June 1974
No. 6

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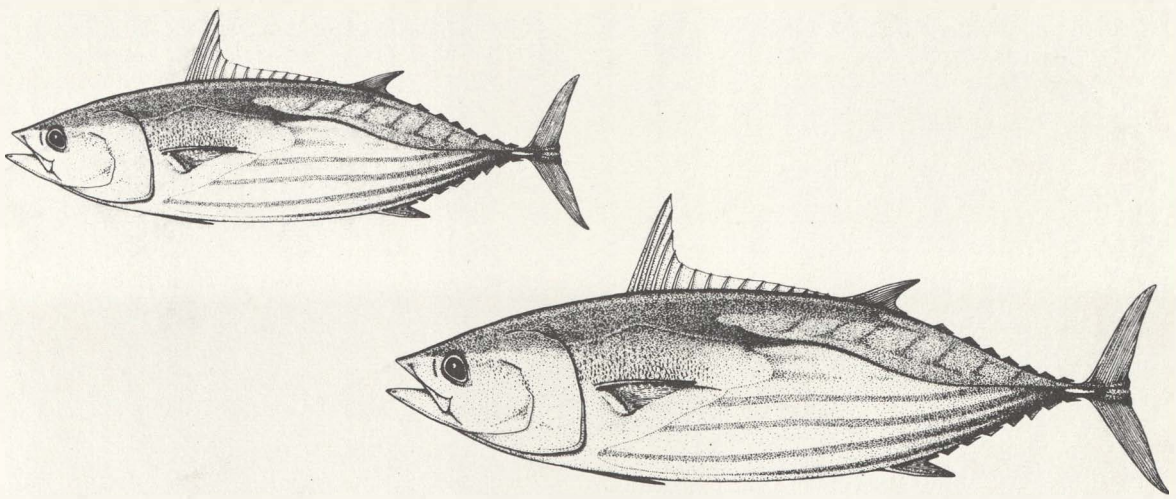
TIBURON, CA 94920

FISHING INFORMATION

Southwest Fisheries Center-La Jolla, California



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U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
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FISHING INFORMATION

JUNE 1974, No. 6

PREFACE

This publication, Fishing Information, appears monthly and contains 1) fishery advisory information, 2) a narrative description of pertinent surface temperature conditions, 3) a narrative description of subsurface temperature structure for parts of the North Pacific, 4) charts of winds and pressures for the eastern North Pacific, 5) charts of sea surface temperature for the North Pacific and eastern tropical Pacific, and 6) charts of subsurface temperature structure in the eastern North Pacific.

A supplement to Fishing Information appears at 15-day intervals throughout the year. This is a chart of sea surface temperature (contoured at 2°F (1°C) intervals) from Baja California to Vancouver Island out to about 135°W. Special bulletins are published in conjunction with the 15-day sea surface temperature charts which include short-term projections of albacore distribution and locations of productive fishing areas, information on oceanographic and atmospheric conditions, and other information as is appropriate during the albacore fishing season.

L.E. Eber, Leader
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Submitted for publication July 22, 1974

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L. Eber (Figures 4 and 6)
F. Miller (Figures 9 and 10)
J. Renner (Figures 1, 2, 3, 5, 7, 8, and 15-Day Supplement)
J.F.T. Saur (Figures 11 and 12)

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R. Allen

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Pacific Environmental Institute, Fisheries Research Board of Canada, West Vancouver, British Columbia, by L.F. Giovando from observations by S.G. Westhaver at Langara Island Light; D.L. Kupillas at Cape St. James Light; L. Collins at Kains Island Lightstation; O.A. Edwards at Amphitrite Point Light.
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Expendable bathythermograph observations are made by the mates of the S.S. Hawaiian Enterprise of Matson Navigation Company. The data are processed under supervision of Dr. D.R. McLain at the NMFS Pacific Environmental Group, Monterey, using computer facilities of the Fleet Numerical Weather Center. The project is partially supported by the National Science Foundation and the Office of Naval Research under Government Order NAonr-9-74.

Sea Surface Temperature and Environmental Conditions

L. EBER AND F. MILLER

Eastern North Pacific

Sea surface temperatures in June 1974 continued to be below normal along the entire west coast of North America. Cooler conditions also persisted in the Gulf of Alaska and southward to about 40°N. Negative deviations reached maximums of 2°F (1.1°C) or more in offshore areas southwest of British columbia. Negative deviations exceeding 2°F (1.1°C) also occurred off southern Oregon and northern California and in the area south of 25°N, between 120° and 130°W (Figure 5).

Surface temperatures were mostly warmer than normal south of 35°N and west of 145°W. The areas of positive deviations had diminished in size since May, reflecting a weak cooling tendency in most of the eastern North Pacific.

Barometric pressures were very close to normal in June 1974. The center of the eastern North Pacific anticyclone was found consistently at about 35°N during the month with some east-west excursion between 135° and 150°W. A high pressure ridge extending from the anticyclonic center into the Pacific Northwest coupled with the thermal low over southwest desert areas created steady north to northwest along-shore winds which maintained strong coastal upwelling.

Western North Pacific

Sea surface temperature conditions in central portions of the western North Pacific continued to be cooler than normal. Negative deviations exceeded 2°F (1.1°C) in several areas. A warming tendency was indicated south and east of Japan by positive deviations of 2°F (1.1°C) or higher (Figure 6). Prevailing winds in these areas ranged from southerly to easterly during the month.

Eastern Tropical Pacific

During May and June, temperatures in the Peru Current and its equatorial extension out to 120°W can be expected to decrease 2°-4°F (1.1°-2.2°C). Nearly all this cooling takes place south of the equator. The sea temperatures in the tropics and subtropics of the northern hemisphere continue to warm with maximum increases of 2°-4°F (1.1°-2.2°C) usually occurring in the local tuna fishing grounds south and west of Baja, California.

In June 1974 sea surface temperatures followed the seasonal trends with only minor exceptions (Figure 9). Again, as in May 1974, sea surface temperatures in the eastern tropical Pacific were as close to the long-term mean in most areas as can be expected. However, along the equator from 100°W-140°W moderate upwelling produced cold surface water between the equator and 5°S, where negative anomalies of 2°F (1.1°C) occurred in several places (Figure 10).

Lacking any shore station data from South America and with very few ship reports east of 90°W and south of the equator, it was not possible to determine whether the offshore surface temperatures in the Peru Current were near normal or slightly below normal. The surface pressure gradient index between 30°S, 90°W and the coast of Peru at 15°S was above normal throughout the month suggesting that the southeast trades were providing the needed wind stress for upwelling along the coast.

In the northern hemisphere between the equator and 5°N there were three areas of positive anomalies of 2°F (1.1°C) or greater (Figure 10). One area extended along 80°W north of Ecuador where the winds were weak and variable instead of the normal prevailing southwesterlies. The two other areas were in the vicinity

of 105°W and 135°W respectively, where light surface winds and slightly above-normal cloud cover, associated with unstable southwesterly flow into the intertropical convergence zone, decreased upwelling near the equator and produced warmer-than-normal surface waters. These conditions are generally ideal for high seas tuna fishing. Off the southern part of Baja California, temperatures increased rapidly in June under persistent light winds and near-normal cloud cover. Sea temperatures had been well below normal for many months in the fishing grounds off Baja California (local banks). The warmer sea temperatures and good fishing weather in this area has improved the bluefin fishing.

