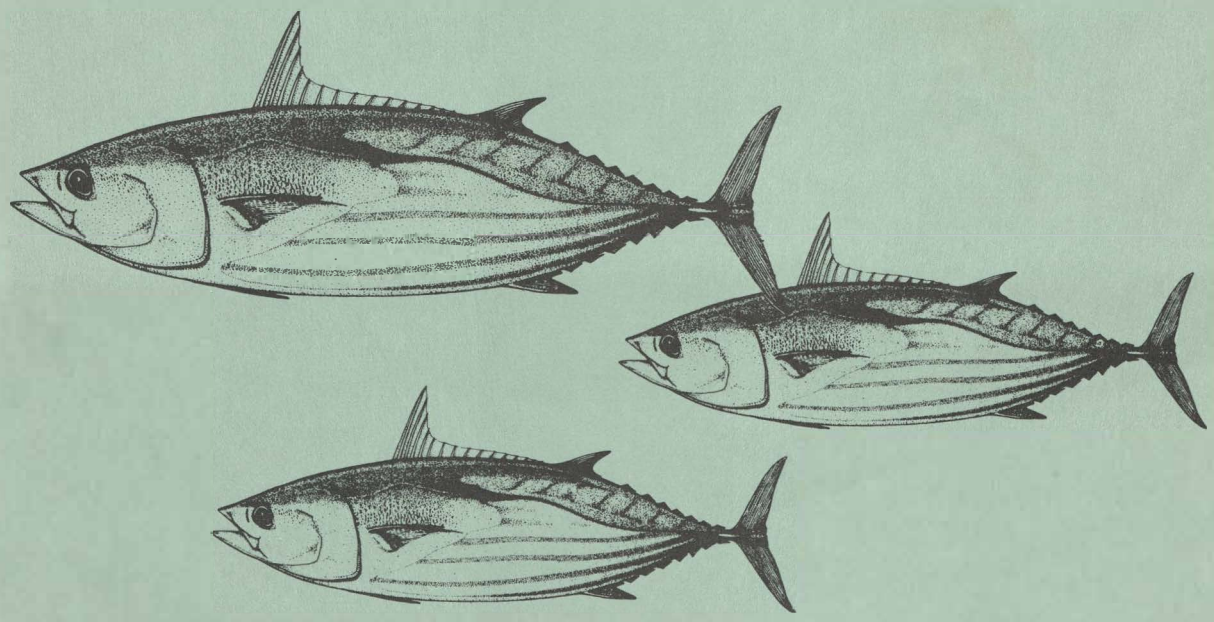
NOVEMBER 1976
No. 11

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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PREFACE

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

The secretary of Commerce has determined that the publication of this periodical is necessary in the transaction of the public business required by law of this Department.

Submitted for publication - December 22, 1976

CONTENTS

ENVIRONMENTAL CHARTS ANALYZED BY:

F. Miller (Figures 8 and 9)
J. Renner (Figures 1, 2, 3, 4, 5, 6, 7, 10 and 15 day Supplement)

TECHNICAL EDITOR:
R. Allen
CARTOGRAPHY:
R. Allen, H. Orr

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Fisheries Research Board of Canada, Pacific Environmental Institute, West Vancouver, British Columbia by L.F. Giovando from observations by
L. Sabourin at Langara Island Light; D.C. Robinson at Cape St. James Light;
L. Collins at Kains Island Lightstation; I.G. McNeil at Amphitrite Point Light
Scripps Institution of Oceanography, La Jolla, California
Fishing Vessels, Aquarius, Carol S., Concho, Jo Linda, Polaris, Maria C. J., Maria Elena, Missouri, Rose Olivia, Santa Elena, Santa Rosa.

Expendable bathythermograph and salinity observations are made by the mates and engineers of the *Hawaiian Queen* of the Matson Navigation Co. The data are processed under supervision of D. R. McLain at the NMFS Pacific Environmental Group, using computer facilities of the Fleet Numerical Weather Central, Monterey. The project is partially supported by the National Science Foundation and the Office of Naval Research.

Due to budget restrictions only the San Francisco - Honolulu sections will appear regularly in the future. At certain times sections between Honolulu and other U.S. west coat ports will appear as available.

Sea Surface Temperature and Environmental Conditions

Forrest R. Miller

Eastern North Pacific

Seasonal cooling progressed at a slower rate than normal over most of the eastern north Pacific. In the Central part of the North Pacific colder than normal sea surface temperatures (SST) of 2°F (1.1°C) or more (Figure 5) were less extensive than in October. In October a very deep and persistent low pressure system formed over the North Pacific at about 170°W and in November moved eastward to a position near 160°W. This low pressure system caused rough seas and strong winds and below normal SST's along its boundaries between 35°N and 45°N. The areas covered by negative SST anomalies east of 160°W were diminished somewhat in November and spread southeastward in association with the eastward shift of the low center. Ahead of the frontal activity, which moved east and intensified in the Aleutian low, and west of a persistent high pressure ridge extending southwestward from the northwest coast of the U.S. (Figure 2), southerly winds and seas moved warmer surface water and air from southern latitudes into the northeast Pacific east of 140°W. Consequently, the area covered by above normal SST's (Figure 5) expanded westward and northward during November. The SST difference between November 1975 and November 1976 (Figure 7) showed an unusually large area off the U.S. west coast covered by positive anomalies greater than 4°F (2.2°C). This large warm year-to-year variation extended southward along the coast of Baja California and westward into the subtropics south of 20°N.

The subtropical Pacific high pressure center which normally lies along 30°N near 145°W was displaced east and north of its normal position during both October and November 1976 (Figure 2). The light winds and clear skies south of 45°N and east of 140°W combined with southerly surface winds and seas the past two months gradually lead to a north and westward expansion of above normal SST's. The SST anomaly patterns in October and November 1976 were almost complete reversals of the SST anomaly patterns in the same months of 1975. Thus, stronger than normal east-west SST gradients developed between 130°W and 150°W north of 40°N from October through November.

