ANALYSIS OF SUSPENDED AND SURFICIAL SEDIMENT IN THE DISCHARGE BASINS OF CRYSTAL RIVER POWER GENERATING FACILITY, CRYSTAL RIVER, FLORIDA

by

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Introduction

Prior to the operation of Crystal River Unit 3, a large-scale study of the ecological effects of thermal discharge, plant design and spoil dike placement were assessed. The results of this study were presented in a report to the Florida Power Corporation in December, 1974.

One concern which emerged during this study was the effect of suspended sediment on the benthic communities of the discharge estuary, and the overall effect of man-made structures in changing local hydrographic conditions. With the commencement of operation of Unit 3, the discharge current doubled in magnitude, and may have imposed further change in the local hydrographic conditions. It was thought that this velocity increase may have led to adverse erosional and depositional effects in the estuary and perhaps out into the Gulf of Mexico.

Initial studies by Cottrell (1974) postulated that sediment was being suspended in the shallow estuary and transported into the discharge canal system, where its fate was undetermined. Surface sediment samples reflected the presence of fine material in three basins which communicate with the discharge current. Two of these basins are also in close proximity to the Cross Florida Barge Canal, located to the north of the discharge area (Fig. 1).

Preliminary sediment trap studies, performed in the shallower basins, showed that large amounts of sediment were being resuspended in the littoral zone near tidal creeks and marshes, and along the canal-estuary boundary. High altitude aerial photographs of the study area also revealed "stringers" of apparently resuspended material initiating in the shallowest areas of the littoral zone. The aerial photographs, however,

did not leave any clues as to the direction of movement of the resuspension, nor its duration. These findings led us to believe that the discharge canal could be acting as a "conduit" for resuspended matter, and actively transporting this material into the outer basins where the sediment could be trapped and allowed to settle.

Cottrell (1974) noted that a 100% increase in discharge velocities with the addition of Unit 3 could alter the hydrographic regime under which the surface sediment is presently stable. Subsequently, it was proposed that a study of the surficial and suspended sediment occurring in areas of possible impact would confirm any future impact attributed to readjustment of the sediment to new hydrographic conditions imposed by increased discharge from the addition of Unit 3.

This report contains the results of a cooperative study conducted by members of Florida Power Corporation's Department of Environmental Affairs and the Rosenstiel School of Marine and Atmospheric Science. The study was designed to analyze sediment trap and surficial sediment parameters in order to compare the amount of material resuspended in particular localities with the local character of the sediment substrate, on a seasonal basis. Such a study provides useful information concerning the fate of suspended material in the water column, and can be used in conjunction with hydrographic studies to assess the impact of the discharge canal on the local sediment transport system.

It must be stressed that the methods used in this study serve only as a tool for drawing conclusions about sediment dispersal and settling. The conclusions must be used in context with hydrological, biological and meteorological data to fully understand the meaning of this information.

Materials and Methods

Sediment Traps

Sixteen sediment traps (Fig. 2a, 2b, and 3) were constructed from 10 cm I.D. PVC pipe, cut into 45 cm lengths. Smaller PVC tubes, 2.5 cm I.D., were inserted into the larger pipe to act as baffles in order to prevent loss of trapped sediment. The pipes were fitted with appropriate sized PVC caps. The bottom cap was cemented to the pipe, while the top cap served only to seal the trap during collection and replacement procedures.

Anchors for the traps were constructed of cement slabs, measuring 5 cm in thickness and approximately 50 cm square. Steel eyebolts were also placed in the cement as attachments for marker buoys. Each anchor had a collar imbedded in the center of the slab. The collars were made from 10 cm pieces of 15 cm I.D. PVC pipe. Three stainless steel bolts were tapped into each collar in order to secure the trap in an upright position.

Collection schedules for the traps were carried out on a quarterly basis for one year. Each quarter sampling consisted of retrieving the contents of the traps at intervals of one day, three days, five days, and eightyone days, when possible. The summation of the quantities of sediment in each sample represents the accumulation of material for one day, four days, nine days, and ninety days. The collection schedule was designed to provide data for constructing resuspension curves in order to estimate a maximum, minimum and average resuspension rate for each sample locality on a quarterly and annual basis.

All samples were collected by Florida Power Corporation personnel, fixed with 5 mg $HgCl_2$, and shipped to Miami for subsequent analysis. In the laboratory, the samples were separated into the sand fraction (> 63 μ)

and the silt and clay fraction (< 63 μ), and analyzed for dry weight, weight of organic matter and inorganic carbonate, and residual weight (siliceous matter and oxides). The laboratory preparations and procedures for the sediment trap samples are outlined and explained in Appendix A.

Substrate Samples

Substrate samples were collected at 22 sample stations, including sediment trap localities (Fig. 3). The substrate samples were collected on the first day of each quarter with an aluminum hand-dredge (Fig. 2c) designed to sample the upper 2 cm of the sediment substrate. The samples were then shipped to Miami and analyzed for percent organic matter and inorganic carbonate, sand-silt-clay percentages, particle size distribution, and statistical measures of mean grain size, sorting, skewness, and kurtosis. Laboratory procedures are too lengthy to present in this section. A detailed outline and explanation of these procedures is presented in Appendix A.

Resuspension Curves

Since the sample collection schedule was designed to monitor the amounts of sediment collected for discrete time periods, a record of the amount of sediment which accumulates over time can be fit to a power curve equation to derive estimates of how much and how fast sediment accumulates. The estimate is for gross sedimentation since the traps are not designed to mimic the natural process of deposition with subsequent resuspension.

The general equation:

$$y = ax^b$$

where y = amount of material in g/m^2

x = number of days for the sample

a = a coefficient which estimates $g/m^2 \cdot day$

b = a coefficient which is an exponent of time.

The data were prepared for the regression by calculating total g/m^2 for each time interval of sampling. These data were then summed to find the total accumulation for each sampling interval. For example, g/m^2 for one day plus g/m^2 for three days equals total g/m^2 for four days, and so on.

It was found, however, that the resuspension data for each individual quarter for each trap had too many missing values, and so, an average accumulation for each time interval was calculated for all four quarters These accumulation data then represent an average annual accumulation or resuspension curve.

Since the use of regression coefficients to express practical meaning is somewhat difficult, a parameter t_{100}, was derived from the regression data. The parameter t_{100} expresses the length of time, in hours, it takes each sample locality to accumulate 100 g/m^2 of sediment.

Results

Resuspension Rates

Resuspension is used in this report to refer to a general process whereby material is suspended in the water column and subsequently comes to rest on the substrate. The occurrence of sudden velocity changes, such as storm events, will resuspend the material once again. The sediment traps capture the resuspended sediment which accumulates during periods of quiescence. Thus, they provide a comparative measure of the resuspension activity occurring in a particular locality.

The average daily resuspension rates were calculated on a grams per meter square per day basis by multiplying the weight of the material captured in the traps by a factor which expands the area of the mouths of the traps to an area of one square meter, and the results are divided by the appropriate number of days for the sample. Appendix B lists the calculated rates for the first, second, third and fourth quarters. Table 1 summarizes the average daily resuspension rates for these sampling periods, and Figures 4 through 19 are maps of the distribution of the data listed in Table 1.

Some general trends are evident from the data. The one-day samples taken at the beginning of the second quarter show extremely high resuspension occurring in the discharge samples. This was found to be attributed to a small weather system which passed during the sampling period. Meterological records showed sustained winds of 15 to 20 mph, a drop in barometric pressure, and a shift in wind direction from about 280° to 240°. The wind stress associated with this system coupled with an ebbing tide produced the dry weight resuspension rates shown in Figure 20. The distribution of these data indicate the response of the suspended sediments to a small perturbation of the water column.

Ninety-day samples for the four quarters show an increase in resuspension rates between the first, second and third quarters. However, the fourth quarter samples indicate a mixture of increasing and decreasing rates. Rates increased for stations B, 3 and 11 only. The ninety-day samples are most likely to provide the best indication of the average resuspension activity, since they tend to average out the effects of storms and periods of low water column activity.

Resuspension rates in Basin 3 remained at moderately high levels throughout the study, and resuspension rates in Basin 4 were moderate

TABLE 1. Average daily resuspension rates for sediment trap samples. Values in $g/m^2 \cdot day$.

Sample	dry weight $\bar{x}$	dry weight s.d.	organic matter $\bar{x}$	organic matter s.d.	carbonate $\bar{x}$	carbonate s.d.	siliceous $\bar{x}$	siliceous s.d.
First Quarter								
STA A	56.8	8.3	20.5	1.9	13.5	4.9	33.4	5.4
STA B	82.5	83.0	16.6	13.7	28.8	33.1	37.2	36.4
STA C	38.2	13.0	8.2	3.4	11.1	4.8	18.9	6.0
STA E	43.1	27.9	10.4	6.0	14.9	9.5	20.7	15.4
STA F	74.1	13.3	12.9	2.9	23.0	4.4	38.2	15.3
STA 2	39.4	7.2	8.8	2.2	11.8	4.5	18.9	3.9
STA 3	73.5	20.9	11.1	5.1	28.0	6.5	34.4	10.0
STA 6	77.2	32.6	14.5	5.8	21.6	13.3	41.1	14.6
STA 9	96.0	42.3	17.8	7.1	34.7	17.6	43.6	19.4
STA 11	199.5	74.1	27.8	12.7	77.7	40.2	94.0	28.1
STA 13	187.3	92.9	29.3	11.3	78.5	53.6	79.5	31.2
STA 16	83.8	37.7	13.8	9.8	19.1	7.6	50.9	36.3
STA 18	69.5	24.4	14.5	7.2	18.8	6.4	36.1	12.3
STA 20	163.9	143.4	29.6	24.8	60.4	55.2	73.8	63.7
STA 21	152.2	114.6	29.7	19.9	52.5	41.3	70.1	53.9
STA 24	48.1	14.5	9.5	2.7	16.5	6.3	23.2	8.7
Second Quarter								
STA A	58.9	75.6	14.5	12.3	14.7	13.9	46.4	32.7
STA B	267.4	333.2	53.4	67.2	37.4	109.1	126.8	157.0
STA C	134.8	163.3	29.3	37.4	32.5	33.5	70.7	88.8
STA E	92.4	90.2	18.4	15.4	26.3	29.2	46.9	46.4
STA F	190.1	138.3	37.7	28.0	42.3	32.6	110.0	79.5
STA 2	92.9	103.9	23.8	31.2	27.1	30.7	42.1	42.1
STA 3	308.1	391.4	64.4	87.8	91.9	106.2	151.9	197.7
STA 6	109.6	225.3	47.3	52.5	47.8	48.4	95.5	125.7
STA 9	234.4	189.2	44.9	39.2	80.0	55.0	109.5	95.2
STA 11	208.9	208.4	35.7	38.8	106.4	58.0	124.6	94.9
STA 13	503.7	589.2	82.0	93.7	210.4	256.3	211.2	239.5
STA 16	315.7	293.1	67.7	61.3	86.6	78.6	161.4	153.4
STA 18	233.0	211.0	50.3	45.6	64.5	55.7	118.2	109.8
STA 20	650.5	634.2	131.0	145.0	210.1	166.7	309.4	326.2
STA 21	652.7	501.6	135.7	111.6	200.8	137.9	316.3	252.2
STA 24	452.3	435.9	86.4	75.3	154.7	157.3	211.3	207.3

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TABLE 1. Continued. Values in $g/m^2 \cdot day$.

Third Quarter

Sample	dry weight $\bar{x}$	dry weight s.d.	organic matter $\bar{x}$	organic matter s.d.	carbonate $\bar{x}$	carbonate s.d.	siliceous $\bar{x}$	siliceous s.d.
STA A	138.2	23.1	30.8	15.3	26.3	5.1	81.1	14.2
STA B	214.6	42.7	27.4	14.6	37.4	10.2	59.9	21.1
STA C	128.5	19.3	27.7	7.5	28.7	9.0	72.1	8.6
STA E	82.9	12.5	18.9	3.4	21.6	8.1	42.3	4.9
STA F	427.8	225.1	85.7	30.1	57.7	23.9	284.5	214.6
STA 2	110.1	24.2	22.8	2.9	33.3	11.6	54.0	14.5
STA 3	252.1	27.0	44.8	13.2	89.6	14.1	117.7	18.0
STA 6	189.8	44.0	37.4	17.2	50.0	9.0	102.4	27.4
STA 9	406.4	135.4	59.2	13.5	181.3	72.9	165.9	48.1
STA 11	311.9	21.4	49.0	18.4	128.3	32.6	135.1	7.9
STA 13	199.8	18.7	33.2	10.1	80.5	7.6	86.2	12.2
STA 16	244.2	71.3	48.9	22.8	68.3	15.2	126.9	41.1
STA 18	389.2	184.9	78.3	35.4	121.6	47.1	189.3	105.4
STA 20	586.7	230.2	94.3	24.1	237.3	119.3	255.2	87.2
STA 21	536.2	230.2	94.6	43.3	194.9	69.4	246.8	118.2
STA 24	421.8	257.5	67.8	30.7	137.2	146.2	170.3	115.7

Fourth Quarter

Sample	dry weight $\bar{x}$	dry weight s.d.	organic matter $\bar{x}$	organic matter s.d.	carbonate $\bar{x}$	carbonate s.d.	siliceous $\bar{x}$	siliceous s.d.
STA A	119.4	65.6	24.3	13.6	34.8	16.2	60.4	35.9
STA B	156.5	58.0	28.7	11.2	56.8	22.0	71.0	24.9
STA C	ns	ns	ns	ns	ns	ns	ns	ns
STA E	44.7	28.5	9.4	4.8	15.8	14.6	19.5	9.1
STA F	163.2	58.8	34.6	11.9	43.2	21.3	85.7	25.6
STA 2	82.9	8.8	17.2	0.4	24.7	6.9	41.1	2.2
STA 3	368.1	93.3	64.3	8.3	129.9	90.5	173.9	11.2
STA 6	288.5	84.9	57.6	2.3	86.9	58.9	144.1	23.6
STA 9	332.0	128.2	54.7	26.0	143.8	70.2	133.4	60.5
STA 11	307.5	139.9	41.6	20.2	136.8	59.7	129.0	61.4
STA 13	72.0	44.0	12.1	11.6	26.1	12.3	33.8	21.2
STA 16	196.6	37.3	37.4	12.7	61.7	0.4	97.6	25.0
STA 18	475.2	262.3	99.2	43.1	136.7	110.5	239.4	108.8
STA 20	ns	ns	ns	ns	ns	ns	ns	ns
STA 21	98.1	97.5	19.9	21.7	31.8	28.4	46.3	47.4
STA 24	251.8	157.4	46.6	31.1	101.5	67.4	103.8	60.5

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during the first quarter, but soared to extremely high values during the second and third quarters and decreased in the fourth quarter. One sample station in Basin 5 (STA 24) experienced over eight times the amount of resuspension for the second and third quarters than during the first quarter, and the rate subsided in the fourth quarter.

Figures 21 through 24 show contours of the distribution of t_{100} parameters for dry weight, organic matter, carbonate, and siliceous residue. Appendix C lists the data used to calculate the regression coefficients, as well as the results of the regression and corresponding t_{100} values.

Each figure displays the same general trend, although the time of accumulation varies for each type of analysis. Organic matter is the slowest to accumulate, while carbonate accumulated almost twice as fast as organic matter. In each sample, roughly 50% of the sample is composed of siliceous residue (the weight of material left after ashing at 1000° C for 4 hours and corrected for the weight of CaO). The isopleths show this relationship in comparing Figure 21 with Figure 24. The t_{100} parameter is nearly two times larger for siliceous residue than for dry weight.

There appear to be three areas which show a consistent pattern of resuspension, regardless of the particular chemical analysis. Basin 1 always shows a high value associated with Station F and the lowest value at Station A. Basins 2 and 3 share similar responses with moderately high values occurring at sample stations 3, 18, and 11, 13 respectively. Station 13 seems, however, to fit better into the resuspension regime of Basins 4 and 5. These basins (4 and 5) experience the highest, and the most rapid accumulation. Basins 6 and 7, the control basins, reflect resuspension and accumulation similar to Basin 1 (neglecting Station F) and Basins 2 and 3, respectively.

Substrate Characteristics

Sand-silt-clay percentages were obtained from each sample station for each quarter. The sand fraction was also analyzed for statistical parameters of mean grain size, sorting, skewness and kurtosis. Figures 25 through 28 are maps of the distribution of the < 63 μ fraction (% silt + % clay) in the substrate samples for each quarter. There is an evident increase in the percentage of fine-grained material in the samples from the first quarter to the second quarter samples. Percentages are nearly the same for the second and third quarters. Fourth quarter samples show a mixture of increases and decreases. In general, increases of more than 5% occurred in the shallower basins (1, 6, 7, and 2a), while decreases occurred in Basin 3. All other stations remained about the same as the second and third quarter samples. This pattern was also observed in the average daily resuspension rates.

Statistical parameters of mean grain size, skewness and kurtosis were calculated for each substrate sample for each quarter. Appendix D lists the results of these analyses.

Throughout the course of the project, replicate analyses were run on samples from Stations F and 21. These analyses were intended to provide an estimate of the variability of the substrate from quarter to quarter and, hopefully, to allow a comparison of the substrate data from each successive quarter as being indicative of actual changes occurring in the upper 2 cm of the sediment surface.

Results of an analysis of variance on these samples indicates that there is nearly equal variation among samples taken during the same quarter, as there is between samples of each quarter. This does not allow the interpretation of changing parameters from quarter to quarter as a

reflection of changes caused by seasonal variations in the substrate. With this in mind, the original raw data on the particle size distribution for each sample from each quarter were added together to find weight percents and produce cumulative weight-percent curves. A new set of grain size parameters were calculated from these pooled data. There is one set of parameters to describe each sample, and no interpretation of changing substrates can be made with any statistical validity.

Figure 29 shows the results of pooled analysis for the parameter of mean grain size. Mean grain sizes range from 2.47 Ø to 3.62 Ø (.18 mm to .081 mm). The finest mean grain sizes occur in Basins 3 and 4 at Stations 10, 12, and 20 (finer grain sizes have higher Ø values). Coarser grain sizes (2.5 Ø) occur in Basin 6 at Station E, and in Basin 3 with samples taken near the relict oyster bars. Basin 1 sediments tend to have mean grain sizes close to 3.0 Ø while sediments in Basin 5 and 2 tend to have mean grain sizes near 2.7 Ø.

Sorting coefficients for the substrate samples are plotted on Figure 30. Most samples are poorly sorted and lie between 1.3 Ø and 1.6 Ø. Moderately sorted material occurs in the eastern part of Basin 2 while the most poorly sorted sediment occurs in close proximity to the relict oyster bars on the western edge of Basin 3.

The distribution of skewness values is shown in Figure 31. Skewness measures the amount of assymetry of the particle size distribution curve. All skewness values are positive indicating that assymetry is caused by a tail of fine material on the distribution curve. Most samples are strongly positive skewed with the exception of Station E and Basin 6. Less positively skewed samples occur near the intake dike in Basins 3 and 5.

Kurtosis measures the ratio of the sorting in the tails of the particle size distributions with the sorting in the central part. Folk and

Ward (1957) describe kurtosis as a sensitive test of the normality of a distribution. The equation which computes kurtosis values is designed to yield a value of 1.00 for normal curves. Kurtosis values range from 0.95 to 1.94. Most samples lie between 1.3 and 1.7. These values indicate that the samples are relatively better sorted in the central area of the distribution than in the tails. The distribution of kurtosis is shown in Figure 32. There does not appear to be any discernible pattern developed with these values.

The weight percent of organic matter is shown in Figure 33. The average weight percents vary from 2.6% at Station 18 to 6.7% at Station 20. Most samples appear to lie between 3% and 4%. Those samples with higher percentages are found exclusively in the outer basins, and samples containing > 5% organic matter are confined to Basins 3 and 4.

Calcium carbonate distributions are depicted in Figure 34. High percentages are found in areas where samples are located near the relict oyster bars of Basin 3 and the shell-sand shoals which define the western limit of Basin 4. In these areas calcium carbonate particles have a tremendous influence on the composition of the substrate, and are produced locally by the attrition of shell material.

Discussion

Throughout the course of this study it had been realized that there would be limitations to inferences concerning the sediment transport and depositional processes occurring at Crystal River. The study was intended to yield data which would be complementary to those found in Cottrell (1974). That is, the emphasis of this study was clearly focused on sediment trap data while Cottrell's earlier study emphasized substrate properties.

The experimental design for the sediment trap portion of this study centered around obtaining estimates of how fast, and how much material can accumulate in the specially designed sediment traps. The data would yield discrete amounts for varying time intervals and thus allow the construction of an accumulation curve for each sample from each quarter. The purpose of deriving these curves was for comparison of slopes as an aid in understanding the seasonal behavior of the sediment flux through the discharge estuary. The chemical analyses would also indicate if there were seasonal patterns of detrital organic matter production and transport. Calcium carbonate analyses were intended to indicate whether or not spoil bank and oyster bar erosion were important factors to the sediment supply.

It appears that greatest scour occurs in pulses during spring tides and also under high wind stress. One such sedimentation event occurred during the one-day samples of the second quarter (June 6-7, 1977). Figure 20 shows the results of the combined effect of wind stress and an ebbing tide acting along vectors of nearly the same direction. It appears as though the synergistic effect of these two processes transported sediment into deeper, offshore areas (Basins 4 and 5). The quantity of material accumulated increases with increasing distance from shore. Unfortunately, it is not known if this material was again resuspended and swept back inshore on the next high tide. One could argue that the strength of the discharge current is too great to allow resuspended material to spread toward shore, but this is only an inference and cannot be demonstrated with the data.

Grain size parameter data may yield helpful information about the despositional environment of the sediment (Folk and Ward, 1957; Mason and Folk, 1958). The parameters are designed to quantitatively describe the

shape of the grain size distribution. Each parameter, or moment measure, offers a different piece of information which can aid in interpreting the depositional history of a particular sediment. They are, however, only a tool and cannot be used exclusively to draw conclusions concerning depositional environments.

Mean grain size distributions (Figure 29) indicate the presence of finer-grained material in Basins 3 and 4. Although smaller grain sizes can be indicative of deposition, this parameter alone cannot demonstrate that deposition is occurring in these areas. Also, deposition could occur in an area where coarse shell material exists, but the shell particles would mask the effects of fine materials in the computation of mean grain size.

Sorting is a measurement of the dispersion of grain size about the mean (standard deviation). The values shown in Figure 30 shows that the sediments become somewhat more poorly sorted (grain size varies considerably about the mean) with increasing distance from shore. However, the pattern is very weak, and in general all of these sediments are poorly sorted according to the criteria of Folk and Ward (1957).

Skewness and kurtosis are both vital clues to the bimodality of the particle size distribution (Folk and Ward, 1957). Valia and Cameron (1977) provide a good discussion of the use of skewness as a sensitive indicator of depositional environments. Folk and Ward (1957) point out that well-sorted sand which is transported , by storms, into the neritic environment where it is mixed with finer particles in a "medium of low sorting efficiency" may be characteristically positively skewed (a "tail" of fine particles) and leptokurtic (very peaked). Figures 31 and 32 show the distribution of skewness and kurtosis. All values are positively skewed and leptokurtic. The positive skewness can result from addition of fine

material to the blanket sand deposit laid down during sea level rise. Since the rise in sea level, the depositional environment has become less efficient in sorting the sediment. A low energy environment (low sorting activity) now exists and addition and mixing of fine material to the sand can account for the observed skewness and kurtosis values. There is, however, an area in Basins 3 and 4 which is more positively skewed and coincides with smaller grain sizes (see Figure 31). There is, therefore, some suggestion that fines are being deposited in these more positively skewed areas.

Kurtosis values are sensitive to bimodality and peakedness of the particle size distribution curve. No pattern is evident with kurtosis as it is with skewness.

Organic matter is most abundant in Basins 3 and 4 (Figure 33). The percentages are somewhat higher in the same sediments which possess high values of positive skewness. The percent organic matter, skewness, and mean grain size data all suggest that high values of these parameters are associated with areas of moderate to high values of accumulation in the sediment traps in Basins 3 and 4.

Calcium carbonate percentages (Figure 34) reflect proximity to shell sources. Most localities with high levels of calcium carbonate occur near relict oyster bars or shell-sand shoals. Other areas with moderate amounts are more difficult to interpret without more information on carbonate particle identity and mineralogy. Cottrell (1974) pointed out that this coast has a complex relationship between quartz-rich sand and carbonate rock. The bottom topography is complex due to a paleo-karst developed on the Crystal River Formation during lower stands of sea level. The mixture of carbonate particles could reflect mixing during sea level rise, or the

surface substrate might also contain carbonate particles from breakdown of the prodigious quantity of shell material which has accumulated in recent history.

Comparison with Previous Studies

Cottrell (1974) also performed sediment trap studies in Basins 1 and 6. Sedimentation rates were calculated to be 0.88 cm/yr and 0.26 cm/yr, respectively. This study found the following average sedimentation rates:

Basin 1 –	2 cm/yr
Basin 2	3.75 cm/yr
Basin 3	4.17 cm/yr
Basin 4	6.75 cm/yr
Basin 5	4.8 cm/yr
Basin 6	1.0 cm/yr
Basin 7	2.5 cm/yr

These rates are for gross sedimentation (uncorrected for resuspension and redeposition).

Substrate samples showed no surprising differences. Cottrell's earlier study contained many more samples from each of the basins. In general, the sample locations compare favorably with the earlier study in respect to grain size parameters.

Conclusions

Basin 4 appears to be a sink for sediments (or at least more so that any other). The basin meets criteria which would suggest active deposition occurring. That is, a mean grain size of 3.62 Ø, strongly positively skewed sediment (0.42 Ø), the highest percent of organic matter (6.7%) and

a high accumulation rate (sedimentation rate of 6.75 cm/yr). Only two parameters suggest that Basin 4 receives its sediment load from the discharge canal, skewness and weight percent organic matter. The only other possible source of sediment for this basin would be the Cross—Florida Barge Canal to the north. However, there is no conclusive evidence from this study to support this contention.

Basin 3 is harder to interpret. Station 13 reflects the same characteristics as Station 24 in Basin 4. Both stations are located near a source of coarse shell which will affect grain size parameters. Both stations have high resuspension rates and contain > 5% organic matter on the substrate. Most other stations in Basin 3 have moderately small grain size, strongly positive skewness, and moderate levels of organic matter. It seems apparent that Basin 3 experiences somewhat moderate levels of deposition with highest levels occurring in the western portion of the basin near Elbow Reef, possibly due to suspension by the discharge current with subsequent deposition behind the oyster bar complex which could provide an energy shadow zone.

The scour effect of an ebbing tide under proper wind stress conditions can transport fairly large quantities of sediment to offshore areas. Unfortunately, t dispersal of suspended sediment on an incoming tide could not be demonstrated with the data. This "blow-out" of the shallower basins is most likely the most significant mechanism for transporting suspension loads into the outer basins via the canal system.

High suspension rates were observed at Station F in Basin 1. The locations of Station F is comparable to Cottrell's Station 11 in the 1974 study. This area is apparently experiencing high rate of resuspension due to its location near the mouth of tidal creek which is still eroding its channel.

Seasonal changes in substrate characterstics cannot be deduced from the quarterly samples because of a high variation in the characteri of the local sediments. Sediment trap samples tend to show seasonal differences but the contribution of different mechanisms would be difficult to isolate from the data.

In general, the seasonal trap samples show higher incidences of accumulation occurring in the second and third quarters. This is most likely attributed to an increase in runoff during seasonal rains on higher rates of sediment supply for the second quarter. Third quarter values are possibly affected more by seasonally high spring tides and very low neap tides coupled with the passage of cold fronts or storms during October and November. Fourth quarter data is more patchy than the rest of the quarters, but winter storms most certainly play a large role in redistributing sediment in these shallow basins. First quarter samples show relatively little sediment activity when compared with the remaining quarter. This period is characterized by a diminished frequency of storms, low rainfall and thus a low activity of sediment readjustment.