Subsurface Temperature Structure in the Northeast Pacific Ocean

J.F.T. Saur

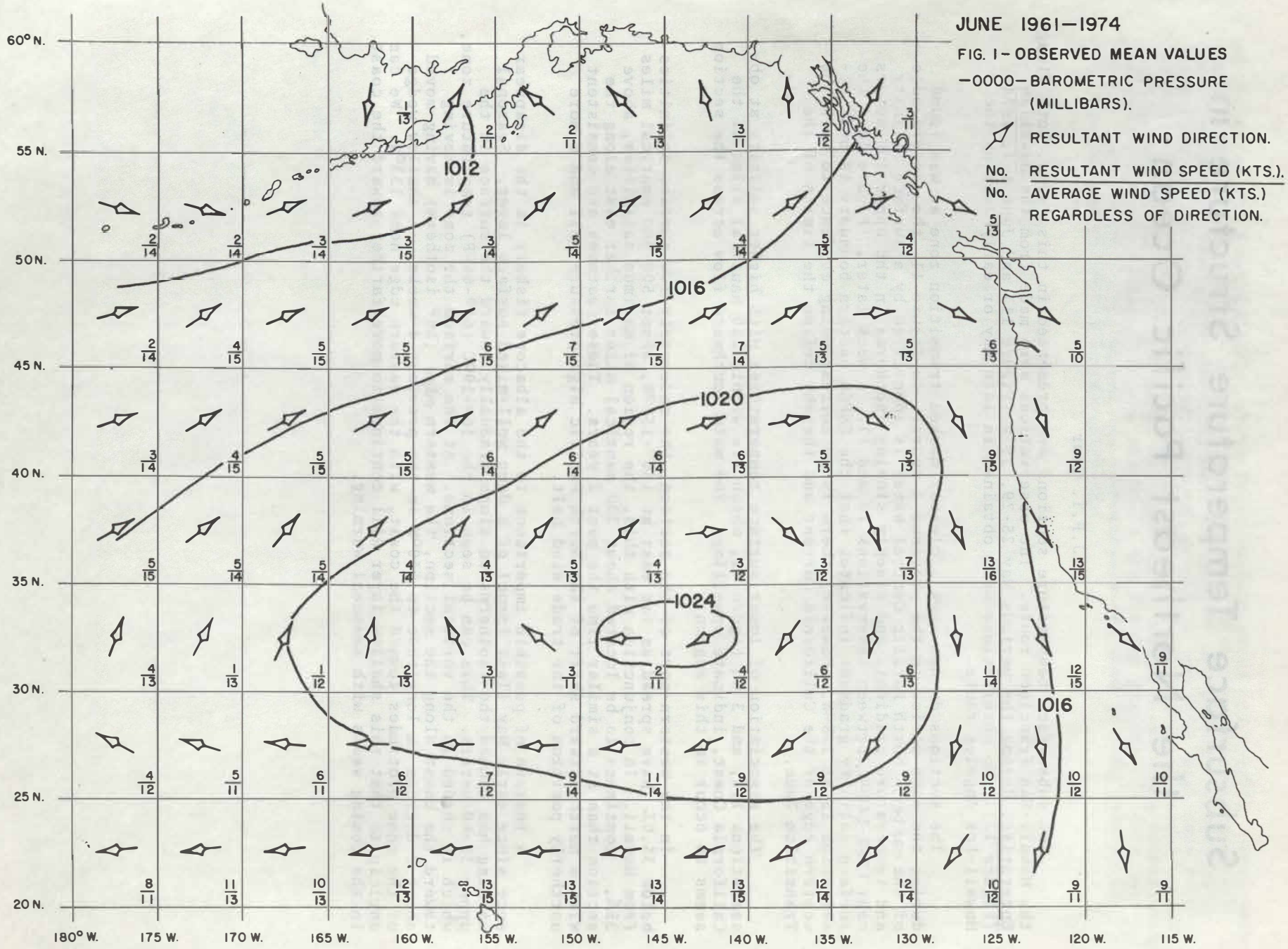
Two subsurface temperature sections are presented in this issue, both along the Hawaii-San Francisco route. The observations were made from the Hawaiian Enterprise, during the periods May 25-29, 1974 (Figure 11) and June 1-4, 1974 (Figure 12). No observations were obtained in late May or early June on the Hawaii-Los Angeles route.

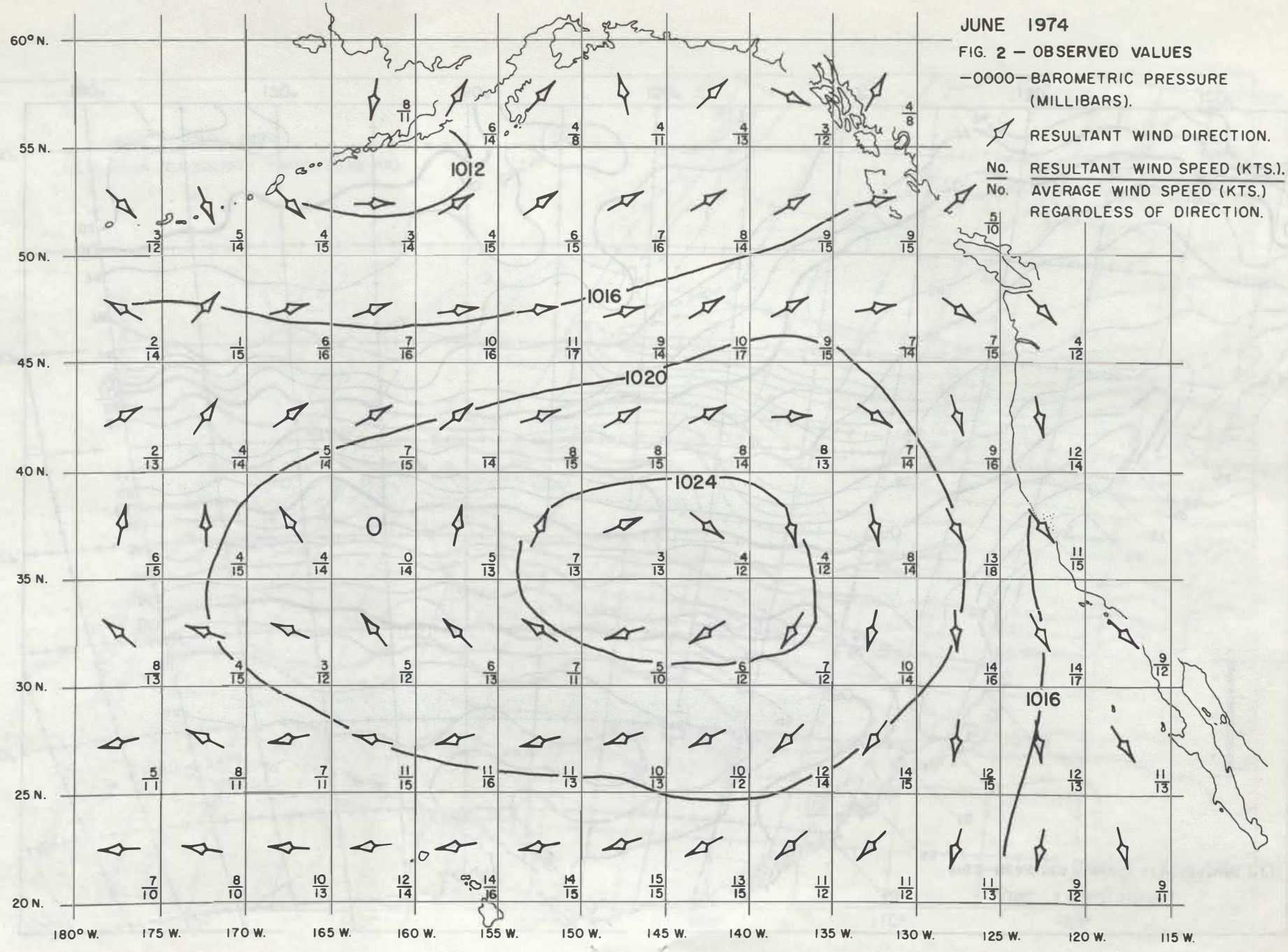
The sections do not show a clearly marked transition zone as was found during the same period in the previous 2 years. In Figure 11, the eastern edge of the eastern North Pacific Central Water is identified by a surface salinity and temperature gradient, and steeply sloping isotherms in the upper 100 meters near 139°-140°W, between observations 10 and 11. A week later, (Figure 12), the surface salinity gradient indicates that the ENPCW eastern boundary is near observation 15 at 138°W. However, there is no corresponding evidence to mark the western edge of the California Current and thereby define the limits of the Transition Zone.

