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NATIONAL MARINE FISHERIES SERVICE

Circular 330

VOLUME 2

EASTROPAC *Atlas*

EASTROPAC *Atlas*

Volume 1	Physical oceanographic and meteorological data from principal participating ships, first survey cruise, February-March 1967.	In preparation
Volume 2	Biological and nutrient chemistry data from principal participating ships, first survey cruise, February-March 1967.	Published April 1971
Volume 3	Physical oceanographic and meteorological data from principal participating ships, first and second monitor cruises, April-July 1967.	In preparation
Volume 4	Biological and nutrient chemistry data from principal participating ships, first and second monitor cruises, April-July 1967.	Published November 1970
Volume 5	Physical oceanographic and meteorological data from principal participating ships, second survey cruise, August-September 1967.	In preparation
Volume 6	Biological and nutrient chemistry data from principal participating ships, second survey cruise, August-September 1967.	In preparation
Volume 7	Physical oceanographic and meteorological data from principal participating ships and *Oceanographer*, third and fourth monitor cruises, October 1967-January 1968.	In preparation
Volume 8	Biological and nutrient chemistry data from principal participating ships and *Oceanographer*, third and fourth monitor cruises, October 1967-January 1968.	In preparation
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Volume 10	Biological and nutrient chemistry data from principal participating ships, third survey cruise, February-March 1968.	In preparation
Volume 11	Data from Latin American cooperating ships and ships of opportunity, all cruises, February 1967-March 1968.	In preparation

Cover. Immature magnificent frigatebirds near Cocos Island.
Photo by John H. Taylor, Scripps Institution of Oceanography.

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 tunas, 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 seemed too numerous for a classical data report. Instead, it was decided to produce an 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; birds, fish schools, and marine mammals.

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April 1971

NOTICE TO RECIPIENTS OF THE EASTROPAC ATLAS, VOLUME 2

In the Introduction to this volume the reader is referred to Volume 1 for background information on the EASTROPAC Project, processing of the data, and preparation of the atlas. Volume 1 has not yet been published, but the introductory material referred to has been placed in Volume 4 which was published in November 1970.

Cuthbert M. Love, Editor
EASTROPAC Atlas

EASTROPAC *Atlas*

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ERRATA

May 1972

FIGURE 14-NO_3-v8. The labeling on the latitude scale is incorrect. The tick mark at the right hand end of the chart should be labeled 5 N instead of 1 S.

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November 1972

FIGURE 10-Ph-150i.	There should be darker shading inside the 40 contour lying just west the Galapagos. There should also be darker shading in the area south of the 20 contour at 14° S., 96° W. The contour at 16° S., 100° W. should be labeled 10.
FIGURE 11-NO_2-v1.	The label on the contour lying between stations 42 and 44 at a depth of 150 m. should read 0.4 instead of 0.6.
FIGURE 11-NO_3-v5.	The small closed contour centered at a depth of 110 m. at station 306 should be labeled 30.
FIGURE 11-NO_2-v5.	The small closed contour centered at a depth of 60 m. at station 303 should be labeled 0.4; the closed contour at 70 m., station 285 should be labeled 0.8; the small closed contour at 110 m., station 228 should be labeled 1.6.
FIGURE 12-NO_3-v2. FIGURE 12-NO_3-v4. FIGURE 12-NO_3-v6.	The dashed contours at or near the tops of these charts indicate 0.1 µg.-at./l. Although the decimal points are there the leading zeros were omitted from the labels. At a quick glance these contours might be mistaken for 1 µg.-at./l.
FIGURE 13-P-v2.	The label on the contour nearest to bottom of the chart at station 36 should read 3.0 instead of 30.
FIGURE 13-Ch-v6.	The label on the contour in the extreme upper right corner is missing. It should read 1.0.

FIGURE 13-Ph-v2. The area below the lower 0.2 contour in the vicinity of stations 64-69 should not be shaded, indicating a concentration of less than 0.2 mg./m.^{3}.

FIGURE 13-Ch-v3. The label on the short contour at extreme lower left should read 0.1 instead of 1.0.

FIGURE 13-Ph-v3. The label on the short contour at extreme lower left should read 0.1 instead of 1.0.

FIGURE 14-NO_3-v3. The small closed contour centered at a depth of 90 m. at station 7 should be labeled 26.

FIGURE 14-NO_3-v6. The longitude scale was omitted from the top of this chart. For the correct position of the 79° W. and 80° W. longitude ticks, see any of the following charts (all found in volume 1): 14-T-v6, 14-S-v6, 14-δ-v6, 14-G-v6, 14-O_2-v6.

FIGURE 14-P-v24. The large closed contour centered at a depth of 100 m. between stations 236 and 238 should be labeled 1.8. The small closed contour centered at 110 m. at station 242 should be labeled 1.6. The small closed contour centered at 50 m. at station 249 should be labeled 1.6.

FIGURE 14-P-v26.
FIGURE 14-NO_3-v26. } Labels for 0, 5 S., and 10 S. should be added to the latitude scale.

FIGURE 14-Ch-v26. The closed contours at station 291 are blurred. The maximum value is 0.87 mg./m.^{3} at a depth of 22 m. The labels on the short contours below the shaded area at stations 287 and 295 should read 0.15 instead of 0.1.

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EASTROPAC *Atlas*

VOLUME 2

BIOLOGICAL AND NUTRIENT CHEMISTRY DATA FROM
PRINCIPAL PARTICIPATING SHIPS
FIRST SURVEY CRUISE, FEBRUARY-MARCH 1967

CUTHBERT M. LOVE, *Editor*

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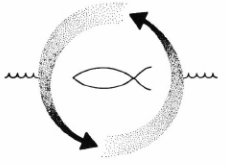

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INTRODUCTION

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 tunas, and also to increase knowledge of the ocean circulation, air-sea interaction, and ecology. The National Marine Fisheries Service (NMFS), formerly Bureau of Commercial Fisheries (BCF), 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 11 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 Latin American cooperating ships and ships of opportunity.

Volume 2 contains biological and nutrient chemistry data collected mainly by the principal participating ships during the first survey cruise period (10-series cruises); February-March 1967. The companion volume presenting the corresponding physical oceanographic and meteorological data is volume 1. The locations of stations occupied by principal participating ships and ships of opportunity are shown in figure 10-TC-a; those occupied by Latin American cooperating ships during the same period are shown in figure 10-TC-b.

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 volume 1 with descriptions by the contributing scientists of the methods used to collect and process the data upon which the atlas charts are based.

CUTHBERT M. LOVE
Editor

Abbreviations used in figure designation system

Cruise or cruise period	Property represented	Mnemonic to explain choice of letters	Indicator for vertical sections or type of horizontal surface
Numbers 11, 12, 13, etc., indicate principal cruises. See figure 1.	T Temperature		v1, v2, etc., indicate vertical sections.
	S Salinity		Vertical sections are assigned consecutive numbers within each cruise which follow the chronological order in which the ship ran the sections.
	δ Thermosteric anomaly (δ_T)		
Letters or letter-number combinations indicate cruises of Latin American cooperating ships or ships of opportunity, as follows:	G Geostrophic velocity		
	O_2 Oxygen concentration		
	O_2Sa Oxygen saturation		Number 10 or 100 following O_2Sa or horizontal P, Si, NO_3, NO_2, or NH_3 charts indicates distribution at that depth (m.).
	ML Thickness of the mixed layer		
	δ300 300 cl./t. thermosteric anomaly surface		
	AP Acceleration Potential		
MZ-4 *Yolanda*, MZ-4	P Phosphate-phosphorus		s Distribution at the sea surface
MZ-5 *Yolanda*, MZ-5	Si Silicate-silicon		δ300 Distribution on the surface where δ_T=300 cl./t.
MZ-6 *Yolanda*, MZ-6	NO_3 Nitrate-nitrogen		ei Distribution integrated over the euphotic layer
MZ-7 *Defiance*, MZ-7	NO_2 Nitrite-nitrogen		150i Distribution integrated to 150 m. depth
MZ-8 *Tuxpan*, MZ-8	NH_3 Ammonia-nitrogen		z Depth of a surface
H1 *Huayaipe*-1	Ch Chlorophyll-a		
H2 *Huayaipe*-2	Ph Phaeophytin		Number 1 or 2 following SP or SW charts indicates one of two 6-month periods into which those observations were divided.
H3 *Huayaipe*-3	PP Primary production		
U1 *Unanue* 6702	EL Thickness of the euphotic layer		
U2 *Unanue* 6708	FCf Fish and cephalopod standing stock		
U3 *Unanue* 6802	Cr Crustacean standing stock		
Y5 *Yelcho* MARCHILE V	Nk Total micronekton standing stock		
Y6 *Yelcho* MARCHILE VI	ZhN Zooplankton standing stock from 50-cm. net hauls, night	Zooplankton, half-meter, Night	
Y7 *Yelcho* MARCHILE VII	Z1N Zooplankton standing stock from 1-m. net hauls, night	Zooplankton, 1-meter, Night	
E6 *Esmeralda* BE VI	ZhD Zooplankton standing stock from 50-cm. net hauls, day	Zooplankton, half-meter, Day	
OP *Oceanographer*	Z1D Zooplankton standing stock from 1-m. net hauls, day	Zooplankton, 1-meter, Day	Numbers 1 to 4 or 1 to 6 following MT or MW charts indicate one of the approximate 2-week periods into which those observations were divided. For all cruise periods except 40, the MT and MW charts were drawn for four 2-week periods. For the 40 cruise period these charts were drawn for six periods ranging from 12 to 16 days in length, but with several days overlap between some periods. Number 1 or 2 following MC charts indicates one of the monthly periods for which those charts were drawn.
CD *Charles H. Davis*	FLN Total fish larvae, night hauls	Fish Larvae, Night	
T3 *Te Vega* 13	FLD Total fish larvae, day hauls	Fish Larvae, Day	
T4 *Te Vega* 14	FE Total fish eggs		
T5 *Te Vega* 15	FS Total skipjack tuna larvae	Fish, Skipjack	
T6 *Te Vega* 16	FA Total *Auxis* larvae	Fish, *Auxis*	
T7 *Te Vega* 17	FC Total *Coryphaena* larvae	Fish, *Coryphaena*	
	FMN Total myctophid larvae, night hauls	Fish, Myctophid, Night	
Numbers 10, 20, 30, 40, 50, 60, 70, indicate 2-month cruise periods.	FMD Total myctophid larvae, day hauls	Fish, Myctophid, Day	
	FGN Total gonostomatid and sternoptychid larvae, night hauls	Fish, Gonostomatid, Night	
	FGD Total gonostomatid and sternoptychid larvae, day hauls	Fish, Gonostomatid, Day	
	BP Relative abundance of plankton-feeding birds	Birds, Plankton-feeding	
	BF Relative abundance of fish and cephalopod-feeding birds	Birds, Fish-feeding	
	SP Porpoise sightings	Sightings, Porpoise	
	SW Whale sightings	Sightings, Whales	
	ST Tuna school sightings, all cruises	Sightings, Tuna	
	UA Upper atmosphere meteorology		
	MW Surface meteorological analysis, winds and pressure	Meteorology, Winds	
	MC Surface meteorological analysis, clouds, dewpoint, temperature	Meteorology, Clouds	
	MT Surface meteorological analysis, sea temperature, sea-air temperature difference, sea temperature anomaly	Meteorology, Temperature	
	RM Reference map		
	TC Track chart		

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Nutrient chemistry—White pages

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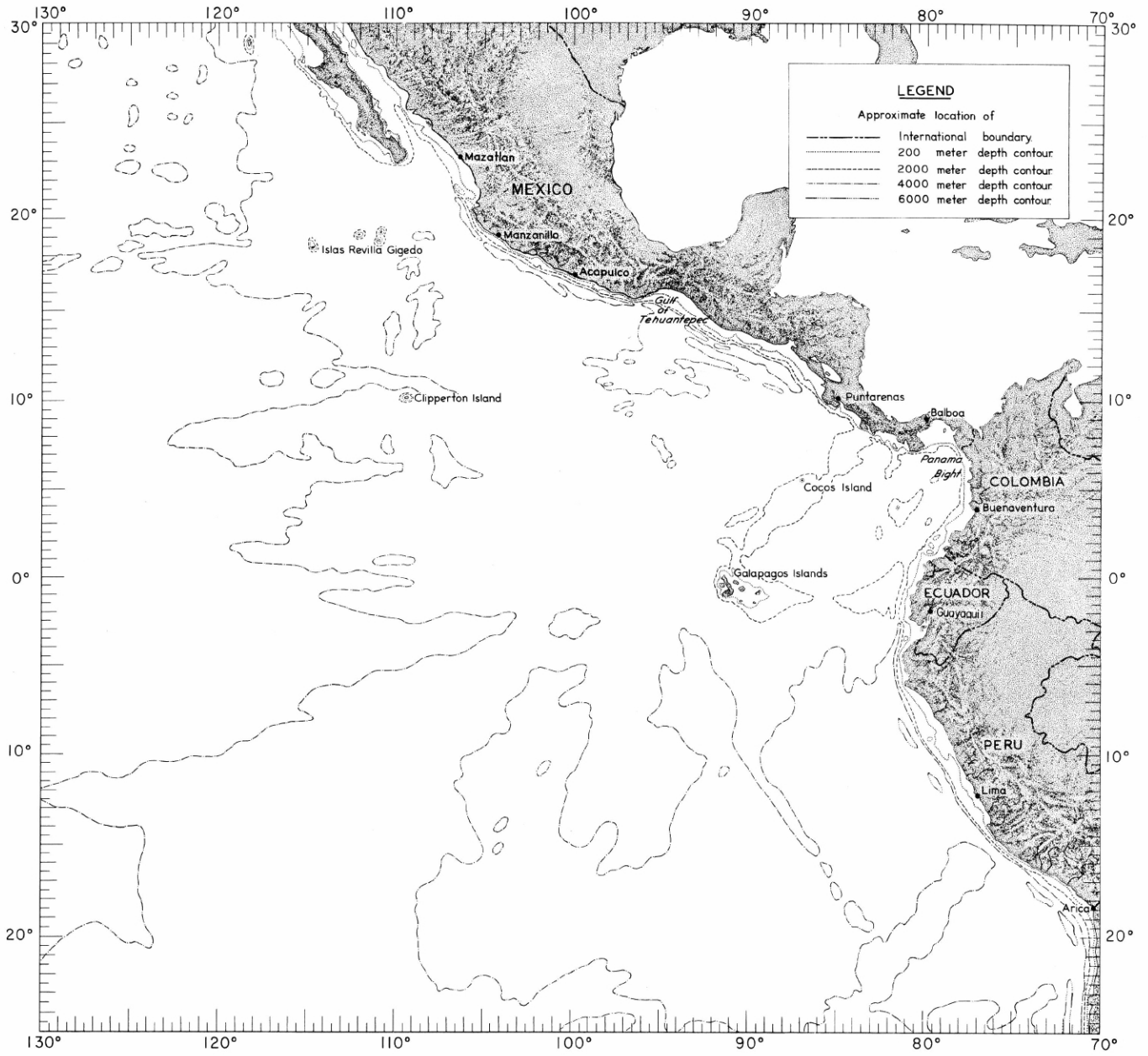
Phytoplankton—Green pages



RM-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.

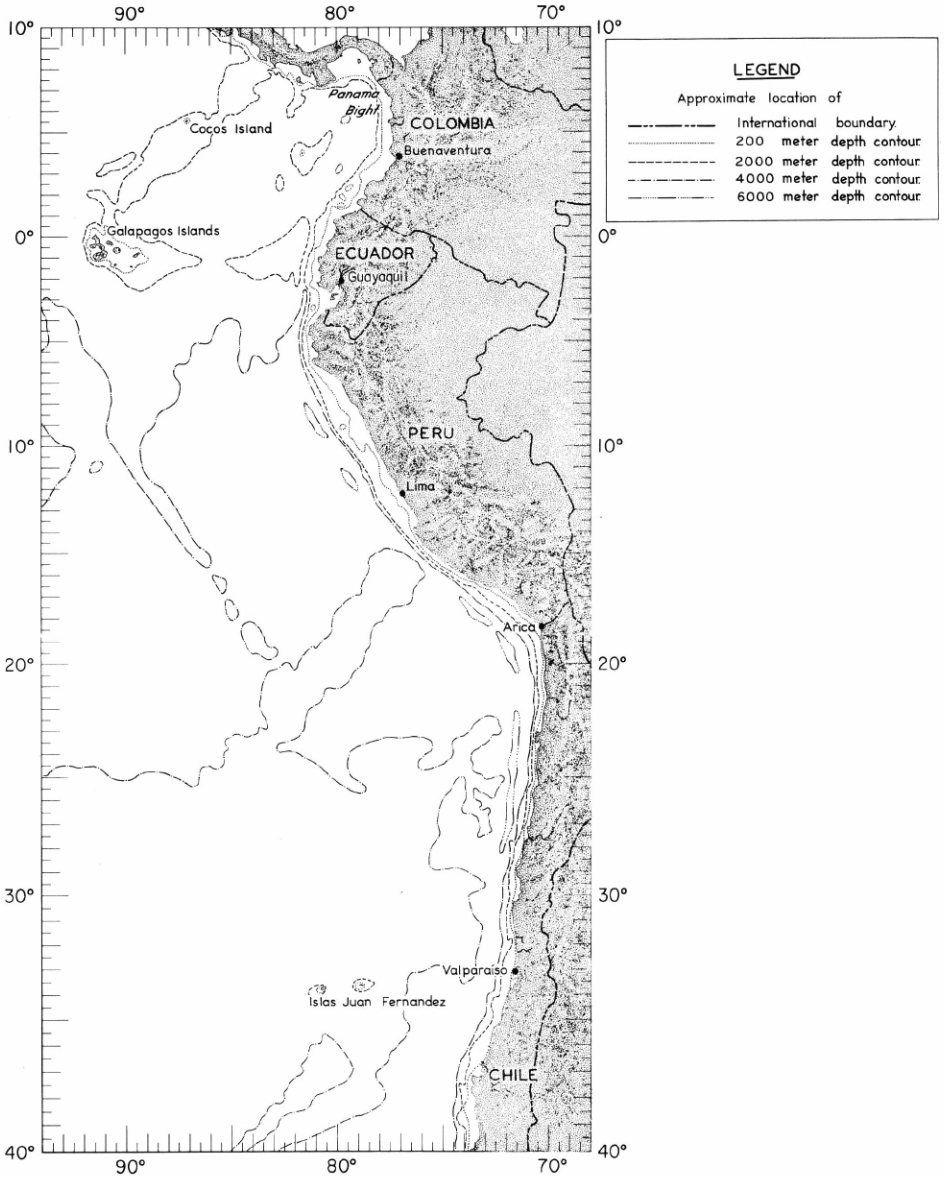
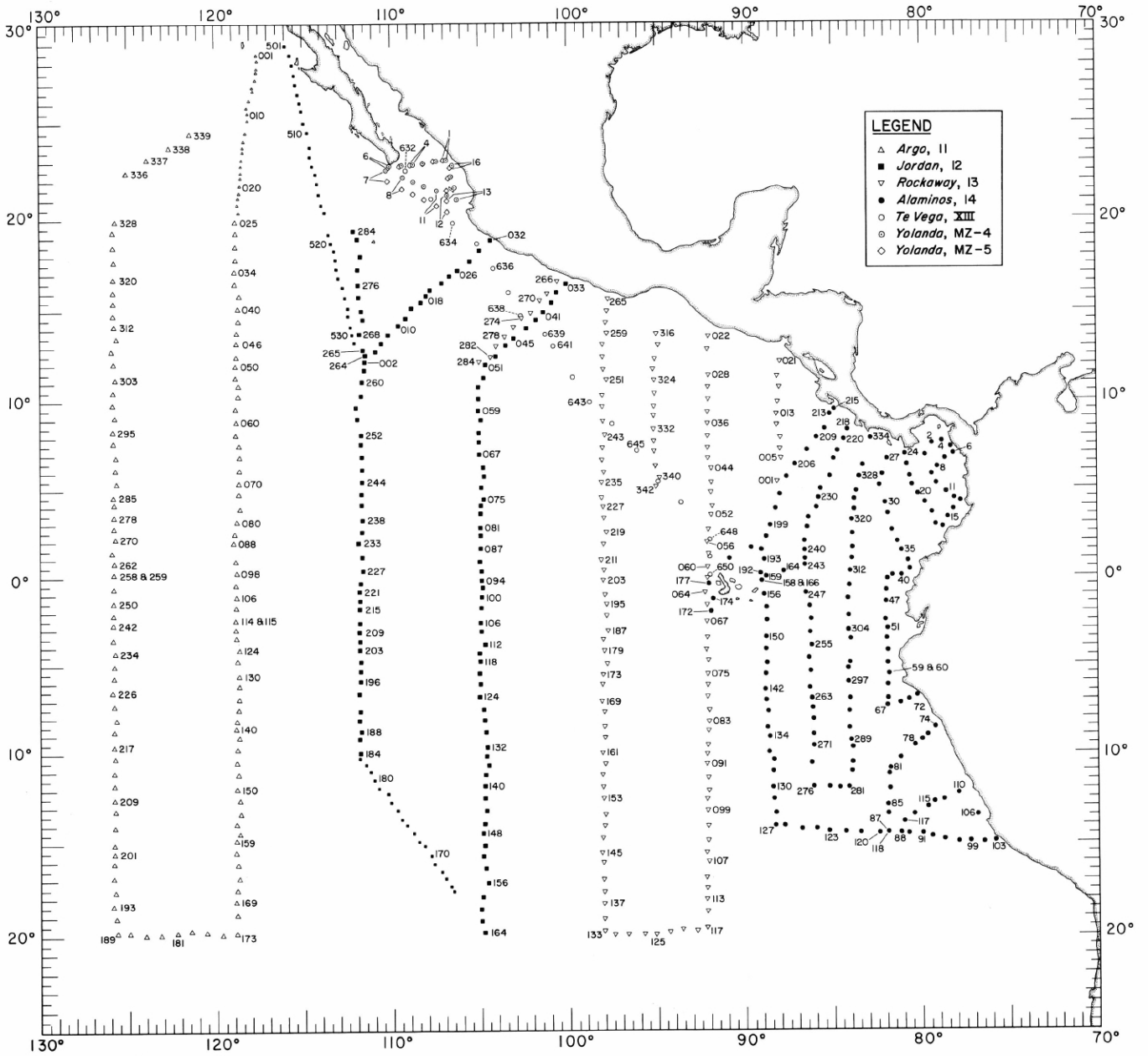
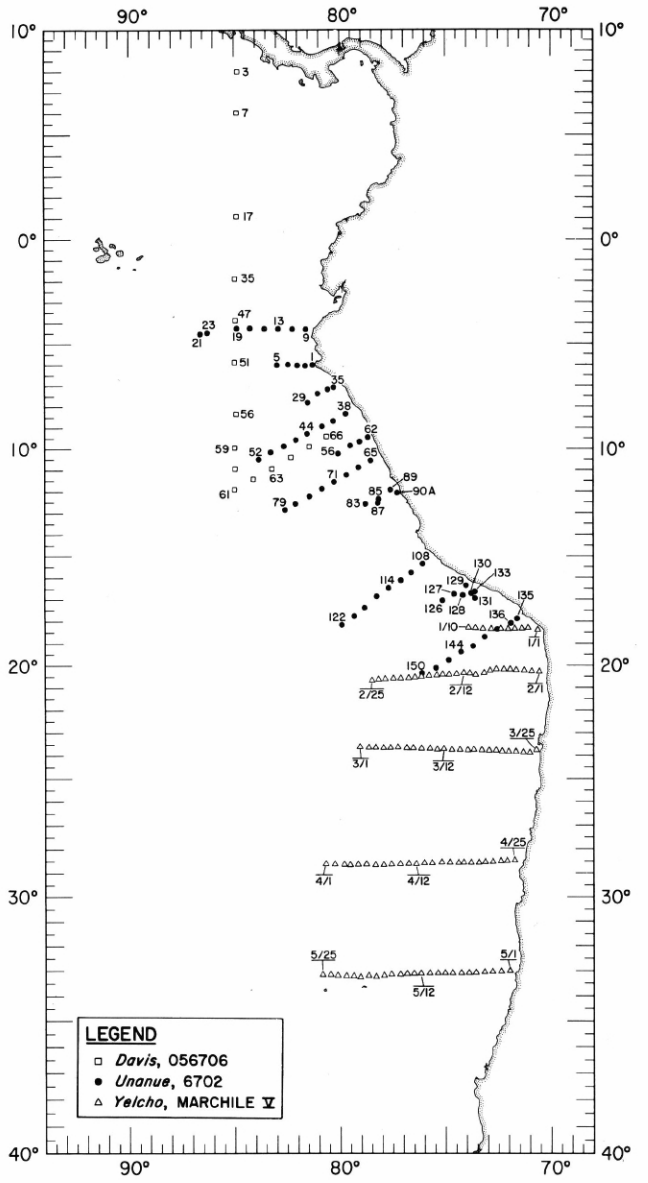


FIGURE RM-b — Reference map of the southern coastal portion of the EASTROPAC area. The topographic shading and bathymetric contours are approximate only and should not be considered as portraying the latest available information.



10-TC-a.

FIGURE 10-TC-a. — Locations of stations occupied by participating ships in the main portion of the EASTROPAC area during the first survey period, February-March 1967.



10-TC-b.

FIGURE 10-TC-b. — Locations of stations occupied by participating ships in the southern coastal portion of the EASTROPAC area during the first survey period, February-March 1967.

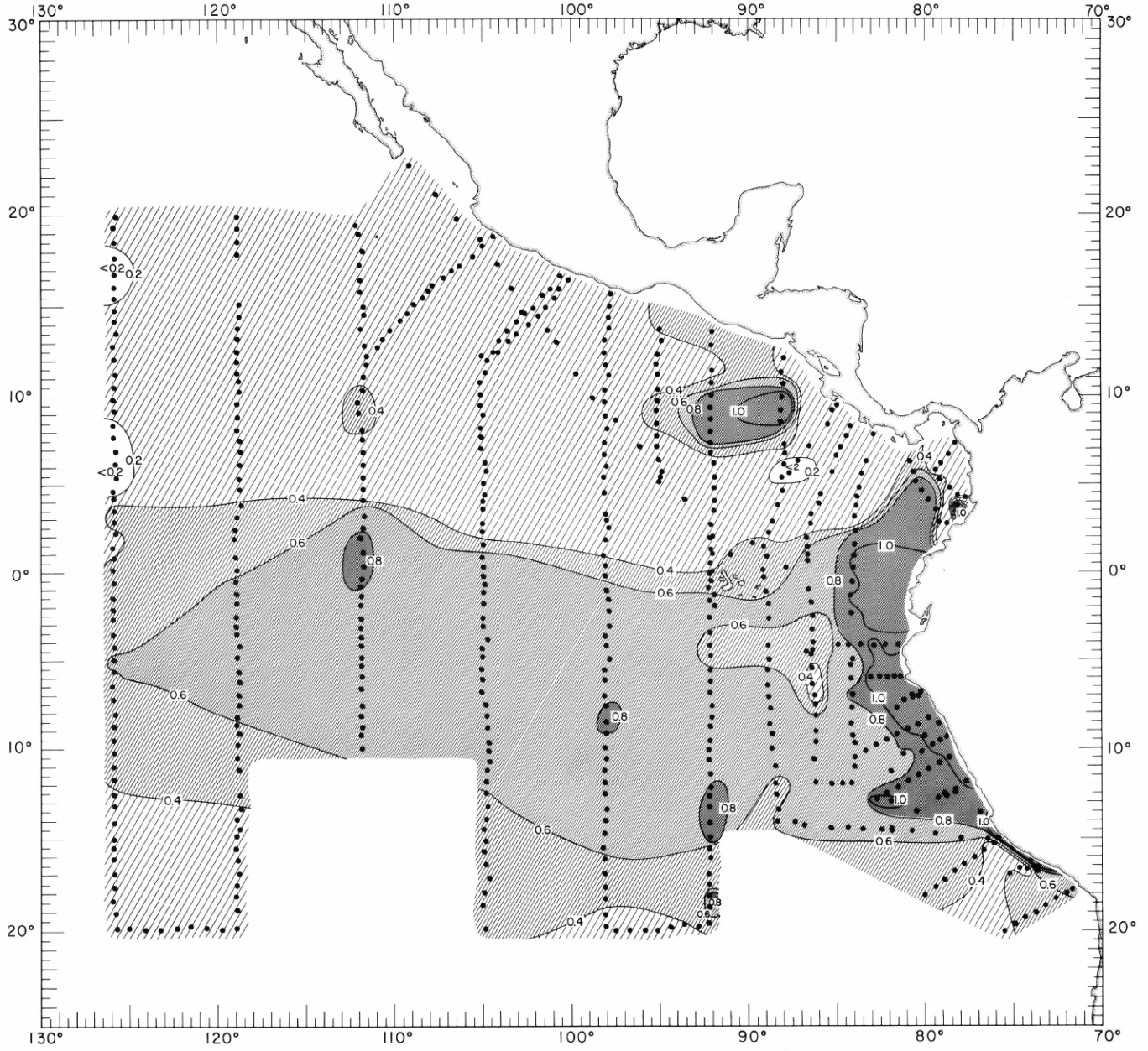
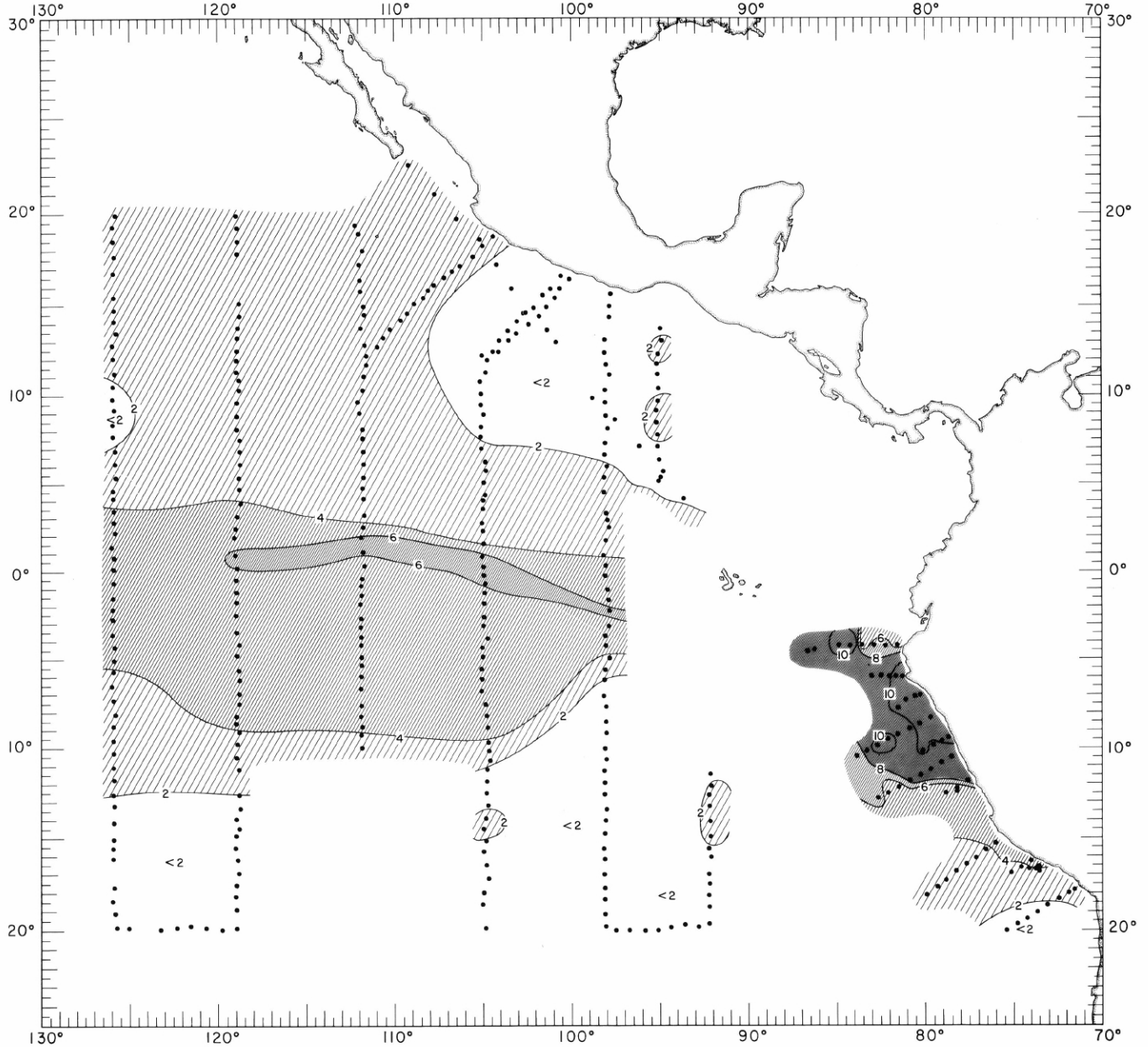


FIGURE 10-P-10. — Phosphate-phosphorus (μg.-at./l.) at 10 meters, February-March 1967.



10-Si-10.

FIGURE 10-Si-10. — Silicate-silicon (μg.-at./l.) at 10 meters, February-March 1967.

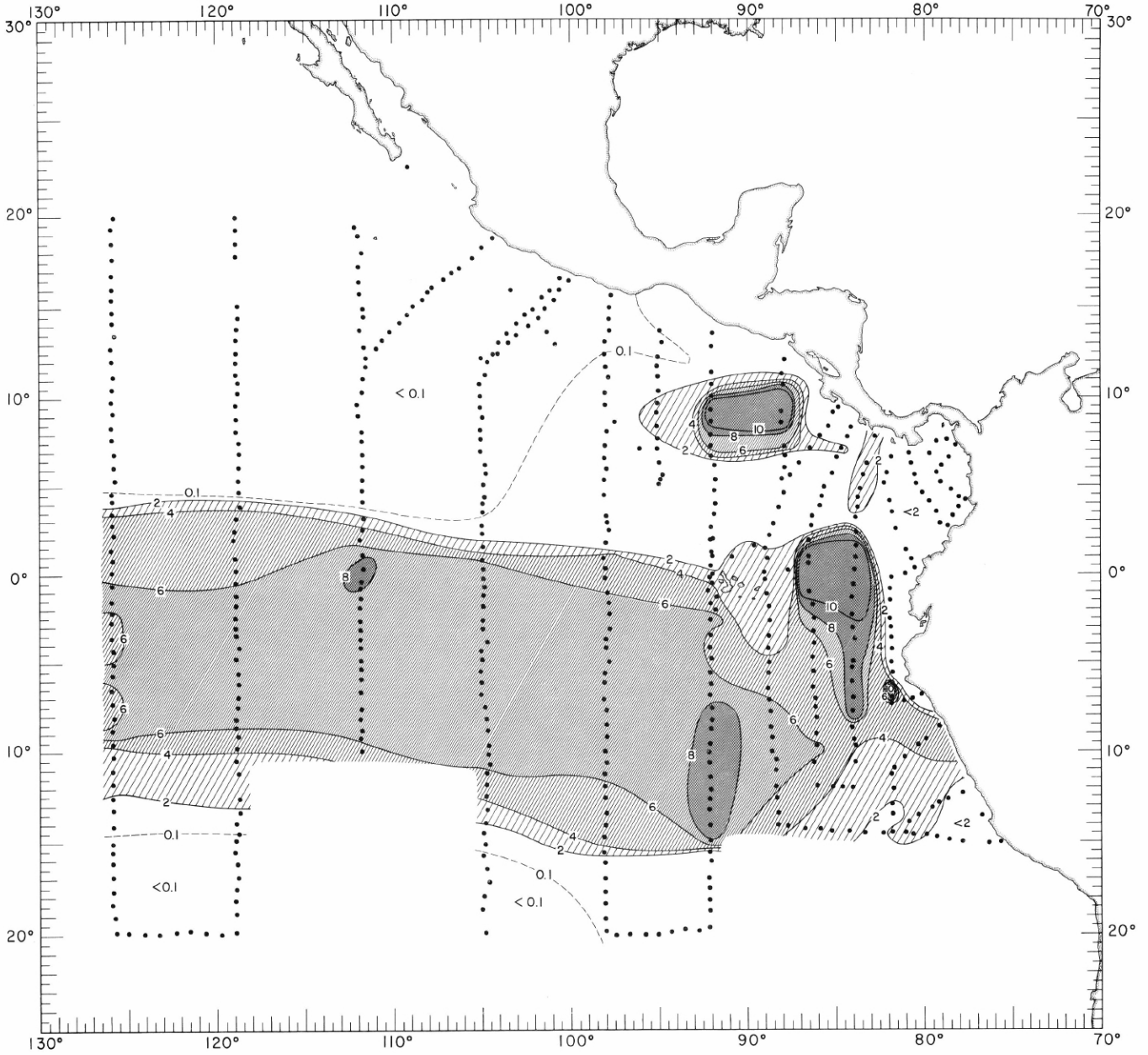


FIGURE 10-NO_3-10. — Nitrate-nitrogen (μg.-at./l.) at 10 meters, February-March, 1967.

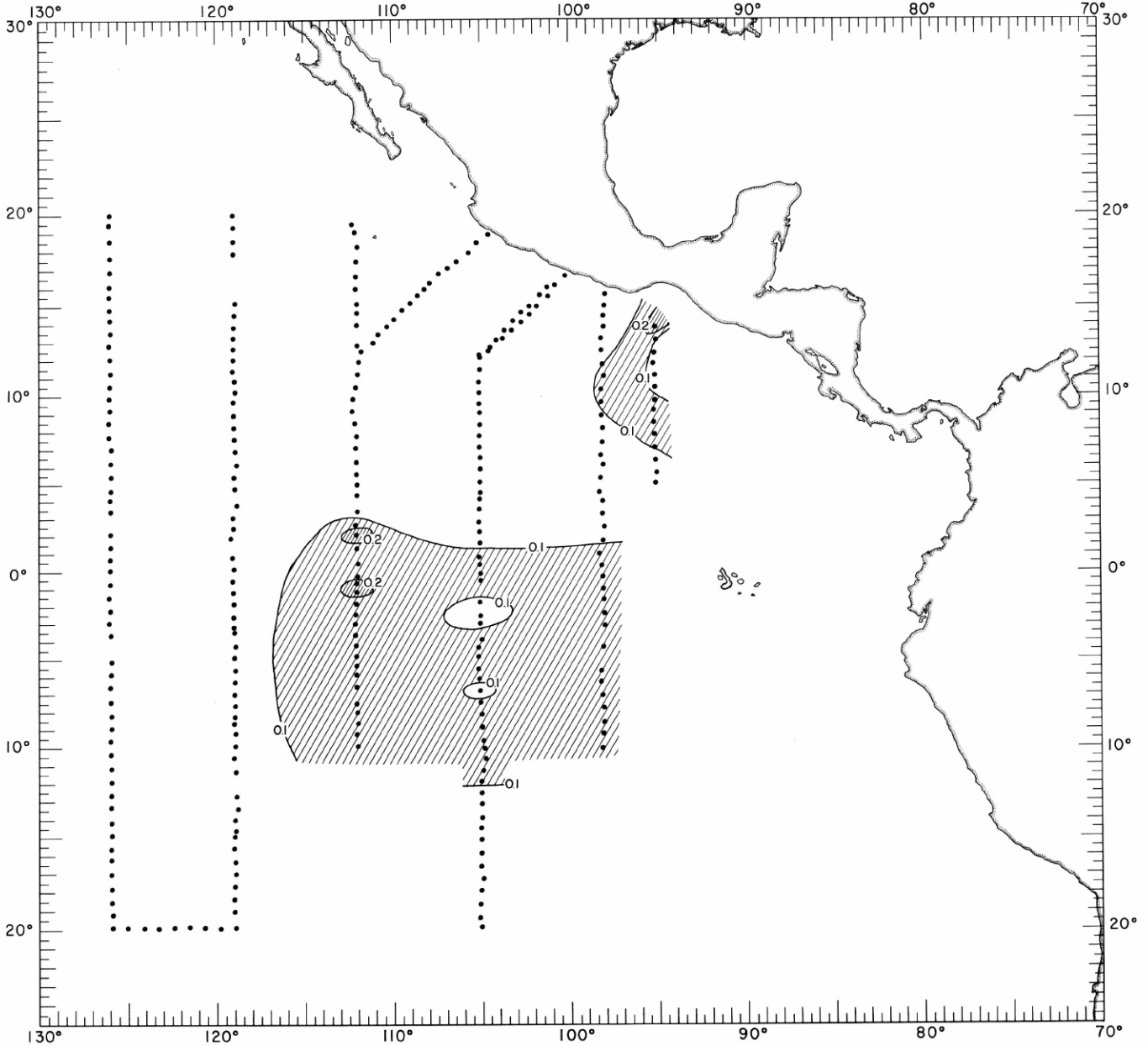
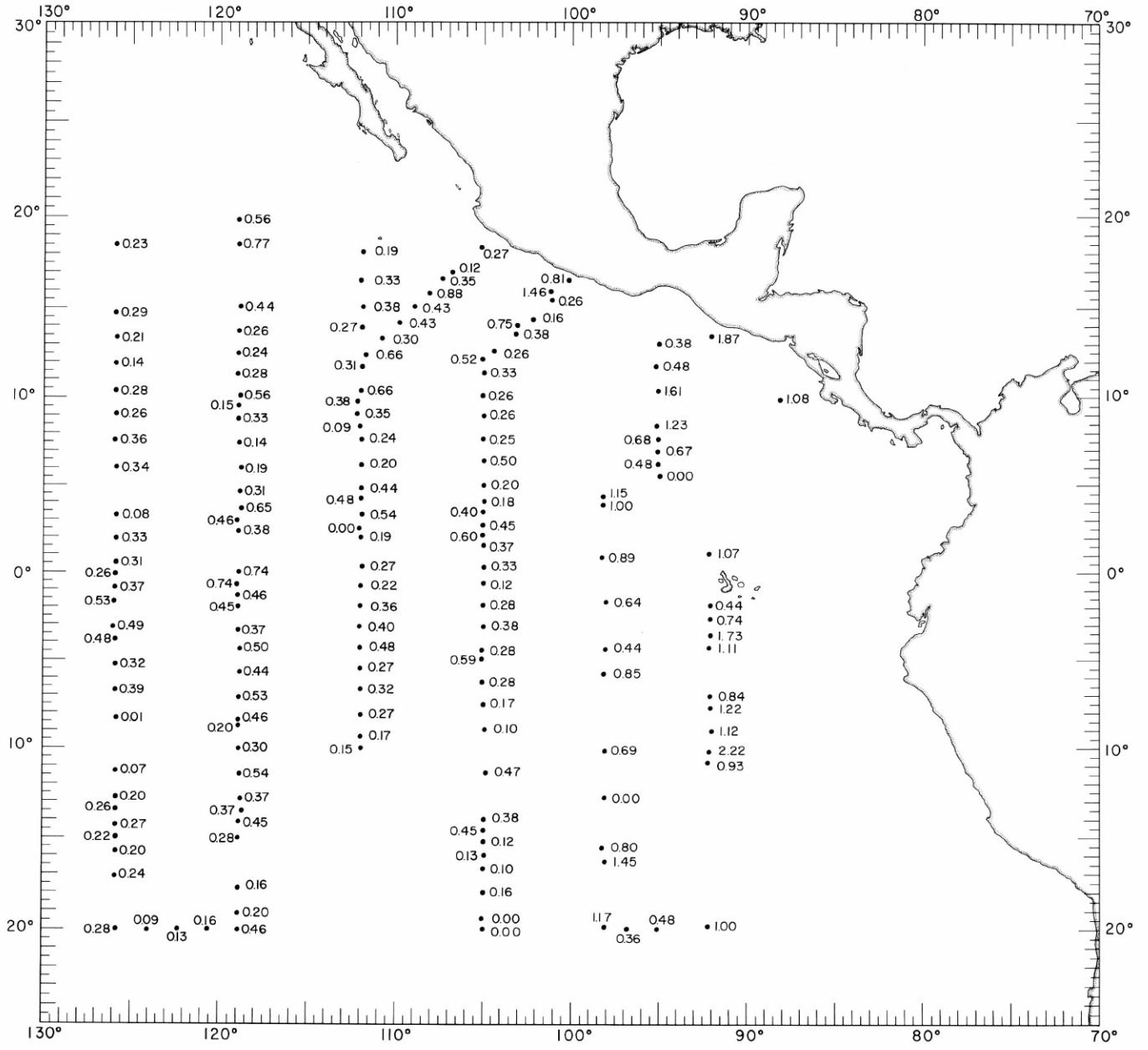
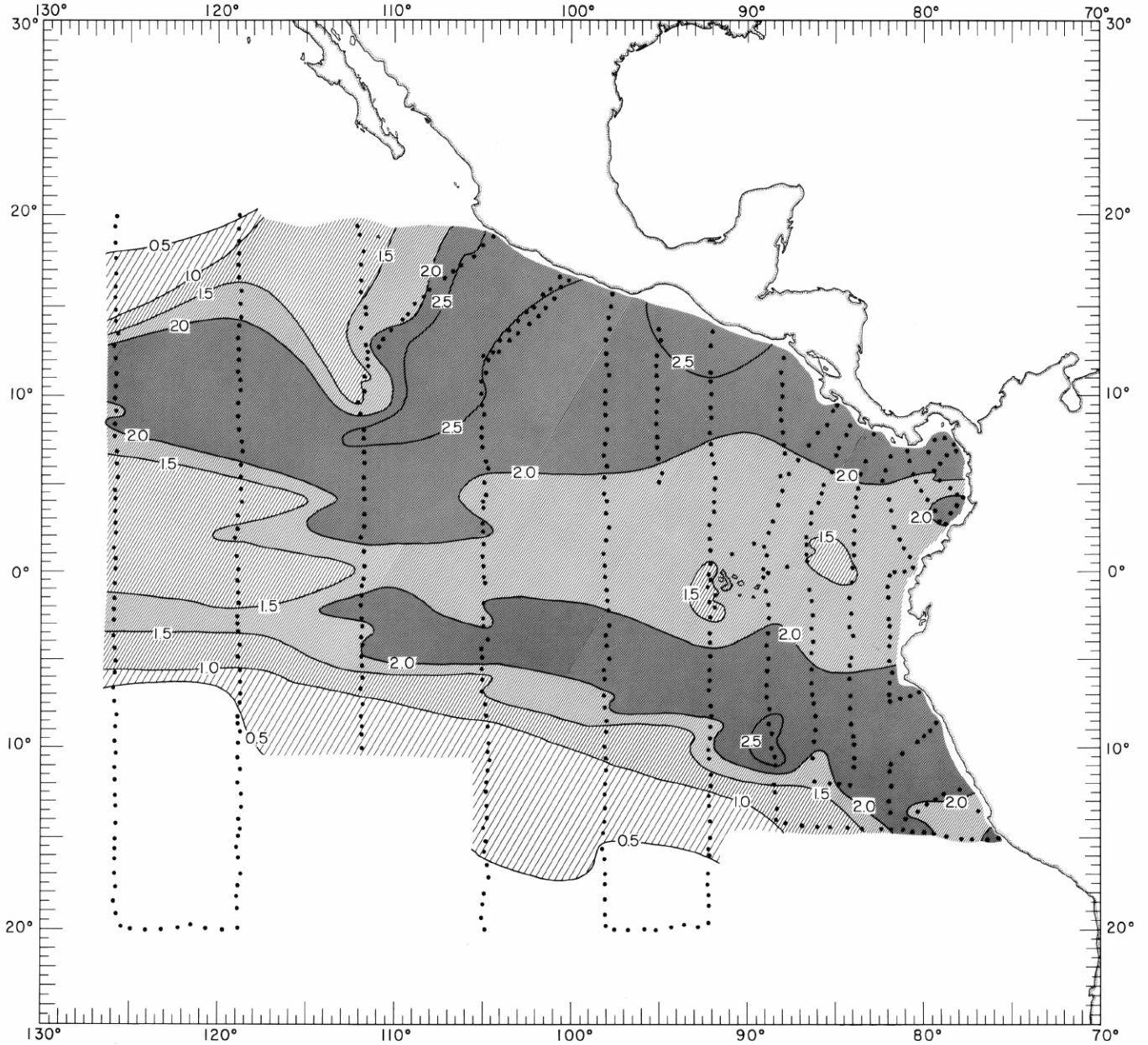


FIGURE 10-NO_2-10. — Nitrite-nitrogen (μg.-at./l.) at 10 meters, February-March 1967.