Western North Pacific

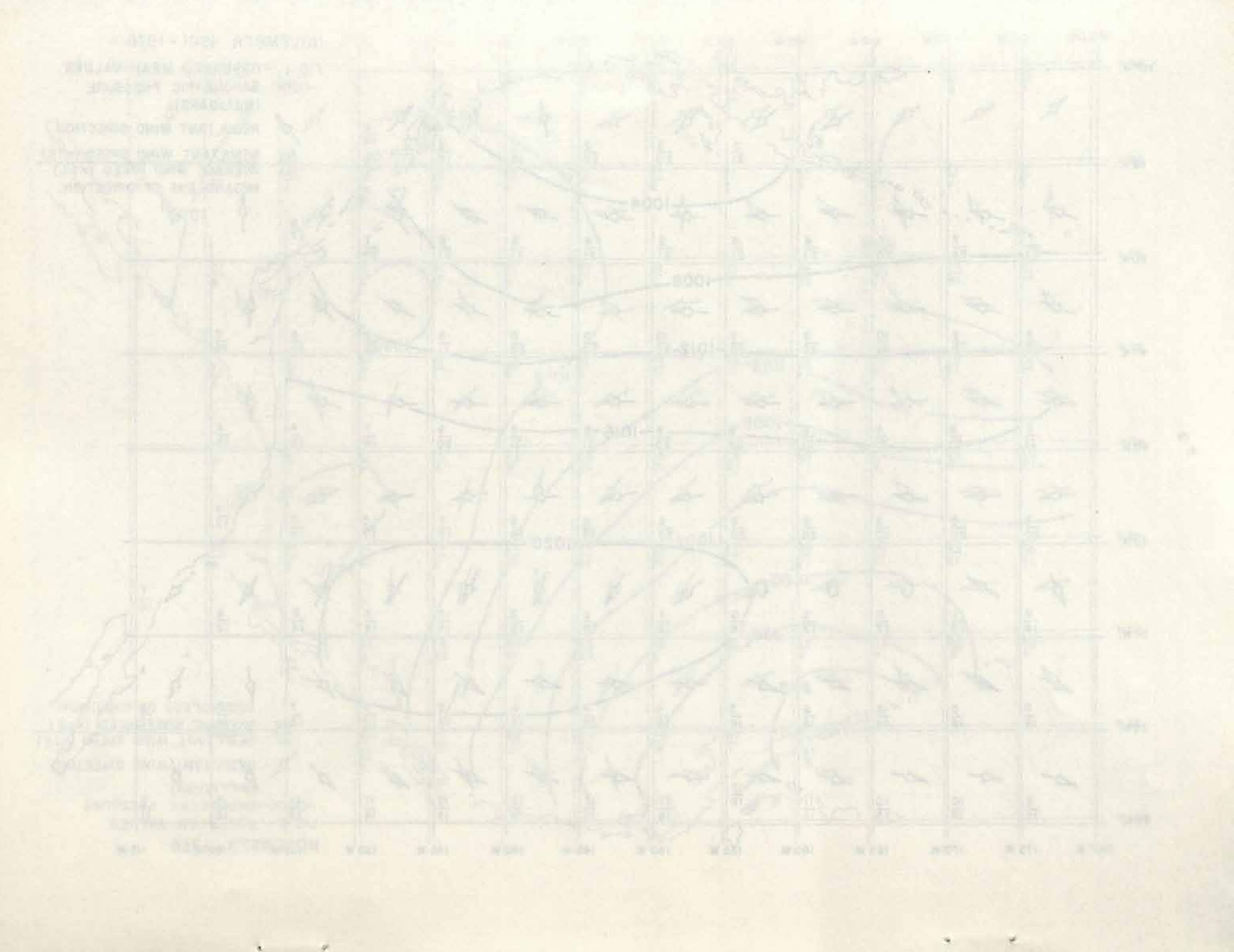
The Aleutian low pressure system centered near 55°N, 160°W in November extended westward toward northern Japan. This deeper-than-normal Aleutian low dominated weather conditions across the entire western Pacific north of 35°N during the entire month. High seas and strong winds along the periphery of the Aleutian low resulted in SST's up to 2 to 4°F (1.1 to 2.2°C) below normal (Figure 6). As the Aleutian low center moved slowly eastward in November, the areas covered by negative SST anomalies began to decrease. To the south of 35°N there was very little change in SST's apart from the expected seasonal cooling. Near 27°N between 160°E and 175°E the western subtropical high pressure center expanded and warming took place under lighter winds and clearer skies than is normal for that region.