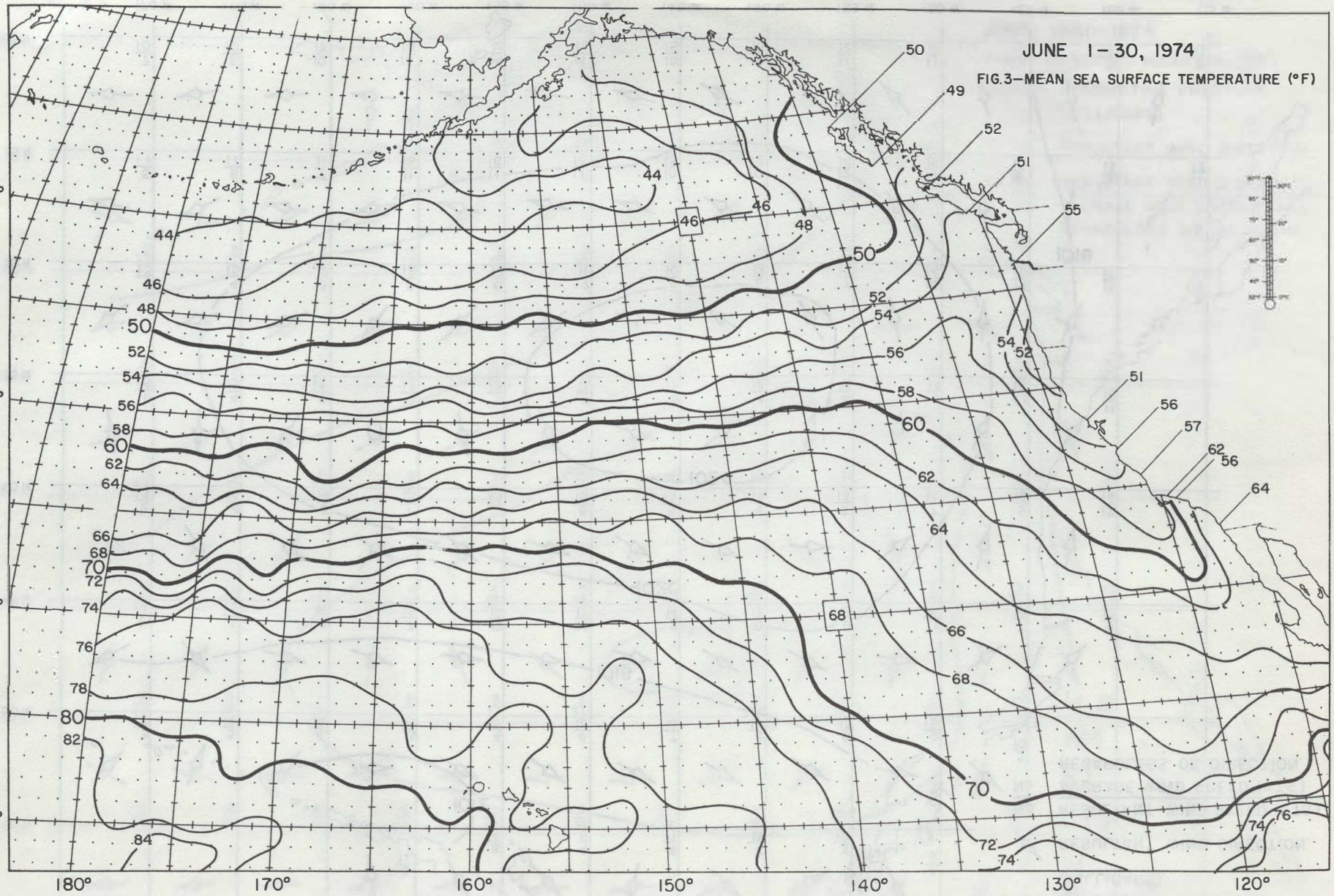
The association of lower surface temperatures with higher salinity at observations 1,2, and 3 in Figure 11, which lie within 250 nautical miles of the California Coast, indicate upwelling. The main southward flow across the section seems to occur in this region.

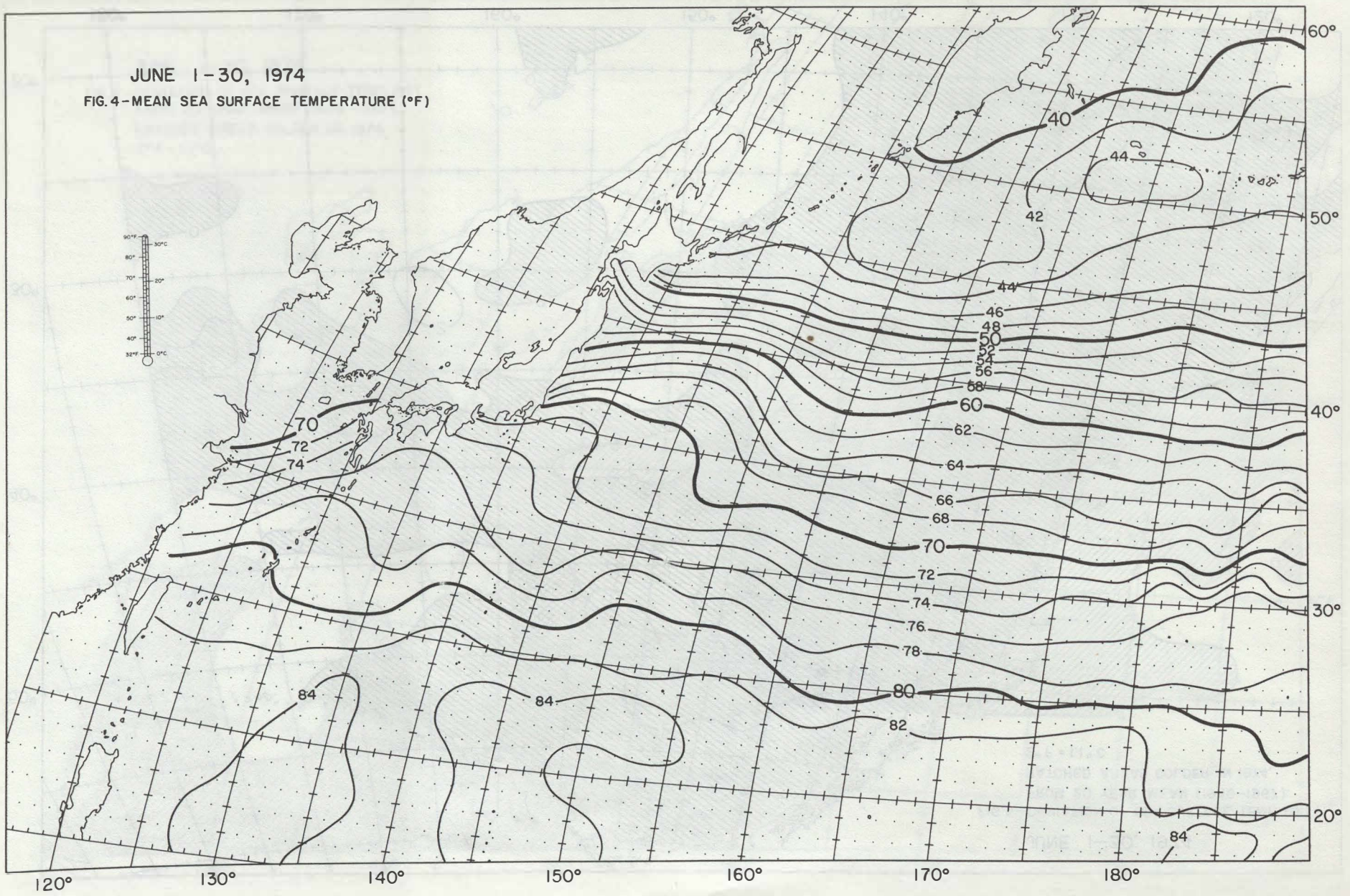
In the western part of the section, the moderately low surface salinities below 35.0‰ have spread as far east at 150°-152°W, about 500-600 nautical miles from Hawaii. In conjunction with this, the region of maximum salinities, above 35‰, continues to be located about 200 nautical miles farther east along the section than at a similar time the past 2 years. These features are consistent with a northeastward shift of the North Pacific high pressure cell and a more northerly position of the trade wind belt.