10-NH$_3$-10.

FIGURE 10-NH$_3$-10.—Ammonia-nitrogen (μg.-at./l.) at 10 meters, February-March 1967. Because the distribution is so irregular no contours have been drawn. Instead the concentration at each station is shown.



10-P-100.

FIGURE 10-P-100. — Phosphate-phosphorus (μg.-at./l.) at 100 meters, February-March 1967.

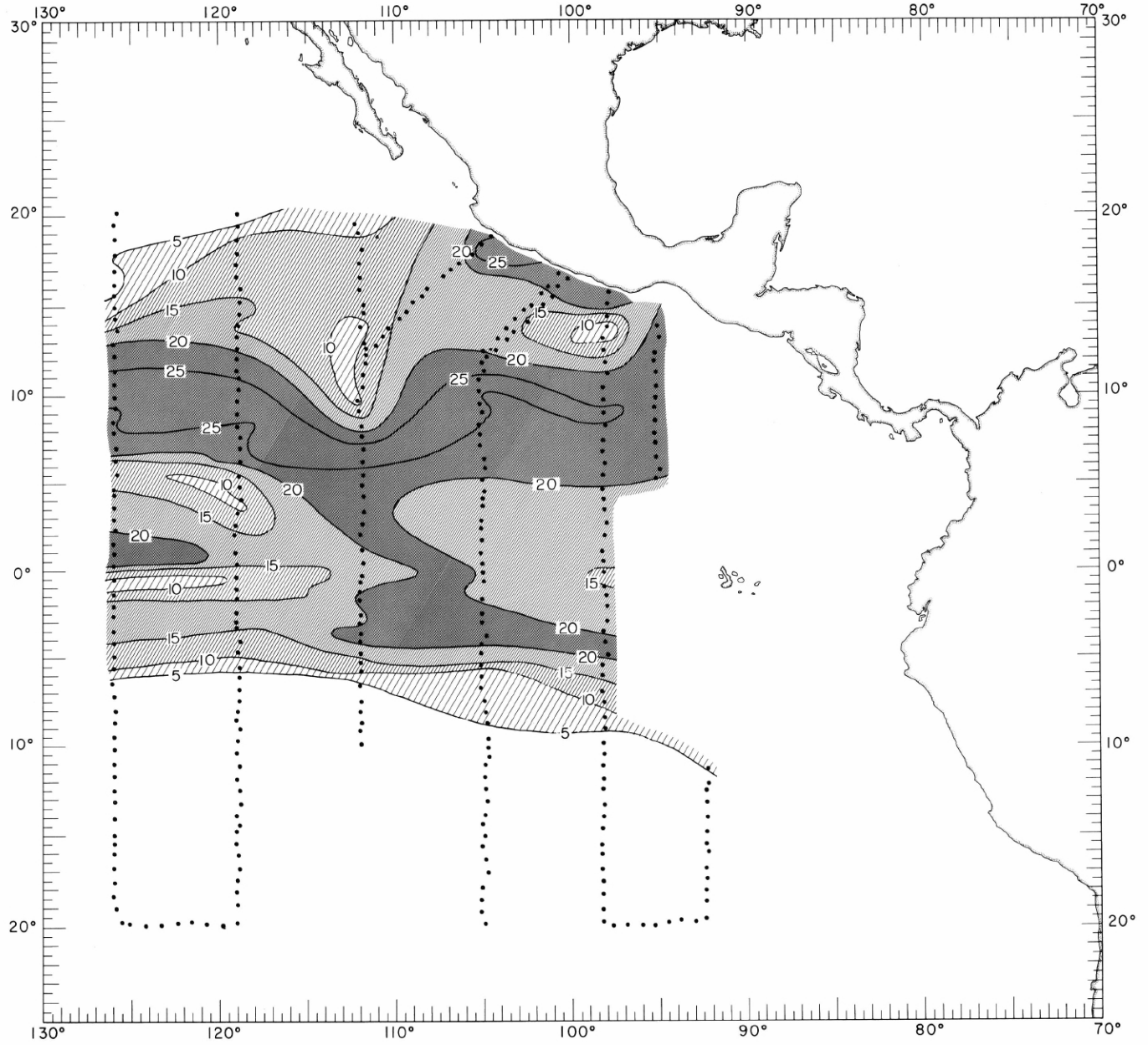


FIGURE 10-Si-100. — Silicate-silicon (μg.-at./l.) at 100 meters, February-March 1967.

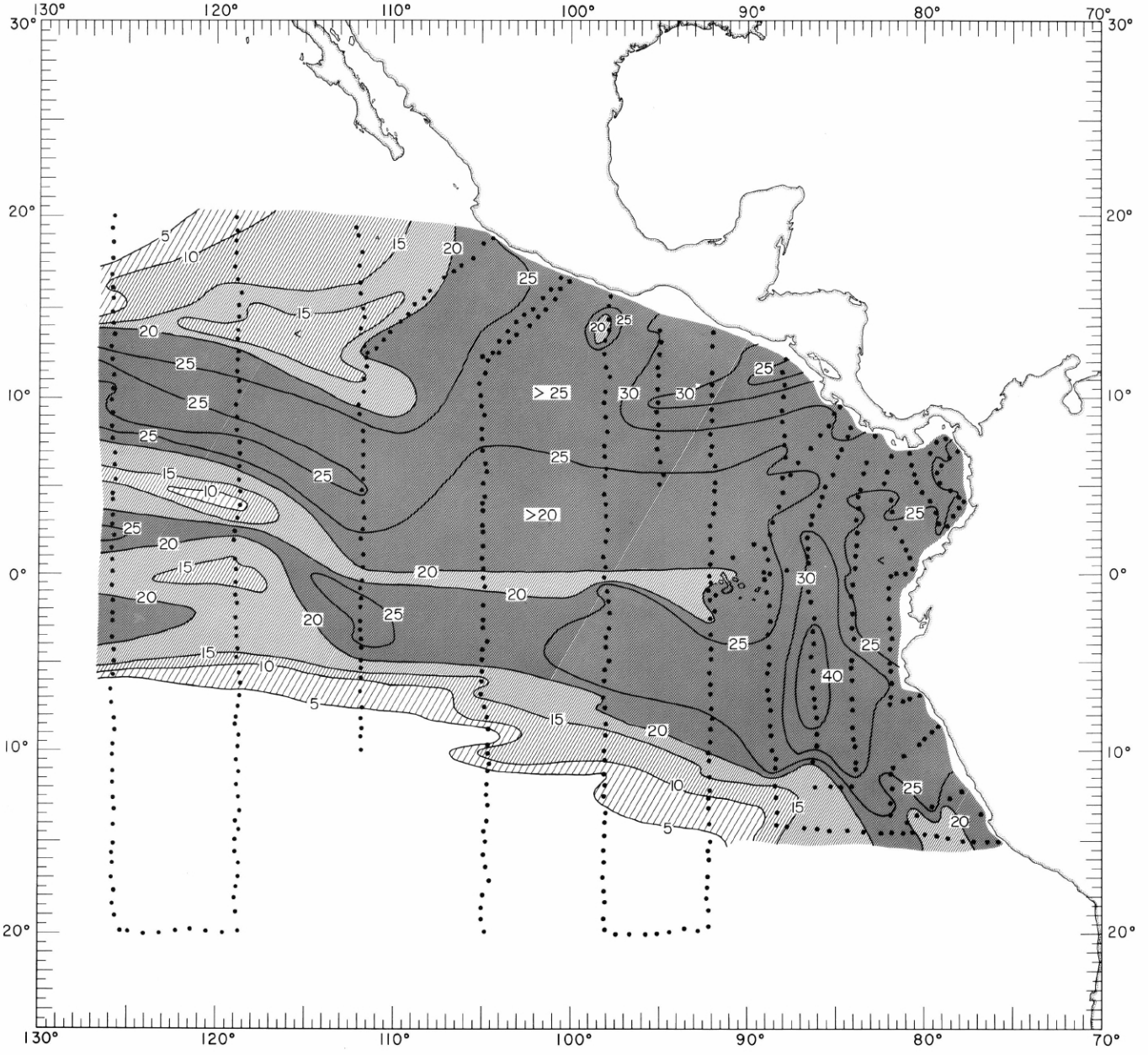


FIGURE 10-NO_3-100. — Nitrate-nitrogen (μg.-at./L) at 100 meters, February-March 1967.

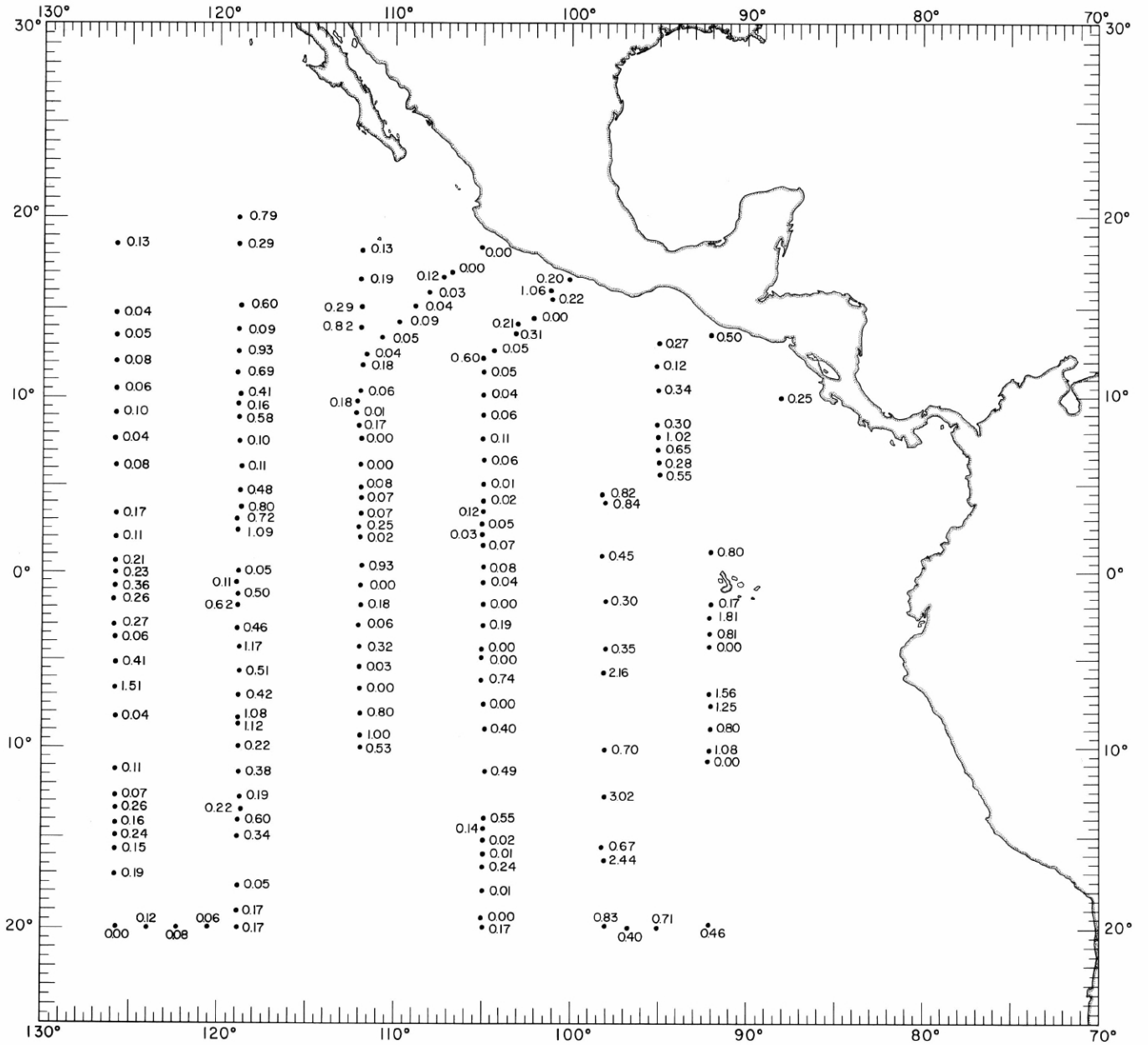
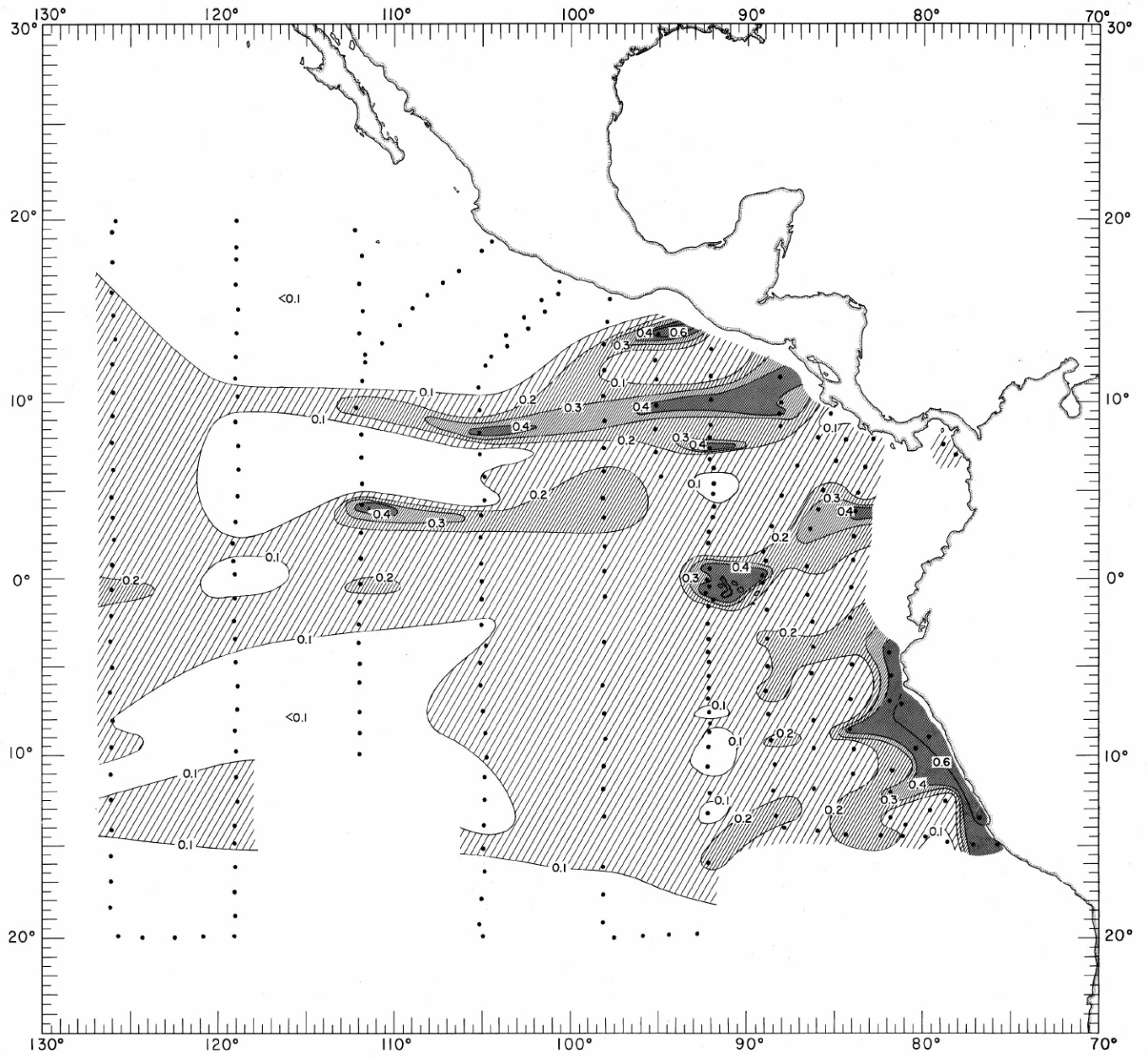
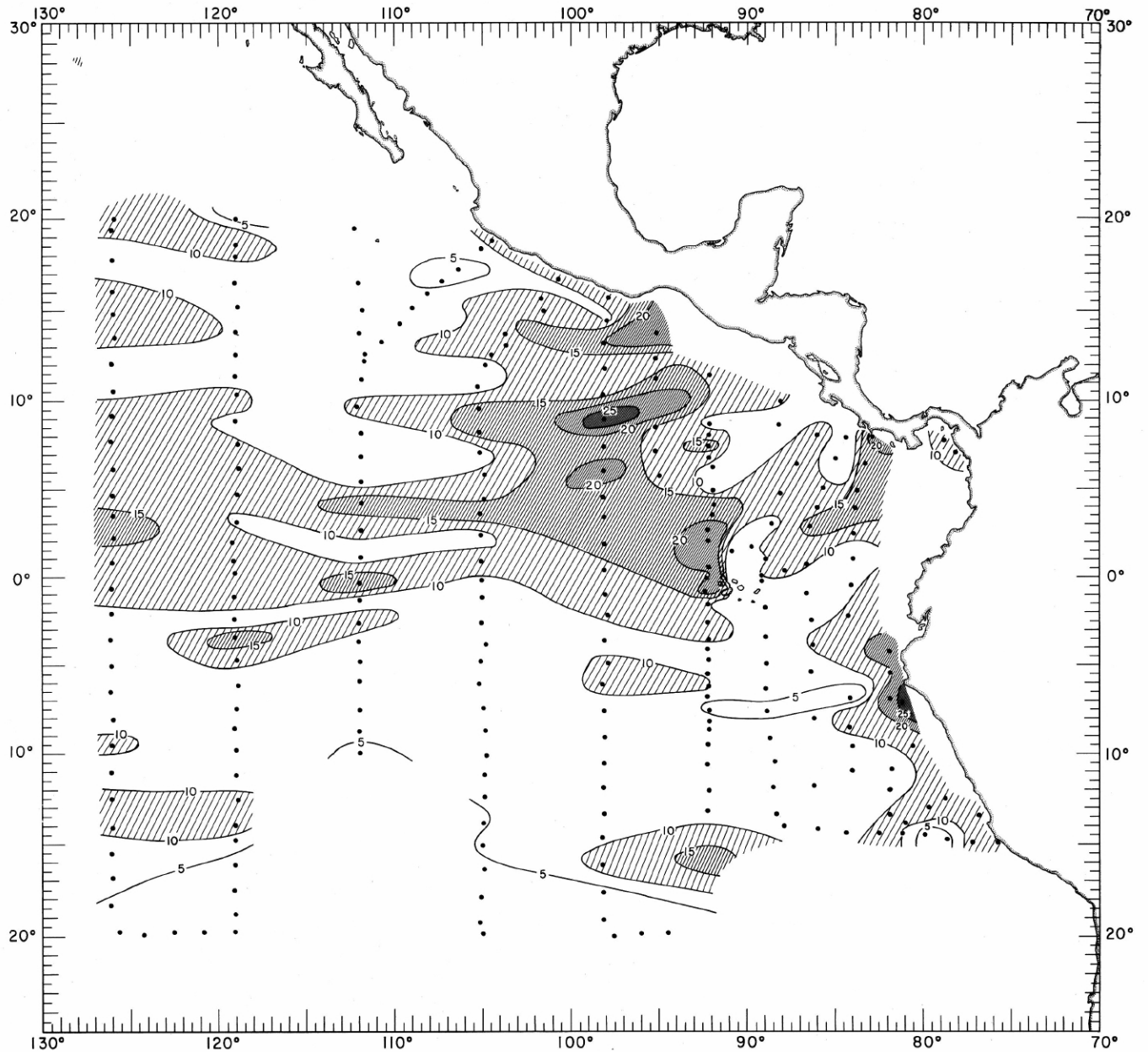


FIGURE 10-NH_3-100.—Ammonia-nitrogen (μg.-at./l.) at 100 meters, February-March 1967. Because the distribution is so irregular no contours have been drawn. Instead the concentration at each station is shown.



10-Ch-s.

FIGURE 10-Ch-s. — Chlorophyll-a (mg./m.^{3}) at the sea surface, February-March 1967.



10-Ch-ei.

FIGURE 10-Ch-ei. — Chlorophyll-a (mg./m.^{2}) integrated over the euphotic layer, February-March 1967.

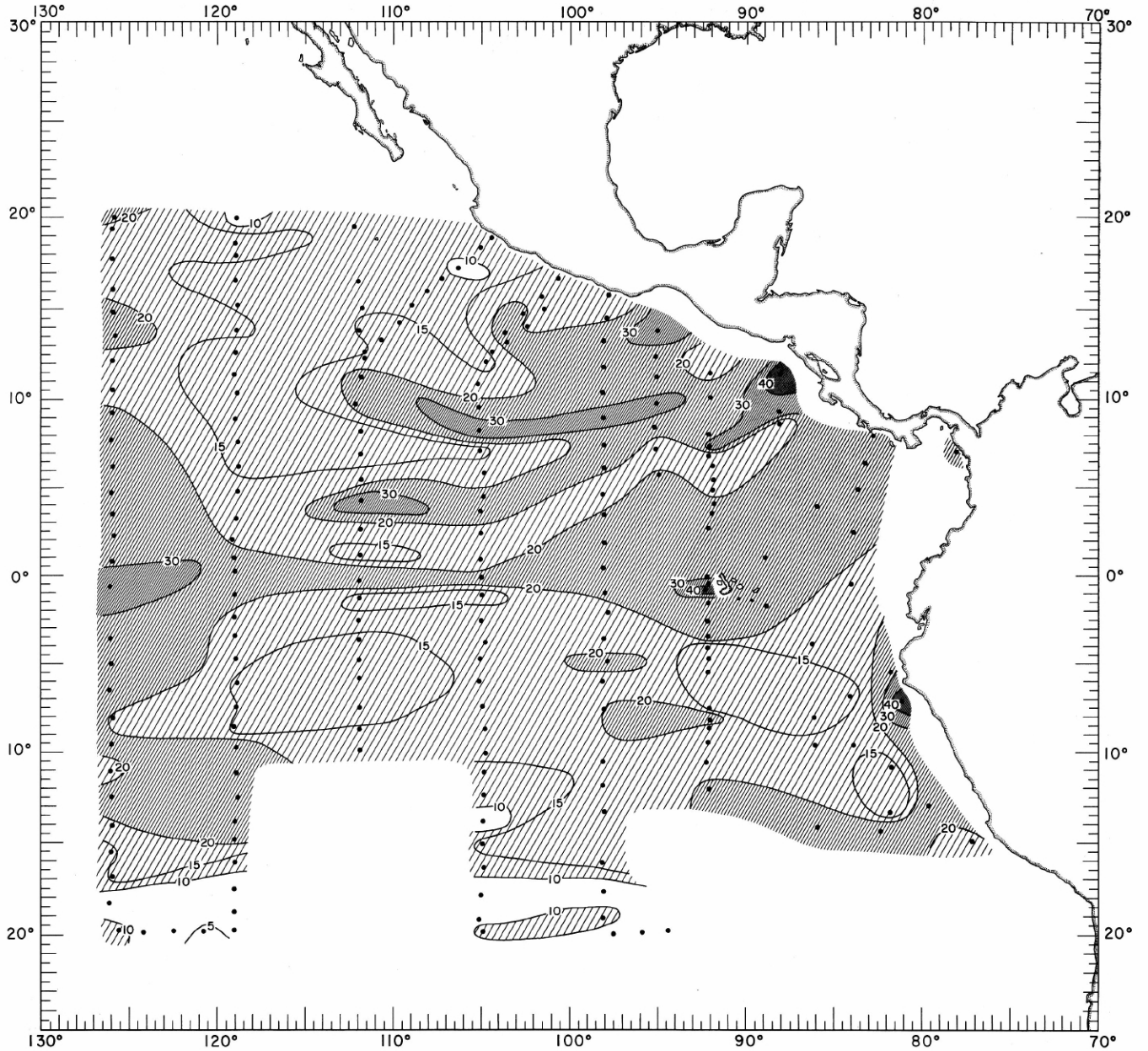


FIGURE 10-Ch-150i. — Chlorophyll-a (mg./m.^{2}) integrated from the sea surface to 150 meters depth, February-March 1967.

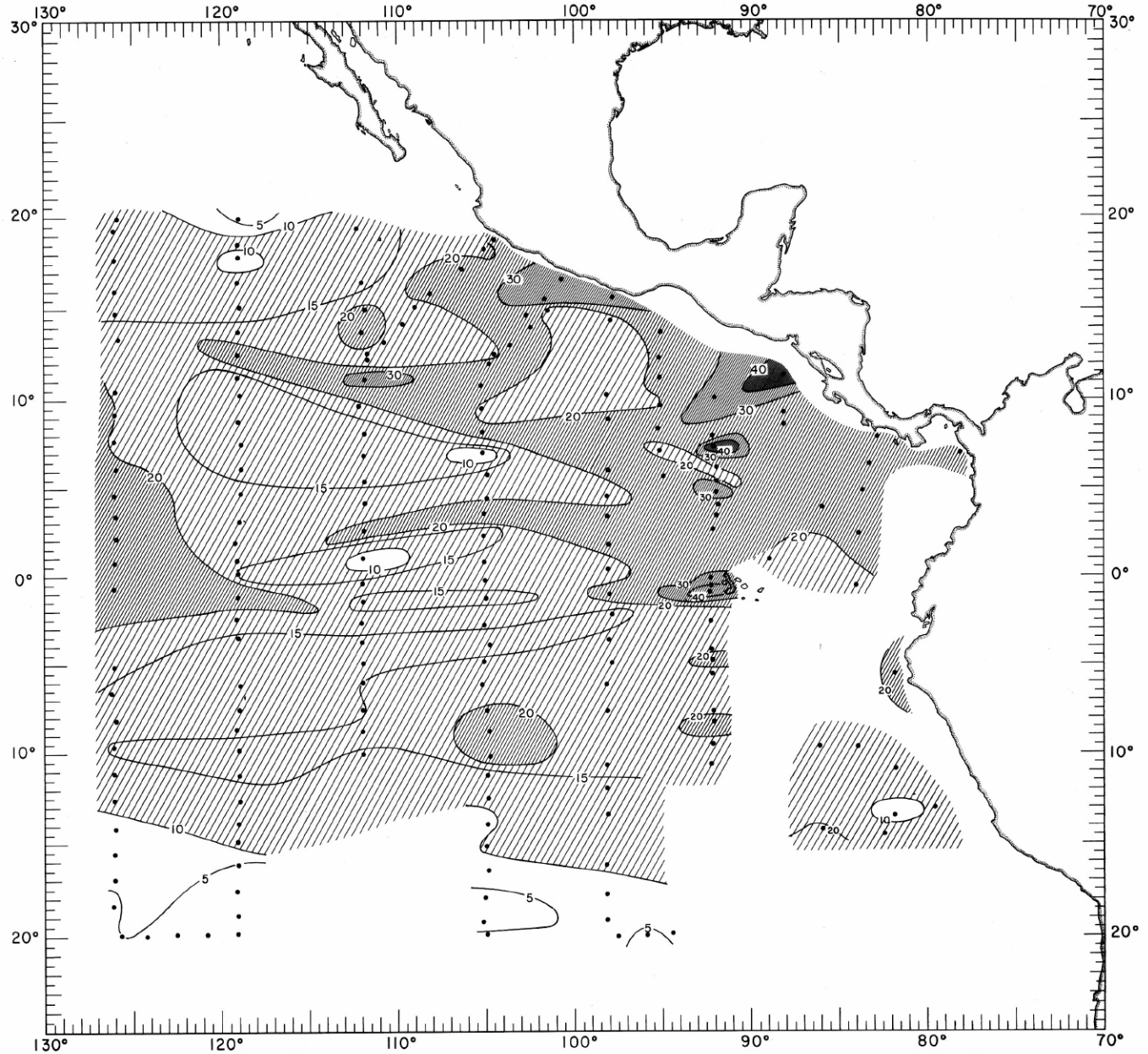
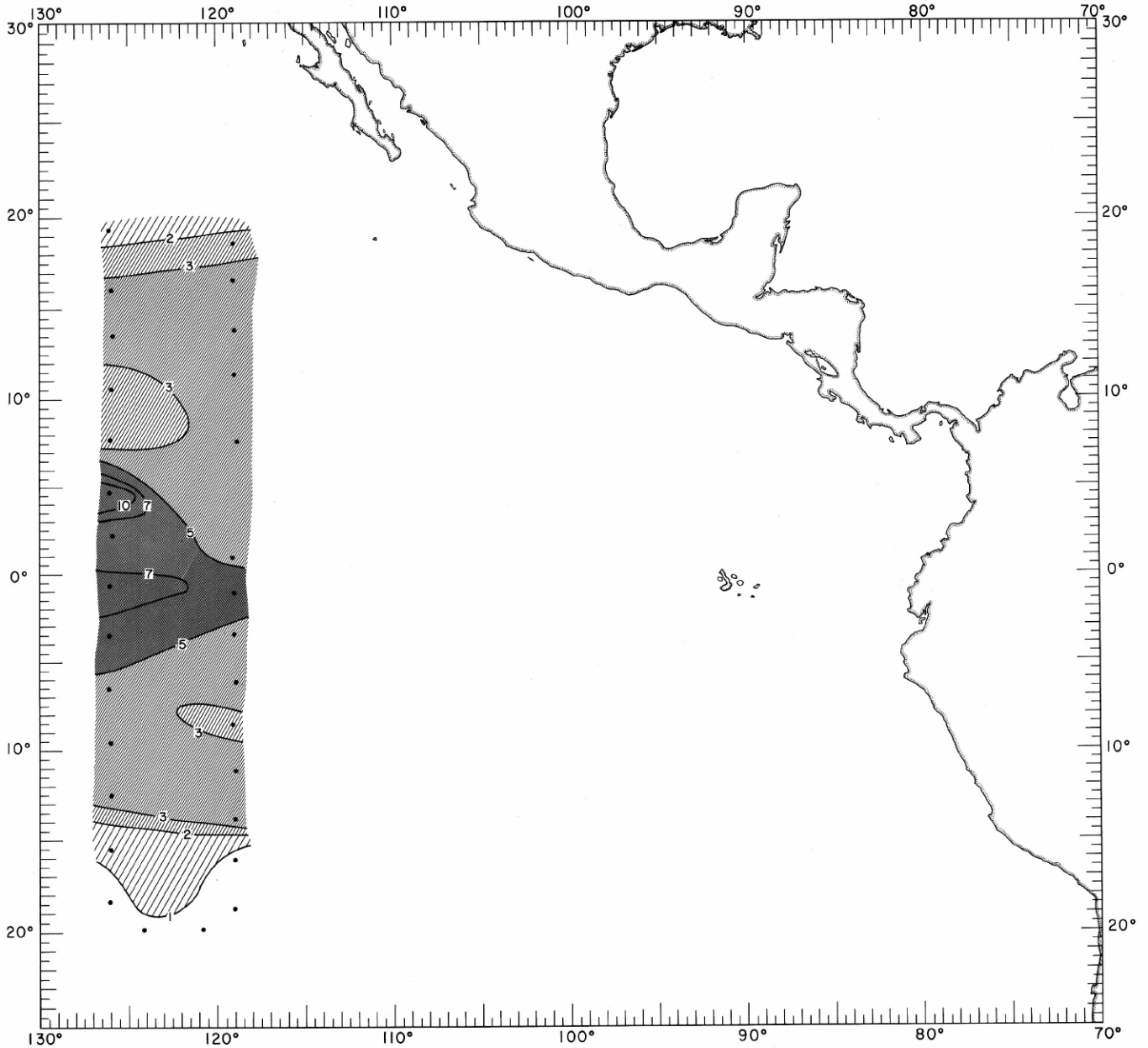


FIGURE 10-Ph-150i. — Phaeophytin (mg./m.^{2}) integrated from the sea surface to 150 meters depth, February-March 1967.



10-PP-s.

FIGURE 10-PP-s. — Primary production (mg. C /m.^{3}/day) at the sea surface, February-March 1967.

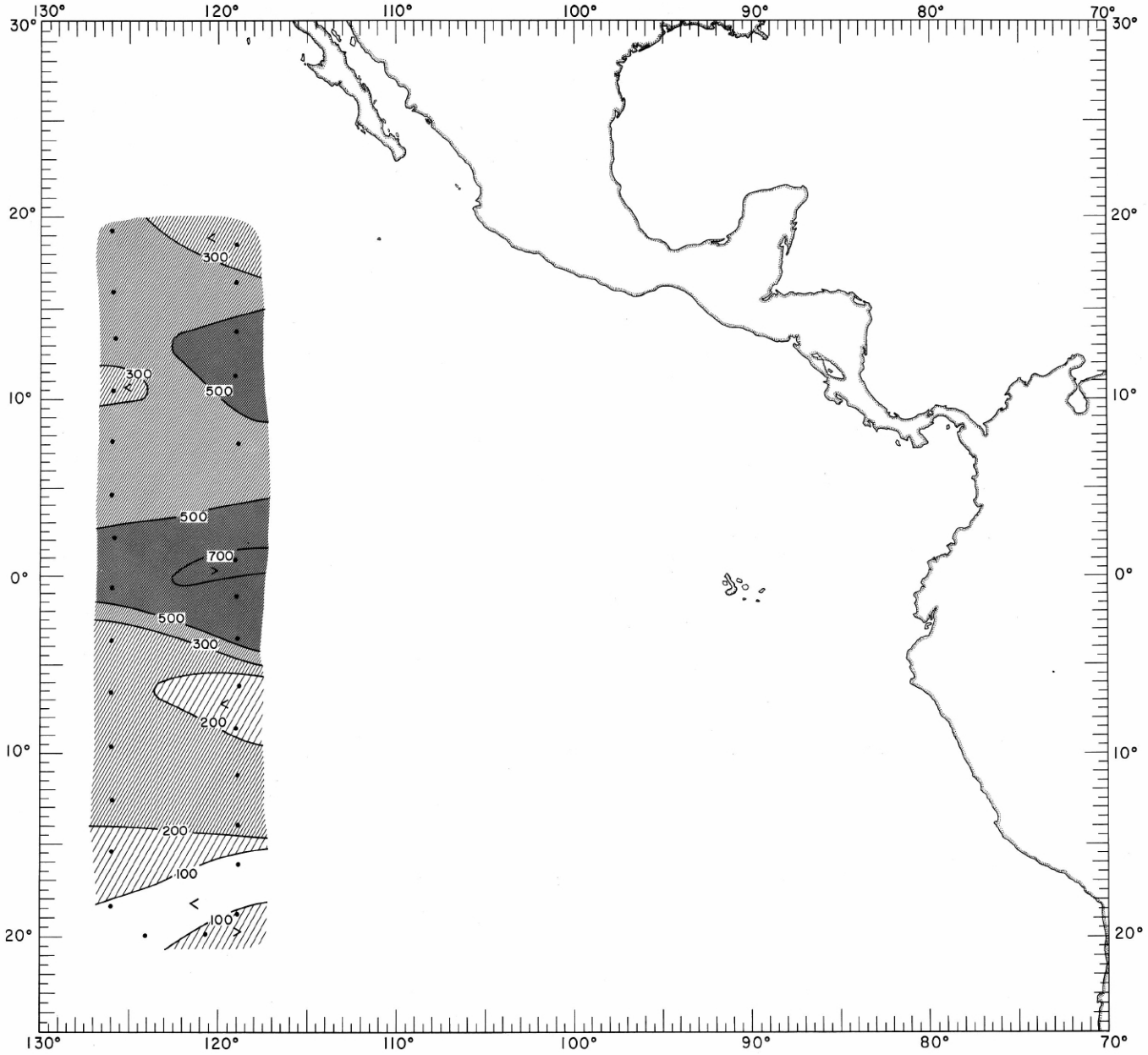
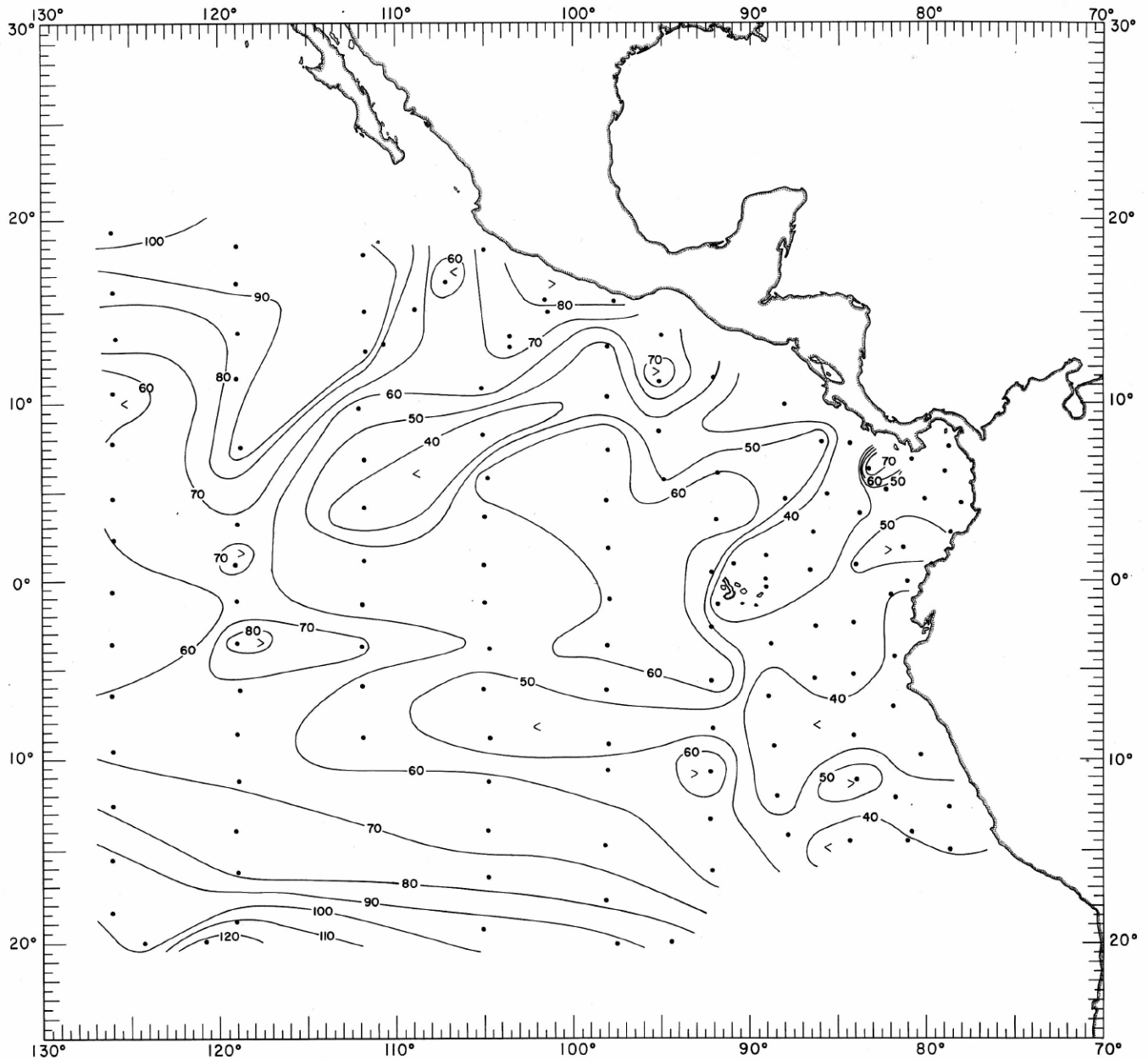


FIGURE 10-PP-ei. — Primary production (mg. C /m.^{2}/day) integrated over the euphotic layer, February-March 1967.



