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TECHNICAL REPORT H-76-13- 4-APP

# BEACH NOURISHMENT TECHNIQUES

## Report 4

## WAVE CLIMATES FOR SELECTED U. S. OFFSHORE BEACH NOURISHMENT PROJECTS

## APPENDIXES A-K

by

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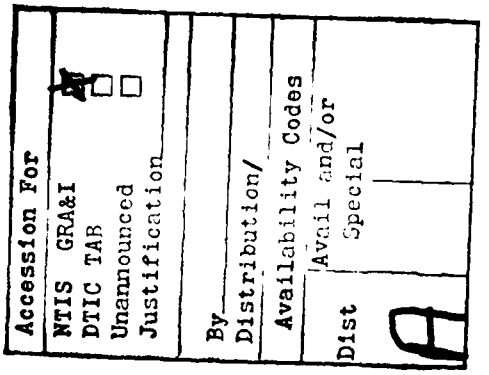
## APPENDIX A: WAVE-HEIGHT COEFFICIENTS AND APPROACH AZIMUTHS

1. Wave-height coefficients (combined refraction and shoaling coefficients) and approach azimuths for various wave period classes and deepwater approach azimuths* resulting from refraction analyses of 10 potential offshore beach nourishment projects are given in Tables A1-A9 and A11 and A12. These coefficients and approach azimuths are applied to deepwater wave statistics to obtain an estimation of the wave climate at the proposed project locations.

2. For those sites on the Atlantic, Gulf, and Great Lakes, the deepwater wave characteristics were determined from the Synoptic Shipboard Meteorological Observation (SSMO) data tapes. The deepwater wave climate for the Redondo Beach, Calif., site was determined from hindcast wave statistics developed for the California Department of Navigation and Ocean Development (DNOD) and Marine Advisers (MA).

3. The wave-height coefficients show the effect of varying wave period on wave-height amplification for different directions-of-approach in deep water. The site approach azimuths show the effect of varying period on the propagation azimuths at the project site. Additionally, for the Redondo Beach, Calif., site, Table A10 also indicates the effect of island sheltering on the changes in both direction-of-approach and wave height before the wave climate has propagated from deep water.




* The deepwater approach azimuths given are the ones used as input to the refraction analysis at each site; i.e., the center directions of 30-deg azimuth segments. See paragraph 18 of the main text for a more detailed explanation.

Table A1

Wave Height Coefficients and Approach Azimuths, Borrow Area, Revere Beach, Mass.

| Deep-Water Approach Azimuth, deg | Wave Height Coefficients for Cited Periods, sec | | | | | | | | | | Approach Azimuths, deg, at Cited Periods, sec | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | <6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | <6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 |
| 30 | 1.00 | 0.87 | 0.99 | 1.05 | 1.00 | 0.93 | 1.69 | 1.28 | 1.3 | 1.37 | 30 | 30 | 30 | 60 | 60 | 60 | 60 | 60 | 60 | 60 |
| 60 | 1.00 | 1.00 | 1.13 | 1.17 | 1.13 | 1.24 | 1.23 | 1.04 | 1.02 | 1.10 | 60 | 60 | 60 | 60 | 60 | 60 | 60 | 60 | 60 | 60 |
| 90 | 1.00 | 1.08 | 0.92 | 0.85 | 0.77 | 0.78 | 0.84 | 1.00 | 0.98 | 0.89 | 90 | 90 | 90 | 90 | 90 | 60 | 60 | 60 | 60 | 60 |

Table A2

Wave Height Coefficients and Approach Azimuths, Between Borrow and Fill Areas, Rockaway Beach, N. Y.

| Deep-Water Approach Azimuth, deg | Wave Height Coefficients for Cited Periods, sec | | | | | | | | | | Approach Azimuths, deg, at Cited Periods, sec | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | <6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | <6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 |
| 90 | 0.98 | 0.78 | 0.80 | 0.93 | 1.10 | 1.20 | 1.28 | 1.38 | 1.45 | 1.50 | 90 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| 120 | 0.98 | 1.36 | 1.00 | 0.73 | 0.77 | 0.83 | 0.93 | 0.97 | 0.80 | 1.00 | 120 | 120 | 120 | 150 | 150 | 150 | 150 | 150 | 150 | 150 |
| 150 | 1.00 | 1.61 | 0.76 | 0.78 | 0.73 | 0.69 | 0.87 | 0.90 | 0.92 | 0.93 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 |
| 180 | 0.98 | 1.15 | 0.60 | 0.43 | 0.37 | 0.28 | 0.25 | 0.20 | 0.18 | 0.29 | 180 | 180 | 180 | 150 | 150 | 150 | 150 | 150 | 150 | 150 |

Table A3

Wave Height Coefficients and Approach Azimuths, Borrow Area, Carolina Beach, N. C.

| Deep-Water Approach Azimuth, deg | Wave Height Coefficients for Cited Periods, sec | | | | | | | | | | Approach Azimuths, deg, at Cited Periods, sec | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | <6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | <6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 |
| 30 | 1.00 | 0.84 | 0.96 | 0.93 | 0.87 | 0.98 | 1.11 | 0.97 | 1.25 | 1.21 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 |
| 60 | 1.01 | 1.04 | 1.03 | 0.98 | 1.04 | 1.09 | 1.13 | 1.15 | 1.27 | 1.26 | 60 | 60 | 60 | 60 | 60 | 60 | 60 | 60 | 60 | 60 |
| 90 | 1.00 | 1.11 | 0.90 | 0.90 | 0.93 | 0.94 | 0.99 | 1.03 | 1.09 | 1.13 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| 120 | 1.00 | 0.99 | 0.88 | 0.87 | 0.86 | 0.77 | 0.96 | 0.98 | 1.09 | 0.91 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| 150 | 1.02 | 1.02 | 0.84 | 0.86 | 0.86 | 1.02 | 0.95 | 0.97 | 1.00 | 0.99 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 |
| 180 | 1.04 | 1.03 | 0.98 | 1.13 | 1.30 | 1.20 | 1.39 | 1.28 | 1.36 | 1.33 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 |

Table A4

Wave Height Coefficients and Approach Azimuths, Fill Area, Carolina Beach N. C.

| Deep-Water Approach Azimuth, deg | Wave Height Coefficients for Cited Periods, sec | | | | | | | | | | Approach Azimuths, deg, at Cited Periods, sec | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | <6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | <6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 |
| 30 | 0.96 | 0.75 | 0.78 | 0.89 | 0.97 | 1.03 | 1.12 | 1.18 | 1.17 | 1.25 | 60 | 60 | 90 | 90 | 90 | 90 | 90 | 90 | 60 | 60 |
| 60 | 0.97 | 1.05 | 1.15 | 1.49 | 1.65 | 1.64 | 1.73 | 1.92 | 1.69 | 1.52 | 60 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| 90 | 0.97 | 1.29 | 1.24 | 1.08 | 1.22 | 1.26 | 1.27 | 1.33 | 1.26 | 1.31 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| 120 | 1.00 | 1.03 | 0.96 | 1.04 | 1.07 | 1.15 | 1.65 | 1.41 | 1.70 | 1.98 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| 150 | 1.08 | 1.27 | 1.29 | 1.42 | 1.45 | 1.65 | 1.73 | 1.76 | 1.94 | 1.97 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| 180 | 0.79 | 0.47 | 0.51 | 0.54 | 0.56 | 0.60 | 0.69 | 0.73 | 0.76 | 0.78 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 |

Table A5

Wave Height Coefficients and Approach Azimuths Between Borrow and Fill Areas, Nassau County, Fla.

| Deep-Water Approach Azimuth, deg | Wave Height Coefficients for Cited Periods, sec | | | | | | | | | | Approach Azimuths, deg, at Cited Periods, sec | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | <6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | <6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 |
| 0 | 0.25 | 0.30 | 0.40 | 0.43 | 0.45 | 0.47 | 0.50 | 0.43 | 0.62 | 0.60 | 30 | 30 | 30 | 30 | 30 | 30 | 60 | 60 | 60 | 60 |
| 30 | 0.50 | 0.45 | 0.43 | 0.58 | 0.46 | 0.63 | 0.65 | 0.76 | 0.76 | 0.85 | 60 | 60 | 60 | 60 | 60 | 60 | 60 | 60 | 60 | 60 |
| 60 | 0.98 | 0.73 | 0.44 | 0.56 | 0.58 | 0.74 | 0.47 | 0.62 | 0.55 | 0.52 | 60 | 60 | 60 | 60 | 60 | 60 | 60 | 60 | 60 | 60 |
| 90 | 1.10 | 0.71 | 0.40 | 0.39 | 0.49 | 0.44 | 0.59 | 0.70 | 0.63 | 0.61 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| 120 | 1.13 | 0.58 | 0.28 | 0.35 | 0.45 | 0.37 | 0.33 | 0.31 | 0.37 | 0.40 | 120 | 120 | 120 | 120 | 90 | 90 | 90 | 90 | 90 | 90 |
| 150 | 1.20 | 0.70 | 0.65 | 0.69 | 0.73 | 0.88 | 0.94 | 1.01 | 1.06 | 0.96 | 150 | 150 | 150 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| 180 | 1.28 | 0.95 | 0.87 | 0.92 | 0.98 | 1.02 | 0.80 | 1.15 | 1.10 | 1.30 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 |

Table A6

Wave Height Coefficients and Approach Azimuths Between Borrow and Fill Areas, Dade County, Fla.

| Deep-Water Approach Azimuth, deg | Wave Height Coefficients for Cited Periods, sec | | | | | | | | | | Approach Azimuths, deg, at Cited Periods, sec | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | <6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | <6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 |
| 0 | 0.58 | 0.45 | 0.48 | 0.42 | 0.43 | 0.59 | 0.59 | 0.66 | 0.77 | 1.04 | 30 | 30 | 30 | 60 | 60 | 60 | 60 | 60 | 90 | 90 |
| 30 | 0.97 | 0.76 | 0.86 | 0.90 | 0.93 | 1.06 | 1.10 | 1.14 | 1.16 | 1.24 | 30 | 60 | 60 | 60 | 60 | 60 | 60 | 60 | 90 | 90 |
| 60 | 0.94 | 0.96 | 0.99 | 1.03 | 1.11 | 1.24 | 1.30 | 1.29 | 1.38 | 1.39 | 60 | 60 | 60 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| 90 | 0.92 | 0.92 | 1.04 | 1.08 | 1.22 | 1.32 | 1.41 | 1.43 | 1.45 | 1.47 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| 120 | 0.95 | 1.01 | 1.01 | 1.10 | 1.13 | 1.29 | 1.35 | 1.45 | 1.55 | 1.66 | 120 | 120 | 120 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| 150 | 0.93 | 0.85 | 0.88 | 0.90 | 0.83 | 0.96 | 1.29 | 1.45 | 1.59 | 1.79 | 150 | 120 | 120 | 120 | 120 | 90 | 90 | 90 | 90 | 90 |
| 180 | 0.57 | 0.23 | 0.30 | 0.41 | 0.47 | 0.50 | 0.81 | 0.99 | 1.31 | 1.29 | 150 | 150 | 120 | 120 | 120 | 120 | 120 | 90 | 90 | 90 |

Table A7

Wave Height Coefficients and Approach Azimuths, Fill Area , Treasure Island, Fla.

| Deep-Water Approach Azimuth, deg | Wave Height Coefficients for Cited Periods, sec | | | | | | | | | | Approach Azimuths, deg, at Cited Periods, sec | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | <6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | <6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 |
| 180 | 1.39 | 1.12 | 1.06 | 1.20 | 1.25 | 1.35 | 1.45 | 1.53 | 1.58 | 1.66 | 210 | 210 | 210 | 210 | 210 | 210 | 210 | 210 | 210 | 210 |
| 210 | 1.11 | 0.90 | 0.90 | 1.07 | 1.14 | 1.23 | 1.31 | 1.29 | 1.37 | 1.53 | 210 | 210 | 210 | 210 | 210 | 210 | 210 | 210 | 210 | 210 |
| 240 | 0.89 | 0.93 | 1.00 | 1.08 | 1.18 | 1.29 | 1.40 | 1.45 | 1.54 | 1.45 | 240 | 240 | 240 | 240 | 240 | 240 | 240 | 240 | 240 | 240 |
| 270 | 1.37 | 1.22 | 1.40 | 1.35 | 1.32 | 1.40 | 1.50 | 1.60 | 1.68 | 1.74 | 270 | 270 | 270 | 270 | 270 | 270 | 270 | 270 | 270 | 270 |
| 300 | 1.15 | 1.30 | 1.44 | 1.43 | 1.51 | 1.49 | 1.59 | 1.70 | 1.77 | 1.80 | 270 | 270 | 270 | 270 | 270 | 270 | 270 | 270 | 270 | 270 |
| 330 | 0.40 | 0.57 | 0.77 | 0.80 | 0.90 | 0.78 | 1.10 | 0.88 | 1.10 | 0.73 | 300 | 300 | 300 | 300 | 300 | 300 | 300 | 300 | 300 | 300 |

Table A8

Wave Height Coefficients and Approach Azimuths Between Borrow and Fill Areas, Panama City, Fla.

| Deep-Water Approach Azimuth, deg | Wave Height Coefficients for Cited Periods, sec | | | | | | | | | | Approach Azimuths, deg, at Cited Periods, sec | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | <6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | <6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 |
| 150 | 0.87 | 0.92 | 0.92 | 0.93 | 0.90 | 1.15 | 1.24 | 1.24 | 1.23 | 1.21 | 150 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 |
| 180 | 0.89 | 1.22 | 1.15 | 1.18 | 1.32 | 1.18 | 1.47 | 1.38 | 1.32 | 1.45 | 180 | 180 | 180 | 180 | 180 | 210 | 210 | 210 | 210 | 210 |
| 210 | 0.90 | 1.38 | 1.20 | 1.09 | 1.23 | 1.33 | 1.29 | 1.29 | 1.37 | 1.49 | 210 | 210 | 210 | 210 | 210 | 210 | 210 | 210 | 210 | 210 |
| 240 | 0.91 | 1.28 | 0.94 | 0.93 | 0.93 | 1.13 | 1.01 | 1.14 | 1.17 | 1.19 | 240 | 240 | 240 | 240 | 240 | 240 | 240 | 240 | 240 | 240 |
| 270 | 0.90 | 1.05 | 0.88 | 0.86 | 0.87 | 0.95 | 1.06 | 1.19 | 1.32 | 1.26 | 270 | 240 | 240 | 240 | 240 | 240 | 240 | 240 | 240 | 240 |
| 300 | 0.76 | 0.66 | 0.86 | 0.80 | 0.76 | 0.92 | 0.87 | 0.86 | 1.02 | 1.05 | 300 | 270 | 270 | 270 | 270 | 270 | 240 | 240 | 240 | 240 |

Table A9

Wave Height Coefficients and Approach Azimuths, Redondo Beach, Calif.

| Sheltered Approach Azimuth deg | Wave Height Coefficients for Cited Periods, sec | | | | | | | | Approach Azimuths, deg, at Cited Periods, sec | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | <6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | >18 | <6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | >18 |
| 210 | 0.30 | 0.50 | 0.70 | 0.85 | 0.96 | 1.00 | 1.02 | 1.30 | 240 | 240 | 240 | 270 | 270 | 270 | 270 | 270 |
| 240 | 0.90 | 0.79 | 0.73 | 0.90 | 0.88 | 0.70 | 0.88 | 0.93 | 240 | 240 | 240 | 270 | 270 | 270 | 270 | 270 |
| 270 | 0.96 | 1.00 | 0.91 | 0.96 | 0.98 | 0.83 | 0.84 | 1.03 | 270 | 270 | 270 | 270 | 270 | 270 | 270 | 270 |
| 300 | 0.95 | 1.00 | 1.03 | 0.87 | 1.01 | 1.19 | 1.09 | 0.95 | 300 | 300 | 300 | 300 | 300 | 300 | 300 | 300 |
| 330 | 0.82 | 0.60 | 0.65 | 0.73 | 0.60 | 0.80 | 0.60 | 0.40 | 330 | 330 | 330 | 330 | 330 | 330 | 330 | 330 |

Table A10

Redondo Beach, Calif., Island

Sheltering Effects

| Period sec | Deepwater Azimuth deg | Sheltered Azimuth deg | Wave-Height Coefficient |
|---|---|---|---|
| 5 | 160 | 205 | 0.08 |
| 7 | 160 | 205 | 0.06 |
| 5 | 170 | 209 | 0.30 |
| 7 | 170 | 209 | 0.29 |
| 9 | 170 | 210 | 0.28 |
| 13 | 170 | 211 | 0.24 |
| 15 | 170 | 212 | 0.21 |
| 17 | 170 | 214 | 0.08 |
| 5 | 180 | 214 | 0.44 |
| 7 | 180 | 214 | 0.43 |
| 9 | 180 | 214 | 0.43 |
| 13 | 180 | 216 | 0.40 |
| 15 | 180 | 216 | 0.37 |
| 17 | 180 | 219 | 0.30 |
| 19 | 180 | 222 | 0.21 |
| 5 | 190 | 218 | 0.56 |
| 7 | 190 | 217 | 0.54 |
| 9 | 190 | 217 | 0.52 |
| 13 | 190 | 218 | 0.48 |
| 15 | 190 | 218 | 0.45 |
| 17 | 190 | 221 | 0.48 |
| 19 | 190 | 224 | 0.30 |
| 5 | 200 | 220 | 0.63 |
| 7 | 200 | 219 | 0.60 |
| 9 | 200 | 218 | 0.56 |
| 13 | 200 | 218 | 0.52 |

(Continued)

Table A10 (Continued)

| Period sec | Deepwater Azimuth deg | Sheltered Azimuth deg | Wave-Height Coefficient |
|---|---|---|---|
| 15 | 200 | 219 | 0.49 |
| 17 | 200 | 221 | 0.42 |
| 19 | 200 | 224 | 0.33 |
| 5 | 210 | 226 | 0.72 |
| 7 | 210 | 225 | 0.69 |
| 9 | 210 | 224 | 0.65 |
| 13 | 210 | 221 | 0.56 |
| 15 | 210 | 219 | 0.51 |
| 17 | 210 | 221 | 0.44 |
| 19 | 210 | 224 | 0.35 |
| 5 | 220 | 231 | 0.80 |
| 7 | 220 | 231 | 0.77 |
| 9 | 220 | 231 | 0.73 |
| 13 | 220 | 230 | 0.64 |
| 15 | 220 | 226 | 0.57 |
| 17 | 220 | 227 | 0.49 |
| 19 | 220 | 229 | 0.39 |
| 5 | 230 | 236 | 0.86 |
| 7 | 230 | 236 | 0.82 |
| 9 | 230 | 236 | 0.78 |
| 11 | 230 | 236 | 0.74 |
| 13 | 230 | 233 | 0.66 |
| 15 | 230 | 228 | 0.57 |
| 17 | 230 | 229 | 0.49 |
| 19 | 230 | 230 | 0.40 |
| 5 | 240 | 240 | 0.87 |
| 7 | 240 | 239 | 0.83 |
| 9 | 240 | 239 | 0.79 |

(Continued)

Table A10 (Continued)

| Period sec | Deepwater Azimuth deg | Sheltered Azimuth deg | Wave-Height Coefficient |
|---|---|---|---|
| 5 | 250 | 245 | 0.88 |
| 7 | 250 | 245 | 0.84 |
| 9 | 250 | 244 | 0.80 |
| 11 | 250 | 244 | 0.75 |
| 13 | 250 | 240 | 0.66 |
| 15 | 250 | 234 | 0.55 |
| 17 | 250 | 234 | 0.47 |
| 5 | 260 | 252 | 0.82 |
| 7 | 260 | 252 | 0.78 |
| 9 | 260 | 252 | 0.74 |
| 11 | 260 | 252 | 0.69 |
| 13 | 260 | 248 | 0.59 |
| 17 | 260 | 237 | 0.43 |
| 5 | 270 | 261 | 0.79 |
| 7 | 270 | 258 | 0.71 |
| 9 | 270 | 258 | 0.66 |
| 11 | 270 | 259 | 0.61 |
| 13 | 270 | 258 | 0.50 |
| 15 | 270 | 255 | 0.36 |
| 17 | 270 | 252 | 0.31 |
| 5 | 280 | 267 | 0.72 |
| 7 | 280 | 264 | 0.64 |
| 9 | 280 | 263 | 0.60 |
| 11 | 280 | 263 | 0.56 |
| 13 | 280 | 263 | 0.45 |
| 15 | 280 | 264 | 0.31 |
| 17 | 280 | 263 | 0.25 |
| 5 | 290 | 267 | 0.60 |

(Continued)

Table A10 (Continued)

| Period Sec | Deepwater Azimuth deg | Sheltered Azimuth deg | Wave-Height Coefficient |
|---|---|---|---|
| 7 | 290 | 266 | 0.58 |
| 9 | 290 | 265 | 0.56 |
| 11 | 290 | 264 | 0.53 |
| 13 | 290 | 264 | 0.42 |
| 15 | 290 | 265 | 0.29 |
| 17 | 290 | 264 | 0.23 |
| 5 | 300 | 272 | 0.49 |
| 7 | 300 | 271 | 0.47 |
| 9 | 300 | 270 | 0.44 |
| 11 | 300 | 269 | 0.42 |
| 13 | 300 | 268 | 0.34 |
| 15 | 300 | 266 | 0.26 |
| 17 | 300 | 265 | 0.21 |
| 5 | 310 | 279 | 0.37 |
| 7 | 310 | 279 | 0.34 |
| 9 | 310 | 278 | 0.31 |
| 11 | 310 | 277 | 0.28 |
| 13 | 310 | 283 | 0.18 |
| 15 | 310 | 288 | 0.12 |
| 17 | 310 | 288 | 0.10 |
| 5 | 320 | 287 | 0.25 |
| 7 | 320 | 287 | 0.23 |
| 9 | 320 | 287 | 0.20 |
| 11 | 320 | 287 | 0.18 |
| 13 | 320 | 288 | 0.15 |
| 15 | 320 | 288 | 0.11 |
| 17 | 320 | 288 | 0.09 |
| 5 | 330 | 288 | 0.19 |

(Continued)

Table A10 (Concluded)

| Period sec | Deepwater Azimuth deg | Sheltered Azimuth deg | Wave-Height Coefficient |
|---|---|---|---|
| 7 | 330 | 287 | 0.19 |
| 9 | 330 | 287 | 0.18 |
| 11 | 330 | 287 | 0.16 |
| 13 | 330 | 288 | 0.13 |
| 15 | 330 | 288 | 0.10 |
| 17 | 330 | 288 | 0.08 |

Table A11

Wave Height Coefficients and Approach Azimuths, Fill Area, Indiana Dunes, Ind.

| Deep-Water Approach Azimuth, deg | Wave Height Coefficients for Cited Periods, sec | | | | | | | | | | Approach Azimuths, deg, at Cited Periods, sec | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | <6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | <6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 |
| 300 | 0.91 | 1.63 | 1.49 | 1.50 | 1.83 | 1.58 | 1.85 | 2.06 | 2.11 | 2.21 | 300 | 300 | 300 | 330 | 330 | 330 | 330 | 330 | 330 | 330 |
| 330 | 0.93 | 1.60 | 1.19 | 1.57 | 1.81 | 1.42 | 1.60 | 1.60 | 1.70 | 1.79 | 330 | 330 | 330 | 330 | 330 | 330 | 330 | 330 | 330 | 330 |
| 0 | 0.91 | 1.33 | 1.41 | 1.57 | 1.48 | 1.52 | 1.70 | 1.84 | 1.91 | 1.89 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 30 | 0.84 | 1.44 | 1.38 | 1.31 | 1.28 | 1.50 | 1.42 | 1.47 | 1.39 | 1.42 | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 60 | 0.55 | 0.40 | 0.46 | 0.56 | 0.60 | 0.73 | 0.78 | 0.85 | 0.90 | 0.80 | 30 | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Table A12

Wave Height Coefficients and Approach Azimuths, Fill Area, Presque Isle, Pa.

| Deep-Water Approach Azimuth, deg | Wave Height Coefficients for Cited Periods, sec | | | | | | | | | | Approach Azimuths, deg, at Cited Periods, sec | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | <6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | <6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 |
| 270 | 1.00 | 1.27 | 1.46 | 1.68 | 1.66 | 1.45 | 1.50 | 1.77 | 1.70 | 1.80 | 270 | 270 | 270 | 300 | 300 | 300 | 300 | 300 | 300 | 300 |
| 300 | 0.95 | 1.07 | 1.17 | 1.25 | 1.36 | 1.45 | 1.54 | 1.62 | 1.68 | 1.75 | 300 | 300 | 300 | 300 | 300 | 300 | 300 | 300 | 300 | 300 |
| 330 | 0.95 | 1.03 | 1.16 | 1.27 | 1.36 | 1.47 | 1.59 | 1.64 | 1.74 | 1.78 | 330 | 330 | 330 | 330 | 330 | 330 | 330 | 330 | 330 | 330 |
| 0 | 0.87 | 0.93 | 1.04 | 1.08 | 1.16 | 1.26 | 1.31 | 1.44 | 1.50 | 1.56 | 0 | 0 | 330 | 330 | 330 | 330 | 330 | 330 | 330 | 330 |
| 30 | 0.68 | 0.83 | 1.04 | 1.18 | 1.19 | 1.17 | 1.24 | 1.31 | 1.39 | 1.46 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 60 | 0.53 | 0.57 | 0.75 | 0.74 | 0.73 | 0.80 | 0.80 | 0.88 | 0.94 | 0.94 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 |

# APPENDIX B: AVERAGE WAVE CLIMATE AT REVERE BEACH, MASS.

1. Appendix B contains the following information for the Revere Beach, Mass., sand borrow site:

   a. Tabulations of monthly percent occurrence of wave-height/period combinations.

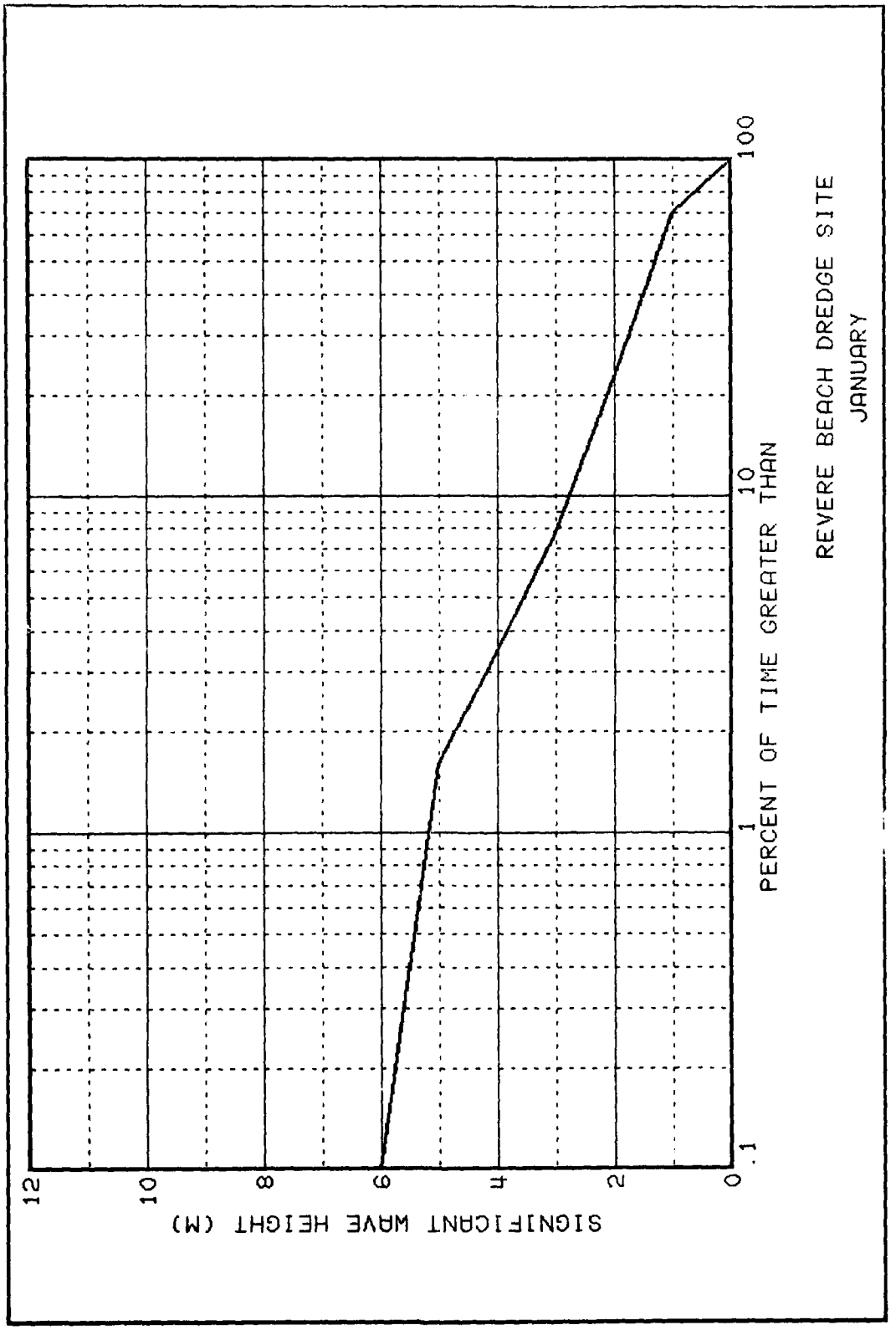
   b. Tabulations of annual percent occurrence by azimuth direction of wave-height/period combinations.

   c. Plots of monthly significant wave-height occurrence in terms of the total percent time per month that these heights are exceeded.

REVERE BEACH DREDGE SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR JANUARY

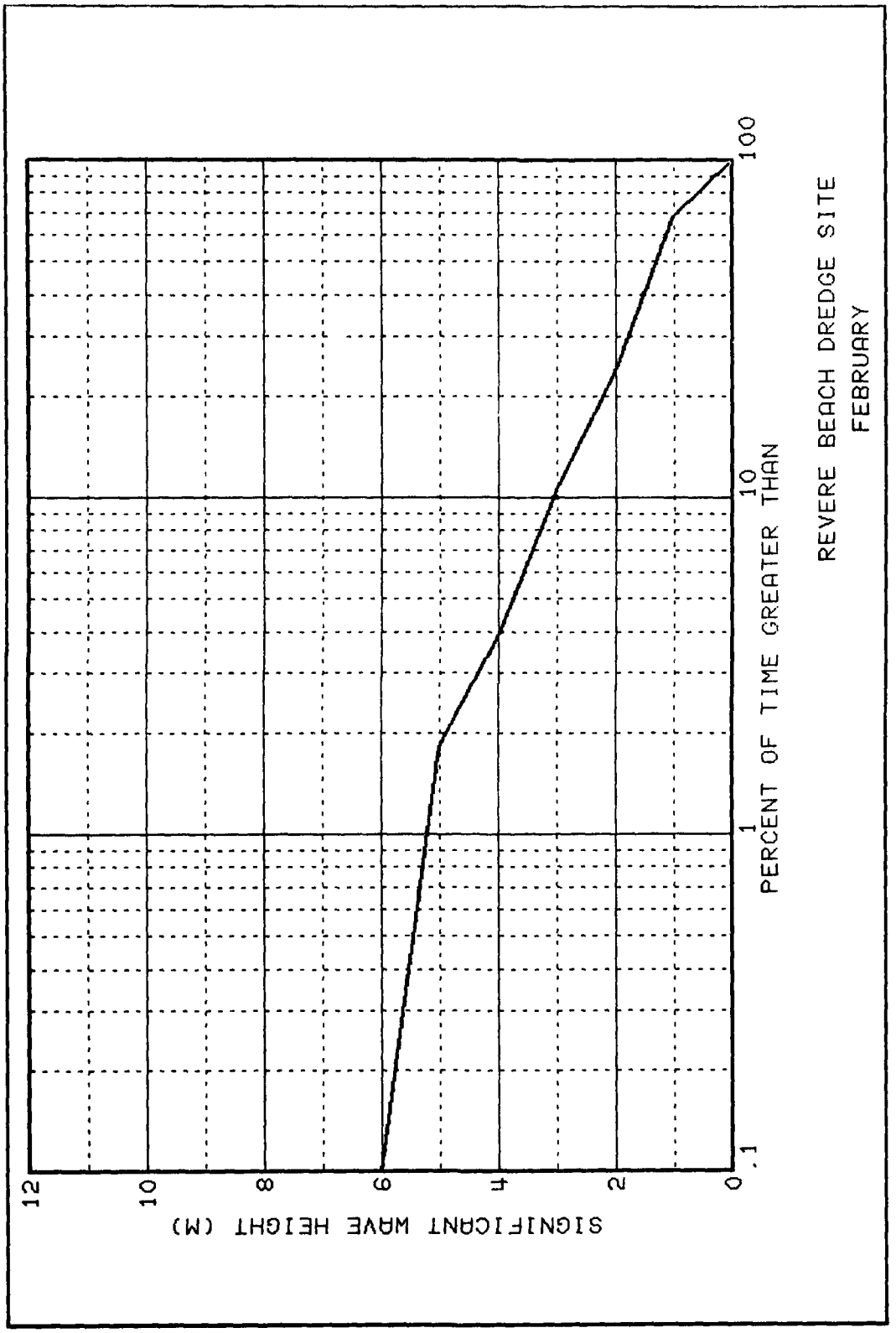
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 28.05 | 1.53 | 0.31 | 0.00 | 0.27 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 30.15 |
| 01-02 | 37.48 | 7.32 | 1.50 | 0.29 | 0.64 | 0.17 | 0.00 | 0.00 | 0.00 | 0.00 | 47.40 |
| 02-03 | 5.49 | 5.74 | 1.99 | 0.75 | 0.57 | 0.13 | 0.00 | 0.00 | 0.00 | 0.00 | 14.66 |
| 03-04 | 0.00 | 1.83 | 1.64 | 0.41 | 0.45 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 4.32 |
| 04-05 | 0.00 | 0.21 | 1.57 | 0.09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.87 |
| 05-06 | 0.82 | 0.00 | 0.78 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.60 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 71.83 | 16.62 | 7.78 | 1.53 | 1.93 | 0.30 | 0.00 | 0.00 | 0.00 | 0.00 | |


REVERE BEACH DREDGE SITE
JANUARY
PERCENT OF TIME GREATER THAN
.1
1
10
100
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12

REVERE BEACH DREDGE SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR FEBRUARY

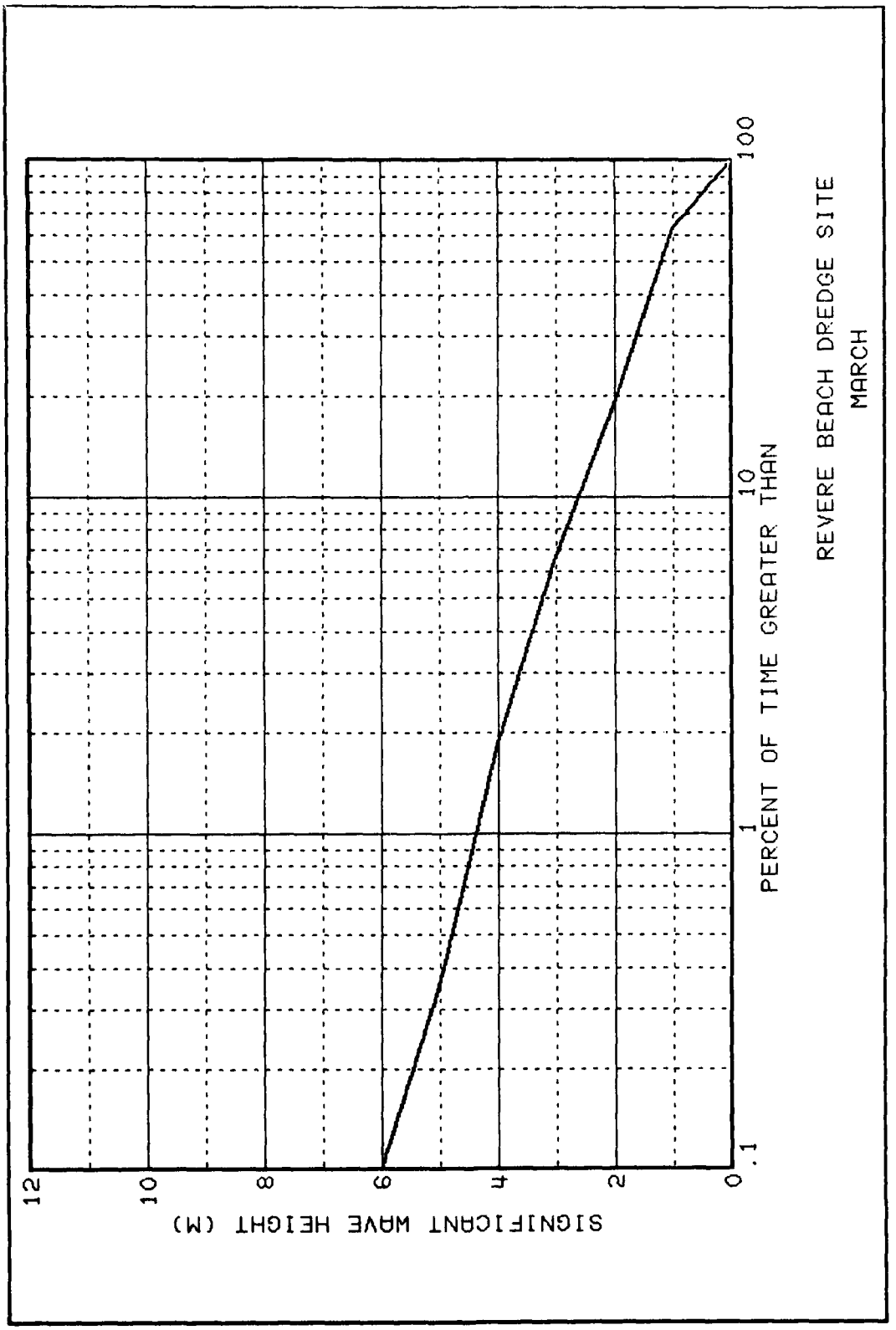
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 28.46 | 1.29 | 1.74 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 31.50 |
| 01-02 | 36.78 | 5.64 | 2.54 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 44.96 |
| 02-03 | 6.81 | 4.02 | 2.18 | 0.00 | 0.00 | 0.05 | 0.00 | 0.00 | 0.00 | 0.00 | 13.06 |
| 03-04 | 3.64 | 1.32 | 1.26 | 0.00 | 0.22 | 0.17 | 0.00 | 0.00 | 0.00 | 0.00 | 6.62 |
| 04-05 | 0.65 | 0.73 | 0.44 | 0.07 | 0.00 | 0.17 | 0.00 | 0.00 | 0.00 | 0.00 | 2.06 |
| 05-06 | 0.00 | 0.20 | 0.25 | 1.13 | 0.00 | 0.24 | 0.00 | 0.00 | 0.00 | 0.00 | 1.81 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 76.34 | 13.21 | 8.42 | 1.19 | 0.22 | 0.63 | 0.00 | 0.00 | 0.00 | 0.00 | |


REVERE BEACH DREDGE SITE
FEBRUARY
PERCENT OF TIME GREATER THAN
.1
1
10
100
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12

REVERE BEACH DREDGE SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR MARCH

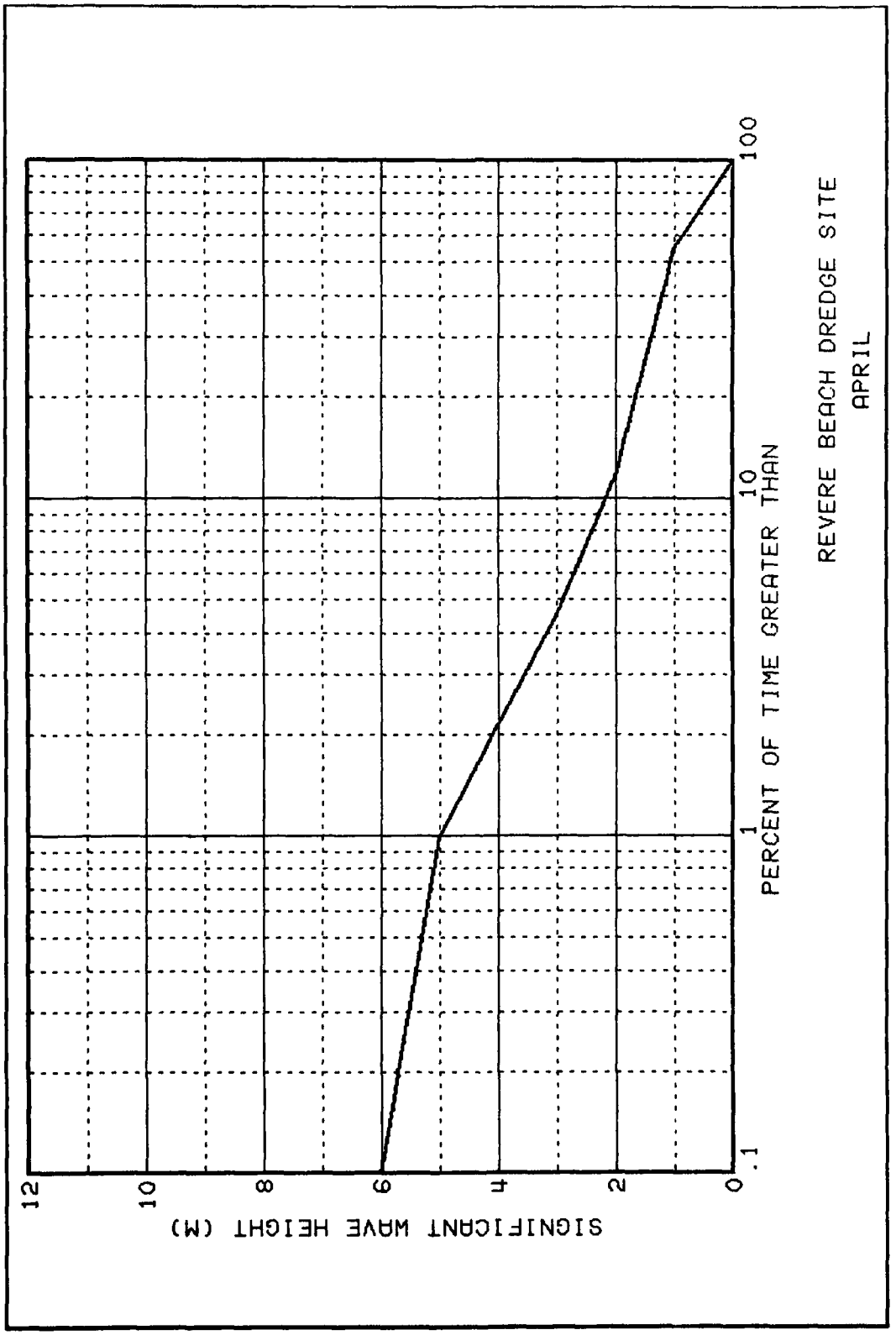
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 34.87 | 1.80 | 0.26 | 0.20 | 0.05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 37.19 |
| 01-02 | 37.69 | 4.17 | 1.24 | 0.20 | 0.47 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 43.78 |
| 02-03 | 6.96 | 4.14 | 0.77 | 0.21 | 0.14 | 0.14 | 0.00 | 0.00 | 0.00 | 0.00 | 12.37 |
| 03-04 | 1.07 | 1.99 | 0.89 | 0.35 | 0.30 | 0.19 | 0.00 | 0.00 | 0.00 | 0.00 | 4.79 |
| 04-05 | 0.00 | 0.65 | 0.38 | 0.25 | 0.22 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.50 |
| 05-06 | 0.16 | 0.00 | 0.17 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.35 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 80.76 | 12.76 | 3.71 | 1.23 | 1.19 | 0.33 | 0.00 | 0.00 | 0.00 | 0.00 | |


REVERE BEACH DREDGE SITE
MARCH
PERCENT OF TIME GREATER THAN
.1
1
10
100
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12

REVERE BEACH DREDGE SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR APRIL

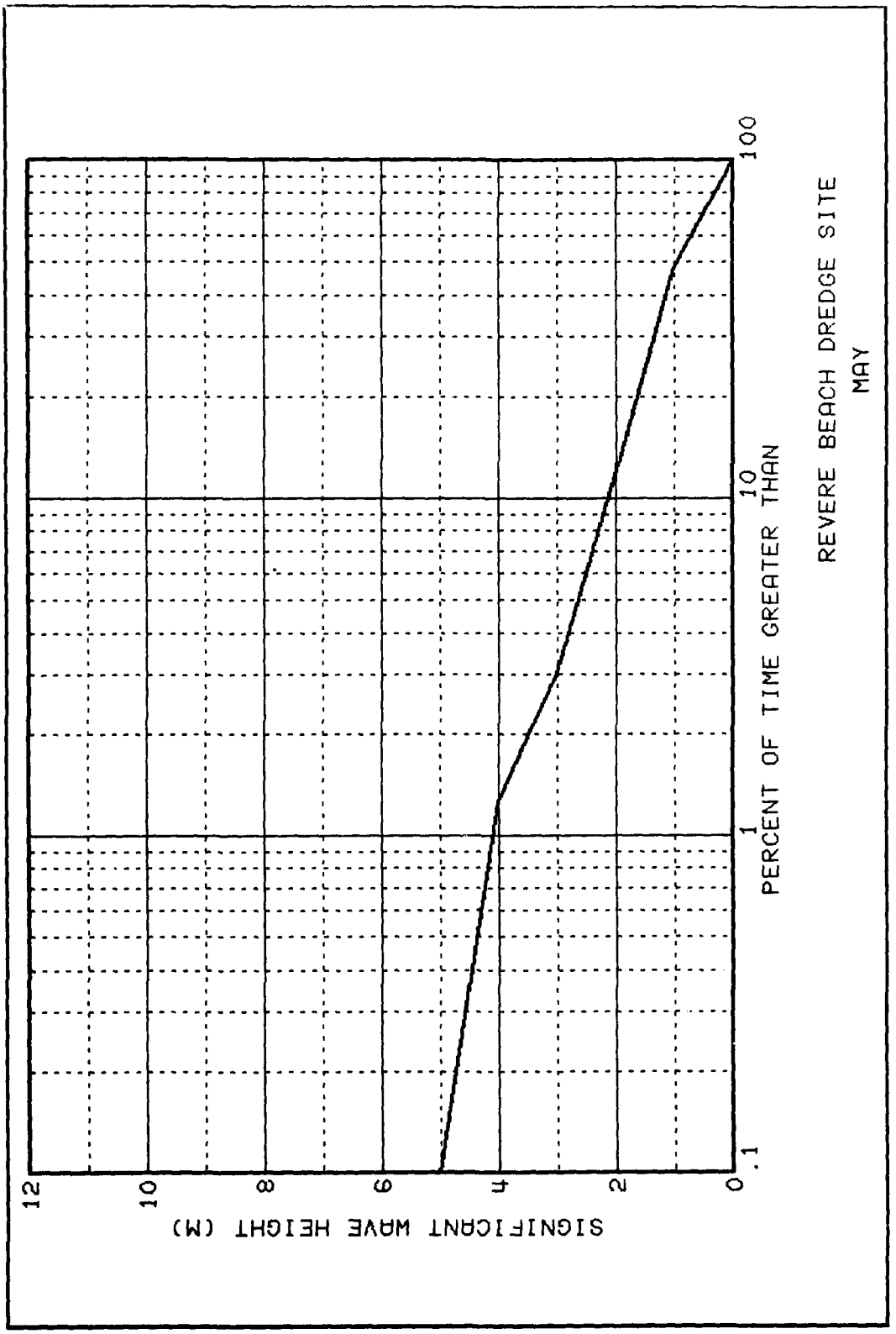
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 39.28 | 3.63 | 2.03 | 0.08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 45.02 |
| 01-02 | 33.11 | 7.47 | 1.56 | 0.62 | 0.60 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 43.36 |
| 02-03 | 2.45 | 2.94 | 1.12 | 0.22 | 0.23 | 0.18 | 0.00 | 0.00 | 0.00 | 0.00 | 7.13 |
| 03-04 | 0.86 | 0.53 | 0.61 | 0.10 | 0.21 | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | 2.34 |
| 04-05 | 0.22 | 0.00 | 0.61 | 0.32 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.15 |
| 05-06 | 0.00 | 0.00 | 0.48 | 0.06 | 0.45 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.99 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 75.93 | 14.57 | 6.39 | 1.39 | 1.49 | 0.21 | 0.00 | 0.00 | 0.00 | 0.00 | |


REVERE BEACH DREDGE SITE
APRIL
PERCENT OF TIME GREATER THAN
100
10
1
.1
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12

REVERE BEACH DREDGE SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR MAY

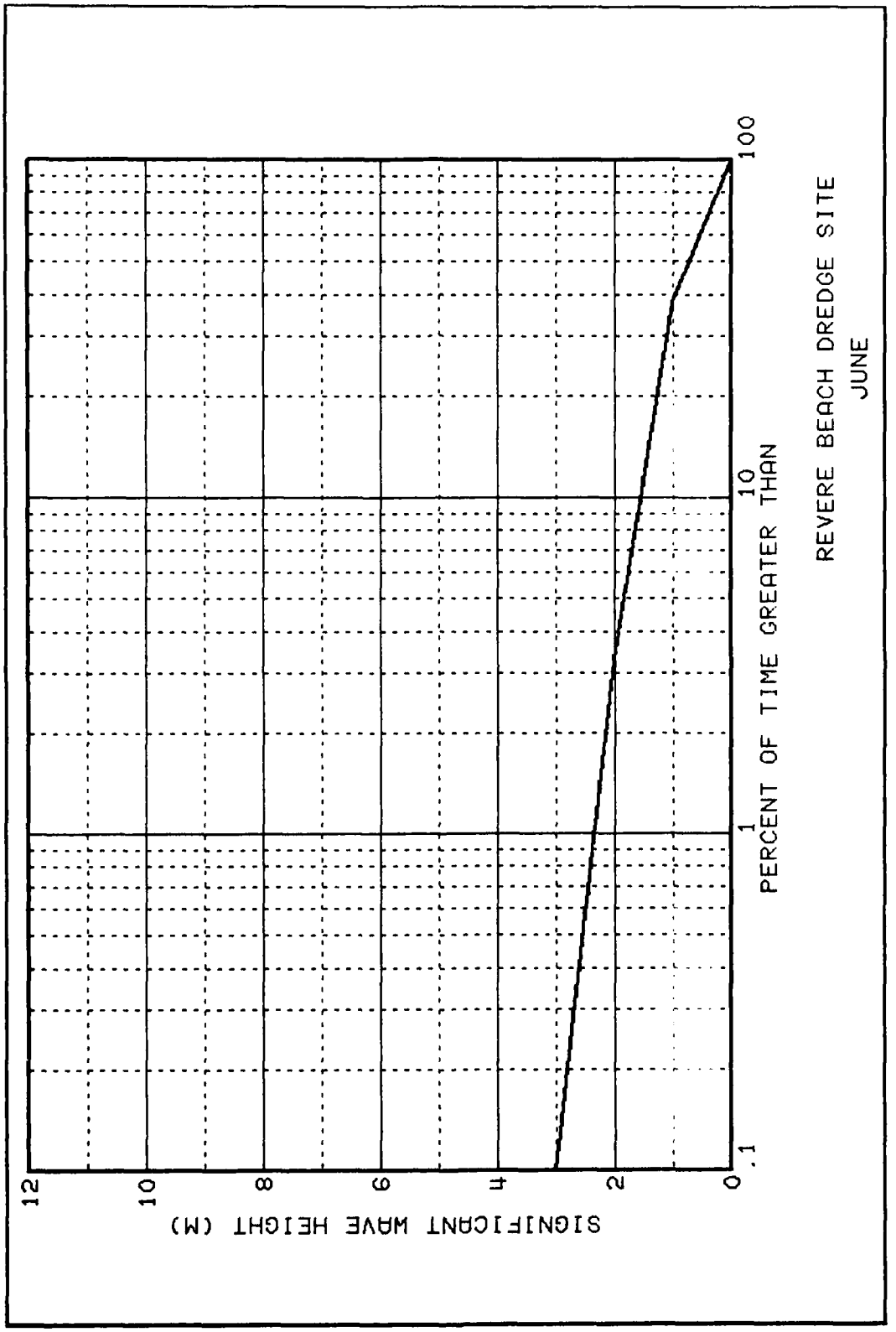
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 47.28 | 2.21 | 2.26 | 0.07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 51.82 |
| 01-02 | 30.91 | 3.12 | 1.16 | 0.80 | 0.47 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 36.45 |
| 02-03 | 4.30 | 2.82 | 0.34 | 0.89 | 0.34 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 8.70 |
| 03-04 | 0.75 | 0.56 | 0.11 | 0.13 | 0.10 | 0.14 | 0.00 | 0.00 | 0.00 | 0.00 | 1.78 |
| 04-05 | 0.00 | 0.61 | 0.00 | 0.18 | 0.00 | 0.47 | 0.00 | 0.00 | 0.00 | 0.00 | 1.26 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 83.24 | 9.32 | 3.86 | 2.06 | 0.91 | 0.60 | 0.00 | 0.00 | 0.00 | 0.00 | |


REVERE BEACH DREDGE SITE
MAY
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12
PERCENT OF TIME GREATER THAN
.1
1
10
100

REVERE BEACH DREDGE SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR JUNE

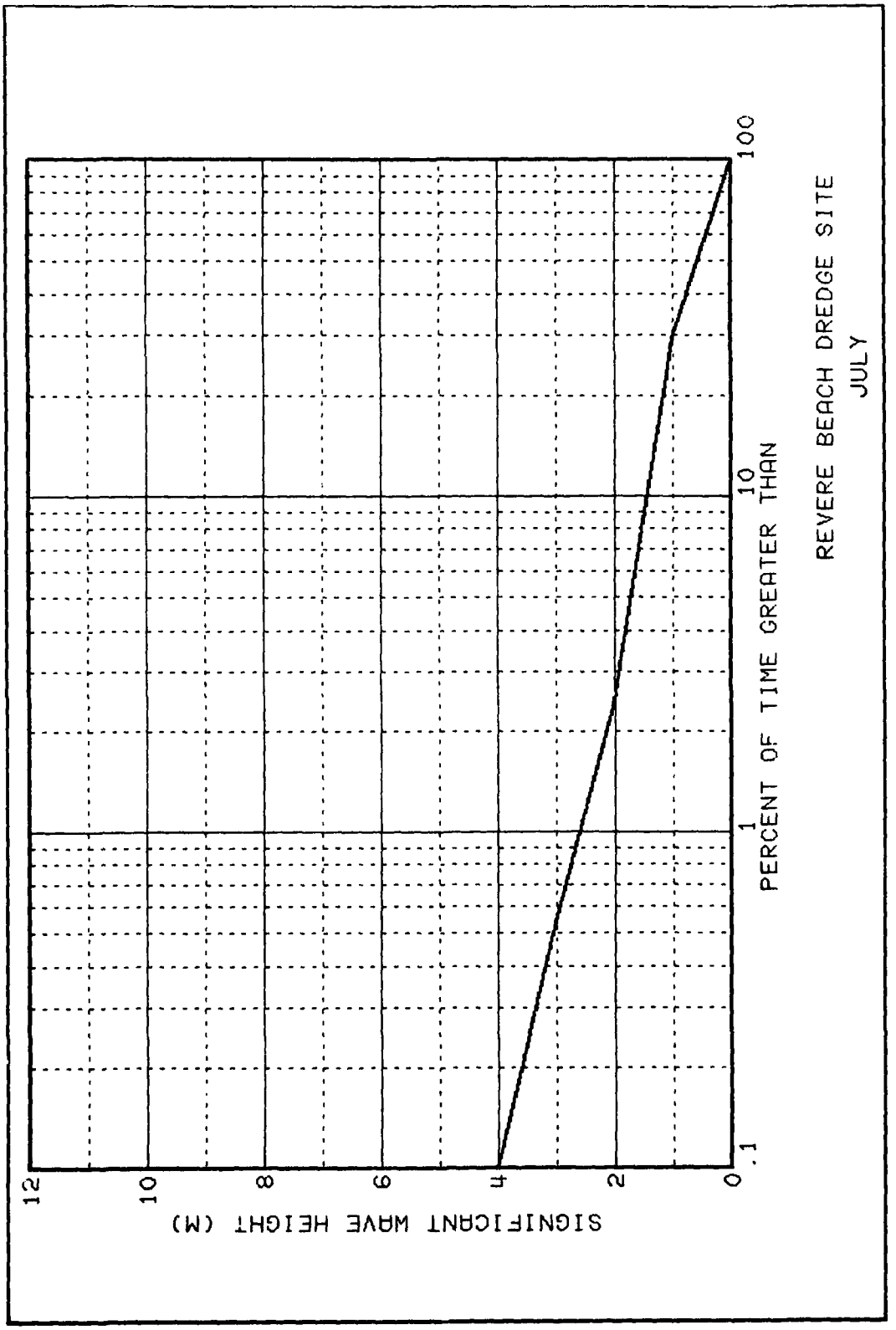
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 58.94 | 2.00 | 1.03 | 0.08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 62.06 |
| 01-02 | 28.88 | 3.76 | 1.62 | 0.38 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 34.64 |
| 02-03 | 0.52 | 1.78 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3.30 |
| 03-04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 88.35 | 7.54 | 3.65 | 0.46 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |


REVERE BEACH DREDGE SITE
JUNE
PERCENT OF TIME GREATER THAN
100
10
1
.1
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12

REVERE BEACH DREDGE SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR JULY

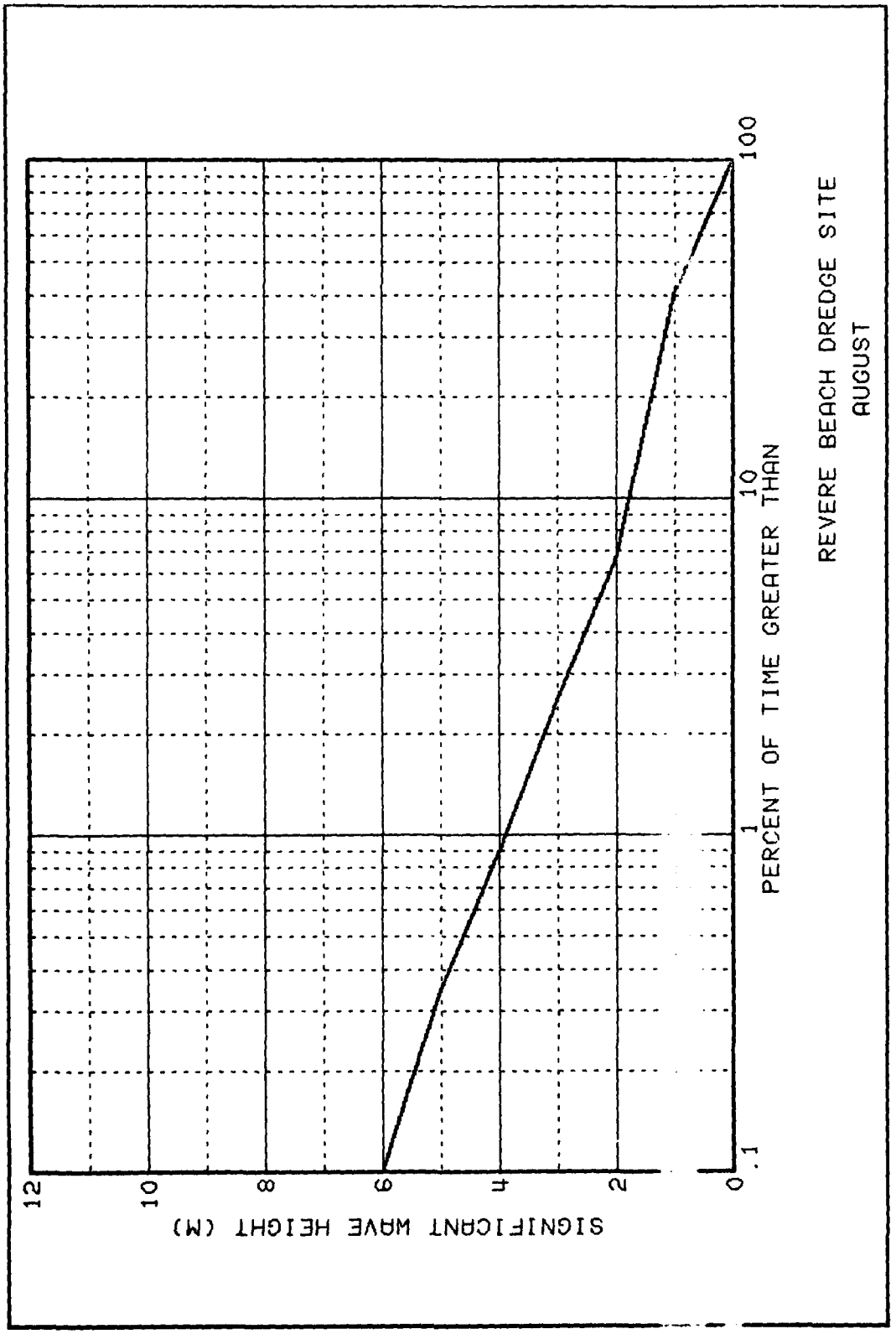
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 64.12 | 4.08 | 0.72 | 0.00 | 0.00 | 0.61 | 0.00 | 0.00 | 0.00 | 1.08 | 70.61 |
| 01-02 | 20.71 | 4.43 | 1.66 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.15 | 26.95 |
| 02-03 | 0.56 | 0.39 | 0.95 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.90 |
| 03-04 | 0.00 | 0.00 | 0.54 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.54 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 85.39 | 8.90 | 3.87 | 0.00 | 0.00 | 0.61 | 0.00 | 0.00 | 0.00 | 1.23 | |


REVERE BEACH DREDGE SITE
JULY
PERCENT OF TIME GREATER THAN
100
10
1
.1
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12

REVERE BEACH DREDGE SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR AUGUST

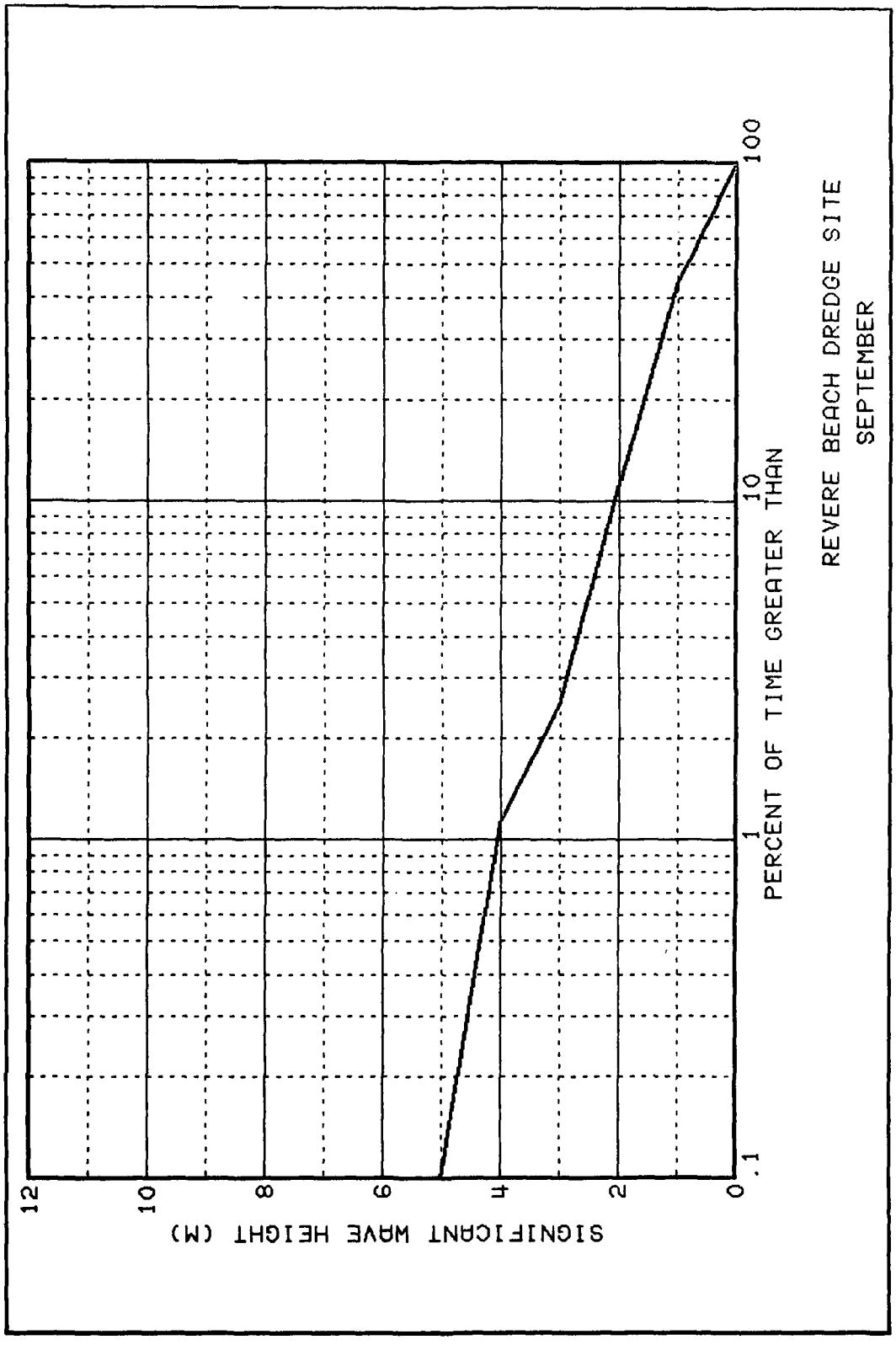
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 55.26 | 2.94 | 0.80 | 0.31 | 0.00 | 0.00 | 0.00 | 0.00 | 0.35 | 0.33 | 59.98 |
| 01-02 | 26.48 | 6.44 | 0.42 | 0.05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.03 | 33.43 |
| 02-03 | 2.41 | 0.92 | 0.55 | 0.20 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 4.08 |
| 03-04 | 0.70 | 0.09 | 0.51 | 0.33 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.63 |
| 04-05 | 0.00 | 0.00 | 0.33 | 0.21 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.54 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.35 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.35 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 84.85 | 10.39 | 2.61 | 1.45 | 0.00 | 0.00 | 0.00 | 0.00 | 0.36 | 0.36 | |


