HEL 2-28

RECENT SEDIMENTS OF THE CENTRAL CALIFORNIA CONTINENTAL SHELF

PIGEON POINT TO SAND HILLS BLUFFS

PART A. INTRODUCTION AND GRAIN SIZE DATA

by

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PART A - INTRODUCTION AND GRAIN SIZE ANALYSIS

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Introduction

The following work is part of a continuing study of the sediments and sedimentary processes of the continental shelf of central California done in cooperation between the University of California, Berkeley, and the Coastal Engineering Research Center, U. S. Army Corps of Engineers. Sediment analyses of the samples were done at the University of California, Berkeley, utilizing the facilities of the Departments of Civil Engineering and Geology and the Institute of Marine Resources. The results of this study will be presented in three separate reports:

Part A Introduction and Grain Size Data (this volume)

Part B Mineralogical Data

Part C Interpretation and Summary of Results

The first two reports, Parts A and B, will be presented with little or no interpretation. In Part C the authors' interpretation of the data plus background information and previous work in the study area will be given.

The area covered by this report extends from Pigeon Point in the north to Sand Hill Point in the south. With the completion of this report a complete section of the continental shelf of California from Russian River to Monterey Bay will have been studied. The methods of sediment analysis employed in the overall study are grain size analysis followed by heavy mineral analysis and interpretation.

Sample Collection

Samples studied in this report include 39 marine samples, and 9 intertidal beach samples taken specifically for this project. Marine

bottom samples were obtained with an orange peel grab sampler from the converted fishing boat San Michele, September 1969. Participants in the marine sampling program were Ralf Carter, Eugene Silva, Tom Yancey, Jamison Bates, and Pat Wilde. Marine samples were obtained from the shoreline to 300 feet below sea level. The sample density is approximately uniform within the study area (see Fig. 1). Intertidal beach samples were obtained in April 1970 by James Lee and Tom Yancey. The beach samples were obtained using a pipe coring device. The coring device was inserted into the beach at approximately mid to low tide level. In this manner a core of the upper six to ten inches of the beach sediment was obtained.

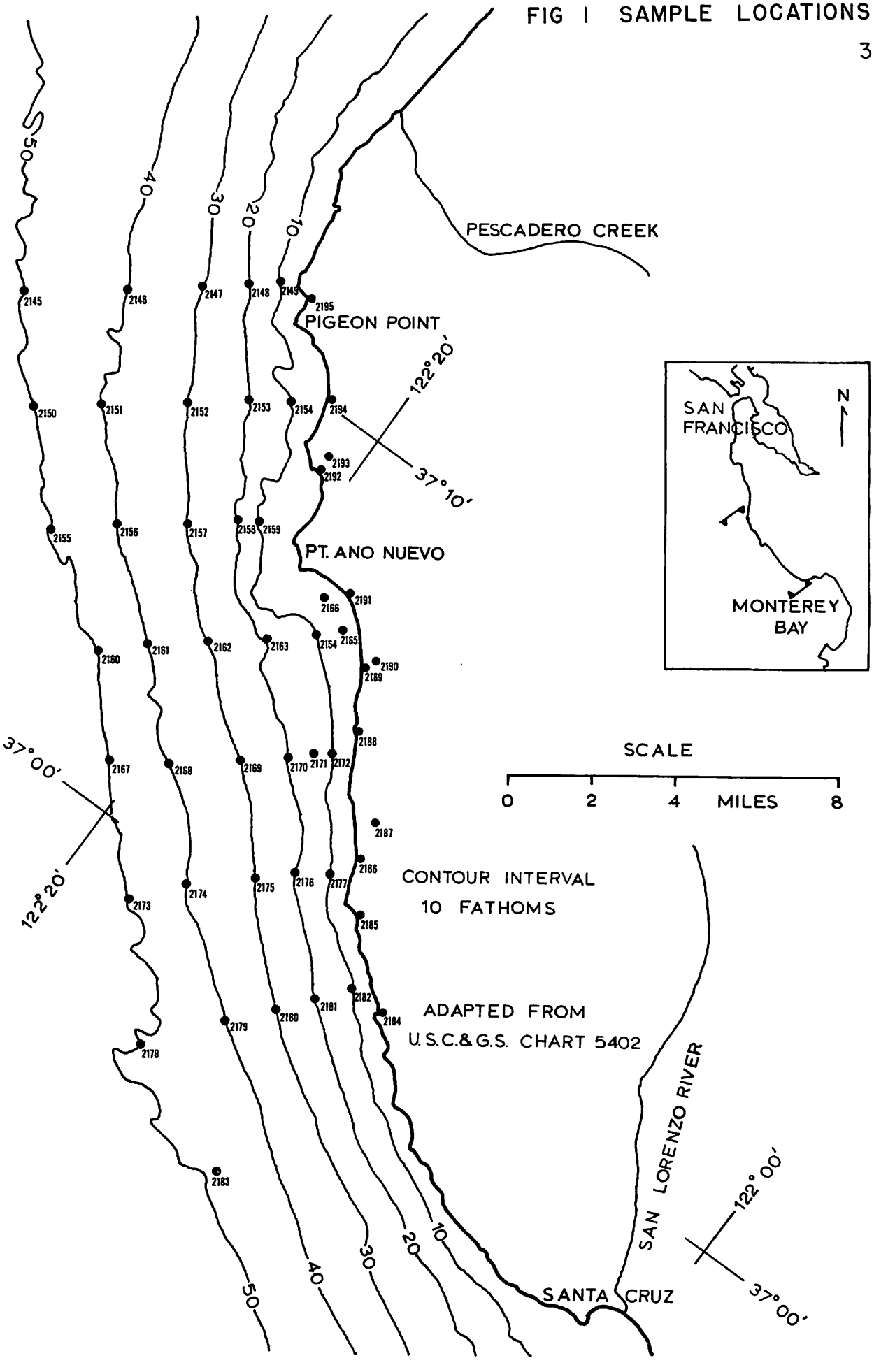
Figure 1 shows the sampling stations (numbers refer to Hydraulic Engineering Laboratory Sediment Collection numbers, U. C. Berkeley) plotted on U. S. Coast and Geodetic Survey Chart 5402. Location of each sample was obtained by Decca radar bearings on shore landmarks. Station depths were obtained by echo sounding with a Raytheon depth finder.

The orange peel bottom sampler took approximately 15 centimeters of surface material. About one liter by volume of sample was saved from each station. This portion of the sample was saved from each station. This portion of the sample was placed in a polyethylene bag and stored in a moist condition in a cylindrical cardboard container until analysis.

Grain Size Analysis

The samples were analyzed by Tom Yancey and James Lee at half phi intervals (Krumbein and Pettijohn, 1938, p. 84) through the entire

FIG I SAMPLE LOCATIONS



range of the sediment size spread. The sediments contain a wide spread of grain sizes, so for the finer grained samples sieving was supplemented by pipette analysis (Folk, 1965, pp. 37-40) for the silt and clay fraction of the sample. The samples were wet sieved through a 4φ (.0625 mm) screen with running sea water. The coarser than 4φ sediments were then dried and sieved in the standard manner. Particles in the silt and clay size range were washed into a reservoir of sea water, and recovered and stored wet in sea water. This procedure enables one to separate silts and clays from coarser particles in a non-destructive manner, i.e., the original composition and particle size of the finer sediments is not changed by treatment with distilled water and drying. The weight of the sample was determined using the wet weighing method of Wilde and others (1970).

The pipette analysis was made at half phi intervals, and carried to a lower limit of 8½φ (0.0027 mm). Only a small number of the samples were carried to 8½φ; these samples had 80% or greater in the silt and clay size fraction. The remaining samples were carried to a lower limit of 7φ (0.0078 mm). 7φ is a convenient lower limit to use in pipette analysis, and in most cases the finer than 7φ fraction represented less than 5% of the sample. Data from this method was proportionately recalculated to fit the sieving data and the size frequency curve and cumulative curve were assembled from these two methods. Each size fraction of the sieving and pipette analysis were weighted on an analytical balance to 0.001 gram and a weight percent value was calculated for each fraction.

The samples were sized through the following sieves:

U. S. Standard Mesh Number	Nominal Opening	Phi Units
5	3.962 mm	- 2.0
7	2.83 mm	- 1.5
10	1.981 mm	- 1.0
14	1.397 mm	- 0.5
18	0.991 mm	0
25	0.701 mm	+ 0.5
25	0.495 mm	+ 1.0
45	0.351 mm	+ 1.5
60	0.246 mm	+ 2.0
80	0.175 mm	+ 2.5
120	0.124 mm	+ 3.0
170	0.088 mm	+ 3.5
230	0.061 mm	+ 4.0

Data Format

The grain size information for each sample is presented in the following pages graphically as (1) a histogram where the width of each bar represents the size range considered and the height of the bar represents the weight percent of that size range; and (2) a cumulative frequency curve, which is a smooth curve drawn between points determined by adding weight percent values in successively smaller grain size classes. Points connected by dashed lines are symmetrically extrapolated values and do not represent measured values.

Modes, or the order of frequency, are determined visually from the histogram, with the first mode being the size class with the

largest weight percent value.

Quartile and percentile values or grain size values at a given weight percent are determined visually from the cumulative curves and are used for calculating statistical measures below. The percentile and quartile subscripts given here indicate the percentage of the distribution coarser than the corresponding grain size value. For example, P_{10} refers to the grain size at which 10% of the distribution is coarser. This procedure does not conform to standard statistical usage but is less ambiguous for grain size work where by convention the cumulative is plotted in order of decreasing grain size, which is the reverse of statistical practice.

Graphically Determined

Parameter	Grain Size at
P_{10}	10th percentile
Q_{25}	25th percentile (3rd quartile)
Q_{50}	50th percentile (2nd quartile)
	MEDIAN
Q_{75}	75th percentile (1st quartile)
P_{90}	90th percentile

Calculated

$$S_o = \sqrt{Q_{25}/Q_{75}}$$

SORTING COEFFICIENT:
(Trask, 1932)

Degree of Scatter

$$S_k = \frac{Q_{25}\ Q_{75}}{(Q_{50})^2}$$

QUARTILE SKEWNESS:
(Trask, 1932)

Symmetry of Distribution

$$K = \frac{Q_{25} - Q_{75}}{2(P_{10} - P_{90})}$$

KURTOSIS:
(Krumbein and Pettijohn, 1938, p. 238)

Comparison of Central Portion of
Curve to Spread of Whole Curve

The above calculated statistical parameters plus median grain size are plotted uncontoured on the basemap as follows - Fig. 2: Median Grain Size; Fig. 3: Sorting Coefficient; Fig. 4: Skewness; Fig. 5: Kurtosis.

For possible further analysis and for those who prefer phi units as the grain size measure, the following statistical parameters have been calculated: Inclusive Graphic Standard Deviation (sorting coefficient), (Folk, 1965, p. 46), Inclusive Graphic Skewness (Folk, 1965, p. 47), and Graphic Kurtosis (Folk, 1965, p. 48). The above calculated statistical parameters plus phi median grain size are plotted uncontoured on the basemap as follows - Fig. 6: Phi Median Grain Size; Fig. 7: Inclusive Graphic Standard Deviation; Fig. 8: Inclusive Graphic Skewness; and Fig. 9: Graphic Kurtosis.