10-EL.

FIGURE 10-EL. — Thickness of the euphotic layer in meters, February-March 1967.

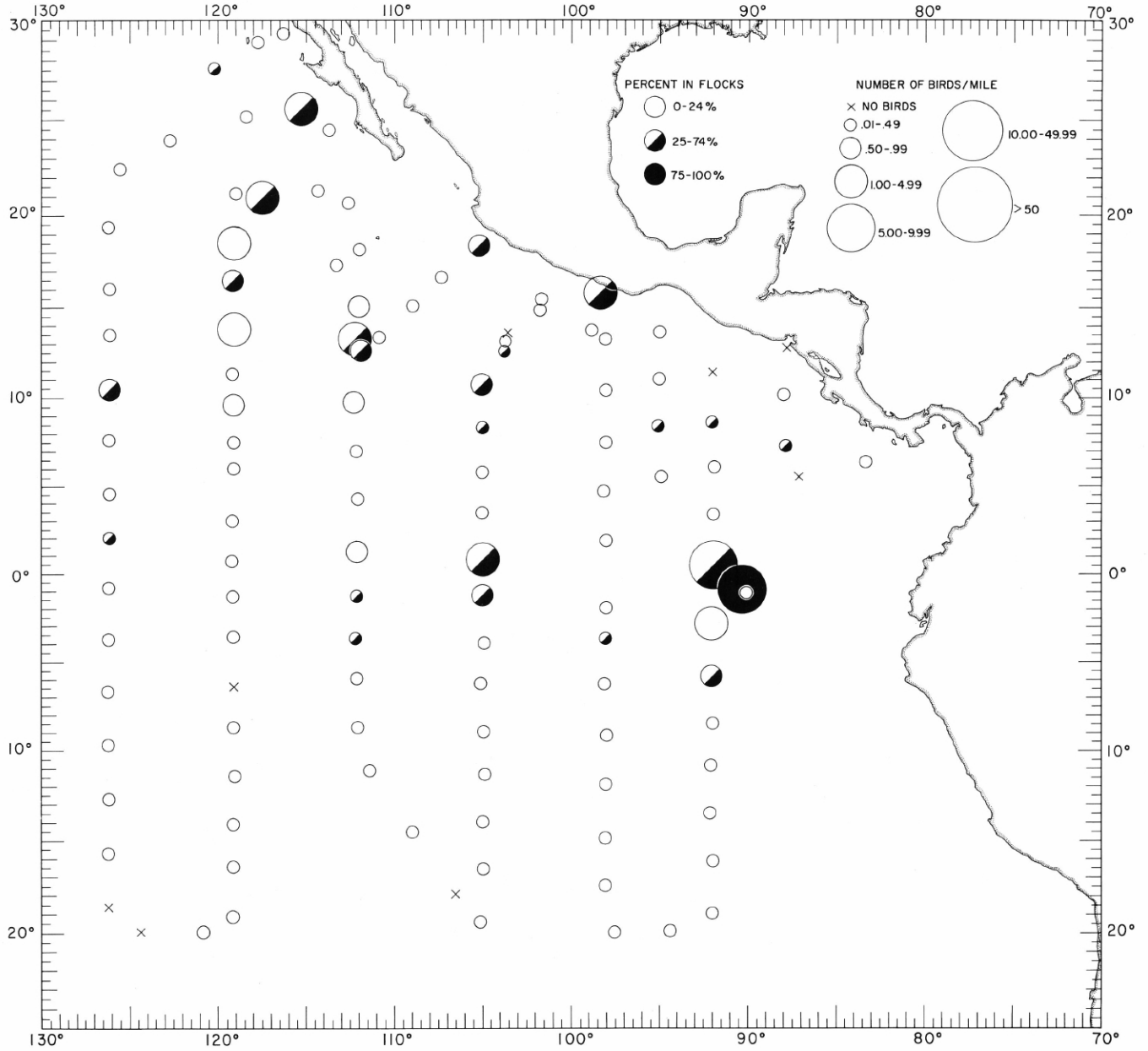


FIGURE 10-BP. — Relative abundance of plankton-feeding birds (birds/mile), February-March 1967.

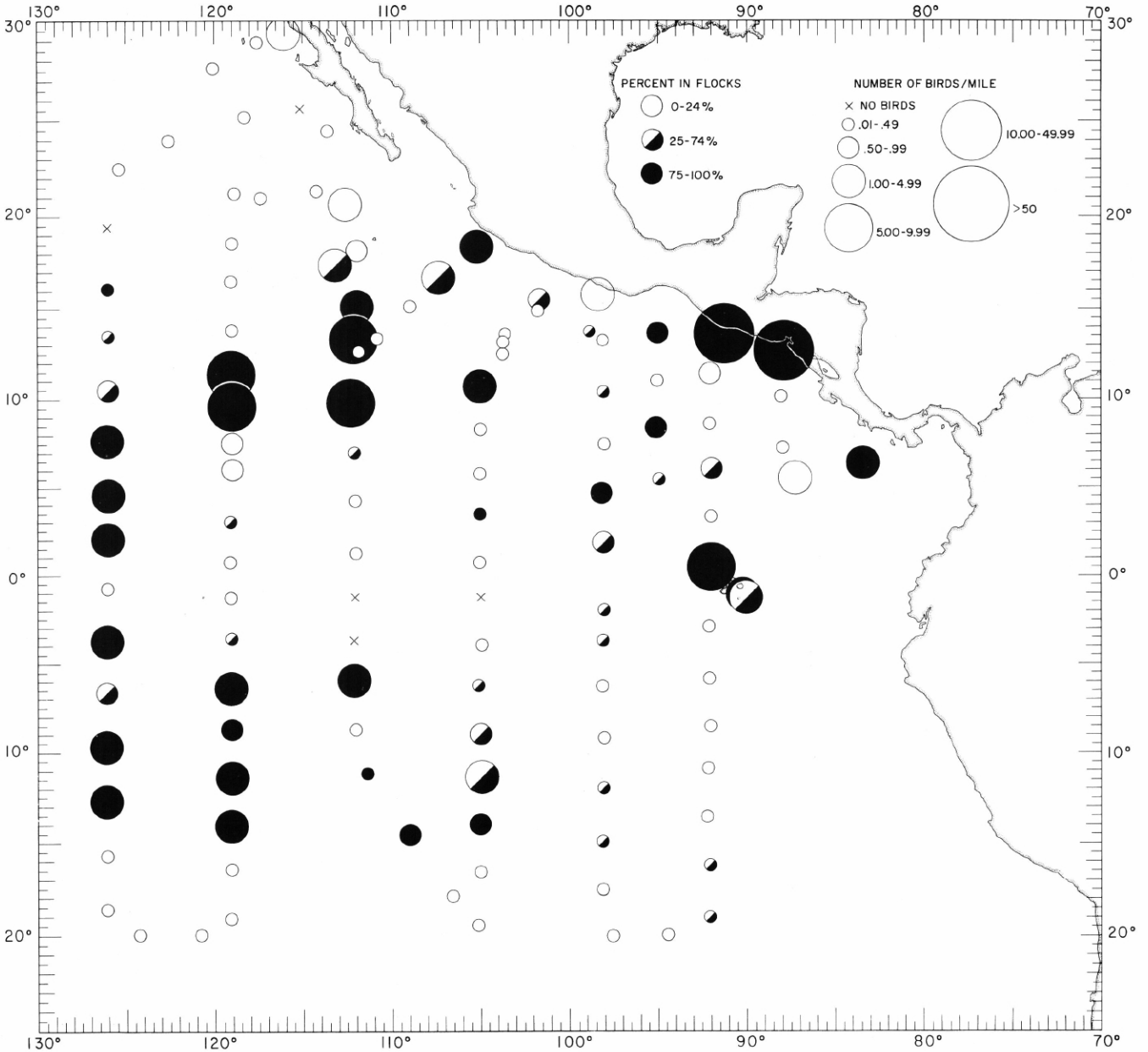


FIGURE 10-BF. — Relative abundance of fish and cephalopod-feeding birds (birds/mile), February-March 1967.

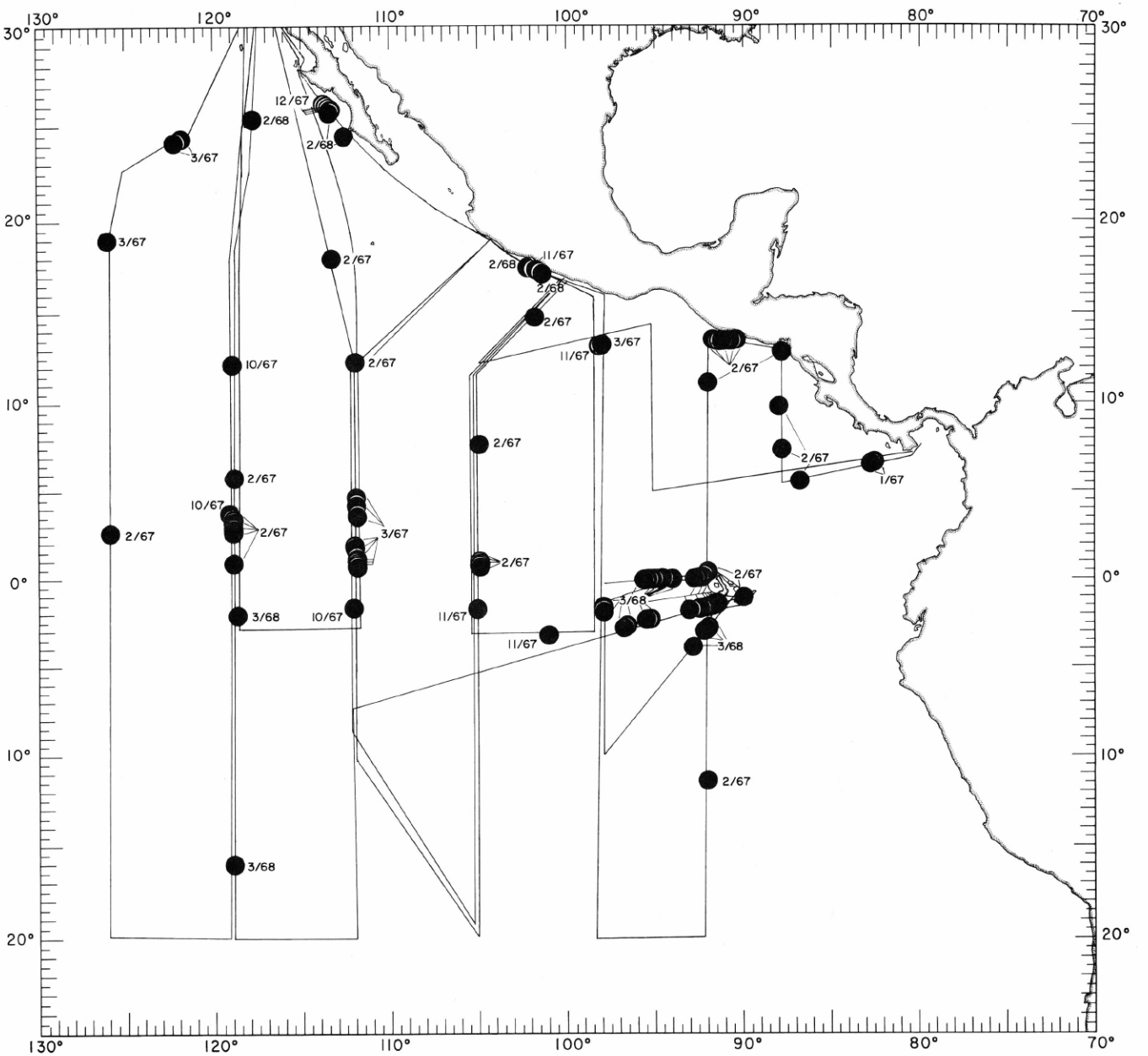
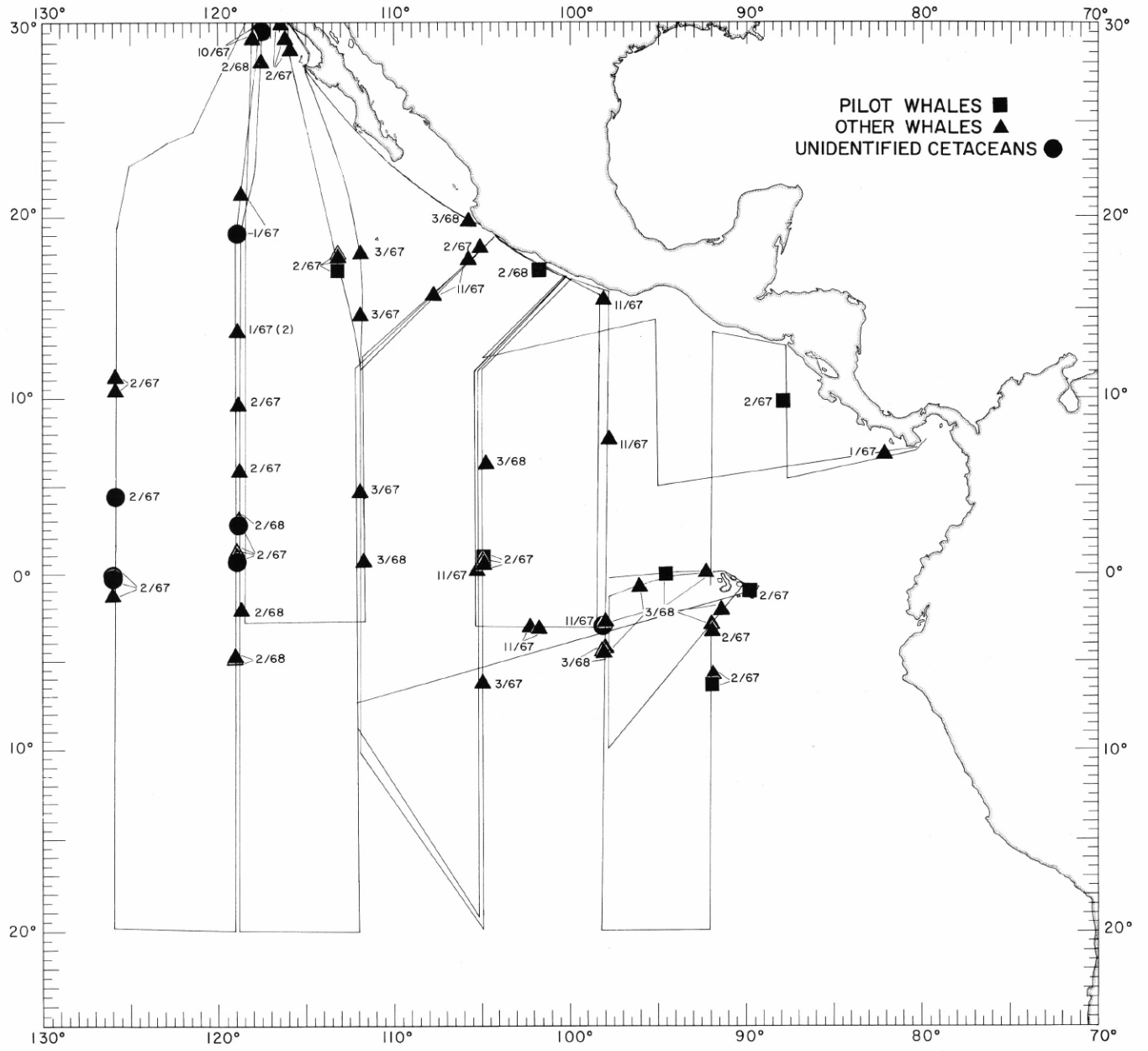


FIGURE SP-1. — Sightings of porpoise made aboard EASTROPAC ships during the months October through March. Month and year of sighting are indicated beside the symbol; cruise tracks are shown by lines.



SW-1.

FIGURE SW-1. — Sightings of whales made aboard EASTROPAC ships during the months October through March. Month and year of sighting are indicated beside the symbol; cruise tracks are shown by lines.

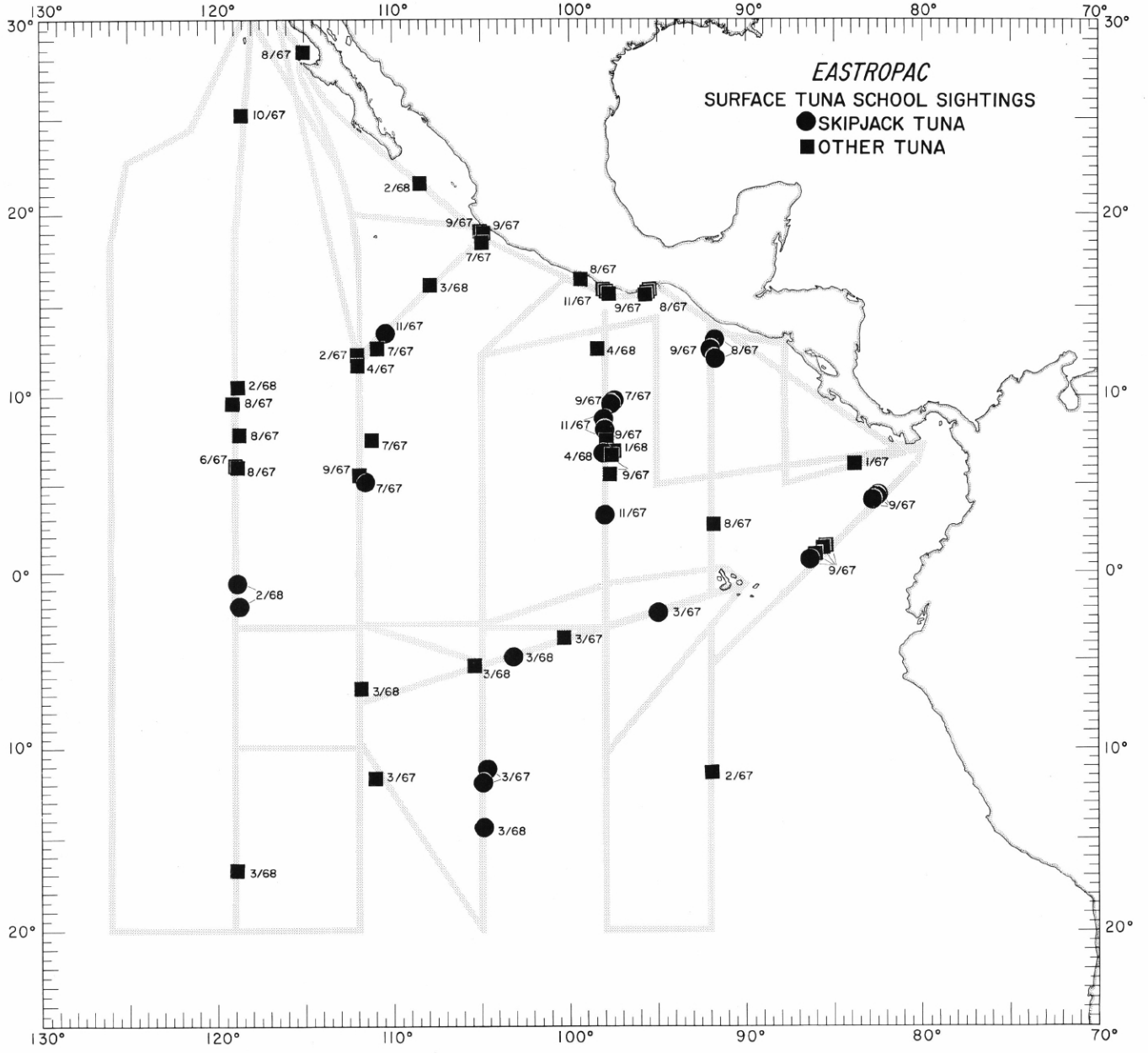
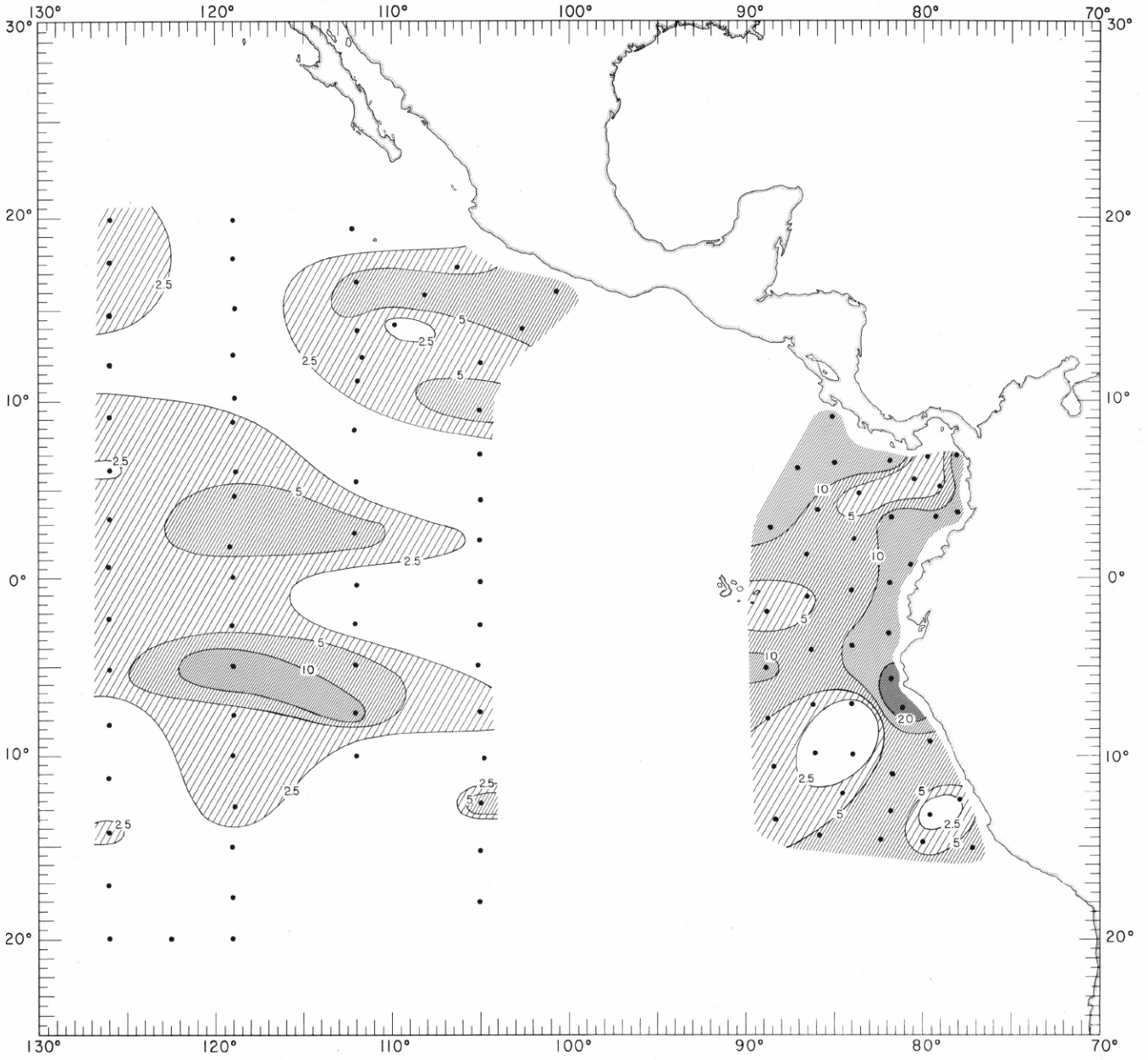


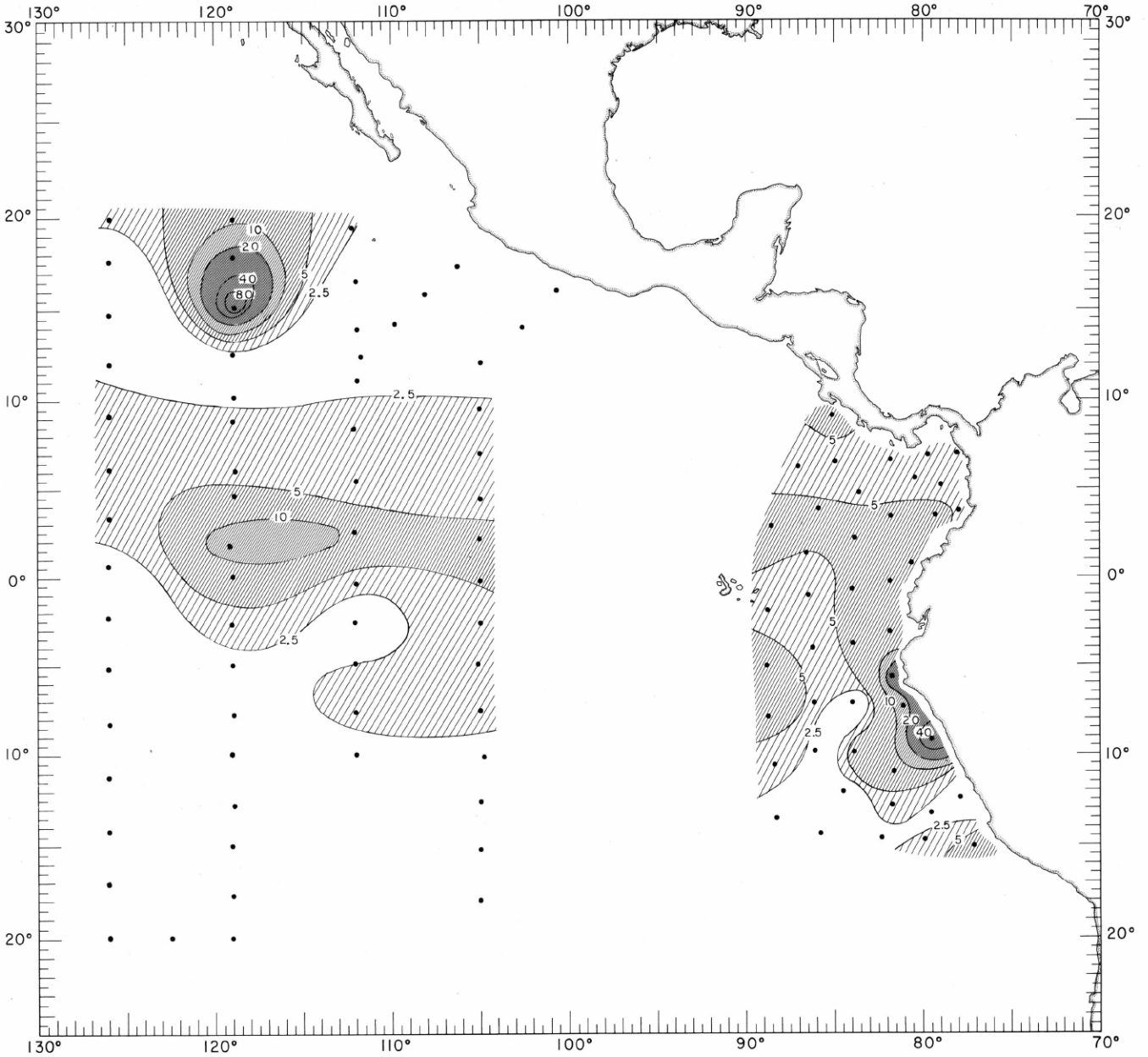
FIGURE ST. — Sightings of surface tuna schools made during all EASTROPAC cruises. Month and year of sighting are indicated beside the symbol; idealized cruise tracks are shown by stippled lines.

ST.



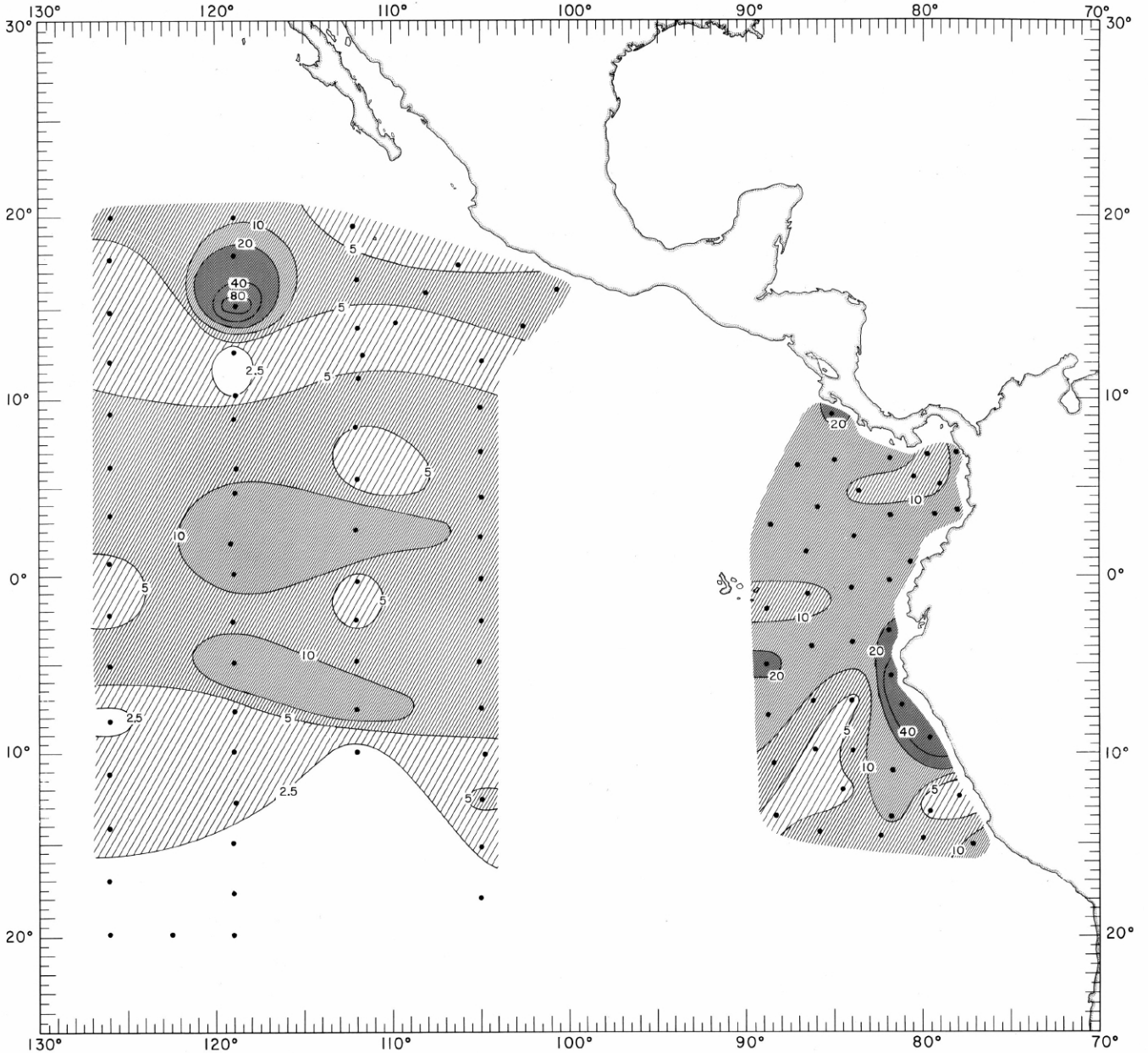
10-FCp.

FIGURE 10-FCp. — Distribution of standing stock (ml./1,000 m.^{3}) of total fish and cephalopods taken in night micronekton hauls during February-March 1967.



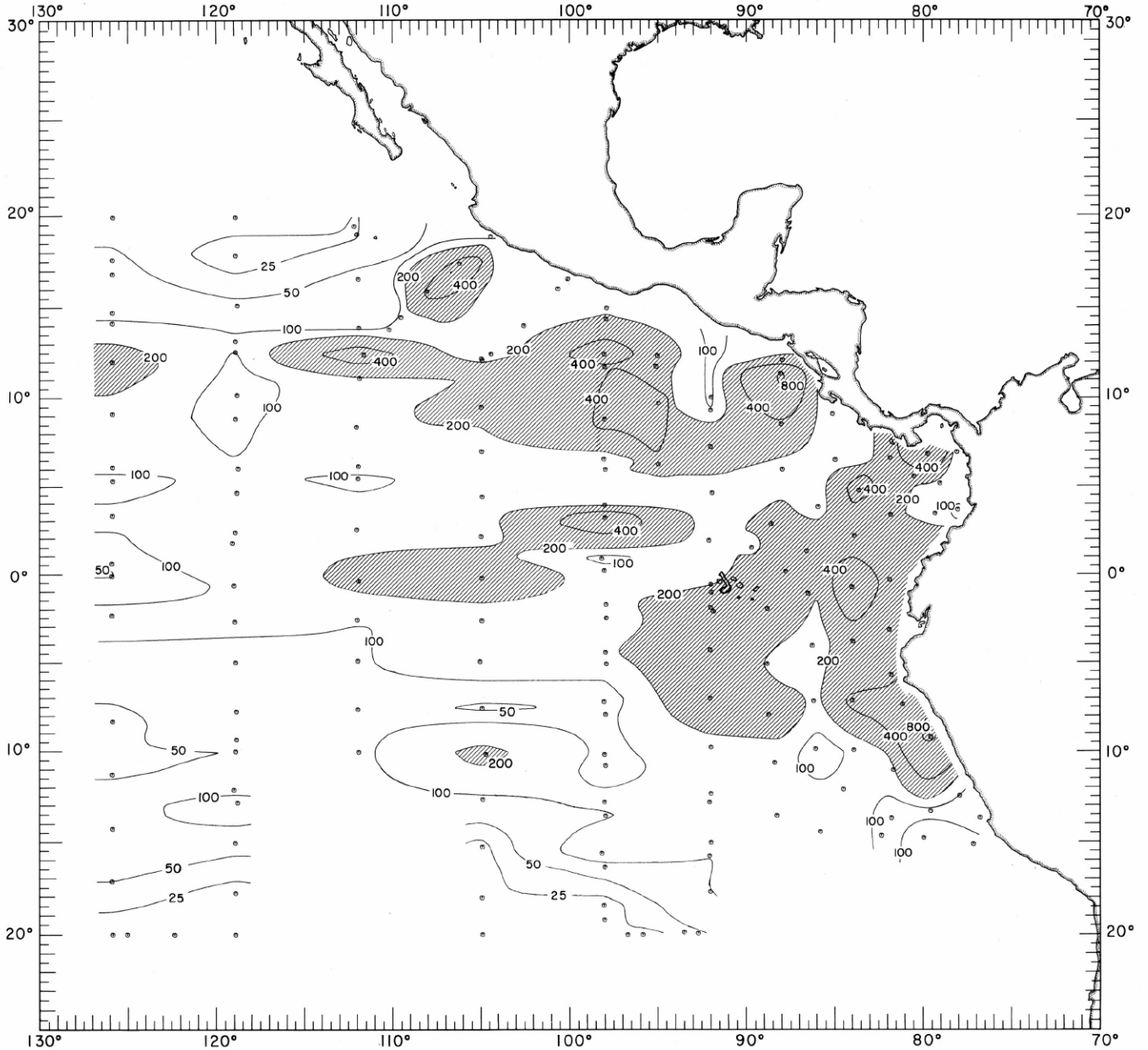
10-Cr.

FIGURE 10-Cr. — Distribution of standing stock (ml./1,000 m.^{3}) of total crustaceans taken in night micronekton hauls during February-March 1967.



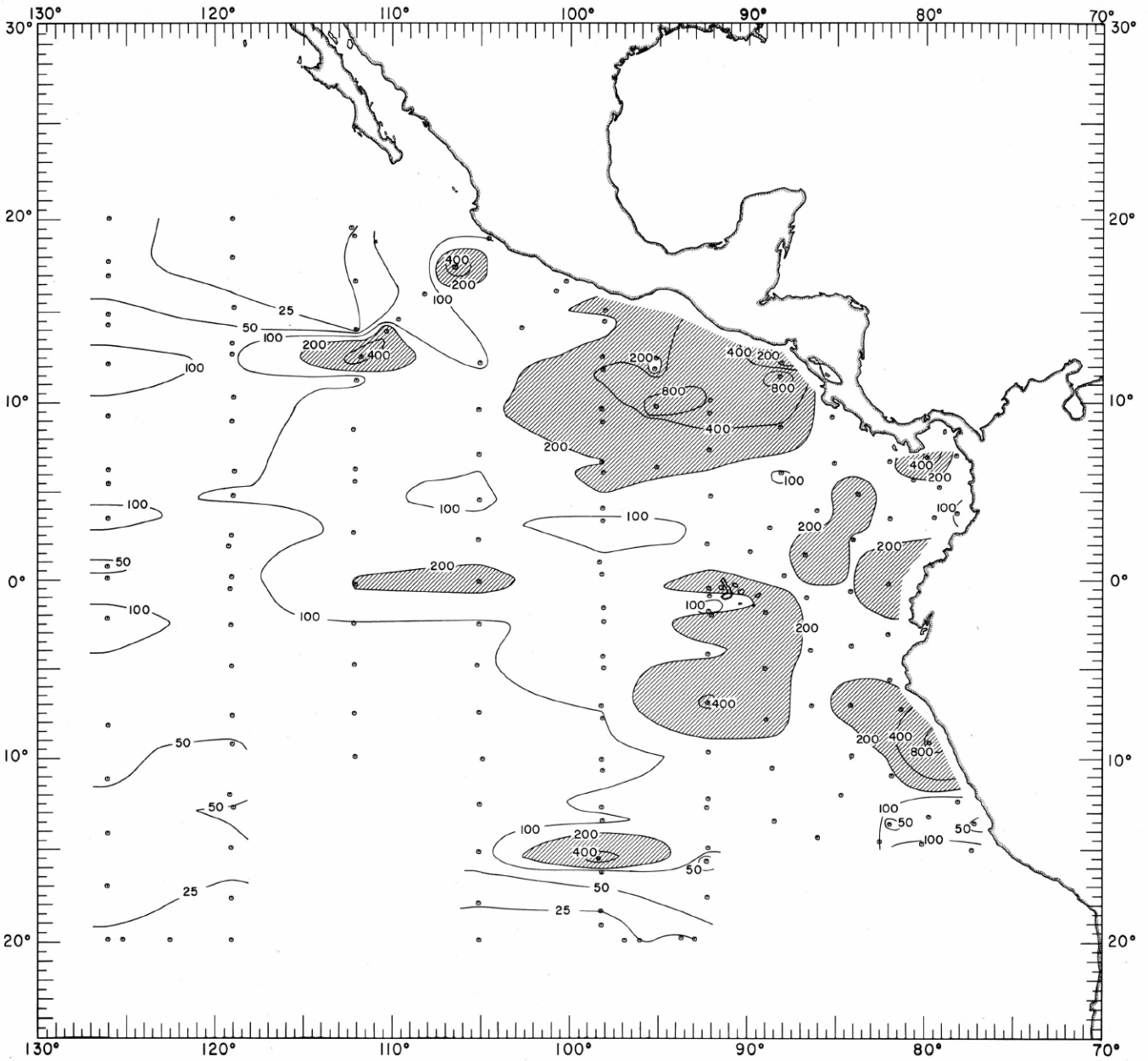
10-Nk.

FIGURE 10-Nk. — Distribution of standing stock (ml./1,000 m.^{3}) of total micronekton taken in night micronekton hauls during February-March 1967.



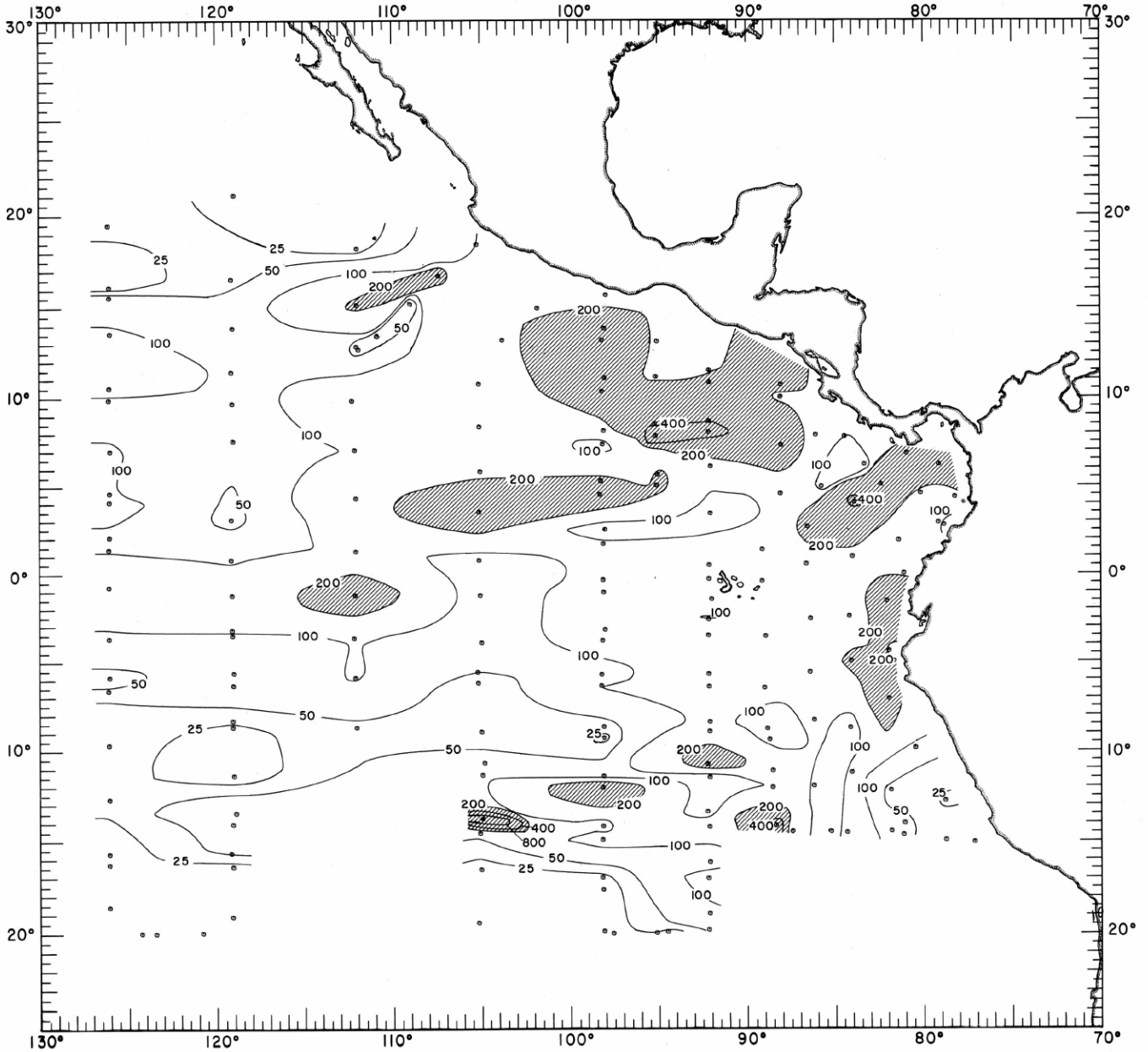
10-ZhN.