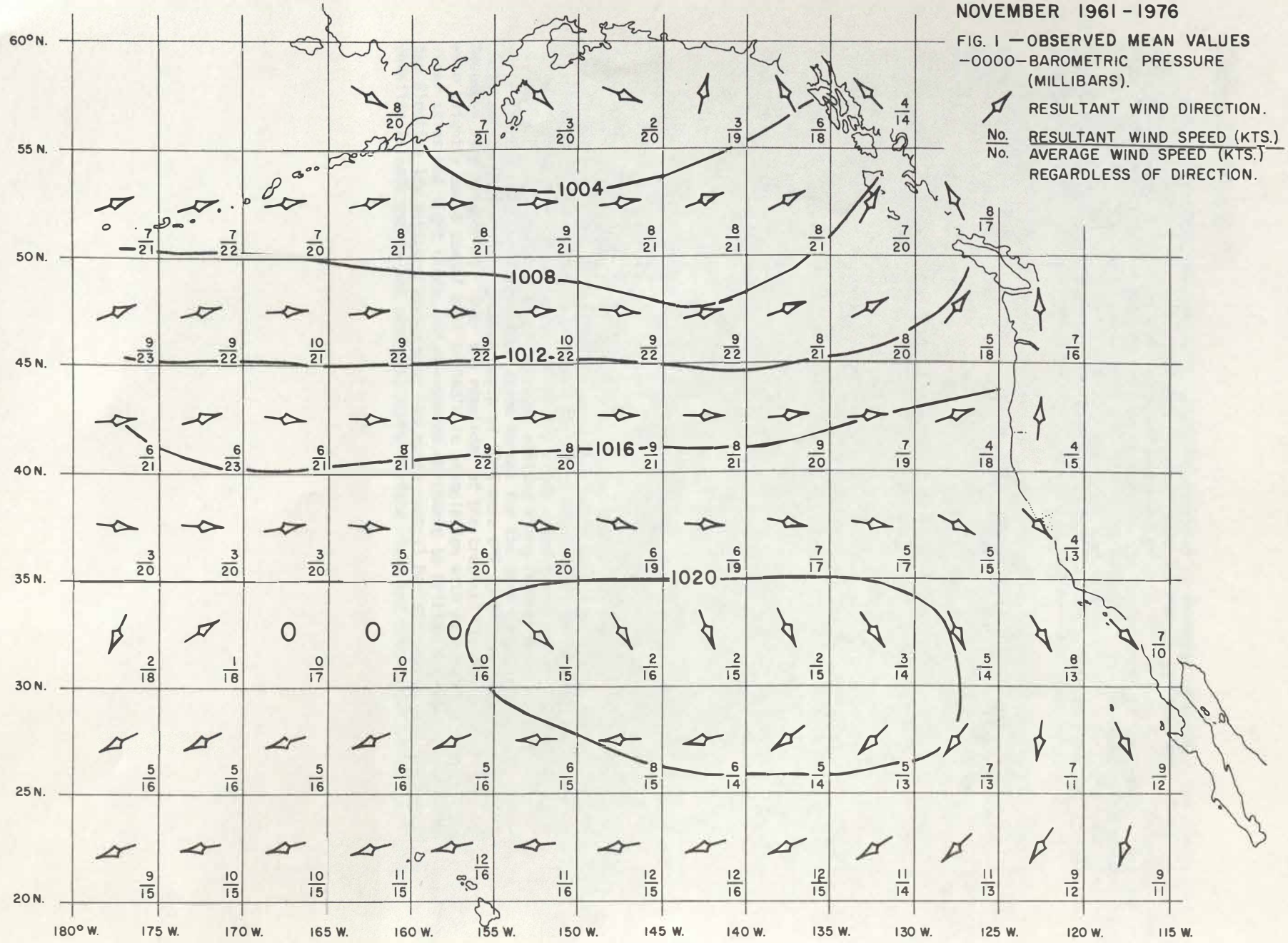
Eastern Tropical Pacific

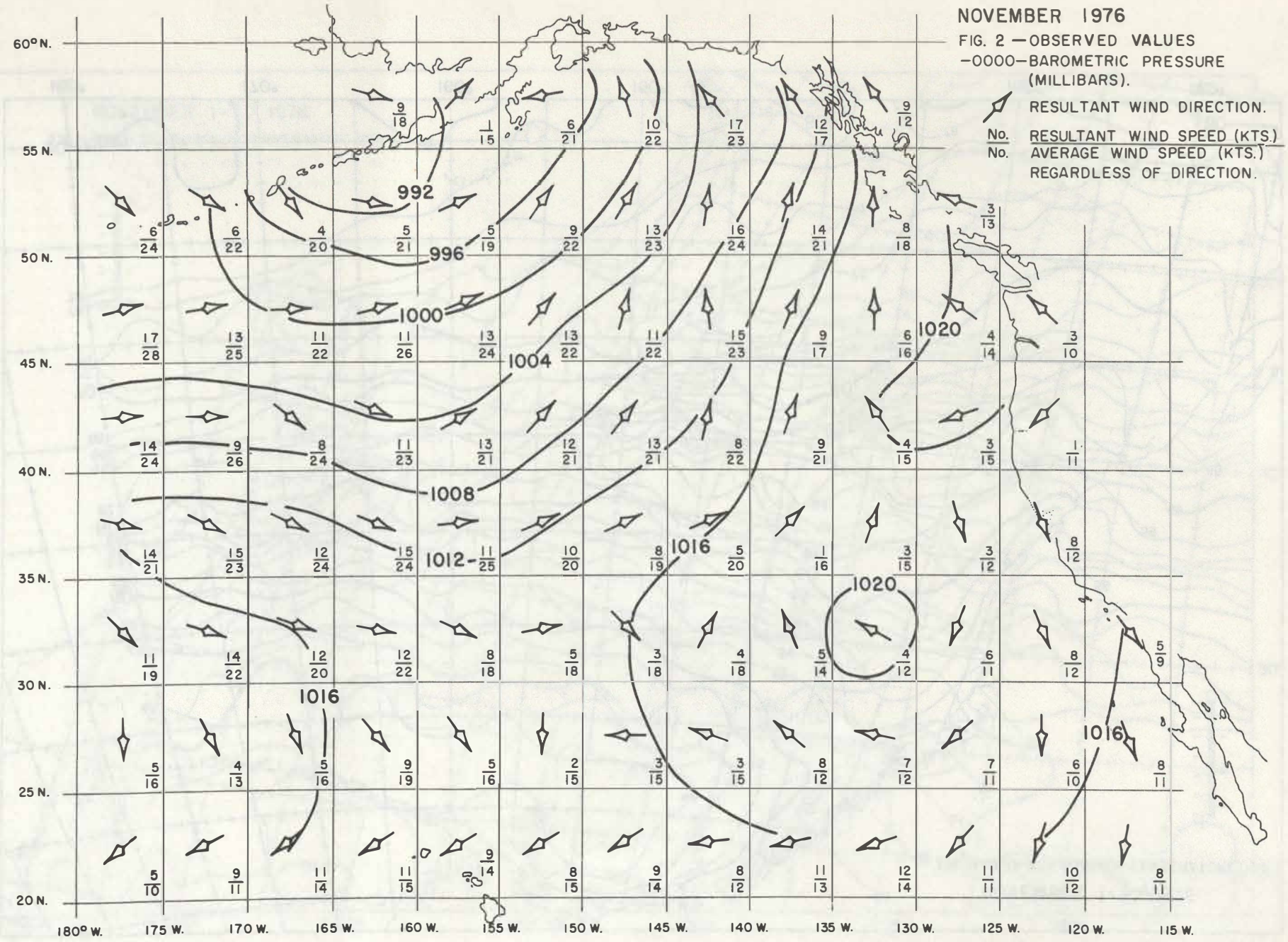
Sea surface temperatures (SST's) normally decrease in November throughout the tropics in the northern hemisphere. Along the west coast of Baja California and the coast of Mexico between 10°N and 30°N SST's normally show seasonal decreases of 2 to 3°F (1.1 to 1.7°C). Extending west from the coastal areas of Mexico and Central America and to the north of the equator, seasonal decreases in SST are usually less than 1°F (0.6°C) in November. In the southern hemisphere there is a normal seasonal warming in November with a maximum of 2 to 3°F (1.1 to 1.7°C) increase in the surface layer of the Peru Current from the equator to 25°S. Over most of the southern hemisphere to 30°S there is normally only a slight warming of less than 1°F (0.6°C).