FIG 2 MEDIAN GRAIN DIAMETER

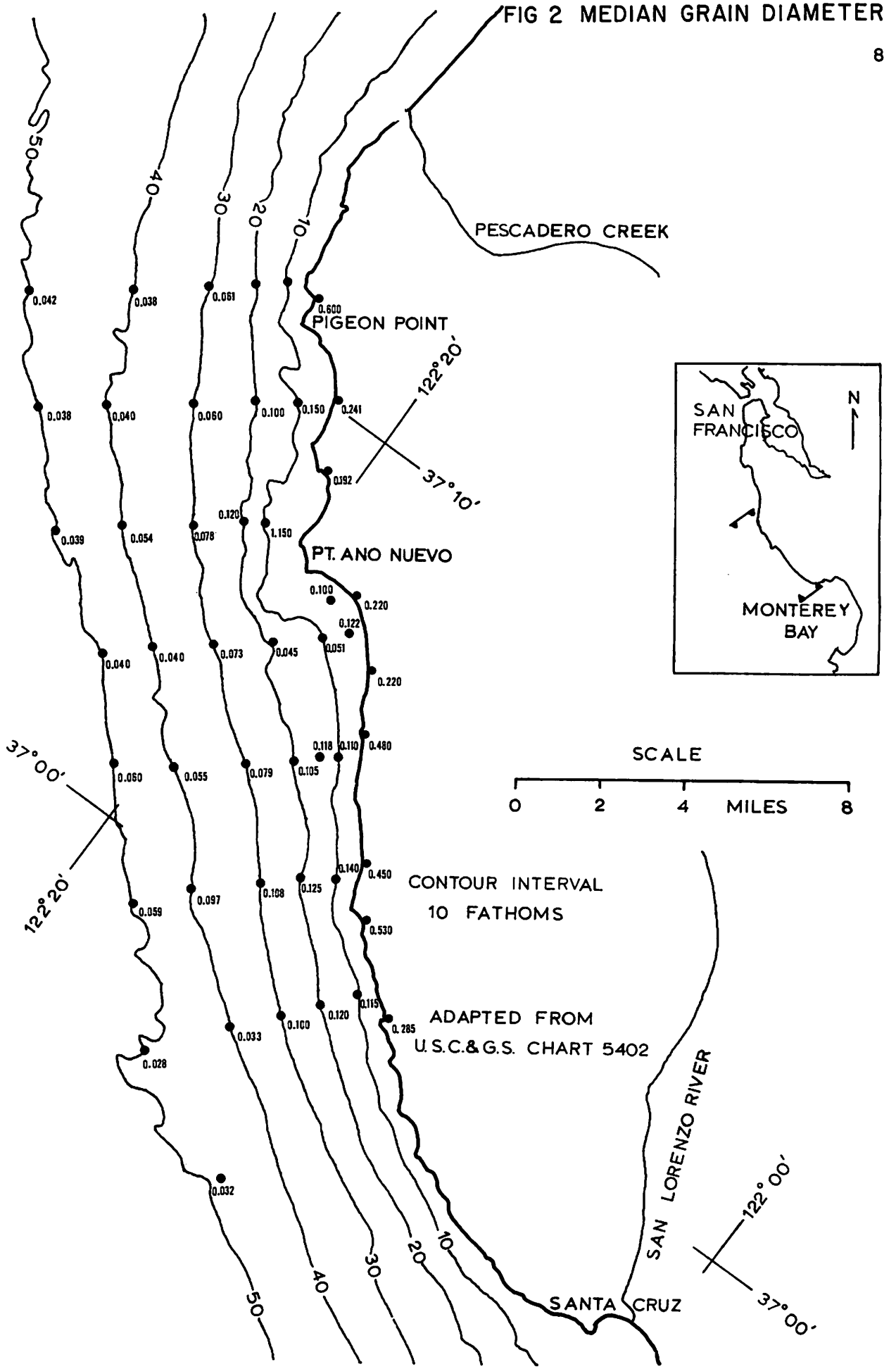


FIG 3 SORTING COEFFICIENT

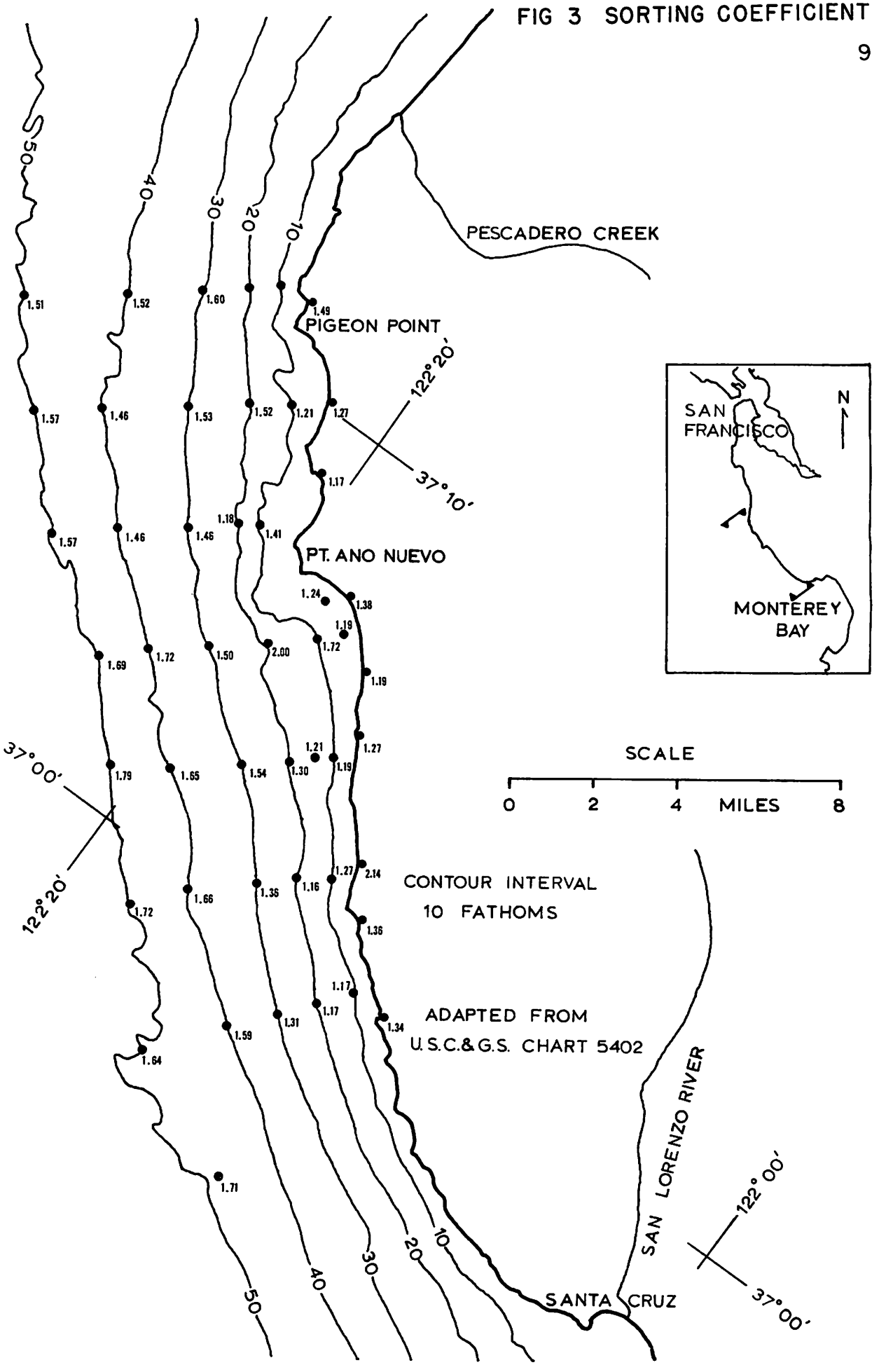


FIG 4 SKEWNESS

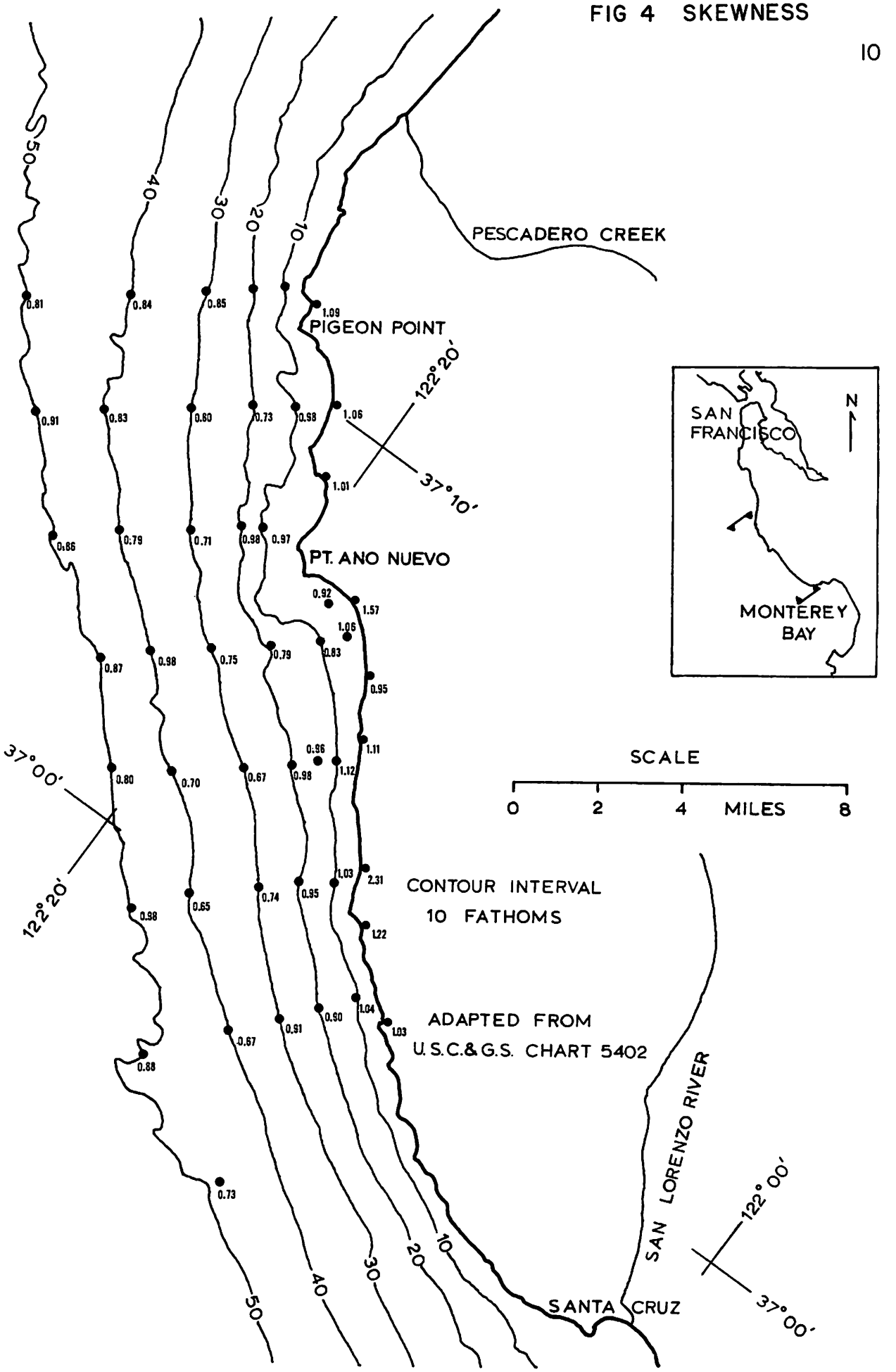


FIG 5 KURTOSIS

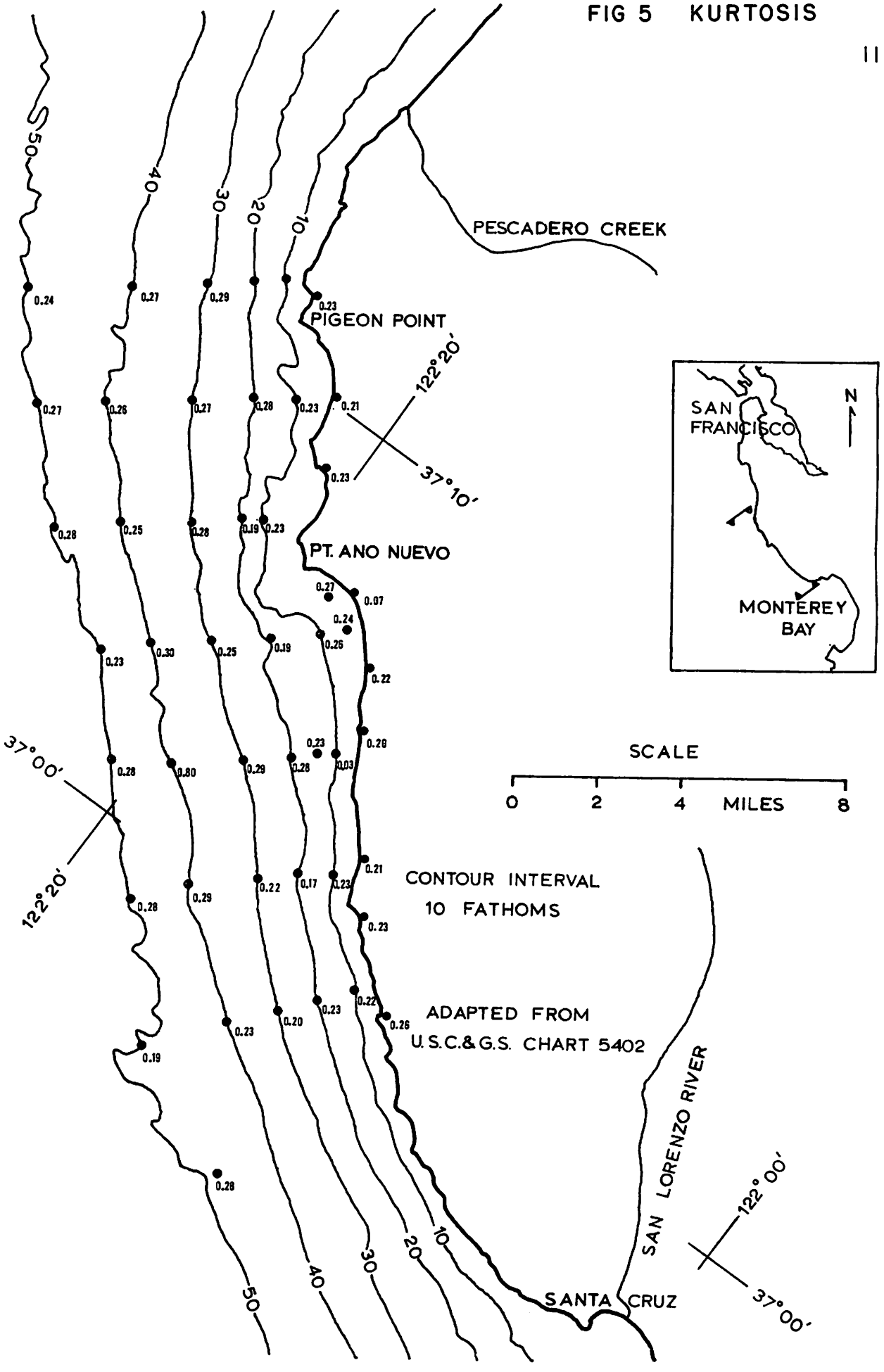


FIG 6 PHI MEDIAN GRAIN DIAMETER

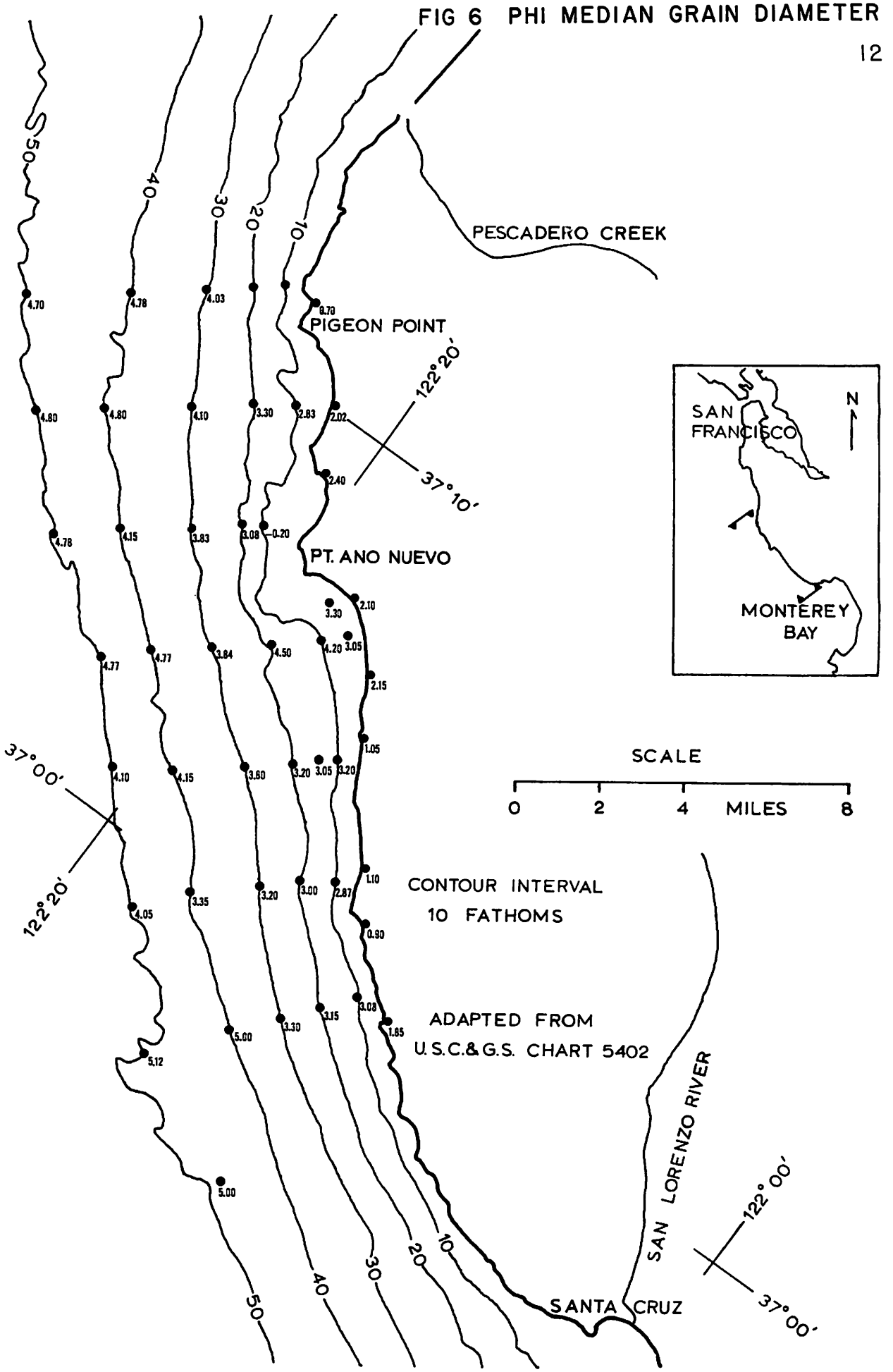


FIG 7 INCLUSIVE GRAPHIC STANDARD DEVIATION

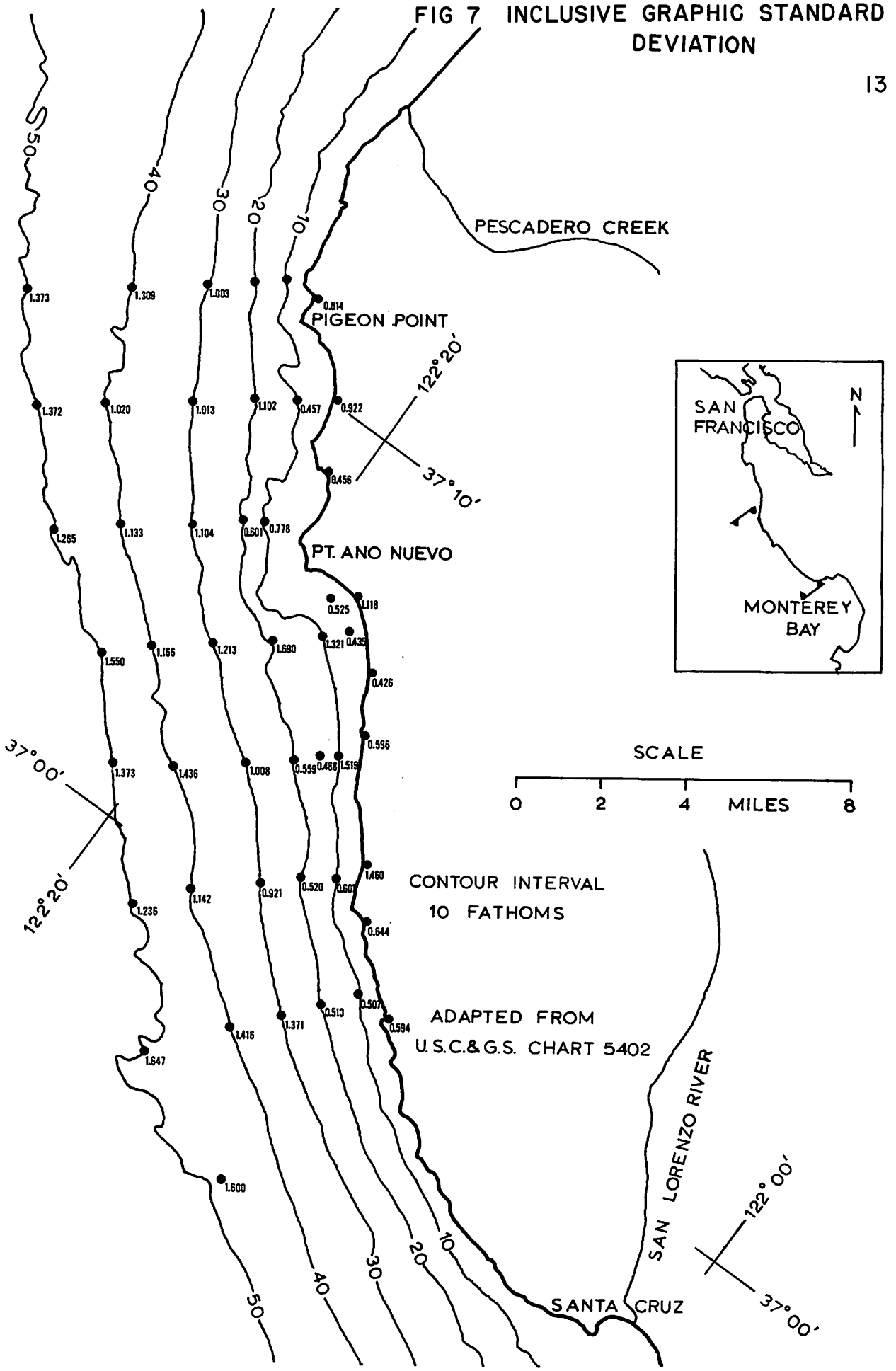


FIG 8 INCLUSIVE GRAPHIC SKEWNSS

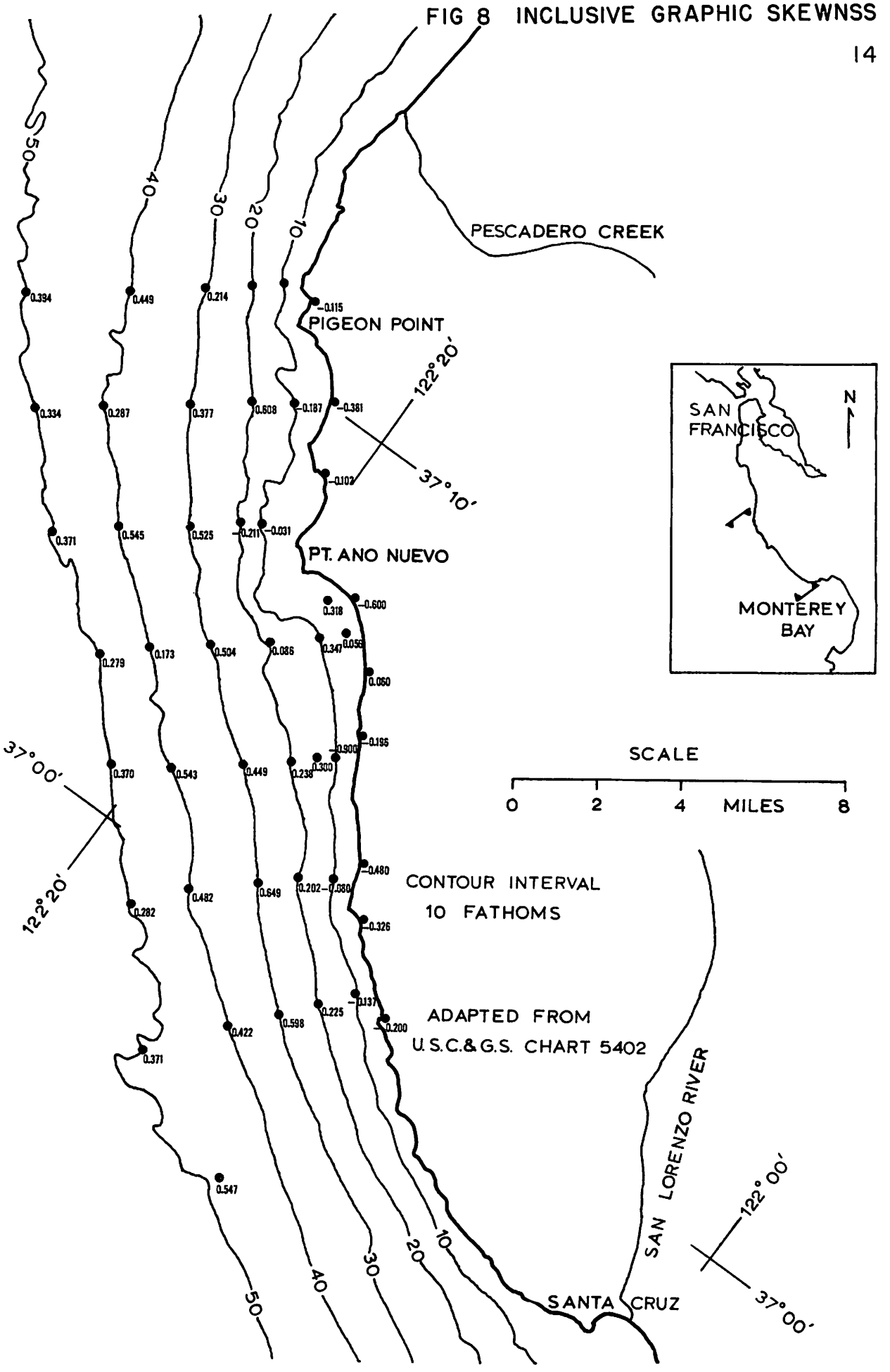
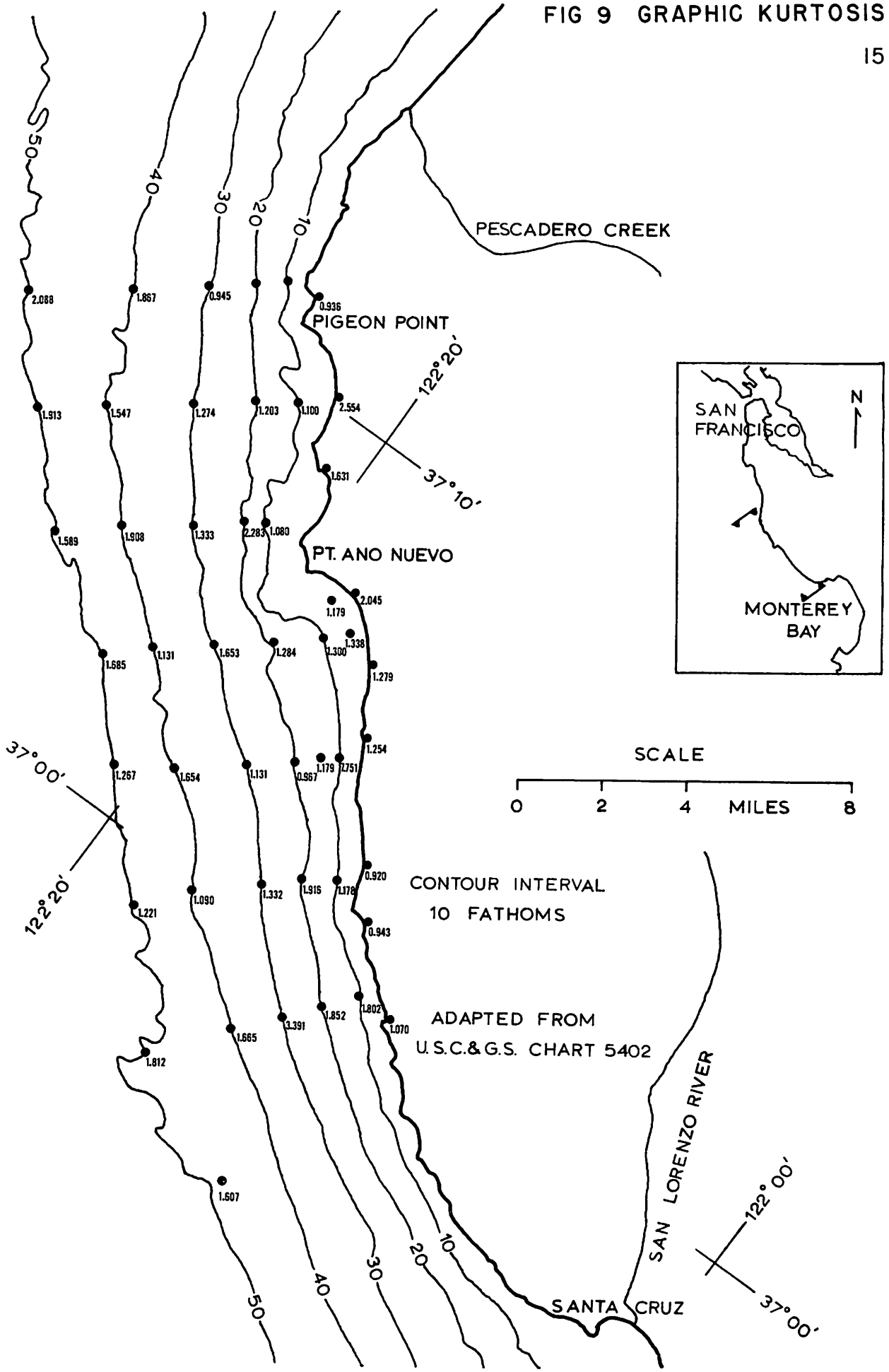


FIG 9 GRAPHIC KURTOSIS



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SIZE ANALYSIS

Sample 2145

Lat. 37° 08.3' Long. 122° 30.1'

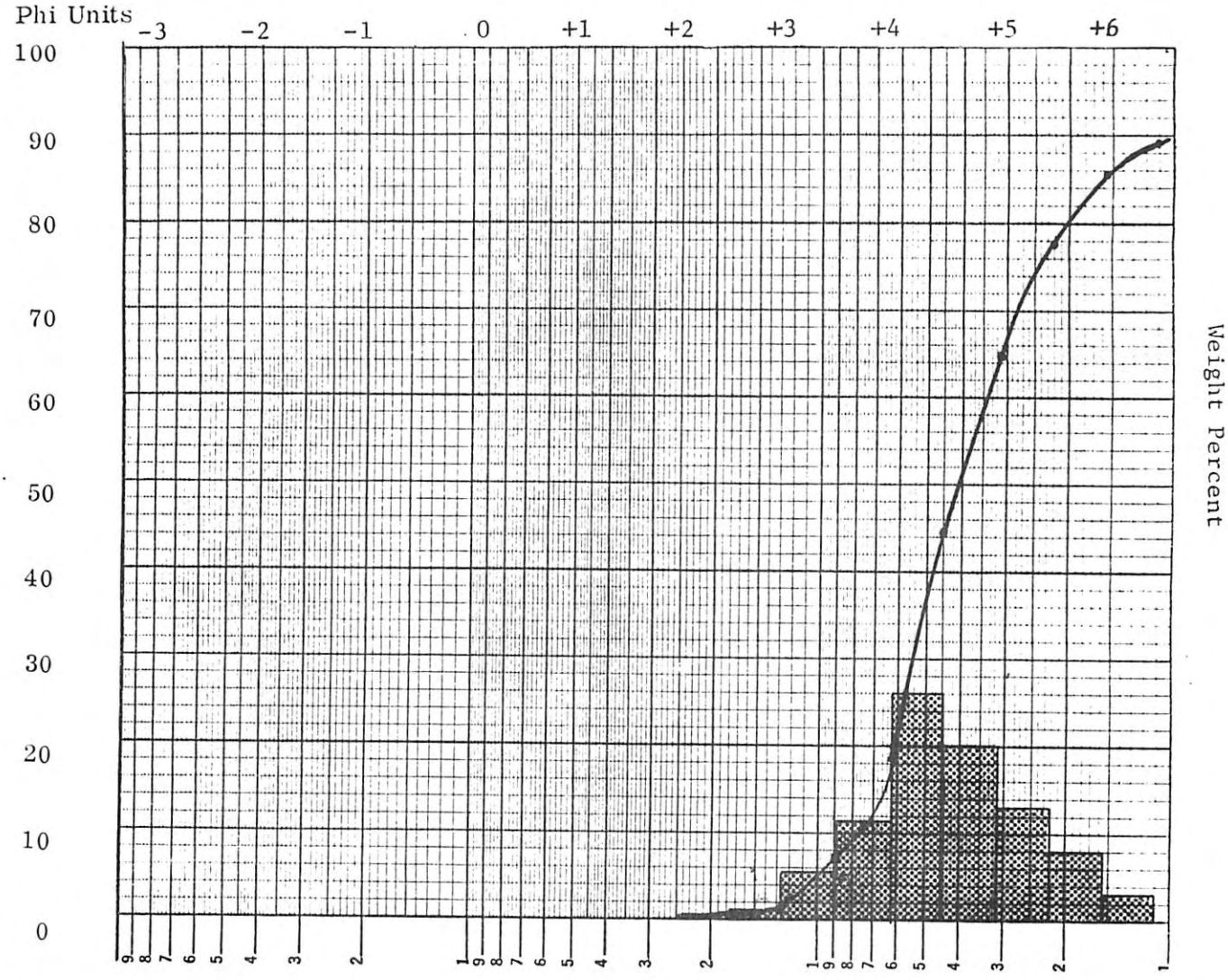
Depth 50 Fathoms

91.6 Meters

300 Feet

Sample description greenish gray very fine grained sandy silt.

Sample Weight 299.659 g



SIZE PARAMETERS

1st Mode	.044 - .062 mm	Q_{25}	.057 mm	Sorting Coef.	1.51
2nd Mode		Median: Q_{50}	.042 mm	Skewness	.808
3rd Mode		Q_{75}	.025 mm	Kurtosis	.235

SIZE ANALYSIS

Sample 2146

Lat. 37° 09.5' Long. 122° 27.6'

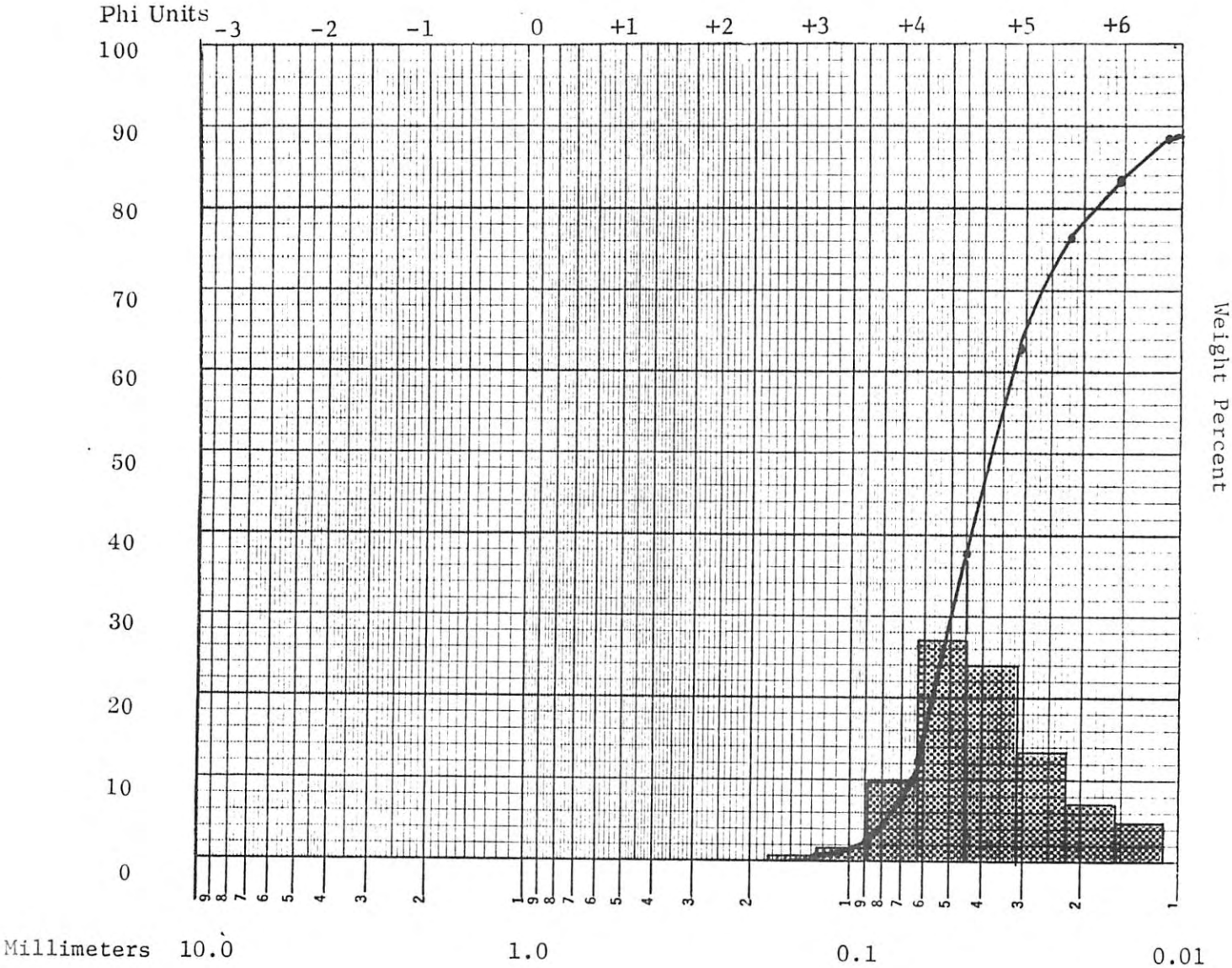
Depth 40.0 Fathoms

73.2 Meters

240.0 Feet

Sample description greenish gray very fine grained sandy silt

Sample Weight 274.196 g



SIZE PARAMETERS

1st Mode .044 - .062 mm

2nd Mode

3rd Mode

Q_{25} .053 mm

Median: Q_{50} .038 mm

Q_{75} .023 mm

Sorting Coef. 1.518

Skewness .844

Kurtosis .265

SIZE ANALYSIS

Sample 2147

Lat. 37° 10.4' Long. 122° 26.3'

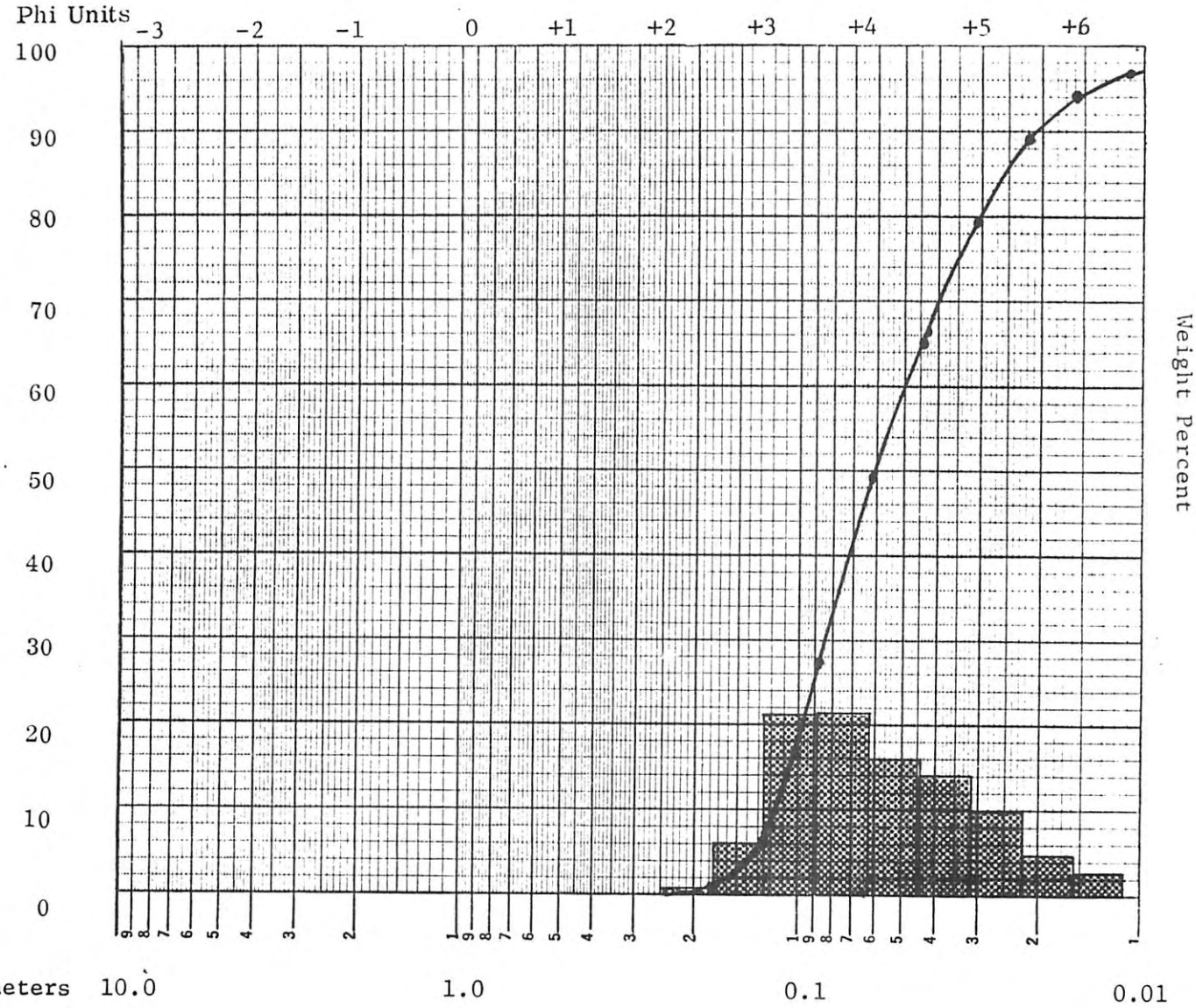
Depth 30.0 Fathoms

54.8 Meters

180.0 Feet

Sample description greenish gray fine grained silty sand

Sample Weight 236.736 g



SIZE PARAMETERS

1st Mode .062 - .088 mm

2nd Mode

3rd Mode

Q_{25} .090 mm

Median: Q_{50} .061 mm

Q_{75} .035 mm

Sorting Coef. 1.604

Skewness .847

Kurtosis .292

SIZE ANALYSIS

Sample 2150

Lat. 37° 06.2' Long. 122° 28.0'

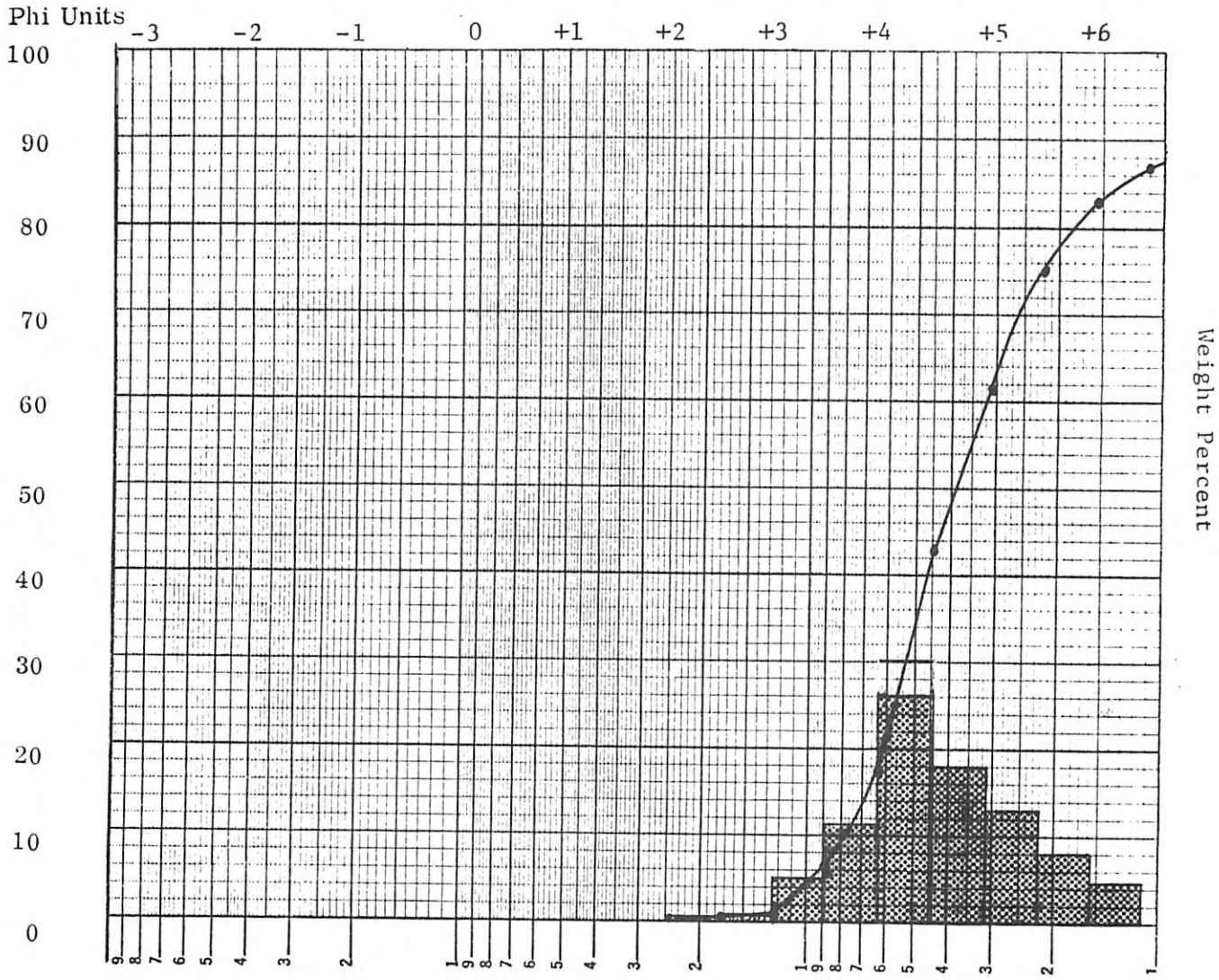
Depth 50.0 Fathoms

91.6 Meters

300.0 Feet

Sample description greenish gray very fine grained sandity silt

Sample Weight 276.513 g



Millimeters 10.0 1.0 0.1 0.01

SIZE PARAMETERS

1st Mode .044 - .062 mm

2nd Mode

3rd Mode

Q_{25} .057 mm

Median: Q_{50} .038 mm

Q_{75} .023 mm

Sorting Coef. 1.57

Skewness .908

Kurtosis .247

SIZE ANALYSIS

Sample 2151

Lat. 37° 07.1' Long. 122° 26.5'