FIGURE 10-ZhN. — Distribution of standing stock (ml./1,000 m.^{3}) of zooplankton taken in 50-cm. net hauls at night, February-March 1967.



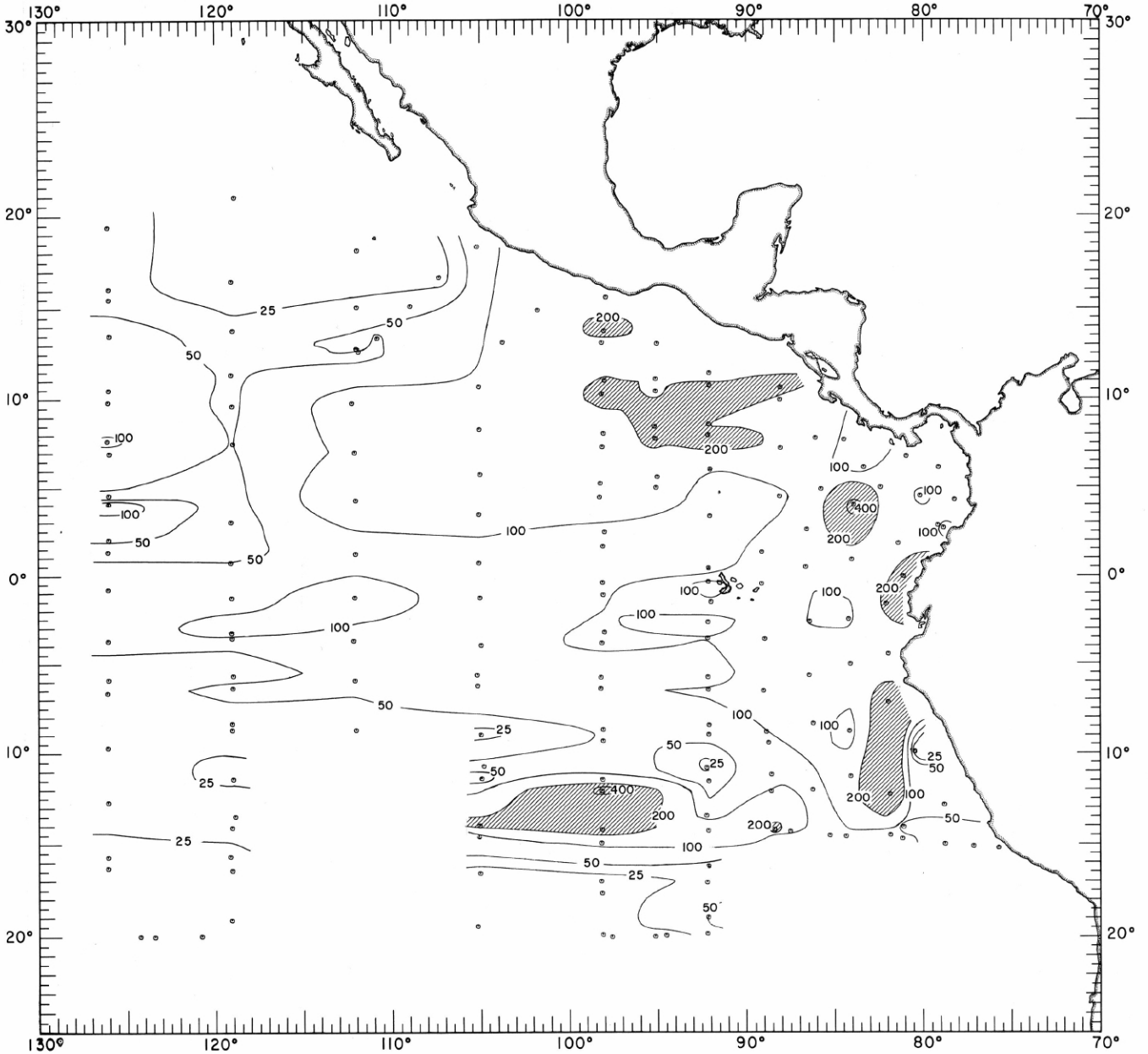
10-Z1N.

FIGURE 10-Z1N. — Distribution of standing stock (ml./1,000 m.^{3}) of zooplankton taken in 1-m. net hauls at night, February-March 1967.



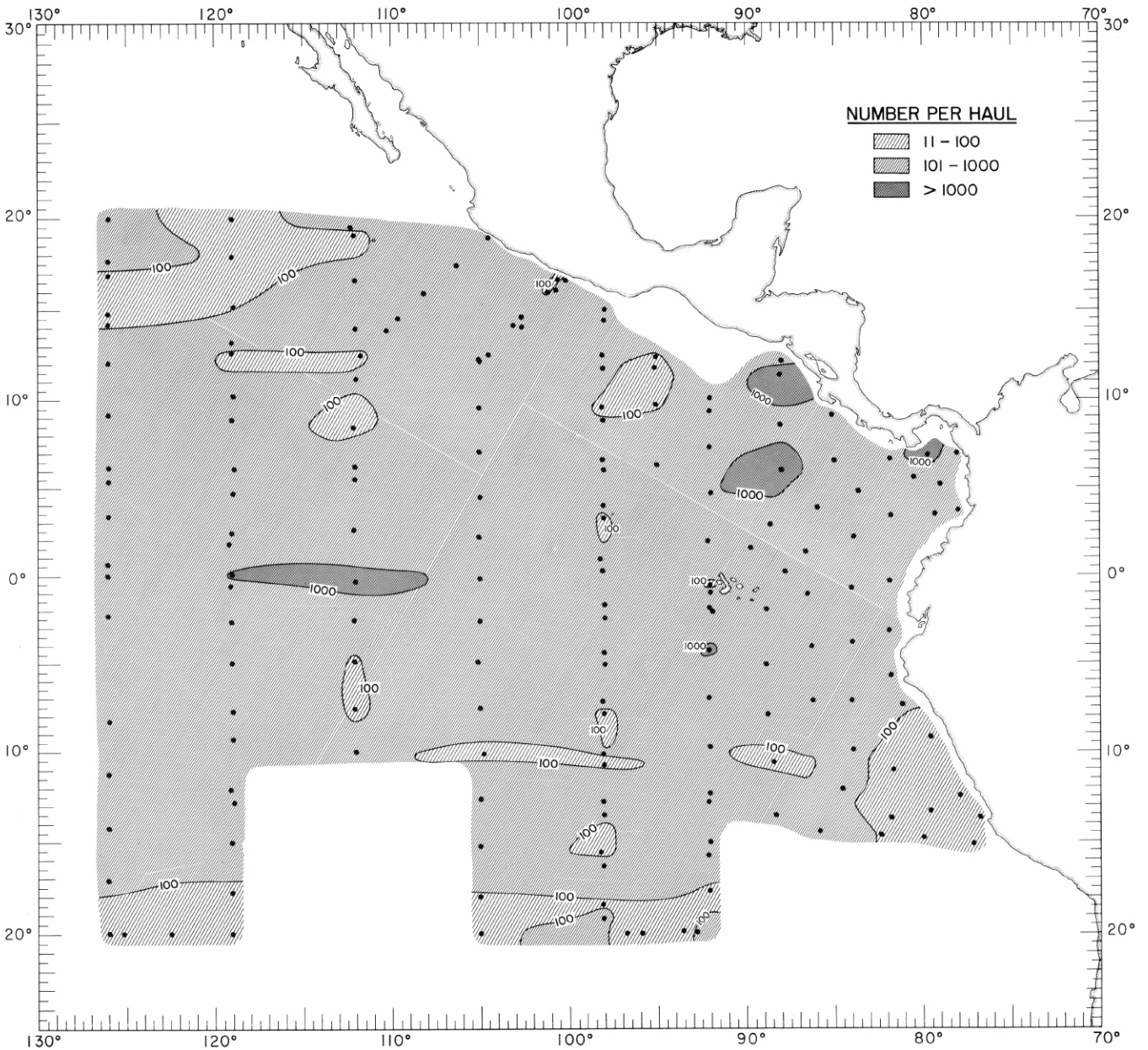
10-ZhD.

FIGURE 10-ZhD. — Distribution of standing stock (ml./1,000 m.^{3}) of zooplankton taken in 50-cm. net hauls during the day, February-March 1967.



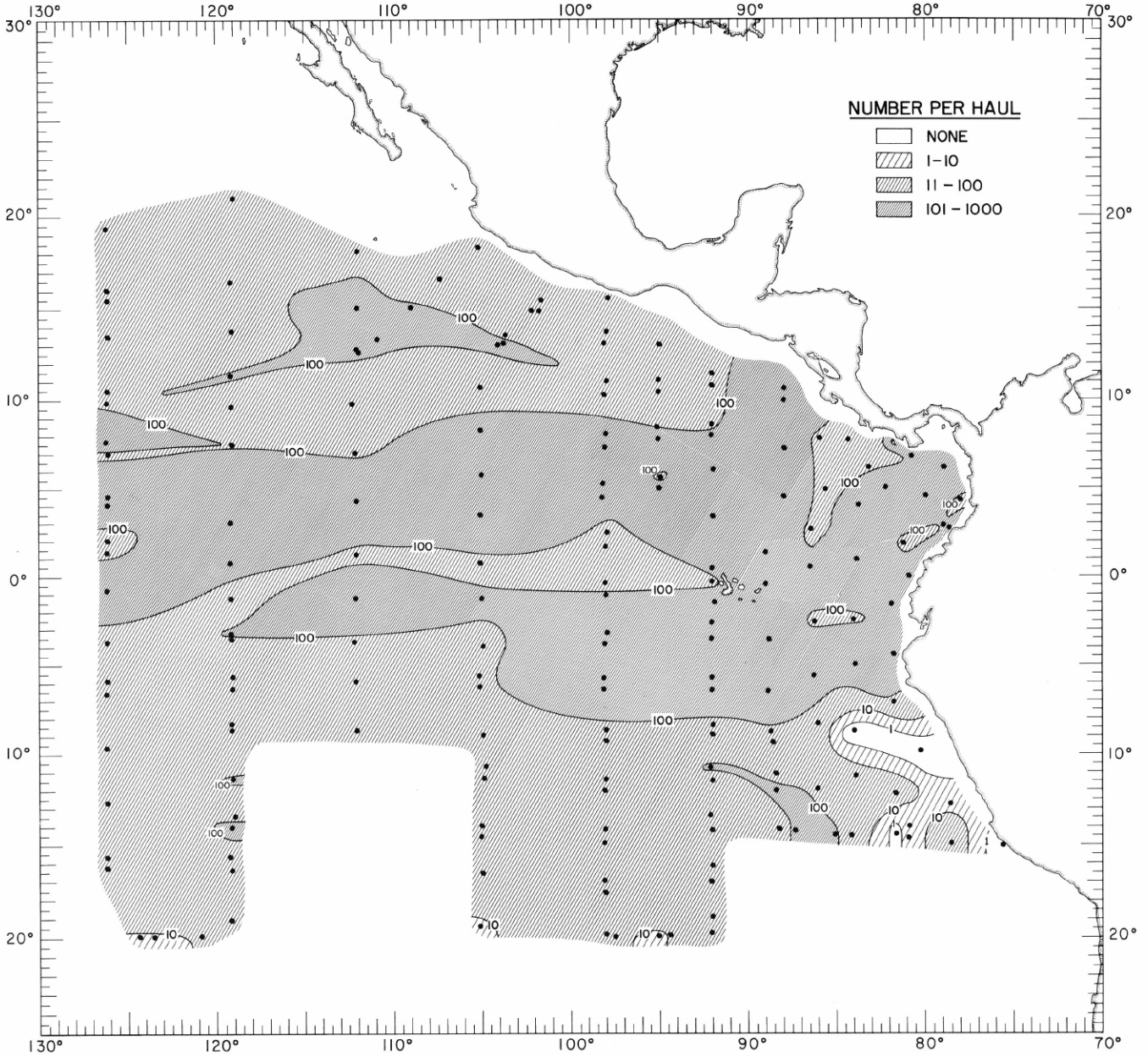
10-Z1D.

FIGURE 10-Z1D. — Distribution of standing stock (ml./1,000 m.^{3}) of zooplankton taken in 1-m net hauls during the day, February-March 1967.



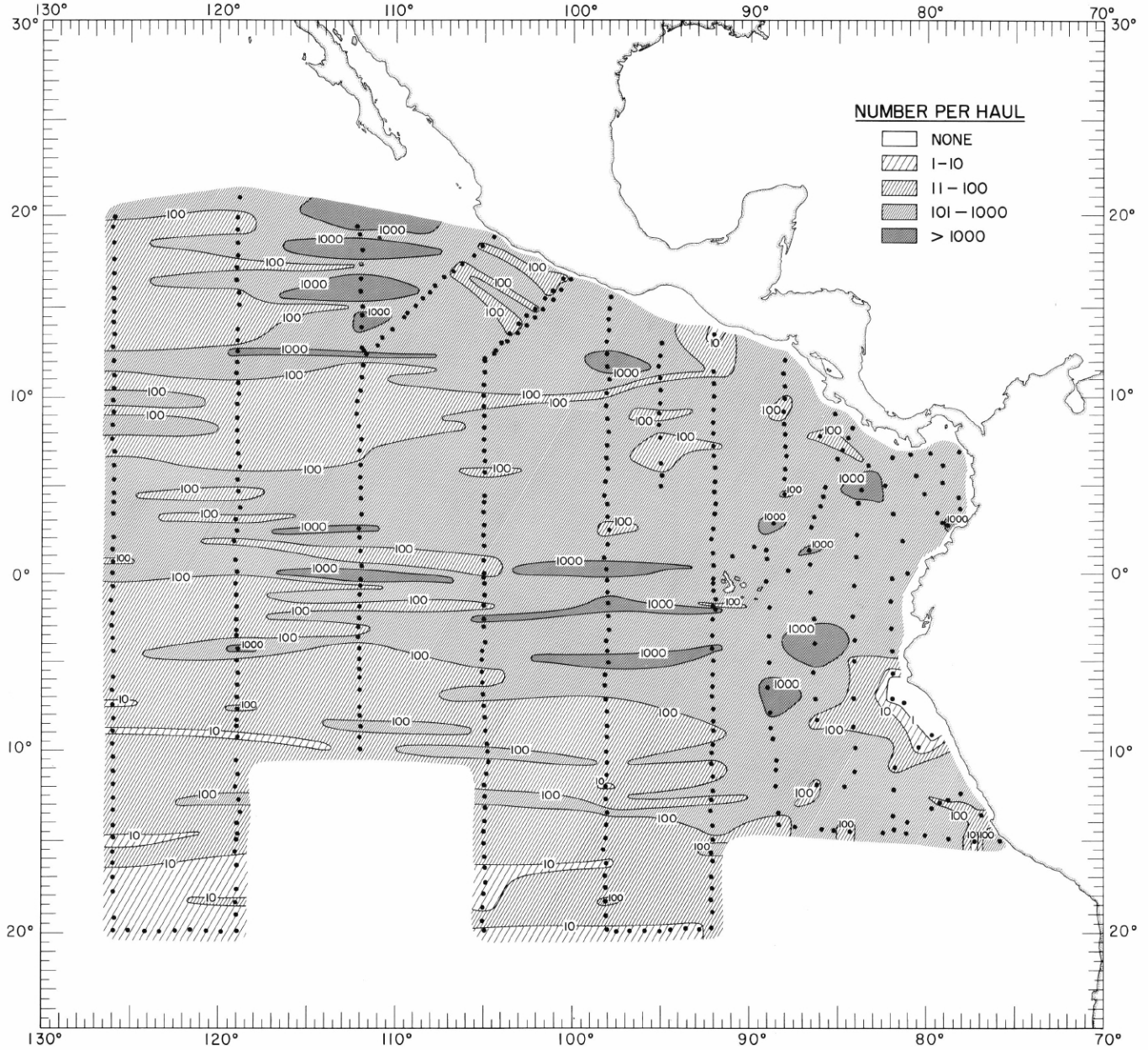
10-FLN.

FIGURE 10-FLN. — Total fish larvae (number/haul) taken in 1-m. oblique plankton hauls at night during February-March 1967.



10-FLD.

FIGURE 10-FLD. — Total fish larvae (number/haul) taken in 1-m. oblique plankton hauls during the day, February-March 1967.



10-FE.

FIGURE 10-FE. — Total fish eggs (number/haul) taken in 1-m. oblique plankton hauls during February-March 1967.

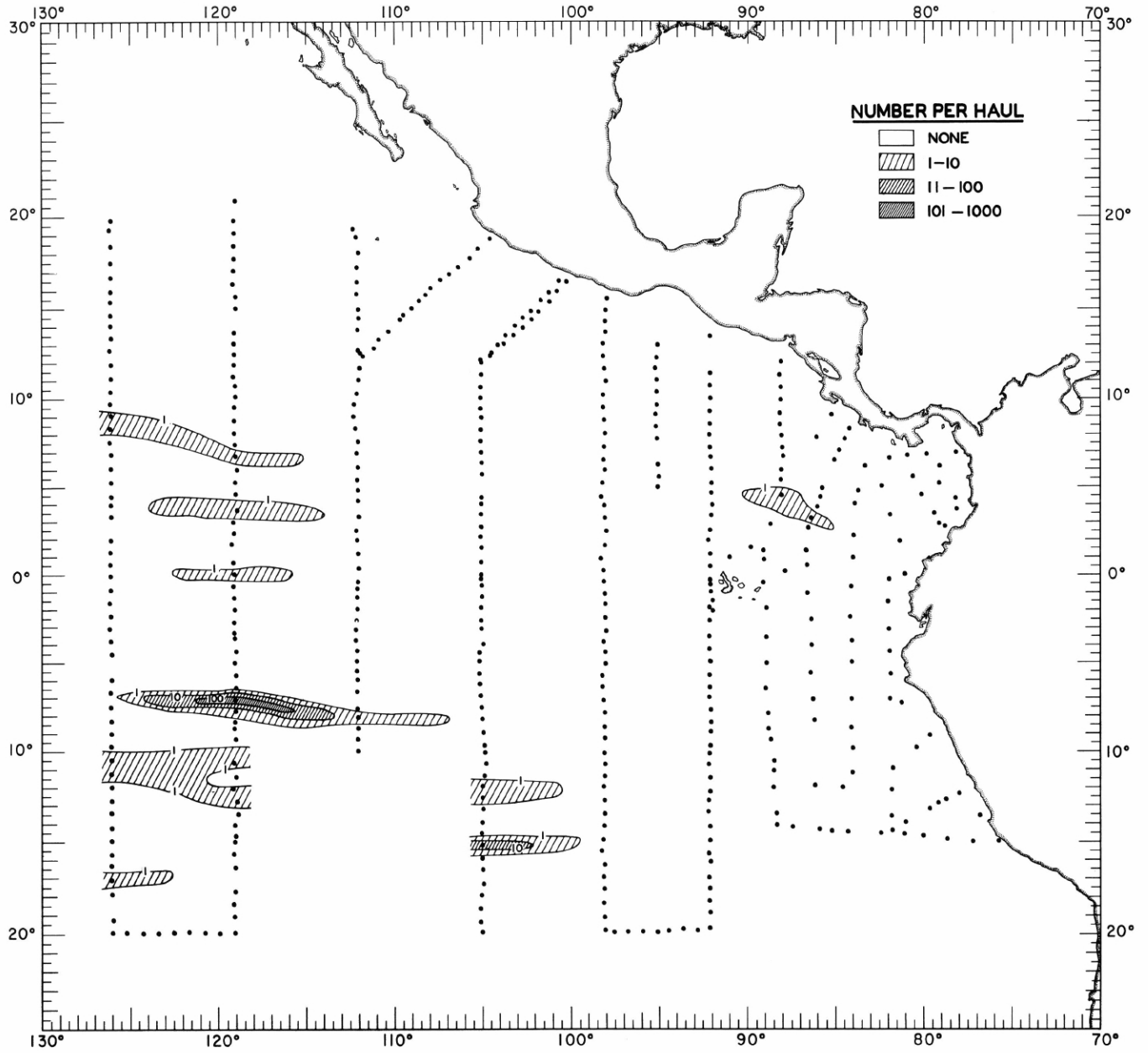
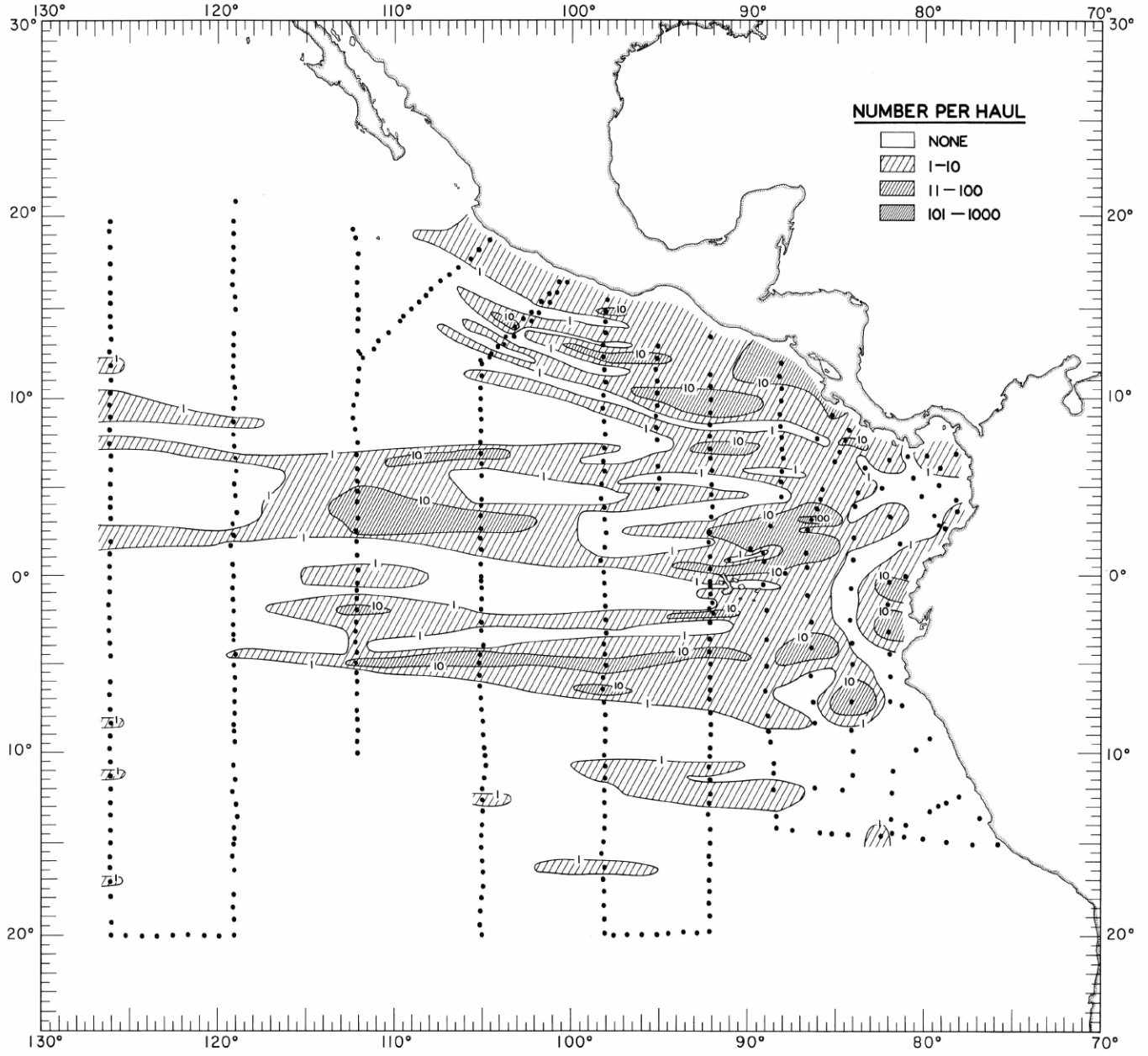


FIGURE 10-FS. — Total skipjack tuna, *Katsuwonus pelamis*, larvae (number/haul) taken in 1-m. oblique plankton hauls during February-March 1967.



10-FA.

FIGURE 10-FA. — Total frigate mackerel, *Auxis*, larvae (number/haul) taken in 1-m. oblique plankton hauls during February-March 1967.

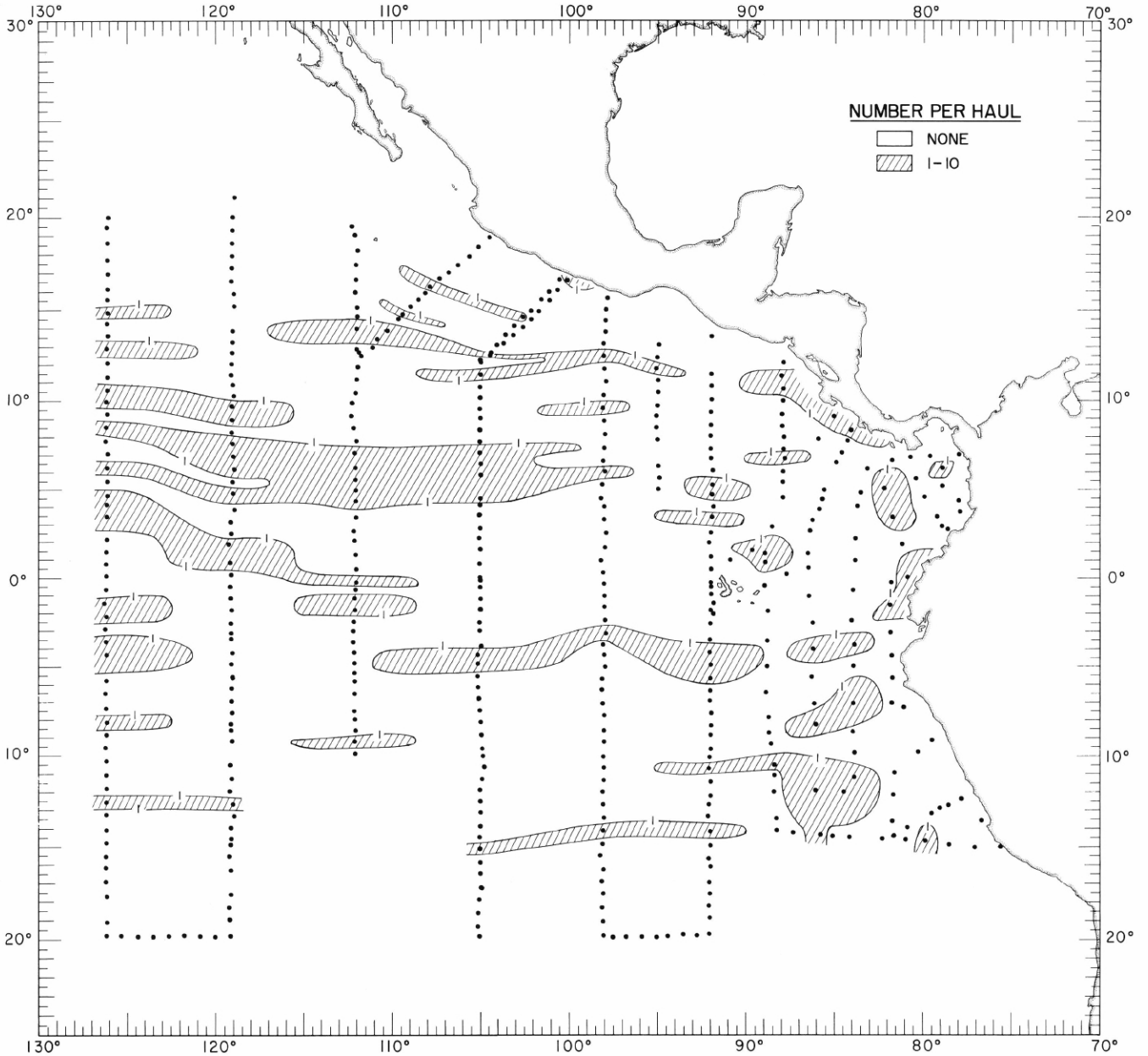
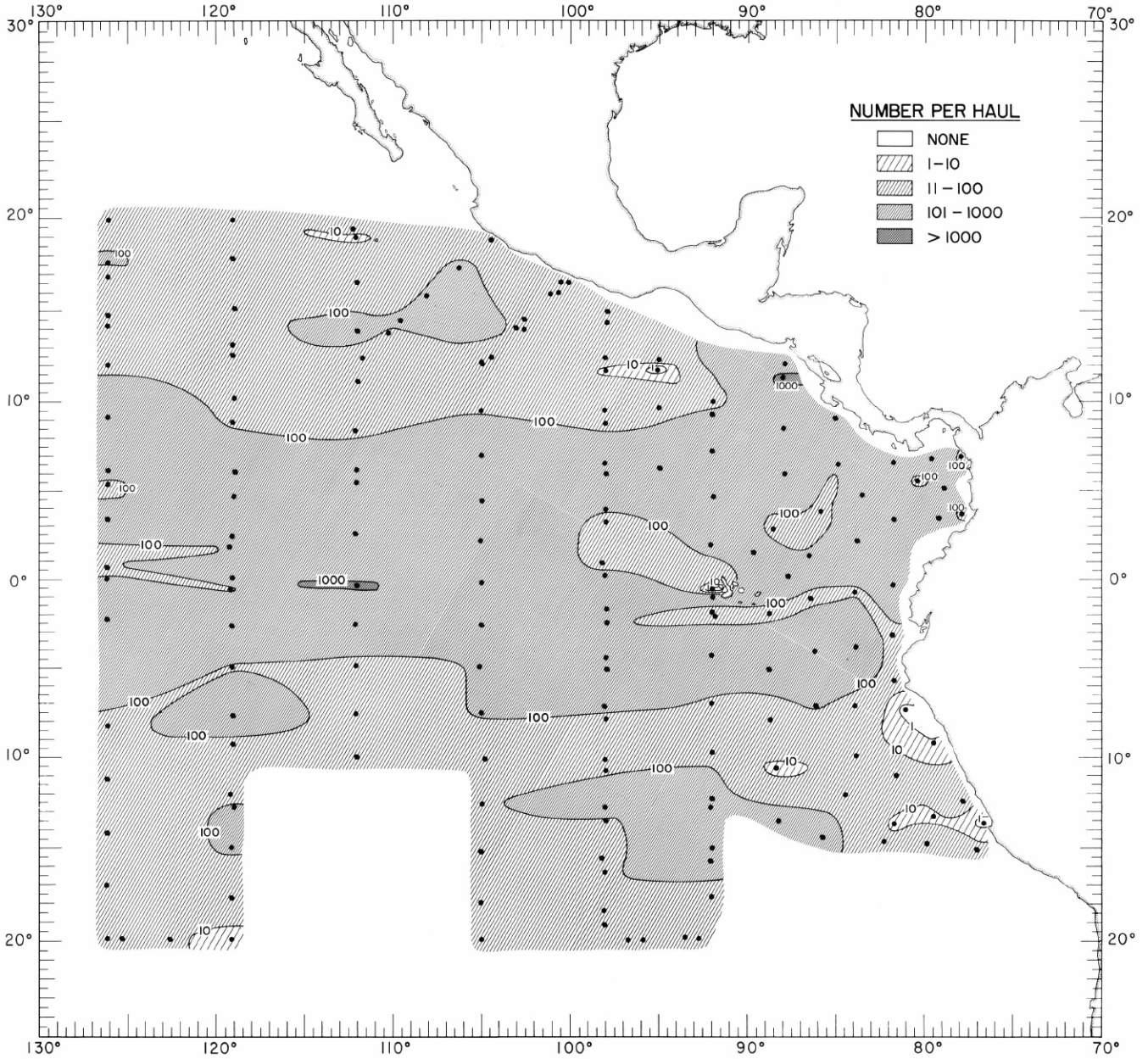
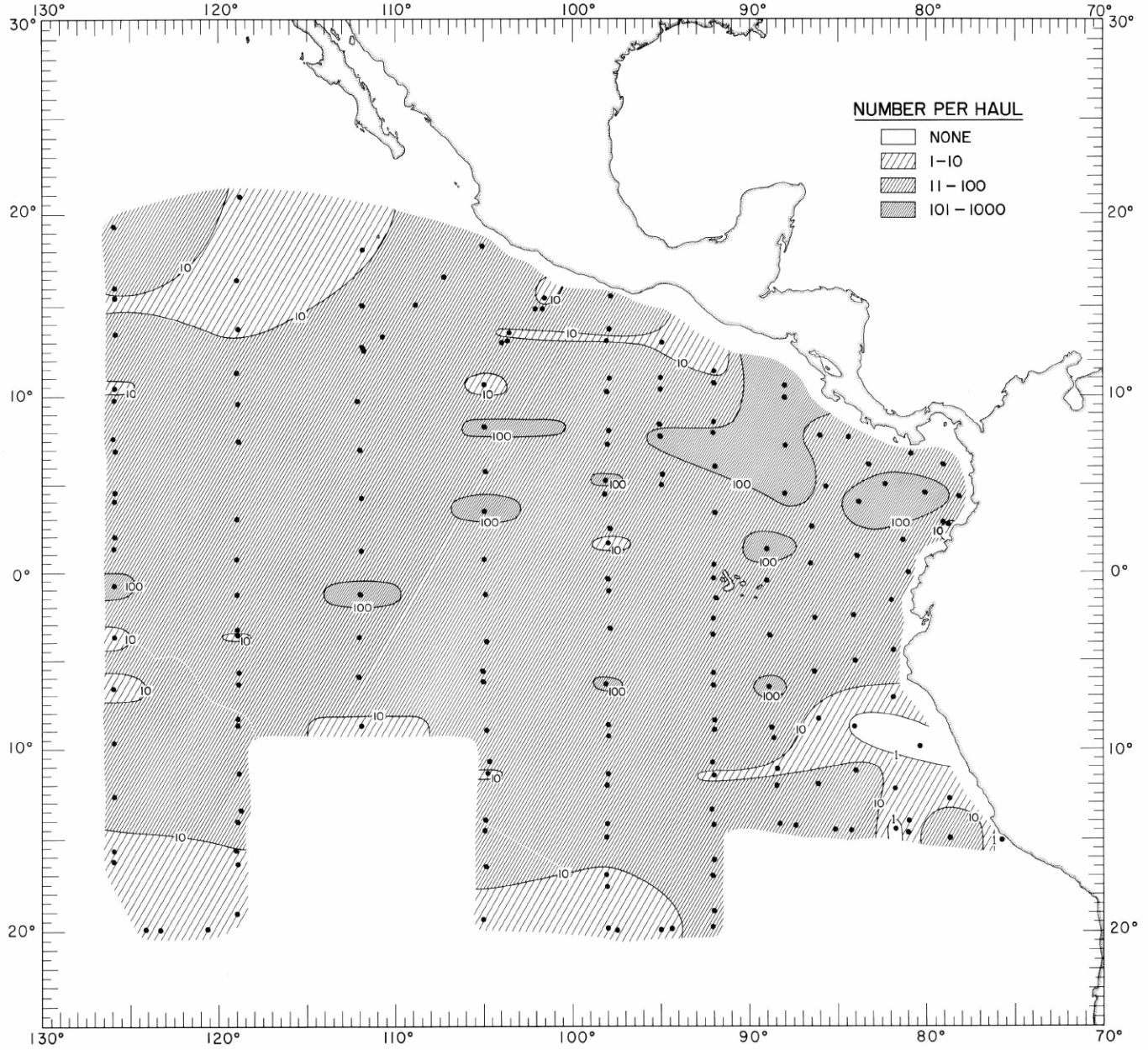


FIGURE 10-FC. — Total dolphin (fish), *Coryphaena*, larvae (number/haul) taken in 1-m. oblique plankton hauls during February-March 1967.



10-FMN.

FIGURE 10-FMN. — Total myctophid larvae (number/haul) taken in 1-m. oblique plankton hauls at night during February-March 1967.



10-FMD.

FIGURE 10-FMD. — Total myctophid larvae (number/haul) taken in 1-m. oblique plankton hauls during the day, February-March 1967.

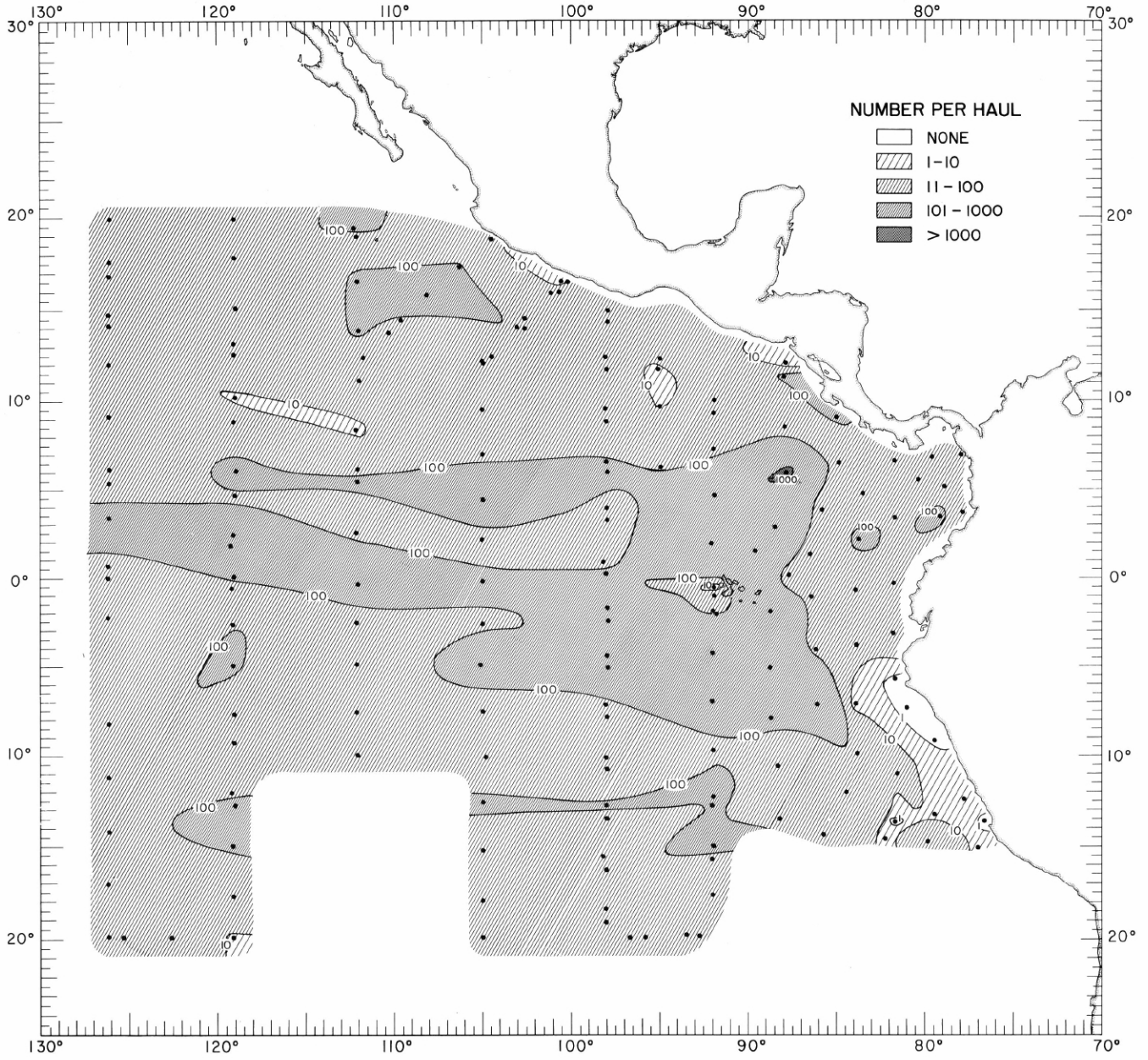
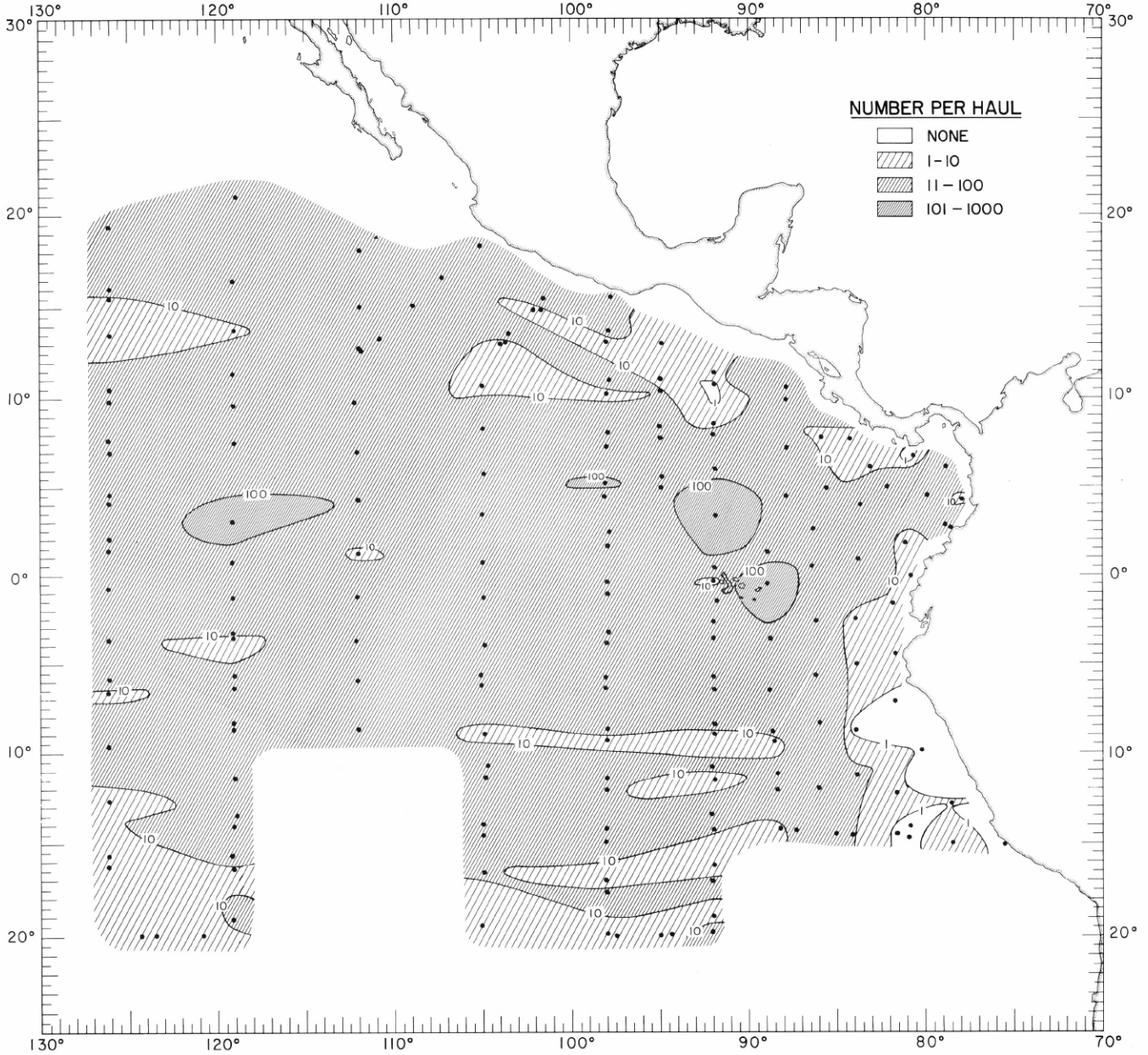


FIGURE 10-FGN. — Total gonostomatid and sternoptychid larvae (number/haul) taken in 1-m. oblique plankton hauls at night during February-March 1967.