REVERE BEACH DREDGE SITE
AUGUST
PERCENT OF TIME GREATER THAN
100
10
1
.1
0
2
4
6
8
10
12
SIGNIFICANT WAVE HEIGHT (M)

REVERE BEACH DREDGE SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR SEPTEMBER

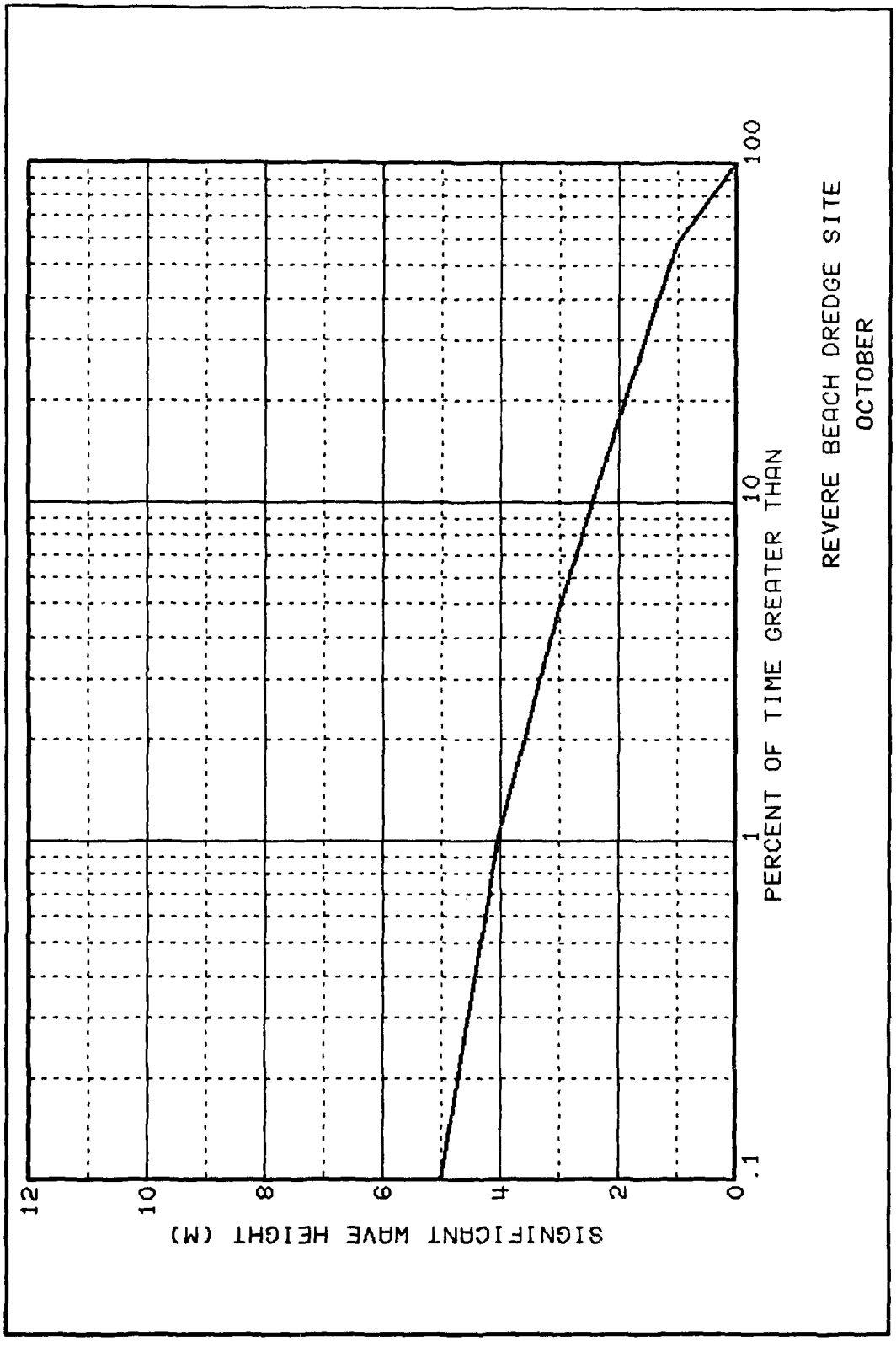
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 54.19 | 0.46 | 1.02 | 0.00 | 0.00 | 0.19 | 0.00 | 0.00 | 0.00 | 0.39 | 56.25 |
| 01-02 | 27.66 | 4.00 | 0.89 | 0.00 | 0.00 | 0.08 | 0.00 | 0.00 | 0.00 | 0.19 | 32.82 |
| 02-03 | 5.45 | 2.21 | 0.61 | 0.00 | 0.00 | 0.15 | 0.00 | 0.00 | 0.00 | 0.04 | 8.46 |
| 03-04 | 0.00 | 0.35 | 0.89 | 0.00 | 0.00 | 0.11 | 0.00 | 0.00 | 0.00 | 0.00 | 1.36 |
| 04-05 | 0.20 | 0.42 | 0.49 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.12 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 87.50 | 7.44 | 3.90 | 0.00 | 0.00 | 0.53 | 0.00 | 0.00 | 0.00 | 0.62 | |


REVERE BEACH DREDGE SITE
SEPTEMBER
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12
PERCENT OF TIME GREATER THAN
.1
1
10
100

REVERE BEACH DREDGE SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR OCTOBER

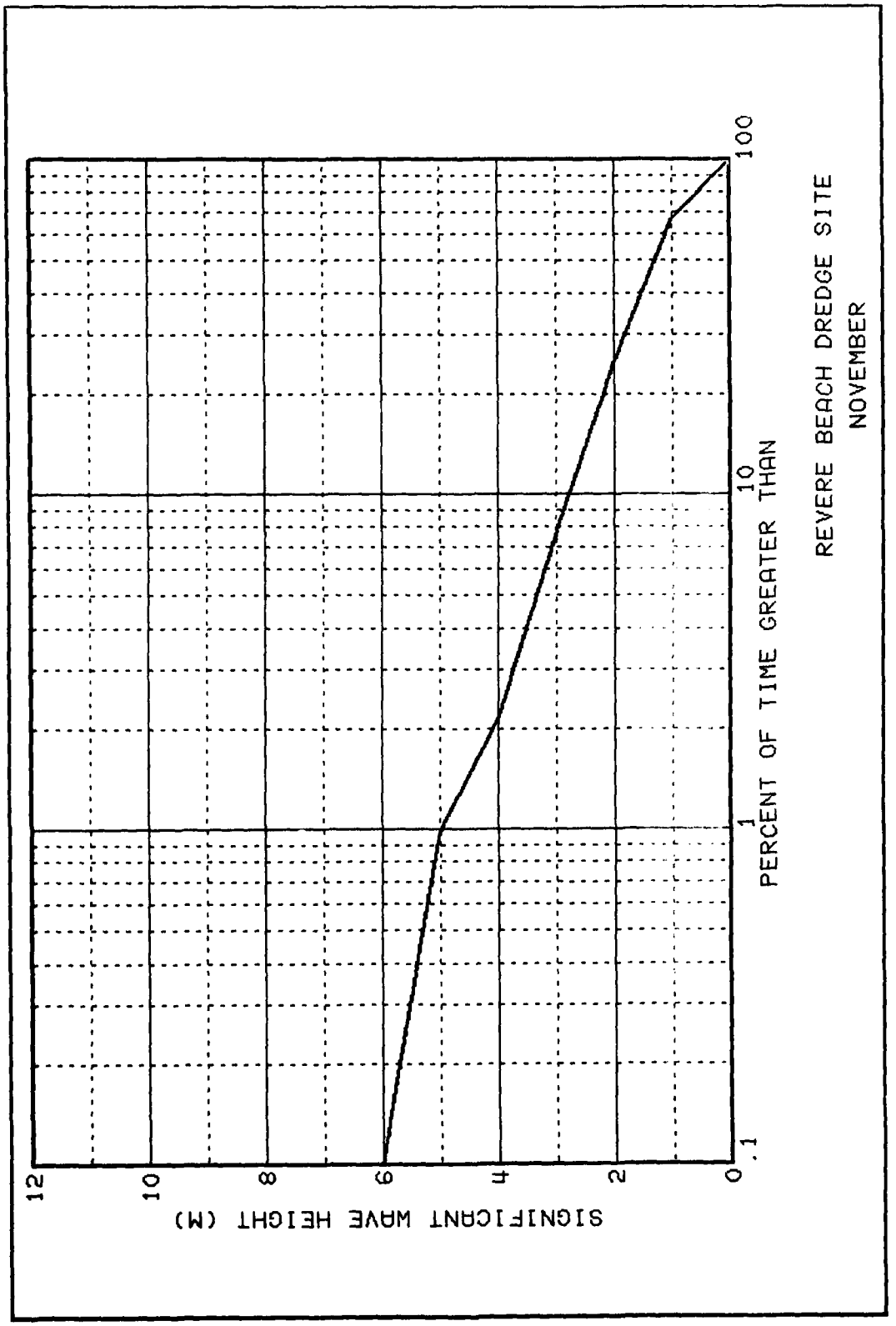
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 5-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 40.75 | 0.25 | 0.32 | 0.28 | 0.06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 41.66 |
| 01-02 | 34.51 | 3.70 | 2.15 | 0.20 | 0.36 | 0.14 | 0.00 | 0.00 | 0.00 | 0.00 | 41.05 |
| 02-03 | 7.19 | 3.03 | 1.70 | 0.00 | 0.30 | 0.25 | 0.00 | 0.00 | 0.00 | 0.00 | 12.46 |
| 03-04 | 0.57 | 2.23 | 0.50 | 0.26 | 0.19 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3.76 |
| 04-05 | 0.00 | 0.14 | 0.62 | 0.20 | 0.10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.07 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 83.02 | 9.35 | 5.30 | 0.94 | 1.00 | 0.38 | 0.00 | 0.00 | 0.00 | 0.00 | |


REVERE BEACH DREDGE SITE
OCTOBER
PERCENT OF TIME GREATER THAN
.1
1
10
100
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12

REVERE BEACH DREDGE SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR NOVEMBER

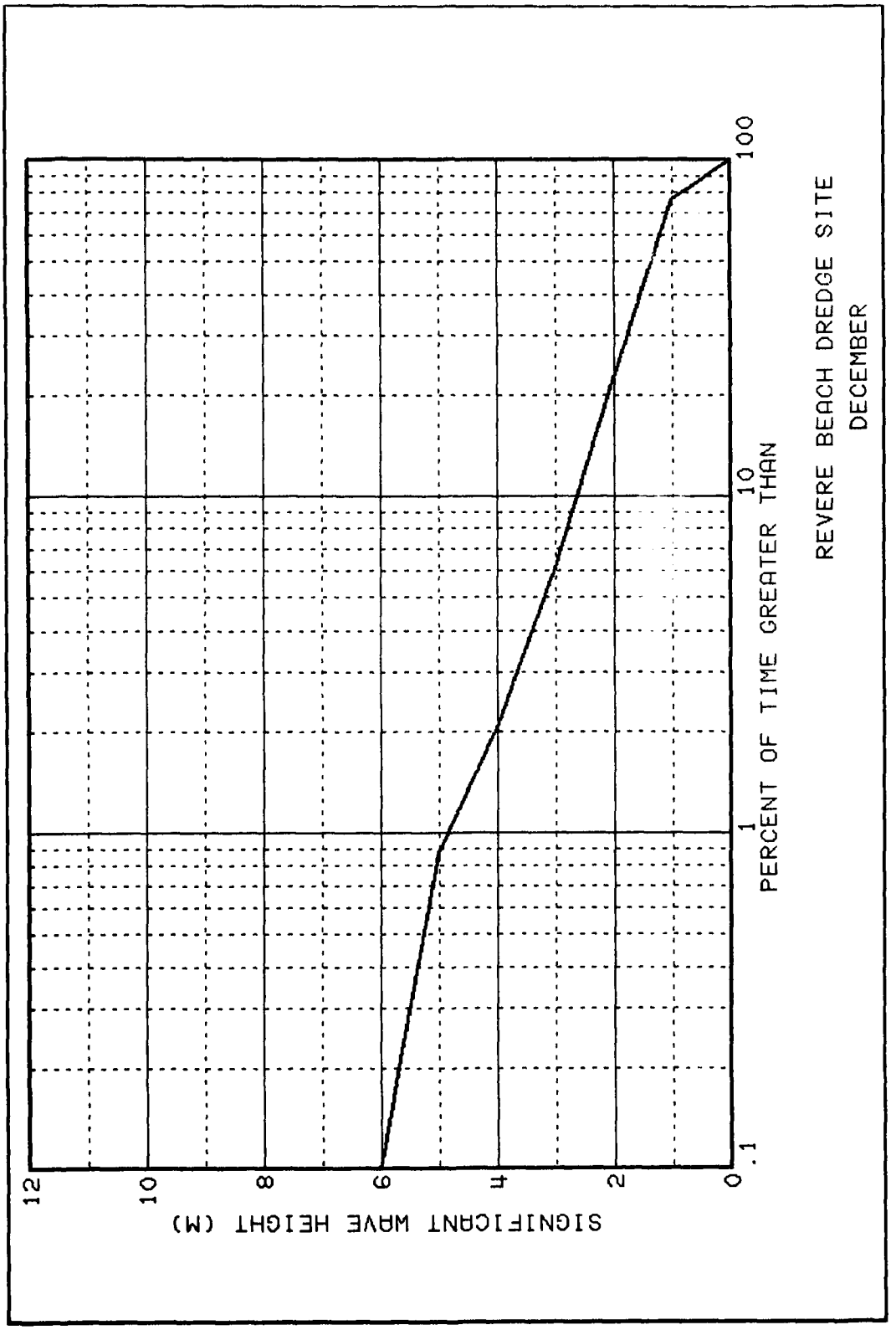
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 30.33 | 1.73 | 1.21 | 0.00 | 0.18 | 0.09 | 0.00 | 0.00 | 0.00 | 0.35 | 33.88 |
| 01-02 | 31.07 | 7.62 | 2.25 | 0.00 | 0.31 | 0.24 | 0.00 | 0.00 | 0.00 | 0.03 | 41.54 |
| 02-03 | 8.97 | 4.15 | 2.82 | 0.52 | 0.33 | 0.26 | 0.00 | 0.00 | 0.00 | 0.00 | 17.04 |
| 03-04 | 1.75 | 1.22 | 1.46 | 0.46 | 0.35 | 0.18 | 0.00 | 0.00 | 0.00 | 0.00 | 5.41 |
| 04-05 | 0.65 | 0.12 | 0.26 | 0.05 | 0.07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.15 |
| 05-06 | 0.83 | 0.15 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.98 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 73.60 | 14.98 | 8.00 | 1.03 | 1.24 | 0.77 | 0.00 | 0.00 | 0.00 | 0.38 | |


REVERE BEACH DREDGE SITE
NOVEMBER
PERCENT OF TIME GREATER THAN
.1
1
10
100
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12

REVERE BEACH DREDGE SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR DECEMBER

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 22.11 | 1.31 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 23.44 |
| 01-02 | 48.74 | 3.55 | 0.45 | 0.00 | 0.30 | 0.06 | 0.00 | 0.00 | 0.00 | 0.00 | 54.11 |
| 02-03 | 11.20 | 2.85 | 1.13 | 0.00 | 0.28 | 0.83 | 0.00 | 0.00 | 0.00 | 0.00 | 16.30 |
| 03-04 | 0.46 | 1.74 | 0.96 | 0.00 | 0.08 | 0.85 | 0.00 | 0.00 | 0.00 | 0.00 | 4.08 |
| 04-05 | 0.45 | 0.54 | 0.20 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.19 |
| 05-06 | 0.00 | 0.05 | 0.59 | 0.00 | 0.00 | 0.23 | 0.00 | 0.00 | 0.00 | 0.00 | 0.87 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 83.96 | 10.04 | 3.35 | 0.00 | 0.66 | 1.97 | 0.00 | 0.00 | 0.00 | 0.00 | |


REVERE BEACH DREDGE SITE
DECEMBER
PERCENT OF TIME GREATER THAN
100
10
1
.1
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12

REVERE BEACH DREDGE SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD

WAVE DIRECTION = 90

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 12.76 | 0.43 | 0.19 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 13.38 |
| 01-02 | 10.12 | 1.17 | 0.30 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 11.59 |
| 02-03 | 1.96 | 0.73 | 0.46 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3.15 |
| 03-04 | 0.25 | 0.19 | 0.17 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.60 |
| 04-05 | 0.02 | 0.08 | 0.08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.18 |
| 05-06 | 0.02 | 0.04 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.08 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 25.13 | 2.64 | 1.21 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |

REVERE BEACH DREDGE SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD

WAVE DIRECTION = 60

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 13.73 | 0.47 | 0.12 | 0.02 | 0.02 | 0.05 | 0.00 | 0.00 | 0.02 | 0.14 | 14.58 |
| 01-02 | 11.61 | 1.98 | 0.45 | 0.02 | 0.12 | 0.07 | 0.00 | 0.00 | 0.00 | 0.03 | 14.29 |
| 02-03 | 2.29 | 1.21 | 0.57 | 0.07 | 0.12 | 0.20 | 0.00 | 0.00 | 0.00 | 0.00 | 4.46 |
| 03-04 | 0.38 | 0.47 | 0.46 | 0.10 | 0.12 | 0.16 | 0.00 | 0.00 | 0.00 | 0.00 | 1.67 |
| 04-05 | 0.04 | 0.13 | 0.21 | 0.08 | 0.03 | 0.05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.54 |
| 05-06 | 0.04 | 0.00 | 0.15 | 0.13 | 0.00 | 0.05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.37 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 28.10 | 4.26 | 1.96 | 0.42 | 0.40 | 0.58 | 0.00 | 0.00 | 0.02 | 0.18 | |

REVERE BEACH DREDGE SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD

WAVE DIRECTION = 90

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 12.81 | 0.84 | 0.65 | 0.07 | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 14.41 |
| 01-02 | 12.25 | 2.03 | 0.75 | 0.17 | 0.17 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 15.37 |
| 02-03 | 1.74 | 1.20 | 0.33 | 0.15 | 0.08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3.48 |
| 03-04 | 0.33 | 0.49 | 0.23 | 0.09 | 0.07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.21 |
| 04-05 | 0.17 | 0.12 | 0.13 | 0.05 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.48 |
| 05-06 | 0.10 | 0.01 | 0.02 | 0.00 | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.18 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 27.41 | 4.69 | 2.11 | 0.52 | 0.41 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |

# APPENDIX C: AVERAGE WAVE CLIMATE AT ROCKAWAY BEACH, N. Y.

1. Appendix C contains the following information for the Rockaway Beach, N. Y., project site:

   a. Tabulations of monthly percent occurrence of wave-height/period combinations.

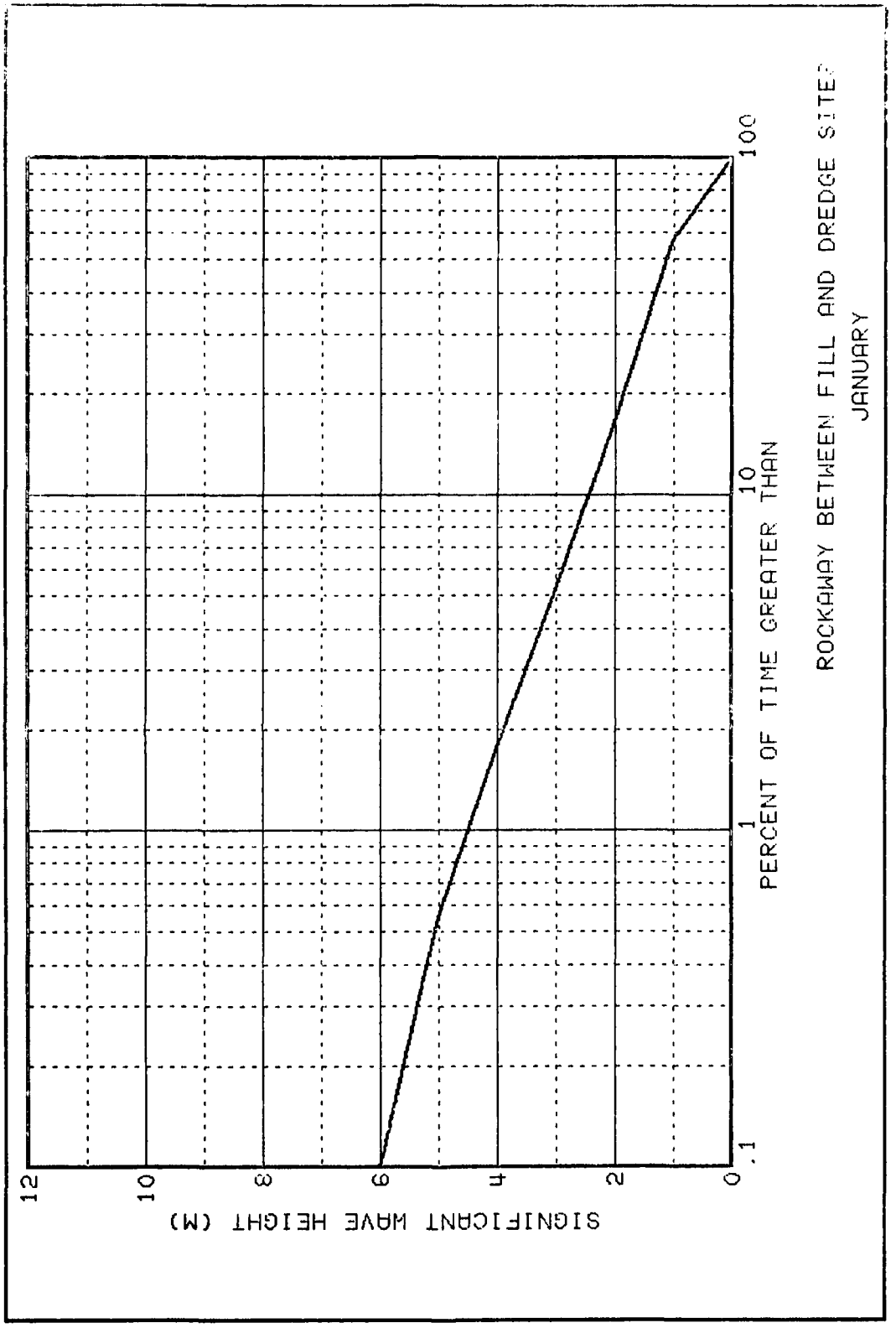
   b. Tabulations of annual percent occurrence by azimuth direction of wave-height/period combinations.

   c. Plots of monthly significant wave-height occurrence in terms of the total percent time per month that these heights are exceeded.

ROCKAWAY BETWEEN FILL AND DREDGE SITES

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR JANUARY

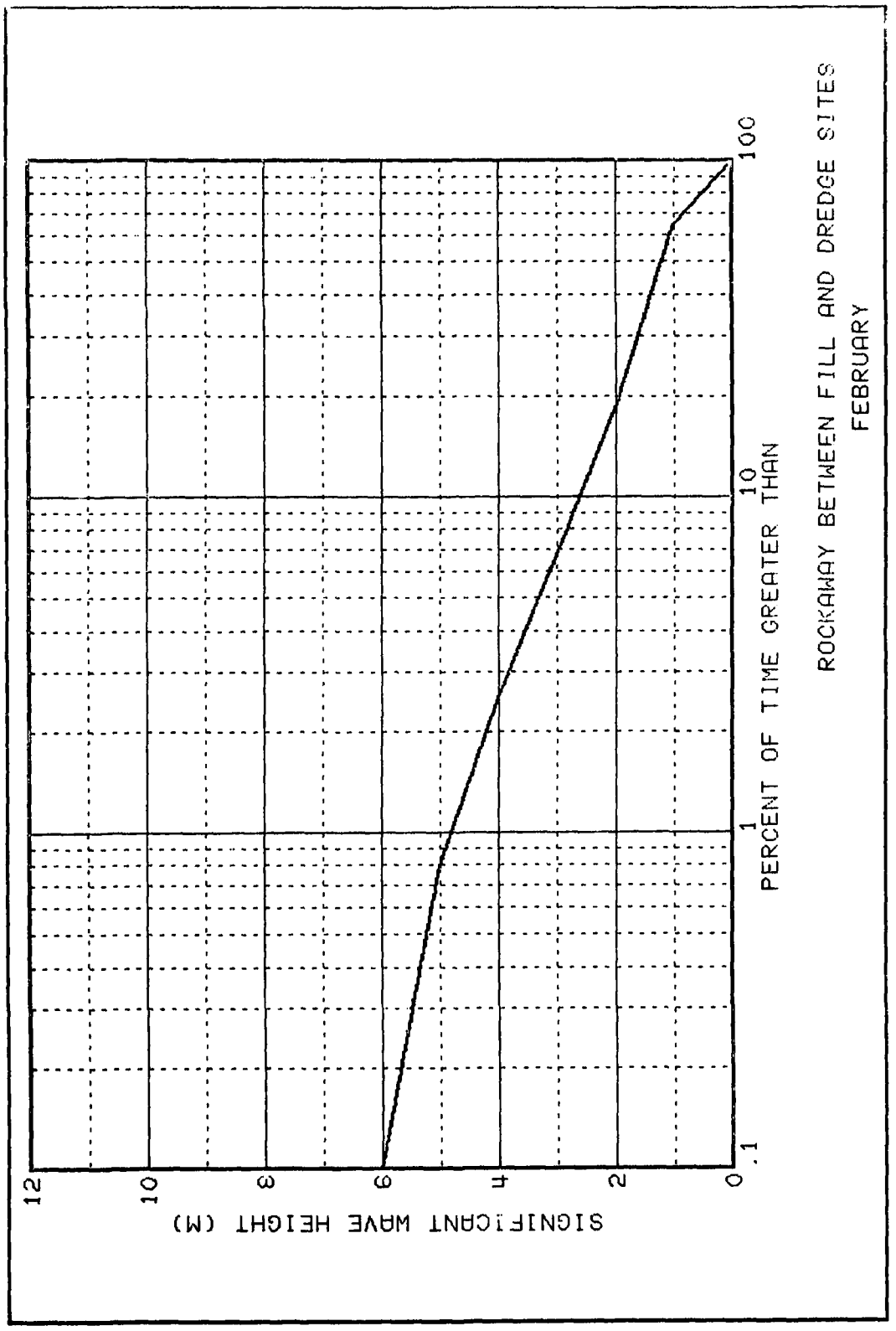
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 37.60 | 3.05 | 0.81 | 0.44 | 0.42 | 0.00 | 0.00 | 0.00 | 0.31 | 0.25 | 42.89 |
| 01-02 | 28.81 | 6.16 | 4.01 | 0.77 | 0.32 | 0.22 | 0.00 | 0.00 | 0.19 | 0.08 | 40.57 |
| 02-03 | 2.19 | 5.11 | 2.49 | 0.59 | 0.68 | 0.03 | 0.00 | 0.00 | 0.00 | 0.17 | 11.25 |
| 03-04 | 0.25 | 1.85 | 0.82 | 0.19 | 0.32 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3.43 |
| 04-05 | 0.48 | 0.73 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.21 |
| 05-06 | 0.00 | 0.30 | 0.00 | 0.00 | 0.25 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.55 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 69.33 | 17.21 | 8.23 | 1.00 | 1.99 | 0.25 | 0.00 | 0.00 | 0.50 | 0.50 | |


ROCKAWAY BETWEEN FILL AND DREDGE SITE
JANUARY
SIGNIFICANT WAVE HEIGHT (M)
PERCENT OF TIME GREATER THAN
0
2
4
6
8
10
12
.1
1
10
100

ROCKAWAY BETWEEN FILL AND DREDGE SITES

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR FEBRUARY

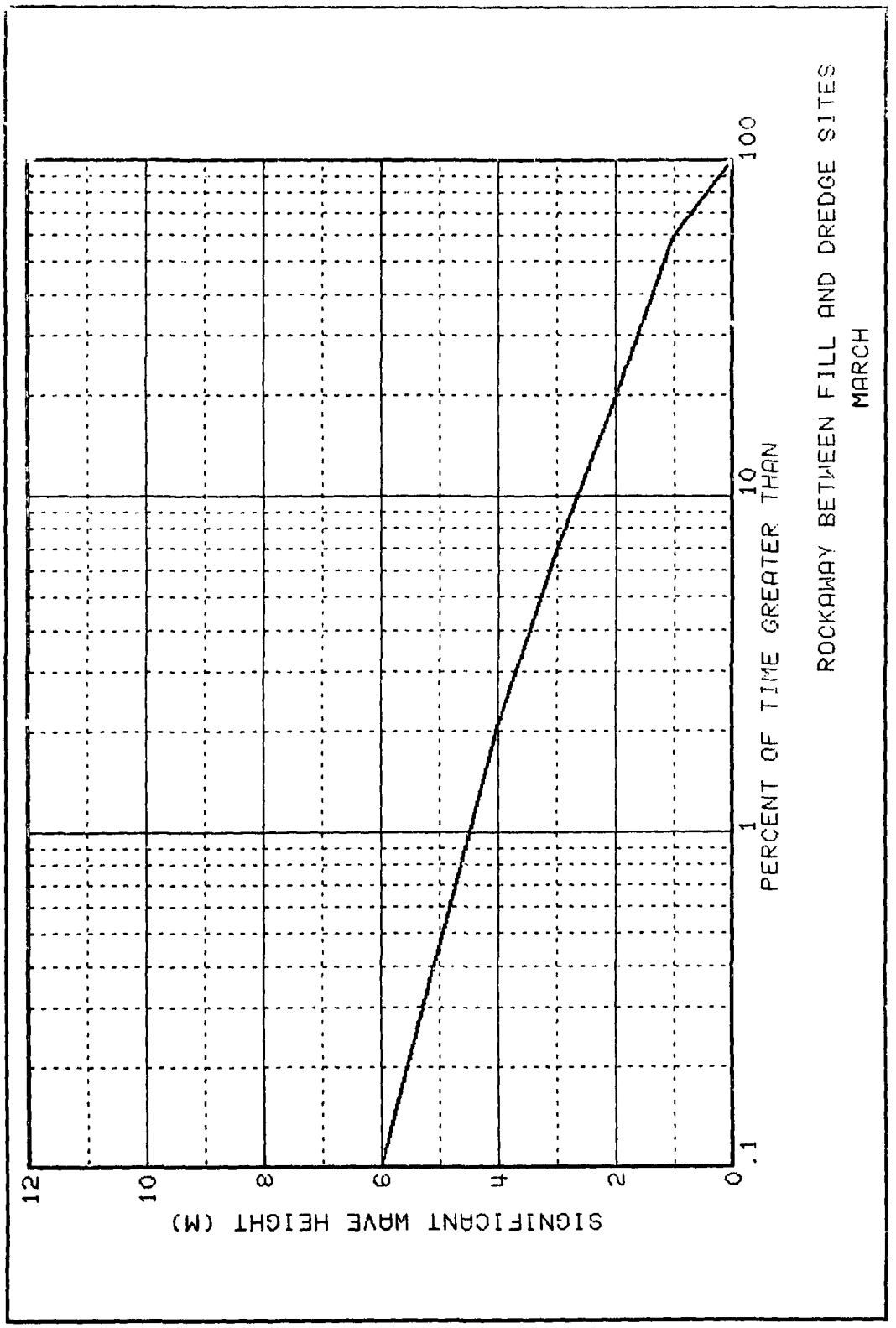
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 29.56 | 2.82 | 1.18 | 0.46 | 0.86 | 0.16 | 0.01 | 0.00 | 0.34 | 0.16 | 35.54 |
| 01-02 | 30.20 | 10.16 | 3.32 | 0.80 | 1.12 | 0.10 | 0.14 | 0.00 | 0.28 | 0.00 | 46.12 |
| 02-03 | 3.32 | 5.86 | 1.01 | 0.79 | 0.60 | 0.05 | 0.00 | 0.00 | 0.01 | 0.00 | 11.65 |
| 03-04 | 1.23 | 2.13 | 0.39 | 0.17 | 0.16 | 0.00 | 0.00 | 0.00 | 0.11 | 0.00 | 4.18 |
| 04-05 | 0.29 | 0.83 | 0.31 | 0.17 | 0.06 | 0.03 | 0.00 | 0.00 | 0.04 | 0.00 | 1.71 |
| 05-06 | 0.00 | 0.26 | 0.16 | 0.10 | 0.16 | 0.13 | 0.00 | 0.00 | 0.00 | 0.00 | 0.79 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 64.60 | 22.05 | 6.37 | 2.48 | 2.95 | 0.47 | 0.16 | 0.00 | 0.78 | 0.16 | |


ROCKAWAY BETWEEN FILL AND DREDGE SITES
FEBRUARY
SIGNIFICANT WAVE HEIGHT (M)
PERCENT OF TIME GREATER THAN
0
2
4
6
8
10
12
.1
1
10
100

ROCKAWAY BETWEEN FILL AND DREDGE SITES

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR MARCH

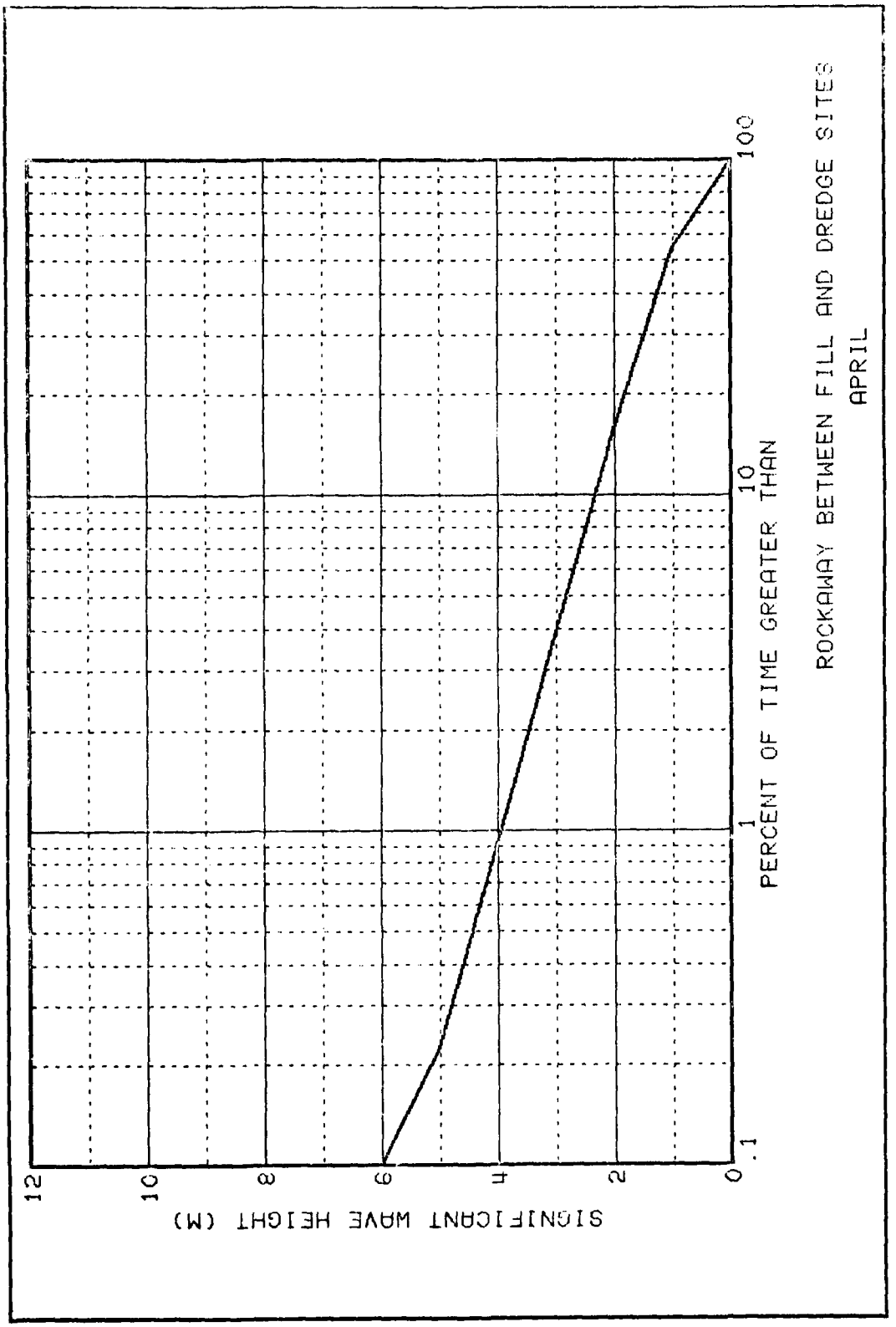
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 34.65 | 2.85 | 1.06 | 0.44 | 0.58 | 0.48 | 0.00 | 0.00 | 0.13 | 0.52 | 40.70 |
| 01-02 | 27.27 | 7.76 | 3.54 | 0.87 | 0.44 | 0.04 | 0.00 | 0.00 | 0.00 | 0.04 | 39.96 |
| 02-03 | 4.31 | 4.84 | 1.60 | 1.30 | 0.21 | 0.13 | 0.00 | 0.00 | 0.00 | 0.09 | 12.48 |
| 03-04 | 0.86 | 2.61 | 0.96 | 0.16 | 0.15 | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 | 4.79 |
| 04-05 | 0.00 | 1.21 | 0.13 | 0.14 | 0.05 | 0.09 | 0.00 | 0.00 | 0.00 | 0.00 | 1.61 |
| 05-06 | 0.00 | 0.24 | 0.00 | 0.08 | 0.00 | 0.00 | 0.13 | 0.00 | 0.00 | 0.00 | 0.45 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 67.10 | 19.51 | 7.28 | 3.00 | 1.43 | 0.78 | 0.13 | 0.00 | 0.13 | 0.65 | |


ROCKAWAY BETWEEN FILL AND DREDGE SITES
MARCH
PERCENT OF TIME GREATER THAN
.1
1
10
100
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12

ROCKAWAY BETWEEN FILL AND DREDGE SITES

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR APRIL

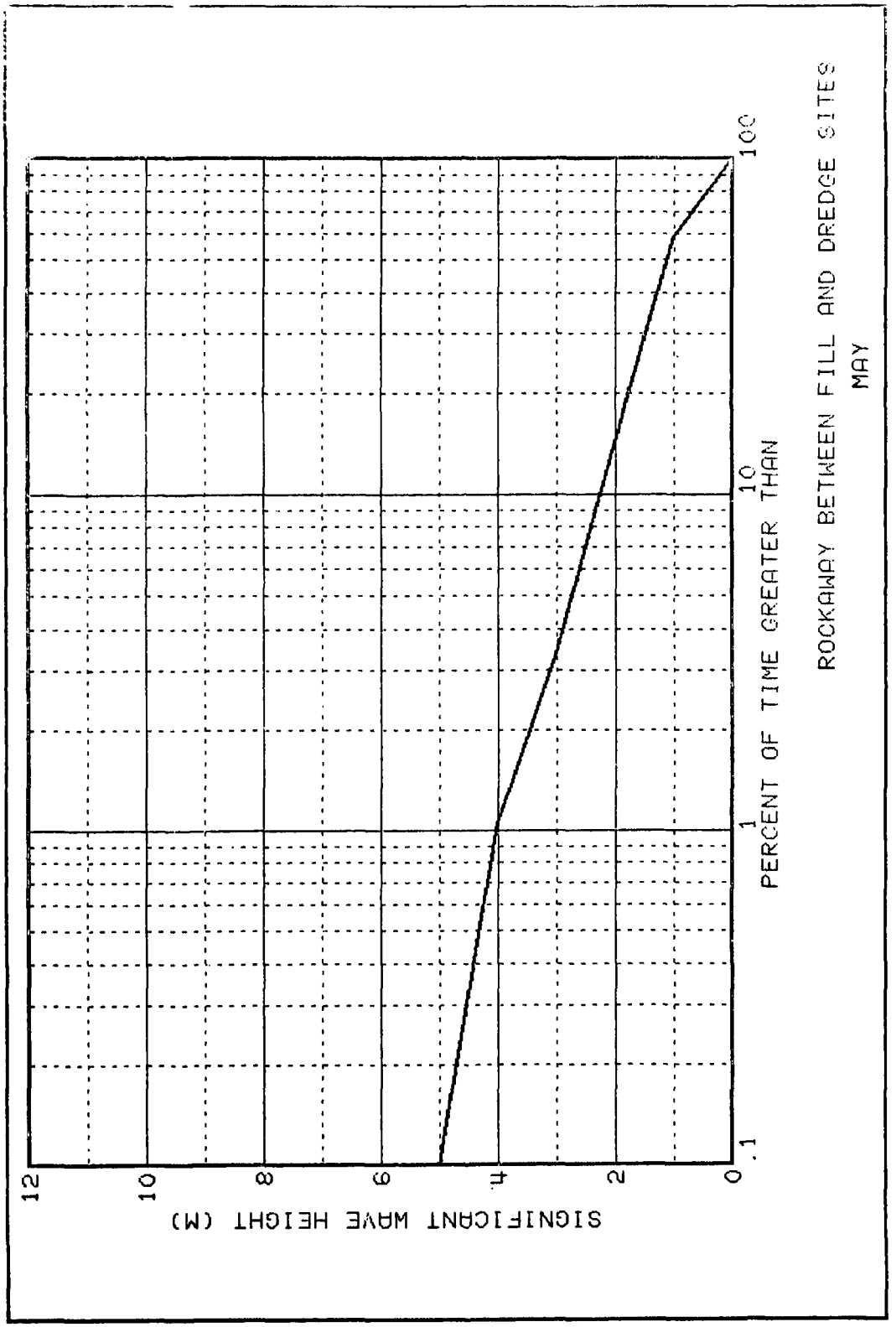
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 37.93 | 3.86 | 1.55 | 0.43 | 0.70 | 0.18 | 0.09 | 0.09 | 0.00 | 0.27 | 45.10 |
| 01-02 | 26.63 | 7.31 | 3.30 | 1.15 | 0.37 | 0.20 | 0.05 | 0.08 | 0.09 | 0.00 | 39.19 |
| 02-03 | 3.95 | 4.51 | 2.01 | 0.95 | 0.19 | 0.06 | 0.04 | 0.00 | 0.09 | 0.00 | 11.80 |
| 03-04 | 0.49 | 2.11 | 0.34 | 0.01 | 0.05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3.00 |
| 04-05 | 0.00 | 0.64 | 0.00 | 0.00 | 0.05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.69 |
| 05-06 | 0.00 | 0.19 | 0.00 | 0.00 | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.23 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 69.01 | 18.61 | 7.20 | 2.55 | 1.40 | 0.44 | 0.18 | 0.18 | 0.18 | 0.27 | |


ROCKAWAY BETWEEN FILL AND DREDGE SITES
APRIL
PERCENT OF TIME GREATER THAN
.1
1
10
100
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12

ROCKAWAY BETWEEN FILL AND DREDGE SITES

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR MAY

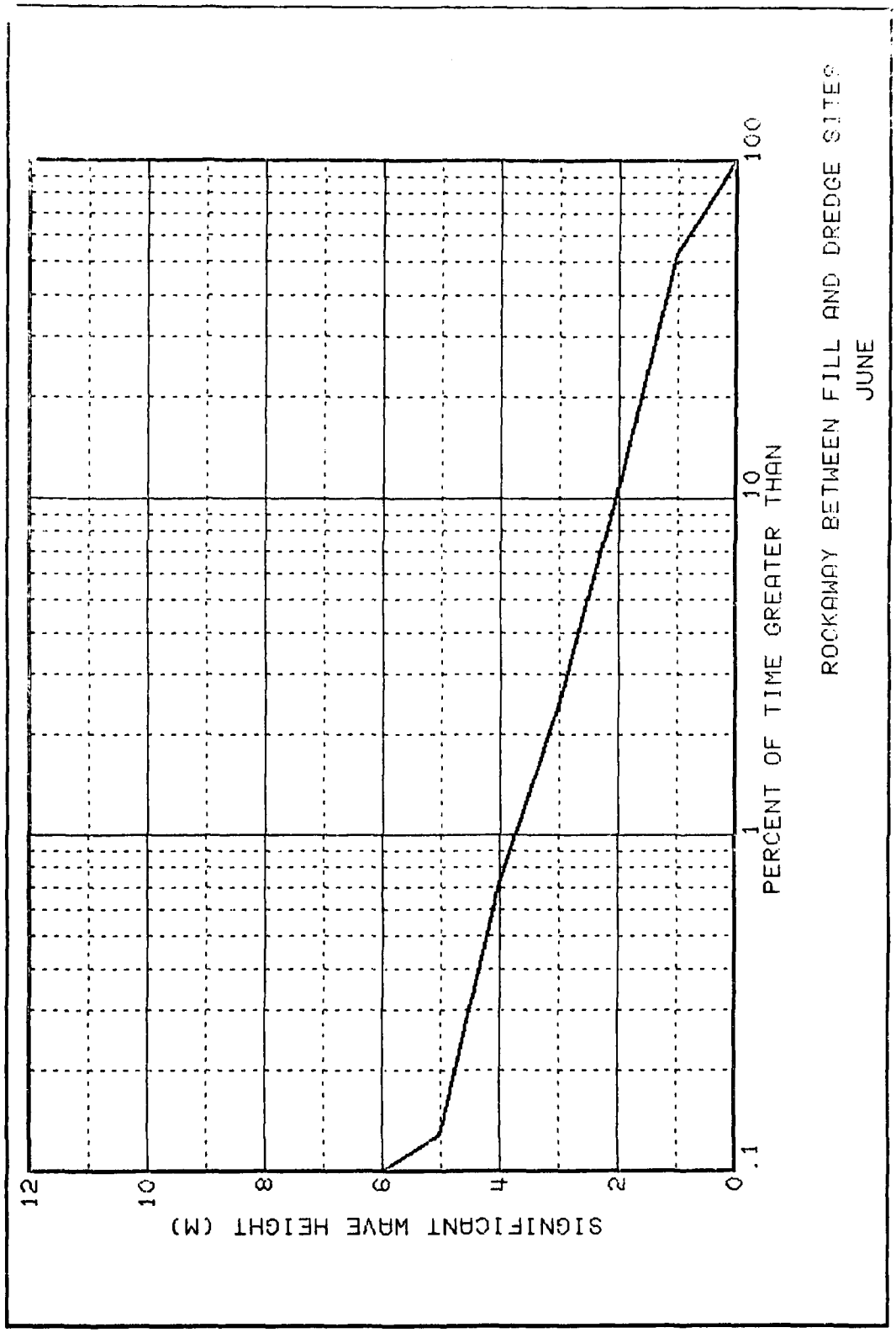
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 33.44 | 3.46 | 2.72 | 0.52 | 0.17 | 0.05 | 0.00 | 0.00 | 0.17 | 0.81 | 41.35 |
| 01-02 | 32.29 | 7.66 | 3.15 | 0.80 | 0.13 | 0.20 | 0.00 | 0.00 | 0.03 | 0.07 | 44.32 |
| 02-03 | 4.21 | 4.75 | 1.53 | 0.23 | 0.00 | 0.06 | 0.00 | 0.00 | 0.00 | 0.13 | 10.91 |
| 03-04 | 0.01 | 1.82 | 0.28 | 0.17 | 0.06 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 2.36 |
| 04-05 | 0.09 | 0.76 | 0.00 | 0.00 | 0.04 | 0.00 | 0.08 | 0.00 | 0.00 | 0.00 | 0.97 |
| 05-06 | 0.00 | 0.07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.08 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 70.04 | 18.52 | 7.68 | 1.72 | 0.40 | 0.30 | 0.10 | 0.00 | 0.20 | 1.01 | |


ROCKAWAY BETWEEN FILL AND DREDGE SITES
MAY
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12
PERCENT OF TIME GREATER THAN
.1
1
10
100

ROCKAWAY BETWEEN FILL AND DREDGE SITES

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR JUNE

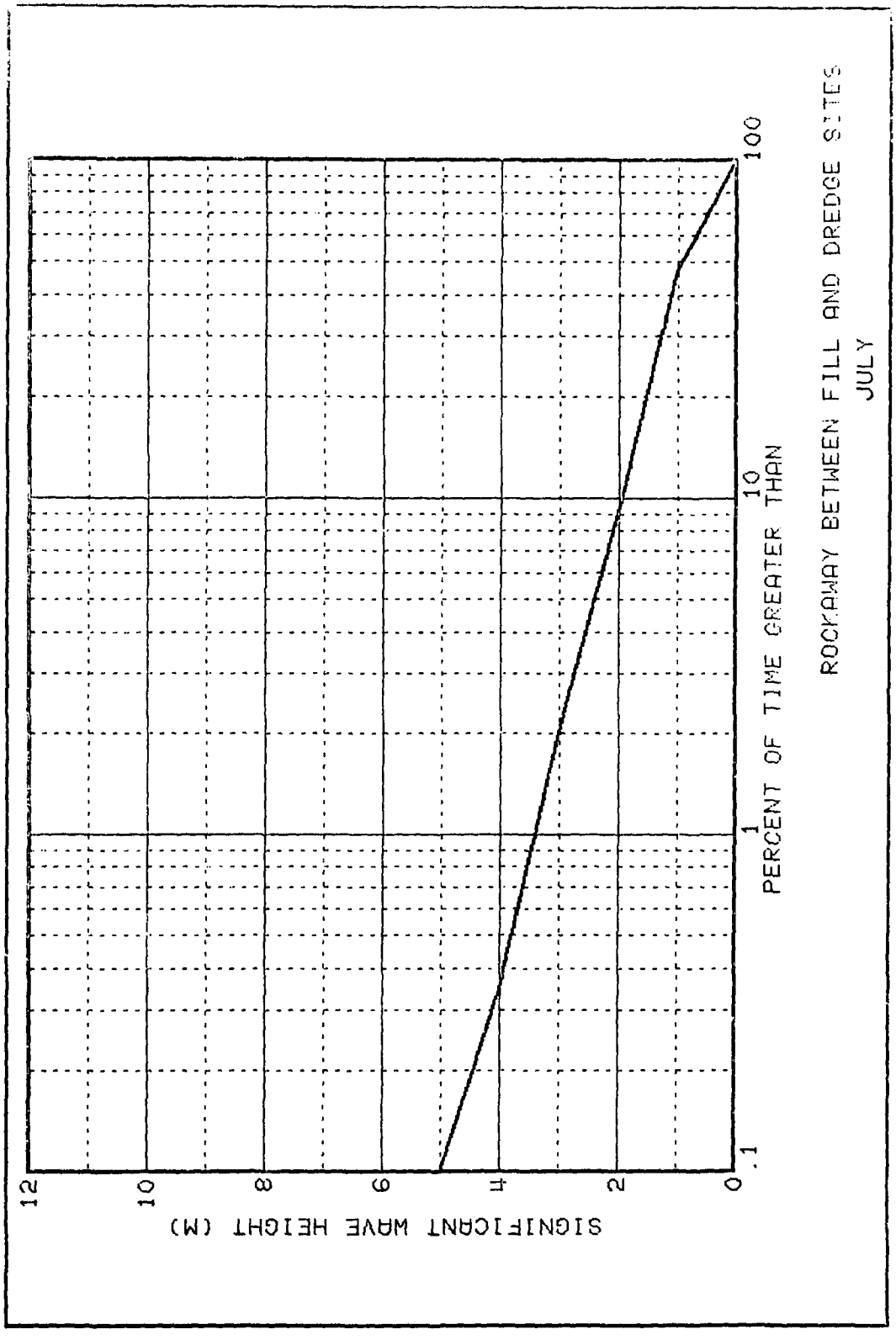
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 39.98 | 3.13 | 2.06 | 0.72 | 0.21 | 0.20 | 0.10 | 0.00 | 0.57 | 0.47 | 47.58 |
| 01-02 | 29.98 | 8.25 | 2.50 | 0.71 | 0.29 | 0.11 | 0.00 | 0.00 | 0.03 | 0.10 | 41.98 |
| 02-03 | 2.15 | 4.85 | 0.44 | 0.18 | 0.22 | 0.10 | 0.00 | 0.00 | 0.00 | 0.13 | 8.06 |
| 03-04 | 0.29 | 1.18 | 0.00 | 0.12 | 0.08 | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | 1.72 |
| 04-05 | 0.00 | 0.39 | 0.00 | 0.07 | 0.05 | 0.08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.59 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.05 | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.13 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 72.40 | 17.80 | 5.00 | 1.80 | 0.80 | 0.70 | 0.10 | 0.00 | 0.60 | 0.70 | |


ROCKAWAY BETWEEN FILL AND DREDGE SITES
JUNE
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12
PERCENT OF TIME GREATER THAN
.1
1
10
100

ROCKAWAY BETWEEN FILL AND DREDGE SITES

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR JULY

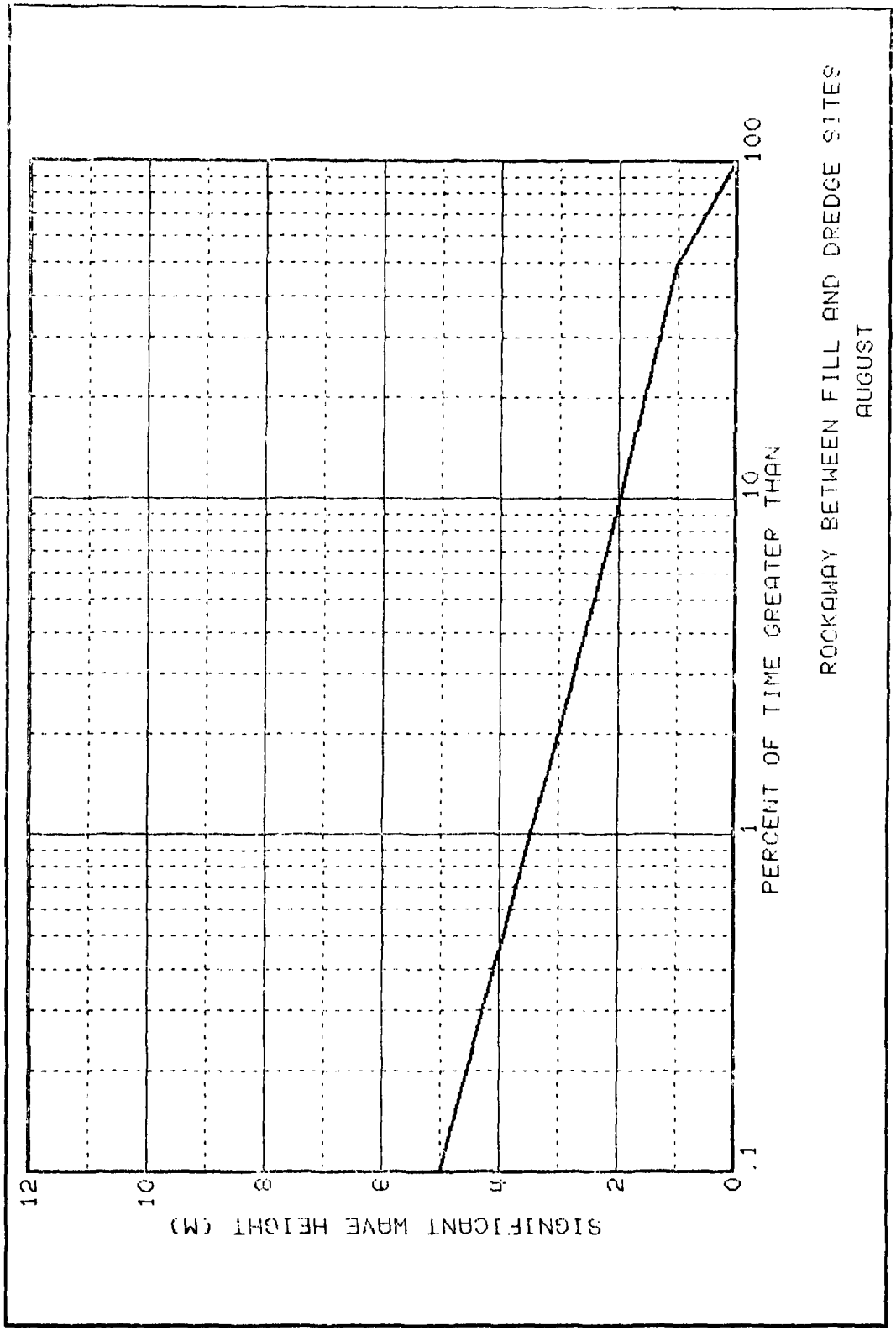
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 45.09 | 2.83 | 2.42 | 0.61 | 0.03 | 0.22 | 0.02 | 0.00 | 0.62 | 0.85 | 52.68 |
| 01-02 | 28.06 | 6.82 | 2.40 | 0.63 | 0.08 | 0.00 | 0.09 | 0.00 | 0.03 | 0.14 | 38.25 |
| 02-03 | 1.59 | 4.76 | 0.55 | 0.16 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 7.06 |
| 03-04 | 0.21 | 1.33 | 0.11 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.66 |
| 04-05 | 0.00 | 0.35 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.35 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 74.94 | 16.08 | 5.48 | 1.42 | 0.11 | 0.22 | 0.11 | 0.00 | 0.66 | 0.00 | |


ROCKAWAY BETWEEN FILL AND DREDGE SITES
JULY
PERCENT OF TIME GREATER THAN
.1
1
10
100
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12

ROCKAWAY BETWEEN FILL AND DREDGE SITES

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR AUGUST

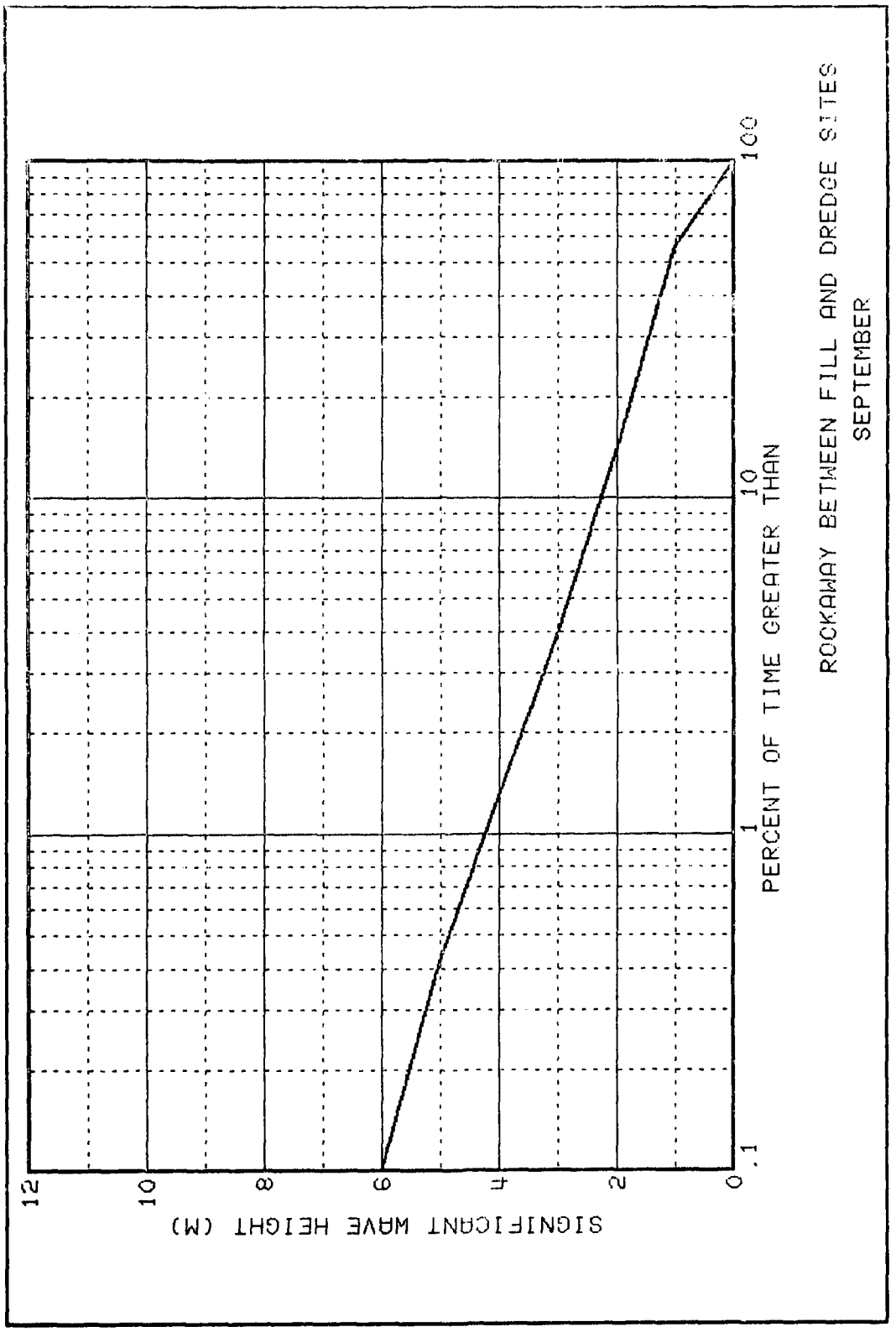
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 41.50 | 4.19 | 1.65 | 1.28 | 0.49 | 0.35 | 0.12 | 0.00 | 0.21 | 0.45 | 50.23 |
| 01-02 | 28.71 | 8.04 | 2.46 | 0.52 | 0.42 | 0.21 | 0.00 | 0.00 | 0.04 | 0.04 | 40.44 |
| 02-03 | 1.07 | 5.14 | 0.64 | 0.16 | 0.25 | 0.05 | 0.05 | 0.00 | 0.00 | 0.00 | 7.37 |
| 03-04 | 0.12 | 1.26 | 0.02 | 0.00 | 0.07 | 0.00 | 0.07 | 0.00 | 0.00 | 0.00 | 1.53 |
| 04-05 | 0.00 | 0.45 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.45 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 71.40 | 19.07 | 4.77 | 1.96 | 1.22 | 0.61 | 0.25 | 0.00 | 0.25 | 0.49 | |


ROCKAWAY BETWEEN FILL AND DREDGE SITES
AUGUST
PERCENT OF TIME GREATER THAN
.1
1
10
100
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12