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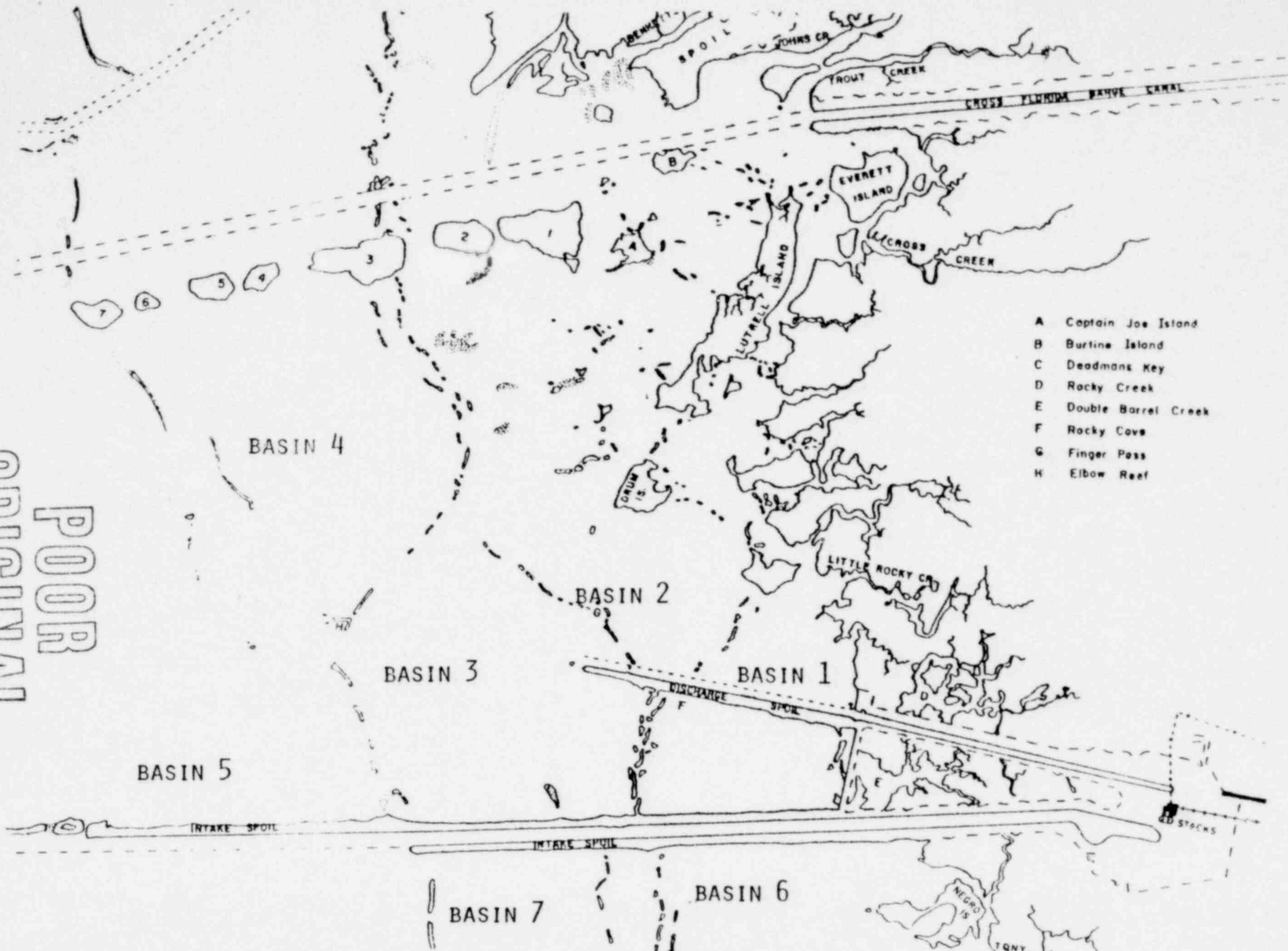

Figure 1. Map depicting coastal features and basins at Crystal River Power Plant.

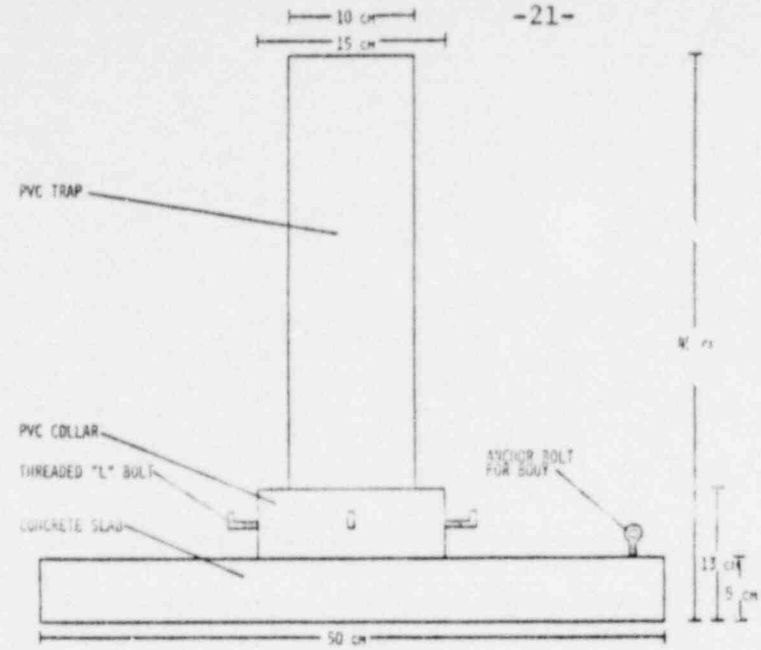

Figure 2a. Side view of sediment trap construction.

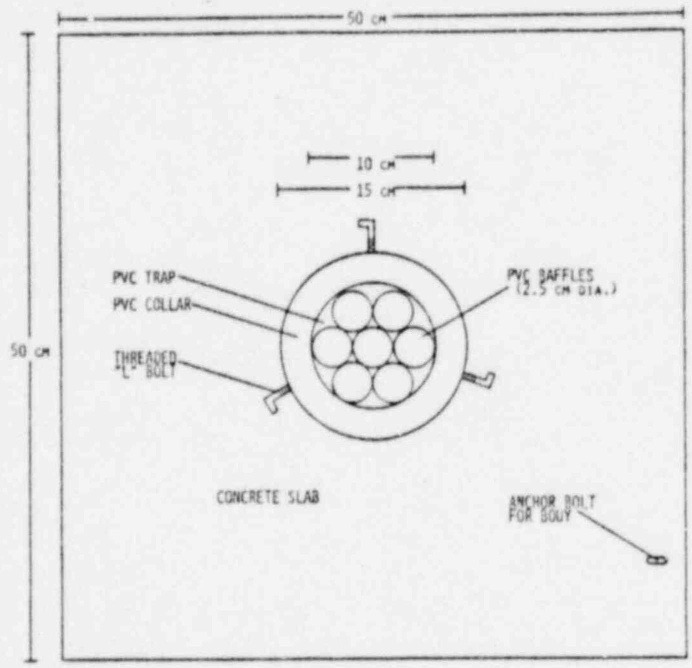

Figure 2b. Plan view of sediment trap construction.

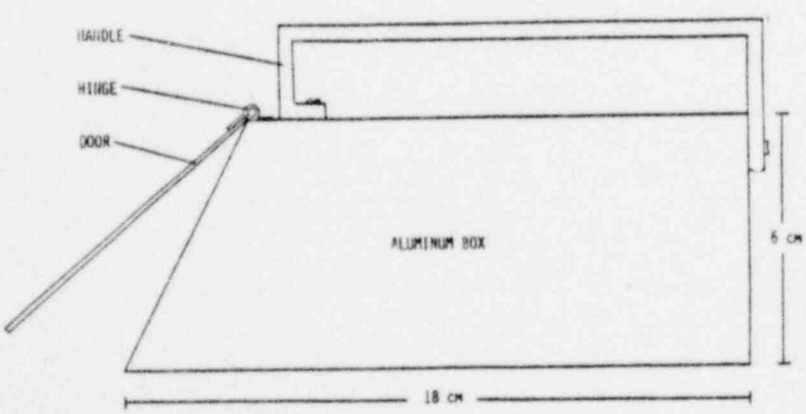

Figure 2c. Schematic representation of the hand-dredge.

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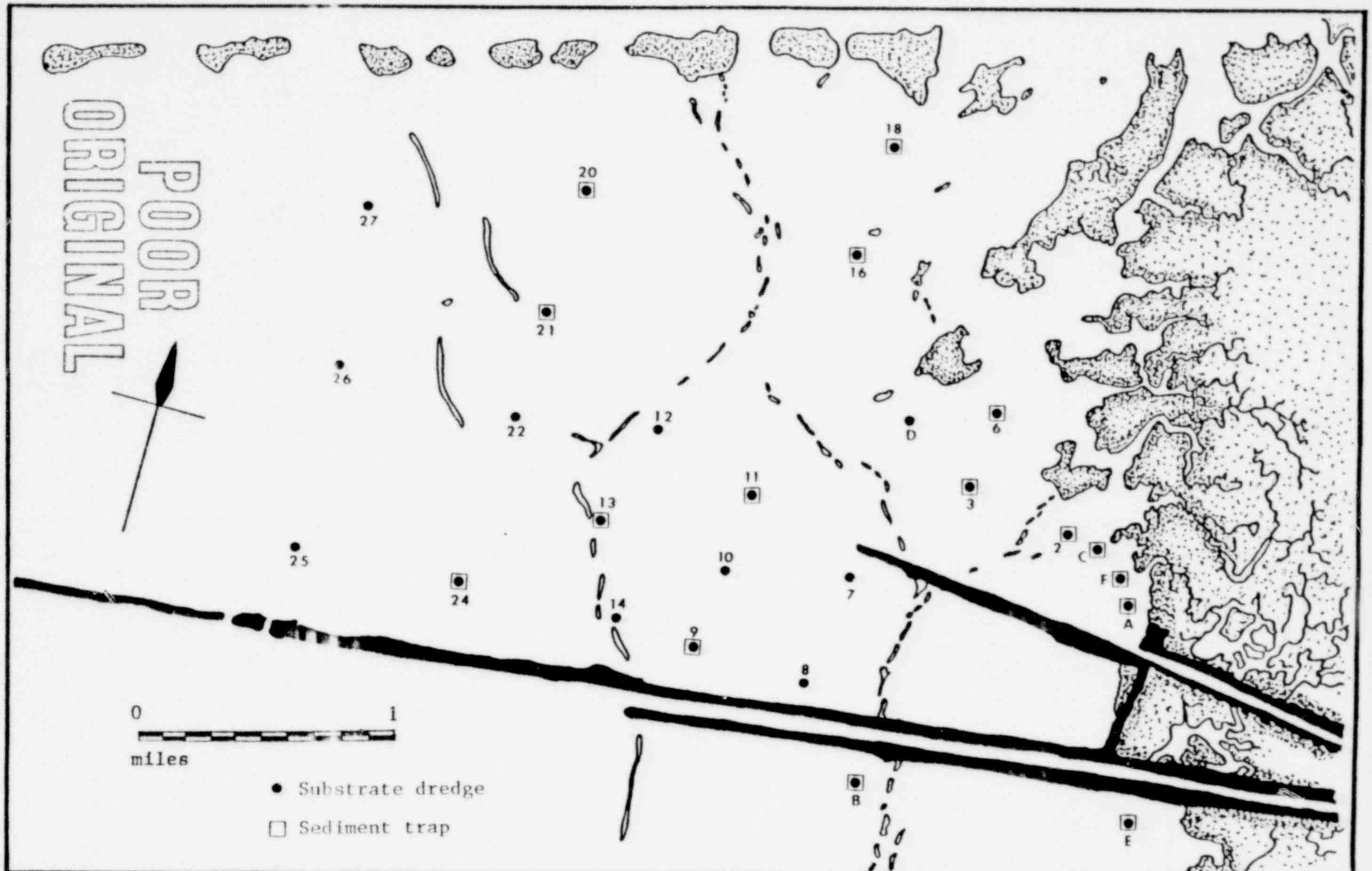

Figure 3. Sample locations for substrate (circles) samples and sediment traps (squares) in the study area.

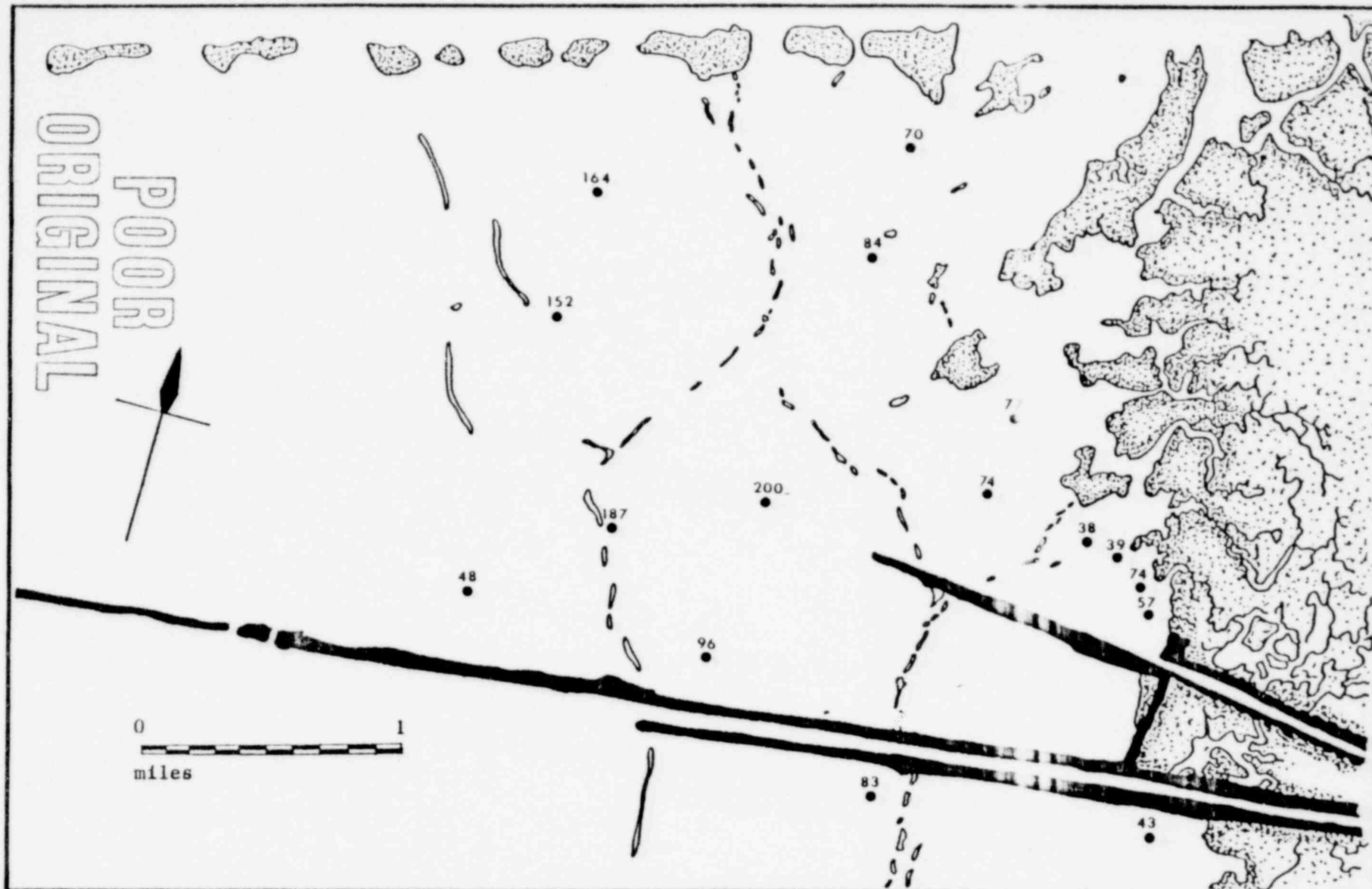

Figure 4. First quarter dry weight for sediment trap samples. Values are in $g/m^2 \cdot$da , average daily resuspension.

Figure 5. Second quarter dry weight for sediment trap samples. Values are in $g/m^2 \cdot day$, average daily resuspension.

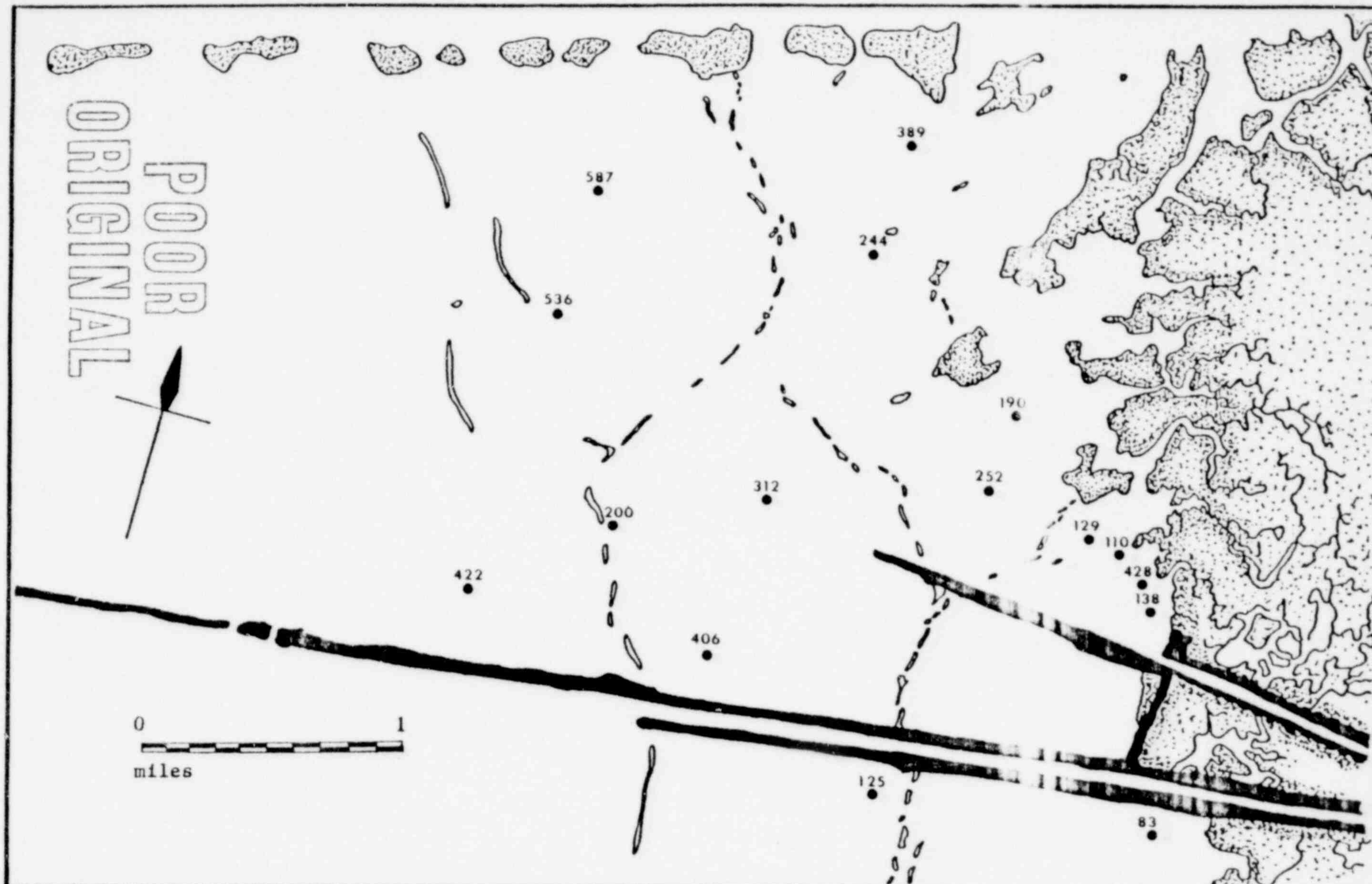

Figure 6. Third quarter dry weight for sediment trap samples. Values are in $g/m^2 \cdot day$, average daily resuspension.

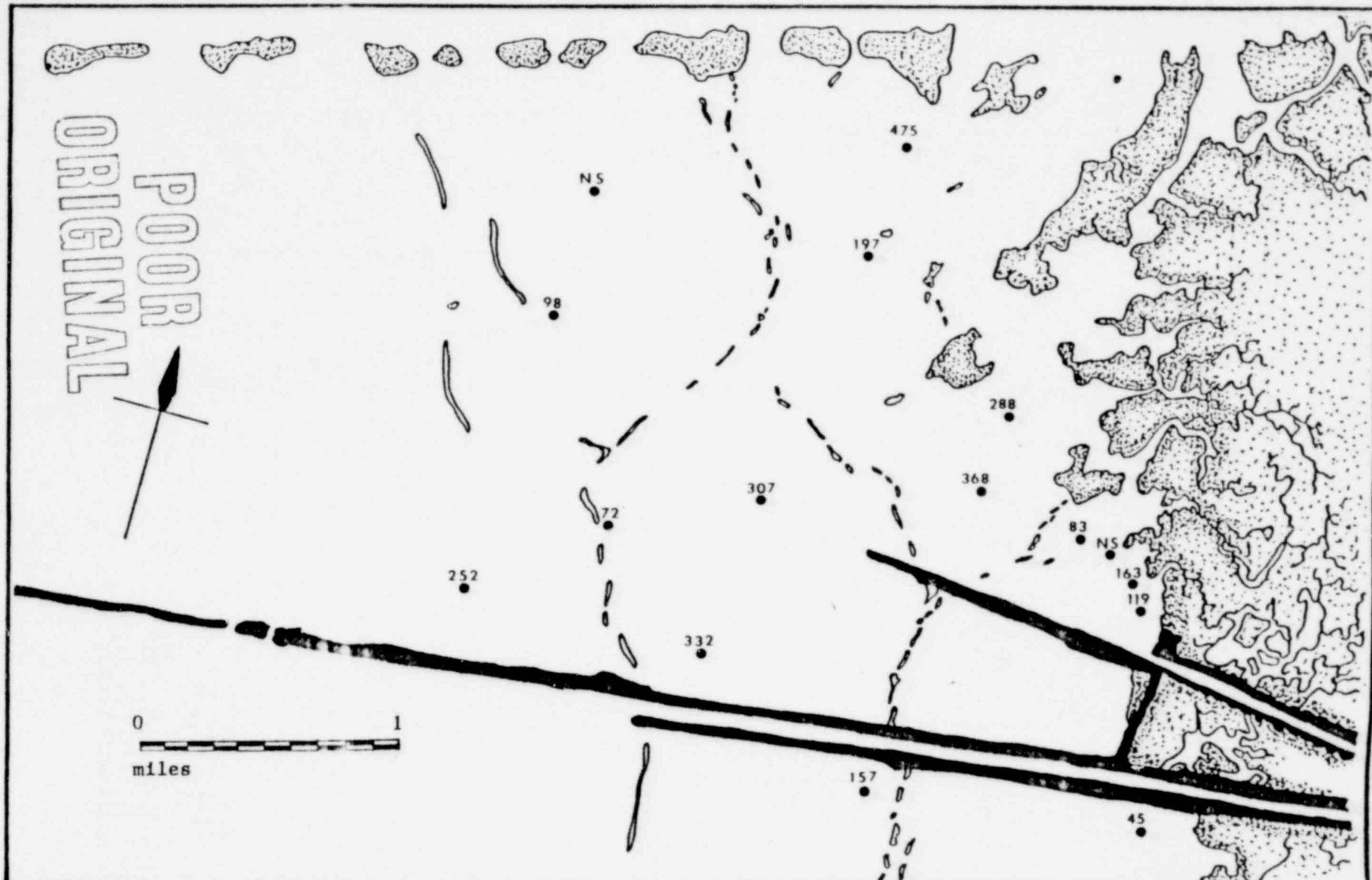

Figure 7. Fourth quarter dry weight for sediment trap samples. Values are in $g/m^2 \cdot day$, average daily resuspension.

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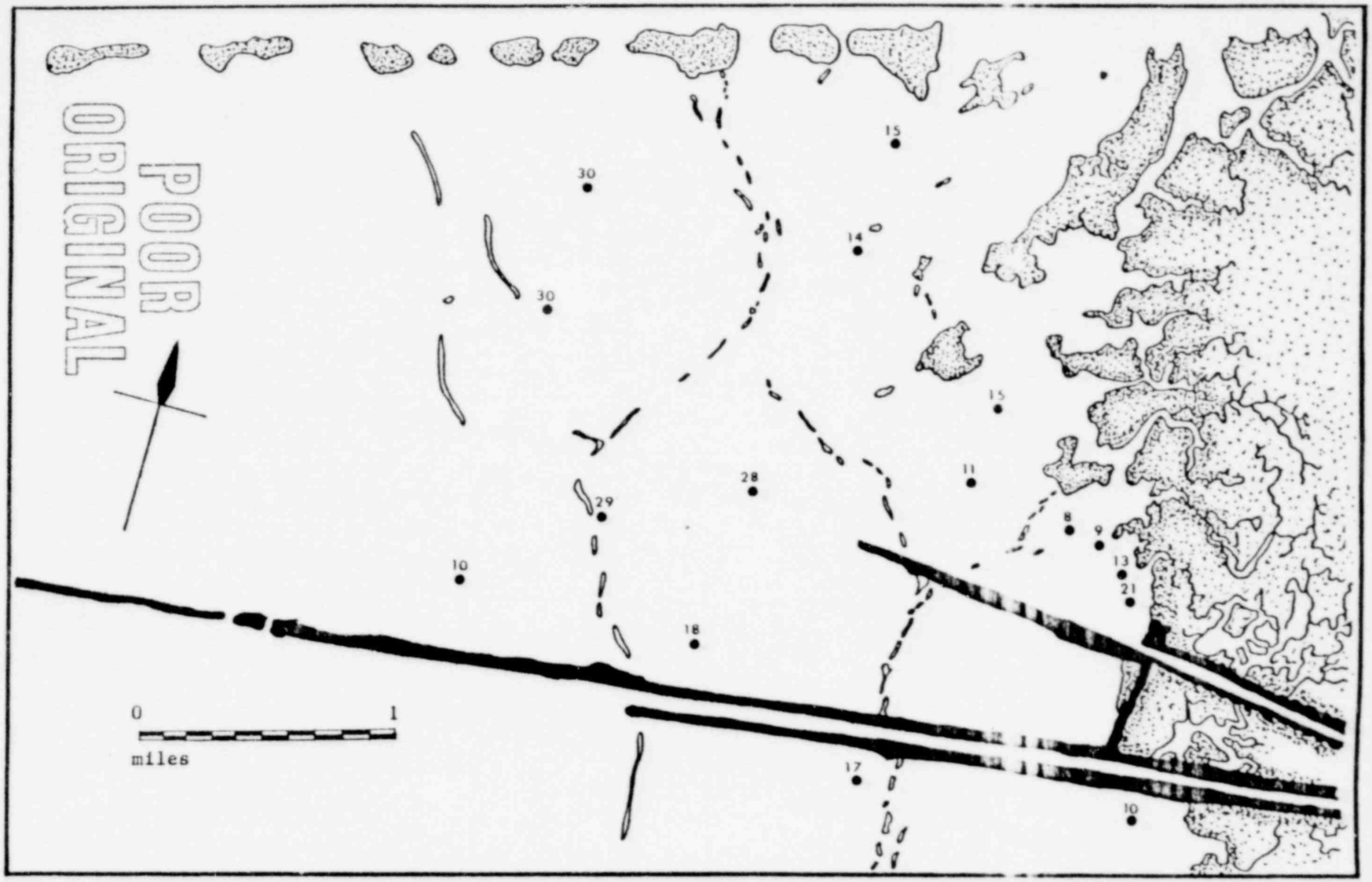

Figure 8. First quarter organic matter content for sediment trap samples. Values are in $g/m^2 \cdot day$, average daily resuspension.

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Figure 9. Second quarter organic matter content for sediment trap samples. Values are in $g/m^2 \cdot day$, average daily resuspension.

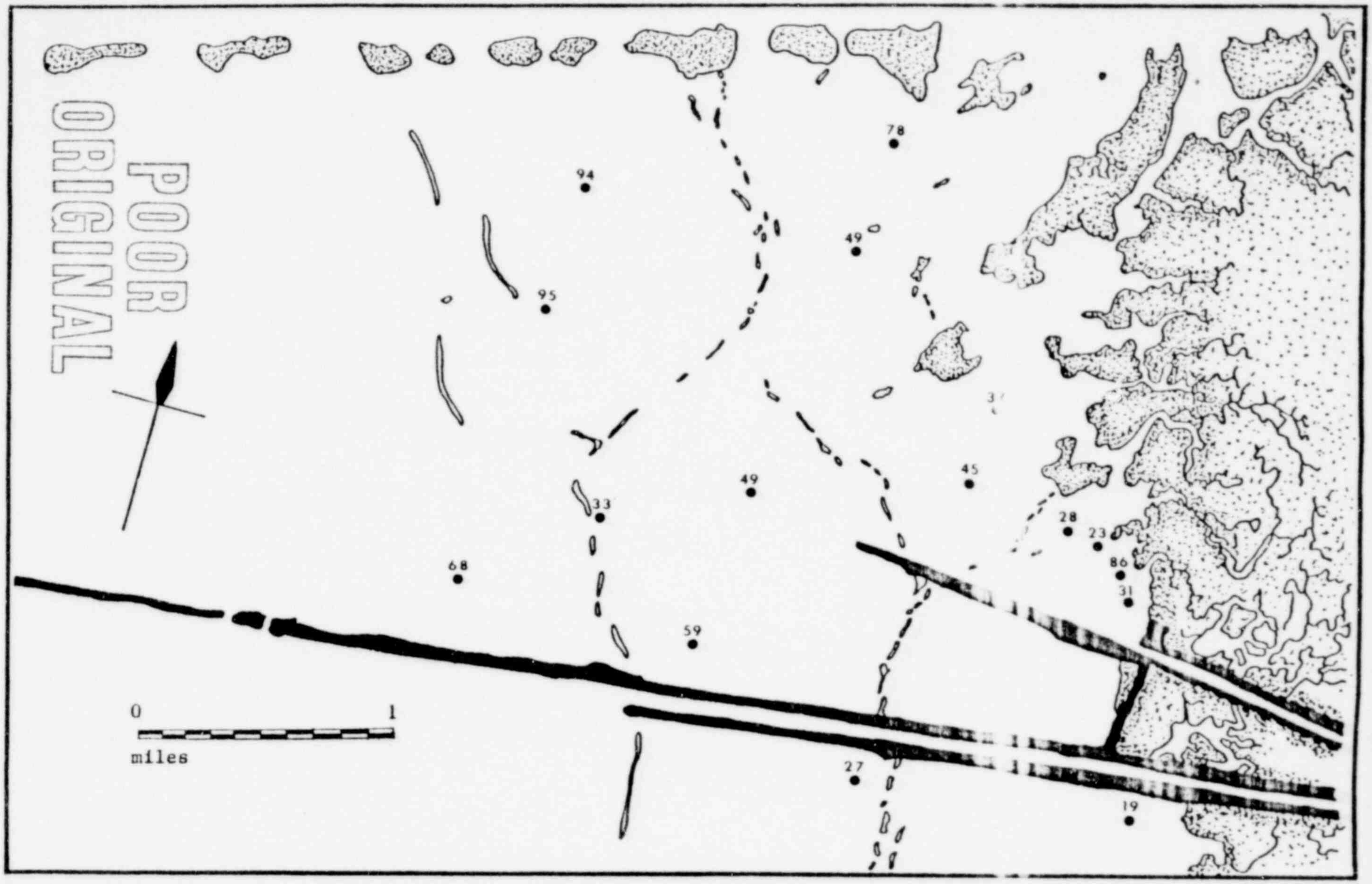

Figure 10. Third quarter organic matter content for sediment trap samples. Values are in $g/m^2 \cdot day$, average daily resuspension.