10-FGD.

FIGURE 10-FGD. — Total gonostomatid and sternoptychid larvae (number/haul) taken in 1-m. oblique plankton hauls during the day, February-March 1967.

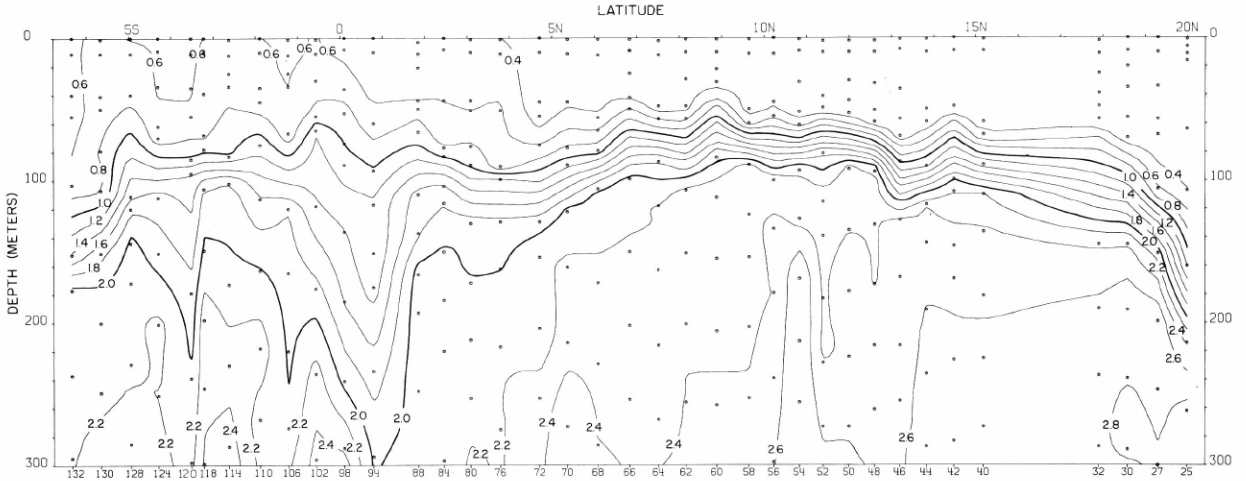


FIGURE 11-P-v1. — Vertical distribution of phosphate-phosphorus (μg.-at./l.) along 119° W. from 28°36′ N. to 6° 21′ S., January 25-February 9, 1967.

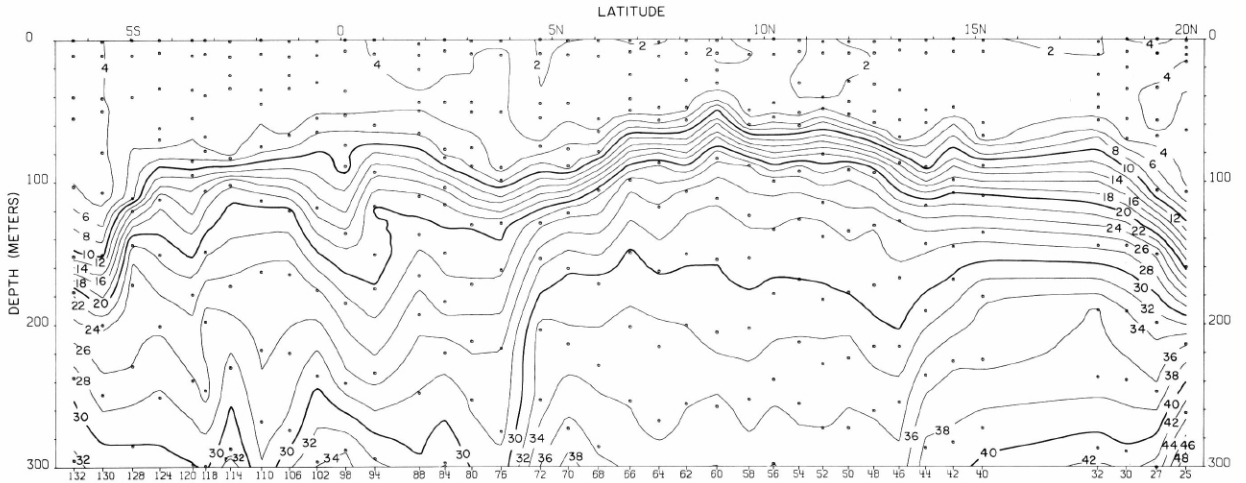
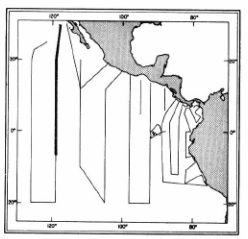


FIGURE 11-Si-v1. — Vertical distribution of silicate-silicon (μg.-at./l.) along 119° W. from 28°36′ N. to 6°21′ S., January 25-February 9, 1967.



11-P-v1.

11-Si-v1.

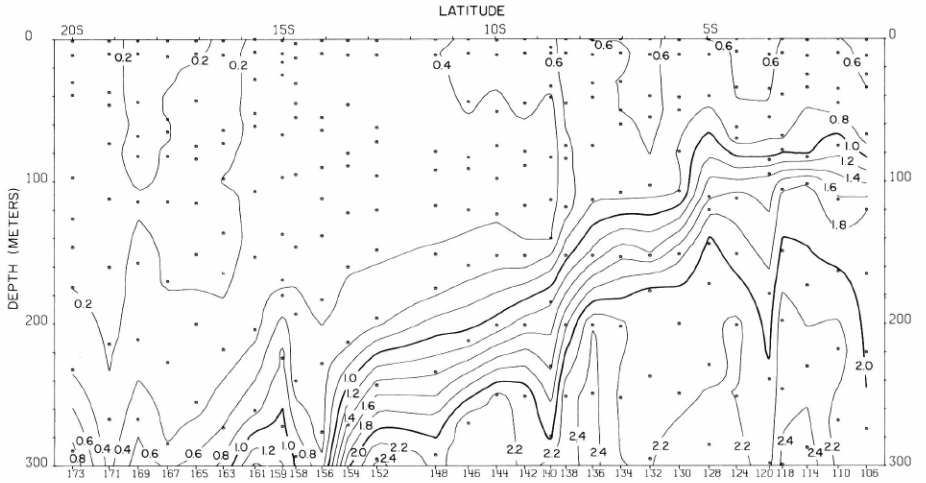


FIGURE 11-P-v2. — Vertical distribution of phosphate-phosphorus (μg.-at./l.) along 119° W. from 1°14′ S. to 20°00′ S., February 7-14, 1967.

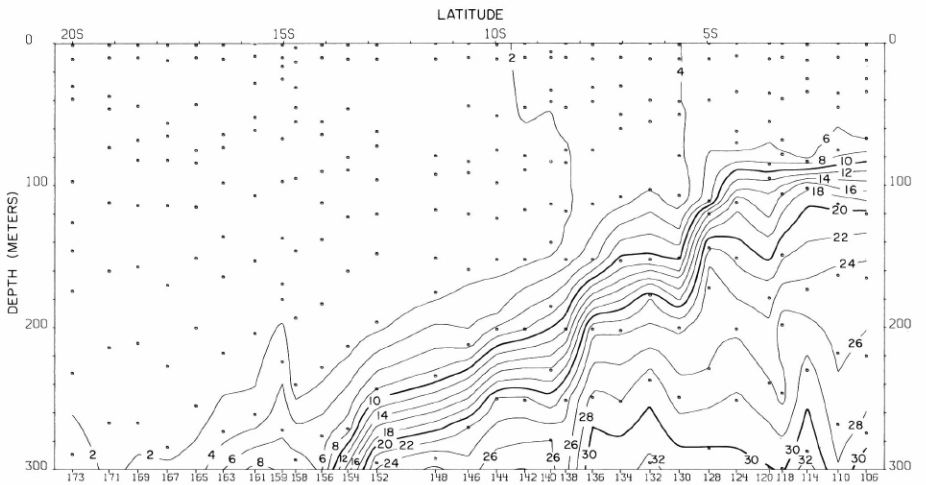
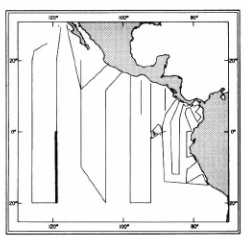


FIGURE 11-Si-v2. — Vertical distribution of silicate-silicon (μg.-at./l.) along 119° W. from 1°14′ S. to 20°00′ S., February 7-14, 1967.



11-P-v2.

11-Si-v2.

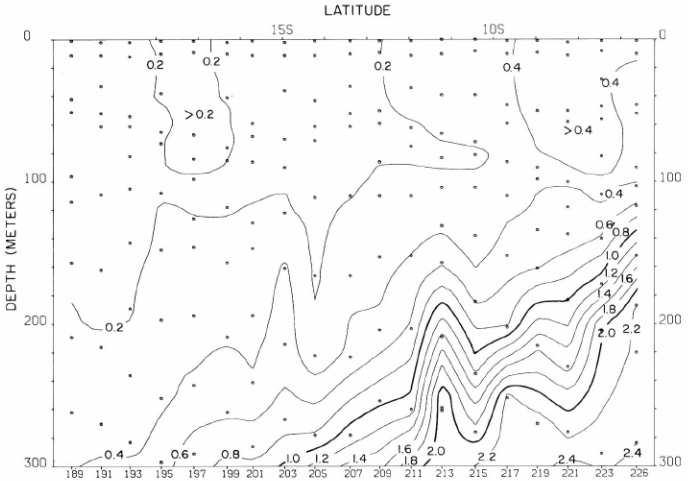


FIGURE 11-P-v4.—Vertical distribution of phosphate-phosphorus (μg.-at./l.) along 126° W. from 19°59′ S. to 6°38′ S., February 16-21, 1967.

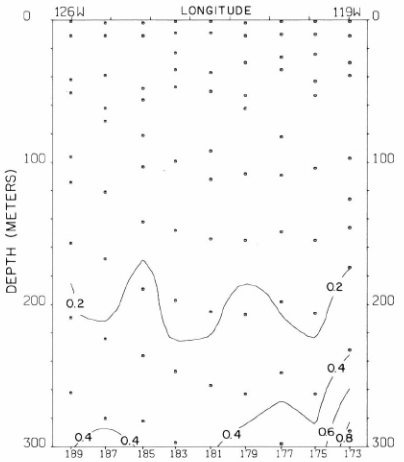


FIGURE 11-P-v3. — Vertical distribution of phosphate-phosphorus (μg.-at./l.) along 20° S., February 14-16, 1967.

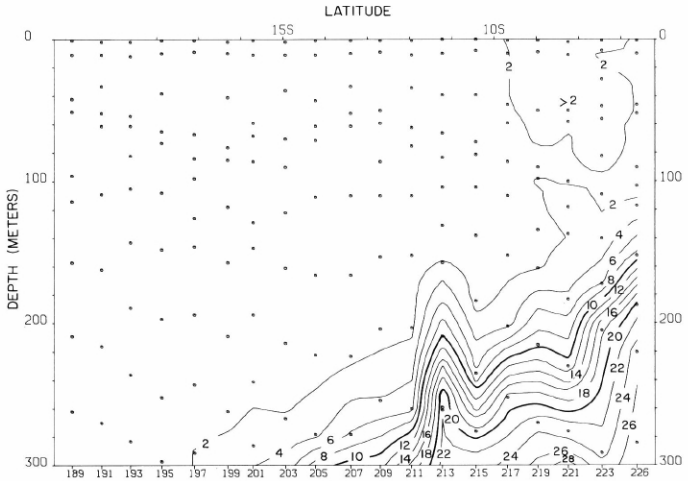


FIGURE 11-Si-v4. — Vertical distribution of silicate-silicon (μg.-at./l.) along 126° W. from 19°59′ S. to 6°38′ S., February 16-21, 1967.

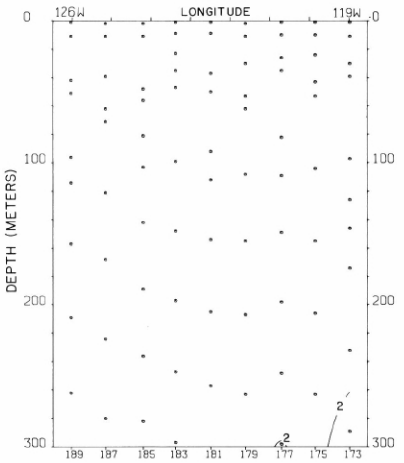
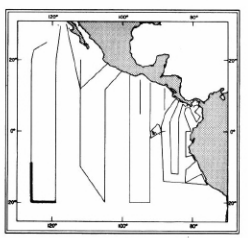


FIGURE 11-Si-v3. — Vertical distribution of silicate-silicon (μg.-at./l.) along 20° S., February 14-16, 1967.



11-P-v3.

11-Si-v3.

11-P-v4.

11-Si-v4.

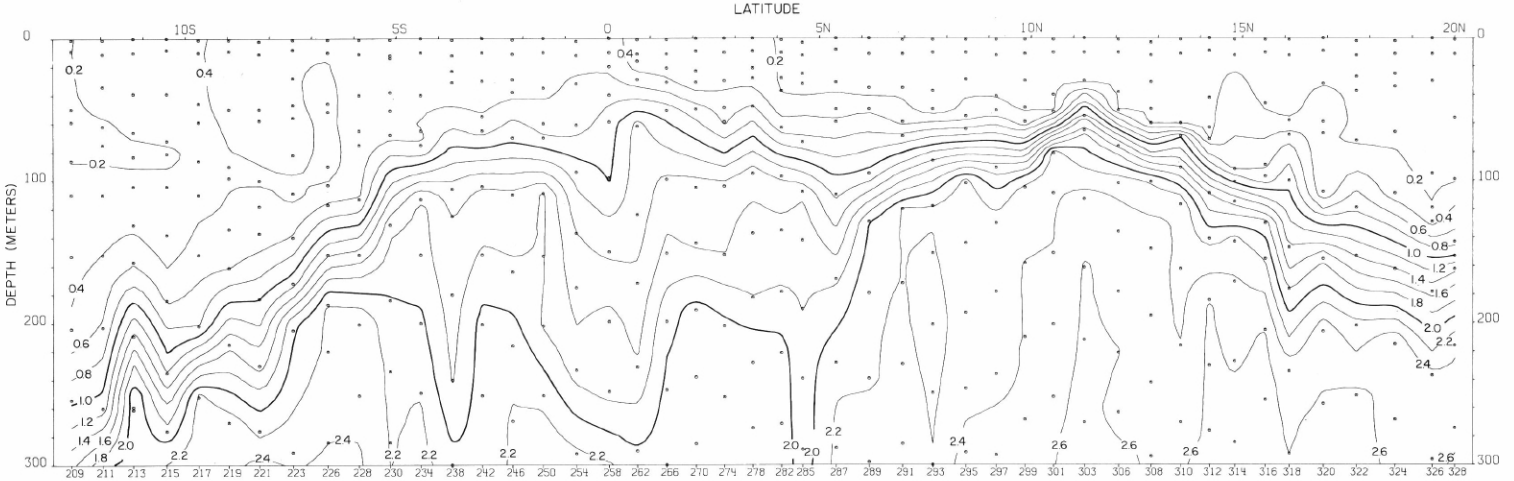


FIGURE 11-P-v5. — Vertical distribution of phosphate-phosphorus (μg.-at./l.) along 126° W. from 12°42′ S. to 20°01′ N., February 19-March 2, 1967.

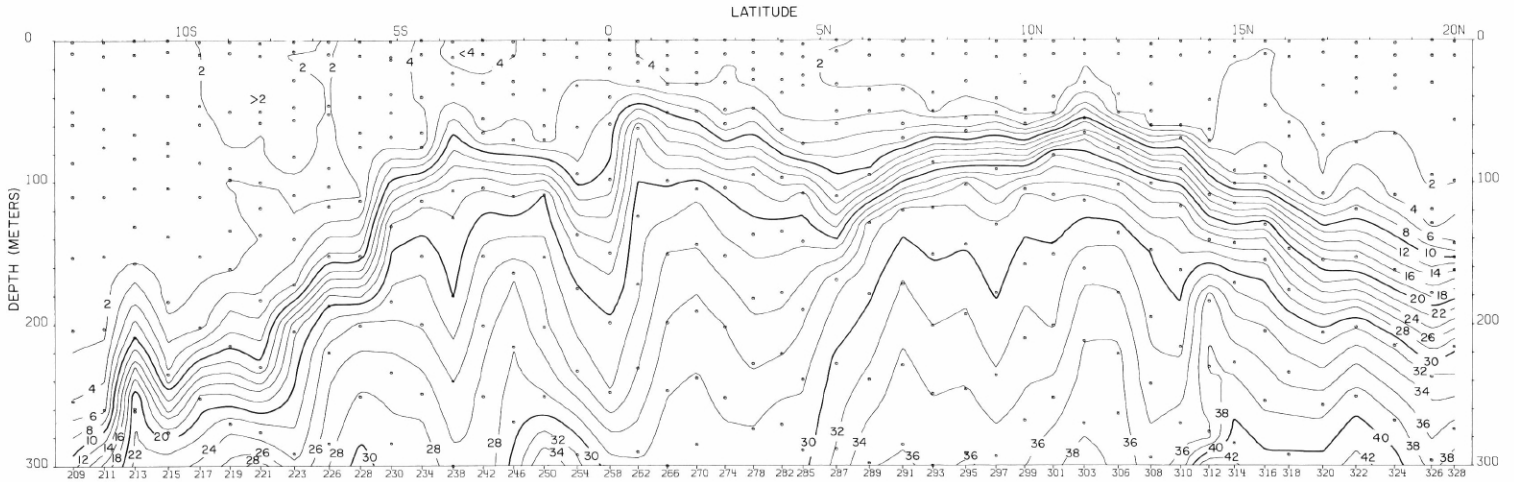
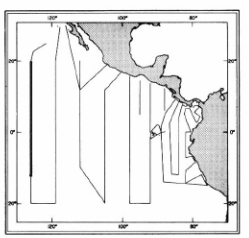


FIGURE 11-Si-v5. — Vertical distribution of silicate-silicon (μg.-at./l.) along 126° W. from 12°42′ S. to 20°01′ N., February 19-March 2, 1967.



11-P-v5.

11-Si-v5.

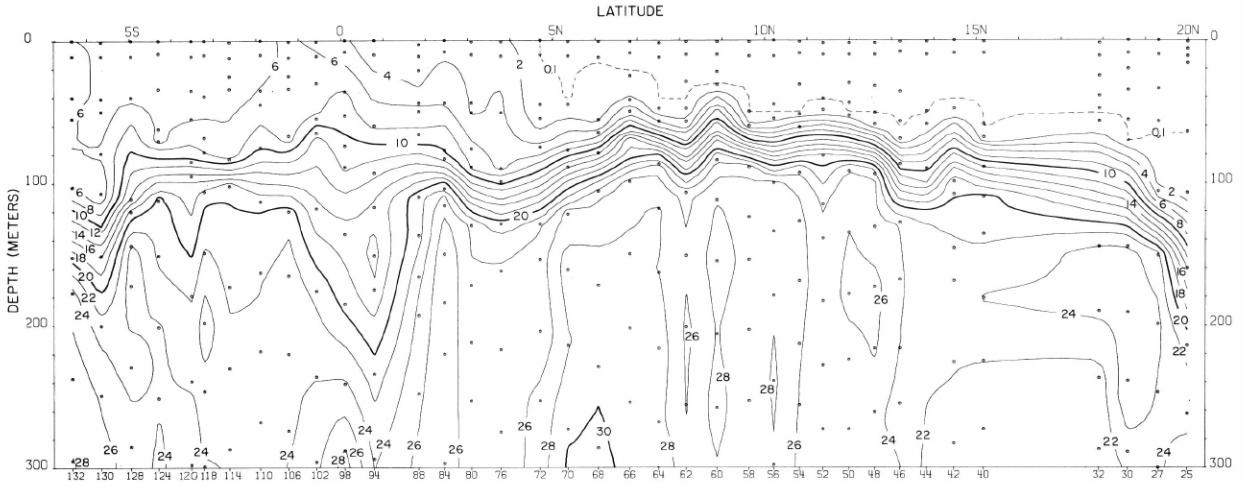


FIGURE 11-NO_3-v1. — Vertical distribution of nitrate-nitrogen (μg.-at./l.) along 119° W. from 28°36′ N. to 6°21′ S., January 25-February 9, 1967.

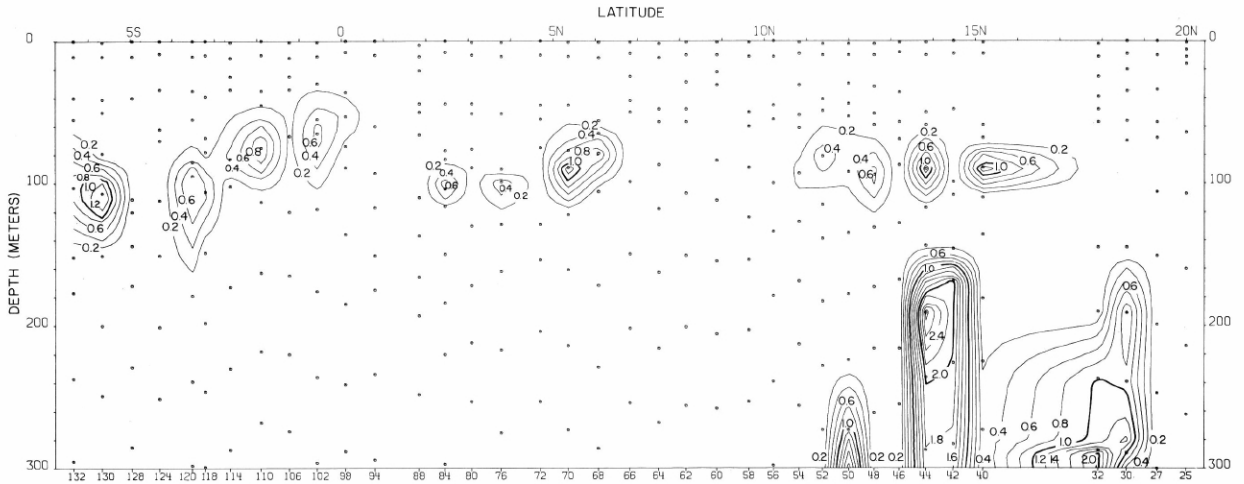
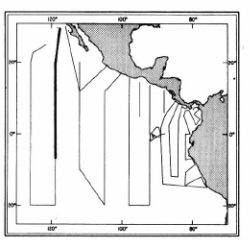


FIGURE 11-NO_2-v1. — Vertical distribution of nitrite-nitrogen (μg.-at./l.) along 119° W. from 28°36′ N. to 6°21′ S., January 25-February 9, 1967.



11-NO_3-v1.

11-NO_2-v1.

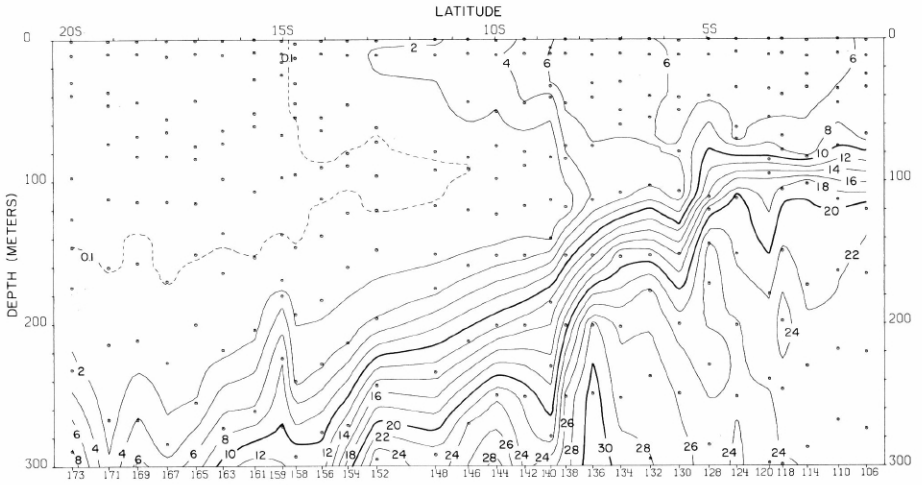


FIGURE 11-NO_3-v2. — Vertical distribution of nitrate-nitrogen (μg.-at./l.) along 119° W. from 1°14′ S. to 20°00′ S., February 7-14, 1967.

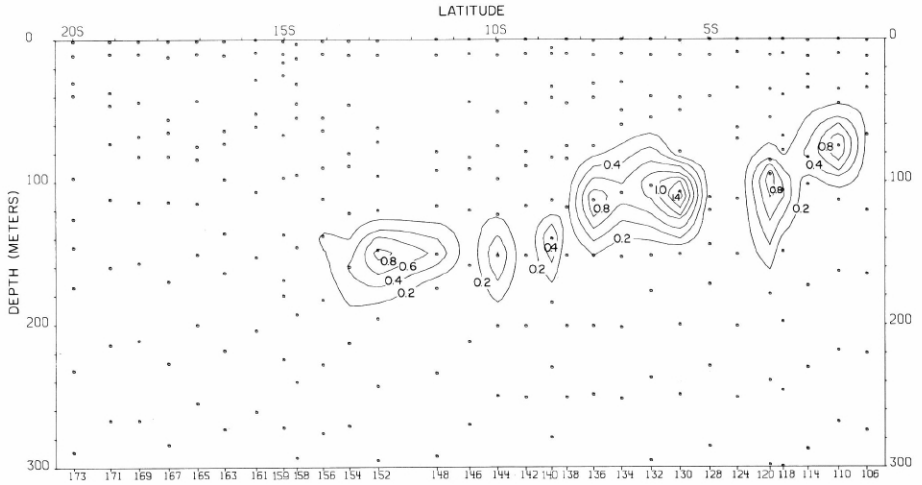
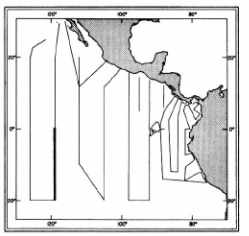


FIGURE 11-NO_2-v2. — Vertical distribution of nitrite-nitrogen (μg.-at./l.) along 119° W. from 1°14′ S. to 20°00′ S., February 7-14, 1967.



11-NO_3-v2.

11-NO_2-v2.

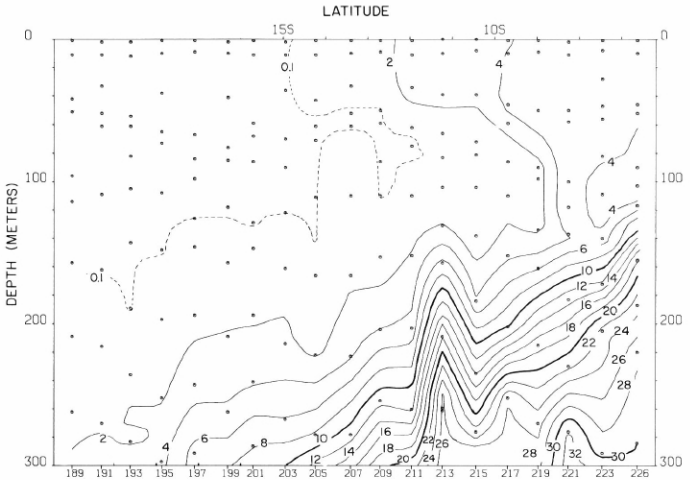


FIGURE 11-NO_3-v4. — Vertical distribution of nitrate-nitrogen (μg.-at./l.) along 126° W. from 19°59′ S. to 6°38′ S., February 16-21, 1967.

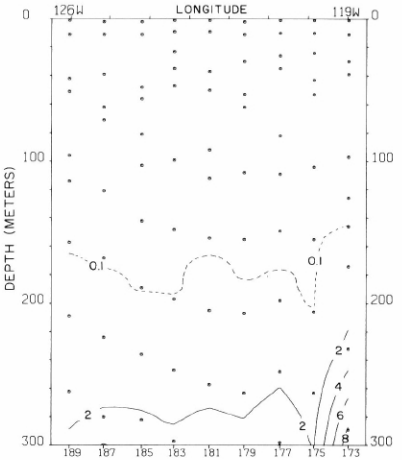


FIGURE 11-NO_3-v3. — Vertical distribution of nitrate-nitrogen (μg.-at./l.) along 20° S., February 14-16, 1967.

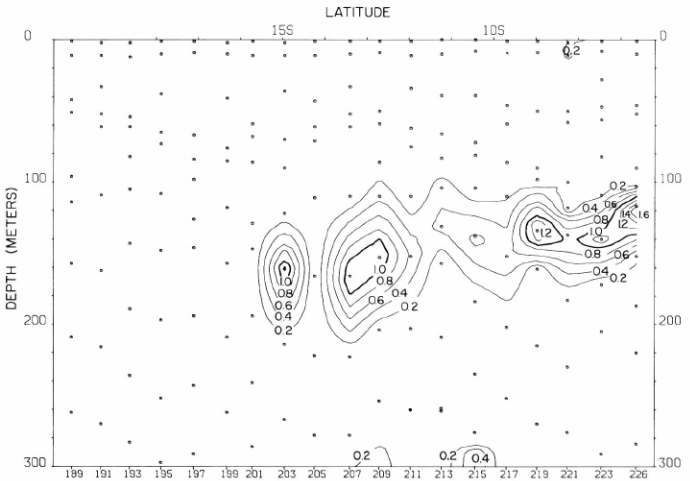


FIGURE 11-NO_2-v4. — Vertical distribution of nitrite-nitrogen (μg.-at./l.) along 126° W. from 19°59′ S. to 6°38′ S., February 16-21, 1967.

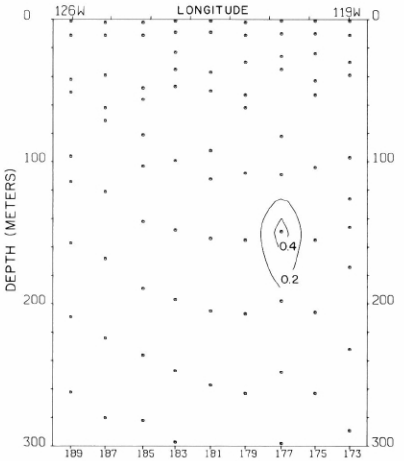
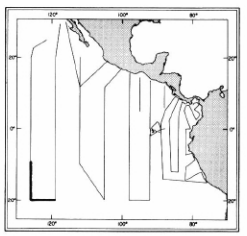


FIGURE 11-NO_2-v3. — Vertical distribution of nitrite-nitrogen (μg.-at./l.) along 20° S., February 14-16, 1967.



11-NO_3-v3.

11-NO_2-v3.

11-NO_3-v4.

11-NO_2-v4.

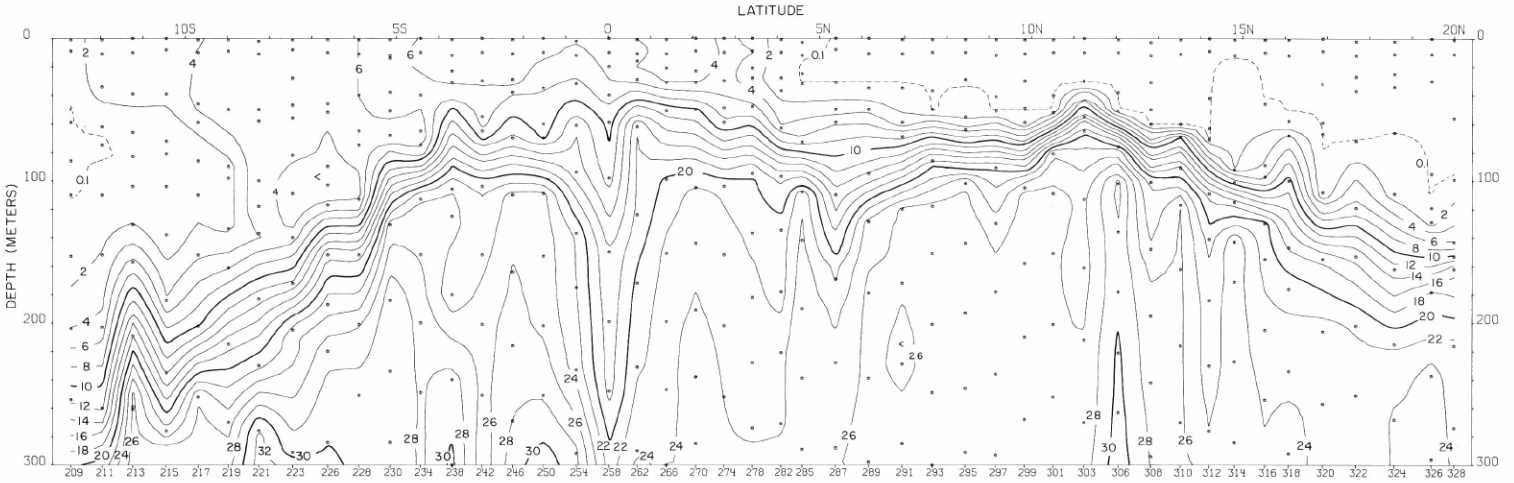


FIGURE 11-NO_3-v5. — Vertical distribution of nitrate-nitrogen (μg.-at./l.) along 126° W. from 12°42′ S. to 20°01′ N., February 19-March 2, 1967.

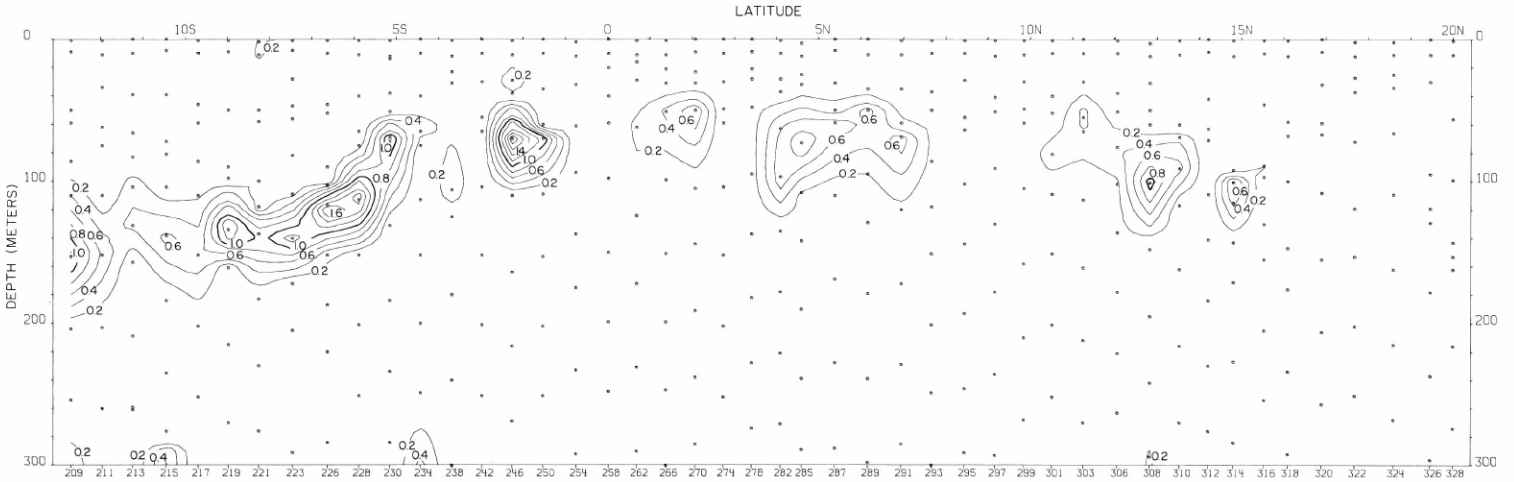
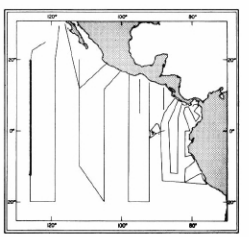


FIGURE 11-NO_2-v5. — Vertical distribution of nitrite-nitrogen (μg.-at./l.) along 126° W. from 12°42′ S. to 20°01′ N., February 19-March 2, 1967.



11-NO_3-v5.

11-NO_2-v5.

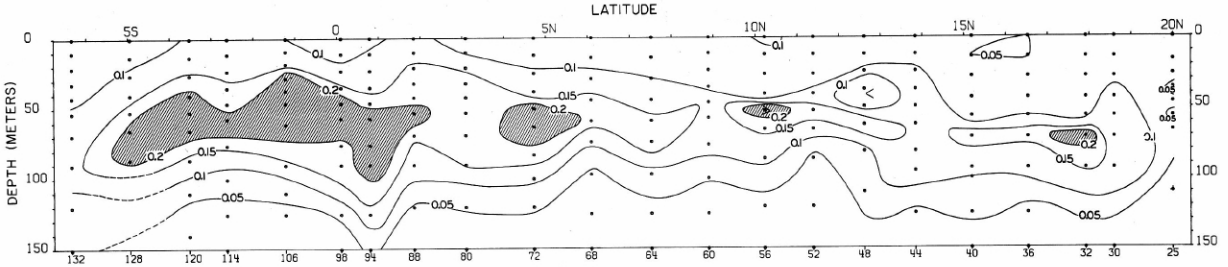


FIGURE 11-Ch-v1. — Vertical distribution of chlorophyll-a (mg./m.^{3}) along 119° W. from 20°00′ N. to 6°21′ S., January 28-February 9, 1967.

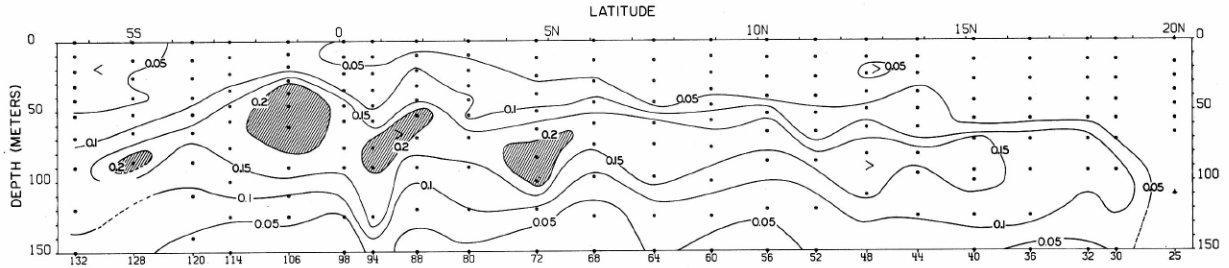


FIGURE 11-Ph-v1. — Vertical distribution of phaeophytin (mg./m.^{3}) along 119° W. from 20°00′ N. to 6°21′ S., January 28-February 9, 1967.

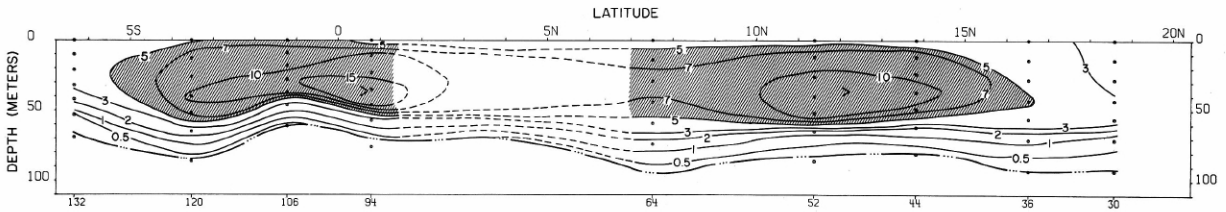
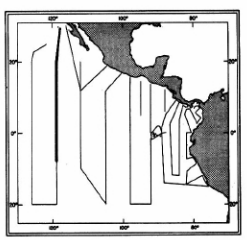


FIGURE 11-PP-v1. — Vertical distribution of primary production (mg. C/m.^{3}/day) along 119° W. from 20°00′ N. to 6°21′ S., January 28-February 9, 1967. The heavy dash-dot line indicates the bottom of the euphotic layer.



11-Ch-v1.

11-Ph-v1.

11-PP-v1.

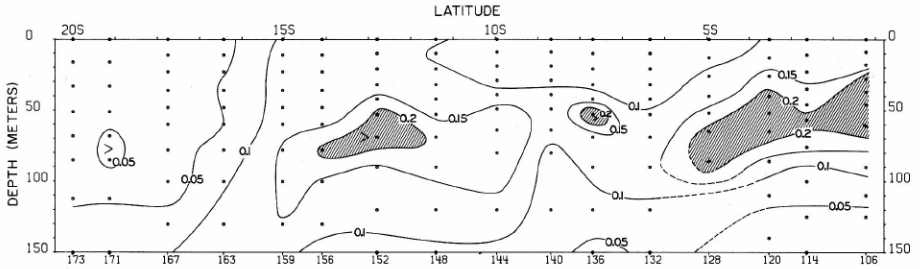


FIGURE 11-Ch-v2. — Vertical distribution of chlorophyll-a (mg./m.^{3}) along 119° W. from 1°14′ S. to 20°00′ S., February 7-14, 1967.

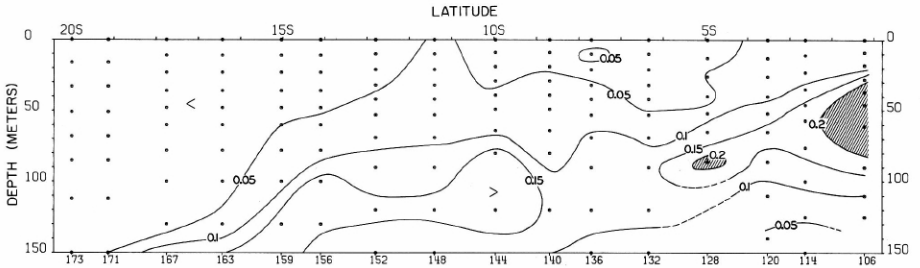


FIGURE 11-Ph-v2. — Vertical distribution of phaeophytin (mg./m.^{3}) along 119° W. from 1°14′ S. to 20°00′ S., February 7-14, 1967.

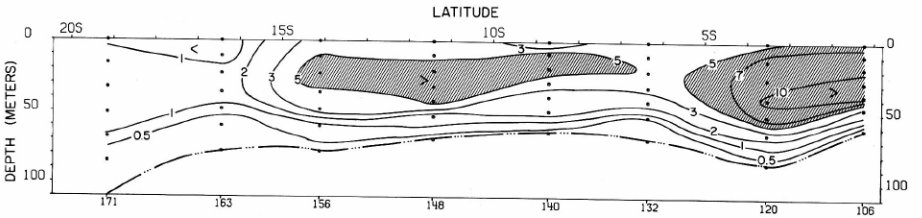
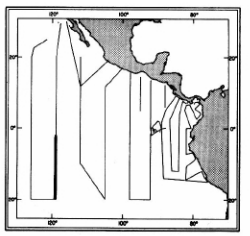


FIGURE 11-PP-v2. — Vertical distribution of primary production (mg. C/m.^{3}/day) along 119° W. from 1°14′ S. to 20°00′ S., February 7-14, 1967. The heavy dash-dot line indicates the bottom of the euphotic layer.



11-Ch-v2.

11-Ph-v2.

11-PP-v2.

