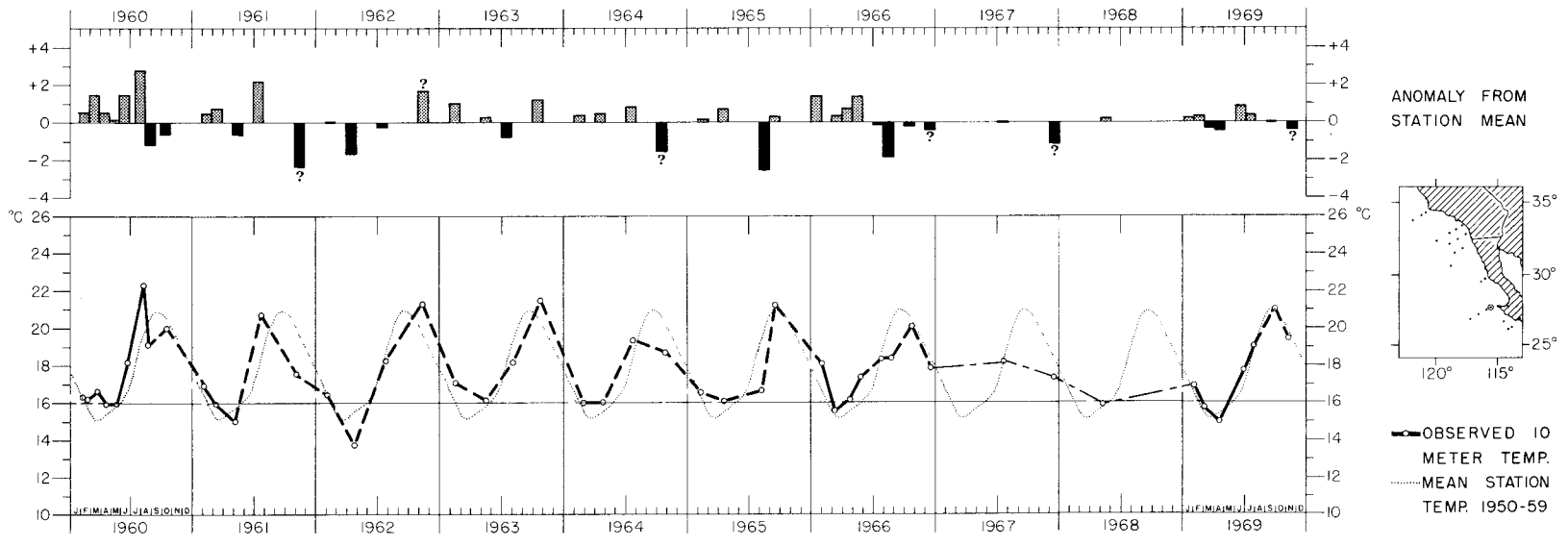
CALCOFI STATION 100.60

10m T
97.50
100.60





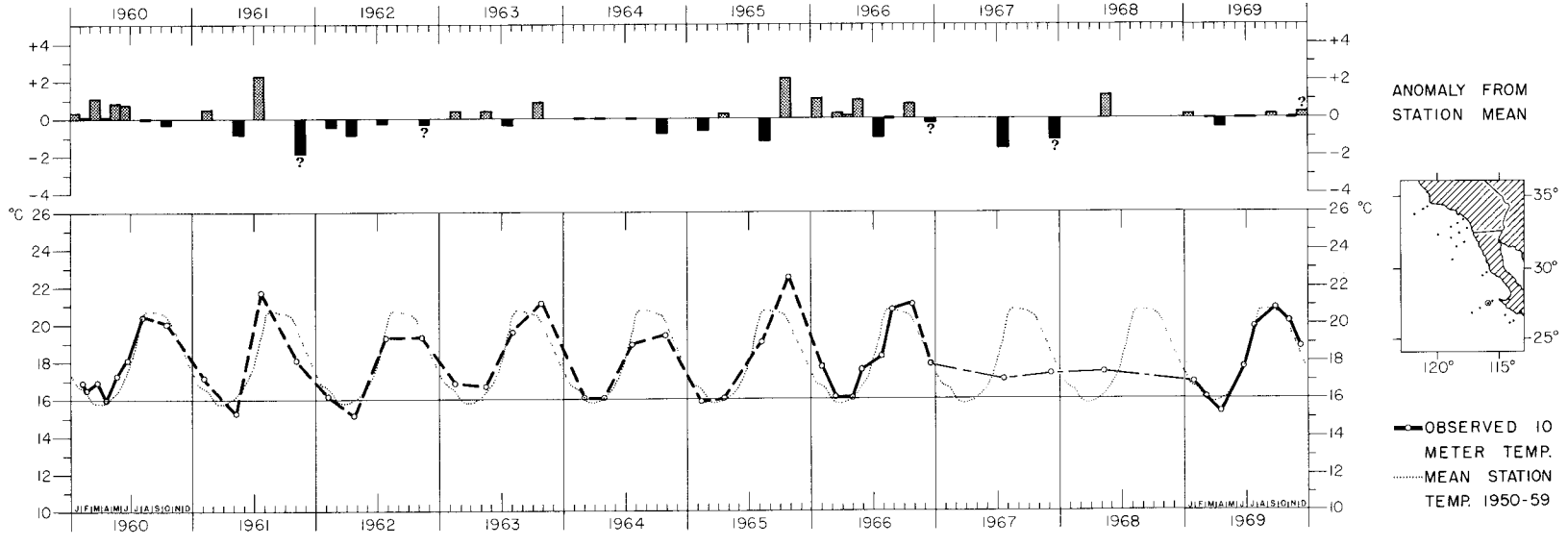
10m T
110.35
110.40



10 METER TEMPERATURE

DCPG 1971

CALCOFI STATION 120.45

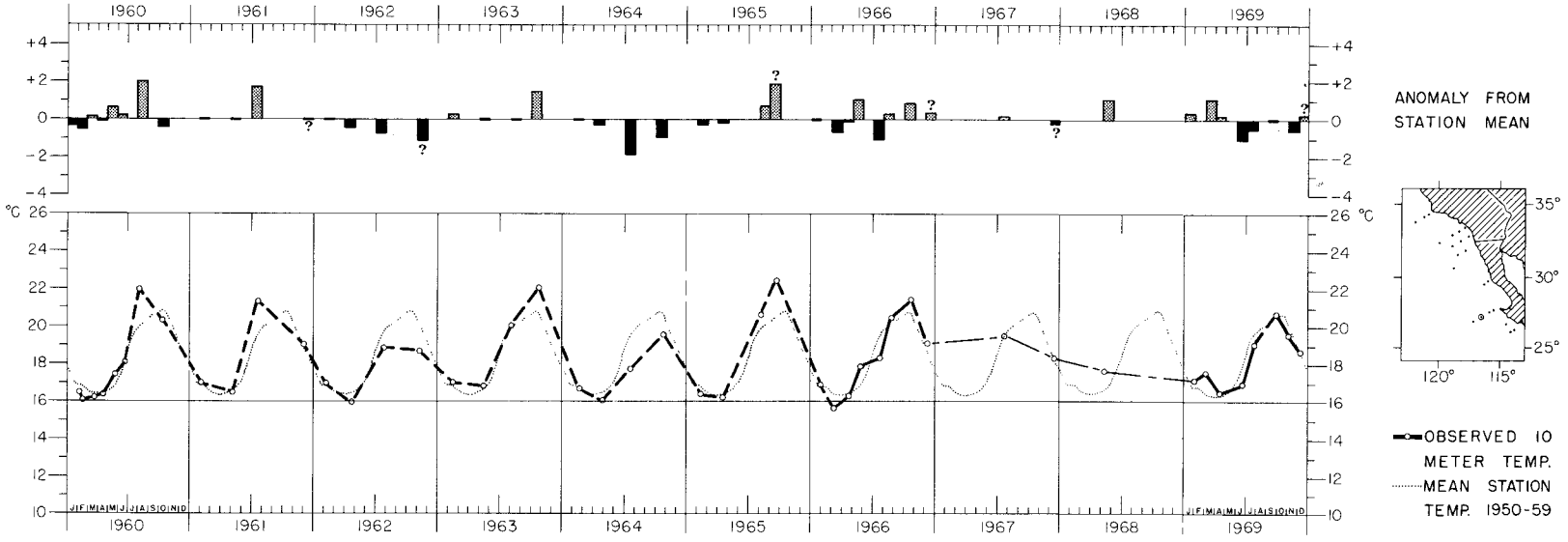


10 METER TEMPERATURE

DCPG 1971

CALCOFI STATION 120.50

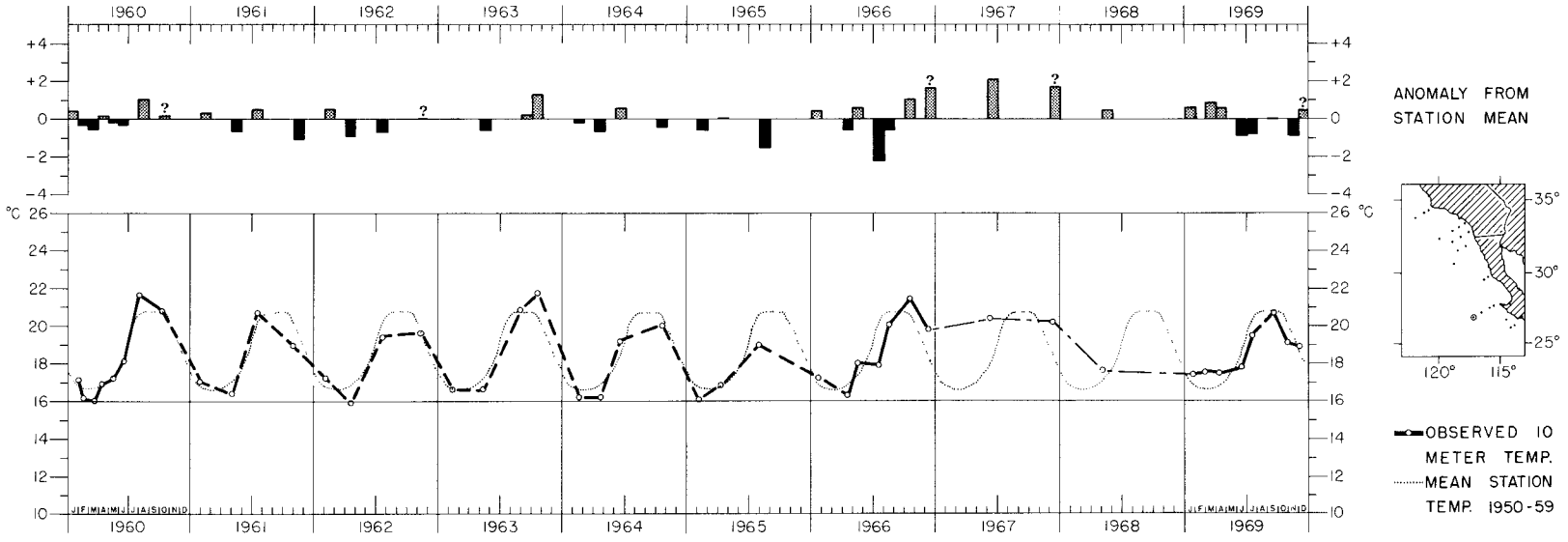
10m T
120.45
120.50



10 METER TEMPERATURE

DCPG 1971

CALCOFI STATION 120.60



10m T

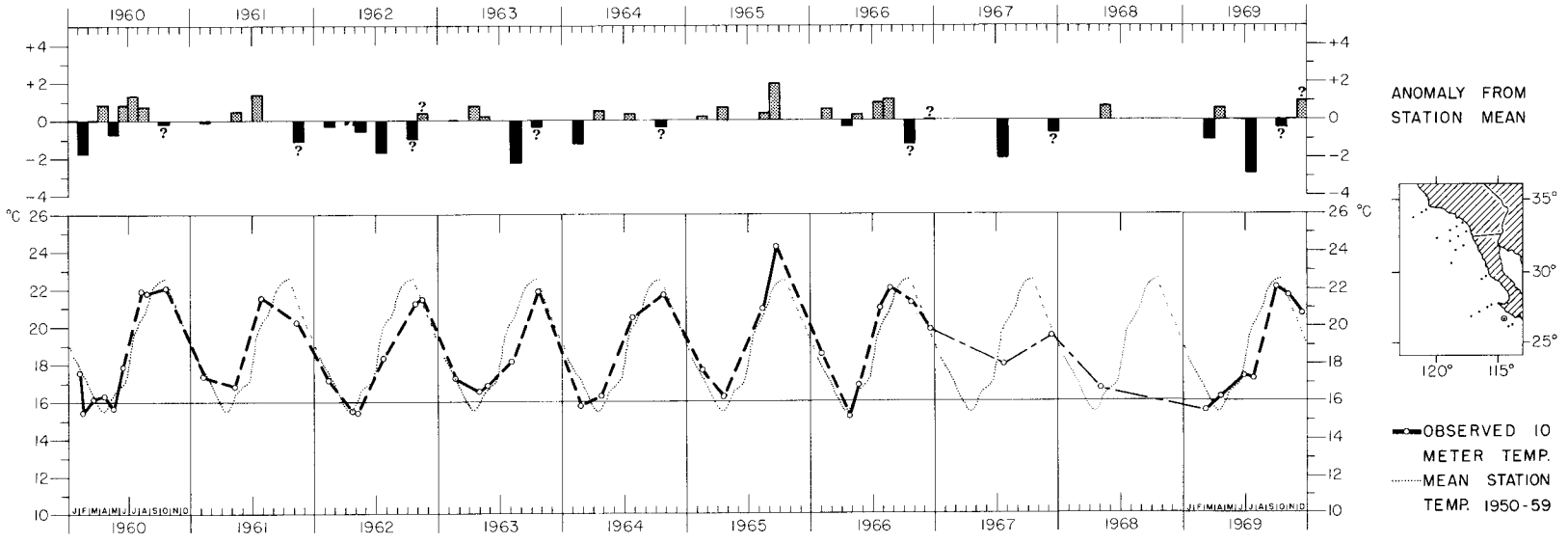
120.60

120.70

10 METER TEMPERATURE

DCPG 1971

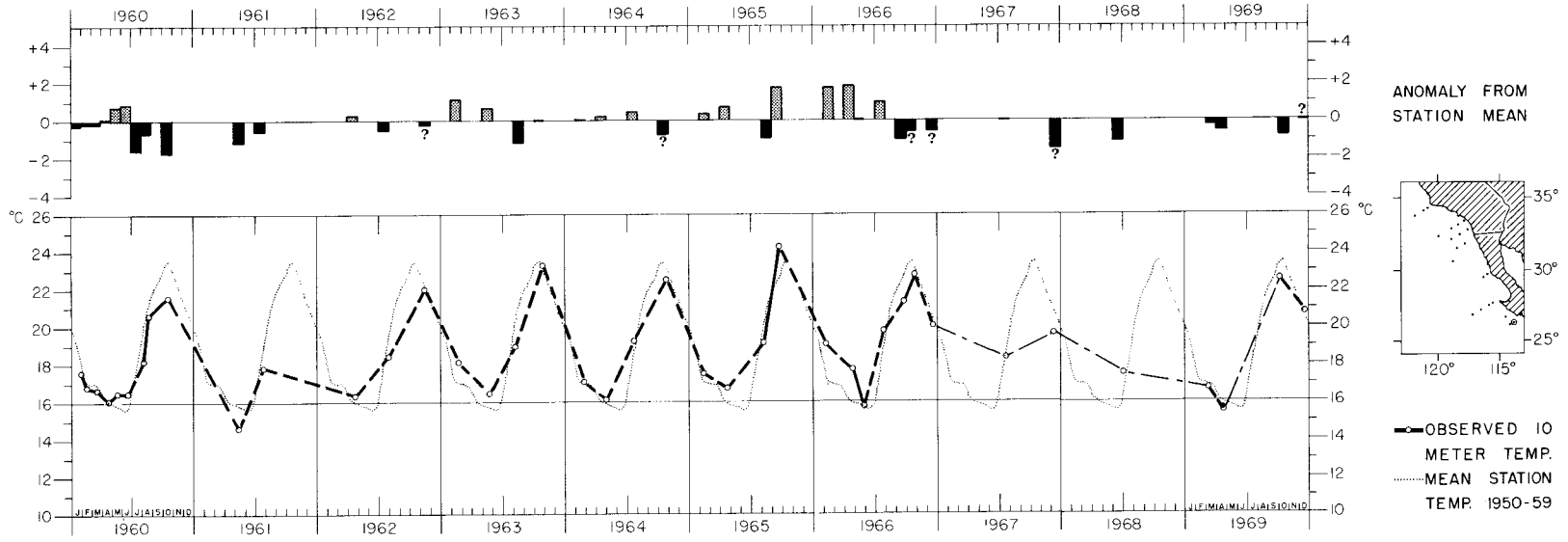
CALCOFI STATION 120.70



10 METER TEMPERATURE

DCPG 1971

CALCOFI STATION 127.40

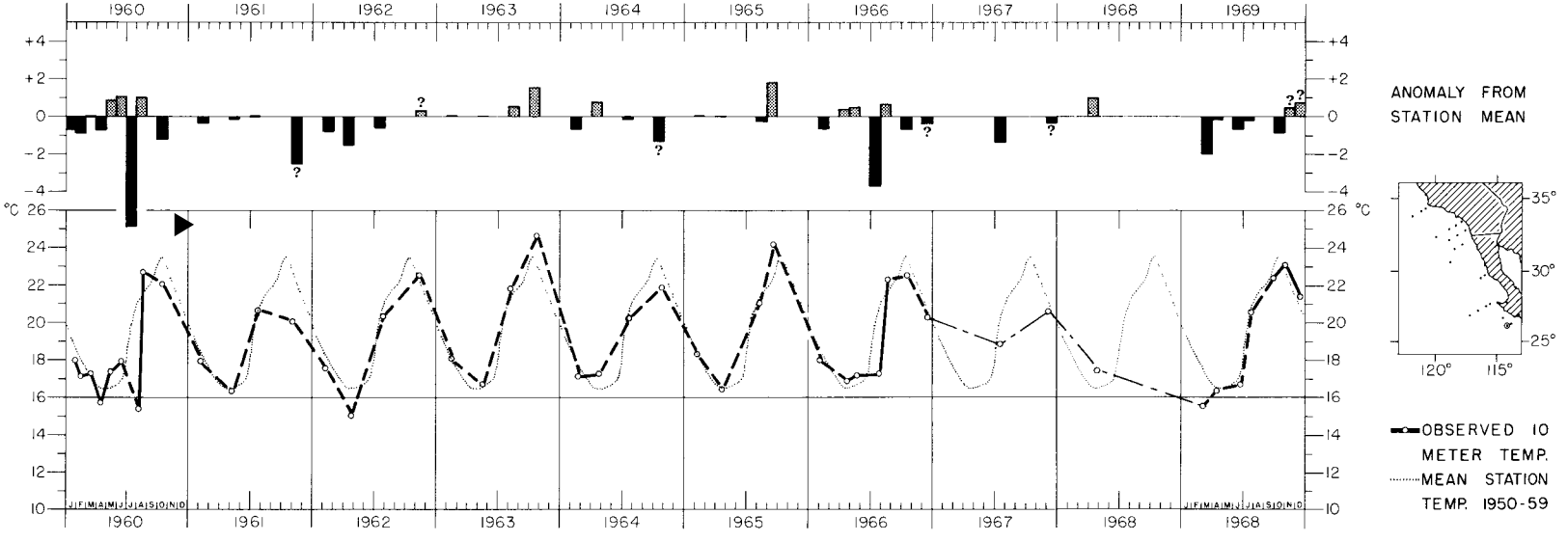


10 METER TEMPERATURE

DCPG 1971

CALCOFI STATION 130.35

10m T
127.40
130.35

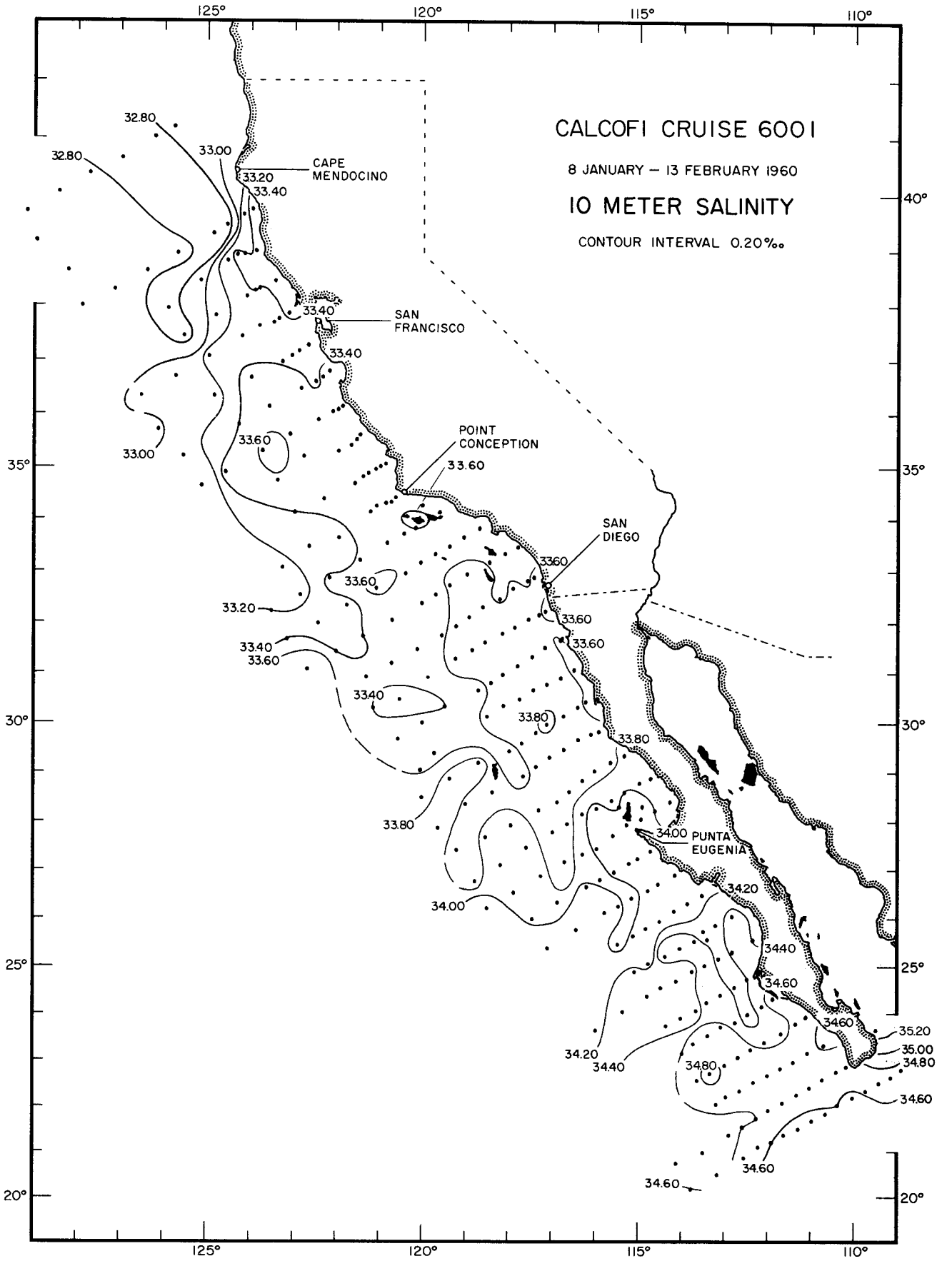


10 METER TEMPERATURE

DCPG 1971

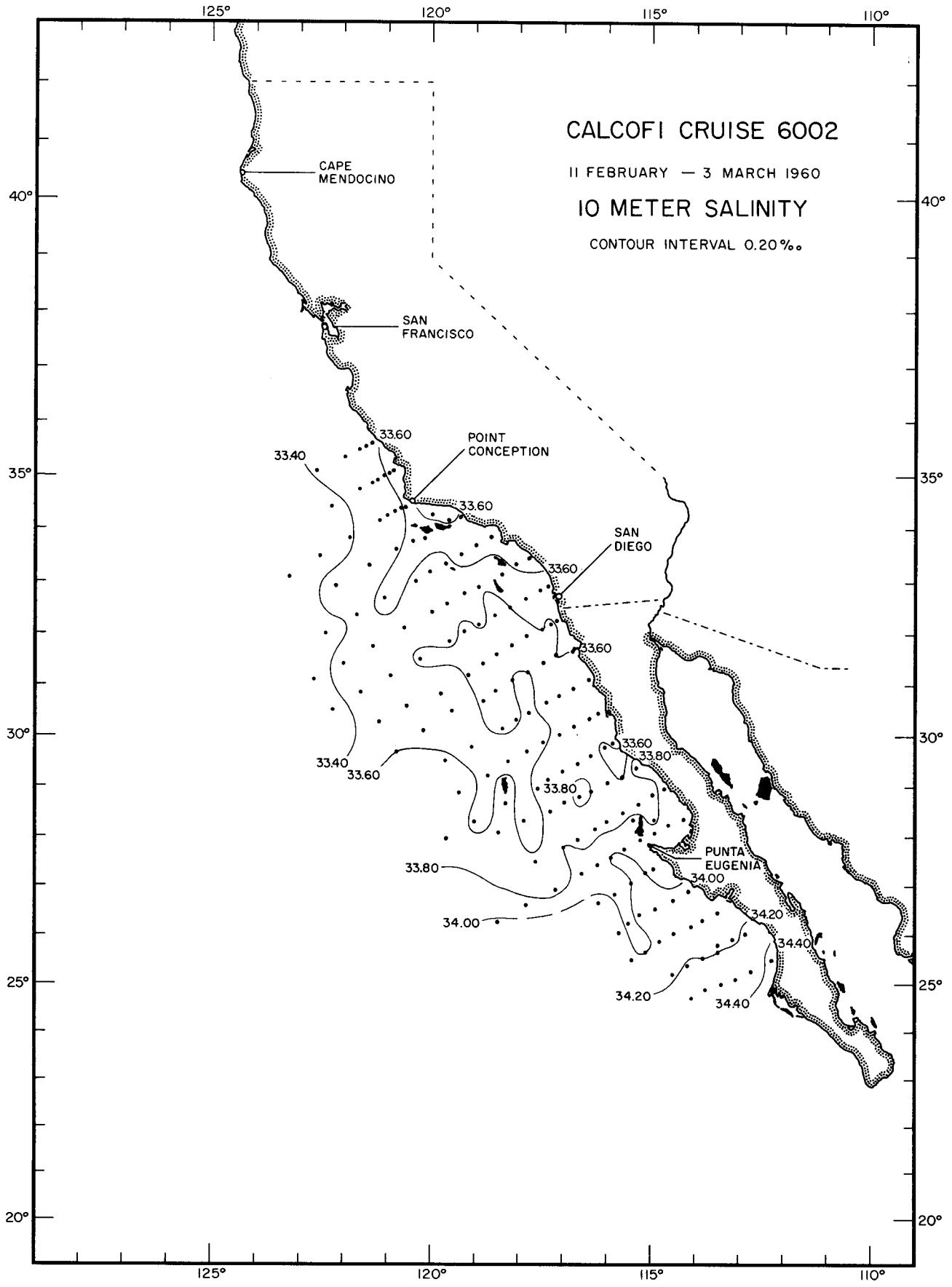
CALCOFI STATION 130.40

10m T
130.40


CALCOFI CRUISE 6001
8 JANUARY – 13 FEBRUARY 1960
10 METER SALINITY
CONTOUR INTERVAL 0.20‰
CAPE MENDOCINO
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
PUNTA EUGENIA
125°
120°
115°
110°
40°
35°
30°
25°
20°
32.80
33.00
33.20
33.40
33.60
33.80
34.00
34.20
34.40
34.60
34.80
35.00
35.20

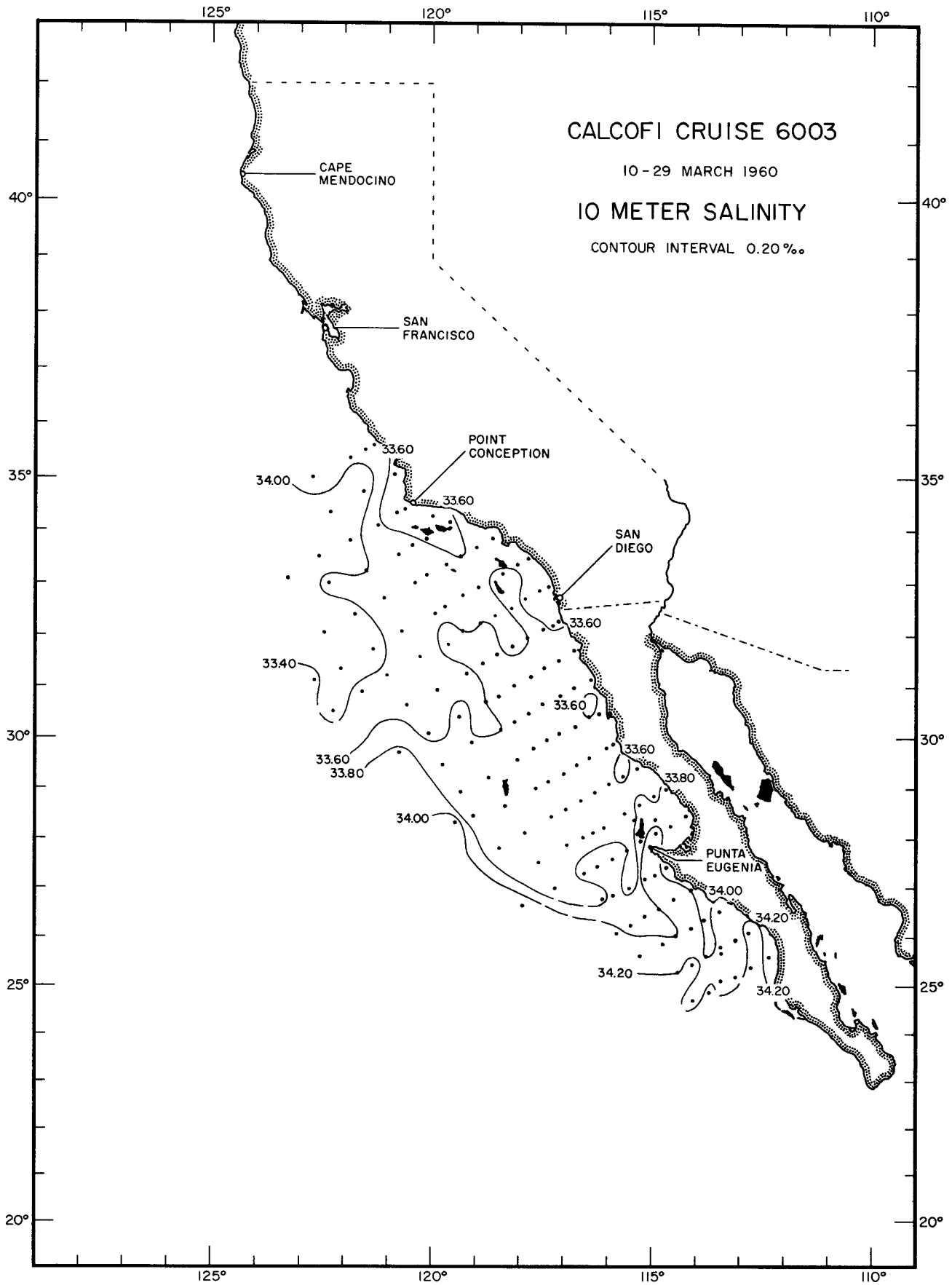
10m S

6001


CALCOFI CRUISE 6002
11 FEBRUARY — 3 MARCH 1960
10 METER SALINITY
CONTOUR INTERVAL 0.20‰
CAPE MENDOCINO
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
PUNTA EUGENIA
33.40
33.60
33.80
34.00
34.20
34.40
125°
120°
115°
110°
40°
35°
30°
25°
20°

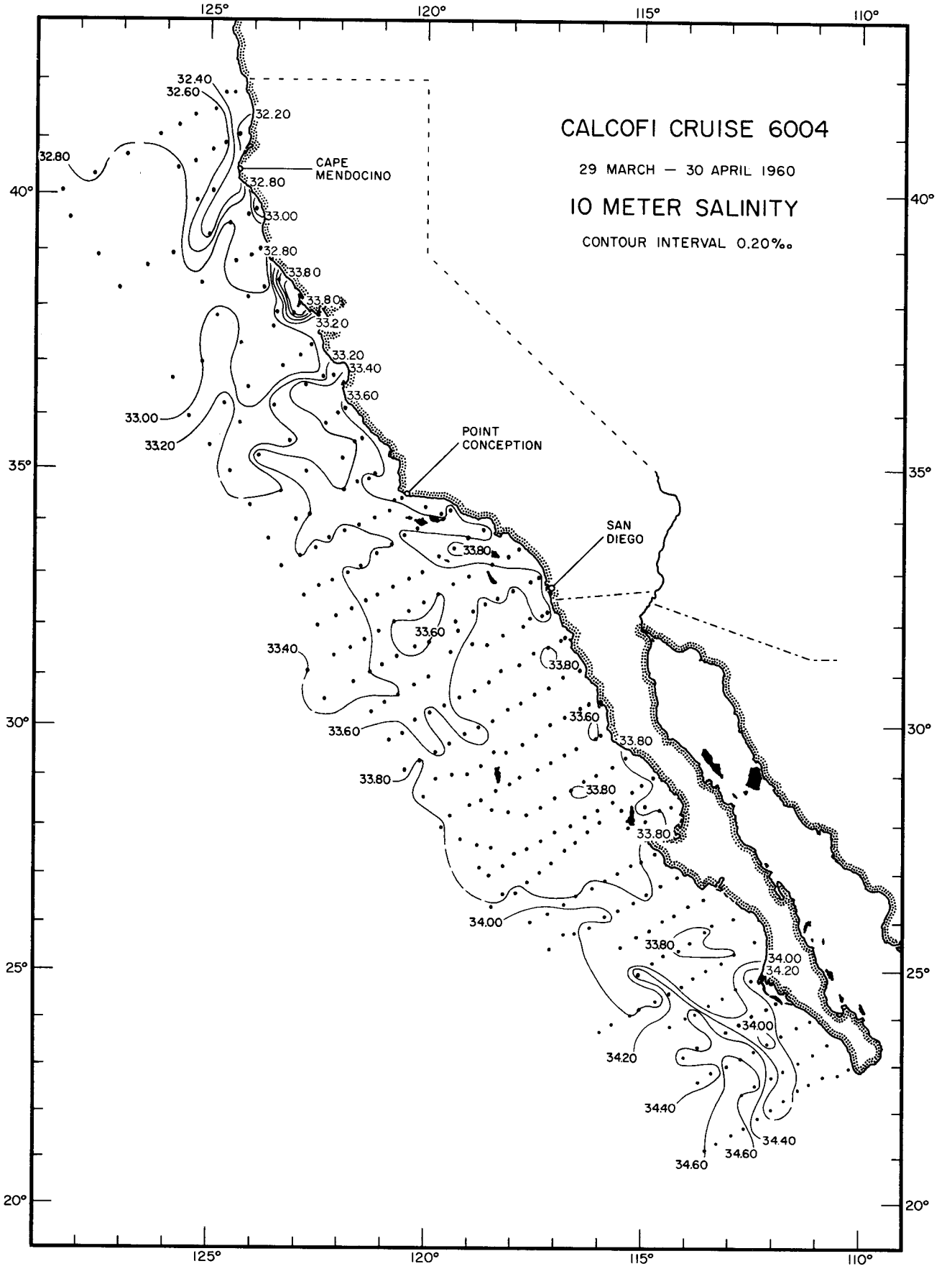
10m S

6002


CALCOFI CRUISE 6003
10 - 29 MARCH 1960
10 METER SALINITY
CONTOUR INTERVAL 0.20 ‰
CAPE MENDOCINO
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
PUNTA EUGENIA
33.60
34.00
33.40
33.80
34.20
125°
120°
115°
110°
40°
35°
30°
25°
20°

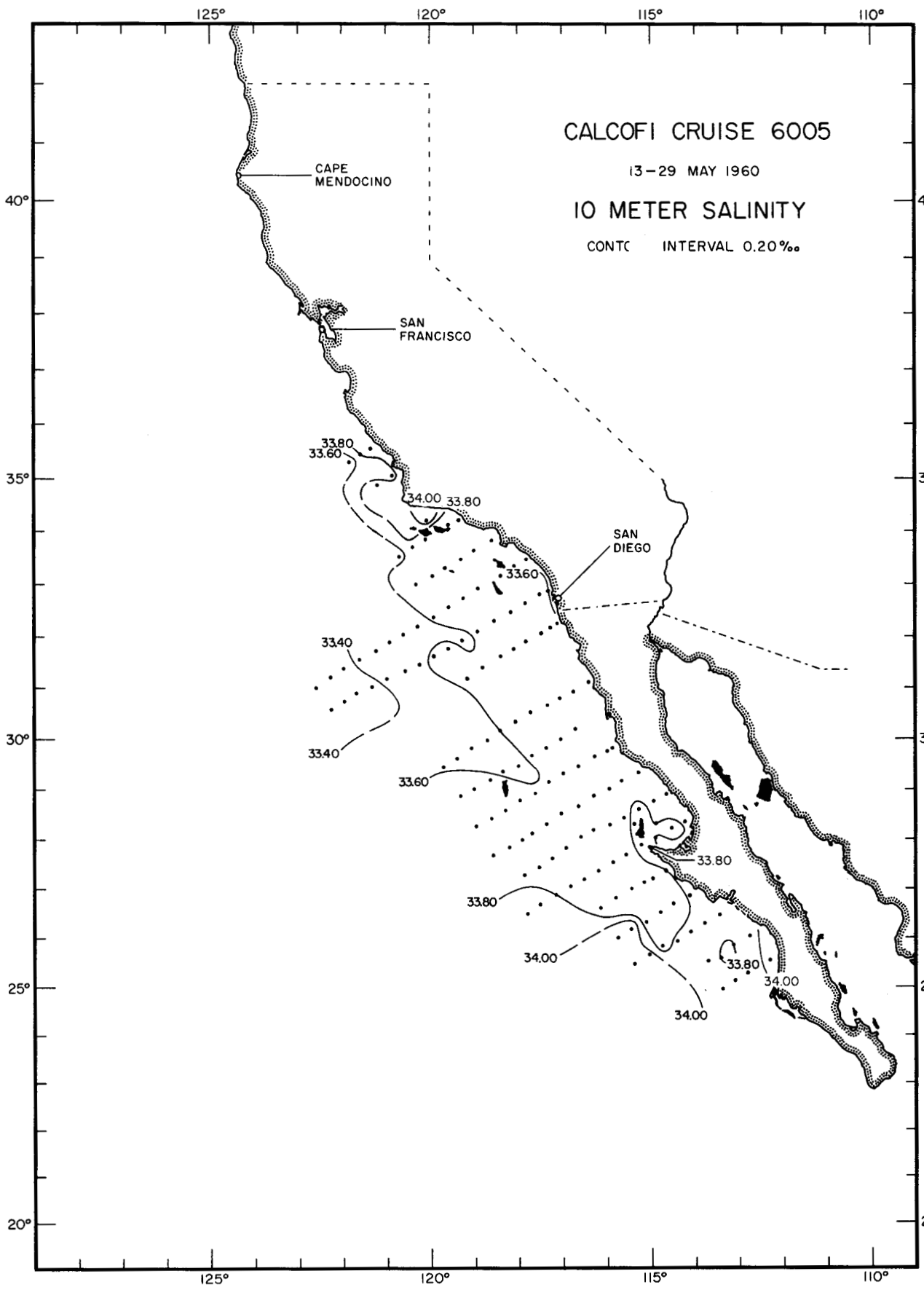
10m S

6003


CALCOFI CRUISE 6004
29 MARCH — 30 APRIL 1960
10 METER SALINITY
CONTOUR INTERVAL 0.20‰
CAPE MENDOCINO
POINT CONCEPTION
SAN DIEGO
125°
120°
115°
110°
40°
35°
30°
25°
20°
32.40
32.60
32.20
32.80
32.80
33.00
32.80
33.80
33.80
33.20
33.20
33.40
33.60
33.00
33.20
33.80
33.60
33.40
33.80
33.60
33.80
33.80
33.80
34.00
33.80
34.00
34.20
34.00
34.20
34.40
34.60
34.60
34.40

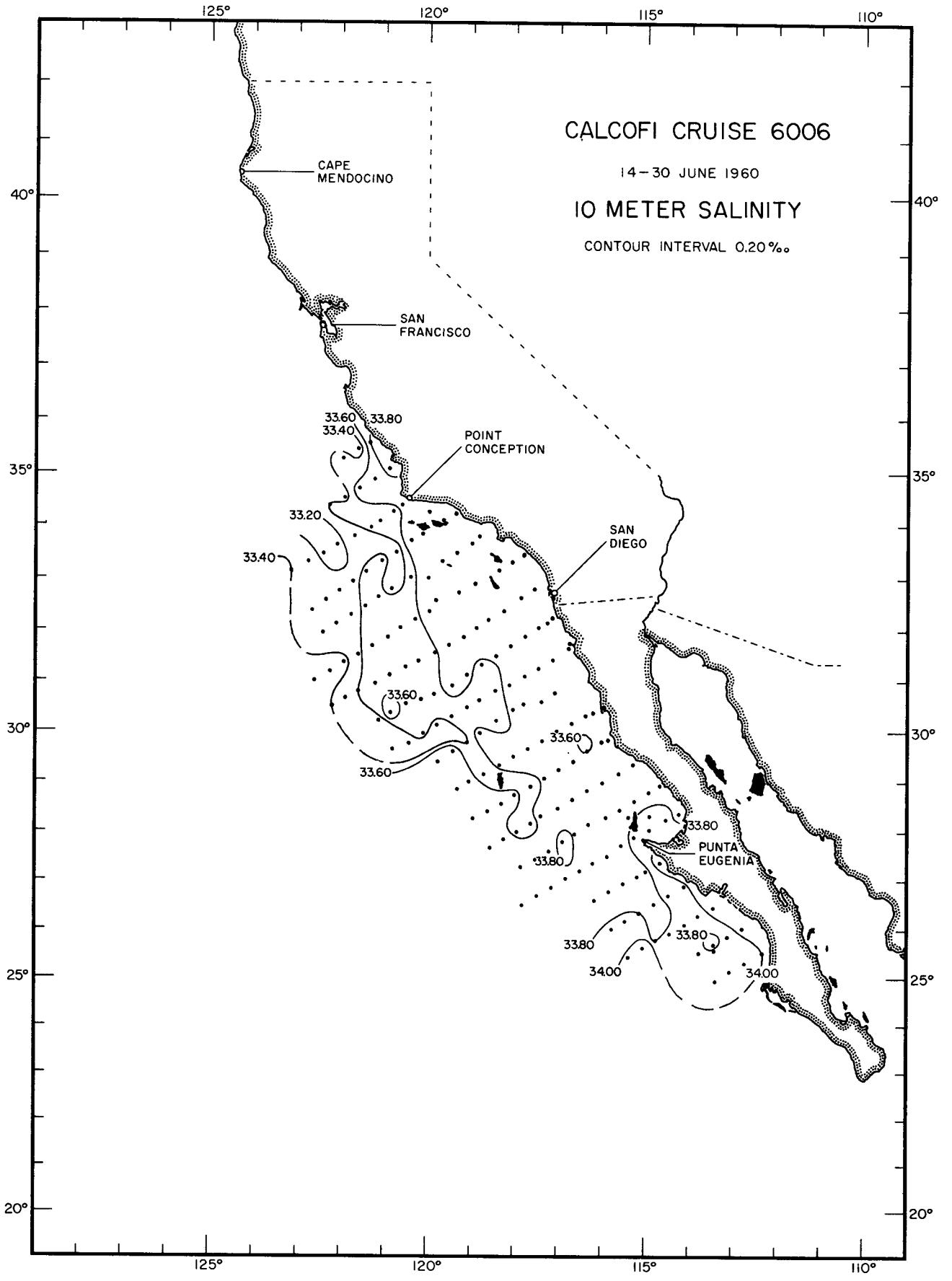
10m S

6004


CALCOFI CRUISE 6005
13–29 MAY 1960
10 METER SALINITY
CONTC INTERVAL 0.20‰
CAPE MENDOCINO
SAN FRANCISCO
SAN DIEGO
33.80
33.60
34.00
33.80
33.60
33.40
33.40
33.60
33.80
33.80
34.00
33.80
34.00
34.00
125°
120°
115°
110°
40°
35°
30°
25°
20°

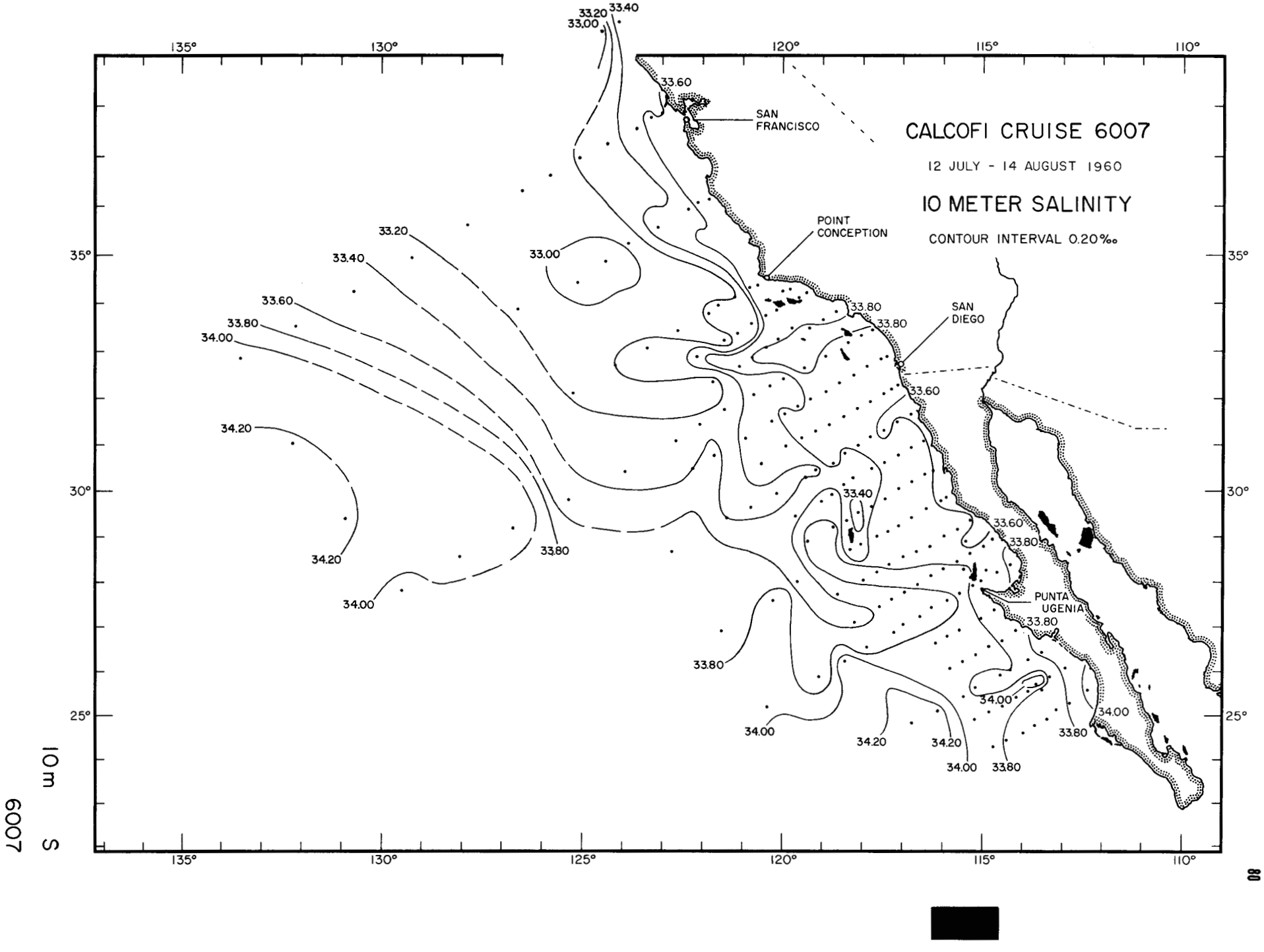
10 m S

6005

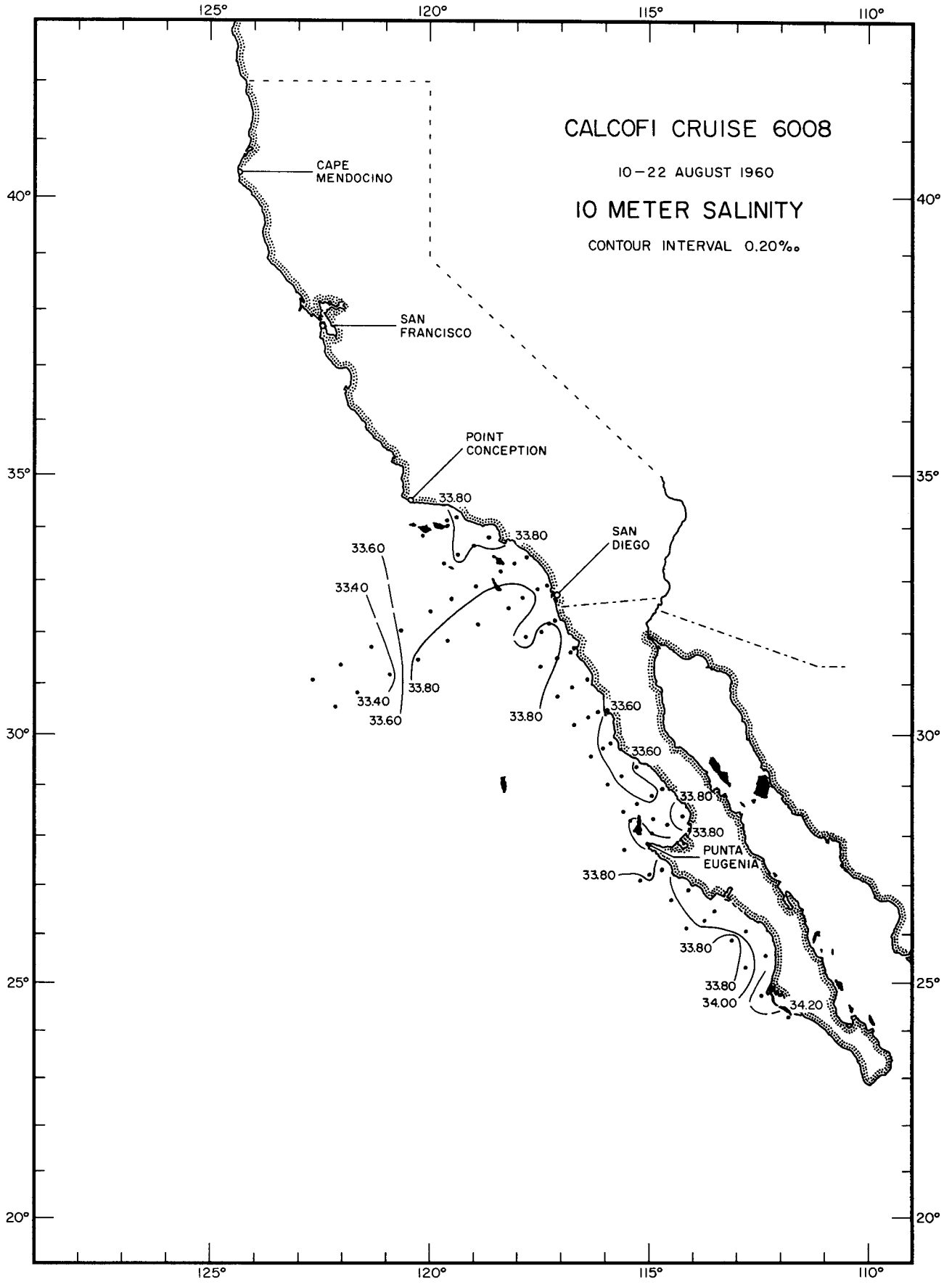

CALCOFI CRUISE 6006
14–30 JUNE 1960
10 METER SALINITY
CONTOUR INTERVAL 0.20‰
CAPE MENDOCINO
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
PUNTA EUGENIA
33.60
33.40
33.80
33.20
34.00
125°
120°
115°
110°
40°
35°
30°
25°
20°

10m S

6006

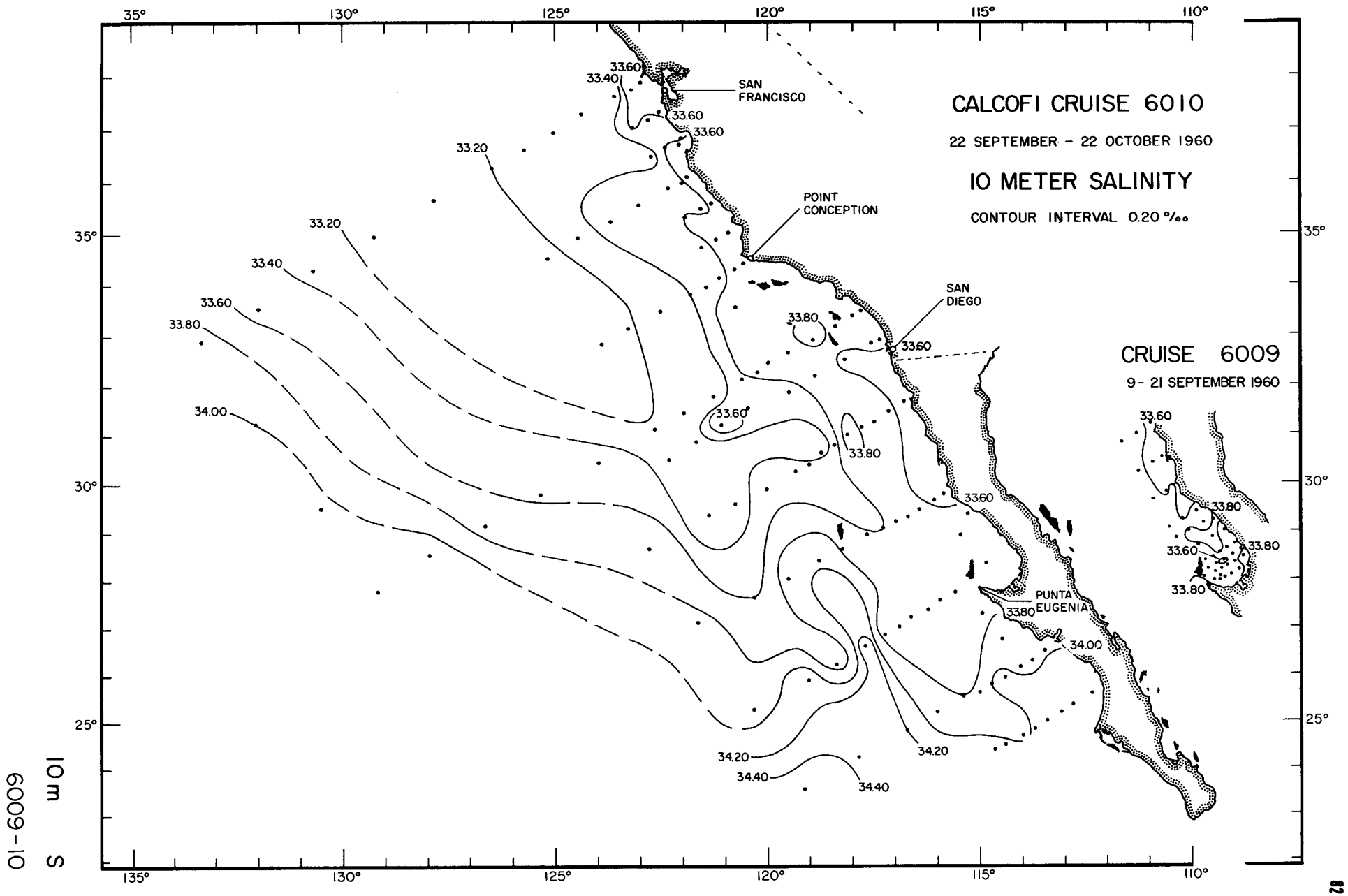

CALCOFI CRUISE 6007
12 JULY - 14 AUGUST 1960
10 METER SALINITY
CONTOUR INTERVAL 0.20‰
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
PUNTA UGENIA
33.00
33.20
33.40
33.60
33.80
34.00
34.20
135°
130°
125°
120°
115°
110°
35°
30°
25°

10m S 6007

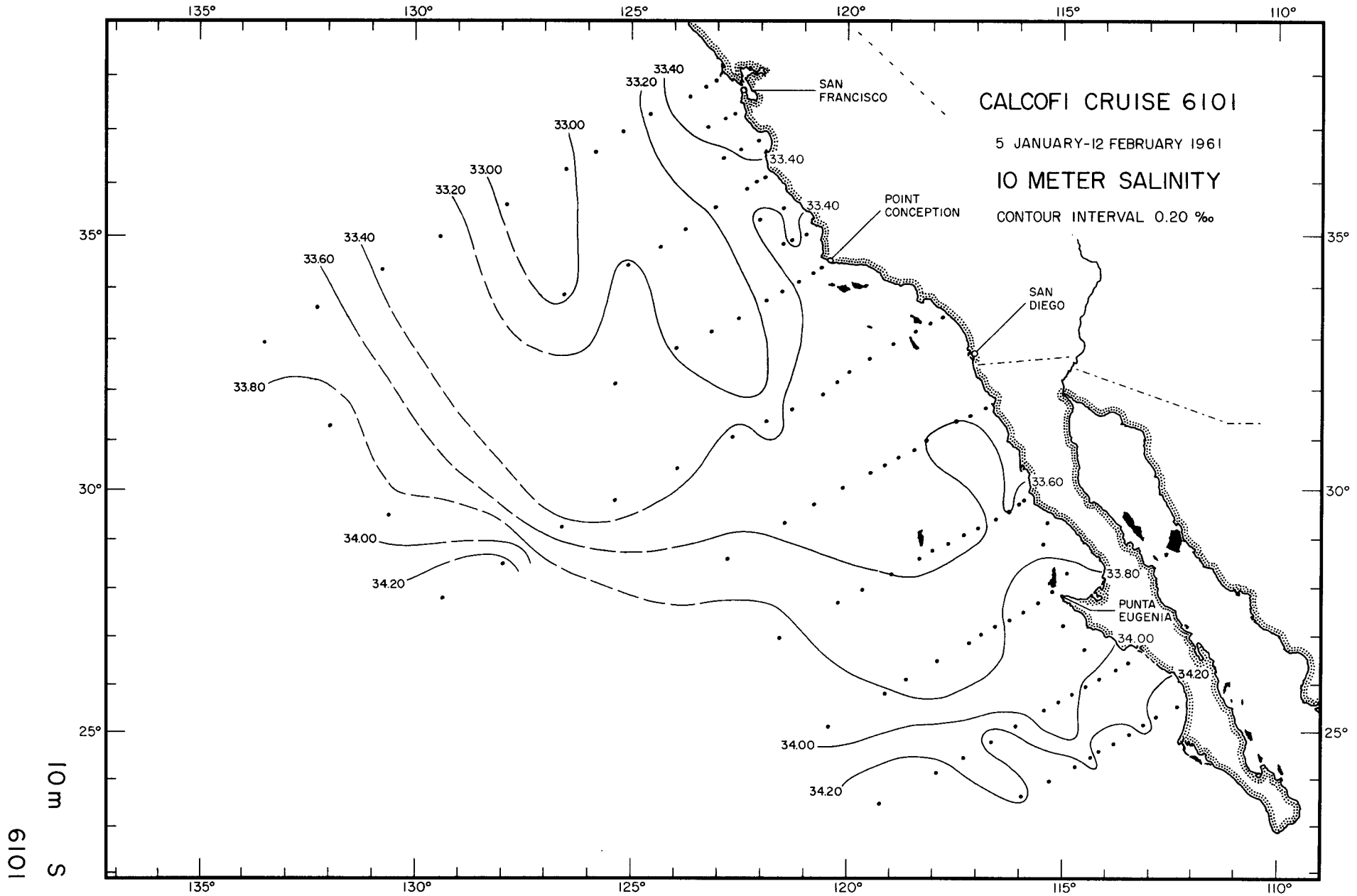

CALCOFI CRUISE 6008
10–22 AUGUST 1960
10 METER SALINITY
CONTOUR INTERVAL 0.20‰
CAPE MENDOCINO
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
PUNTA EUGENIA
125°
120°
115°
110°
40°
35°
30°
25°
20°
33.60
33.40
33.80
34.00
34.20