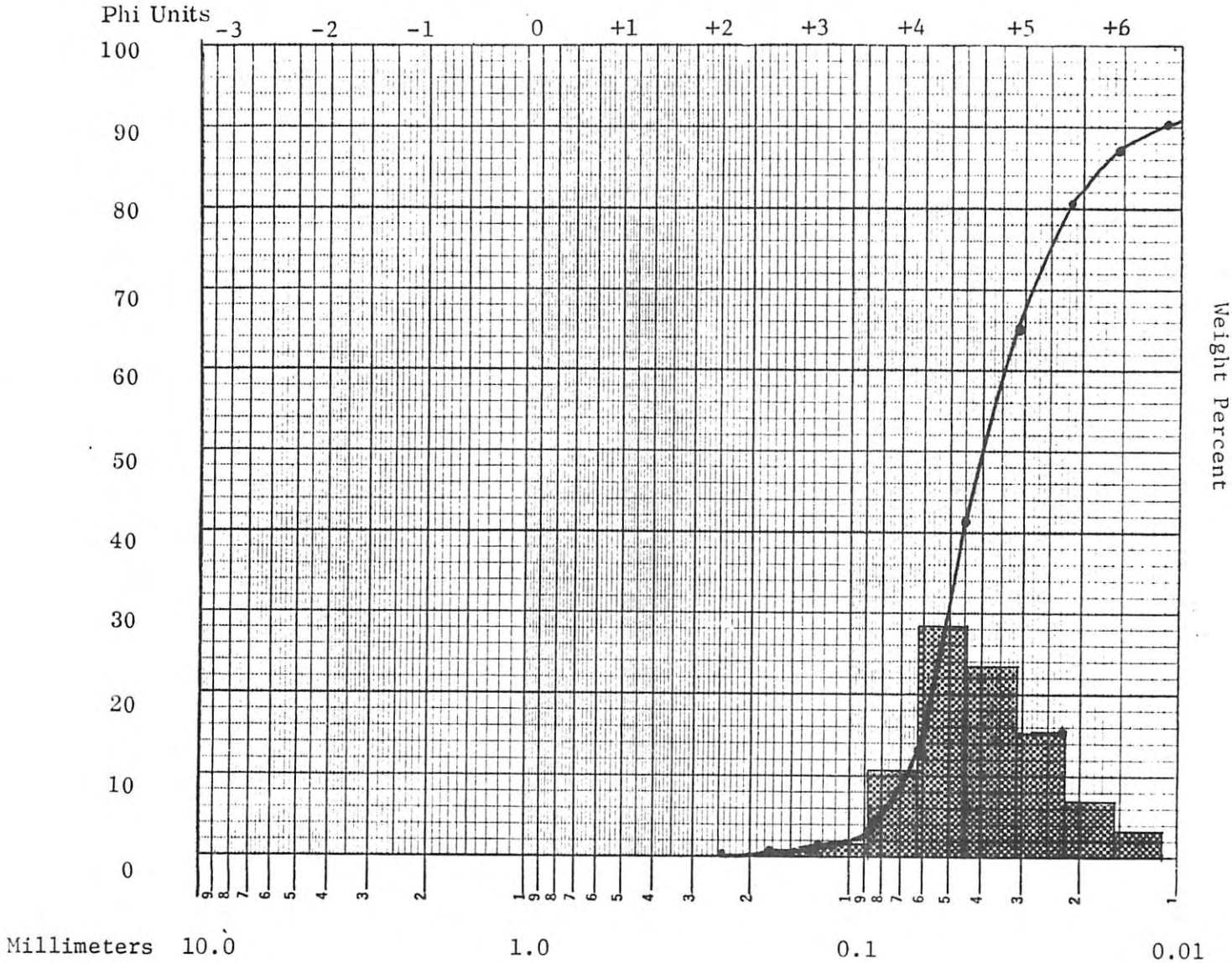
Depth 40.0 Fathoms

73.2 Meters

240.0 Feet

Sample description greenish gray very fine grained sandy silt

Sample Weight 161.384 g



SIZE PARAMETERS

1st Mode .044 - .062 mm

2nd Mode

3rd Mode

Q_{25} .053 mm

Median: Q_{50} .040 mm

Q_{75} .025 mm

Sorting Coef. 1.46

Skewness .828

Kurtosis .257

SIZE ANALYSIS

Sample 2152

Lat. 37° 08.3' Long. 122° 24.7'

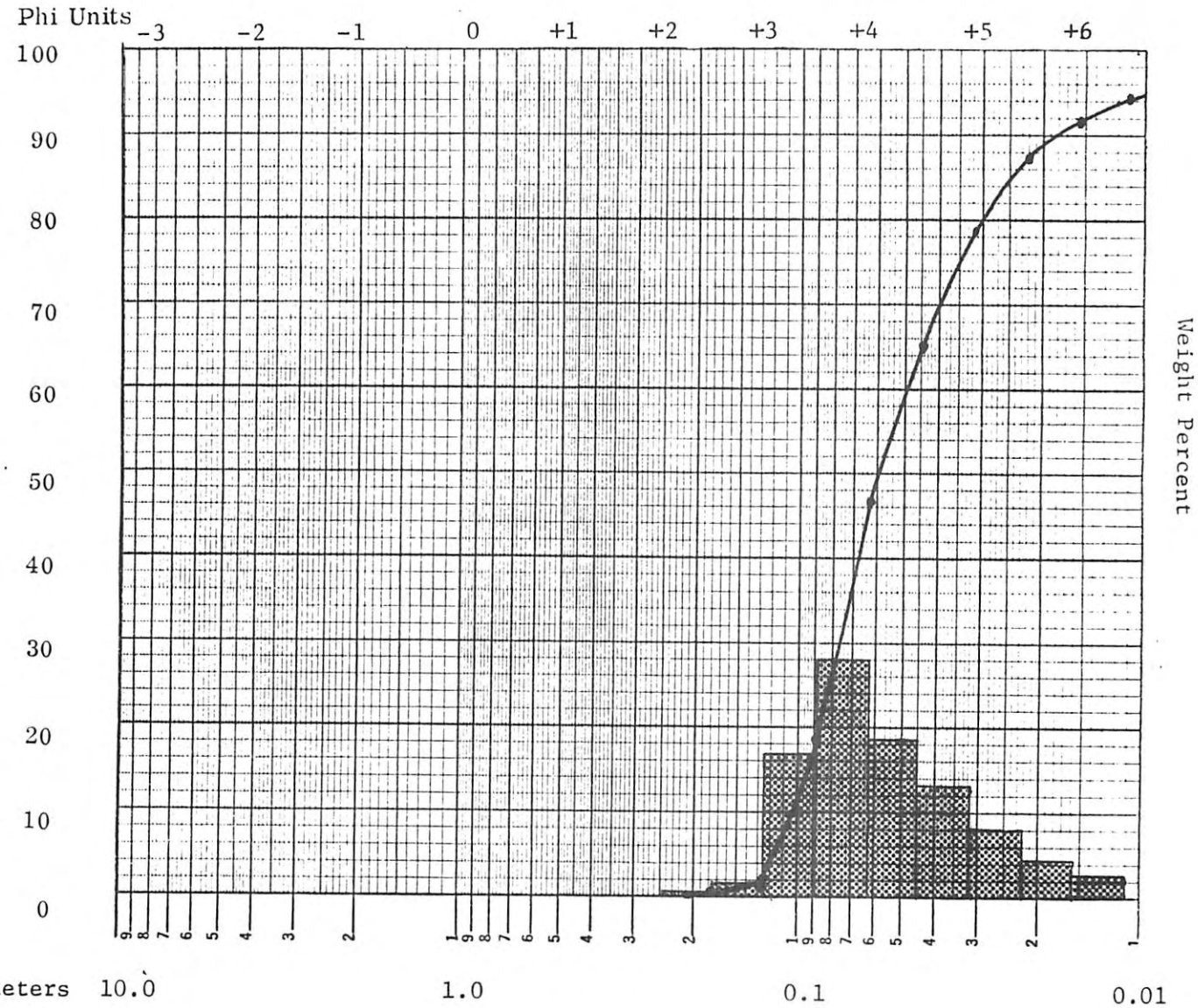
Depth 30.0 Fathoms

54.8 Meters

180.0 Feet

Sample description greenish gray fine grained silty sand

Sample Weight 252.516 g



SIZE PARAMETERS

1st Mode .062 - .088 mm

2nd Mode

3rd Mode

Q_{25} .082 mm

Median: Q_{50} .060 mm

Q_{75} .035 mm

Sorting Coef. 1.53

Skewness .797

Kurtosis .270

SIZE ANALYSIS

Sample 2153

Lat. 37° 09.1' Long. 122° 23.4'

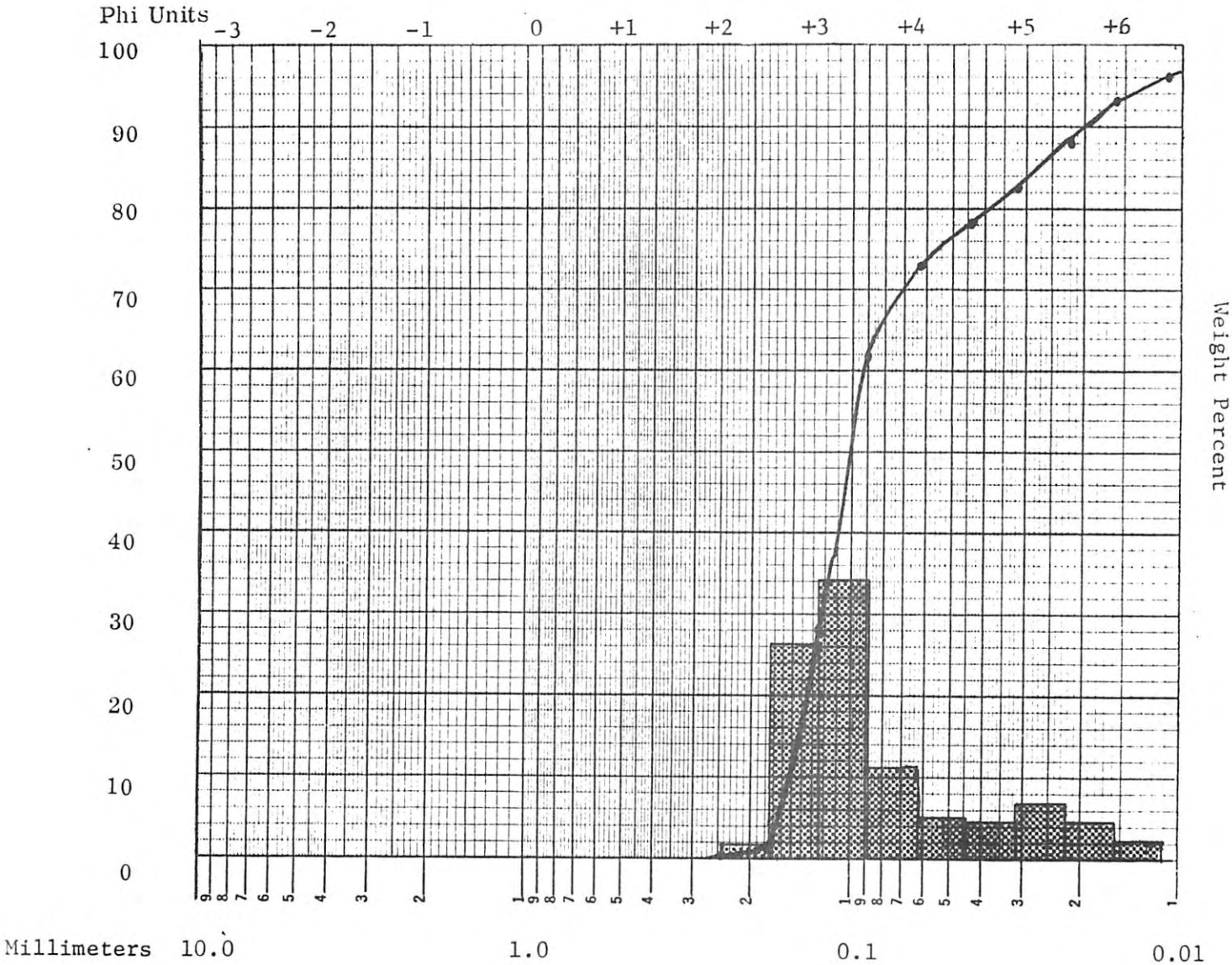
Depth 20.0 Fathoms

36.6 Meters

120.0 Feet

Sample description gray colored fine grained silty sand

Sample Weight 196.250 g



SIZE PARAMETERS

1st Mode	.088 - .125 mm	Q_{25}	.130 mm	Sorting Coef.	1.52
2nd Mode	.022 - .031 mm	Median: Q_{50}	.10 mm	Skewness	.728
3rd Mode		Q_{75}	.056 mm	Kurtosis	.280

SIZE ANALYSIS

Sample 2154

Lat. 37° 09.6' Long. 122° 22.5'

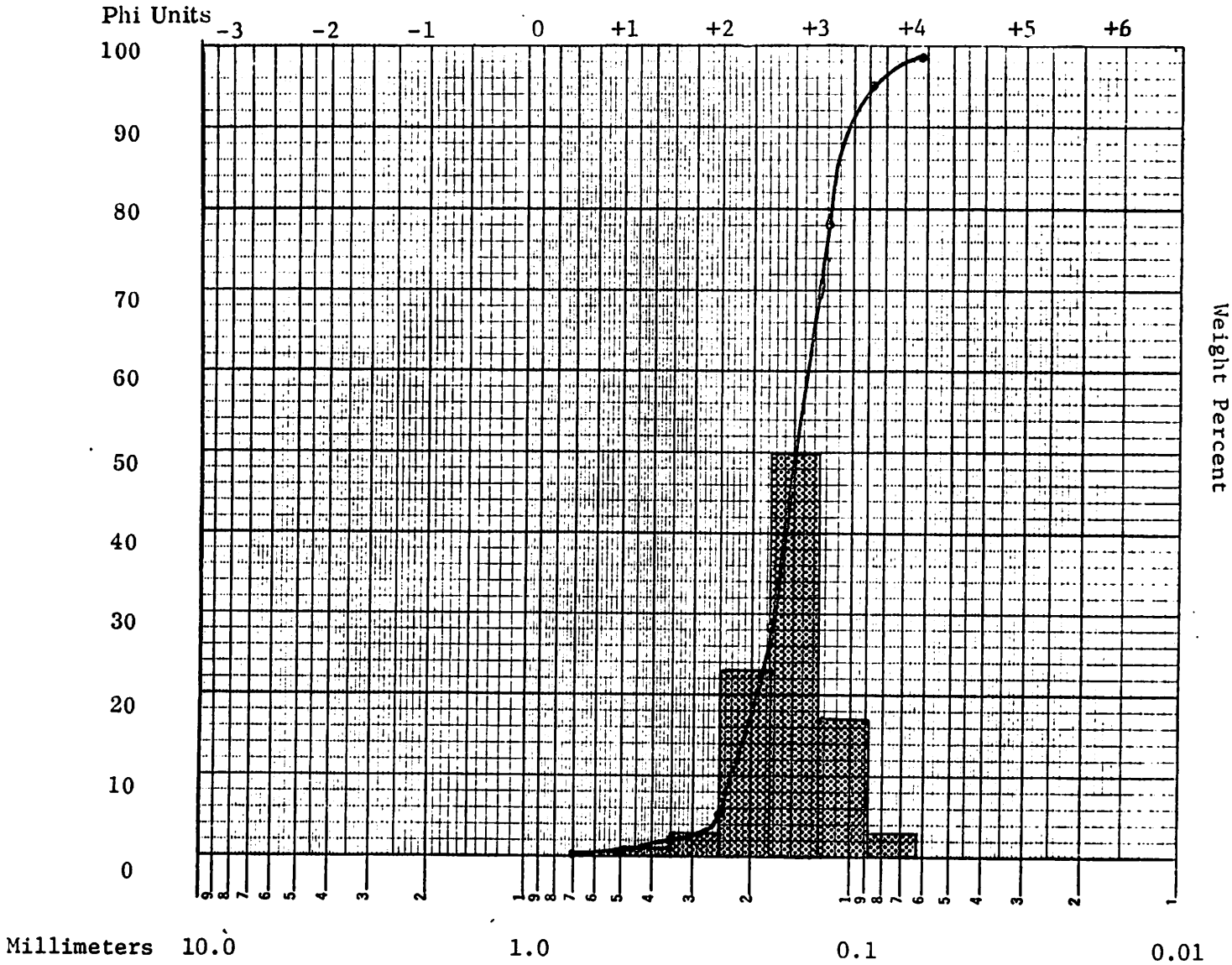
Depth 10.0 Fathoms

18.3 Meters

60.0 Feet

Sample description gray colored fine grained sand

Sample Weight 280.895 g



SIZE PARAMETERS

1st Mode .125 - .177 mm

2nd Mode

3rd Mode

Q_{25} .180 mm

Median: Q_{50} .150 mm

Q_{75} .122 mm

Sorting Coef. 1.214

Skewness .976

Kurtosis .228

SIZE ANALYSIS

Sample 2155

Lat. 37° 04.3' Long. 122° 25.7'

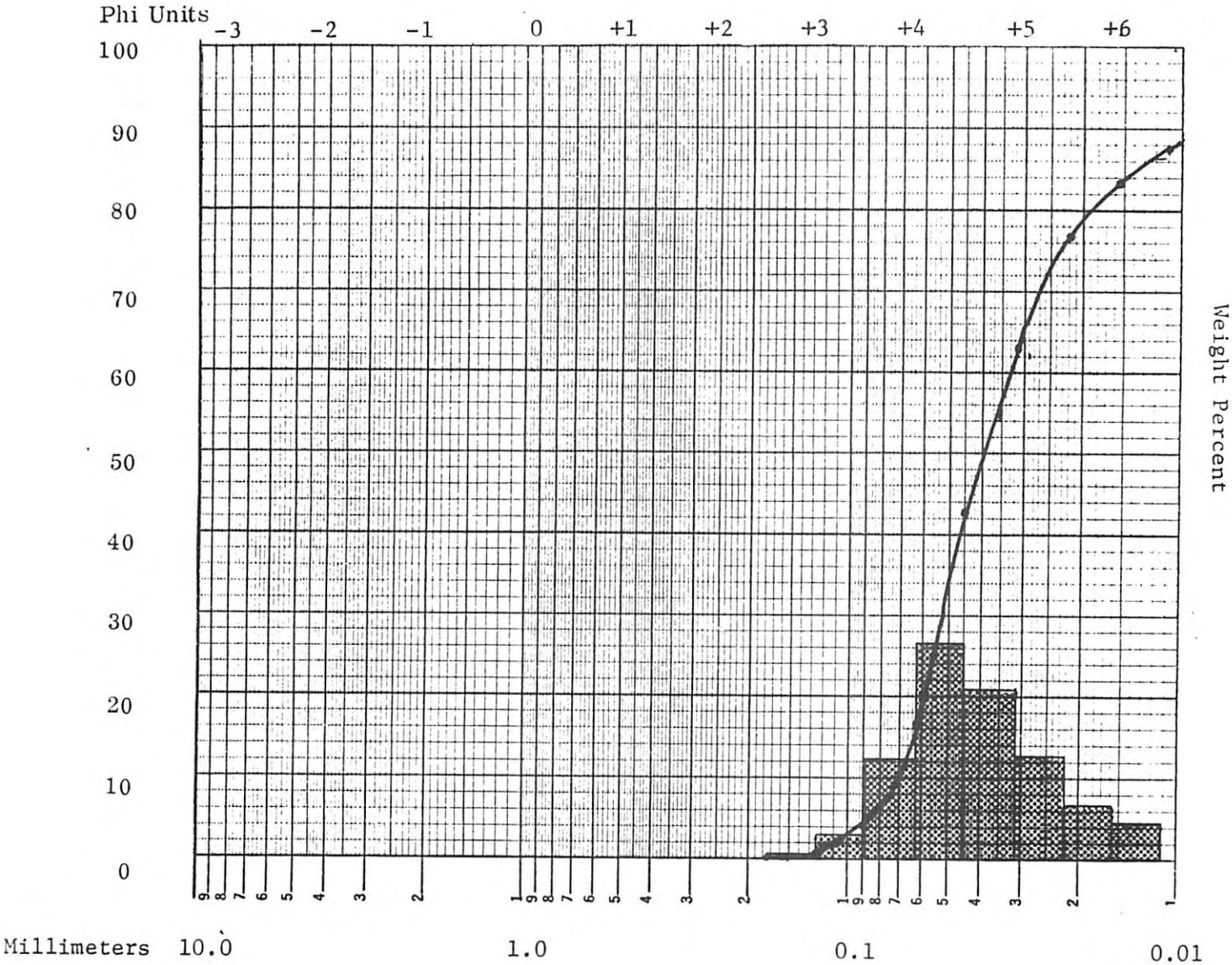
Depth 50.0 Fathoms

91.6 Meters

300.0 Feet

Sample description greenish gray very fine grained sandy silt

Sample Weight 181.190 g



SIZE PARAMETERS

1st Mode	.044 - .062 mm	Q_{25}	.057 mm	Sorting Coef.	1.574
2nd Mode		Median: Q_{50}	.039 mm	Skewness	.862
3rd Mode		Q_{75}	.023 mm	Kurtosis	.276

SIZE ANALYSIS

Sample 2156

Lat. 37° 05.2 Long. 122° 24.7'

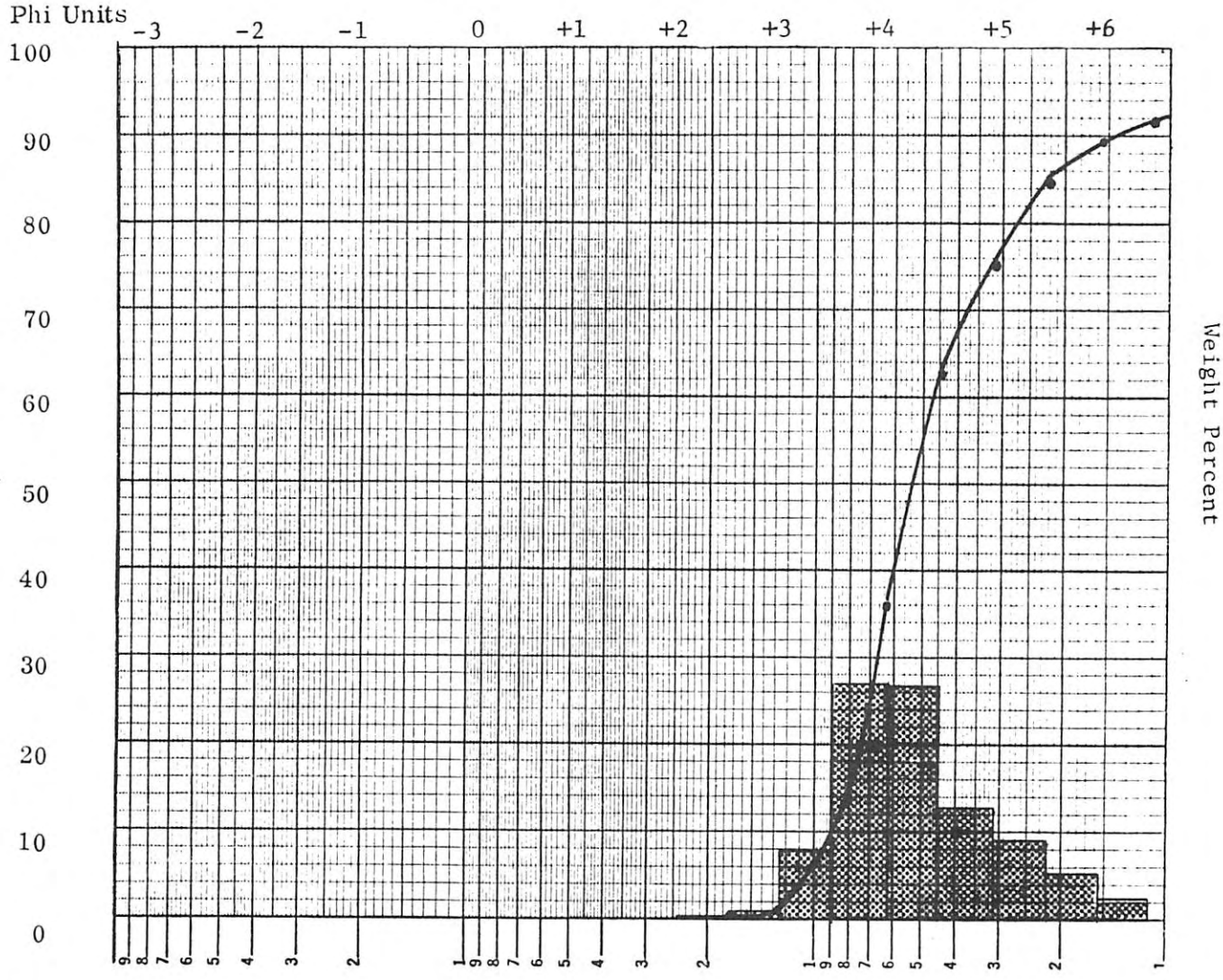
Depth 40.0 Fathoms

73.2 Meters

240.0 Feet

Sample description greenish gray very fine grained sandy silt

Sample Weight 208.419



Millimeters 10.0 1.0 0.1 0.01

SIZE PARAMETERS

1st Mode .062 - .088 mm

2nd Mode

3rd Mode

Q_{25} .070 mm

Median: Q_{50} .054 mm

Q_{75} .033 mm

Sorting Coef. 1.456

Skewness .792

Kurtosis .245

SIZE ANALYSIS

Sample 2157

Lat. 37° 06.2' Long. 122° 22.8'

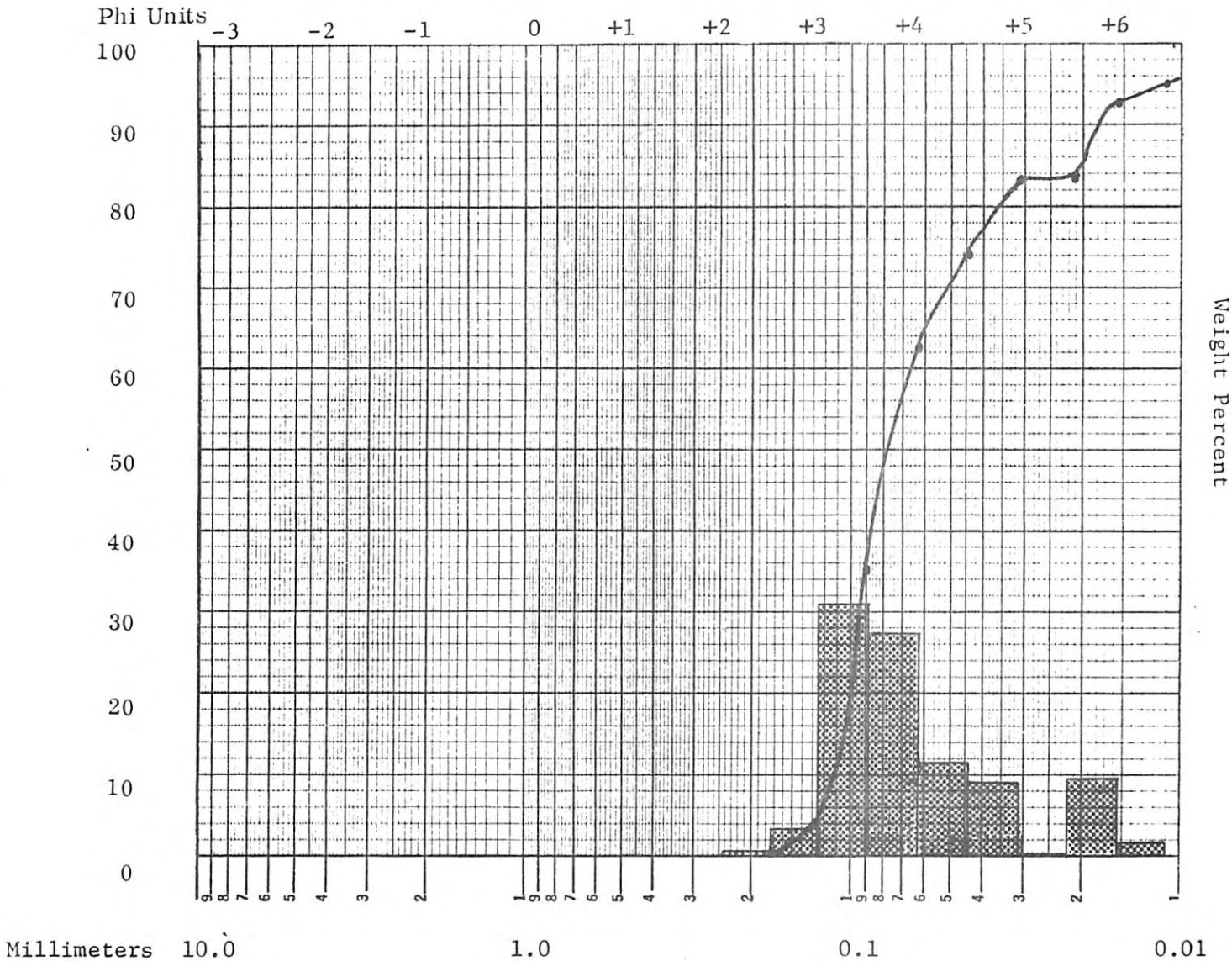
Depth 30.0 Fathoms

54.8 Meters

180.0 Feet

Sample description greenish gray fine grained silty sand

Sample Weight 168.141 g



SIZE PARAMETERS

1st Mode	.088 - .125 mm	Q_{25}	.096 mm	Sorting Coef.	1.460
2nd Mode	.0156 - .022 mm	Median: Q_{50}	.078 mm	Skewness	.710
3rd Mode		Q_{75}	.045 mm	Kurtosis	.277

SIZE ANALYSIS

Sample 2158

Lat. 37° 06.8' Long. 122° 21.8'

