366

PHYSICAL AND CHEMICAL DATA FOR BOTTOM SEDIMENTS SOUTH ATLANTIC COAST OF THE UNITED STATES

Gill Cruises 1-9

SPECIAL SCIENTIFIC REPORT-FISHERIES No. 366

UNITED STATES DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE

United States Department of the Interior, Fred A. Seaton, Secretary
Fish and Wildlife Service, Arnie J. Suomela, Commissioner
Bureau of Commercial Fisheries, Donald L. McKernan, Director

PHYSICAL AND CHEMICAL DATA FOR BOTTOM SEDIMENTS SOUTH ATLANTIC COAST OF THE UNITED STATES M/V THEODORE N. GILL CRUISES 1-9

by

Joseph E. Moore and Donn S. Gorsline

United States Fish and Wildlife Service
Special Scientific Report--Fisheries No. 366

Washington, D. C.
October 1960

M/V *Theodore N. Gill*

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ABSTRACT

Detailed data are presented on the mechanical and chemical composition of bottom sediments collected during nine cruises of the M/V *Theodore N. Gill* off the south Atlantic coast of the United States. Methods and procedures are given for the various analyses. The pattern of the sediment textural types is discussed and presented graphically.

INTRODUCTION

During the years 1953-54 the Bureau of Commercial Fisheries Biological Laboratory, Brunswick, Georgia, accomplished nine cruises with the M/V *Theodore N. Gill* off the south Atlantic coast of the United States between Cape Hatteras and Jupiter Light (Florida Straits) extending from near the beaches to beyond the axis of the Gulf Stream. The basic station plan is shown in figure 1.

Background of the program; cooperating agencies; objectives; procedures on station; chemical, biological, and oceanographic methods and procedures; and processed physical oceanographic, biological, and chemical data are given in nine basic cruise reports (Anderson, Gehringer, and Cohen, 1956a and 1956b; and Anderson and Gehringer, 1957a, 1957b, 1958a, 1958b, 1959a, 1959b, and 1960).

Information on bottom types is useful in several types of fishery studies. For example some species of shrimp and fish prefer and are found almost exclusively on mud bottoms, some species must have coral or rock reefs, while others prefer sand. Knowledge of bottom sediments would then be invaluable in determination of distribution and possible abundance for certain species. Likewise, certain bottom types are much more productive generally than other types, and knowledge of bottom sediment types provides a clue to the richness of an area. Such data are also of value to marine geologists as clues to origin of deposits and of water movements, among other things.

Note.--Joseph E. Moore, Analytical Chemist, Bureau of Commercial Fisheries, U.S. Fish and Wildlife Service, Brunswick, Ga., and Donn S. Gorsline, Marine Geologist, Oceanographic Institute, Florida State University, Tallahassee, Fla.

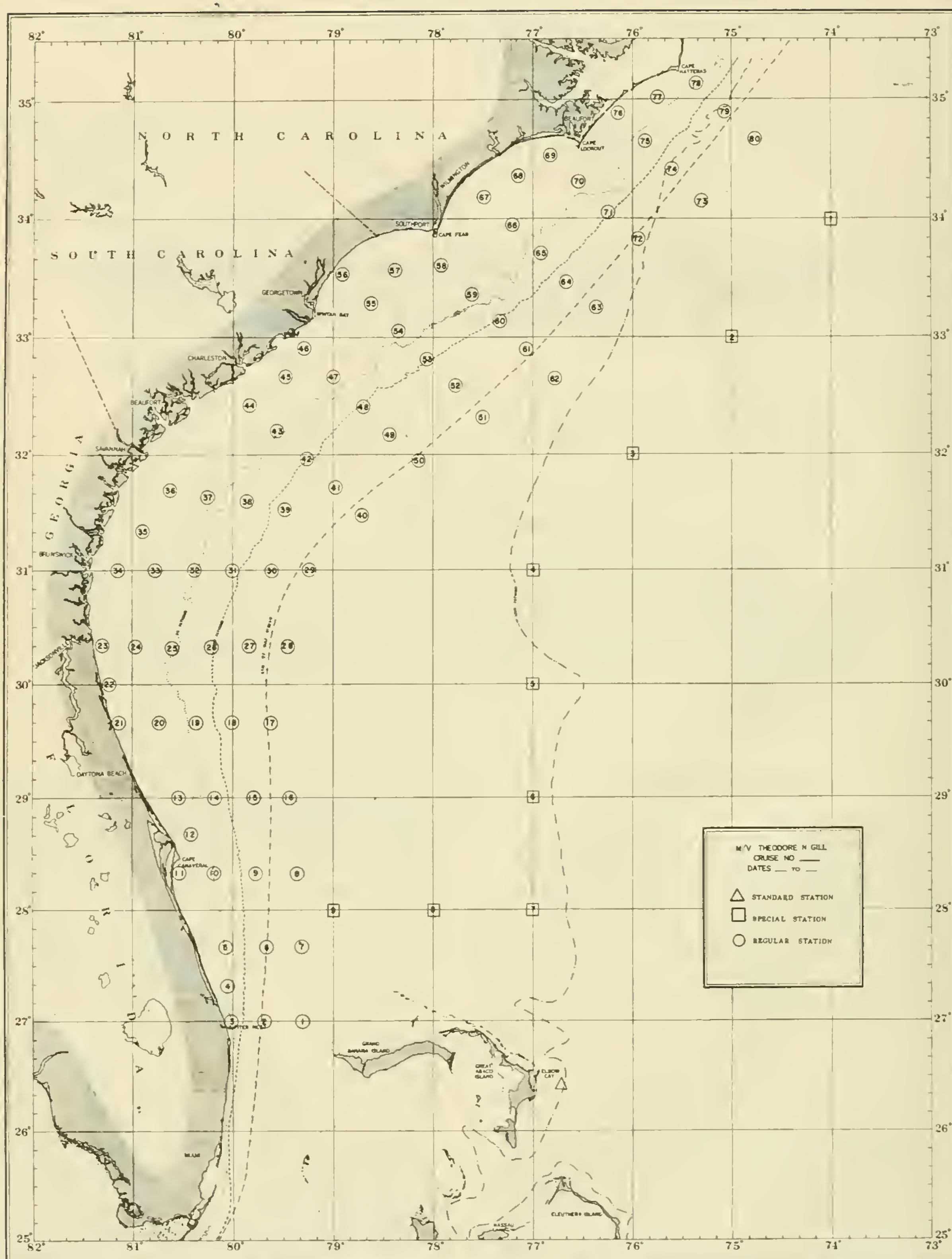

Figure 1.--Basic station plan.

Bottom sediment samples were obtained during the nine cruises on as many of the stations as depths and currents permitted the sampler to function. These were taken by means of an orange peel dredge--modified in weight by addition of lead to the arms, and by welding covers over the blades to prevent the sample being washed out (fig. 2). At sea the samples were placed in double polyethylene bags (without preservative), tightly closed with rubber bands, and stored in this manner until analyzed. Half of each sample was furnished to the Navy Hydrographic Office.

This report (a joint undertaking between the Bureau of Commercial Fisheries and the Oceanographic Institute, Florida State University, Tallahassee, Florida) is to explain the bottom sediment program, give methods and procedures, present the assembled chemical and physical data by station (table 1, p. 28), and to outline the general character of the bottom materials in the work area.

In the sections to follow, the "Chemical Methods and Procedures" were contributed by Moore and the "Geological Methods and Procedures" by Gorsline.

CHEMICAL METHODS AND PROCEDURES

GENERAL

Each half sample retained at the Brunswick laboratory was air dried, thoroughly mixed, and a representative portion ground in a ball mill and stored in a glass bottle. A 3- to 4-gm. portion of each ground sample was dried at 110° C. for 3 hours and then placed in a desiccator with dry calcium sulfate until the portions to be analyzed were weighed. All chemicals used in the various analyses were analytical reagent grade. All sample portions were weighed to the fourth decimal place.

METHODS

Loss on ignition

Procedure: Weigh 0.5 to 1.0 gm. of sample into a dried and weighed No. 1 porcelain crucible and ignite for 45 minutes at 850° C. ± 25° C. in an electric furnace. Transfer crucible and contents to a desiccator to cool. When cool, reweigh and determine loss in weight. Results are reported as percent loss on ignition on dry weight basis.

Insoluble residue

Reagents:

1. 6N hydrochloric acid (HCl) - equal volumes of concentrated hydrochloric acid and distilled water.

Procedure: Weigh 1.0 gm. of sample into a 150-ml. beaker and add 10 ml. of 6N hydrochloric acid. Evaporate mixture to dryness on a hot plate at medium setting and allow residue to bake 10 minutes. After cooling, add 10 ml. of 6N hydrochloric acid, stir thoroughly and filter mixture through a dried, weighed, No. 3 Gooch crucible. Dry crucible and contents in an oven at 110° C. until constant weight is reached, cooling in desiccator between weighings. Results are reported as percent insoluble residue on dry weight basis.

Aluminum oxide

Reagents:

1. Concentrated ammonium hydroxide (NH_4OH).
2. Concentrated nitric acid (HNO_3).
3. Concentrated hydrochloric acid (HCl).
4. 3N hydrochloric acid (HCl) - 1 volume of concentrated hydrochloric acid and 3 volumes of distilled water.

Figure 2.--Modified orange-peel bottom sampler.

5. 6N hydrochloric acid (HCl) - equal volumes of concentrated hydrochloric acid and distilled water.

6. Tartaric acid ($C_4H_6O_6$) solution (10 percent) - dissolve 100 gms. of tartaric acid in distilled water and dilute to 1 liter.

7. 1N ammonium hydroxide (NH_4OH) - dissolve and dilute 67 ml. of concentrated ammonium hydroxide to 1 liter with distilled water.

8. Ammonium acetate (CH_3COONH_4) buffer solution (20 percent) - dissolve 200 gms. of ammonium acetate in 1N ammonium hydroxide (NH_4OH) solution and dilute to 1 liter with distilled water.

9. 1N acetic acid (CH_3COOH) - dilute 58 ml. of concentrated acetic acid to 1 liter with distilled water.

10. Oxine (C_9H_7NO, 8-quinolinol) solution (2 percent) - dissolve 20 gms. of 8-quinolinol in 1N acetic acid and dilute to 1 liter with distilled water.

11. Chloroform ($CHCl_3$).

12. Aluminum oxide (Al_2O_3) standard solution (500 mu gms./ml.) - dissolve 4.4500 gms. of aluminum ammonium sulfate [$Al_2(SO_4)_3 \cdot (NH_4)_2SO_4 \cdot 24H_2O$] in distilled water and dilute to 1 liter.

13. Aluminum oxide (Al_2O_3) standard solution (25 mu gms./ml.) - dilute 25 ml. of aluminum oxide standard solution (500 mu gms./ml.) to 500 ml. with distilled water.

Procedure: Kenyon and Bewick (1952) described a photometric method for determining aluminum as the oxinate in a sample containing several other metals, by complexation with 8-quinolinol, manipulation of the pH and extraction with chloroform to remove interfering ions and then to get the aluminum oxinate. This is the basic method used to determine the concentration of aluminum in sediments.

Weigh about 0.2 gm. of sample into a 150-ml. beaker and add 10 ml. of 6N hydrochloric acid and 5 ml. of concentrated nitric acid. Heat at medium setting on an electric hot plate until evaporation is complete, bake for 10 minutes, allow to cool and add 3 ml. 6N hydrochloric acid. Heat on the hot plate to near boiling and filter the mixture using a medium-flow filter paper (Whatman No. 4) catching the filtrate in a 100-ml. volumetric flask. Fill flask to mark with distilled water, mix well and transfer 10 ml. of the solution to a 150-ml. beaker. Add 50 ml. of distilled water and adjust to a pH of less than 4. Add 3 ml. of 10 percent tartaric acid solution, 2 ml. of ammonium acetate solution and 2 ml. of oxine (8-quinolinol) solution. Mix thoroughly and adjust pH to 6.6 with concentrated and 1N ammonium hydroxide solutions, digest 15 minutes in a water bath at 65° C. and let cool. Adjust the pH to 2.8 with 3N hydrochloric acid and transfer the solution to a separatory funnel. Extract with two 10-ml. portions of chloroform and discard extracts. Return aqueous solution to a 150-ml. beaker, add 1 ml. of oxine solution, adjust pH to 5.7 with concentrated and 1N ammonium hydroxide and digest in water bath at 15° C. for 15 minutes. Return solution to separatory funnel and extract with two 10-ml. portions of chloroform, shaking the first portion 2 minutes and the second for 1 minute. Filter the chloroform extracts through a chloroform-wetted filter paper and catch the filtrate in a 50-ml. volumetric flask. Wash filter well with chloroform, adding washings to the flask and fill to mark with chloroform.

Make a set of standards by placing 0-, 2-, 4-, 6- and 8-ml. portions of the 25 mu gms. Al_2O_3 per ml. solution in a series of 150-ml. beakers and diluting each to 60 ml. with distilled water. This gives solutions containing 0, 50, 100, 150 and 200 mu gms. of aluminum oxide. Adjust the pH to less than 4 with 3N hydrochloric acid and add 3 ml. of 10 percent tartaric acid, 2 ml. of ammonium acetate buffer, 2 ml. of oxine solution and then adjust the pH to 5.7 with concentrated and 1N ammonium hydroxide. Digest the solution 15 minutes in a water bath at 65° C., let cool and transfer to a separatory funnel. Extract the aluminum oxinate with two 10-ml. portions of chloroform, shaking first portion 2 minutes and the second portion 1 minute. Filter extracts through a chloroform-wetted filter paper, catching the extracts in a 50-ml. volumetric flask. Wash filter well with chloroform, adding washings to flask and filling to mark with chloroform.

Determine the absorbancy for each sample and standard with a Beckman Model DU spectrophotometer with the tungsten lamp light source and settings as follows: Photomultiplier - set to null dark current; sensitivity control - midpoint; wave length - 390 m mu; selector switch - 0.1; phototube resistor - 2000 megohms; slit width - 0.15 mm. Plot the absorption values of the standards against their concentrations and determine the slope of the resulting line. Run a set of standards at least once a day. Use the reciprocal of the slope of the standard curve and the absorption values of the samples to find the amount of aluminum oxide present and report as percent aluminum oxide on dry weight basis.

Ferric oxide

Reagents:

1. 6N hydrochloric acid (HCl) - equal volumes of concentrated hydrochloric acid and distilled water.
2. Concentrated nitric acid (HNO_3).
3. Ammonium chloride (NH_4Cl) 20 percent solution - dissolve 200 gms. of ammonium chloride in distilled water and dilute to 1 liter.
4. Ammonium chloride (NH_4Cl) 1 percent solution - dissolve 10 gms. of ammonium chloride in distilled water and dilute to 1 liter.
5. Concentrated ammonium hydroxide (NH_4OH).
6. Ferric oxide (Fe_2O_3) standard solution (1000 p.p.m.) - dissolve 1.0000 gm. of oven dried (110° C.) ferric oxide in 30 ml. of 6N hydrochloric acid and dilute to 1 liter with distilled water. Store standard solution in a polyethylene bottle.
7. Methyl orange solution - dissolve 1 gm. of methyl orange in distilled water and dilute to 1 liter.

Procedure: A method reported by Dean and Burger (1955) for the flame spectrophotometric determination of iron was used in developing this method for iron in marine sediments.

Weigh 1.5 gms. of dry sample into a 150-ml. beaker and add 10 ml. of 6N hydrochloric acid and 5 ml. of concentrated nitric acid. Heat at medium setting on an electric hot plate until evaporation is complete, bake 10 minutes, allow to cool, and add 10 ml. of 6N hydrochloric acid. Heat to near boiling and filter through a medium-texture filter paper while still hot. Add three drops of methyl orange solution and 15 ml. of 20 percent ammonium chloride solution to the filtrate and washings. Add concentrated ammonium hydroxide dropwise until the methyl orange end-point is reached and then add 2 ml. in excess. Heat solution to boiling and immediately filter through open texture filter paper. Wash gelatinous precipitate with hot 1 percent ammonium chloride solution discarding filtrate and washings. Wash precipitate through the filter paper by adding 10 ml. of 6N hydrochloric acid dropwise, catch the resultant filtrate and washings in a 100-ml. volumetric flask and fill flask to the mark with distilled water. Set aside for flame analysis. From the 1000 p.p.m. ferric oxide standard solution prepare a series of standards with concentrations of 0, 50, 100, 150 and 200 p.p.m. ferric oxide.

Measure emission intensities for each sample as follows: unknown, distilled water, standard judged to be below unknown, distilled water, standard judged to be above unknown, and distilled water (the value obtained for distilled water is subtracted from the value obtained for each unknown and each standard) using a Beckman Model DU spectrophotometer equipped with photomultiplier and oxy-acetylene flame attachment. Spectrophotometer settings as follows: Photomultiplier - set to null dark current; sensititivity control - midpoint; wave length - 372 m mu; selector switch - 0.1; phototube resistor - 10,000 megohms; slit width - adjust to zero meter needle on 200 p.p.m. ferric oxide at 100 percent emission; acetylene pressure - 4.3 p.s.i.; oxygen pressure - 9.3 p.s.i. Bracket the net emission of the unknown by reading the appropriate pair of standards from the prepared series of standards immediately after reading the unknown. Report the concentration as percent ferric oxide on dry weight basis.

Manganous oxide

Reagents and Apparatus:

1. 3N hydrochloric acid (HCl) - 1 volume of concentrated hydrochloric acid and 3 volumes of distilled water.

2. 6N hydrochloric acid (HCl) - equal volumes of concentrated hydrochloric acid and distilled water.

3. Concentrated nitric acid (HNO_3).

4. Amberlite IRA 400 (OH) - anion exchange resin (manufactured by Rohm and Haas Company).

5. Manganese dioxide (MnO_2) standard solution (500 p.p.m.) - dissolve 0.2500 gm. of manganese dioxide in 20 ml. of 6N hydrochloric acid; heat until dissolved and dilute to 500 ml. with distilled water.

6. Calcium oxide (CaO) solution (10,000 p.p.m.) - dissolve 4.4617 gms. of calcium carbonate ($CaCO_3$) in 20 ml. of 6N hydrochloric acid and dilute to 250 ml. with distilled water.

7. Anion exchange column - the column is made by placing a plug of glass wool above the stopcock of a 50-ml. buret and adding amberlite IRA 400 (OH) anion exchange resin to a depth of 30 cm. in the buret. (The column is recharged after each third sample is passed through by washing with 150 ml. of 3N hydrochloric acid and rinsing with 150 ml. of freshly boiled and cooled distilled water.)

Procedure: Dippel and Bricker (1955) reported a rapid flame photometric method for the determination of manganese in a variety of materials, by measuring the intensity of the manganese line at 403.3 m mu. They found the intensity to vary directly and linearly with the concentration of manganese up to 200 p.p.m., and that interference was exhibited by phosphate, sulfate and chloride ions. We used an anion exchange resin to remove interfering anions and added calcium to all standards to give a concentration of at least 1000 p.p.m. calcium oxide to offset the effect of that present in the samples.

Weigh about 1.0 gm. of dried sample into a 150-ml. beaker and add 10 ml. of 6N hydrochloric acid and 5 ml. of concentrated nitric acid. Heat at medium setting on an electric hot plate until evaporation is complete, bake for 10 minutes, allow to cool, and add 1 ml. of 6N hydrochloric acid and 15 ml. of distilled water. Heat to near boiling and filter the mixture using a medium-flow filter paper (we used Whatman No. 4) letting the filtrate flow directly into the anion exchange column. Catch the effluent in a 100-ml. volumetric flask and fill to the mark with distilled water. Add 10 ml. of calcium oxide solution to each of a set of standards containing concentrations of 0, 100, 200, 300 and 400 p.p.m. of manganese dioxide (prepare from standard solution).

Measure emission intensities for each sample as follows: unknown, distilled water, standard judged to be below unknown, distilled water, standard judged to be above unknown, and distilled water (the value obtained for distilled water is subtracted from the value obtained for each unknown and each standard) using a Beckman Model DU spectrophotometer equipped with photomultiplier and oxy-acetylene flame attachment. Spectrophotometer settings as follows: Photomultiplier - set to null dark current; sensitivity control - clockwise extreme; wave length - 403.3 m mu; selector switch - 0.1; phototube resistor - 2000 megohms; slit width - adjust to zero meter needle on 400 p.p.m. manganese dioxide at 100 percent transmission; acetylene pressure - 3.5 p.s.i.; oxygen pressure - 9.3 p.s.i. Bracket the net emission of the unknown by reading the appropriate pair of standards from the prepared series of standards immediately after reading the unknown. Report concentration as percent manganous oxide on dry weight basis. (We first determined percent manganese dioxide, but subsequently found percent manganous oxide would be a more useful expression.)

Magnesium oxide and potassium oxide

Reagents:

1. 6N hydrochloric acid (HCl) - equal volumes of concentrated hydrochloric acid and distilled water.

2. Concentrated nitric acid (HNO_3).

3. Magnesium oxide (MgO) standard solution (2000 p.p.m.) - weigh 2.0000 gms. of oven dried (110° C.) magnesium oxide into a 400-ml. beaker. Dissolve in a minimum volume of 6N hydrochloric acid, transfer to a 1-liter volumetric flask, and fill to mark with distilled water.

4. Potassium oxide (K_2O) standard solution (1000 p.p.m.) - weigh 1.5828 gms. of oven dried (110° C.) potassium chloride into a 1-liter volumetric flask, dissolve and dilute to 1 liter with distilled water.

5. Aluminum oxide (Al_2O_3) standard solution (4000 p.p.m.) - dissolve in distilled water 4.4500 gms. of aluminum ammonium sulfate [$Al_2(SO_4)_3 \cdot (NH_4)_2SO_4 \cdot 24H_2O$] and dilute to 250 ml. with distilled water.

6. Ferric oxide (Fe_2O_3) standard solution (2000 p.p.m.) - dissolve 1.0000 gm. of oven dried (110° C.) ferric oxide in 30 ml. of 6N hydrochloric acid and dilute to 500 ml. with distilled water.

7. Manganese dioxide (MnO_2) standard solution (500 p.p.m.) - place 0.2500 gm. of oven dried (110° C.) manganese dioxide in 20 ml. of 6N hydrochloric acid, heat until dissolved and dilute to 500 ml. with distilled water.

8. Calcium oxide (CaO) standard solution (10,000 p.p.m.) - dissolve 4.4617 gms. of calcium carbonate ($CaCO_3$) in 20 ml. of 6N hydrochloric acid and dilute to 250 ml. with distilled water.

9. Phosphorus pentoxide (P_2O_5) standard solution (500 p.p.m.) - dissolve 0.5000 gm. of anhydrous dibasic phosphate (Na_2HPO_4) in carbon dioxide (CO_2) free distilled water and allow to flow through a cation exchange column. Catch effluent in a 500-ml. volumetric flask and dilute to 500 ml. with distilled water.

Procedure: We have used the basic system for the determinations of magnesium and potassium in bottom sediments as reported by Roy (1956).

Weigh 1.0 gm. of dried sample into a 150-ml. beaker and add 10 ml. of 6N hydrochloric acid and 5 ml. of concentrated nitric acid. Heat at medium setting on an electric hot plate until evaporation is complete, bake for 10 minutes, allow to cool, add 2 ml. of 6N hydrochloric acid and 10 ml. of distilled water. Heat to near boiling and filter the mixture using a medium-flow filter paper (we used Whatman No. 4) catching the filtrate in a 100-ml. volumetric flask. Fill to mark with distilled water and use for determining magnesium oxide and potassium oxide. To each of a series of six 100-ml. volumetric flasks, add 5 ml. of the 4000 p.p.m. aluminum oxide standard, 25 ml. of the 2000 p.p.m. ferric oxide standard, 2 ml. of the 500 p.p.m. manganese dioxide standard, 7 ml. of the 10,000 p.p.m. calcium oxide standard, and 4 ml. of the 500 p.p.m. phosphorus pentoxide standard--this gives final concentrations of 200 p.p.m. aluminum oxide, 500 p.p.m. ferric oxide, 10 p.p.m. manganese dioxide, 700 p.p.m. calcium oxide, and 500 p.p.m. phosphorus pentoxide. Then add 0-, 5-, 15-, 20- and 25-ml. portions of the standard 2000 p.p.m. magnesium oxide solution to the flasks and in the same order add 0-, 2-, 4-, 6-, 8- and 10-ml. portions of the standard 1000 p.p.m. potassium oxide solution--this gives concentrations in p.p.m. of magnesium oxide and potassium oxide, respectively of; 0 and 0, 100 and 20, 200 and 40, 300 and 60, 400 and 80, and 500 and 100.

