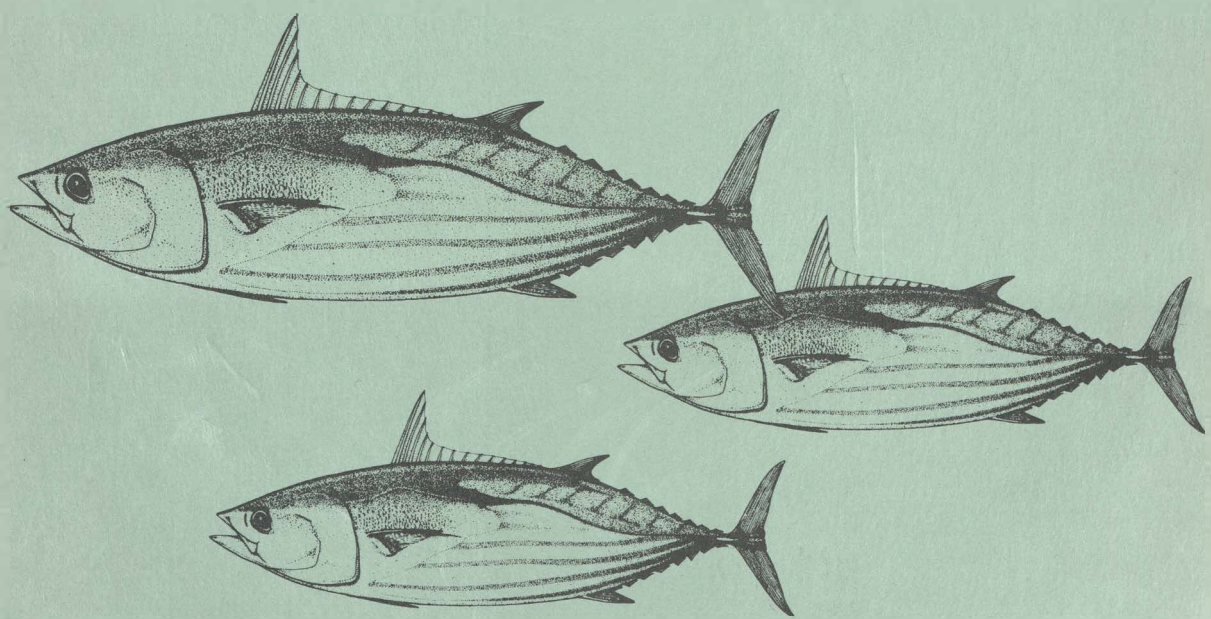
AUGUST 1976
No. 8

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

AUGUST 1976 , No. 8

EDITOR: JAMES A. RENNER

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 - October 4, 1976

CONTENTS

ENVIRONMENTAL CHARTS ANALYZED BY:

F. Miller (Figures 8 and 9)
J. Renner (Figures 1, 2, 3, 4, 5, 6, 7, 10, 11, 12 and 15 day Supplement)

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

Acknowledgements

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National Environmental Satellite Service, Washington, D.C.
National Marine Fisheries Service, La Jolla, California; Honolulu, Hawaii
National Ocean Survey, Pacific Marine Center, Seattle, Washington
National Weather Service, San Diego, California and Washington, D.C.
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; G. Anderson 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, Cabrillo, Caribe, Cheryl Marie, Christina C., Eastern Pacific, Frances Ann, Gemini, Karen Mary, Maria C.J., Maria Elena, Marietta, Mermaid, Polaris, Raefello, Santa Elena, Santa Rosa, Saratoga, Seaquest, Sea Treasure, Venturous, Willa G.*

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

Sea Surface Temperature and Environmental Conditions

N. CLARK AND F. MILLER

Eastern North Pacific

Although sea surface temperatures increased over the entire eastern North Pacific during August 1976, they did so at below normal rates. The area of greatest warming occurred between 35° N and 50° N and 150° W and 180° where the temperatures increased by 3 to 5° F (1.7 to 2.8° C) between July and August.

The sea surface temperature anomaly pattern for August is similar to that for July with a band of 1 to 3° F (0.6 to 1.7° C) above-normal temperatures extending across the entire eastern North Pacific between 25° N and 35° N and offshore southern Oregon and northern California; 2 to 6° F (1.1 to 3.3° C) below-normal temperatures extend northward from 35° N to the Aleutian Islands and over the entire Gulf of Alaska; 1 to 2° F (0.6 to 1.1° C) below-normal temperatures persisted throughout the month off central California, while above-normal temperatures off southern California and northern Baja California dropped to 1 to 3° F (0.6 to 1.7° C) below-normal values.

Sea level pressures were up to 3 millibars below normal over most of the eastern North Pacific north of 40° N during August and were around 1 millibar above normal south of 40° N. These conditions resulted in an average high pressure cell centered near 35° N and 155° W and above-normal westerly winds between 40° N and 55° N due to the strong north-south pressure gradients over this region. Coastal upwelling decreased along the coast between Cape Blanco and Point Conception because of weaker-than-normal north-to-northwesterly winds; however, upwelling increased and ocean warming was impeded off southern California and northern Baja California due to an increase in northwesterly winds during the month.

Western North Pacific

The greatest change in the sea surface temperature anomaly pattern during August 1976 occurred between 35° N and 50° N and 150° E and 180° where temperatures that were either 1 to 3° F (0.6 to 1.7° C) above or below normal decreased to 2 to 8° F (1.1 to 4.4° C) below-normal values.

Temperatures that were 2 to 4° F (1.1 to 2.2° C) below normal over the area between 20° N and 35° N and 125° E and 150° E increased to slightly above-normal values.

The area of above-normal temperatures that appeared east of Honshu during July disappeared during August, and 1 to 4° F (0.6 to 2.2° C) below-normal temperature conditions developed offshore both Honshu and Hokkaido.