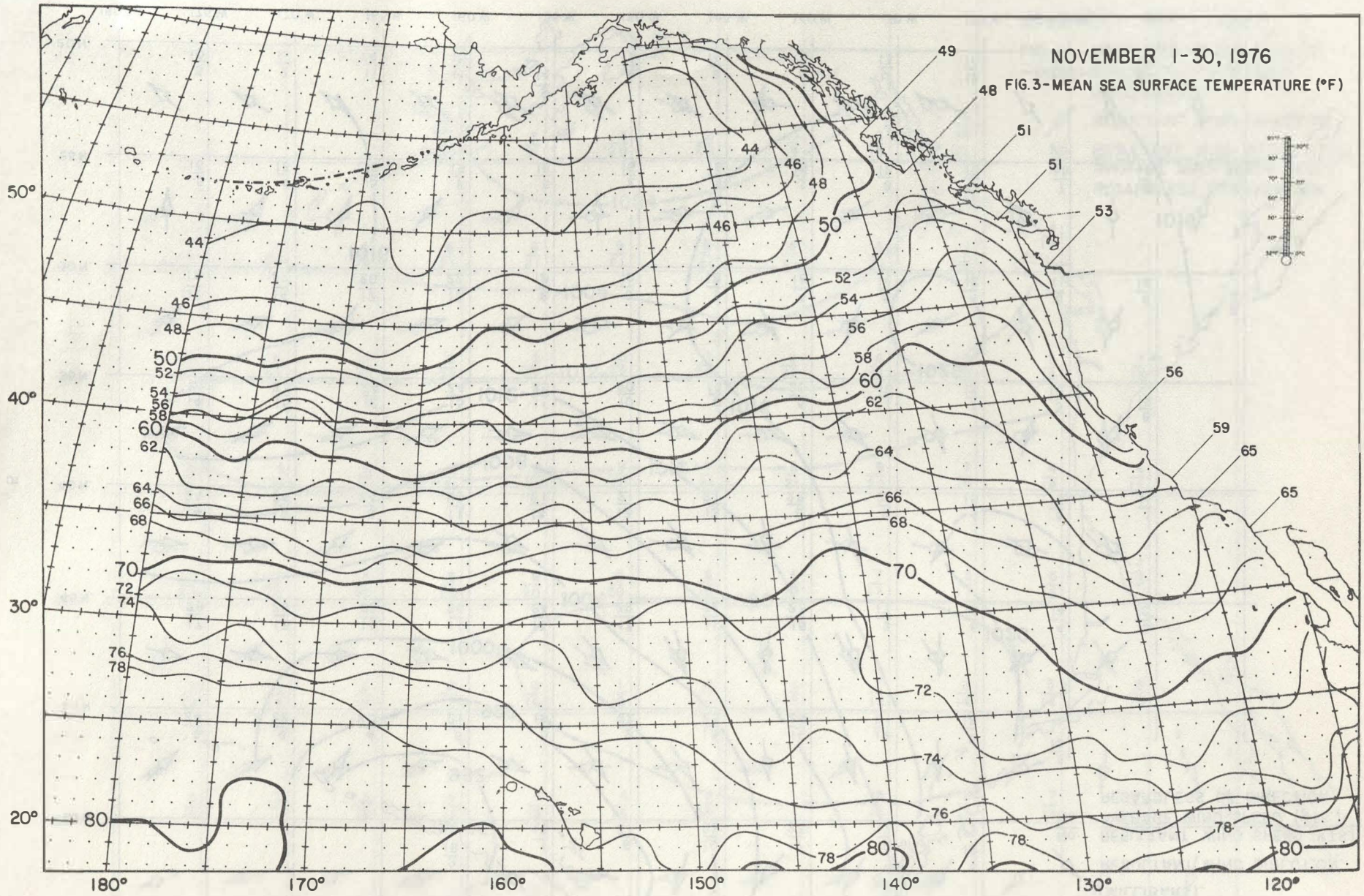
The dominant feature during November 1976 was the above normal SST's along the entire equatorial area between 5°N and 5°S west of 130°W and between 10°N and 10°S from 130°W to 90°W (Figure 9). Also, the above normal SST's extended southeast from the Galápagos Islands in a band 400 to 500 nautical miles wide to the coast of Peru between 8°S and 13°S (Figure 9). Along the coastal regions of Ecuador and the coast of Peru south of 15°S, SST's were slightly below normal. The approach of the southern summer season in the southern hemisphere is usually associated with rising SST's, especially in the Peru Current. However, during November 1976 the pattern and extent of positive SST anomalies off the coast of South America did not change much since October. Cloud photographs and SST's, derived from satellite infrared data, showed that the seasonal warming progressed at a normal rate along the coast of South America under less than normal cloud conditions. The subtropical high pressure center west of Peru was much weaker than normal in the first half of November. However, by the end of the month, the high pressure center returned to its normal intensity with more steady southeast trade winds along the coast of Peru than since the first half of September 1976. Because surface heating of 1 to 2°F (0.6 to 1.1°C) usually occurs in the surface layers of the Peru Current north of 30°S, SST's are expected to remain above normal in December 1976 over much of the Peru Current from 5°S to 15°S. In areas along the coast of Peru more than 100 miles offshore and along the equator where fairly clear skies usually prevail in December, SST's will probably increase to 4 to 6°F (2.2 to 3.3°C) above normal.