ROCKAWAY BETWEEN FILL AND DREDGE SITES

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR SEPTEMBER

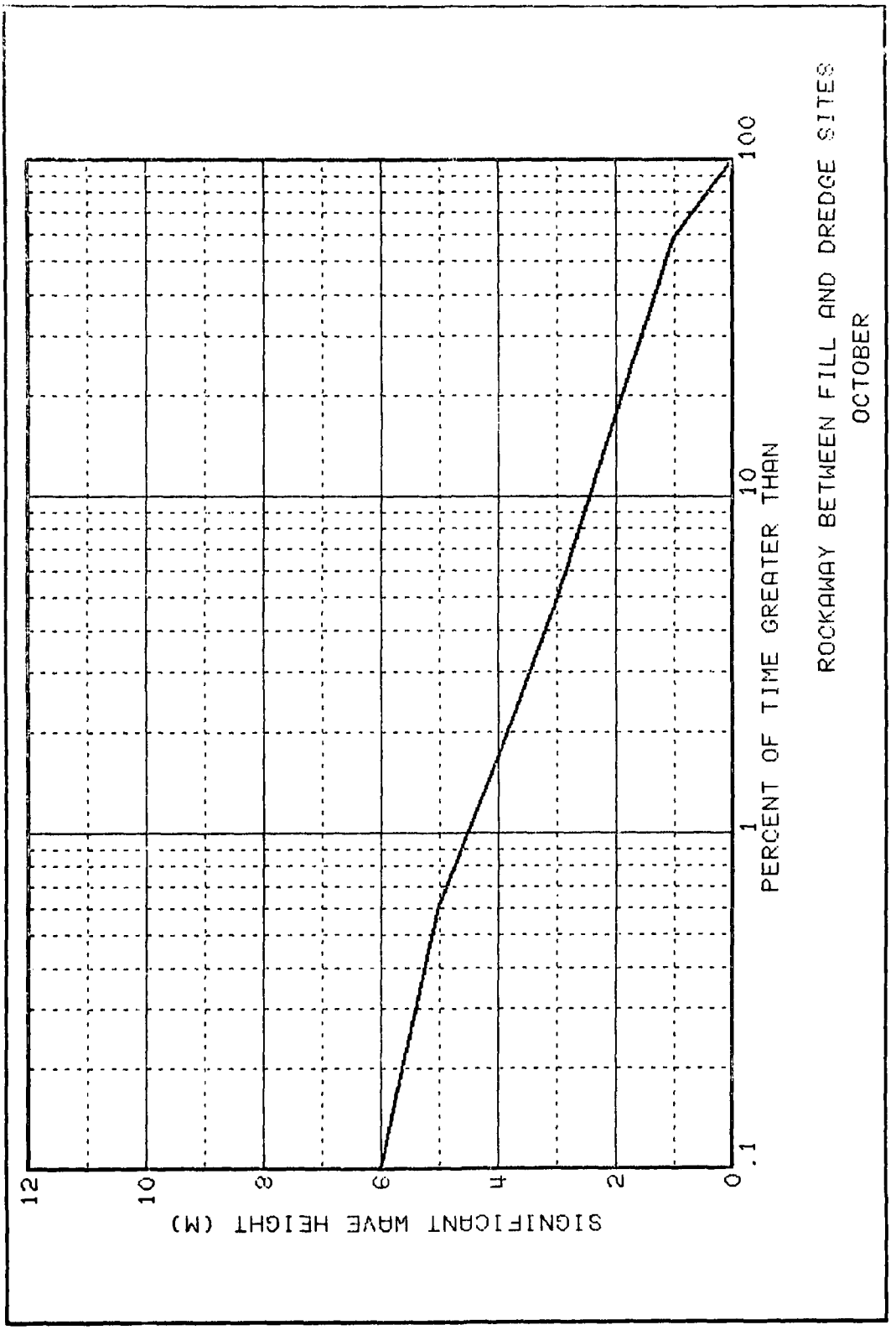
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 37.77 | 2.47 | 1.25 | 0.89 | 1.06 | 0.16 | 0.13 | 0.00 | 0.13 | 0.40 | 44.26 |
| 01-02 | 30.77 | 7.16 | 2.41 | 0.61 | 0.90 | 0.11 | 0.00 | 0.00 | 0.00 | 0.00 | 41.95 |
| 02-03 | 2.69 | 4.62 | 1.57 | 0.68 | 0.29 | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 | 9.89 |
| 03-04 | 0.12 | 1.58 | 0.34 | 0.42 | 0.00 | 0.04 | 0.00 | 0.10 | 0.00 | 0.00 | 2.60 |
| 04-05 | 0.00 | 0.35 | 0.00 | 0.30 | 0.07 | 0.09 | 0.00 | 0.01 | 0.06 | 0.00 | 0.88 |
| 05-06 | 0.00 | 0.27 | 0.00 | 0.02 | 0.06 | 0.00 | 0.00 | 0.00 | 0.07 | 0.00 | 0.42 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 71.35 | 16.45 | 5.57 | 2.92 | 2.39 | 0.40 | 0.13 | 0.13 | 0.27 | 0.40 | |


ROCKAWAY BETWEEN FILL AND DREDGE SITES
SEPTEMBER
PERCENT OF TIME GREATER THAN
.1
1
10
100
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12

ROCKAWAY BETWEEN FILL AND DREDGE SITES

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR OCTOBER

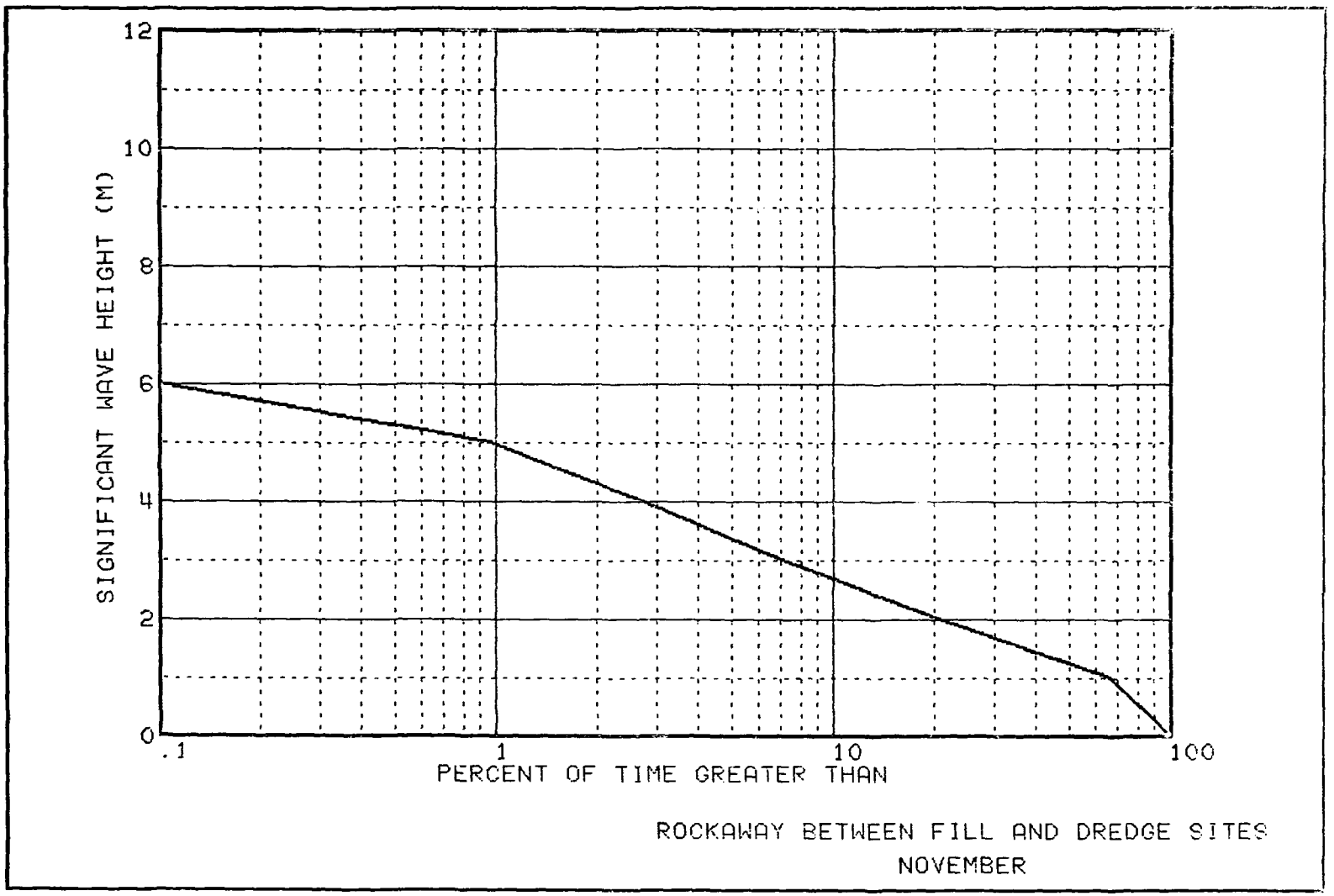
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 34.45 | 3.76 | 1.61 | 0.18 | 0.26 | 0.13 | 0.00 | 0.26 | 0.48 | 0.23 | 41.33 |
| 01-02 | 28.85 | 7.92 | 3.77 | 0.33 | 0.18 | 0.00 | 0.00 | 0.00 | 0.10 | 0.17 | 41.31 |
| 02-03 | 4.62 | 5.30 | 1.96 | 0.20 | 0.22 | 0.20 | 0.00 | 0.00 | 0.00 | 0.00 | 12.50 |
| 03-04 | 0.25 | 1.98 | 0.62 | 0.29 | 0.00 | 0.07 | 0.00 | 0.00 | 0.00 | 0.00 | 3.20 |
| 04-05 | 0.00 | 0.85 | 0.13 | 0.07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.05 |
| 05-06 | 0.00 | 0.48 | 0.00 | 0.00 | 0.00 | 0.00 | 0.13 | 0.00 | 0.00 | 0.00 | 0.61 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 68.17 | 20.29 | 8.09 | 1.06 | 0.66 | 0.40 | 0.13 | 0.26 | 0.58 | 0.40 | |


ROCKAWAY BETWEEN FILL AND DREDGE SITES
OCTOBER
PERCENT OF TIME GREATER THAN
.1
1
10
100
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12

ROCKAWAY BETWEEN FILL AND DREDGE SITES

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR NOVEMBER

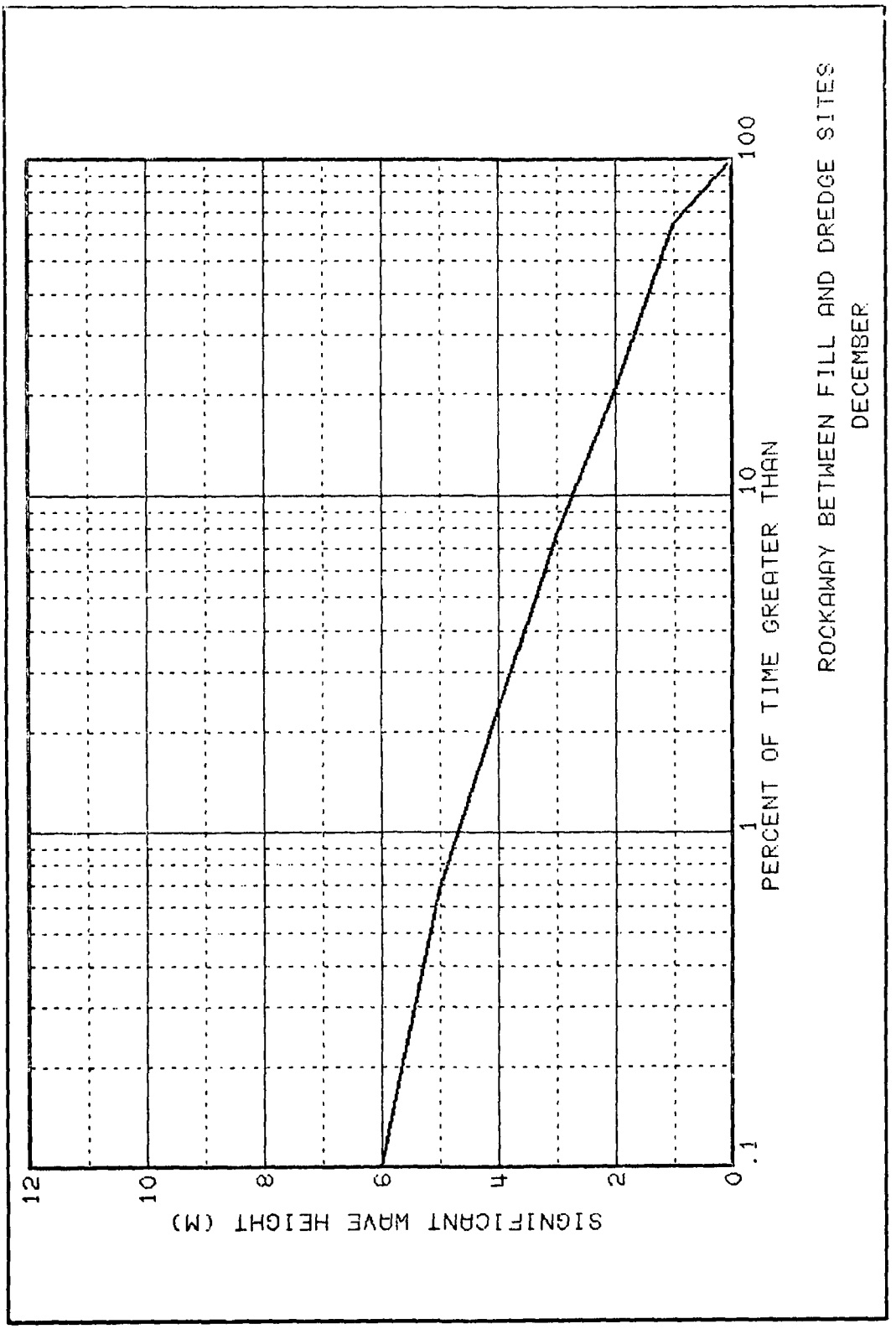
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 28.61 | 2.20 | 0.88 | 0.56 | 0.17 | 0.08 | 0.00 | 0.00 | 0.51 | 0.51 | 33.52 |
| 01-02 | 32.11 | 6.98 | 3.69 | 2.12 | 0.14 | 0.58 | 0.00 | 0.00 | 0.33 | 0.00 | 45.96 |
| 02-03 | 4.09 | 5.26 | 2.39 | 1.60 | 0.03 | 0.08 | 0.00 | 0.00 | 0.00 | 0.00 | 13.45 |
| 03-04 | 0.51 | 2.58 | 0.86 | 0.29 | 0.00 | 0.11 | 0.00 | 0.00 | 0.00 | 0.00 | 4.35 |
| 04-05 | 0.17 | 1.16 | 0.29 | 0.00 | 0.09 | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 | 1.76 |
| 05-06 | 0.15 | 0.43 | 0.00 | 0.00 | 0.25 | 0.13 | 0.00 | 0.00 | 0.00 | 0.00 | 0.96 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 65.65 | 18.61 | 8.12 | 4.57 | 0.68 | 1.02 | 0.00 | 0.00 | 0.85 | 0.51 | |


12
10
8
6
4
2
0
SIGNIFICANT WAVE HEIGHT (M)
.1
1
10
100
PERCENT OF TIME GREATER THAN
ROCKAWAY BETWEEN FILL AND DREDGE SITES
NOVEMBER

ROCKAWAY BETWEEN FILL AND DREDGE SITES

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR DECEMBER

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 27.65 | 3.45 | 2.33 | 1.11 | 0.37 | 0.43 | 0.00 | 0.00 | 0.23 | 0.00 | 35.57 |
| 01-02 | 26.62 | 10.34 | 5.79 | 1.22 | 0.09 | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 | 44.09 |
| 02-03 | 2.52 | 7.57 | 2.11 | 0.39 | 0.03 | 0.12 | 0.00 | 0.00 | 0.00 | 0.00 | 12.73 |
| 03-04 | 0.89 | 2.74 | 1.17 | 0.14 | 0.21 | 0.12 | 0.03 | 0.00 | 0.00 | 0.00 | 5.30 |
| 04-05 | 0.00 | 1.00 | 0.00 | 0.16 | 0.20 | 0.00 | 0.18 | 0.00 | 0.10 | 0.00 | 1.64 |
| 05-06 | 0.00 | 0.49 | 0.00 | 0.00 | 0.04 | 0.00 | 0.02 | 0.00 | 0.13 | 0.00 | 0.68 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 57.68 | 25.58 | 11.40 | 3.02 | 0.93 | 0.70 | 0.23 | 0.00 | 0.46 | 0.00 | |


ROCKAWAY BETWEEN FILL AND DREDGE SITES
DECEMBER
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12
PERCENT OF TIME GREATER THAN
.1
1
10
100

ROCKAWAY BETWEEN FILL AND DREDGE SITES

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD

WAVE DIRECTION = 90

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 7.30 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 7.30 |
| 01-02 | 7.33 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 7.33 |
| 02-03 | 1.13 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.13 |
| 03-04 | 0.12 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.12 |
| 04-05 | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.04 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 15.92 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |

ROCKAWAY BETWEEN FILL AND DREDGE SITES

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD

WAVE DIRECTION = 120

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 6.80 | 1.83 | 0.50 | 0.06 | 0.10 | 0.05 | 0.00 | 0.00 | 0.04 | 0.03 | 9.40 |
| 01-02 | 4.77 | 4.11 | 1.48 | 0.24 | 0.09 | 0.04 | 0.01 | 0.00 | 0.02 | 0.04 | 10.79 |
| 02-03 | 0.41 | 2.01 | 0.95 | 0.38 | 0.10 | 0.03 | 0.00 | 0.00 | 0.00 | 0.04 | 3.93 |
| 03-04 | 0.07 | 0.62 | 0.32 | 0.10 | 0.05 | 0.02 | 0.00 | 0.01 | 0.01 | 0.00 | 1.20 |
| 04-05 | 0.00 | 0.13 | 0.05 | 0.05 | 0.04 | 0.03 | 0.02 | 0.00 | 0.01 | 0.00 | 0.32 |
| 05-06 | 0.00 | 0.03 | 0.01 | 0.01 | 0.05 | 0.02 | 0.01 | 0.00 | 0.01 | 0.00 | 0.20 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 12.05 | 8.77 | 3.31 | 0.85 | 0.43 | 0.17 | 0.04 | 0.01 | 0.09 | 0.11 | |

ROCKAWAY BETWEEN FILL AND DREDGE SITES

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD

WAVE DIRECTION = 150

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 7.78 | 0.36 | 0.43 | 0.57 | 0.34 | 0.17 | 0.05 | 0.03 | 0.26 | 0.41 | 10.39 |
| 01-02 | 6.21 | 0.77 | 0.77 | 0.60 | 0.28 | 0.11 | 0.02 | 0.01 | 0.06 | 0.02 | 8.84 |
| 02-03 | 0.58 | 1.41 | 0.31 | 0.20 | 0.10 | 0.05 | 0.00 | 0.00 | 0.01 | 0.00 | 2.66 |
| 03-04 | 0.11 | 0.73 | 0.09 | 0.05 | 0.02 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 1.00 |
| 04-05 | 0.01 | 0.45 | 0.01 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.50 |
| 05-06 | 0.00 | 0.08 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.10 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 14.68 | 3.79 | 1.60 | 1.43 | 0.75 | 0.34 | 0.09 | 0.04 | 0.34 | 0.43 | |

ROCKAWAY BETWEEN FILL AND DREDGE SITES

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD

WAVE DIRECTION = 180

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 14.56 | 1.04 | 0.78 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 16.38 |
| 01-02 | 10.90 | 2.93 | 0.95 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 14.77 |
| 02-03 | 0.98 | 1.65 | 0.17 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2.79 |
| 03-04 | 0.10 | 0.52 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.63 |
| 04-05 | 0.01 | 0.11 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.12 |
| 05-06 | 0.01 | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.05 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 26.56 | 6.28 | 1.90 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |

# APPENDIX D: AVERAGE WAVE CLIMATE AT CAROLINA BEACH, N. C.

1. Appendix D contains two sets of the following information. One set is for the sand borrow areas at Carolina Beach, N. C., and the other is for the fill area:

a. Tabulations of monthly percent occurrence of wave-height/period combinations.

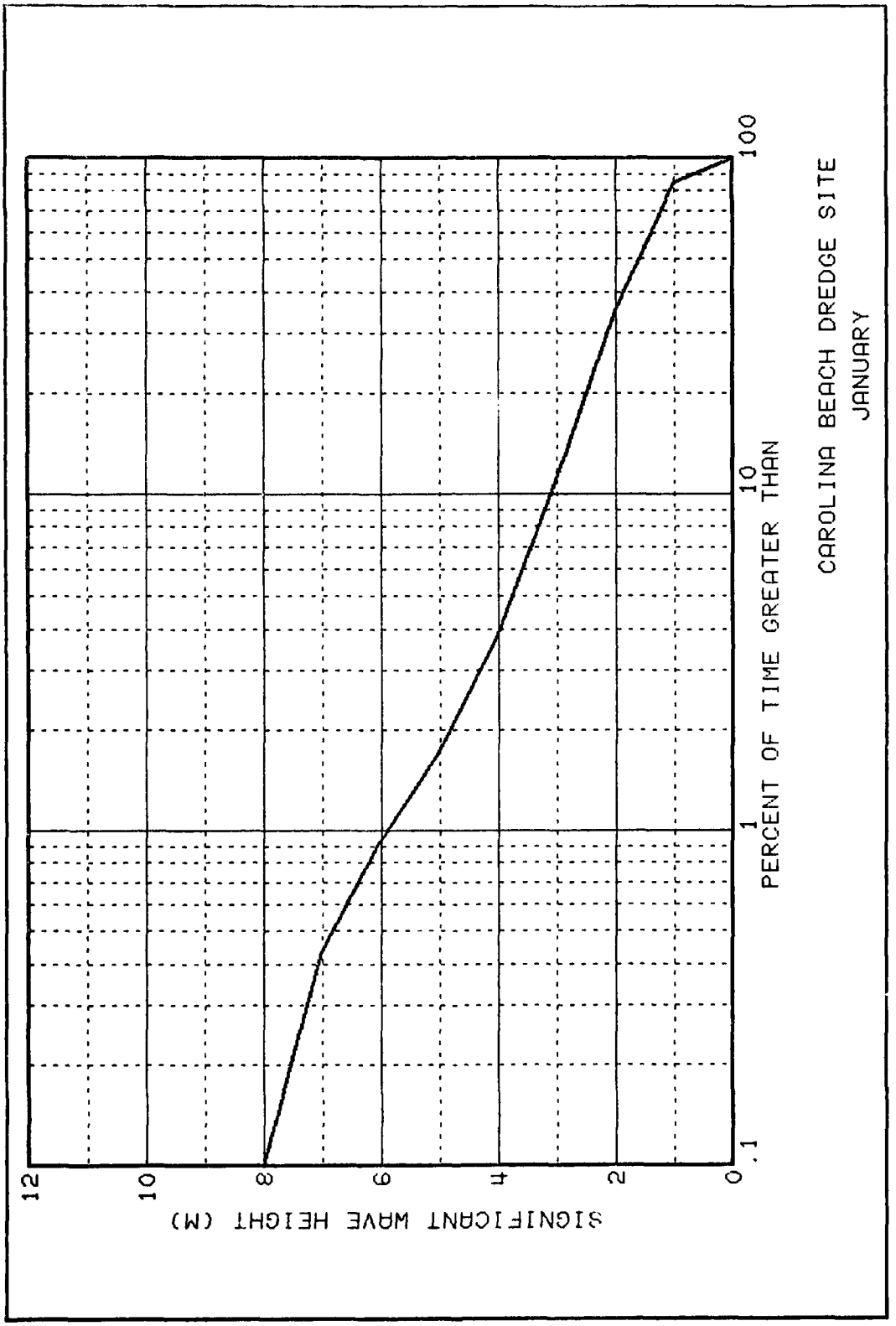
b. Tabulations of annual percent occurrence by azimuth direction of wave-height/period combinations.

c. Plots of monthly significant wave-height occurrence in terms of the total percent time per month that these heights are exceeded.

CAROLINA BEACH DREDGE SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR JANUARY

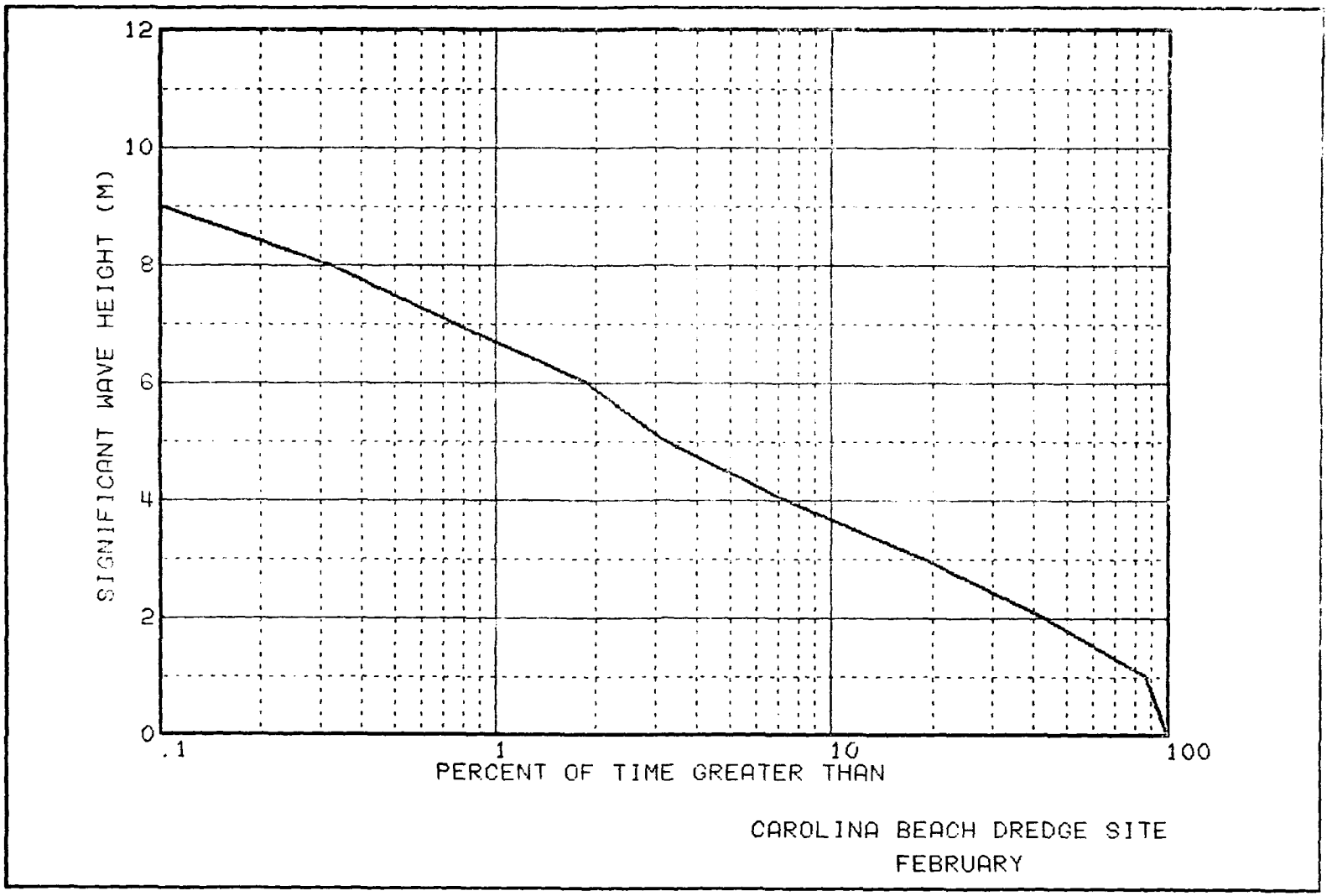
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-5 | 6-7 | 8-9 | 10-11 | 12-13 | 14-15 | 16-17 | 18-19 | 20-21 | >21 | |
| 00-01 | 12.69 | 1.49 | 0.58 | 0.14 | 0.08 | 0.00 | 0.00 | 0.00 | 0.09 | 0.22 | 15.29 |
| 01-02 | 36.45 | 8.28 | 2.86 | 0.43 | 0.31 | 0.11 | 0.00 | 0.00 | 0.13 | 0.23 | 49.79 |
| 02-03 | 10.17 | 5.68 | 4.49 | 1.69 | 0.67 | 0.13 | 0.00 | 0.00 | 0.02 | 0.04 | 23.88 |
| 03-04 | 1.52 | 2.00 | 1.52 | 1.36 | 0.63 | 0.17 | 0.00 | 0.00 | 0.00 | 0.00 | 7.19 |
| 04-05 | 0.27 | 0.34 | 0.66 | 0.69 | 0.14 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 2.13 |
| 05-06 | 0.27 | 0.09 | 0.15 | 0.14 | 0.14 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.79 |
| 06-07 | 0.04 | 0.06 | 0.07 | 0.09 | 0.12 | 0.03 | 0.00 | 0.00 | 0.00 | 0.10 | 0.50 |
| 07-08 | 0.11 | 0.12 | 0.01 | 0.05 | 0.04 | 0.04 | 0.00 | 0.00 | 0.00 | 0.03 | 0.39 |
| 08-09 | 0.01 | 0.01 | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.05 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 61.53 | 20.06 | 10.33 | 4.59 | 2.14 | 0.49 | 0.00 | 0.00 | 0.25 | 0.61 | |


CAROLINA BEACH DREDGE SITE
JANUARY
PERCENT OF TIME GREATER THAN
.1
1
10
100
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12

CAROLINA BEACH DREDGE SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR FEBRUARY

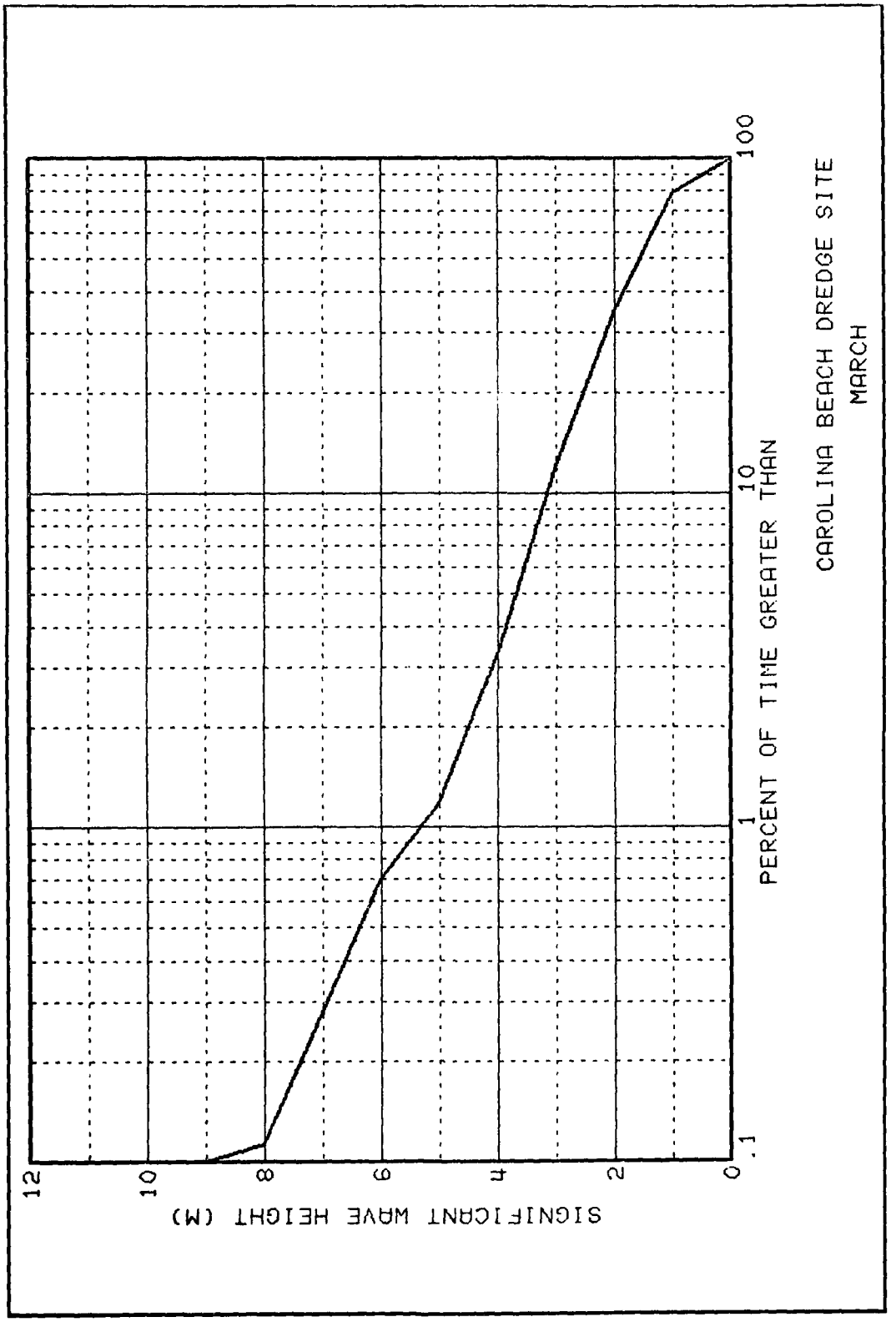
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-5 | 6-7 | 8-9 | 10-11 | 12-13 | 14-15 | 16-17 | 18-19 | 20-21 | >21 | |
| 00-01 | 11.55 | 1.25 | 0.25 | 0.08 | 0.10 | 0.00 | 0.00 | 0.00 | 0.14 | 0.16 | 13.53 |
| 01-02 | 28.90 | 10.27 | 2.98 | 0.71 | 0.50 | 0.16 | 0.00 | 0.00 | 0.04 | 0.06 | 43.62 |
| 02-03 | 7.53 | 8.76 | 5.37 | 1.75 | 0.63 | 0.14 | 0.05 | 0.00 | 0.00 | 0.03 | 24.25 |
| 03-04 | 2.56 | 2.44 | 3.18 | 2.30 | 0.48 | 0.24 | 0.13 | 0.00 | 0.00 | 0.00 | 11.33 |
| 04-05 | 0.95 | 0.78 | 1.21 | 0.58 | 0.41 | 0.08 | 0.03 | 0.00 | 0.00 | 0.00 | 4.03 |
| 05-06 | 0.25 | 0.20 | 0.33 | 0.28 | 0.14 | 0.08 | 0.06 | 0.00 | 0.00 | 0.00 | 1.35 |
| 06-07 | 0.46 | 0.07 | 0.19 | 0.09 | 0.23 | 0.04 | 0.04 | 0.00 | 0.00 | 0.00 | 1.11 |
| 07-08 | 0.10 | 0.00 | 0.18 | 0.09 | 0.02 | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.43 |
| 08-09 | 0.01 | 0.00 | 0.04 | 0.08 | 0.10 | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.26 |
| 09-10 | 0.00 | 0.00 | 0.05 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.06 |
| TOTAL | 52.32 | 23.77 | 13.78 | 5.95 | 2.60 | 0.80 | 0.31 | 0.00 | 0.19 | 0.25 | |


12
10
8
6
4
2
0
SIGNIFICANT WAVE HEIGHT (M)
.1
1
10
100
PERCENT OF TIME GREATER THAN
CAROLINA BEACH DREDGE SITE
FEBRUARY

CAROLINA BEACH DREDGE SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR MARCH

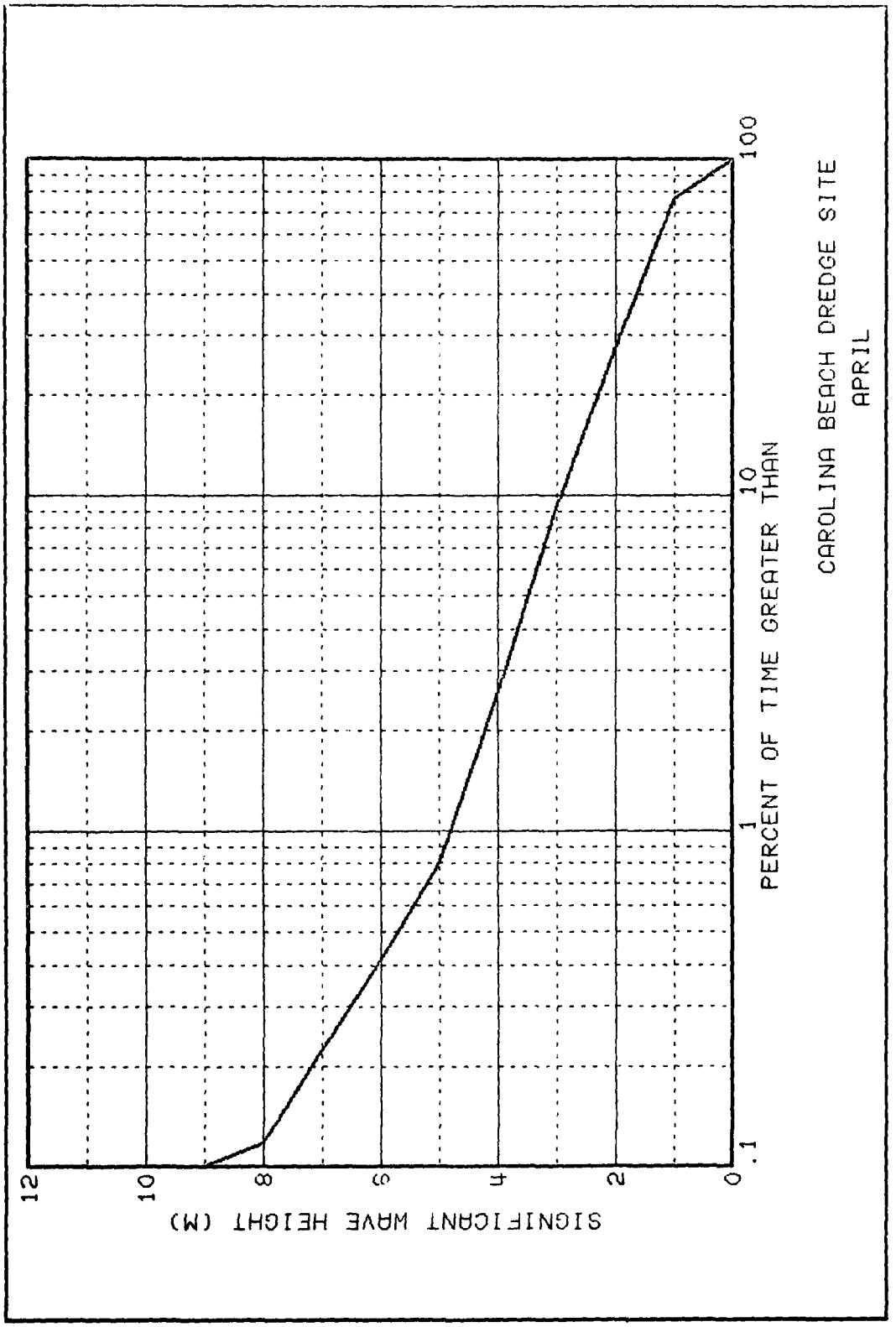
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-5 | 6-7 | 8-9 | 10-11 | 12-13 | 14-15 | 16-17 | 18-19 | 20-21 | >21 | |
| 00-01 | 18.53 | 1.63 | 0.40 | 0.19 | 0.06 | 0.00 | 0.00 | 0.00 | 0.08 | 0.29 | 21.20 |
| 01-02 | 30.51 | 9.66 | 2.84 | 0.77 | 0.18 | 0.08 | 0.04 | 0.08 | 0.06 | 0.15 | 44.37 |
| 02-03 | 7.67 | 7.76 | 4.97 | 1.39 | 0.31 | 0.17 | 0.01 | 0.06 | 0.01 | 0.01 | 22.34 |
| 03-04 | 2.30 | 2.26 | 2.52 | 1.28 | 0.30 | 0.09 | 0.00 | 0.07 | 0.00 | 0.00 | 8.82 |
| 04-05 | 0.55 | 0.71 | 0.31 | 0.31 | 0.14 | 0.08 | 0.00 | 0.00 | 0.00 | 0.00 | 2.10 |
| 05-06 | 0.12 | 0.11 | 0.06 | 0.04 | 0.06 | 0.04 | 0.03 | 0.00 | 0.00 | 0.00 | 0.48 |
| 06-07 | 0.01 | 0.09 | 0.04 | 0.13 | 0.07 | 0.00 | 0.07 | 0.00 | 0.00 | 0.00 | 0.42 |
| 07-08 | 0.05 | 0.10 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.17 |
| 08-09 | 0.00 | 0.02 | 0.00 | 0.05 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.07 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.04 |
| TOTAL | 59.75 | 22.34 | 11.15 | 4.17 | 1.12 | 0.51 | 0.15 | 0.20 | 0.15 | 0.46 | |


CAROLINA BEACH DREDGE SITE
MARCH
PERCENT OF TIME GREATER THAN
.1
1
10
100
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12

CAROLINA BEACH DREDGE SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR APRIL

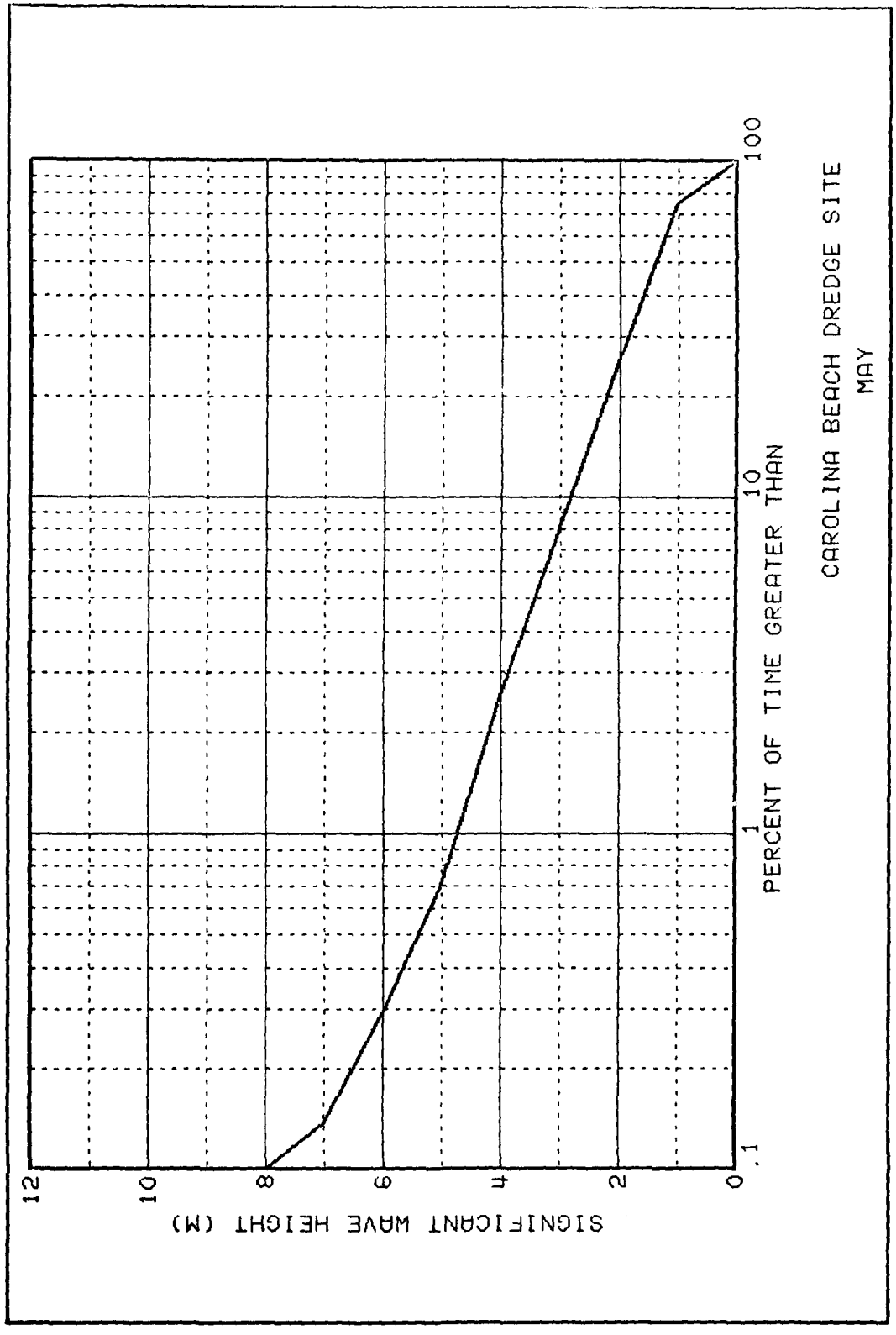
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-5 | 6-7 | 8-9 | 10-11 | 12-13 | 14-15 | 16-17 | 18-19 | 20-21 | >21 | |
| 00-01 | 19.95 | 1.81 | 0.71 | 0.13 | 0.07 | 0.00 | 0.00 | 0.00 | 0.16 | 0.57 | 23.39 |
| 01-02 | 34.74 | 10.62 | 2.54 | 0.74 | 0.29 | 0.05 | 0.09 | 0.00 | 0.16 | 0.10 | 49.34 |
| 02-03 | 6.68 | 6.86 | 3.05 | 1.06 | 0.30 | 0.13 | 0.00 | 0.00 | 0.04 | 0.00 | 18.12 |
| 03-04 | 2.18 | 1.85 | 1.57 | 0.61 | 0.25 | 0.06 | 0.01 | 0.00 | 0.07 | 0.00 | 6.60 |
| 04-05 | 0.21 | 0.45 | 0.39 | 0.38 | 0.18 | 0.03 | 0.09 | 0.01 | 0.00 | 0.00 | 1.74 |
| 05-06 | 0.01 | 0.03 | 0.07 | 0.13 | 0.03 | 0.06 | 0.00 | 0.04 | 0.00 | 0.00 | 0.38 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.07 | 0.04 | 0.05 | 0.00 | 0.04 | 0.00 | 0.00 | 0.19 |
| 07-08 | 0.05 | 0.00 | 0.00 | 0.00 | 0.01 | 0.02 | 0.01 | 0.01 | 0.00 | 0.00 | 0.11 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.03 | 0.04 | 0.00 | 0.00 | 0.00 | 0.08 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.04 |
| TOTAL | 63.82 | 21.63 | 8.33 | 3.18 | 1.16 | 0.43 | 0.24 | 0.10 | 0.43 | 0.67 | |


CAROLINA BEACH DREDGE SITE
APRIL
PERCENT OF TIME GREATER THAN
.1
1
10
100
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12

CAROLINA BEACH DREDGE SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR MAY

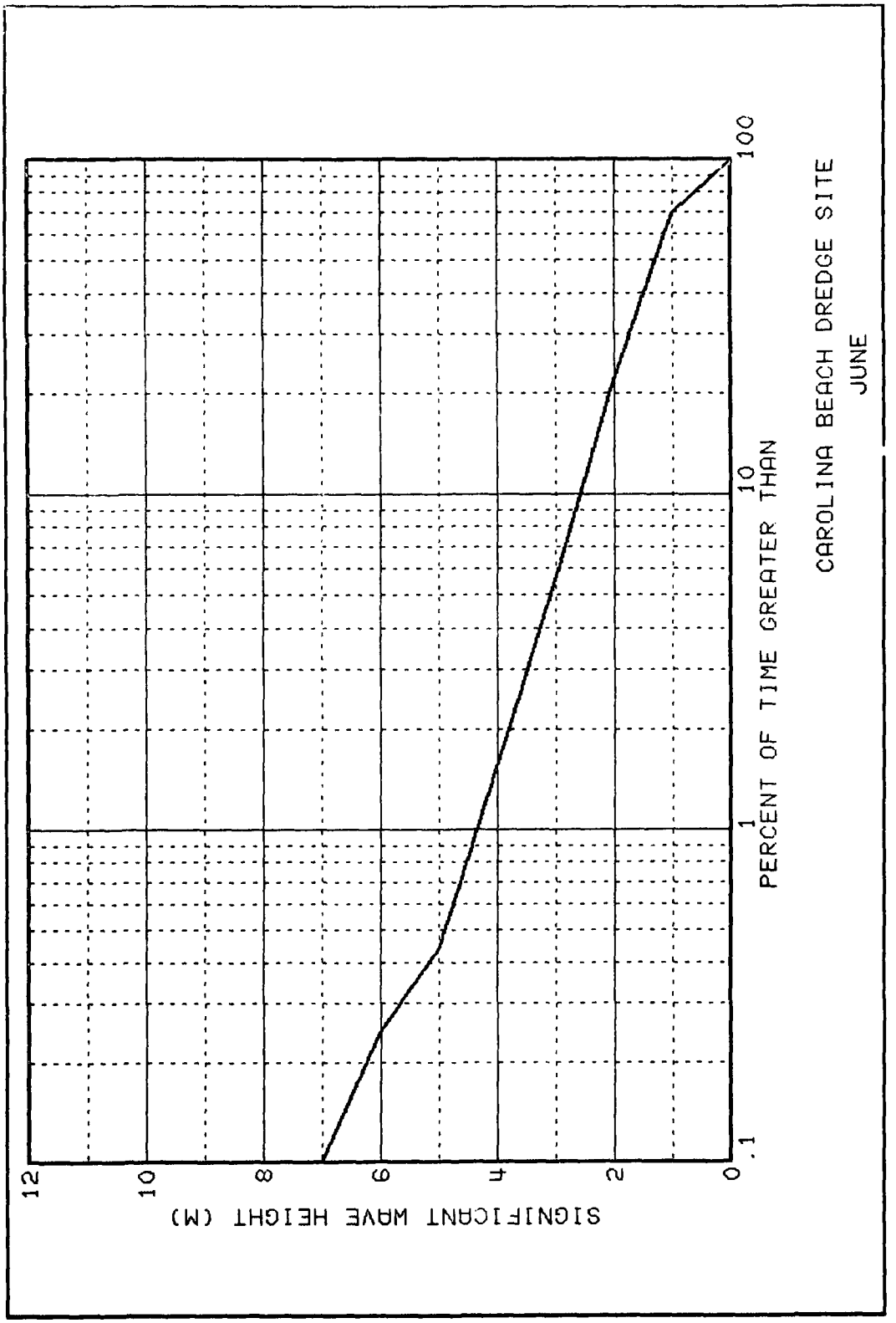
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-5 | 6-7 | 8-9 | 10-11 | 12-13 | 14-15 | 16-17 | 18-19 | 20-21 | >21 | |
| 00-01 | 22.00 | 1.91 | 0.71 | 0.21 | 0.15 | 0.05 | 0.00 | 0.00 | 0.04 | 0.25 | 25.31 |
| 01-02 | 33.68 | 11.53 | 2.80 | 0.69 | 0.18 | 0.14 | 0.00 | 0.02 | 0.07 | 0.16 | 49.29 |
| 02-03 | 6.54 | 6.08 | 3.17 | 1.04 | 0.13 | 0.18 | 0.00 | 0.02 | 0.06 | 0.06 | 17.28 |
| 03-04 | 1.27 | 1.90 | 1.57 | 0.54 | 0.09 | 0.17 | 0.00 | 0.00 | 0.01 | 0.00 | 5.56 |
| 04-05 | 0.24 | 0.49 | 0.47 | 0.27 | 0.16 | 0.15 | 0.04 | 0.00 | 0.03 | 0.00 | 1.85 |
| 05-06 | 0.01 | 0.12 | 0.16 | 0.02 | 0.09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.41 |
| 06-07 | 0.00 | 0.06 | 0.01 | 0.08 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.16 |
| 07-08 | 0.00 | 0.01 | 0.00 | 0.04 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.06 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 |
| >10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 |
| TOTAL | 63.75 | 22.10 | 8.89 | 2.90 | 0.87 | 0.73 | 0.04 | 0.04 | 0.22 | 0.47 | |


CAROLINA BEACH DREDGE SITE
MAY
PERCENT OF TIME GREATER THAN
100
10
1
.1
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12

CAROLINA BEACH DREDGE SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR JUNE

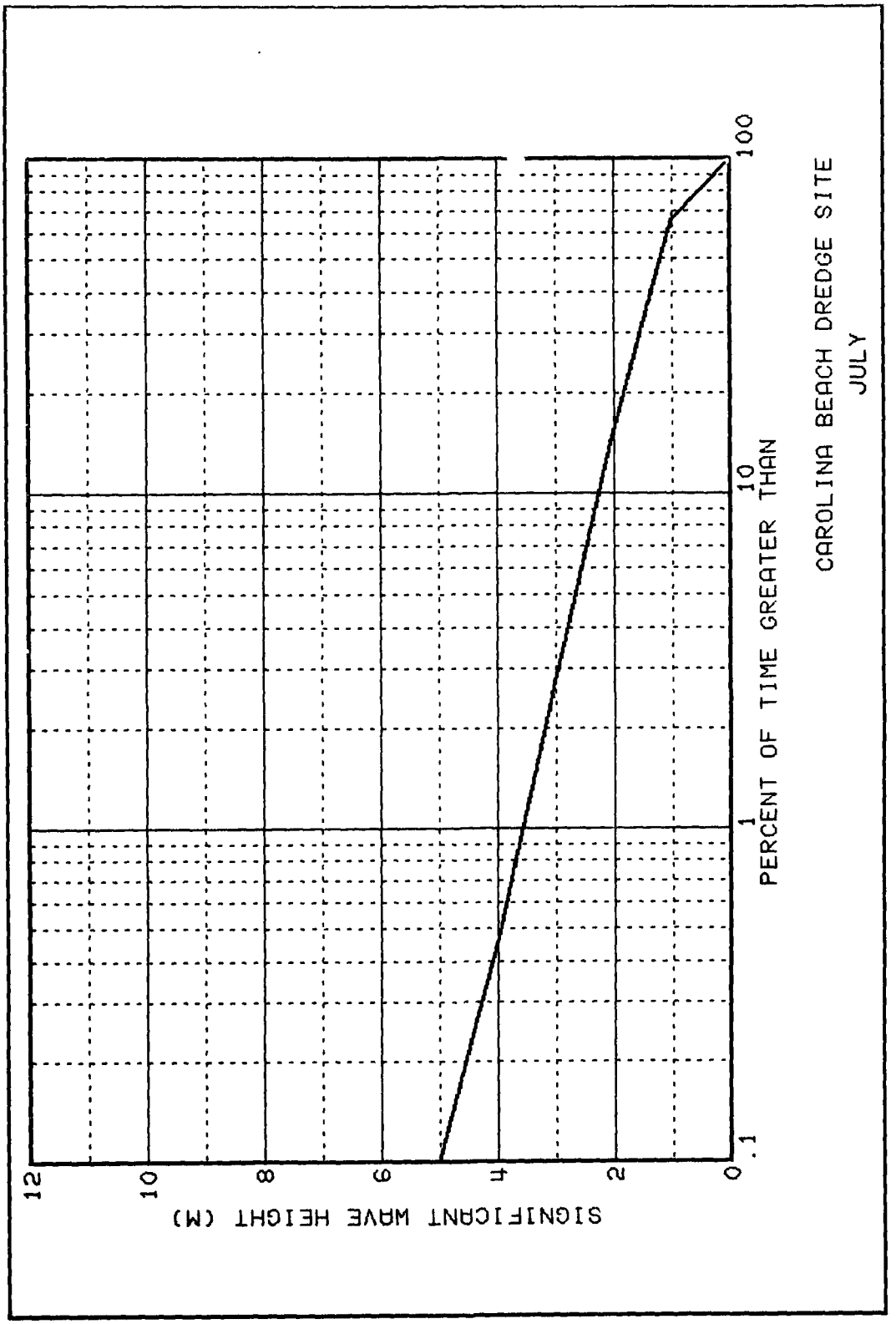
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-5 | 6-7 | 8-9 | 10-11 | 12-13 | 14-15 | 16-17 | 18-19 | 20-21 | >21 | |
| 00-01 | 26.68 | 2.35 | 0.69 | 0.08 | 0.03 | 0.01 | 0.00 | 0.00 | 0.24 | 0.77 | 30.86 |
| 01-02 | 31.72 | 11.36 | 2.85 | 0.71 | 0.34 | 0.06 | 0.00 | 0.04 | 0.12 | 0.21 | 47.40 |
| 02-03 | 5.58 | 5.91 | 3.07 | 1.11 | 0.27 | 0.18 | 0.00 | 0.00 | 0.02 | 0.04 | 16.18 |
| 03-04 | 0.36 | 1.54 | 1.28 | 0.62 | 0.11 | 0.07 | 0.03 | 0.00 | 0.01 | 0.00 | 4.02 |
| 04-05 | 0.09 | 0.35 | 0.14 | 0.25 | 0.16 | 0.05 | 0.02 | 0.00 | 0.03 | 0.00 | 1.10 |
| 05-06 | 0.00 | 0.05 | 0.01 | 0.06 | 0.02 | 0.05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.19 |
| 06-07 | 0.04 | 0.00 | 0.00 | 0.00 | 0.08 | 0.05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.18 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 |
| TOTAL | 64.48 | 21.55 | 8.04 | 2.88 | 1.02 | 0.51 | 0.04 | 0.04 | 0.42 | 1.02 | |


CAROLINA BEACH DREDGE SITE
JUNE
PERCENT OF TIME GREATER THAN
.1
1
10
100
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12

CAROLINA BEACH DREDGE SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR JULY

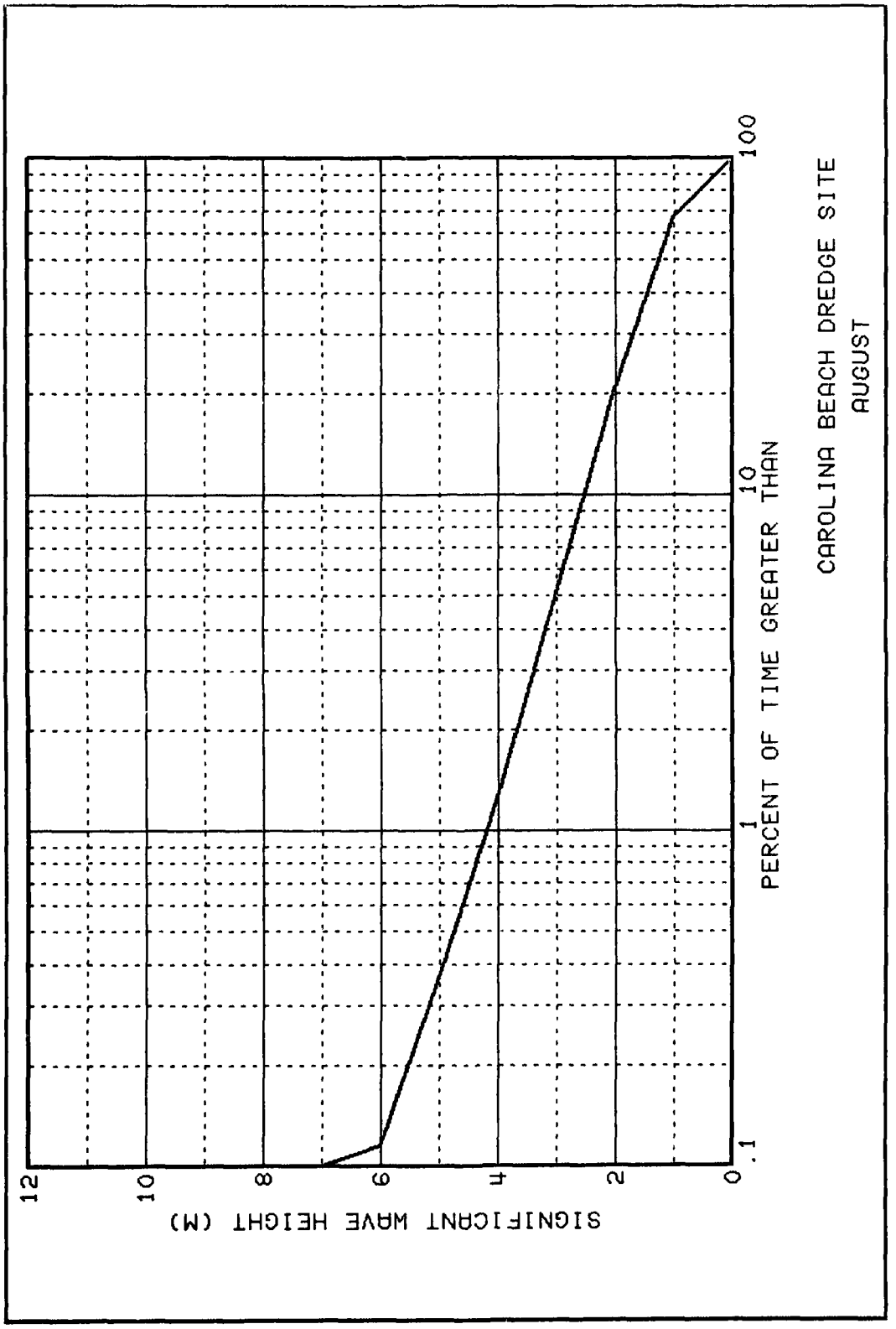
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-5 | 6-7 | 8-9 | 10-11 | 12-13 | 14-15 | 16-17 | 18-19 | 20-21 | >21 | |
| 00-01 | 29.21 | 2.01 | 1.30 | 0.18 | 0.21 | 0.06 | 0.10 | 0.00 | 0.56 | 0.81 | 34.45 |
| 01-02 | 33.44 | 11.95 | 3.12 | 0.49 | 0.31 | 0.06 | 0.01 | 0.04 | 0.23 | 0.45 | 50.10 |
| 02-03 | 4.11 | 5.27 | 2.09 | 0.80 | 0.20 | 0.07 | 0.00 | 0.02 | 0.08 | 0.07 | 12.69 |
| 03-04 | 0.47 | 1.06 | 0.17 | 0.46 | 0.09 | 0.06 | 0.00 | 0.00 | 0.00 | 0.00 | 2.31 |
| 04-05 | 0.01 | 0.06 | 0.05 | 0.04 | 0.15 | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.36 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 67.24 | 20.35 | 6.72 | 1.97 | 0.99 | 0.35 | 0.12 | 0.06 | 0.87 | 1.33 | |


CAROLINA BEACH DREDGE SITE
JULY
PERCENT OF TIME GREATER THAN
100
10
1
.1
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12

CAROLINA BEACH DREDGE SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR AUGUST

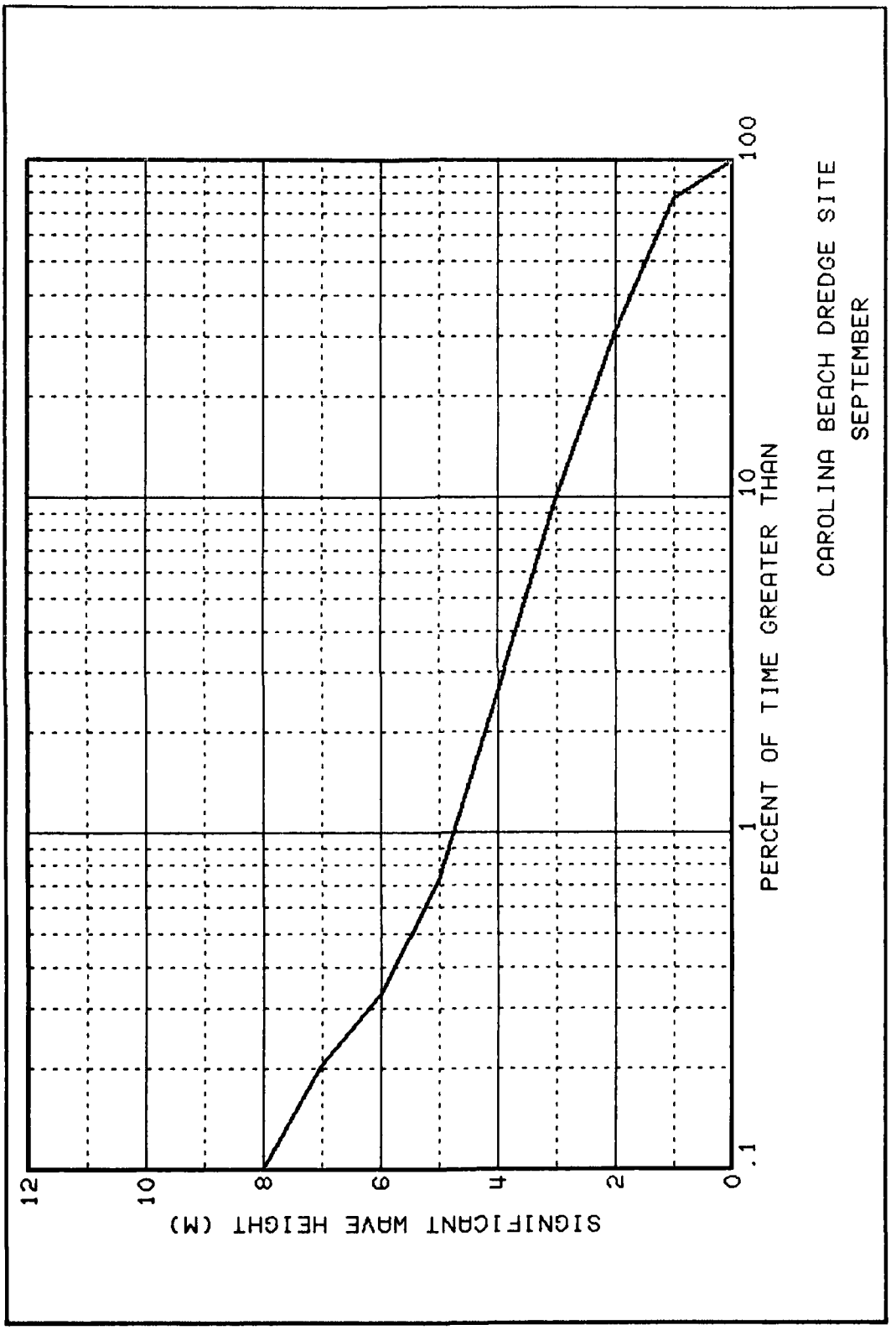
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-5 | 6-7 | 8-9 | 10-11 | 12-13 | 14-15 | 16-17 | 18-19 | 20-21 | >21 | |
| 00-01 | 29.16 | 2.03 | 0.66 | 0.24 | 0.10 | 0.10 | 0.09 | 0.00 | 0.37 | 0.39 | 33.12 |
| 01-02 | 30.67 | 10.69 | 3.20 | 0.83 | 0.17 | 0.12 | 0.00 | 0.04 | 0.05 | 0.22 | 46.00 |
| 02-03 | 4.86 | 5.62 | 3.00 | 1.53 | 0.46 | 0.21 | 0.00 | 0.00 | 0.01 | 0.04 | 15.74 |
| 03-04 | 0.77 | 1.33 | 0.69 | 0.65 | 0.26 | 0.11 | 0.00 | 0.00 | 0.03 | 0.01 | 3.87 |
| 04-05 | 0.29 | 0.18 | 0.25 | 0.08 | 0.02 | 0.02 | 0.00 | 0.00 | 0.00 | 0.04 | 0.89 |
| 05-06 | 0.05 | 0.07 | 0.05 | 0.05 | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.25 |
| 06-07 | 0.00 | 0.01 | 0.00 | 0.05 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.08 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.04 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 65.81 | 19.93 | 7.86 | 3.47 | 1.06 | 0.55 | 0.09 | 0.05 | 0.46 | 0.69 | |