Figure 11. Fourth quarter organic matter content for sediment trap samples. Values are in $g/m^2 \cdot day$, average daily resuspension.

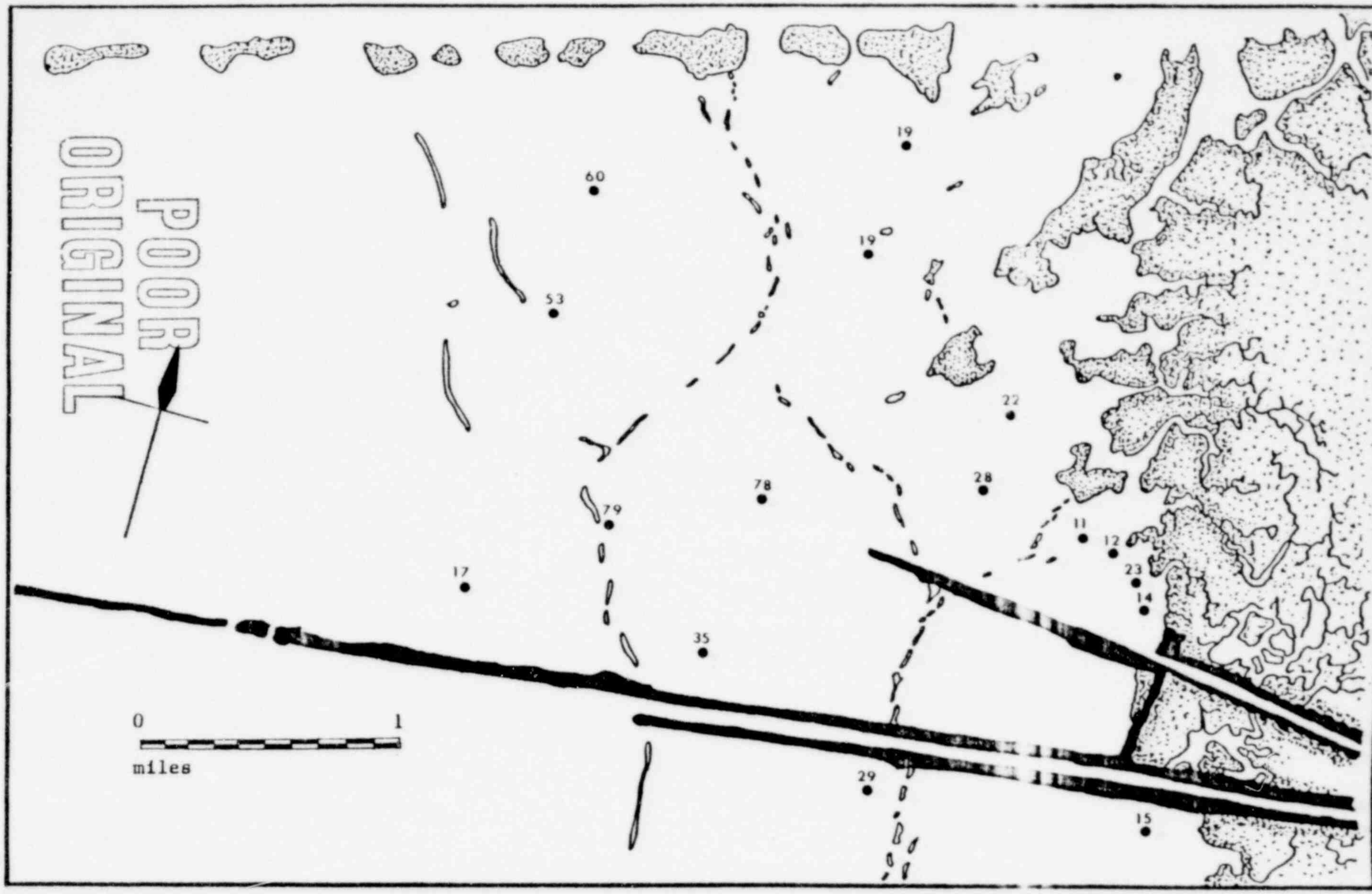

Figure 12. First quarter carbonate content for sediment trap samples. Values are in g/m^2·day, average daily resuspension.

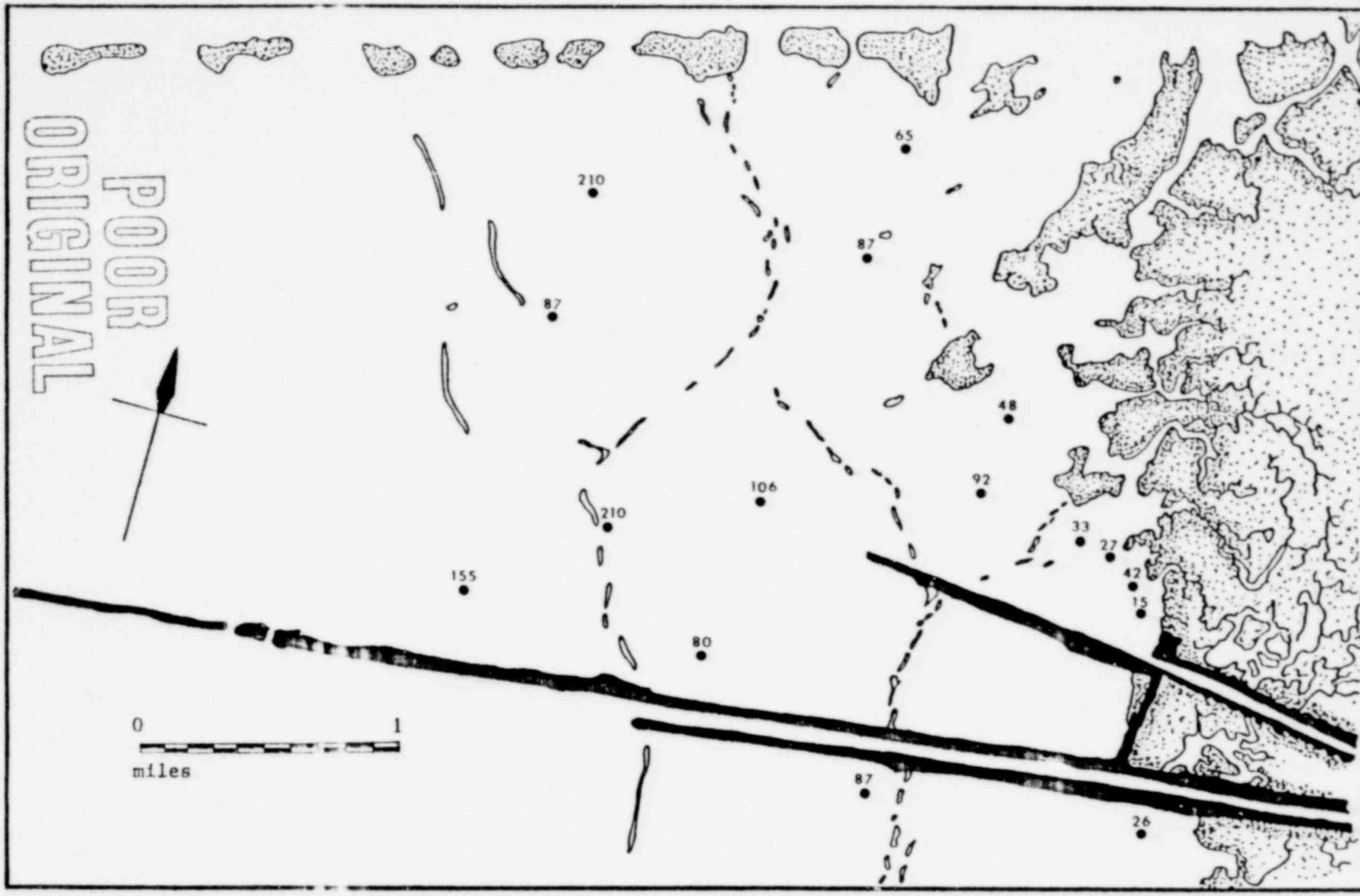

Figure 13. Second quarter carbonate content for sediment traps. Values are in $g/m^2 \cdot day$, average daily resuspension.

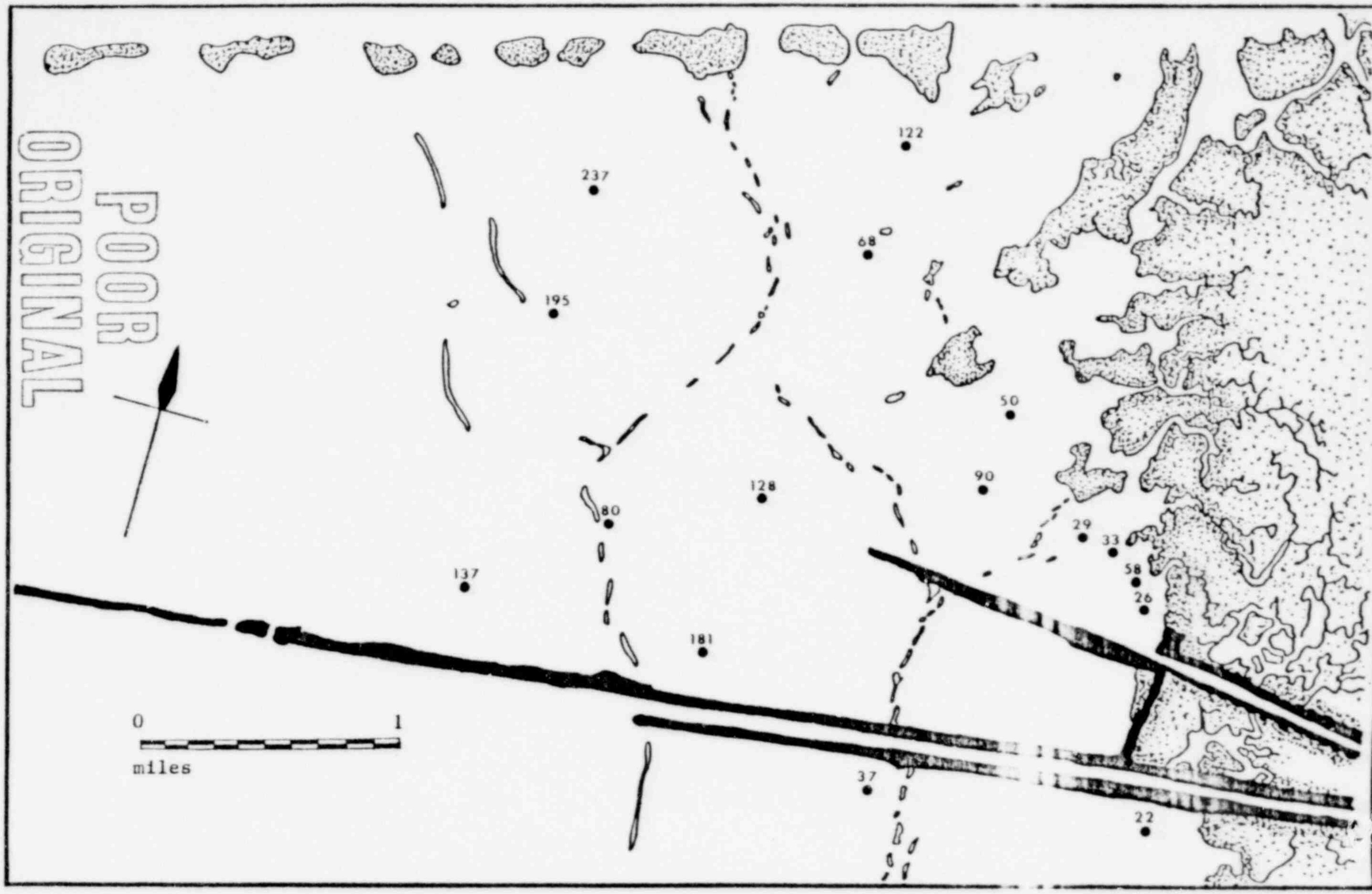

Figure 14. Third quarter carbonate content for sediment traps. Values are in $g/m^2 \cdot da$, average daily resuspension.

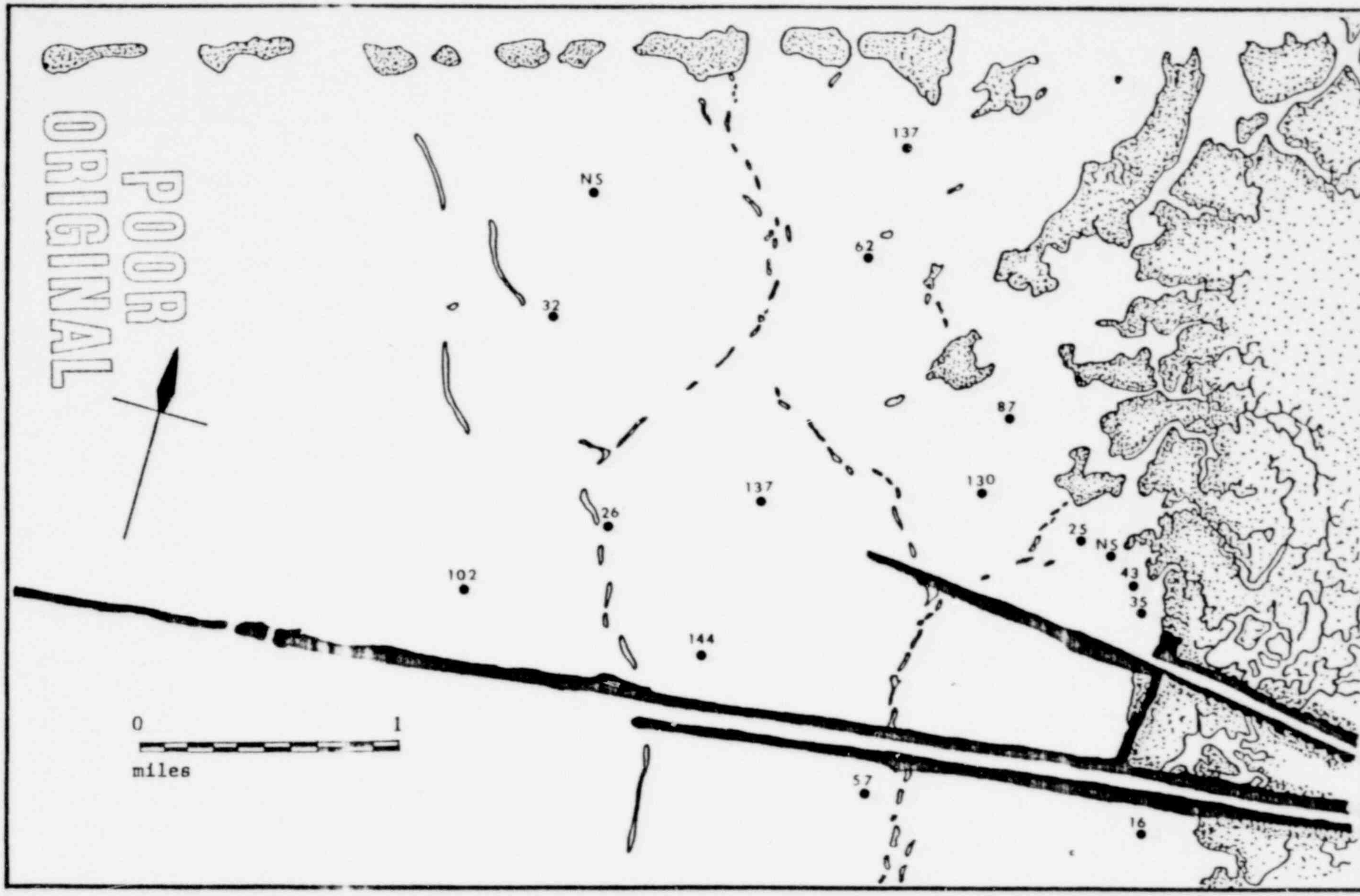

Figure 15. Fourth quarter carbonate content for sediment traps. Values are in $g/m^2 \cdot day$, average daily resuspension.

Figure 16. First quarter siliceous content for sediment trap samples. Values are in g/m^2·day, average daily resuspension.

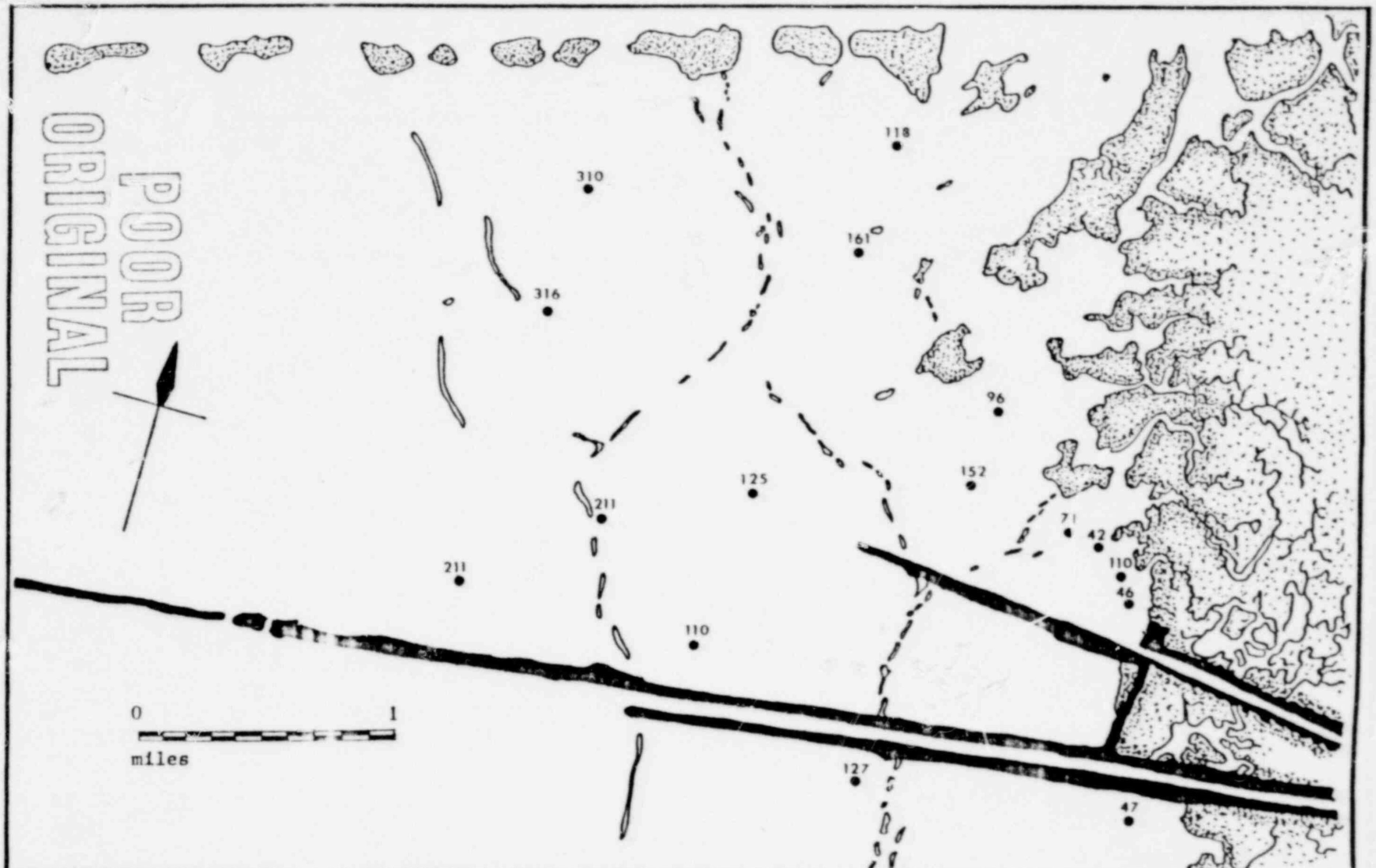

Figure 17. Second quarter s[illegible]liceous content for sediment trap samples. Values are in g/m^2·day, average daily resuspension.

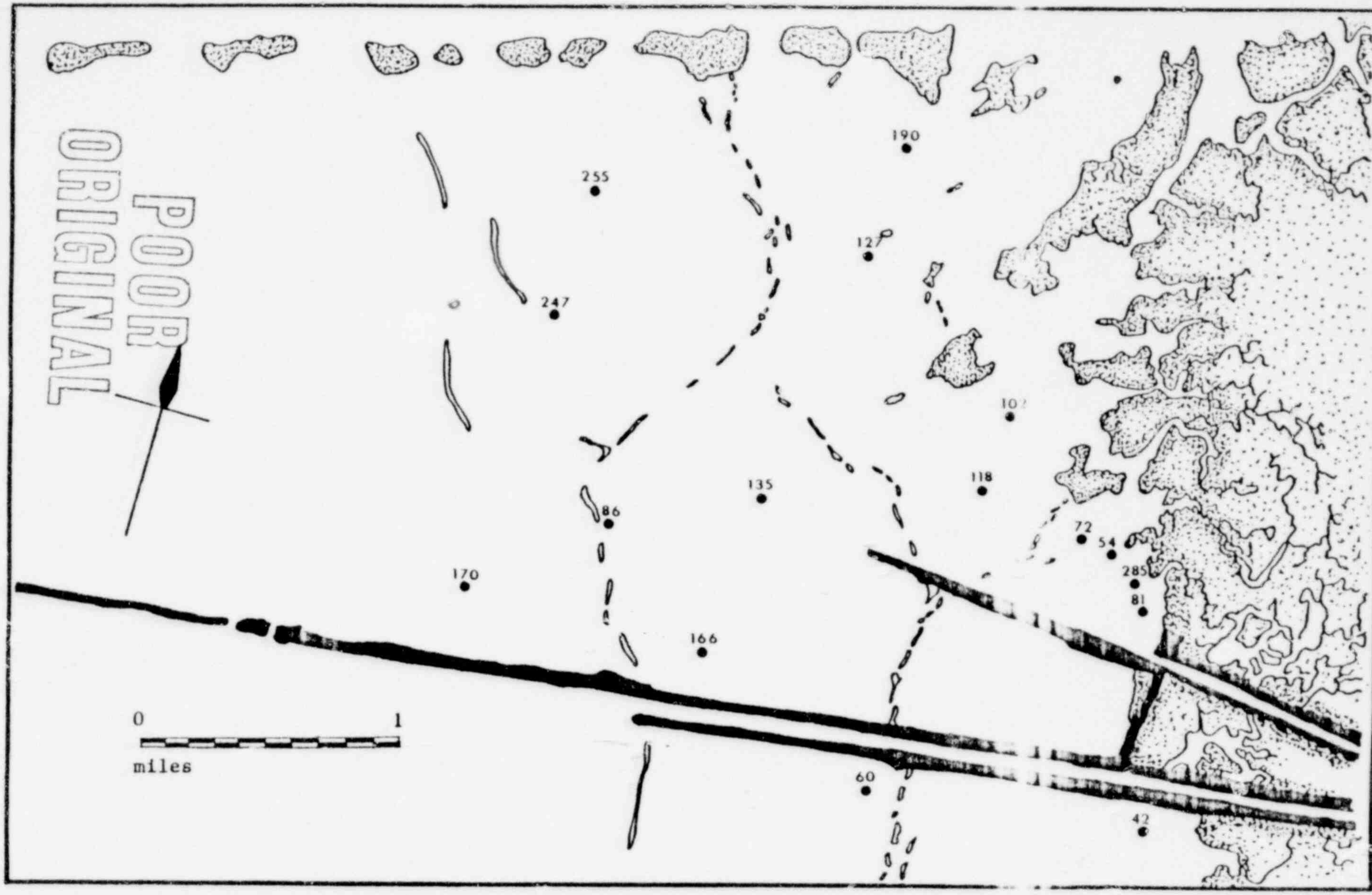

Figure 18. Third quarter siliceous content for sediment trap samples. Values are in g/m^2·day, average daily resuspension.

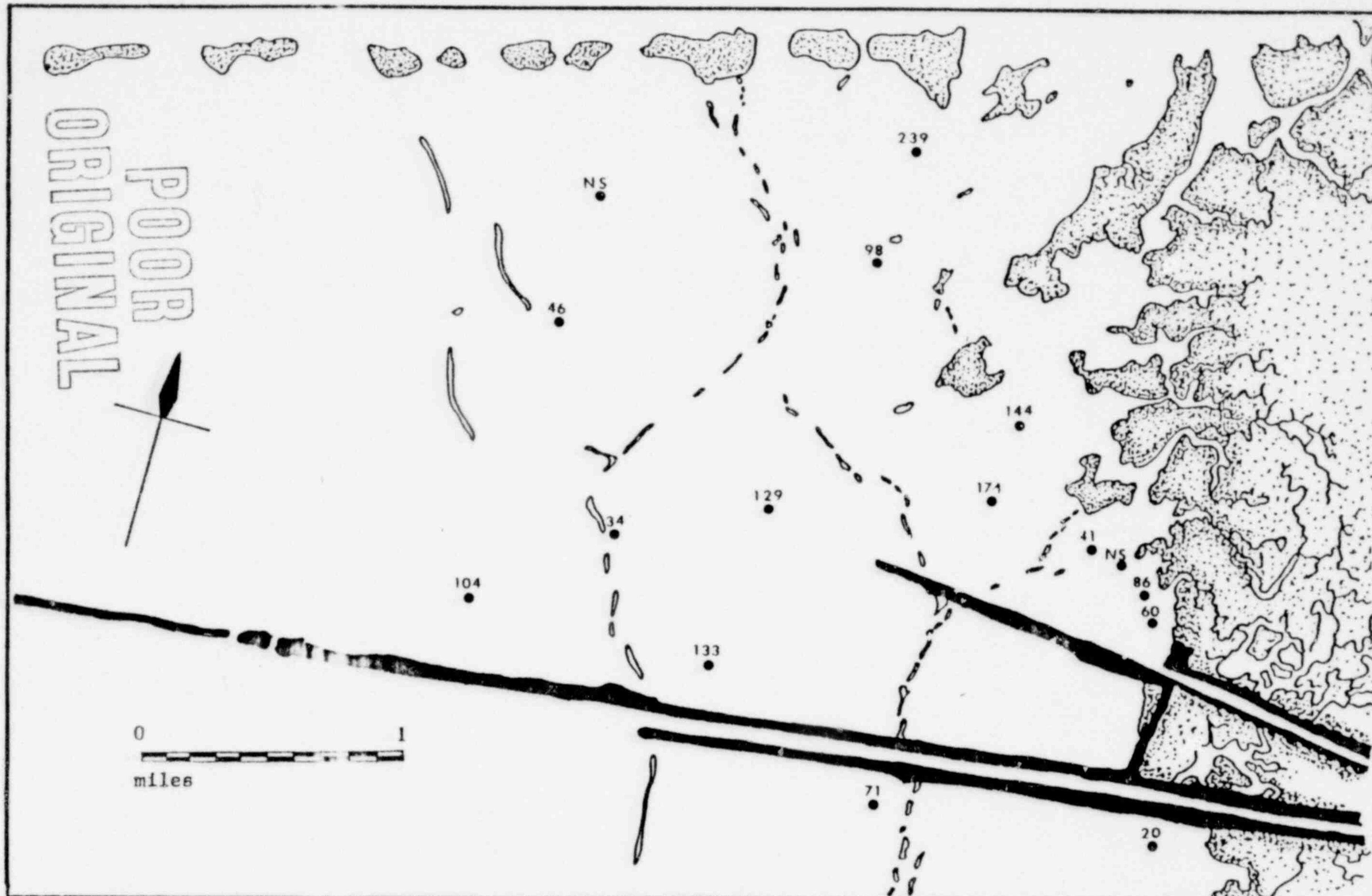

Figure 19. Fourth quarter siliceous content for sediment trap samples. Values are in g/m^2·day, average daily resuspension.

