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Fish and Wildlife Service, Arnie J. Suomela, Commissioner

GULF OF MEXICO PHYSICAL AND CHEMICAL DATA FROM ALASKA CRUISES

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With a note on

SOME ASPECTS OF THE PHYSICAL OCEANOGRAPHY OF THE GULF OF MEXICO

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Special Scientific Report: Fisheries 249

Washington, D. C.

October 1958

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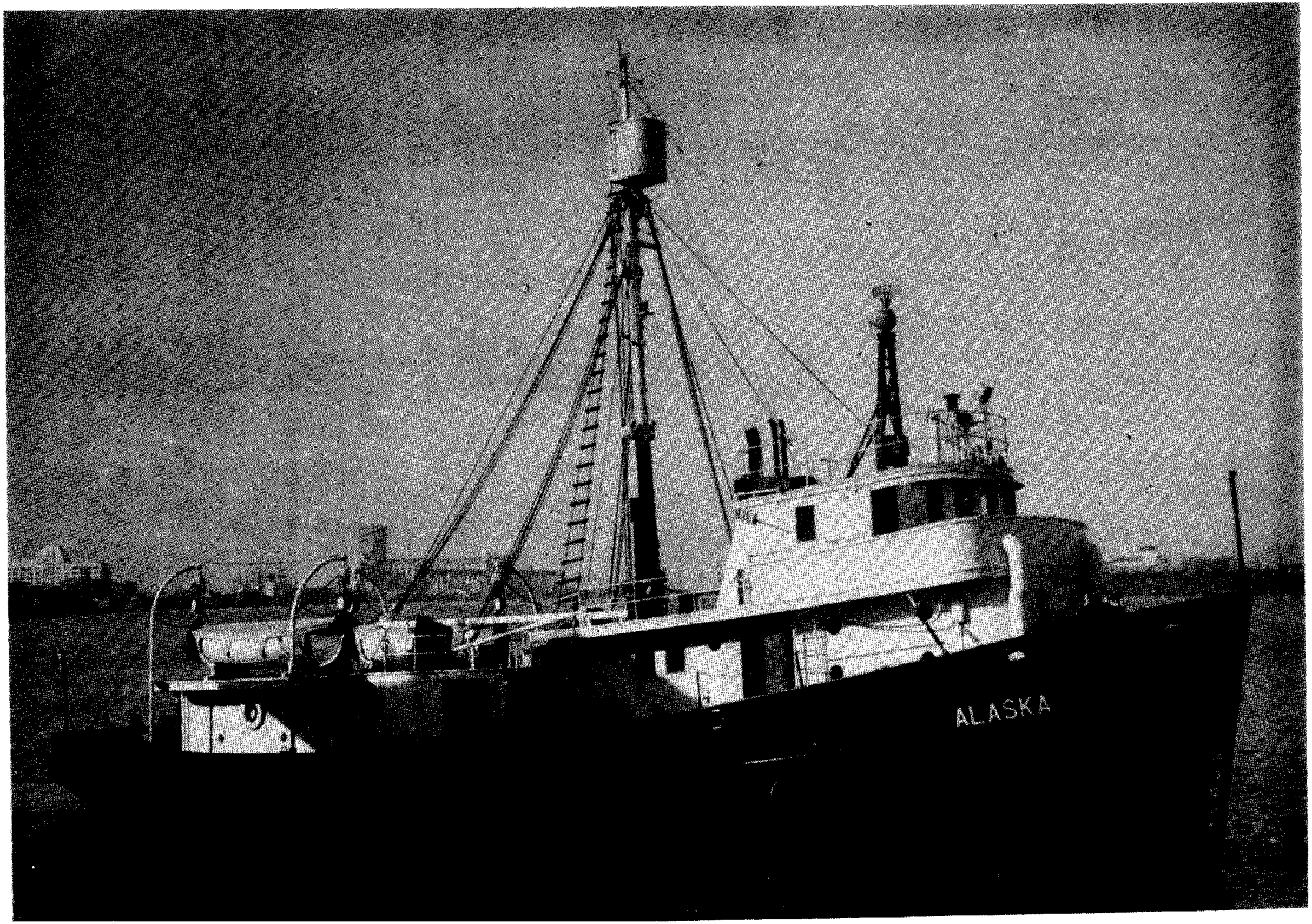
A B S T R A C T

This report is principally a list of chemical data collected aboard the U. S. Fish and Wildlife Service M/V ALASKA while she was engaged in a biological and oceanographic survey of the Gulf of Mexico. The tables include observations on salinity, temperature, sigma-t, nitrate-nitrite nitrogen, total phosphorus, inorganic phosphorus, "carbohydrates", and "proteins". Some special data on the uranium and phosphorus content of certain water samples and sediments are included. A brief introduction includes remarks on the physical oceanography of the Gulf of Mexico and the study of organic compounds.


ALASKA

GULF OF MEXICO PHYSICAL AND CHEMICAL DATA FROM ALASKA CRUISES

INTRODUCTION

Before 1950 the only systematic surveys of the chemical features of the entire Gulf of Mexico were the cruises of MABEL TAYLOR in 1932 (Parr, 1935) and ATLANTIS in 1935 (Bulletin Hydrographique, 1936). Partly as a result of military interest in the oceans and partly because of an increased demand for sea foods, the oceanic environment began to attract renewed and more intensive attention following World War II. Because of the added stimulus of a great increase in the value of the annual shrimp and menhaden production in the Gulf of Mexico, Congress authorized the U. S. Fish and Wildlife Service to expand its investigations of the fisheries and oceanography of Gulf waters. This effort encompassed physical oceanography, marine biology and chemistry, and exploratory-fishing operations.

The biological section of the program was assigned to the Gulf Fishery Investigations with headquarters at Galveston, Texas. The physical oceanography was assigned to the Texas Agricultural and Mechanical College Department of Oceanography through U. S. Navy Office of Naval Research and the Bureau of Ships.

The cruises were planned with the Texas A. and M. group, and were designed to conform to the needs of the oceanographic problems. One of the major oceanographic problems concerned the water transport system in the Yucatan Channel, southeastern Gulf, and Florida Strait area. The majority of the cruises were directed to that region. All plans for biological observations were adapted to the requirements of the hydrographic program.

The observations fell into these categories: Salinity and temperature data for dynamic computations, meteorological observations, chemical determinations (other than salinity) for biological interpretation, and plankton collections.

The data pertaining to dynamic computations, and some inorganic phosphorus values, have been published in a preliminary form by the Texas A. and M. Department of Oceanography (1954, 1955). The plankton data will be presented in separate reports.

This report will present all chemical, physical, and meteorological data. The climatological, salinity, and temperature data have been taken from the A. and M. reports and are included here for the convenience which comes from having all data listed in the same place. The following explanations apply to all cruises, but when special conditions apply to a given cruise they will be found at the head of the tables for that cruise.

METHODS

1. Collection of chemical samples on shipboard.

   Salinity. Samples were drawn from standard Nansen bottles into 4-ounce prescription bottles with bakelite screw caps. Each sample bottle was wrapped tightly with plastic electrician's tape at the juncture of cap and bottle.

   Total phosphorus. Handled as above except that thorium carbonate was added according to Harvey (1948).

   Nitrate-nitrite nitrogen; inorganic phosphorus, carbohydrate, protein (tyrosine, tyrosine-tryptophan) samples were preserved in the frozen state according to the method given by Collier and Marvin (1953).

2. Analytical methods.[1/]

1/ Most salinity determinations and all phosphate-P, nitrate-nitrite-N, carbohydrate, tyrosine, and tyrosine-tryptophan determinations were made in the Galveston laboratory under the direction of Messrs. K. T. Marvin and P. J. Wangersky. Mr. Marvin supervised the interpolation of all values for standard depths except salinity, temperature, and density, which were done by the Texas A. and M. Department of Oceanography.

Salinity. As described by Knudsen (1901). Electrometric end points were used after August 1951.

Inorganic phosphorus. By the method of Robinson and Thompson (1948), except that a Fisher electrophotometer was used to measure color intensity.

Total phosphorus. By the method of Harvey (1948), except that the Fisher AC electrophotometer was used to measure color intensity.

Nitrate-nitrite nitrogen. By the method of Marvin (1955).

Protein (tyrosine and tyrosine-tryptophan index). The values are given in milligrams per liter of tyrosine-tryptophan for the first three cruises, and for tyrosine thereafter. The determinations for the first three cruises were according to the method of Erdman and Little (1950) and for the remainder by an adaptation of the method of Sizer and Peacock (1947). There are no data for interconversion of the results. Wangersky developed the latter method and his description follows:

"The sea water samples were treated with an equal volume of 0.25 normal NaOH, then autoclaved for five hours at a pressure of forty pounds. The samples were transferred after cooling to centrifuge tubes, a small amount of celite was added to each tube, and the samples then spun for ten minutes at 900 - 1000 revolutions per minute. The supernatant liquid was then drawn off into a quartz or silica spectrophotometer cell, and read at 2400 A. on the Beckman model D. C. spectrophotometer.

"Since a few of the sample bottles may lose fluid by expansion during the autoclaving, the samples were run in triplicate. The slope of the Beer's law curve for this analysis varies with the temperature, pressure, and time of heating, making it advisable to run a full set of standards with each batch of samples. The celite was added in order to settle the slight haze of colloidal magnesium hydroxide, which would have otherwise given a false high reading. If the celite was added before the autoclaving, the high temperature caused it to decompose, giving a reading even higher than the magnesium hydroxide alone.

"The standards and blanks were made equivalent to normal sea water in NaCl and Mg ++."

Carbohydrates. By the method of Erdman and Little (1950). See also Collier at al. (1953), and Zein-Eldin and May (in press).

URANIUM AND PHOSPHORUS CONCENTRATIONS IN CERTAIN SAMPLES OF WATER AND SEDIMENTS FROM THE GULF OF MEXICO

At the time these cruises were in progress the U. S. Geological Survey was interested in the uranium and phosphorus concentrations in the water and bottom sediments. The samples were collected aboard the ALASKA and forwarded to the Trace Element Section of the Geological Survey for analysis. We are indebted to the Geological Survey through Dr. Frank Grimaldi and his associates for making these data available for inclusion here. The data are presented in the following tables. Phosphorus was determined by a method essentially that of Quinlan and DeSesa (1955). Uranium was determined by fluorometric analysis (Grimaldi, May, and Fletcher, 1952).

REMARKS ON ANALYSES OF ORGANIC COMPOUNDS

Since this is the first oceanographic investigation to incorporate a systematic survey of specific classes of organic compounds, it is appropriate to give some of the reasons for doing so.

It is known that biologically active organic compounds exist in solution or suspension in variable concentrations in natural sea waters (Collier, Ray, Magnitsky, and Bell, 1953). The possible significance of these compounds was reviewed by Collier (1953). The generally low concentrations of carbohydrate-like materials in the Gulf of Mexico was suspected and recognized in our early work (Collier et al., 1953). However, when the present series of oceanographic studies was being planned it was considered desirable to study this matter in more detail.

Table 1.--Phosphorus and uranium content of some bottom samples collected on Alaska cruises 2 and 3.

Cruise 2

Station	Depth (fathom)	Percent P_2O_5	Percent U
1	10	0.11	0.0003
3	12	0.12	0.0003
5	12	0.09	0.0003
7	15	0.12	0.0005
9	14	0.11	0.0003
11	17	0.09	0.0003
13	12	0.08	0.0003
15	21	0.11	0.0004
17	32	0.11	0.0003
18	62	0.18	0.0003
21	1140	0.18	0.0003
23	1360	0.16	0.0003
27	580	0.20	0.0003
30	325	0.20	0.0003
31	25	0.12	0.0003
32	6	0.19	0.0003
34	44	0.09	0.0003
48	95	0.21	0.0005
50	10	0.16	0.0004
52	40	0.21	0.0005
54	29	0.14	0.0005
64	50	0.14	0.0003
66	13	0.09	0.0003

Cruise 3

Station	Depth (fathom)	Percent P_2O_5	Percent U
2	21	0.09	0.0002
3	750	0.13	0.0003
5	1500	0.12	0.0002
6	1650	0.12	0.0003
7	1700	0.12	0.0002
8	1720	0.17	0.0002
10	102	0.10	0.0002
12	25	0.11	0.0002
13	11	0.03	0.0002
15	15	0.09	0.0002
16	110	0.12	0.0002
17	37	0.12	0.0002
21	118	0.09	0.0001
25	98	0.12	0.0002
26	70	0.12	0.0002

The results are included in the tables of this report.

The outstanding features in this respect are two: the predominance of low values as compared to estuarial or marsh waters, and the high degree of variability. The variability alone gives these determinations their significance because they reflect the lack of uniformity in the distribution of the loci of biotic activity in the Gulf of Mexico. This is consistent with the recognized heterogeneous distribution of plankton elements. There is a tendency for the concentrations of the compounds found in closely spaced samples to conform to the concept of contagiously distributed populations of plankton as described by Barnes and Marshall (1951).

Table 2.--Uranium content of some water samples collected on Alaska cruises 1 and 3.

Cruise 1

Station	Depth m.	Percent uranium
7	Surface	2.9×10^{-7}
	200	2.6×10^{-7}
	600	2.3×10^{-7}
	1800	2.6×10^{-7}
43	Surface	2.2×10^{-7}
	165	2.3×10^{-7}
	335	2.6×10^{-7}
	500	2.0×10^{-7}
	640	2.8×10^{-7}

Cruise 3

Station	Depth m.	Percent uranium
8	Surface	2.7×10^{-7}
	500	2.8×10^{-7}
	1300	2.6×10^{-7}
	2200	3.0×10^{-7}
	2900	3.1×10^{-7}
37	Surface	2.9×10^{-7}
	5	2.7×10^{-7}
	15	2.6×10^{-7}

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SOME ASPECTS OF THE PHYSICAL OCEANOGRAPHY OF THE GULF OF MEXICO

(Based on data collected on the cruises of the ALASKA)

By

Kenneth H. Drummond
and
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Temperature. A large number of sea surface temperature observations have been collected in the Gulf of Mexico. Probably the sea surface temperature values most referred to in this area are those of Fuglister (1947). These are mean isotherms and show variation from month to month. The main feature of the average winter pattern is a gradual decrease from approximately 75° F. (23.9° C.) in the south to 65° F. (18.3° C.) in the north for all parts of the Gulf. The gradient is larger in the eastern portion. In the summer the average temperatures approach uniformity at 84° F. (28.9° C.) throughout the region. However, measurements made during the cruises of the ALASKA indicate that considerable deviation from these average isotherms may occur at certain times. For example, in August the mean charts show a temperature of 84° F. (28.9° C.) throughout the Gulf whereas ALASKA data show variations from 85° F. (29.4° C.) to 89° F. (31.7° C.) for the northeastern portion of the Gulf.

Temperature-depth sections (surface to 1000 meters) for the first three cruises of the ALASKA are presented pictorially in figure 1. Station positions and cruise lines for each of the cruises are incorporated into the illustration to assist in orienting the temperature-depth sections. A scale of depths in 100-meter intervals and a key to the temperature ranges are given in the legend. Temperature-depth sections for the shallow continental shelf areas are omitted and the omission is indicated by the dashed cruise lines (i.e. western Gulf and northwestern Gulf).

Histograms showing frequency of the distribution of temperature and salinity at various depths greater than 800 meters for cruises 1-1A, 2-2B, and 3-1C are presented in figure 2.

Salinity. Until a systematic oceanographic survey of the Gulf was made by the ALASKA even fewer data than those of temperature were available on surface salinities. Parr (1935) prepared a chart of the distribution of average salinities for the upper 50 meters. This chart shows a range of 36.00 °/oo to 36.25 °/oo for the Gulf region. More recent data on sea surface salinities obtained on the ALASKA cruises are presented in figures 3 through 8. Data from cruise 8-3C lacked continuity between station lines in both space and time and were therefore omitted.

Histograms showing the frequency of the distribution of salinity and temperature at various depths from 800 meters to 2,000 meters are presented in figure 2.

Depth of Motionless Layers. A study of the depth of the motionless layer in the Gulf of Mexico was made by Adams (1954) using the methods of Defant and Hidaka. Data used in this study were obtained on cruises 1-1A, 2-1B and 3-1C of the ALASKA. Excerpts from Mr. Adams' report are as follows:

> "A comparison of the results of the methods is of interest. It will be noted that with Defant's method (see figure 10), two maxima are obtained, one in the western Gulf and one in the east central Gulf. These maxima also appear in Hidaka's method but both are of different magnitudes. The western Gulf maximum in figure 10 is found to the southeast using Hidaka's method with the latter being about 300 m. greater than the former. The east central maximum in figure 10 is again displaced to the southeast using Hidaka's method, but in this case the latter is about 600 m. smaller than the former. Both methods show a variation in depth of the motionless layer of from 200 to greater than 1,000 m. Moreover, the methods show good agreement in the area of Yucatan Channel and fair agreement in the Straits of Florida."

Currents. The cruises of the research vessel ALASKA provided the first complete coverage of the Gulf of Mexico with information needed to compute the deep water currents. It was on the basis of these current patterns that sufficient evidence was acquired to point out the existence of a large-scale, semi-permanent, anti-cyclonic eddy in the eastern Gulf.

The results of contouring the dynamic heights of cruises 1-1A, 2-1B, and 3-1C are illustrated in figures 11 and 12. They show a small intense eddy approximately 100 miles to the northeast of the Yucatan Channel. It may also be observed that the Yucatan current flows a considerable distance to the northwest (300 miles) before turning south and east and departing through the Florida Straits. A second, less intense, anti-cyclonic eddy is pictured approximately 100 miles off Pensacola, Florida. Each of the two eddies described above is a consequence of the combined analysis of two cruises taken several weeks apart and consisting of only a small number of stations. Therefore, the resulting composite analysis may lack detail and continuity in time and space.

Cruise 4-2A (in the winter of 1952), graphically shows for the first time the existence of a large-scale, anti-cyclonic eddy centered at 86° 36' West longitude and 26° 00' North latitude. See figure 13 for the surface current pattern. The analysis here is likely to be more indicative of a synoptic current pattern inasmuch as the period of the cruise in the region of the eddy was about two weeks. It should also be noted that the eddy shown in figure 13 is somewhat obscured in figures 11 and 12 by the contouring of dynamic height data from two separate cruises (cruises 1-1A and 3-1C).

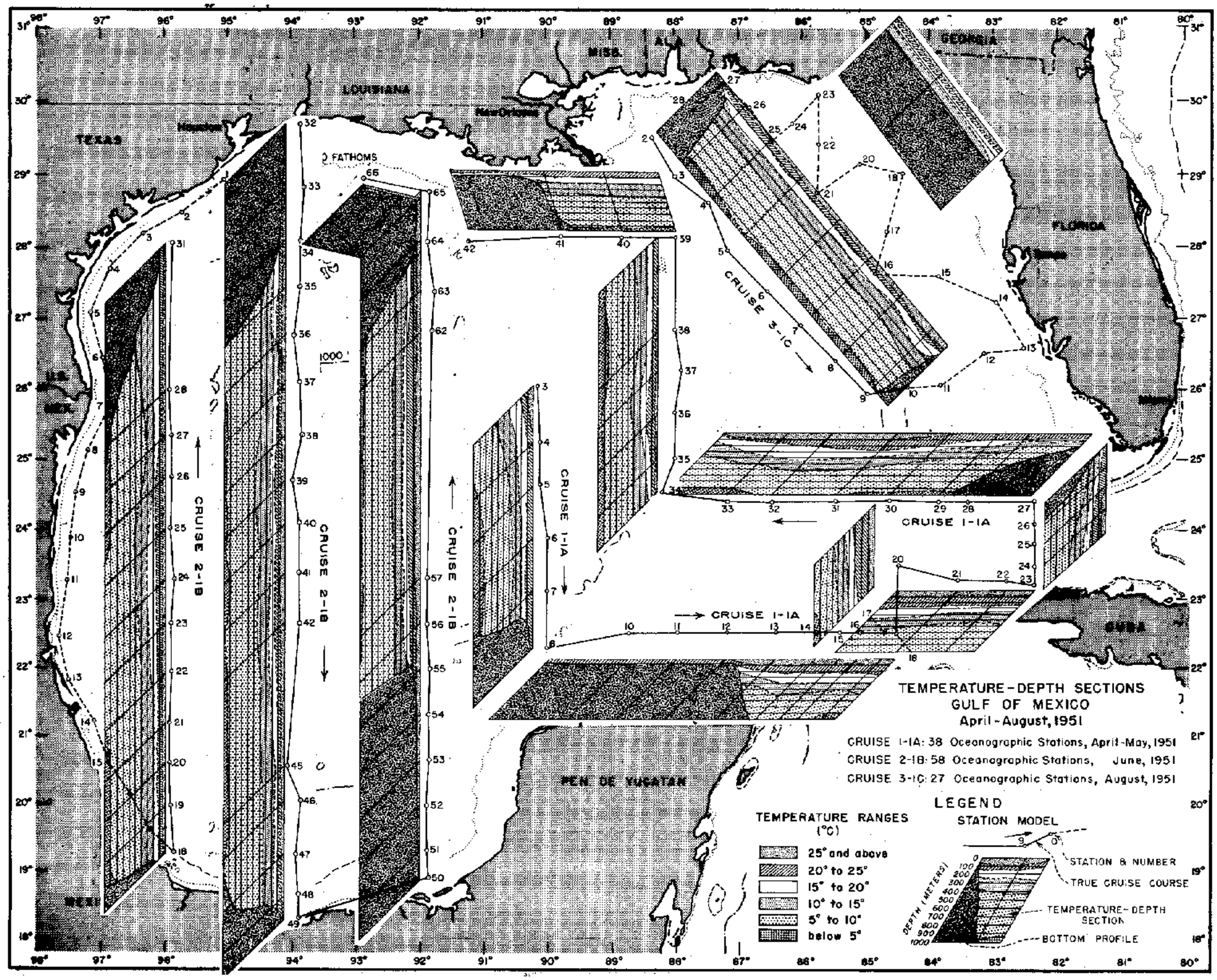

Figure 1.

Cruise 5-2C (in the summer of 1952) also displays, from analysis of dynamic height data, a large, anti-cyclonic eddy in the same region (figure 14).

On the basis of the comparison of the three sets of dynamic height data from the eastern Gulf of Mexico, cruise 54-10 of the A. A. JAKKULA was designed to investigate the region with emphasis on the movements of the eddy currents. Preliminary analysis of these data has also shown the same well-defined eddy but it is somewhat larger in size.