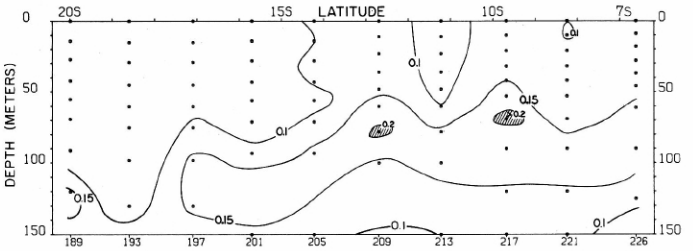


FIGURE 11-Ch-v4. — Vertical distribution of chlorophyll-a (mg./m.^{3}) along 126° W. from 19°59′ S. to 6°38′ S., February 16-21, 1967.

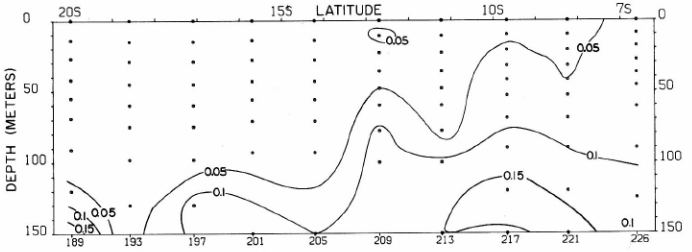


FIGURE 11-Ph-v4. — Vertical distribution of phaeophytin (mg./m.^{3}) along 126° W. from 19°59′ S. to 6°38′ S., February 16-21, 1967.

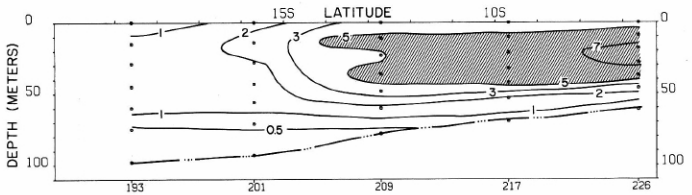


FIGURE 11-PP-v4. — Vertical distribution of primary production (mg. C/m.^{3}/day) along 126° W. from 19°59′ S. to 6°38′ S., February 16-21, 1967. The heavy dash-dot line indicates the bottom of the euphotic layer.

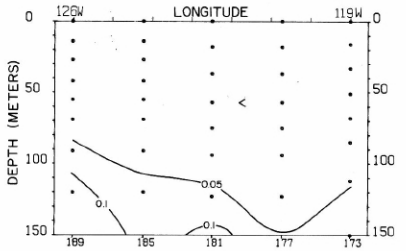


FIGURE 11-Ch-v3. — Vertical distribution of chlorophyll-a (mg./m.^{3}) along 20° S., February 14-16, 1967.

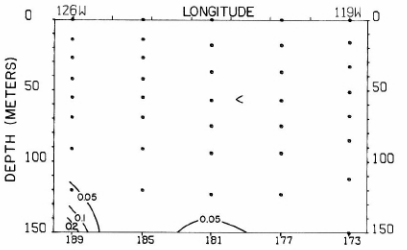


FIGURE 11-Ph-v3. — Vertical distribution of phaeophytin (mg./m.^{3}) along 20° S., February 14-16, 1967.

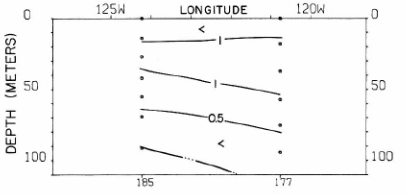
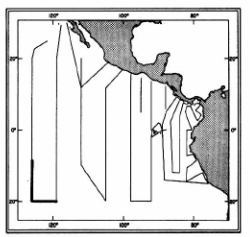


FIGURE 11-PP-v3. — Vertical distribution of primary production (mg. C/m.^{3}/day) along 20° S., February 14-16, 1967. The heavy dash-dot line indicates the bottom of the euphotic layer.



11-Ch-v3.

11-Ph-v3.

11-PP-v3.

11-Ch-v4.

11-Ph-v4.

11-PP-v4.

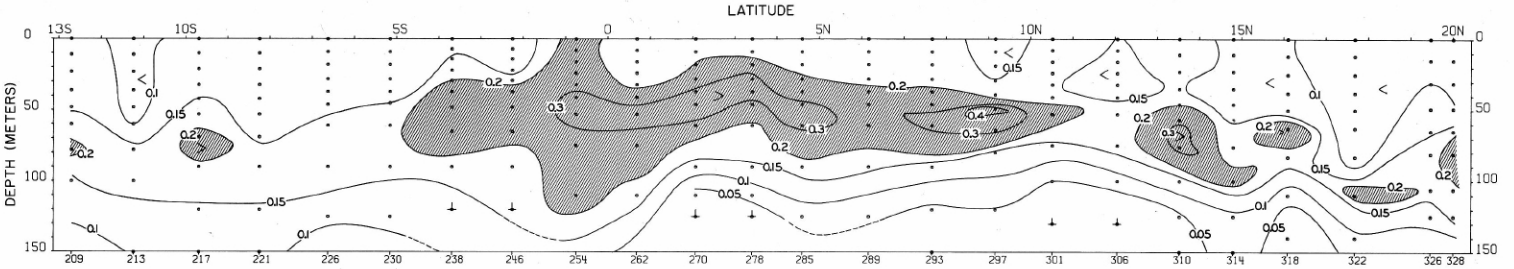


FIGURE 11-Ch-v5. — Vertical distribution of chlorophyll-a (mg./m.^{3}) along 126° W. from 12°42′ S. to 20°01′ N., February 19-March 2, 1967.

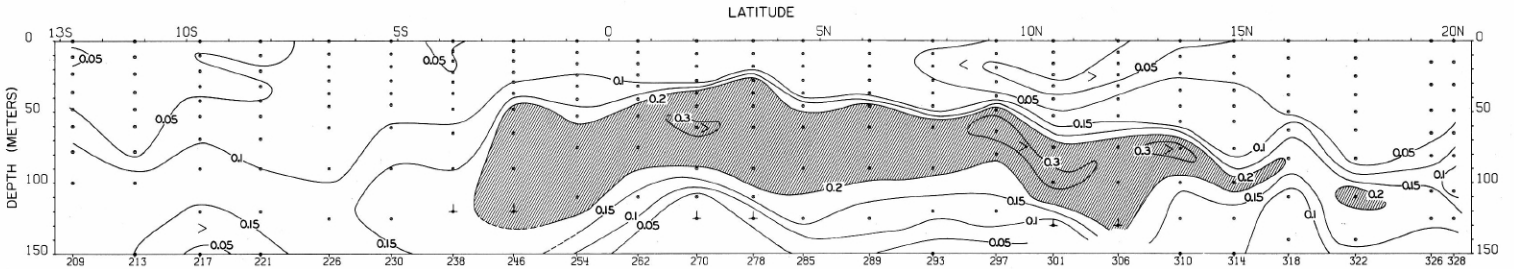


FIGURE 11-Ph-v5. — Vertical distribution of phaeophytin (mg./m.^{3}) along 126° W. from 12°42′ S. to 20°01′ N., February 19-March 2, 1967.

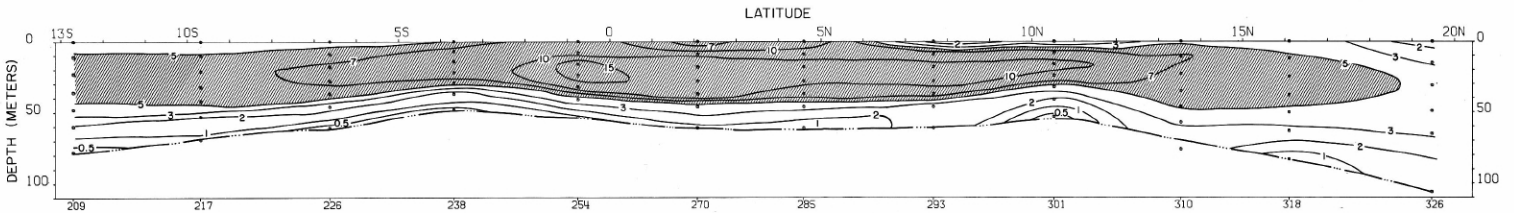
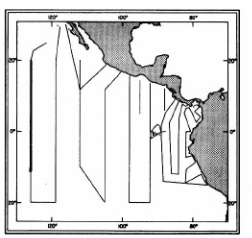


FIGURE 11-PP-v5. — Vertical distribution of primary production (mg. C/m.^{3}/day) along 126° W., from 12°42′ S. to 20°01′ N., February 19-March 2, 1967. The heavy dash-dot line indicates the bottom of the euphotic layer.



11-Ch-v5.

11-Ph-v5.

11-PP-v5.

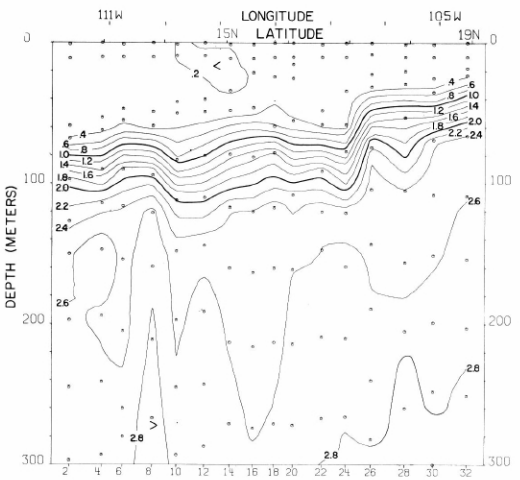


FIGURE 12-P-v2.—Vertical distribution of phosphate-phosphorous (μg.-at./l.) along a section from 12° N., 112° W. to Manzanillo, February 12-16, 1967.

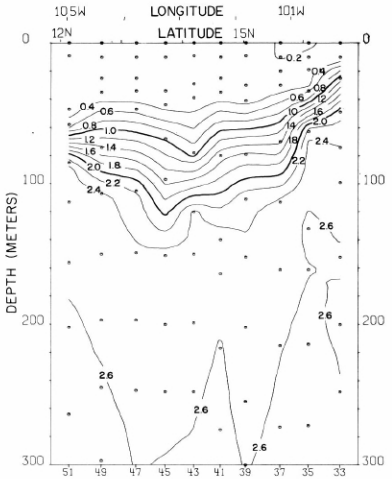


FIGURE 12-P-v3.—Vertical distribution of phosphate-phosphorous (μg.-at./l.) along a section from Acapulco to 12° N., 105° W., February 19-21, 1967.

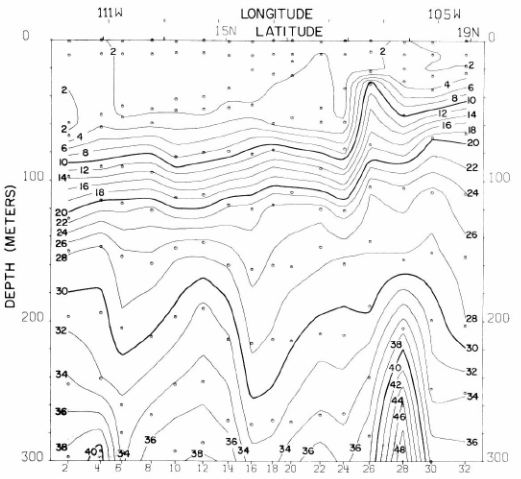


FIGURE 12-Si-v2. — Vertical distribution of silicate-silicon (μg.-at./l.) along a section from 12° N., 112° W. to Manzanillo, February 12-16, 1967.

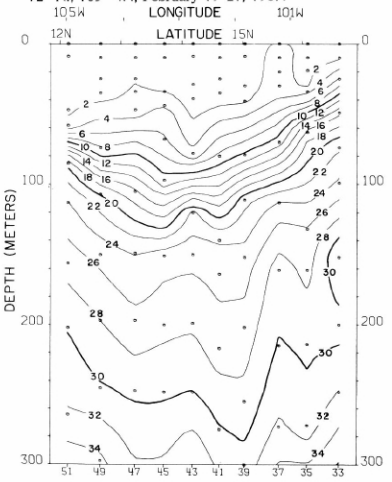


FIGURE 12-Si-v3. — Vertical distribution of silicate-silicon (μg.-at./l.) along a section from Acapulco to 12° N., 105° W., February 19-21, 1967.

12-P-v2.

12-Si-v2.

12-P-v3.

12-Si-v3.

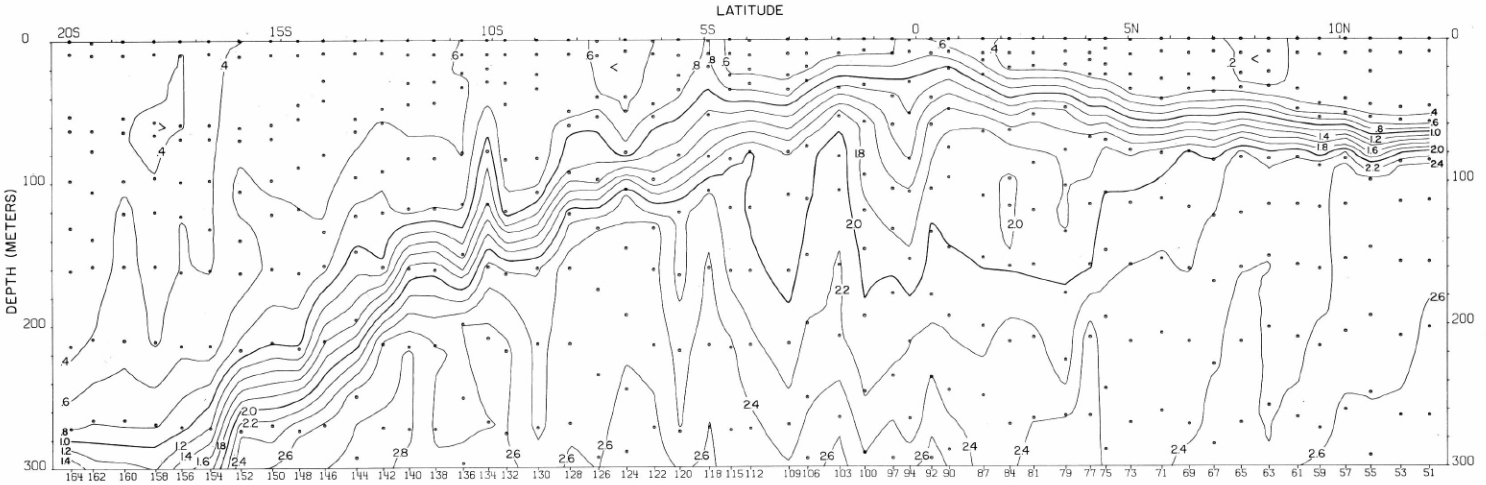


FIGURE 12-P-v4. — Vertical distribution of phosphate-phosphorus (μg.-at./l.) along 105° W., February 21-March 6, 1967.

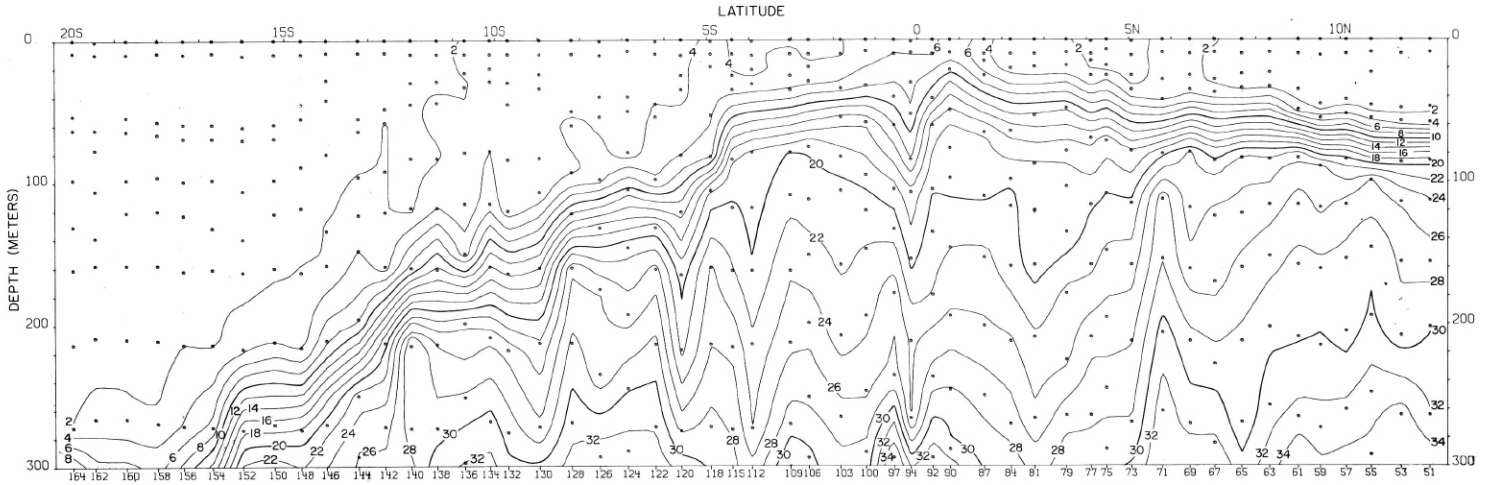
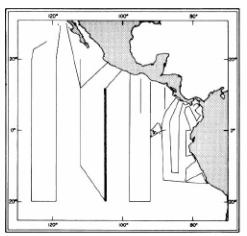


FIGURE 12-Si-v4. — Vertical distribution of silicate-silicon (μg.-at./l.) along 105° W., February 21-March 6, 1967.



12-P-v4.

12-Si-v4.

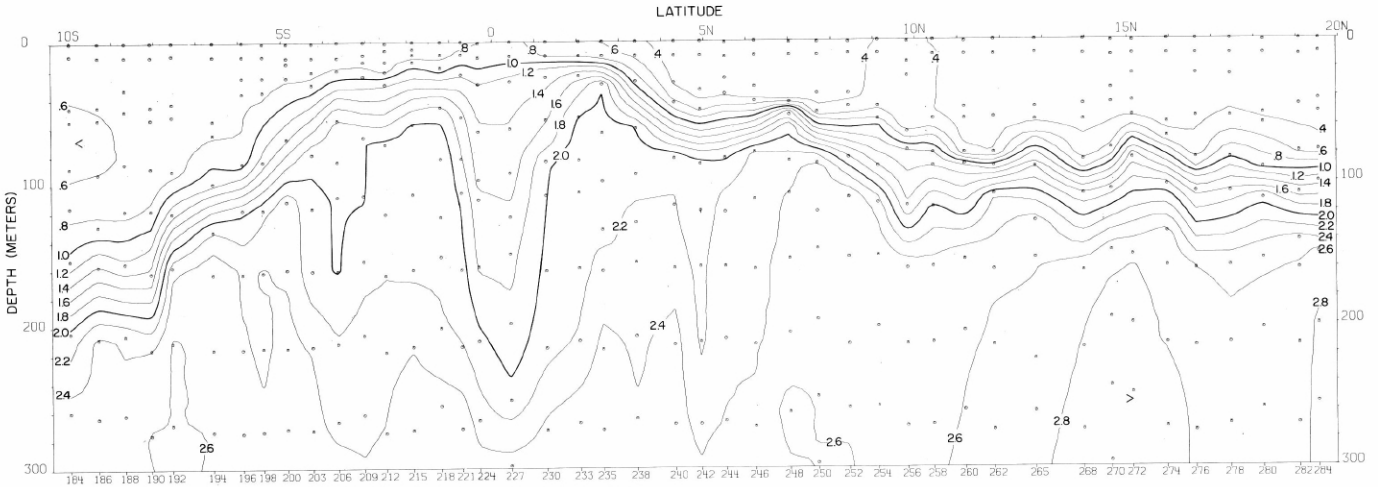


FIGURE 12-P-v6. — Vertical distribution of phosphate-phosphorus (μg.-at./l.) along 112° W., March 9-21, 1967.

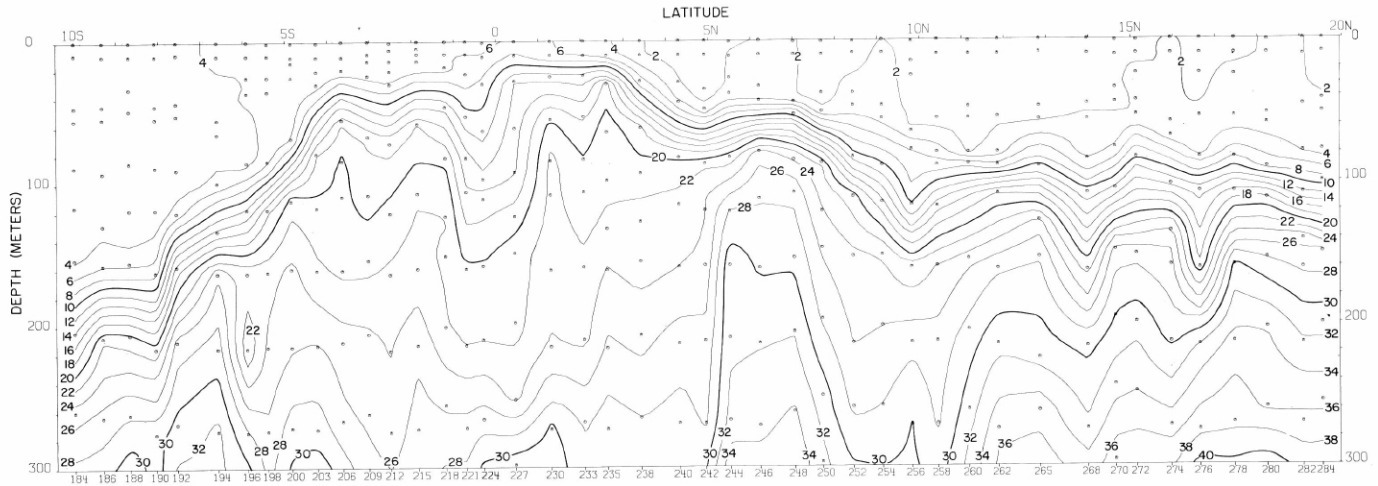
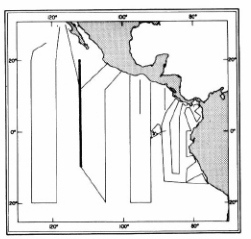


FIGURE 12-Si-v6. — Vertical distribution of silicate-silicon (μg.-at./l.) along 112° W., March 9-21, 1967.



12-P-v6.

12-Si-v6.

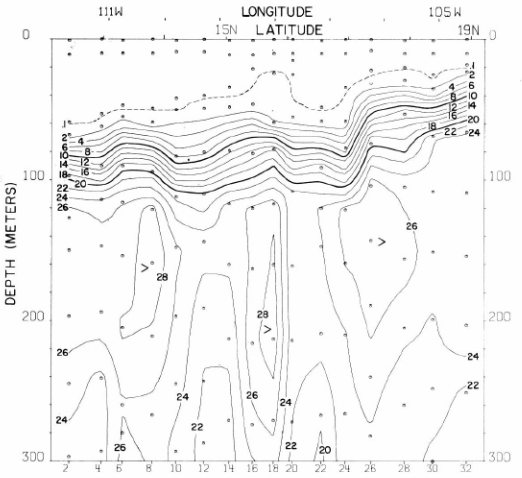


FIGURE 12-NO_3-v2.—Vertical distribution of nitrate-nitrogen (μg.-at./l.) along a section from 12° N., 112° W. to Manzanillo, February 12-16, 1967.

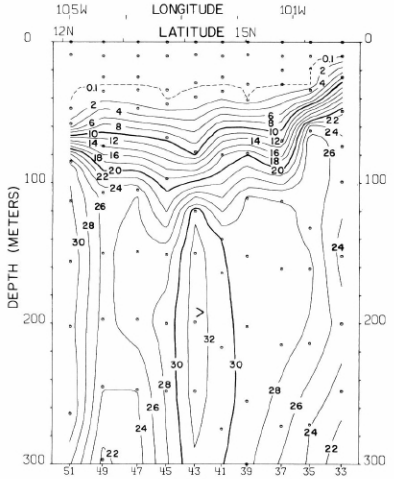


FIGURE 12-NO_3-v3. — Vertical distribution of nitrate-nitrogen (μg.-at./l.) along a section from Acapulco to 12° N., 105° W., February 19-21, 1967.

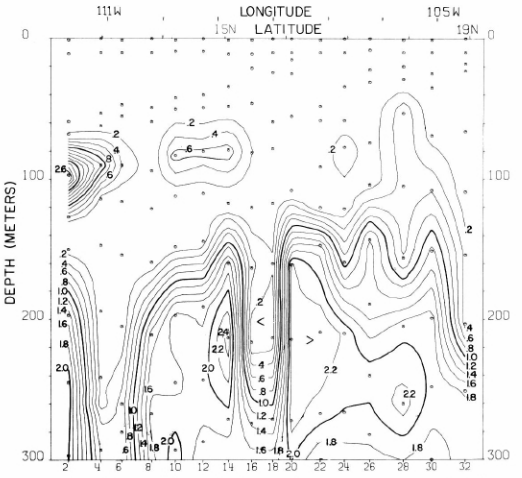


FIGURE 12-NO_2-v2.—Vertical distribution of nitrite-nitrogen (μg.-at./l.) along a section from 12° N., 112° W. to Manzanillo, February 12-16, 1967.

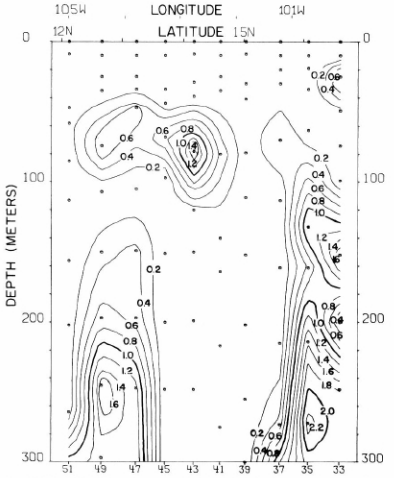
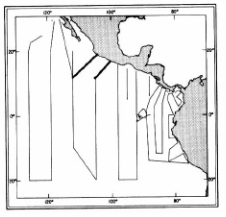


FIGURE 12-NO_2-v3. — Vertical distribution of nitrite-nitrogen (μg.-at./l.) along a section from Acapulco to 12° N., 105° W., February 19-21, 1967.



12-NO_3-v2.

12-NO_2-v2.

12-NO_3-v3.

12-NO_2-v3.

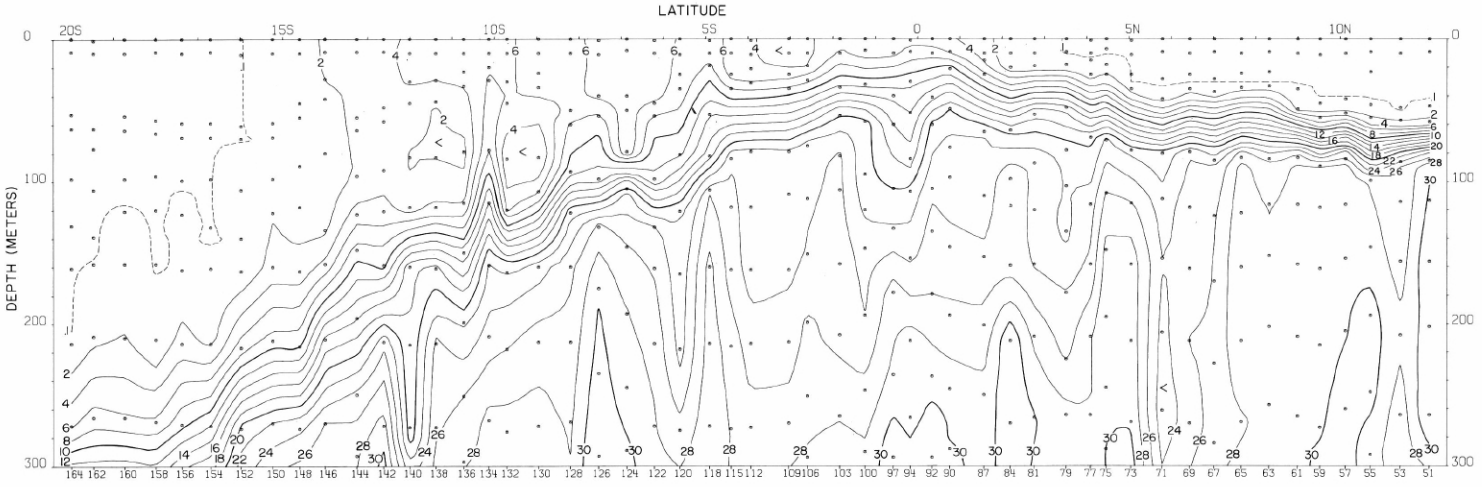


FIGURE 12-NO_3-v4. — Vertical distribution of nitrate-nitrogen (μg.-at./l.) along 105° W., February 21-March 6, 1967.

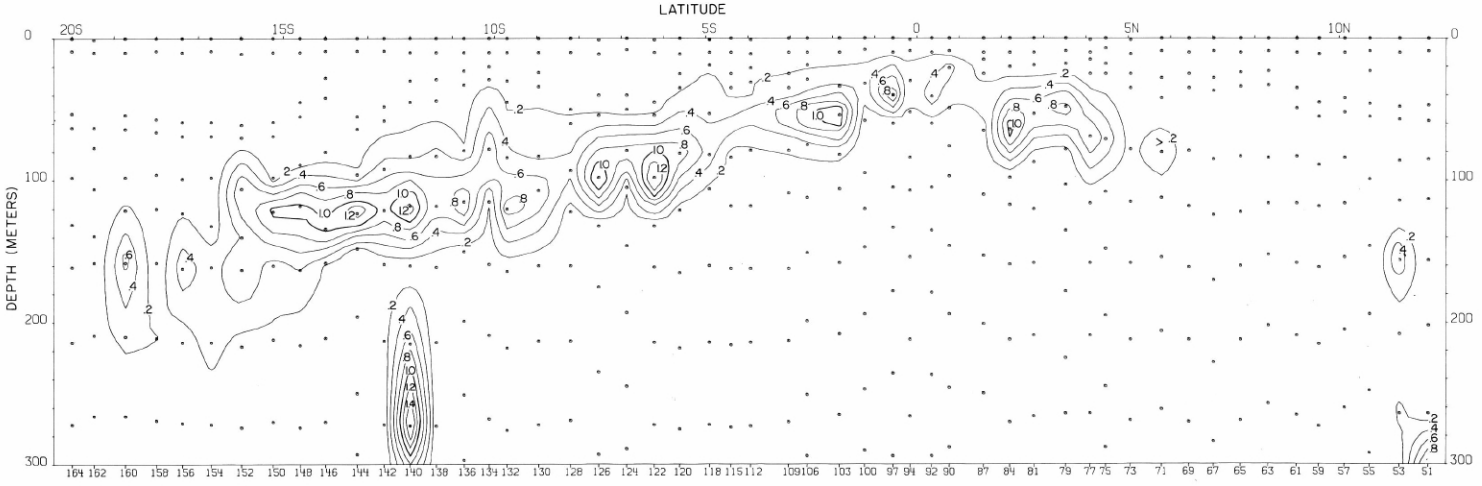
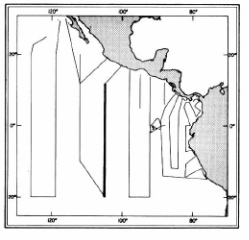


FIGURE 12-NO_2-v4. — Vertical distribution of nitrite-nitrogen (μg.-at./l.) along 105° W., February 21-March 6, 1967.



12-NO_3-v4.

12-NO_2-v4.

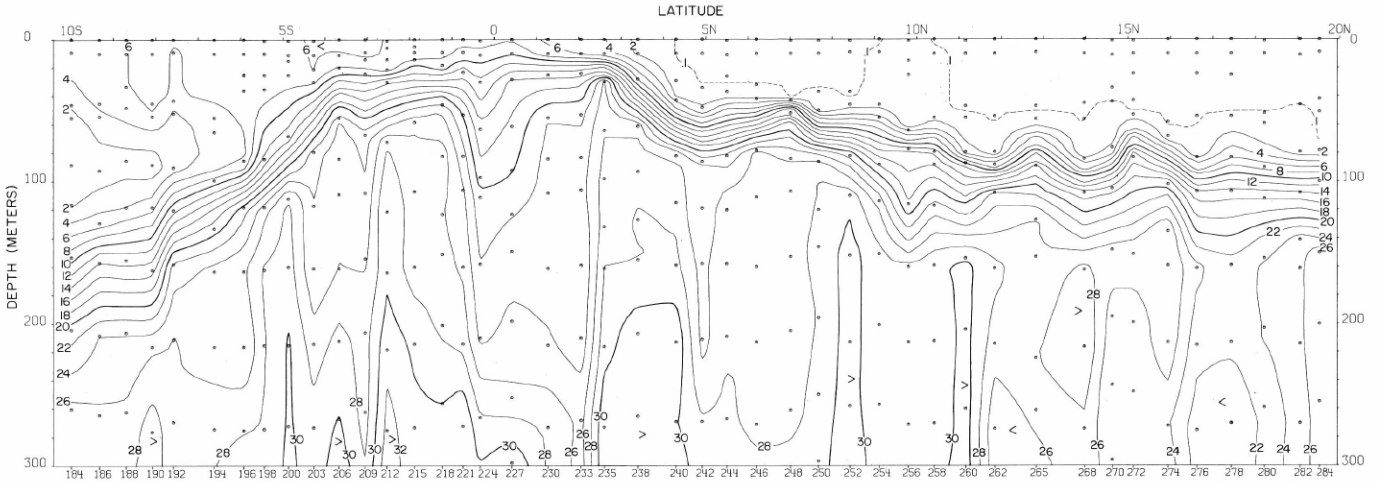


FIGURE 12-NO_3-v6. — Vertical distribution of nitrate-nitrogen (μg.-at./l.) along 112° W., March 9-21, 1967.

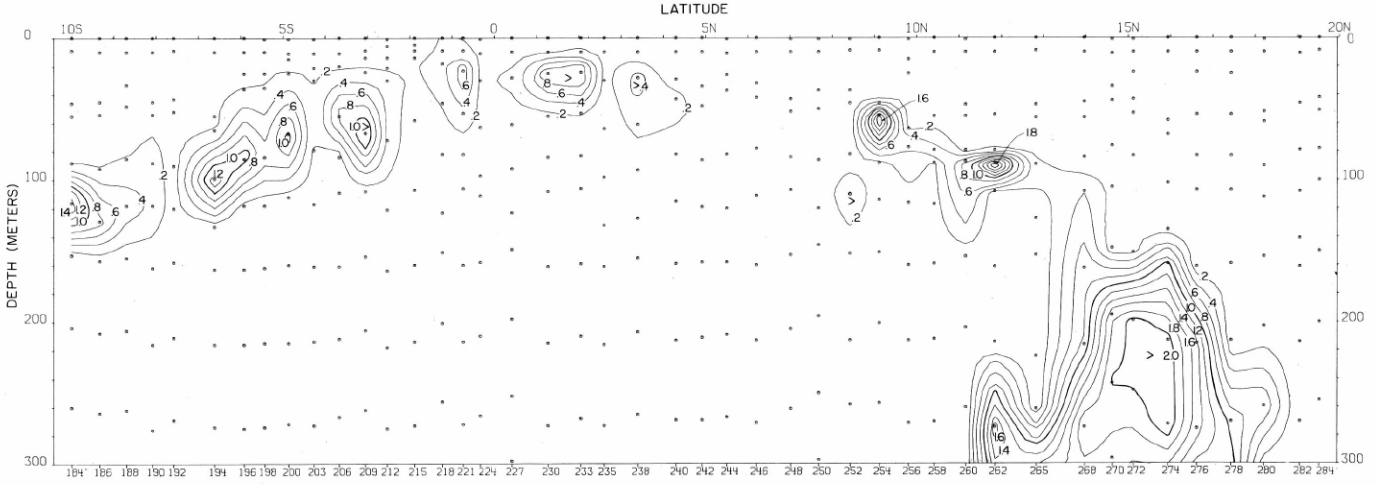
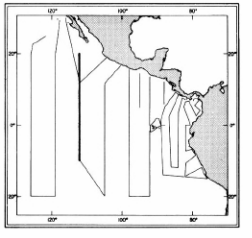


FIGURE 12-NO_2-v6. — Vertical distribution of nitrite-nitrogen (μg.-at./l.) along 112° W., March 9-21, 1967.



12-NO_3-v6.

12-NO_2-v6.

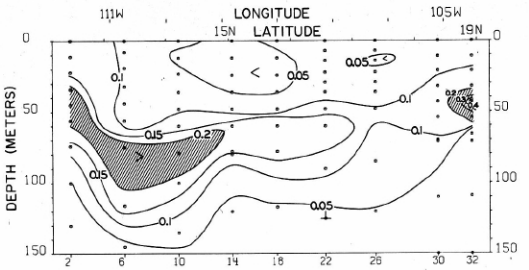


FIGURE 12-Ch-v2. — Vertical distribution of chlorophyll-a (mg./m.^{3}) along a section from 12° N., 112° W. to Manzanillo, February 12-16, 1967.

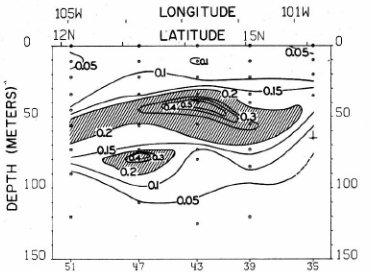


FIGURE 12-Ch-v3. — Vertical distribution of chlorophyll-a (mg./m.^{3}) along a section from Acapulco to 12° N., 105° W., February 19-21, 1967.

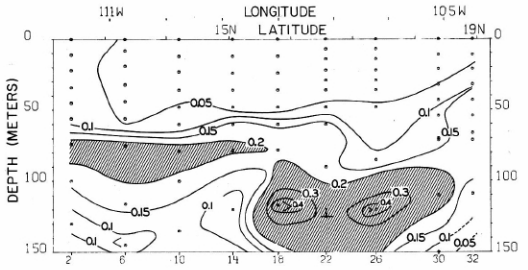


FIGURE 12-Ph-v2. — Vertical distribution of phaeophytin (mg./m.^{3}) along a section from 12° N., 112° W. to Manzanillo, February 12-16, 1967.

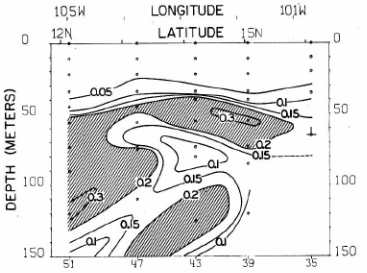
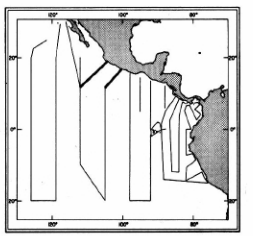


FIGURE 12-Ph-v3. — Vertical distribution of phaeophytin (mg./m.^{3}) along a section from Acapulco to 12° N., 105° W., February 19-21, 1967.



12-Ch-v2.

12-Ph-v2.

12-Ch-v3.

12-Ph-v3.

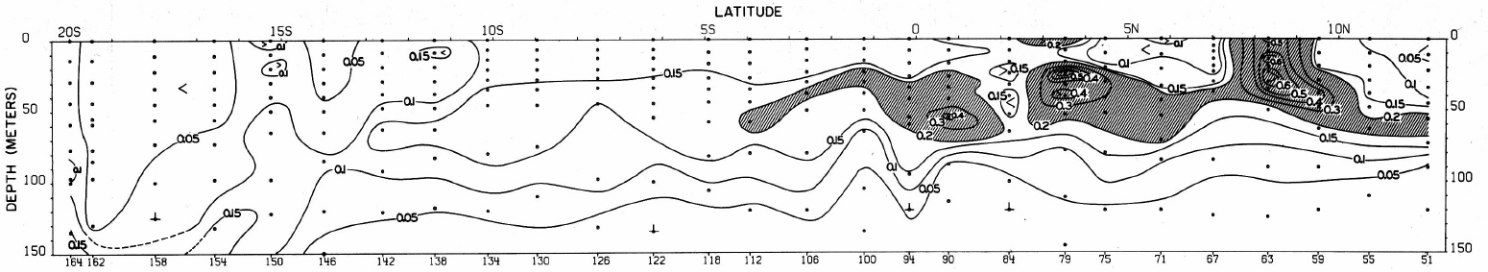


FIGURE 12-Ch-v4. — Vertical distribution of chlorophyll-a (mg./m.^{3}) along 105° W., February 21-March 6, 1967.

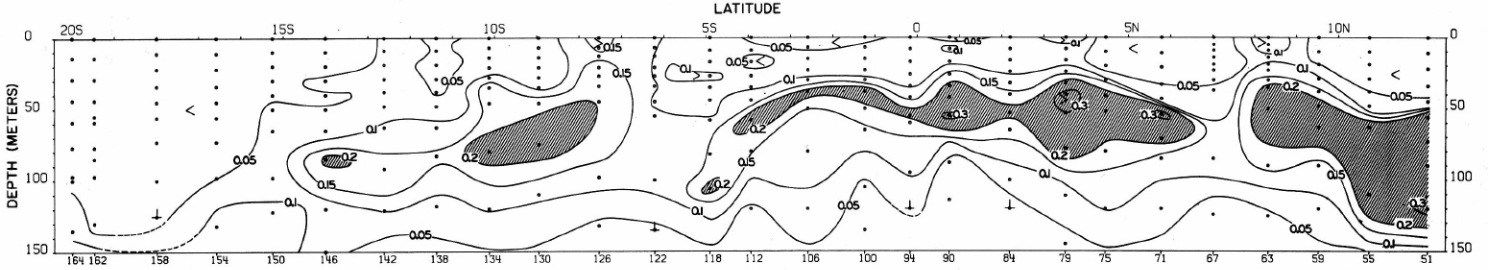
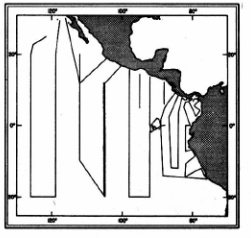


FIGURE 12-Ph-v4. — Vertical distribution of phaeophytin (mg./m.^{3}) along 105° W., February 21-March 6, 1967.



12-Ch-v4.

12-Ph-v4.

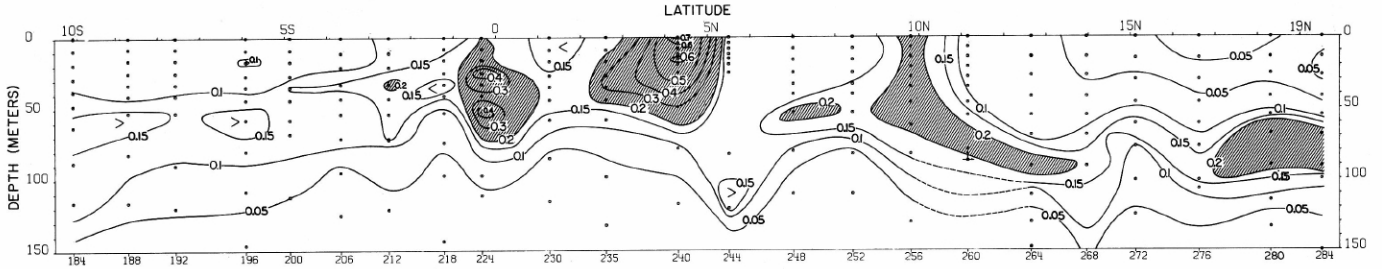


FIGURE 12-Ch-v6. — Vertical distribution of chlorophyll-a (mg./m.^{3}) along 112° W., March 9-21, 1967.