Measure emission intensities for each sample as follows: unknown, distilled water, standard judged to be below unknown, distilled water, standard judged to be above unknown, and distilled water (the value obtained for distilled water is subtracted from the value obtained for each unknown and each standard) using a Beckman Model DU spectrophotometer equipped with photomultiplier and oxy-acetylene flame attachments. Spectrophotometer settings for magnesium oxide and analysis as follows: Photomultiplier - set to null dark current; sensitivity control - about midpoint; wave length - 285.2 m mu; selector switch - 0.1; phototube resistor - 10,000 megohms; slit width - adjust to zero meter needle on 500 p.p.m. magnesium oxide standard at 100 percent emission; acetylene pressure - 3.5 p.s.i.; oxygen pressure - 9.5 p.s.i. Bracket the net emission of the unknown by reading the appropriate pair of standards from the prepared series of standards immediately after reading the unknown. Report the concentration as percent magnesium oxide on dry weight basis. Spectrophotometer settings for potassium oxide analysis as follows: Photomultiplier - set to null dark current; sensitivity control - about midpoint; wave length - 766.5 m mu; selector switch - 0.1; phototube resistor - 10,000 megohms; slit width - adjust to zero meter needle on 100 p.p.m. potassium oxide standard at 100 percent emission; acetylene pressure - 4.5 p.s.i.; oxygen pressure - 11.0 p.s.i. Bracket the net emission of the unknown by reading the appropriate pair of standards from the prepared series of standards immediately after reading the unknown. Report the concentration as percent potassium oxide on dry weight basis.

Calcium oxide

Reagents and Standards:

1. 3N hydrochloric acid (HCl) - 1 volume of concentrated hydrochloric acid and 3 volumes of distilled water.

2. 6N hydrochloric acid (HCl) - equal volumes of concentrated hydrochloric acid and distilled water.

3. Concentrated nitric acid (HNO_3).

4. Calcium oxide (CaO) solution (1000 p.p.m.) - dry National Bureau of Standards argillaceous limestone sample No. 1a (containing 41.32 percent calcium oxide) at 105° C. for 3 hours, cool in a desiccator over calcium sulfate ($CaSO_4$) and weigh 2.4201 gms. into a 400-ml. beaker. Add 25 ml. of 6N hydrochloric acid and 12.5 ml. of concentrated nitric acid. Evaporate to dryness on a hot plate at medium setting and let bake 10 minutes after dryness is reached. Allow to cool, add 5 ml. of 6N hydrochloric acid and 40 ml. of distilled water and heat to near boiling. Filter, letting the filtrate pass through the anion exchange column and catching the effluent and washings in a 1000-ml. volumetric flask. Fill flask to mark with distilled water.

5. Amberlite IRA 400 (OH) - anion exchange resin (manufactured by Rohm and Haas Company).

6. Anion exchange column - the column is made by placing a plug of glass wool above the stopcock of a 50-ml. buret and adding amberlite IRA 400 (OH) anion exchange resin to a depth of 30 cm. in the buret. (The calcium is recharged

after each third sample is passed through by washing with 150 ml. of 3N hydrochloric acid and rinsing with 150 ml. of freshly boiled and cooled distilled water.)

Procedure: The method used in determining calcium is a modification of a successful application of the flame method to a complex material of fairly high calcium content reported by Standen and Tennant (1956), and utilizing an anion interference removal procedure described by Beckman Instruments, Inc. (1955).

Weigh 0.1-1.0 gram of sample depending upon the apparent CaO content) into a 150-ml. beaker. (Insoluble residue was determined previous to CaO--and CaO content varies somewhat inversely to that of insoluble residue.) Add 10 ml. of 6N hydrochloric acid and 5 ml. of concentrated nitric acid. Heat at medium setting on an electric hot plate until evaporation is complete, bake for 10 minutes, allow to cool and add 1 ml. of 6N hydrochloric acid and 15 ml. of distilled water. Heat to near boiling and filter this mixture using a medium-flow filter paper, letting the filtrate flow directly into the anion exchange column. Catch the effluent in a 100-ml. volumetric flask, fill flask to mark with distilled water and set aside for flame analysis.

Make up a set of standards in concentrations of 0, 500, 600, 700, 800, 900, and 1000 p.p.m. CaO from the 1000 p.p.m. CaO standard solution.

Measure emission intensities for each sample as follows: Unknown, distilled water, standard judged to be below unknown, distilled water, standard judged to be above unknown, and distilled water (the value obtained for distilled water is subtracted from the value obtained for each unknown and each standard) using a Beckman Model DU spectrophotometer equipped with photomultiplier and oxy-acetylene flame attachments. Spectrophotometer settings as follows: Photomultiplier - set to null dark current; sensitivity control - clockwise extreme; wave length - 554 m mu; selector switch - 0.1; phototube resistor - 10,000 megohms; slit width - adjust to zero meter needle on 1000 p.p.m. calcium oxide standard at 100 percent transmission; acetylene pressure - 3.5 p.s.i.; oxygen pressure - 9.1 p.s.i. Bracket the net emission of the unknown by reading the appropriate pair of standards from the prepared series of standards immediately after reading the unknown. Report the concentration as percent calcium oxide on dry weight basis.

Phosphorus pentoxide

Reagents and Apparatus:

1. 3N hydrochloric acid (HCl) - 1 volume of concentrated hydrochloric acid and 3 volumes of distilled water.

2. 6N hydrochloric acid (HCl) - equal volumes of concentrated hydrochloric acid and distilled water.

3. Concentrated nitric acid (HNO_3).

4. Dowex 50x8 - cation exchange resin. (Dow Chemical Company).

5. Phosphorus pentoxide (P_2O_5) standard solution (500 p.p.m.) - dissolve 0.5000 gm. of anhydrous sodium dibasic phosphate (Na_2HPO_4) in recently boiled (CO_2 free) distilled water and allow to flow through a cation exchange column. Catch effluent in a 500-ml. volumetric flask and dilute to 500 ml. with distilled water.

6. Calcium oxide (CaO) solution (10,000 p.p.m.) - dissolve 8.9236 gms. of calcium carbonate ($CaCO_3$) in a slight excess of 6N hydrochloric acid (about 25 ml.), evaporate to dryness, redissolve in 6N hydrochloric acid and dilute to 500 ml. with distilled water.

7. Cation exchange column - the column is made by placing a plug of glass wool above the stopcock of a 50-ml. buret and adding 20 to 50 mesh Dowex 50x8 cation exchange resin to a depth of 30 cm.

in the buret. (The column is recharged after each third sample is passed through by washing with 150 ml. of 3N hydrochloric acid and rinsing with 150 ml. of freshly boiled and cooled distilled water).

Procedure: Dippel, Bricker, and Furman (1954) reported that in flame analysis "at the lower phosphate concentrations, the emission intensity of calcium varies linearly and inversely with the phosphate concentration." This is the basis used for the determination of phosphorus pentoxide. A cation exchange resin is used to remove interfering cations.

Weigh between 0.5 and 1.0 gm. of dried sample into a 150-ml. beaker and add 10 ml. of 6N hydrochloric acid and 5 ml. of concentrated nitric acid. Heat at medium setting on an electric hot plate until evaporation is complete, bake for 10 minutes, allow to cool, and add 2 ml. of 6N hydrochloric acid and 10 ml. of distilled water. Heat to near boiling and filter the mixture using a medium-flow filter paper (we used Whatman No. 4 filter paper), letting the filtrate flow directly into the cation exchange column, and catch the effluent in a 100-ml. volumetric flask. Wash the filter and column with freshly boiled and cooled distilled water until about 80 ml. of effluent is collected in the flask. Pipette 10 ml. of calcium oxide solution into the volumetric flask and fill to the mark with distilled water. Add 10 ml. of calcium oxide solution to each of a set of standards containing concentrations of 0, 100, 200, 300 and 400 p.p.m. of phosphorus pentoxide in 100-ml. volumetric flasks.

Measure emission intensities for each sample as follows: unknown, distilled water, standard judged to be below unknown, distilled water, standard judged to be above unknown, and distilled water (the value obtained for distilled water is subtracted from the value obtained for each unknown and each standard) using a Beckman Model DU spectrophotometer equipped with photomultiplier and oxy-acetylene flame attachments. Spectrophotometer settings as follows: Photomultiplier - set to null dark current; sensitivity control - about midpoint; wave length - 554 m mu; selector switch - 0.1; phototube resistor - 2000 megohms; slit width - adjust to zero meter needle on 0 p.p.m. phosphorus pentoxide standard at 100 percent emission; acetylene pressure - 3.5 p.s.i.; oxygen pressure - 9.5 p.s.i. Bracket the net emission of the unknown by reading the appropriate pair of standards from the prepared series of standards immediately after reading the unknown. Report the concentration as percent phosphorus pentoxide on dry weight basis.

Strontium

Reagents and Apparatus:

1. 6N hydrochloric acid (HCl) - equal volumes of concentrated hydrochloric acid and distilled water.

2. 3N hydrochloric acid (HCl) - 1 volume of concentrated hydrochloric acid to 3 volumes of distilled water.

3. Concentrated nitric acid (HNO_3).

4. Strontium (Sr) standard solution (1000 p.p.m.) - dissolve 1.6849 gms. of strontium carbonate ($SrCO_3$) in 10 ml. of 6N hydrochloric acid. Filter, using rapid-flow filter paper, letting filtrate pass through a column of amberlite IRA 400 (OH) and catching the effluent in a 1-liter volumetric flask. Rinse the column well with freshly boiled distilled water, add washings to the 1-liter flask, and fill to mark with distilled water.

5. Strontium (Sr) standard solution (200 p.p.m.) - dilute 200 ml. of strontium standard solution (1000 p.p.m.) to 1 liter with distilled water.

6. Amberlite IRA 400 (OH) - anion exchange resin (manufactured by Rohm and Haas Company).

7. Anion exchange column - the column is made by placing a plug of

glass wool above the stopcock of a 50-ml. buret and adding amberlite IRA 400 (OH) anion exchange resin to a depth of 30 cm. in the buret. (The column is recharged after each third sample is passed through by washing with 150 ml. of 3N hydrochloric acid and rinsing with 150 ml. of freshly boiled and cooled distilled water).

Procedure: Chow and Thompson (1955) reported a procedure for determining strontium in seawater. This was used as a guide in developing a method for determining strontium in marine sediments.

Weigh 1.0 gm. of dried sample into a 150-ml. beaker and add 10 ml. of 6N hydrochloric acid and 5 ml. of concentrated nitric acid. Heat at medium setting on an electric hot plate until evaporation is complete, bake for 10 minutes, allow to cool, and add 1 ml. of 6N hydrochloric acid and 15 ml. of distilled water. Heat to near boiling and filter the mixture using a medium-flow filter paper, let the filtrate flow directly into the anion exchange column, and catch effluent in a 100-ml. volumetric flask. Wash the filter and column with CO_2-free distilled water, catching the washings in the 100-ml. flask also, add 5 ml. of the 200 p.p.m. strontium standard solution (representing 10 p.p.m. added strontium) and finish filling to mark with distilled water. Set aside for flame analysis.

Make up standards of 0, 10, 20, 30, 40 and 50 p.p.m. strontium from the 200 p.p.m. strontium standard solution. Adjust the Beckman Model DU spectrophotometer to read 100 percent emission for the 50 p.p.m. strontium standard at 460.7 m mu wave length. Read and record the flame intensity of each of the standards, taking and recording a reading on distilled water subsequent to each standard. Set the wave length at 454 m mu and determine and record flame intensities of standards and subsequent distilled water. Subtract flame intensities of distilled water from those of standards at both wave lengths, then deduct the remainder of the flame intensity taken at 454 m mu from that taken at 460.7 and plot these remainders against the concentrations. From this standard curve determine the net flame intensity representing 100 p.p.m. strontium.

Determine the flame intensities of each unknown with a subsequent distilled water reading for each at 460.7 m mu and at 454 m mu wave length. Subtract readings of water from those of the unknowns, and then subtract the remainder of the intensity of 454 m mu from that taken at 460.7 m mu and from this remainder subtract the net flame intensity representing 10 p.p.m. strontium to compensate for the 10 p.p.m. strontium added to each unknown. Use the net intensity from the unknowns and the standard curve to find the strontium concentration. Report as percent strontium on a dry weight basis. Spectrophotometer settings as follows: Photomultiplier - set to null dark current; sensitivity control - counterclockwise extreme; wave length - strontium spectral line 460.7 m mu and also flame background at 454 m mu; selector switch - 0.1; phototube resistor - 2000 megohms; slit width - .01 to .02 mm.; acetylene pressure - 3.5 p.s.i.; oxygen pressure - 12 p.s.i.

Chloride

Reagents:

1. Standard chloride solution [0.10N sodium chloride ($NaCl$)] - dissolve 5.8460 gms. of sodium chloride in distilled water and dilute to 1 liter.

2. Silver nitrate ($AgNO_3$) - dissolve 7.5 gms. of silver nitrate in distilled water and dilute to 1 liter.

3. Indicator [8 percent potassium chromate (K_2CrO_4) solution] - dissolve 8.0 gms. of potassium chromate in distilled water and dilute to 100 ml.

Procedure: A modification of the procedure used by Anderson, Gehringer and Cohen (1956a) for salinity (Knudsen method) was employed on leachings of sediments to determine their chloride content.

Standardize the silver nitrate solution by titrating it against 10 ml. of the 0.10N sodium chloride solution, using potassium chromate indicator. Calculate the chloride equivalent per ml. of silver nitrate solution from this titration.

Weigh 2.0 gms. of dried sample and place in a 200-ml. Erlenmeyer flask, add 100 ml. of distilled water, stopper flask and shake vigorously for 10 minutes. Titrate duplicate 25-ml. aliquots of the decantate with standardized silver nitrate solution using potassium chromate as an indicator. Multiply volume of silver nitrate solution required by its chloride equivalent to find the weight of chloride in one quarter of the weighed out sample. Results are recorded as percent chloride on dry weight basis.

GEOLOGICAL METHODS AND PROCEDURES

GENERAL

Sample storage and catalogue procedure

Representative portions of the total original samples were transported in cardboard 1-pint ice cream cartons from the Bureau of Commercial Fisheries Biological Laboratory, Brunswick, Georgia, to the Sediment Research Laboratory, Florida State University, Tallahassee, Florida. Upon arrival, approximately one-half of each sample was split quantitatively with a Jones Splitter and sent to other laboratories for microfaunal analysis. The remaining fraction was placed in a corked glass shell vial. These served as the sample containers during analysis. After laboratory examination the various samples were placed in clear plastic boxes and stored in the sediment sample collections of the Department of Geology, Florida State University, in order of *Gill* sample number. Powdered fractions of samples are stored in glass vials in the reference collections and may also be obtained from the Bureau of Commercial Fisheries Biological Laboratory, Brunswick, Georgia. All stored samples have been dried at 100° C. prior to storage.

General notes on methods and calculations

Unless otherwise specified, all solutions have been prepared with distilled water and chemicals of reagent grade. The determinations of organic carbon, nitrogen and carbonate were made on total sample. Heavy mineral determinations were made for each size fraction and then combined to give the value for the total sample.

Bioclastic components were examined under a binocular microscope at intermediate magnification. The dominant percent component was estimated visually. In all instances the dominance was great and none of the samples was found to be a problem in classification.

The precision of the carbon, carbonate, and heavy mineral analyses is probably at least one order of magnitude greater than the precision of sampling. The very small organic content and the small samples available brought the nitrogen analysis procedure very close to its limits of precision. For this reason, the organic contents should be estimated from the carbon values.

Calculations of the textural parameters were made using a programmed IBM 650 and punch card data entry. The other computations were made using a desk calculator. Variability and trend surface analysis has been performed on the data and will appear in a paper in preparation by Drs. Gorsline and Goodell of the Florida State University. Persons interested in obtaining copies of these data should write to Dr. H. G. Goodell at the Department of Geology of the Florida State University.

Formulae

Carbonate percentages:

$$\% CaCO_3 = 0.1605 \ \frac{VP}{TW}$$

where V = volume of CO_2 evolved, in ml.

P = atmospheric pressure corrected for water vapor pressure, in mm. Hg

T = temperature in $^{\circ}$ K

W = sample weight in gms.

Nitrogen percentages:

$$\% N = \frac{\text{(milliequivalents HCl) (1.4)}}{\text{sample weight}}$$

$$\text{meq HCl} = \text{(ml. HCl)} (N_{HCl}) - \text{(ml. NaOH)} (N_{NaOH})$$

Carbon percentages:

$$\% C = \frac{\text{(Average blank value - Burette rdg.) (20) (0.138)}}{\text{(ml. blank) (taken from standardization)}}$$

If all reagents are exactly made then the ml. blank will equal 20 and the equation will be a simple corrected burette reading multiplied by 0.138.

METHODS

Textural analysis [1]

Reagents:

1. Dispersing agent - 40 to 50 gms. of Calgon are dissolved in 200 ml. of water and then added to 5 gallons of water and mixed. A 50-ml. aliquot is drawn off by pipette and dried at 100° C. The weight of dispersing agent per 50 ml. is noted on the storage bottle.

Procedure: A 20- to 30-gm. sample is washed with dispersing agent through a screen of 0.062 mm. mesh and the fine material is caught in a 1000-ml. graduated cylinder. The portion coarser than 0.062 mm. in diameter is dried. The finer fraction is brought up to 1 liter with dispersing agent and agitated. During agitation a 50-ml. aliquot is drawn by pipette and dried and weighed. If an appreciable amount of fine-grained material is present, subsequent aliquots are removed according to a previously computed time schedule from a fixed depth below the suspension surface (see Krumbein and Pettijohn, 1938, pp. 135-181). This pipette analysis will yield the size distribution of the fine fraction. The coarser particles are graded by seiving them through a nested set of screens with meshes ranging from 4 mm. to 0.062 mm. The intervals are taken from Wentworth's classification of grain sizes (1922). The sand grades are carefully removed from each screen, examined under a binocular microscope to check for possible aggregation, and weighed.

After both distributions have been determined the results of the separate analyses are combined to yield the gross size gradation in the entire sample.

The weight percentages are tabulated and punched into IBM code cards. The parameters of the size distributions are then computed by an appropriate program on the digital computer.

After weight percentages in each size grade have been computed, the totals for particles of less than 0.062 mm. diameter, 0.062 to 2.000 mm. diameter, and greater than 2.000 mm. diameter are calculated. These are the silt-clay, sand, and gravel percentages respectively.

Carbonate content [2]

Reagents:

1. 1.0N sulfuric acid - 56 ml. of concentrated sulfuric acid are added to distilled water and brought up to 1 liter in a volumetric flask.

Procedure: Approximately 0.300 gm. of dried powdered sample is placed in the sample tube of a carbonate apparatus. The system is brought to the room pressure and then closed. About 4 to 5 ml. of the acid are introduced into the closed system via the acid holder tube and a slight vacuum is placed on the system by lowering the mercury manometer. After the initial reaction has ceased, the sample tube is heated gently until the reaction is complete. After the system has been cooled to room temperature, the pres-

[1] Following Krumbein and Pettijohn, 1938

[2] Following Bien, 1952

sure inside the system is equalized by manipulating the mercury reservoir and the evolved volume of carbon dioxide gas is read from the graduated glass reservoir tube. A correction is made for the water vapor pressure included in the barometric pressure and then connected pressure, room temperature and evolved gas volume are combined with the sample weight to calculate the carbonate content.

Organic nitrogen[3]

Reagents:

1. 0.01N hydrochloric acid - 0.86 ml. hydrochloric acid is added to about 950 ml. of distilled water in a volumetric flask and standardized against the dried sodium carbonate solution. Water is added until the normality of the acid is 0.01.
2. 0.01N sodium hydroxide solution - a concentrated carbonate-free solution of sodium hydroxide is prepared by dissolving an equal weight of sodium hydroxide in water and then placing the stoppered mixture in a water bath at 80° C. for 12 hours. One-half ml. of the clear supernatant liquid is then pipetted into about 900 ml. of freshly boiled water. This is standardized against the hydrocloric acid using methyl red indicator.
3. Sodium carbonate solution - 0.0250 gm. of sodium carbonate which has been dried in an oven at 250° C. for 2 hours is added to 50 ml. of distilled water. This is boiled and then titrated against the fresh hydrochloric acid solution using methyl orange indicator in order to determine the normality of the acid. Weighing of the carbonate should be done as carefully and accurately as is possible.
4. Methyl red - 0.15 gm. of methyl red is treated with 40 ml. of sodium hydroxide solution and then stored in a glass stoppered bottle.

Procedure: Samples are powdered and dried overnight at 105° C. After cooling, 0.200 gm. of the sample is placed in a Kjeldahl flask together with two Hengars granules and 3 ml. of concentrated sulfuric acid. The mixture is heated gently initially and then over a strong flame for a total of 15 minutes. After cooling slightly, three drops of 30 percent hydrogen peroxide are added and heating resumed for another 10 minutes. If the solutions are not clear amber or pale green in color, then three more drops of peroxide are added and heating resumed. The cooled sample solutions are then washed into a steam distilling unit of the Kjeldahl type and mixed with 15 ml. of 40 percent sodium hydroxide. The two solutions are mixed and the resulting ammonia distilled over to the acid trap by steam drive. The evolved gas is passed through a carefully measured 10-ml. volume of 0.01N hydrochloric acid. Ten minutes of distilling are usually sufficient. The acid solution is then brought to boiling and back-titrated with 0.01N sodium hydroxide to a clear pale orange end point using three drops of methyl red indicator.

Organic carbon[4]

Reagents:

1. Potassium dichromate solution - 19.61 gms. of potassium dichromate ($K_2Cr_2O_7$) are ground and dried at 110° C. After cooling in a desiccator, the reagent is dissolved in water and made up to 1 liter in a volumetric flask.
2. Ferrous ammonium sulfate solution - 78.6 gms. of ferrous ammonium sulfate are dissolved in water containing 20 ml. of sulfuric acid and made up to 1 liter in a volumetric flask. This solution should be standardized frequently as it deteriorates in the presence of air.
3. Diphenylamine - 0.5 gm. of diphenylamine is dissolved in 100 ml. of concentrated sulfuric acid. This is then poured slowly into 20 ml. of cold water.

Procedure: A large pyrex test tube is cleaned and dried and 10 ml. of

[3] Following Niederl and Niederl, 1947

[4] Following Allison, 1935

potassium dichromate solution is pipetted in. This is evaporated to dryness overnight at 80° to 85° C. After drying, 0.500 gm. of dried powdered sediment is added and 10 ml. of concentrated sulfuric acid is drawn into the tube from a burette. The sample and solution are heated to about 175° C. with constant stirring over a Bunsen burner in a period of 90 seconds. The mixture is air cooled to 100° C. and then cooled in running cold water. The contents of the tube are poured into about 50 ml. of distilled water and the tube rinsed until the volume of liquid is about 150 ml. Five gms. of sodium fluoride is added and the mixture titrated against ferrous ammonium sulfate using diphenylamine indicator. Three drops of indicator are sufficient. The end point is a slow but distinct change from blue to green.