CAROLINA BEACH DREDGE SITE
AUGUST
PERCENT OF TIME GREATER THAN
0.1
1
10
100
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12

CAROLINA BEACH DREDGE SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR SEPTEMBER

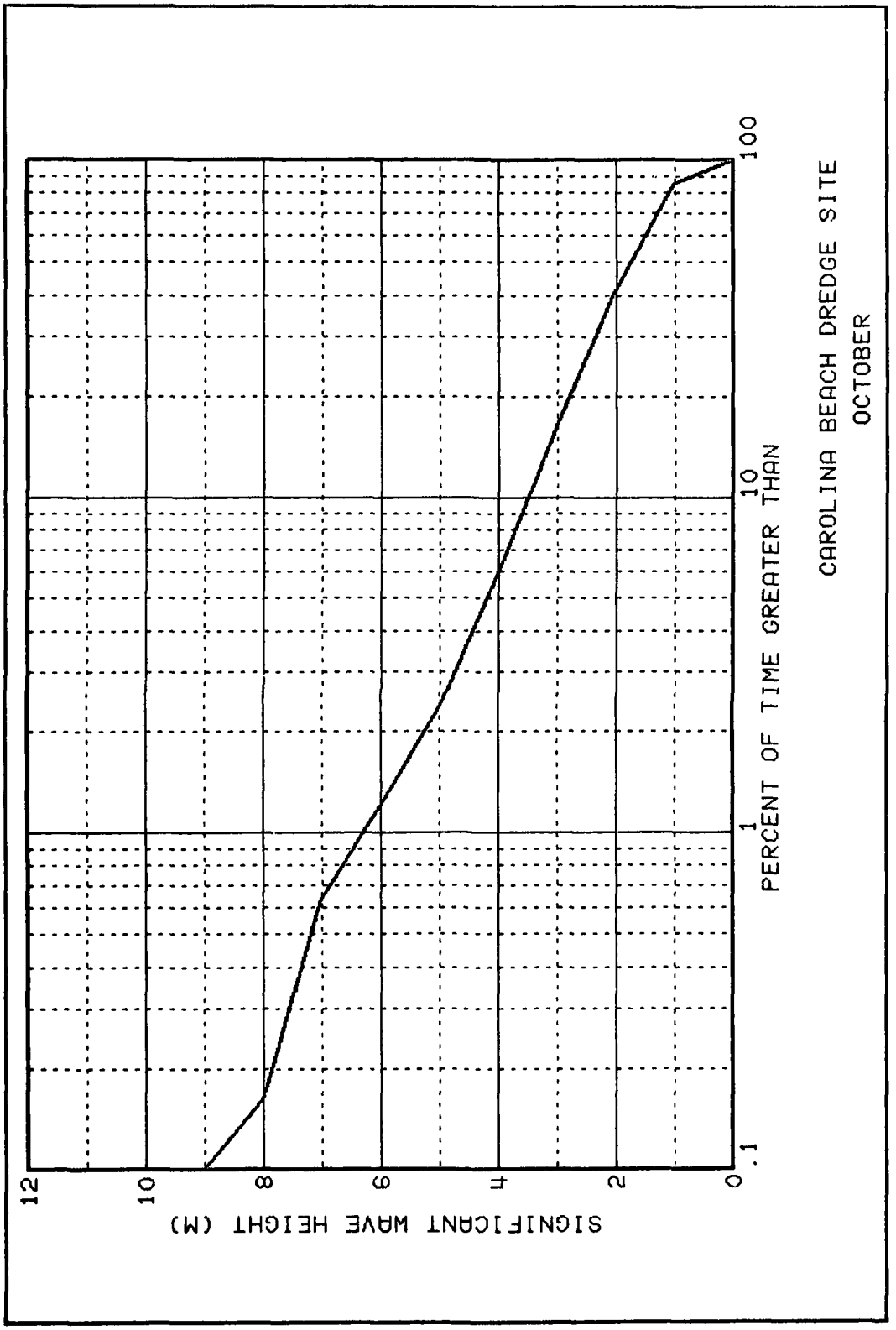
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-5 | 6-7 | 8-9 | 10-11 | 12-13 | 14-15 | 16-17 | 18-19 | 20-21 | >21 | |
| 00-01 | 20.60 | 1.13 | 0.50 | 0.14 | 0.18 | 0.01 | 0.00 | 0.05 | 0.17 | 0.28 | 23.07 |
| 01-02 | 29.61 | 11.89 | 2.76 | 0.98 | 0.38 | 0.20 | 0.05 | 0.01 | 0.15 | 0.06 | 46.09 |
| 02-03 | 5.92 | 7.86 | 4.54 | 1.63 | 0.72 | 0.19 | 0.03 | 0.00 | 0.03 | 0.03 | 20.95 |
| 03-04 | 0.99 | 2.53 | 2.03 | 1.03 | 0.35 | 0.26 | 0.04 | 0.00 | 0.02 | 0.02 | 7.27 |
| 04-05 | 0.14 | 0.46 | 0.61 | 0.42 | 0.18 | 0.06 | 0.00 | 0.00 | 0.01 | 0.03 | 1.90 |
| 05-06 | 0.04 | 0.03 | 0.11 | 0.08 | 0.09 | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.39 |
| 06-07 | 0.00 | 0.04 | 0.04 | 0.00 | 0.04 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.12 |
| 07-08 | 0.00 | 0.02 | 0.07 | 0.00 | 0.01 | 0.00 | 0.03 | 0.00 | 0.00 | 0.00 | 0.13 |
| 08-09 | 0.00 | 0.00 | 0.04 | 0.00 | 0.00 | 0.00 | 0.03 | 0.00 | 0.00 | 0.00 | 0.07 |
| 09-10 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 |
| TOTAL | 57.30 | 23.97 | 10.70 | 4.29 | 1.94 | 0.75 | 0.19 | 0.06 | 0.38 | 0.41 | |


CAROLINA BEACH DREDGE SITE
SEPTEMBER
PERCENT OF TIME GREATER THAN
0.1
1
10
100
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12

CAROLINA BEACH DREDGE SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR OCTOBER

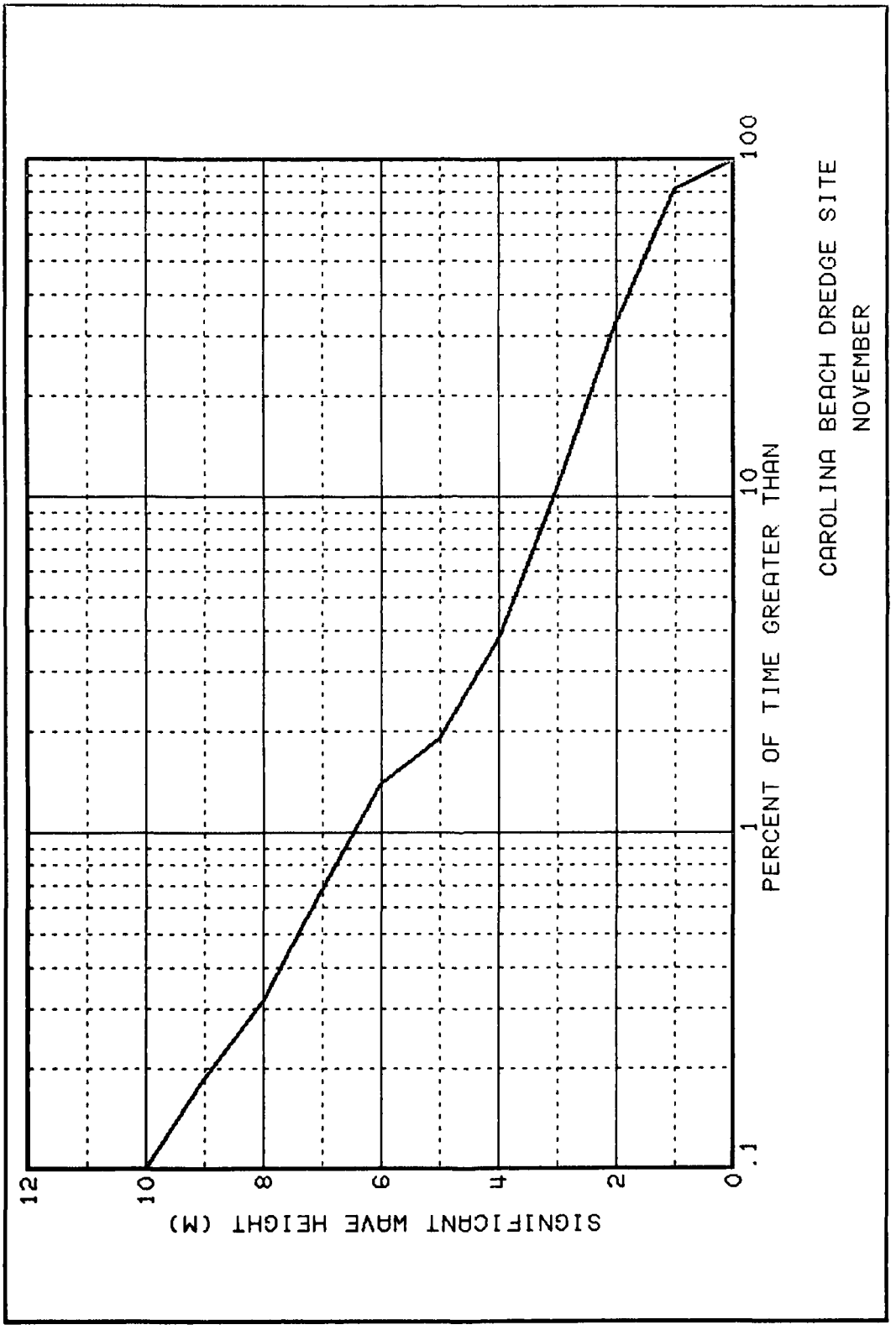
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-5 | 6-7 | 8-9 | 10-11 | 12-13 | 14-15 | 16-17 | 18-19 | 20-21 | >21 | |
| 00-01 | 12.96 | 1.08 | 0.25 | 0.10 | 0.04 | 0.00 | 0.00 | 0.00 | 0.03 | 0.19 | 14.64 |
| 01-02 | 28.83 | 11.04 | 2.71 | 1.00 | 0.30 | 0.07 | 0.00 | 0.00 | 0.02 | 0.05 | 44.02 |
| 02-03 | 9.25 | 8.05 | 4.81 | 1.91 | 0.66 | 0.25 | 0.00 | 0.03 | 0.01 | 0.00 | 24.97 |
| 03-04 | 2.97 | 2.69 | 2.47 | 1.57 | 0.59 | 0.12 | 0.02 | 0.01 | 0.01 | 0.00 | 10.44 |
| 04-05 | 0.57 | 0.61 | 1.08 | 0.68 | 0.30 | 0.19 | 0.05 | 0.06 | 0.03 | 0.00 | 3.58 |
| 05-06 | 0.31 | 0.18 | 0.30 | 0.12 | 0.11 | 0.08 | 0.03 | 0.00 | 0.00 | 0.00 | 1.15 |
| 06-07 | 0.15 | 0.14 | 0.04 | 0.07 | 0.01 | 0.15 | 0.00 | 0.00 | 0.00 | 0.00 | 0.56 |
| 07-08 | 0.06 | 0.15 | 0.03 | 0.04 | 0.02 | 0.18 | 0.01 | 0.00 | 0.00 | 0.00 | 0.48 |
| 08-09 | 0.00 | 0.04 | 0.01 | 0.01 | 0.01 | 0.05 | 0.03 | 0.00 | 0.00 | 0.00 | 0.14 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 |
| TOTAL | 55.10 | 23.98 | 11.70 | 5.50 | 2.04 | 1.11 | 0.13 | 0.10 | 0.10 | 0.23 | |


CAROLINA BEACH DREDGE SITE
OCTOBER
PERCENT OF TIME GREATER THAN
100
10
1
.1
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12

CAROLINA BEACH DREDGE SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR NOVEMBER

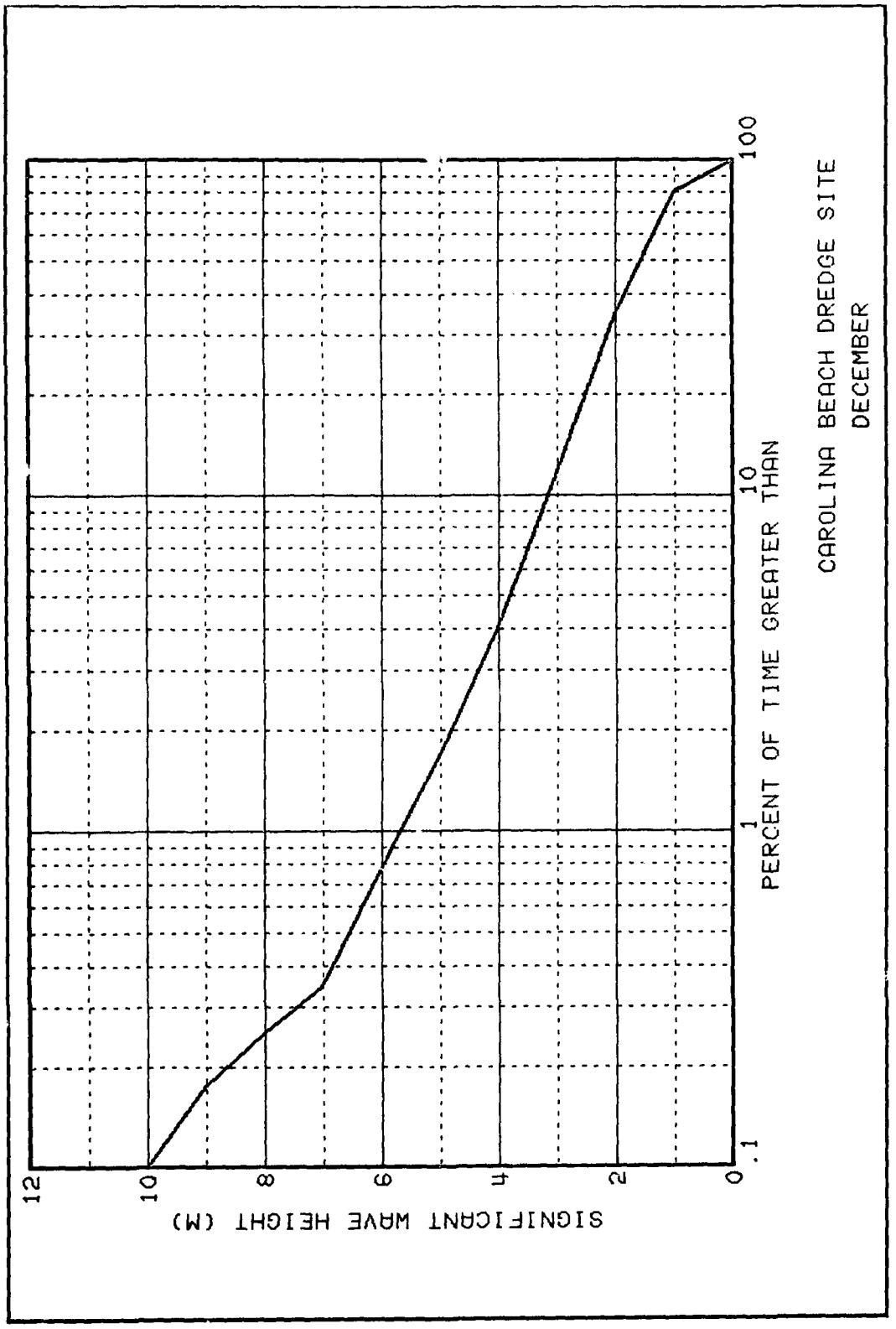
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-5 | 6-7 | 8-9 | 10-11 | 12-13 | 14-15 | 16-17 | 18-19 | 20-21 | >21 | |
| 00-01 | 15.72 | 1.54 | 0.25 | 0.22 | 0.01 | 0.00 | 0.04 | 0.00 | 0.16 | 0.28 | 18.22 |
| 01-02 | 32.23 | 12.75 | 3.15 | 0.70 | 0.13 | 0.07 | 0.00 | 0.00 | 0.03 | 0.08 | 49.14 |
| 02-03 | 7.50 | 7.72 | 4.94 | 1.27 | 0.39 | 0.16 | 0.00 | 0.00 | 0.10 | 0.02 | 22.09 |
| 03-04 | 1.60 | 1.88 | 1.55 | 1.26 | 0.32 | 0.12 | 0.08 | 0.00 | 0.05 | 0.00 | 6.84 |
| 04-05 | 0.34 | 0.39 | 0.31 | 0.38 | 0.15 | 0.14 | 0.08 | 0.00 | 0.04 | 0.00 | 1.84 |
| 05-06 | 0.03 | 0.08 | 0.15 | 0.03 | 0.07 | 0.06 | 0.03 | 0.00 | 0.00 | 0.04 | 0.50 |
| 06-07 | 0.26 | 0.00 | 0.14 | 0.04 | 0.05 | 0.22 | 0.00 | 0.00 | 0.00 | 0.01 | 0.72 |
| 07-08 | 0.07 | 0.01 | 0.05 | 0.00 | 0.00 | 0.18 | 0.05 | 0.00 | 0.00 | 0.00 | 0.36 |
| 08-09 | 0.00 | 0.04 | 0.01 | 0.00 | 0.00 | 0.02 | 0.05 | 0.00 | 0.00 | 0.00 | 0.13 |
| 09-10 | 0.00 | 0.04 | 0.00 | 0.00 | 0.03 | 0.00 | 0.05 | 0.03 | 0.00 | 0.00 | 0.15 |
| >10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.03 |
| TOTAL | 57.75 | 24.45 | 10.54 | 3.90 | 1.16 | 0.97 | 0.39 | 0.05 | 0.39 | 0.44 | |


CAROLINA BEACH DREDGE SITE
NOVEMBER
PERCENT OF TIME GREATER THAN
.1
1
10
100
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12

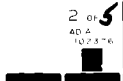
CAROLINA BEACH DREDGE SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR DECEMBER

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-5 | 6-7 | 8-9 | 10-11 | 12-13 | 14-15 | 16-17 | 18-19 | 20-21 | >21 | |
| 00-01 | 17.33 | 1.05 | 0.51 | 0.13 | 0.01 | 0.02 | 0.00 | 0.06 | 0.05 | 0.54 | 19.70 |
| 01-02 | 29.54 | 11.72 | 2.85 | 1.02 | 0.30 | 0.16 | 0.00 | 0.00 | 0.04 | 0.18 | 45.82 |
| 02-03 | 7.03 | 7.81 | 5.30 | 1.92 | 0.42 | 0.07 | 0.04 | 0.00 | 0.08 | 0.05 | 22.73 |
| 03-04 | 1.47 | 2.11 | 1.85 | 1.57 | 0.54 | 0.00 | 0.06 | 0.00 | 0.08 | 0.05 | 7.71 |
| 04-05 | 0.62 | 0.56 | 0.55 | 0.28 | 0.26 | 0.07 | 0.02 | 0.00 | 0.00 | 0.00 | 2.36 |
| 05-06 | 0.13 | 0.17 | 0.25 | 0.15 | 0.13 | 0.07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.90 |
| 06-07 | 0.17 | 0.05 | 0.10 | 0.03 | 0.03 | 0.05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.43 |
| 07-08 | 0.03 | 0.02 | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.10 |
| 08-09 | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.05 | 0.00 | 0.00 | 0.08 |
| 09-10 | 0.04 | 0.00 | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.06 | 0.00 | 0.00 | 0.13 |
| >10 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 | 0.04 |
| TOTAL | 56.39 | 23.47 | 11.52 | 5.10 | 1.70 | 0.44 | 0.12 | 0.19 | 0.25 | 0.82 | |


CAROLINA BEACH DREDGE SITE
DECEMBER
PERCENT OF TIME GREATER THAN
100
10
1
.1
SIGNIFICANT WAVE HEIGHT (M)
12
10
8
6
4
2
0

AD-A102 376 ARMY ENGINEER WATERWAYS EXPERIMENT STATION VICKSBURG MS F/G 8/3
BEACH NOURISHMENT TECHNIQUES. REPORT 4. WAVE CLIMATES FOR SELEC--ETC(U)
APR 81 D L DURHAM, L Z HALES, T W RICHARDSON
UNCLASSIFIED WES-TR-H-76-13-4-APP NL



CAROLINA BEACH DREDGE SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD

WAVE DIRECTION = 30

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-5 | 6-7 | 8-9 | 10-11 | 12-13 | 14-15 | 16-17 | 18-19 | 20-21 | >21 | |
| 00-01 | 2.35 | 0.53 | 0.05 | 0.02 | 0.02 | 0.00 | 0.00 | 0.00 | 0.02 | 0.03 | 3.03 |
| 01-02 | 4.62 | 2.13 | 0.42 | 0.13 | 0.05 | 0.01 | 0.00 | 0.00 | 0.00 | 0.01 | 7.37 |
| 02-03 | 1.24 | 1.19 | 0.91 | 0.30 | 0.09 | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 | 3.78 |
| 03-04 | 0.27 | 0.27 | 0.46 | 0.20 | 0.07 | 0.02 | 0.01 | 0.00 | 0.00 | 0.00 | 1.30 |
| 04-05 | 0.07 | 0.03 | 0.13 | 0.08 | 0.02 | 0.02 | 0.01 | 0.00 | 0.01 | 0.00 | 0.37 |
| 05-06 | 0.02 | 0.01 | 0.04 | 0.03 | 0.01 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.12 |
| 06-07 | 0.02 | 0.01 | 0.02 | 0.01 | 0.02 | 0.01 | 0.00 | 0.00 | 0.00 | 0.01 | 0.10 |
| 07-08 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.01 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 8.60 | 4.16 | 2.04 | 0.77 | 0.28 | 0.11 | 0.05 | 0.01 | 0.03 | 0.05 | |

CAROLINA BEACH DREDGE SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD

WAVE DIRECTION = 60

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-5 | 6-7 | 8-9 | 10-11 | 12-13 | 14-15 | 16-17 | 18-19 | 20-21 | >21 | |
| 00-01 | 4.54 | 0.25 | 0.09 | 0.03 | 0.00 | 0.00 | 0.01 | 0.01 | 0.04 | 0.09 | 5.06 |
| 01-02 | 8.45 | 2.91 | 0.70 | 0.20 | 0.05 | 0.03 | 0.00 | 0.00 | 0.02 | 0.04 | 12.40 |
| 02-03 | 2.09 | 2.44 | 1.29 | 0.48 | 0.12 | 0.06 | 0.01 | 0.00 | 0.01 | 0.01 | 6.50 |
| 03-04 | 0.46 | 0.71 | 0.71 | 0.46 | 0.12 | 0.04 | 0.01 | 0.00 | 0.01 | 0.00 | 2.52 |
| 04-05 | 0.09 | 0.18 | 0.26 | 0.17 | 0.13 | 0.03 | 0.01 | 0.00 | 0.01 | 0.01 | 0.89 |
| 05-06 | 0.03 | 0.03 | 0.08 | 0.04 | 0.04 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.23 |
| 06-07 | 0.00 | 0.01 | 0.01 | 0.03 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.08 |
| 07-08 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.07 |
| 08-09 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 |
| TOTAL | 15.65 | 6.54 | 3.17 | 1.42 | 0.49 | 0.22 | 0.04 | 0.02 | 0.10 | 0.15 | |

CAROLINA BEACH DREDGE SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD

WAVE DIRECTION = 90

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-5 | 6-7 | 8-9 | 10-11 | 12-13 | 14-15 | 16-17 | 18-19 | 20-21 | >21 | |
| 00-01 | 3.75 | 0.22 | 0.16 | 0.04 | 0.03 | 0.00 | 0.00 | 0.00 | 0.03 | 0.08 | 4.32 |
| 01-02 | 5.89 | 2.04 | 0.76 | 0.20 | 0.07 | 0.02 | 0.00 | 0.00 | 0.03 | 0.03 | 9.06 |
| 02-03 | 1.09 | 1.40 | 0.75 | 0.30 | 0.11 | 0.02 | 0.00 | 0.00 | 0.01 | 0.01 | 3.69 |
| 03-04 | 0.20 | 0.52 | 0.23 | 0.19 | 0.07 | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 | 1.26 |
| 04-05 | 0.03 | 0.12 | 0.05 | 0.04 | 0.02 | 0.02 | 0.01 | 0.00 | 0.00 | 0.00 | 0.30 |
| 05-06 | 0.02 | 0.03 | 0.01 | 0.01 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.09 |
| 06-07 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.06 |
| 07-08 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 |
| 08-09 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.01 |
| TOTAL | 10.99 | 4.38 | 1.97 | 0.80 | 0.31 | 0.15 | 0.03 | 0.02 | 0.08 | 0.12 | |

CAROLINA BEACH DREDGE SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD

WAVE DIRECTION = 120

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-5 | 6-7 | 8-9 | 10-11 | 12-13 | 14-15 | 16-17 | 18-19 | 20-21 | >21 | |
| 00-01 | 1.75 | 0.21 | 0.05 | 0.02 | 0.01 | 0.01 | 0.00 | 0.00 | 0.01 | 0.03 | 2.08 |
| 01-02 | 2.43 | 1.04 | 0.24 | 0.07 | 0.03 | 0.02 | 0.00 | 0.00 | 0.00 | 0.01 | 3.85 |
| 02-03 | 0.41 | 0.52 | 0.25 | 0.08 | 0.04 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 1.31 |
| 03-04 | 0.08 | 0.11 | 0.08 | 0.06 | 0.02 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.36 |
| 04-05 | 0.01 | 0.01 | 0.02 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.07 |
| 05-06 | 0.00 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 |
| 06-07 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 |
| 07-08 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 4.69 | 1.90 | 0.65 | 0.25 | 0.10 | 0.06 | 0.01 | 0.01 | 0.01 | 0.04 | |

CAROLINA BEACH DREDGE SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD

WAVE DIRECTION = 150

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-5 | 6-7 | 8-9 | 10-11 | 12-13 | 14-15 | 16-17 | 18-19 | 20-21 | >21 | |
| 00-01 | 3.30 | 0.20 | 0.11 | 0.02 | 0.03 | 0.00 | 0.00 | 0.00 | 0.03 | 0.08 | 3.77 |
| 01-02 | 4.20 | 1.35 | 0.39 | 0.10 | 0.05 | 0.02 | 0.01 | 0.01 | 0.01 | 0.03 | 6.16 |
| 02-03 | 0.74 | 0.65 | 0.37 | 0.14 | 0.05 | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | 1.99 |
| 03-04 | 0.20 | 0.17 | 0.12 | 0.08 | 0.03 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.61 |
| 04-05 | 0.06 | 0.05 | 0.02 | 0.02 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.15 |
| 05-06 | 0.01 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 |
| 06-07 | 0.04 | 0.01 | 0.01 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.07 |
| 07-08 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 8.55 | 2.44 | 1.02 | 0.36 | 0.18 | 0.09 | 0.02 | 0.02 | 0.05 | 0.11 | |

CAROLINA BEACH DREDGE SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD

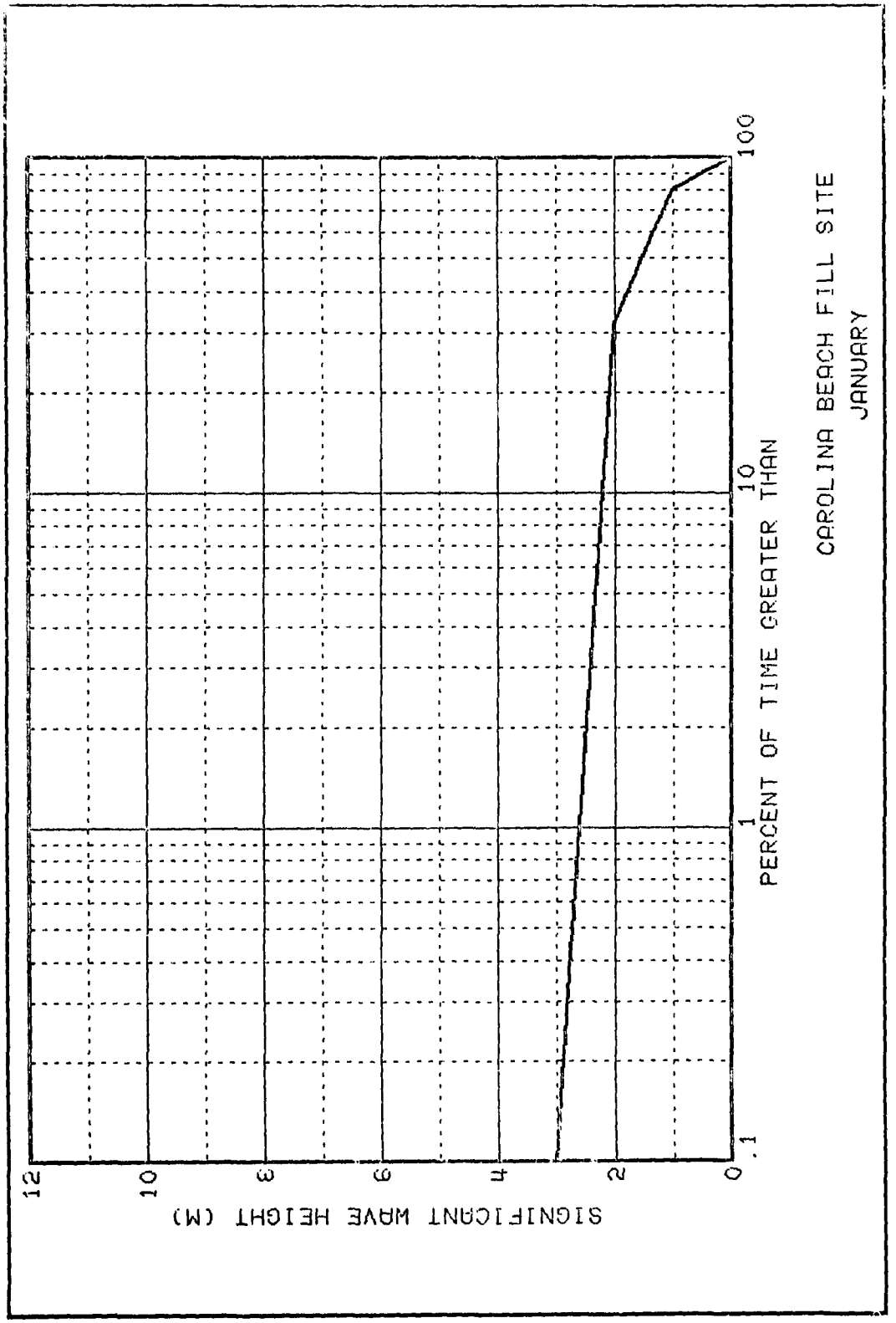
WAVE DIRECTION = 180

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-5 | 6-7 | 8-9 | 10-11 | 12-13 | 14-15 | 16-17 | 18-19 | 20-21 | >21 | |
| 00-01 | 4.14 | 0.19 | 0.09 | 0.02 | 0.01 | 0.01 | 0.00 | 0.00 | 0.04 | 0.07 | 4.56 |
| 01-02 | 5.92 | 1.66 | 0.38 | 0.08 | 0.03 | 0.01 | 0.00 | 0.00 | 0.02 | 0.03 | 8.13 |
| 02-03 | 1.33 | 0.86 | 0.49 | 0.13 | 0.03 | 0.01 | 0.00 | 0.00 | 0.01 | 0.01 | 2.87 |
| 03-04 | 0.34 | 0.24 | 0.12 | 0.10 | 0.03 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.84 |
| 04-05 | 0.08 | 0.06 | 0.03 | 0.04 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.23 |
| 05-06 | 0.02 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.07 |
| 06-07 | 0.02 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.04 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 |
| TOTAL | 11.85 | 3.01 | 1.12 | 0.40 | 0.14 | 0.05 | 0.00 | 0.01 | 0.07 | 0.12 | |

CAROLINA BEACH FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR JANUARY

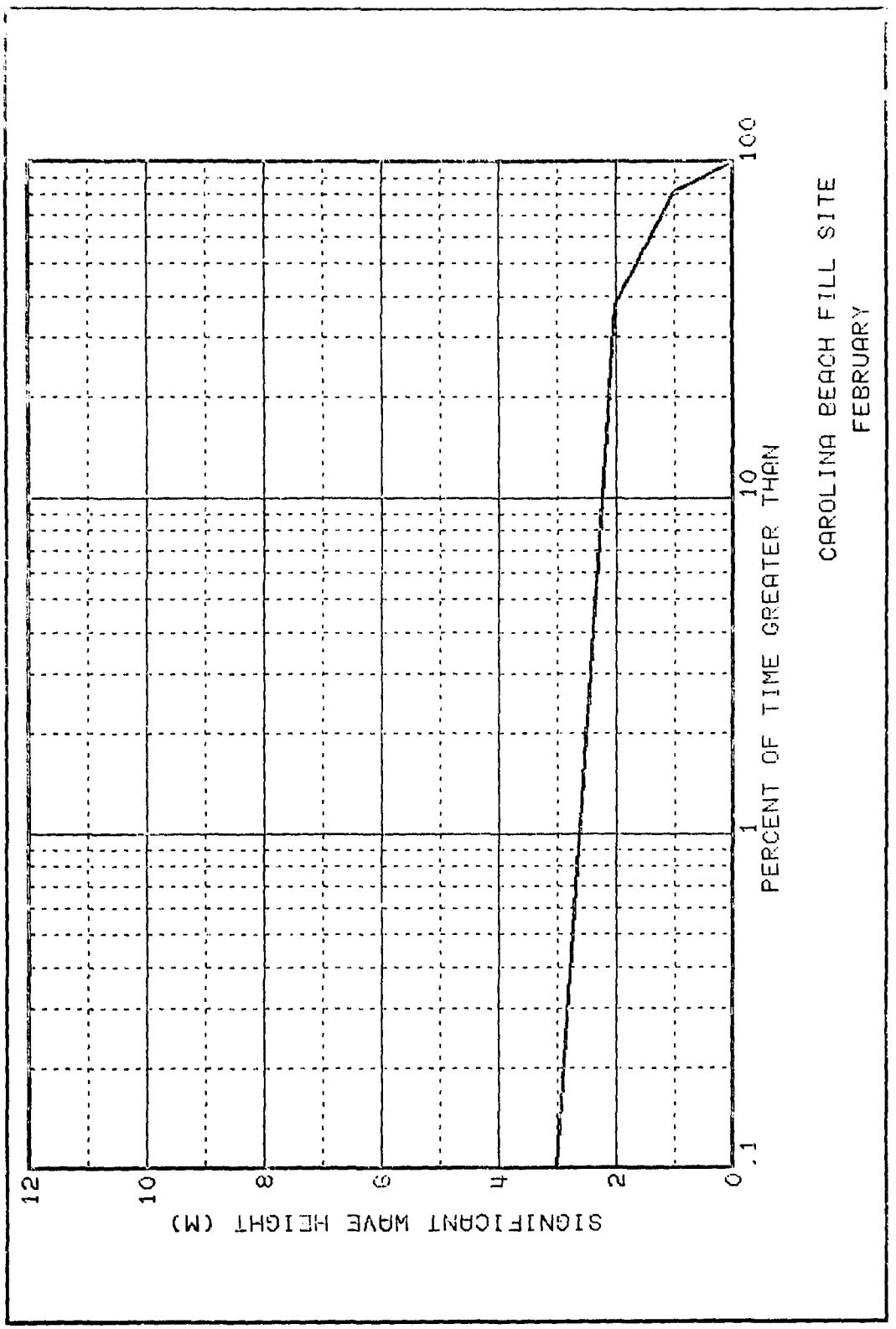
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-5 | 6-7 | 8-9 | 10-11 | 12-13 | 14-15 | 16-17 | 18-19 | 20-21 | >21 | |
| 00-01 | 15.20 | 2.94 | 0.78 | 0.19 | 0.06 | 0.00 | 0.00 | 0.00 | 0.11 | 0.17 | 19.46 |
| 01-02 | 35.45 | 8.70 | 3.05 | 0.58 | 0.24 | 0.07 | 0.00 | 0.00 | 0.08 | 0.13 | 48.40 |
| 02-03 | 10.89 | 8.42 | 6.50 | 3.82 | 1.74 | 0.42 | 0.00 | 0.00 | 0.05 | 0.31 | 32.15 |
| 03-04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 61.53 | 20.06 | 10.33 | 4.59 | 2.14 | 0.49 | 0.00 | 0.00 | 0.25 | 0.61 | |


CAROLINA BEACH FILL SITE
JANUARY
PERCENT OF TIME GREATER THAN
.1
1
10
100
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12

CAROLINA BEACH FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR FEBRUARY

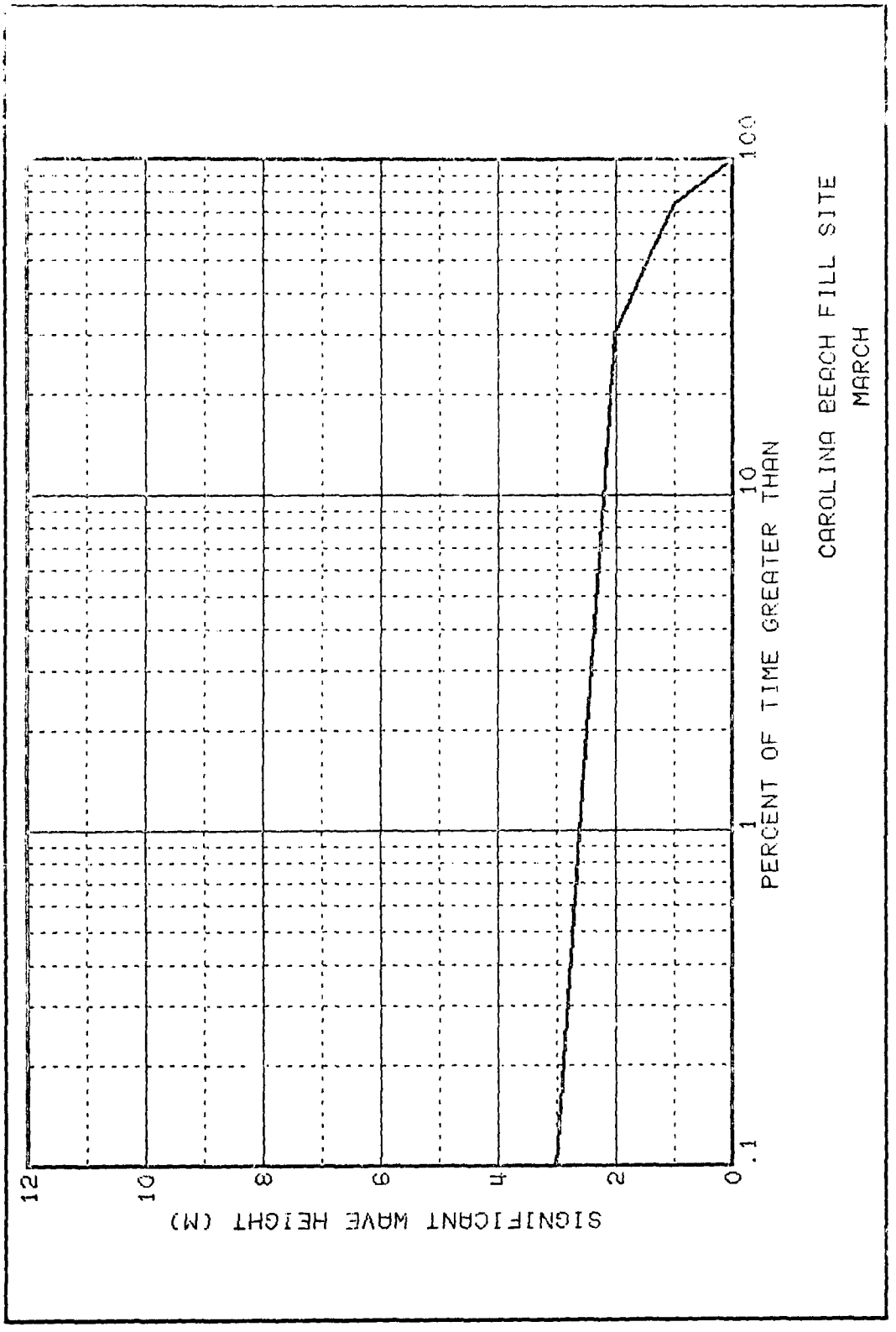
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-5 | 6-7 | 8-9 | 10-11 | 12-13 | 14-15 | 16-17 | 18-19 | 20-21 | >21 | |
| 00-01 | 13.39 | 4.02 | 0.83 | 0.14 | 0.04 | 0.04 | 0.00 | 0.00 | 0.15 | 0.13 | 18.76 |
| 01-02 | 28.38 | 9.74 | 3.51 | 1.22 | 0.35 | 0.07 | 0.00 | 0.00 | 0.04 | 0.12 | 43.42 |
| 02-03 | 10.55 | 10.00 | 9.43 | 4.59 | 2.21 | 0.69 | 0.31 | 0.00 | 0.00 | 0.00 | 37.79 |
| 03-04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 52.32 | 23.77 | 13.78 | 5.95 | 2.60 | 0.80 | 0.31 | 0.00 | 0.19 | 0.25 | |


CAROLINA BEACH FILL SITE
FEBRUARY
SIGNIFICANT WAVE HEIGHT (M)
PERCENT OF TIME GREATER THAN
0
2
4
6
8
10
12
.1
1
10
100

CAROLINA BEACH FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR MARCH

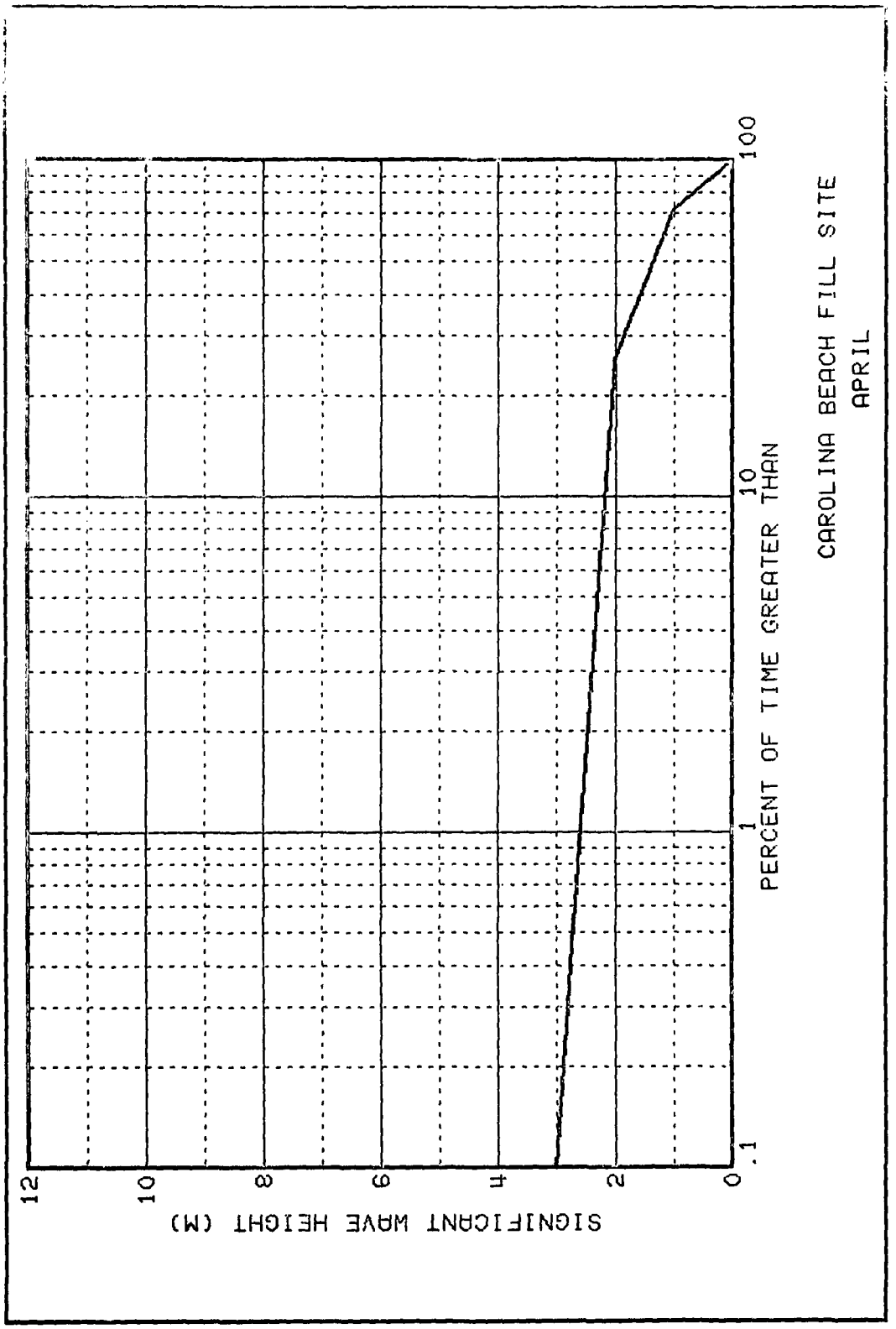
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-5 | 6-7 | 8-9 | 10-11 | 12-13 | 14-15 | 16-17 | 18-19 | 20-21 | >21 | |
| 00-01 | 21.33 | 4.02 | 0.58 | 0.23 | 0.05 | 0.00 | 0.00 | 0.02 | 0.09 | 0.29 | 26.62 |
| 01-02 | 29.56 | 9.40 | 3.13 | 0.53 | 0.22 | 0.01 | 0.01 | 0.04 | 0.04 | 0.09 | 43.03 |
| 02-03 | 8.85 | 8.92 | 7.43 | 3.42 | 0.85 | 0.50 | 0.14 | 0.15 | 0.02 | 0.07 | 30.35 |
| 03-04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 59.75 | 22.34 | 11.15 | 4.17 | 1.12 | 0.51 | 0.15 | 0.20 | 0.15 | 0.45 | |


CAROLINA BEACH FILL SITE
MARCH
SIGNIFICANT WAVE HEIGHT (M)
PERCENT OF TIME GREATER THAN
0
2
4
6
8
10
12
.1
1
10
100

CAROLINA BEACH FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR APRIL

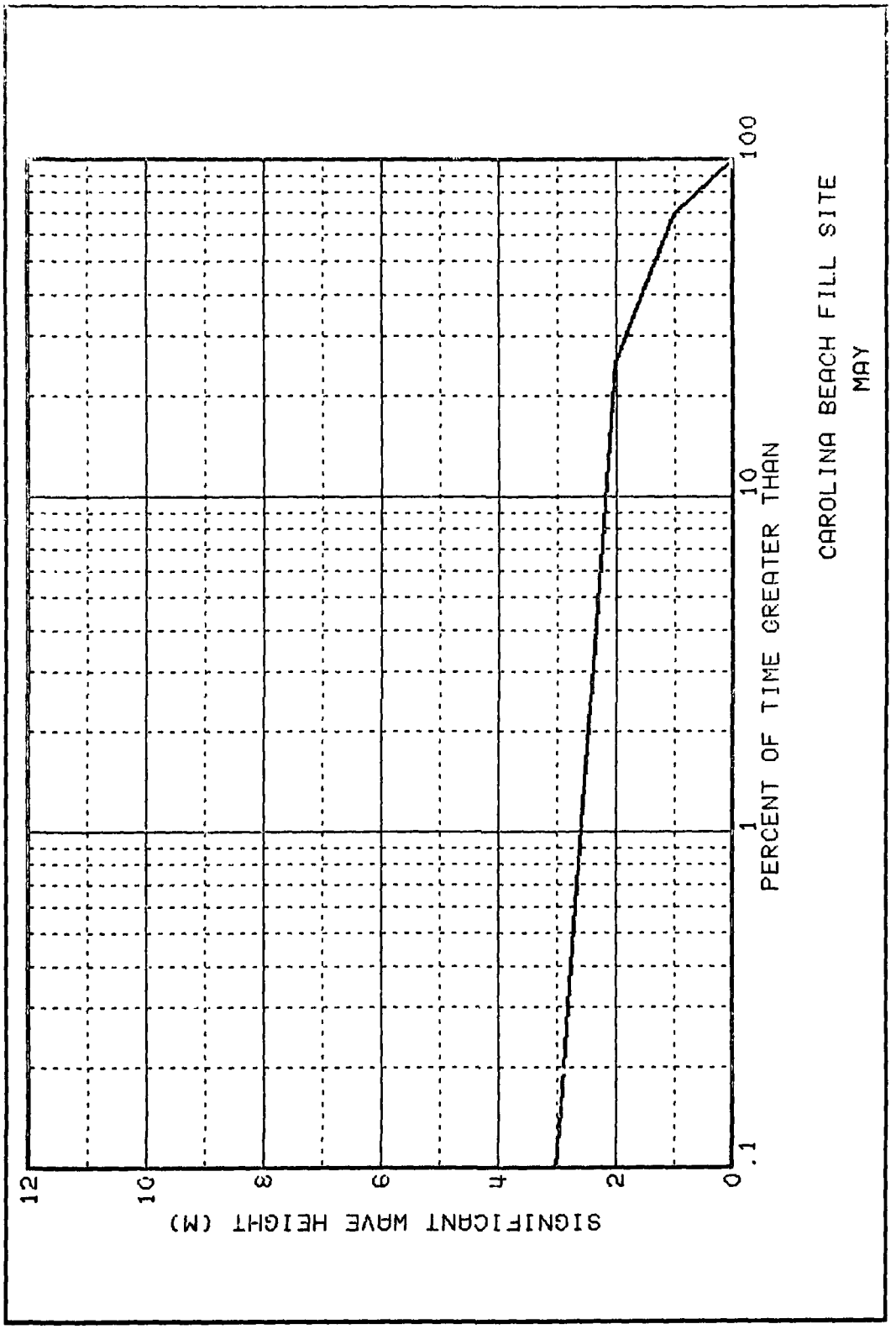
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-5 | 6-7 | 8-9 | 10-11 | 12-13 | 14-15 | 16-17 | 18-19 | 20-21 | >21 | |
| 00-01 | 22.94 | 4.10 | 0.97 | 0.29 | 0.11 | 0.00 | 0.00 | 0.00 | 0.15 | 0.42 | 28.98 |
| 01-02 | 32.66 | 8.94 | 2.46 | 0.65 | 0.19 | 0.06 | 0.04 | 0.00 | 0.13 | 0.20 | 45.34 |
| 02-03 | 8.22 | 8.58 | 4.89 | 2.24 | 0.85 | 0.37 | 0.21 | 0.10 | 0.15 | 0.05 | 25.67 |
| 03-04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 63.82 | 21.63 | 8.33 | 3.18 | 1.16 | 0.43 | 0.25 | 0.10 | 0.43 | 0.67 | |


CAROLINA BEACH FILL SITE
APRIL
PERCENT OF TIME GREATER THAN
.1
1
10
100
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12

CAROLINA BEACH FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR MAY

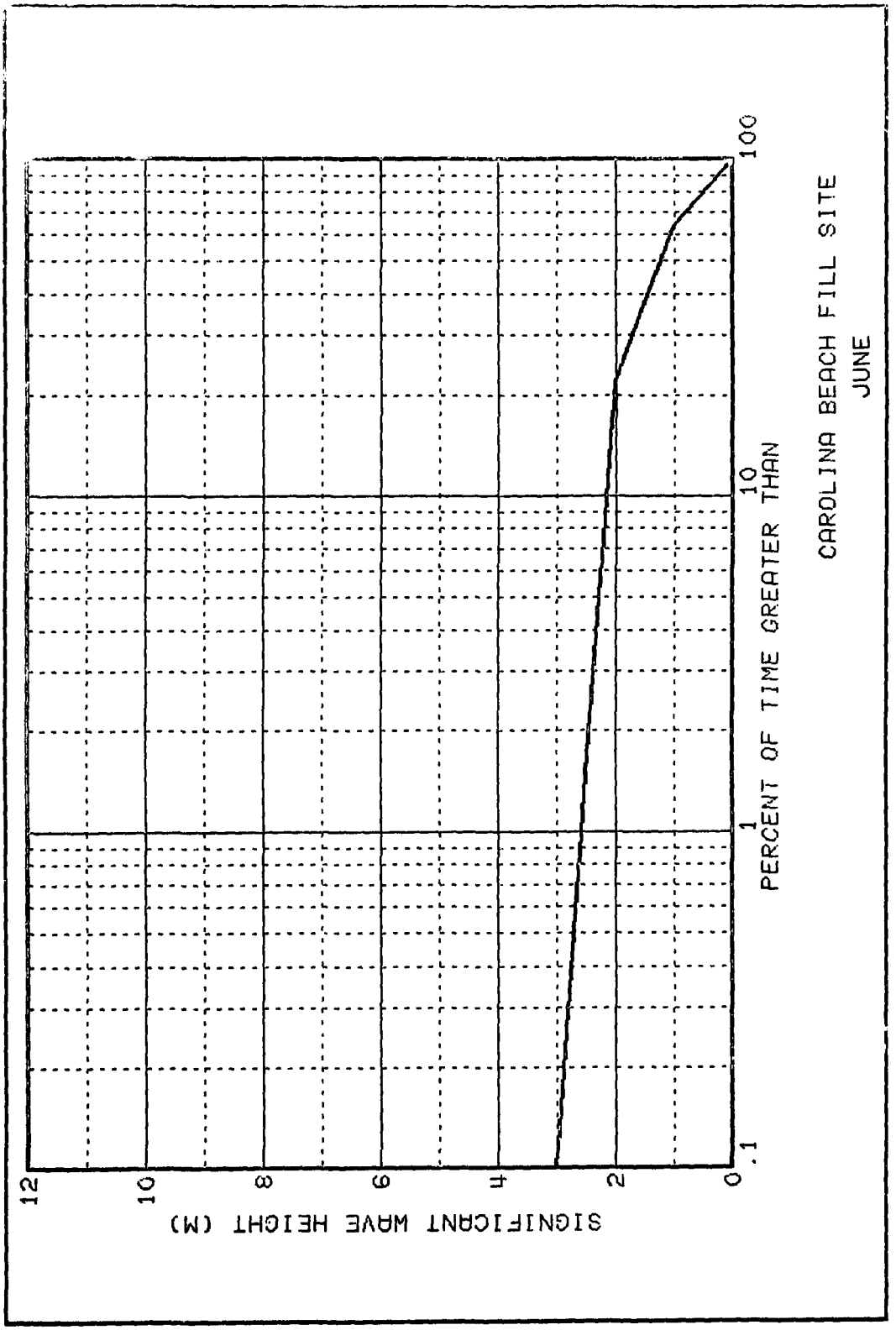
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-5 | 6-7 | 8-9 | 10-11 | 12-13 | 14-15 | 16-17 | 18-19 | 20-21 | >21 | |
| 00-01 | 24.51 | 4.83 | 0.94 | 0.20 | 0.16 | 0.04 | 0.00 | 0.02 | 0.04 | 0.24 | 30.98 |
| 01-02 | 31.99 | 8.63 | 2.57 | 0.38 | 0.19 | 0.05 | 0.00 | 0.03 | 0.06 | 0.12 | 44.02 |
| 02-03 | 7.24 | 8.64 | 5.38 | 2.32 | 0.52 | 0.64 | 0.04 | 0.00 | 0.11 | 0.11 | 25.02 |
| 03-04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 63.75 | 22.10 | 8.89 | 2.90 | 0.87 | 0.73 | 0.04 | 0.04 | 0.22 | 0.47 | |


CAROLINA BEACH FILL SITE
MAY
PERCENT OF TIME GREATER THAN
.1
1
10
100
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12

CAROLINA BEACH FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR JUNE

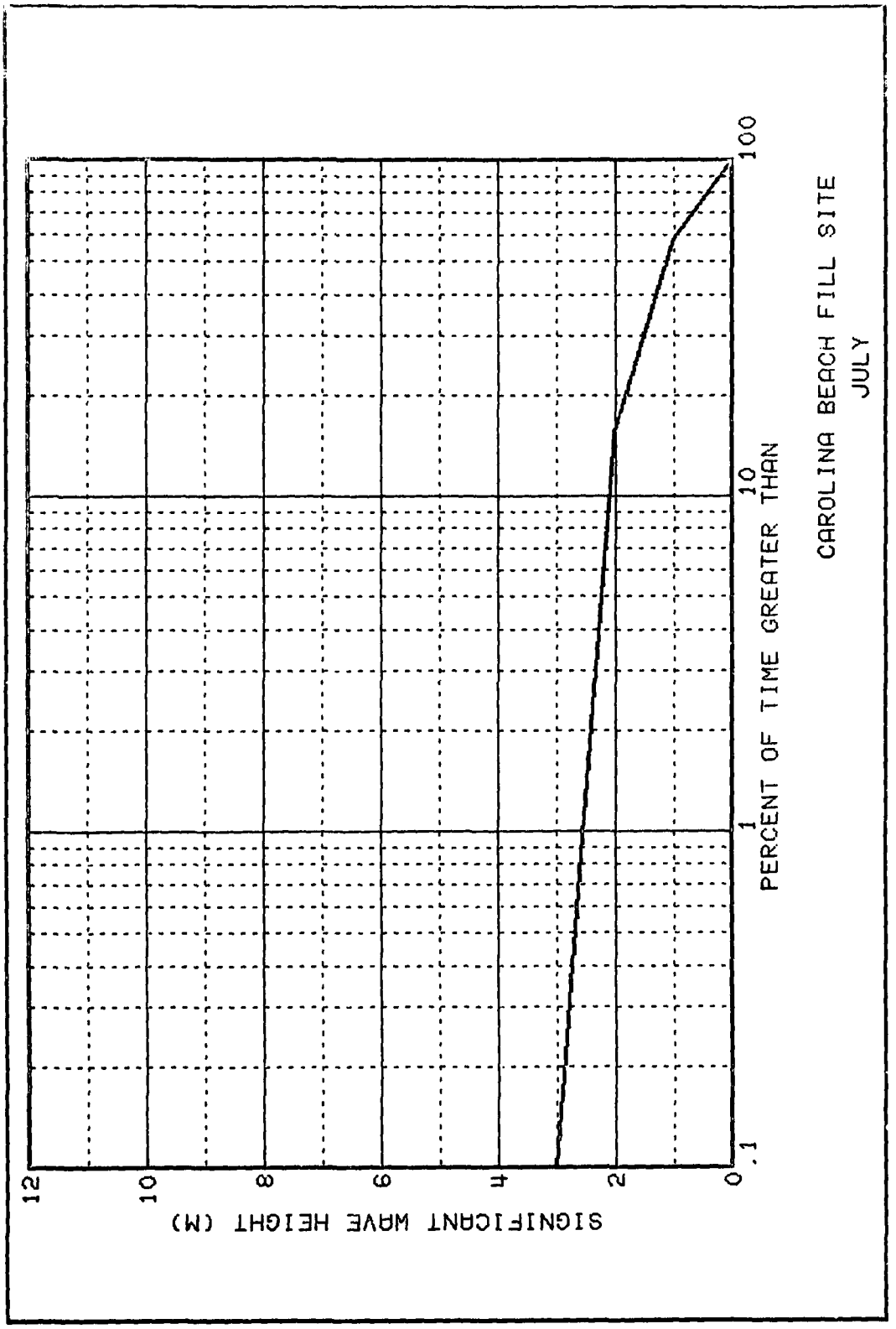
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-5 | 6-7 | 8-9 | 10-11 | 12-13 | 14-15 | 16-17 | 18-19 | 20-21 | >21 | |
| 00-01 | 29.35 | 4.86 | 0.65 | 0.20 | 0.10 | 0.00 | 0.00 | 0.00 | 0.23 | 0.65 | 36.04 |
| 01-02 | 29.88 | 8.62 | 2.41 | 0.46 | 0.18 | 0.04 | 0.00 | 0.01 | 0.11 | 0.30 | 42.01 |
| 02-03 | 5.25 | 8.07 | 4.98 | 2.22 | 0.74 | 0.47 | 0.04 | 0.04 | 0.08 | 0.07 | 21.96 |
| 03-04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 64.48 | 21.55 | 8.04 | 2.88 | 1.02 | 0.51 | 0.04 | 0.04 | 0.42 | 1.02 | |


CAROLINA BEACH FILL SITE
JUNE
PERCENT OF TIME GREATER THAN
100
10
1
.1
SIGNIFICANT WAVE HEIGHT (M)
12
10
8
6
4
2
0

CAROLINA BEACH FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR JULY

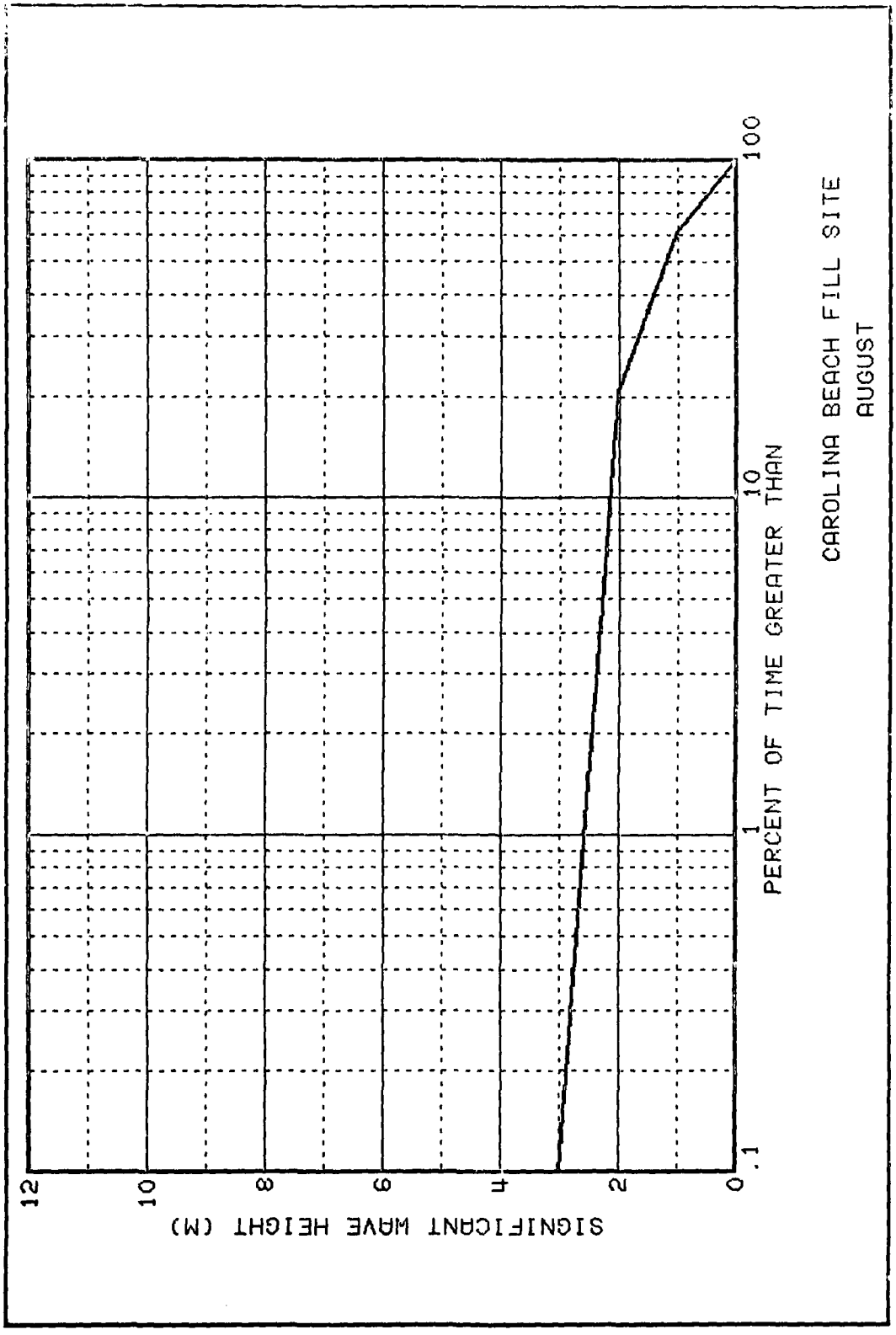
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-5 | 6-7 | 8-9 | 10-11 | 12-13 | 14-15 | 16-17 | 18-19 | 20-21 | >21 | |
| 00-01 | 33.32 | 4.90 | 1.81 | 0.31 | 0.27 | 0.04 | 0.07 | 0.00 | 0.48 | 0.71 | 41.90 |
| 01-02 | 30.55 | 8.24 | 2.42 | 0.37 | 0.18 | 0.06 | 0.05 | 0.00 | 0.24 | 0.37 | 42.48 |
| 02-03 | 3.37 | 7.21 | 2.48 | 1.29 | 0.53 | 0.25 | 0.00 | 0.06 | 0.15 | 0.25 | 15.62 |
| 03-04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 67.24 | 20.35 | 6.72 | 1.97 | 0.99 | 0.35 | 0.12 | 0.06 | 0.87 | 1.33 | |


CAROLINA BEACH FILL SITE
JULY
PERCENT OF TIME GREATER THAN
0.1
1
10
100
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12