10m S

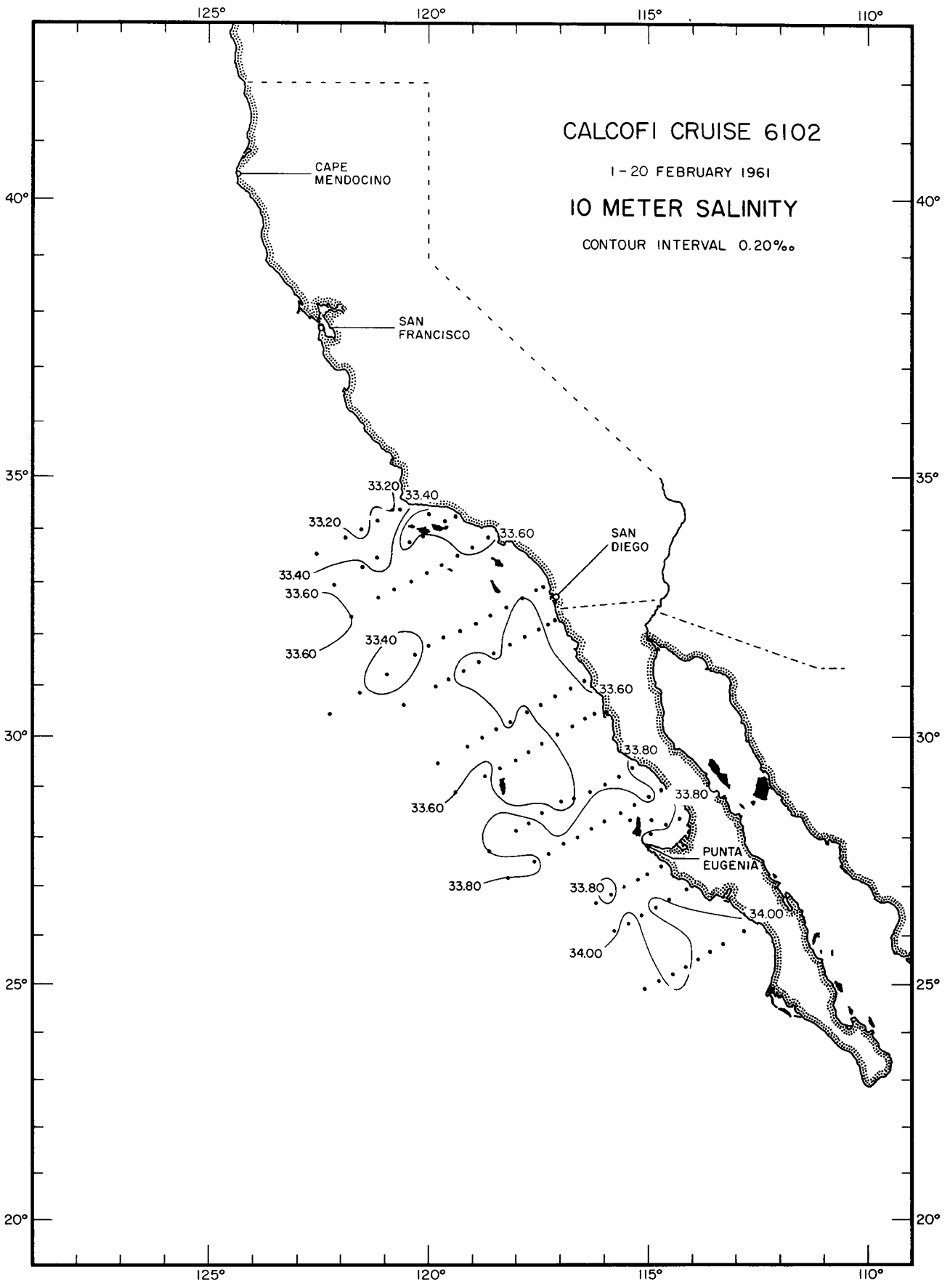
6008


CALCOFI CRUISE 6010
22 SEPTEMBER - 22 OCTOBER 1960
10 METER SALINITY
CONTOUR INTERVAL 0.20 ‰
CRUISE 6009
9 - 21 SEPTEMBER 1960
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
PUNTA EUGENIA
35°
130°
125°
120°
115°
110°
30°
25°
135°
33.20
33.40
33.60
33.80
34.00
34.20
34.40

01-6009 S 10m

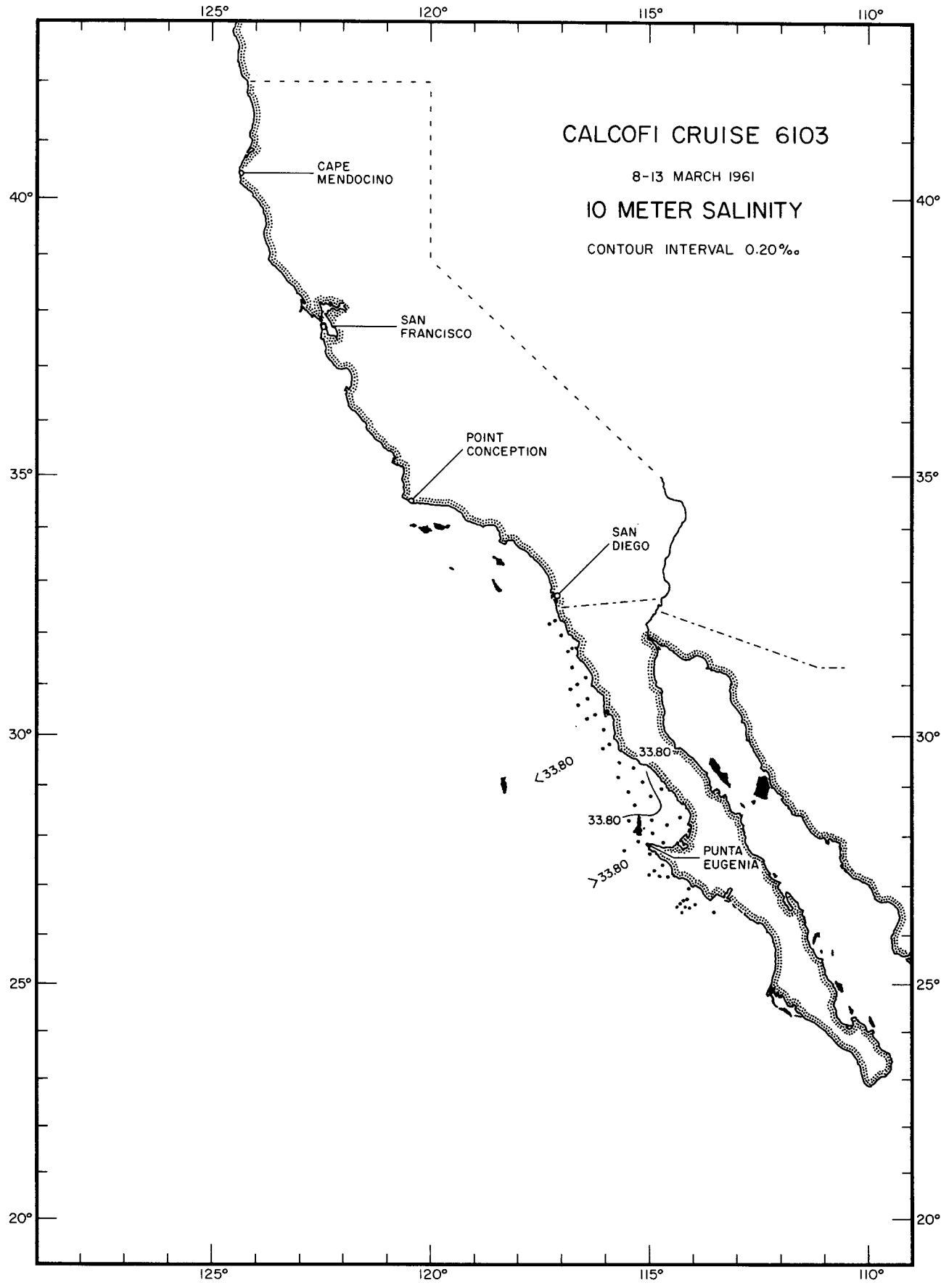

CALCOFI CRUISE 6101
5 JANUARY-12 FEBRUARY 1961
10 METER SALINITY
CONTOUR INTERVAL 0.20 ‰
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
PUNTA EUGENIA
33.00
33.20
33.40
33.60
33.80
34.00
34.20
135°
130°
125°
120°
115°
110°
35°
30°
25°

6101 S 10m


CALCOFI CRUISE 6102
1 - 20 FEBRUARY 1961
10 METER SALINITY
CONTOUR INTERVAL 0.20‰
CAPE MENDOCINO
SAN FRANCISCO
SAN DIEGO
PUNTA EUGENIA
33.20
33.40
33.60
33.80
34.00
125°
120°
115°
110°
40°
35°
30°
25°
20°

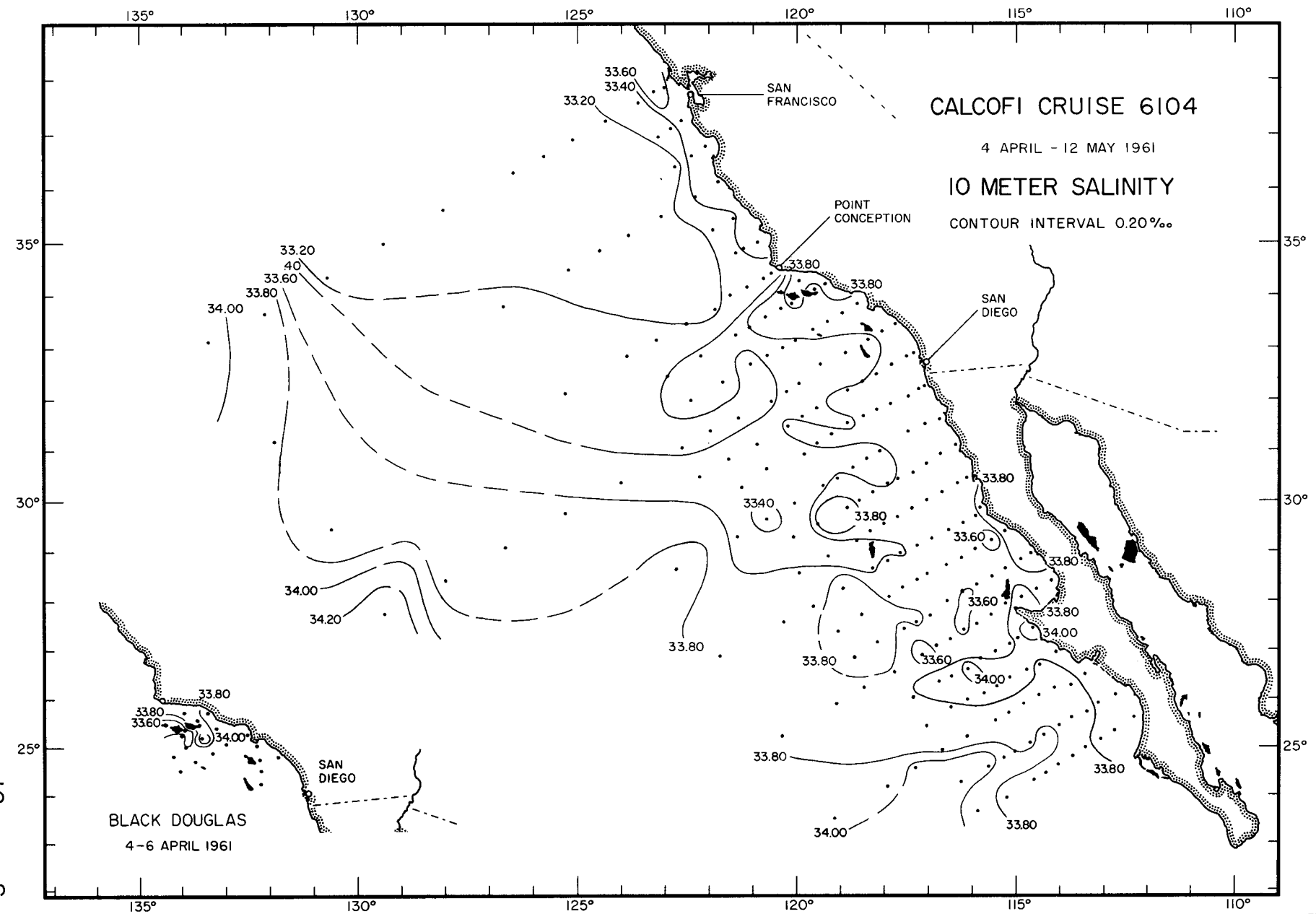
10m S

6102

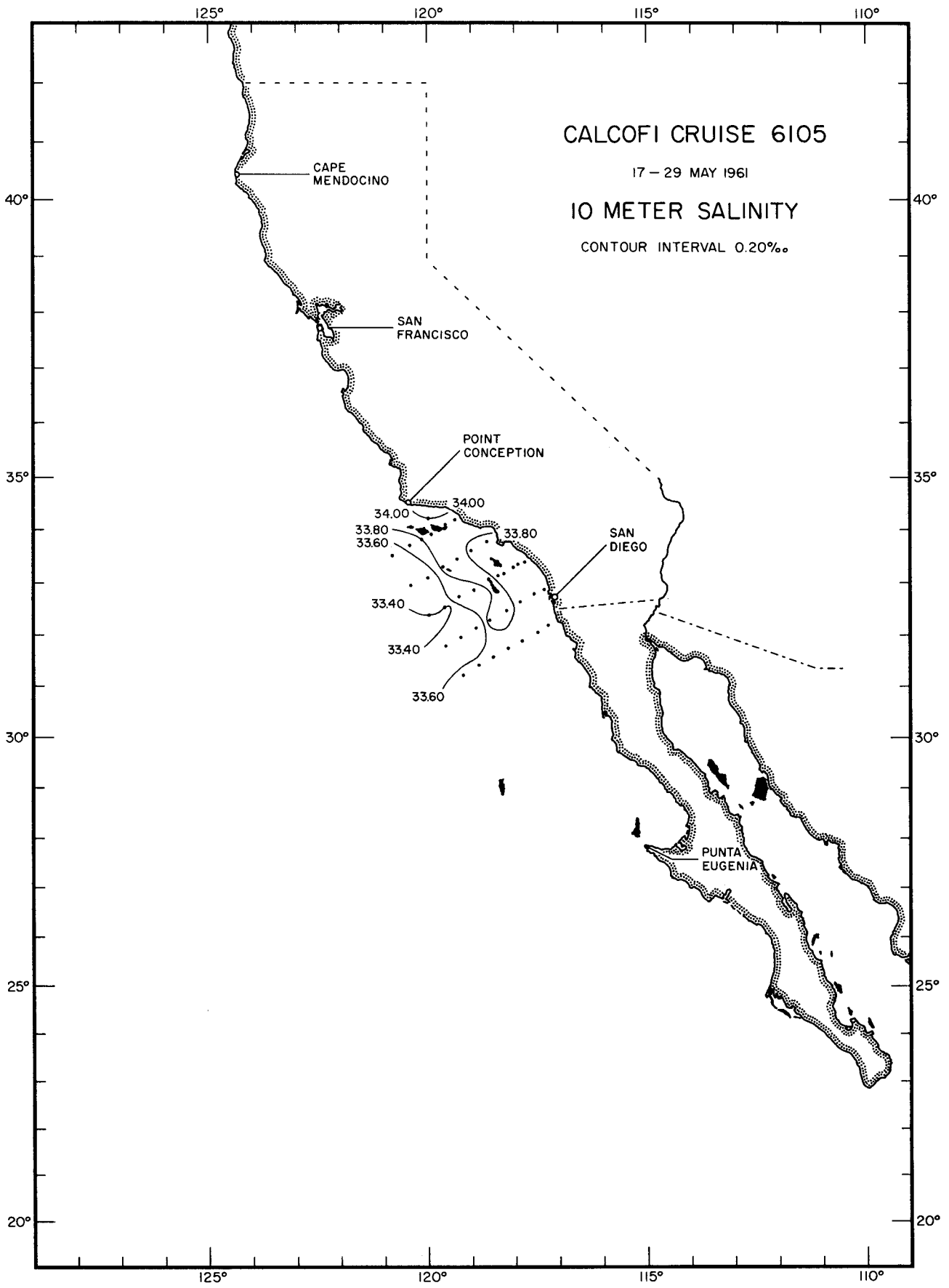

CALCOFI CRUISE 6103
8-13 MARCH 1961
10 METER SALINITY
CONTOUR INTERVAL 0.20‰
CAPE MENDOCINO
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
PUNTA EUGENIA
33.80
<33.80
33.80
>33.80
125°
120°
115°
110°
40°
35°
30°
25°
20°

10 m S

6103

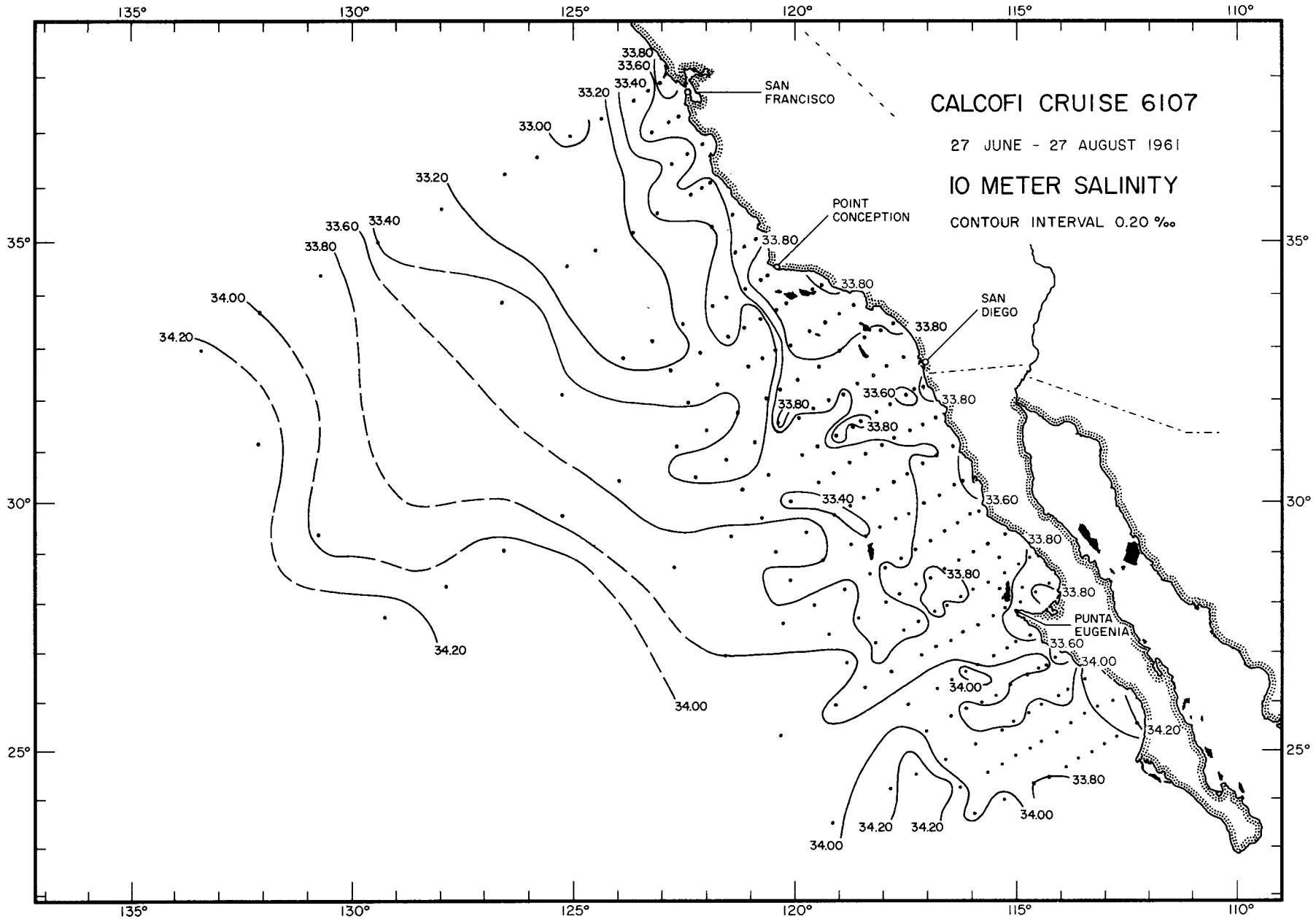

CALCOFI CRUISE 6104
4 APRIL - 12 MAY 1961
10 METER SALINITY
CONTOUR INTERVAL 0.20‰
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
SAN DIEGO
BLACK DOUGLAS
4-6 APRIL 1961
135°
130°
125°
120°
115°
110°
35°
30°
25°
33.60
33.40
33.20
33.80
33.80
33.20
40
33.60
33.80
34.00
33.80
33.40
33.80
33.60
33.80
34.00
34.20
33.80
33.80
33.80
33.60
34.00
33.80
33.60
34.00
33.80
33.80
34.00
33.80
33.80
33.60
34.00

10m S 6104

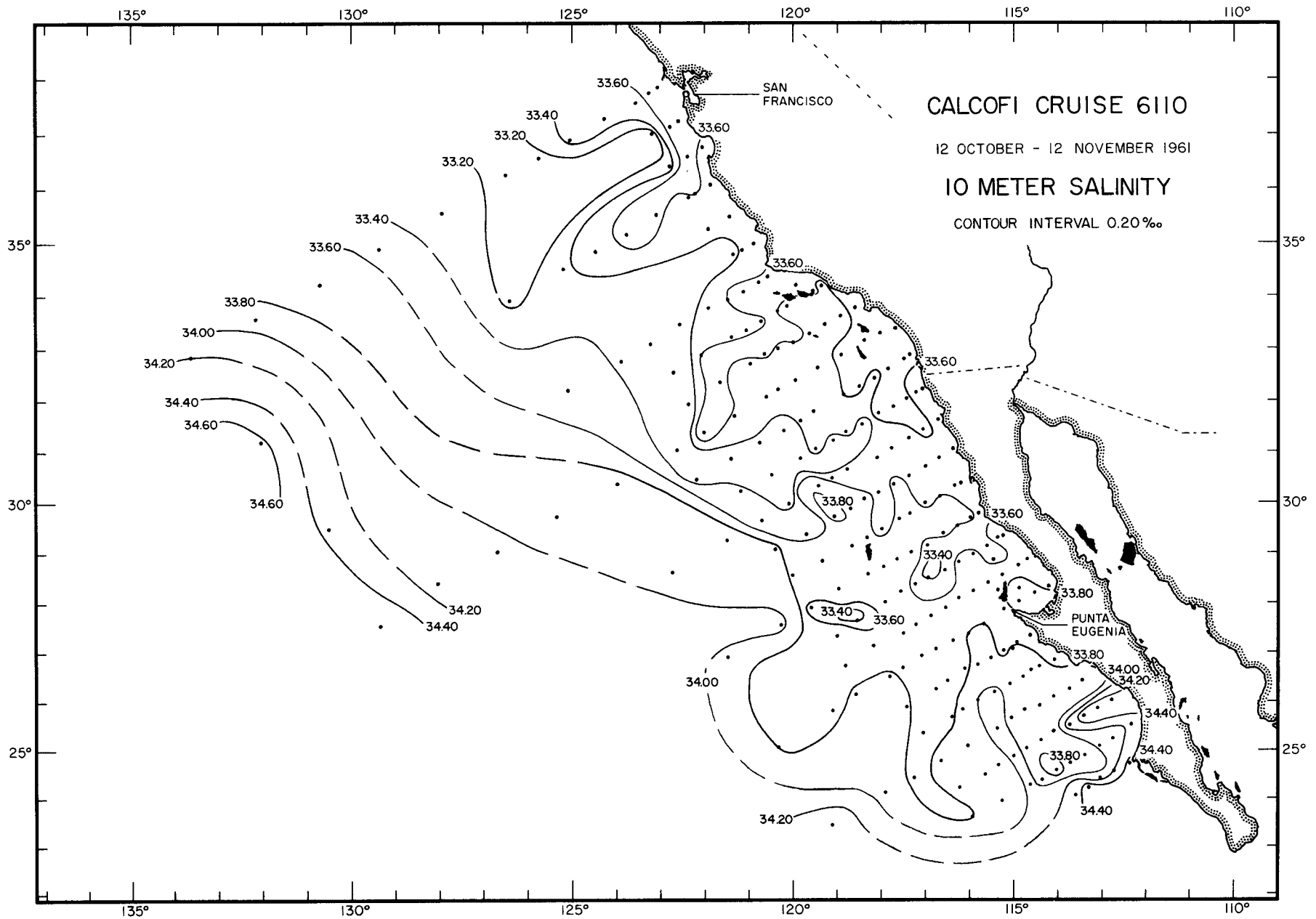

CALCOFI CRUISE 6105
17 – 29 MAY 1961
10 METER SALINITY
CONTOUR INTERVAL 0.20‰
CAPE MENDOCINO
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
PUNTA EUGENIA
34.00
34.00
33.80
33.60
33.80
33.40
33.40
33.60
125°
120°
115°
110°
40°
35°
30°
25°
20°

10m S

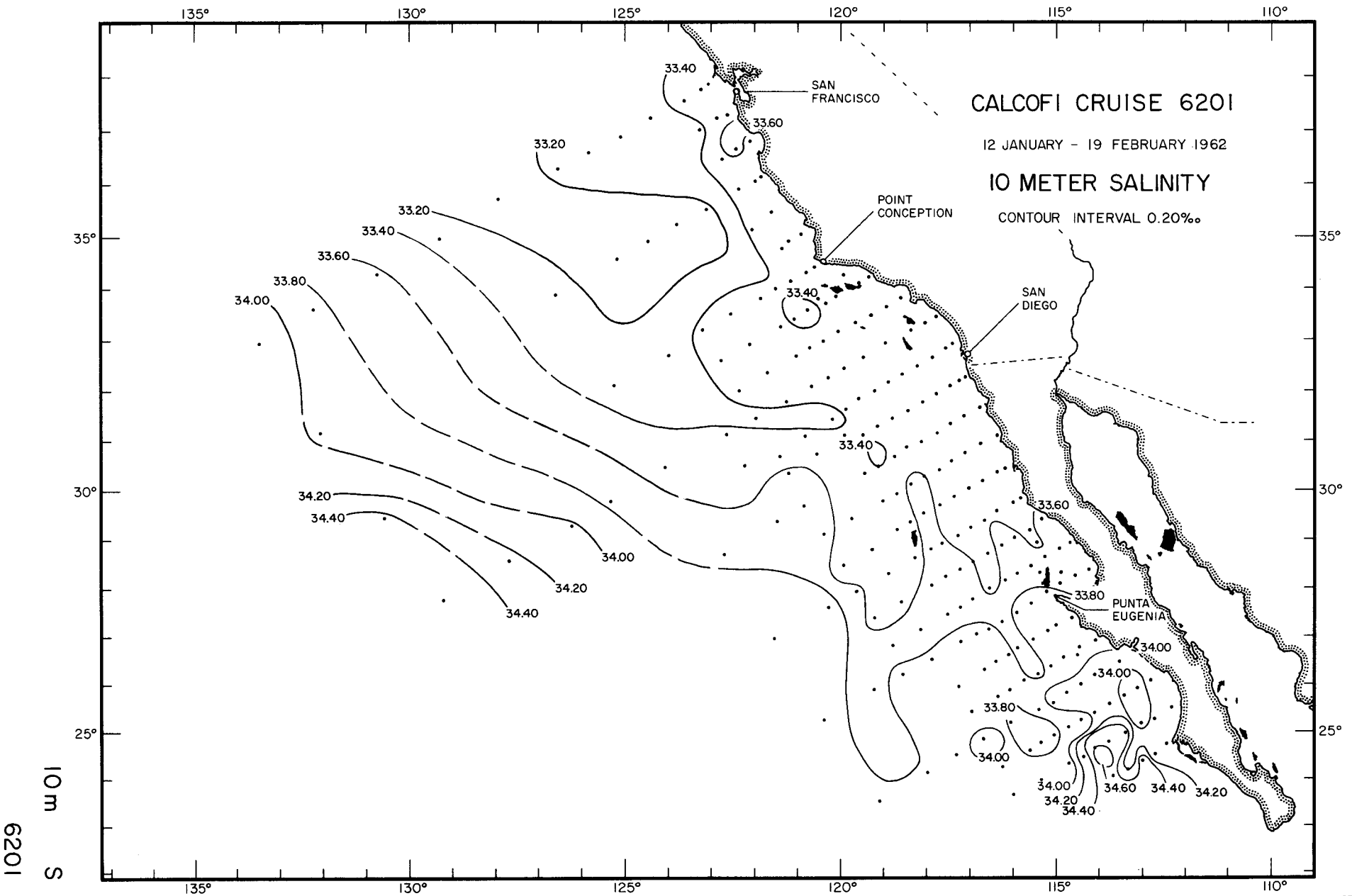
6105


CALCOFI CRUISE 6107
27 JUNE - 27 AUGUST 1961
10 METER SALINITY
CONTOUR INTERVAL 0.20 ‰
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
PUNTA EUGENIA
135°
130°
125°
120°
115°
110°
35°
30°
25°
33.00
33.20
33.40
33.60
33.80
34.00
34.20

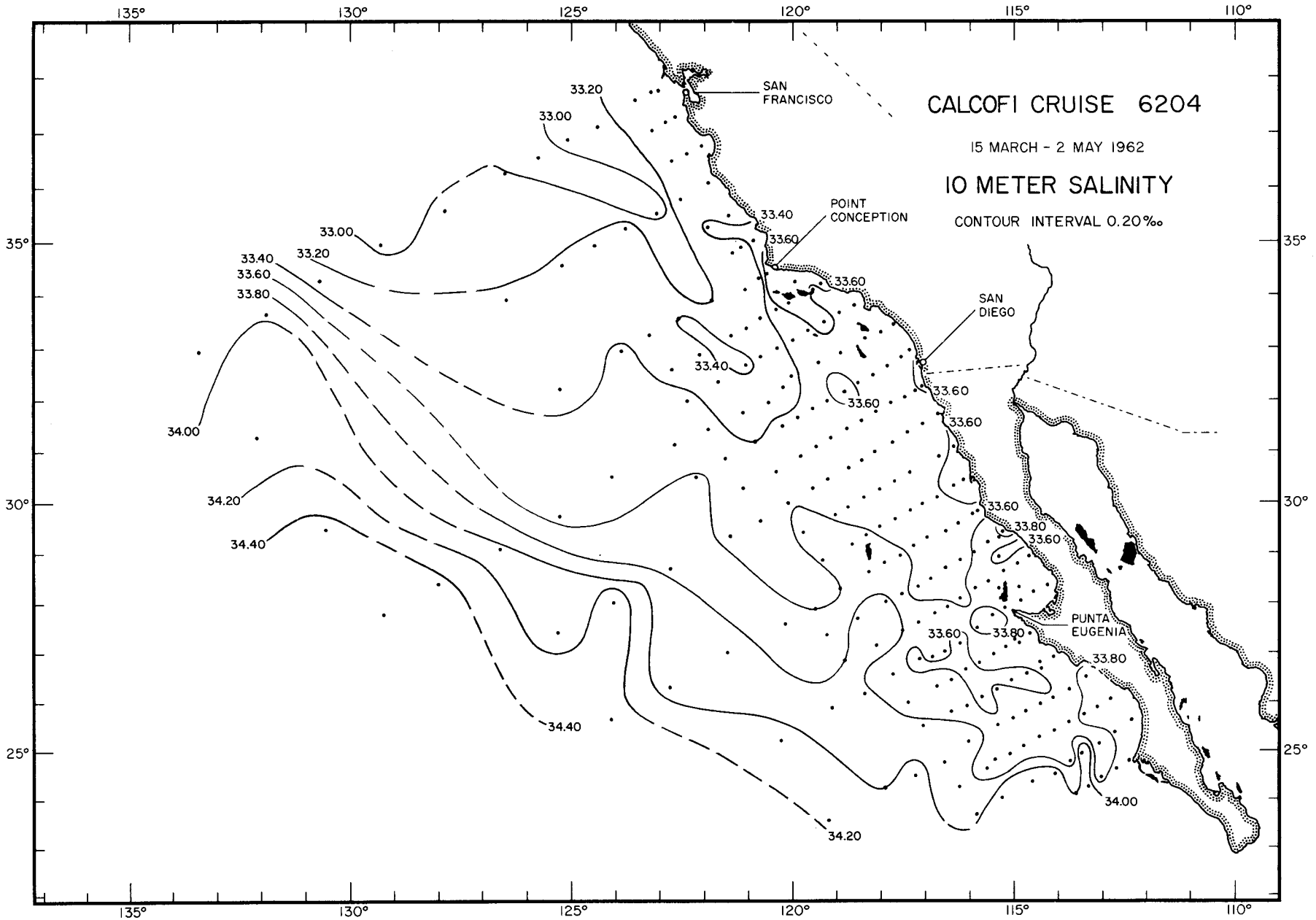
10m S 6107


CALCOFI CRUISE 6110
12 OCTOBER - 12 NOVEMBER 1961
10 METER SALINITY
CONTOUR INTERVAL 0.20‰
SAN FRANCISCO
PUNTA EUGENIA
135°
130°
125°
120°
115°
110°
35°
30°
25°
33.20
33.40
33.60
33.80
34.00
34.20
34.40
34.60

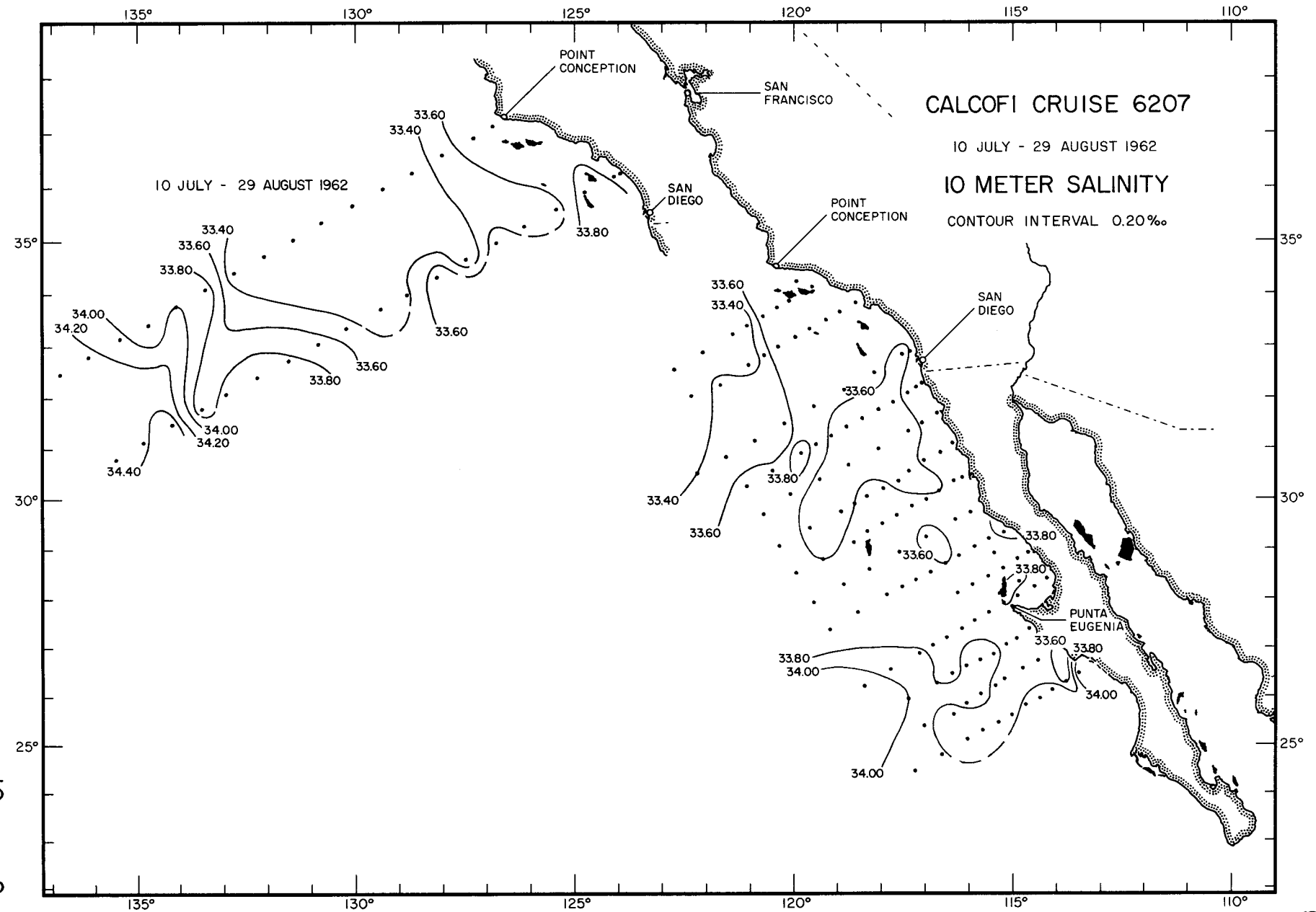
10m S 6110


CALCOFI CRUISE 6201
12 JANUARY - 19 FEBRUARY 1962
10 METER SALINITY
CONTOUR INTERVAL 0.20‰
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
PUNTA EUGENIA
135°
130°
125°
120°
115°
110°
35°
30°
25°
33.40
33.60
33.20
33.80
34.00
34.20
34.40
34.60

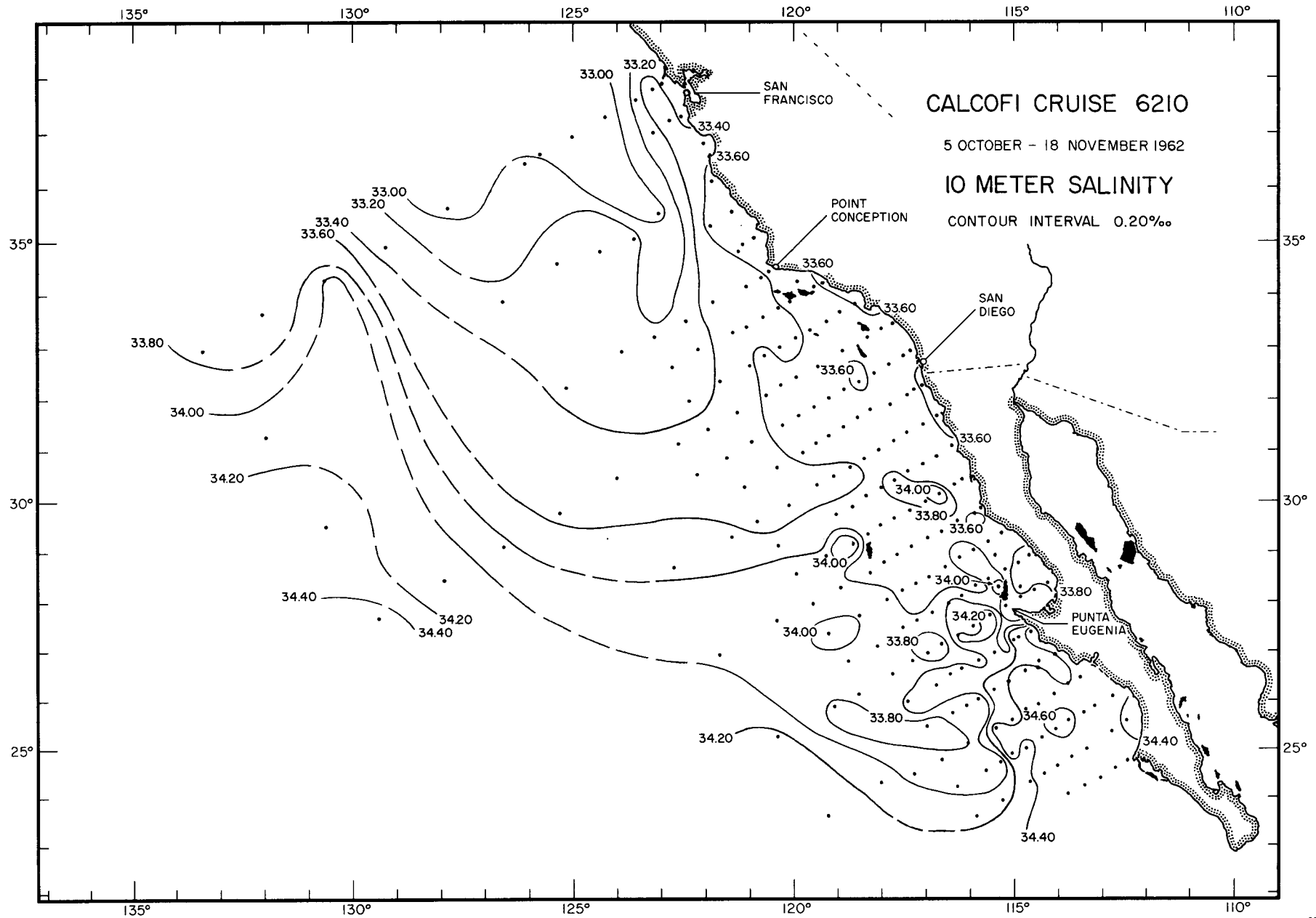
10m S 6201


CALCOFI CRUISE 6204
15 MARCH - 2 MAY 1962
10 METER SALINITY
CONTOUR INTERVAL 0.20‰
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
PUNTA EUGENIA
135°
130°
125°
120°
115°
110°
35°
30°
25°
33.20
33.00
33.40
33.60
33.80
34.00
34.20
34.40

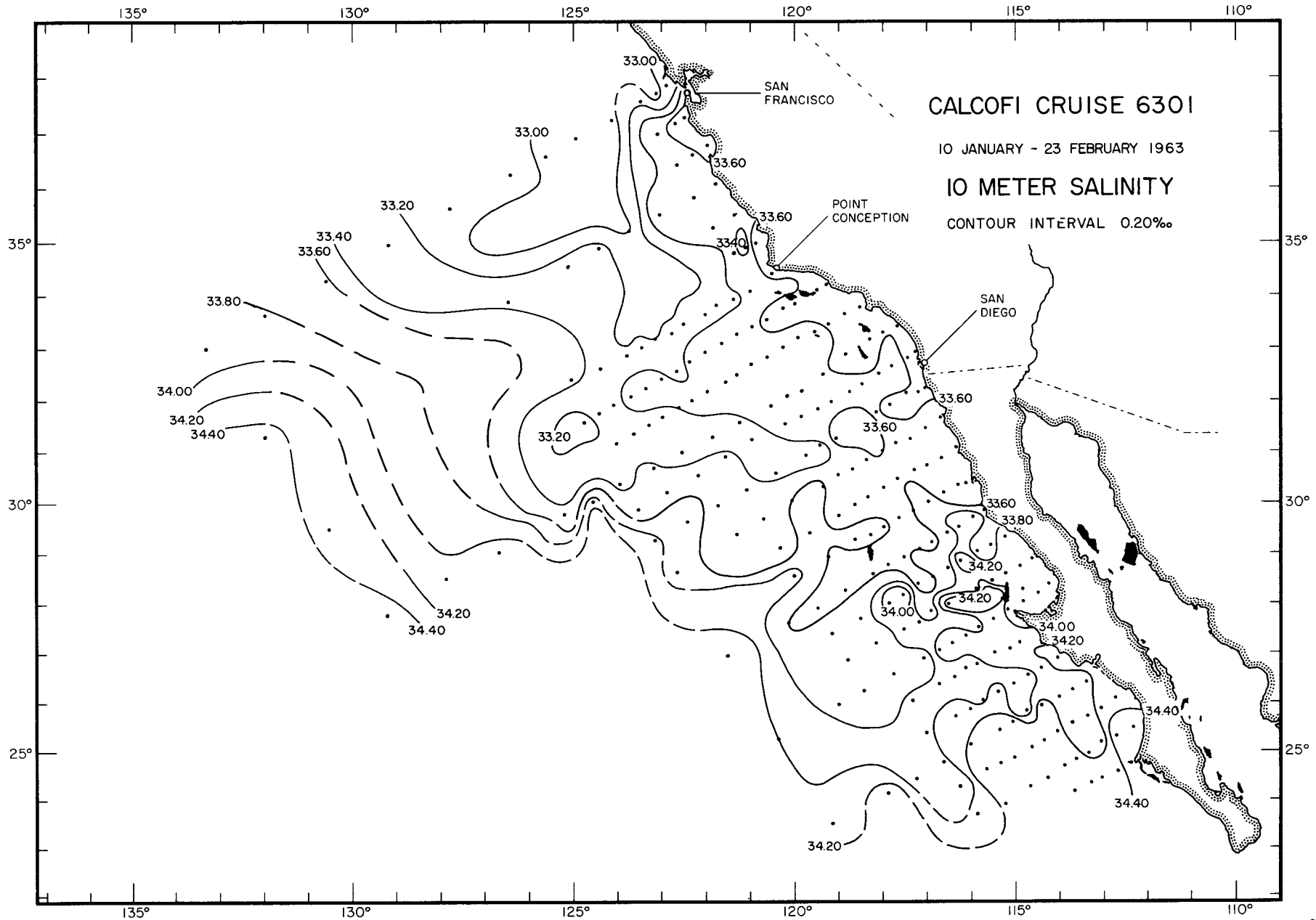
10m S 6204


CALCOFI CRUISE 6207
10 JULY - 29 AUGUST 1962
10 METER SALINITY
CONTOUR INTERVAL 0.20‰
10 JULY - 29 AUGUST 1962
POINT CONCEPTION
SAN FRANCISCO
SAN DIEGO
POINT CONCEPTION
SAN DIEGO
PUNTA EUGENIA
135°
130°
125°
120°
115°
110°
35°
30°
25°
33.40
33.60
33.80
34.00
34.20
34.40

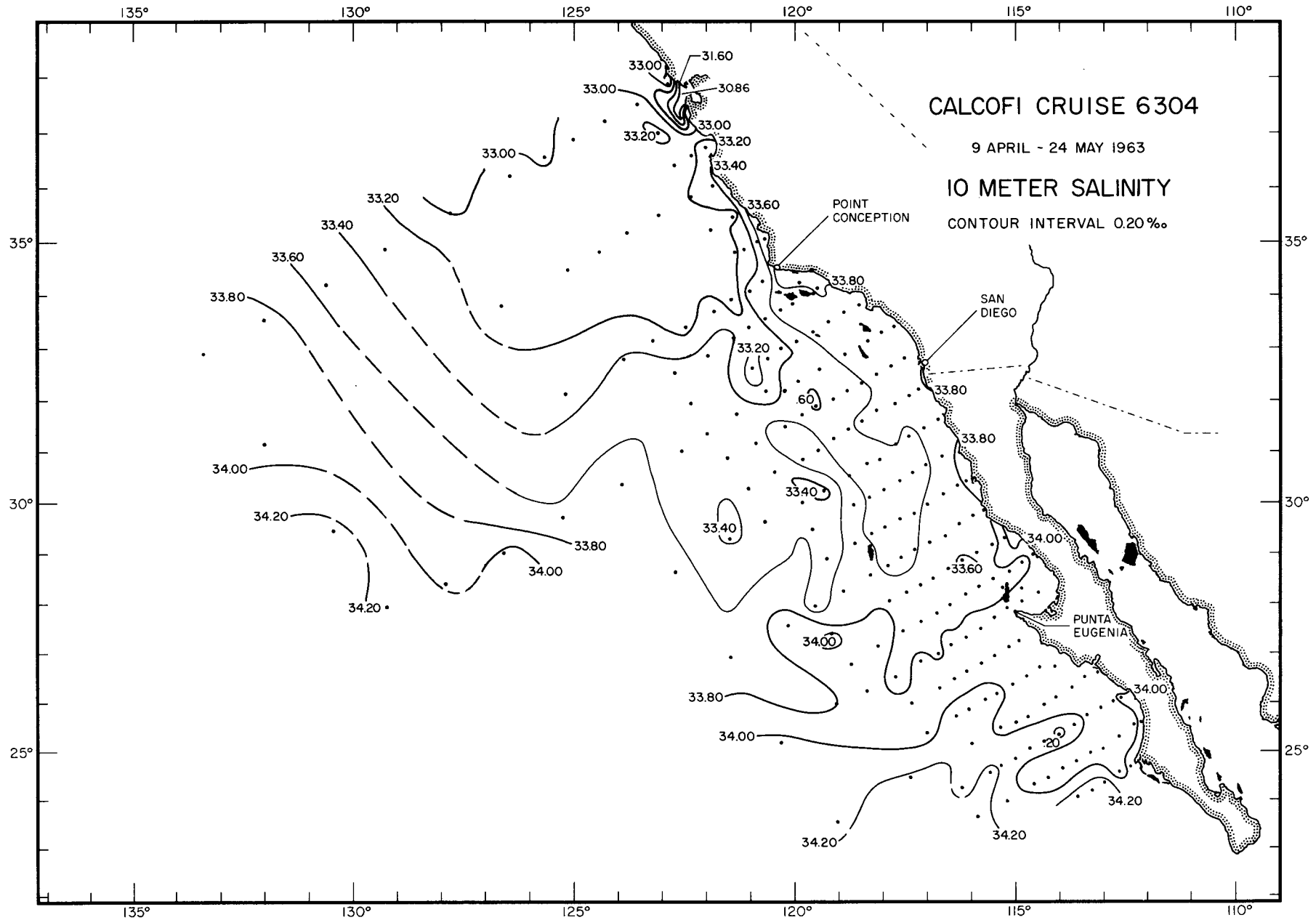
10m S 6207


CALCOFI CRUISE 6210
5 OCTOBER – 18 NOVEMBER 1962
10 METER SALINITY
CONTOUR INTERVAL 0.20‰
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
PUNTA EUGENIA
135°
130°
125°
120°
115°
110°
35°
30°
25°
33.00
33.20
33.40
33.60
33.80
34.00
34.20
34.40
34.60

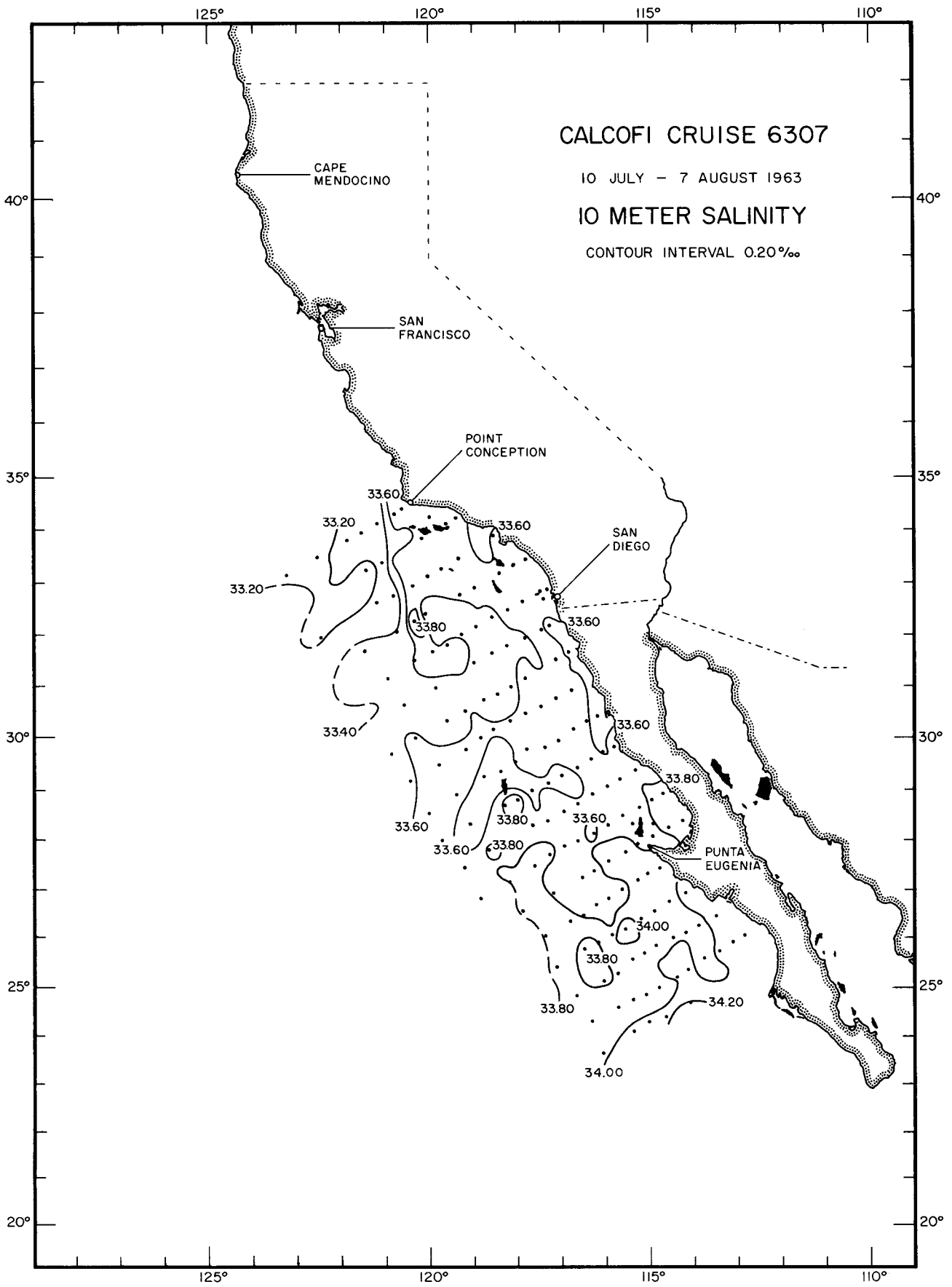
10m S 6210


CALCOFI CRUISE 6301
10 JANUARY - 23 FEBRUARY 1963
10 METER SALINITY
CONTOUR INTERVAL 0.20‰
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
135°
130°
125°
120°
115°
110°
35°
30°
25°
33.00
33.20
33.40
33.60
33.80
34.00
34.20
34.40

10m S 6301

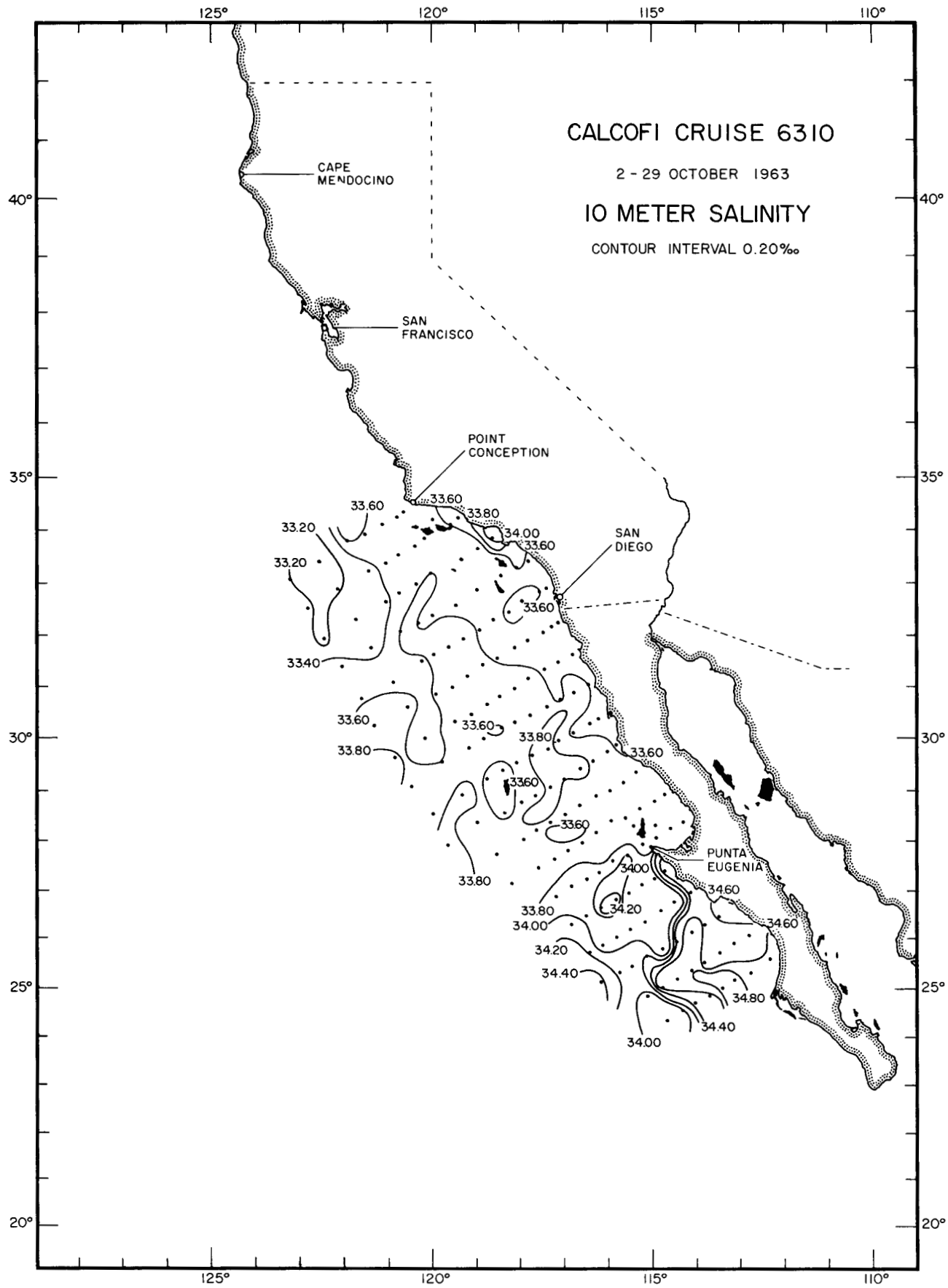

CALCOFI CRUISE 6304
9 APRIL - 24 MAY 1963
10 METER SALINITY
CONTOUR INTERVAL 0.20‰
POINT CONCEPTION
SAN DIEGO
PUNTA EUGENIA
135°
130°
125°
120°
115°
110°
35°
30°
25°
31.60
33.00
30.86
33.20
33.40
33.60
33.80
34.00
34.20
.60
.20

10m S 6304


CALCOFI CRUISE 6307
10 JULY – 7 AUGUST 1963
10 METER SALINITY
CONTOUR INTERVAL 0.20‰
CAPE MENDOCINO
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
PUNTA EUGENIA
125°
120°
115°
110°
40°
35°
30°
25°
20°
33.20
33.40
33.60
33.80
34.00
34.20