Blank determinations should be run together with each group of three or four samples.

Sediment type

Reagents: None required.

Procedure: Following the mechanical analysis of the distribution of grain sizes in a sediment sample, the percentages of grains of clay, salt, sand, and gravel size are determined following Wentworth's classes of size grades (1922). A textural type name is then determined using the graphical method of locating the position of the individual sample in a tetrahedron whose quoins represent 100 percent clay, silt, sand or gravel (fig. 3). Except in rare instances, marine sediments are usually composed of no more than three components. For this reason, a simple triangle diagram is sufficient for the classification procedure. If a sediment sample is composed of 5 percent silt, 65 percent sand and 30 percent gravel, then the position of this combination on the triangle shown in figure 3 would

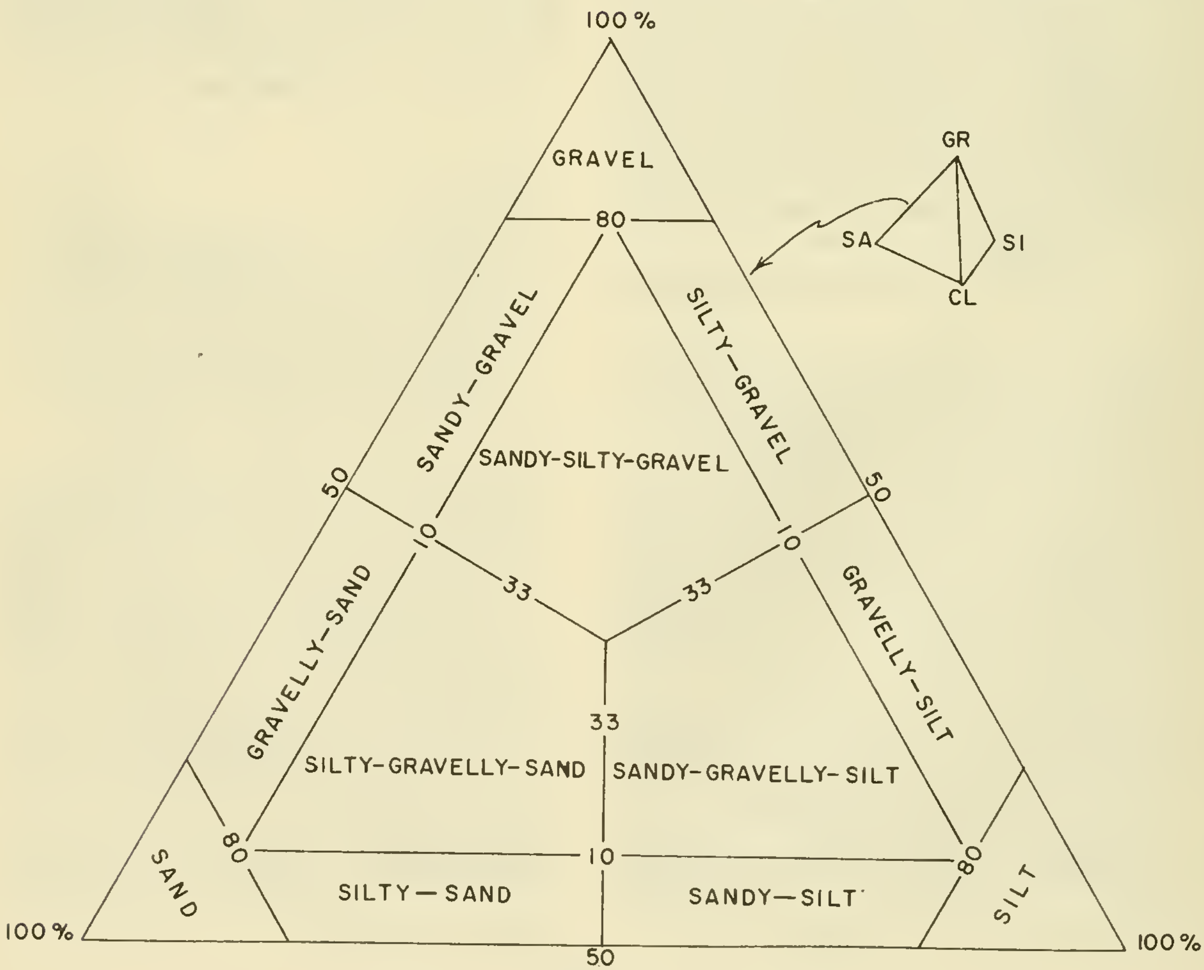

Figure 3.--Tetrahedron for determining textural types.

fall within the limits of gravelly sand. A sample containing less than 5 percent silt and sand and 95 percent gravel would be termed a gravel.

In addition to the textural term, appropriate modifiers are added to indicate composition. If a sample is composed of 95 percent sand-sized particles, and if these grains are principally fragments of shells, then the type name would be shell fragment sand.

Heavy mineral contents

Reagents:

1. Bromoform, density 2.9.
2. Ethyl alcohol.

Procedure: A dried sediment sample of about 5 gms. weight is placed in a central open-ended tube inside of a 60-ml. centrifuge tube. The sample is stirred together with 40 ml. of heavy liquid and then spun at 2000 r.p.m. for 5 minutes. The sample is stirred again and the mixture spun for a second 5 minutes at 2000 r.p.m. After centrifuging, the inner tube containing the light fraction is removed after stoppering its upper end and then drained into a paper filter. The heavy liquid is caught and returned to use. The filtered sediment is washed with alcohol and the washings saved for reclamation of the heavy liquid. After the washing, the light minerals are allowed to air dry. The outer tube containing the heavy grains is poured into a second paper filter and treated in similar fashion. Both papers are folded over and marked with the sample number. The weights of the light and heavy mineral fractions are recorded and the percentages of each calculated on the basis of total sample weight.

GENERAL CHARACTER OF BOTTOM MATERIALS

The pattern of the sediment textural types is indicated on figure 4. It is evident that the position of the Gulf Stream has an important bearing on the sediment character if one notes that the boundary of the high carbonate sediment (shown by the 50 percentile contour) essentially lies along the boundary of the north-flowing stream and the inner mainly south-flowing currents. The sediments seaward of this approximate boundary are dominantly composed of the tests of Foraminifera. Inshore from this zone the sediments are varying combinations of quartz sands and shell fragment sands. In general, the proportion of shell fragments and of carbonate percentages increases from shore to the shelf edge, and from north to south along the inner shelf. Off Florida, the shelf sediments are dominantly shell fragment (shell hash) sands and gravels.

In a few of the stations closest to shore a silty sand appears that probably represents the present sediment contribution from the land sources. The roughly linear trend of gravelly sand patches may indicate the approximate position of old strand lines during lower sea levels of the glacial ages. Finer sediments appear on the upper slopes and on the outer portion of the Blake Plateau. However, the coarsest bottom materials are present along the inner margin of the Blake Plateau and under the main portion of the Gulf Stream. The finer sediments present in this zone to the south may represent finer materials lying behind the gentle sill that forms the terminus of the Florida Straits. Beyond this low barrier, the main current apparently sweeps most fine material to the north.

Organic contents are very low over much of the shelf and outer Blake Plateau. This plus the large proportion of mollusk fragments would appear to be the result of slow rates of deposition and long exposure at the surface. It is probable that the major part of the shelf sediment cover is relict or residual from the pre-Recent. This same pattern is evidenced on many shelf areas of the world (see Emery, 1952, 1954, and 1960).

A striking feature of the Blake Plateau is the presence of manganese nodules. Bottom photographs in the files of the Woods Hole Oceanographic Institute and the Lamont Geological Observatory show that much of the area of the Blake Plateau is covered by cobble and pebble

Figure 4.--Pattern of sediment textural types.

sized nodules. These are indicative of slow rates of deposition in these areas.

Along the edge of the shelf, the foraminiferal sands and silty sands contain the mineral glauconite which is an indicator of slow sedimentation rates. These are also indicated by high potassium values in the tabulated chemical data.

Some of the shelf sediments are iron-stained. Others contain some small phosphorite grains. All indicating that the present sediment surface is either one of slow accumulation or is an old pre-Recent sediment cover.

The association of foraminiferal sands and the more normal shelf sediments is strikingly similar to patterns along the shelf and slope of the South and East China Sea, along which the great Japanese Current flows. Niino and Emery (1959) have illustrated patterns from that area which are almost identical with those of the area covered by the *Gill* cruises.

The chemical data tabulated in this report reflect the generally simple composition of the sediments. Much of the insoluble material is silica in the form of detrital quartz. The carbonate is predominantly in the form of shell fragments and other organic debris. Calcareous rock fragments of older terrains are negligible or absent. Some rock fragments are present in two or three samples from the northern inner shelf. Heavy mineral percentages are usually less than 1 percent and rarely as much as 2 percent.

The principal sources of the iron and phosphorus is apparently the shell debris. In the samples in which iron staining and phosphorite are present these values are markedly increased. Potassium is low except where glauconite occurs. Alumina, strontium and manganese are all present in very small quantities in the organic debris except in the samples containing manganese nodules in which the manganese percentages become very large portions of the total sample composition. In general, the strontium contents are highest in areas of shell debris and authigenic mineral concentrations, and low in the foraminiferal sediments. Magnesium is highest in the shell fragment sands and low in the calcareous foraminiferal sediments.

Modern sedimentation appears to be active in the inner shelf and in the slope areas but is absent or very slow over the outer shelf, the inner Blake Plateau and in the areas of authigenic mineral formation at the shelf edge and the central Blake Plateau.

STATION AND SAMPLE LOCATIONS

The positions of the samples of bottom sediments tabulated in this report are shown in figures 5 through 7. When positions are identical for several different samples, all are shown in bold type immediately above the station position. Sample data are tabulated in order of station number in the data section of the report.

The precision of station location is not sufficient to place the individual samples within an area smaller than a 3- to 5-mile circle; therefore, when considerable variability is present in sample textures it is not possible to show these variations in their true relationship. The variations are real and are all larger than the margin of error in the analytical procedure. In those examples where the variability is quite small, it will probably be permissible to assign variability in other parameters to seasonal changes. At stations where textural variability is large, seasonal variations will be obscure and should be made with great caution.

One additional caution with respect to the interpretation of the tabulated data is that patterns of sedimentological characteristics should be described in no greater detail than the minimum sample spacing. It is not valid to draw detailed or definite lines of

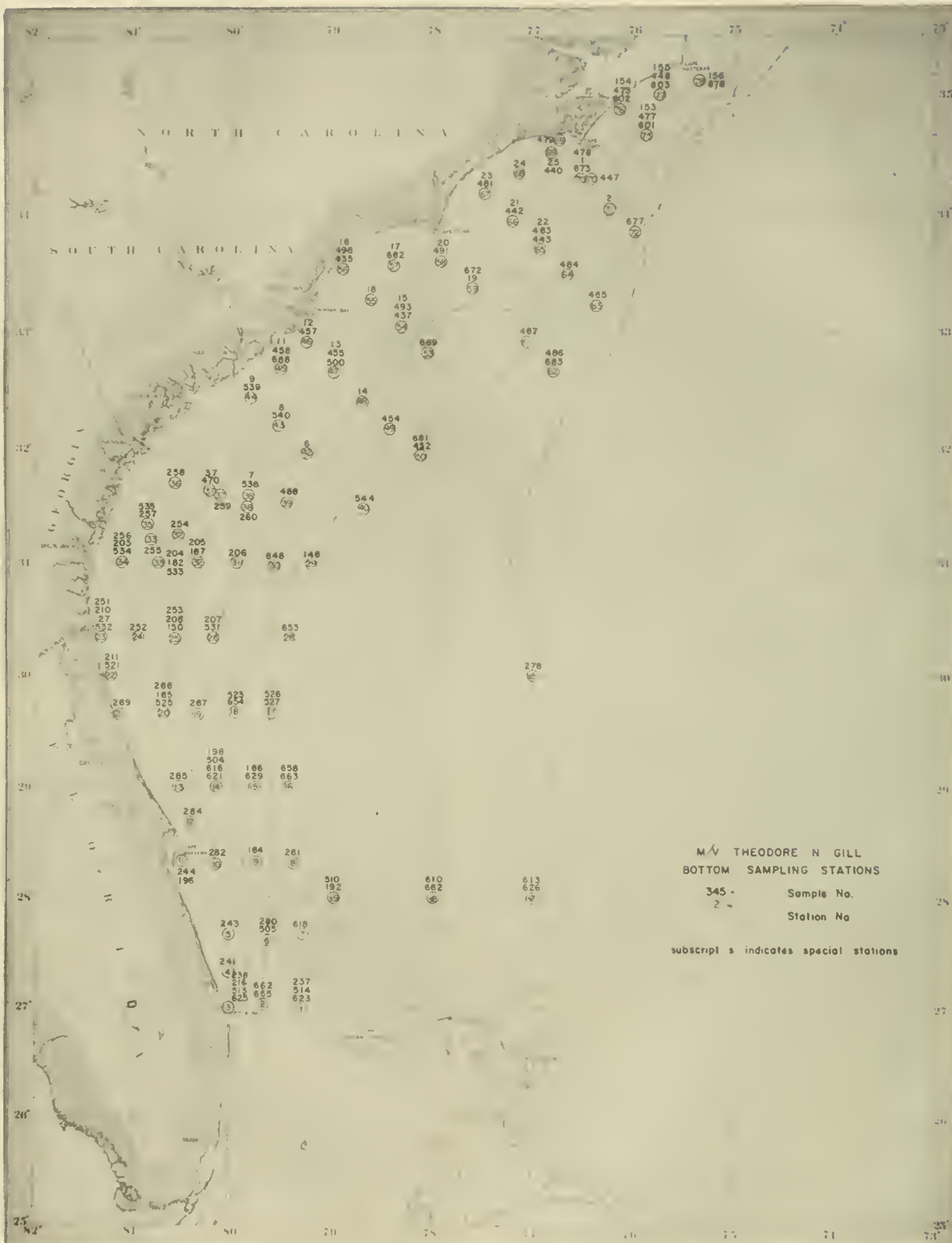

Figure 5.--Positions of samples of bottom sediments.

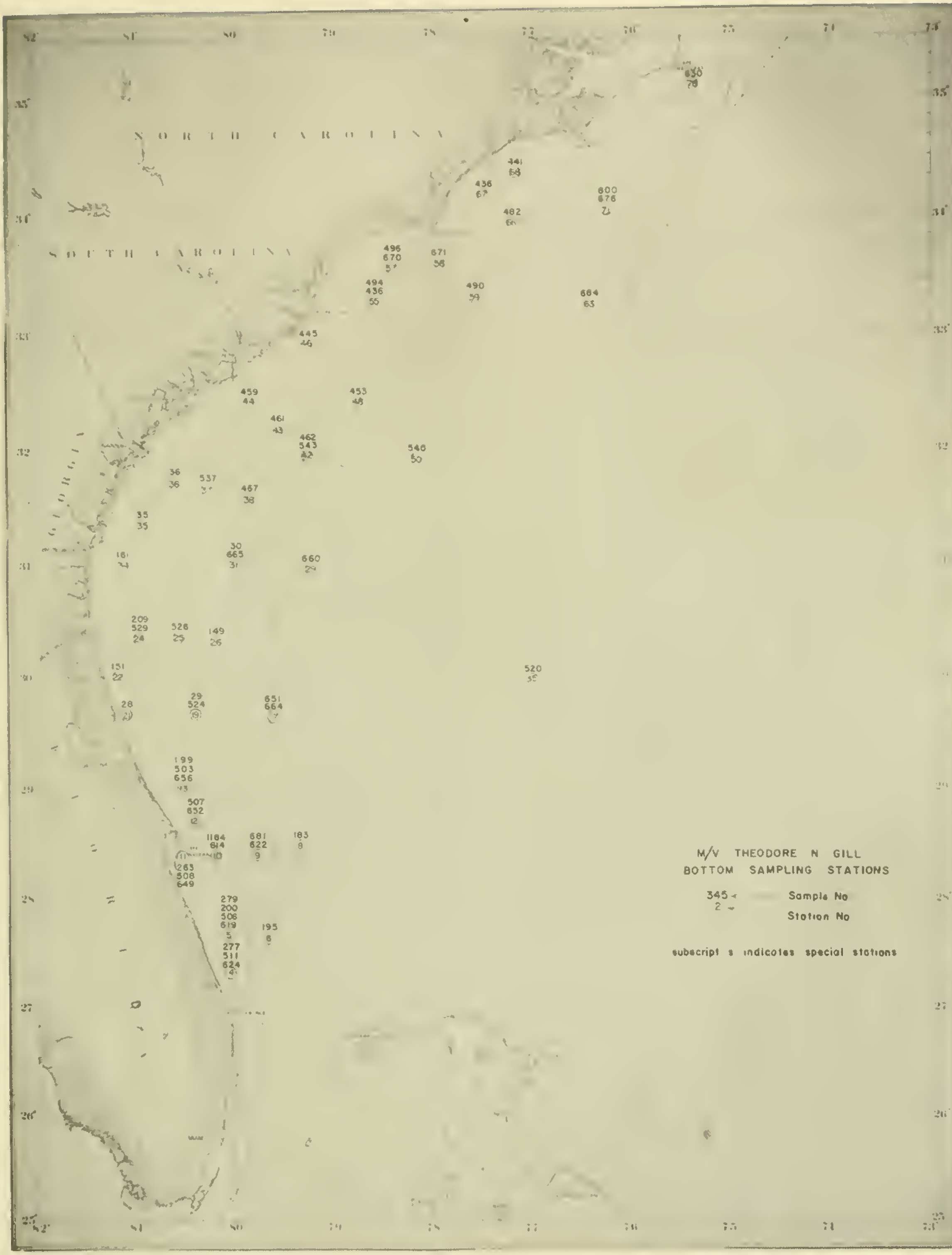

Figure 6.--Positions of samples of bottom sediments.

Figure 7.--Positions of samples of bottom sediments.

demarcation for zones of less than 5 to 10 miles in any dimension.

ACKNOWLEDGMENTS

Acknowledgments are necessarily made in two groups: those associated with Mr. Moore at the Bureau of Commercial Fisheries Biological Laboratory, Brunswick, Georgia, for the chemical analyses; and those associated with Dr. Gorsline at the Oceanographic Institute of the Florida State University, Tallahassee, Florida, for the mechanical-organic analyses.

Acknowledgment is made to the following individuals for contributions in the analysis and assembling of the chemical material: To Edward Cohen (former chemist) for work in developing the methods and initiating the analyses; and to various members of the laboratory staff who assisted in one way or another, and especially to Herbert R. Gordy who assisted in the actual analyses and assembling of the data.

Dr. Sidney W. Fox, director of the Oceanographic Institute of the Florida State University, very kindly made available office and laboratory space, equipment and travel expenses involved in the mechanical-organic analysis of the *Gill* samples. Dr. H. G. Goodell of the Department of Geology of the Florida State University offered suggestions for the analysis of the data which made possible several time-saving changes in the procedures. He also made available the facilities of the Sediment Research Laboratory of the Department of Geology. Mr. Orrin H. Pilkey, research assistant in the Oceanographic Institute, carried out many of the routine analyses and assisted in the tabulation and computation of the sedimentologic data. Dr. Orville L. Bandy of the University of Southern California has agreed to study the foraminiferal contents of the sediments, and Dr. Neil C. Hulings of Texas Christian University is completing an examination of the Ostracoda.

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EXPLANATION OF TABLES

1. Station. Stations are numbered consecutively, starting with one, at the beginning of each cruise. The station pattern and numbers as shown in figure 1 were maintained on each cruise. If a station or series of stations was not occupied, these station numbers are omitted. Regular stations have numbers only; standard and special stations are specifically indicated.

2. Cruise. The first cruise over the established station pattern (fig. 1) was numbered *Gill* 1, and subsequent cruises *Gill* 2 through *Gill* 9.

3. Sample number. This is the original number placed on the plastic bags at time sample was obtained.

4. Latitude and longitude. The position of the station is given in degrees and minutes.

5. Depth (meters). Is the observed uncorrected sonic sounding for the station, recorded in meters.

6. Date. Month, day and year are given.

7. Sediment type. This is the textural type as determined from the size grade distribution and from the triangle diagram of figure 3. Abbreviations are: Cl = clay, Si = silt, Sa = sand, Gr = gravel. As an example, GrSa = gravelly sand, SiSa = silty sand.

8. Loss on ignition. This is the percentage of dry sample that is volatilized between the temperatures of 110° C and 850° C. In samples containing a large percentage of shell the major loss is carbon dioxide from calcium carbonate. Loss also derives from vegetable material and inorganic hydroxides and salts.

9. Insoluble residue. This is the percentage of dry sample that is insoluble in hydrochloric acid.

10. Aluminum oxide. This is the percentage of hydrochloric acid soluble aluminum present on a dry weight basis and reported as aluminum oxide.

11. Ferric oxide. Represents the percentage of hydrochloric acid-soluble iron present on a dry weight basis and reported as ferric oxide.

12. Manganous oxide. This is the percentage of hydrochloric acid-soluble manganese present on a dry weight basis and reported as manganous oxide.

13. Magnesium oxide. This is the percentage of hydrochloric acid-soluble magnesium present on a dry weight basis and reported as magnesium oxide.

14. Calcium oxide. This is the percentage of hydrochloric acid-soluble calcium present on a dry weight basis and reported as calcium oxide.

15. Potassium oxide. This is the percentage of hydrochloric acid-soluble potassium present on a dry weight basis and reported as potassium oxide.

16. Phosphorus pentoxide. The major portion of phosphorus in marine sediments is believed to be from apatite and the bodies and skeletons of animals. This is the percentage of phosphorus (soluble in hydrochloric acid) present on a dry weight basis reported as phosphorus pentoxide.

17. Strontium. This is the percentage of acid-soluble strontium present on a dry weight basis.

18. Chlorides. These values are the percentages of total soluble halides present on a dry weight basis.

19. Organic nitrogen. These values are in weight percent of total sample and are an indication of the amount of organic matter present in the sediment. The nitrogen content in these sediments is very much lower than in most shelf sediments and is close to the limits of accuracy of the Kjeldahl method. The high carbon-nitrogen ratios may be an indication of the relatively greater age of some of the sediment.

20. Organic carbon. The organic carbon values are good indicators of the organic content. Trask (1932) has stated that an approximation of the total organic content can be calculated by multiplying the organic carbon by 1.8. These values shown are in terms of weight percent of total sample.

21. Calcium carbonate. This is actually total carbonate in weight percent of total sample. Minor amounts of magnesium and strontium carbonate are always present in organic carbonates. Variation in carbonate content is probably great because of the relatively small size of the samples. A single shell may fall into any representative split of a small sample and affect the resulting carbonate values by several percent. The values are precise for any one sample but variation is high at any individual station.

22. Gravel. This is the weight percent of total sample of particles having diameters larger than 2 mm.

23. Sand. This is the weight percent of total sample of particles having diameters between 0.062 mm. and 2.000 mm.

24. Silt. This is the weight percent of total sample of particles having diameters between 0.004 mm. and 0.062 mm.

25. Clay. This is the weight percent of total sample of particles having diameters less than 0.004 mm.

26. Median diameter. These are actually mean diameters as computed by the IBM 650 digital computer. The difference between the mean

and median is quite small for most of these well sorted sediments. Medians can be calculated by plotting the weight percentages of size grades in cumulative curves if the value is desired.

27. Sorting. The degree of sorting is here indicated by the standard deviation in phi units. These values have been computed by IBM 650 digital computer programming.

28. First quartile. The quartile diameters are indicated for a group of representative samples covering the entire area, but not for all samples. Persons interested in quartiles for all samples may pick these from cumulative curves derived from the tabulated size data.

29. Third quartile. These values are also shown only for a representative series as described above.

30. Sieve weight percent. The tabulated data show the size grade distribution in terms of weight percent of total sample. These values may be used to construct cumulative curves of the size distribution of each sample.