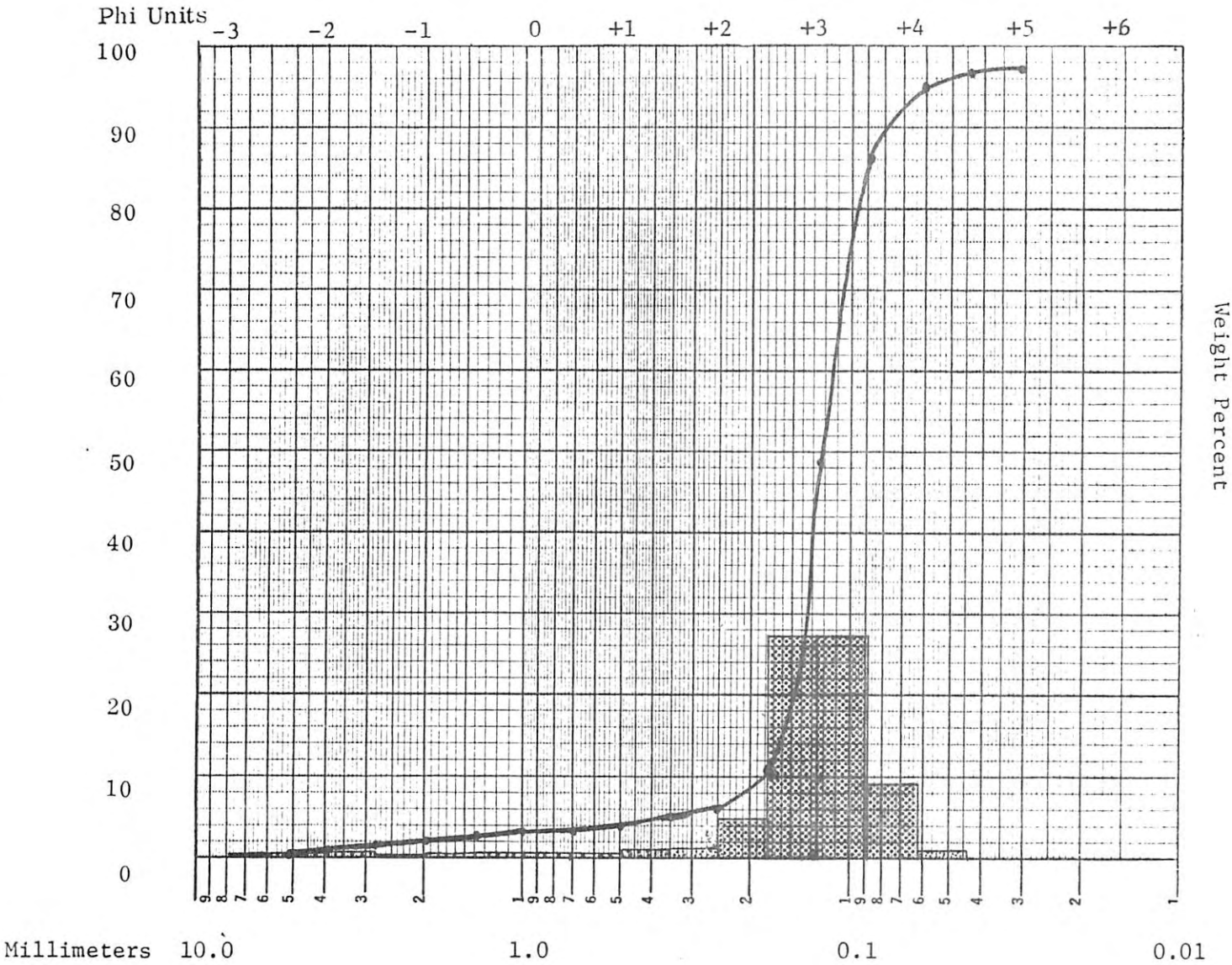
Depth 20 Fathoms

36.6 Meters

120.0 Feet

Sample description gray colored fine grained sand with abundant coarse shell material and a few assorted pebbles

Sample Weight 153.081 g



SIZE PARAMETERS

1st Mode	.088 - .175 mm	Q_{25}	.140 mm	Sorting Coef.	1.177
2nd Mode	2.88 - 4.00 mm	Median: Q_{50}	.120 mm	Skewness	.982
3rd Mode		Q_{75}	.101 mm	Kurtosis	.193

SIZE ANALYSIS

Sample 2159

Lat. 37° 07.1' Long. 122° 21.3'

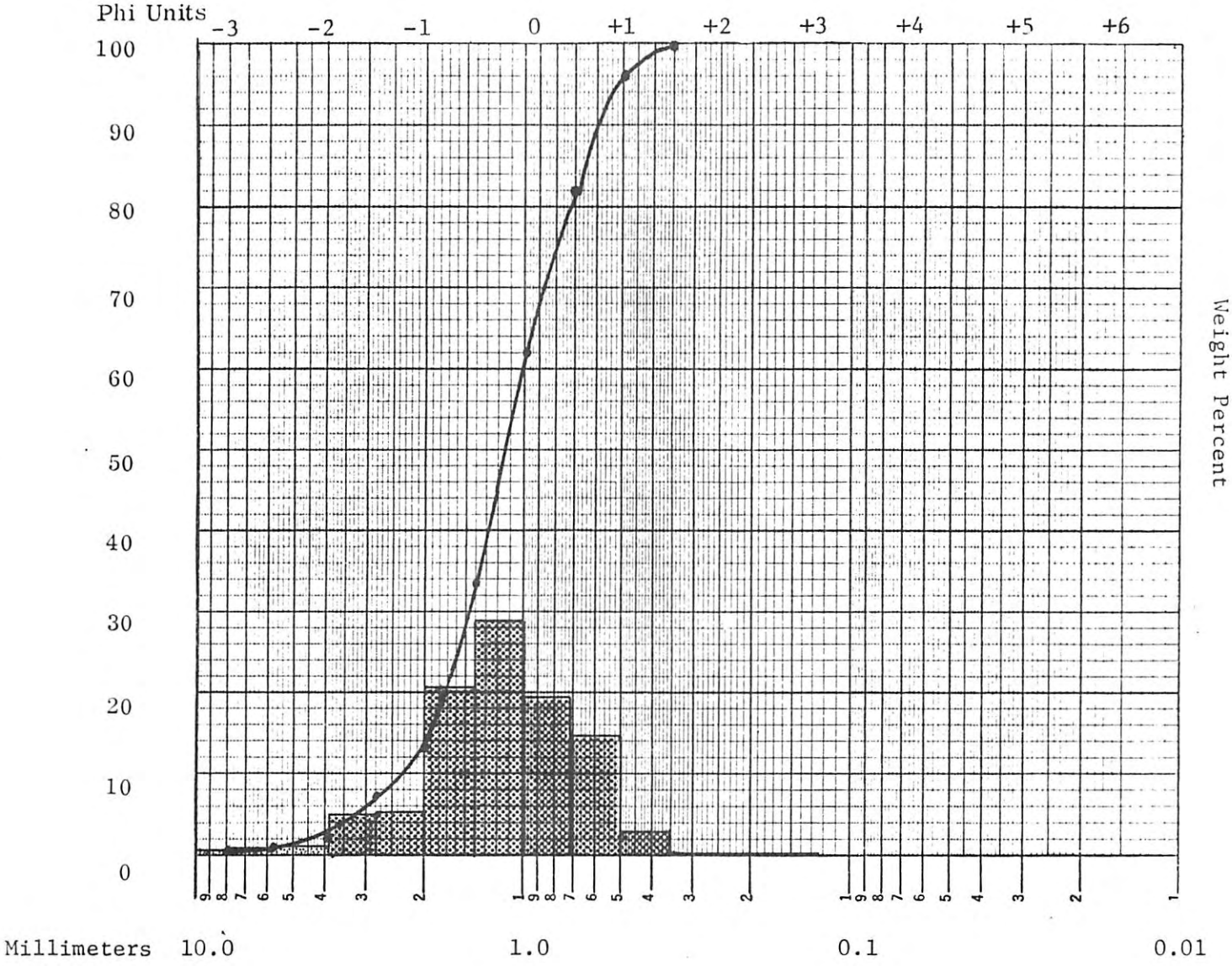
Depth 10.0 Fathoms

18.3 Meters

60.0 Feet

Sample description coarse grained sand and pebbles, consisting of large shell and rock frag., from tidal channel lag deposit?

Sample Weight 126.964 g.



SIZE PARAMETERS

1st Mode .991 - 1.397 mm

2nd Mode

3rd Mode

Q_{25} 1.58 mm

Median: Q_{50} 1.15 mm

Q_{75} .80 mm

Sorting Coef. 1.405

Skewness .956

Kurtosis .229

SIZE ANALYSIS

Sample 2160

Lat. 37° 02.7' Long. 122° 22.8'

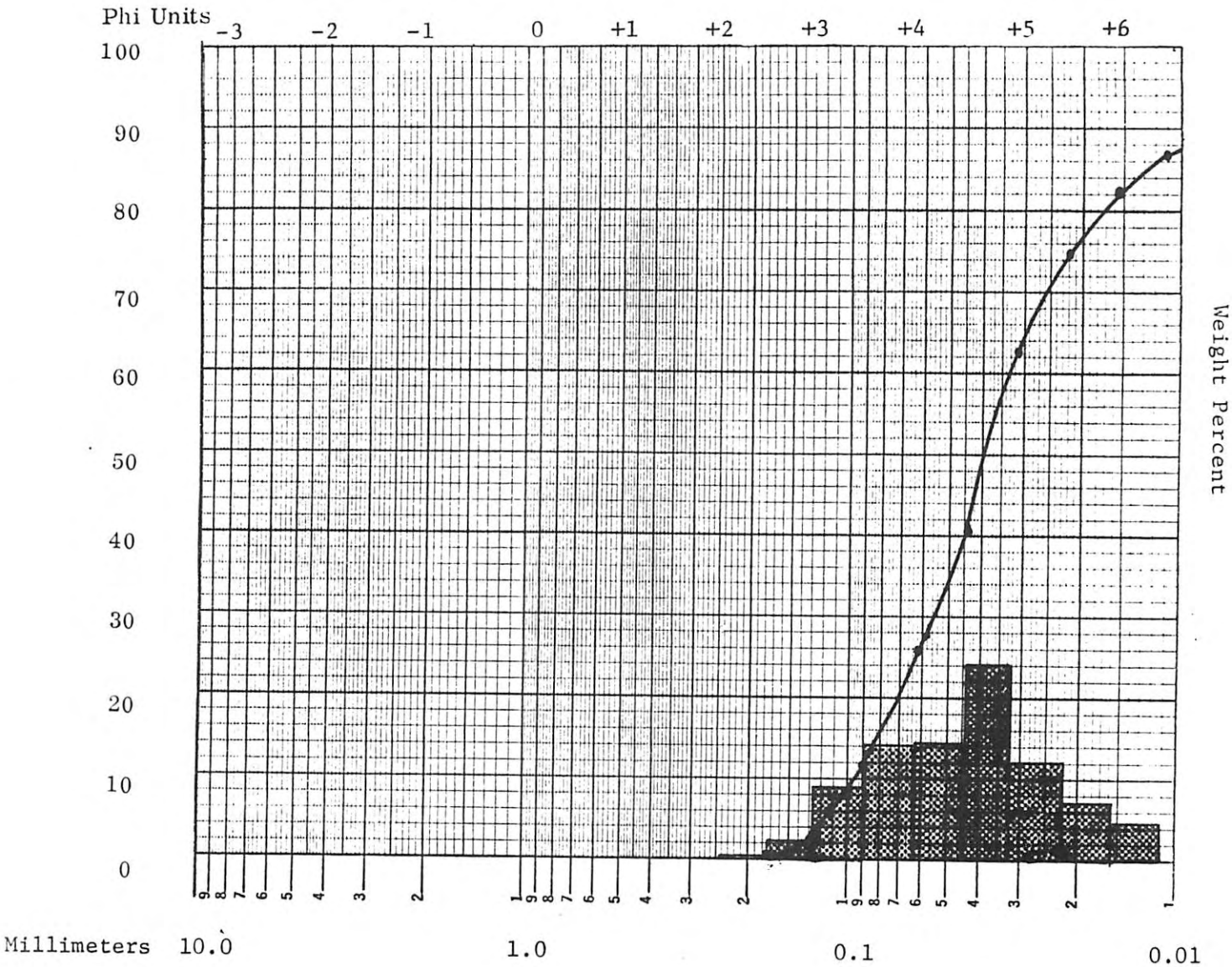
Depth 50.0 Fathoms

91.6 Meters

300.0 Feet

Sample description greenish gray very fine grained sandy silt

Sample Weight 224.874 g



SIZE PARAMETERS

1st Mode .031 - .044 mm

2nd Mode

3rd Mode

Q_{25} .063 mm

Median: Q_{50} .040 mm

Q_{75} .022 mm

Sorting Coef. 1.692

Skewness .866

Kurtosis .233

SIZE ANALYSIS

Sample 2161

Lat. 37° 03.5' Long. 122° 21.7'

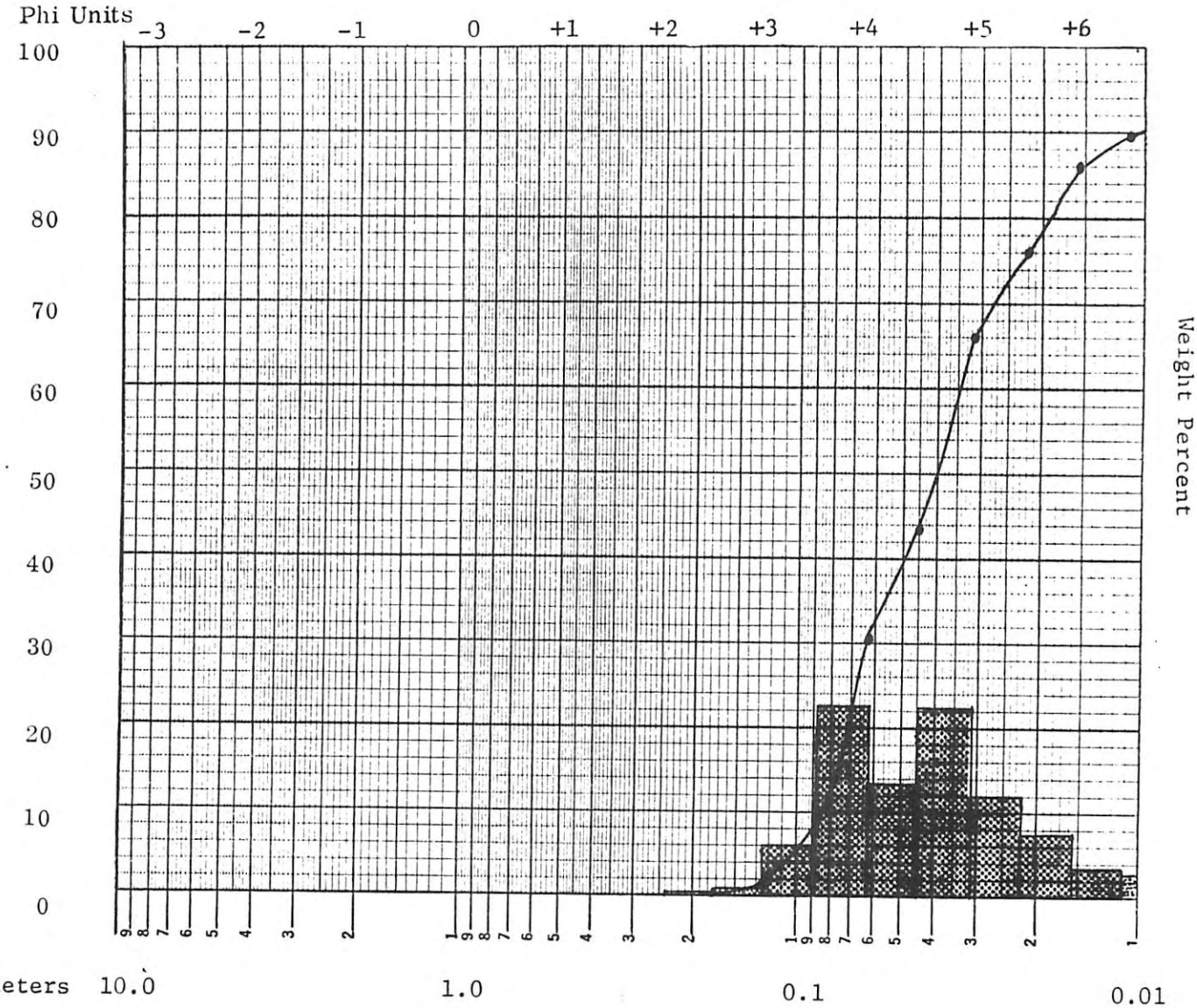
Depth 40.0 Fathoms

73.2 Meters

240.0 Feet

Sample description greenish gray very fine grained sandy silt

Sample Weight 220.335 g



SIZE PARAMETERS

1st Mode .062 - .088 mm

2nd Mode .031 - .044 mm

3rd Mode

Q_{25} .068 mm

Median: Q_{50} .040 mm

Q_{75} .023 mm

Sorting Coef. 1.719

Skewness .977

Kurtosis .302

SIZE ANALYSIS

Sample 2162

Lat. 37° 04.3' Long. 122° 20.4'

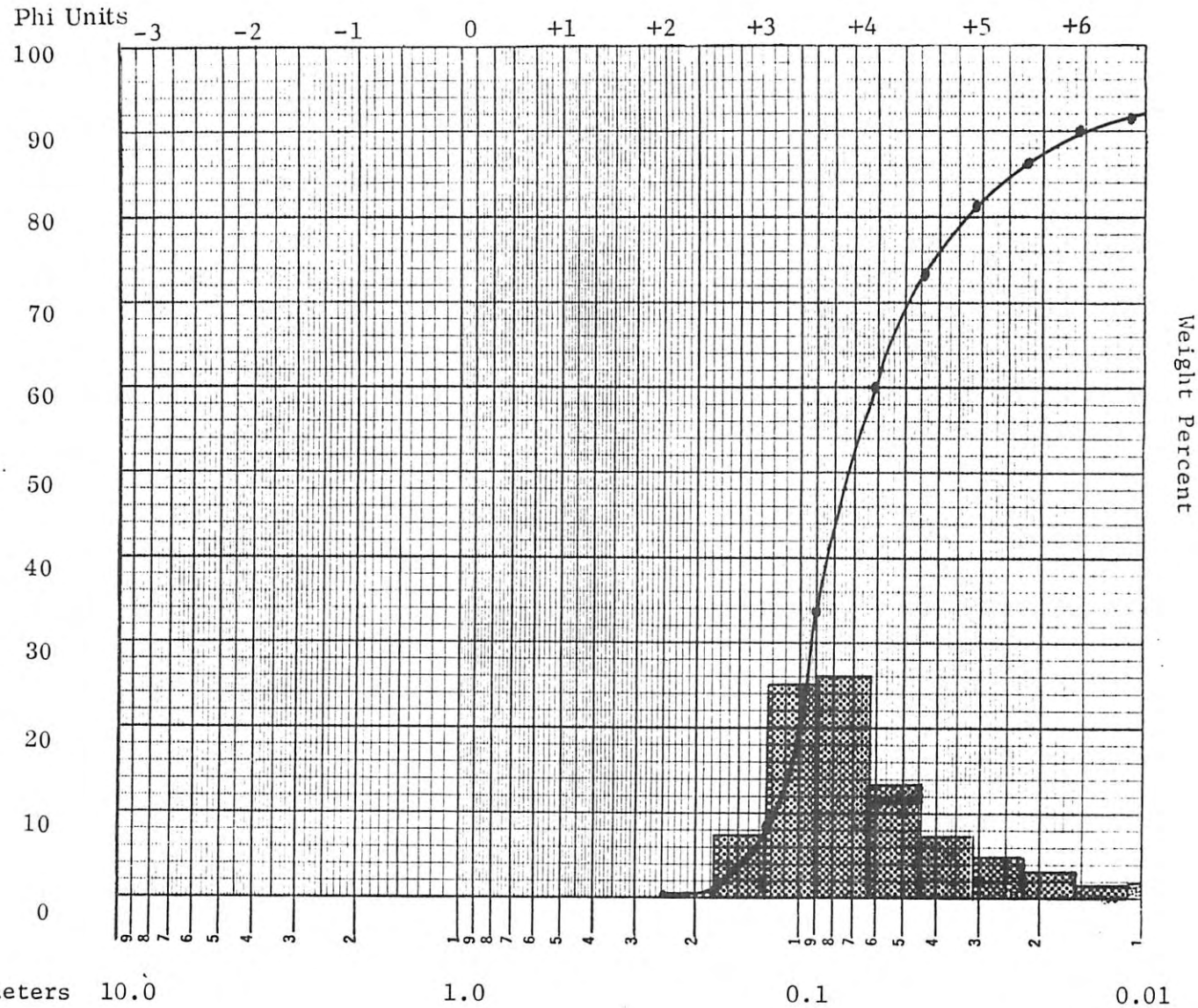
Depth 30.0 Fathoms

54.8 Meters

180.0 Feet

Sample description greenish gray fine grained silty sand

Sample Weight 206.932 g



SIZE PARAMETERS

1st Mode .062 - .088 mm

2nd Mode

3rd Mode

Q_{25} .095 mm

Median: Q_{50} .073 mm

Q_{75} .042 mm

Sorting Coef. 1.503

Skewness .749

Kurtosis .252

SIZE ANALYSIS

Sample 2163

Lat. 37° 05.1' Long. 122° 19.3'

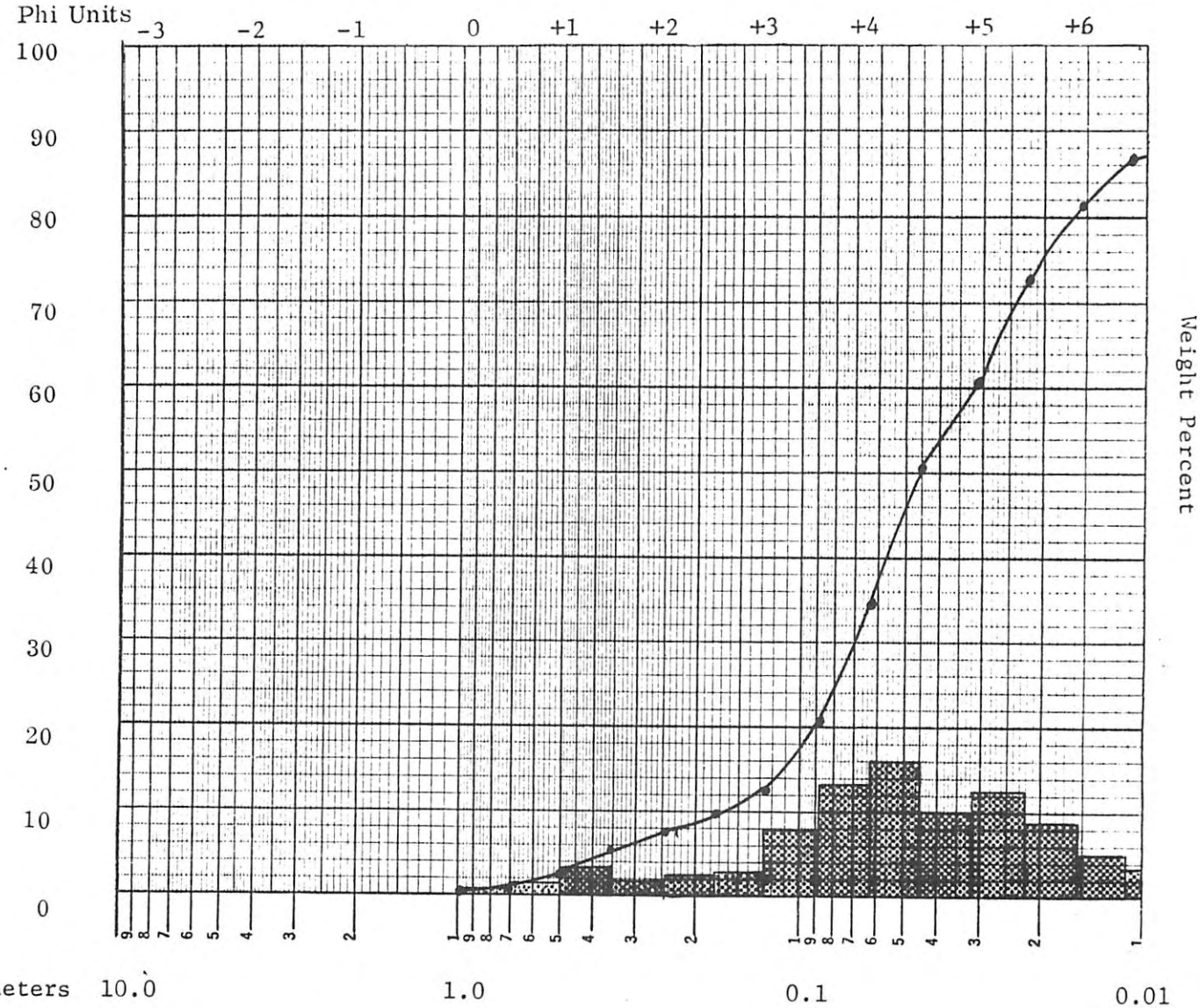
Depth 20.0 Fathoms

36.6 Meters

120.0 Feet

Sample description greenish gray fine grained sandy silt

Sample Weight 200.667 g



SIZE PARAMETERS

1st Mode	.044 - .062 mm	Q_{25}	.080 mm	Sorting Coef.	2.000
2nd Mode	.022 - .031 mm	Median: Q_{50}	.045 mm	Skewness	.790
3rd Mode	.351 - .495 mm	Q_{75}	.020 mm	Kurtosis	.192

SIZE ANALYSIS

Sample 2164

Lat. 37° 05.7' Long. 122° 18.2'

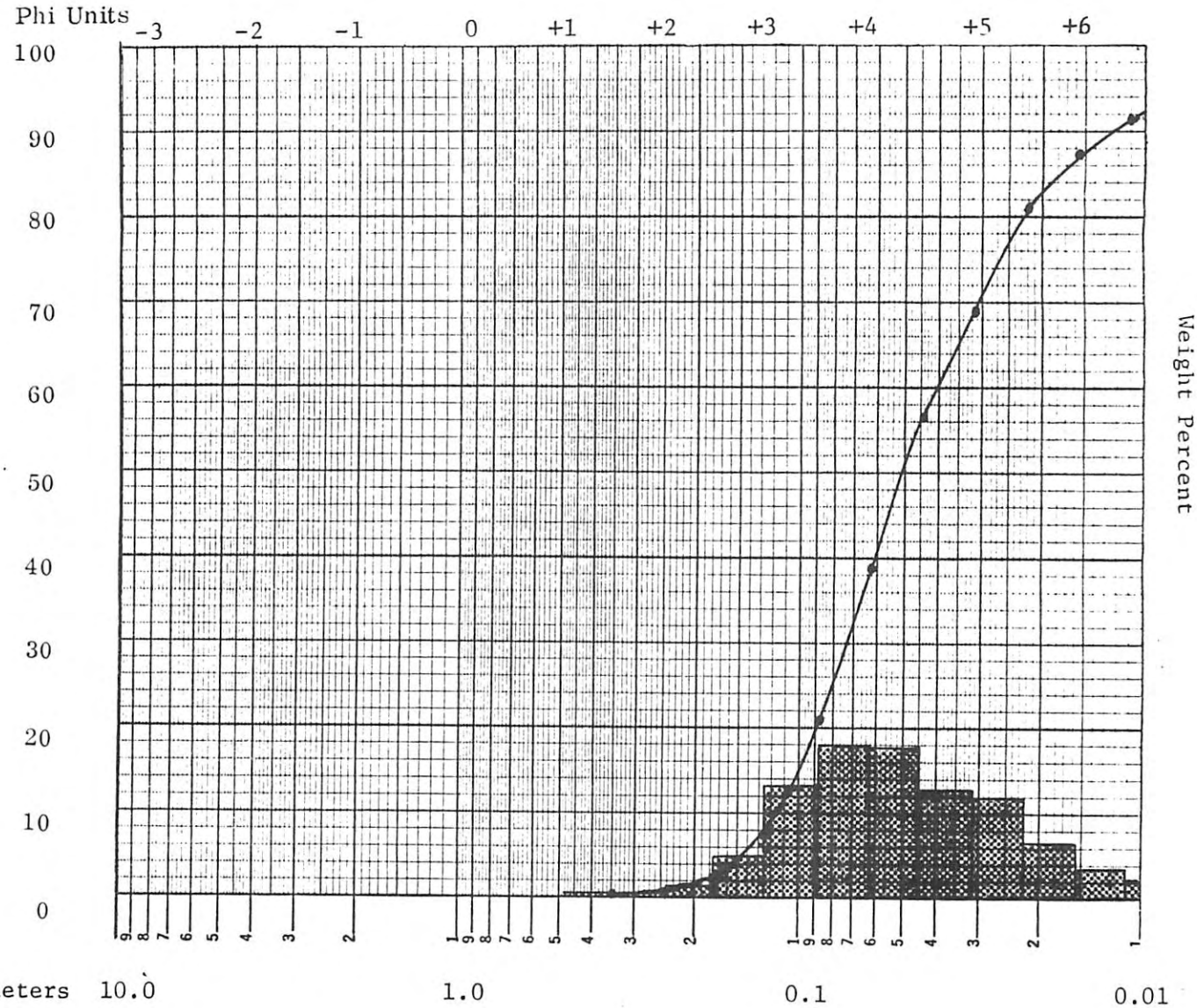
Depth 10.0 Fathoms

18.3 Meters

60.0 Feet

Sample description gray colored fine grained sandy silt

Sample Weight 210.418 g.



