EASTROPAC Atlas

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Biological and nutrient chemistry data from principal participating ships, first survey cruise, February-March 1967.

Published
June 1972

Volume 3
Physical oceanographic and meteorological data from principal participating ships, first and second monitor cruises, April-July 1967.

Published
September 1971

Volume 4
Biological and nutrient chemistry data from principal participating ships, first and second monitor cruises, April-July 1967.

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November 1970

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Physical oceanographic and meteorological data from principal participating ships, second survey cruise, August-September 1967.

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September 1972

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December 1972

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Published
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In preparation

Volume 11
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In preparation

ABSTRACT

This atlas contains charts depicting the distribution of physical, chemical, and biological oceanographic properties and associated meteorological properties observed during EASTROPAC. EASTROPAC was an international cooperative investigation of the eastern tropical Pacific Ocean (20° N. to 20° S. and from the west coasts of the American continents to 119° W.), which was intended to provide data necessary for a more effective use of the marine resources of the area, especially tropical tuna, and also to increase knowledge of the ocean circulation, air-sea interaction, and ecology. The Bureau of Commercial Fisheries (now National Marine Fisheries Service) was the coordinating agency. The field work, from February 1967 through March 1968, was divided into seven 2-month cruise periods. During each cruise period one or more ships were operating in the study area.

On completion of the field work the data amassed too numerous for a classical data report. Instead, it was decided to produce a 11-volume atlas of the results, with 5 volumes containing physical oceanographic and meteorological data from the principal participating ships, 5 volumes containing biological and nutrient chemistry data from the same ships, and 1 volume containing all data from Latin American cooperating ships and ships of opportunity. Extensive use was made of a computer and automatic plotter in preparation of the atlas charts. Methods used to collect and process the data upon which the atlas is based are described in detail by the contributors of the following categories of charts: temperature, salinity, and derived quantities thickness of the upper mixed layer; dissolved oxygen; meteorology; nutrient chemistry; phytoplankton standing stocks and production; zooplankton and fish larvae; micronekton; seabirds, fish schools, and marine mammals.

Cover, Nematocyst squall on Calm Island.
Photo by John H. Tapp, Scripps Institution of Oceanography.
The shading scales were omitted from these fish larvae and fish eggs charts. The shading scheme used is the same as was used on the 10-series fish larvae charts in Volume 2 and the 20- and 30-series charts in Volume 4, and is shown below:

**NUMBER PER HAUL**

- □ □ □ □ □ NONE
- □ □ □ □ □ 1-10
- □ □ □ □ □ 11-100
- □ □ □ □ □ 101-1000
- □ □ □ □ □ > 1000

FIGURE 45-Si-v1. The small closed contour at a depth of 210 m. at station 127 should be labeled 28.

FIGURE 46-Si-v3. The small closed contour at a depth of 160 m. at station 82 should be labeled 18.

FIGURE 46-P-v4. The closed contour at a depth of 210 m. at station 183 should be labeled 2.6. The small closed contour at 210 m. at station 153 should be labeled 2.2.
FIGURE 50-8300-z. There should be a 25 m contour in the vicinity of 8°S., 85°W. The chartlet below shows its location:

FIGURE 60-S-v5. The short unlabeled line at a depth of 170 m between stations 207 and 213 is extraneous and should be disregarded. The heavy contour which intersects the sea surface at 8.1°N and 9.7°N should be labeled 33.5.
FIGURE 50-S-v5. The closed heavy contour at a depth of 50-100m in the vicinity of 10°-20S should be labeled 35.0. The heavy contour which intersects the sea surface at 2.20°N and 4.30°N should be labeled 34.0.

FIGURE 50-S-v6. The heavy contour which intersects the sea surface at 6.80°N and 7.70°N should be labeled 33.0.

FIGURE OP-S-v4. The dot at the sea surface near 10° N is not a contour and should be disregarded.

FIGURE OP-02-v1. FIGURE OP-02-v3. FIGURE OP-02-v4. The whole numbered contours (1.00, 2.00, etc.) on these charts have not been accented with heavier lines as is the case with other oxygen sections in this and other volumes.

FIGURE OP-02-v1. The contour at the top center of the chart should be labeled 5.50 instead of 55.0.

FIGURE OP-02-v3. Some of the contours near the surface are incorrectly labeled. The short contour at the very top, in the vicinity of 20S should be labeled 5.25. The contour immediately below it should be labeled 5.00. The next contour down (the first one to extend across the whole section) should be labeled 4.75 instead of 4.50.

FIGURE 60-S-v3. The small heavy contour which intersects the sea surface twice in the vicinity of 15.50°N should be labeled 33.5.

VOLUME 1

INTRODUCTION---- Page 9, Paragraph 2, Line 1 now reads "... 20 cm diameter Secchi disc.", this should read "... 30 cm diameter Secchi disc."
EASTROPAC ATLAS

VOLUME 7
PHYSICAL OCEANOGRAPHIC AND METEOROLOGICAL DATA FROM PRINCIPAL PARTICIPATING SHIPS AND OCEANOGRAPHER THIRD AND FOURTH MONITOR CRUISES, OCTOBER 1967-JANUARY 1968

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CIRCULAR 330
WASHINGTON, D.C.
JULY 1973

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INTRODUCTION

EASTROPAC was an international cooperative investigation of the eastern tropical Pacific Ocean which was intended to provide data necessary for a more effective use of the marine resources of the area, especially tropical tuna, and to increase knowledge of the ocean circulation, air-sea interaction, and ecology. The National Marine Fisheries Service (NMFS) — the Bureau of Commercial Fisheries (BCF) at the time of the investigation — was the coordinating agency. The field work, from February 1967 through March 1968, was divided into seven 2-month cruise periods. At a meeting of the EASTROPAC Coordinating Committee held at La Jolla, in April 1968, it was decided that the data derived from the cruises were so numerous as to render classical data reports impractical and that a comprehensive atlas of the physical and biological results of the project should be produced instead. The atlas has been divided into 9 volumes, with five volumes containing physical oceanographic and meteorological data from the principal participating ships, five volumes containing biological and nutrient chemistry data from the same ships, and one volume containing all data from all the participating ships and cruises.

Volume 7 contains physical oceanographic and meteorological data collected by the principal participating ships and meteorological data for the third and fourth cruise periods cruises 30 October—November 1967 and cruise 65, December 1967—January 1968. The companion volume presenting the corresponding biological and nutrient chemistry data is volume 8. The locations of stations occupied by participating ships are shown in figure 50-D and figure 50-T.

Information concerning the history and organization of the EASTROPAC Project, a description of the cruises undertaken, the program of observations, the methods used for preparation of the charts, and remarks on the organization of the atlas are contained in volumes 1 and 4 with descriptions by the coordinating scientists of the methods used to collect and process the data upon which the atlas charts are based.

CUTHBERT M. LOVE
Editor
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FIGURE 51-0-4300—Salinity (‰) at the surface where $n_0 = 1.0$, October-November 1967. The heavy dashed line in the vicinity of 75° W and west of the Galapagos indicates the intersections of this surface with the sea surface. The table shows the temperature corresponding to each isohaline on the chart.