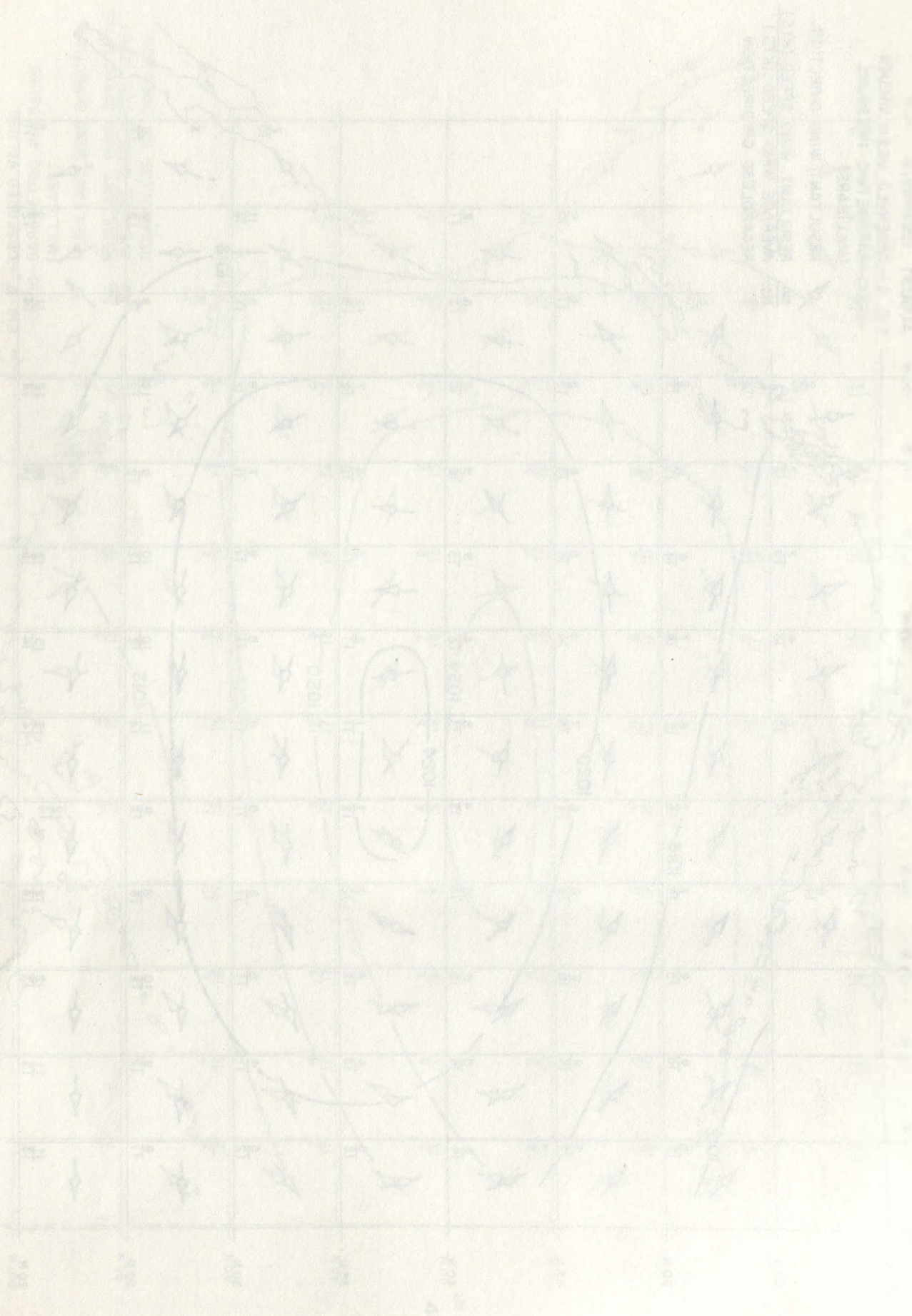
Eastern Tropical Pacific

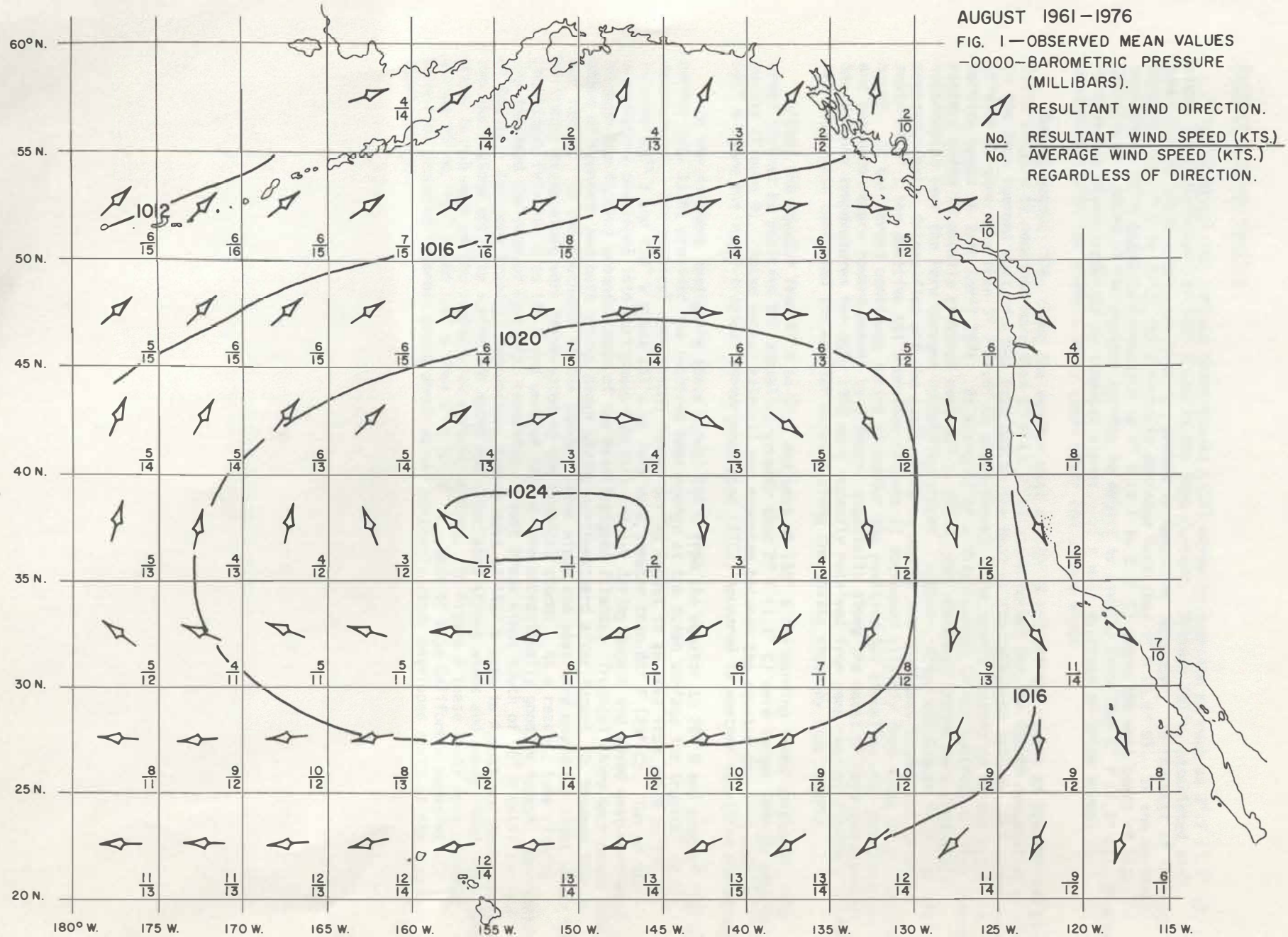
During August sea surface temperatures (SST) normally decrease as much as 3° F (1.7° C) along the equator east of 110° W and in the Peru Current. Minimum SST's, associated with upwelling in these areas, are usually reached in August or September. To the west of the Peru Current from 5° S to 30° S SST's normally decrease less than 1° F (0.6° C). In the northern hemisphere SST's normally increase 2 to 4° F (1.1 to 2.2° C) along the west coast of Baja California. North of the equator warming in August is usually less than 2° F (1.1° C). However, at times in areas traversed by tropical storms, SST's will decrease to below normal in association with the storm's heavy cloud cover and strong winds.