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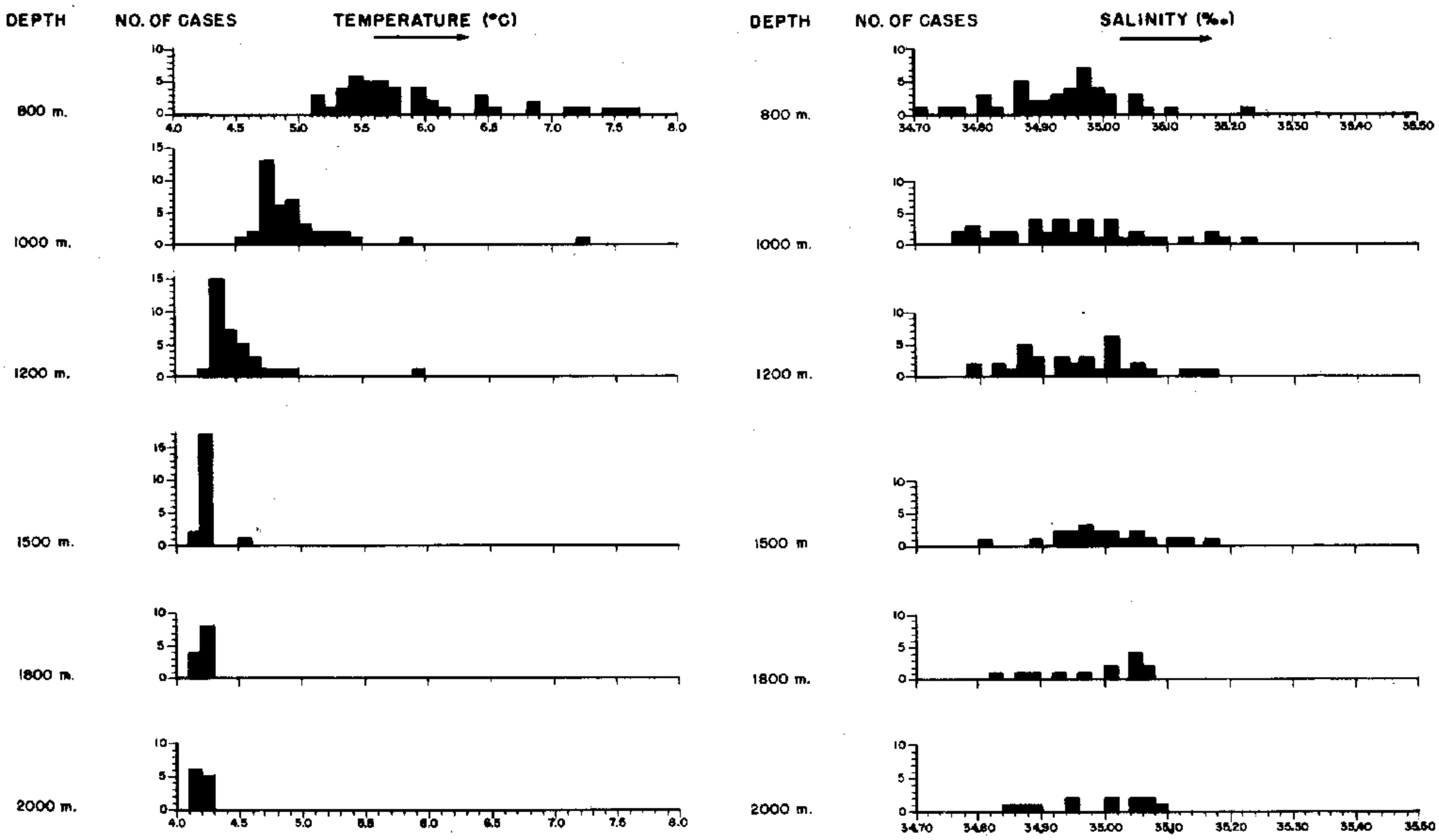
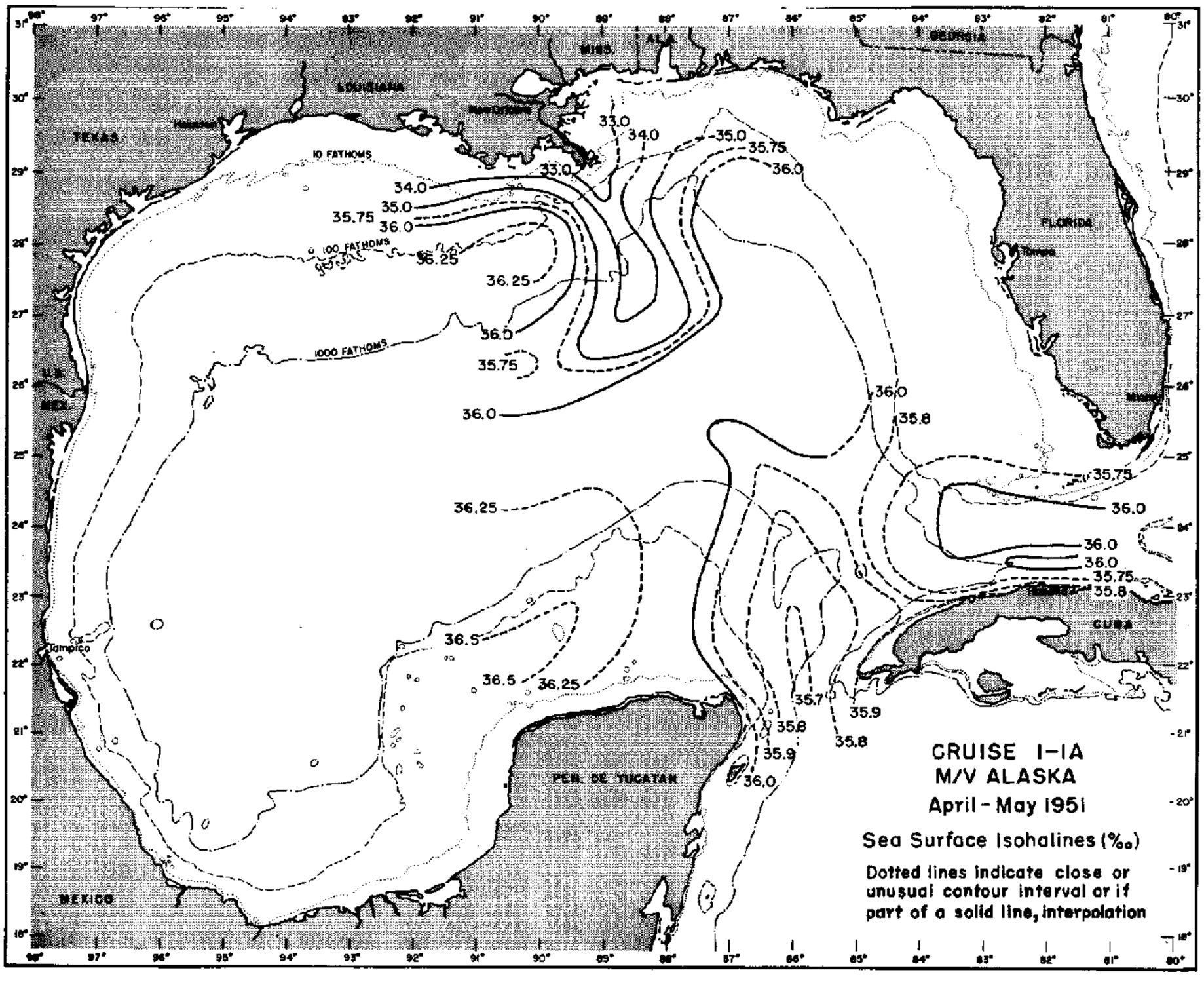


Figure 2.--Frequency distribution of temperatures and salinities at various depths.



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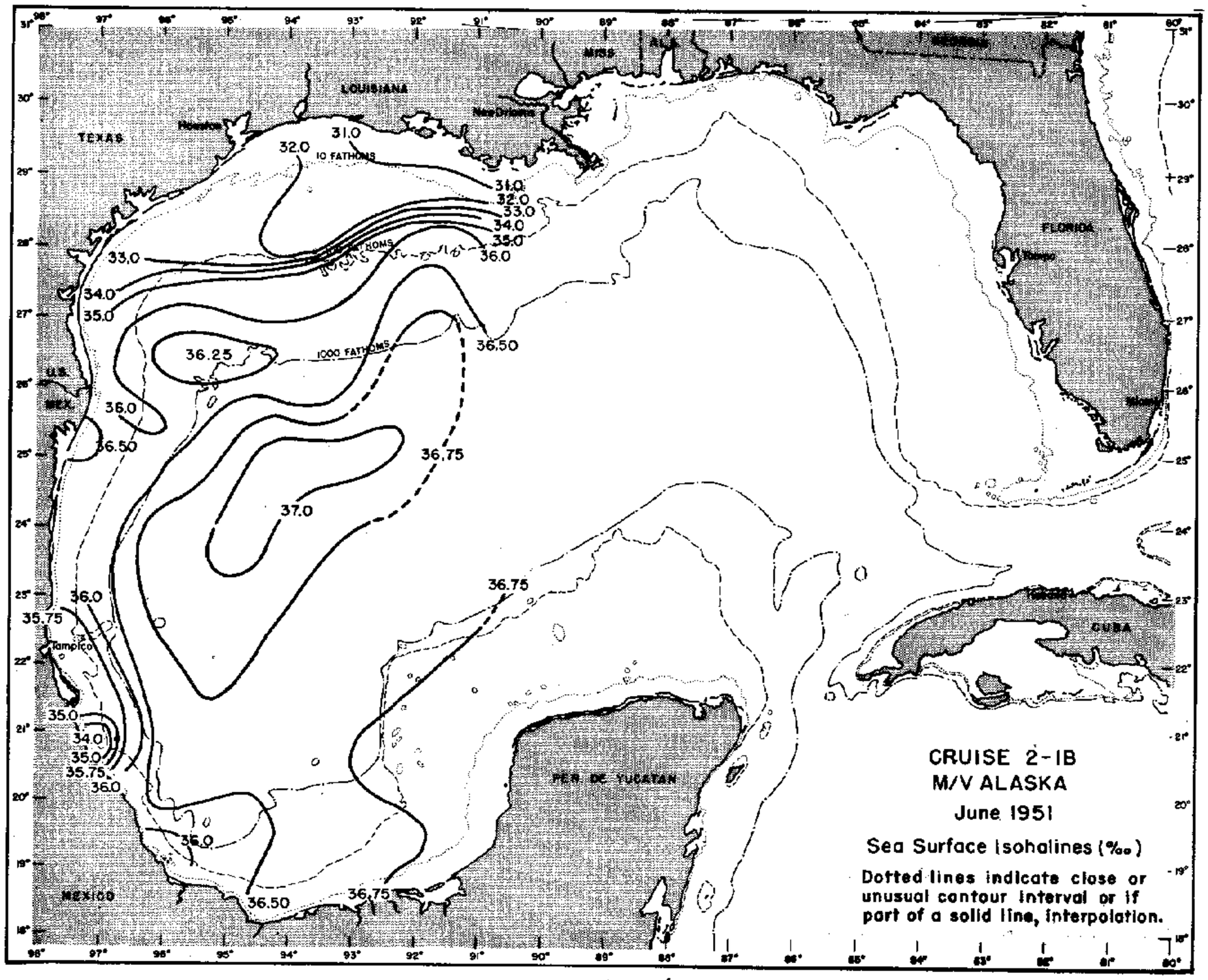

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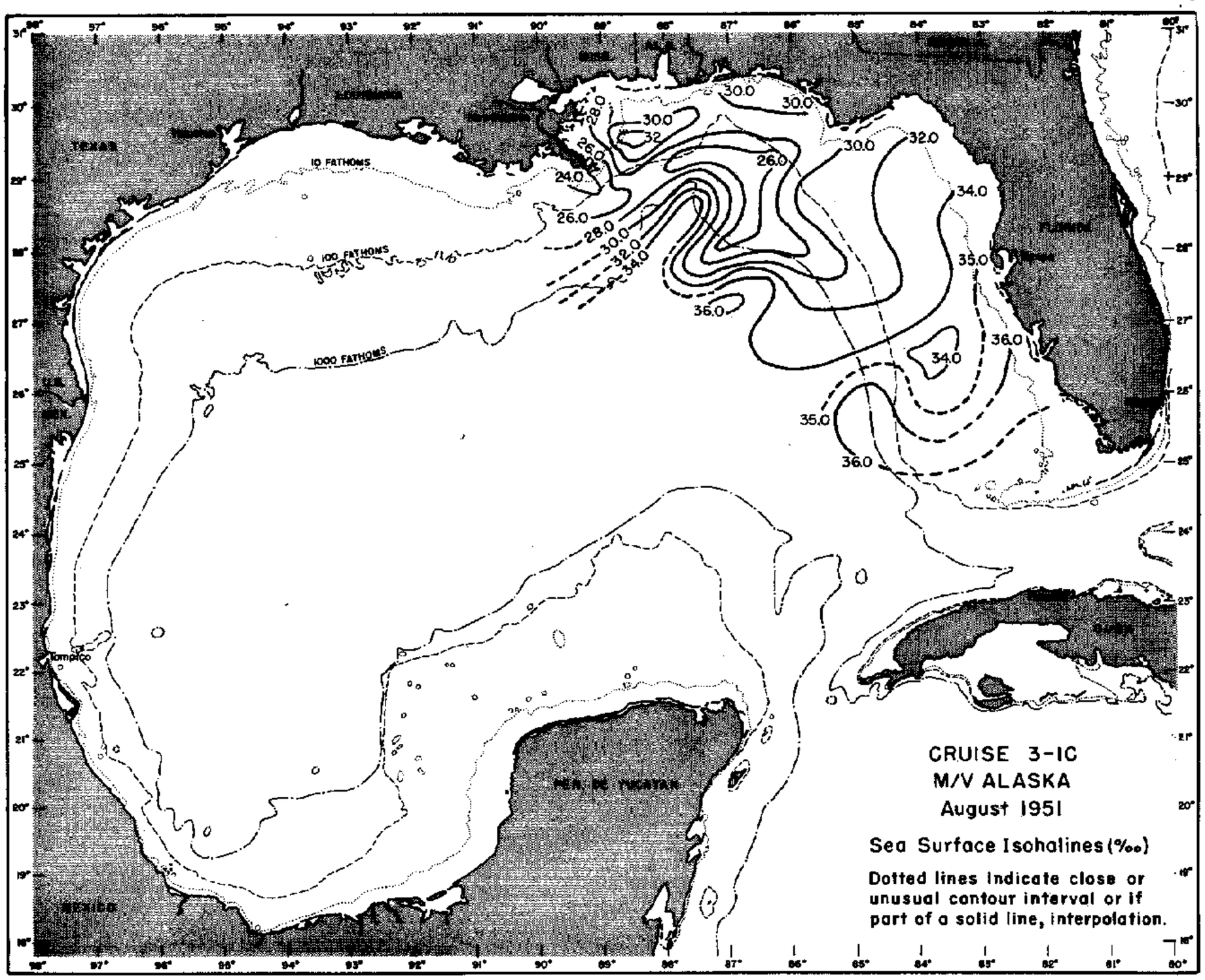

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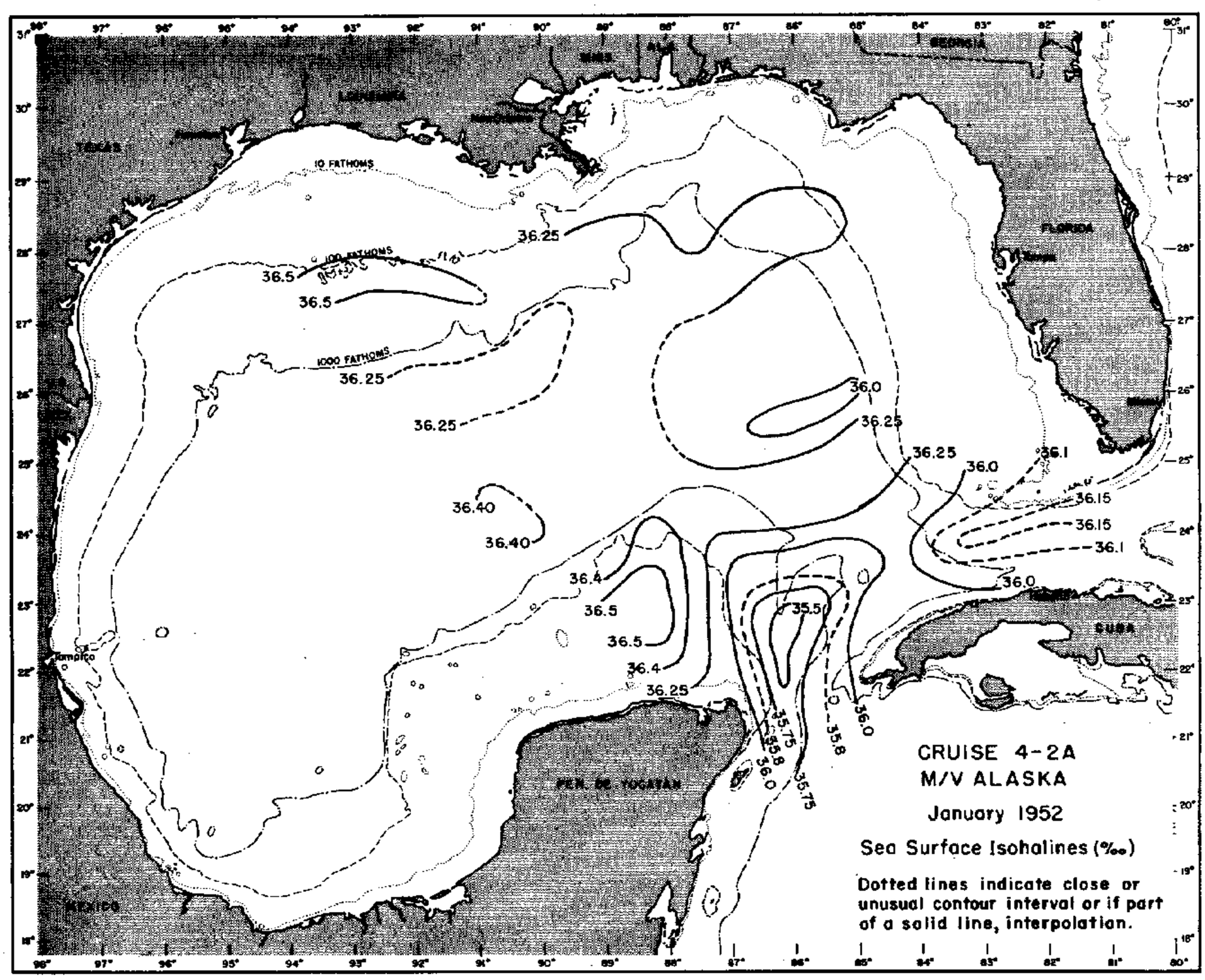

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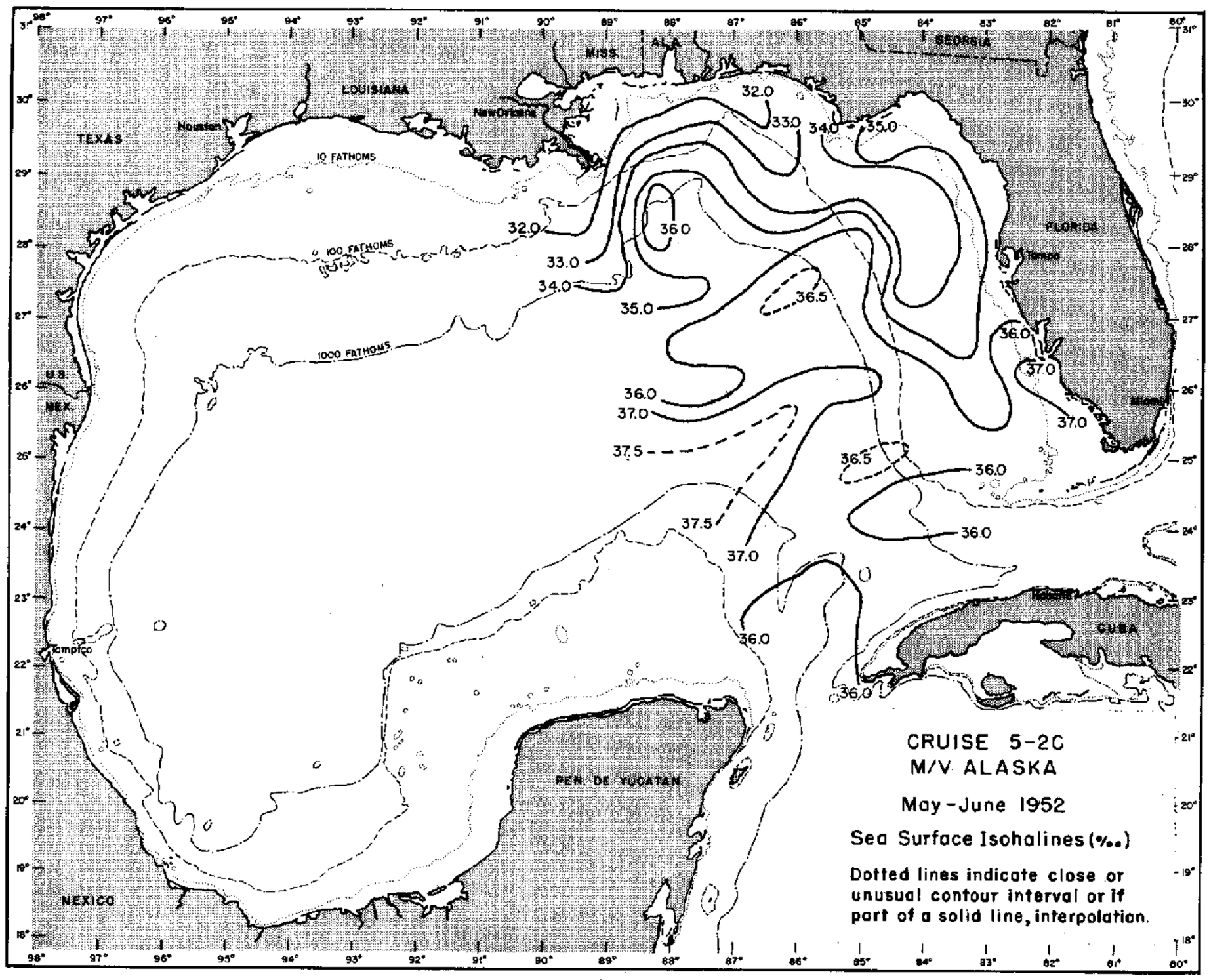

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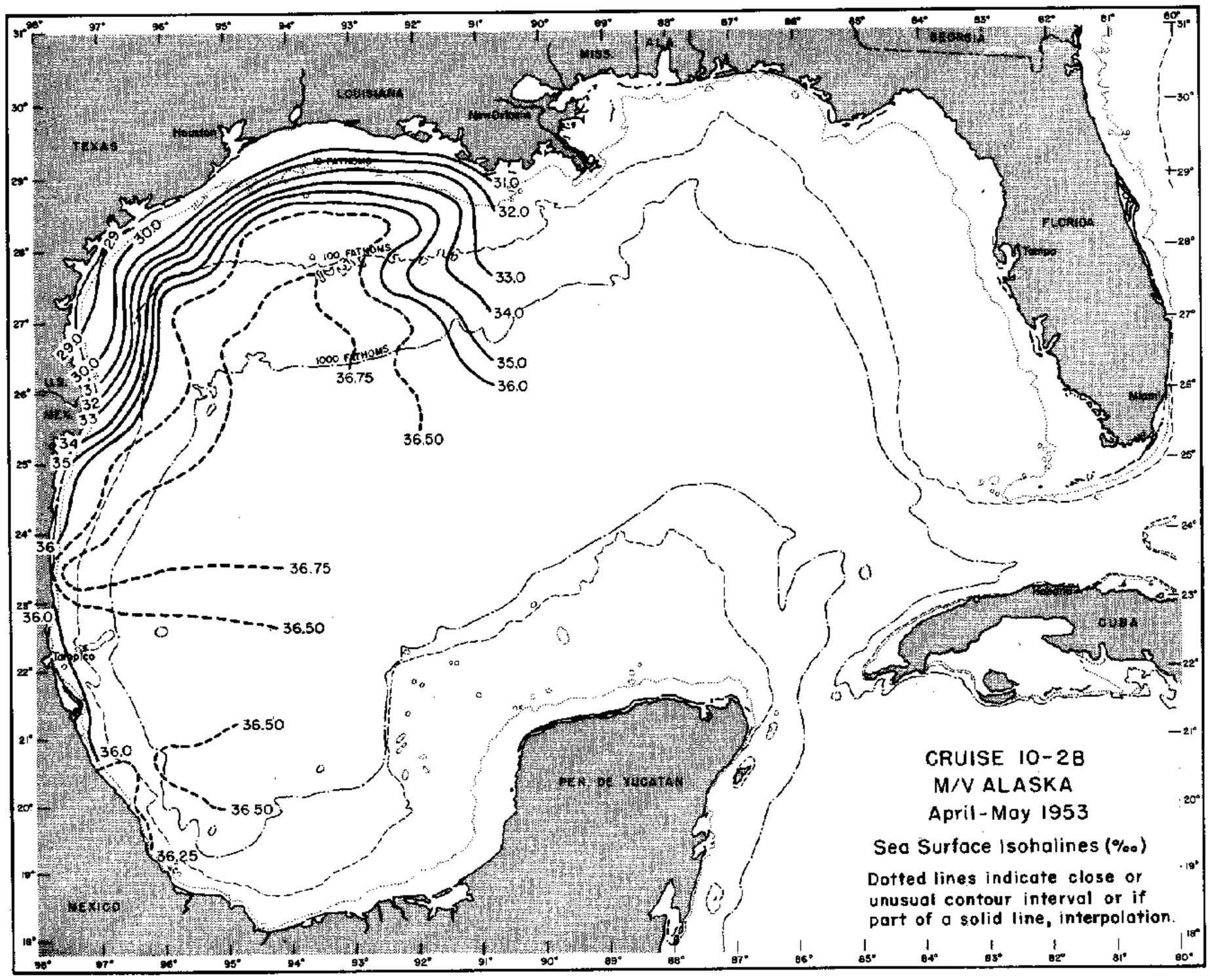

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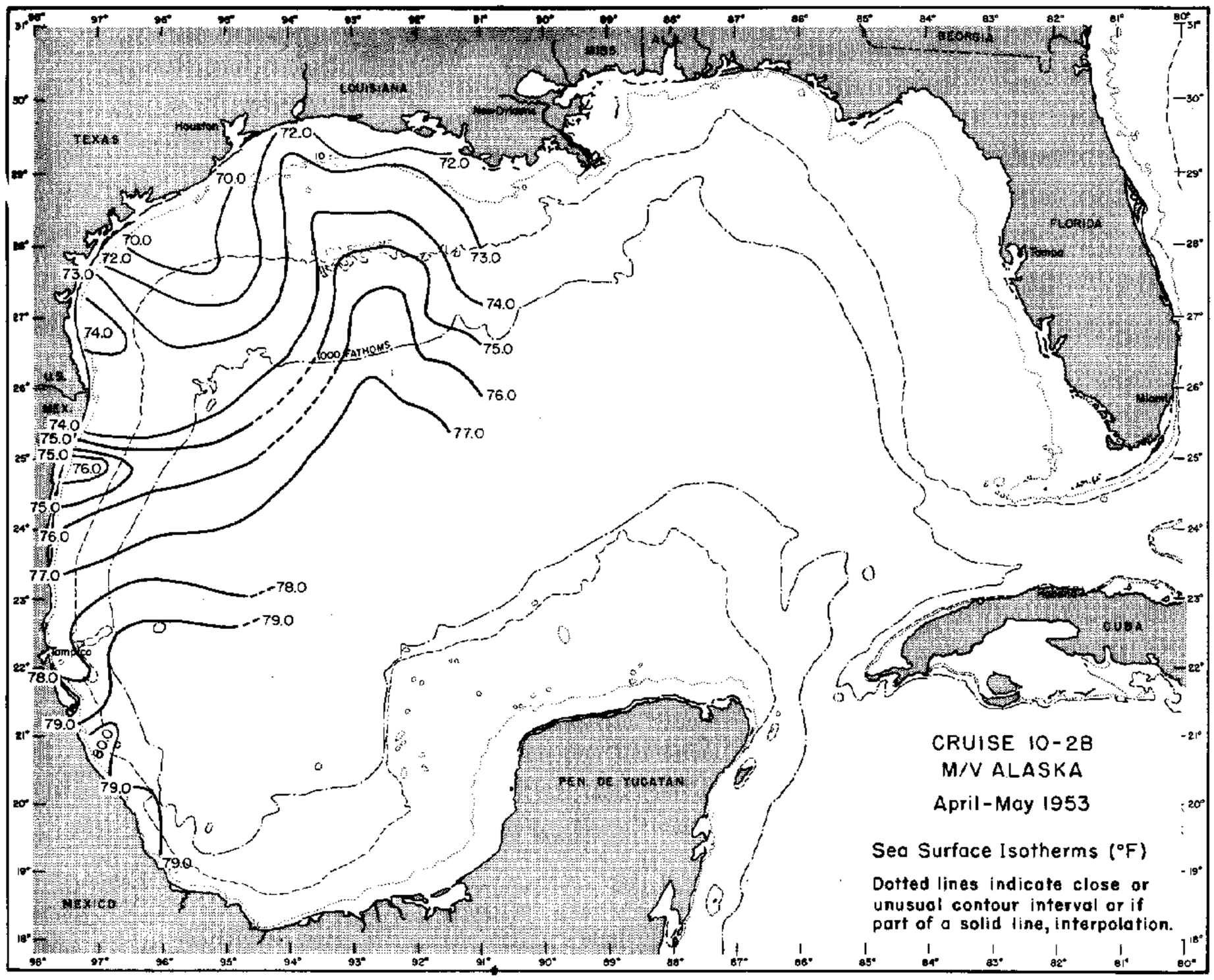