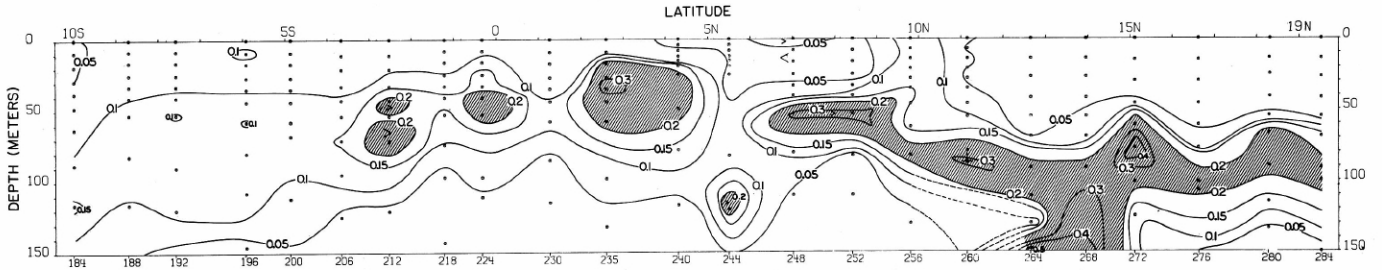
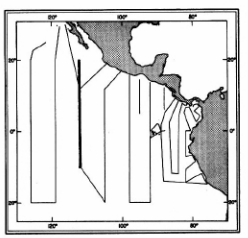


FIGURE 12-Ph-v6. — Vertical distribution of phaeophytin (mg./m.^{3}) along 112° W., March 9-21, 1967.



12-Ch-v6.

12-Ph-v6.

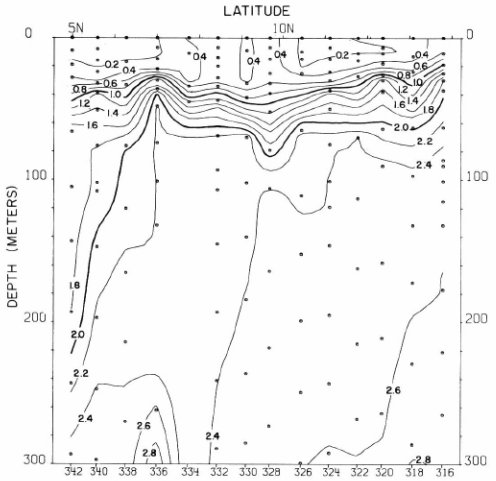


FIGURE 13-P-v6. — Vertical distribution of phosphate-phosphorus (μg.-at./l.) along 95° W., March 17-20, 1967.

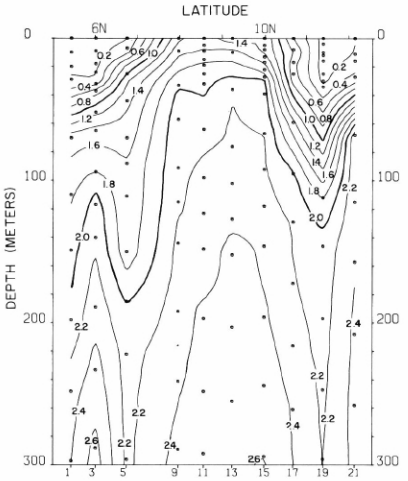


FIGURE 13-P-v1. — Vertical distribution of phosphate-phosphorus (μg.-at./l.) along 88° W., February 1-4, 1967.

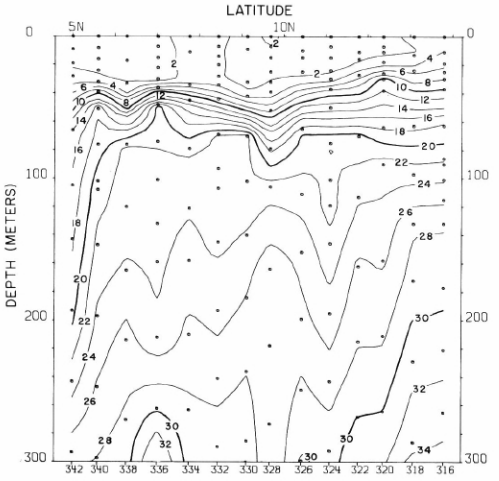
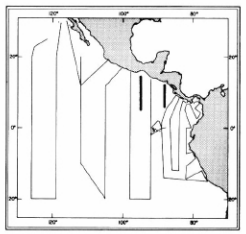


FIGURE 13-Si-v6. — Vertical distribution of silicate-silicon (μg.-at./l.) along 95° W., March 17-20, 1967.



13-P-v1.

13-P-v6.

13-Si-v6.

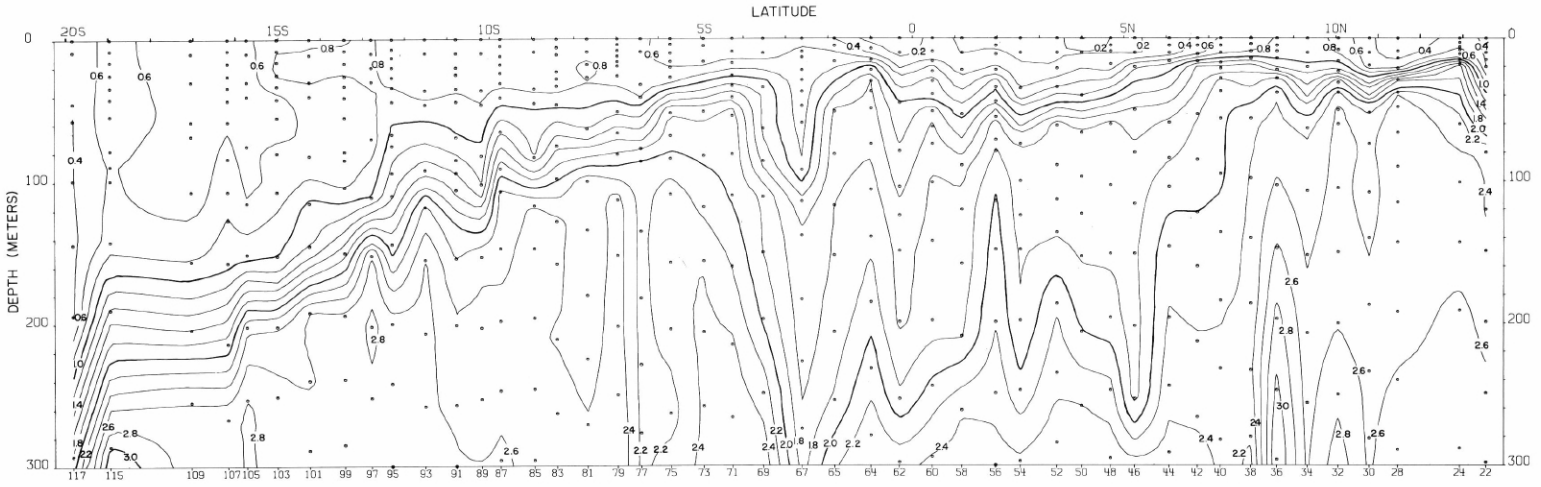


FIGURE 13-P-v2. — Vertical distribution of phosphate-phosphorus (μg.-at./l.) along 92° W., February 7-21, 1967.

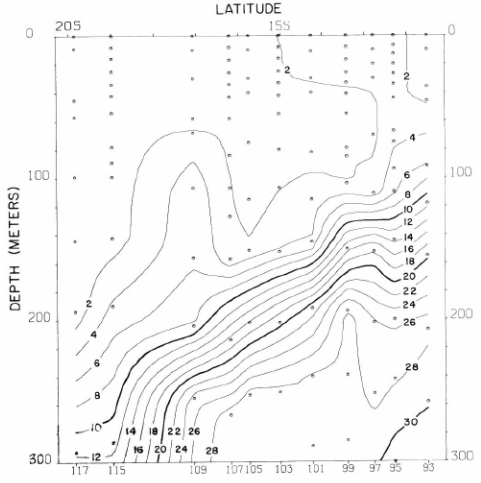
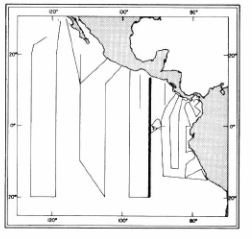


FIGURE 13-Si-v2.—Vertical distribution of silicate-silicon (μg.-at./l.) along 92° W., February 18-21, 1967.



13-P-v2.

13-Si-v2.

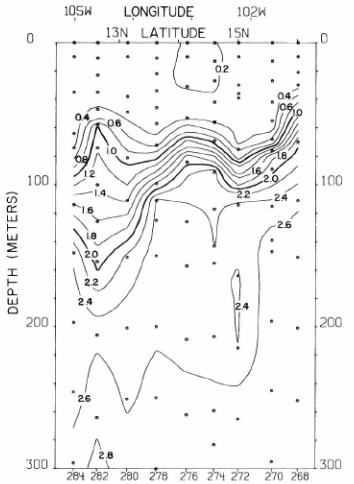


FIGURE 13-P-v5. — Vertical distribution of phosphate-phosphorus (μg.-at./l) along a section from Acapulco to 12° N., 105° W., March 13-15, 1967.

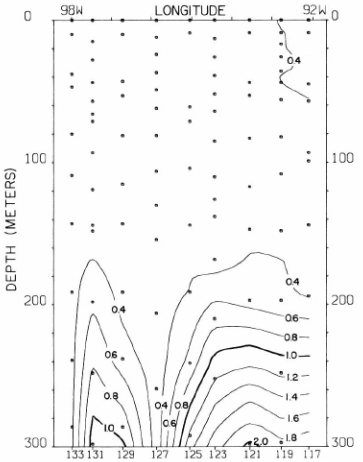


FIGURE 13-P-v3. — Vertical distribution of phosphate-phosphorus (μg.-at./l.) along 20° S., February 21-23, 1967.

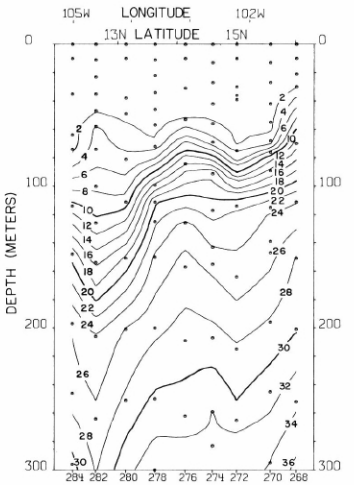


FIGURE 13-Si-v5. — Vertical distribution of silicate-silicon (μg.-at./l.) along a section from Acapulco to 12° N., 105° W., March 13-15, 1967.

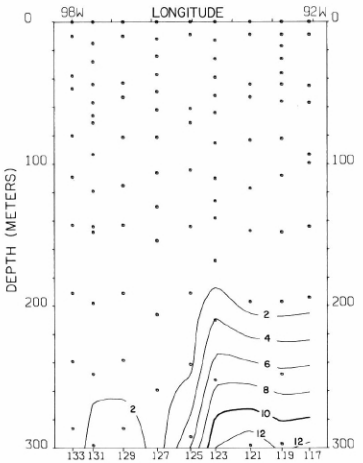
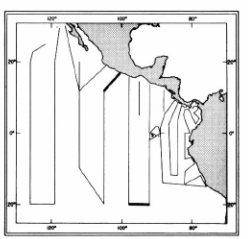


FIGURE 13-Si-v3. — Vertical distribution of silicate-silicon (μg.-at./l.) along 20° S., February 21-23, 1967.



13-P-v3.

13-Si-v3.

13-P-v5.

13-Si-v5.

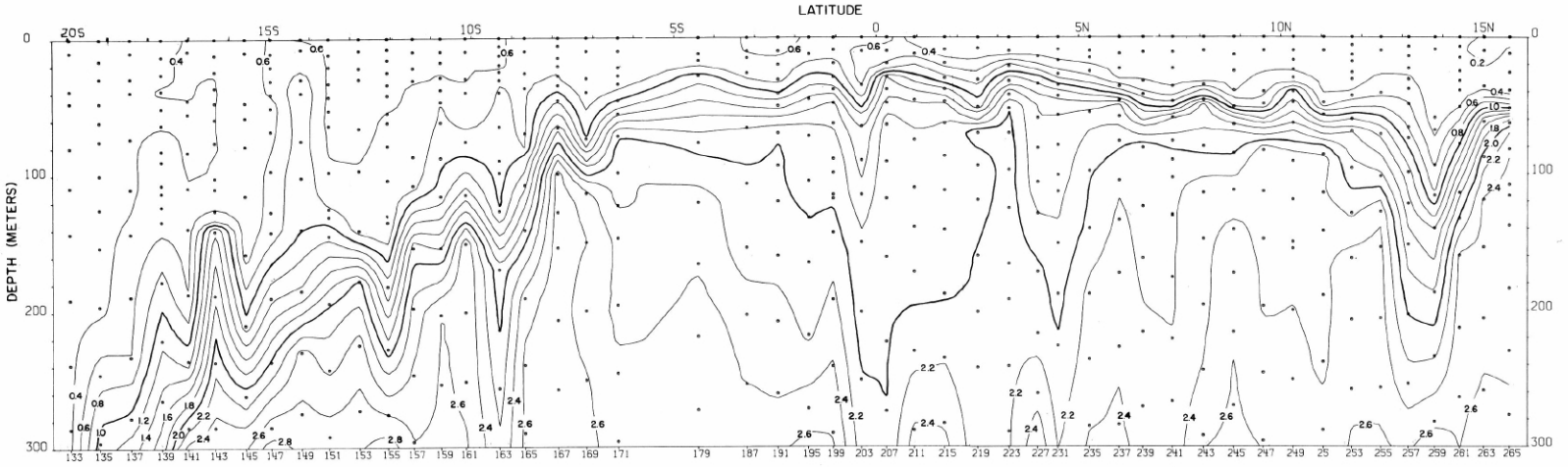


FIGURE 13-P-v4. — Vertical distribution of phosphate-phosphorous (μg.-at./l.) along 98° W., February 23-March 8, 1967.

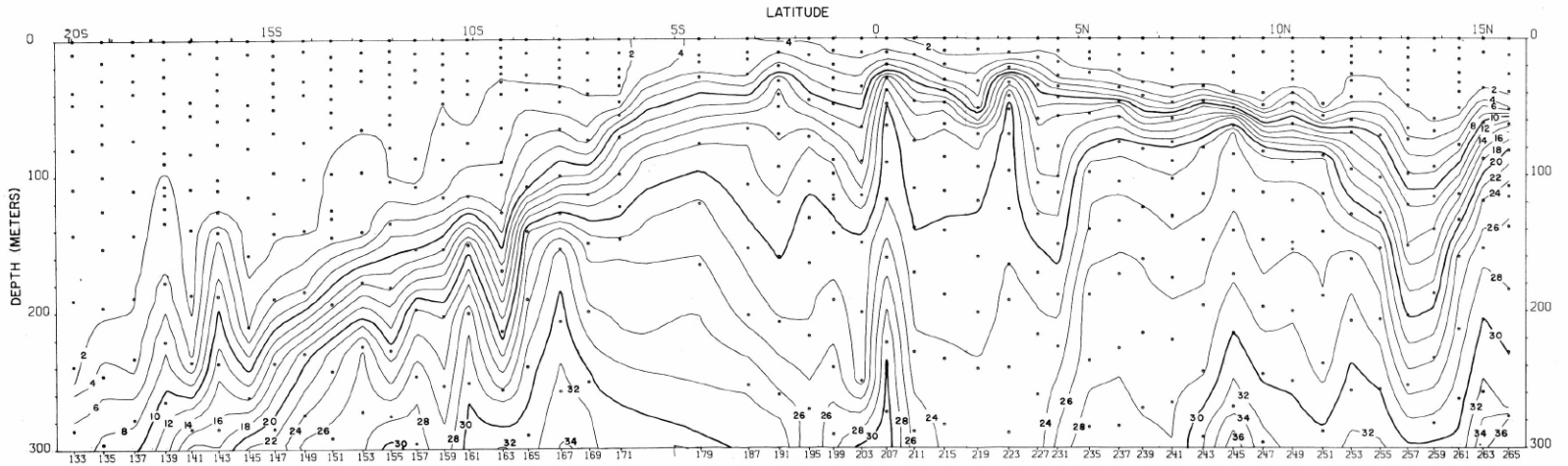
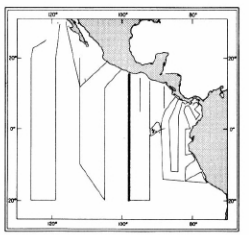


FIGURE 13-Si-v4. — Vertical distribution of silicate-silicon (μg.-at./l.) along 98° W., February 23-March 8, 1967.



13-P-v4.

13-Si-v4.

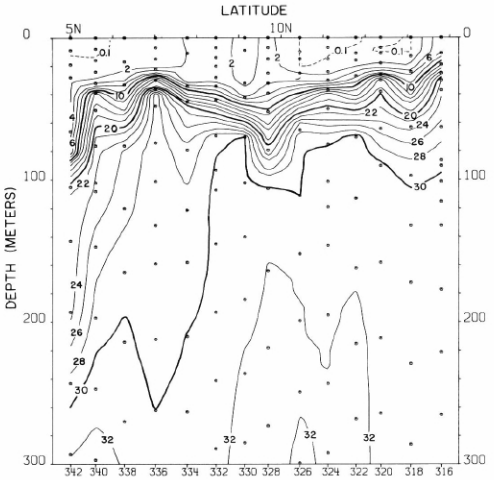


FIGURE 13-NO_3-v6. — Vertical distribution of nitrate-nitrogen (μg.-at./l.) along 95° W., March 17-20, 1967.

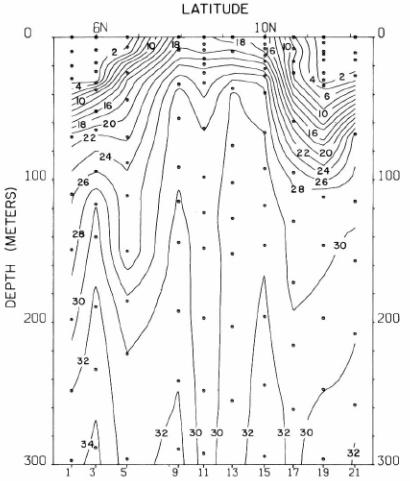


FIGURE 13-NO_3-v1. — Vertical distribution of nitrate-nitrogen (μg.-at./l.) along 88° W., February 1-4, 1967.

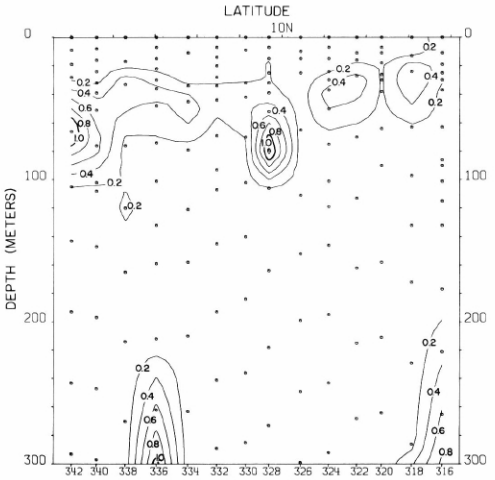
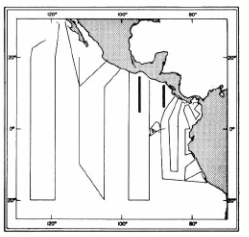


FIGURE 13-NO_2-v6. — Vertical distribution of nitrite-nitrogen (μg.-at./l.) along 95° W., March 17-20, 1967.



13-NO_3-v1.

13-NO_3-v6.

13-NO_2-v6.

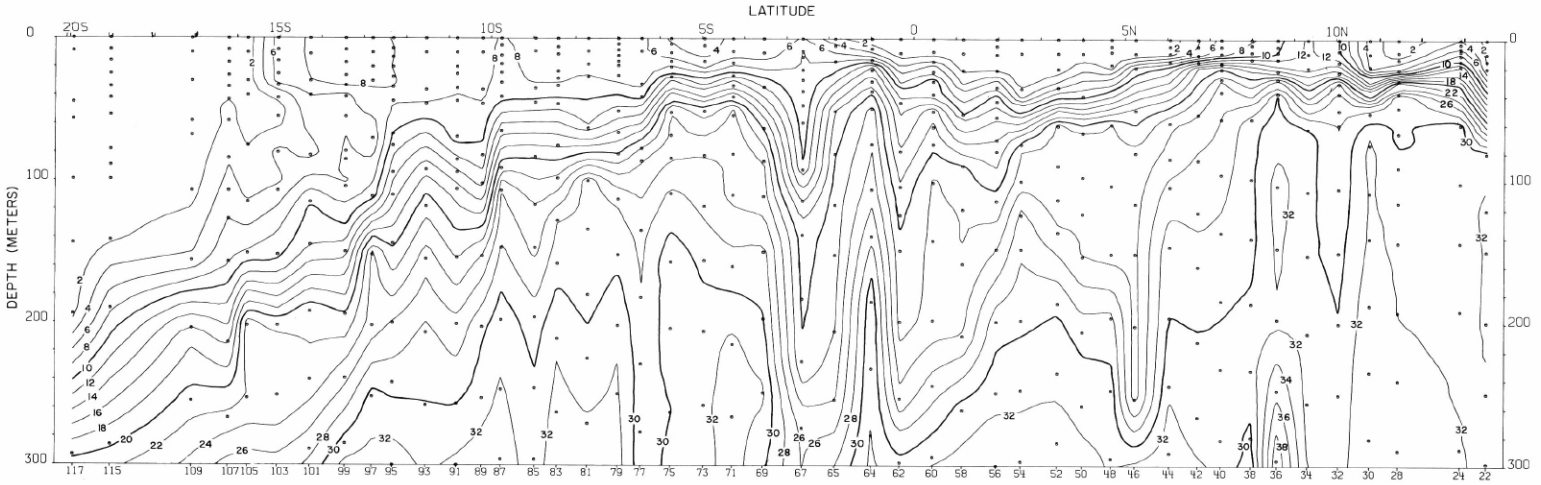
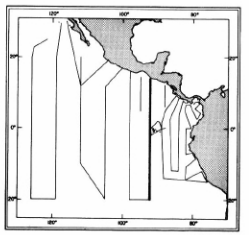


FIGURE 13-NO_3-v2. — Vertical distribution of nitrate-nitrogen (μg.-at./l.) along 92° W., February 7-21, 1967.



13-NO_3-v2.

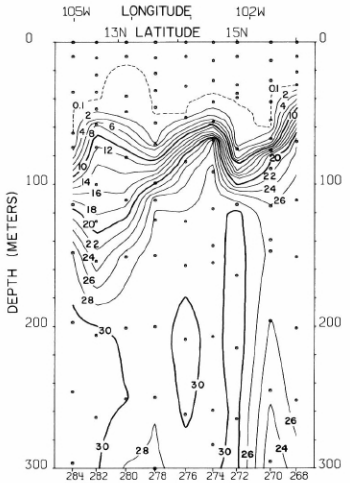


FIGURE 13-NO_3-v5.—Vertical distribution of nitrate-nitrogen (μg.-at./l.) along a section from Acapulco to 12° N., 105° W., March 13-15, 1967.

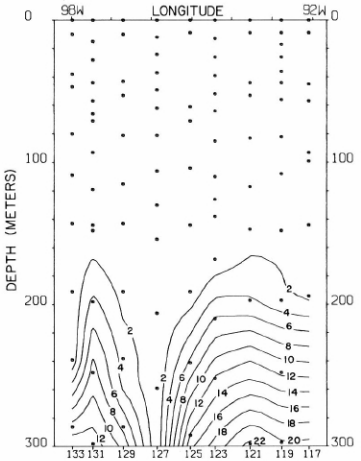


FIGURE 13-NO_3-v3.—Vertical distribution of nitrate-nitrogen (μg. at./l.) along 20° S., February 21-23, 1967.

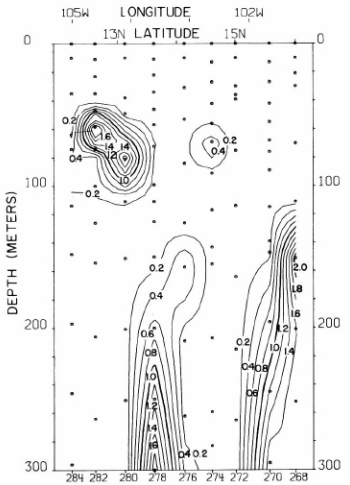
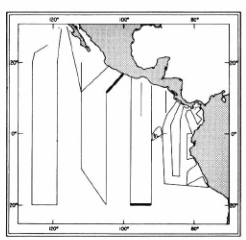


FIGURE 13-NO_2-v5.—Vertical distribution of nitrite-nitrogen (μg.-at./l.) along a section from Acapulco to 12° N., 105° W., March 13-15, 1967.



13-NO_3-v3.

13-NO_3-v5.

13-NO_2-v5.

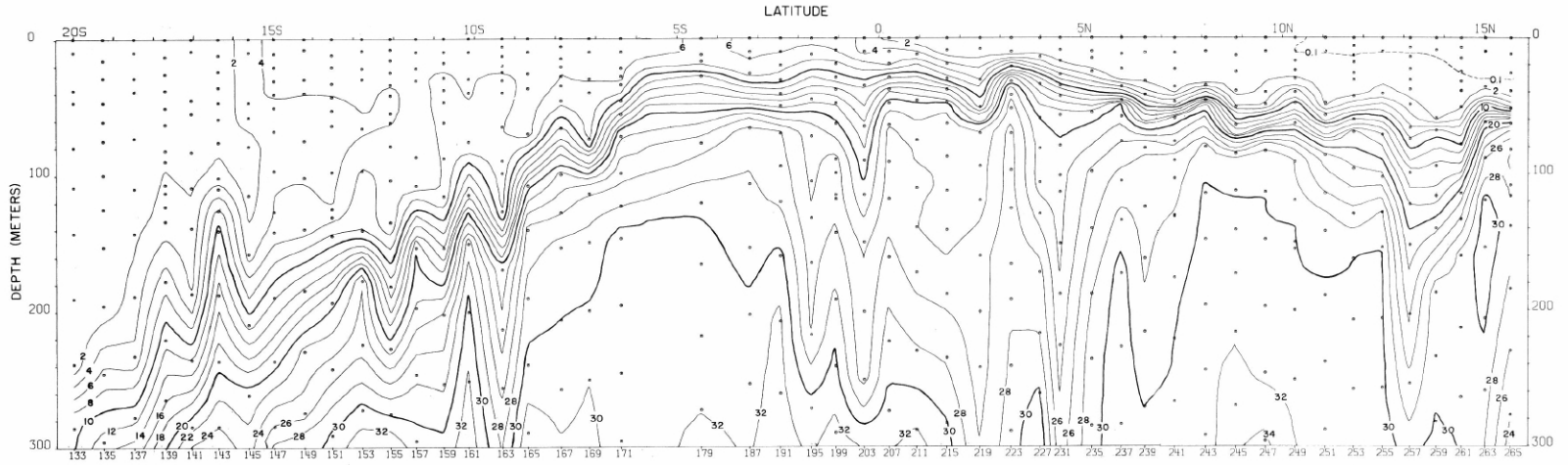


FIGURE 13-NO_3-v4. — Vertical distribution of nitrate-nitrogen (μg.-at./l.) along 98° W., February 23-March 8, 1967.

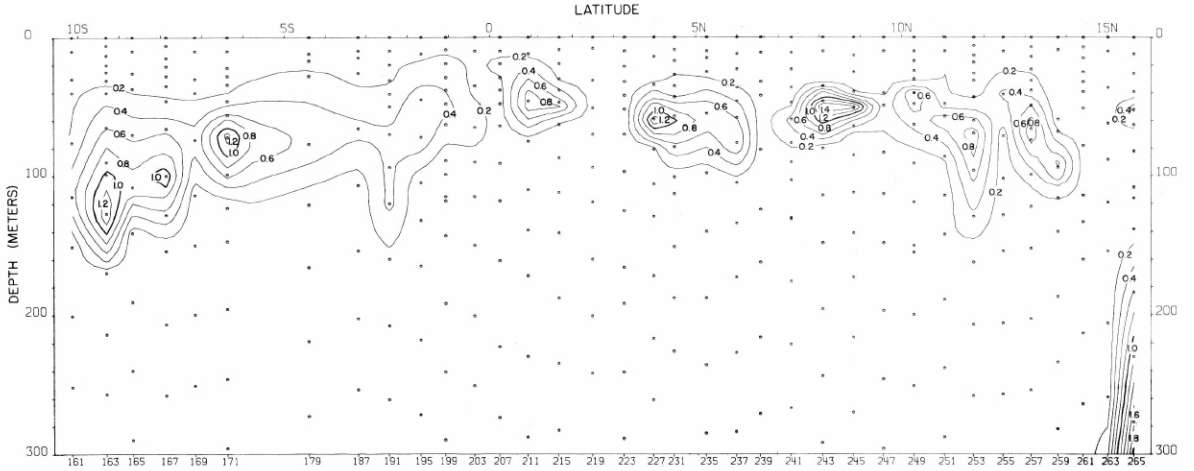
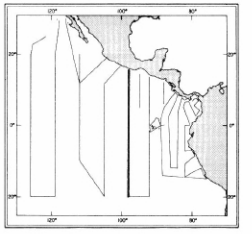


FIGURE 13-NO_2-v4. — Vertical distribution of nitrite-nitrogen (μg.-at./l.) along 98° W., February 23-March 8, 1967.



13-NO_3-v4.

13-NO_2-v4.

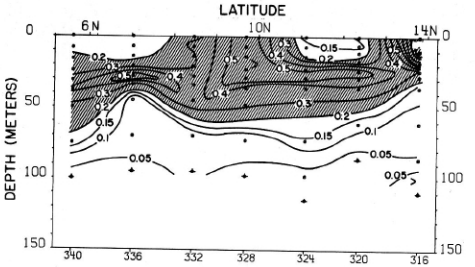


FIGURE 13-Ch-v6.—Vertical distribution of chlorophyll-a (mg./m.^{3}) along 95° W., March 17-20, 1967.

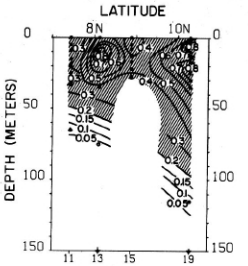


FIGURE 13-Ch-v1.—Vertical distribution of chlorophyll-a (mg./m.^{3}) along 88° W., February 1-4, 1967.

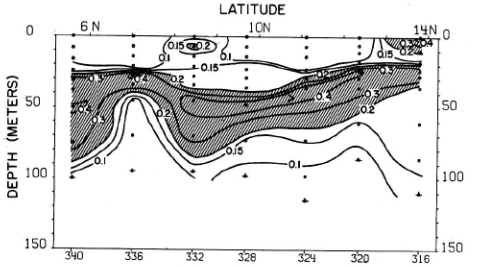


FIGURE 13-Ph-v6.—Vertical distribution of phaeophytin (mg./m.^{3}) along 95° W., March 17-20, 1967.

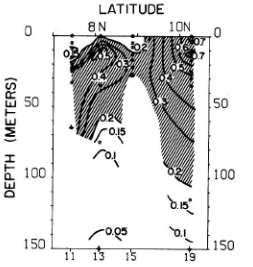
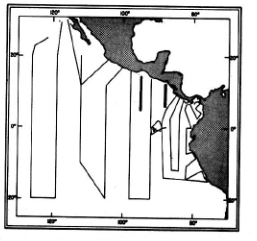


FIGURE 13-Ph-v1.—Vertical distribution of phaeophytin (mg./m.^{3}) along 88° W., February 1-4, 1967.



13-Ch-v1.

13-Ph-v1.

13-Ch-v6.

13-Ph-v6.

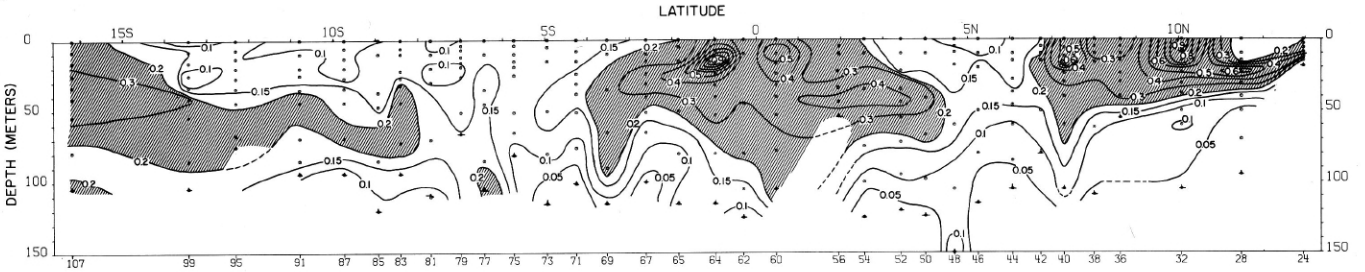


FIGURE 13-Ch-v2. — Vertical distribution of chlorophyll-a (mg./m.^{3}) along 92° W., February 7-21, 1967.

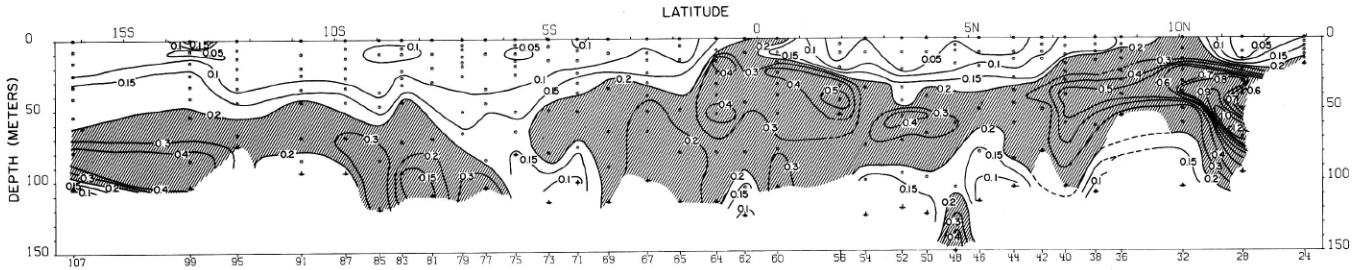
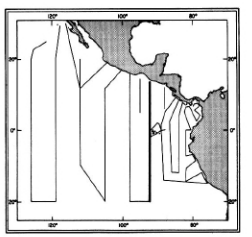


FIGURE 13-Ph-v2. — Vertical distribution of phaeophytin (mg./m.^{3}) along 92° W., February 7-21, 1967.



13-Ch-v2.

13-Ph-v2.

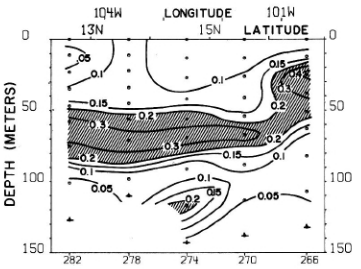


FIGURE 13-Ch-v5. — Vertical distribution of chlorophyll-a (mg./m.^{3}) along a section from Acapulco to 12° N., 105° W., March 13-15, 1967.

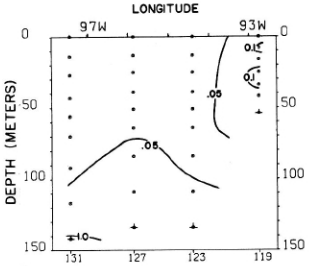


FIGURE 13-Ch-v3. — Vertical distribution of chlorophyll-a (mg./m.^{3}) along 20° S., February 21-23, 1967.

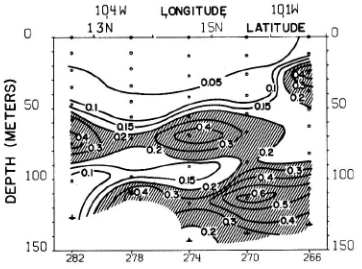


FIGURE 13-Ph-v5. — Vertical distribution of phaeophytin (mg./m.^{3}) along a section from Acapulco to 12° N., 105° W., March 13-15, 1967.

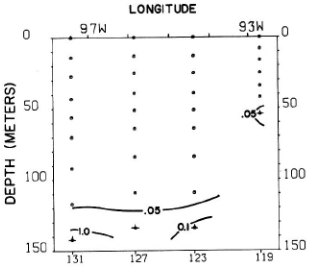
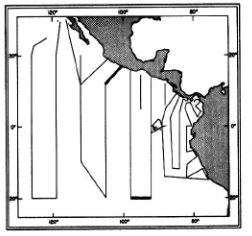


FIGURE 13-Ph-v3. — Vertical distribution of phaeophytin (mg./m.^{3}) along 20° S., February 21-23, 1967.



13-Ch-v3.

13-Ph-v3.

13-Ch-v5.

13-Ph-v5.

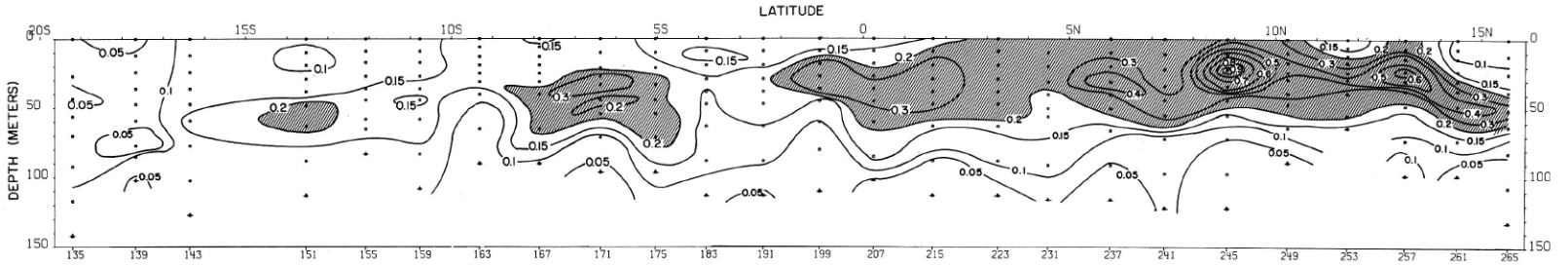


FIGURE 13-Ch-v4. — Vertical distribution of chlorophyll-a (mg./m.^{3}) along 98° W., February 23-March 8, 1967.

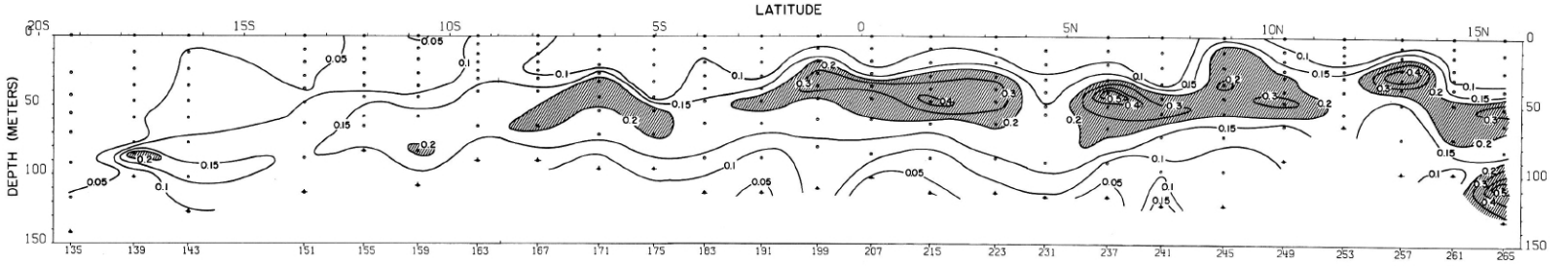
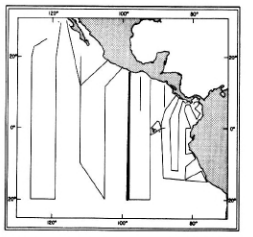


FIGURE 13-Ph-v4. — Vertical distribution of phaeophytin (mg./m.^{3}) along 98° W., February 23-March 8, 1967.



13-Ch-v4.

13-Ph-v4.

FIGURE 14-P-v3. — Vertical distribution of phosphate-phosphorus (μg.-at./l.) along a northeast-southwest section in the Panama Bight from the coast of Colombia to 5°43′ N., 79°22′ W,. February 1, 1967.

FIGURE 14-P-v4. — Vertical distribution of phosphate-phosphorus (μg.-at./l.) along a northwest-southeast section in the central portion of the Panama Bight from 5°43′ N., 79°22′ W. to the coast of Colombia, February 1-2, 1967.

FIGURE 14-P-v5. — Vertical distribution of phosphate-phosphorus (μg.-at./l.) along a section in the Panama Bight near the coast of Colombia from 4°10′ N. to 2°45′ N., February 2-3, 1967.

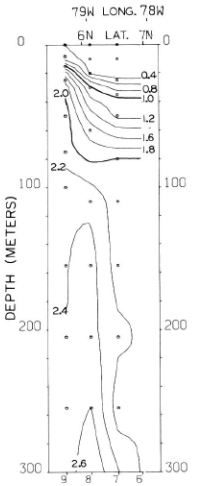


FIGURE 14-P-v3.

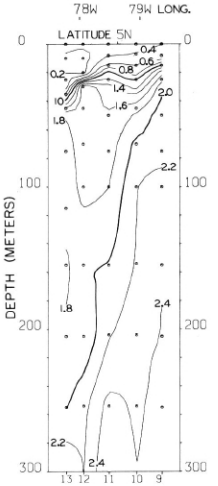


FIGURE 14-P-v4.

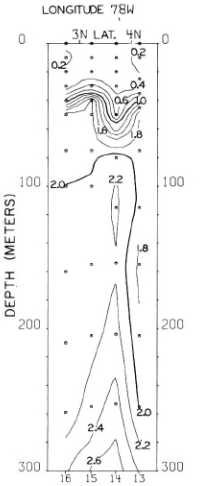


FIGURE 14-P-v5.

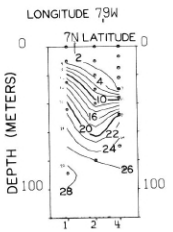


FIGURE 14-NO_3-v1.

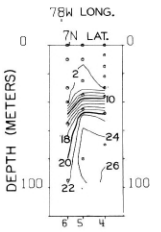


FIGURE 14-NO_3-v2.

FIGURE 14-NO_3-v1. — Vertical distribution of nitrate-nitrogen (μg.-at./l.) along a southwest-northeast section in the northern portion of the Panama Bight from 79°44′ W. to 78°43′ W., January 31, 1967.

FIGURE 14-NO_3-v2. — Vertical distribution of nitrate-nitrogen (μg.-at./l.) along a section in the Panama Bight near the coasts of Panama and Colombia from 7°35′ N. to 6°58′ N., January 31-February 1, 1967.

FIGURE 14-NO_3-v3. — Vertical distribution of nitrate-nitrogen (μg.-at./l.) along a northeast-southwest section in the Panama Bight from the coast of Colombia to 5°43′ N., 79°22′ W., February 1, 1967.

FIGURE 14-NO_3-v4. — Vertical distribution of nitrate-nitrogen (μg.-at./l.) along a northwest-southeast section in the central portion of the Panama Bight from 5°43′ N., 79°22′ W., to the coast of Colombia, February 1-2, 1967.

FIGURE 14-NO_3-v5. — Vertical distribution of nitrate-nitrogen (μg.-at./l.) along a section in the Panama Bight near the coast of Colombia from 4°10′ N. to 2°45′ N., February 2-3, 1967.

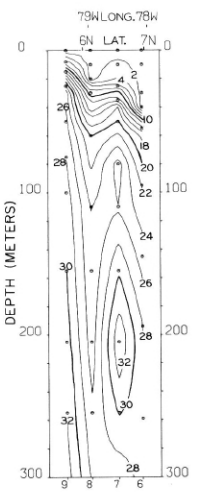


FIGURE 14-NO_3-v3.