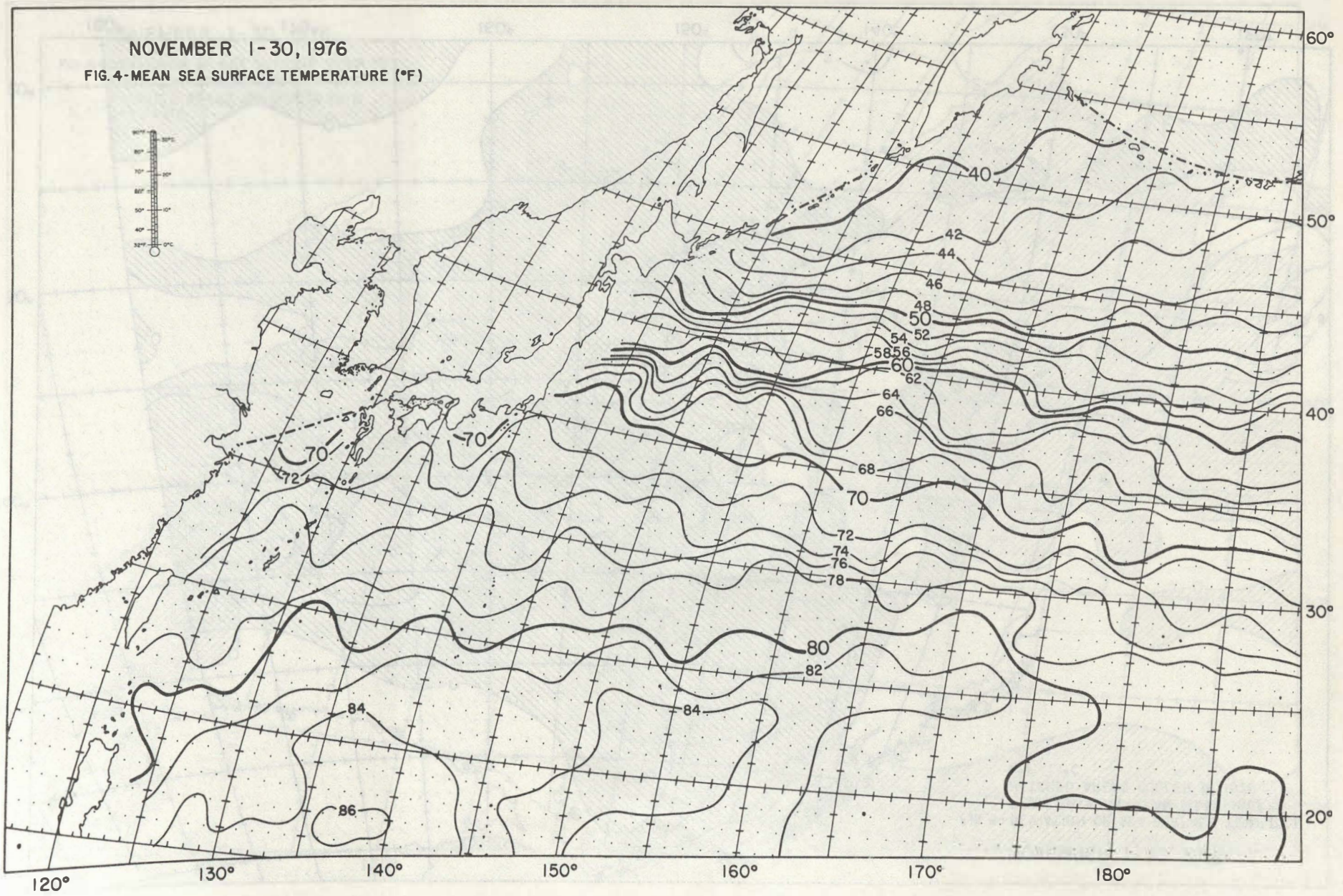
In the central equatorial Pacific, SST's (Figure 8) have been increasing steadily for several months and the positive SST anomalies (Figure 9) increased significantly the past two months. As a result, weather activity along the intertropical convergence zone west of 140°W increased and upwelling of cold subsurface water was markedly reduced. North of the equator SST's were significantly below normal in only two areas. In the Gulf of Tehuantepec (south coast of Mexico) and off the west coast of Costa Rica SST's were 2 to 4°F (1.1 to 2.2°C) below normal, as a result of frequent and persistent northerly winds which followed cold weather outbreaks into the Gulf of Mexico. These strong northerly winds mixed the water to 150 feet or more and rapidly cooled SST's. In contrast to the coastal cooling along Central America, SST's along the west coast of Baja California have been above normal for the past three months. SST's in the local (Baja California) fishing grounds south of 30°N were 6°F (3.3°C) or more above those of November 1975 (Figure 7). Over the remainder of the tropical Pacific north of the equator, SST's were slightly above normal east of 140°W in association with an extensive high pressure ridge, clear skies and light winds, which extended northward to British Columbia. To the west of 140°W, the Aleutian low pressure system over the north central Pacific caused some cooling around the Hawaiian Islands and to the southwest where surface winds and cloud cover were above normal.