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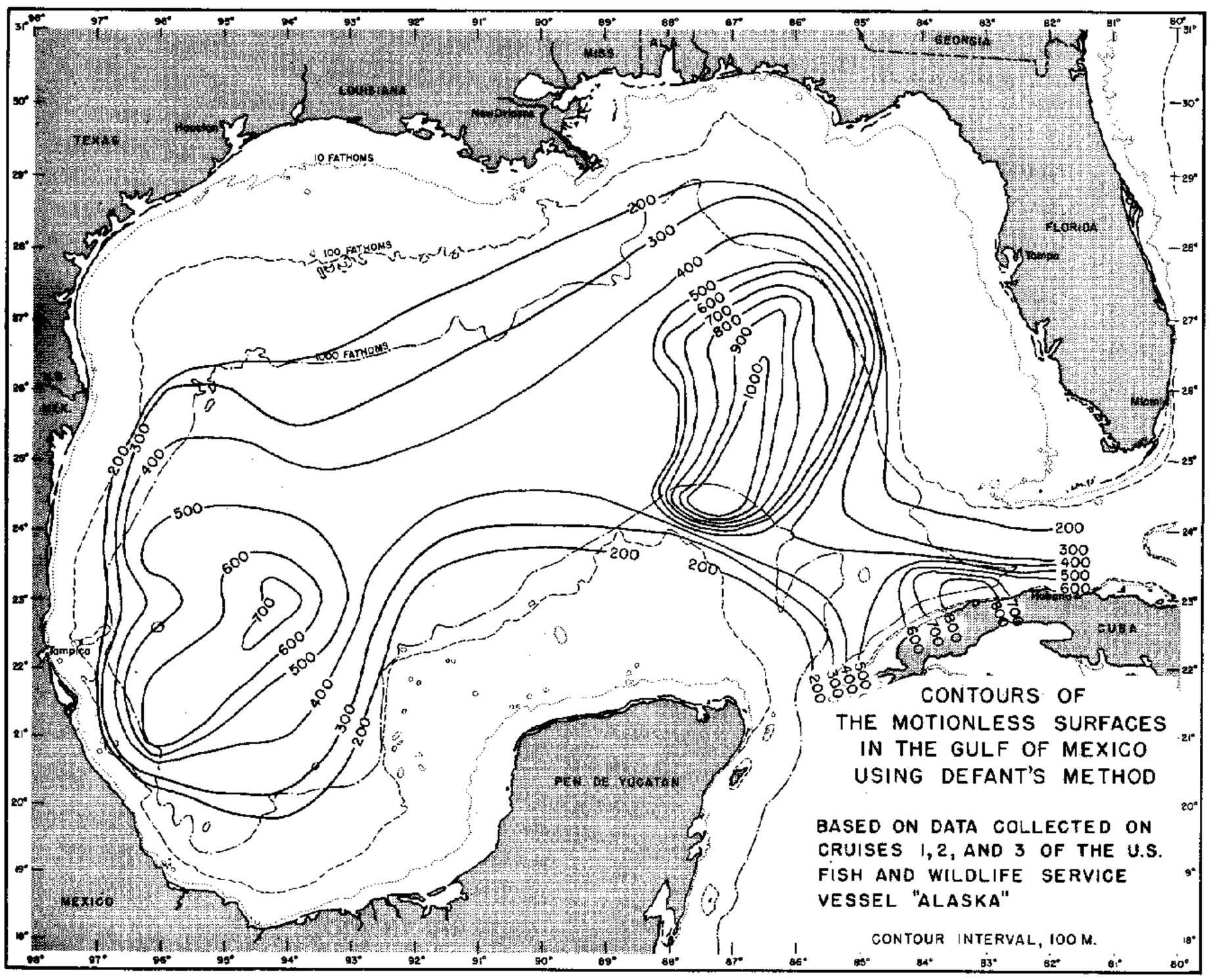

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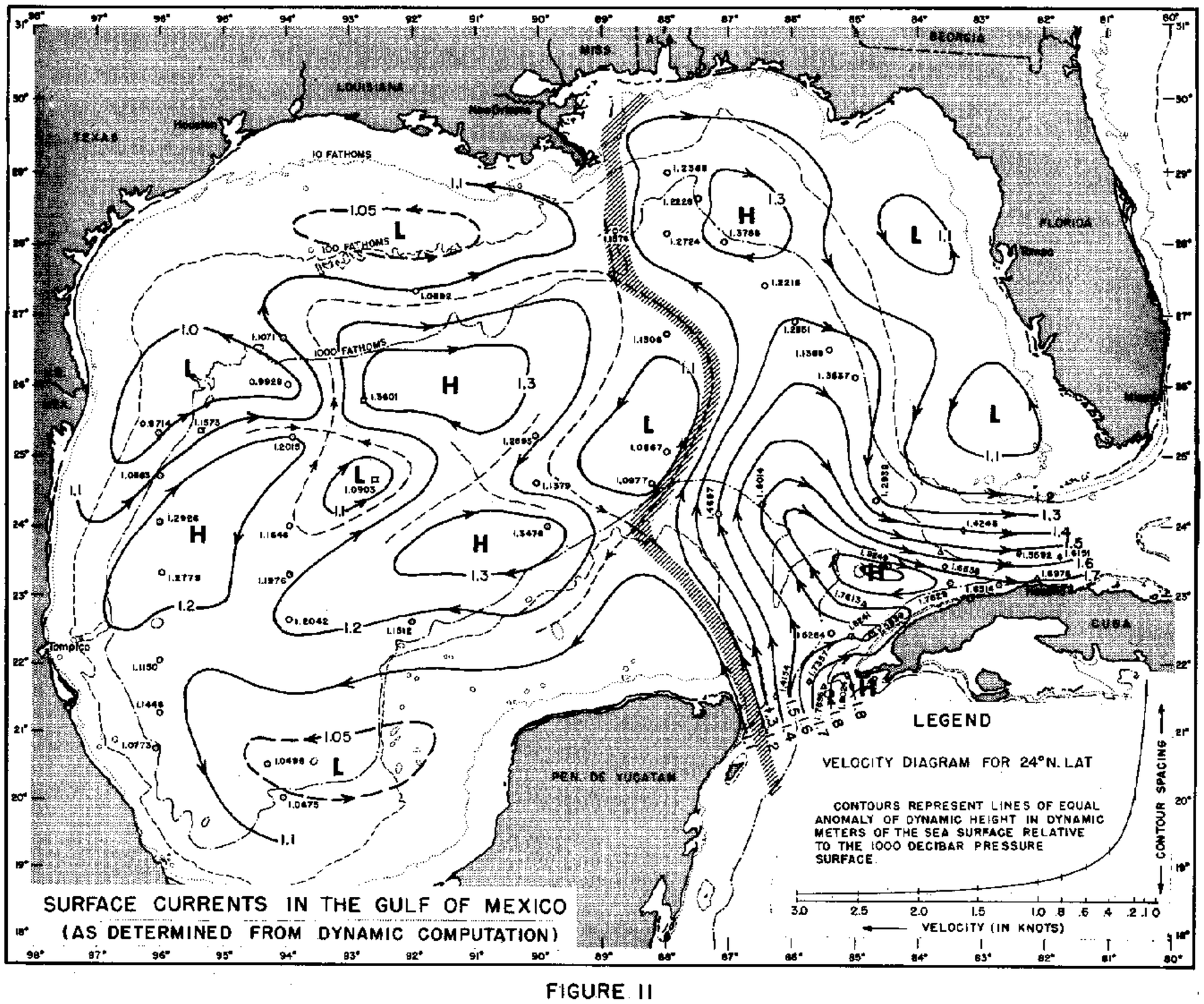

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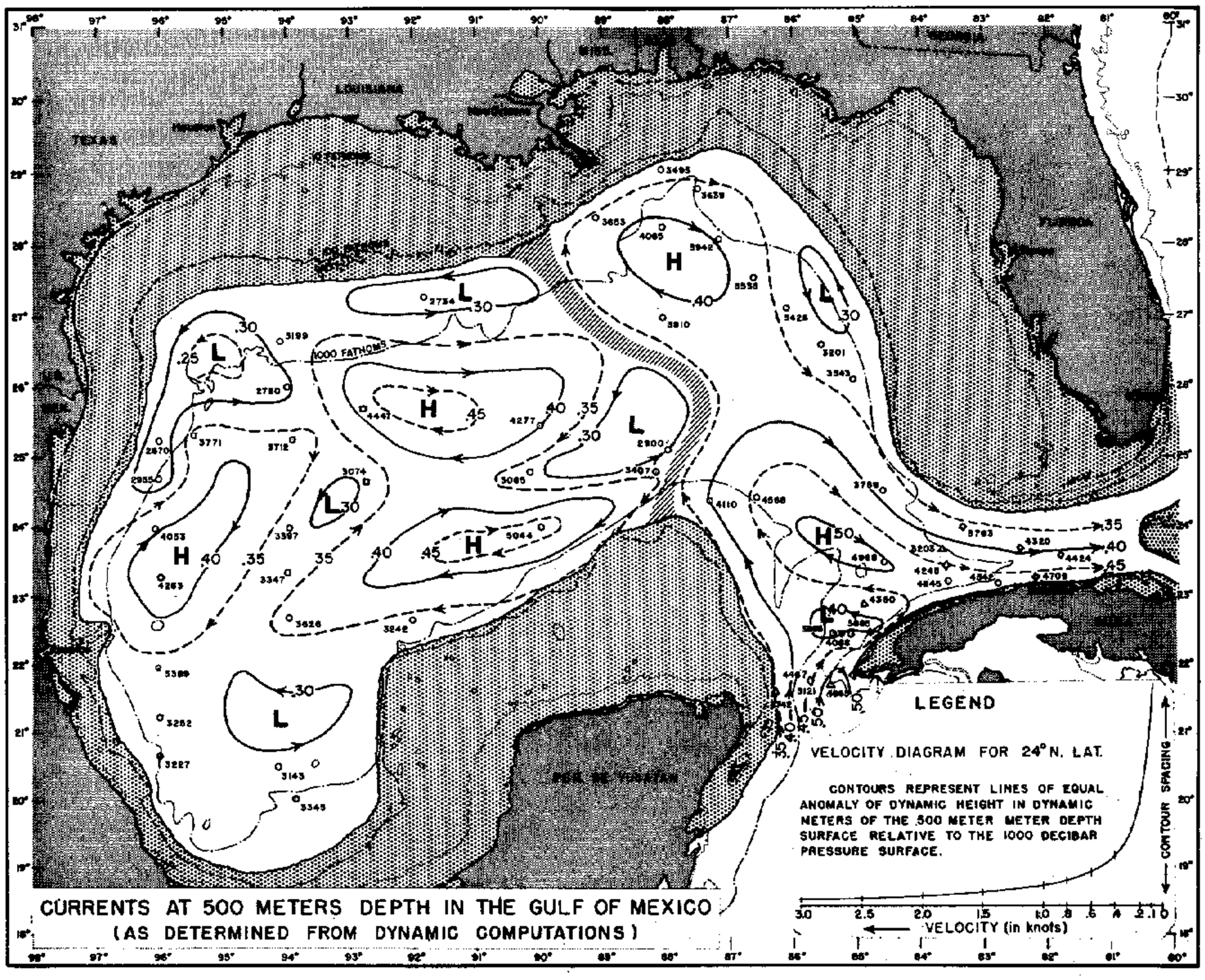

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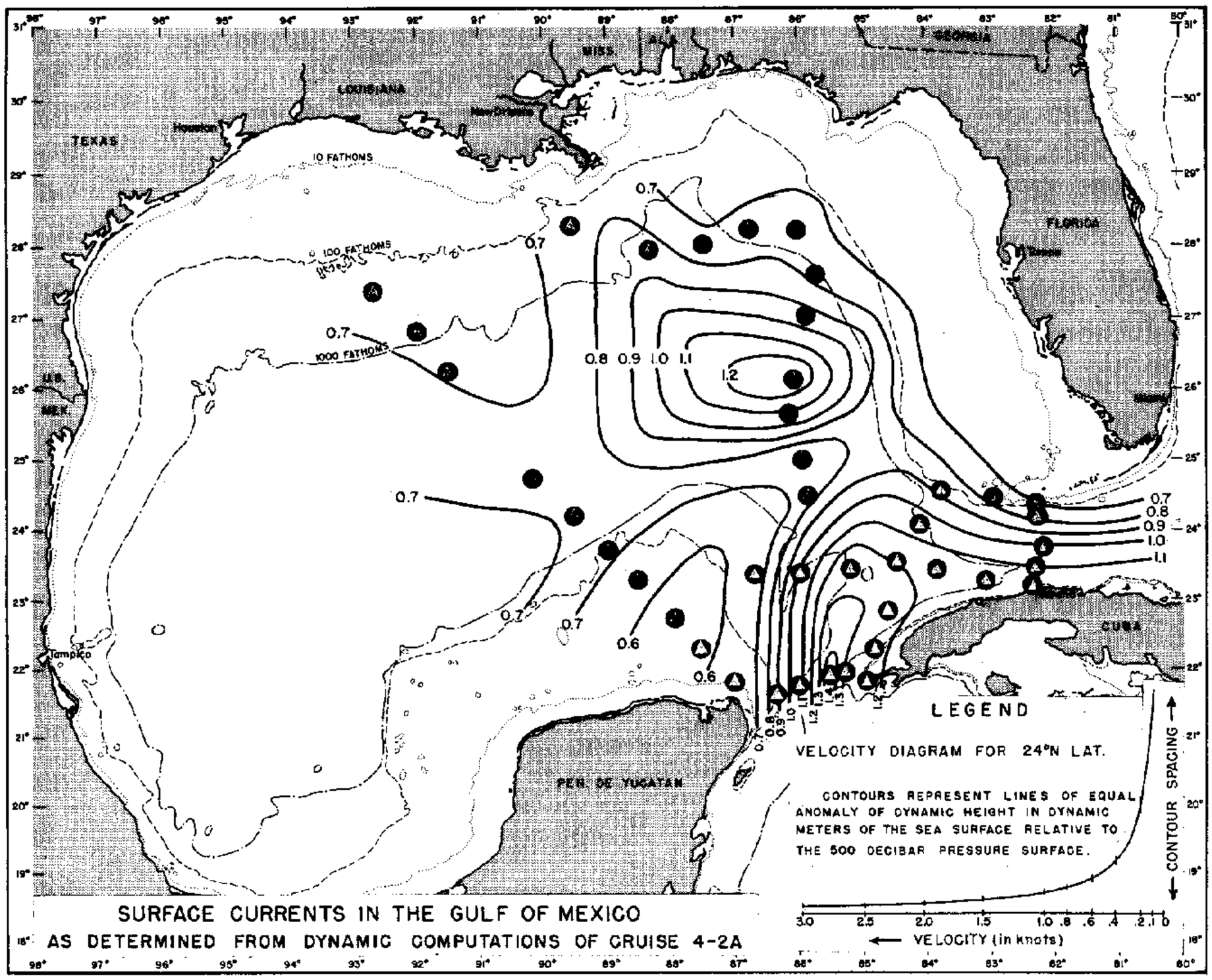

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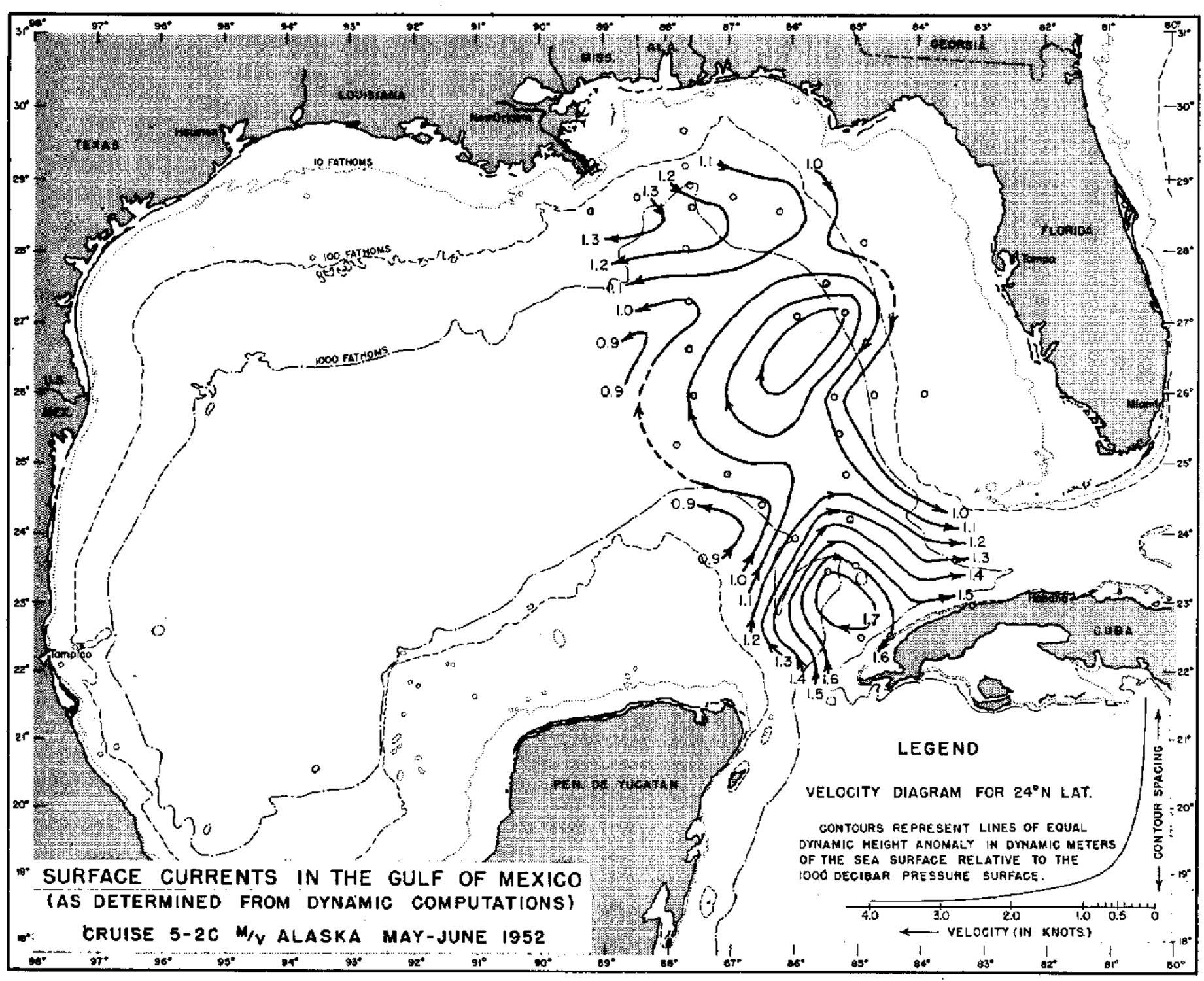

FIGURE 14

Notes Concerning the Tables.

Cruise and station numbers: In the following tables the station designation has three terms. The first term is a serial number applied to all cruises of ALASKA regardless of locale. The second term applies to the three basic cruise areas worked out for the specific hydrographic studies in cooperation with Texas A. and M. Department of Oceanography. These areas were designated A, B, and C. The numbers immediately preceding a given letter indicate serially the cruises in that particular area. The third term is the serial number of the station as occupied on any given cruise. Thus Station 4-2A-29 was the twenth-ninth station occupied on the second cruise in area "A". The first term, 4, indicates that this was the fourth cruise of ALASKA while she was stationed at Galveston.

There were a number of special cruises not related to the basic plan for the study of the Gulf of Mexico which were assigned serial numbers in regular order. It is for this reason that cruises 6, 7, and 9 do not appear in these tables.

Depth: in meters (1 fathom = 1.8285 meters).

Temperature: degrees Centigrade.

Salinity: parts per thousand, converted from chloride content according to Knudsen's tables.

Sigma-t (σ_t): Derived from computed relationships between density (Mass per unit volume) and the specific volume of given samples of sea water in their places of origin (in situ), LaFond (1951). $\sigma_{s,t,p} = 1{,}000 (\rho_{s,t,p} - 1)$, where ρ = density, s = salinity $^o/oo$, t = temperature (°C.), and p = pressure (decibars). This definition refers to the density at the pressure at which the sample was collected. The same expression for pressure = 0 (surface) is $\sigma_{s,t,o} = 1{,}000 (\rho_{s,t,o} - 1)$. $\sigma_{s,t,o}$ is commonly shortened to σ_t and provides an index number for the density of a given sample at the sea surface and for a given salinity and temperature. Thus a density ($\rho_{s,t,o}$) of 1.02567 is converted by definition to a σ_t of 25.67 [$\sigma_t = 1{,}000(1.02567 - 1)$]. Sigma-t ($\sigma_t$)) can be determined from salinity and temperature by the use of graphs or tables (LaFond, 1951).

Total phosphorus (Total PO_4-P): microgram-atoms per liter of phosphate phosphorus. The final colorimetric determination is made as phosphate phosphorus after digestion.

Inorganic phosphorus (Inorg. PO_4-P): Inorganic phosphorus as phosphate phosphorus, undigested samples, in microgram-atoms per liter.

Nitrate-nitrite (NO_3-N): Nitrate-nitrite nitrogen in microgram-atoms of nitrogen per liter.

Carbohydrates (Carb. Mg./l): As arabinose equivalents in milligrams per liter. The general term carbohydrates should be used because there may be several pentoses or hexoses involved. Arabinose is used as a standard for comparison during the analytical process. Undoubtedly these carbohydrate materials are present in the form of monosaccharides, oligosaccharides, and polysaccharides.

Protein (Prot. Mg./l): Given in terms of tyrosine in milligrams per liter. The tyrosine may represent any number of known and unknown specific proteinaceous materials, and is used as a standard because of the adaptability of the analytical method to sea water.