FIGURE 51-0-4300—Accleration potential (g/µg) at the surface where $n_0 = 1.0$, October-November 1967. The heavy dashed line in the vicinity of 75° W and west of the Galapagos indicates the intersections of this surface with the sea surface. For computing accleration potential, thermosteric anomaly, $n_0$, was used instead of specific volume anomaly, $n$. The zero contour is the vicinity of 75° W. The lines indicate the intersections of this surface with the sea surface.

FIGURE 51-0-4300—Oxygen (µg/l) at the surface where $n_0 = 1.0$, October-November 1967. The heavy dashed line in the vicinity of 75° W and west of the Galapagos indicates the intersections of this surface with the sea surface.

FIGURE 51-0-4300—Depth (m) of the surface where $n_0 = 1.0$, October-November 1967. The heavy dashed line in the vicinity of 75° W and west of the Galapagos indicates the intersections of this surface with the sea surface. For computing accleration potential, thermosteric anomaly, $n_0$, was used instead of specific volume anomaly, $n$. The zero contour is the vicinity of 75° W. The lines indicate the intersections of this surface with the sea surface.

FIGURE 51-0-4300—Salinity (‰) at the surface where $n_0 = 1.0$, October-November 1967. The heavy dashed line in the vicinity of 75° W and west of the Galapagos indicates the intersections of this surface with the sea surface.

Meteorology—Blue pages

FIGURE 52-W-4—Analysis of the surface air pressure and surface winds from all available ship observations, averaged over 2°-degree (latitude-longitude) squares for the period October 1-15, 1967. Heavy dashed lines are isolines. Solid lines are streamlines showing the mean resultant direction of wind flow. Light dashed lines are isolines indicating mean resultant wind speed (km). Pressure (inh) averages over 5-degree squares is plotted above the mean position of the square, and resultant wind direction followed by speed (km) is plotted below. The monthly climatological position of the intertropical convergence zone is shown by a white dashed band.

FIGURE 52-W-4—Analysis of the surface air pressure and surface winds from all available ship observations, averaged over 2°-degree (latitude-longitude) squares for the period November 16-30, 1967. Heavy dashed lines are isolines. Solid lines are streamlines showing the mean resultant direction of wind flow. Light dashed lines are isolines indicating mean resultant wind speed (km). Pressure (inh) averaged over 5-degree squares is plotted above the mean position of the square, and resultant wind direction followed by speed (km) is plotted below. The monthly climatological position of the intertropical convergence zone is shown by a white dashed band.

FIGURE 52-W-4—Analysis of the surface air pressure and surface winds from all available ship observations, averaged over 2°-degree (latitude-longitude) squares for the period December 16-30, 1967. Heavy dashed lines are isolines. Solid lines are streamlines showing the mean resultant direction of wind flow. Light dashed lines are isolines indicating mean resultant wind speed (km). Pressure (inh) averaged over 5-degree squares is plotted above the mean position of the square, and resultant wind direction followed by speed (km) is plotted below. The monthly climatological position of the intertropical convergence zone is shown by a white dashed band.

FIGURE 52-W-4—Analysis of the surface air pressure and surface winds from all available ship observations, averaged over 2°-degree (latitude-longitude) squares for the period January 1-15, 1968. Heavy dashed lines are isolines. Solid lines are streamlines showing the mean resultant direction of wind flow. Light dashed lines are isolines indicating mean resultant wind speed (km). Pressure (inh) averaged over 5-degree squares is plotted above the mean position of the square, and resultant wind direction followed by speed (km) is plotted below. The monthly climatological position of the intertropical convergence zone is shown by a white dashed band.

FIGURE 52-W-4—Analysis of the surface air pressure and surface winds from all available ship observations, averaged over 2°-degree (latitude-longitude) squares for the period February 16-30, 1968. Heavy dashed lines are isolines. Solid lines are streamlines showing the mean resultant direction of wind flow. Light dashed lines are isolines indicating mean resultant wind speed (km). Pressure (inh) averaged over 5-degree squares is plotted above the mean position of the square, and resultant wind direction followed by speed (km) is plotted below. The monthly climatological position of the intertropical convergence zone is shown by a white dashed band.

FIGURE 52-W-4—Analysis of the surface air pressure and surface winds from all available ship observations, averaged over 2°-degree (latitude-longitude) squares for the period March 16-30, 1968. Heavy dashed lines are isolines. Solid lines are streamlines showing the mean resultant direction of wind flow. Light dashed lines are isolines indicating mean resultant wind speed (km). Pressure (inh) averaged over 5-degree squares is plotted above the mean position of the square, and resultant wind direction followed by speed (km) is plotted below. The monthly climatological position of the intertropical convergence zone is shown by a white dashed band.

FIGURE 52-W-4—Analysis of the surface air pressure and surface winds from all available ship observations, averaged over 2°-degree (latitude-longitude) squares for the period April 16-30, 1968. Heavy dashed lines are isolines. Solid lines are streamlines showing the mean resultant direction of wind flow. Light dashed lines are isolines indicating mean resultant wind speed (km). Pressure (inh) averaged over 5-degree squares is plotted above the mean position of the square, and resultant wind direction followed by speed (km) is plotted below. The monthly climatological position of the intertropical convergence zone is shown by a white dashed band.
FIGURE 59.-V.-Analysis of sea surface temperatures based on averages for 2-degree (latitude-longitude) squares from all available ship observations for the period November 5-14, 1942. Solid lines are sea surface isotherms (°C); dashed lines are dashed where data are sparse. Dark-hatching surface areas with positive temperature anomalies (computed from mean sea surface temperatures averaged over 22 years) greater than 1°C, light-hatching shows areas with negative anomalies greater than 1°C. See surface temperature (°C ± 0.1) averaged for 5-degree squares is plotted above the mean position of the square; sea temperature minus air temperature difference (°C ± 0.1) is plotted below the symbol.

FIGURE 59.-W.-V.-Analysis of sea surface temperatures based on averages for 2-degree (latitude-longitude) squares from all available ship observations for the period November 15-31, 1942. Solid lines are sea surface isotherms (°C); dashed lines are dashed where data are sparse. Dark-hatching surface areas with positive temperature anomalies (computed from mean sea surface temperatures averaged over 22 years) greater than 1°C, light-hatching shows areas with negative anomalies greater than 1°C. See surface temperature (°C ± 0.1) averaged for 5-degree squares is plotted above the mean position of the square; sea temperature minus air temperature difference (°C ± 0.1) is plotted below the symbol.

FIGURE 59.-X.-V.-Analysis of the surface dew-point temperature of the air and total cloud cover based on 2-degree (latitude-longitude) averages from all available ship observations for the period of October 1942. Solid lines depict the monthly mean total cloud cover in units; the lines are dashed where data are sparse. Dark-hatching lines are isotherms of the mean monthly dew-point temperature at 2-degree (°C) intervals, areas where 15 percent or more of the ships reported rain of any type at or within sight of the ship are shaded. Dew-point temperature (°C ± 0.1) averaged for 5-degree squares is plotted above the mean position of the square; total cloud cover (shades) below and rainfall frequency (%) to the right of the symbol.