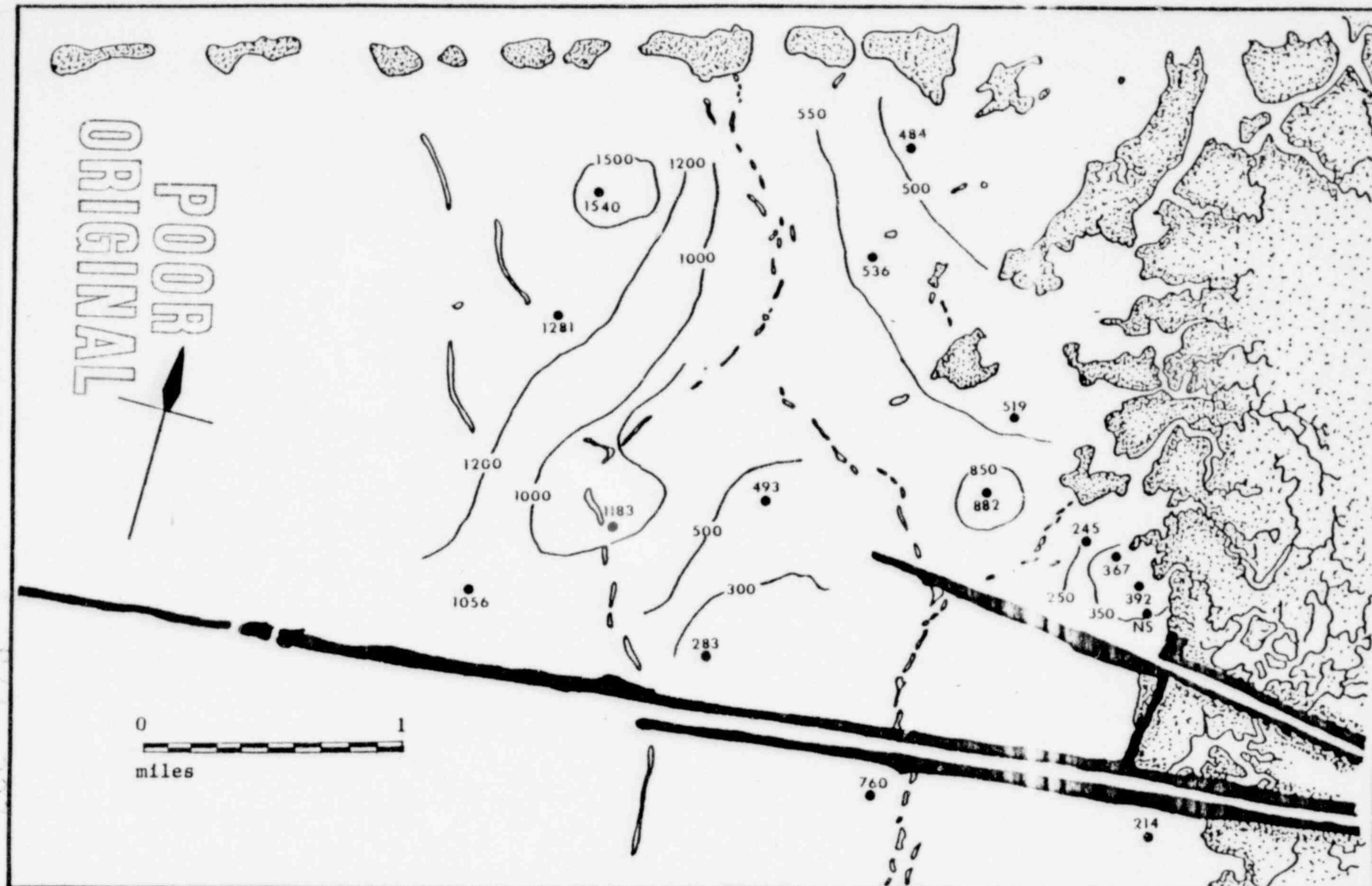

Figure 20. Twenty-four hour dry weight content for sediment trap samples after passage of a storm. Values are in $g/m^2 \cdot day$.

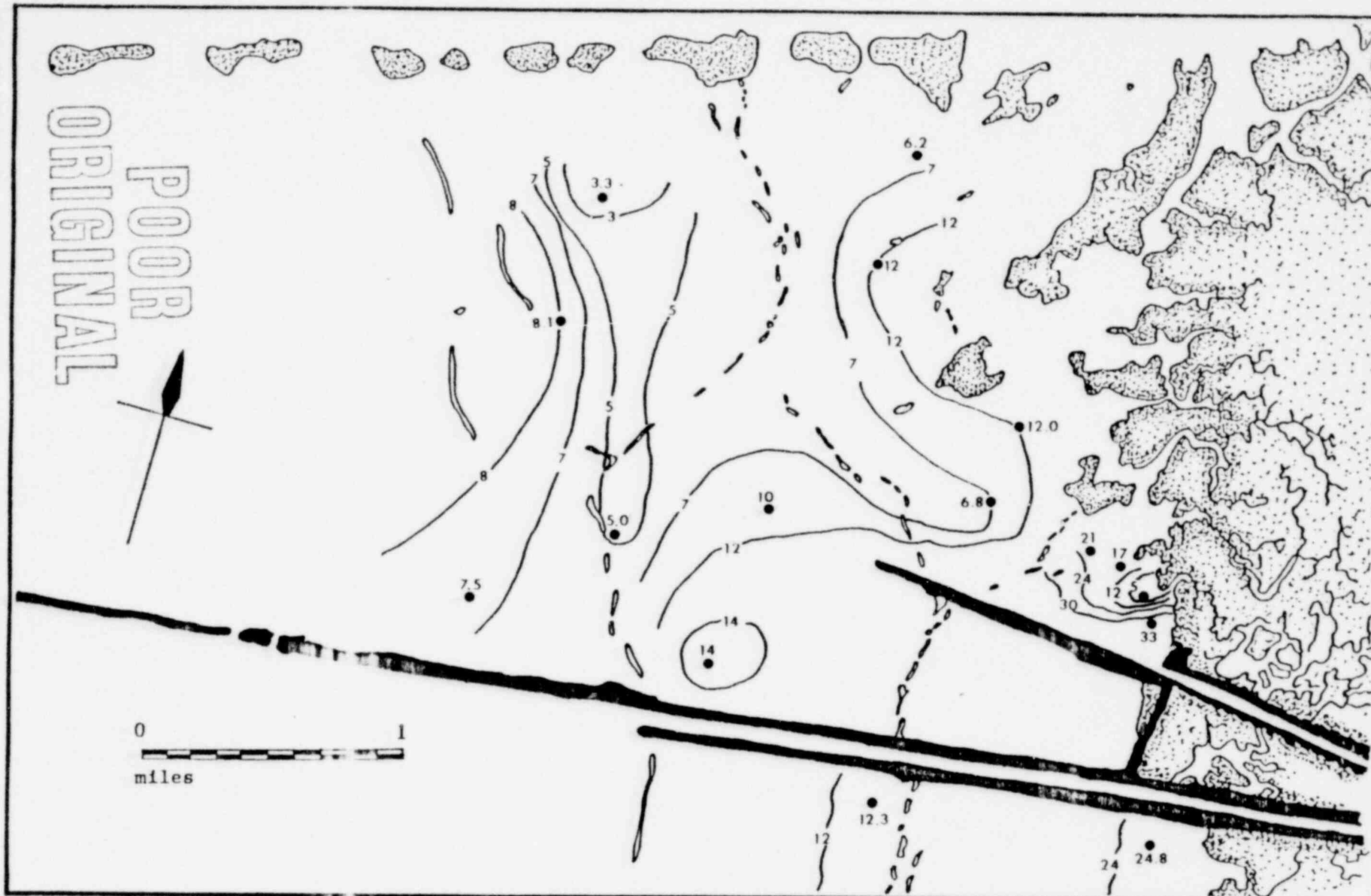

Figure 21. Distribution of t_{100} parameter for dry weight content. Values are in hours/100g/m^2.

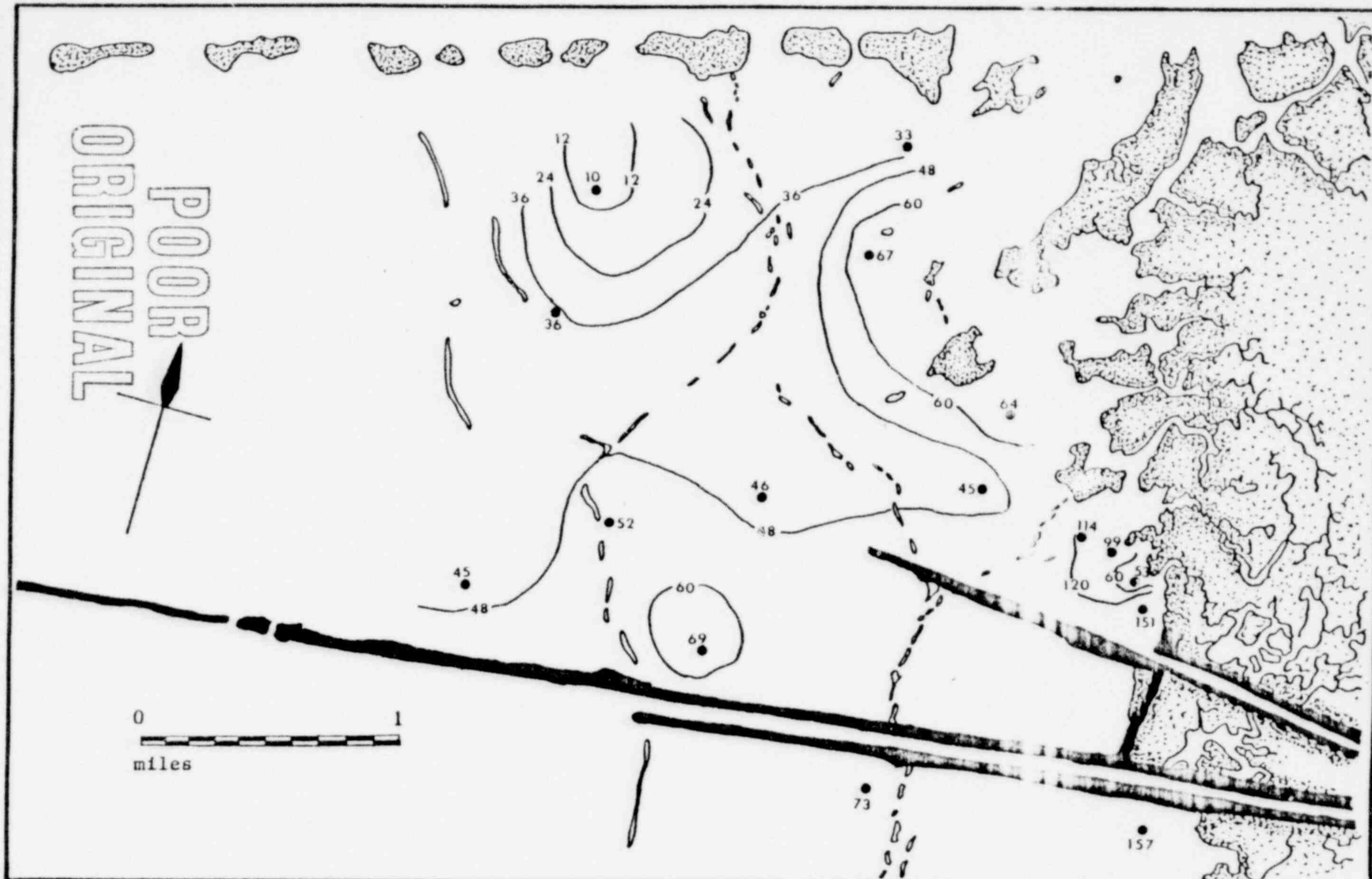

Figure 22. Distribution of t_{100} parameter for organic matter content. Values are in hours/100g/m^2.

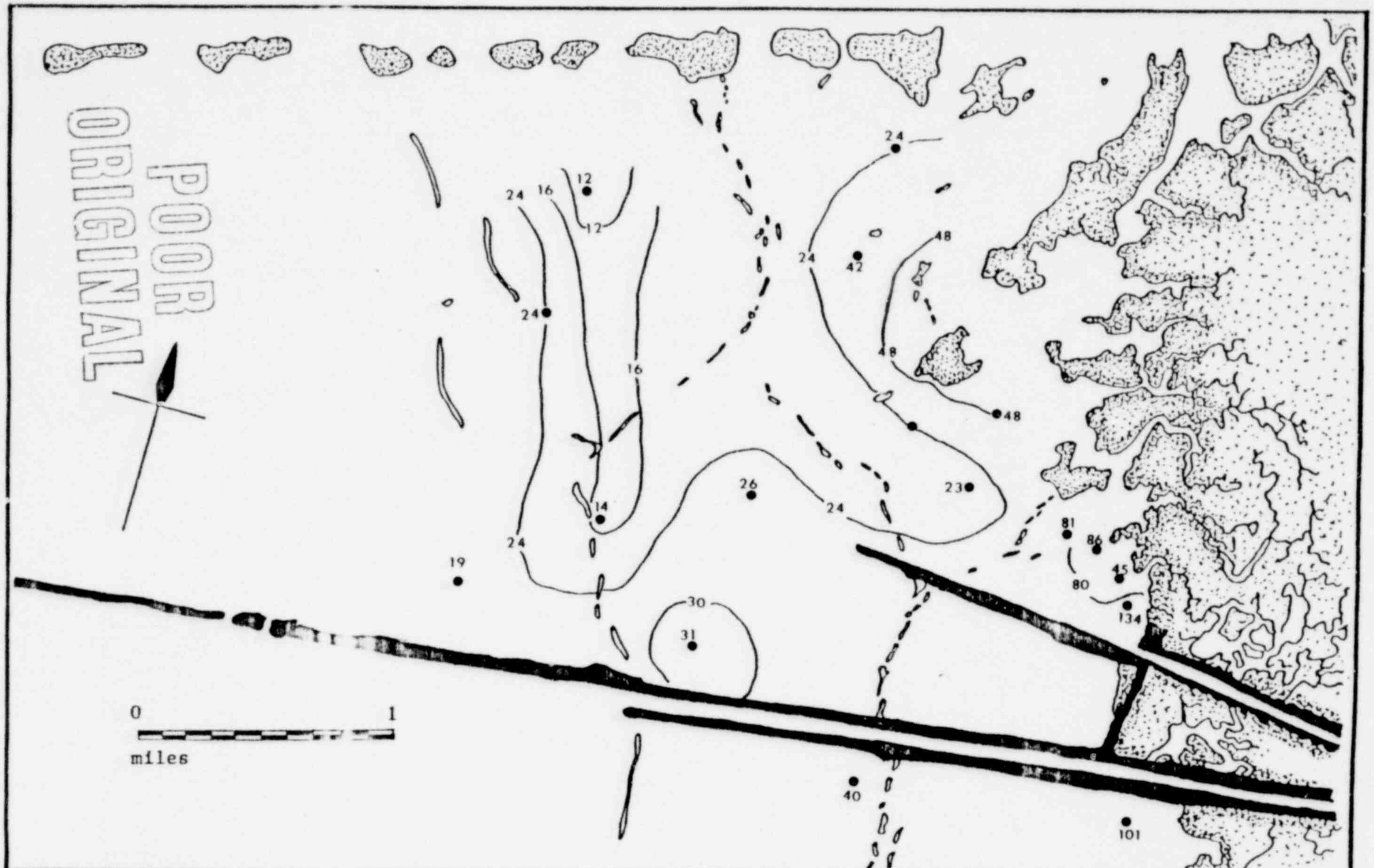

Figure 23. Distribution of t_{100} parameter for carbonate content. Values are in hours/100g/m^2.

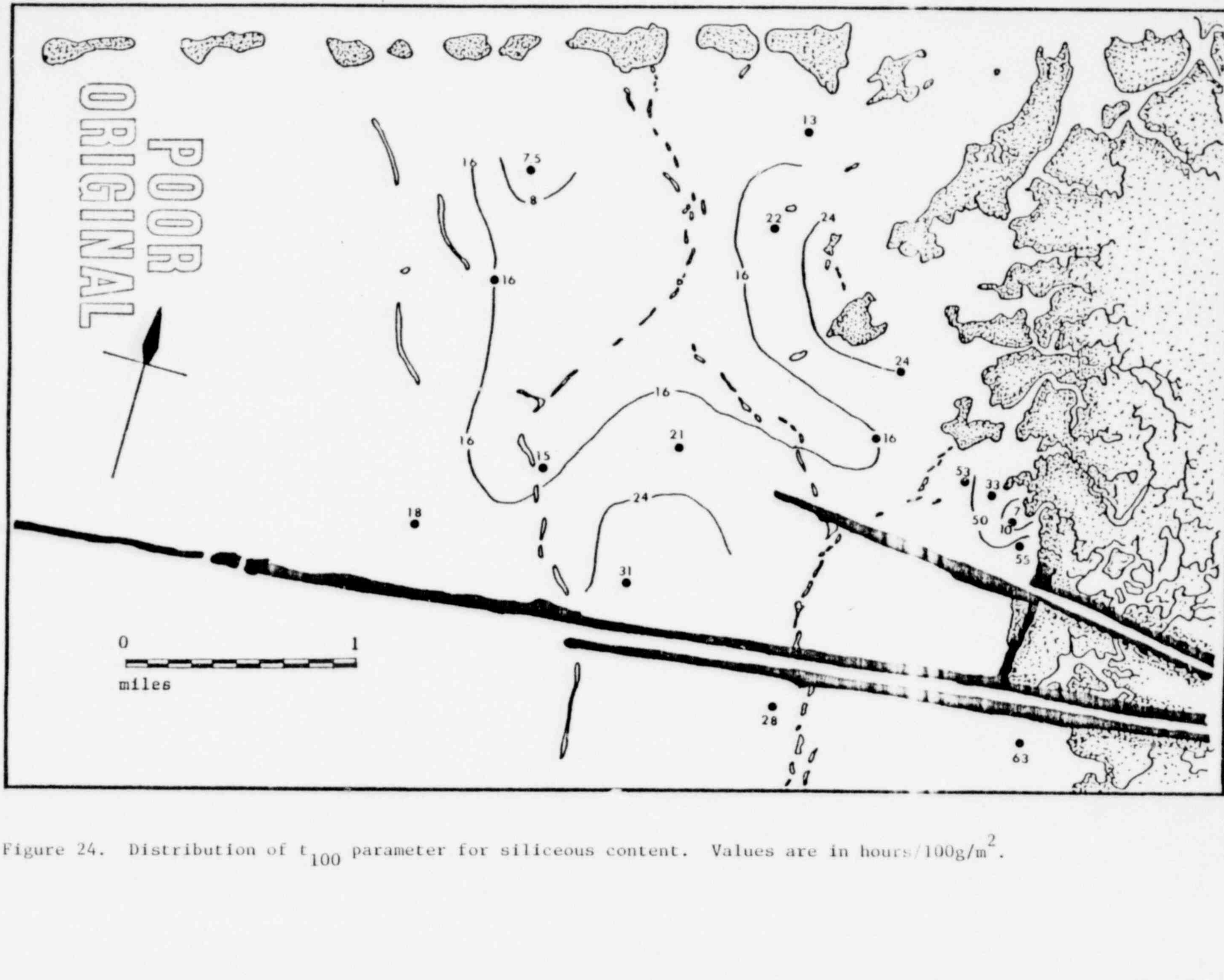

Figure 24. Distribution of t_{100} parameter for siliceous content. Values are in hours/100g/m^2.

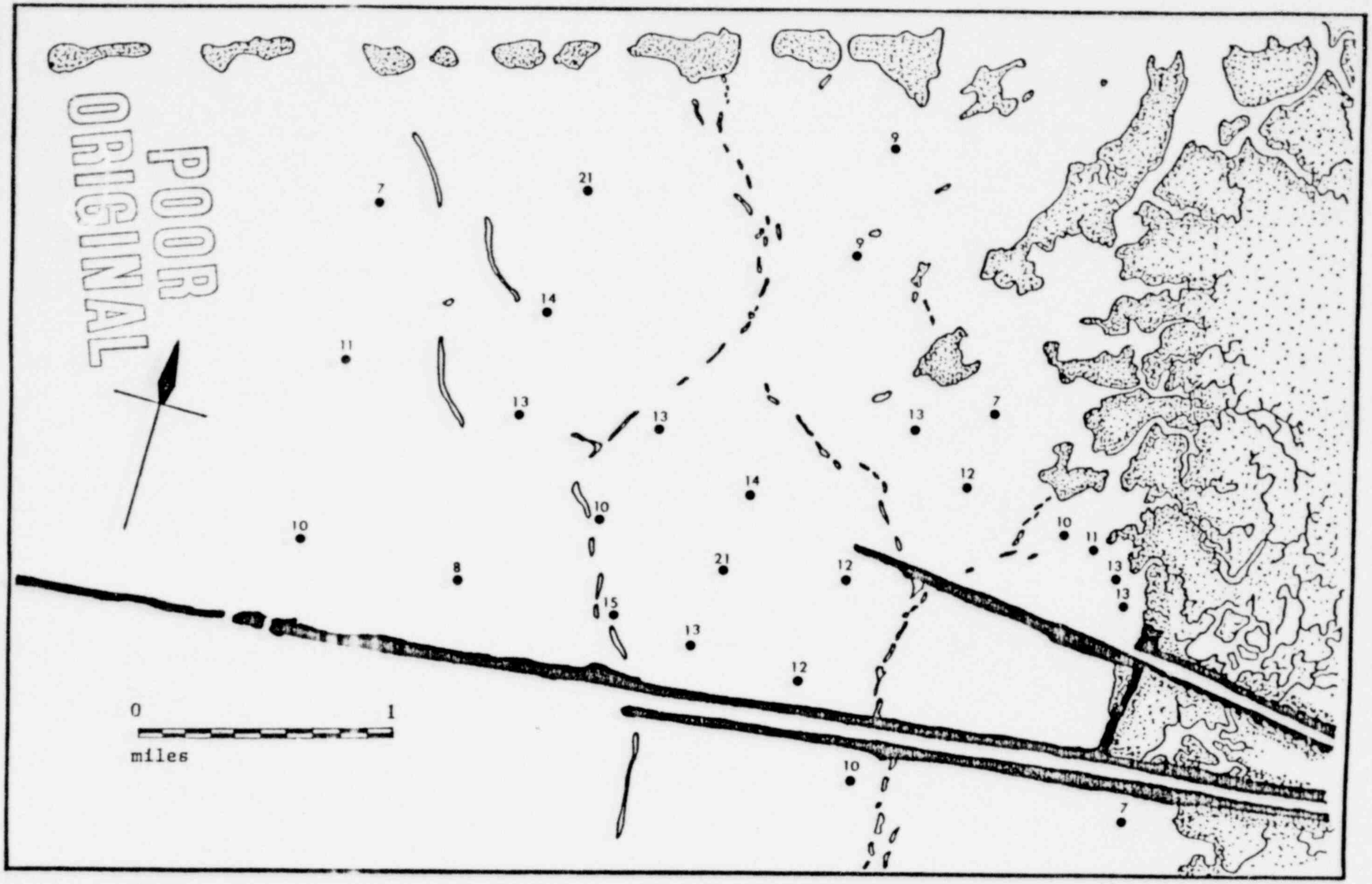

Figure 25. First quarter percent by weight for silt and clay (<63μ) for dredge samples.

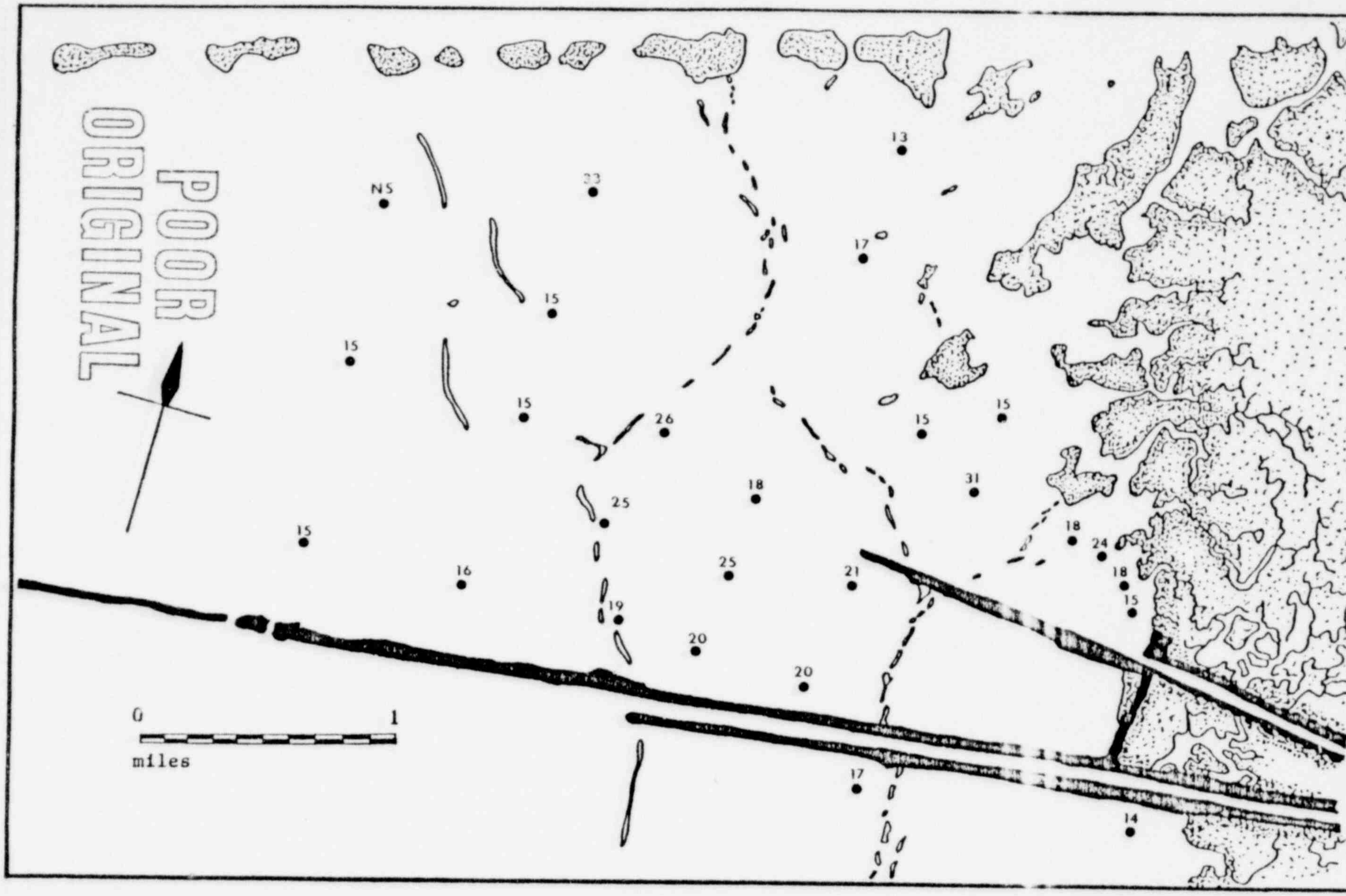

Figure 26. Second quarter percent by weight for silt and clay (<63μ) for dredge samples.

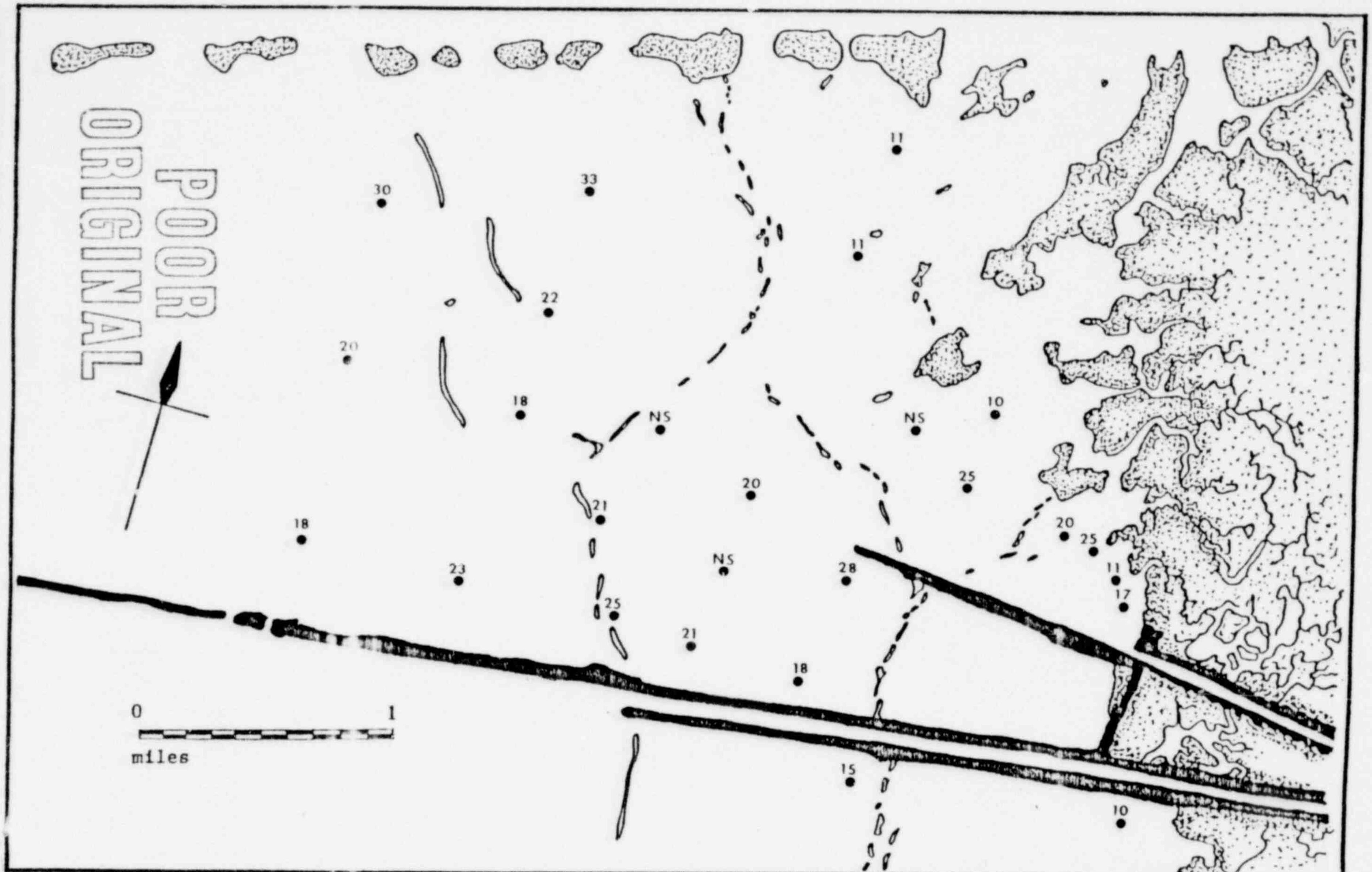

Figure 27. Third quarter percent by weight for silt and clay (<63μ) for dredge samples.