Table 3.--Water color (Forel scale)

Code	Description
00	Deep blue
10	Blue
20	Green blue
30	Blue green
40	Green
50	Light green
60	Yellowish green
70	Yellow green
80	Green yellow
90	Greenish yellow
99	Yellow

TABLE 4. NUMERICAL WEATHER CODES—PRESENT WEATHER

00 Cloud development NOT observed or NOT observable during past hour.	**01** Clouds generally dissolving or becoming less developed during past hour.	**02** State of sky on the whole unchanged during past hour.	**03** Clouds generally forming or developing during past hour.	**04** Visibility reduced by smoke.	**05** Haze.	**06** Widespread dust in suspension in the air, NOT raised by wind, at time of observation.	**07** Dust or sand raised by wind, at time of observation.	**08** Well developed dust devil(s) within past hour.	**09** Duststorm or sandstorm within sight of or at station during past hour.
10 Light fog.	**11** Patches of shallow fog at station, NOT deeper than 6 feet on land.	**12** More or less continuous shallow fog at station, NOT deeper than 6 feet on land.	**13** Lightning visible, no thunder heard.	**14** Precipitation within sight, but NOT reaching the ground.	**15** Precipitation within sight, reaching the ground, but distant from station.	**16** Precipitation within sight, reaching the ground, near to but NOT at station.	**17** Thunder heard, but no precipitation at the station.	**18** Squall(s) within sight during past hour.	**19** Funnel cloud(s) within sight during past hour.
20 Drizzle (NOT freezing and NOT falling as showers) during past hour, but NOT at time of ob.	**21** Rain (NOT freezing and NOT falling as showers) during past hour, but NOT at time of ob.	**22** Snow (NOT falling as showers) during past hour, but NOT at time of observation.	**23** Rain and snow (NOT falling as showers) during past hour, but NOT at time of observation.	**24** Freezing drizzle or freezing rain (NOT falling as showers) during past hour, but NOT at time of observation.	**25** Showers of rain during past hour, but NOT at time of observation.	**26** Showers of snow, or of rain and snow, during past hour, but NOT at time of observation.	**27** Showers of hail, or of hail and rain, during past hour, but NOT at time of observation.	**28** Fog during past hour, but NOT at time of observation.	**29** Thunderstorm (with or without precipitation) during past hour, but NOT at time of observation.
30 Slight or moderate duststorm or sandstorm has decreased during past hour.	**31** Slight or moderate duststorm or sandstorm no appreciable change during past hour.	**32** Slight or moderate duststorm or sandstorm has increased during past hour.	**33** Severe duststorm or sandstorm, has decreased during past hour.	**34** Severe duststorm or sandstorm, no appreciable change during past hour.	**35** Severe duststorm or sandstorm, has increased during past hour.	**36** Slight or moderate drifting snow, generally low.	**37** Heavy drifting snow, generally low.	**38** Slight or moderate drifting snow, generally high.	**39** Heavy drifting snow, generally high.
40 Fog at distance at time of observation, but NOT at station during past hour.	**41** Fog in patches.	**42** Fog, sky discernible, has become thinner during past hour.	**43** Fog, sky NOT discernible, has become thinner during past hour.	**44** Fog, sky discernible, no appreciable change during past hour.	**45** Fog, sky NOT discernible no appreciable change during past hour.	**46** Fog, sky discernible, has begun or become thicker during past hour.	**47** Fog, sky NOT discernible, has begun or become thicker during past hour.	**48** Fog, depositing rime, sky discernible.	**49** Fog, depositing rime, sky not discernible.
50 Intermittent drizzle (NOT freezing) slight at time of observation.	**51** Continuous drizzle (NOT freezing) slight at time of observation.	**52** Intermittent drizzle (NOT freezing) moderate at time of ob.	**53** Continuous drizzle (NOT freezing), moderate at time of ob.	**54** Intermittent drizzle (NOT freezing), thick at time of observation.	**55** Continuous drizzle (NOT freezing), thick at time of observation.	**56** Slight freezing drizzle.	**57** Moderate or thick freezing drizzle.	**58** Drizzle and rain, slight.	**59** Drizzle and rain, moderate or heavy.
60 Intermittent rain (NOT freezing), slight at time of observation.	**61** Continuous rain (NOT freezing), slight at time of observation.	**62** Intermittent rain (NOT freezing), moderate at time of ob.	**63** Continuous rain (NOT freezing), moderate at time of observation.	**64** Intermittent rain (NOT freezing), heavy at time of observation.	**65** Continuous rain (NOT freezing), heavy at time of observation.	**66** Slight freezing rain.	**67** Moderate or heavy freezing rain.	**68** Rain or drizzle and snow, slight.	**69** Rain or drizzle and snow, moderate or heavy.
70 Intermittent fall of snowflakes, slight at time of observation.	**71** Continuous fall of snowflakes, slight at time of observation.	**72** Intermittent fall of snowflakes, moderate at time of observation.	**73** Continuous fall of snowflakes, moderate at time of observation.	**74** Intermittent fall of snowflakes, heavy at time of observation.	**75** Continuous fall of snowflakes, heavy at time of observation.	**76** Ice needles (with or without fog).	**77** Granular snow (with or without fog).	**78** Isolated starlike snow crystals (with or without fog).	**79** Ice pellets (sleet, U. S. definition).
80 Slight rain shower(s).	**81** Moderate or heavy rain shower(s).	**82** Violent rain shower(s).	**83** Slight shower(s) of rain and snow mixed.	**84** Moderate or heavy shower(s) of rain and snow mixed.	**85** Slight snow shower(s).	**86** Moderate or heavy snow shower(s).	**87** Slight shower(s) of soft or small hail with or without rain or rain and snow mixed.	**88** Moderate or heavy shower(s) of soft or small hail with or without rain or rain and snow mixed.	**89** Slight shower(s) of hail, with or without rain or rain and snow mixed, not associated with thunder.
90 Moderate or heavy shower(s) of hail, with or without rain or rain and snow mixed, not associated with thunder.	**91** Slight rain at time of ob.; thunderstorm during past hour, but NOT at time of observation.	**92** Moderate or heavy rain at time of ob.; thunderstorm during past hour, but NOT at time of observation.	**93** Slight snow or rain and snow mixed or hail at time of observation.; thunderstorm during past hour, but not at time of observations.	**94** Mod. or heavy snow, or rain and snow mixed or hail at time of ob.; thunderstorm during past hour, but NOT at time of observation.	**95** Slight or mod. thunderstorm without hail, but with rain and/or snow at time of observation.	**96** Slight or moderate thunderstorm, with hail at time of observation.	**97** Heavy thunderstorm, without hail, but with rain and/or snow at time of observation.	**98** Thunderstorm combined with duststorm or sandstorm at time of observation.	**99** Heavy thunderstorm with hail at time of observation.

Table 5.--Sea amount

Code	Approximate height (feet)	Description
0	---	Calm
1	Less than 1	Smooth
2	1 to 3	Slight
3	3 to 5	Moderate
4	5 to 8	Rough
5	8 to 12	Very rough
6	12 to 20	High
7	20 to 40	Very high
8	40 and over	Mountainous
9	---	Very rough confused sea

Table 6.--Cloud symbols and code for degree of cloud coverage

Symbol	Cloud type	Code No.	Tenths of sky covered
Ci	Cirrus	0	None
Cc	Cirrocumulus	1	1
Cs	Cirrostratus	2	2
Ac	Altocumulus	3	3
As	Altostratus	4	4
Sc	Stratocumulus	5	5
St	Stratus	6	6
Ns	Nimbostratus	7	7
Cu	Cumulus	8	8
Cb	Cumulonimbus	9	9
		10	10

Table 7.--Wind speed (Beaufort scale)

Code	Speed	Description
00	Less than 1 knot	Calm
01	1 - 3 knots	Light airs
02	4 - 6 knots	Light breeze
03	7 - 10 knots	Gentle breeze
04	11 - 16 knots	Moderate breeze
05	17 - 21 knots	Fresh breeze
06	22 - 27 knots	Strong breeze
07	28 - 33 knots	Moderate gale
08	34 - 40 knots	Fresh gale
09	41 - 47 knots	Strong gale
10	48 - 55 knots	Whole gale
11	56 - 63 knots	Storm
12	64 knots and above	Hurricane

Table 8.--Visibility

Code	Description	Distance
0	Dense fog	50 yards
1	Thick fog	200 yards
2	Fog	400 yards
3	Moderate fog	1000 yards
4	Thin fog or mist	1 mile
5	Visibility poor	2 miles
6	Visibility moderate	5 miles
7	Visibility good	10 miles
8	Visibility very good	30 miles
9	Visibility excellent	over 30 miles

Notes on Cruises 1 through 3

It will be noticed that samples for organic determinations were taken at three levels at alternate stations, and that total phosphorus was not included. These early collections were made to determine the feasibility of freezing the samples at sea with subsequent analyses being made ashore after a cruise was completed. During these early cruises we were also short of personnel and it would have been impossible to analyze full complements of samples as in the later cruises.

Note on Cruise 1

The carbohydrate values for Cruise 1 at the deeper levels are almost all indicated as "green". This means that the reacted samples were green to the eye instead of the normal reddish-purple. However, the filters used in the photometer prevented the measurement of the light transmitted in the green portion of the spectrum, hence some green values are given as zero carbohydrates. The fact that the green response all but disappeared in the later analyses would indicate that an unknown technical difficulty caused the reaction to yield green. The values are included for the sake of completeness, and because, in spite of the discoloration, I feel that they are still representative of some measurable component present in the sea water. The existence of values of similar magnitudes in the deeper levels at stations occupied during the later cruises supports this contention. There is a possibility that high nitrate-nitrites will cause a green reaction to N-ethyl carbazole reagent in the absence of carbohydrates.

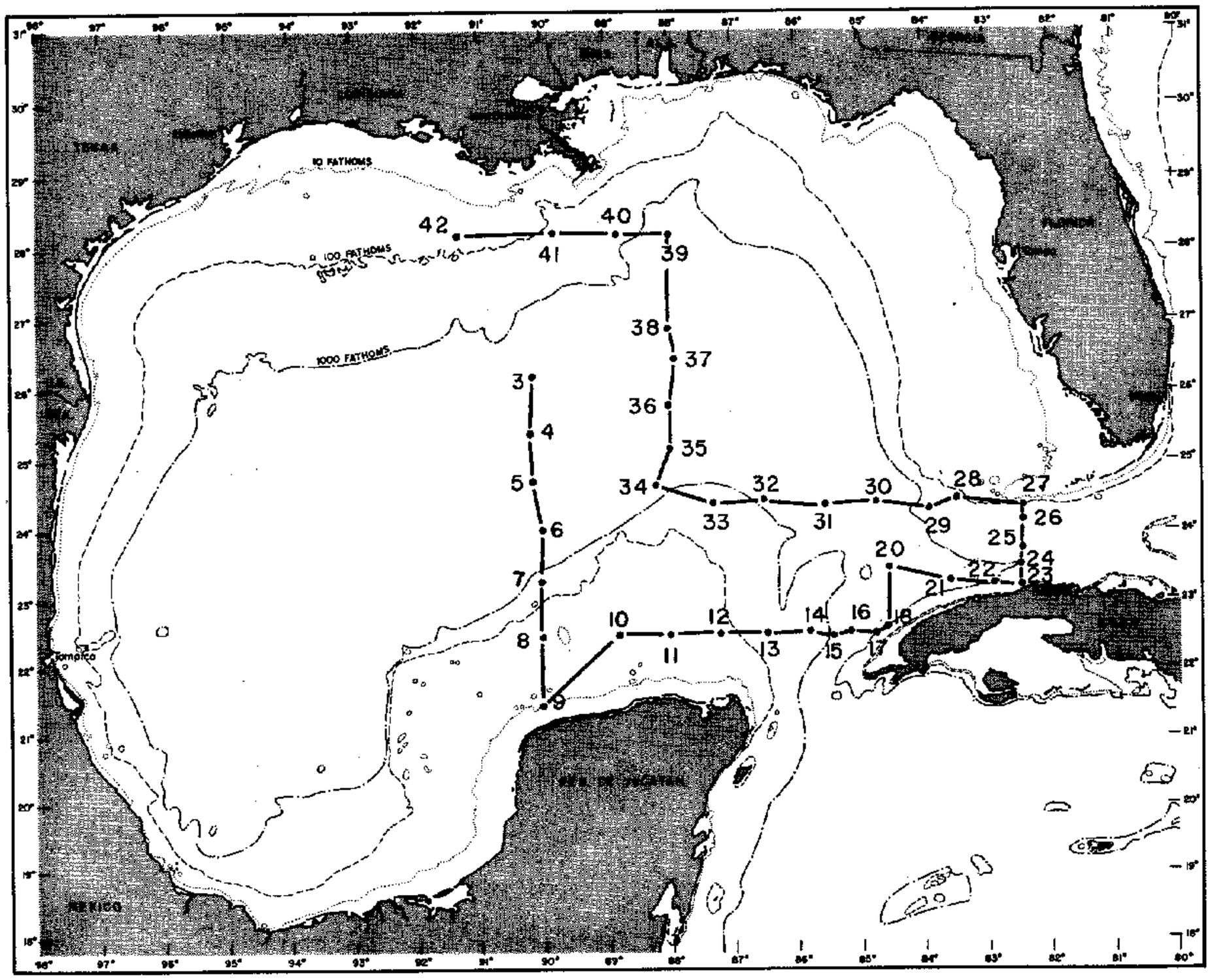

Figure 15.--Locations of stations occupied on Cruise 1-1A.

STATION NO. 1-1A-3

DATE 22 4 1951 (Day Month Year) LAT. 26° 07' N. LONG. 90° 09' W.

TIME 0502 (GCT) DEPTH 1660 (Faths.) MAX. SAMPLE DEPTH 400 (Meters) WIRE ANGLE 38 °

WATER COLOR - (Code) WEATHER 02 (Code) SEA 4 (Code) SWELL 120 (Direction) ° T. 6 (Hgt.) ft.

5 (Period) sec. CLOUDS Cu (Type) 2 (Amount) TEMP. 78.0 (Dry) °F. 75.0 (Wet) °F.

BAR. 30.00 in. REL. HUM. 87 WIND 175 (Direction) ° T. 4 (Force) VIS. 8 (Code)

OBSERVED VALUES

Depth	Temp. °C.	Sal. ‰	Inorg. PO_4-P	NO_3-N	Carb. Mg/l	Prot. Mg/l
0	25.60	35.84				
8	25.61	35.82	0.0	0.6	1.6	0.0
24	25.62	35.86				
46	25.57	35.82				
67	25.57	35.88				
86	25.62	35.84				
123	25.61	35.79				
158	23.16	36.65	0.1	3.8	0.1	2.3
234	---	36.53				
312	---	35.81				
400	14.99	35.79				
*1170	---	---	0.4	0.3	0	0.0

VALUES AT STANDARD DEPTHS

Depth	Temp. °C.	Sal. ‰	σ_t
0	25.60	35.84	23.81
10	25.61	35.82	23.79
20	25.62	35.82	23.79
30	25.59	35.82	23.80
50	25.57	35.82	23.81
75	25.57	35.84	23.82
100	25.61	35.85	23.82
150	23.60	36.60	24.99
200	20.05	36.69	26.05
250	18.11	36.60	26.49
300	16.57	35.90	26.32
400	14.99	35.79	26.60

*Uncorrected depth

STATION NO. 1-1A-4

DATE 22 4 1951 (Day Month Year) LAT. 25° 20' N. LONG. 90° 07' W.

TIME 2108 (GCT) DEPTH 1850 (Faths.) MAX. SAMPLE DEPTH 1306 (Meters) WIRE ANGLE 23 °

WATER COLOR - (Code) WEATHER 01 (Code) SEA 2 (Code) SWELL 150 (Direction) ° T. 6 (Hgt.) ft.

6 (Period) sec. CLOUDS Cu (Type) 5 (Amount) TEMP. 80.8 (Dry) °F. 70.6 (Wet) °F.

BAR. 30.00 in. REL. HUM. 61% WIND 180 (Direction) ° T. 1 (Force) VIS. 8 (Code)

OBSERVED VALUES			VALUES AT STANDARD DEPTHS			
Depth	Temp. °C	Sal. ‰	Depth	Temp. °C	Sal. ‰	σ_t
0	24.99	36.08	0	24.99	36.08	24.18
9	24.59	36.02	10	24.59	36.02	24.26
27	23.57	36.24	20	23.85	36.06	24.51
54	22.15	36.78	30	22.90	36.27	24.94
80	21.28	36.82	50	22.17	36.77	25.53
105	20.44	36.71	75	21.35	36.82	25.80
156	18.43	36.49	100	20.50	36.76	25.99
205	17.22	36.36	150	18.70	36.51	26.27
305	14.07	35.81	200	17.40	36.37	26.49
402	11.20	35.37	250	15.55	36.10	26.71
504	9.24	35.08	300	14.15	35.83	26.81
605	8.81	35.08	400	11.35	35.39	27.03
864	5.35	34.79	500	9.30	35.09	27.16
1306	4.28	34.87	600	8.89	35.08	27.22
			700	7.73	34.88	27.24
			800	6.05	34.84	27.44
			1000	4.80	34.80	27.56
			1200.	4.39	34.83	27.63

STATION NO. 1-1A-5

DATE 23 4 1951 LAT. 24° 40' N. LONG. 90° 07' W.
Day Month Year

TIME 1417 DEPTH 2000 MAX. SAMPLE DEPTH 1257 WIRE ANGLE 28 °
GCT Faths. Meters

WATER COLOR - WEATHER 01 SEA 1 SWELL 075 ° T. 5 ft.
Code Code Code Direction Hgt.

7 sec. CLOUDS Cu 6 TEMP. 77.6 °F. 74.0 °F.
Period Type Amount Dry Wet

BAR. 30.01 in. REL. HUM. 83% WIND 080 ° T. 3 VIS. 8
Direction Force Code

OBSERVED VALUES

Depth	Temp. °C	Sal. ‰	Inorg. PO_4-P	NO_3-N	Carb. Mg/l	Prot. Mg/l
0	24.11	36.24				
13	24.23	36.13	0	1.3	0.4	0
30	23.59	36.47				
62	22.64	36.49				
90	21.07	36.35				
120	19.48	36.51				
179	16.23	36.08				
240	14.01	35.70				
358	10.49	35.19				
484	8.32	34.90				
736	5.91	35.23				
995	4.90	35.16	1.8	16.6	3.6[a]	1.6
1257	4.33	34.79				
* 2500	---	---	0.5	0.9	3.0	0

(a) green carbohydrates

* Uncorrected depth

STATION NO. 1-1A-5

VALUES AT STANDARD DEPTHS

Depth	Temp. °C	Sal. ‰	σ_t
0	24.11	36.24	24.57
10	24.25	36.15	24.46
20	23.90	36.14	24.55
30	23.59	36.47	24.90
50	22.95	36.50	25.10
75	21.90	36.41	25.34
100	20.70	36.38	25.64
150	17.70	36.39	26.43
200	15.40	35.92	26.61
250	13.60	35.63	26.78
300	11.98	35.40	26.92
400	9.65	35.07	27.09
500	8.09	34.91	27.21
600	6.99	35.06	27.49
700	6.12	35.21	27.72
800	5.60	35.22	27.80
1000	4.90	35.16	27.84
1200	4.65	34.87	27.63

STATION NO. 1-1A-6

DATE 23 4 1951 (Day Month Year) LAT. 24° 00' N. LONG. 90° 00' W.

TIME 2300 (GCT) DEPTH 1900 (Faths.) MAX. SAMPLE DEPTH 1292 (Meters) WIRE ANGLE 5 °

WATER COLOR - (Code) WEATHER 01 (Code) SEA 1 (Code) SWELL 075 (Direction) ° T. 4 (Hgt.) ft.

5 (Period) sec. CLOUDS Sc Cu (Type) 2 5 (Amount) TEMP. 77.6 (Dry) °F. 74.4 (Wet) °F.

BAR. 30.02 in. REL. HUM. 83 % WIND 080 (Direction) ° T. 1 (Force) VIS. 9 (Code)

OBSERVED VALUES			VALUES AT STANDARD DEPTHS			
Depth	Temp. °C.	Sal. ‰	Depth	Temp. °C	Sal. ‰	σ_t
0	24.39	36.26	0	24.39	36.26	24.50
13	24.12	36.35	10	24.10	36.32	24.63
29	23.34	36.44	20	23.64	36.39	24.82
63	22.65	36.56	30	23.34	36.46	24.96
92	21.90	36.53	50	22.87	36.53	25.15
124	20.27	36.35	75	22.38	36.56	25.31
182	15.89	36.02	100	21.38	36.48	25.53
241	12.88	35.52	150	18.60	36.16	26.03
355	9.65	35.05	200	14.70	35.92	26.76
483	7.82	34.67	250	12.45	35.46	26.88
1011	7.02	34.79	300	11.00	35.21	26.96
1292	5.23	34.83	400	8.83	34.87	27.06
			500	7.78	34.65	27.05
			600	7.45	34.63	27.08
			700	7.20	34.67	27.15
			800	7.10	34.71	27.20
			1000	7.02	34.78	27.26
			1200	5.98	34.82	27.43

STATION NO. 1-1A-7

DATE 24 4 1951 (Day Month Year) LAT. 23° 15' N. LONG. 90° 00' W.

TIME 0749 (GCT) DEPTH 420 (Faths.) MAX. SAMPLE DEPTH 296 (Meters) WIRE ANGLE 8 °

WATER COLOR - (Code) WEATHER 01 (Code) SEA 2 (Code) SWELL --- (Direction) ° T. 4 (Hgt.) ft.

6 (Period) sec. CLOUDS Cu (Type) 2 (Amount) TEMP. 76.6 (Dry) °F. 73.5 (Wet) °F.

BAR. 30.02 in. REL. HUM. 87% WIND 045 (Direction) ° T. 2 (Force) VIS. 8 (Code)

OBSERVED VALUES

Depth	Temp. °C	Sal. ‰	Inorg. PO_4-P	NO_3-N	Carb. Mg/l	Prot. Mg/l
0	24.65	36.27	0.1	0.5	0	1.2
10	24.47	36.36				
25	24.28	36.40				
50	23.66	36.45				
75	22.93	36.49				
99	22.15	36.47				
148	18.10	36.11				
198	14.64	35.90	1.1	12.2	1.1	0
296	12.01	35.50				
*400	---	---	0.6	13.4	0[a]	0

(a) green carbohydrates
*Uncorrected depth

VALUES AT STANDARD DEPTHS

Depth	Temp. °C.	Sal. ‰	σ_t
0	24.65	36.27	24.43
10	24.47	36.35	24.54
20	24.33	36.39	24.61
30	24.12	36.41	24.69
50	23.66	36.45	24.86
75	22.93	36.49	25.10
100	22.15	36.47	25.31
150	17.67	36.11	26.22
200	14.55	35.90	26.78
250	13.14	35.67	26.90
300	11.97	35.49	26.99

STATION NO. 1-1A-8

DATE 24 4 1951 LAT. 22° 25' N. LONG. 90° 00' W.
Day Month Year

TIME 1608 DEPTH 28 MAX. SAMPLE DEPTH 50 WIRE ANGLE 5 °
GCT Faths. Meters

WATER COLOR - WEATHER 01 SEA 2 SWELL 060 ° T. 4 ft.
Code Code Code Direction Hgt.

5 sec. CLOUDS Cu 2 TEMP. 80.0 °F. 75.6 °F.
Period Type Amount Dry Wet

BAR. 30.05 in. REL. HUM. 81 % WIND 060 ° T. 2 VIS. 9
Direction Force Code

OBSERVED VALUES			VALUES AT STANDARD DEPTHS			
Depth	Temp. °C.	Sal. ‰	Depth	Temp. °C.	Sal. ‰	σ_t
0	24.58	36.51	0	24.58	36.51	24.63
10	24.53	36.51	10	24.53	36.51	24.65
25	24.29	36.62	20	24.38	36.62	24.77
50	23.64	36.51	30	24.11	36.62	24.85
			50	23.64	36.51	24.91

STATION NO. 1-1A-10

DATE 25 4 1951 LAT. 22° 30' N. LONG. 88° 46' W.
Day Month Year

TIME 1826 DEPTH 29 MAX. SAMPLE DEPTH 40 WIRE ANGLE 8 °
GCT Faths. Meters

WATER COLOR - WEATHER 00 SEA 2 SWELL -- ° T. 6 ft.
Code Code Code Direction Hgt.

6 sec. CLOUDS -- -- TEMP. 80.0 °F. 75.1 °F.
Period Type Amount Dry Wet

BAR. 30.00 in. REL. HUM. 79% WIND 080 ° T. 3 VIS. 9
Direction Force Code

OBSERVED VALUES

Depth	Temp. °C	Sal. ‰	Inorg. PO_4-P	NO_3-N	Carb. Mg/l	Prot. Mg/l
0	24.38	36.26	1.4	0.6	8.3	0.0
5	24.25	36.26				
20	23.70	36.26	0.1	0.8	5.2	0.0
40	22.03	36.35	0.0	0.9	7.7	0.0

VALUES AT STANDARD DEPTHS

Depth	Temp. °C.	Sal. ‰	σ_t
0	24.38	36.26	24.50
10	24.11	36.26	24.58
20	23.70	36.26	24.70
30	23.05	36.29	24.92

STATION NO. 1-1A-11

DATE 26 4 1951 LAT. 22° 30' N. LONG. 88° 00' W.
Day Month Year

TIME 0310 DEPTH 25 MAX. SAMPLE DEPTH 34 WIRE ANGLE 12 °
GCT Faths. Meters

WATER COLOR - WEATHER 00 SEA 2 SWELL 080 ° T. 5 ft.
Code Code Code Direction Hgt.

4 sec. CLOUDS -- -- TEMP. 77.0 °F. 74.0 °F.
Period Type Amount Dry Wet

BAR. 30.01 in. REL. HUM. 87% WIND 090 ° T. 4 VIS. 8
Direction Force Code

OBSERVED VALUES

Depth	Temp. °C.	Sal. ‰	Inorg. PO_4-P	NO_3-N	Carb. Mg/l	Prot. Mg/l
0	24.52	36.29	3.6	0.5	2.0	0.0
10	24.52	36.27				
24	22.88	36.17	0.1	0.4	0.1	0.0
34	21.75	36.24	1.4	0.6	3.6	0.0

VALUES AT STANDARD DEPTHS

Depth	Temp. °C.	Sal. ‰	σ_t
0	24.52	36.29	24.48
10	24.52	36.27	24.47
20	23.60	36.18	24.67
30	22.25	36.18	25.06

STATION NO. 1-1A-12

DATE 26 4 1951 (Day Month Year) LAT. 22° 30' N. LONG. 87° 14' W.

TIME 1235 (GCT) DEPTH 25 (Faths.) MAX. SAMPLE DEPTH 30 (Meters) WIRE ANGLE 3 °

WATER COLOR - (Code) WEATHER 01 (Code) SEA 2 (Code) SWELL 090 (Direction) ° T. 5 (Hgt.) ft.

5 (Period) sec. CLOUDS Sc Cu (Type) 1 2 (Amount) TEMP. 77.5 (Dry) °F. 73.9 (Wet) °F.