SIZE PARAMETERS

1st Mode .062 - .088 mm

2nd Mode

3rd Mode

Q_{25} .080 mm

Median: Q_{50} .051 mm

Q_{75} .027 mm

Sorting Coef. 1.721

Skewness .830

Kurtosis .257

SIZE ANALYSIS

Sample 2165

Lat. 37° 06.2' Long. 122° 17.7'

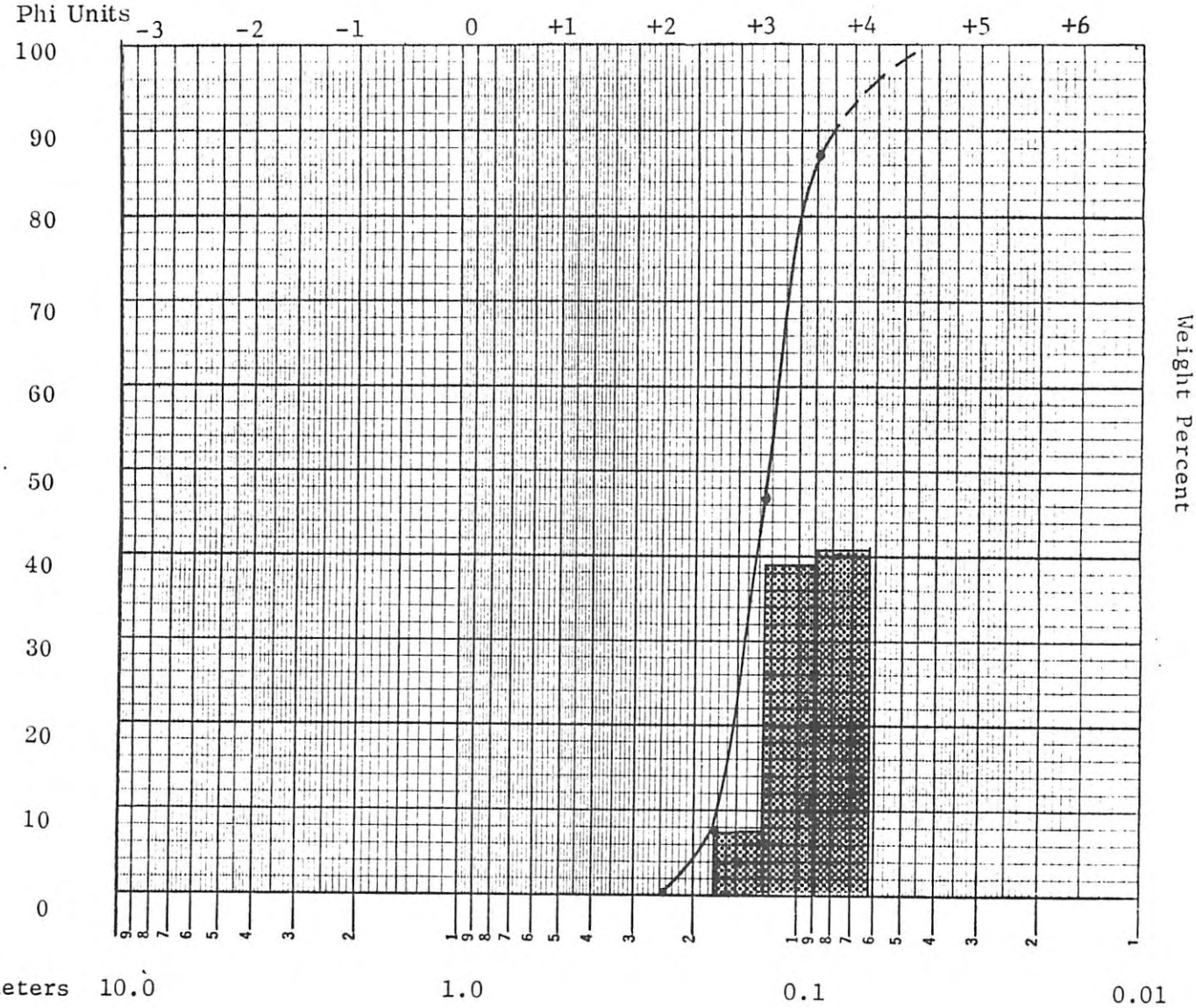
Depth 5.0 Fathoms

9.2 Meters

30.0 Feet

Sample description gray colored fine grained sand

Sample Weight 268.049 g



SIZE PARAMETERS

1st Mode .062 - .088 mm

2nd Mode

3rd Mode

Q_{25} .149 mm

Median: Q_{50} .122 mm

Q_{75} .106 mm

Sorting Coef. 1.185

Skewness 1.06

Kurtosis .239

SIZE ANALYSIS

Sample 2166

Lat. 37° 06.5' Long. 122° 18.6'

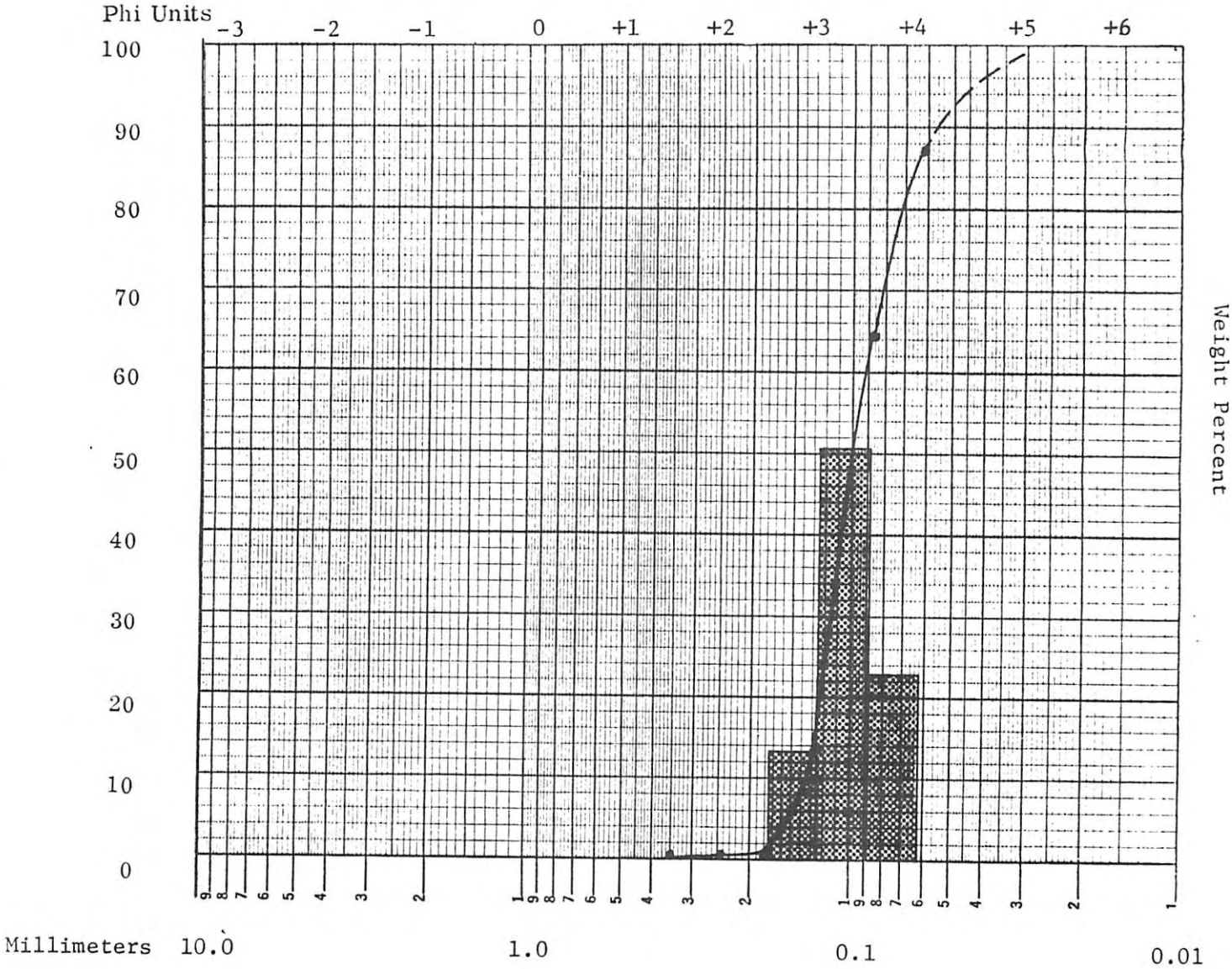
Depth 6.7 Fathoms

12.2 Meters

40.0 Feet

Sample description greenish gray fine grained sand

Sample Weight 129.831 g



SIZE PARAMETERS

1st Mode .088 - .125

2nd Mode

3rd Mode

Q_{25} .119 mm

Median: Q_{50} .100 mm

Q_{75} .077 mm

Sorting Coef. 1.243

Skewness .916

Kurtosis .269

SIZE ANALYSIS

Sample 2167

Lat. 37° 00.9' Long. 122° 20.6'

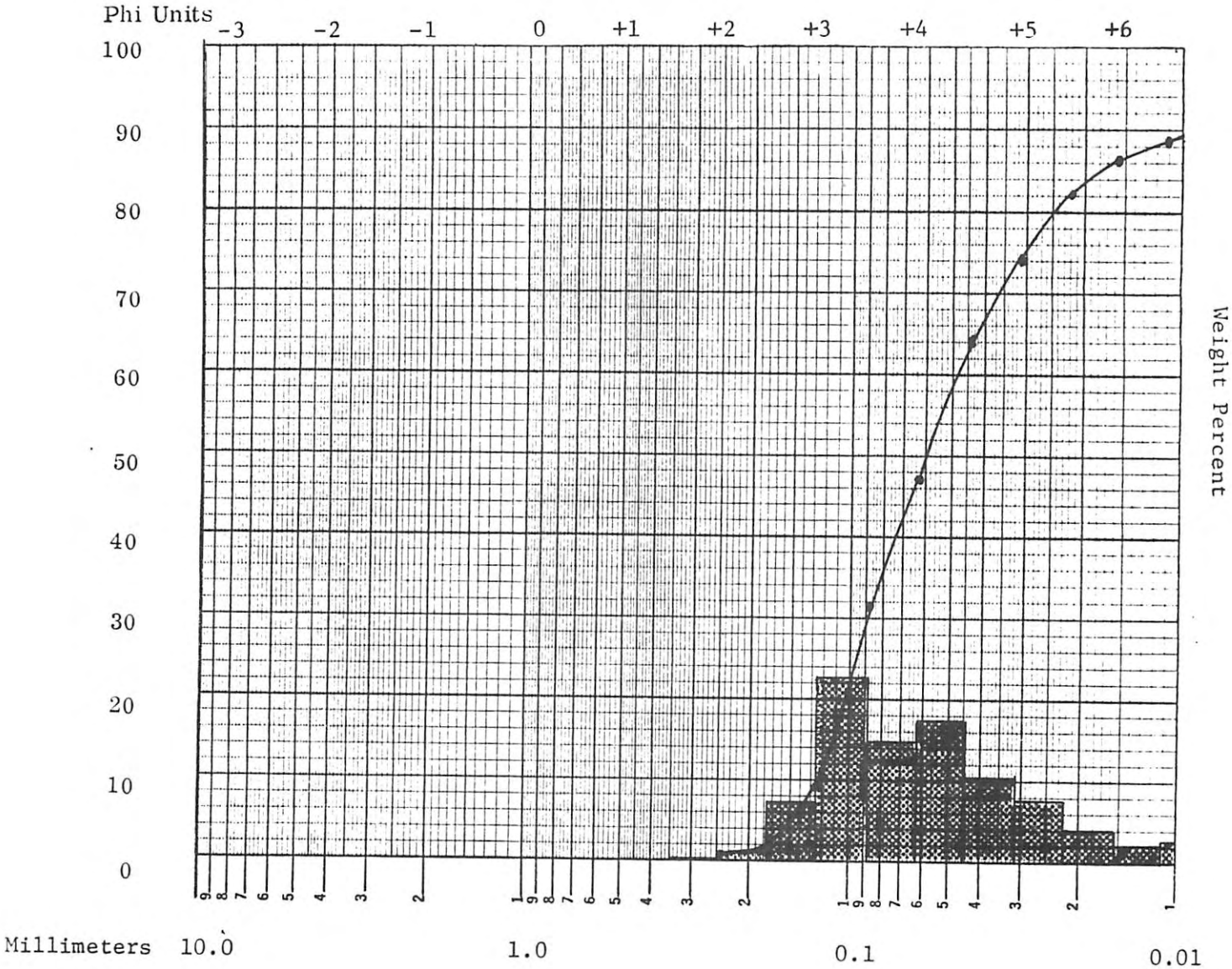
Depth 50.0 Fathoms

91.6 Meters

300.0 Feet

Sample description greenish gray very fine grained silty sand

Sample Weight 183.354 g



SIZE PARAMETERS

1st Mode	.088 - .125 mm	Q_{25}	.096 mm	Sorting Coef.	1.788
2nd Mode	.044 - .062 mm	Median: Q_{50}	.060 mm	Skewness	.800
3rd Mode	.008 - .011 mm	Q_{75}	.030 mm	Kurtosis	.284

SIZE ANALYSIS

Sample 2168

Lat. 37° 01.7' Long. 122° 19.4'

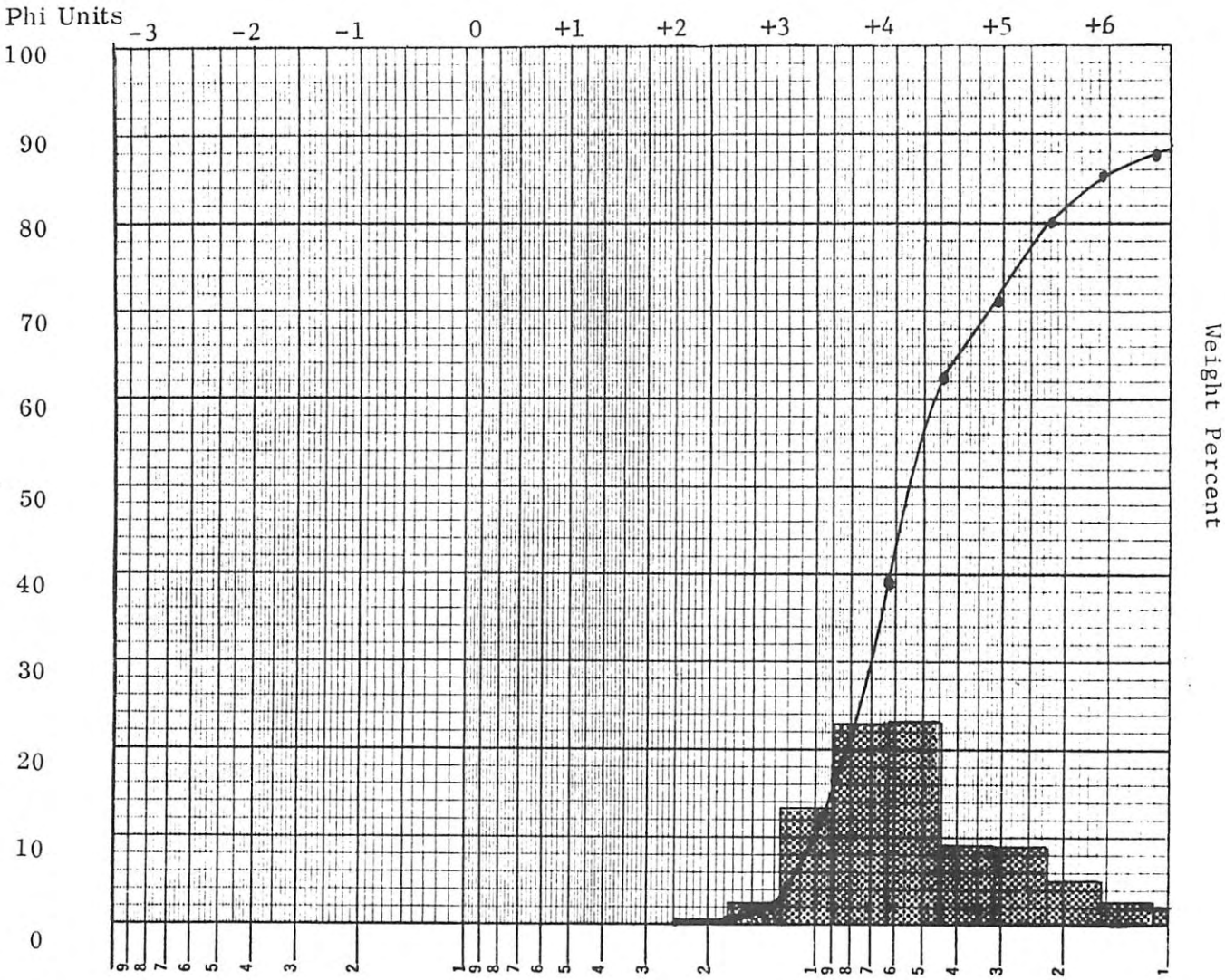
Depth 40.0 Fathoms

73.2 Meters

240.0 Feet

Sample description greenish gray very fine grained sandy silt

Sample Weight 254.843 g



Millimeters 10.0 1.0 0.1 0.01

SIZE PARAMETERS

1st Mode .044 - .062 mm

2nd Mode

3rd Mode

Q_{25} .076 mm

Median: Q_{50} .055 mm

Q_{75} .028 mm

Sorting Coef. 1.647

Skewness .703

Kurtosis .800

SIZE ANALYSIS

Sample 2169

Lat. 37° 02.6' Long. 122° 17.8'

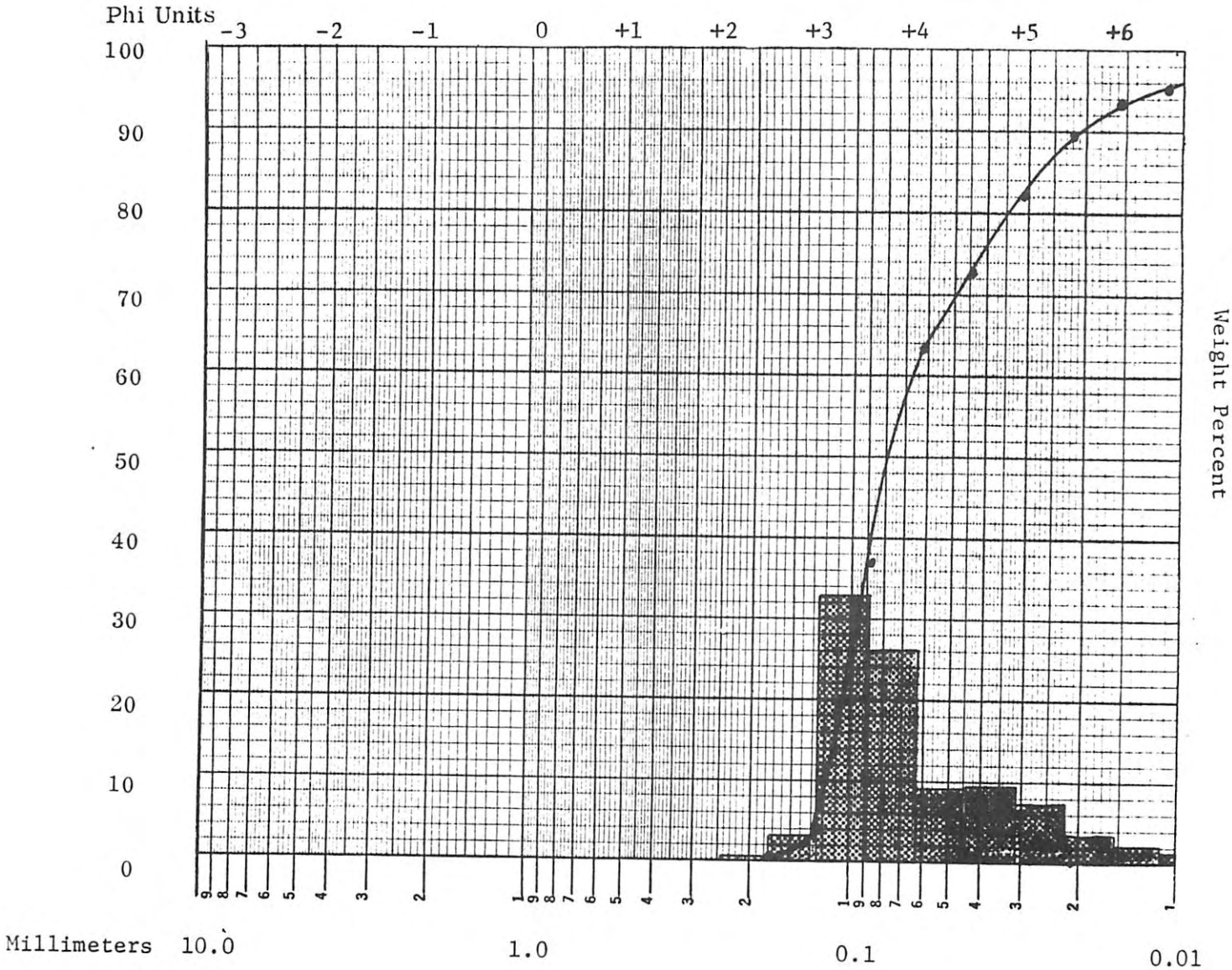
Depth 30.0 Fathoms

54.8 Meters

180.0 Feet

Sample description greenish gray fine grained sandy silt

Sample Weight 207.578 g



SIZE PARAMETERS

1st Mode .088 - .125 mm

2nd Mode .031 - .044 mm

3rd Mode

Q_{25} .100 mm

Median: Q_{50} .079 mm

Q_{75} .042 mm

Sorting Coef. 1.543

Skewness .673

Kurtosis .293

SIZE ANALYSIS

Sample 2170

Lat. 37° 03.3' Long. 122° 16.9'

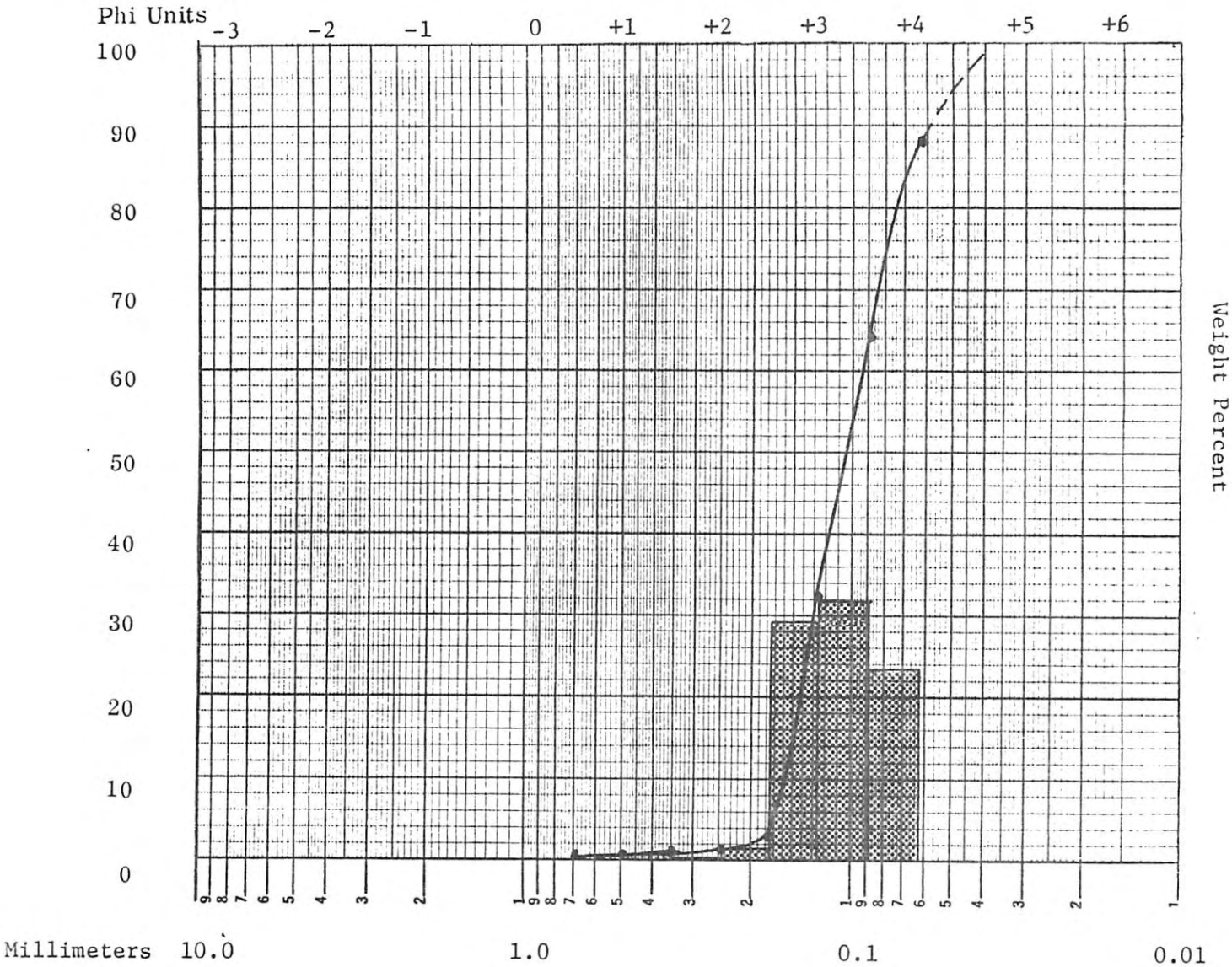
Depth 20.0 Fathoms

36.6 Meters

120.0 Feet

Sample description gray colored fine grained sand

Sample Weight 202.423 g



SIZE PARAMETERS

1st Mode	.088 - .125 mm	Q_{25}	.135 mm	Sorting Coef.	1.300
2nd Mode	.351 - .495 mm	Median: Q_{50}	.105 mm	Skewness	.976
3rd Mode		Q_{75}	.080 mm	Kurtosis	.275

SIZE ANALYSIS

Sample 2171

Lat. 37° 03.7' Long. 122° 16.4'

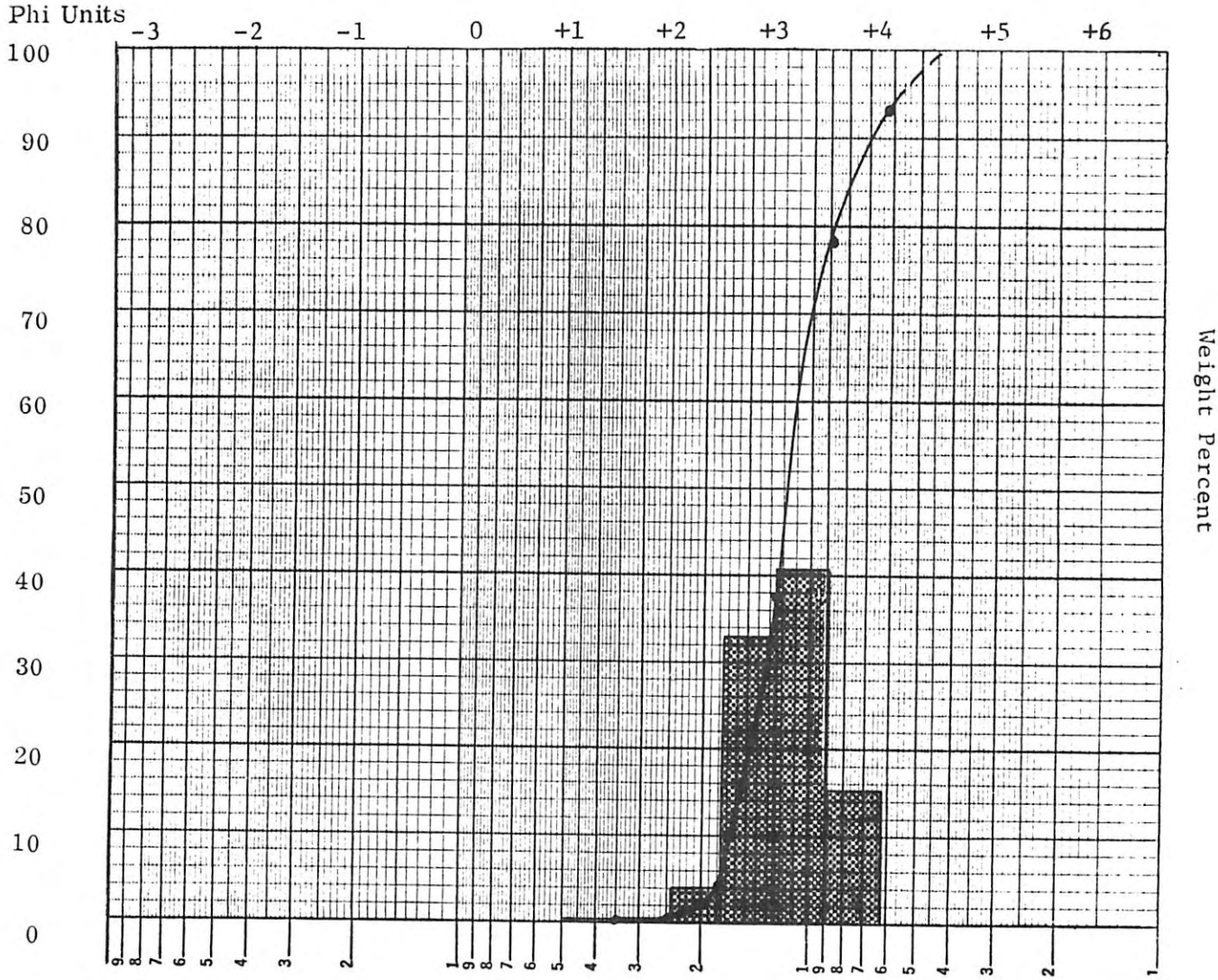
Depth 15.0 Fathoms

27.4 Meters

90.0 Feet

Sample description gray' colored fine grained sand

Sample Weight 175.391 g



Millimeters 10.0 1.0 0.1 0.01

SIZE PARAMETERS

1st Mode .088 - .125 mm

2nd Mode

3rd Mode

Q_{25} .140 mm

Median: Q_{50} .118 mm

Q_{75} .095 mm

Sorting Coef. 1.214

Skewness .955

Kurtosis .234

SIZE ANALYSIS

Sample 2172

Lat. 37°03.9' Long. 122° 15.9'