FIGURE 59.-Y.-V.-Analysis of the surface dew-point temperature of the air and total cloud cover based on 2-degree (latitude-longitude) averages from all available ship observations for the period of November 1942. Solid lines depict the monthly mean total cloud cover in units; the lines are dashed where data are sparse. Dark-hatching lines are isotherms of the mean monthly dew-point temperature at 2-degree (°C) intervals, areas where 15 percent or more of the ships reported rain of any type at or within sight of the ship are shaded. Dew-point temperature (°C ± 0.1) averaged for 5-degree squares is plotted above the mean position of the square; total cloud cover (shades) below and rainfall frequency (%) to the right of the symbol.

Temperature and salinity—White pages

FIGURE 59.-Z.-V.-Vertical distribution of temperature (°C) along 110°F W, October 26-29, 1942.

FIGURE 59.-A.-V.-Vertical distribution of temperature (°C) along 112°F W, October 30-November 4, 1942.

FIGURE 59.-J.-V.-Vertical distribution of temperature (°C) along a section from 12° N, 112°F W to Manus, November 4-7, 1942.

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FIGURE 59.-K.-V.-Vertical distribution of salinity (‰) along 113°F W, November 13-17, 1942.


Thermocline anomaly and geostrophic velocity—Yellow pages

FIGURE 59.-X.-V.-Vertical distribution of thermocline anomaly, t, (‰/m) along 113°F W, October 20-29, 1942.

FIGURE 59.-Y.-V.-Vertical distribution of thermocline anomaly, t, (‰/m) along 112°F W, October 30-November 4, 1942.

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FIGURE 59.-Z.-V.-Vertical distribution of oxygen (mL/L) along 110°F W, October 26-29, 1942.

FIGURE 59.-A.-V.-Vertical distribution of oxygen (mL/L) along 112°F W, October 30-November 4, 1942.

FIGURE 59.-J.-V.-Vertical distribution of oxygen (mL/L) along a section from 12° N, 112°F W to Manus, November 4-7, 1942.

FIGURE 59.-K.-V.-Vertical distribution of oxygen (mL/L) along a section from Acapulco to 12° N, 107°F W, November 11-13, 1942.

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FIGURE 59.-K.-V.-Vertical distribution of oxygen (mL/L) along 113°F W, November 13-17, 1942.

FIGURE 59.-L.-V.-Vertical distribution of oxygen (mL/L) along 108°F W, November 10-20, 1942.

Temperature and salinity—White pages

FIGURE 59.-Z.-V.-Vertical distribution of temperature (°C) along a northeast-southwest section from the coast of Peru to 12° S, 85° W, November 14-15, 1942.

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FIGURE 59.-J.-V.-Vertical distribution of temperature (°C) along a southeast-northwest section from the Equator to 15° S, 85° W, November 10-12, 1942.

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FIGURE 59.-L.-V.-Vertical distribution of temperature (°C) along a southwest-northeast section from the Equator to 15° S, 85° W, November 10-12, 1942.

FIGURE 59.-M.-V.-Vertical distribution of temperature (°C) along a northeast-southwest section from the coast of Ecuador to 15° S, 85° W, November 10-12, 1942.
Thermocline anomaly and geostrophic velocity—Yellow pages

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FIGURE OP-8-v—Vertical distribution of thermocline anomaly, $A_p (c/m/L)$, along 85° W, November 15-19, 1967.

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FIGURE OP-1v—Vertical section of the atmosphere along 80° W, November 21-25, 1967. Solid lines are isotherms of air temperature (°C). Dashed lines are isobars of sea surface pressure (c/m/L). Surface air temperature is plotted above surface mixing ratio and below a base line representing the surface pressure (c/m/L). The computed height (m) of each standard pressure surface is plotted for the nearest 100 meters below the section. At other stations the difference of computed height minus the corresponding height at the northern station is shown at each standard level.

Surface and near-surface properties—Pages of various colors

FIGURE 60-9000—Depth (m) of the surface where $A_p = 100 c/m/L$, December 1967, January 1968.

FIGURE 60-8450—Salinity (S) on the surface where $A_p = 30 c/m/L$, December 1967, January 1968. The table shows the temperature corresponding to each isoline on the chart.

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FIGURE 60-8250—Salinity (S) on the surface where $A_p = 250 c/m/L$, December 1967, January 1968. The table shows the temperature corresponding to each isoline on the chart.

FIGURE 60-AP-4250—Acceleration potential (c/m/sec), relative to 900 ft, on the surface where $A_p = 250 c/m/L$, December 1967, January 1968. For computing acceleration potential, thermocline anomaly, $A_p$, was used instead of specific volume anomaly, $A$.

FIGURE 60-OP-4250—Oxygen (ml/L) on the surface where $A_p = 250 c/m/L$, December 1967, January 1968.

FIGURE 60-4250—Depth (m) of the surface where $A_p = 250 c/m/L$, December 1967, January 1968.

FIGURE 60-8250—Salinity (S) on the surface where $A_p = 250 c/m/L$, December 1967, January 1968. The table shows the temperature corresponding to each isoline on the chart.

FIGURE 60-AP-4250—Acceleration potential (c/m/sec), relative to 900 ft, on the surface where $A_p = 250 c/m/L$, December 1967, January 1968. For computing acceleration potential, thermocline anomaly, $A_p$, was used instead of specific volume anomaly, $A$.

FIGURE 60-OP-4250—Oxygen (ml/L) on the surface where $A_p = 250 c/m/L$, December 1967, January 1968.

FIGURE 60-4250—Depth (m) of the surface where $A_p = 250 c/m/L$, December 1967, January 1968.

FIGURE 60-8250—Salinity (S) on the surface where $A_p = 250 c/m/L$, December 1967, January 1968. The table shows the temperature corresponding to each isoline on the chart.

FIGURE 60-AP-4250—Acceleration potential (c/m/sec), relative to 900 ft, on the surface where $A_p = 250 c/m/L$, December 1967, January 1968. For computing acceleration potential, thermocline anomaly, $A_p$, was used instead of specific volume anomaly, $A$.

FIGURE 60-OP-4250—Oxygen (ml/L) on the surface where $A_p = 250 c/m/L$, December 1967, January 1968.

FIGURE 60-4250—Depth (m) of the surface where $A_p = 250 c/m/L$, December 1967, January 1968.

FIGURE 60-8250—Salinity (S) on the surface where $A_p = 250 c/m/L$, December 1967, January 1968. The table shows the temperature corresponding to each isoline on the chart.

FIGURE 60-AP-4250—Acceleration potential (c/m/sec), relative to 900 ft, on the surface where $A_p = 250 c/m/L$, December 1967, January 1968. For computing acceleration potential, thermocline anomaly, $A_p$, was used instead of specific volume anomaly, $A$.

FIGURE 60-OP-4250—Oxygen (ml/L) on the surface where $A_p = 250 c/m/L$, December 1967, January 1968.

FIGURE 60-4250—Depth (m) of the surface where $A_p = 250 c/m/L$, December 1967, January 1968.