CAROLINA BEACH FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR AUGUST

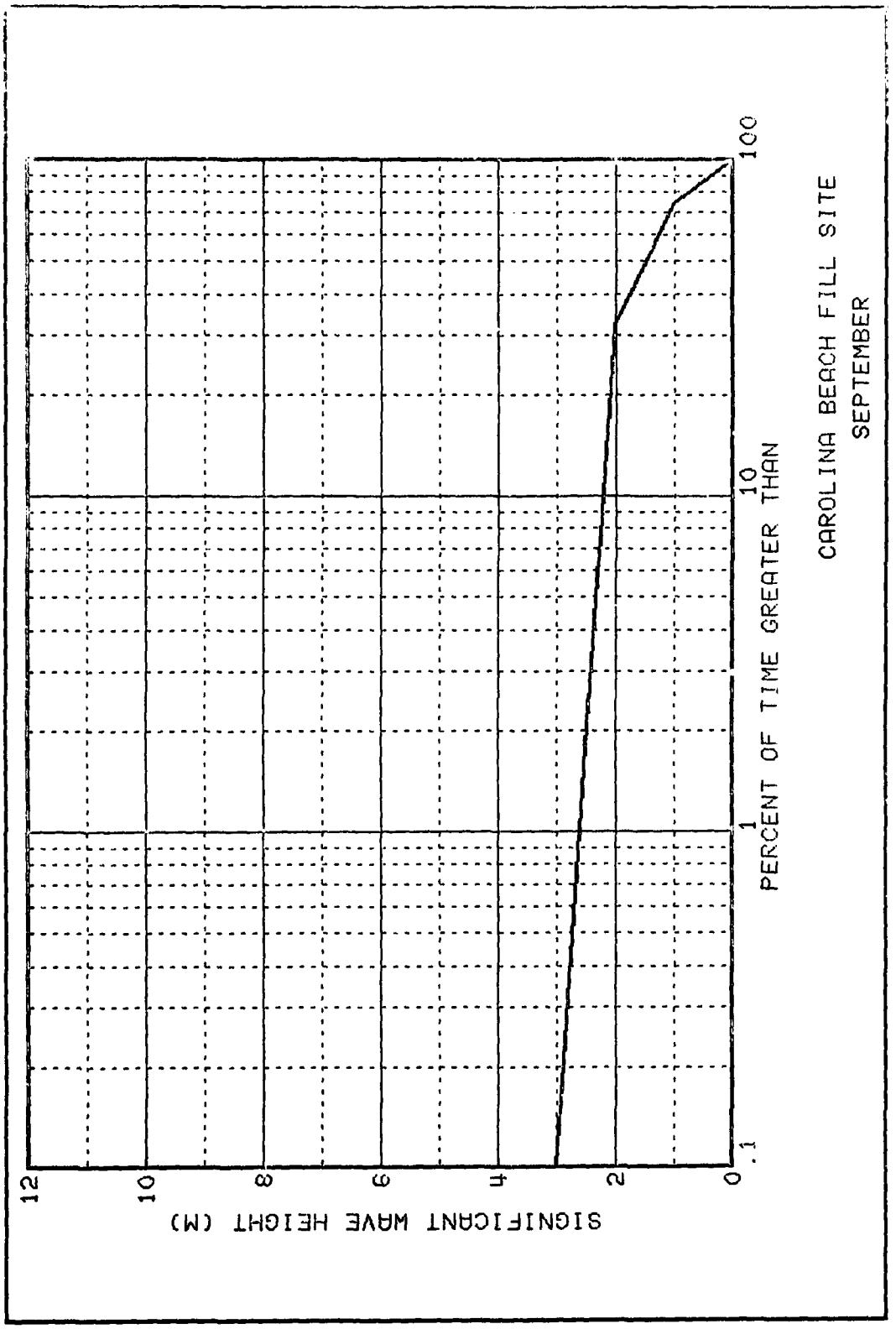
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-5 | 6-7 | 8-9 | 10-11 | 12-13 | 14-15 | 16-17 | 18-19 | 20-21 | >21 | |
| 00-01 | 32.06 | 4.25 | 1.08 | 0.29 | 0.11 | 0.10 | 0.06 | 0.00 | 0.30 | 0.34 | 38.60 |
| 01-02 | 28.73 | 8.01 | 2.57 | 0.63 | 0.09 | 0.16 | 0.03 | 0.02 | 0.15 | 0.20 | 40.58 |
| 02-03 | 5.03 | 7.67 | 4.21 | 2.55 | 0.87 | 0.29 | 0.00 | 0.02 | 0.02 | 0.16 | 20.81 |
| 03-04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 65.21 | 19.93 | 7.86 | 3.47 | 1.06 | 0.55 | 0.09 | 0.05 | 0.46 | 0.69 | |


CAROLINA BEACH FILL SITE
AUGUST
PERCENT OF TIME GREATER THAN
100
10
1
.1
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12

CAROLINA BEACH FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR SEPTEMBER

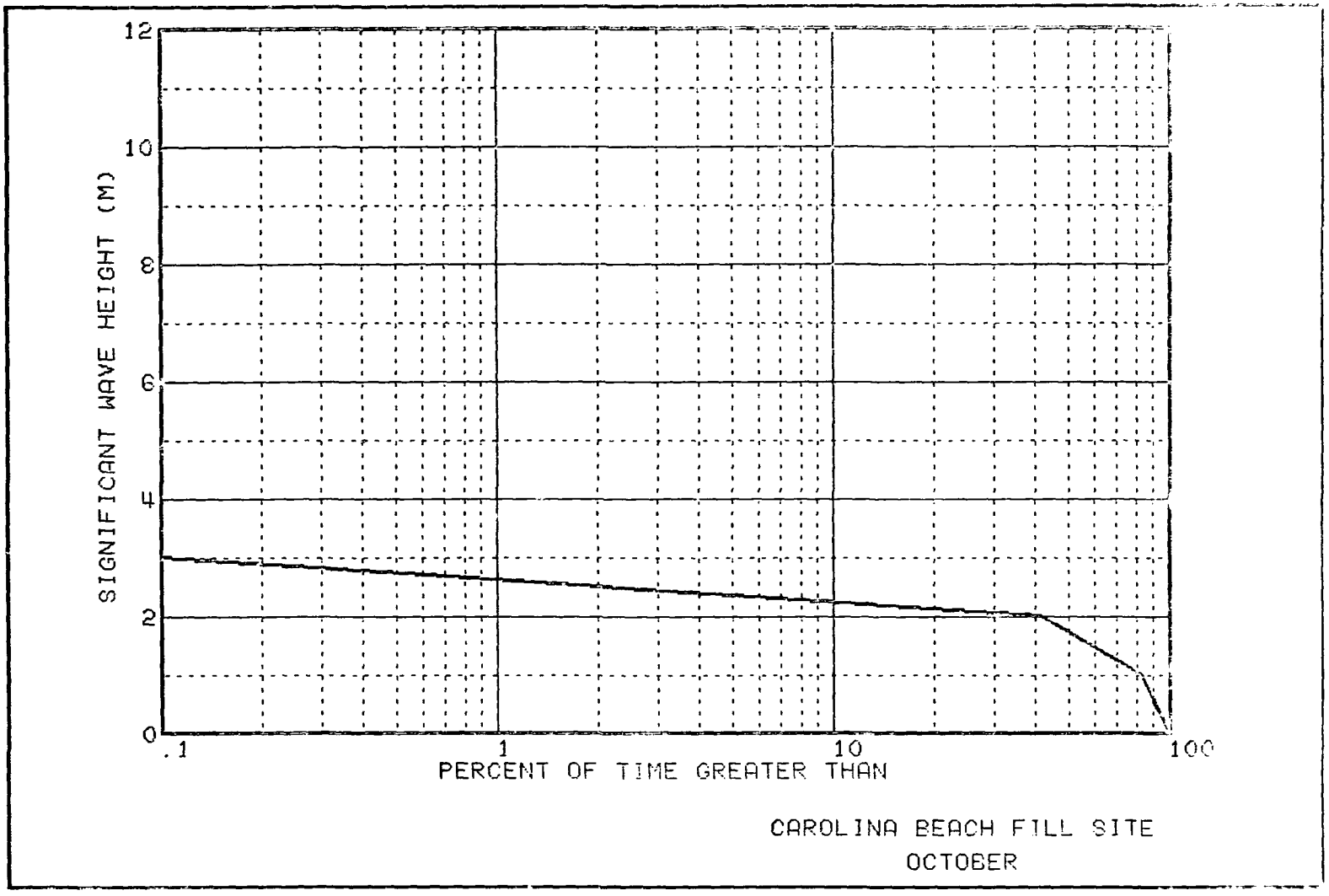
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-5 | 6-7 | 8-9 | 10-11 | 12-13 | 14-15 | 16-17 | 18-19 | 20-21 | >21 | |
| 00-01 | 22.02 | 2.29 | 0.70 | 0.09 | 0.16 | 0.02 | 0.00 | 0.03 | 0.16 | 0.20 | 25.67 |
| 01-02 | 28.68 | 9.88 | 2.12 | 0.82 | 0.21 | 0.09 | 0.03 | 0.03 | 0.12 | 0.13 | 42.10 |
| 02-03 | 6.60 | 11.79 | 7.89 | 3.28 | 1.57 | 0.64 | 0.16 | 0.00 | 0.10 | 0.08 | 32.21 |
| 03-04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 57.30 | 23.97 | 10.70 | 4.20 | 1.94 | 0.75 | 0.19 | 0.06 | 0.38 | 0.41 | |


CAROLINA BEACH FILL SITE
SEPTEMBER
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12
PERCENT OF TIME GREATER THAN
.1
1
10
100

CAROLINA BEACH FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR OCTOBER

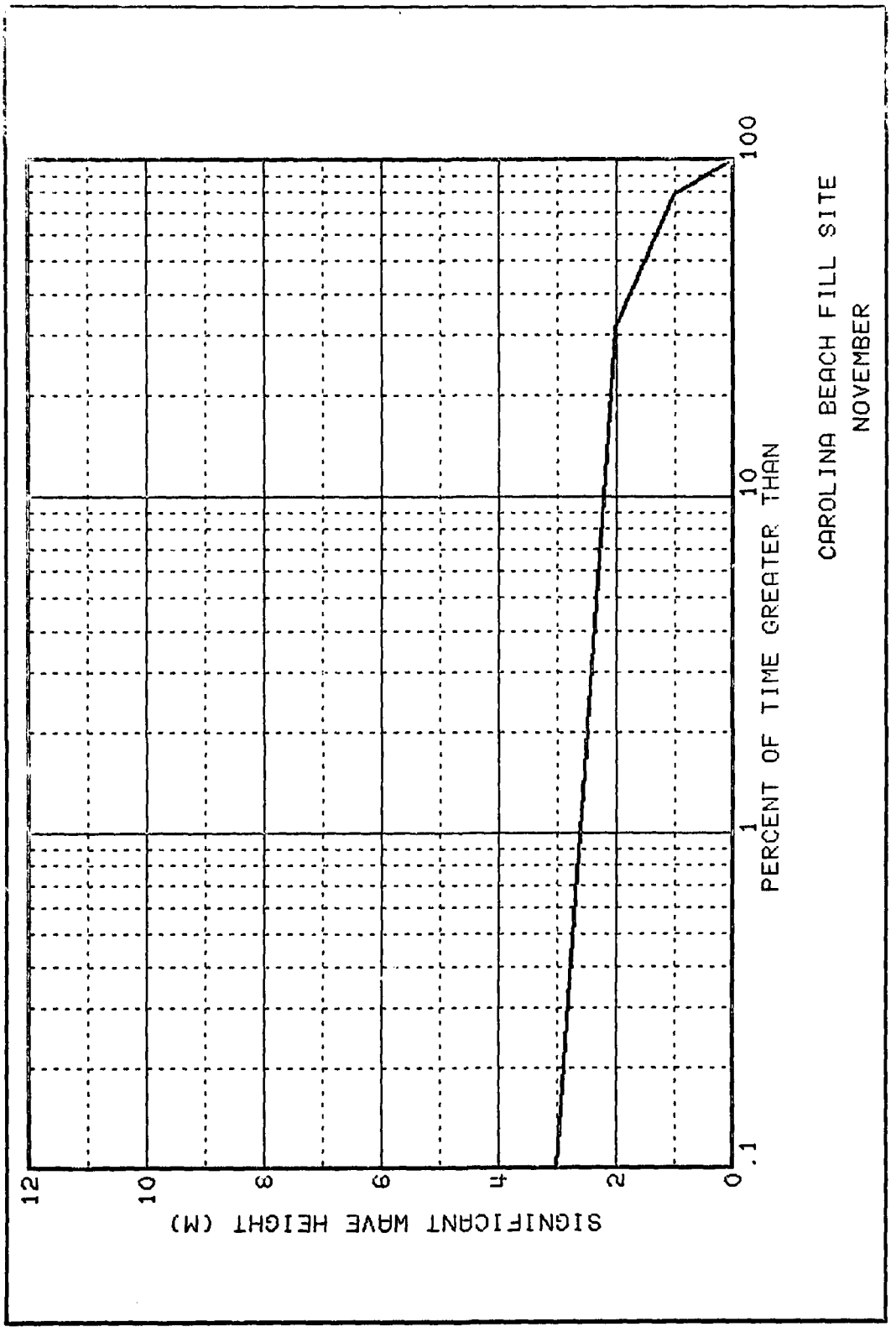
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-5 | 6-7 | 8-9 | 10-11 | 12-13 | 14-15 | 16-17 | 18-19 | 20-21 | >21 | |
| 00-01 | 14.22 | 2.03 | 0.37 | 0.07 | 0.03 | 0.00 | 0.00 | 0.00 | 0.02 | 0.20 | 16.94 |
| 01-02 | 28.25 | 10.04 | 2.39 | 0.68 | 0.08 | 0.03 | 0.00 | 0.00 | 0.02 | 0.04 | 41.53 |
| 02-03 | 12.63 | 11.90 | 8.95 | 4.75 | 1.93 | 1.08 | 0.13 | 0.10 | 0.06 | 0.00 | 41.53 |
| 03-04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 55.10 | 23.98 | 11.70 | 5.50 | 2.04 | 1.11 | 0.13 | 0.10 | 0.10 | 0.23 | |


12
10
8
6
4
2
0
SIGNIFICANT WAVE HEIGHT (M)
.1
1
10
100
PERCENT OF TIME GREATER THAN
CAROLINA BEACH FILL SITE
OCTOBER

CAROLINA BEACH FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR NOVEMBER

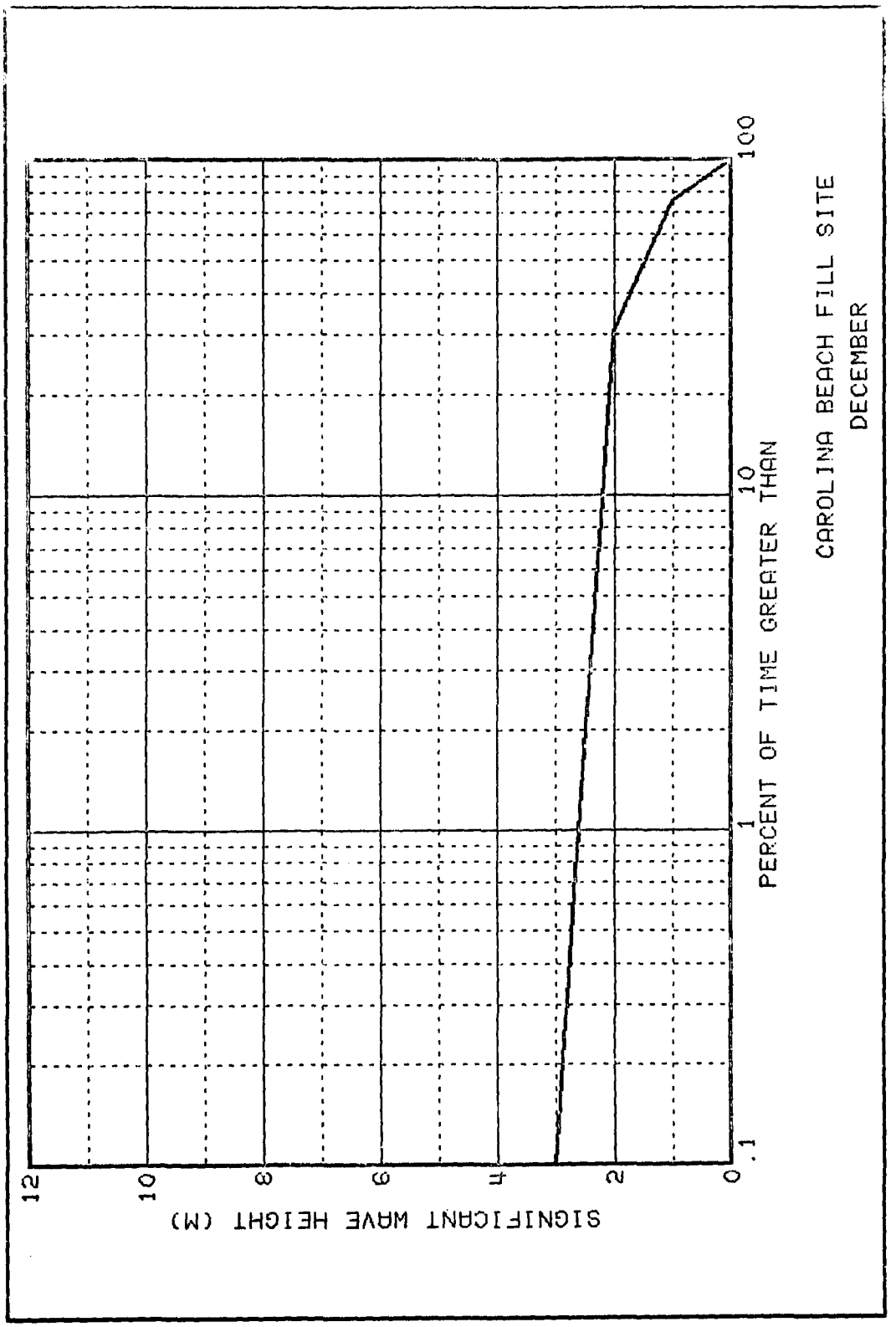
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-5 | 6-7 | 8-9 | 10-11 | 12-13 | 14-15 | 16-17 | 18-19 | 20-21 | >21 | |
| 00-01 | 17.52 | 3.12 | 0.43 | 0.26 | 0.00 | 0.00 | 0.04 | 0.00 | 0.13 | 0.26 | 21.76 |
| 01-02 | 31.19 | 11.22 | 3.43 | 0.68 | 0.07 | 0.01 | 0.01 | 0.00 | 0.06 | 0.12 | 46.79 |
| 02-03 | 9.05 | 10.11 | 6.68 | 2.97 | 1.09 | 0.96 | 0.34 | 0.05 | 0.19 | 0.05 | 31.48 |
| 03-04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 57.75 | 24.45 | 10.54 | 3.90 | 1.16 | 0.97 | 0.39 | 0.05 | 0.39 | 0.41 | |


CAROLINA BEACH FILL SITE
NOVEMBER
PERCENT OF TIME GREATER THAN
.1
1
10
100
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12

CAROLINA BEACH FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR DECEMBER

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-5 | 6-7 | 8-9 | 10-11 | 12-13 | 14-15 | 16-17 | 18-19 | 20-21 | >21 | |
| 00-01 | 19.48 | 3.62 | 0.31 | 0.13 | 0.05 | 0.00 | 0.00 | 0.04 | 0.07 | 0.47 | 24.77 |
| 01-02 | 28.63 | 10.25 | 3.79 | 1.24 | 0.24 | 0.10 | 0.00 | 0.08 | 0.05 | 0.26 | 44.58 |
| 02-03 | 8.27 | 9.61 | 6.61 | 3.74 | 1.41 | 0.34 | 0.12 | 0.13 | 0.13 | 0.09 | 30.64 |
| 03-04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 56.39 | 23.47 | 11.52 | 5.10 | 1.70 | 0.44 | 0.12 | 0.19 | 0.25 | 0.82 | |


CAROLINA BEACH FILL SITE
DECEMBER
PERCENT OF TIME GREATER THAN
.1
1
10
100
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12

CAROLINA BEACH FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD

WAVE DIRECTION = 30

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-5 | 6-7 | 8-9 | 10-11 | 12-13 | 14-15 | 16-17 | 18-19 | 20-21 | >21 | |
| 00-01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 01-02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 02-03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 03-04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |

CAROLINA BEACH FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD

WAVE DIRECTION = 60

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-5 | 6-7 | 8-9 | 10-11 | 12-13 | 14-15 | 16-17 | 18-19 | 20-21 | >21 | |
| 00-01 | 7.39 | 0.80 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.03 | 8.24 |
| 01-02 | 12.96 | 2.28 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 15.26 |
| 02-03 | 3.89 | 1.08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 4.99 |
| 03-04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 24.25 | 4.16 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 | 0.05 | |

CAROLINA BEACH FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD

WAVE DIRECTION = 90

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-5 | 6-7 | 8-9 | 10-11 | 12-13 | 14-15 | 16-17 | 18-19 | 20-21 | >21 | |
| 00-01 | 3.93 | 0.44 | 0.29 | 0.07 | 0.03 | 0.00 | 0.01 | 0.00 | 0.06 | 0.15 | 4.98 |
| 01-02 | 5.78 | 4.30 | 1.74 | 0.36 | 0.08 | 0.03 | 0.01 | 0.01 | 0.05 | 0.08 | 12.44 |
| 02-03 | 1.28 | 6.18 | 5.14 | 2.56 | 0.96 | 0.44 | 0.10 | 0.04 | 0.06 | 0.04 | 16.81 |
| 03-04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 10.99 | 10.92 | 7.18 | 3.00 | 1.08 | 0.47 | 0.12 | 0.05 | 0.17 | 0.27 | |

CAROLINA BEACH FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD

WAVE DIRECTION = 120

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-5 | 6-7 | 8-9 | 10-11 | 12-13 | 14-15 | 16-17 | 18-19 | 20-21 | >21 | |
| 00-01 | 4.86 | 0.35 | 0.08 | 0.01 | 0.02 | 0.00 | 0.00 | 0.00 | 0.02 | 0.06 | 5.41 |
| 01-02 | 6.34 | 1.84 | 0.37 | 0.08 | 0.05 | 0.02 | 0.00 | 0.00 | 0.02 | 0.05 | 8.77 |
| 02-03 | 2.03 | 2.15 | 1.22 | 0.52 | 0.20 | 0.13 | 0.02 | 0.02 | 0.02 | 0.04 | 6.35 |
| 03-04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 13.24 | 4.34 | 1.67 | 0.61 | 0.28 | 0.15 | 0.03 | 0.02 | 0.06 | 0.15 | |

CAROLINA BEACH FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD

WAVE DIRECTION = 150

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-5 | 6-7 | 8-9 | 10-11 | 12-13 | 14-15 | 16-17 | 18-19 | 20-21 | >21 | |
| 00-01 | 5.96 | 2.05 | 0.43 | 0.11 | 0.04 | 0.02 | 0.00 | 0.00 | 0.06 | 0.10 | 8.77 |
| 01-02 | 5.03 | 0.92 | 0.63 | 0.23 | 0.06 | 0.01 | 0.00 | 0.00 | 0.02 | 0.02 | 6.93 |
| 02-03 | 0.80 | 0.04 | 0.05 | 0.06 | 0.04 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 1.01 |
| 03-04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 11.79 | 3.01 | 1.12 | 0.40 | 0.14 | 0.05 | 0.00 | 0.01 | 0.07 | 0.12 | |

CAROLINA BEACH FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD

WAVE DIRECTION = 180

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-5 | 6-7 | 8-9 | 10-11 | 12-13 | 14-15 | 16-17 | 18-19 | 20-21 | >21 | |
| 00-01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 01-02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 02-03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 03-04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |

# APPENDIX E: AVERAGE WAVE CLIMATE AT NASSAU COUNTY, FLA.

1. Appendix E contains the following information for the Nassau County, Fla., project site:

   a. Tabulations of monthly percent occurrence of wave-height/period combinations.

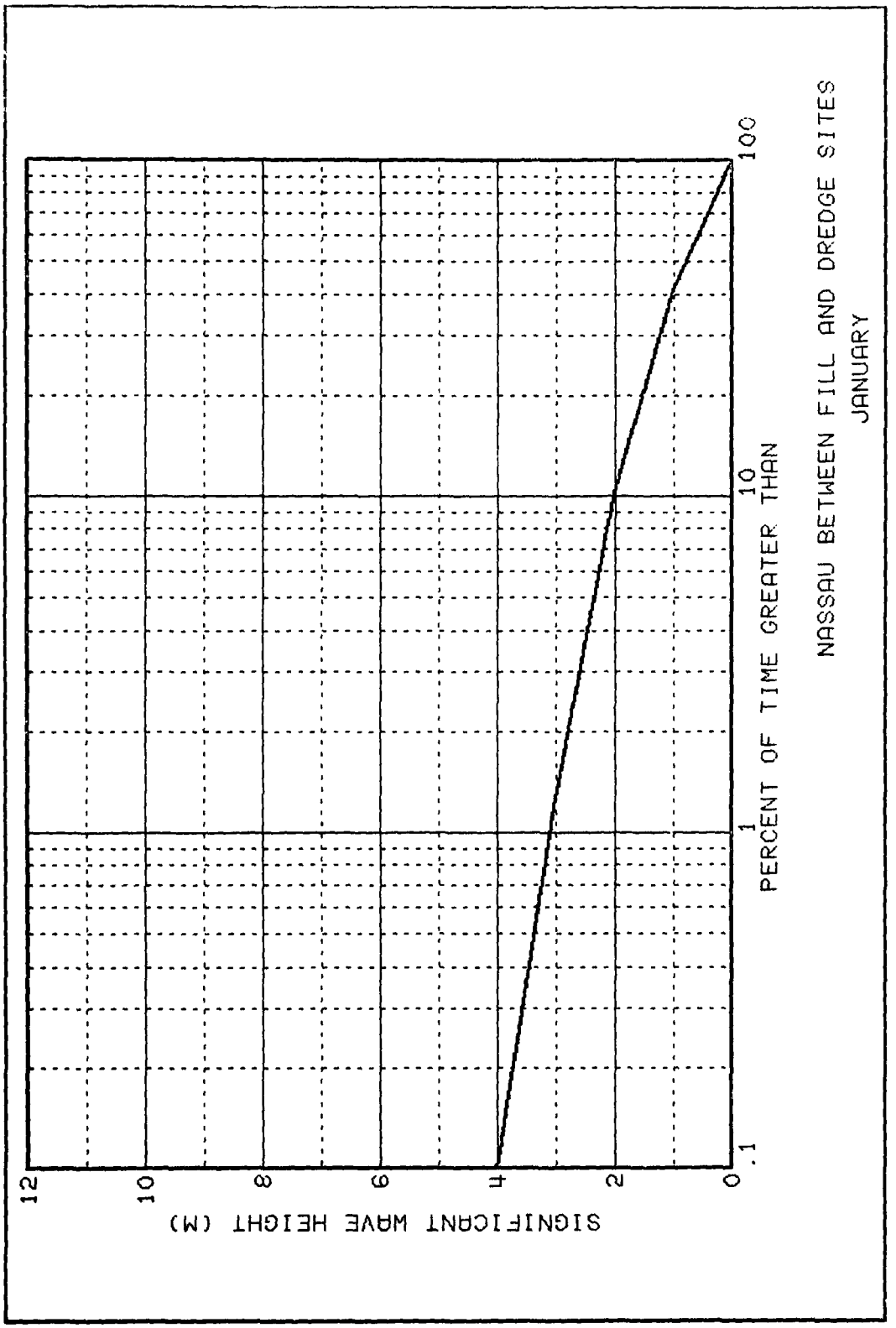
   b. Tabulations of annual percent occurrence by azimuth direction of wave-height/period combinations.

   c. Plots of monthly significant wave-height occurrence in terms of the total percent time per month that these heights are exceeded.

NASSAU BETWEEN FILL AND DREDGE SITES

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR JANUARY

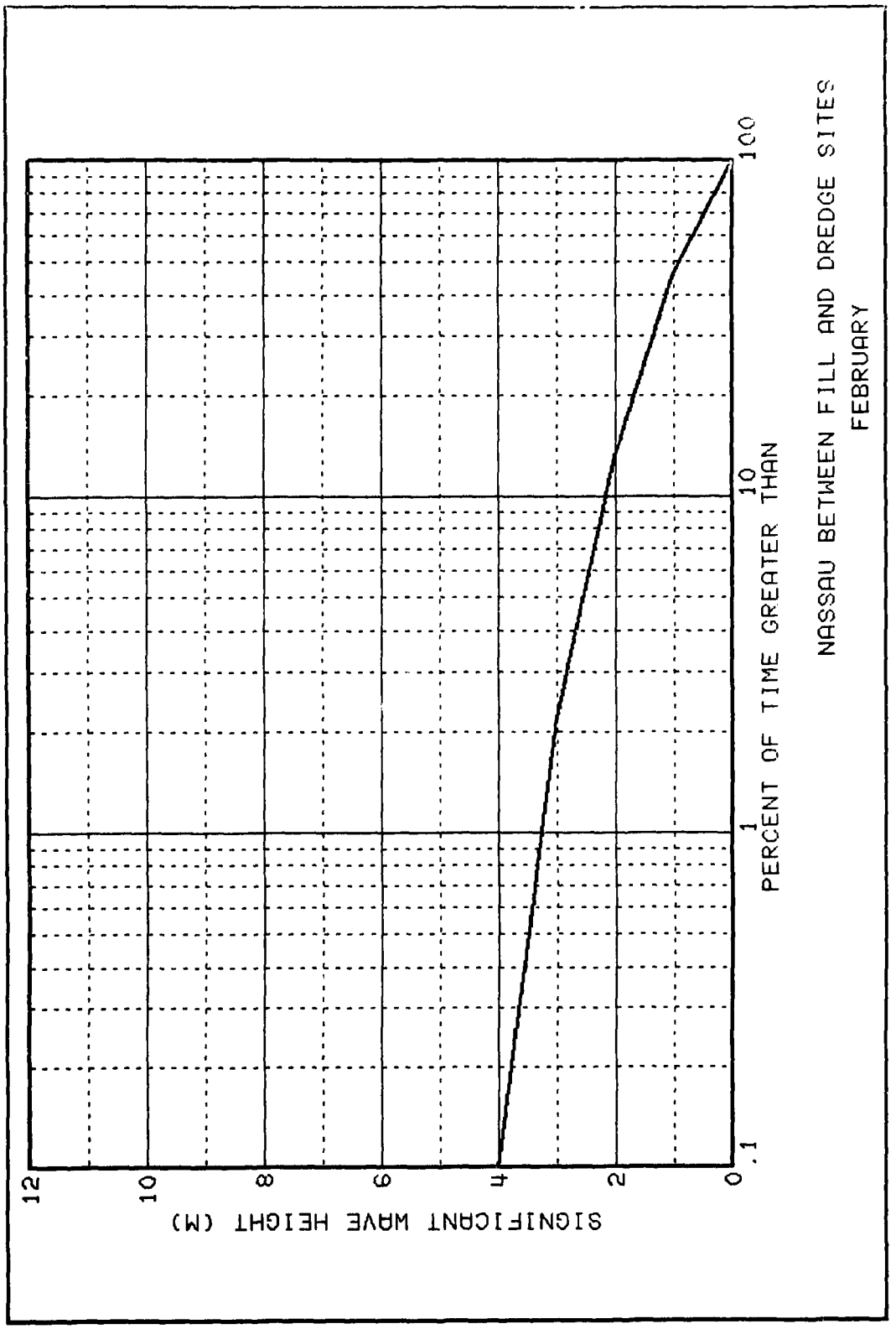
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 43.46 | 10.22 | 3.08 | 0.94 | 0.11 | 0.32 | 0.30 | 0.00 | 0.09 | 0.29 | 58.82 |
| 01-02 | 19.07 | 7.14 | 2.41 | 1.06 | 0.68 | 0.29 | 0.00 | 0.00 | 0.01 | 0.21 | 30.87 |
| 02-03 | 6.27 | 1.69 | 0.43 | 0.39 | 0.17 | 0.08 | 0.00 | 0.00 | 0.00 | 0.00 | 9.04 |
| 03-04 | 0.82 | 0.17 | 0.05 | 0.00 | 0.13 | 0.10 | 0.00 | 0.00 | 0.00 | 0.00 | 1.28 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 69.62 | 19.22 | 5.98 | 2.39 | 1.10 | 0.80 | 0.30 | 0.00 | 0.10 | 0.50 | |


NASSAU BETWEEN FILL AND DREDGE SITES
JANUARY
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12
PERCENT OF TIME GREATER THAN
.1
1
10
100

NASSAU BETWEEN FILL AND DREDGE SITES

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR FEBRUARY

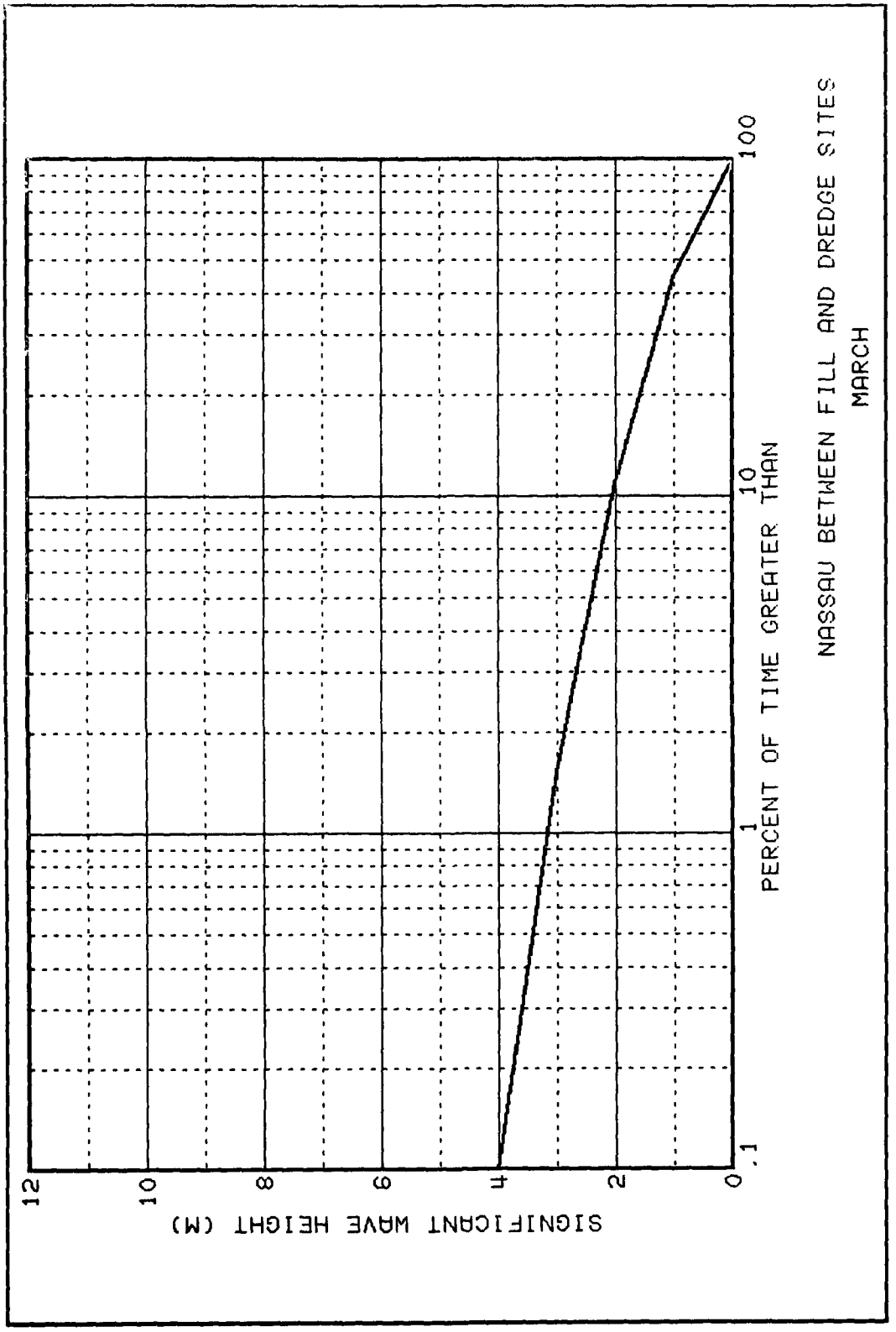
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 37.60 | 9.07 | 4.74 | 1.08 | 0.57 | 0.07 | 0.13 | 0.00 | 0.00 | 0.50 | 53.76 |
| 01-02 | 17.65 | 8.59 | 3.91 | 1.53 | 0.89 | 0.42 | 0.00 | 0.00 | 0.00 | 0.03 | 33.03 |
| 02-03 | 6.79 | 2.64 | 0.81 | 0.47 | 0.00 | 0.20 | 0.00 | 0.11 | 0.00 | 0.00 | 11.02 |
| 03-04 | 1.53 | 0.21 | 0.07 | 0.10 | 0.13 | 0.10 | 0.00 | 0.02 | 0.00 | 0.00 | 2.17 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 63.57 | 20.53 | 9.53 | 3.18 | 1.59 | 0.79 | 0.13 | 0.13 | 0.00 | 0.53 | |


NASSAU BETWEEN FILL AND DREDGE SITES
FEBRUARY
PERCENT OF TIME GREATER THAN
.1
1
10
100
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12

NASSAU BETWEEN FILL AND DREDGE SITES

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR MARCH

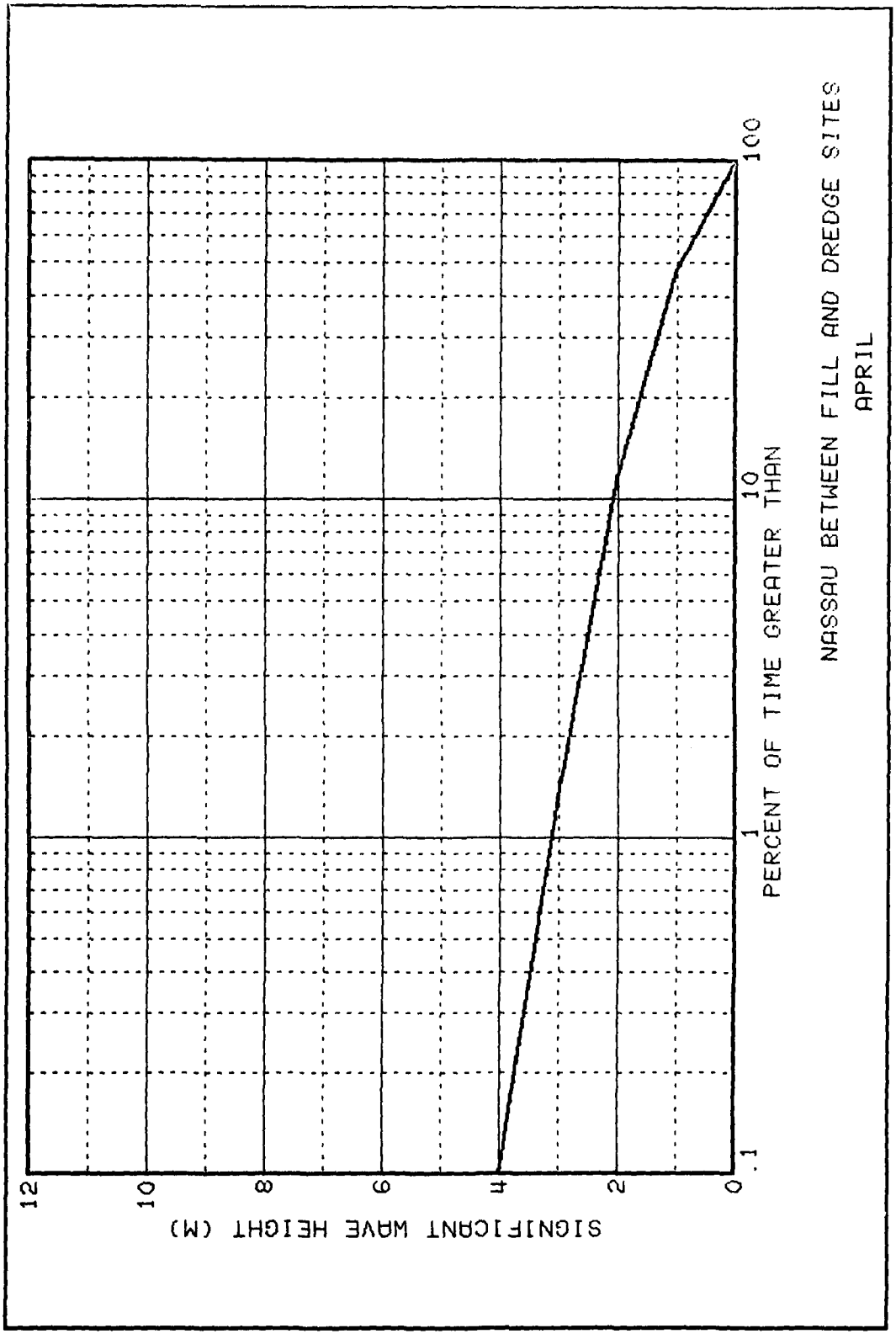
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 42.69 | 6.92 | 3.21 | 0.89 | 0.64 | 0.00 | 0.10 | 0.00 | 0.19 | 0.87 | 55.50 |
| 01-02 | 23.14 | 7.31 | 2.26 | 0.75 | 0.05 | 0.00 | 0.00 | 0.00 | 0.01 | 0.02 | 33.55 |
| 02-03 | 7.97 | 0.77 | 0.42 | 0.17 | 0.00 | 0.09 | 0.00 | 0.00 | 0.00 | 0.00 | 9.42 |
| 03-04 | 1.13 | 0.17 | 0.05 | 0.07 | 0.00 | 0.10 | 0.00 | 0.00 | 0.00 | 0.00 | 1.53 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 74.92 | 15.16 | 5.94 | 1.88 | 0.69 | 0.20 | 0.10 | 0.00 | 0.20 | 0.89 | |


NASSAU BETWEEN FILL AND DREDGE SITES
MARCH
PERCENT OF TIME GREATER THAN
.1
1
10
100
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12

NASSAU BETWEEN FILL AND DREDGE SITES

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR APRIL

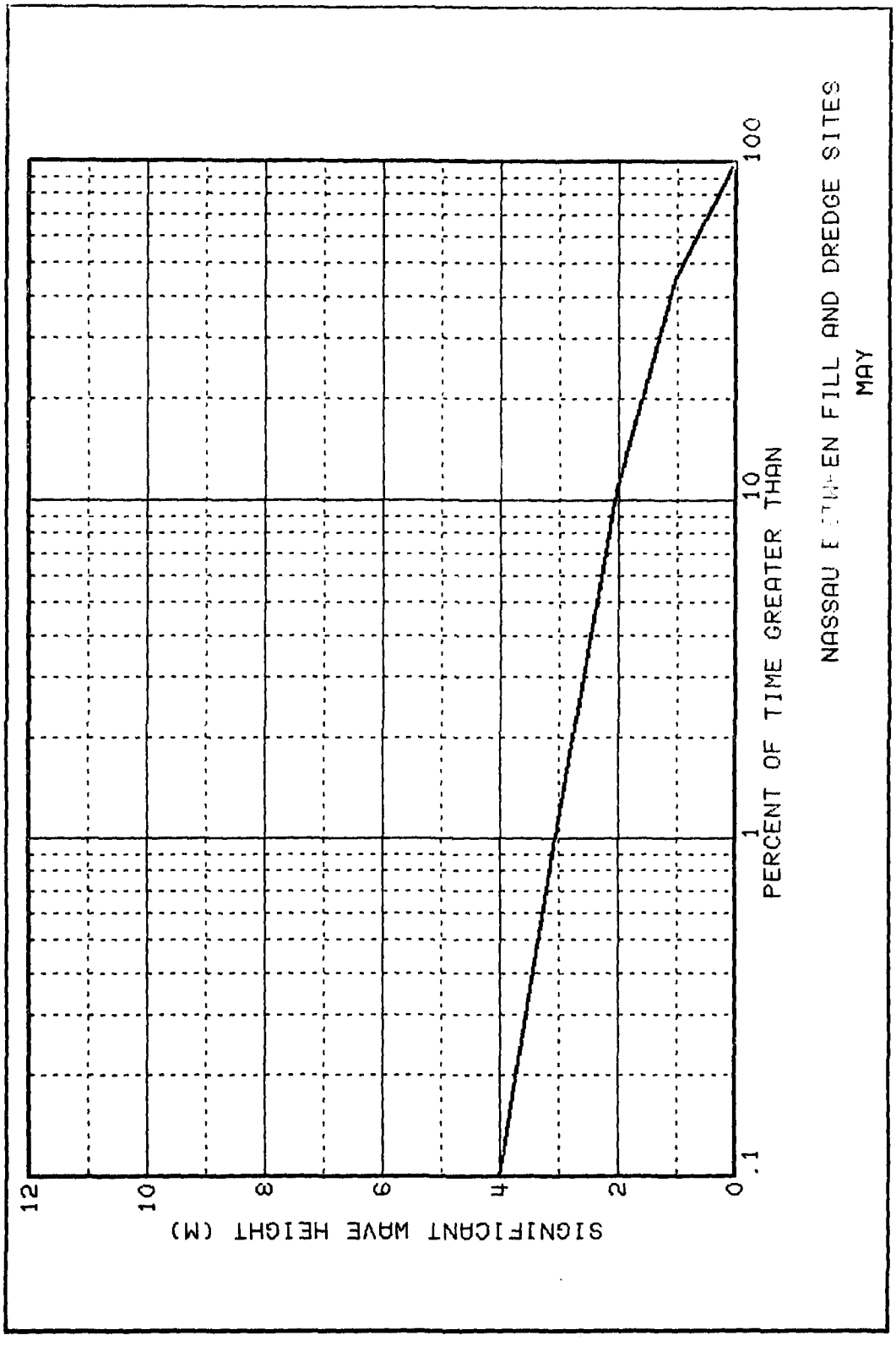
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 38.77 | 8.79 | 2.27 | 0.75 | 0.13 | 0.09 | 0.01 | 0.09 | 0.35 | 1.02 | 52.27 |
| 01-02 | 26.20 | 6.77 | 1.74 | 0.70 | 0.33 | 0.00 | 0.09 | 0.00 | 0.12 | 0.20 | 36.14 |
| 02-03 | 8.64 | 0.92 | 0.24 | 0.35 | 0.10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 10.26 |
| 03-04 | 1.02 | 0.09 | 0.15 | 0.07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.32 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 74.62 | 16.57 | 4.40 | 1.87 | 0.56 | 0.09 | 0.09 | 0.09 | 0.47 | 1.22 | |


NASSAU BETWEEN FILL AND DREDGE SITES
APRIL
SIGNIFICANT WAVE HEIGHT (M)
PERCENT OF TIME GREATER THAN
0
2
4
6
8
10
12
.1
1
10
100

NASSAU BETWEEN FILL AND DREDGE SITES

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR MAY

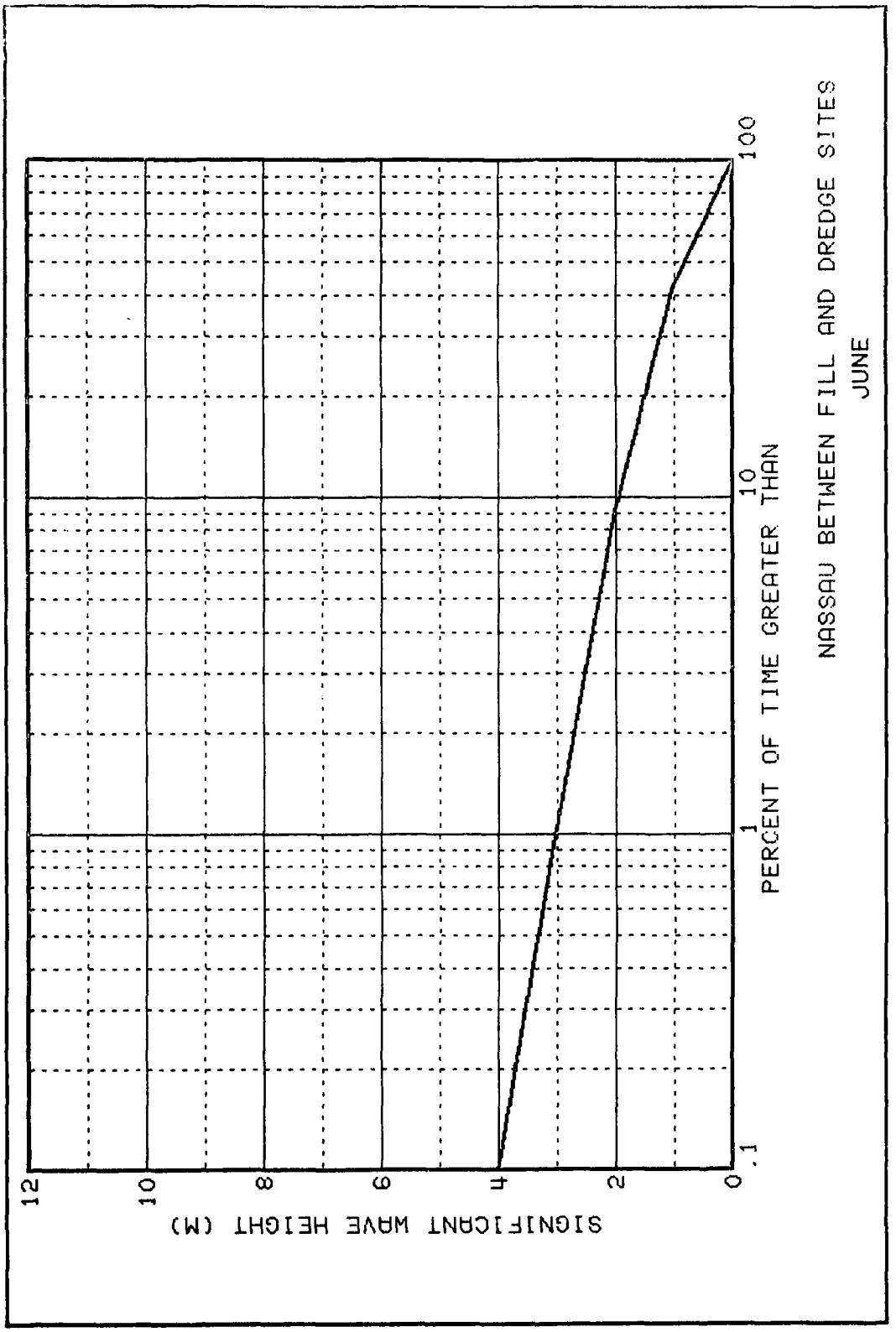
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 39.91 | 7.45 | 3.94 | 1.52 | 0.22 | 0.23 | 0.10 | 0.00 | 0.18 | 0.65 | 54.20 |
| 01-02 | 25.44 | 6.08 | 1.89 | 0.63 | 0.27 | 0.23 | 0.00 | 0.00 | 0.02 | 0.15 | 34.72 |
| 02-03 | 8.37 | 0.68 | 0.54 | 0.33 | 0.00 | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | 9.94 |
| 03-04 | 0.94 | 0.00 | 0.00 | 0.00 | 0.00 | 0.20 | 0.00 | 0.00 | 0.00 | 0.00 | 1.14 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 74.65 | 14.21 | 6.36 | 2.48 | 0.50 | 0.70 | 0.10 | 0.00 | 0.20 | 0.80 | |


NASSAU [illegible]EN FILL AND DREDGE SITES
MAY
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12
PERCENT OF TIME GREATER THAN
.1
1
10
100

NASSAU BETWEEN FILL AND DREDGE SITES

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR JUNE

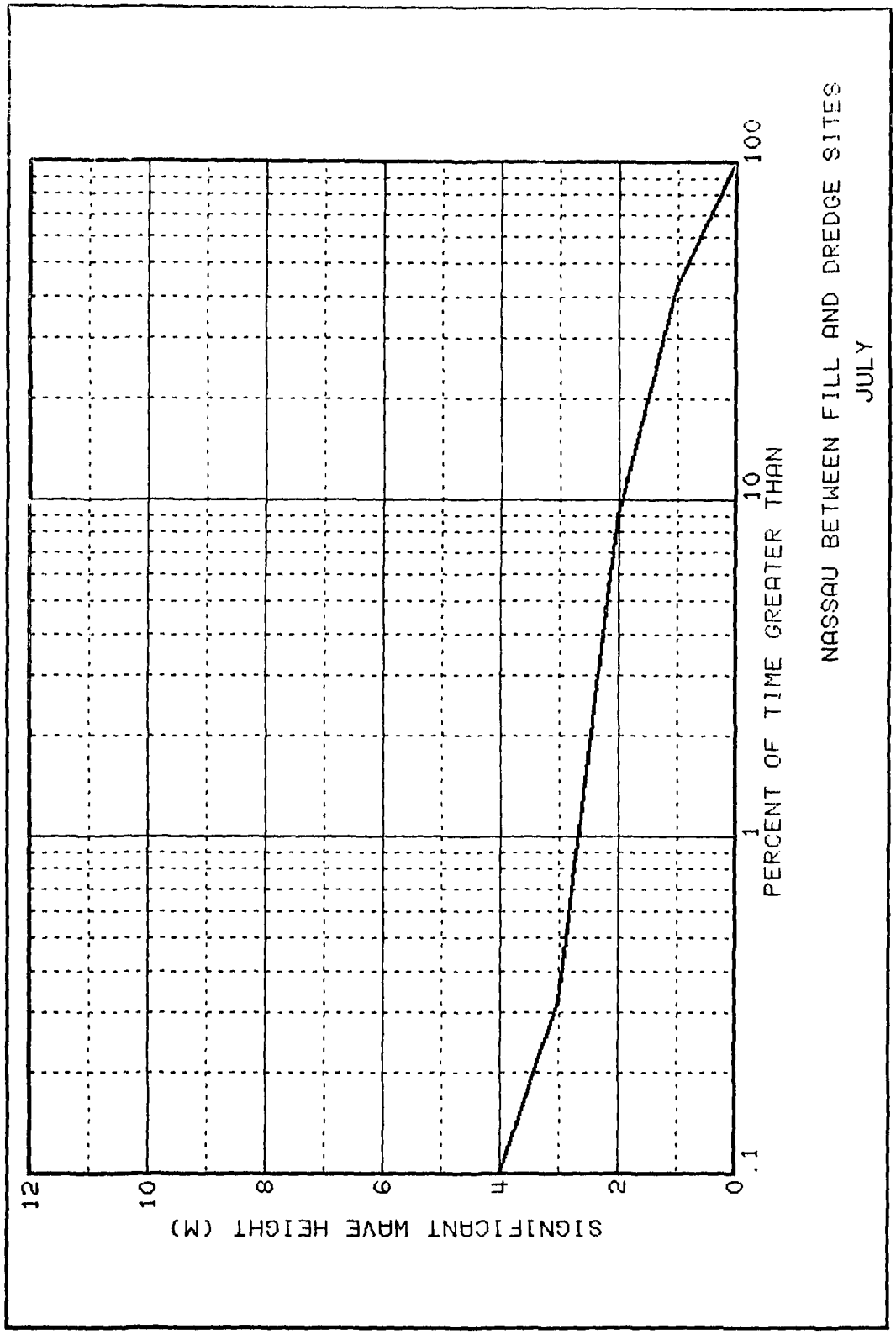
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 43.79 | 8.42 | 2.83 | 0.60 | 0.08 | 0.09 | 0.09 | 0.00 | 0.26 | 1.27 | 57.43 |
| 01-02 | 24.46 | 7.12 | 0.92 | 0.45 | 0.19 | 0.17 | 0.00 | 0.00 | 0.02 | 0.09 | 33.43 |
| 02-03 | 7.38 | 0.47 | 0.06 | 0.04 | 0.09 | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 | 8.09 |
| 03-04 | 0.75 | 0.15 | 0.00 | 0.00 | 0.00 | 0.14 | 0.00 | 0.00 | 0.00 | 0.00 | 1.04 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 76.38 | 16.17 | 3.81 | 1.09 | 0.36 | 0.45 | 0.09 | 0.00 | 0.27 | 1.36 | |


NASSAU BETWEEN FILL AND DREDGE SITES
JUNE
SIGNIFICANT WAVE HEIGHT (M)
12
10
8
6
4
2
0
PERCENT OF TIME GREATER THAN
.1
1
10
100

NASSAU BETWEEN FILL AND DREDGE SITES

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR JULY

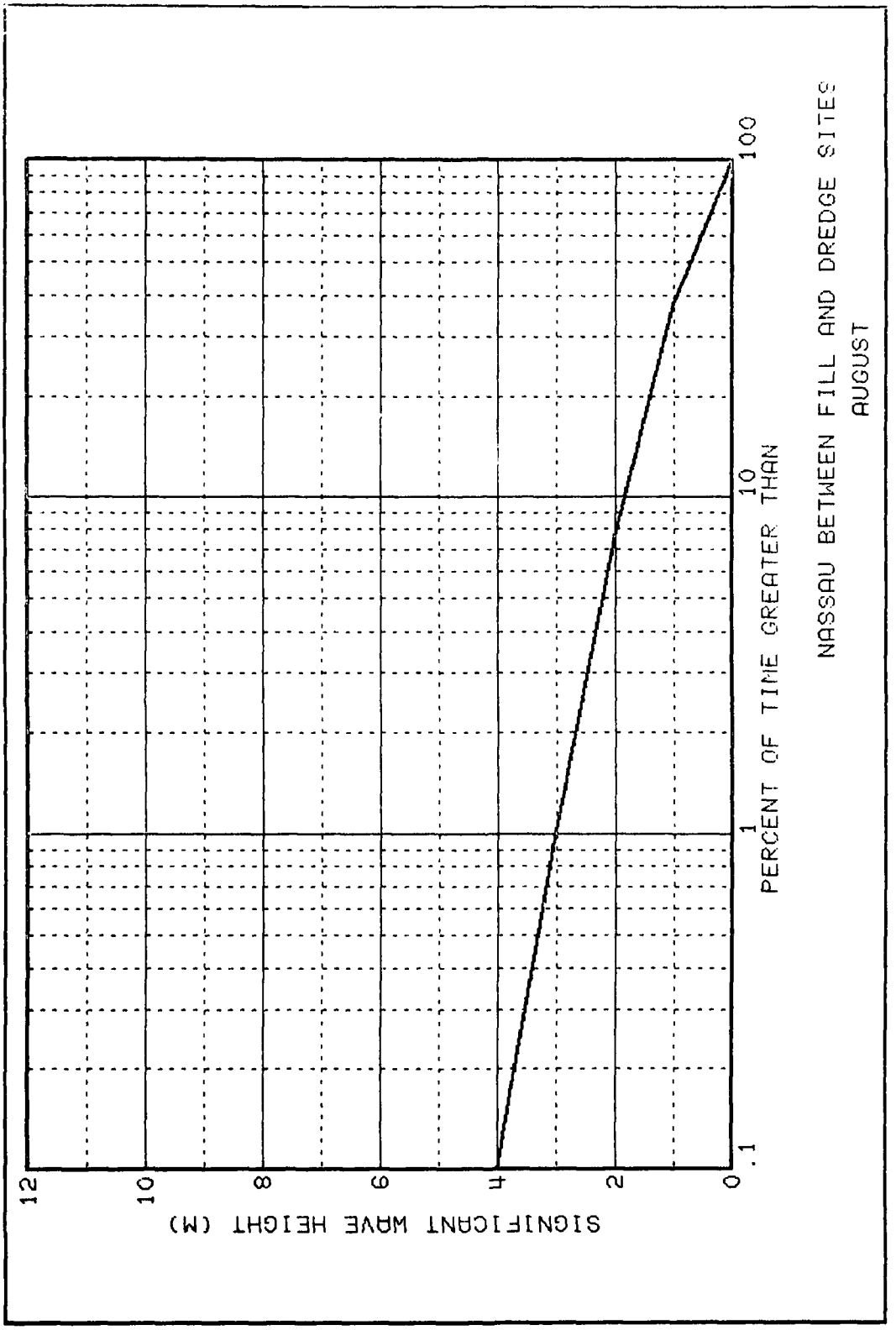
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 46.42 | 6.71 | 1.63 | 0.90 | 0.14 | 0.08 | 0.00 | 0.00 | 0.00 | 1.35 | 57.24 |
| 01-02 | 24.61 | 7.56 | 0.65 | 0.25 | 0.00 | 0.06 | 0.00 | 0.25 | 0.00 | 0.38 | 33.74 |
| 02-03 | 8.19 | 0.29 | 0.17 | 0.00 | 0.00 | 0.00 | 0.00 | 0.04 | 0.00 | 0.00 | 8.68 |
| 03-04 | 0.18 | 0.00 | 0.00 | 0.00 | 0.00 | 0.14 | 0.00 | 0.00 | 0.00 | 0.00 | 0.33 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 79.40 | 14.55 | 2.45 | 1.15 | 0.14 | 0.29 | 0.00 | 0.29 | 0.00 | 1.73 | |


NASSAU BETWEEN FILL AND DREDGE SITES
JULY
PERCENT OF TIME GREATER THAN
.1
1
10
100
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12

NASSAU BETWEEN FILL AND DREDGE SITES

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR AUGUST

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 45.67 | 9.60 | 4.44 | 1.06 | 0.56 | 0.23 | 0.01 | 0.00 | 0.00 | 1.04 | 62.61 |
| 01-02 | 19.50 | 6.05 | 2.17 | 1.03 | 0.24 | 0.44 | 0.09 | 0.00 | 0.00 | 0.27 | 29.80 |
| 02-03 | 5.69 | 0.38 | 0.25 | 0.08 | 0.07 | 0.09 | 0.00 | 0.00 | 0.00 | 0.00 | 6.56 |
| 03-04 | 0.82 | 0.09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.11 | 0.00 | 0.00 | 0.00 | 1.02 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 71.68 | 16.12 | 6.86 | 2.18 | 0.87 | 0.76 | 0.22 | 0.00 | 0.00 | 1.31 | |


NASSAU BETWEEN FILL AND DREDGE SITES
AUGUST
PERCENT OF TIME GREATER THAN
.1
1
10
100
SIGNIFICANT WAVE HEIGHT (M)
0
2
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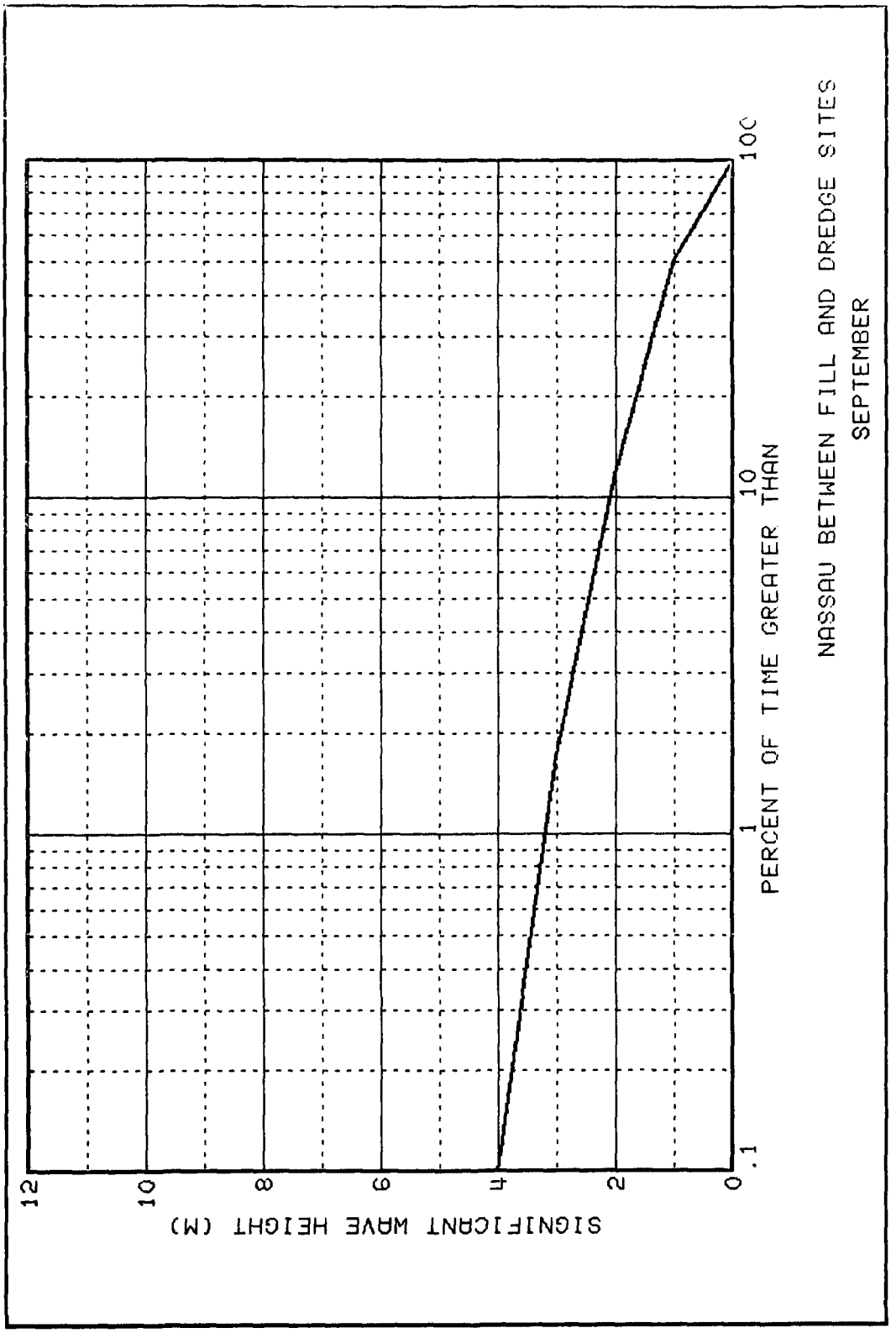
12