31. Heavy mineral. This figure is actually a composite of the weight percentages of heavy minerals in each of the three finest sand sizes. The individual percentages indicate that all heavy minerals are contained predominantly in the 0.062- to 0.125-mm. range.

32. Light mineral. This is the weight percent of total sample made up of materials with a density of less than 2.9.

33. Bioclastic. This symbol indicates the dominant bioclastic type. The symbols are: Fm = foraminifera, Sh = shell fragments, Co = coral fragments, Alg = algal debris.

Table 1.--Chemical and physical properties of bottom sediments by stations

Station	1	1	1	2	2
Cruise	1	5	6	6	9
Sample No.	237	514	623	662	655
Latitude N.	26°59'	27°00'	27°00'	27°02'	27°02'
Longitude W.	79°18'	79°18'	79°18'	79°41'	79°41'
Depth (meters)	597	576	631	616	576
Date (mo., day, yr.)	2-17-53	1-30-54	4-25-54	4-25-54	11-16-54
Sediment Type	Sa	Sa	Sa Si	Sa	Sa Si
Loss on Ignition, %	44.49	44.30	44.37	42.14	41.63
Insoluble Residue, %	1.49	0.79	0.88	5.28	5.01
Al_2O_3, %	0.13	0.18	0.15	0.24	0.45
Fe_2O_3, %	0.83	0.44	0.63	0.70	0.58
MnO, %	0.14	0.26	0.33	0.38	0.31
MgO, %	3.47	3.97	3.77	1.54	1.55
CaO, %	50.79	51.22	54.32	51.74	53.57
K_2O, %	0.13	0.24	0.28	0.27	0.30
P_2O_5, %	6.65	6.20	5.98	5.59	3.86
Sr, %	0.35	0.35	0.34	0.69	0.63
Cl, %	0.92	0.78	0.75	1.16	1.22
Organic Nitrogen, %	0.013		0.013	0.045	0.055
Organic Carbon, %	0.301		0.223	0.576	0.593
$CaCO_3$, %	92.9		96.9	92.7	92.9
Gravel, %	6.11	8.10	2.53	3.94	0.00
Sand, %	87.77	89.61	35.18	94.03	32.98
Silt, %	6.12	2.29	59.43	2.13	61.02
Clay, %	0.00	0.00	2.86	0.00	6.00
Median Diameter (mm)	0.36	0.41	0.027	0.50	0.022
Sorting (Trask)	1.91	1.51	2.47	1.40	2.21
First Quartile (mm)	0.84		0.12	0.84	0.09
Third Quartile (mm)	0.22		0.02	0.33	0.02
Sieve Weight, % (mu)					
+ 2000	6.11	8.10	2.53	3.94	0.00
+ 1000	14.17	7.11	1.43	13.20	0.17
+ 500	21.00	21.19	2.22	41.01	3.00
+ 250	31.15	39.47	5.46	26.32	7.76
+ 125	12.74	16.22	10.70	8.80	9.26
+ 62	8.71	5.62	15.37	4.60	12.79
- 62	6.12	2.29	62.29	2.13	67.02
Heavy Mineral, %	0.01		0.01	0.04	0.05
Light Mineral, %	99.99		99.99	99.96	99.95
Bioclastic, %	Fm	Fm	Fm	Fm	Fm

Table 1.--Chemical and physical properties of bottom sediments by stations

Station	3	3	3	3
Cruise	1	4	5	6
Sample No.	238	216	513	625
Latitude N.	27°00'	27°00'	27°00'	27°00'
Longitude W.	80°04'	80°04'	80°04'	80°04'
Depth (meters)	19	14	12	12
Date (mo., day, yr.)	2-17-53	10-12-53	1-30-54	4-26-54
Sediment Type	Sa	Sa	Sa	Sa
Loss on Ignition, %	19.39	31.38	30.31	32.47
Insoluble Residue, %	55.54	27.28	33.03	26.17
Al_2O_3, %	0.07	0.10	0.06	0.04
Fe_2O_3, %	0.33	0.37	0.31	0.38
MnO, %	0.00	0.02	0.04	0.24
MgO, %	1.10	2.06	1.72	1.97
CaO, %	19.93	39.01	38.83	41.45
K_2O, %	0.16	0.21	0.16	0.20
P_2O_5, %	6.26	42.60	6.12	5.34
Sr, %	0.35	0.35	0.42	0.38
Cl, %	0.55	0.52	0.51	0.57
Organic Nitrogen, %	0.011			
Organic Carbon, %	0.116			
$CaCO_3$, %	64.0			
Gravel, %	0.52	2.98	0.66	1.79
Sand, %	99.36	97.02	99.34	97.28
Silt, %	0.12	0.00	0.00	0.93
Clay, %	0.00	0.00	0.00	0.00
Median Diameter (mm)	0.32	0.37	0.47	0.35
Sorting (Trask)	0.90	1.64	0.88	1.20
First Quartile (mm)	0.44			
Third Quartile (mm)	0.22			
Sieve Weight, % (mu)				
+ 2000	0.52	2.98	0.66	1.79
+ 1000	5.15	9.08	4.48	9.48
+ 500	13.16	17.77	13.67	17.32
+ 250	42.63	34.50	44.66	32.50
+ 125	37.37	34.62	34.46	36.12
+ 62	1.05	1.05	2.07	1.86
- 62	0.12	0.00	0.00	0.93
Heavy Mineral, %	0.04			
Light Mineral, %	99.96			
Bioclastic, %	Sh	Sh	Sh	Sh

Table 1.--Chemical and physical properties of bottom sediments by stations

Station	4	4	4	4
Cruise	1	2	5	6
Sample No.	241	277	511	624
Latitude N.	27°20'	27°20'	27°20'	27°20'
Longitude W.	80°03'	80°04'	80°04'	80°04'
Depth (meters)	24	22	24	24
Date (mo., day, yr.)	2-17-53	4-23-53	1-30-54	4-26-54
Sediment Type	Sa	Sa	Gr Sa	Si Sa
Loss on Ignition, %	37.88	33.67	41.49	38.90
Insoluble Residue, %	14.57	22.93	7.60	11.09
Al_2O_3, %	0.06	0.11	0.14	0.13
Fe_2O_3, %	0.77	0.49	0.75	0.78
MnO, %	0.07	0.07	0.11	0.31
MgO, %	1.19	1.27	1.00	1.40
CaO, %	46.87	41.50	53.27	50.88
K_2O, %	0.26	0.22	0.21	0.18
P_2O_5, %	5.41	6.84	5.73	5.50
Sr, %	0.55	0.27	0.45	0.54
Cl, %	0.40	0.50	0.40	0.40
Organic Nitrogen, %		0.007	0.013	
Organic Carbon, %		0.203	0.157	
$CaCO_3$, %		78.8	93.0	
Gravel, %	7.84	0.79	22.58	14.72
Sand, %	91.67	98.89	71.06	82.67
Silt, %	0.49	0.32	6.36	2.61
Clay, %	0.00	0.00	0.00	0.00
Median Diameter (mm)	0.55	0.39	0.61	0.56
Sorting (Trask)	1.22	1.00	2.23	1.71
First Quartile (mm)		0.56	1.85	
Third Quartile (mm)		0.26	0.30	
Sieve Weight, % (mu)				
+ 2000	7.84	0.79	22.58	14.72
+ 1000	15.46	10.02	26.59	16.87
+ 500	25.77	17.93	16.17	24.31
+ 250	37.94	49.00	12.63	26.26
+ 125	10.91	19.83	7.37	9.02
+ 62	1.59	2.11	8.30	6.21
- 62	0.49	0.32	6.36	2.61
Heavy Mineral, %		0.14	0.04	
Light Mineral, %		99.86	99.96	
Bioclastic, %	Sh	Sh	Sh	Sh

Table 1.--Chemical and physical properties of bottom sediments by stations

Station	5	5	5	5	5
Cruise	1	2	4	5	6
Sample No.	243	279	200	506	619
Latitude N.	27°40'	27°40'	27°40'	27°40'	27°40'
Longitude W.	80°03'	80°04'	80°04'	80°04'	80°04'
Depth (meters)	38	49	34	37	37
Date (mo., day, yr.)	2-17-53	4-23-53	10-12-53	1-31-54	4-26-54
Sediment Type	Sa	Sa	Sa		Si Sa
Loss on Ignition, %	18.06	31.92	13.85	14.70	15.40
Insoluble Residue, %	55.41	26.72	68.76	66.23	65.43
Al_2O_3, %	0.13	0.19	0.33	0.21	0.26
Fe_2O_3, %	0.38	0.98	0.29	0.44	0.55
MnO, %	0.01	0.07	0.02	0.02	0.09
MgO, %	0.63	1.37	0.74	0.86	0.78
CaO, %	18.99	39.78	17.76	16.93	18.04
K_2O, %	0.09	0.25	0.13	0.17	0.13
P_2O_5, %	6.01	8.07	3.56	5.81	5.81
Sr, %	0.32	0.21	0.31	0.25	0.33
Cl, %	0.63	0.64	0.68	0.70	0.74
Organic Nitrogen, %		0.031			0.016
Organic Carbon, %		0.225			0.200
$CaCO_3$, %		82.3			30.7
Gravel, %	5.25	1.71	0.66		0.95
Sand, %	87.79	90.65	92.85		78.92
Silt, %	6.96	7.64	6.49		18.72
Clay, %	0.00	0.00	0.00		1.41
Median Diameter (mm)	0.11	0.21	0.09		0.06
Sorting (Trask)	1.68	2.00	1.22		1.68
First Quartile (mm)		0.60			0.10
Third Quartile (mm)		0.10			0.05
Sieve Weight, % (mu)					
+ 2000	5.25	1.71	0.66		0.95
+ 1000	2.48	11.43	1.16		1.74
+ 500	2.16	17.35	1.79		0.73
+ 250	2.17	17.14	2.44		0.56
+ 125	7.88	11.33	9.50		3.55
+ 62	73.10	33.40	77.96		72.34
- 62	6.96	7.64	6.49		20.13
Heavy Mineral, %		0.27			0.47
Light Mineral, %		99.73			99.53
Bioclastic, %	Sh	Sh	Sh		Fm

Table 1.--Chemical and physical properties of bottom sediments by stations

Station	6	6	6	7
Cruise	2	4	5	6
Sample No.	280	195	505	618
Latitude N.	27°40'	27°37'	27°40'	27°40'
Longitude W.	79°41'	79°40'	79°41'	79°18'
Depth (meters)	567	543	475	549
Date (mo., day, yr.)	4-23-53	10-13-53	1-31-54	4-26-54
Sediment Type		Sa Si		Si Sa
Loss on Ignition, %	39.65	39.99	39.22	44.71
Insoluble Residue, %	9.79	10.03	10.88	0.86
Al_2O_3, %	0.50	0.44	0.45	0.15
Fe_2O_3, %	0.90	0.64	0.80	0.74
MnO, %	0.07	0.08	0.07	0.34
MgO, %	1.57	1.48	1.53	3.83
CaO, %	46.01	47.99	47.16	54.78
K_2O, %	0.36	0.35	0.31	0.23
P_2O_5, %	10.46	3.53	6.12	5.32
Sr, %	0.40	0.58	0.55	0.40
Cl, %	1.25	1.22	1.80	1.31
Organic Nitrogen, %		0.035		0.021
Organic Carbon, %		0.667		0.258
$CaCO_3$, %		82.7		99.0
Gravel, %		0.00		6.83
Sand, %		38.93		78.52
Silt, %		56.74		12.71
Clay, %		4.33		1.94
Median Diameter (mm)		0.026		0.30
Sorting (Trask)		2.30		2.51
First Quartile (mm)		0.12		1.02
Third Quartile (mm)		0.04		0.18
Sieve Weight, % (mu)				
+ 2000		0.00		6.83
+ 1000		0.08		19.06
+ 500		3.58		19.48
+ 250		9.98		24.58
+ 125		9.23		9.60
+ 62		16.06		5.80
- 62		61.07		14.65
Heavy Mineral, %		0.04		0.00
Light Mineral, %		99.96		100.00
Bioclastic, %		Fm		Fm

Table 1.--Chemical and physical properties of bottom sediments by stations

Station	8	8	9	9	9
Cruise	2	4	4	6	9
Sample No.	281	183	184	661	622
Latitude N.	28°19'	28°18'	28°17'	28°21'	28°20'
Longitude W.	79°26'	79°26'	79°49'	79°48'	79°48'
Depth (meters)	795	777	374	476	439
Date (mo., day, yr.)	4-24-53	10-13-53	10-13-53	4-27-54	11-17-54
Sediment Type		Sa			Sa Cl Si
Loss on Ignition, %	44.03	42.01	33.47	35.19	35.27
Insoluble Residue, %	0.68	2.37	23.67	19.10	19.06
Al_2O_3, %	0.15	0.40	1.46	1.25	1.25
Fe_2O_3, %	0.80	1.05	1.49	1.34	1.13
MnO, %	0.14	0.20	0.06	0.32	0.33
MgO, %	1.89	1.16	1.76	1.59	1.51
CaO, %	47.57	50.73	35.66	42.90	44.42
K_2O, %	0.33	0.34	0.44	0.33	0.39
P_2O_5, %	7.73	5.05	3.75	6.18	3.57
Sr, %	0.14	0.25	0.44	0.56	0.43
Cl, %	1.53	1.57	1.59	1.49	1.59
Organic Nitrogen, %		0.010			0.071
Organic Carbon, %		0.248			1.189
$CaCO_3$, %		92.1			69.2
Gravel, %		0.70			0.00
Sand, %		95.59			13.29
Silt, %		3.71			70.26
Clay, %		0.00			16.45
Median Diameter (mm)		0.29			0.012
Sorting (Trask)		1.32			1.61
First Quartile (mm)		0.43			0.04
Third Quartile (mm)		0.24			0.01
Sieve Weight, % (mu)					
+ 2000		0.70			0.00
+ 1000		2.12			0.08
+ 500		13.14			0.95
+ 250		57.58			3.80
+ 125		15.43			4.14
+ 62		7.32			4.32
- 62		3.71			86.71
Heavy Mineral, %		0.01			0.01
Light Mineral, %		99.99			99.99
Bioclastic, %		Fm			Fm

Table 1.--Chemical and physical properties of bottom sediments by stations

Station	10	10	10	10
Cruise	2	4	5	6
Sample No.	282	1184	509	614
Latitude N.	28°18'	28°20'	28°19'	28°20'
Longitude W.	80°10'	80°10'	80°12'	80°10'
Depth (meters)	36	38	31	38
Date (mo., day, yr.)	4-24-53	10-13-53	2-1-54	4-27-54
Sediment Type	Gr Sa	Sa	Sa	Sa
Loss on Ignition, %	38.35	39.35	36.09	38.16
Insoluble Residue, %	11.21	9.12	19.68	13.09
Al_2O_3, %	0.18	0.28	0.19	0.51
Fe_2O_3, %	1.42	1.58	1.16	1.35
MnO, %	0.09	0.07	0.07	0.29
MgO, %	1.63	1.98	1.92	1.74
CaO, %	47.58	24.33	45.73	47.02
K_2O, %	0.25	0.21	0.20	0.18
P_2O_5, %	10.81	4.14	5.82	5.95
Sr, %	0.42	0.48	0.44	0.67
Cl, %	0.61	0.47	0.63	0.50
Organic Nitrogen, %		0.011		
Organic Carbon, %		0.325		
$CaCO_3$, %		39.3		
Gravel, %	18.23	7.44	2.16	3.36
Sand, %	78.22	91.71	97.36	94.44
Silt, %	3.55	0.85	0.48	2.20
Clay, %	0.00	0.00	0.00	0.00
Median Diameter (mm)	0.49	0.53	0.33	0.40
Sorting (Trask)	1.95	1.29	1.17	1.42
First Quartile (mm)		0.93		
Third Quartile (mm)		0.32		
Sieve Weight, % (mu)				
+ 2000	18.23	7.44	2.16	3.36
+ 1000	15.93	15.14	7.68	10.09
+ 500	15.83	26.12	17.12	25.80
+ 250	19.44	37.05	33.84	36.13
+ 125	18.69	11.13	33.30	16.57
+ 62	8.33	2.27	5.42	5.85
- 62	3.55	0.85	0.48	2.20
Heavy Mineral, %		0.04		
Light Mineral, %		99.96		
Bioclastic, %	Sh	Sh	Sh	Sh

Table 1.--Chemical and physical properties of bottom sediments by stations

Station	11	11	11	11	11
Cruise	1	2	4	5	6
Sample No.	244	283	196	508	649
Latitude N.	28°20'	28°20'	28°20'	28°20'	28°20'
Longitude W.	80°33'	80°32'	80°33'	80°32'	80°32'
Depth (meters)	13	12	12	13	13
Date (mo., day, yr.)	2-19-53	4-24-53	10-14-53	2-1-54	4-27-54
Sediment Type	Sa	Si Sa	Si Sa		Si Sa
Loss on Ignition, %	10.61	10.17	9.53	11.01	10.87
Insoluble Residue, %	75.90	75.88	76.28	73.97	75.59
Al_2O_3, %	0.10	0.67	1.30	0.76	0.57
Fe_2O_3, %	0.57	1.15	1.57	1.15	0.78
MnO, %	0.02	0.03	0.01	0.02	0.09
MgO, %	0.60	0.75	0.81	0.74	0.74
CaO, %	14.00	8.16	9.62	13.75	11.80
K_2O, %	0.11	0.18	0.24	0.19	0.12
P_2O_5, %	2.38	5.07	3.46	6.70	5.50
Sr, %	0.15	0.17	0.14	0.13	0.11
Cl, %	0.45	0.75	0.78	0.68	0.56
Organic Nitrogen, %	0.006	0.019			
Organic Carbon, %	0.114	0.383			
$CaCO_3$, %	5.6	25.1			
Gravel, %	0.16	7.70	1.10		3.80
Sand, %	99.14	58.44	55.17		83.37
Silt, %	0.70	28.57	43.73		12.83
Clay, %	0.00	5.29	0.00		0.00
Median Diameter (mm)	0.25	0.066	0.038		0.14
Sorting (Trask)	0.71	2.61	2.15		2.01
First Quartile (mm)	0.32	0.14			
Third Quartile (mm)	0.20	0.05			
Sieve Weight, % (mu)					
+ 2000	0.16	7.70	1.10		3.80
+ 1000	0.10	2.43	0.55		2.84
+ 500	1.18	2.53	1.43		4.34
+ 250	51.26	5.77	5.62		21.53
+ 125	45.04	7.39	6.72		21.99
+ 62	1.56	40.32	40.85		32.67
- 62	0.70	33.66	43.73		12.83
Heavy Mineral, %	0.40	0.52			
Light Mineral, %	99.60	99.48			
Bioclastic, %	Sh	Sh	Sh		Sh

Table 1.--Chemical and physical properties of bottom sediments by stations

Station	12	12	12
Cruise	2	5	6
Sample No.	284	507	652
Latitude N.	28°41'	28°41'	28°41'
Longitude W.	80°26'	80°25'	80°25'
Depth (meters)	18	20	18
Date (mo., day, yr.)	4-24-53	2-1-54	4-27-54
Sediment Type	Sa	Sa	Gr Sa
Loss on Ignition, %	25.57	25.18	29.42
Insoluble Residue, %	42.40	43.74	33.01
Al_2O_3, %	0.12	0.12	0.34
Fe_2O_3, %	0.67	0.93	0.97
MnO, %	0.06	0.04	0.24
MgO, %	0.77	0.70	0.72
CaO, %	25.28	32.50	38.95
K_2O, %	0.17	0.14	0.14
P_2O_5, %	5.57	6.14	5.12
Sr, %	0.20	0.44	0.44
Cl, %	0.41	0.37	0.44
Organic Nitrogen, %	0.005		0.009
Organic Carbon, %	0.129		0.180
$CaCO_3$, %	54.0		69.7
Gravel, %	3.15	3.02	15.49
Sand, %	96.40	96.34	81.32
Silt, %	0.45	0.64	3.19
Clay, %	0.00	0.00	0.00
Median Diameter (mm)	0.52	0.48	0.70
Sorting (Trask)	1.05	1.01	1.66
First Quartile (mm)	0.80		1.45
Third Quartile (mm)	0.35		0.42
Sieve Weight, % (mu)			
+ 2000	3.15	3.02	15.49
+ 1000	13.35	8.60	24.43
+ 500	31.25	30.00	26.60
+ 250	43.20	49.92	26.01
+ 125	7.15	6.79	1.84
+ 62	1.45	1.03	2.44
- 62	0.45	0.64	3.19
Heavy Mineral, %	0.10		0.16
Light Mineral, %	99.90		99.84
Bioclastic, %	Sh	Sh	Sh

Table 1.--Chemical and physical properties of bottom sediments by stations

Station	13	13	13	13
Cruise	2	4	5	6
Sample No.	285	199	503	656
Latitude N.	29°00'	29°00'	29°00'	29°00'
Longitude W.	80°33'	80°32'	80°32'	80°31'
Depth (meters)	17	20	16	18
Date (mo., day, yr.)	4-25-53	10-14-53	2-2-54	4-27-54
Sediment Type	Sa	Sa	Si Sa	Sa
Loss on Ignition, %	20.46	24.40	22.77	23.90
Insoluble Residue, %	52.94	47.11	49.47	46.62
Al_2O_3, %	0.10	0.14	0.08	0.11
Fe_2O_3, %	0.76	0.20	0.66	0.68
MnO, %	0.03	0.04	0.02	0.16
MgO, %	0.71	0.65	0.70	0.91
CaO, %	27.99	32.23	29.82	30.66
K_2O, %	0.17	0.13	0.12	0.13
P_2O_5, %	5.37	3.58	5.37	5.66
Sr, %	0.39	0.35	0.57	0.28
Cl, %	0.40	0.37	0.53	0.49
Organic Nitrogen, %		0.011	0.012	
Organic Carbon, %		0.077	0.568	
$CaCO_3$, %		46.3	26.8	
Gravel, %	2.82	4.40	2.24	4.30
Sand, %	96.85	95.14	71.92	95.70
Silt, %	0.33	0.46	16.95	0.00
Clay, %	0.00	0.00	8.89	0.00
Median Diameter (mm)	0.55	0.55	0.095	0.52
Sorting (Trask)	0.96	1.09	2.39	0.94
First Quartile (mm)		0.87	0.30	
Third Quartile (mm)		0.36	0.06	
Sieve Weight, % (mu)				
+ 2000	2.82	4.40	2.24	4.30
+ 1000	10.45	14.88	3.02	8.02
+ 500	44.89	32.72	4.83	37.69
+ 250	33.33	37.97	21.89	39.58
+ 125	7.52	8.67	19.36	10.19
+ 62	0.66	0.90	22.82	0.22
- 62	0.33	0.46	25.84	0.00
Heavy Mineral, %		0.19		
Light Mineral, %		99.81		
Bioclastic, %	Sh	Sh	Sh	Sh