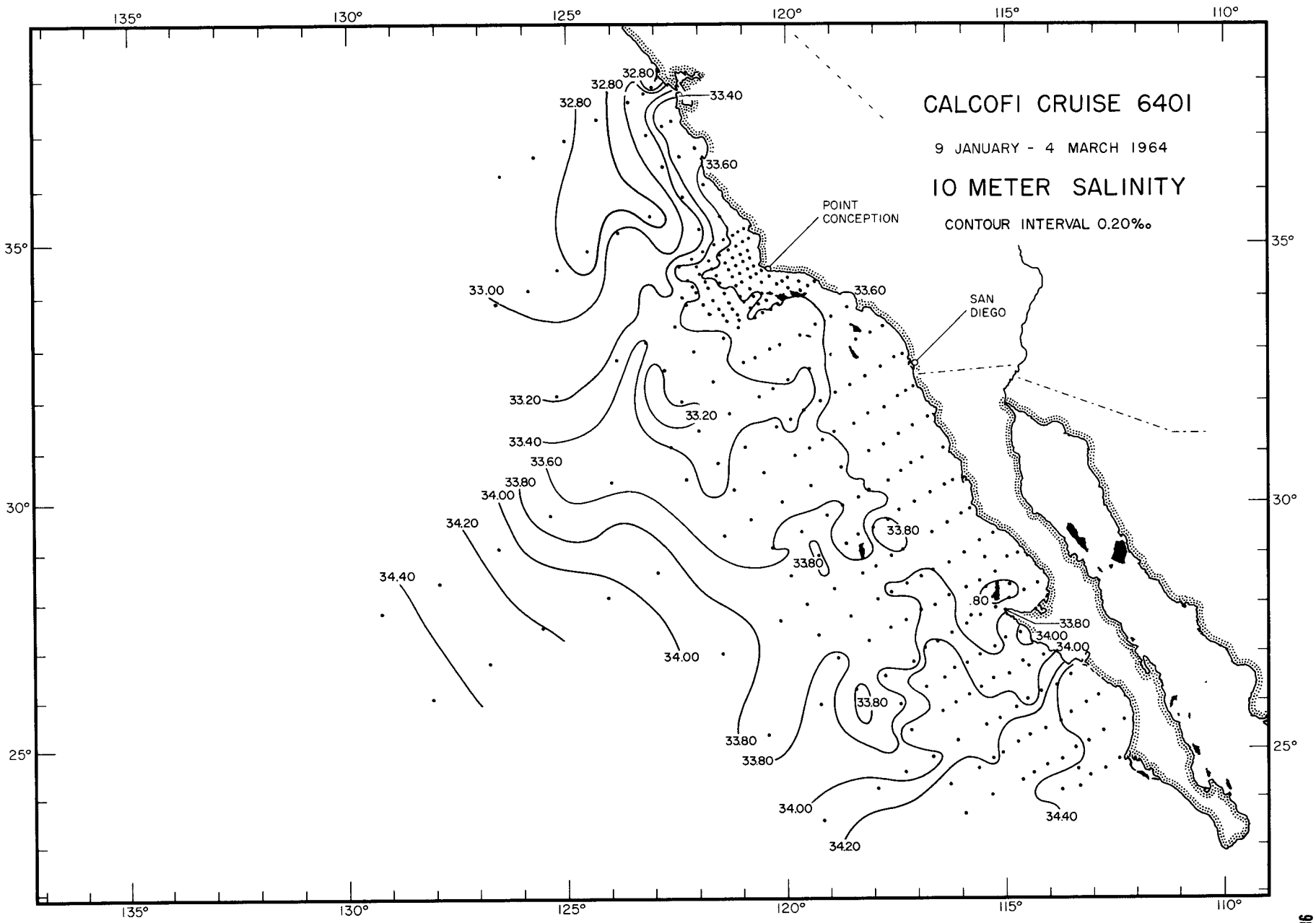
10m S

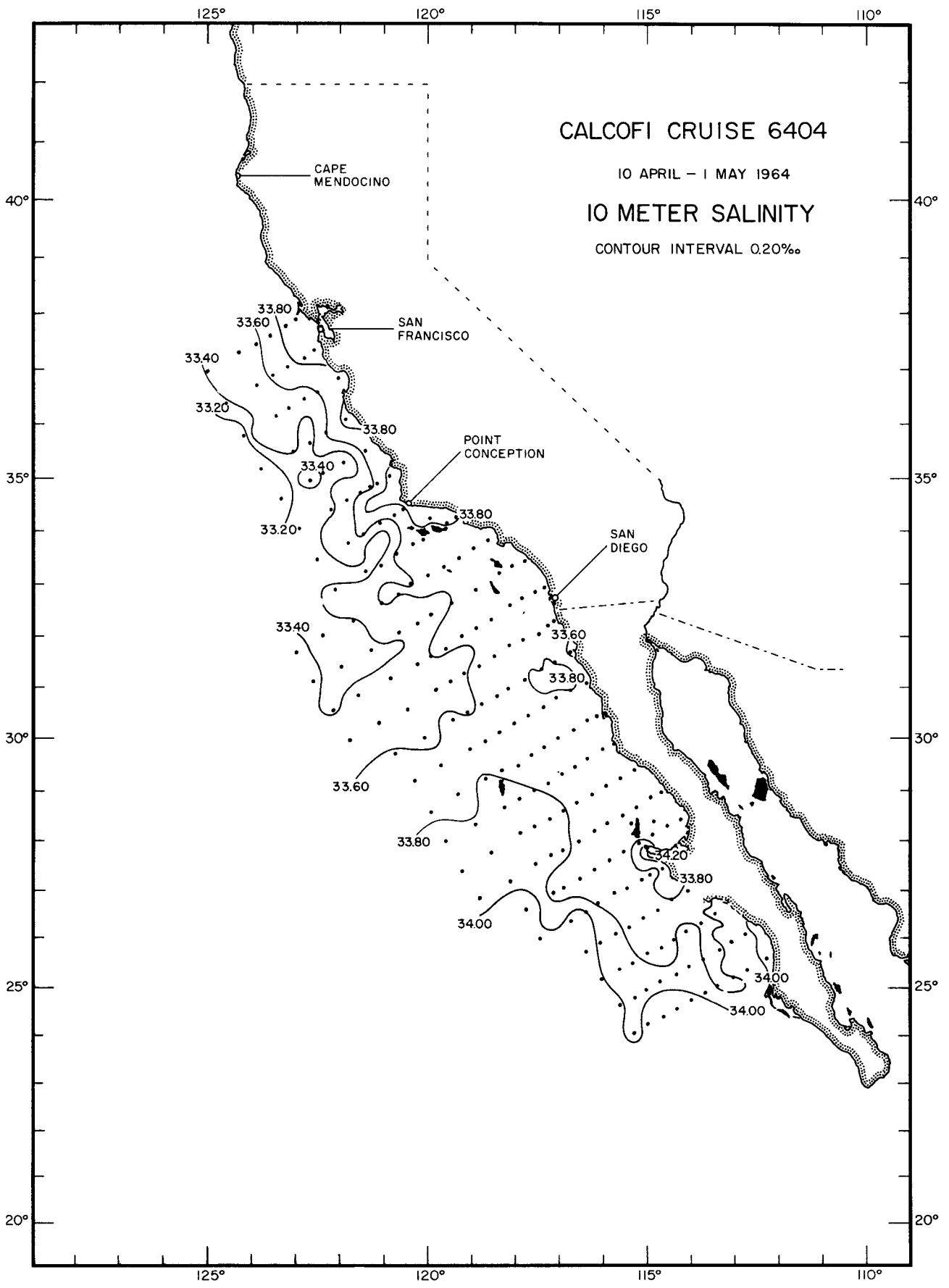
6307


CALCOFI CRUISE 6310
2 - 29 OCTOBER 1963
10 METER SALINITY
CONTOUR INTERVAL 0.20‰
CAPE MENDOCINO
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
PUNTA EUGENIA
125°
120°
115°
110°
40°
35°
30°
25°
20°
33.20
33.40
33.60
33.80
34.00
34.20
34.40
34.60
34.80

10m S

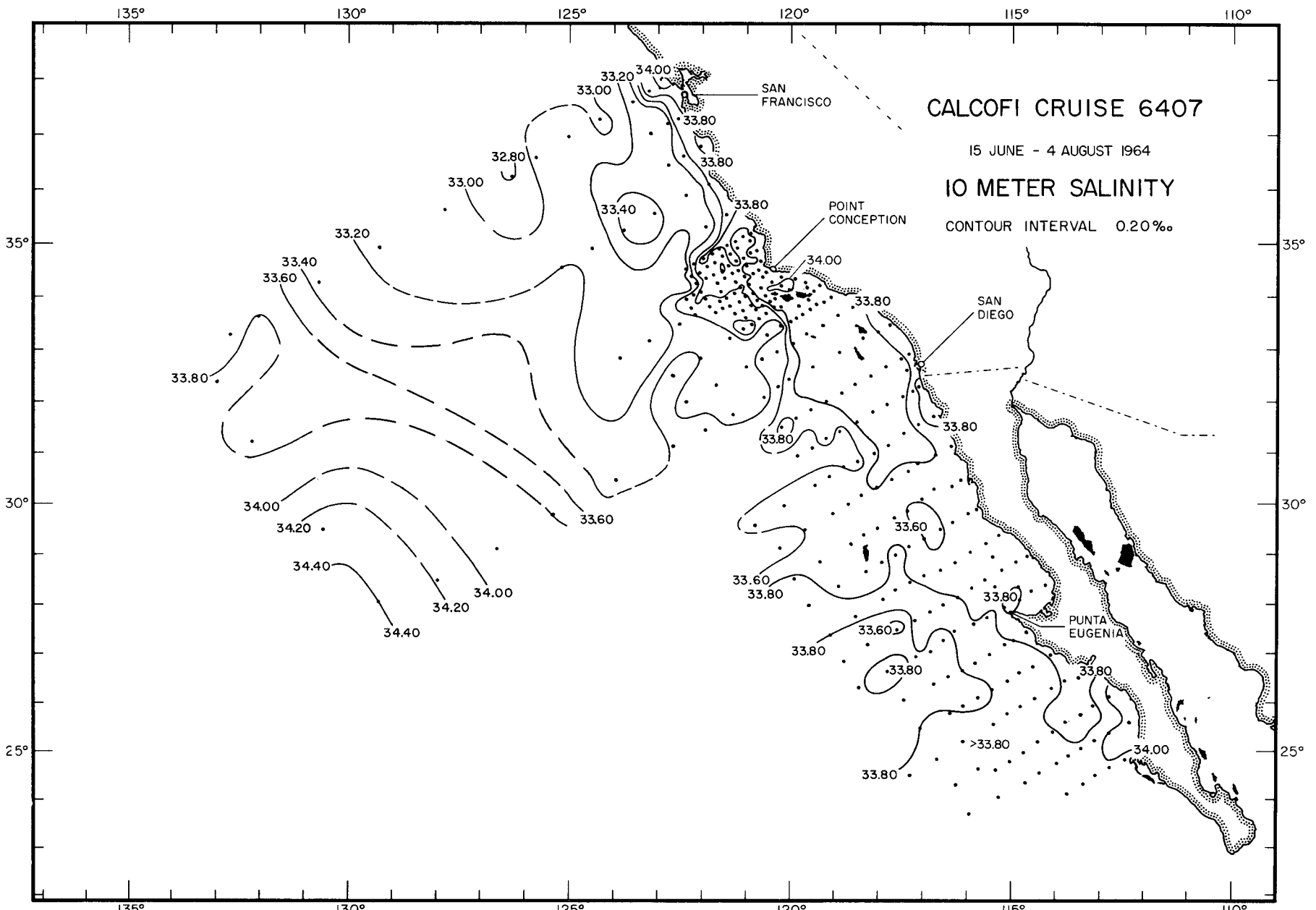
6310


CALCOFI CRUISE 6401
9 JANUARY - 4 MARCH 1964
10 METER SALINITY
CONTOUR INTERVAL 0.20‰
POINT CONCEPTION
SAN DIEGO
135°
130°
125°
120°
115°
110°
35°
30°
25°
32.80
33.40
33.60
33.00
33.20
33.40
33.60
33.80
34.00
34.20
34.40
10m S 6401

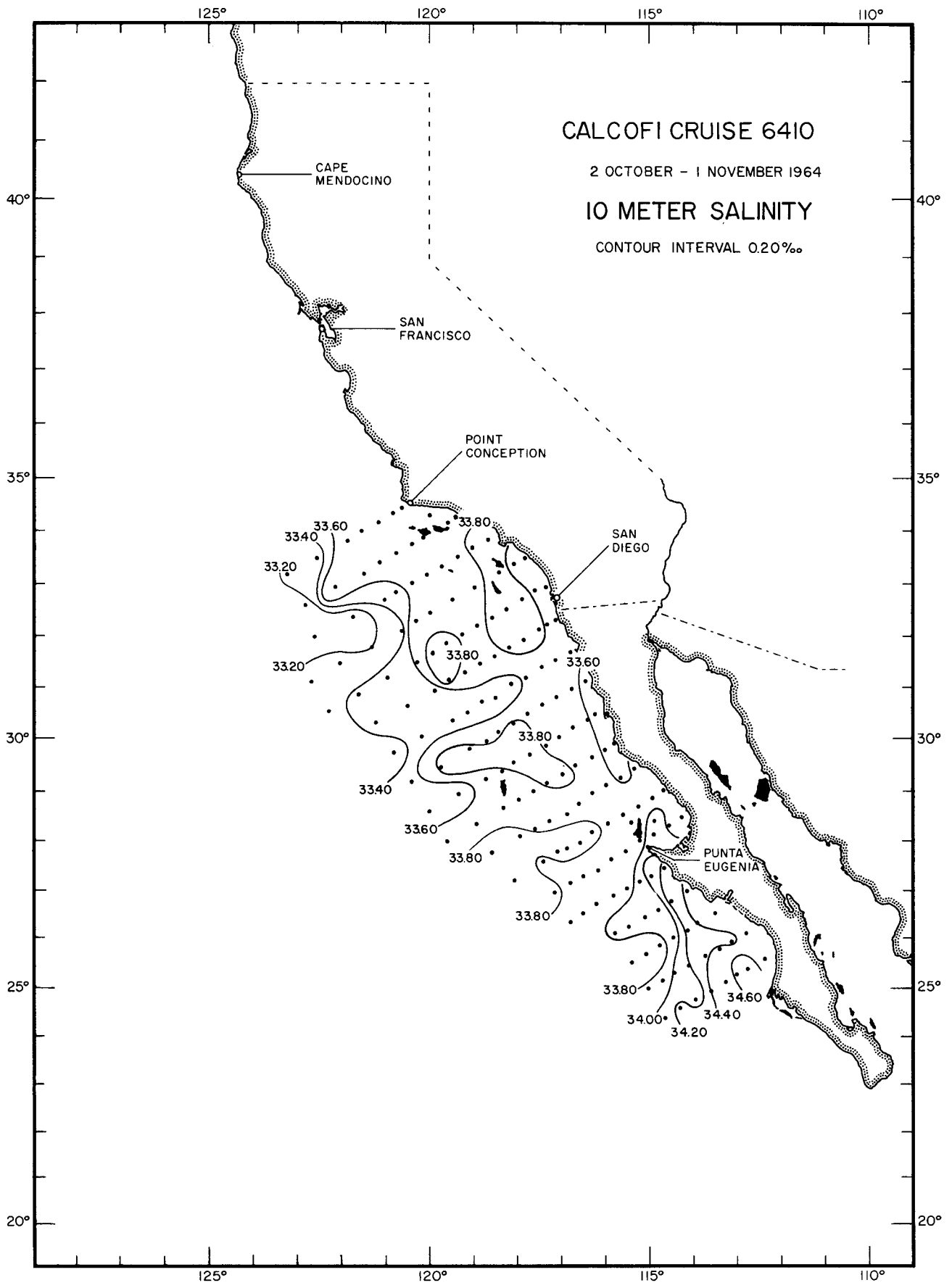

CALCOFI CRUISE 6404
10 APRIL – 1 MAY 1964
10 METER SALINITY
CONTOUR INTERVAL 0.20‰
CAPE MENDOCINO
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
125°
120°
115°
110°
40°
35°
30°
25°
20°
33.80
33.60
33.40
33.20
33.80
33.40
33.20
33.80
33.40
33.60
33.80
33.60
33.80
34.20
33.80
34.00
34.00
34.00

10m S

6404

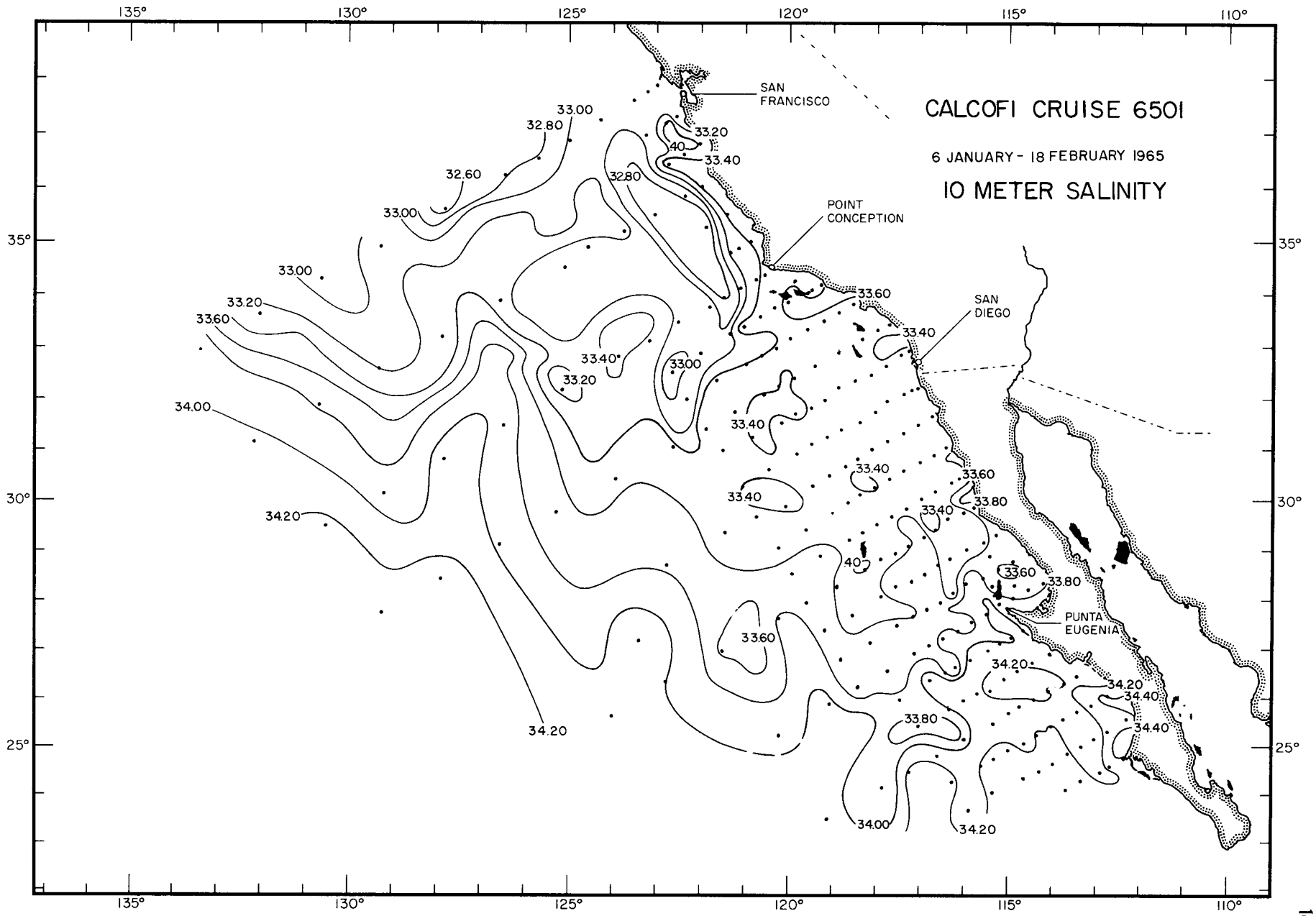

CALCOFI CRUISE 6407
15 JUNE - 4 AUGUST 1964
10 METER SALINITY
CONTOUR INTERVAL 0.20‰
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
PUNTA EUGENIA
135°
130°
125°
120°
115°
110°
35°
30°
25°
33.00
33.20
34.00
33.80
32.80
33.40
33.60
34.20
34.40
>33.80

10m S 6407

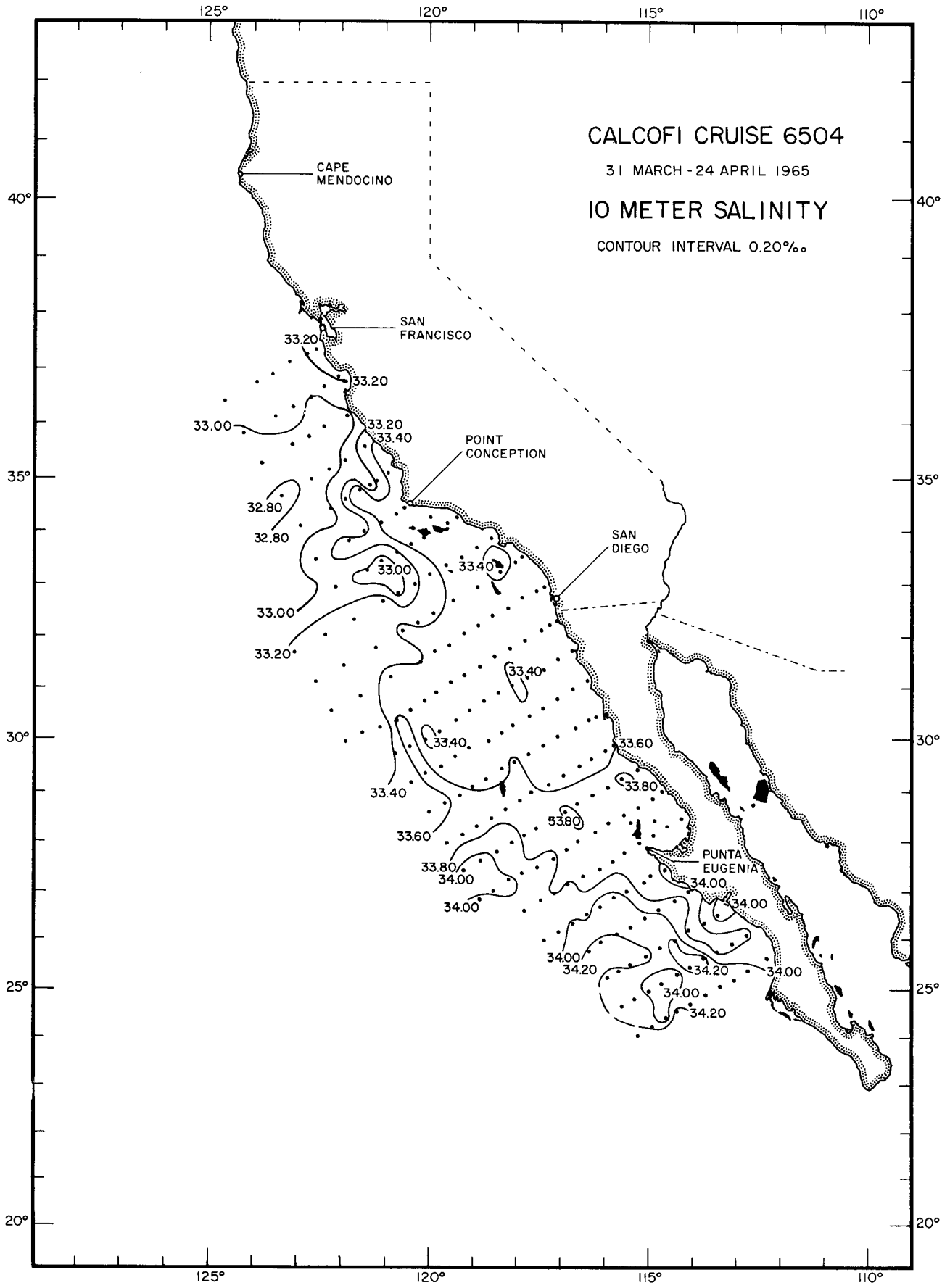

CALCOFI CRUISE 6410
2 OCTOBER - 1 NOVEMBER 1964
10 METER SALINITY
CONTOUR INTERVAL 0.20‰
CAPE MENDOCINO
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
PUNTA EUGENIA
125°
120°
115°
110°
40°
35°
30°
25°
20°
33.40
33.60
33.80
33.20
33.80
33.60
33.80
33.40
33.60
33.80
33.80
33.80
34.60
34.00
34.40
34.20

10m S

6410

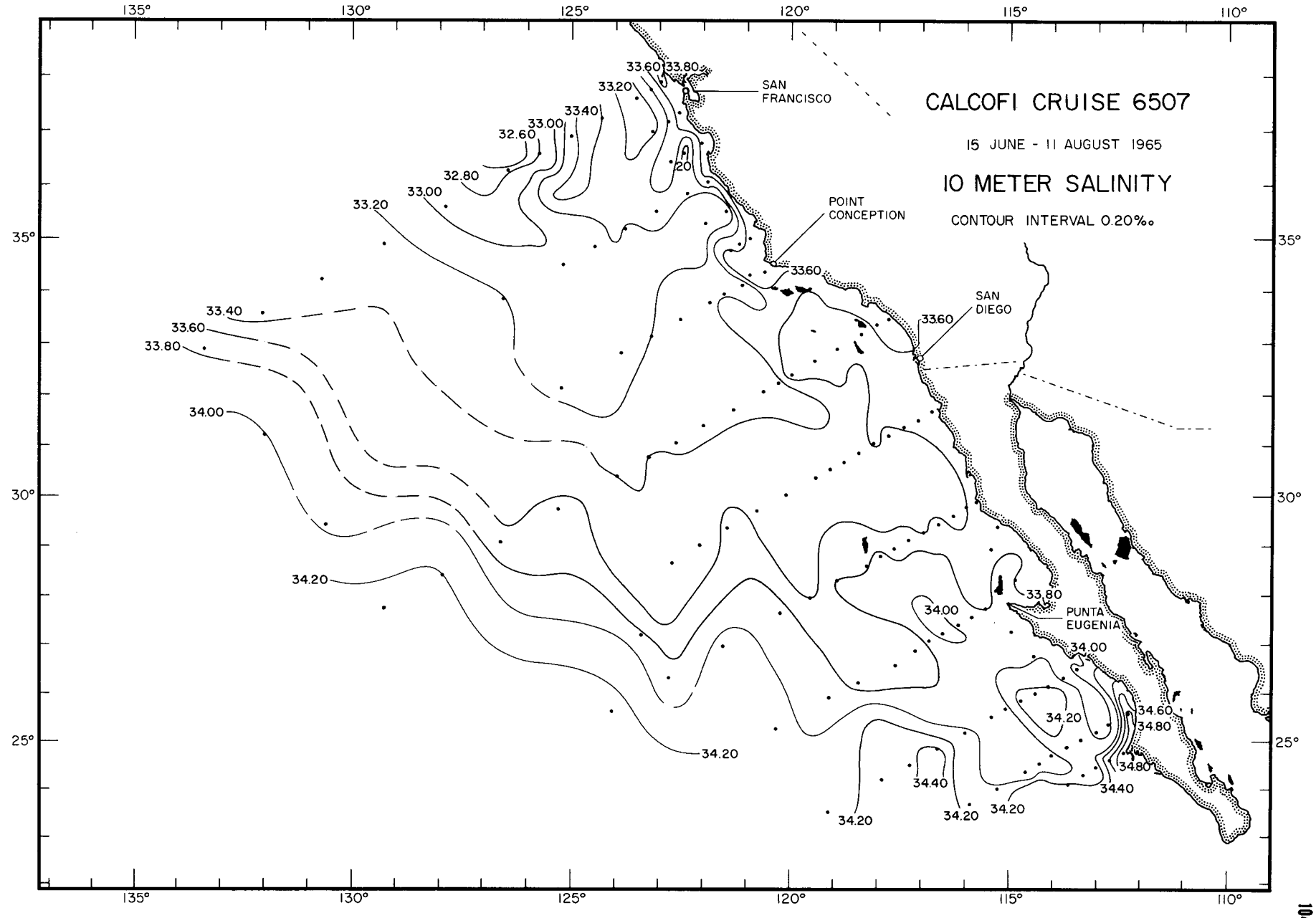

CALCOFI CRUISE 6501
6 JANUARY - 18 FEBRUARY 1965
10 METER SALINITY
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
PUNTA EUGENIA
135°
130°
125°
120°
115°
110°
35°
30°
25°
33.00
32.80
33.20
40
33.40
32.60
33.00
32.80
33.00
33.20
33.60
33.40
33.00
33.20
34.00
33.40
33.60
33.40
33.40
33.60
33.80
34.20
33.40
40
33.60
33.80
33.60
34.20
34.20
34.40
33.80
34.40
34.00
34.20

10m S 6501

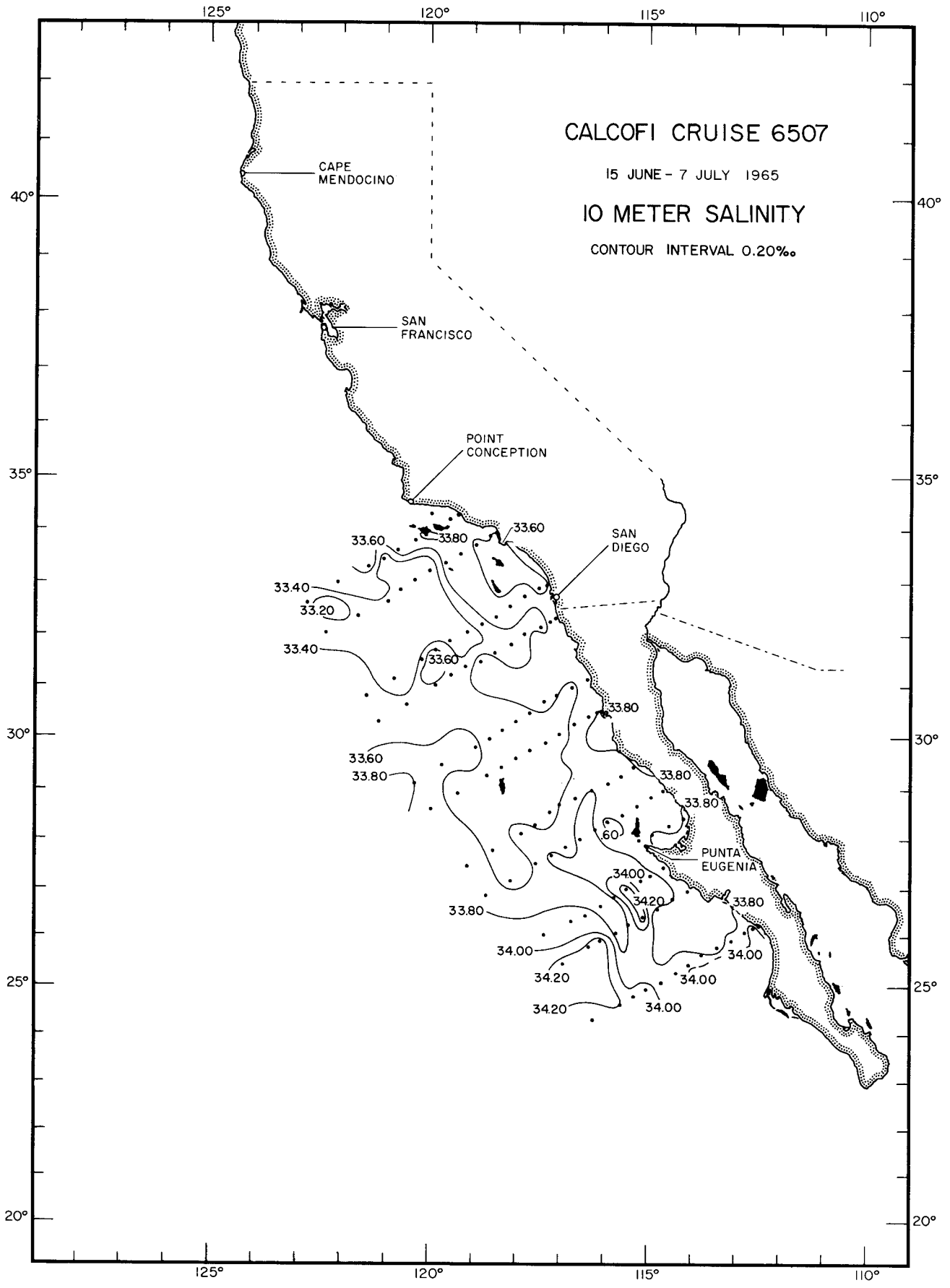

CALCOFI CRUISE 6504
31 MARCH - 24 APRIL 1965
10 METER SALINITY
CONTOUR INTERVAL 0.20‰
CAPE MENDOCINO
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
PUNTA EUGENIA
125°
120°
115°
110°
40°
35°
30°
25°
20°
33.00
33.20
33.40
32.80
33.60
33.80
34.00
34.20

10m S

6504

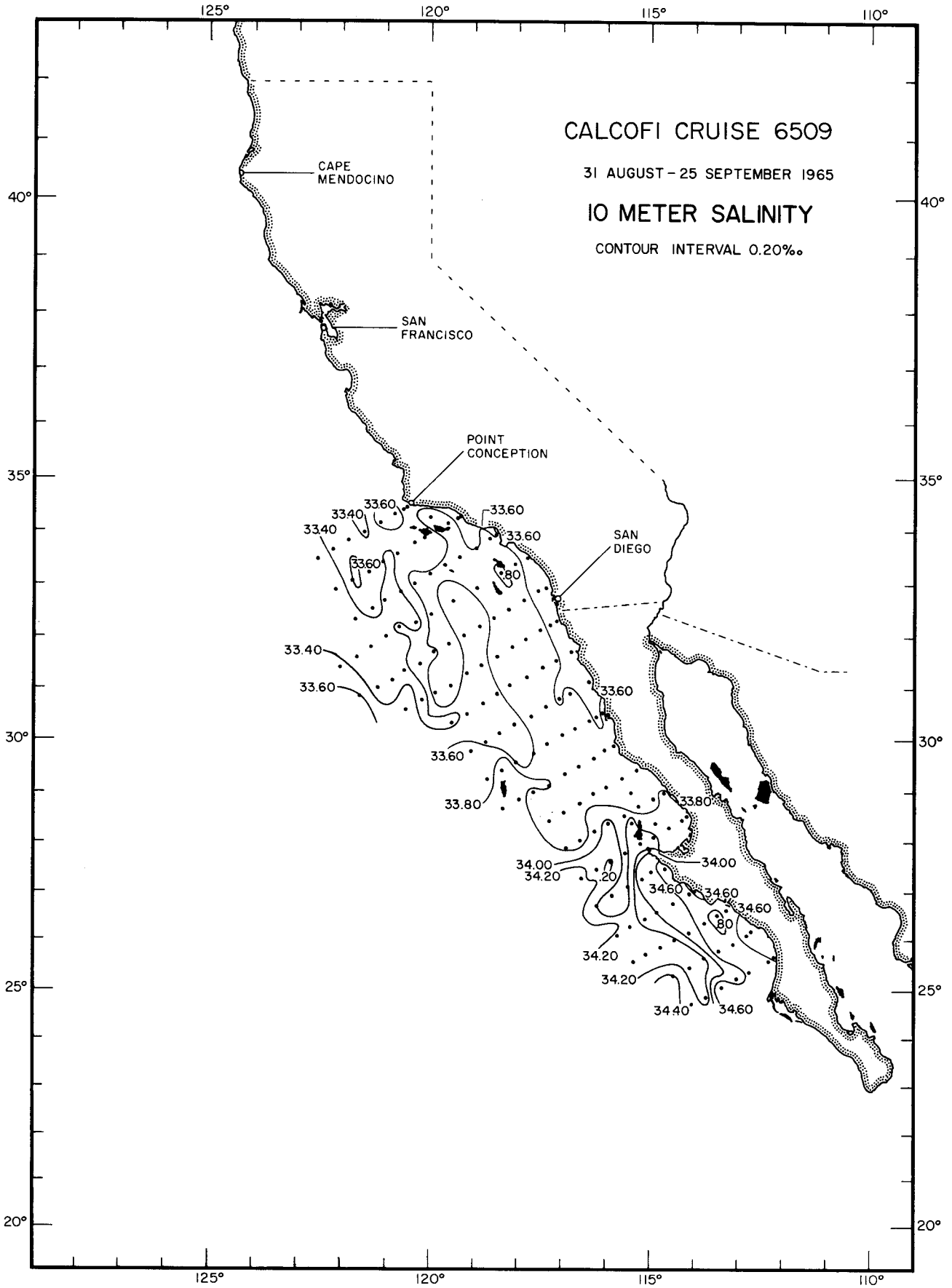

CALCOFI CRUISE 6507
15 JUNE - 11 AUGUST 1965
10 METER SALINITY
CONTOUR INTERVAL 0.20‰
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
PUNTA EUGENIA
135°
130°
125°
120°
115°
110°
35°
30°
25°
33.60
33.80
33.20
33.40
33.00
32.60
32.80
33.20
33.00
33.60
33.40
33.60
33.80
34.00
34.20
34.20
33.60
33.80
34.00
34.00
34.20
34.60
34.80
34.80
34.40
34.40
34.20
34.20
34.20

10m S 6507


CALCOFI CRUISE 6507
15 JUNE - 7 JULY 1965
10 METER SALINITY
CONTOUR INTERVAL 0.20‰
CAPE MENDOCINO
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
PUNTA EUGENIA
125°
120°
115°
110°
40°
35°
30°
25°
20°
33.60
33.80
33.40
33.20
34.00
34.20
60

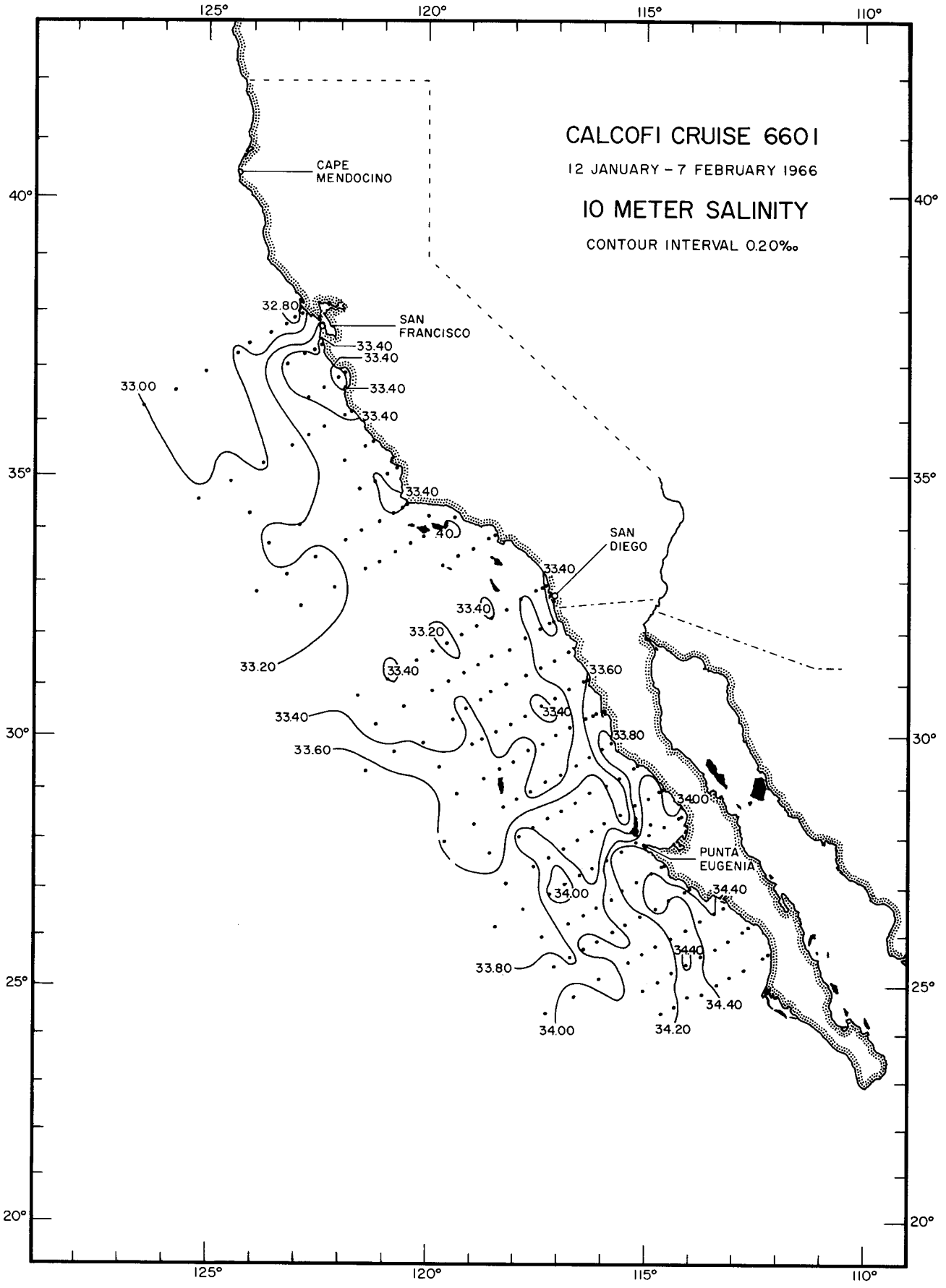
10m S

6507


CALCOFI CRUISE 6509
31 AUGUST - 25 SEPTEMBER 1965
10 METER SALINITY
CONTOUR INTERVAL 0.20‰
CAPE MENDOCINO
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
125°
120°
115°
110°
40°
35°
30°
25°
20°
33.40
33.60
33.80
34.00
34.20
34.40
34.60

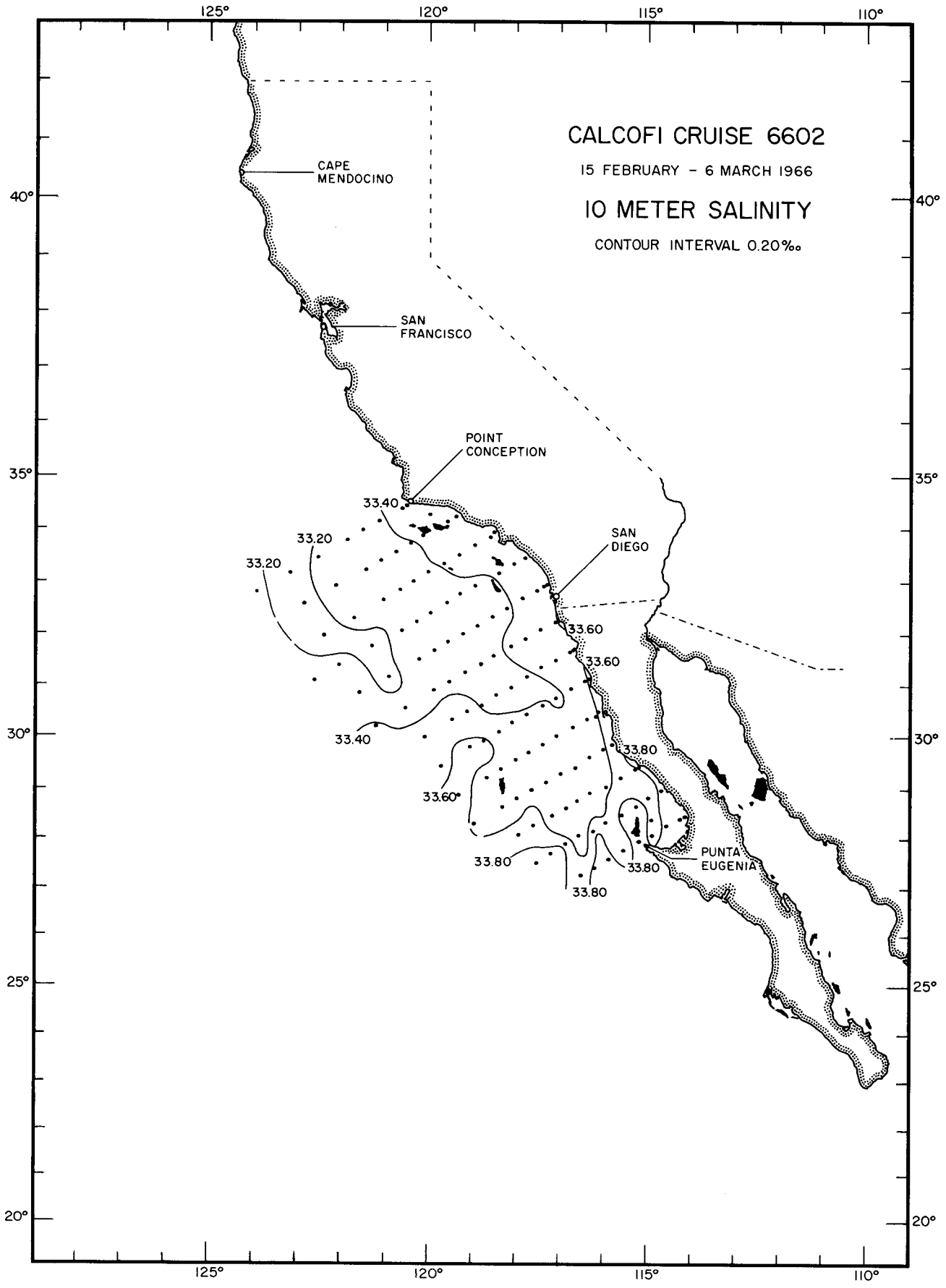
10m S

6509


CALCOFI CRUISE 6601
12 JANUARY - 7 FEBRUARY 1966
10 METER SALINITY
CONTOUR INTERVAL 0.20‰
CAPE MENDOCINO
SAN FRANCISCO
SAN DIEGO
PUNTA EUGENIA
125°
120°
115°
110°
40°
35°
30°
25°
20°
32.80
33.00
33.20
33.40
33.60
33.80
34.00
34.20
34.40

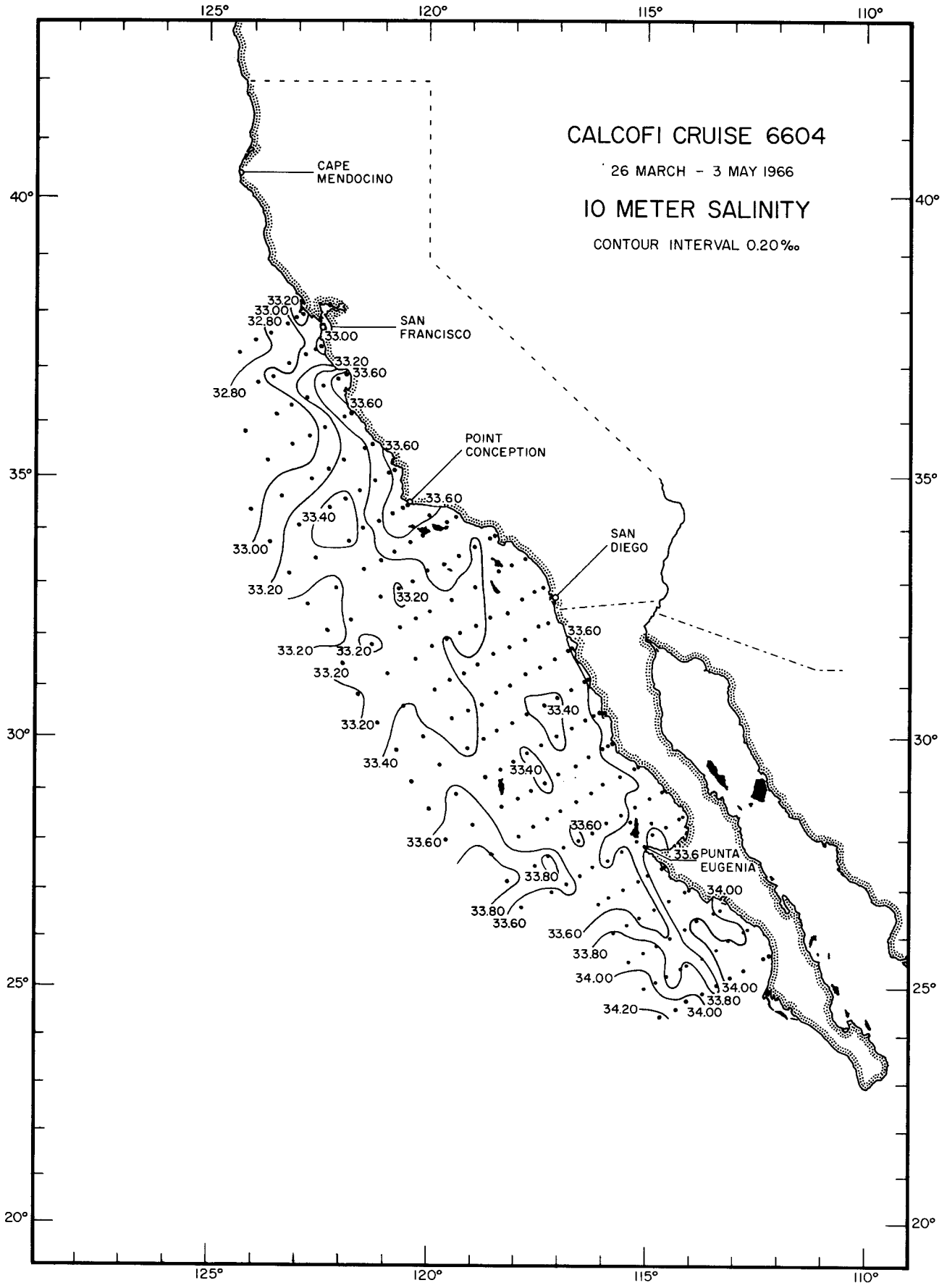
10m S

6601


CALCOFI CRUISE 6602
15 FEBRUARY - 6 MARCH 1966
10 METER SALINITY
CONTOUR INTERVAL 0.20‰
CAPE MENDOCINO
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
PUNTA EUGENIA
33.20
33.20
33.40
33.40
33.60
33.60
33.60
33.80
33.80
33.80
33.80
125°
120°
115°
110°
40°
35°
30°
25°
20°

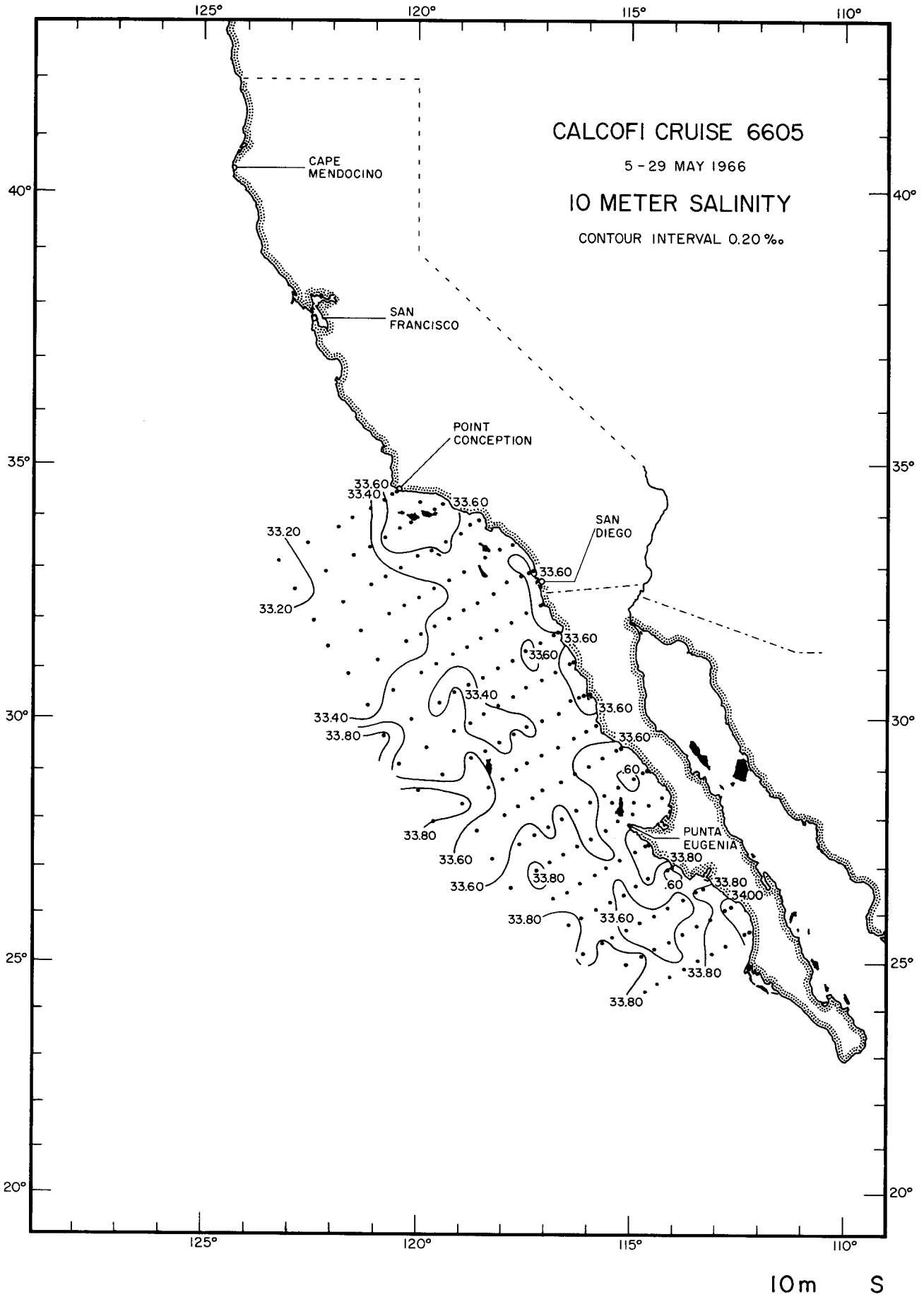
10m S

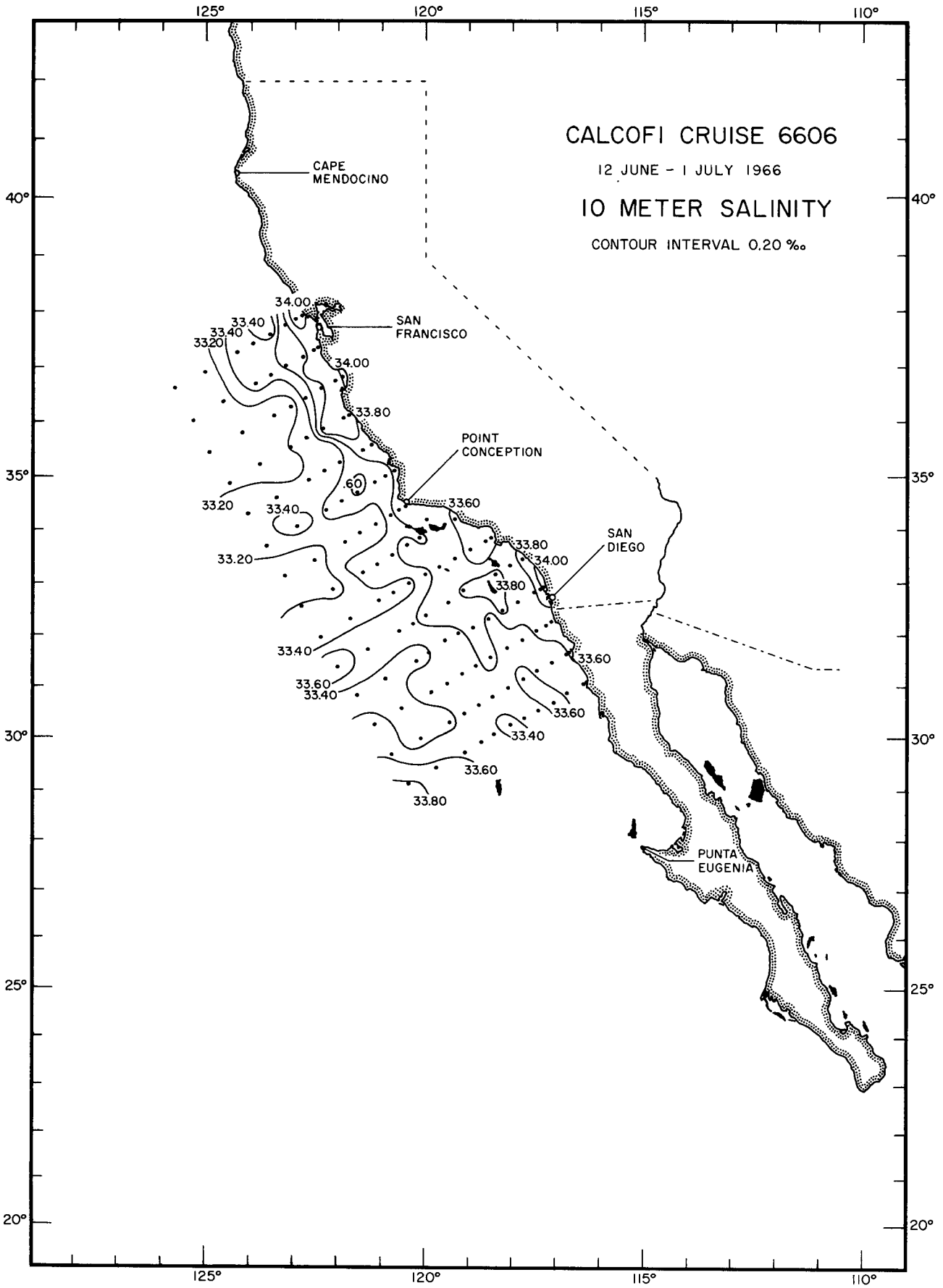
6602


CALCOFI CRUISE 6604
26 MARCH - 3 MAY 1966
10 METER SALINITY
CONTOUR INTERVAL 0.20‰
CAPE MENDOCINO
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
PUNTA EUGENIA
125°
120°
115°
110°
40°
35°
30°
25°
20°
33.20
33.00
32.80
33.00
33.20
33.60
32.80
33.60
33.60
33.60
33.40
33.00
33.20
33.20
33.20
33.20
33.20
33.60
33.40
33.20
33.40
33.40
33.60
33.60
33.6
33.80
34.00
33.80
33.60
33.60
33.80
34.00
34.00
33.80
34.20
34.00

10m S

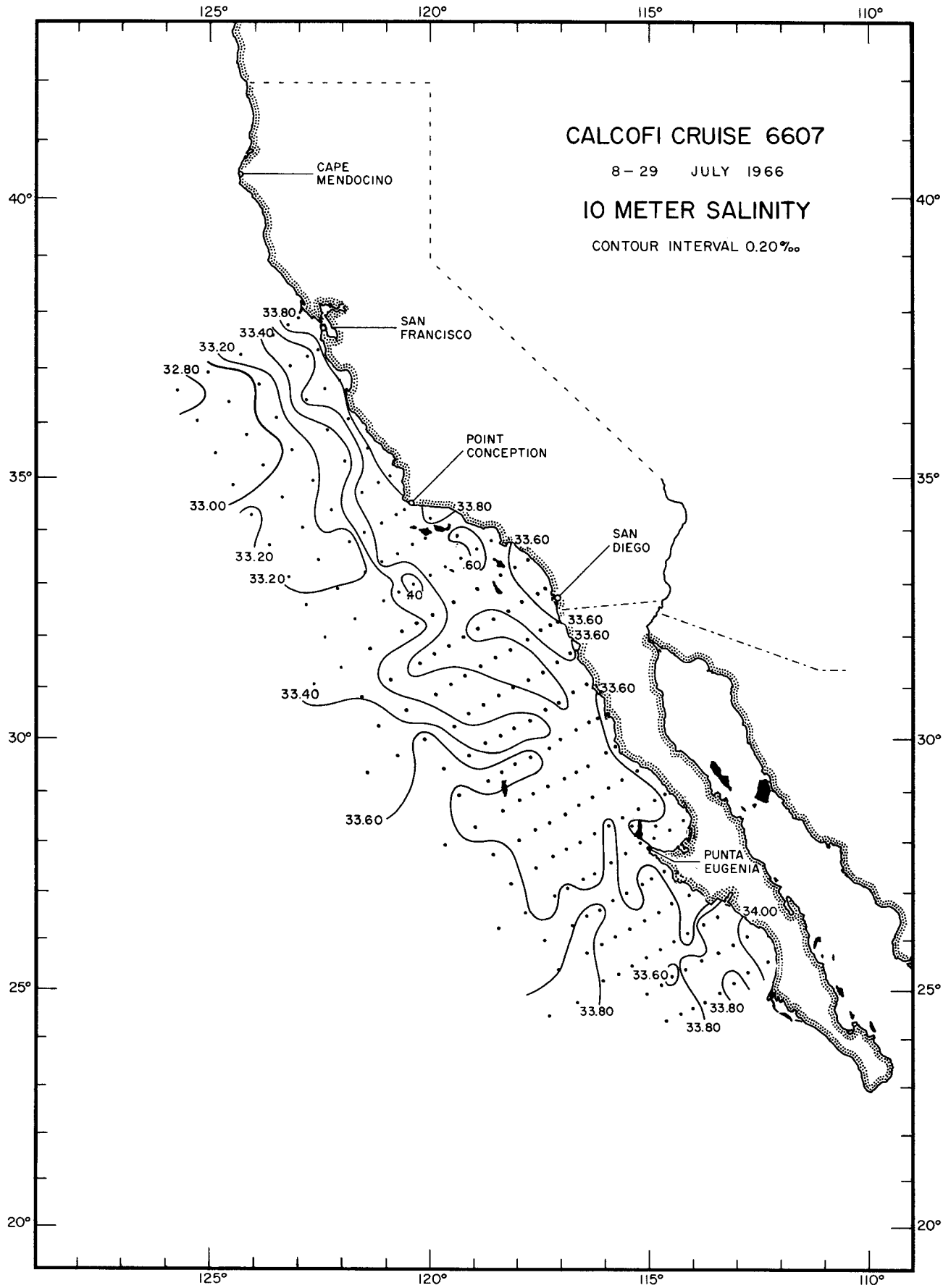
6604


CALCOFI CRUISE 6605
5 - 29 MAY 1966
10 METER SALINITY
CONTOUR INTERVAL 0.20 ‰
CAPE MENDOCINO
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
PUNTA EUGENIA
125°
120°
115°
110°
40°
35°
30°
25°
20°
33.20
33.40
33.60
33.80
34.00
10m S