NASSAU BETWEEN FILL AND DREDGE SITES

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR SEPTEMBER

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 32.75 | 9.29 | 4.68 | 0.91 | 0.04 | 0.11 | 0.16 | 0.00 | 0.53 | 0.78 | 49.25 |
| 01-02 | 21.89 | 9.62 | 3.79 | 2.20 | 0.64 | 0.59 | 0.02 | 0.00 | 0.02 | 0.09 | 38.95 |
| 02-03 | 6.02 | 2.40 | 0.26 | 0.59 | 0.42 | 0.34 | 0.06 | 0.00 | 0.00 | 0.00 | 10.08 |
| 03-04 | 0.99 | 0.27 | 0.09 | 0.07 | 0.00 | 0.30 | 0.00 | 0.00 | 0.00 | 0.00 | 1.71 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 61.65 | 21.57 | 8.82 | 3.86 | 1.10 | 1.34 | 0.24 | 0.00 | 0.55 | 0.87 | |


NASSAU BETWEEN FILL AND DREDGE SITES
SEPTEMBER
PERCENT OF TIME GREATER THAN
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10
100
SIGNIFICANT WAVE HEIGHT (M)
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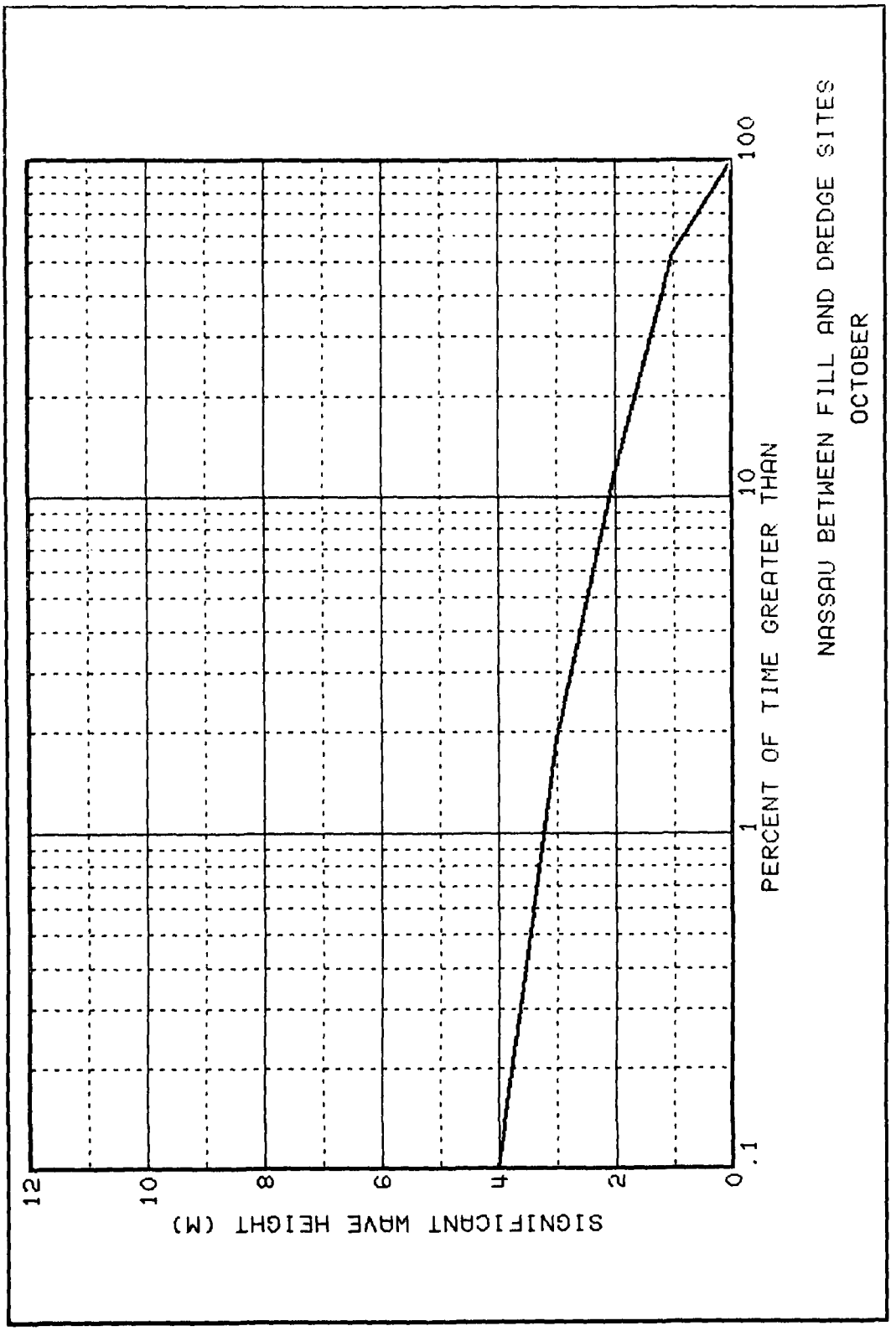
10
12

NASSAU BETWEEN FILL AND DREDGE SITES

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR OCTOBER

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 27.60 | 10.40 | 6.86 | 1.00 | 0.28 | 0.04 | 0.00 | 0.00 | 0.00 | 0.63 | 46.81 |
| 01-02 | 19.02 | 11.91 | 6.01 | 3.32 | 0.64 | 0.41 | 0.00 | 0.00 | 0.00 | 0.10 | 41.41 |
| 02-03 | 5.28 | 2.58 | 0.46 | 1.03 | 0.39 | 0.06 | 0.07 | 0.00 | 0.00 | 0.00 | 9.88 |
| 03-04 | 1.24 | 0.24 | 0.01 | 0.19 | 0.22 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.90 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 53.13 | 25.14 | 13.34 | 5.54 | 1.53 | 0.51 | 0.07 | 0.00 | 0.00 | 0.73 | |


NASSAU BETWEEN FILL AND DREDGE SITES
OCTOBER
PERCENT OF TIME GREATER THAN
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100
SIGNIFICANT WAVE HEIGHT (M)
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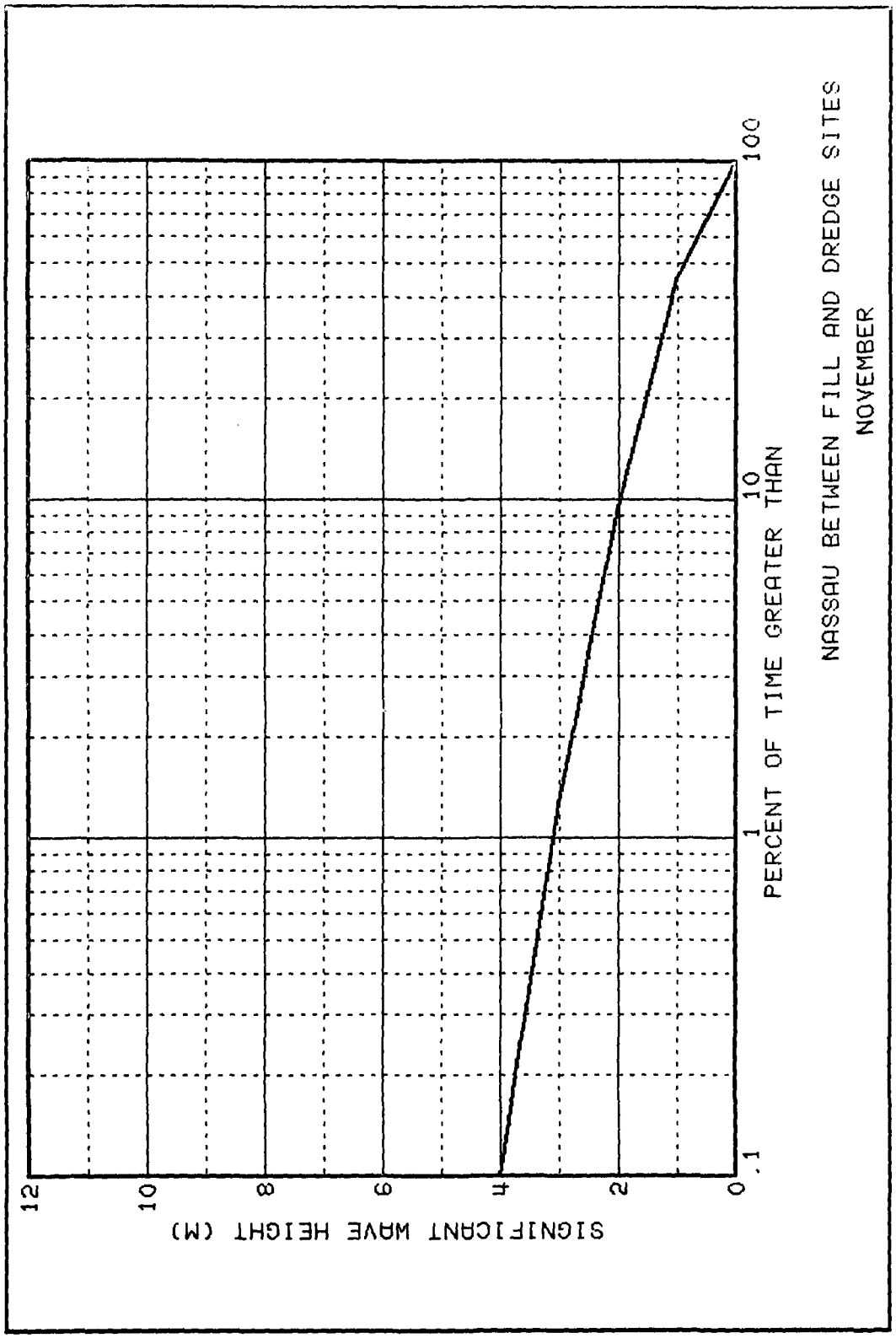
NASSAU BETWEEN FILL AND DREDGE SITES

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR NOVEMBER

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 37.27 | 10.65 | 4.94 | 1.80 | 0.09 | 0.02 | 0.00 | 0.00 | 0.00 | 0.34 | 55.11 |
| 01-02 | 19.21 | 9.50 | 4.48 | 1.39 | 0.38 | 0.24 | 0.01 | 0.00 | 0.00 | 0.15 | 35.36 |
| 02-03 | 5.23 | 1.50 | 0.42 | 0.61 | 0.28 | 0.15 | 0.08 | 0.00 | 0.00 | 0.00 | 8.25 |
| 03-04 | 0.85 | 0.25 | 0.00 | 0.17 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.27 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 62.56 | 21.90 | 9.83 | 3.96 | 0.74 | 0.41 | 0.09 | 0.00 | 0.00 | 0.50 | |


NASSAU BETWEEN FILL AND DREDGE SITES
NOVEMBER
PERCENT OF TIME GREATER THAN
.1
1
10
100
SIGNIFICANT WAVE HEIGHT (M)
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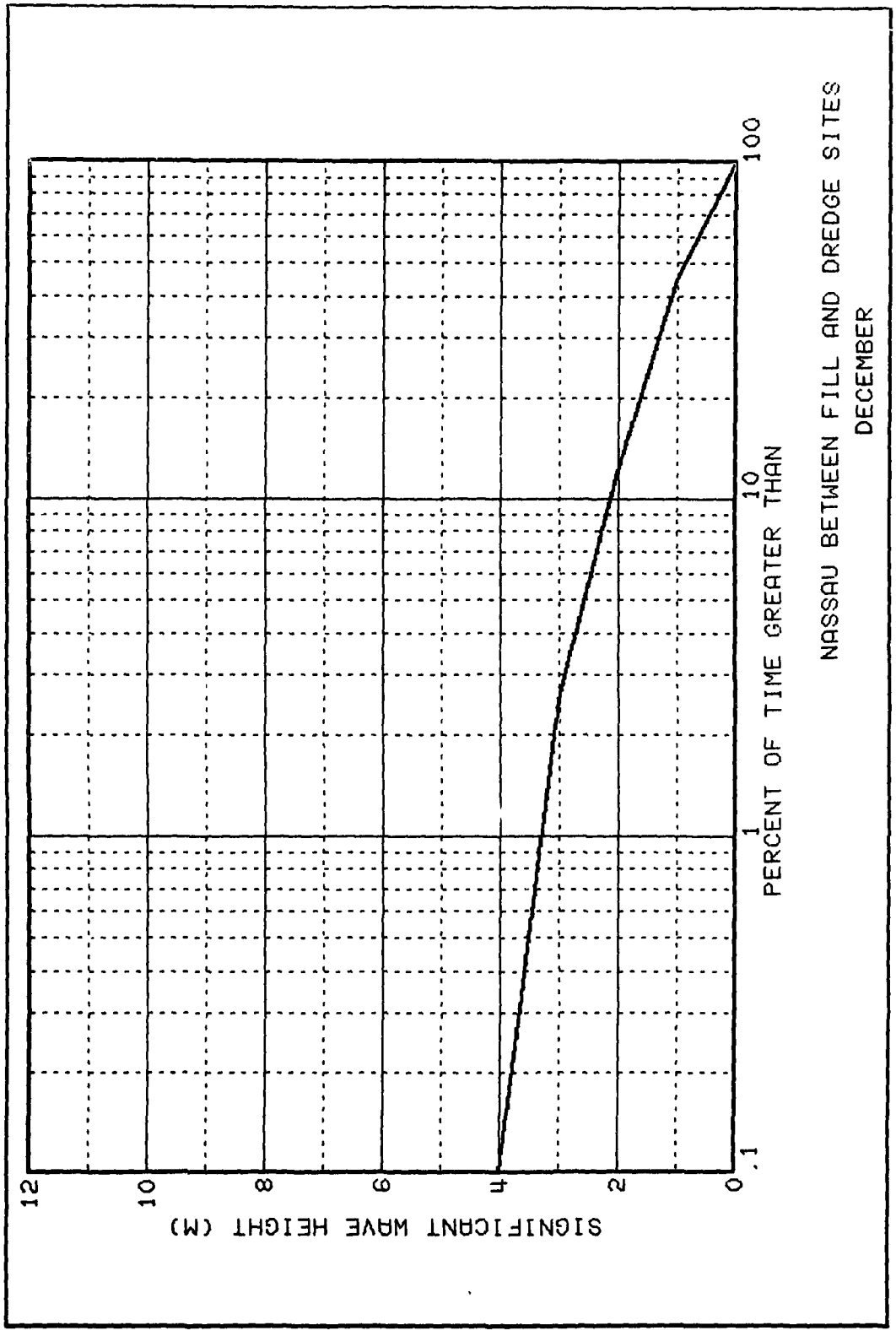
10
12

NASSAU BETWEEN FILL AND DREDGE SITES

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR DECEMBER

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 39.20 | 9.85 | 4.10 | 0.79 | 0.55 | 0.19 | 0.22 | 0.00 | 0.00 | 0.62 | 55.52 |
| 01-02 | 19.31 | 8.26 | 3.41 | 1.16 | 0.00 | 0.14 | 0.00 | 0.00 | 0.00 | 0.04 | 32.33 |
| 02-03 | 7.53 | 0.82 | 0.44 | 0.25 | 0.52 | 0.05 | 0.00 | 0.00 | 0.00 | 0.00 | 9.60 |
| 03-04 | 1.40 | 0.49 | 0.00 | 0.22 | 0.25 | 0.18 | 0.00 | 0.00 | 0.00 | 0.00 | 2.54 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 67.44 | 19.42 | 7.95 | 2.43 | 1.32 | 0.55 | 0.22 | 0.00 | 0.00 | 0.66 | |


NASSAU BETWEEN FILL AND DREDGE SITES
DECEMBER
PERCENT OF TIME GREATER THAN
.1
1
10
100
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
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10
12

NASSAU BETWEEN FILL AND DREDGE SITES

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD

WAVE DIRECTION = 0

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 01-02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 02-03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 03-04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |

NASSAU BETWEEN FILL AND DREDGE SITES

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD

WAVE DIRECTION = 30

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 9.05 | 2.12 | 0.58 | 0.18 | 0.03 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 11.97 |
| 01-02 | 0.05 | 0.14 | 0.41 | 0.29 | 0.05 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.95 |
| 02-03 | 0.00 | 0.00 | 0.05 | 0.05 | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.14 |
| 03-04 | 0.00 | 0.00 | 0.00 | 0.01 | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.04 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 9.10 | 2.26 | 1.04 | 0.53 | 0.14 | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | |

NASSAU BETWEEN FILL AND DREDGE SITES

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD

WAVE DIRECTION = 60

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 11.85 | 3.08 | 1.48 | 0.30 | 0.08 | 0.01 | 0.04 | 0.00 | 0.02 | 0.23 | 17.10 |
| 01-02 | 5.34 | 2.94 | 1.41 | 0.64 | 0.15 | 0.08 | 0.01 | 0.00 | 0.01 | 0.04 | 10.62 |
| 02-03 | 0.54 | 0.57 | 0.12 | 0.24 | 0.11 | 0.05 | 0.02 | 0.01 | 0.00 | 0.00 | 1.65 |
| 03-04 | 0.14 | 0.05 | 0.00 | 0.04 | 0.03 | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.30 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 17.88 | 6.64 | 3.00 | 1.22 | 0.38 | 0.19 | 0.07 | 0.01 | 0.02 | 0.28 | |

NASSAU BETWEEN FILL AND DREDGE SITES

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD

WAVE DIRECTION = 90

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 3.88 | 1.01 | 1.01 | 0.25 | 0.14 | 0.09 | 0.03 | 0.00 | 0.04 | 0.15 | 6.59 |
| 01-02 | 4.44 | 1.61 | 0.51 | 0.23 | 0.09 | 0.10 | 0.00 | 0.00 | 0.00 | 0.01 | 6.99 |
| 02-03 | 1.22 | 0.33 | 0.02 | 0.02 | 0.02 | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | 1.63 |
| 03-04 | 0.16 | 0.05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.21 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 9.70 | 2.99 | 1.54 | 0.50 | 0.24 | 0.21 | 0.03 | 0.00 | 0.04 | 0.15 | |

NASSAU BETWEEN FILL AND DREDGE SITES

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD

WAVE DIRECTION = 120

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 3.80 | 1.23 | 0.65 | 0.25 | 0.01 | 0.01 | 0.01 | 0.01 | 0.05 | 0.20 | 6.21 |
| 01-02 | 3.45 | 0.83 | 0.05 | 0.11 | 0.04 | 0.04 | 0.01 | 0.01 | 0.00 | 0.03 | 4.56 |
| 02-03 | 1.18 | 0.03 | 0.00 | 0.06 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 1.30 |
| 03-04 | 0.20 | 0.00 | 0.00 | 0.01 | 0.00 | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.23 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 8.63 | 2.09 | 0.70 | 0.43 | 0.06 | 0.09 | 0.02 | 0.02 | 0.05 | 0.23 | |

NASSAU BETWEEN FILL AND DREDGE SITES

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD

WAVE DIRECTION = 150

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 10.32 | 1.63 | 0.32 | 0.04 | 0.01 | 0.01 | 0.01 | 0.00 | 0.04 | 0.19 | 12.57 |
| 01-02 | 8.32 | 2.65 | 0.59 | 0.04 | 0.05 | 0.02 | 0.00 | 0.01 | 0.00 | 0.06 | 11.74 |
| 02-03 | 3.90 | 0.41 | 0.18 | 0.03 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 4.53 |
| 03-04 | 0.49 | 0.09 | 0.04 | 0.02 | 0.00 | 0.03 | 0.01 | 0.00 | 0.00 | 0.00 | 0.67 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 23.02 | 4.78 | 1.11 | 0.14 | 0.06 | 0.07 | 0.02 | 0.01 | 0.05 | 0.24 | |

| | | |

# APPENDIX F: AVERAGE WAVE CLIMATE AT DADE COUNTY, FLA.

1. Appendix F contains the following information for the Dade County, Fla., project site:

   a. Tabulations of monthly percent occurrence of wave-height/period combinations.

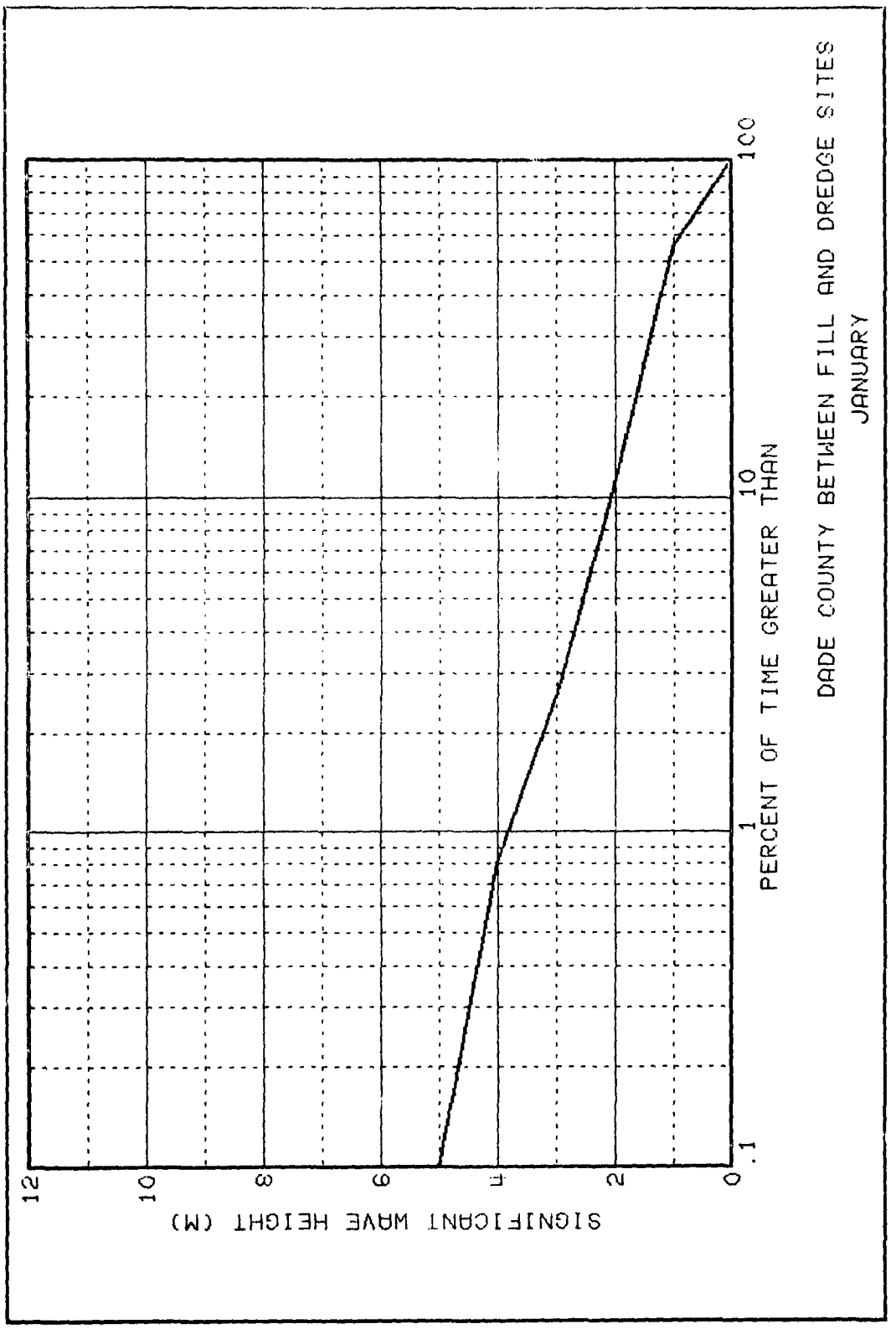
   b. Tabulations of annual percent occurrence by azimuth direction of wave-height/period combinations.

   c. Plots of monthly significant wave-height occurrence in terms of the total percent time per month that these heights are exceeded.

DARK COUNTY BETWEEN FILL AND OFFSHORE SITES

CUMULATIVE SEA - SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR JANUARY

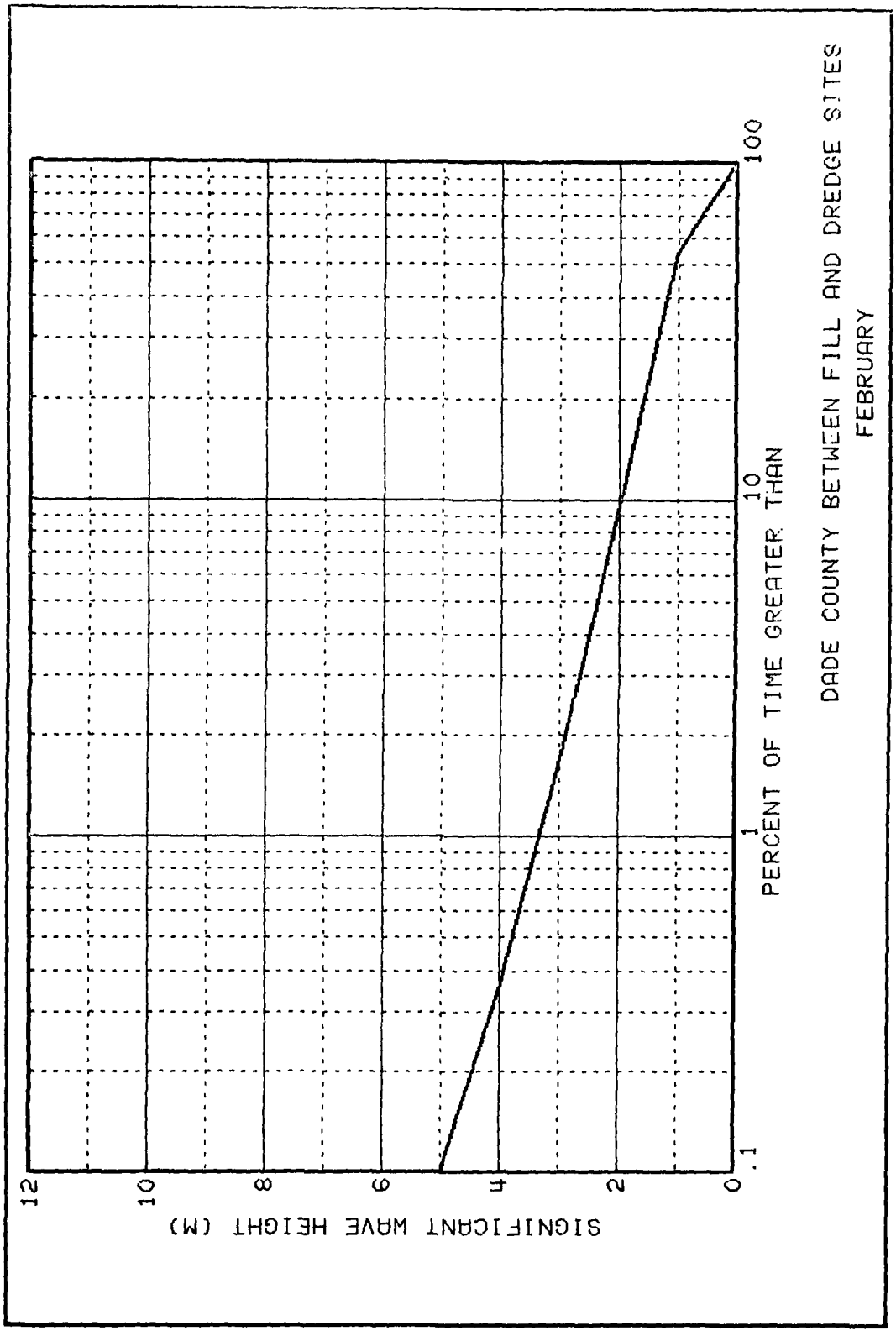
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 05-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | [illegible] | 7.05 | 1.34 | 0.58 | 0.38 | 0.06 | 0.06 | 0.00 | [illegible] | 0.87 | 40.00 |
| 01-02 | 23.38 | 11.16 | 3.20 | 0.52 | 0.86 | 0.16 | 0.02 | 0.00 | 0.08 | 0.37 | [illegible] |
| 02-03 | 2.81 | 3.08 | 1.07 | 0.38 | 0.34 | 0.09 | [illegible] | 0.00 | 0.00 | 0.19 | 8.00 |
| 03-04 | 0.17 | 0.27 | 0.65 | 0.20 | 0.26 | 0.03 | 0.00 | 0.01 | 0.00 | 0.05 | 1.70 |
| 04-05 | 0.11 | 0.00 | 0.05 | 0.07 | 0.00 | 0.15 | 0.00 | 0.06 | 0.06 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | [illegible] | [illegible] |
| TOTAL | 65.70 | 21.57 | 8.04 | 2.15 | 1.85 | 0.49 | 0.12 | 0.06 | 0.19 | 1.47 | |


DADE COUNTY BETWEEN FILL AND DREDGE SITES
JANUARY
PERCENT OF TIME GREATER THAN
.1
1
10
100
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12

DADE COUNTY BETWEEN FILL AND DREDGE SITES

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR FEBRUARY

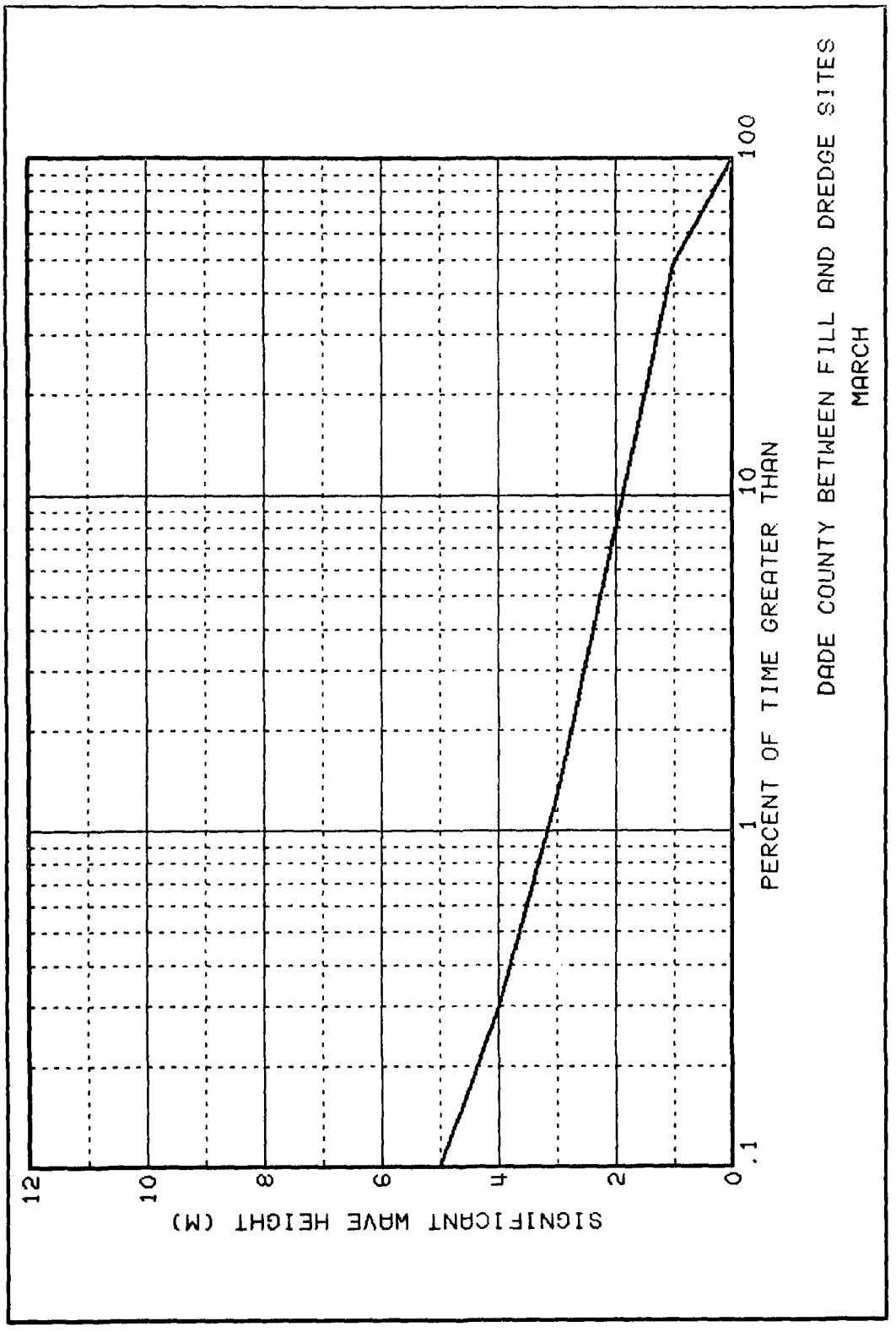
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 35.47 | 7.30 | 1.77 | 0.28 | 0.15 | 0.05 | 0.00 | 0.00 | 0.11 | 0.88 | 45.95 |
| 01-02 | 28.42 | 11.29 | 3.32 | 0.89 | 0.29 | 0.04 | 0.00 | 0.00 | 0.02 | 0.55 | 44.03 |
| 02-03 | 2.13 | 2.28 | 2.10 | 0.52 | 0.17 | 0.10 | 0.09 | 0.00 | 0.00 | 0.11 | 7.55 |
| 03-04 | 0.17 | 0.58 | 0.49 | 0.22 | 0.02 | 0.01 | 0.03 | 0.00 | 0.00 | 0.00 | 1.20 |
| 04-05 | 0.04 | 0.00 | 0.12 | 0.08 | 0.06 | 0.05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.35 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 66.23 | 21.20 | 7.80 | 2.00 | 0.69 | 0.25 | 0.13 | 0.00 | 0.13 | 1.50 | |


DADE COUNTY BETWEEN FILL AND DREDGE SITES
FEBRUARY
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12
PERCENT OF TIME GREATER THAN
.1
1
10
100

DADE COUNTY BETWEEN FILL AND DREDGE SITES

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR MARCH

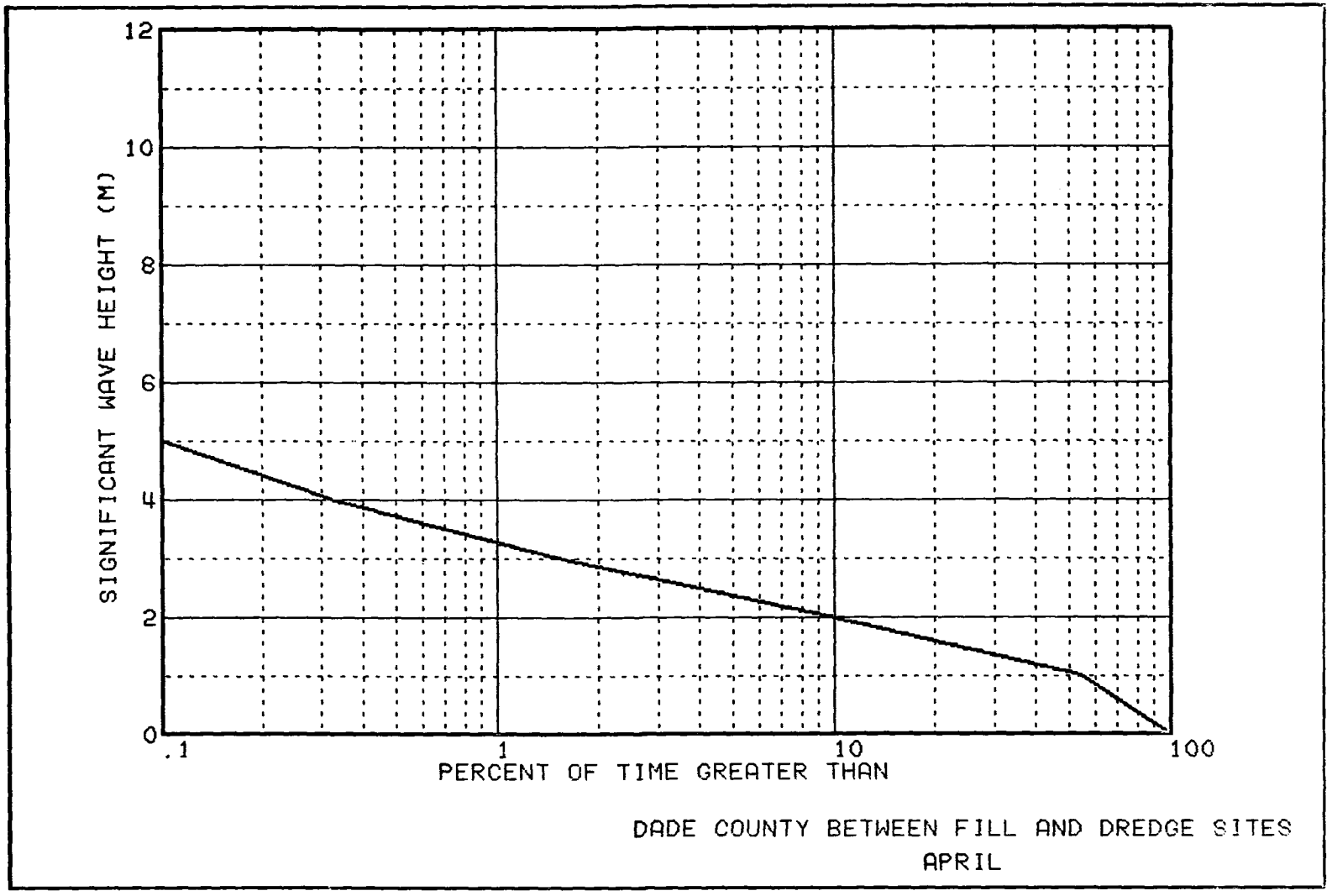
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 5-9 | 9-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 39.03 | 8.57 | 1.94 | 0.37 | 0.26 | 0.24 | 0.00 | 0.00 | 0.23 | 0.90 | 51.34 |
| 01-02 | 26.81 | 9.28 | 3.09 | 0.72 | 0.13 | 0.10 | 0.06 | 0.00 | 0.10 | 0.46 | 40.80 |
| 02-03 | 2.76 | 2.09 | 1.09 | 0.11 | 0.19 | 0.12 | 0.00 | 0.00 | 0.07 | 0.17 | 6.60 |
| 03-04 | 0.21 | 0.24 | 0.32 | 0.09 | 0.05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.93 |
| 04-05 | 0.08 | 0.00 | 0.12 | 0.00 | 0.00 | 0.06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.29 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 68.89 | 19.30 | 6.56 | 1.32 | 0.59 | 0.52 | 0.06 | 0.00 | 0.40 | 1.55 | |


DADE COUNTY BETWEEN FILL AND DREDGE SITES
MARCH
PERCENT OF TIME GREATER THAN
.1
1
10
100
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12

DADE COUNTY BETWEEN FILL AND DREDGE SITES

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR APRIL

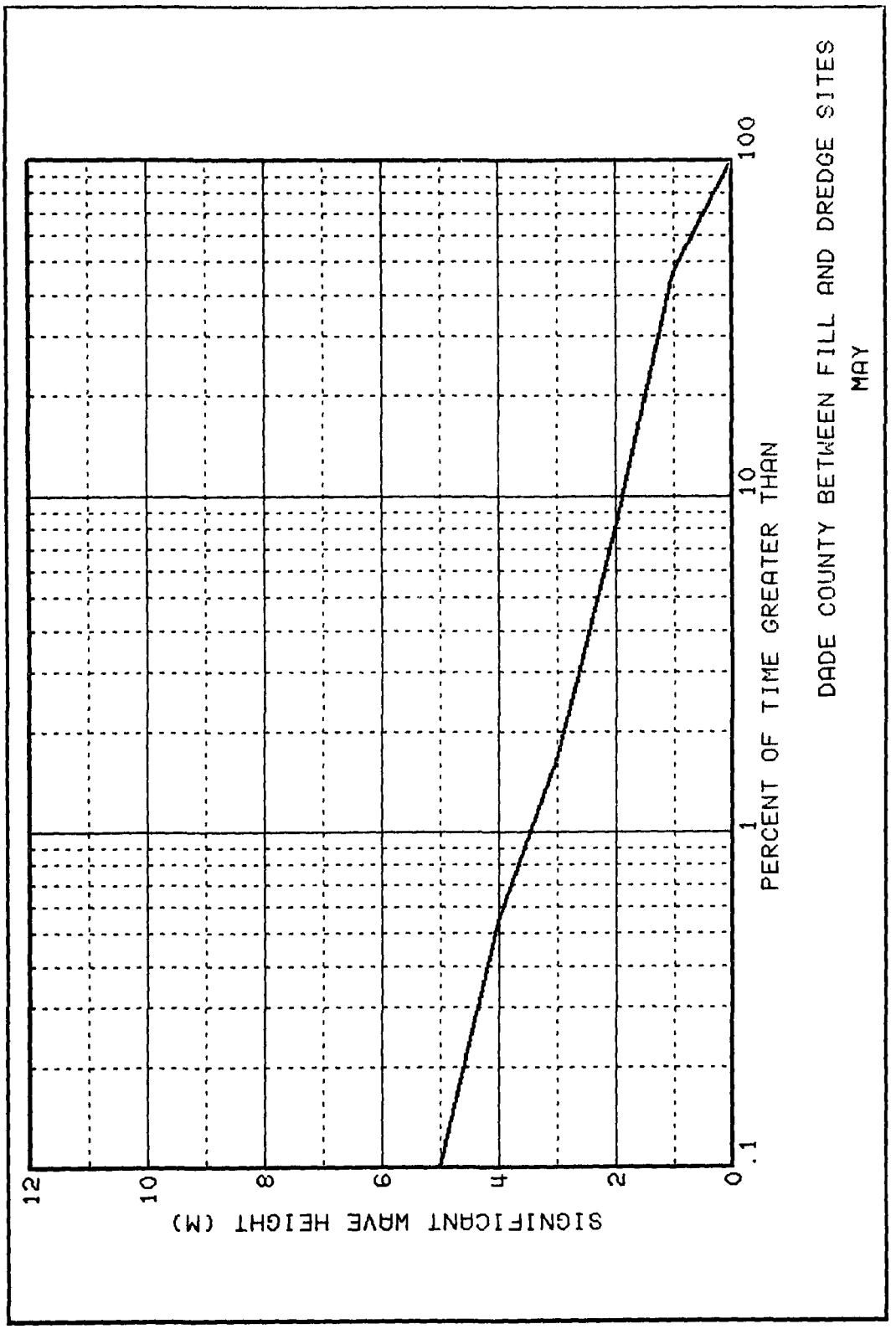
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 36.22 | 5.16 | 1.29 | 0.52 | 0.15 | 0.00 | 0.00 | 0.04 | 0.00 | 1.06 | 45.43 |
| 01-02 | 33.92 | 12.20 | 2.16 | 0.85 | 0.25 | 0.06 | 0.00 | 0.02 | 0.00 | 0.43 | 44.98 |
| 02-03 | 3.89 | 2.38 | 1.35 | 0.44 | 0.22 | 0.05 | 0.00 | 0.05 | 0.03 | 0.11 | 8.09 |
| 03-04 | 0.82 | 0.32 | 0.25 | 0.20 | 0.08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.19 |
| 04-05 | 0.18 | 0.00 | 0.06 | 0.05 | 0.08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.32 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 83.43 | 21.66 | 5.10 | 2.00 | 0.78 | 0.11 | 0.00 | 0.11 | 0.03 | 1.66 | |


12
10
8
6
4
2
0
SIGNIFICANT WAVE HEIGHT (M)
.1
1
10
100
PERCENT OF TIME GREATER THAN
DADE COUNTY BETWEEN FILL AND DREDGE SITES
APRIL

DARE COUNTY BETWEEN FILL AND DREDGE SITES

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR MAY

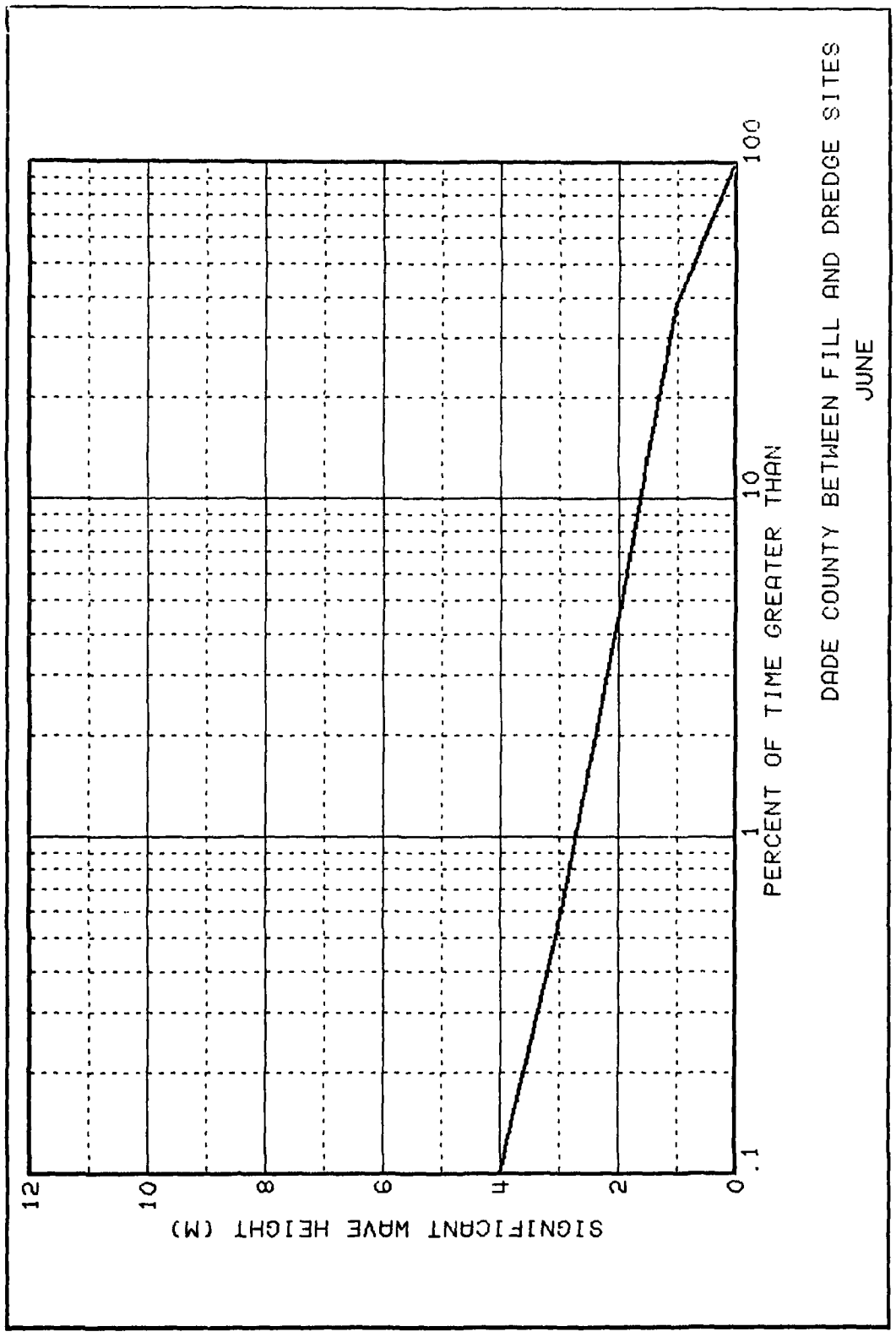
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 46.16 | 4.02 | 0.68 | 0.12 | 0.02 | 0.21 | 0.00 | 0.00 | 0.36 | 1.00 | 53.47 |
| 01-02 | 25.96 | 3.97 | 1.30 | 0.36 | 0.24 | 0.00 | 0.02 | 0.00 | 0.16 | 0.58 | 33.34 |
| 02-03 | 3.24 | 2.40 | 0.34 | 0.31 | 0.15 | 0.04 | 0.04 | 0.00 | 0.00 | 0.21 | 6.33 |
| 03-04 | 0.12 | 0.38 | 0.20 | 0.15 | 0.07 | 0.08 | 0.04 | 0.00 | 0.00 | 0.08 | 1.11 |
| 04-05 | 0.00 | 0.09 | 0.22 | 0.05 | 0.04 | 0.09 | 0.00 | 0.00 | 0.05 | 0.00 | 0.54 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 75.48 | 10.71 | 2.74 | 0.51 | 0.52 | 0.42 | 0.10 | 0.00 | 0.57 | 1.02 | |


DADE COUNTY BETWEEN FILL AND DREDGE SITES
MAY
PERCENT OF TIME GREATER THAN
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12
.1
1
10
100

DADE COUNTY BETWEEN FILL AND DREDGE SITES

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR JUNE

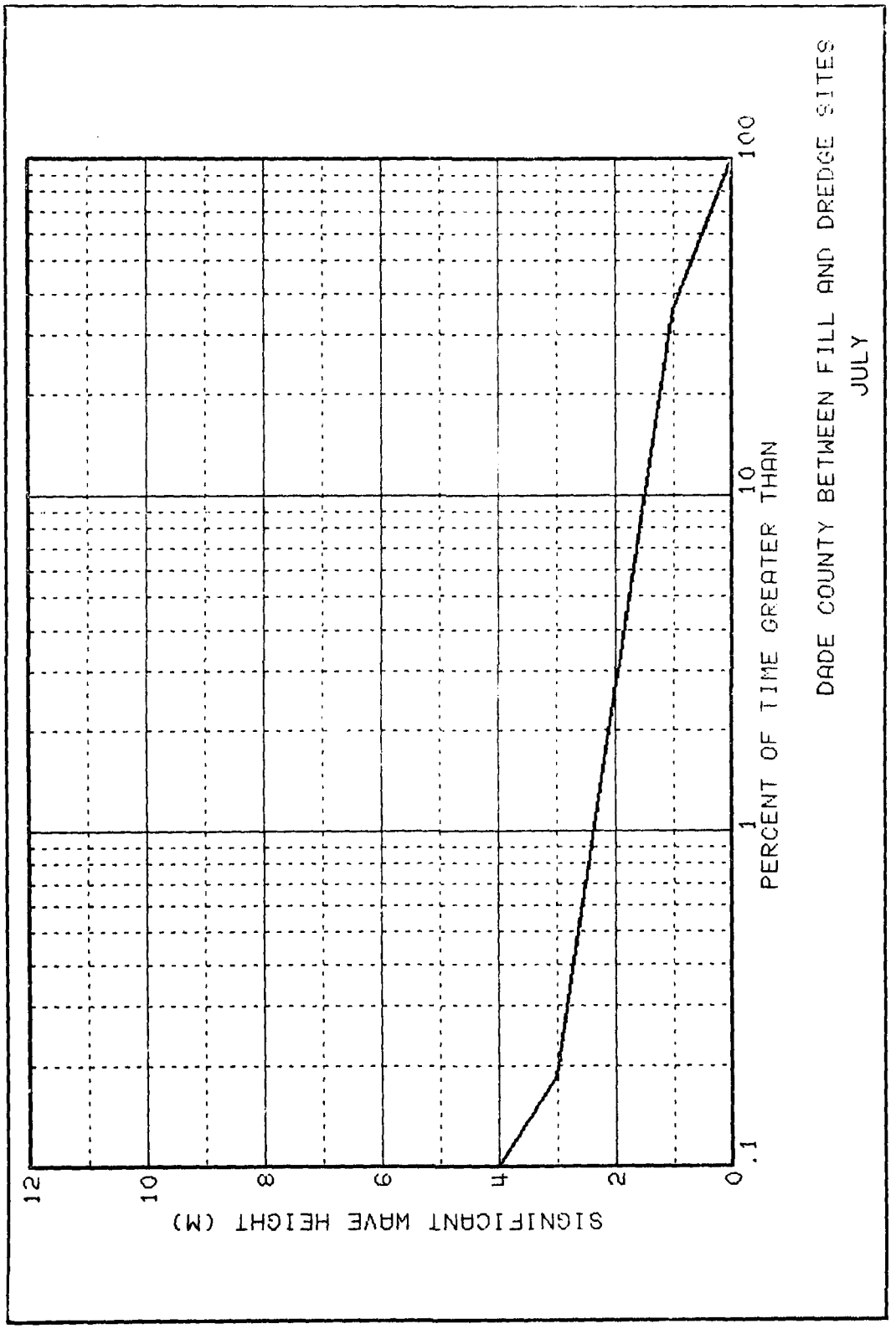
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 52.10 | 5.60 | 1.14 | 0.58 | 0.00 | 0.41 | 0.00 | 0.05 | 0.45 | 1.52 | 61.68 |
| 01-02 | 24.47 | 6.72 | 1.41 | 0.10 | 0.17 | 0.17 | 0.00 | 0.00 | 0.23 | 0.70 | 33.97 |
| 02-03 | 1.00 | 1.33 | 0.73 | 0.15 | 0.23 | 0.10 | 0.00 | 0.00 | 0.06 | 0.10 | 3.80 |
| 03-04 | 1.00 | 0.07 | 1.14 | 0.05 | 0.04 | 0.07 | 0.00 | 0.00 | 0.00 | 0.03 | 0.40 |
| 04-05 | 0.00 | 0.00 | 0.06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.06 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 77.58 | 13.73 | 3.47 | 0.88 | 0.45 | 0.74 | 0.00 | 0.05 | 0.74 | 2.35 | |


DADE COUNTY BETWEEN FILL AND DREDGE SITES
JUNE
PERCENT OF TIME GREATER THAN
.1
1
10
100
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12

DADE COUNTY BETWEEN TILL AND DREDGE SITES

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR JULY

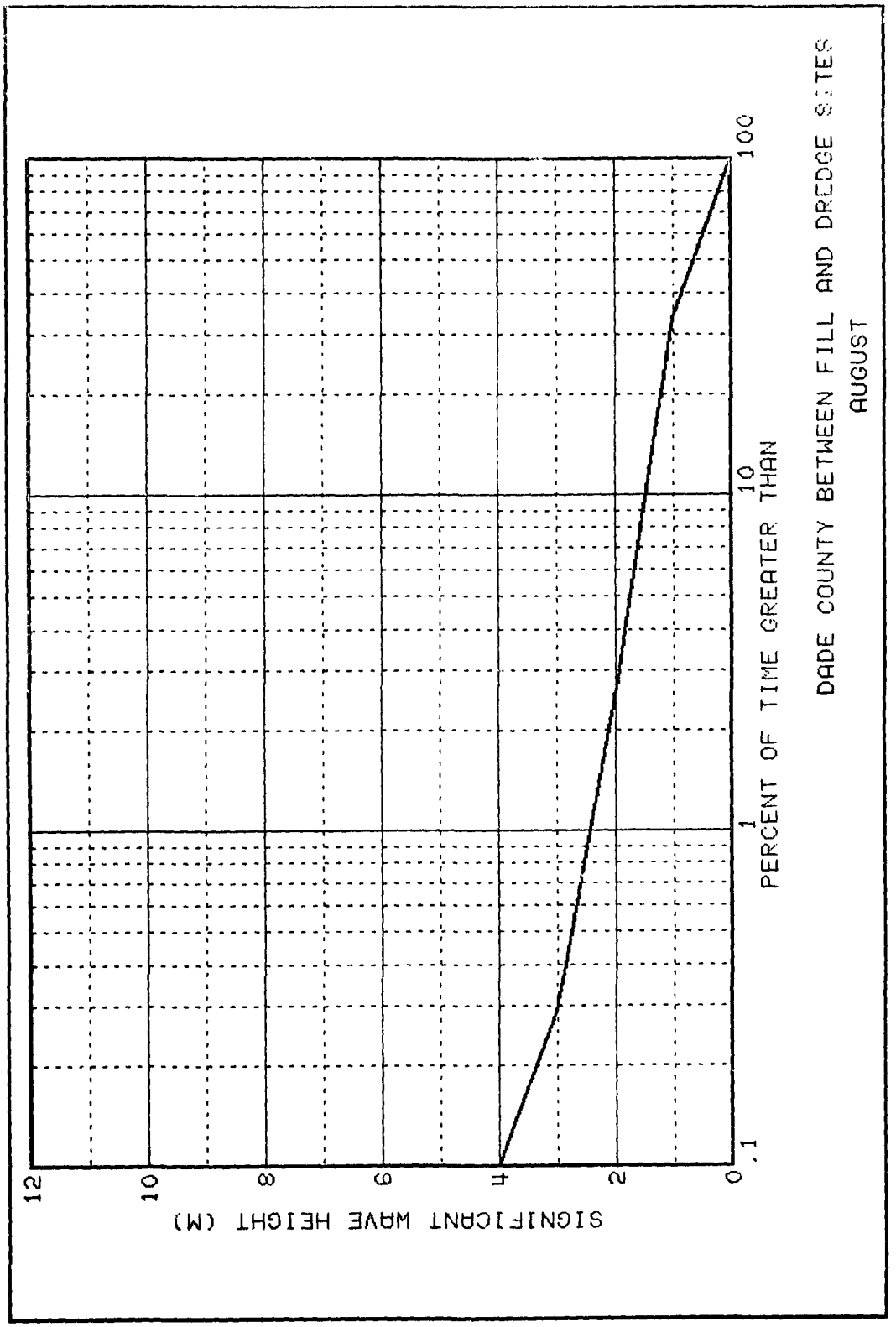
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 5-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 55.58 | 4.00 | 0.90 | 0.36 | 0.08 | 0.05 | 0.10 | 0.00 | 0.22 | 2.05 | 64.20 |
| 01-02 | 25.48 | 6.32 | 1.11 | 0.48 | 0.07 | 0.08 | 0.04 | 0.02 | 0.10 | 1.06 | 38.09 |
| 02-03 | .68 | 0.85 | 0.35 | 0.13 | 0.07 | 0.02 | 0.00 | 0.08 | 0.00 | 0.18 | 2.42 |
| 03-04 | 0.07 | 0.00 | 0.02 | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.14 |
| 04-05 | 0.00 | 0.00 | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 10-11 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 11-12 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 12-13 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 13-14 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 14-15 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 15-16 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 16-17 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 17-18 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 18-19 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 19-20 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 20-21 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 21-22 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 22-23 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 23-24 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| >24 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |


DADE COUNTY BETWEEN FILL AND DREDGE SITES
JULY
PERCENT OF TIME GREATER THAN
.1
1
10
100
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12

DADE COUNTY BETWEEN FILL AND DREDGE SITES

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR AUGUST

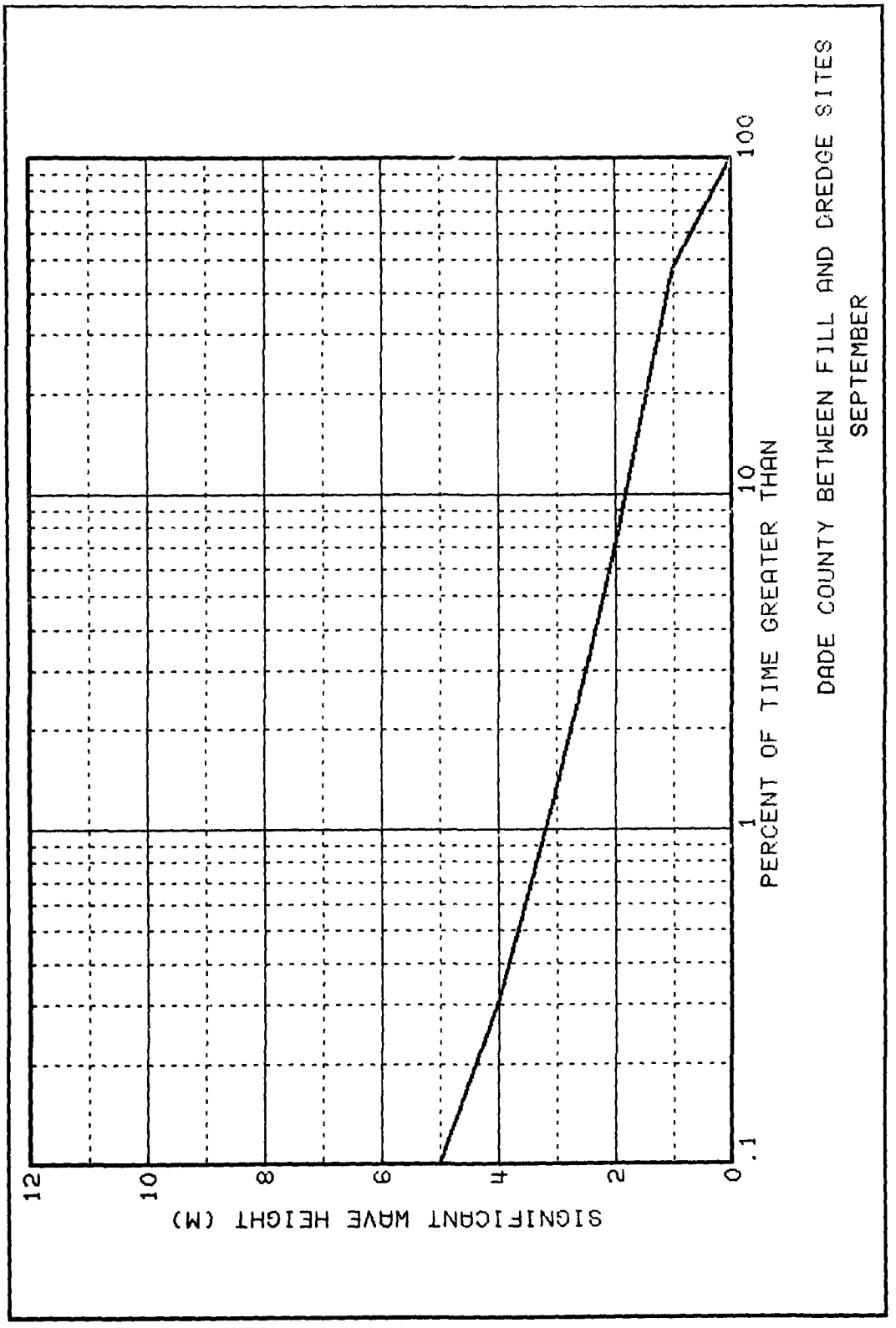
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 58.88 | 3.80 | 1.01 | 0.31 | 0.17 | 0.04 | 0.14 | 0.00 | 0.39 | 1.55 | 66.30 |
| 01-02 | 22.47 | 6.33 | 1.04 | 0.19 | 0.17 | 0.10 | 0.01 | 0.00 | 0.13 | 0.75 | 31.20 |
| 02-03 | 0.81 | 0.69 | 0.23 | 0.22 | 0.09 | 0.02 | 0.00 | 0.05 | 0.03 | 0.06 | 2.19 |
| 03-04 | 0.00 | 0.06 | 0.08 | 0.03 | 0.02 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 0.20 |
| 04-05 | 0.00 | 0.03 | 0.01 | 0.05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.09 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 82.16 | 10.91 | 2.37 | 0.81 | 0.45 | 0.15 | 0.15 | 0.05 | 0.55 | 2.37 | |


DADE COUNTY BETWEEN FILL AND DREDGE SITES
AUGUST
PERCENT OF TIME GREATER THAN
.1
1
10
100
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12