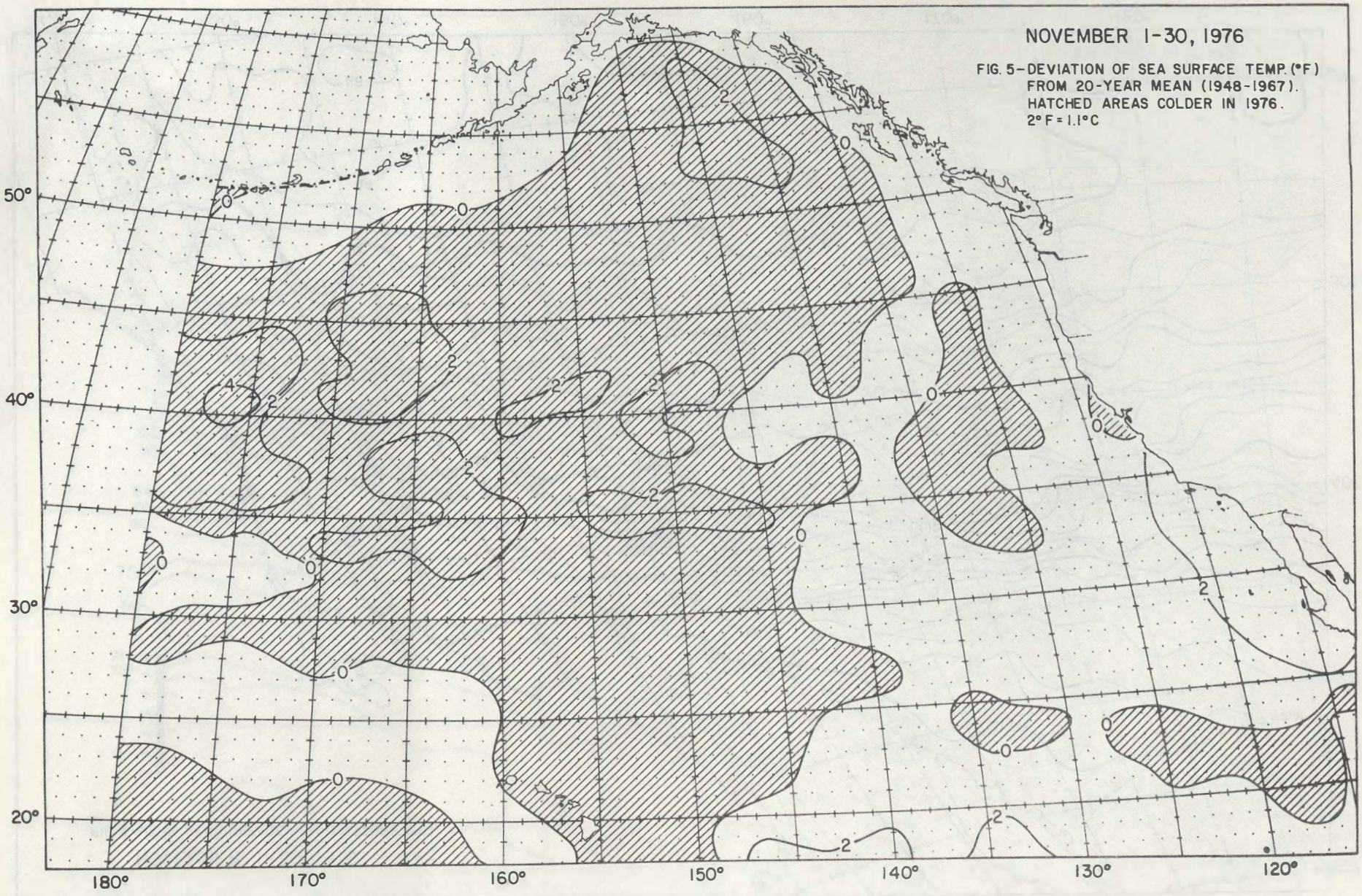


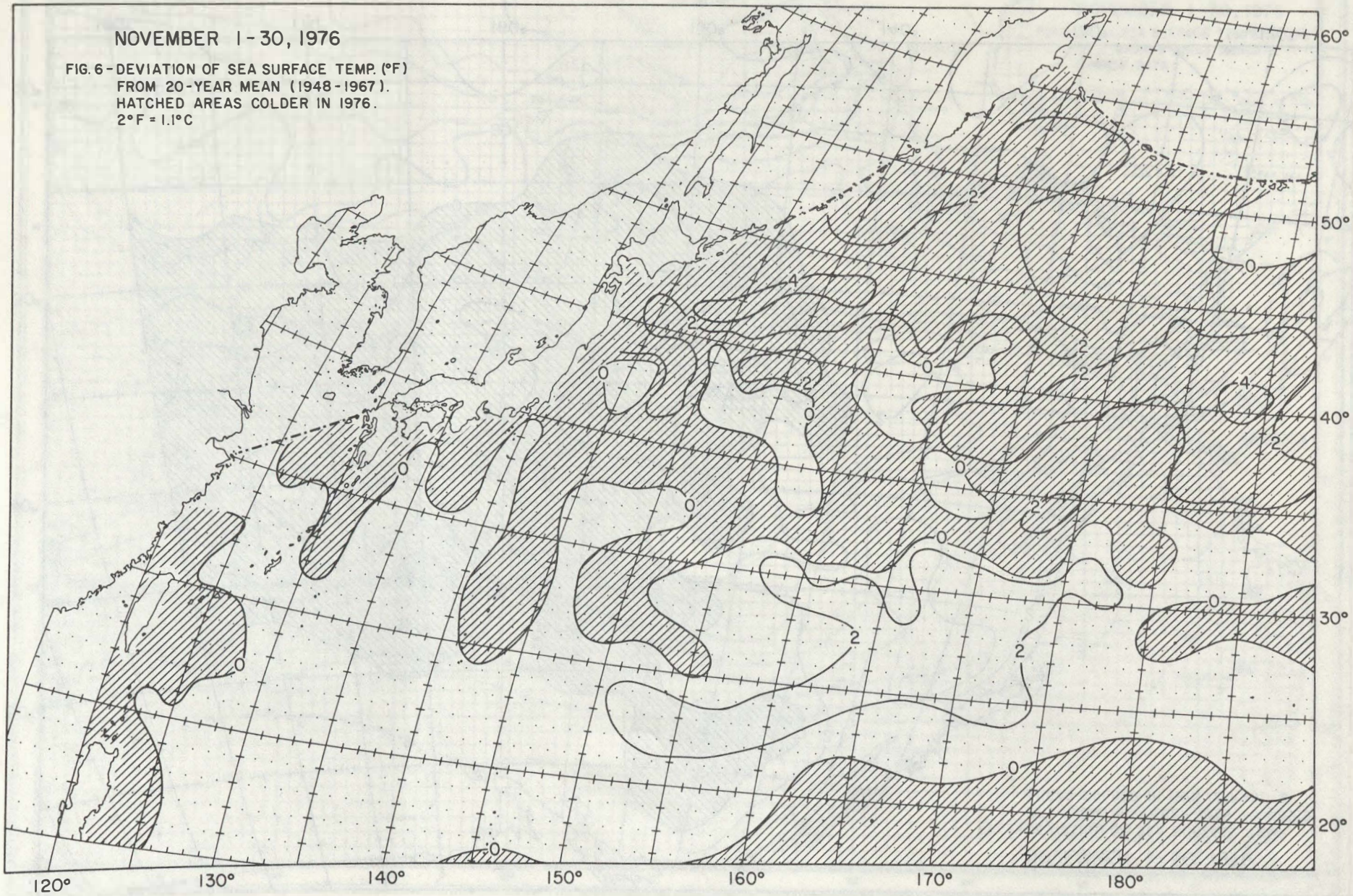

NOVEMBER 1961 - 1976
FIG. 1 — OBSERVED MEAN VALUES
—0000— BAROMETRIC PRESSURE (MILLIBARS).
RESULTANT WIND DIRECTION.
No. RESULTANT WIND SPEED (KTS.)
No. AVERAGE WIND SPEED (KTS.) REGARDLESS OF DIRECTION.
1004
1008
1012
1016
1020
60° N.
55 N.
50 N.
45 N.
40 N.
35 N.
30 N.
25 N.
20 N.
180° W.
175 W.
170 W.
165 W.
160 W.
155 W.
150 W.
145 W.
140 W.
135 W.
130 W.
125 W.
120 W.
115 W.