BAR. 30.29 in. REL. HUM. 85 % WIND 090 (Direction) ° T. 3 (Force) VIS. 8 (Code)

OBSERVED VALUES			VALUES AT STANDARD DEPTHS			
Depth	Temp. °C.	Sal. ‰	Depth	Temp. °C.	Sal. ‰	σ_t
0	24.23	35.88	0	24.23	35.88	24.26
10	23.73	36.13	10	23.73	36.13	24.60
30	20.63	36.11	20	21.45	36.12	25.24
			30	20.63	36.11	25.46

STATION NO. 1-1A-13

DATE 26 4 1951 LAT. 22° 30' N. LONG. 86° 25' W.
Day Month Year

TIME 1935 DEPTH 300 MAX. SAMPLE DEPTH 426 WIRE ANGLE 23 °
GCT Faths. Meters

WATER COLOR - WEATHER 01 SEA 2 SWELL 040 ° T. 7 ft.
Code Code Code Direction Hgt.

6 sec. CLOUDS Sc Cu 1 3 TEMP. 84.0 °F. 75.8 °F.
Period Type Amount Dry Wet

BAR. 30.00 in. REL. HUM. 69 % WIND 045 ° T. 3 VIS. 9
Direction Force Code

OBSERVED VALUES

Depth	Temp. °C.	Sal. ‰	Inorg. PO_4-P	NO_3-N	Carb. Mg/l	Prot. Mg/l
0	27.13	35.79	0.0	0.3	4.3	0.4
9	26.92	35.71				
23	26.88	35.75				
46	26.22	35.82				
69	24.87	35.91				
91	24.24	36.45				
139	20.87	36.67				
181	---	36.40				
219	---	36.08	0.5	10.2	5.7	0.0
256	15.50	35.84				
294	14.71	35.86				
334	13.09	35.53				
376	10.88	35.26				
422	9.60	35.25	1.4	19.1	1.8[a]	1.5
426	9.34	---				

(a) Green carbohydrates

STATION NO. 1-1A-13

VALUES AT STANDARD DEPTHS			
Depth	Temp. °C	Sal. ‰	σ_t
0	27.13	35.79	23.29
10	26.92	35.71	23.30
20	26.88	35.74	23.33
30	26.70	35.77	23.41
50	26.02	35.83	23.67
75	24.68	35.98	24.20
100	24.19	36.52	24.75
150	20.00	36.65	26.04
200	16.50	36.24	26.60
250	15.70	35.84	26.48
300	13.45	35.84	26.97
400	10.12	35.25	27.15

STATION NO. 1-1A-14

DATE 27 4 1951 LAT. 22° 30' N. LONG. 85° 48' W.
Day Month Year

TIME 0545 DEPTH 600 MAX. SAMPLE DEPTH 764 WIRE ANGLE 23°
GCT Faths. Meters

WATER COLOR - WEATHER 01 SEA 2 SWELL 070 ° T. 4 ft.
Code Code Code Direction Hgt.

5 sec. CLOUDS Cu 3 TEMP. 78.3 °F. 74.4 °F.
Period Type Amount Dry Wet

BAR: 34.04 in. REL. HUM. 83% WIND 070 ° T. 4 VIS. 8
Direction Force Code

OBSERVED VALUES			VALUES AT STANDARD DEPTHS			
Depth	Temp. °C	Sal. ‰	Depth	Temp. °C	Sal. ‰	σ_t
0	26.37	35.71	0	26.37	35.71	23.47
9	26.38	35.68	10	26.40	35.68	23.44
23	26.38	35.81	20	26.39	35.81	23.54
46	25.47	35.68	30	26.17	35.79	23.60
69	24.95	35.75	50	25.33	35.69	23.78
92	24.79	36.08	75	24.90	35.80	24.00
138	24.80	36.17	100	24.80	36.13	24.28
174	24.27	36.09	150	24.72	36.15	24.32
235	---	36.74	200	21.95	36.39	25.31
287	17.49	36.42	250	19.20	36.70	26.29
342	15.76	36.24	300	17.07	36.38	26.57
413	13.78	35.81	400	14.10	35.86	26.85
487	11.68	35.53	500	11.43	35.49	27.10
576	10.16	35.28				
764	---	35.75				

STATION NO. 1-1A-15

DATE 27 4 1951 (Day Month Year) LAT. 22° 30' N. LONG. 85° 25' W.

TIME 1248 (GCT) DEPTH 1100 (Faths.) MAX. SAMPLE DEPTH 2299 (Meters) WIRE ANGLE 10 °

WATER COLOR - (Code) WEATHER 01 (Code) SEA 2 (Code) SWELL --- (Direction) ° T. 7 (Hgt.) ft.

5 (Period) sec. CLOUDS Sc Cu (Type) 1 1 (Amount) TEMP. 78.2 (Dry) °F. 73.4 (Wet) °F.

BAR. 30.06 in. REL. HUM. 80 % WIND 045 (Direction) ° T. 3 (Force) VIS. 9 (Code)

OBSERVED VALUES

Depth	Temp. °C	Sal. ‰	Inorg. PO_4-P	NO_3-N	Carb. Mg/l	Prot. Mg/l
0	26.09	35.77	0.0	1.1	0.0	1.1
14	26.06	35.73				
33	25.94	35.81				
71	24.94	35.93				
105	24.01	36.26				
142	22.95	36.71				
212	19.75	36.69				
280	17.85	36.44				
408	---	35.88				
541	10.96	35.35				
796	6.43	34.88				
1058	4.91	34.85	1.0	21.1[b]	2.0[a]	0.0
1329	4.29	34.92				
1611	4.21	34.94				
2299	---	34.92	2.4	23.3[b]	2.8[a]	0.0

(a) Green carbohydrates
(b) Indicates not in accurate range of curve- value probably somewhat higher.

STATION NO. 1-1A-15

VALUES AT STANDARD DEPTHS

Depth	Temp. °C	Sal. ‰	σ_t
0	26.09	35.77	23.61
10	26.09	35.74	23.58
20	26.02	35.74	23.61
30	25.99	35.78	23.65
50	25.55	35.86	23.84
75	24.75	35.94	24.15
100	24.07	36.07	24.45
150	22.59	36.71	25.37
200	20.17	36.70	26.03
250	18.63	36.59	26.35
300	17.10	36.30	26.50
400	14.35	35.90	26.83
500	11.80	35.45	27.00
600	9.50	35.25	27.25
700	7.64	35.05	27.39
800	6.44	34.88	27.42
1000	5.16	34.84	27.55
1200	4.49	34.89	27.67
1500	4.20	34.93	27.73

STATION NO. 1-1A-16

DATE 27 4 1951 LAT. 22° 30' N. LONG. 85° 07' W.
Day Month Year

TIME 1900 DEPTH 1200 MAX. SAMPLE DEPTH 1210 WIRE ANGLE 14 °
GCT Faths. Meters

WATER COLOR - WEATHER 01 SEA 2 SWELL --- ° T. - ft.
Code Code Code Direction Hgt.

4 sec. CLOUDS Sc Cu 1 1 TEMP. 78.5 °F. 73.1 °F.
Period Type Amount Dry Wet

BAR. 30.04 in. REL. HUM. 77% WIND 045 ° T. 3 VIS. 9
Direction Force Code

OBSERVED VALUES			VALUES AT STANDARD DEPTHS			
Depth	Temp. °C	Sal. ‰	Depth	Temp. °C	Sal. ‰	σ_t
0	26.16	35.82	0	26.16	35.82	23.62
10	25.86	35.86	10	25.86	35.86	23.75
29	25.55	35.86	20	25.70	35.86	23.80
58	25.10	35.88	30	25.55	35.86	23.84
87	24.97	36.06	50	25.21	35.87	23.95
115	24.41	36.26	75	25.00	35.97	24.09
170	22.81	36.76	100	24.77	36.14	24.29
223	---	36.73	150	23.53	36.58	25.00
324	15.77	36.04	200	21.31	36.76	25.77
508	11.51	35.46	250	19.03	36.45	26.14
600	7.50	34.85	300	16.81	36.11	26.43
802	6.14	34.74	400	14.00	35.85	26.86
1003	5.10	34.79	500	11.80	35.53	27.06
1210	4.74	34.87	600	7.50	34.85	27.25
			700	6.75	34.76	27.29
			800	6.13	34.74	27.35
			1000	5.10	34.79	27.52
			1200	4.78	34.87	27.62

STATION NO. 1-1A-17

DATE 28 4 1951 LAT. 22° 30' N. LONG. 84° 45' W.
Day Month Year

TIME 0045 DEPTH 1000 MAX. SAMPLE DEPTH 1208 WIRE ANGLE 21 °
GCT Faths. Meters

WATER COLOR - WEATHER 01 SEA 2 SWELL 050 ° T. 5 ft.
Code Code Code Direction Hgt.

4 sec. CLOUDS Cu 3 TEMP. 78.4 °F. 73.2 °F.
Period Type Amount Dry Wet

BAR. 30.00 in. REL. HUM. 78 % WIND 060 ° T. 4 VIS. 8
Direction Force Code

OBSERVED VALUES

Depth	Temp. °C	Sal. ‰	Inorg. PO_4-P	NO_3-N	Carb. Mg/l	Prot. Mg/l
0	25.95	35.82	0.0	0.5	2.2	0.0
14	25.94	35.84				
33	25.59	35.82				
70	24.90	35.95				
103	---	36.24				
139	21.97	36.87				
265	19.93	36.47				
377	---	35.86				
487	12.06	35.48				
580	9.01	35.21				
685	6.70	34.85	2.1	24.4[b]	1.8	4.0
931	4.97	34.90				
1208	4.35	34.92				
*1200	--	---	2.8	20.4	7.4	0.0

*Uncorrected depth
(b) Indicates not in accurate range of curve- value probably somewhat higher.

STATION NO. 1-1A-17

VALUES AT STANDARD DEPTHS

Depth	Temp. °C	Sal. ‰	σ_t
0	25.95	35.82	23.69
10	25.95	35.84	23.70
20	25.88	35.83	23.72
30	25.63	35.82	23.79
50	25.30	35.88	23.93
75	24.61	35.98	24.22
100	23.55	36.19	24.69
150	21.80	36.87	25.71
200	21.00	36.80	25.88
250	20.28	36.56	25.89
300	18.74	36.20	26.02
400	15.13	35.78	26.56
500	11.51	35.46	27.06
600	8.39	35.14	27.34
700	6.53	34.84	27.38
800	5.68	34.86	27.50
1000	4.78	34.91	27.65
1200	4.36	34.92	27.71

STATION NO. 1-1A-18

DATE 28 4 1951 LAT. 22° 30' N. LONG. 84° 32' W.
Day Month Year

TIME 0443 DEPTH 600 MAX. SAMPLE DEPTH 448 WIRE ANGLE 20 °
GCT Faths. Meters

WATER COLOR - WEATHER 01 SEA 2 SWELL --- ° T. - ft.
Code Code Code Direction Hgt.

--- sec. CLOUDS Cu 3 TEMP. 77.8 °F. 72.9 °F.
Period Type Amount Dry Wet

BAR. 30.03 in. REL. HUM. 79% WIND 050 ° T. 4 VIS. 8
Direction Force Code

OBSERVED VALUES			VALUES AT STANDARD DEPTHS			
Depth	Temp. °C	Sal. ‰	Depth	Temp. °C	Sal. ‰	σ_t
0	26.06	35.90	0	26.06	35.90	23.71
9	26.05	35.81	10	26.15	35.81	23.65
23	26.07	35.79	20	26.07	35.79	23.63
46	25.70	35.81	30	26.00	35.79	23.65
69	---	35.84	50	25.61	35.81	23.79
92	24.56	35.95	75	24.99	35.86	24.01
137	23.32	36.62	100	24.36	36.04	24.34
182	21.79	36.67	150	22.87	36.65	25.24
268	---	36.36	200	21.30	36.67	25.70
356	16.70	35.93	250	19.81	36.65	26.09
448	13.90	35.82	300	18.34	36.56	26.40
			400	15.26	35.86	26.59

STATION NO. 1-1A-20

DATE 28 4 1951 LAT. 23° 28' N. LONG. 84° 32' W.
Day Month Year

TIME 1452 DEPTH 1540 MAX. SAMPLE DEPTH 1296 WIRE ANGLE 37 °
GCT Faths Meters

WATER COLOR - WEATHER 01 SEA 2 SWELL 045 ° T. 3 ft.
Code Code Code Direction Hgt.

4 sec. CLOUDS Cu 1 TEMP. 79.5 °F. 73.0 °F.
Period Type Amount Dry Wet

BAR. 30.05 in. REL. HUM. 74 % WIND 045 ° T. 4 VIS. 9
Direction Force Code

OBSERVED VALUES

Depth	Temp. °C	Sal. ‰	Inorg. PO_4-P	NO_3-N	Carb. Mg/l	Prot. Mg/l
0	26.09	35.70	0.0	0.9	0	1.0
8	26.10	35.64				
24	26.09	35.62				
48	26.06	35.55				
72	25.52	35.64				
98	25.06	35.82				
148	24.05	36.18				
199	23.09	36.82				
304	---	36.42				
405	---	36.04				
515	12.75	35.66				
621	10.13	35.28	1.7	25.3[b]	1.5[a]	0.2
845	7.05	34.92				
1064	5.43	---				
1275	4.57	---	1.5	19.4	7.2[a]	0.0

(a) Green carbohydrates
(b) Indicates not in accurate range of curve- value probably somewhat higher.

STATION NO. 1-1A-20

VALUES AT STANDARD DEPTHS			
Depth	Temp. °C	Sal. ‰	σ_t
0	26.09	35.70	23.55
10	26.10	35.64	23.51
20	26.09	35.63	23.50
30	26.09	35.59	23.47
50	26.06	35.55	23.45
75	25.52	35.64	23.69
100	25.09	35.81	23.95
150	24.12	36.14	24.49
200	23.19	36.80	25.26
250	22.05	36.71	25.52
300	20.70	36.51	25.74
400	17.50	36.10	26.25
500	14.09	35.77	26.78
600	11.09	35.45	27.13
700	9.16	35.15	27.23
800	7.60	34.97	27.33
1000	5.85	34.93	27.54
1200	4.85	34.98	27.70

STATION NO. 1-1A-21

DATE 29 4 1951 LAT. 23° 15' N. LONG. 83° 35' W.
Day Month Year

TIME 0052 DEPTH 1350 MAX. SAMPLE DEPTH 1201 WIRE ANGLE 34 °
GCT Faths. Meters

WATER COLOR - WEATHER 01 SEA 3 SWELL 045 ° T. 9 ft.
Code Code Code Direction Hgt.

6 sec. CLOUDS Sc Cu 1 2 TEMP. 78.6 °F. 74.0 °F.
Period Type Amount Dry Wet

BAR. 29.94 in. REL. HUM. 81% WIND 045 ° T. 4 VIS. 8
Direction Force Code

OBSERVED VALUES			VALUES AT STANDARD DEPTHS			
Depth	Temp. °C	Sal. ‰	Depth	Temp. °C	Sal. ‰	σ_t
0	26.23	35.68	0	26.23	35.68	23.50
8	25.24	35.68	10	26.25	35.67	23.48
25	25.96	35.66	20	26.20	35.66	23.49
49	25.59	35.68	30	25.93	35.66	23.57
74	---	35.79	50	25.55	35.70	23.72
99	24.83	35.90	75	25.10	35.80	23.94
150	24.36	36.44	100	24.85	35.94	24.12
201	21.32	36.80	150	24.30	36.47	24.68
302	---	36.35	200	21.40	36.80	25.77
399	14.86	35.93	250	19.30	36.76	26.31
500	12.56	35.50	300	17.50	36.35	26.45
596	9.96	35.08	400	14.80	35.92	26.74
797	6.90	34.81	500	12.56	35.50	26.89
996	5.35	34.90	600	9.80	35.07	27.06
1201	4.61	34.85	700	8.15	34.89	27.19
			800	6.85	34.81	27.31
			1000	5.32	34.90	27.58
			1200	4.60	34.85	27.62

STATION NO. 1-1A-22

DATE 29 4 1951 LAT. 23° 15' N. LONG. 82° 50' W.
Day Month Year

TIME 0858 DEPTH 1000 MAX. SAMPLE DEPTH 1188 WIRE ANGLE 20°
GCT Faths. Meters

WATER COLOR - WEATHER 01 SEA 2 SWELL 090 ° T. 8 ft.
Code Code Code Direction Hgt.

7 sec. CLOUDS Cu 1 TEMP. 77.9 °F. 73.2 °F.
Period Type Amount Dry Wet

BAR. 29.91 in. REL. HUM. 79 % WIND 090 ° T. 4 VIS. 8
Direction Force Code

OBSERVED VALUES			VALUES AT STANDARD DEPTHS			
Depth	Temp. °C	Sal. ‰	Depth	Temp. °C	Sal. ‰	σ_t
0	26.47	35.71	0	26.47	35.71	23.44
9	26.49	35.75	10	26.48	35.75	23.47
28	26.52	35.88	20	26.50	35.86	23.55
57	25.99	35.88	30	26.50	35.88	23.56
86	24.17	35.95	50	26.15	35.88	23.67
116	23.79	35.93	75	24.60	35.94	24.19
176	21.80	---	100	23.99	35.96	24.39
236	20.30	36.55	150	22.60	36.09	24.89
357	15.56	36.04	200	21.10	36.39	25.54
595	9.02	35.01	250	19.49	36.54	26.09
712	7.30	34.85	300	17.29	36.25	26.42
952	5.48	34.83	400	13.82	35.84	26.89
1188	4.56	34.87	500	11.12	35.40	27.08
			600	9.00	35.00	27.14
			700	7.45	34.85	27.26
			800	6.50	34.82	27.37
			1000	5.20	34.83	27.54
			1200	4.50	34.88	27.66

STATION NO. 1-1A-23

DATE 29 4 1951 LAT. 23° 11' N. LONG. 82° 24' W.
Day Month Year

TIME 1406 DEPTH 600 MAX. SAMPLE DEPTH 724 WIRE ANGLE 20°
GCT Faths. Meters

WATER COLOR - WEATHER 01 SEA 2 SWELL 090 ° T. 5 ft.
Code Code Code Direction Hgt.

6 sec. CLOUDS Cu 1 TEMP. 79.0 °F. 73.6 °F.
Period Type Amount Dry Wet

BAR. 29.91 in. REL. HUM. 77 % WIND 090 ° T. 3 VIS. 9
Direction Force Code

OBSERVED VALUES

Depth	Temp. °C	Sal. ‰	Inorg. PO_4-P	NO_3-N	Carb. Mg/l	Prot. Mg/l
0	26.28	35.79	0.0	1.3	2.1	0.0
9	26.29	35.81				
24	26.20	35.82				
48	25.37	35.79				
72	24.92	35.97				
97	23.89	36.02				
205	21.38	36.62				
257	---	36.49				
309	17.10	36.26				
365	15.58	36.11	2.2	18.0	0.0[a]	0.0
416	14.52	---				
518	11.53	35.53				
624	9.38	35.23				
724	7.72	35.03	2.8	19.2	3.5[a]	0.0

(a) Green carbohydrates

STATION NO. 1-1A-23

VALUES AT STANDARD DEPTHS			
Depth	Temp. °C	Sal. ‰	σ_t
0	26.28	35.79	23.56
10	26.29	35.81	23.57
20	26.18	35.82	23.62
30	25.89	35.81	23.70
50	25.28	35.79	23.87
75	24.80	35.98	24.16
100	23.85	36.03	24.49
150	23.19	36.41	24.97
200	21.50	36.61	25.60
250	19.36	36.51	26.10
300	17.37	36.30	26.44
400	14.89	35.94	26.74
500	12.00	35.59	27.07
600	9.80	35.23	27.18
700	8.09	35.08	27.34

STATION NO. 1-1A-24

DATE 29 4 1951 LAT. 23° 27 N. LONG. 82° 24 W.
Day Month Year

TIME 1837 DEPTH 900 MAX. SAMPLE DEPTH 875 WIRE ANGLE 22 °
GCT Faths. Meters

WATER COLOR - WEATHER 01 SEA 3 SWELL --- ° T. 8 ft.
Code Code Code Direction Hgt.

6 sec. CLOUDS Cb Cu 1 2 TEMP. 78.5 °F. 73.8 °F.
Period Type Amount Dry Wet

BAR. 29.90 in. REL. HUM. 83 % WIND 090 ° T. 4 VIS. 9
Direction Force Code

OBSERVED VALUES			VALUES AT STANDARD DEPTHS			
Depth	Temp. °C	Sal. ‰	Depth	Temp. °C	Sal. ‰	σ_t
0	26.62	36.35	0	26.62	36.35	23.88
9	26.56	36.31	10	26.56	36.31	23.87
27	26.50	36.09	20	26.52	36.19	23.79
53	25.18	36.42	30	26.46	36.09	23.73
79	23.69	36.49	50	25.70	36.42	24.22
104	23.39	36.53	75	23.80	36.49	24.85
197	19.32	36.67	100	23.45	36.52	24.97
363	---	36.29	150	22.14	36.62	25.43
446	---	35.84	200	19.30	36.66	26.23
529	9.78	35.19	250	16.75	36.41	26.67
700	8.13	35.01	300	14.70	36.15	26.94
875	6.82	34.90	400	12.15	35.61	27.05
			500	10.20	35.24	27.12
			600	9.04	35.09	27.20
			700	8.13	35.01	27.28
			800	7.43	34.94	27.33

STATION NO. 1-1A-25

DATE 29 4 1951 LAT. 23° 46' N. LONG. 82° 24' W.
Day Month Year

TIME 2310 DEPTH 800 MAX. SAMPLE DEPTH 892 WIRE ANGLE - °
GCT Faths. Meters

WATER COLOR - WEATHER 01 SEA 2 SWELL 090 °T. 6 ft.
Code Code Code Direction Hgt.

--- sec. CLOUDS Cs 7 TEMP. 77.0 °F. 74.0 °F.
Period Type Amount Dry Wet

BAR. 29.89 in. REL. HUM. 87 % WIND 090 ° T. 5 VIS. 8
Direction Force Code

OBSERVED VALUES			VALUES AT STANDARD DEPTHS			
Depth	Temp. °C	Sal. ‰	Depth	Temp. °C	Sal. ‰	σ_t
0	24.83	36.06	0	24.83	36.06	24.21
9	24.73	36.09	10	24.73	36.09	24.27
27	23.53	36.15	20	24.05	36.12	24.49
55	22.29	36.27	30	23.50	36.10	24.69
82	21.40	36.42	50	22.41	36.26	25.08
109	19.76	36.42	75	21.66	36.42	25.41
152	17.68	36.35	100	20.70	36.43	25.68
212	15.34	35.91	150	18.20	36.38	26.30
306	12.35	35.53	200	15.80	36.03	26.60
388	9.73	35.19	250	14.10	35.74	26.76
556	7.19	34.96	300	12.50	35.53	26.92
725	6.31	34.92	400	9.51	35.16	27.18
892	5.49	34.94	500	7.78	35.00	27.33
			600	6.95	34.94	27.40
			700	6.44	34.92	27.45
			800	5.93	34.93	27.53

STATION NO. 1-1A-26

DATE 30 4 1951 LAT. 24° 03' N. LONG. 82° 24' W.
Day Month Year

TIME 0311 DEPTH 350 MAX. SAMPLE DEPTH 298 WIRE ANGLE 0 °
GCT Faths. Meters

WATER COLOR - WEATHER 01 SEA 2 SWELL 090 ° T. 3 ft.
Code Code Code Direction Hgt.

4 sec. CLOUDS Cu 3 TEMP. 77.0 °F. 75.1 °F.
Period Type Amount Dry Wet

BAR. 29.91 in. REL. HUM. 91 % WIND 090 ° T. 3 VIS. 8
Direction Force Code

OBSERVED VALUES			VALUES AT STANDARD DEPTHS			
Depth	Temp. °C	Sal. ‰	Depth	Temp. °C	Sal. ‰	σ_t
0	24.72	36.17	0	24.72	36.17	24.33
10	24.68	36.13	10	24.68	36.13	24.31
25	24.43	36.09	20	24.48	36.09	24.34
49	21.70	36.38	30	23.70	36.18	24.64
74	19.67	36.31	50	21.70	36.38	25.37
99	16.79	36.20	75	19.20	36.30	25.98
148	13.57	35.70	100	16.70	36.20	26.52
198	13.41	35.55	150	13.56	35.69	26.83
298	9.83	35.19	200	13.39	35.54	26.75
			250	11.80	35.34	26.91
			300	9.80	35.19	27.15

STATION NO. 1-1A-27

DATE 4 5 1951 (Day Month Year) LAT. 24° 22' N. LONG. 82° 24' W.

TIME 0047 (GCT) DEPTH 70 (Faths.) MAX. SAMPLE DEPTH 100 (Meters) WIRE ANGLE 0 °

WATER COLOR - (Code) WEATHER 04 (Code) SEA 1 (Code) SWELL 330 (Direction) ° T. 1 (Hgt.) ft.

8 (Period) sec. CLOUDS - (Type) -- (Amount) TEMP. 77.9 (Dry) °F. 71.1 (Wet) °F.