CALCOFI CRUISE 6606
12 JUNE - 1 JULY 1966
10 METER SALINITY
CONTOUR INTERVAL 0.20 ‰
CAPE MENDOCINO
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
PUNTA EUGENIA
125°
120°
115°
110°
40°
35°
30°
25°
20°
34.00
33.40
33.40
33.20
34.00
33.80
33.20
33.40
.60
33.60
33.80
34.00
33.80
33.20
33.40
33.60
33.60
33.40
33.60
33.40
33.60
33.80

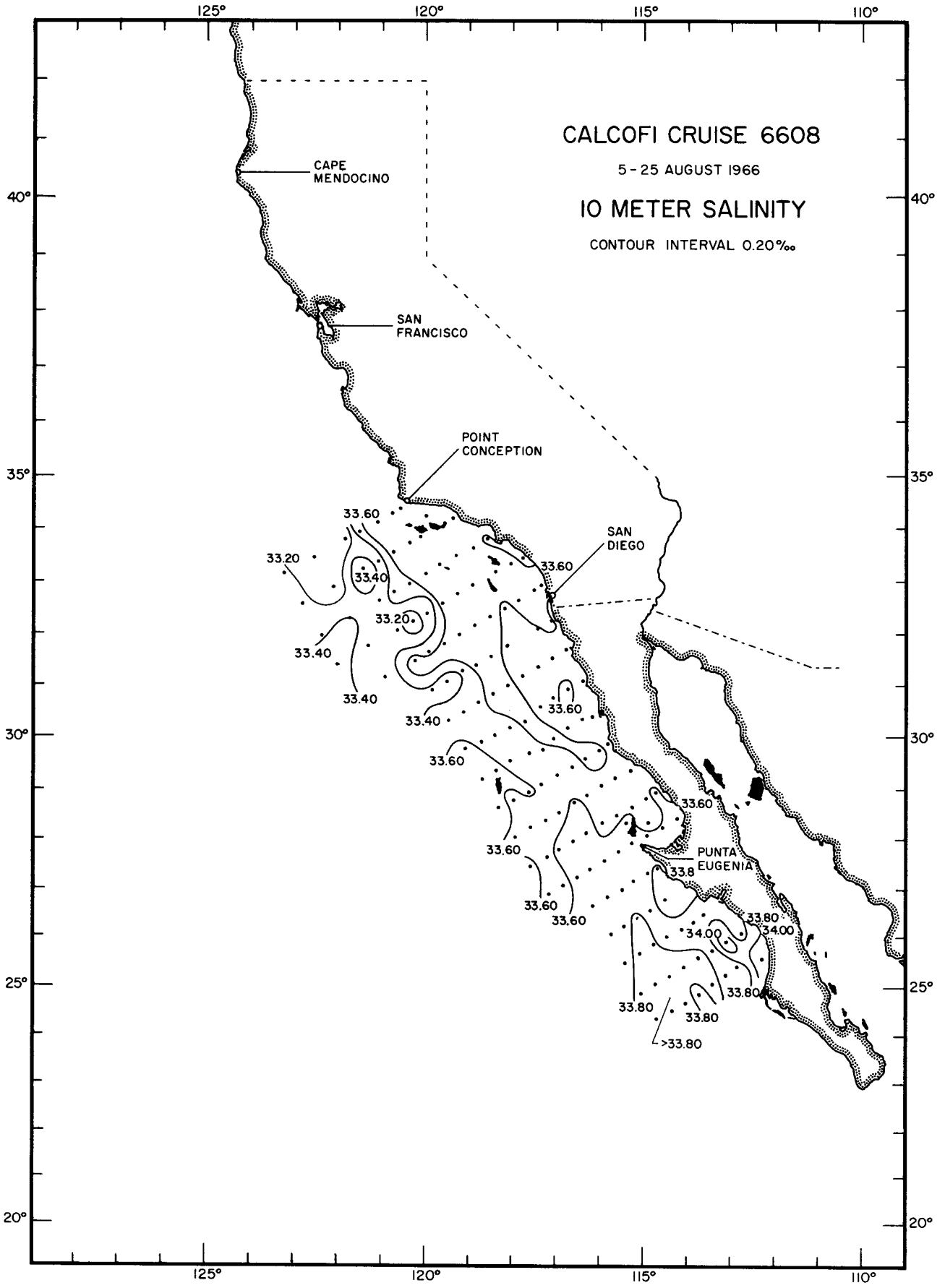
10m S

6606


CALCOFI CRUISE 6607
8 – 29 JULY 1966
10 METER SALINITY
CONTOUR INTERVAL 0.20‰
CAPE MENDOCINO
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
PUNTA EUGENIA
125°
120°
115°
110°
40°
35°
30°
25°
20°
33.80
33.40
33.20
32.80
33.00
33.20
33.20
.60
.40
33.80
33.60
33.60
33.60
33.60
33.40
33.60
34.00
33.60
33.80
33.80
33.80

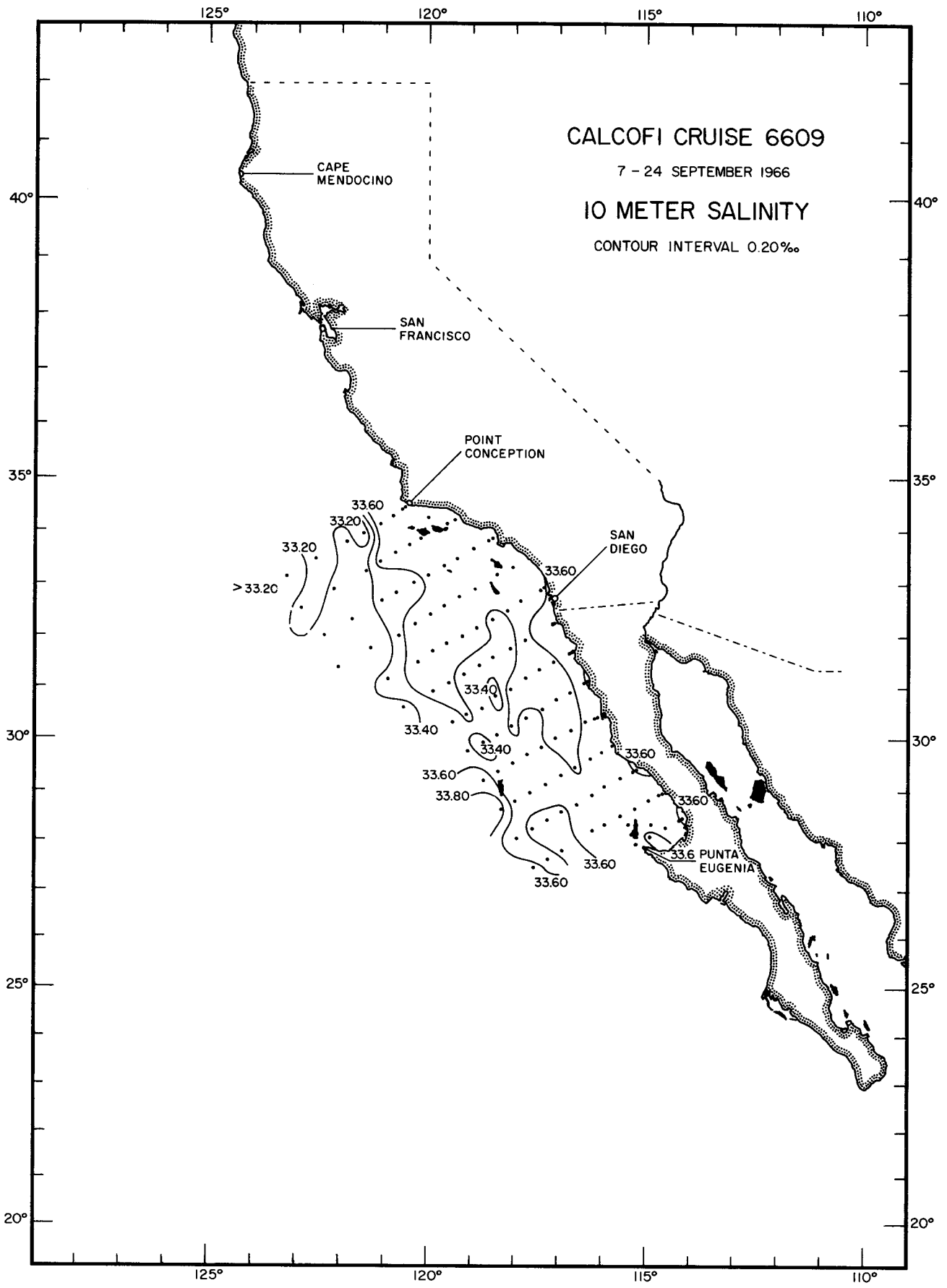
10m S

6607


CALCOFI CRUISE 6608
5 - 25 AUGUST 1966
10 METER SALINITY
CONTOUR INTERVAL 0.20‰
CAPE MENDOCINO
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
PUNTA EUGENIA
125°
120°
115°
110°
40°
35°
30°
25°
20°
33.20
33.40
33.60
33.8
34.00
33.80
>33.80

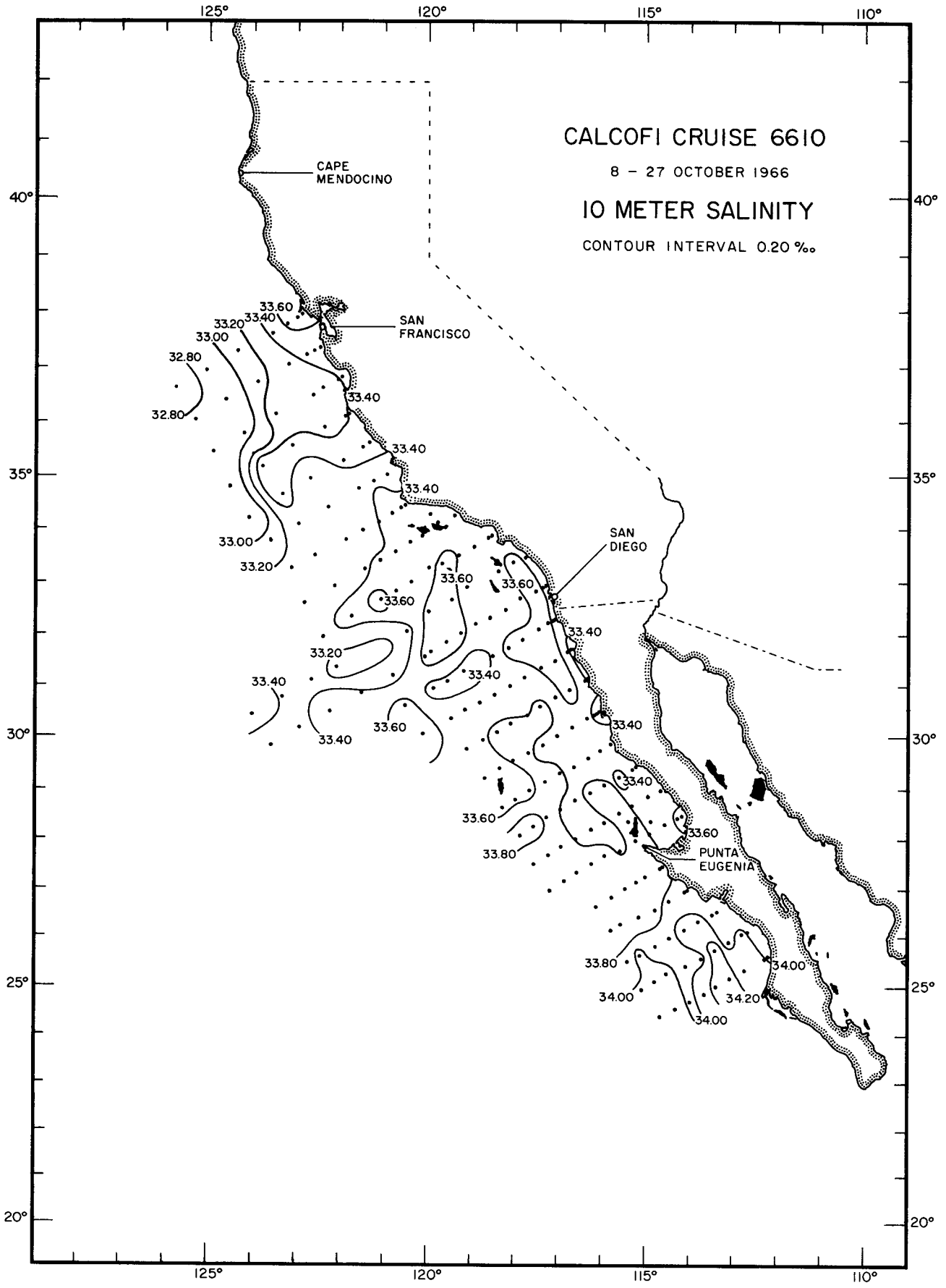
10m S

6608


CALCOFI CRUISE 6609
7 - 24 SEPTEMBER 1966
10 METER SALINITY
CONTOUR INTERVAL 0.20‰
CAPE MENDOCINO
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
PUNTA EUGENIA
33.6
33.60
33.20
>33.20
33.40
33.80
125°
120°
115°
110°
40°
35°
30°
25°
20°

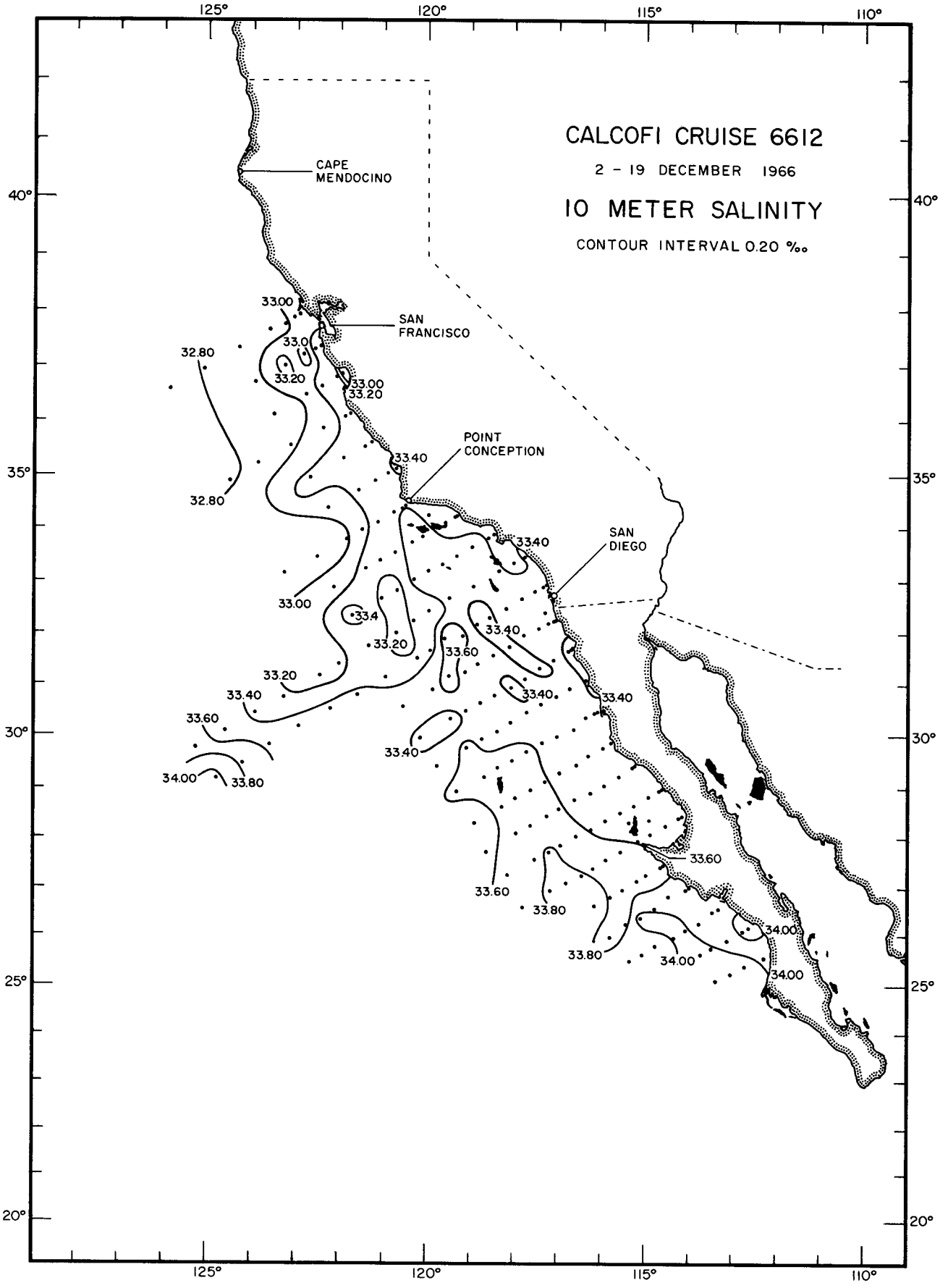
10m S

6609


CALCOFI CRUISE 6610
8 - 27 OCTOBER 1966
10 METER SALINITY
CONTOUR INTERVAL 0.20 ‰
CAPE MENDOCINO
SAN FRANCISCO
SAN DIEGO
PUNTA EUGENIA
125°
120°
115°
110°
40°
35°
30°
25°
20°
32.80
33.00
33.20
33.40
33.60
33.80
34.00
34.20

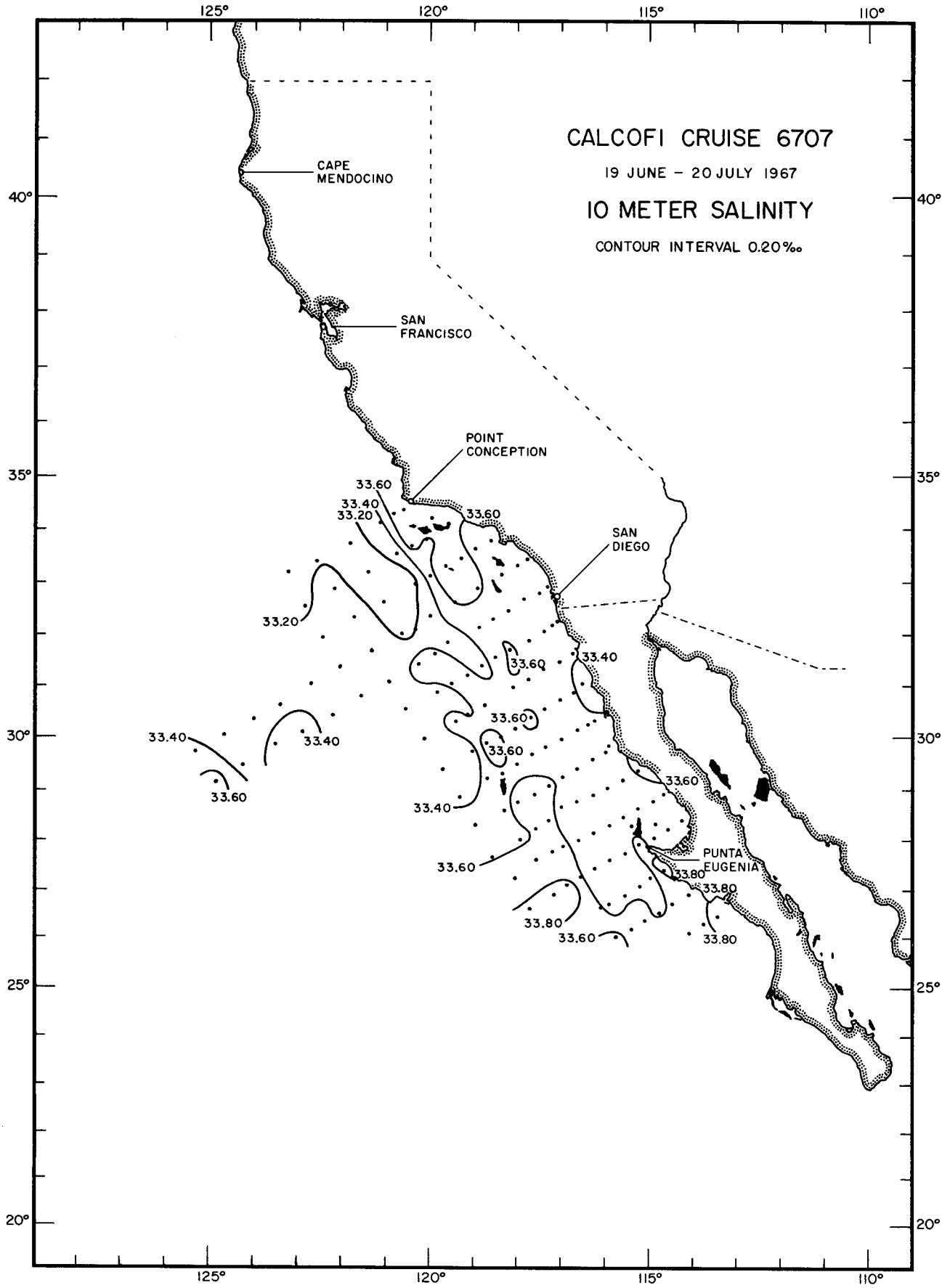
10m S

6610


CALCOFI CRUISE 6612
2 - 19 DECEMBER 1966
10 METER SALINITY
CONTOUR INTERVAL 0.20 ‰
CAPE MENDOCINO
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
125°
120°
115°
110°
40°
35°
30°
25°
20°
33.00
33.0
32.80
33.20
33.00
33.20
33.40
32.80
33.40
33.00
33.4
33.20
33.40
33.60
33.20
33.40
33.40
33.40
33.60
34.00
33.80
33.40
33.60
33.60
33.80
33.80
34.00
34.00
34.00

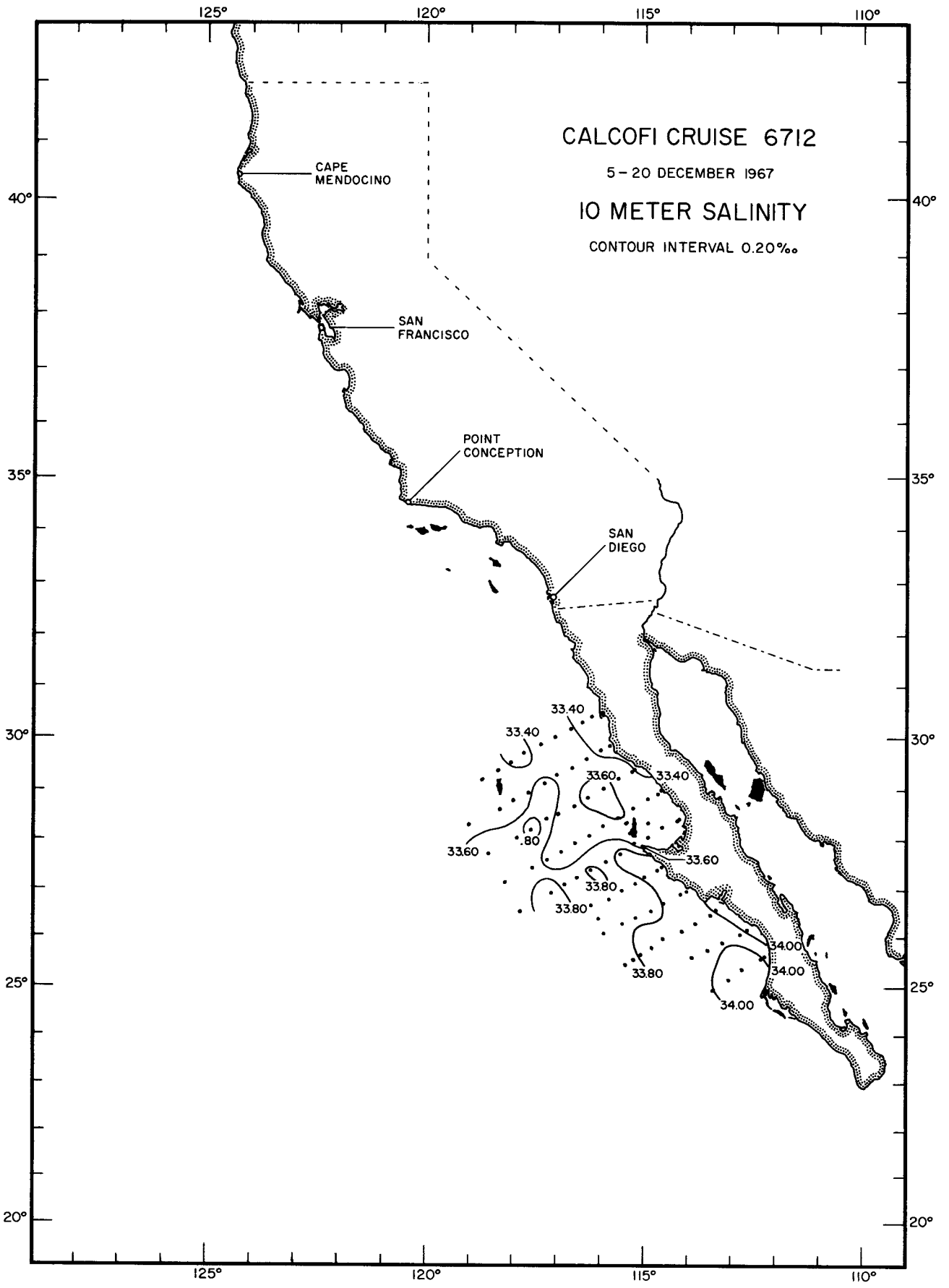
10m S

6612


CALCOFI CRUISE 6707
19 JUNE – 20 JULY 1967
10 METER SALINITY
CONTOUR INTERVAL 0.20‰
CAPE MENDOCINO
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
PUNTA EUGENIA
125°
120°
115°
110°
40°
35°
30°
25°
20°
33.20
33.40
33.60
33.80

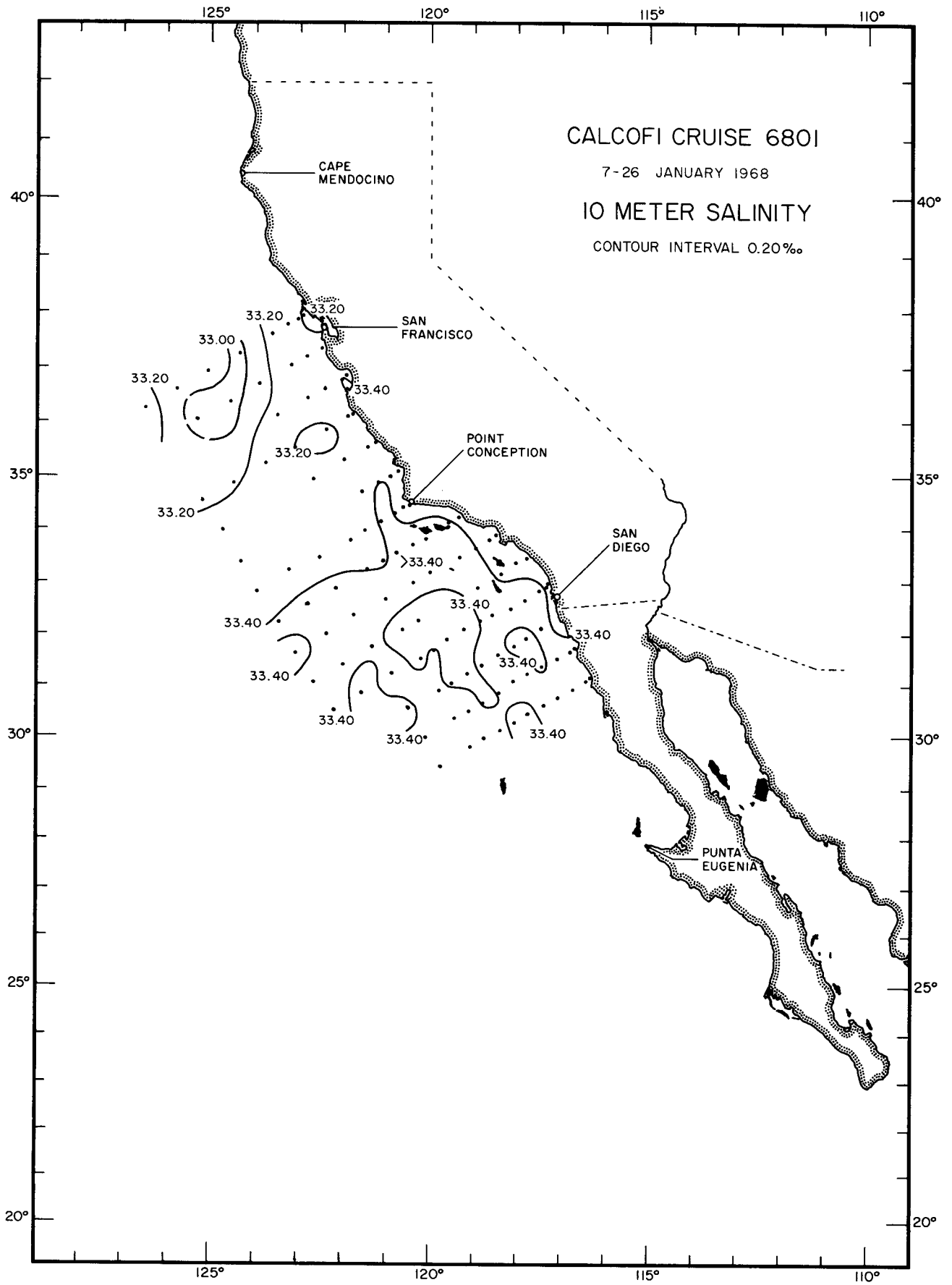
10m S

6707


CALCOFI CRUISE 6712
5 - 20 DECEMBER 1967
10 METER SALINITY
CONTOUR INTERVAL 0.20‰
CAPE MENDOCINO
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
125°
120°
115°
110°
40°
35°
30°
25°
20°
33.40
33.60
.80
33.80
34.00

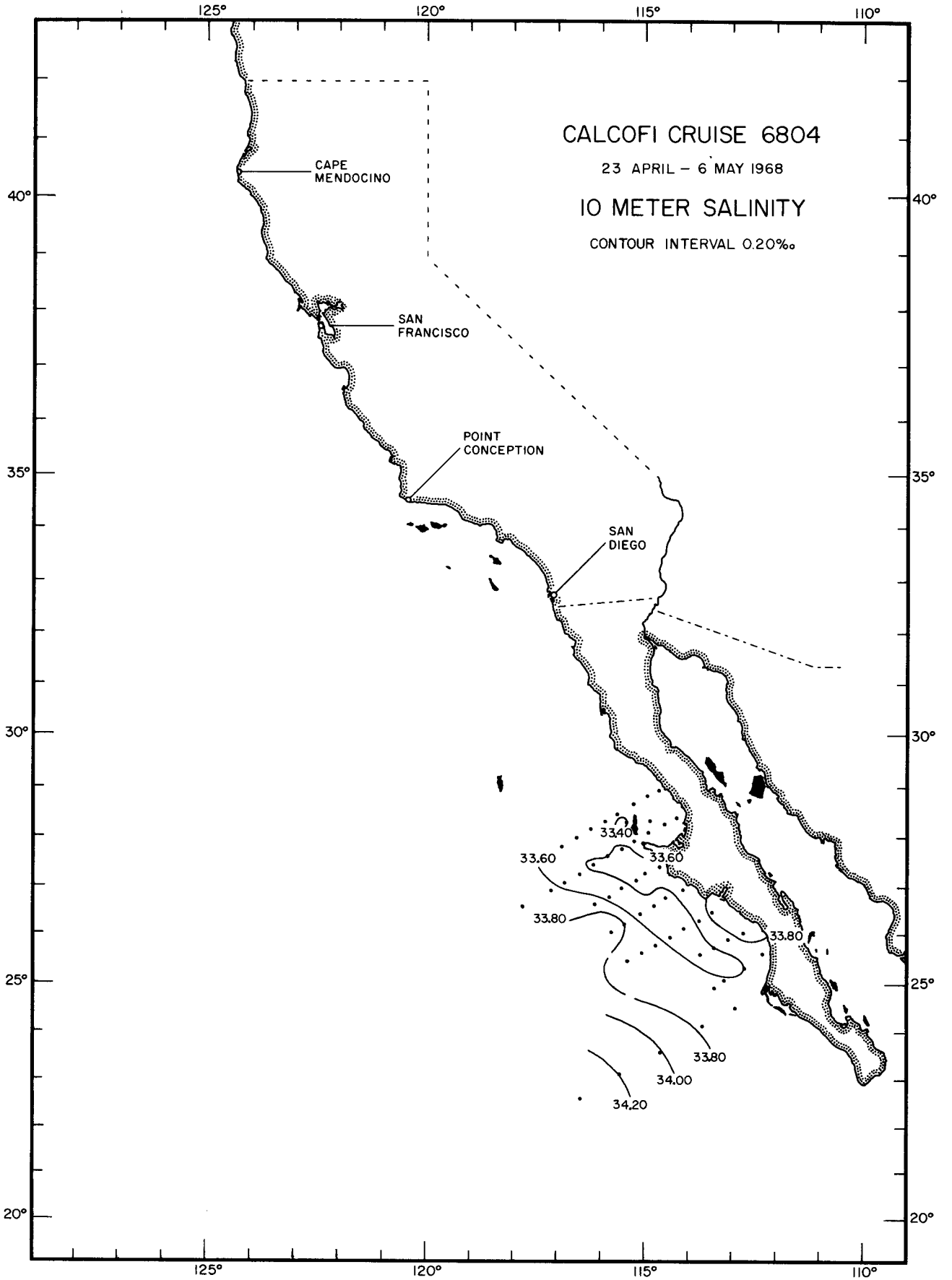
10m S

6712


CALCOFI CRUISE 6801
7-26 JANUARY 1968
10 METER SALINITY
CONTOUR INTERVAL 0.20‰
CAPE MENDOCINO
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
PUNTA EUGENIA
33.00
33.20
33.40
125°
120°
115°
110°
40°
35°
30°
25°
20°

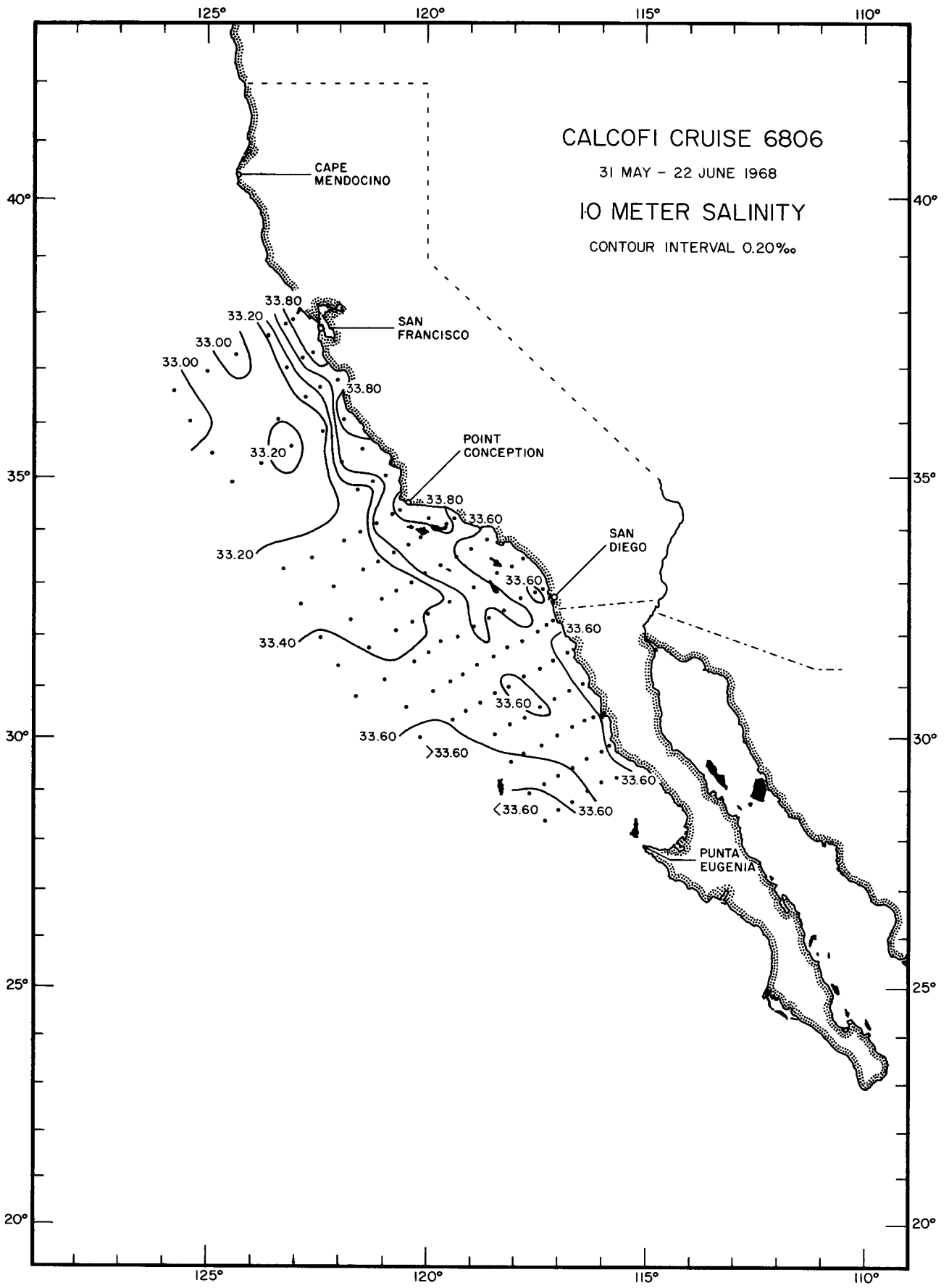
10m S

6801


CALCOFI CRUISE 6804
23 APRIL – 6 MAY 1968
10 METER SALINITY
CONTOUR INTERVAL 0.20‰
CAPE MENDOCINO
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
33.40
33.60
33.60
33.80
33.80
33.80
34.00
34.20
125°
120°
115°
110°
40°
35°
30°
25°
20°

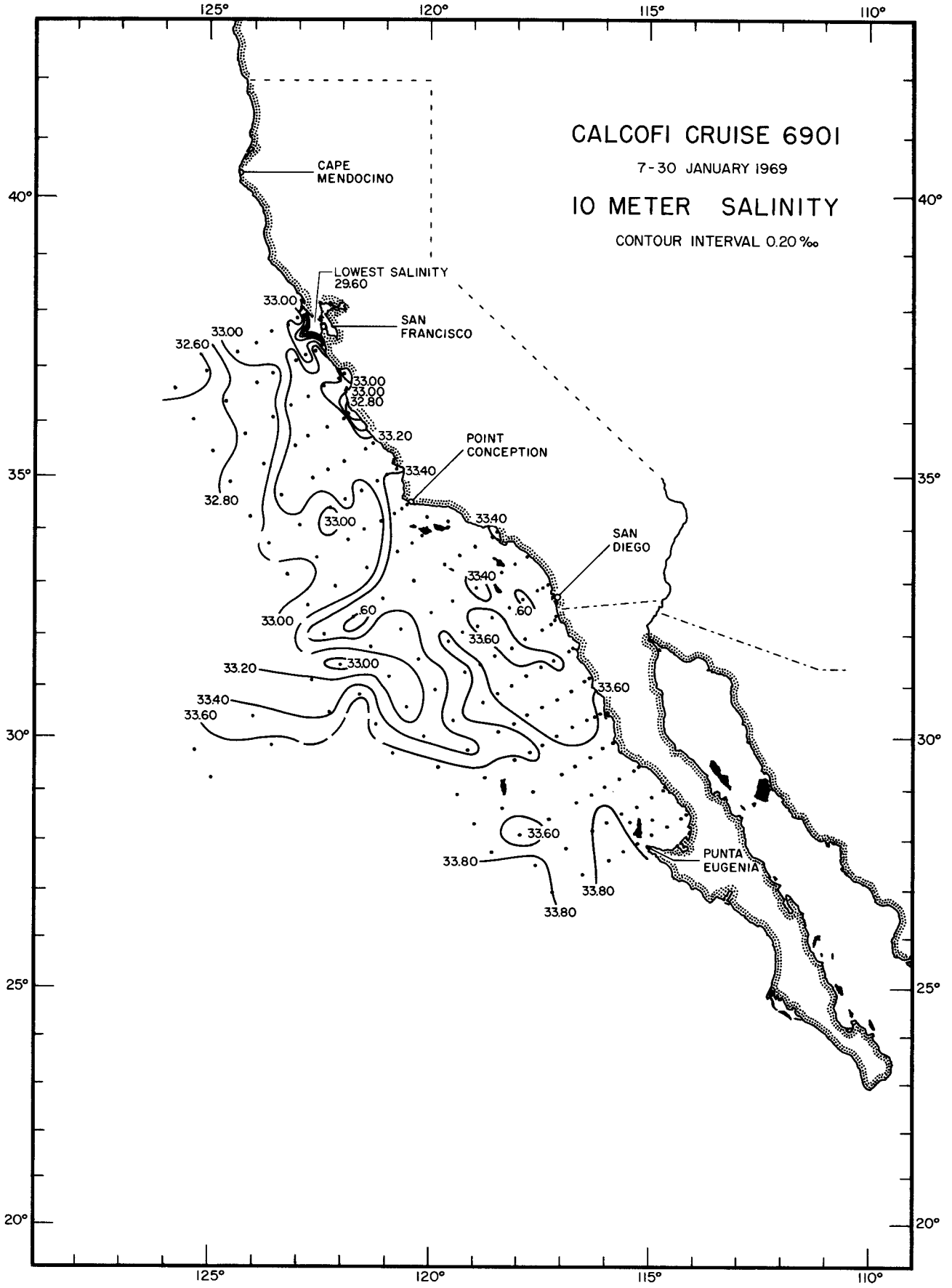
10 m S

6804


CALCOFI CRUISE 6806
31 MAY - 22 JUNE 1968
10 METER SALINITY
CONTOUR INTERVAL 0.20‰
CAPE MENDOCINO
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
PUNTA EUGENIA
33.80
33.20
33.00
33.00
33.80
33.20
33.80
33.60
33.20
33.60
33.40
33.60
33.60
>33.60
33.60
<33.60
33.60
125°
120°
115°
110°
40°
35°
30°
25°
20°

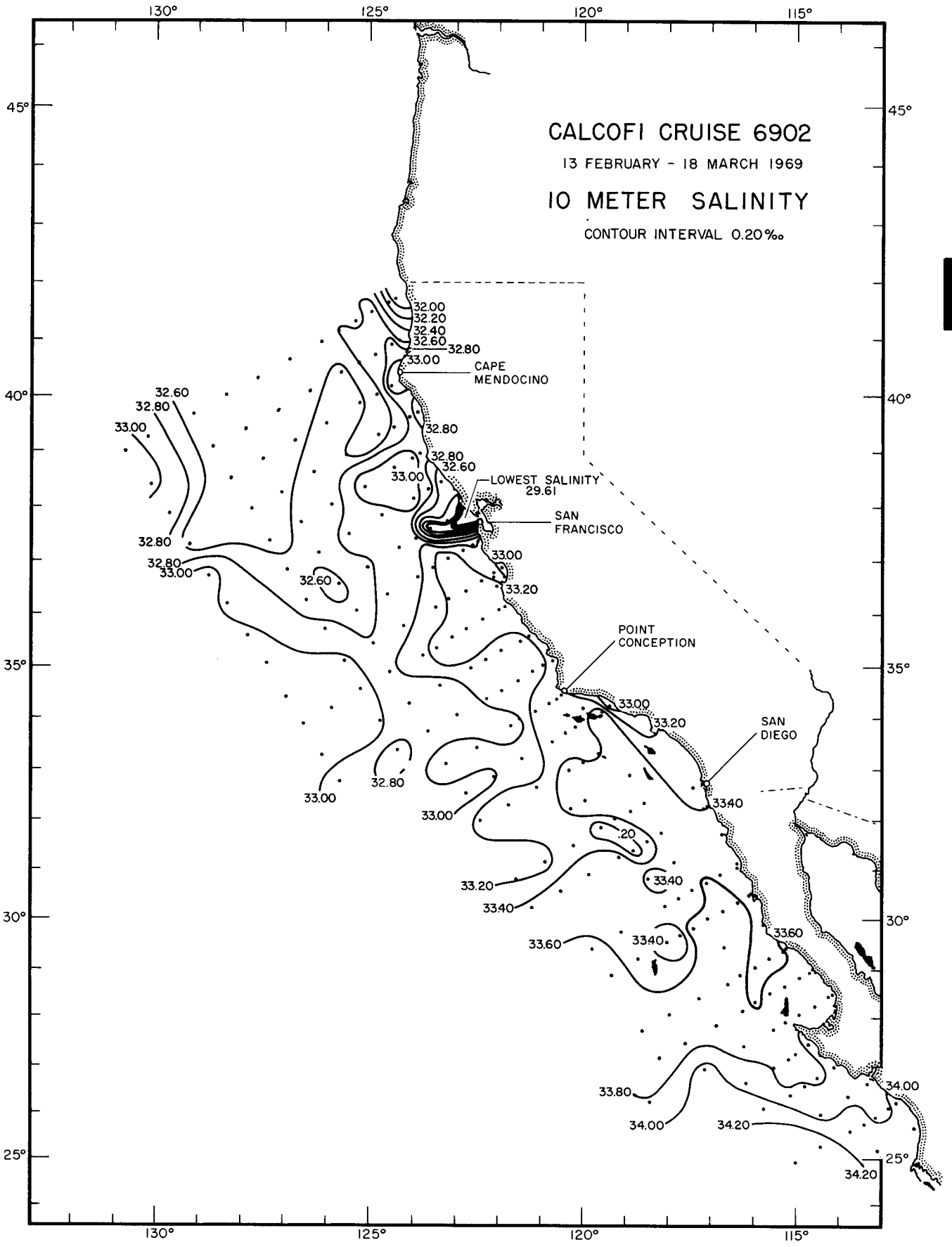
10m S

6806


CALCOFI CRUISE 6901
7-30 JANUARY 1969
10 METER SALINITY
CONTOUR INTERVAL 0.20 ‰
CAPE MENDOCINO
LOWEST SALINITY 29.60
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
PUNTA EUGENIA
33.00
32.60
32.80
33.20
33.40
.60
33.60
33.80
125°
120°
115°
110°
40°
35°
30°
25°
20°

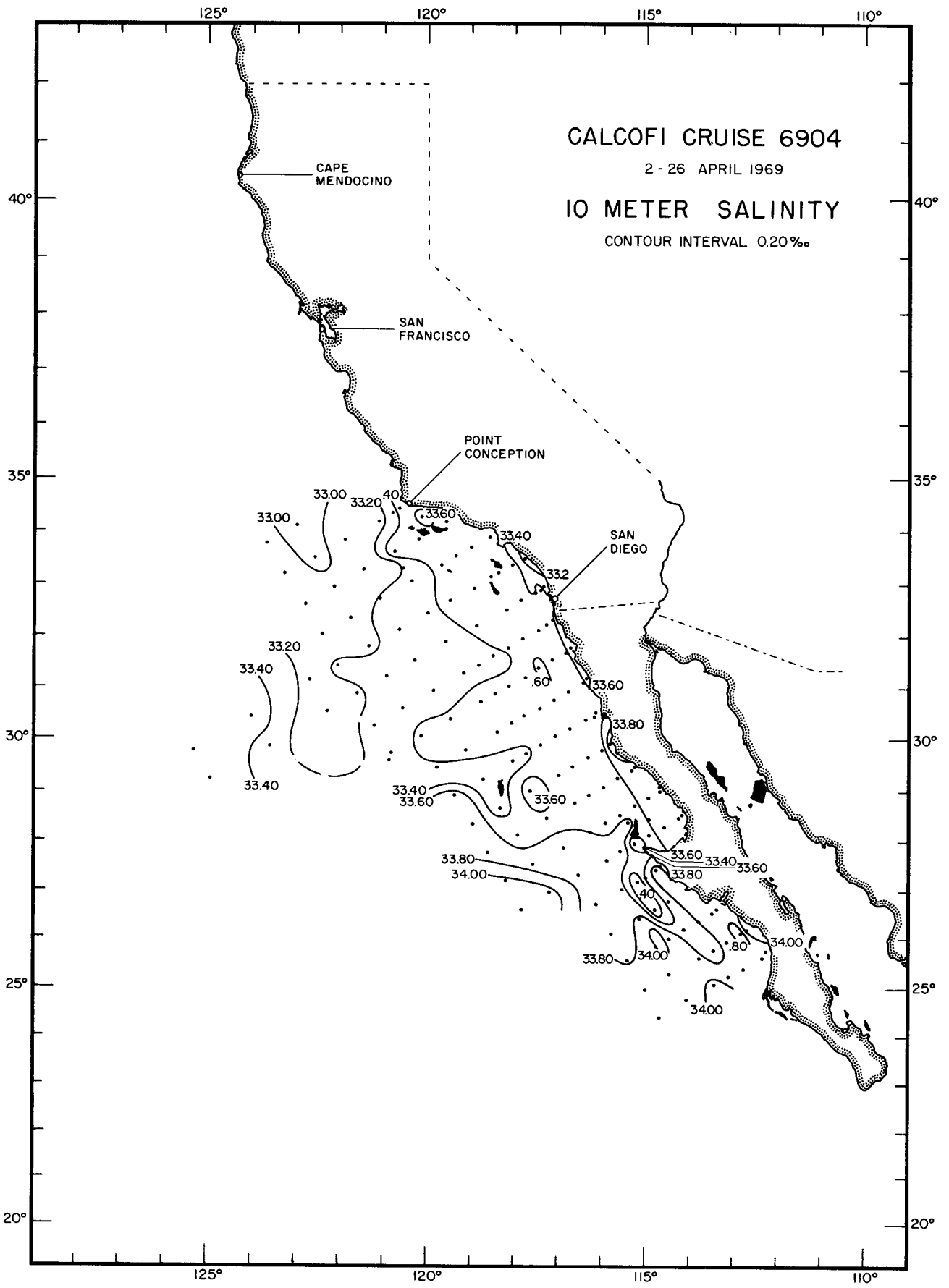
10 m S

6901


CALCOFI CRUISE 6902
13 FEBRUARY - 18 MARCH 1969
10 METER SALINITY
CONTOUR INTERVAL 0.20‰
CAPE MENDOCINO
LOWEST SALINITY 29.61
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
130°
125°
120°
115°
45°
40°
35°
30°
25°

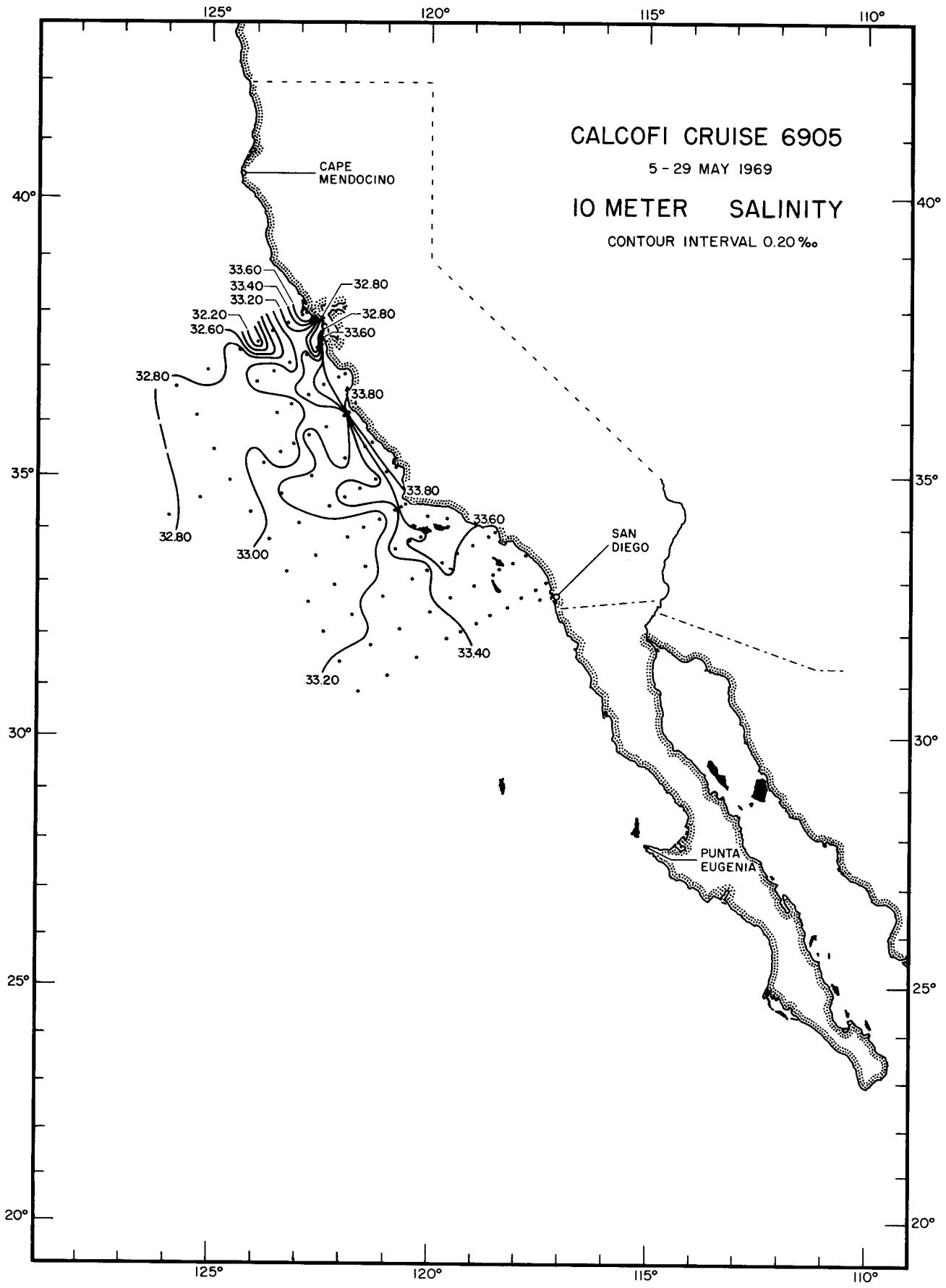
10m S

6902


CALCOFI CRUISE 6904
2 - 26 APRIL 1969
10 METER SALINITY
CONTOUR INTERVAL 0.20‰
CAPE MENDOCINO
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
125°
120°
115°
110°
40°
35°
30°
25°
20°
33.00
33.20
33.40
33.60
33.80
34.00
33.2
.40
.60
.80

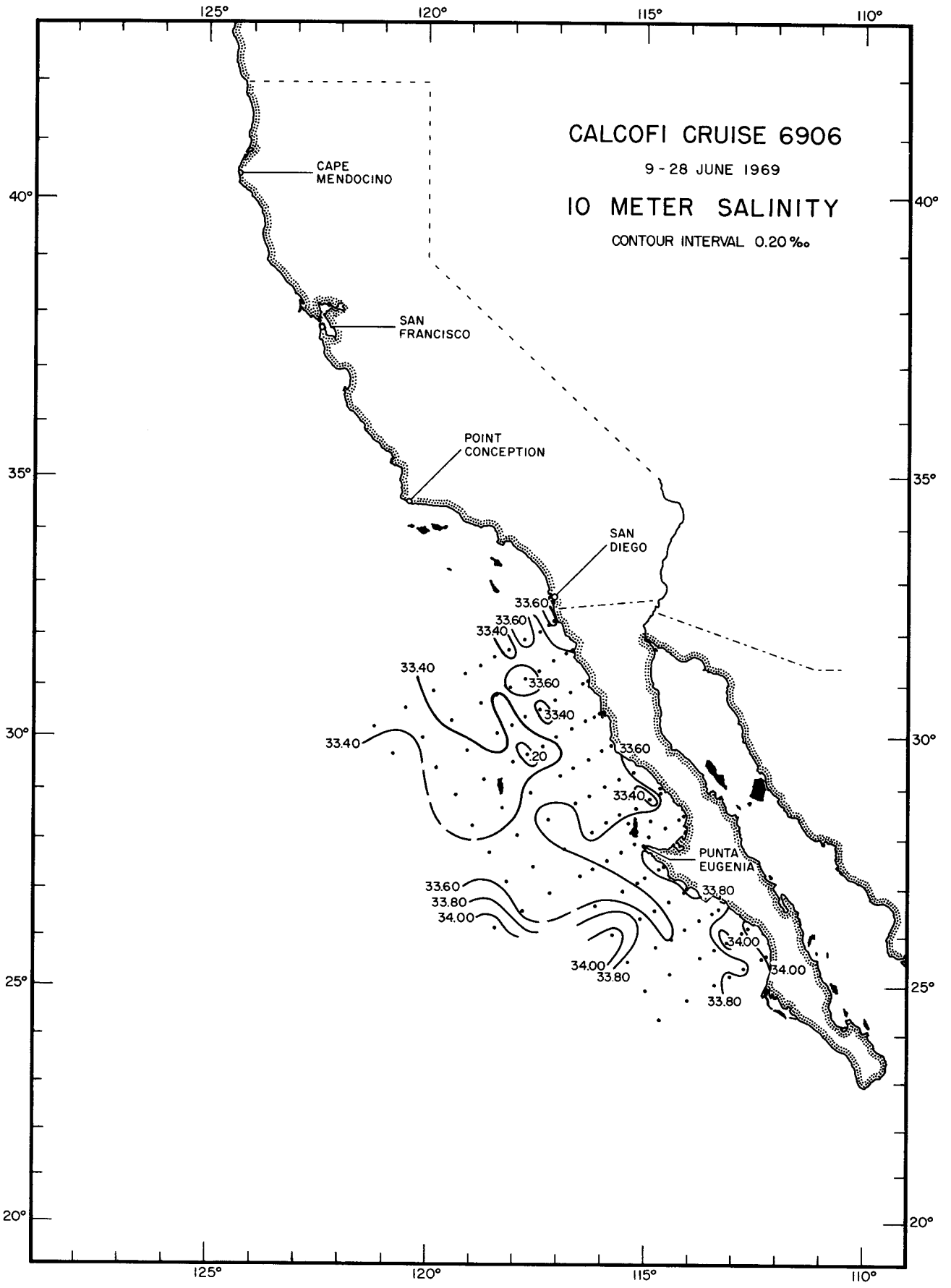
10m S

6904


CALCOFI CRUISE 6905
5 - 29 MAY 1969
10 METER SALINITY
CONTOUR INTERVAL 0.20 ‰
CAPE MENDOCINO
SAN DIEGO
PUNTA EUGENIA
33.60
33.40
33.20
32.20
32.60
32.80
32.80
33.60
32.80
33.80
33.80
33.60
32.80
33.00
33.40
33.20
125°
120°
115°
110°
40°
35°
30°
25°
20°