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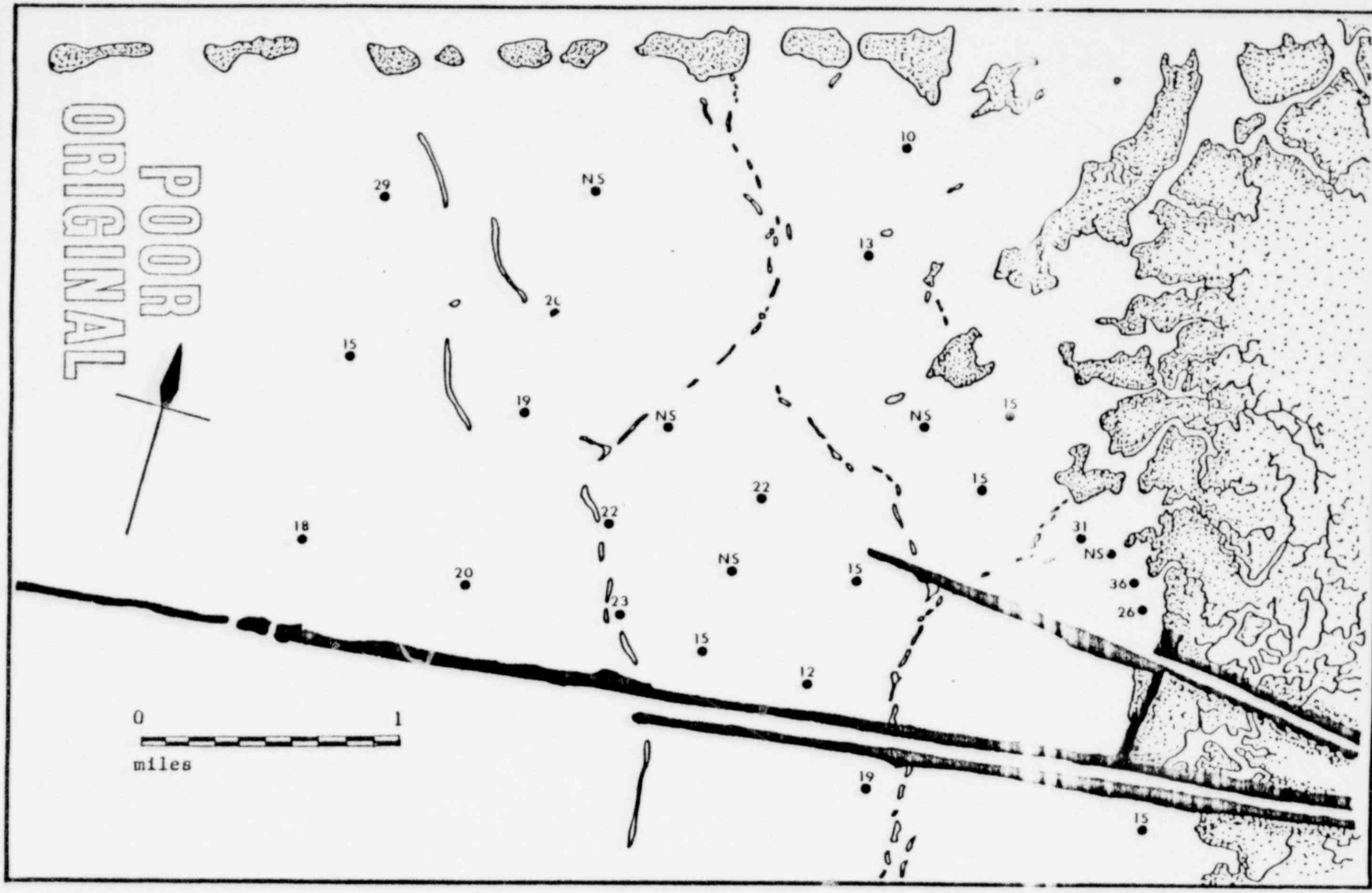

Figure 28. Fourth quarter percent by weight for silt and clay (<63μ) for dredge sampl s.

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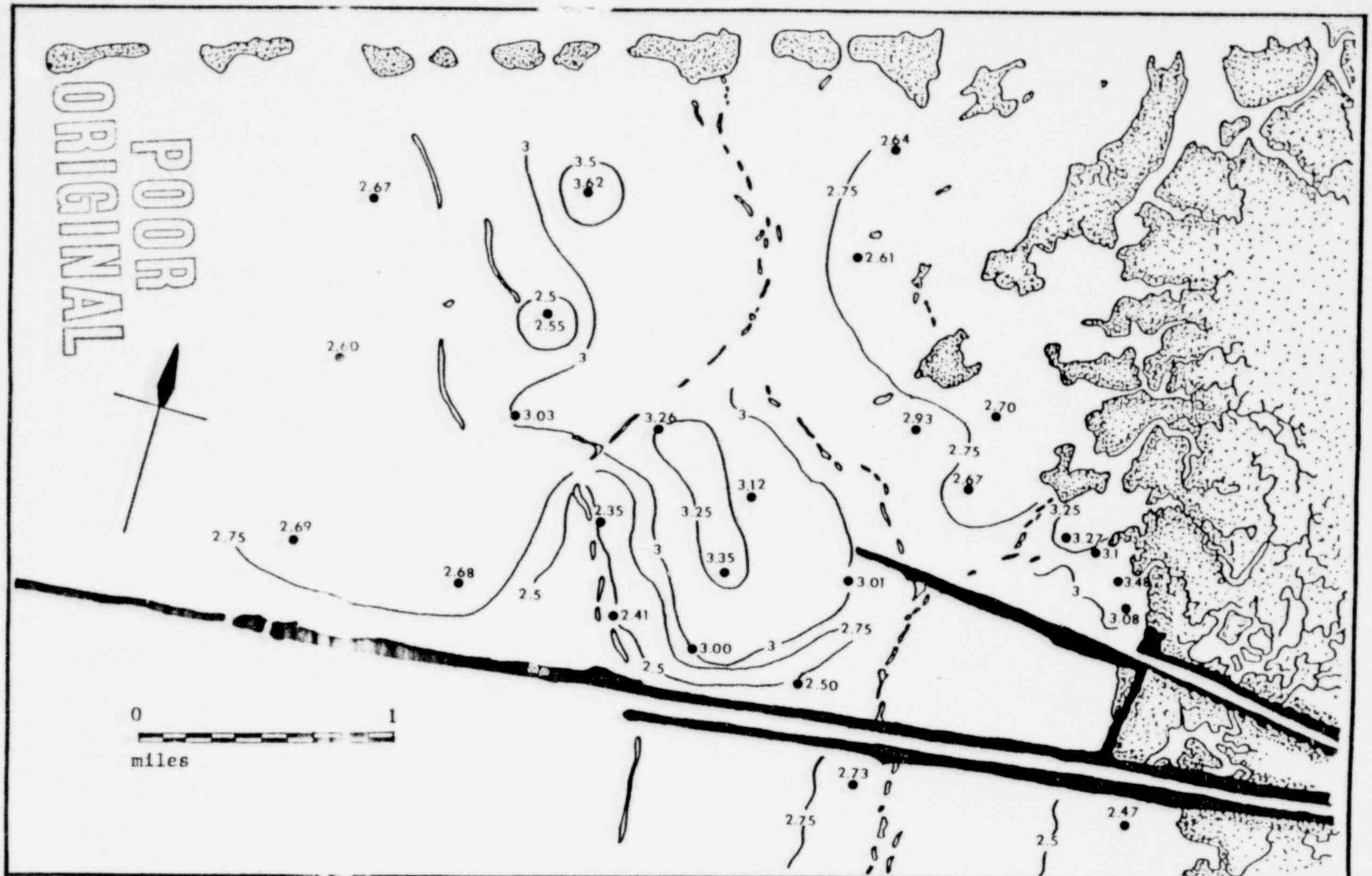

Figure 29. Distribution of mean grain size from pooled analysis of four quarters. Values are in Ø units.

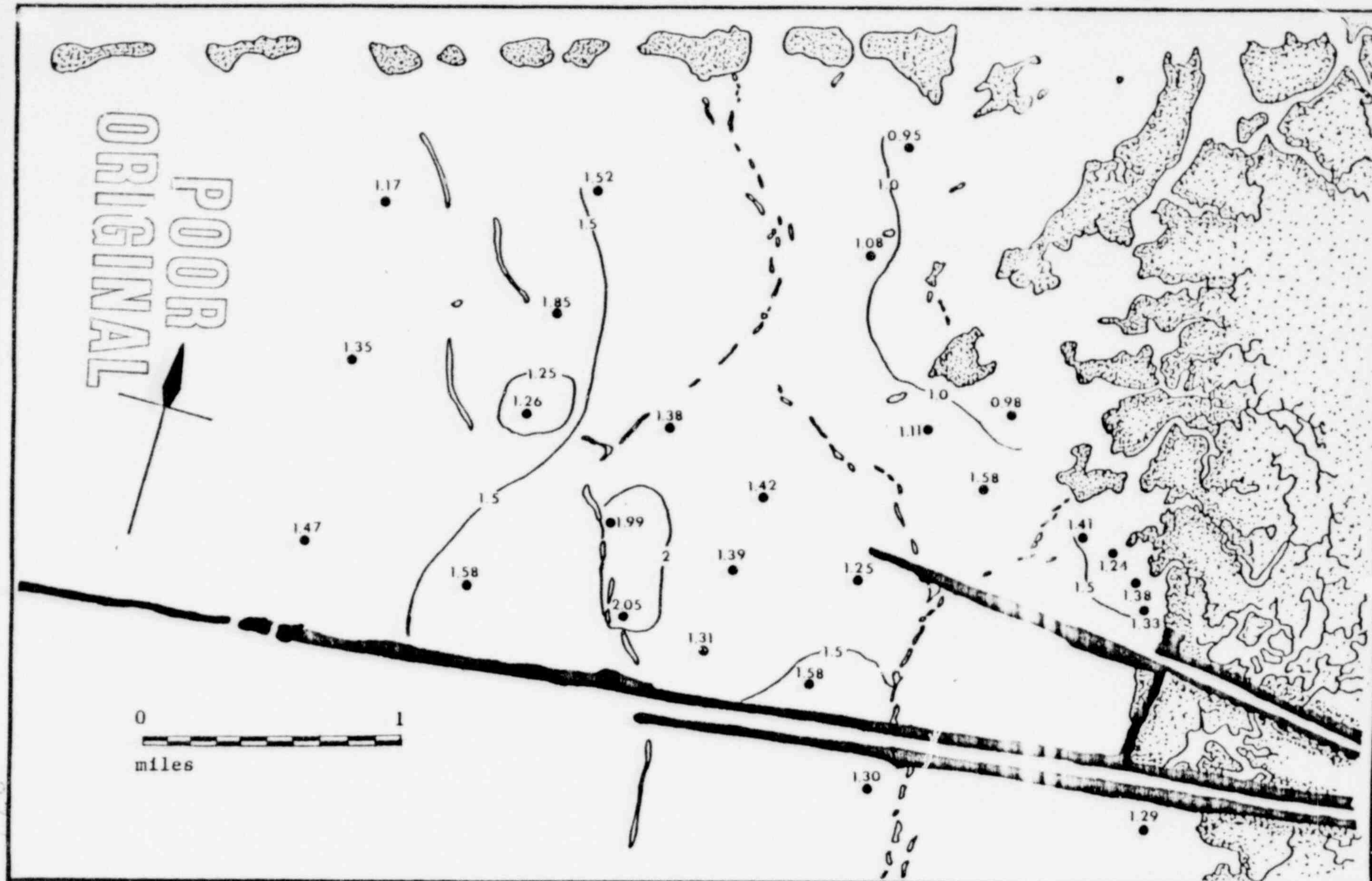

Figure 30. Distribution of sorting coefficients from pooled analyses for four quarters. Values are in Ø units.

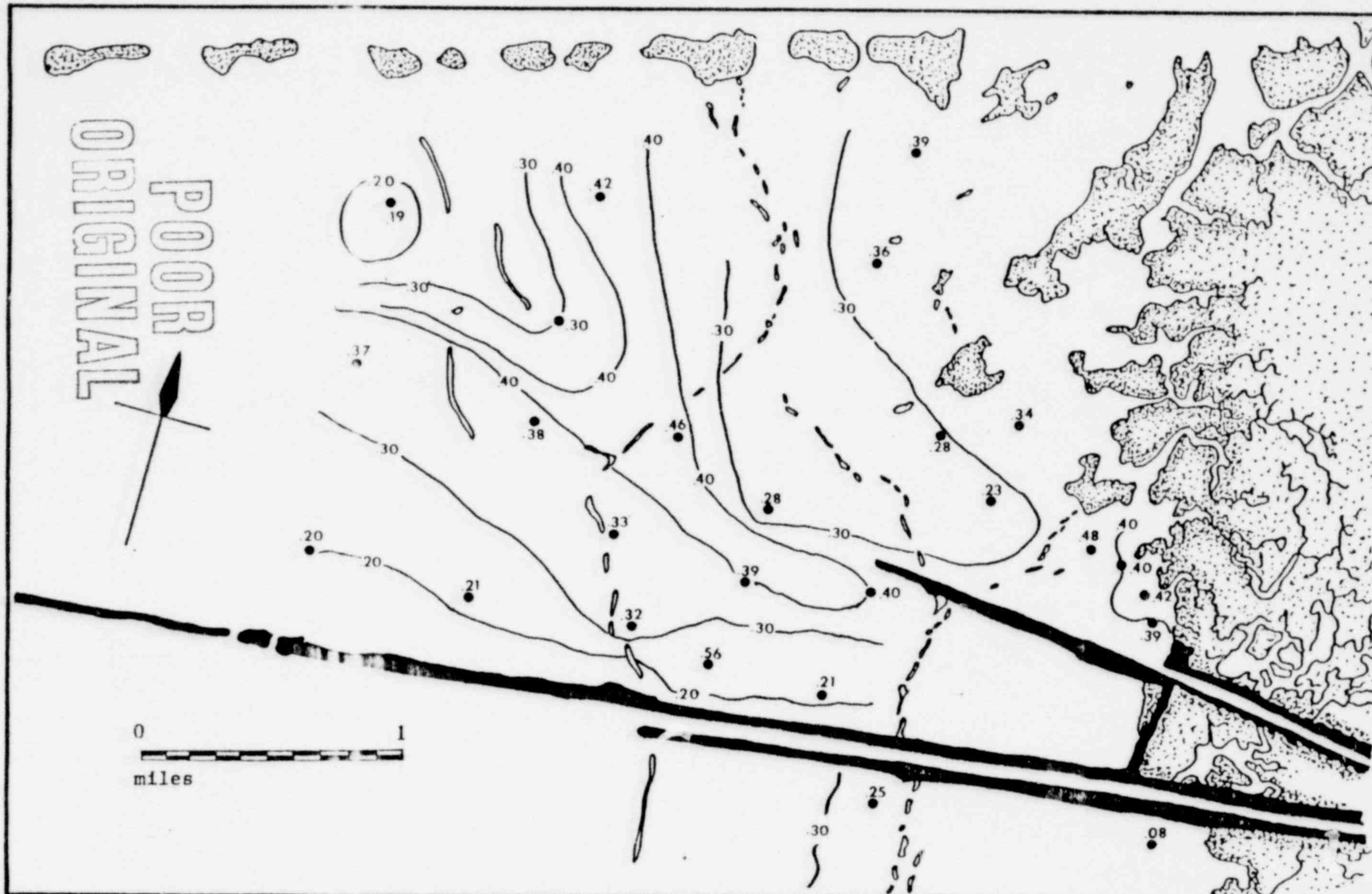

Figure 31. Distribution of skewness values from pooled analyses for four quarters. Values are in Ø units.

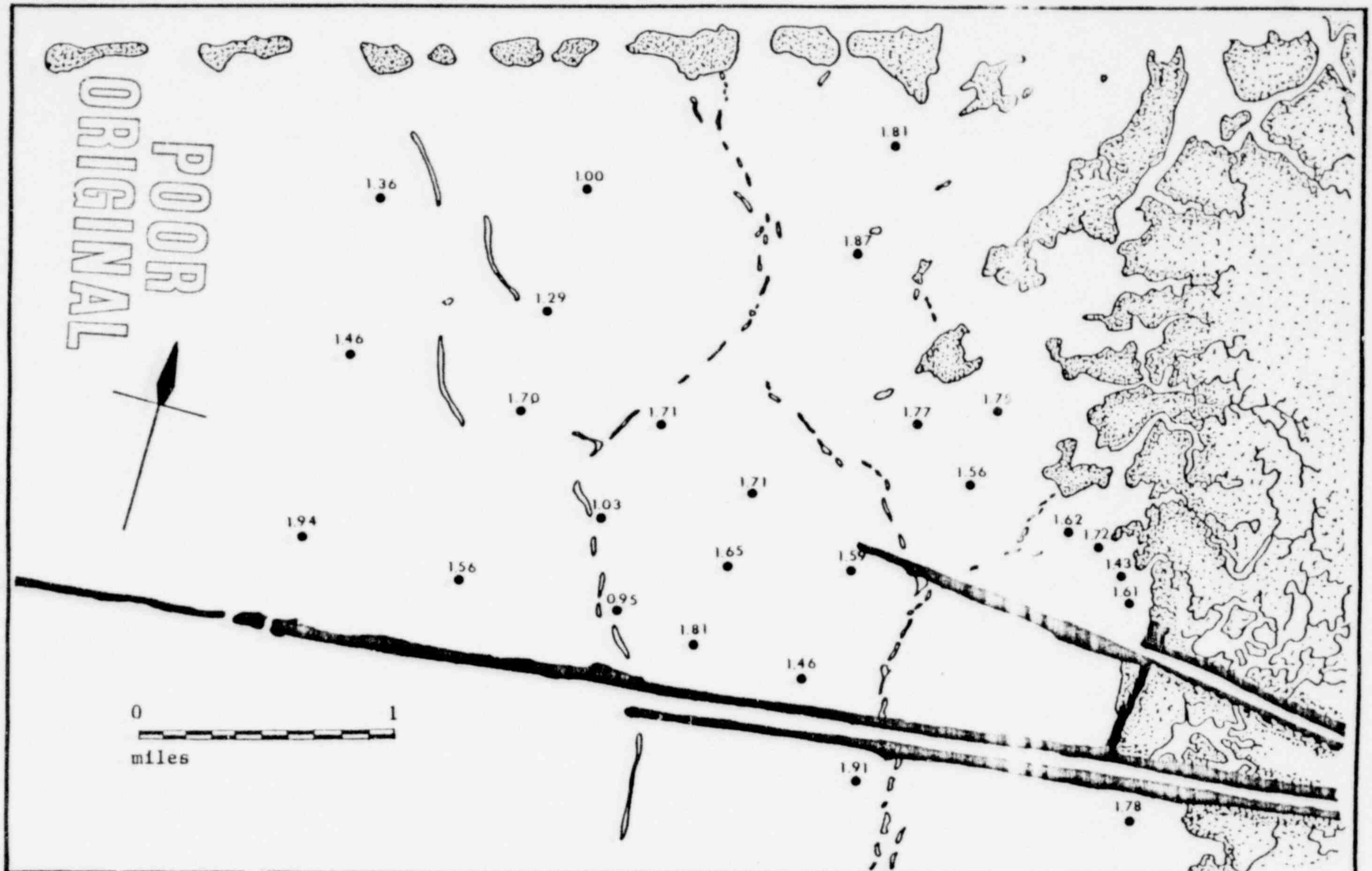

Figure 32. Distribution of kurtosis values from pooled analyses for four quarters. Values are in Ø units.

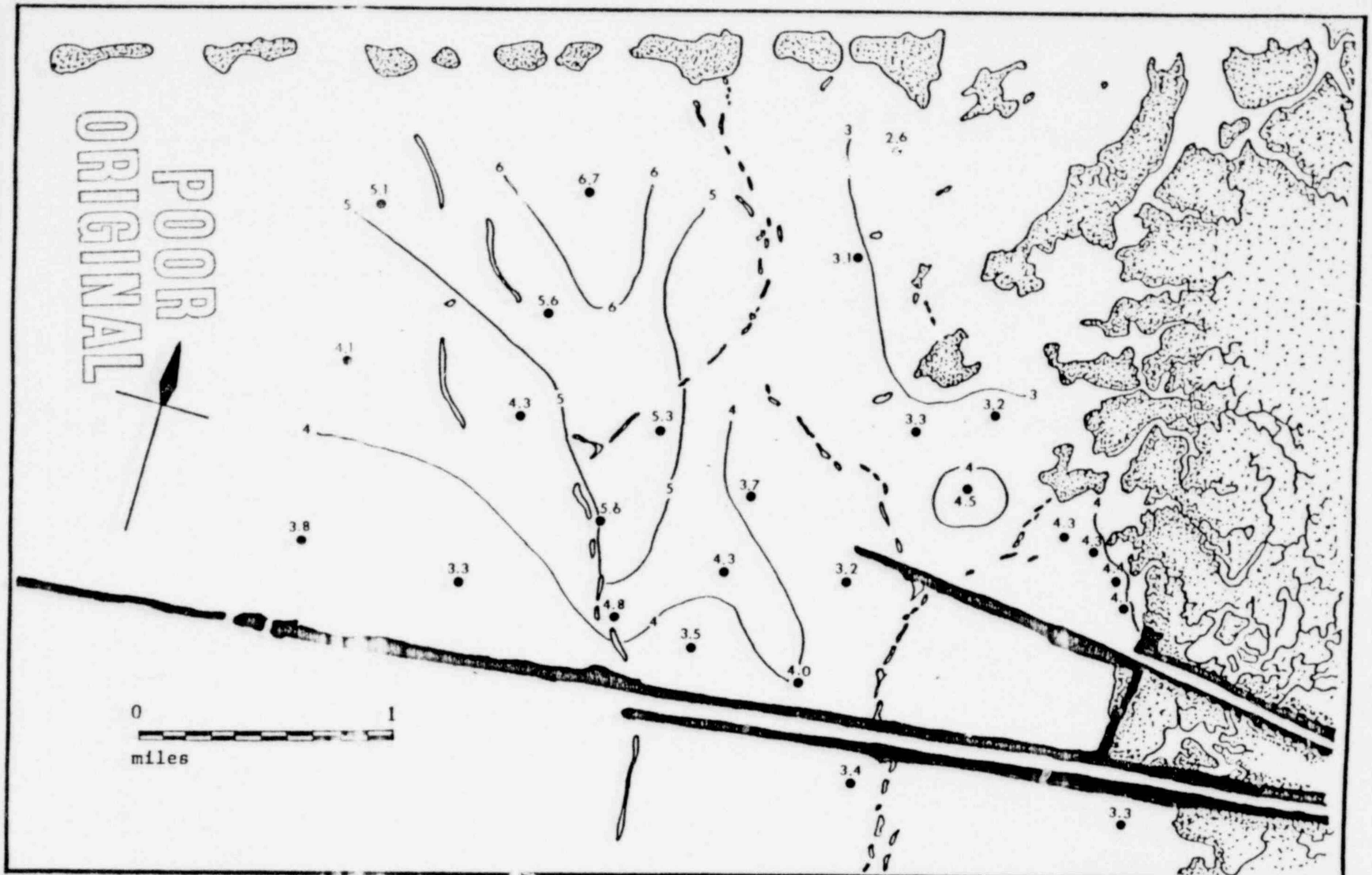

Figure 33. Distribution of average percent organic matter for dredge samples for four quarters.

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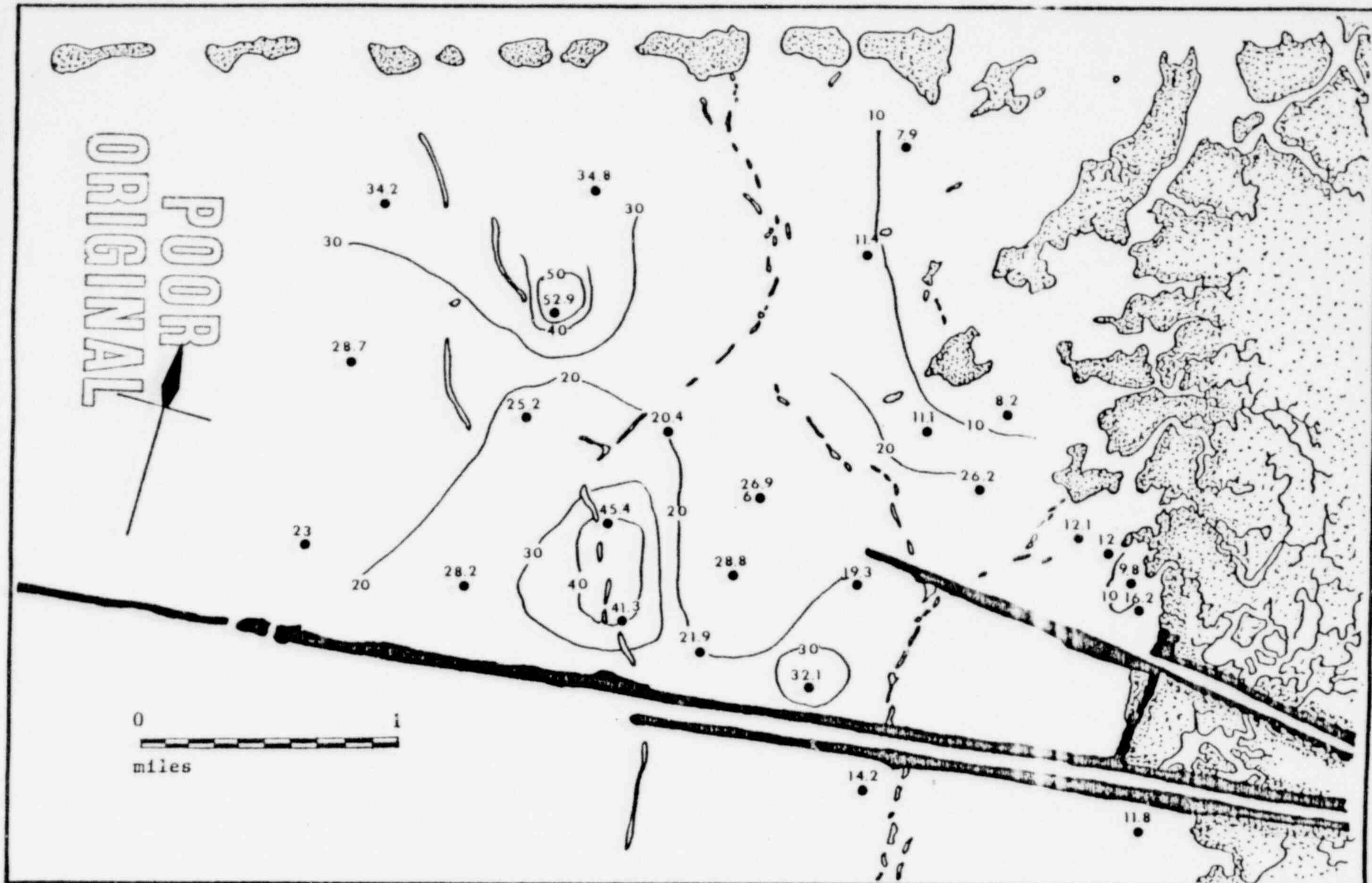


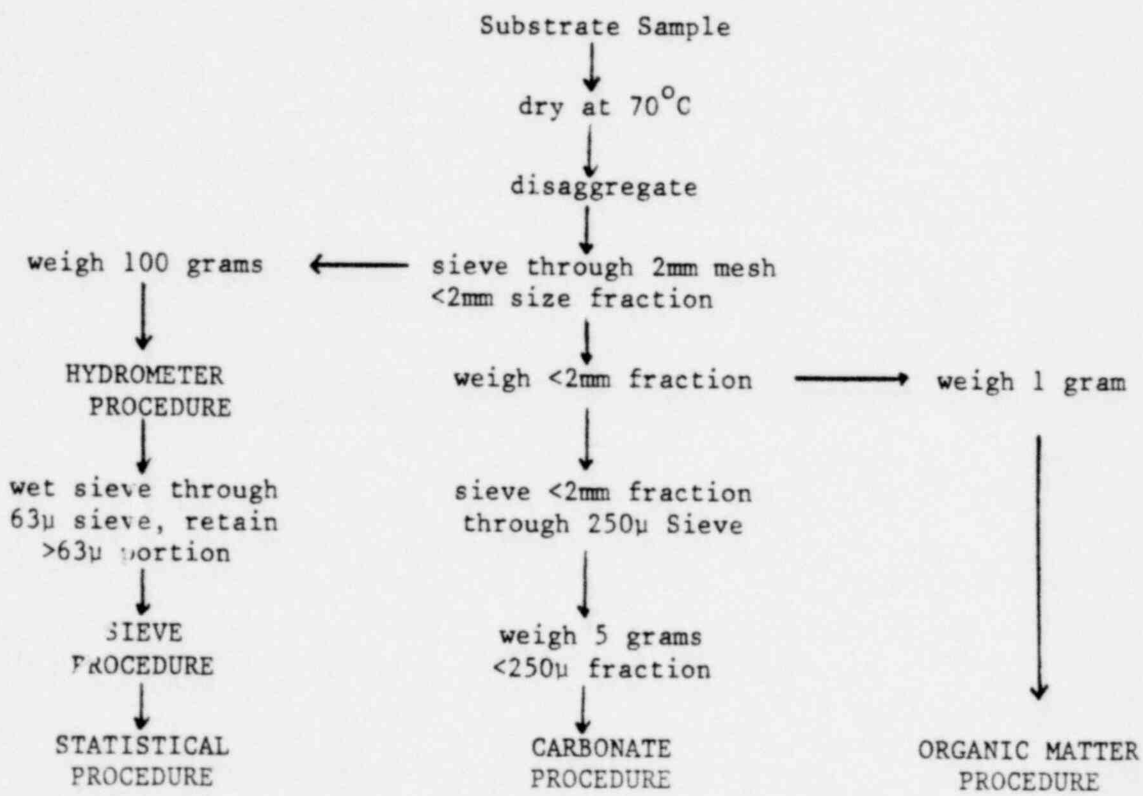
Figure 34. Distribution of average percent calcium carbonate for dredge samples for four quarters.