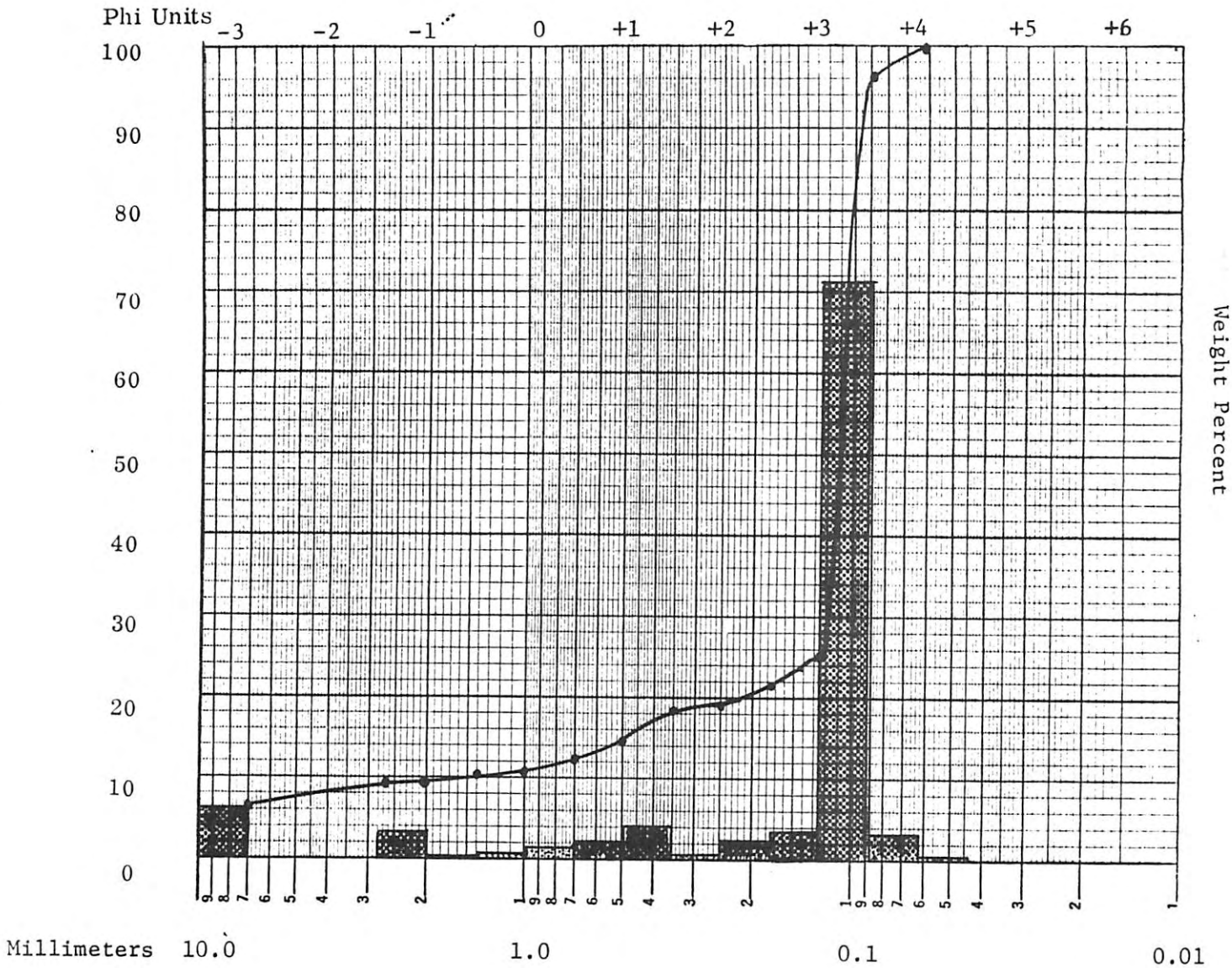
Depth 10.0 Fathoms

18.3 Meters

60.0 Feet

Sample description gray colored fine grained sand with some shell material and a few rock fragments

Sample Weight 4.1717 g



SIZE PARAMETERS

1st Mode	.088 - .125 mm	Q_{25}	.130 mm	Sorting Coef.	1.118
2nd Mode	7.0 - 10.0 mm	Median: Q_{50}	.110 mm	Skewness	1.117
3rd Mode	.351 - .495 mm	Q_{75}	.104 mm	Kurtosis	.033

SIZE ANALYSIS

Sample 2173

Lat. 36° 58.8' Long. 122° 18.0'

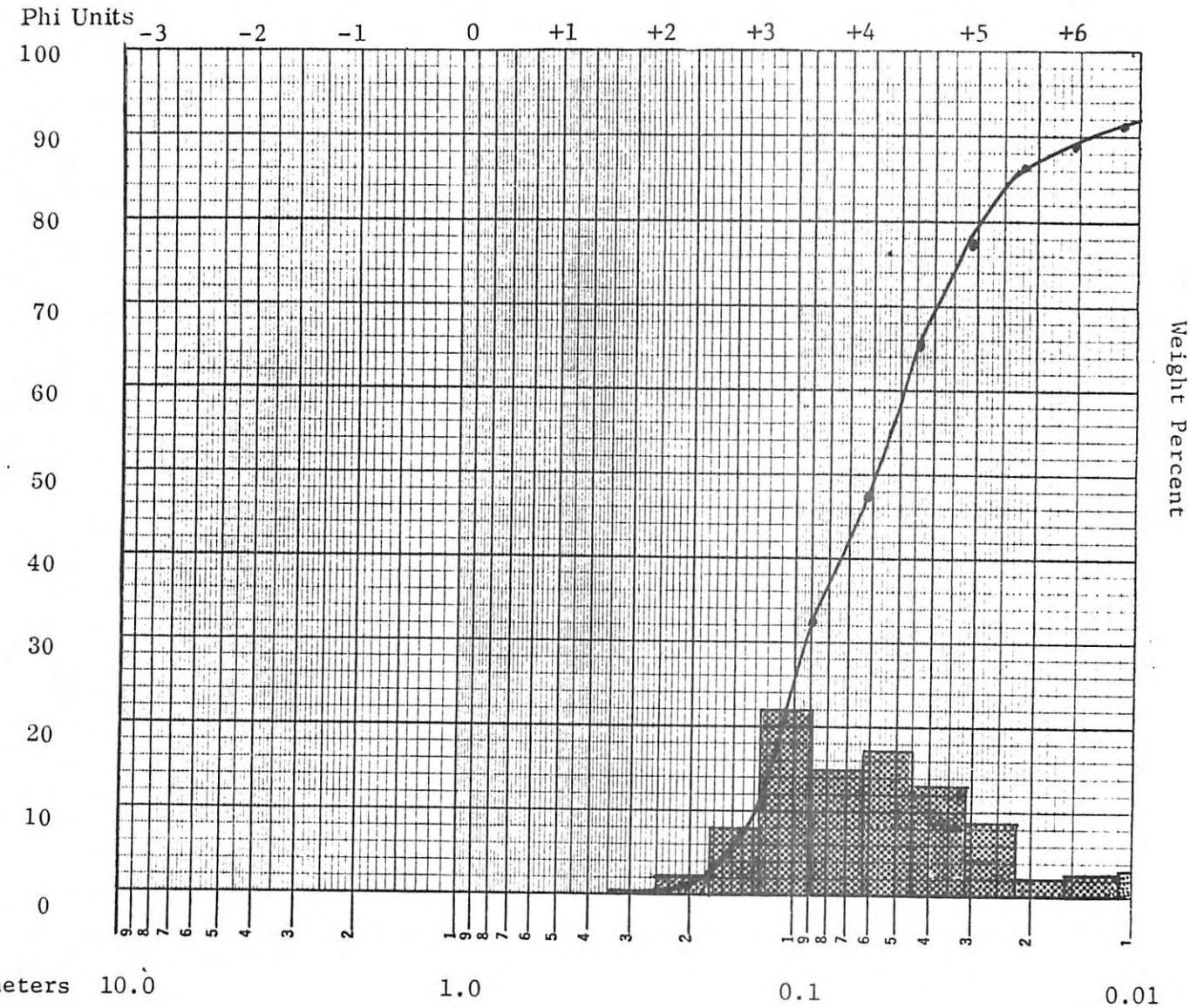
Depth 50.0 Fathoms

91.6 Meters

300.0 Feet

Sample description greenish gray very fine grained sandy silt with much glauconite

Sample Weight 204.204 g



SIZE PARAMETERS

1st Mode	.088 - .125 mm	Q_{25}	.100 mm	Sorting Coef.	1.715
2nd Mode	.044 - .062 mm	Median: Q_{50}	.059 mm	Skewness	.977
3rd Mode	.008 - .011 mm	Q_{75}	.034 mm	Kurtosis	.284

SIZE ANALYSIS

Sample 2174

Lat. 36° 59.7' Long. 122° 17.1'

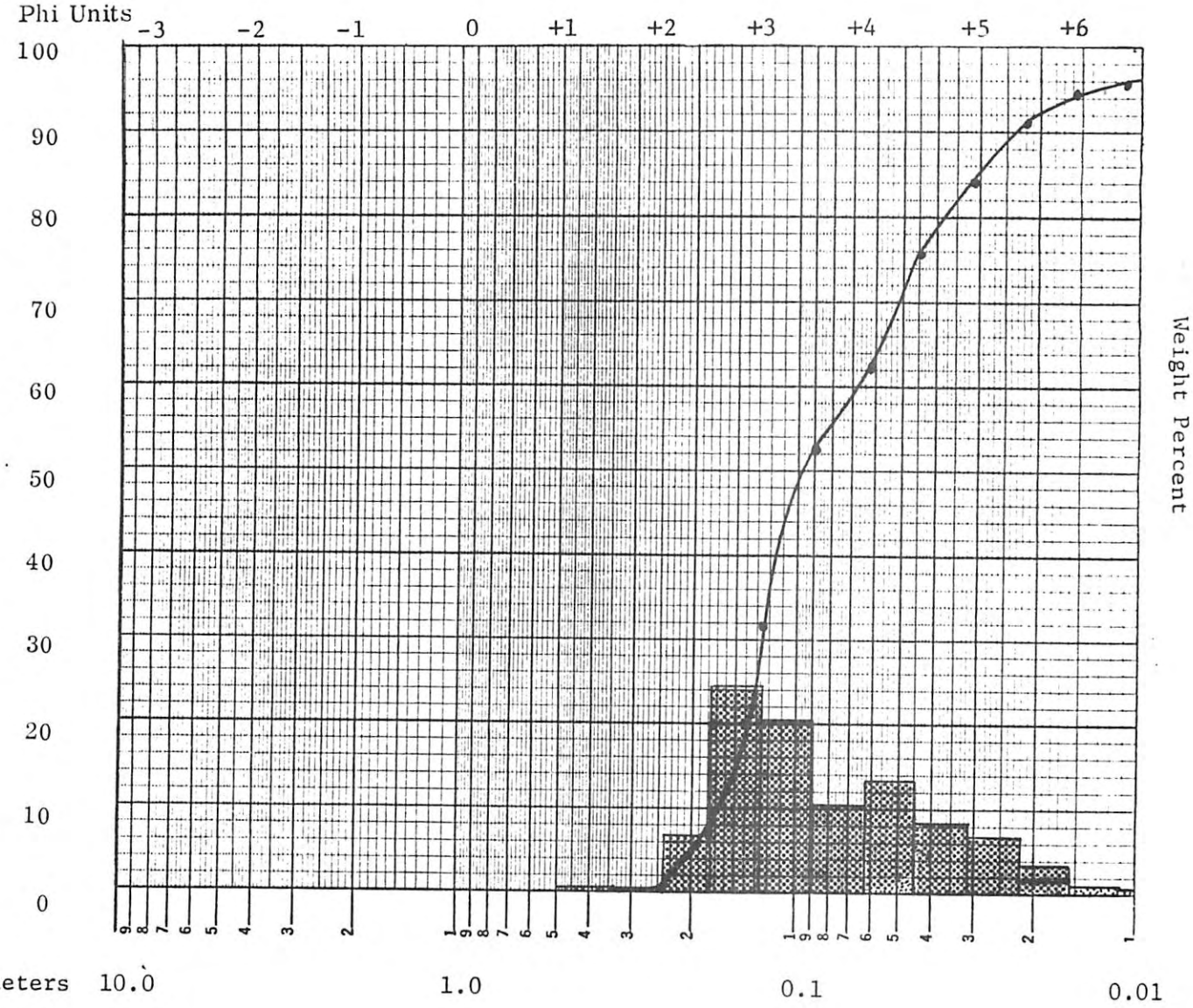
Depth 40.0 Fathoms

73.2 Meters

240.0 Feet

Sample description greenish gray fine grained silty sand

Sample Weight 162.003 g



SIZE PARAMETERS

1st Mode .125 - .177 mm

2nd Mode .044 - .062 mm

3rd Mode

Q_{25} .130 mm

Median: Q_{50} .097 mm

Q_{75} .047 mm

Sorting Coef. 1.663

Skewness .649

Kurtosis .287

SIZE ANALYSIS

Sample 2175

Lat. 37° 00.8' Long. 122° 15.6'

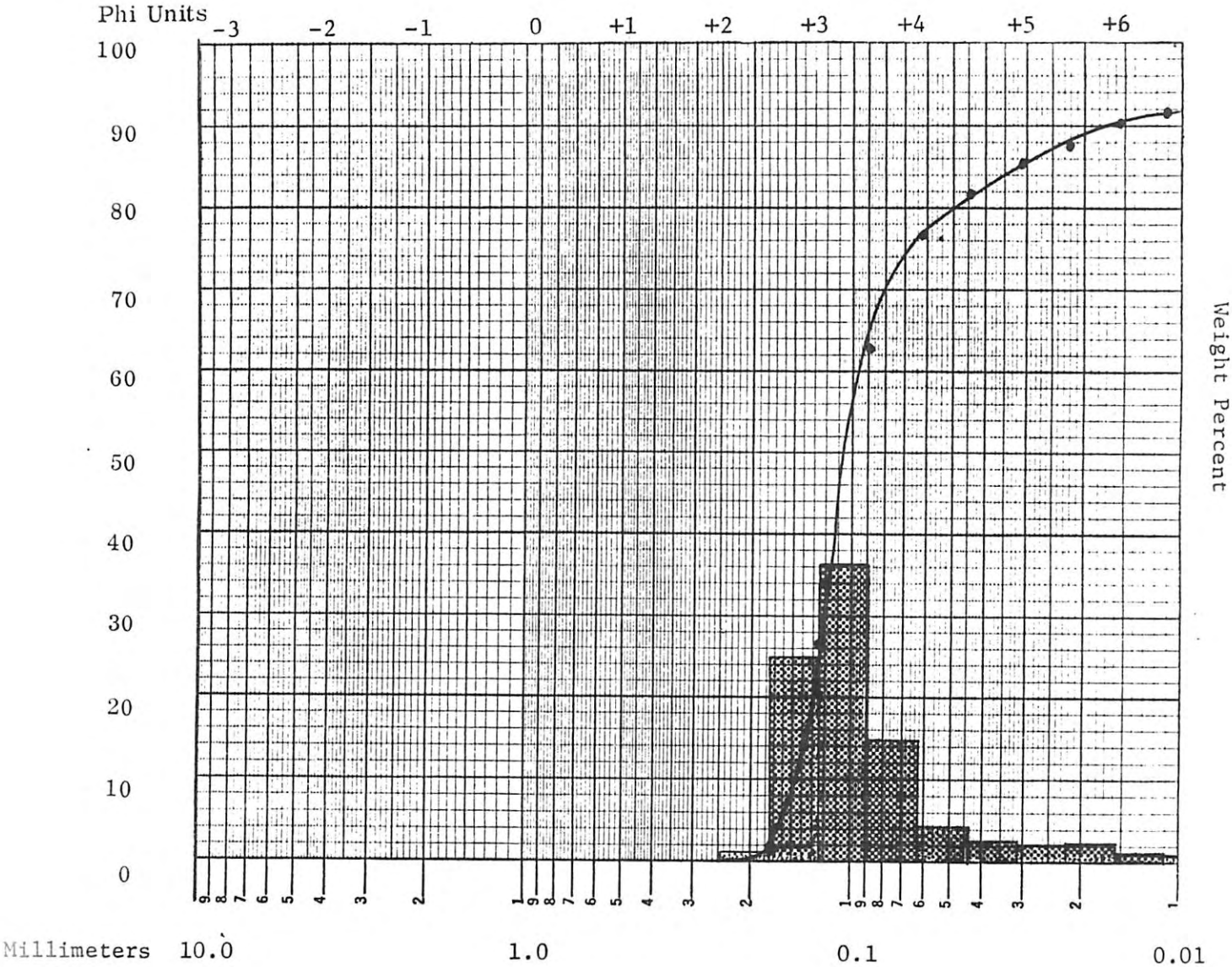
Depth 30.0 Fathoms

54.8 Meters

180.0 Feet

Sample description greenish gray fine grained silty sand

Sample Weight 161.922 g



SIZE PARAMETERS

1st Mode	.088 - .125 mm	Q_{25}	.126 mm	Sorting Coef.	1.361
2nd Mode	.0156 - .022 mm	Median: Q_{50}	.108 mm	Skewness	.735
3rd Mode		Q_{75}	.068 mm	Kurtosis	.223

SIZE ANALYSIS

Sample 2176

Lat. 37° 01.3' Long. 122° 14.8'

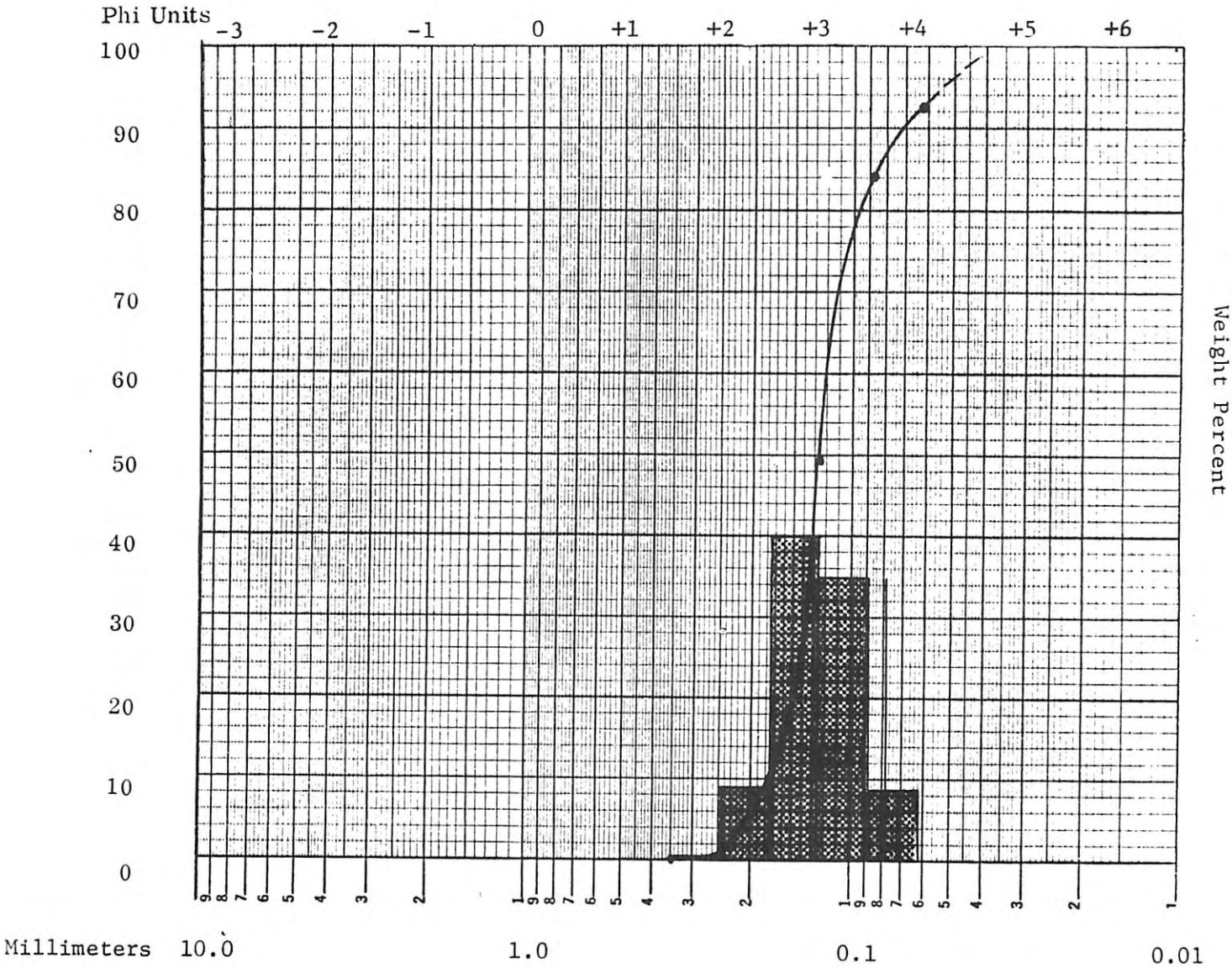
Depth 20.0 Fathoms

36.6 Meters

120.0 Feet

Sample description greenish gray fine grained sand

Sample Weight 144.890 g



SIZE PARAMETERS

1st Mode	.125 - .177 mm	Q_{25}	.141 mm	Sorting Coef.	1.159
2nd Mode		Median: Q_{50}	.125 mm	Skewness	.947
3rd Mode		Q_{75}	.105 mm	Kurtosis	.165

SIZE ANALYSIS

Sample 2177

Lat. 37° 01.8' Long. 122° 14.1'

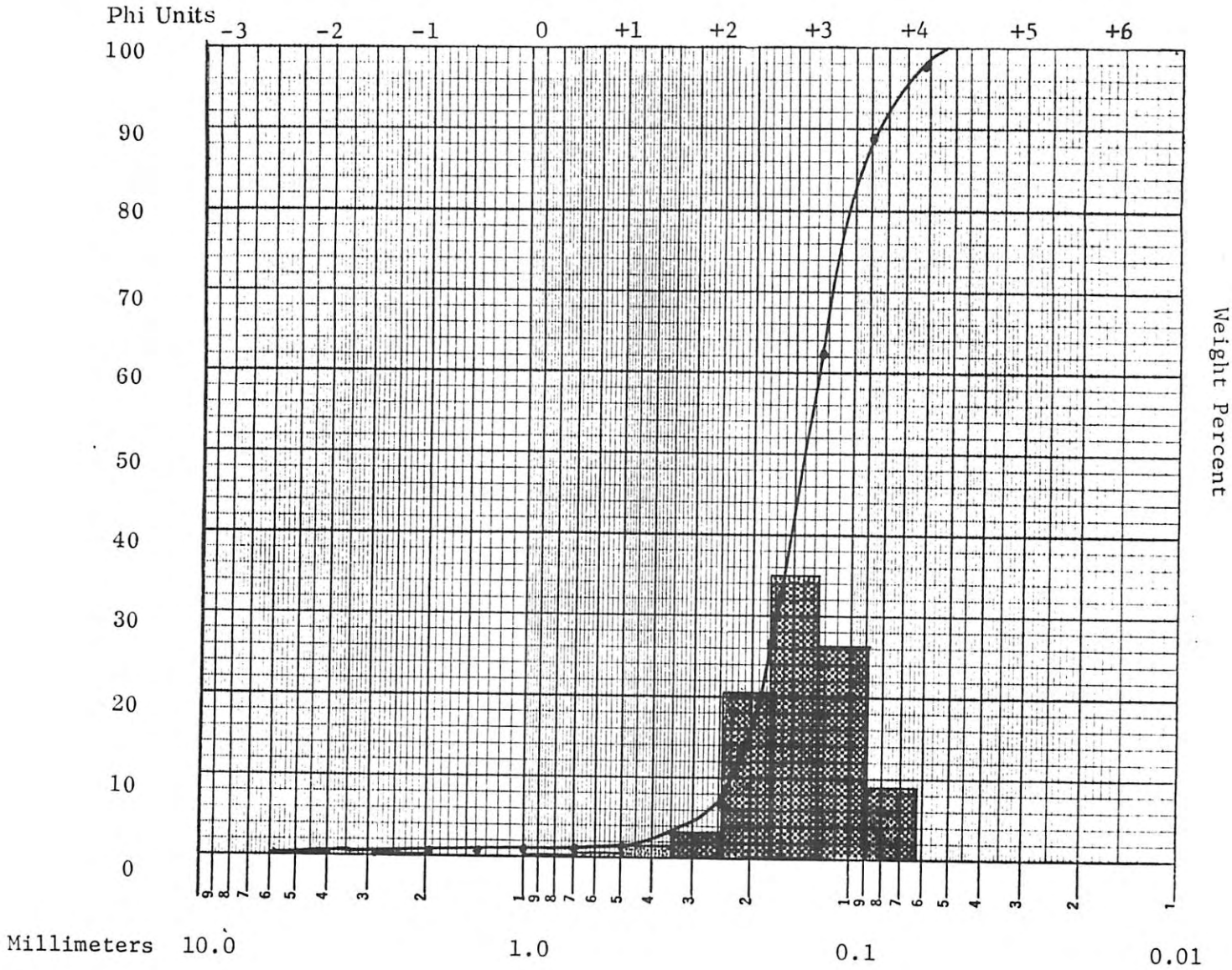
Depth 10 Fathoms

18.3 Meters

60.0 Feet

Sample description gray colored fine grained sand with occasional small pebbles

Sample Weight 122.004 g



SIZE PARAMETERS

1st Mode 1.981 - 2.80 mm

2nd Mode

3rd Mode

Q_{25} .180 mm

Median: Q_{50} .140 mm

Q_{75} .112 mm

Sorting Coef. 1.268

Skewness 1.03

Kurtosis .234

SIZE ANALYSIS

Sample 2178

Lat. 36° 56.3 Long. 122° 15.5'

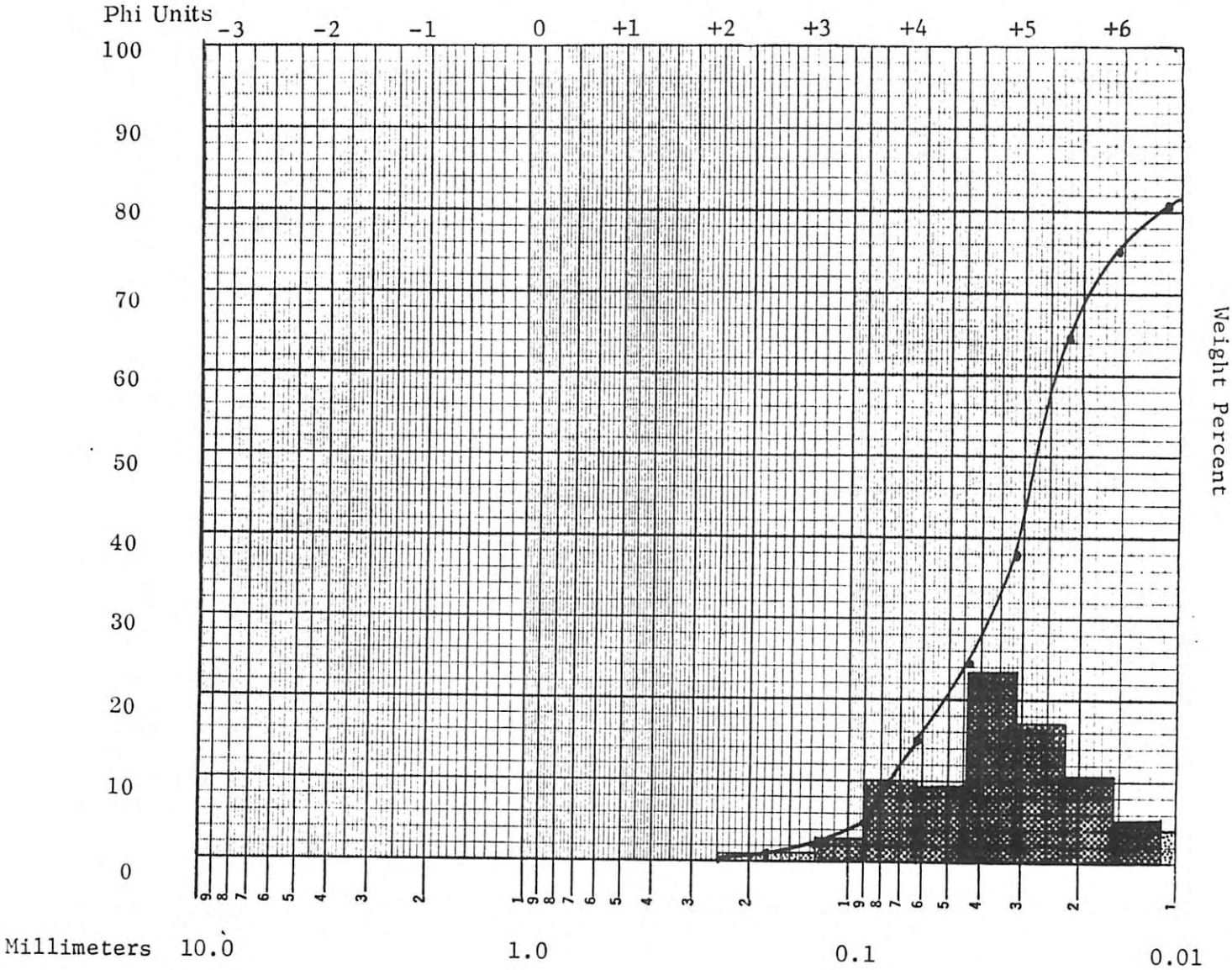
Depth 49.1 Fathoms

90.0 Meters

295.0 Feet

Sample description greenish gray very fine grained sandy silt with much glauconite and common large glauconite aggregates

Sample Weight 236.795 g



SIZE PARAMETERS

1st Mode	.031 - .044 mm	Q_{25}	.043 mm	Sorting Coef.	1.640
2nd Mode	.062 - .088 mm	Median: Q_{50}	.028 mm	Skewness	.878
3rd Mode		Q_{75}	.016 mm	Kurtosis	.190

SIZE ANALYSIS

Sample 2179

Lat. 36° 57.9' Long. 122° 14.0'