DADE COUNTY BETWEEN FILL AND DREDGE SITES

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR SEPTEMBER

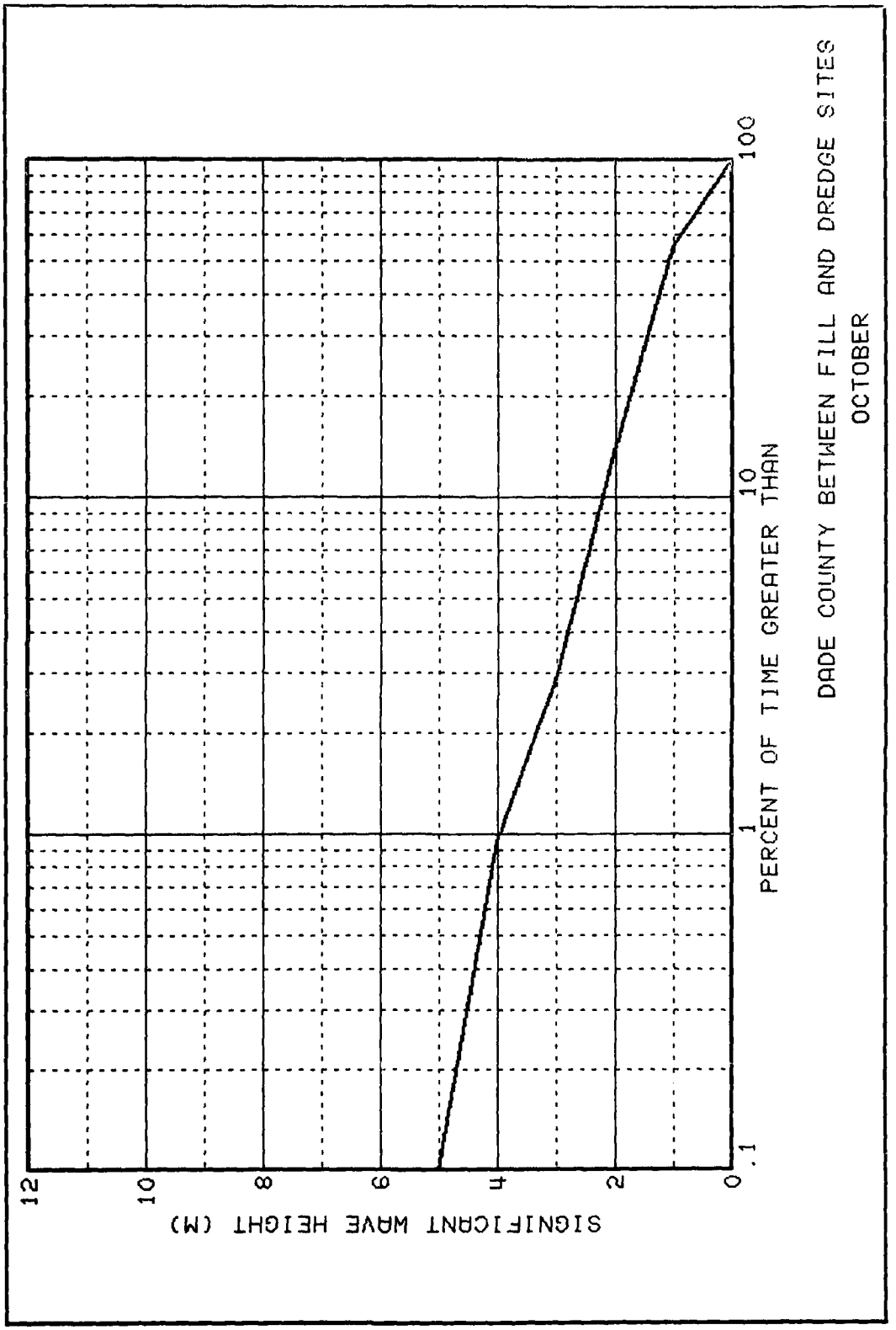
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 44.54 | 5.50 | 1.11 | 0.34 | 0.15 | 0.28 | 0.00 | 0.00 | 0.18 | 0.75 | 52.84 |
| 01-02 | 27.69 | 9.23 | 1.93 | 0.48 | 0.29 | 0.11 | 0.00 | 0.00 | 0.08 | 0.40 | 40.22 |
| 02-03 | 1.83 | 1.85 | 1.25 | 0.35 | 0.04 | 0.28 | 0.00 | 0.00 | 0.03 | 0.02 | 5.65 |
| 03-04 | 0.09 | 0.19 | 0.25 | 0.19 | 0.08 | 0.19 | 0.00 | 0.00 | 0.00 | 0.00 | 0.99 |
| 04-05 | 0.04 | 0.00 | 0.15 | 0.07 | 0.02 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.31 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 74.19 | 16.77 | 4.69 | 1.42 | 0.59 | 0.88 | 0.00 | 0.00 | 0.29 | 1.17 | |


DADE COUNTY BETWEEN FILL AND DREDGE SITES
SEPTEMBER
PERCENT OF TIME GREATER THAN
.1
1
10
100
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12

DADE COUNTY BETWEEN FILL AND DREDGE SITES

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR OCTOBER

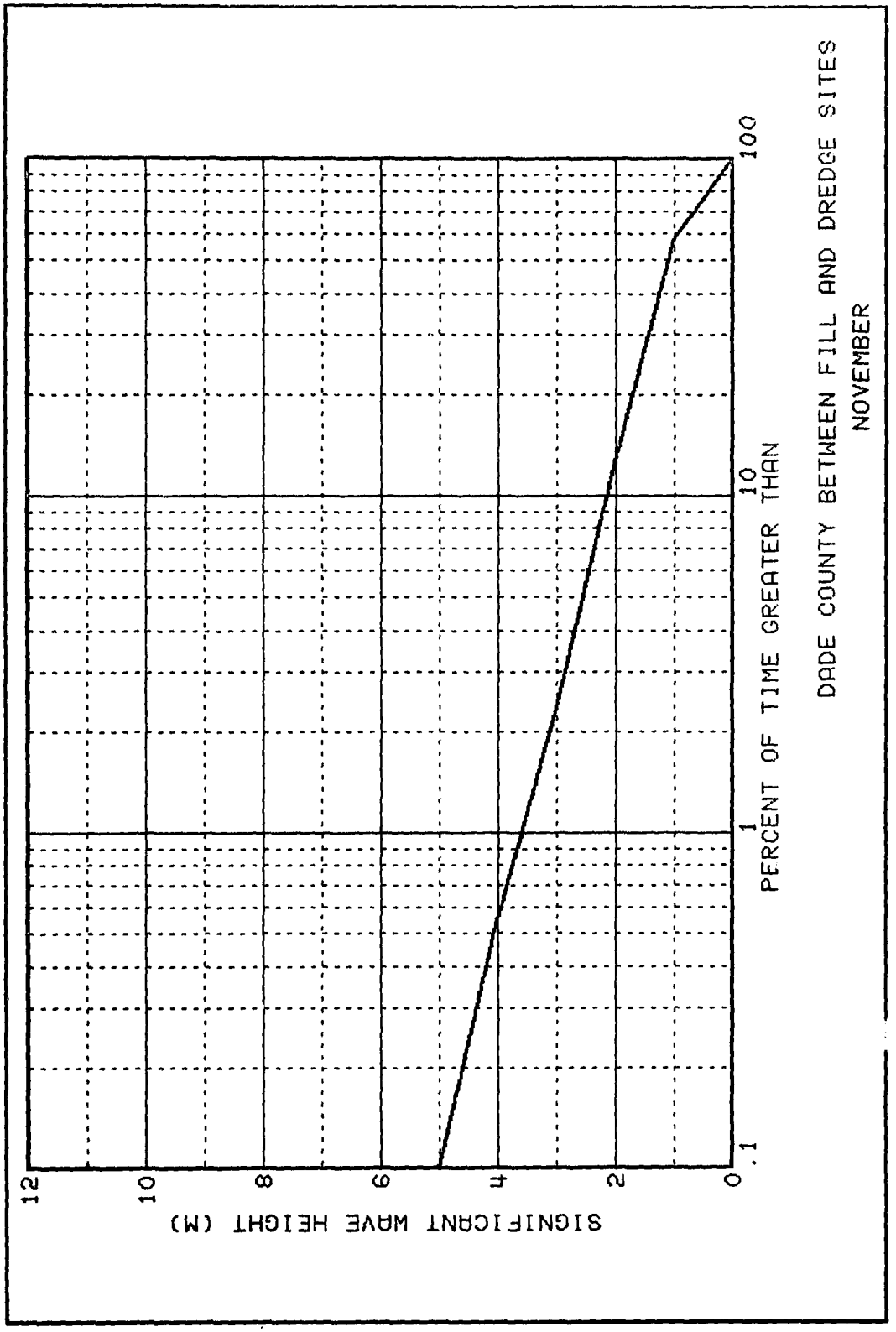
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 34.23 | 7.15 | 1.11 | 0.36 | 0.16 | 0.13 | 0.04 | 0.04 | 0.36 | 0.87 | 44.44 |
| 01-02 | 24.47 | 12.60 | 3.36 | 0.49 | 0.15 | 0.16 | 0.01 | 0.02 | 0.09 | 0.45 | 41.80 |
| 02-03 | 2.69 | 3.91 | 2.72 | 1.08 | 0.26 | 0.08 | 0.00 | 0.00 | 0.05 | 0.09 | 10.88 |
| 03-04 | 0.20 | 0.44 | 0.79 | 0.26 | 0.15 | 0.03 | 0.05 | 0.00 | 0.00 | 0.01 | 1.93 |
| 04-05 | 0.18 | 0.03 | 0.21 | 0.23 | 0.24 | 0.00 | 0.00 | 0.00 | 0.00 | 0.05 | 0.95 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 61.76 | 24.13 | 8.19 | 2.48 | 0.96 | 0.40 | 0.10 | 0.05 | 0.51 | 1.47 | |


DADE COUNTY BETWEEN FILL AND DREDGE SITES
OCTOBER
PERCENT OF TIME GREATER THAN
.1
1
10
100
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12

DADE COUNTY BETWEEN FILL AND DREDGE SITES

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR NOVEMBER

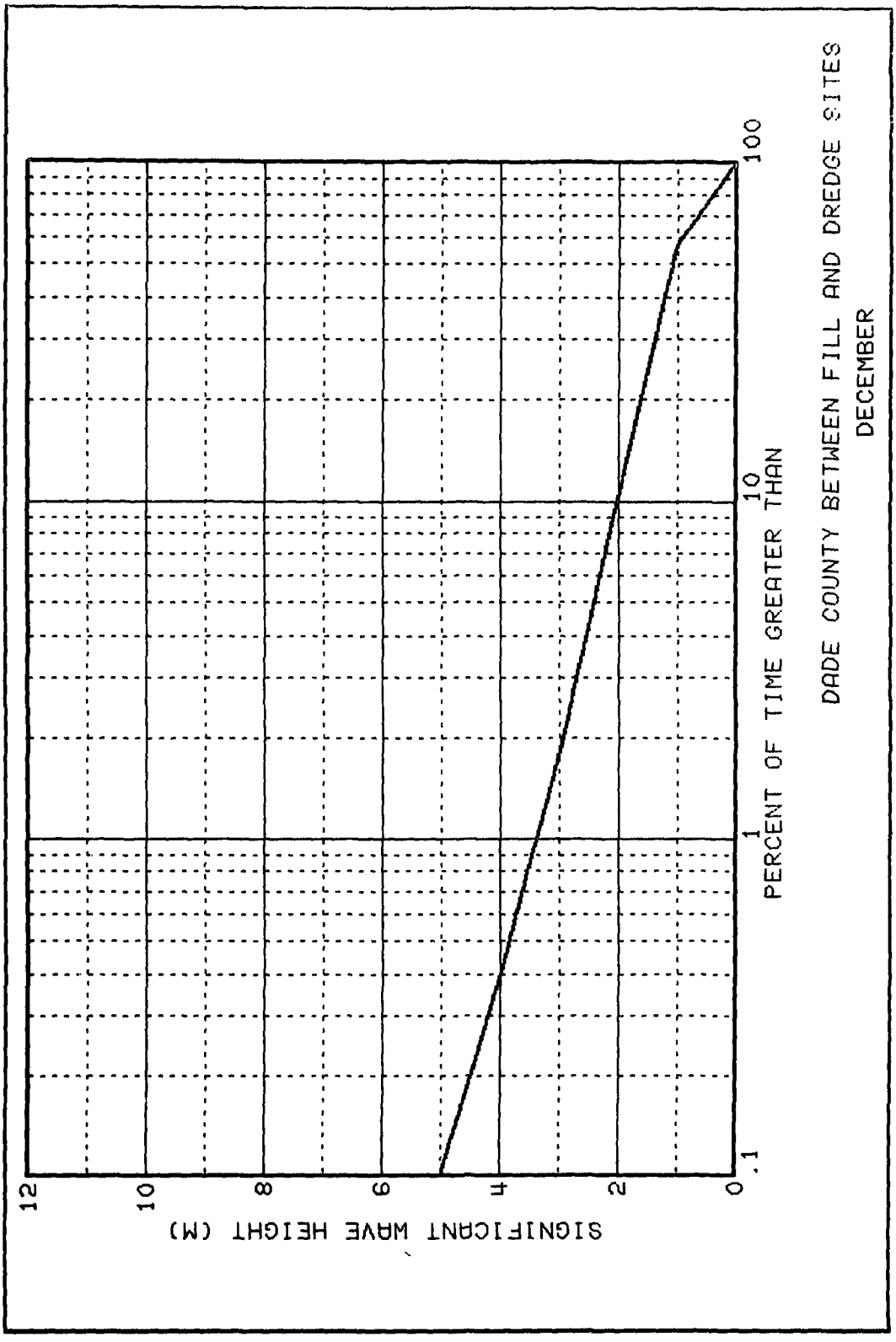
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 31.70 | 7.33 | 1.06 | 0.53 | 0.28 | 0.09 | 0.09 | 0.04 | 0.17 | 0.97 | 42.28 |
| 01-02 | 26.76 | 14.27 | 2.50 | 0.90 | 0.06 | 0.04 | 0.01 | 0.03 | 0.04 | 0.40 | 45.02 |
| 02-03 | 2.55 | 4.34 | 2.54 | 0.61 | 0.18 | 0.07 | 0.00 | 0.05 | 0.00 | 0.00 | 10.35 |
| 03-04 | 0.32 | 0.48 | 0.43 | 0.38 | 0.09 | 0.05 | 0.00 | 0.04 | 0.00 | 0.00 | 1.80 |
| 04-05 | 0.05 | 0.09 | 0.18 | 0.05 | 0.07 | 0.05 | 0.00 | 0.05 | 0.00 | 0.00 | 0.55 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 61.37 | 26.51 | 6.72 | 2.40 | 0.69 | 0.32 | 0.11 | 0.21 | 0.21 | 1.37 | |


DADE COUNTY BETWEEN FILL AND DREDGE SITES
NOVEMBER
PERCENT OF TIME GREATER THAN
0.1
1
10
100
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12

DADE COUNTY BETWEEN FILL AND DREDGE SITES

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR DECEMBER

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 33.21 | 6.08 | 1.68 | 0.27 | 0.12 | 0.14 | 0.04 | 0.00 | 0.12 | 1.25 | 42.92 |
| 01-02 | 29.43 | 11.92 | 3.71 | 0.90 | 0.17 | 0.23 | 0.01 | 0.00 | 0.01 | 0.49 | 46.88 |
| 02-03 | 2.37 | 2.99 | 2.04 | 0.67 | 0.09 | 0.17 | 0.00 | 0.00 | 0.04 | 0.10 | 8.46 |
| 03-04 | 0.13 | 0.31 | 0.47 | 0.38 | 0.02 | 0.04 | 0.00 | 0.00 | 0.01 | 0.01 | 1.36 |
| 04-05 | 0.00 | 0.00 | 0.07 | 0.09 | 0.17 | 0.00 | 0.06 | 0.00 | 0.00 | 0.00 | 0.39 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 65.15 | 21.29 | 7.97 | 2.31 | 0.58 | 0.58 | 0.12 | 0.00 | 0.17 | 1.85 | |


DADE COUNTY BETWEEN FILL AND DREDGE SITES
DECEMBER
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12
PERCENT OF TIME GREATER THAN
.1
1
10
100

DADE COUNTY BETWEEN FILL AND DREDGE SITES

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD

WAVE DIRECTION = 0

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 01-02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 02-03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 03-04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |

DADE COUNTY BETWEEN FILL AND DREDGE SITES

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD

WAVE DIRECTION = 30

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 7.55 | 1.97 | 0.52 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 10.05 |
| 01-02 | 4.22 | 0.82 | 0.63 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 5.68 |
| 02-03 | 0.52 | 0.03 | 0.06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.61 |
| 03-04 | 0.05 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.05 |
| 04-05 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 12.35 | 2.83 | 1.22 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |

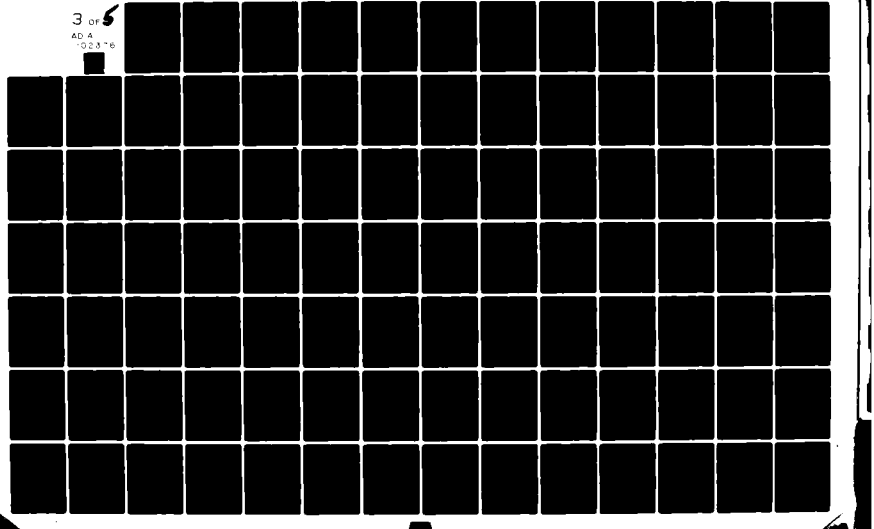
DADE COUNTY BETWEEN FILL AND DREDGE SITES

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD

WAVE DIRECTION = 60

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 6.45 | 1.19 | 0.18 | 0.19 | 0.10 | 0.09 | 0.00 | 0.00 | 0.00 | 0.00 | 8.19 |
| 01-02 | 6.55 | 4.22 | 0.77 | 0.33 | 0.11 | 0.05 | 0.01 | 0.00 | 0.00 | 0.00 | 12.04 |
| 02-03 | 0.63 | 1.42 | 0.82 | 0.11 | 0.07 | 0.05 | 0.01 | 0.01 | 0.00 | 0.00 | 3.11 |
| 03-04 | 0.06 | 0.17 | 0.22 | 0.05 | 0.03 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.55 |
| 04-05 | 0.02 | 0.01 | 0.07 | 0.03 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.14 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 13.70 | 7.02 | 2.06 | 0.72 | 0.30 | 0.22 | 0.02 | 0.01 | 0.00 | 0.00 | |

AD-A102 376 ARMY ENGINEER WATERWAYS EXPERIMENT STATION VICKSBURG MS F/G 8/3
BEACH NOURISHMENT TECHNIQUES. REPORT 4. WAVE CLIMATES FOR SELEC--ETC(U)
APR 81 D L DURHAM, L Z HALES, T W RICHARDSON
UNCLASSIFIED WES-TR-H-76-13-4-APP NL



DADE COUNTY BETWEEN FILL AND DREDGE SITES

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD

WAVE DIRECTION = 90

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 10.64 | 0.83 | 0.11 | 0.11 | 0.04 | 0.03 | 0.02 | 0.01 | 0.24 | 1.16 | 13.20 |
| 01-02 | 7.83 | 3.03 | 0.50 | 0.16 | 0.08 | 0.04 | 0.01 | 0.01 | 0.09 | 0.57 | 12.32 |
| 02-03 | 0.52 | 0.68 | 0.35 | 0.29 | 0.10 | 0.04 | 0.00 | 0.01 | 0.03 | 0.11 | 2.13 |
| 03-04 | 0.04 | 0.06 | 0.09 | 0.13 | 0.05 | 0.03 | 0.00 | 0.00 | 0.00 | 0.01 | 0.41 |
| 04-05 | 0.01 | 0.01 | 0.02 | 0.05 | 0.06 | 0.02 | 0.00 | 0.01 | 0.01 | 0.00 | 0.20 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 19.04 | 4.60 | 1.07 | 0.74 | 0.32 | 0.16 | 0.04 | 0.04 | 0.37 | 1.86 | |

DADE COUNTY BETWEEN FILL AND DREDGE SITES

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD

WAVE DIRECTION = 120

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 4.29 | 0.73 | 0.42 | 0.08 | 0.02 | 0.03 | 0.02 | 0.00 | 0.00 | 0.00 | 5.59 |
| 01-02 | 3.04 | 1.87 | 0.39 | 0.06 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 5.37 |
| 02-03 | 0.18 | 0.25 | 0.14 | 0.02 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.60 |
| 03-04 | 0.01 | 0.01 | 0.02 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.05 |
| 04-05 | 0.01 | 0.01 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 7.53 | 2.87 | 0.98 | 0.17 | 0.04 | 0.04 | 0.02 | 0.00 | 0.00 | 0.00 | |

DADE COUNTY BETWEEN FILL AND DREDGE SITES

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD

WAVE DIRECTION = 150

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 13.51 | 1.28 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 14.79 |
| 01-02 | 4.74 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 4.74 |
| 02-03 | 0.16 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.16 |
| 03-04 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 18.41 | 1.28 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |

DADE COUNTY BETWEEN FILL AND DREDGE SITES

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD

WAVE DIRECTION = 180

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 01-02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 02-03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 03-04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |

# APPENDIX G: AVERAGE WAVE CLIMATE AT TREASURE ISLAND, FLA.

1. Appendix G contains the following information for the Treasure Island, Fla., fill site:

a. Tabulations of monthly percent occurrence of wave-height/period combinations.

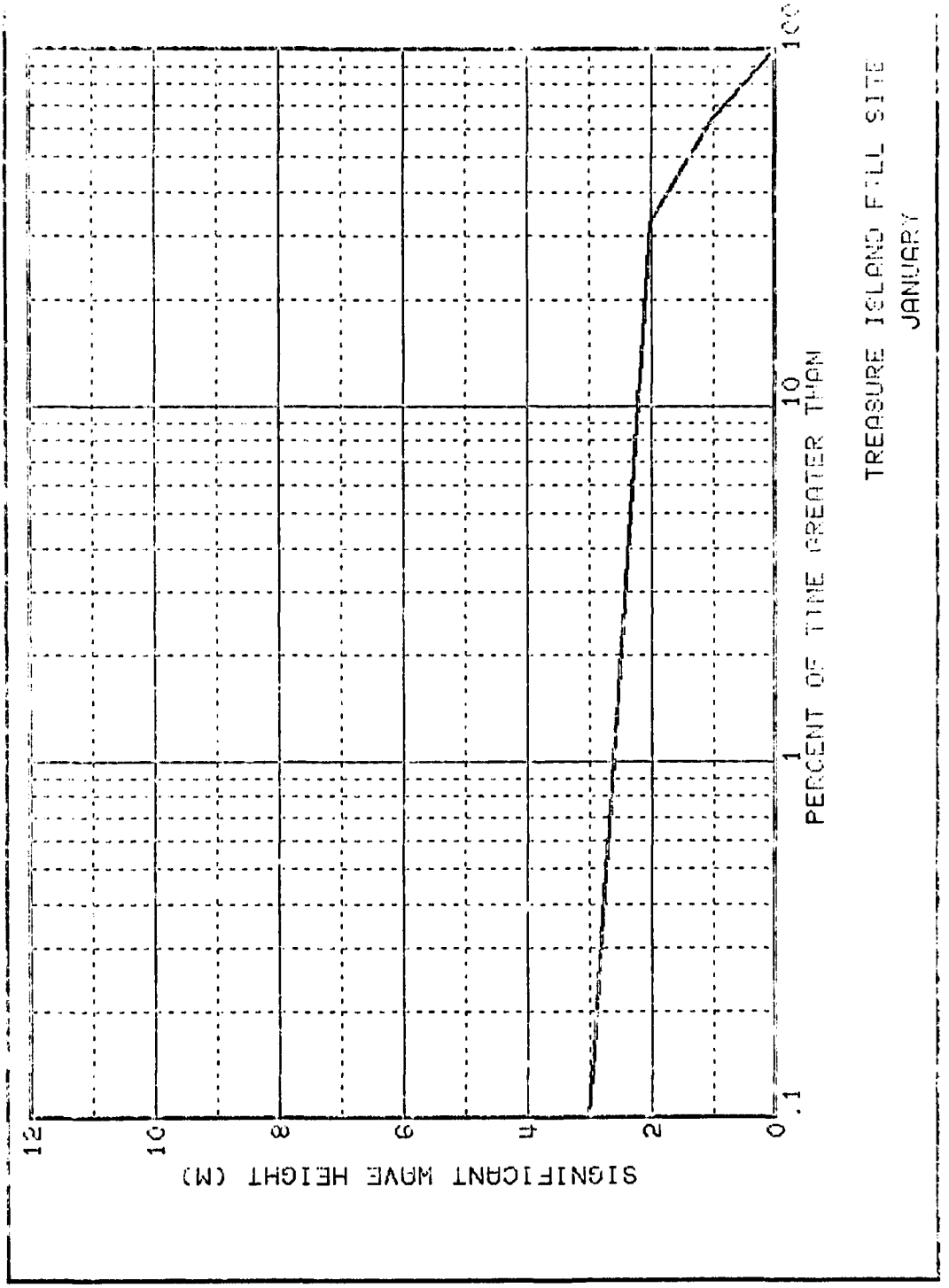
b. Tabulations of annual percent occurrence by azimuth direction of wave-height/period combinations.

c. Plots of monthly significant wave-height occurrence in terms of the total percent time per month that these heights are exceeded.

TREASURE ISLAND FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR JANUARY

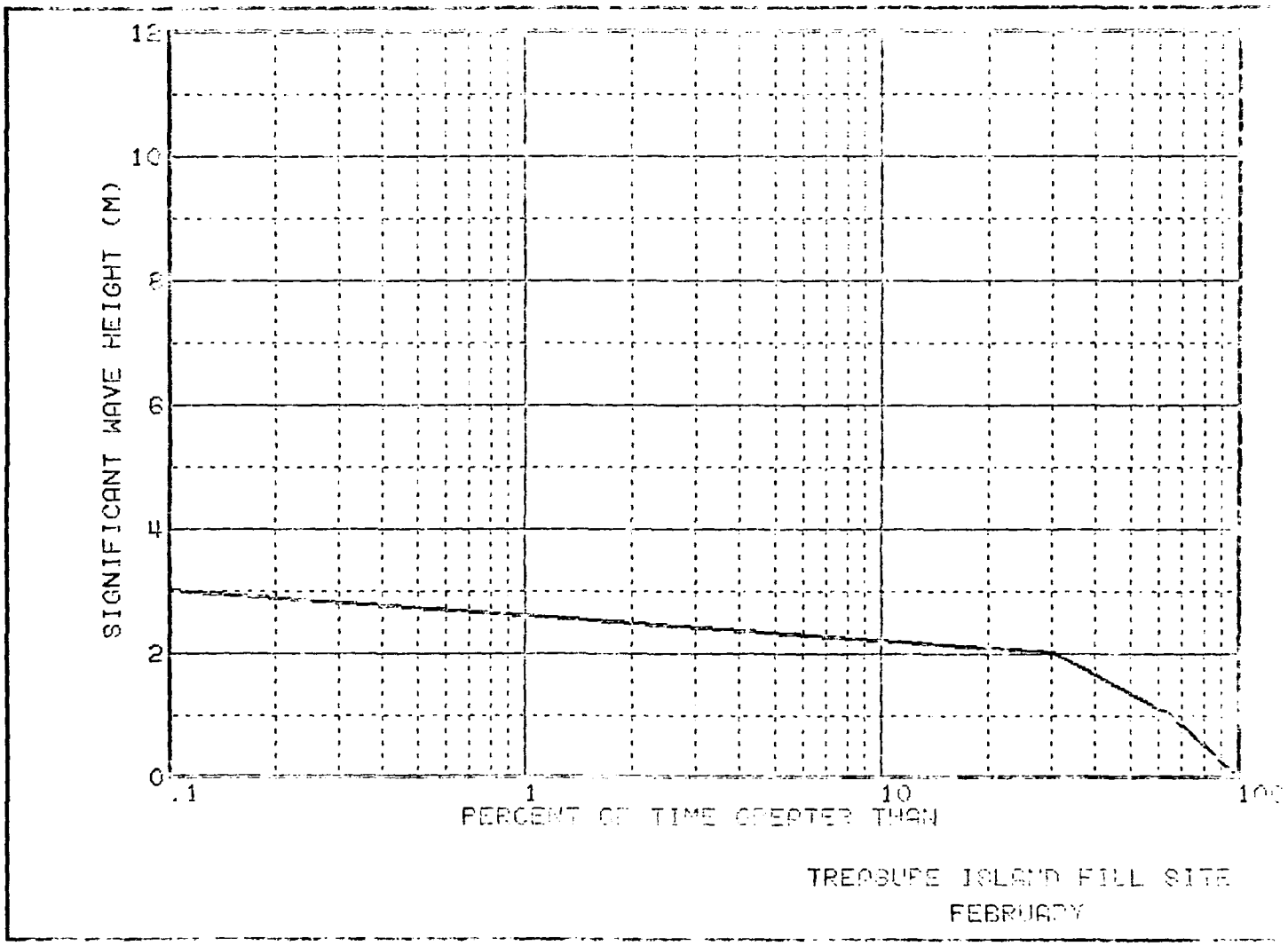
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 21.58 | 3.10 | 1.65 | 1.08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 27.37 |
| 01-02 | 11.49 | 12.85 | 5.11 | 0.08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 31.53 |
| 02-03 | 10.89 | 9.33 | 5.02 | 0.42 | 0.05 | 0.00 | 0.00 | 0.00 | 0.00 | 1.00 | 26.71 |
| 03-04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 43.96 | 25.28 | 11.78 | 1.58 | 0.05 | 0.00 | 0.00 | 0.00 | 0.00 | 1.00 | 83.61 |


TREASURE ISLAND FILL SITE
JANUARY
SIGNIFICANT WAVE HEIGHT (M)
PERCENT OF TIME GREATER THAN
0
2
4
6
8
10
12
.1
1
10
100

TREASURE ISLAND FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR FEBRUARY

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <3-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 26.35 | 5.45 | 0.18 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2.74 | 34.71 |
| 01-02 | 14.33 | 12.46 | 4.74 | 1.41 | 0.00 | 0.26 | 0.00 | 0.00 | 0.00 | 1.80 | 34.79 |
| 02-03 | 9.32 | 7.70 | 6.68 | 5.20 | 0.61 | 0.06 | 0.00 | 0.00 | 0.00 | 0.00 | 29.57 |
| 03-04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 50.00 | 25.61 | 11.61 | 6.61 | 0.61 | 0.32 | 0.00 | 0.00 | 0.00 | 4.54 | 99.87 |


SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12
.1
1
10
100
PERCENT OF TIME GREATER THAN
TREASURE ISLAND FILL SITE
FEBRUARY

TREASURE ISLAND FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR MARCH

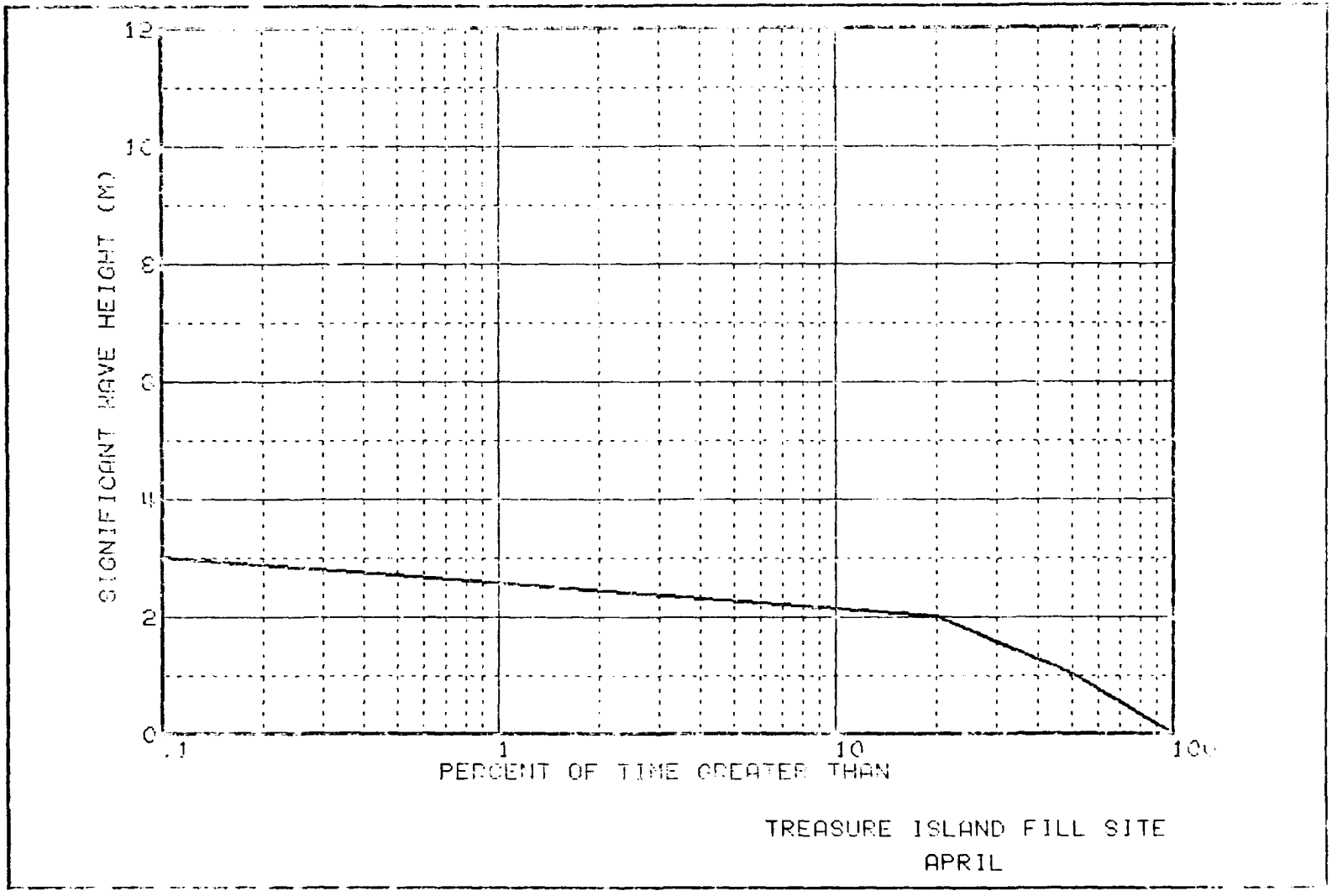
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <3-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 25.86 | 3.24 | 1.08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 30.18 |
| 01-02 | 18.48 | 18.62 | 3.27 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 40.37 |
| 02-03 | 18.01 | 7.04 | 3.03 | 1.08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 29.16 |
| 03-04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 62.35 | 28.90 | 7.38 | 1.08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 100.00 |

TREASURE ISLAND FILL SITE
MARCH
PERCENT OF TIME CENTER FREQ.
SIGNIFICANT WAVE HEIGHT (M)

TREASURE ISLAND FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR APRIL

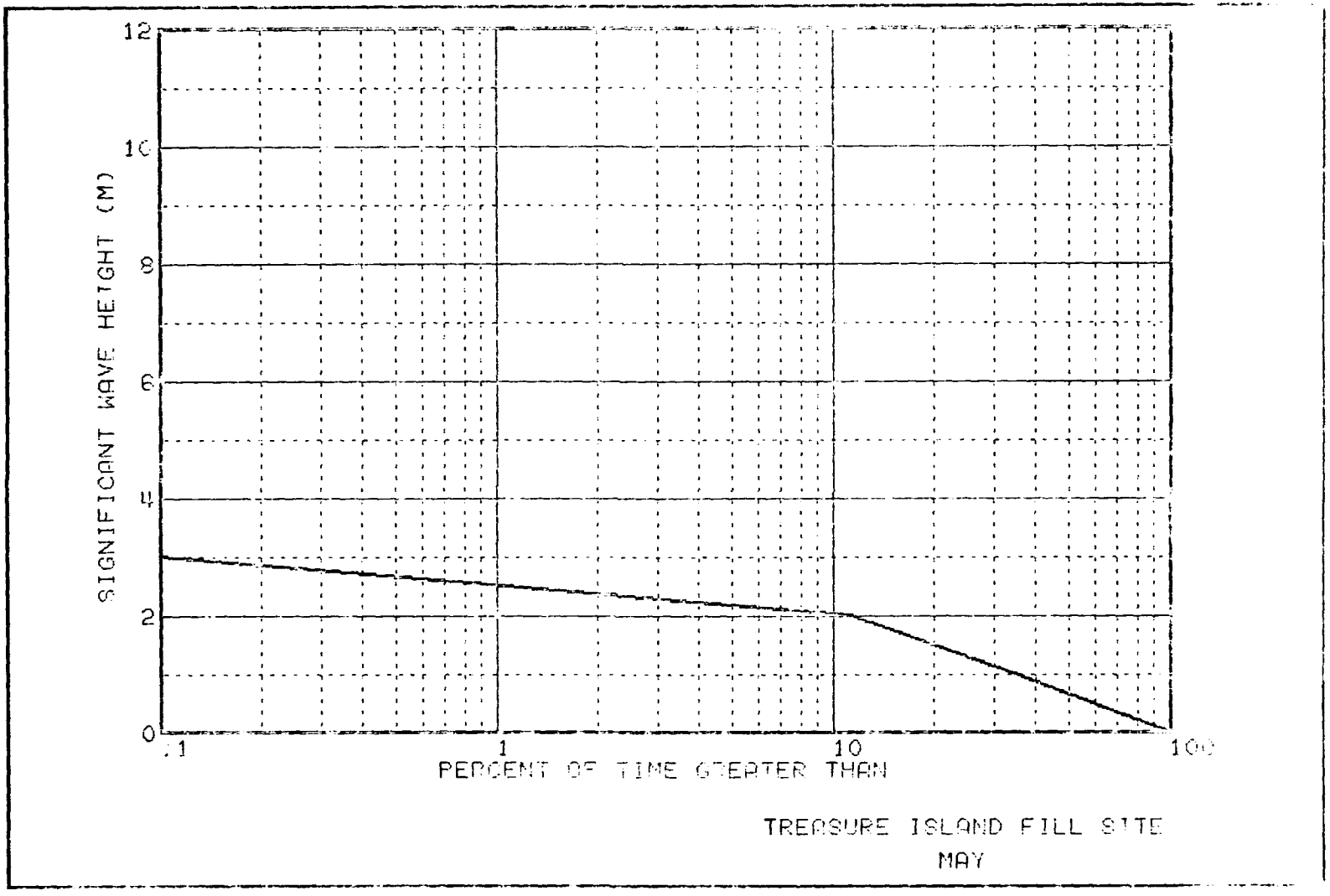
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | |
| 00-01 | 41.04 | 4.76 | 1.04 | 0.31 | 0.09 | 0.01 | 0.00 | 0.00 | 0.00 | |
| 01-02 | 18.82 | 7.08 | 0.83 | 0.10 | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 02-03 | 14.17 | 2.79 | 0.38 | 0.06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 03-04 | 0.40 | 0.20 | 0.10 | 0.02 | 0.00 | 0.00 | | | | |
| 04-05 | 0.00 | 0.00 | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| TOTAL | | | | | | | | | | |


SIGNIFICANT WAVE HEIGHT (M)
0
2
12
.1
1
10
PERCENT OF TIME GREATER THAN
TREASURE ISLAND FILL SITE
APRIL

TREASURE ISLAND FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR MAY

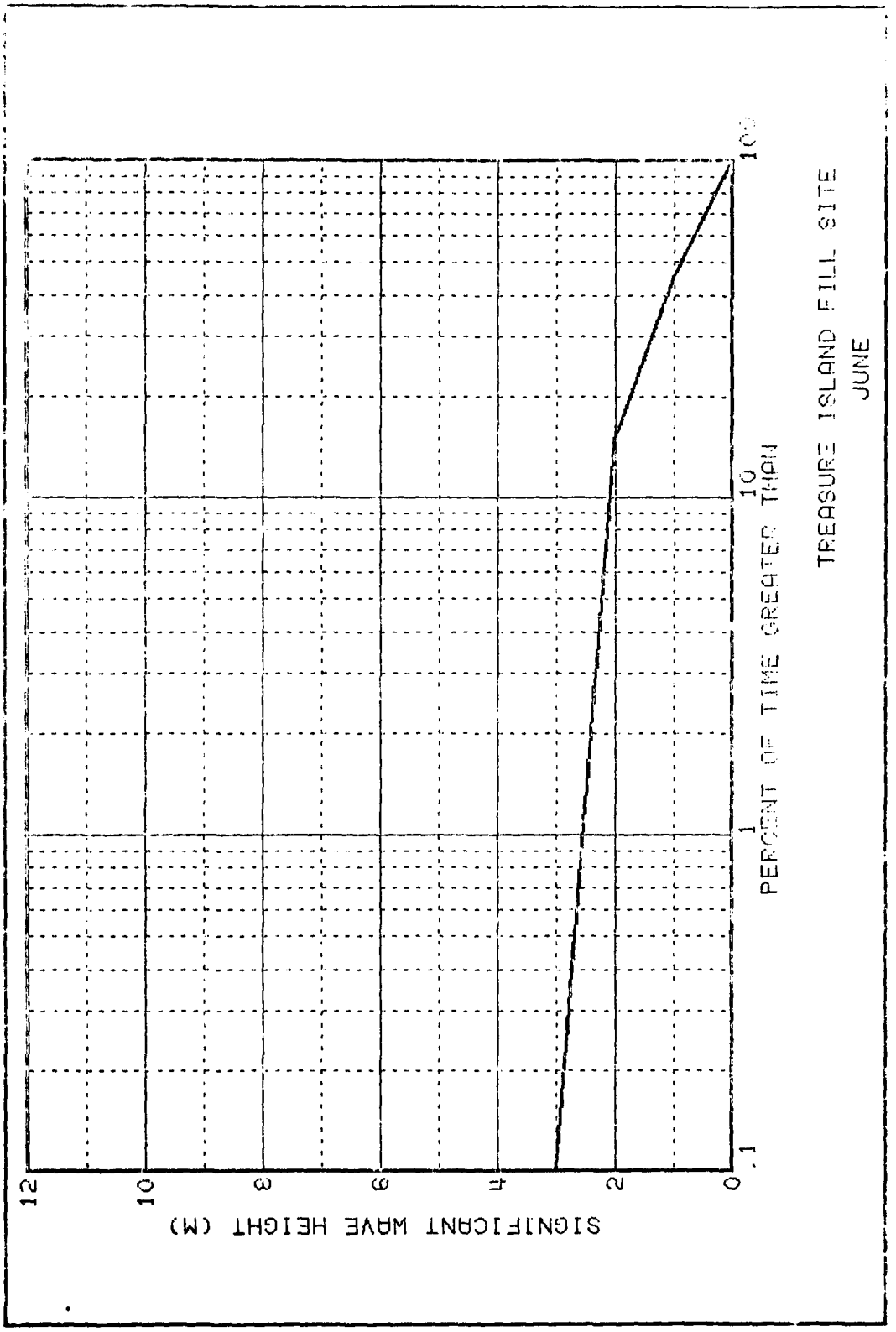
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 59.08 | 4.42 | 0.00 | 0.00 | 0.71 | 0.00 | 0.73 | 0.00 | 0.00 | 0.53 | 65.47 |
| 01-02 | 17.84 | 4.21 | 0.72 | 0.00 | 0.10 | 0.00 | 0.07 | 0.00 | 0.00 | 0.28 | 23.21 |
| 02-03 | 5.34 | 5.28 | 0.09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 11.32 |
| 03-04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 82.26 | 14.32 | 0.81 | 0.00 | 0.81 | 0.00 | 0.81 | 0.00 | 0.00 | 0.81 | |


12
10
8
6
4
2
0
SIGNIFICANT WAVE HEIGHT (M)
.1
1
10
100
PERCENT OF TIME GREATER THAN
TREASURE ISLAND FILL SITE
MAY

TREASURE ISLAND FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR JUNE

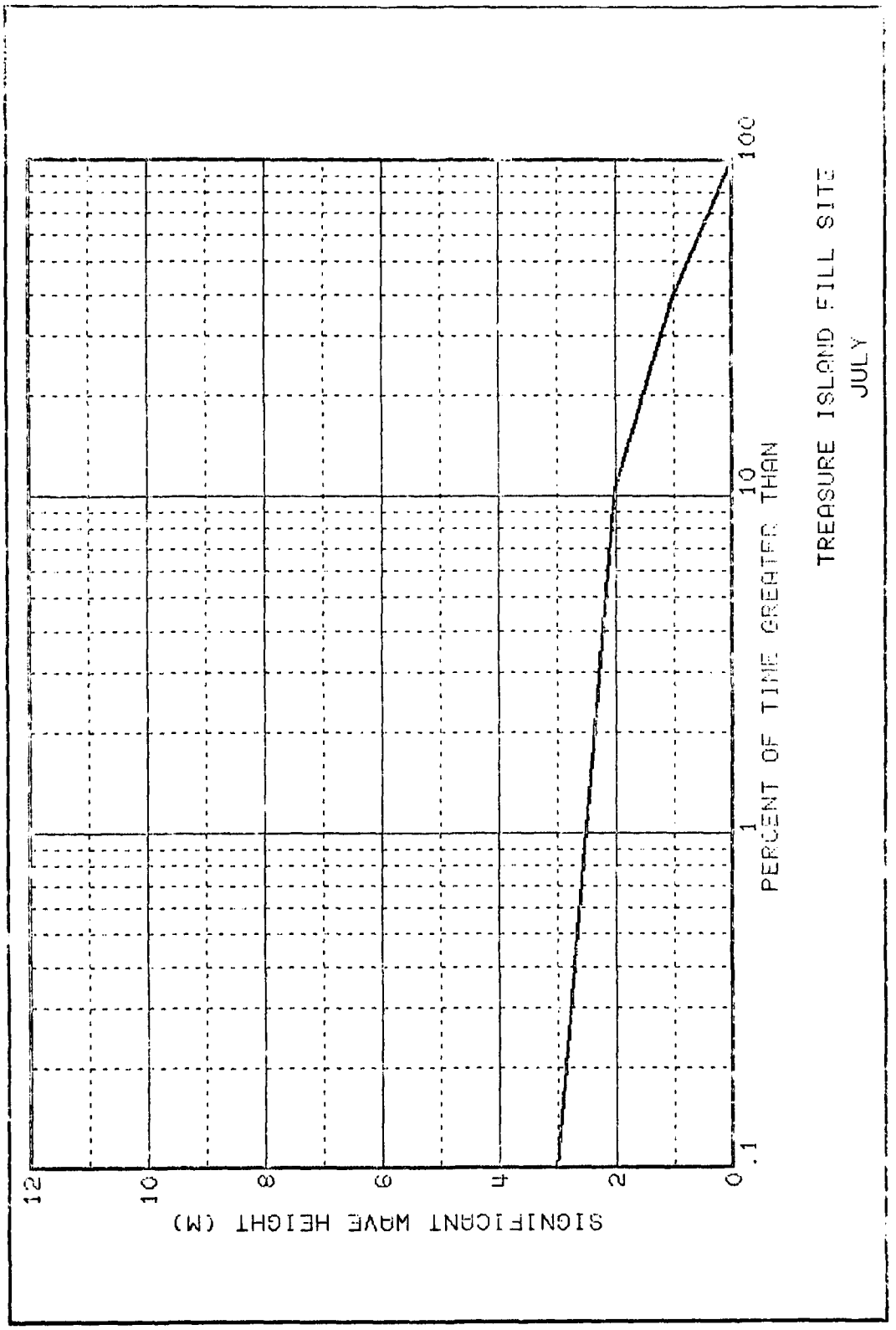
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <3-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 47.31 | 4.44 | 1.30 | 0.93 | 0.00 | 0.00 | 0.00 | 0.00 | 0.37 | 0.81 | 55.16 |
| 01-02 | 21.93 | 6.06 | 1.15 | 0.07 | 0.00 | 0.28 | 0.00 | 0.00 | 0.14 | 0.26 | 29.87 |
| 02-03 | 9.63 | 2.57 | 1.56 | 0.50 | 0.00 | 0.23 | 0.00 | 0.00 | 0.00 | 0.45 | 14.96 |
| 03-04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 78.87 | 13.08 | 4.01 | 1.51 | 0.00 | 0.51 | 0.00 | 0.00 | 0.51 | 1.51 | 100.00 |


TREASURE ISLAND FILL SITE
JUNE
SIGNIFICANT WAVE HEIGHT (M)
12
10
8
6
4
2
0
PERCENT OF TIME GREATER THAN
.1
1
10

TREASURE ISLAND FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR JULY

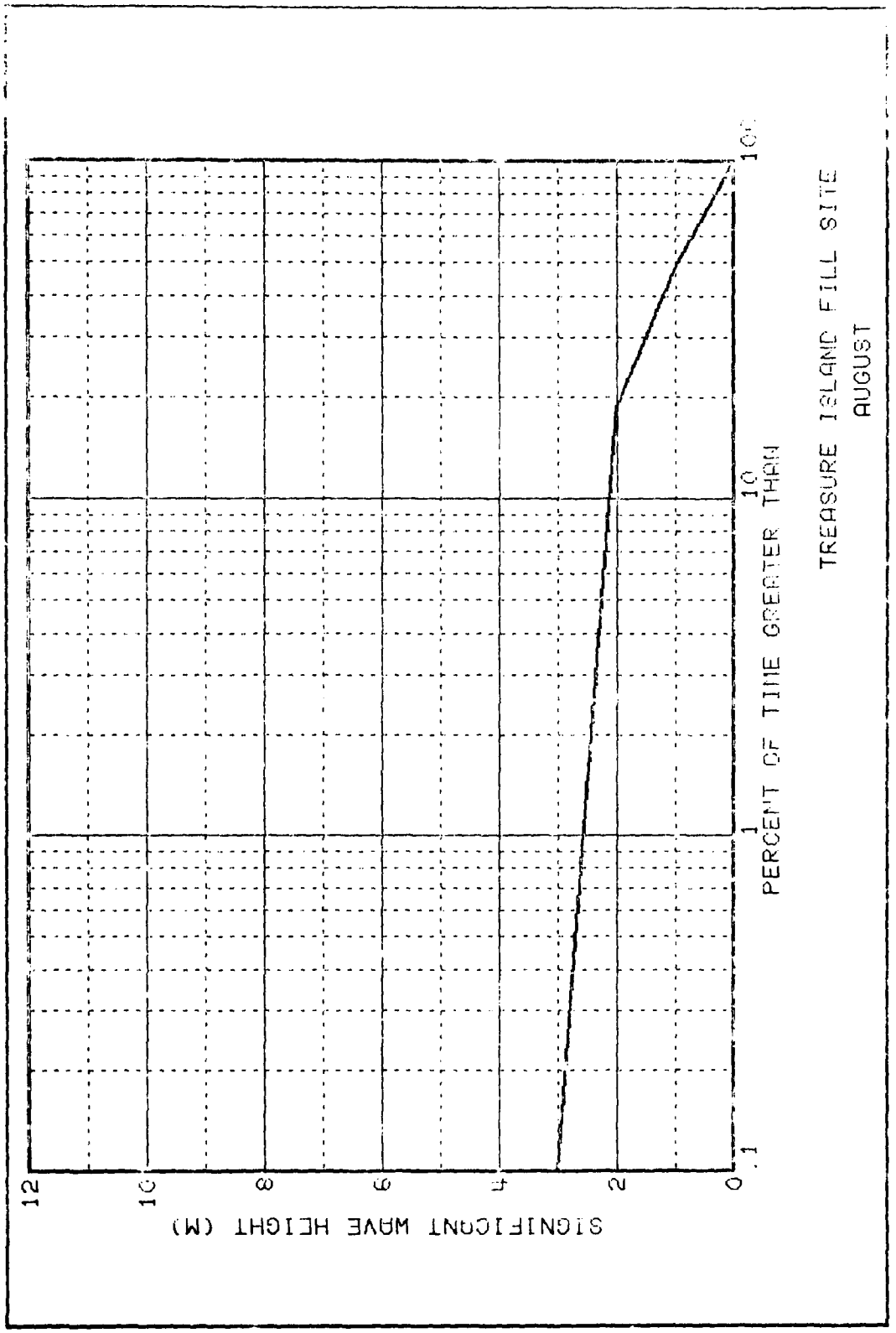
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 54.97 | 1.18 | 1.42 | 0.00 | 0.00 | 0.42 | 0.00 | 0.00 | 0.00 | 2.53 | 60.52 |
| 01-02 | 21.30 | 4.35 | 1.52 | 0.00 | 0.00 | 0.17 | 0.00 | 0.00 | 0.00 | 1.59 | 28.93 |
| 02-03 | 7.84 | 2.11 | 0.59 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 10.55 |
| 03-04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 84.11 | 7.65 | 3.53 | 0.00 | 0.00 | 0.59 | 0.00 | 0.00 | 0.00 | 4.12 | |


TREASURE ISLAND FILL SITE
JULY
PERCENT OF TIME GREATER THAN
.1
1
10
100
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12

TREASURE ISLAND FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR AUGUST

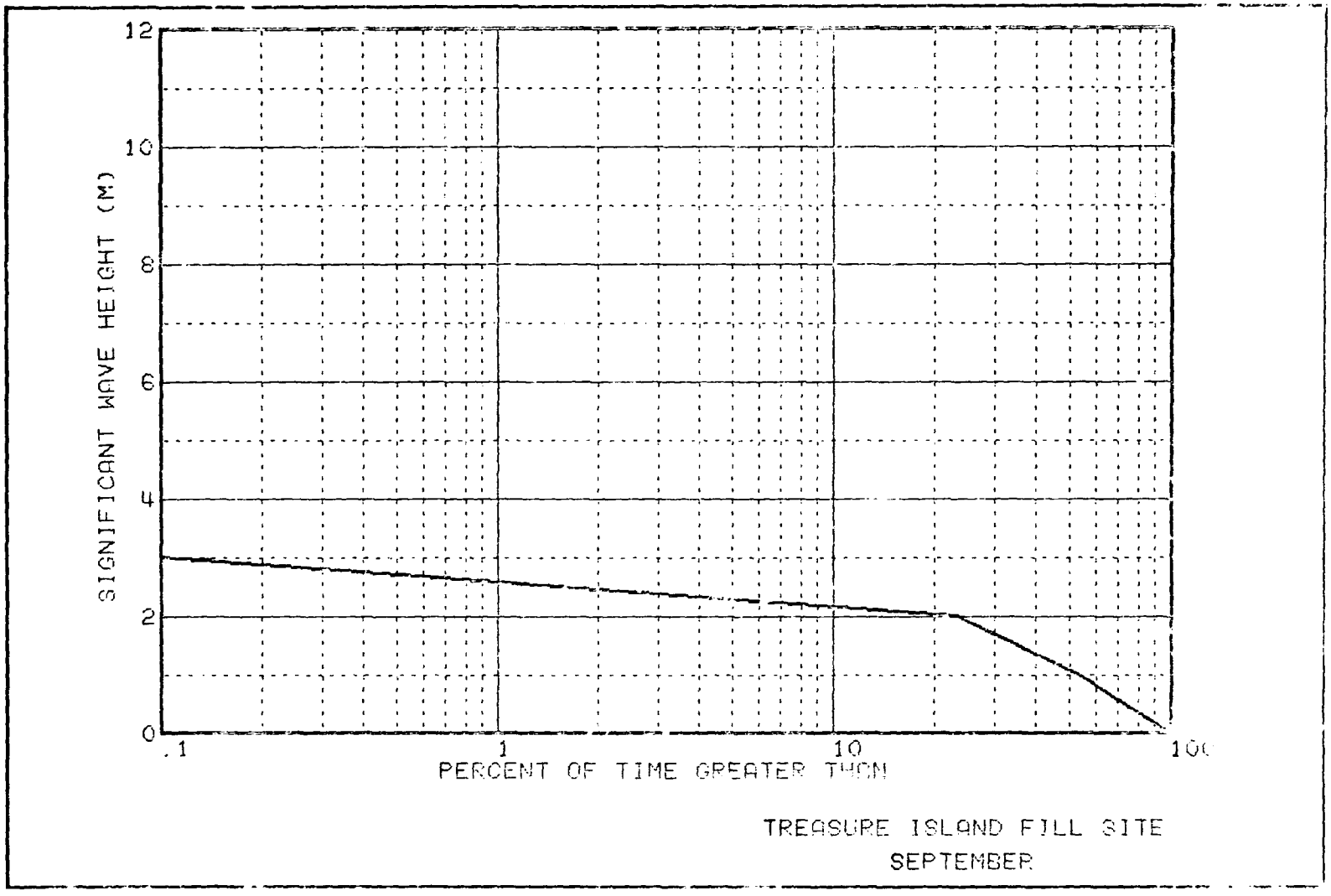
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 43.80 | 2.98 | 0.58 | 0.00 | 0.00 | 0.00 | 0.00 | 0.58 | 0.89 | 2.93 | 51.75 |
| 01-02 | 18.86 | 7.16 | 1.96 | 0.00 | 0.00 | 0.36 | 0.00 | 0.00 | 0.26 | 1.09 | 29.70 |
| 02-03 | 11.47 | 4.23 | 1.48 | 0.57 | 0.57 | 0.21 | 0.00 | 0.00 | 0.00 | 0.00 | 18.54 |
| 03-04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 74.13 | 14.37 | 4.02 | 0.57 | 0.57 | 0.57 | 0.00 | 0.58 | 1.15 | 4.02 | |


TREASURE ISLAND FILL SITE
AUGUST
PERCENT OF TIME GREATER THAN
.1
1
10
100
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12

TREASURE ISLAND FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR SEPTEMBER

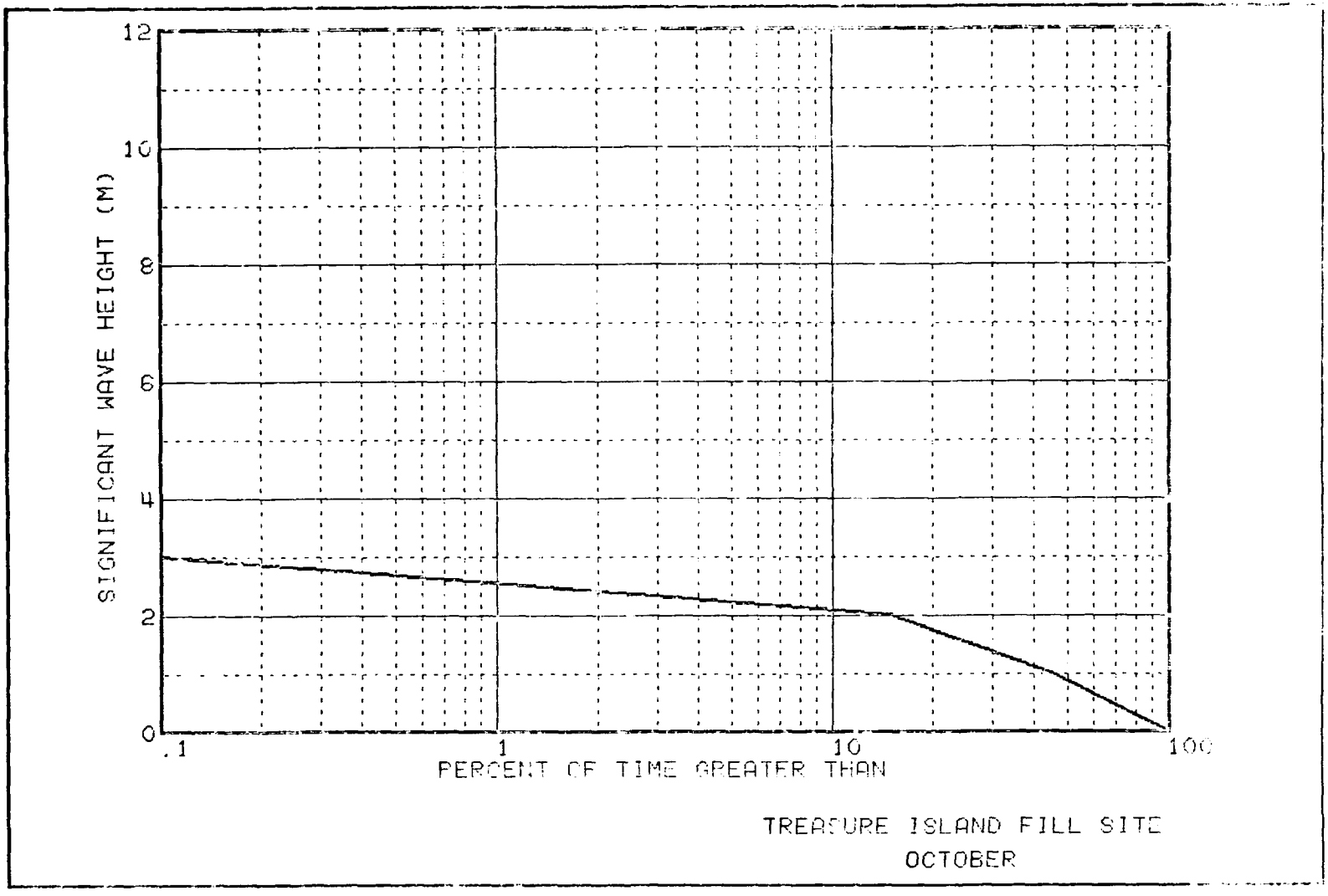
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 40.26 | 4.02 | 0.49 | 0.00 | 0.55 | 0.00 | 0.48 | 0.00 | 0.00 | 1.21 | 47.00 |
| 01-02 | 21.41 | 4.67 | 2.41 | 0.00 | 0.14 | 0.00 | 0.21 | 0.00 | 0.09 | 0.86 | 29.79 |
| 02-03 | 7.30 | 7.17 | 4.00 | 4.14 | 0.00 | 0.00 | 0.00 | 0.00 | 0.60 | 0.00 | 23.21 |
| 03-04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 68.97 | 15.86 | 6.89 | 4.14 | 0.69 | 0.00 | 0.69 | 0.00 | 0.69 | 2.07 | |


12
10
8
6
4
2
0
SIGNIFICANT WAVE HEIGHT (M)
.1
1
10
PERCENT OF TIME GREATER THAN
TREASURE ISLAND FILL SITE
SEPTEMBER

TREASURE ISLAND FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR OCTOBER

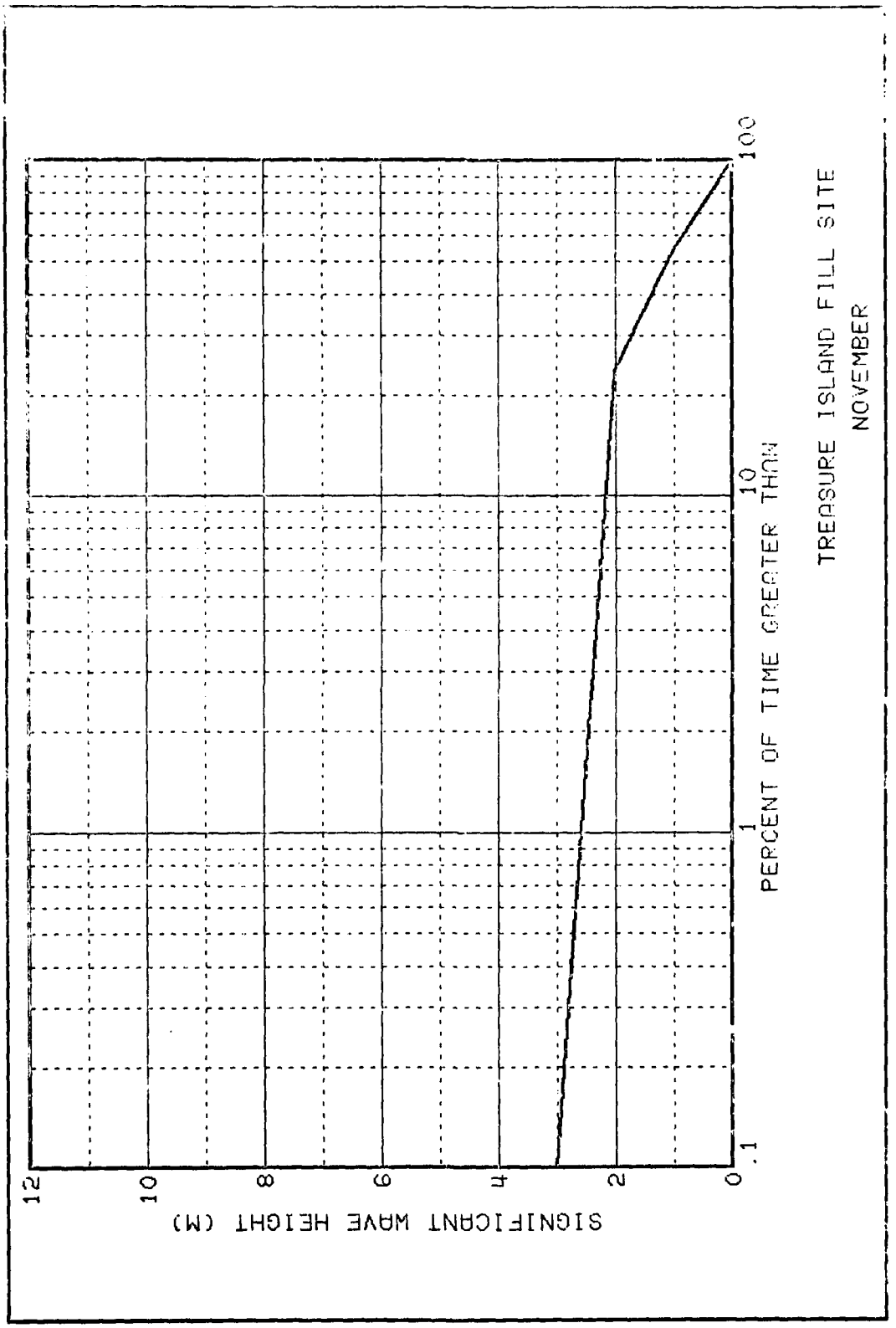
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 45.61 | 7.92 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.59 | 0.99 | 55.11 |
| 01-02 | 14.21 | 12.70 | 0.99 | 0.81 | 0.00 | 0.00 | 0.35 | 0.00 | 0.22 | 0.71 | 29.99 |
| 02-03 | 4.70 | 3.57 | 3.85 | 1.61 | 0.00 | 0.00 | 0.46 | 0.00 | 0.00 | 0.72 | 14.91 |
| 03-04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 64.52 | 24.19 | 4.84 | 2.42 | 0.00 | 0.00 | 0.81 | 0.00 | 0.81 | 2.42 | |


12
10
8
6
4
2
0
SIGNIFICANT WAVE HEIGHT (M)
.1
1
10
100
PERCENT OF TIME GREATER THAN
TREASURE ISLAND FILL SITE
OCTOBER

TREASURE ISLAND FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR NOVEMBER

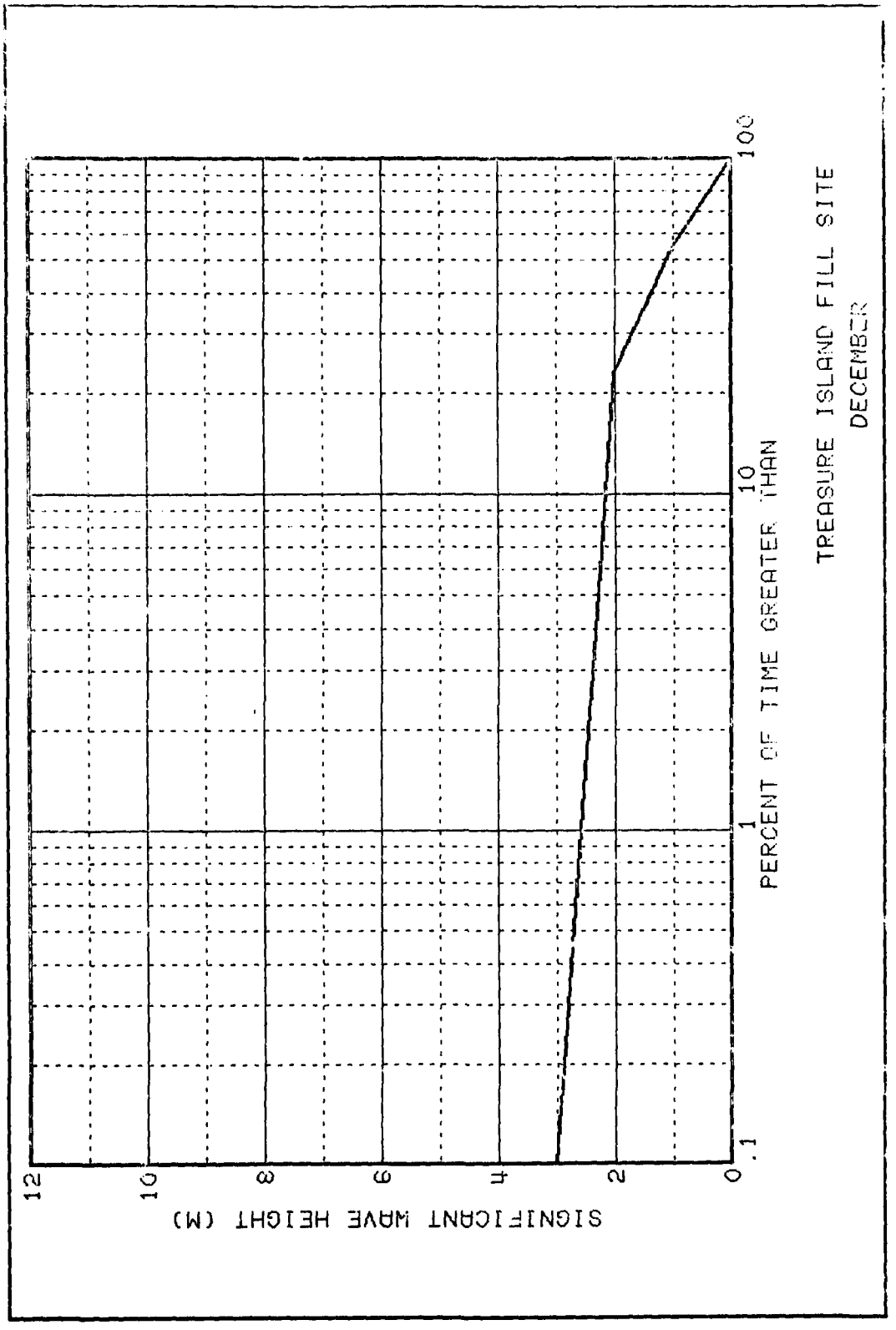
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 36.60 | 6.93 | 0.20 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.74 | 45.48 |
| 01-02 | 18.41 | 9.48 | 1.28 | 0.00 | 0.35 | 1.14 | 0.00 | 0.00 | 0.00 | 0.29 | 30.95 |
| 02-03 | 8.50 | 7.91 | 1.22 | 3.38 | 1.68 | 0.88 | 0.00 | 0.00 | 0.00 | 0.00 | 23.57 |
| 03-04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 63.51 | 24.32 | 2.70 | 3.38 | 2.03 | 2.03 | 0.00 | 0.00 | 0.00 | 2.03 | |


TREASURE ISLAND FILL SITE
NOVEMBER
PERCENT OF TIME GREATER THAN
.1
1
10
100
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12

TREASURE ISLAND FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR DECEMBER

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 36.41 | 8.31 | 0.27 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.33 | 45.32 |
| 01-02 | 13.94 | 12.54 | 3.84 | 1.21 | 0.00 | 0.00 | 0.73 | 0.00 | 0.00 | 0.56 | 31.82 |
| 02-03 | 4.11 | 6.83 | 7.60 | 1.47 | 1.78 | 0.89 | 0.16 | 0.00 | 0.00 | 0.00 | 22.85 |
| 03-04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 54.47 | 27.68 | 10.71 | 2.68 | 1.78 | 0.89 | 0.89 | 0.00 | 0.00 | 0.89 | 100.00 |


TREASURE ISLAND FILL SITE
DECEMBER
SIGNIFICANT WAVE HEIGHT (M)
PERCENT OF TIME GREATER THAN
0
2
4
6
8
10
12
.1
1
10
100

TREASURE ISLAND FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD

WAVE DIRECTION = 180

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 01-02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 02-03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 03-04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |

TREASURE ISLAND FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD

WAVE DIRECTION = 210

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 9.74 | 1.00 | 0.07 | 0.05 | 0.09 | 0.00 | 0.04 | 0.00 | 0.15 | 0.48 | 11.62 |
| 01-02 | 7.66 | 2.83 | 0.67 | 0.15 | 0.02 | 0.03 | 0.02 | 0.00 | 0.07 | 0.30 | 11.75 |
| 02-03 | 4.64 | 1.56 | 0.99 | 0.52 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 7.74 |
| 03-04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 22.04 | 5.40 | 1.72 | 0.72 | 0.11 | 0.06 | 0.06 | 0.00 | 0.22 | 0.78 | |

TREASURE ISLAND FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD

WAVE DIRECTION = 240

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 7.75 | 0.42 | 0.11 | 0.05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.23 | 8.57 |
| 01-02 | 2.95 | 1.13 | 0.50 | 0.05 | 0.00 | 0.03 | 0.02 | 0.00 | 0.00 | 0.10 | 4.79 |
| 02-03 | 0.26 | 0.51 | 0.22 | 0.18 | 0.00 | 0.03 | 0.03 | 0.00 | 0.00 | 0.00 | 1.23 |
| 03-04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 10.96 | 2.06 | 0.84 | 0.28 | 0.00 | 0.06 | 0.05 | 0.00 | 0.00 | 0.33 | |

TREASURE ISLAND FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD

WAVE DIRECTION = 270

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 7.96 | 0.49 | 0.24 | 0.04 | 0.00 | 0.04 | 0.00 | 0.00 | 0.00 | 0.22 | 8.99 |
| 01-02 | 8.66 | 1.97 | 0.28 | 0.04 | 0.08 | 0.04 | 0.00 | 0.00 | 0.01 | 0.18 | 9.20 |
| 02-03 | 4.20 | 3.16 | 1.49 | 0.75 | 0.30 | 0.14 | 0.00 | 0.00 | 0.05 | 0.21 | 10.31 |
| 03-04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 20.81 | 5.62 | 2.00 | 0.84 | 0.38 | 0.22 | 0.00 | 0.00 | 0.06 | 0.61 | |

TREASURE ISLAND FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD

WAVE DIRECTION = 300

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 14.38 | 3.15 | 0.34 | 0.07 | 0.00 | 0.00 | 0.05 | 0.11 | 0.10 | 0.51 | 18.65 |
| 01-02 | 0.70 | 2.78 | 1.19 | 0.15 | 0.00 | 0.00 | 0.05 | 0.00 | 0.01 | 0.11 | 5.00 |
| 02-03 | 0.06 | 0.36 | 0.92 | 0.45 | 0.11 | 0.13 | 0.01 | 0.00 | 0.00 | 0.00 | 2.08 |
| 03-04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 15.03 | 6.29 | 2.45 | 0.67 | 0.11 | 0.13 | 0.11 | 0.11 | 0.11 | 0.61 | |

TREASURE ISLAND FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD

WAVE DIRECTION = 330

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 01-02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 02-03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 03-04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |

# APPENDIX H: AVERAGE WAVE CLIMATE AT PANAMA CITY, FLA.

1. Appendix H contains the following information for the Panama City, Fla., project site:

   a. Tabulations of monthly percent occurrence of wave-height/period combinations.