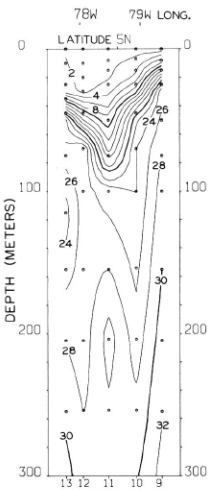


FIGURE 14-NO_3-v4.

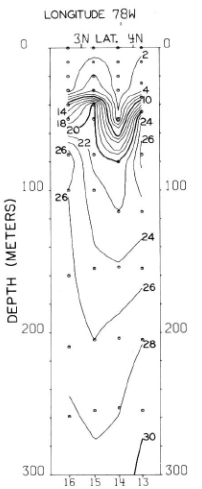
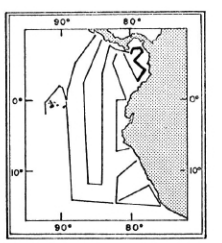


FIGURE 14-NO_3-v5.



14-NO_3-v1.
14-NO_3-v2.
14-NO_3-v3.
14-NO_3-v4.
14-NO_3-v5.
14-P-v3.
14-P-v4.
14-P-v5.

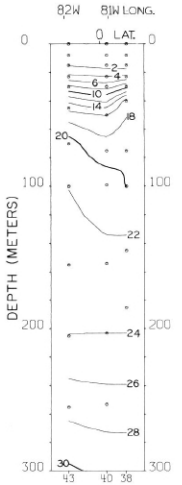


FIGURE 14-NO_3-v9.—Vertical distribution of nitrate-nitrogen (μg.-at./l.) along the Equator from the coast of Ecuador to 81°54′ W., February 8-9, 1967.

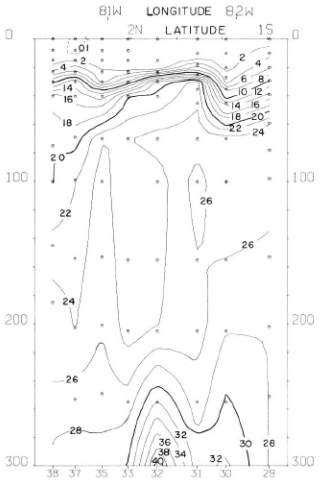


FIGURE 14-NO_3-v8. — Vertical distribution of nitrate-nitrogen (μg.-at./l.) along a northwest-southeast section from 5°03′ N., 82°18′ W. to the coast of Ecuador, February 6-8, 1967.

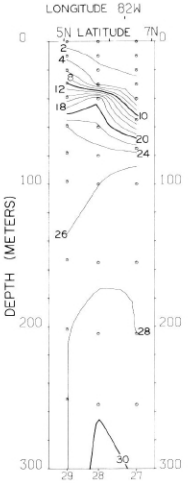


FIGURE 14-NO_3-v7. — Vertical distribution of nitrate-nitrogen (μg.-at./l.) along a northeast-southwest section from Isla Coiba, Panama to 5°03′ N., 82°18′ W., February 5-6, 1967.

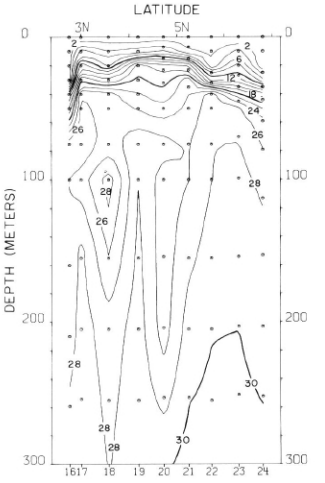
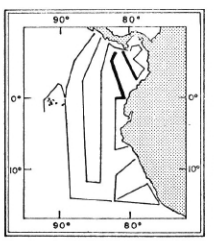


FIGURE 14-NO_3-v6. — Vertical distribution of nitrate-nitrogen (μg.-at./l.) along a southeast-northwest section across the Panama Bight from the coast of Colombia to Peninsula de Azuero, Panama, February 3-5, 1967.



14-NO_3-v6.

14-NO_3-v7.

14-NO_3-v8.

14-NO_3-v9.

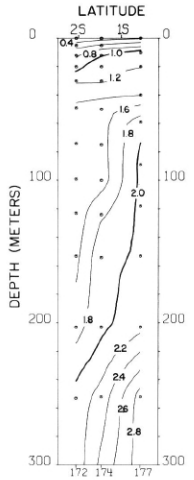


FIGURE 14-P-v19.—Vertical distribution of phosphate-phosphorus (μg.-at./l.) along 92° W., west of the Galapagos Islands, March 8-9, 1967.

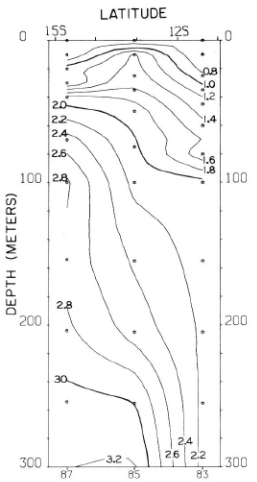


FIGURE 14-P-v13. — Vertical distribution of phosphate-phosphorus (μg.-at./l.) along 81°46′ W. from 11°02′ S. to 14°37′ S., February 14-15, 1967.

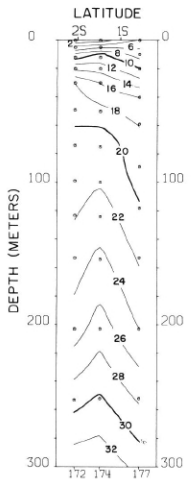


FIGURE 14-NO_3-v19.—Vertical distribution of nitrate-nitrogen (μg.-at./l.) along 92° W., west of the Galapagos Islands, March 8-9, 1967.

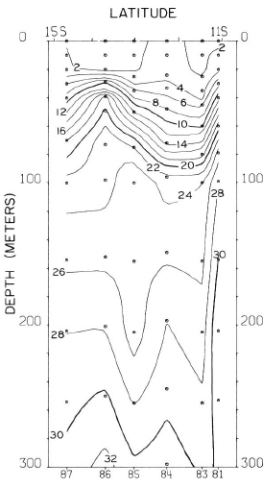


FIGURE 14-NO_3-v13. — Vertical distribution of nitrate-nitrogen (μg.-at./l.) along 81°46′ W. from 11°02′ S. to 14°37′ S., February 14-15, 1967.

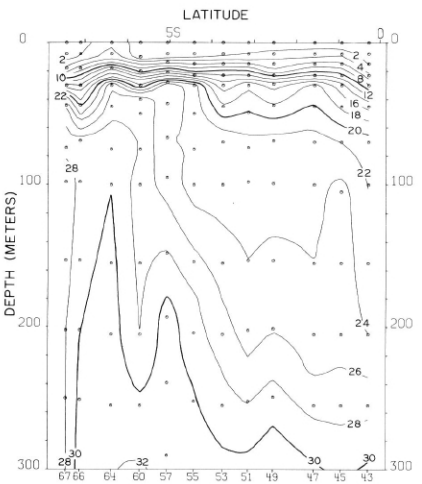
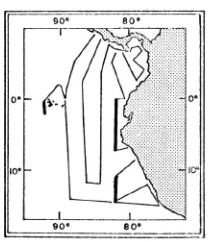


FIGURE 14-NO_3-v10. — Vertical distribution of nitrate-nitrogen (μg.-at./l.) along 82° W. from 0°18′ S. to 7°27′ S., February 9-11, 1967.



14-NO_3-v10.

14-P-v13.

14-NO_3-v13.

14-P-v19.

14-NO_3-v19.

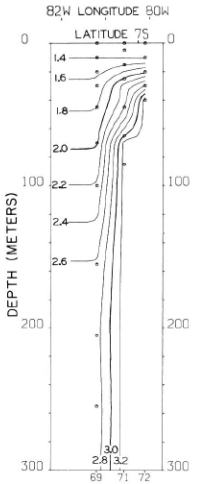


FIGURE 14-P-v11. — Vertical distribution of phosphate-phosphorus (μg.-at./l.) along 7°15′ S. from 81°50′ W. to the coast of Peru, February 11-12, 1967.

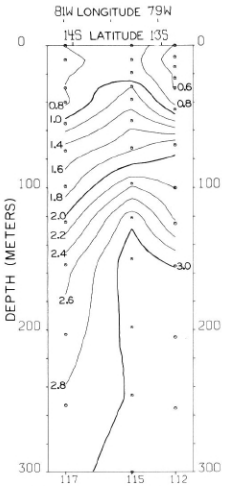


FIGURE 14-P-v16. — Vertical distribution of phosphate-phosphorus (μg.-at./l.) along a northeast-southwest section from the coast of Peru to 14°30′ S., 81°43′ W., February 24-25, 1967.

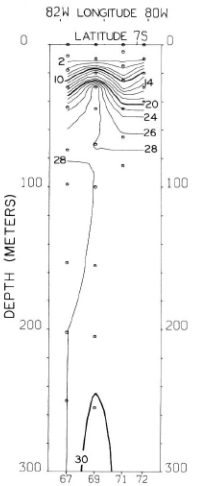


FIGURE 14-NO_3-v11. — Vertical distribution of nitrate-nitrogen (μg.-at./l.) along 7°15′ S. from 81°50′ W. to the coast of Peru, February 11-12, 1967

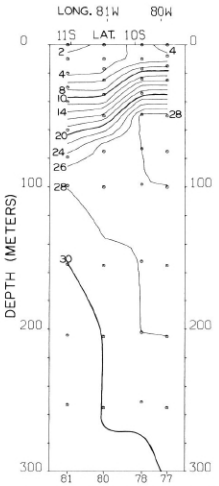


FIGURE 14-NO_3-v12. — Vertical distribution of nitrate-nitrogen (μg.-at./l.) along a northeast-southwest section from the coast of Peru to 11° S., 81°46′ W., February 13-14, 1967.

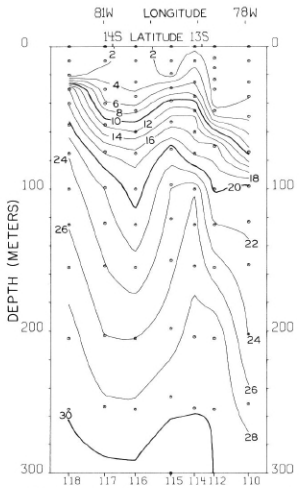


FIGURE 14-NO_3-v16. — Vertical distribution of nitrate-nitrogen (μg.-at./l.) along a northeast-southwest section from the coast of Peru to 14°30′ S., 81°43′ W., February 24-25, 1967.

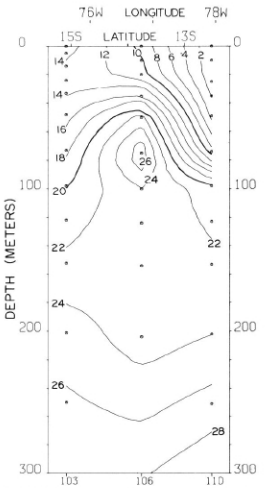
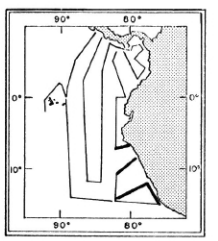


FIGURE 14-NO_3-v15. — Vertical distribution of nitrate-nitrogen (μg.-at./l.) along the coast of Peru from 15°07′ S. to 12°27′ S., February 17-24, 1967.



14-P-v11.

14-NO_3-v11.

14-NO_3-v12.

14-NO_3-v15.

14-P-v16.

14-NO_3-v16.

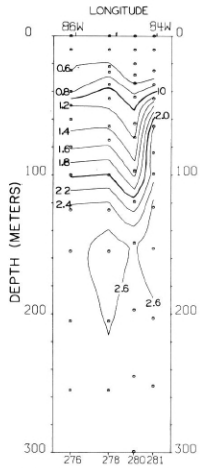


FIGURE 14-P-v25. — Vertical distribution of phosphate-phosphorous (μg-at./l.) along 12° S., March 25-26, 1967.

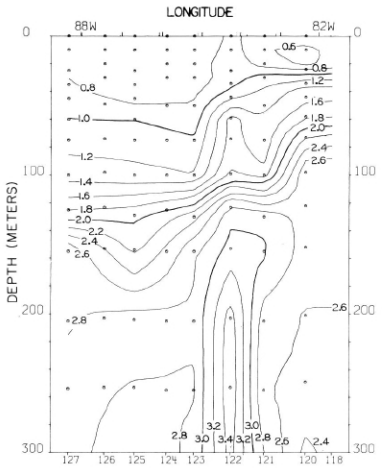


FIGURE 14-P-v17.—Vertical distribution of phosphate-phosphorus (μg.-at./l.) along 14°30′ S. from 81°43′ W. to 88°17′ W., February 26-27, 1967.

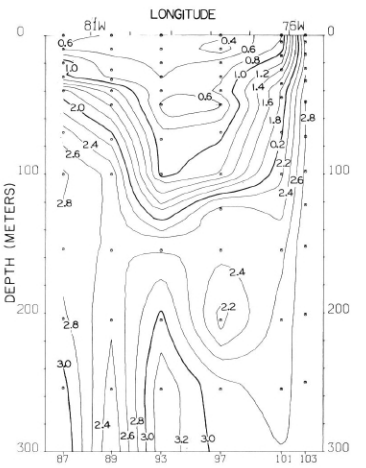


FIGURE 14-P-v14. — Vertical distribution of phosphate-phosphorus (μg.-at./l.) along 15° S. from 81°46′ W. to the coast of Peru, February 15-17, 1967.

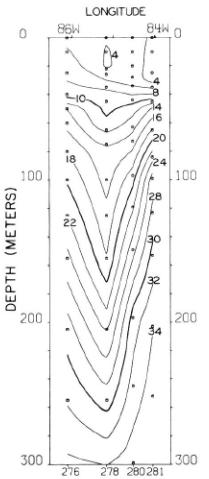


FIGURE 14-NO_3-v25. — Vertical distribution of nitrate-nitrogen (μg.-at./l.) along 12° S., March 25-26, 1967.

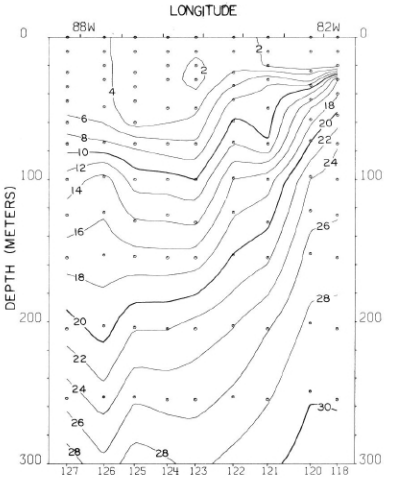


FIGURE 14-NO_3-v17. — Vertical distribution of nitrate-nitrogen (μg.-at./l.) along 14°30′ S. from 81°43′ W. to 88°17′ W., February 26-27, 1967.

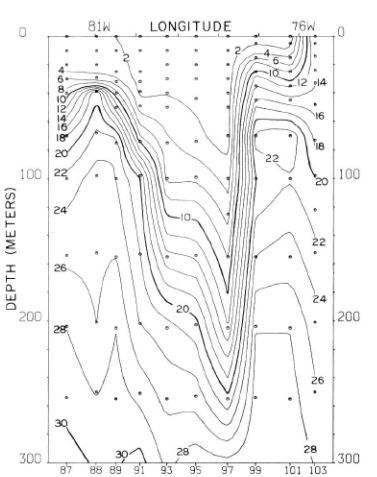
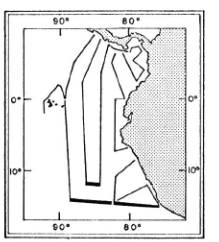


FIGURE 14-NO_3-v14. — Vertical distribution of nitrate-nitrogen (μg.-at./l.) along 15° S. from 81°46′ W. to the coast of Peru, February 15-17, 1967.



14-P-v14.

14-NO_3-v14.

14-P-v17.

14-NO_3-v17.

14-P-v25.

14-NO_3-v25.

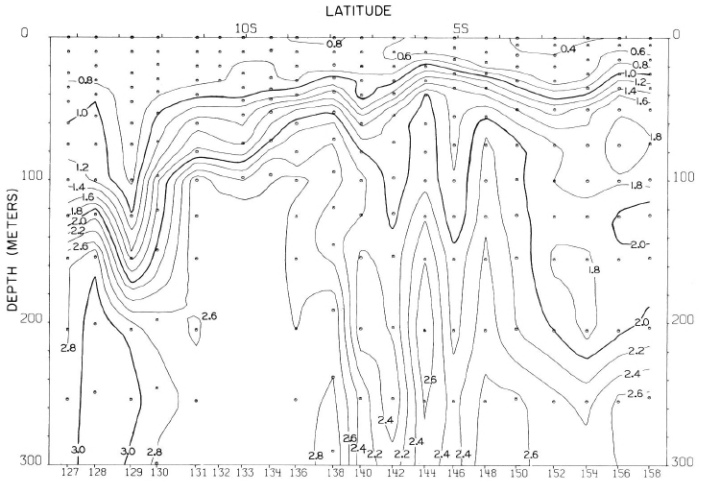


FIGURE 14-P-v18. — Vertical distribution of phosphate-phosphorus (μg.-at./l.) along 88°46′ W., February 27-March 4, 1967.

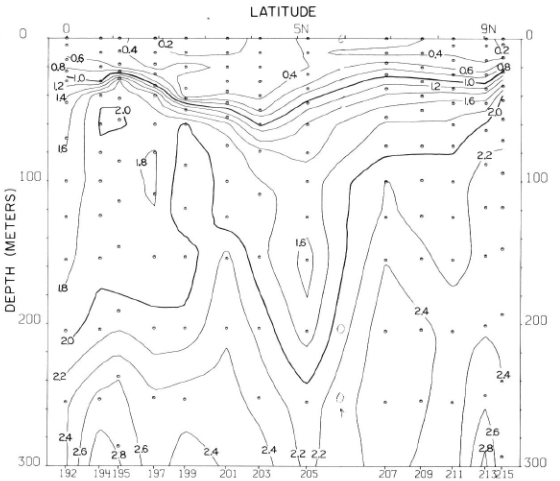


FIGURE 14-P-v22. — Vertical distribution of phosphate-phosphorus (μg.-at./l.) along a southwest-northeast section from the Equator at 89°03′ W. to Puntarenas, March 11-15, 1967.

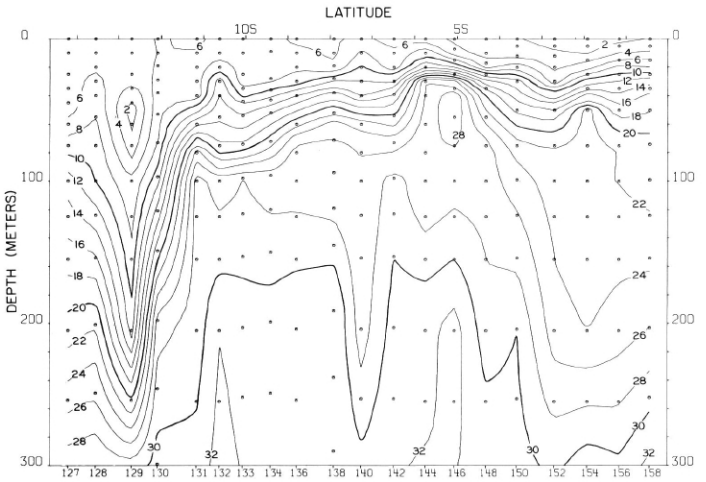


FIGURE 14-NO_3-v18. — Vertical distribution of nitrate-nitrogen (μg.-at./l.) along 88°46′ W., February 27-March 4, 1967.

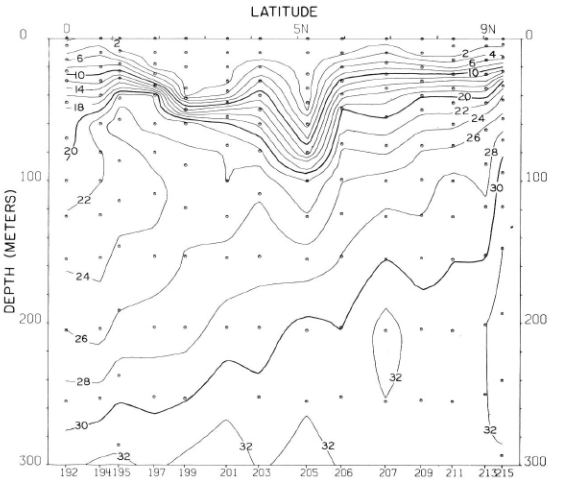
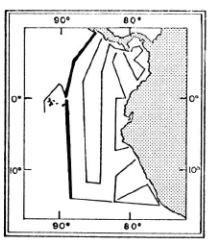


FIGURE 14-NO_3-v22. — Vertical distribution of nitrate-nitrogen (μg.-at./l.) along a southwest-northeast section from the Equator at 89°03′ W. to Puntarenas, March 11-15, 1967.



14-P-v18.

14-NO_3-v18.

14-P-v22.

14-NO_3-v22.

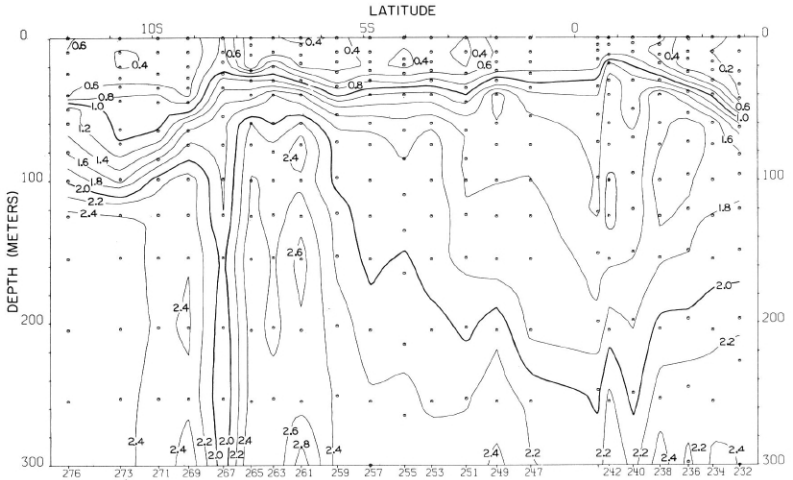


FIGURE 14-P-v24. — Vertical distribution of phosphate-phosphorous (μg.-at./l.) along 86°19′ W., March 20-25, 1967.

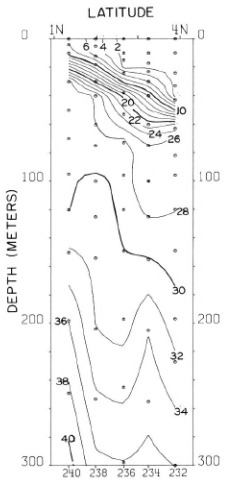


FIGURE 14-NO_3-v24. — Vertical distribution of nitrate-nitrogen (μg.-at./l.) along 86°19′W., March 20-21, 1967.

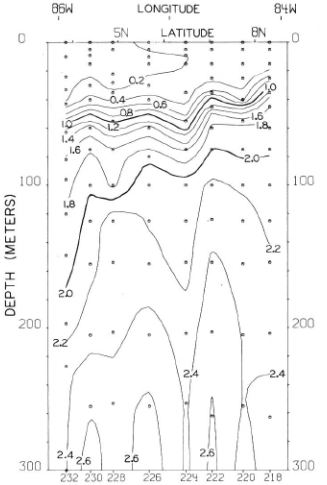


FIGURE 14-P-v23. — Vertical distribution of phosphate-phosphorus (μg.-at./l.) along a northeast-southwest section from the coast of Costa Rica to 3°52′ N., 85°57′ W., March 18-20, 1967.

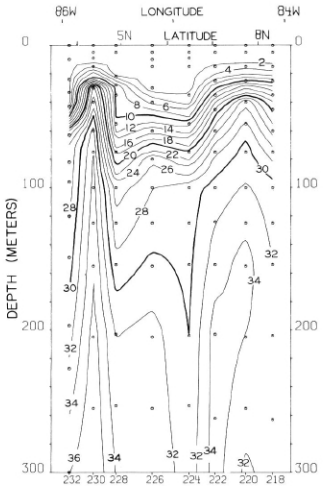
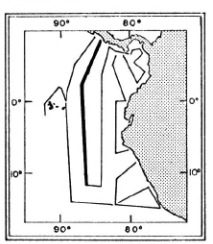


FIGURE 14-NO_3-v23. — Vertical distribution of nitrate-nitrogen (μg.-at./l.) along a northeast-southwest section from the coast of Costa Rica to 3°52′ N., 85°57′ W., March 18-20, 1967.



14-P-v23.

14-NO_3-v23.

14-P-v24.

14-NO_3-v24.

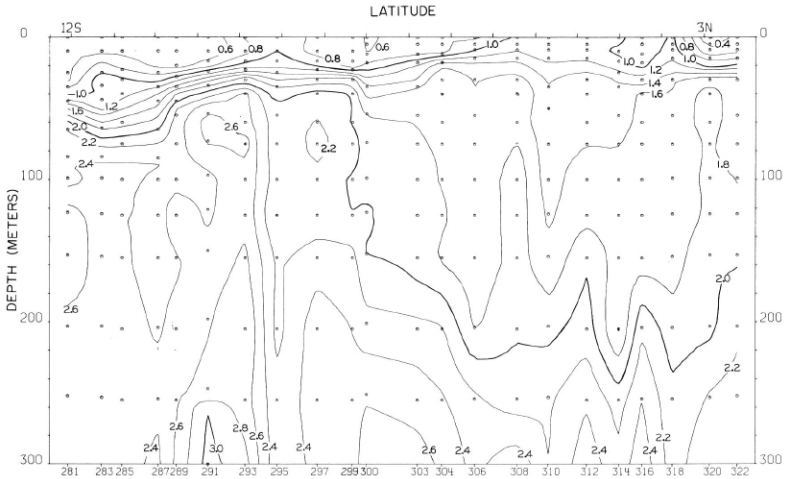


FIGURE 14-P-v26. — Vertical distribution of phosphate-phosphorus (μg.-at./l.) along 84° W., March 26-31, 1967.

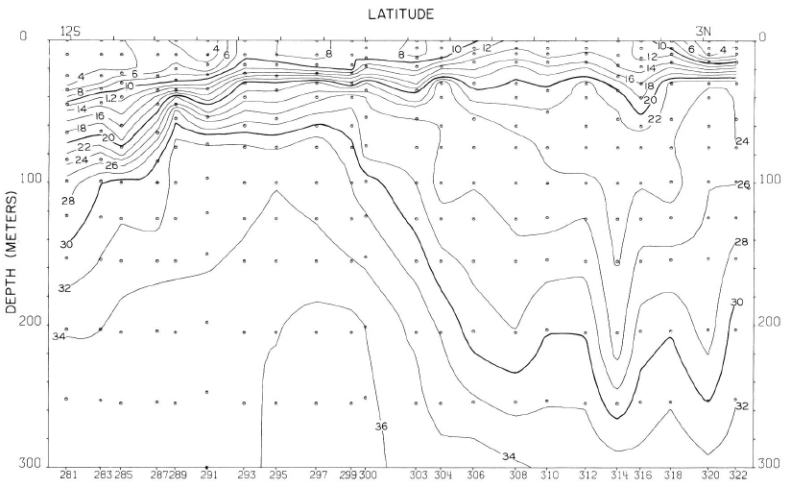


FIGURE 14-NO_3-v26. — Vertical distribution of nitrate-nitrogen (μg.-at./l.) along 84° W., March 26-31, 1967.

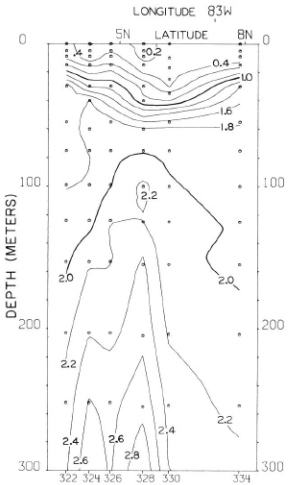


FIGURE 14-P-v27. — Vertical distribution of phosphate-phosphorous (μg.-at./l.) along a southwest-northeast section from 3°45′ N., 83°48′ W. to Punta Burica, Costa Rica-Panama, March 31-April 2, 1967.

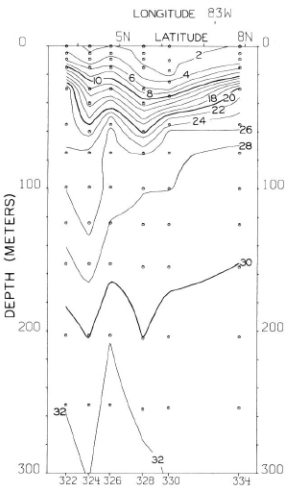
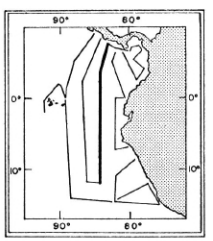


FIGURE 14-NO_3-v27. — Vertical distribution of nitrate-nitrogen (μg.-at./l.) along a southwest-northeast section from 3°45′ N., 83°48′ W. to Punta Burica, Costa Rica-Panama, March 31-April 2, 1967.



14-P-v26.

14-NO_3-v26.

14-P-v27.

14-NO_3-v27.

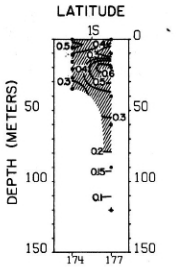


FIGURE 14-Ch-v19. — Vertical distribution of chlorophyll-a (mg./m.^{3}) along 92° W., west of the Galapagos Islands, March 8-9, 1967.

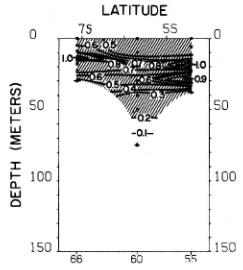


FIGURE 14-Ch-v10. — Vertical distribution of chlorophyll-a (mg./m.^{3}) along 82° W. from 0°18′ S. to 7°27′ S., February 9-11, 1967.

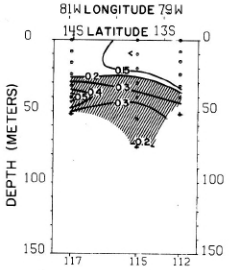


FIGURE 14-Ch-v16. — Vertical distribution of chlorophyll-a (mg./m.^{3}) along a northeast-southwest section from the coast of Peru to 14°30′ S., 81°43′ W., February 24-25, 1967.

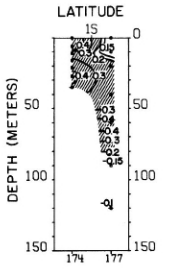


FIGURE 14-Ph-v19. — Vertical distribution of phaeophytin (mg./m.^{3}) along 92° W., west of the Galapagos Islands, March 8-9, 1967.

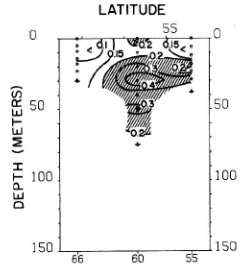


FIGURE 14-Ph-v10. — Vertical distribution of phaeophytin (mg./m.^{3}) along 82° W. from 0°18′ S. to 7°27′ S., February 9-11, 1967.

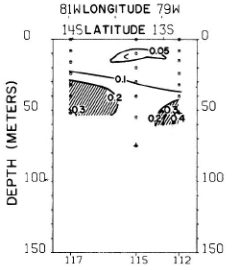
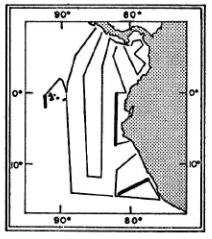


FIGURE 14-Ph-v16. — Vertical distribution of phaeophytin (mg./m.^{3}) along a northeast-southwest section from the coast of Peru to 14°30′ S., 81°43′ W., February 24-25, 1967.



14-Ch-v10.

14-Ph-v10.

14-Ch-v16.

14-Ph-v16.

14-Ch-v19.

14-Ph-v19.

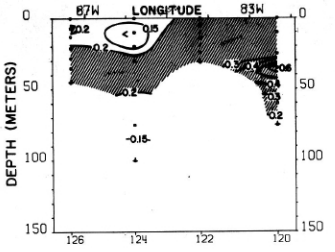


FIGURE 14-Ch-v17. — Vertical distribution of chlorophyll-a (mg./m.^{3}) along 14°30′ S. from 81°43′ W. to 88°17′ W., February 26-27, 1967.

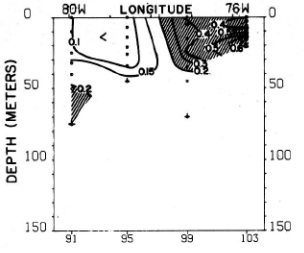


FIGURE 14-Ch.-v14. — Vertical distribution of chlorophyll-a (mg./m.^{3}) along 15° S. from 81°46′ W. to the coast of Peru, February 15-17, 1967.

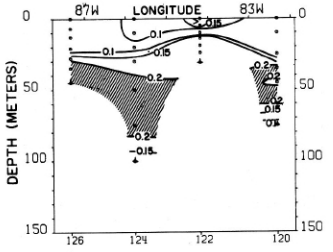


FIGURE 14-Ph-v17. — Vertical .distribution of phaeophytin (mg./m.^{3}) along 14°30′ S. from 81°43′ W. to 88°17′ W., February 26-27, 1967.

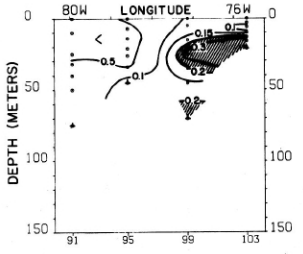
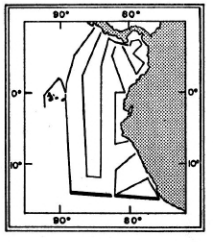


FIGURE 14-Ph.-v14. — Vertical distribution of phaeophytin (mg./m.^{3}) along 15° S. from 81°46′ W. to the coast of Peru, February 15-17, 1967.



14-Ch.-v14.

14-Ph.-v14.

14-Ch-v17.

14-Ph-v17.

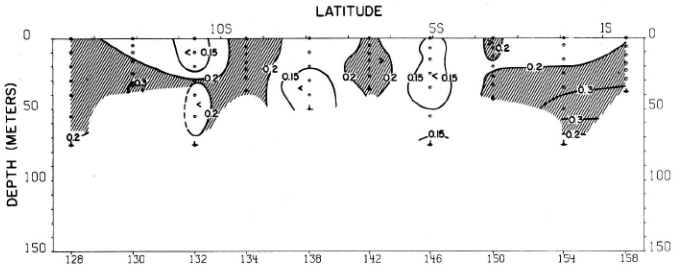


FIGURE 14-Ch-v18. — Vertical distribution of chlorophyll-a (mg./m.^{3}) along 88°46′ W., February 27-March 4, 1967.

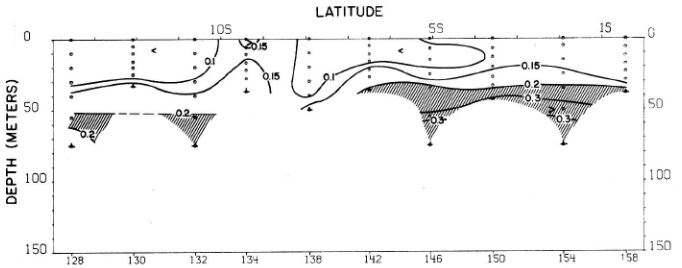


FIGURE 14-Ph-v18. — Vertical distribution of phaeophytin (mg./m.^{3}) along 88°46′ W., February 27-March 4, 1967.

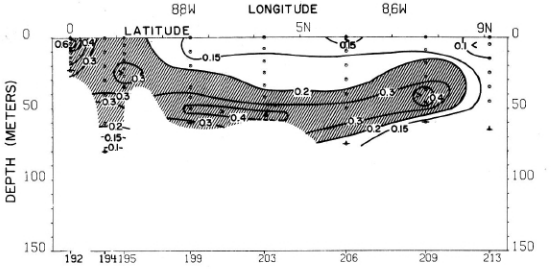


FIGURE 14-Ch-v22. — Vertical distribution of chlorophyll-a (mg./m.^{3}) along a southwest-northeast section from the Equator at 89°03′ W. to Puntarenas, March 11-15, 1967.

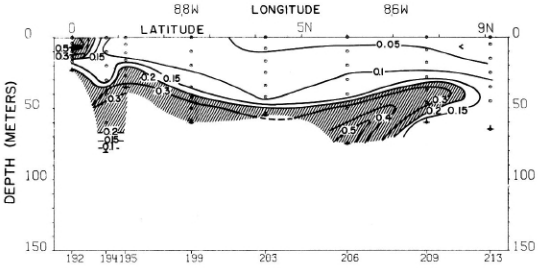
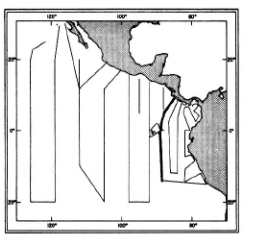


FIGURE 14-Ph-v22. — Vertical distribution of phaeophytin (mg./m.^{3}) along a southwest-northeast section from the Equator at 89°03′ W. to Puntarenas, March 11-15, 1967.



14-Ch-v18.

14-Ph-v18.

14-Ch-v22.

14-Ph-v22.

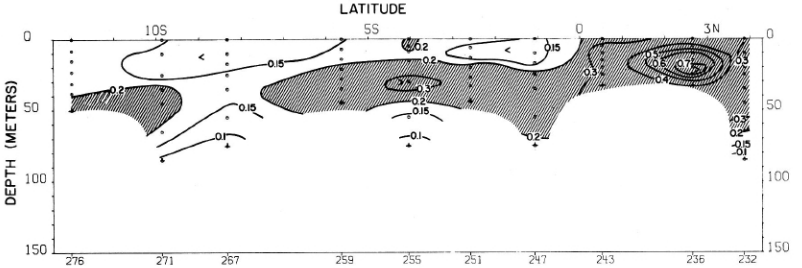


FIGURE 14-Ch-v24. — Vertical distribution of chlorophyll-a (mg./m.^{3}) along 86°19′ W., March 20-25, 1967.

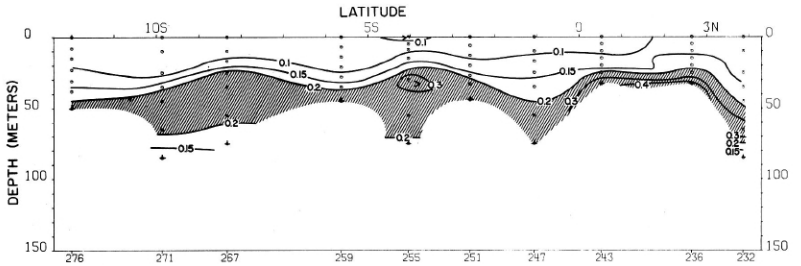


FIGURE 14-Ph-v24. — Vertical distribution of phaeophytin (mg./m.^{3}) along 86°19′ W., March 20-25, 1967.

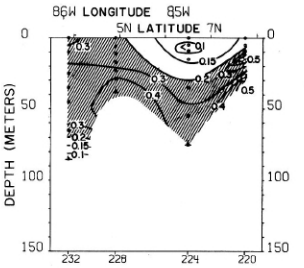


FIGURE 14-Ch-v23. — Vertical distribution of chlorophyll-a (mg./m.^{3}) along a northeast-southwest section from the coast of Costa Rica to 3°52′ N., 85°57′ W., March 18-20, 1967.

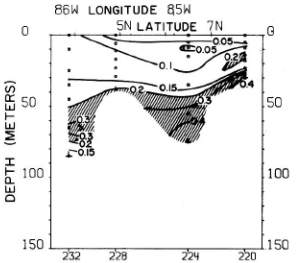
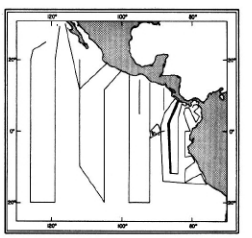


FIGURE 14-Ph-v23. — Vertical distribution of phaeophytin (mg./m.^{3}) along a northeast-southwest section from the coast of Costa Rica to 3°52′ N., 85°57′ W., March 18-20, 1967.



14-Ch-v23.

14-Ph-v23.

14-Ch-v24.

14-Ph-v24.

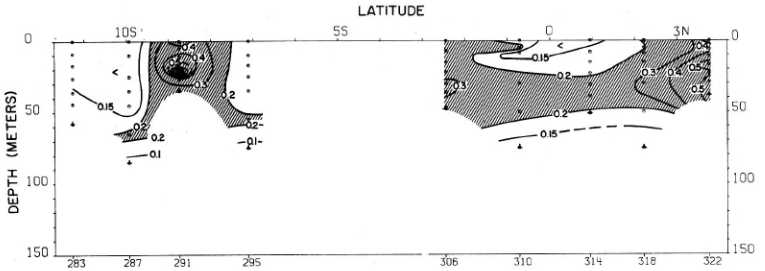


FIGURE 14-Ch-v26. — Vertical distribution of chlorophyll-a (mg./m.^{3}) along 84° W., March 26-31, 1967.

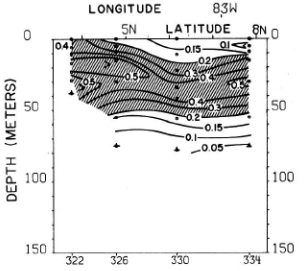


FIGURE 14-Ch-v27.—Vertical distribution of chlorophyll-a (mg./m.^{3}) along a southwest-northeast section from 3°45′ N., 83°48′ W. to Punta Burica, Costa Rica-Panama, March 31-April 2, 1967.

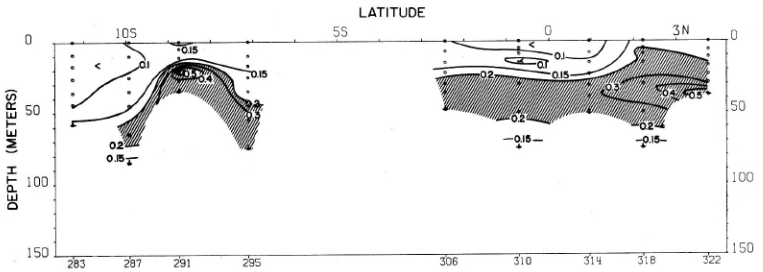


FIGURE 14-Ph-v26. — Vertical distribution of phaeophytin (mg./m.^{3}) along 84° W., March 26-31, 1967.

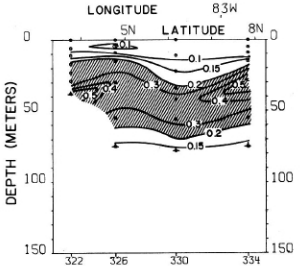
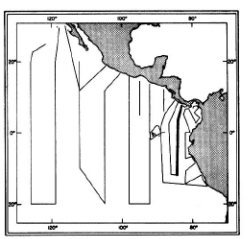


FIGURE 14-Ph-v27.—Vertical distribution of phaeophytin (mg./m.^{3}) along a southwest-northeast section from 3°45′ N., 83°48′ W. to Punta Burica, Costa Rica-Panama, March 31-April 2, 1967.



14-Ch-v26.

14-Ph-v26.

14-Ch-v27.

14-Ph-v27.