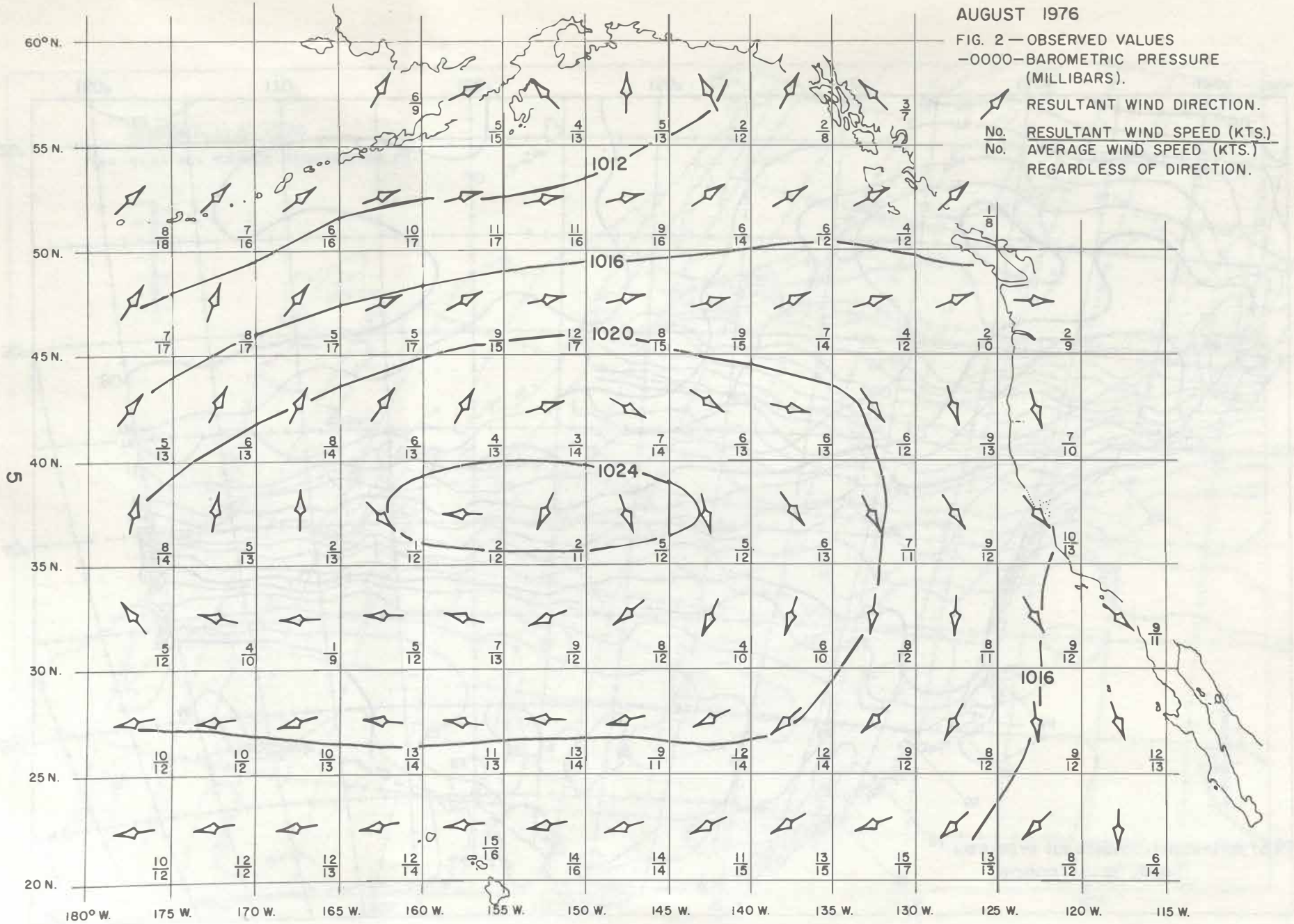
During August 1976, along the equator east of 120° W and off the coasts of Ecuador and Peru, SST's (Figure 8) remained more than 2° F (1.1° C) above normal for the fourth consecutive month. In the Peru Current west of Lima, Peru and to the west of the Galápagos Islands, SST anomalies (Figure 9) were more than 3° F (1.6° C) above normal. The events leading up to the extensive warming began in late April 1976. As a result of a displacement in the subtropical high pressure center, which is usually centered near 30° S, 90° W, the southeast trades were frequently interrupted over the Peru Current by passing storms. However, after mid-August 1976, the high pressure center intensified off the coast of Peru; and as the southeast trades set in again south of 5° S the positive SST anomalies (Figure 9) decreased slightly from those of the previous month. If this trend continues during September the positive SST anomalies will not increase and may even return toward normal by October, especially along the coast of Peru and Ecuador. Sea surface temperatures for July 1976 were recently received from some coastal stations in Peru and these data confirmed the earlier warming along the coasts shown by ship reports.

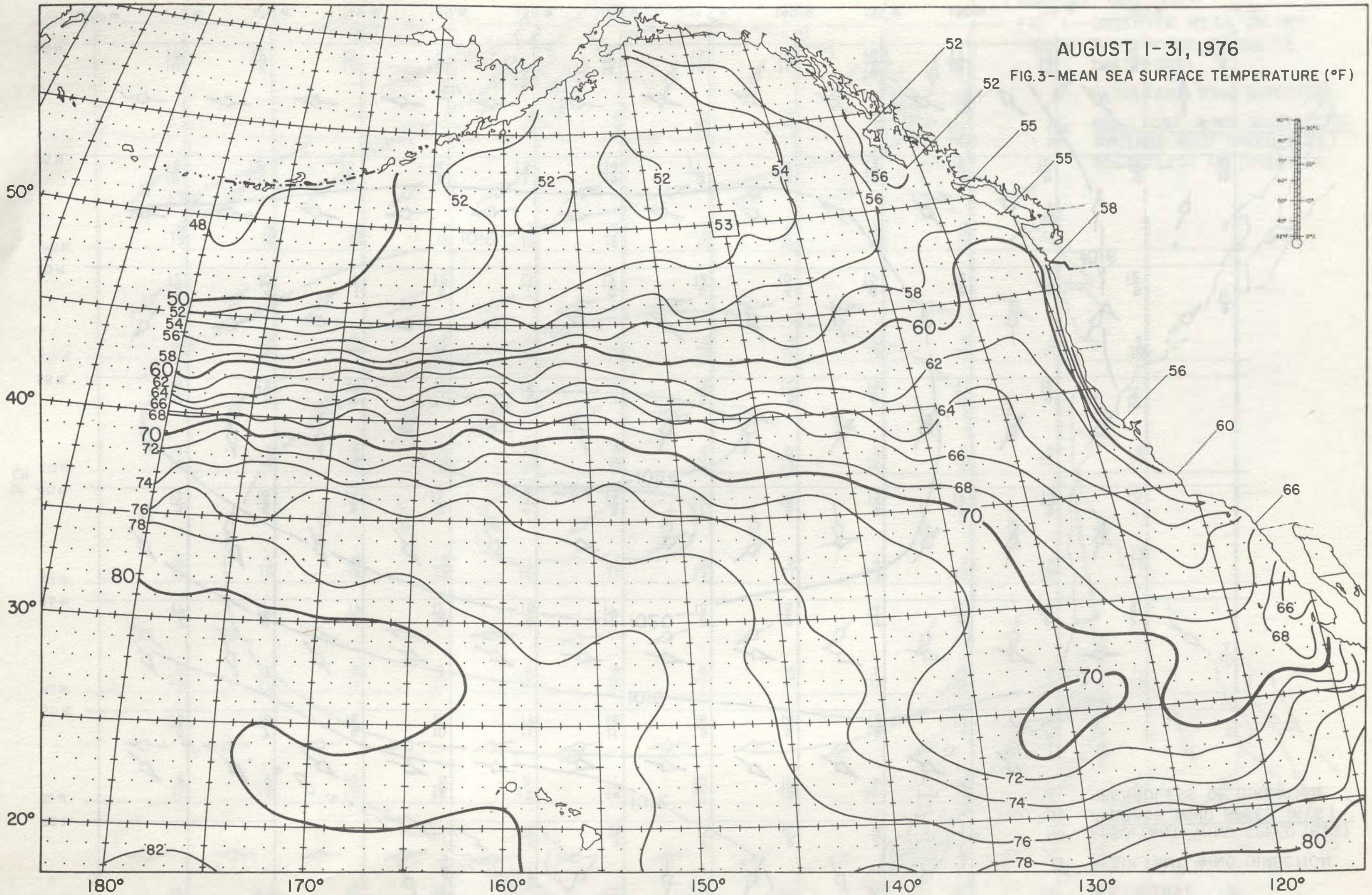
Along the equator from 5° N to 5° S and west of 130° W the warming trend continued. The areas covered by positive SST anomalies greater than 2° F (1.1° C) were larger than in previous months (Figure 9). Above normal rainfall was reported between the equator and 5° N west of 140° W where the inter-tropical convergence zone (ITCZ) appeared in weather satellite photographs.

In the northern hemisphere above normal SST's from the equator to 20° N and east of 130° W during July 1976, provided the required heat energy at the ocean surface for tropical storm development. Six tropical depressions formed during August in an area from 10° N to 15° N between 100° W and 120° W where SST's in July were greater than 84° F (29° C). Two of the depressions developed into hurricanes Hyacinth and Iva during August and moved west-northwest through the fishing grounds south of the Revillagigedo Islands. Tropical storm Gwen moved west ahead of Hyacinth and both storms began moving northwestward after August 10, between 120° W and 130° W. To the southwest of the storms' paths winds and seas were unusually light where the northeast trade winds were interrupted by the tropical storms. As a result, tuna fishing conditions from 10° N to 15° N and west of 120° W were exceptionally good in August. Hurricane Iva followed the path of Hyacinth, resulting in weak trade winds south of 15° N until the end of August. Two more tropical depressions formed east of 110° W late in August and moved westward. The heavy storm activity during the month and associated strong winds and heavy cloud cover left areas in the wake of the storms with deficit heating. In Figure 9 these areas were centered around 95° W, 105° W and 120° W from 5° N to 15° N. West of Baja California negative SST anomalies occurred in areas where above normal northerly winds developed north of the tropical storm centers.