APPENDIX A

LABORATORY PREPARATION AND PROCEDURES

SUBSTRATE SAMPLE PREPARATION

Laboratory preparations for substrate and sediment trap samples vary somewhat because of differences in the inherent properties of each type of sample. Substrate samples followed this sample preparation scheme:



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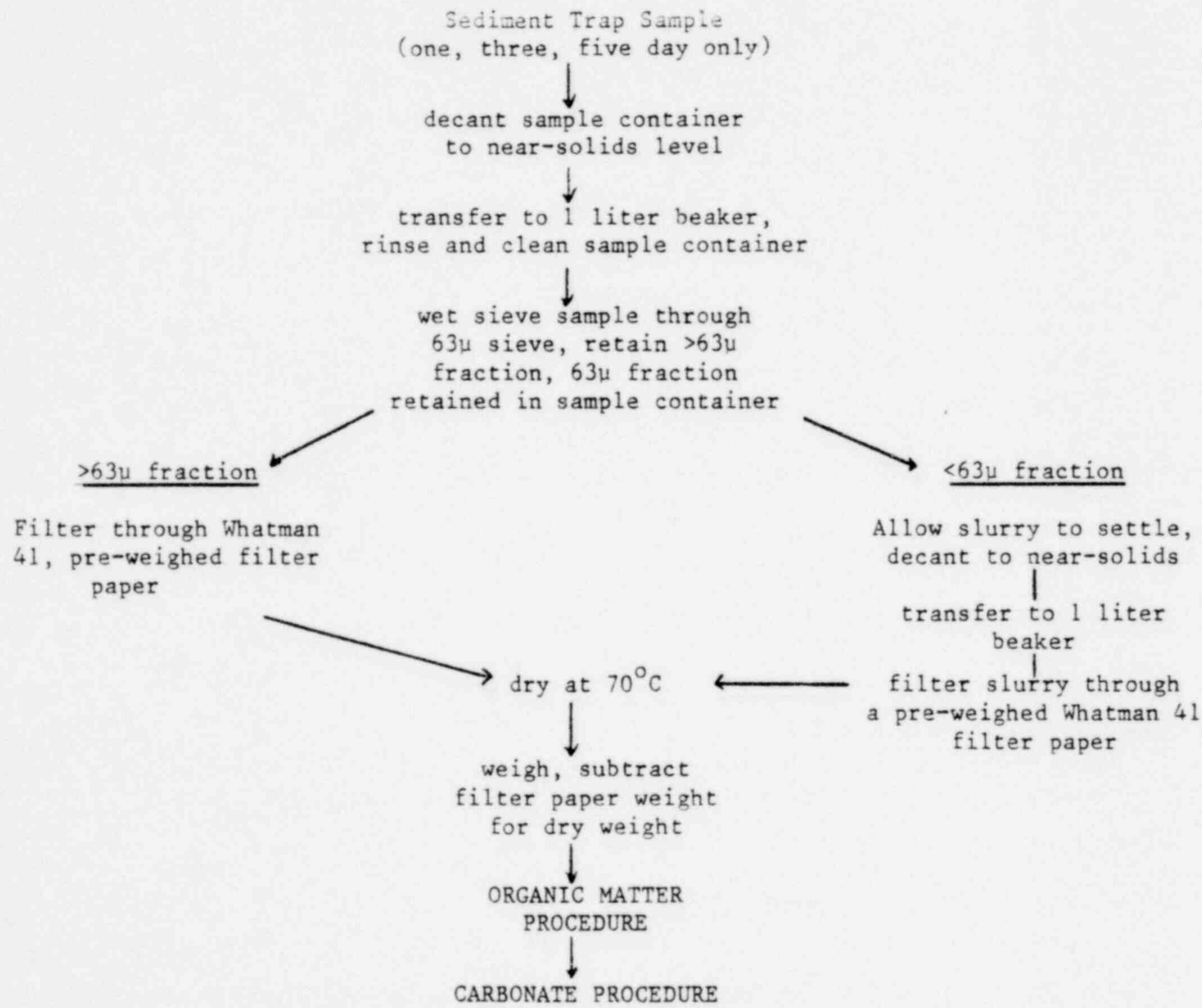
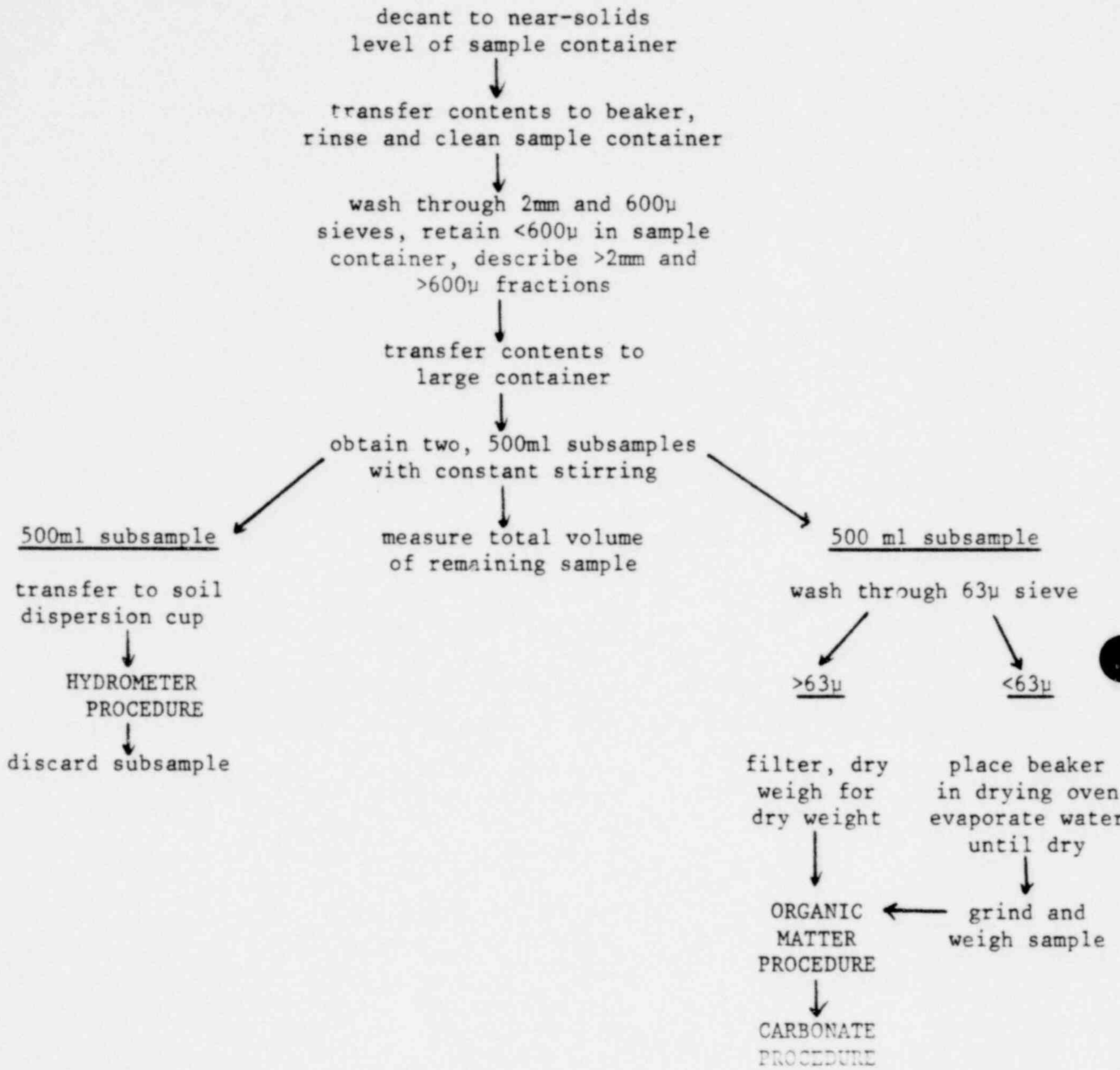
SEDIMENT TRAP SAMPLE PREPARATION

Two preparation procedures were used for the sediment trap samples. The diurnal and multiple diurnal samples contained small amounts of sediment compared to the quarterly samples, and analysis was able to be done using filtering techniques. The quarterly samples had to be subsampled and thus required a slightly difference scheme of sample preparation. Preparation schemes are as follows:



Quarterly
Sediment Trap Sample



ORGANIC MATTER PROCEDURE

The organic matter procedure is a loss-on-ignition technique whereby an oven-dried sample of one gram of substrate sample is placed into a precombusted, preweighed crucible, and heated to 550°C for four hours in a muffle furnace. After cooling to room temperature in a dessicator, the

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sample and crucible are weighed again to determine the weight loss of organic matter by ignition. This procedure has been compared to other existing methods for accuracy and precision by Dean (1974). Dean states that the procedure was found to equal or excel the accuracy and precision of several other methods.

A slight modification of the above procedure was used in the analysis of the sediment trap samples. The quantity of material analyzed was dictated by the dry weight of the sample fractions (>63 and <63μ). These weights varied from less than one gram to nearly fifteen grams. All filter paper used in the analysis was ashless (0.01% ash).

CARBONATE PROCEDURE

The procedure for analyzing inorganic carbonate in the substrate samples followed a modified procedure of Maxwell (1968) for limestone residues. This procedure utilizes the weight loss of carbon as carbon dioxide upon acidification with 6N HCl for substrate samples which contain minor amounts of organic carbon (less than 4%).

Approximately 10g of oven-dried sample was sieved through a 250μ sieve in order to lessen the influence of coarse shell material produced <u>in situ</u>. A 5g sample was weighed out and placed in a 250 ml beaker. One hundred ml of 6N HCl was carefully added to the beaker with a few drops of ethanol to prevent foaming. The sample was washed with distilled water and filtered with a Buchner funnel on a pre-weighed filter paper (Whatman 41). The remaining residue was then dried at 70°C and weighed again to determine the weight loss of carbonate in the sample. The weight loss is expressed as the weight percent of carbon dioxide as inorganic carbonate.

A different method of analysis for carbonate was used on sediment trap samples. This particular method has been reported by Dean (174) and, like

the ORGANIC MATTER PROCEUDRE, it utilizes a loss-on-ignition technique. The method was convenient because the samples could be analyzed for their carbonate content directly after weighing the weight loss at 550°C for organic matter content. Inorganic carbonates (aragonite, calcite, dolomite) decompose into their oxides and carbon dioxide at about 800°C. The procedure used 1000°C for four hours for the analysis as suggested by Dean (1974).

HYDROMETER PROCEDURE

This procedure is modified after Bouyoucos (1962) and entails the following procedural design:

Materials: Soil hydrometer, soil mixer, 1000 ml glass cylinders, dispersion cups with baffles, 5% Calgon solution, thermometer, 500 ml glass beakers, cover glasses, rubber stopper for cap of soil cylinder, plastic wash bottles, stop watch, amyl alcohol.

Procedure:

1. Weigh 50 g of air-dry sediment or 100 g if very sandy, which has been passed through a 2mm sieve.

2. Transfer sediment to 500 ml beaker, add 100 ml of 5% Calgon solution, mix thoroughly, let stand covered with watch glass for 12-15 hours or overnight.

3. Transfer and wash contents into soil dispersion cup with distilled water, and fill the cup to within three inches of the top.

4. Connect cup to soil mixer and stir for 15 minutes.

5. Disconnect and wash contents into soil cylinder using water jet from plastic bottle, and fill to liter mark.

6. Place rubber stopper on cylinder and shake contents by turning cylinder completely upside down and then back again at least 20 times.

7. Immediately start timer or stop watch, remove stopper, add three drops of amyl alcohol to dissipate froth, then gently place the hydrometer into suspension. Take reading at 40 seconds.

8. Slowly remove hydrometer. Allow cylinder with sample to set for one hour, re-insert hydrometer slowly and carefully, and read again.

9. Carefully remove hydrometer. Allow cylinder to set for an additonal hour (2 hours of time from agitation) and take the final reading.

10. After the two hour reading, wash suspension on a 63µ sieve, discarding the materials which pass through. Retain portion on the sieve, dry in oven at 70°C. Use this portion of the sample for SIEVE PROCEDURE.

Corrections and calculations: When floating in a 5% Calgon solution, the hydrometer has a stem reading of approximately 4.5. This value must be subtracted from every hydrometer reading obtained according to this procedure. An additional correction for temperature may be necessary as the hydrometer is calibrated to read correctly at 68°F. If the temperature differs significantly, a correction must be made as follows:

> Temperature correction = 0.2 x (suspension temperature °F – 68°F) Add this algebraically to the observed hydrometer reading.

After all corrections have been made, obtain percentages of sand, coarse silt, fine silt, and clay as follows:

At 40 seconds:

$$\frac{\text{Corrected hydrometer reading}}{\text{Dry wt. of soil}} \times 100 = \%(\text{c. si.} + \text{f. si.} + \text{clay})$$

At one hour:

$$\frac{\text{Corrected hydrometer reading}}{\text{Dry wt. of soil}} \times 100 = \%(\text{f. si.} + \text{clay})$$

At two hours:

$$\frac{\text{Corrected hydrometer reading}}{\text{Dry wt. of soil}} \times 100 = \%\ \text{clay}$$

% sand = 100 %(c. si. + f. si. + clay)

% coarse silt = %(c. si. + f. si. + clay) %(f. si. + clay)

% fine silt = %(f. si. + clay) % clay

A modified hydrometer procedure was used for quarterly sediment trap samples. It is not possible to obtain a dry weight on such a sample before the analysis since the dried material may lose much of the particulate properties inherent in the wet sample. In this case, a 500 ml subsample was obtained from the large sample and used in the analysis. The dry weight of the subsample was obtained after the procedure in order to calculate the percentages. Except for this departure from procedure, all other steps for the HYDROMETER PROCEDURE are the same as above.

SITE PROCEDURE

After washing the silt and clay from the sample used in the HYDROMETER PROCEDURE, the sand portion was receovered and used in this procedure to obtain the particle size distribution of the sand fraction. This sample was dried at 70°C, weighed and then sieved on a sieve shaker at 1/2 Ø intervals (in mesh sizes of 25, 35, 45, 60, 80, 120 and 230, see STATISTICAL PROCEDURE for discussion of Ø). After sieving for approximately 20 minutes, the quantity of sand retained on each screen was weighed and recorded for statistical analysis of parameters of particle size distribution.

STATISTICAL PROCEDURE

Data obtained form the SIEVE PROCEDURE were analyzed by a special statistical procedure developed by Folk (1966). These grain size parameters are calculated form a cumulative frequency curve of grain diameter versus weight percent (obtained by sieving at 1/2 Ø intervals). The phi (Ø) scale is used as the principal measure of diameter and is expressed as $-\log_2$mm, where mm is the diameter of the particle in

millimeters. Cumulative weight percents are plotted on log probability graph paper with their respective weights. From the graph, diameters at various percentiles are read and used in Folk's formulas in order to obtain the appropriate grain size parameters. For example, if the specific formula asks for Ø84, this indicates that the grain size (in phi units) occurring at the 84th percentile mark of the grain size distribution must be read from the graph and used in the calculation. The formulas and significance of Folk's parameters are:

Graphic mean diameter: Also called mean grain size, this parameter measures the average grain size of the sediment and is computed by the formula:

$$(\phi16 + \phi50 + \phi84)/3$$

Sorting coefficient: Also referred to as inclusive graphic standard deviation, it is calculated by the formula:

$$\frac{\phi84 \quad \phi16}{4} + \frac{\phi95 \quad \phi5}{6.6}$$

Sorting is a measure of the dispersion around the mean (standard deviation) and includes 90% of the grain size distribution in the calculation. Values for sorting are classified by the following scheme:

Very well sorted	.35Ø	
Well sorted	.35	.50Ø
Moderately well sorted	.50	.71Ø
Moderately sorted	.71	1.0Ø
Poorly sorted	1.0	2.0Ø
Very poorly sorted	2.0	4.0Ø
Extremely poorly sorted	> 4.0Ø	

Inclusive graphic skewness: Skewness is a measure of the symmetry of the frequency curve. A perfectly symmetrical curve has a skewness of 0.0. Negative skewness values indicate that the distribution is skewed toward the coarser size classes. Positive values indicate that the direction of asymmetry is in the direction of the finer grain sizes. The formula for this parameter is:

$$\frac{\phi16 + \phi84 \quad 2\phi50}{2(\phi84 \quad \phi16)} + \frac{\phi5 + \phi95 \quad 2\phi50}{2(\phi95 \quad \phi5)}$$

Skewness values range from +1.00 to -1.00

Strongly fine-skewed	+1.00 to +0.30
Fine-skewed	+0.30 to +0.10
Near symmetrical	+0.10 to -0.10
Coarse-skewed	-0.10 to -0.30
Strongly coarse-skewed	-0.30 to -1.00

Graphic kurotsis: Although kurtosis is always calculated as a measure of "peakedness" of the grain size distribution, its relationship to depositional environments is still questionable. It is calcualted by the formula:

$$\frac{\phi 95 \quad \phi 5}{2.44(\phi 75 \quad \phi 25}$$

Kurtosis values range from .41 to 8.00. The ranges and classifications are:

Very platykurtic	0.41 to 0.67
Platykurtic (flat)	0.67 to 0.90
Mesokurtic	0.90 to 1.11
Leptokurtic (peaked)	1.11 to 1.50
Very leptokurtic	1.50 to 3.00
Extremely leptokurtic	3.00 to 8.00

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A P P E N D I X   B

Calculated Rates of Resuspension

for Sediment Trap Samples

APPENDIX B

TRAP A

$g/m^2 \cdot day$

	24 Hours				3 Days				5 Days				90 Days			
	>63μ	<63μ	Total	% Dry wt. Total	>63μ	<63μ	Total	% Dry wt. Total	>63μ	<63μ	Total	% Dry wt. Total	>63μ	<63μ	Total	% Dry wt. Total
1st Quarter																
Dry weight	37.1	22.9	59.9	----	21.1	25.4	46.5	----	17.2	48.8	66.0	----	14.1	40.6	54.7	----
Organic matter	6.2	7.8	10.6	23.3	4.2	5.0	9.2	19.8	3.3	9.6	12.9	19.6	0.7	9.9	10.6	19.3
Carbonate	3.5	7.1	10.6	17.7	3.9	8.0	11.9	25.5	3.1	14.0	17.1	25.9	0.3	7.0	7.3	13.4
Siliceous	27.4	8.0	35.3	59.0	13.0	12.4	25.3	54.7	10.8	25.2	36.0	54.5	13.1	23.7	36.8	67.3
2nd Quarter																
Dry weight	- not sampled -				19.1	33.1	52.2	----	13.1	18.8	31.9	----	7.5	135.1	142.6	----
Organic matter	- not sampled -				2.9	6.5	9.4	17.9	1.2	4.3	5.5	17.3	1.0	27.6	28.5	20.1
Carbonate	- not sampled -				2.7	6.7	9.4	18.1	0.7	3.4	4.1	12.9	0.6	29.9	30.5	21.4
Siliceous	- not sampled -				13.5	19.9	33.4	64.0	11.2	11.1	22.3	69.8	6.0	77.6	83.6	58.5
3rd Quarter																
Dry weight	34.9	78.9	113.8	----	- not sampled -				25.7	115.6	141.2	----	6.2	153.3	159.6	----
Organic matter	3.5	14.8	18.4	16.2	- not sampled -				2.5	23.6	26.1	18.4	1.3	46.6	47.9	28.9
Carbonate	7.4	23.2	30.6	26.9	- not sampled -				4.3	23.4	27.7	19.6	0.7	19.8	20.6	12.4
Siliceous	24.0	40.9	64.8	59.9	- not sampled -				18.9	68.6	87.4	62.0	4.3	86.9	91.1	58.7
4th Quarter																
Dry weight	- not sampled -				- not sampled -				13.4	152.5	165.8	----	5.7	67.3	73.0	----
Organic matter	- not sampled -				- not sampled -				3.3	30.7	33.9	20.4	1.2	13.4	14.7	20.1
Carbonate	- not sampled -				- not sampled -				1.6	44.6	46.2	27.9	0.7	22.6	23.3	31.9
Siliceous	- not sampled -				- not sampled -				8.6	77.2	85.7	51.7	3.7	31.3	35.0	48.0

TRAP B

$g/m^2 \cdot day$

	24 Hours				3 Days				5 Days				90 Days			
1st Quarter	>63µ	<63µ	Total	% Dry wt. Total	>63µ	<63µ	Total	% Dry wt. Total	>63µ	<63µ	Total	% Dry wt. Total	>63µ	<63µ	Total	% Dry wt. Total
Dry weight	13.6	24.7	38.2	----	16.1	37.9	54.0	----	33.0	173.2	206.2	----	1.1	30.5	31.6	----
Organic matter	4.3	7.5	11.9	31.0	2.1	6.9	9.0	16.7	7.1	29.9	37.0	17.9	0.1	8.2	8.3	26.1
Carbonate	2.1	7.1	9.2	24.1	4.5	15.1	19.6	36.4	10.5	67.3	77.8	[illegible]	0.2	8.3	8.5	26.8
Siliceous	7.2	10.1	17.1	44.9	9.5	15.9	25.4	46.9	15.4	76.0	91.4	44.3	0.8	14.0	14.8	47.1
2nd Quarter																
Dry weight	29.3	730.8	760.1	----	10.1	39.9	50.1	----	21.9	56.3	78.4	----	9.8	171.4	181.2	----
Organic matter	5.4	147.4	152.8	20.1	1.6	8.5	10.1	20.2	3.5	11.9	15.3	19.5	0.7	34.5	35.2	19.4
Carbonate	9.1	240.1	249.2	32.8	4.0	14.8	18.8	37.5	6.8	18.8	25.6	32.8	3.3	52.5	55.8	30.7
Siliceous	14.8	343.3	358.1	47.1	4.5	16.6	21.2	42.3	11.6	25.6	37.5	47.7	5.8	84.4	90.2	49.9
3rd Quarter																
Dry weight	15.0	74.7	89.7	----	18.6	117.7	136.4	----	12.6	79.7	72.3	----	3.7	176.2	179.9	----
Organic matter	4.0	12.9	17.0	18.9	3.5	22.3	25.8	18.9	2.7	15.6	18.2	19.7	0.7	47.8	48.5	27.0
Carbonate	5.3	23.5	28.8		4.5	45.0	49.5	36.4	3.1	25.9	29.0	31.4	1.2	40.9	42.1	26.4
Siliceous	5.7	38.3	43.9	49.0	10.6	50.4	61.144.7		6.8	38.2	45.1	48.9	1.8	87.5	89.3	46.6
4th Quarter																
Dry weight	40.7	66.6	107.3	----	- not sampled -				21.3	120.5	141.8	----	4.7	215.8	220.5	----
Organic matter	7.4	11.0	18.4	17.2	- not sampled -				4.3	22.8	27.1	19.1	1.1	39.6	40.7	18.5
Carbonate	10.7	29.1	39.8	37.1	- not sampled -				6.4	42.4	48.9	34.5	1.0	80.7	81.7	37.1
Siliceous	22.6	26.5	49.1	45.7	- not sampled -				10.6	55.3	65.8	46.4	2.6	95.5	98.1	44.4

POOR ORIGINAL

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TRAP C

g/m^2·day

	24 Hours				3 Days				5 Days				90 Days			
1st Quarter	>63µ	<63µ	Total	% Dry wt. Total	>63µ	<63µ	Total	% Dry wt. Total	>63µ	<63µ	Total	% Dry wt. Total	>63µ	<63µ	Total	% Dry wt. Total
Dry weight	14.8	42.6	57.3	----	4.9	23.2	28.0	----	7.0	26.8	33.8	----	3.1	30.5	33.6	----
Organic matter	3.8	9.1	13.0	22.6	1.9	4.1	5.9	21.2	1.0	4.6	5.6	16.6	0.3	7.8	8.1	24.2
Carbonate	0.2	17.2	17.4	30.5	0.2	9.2	9.4	33.4	1.7	9.8	11.5	33.9	0.1	6.0	6.1	18.2
Siliceous	10.8	16.3	26.9	46.9	2.8	9.9	12.7	45.4	4.3	12.4	16.7	49.5	2.7	16.7	19.4	57.6
2nd Quarter																
Dry weight	31.8	335.6	367.6	----	16.1	17.0	33.0	----	16.0	22.5	38.5	----	4.1	86.8	90.9	----
Organic matter	5.8	79.1	84.6	23.0	2.3	3.2	5.5	16.5	2.3	4.9	7.2	18.6	0.3	19.7	20.0	22.0
Carbonate	5.7	74.0	79.7	21.6	3.6	5.6	9.2	28.0	2.1	6.2	8.3	21.4	0.4	32.3	32.7	35.9
Siliceous	20.3	182.5	203.3	55.4	10.2	8.2	18.3	55.5	11.6	1[illegible].4	23.0	60.0	3.4	34:8	38.2	42.1
3rd Quarter																
Dry weight	22.9	76.9	99.8	----	17.1	117.8	134.9	----	29.5	108.7	138.3	----	5.6	135.4	140.9	----
Organic matter	1.3	19.6	20.8	20.9	2.3	24.5	26.8	19.9	2.6	22.3	24.9	18.0	0.4	37.8	38.3	27.1
Carbonate	2.1	16.1	18.1	18.2	1.6	36.8	38.4	28.4	3.5	29.9	33.5	24.3	0.7	24.2	24.9	17.7
Siliceous	19.5	41.2	60.9	60.9	13.2	56.5	69.7	51.7	23.4	56.5	79.9	57.7	4.5	73.4	77.7	55.2
4th Quarter																
Dry weight	- not sampled -				- not sampled -				- not sampled -				- not sampled -			
Organic matter	- not sampled -				- not sampled -				- not sampled -				- not sampled -			
Carbonate	- not sampled -				- not sampled -				- not sampled -				- not sampled -			
Siliceous	- not sampled -				- not sampled -				- not sampled -				- not sampled -			