BAR. 29.89 in. REL. HUM. 71 % WIND 330 (Direction) °T. 1 (Force) VIS. 7 (Code)

OBSERVED VALUES			VALUES AT STANDARD DEPTHS			
Depth	Temp. °C	Sal. ‰	Depth	Temp. °C	Sal. ‰	σ_t
0	25.51	36.06	0	25.51	36.06	24.01
10	24.85	36.02	10	24.85	36.02	24.18
25	23.12	36.09	20	23.09	36.05	24.72
50	20.24	36.24	30	22.51	36.13	24.95
75	16.38	36.02	50	20.24	36.24	25.66
100	13.84	35.71	75	16.38	36.02	26.46
			100	13.84	35.71	26.79

STATION NO. 1-1A-28

DATE 4 5 1951 (Day Month Year) LAT. 24° 22' N. LONG. 83° 27'W.

TIME 0916 (GCT) DEPTH 320 (Faths.) MAX. SAMPLE DEPTH 360 (Meters) WIRE ANGLE 16°

WATER COLOR - (Code) WEATHER 00 (Code) SEA 1 (Code) SWELL 345 (Direction) ° T. 1 (Hgt.) ft.

- (Period) sec. CLOUDS 00 (Type) 00 (Amount) TEMP. 76.0 °F. (Dry) 71.5 °F. (Wet)

BAR. 29.88in. REL. HUM. 80 % WIND 350 (Direction) ° T. 1 (Force) VIS. 8 (Code)

OBSERVED VALUES

Depth	Temp. °C	Sal. ‰	Inorg. PO_4-P	NO_3-N	Carb. Mg/l	Prot. Mg/l
0	25.16	36.35	0.1	0.5	2.9	1.8[c]
10	24.86	36.33				
24	24.71	36.35				
48	22.88	36.35				
71	21.92	36.69				
94	---	36.60				
139	12.81	35.86				
183	12.12	35.46	1.5	21.6[b]	7.8[a]	---
271	9.43	35.16				
360	8.10	35.07		18.2	10.3[a]	1.0

(a) Green carbohydrates
(b) Indicates not in accurate range of curve- value probably somewhat higher.
(c) Indicates cloudy sample.

STATION NO. 1-1A-28

VALUES AT STANDARD DEPTHS

Depth	Temp. °C	Sal. ‰	σ_t
0	25.16	36.35	24.33
10	24.86	36.33	24.41
20	24.72	36.34	24.46
30	24.40	36.35	24.56
50	22.80	36.38	25.06
75	21.70	36.69	26.60
100	19.02	36.58	26.24
150	12.78	35.74	27.03
200	11.79	35.40	26.96
250	10.00	35.22	27.14
300	9.00	35.12	27.23

STATION NO. 1-1A-29

DATE 4 5 1951 (Day Month Year) LAT. 24° 22' N. LONG. 83° 55' W.

TIME 1517 (GCT) DEPTH 600 (Faths.) MAX. SAMPLE DEPTH 484 (Meters) WIRE ANGLE 20°

WATER COLOR - (Code) WEATHER 04 (Code) SEA 1 (Code) SWELL 330 (Direction) ° T. 2 (Hgt.) ft.

5 (Period) sec. CLOUDS Ci (Type) 1 (Amount) TEMP. 81.5 (Dry) °F. 74.6 (Wet) °F.

BAR. 29.91 in. REL. HUM. 72 % WIND 330 (Direction) ° T. 1 (Force) VIS. 7 (Code)

OBSERVED VALUES

Depth	Temp. °C	Sal. ‰	Inorg. PO_4-P	NO_3-N	Carb. Mg/l	Prot. Mg/l
0	24.45	35.43	0.1	1.1	1.0	0.0
10	23.65	35.75				
24	22.56	35.90				
46	21.93	36.31				
68	21.68	36.56				
89	20.64	36.53				
126	19.04	36.38				
158	16.90	36.31				
218	14.42	35.90				
231	12.76	35.86				
345	11.38	35.50	1.3	14.9	3.9[a]	---
414	9.87	35.26				
484	10.06	35.32				
*800	---	---	---	10.9	1.2	---

*Uncorrected depth
(a) Green carbohydrates

STATION NO. 1-1A-29

VALUES AT STANDARD DEPTHS

Depth	Temp. °C	Sal. ‰	σ_t
0	24.45	35.43	23.85
10	23.65	35.75	24.33
20	22.80	35.90	24.69
30	22.38	36.05	24.93
50	21.89	36.37	25.31
75	21.50	36.56	25.56
100	20.21	36.48	25.85
150	17.29	36.33	26.48
200	15.05	36.10	26.83
250	13.47	35.88	27.00
300	12.35	35.80	27.16
400	10.07	35.26	27.16

STATION NO. 1-1A-30

DATE 5 5 1951 (Day Month Year) LAT. 24° 23' N. LONG. 84° 40' W.

TIME 0235 (GCT) DEPTH 1820 (Faths.) MAX. SAMPLE DEPTH 2278 (Meters) WIRE ANGLE 13°

WATER COLOR - (Code) WEATHER 01 (Code) SEA 2 (Code) SWELL 280 (Direction) ° T. 2 (Hgt.) ft.

5 (Period) sec. CLOUDS Cu (Type) 1 (Amount) TEMP. 78.8 (Dry) °F. 71.3 (Wet) °F.

BAR. 29.86 in. REL. HUM. 68 % WIND 280 (Direction) ° T. 2 (Force) VIS. 9 (Code)

OBSERVED VALUES			VALUES AT STANDARD DEPTHS			
Depth	Temp. °C	Sal. ‰	Depth	Temp. °C	Sal. ‰	σ_t
0	25.76	35.77	0	25.76	35.77	23.71
15	24.36	35.59	10	25.00	35.63	23.84
34	23.92	35.95	20	24.17	35.58	24.05
73	21.70	36.35	30	23.97	35.58	24.11
107	21.45	36.60	50	22.70	35.90	24.72
145	---	36.53	75	21.69	36.35	25.35
216	16.81	36.31	100	21.49	36.60	25.59
286	13.87	35.91	150	20.47	36.52	25.81
417	10.45	35.26	200	17.82	36.37	26.38
553	8.14	34.96	250	14.92	36.11	26.86
680	6.80	34.94	300	13.34	35.76	26.93
815	5.64	34.90	400	10.76	35.30	27.07
1076	4.72	34.94	500	8.88	35.04	27.19
1340	4.30	34.99	600	7.65	34.95	27.31
1610	4.21	34.96	700	6.55	34.94	27.45
2278	4.20	34.96	800	5.73	34.90	27.53
			1000	4.92	34.92	27.64
			1200	4.44	34.96	27.73
			1500	4.23	34.97	27.76
			2000	4.20	34.95	27.75

STATION NO. 1-1A-31

DATE 5 5 1951 (Day Month Year) LAT. 24° 22' N. LONG. 85° 31' W.

TIME 1320 (GCT) DEPTH 1800 (Faths.) MAX. SAMPLE DEPTH 761 (Meters) WIRE ANGLE 25°

WATER COLOR - (Code) WEATHER 13 (Code) SEA 2 (Code) SWELL 280 (Direction) ° T. 4 (Hgt.) ft.

4 (Period) sec. CLOUDS Sc Cu (Type) 2 2 (Amount) TEMP. 80.3 (Dry) °F. 73.0 (Wet) °F.

BAR. 29.90 in. REL. HUM. 72 % WIND 280 (Direction) ° T. 2 (Force) VIS. 9 (Code)

OBSERVED VALUES

Depth	Temp. °C	Sal. ‰	Inorg. PO_4-P	NO_3-N	Carb. Mg/l	Prot. Mg/l
0	26.12	35.91	1.6	0.4	16.9	0.0
14	26.09	35.88				
32	25.86	35.88				
68	25.05	35.91				
99	24.52	36.04				
134	23.88	36.26				
200	22.66	36.74				
265	19.64	36.73				
389	15.02	35.95				
516	10.84	35.26				
634	8.77	35.05				
761	7.08	34.90				
* 800	---	---	0.0	1.5	0.7	0.0
*1500	---	---	0.8	18.9	0.0[a]	0.5

*Uncorrected depth.
(a) Green carbohydrates

STATION NO. 1-1A-31

VALUES AT STANDARD DEPTHS			
Depth	Temp. °C	Sal. ‰	σ_t
0	26.12	35.91	23.70
10	26.09	35.88	23.69
20	26.02	35.88	23.71
30	25.87	35.88	23.76
50	25.47	35.89	23.89
75	24.86	35.94	24.11
100	24.45	36.04	24.31
150	23.70	36.40	24.81
200	22.66	36.74	25.37
250	20.49	36.75	25.98
300	18.45	36.60	26.40
400	14.45	35.83	26.75
500	11.25	35.31	26.99
600	9.30	35.11	27.17
700	7.85	34.97	27.29

STATION NO. 1-1A-32

DATE 5 5 1951 (Day Month Year) LAT. 24° 22' N. LONG. 86° 30' W.

TIME 2303 (GCT) DEPTH 1150 (Faths.) MAX. SAMPLE DEPTH 1813 (Meters) WIRE ANGLE 0 °

WATER COLOR - (Code) WEATHER 01 (Code) SEA 2 (Code) SWELL 330 (Direction) ° T. 4 (Hgt.) ft.

5 (Period) sec. CLOUDS Ci Cu (Type) 1 1 (Amount) TEMP. 80.1 (Dry) °F. 73.0 (Wet) °F.

BAR. 29.86 in. REL. HUM. 72 % WIND 270 (Direction) ° T. 3 (Force) VIS. 9 (Code)

OBSERVED VALUES			VALUES AT STANDARD DEPTHS			
Depth	Temp. °C	Sal. ‰	Depth	Temp. °C	Sal. ‰	σ_t
0	26.56	35.88	0	26.56	35.88	23.54
15	26.15	35.95	10	26.21	35.94	23.70
35	25.99	35.99	20	26.10	35.97	23.75
75	25.22	36.13	30	26.00	35.99	23.80
110	24.83	36.65	50	25.75	36.03	23.91
150	23.58	36.83	75	25.32	36.13	24.12
226	19.49	36.87	100	24.95	36.40	24.43
302	17.74	36.64	150	23.58	36.83	25.17
450	14.01	35.88	200	20.65	36.88	26.04
608	10.04	35.26	250	18.84	36.84	26.49
755	7.84	34.97	300	17.84	36.70	26.63
911	6.11	34.94	400	15.50	36.11	26.73
1213	4.52	34.97	500	12.75	35.64	26.96
1513	4.22	34.99	600	10.25	35.29	27.15
1813	4.19	35.05	700	8.60	35.05	27.24
			800	7.22	34.95	27.37
			1000	5.46	34.94	27.59
			1200	4.58	34.97	27.72
			1500	4.20	34.99	27.78

STATION NO. 1-1A-33

DATE 6 5 1951 (Day Month Year) LAT. 24° 22' N. LONG. 87° 15' W.

TIME 0530 (GCT) DEPTH 750 (Faths.) MAX. SAMPLE DEPTH 1167 (Meters) WIRE ANGLE 9 °

WATER COLOR - (Code) WEATHER 01 (Code) SEA 2 (Code) SWELL 270 (Direction) ° T. 5 (Hgt.) ft.

6 (Period) sec. CLOUDS Cu (Type) 2 (Amount) TEMP. 78.0 (Dry) °F. 72.5 (Wet) °F.

BAR. 29.91 in. REL. HUM. 77 % WIND 270 (Direction) ° T. 3 (Force) VIS. 8 (Code)

OBSERVED VALUES

Depth	Temp. °C	Sal. ‰	Inorg. PO_4-P	NO_3-N	Carb. Mg/l	Prot. Mg/l
0	27.19	36.04	0.1	0.6	0.0	2.5
10	27.18	36.04				
25	27.12	36.08				
54	26.07	36.20				
79	25.22	36.42				
108	23.39	36.98				
214	17.87	36.65				
312	15.89	36.09				
412	13.04	35.59				
507	10.37	35.21				
602	8.57	34.99	2.1	21.1[b]	10.6[a]	0.8
784	6.04	34.87				
973	4.78	34.87				
1167	4.34	34.92	2.4	21.5[b]	2.4[a]	0.0

(a) Green carbohydrates.
(b) Indicates not in accurate range of curve-value probably somewhat higher.

STATION NO. 1-1A-33

VALUES AT STANDARD DEPTHS

Depth	Temp. °C	Sal. ‰	σ_t
0	27.19	36.04	23.46
10	27.18	36.04	23.46
20	27.11	36.06	23.50
30	26.98	36.10	23.57
50	26.37	36.19	23.84
75	25.40	36.38	24.28
100	24.00	36.97	25.15
150	20.60	36.92	26.08
200	18.42	36.71	26.49
250	17.10	36.43	26.60
300	16.18	36.15	26.61
400	13.40	35.65	26.83
500	10.55	35.23	27.05
600	8.57	35.00	27.21
700	7.10	34.91	27.35
800	5.95	34.87	27.48
1000	4.73	34.88	27.63
1200	(4.35)	(34.93)	27.71

( ) Extrapolated values.

STATION NO. 1-1A-34

DATE 6 5 1951 (Day Month Year) LAT. 24° 38' N. LONG. 88° 12' W.

TIME 1245 (GCT) DEPTH 850 (Faths.) MAX. SAMPLE DEPTH 1381 (Meters) WIRE ANGLE 4 °

WATER COLOR - (Code) WEATHER 01 (Code) SEA 2 (Code) SWELL 000 (Direction) ° T. 3 (Hgt.) ft.

4 (Period) sec. CLOUDS Ci Cu (Type) 3,2,3 (Amount) TEMP. 78.2 (Dry) °F. 72.0 (Wet) °F.

BAR. 29.96 in. REL. HUM. 75 % WIND 000 (Direction) ° T. 3 (Force) VIS. 9 (Code)

OBSERVED VALUES			VALUES AT STANDARD DEPTHS			
Depth	Temp. °C	Sal. ‰	Depth	Temp. °C	Sal. ‰	σ_t
0	25.48	36.22	0	25.48	36.22	24.14
10	25.48	36.24	10	25.48	36.24	24.15
30	24.92	36.58	20	25.29	36.45	24.37
60	20.50	36.49	30	24.92	36.58	24.58
90	17.97	36.35	50	21.50	36.53	25.54
120	16.17	36.17	75	19.30	36.40	26.03
180	13.95	35.79	100	17.12	36.30	26.50
240	12.74	35.55	150	14.85	35.98	26.78
359	9.77	35.10	200	13.61	35.72	26.84
473	7.76	34.99	250	12.45	35.49	26.90
593	6.59	34.85	300	11.15	35.26	26.97
708	5.74	34.85	400	8.95	35.07	27.20
942	4.88	34.88	500	7.47	34.95	27.33
1166	4.36	34.88	600	6.53	34.84	27.38
1381	4.24	34.96	700	5.79	34.85	27.48
			800	5.38	34.86	27.54
			1000	4.70	34.88	27.64
			1200	4.31	34.89	27.69

STATION NO. 1-1A-35

DATE 6 5 51 (Day Month Year) LAT. 25° 09' N. LONG. 88° 00' W.

TIME 1836 (GCT) DEPTH 1800 (Faths.) MAX. SAMPLE DEPTH 2275 (Meters) WIRE ANGLE 20 °

WATER COLOR - (Code) WEATHER 01 (Code) SEA 2 (Code) SWELL 080 (Direction) ° T. 4 (Hgt.) ft.

4 (Period) sec. CLOUDS Ci Cu (Type) 4 1 (Amount) TEMP. 79.8 (Dry) °F. 70.3 (Wet) °F.

BAR. 29.96 in. REL. HUM. 61 % WIND 090 (Direction) ° T. 2 (Force) VIS. 9 (Code)

OBSERVED VALUES

Depth	Temp. °C	Sal. ‰	Inorg. PO_4-P	NO_3-N	Carb. Mg/l	Prot. Mg/l
0	25.62	36.09	0.0	0.9	6.2	0.0
14	25.17	36.08				
33	23.93	36.04				
71	20.78	36.42				
103	18.34	---				
141	16.10	36.35				
212	13.92	36.00				
282	11.89	35.62				
419	9.09	35.16				
564	7.23	35.03				
700	5.99	35.03				
842	5.22	35.05				
1113	4.39	35.08	1.7	21.5[b]	0.4	0.0
1381	4.22	34.97				
1647	4.19	34.88				
2275	4.20	34.85	1.3	18.1	0.0	0.0

(b) Indicates not in accurate range of curve- value probably somewhat higher.

STATION NO. 1-1A-35

VALUES AT STANDARD DEPTHS

Depth	Temp. °C	Sal. ‰	σ_t
0	25.62	36.09	23.99
10	25.40	36.08	24.05
20	24.55	36.08	24.31
30	24.10	36.02	24.40
50	22.45	36.25	25.06
75	20.50	36.42	25.73
100	18.65	36.40	26.20
150	15.90	36.34	26.82
200	14.30	36.08	26.97
250	12.73	35.79	27.08
300	11.45	35.55	27.14
400	9.38	35.20	27.23
500	7.99	35.07	27.35
600	6.87	35.03	27.48
700	5.99	35.03	27.60
800	5.38	35.05	27.69
1000	4.62	35.07	27.80
1200	4.31	35.05	27.81
1500	4.21	34.92	27.72
2000	4.12	34.86	27.68

STATION NO. 1-1A-36

DATE 7 5 1951 (Day Month Year) LAT. 25° 46' N. LONG. 88° 00' W.

TIME 0115 (GCT) DEPTH 1700 (Faths.) MAX. SAMPLE DEPTH 854 (Meters) WIRE ANGLE 25°

WATER COLOR -- (Code) WEATHER 01 (Code) SEA 1 (Code) SWELL 080 (Direction) ° T. 2 (Hgt.) ft.

4 (Period) sec. CLOUDS Ac Cl St (Type) 4,3,1 (Amount) TEMP. 78.0 (Dry) °F. 70.0 (Wet) °F.

BAR. 29.98 in. REL. HUM. 67 % WIND 080 (Direction) ° T. 1 (Force) VIS. 8 (Code)

OBSERVED VALUES			VALUES AT STANDARD DEPTHS			
Depth	Temp °C	Sal. ‰	Depth	Temp. °C	Sal. ‰	σ_t
0	25.73	36.24	0	25.73	36.24	24.07
14	25.66	36.29	10	25.67	36.29	24.13
33	25.34	36.18	20	25.40	36.24	24.18
70	---	36.65	30	25.21	36.18	24.19
103	22.82	---	50	24.90	36.35	24.41
140	21.19	36.45	75	24.00	36.65	24.91
204	18.14	36.24	100	23.00	36.58	25.15
263	14.73	36.06	150	20.70	36.44	25.69
360	11.28	35.34	200	18.18	36.25	26.20
438	9.05	34.88	250	15.35	36.10	26.76
505	7.62	---	300	13.30	35.83	26.99
617	6.20	34.85	400	9.80	34.99	27.00
854	5.07	34.88	500	7.77	34.86	27.22
			600	6.37	34.85	27.41
			700	5.55	34.86	27.52
			800	5.19	34.87	27.57

STATION NO. 1-1A-37

DATE 7 5 1951 (Day Month Year) LAT. 26° 22' N. LONG. 87° 55' W.

TIME 0836 (GCT) DEPTH 1500 (Faths.) MAX. SAMPLE DEPTH 753 (Meters) WIRE ANGLE 37°

WATER COLOR - (Code) WEATHER 01 (Code) SEA 1 (Code) SWELL 170 (Direction) ° T. 4 (Hgt.) ft.

5 (Period) sec. CLOUDS -- (Type) -- (Amount) TEMP. 77.8 (Dry) °F. 69.9 (Wet) °F.

BAR. 29.96 in. REL. HUM. 67 % WIND 170 (Direction) ° T. 2 (Force) VIS. 8 (Code)

OBSERVED VALUES

Depth	Temp. °C	Sal. ‰	Inorg. PO_4-P	NO_3-N	Carb. Mg/l	Prot. Mg/l
0	25.70	36.24	0.0	0.7	4.2	0.0
12	25.71	36.08				
28	25.08	36.13				
60	23.37	36.51				
85	22.27	36.83				
114	20.97	36.69				
163	18.83	36.58				
208	17.22	36.38				
296	13.82	35.82				
390	10.81	35.30				
480	9.05	35.07				
572	7.55	34.87				
753	5.93	34.83	1.8	13.3	0.0[a]	0.0
*1500	---	---	1.6	22.8[b]	0.5	0.0

(a) Green carbohydrates
(b) Indicates not in accurate range of curve- value probably somewhat higher

* Uncorrected depth.

STATION NO. 1-1A-37

VALUES AT STANDARD DEPTHS

Depth	Temp. °C	Sal. ‰	σ_t
0	25.70	36.24	24.08
10	25.70	36.18	24.04
20	25.60	36.09	24.00
30	25.00	36.16	24.24
50	24.30	36.41	24.64
75	22.60	36.79	25.43
100	21.55	36.76	25.70
150	19.40	36.61	26.17
200	17.58	36.42	26.48
250	15.80	36.12	26.67
300	13.59	35.82	26.92
400	10.60	35.27	27.08
500	8.81	35.00	27.17
600	7.22	34.86	27.30
700	6.30	34.83	27.40

STATION NO. 1-1A-38

DATE 7 5 1951 (Day Month Year) LAT. 26° 54' N. LONG. 88° 00' W.

TIME 1633 (GCT) DEPTH 1400 (Faths.) MAX. SAMPLE DEPTH 1980 (Meters) WIRE ANGLE 37 °

WATER COLOR -- (Code) WEATHER 01 (Code) SEA 2 (Code) SWELL 0 (Direction) ° T. 0 (Hgt.) ft.

0 (Period) sec. CLOUDS Cs (Type) 6 (Amount) TEMP. 79.0 (Dry) °F. 72.0 (Wet) °F.

BAR. 30.05 in. REL. HUM. 71 % WIND 025 (Direction) ° T. 2 (Force) VIS. 9 (Code)

OBSERVED VALUES			VALUES AT STANDARD DEPTHS			
Depth	Temp. °C	Sal. ‰	Depth	Temp. °C	Sal. ‰	σ_t
0	25.07	34.78	0	25.07	34.78	23.18
12	25.05	36.18	10	25.06	36.18	24.23
28	23.55	36.51	20	23.90	36.49	24.82
60	21.30	36.53	30	23.10	36.51	25.07
88	20.06	36.47	50	21.90	36.53	25.43
120	18.26	36.47	75	20.89	36.50	25.68
180	14.99	36.06	100	19.35	36.46	26.06
239	12.86	35.68	150	16.40	36.31	26.68
352	9.81	35.14	200	14.20	35.90	26.86
471	7.80	34.90	250	12.60	35.62	26.97
582	6.51	34.70	300	11.20	35.36	27.04
701	5.65	34.74	400	9.00	35.03	27.16
934	4.68	34.76	500	7.50	34.83	27.23
1165	4.31	34.87	600	6.40	34.70	27.28
1398	4.20	34.83	700	5.65	34.74	27.41
1980	4.19	34.85	800	5.19	34.76	27.48
			1000	4.53	34.79	27.58
			1200	4.25	34.87	27.68
			1500	4.19	34.81	27.64
			2000	(4.15)	(34.85)	27.67

() Extrapolated values

STATION NO. 1-1A-39

DATE 8 5 1951 (Day Month Year) LAT. 28° 11' N. LONG. 88° 00' W.

TIME 0310 (GCT) DEPTH 1200 (Faths.) MAX. SAMPLE DEPTH 2117 (Meters) WIRE ANGLE 20 °

WATER COLOR -- (Code) WEATHER 01 (Code) SEA 2 (Code) SWELL 025 (Direction) ° T. 4 (Hgt.) ft.

6 (Period) sec. CLOUDS -- (Type) -- (Amount) TEMP. 72.6 (Dry) °F. 67.5 (Wet) °F.

BAR. 30.05 in. REL. HUM. 78% WIND 025 (Direction) ° T. 2 (Force) VIS. 8 (Code)

OBSERVED VALUES			VALUES AT STANDARD DEPTHS			
Depth	Temp. °C	Sal. ‰	Depth	Temp. °C	Sal. ‰	σ_t
0	23.91	35.68	0	23.91	35.68	24.20
14	23.81	35.75	10	23.90	35.74	24.25
33	21.71	36.08	20	23.50	35.87	24.47
70	21.20	36.29	30	21.80	35.99	25.04
103	20.04	36.31	50	21.55	36.21	25.28
140	18.96	36.44	75	21.10	36.30	25.47
211	15.22	35.97	100	20.25	36.31	25.71
280	13.16	---	150	18.60	36.44	26.24
413	9.89	34.94	200	15.70	36.13	26.70
554	7.72	34.79	250	14.41	35.75	26.70
685	6.47	34.78	300	13.05	35.44	26.74
822	5.54	34.81	400	10.20	34.98	26.92
1090	4.60	34.85	500	8.40	34.83	27.10
1362	4.27	34.88	600	7.29	34.78	27.23
1637	4.19	34.88	700	6.40	34.78	27.35
2117	4.21	34.88	800	5.70	34.80	27.45
			1000	4.85	34.84	27.59
			1200	4.39	34.86	27.65
			1500	4.21	34.88	27.69
			2000	4.19	34.88	27.69

STATION NO. 1-1A-40

DATE 8 5 1951 (Day Month Year) LAT. 28° 13' N. LONG. 88° 52' W.

TIME 1039 (GCT) DEPTH 740 (Faths.) MAX. SAMPLE DEPTHS 960 (Meters) WIRE ANGLE 18°

WATER COLOR -- (Code) WEATHER 01 (Code) SEA 2 (Code) SWELL 070 (Direction) ° T. 3 (Hgt.) ft.