A feature of possible importance to the albacore fishery is the disappearance since early May (last issue) of a deep well-mixed surface layer. Seasonal warming has caused the isotherms to slope gradually toward the surface in the upper 30-60 meters. This can be seen in the 16°-19°C (61°-66°F) temperature zone, which is shaded in the vertical sections. At the surface the zone is moving toward the coast along the section, the western edge (19° isotherm) having moved about 2 degrees in longitude to 140°W in the previous 4 weeks. A shallow wedge of the zone protrudes toward the coast, with the eastern edge near 133°W. We can anticipate that this shallow layer will continue to move farther toward the coast in the coming weeks with seasonal warming.


JUNE 1961—1974
FIG. 1 - OBSERVED MEAN VALUES
—0000— BAROMETRIC PRESSURE (MILLIBARS).
RESULTANT WIND DIRECTION.
No. RESULTANT WIND SPEED (KTS.).
No. AVERAGE WIND SPEED (KTS.) REGARDLESS OF DIRECTION.
1012
1016
1020
1024
1016
60° N.
55 N.
50 N.
45 N.
40 N.
35 N.
30 N.
25 N.
20 N.
180° W.
175 W.
170 W.
165 W.
160 W.
155 W.
150 W.
145 W.
140 W.
135 W.
130 W.
125 W.
120 W.
115 W.


JUNE 1974
FIG. 2 — OBSERVED VALUES
—0000— BAROMETRIC PRESSURE (MILLIBARS).
RESULTANT WIND DIRECTION.
No. / No. RESULTANT WIND SPEED (KTS.). / AVERAGE WIND SPEED (KTS.) REGARDLESS OF DIRECTION.
1012
1016
1020
1024
1016
60° N.
55 N.
50 N.
45 N.
40 N.
35 N.
30 N.
25 N.
20 N.
180° W.
175 W.
170 W.
165 W.
160 W.
155 W.
150 W.
145 W.
140 W.
135 W.
130 W.
125 W.
120 W.
115 W.