AUGUST 1961–1976
FIG. 1—OBSERVED MEAN 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.

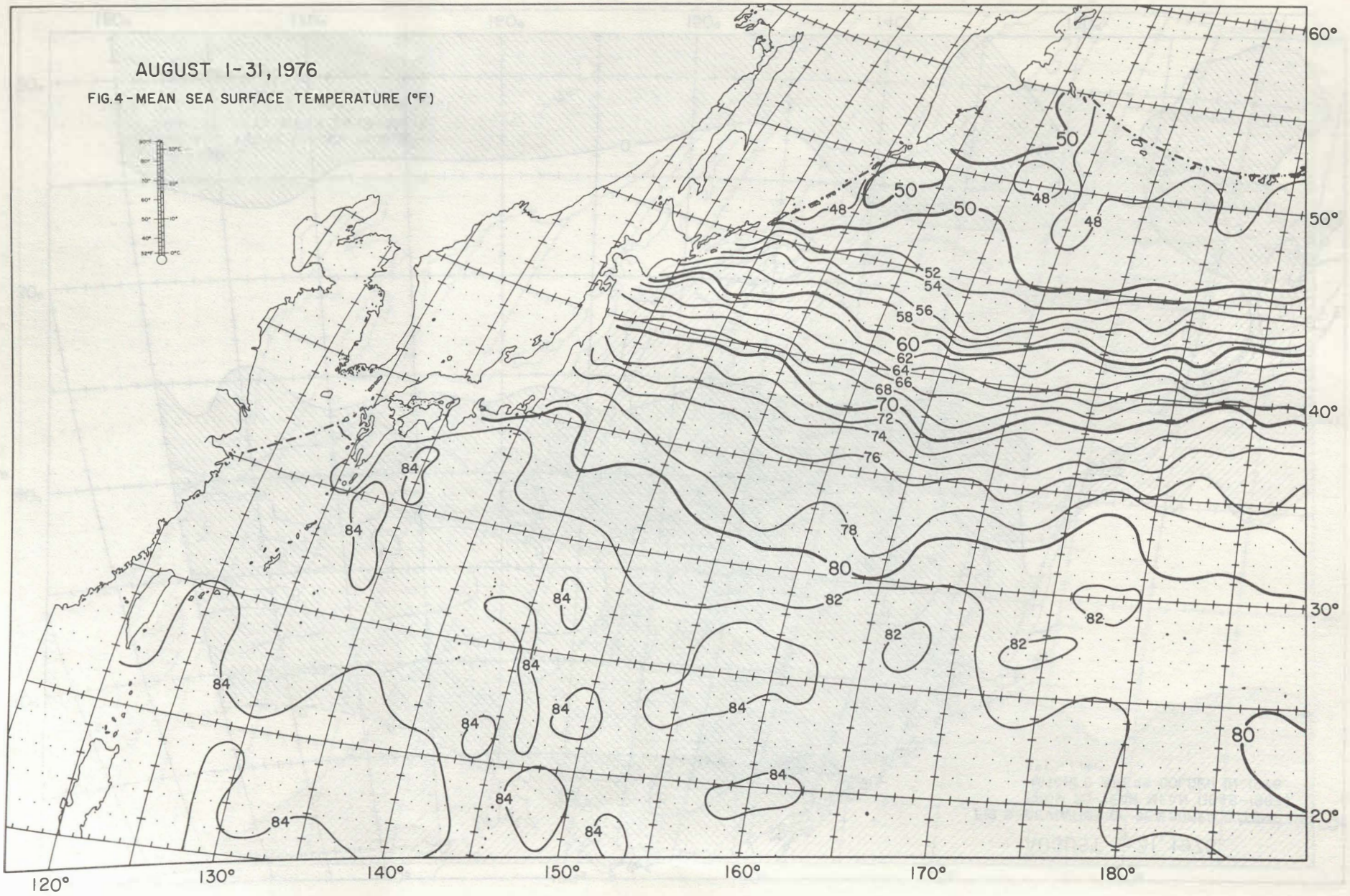

AUGUST 1976
FIG. 2 — OBSERVED VALUES
—0000— BAROMETRIC PRESSURE (MILLIBARS).
RESULTANT WIND DIRECTION.
No. / No. RESULTANT WIND SPEED (KTS.) / AVERAGE WIND SPEED (KTS.) REGARDLESS OF DIRECTION.
1012
1016
1020
1024
1016
60° N.
55 N.
50 N.
45 N.
40 N.
35 N.
30 N.
25 N.
20 N.
180° W.
175 W.
170 W.
165 W.
160 W.
155 W.
150 W.
145 W.
140 W.
135 W.
130 W.
125 W.
120 W.
115 W.