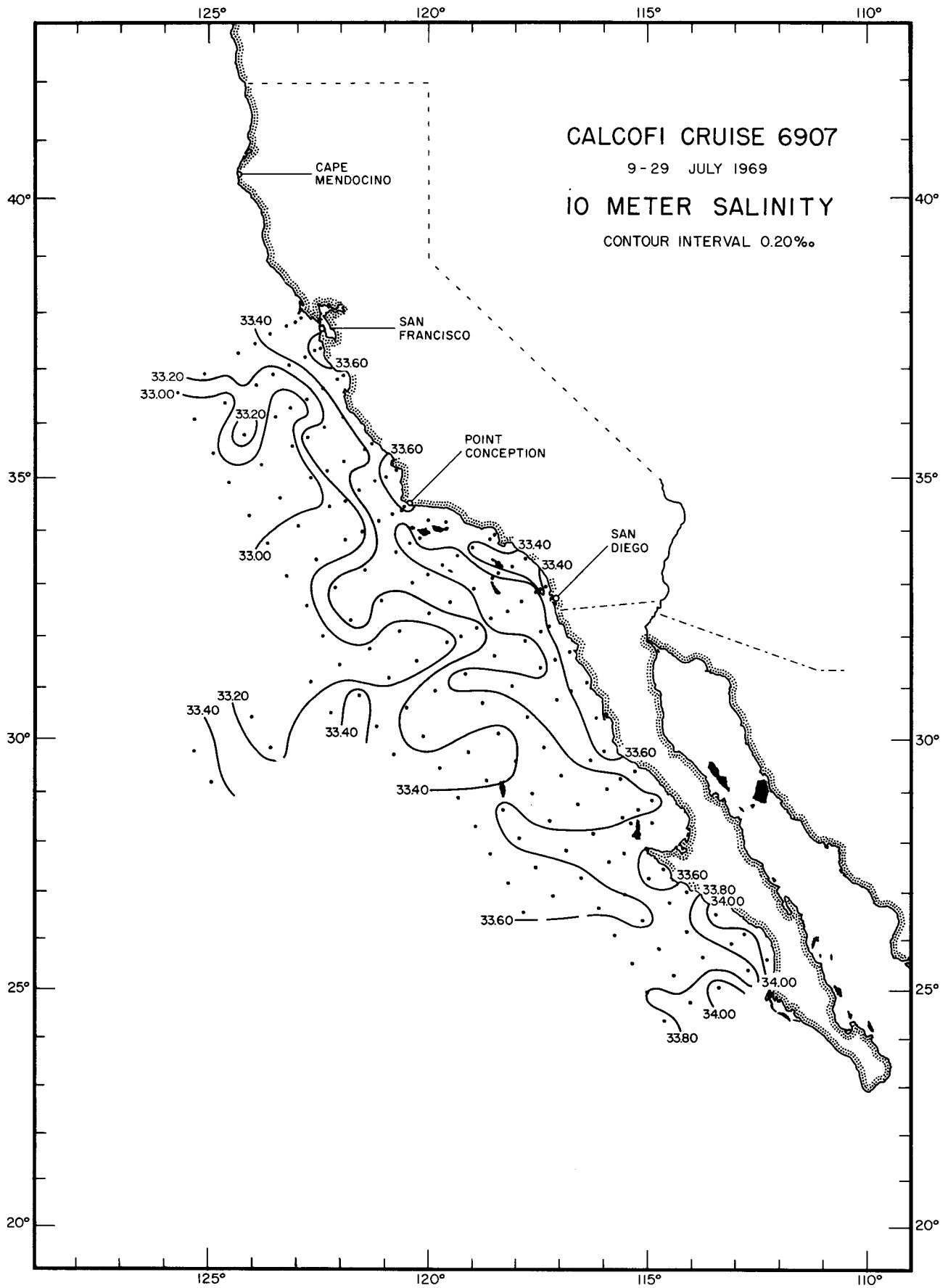
10m S

6905


CALCOFI CRUISE 6906
9 - 28 JUNE 1969
10 METER SALINITY
CONTOUR INTERVAL 0.20 ‰
CAPE MENDOCINO
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
PUNTA EUGENIA
125°
120°
115°
110°
40°
35°
30°
25°
20°
33.60
33.40
33.80
34.00
.20

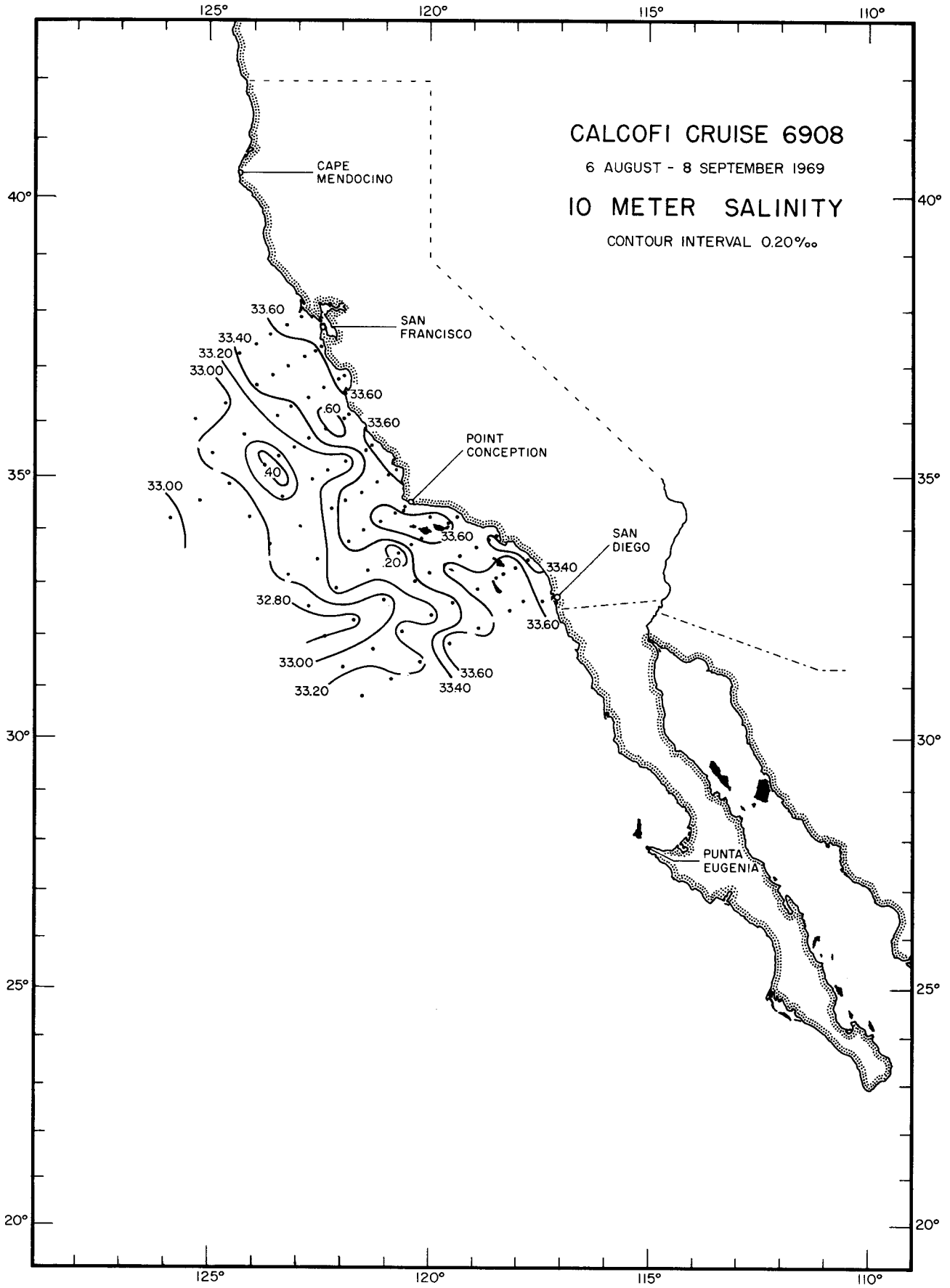
10m S

6906


CALCOFI CRUISE 6907
9-29 JULY 1969
10 METER SALINITY
CONTOUR INTERVAL 0.20‰
CAPE MENDOCINO
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
125°
120°
115°
110°
40°
35°
30°
25°
20°
33.40
33.60
33.20
33.00
33.80
34.00

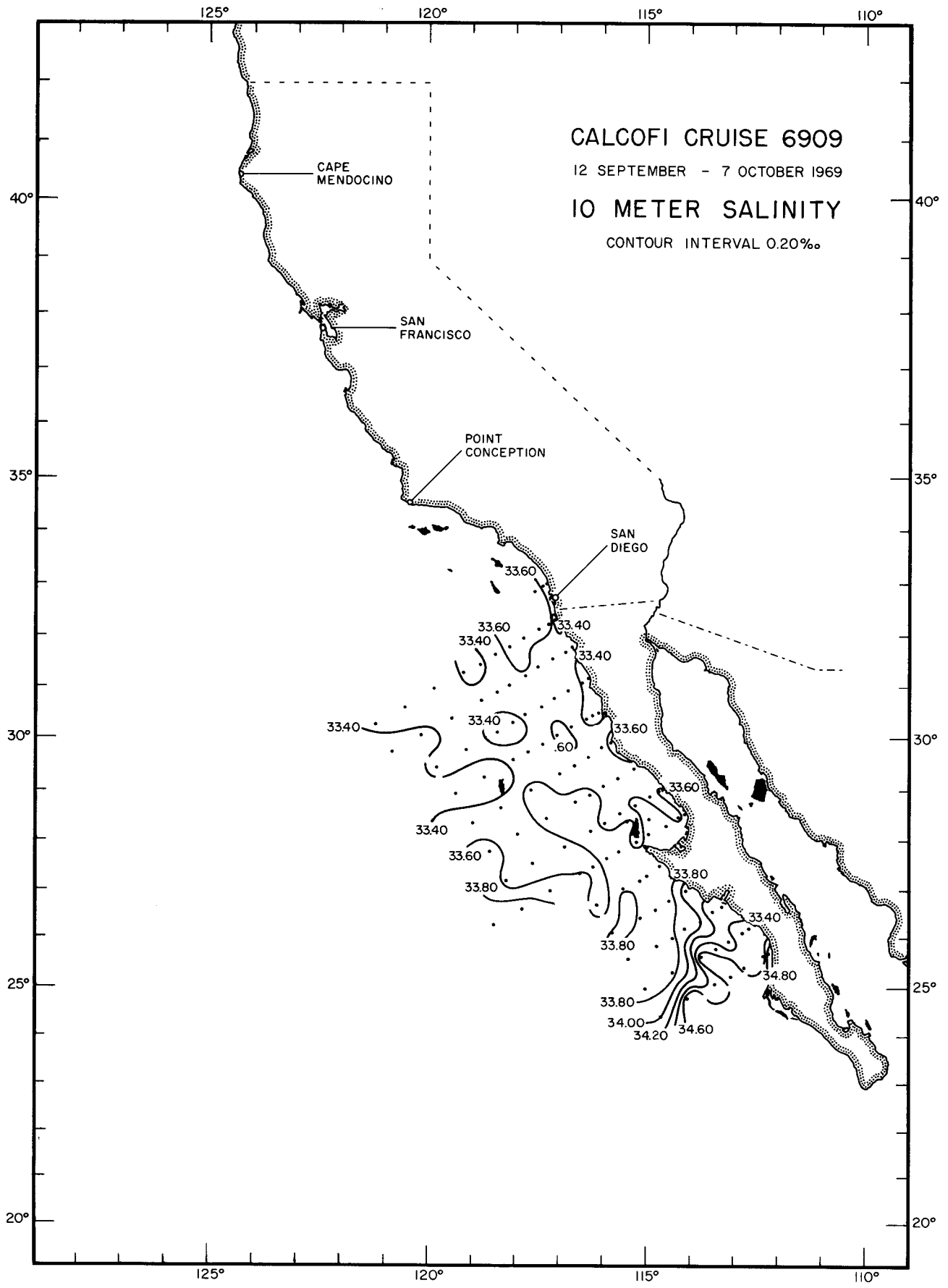
10m S

6907


CALCOFI CRUISE 6908
6 AUGUST - 8 SEPTEMBER 1969
10 METER SALINITY
CONTOUR INTERVAL 0.20‰
CAPE MENDOCINO
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
PUNTA EUGENIA
33.60
33.40
33.20
33.00
.60
.40
.20
32.80
125°
120°
115°
110°
40°
35°
30°
25°
20°

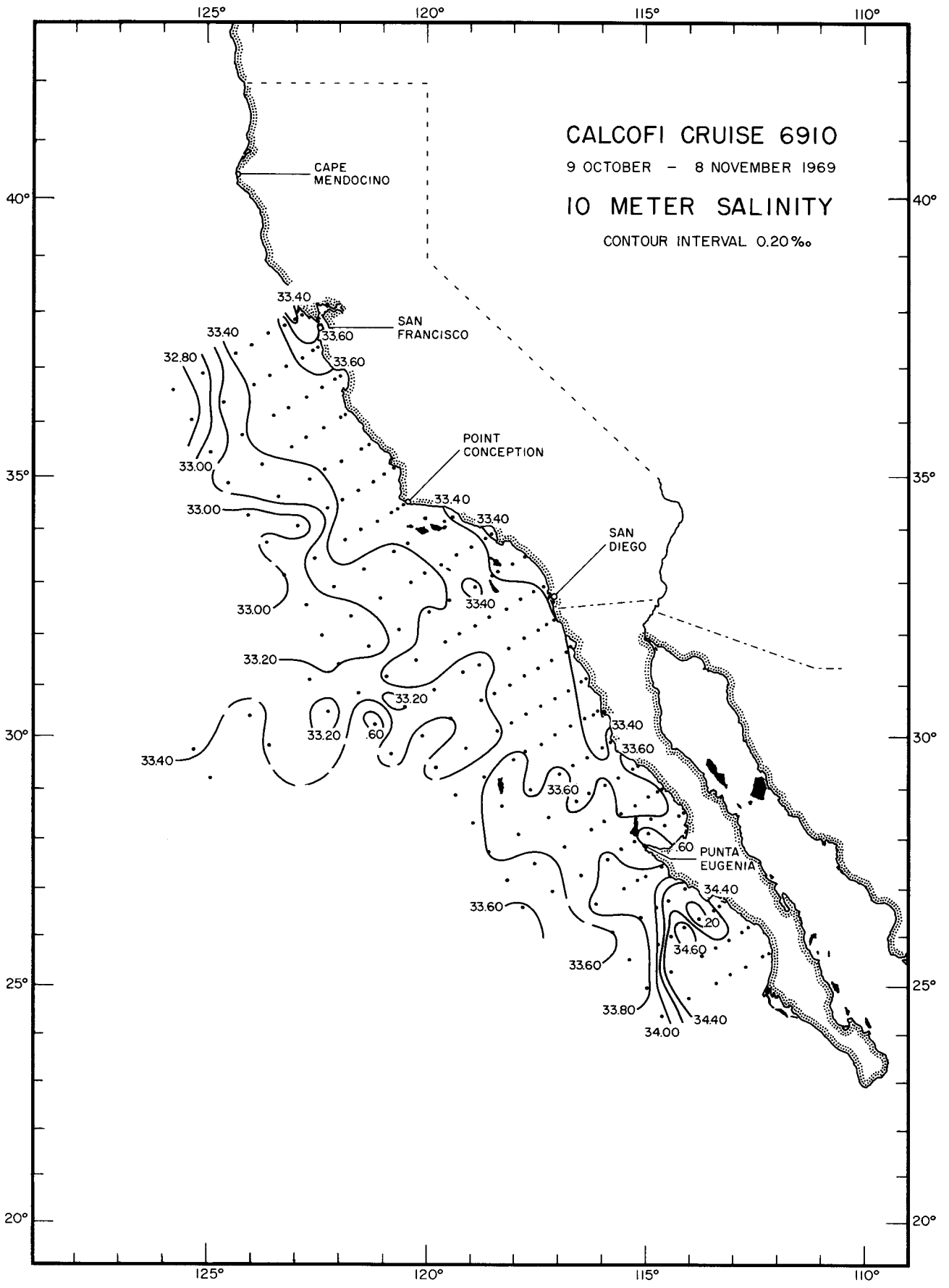
10m S

6908


CALCOFI CRUISE 6909
12 SEPTEMBER - 7 OCTOBER 1969
10 METER SALINITY
CONTOUR INTERVAL 0.20‰
CAPE MENDOCINO
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
125°
120°
115°
110°
40°
35°
30°
25°
20°
33.60
33.40
33.80
34.00
34.20
34.60
34.80

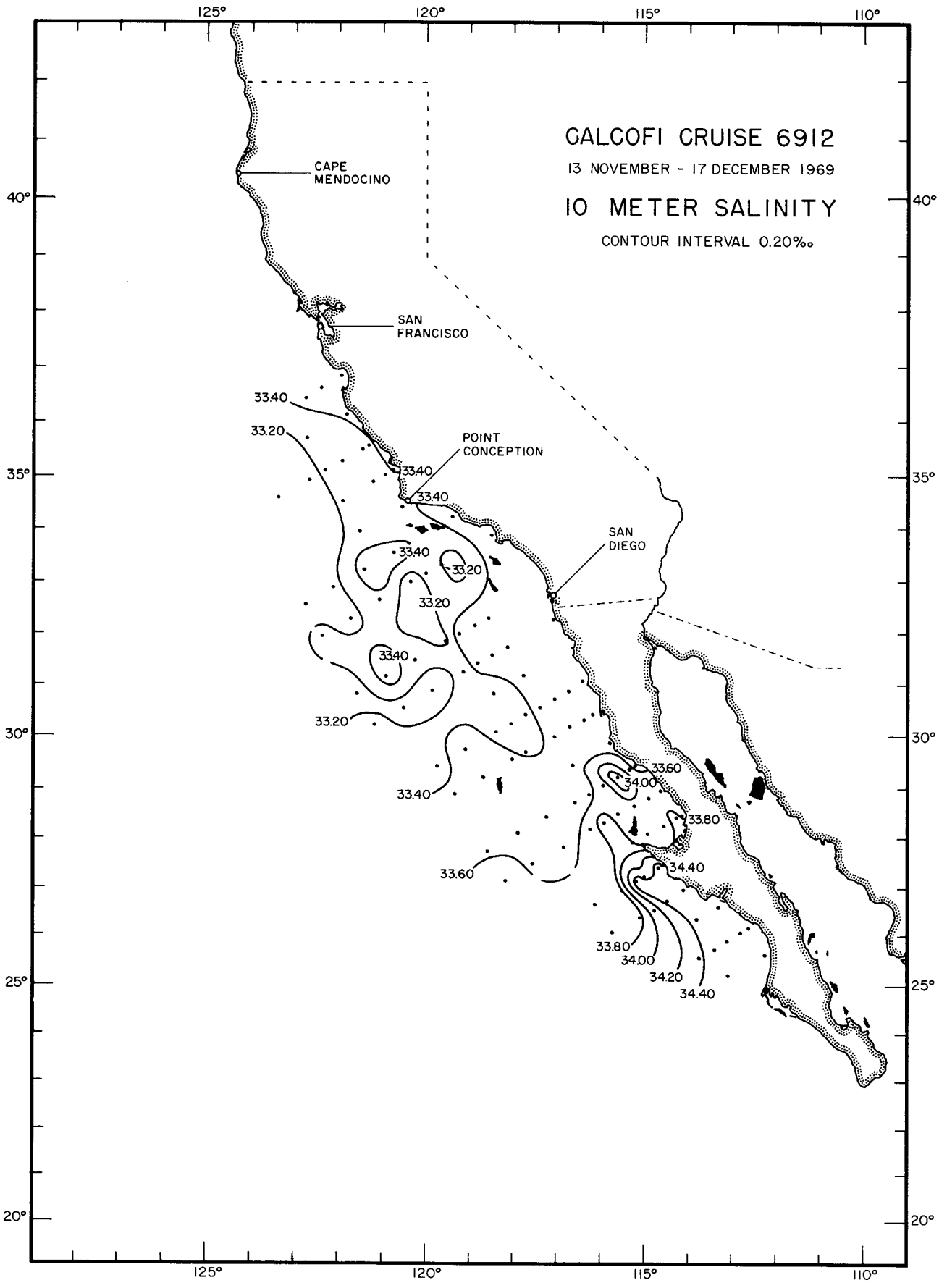
10m S

6909


CALCOFI CRUISE 6910
9 OCTOBER – 8 NOVEMBER 1969
10 METER SALINITY
CONTOUR INTERVAL 0.20‰
CAPE MENDOCINO
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
PUNTA EUGENIA
125°
120°
115°
110°
40°
35°
30°
25°
20°
33.40
33.60
32.80
33.00
33.20
.60
34.40
.20
34.60
33.80
34.00

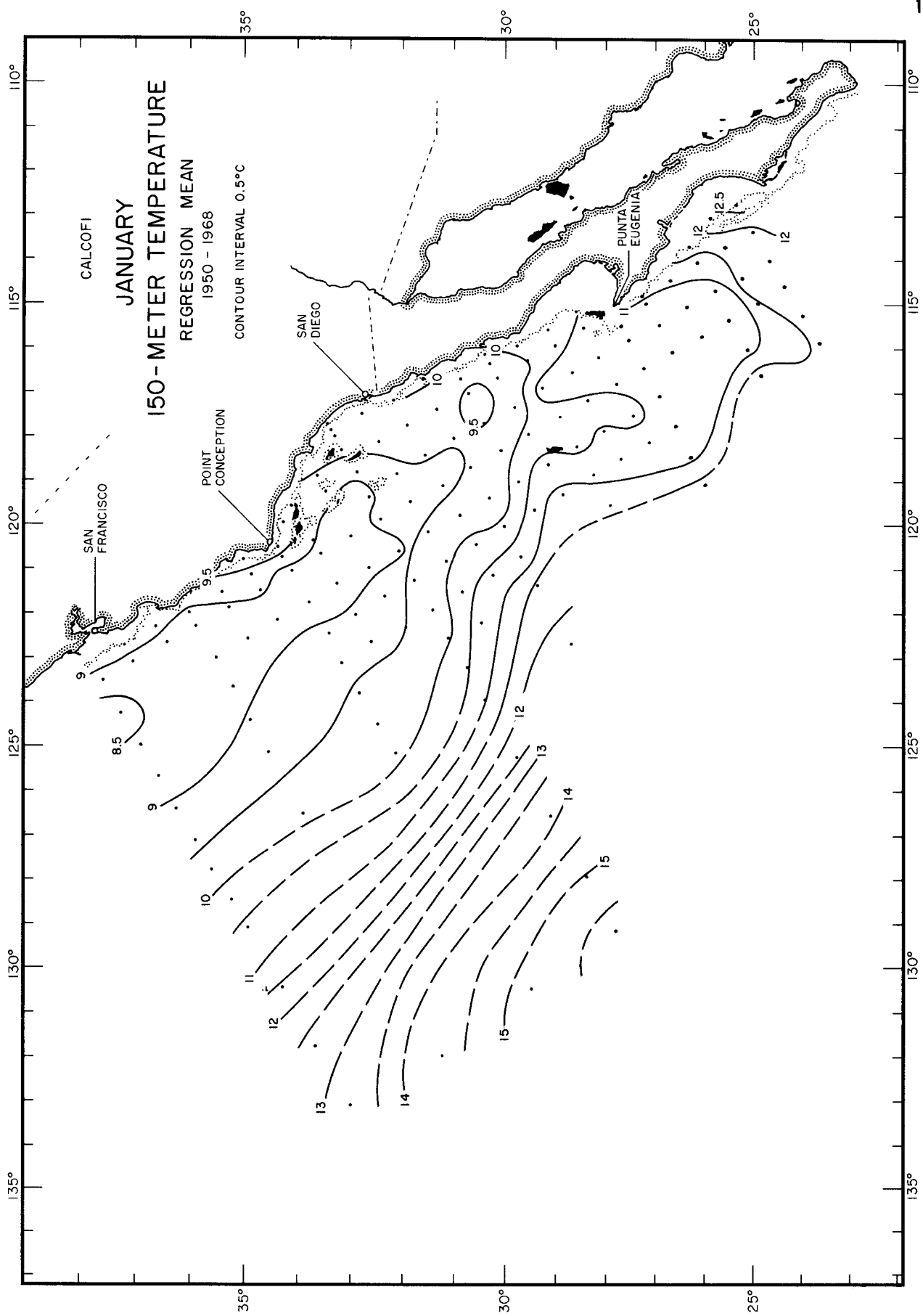
10m S

6910

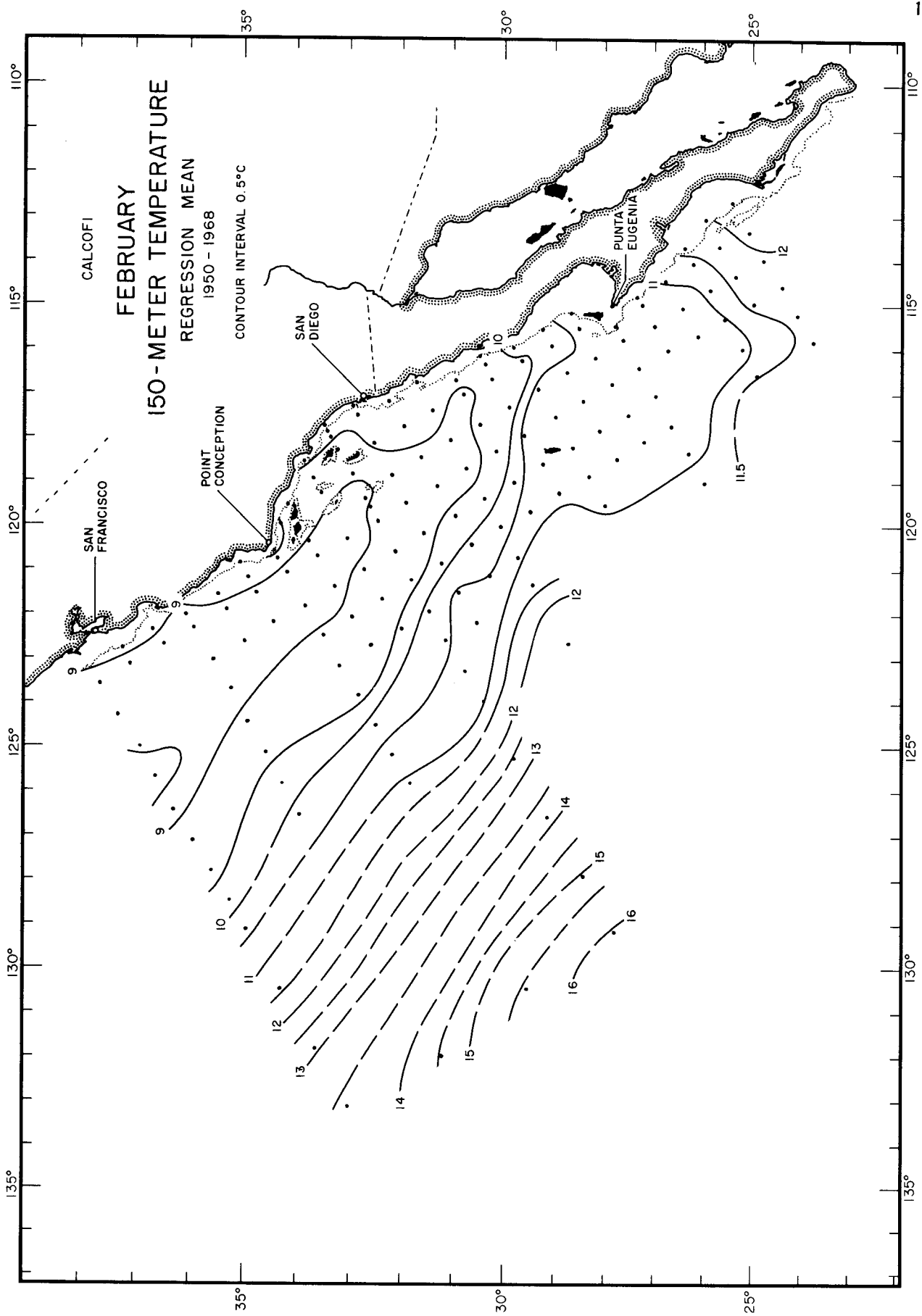

CALCOFI CRUISE 6912
13 NOVEMBER - 17 DECEMBER 1969
10 METER SALINITY
CONTOUR INTERVAL 0.20‰
CAPE MENDOCINO
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
125°
120°
115°
110°
40°
35°
30°
25°
20°
33.40
33.20
33.60
34.00
33.80
34.40
34.20