Table 1.--Chemical and physical properties of bottom sediments by stations

Station	14	14	14	14
Cruise	4	5	6	7
Sample No.	198	504	616	621
Latitude N.	29°00'	29°00'	29°00'	29°00'
Longitude W.	80°10'	80°10'	80°10'	80°10'
Depth (meters)	60	66	62	60
Date (mo., day, yr.)	10-14-53	2-2-54	4-27-54	6-25-54
Sediment Type	Sa	Sa	Sa	Sa
Loss on Ignition, %	38.57	37.76	41.13	34.94
Insoluble Residue, %	11.89	5.57	5.19	19.88
Al_2O_3, %	0.27	0.20	0.26	0.26
Fe_2O_3, %	1.03	1.79	1.70	0.96
MnO, %	0.11	0.07	0.37	0.33
MgO, %	2.10	1.96	1.90	1.82
CaO, %	47.93	51.61	53.01	43.70
K_2O, %	0.23	0.23	0.18	0.29
P_2O_5, %	3.58	5.13	5.62	3.94
Sr, %	0.60	0.96	0.79	0.55
Cl, %	0.68	0.55	0.43	1.02
Organic Nitrogen, %			0.024	0.010
Organic Carbon, %			0.394	0.380
$CaCO_3$, %			90.8	71.4
Gravel, %	0.72	0.35	0.61	1.17
Sand, %	96.69	98.65	98.72	95.31
Silt, %	2.59	1.00	0.67	3.52
Clay, %	0.00	0.00	0.00	0.00
Median Diameter (mm)	0.22	0.34	0.34	0.17
Sorting (Trask)	1.31	1.06	1.08	1.35
First Quartile (mm)			0.52	0.23
Third Quartile (mm)			0.23	0.11
Sieve Weight, % (mu)				
+ 2000	0.72	0.35	0.61	1.17
+ 1000	3.67	4.17	6.47	3.31
+ 500	10.50	24.27	20.31	5.27
+ 250	26.02	40.25	40.54	12.16
+ 125	39.31	27.04	27.09	44.47
+ 62	17.19	2.92	4.31	30.10
- 62	2.59	1.00	0.67	3.52
Heavy Mineral, %			0.02	0.64
Light Mineral, %			99.98	99.36
Bioclastic, %	Sh	Sh	Sh	Fm Sh

Table 1.--Chemical and physical properties of bottom sediments by stations

Station	15	15	16	16
Cruise	4	9	6	7
Sample No.	186	629	658	663
Latitude N.	29°00'	29°00'	29°00'	29°00'
Longitude W.	79°48'	79°48'	79°26'	79°26'
Depth (meters)	677	768	832	823
Date (mo., day, yr.)	10-14-53	11-18-54	4-28-54	6-25-54
Sediment Type		Sa Gr Si	Sa Gr	Sa
Loss on Ignition, %	36.30	37.36	21.53	43.01
Insoluble Residue, %	17.03	13.85	7.52	1.41
Al_2O_3, %	0.66	0.98		0.19
Fe_2O_3, %	1.05	1.73	40.94	0.48
MnO, %	0.07	0.29	6.78	0.47
MgO, %	1.48	1.88	2.45	1.09
CaO, %	42.96	47.00	8.49	55.01
K_2O, %	0.37	0.30	0.61	0.34
P_2O_5, %	4.33	3.73	10.82	3.47
Sr, %	0.59	0.47	0.03	0.29
Cl, %	1.24	1.14	0.32	1.67
Organic Nitrogen, %		0.006	0.011	0.021
Organic Carbon, %		0.382	0.100	0.366
$CaCO_3$, %		78.8	29.2	
Gravel, %		23.79	86.52	4.93
Sand, %		19.47	10.54	91.42
Silt, %		49.73	2.22	3.65
Clay, %		7.01	0.72	0.00
Median Diameter (mm)		0.057	2.08	0.40
Sorting (Trask)		3.59	1.55	1.43
First Quartile (mm)		0.48	20.00	0.59
Third Quartile (mm)		0.03	3.50	0.32
Sieve Weight, % (mu)				
+ 2000		23.79	86.52	4.93
+ 1000		0.37	5.99	4.43
+ 500		1.40	2.22	23.38
+ 250		4.07	1.13	56.90
+ 125		3.26	0.72	4.64
+ 62		10.37	0.48	2.07
- 62		56.74	2.94	3.65
Heavy Mineral, %			n.a.*	0.01
Light Mineral, %			n.a.*	99.99
Bioclastic, %		Fm	Fm	Fm

* not applicable-manganese nodules

Table 1.--Chemical and physical properties of bottom sediments by stations

Station	17	17	17	18	18
Cruise	5	6	7	5	9
Sample No.	526, 527	651	664*	523	654
Latitude N.	29°40'	29°37'	29°38'	29°40'	29°40'
Longitude W.	79°36'	79°36'	79°36'	80°00'	80°00'
Depth (meters)	777	850	777	530	576
Date (mo., day, yr.)	2-5-54	4-28-54	6-25-54	2-4-54	11-18-54
Sediment Type	Sa Gr	Si Gr Sa		Cl Si Sa	
Loss on Ignition, %	42.53	42.75	42.92	36.53	37.37
Insoluble Residue, %	2.30	2.20	1.18	14.23	13.75
Al_2O_3, %	0.28	0.23		0.69	0.81
Fe_2O_3, %	0.58	0.62		1.25	1.35
MnO, %	0.12	0.22		0.07	0.29
MgO, %	0.71	0.81		1.24	1.36
CaO, %	56.33	53.72		46.92	48.76
K_2O, %	0.24	0.24		0.37	0.33
P_2O_5, %	6.57	5.22		6.47	3.77
Sr, %	1.09	0.69		1.18	0.49
Cl, %	1.04	1.14	3.89	1.79	1.38
Organic Nitrogen, %	0.008	0.039		0.097	
Organic Carbon, %	0.368	0.359		0.794	
$CaCO_3$, %	90.2	89.5		75.1	
Gravel, %	79.59	21.96		0.00	
Sand, %	12.36	55.79		47.70	
Silt, %	8.05	22.25		41.84	
Clay, %	0.00	0.00		10.46	
Median Diameter (mm)	1.36	0.26		0.038	
Sorting (Trask)	2.47	3.06		2.51	
First Quartile (mm)	4.30	1.55		0.20	
Third Quartile (mm)	2.00	0.10		0.02	
Sieve Weight, % (mu)					
+ 2000	79.59	21.96		0.00	
+ 1000	2.30	9.08		0.55	
+ 500	1.82	14.37		6.51	
+ 250	3.07	15.94		13.76	
+ 125	2.97	9.27		12.29	
+ 62	2.20	7.13		14.59	
- 62	8.05	22.25		52.30	
Heavy Mineral, %	0.01	0.02		0.02	
Light Mineral, %	99.99	99.98		99.98	
Bioclastic, %	Co	Fm Co		Fm	

* Sample insufficient for complete analysis.

Table 1.--Chemical and physical properties of bottom sediments by stations

Station	19	19	19
Cruise	2	4	5
Sample No.	287	29	524
Latitude N.	29°39'	29°40'	29°40'
Longitude W.	80°23'	80°23'	80°23'
Depth (meters)	42	42	37
Date (mo., day, yr.)	4-26-53	10-15-53	2-4-54
Sediment Type	Sa	Sa	Sa
Loss on Ignition, %	22.55	20.97	24.28
Insoluble Residue, %	48.44	52.76	44.11
Al_2O_3, %	0.10	0.22	0.13
Fe_2O_3, %	0.54	0.76	0.48
MnO, %	0.04	0.03	0.04
MgO, %	1.29	1.34	1.39
CaO, %	33.51	26.80	30.88
K_2O, %	0.17	0.13	0.15
P_2O_5, %	3.94	4.20	6.06
Sr, %	0.43	0.42	1.05
Cl, %	0.43	0.44	0.56
Organic Nitrogen, %	0.009		
Organic Carbon, %	0.030		
$CaCO_3$, %	54.1		
Gravel, %	0.52	0.00	4.21
Sand, %	99.24	99.70	94.68
Silt, %	0.24	0.30	1.11
Clay, %	0.00	0.00	0.00
Median Diameter (mm)	0.44	0.36	0.39
Sorting (Trask)	0.85	0.76	1.15
First Quartile (mm)	0.62		
Third Quartile (mm)	0.32		
Sieve Weight, % (mu)			
+ 2000	0.52	0.00	4.21
+ 1000	6.05	0.97	2.78
+ 500	32.39	23.00	24.42
+ 250	49.09	57.05	47.75
+ 125	10.94	17.61	17.46
+ 62	0.77	1.07	2.27
- 62	0.24	0.30	1.11
Heavy Mineral, %	0.16		
Light Mineral, %	99.84		
Bioclastic, %	Sh	Sh	Sh

Table 1.--Chemical and physical properties of bottom sediments by stations

Station	20	20	20
Cruise	2	4	5
Sample No.	288	185	525
Latitude N.	29°40'	29°40'	29°40'
Longitude W.	80°45'	80°45'	80°45'
Depth (meters)	27	27	26
Date (mo., day, yr.)	4-26-53	10-15-53	2-4-54
Sediment Type			Gr Sa
Loss on Ignition, %	19.15	11.68	26.09
Insoluble Residue, %	54.98	72.16	41.41
Al_2O_3, %	0.10	0.07	0.13
Fe_2O_3, %	0.23	0.19	0.48
MnO, %	0.02	0.02	0.04
MgO, %	0.71	0.60	0.74
CaO, %	24.93	19.19	32.36
K_2O, %	0.12	0.08	0.16
P_2O_5, %	5.40	4.65	5.74
Sr, %	0.25	0.26	0.34
Cl, %	0.44	0.38	0.44
Organic Nitrogen, %			0.011
Organic Carbon, %			0.129
$CaCO_3$, %			95.8
Gravel, %			13.63
Sand, %			85.80
Silt, %			0.57
Clay, %			0.00
Median Diameter (mm)			0.70
Sorting (Trask)			1.35
First Quartile (mm)			1.38
Third Quartile (mm)			0.38
Sieve Weight, % (mu)			
+ 2000			13.63
+ 1000			24.06
+ 500			26.19
+ 250			24.23
+ 125			9.29
+ 62			2.03
- 62			0.57
Heavy Mineral, %			0.08
Light Mineral, %			99.92
Bioclastic, %			Sh

Table 1.--Chemical and physical properties of bottom sediments by stations

Station	21	21	21
Cruise	2	4	5
Sample No.	289	28	522
Latitude N.	29°39'	29°40'	29°41'
Longitude W.	81°08'	81°06'	81°08'
Depth (meters)	16	18	16
Date (mo., day, yr.)	4-26-53	10-15-53	2-4-54
Sediment Type	Sa	Sa	Sa
Loss on Ignition, %	1.90	4.00	2.02
Insoluble Residue, %	95.55	90.77	94.12
Al_2O_3, %	0.06	0.15	0.11
Fe_2O_3, %	0.14	0.17	0.22
MnO, %	0.00	0.00	0.00
MgO, %	0.18	0.30	0.31
CaO, %	2.16	4.23	3.35
K_2O, %	0.04	0.06	0.09
P_2O_5, %	1.06	0.74	0.55
Sr, %	0.00	0.00	0.05
Cl, %	0.45	0.51	0.38
Organic Nitrogen, %		0.004	
Organic Carbon, %		0.104	
$CaCO_3$, %		12.5	
Gravel, %	0.48	0.33	0.92
Sand, %	99.30	99.33	98.83
Silt, %	0.22	0.34	0.25
Clay, %	0.00	0.00	0.00
Median Diameter (mm)	0.19	0.21	0.19
Sorting (Trask)	0.59	0.72	0.67
First Quartile (mm)		0.25	
Third Quartile (mm)		0.17	
Sieve Weight, % (mu)			
+ 2000	0.48	0.33	0.92
+ 1000	0.60	1.11	0.66
+ 500	1.22	1.77	1.58
+ 250	11.30	22.34	9.03
+ 125	83.38	68.46	82.03
+ 62	2.80	5.65	5.53
- 62	0.22	0.34	0.25
Heavy Mineral, %		0.18	
Light Mineral, %		99.82	
Bioclastic, %	Sh	Sh	Sh

Table 1.--Chemical and physical properties of bottom sediments by stations

Station	22	22	22
Cruise	2	4	5
Sample No.	211	151	521
Latitude N.	30°00'	30°00'	30°00'
Longitude W.	81°14'	81°12'	81°14'
Depth (meters)	13	12	14
Date (mo., day, yr.)	4-26-53	10-15-53	2-4-54
Sediment Type	Sa	Sa	Sa
Loss on Ignition, %	6.56	5.80	5.96
Insoluble Residue, %	85.77	86.78	87.70
Al_2O_3, %	0.08	0.06	0.06
Fe_2O_3, %	0.29	0.19	0.25
MnO, %	0.00	0.00	0.00
MgO, %	0.32	0.35	0.30
CaO, %	8.10	6.32	6.83
K_2O, %	0.06	0.05	0.06
P_2O_5, %	1.77	3.59	2.93
Sr, %	0.06	0.10	0.15
Cl, %	0.47	0.41	0.55
Organic Nitrogen, %	0.009	0.003	
Organic Carbon, %	0.143	0.066	
$CaCO_3$, %	48.0	5.8	
Gravel, %	2.61	0.34	2.04
Sand, %	97.10	99.56	96.78
Silt, %	0.29	0.10	1.18
Clay, %	0.00	0.00	0.00
Median Diameter (mm)	0.38	0.29	0.24
Sorting (Trask)	0.97	0.82	1.11
First Quartile (mm)	0.50	0.40	
Third Quartile (mm)	0.25	0.21	
Sieve Weight, % (mu)			
+ 2000	2.61	0.34	2.04
+ 1000	4.69	2.87	1.86
+ 500	17.90	11.18	7.69
+ 250	50.68	41.42	32.18
+ 125	22.83	43.15	46.42
+ 62	1.00	0.94	8.63
- 62	0.29	0.10	1.18
Heavy Mineral, %	0.15	0.30	
Light Mineral, %	99.85	99.70	
Bioclastic, %	Sh	Sh	Sh

Table 1.--Chemical and physical properties of bottom sediments by stations

Station	23	23	23	23
Cruise	1	2	4	5
Sample No.	251	210	27	532
Latitude N.	30°20'	30°20'	30°20'	30°20'
Longitude W.	81°20'	81°20'	81°20'	81°20'
Depth (meters)	15	16	12	15
Date (mo., day, yr.)	2-21-53	4-26-53	10-15-53	2-5-54
Sediment Type		Si Sa	Sa	Si Sa
Loss on Ignition, %	3.61	7.90	1.29	5.88
Insoluble Residue, %	91.60	79.95	97.50	86.20
Al_2O_3, %	0.12	0.89	0.11	0.77
Fe_2O_3, %	0.40	1.17	0.38	1.16
MnO, %	0.00	0.02	0.00	0.00
MgO, %	0.40	0.61	0.28	0.53
CaO, %	3.96	5.59	0.76	3.95
K_2O, %	0.05	0.19	0.05	0.15
P_2O_5, %	0.99	1.91	0.51	1.89
Sr, %	0.07	0.06	0.00	0.07
Cl, %	0.36	0.76	0.44	0.81
Organic Nitrogen, %		0.043	0.002	0.034
Organic Carbon, %		0.688	0.150	0.717
$CaCO_3$, %		17.6	4.5	8.4
Gravel, %		0.00	0.20	0.00
Sand, %		79.04	99.69	82.12
Silt, %		20.96	0.11	17.88
Clay, %		0.00	0.00	0.00
Median Diameter (mm)		0.19	0.22	0.082
Sorting (Trask)		0.97	0.66	1.73
First Quartile (mm)		0.12	0.27	0.16
Third Quartile (mm)		0.07	0.15	0.07
Sieve Weight, % (mu)				
+ 2000		0.00	0.20	0.00
+ 1000		2.03	0.55	0.70
+ 500		2.72	3.20	1.27
+ 250		10.65	24.79	7.35
+ 125		63.64	67.00	30.68
+ 62		8.67	4.15	42.12
- 62		1.47	0.11	17.88
Heavy Mineral, %		0.06	0.23	0.04
Light Mineral, %		99.94	99.77	99.96
Bioclastic, %		Sh Fm	Sh	Sh

Table 1.--Chemical and physical properties of bottom sediments by stations

Station	24	24	24	24
Cruise	1	2	4	5
Sample No.	252	209	26	529
Latitude N.	30°20'	30°20'	30°21'	30°20'
Longitude W.	80°58'	80°57'	80°58'	80°59'
Depth (meters)	25	29	29	22
Date (mo., day, yr.)	2-21-53	4-26-53	10-15-53	2-5-54
Sediment Type	Sa	Sa	Sa	Gr Sa
Loss on Ignition, %	16.53	9.68	10.68	24.00
Insoluble Residue, %	67.78	78.58	76.03	47.29
Al_2O_3, %	0.10	0.09	0.11	0.09
Fe_2O_3, %	0.30	0.28	0.35	0.88
MnO, %	0.00	0.02	0.01	0.05
MgO, %	0.64	0.62	0.72	0.99
CaO, %	13.55	11.27	13.05	33.42
K_2O, %	0.10	0.09	0.09	0.15
P_2O_5, %	5.13	2.53	3.23	6.69
Sr, %	0.22	0.12	0.22	0.29
Cl, %	0.43	0.59	0.55	0.50
Organic Nitrogen, %			0.006	
Organic Carbon, %			0.038	
$CaCO_3$, %			21.8	77.9
Gravel, %	4.57	0.28	0.98	12.79
Sand, %	95.12	98.94	98.86	87.04
Silt, %	0.31	0.78	0.16	0.17
Clay, %	0.00	0.00	0.00	0.00
Median Diameter (mm)	0.30	0.16	0.21	0.88
Sorting (Trask)	1.22	0.84	0.94	1.09
First Quartile (mm)			0.26	1.46
Third Quartile (mm)			0.15	0.57
Sieve Weight, % (mu)				
+ 2000	4.57	0.28	0.98	12.79
+ 1000	5.54	1.11	2.60	32.97
+ 500	10.60	2.31	4.78	35.01
+ 250	29.36	5.95	18.18	13.41
+ 125	42.40	62.57	59.33	5.15
+ 62	7.22	27.50	13.97	0.50
- 62	0.31	0.78	0.16	0.17
Heavy Mineral, %			0.59	0.11
Light Mineral, %			99.41	99.89
Bioclastic, %	Sh	Sh	Sh	Sh

Table 1.--Chemical and physical properties of bottom sediments by stations

Station	25	25	25	25
Cruise	1	2	4	5
Sample No.	253	208	150	528
Latitude N.	30°20'	30°20'	30°20'	30°20'
Longitude W.	80°35'	80°35'	80°35'	80°34'
Depth (meters)	33	33	31	33
Date (mo., day, yr.)	2-22-53	4-27-53	10-15-53	2-5-54
Sediment Type	Sa	Sa	Sa	Sa
Loss on Ignition, %	18.89	23.41	25.57	21.52
Insoluble Residue, %	55.48	46.08	39.49	49.97
Al_2O_3, %	0.17	0.09	0.15	0.12
Fe_2O_3, %	0.39	0.36	0.69	0.60
MnO, %	0.04	0.05	0.04	0.05
MgO, %	0.83	0.95	0.82	0.88
CaO, %	24.59	27.70	30.83	28.78
K_2O, %	0.13	0.12	0.14	0.14
P_2O_5, %	5.11	3.22	4.10	5.84
Sr, %	0.39	0.51	0.64	0.61
Cl, %	0.34	0.40	0.45	0.39
Organic Nitrogen, %				0.012
Organic Carbon, %				0.121
$CaCO_3$, %				49.5
Gravel, %	0.45	2.31	4.06	0.51
Sand, %	98.97	97.46	95.73	99.39
Silt, %	0.58	0.23	0.21	0.10
Clay, %	0.00	0.00	0.00	0.00
Median Diameter (mm)	0.41	0.51	0.62	0.44
Sorting (Trask)	0.86	0.90	0.98	0.82
First Quartile (mm)				0.61
Third Quartile (mm)				0.32
Sieve Weight, % (mu)				
+ 2000	0.45	2.31	4.06	0.51
+ 1000	3.27	9.50	17.91	7.56
+ 500	29.09	35.57	40.39	27.50
+ 250	54.65	45.61	32.03	53.59
+ 125	10.95	6.36	4.77	10.09
+ 62	1.01	0.42	0.63	0.65
- 62	0.58	0.23	0.21	0.10
Heavy Mineral, %				0.51
Light Mineral, %				99.49
Bioclastic, %				Sh

Table 1.--Chemical and physical properties of bottom sediments by stations

Station	26	26	26	28
Cruise	2	4	5	9
Sample No.	207	149	531	653
Latitude N.	30°20'	30°17'	30°20'	30°20'
Longitude W.	80°12'	80°11'	80°12'	79°27'
Depth (meters)	165	201	155	786
Date (mo., day, yr.)	4-27-53	10-16-53	2-5-54	11-19-54
Sediment Type	Si Sa	Si Sa		Sa
Loss on Ignition, %	33.44	31.11	33.02	42.88
Insoluble Residue, %	25.30	27.91	26.83	1.79
Al_2O_3, %	0.60	0.60	0.36	0.25
Fe_2O_3, %	0.82	1.57	0.76	0.76
MnO, %	0.05	0.05	0.04	0.39
MgO, %	1.57	1.36	1.52	0.89
CaO, %	38.15	38.84	39.39	56.65
K_2O, %	0.32	0.34	0.25	0.23
P_2O_5, %	6.34	3.55	6.53	3.88
Sr, %	0.40	0.34	0.39	0.59
Cl, %	1.50	1.03	1.12	1.03
Organic Nitrogen, %	0.022	0.069		Tr
Organic Carbon, %	0.894	0.655		Tr
$CaCO_3$, %	68.4	69.4		89.5
Gravel, %	0.00	0.29		
Sand, %	60.05	81.33		
Silt, %	36.50	18.38		
Clay, %	3.45	0.00		
Median Diameter (mm)	0.043	0.13		
Sorting (Trask)	2.07	2.15		
First Quartile (mm)	0.14	0.32		
Third Quartile (mm)	0.04	0.09		
Sieve Weight, % (mu)				
+ 2000	0.00	0.29		
+ 1000	0.14	3.84		
+ 500	1.13	9.52		
+ 250	3.29	18.60		
+ 125	24.01	37.27		
+ 62	31.48	12.10		
- 62	39.95	18.38		
Heavy Mineral, %	0.22	0.35		
Light Mineral, %	99.78	99.65		
Bioclastic, %	Fm	Fm Sh		Fm

Table 1.--Chemical and physical properties of bottom sediments by stations

Station	29	29	30
Cruise	4	9	9
Sample No.	148	660*	648
Latitude N.	30°59'	30°57'	30°58'
Longitude W.	79°14'	79°14'	79°37'
Depth (meters)	732	768	585
Date (mo., day, yr.)	10-16-53	11-20-54	11-20-54
Sediment Type	Gr Sa		Si Sa Gr
Loss on Ignition, %	43.30	43.22	40.13
Insoluble Residue, %	1.85	1.52	7.15
Al_2O_3, %	0.35		0.72
Fe_2O_3, %	0.97		1.13
MnO, %	0.19	0.46	0.35
MgO, %	2.32		1.00
CaO, %	53.00		51.01
K_2O, %	0.24		0.32
P_2O_5, %	3.52		3.97
Sr, %	0.41		0.69
Cl, %	0.94	0.82	0.93
Organic Nitrogen, %	0.012		0.082
Organic Carbon, %	0.160		0.313
$CaCO_3$, %	89.4		86.0
Gravel, %	13.98		59.90
Sand, %	77.61		20.92
Silt, %	8.41		19.18
Clay, %	0.00		0.00
Median Diameter (mm)	0.31		0.57
Sorting (Trask)	2.12		3.31
First Quartile (mm)	0.59		8.00
Third Quartile (mm)	0.18		0.20
Sieve Weight, % (mu)			
+ 2000	13.98		59.90
+ 1000	5.20		1.81
+ 500	7.63		1.75
+ 250	37.49		9.81
+ 125	21.08		5.42
+ 62	6.21		2.13
- 62	8.41		19.18
Heavy Mineral, %	0.01		0.01
Light Mineral, %	99.99		99.99
Bioclastic, %	Fm	Fm	Co Fm

* Sample insufficient for complete analysis.