FIGURE 60-8250—Salinity (S) on the surface where $A_p = 250 c/m/L$, December 1967, January 1968. The table shows the temperature corresponding to each isoline on the chart.

FIGURE 60-AP-4250—Acceleration potential (c/m/sec), relative to 900 ft, on the surface where $A_p = 250 c/m/L$, December 1967, January 1968. For computing acceleration potential, thermocline anomaly, $A_p$, was used instead of specific volume anomaly, $A$.

FIGURE 60-OP-4250—Oxygen (ml/L) on the surface where $A_p = 250 c/m/L$, December 1967, January 1968.

FIGURE 60-4250—Depth (m) of the surface where $A_p = 250 c/m/L$, December 1967, January 1968.

FIGURE 60-8250—Salinity (S) on the surface where $A_p = 250 c/m/L$, December 1967, January 1968. The table shows the temperature corresponding to each isoline on the chart.

FIGURE 60-AP-4250—Acceleration potential (c/m/sec), relative to 900 ft, on the surface where $A_p = 250 c/m/L$, December 1967, January 1968. For computing acceleration potential, thermocline anomaly, $A_p$, was used instead of specific volume anomaly, $A$.
FIGURE RM-a. — Reference map of the main portion of the EASTROPAC area. The topographic shading and bathymetric contours are approximate only and should not be considered as portraying the latest available information.
FIGURE RMA — Reference map of the southern coastal portion of the EASTROPAC area. The topographic shading and bathymetric contours are approximate only and should not be considered as portraying the latest available information.
FIGURE 50-TC.— Locations of stations occupied by participating ships during the third monitor period, October-November 1967.
FIGURE 60-TC. — Locations of stations occupied by participating ships during the fourth monitor period, December 1967-January 1968.
FIGURE 50-T_s.—Temperature (°C) at the sea surface, October-November 1967. These contours are based on Nansen cast data.
FIGURE 10 ML.—Thickness of the mixed layer in meters, October-November 1967. Dashed lines indicate portions of the cruise track where such data were collected.
FIGURE 50.8a.—Salinity (%o) at the sea surface, October-November 1967. These contours are based on Nansen cast data.
FIGURE 59-O2Sa-10.—Oxygen saturation (%) at 10 meters, October-November 1967. Areas with less than 100% saturation are shaded.
FIGURE 50-8300.——Depth (m.) of the surface where \( \delta_T = 300 \text{ c.f./c.} \), October-November 1967. The zero contours in the vicinity of 83° W. and west of the Galapagos indicate the intersections of this surface with the sea surface.
FIGURE 50.5-3500—Salinity (‰) on the surface where δ<sub>T</sub> = 300 d/s, October-November 1967. The heavy dashed lines in the vicinity of 85° W. and west of the Galápagos indicate the intersections of this surface with the sea surface. The table shows the temperature corresponding to each isohaline on the chart.
FIGURE 50-AP-306: Acceleration potential (J/kg), relative to 500 db, on the surface where \( \delta_T = 300 \) °C. October-November 1967. The heavy dashed lines in the vicinity of 85° W. and west of the Galápagos indicate the intersections of this surface with the sea surface. For computing acceleration potential, thermosteric anomaly, \( \delta_T \), was used instead of specific volume anomaly, \( \delta \).
FIGURE 50-O-9009.—Oxygen (ml/l) on the surface where \(\delta_T = 300\) c/l. October-November 1967. The heavy dashed lines in the vicinity of 85° W. and west of the Galapagos indicate the intersections of this surface with the sea surface.
FIGURE 50-0250z.—Depth (m) of the surface where $\delta r = 250$ cl./l., October-November 1967. The zero contour in the vicinity of 11° S, 85° W, indicates the intersection of this surface with the sea surface.
FIGURE 36-S-S230—Salinity (‰) on the surface where $h = 250$ d.f., October-November 1967. The heavy dashed line in the vicinity of 11° S, 85° W, indicates the intersection of this surface with the sea surface. The table shows the temperature corresponding to each isohaline on the chart.
FIGURE 30-AP-2250.—Acceleration potential (l./kg.), relative to 500 db., on the surface where $\delta_\gamma = 250$ cl./c., October-November 1967. The heavy dashed line in the vicinity of 11° S, 85° W, indicates the intersection of this surface with the sea surface. For computing acceleration potential, thernosonic anomaly, $\delta_\gamma$, was used instead of specific volume anomaly, $\delta$. 
FIGURE 50-O-4240.—Oxygen (ml./l.) on the surface where $\delta_t = 250$ cl./l., October-November 1967. The heavy dashed line in the vicinity of 11° S, 85° W, indicates the intersection of this surface with the sea surface.
FIGURE 30-3/20:-Depth (m.) of the surface where $\delta r = 200$ c.l./s., October-November 1967.
FIGURE 59-S-2200—Salinity (‰) on the surface where $\delta_1 = 200$ d.l.t., October-November 1967. The table shows the temperature corresponding to each isohaline on the chart.
FIGURE 58-AP-0300—Acceleration potential (g/kr), relative to 400 db, on the surface where $\beta_l = 200$ d/t, October-November 1967. For computing acceleration potential, thermostatic anomaly, $\beta_l$ was used instead of specific volume anomaly, $\delta$. 
FIGURE 50-0-8200.—Oxygen (mL/L) on the surface where $\theta_t = 200$ $\text{cl}^\circ$, October-November 1967.
FIGURE 50-8160-z.—Depth (m.) of the surface where $\delta T = 160$ cl./l., October-November 1967.
FIGURE S-5160—Salinity (‰) on the surface where \( \theta_l = 160 \) cl./l. October-November 1967. The table shows the temperature corresponding to each isohaline on the chart.
FIGURE 50-AP-5160.—Acceleration potential (j/kg), relative to 500 db., on the surface where \( \delta r = 160 \) cl./s., October-November 1967. For computing acceleration potential, thermocenic anomaly, \( \delta r \), was used instead of specific volume anomaly, \( \delta \).
FIGURE 50-O-8160.—Oxygen (mL/L) on the surface where δ1 = 160 d/L, October-November 1967.
FIGURE 50-MW-1. Analyses of the surface air pressure and surface winds from all available ship observations, averaged over 2-degree (latitude-longitude) squares for the period October 1-15, 1967. Heavy dashed lines are isobars. Solid lines are streamlines showing the mean resultant direction of wind flow. Light dash-dot lines are isochrones indicating mean resultant wind speed (km/hr). Pressure (mb) averaged for 5-degree squares is plotted above the mean position of the square, and resultant wind direction followed by speed (km/hr) is plotted below. The monthly climatological position of the intertropical convergence zone is shown by a wide dashed line.
FIGURE 56-MW-2.—Analysis of the surface air pressure and surface winds from all available ship observations, averaged over 2-degree (latitude-longitude) squares for the period October 16–31, 1967. Heavy dashed lines are isobars. Solid lines are streamlines showing the mean resultant direction of wind flow. Light dash-dot lines are isobars indicating mean resultant wind speed (km.). Pressure (mb.) averaged for 5-degree squares is plotted above the mean position of the square, and resultant wind direction followed by speed (km.) is plotted below. The monthly climatological position of the intertropical convergence zone is shown by a wide dashed band.
FIGURE 56-MW-3.—Analyses of the surface air pressure and surface winds from all available ship observations, averaged over 5-degree (latitude-longitude) squares for the period November 1-14, 1967. Heavy dashed lines are isobars. Solid lines are streamlines showing the mean resultant direction of wind flow. Light dash-dot lines are isobars indicating mean resultant wind speed (km/h). Pressure (mb) averaged for 5-degree squares is plotted above the mean position of the squares, and resultant wind direction followed by speed (km/h) is plotted below. The monthly climatological position of the intertropical convergence zone is shown by a wide dashed band.
FIGURE 30-MW-4—Analyses of the surface air pressure and surface winds from all available ship observations, averaged over 2-degree (latitude-longitude) squares for the period November 15-30, 1967. Heavy dashed lines are isolines. Solid lines are streamlines showing the mean resultant direction of wind flow. Light dash-dot lines are isochths indicating mean resultant wind speed (kts.). Pressure (mb) averaged for 5-degree squares is plotted above the mean position of the square, and resultant wind direction followed by speed (kts.) is plotted below. The monthly climatological position of the intertropical convergence zone is shown by a wide dashed band.
FIGURE 30-MT-1.—Analysis of sea surface temperatures based on averages for 2-degree (latitude-longitude) squares from all available ship observations for the period October 1-13, 1967. Solid lines are sea surface isotherms (°C); the isotherms are dashed where data are sparse. Dark hatching outlines areas with positive temperature anomalies (computed from mean sea surface temperature averaged over 22 years) greater than 1 °C; light hatching shows areas with negative anomalies greater than 1 °C. Sea surface temperature (°C x 10) averaged for 5-degree squares is plotted above the mean position of the square; sea temperature minus air temperature difference (°C x 10) is plotted below the symbol.
FIGURE 50-MT-2—Analysis of sea surface temperatures based on averages for 2-degree (latitude-longitude) squares from all available ship observations for the period October 16-31, 1967. Solid lines are sea surface isotherms (°C); the isotherms are dashed where data are sparse. Dark hatching outlines areas with positive temperature anomalies (computed from mean sea surface temperatures averaged over 22 years) greater than 1°C. Light hatching shows areas with negative anomalies greater than 1°C. Sea surface temperature (°C x 10) averaged for 3-degree squares is plotted above the mean position of the square; sea temperature minus air temperature difference (°C x 10) is plotted below the symbol.
FIGURE 36-MT-3.—Analysis of sea surface temperatures based on averages for 2-degree (latitude-longitude) squares from all available ship observations for the period November 1-14, 1962. Solid lines are sea surface isotherms (°C); the isotherms are dashed where data are sparse. Dark hatching outlines areas with positive temperature anomalies (computed from mean sea surface temperatures averaged over 22 years) greater than 1°C; light hatching shows areas with negative anomalies greater than 1°C. Sea surface temperature (°C × 10) averaged for 3-degree squares is plotted above the mean position of the square; sea temperature minus air temperature difference (°C × 10) is plotted below the symbol.
FIGURE 50MT-4.—Analysis of sea surface temperatures based on averages for 2-degree (latitude-longitude) squares from all available ship observations for the period November 15-30, 1967. Solid lines are sea surface isotherms (°C); the isotherms are dashed where data are sparse. Dark hatching outlines areas with positive temperature anomalies (computed from mean sea surface temperatures averaged over 22 years) greater than 1° C.; light hatching shows areas with negative anomalies greater than 1° C. Sea surface temperature (°C x 10) averaged for 5-degree squares is plotted above the mean position of the square; sea temperature minus air temperature difference (°C x 10) is plotted below the symbol.
FIGURE 39-MC-1—Analyses of the surface dew-point temperature of the air and total cloud cover based on 2-degree (latitude-longitude) averages from all available ship observations for the month of October 1967. Solid lines depict the monthly mean total cloud cover in oktas; the lines are dashed where data are sparse. Dash-dot lines are isolinels of the mean monthly dew-point temperature at 2-degree (Celsius) intervals. Areas where 15 percent or more of the ships reported rain at or within sight of the ship are shaded. Dew-point temperature (°C x 10) averaged for 5-degree squares is plotted above the mean position of the square, with total cloud cover (oktas) below and rainfall frequency (%) to the right of the symbol.
FIGURE 56-MC-2.—An analysis of the surface dew-point temperature of the air and total cloud cover based on 2-degree (latitude-longitude) averages from all available ship observations for the month of November 1967. Solid lines depict the monthly mean total cloud cover in oktas; the lines are dashed where data are sparse. Dash-dot lines are isotherms of the mean monthly dew-point temperature at 2-degree (C.) intervals. Areas where 15 percent or more of the ships reported rain of any type at or within sight of the ship are shaded. Dew-point temperature (°C × 10) averaged for 5-degree squares is plotted above the mean position of the squares, with total cloud cover (oktas) below and rainfall frequency (%) to the right of the symbol.
FIGURE 50-T-v1.—Vertical distribution of temperature (°C) along 119º 10' W., October 20-29, 1967.
FIGURE 50-T-v2.—Vertical distribution of temperature (°C.) along 112°10' W.,
October 30-November 4, 1967.