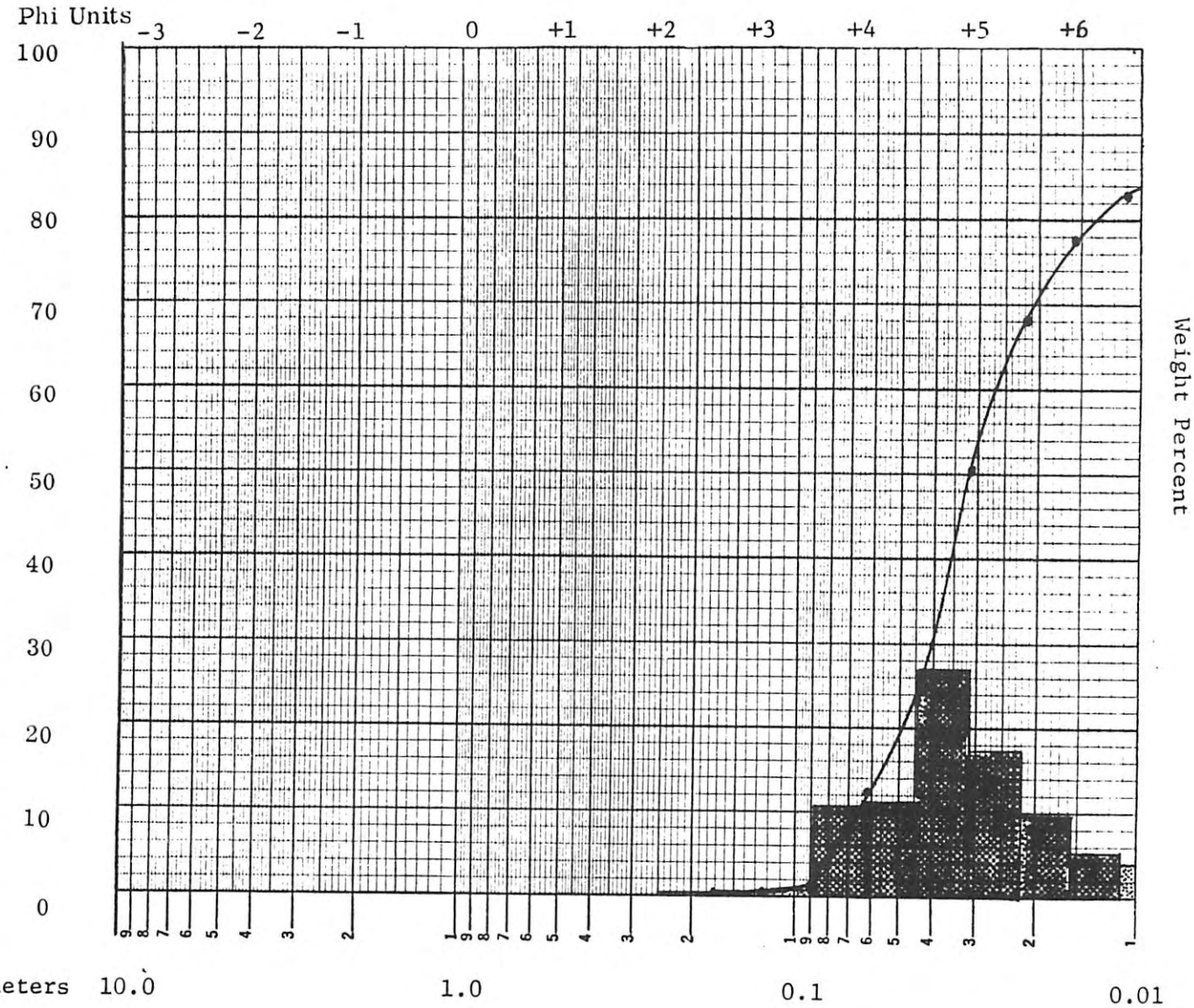
Depth 40.3 Fathoms

74.4 Meters

242.0 Feet

Sample description greenish gray very fine grained sandy silt

Sample Weight 248.859 g



SIZE PARAMETERS

1st Mode .031 - .044 mm

2nd Mode

3rd Mode

Q_{25} .043 mm

Median: Q_{50} .033 mm

Q_{75} .017 mm

Sorting Coef. 1.590

Skewness .671

Kurtosis .233

SIZE ANALYSIS

Sample 2180

Lat. 36° 58.7' Long. 122° 13.1'

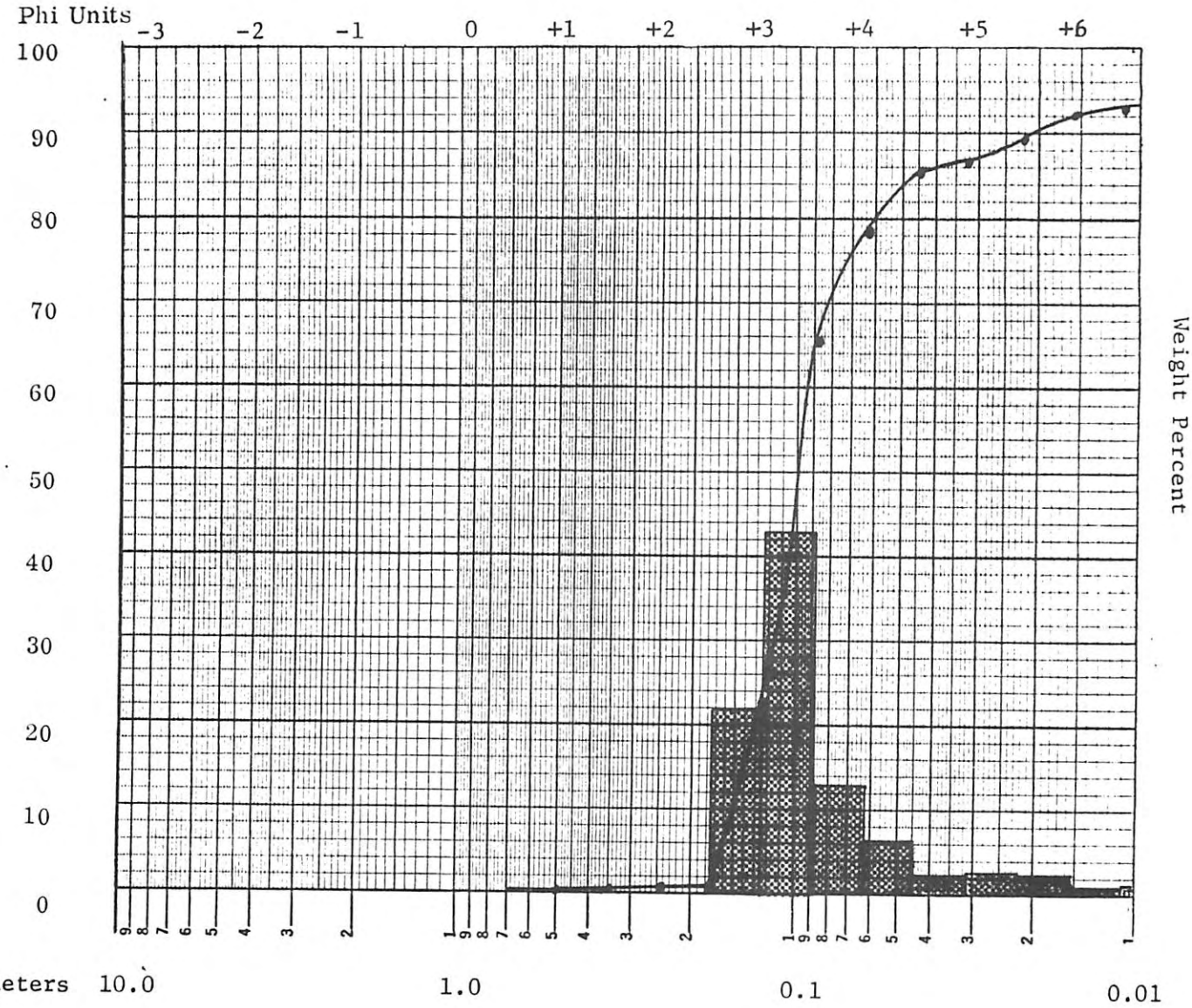
Depth 30.0 Fathoms

54.8 Meters

180.0 Feet

Sample description greenish gray fine grained silty sand

Sample Weight 32.772 g



SIZE PARAMETERS

1st Mode	.088 - .125 mm	Q_{25}	.125 mm	Sorting Coef.	1.309
2nd Mode	.022 - .031 mm	Median: Q_{50}	.100 mm	Skewness	.913
3rd Mode	.351 - .495 mm	Q_{75}	.073 mm	Kurtosis	.202

SIZE ANALYSIS

Sample 2181

Lat. 36° 59.4' Long. 122° 12.4'

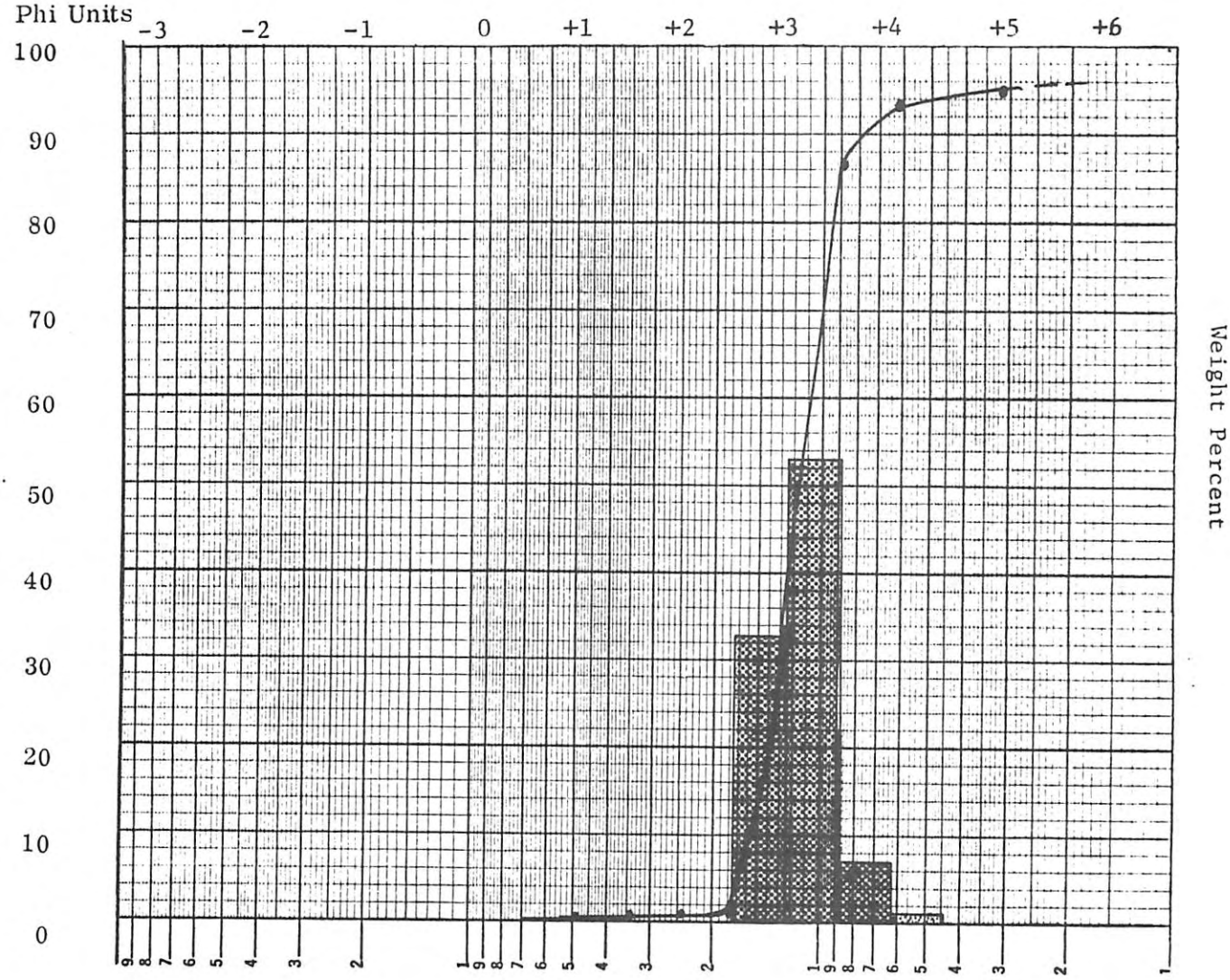
Depth 20.0 Fathoms

36.6 Meters

120.0 Feet

Sample description greenish gray fine grained silty sand with some very small pebbles

Sample Weight 171.962 g



SIZE PARAMETERS

1st Mode	.088 - .125 mm	Q_{25}	.133 mm	Sorting Coef.	1.171
2nd Mode	.351 - .495 mm	Median: Q_{50}	.120 mm	Skewness	.896
3rd Mode		Q_{75}	.097 mm	Kurtosis	.225

SIZE ANALYSIS

Sample 2182

Lat. 37° 00.1' Long. 122° 11.8'

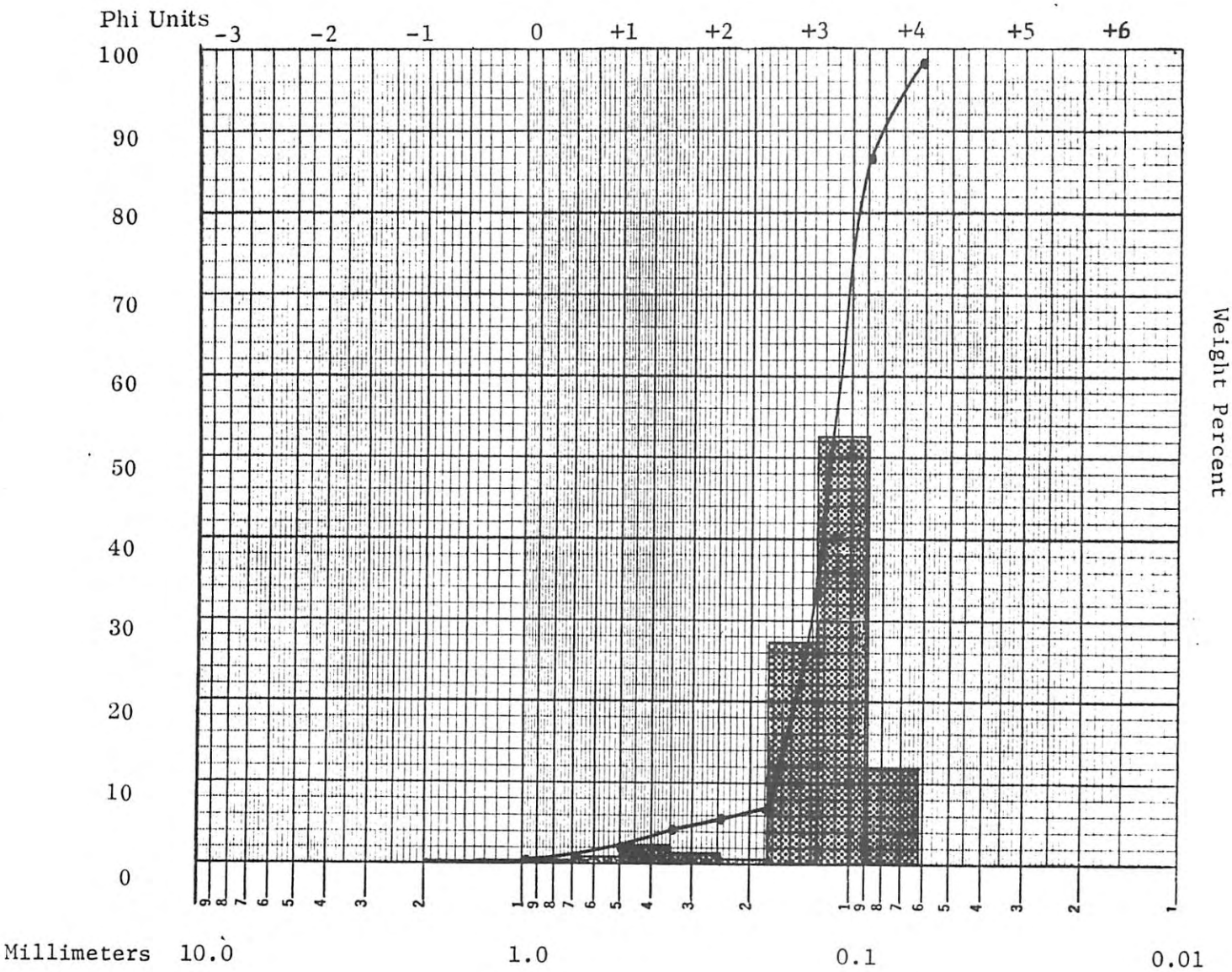
Depth 10 Fathoms

18.3 Meters

60.0 Feet

Sample description gray colored fine grained sand with some shell material

Sample Weight 22.909 g



SIZE PARAMETERS

1st Mode	.088 - .125 mm	Q_{25}	.138 mm	Sorting Coef.	1.174
2nd Mode	.351 - .495 mm	Median: Q_{50}	.115 mm	Skewness	1.04
3rd Mode		Q_{75}	.100 mm	Kurtosis	.218

SIZE ANALYSIS

Sample 2183

Lat. 36° 55.2' Long. 122° 11.7'

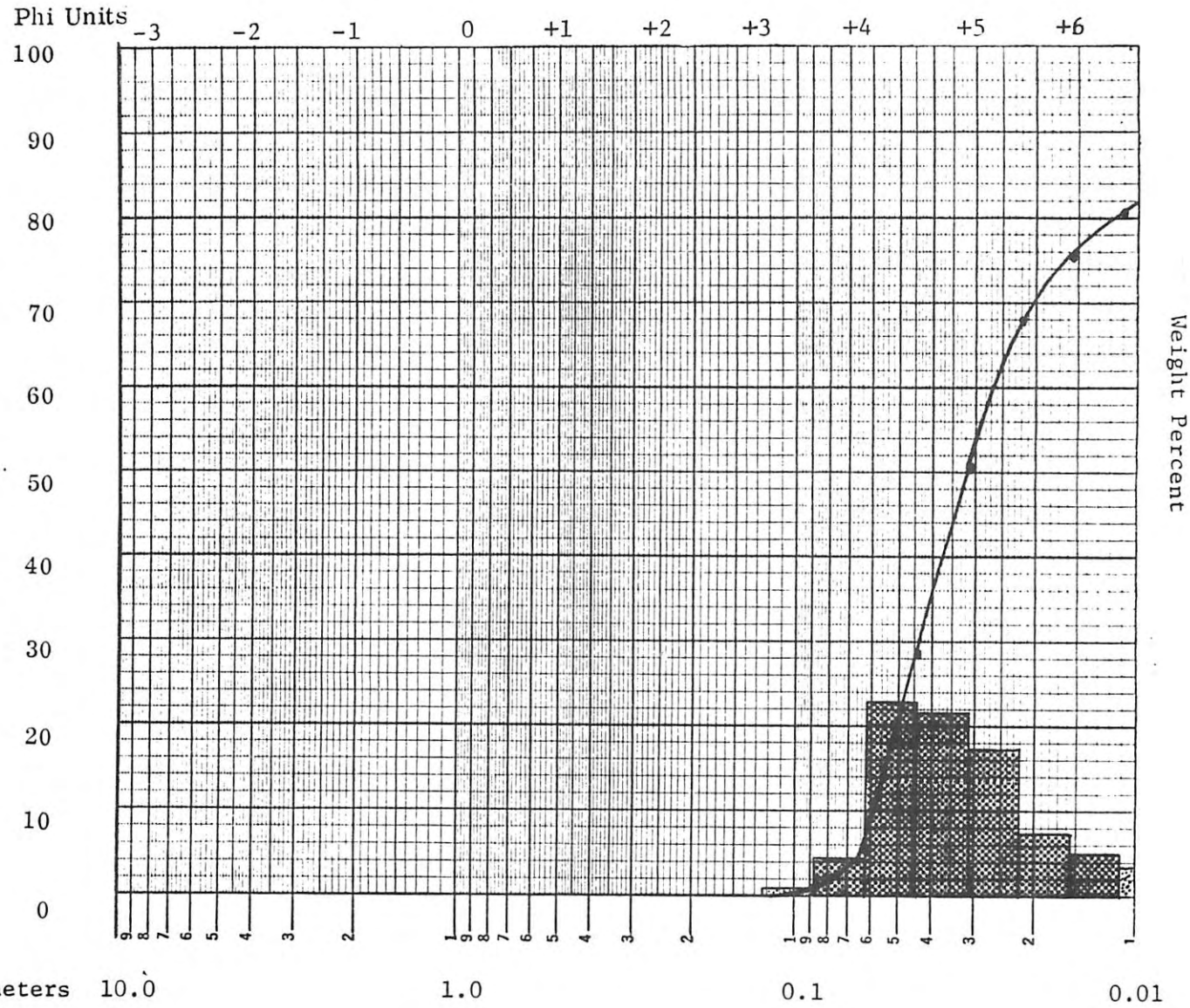
Depth 48.3 Fathoms

88.4 Meters

290.0 Feet

Sample description greenish gray very fine grained sandy silt

Sample Weight 239.688 g



SIZE PARAMETERS

1st Mode	.044 - .062 mm	Q_{25}	.047 mm	Sorting Coef.	1.714
2nd Mode		Median: Q_{50}	.032 mm	Skewness	.734
3rd Mode		Q_{75}	.016 mm	Kurtosis	.275

SIZE ANALYSIS

Sample 2184

Lat. 37° 00.0' Long. 122° 11.7

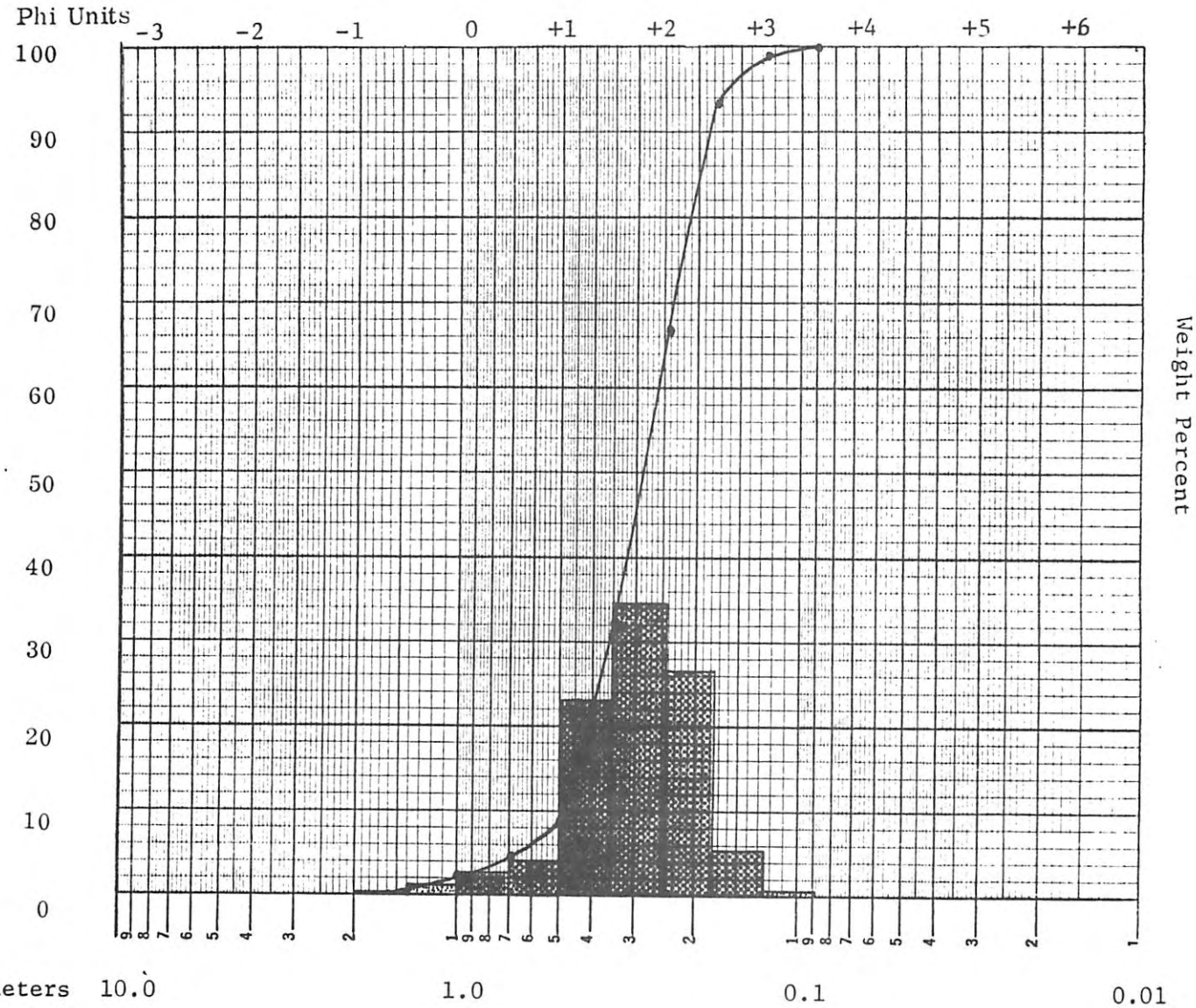
Depth Intertidal Fathoms

" Meters

" Feet

Sample description medium to fine beach sand

Sample Weight 257.335 g



SIZE PARAMETERS

1st Mode	.246 - .351 mm	Q_{25}	.380 mm	Sorting Coef.	1.314
2nd Mode		Median: Q_{50}	.285 mm	Skewness	1.029
3rd Mode		Q_{75}	.220 mm	Kurtosis	.262

SIZE ANALYSIS

Sample 2185

Lat. 37° 01.5' Long. 122° 12.9'

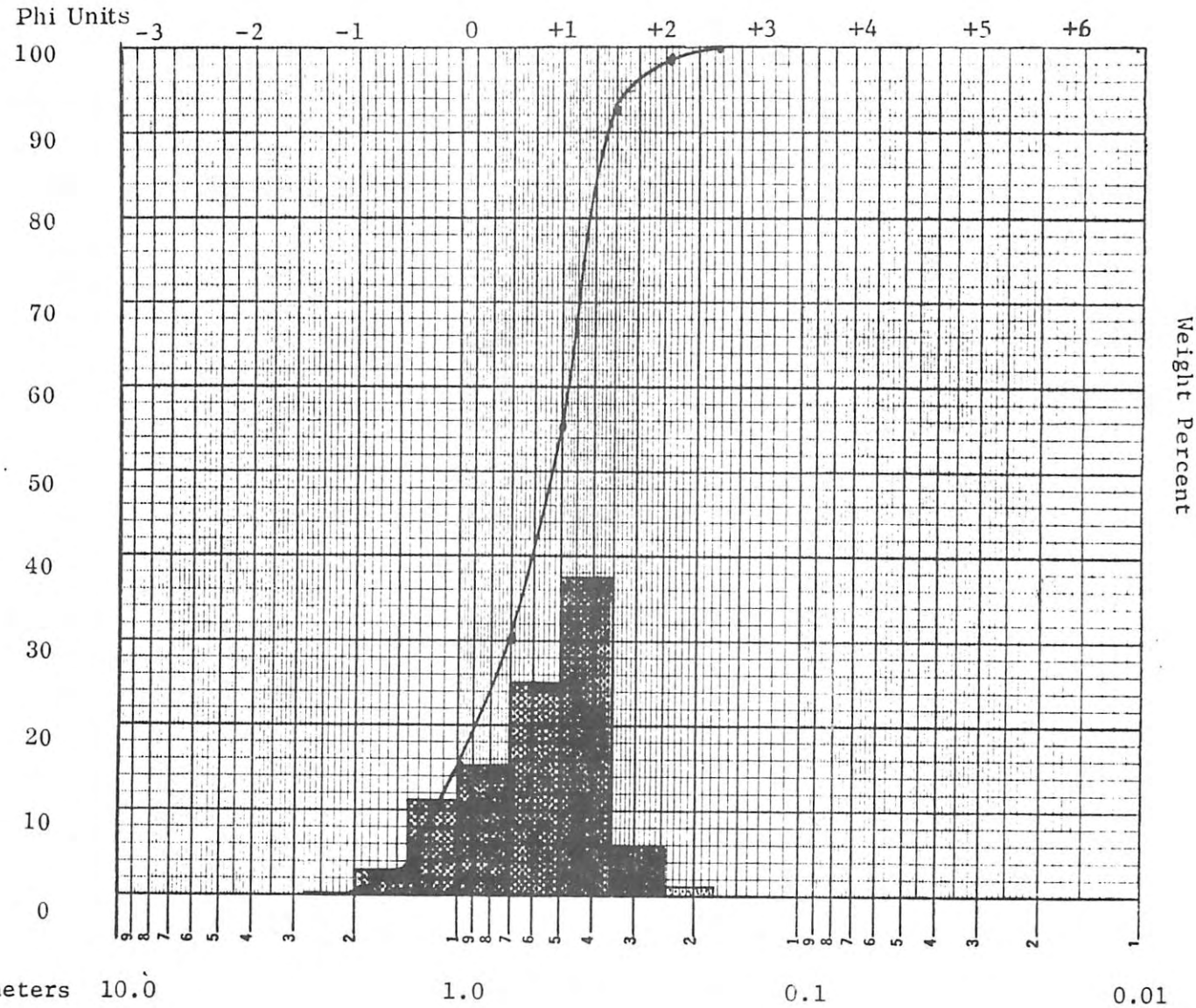
Depth Intertidal Fathoms

" Meters

" Feet

Sample description medium size beach sand

Sample Weight 363.205 g



SIZE PARAMETERS

1st Mode .351 - .495

2nd Mode

3rd Mode

Q_{25} .80 mm

Median: Q_{50} .53 mm

Q_{75} .43 mm

Sorting Coef. 1.364

Skewness 1.224

Kurtosis .228

SIZE ANALYSIS

Sample 2186

Lat. 37° 02.5' Long. 122° 13.7'