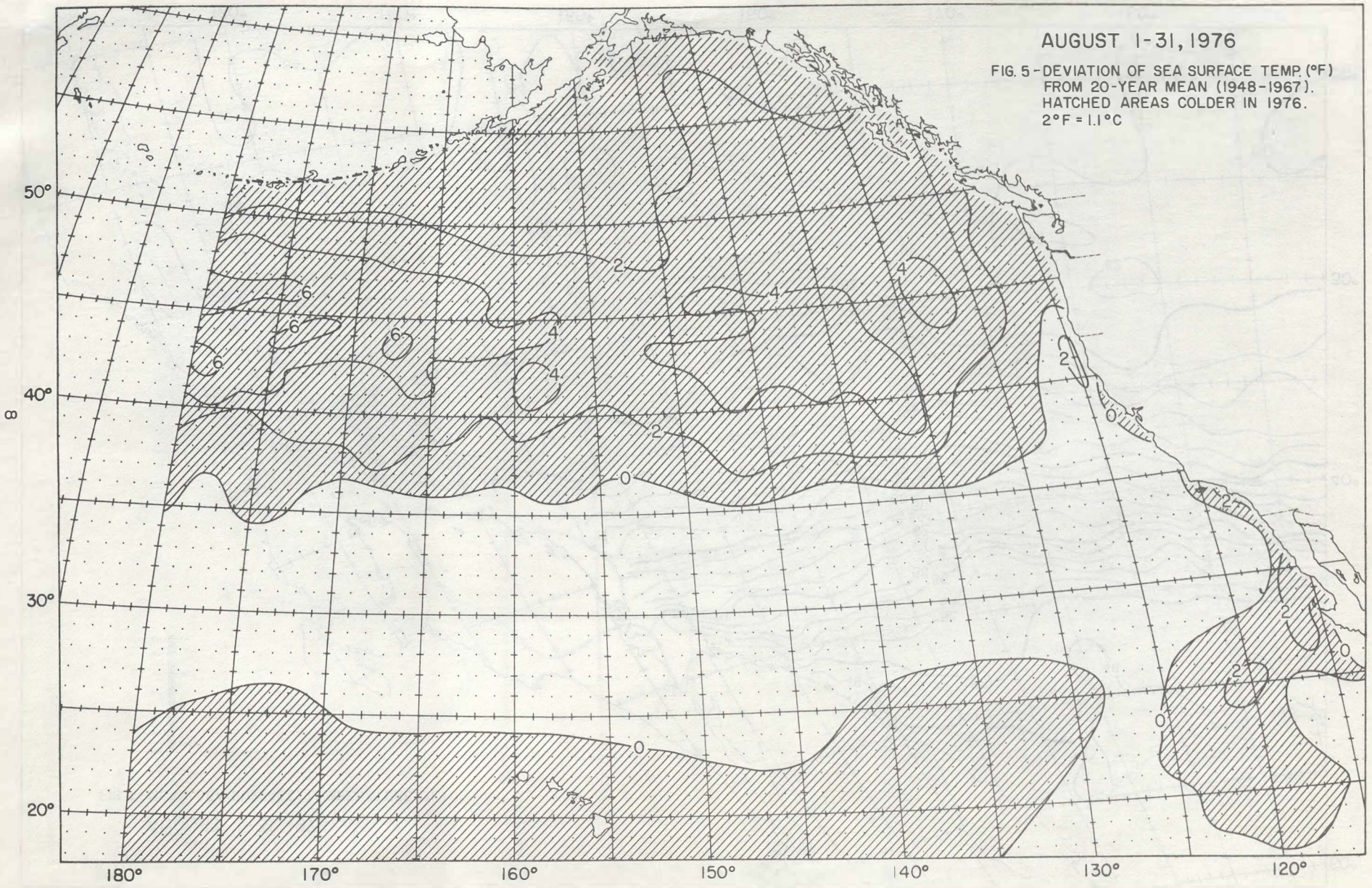


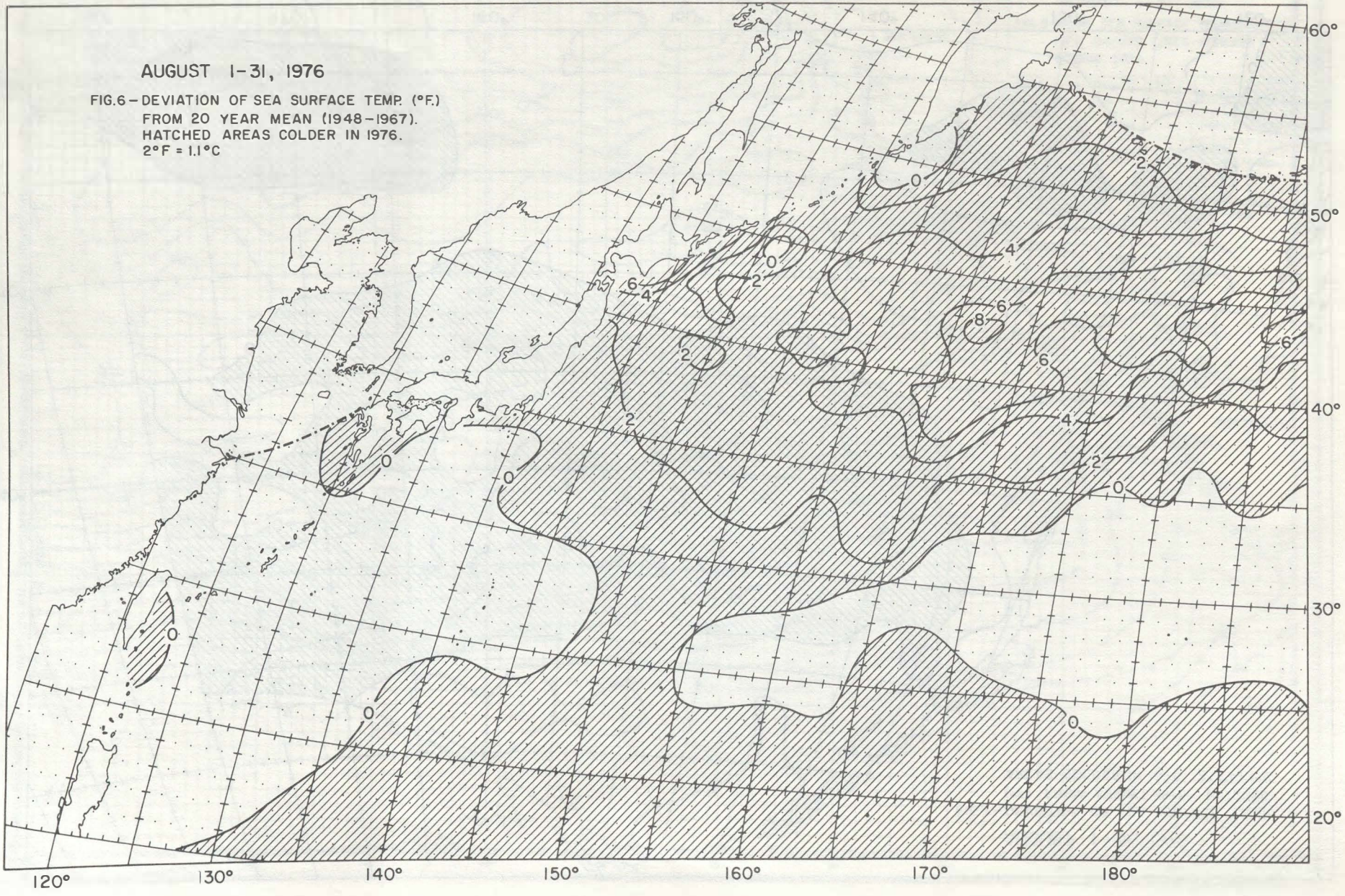
AUGUST 1-31, 1976
FIG.3-MEAN SEA SURFACE TEMPERATURE (°F)