Table 1.--Chemical and physical properties of bottom sediments by stations

Station	31	31	31
Cruise	2	4	7
Sample No.	206	30	665
Latitude N.	31°00'	31°00'	31°00'
Longitude W.	79°59'	80°00'	80°00'
Depth (meters)	51	54	56
Date (mo., day, yr.)	4-28-53	10-16-53	6-27-54
Sediment Type	Sa	Sa	Sa
Loss on Ignition, %	6.16	5.51	6.25
Insoluble Residue, %	87.56	88.43	86.07
Al_2O_3, %	0.08	0.09	0.11
Fe_2O_3, %	0.21	0.25	0.32
MnO, %	0.00	0.00	0.10
MgO, %	0.48	0.54	0.51
CaO, %	6.13	5.93	6.87
K_2O, %	0.02	0.05	0.06
P_2O_5, %	1.06	3.18	2.18
Sr, %	0.19	0.23	0.17
Cl, %	0.15	0.43	0.50
Organic Nitrogen, %	0.002		
Organic Carbon, %	0.065		
$CaCO_3$, %	14.6		
Gravel, %	1.13	2.80	1.77
Sand, %	98.41	96.74	98.23
Silt, %	0.46	0.46	0.00
Clay, %	0.00	0.00	0.00
Median Diameter (mm)	0.42	0.46	0.44
Sorting (Trask)	0.89	1.00	0.78
First Quartile (mm)	0.58		
Third Quartile (mm)	0.32		
Sieve Weight, % (mu)			
+ 2000	1.13	2.80	1.77
+ 1000	4.96	6.99	4.64
+ 500	27.72	31.44	27.90
+ 250	54.49	45.77	56.39
+ 125	10.19	11.58	9.13
+ 62	1.05	0.96	0.17
- 62	0.46	0.46	0.00
Heavy Mineral, %	0.28		
Light Mineral, %	99.72		
Bioclastic, %	Sh	Sh	Sh

Table 1.--Chemical and physical properties of bottom sediments by stations

Station	32	32	32
Cruise	1	2	4
Sample No.	254	205	187
Latitude N.	31°14'	31°00'	31°00'
Longitude W.	80°32'	80°23'	80°23'
Depth (meters)	37	34	36
Date (mo., day, yr.)	2-22-53	4-28-53	10-17-53
Sediment Type	Sa	Sa	Sa
Loss on Ignition, %	1.88	3.88	3.75
Insoluble Residue, %	96.25	91.04	91.00
Al_2O_3, %	0.06	0.10	0.05
Fe_2O_3, %	0.19	0.20	0.09
MnO, %	0.00	0.00	0.00
MgO, %	0.15	0.39	0.31
CaO, %	1.79	2.43	3.81
K_2O, %	0.00	0.08	0.02
P_2O_5, %	0.00	0.00	1.45
Sr, %	0.00	0.06	0.10
Cl, %	0.26	0.57	0.36
Organic Nitrogen, %	0.003		0.006
Organic Carbon, %	0.117		0.133
$CaCO_3$, %	7.3		48.9
Gravel, %	0.61	0.26	5.23
Sand, %	99.16	99.54	93.82
Silt, %	0.23	0.20	0.95
Clay, %	0.00	0.00	0.00
Median Diameter (mm)	0.48	0.47	0.60
Sorting (Trask)	0.93	0.77	1.28
First Quartile (mm)	0.72		1.15
Third Quartile (mm)	0.33		0.37
Sieve Weight, % (mu)			
+ 2000	0.61	0.26	5.23
+ 1000	12.65	7.48	26.07
+ 500	30.02	35.02	26.11
+ 250	46.28	48.75	31.01
+ 125	9.21	8.29	8.77
+ 62	1.00	0.20	1.86
- 62	0.23	0.00	0.95
Heavy Mineral, %	0.13		0.58
Light Mineral, %	99.87		99.42
Bioclastic, %	Sh	Sh	Sh

Table 1.--Chemical and physical properties of bottom sediments by stations

Station	33	33	33	33
Cruise	1	2	4	5
Sample No.	255	204	182	533
Latitude N.	31°11'	31°00'	31°00'	31°00'
Longitude W.	80°49'	80°46'	80°46'	80°46'
Depth (meters)	27	23	27	22
Date (mo., day, yr.)	2-22-53	4-28-53	10-17-53	2-10-54
Sediment Type	Gr Sa	Sa	Sa	Sa
Loss on Ignition, %	2.72	5.04	5.15	5.95
Insoluble Residue, %	93.73	87.65	87.07	81.80
Al_2O_3, %	0.16	0.09	0.12	0.05
Fe_2O_3, %	0.20	0.18	0.25	0.27
MnO, %	0.00	0.00	0.00	0.00
MgO, %	0.17	0.34	0.55	0.27
CaO, %	3.23	6.34	5.68	9.64
K_2O, %	0.06	0.03	0.07	0.06
P_2O_5, %	0.31	1.91	2.53	4.27
Sr, %	0.06	0.08	0.15	0.14
Cl, %	0.29	0.51	0.60	0.49
Organic Nitrogen, %	0.003			0.004
Organic Carbon, %	0.129			0.096
$CaCO_3$, %	11.8			13.8
Gravel, %	14.39	1.05	0.41	0.89
Sand, %	82.74	98.41	97.45	93.47
Silt, %	2.87	0.54	2.14	5.64
Clay, %	0.00	0.00	0.00	0.00
Median Diameter (mm)	0.54	0.28	0.17	0.26
Sorting (Trask)	1.72	0.93	0.91	1.80
First Quartile (mm)	0.90			0.48
Third Quartile (mm)	0.30			0.16
Sieve Weight, % (mu)				
+ 2000	14.39	1.05	0.41	0.89
+ 1000	17.22	3.40	0.75	1.49
+ 500	21.33	7.13	1.71	16.60
+ 250	26.89	41.26	10.10	29.10
+ 125	13.55	44.85	75.48	8.18
+ 62	3.75	1.77	9.41	8.10
- 62	2.87	0.54	2.14	5.64
Heavy Mineral, %	0.28			0.58
Light Mineral, %	99.72			99.42
Bioclastic, %	Sh	Sh	Sh	Sh

Table 1.--Chemical and physical properties of bottom sediments by stations

Station	34	34	34	34
Cruise	1	2	4	5
Sample No.	256	203	181	534
Latitude N.	31°00'	31°00'	31°00'	31°00'
Longitude W.	81°09'	81°09'	81°08'	81°09'
Depth (meters)	13	14	15	15
Date (mo., day, yr.)	2-22-53	4-28-53	10-17-53	2-10-54
Sediment Type	Sa	Sa	Sa	Sa
Loss on Ignition, %	3.07	1.96	1.58	2.74
Insoluble Residue, %	93.05	96.67	96.66	92.99
Al_2O_3, %	0.05	0.04	0.03	0.07
Fe_2O_3, %	0.09	0.04	0.00	0.21
MnO, %	0.00	0.00	0.00	0.00
MgO, %	0.14	0.20	0.16	0.22
CaO, %	3.60	1.13	1.51	3.02
K_2O, %	0.06	0.01	0.02	0.06
P_2O_5, %	0.13	0.07	1.18	1.57
Sr, %	0.05	0.00	0.03	0.06
Cl, %	0.44	0.31	0.46	0.46
Organic Nitrogen, %		0.037		
Organic Carbon, %		0.193		
$CaCO_3$, %		82.0		
Gravel, %	0.49	0.56	0.29	0.14
Sand, %	98.77	99.25	99.71	99.66
Silt, %	0.74	0.19	0.00	0.20
Clay, %	0.00	0.00	0.00	0.00
Median Diameter (mm)	0.26	0.39	0.30	0.21
Sorting (Trask)	0.95	0.85	0.82	0.70
First Quartile (mm)		0.56		
Third Quartile (mm)		0.29		
Sieve Weight, % (mu)				
+ 2000	0.49	0.56	0.29	0.14
+ 1000	2.81	2.79	2.26	0.50
+ 500	8.65	27.66	14.38	4.87
+ 250	36.44	51.73	40.94	19.52
+ 125	46.96	14.56	40.73	69.09
+ 62	3.91	2.51	1.40	5.68
- 62	0.74	0.19	0.00	0.20
Heavy Mineral, %		0.23		
Light Mineral, %		99.77		
Bioclastic, %	Sh	Sh	Sh	Sh

Table 1.--Chemical and physical properties of bottom sediments by stations

Station	35	35	35	35
Cruise	1	2	4	5
Sample No.	257	35	471	535
Latitude N.	31°20'	31°21'	31°21'	31°20'
Longitude W.	80°52'	80°55'	80°52'	80°54'
Depth (meters)	16	15	18	16
Date (mo., day, yr.)	2-27-53	5-5-53	10-22-53	2-10-54
Sediment Type	Sa	Sa	Sa	Sa
Loss on Ignition, %	2.82	3.20	2.84	11.93
Insoluble Residue, %	92.80	91.75	93.13	75.60
Al_2O_3, %	0.02	0.04	0.03	0.04
Fe_2O_3, %	0.11	0.11	0.24	0.23
MnO, %	0.00	0.00	0.00	0.00
MgO, %	0.21	0.14	0.20	0.38
CaO, %	2.38	3.59	3.67	4.45
K_2O, %	0.02	0.03	0.03	0.04
P_2O_5, %	0.78	1.16	1.45	5.78
Sr, %	0.04	0.09	0.10	0.09
Cl, %	0.37	0.30	0.35	0.37
Organic Nitrogen, %		0.044		0.003
Organic Carbon, %		0.219		0.123
$CaCO_3$, %		11.6		10.3
Gravel, %	0.32	2.55	0.30	7.61
Sand, %	99.68	97.09	99.70	91.01
Silt, %	0.00	0.36	0.00	1.38
Clay, %	0.00	0.00	0.00	0.00
Median Diameter (mm)	0.37	0.51	0.35	0.49
Sorting (Trask)	0.73	1.00	0.72	1.34
First Quartile (mm)		0.72		0.82
Third Quartile (mm)		0.34		0.31
Sieve Weight, % (mu)				
+ 2000	0.32	2.55	0.30	7.61
+ 1000	3.00	11.74	1.81	10.23
+ 500	17.88	33.06	17.68	28.63
+ 250	60.52	42.41	57.99	38.33
+ 125	17.52	9.13	21.65	10.94
+ 62	0.76	0.75	0.57	2.88
- 62	0.00	0.36	0.00	1.38
Heavy Mineral, %		1.13		0.53
Light Mineral, %		98.87		99.47
Bioclastic, %	Sh	Sh	Sh	Sh

Table 1.--Chemical and physical properties of bottom sediments by stations

Station	36	36	36	36
Cruise	1	2	4	5
Sample No.	258	36	466	536
Latitude N.	31°42'	31°42'	31°41'	31°40'
Longitude W.	80°36'	80°38'	80°35'	80°37'
Depth (meters)	16	21	18	16
Date (mo., day, yr.)	2-27-53	5-5-53	10-22-53	2-10-54
Sediment Type	Sa	Sa	Sa	Sa
Loss on Ignition, %	3.47	3.54	4.68	3.05
Insoluble Residue, %	89.40	87.51	87.38	90.50
Al_2O_3, %	0.12	0.09	0.06	0.04
Fe_2O_3, %	0.31	0.15	0.19	0.20
MnO, %	0.00	0.00	0.00	0.00
MgO, %	0.26	0.14	0.27	0.23
CaO, %	4.30	3.41	6.42	4.40
K_2O, %	0.06	0.05	0.05	0.05
P_2O_5, %	2.43	1.73	2.12	3.04
Sr, %	0.03	0.05	0.16	0.07
Cl, %	0.44	0.51	0.38	0.49
Organic Nitrogen, %			0.009	
Organic Carbon, %			0.080	
$CaCO_3$, %			8.6	
Gravel, %	0.66	0.23	1.73	1.98
Sand, %	99.23	99.41	98.17	94.97
Silt, %	0.11	0.36	0.10	3.05
Clay, %	0.00	0.00	0.00	0.00
Median Diameter (mm)	0.24	0.22	0.38	0.27
Sorting (Trask)	0.80	0.70	0.93	1.29
First Quartile (mm)			0.55	
Third Quartile (mm)			0.25	
Sieve Weight, % (mu)				
+ 2000	0.66	0.23	1.73	1.98
+ 1000	1.60	0.60	5.08	2.51
+ 500	5.53	3.91	22.48	10.47
+ 250	28.70	25.47	45.58	44.11
+ 125	59.59	67.29	24.39	34.53
+ 62	3.81	2.14	0.64	3.35
- 62	0.11	0.36	0.10	3.05
Heavy Mineral, %			0.82	
Light Mineral, %			99.18	
Bioclastic, %	Sh	Sh	Sh	Sh

Table 1.--Chemical and physical properties of bottom sediments by stations

Station	37	37	37	37
Cruise	1	2	4	5
Sample No.	259	37	470	537
Latitude N.	31°36'	31°38'	31°38'	31°38'
Longitude W.	80°10'	80°14'	80°14'	80°18'
Depth (meters)	32	32	27	29
Date (mo., day, yr.)	2-27-53	5-5-53	10-22-53	2-10-54
Sediment Type	Sa	Sa	Sa	Sa
Loss on Ignition, %	2.97	3.95	3.92	2.50
Insoluble Residue, %	92.97	91.64	91.84	91.24
Al_2O_3, %	0.09	0.10	0.06	0.01
Fe_2O_3, %	0.26	0.24	0.22	0.44
MnO, %	0.00	0.00	0.00	0.00
MgO, %	0.38	0.41	0.67	0.25
CaO, %	2.92	3.74	6.55	2.85
K_2O, %	0.02	0.03	0.05	0.02
P_2O_5, %	0.71	0.00	2.87	0.82
Sr, %	0.02	0.10	0.17	0.05
Cl, %	0.33	0.28	0.55	0.29
Organic Nitrogen, %	0.006		0.003	
Organic Carbon, %	0.059		0.099	
$CaCO_3$, %	15.6		39.3	
Gravel, %	0.00	0.14	0.95	5.22
Sand, %	99.65	99.86	99.05	94.36
Silt, %	0.35	0.00	0.00	0.42
Clay, %	0.00	0.00	0.00	0.00
Median Diameter (mm)	0.39	0.31	0.40	0.50
Sorting (Trask)	0.94	0.72	0.98	1.12
First Quartile (mm)	0.59		0.60	
Third Quartile (mm)	0.26		0.24	
Sieve Weight, % (mu)				
+ 2000	0.00	0.14	0.95	5.22
+ 1000	7.05	1.52	10.55	10.68
+ 500	26.39	11.13	19.75	30.12
+ 250	43.86	52.12	41.35	40.01
+ 125	21.56	34.25	27.10	12.39
+ 62	0.79	0.84	0.30	1.16
- 62	0.35	0.00	0.00	0.42
Heavy Mineral, %	0.83		0.39	
Light Mineral, %	99.17		99.61	
Bioclastic, %	Sh	Sh	Sh	Sh

Table 1.--Chemical and physical properties of bottom sediments by stations

Station	38	38	38	38	39
Cruise	1	2	4	5	4
Sample No.	260	7	467	538	468
Latitude N.	31°31'	31°36'	31°36'	31°36'	31°34'
Longitude W.	79°52'	79°51'	79°50'	79°51'	79°28'
Depth (meters)	45	45	42	42	457
Date (mo., day, yr.)	2-27-53	5-5-53	10-22-53	2-11-54	10-24-53
Sediment Type	Sa	Sa	Sa	Sa	Gr Sa
Loss on Ignition, %	2.86	1.98	2.51	2.45	34.83
Insoluble Residue, %	93.82	95.07	94.33	95.31	16.38
Al_2O_3, %	0.06	0.07	0.04	0.01	0.69
Fe_2O_3, %	0.31	0.14	0.11	0.14	5.04
MnO, %	0.03	0.00	0.00	0.00	0.13
MgO, %	0.20	0.16	0.18	0.17	1.38
CaO, %	2.24	1.39	2.86	1.98	40.31
K_2O, %	0.04	0.02	0.04	0.00	0.91
P_2O_5, %	0.85	0.00	0.51	0.65	3.28
Sr, %	0.05	0.00	0.02	0.02	0.67
Cl, %	0.44	0.39	0.37	0.49	0.97
Organic Nitrogen, %				0.002	0.014
Organic Carbon, %				0.116	0.270
$CaCO_3$, %				40.5	77.7
Gravel, %	0.21	0.43	0.37		15.61
Sand, %	99.59	99.29	99.63		83.82
Silt, %	0.20	0.28	0.00		0.57
Clay, %	0.00	0.00	0.00		0.00
Median Diameter (mm)	0.42	0.43	0.49		0.89
Sorting (Trask)	0.82	0.77	0.70		1.26
First Quartile (mm)					1.60
Third Quartile (mm)					0.48
Sieve Weight, % (mu)					
+ 2000	0.21	0.43	0.37		15.61
+ 1000	3.58	2.57	5.84		37.32
+ 500	33.05	33.36	40.88		20.63
+ 250	48.53	53.54	47.91		21.42
+ 125	13.43	9.35	4.82		3.11
+ 62	1.00	0.47	0.18		1.34
- 62	0.20	0.28	0.00		0.57
Heavy Mineral, %					0.25
Light Mineral, %					99.75
Bioclastic, %					Fm Co

Table 1.--Chemical and physical properties of bottom sediments by stations

Station	40	42	42	42
Cruise	5	2	4	5
Sample No.	544	6	462	543
Latitude N.	31°28'	31°57'	31°57'	31°57'
Longitude W.	78°40'	79°18'	79°16'	79°16'
Depth (meters)	528	137	155	106
Date (mo., day, yr.)	2-15-54	5-6-53	10-25-53	2-14-54
Sediment Type	Sa		Si Sa	
Loss on Ignition, %	44.01	33.10	25.39	24.23
Insoluble Residue, %	1.08	25.66	41.90	46.74
Al_2O_3, %	0.17	0.57	0.61	0.70
Fe_2O_3, %	0.55	1.12	2.82	1.97
MnO, %	0.10	0.06	0.05	0.03
MgO, %	3.89	1.67	1.74	1.71
CaO, %	53.63	36.36	30.08	30.05
K_2O, %	0.24	0.26	0.24	0.28
P_2O_5, %	4.29	4.03	3.26	6.49
Sr, %	0.55	0.26	0.35	0.33
Cl, %	0.65	1.34	0.84	0.83
Organic Nitrogen, %	0.016		0.006	
Organic Carbon, %	0.079		0.532	
$CaCO_3$, %	92.0		53.5	
Gravel, %	2.10		0.37	
Sand, %	97.90		87.28	
Silt, %	0.00		12.35	
Clay, %	0.00		0.00	
Median Diameter (mm)	0.55		0.11	
Sorting (Trask)	0.83		1.63	
First Quartile (mm)	0.77		0.19	
Third Quartile (mm)	0.39		0.09	
Sieve Weight, % (mu)				
+ 2000	2.10		0.37	
+ 1000	12.92		1.41	
+ 500	34.43		1.85	
+ 250	47.53		6.45	
+ 125	2.77		50.85	
+ 62	0.25		26.72	
- 62	0.00		12.35	
Heavy Mineral, %	0.13		0.14	
Light Mineral, %	99.87		99.86	
Bioclastic, %	Fm Co		Fm	

Table 1.--Chemical and physical properties of bottom sediments by stations

Station	43	43	43
Cruise	2	4	5
Sample No.	8	461	540
Latitude N.	32°12'	32°11'	32°12'
Longitude W.	79°33'	79°33'	79°33'
Depth (meters)	31	36	33
Date (mo., day, yr.)	5-6-53	10-25-53	2-14-54
Sediment Type	Sa	Sa	Sa
Loss on Ignition, %	2.41	5.97	5.90
Insoluble Residue, %	94.83	87.21	88.14
Al_2O_3, %	0.04	1.18	0.12
Fe_2O_3, %	0.12	0.42	0.44
MnO, %	0.00	0.00	0.00
MgO, %	0.19	0.55	0.52
CaO, %	2.29	5.50	7.21
K_2O, %	0.00	0.05	0.05
P_2O_5, %	0.00	1.96	1.90
Sr, %	0.07	0.11	0.13
Cl, %	0.29	0.47	0.48
Organic Nitrogen, %	0.007	0.006	
Organic Carbon, %	0.115	0.116	
$CaCO_3$, %	8.0		
Gravel, %	0.27	0.00	0.60
Sand, %	99.54	99.44	99.15
Silt, %	0.19	0.56	0.24
Clay, %	0.00	0.00	0.00
Median Diameter (mm)	0.55	0.24	0.28
Sorting (Trask)	0.97	0.80	0.88
First Quartile (mm)	0.87	0.31	
Third Quartile (mm)	0.36	0.19	
Sieve Weight, % (mu)			
+ 2000	0.27	0.00	0.61
+ 1000	19.46	1.67	2.65
+ 500	35.03	5.48	11.25
+ 250	34.41	31.61	37.13
+ 125	10.22	58.65	45.98
+ 62	0.42	2.03	2.14
- 62	0.19	0.56	0.24
Heavy Mineral, %	0.82	0.63	
Light Mineral, %	99.18	99.37	
Bioclastic, %	Sh	Sh	Sh

Table 1.--Chemical and physical properties of bottom sediments by stations

Station	44	44	44
Cruise	2	4	5
Sample No.	9	459	539
Latitude N.	32°26'	32°24'	32°26'
Longitude W.	79°50'	79°50'	79°50'
Depth (meters)	15	17	13
Date (mo., day, yr.)	5-6-53	10-25-53	2-14-54
Sediment Type	Sa	Sa	Sa
Loss on Ignition, %	14.93	4.65	20.94
Insoluble Residue, %	68.89	89.06	53.23
Al_2O_3, %	0.10	1.16	0.14
Fe_2O_3, %	0.30	0.27	0.35
MnO, %	0.03	0.00	0.02
MgO, %	0.39	0.31	0.50
CaO, %	15.64	4.65	29.07
K_2O, %	0.09	0.07	0.13
P_2O_5, %	4.25	1.70	6.01
Sr, %	0.27	0.08	0.26
Cl, %	0.32	0.58	0.48
Organic Nitrogen, %	0.009	0.004	
Organic Carbon, %	0.106	0.148	
$CaCO_3$, %	33.0	68.9	
Gravel, %	8.98	0.00	9.35
Sand, %	90.72	97.42	88.84
Silt, %	0.30	2.58	1.81
Clay, %	0.00	0.00	0.00
Median Diameter (mm)	0.80	0.17	0.49
Sorting (Trask)	1.17	0.88	1.56
First Quartile (mm)	1.37	0.22	
Third Quartile (mm)	0.50	0.15	
Sieve Weight, % (mu)			
+ 2000	8.98	0.00	9.35
+ 1000	36.38	0.58	17.09
+ 500	29.72	1.13	23.20
+ 250	15.30	8.47	21.58
+ 125	8.60	79.90	24.31
+ 62	0.72	7.34	2.66
- 62	0.30	2.58	1.81
Heavy Mineral, %	0.21	1.19	
Light Mineral, %	99.79	98.81	
Bioclastic, %	Sh	Sh	Sh