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T R A P E

$g/m^2 \cdot day$

	24 Hours				3 Days				5 Days				90 Days			
1st Quarter	>63µ	<63µ	Total	% Dry wt. Total	>63µ	<63µ	Total	% Dry wt. Total	>63µ	<63µ	Total	% Dry wt. Total	>63µ	<63µ	Total	% Dry wt. Total
Dry weight	11.2	13.6	24.8	----	10.2	9.6	19.8	----	18.9	62.2	81.1	----	2.0	44.5	46.5	----
Organic matter	2.7	5.1	7.8	31.3	1.5	2.3	3.8	19.4	4.6	13.3	17.9	22.1	0.4	11.7	12.1	26.0
Carbonate	6.2	16.8	22.9		1.2	3.4	4.6	23.4	4.7	18.3	23.0	28.4	0.2	8.8	9.1	19.6
Siliceous	2.3				7.5	3.9	11.4	57.2	9.6	30.5	40.2	49.5	1.4	24.0	25.3	54.4
2nd Quarter																
Dry weight	10.2	204.5	214.8	----	5.5	13.8	19.3	----	15.9	13.9	29.8	----	5.3	100.5	105.8	----
Organic matter	2.7	33.2	35.9	16.7	1.0	3.4	4.3	22.5	3.4	3.3	6.7	22.6	0.6	26.0	26.6	25.1
Carbonate	1.2	66.7	67.9	31.6	1.1	3.5	4.6	23.9	4.0	3.7	7.7	25.9	1.2	23.6	24.8	23.4
Siliceous	6.3	104.6	111.0	51.7	3.4	6.9	10.4	53.6	8.5	6.9	15.4	51.5	3.5	50.9	54.4	51.5
3rd Quarter																
Dry weight	35.0	56.0	91.0	----	22.8	72.5	95.4	----	22.5	45.9	68.3	----	3.2	73.7	76.9	----
Organic matter	6.1	12.9	18.9	20.8	5.4	15.5	20.9	22.0	5.3	8.9	14.2	20.8	0.6	21.2	21.8	28.4
Carbonate	16.7	12.8	29.5	32.3	4.4	22.6	26.9	28.2	4.4	13.9	18.3	26.8	0.4	11.5	11.9	15.5
Siliceous	12.2	30.3	42.6	46.9	13.0	34.4	47.6	49.8	12.8	23.1	35.8	52.4	2.2	41.0	43.2	56.1
4th Quarter																
Dry weight	- not sampled -				- not sampled -				5.8	18.7	24.5	----	2.3	62.5	64.8	----
Organic matter	- not sampled -				- not sampled -				1.5	4.5	6.0	24.5	0.8	12.0	12.8	19.8
Carbonate	- not sampled -				- not sampled -				1.0	4.5	5.5	22.6	0.1	26.0	26.1	40.3
Siliceous	- not sampled -				- not sampled -				3.2	9.8	13.0	52.9	1.5	24.5	25.9	39.9

T R A P F

$g/m^2 \cdot day$

	24 Hours				3 Days				5 Days				90 Days			
1st Quarter	>63μ	<63μ	Total	% Dry wt. Total	>63μ	<63μ	Total	% Dry wt. Total	>63μ	<63μ	Total	% Dry wt. Total	>63μ	<63μ	Total	% Dry wt. Total
Dry weight	25.4	43.1	68.4	----	15.6	44.7	58.3	----	20.3	61.6	81.9	----	16.4	71.3	87.7	----
Organic matter	5.6	3.9	9.4	13.8	3.5	8.1	11.6	19.8	3.2	11.9	15.0	18.4	1.4	14.1	15.5	17.7
Carbonate	10.0	14.8	24.9	36.4		16.4	27.5	47.3	3.3	19.2	22.5	27.5	1.0	16.3	17.2	19.6
Siliceous	9.8	24.4	34.1	49.8		20.2	19.2	32.9	13.8	30.5	44.4	54.1	14.0	40.9	55.0	62.7
2nd Quarter																
Dry weight	61.3	330.8	392.1	----	30.8	57.1	88.0	----	41.0	75.1	116.1	----	14.8	149.3	164.0	----
Organic matter	8.8	69.2	78.0	19.9	4.2	13.1	17.4	19.8	5.4	14.7	20.1	17.3	1.5	33.9	35.4	21.6
Carbonate	4.6	81.2	85.8	21.8	3.7	10.8	14.5	16.4	3.8	16.6	20.4	17.5	0.9	47.7	48.6	29.6
Siliceous	47.9	180.4	228.3	58.3	22.9	33.2	56.1	63.8	31.8	43.8	75.6	65.2	12.4	67.7	80.0	48.8
3rd Quarter																
Dry weight	464.6	294.6	759.2	----	75.5	264.8	340.3	----	63.2	291.2	354.4	----	13.0	244.2	257.2	----
Organic matter	20.1	60.5	80.6	10.6	11.4	55.9	67.3	19.8	9.5	55.6	65.1	18.4	1.9	127.7	129.6	50.4
Carbonate	24.0	59.2	83.3	10.9	3.2	55.9	59.1	17.3	3.8	58.9	62.7	17.7	1.3	24.3	25.5	10.0
Siliceous	420.5	174.9	595.3	78.5	60.9	153.0	213.9	62.9	49.9	176.7	226.6	63.9	9.8	92.2	102.1	39.6
4th Quarter																
Dry weight	- not sampled -				- not sampled -				19.3	185.5	204.8	----	9.9	111.7	121.6	----
Organic matter	- not sampled -				- not sampled -				4.8	38.0	42.8	20.9	2.3	23.6	25.9	21.3
Carbonate	- not sampled -				- not sampled -				2.1	56.1	58.2	28.4	0.7	27.4	28.1	23.1
Siliceous	- not sampled -				- not sampled -				12.4	91.4	103.8	50.7	6.9	60.7	67.6	55.6

T R A P 2

g/m^2·day

1st Quarter	24 Hours >63μ	24 Hours <63μ	24 Hours Total	24 Hours % Dry wt. Total	3 Days >63μ	3 Days <63μ	3 Days Total	3 Days % Dry wt. Total	5 Days >63μ	5 Days <63μ	5 Days Total	5 Days % Dry wt. Total	90 Days >63μ	90 Days <63μ	90 Days Total	90 Days % Dry wt. Total
Dry weight	10.6	33.7	44.3	----	6.5	26.3	32.8	----	7.5	39.3	46.8	----	4.9	28.8	33.7	----
Organic matter	4.0	7.9	11.9	26.9	1.3	6.1	7.3	22.4	1.1	7.6	8.7	18.5	0.2	7.0	7.2	21.4
Carbonate	2.6	14.0	16.6	37.5	1.5	8.1	9.7	29.6	1.6	12.7	14.3	30.5	0.2	6.3	6.5	19.1
Siliceous	4.0	11.8	15.8	35.6	3.7	12.1	15.8	48.0	4.8	19.0	23.8	51.0	4.5	15.5	20.0	59.5
2nd Quarter																
Dry weight	22.8	221.7	244.5	----	11.6	18.5	30.1	----	9.5	11.7	21.2	----	2.3	73.4	75.8	----
Organic matter	5.8	64.1	69.9	28.6	1.6	4.3	5.9	19.5	1.0	2.6	3.6	17.0	0.4	15.3	15.7	20.7
Carbonate	1.6	69.4	71.0	29.1	2.7	4.7	7.4	24.6	0.9	3.7	4.6	21.6	0.4	24.9	25.3	33.4
Siliceous	15.4	88.2	103.6	42.3	7.3	9.5	16.8	55.9	7.6	5.4	13.0	61.4	1.5	33.2	34.8	45.9
3rd Quarter																
Dry weight	20.1	87.1	107.2	----	21.8	102.4	124.2	----	20.5	111.2	131.7	----	2.1	75.1	77.2	----
Organic matter	5.5	13.6	19.1	17.8	2.8	22.9	25.7	20.7	2.9	21.6	24.6	18.7	0.5	21.3	21.8	28.3
Carbonate	3.4	39.8	43.2	40.3	5.2	30.1	35.4	28.4	3.7	34.1	37.8	28.7	0.1	16.5	16.6	21.4
Siliceous	11.2	33.7	44.9	42.0	13.8	49.4	63.1	50.9	13.9	55.5	69.3	52.7	1.5	37.3	38.8	50.3
4th Quarter																
Dry weight		- not sampled -				- not sampled -			13.1	76.0	89.1	----	3.2	73.5	76.7	----
Organic matter		- not sampled -				- not sampled -			2.6	14.3	16.9	19.0	1.1	16.4	17.5	22.7
Carbonate		- not sampled -				- not sampled -			3.0	26.6	29.6	3[illegible].2	0.2	19.6	19.8	25.8
Siliceous		- not sampled -				- not sampled -			7.6	35.1	42.7	4[illegible].8	2.0	37.5	39.5	51.5

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T R A P 3

g/m^2·day

1st Quarter	24 Hours >63µ	24 Hours <63µ	24 Hours Total	24 Hours % Dry wt. Total	3 Days >63µ	3 Days <63µ	3 Days Total	3 Days % Dry wt. Total	5 Days >63µ	5 Days <63µ	5 Days Total	5 Days % Dry wt. Total	90 Days >63µ	90 Days <63µ	90 Days Total	90 Days % Dry wt. Total
Dry weight	6.3	60.8	67.2	----	4.3	47.4	51.7	----	12.1	89.6	101.6	----	7.5	65.9	73.5	----
Organic matter	3.9	3.2	7.1	10.5	0.0	7.7	7.7	14.9	2.4	15.8	18.2	17.9	0.5	11.0	11.5	15.7
Carbonate	1.3	23.6	24.9	37.1	1.1	20.2	21.3	41.2	3.9	32.3	36.3	35.7	2.5	27.0	29.5	40.3
Siliceous	1.1	34.0	35.2	52.4	3.2	19.5	22.7	43.9	5.8	41.5	47.1	46.4	4.5	27.9	32.5	44.1
2nd Quarter																
Dry weight	36.9	845.6	882.5	----	34.9	40.2	75.0	----	10.2	35.0	45.2	----	26.7	203.0	229.7	----
Organic matter	10.0	184.1	194.1	22.0	5.5	8.1	13.6	18.1	1.6	6.4	8.0	17.7	1.3	40.4	41.7	18.1
Carbonate	6.7	238.8	245.6	27.8	12.7	13.2	25.9	34.6	3.7	12.6	16.4	36.2	4.9	74.8	79.7	34.8
Siliceous	20.2	422.7	442.8	50.3	16.7	18.9	35.5	47.3	4.9	16.0	20.8	46.1	20.5	87:8	108.3	47.1
3rd Quarter																
Dry weight	32.5	207.5	240.0	----	25.4	261.0	286.4	----	22.5	200.9	223.4	----	13.7	244.8	258.5	----
Organic matter	4.9	30.2	35.0	14.6	5.0	47.2	52.2	18.2	3.6	28.6	32.3	14.4	1.3	58.2	59.5	23.0
Carbonate	14.6	88.3	102.9	42.8	5.0	91.7	96.7	33.7	5.9	82.4	88.3	39.6	3.2	67.3	70.5	27.3
Siliceous	13.0	89.0	102.1	42.7	15.4	122.1	137.5	48.1	13.0	89.9	102.8	46.0	9.2	119.3	128.5	49.7
4th Quarter																
Dry weight	- not sampled -				- not sampled -				7.1	427.1	434.2	----	10.5	291.6	302.1	----
Organic matter	- not sampled -				- not sampled -				1.1	57.3	58.4	13.5	1.6	68.5	70.2	23.2
Carbonate	- not sampled -				- not sampled -				2.3	191.6	193.9	44.7	2.6	63.3	65.9	21.8
Siliceous	- not sampled -				- not sampled -				3.6	178.2	181.8	41.8	6.2	159.8	166.0	55.0

POOR ORIGINAL

TRAP 6

$g/m^2 \cdot day$

	24 Hours				3 Days				5 Days				90 Days			
1st Quarter	>63μ	<63μ	Total	% Dry wt. Total	>63μ	<63μ	Total	% Dry wt. Total	>63μ	<63μ	Total	% Dry wt. Total	>63μ	<63μ	Total	% Dry wt. Total
Dry weight	22.3	41.0	63.3	----	19.3	34.8	54.1	----	20.0	105.4	125.4	----	4.6	61.2	65.8	----
Organic matter	4.6	10.1	14.7	23.2	0.9	5.8	6.8	12.5	3.5	17.6	21.0	16.8	0.5	14.8	15.3	23.2
Carbonate	1.3	13.2	14.5	23.0	1.4	14.1	15.4	28.4	5.2	36.3	41.5	33.0	0.5	14.6	15.0	23.0
Siliceous	16.4	17.7	34.1	53.8	17.0	14.9	31.[illegible]	59.1	11.3	51.5	62.9	50.2	3.6	31.8	35.5	53.8
2nd Quarter																
Dry weight	37.1	482.1	519.2	----	11.9	18.7	30.6	----	26.9	31.8	58.7	----	9.2	144.6	153.8	----
Organic matter	7.4	116.5	123.9	23.9	1.9	3.3	5.3	17.2	19.7	6.7	26.5	45.1	0.7	32.7	33.4	21.7
Carbonate	7.4	107.9	115.3	22.3	3.7	9.6	13.3	43.2	1.6	10.5	12.2	20.7	1.4	49.0	50.4	32.8
Siliceous	22.3	257.7	280.0	53.8	6.3	5.8	12.0	39.6	5.6	14.6	20.0	34.2	7.1	62.9	70.0	45.6
3rd Quarter																
Dry weight	22.9	123.7	146.6	----	31.5	185.4	216.8	----	22.6	135.9	158.6	----	12.4	224.8	237.2	----
Organic matter	2.6	20.5	23.1	15.8	4.6	36.1	40.7	18.8	2.3	23.3	25.5	16.1	1.4	59.0	60.4	25.5
Carbonate	1.4	44.6	46.0	31.4	5.3	56.7	62.1	28.7	3.6	47.0	50.6	31.8	1.2	39.9	41.1	17.3
Siliceous	18.9	58.6	77.5	52.8	21.6	92.6	114.0	52.6	16.7	65.6	82.5	52.1	9.8	125.9	135.71	57.2
4th Quarter																
Dry weight	- not sampled -				- not sampled -				7.6	340.9	348.5	----	5.9	222.7	228.6	----
Organic matter	- not sampled -				- not sampled -				0.9	58.3	59.2	17.0	1.0	54.9	55.9	24.4
Carbonate	- not sampled -				- not sampled -				1.2	127.3	128.5	36.9	1.1	44.1	45.2	19.8
Siliceous	- not sampled -				- not sampled -				5.5	155.3	160.8	46.1	3.8	123.7	127.5	55.8

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TRAP 9

$g/m^2 \cdot day$

	24 Hours			% Dry wt.	3 Days			% Dry wt.	5 Days			% Dry wt.	90 Days			% Dry wt.
1st Quarter	>63μ	<63μ	Total	Total	>63μ	<63μ	Total	Total	>63μ	<63μ	Total	Total	>63μ	<63μ	Total	Total
Dry weight	10.8	44.2	55.0	----	13.2	73.1	86.3	----	20.9	134.4	155.3	----	5.1	82.4	87.5	----
Organic matter	1.5	11.5	13.0	23.6	0.6	11.2	11.8	13.7	3.5	23.9	27.3	17.6	0.5	18.7	19.2	22.0
Carbonate	2.0	15.1	17.1	31.2	4.4	33.9	38.3	44.4	4.6	52.9	57.5	37.1	1.5	24.2	25.7	29.3
Siliceous	7.3	17.6	24.9	45.2	8.2	28.0	36.2	41.9	12.8	57.6	70.5	45.3	3.1	39.5	42.6	48.7
2nd Quarter																
Dry weight	9.1	273.6	282.8	----	14.0	83.5	97.5	----	19.0	56.7	75.6	----	25.7	455.8	481.5	----
Organic matter	1.4	54.6	56.0	19.8	2.3	12.8	15.1	15.5	2.7	10.2	12.8	17.0	1.8	93.8	95.6	19.8
Carbonate	2.9	88.7	91.6	32.5	5.6	39.6	45.2	46.4	7.2	23.3	30.4	40.3	10.7	141.9	152.6	31.6
Siliceous	4.8	130.3	135.2	47.7	6.1	31.1	37.2	38.1	9.1	23.2	32.4	42.7	13.2	220.1	233.3	48.6
3rd Quarter																
Dry weight	72.1	246.7	318.8	----	85.0	259.7	344.8	----	72.9	285.5	358.4	----	23.2	580.2	603.4	----
Organic matter	11.3	42.0	53.3	16.7	12.5	44.1	56.6	16.4	11.6	36.5	48.1	13.4	2.3	76.4	78.7	13.0
Carbonate	30.9	103.0	133.9	42.1	27.8	107.0	134.8	39.1	30.8	137.7	168.5	47.1	11.2	276.8	287.9	47.8
Siliceous	29.9	101.7	131.6	41.2	44.7	108.6	153.4	44.5	30.5	111.3	141.8	39.5	9.7	227.0	236.8	39.2
4th Quarter																
Dry weight	60.7	126.0	186.7	----	- not sampled -				45.9	383.4	429.4	----	19.0	360.8	379.8	----
Organic matter	6.6	22.7	29.4	15.7	- not sampled -				5.4	48.0	53.4	12.4	2.3	79.1	81.4	21.4
Carbonate	34.4	57.2	91.6	49.1	- not sampled -				25.3	198.3	223.6	52.1	7.3	109.1	116.3	30.6
Siliceous	19.7	46.1	65.7	35.2	- not sampled -				15.2	137.1	152.4	35.5	9.4	172.6	182.1	48.0

TRAP 11

$g/m^2 \cdot day$

	24 Hours			% Dry wt.	3 Days			% Dry wt.	5 Days			% Dry wt.	90 Days			% Dry wt.
1st Quarter	>63µ	<63µ	Total	Total	>63µ	<63µ	Total	Total	>63µ	<63µ	Total	Total	>63µ	<63µ	Total	Total
Dry weight	53.5	85.3	138.8	----	28.9	172.1	201.0	----	56.5	246.8	303.3	----	22.6	132.1	154.7	----
Organic matter	10.1	5.5	15.6	11.2	2.8	24.9	27.8	13.8	7.0	38.4	45.3	15.0	1.5	20.8	22.3	14.4
Carbonate	2.6	27.3	29.9	21.6	7.8	82.9	90.8	45.3	22.1	102.8	125.0	41.2	7.7	57.4	65.1	42.1
Siliceous	40.8	52.5	93.3	67.2	18.3	64.3	82.4	40.9	27.4	105.6	133.0	43.8	13.4	53.9	67.3	43.5
2nd Quarter																
Dry weight	44.4	448.9	493.3	----	28.3	102.1	130.4	----	43.4	167.8	211.2	----		- not sampled -		
Organic matter	4.7	86.2	91.0	18.4	4.0	17.1	21.1	16.2	4.6	25.2	29.7	14.1		- not sampled -		
Carbonate	12.7	157.7	170.3	34.6	12.6	44.4	57.0	[illegible].7	16.9	75.1	92.0	43.7		- not sampled -		
Siliceous	27.0	205.0	232.0	47.0	11.7	40.6	52.3	40.1	21.9	67.5	89.5	42.2		- not sampled -		
3rd Quarter																
Dry weight		- not sampled -				- not sampled -			75.4	252.5	327.9	----	33.9	262.8	296.7	----
Organic matter		- not sampled -				- not sampled -			5.7	30.3	36.0	11.0	1.8	60.2	62.2	20.9
Carbonate		- not sampled -				- not sampled -			21.7	129.6	151.3	46.2	16.6	88.6	105.2	35.5
Siliceous		- not sampled -				- not sampled -			48.0	92.6	140.6	42.8	15.5	114.0	129.5	43.6
4th Quarter																
Dry weight	105.0	158.1	263.1	----		- not sampled -			27.7	167.5	195.2	----	32.6	431.6	464.2	----
Organic matter	7.8	21.9	29.8	11.3		- not sampled -			2.8	27.4	30.2	15.4	3.0	62.0	65.0	14.0
Carbonate	46.3	81.8	128.1	48.7		- not sampled -			10.5	71.4	82.0	42.0	15.6	184.7	200.4	43.2
Siliceous	50.9	54.4	105.2	40.0		- not sampled -			14.5	68.7	83.1	42.6	14.0	184.9	198.8	42.8

TRAP 13

$g/m^2 \cdot day$

24 Hours

	>63μ	<63μ	Total	% Dry wt. Total
1st Quarter				
Dry weight	37.9	81.4	119.3	----
Organic matter	3.8	20.1	23.8	20.0
Carbonate	3.6	21.4	25.0	20.9
Siliceous	30.5	39.9	70.5	59.1
2nd Quarter				
Dry weight	44.0	1139.4	1183.4	----
Organic matter	7.9	181.9	189.8	16.0
Carbonate	18.3	488.1	506.4	42.8
Siliceous	17.8	469.4	487.2	41.2
3rd Quarter				
Dry weight	61.2	148.1	209.3	----
Organic matter	5.9	22.6	28.6	13.6
Carbonate	14.4	69.7	84.0	40.3
Siliceous	40.9	55.8	96.7	46.1
4th Quarter				
Dry weight	22.7	43.5	66.2	----
Organic matter	0.9	4.8	5.7	8.7
Carbonate	10.8	14.9	25.7	38.8
Siliceous	11.0	23.8	34.7	52.5

3 Days

	>63μ	<63μ	Total	% Dry wt. Total
1st Quarter				
Dry weight	41.7	186.1	227.7	----
Organic matter	6.5	28.4	34.9	15.3
Carbonate	14.6	87.2	101.8	44.8
Siliceous	20.6	70.5	91.0	39.9
2nd Quarter				
Dry weight	36.1	101.1	137.2	----
Organic matter	1.6	18.3	19.9	14.5
Carbonate	16.5	41.4	57.9	42.1
Siliceous	18.0	41.4	59.4	43.4
3rd Quarter				
Dry weight	24.0	174.9	198.9	----
Organic matter	3.7	27.7	31.4	15.8
Carbonate	9.9	79.6	89.5	45.0
Siliceous	10.4	67.6	78.0	39.2
4th Quarter				
Dry weight	- not sampled -			
Organic matter	- not sampled -			
Carbonate	- not sampled -			
Siliceous	- not sampled -			

5 Days

	>63μ	<63μ	Total	% Dry wt. Total
1st Quarter				
Dry weight	26.2	273.2	299.3	----
Organic matter	4.4	37.3	41.8	14.0
Carbonate	10.6	131.7	142.4	47.5
Siliceous	11.2	104.2	115.1	38.5
2nd Quarter				
Dry weight	41.4	149.2	190.6	----
Organic matter	6.0	30.3	36.4	19.1
Carbonate	15.9	51.3	67.3	35.3
Siliceous	19.5	67.6	86.9	45.6
3rd Quarter				
Dry weight	26.2	148.0	174.2	----
Organic matter	3.8	21.2	25.0	14.3
Carbonate	7.7	68.0	75.7	43.4
Siliceous	14.7	58.8	73.5	42.3
4th Quarter				
Dry weight	7.5	23.8	31.2	----
Organic matter	0.8	4.2	5.0	15.9
Carbonate	3.7	10.3	14.0	44.9
Siliceous	2.9	9.4	12.2	39.2

90 Days

	>63μ	<63μ	Total	% Dry wt. Total
1st Quarter				
Dry weight	10.5	92.3	102.8	----
Organic matter	1.0	15.5	16.5	16.0
Carbonate	4.4	40.4	44.8	43.7
Siliceous	5.1	36.4	41.5	40.3
2nd Quarter				
Dry weight	- not sampled -			
Organic matter	- not sampled -			
Carbonate	- not sampled -			
Siliceous	- not sampled -			
3rd Quarter				
Dry weight	12.6	204.5	217.1	----
Organic matter	1.4	46.4	47.8	22.0
Carbonate	5.5	67.4	72.9	33.7
Siliceous	5.7	90.7	96.4	44.3
4th Quarter				
Dry weight	4.9	113.8	118.7	----
Organic matter	0.9	24.6	25.5	21.4
Carbonate	2.0	36.6	38.6	32.5
Siliceous	2.1	52.6	54.7	46.1

POOR ORIGINAL

TRAP 16

$g/m^2 \cdot day$

	24 Hours			% Dry wt.	3 Days			% Dry wt.	5 Days			% Dry wt.	90 Days			% Dry wt.
1st Quarter	>63μ	<63μ	Total	Total	>63μ	<63μ	Total	Total	>63μ	<63μ	Total	Total	>63μ	<63μ	Total	Total
Dry weight	86.8	35.1	121.9	----	6.6	26.3	32.9	----	27.7	70.5	98.2	----	2.6	79.4	82.1	----
Organic matter	5.0	1.1	6.1	5.0	0.0	5.0	5.0	12.4	6.7	18.2	24.9	25.4	0.4	18.8	19.2	23.4
Carbonate	2.0	12.7	14.7	12.0	1.8	11.6	13.4	40.7	8.0	22.1	30.1	30.7	0.5	17.7	18.1	[illegible]
Siliceous	79.8	21.3	101.1	83.0	4.8	9.7	14.5	46.9	13.0	30.2	43.2	43.9	1.7	42.9	44.8	54.5
2nd Quarter																
Dry weight	13.1	522.8	535.9	----	12.0	45.8	57.8	----	14.4	53.8	68.1	----	8.4	592.4	600.9	----
Organic matter	2.4	118.3	120.7	22.5	4.9	[illegible]	14.8	25.7	2.9	11.3	14.2	20.8	1.1	119.7	120.8	20.1
Carbonate	2.3	141.2	143.5	26.8	2.8	13.7	16.6	28.7	4.0	17.4	21.4	31.4	2.6	162.4	165.0	27.5
Siliceous	8.4	263.3	271.7	50.7	4.3	22.1	26.4	45.6	7.5	25.1	[illegible]	47.8	4.7	310.3	315.1	52.4
3rd Quarter																
Dry weight	54.4	178.3	232.7	----	60.5	194.4	254.9	----	31.5	126.4	157.9	----	7.7	323.5	331.2	----
Organic matter	8.7	33.4	42.1	18.1	8.0	32.4	40.4	15.8	6.4	24.5	30.9	19.6	1.0	81.3	82.3	24.9
Carbonate	12.0	58.7	70.8	30.5	8.2	76.5	84.6	33.2	6.0	42.0	48.0	30.5	2.5	67.6	70.0	21.2
Siliceous	33.7	86.2	119.8	51.4	44.3	85.5	129.9	51.0	19.1	59.9	79.0	49.9	4.2	74.6	178.9	53.9
4th Quarter																
Dry weight	- not sampled -				- not sampled -				33.0	137.2	170.2	----	6.1	216.9	223.0	----
Organic matter	- not sampled -				- not sampled -				5.5	22.9	28.4	16.7	1.2	45.1	46.3	20.8
Carbonate	- not sampled -				- not sampled -				9.7	52.2	61.9	36.4	1.0	60.4	61.4	27.6
Siliceous	- not sampled -				- not sampled -				17.8	62.1	79.9	46.9	3.9	111.4	115.3	51.6

TRAP 18

g/m^2·day

	24 Hours				3 Days				5 Days				90 Days			
	>63µ	<63µ	Total	% Dry wt. Total	>63µ	<63µ	Total	% Dry wt. Total	>63µ	<63µ	Total	% Dry wt. Total	>63µ	<63µ	Total	% Dry wt. Total
1st Quarter																
Dry weight		- not sampled -			18.3	52.3	70.6	----	10.6	33.9	44.5	----	6.2	87.0	93.3	----
Organic matter		- not sampled -			2.1	9.2	11.3	16.0	1.8	7.7	9.5	21.3	0.7	22.0	22.7	24.3
Carbonate		- not sampled -			2.3	20.2	22.6	31.8	2.4	8.9	11.4	25.5	0.9	21.7	22.5	24.1
Siliceous		- not sampled -			13.9	22.9	36.7	52.2	6.4	17.3	23.6	53.2	4.6	43.3	48.1	51.6
2nd Quarter																
Dry weight	19.8	464.7	484.1	----	17.7	58.0	75.8	----	9.7	32.5	42.2	----	7.4	322.5	329.9	----
Organic matter	6.7	96.2	102.9	21.2	3.4	12.6	16.1	21.2	1.9	6.6	8.5	20.2	0.8	72.7	73.6	22.3
Carbonate	3.0	128.1	131.1	27.1	5.9	18.8	24.7	32.5	1.8	11.0	12.8	30.3	1.9	87.6	89.5	27.1
Siliceous	10.1	240.4	250.1	51.7	8.4	26.6	35.0	46.3	6.0	14.9	20.9	49.5	4.7	162.2	166.8	50.6
3rd Quarter																
Dry weight		- not sampled -			27.8	297.7	3[illegible]	----	28.9	21[illegible].6	244.5	----	10.9	586.5	597.5	----
Organic matter		- not sampled -			4.6	67.6	72.2	22.2	5.8	40.7	46.4	19.0	1.4	114.9	116.3	19.5
Carbonate		- not sampled -			5.6	85.0	90.5	27.8	5.9	92.5	98.4	40.3	2.1	173.7	175.8	29.3
Siliceous		- not sampled -			17.6	145.1	162.8	50.0	17.2	[illegible]2.4	99.7	40.7	7.4	297.[illegible]	305.4	51.2
4th Quarter																
Dry weight		- not sampled -				- not sampled -			10.8	649.9	660.7	----	8.5	281.2	289.7	----
Organic matter		- not sampled -				- not sampled -			1.6	127.9	129.6	19.6	1.7	67.0	68.7	23.7
Carbonate		- not sampled -				- not sampled -			1.6	213.[illegible]	214.8	32.5	1.3	57.3	58.6	20.2
Siliceous		- not sampled -				- not sampled -			7.6	308.8	316.3	47.9	5.5	156.9	162.4	56.1