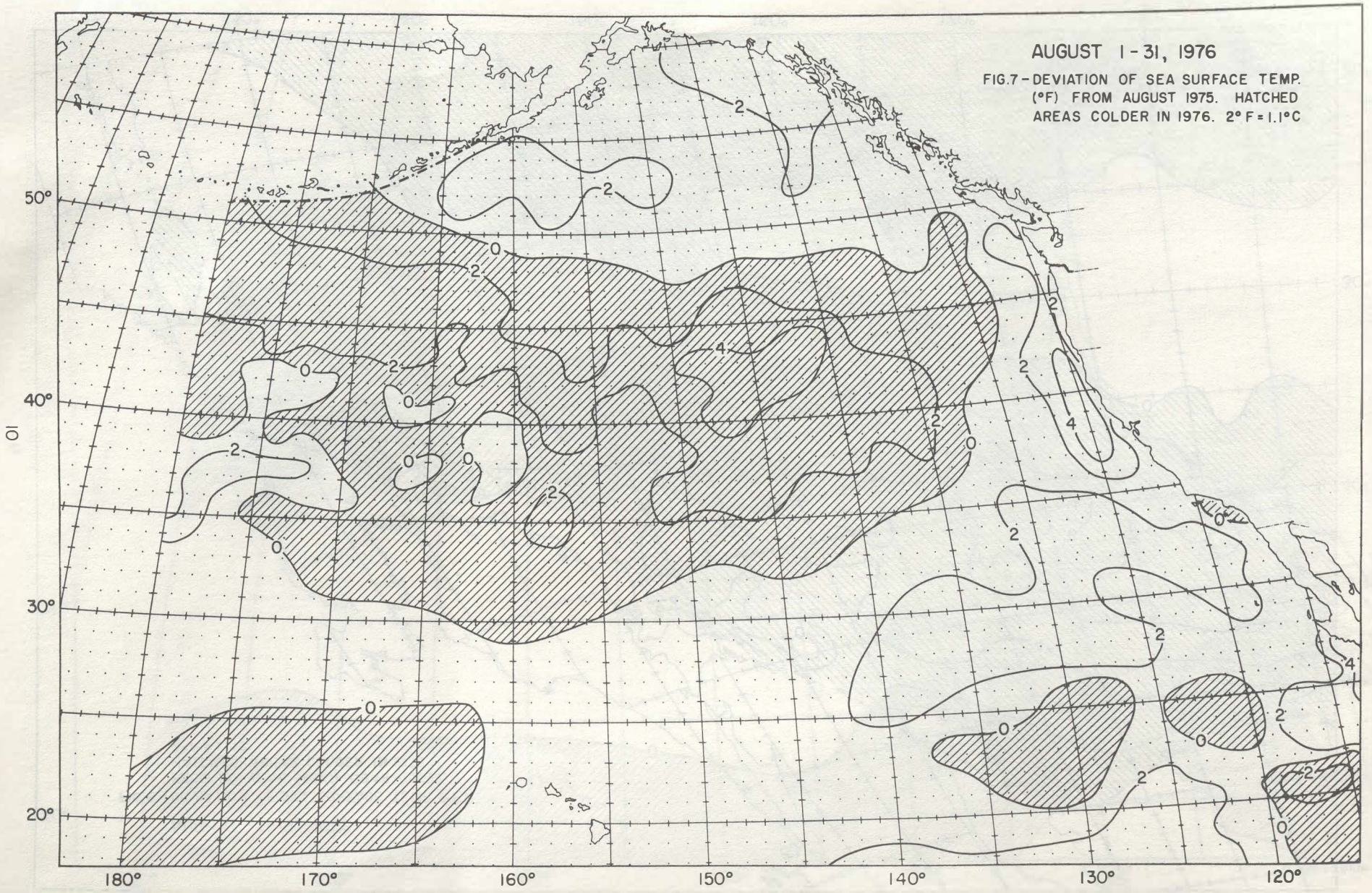
AUGUST 1-31, 1976

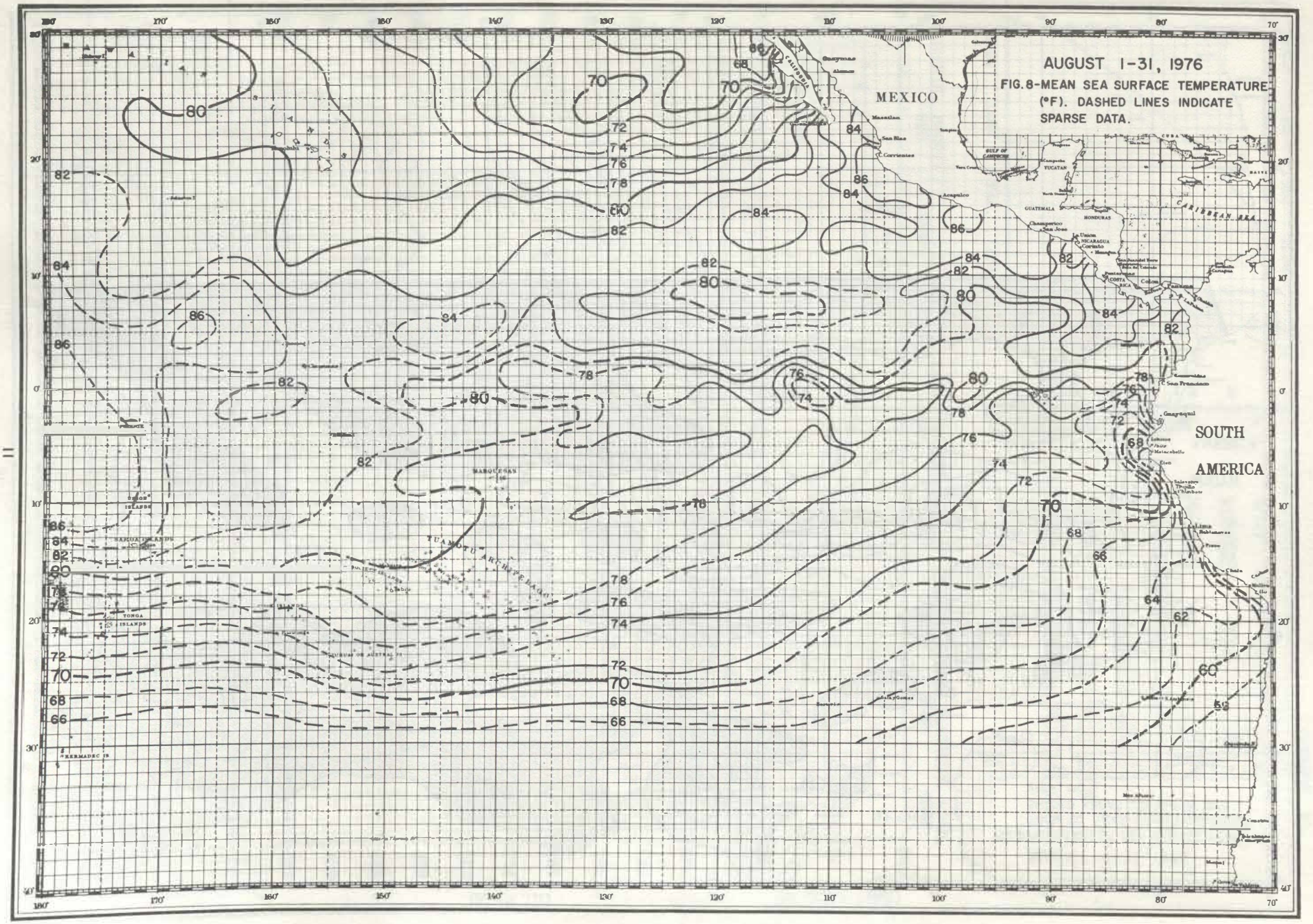
FIG.4 - MEAN SEA SURFACE TEMPERATURE (°F)




AUGUST 1-31, 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°
6
4
2
0


AUGUST 1-31, 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°
0
2
4
6
8


AUGUST 1 - 31, 1976
FIG.7 - DEVIATION OF SEA SURFACE TEMP. (°F) FROM AUGUST 1975. HATCHED AREAS COLDER IN 1976. 2° F = 1.1°C
50°
40°
30°
20°
180°
170°
160°
150°
140°
130°
120°


AUGUST 1-31, 1976
FIG. 8-MEAN SEA SURFACE TEMPERATURE (°F). DASHED LINES INDICATE SPARSE DATA.
MEXICO
SOUTH AMERICA
CARIBBEAN SEA
TUAMOTU ARCHIPELAGO
TONGA ISLANDS
KERMADEC IS

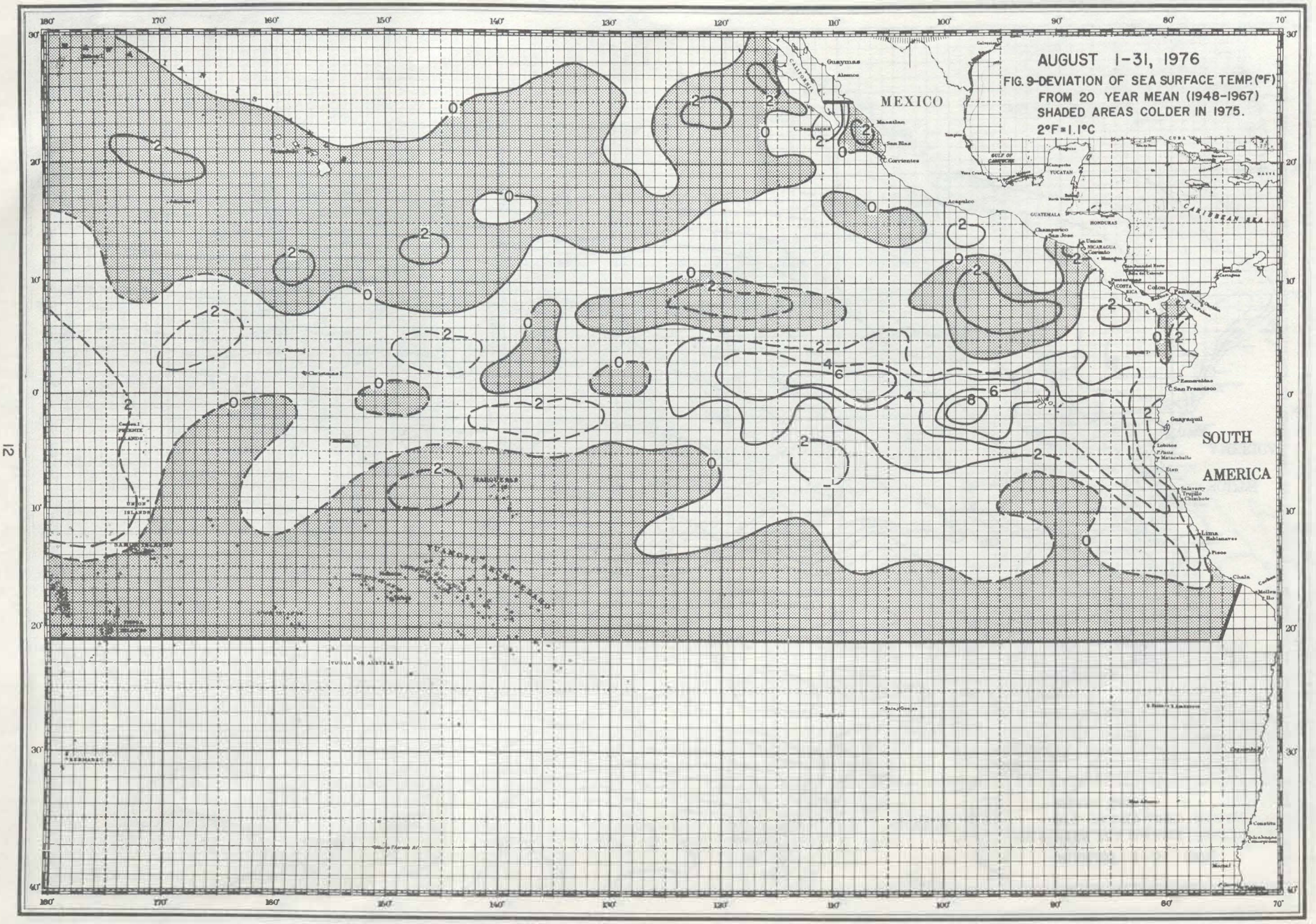
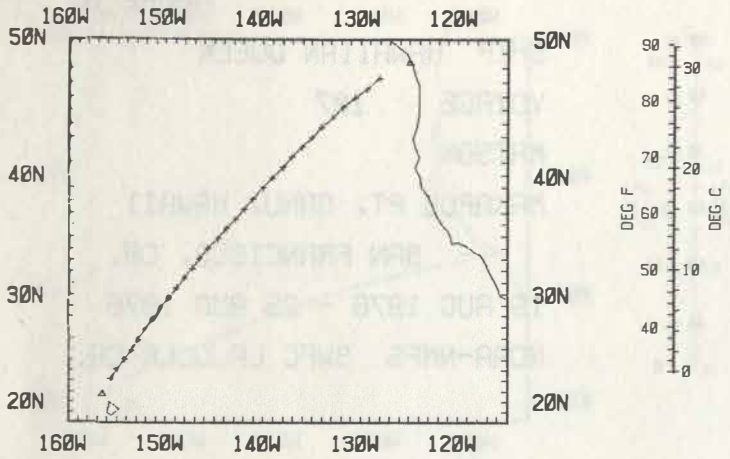