Table 1.--Chemical and physical properties of bottom sediments by stations

Station	45	45	45
Cruise	2	4	7
Sample No.	11	458	668
Latitude N.	32°40'	32°40'	32°40'
Longitude W.	79°32'	79°32'	79°32'
Depth (meters)	15	16	14
Date (mo., day, yr.)	5-6-53	10-26-53	7-3-54
Sediment Type	Sa	Sa	Sa
Loss on Ignition, %	4.58	10.68	8.08
Insoluble Residue, %	90.57	76.06	81.74
Al_2O_3, %	0.12	0.10	0.13
Fe_2O_3, %	0.44	0.52	0.46
MnO, %	0.00	0.01	0.05
MgO, %	0.42	0.42	0.43
CaO, %	4.41	11.53	8.80
K_2O, %	0.11	0.10	0.09
P_2O_5, %	1.02	3.16	3.50
Sr, %	0.13	0.16	0.07
Cl, %	0.42	0.46	0.56
Organic Nitrogen, %			0.006
Organic Carbon, %			0.161
$CaCO_3$, %			16.5
Gravel, %	0.14	4.56	0.52
Sand, %	99.78	94.59	96.01
Silt, %	0.08	0.85	2.57
Clay, %	0.00	0.00	0.00
Median Diameter (mm)	0.20	0.31	0.22
Sorting (Trask)	0.51	1.29	1.16
First Quartile (mm)			0.32
Third Quartile (mm)			0.17
Sieve Weight, % (mu)			
+ 2000	0.14	4.56	0.52
+ 1000	0.36	6.43	3.18
+ 500	1.24	14.26	7.97
+ 250	13.87	23.40	21.88
+ 125	81.58	46.05	59.85
+ 62	2.73	4.45	4.03
- 62	0.08	0.85	2.57
Heavy Mineral, %			1.08
Light Mineral, %			98.92
Bioclastic, %	Sh	Sh	Sh

Table 1.--Chemical and physical properties of bottom sediments by stations

Station	46	46	46
Cruise	2	4	5
Sample No.	12	457	445
Latitude N.	32°54'	32°54'	32°55'
Longitude W.	79°16'	79°16'	79°16'
Depth (meters)	11	18	13
Date (mo., day, yr.)	5-6-53	10-26-53	2-16-54
Sediment Type	Gr Sa	Gr Sa	Gr Sa
Loss on Ignition, %	8.85	14.43	6.83
Insoluble Residue, %	80.61	69.61	85.47
Al_2O_3, %	0.09	0.11	0.06
Fe_2O_3, %	0.49	0.67	0.69
MnO, %	0.02	0.03	0.02
MgO, %	0.36	0.24	0.43
CaO, %	8.10	23.11	10.02
K_2O, %	0.05	0.13	0.07
P_2O_5, %	2.02	3.93	5.94
Sr, %	0.13	0.22	0.17
Cl, %	0.22	0.34	0.58
Organic Nitrogen, %	0.010	0.003	
Organic Carbon, %	0.079	0.090	
$CaCO_3$, %	21.7	37.7	
Gravel, %	19.29	22.60	13.21
Sand, %	79.84	72.24	82.10
Silt, %	0.87	5.16	4.69
Clay, %	0.00	0.00	0.00
Median Diameter (mm)	0.85	0.52	0.42
Sorting (Trask)	1.33	2.04	1.86
First Quartile (mm)	1.70	1.68	
Third Quartile (mm)	0.49	0.28	
Sieve Weight, % (mu)			
+ 2000	19.29	22.60	13.21
+ 1000	24.91	10.77	7.73
+ 500	30.61	16.28	22.28
+ 250	19.12	28.07	32.16
+ 125	4.07	12.84	13.96
+ 62	1.13	4.28	5.97
- 62	0.87	5.16	4.69
Heavy Mineral, %	0.35	0.56	
Light Mineral, %	99.65	99.44	
Bioclastic, %	Sh	Sh	Sh

Table 1.--Chemical and physical properties of bottom sediments by stations

Station	47	47	47
Cruise	2	4	5
Sample No.	13	455	500
Latitude N.	32°40'	32°40'	32°40'
Longitude W.	79°00'	79°00'	79°00'
Depth (meters)	29	27	29
Date (mo., day, yr.)	5-6-53	10-26-53	2-15-54
Sediment Type	Sa	Sa	Sa
Loss on Ignition, %	3.42	3.69	4.65
Insoluble Residue, %	92.06	92.21	84.94
Al_2O_3, %	0.09	0.15	0.07
Fe_2O_3, %	0.70	0.51	0.35
MnO, %	0.00	0.00	0.03
MgO, %	0.36	0.41	0.37
CaO, %	3.31	3.33	6.02
K_2O, %	0.04	0.05	0.05
P_2O_5, %	0.52	0.68	1.45
Sr, %	0.08	0.08	0.12
Cl, %	0.41	0.50	0.43
Organic Nitrogen, %			0.001
Organic Carbon, %			0.015
$CaCO_3$, %			13.1
Gravel, %	8.15	0.30	2.13
Sand, %	91.42	99.37	97.39
Silt, %	0.43	0.33	0.48
Clay, %	0.00	0.00	0.00
Median Diameter (mm)	0.53	0.40	0.48
Sorting (Trask)	1.15	0.81	1.05
First Quartile (mm)			0.73
Third Quartile (mm)			0.31
Sieve Weight, % (mu)			
+ 2000	8.15	0.30	2.13
+ 1000	8.52	2.48	11.43
+ 500	31.46	27.76	31.55
+ 250	40.40	54.01	39.75
+ 125	9.81	14.43	13.85
+ 62	1.23	0.69	0.81
- 62	0.43	0.33	0.48
Heavy Mineral, %			0.56
Light Mineral, %			99.44
Bioclastic, %	Sh	Sh	Sh

Table 1.--Chemical and physical properties of bottom sediments by stations

Station	48	48	48	49
Cruise	2	4	5	4
Sample No.	14	453	501	454
Latitude N.	32°24'	32°25'	32°26'	32°11'
Longitude W.	78°43'	78°44'	78°42'	78°26'
Depth (meters)	366	210	238	332
Date (mo., day, yr.)	5-6-53	10-26-53	2-15-54	10-26-53
Sediment Type	Si Sa	Si Sa		Sa
Loss on Ignition, %	33.45	28.23	29.72	42.49
Insoluble Residue, %	24.91	34.32	32.78	3.86
Al_2O_3, %	0.78	0.90	0.83	0.38
Fe_2O_3, %	2.25	3.19	3.56	1.87
MnO, %	0.07	0.05	0.06	0.17
MgO, %	1.39	1.30	1.20	1.75
CaO, %	39.71	33.92	36.20	50.68
K_2O, %	0.55	0.58	0.57	0.33
P_2O_5, %	4.15	3.18	5.96	3.27
Sr, %	0.39	0.36	0.36	0.51
Cl, %	1.44	1.05	1.09	1.13
Organic Nitrogen, %		0.059		0.026
Organic Carbon, %		0.434		0.315
$CaCO_3$, %		59.5		21.8
Gravel, %	0.00	3.42		0.72
Sand, %	59.23	77.60		99.28
Silt, %	40.77	18.98		0.00
Clay, %		0.00		0.00
Median Diameter (mm)	0.046	0.126		0.52
Sorting (Trask)	2.20	2.30		0.64
First Quartile (mm)		0.30		0.66
Third Quartile (mm)		0.08		0.41
Sieve Weight, % (mu)				
+ 2000	0.00	3.42		0.72
+ 1000	0.14	5.97		4.19
+ 500	1.65	6.36		45.92
+ 250	7.62	12.89		47.85
+ 125	26.83	31.92		1.03
+ 62	22.99	20.46		0.29
- 62	40.77	18.98		0.00
Heavy Mineral, %		0.38		0.12
Light Mineral, %		99.62		99.88
Bioclastic, %	Fm	Fm		Sh Fm

Table 1.--Chemical and physical properties of bottom sediments by stations

Station	50	50	50	53
Cruise	4	5	8	7
Sample No.	452	545	681	669
Latitude N.	31°57'	31°54'	31°56'	32°49'
Longitude W.	78°09'	78°10'	78°10'	78°04'
Depth (meters)	723	658	709	173
Date (mo., day, yr.)	10-26-53	2-15-54	9-26-54	7-4-54
Sediment Type	Si Gr Sa		Gr Sa	Si Gr Sa
Loss on Ignition, %	30.83	39.61	42.81	26.27
Insoluble Residue, %	6.36	5.48	2.67	33.82
Al_2O_3, %	0.64	0.21	0.45	1.16
Fe_2O_3, %	1.61	0.44	1.10	7.03
MnO, %	0.11	0.10	0.35	0.49
MgO, %	1.03	1.24	2.10	1.80
CaO, %	44.74	58.36	55.59	29.18
K_2O, %	0.41	0.26	0.26	1.41
P_2O_5, %	6.45	6.38	3.96	4.07
Sr, %	0.34	0.92	0.61	0.31
Cl, %	0.54	0.69	0.61	1.08
Organic Nitrogen, %	0.020		0.006	0.019
Organic Carbon, %	0.350		0.208	0.597
$CaCO_3$, %	95.0		87.4	50.5
Gravel, %	27.05		46.37	16.97
Sand, %	49.64		53.44	73.03
Silt, %	21.69		0.19	10.00
Clay, %	1.62		0.00	0.00
Median Diameter (mm)	0.25		1.27	0.27
Sorting (Trask)	3.19		1.27	2.33
First Quartile (mm)	0.36		4.00	0.71
Third Quartile (mm)	0.07		0.50	0.12
Sieve Weight, % (mu)				
+ 2000	27.05		46.37	16.97
+ 1000	10.15		18.57	2.03
+ 500	6.64		10.28	13.17
+ 250	11.95		23.44	22.67
+ 125	11.63		1.15	19.89
+ 62	9.27		0.19	15.27
- 62	23.31		0.00	10.00
Heavy Mineral, %	0.35		0.03	0.24
Light Mineral, %	99.65		99.97	99.76
Bioclastic, %	Co Fm		Al Co Fm	Fm

Table 1.--Chemical and physical properties of bottom sediments by stations

Station	54	54	54
Cruise	2	4	5
Sample No.	15	493	437
Latitude N.	33°03'	33°03'	33°03'
Longitude W.	78°21'	78°21'	78°21'
Depth (meters)	30	31	29
Date (mo., day, yr.)	5-7-53	10-27-53	2-16-54
Sediment Type		Sa	Sa
Loss on Ignition, %	1.85	1.79	1.62
Insoluble Residue, %	95.89	96.70	96.44
Al_2O_3, %	0.04	0.04	0.04
Fe_2O_3, %	0.15	0.42	0.18
MnO, %	0.00	0.00	0.00
MgO, %	0.25	0.21	0.17
CaO, %	1.18	1.97	1.34
K_2O, %	0.03	0.00	0.02
P_2O_5, %	0.00	0.04	4.87
Sr, %	0.04	0.09	0.00
Cl, %	0.39	0.41	0.45
Organic Nitrogen, %			0.008
Organic Carbon, %			0.176
$CaCO_3$, %			12.9
Gravel, %		0.62	0.28
Sand, %		99.38	99.57
Silt, %		0.00	0.15
Clay, %		0.00	0.00
Median Diameter (mm)		0.50	0.51
Sorting (Trask)		0.75	0.85
First Quartile (mm)			0.75
Third Quartile (mm)			0.36
Sieve Weight, % (mu)			
+ 2000		0.62	0.28
+ 1000		6.96	11.69
+ 500		40.89	37.43
+ 250		45.38	43.22
+ 125		5.80	6.46
+ 62		0.35	0.77
- 62		0.00	0.15
Heavy Mineral, %			0.41
Light Mineral, %			99.59
Bioclastic, %			Sh

Table 1.--Chemical and physical properties of bottom sediments by stations

Station	55	55	55
Cruise	2	4	5
Sample No.	16	494	436
Latitude N.	33°17'	33°18'	33°18'
Longitude W.	78°38'	78°38'	78°38'
Depth (meters)	18	18	18
Date (mo., day, yr.)	5-8-53	10-27-53	2-16-54
Sediment Type	Sa	Sa	Sa
Loss on Ignition, %	1.27	1.42	0.99
Insoluble Residue, %	96.65	97.20	98.37
Al_2O_3, %	0.02	0.09	0.01
Fe_2O_3, %	0.23	0.15	0.35
MnO, %	0.00	0.00	0.00
MgO, %	0.11	0.24	0.19
CaO, %	0.87	1.04	0.60
K_2O, %	0.01	0.02	0.00
P_2O_5, %	0.00	0.00	0.00
Sr, %	0.00	0.00	0.00
Cl, %	0.25	0.37	0.38
Organic Nitrogen, %		0.008	0.005
Organic Carbon, %		0.120	0.046
$CaCO_3$, %		5.6	7.6
Gravel, %	3.47	0.73	2.20
Sand, %	96.13	98.87	97.70
Silt, %	0.40	0.40	0.10
Clay, %	0.00	0.00	0.00
Median Diameter (mm)	0.51	0.37	0.64
Sorting (Trask)	1.06	0.94	0.93
First Quartile (mm)		0.51	0.88
Third Quartile (mm)		0.25	0.43
Sieve Weight, % (mu)			
+ 2000	3.47	0.73	2.20
+ 1000	11.28	5.18	22.73
+ 500	37.20	20.09	39.99
+ 250	34.87	48.82	30.02
+ 125	11.83	23.65	4.41
+ 62	0.95	1.13	0.55
- 62	0.40	0.40	0.10
Heavy Mineral, %		0.14	0.13
Light Mineral, %		99.86	99.87
Bioclastic, %	Sh	Sh	Sh

Table 1.--Chemical and physical properties of bottom sediments by stations

Station	56	56	56
Cruise	2	4	5
Sample No.	18	498	433
Latitude N.	33°32'	33°32'	33°32'
Longitude W.	78°55'	78°55'	78°55'
Depth (meters)	9	12	9
Date (mo., day, yr.)	5-8-53	10-27-53	2-16-54
Sediment Type	Sa	Sa	Sa
Loss on Ignition, %	1.42	4.26	2.05
Insoluble Residue, %	97.39	91.26	96.30
Al_2O_3, %	0.05	0.09	0.05
Fe_2O_3, %	0.30	0.40	0.26
MnO, %	0.00	0.00	0.00
MgO, %	0.17	0.19	0.19
CaO, %	1.00	4.87	2.53
K_2O, %	0.01	0.05	0.04
P_2O_5, %	0.00	0.76	5.09
Sr, %	0.04	0.05	0.02
Cl, %	0.37	0.45	0.43
Organic Nitrogen, %	0.006		
Organic Carbon, %	0.075		
$CaCO_3$, %	7.5		
Gravel, %	0.00	1.19	0.79
Sand, %	100.00	98.57	99.13
Silt, %	0.00	0.24	0.08
Clay, %	0.00	0.00	0.00
Median Diameter (mm)	0.45	0.37	0.44
Sorting (Trask)	0.83	0.93	0.93
First Quartile (mm)	0.64		
Third Quartile (mm)	0.31		
Sieve Weight, % (mu)			
+ 2000	0.00	1.19	0.79
+ 1000	8.57	4.24	9.52
+ 500	30.84	21.45	30.20
+ 250	46.52	47.52	41.64
+ 125	13.82	23.89	17.29
+ 62	0.25	1.47	0.48
- 62	0.00	0.24	0.08
Heavy Mineral, %	0.26		
Light Mineral, %	99.74		
Bioclastic, %	Sh	Sh	Sh

Table 1.--Chemical and physical properties of bottom sediments by stations

Station	57	57	57	57
Cruise	2	4	7	8
Sample No.	17	496	670	682
Latitude N.	33°34'	33°34'	33°34'	33°34'
Longitude W.	78°25'	78°24'	78°24'	78°25'
Depth (meters)	20	20	18	16
Date (mo., day, yr.)	5-8-53	10-27-53	7-5-54	9-27-54
Sediment Type	Sa	Sa	Sa	Sa
Loss on Ignition, %	0.85	1.49	4.31	2.33
Insoluble Residue, %	98.33	95.09	90.30	93.71
Al_2O_3, %	0.05	0.11	0.25	0.14
Fe_2O_3, %	0.14	0.33	0.56	0.40
MnO, %	0.00	0.00	0.00	0.01
MgO, %	0.08	0.24	0.47	0.29
CaO, %	0.69	2.39	3.88	2.13
K_2O, %	0.00	0.05	0.07	0.03
P_2O_5, %	0.54	0.00	1.22	0.40
Sr, %	0.00	0.00	0.05	0.03
Cl, %	0.26	0.43	0.60	0.38
Organic Nitrogen, %	0.003	0.003		
Organic Carbon, %	0.022	0.500		
$CaCO_3$, %	54.3	15.2		
Gravel, %	2.31	0.00	0.20	2.36
Sand, %	97.50	99.84	97.27	97.34
Silt, %	0.19	0.16	2.53	0.30
Clay, %	0.00	0.00	0.00	0.00
Median Diameter (mm)	0.68	0.20	0.15	0.55
Sorting (Trask)	0.85	0.63	1.06	0.96
First Quartile (mm)	0.98	0.25		
Third Quartile (mm)	0.49	0.16		
Sieve Weight, % (mu)				
+ 2000	2.31	0.00	0.20	2.36
+ 1000	21.18	0.25	1.13	13.47
+ 500	49.60	0.94	2.83	38.38
+ 250	24.59	23.29	9.74	40.07
+ 125	1.79	66.13	51.81	4.04
+ 62	0.34	9.23	31.76	1.38
- 62	0.19	0.16	2.53	0.30
Heavy Mineral, %	0.12	1.05		
Light Mineral, %	99.88	98.95		
Bioclastic, %	Sh	Sh	Sh	Sh

Table 1.--Chemical and physical properties of bottom sediments by stations

Station	58	58	58
Cruise	2	4	7
Sample No.	20	491	671
Latitude N.	33°36'	33°36'	33°36'
Longitude W.	77°56'	77°56'	77°54'
Depth (meters)	20	18	16
Date (mo., day, yr.)	5-8-53	10-27-53	7-5-54
Sediment Type	Si Sa	Sa	Sa
Loss on Ignition, %	5.50	5.15	4.25
Insoluble Residue, %	85.30	87.98	89.82
Al_2O_3, %	0.31	0.16	0.20
Fe_2O_3, %	0.96	0.67	0.57
MnO, %	0.00	0.00	0.00
MgO, %	0.65	0.53	0.43
CaO, %	4.08	5.19	4.18
K_2O, %	0.10	0.07	0.07
P_2O_5, %	1.58	1.78	1.87
Sr, %	0.08	0.08	0.06
Cl, %	0.61	0.59	0.58
Organic Nitrogen, %			0.026
Organic Carbon, %			0.130
$CaCO_3$, %			9.4
Gravel, %	0.00	0.34	0.00
Sand, %	85.51	98.77	99.63
Silt, %	14.49	0.89	0.37
Clay, %	0.00	0.00	0.00
Median Diameter (mm)	0.087	0.16	0.16
Sorting (Trask)	1.56	0.80	0.67
First Quartile (mm)			0.49
Third Quartile (mm)			0.12
Sieve Weight, % (mu)			
+ 2000	0.00	0.34	0.00
+ 1000	0.29	0.60	0.30
+ 500	1.04	1.39	1.29
+ 250	4.03	8.23	6.49
+ 125	35.67	65.12	64.79
+ 62	44.48	23.43	26.76
- 62	14.49	0.89	0.37
Heavy Mineral, %			0.43
Light Mineral, %			99.57
Bioclastic, %	Sh	Sh	Sh

Table 1.--Chemical and physical properties of bottom sediments by stations

Station	59	59	59	61
Cruise	2	4	7	4
Sample No.	19	490	672	487
Latitude N.	33°22'	33°21'	33°22'	32°53'
Longitude W.	77°37'	77°38'	77°38'	77°04'
Depth (meters)	22	22	24	484
Date (mo., day, yr.)	5-8-53	11-8-53	7-5-54	11-8-53
Sediment Type	Sa	Sa	Sa	Gr Sa
Loss on Ignition, %	11.22	15.30	19.52	31.55
Insoluble Residue, %	75.16	65.76	53.92	25.90
Al_2O_3, %	0.07	0.09	0.14	0.16
Fe_2O_3, %	1.13	0.73	1.38	11.05
MnO, %	0.02	0.04	0.20	0.09
MgO, %	0.68	0.83	0.75	1.36
CaO, %	14.53	20.52	23.07	37.58
K_2O, %	0.10	0.11	0.12	1.60
P_2O_5, %	5.24	3.60	3.75	3.95
Sr, %	0.24	0.42	0.36	0.30
Cl, %	0.34	0.40	0.44	1.26
Organic Nitrogen, %			0.011	0.020
Organic Carbon, %			0.167	0.254
$CaCO_3$, %			72.5	91.2
Gravel, %	0.93	1.54	3.60	23.02
Sand, %	99.07	97.60	96.40	76.83
Silt, %	0.00	0.86	0.00	0.15
Clay, %	0.00	0.00	0.00	0.00
Median Diameter (mm)	0.34	0.29	0.52	0.91
Sorting (Trask)	0.79	0.96	1.01	1.19
First Quartile (mm)			0.80	1.85
Third Quartile (mm)			0.33	0.48
Sieve Weight, % (mu)				
+ 2000	0.93	1.54	3.60	23.02
+ 1000	3.47	1.74	13.23	21.94
+ 500	11.76	8.85	34.70	24.53
+ 250	55.67	48.16	33.94	29.64
+ 125	27.91	37.10	14.44	0.58
+ 62	0.26	1.75	0.09	0.14
- 62	0.00	0.86	0.00	0.15
Heavy Mineral, %			0.13	0.003
Light Mineral, %			99.87	99.997
Bioclastic, %	Sh	Sh	Sh	Co Fm

Table 1.--Chemical and physical properties of bottom sediments by stations

Station	62	62	63	63
Cruise	4	8	4	8
Sample No.	486	683	485	684
Latitude N.	32°40'	32°40'	33°14'	33°14'
Longitude W.	76°46'	76°46'	76°22'	76°25'
Depth (meters)	791	826	750	704
Date (mo., day, yr.)	11-8-53	9-27-54	11-8-53	9-28-54
Sediment Type	Si Sa		Si Sa	Sa
Loss on Ignition, %	35.86	35.88	33.91	35.94
Insoluble Residue, %	18.67	19.05	24.14	18.10
Al_2O_3, %	1.43	1.20	0.87	1.15
Fe_2O_3, %	1.79	2.48	2.80	3.33
MnO, %	0.07	0.30	0.05	0.38
MgO, %	1.04	1.38	1.26	1.31
CaO, %	41.07	43.33	40.03	44.18
K_2O, %	0.48	0.47	0.47	0.57
P_2O_5, %	5.34	3.61	5.69	3.71
Sr, %	0.30	0.39	0.26	0.35
Cl, %	1.60	1.52	1.59	1.32
Organic Nitrogen, %	0.102		0.060	
Organic Carbon, %	0.940		1.086	
$CaCO_3$, %	73.2		39.3	
Gravel, %	0.00		0.00	0.00
Sand, %	49.15		53.88	96.29
Silt, %	42.95		46.12	3.71
Clay, %	7.90		0.00	0.00
Median Diameter (mm)	0.061		0.047	0.26
Sorting (Trask)	2.80		2.49	1.32
First Quartile (mm)	0.18		0.22	
Third Quartile (mm)	0.02		0.03	
Sieve Weight, % (mu)				
+ 2000	0.00		0.00	0.00
+ 1000	4.01		0.39	1.35
+ 500	19.48		4.84	15.64
+ 250	16.14		17.70	44.16
+ 125	9.52		17.50	26.64
+ 62	15.57		13.45	8.50
- 62	50.85		46.12	3.71
Heavy Mineral, %	0.02			
Light Mineral, %	99.98			
Bioclastic, %				
	Fm	Fm	Fm	Fm