JUNE 1 – 30, 1974
FIG.3–MEAN SEA SURFACE TEMPERATURE (°F)
50°
40°
30°
20°
180°
170°
160°
150°
140°
130°
120°


JUNE 1-30, 1974
FIG. 4-MEAN SEA SURFACE TEMPERATURE (°F)
90°F 30°C
80° 20°
70° 10°
60° 0°
50°
40°
32°F
60°
50°
40°
30°
20°
120°
130°
140°
150°
160°
170°
180°
40
42
44
46
48
50
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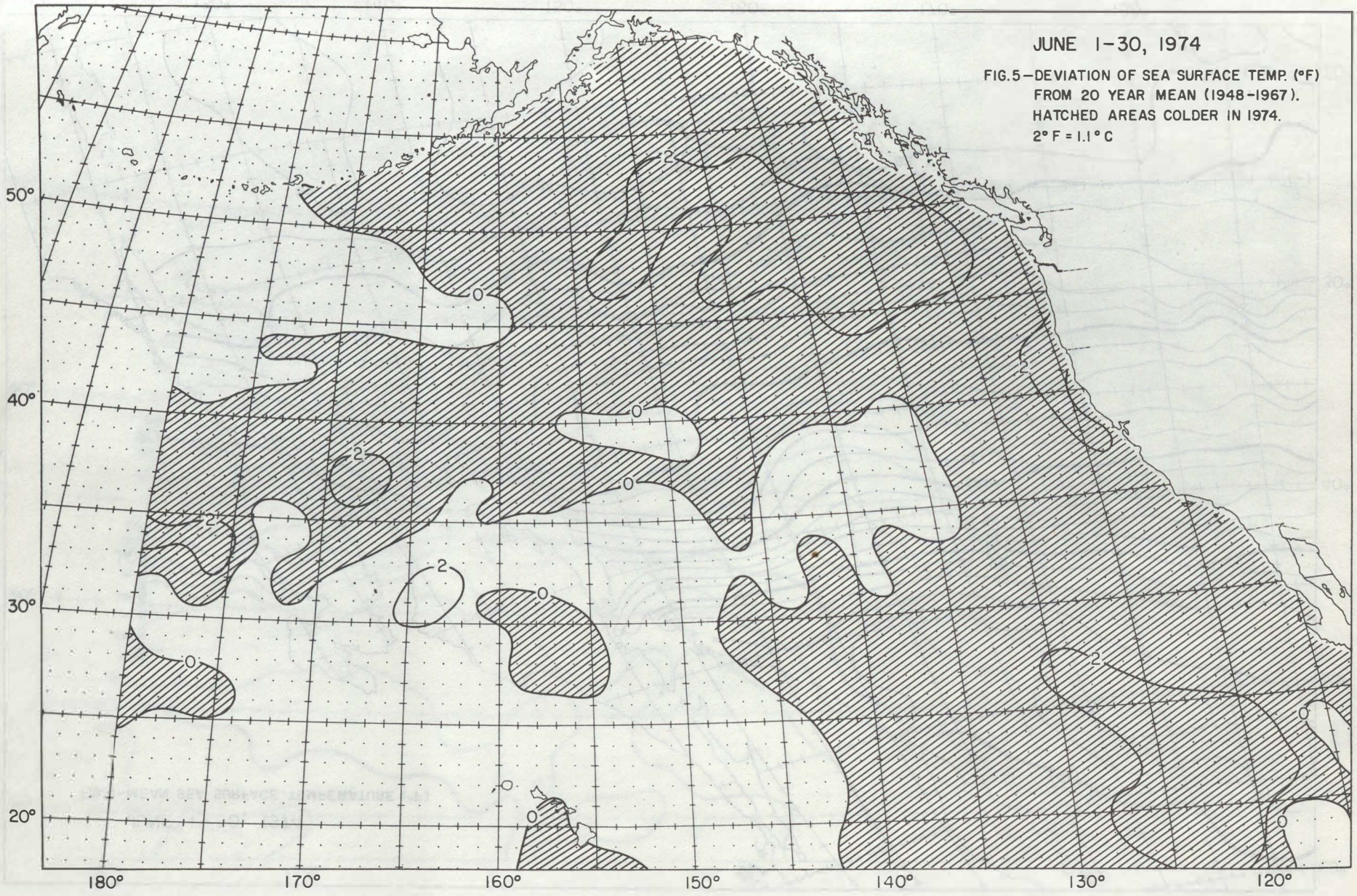
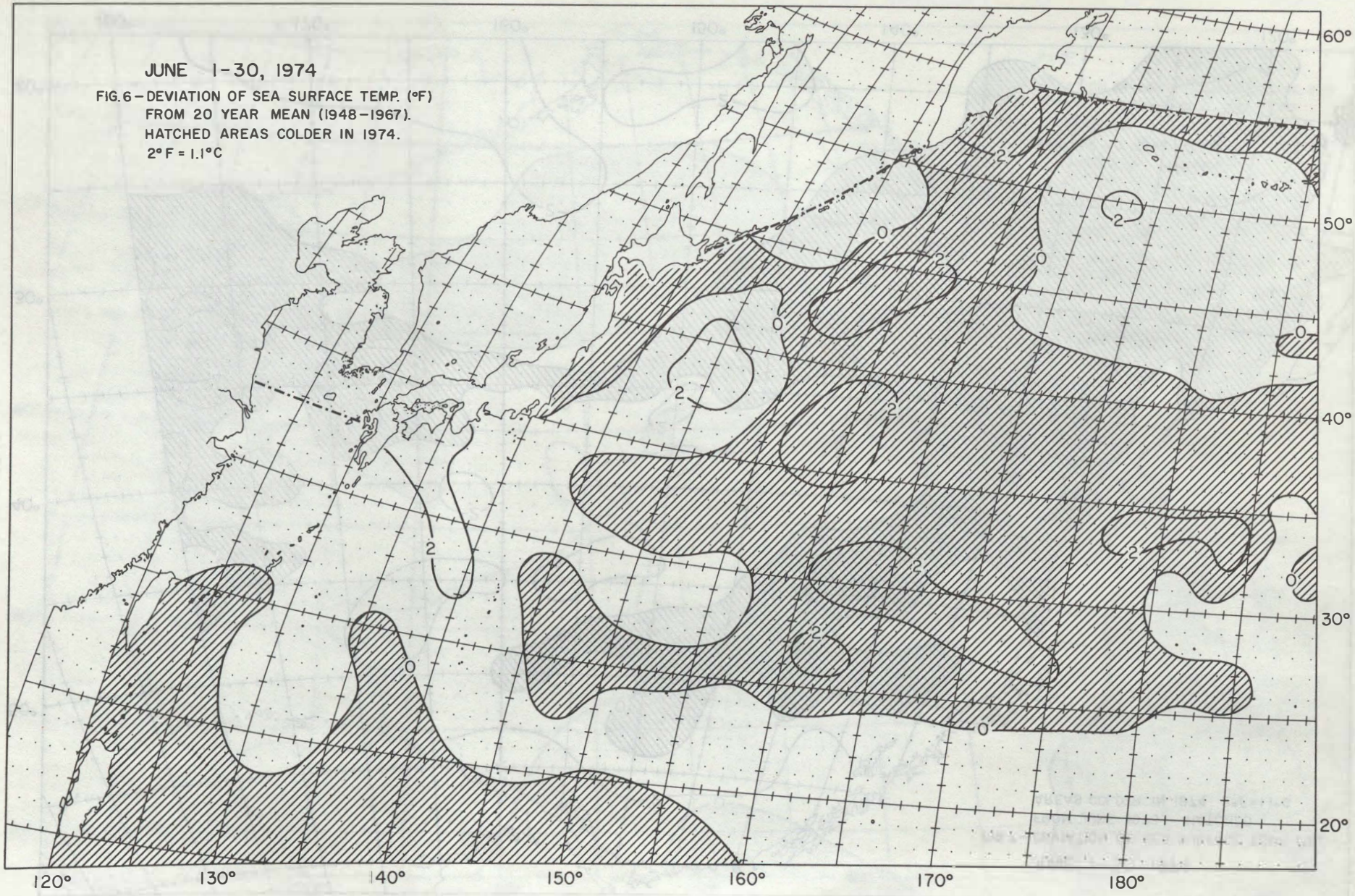
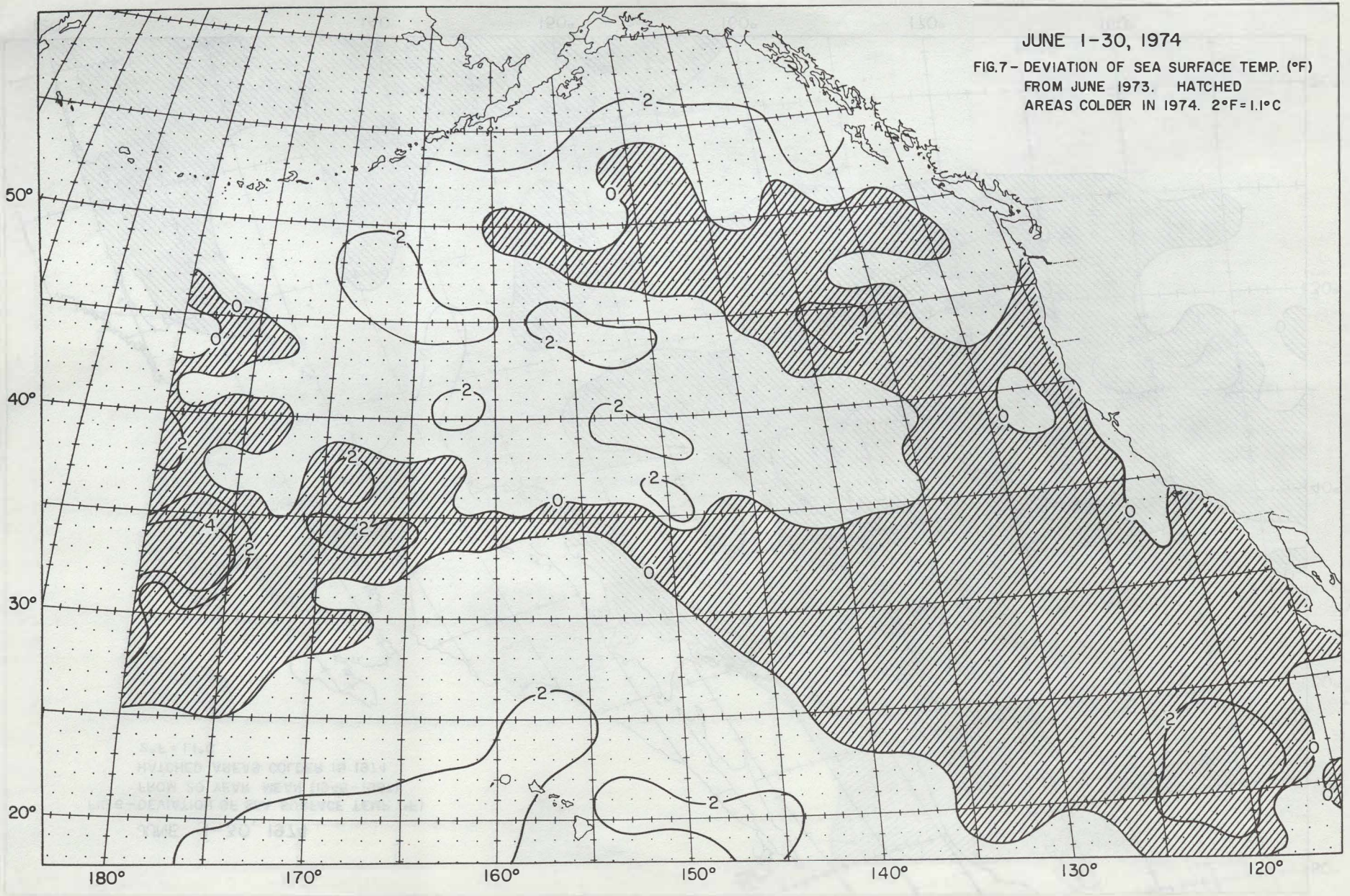
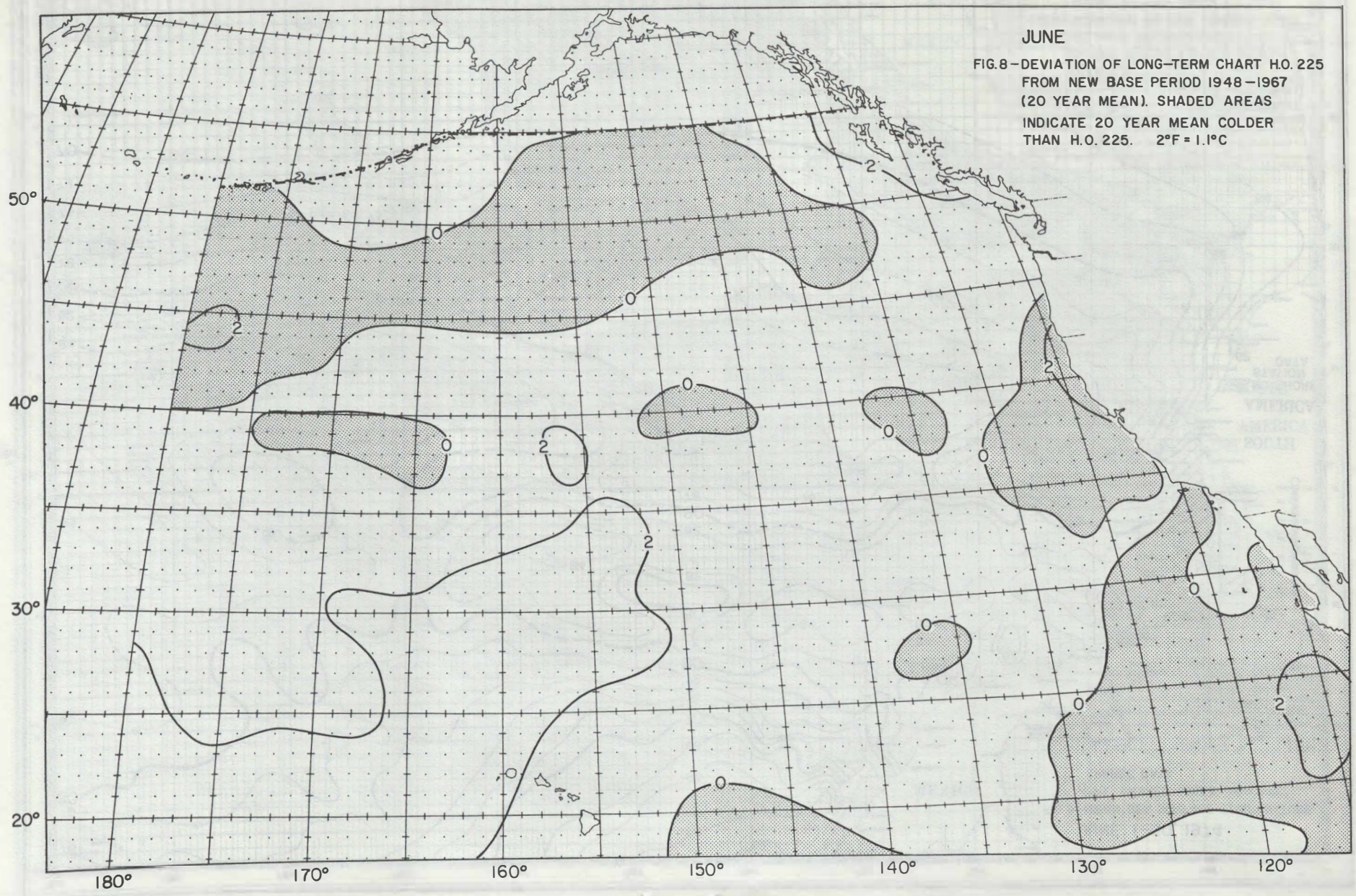
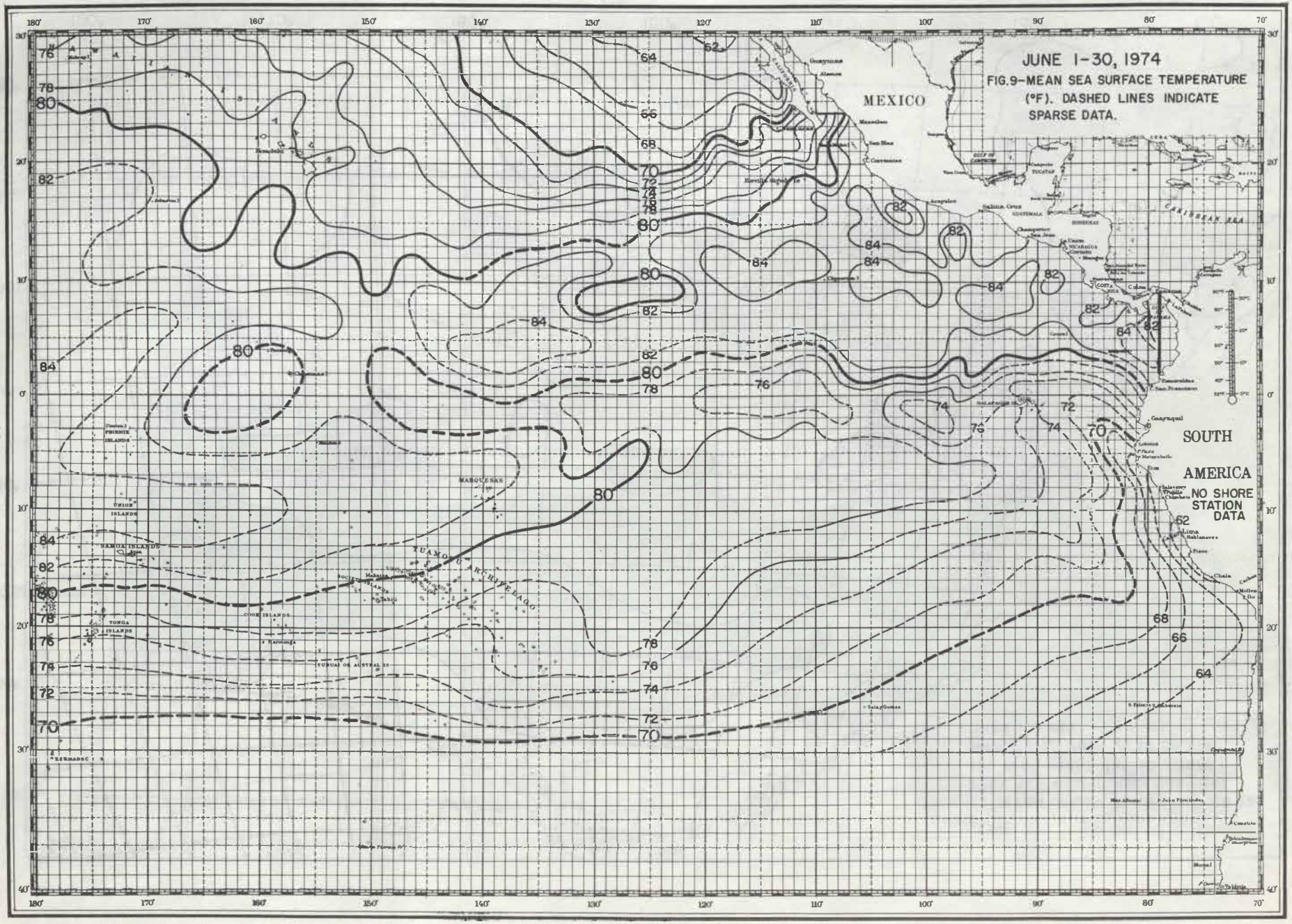
70
72
74
76
78
80
82
84
84
84