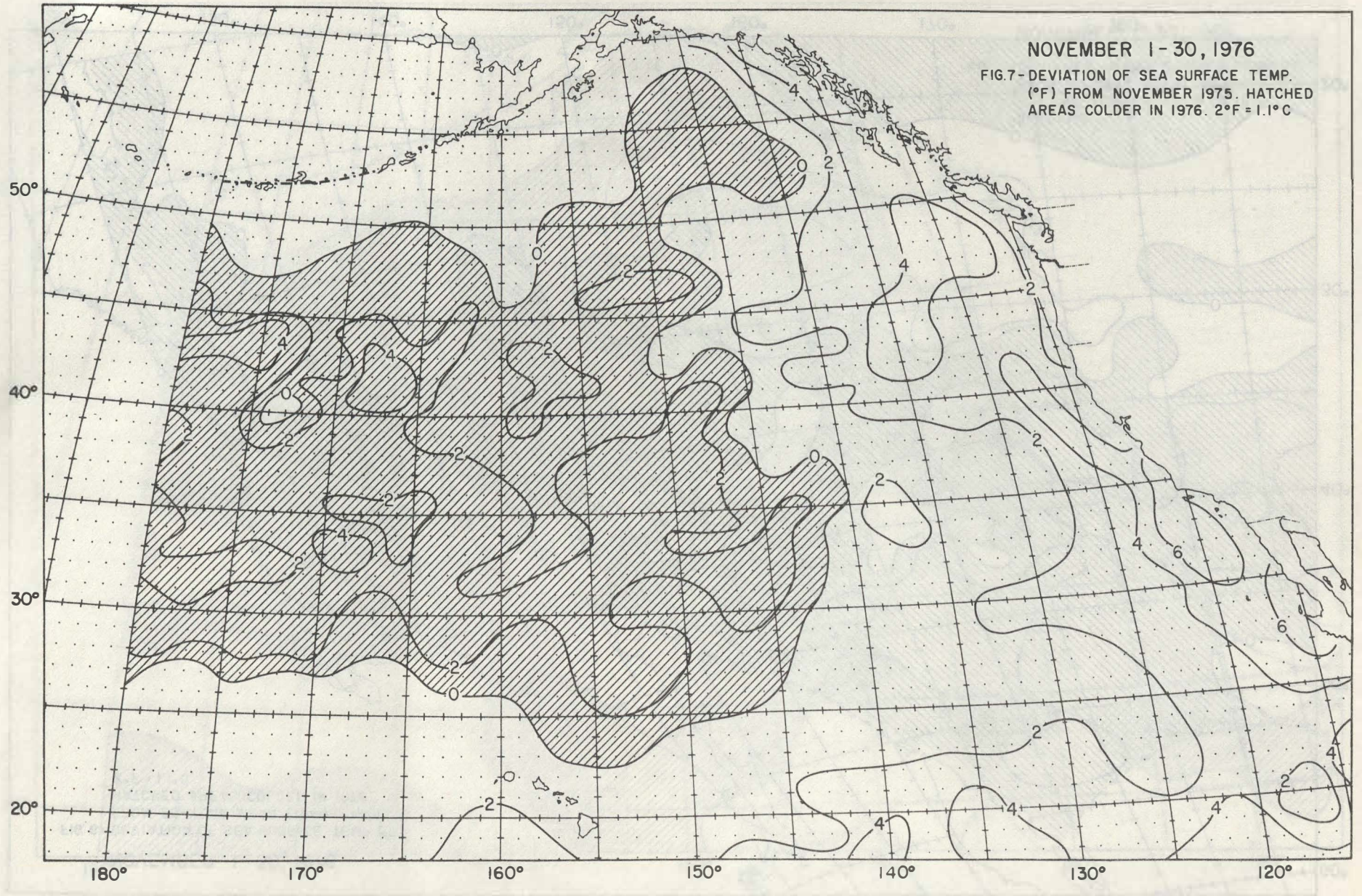

NOVEMBER 1976
FIG. 2 —OBSERVED VALUES
—0000—BAROMETRIC PRESSURE (MILLIBARS).
RESULTANT WIND DIRECTION.
No. RESULTANT WIND SPEED (KTS.)
No. AVERAGE WIND SPEED (KTS.) REGARDLESS OF DIRECTION.
60° N.
55 N.
50 N.
45 N.
40 N.
35 N.
30 N.
25 N.
20 N.
180° W.
175 W.
170 W.
165 W.
160 W.
155 W.
150 W.
145 W.
140 W.
135 W.
130 W.
125 W.
120 W.
115 W.
992
996
1000
1004
1008
1012
1016
1020
1016
1020
1016

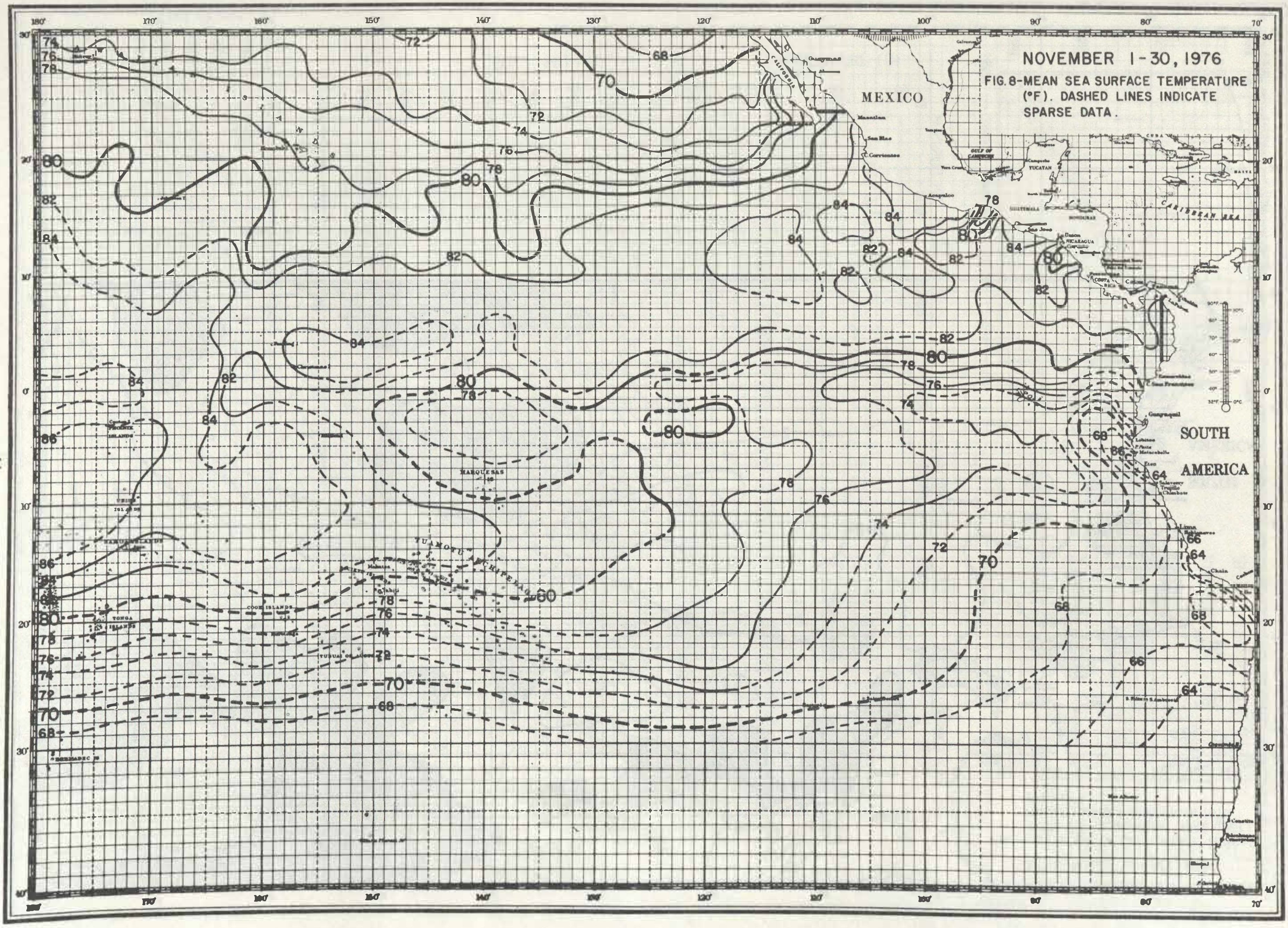

NOVEMBER 1-30, 1976
FIG.3-MEAN SEA SURFACE TEMPERATURE (°F)
50°
40°
30°
20°
180°
170°
160°
150°
140°
130°
120°


NOVEMBER 1-30, 1976
FIG. 4-MEAN SEA SURFACE TEMPERATURE (°F)
40
42
44
46
48
50
52
54
56
58
60
62
64
66
68
70
72
74
76
78
80
82
84
86
70
72
70
84
60°
50°
40°
30°
20°
120°
130°
140°
150°
160°
170°
180°