FIGURE 50-T-v3.—Vertical distribution of temperature (°C.)
along a section from 12° N., 112°10' W. to Manzanillo.
November 4-7, 1967.
FIGURE 50-T-v3.—Vertical distribution of temperature (°C) along 105°10' W., November 13-18, 1967.

FIGURE 50-T-v4.—Vertical distribution of temperature (°C) along a section from Asuncion to 12° N., 109°10' W., November 11-13, 1967.
FIGURE 50.T-v6.—Vertical distribution of temperature (°C) along 98°10' W.
November 29-26, 1967.
FIGURE 59-S-v1.—Vertical distribution of salinity (‰) along 119°10' W., October 20-29, 1967.
FIGURE 50.5-v2.—Vertical distribution of salinity (‰) along 112°10' W., October 30-November 4, 1967.

FIGURE 50.5-v3.—Vertical distribution of salinity (‰) along a section from 12° N., 112°10' W. to Manzanillo, November 4-7, 1967.

FIGURE 50S-v4—Vertical distribution of salinity (‰) along a section from Acapulco to 12° N., 103°10' W., November 11-13, 1967.
FIGURE 50-S-6.—Vertical distribution of salinity (‰) along 98°10' W., November 20-26, 1967.
FIGURE 50-8-v1—Vertical distribution of thermosteric anomaly, $\delta_T$, (cl./t.) along 119$^\circ$10' W., October 20-29, 1967.
FIGURE 50.4-2. Vertical distribution of thermosteric anomaly, $\delta_r$, (c.f./t.) along 112°10' W., October 30 - November 4, 1967.

FIGURE 50.4-3. Vertical distribution of thermosteric anomaly, $\delta_r$, (c.f./t.) along a section from 12° N, 112°10' W. to Manzanillo, November 4 - 7, 1967.
FIGURE 50.5. Vertical distribution of thermometric anomaly, $\beta_T$, (C/l.) along 105°10' W., November 13-18, 1967.