JUNE 1-30, 1974
FIG. 5 — DEVIATION OF SEA SURFACE TEMP. (°F) FROM 20 YEAR MEAN (1948-1967). HATCHED AREAS COLDER IN 1974.
2° F = 1.1° C
50°
40°
30°
20°
180°
170°
160°
150°
140°
130°
120°
2
0


JUNE 1-30, 1974
FIG. 6 – DEVIATION OF SEA SURFACE TEMP. (°F) FROM 20 YEAR MEAN (1948–1967). HATCHED AREAS COLDER IN 1974.
2° F = 1.1° C
60°
50°
40°
30°
20°
120°
130°
140°
150°
160°
170°
180°
0
2


JUNE 1-30, 1974
FIG.7- DEVIATION OF SEA SURFACE TEMP. (°F) FROM JUNE 1973. HATCHED AREAS COLDER IN 1974. 2°F=1.1°C
50°
40°
30°
20°
180°
170°
160°
150°
140°
130°
120°
2
0
-2
-4


JUNE
FIG. 8 – DEVIATION OF LONG-TERM CHART H.O. 225 FROM NEW BASE PERIOD 1948–1967 (20 YEAR MEAN). SHADED AREAS INDICATE 20 YEAR MEAN COLDER THAN H.O. 225. 2°F = 1.1°C
50°
40°
30°
20°
180°
170°
160°
150°
140°
130°
120°
0
2


JUNE 1-30, 1974
FIG.9-MEAN SEA SURFACE TEMPERATURE (°F). DASHED LINES INDICATE SPARSE DATA.
MEXICO
SOUTH AMERICA
NO SHORE STATION DATA
CARIBBEAN SEA
PHOENIX ISLANDS
UNION ISLANDS
SAMOA ISLANDS
TUAMOTU ARCHIPELAGO
SOCIETY ISLANDS
COOK ISLANDS
TONGA ISLANDS
TUBUAI OR AUSTRAL IS
MARQUESAS
BERMUDA
Honolulu
Tahiti
Lima
Guayaquil

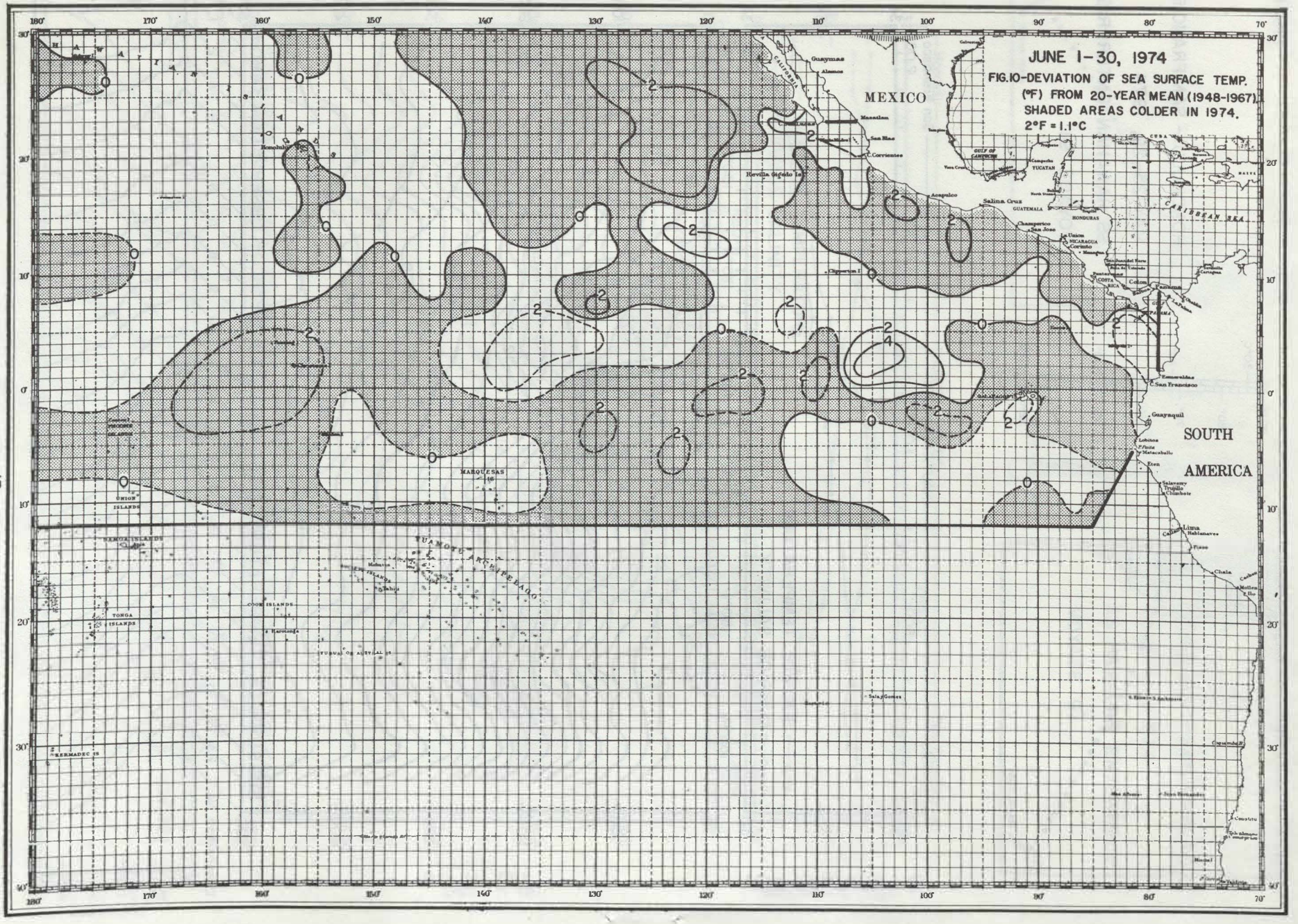
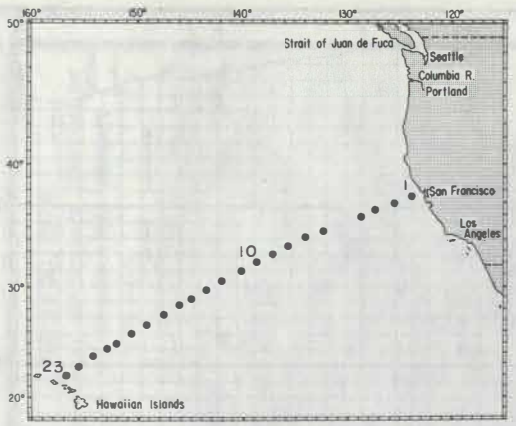
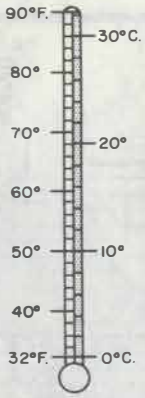