10m S

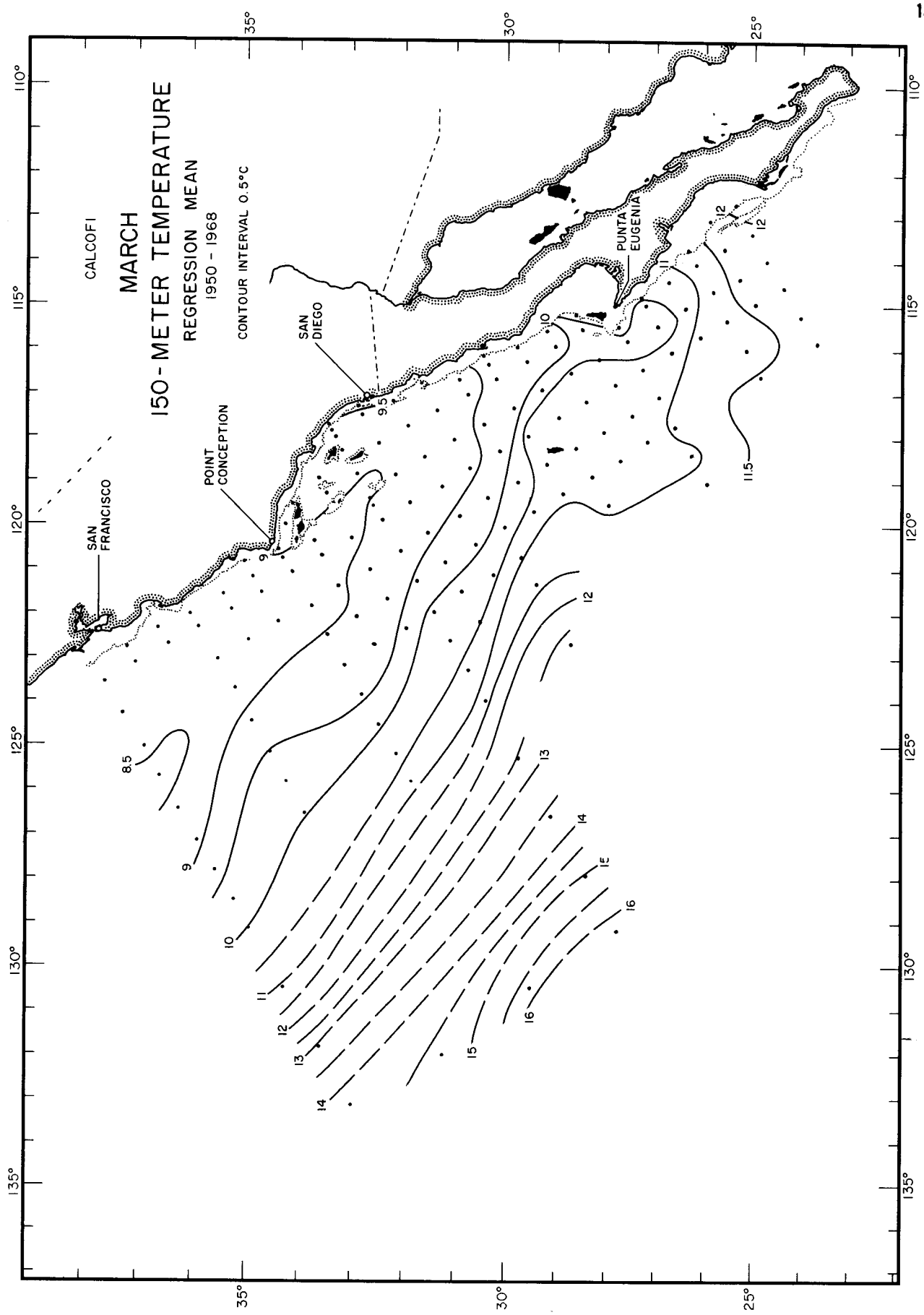
6912



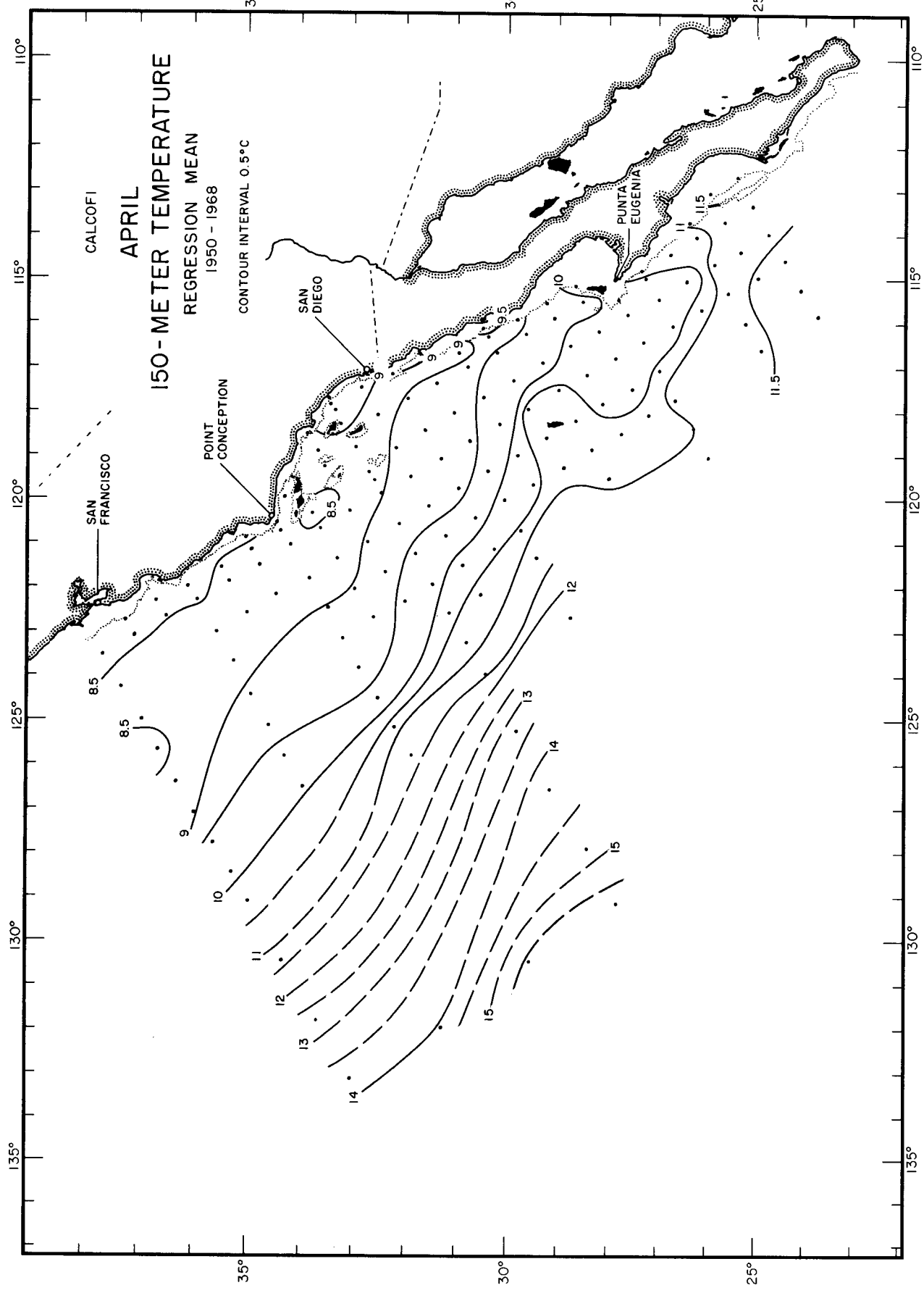
Regression Mean 150 m T
JANUARY



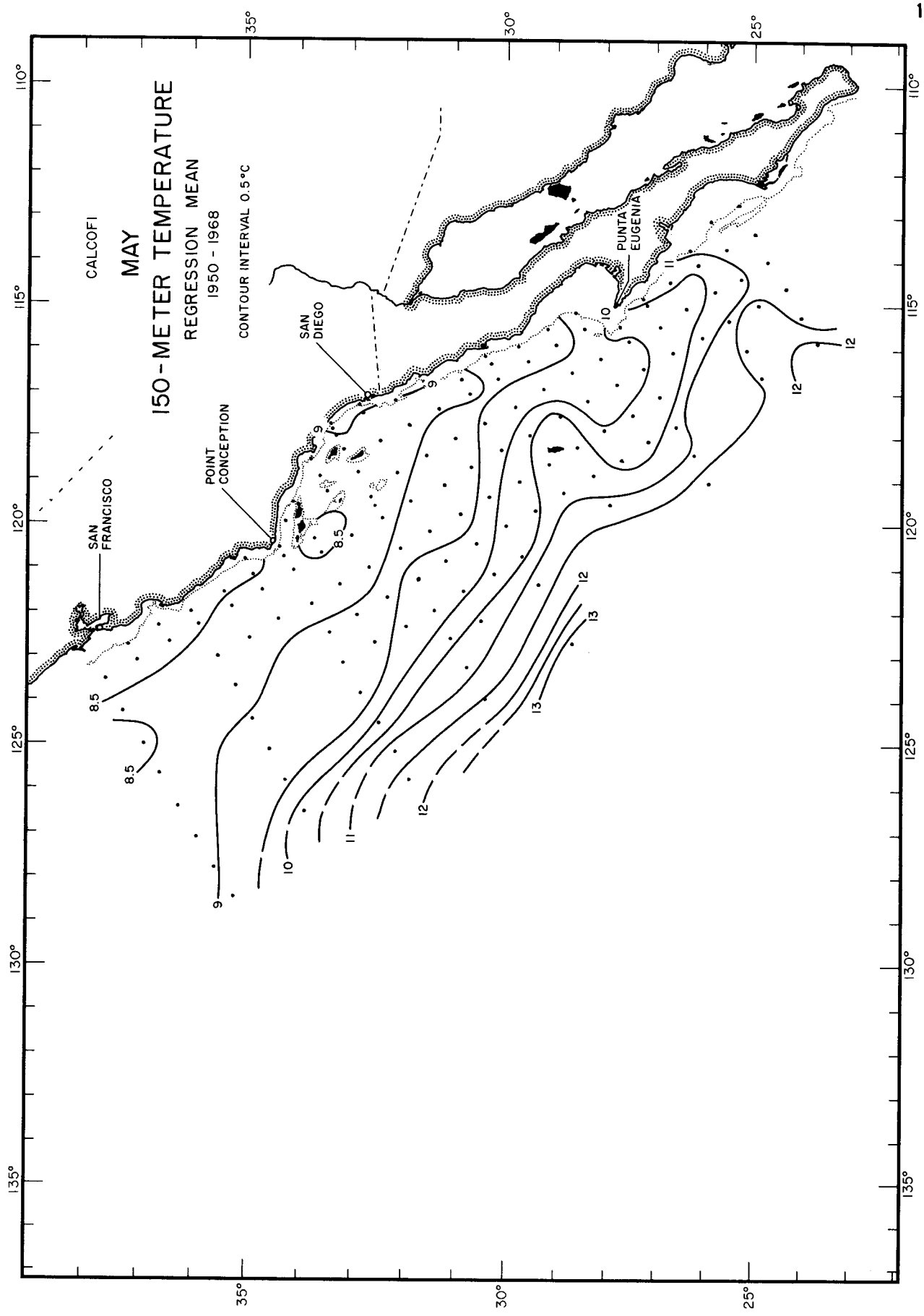
Regression Mean 150 m T
FEBRUARY



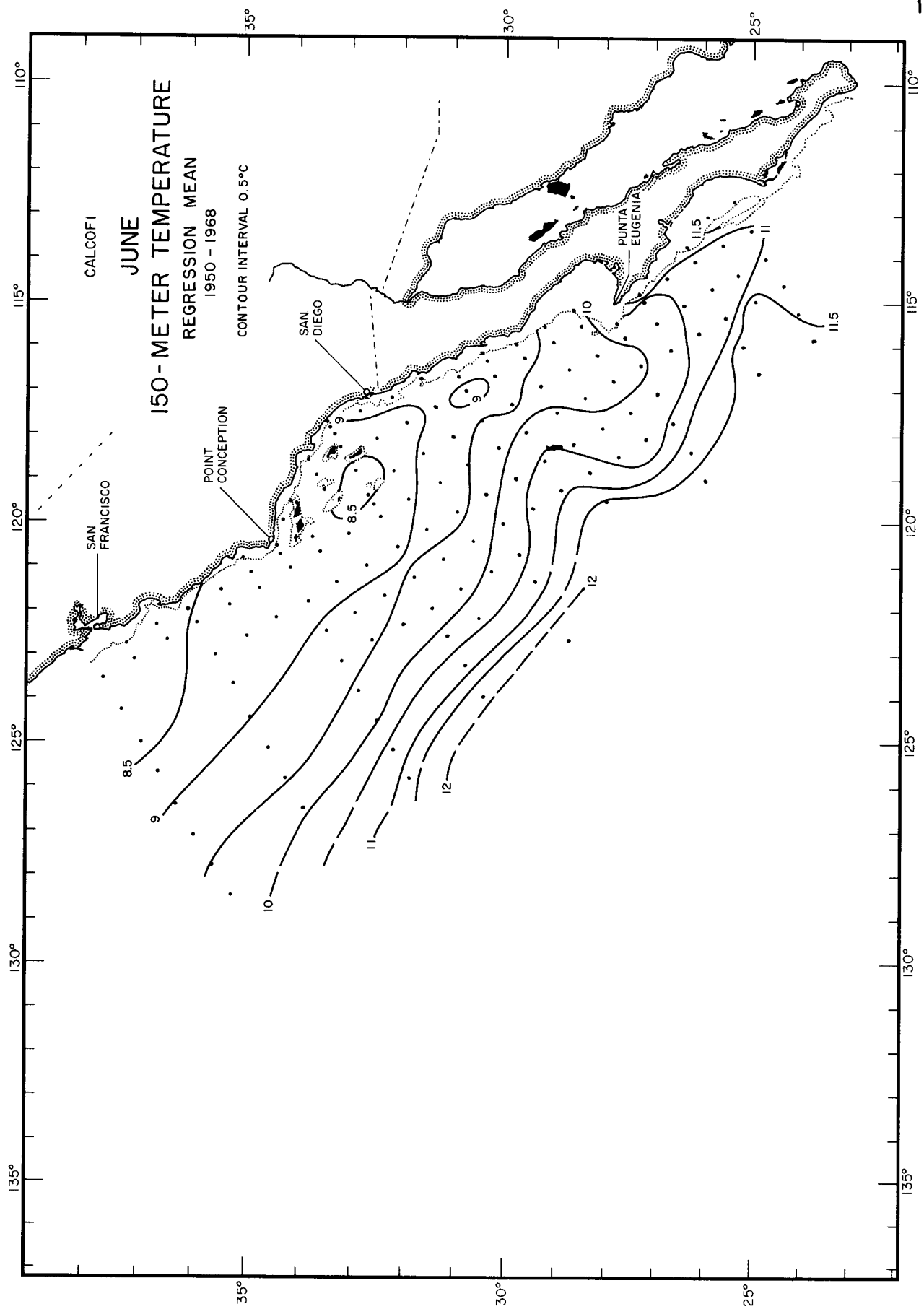
Regression Mean 150 m T
MARCH



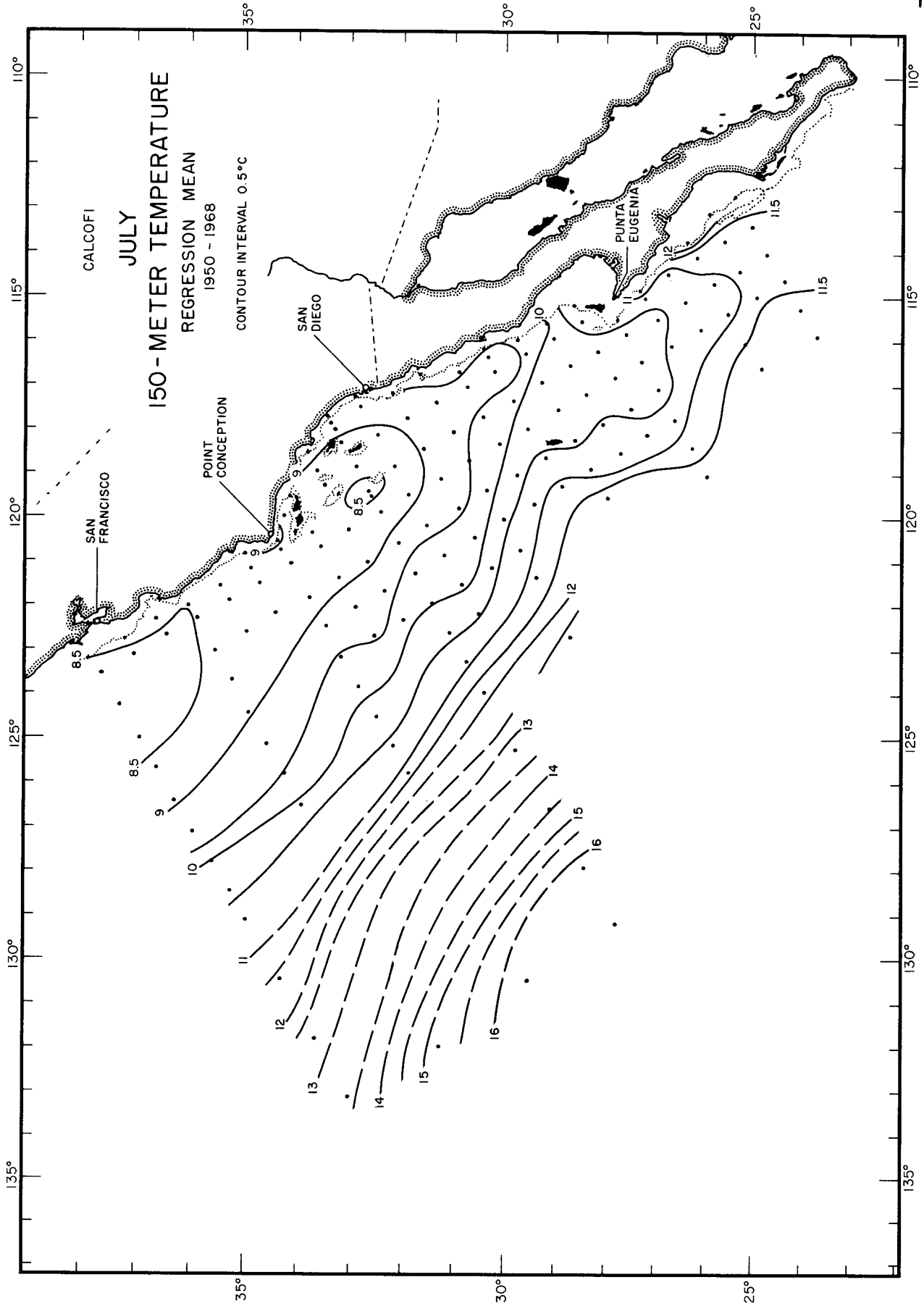
Regression Mean 150 m T
APRIL



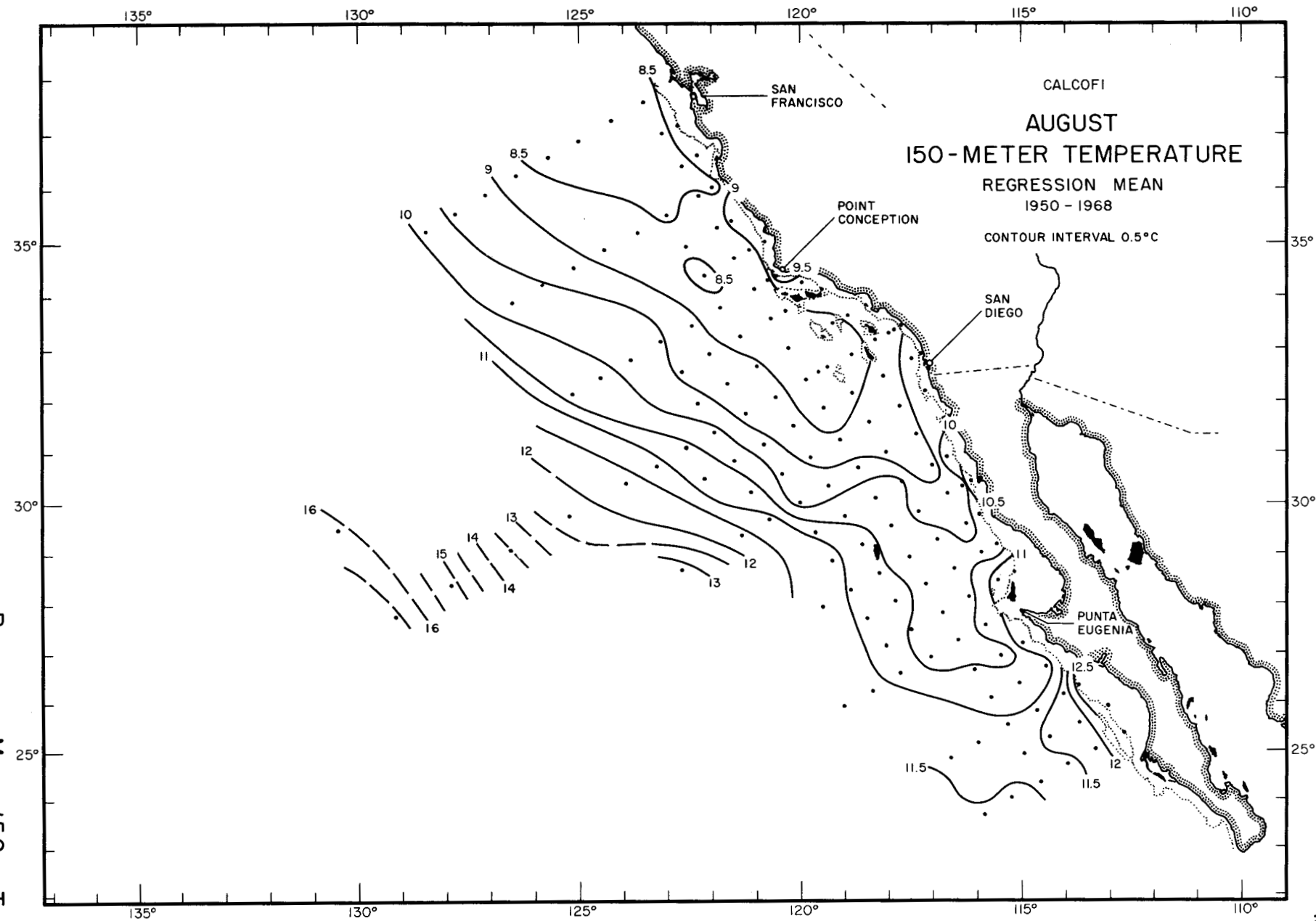
Regression Mean 150 m T
MAY



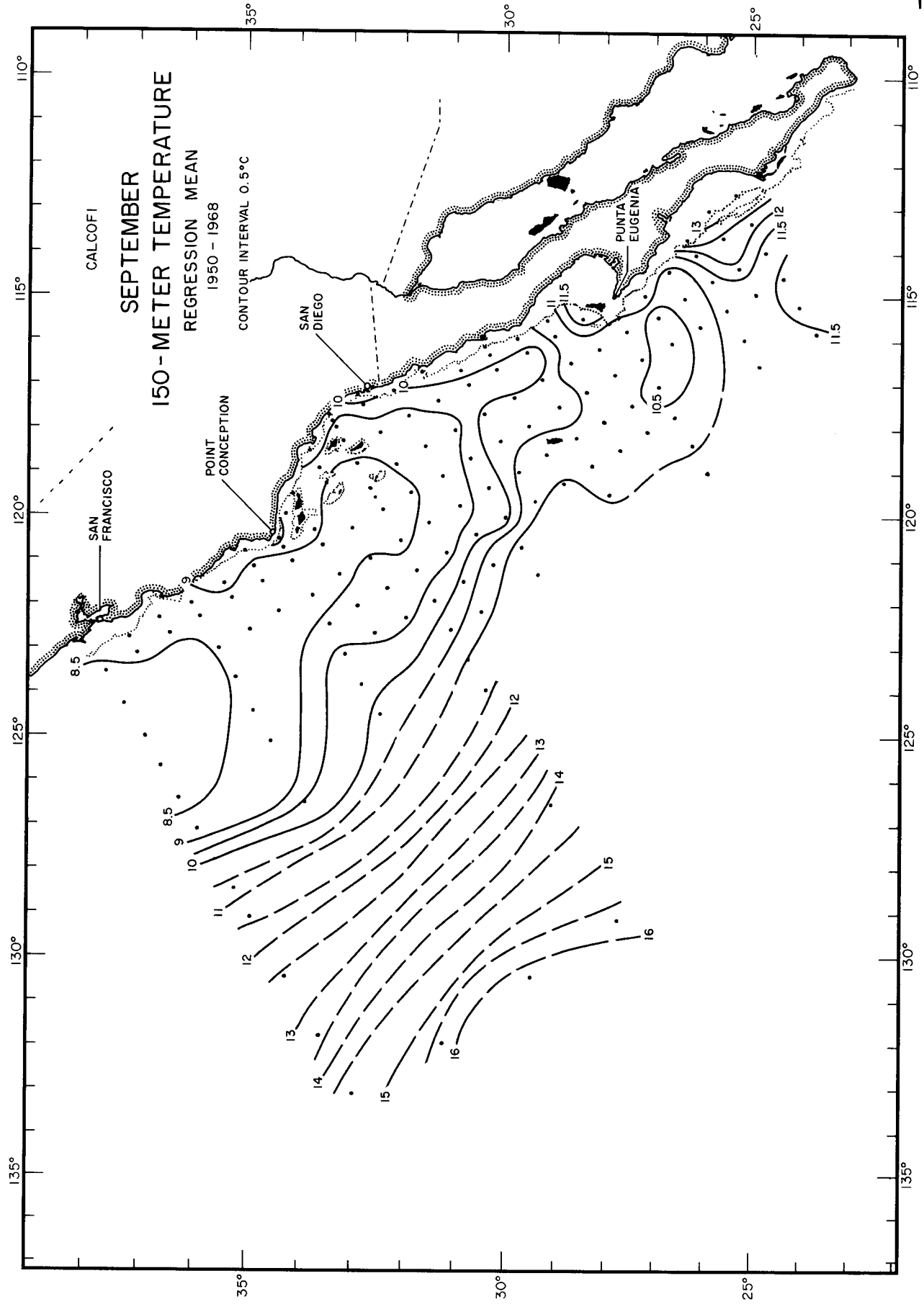
Regression Mean 150 m T
JUNE



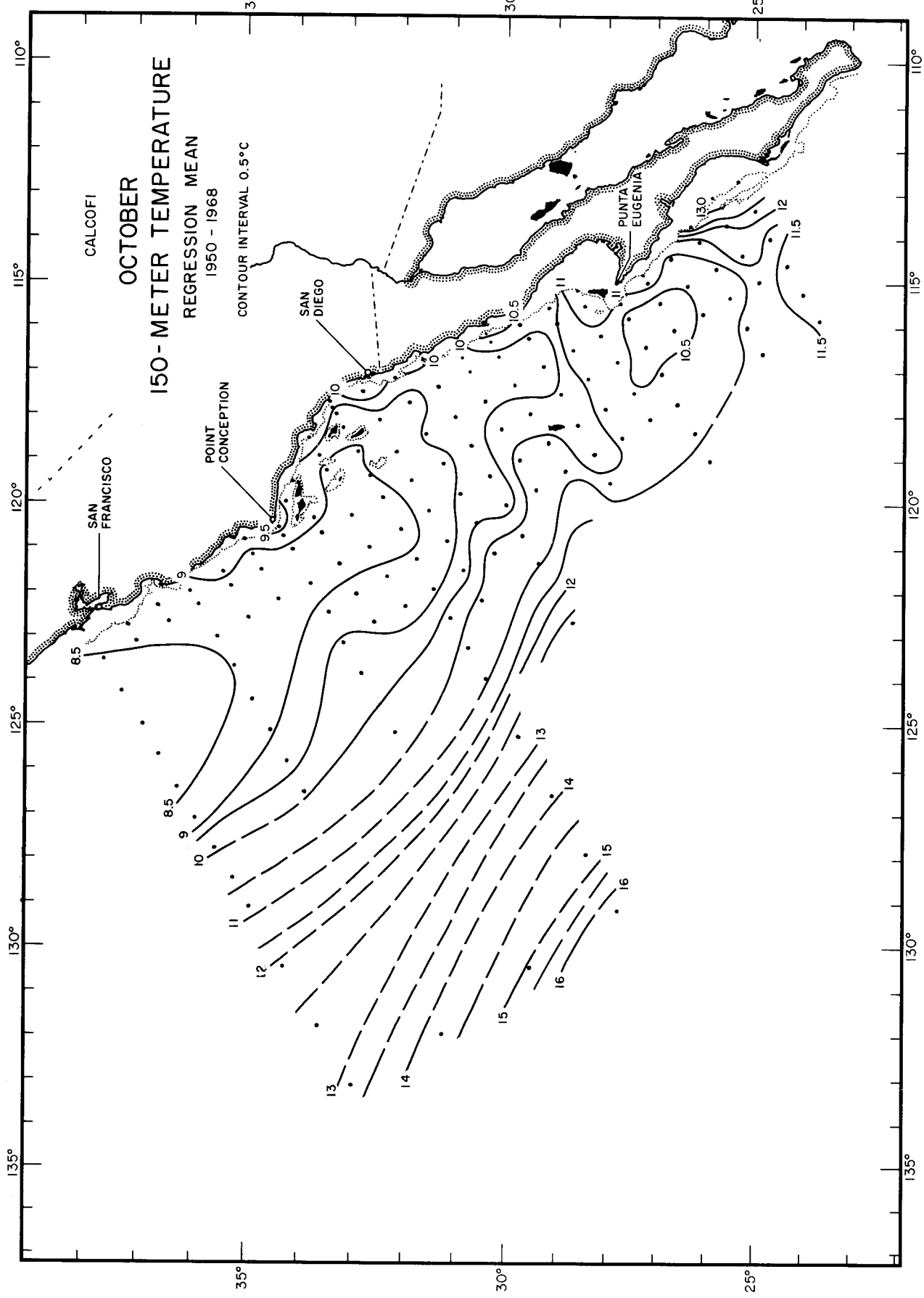
Regression Mean 150 m T
JULY



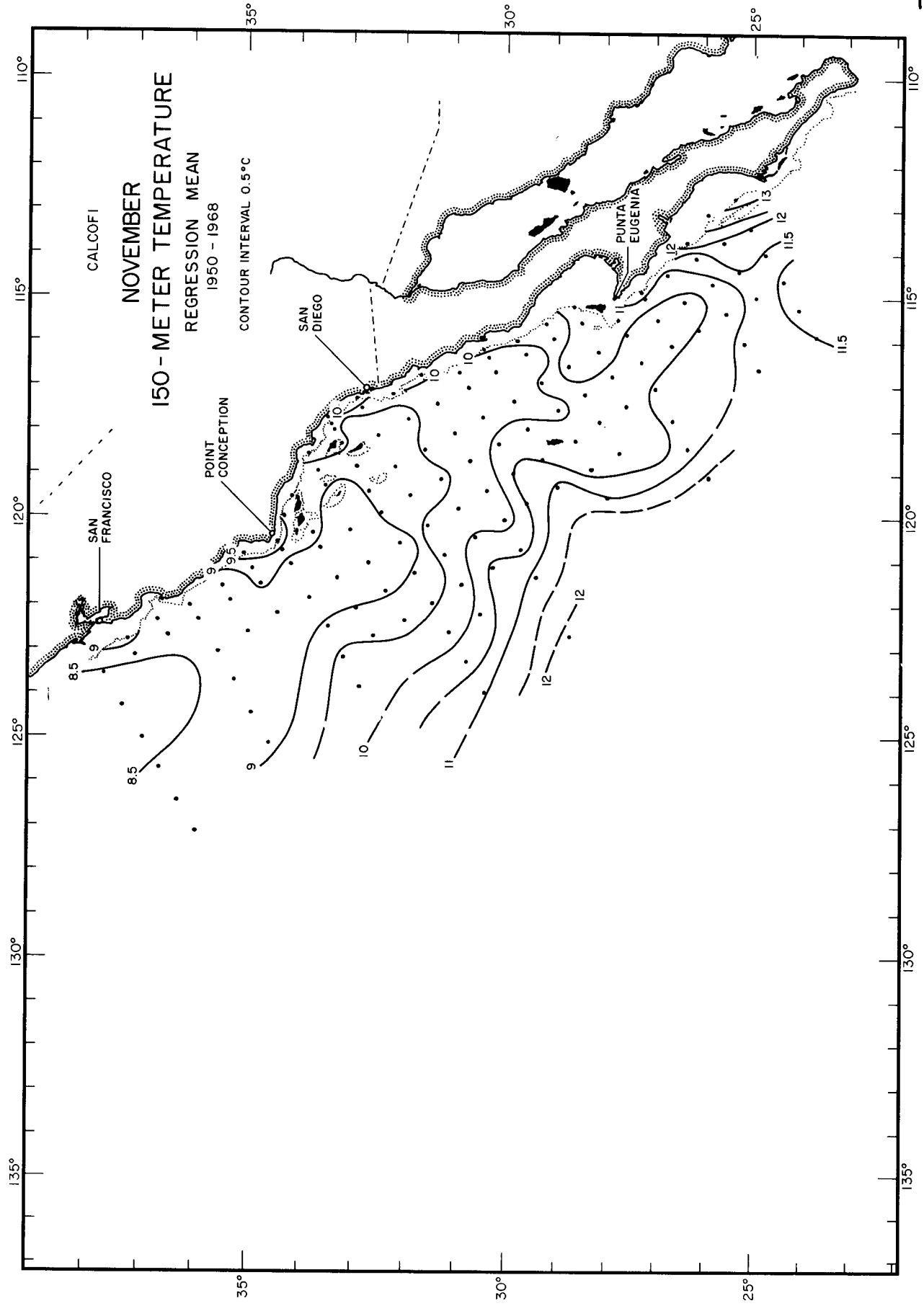
Regression Mean 150 m T
AUGUST



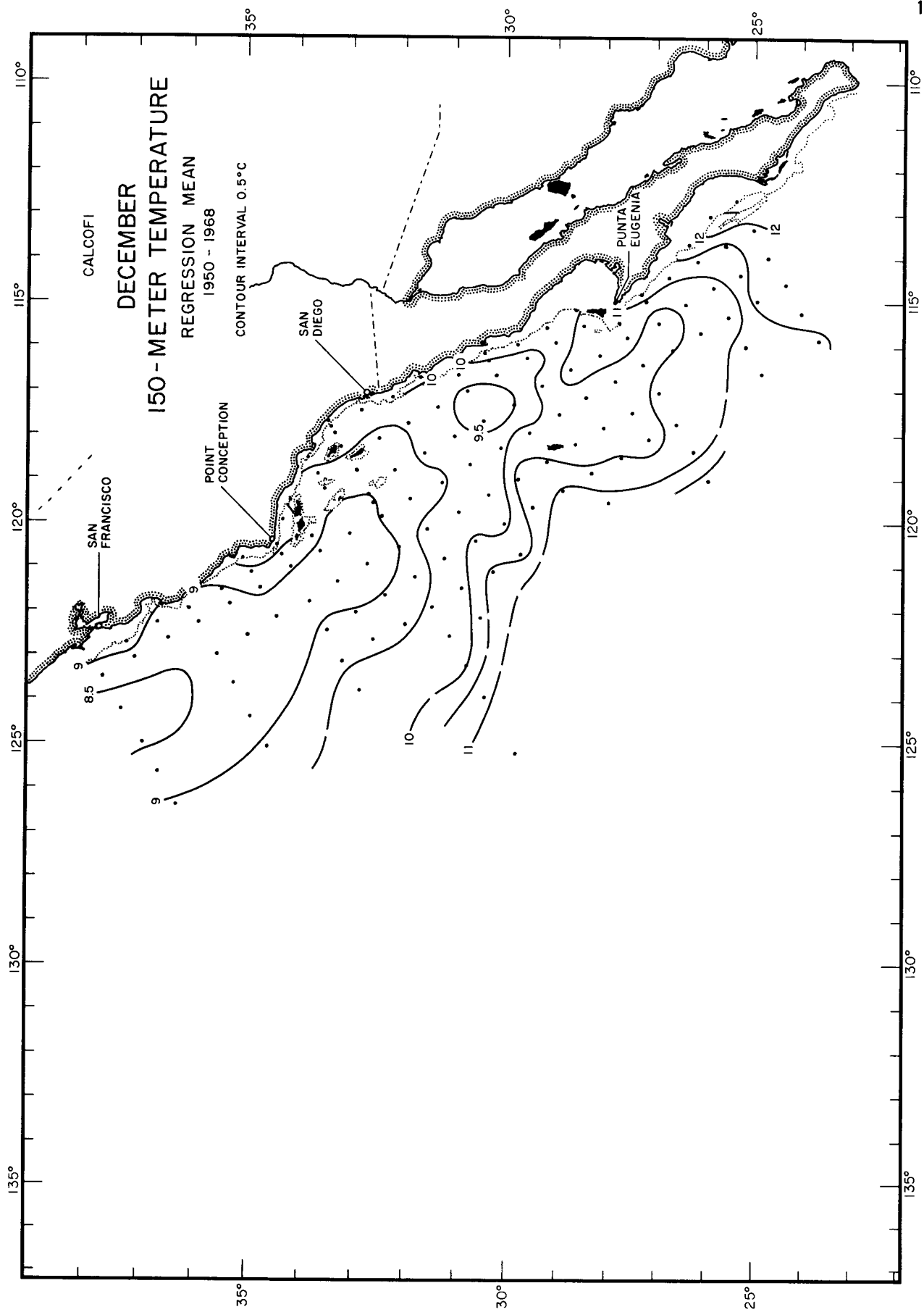
Regression Mean 150 m T
SEPTEMBER



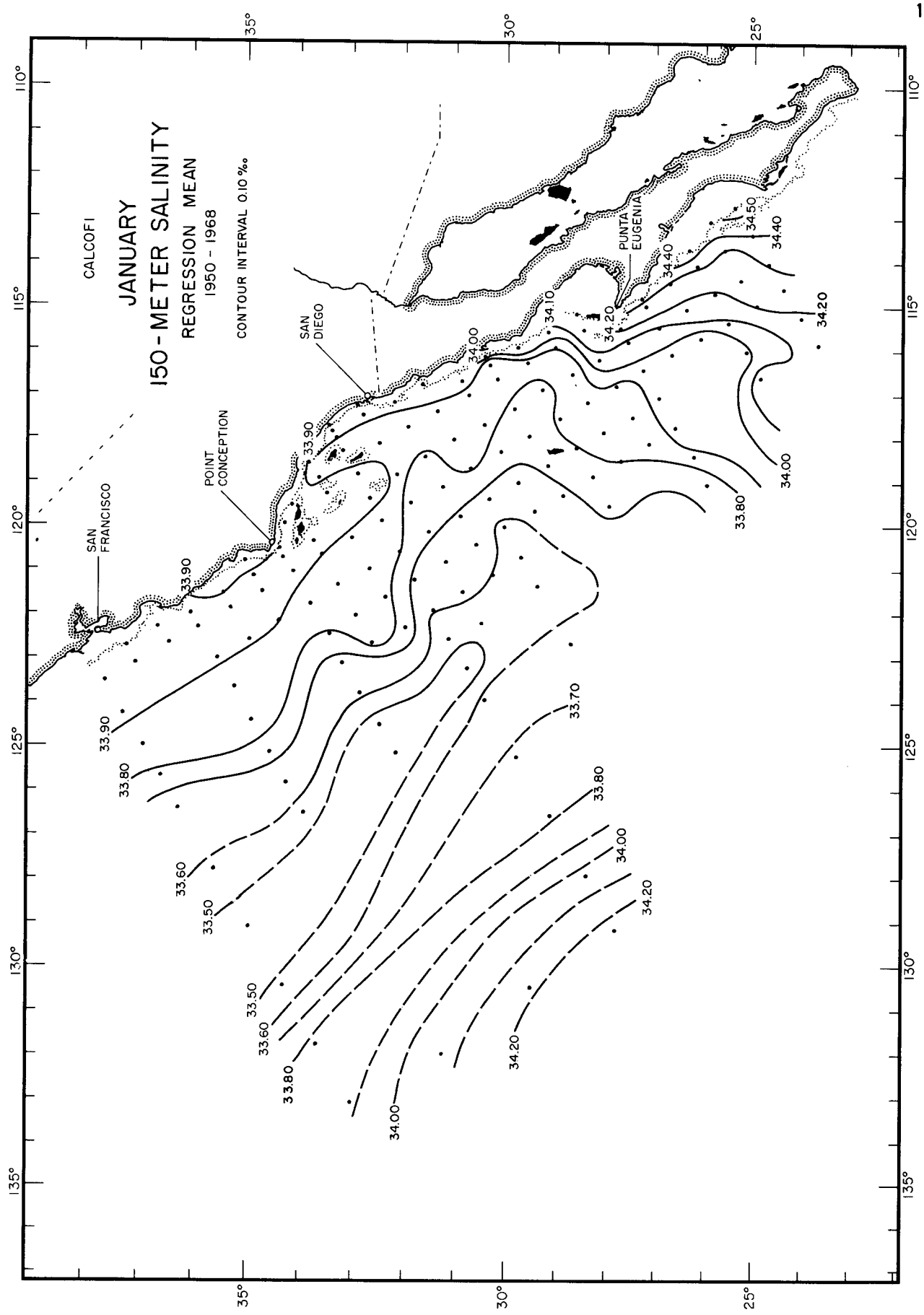
Regression Mean 150 m T
OCTOBER



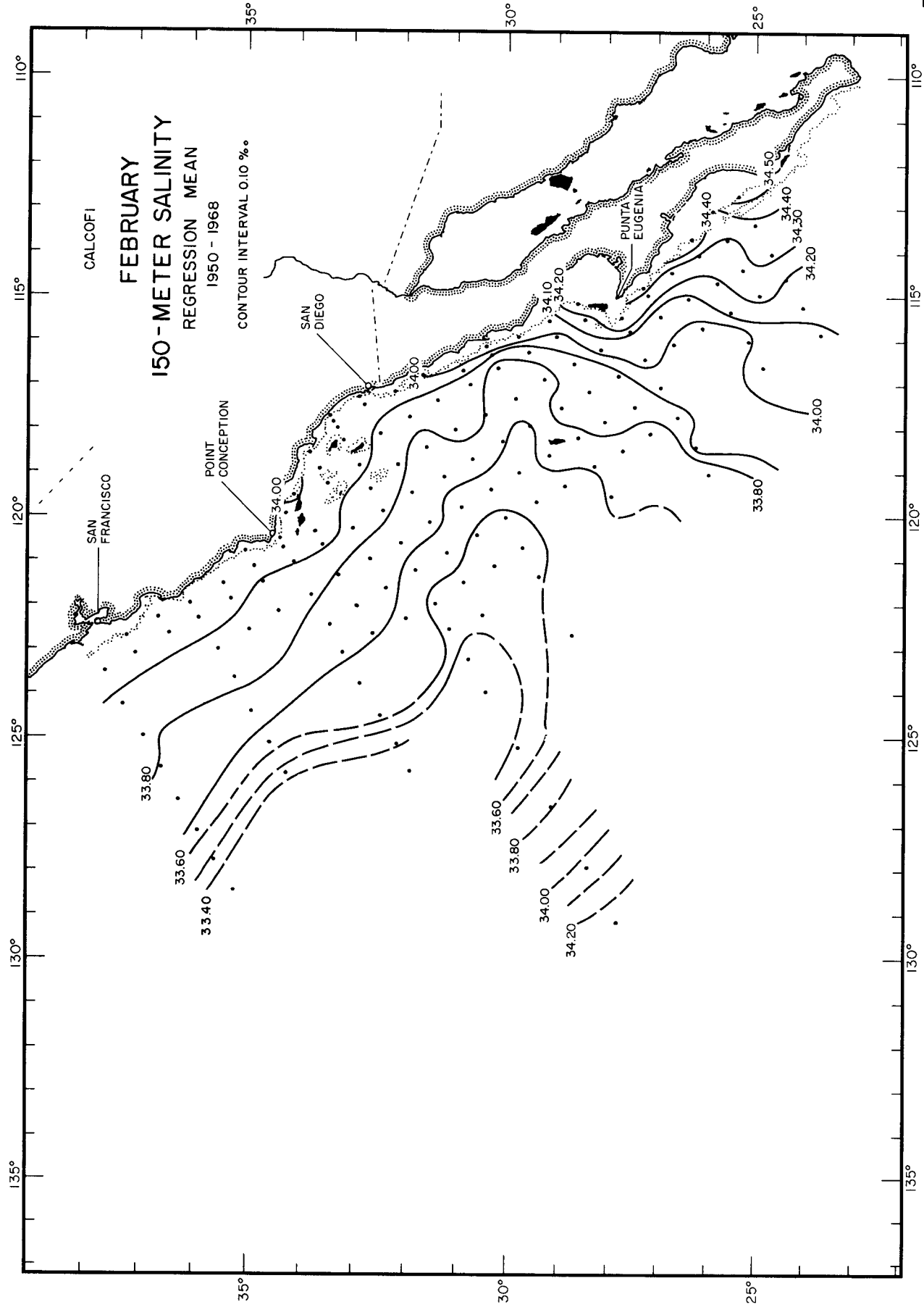
Regression Mean 150 m T
NOVEMBER



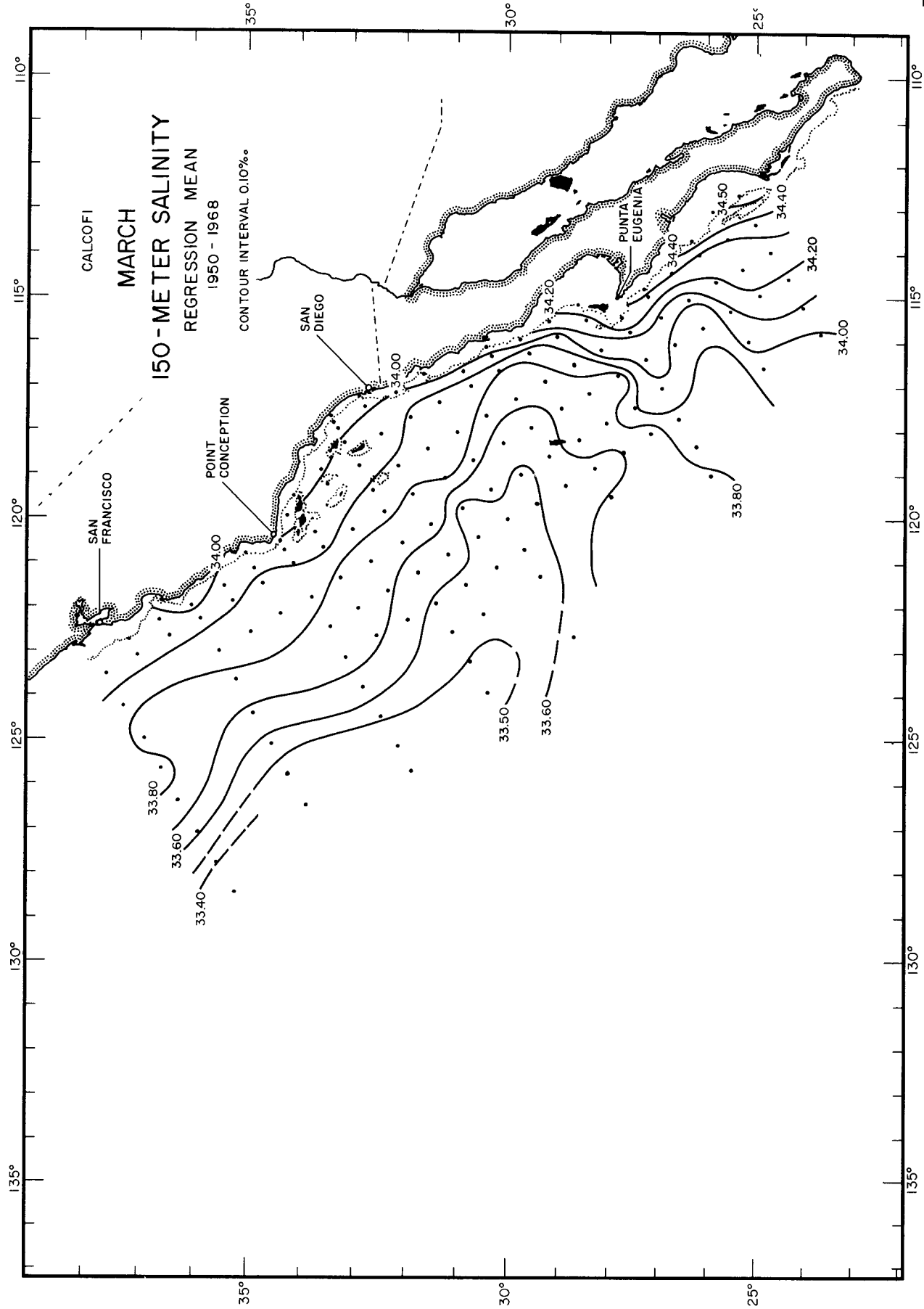
Regression Mean 150 m T
DECEMBER



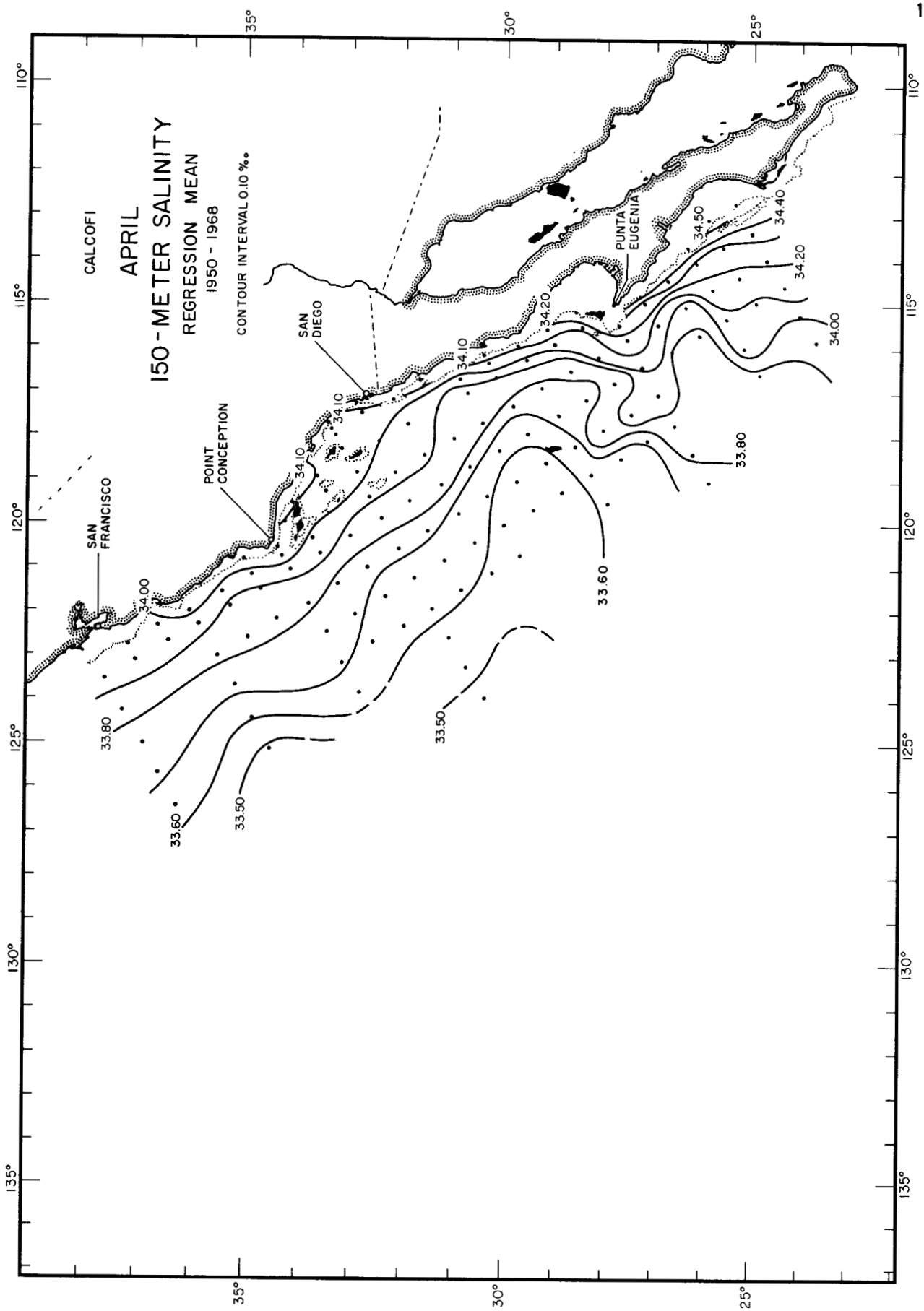
Regression Mean 150 m S
JANUARY



Regression Mean 150 m S
FEBRUARY

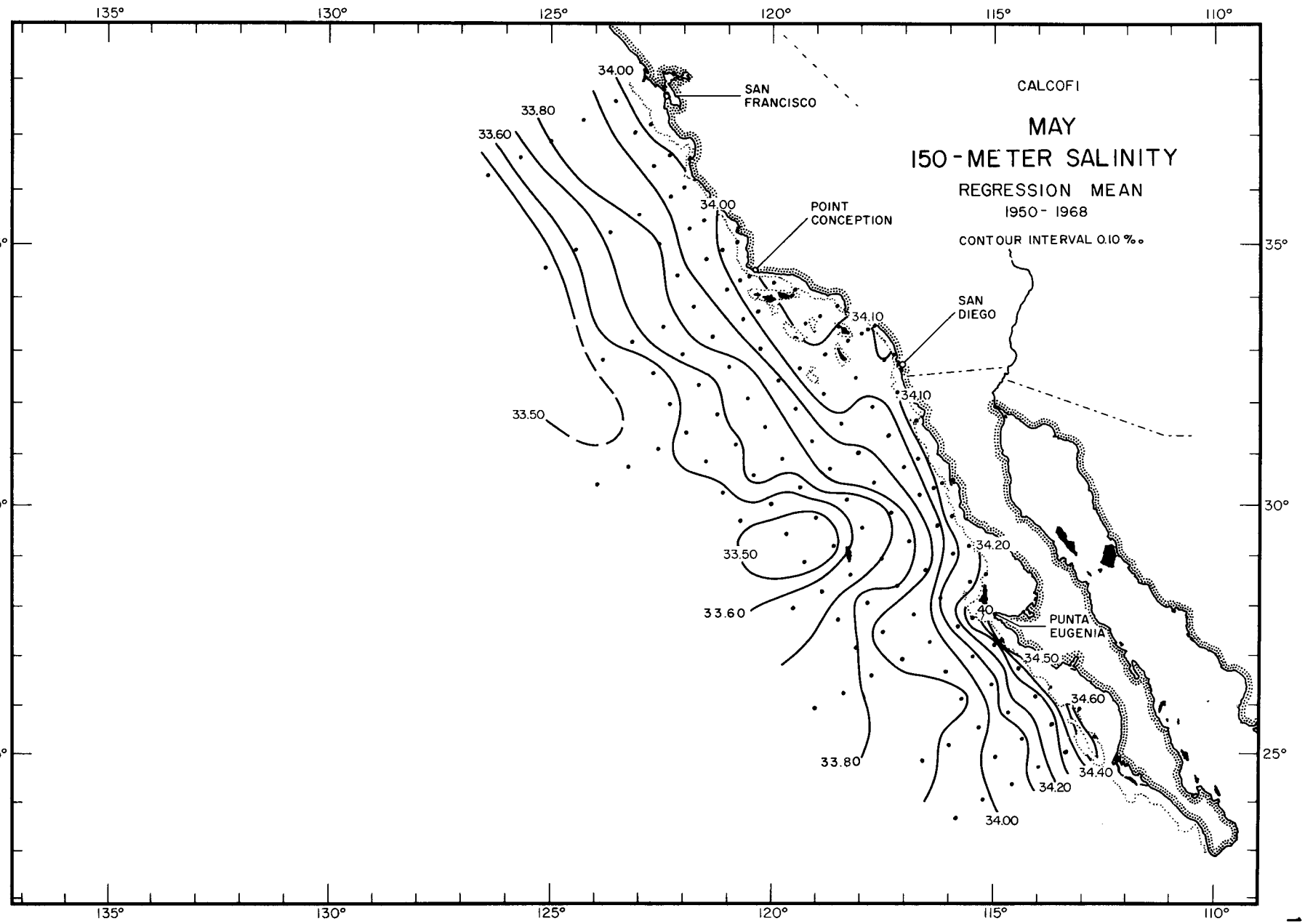


Regression Mean 150 m S
MARCH

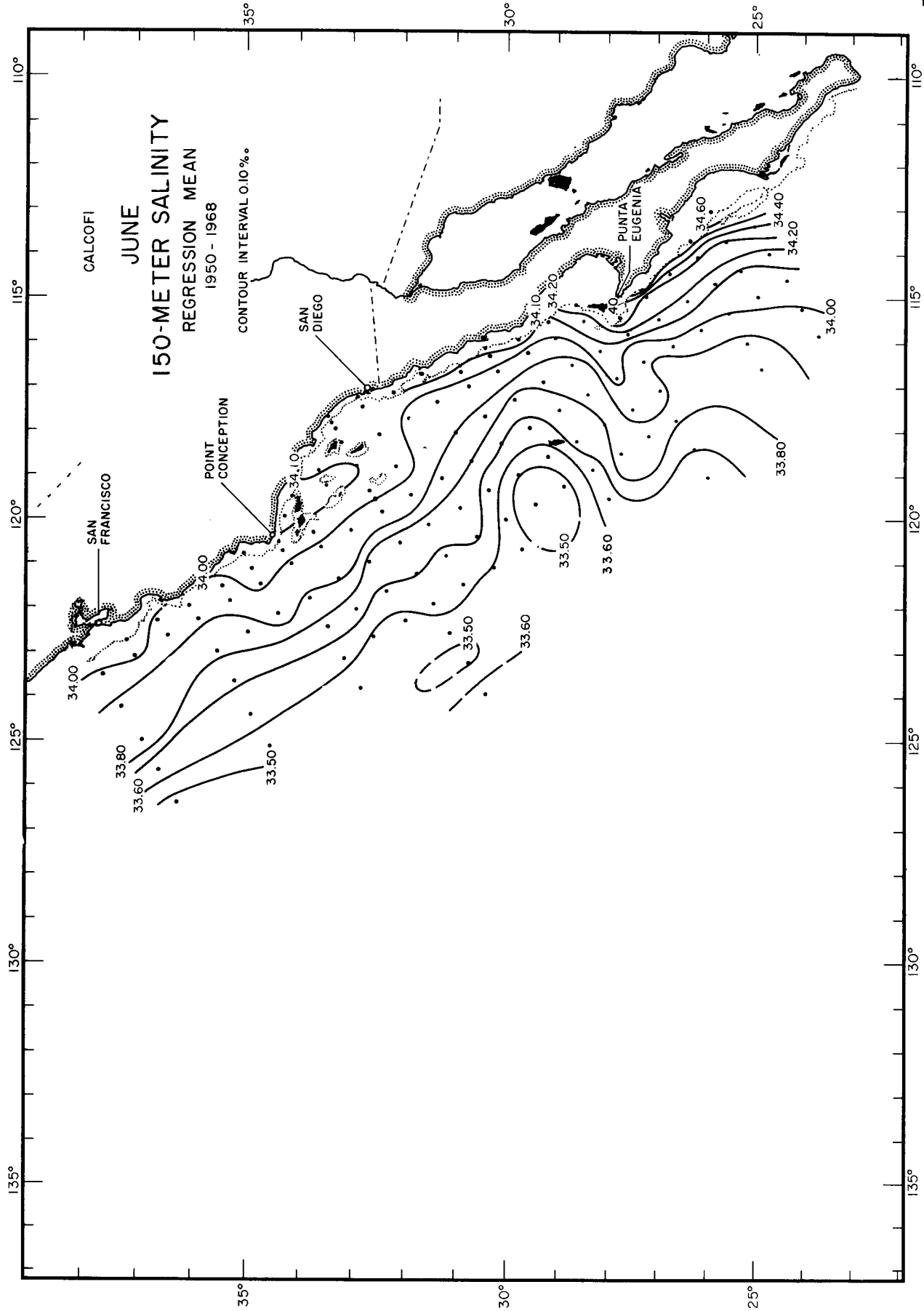


Regression Mean 150 m S

APRIL

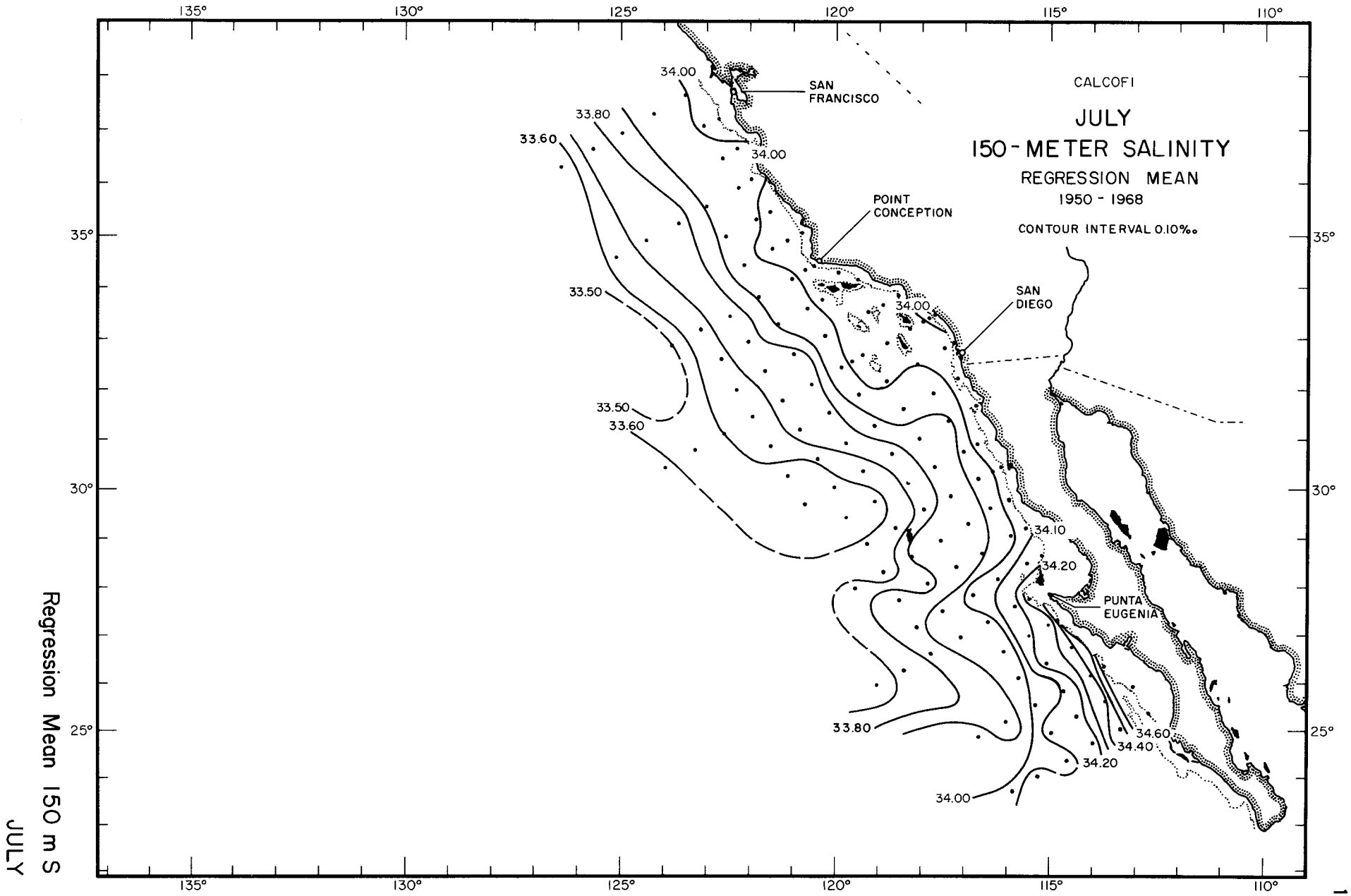


Regression Mean 150 m S
MAY



Regression Mean 150 m S

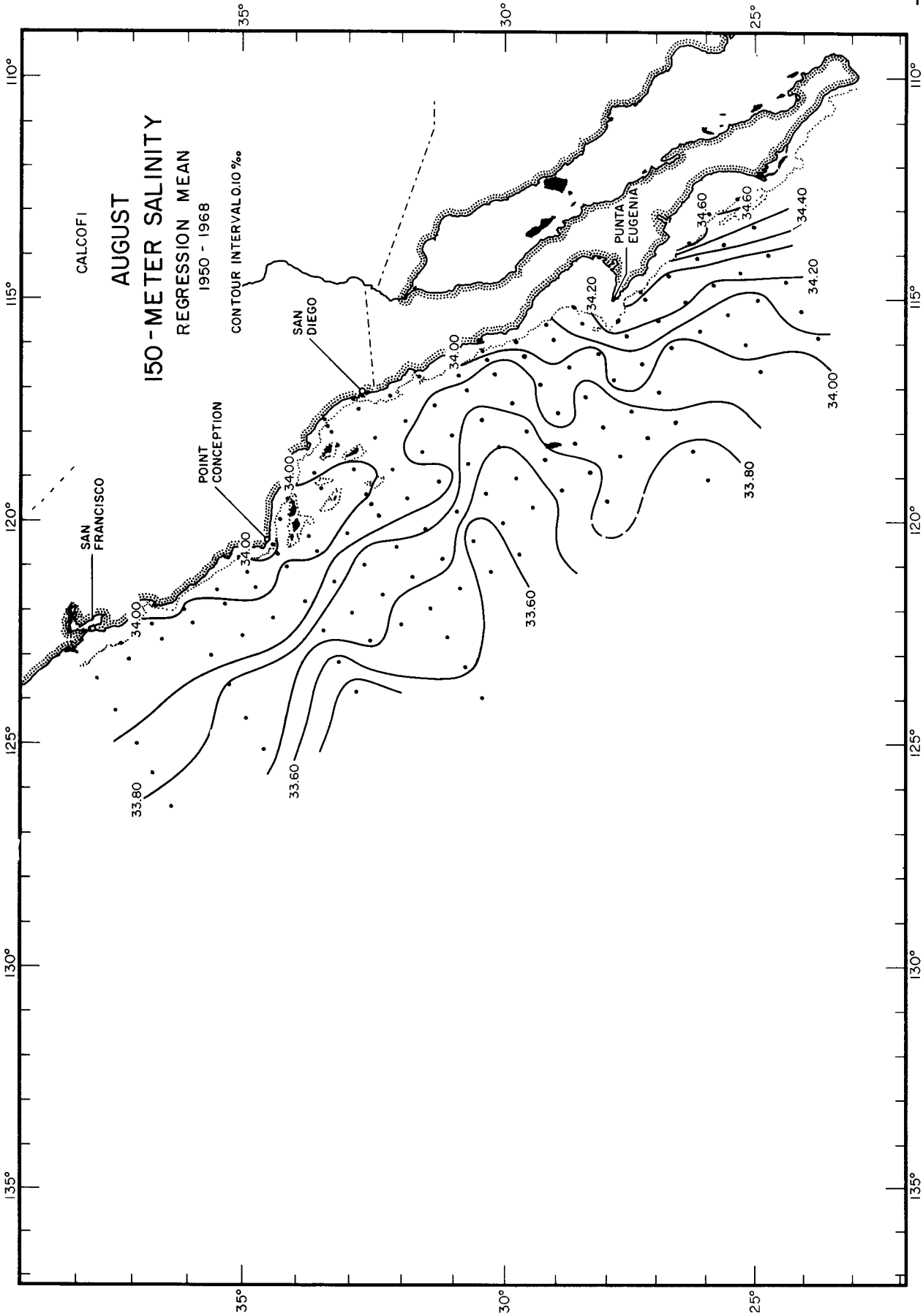
JUNE



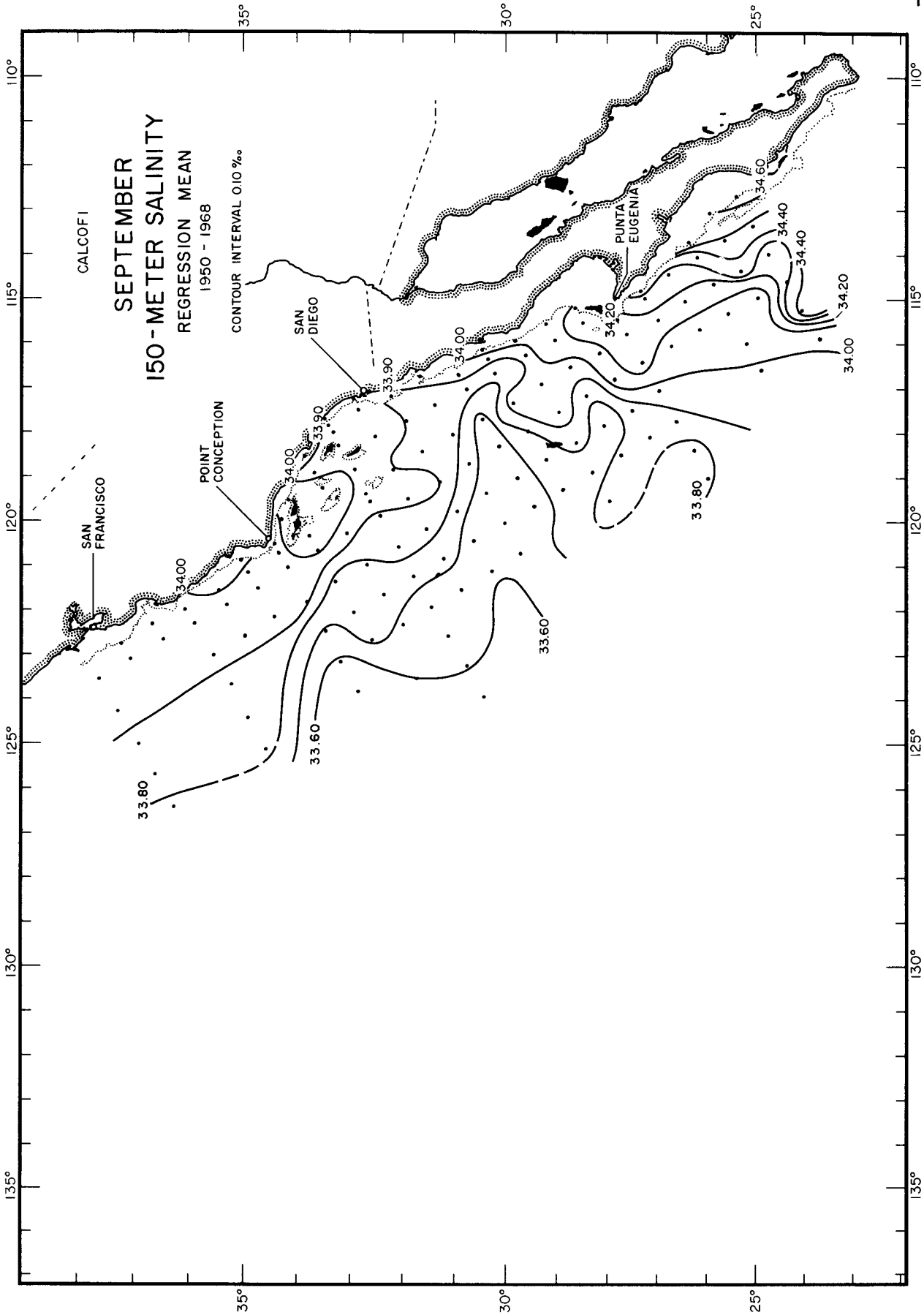
Regression Mean 150 m S

JULY

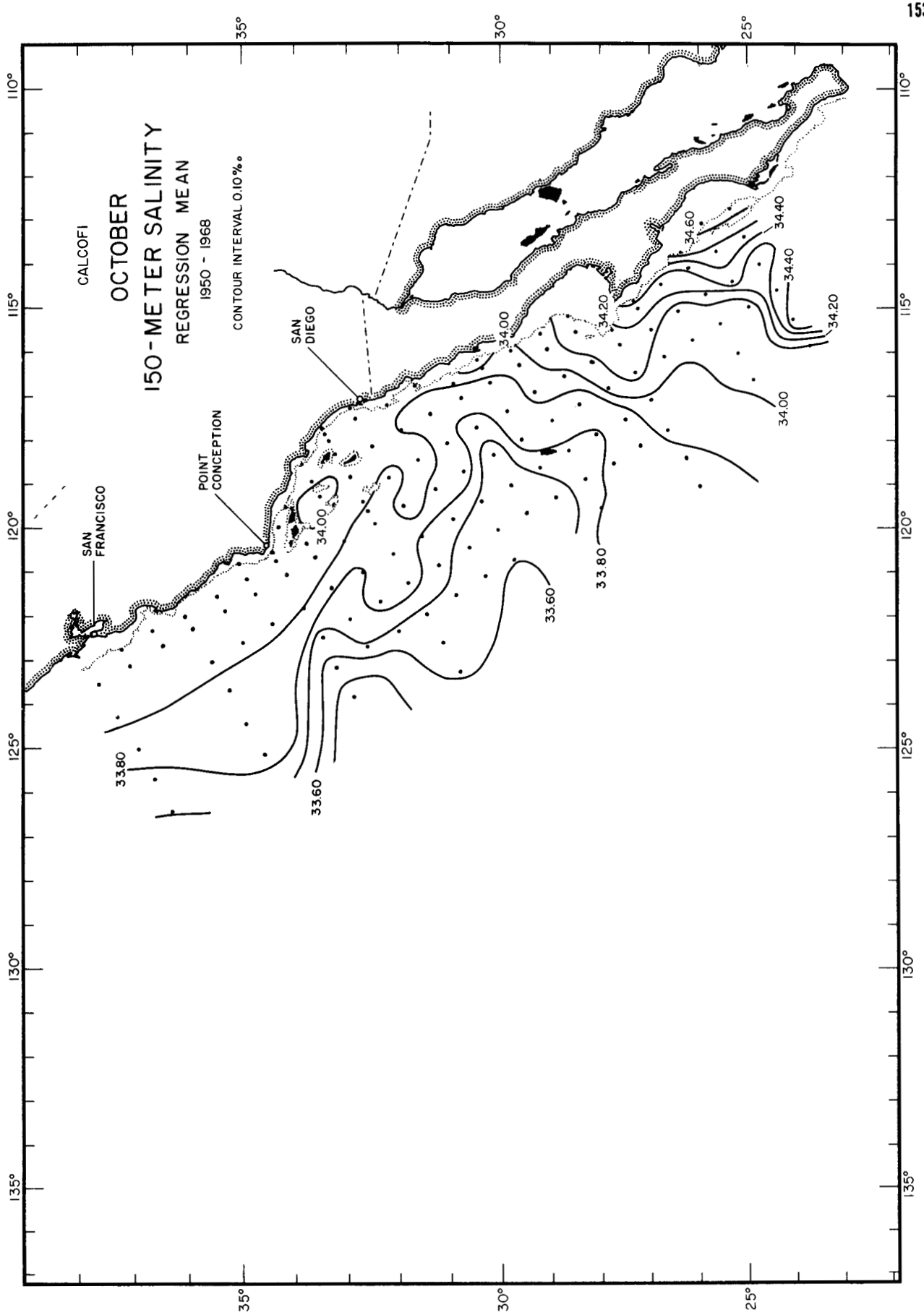
150



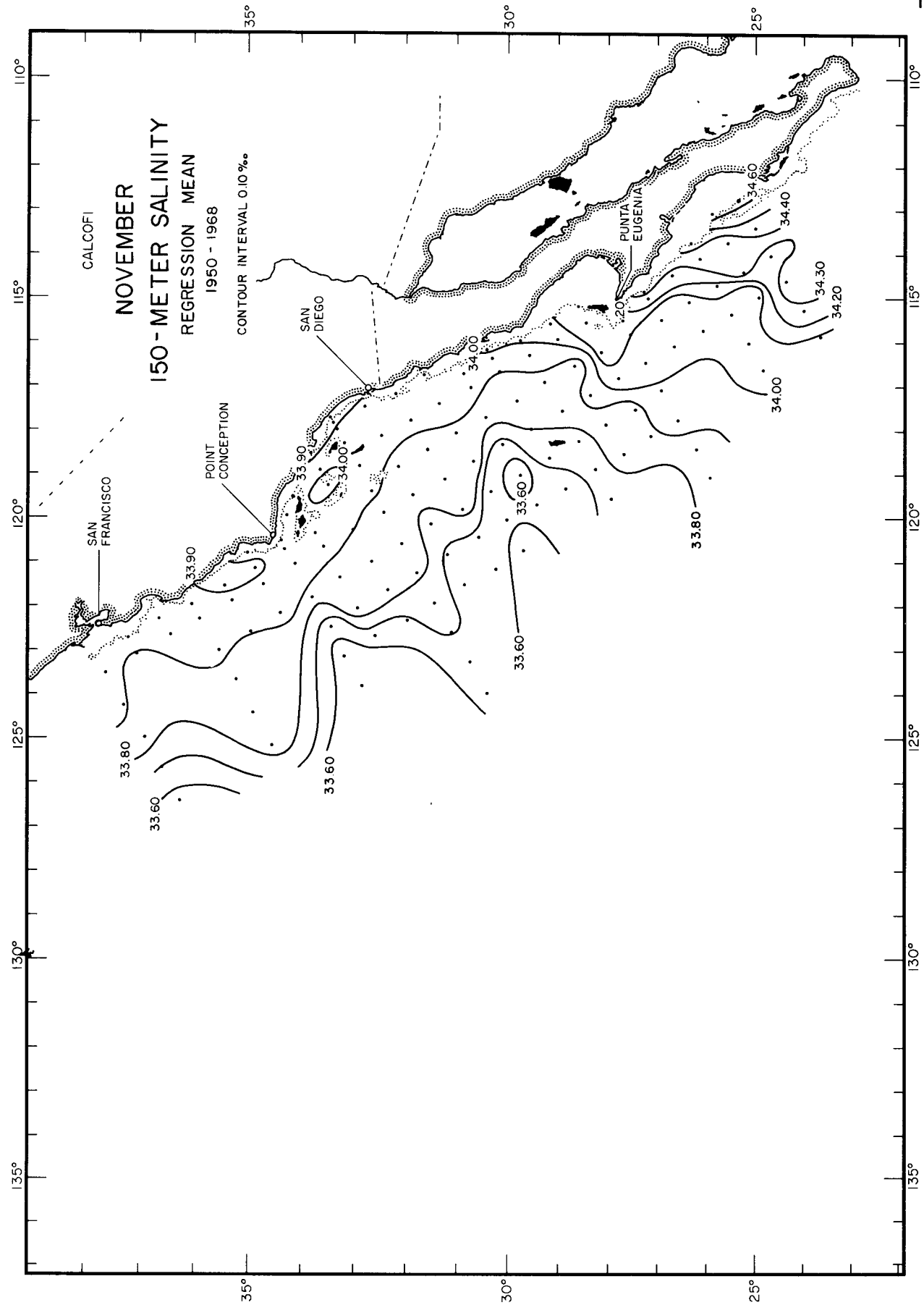
Regression Mean 150 m S
AUGUST



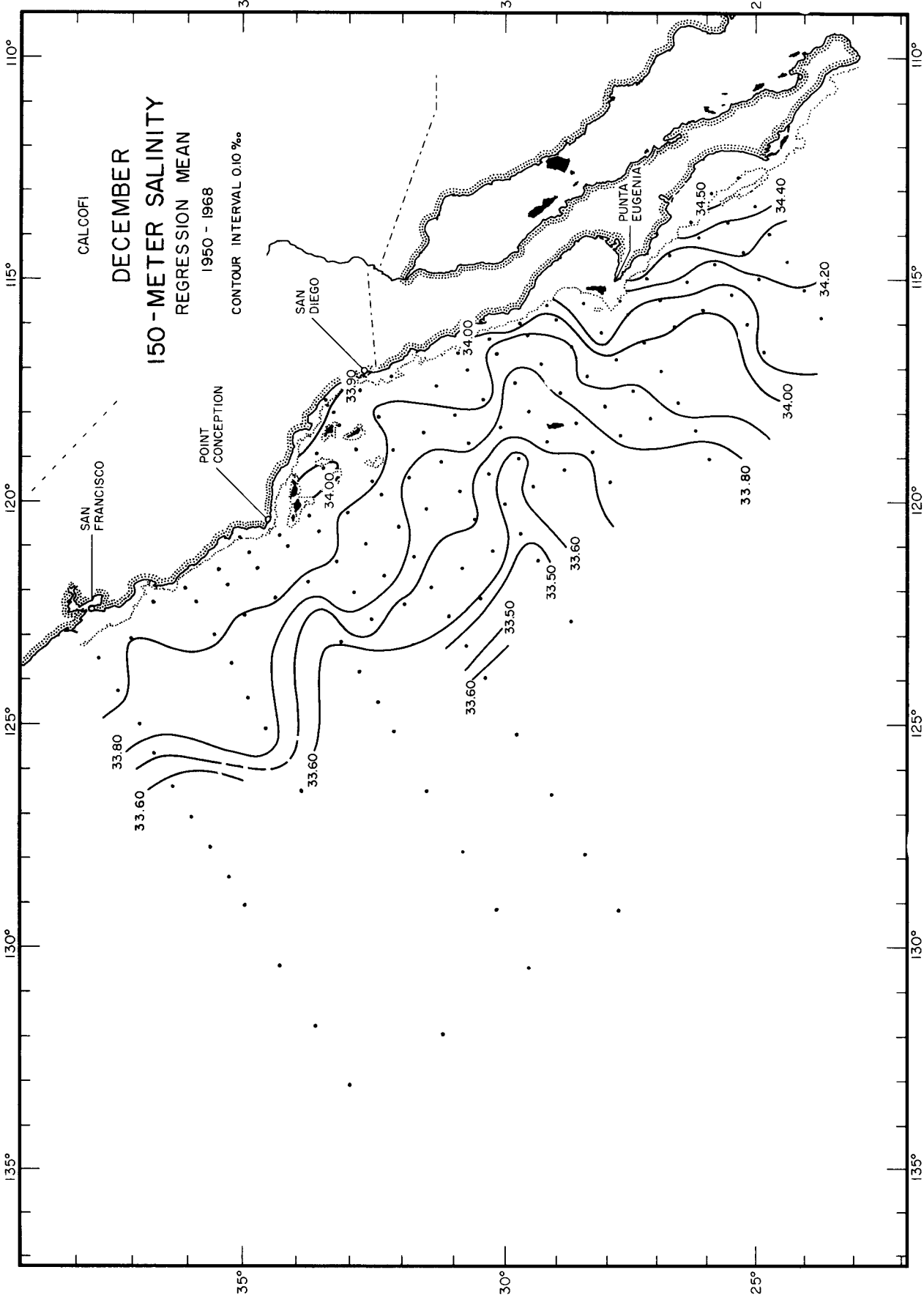