FIGURE 50.6. Vertical distribution of thermodendrism anomaly, $\beta_T$, (C/l.) along a section from Acapulco to 12° N., 105°10' W., November 11-13, 1967.
FIGURE 50-8-vb. — Vertical distribution of thermocline anomaly, δt, (c/s.) along 98°10' W., November 20-26, 1967.
FIGURE 50-G-1. — Vertical distribution of the zonal component of geostrophic velocity (cm/sec.), relative to 500 db, along 110°10' W, October 20-29, 1967. Dark shading indicates eastward flow with a velocity greater than 5 cm/sec.; light shading indicates westward flow with a velocity greater than 5 cm/sec.
FIGURE 50.G-v2.—Vertical distribution of the zonal component of geostrophic velocity (cm./sec.), relative to 500 db., along 112° 10' W., October 30-November 4, 1967. Dark shading indicates eastward flow with a velocity greater than 3 cm./sec.; light shading indicates westward flow with a velocity greater than 3 cm./sec.

FIGURE 50.G-v3.—Vertical distribution of the component of geostrophic velocity (cm./sec.), relative to 500 db., normal to a section from 12° N., 112° 10' W., to Manzanillo, November 4-7, 1967. Dark shading indicates flow toward the southeast with a velocity greater than 3 cm./sec.; light shading indicates flow toward the northwest with a velocity greater than 3 cm./sec.
FIGURE 50-G-5.—Vertical distribution of the zonal component of geostrophic velocity (cm./sec.), relative to 500 db, along 105° 10' W., November 13-18, 1967. Dark shading indicates easterly flow with a velocity greater than 5 cm./sec.; light shading indicates westerly flow with a velocity greater than 5 cm./sec.

FIGURE 50-G-4.—Vertical distribution of the component of geostrophic velocity (cm./sec.), relative to 300 db, normal to a section from Acapulco to 12° N., 105° 10' W., November 11-13, 1967. Dark shading indicates flow toward the southeast with a velocity greater than 5 cm./sec.; light shading indicates flow toward the northwest with a velocity greater than 5 cm./sec.
FIGURE 50.G-6.—Vertical distribution of the zonal component of geostrophic velocity (cm./sec.), relative to 300 dba, along 98°10' W., November 20–26, 1967. Dark shading indicates eastward flow with a velocity greater than 5 cm./sec.; light shading indicates westward flow with a velocity greater than 5 cm./sec.
FIGURE 50-O₂-v1.—Vertical distribution of oxygen (ml/l.) along 119°10' W., October 20-29, 1967.
FIGURE 50.02—Vertical distribution of oxygen (ml/l) along 112°10' W.

FIGURE 50.03—Vertical distribution of oxygen (ml/l) along a section from 12° N. 112°10' W. to Manzanillo.
FIGURE 50.O_{2}-v3. — Vertical distribution of oxygen (mol/l.) along 105°10' W.

FIGURE 50.O_{2}-v4. — Vertical distribution of oxygen (mol/l.) along a section from Acapulco to 14° N., 105°10' W.
November 11-13, 1967.
FIGURE 50-O-v6.—Vertical distribution of oxygen (ml./l) along 90°19' W., November 20–27, 1967.
FIGURE OP-Tv2.—Vertical distribution of temperature (°C) along 85° W., November 15-19, 1963.

FIGURE OP-Tv1.—Vertical distribution of temperature (°C) along a northeast-southwest section from the coast of Peru to 12° S., 85° W., November 14-15, 1967.
FIGURE O*T-v4.—Vertical distribution of temperature (°C.) along 92° W., November 21-26, 1967.

FIGURE O*T-v3.—Vertical distribution of temperature (°C.) along a northeast-southwest section from the Equator at 85° W. to 3° S., 92° W., November 19-21, 1967.

FIGURE OP-Sv3—Vertical distribution of salinity (‰) along a northeast-southwest section from the Equator at 80° W. to 3° S., 92° W., November 19-21, 1967.

FIGURE OP-6-4.—Vertical distribution of thermometric anomaly, $\delta T$, (cl./$m.$) along 92° W., November 21-26, 1967.

FIGURE OP-6-3.—Vertical distribution of thermometric anomaly, $\delta T$, (cl./$m.$) along a northeast-southwest section from the Equator at 83° W. to 3° S., 93° W., November 19-21, 1967.
FIGURE OPG-v1.—Vertical distribution of the component of geostrophic velocity (cm./sec.), relative to 500 db, normal to a northeast-southwest section from the coast of Peru to 12° S, 85° W, November 14-15, 1967. Dark shading indicates flow toward the southeast with a velocity greater than 5 cm./sec.

FIGURE OPG-v2.—Vertical distribution of the zonal component of geostrophic velocity (cm./sec.), relative to 500 db, along 85° W, November 15-18, 1967. Dark shading indicates eastward flow with a velocity greater than 5 cm./sec.

FIGURE OPG-v4.—Vertical distribution of the zonal component of geostrophic velocity (cm./sec.), relative to 500 db, along 92° W, November 24-25, 1967. Since there were no geostrophic velocity components equal to or greater than 5 cm./sec. on this section, no contours are shown.
FIGURE OP-O₂-w2.—Vertical distribution of oxygen (ml/l) along 85° W., November 13-19, 1967.

FIGURE OP-O₂-w1.—Vertical distribution of oxygen (ml/l) along a northeast-southwest section from the coast of Peru to 12° S., 65° W., November 14-15, 1967.
FIGURE OP-O4.-Vertical distribution of oxygen (mL/L) along 92° W., November 21-26, 1967.

FIGURE OP-O5.-Vertical distribution of oxygen (mL/L) along a northeast-southwest section from the Equator at 93° W. to 3° S., 92° W., November 19-21, 1967.
FIGURE OP-UA v4.—Vertical section of the atmosphere along 93° W., November 21-28, 1967. Solid lines are isotherms of air temperature (°C). Dashed lines are isopleths of mixing ratio of the air (g/kg). Surface air temperature is plotted above surface mixing ratio and below a base line representing the surface pressure (mb). The computed height (m) of each standard pressure surface is plotted for the northernmost radiosonde station of the section. At other stations the difference of computed height minus the corresponding height at the northern station is shown at each standard level.