TRAP 20

$g/m^2 \cdot day$

	24 Hours				3 Days				5 Days				90 Days			
1st Quarter	>63µ	<63µ	Total	% Dry wt. Total	>63µ	<63µ	Total	% Dry wt. Total	>63µ	<63µ	Total	% Dry wt. Total	>63µ	<63µ	Total	% Dry wt. Total
Dry weight	8.2	23.9	32.1	----	21.8	68.4	90.3	----	48.0	313.0	361.0	----	12.0	160.1	172.1	----
Organic matter	1.6	6.5	8.1	25.2	3.5	10.5	14.0	15.5	9.7	53.4	63.1	17.5	1.2	32.1	33.2	19.3
Carbonate	1.4	8.2	9.6	29.8	5.1	30.1	35.3	39.1	16.9	120.5	137.4	38.0	4.8	54.7	59.4	34.6
Siliceous	5.2	9.2	14.4	45.0	13.2	27.8	41.0	45.4	21.4	139.1	160.5	44.5	6.0	73.3	79.5	46.1
2nd Quarter																
Dry weight	47.7	1491.2	1538.9	----	35.3	158.8	194.1	----	13.3	180.8	194.1	----	14.7	660.4	675.0	----
Organic matter	10.0	329.3	339.4	22.1	5.9	25.5	31.3	16.1	2.4	30.8	33.2	17.1	1.9	118.4	120.2	17.8
Carbonate	14.0	409.7	423.7	27.5	14.0	68.2	82.2	42.3	4.7	68.4	73.1	37.8	6.7	254.7	261.4	38.7
Siliceous	23.7	752.2	775.8	50.4	23.5	65.1	80.6	41.6	6.2	81.6	87.8	45.1	6.1	287.3	293.4	43.5
3rd Quarter																
Dry weight	86.8	452.2	539.0	----	112.9	724.2	837.2	----	75.3	308.7	384.1	----	- not sampled -			
Organic matter	14.1	78.8	92.9	17.2	18.2	100.9	119.1	14.2	15.3	55.7	71.0	18.5	- not sampled -			
Carbonate	35.7	175.7	211.3	39.1	41.4	326.0	367.4	43.9	22.6	110.5	133.1	34.6	- not sampled -			
Siliceous	37.0	197.8	234.8	43.7	53.3	297.3	350.7	41.9	37.4	142.5	180.0	46.9	- not sampled -			
4th Quarter																
Dry weight	- not sampled -				- not sampled -				- not sampled -				- not sampled -			
Organic matter	- not sampled -				- not sampled -				- not sampled -				- not sampled -			
Carbonate	- not sampled -				- not sampled -				- not sampled -				- not sampled -			
Siliceous	- not sampled -				- not sampled -				- not sampled -				- not sampled -			

T R A P 21

$g/m^2 \cdot day$

	24 Hours				3 Days				5 Days				90 Days			
1st Quarter	>63µ	<63µ	Total	% Dry wt. Total	>63µ	<63µ	Total	% Dry wt. Total	>63µ	<63µ	Total	% Dry wt. Total	>63µ	<63µ	Total	% Dry wt. Total
Dry weight	11.4	28.4	39.9	----	9.8	105.9	115.7	----	31.0	280.5	311.5	----	7.4	134.3	141.7	----
Organic matter	3.8	7.2	11.0	27.7	1.0	19.1	20.2	17.4	6.4	50.6	57.0	18.3	1.4	29.1	30.5	21.5
Carbonate	0.8	12.0	12.8	32.3	2.7	41.8	44.4	38.4	10.7	99.9	110.6	35.5	3.0	39.0	42.0	29.6
Siliceous	6.8	9.2	16.1	40.0	6.1	45.0	51.1	44.2	13.9	130.0	143.9	46.2	3.0	66.2	69.2	48.9
2nd Quarter																
Dry weight	26.3	1254.5	11280.8	----	51.8	174.1	225.9	----	13.7	257.5	271.1	----	31.6	801.5	833.1	----
Organic matter	6.2	270.5	276.8	21.6	9.3	32.3	41.6	18.4	2.1	48.9	51.0	18.8	2.8	170.8	173.5	20.8
Carbonate	6.9	364.8	371.8	28.9	19.6	64.6	84.2	37.3	4.9	88.9	93.8	34.6	16.6	236.6	253.2	30.5
Siliceous	13.2	619.2	632.2	49.5	22.9	77.2	100.1	44.3	6.7	119.7	126.3	46.6	12.3	394.1	406.4	48.7
3rd Quarter																
Dry weight	71.8	282.2	354.1	----	77.9	383.8	461.8	----	65.5	390.0	455.5	----	21.9	851.5	873.5	----
Organic matter	13.7	49.9	63.6	17.9	14.7	69.9	84.6	18.3	9.9	61.9	71.8	15.7	2.7	155.5	158.2	18.1
Carbonate	29.7	112.4	142.1	40.1	20.1	143.2	163.3	35.4	18.9	158.4	177.3	38.9	10.5	286.2	296.7	34.0
Siliceous	28.4	119.9	148.4	42.0	43.1	170.7	213.9	46.3	36.7	169.7	206.4	45.4	8.7	409.8	418.6	47.9
4th Quarter																
Dry weight	18.9	10.2	29.1	----		- not sampled -			8.3	158.7	167.0	----		- not sampled -		
Organic matter	0.6	4.1	4.7	15.9		- not sampled -			1.7	33.5	35.3	21.1		- not sampled -		
Carbonate	5.5	6.1	11.7	40.2		- not sampled -			3.1	48.8	51.9	31.1		- not sampled -		
Siliceous	12.8	0.0	12.8	43.9		- not sampled -			3.4	76.4	79.8	47.8		- not sampled -		

TRAP 24

$g/m^2 \cdot day$

	24 Hours				3 Days			
1st Quarter	>63μ	<63μ	Total	% Dry wt. Total	>63μ	<63μ	Total	% Dry wt. Total
Dry weight	21.8	25.7	47.5	----	2.6	25.2	27.8	----
Organic matter	4.1	6.1	10.2	21.5	0.8	4.9	5.7	20.7
Carbonate	0.2	11.3	11.6	24.3	0.2	10.8	11.1	39.8
Siliceous	17.5	8.3	30.1	54.2	1.6	9.5	11.0	39.5
2nd Quarter								
Dry weight	32.2	1024.0	1056.2	----	27.3	91.3	118.6	----
Organic matter	7.6	170.6	178.2	16.9	4.9	16.4	21.2	17.9
Carbonate	10.1	373.7	383.8	36.4	12.2	36.4	48.6	40.9
Siliceous	14.5	479.7	494.2	46.7	10.2	38.5	48.8	41.2
3rd Quarter								
Dry weight	54.3	263.2	317.5	----	46.7	240.4	287.1	----
Organic matter	10.6	48.7	59.3	18.7	9.1	40.5	49.6	17.3
Carbonate	22.6	104.6	127.3	40.0	16.8	135.4	152.1	53.0
Siliceous	21.0	109.9	130.9	41.3	20.8	64.5	85.4	29.7
4th Quarter								
Dry weight	123.4	309.9	433.2	----	- not sampled -			
Organic matter	22.2	60.2	82,4	19.0	- not sampled -			
Carbonate	51.0	126.2	177.2	40.9	- not sampled -			
Siliceous	50.2	123.5	173.7	40.1	- not sampled -			

	5 Days				90 Days			
1st Quarter	>63μ	<63μ	Total	% Dry wt. Total	>63μ	<63μ	Total	% Dry wt. Total
Dry weight	5.9	51.3	57.2	----	1.2	58.5	59.7	----
Organic matter	0.9	8.9	9.9	17.3	0.0	12.2	12.2	20.5
Carbonate	?.7	21.5	24.2	42.3	0.5	18.5	18.9	31.6
Siliceous	2.3	20.9	23.1	40.4	0.7	27.8	28.6	47.9
2nd Quarter								
Dry weight	26.5	121.1	147.5	----	9.4	477.6	487.0	----
Organic matter	4.3	24.1	28.4	19.3	1.6	116.1	117.7	24.2
Carbonate	10.7	44.4	55.1	37.3	4.2	126.8	131.1	26.8
Siliceous	11.5	52.6	64.0	43.4	3.6	234.7	238.2	49.0
3rd Quarter								
Dry weight	27.9	247.8	275.7	----	15.8	791.5	807.2	----
Organic matter	5.9	43.1	49.0	17.8	2.2	111.1	113.3	14.0
Carbonate	8.9	94.1	102.9	37.3	8.2	344.5	352.7	43.7
Siliceous	13.1	110.6	123.8	44.9	5.4	335.9	341.2	42.3
4th Quarter								
Dry weight	37.3	135.2	172.5	----	11.0	138.8	149.8	----
Organic matter	5.1	21.3	26.4	15.3	1.3	29.6	30.9	20.7
Carbonate	17.7	61.5	79.3	46.0	4.5	43.4	47.9	32.0
Siliceous	14.5	52.4	66.8	38.7	5.2	65.8	71.0	47.3

A P P E N D I X C

Results of Regression Analysis of Resuspension Curves and Resultant t_{100} Parameters

APPENDIX C

DRY WEIGHT

	1	4	9	90	a	b	r	t_{100}(hrs)
Trap A	87	235	741	9,446	71.33	1.0660	.9947	32.95
Trap B	249	490	1,138	13,555	184.67	.9141	.9865	12.27
Trap C	175	371	722	7,897	136.02	.8640	.9886	16.81
Trap E	110	334	589	6,524	97.23	.9114	.9961	24.75
Trap F	407	894	1,841	14,608	343.77	.8105	.9945	5.23
Trap 2	132	319	680	6,014	112.74	.8624	.9957	20.88
Trap 3	397	810	1,815	19,306	305.92	.8857	.9891	5.79
Trap 6	243	545	1,409	15,286	192.94	.9438	.9932	11.96
Trap 9	211	740	2,013	33,445	179.72	1.1403	.9974	14.35
Trap 11	298	795	2,092	26,813	243.08	1.0199	.99[illegible]8	10.04
Trap 13	395	959	1,828	13,670	350.74	.7965	.9970	4.97
Trap 16	297	643	1,261	26,314	201.78	1.0204	.9798	12.07
Trap 18	484	956	2,196	28,731	352.12	.9339	.9854	6.23
Trap 20	703	1,824	3,389	37,696	586.23	.8950	.9937	3.32
Trap 21	426	1,229	2,772	52,676	328.12	1.0879	.9920	8.05
Trap 24	464	898	1,714	32,164	309.70	.9677	.9760	7.46

ORGANIC MATTER

	1	4	9	90	a	b	r	t_{100}(hrs)
Trap A	16	44	142	2,201	12.76	1.1182	.9937	151.29
Trap B	50	95	217	2,904	35.60	.9308	.9834	72.79
Trap C	40	78	141	1,933	28.42	.8852	.9807	99.41
Trap E	21	50	106	1,590	15.82	.9821	.9892	156.87
Trap F	56	152	331	4,511	45.38	.9903	.9939	53.30
Trap 2	34	73	140	1,397	26.82	.8444	.9905	114.07
Trap 3	79	152	298	4,002	56.49	.8962	.9818	45.39
Trap 6	54	107	272	3,613	39.10	.9637	.9861	63.59
Trap 9	38	121	298	5,865	30.09	1.1369	.9945	69.01
Trap 11	46	267	443	4,475	52.31	.9991	.9960	45.91
Trap 13	62	148	284	2,708	51.87	.8514	.9939	33.15
Trap 16	56	117	240	5,679	36.65	1.0531	.9773	67.03
Trap 18	103	203	445	6,141	73.95	.9343	.9839	33.15
Trap 20	147	311	590	6,803	188.50	.7434	.9622	10.23
Trap 21	89	235	504	10,284	65.34	1.0751	.9884	35.66
Trap 24	83	159	301	5,852	54.56	.9731	.9751	44.73

CARBONATE

	1	4	9	90	a	b	r	t_{100}(hrs)
Trap A	21	53	172	1,826	17.21	1.0218	.9942	134.32
Trap B	82	170	396	4,205	63.57	.8980	.9898	39.74
Trap C	38	96	184	2,266	30.81	.9197	.9918	86.32
Trap E	40	76	144	1,600	29.85	.8400	.9836	101.24
Trap F	65	166	371	2,788	58.53	.8477	.9980	45.14
Trap 2	44	96	204	1,585	37.25	.8121	.9946	80.96
Trap 3	125	268	687	5,661	103.71	.8692	.9933	23.02
Trap 6	59	149	441	3,512	52.18	.9293	.9957	48.33
Trap 9	84	302	902	12,698	74.63	1.1307	.9983	31.09
Trap 11	109	331	894	10,903	92.26	1.0394	.9973	25.94
Trap 13	160	410	784	5,004	150.23	.7703	.9990	14.15
Trap 16	76	191	393	6,776	57.01	1.0155	.9884	41.74
Trap 18	131	269	691	7,705	100.09	.9319	.9893	23.98
Trap 20	215	700	1,274	14,265	194.60	.9344	.9974	11.77
Trap 21	135	348	890	16,871	99.79	1.0973	.9903	24.05
Trap 24	175	387	714	11,863	126.01	.9562	.9829	18.85

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SILICEOUS

	1	4	9	90	a	b	r	t_{100}(hrs)
Trap A	50	138	427	5,419	41.37	1.0644	.9952	55.00
Trap B	117	225	525	6,446	86.47	.9179	.9853	28.12
Trap C	97	198	397	4,050	75.48	.8484	.9886	33.44
Trap E	52	122	252	3,265	40.40	.9378	.9903	63.09
Trap F	286	575	1,138	7,308	245.01	.7347	.9943	7.09
Trap 2	55	151	336	3,032	48.83	.9029	.9979	53.09
Trap 3	190	386	827	9,641	143.28	.8950	.9873	16.06
Trap 6	131	289	696	8,160	101.66	.9411	.9908	23.58
Trap 9	90	316	813	14,882	74.77	1.1505	.9968	30.90
Trap 11	144	346	903	11,585	113.01	.9982	.9924	21.23
Trap 13	172	401	760	5,958	148.92	.7983	.9956	14.57
Trap 16	164	335	628	13,874	107.72	1.0114	.9755	22.30
Trap 18	250	485	1,060	14,889	177.91	.9346	.9831	12.96
Trap 20	342	814	1,528	16,630	277.62	.8761	.9919	7.48
Trap 21	203	568	1,263	25,406	152.70	1.0918	.9905	16.29
Trap 24	207	352	700	14,449	129.01	.9756	.9690	18.49

A P P E N D I X D

Results of Grain Size Analyses for Substrate Dredge Samples

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APPENDIX D

	Mean Grain Size Ø	Sorting Ø	Skewness Ø	Kurtosis Ø
		CONTROL BASINS		
Station B				
1st Quarter	2.65	1.01	0.18	1.67
2nd Quarter	2.92	1.42	0.18	1.83
3rd Quarter	2.47	1.20	0.40	1.97
4th Quarter	2.78	1.57	0.38	2.60
Pooled	2.73	1.30	0.25	1.91
Station E				
1st Quarter	2.41	1.18	-0.08	1.50
2nd Quarter	2.61	1.33	0.13	1.80
3rd Quarter	2.29	1.34	0.08	1.63
4th Quarter	2.58	1.29	0.23	2.04
Pooled	2.47	1.29	0.08	1.78
		BASIN 1		
Station A				
1st Quarter	2.97	1.21	0.29	1.76
2nd Quarter	2.87	1.14	0.25	1.70
3rd Quarter	2.88	1.39	0.52	1.53
4th Quarter	3.47	1.44	0.48	1.20
Pooled	3.08	1.33	0.39	1.61
Station C				
1st Quarter	3.09	1.08	0.22	2.02
2nd Quarter	3.00	1.27	0.51	1.66
3rd Quarter	3.25	1.33	0.48	1.82
4th Quarter	ns	ns	ns	ns
Pooled	3.10	1.24	0.40	1.72
Station F				
1st Quarter	3.17	1.31	0.31	1.73
2nd Quarter	2.87	1.30	0.55	1.72
3rd Quarter	2.47	0.94	0.41	1.66
4th Quarter	3.95	1.48	0.42	0.84
Pooled	3.18	1.38	0.42	1.43
Station 2				
1st Quarter	2.70	1.00	0.15	1.71
2nd Quarter	3.33	1.43	0.46	1.39
3rd Quarter	3.41	1.45	0.53	1.12
4th Quarter	3.45	1.53	0.57	0.86
Pooled	3.27	1.41	0.48	1.62

	Mean Grain Size Ø	Sorting Ø	Skewness Ø	Kurtosis Ø
		BASIN 2A		
Station D				
1st Quarter	2.92	1.10	0.30	1.83
2nd Quarter	2.94	1.11	0.26	1.70
3rd Quarter	ns	ns	ns	ns
4th Quarter	ns	ns	ns	ns
Pooled	2.93	1.11	0.28	1.77
Station 3				
1st Quarter	2.42	1.33	0.01	1.53
2nd Quarter	3.31	1.79	0.40	0.79
3rd Quarter	2.97	1.86	0.30	1.09
4th Quarter	2.58	1.45	0.27	1.71
Pooled	2.67	1.58	0.23	1.56
Station 6				
1st Quarter	2.73	0.88	0.17	1.73
2nd Quarter	2.94	1.12	0.37	1.81
3rd Quarter	2.74	0.94	0.22	1.71
4th Quarter	2.60	1.04	0.64	3.49
Pooled	2.70	0.98	0.34	1.75
		BASIN 3		
Station 7				
1st Quarter	2.92	1.13	0.24	1.71
2nd Quarter	3.33	1.37	0.35	1.59
3rd Quarter	3.05	1.28	0.34	1.64
4th Quarter	2.70	1.13	0.61	2.36
Pooled	3.01	1.25	0.40	1.59
Station 8				
1st Quarter	2.33	1.40	0.08	1.38
2nd Quarter	2.67	1.71	0.41	1.55
3rd Quarter	2.76	1.70	0.23	1.44
4th Quarter	2.24	1.49	0.03	1.40
Pooled	2.50	1.58	0.21	1.46
Station 9				
1st Quarter	3.13	1.33	0.47	1.91
2nd Quarter	3.26	1.42	0.47	1.58
3rd Quarter	3.16	1.41	0.53	1.59
4th Quarter	2.58	1.04	0.58	2.61
Pooled	3.00	1.31	0.56	1.81

	Mean Grain Size Ø	Sorting Ø	Skewness Ø	Kurtosis Ø
Station 10				
1st Quarter	3.19	1.35	0.30	2.28
2nd Quarter	3.52	1.43	0.49	1.03
3rd Quarter	ns	ns	ns	ns
4th Quarter	ns	ns	ns	ns
Pooled	3.35	1.39	0.39	1.65
Station 11				
1st Quarter	3.03	1.14	0.17	2.04
2nd Quarter	3.14	1.29	0.28	1.87
3rd Quarter	2.95	1.66	0.36	1.66
4th Quarter	3.29	1.53	0.31	1.54
Pooled	3.12	1.42	0.28	1.71
Station 12				
1st Quarter	3.16	1.13	0.40	2.15
2nd Quarter	3.31	1.53	0.53	1.00
3rd Quarter	ns	ns	ns	ns
4th Quarter	ns	ns	ns	ns
Pooled	3.26	1.38	0.46	1.71
Station 13				
1st Quarter	1.75	1.65	0.31	1.02
2nd Quarter	2.54	2.11	0.31	0.83
3rd Quarter	2.38	2.00	0.32	1.05
4th Quarter	2.58	2.06	0.31	0.99
Pooled	2.35	1.99	0.33	1.03
Station 14				
1st Quarter	2.43	2.02	0.21	0.94
2nd Quarter	2.29	1.98	0.38	1.01
3rd Quarter	2.48	2.12	0.31	0.80
4th Quarter	2.47	2.05	0.32	1.69
Pooled	2.41	2.05	0.32	0.95

BASIN 2B

	Mean Grain Size Ø	Sorting Ø	Skewness Ø	Kurtosis Ø
Station 16				
1st Quarter	2.53	1.10	0.27	1.82
2nd Quarter	2.77	1.35	0.42	1.59
3rd Quarter	2.75	0.99	0.29	1.79
4th Quarter	2.57	0.96	0.53	2.36
Pooled	2.61	1.08	0.36	1.87

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	Mean Grain Size Ø	Sorting Ø	Skewness Ø	Kurtosis Ø
Station 18				
1st Quarter	2.77	0.91	0.21	1.70
2nd Quarter	2.70	0.99	0.33	1.73
3rd Quarter	2.64	0.94	0.31	1.81
4th Quarter	2.43	0.83	0.50	2.89
Pooled	2.64	0.95	0.39	1.81
		BASIN 4		
Station 20				
1st Quarter	3.52	1.63	0.25	1.37
2nd Quarter	3.76	1.42	0.51	0.92
3rd Quarter	3.65	1.54	0.54	0.83
4th Quarter	ns	ns	ns	ns
Pooled	3.62	1.52	0.42	1.00
Station 21				
1st Quarter	2.13	1.56	0.16	1.38
2nd Quarter	1.94	1.65	0.21	1.27
3rd Quarter	2.62	1.84	0.38	1.34
4th Quarter	2.60	1.83	0.32	1.45
Pooled	2.55	1.85	0.30	1.29
Station 22				
1st Quarter	2.99	1.19	0.22	1.94
2nd Quarter	1.94	1.65	0.21	1.27
3rd Quarter	2.62	1.84	0.38	1.34
4th Quarter	2.60	1.83	0.32	1.45
Pooled	2.55	1.85	0.30	1.29
		BASIN 5		
Station 24				
1st Quarter	2.21	1.31	0.03	1.32
2nd Quarter	2.46	1.50	0.21	1.68
3rd Quarter	3.06	1.68	0.33	1.41
4th Quarter	2.94	1.63	0.31	1.52
Pooled	2.68	1.58	0.21	1.56
Station 25				
1st Quarter	1.87	1.59	0.19	1.13
2nd Quarter	2.60	1.16	0.21	2.00
3rd Quarter	3.07	1.31	0.37	1.93
4th Quarter	3.03	1.36	0.45	2.00
Pooled	2.69	1.47	0.20	1.94

	Mean Grain Size Ø	Sorting Ø	Skewness Ø	Kurtosis Ø
Station 26				
1st Quarter	2.72	0.97	0.20	1.83
2nd Quarter	2.46	1.32	0.35	1.32
3rd Quarter	2.61	1.61	0.61	1.46
4th Quarter	2.58	1.32	0.42	1.54
Pooled	2.60	1.35	0.37	1.46
Station 27				
1st Quarter	2.23	1.27	-0.05	1.28
2nd Quarter	ns	ns	ns	ns
3rd Quarter	3.43	1.76	0.27	0.85
4th Quarter	3.07	1.98	0.26	0.88
Pooled	2.67	1.71	0.19	1.36

APPENDIX E

Results of Organic Matter and Carbonate Analyses

for Dredge and Sediment Trap Samples

APPENDIX

	Dredge %O.M.	Dredge $\%CO_3$	Trap %O.M.	Trap $\%CO_3$
Station A				
1st Quarter	4.06	10.1	19.3	13.4
2nd Quarter	2.94	12.4	20.1	21.4
3rd Quarter	3.50	13.3	28.9	12.4
4th Quarter	5.69	28.9	20.1	31.9
Average	4.05	16.2	22.1	19.8
Station B				
1st Quarter	3.48	10.5	26.1	26.8
2nd Quarter	3.53	12.9	19.4	30.7
3rd Quarter	3.36	21.0	27.0	26.4
4th Quarter	3.31	12.4	18.5	37.1
Average	3.42	14.2	22.8	30.3
Station C				
1st Quarter	6.04	11.7	24.2	18.2
2nd Quarter	3.60	8.3	22.0	35.9
3rd Quarter	3.20	15.9	27.1	17.7
4th Quarter	ns	ns	ns	ns
Average	4.28	12.0	24.4	23.9
Station D				
1st Quarter	3.65	20.1	----	----
2nd Quarter	3.02	14.1	----	----
3rd Quarter	ns	ns	----	----
4th Quarter	ns	ns	----	----
Average	3.34	17.1		
Station E				
1st Quarter	3.46	13.9	26.0	19.6
2nd Quarter	3.49	10.9	25.1	23.4
3rd Quarter	2.72	11.4	28.4	15.5
4th Quarter	3.35	10.8	19.8	40.3
Average	3.26	11.8	24.8	24.7
Station F				
1st Quarter	4.26	10.6	17.7	19.6
2nd Quarter	2.88	4.0	21.6	29.6
3rd Quarter	2.42	10.6	50.4	10.0
4th Quarter	8.16	14.1	21.3	23.1
Average	4.43	9.8	27.8	20.6

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	Dredge %O.M.	Dredge $\%CO_3$	Trap %O.M.	Trap $\%CO_3$
Station 2				
1st Quarter	4.64	8.9	21.4	19.1
2nd Quarter	2.94	8.6	20.7	33.4
3rd Quarter	3.73	14.0	28.3	21.4
4th Quarter	6.05	16.8	22.7	25.8
Average	4.34	12.1	23.3	24.9
Station 3				
1st Quarter	5.31	24.1	15.7	40.3
2nd Quarter	4.95	28.7	18.1	34.8
3rd Quarter	4.11	30.8	23.0	27.3
4th Quarter	3.45	21.3	23.2	21.8
Average	4.46	26.2	20.0	31.1
Station 6				
1st Quarter	3.06	7.2	23.2	23.0
2nd Quarter	3.36	3.4	21.7	32.8
3rd Quarter	2.74	11.0	25.5	17.3
4th Quarter	3.54	11.3	24.4	19.8
Average	3.18	8.2	23.7	23.2
Station 7				
1st Quarter	3.92	19.1	----	----
2nd Quarter	3.40	18.4	----	----
3rd Quarter	2.15	20.5	----	----
4th Quarter	3.46	19.0	----	----
Average	3.23	19.3		
Station 8				
1st Quarter	3.97	35.8	----	----
2nd Quarter	3.55	31.9	----	----
3rd Quarter	4.86	34.9	----	----
4th Quarter	3.58	26.0	----	----
Average	3.99	32.1		
Station 9				
1st Quarter	4.43	25.8	22.0	29.3
2nd Quarter	3.00	17.8	19.8	31.6
3rd Quarter	2.37	20.6	13.0	47.8
4th Quarter	4.03	23.3	21.4	30.6
Average	3.46	21.9	19.1	34.8

	Dredge %O.M.	Dredge $\%CO_3$	Trap %O.M.	Trap $\%CO_3$
Station 10				
1st Quarter	4.56	31.9	----	----
2nd Quarter	4.08	25.7	----	----
3rd Quarter	ns	ns		
4th Quarter	ns	ns		
Average	4.32	28.8		
Station 11				
1st Quarter	4.02	30.3	14.4	42.1
2nd Quarter	3.71	21.2	ns	ns
3rd Quarter	2.97	34.2	20.9	35.5
4th Quarter	3.93	21.8	14.0	43.2
Average	3.66	26.9	16.4	40.3
Station 12				
1st Quarter	3.77	21.4	----	----
2nd Quarter	6.89	19.3	----	----
3rd Quarter	ns	ns		
4th Quarter	ns	ns		
Average	5.33	20.4		
Station 13				
1st Quarter	6.13	44.4	16.0	43.7
2nd Quarter	7.97	46.0	ns	ns
3rd Quarter	2.52	49.1	22.0	33.7
4th Quarter	5.77	42.1	21.4	32.5
Average	5.60	45.4	19.8	36.6
Station 14				
1st Quarter	6.13	41.7	----	----
2nd Quarter	4.65	38.0	----	----
3rd Quarter	4.44	43.8	----	----
4th Quarter	3.98	41.6	----	----
Average	4.80	41.3		
Station 16				
1st Quarter	3.44	10.1	23.4	22.1
2nd Quarter	3.97	9.6	20.1	27.5
3rd Quarter	2.24	13.3	24.9	21.2
4th Quarter	2.87	21.4	20.8	27.6
Average	3.13	11.4	22.3	24.6

	Dredge %O.M.	Dredge $\%CO_3$	Trap %O.M.	Trap $\%CO_3$
Station 18				
1st Quarter	3.22	7.1	24.3	24.1
2nd Quarter	2.57	6.8	22.3	27.1
3rd Quarter	1.79	8.1	19.5	29.3
4th Quarter	2.79	9.8	23.7	20.2
Average	2.59	7.9	22.5	25.2
Station 20				
1st Quarter	9.16	40.4	19.3	34.6
2nd Quarter	6.09	29.2	17.8	38.7
3rd Quarter	4.90	1.0	ns	ns
4th Quarter	ns	ns	ns	ns
Average	6.72	34.8	18.6	36.7
Station 21				
1st Quarter	5.78	47.9	21.5	29.6
2nd Quarter	6.17	51.2	20.8	30.5
3rd Quarter	4.70	62.7	18.1	34.0
4th Quarter	5.65	50.0	ns	ns
Average	5.58	53.0	20.1	31.4
Station 22				
1st Quarter	6.64	26.4	----	----
2nd Quarter	3.54	22.6	----	----
3rd Quarter	3.33	28.5	----	----
4th Quarter	3.64	23.5	----	----
Average	4.29	25.3		
Station 24				
1st Quarter	3.76	18.2	20.5	31.6
2nd Quarter	2.91	21.8	24.2	26.8
3rd Quarter	2.86	47.4	14.0	43.7
4th Quarter	3.69	25.3	20.7	32.0
Average	3.31	28.2	19.9	33.5
Station 25				
1st Quarter	5.11	31.3	----	----
2nd Quarter	3.50	19.4	----	----
3rd Quarter	2.42	20.1	----	----
4th Quarter	4.27	21.2	----	----
Average	3.83	23.0		

	Dredge %O.M.	Dredge $\%CO_3$	Trap %O.M.	Trap $\%CO_3$
<u>Station 26</u>				
1st Quarter	4.14	17.7	----	----
2nd Quarter	4.44	29.1	----	----
3rd Quarter	4.16	37.8	----	----
4th Quarter	3.63	30.2	----	----
Average	4.09	28.7		
<u>Station 27</u>				
1st Quarter	3.45	25.2	----	----
2nd Quarter	ns	ns	----	----
3rd Quarter	4.62	39.5	----	----
4th Quarter	7.12	38.0	----	----
Average	5.06	34.2		