JUNE 1-30, 1974
FIG.10-DEVIATION OF SEA SURFACE TEMP. (°F) FROM 20-YEAR MEAN (1948-1967). SHADED AREAS COLDER IN 1974.
2°F = 1.1°C
MEXICO
SOUTH AMERICA
CARIBBEAN SEA
GUATEMALA
HONDURAS
NICARAGUA
COSTA RICA
PANAMA
CUBA
HAITI
JAMAICA
TUAMOTU ARCHIPELAGO
MARQUESAS
COOK ISLANDS
TONGA ISLANDS
EASTER I.
JUAN FERNANDEZ
Guaymas
Mazatlan
San Blas
Corrientes
Acapulco
Salina Cruz
Champerico
San Jose
Corinto
Cristobal
Colon
Panama
Buenaventura
San Francisco
Guayaquil
Salaverry
Trujillo
Chimbote
Lima
Callao
Pisco
Chala
Mollendo
Arica
Iquique
Antofagasta
Valparaiso
Talcahuano
Papeete
Rarotonga
Pago Pago
Honolulu

FIGURE 11.





HONOLULU – SAN FRANCISCO

MAY 25–29, 1974

SS HAWAIIAN ENTERPRISE

VOYAGE 91

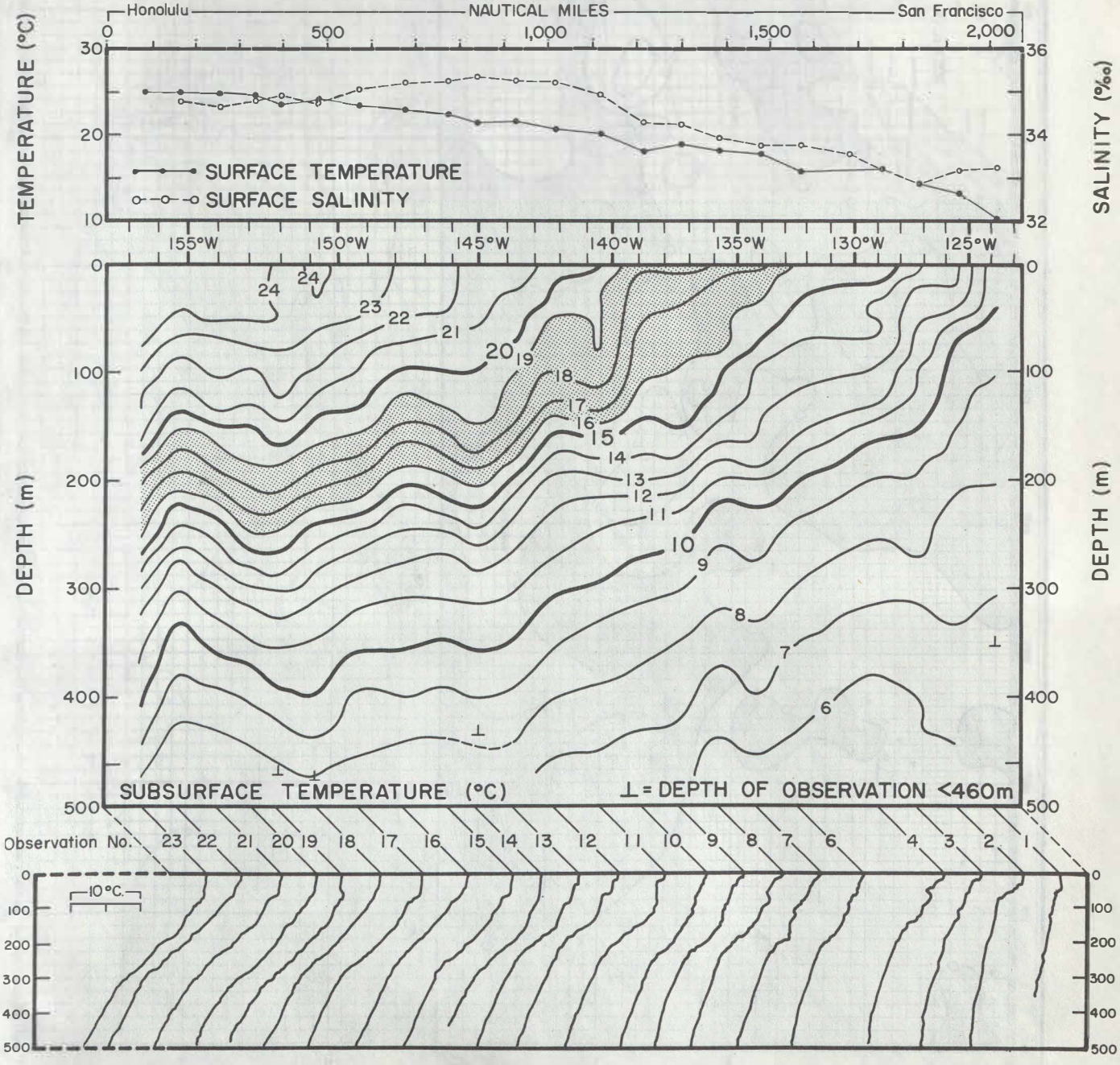
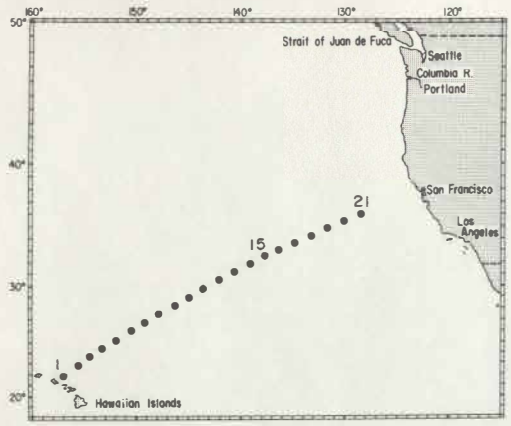
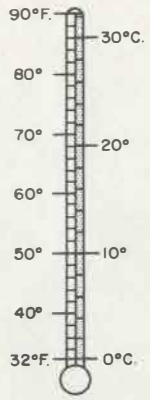


FIGURE 12





HONOLULU – SAN FRANCISCO

JUNE 1-4, 1974

SS HAWAIIAN ENTERPRISE

VOYAGE 91