Table 1.--Chemical and physical properties of bottom sediments by stations

Station	64	65	65	65
Cruise	4	2	4	5
Sample No.	484	22	483	443
Latitude N.	33°28'	33°42'	33°43'	33°43'
Longitude W.	76°39'	76°56'	76°56'	76°56'
Depth (meters)	338	42	40	40
Date (mo., day, yr.)	11-8-53	5-9-53	11-9-53	2-20-54
Sediment Type	Sa	Gr Sa	Sa	Sa
Loss on Ignition, %	24.69	18.84	18.58	18.44
Insoluble Residue, %	37.57	57.41	59.61	57.06
Al_2O_3, %	1.40	0.04	0.06	0.10
Fe_2O_3, %	8.57	0.30	0.49	0.30
MnO, %	0.09	0.04	0.02	0.02
MgO, %	1.63	1.49	1.43	1.56
CaO, %	28.56	22.66	21.18	23.11
K_2O, %	2.15	0.10	0.15	0.10
P_2O_5, %	3.62	6.65	3.42	5.93
Sr, %	0.26	0.32	0.33	0.30
Cl, %	1.37	0.46	0.51	0.49
Organic Nitrogen, %	0.007	0.006	0.010	
Organic Carbon, %	0.343	0.197	0.093	
$CaCO_3$, %	98.4	47.0	42.4	
Gravel, %	0.00	12.16	1.42	2.05
Sand, %	99.80	87.55	97.59	97.70
Silt, %	0.20	0.29	0.99	0.25
Clay, %	0.00	0.00	0.00	0.00
Median Diameter (mm)	0.21	0.52	0.29	0.35
Sorting (Trask)	0.63	1.27	1.03	0.87
First Quartile (mm)	0.27	0.88	0.39	
Third Quartile (mm)	0.16	0.30	0.20	
Sieve Weight, % (mu)				
+ 2000	0.00	12.16	1.42	2.05
+ 1000	0.00	9.75	3.72	2.74
+ 500	0.58	21.25	8.24	11.54
+ 250	31.34	40.51	42.35	58.88
+ 125	60.51	15.28	40.93	23.84
+ 62	7.37	0.76	2.35	0.70
- 62	0.20	0.29	0.99	0.25
Heavy Mineral, %		0.09	0.23	
Light Mineral, %		99.91	99.77	
Bioclastic, %	Fm	Sh	Sh	Sh

Table 1.--Chemical and physical properties of bottom sediments by stations

Station	66	66	66
Cruise	2	4	5
Sample No.	21	482	442
Latitude N.	33°57'	33°57'	33°57'
Longitude W.	77°13'	77°12'	77°13'
Depth (meters)	28	32	27
Date (mo., day, yr.)	5-9-53	11-9-53	2-20-54
Sediment Type	Sa	Sa	Sa
Loss on Ignition, %	10.09	9.11	14.61
Insoluble Residue, %	75.73	79.07	66.01
Al_2O_3, %	0.08	0.13	0.16
Fe_2O_3, %	0.42	0.50	0.50
MnO, %	0.02	0.00	0.02
MgO, %	0.60	0.64	0.81
CaO, %	17.39	10.25	21.18
K_2O, %	0.07	0.08	0.09
P_2O_5, %	6.20	3.16	6.53
Sr, %	0.32	0.20	0.36
Cl, %	0.35	0.46	0.43
Organic Nitrogen, %	0.003	Tr	0.017
Organic Carbon, %	0.098	Tr	0.069
$CaCO_3$, %	23.1	15.1	34.6
Gravel, %	6.36	0.47	8.53
Sand, %	93.37	99.53	91.16
Silt, %	0.27	0.00	0.31
Clay, %	0.00	0.00	0.00
Median Diameter (mm)	0.54	0.37	0.50
Sorting (Trask)	1.11	0.73	1.20
First Quartile (mm)	0.87		0.82
Third Quartile (mm)	0.33		0.31
Sieve Weight, % (mu)			
+ 2000	6.36	0.47	8.53
+ 1000	14.10	3.04	10.70
+ 500	25.26	19.00	22.07
+ 250	43.45	59.23	43.31
+ 125	9.78	18.00	14.00
+ 62	0.78	0.26	1.08
- 62	0.27	0.00	0.31
Heavy Mineral, %	0.53	0.26	0.36
Light Mineral, %	99.47	99.74	99.64
Bioclastic, %	Sh	Sh	Sh

Table 1.--Chemical and physical properties of bottom sediments by stations

Station	67	67	67	68	68
Cruise	2	4	5	2	5
Sample No.	23	481	438	24	441
Latitude N.	34°11'	34°11'	34°11'	34°23'	34°22'
Longitude W.	77°30'	77°30'	77°29'	77°10'	77°09'
Depth (meters)	16	20	18	20	22
Date (mo., day, yr.)	5-9-53	11-9-53	2-17-54	5-9-53	2-20-54
Sediment Type	Gr Sa	Sa	Gr Sa	Gr Sa	Sa
Loss on Ignition, %	10.11	9.37	10.17	7.92	4.50
Insoluble Residue, %	72.57	78.85	68.12	78.57	85.69
Al_2O_3, %	0.09	0.11	0.13	0.12	0.09
Fe_2O_3, %	0.38	0.49	0.70	0.34	0.23
MnO, %	0.02	0.01	0.00	0.00	0.00
MgO, %	0.72	0.57	0.65	0.40	0.31
CaO, %	11.31	11.42	12.53	6.87	5.95
K_2O, %	0.12	0.08	0.08	0.08	0.05
P_2O_5, %	5.25	3.42	5.26	1.47	5.61
Sr, %	0.26	0.14	0.18	0.14	0.22
Cl, %	0.46	0.48	0.51	0.33	0.42
Organic Nitrogen, %		0.002		0.013	0.004
Organic Carbon, %		0.020		0.153	0.080
$CaCO_3$, %		36.0		26.7	9.4
Gravel, %	13.67	2.55	13.50	19.31	0.00
Sand, %	79.49	96.29	85.13	80.35	99.91
Silt, %	6.84	1.16	1.37	0.34	0.09
Clay, %	0.00	0.00	0.00	0.00	0.00
Median Diameter (mm)	0.25	0.32	0.38	0.68	0.31
Sorting (Trask)	2.00	1.13	1.53	1.38	0.65
First Quartile (mm)		0.45		1.50	0.40
Third Quartile (mm)		0.21		0.35	0.24
Sieve Weight, % (mu)					
+ 2000	13.67	2.55	13.50	19.31	0.00
+ 1000	2.10	3.77	3.17	14.38	0.68
+ 500	4.91	13.46	12.36	23.06	9.98
+ 250	18.83	43.78	31.47	30.71	61.86
+ 125	44.42	32.38	35.14	11.19	26.37
+ 62	9.23	2.90	2.99	1.01	1.02
- 62	6.84	1.16	1.37	0.34	0.09
Heavy Mineral, %		0.29		0.61	0.29
Light Mineral, %		99.71		99.39	99.71
Bioclastic, %	Sh	Sh	Sh	Sh	Sh

Table 1.--Chemical and physical properties of bottom sediments by stations

Station	69	69	69
Cruise	2	4	5
Sample No.	25	479	440
Latitude N.	34°32'	34°39'	34°32'
Longitude W.	76°50'	76°43'	76°49'
Depth (meters)	20	10	18
Date (mo., day, yr.)	5-9-53	11-9-53	2-20-54
Sediment Type	Sa	Sa	Sa
Loss on Ignition, %	17.29	6.08	15.70
Insoluble Residue, %	55.06	84.63	63.10
Al_2O_3, %	0.31	0.41	0.19
Fe_2O_3, %	1.83	0.77	1.43
MnO, %	0.05	0.01	0.02
MgO, %	0.78	0.51	0.69
CaO, %	20.24	5.72	19.50
K_2O, %	0.11	0.11	0.11
P_2O_5, %	5.74	1.94	5.35
Sr, %	0.31	0.10	0.38
Cl, %	0.47	0.55	0.51
Organic Nitrogen, %	0.008		0.012
Organic Carbon, %	0.227		0.173
$CaCO_3$, %	44.3		36.8
Gravel, %	1.24	2.51	1.33
Sand, %	98.28	96.65	98.36
Silt, %	0.48	0.84	0.31
Clay, %	0.00	0.00	0.00
Median Diameter (mm)	0.27	0.19	0.25
Sorting (Trask)	0.92	1.11	0.86
First Quartile (mm)	0.36		0.33
Third Quartile (mm)	0.19		0.19
Sieve Weight, % (mu)			
+ 2000	1.24	2.51	1.33
+ 1000	2.49	2.46	1.48
+ 500	6.09	4.51	5.23
+ 250	40.10	8.87	33.40
+ 125	46.43	62.37	55.17
+ 62	3.17	18.44	3.08
- 62	0.48	0.84	0.31
Heavy Mineral, %	1.11		0.58
Light Mineral, %	98.89		99.42
Bioclastic, %	Sh	Sh	Sh

Table 1.--Chemical and physical properties of bottom sediments by stations

Station	70	70	70	70
Cruise	2	4	5	7
Sample No.	1	478	447	673
Latitude N.	34°18'	34°19'	34°18'	34°18'
Longitude W.	76°32'	76°32'	76°26'	76°32'
Depth (meters)	26	27	26	24
Date (mo., day, yr.)	5-10-53	11-9-53	2-22-54	7-10-54
Sediment Type	Sa	Gr Sa	Sa	Sa
Loss on Ignition, %	6.73	30.73	4.40	5.07
Insoluble Residue, %	84.84	31.14	88.82	88.44
Al_2O_3, %	0.05	0.17	0.13	0.17
Fe_2O_3, %	0.51	1.41	0.47	0.56
MnO, %	0.02	0.08	0.00	0.02
MgO, %	0.51	0.75	0.46	0.43
CaO, %	7.14	33.47	6.34	5.69
K_2O, %	0.08	0.21	0.07	0.07
P_2O_5, %	5.64	3.14	5.25	1.71
Sr, %	0.16	0.32	0.18	0.10
Cl, %	0.61	0.35	0.50	0.52
Organic Nitrogen, %	0.005	0.008	0.007	
Organic Carbon, %	0.054	0.088	0.189	
$CaCO_3$, %	14.2	71.0	12.5	
Gravel, %	0.00	15.37	0.00	0.16
Sand, %	99.78	84.44	99.88	99.59
Silt, %	0.22	0.19	0.12	0.25
Clay, %	0.00	0.00	0.00	0.00
Median Diameter (mm)	0.20	0.71	0.21	0.18
Sorting (Trask)	0.72	1.47	0.58	0.66
First Quartile (mm)	0.22	1.50	0.95	
Third Quartile (mm)	0.15	0.35	0.18	
Sieve Weight, % (mu)				
+ 2000	0.00	15.37	0.00	0.16
+ 1000	1.78	27.66	0.77	0.74
+ 500	2.76	24.35	1.90	1.83
+ 250	13.64	13.74	19.49	9.47
+ 125	72.78	12.61	75.44	75.37
+ 62	8.82	6.08	2.28	12.18
- 62	0.22	0.19	0.12	0.25
Heavy Mineral, %	0.41	0.17	0.07	
Light Mineral, %	99.59	99.83	99.93	
Bioclastic, %	Sh	Sh	Sh	Sh

Table 1.--Chemical and physical properties of bottom sediments by stations

Station	71	71	71	72
Cruise	2	5	7	7
Sample No.	2	600	676	677
Latitude N.	34°04'	34°03'	34°04'	33°50'
Longitude W.	76°15'	76°15'	76°14'	75°59'
Depth (meters)	118	146	135	667
Date (mo., day, yr.)	5-10-53	2-22-54	7-10-54	7-10-54
Sediment Type			Sa	Si Sa
Loss on Ignition, %	28.03	33.29	31.02	33.01
Insoluble Residue, %	35.93	20.38	30.36	24.36
Al_2O_3, %	0.06	0.20	0.12	0.86
Fe_2O_3, %	1.60	1.11	1.00	2.90
MnO, %	0.07	0.04	0.30	0.37
MgO, %	2.57	2.55	1.96	1.10
CaO, %	35.86	44.52	37.44	40.74
K_2O, %	0.14	0.19	0.19	0.53
P_2O_5, %	5.34	5.56	3.88	4.32
Sr, %	0.43	0.47	0.35	0.38
Cl, %	0.30	0.47	0.45	1.41
Organic Nitrogen, %			0.011	0.077
Organic Carbon, %			0.147	0.918
$CaCO_3$, %			70.5	66.8
Gravel, %			6.21	0.00
Sand, %			93.69	64.87
Silt, %			0.10	31.23
Clay, %			0.00	3.90
Median Diameter (mm)			0.54	0.062
Sorting (Trask)			1.10	2.31
First Quartile (mm)			0.87	0.20
Third Quartile (mm)			0.33	0.05
Sieve Weight, % (mu)				
+ 2000			6.21	0.00
+ 1000			15.05	0.10
+ 500			26.16	5.04
+ 250			40.29	16.14
+ 125			11.75	23.26
+ 62			0.44	20.33
- 62			0.10	35.13
Heavy Mineral, %			0.13	0.09
Light Mineral, %			99.87	99.91
Bioclastic, %			Sh	Fm

Table 1.--Chemical and physical properties of bottom sediments by stations

Station	75	75	75
Cruise	2	4	5
Sample No.	153	477	601
Latitude N.	34°39'	34°39'	34°39'
Longitude W.	75°53'	75°52'	75°53'
Depth (meters)	39	42	37
Date (mo., day, yr.)	5-11-53	11-12-53	2-23-54
Sediment Type	Sa	Sa	Sa
Loss on Ignition, %	2.53	2.78	3.51
Insoluble Residue, %	93.76	93.40	92.28
Al_2O_3, %	0.04	0.06	0.07
Fe_2O_3, %	0.30	0.44	0.16
MnO, %	0.00	0.00	0.00
MgO, %	0.23	0.20	0.29
CaO, %	3.29	2.62	3.79
K_2O, %	0.04	0.05	0.05
P_2O_5, %	0.62	0.00	1.06
Sr, %	0.11	0.07	0.10
Cl, %	0.38	0.35	0.39
Organic Nitrogen, %	0.003		0.005
Organic Carbon, %	0.031		0.010
$CaCO_3$, %	10.5		12.1
Gravel, %	0.65	0.75	2.15
Sand, %	98.84	99.11	97.32
Silt, %	0.51	0.14	0.53
Clay, %	0.00	0.00	0.00
Median Diameter (mm)	0.32	0.38	0.44
Sorting (Trask)	0.95	0.87	1.06
First Quartile (mm)	0.46		0.69
Third Quartile (mm)	0.22		0.29
Sieve Weight, % (mu)			
+ 2000	0.65	0.75	2.15
+ 1000	3.07	4.02	8.30
+ 500	16.56	24.64	31.73
+ 250	45.04	47.10	39.26
+ 125	31.76	22.57	16.64
+ 62	2.41	0.78	1.39
- 62	0.51	0.14	0.53
Heavy Mineral, %	0.57		0.22
Light Mineral, %	99.43		99.78
Bioclastic, %	Sh	Sh	Sh

Table 1.--Chemical and physical properties of bottom sediments by stations

Station	76	76	76
Cruise	2	4	5
Sample No.	154	473	602
Latitude N.	34°53'	34°53'	34°53'
Longitude W.	76°10'	76°10'	76°09'
Depth (meters)	14	18	20
Date (mo., day, yr.)	5-11-53	11-12-53	2-23-54
Sediment Type	Sa	Sa	Sa
Loss on Ignition, %	8.00	7.54	3.33
Insoluble Residue, %	81.97	85.25	91.57
Al_2O_3, %	0.27	0.12	0.14
Fe_2O_3, %	1.22	1.15	0.35
MnO, %	0.04	0.00	0.00
MgO, %	0.41	0.27	0.36
CaO, %	15.39	7.81	3.06
K_2O, %	0.11	0.07	0.03
P_2O_5, %	4.62	2.46	1.10
Sr, %	0.20	0.13	0.08
Cl, %	0.35	0.33	0.37
Organic Nitrogen, %	0.005		0.002
Organic Carbon, %	0.041		0.102
$CaCO_3$, %	27.4		8.6
Gravel, %	4.20	4.91	0.00
Sand, %	95.74	94.67	99.90
Silt, %	0.06	0.42	0.10
Clay, %	0.00	0.00	0.00
Median Diameter (mm)	0.56	0.51	0.24
Sorting (Trask)	0.99	1.08	0.66
First Quartile (mm)	0.87		0.30
Third Quartile (mm)	0.37		0.19
Sieve Weight, % (mu)			
+ 2000	4.20	4.91	0.00
+ 1000	14.81	11.70	1.10
+ 500	34.40	28.88	3.00
+ 250	37.71	44.78	35.20
+ 125	8.30	8.05	58.45
+ 62	0.52	1.26	2.15
- 62	0.06	0.42	0.10
Heavy Mineral, %	0.74		0.47
Light Mineral, %	99.26		99.53
Bioclastic, %	Sh	Sh	Sh

Table 1.--Chemical and physical properties of bottom sediments by stations

Station	77	77	77
Cruise	2	4	5
Sample No.	155	448	603
Latitude N.	35°01'	35°02'	35°01'
Longitude W.	75°45'	75°46'	75°44'
Depth (meters)	21	23	24
Date (mo., day, yr.)	5-11-53	11-13-53	2-23-54
Sediment Type	Sa		
Loss on Ignition, %	1.85	1.98	2.27
Insoluble Residue, %	96.21	95.83	94.94
Al_2O_3, %	0.14	0.19	0.17
Fe_2O_3, %	0.38	0.40	0.53
MnO, %	0.01	0.00	0.00
MgO, %	0.26	0.37	0.31
CaO, %	1.39	1.44	3.60
K_2O, %	0.04	0.10	0.04
P_2O_5, %	0.21	0.10	0.64
Sr, %	0.01	0.07	0.05
Cl, %	0.44	0.50	0.50
Organic Nitrogen, %	0.010		
Organic Carbon, %	0.097		
$CaCO_3$, %	11.0		
Gravel, %	0.15		
Sand, %	99.52		
Silt, %	0.33		
Clay, %	0.00		
Median Diameter (mm)	0.19		
Sorting (Trask)	0.62		
First Quartile (mm)	0.23		
Third Quartile (mm)	0.16		
Sieve Weight, % (mu)			
+ 2000	0.15		
+ 1000	0.56		
+ 500	1.28		
+ 250	13.33		
+ 125	77.43		
+ 62	6.92		
- 62	0.33		
Heavy Mineral, %	0.38		
Light Mineral, %	99.62		
Bioclastic, %	Sh		

Table 1.--Chemical and physical properties of bottom sediments by stations

Station	78	78	78
Cruise	2	7	8
Sample No.	156	678	630
Latitude N.	35°06'	35°06'	35°08'
Longitude W.	75°21'	75°20'	75°22'
Depth (meters)	30	23	24
Date (mo., day, yr.)	5-11-53	7-11-54	9-29-54
Sediment Type	Si Sa	Sa	Sa
Loss on Ignition, %	3.59	1.66	2.03
Insoluble Residue, %	89.90	96.13	95.06
Al_2O_3, %	0.56	0.15	0.21
Fe_2O_3, %	1.81	0.52	0.51
MnO, %	0.01	0.00	0.00
MgO, %	0.70	0.15	0.18
CaO, %	1.12	0.93	1.59
K_2O, %	0.17	0.06	0.04
P_2O_5, %	0.20	0.00	0.20
Sr, %	0.01	0.00	0.00
Cl, %	1.00	0.54	0.42
Organic Nitrogen, %	0.035	0.008	0.005
Organic Carbon, %	0.288	0.078	0.173
$CaCO_3$, %	8.2	3.3	6.8
Gravel, %	0.00	0.00	0.00
Sand, %	77.39	98.90	100.00
Silt, %	22.61	1.10	0.00
Clay, %	0.00	0.00	0.00
Median Diameter (mm)	0.074	0.18	0.27
Sorting (Trask)	1.81	0.68	0.56
First Quartile (mm)	0.16	0.22	0.33
Third Quartile (mm)	0.07	0.15	0.21
Sieve Weight, % (mu)			
+ 2000	0.00	0.00	0.00
+ 1000	0.17	0.14	0.35
+ 500	0.24	0.40	1.66
+ 250	0.65	12.82	56.03
+ 125	51.13	77.44	40.90
+ 62	25.21	8.10	1.06
- 62	22.61	1.10	0.00
Heavy Mineral, %	1.11	0.31	0.39
Light Mineral, %	98.89	99.69	99.61
Bioclastic, %	Sh	Sh	Sh

Table 1.--Chemical and physical properties of bottom sediments by stations

Station	Spc. 5	Spc. 5	Spc. 7	Spc. 7
Cruise	2	5	6	9
Sample No.	278*	520	613	626
Latitude N.	30°00'	29°58'	28°00'	28°00'
Longitude W.	77°00'	77°00'	77°00'	77°00'
Depth (meters)	1006	942	1079	1097
Date (mo., day, yr.)	4-18-53	1-21-54	4-16-54	11-5-54
Sediment Type				Sa Si
Loss on Ignition, %	41.32	41.50	43.57	41.93
Insoluble Residue, %	2.57	3.63	3.35	3.78
Al_2O_3, %		0.28	0.32	0.50
Fe_2O_3, %		0.70	0.65	0.55
MnO, %		0.13	0.36	0.41
MgO, %		1.02	1.48	1.41
CaO, %	45.41	53.14	52.72	55.44
K_2O, %		0.33	0.28	0.28
P_2O_5, %		5.80	5.15	3.45
Sr, %		0.24	0.88	0.66
Cl, %	1.19	1.84	1.31	1.10
Organic Nitrogen, %				0.033
Organic Carbon, %				
$CaCO_3$, %				91.8
Gravel, %				0.00
Sand, %				37.69
Silt, %				62.31
Clay, %				
Median Diameter (mm)				0.028
Sorting (Trask)				2.44
First Quartile (mm)				0.17
Third Quartile (mm)				0.02
Sieve Weight, % (mu)				
+ 2000				0.00
+ 1000				0.62
+ 500				2.65
+ 250				14.57
+ 125				13.71
+ 62				6.14
- 62				62.31
Heavy Mineral, %				0.01
Light Mineral, %				99.99
Bioclastic, %	Fm	Fm	Fm	Fm

* Sample insufficient for complete analysis.

Table 1.--Chemical and physical properties of bottom sediments by stations

Station	Spc. 8	Spc. 8	Spc. 9	Spc. 9
Cruise	6	7	4	5
Sample No.	610	662	192	510*
Latitude N.	28°00'	28°00'	28°00'	28°00'
Longitude W.	78°00'	78°00'	79°00'	79°00'
Depth (meters)	1042	1033	860	832
Date (mo., day, yr.)	4-17-54	6-12-54	10-13-53	2-1-54
Sediment Type	Si Sa		Si Sa	Sa Gr
Loss on Ignition, %	42.38	41.88	42.60	
Insoluble Residue, %	2.18	1.23	1.89	
Al_2O_3, %	0.24	0.16	0.25	
Fe_2O_3, %	0.51	0.41	0.88	
MnO, %	0.46	0.40	0.13	
MgO, %	1.17	0.86	1.63	
CaO, %	52.37	55.37	53.13	
K_2O, %	0.26	0.40	0.31	
P_2O_5, %	5.77	3.72	3.50	
Sr, %	0.54	0.35	0.26	
Cl, %	1.54	3.18	1.10	
Organic Nitrogen, %	0.029		0.007	0.006
Organic Carbon, %	0.321		0.157	0.282
$CaCO_3$, %	93.4		96.2	97.1
Gravel, %	1.41		8.08	50.08
Sand, %	59.00		46.30	34.47
Silt, %	25.74		43.03	9.69
Clay, %	13.85		2.59	5.76
Median Diameter (mm)	0.076		0.037	0.53
Sorting (Trask)	2.75		2.33	3.04
First Quartile (mm)	0.37		0.17	4.00
Third Quartile (mm)	0.03		0.04	0.19
Sieve Weight, % (mu)				
+ 2000	1.41		1.53	50.08
+ 1000	1.19		0.66	3.32
+ 500	11.07		0.86	2.62
+ 250	29.82		5.88	13.87
+ 125	12.07		17.58	11.87
+ 62	5.85		21.32	2.79
- 62	39.59		45.62	15.45
Heavy Mineral, %	0.02		0.004	0.06
Light Mineral, %	99.98		99.996	99.94
Bioclastic, %	FM		Fm	Fm

* Sample insufficient for complete analysis.

GPO 902536