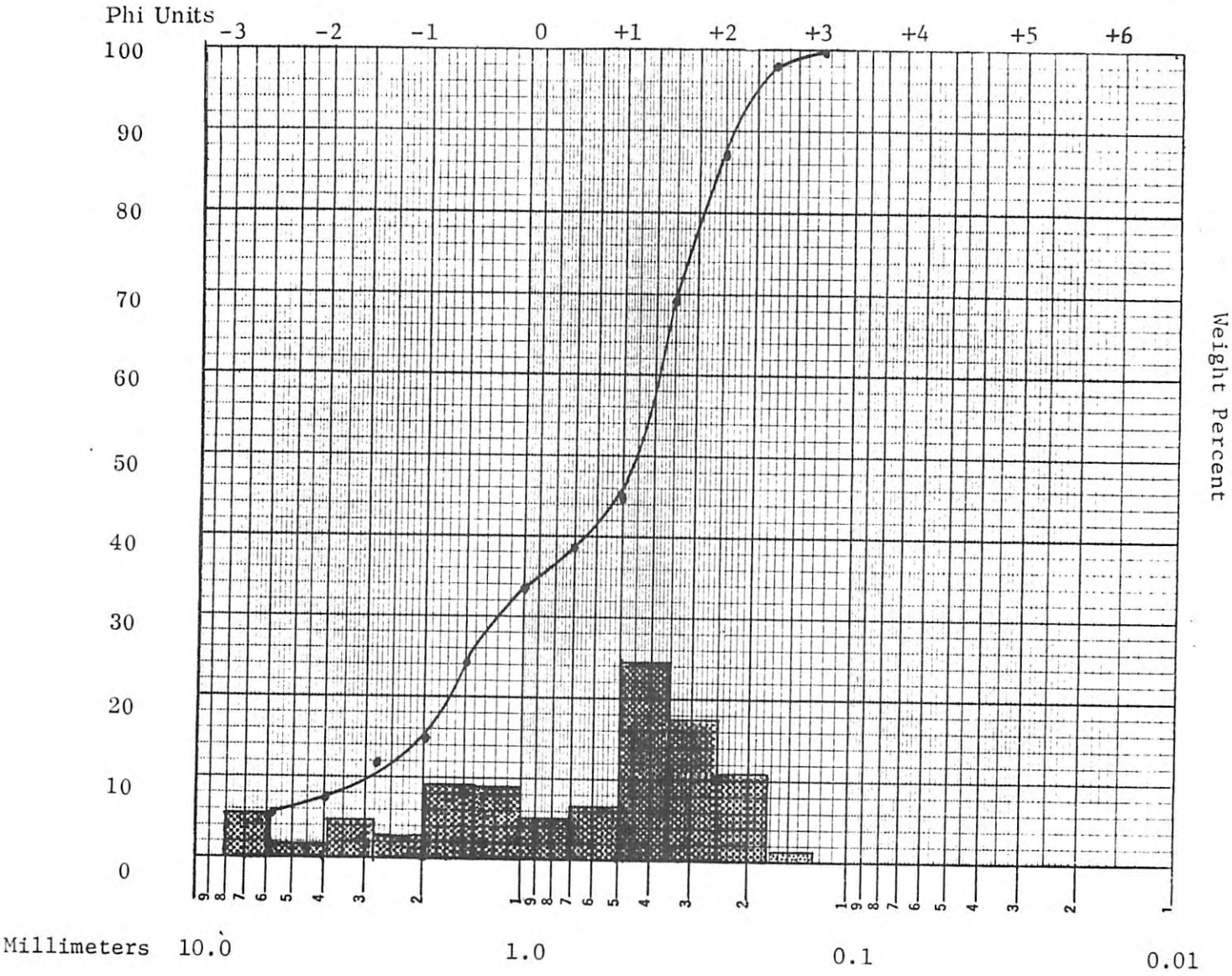
Depth Intertidal Fathoms

" Meters

" Feet

Sample description medium to coarse beach sand with occasional small pebbles

Sample Weight 555.499 g



SIZE PARAMETERS

1st Mode	.351 - .495 mm	Q_{25}	1.46 mm	Sorting Coef.	2.136
2nd Mode	1.41 - 2.00 mm	Median: Q_{50}	.45 mm	Skewness	2.307
3rd Mode	5.80 - 8.00 mm	Q_{75}	.32 mm	Kurtosis	.214

SIZE ANALYSIS

Sample 2188

Lat. 37° 04.7' Long. 122° 15.8'

Depth Intertidal Fathoms

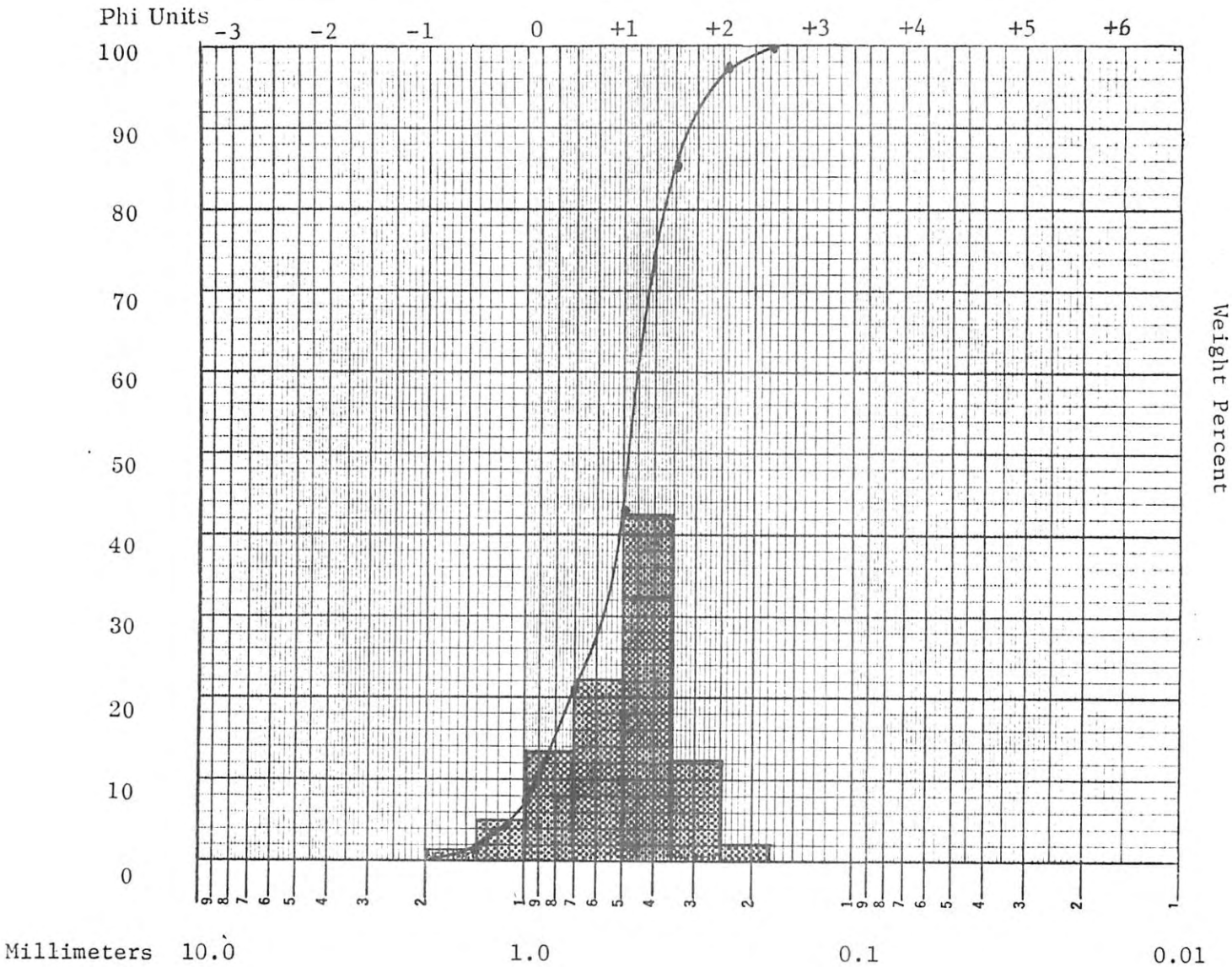
" Meters

" Feet

Sample description medium size

beach sand

Sample Weight 389.730 g



SIZE PARAMETERS

1st Mode	.351 - .495 mm	Q_{25}	.64 mm	Sorting Coef.	1.265
2nd Mode		Median: Q_{50}	.48 mm	Skewness	1.111
3rd Mode		Q_{75}	.40 mm	Kurtosis	.203

SIZE ANALYSIS

Sample 2189

Lat. 37° 05.8' Long. 122° 16.6'

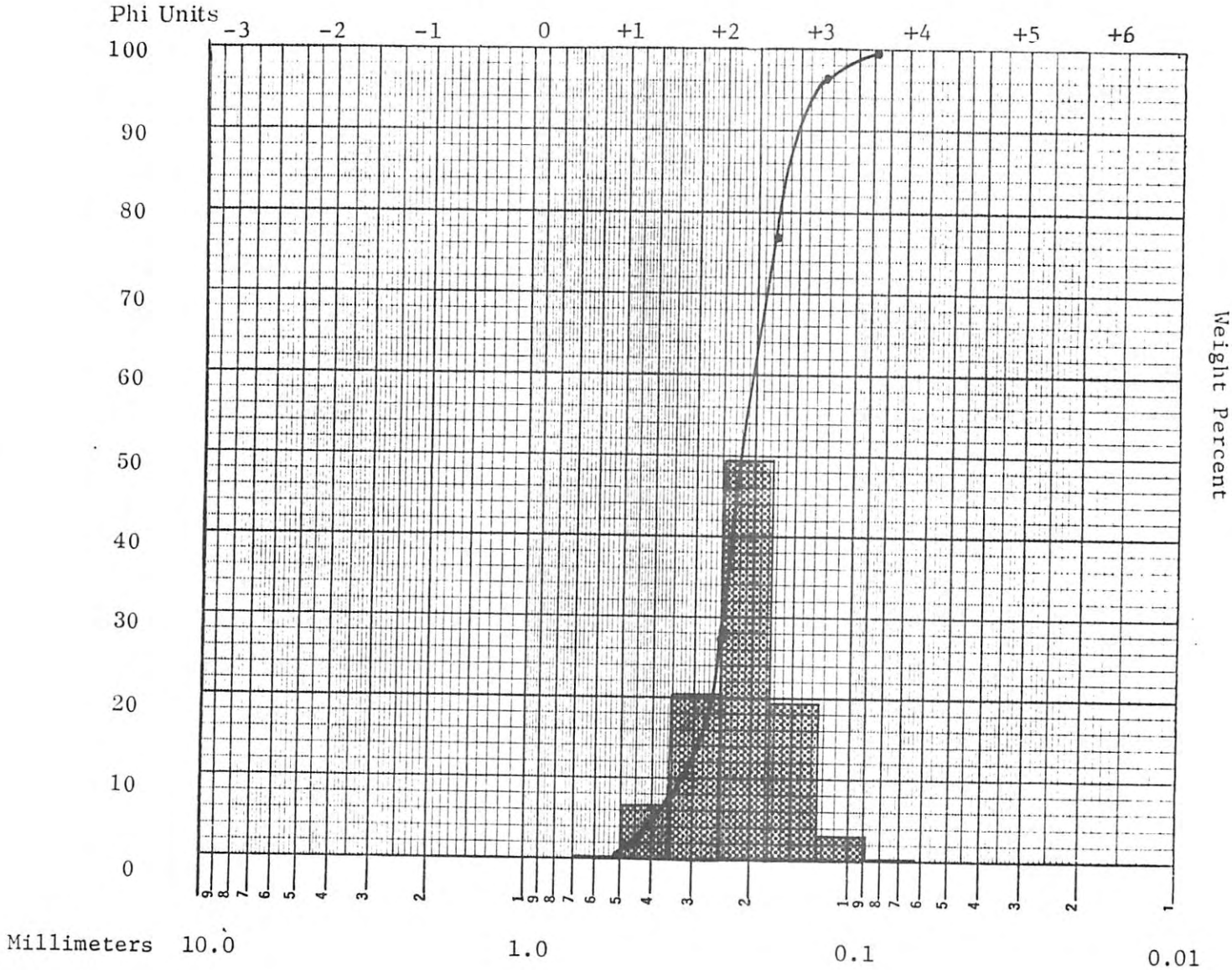
Depth Intertidal Fathoms

" Meters

" Feet

Sample description fine beach sand

Sample Weight 201.876 g



SIZE PARAMETERS

1st Mode .177 - .246

2nd Mode

3rd Mode

Q_{25} .255 mm

Median: Q_{50} .220 mm

Q_{75} .180 mm

Sorting Coef. 1.190

Skewness .948

Kurtosis .223

SIZE ANALYSIS

Sample 2191

Lat. 37° 07.0' Long. 122° 18.3'

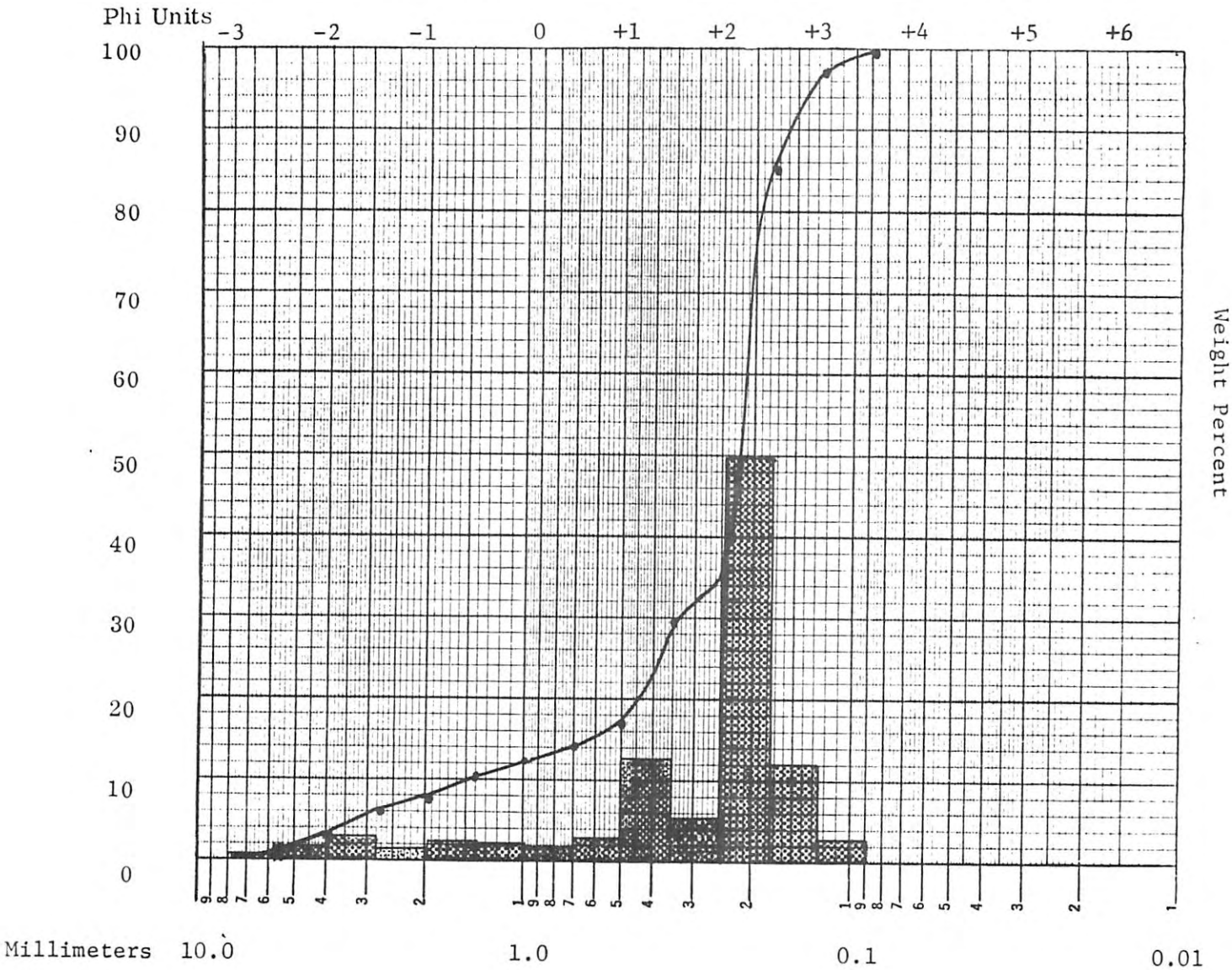
Depth Intertidal Fathoms

" Meters

" Feet

Sample description fine to medium beach sand with medium sized pebbles

Sample Weight 548.051 g



SIZE PARAMETERS

1st Mode	.177 - .246 mm	Q_{25}	.380 mm	Sorting Coef.	1.378
2nd Mode	.351 - .495 mm	Median: Q_{50}	.220 mm	Skewness	1.57
3rd Mode	2.83 - 4.00 mm	Q_{75}	.200 mm	Kurtosis	.070

SIZE ANALYSIS

Sample 2192

Lat. 37° 08.7' Long. 122° 20.7'

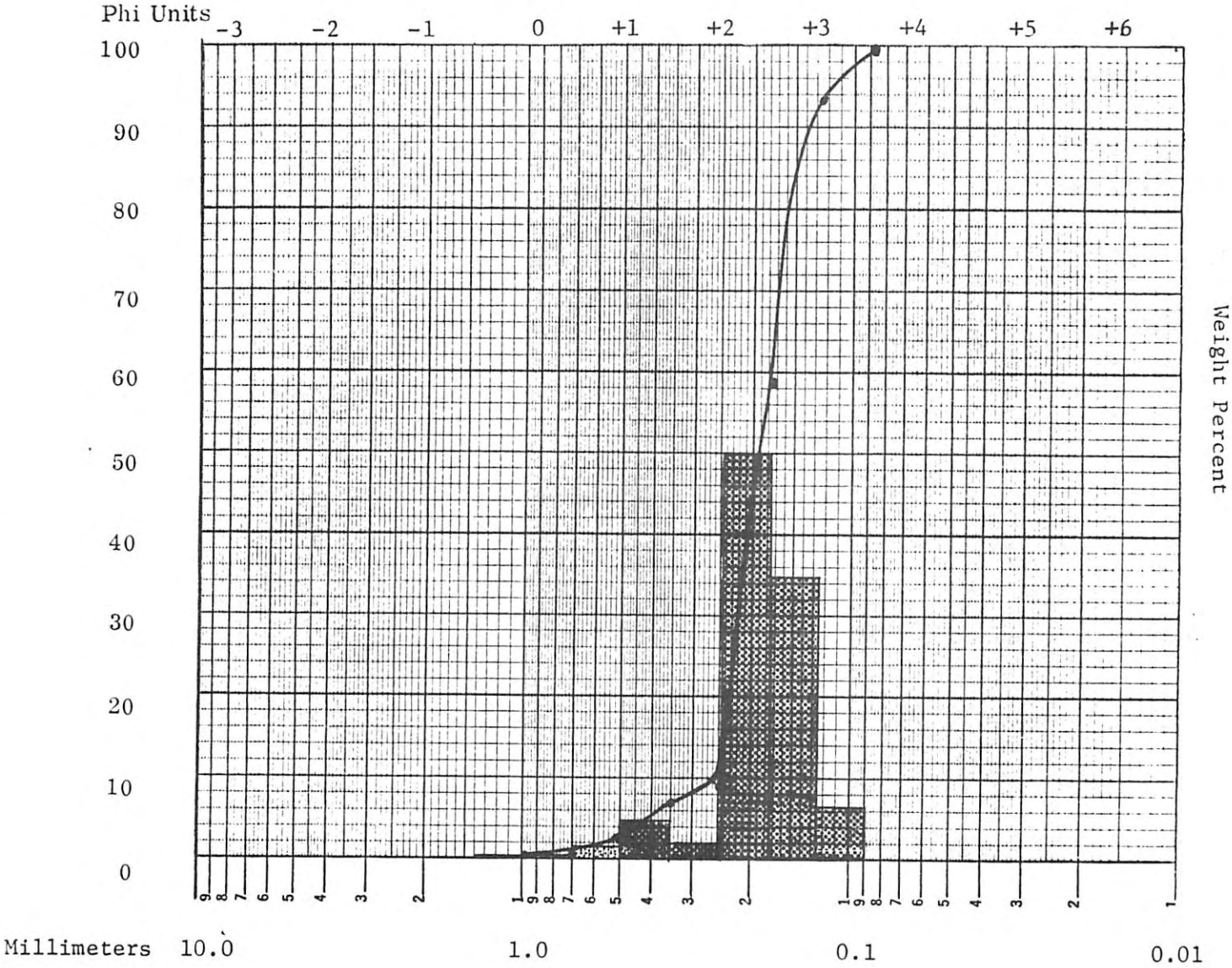
Depth Intertidal Fathoms

" Meters

" Feet

Sample description Fine to medium beach sand

Sample Weight 107.932



SIZE PARAMETERS

1st Mode	.177 - .246 mm	Q_{25}	.225 mm	Sorting Coef.	1.168
2nd Mode	.351 - .495 mm	Median: Q_{50}	.192 mm	Skewness	1.007
3rd Mode		Q_{75}	.165 mm	Kurtosis	.229

SIZE ANALYSIS

Sample 2194

Lat. 37° 10.4' Long. 122° 22.0'

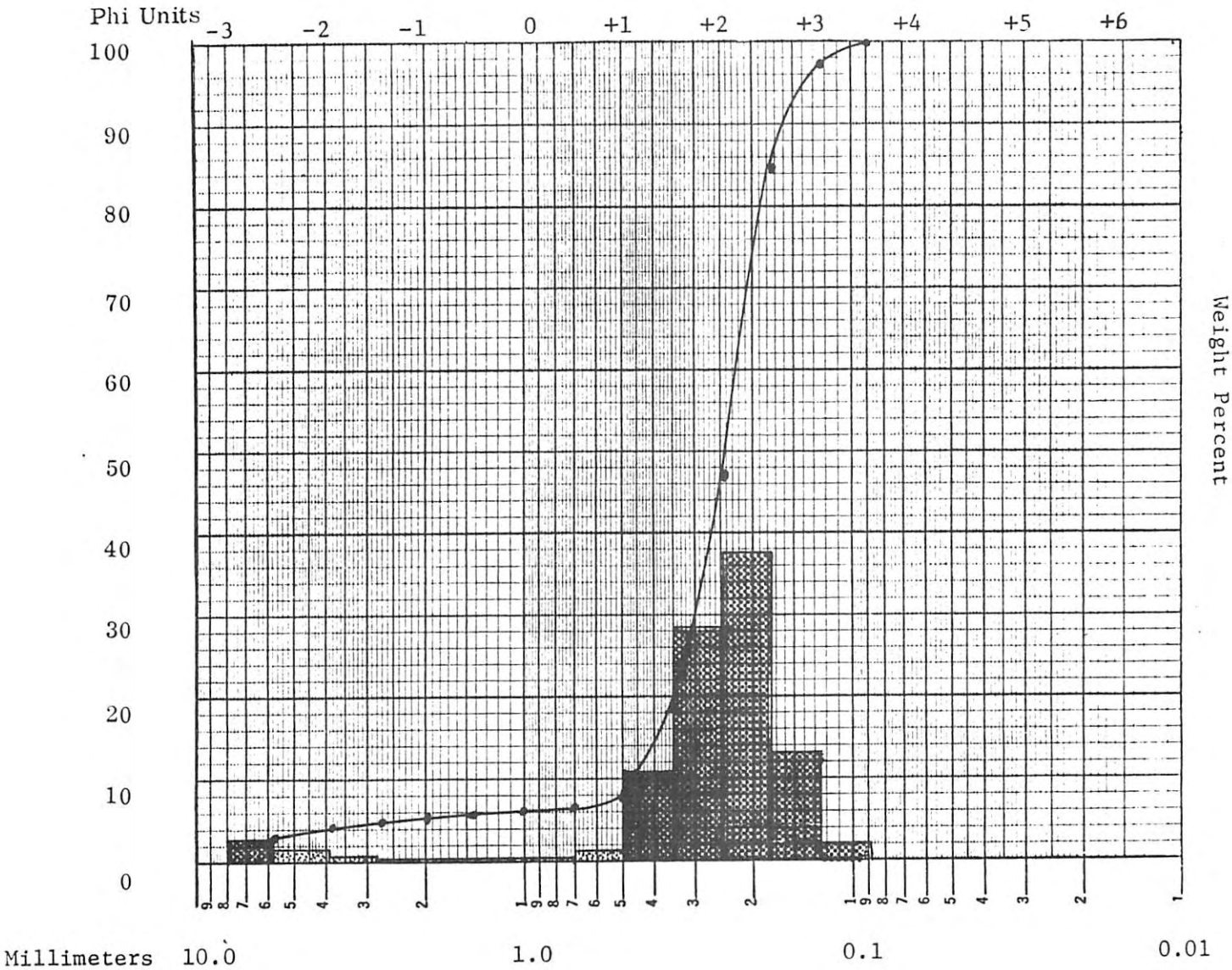
Depth Intertidal Fathoms

" Meters

" Feet

Sample description fine beach sand with small pebbles

Sample Weight 419.825



SIZE PARAMETERS

1st Mode .177 - .246 mm

2nd Mode 5.80 - 8.00 mm

3rd Mode

Q_{25} .315 mm

Median: Q_{50} .241 mm

Q_{75} .195 mm

Sorting Coef. 1.271

Skewness 1.058

Kurtosis .214

SIZE ANALYSIS

Sample 2195

Lat. 37° 11.6' Long. 122° 23.8'

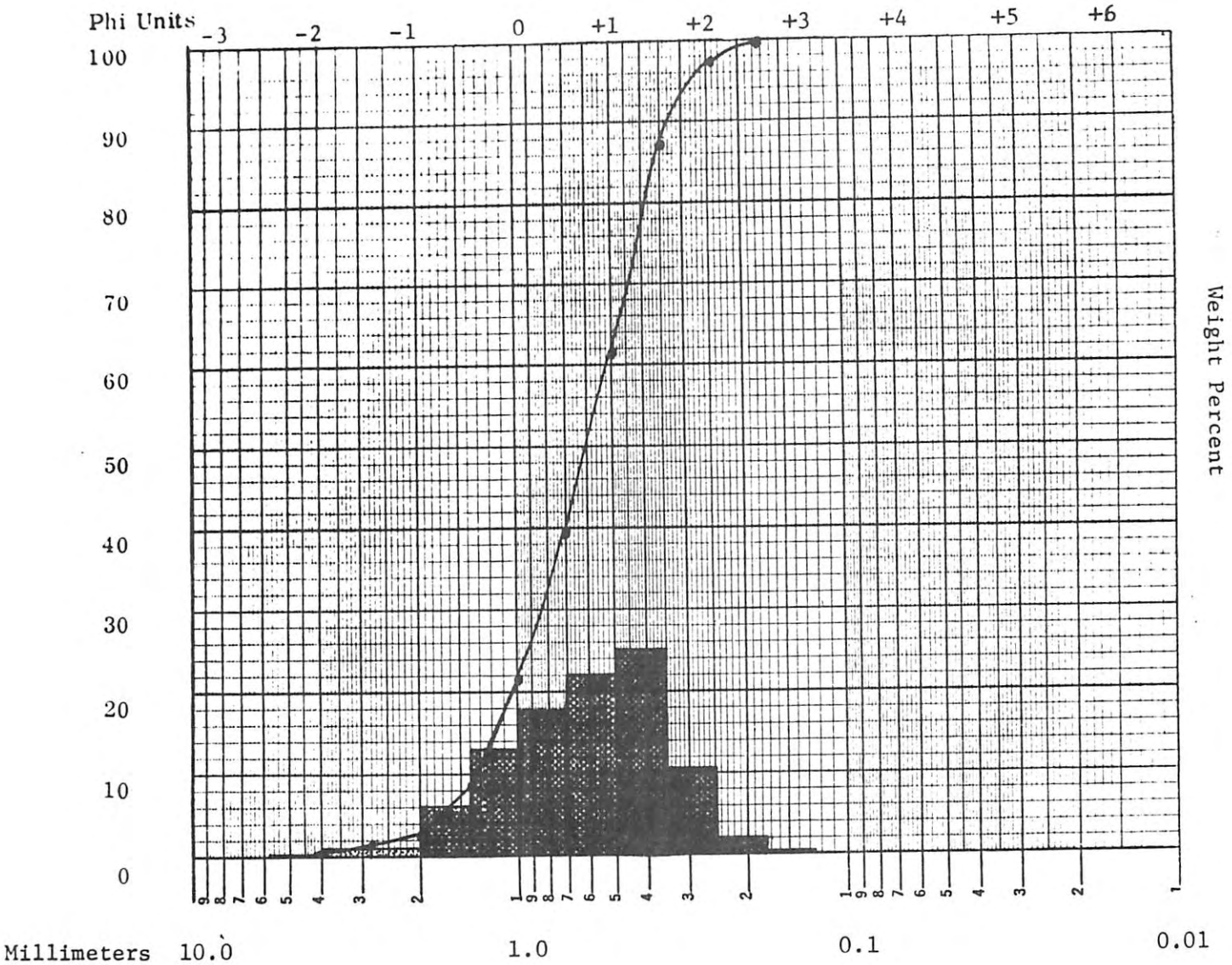
Depth Intertidal Fathoms

" Meters

" Feet

Sample description medium to coarse beach sand

Sample Weight 390.322



SIZE PARAMETERS

1st Mode .351 - .495 mm

2nd Mode

3rd Mode

Q_{25} .930 mm

Median: Q_{50} .600 mm

Q_{75} .420 mm

Sorting Coef. 1.488

Skewness 1.085

Kurtosis .229