FIGURE OP-UA v2.—Vertical section of the atmosphere along 85° W., November 16-21, 1967. Solid lines are isotherms of air temperature (°C). Dashed lines are isopleths of mixing ratio of the air (g/kg). Surface air temperature is plotted above surface mixing ratio and below a base line representing the surface pressure (mb). The computed height (m) of each standard pressure surface is plotted for the northernmost radiosonde station of the section. At other stations the difference of computed height minus the corresponding height at the northern station is shown at each standard level.
FIGURE 60-T.s.—Temperature (°C) at the sea surface, December 1967-January 1968. These contours are based on Nansen cast data.
FIGURE 6a ML.—Thickness of the mixed layer in meters, December 1967-January 1968. Dashed lines indicate portions of the cruise track where such data were collected.
FIGURE 60. S%, Salinity (%o) at the sea surface, December 1967-January 1968. The contours are based on Nansen cast data.
FIGURE 60-Oz-10.—Oxygen saturation (%) at 10 meters, December 1967-January 1968. Areas with less than 100% saturation are shaded.
FIGURE 60-300-z.—Depth (m.) of the surface where $\sigma_t = 300 \text{ d}./\text{t}$, December 1967-January 1968.
FIGURE 60-S-5300.—Salinity (‰) on the surface where ρ = 300 cl/l, December 1967-January 1968. The table shows the temperature corresponding to each isoline on the chart.
FIGURE 60-AP-3300—Acceleration potential (j/kg), relative to 300 db, on the surface where $\delta_T = 300$ cl./l, December 1967-January 1968. For computing acceleration potential, isothermic anomaly, $\delta_T$, was used instead of specific volume anomaly, $\delta$.
FIGURE 60-0-0300.—Oxygen (mil./L) on the surface where $\theta_T = 300$ cld./L, December 1967-January 1968.
FIGURE 60-0250-z. Depth (m.) of the surface where δT = 250 °C, December 1967-January 1968.
FIGURE 60-S-2250.—Salinity ($\gamma_{\text{sa}}$) on the surface where $\delta_T = 250$ d.l./l., December 1967-January 1968. The table shows the temperature corresponding to each isohaline on the chart.
FIGURE 60-AP-3250.—Acceleration potential (l/kg), relative to 500 dbar, on the surface where δt = 250 °C/t, December 1967-January 1968. For computing acceleration potential, the isotherms of density, δt, were used instead of specific volume anomaly, δv.
FIGURE 60-329a.—Depth (m.) of the surface where $\delta_T = 200$ c.p.t., December 1967-January 1968.
FIGURE 16-S-1200.—Salinity (%) on the surface where $S_T = 200$ d./t., December 1967-January 1968. The table shows the temperature corresponding to each isohaline on the chart.
FIGURE 60-AP-2000.—Acceleration potential (l./kg.), relative to 100 db., on the surface where $\delta r = 200$ cl./l., December 1967-January 1968. For computing acceleration potential, thermometric anomaly, $\delta r$, was used instead of specific volume anomaly, $\delta$.
FIGURE 60.0-597.—Oxygen (mL/L) on the surface where δ1 = 200 cl./l., December 1967-January 1968.
FIGURE 60.3160a.—Depth (m) of the surface where δT = 160 °C, December 1967-January 1968.
FIGURE 60-S-5168—Salinity ($S^o$) on the surface where $S_T = 160$ cl./l., December 1967-January 1968. The table shows the temperature corresponding to each isohaline on the chart.
FIGURE 60-AP-8166.—Acceleration potential (f./kg.), relative to 500 db, on the surface where $\delta_\gamma = 160$ cl./l., December 1967-January 1968. For computing acceleration potential, thermosteric anomaly, $\delta_\gamma$, was used instead of specific volume anomaly, $\delta$. 
FIGURE 60-0-0160.—Oxygen (ml/l.) on the surface where $\delta_0 = 160$ cl/l., December 1967-January 1968.
FIGURE 60-MW-1.—Analysis of the surface air pressure and surface winds from all available ship observations, averaged over 2-degree (latitude-longitude) squares for the period December 1-15, 1967. Heavy dashed lines are isobars. Bold lines are streamlines showing the mean resultant direction of wind flow. Light dash-dot lines are isochas indicating mean resultant wind speed (kn.). Pressure (mb) averaged for 3-degree squares is plotted above the mean position of the square, and resultant wind direction followed by speed (kn.) is plotted below. The monthly climatological position of the intertropical convergence zone is shown by a wide dashed band.
FIGURE 60-MW-2.—Analysis of the surface air pressure and surface winds from all available ship observations, averaged over 2-degree (latitude-longitude) squares for the period December 17-31, 1962. Heavy dashed lines are isobars. Solid lines are streamlines showing the mean resultant direction of wind flow. Light dash-dot lines are isochrones indicating mean resultant wind speed (knots). Pressure (mb) averaged for 5-degree squares is plotted above the mean position of the isobars, and resultant wind direction followed by speed (knots) is plotted below. The monthly climatological position of the intertropical convergence zone is shown by a wide dashed line.
FIGURE 60-MW-3.—Analyses of the surface air pressure and surface winds from all available ship observations, averaged over 2-degree (latitude-longitude) squares for the period January 1-14, 1968. Heavy dashed lines are isobars. Solid lines are streamlines showing the mean resultant direction of wind flow. Light dash-dot lines are isotachs indicating mean resultant wind speed (knots). Pressure (mb) averaged for 5-degree squares is plotted above the mean position of the square, and resultant wind direction followed by speed (knots) is plotted below. The monthly climatological position of the intertropical convergence zone is shown by a wide dashed band.
FIGURE 60-MW-4.—Analyses of the surface air pressure and surface winds from all available ship observations, averaged over 2-degree (latitude-longitude) squares for the period January 15-31, 1968. Heavy dashed lines are isolines. Solid lines are streamlines showing the mean resultant direction of wind flow. Light dash-dot lines are isolines indicating mean resultant wind speed (knots). Pressure (mb) averaged for 5-degree squares is plotted above the mean position of the square, and resultant wind direction followed by speed (knots) is plotted below. The monthly climatological position of the intertropical convergence zone is shown by a wide dashed band.
FIGURE 60-MT-1.—Analysis of sea surface temperatures based on averages for 2-degree (latitude-longitude) squares from all available ship observations for the period December 1-16, 1967. Solid lines are sea surface isotherms (°C); the isotherms are dashed where data are sparse. Dark hatching outlines areas with positive temperature anomalies (computed from mean sea surface temperatures averaged over 52 years) greater than 1°C. Light hatching shows areas with negative anomalies greater than 1°C. Sea surface temperature (°C x 10) averaged for 5-degree squares is plotted above the mean position of the square; sea temperature minus air temperature difference (°C x 10) is plotted below the symbol.
FIGURE 60-MT-2.—Analysis of sea surface temperatures based on averages for 2-degree (latitude-longitude) squares from all available ship observations for the period December 17–31, 1967. Solid lines are sea surface isotherms (°C); the isotherms are dashed where data are sparse. Dark hatching outlines areas with positive temperature anomalies (computed from mean sea surface temperatures averaged over 22 years) greater than 1° C; light hatching shows areas with negative anomalies greater than 1° C. Sea surface temperature (°C x 10) averaged for 3-degree squares is plotted above the mean position of the square; sea temperature minus air temperature difference (°C x 10) is plotted below the symbol.
FIGURE 60-MT-3—Analysis of sea surface temperatures based on averages for 2-degree (latitude-longitude) squares from all available ship observations for the period January 1-14, 1968. Solid lines are sea surface isotherms (°C); the isotherms are dashed where data are sparse. Dark hatching outlines areas with positive temperature anomalies (computed from mean sea surface temperatures averaged over 22 years) greater than 1° C; light hatching shows areas with negative anomalies greater than 1° C. Sea surface temperature (°C × 10) averaged for 3-degree squares is plotted above the mean position of the square; sea temperature minus air temperature difference (°C × 10) is plotted below the symbol.
FIGURE 66-MT-4.—Analysis of sea surface temperatures based on averages for 2-degree (latitude-longitude) squares from all available ship observations for the period January 1966–1988. Solid lines are sea surface isotherms (°C); the isotherms are dashed where data are sparse. Dark hatching outlines areas with positive temperature anomalies (computed from mean sea surface temperatures averaged over 22 years) greater than 1°C; light hatching shows areas with negative anomalies greater than 1°C. Sea surface temperatures (°C x 10) averaged for 5-degree squares is plotted above the mean position of the square; sea temperature minus air temperature difference (°C x 10) is plotted below the symbol.
FIGURE 60-MC-1—Analyses of the surface dew-point temperature of the air and total cloud cover based on 2-degree (latitude-longitude) averages from all available ship observations for the month of December 1967. Solid lines depict the monthly mean total cloud cover in octas; the lines are dashed where data are sparse. Dash-dot lines are isolines of the mean monthly dew-point temperature at 2-degree (C.) intervals. Areas where 15 percent or more of the ships reported rain of any type at or within sight of the ship are shaded. Dew-point temperature (°C. x 10) averaged for 5-degree squares is plotted above the mean position of the square, with total cloud cover (octas) below the rainfall frequency (%) to the right of the symbol.
FIGURE 60-MC-2—Analyses of the surface dew-point temperature of the air and total cloud cover based on 3-degree (latitude-longitude) averages from all available ship observations for the month of January 1968. Solid lines depict the monthly mean total cloud cover in octas; the lines are dashed where data are sparse. Dashed lines are isotherms of the mean monthly dew-point temperature at 2-degree (C) intervals. Areas where 15 percent or more of the ships reported rain of any type at or within sight of the ship are shaded. Dew-point temperature (°C x 10) averaged for 5-degree squares is plotted above the mean position of the square, with total cloud cover (octas) below the rainfall frequency (%) to the right of the symbol.
FIGURE 60-T-1. Vertical distribution of temperature (°C) along 118°45'W, December 21-31, 1967.
FIGURE 60-T-2.—Vertical distribution of temperature (°C.) along 111°45' W., January 2-6, 1968.