AUGUST 1-31, 1976
FIG. 9-DEVIATION OF SEA SURFACE TEMP. (°F)
FROM 20 YEAR MEAN (1948-1967)
SHADED AREAS COLDER IN 1975.
2°F = 1.1°C
MEXICO
SOUTH
AMERICA
CARIBBEAN SEA
GUATEMALA
HONDURAS
NICARAGUA
COSTA RICA
Guaymas
Mazatlan
San Blas
C. Corrientes
Acapulco
Champerico
San Jose
Corinto
Panama
Colon
Guayaquil
Salaverry
Trujillo
Chimbote
Lima
Pisco
Chala
Mollendo
Arica
Iquique
Antofagasta
Coquimbo
Valparaiso
Talcahuano
Concepcion
Corral
Puerto Montt
Chiloe I.
Juan Fernandez Is.
Easter I.
Galapagos Is.
Cocos I.
REVILLAGIGEDO IS.
CLIPPERTON I.
MALPELO I.
GORGONA I.
GULF OF CALIFORNIA
GULF OF CAMPECHE
YUCATAN
CUBA
HAITI
JAMAICA
Tampico
Veracruz
Galveston
Progreso
Campeche
Belize
Roatan
Puerto Limon
Cartagena
Maracaibo
Aruba
Curacao
Trinidad
Barbados
Tobago
Margarita I.
Guadeloupe
Martinique
St. Lucia
St. Vincent
Grenada
Bermuda
Azores
Canary Is.
Cape Verde Is.
Madeira
Tuamotu Archipelago
Society Is.
Marquesas Is.
Samoa Is.
Tonga Is.
Fiji Is.
Tuvalu or Ellice Is.
Gilbert Is.
Marshall Is.
Caroline Is.
Mariana Is.
Wake I.
Johnston I.
Line Islands
Phoenix Islands
Union Islands
Hawaiian Islands
Midway Is.
Bermuda Is.
Sala y Gomez
Nazca
Chala
Mollendo
Arica
Iquique
Antofagasta
Coquimbo
Valparaiso
Talcahuano
Concepcion
Corral
Puerto Montt
Chiloe I.
Juan Fernandez Is.
Easter I.
Galapagos Is.
Cocos I.
REVILLAGIGEDO IS.
CLIPPERTON I.
MALPELO I.
GORGONA I.
GULF OF CALIFORNIA
GULF OF CAMPECHE
YUCATAN
CUBA
HAITI
JAMAICA
Tampico
Veracruz
Galveston
Progreso
Campeche
Belize
Roatan
Puerto Limon
Cartagena
Maracaibo
Aruba
Curacao
Trinidad
Barbados
Tobago
Margarita I.
Guadeloupe
Martinique
St. Lucia
St. Vincent
Grenada
Bermuda
Azores
Canary Is.
Cape Verde Is.
Madeira
Tuamotu Archipelago
Society Is.
Marquesas Is.
Samoa Is.
Tonga Is.
Fiji Is.
Tuvalu or Ellice Is.
Gilbert Is.
Marshall Is.
Caroline Is.
Mariana Is.
Wake I.
Johnston I.
Line Islands
Phoenix Islands
Union Islands
Hawaiian Islands
Midway Is.
Bermuda Is.
Sala y Gomez
Nazca

FIGURE 10



SHIP CALIFORNIAN

VOYAGE 274

MATSON

CAPE FLATTERY, WASH.

- KAHULUI, HAWAII

11 AUG 1976 - 17 AUG 1976

NOAA-NMFS SWFC LAJOLLA CA.

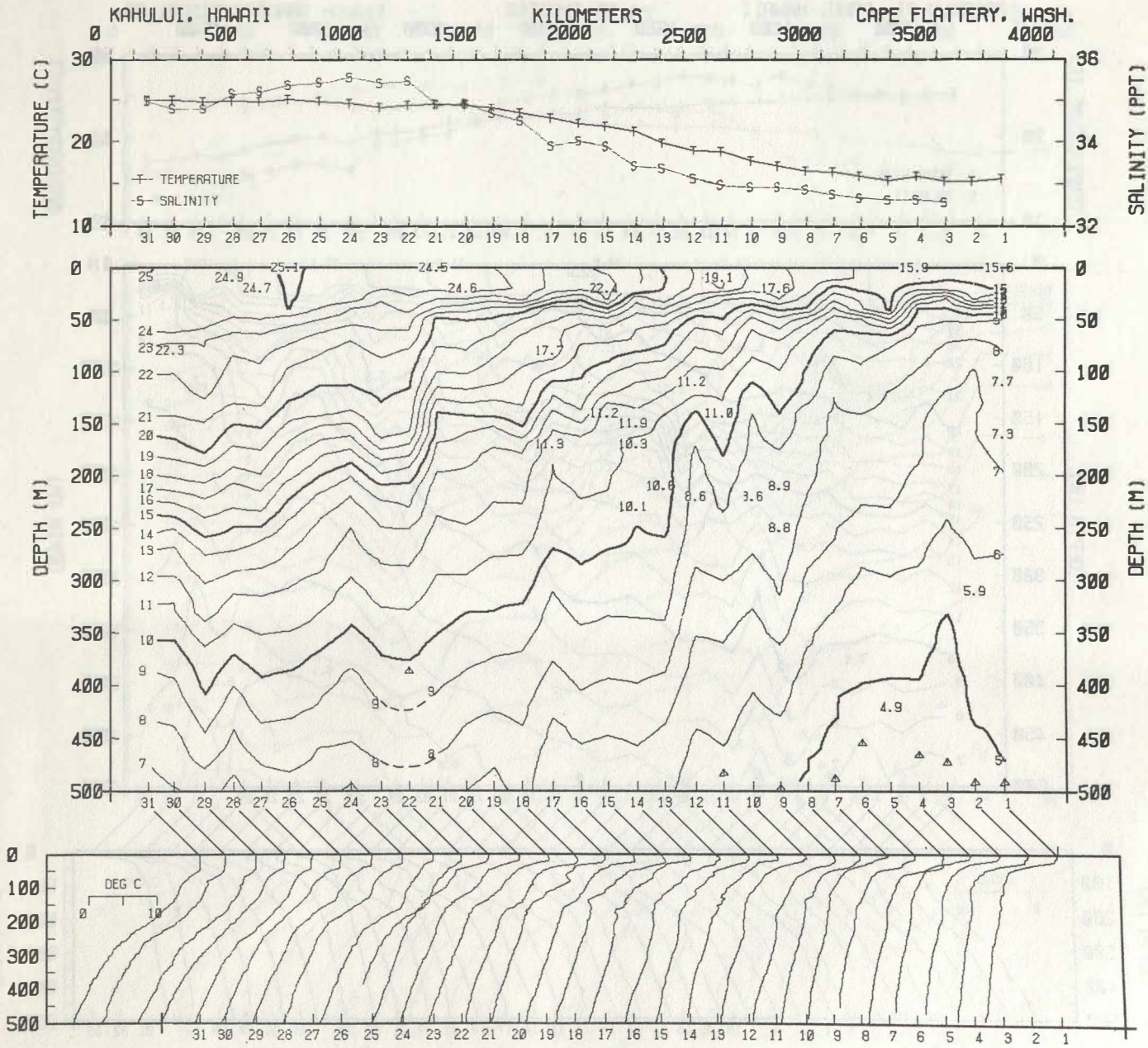
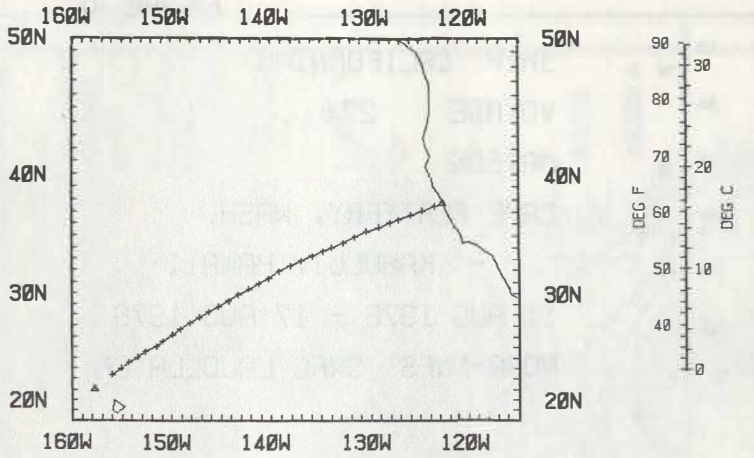