4 (Period) sec. CLOUDS Sc (Type) 9 (Amount) TEMP. 73.4 (Dry) °F. 67.5 (Wet) °F.

BAR. 30.06 in. REL. HUM. 73 % WIND 070 (Direction) ° T. 2 (Force) VIS. 9 (Code)

OBSERVED VALUES			VALUES AT STANDARD DEPTHS			
Depth	Temp. °C	Sal. ‰	Depth	Temp. °C	Sal. ‰	σ_t
0	23.59	33.80	0	23.59	33.80	22.88
9	23.67	35.32	10	23.67	35.61	24.22
23	22.28	36.47	20	22.45	36.41	25.18
47	21.57	36.53	30	21.99	36.51	25.39
71	21.06	36.44	50	21.50	36.53	25.54
95	20.47	36.40	75	21.01	36.43	25.60
147	17.03	36.15	100	20.10	36.39	25.81
193	15.44	35.99	150	17.00	36.14	26.41
284	12.14	35.46	200	15.02	35.96	26.72
381	9.91	35.34	250	13.20	35.63	26.86
473	8.31	35.05	300	11.71	35.43	27.00
571	6.91	34.83	400	9.60	35.29	27.27
665	6.31	34.90	500	7.83	34.97	27.30
764	5.68	36.53	600	6.70	34.85	27.36
960	4.92	34.79	700	6.08	34.90	27.48
			800	5.41	34.87	27.54
			1000	(4.90)	(34.77)	27.53

() Extrapolated values.

STATION NO. 1-1A-41

DATE 8 5 1951 (Day Month Year) LAT. 28° 13' N. LONG. 89° 49' W.

TIME 1718 (GCT) DEPTH 390 (Faths.) MAX. SAMPLE DEPTH 594 (Meters) WIRE ANGLE 8 °

WATER COLOR -- (Code) WEATHER 01 (Code) SEA 3 (Code) SWELL 070 (Direction) ° T. 6 (Hgt.) ft.

4 (Period) sec. CLOUDS Sc (Type) 9 (Amount) TEMP. 75.0 (Dry) °F. 67.7 (Wet) °F.

BAR. 30.07 in. REL. HUM. 70 % WIND 070 (Direction) ° T. 5 (Force) VIS. 9 (Code)

OBSERVED VALUES

Depth	Temp. °C	Sal. ‰	Inorg. PO_4-P	NO_3-N	Carb. Mg/l	Prot. Mg/l
0	24.02	36.44	0.0	0.9	0.0	1.3
10	24.03	36.42				
25	22.81	36.40				
49	21.17	36.38				
74	20.71	36.36				
98	19.66	36.24				
198	13.49	35.61				
297	10.49	35.10	1.4	21.6[b]	1.4[a]	0.5
396	8.77	34.83				
495	7.73	34.90				
594	7.12	34.69	1.7	23.7[b]	5.8[a]	0.0

(a) Green carbohydrates.
(b) Indicates not in accurate range of curve-value probably somewhat higher.

STATION NO. 1-1A-41

VALUES AT STANDARD DEPTHS			
Depth	Temp. °C	Sal. ‰	σ_t
0	24.02	36.44	24.75
10	24.03	36.42	24.73
20	23.20	36.40	24.96
30	22.10	36.39	25.26
50	21.17	36.38	25.52
75	20.60	36.36	25.66
100	19.50	36.24	25.86
150	16.25	35.97	26.45
200	13.41	35.61	26.80
250	11.75	35.29	26.88
300	10.45	35.10	26.97
400	8.70	34.82	27.04
500	7.68	34.75	27.15
600	(7.09)	(34.68)	27.18

() Extrapolated values.

STATION NO. 1-1A-42

DATE 9 5 1951 LAT. 28° 08' N. LONG. 91° 15' W.
Day Month Year

TIME 0253 DEPTH 51 MAX. SAMPLE DEPTH 70 WIRE ANGLE 20°
GCT Faths. 60 Meters

WATER COLOR -- WEATHER 07 SEA 4 SWELL 070 ° T. 10 ft.
Code Code Code Direction Hgt.

7 sec. CLOUDS -- -- TEMP. 72.0 °F. 70.1 °F.
Period Type Amount Dry Wet

BAR. 29.96 in. REL. HUM. 91 % WIND 070 ° T. 6 VIS. 5
Direction Force Code

OBSERVED VALUES

Depth	Temp. °C	Sal. ‰	Inorg. PO_4-P	NO_3-N	Carb. Mg/l	Prot. Mg/l
0	23.09	36.11	0.0	0.4	2.5	0.0
9	23.07	36.08				
23	20.95	36.20				
47	20.36	36.40	0.0	1.0	5.2	0.7
70	19.69	36.24	0.1	1.1	0.4	0.1

VALUES AT STANDARD DEPTHS

Depth	Temp. °C	Sal. ‰	σ_t
0	23.09	36.11	24.77
10	23.07	36.08	24.75
20	21.10	36.20	25.40
30	20.80	36.33	25.58
50	20.28	36.39	25.76
75	(19.60)	(36.25)	25.84

Extrapolated values.

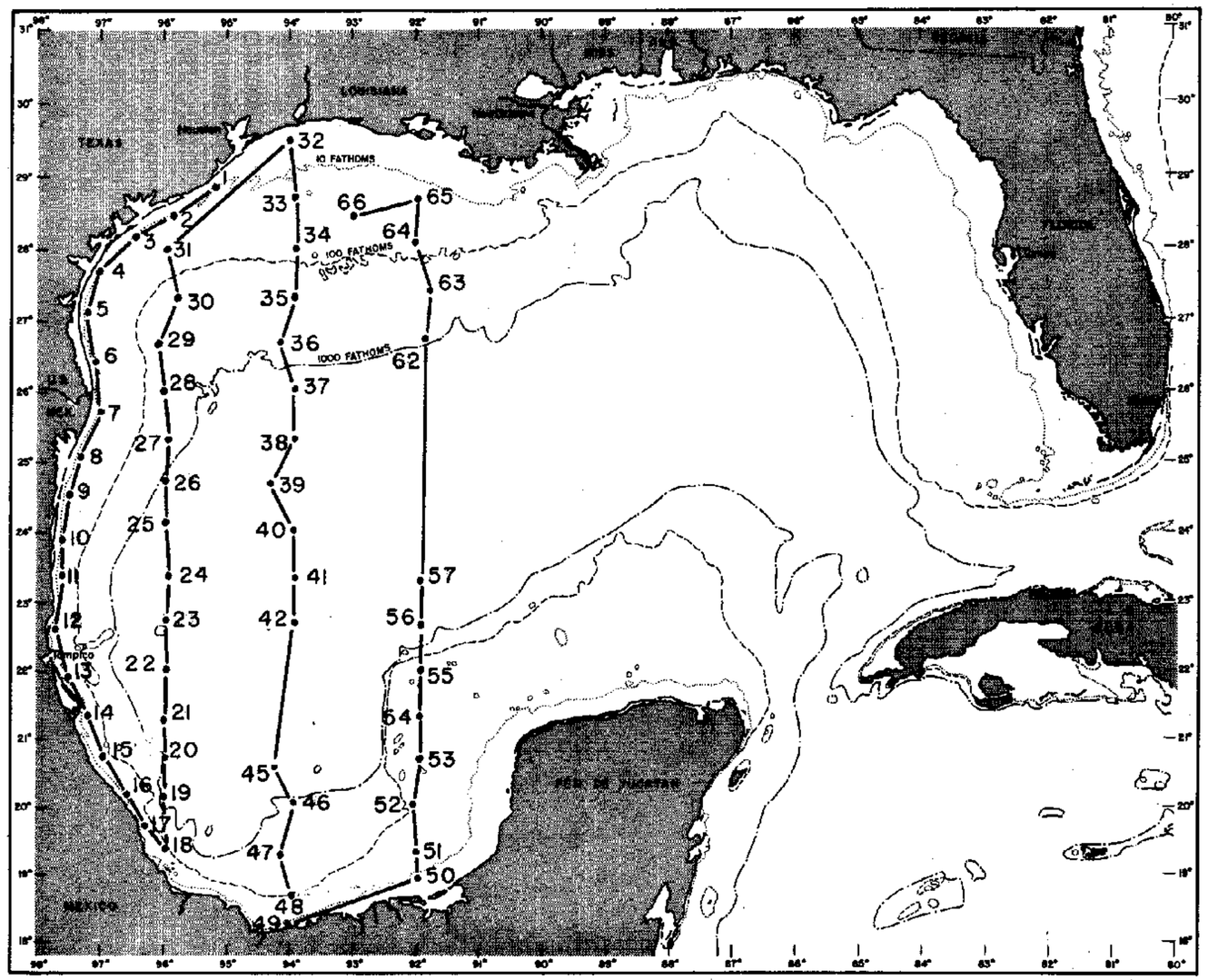

Figure 16.--Locations of stations occupied on Cruise 2-1B.

STATION NO. 2-1B-1

DATE 5 6 1951 (Day Month Year) LAT. 28° 51' N. LONG. 95° 11' W.

TIME 0427 (GCT) DEPTH 10 (Faths.) MAX. SAMPLE DEPTH 13 (Meters) WIRE ANGLE 0°

WATER COLOR - (Code) WEATHER 00 (Code) SEA 2 (Code) SWELL 045 (Direction) ° T. 3 (Hgt.) ft.

6 (Period) sec. CLOUDS -- (Type) -- (Amount) TEMP. 77.6 (Dry) °F. 73.5 (Wet) °F.

BAR. 30.03 in. REL. HUM. 83% WIND 045 (Direction) ° T. 2 (Force) VIS. 8 (Code)

OBSERVED VALUES

Depth	Temp. °C	Sal. ‰	Inorg. PO_4-P	NO_3-N	Carb. Mg/l	Prot. Mg/l
0	26.42	---	0.0	0.3	1.0	0.1
6	26.46	---	0.2	0.2	2.6	0.4
13	23.80	33.75	1.0	1.0	0.2	1.5

VALUES AT STANDARD DEPTHS

Depth	Temp. °C	Sal. ‰	σ_t
0	26.42	---	---
10	26.25	---	---

STATION NO. 2-1B-2

DATE 5 6 1951 (Day Month Year) LAT. 28° 28' N. LONG. 95° 49' W.

TIME 1015 (GCT) DEPTH 10 (Faths.) MAX. SAMPLE DEPTH 12 (Meters) WIRE ANGLE 0 °

WATER COLOR - (Code) WEATHER 01 (Code) SEA 2 (Code) SWELL --- (Direction) ° T. 4 (Hgt.) ft.

7 (Period) sec. CLOUDS Cu (Type) 2 (Amount) TEMP. 77.0 (Dry) °F. 74.3 (Wet) °F.

BAR. 29.99 in. REL. HUM. 88 % WIND 030 (Direction) ° T. 2 (Force) VIS. 8 (Code)

OBSERVED VALUES			VALUES AT STANDARD DEPTHS			
Depth	Temp. °C	Sal. ‰	Depth	Temp. °C	Sal. ‰	σ_t
0	26.37	---	0	26.37	---	---
6	26.37	---	10	26.25	---	---
12	26.15	---				

STATION NO. 2-1B-3

DATE 5 6 1951 (Day Month Year) LAT. 28° 09' N. LONG. 96° 27' W.

TIME 1520 (GCT) DEPTH 10 (Faths.) MAX. SAMPLE DEPTH 12 (Meters) WIRE ANGLE 0°

WATER COLOR -- (Code) WEATHER 01 (Code) SEA 2 (Code) SWELL 090 (Direction) ° T. 4 (Hgt.) ft.

6 (Period) sec. CLOUDS Cu (Type) 2 (Amount) TEMP. 81.3 (Dry) °F. 74.3 (Wet) °F.

BAR. 30.06 in. REL. HUM. 72 % WIND 090 (Direction) ° T. 2 (Force) VIS. 9 (Code)

OBSERVED VALUES

Depth	Temp. °C	Sal. ‰	Inorg. PO_4-P	NO_3-N	Carb. Mg/l	Prot. Mg/l
0	26.09	32.48	0.2	0.3	0.8	0.6
6	26.07	32.52	0.0	0.0	3.0	0.6
12	25.95	32.47	0.4	0.0	1.9	0.6

STATION NO. 2-1B-3

VALUES AT STANDARD DEPTHS			
Depth	Temp. °C	Sal. ‰	σ_t
0	26.09	32.48	21.13
10	25.95	32.49	21.18

STATION NO. 2-1B-4

DATE 5 6 1951 (Day Month Year) LAT. 27° 40' N. LONG. 97° 00' W.

TIME 2022 (GCT) DEPTH 10 (Faths.) MAX. SAMPLE DEPTH 12 (Meters) WIRE ANGLE 0°

WATER COLOR -- (Code) WEATHER 01 (Code) SEA 2 (Code) SWELL 090 (Direction) ° T. 4 ft.

4 (Period) sec. CLOUDS Cu (Type) 1 (Amount) TEMP. 83.9 (Dry) °F. 77.0 (Wet) °F.

BAR. 30.03 in. REL. HUM. 73 % WIND 090 (Direction) ° T. 3 (Force) VIS. 9 (Code)

OBSERVED VALUES			VALUES AT STANDARD DEPTHS			
Depth	Temp. °C	Sal. ‰	Depth	Temp. °C	Sal. ‰	σ_t
0	25.81	33.53	0	25.81	33.53	22.01
6	25.58	33.49	10	25.39	33.49	22.11
12	25.30	33.49				

STATION NO. 2-1B-5

DATE 6 6 1951 LAT. 27° 04' N. LONG. 97° 16' W.
Day Month Year

TIME 0130 DEPTH 11 MAX. SAMPLE DEPTH 12 WIRE ANGLE 3 °
GCT Faths. Meters

WATER COLOR -- WEATHER 01 SEA 2 SWELL 090 ° T. 6 ft.
Code Code Code Direction Hgt.

5 sec. CLOUDS Sc Ac 1, 1 TEMP. 79.6 °F. 75.7 °F.
Period Type Amount Dry Wet

BAR. 29.97 in. REL. HUM. 83 % WIND 090 ° T. 3 VIS. 8
Direction Force Code

OBSERVED VALUES

Depth	Temp. °C	Sal. ‰	Inorg. PO_4-P	NO_3-N	Carb. Mg/l	Prot. Mg/l
0	25.18	34.02	0.2	0.3	1.8	0.5
6	24.75	34.02	0.3	0.2	1.2	0.0
12	24.65	34.07	0.0	0.2	0.9	0.0

VALUES AT STANDARD DEPTHS

Depth	Temp. °C	Sal. ‰	σ_t
0	25.18	34.02	22.57
10	24.66	34.05	22.75

STATION NO. 2-1B-6

DATE 6 6 1951 (Day Month Year) LAT. 26° 25' N. LONG. 97° 05' W.

TIME 0710 (GCT) DEPTH 11 (Faths.) MAX. SAMPLE DEPTH 12 (Meters) WIRE ANGLE 0 °

WATER COLOR -- (Code) WEATHER 00 (Code) SEA 2 (Code) SWELL 090 (Direction) ° T. 5 (Hgt.) ft.

-- (Period) sec. CLOUDS -- (Type) -- (Amount) TEMP. 78.8 (Dry) °F. 76.3 (Wet) °F.

BAR. 29.95 in. REL. HUM. 89 % WIND 090 (Direction) ° T. 3 (Force) VIS. 8 (Code)

OBSERVED VALUES			VALUES AT STANDARD DEPTHS			
Depth	Temp. °C	Sal. ‰	Depth	Temp. °C	Sal. ‰	σ_t
0	25.35	35.97	0	25.35	35.97	23.99
6	25.34	35.95	10	23.62	35.93	24.48
12	23.61	35.91				

STATION NO. 2-1B-7

DATE 6 6 1951 (Day Month Year) LAT. 25° 45' N. LONG. 97° 00' W.

TIME 1227 (GCT) DEPTH 15 (Faths.) MAX. SAMPLE DEPTH 20 (Meters) WIRE ANGLE 0 °

WATER COLOR -- (Code) WEATHER 01 (Code) SEA 3 (Code) SWELL 100 (Direction) ° T. 6 (Hgt.) ft.

3 (Period) sec. CLOUDS Cu (Type) 1 (Amount) TEMP. 79.1 (Dry) °F. 76.6 (Wet) °F.

BAR. 29.93 in. REL. HUM. 89% WIND 100 (Direction) ° T. 3 (Force) VIS. 8 (Code)

OBSERVED VALUES

Depth	Temp. °C	Sal. ‰	Inorg. PO_4-P	NO_3-N	Carb. Mg/l	Prot. Mg/l
0	24.56	36.08	0.0	0.3	0.6[a]	0.0
10	23.12	35.95	0.1	0.0	1.6	0.1
20	21.30	36.38	0.4	3.9	0.6	0.8

(a) Green carbohydrates.

STATION NO. 2-1B-7

VALUES AT STANDARD DEPTHS			
Depth	Temp. °C	Sal. ‰	σ_t
0	24.56	36.08	24.31
10	23.12	35.95	24.64
20	21.30	36.38	25.48

STATION NO. 2-1B-8

DATE 6 6 1951 (Day Month Year) LAT. 25° 09' N. LONG. 97° 19' W.

TIME 1814 (GCT) DEPTH 9 (Faths.) MAX. SAMPLE DEPTH 12 (Meters) WIRE ANGLE 3 °

WATER COLOR -- (Code) WEATHER 01 (Code) SEA 3 (Code) SWELL 135 (Direction) ° T. 7 (Hgt.) ft.

4 (Period) sec. CLOUDS Cu (Type) 1 (Amount) TEMP. 81.6 (Dry) °F. 77.7 (Wet) °F.

BAR. 29.94 in. REL. HUM. 84 % WIND 135 (Direction) ° T. 4 (Force) VIS. 8 (Code)

OBSERVED VALUES			VALUES AT STANDARD DEPTHS			
Depth	Temp. °C	Sal. ‰	Depth	Temp. °C	Sal. ‰	σ_t
0	25.31	36.53	0	25.31	36.53	24.42
6	25.25	36.45	10	24.00	36.48	24.78
12	22.44	36.55				

STATION NO. 2-1B-9

DATE 6 6 1951 LAT. 24° 33' N. LONG. 97° 31' W.
Day Month Year

TIME 2336 DEPTH 14 MAX. SAMPLE DEPTH 18 WIRE ANGLE 2°
GCT Faths. Meters

WATER COLOR - WEATHER 01 SEA 3 SWELL 135 ° T. 6 ft.
Code Code Code Direction Hgt.

4 sec. CLOUDS Ci Sc 1 1 TEMP. 84.5 °F. 79.0 °F.
Period Type Amount Dry Wet

BAR. 29.83 in. REL. HUM. 78 % WIND 135 ° T. 4 VIS. 9
Direction Force Code

OBSERVED VALUES

Depth	Temp. °C	Sal. ‰	Inorg. PO_4-P	NO_3-N	Carb. Mg/l	Prot. Mg/l
0	25.56	36.35	0.0	0.0	1.6	0.9
9	24.59	36.38	0.5	0.2	0.2	0.0
18	21.49	36.49	0.0	0.1	0.4	0.4

VALUES AT STANDARD DEPTHS

Depth	Temp. °C	Sal. ‰	σ_t
0	25.56	36.35	24.21
10	24.50	36.38	24.56
20	(21.20)	(36.60)	25.67

() Extrapolated values

STATION NO. 2-1B-10

DATE 7 6 1951 (Day Month Year) LAT. 23° 55' N. LONG. 97° 36' W.

TIME 0517 (GCT) DEPTH 10 (Faths.) MAX. SAMPLE DEPTH 12 (Meters) WIRE ANGLE 3 °

WATER COLOR -- (Code) WEATHER 00 (Code) SEA 2 (Code) SWELL 135 (Direction) ° T. 4 (Hgt.) ft.

4 (Period) sec. CLOUDS -- (Type) --- (Amount) TEMP. 79.2 (Dry) °F. 76.0 (Wet) °F.

BAR. 29.86 in. REL. HUM 87 % WIND 135 (Direction) ° T. 4 (Force) VIS. 8 (Code)

OBSERVED VALUES			VALUES AT STANDARD DEPTHS			
Depth	Temp. °C	Sal. ‰	Depth	Temp. °C	Sal. ‰	σ_t
0	25.19	36.42	0	25.19	36.42	24.38
6	24.64	36.42	10	24.00	36.58	24.86
12	23.15	36.62				

STATION NO. 2-1B-11

DATE 7 6 1951 (Day Month Year) LAT. 23° 18' N. LONG. 97° 38' W.

TIME 1144 (GCT) DEPTH 17 (Faths.) MAX. SAMPLE DEPTH 32 (Meters) WIRE ANGLE 6 °

WATER COLOR -- (Code) WEATHER 02 (Code) SEA 2 (Code) SWELL 135 (Direction) ° T. 5 (Hgt.) ft.

3 (Period) sec. CLOUDS Cu (Type) 7 (Amount) TEMP. 78.8 (Dry) °F. 76.9 (Wet) °F.

BAR. 29.82 in. REL. HUM. 91 % WIND 135 (Direction) ° T. 2 (Force) VIS. 7 (Code)

OBSERVED VALUES

Depth	Temp. °C	Sal. ‰	Inorg. PO_4-P	NO_3-N	Carb. Mg/l	Prot. Mg/l
0	25.21	36.33	0.4	0.0	1.9	0.2
16	23.97	36.42	0.2	0.4	1.4	0.8
32	21.78	36.49	0.9	2.4	1.2	0.1

STATION NO. 2-1B-11

VALUES AT STANDARD DEPTHS			
Depth	Temp. °C	Sal. ‰	σ_t
0	25.21	36.33	24.30
10	24.60	36.39	24.53
20	23.59	36.45	24.88
30	22.10	36.48	25.33

STATION NO. 2-1B-12

DATE 7 6 1951 (Day Month Year) LAT. 22° 31' N. LONG. 97° 45' W.

TIME 1905 (GCT) DEPTH 12 (Faths.) MAX. SAMPLE DEPTH 14 (Meters) WIRE ANGLE 1 °

WATER COLOR -- (Code) WEATHER 01 (Code) SEA 2 (Code) SWELL 130 (Direction) ° T. 4 (Hgt.) ft.

3 (Period) sec. CLOUDS Cu Sc (Type) 1 1 (Amount) TEMP. 84.5 (Dry) °F. 80.0 (Wet) °F.

BAR. 29.84 in. REL. HUM. 82 % WIND 130 (Direction) ° T. 7 (Force) VIS. 8 (Code)

OBSERVED VALUES			VALUES AT STANDARD DEPTHS			
Depth	Temp. °C	Sal. ‰	Depth	Temp. °C	Sal. ‰	σ_t
0	26.15	35.34	0	26.15	35.34	23.26
7	23.61	36.35	10	23.10	36.40	24.99
14	22.34	36.56				

STATION NO. 2-1B-13

DATE 8 6 1951 (Day Month Year) LAT. 21° 53' N. LONG. 97° 34' W.

TIME 0032 (GCT) DEPTH 10 (Faths.) MAX. SAMPLE DEPTH 12 (Meters) WIRE ANGLE 6 °

WATER COLOR -- (Code) WEATHER 01 (Cu Code) SEA 2 (Code) SWELL 090 (Direction) ° T. 5 (Hgt.) ft.

4 (Period) sec. CLOUDS Ci,Sc (Type) 1,2,1 (Amount) TEMP. 83.0 (Dry) °F. 78.7 (Wet) °F.

BAR. 29.74 in. REL. HUM. 83 % WIND 090 (Direction) ° T. 4 (Force) VIS. 9 (Code)

OBSERVED VALUES

Depth	Temp. °C	Sal. ‰	Inorg. PO_4-P	NO_3-N	Carb. Mg/l	Prot. Mg/l
0	26.09	35.68	0.0	0.0	1.2	0.0
6	24.37	36.38	0.4	0.1	2.0	0.2
12	22.18	36.55	0.0	0.2	1.7	1.2

VALUES AT STANDARD DEPTHS

Depth	Temp. °C	Sal. ‰	σ_t
0	26.09	35.68	23.54
10	22.50	36.51	25.24

STATION NO. 2-1B-14

DATE 8 6 1951 (Day Month Year) LAT. 21° 18' N. LONG. 97° 14' W.

TIME 0715 (GCT) DEPTH 13 (Faths.) MAX. SAMPLE DEPTH 14 (Meters) WIRE ANGLE 0 °

WATER COLOR -- (Code) WEATHER 01 (Code) SEA 2 (Code) SWELL 135 (Direction) ° T. 3 (Hgt.) ft.

4 (Period) sec. CLOUDS Cu (Type) 2 (Amount) TEMP. 80.8 (Dry) °F. 78.0 (Wet) °F.

BAR. 29.82 in. REL. HUM. 88 % WIND 135 (Direction) ° T. 2 (Force) VIS. 8 (Code)

OBSERVED VALUES			VALUES AT STANDARD DEPTHS			
Depth	Temp. °C	Sal. ‰	Depth	Temp. °C	Sal. ‰	σ_t
0	25.91	35.71	0	25.91	35.71	23.62
7	25.35	36.00	10	24.60	36.25	24.43
14	22.46	36.45				

STATION NO. 2-1B-15

DATE 8 6 1951 (Day Month Year) LAT. 20° 41' N. LONG. 96° 58' W.