FIGURE 60-T-3.—Vertical distribution of temperature (°C.) along a section from 12° N, 111°45' W. to Mazatlan, January 6-9, 1968.
FIGURE 60-T-v3.—Vertical distribution of temperature (°C) along 104°45' W., January 15-21, 1968.

FIGURE 60-T-v4.—Vertical distribution of temperature (°C) along a section from Acapulco to 12° N, 104°45' W., January 13-15, 1968.
FIGURE 60-T-6: Vertical distribution of temperature (°C) along 97°45' W., January 22-28, 1968.
FIGURE 60.S-v.2—Vertical distribution of salinity (‰) along 111°45' W.
January 2–6, 1968.

FIGURE 60.S-v.3—Vertical distribution of salinity (‰) along a section from 12° N., 111°45' W. to Manzanillo, January 6–9, 1968.
FIGURE 60-S-5.—Vertical distribution of salinity (%) along 104°45' W., January 15-21, 1968.

FIGURE 60-S-4.—Vertical distribution of salinity (%) along a section from Acapulco to 12° N., 104°45' W., January 15-19, 1968.
FIGURE 60-S-v6.—Vertical distribution of salinity (%) along 97°15' W., January 22-28, 1968.
FIGURE 66-5v1.—Vertical distribution of thermosteric anomaly, \( \delta T \), (\( \delta T/c_0 \)) along 118° 45' W., December 21-31, 1967.
FIGURE 60.8-v2: Vertical distribution of thermosteric anomaly, $\delta T$ (deg./m) along 111°45' W, January 2-6, 1968.

FIGURE 60.8-v3: Vertical distribution of thermosteric anomaly, $\delta T$ (deg./m) along a section from 12° N, 111°45' W, to Manzanillo, January 6-9, 1968.
Figure 60-8-5.—Vertical distribution of thermosteric anomaly, $\beta_T$ (cl./c.) along 104°45' W., January 15-21, 1968.

Figure 60-8-4.—Vertical distribution of thermosteric anomaly, $\beta_T$ (cl./c.) along section from Acapulco to 12° N., 104°45' W., January 13-13, 1968.
FIGURE 60-8-6.—Vertical distribution of thermometric anomaly, $\delta T$ (°C), along 97°49' W., January 22-28, 1968.
FIGURE 60-G-v1.—Vertical distribution of the zonal component of geostrophic velocity (cm./sec.), relative to 500 db., along 118°45' W., December 21-31, 1967. Dark shading indicates eastward flow with a velocity greater than 5 cm./sec.; light shading indicates westward flow with a velocity greater than 5 cm./sec.
FIGURE 66-G-2—Vertical distribution of the zonal component of geostrophic velocity (cm./sec.), relative to 500 db., along 117°45' W., January 2-6, 1968. Dark shading indicates eastward flow with a velocity greater than 5 cm./sec.; light shading indicates westward flow with a velocity greater than 5 cm./sec.

FIGURE 66-G-3—Vertical distribution of the component of geostrophic velocity (cm./sec.), relative to 500 db., normal to a section from 12° N., 111°45' W., to Manzanillo, January 6-9, 1968. Dark shading indicates flow toward the southeast with a velocity greater than 5 cm./sec.; light shading indicates flow toward the northwest with a velocity greater than 5 cm./sec.
FIGURE 6A-4—Vertical distribution of the zonal component of geostrophic velocity (cm/sec), relative to 500 db, along 104°45' W, January 14-15, 1968. Dark shading indicates eastward flow with a velocity greater than 5 cm/sec; light shading indicates westward flow with a velocity greater than 5 cm/sec.

FIGURE 6A-4—Vertical distribution of the component of geostrophic velocity (cm/sec), relative to 500 db, normal to a section from Acapulco to 12° N, 104°45' W, January 14-15, 1968. Dark shading indicates flow toward the southeast with a velocity greater than 5 cm/sec.
FIGURE 60.C-v6.—Vertical distribution of the zonal component of geostrophic velocity (cm./sec.), relative to 300 db., along 97°49' W., January 22-28, 1968. Dark shading indicates easterly flow with a velocity greater than 5 cm./sec.; light shading indicates westerly flow with a velocity greater than 5 cm./sec.
FIGURE 60-O-v1.—Vertical distribution of oxygen (ml/L) along 116°45' W., December 21-31, 1967.
FIGURE 66-O-2—Vertical distribution of oxygen (ml/l.) along 111° 45' W.,
January 2-6, 1968.

FIGURE 66-O-3—Vertical distribution of oxygen (ml/l.) along a section from 12° N. 111° 45' W. to
Manzanillo, January 6-9, 1968.
Figure 60-O2-4. Vertical distribution of oxygen (ml/l) along 104°45' W.,

Figure 60-O2-5. Vertical distribution of oxygen (ml/l) along a section from Acapulco to 12° N. 104°45' W.,
FIGURE 60-O-06.—Vertical distribution of oxygen (ml./l.) along 97°45' W., January 22-29, 1968.