FIGURE 11



SHIP HAWAIIAN QUEEN

VOYAGE 187

MATSON

MAKAPUU PT, OAHU, HAWAII

- SAN FRANCISCO, CA.

19 AUG 1976 - 25 AUG 1976

NOAA-NMFS SWFC LAJOLLA CA.

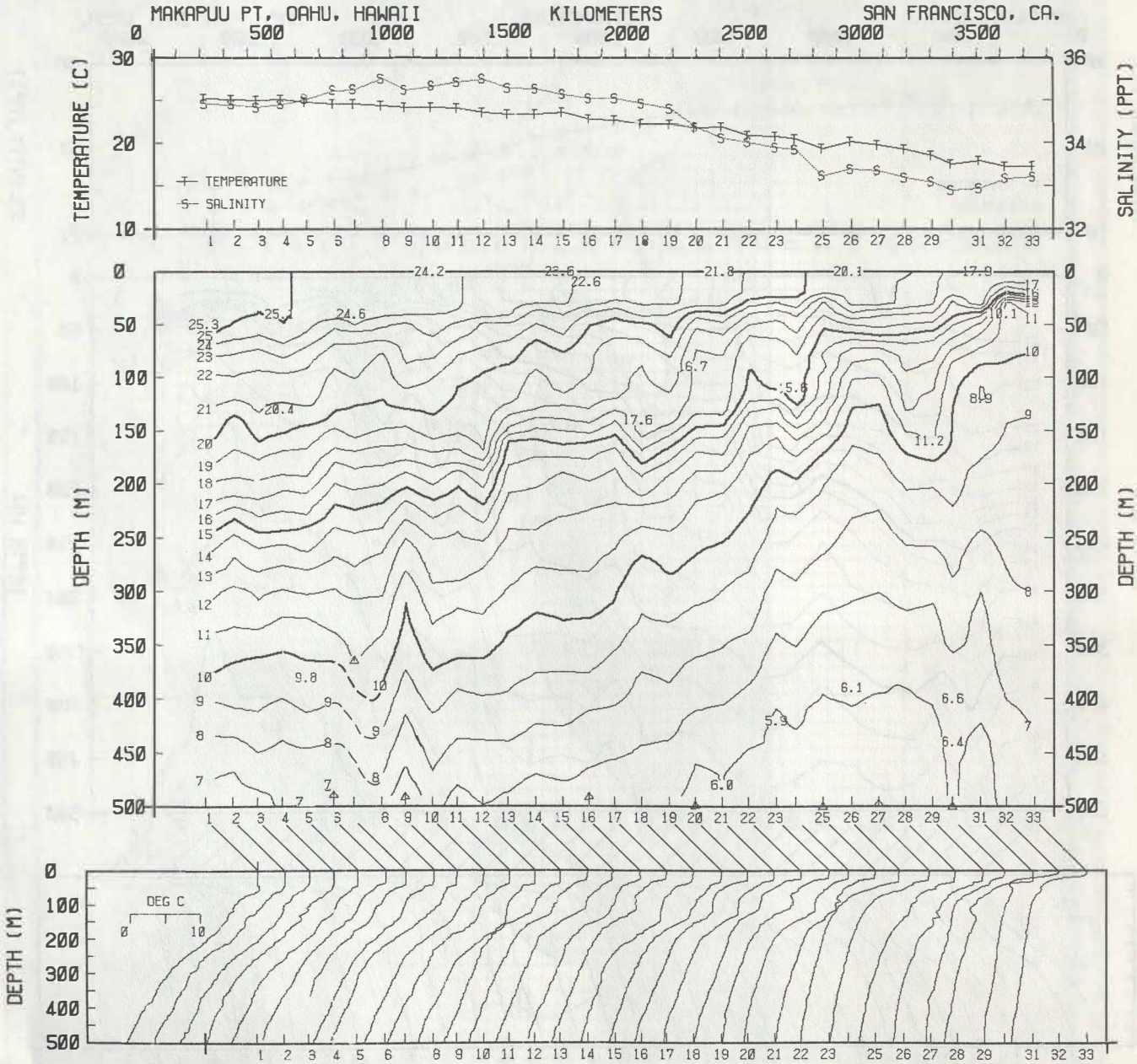
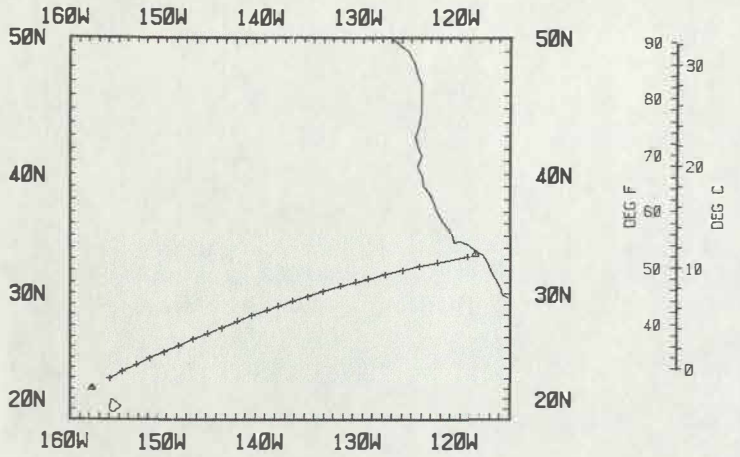


FIGURE 12



SHIP HAWAIIAN ENTERPRISE

VOYAGE 147

MATSON

MAKAPUU PT, OAHU, HAWAII

- LOS ANGELES, CA.

11 AUG 1976 - 16 AUG 1976

NOAA-NMFS SWFC LAJOLLA CA.