NOVEMBER 1-30, 1976
FIG. 5-DEVIATION OF SEA SURFACE TEMP. (°F) FROM 20-YEAR MEAN (1948-1967). HATCHED AREAS COLDER IN 1976. 2° F = 1.1° C
50°
40°
30°
20°
180°
170°
160°
150°
140°
130°
120°


NOVEMBER 1-30, 1976
FIG. 6 - DEVIATION OF SEA SURFACE TEMP. (°F) FROM 20-YEAR MEAN (1948-1967). HATCHED AREAS COLDER IN 1976. 2°F = 1.1°C
60°
50°
40°
30°
20°
120°
130°
140°
150°
160°
170°
180°


NOVEMBER 1-30, 1976
FIG.7-DEVIATION OF SEA SURFACE TEMP. (°F) FROM NOVEMBER 1975. HATCHED AREAS COLDER IN 1976. 2°F = 1.1°C
50°
40°
30°
20°
180°
170°
160°
150°
140°
130°
120°


NOVEMBER 1-30, 1976
FIG. 8-MEAN SEA SURFACE TEMPERATURE (°F). DASHED LINES INDICATE SPARSE DATA.
MEXICO
SOUTH AMERICA
MARQUESAS
TUAMOTU ARCHIPELAGO
COOK ISLANDS
TONGA ISLANDS
CARIBBEAN SEA
GULF OF CAMPECHE
YUCATAN
GUATEMALA
HONDURAS
NICARAGUA
COSTA RICA
Mazatlan
San Blas
Acapulco
Guayaquil
Lima
Tahiti
Galapagos

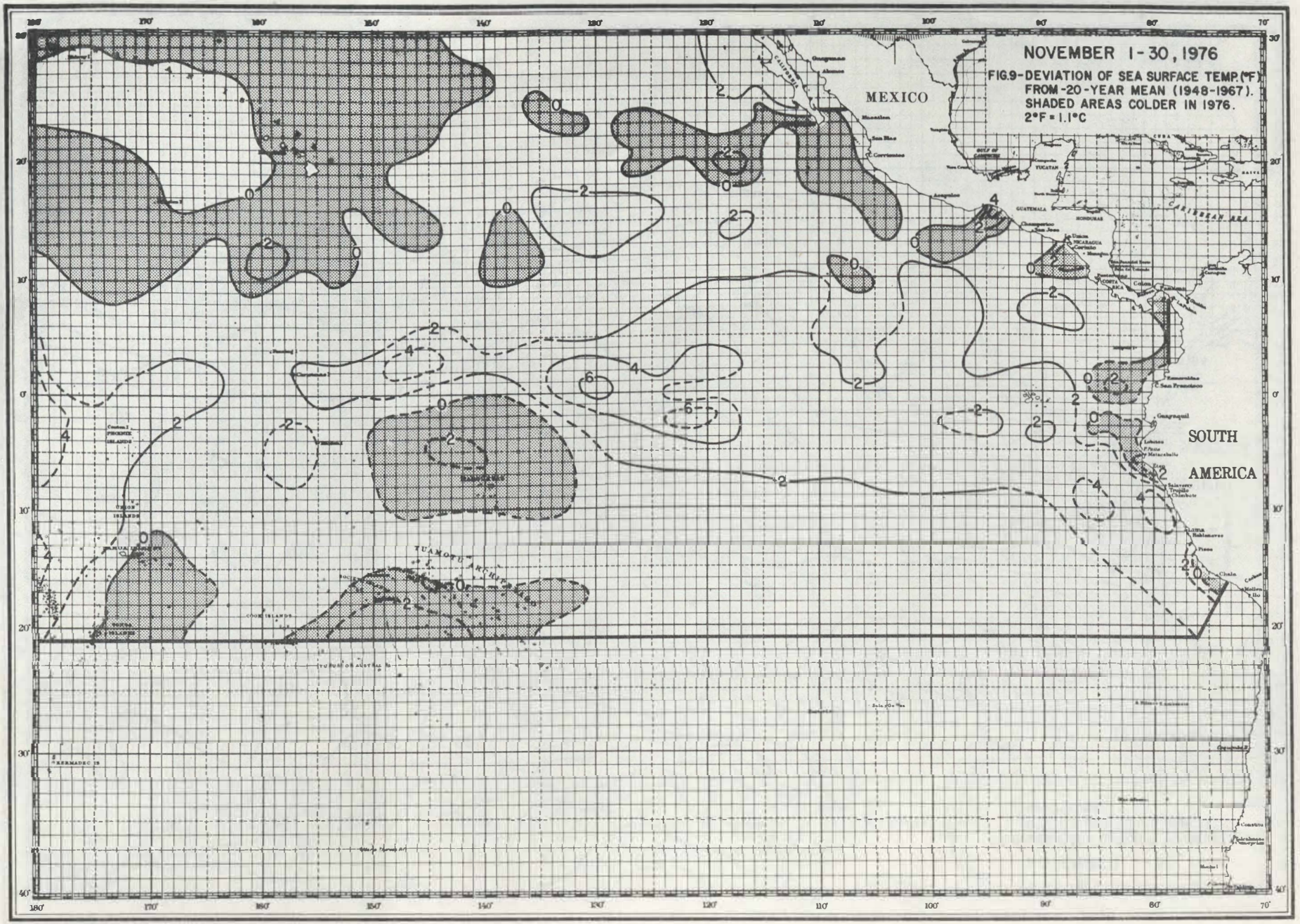

NOVEMBER 1-30, 1976
FIG.9-DEVIATION OF SEA SURFACE TEMP.(°F) FROM-20-YEAR MEAN (1948-1967). SHADED AREAS COLDER IN 1976. 2°F = 1.1°C
MEXICO
SOUTH AMERICA
CARIBBEAN SEA
TUAMOTU ARCHIPELAGO
TUBUAI OR AUSTRAL IS
KERMADEC IS
COOK ISLANDS
PENRHYN ISLANDS
ORONO ISLANDS
180°
170°
160°
150°
140°
130°
120°
110°
100°
90°
80°
70°
30°
20°
10°
0°
40°

FIGURE 10

SHIP HAWAIIAN QUEEN

VOYAGE 192

MATSON

SAN FRANCISCO, CA.

- MAKAPUU PT, OAHU, HAWAII

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