TIME 1316 (GCT) DEPTH 20 (Faths.) MAX. SAMPLE DEPTH 30 (Meters) WIRE ANGLE 0°

WATER COLOR -- (Code) WEATHER 02 (Ac Code) SEA 2 (Code) SWELL 090 (Direction) ° T. 5 (Hgt.) ft.

3 (Period) sec. CLOUDS Cu Ci (Type) 1,6,1 (Amount) TEMP. 81.3 (Dry) °F. 77.4 (Wet) °F.

BAR. 29.83 in. REL. HUM. 84 % WIND 090 (Direction) ° T. 3 (Force) VIS. 7 (Code)

OBSERVED VALUES

Depth	Temp. °C	Sal. ‰	Inorg. PO_4-P	NO_3-N	Carb. Mg/l	Prot. Mg/l
0	25.78	33.77	0.1	---	1.8	---
15	22.14	36.64	0.0	0.4	0.0	0.0
30	22.00	36.65	0.0	0.6	1.0	0.6

STATION NO. 2-1B-15

VALUES AT STANDARD DEPTHS			
Depth	Temp. °C	Sal. ‰	σ_t
0	25.78	33.77	22.20
10	25.00	35.60	23.82
20	23.60	36.65	25.03
30	22.00	36.65	25.49

STATION NO. 2-1B-16

DATE 8 6 1951 (Day Month Year) LAT. 20° 08' N. LONG. 96° 35' W.

TIME 1859 (GCT) DEPTH 15 (Faths.) MAX. SAMPLE DEPTH 20 (Meters) WIRE ANGLE 6 °

WATER COLOR -- (Code) WEATHER 01 (Code) SEA 2 (Code) SWELL 110 (Direction) ° T. 6 (Hgt.) ft.

7 (Period) sec. CLOUDS Sc Cu (Type) 3,1,2 (Amount) TEMP. 83.9 (Dry) °F. 80.0 (Wet) °F.

BAR. 29.84 in. REL. HUM. 84 % WIND 110 (Direction) ° T. 3 (Force) VIS. 7 (Code)

OBSERVED VALUES			VALUES AT STANDARD DEPTHS			
Depth	Temp. °C	Sal. ‰	Depth	Temp. °C	Sal. ‰	σ_t
0	25.64	36.47	0	25.64	36.47	24.28
10	22.53	36.67	10	22.53	36.67	25.35
20	21.48	36.56	20	21.48	36.56	25.57

STATION NO. 2-1B-17

DATE 8 6 1951 (Day Month Year) LAT. 19° 43' N. LONG. 96° 20' W.

TIME 2341 (GCT) DEPTH 30 (Faths.) MAX. SAMPLE DEPTH 49 (Meters) WIRE ANGLE 8 °

WATER COLOR -- (Code) WEATHER 01 (Code) SEA 2 (Code) SWELL 090 (Direction) ° T. 5 (Hgt.) ft.

5 (Period) sec. CLOUDS Cu Ci (Type) 1.1 (Amount) TEMP. 83.5 (Dry) ° F. 79.6 (Wet) °F.

BAR. 29.78 in. REL. HUM. 84 % WIND 090 (Direction) ° T. 4 (Force) VIS. 8 (Code)

OBSERVED VALUES

Depth	Temp. °C	Sal. ‰	Inorg. PO_4-P	NO_3-N	Carb. Mg/l	Prot. Mg/l
0	28.14	36.38	0.0	0.1	2.4	0.0
25	23.63	36.78	0.0	0.1	0.8	0.2
49	21.74	36.60	0.1	0.4	0.2	0.4

VALUES AT STANDARD DEPTHS

Depth	Temp. °C	Sal. ‰	σ_t
0	28.14	36.38	23.41
10	26.80	36.60	24.01
20	25.50	36.77	24.54
30	23.05	36.77	25.28
50	21.70	36.59	25.53

STATION NO. 2-1B-18

DATE 9 6 1951 (Day Month Year) LAT. 19° 21' N. LONG. 95° 58' W.

TIME 0436 (GCT) DEPTH 65 (Faths.) MAX. SAMPLE DEPTH 74 (Meters) WIRE ANGLE 8 °

WATER COLOR - (Code) WEATHER 00 (Code) SEA 2 (Code) SWELL 090 (Direction) ° T. 6 (Hgt.) ft.

5 (Period) sec. CLOUDS -- (Type) -- (Amount) TEMP. 82.3 (Dry) °F. 78.8 (Wet) °F.

BAR. 29.85 in. REL. HUM. 86 % WIND 090 (Direction) °T. 4 (Force) VIS. 8 (Code)

OBSERVED VALUES			VALUES AT STANDARD DEPTHS			
Depth	Temp. °C	Sal. ‰	Depth	Temp. °C	Sal. ‰	σ_t
0	27.83	35.66	0	27.83	35.66	22.97
10	27.11	---	10	27.11	36.23	23.63
25	24.69	36.56	20	25.30	36.52	24.42
49	22.68	36.69	30	24.10	36.62	24.86
74	21.35	36.51	50	22.57	36.69	25.36
			75	21.30	36.51	25.58

STATION NO. 2-1B-19

DATE 9 6 1951 (Day Month Year) LAT. 20° 02' N. LONG. 96° 00' W.

TIME 1257 (GCT) DEPTH 950 (Faths.) MAX. SAMPLE DEPTH 1335 (Meters) WIRE ANGLE 12°

WATER COLOR - (Code) WEATHER 01 (Code) SEA 2 (Code) SWELL 090 (Direction) ° T. 6 (Hgt.) ft.

6 (Period) sec. CLOUDS Ci Sc (Type) 2.4.1 (Amount) TEMP. 83.0 (Dry) °F. 79.1 (Wet) °F.

BAR. 29.90 in. REL. HUM. 84 % WIND 090 (Direction) ° T. 3 (Force) VIS. 9 (Code)

OBSERVED VALUES

Depth	Temp. °C	Sal. ‰	Inorg. PO_4-P	NO_3-N	Carb. Mg/l	Prot. Mg/l
0	27.12	36.60	0.0	0.2	1.0	0.1
10	26.93	36.62				
29	24.12	36.82				
58	22.90	36.83				
87	21.91	36.74				
116	19.91	36.60				
175	16.63	36.33				
232	14.45	36.00				
348	10.86	35.50				
458	8.94	35.07				
572	7.30	35.05	1.6	78.2	0.4	0.3
682	6.19	34.97				
907	---	36.60				
1124	11.99	35.81				
1335	3.92	35.30	2.0	63.8	1.2	0.0

STATION NO. 2-1B-19

VALUES AT STANDARD DEPTHS			
Depth	Temp. °C	Sal. ‰	σ_t
0	27.12	36.60	23.91
10	26.93	36.62	23.98
20	25.95	36.79	24.42
30	24.10	36.82	25.01
50	23.20	36.83	25.28
75	22.25	36.77	25.51
100	21.35	36.67	25.69
150	17.98	36.48	26.43
200	15.49	36.18	26.79
250	13.43	35.93	27.04
300	12.00	35.72	27.17
400	9.95	35.23	27.16
500	8.39	35.05	27.27
600	6.99	35.04	27.47
700	6.12	34.96	27.53

STATION NO. 2-1B-20

DATE 9 6 1951 (Day Month Year) LAT. 20° 40' N. LONG. 96° 01' W.

TIME 2000 (GCT) DEPTH 1030 (Faths.) MAX. SAMPLE DEPTH 1379 (Meters) WIRE ANGLE 8 °

WATER COLOR - (Code) WEATHER 01 (Code) SEA 2 (Code) SWELL 090 (Direction) ° T. - (Hgt.) ft.

--- (Period) sec. CLOUDS Cec Ci (Type) 1.1 (Amount) TEMP. 84.7 (Dry) °F. 79.3 (Wet) °F.

BAR. 29.93 in. REL. HUM. 78 % WIND 135 (Direction) ° T. 3 (Force) VIS. 9 (Code)

OBSERVED VALUES			VALUES AT STANDARD DEPTHS			
Depth	Temp. °C	Sal. ‰	Depth	Temp. °C	Sal. ‰	σ_t
0	27.49	36.67	0	27.49	36.67	23.84
10	27.06	36.65	10	27.06	36.65	23.96
30	25.76	36.80	20	26.49	36.69	24.17
59	22.96	36.74	30	25.76	36.80	24.49
89	21.92	36.73	50	23.60	36.74	25.10
118	19.87	36.69	75	22.45	36.73	25.42
178	15.45	36.24	100	21.12	36.71	25.78
237	13.44	35.92	150	17.28	36.45	26.58
357	10.77	35.52	200	14.60	36.10	26.93
472	9.19	35.43	250	13.05	35.87	27.07
591	7.49	35.07	300	11.91	35.65	27.13
706	6.15	34.70	400	10.14	35.50	27.34
939	4.92	34.94	500	8.82	35.35	27.44
1164	4.35	34.99	600	7.35	35.06	27.44
1379	---	35.01	700	6.20	35.00	27.55
			800	5.53	34.96	27.60
			1000	4.73	34.95	27.69
			1200	(4.30)	35.00	27.78

() Extrapolated values.

STATION NO. 2-1B-21

DATE 10 6 1951 LAT. 21° 15' N. LONG. 96° 01' W.
Day Month Year

TIME 0430 DEPTH 1140 MAX. SAMPLE DEPTH 1164 WIRE ANGLE 12°
GCT Faths. Meters

WATER COLOR - WEATHER 00 SEA 2 SWELL 090 ° T. - ft.
Code Code Code Direction Hgt.

4 sec. CLOUDS -- -- TEMP. 81.5 °F. 78.7 °F.
Period Type Amount Dry Wet

BAR. 29.92 in. REL. HUM. 88 % WIND 135 ° T. 3 VIS. 9
Direction Force Code

OBSERVED VALUES

Depth	Temp. °C	Sal. ‰	Inorg. PO_4-P	NO_3-N	Carb. Mg/l	Prot. Mg/l
0	27.26	36.73	0.1	0.1	4.3	0.4
10	27.26	36.73				
30	27.04	36.78				
59	24.03	36.73				
89	21.65	36.67				
118	18.92	36.56				
178	15.70	36.15				
237	13.48	35.79				
356	10.71	35.37				
471	8.81	35.10				
590	7.09	34.97				
704	6.04	34.97	1.9	82.1	1.6[a]	0.1
939	4.88	35.01				
1164	4.36	34.88	1.8	49.6	3.6	0.2

(a) Green carbohydrates.

STATION NO. 2-1B-21

VALUES AT STANDARD DEPTHS

Depth	Temp. °C	Sal. ‰	σ_t
0	27.26	36.73	23.96
10	27.26	36.73	23.96
20	27.20	36.77	24.01
30	27.04	36.78	24.07
50	26.20	36.75	24.31
75	22.88	36.70	25.28
100	20.10	36.63	26.00
150	16.95	36.34	26.57
200	14.95	36.00	26.77
250	13.18	35.74	26.95
300	11.98	35.55	27.04
400	10.00	35.26	27.17
500	8.47	35.04	27.26
600	7.02	34.97	27.41
700	6.11	34.97	27.54
800	5.48	34.99	27.63
1000	4.71	(35.01)	27.74

() Extrapolated values.

STATION NO. 2-1B-22

DATE 10 6 1951 (Day Month Year) LAT. 22° 00' N. LONG. 96° 00' W.

TIME 1258 (GCT) DEPTH 1400 (Faths.) MAX. SAMPLE DEPTH 1625 (Meters) WIRE ANGLE 25°

WATER COLOR - (Code) WEATHER 01 (Code) SEA 2 (Code) SWELL 090 (Direction) ° T. 8 (Hgt.) ft.

7 (Period) sec. CLOUDS Ci (Type) 1 (Amount) TEMP. 81.5 (Dry) °F. 77.4 (Wet) °F.

BAR. 29.93 in. REL. HUM. 84 % WIND 090 (Direction) ° T. 3 (Force) VIS. 9 (Code)

OBSERVED VALUES			VALUES AT STANDARD DEPTHS			
Depth	Temp. °C	Sal. ‰	Depth	Temp. °C	Sal. ‰	σ_t
0	27.33	36.73	0	27.33	36.73	23.94
13	27.31	36.74	10	27.31	36.74	23.95
31	24.61	36.62	20	26.90	36.68	24.04
68	22.56	36.74	30	25.01	36.62	24.58
100	21.39	36.56	50	23.65	36.72	25.07
136	18.94	36.64	75	22.30	36.73	25.47
205	15.45	36.29	100	21.39	36.70	25.70
272	13.00	35.90	150	18.15	36.62	26.49
400	9.94	35.41	200	15.77	36.32	26.83
535	7.78	35.10	250	13.95	36.02	27.00
658	6.46	34.92	300	12.55	35.79	27.11
792	5.49	34.96	400	9.94	35.41	27.30
1057	5.90	34.92	500	8.35	35.18	27.38
1333	4.88	34.92	600	6.99	34.97	27.42
1625	4.31	34.97	700	6.13	34.94	27.51
			800	5.48	34.96	27.61
			1000	5.05	34.92	27.63
			1200	4.92	34.92	27.64
			1500	4.58	34.95	27.71

STATION NO. 2-1B-23

DATE 10 6 1951 (Day Month Year) LAT. 22° 42' N. LONG. 96° 00' W.

TIME 2155 (GCT) DEPTH 1400 (Faths.) MAX. SAMPLE DEPTH 753 (Meters) WIRE ANGLE 23 °

WATER COLOR - (Code) WEATHER 01 (Code) SEA 2 (Code) SWELL 090 (Direction) ° T. - (Hgt.) ft.

--- (Period) sec. CLOUDS Cu (Type) 6 (Amount) TEMP. 82.6 (Dry) °F. 79.2 (Wet) °F.

BAR. 29.90 in. REL. HUM. 86 % WIND 090 (Direction) ° T. 3 (Force) VIS. 8 (Code)

OBSERVED VALUES

Depth	Temp. °C	Sal. ‰	Inorg. PO_4-P	NO_3-N	Carb. Mg/l	Prot. Mg/l
0	27.53	36.80	0.0	0.2	0.2	0.4
14	27.10	36.85				
32	23.91	36.80				
69	23.01	36.76				
101	22.30	36.78				
137	21.18	36.71				
202	17.27	36.35				
268	14.32	36.00				
388	10.80	35.35				
511	8.58	35.08				
627	7.09	34.92				
753	6.09	34.92	2.2	78.8	1.2	1.4

STATION NO. 2-1B-23

VALUES AT STANDARD DEPTHS

Depth	Temp. °C	Sal. ‰	σ_t
0	27.53	36.80	23.92
10	27.25	36.85	24.05
20	26.10	36.84	24.41
30	24.52	36.81	24.87
50	23.60	36.77	25.12
75	22.87	36.76	25.32
100	22.32	36.78	25.50
150	20.20	36.62	25.96
200	17.50	36.37	26.46
250	15.40	36.09	26.74
300	13.30	35.73	26.91
400	10.57	35.32	27.12
500	8.83	35.10	27.24
600	7.47	34.93	27.32
700	6.49	34.92	27.45
800	(5.90)	(34.92)	27.52

() Extrapolated values.

STATION NO. 2-1B-24

DATE 11 6 1951 LAT. 23° 20'N. LONG. 95° 57' W.
Day Month Year

TIME 0508 DEPTH 1400 MAX. SAMPLE DEPTH 1718 WIRE ANGLE 12°
GCT Faths. Meters

WATER COLOR -- WEATHER 00 SEA 2 SWELL 090 ° T. 4 ft.
Code Code Code Direction Hgt.

7 sec. CLOUDS -- --- TEMP. 82.3 °F. 79.3 °F.
Period Type Amount Dry Wet

BAR. 29.85 in. REL. HUM. 88 % WIND 135 ° T. 2 VIS. 8
Direction Force Code

OBSERVED VALUES			VALUES AT STANDARD DEPTHS			
Depth	Temp. °C	Sal. ‰	Depth	Temp. °C	Sal. ‰	σ_t
0	27.49	36.94	0	27.49	36.94	24.04
15	27.15	36.96	10	27.25	36.95	24.13
34	23.59	36.93	20	25.50	36.95	24.68
73	22.87	37.10	30	23.95	36.93	25.14
108	22.44	36.89	50	23.35	36.98	25.35
147	21.17	36.73	75	22.90	37.10	25.57
221	17.40	36.53	100	22.55	36.97	25.58
293	14.98	36.36	150	21.05	36.72	25.81
432	11.02	35.48	200	19.00	36.60	26.26
578	8.80	35.12	250	16.51	36.48	26.78
714	7.19	34.92	300	14.53	36.34	27.13
858	5.96	35.03	400	11.80	35.67	27.17
1139	4.68	34.74	500	9.96	35.28	27.20
1423	4.25	35.05	600	8.60	35.08	27.26
1718	4.20	35.01	700	7.37	34.93	27.33
			800	6.41	34.85	27.40
			1000	5.25	34.76	27.48
			1200	4.61	34.78	27.57
			1500	4.25	35.05	27.82

STATION NO. 2-1B-25

VALUES AT STANDARD DEPTHS

Depth	Temp. °C	Sal. ‰	σ_t
0	27.34	36.78	23.97
10	27.20	36.80	24.03
20	27.00	36.84	24.12
30	24.00	36.87	25.08
50	23.09	36.86	25.34
75	22.55	36.84	25.48
100	22.00	36.89	25.67
150	20.05	36.52	25.93
200	17.98	36.45	26.40
250	16.58	36.38	26.69
300	15.35	36.21	26.84
400	13.00	35.78	27.01
500	10.95	35.50	27.19
600	9.17	35.27	27.32
700	7.79	35.11	27.41
800	6.80	34.99	27.46
1000	5.33	34.83	27.52
1200	4.38	34.79	27.60

STATION NO. 2-1B-26

DATE 11 6 1951 (Day Month Year) LAT. 24° 45' N. LONG. 96° 00' W.

TIME 1950 (GCT) DEPTH 1300 (Faths.) MAX. SAMPLE DEPTH 2530 (Meters) WIRE ANGLE 27° 30°

WATER COLOR -- (Code) WEATHER 01 (Code) SEA 3 (Code) SWELL 135 (Direction) ° T. 10 (Hgt.) ft.

6 (Period) sec. CLOUDS Cu Ci (Type) 1,1 (Amount) TEMP. 83.0 (Dry) °F. 78.0 (Wet) °F.

BAR. 29.82 in. REL. HUM. 80 % WIND 135 (Direction) ° T. 4 (Force) VIS. 9 (Code)

OBSERVED VALUES

Depth	Temp. °C	Sal. ‰	Inorg. PO_4-P	NO_3-N	Carb. Mg/l	Prot. Mg/l
Cast I						
0	27.57	36.53				
14	27.32	36.53				
31	26.04	36.73				
65	23.02	36.74				
95	21.10	36.67				
128	18.74	36.45				
188	15.36	36.13				
250	13.25	35.71				
369	10.03	35.25				
497	7.81	34.97				
619	6.46	35.01				
753	5.49	35.01				
1019	4.76	35.23				
1297	4.33	35.14				
1588	4.22	35.12				
Cast II						
1655	4.18	35.07	1.6	75.8	2.2	1.0
1845	4.20	35.07	1.6	24.6	1.5[a]	0.2
2134	4.21	35.05	1.6	64.1	2.0[a]	0.2
*2530	4.20	35.01	2.1	48.8	1.5	0.4

* Cloudy sample - centrifuged

(a) Green carbohydrates.

STATION NO. 2-1B-26

VALUES AT STANDARD DEPTHS

Depth	Temp. °C	Sal. ‰	σ_t
0	27.57	36.53	23.71
10	27.45	36.53	23.75
20	27.12	36.54	23.86
30	26.50	36.73	24.20
50	24.50	36.74	24.83
75	22.30	36.72	25.46
100	20.50	36.65	25.90
150	17.63	36.32	26.39
200	14.80	36.04	26.83
250	13.25	35.71	26.91
300	11.83	35.50	27.03
400	9.48	35.16	27.18
500	7.82	34.97	27.30
600	6.60	35.01	27.50
700	5.82	35.01	27.60
800	5.32	35.04	27.69
1000	4.81	35.22	27.89
1200	4.47	35.17	27.89
1500	4.21	35.13	27.89
2000	4.20	35.06	27.83
2500	4.20	35.01	27.79

STATION NO. 2-1B-27

DATE 12 6 1951 LAT. 25° 20' N. LONG. 96° 00' W.
Day Month Year

TIME 0425 DEPTH 550 MAX. SAMPLE DEPTH 916 WIRE ANGLE 8 °
GCT Faths. Meters

WATER COLOR - WEATHER 01 SEA 2 SWELL 135 ° T. - ft.
Code Code Code Direction Hgt.

-- sec. CLOUDS Cu 4 TEMP. 80.7 °F. 78.3 °F.
Period Type Amount Dry Wet

BAR. 29.76 in. REL. HUM. 89 % WIND 135 ° T. 4-5 VIS. 9
Direction Force Code

OBSERVED VALUES

Depth	Temp. °C	Sal. ‰	Inorg. PO_4-P	NO_3-N	Carb. Mg/l	Prot. Mg/l
0	27.08	36.06	1.6	0.2	0.3	0.4
10	27.08	36.22				
25	25.12	36.45				
50	21.45	36.60				
75	20.84	36.87				
99	19.34	36.69				
154	15.73	36.22				
203	13.70	35.91				
303	10.40	35.26				
408	7.72	34.96				
508	6.67	34.96				
612	6.00	34.99				
711	5.48	34.96				
816	5.06	35.08	0.2	9.6	0.9	0.4
916	4.73	35.16	0.0	75.1	1.2	0.2

STATION NO. 2-1B-27

VALUES AT STANDARD DEPTHS			
Depth	Temp. °C	Sal. ‰	σ_t
0	27.08	36.06	23.51
10	27.08	36.22	23.63
20	25.90	36.41	24.15
30	23.92	36.49	24.81
50	21.45	36.60	25.61
75	20.84	36.87	25.98
100	19.29	36.69	26.25
150	15.85	36.25	26.76
200	13.81	35.93	26.96
250	12.10	35.61	27.06
300	10.43	35.29	27.12
400	7.88	34.97	27.29
500	6.79	34.96	27.44
600	6.04	34.99	27.56
700	5.55	34.96	27.60
800	5.12	35.06	27.73
1000	(4.60)	(35.17)	27.88

() Extrapolated values.

STATION NO. 2-1B-28

DATE 12 6 1951 (Day Month Year) LAT. 26° 00' N. LONG. 96° 02' W.

TIME 1040 (GCT) DEPTH 490 (Faths.) MAX. SAMPLE DEPTH 687 (Meters) WIRE ANGLE 32 °

WATER COLOR - (Code) WEATHER 01 (Code) SEA 3 (Code) SWELL 135 (Direction) ° T. 12 (Hgt.) ft.

5 (Period) sec. CLOUDS Cu (Type) 5 (Amount) TEMP. 81.7 (Dry) °F. 79.0 (Wet) °F.

BAR. 29.77 in. REL. HUM. 89 % WIND 135 (Direction) ° T. 5 (Force) VIS. 9 (Code)

OBSERVED VALUES			VALUES AT STANDARD DEPTHS			
Depth	Temp. °C	Sal. ‰	Depth	Temp. °C	Sal. ‰	σ_t
0	27.22	36.26	0	27.22	36.26	23.62
9	27.23	36.33	10	27.23	36.34	23.67
21	26.64	36.44	20	26.80	36.44	23.89
43	24.01	36.64	30	26.28	36.52	24.11
64	21.99	36.76	50	23.30	36.70	25.15
85	20.94	36.74	75	21.35	36.75	25.75
130	18.27	36.65	100	19.99	36.71	26.09
169	16.36	36.42	150	17.43	36.55	26.62
207	14.74	36.27	200	15.15	36.29	26.95
244	13.47	35.79	250	13.21	35.75	26.95
324	11.16	35.52	300	11.72	35.57	27.10
405	9.57	35.41	400	9.62	35.42	27.36
494	8.13	35.16	500	8.10	35.15	27.40
585	7.14	35.01	600	7.00	35.00	27.44
687	6.29	34.94				

STATION NO. 2-1B-31

DATE 13 6 1951 LAT. 28° 00' N. LONG. 96° 00' W.
Day Month Year

TIME 0425 DEPTH 25 MAX. SAMPLE DEPTH 40 WIRE ANGLE 5 °
GCT Faths. Meters

WATER COLOR - WEATHER 03 SEA 2 SWELL 045 ° T. 7 ft.
Code Code Code Direction Hgt.

5 sec. CLOUDS - 10 TEMP. 79.6 °F. 75.4 °F.
Period Type Amount Dry Wet

BAR. 29.85 in. REL. HUM. 82 % WIND 045 ° T. 4-5 VIS. 7
Direction Force Code

OBSERVED VALUES

Depth	Temp. °C	Sal. ‰	Inorg. PO_4-P	NO_3-N	Carb. Mg/l	Prot. Mg/l
0	27.15	36.44	0.1	0.4	0.6	0.0
20	25.32	33.21	0.0	0.2	0.8	0.8
40	21.51	32.28	0.5	0.0	2.8	0.8

VALUES AT STANDARD DEPTHS

Depth	Temp. °C	Sal. ‰	σ_t
0	27.15	32.38	20.72
10	26.50	32.92	21.33
20	25.32	33.21	21.92
30	23.50	34.42	23.37