Regression Mean 150 m S
SEPTEMBER



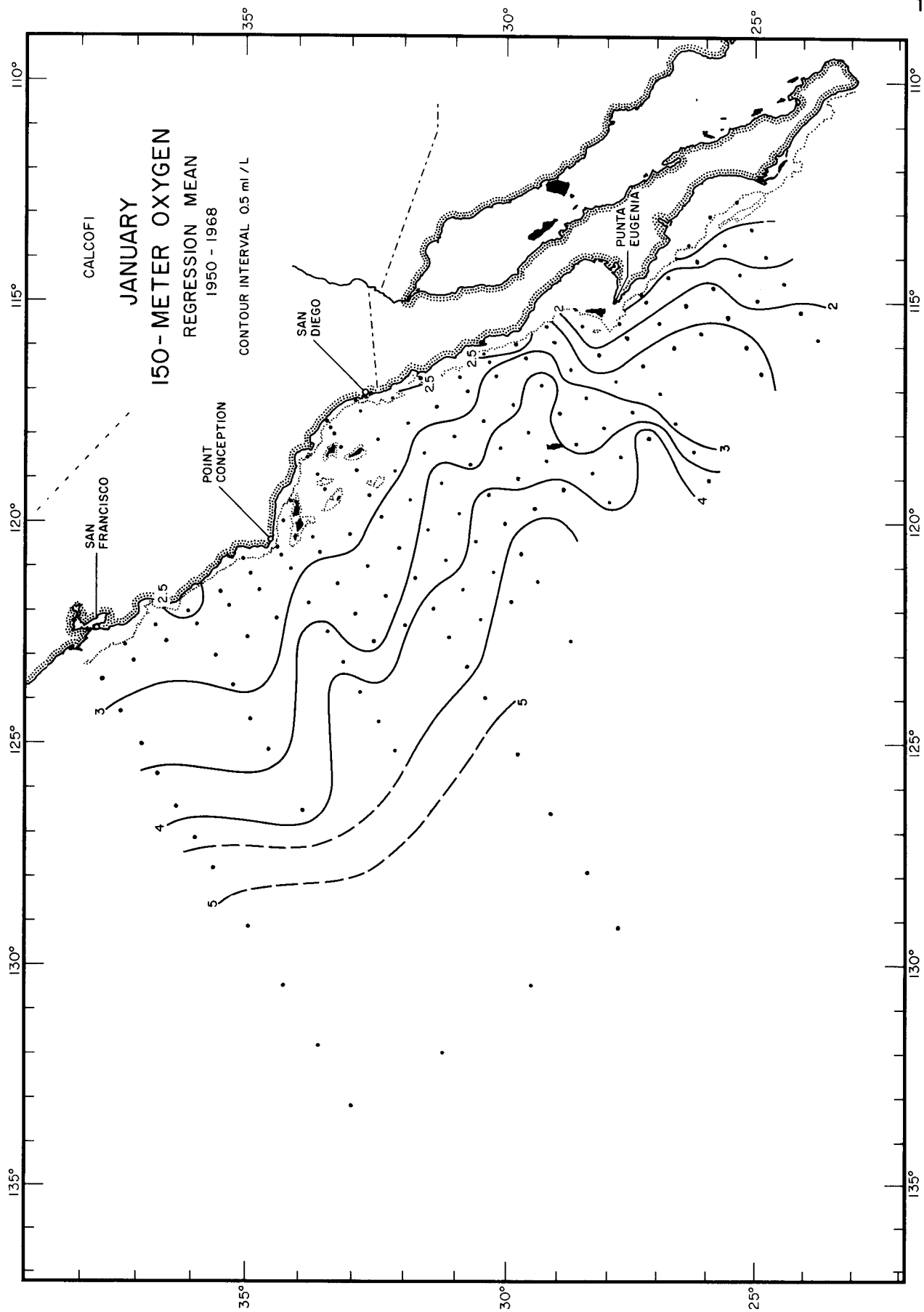
Regression Mean 150 m S
OCTOBER



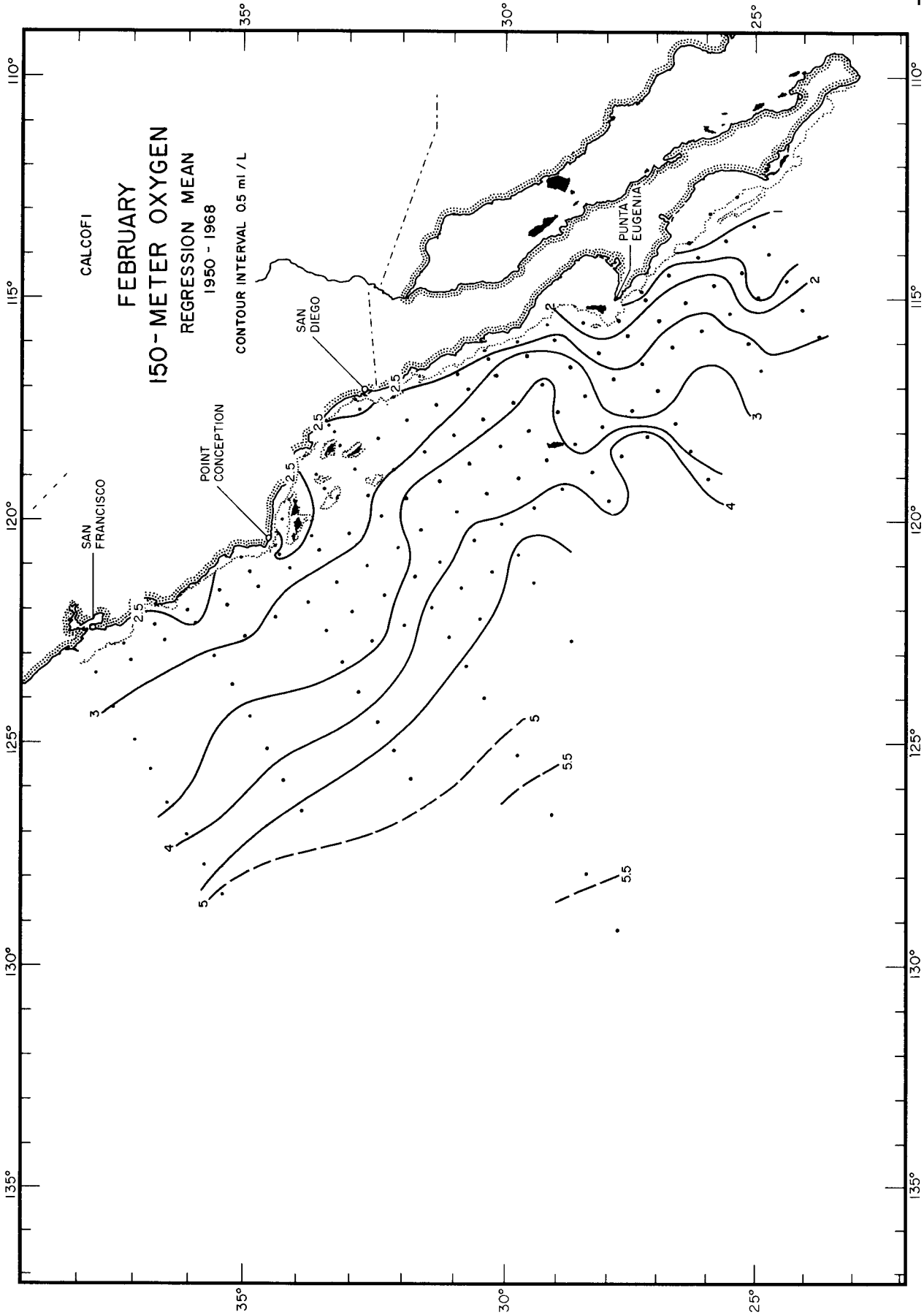
Regression Mean 150 m S
NOVEMBER



Regression Mean 150 m S
DECEMBER

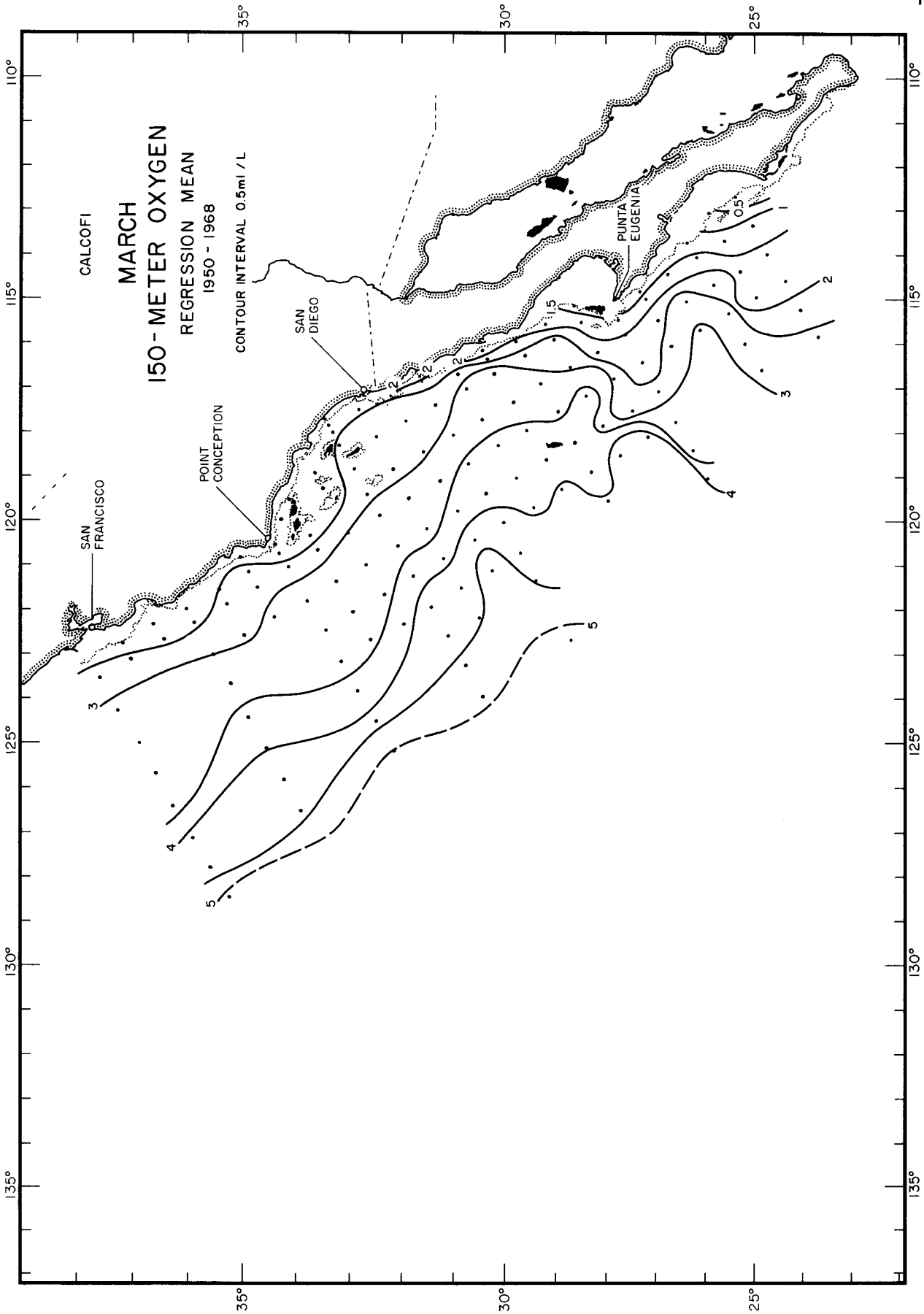


Regression Mean 150 m O_2
JANUARY

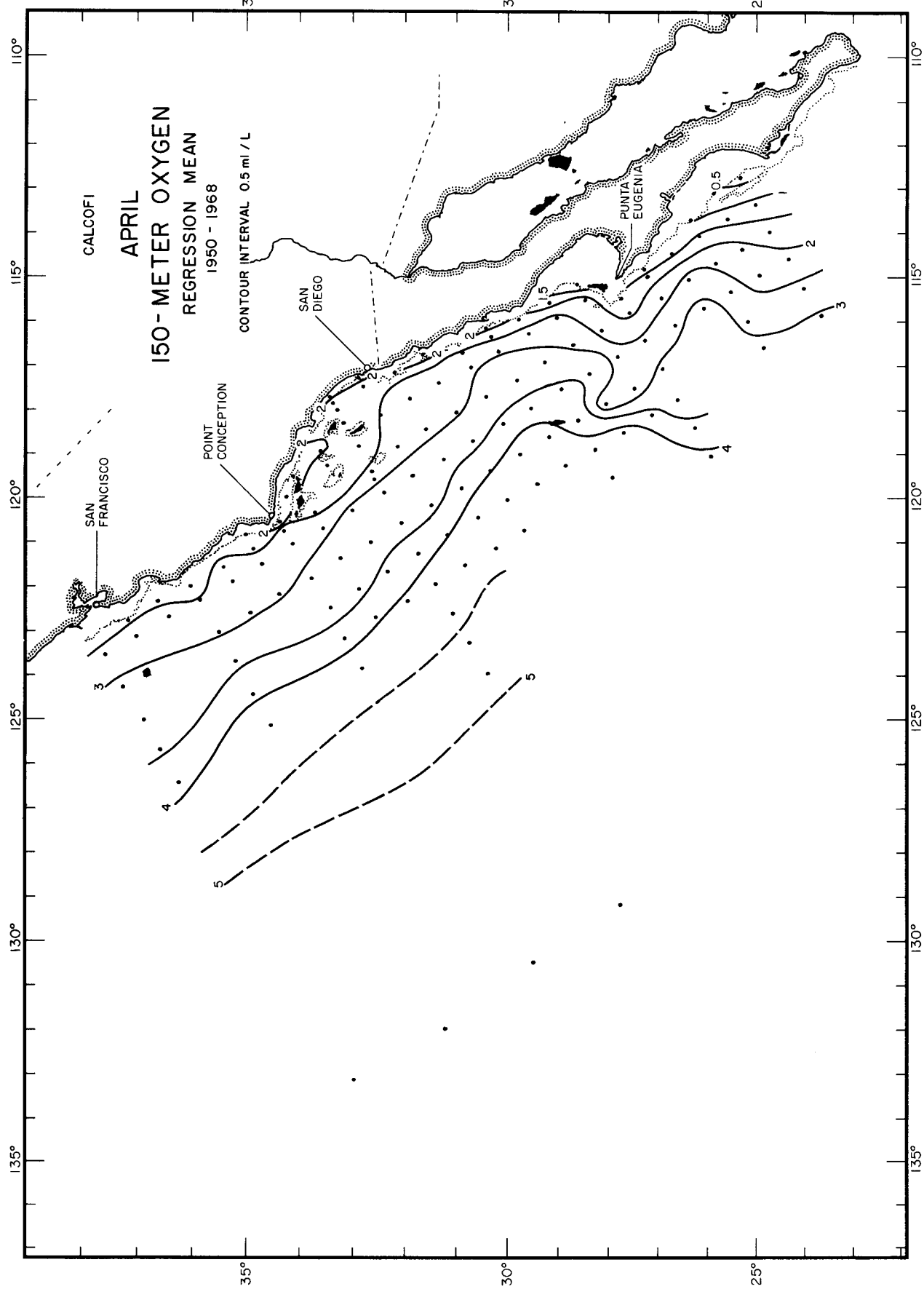


Regression Mean 150 m O_2

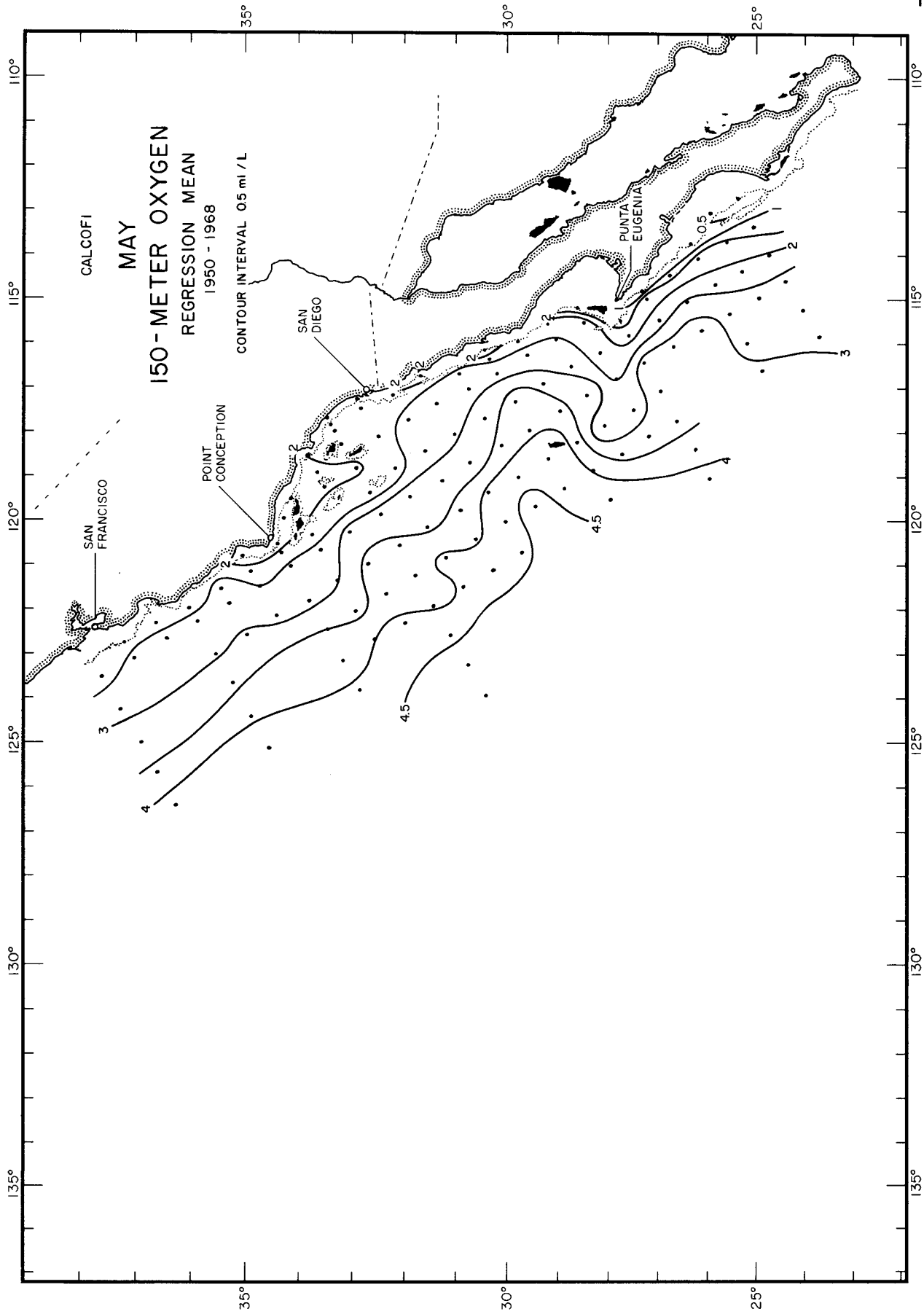
FEBRUARY



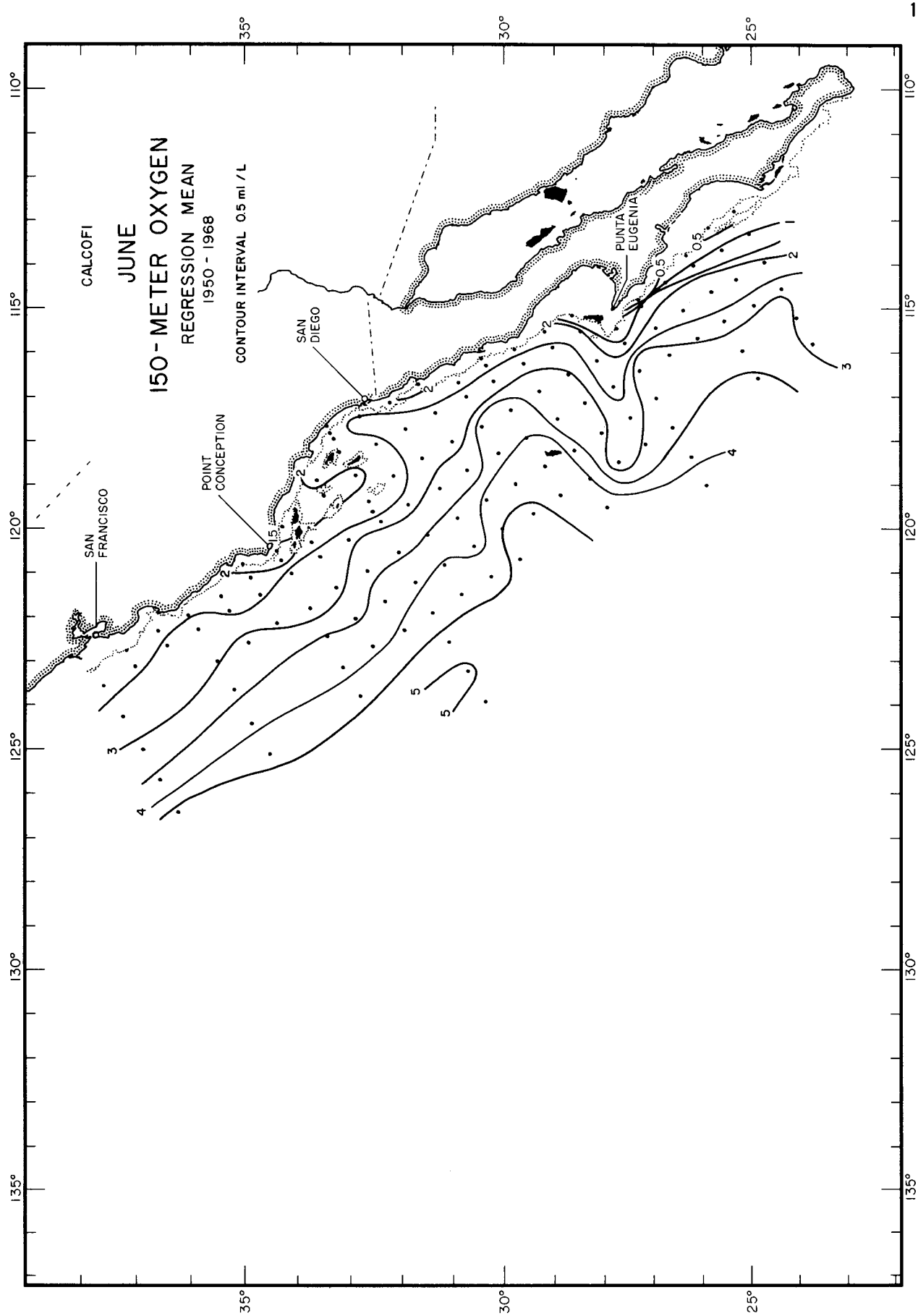
Regression Mean 150 m O_2
MARCH



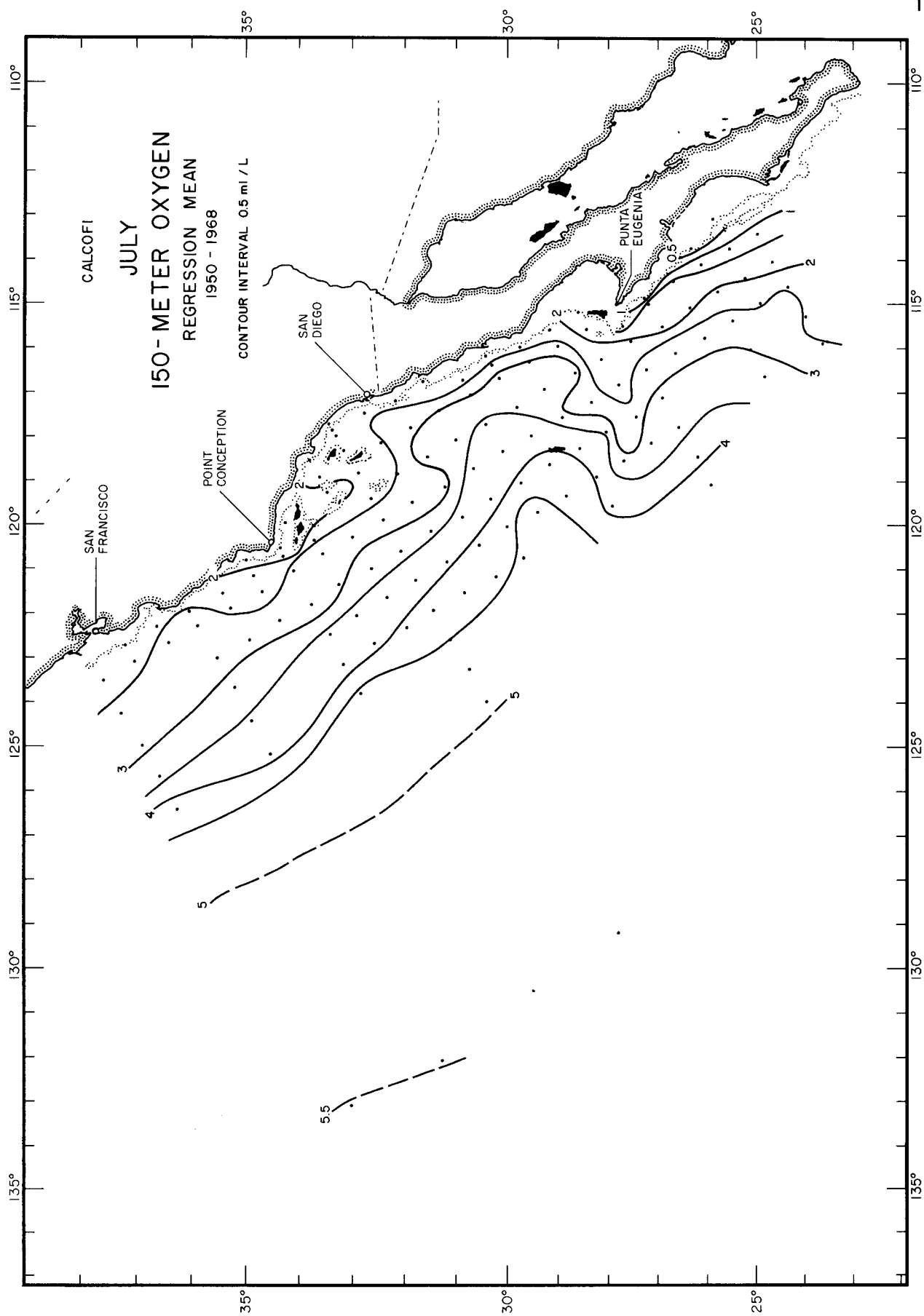
Regression Mean 150 m O_2
APRIL



Regression Mean 150 m O_2
MAY

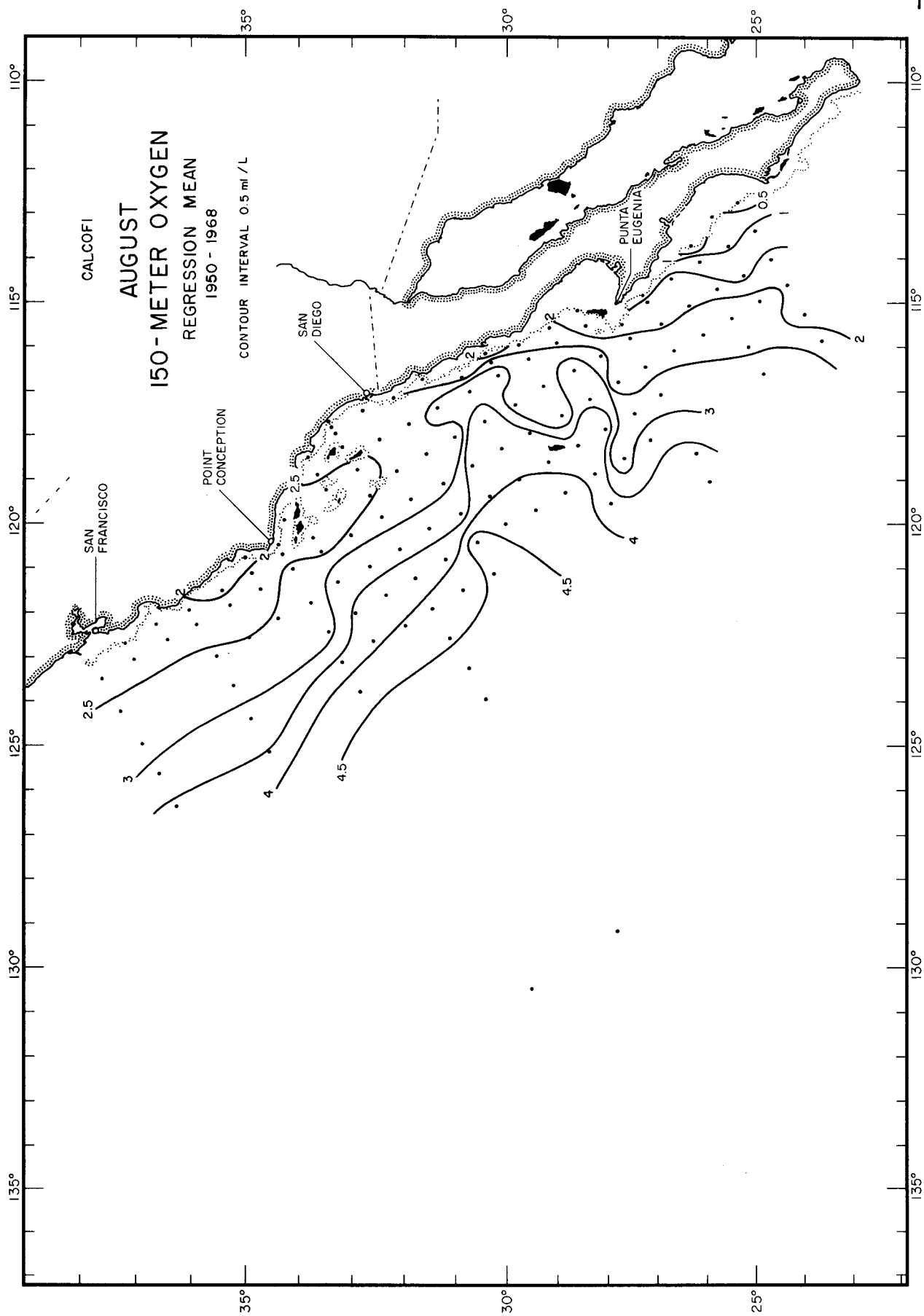


Regression Mean 150 m O_2
JUNE

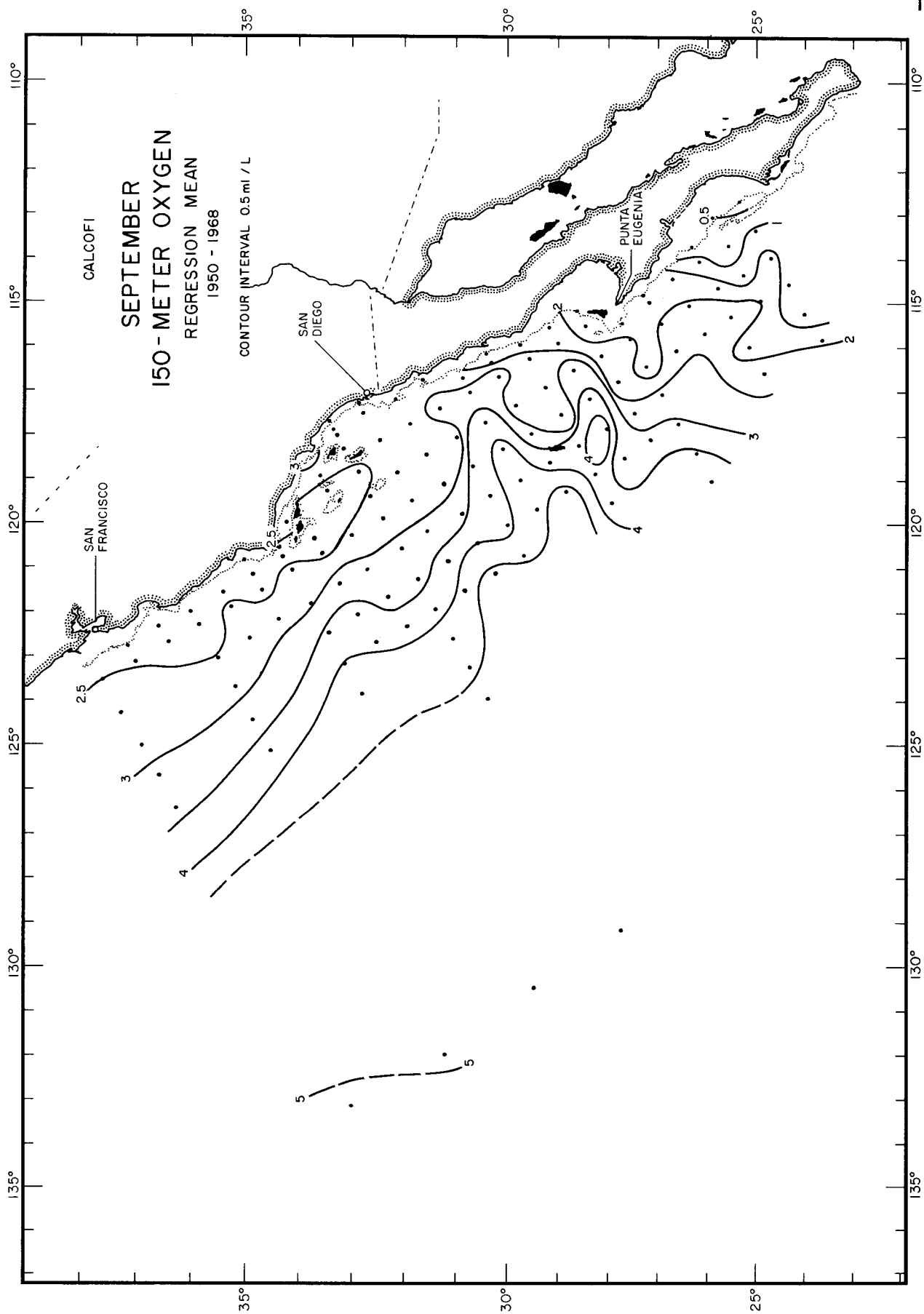


Regression Mean 150 m O_2

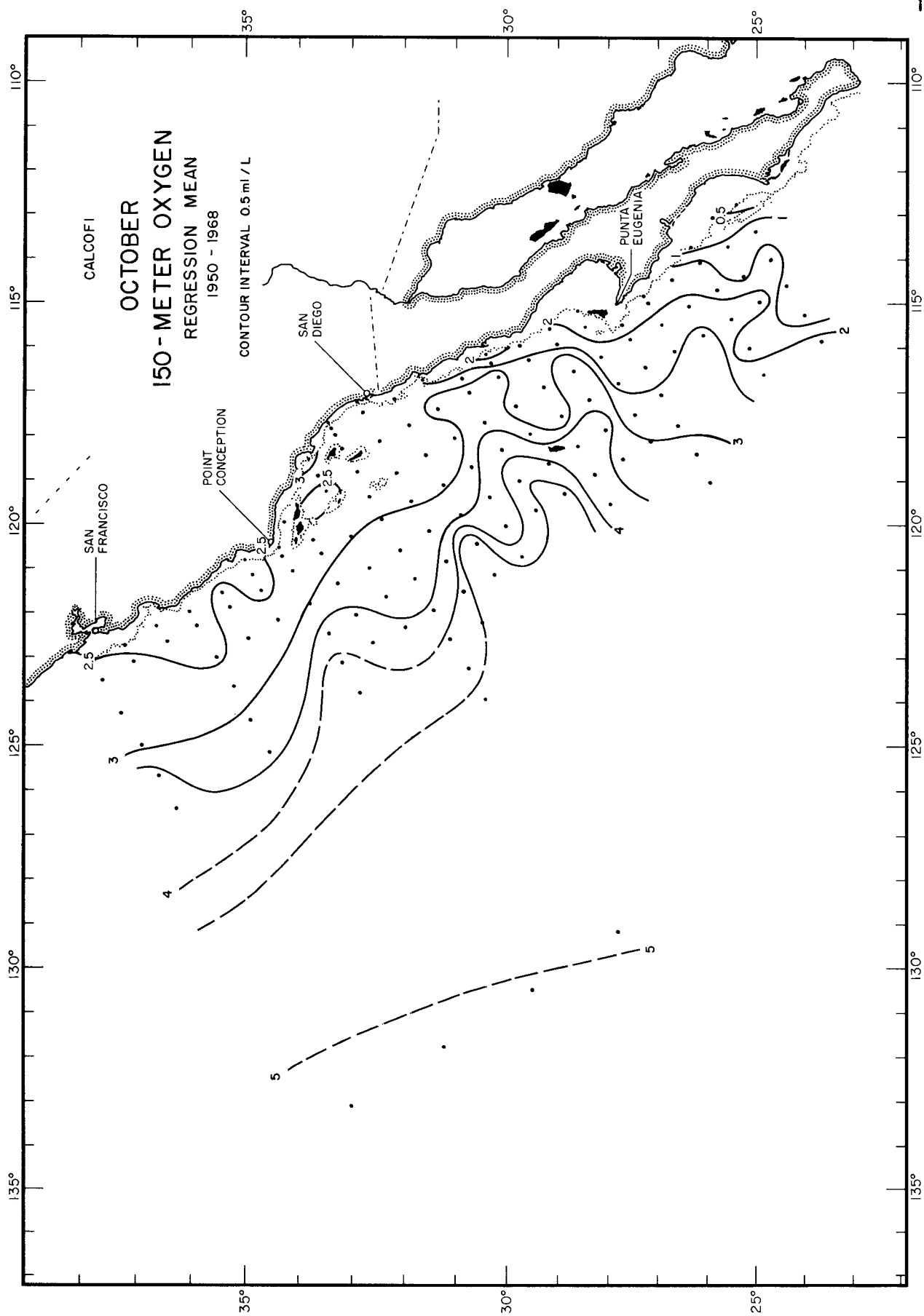
JULY



Regression Mean 150 m O_2
AUGUST

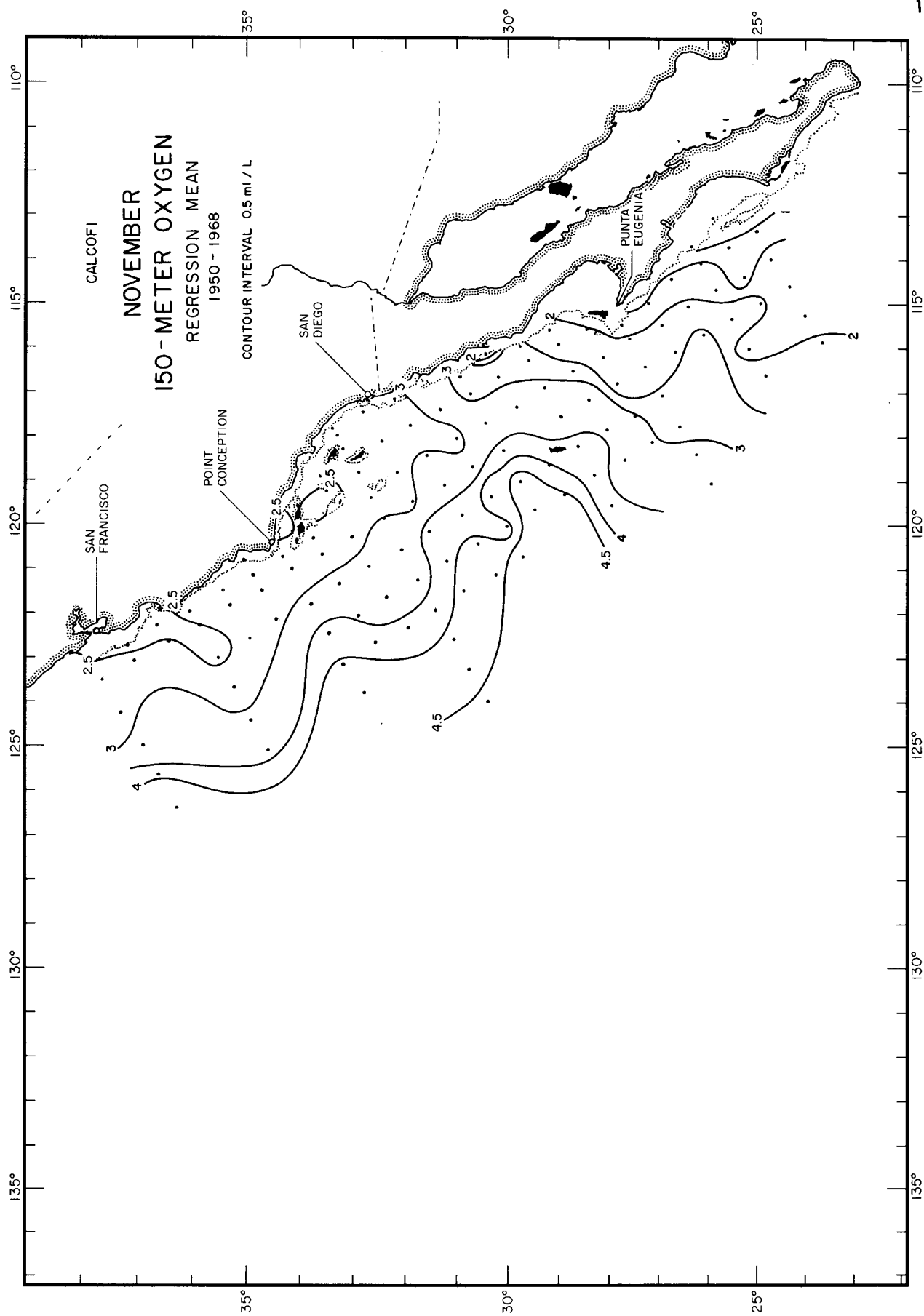


Regression Mean 150 m O_2
SEPTEMBER



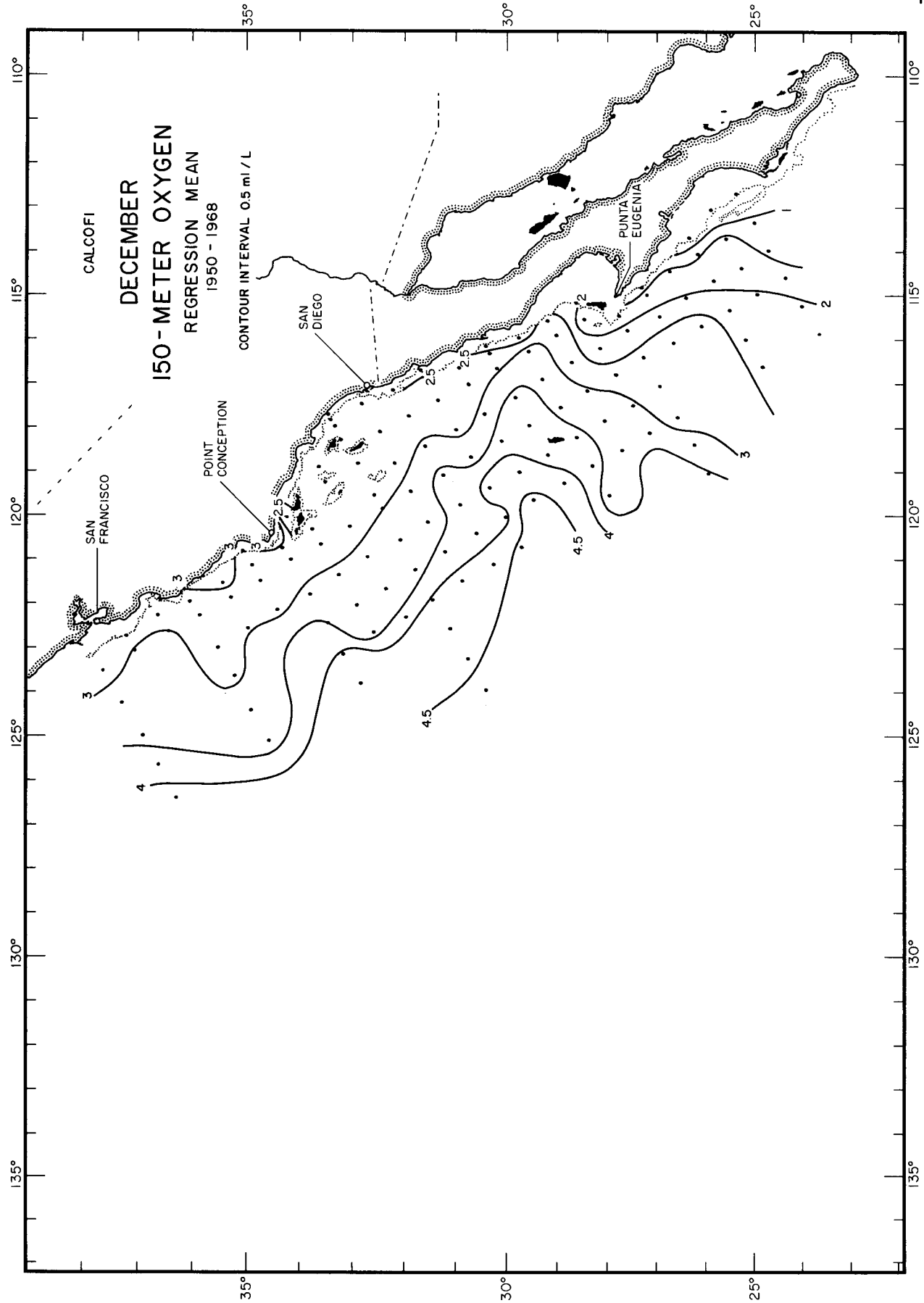
Regression Mean 150 m O_2

OCTOBER

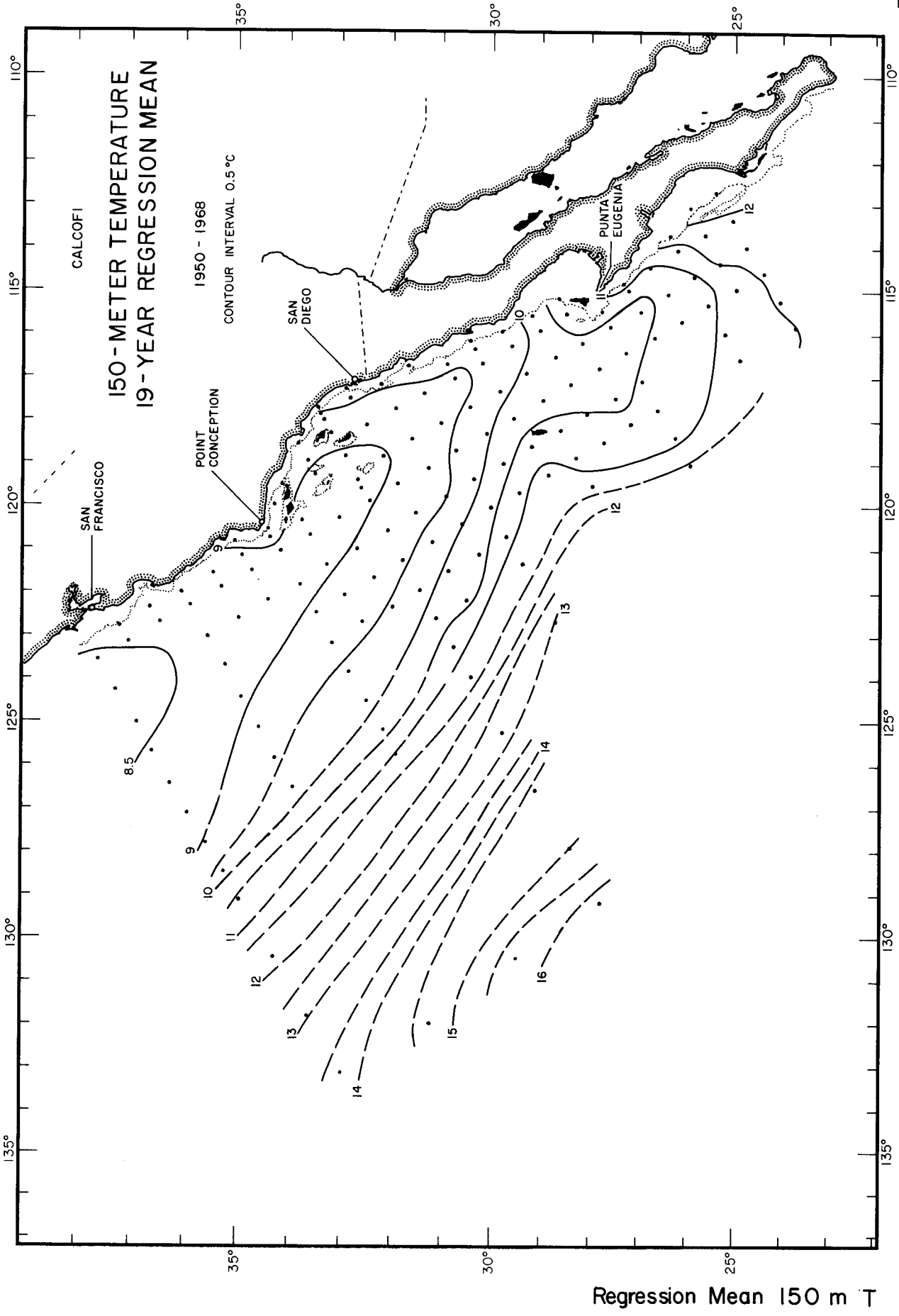


Regression Mean 150 m O_2

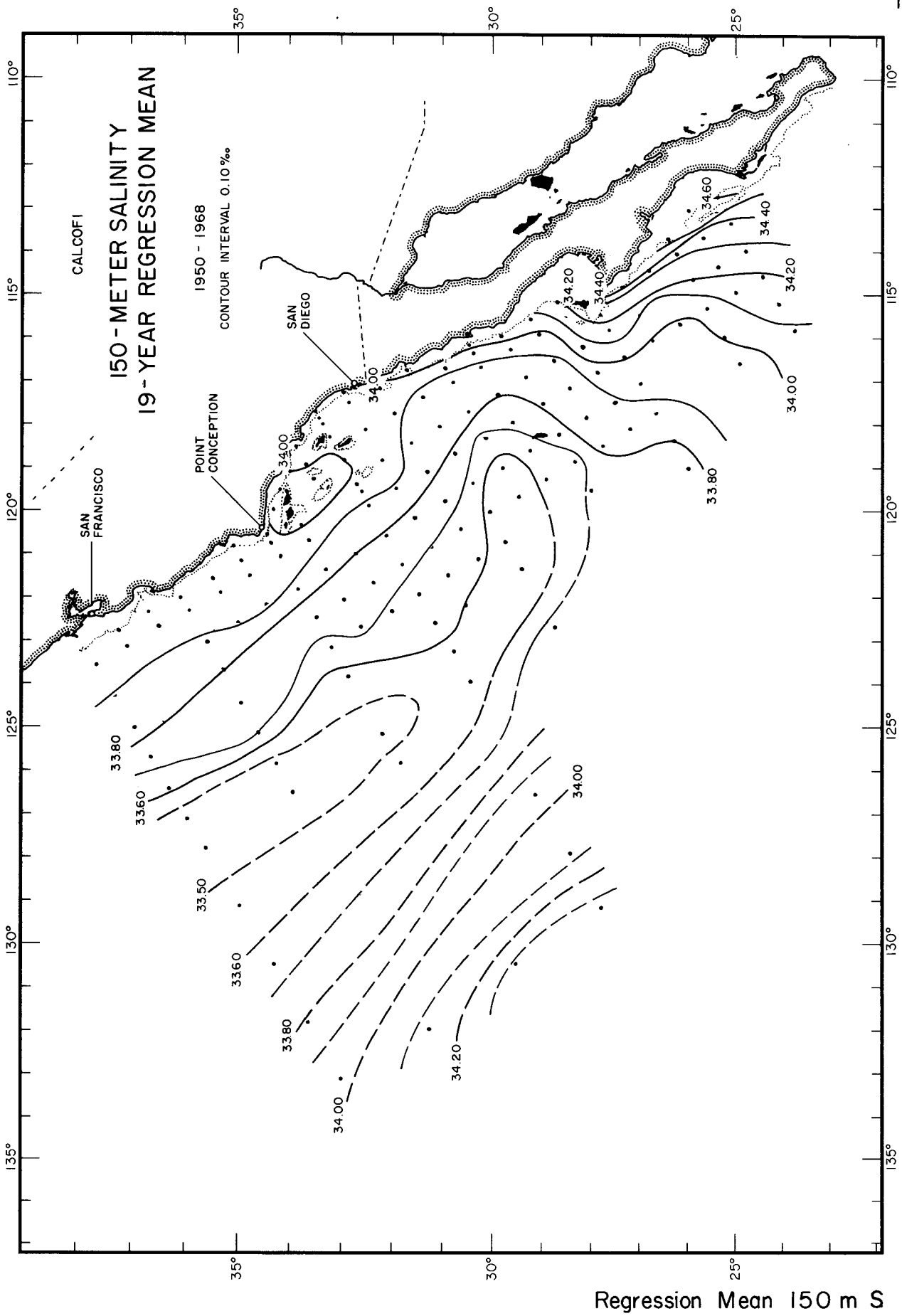
NOVEMBER



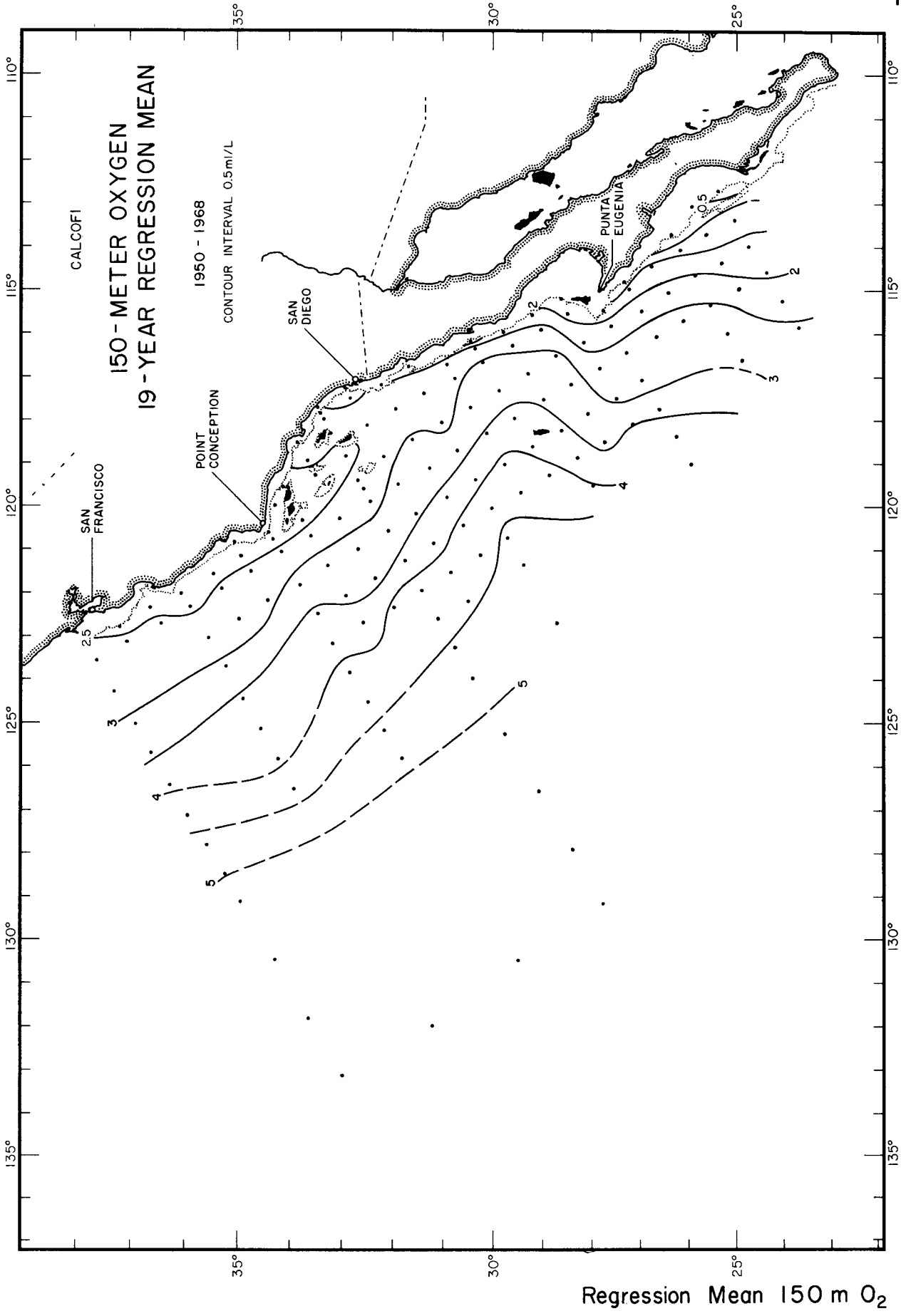
Regression Mean 150 m O_2
DECEMBER

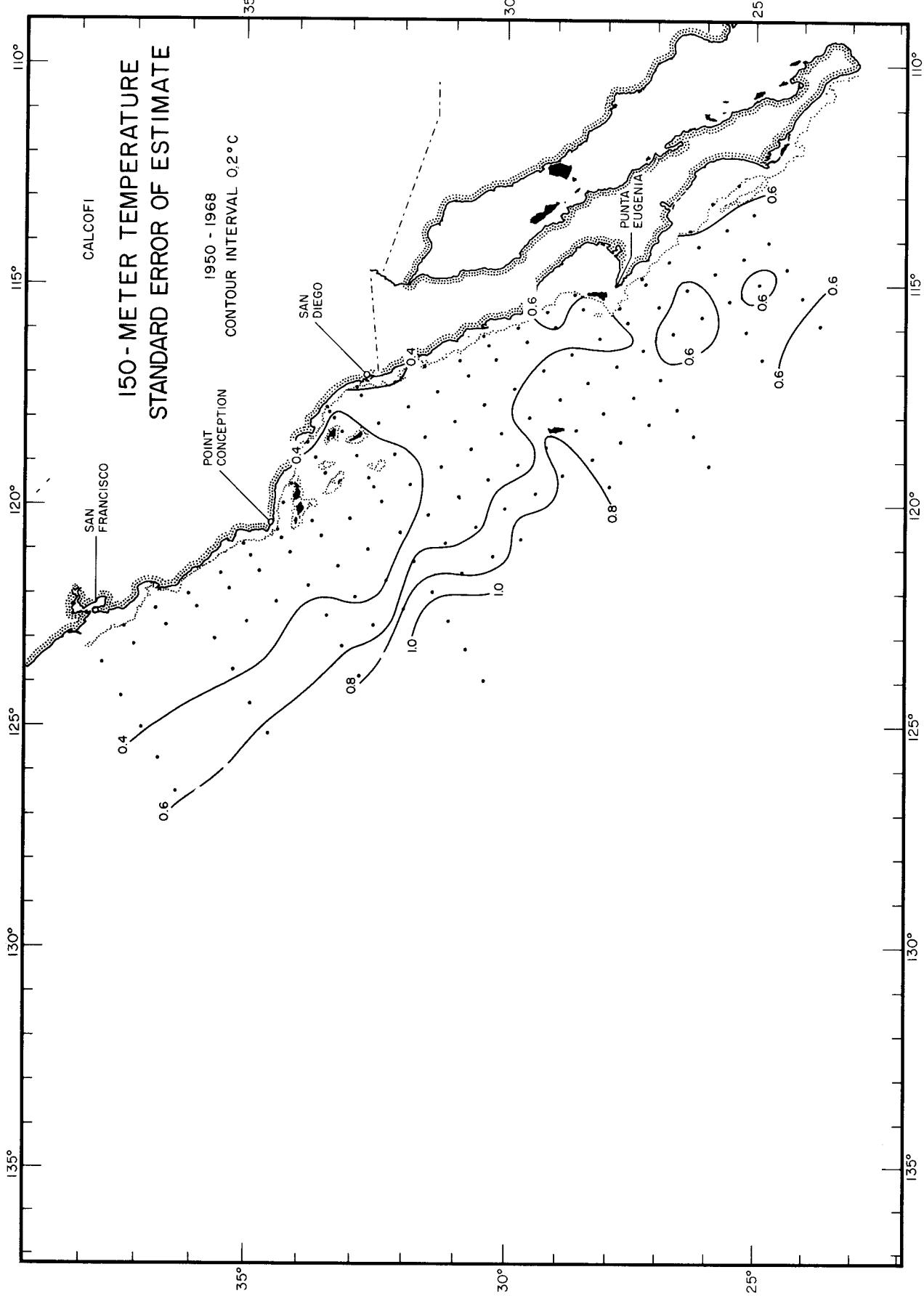


Regression Mean 150 m T

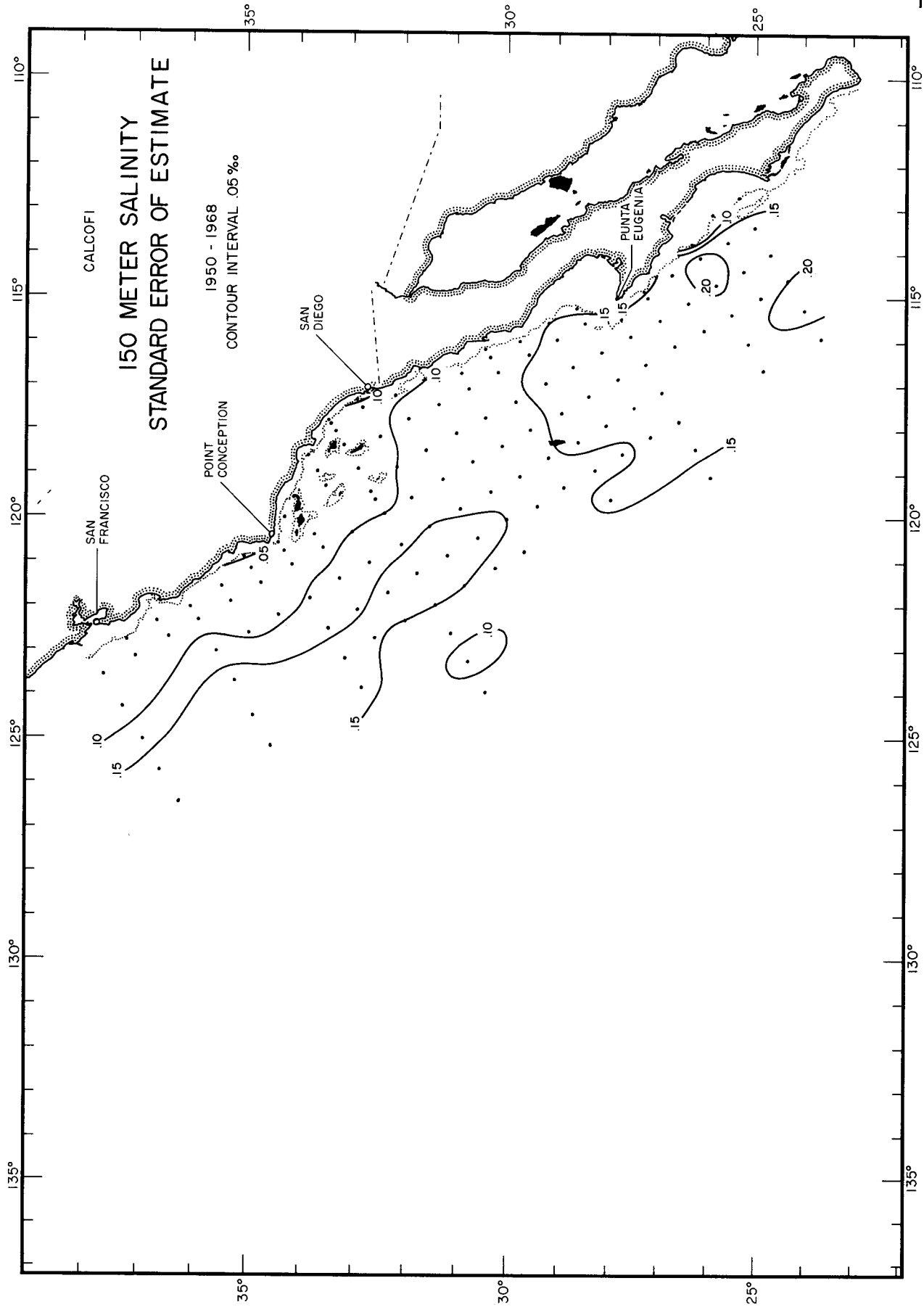


Regression Mean 150 m S

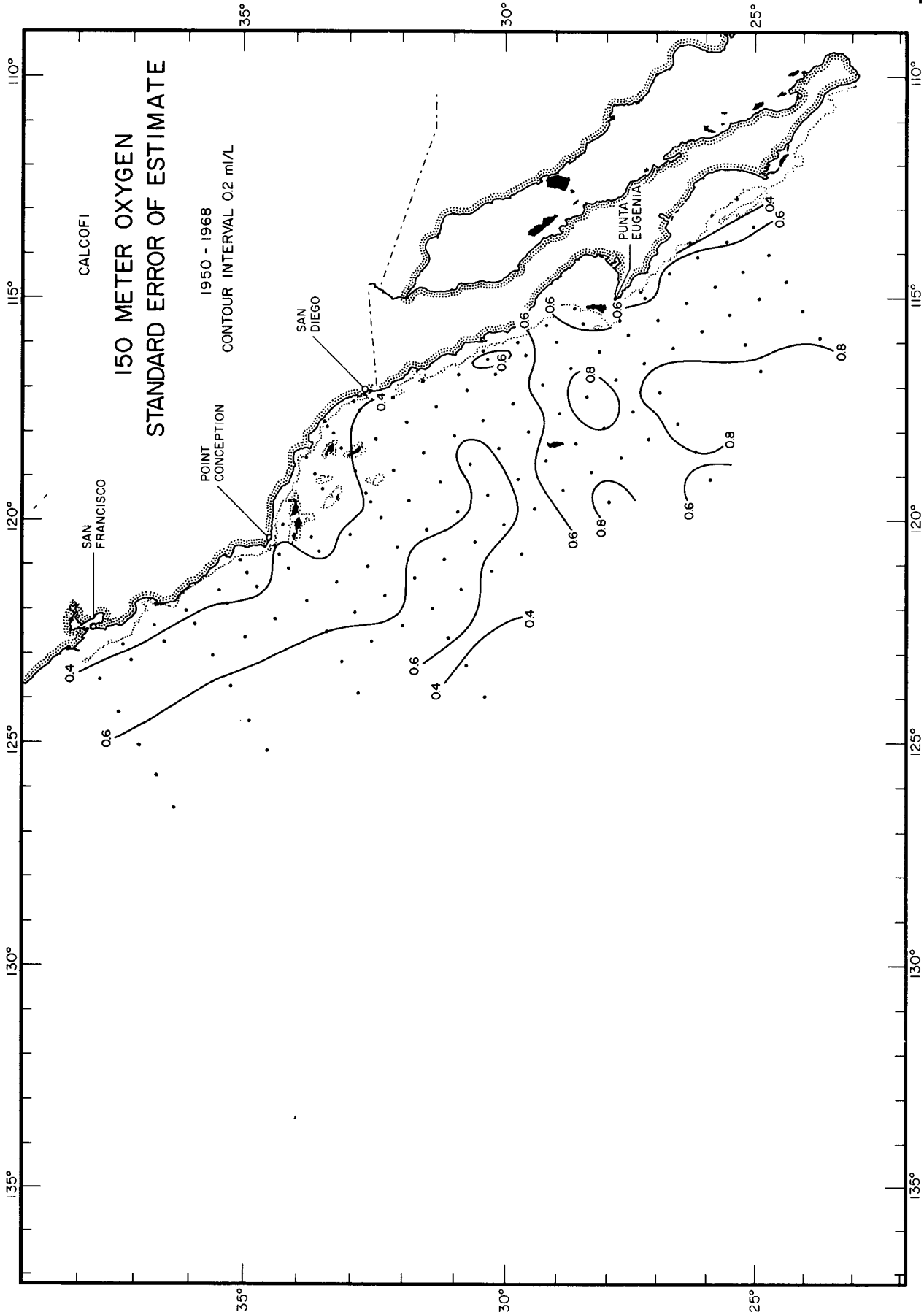

150-METER OXYGEN
19-YEAR REGRESSION MEAN
1950 - 1968
CONTOUR INTERVAL 0.5ml/L
CALCOFI
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
PUNTA EUGENIA
35°
30°
25°
110°
115°
120°
125°
130°
135°
0.5
1
2
3
4
5
Regression Mean 150 m O_2



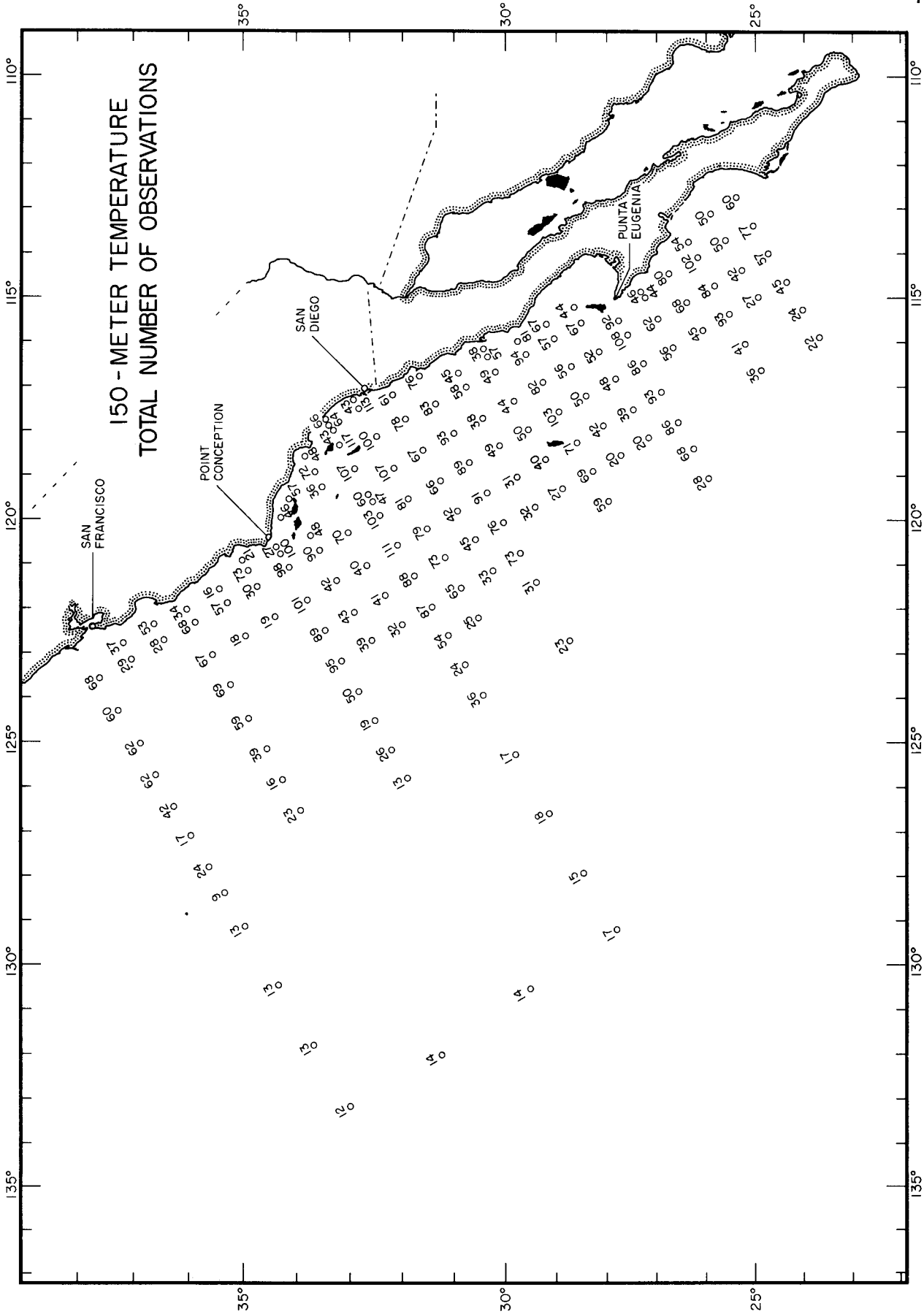
150 m T
STANDARD ERROR OF ESTIMATE



150 m S
STANDARD ERROR OF ESTIMATE

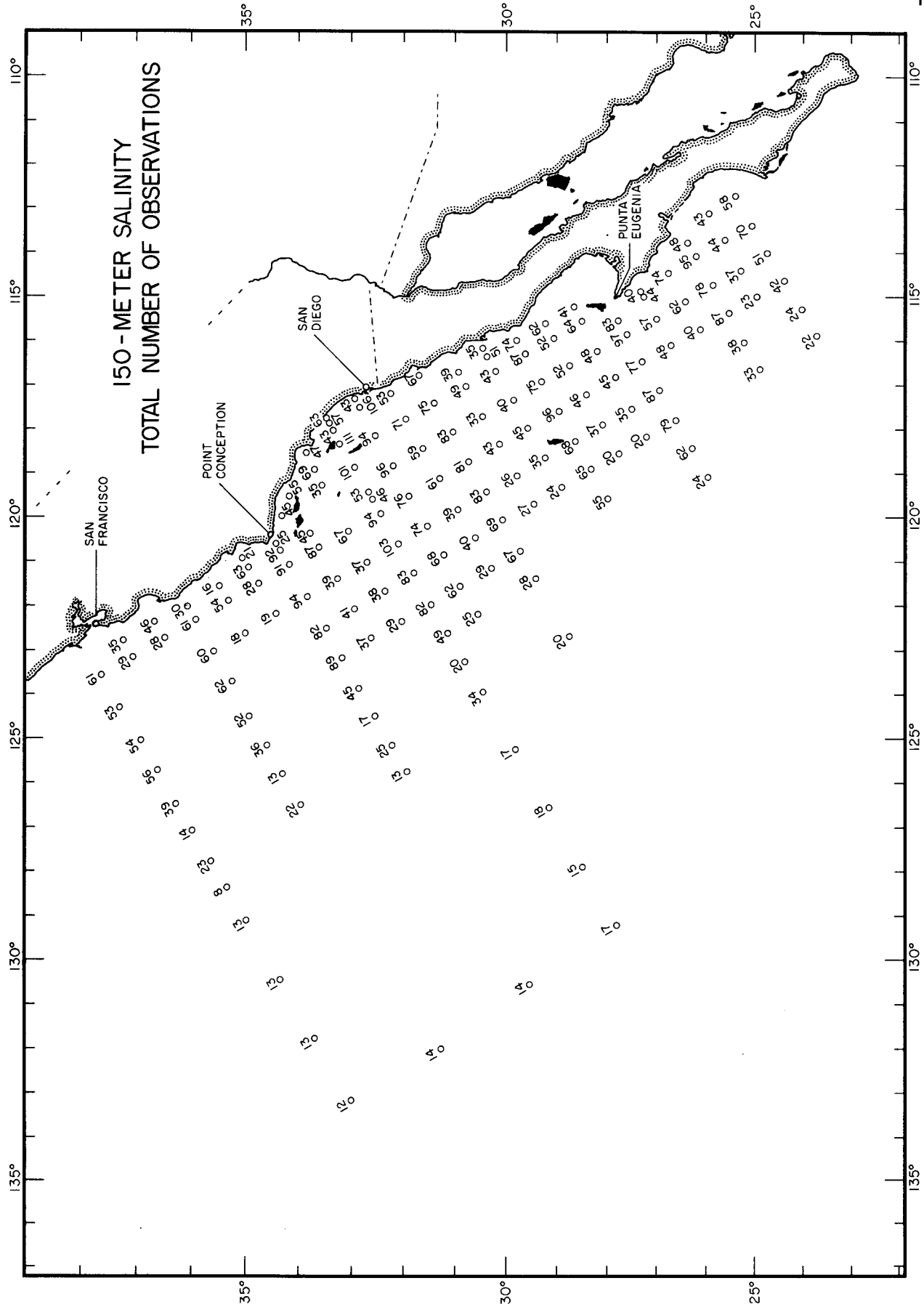


150 m O_2
STANDARD ERROR OF ESTIMATE



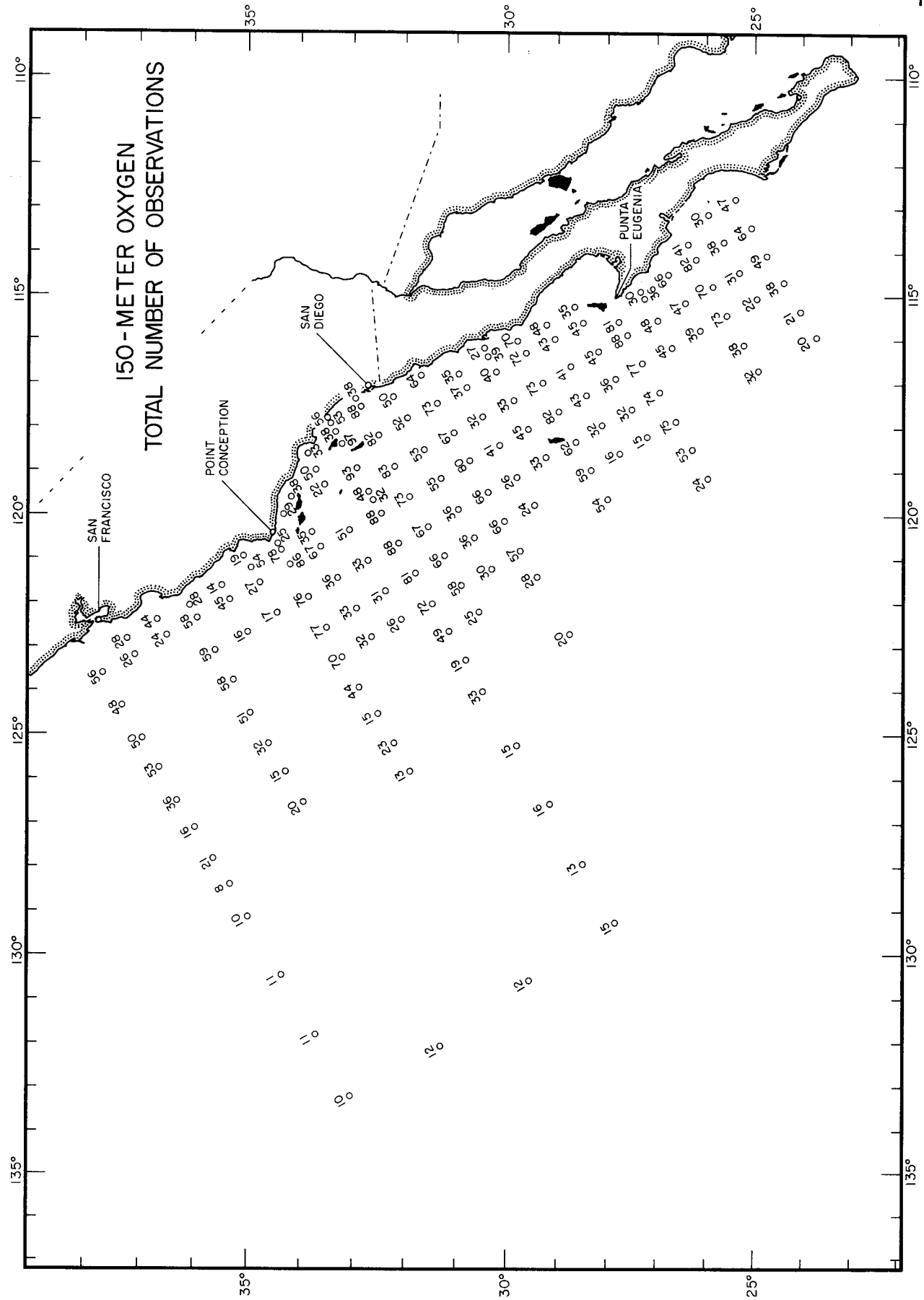
150m T

TOTAL NUMBER OF OBSERVATIONS



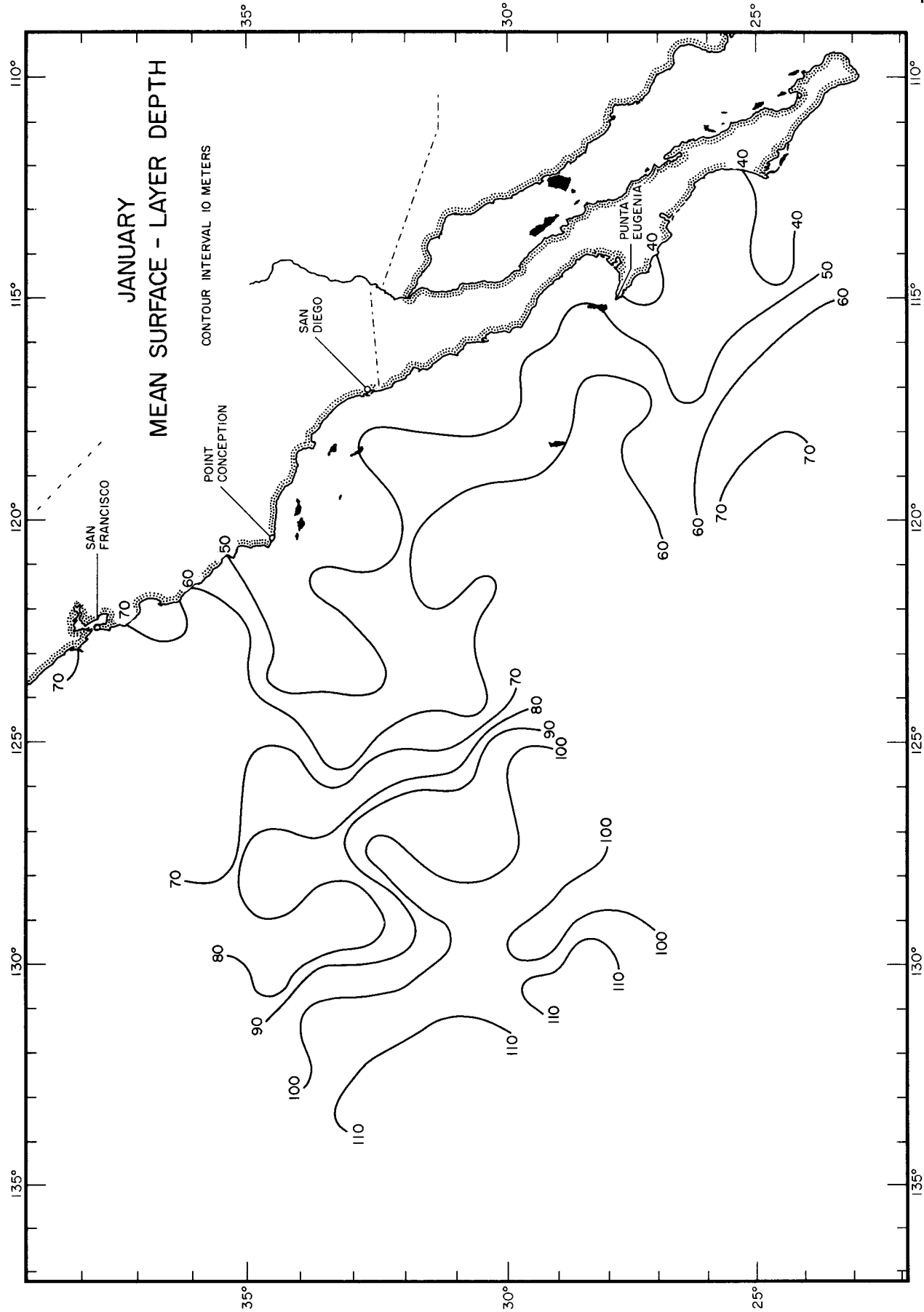
150 m S

TOTAL NUMBER OF OBSERVATIONS

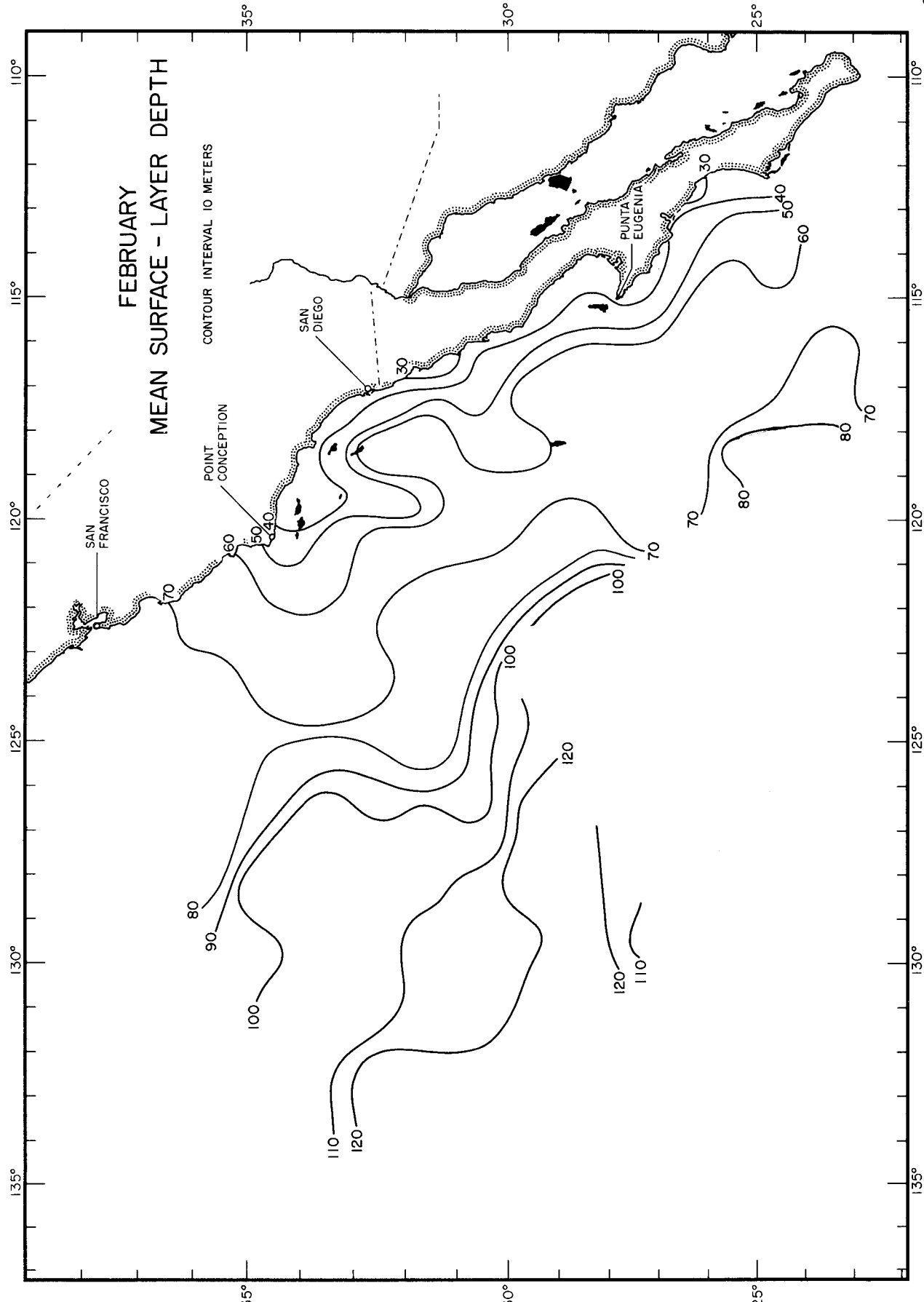


150 m O_2

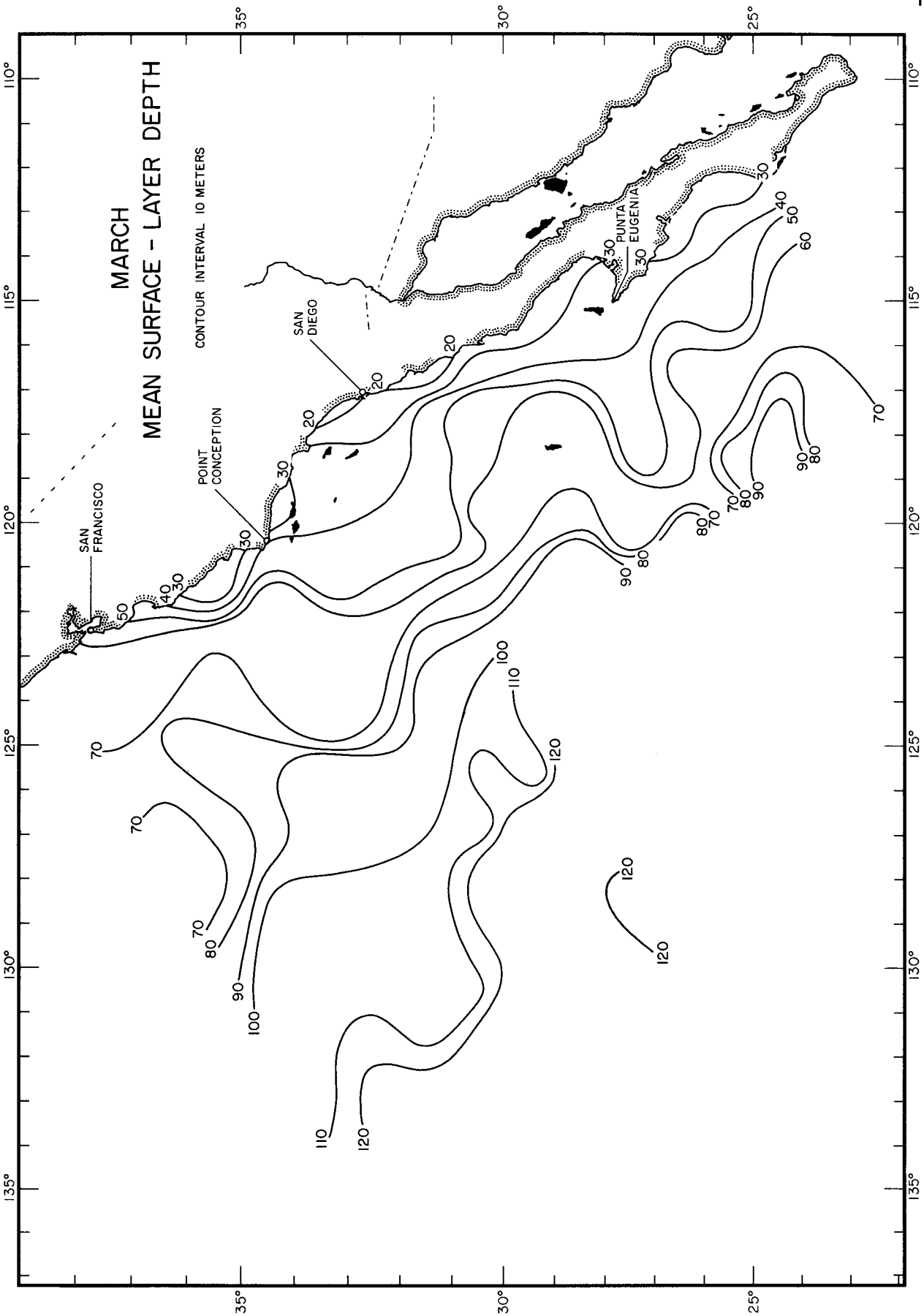
TOTAL NUMBER OF OBSERVATIONS



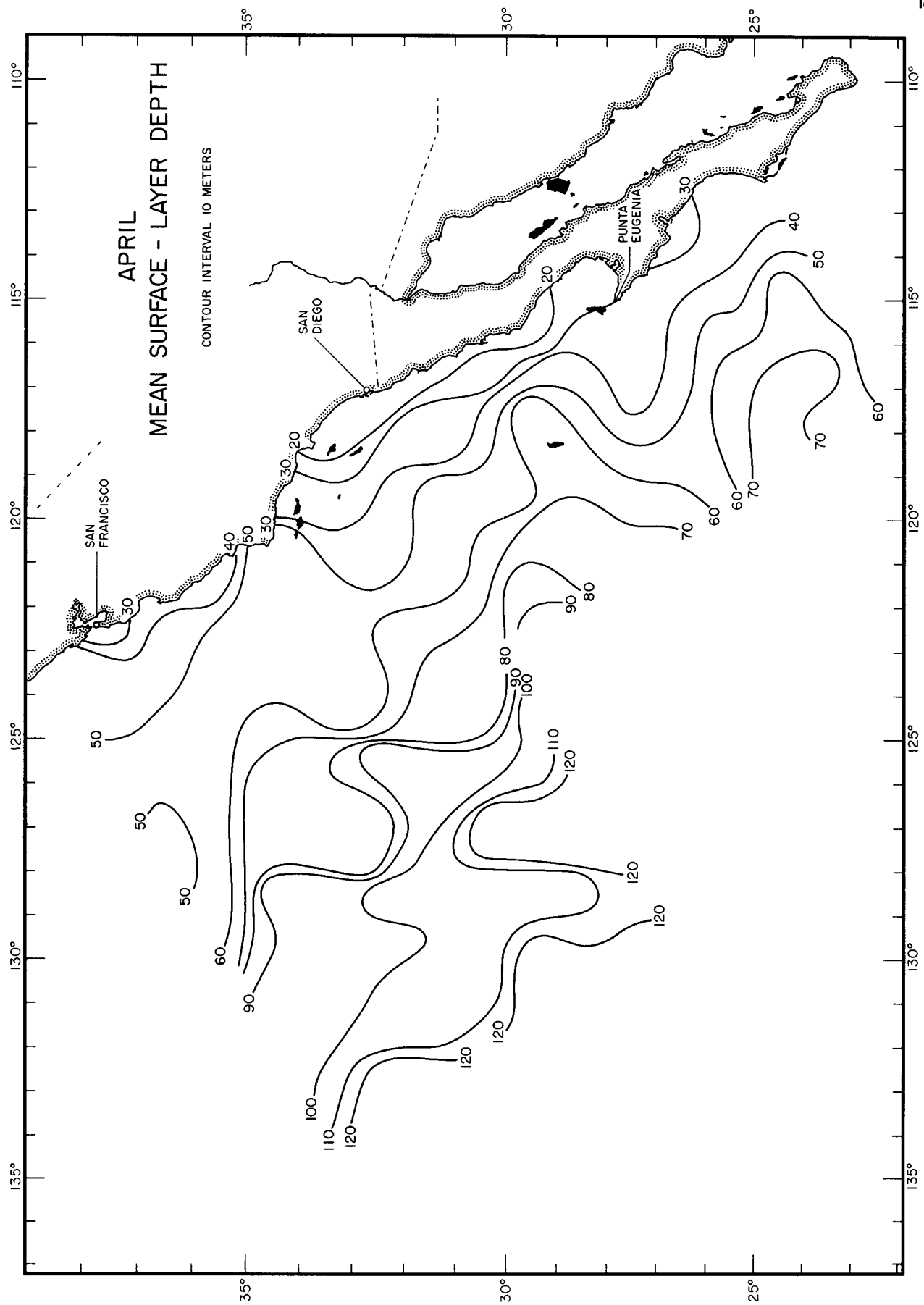
MEAN SURFACE - LAYER DEPTH
JANUARY



MEAN SURFACE - LAYER DEPTH
FEBRUARY

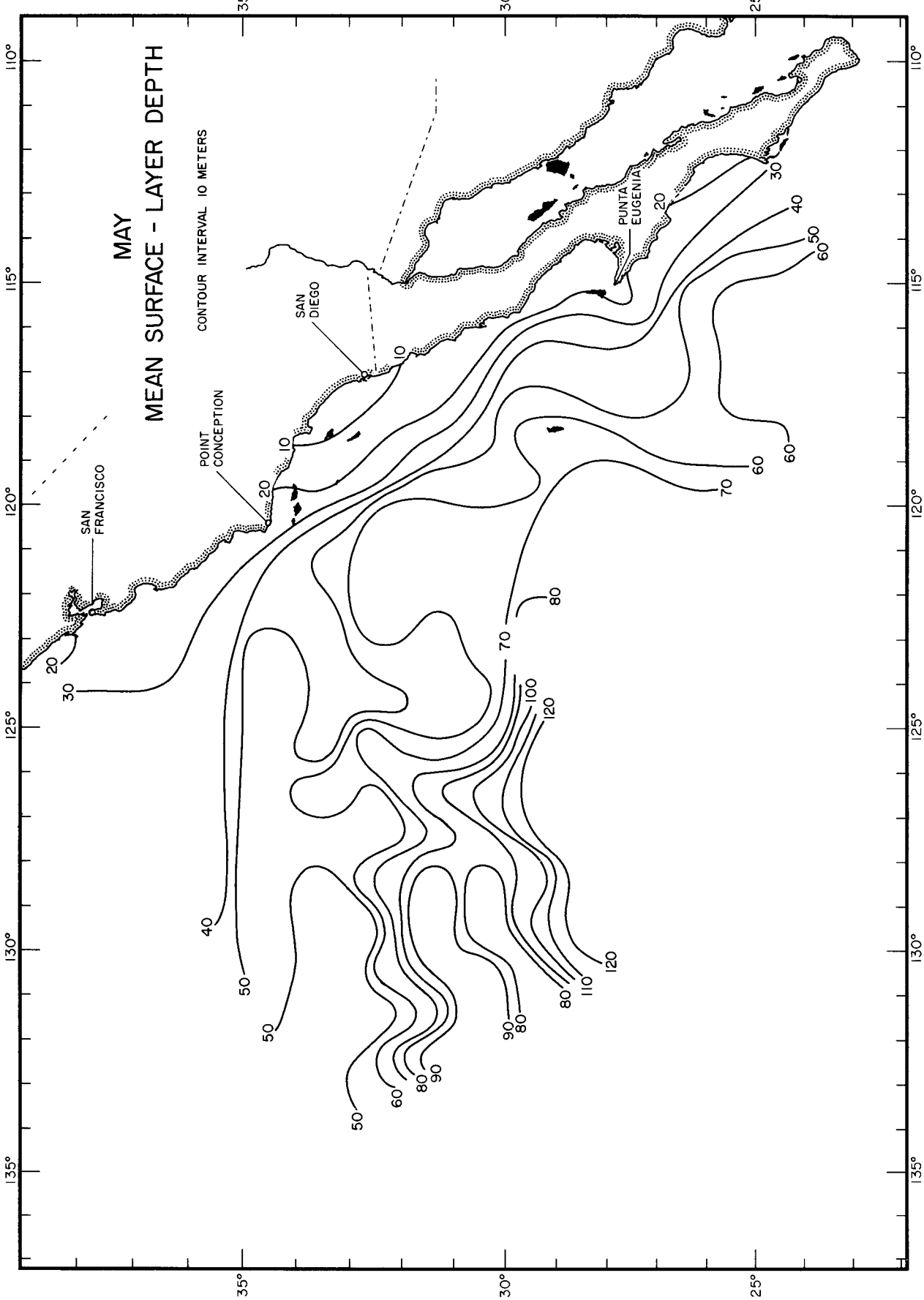


MEAN SURFACE - LAYER DEPTH
MARCH



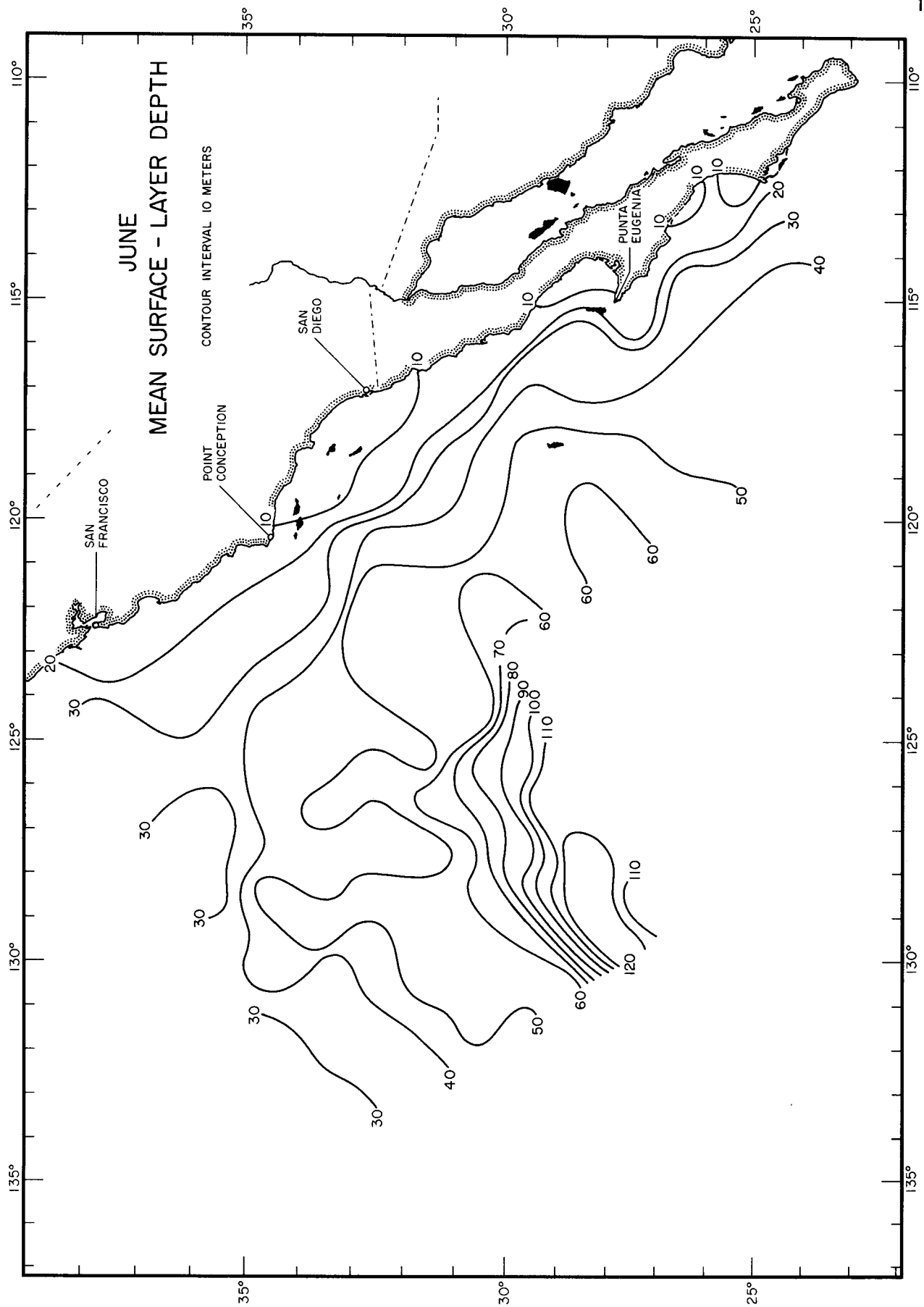
MEAN SURFACE - LAYER DEPTH

APRIL

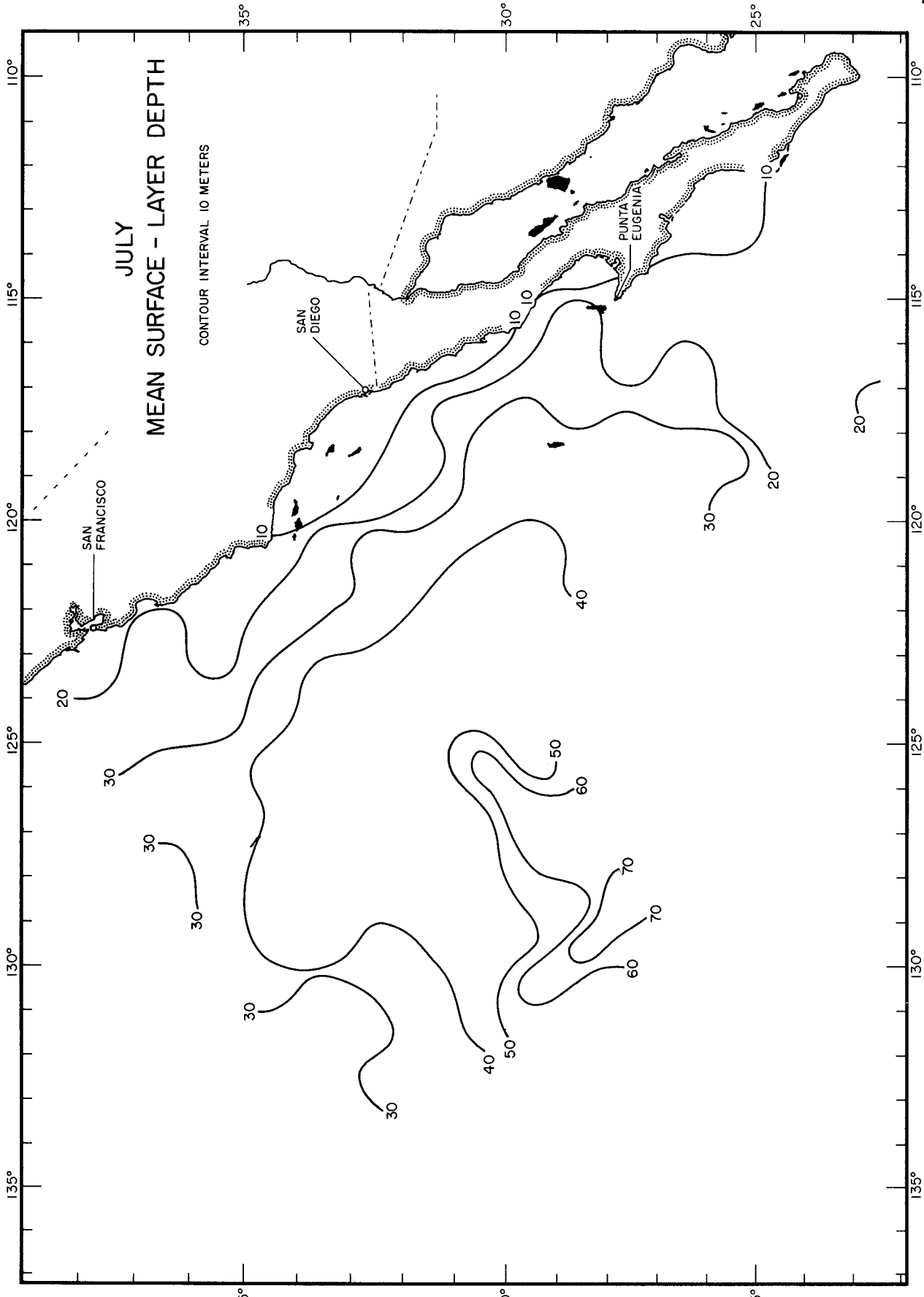


MEAN SURFACE - LAYER DEPTH

MAY

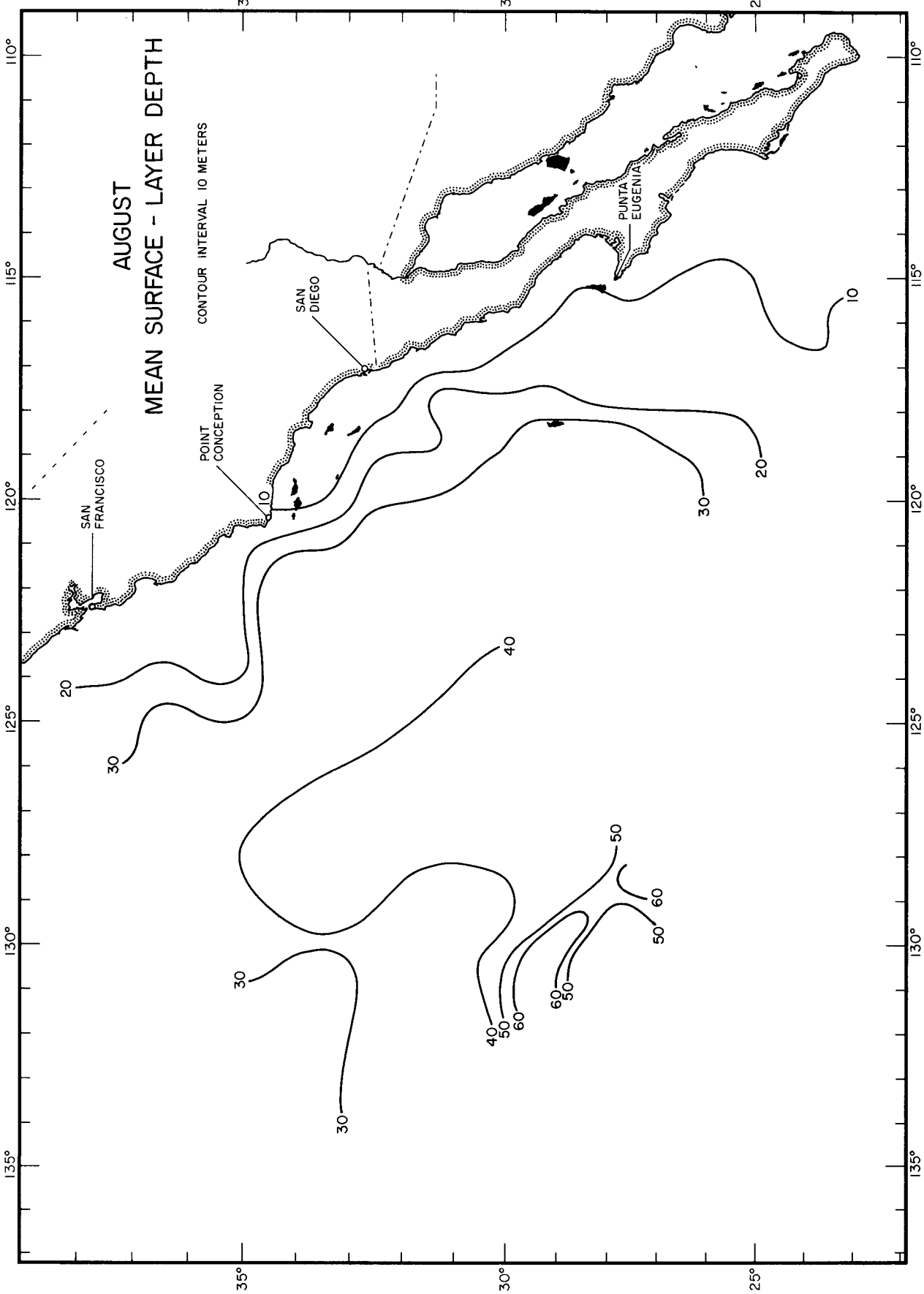


MEAN SURFACE - LAYER DEPTH
JUNE

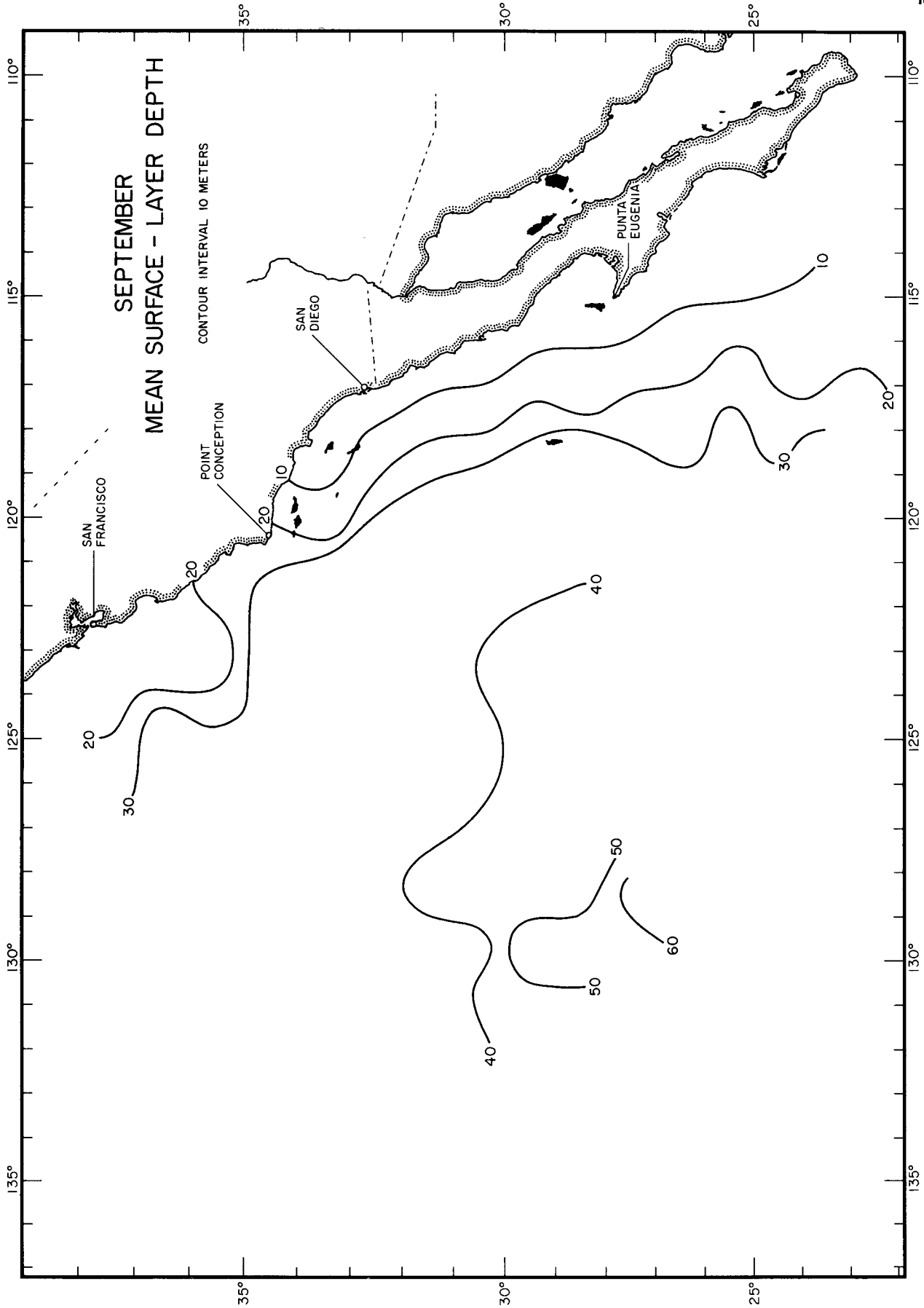


MEAN SURFACE - LAYER DEPTH

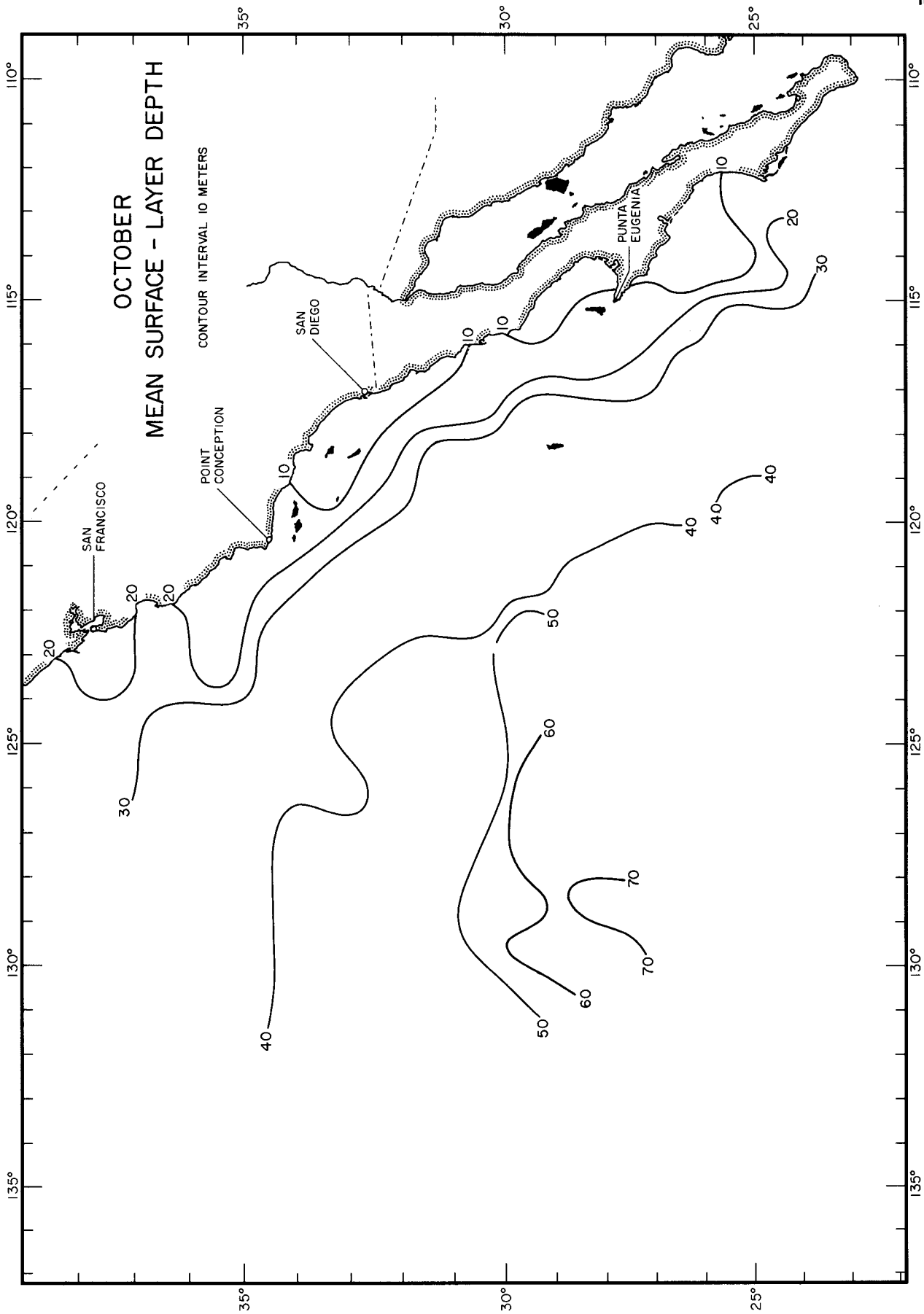
JULY



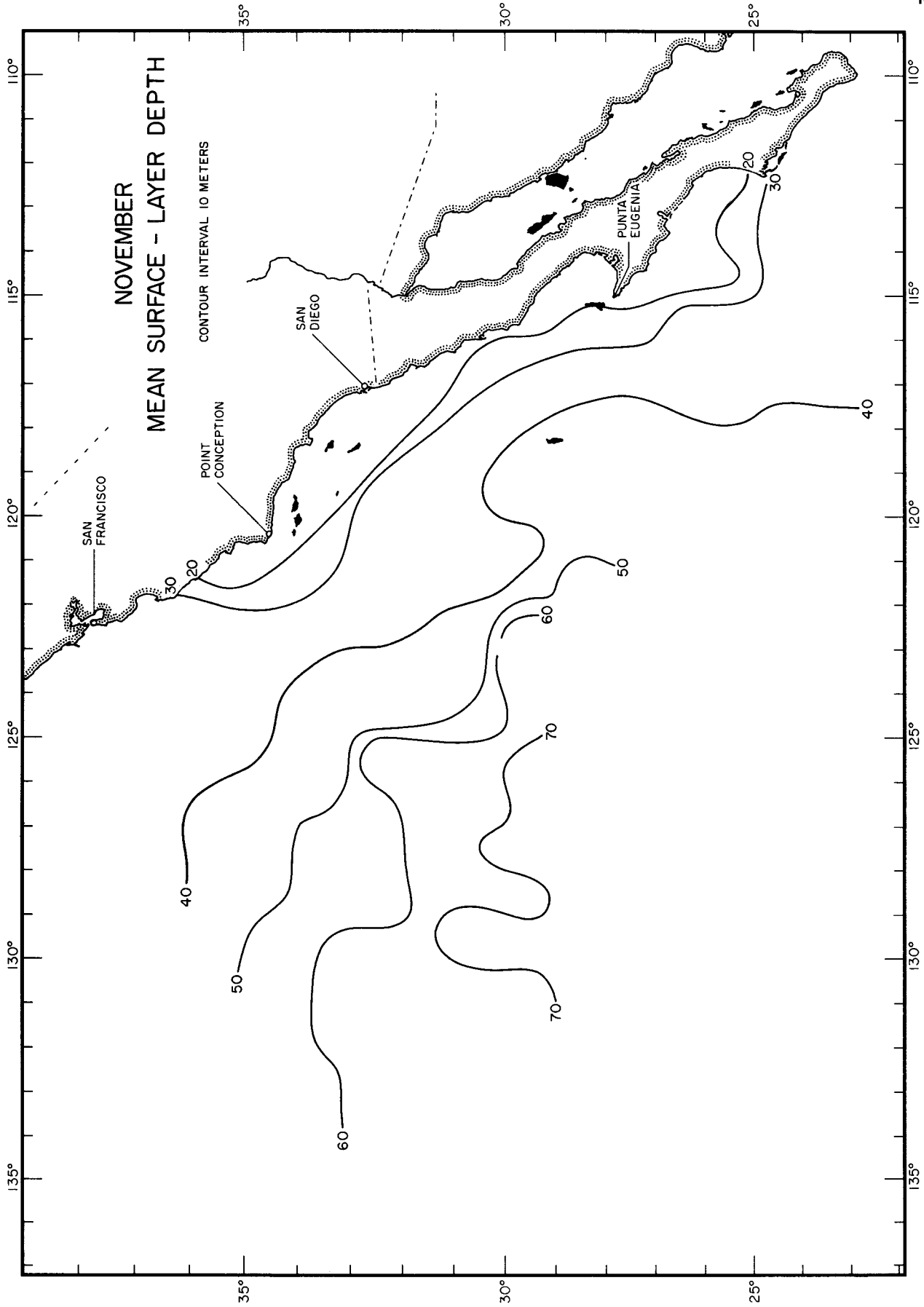
MEAN SURFACE - LAYER DEPTH
AUGUST



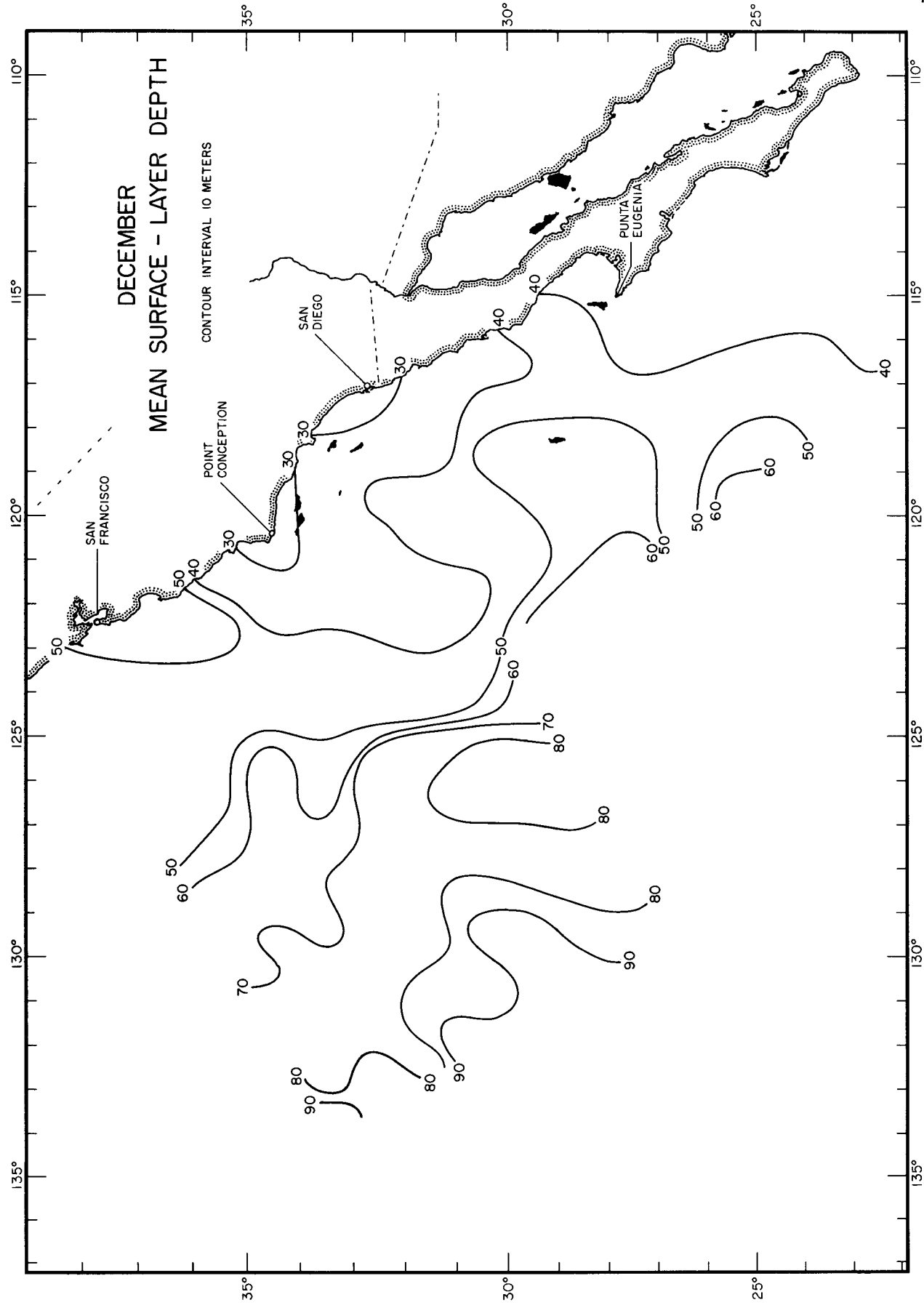
MEAN SURFACE - LAYER DEPTH
SEPTEMBER



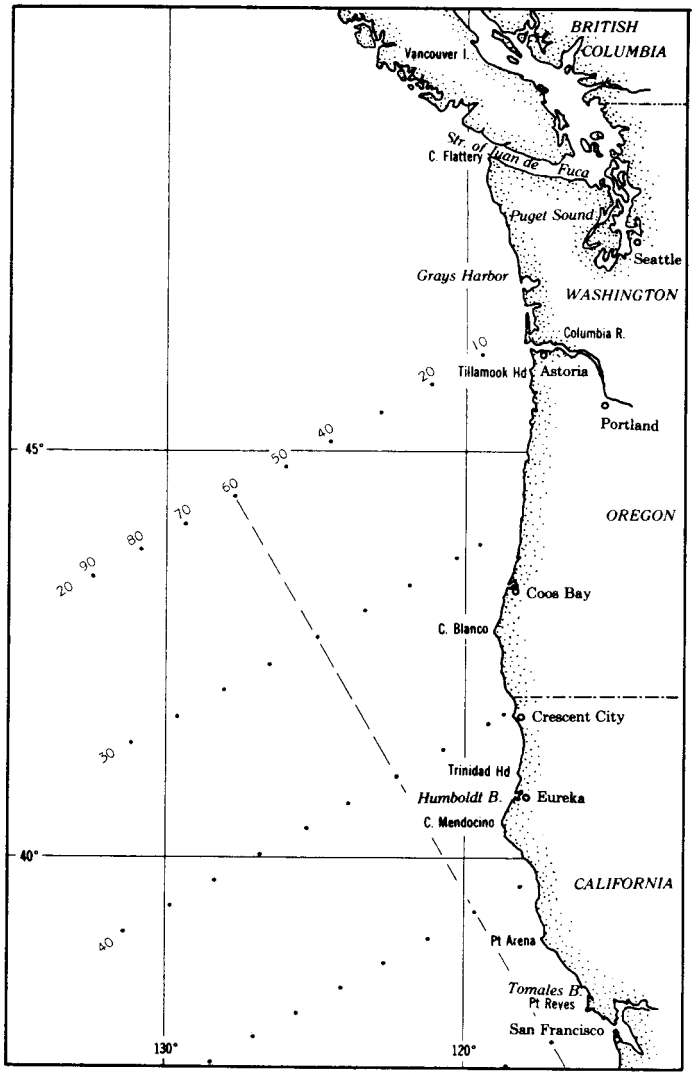
MEAN SURFACE - LAYER DEPTH
OCTOBER

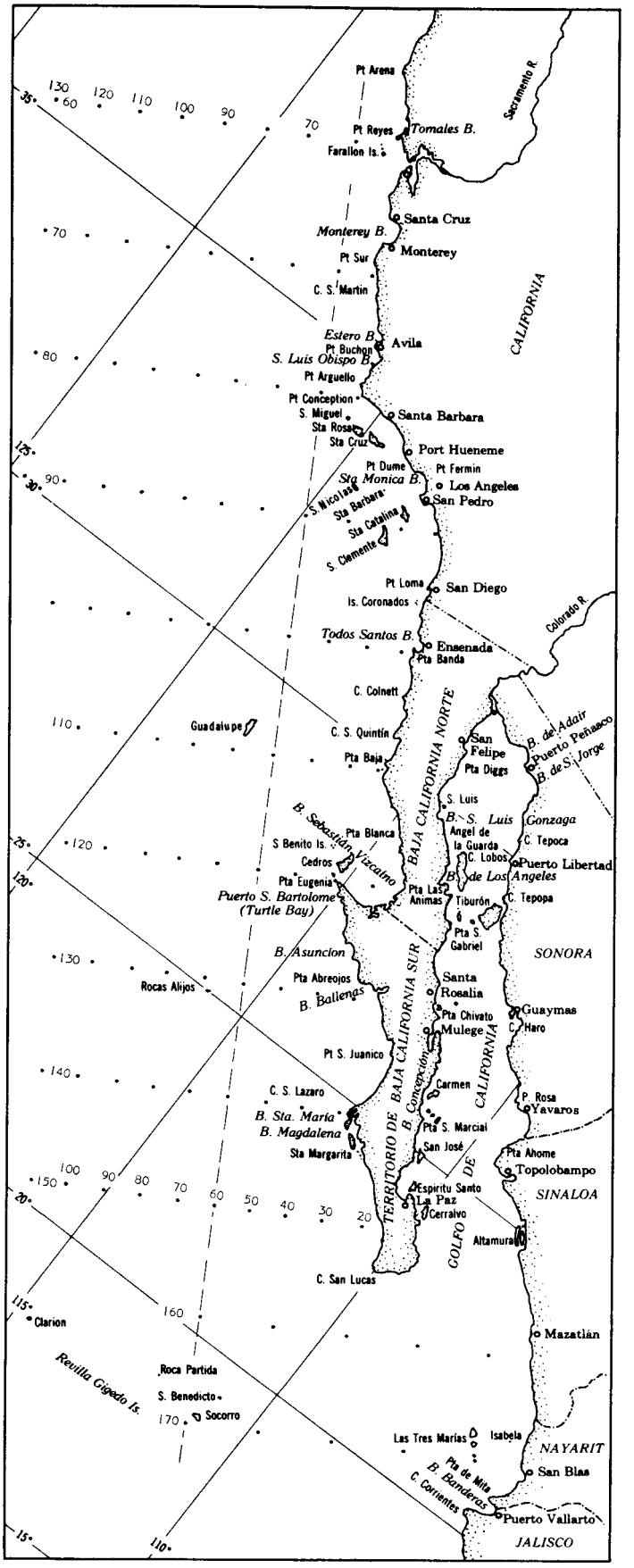


MEAN SURFACE - LAYER DEPTH
NOVEMBER



MEAN SURFACE - LAYER DEPTH
DECEMBER





These maps are designed to show essential details of the area most intensively studied by the California Cooperative Oceanic Fisheries Investigations. This is approximately the same area as is shown in color on the front cover. Geographical place names are those most commonly used in the various publications emerging from the research. The cardinal station lines extending southwestward from the coast are shown. They are 120 miles apart. Additional lines are utilized as needed and can be as closely spaced as 12 miles apart and still have individual numbers. The stations along the lines are numbered with respect to the station 60 line, the numbers increasing to the west and decreasing to the east. Most of them are 40 miles apart, and are numbered in groups of 10. This permits adding stations as close as 4 miles apart as needed. An example of the usual identification is 120.65. This station is on line 120, 20 nautical miles southwest of station 60.

The projection of the front cover is Lambert's Azimuthal Equal Area Projection. The detail maps are a Mercator projection.

CONTENTS