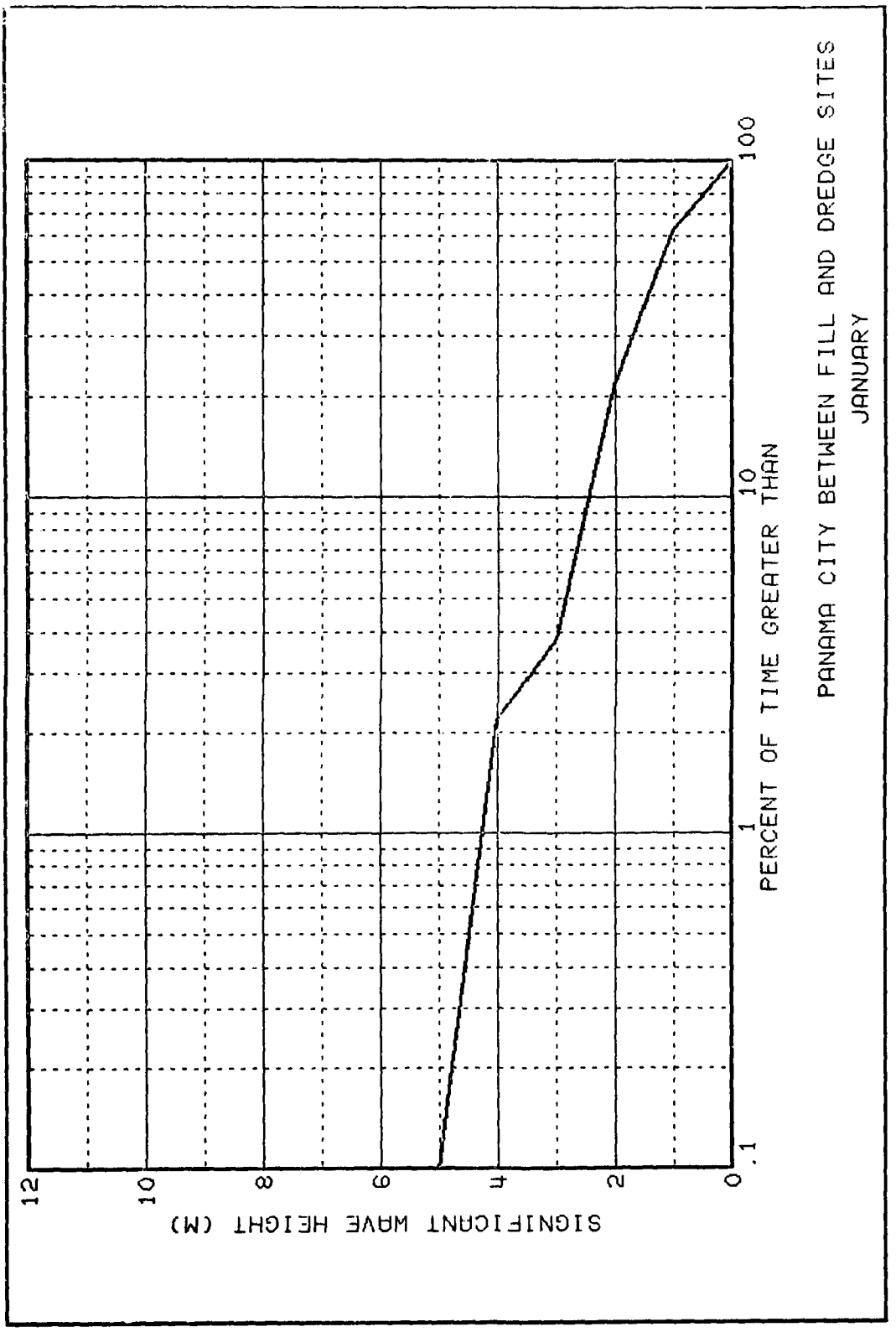
   b. Tabulations of annual percent occurrence by azimuth direction of wave-height/period combinations.

   c. Plots of monthly significant wave-height occurrence in terms of the total percent time per month that these heights are exceeded.

PANAMA CITY BETWEEN FILL AND DREDGE SITES

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR JANUARY

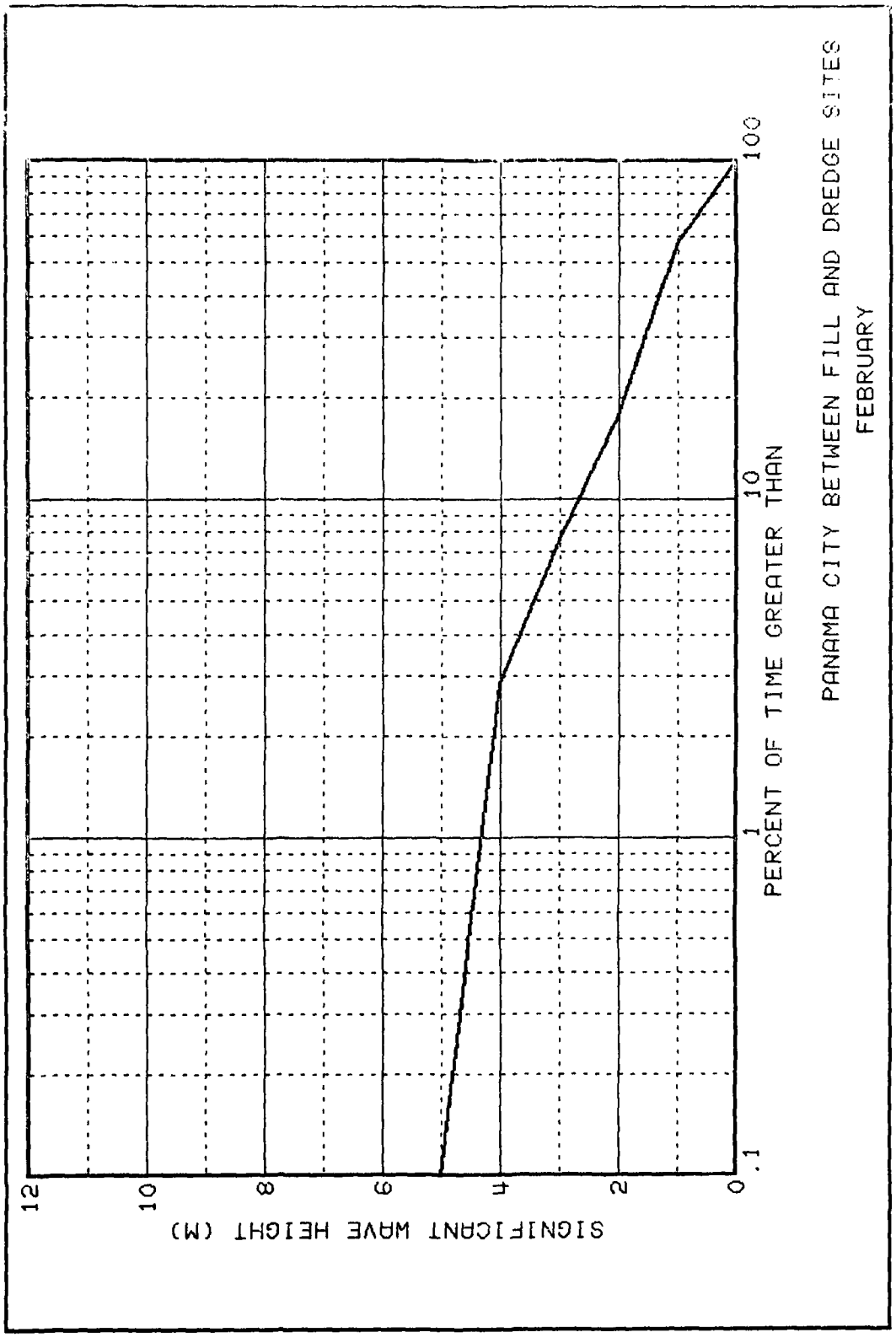
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 26.58 | 6.06 | 0.00 | 0.00 | 2.94 | 0.00 | 0.00 | 0.00 | 0.00 | 2.03 | 37.61 |
| 01-02 | 33.12 | 4.42 | 0.51 | 0.00 | 1.86 | 0.00 | 0.00 | 0.00 | 0.00 | 0.91 | 40.82 |
| 02-03 | 7.94 | 3.81 | 2.43 | 0.00 | 1.08 | 0.00 | 0.00 | 0.00 | 0.00 | 2.52 | 17.79 |
| 03-04 | 0.00 | 0.42 | 0.75 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.42 | 1.59 |
| 04-05 | 0.00 | 0.00 | 2.19 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2.19 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 67.65 | 14.71 | 5.88 | 0.00 | 5.88 | 0.00 | 0.00 | 0.00 | 0.00 | 5.88 | |


PANAMA CITY BETWEEN FILL AND DREDGE SITES
JANUARY
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12
PERCENT OF TIME GREATER THAN
.1
1
10
100

PANAMA CITY BETWEEN FILL AND DREDGE SITES

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR FEBRUARY

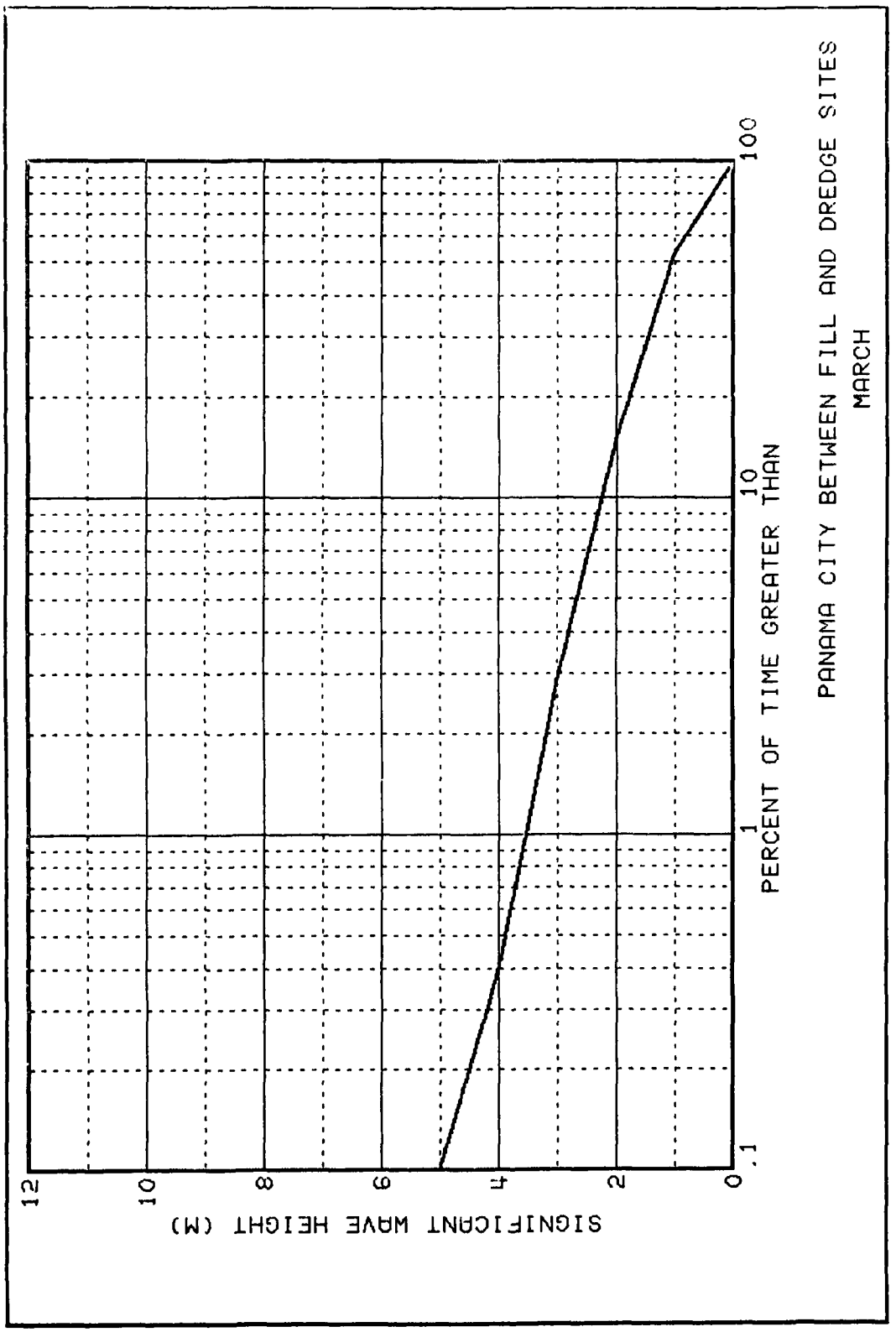
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 40.31 | 2.72 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 43.03 |
| 01-02 | 36.53 | 1.96 | 0.78 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 39.27 |
| 02-03 | 3.16 | 4.22 | 2.08 | 0.65 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 10.10 |
| 03-04 | 0.00 | 2.52 | 0.00 | 2.21 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 4.73 |
| 04-05 | 0.00 | 0.00 | 2.86 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2.86 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 80.00 | 11.43 | 5.71 | 2.86 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |


PANAMA CITY BETWEEN FILL AND DREDGE SITES
FEBRUARY
SIGNIFICANT WAVE HEIGHT (M)
12
10
8
6
4
2
0
PERCENT OF TIME GREATER THAN
100
10
1
.1

PANAMA CITY BETWEEN FILL AND DREDGE SITES

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR MARCH

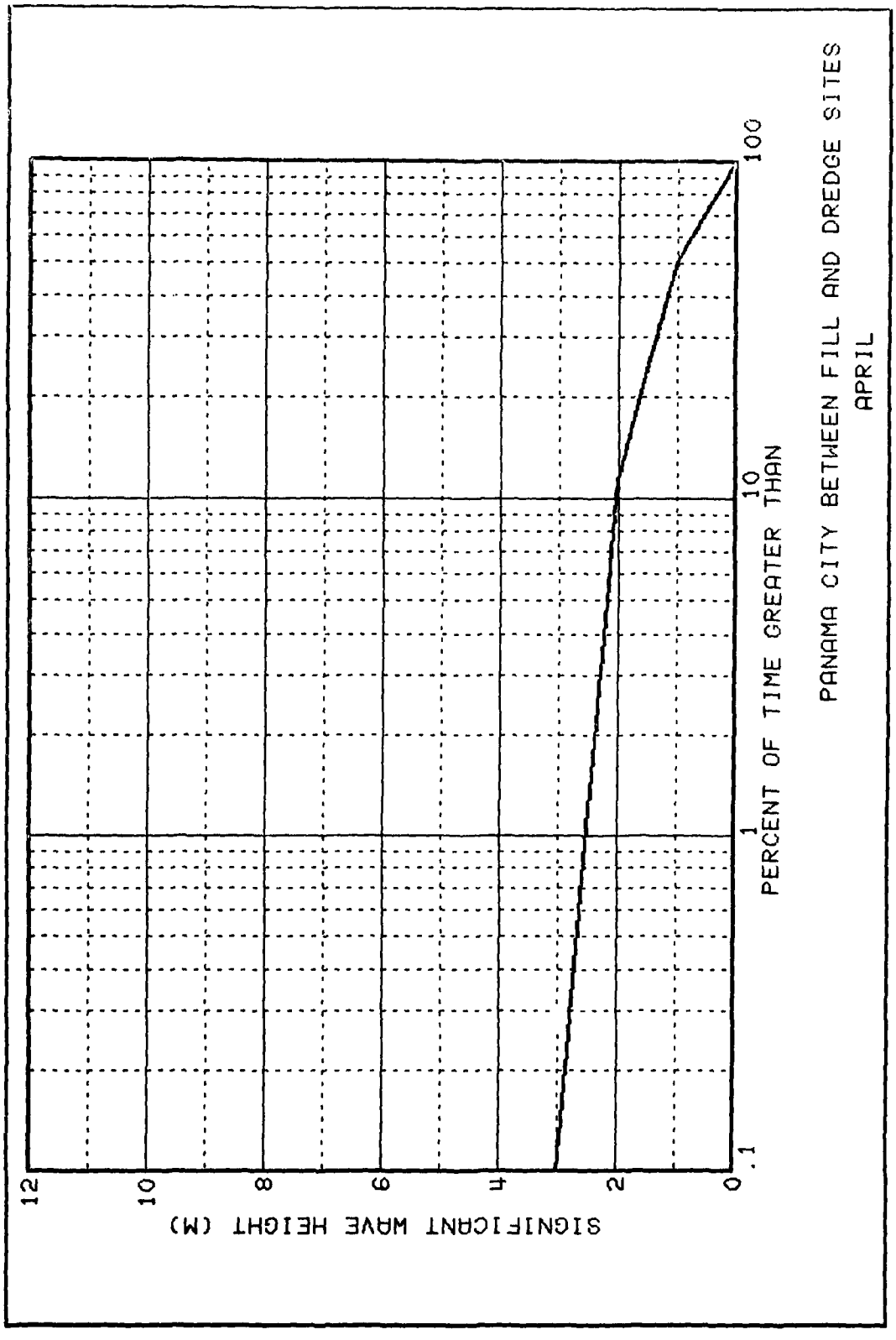
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 44.51 | 2.40 | 0.33 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 47.24 |
| 01-02 | 26.77 | 7.20 | 3.73 | 0.31 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 38.01 |
| 02-03 | 2.18 | 4.69 | 2.06 | 1.73 | 0.00 | 1.24 | 0.00 | 0.00 | 0.00 | 0.00 | 11.91 |
| 03-04 | 0.00 | 1.65 | 0.00 | 0.00 | 0.00 | 0.80 | 0.00 | 0.00 | 0.00 | 0.00 | 2.45 |
| 04-05 | 0.00 | 0.39 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.39 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 73.47 | 16.33 | 6.12 | 2.04 | 0.00 | 2.04 | 0.00 | 0.00 | 0.00 | 0.00 | |


PANAMA CITY BETWEEN FILL AND DREDGE SITES
MARCH
SIGNIFICANT WAVE HEIGHT (M)
12
10
8
6
4
2
0
.1
1
10
100
PERCENT OF TIME GREATER THAN

PANAMA CITY BETWEEN FILL AND DREDGE SITES

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR APRIL

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 44.71 | 2.50 | 0.22 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.98 | 49.41 |
| 01-02 | 25.91 | 9.59 | 3.15 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.52 | 39.17 |
| 02-03 | 1.88 | 5.41 | 4.13 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 11.43 |
| 03-04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 72.50 | 17.50 | 7.50 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2.50 | |

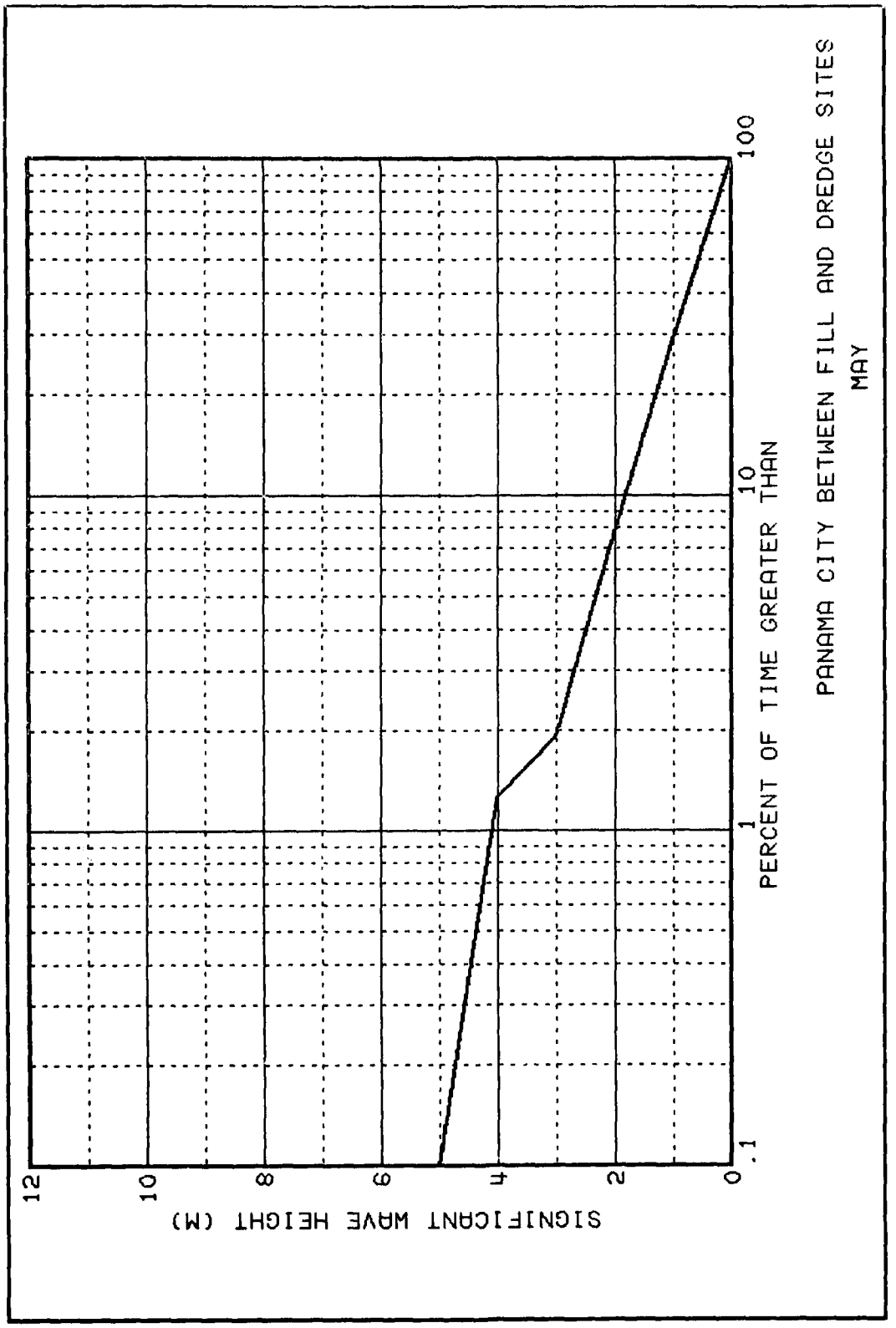

PANAMA CITY BETWEEN FILL AND DREDGE SITES
APRIL
PERCENT OF TIME GREATER THAN
.1
1
10
100
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12

PANAMA CITY BETWEEN FILL AND DREDGE SITES

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR MAY

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 62.14 | 3.48 | 0.43 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.46 | 3.23 | 70.74 |
| 01-02 | 10.93 | 6.00 | 3.42 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.47 | 0.61 | 21.43 |
| 02-03 | 0.00 | 5.90 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 5.90 |
| 03-04 | 0.00 | 0.67 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.67 |
| 04-05 | 0.00 | 1.25 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.25 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 73.08 | 17.31 | 3.85 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.92 | 3.85 | |

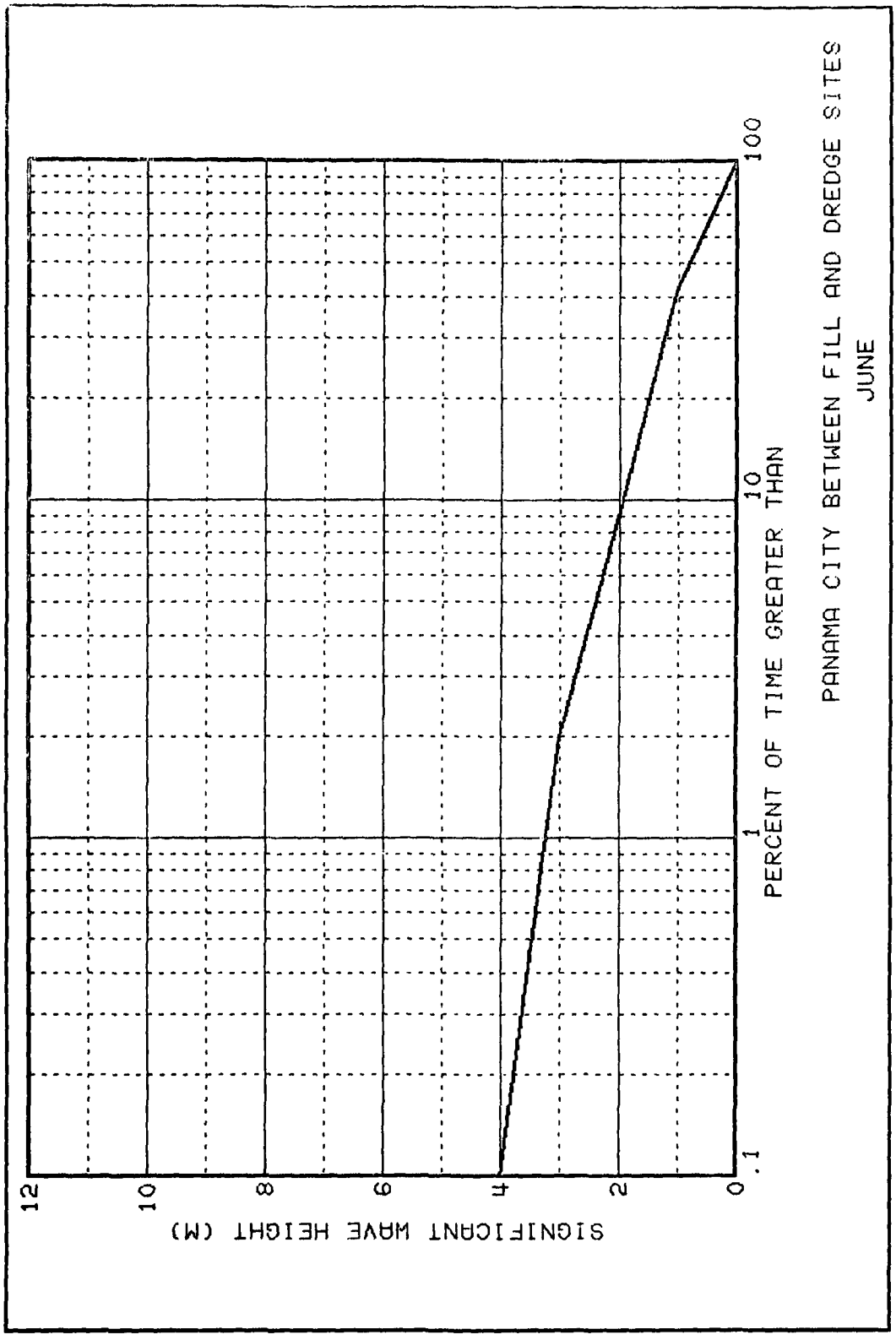
H10


PANAMA CITY BETWEEN FILL AND DREDGE SITES
MAY
PERCENT OF TIME GREATER THAN
.1
1
10
100
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12

PANAMA CITY BETWEEN FILL AND DREDGE SITES

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR JUNE

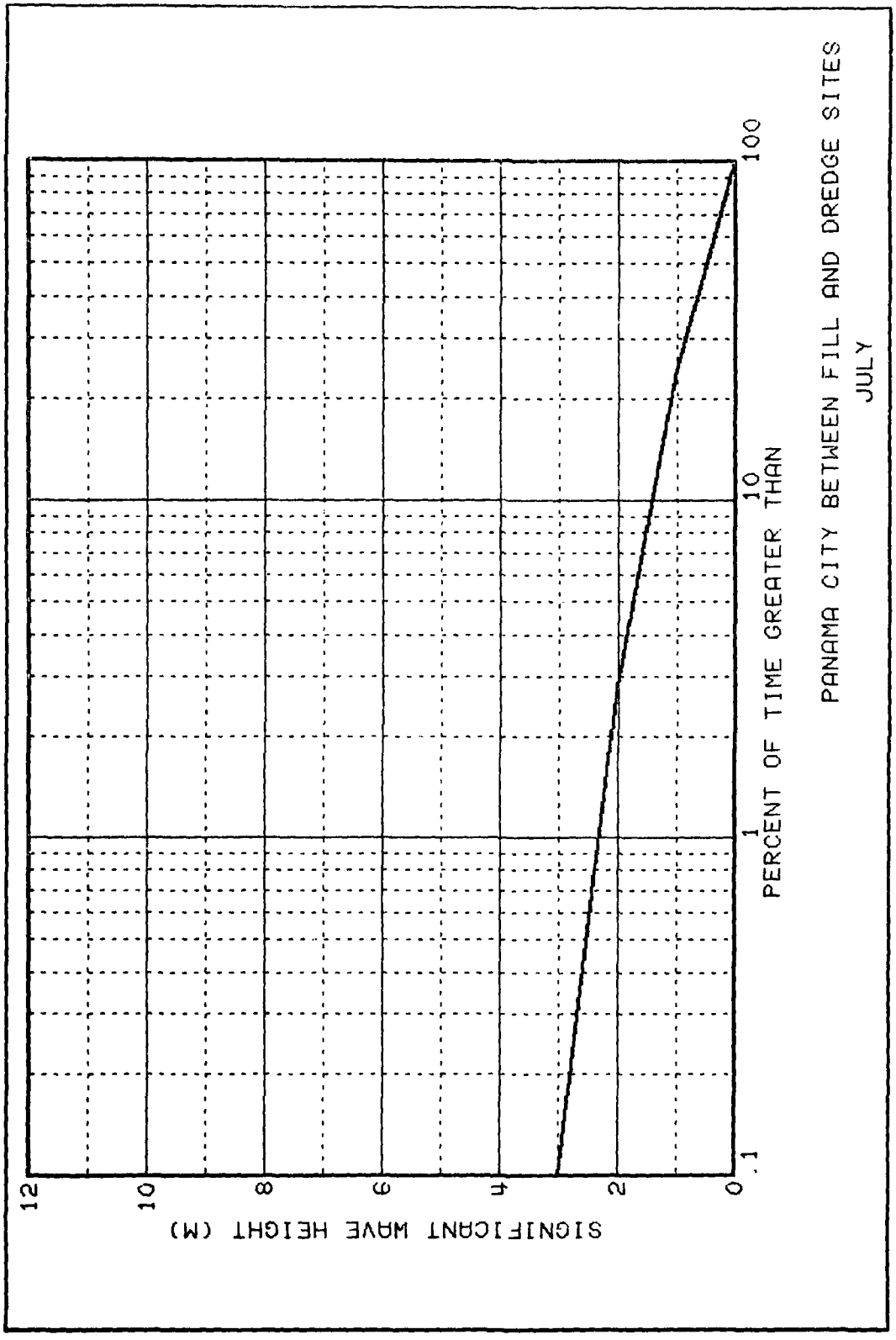
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 57.26 | 0.37 | 0.22 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 57.85 |
| 01-02 | 21.63 | 7.73 | 2.64 | 1.19 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 33.20 |
| 02-03 | 1.11 | 5.61 | 0.00 | 0.24 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 6.96 |
| 03-04 | 0.00 | 1.99 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.99 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 80.00 | 15.71 | 2.86 | 1.43 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |


PANAMA CITY BETWEEN FILL AND DREDGE SITES
JUNE
PERCENT OF TIME GREATER THAN
.1
1
10
100
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12

PANAMA CITY BETWEEN FILL AND DREDGE SITES

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR JULY

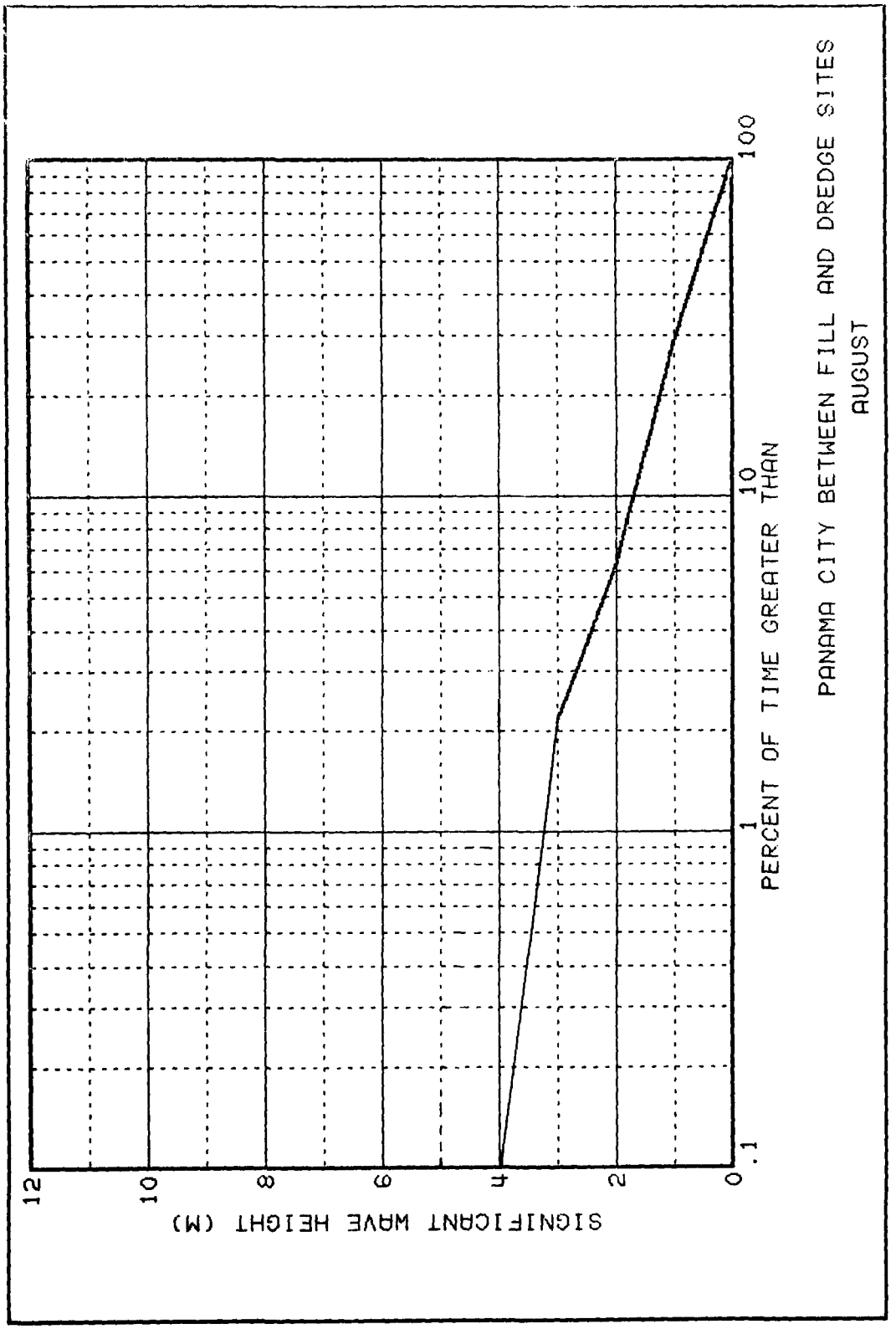
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 71.52 | 0.89 | 1.40 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.00 | 1.02 | 75.84 |
| 01-02 | 17.68 | 2.14 | 1.07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.23 | 0.21 | 21.33 |
| 02-03 | 0.93 | 1.90 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2.83 |
| 03-04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 90.13 | 4.94 | 2.47 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.23 | 1.23 | |


PANAMA CITY BETWEEN FILL AND DREDGE SITES
JULY
PERCENT OF TIME GREATER THAN
.1
1
10
100
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12

PANAMA CITY BETWEEN FILL AND DREDGE SITES

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR AUGUST

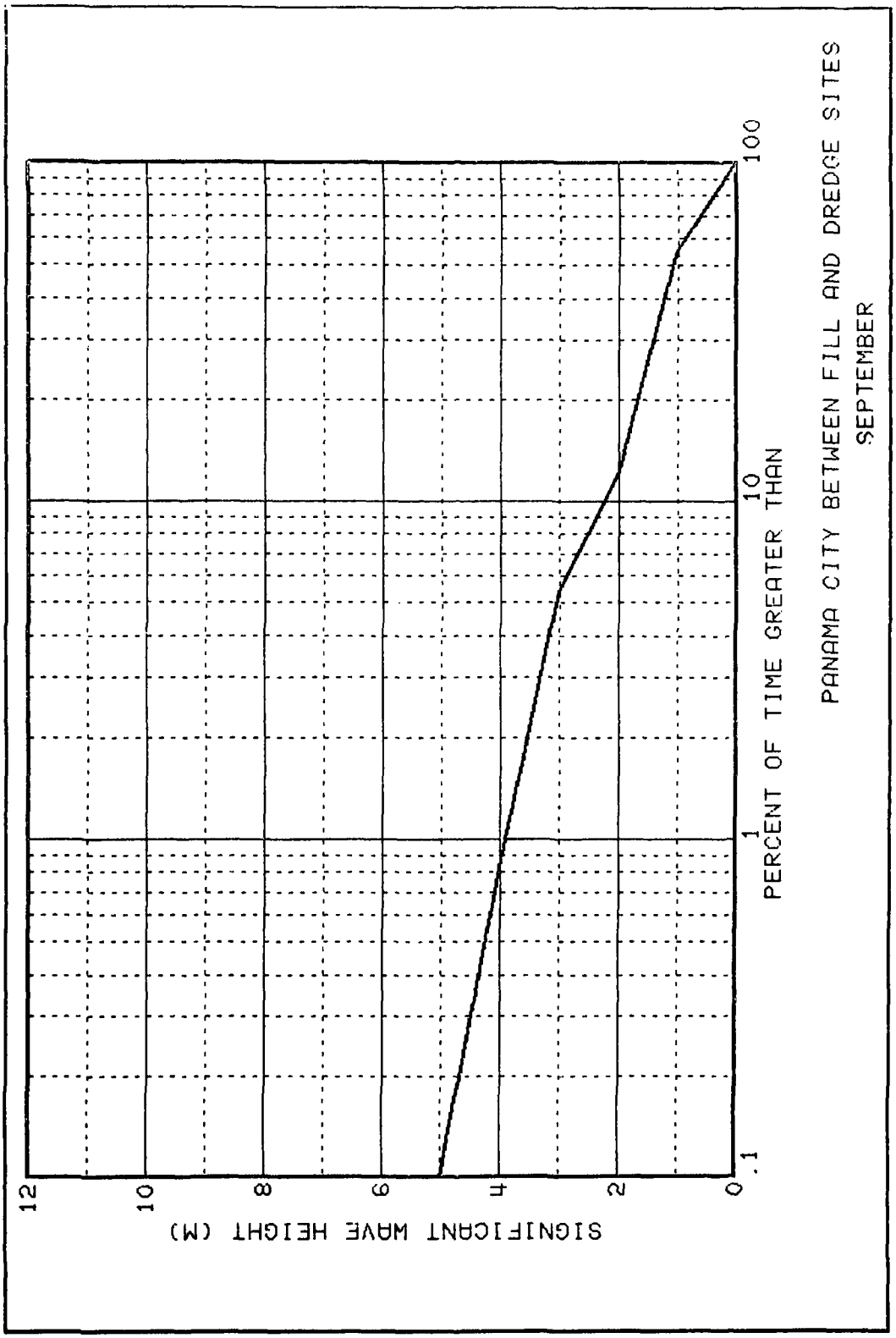
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 60.15 | 3.87 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 5.22 | 2.09 | 0.00 | 71.43 |
| 01-02 | 17.40 | 3.77 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.16 | 0.04 | 0.00 | 22.37 |
| 02-03 | 3.31 | 0.77 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 4.08 |
| 03-04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 04-05 | 0.00 | 0.00 | 0.00 | 2.13 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2.13 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 80.85 | 8.51 | 0.00 | 2.13 | 0.00 | 0.00 | 0.00 | 6.38 | 2.13 | 0.00 | |


PANAMA CITY BETWEEN FILL AND DREDGE SITES
AUGUST
SIGNIFICANT WAVE HEIGHT (M)
12
10
8
6
4
2
0
PERCENT OF TIME GREATER THAN
.1
1
10
100

PANAMA CITY BETWEEN FILL AND DREDGE SITES

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR SEPTEMBER

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 42.78 | 1.46 | 0.12 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 44.36 |
| 01-02 | 33.19 | 7.79 | 2.64 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 43.62 |
| 02-03 | 1.05 | 1.92 | 3.00 | 0.61 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 6.58 |
| 03-04 | 0.00 | 1.00 | 1.00 | 2.62 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 4.62 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.83 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.83 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 77.03 | 12.16 | 6.75 | 4.05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |

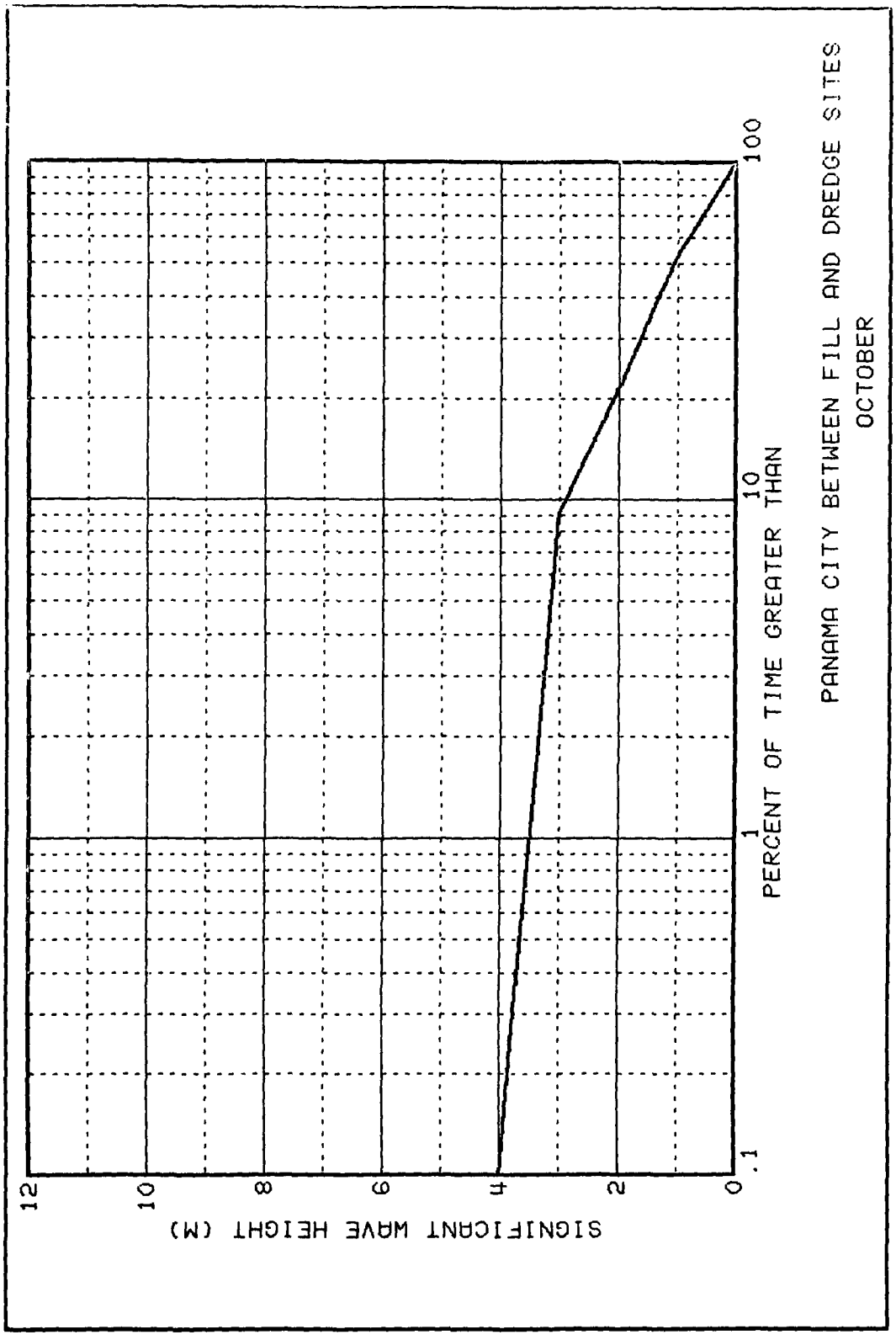

PANAMA CITY BETWEEN FILL AND DREDGE SITES
SEPTEMBER
PERCENT OF TIME GREATER THAN
.1
1
10
100
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12

PANAMA CITY BETWEEN FILL AND DREDGE SITES

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR OCTOBER

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 47.39 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 47.39 |
| 01-02 | 31.49 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 31.49 |
| 02-03 | 4.46 | 7.65 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 12.11 |
| 03-04 | 0.00 | 9.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 9.02 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 83.33 | 16.67 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |

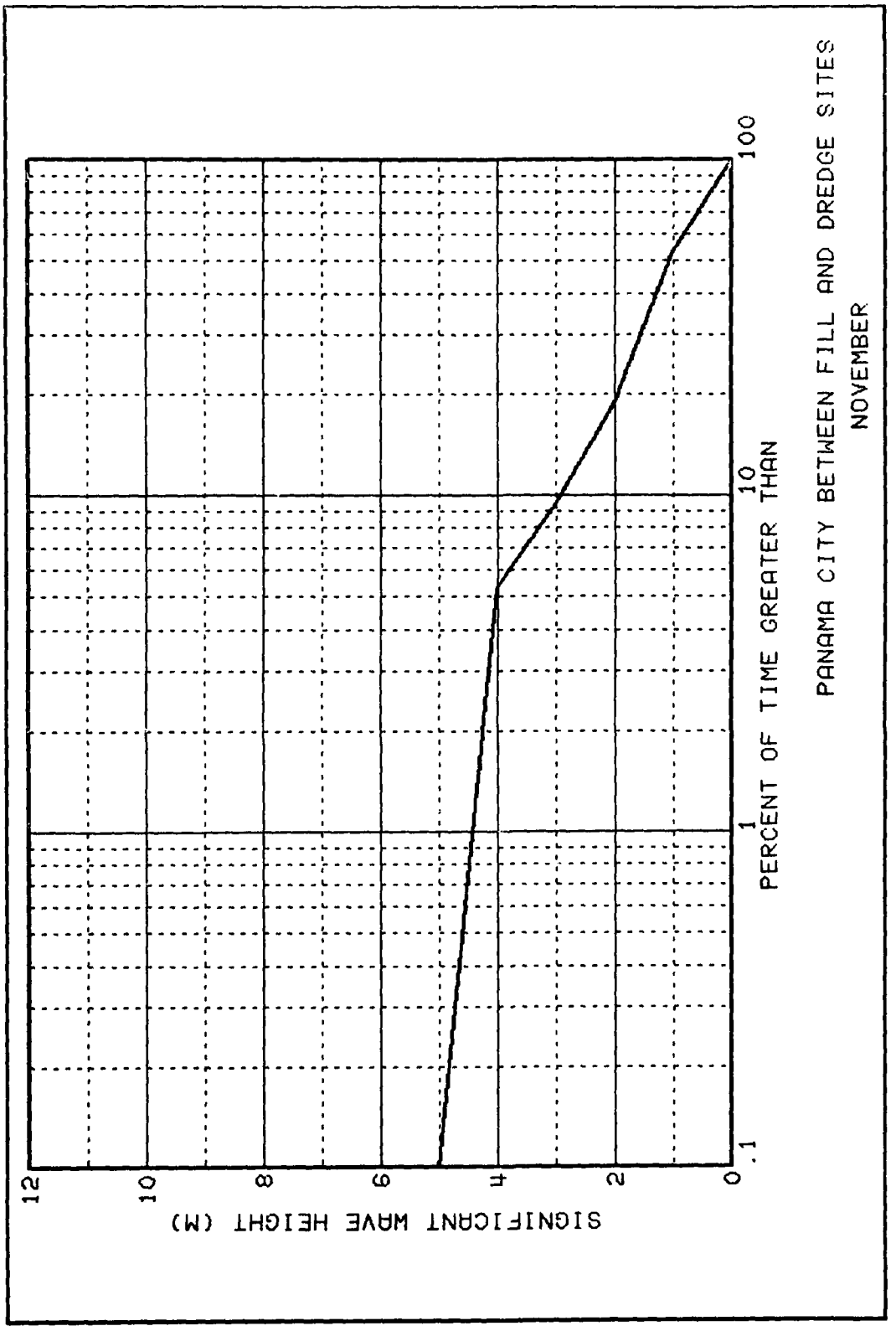
H20


PANAMA CITY BETWEEN FILL AND DREDGE SITES
OCTOBER
PERCENT OF TIME GREATER THAN
.1
1
10
100
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12

PANAMA CITY BETWEEN FILL AND DREDGE SITES

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR NOVEMBER

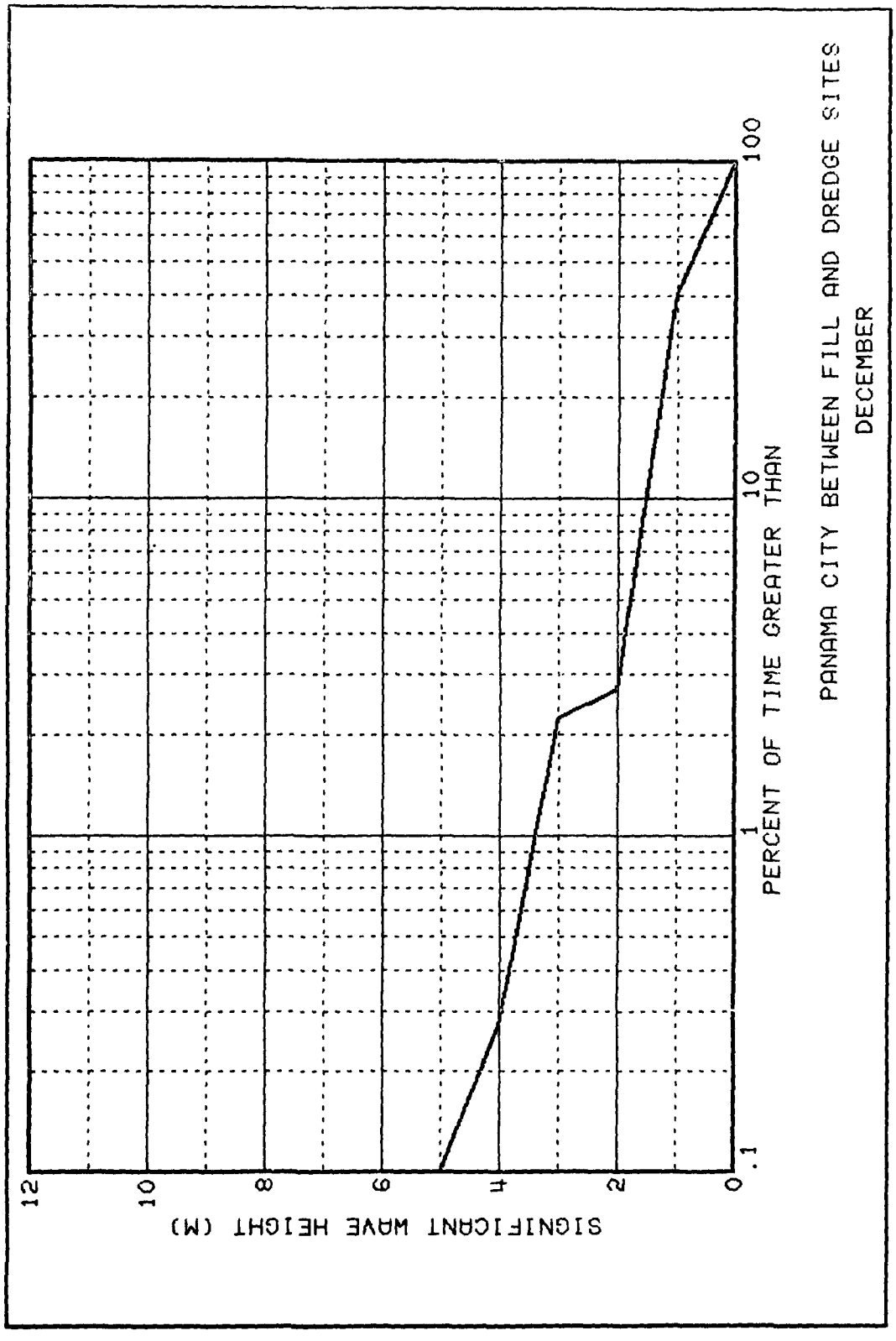
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 41.72 | 0.32 | 0.00 | 4.63 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 46.67 |
| 01-02 | 21.24 | 9.78 | 0.64 | 2.78 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 34.45 |
| 02-03 | 0.00 | 6.41 | 3.06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 9.47 |
| 03-04 | 0.00 | 4.07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 4.07 |
| 04-05 | 0.00 | 5.34 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 5.34 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 62.96 | 25.93 | 3.70 | 7.41 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |


PANAMA CITY BETWEEN FILL AND DREDGE SITES
NOVEMBER
PERCENT OF TIME GREATER THAN
.1
1
10
100
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12

PANAMA CITY BETWEEN FILL AND DREDGE SITES

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR DECEMBER

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 48.15 | 7.62 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 4.10 | 59.87 |
| 01-02 | 30.23 | 5.89 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.31 | 37.43 |
| 02-03 | 0.00 | 0.47 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.47 |
| 03-04 | 0.00 | 1.96 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.96 |
| 04-05 | 0.00 | 0.27 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.27 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 78.38 | 16.22 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 5.40 | |


PANAMA CITY BETWEEN FILL AND DREDGE SITES
DECEMBER
PERCENT OF TIME GREATER THAN
100
10
1
.1
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12

PANAMA CITY BETWEEN FILL AND DREDGE SITES

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD

WAVE DIRECTION = 150

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 12.45 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 12.45 |
| 01-02 | 6.07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 6.07 |
| 02-03 | 0.25 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.25 |
| 03-04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 18.77 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |

PANAMA CITY BETWEEN FILL AND DREDGE SITES

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD

WAVE DIRECTION = 180

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 7.23 | 0.98 | 0.24 | 0.00 | 0.00 | 0.00 | 0.00 | 0.28 | 0.14 | 0.29 | 9.16 |
| 01-02 | 5.40 | 3.32 | 0.92 | 0.03 | 0.00 | 0.00 | 0.00 | 0.07 | 0.03 | 0.06 | 9.84 |
| 02-03 | 0.53 | 2.02 | 0.82 | 0.23 | 0.00 | 0.11 | 0.00 | 0.00 | 0.00 | 0.00 | 3.70 |
| 03-04 | 0.00 | 1.02 | 0.13 | 0.34 | 0.00 | 0.07 | 0.00 | 0.00 | 0.00 | 0.00 | 1.56 |
| 04-05 | 0.00 | 0.37 | 0.18 | 0.28 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.83 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 13.16 | 7.72 | 2.28 | 0.88 | 0.00 | 0.18 | 0.00 | 0.35 | 0.18 | 0.35 | |

PANAMA CITY BETWEEN FILL AND DREDGE SITES

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD

WAVE DIRECTION = 210

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 8.46 | 0.25 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.24 | 8.96 |
| 01-02 | 4.56 | 0.57 | 0.12 | 0.15 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.11 | 5.50 |
| 02-03 | 0.14 | 0.61 | 0.06 | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.83 |
| 03-04 | 0.00 | 0.13 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.13 |
| 04-05 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 13.16 | 1.58 | 0.18 | 0.18 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.35 | |

PANAMA CITY BETWEEN FILL AND DREDGE SITES

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD

WAVE DIRECTION = 240

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 7.68 | [illegible] | [illegible] | [illegible] | 0.00 | 0.00 | 0.00 | 0.15 | 0.31 | 0.43 | 9.37 |
| [illegible] | 2.31 | [illegible] | [illegible] | [illegible] | [illegible] | 0.00 | 0.00 | [illegible] | [illegible] | 0.09 | 4.76 |
| 02-03 | [illegible] | [illegible] | [illegible] | [illegible] | 0.00 | [illegible] | 0.00 | 0.00 | 0.00 | 0.15 | 1.68 |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 | 0.51 |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | 10.00 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | |

PANAMA CITY BETWEEN FILL AND DREDGE SITES

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD

WAVE DIRECTION = 270

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 7.72 | 0.45 | 0.09 | 0.22 | 0.18 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 8.59 |
| 01-02 | 2.88 | 0.61 | 0.20 | 0.13 | 0.11 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3.94 |
| 02-03 | 0.27 | 0.17 | 0.12 | 0.00 | 0.06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.63 |
| 03-04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 10.88 | 1.23 | 0.35 | 0.35 | 0.35 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |

## APPENDIX I: AVERAGE WAVE CLIMATE AT REDONDO BEACH, CALIF.

1. Appendix I contains two sets of the following information. One set is for the sand borrow area at Redondo Beach, Calif., (deep water), and the other is for the fill area:

a. Tabulations of monthly percent occurrence of wave-height/period combinations.

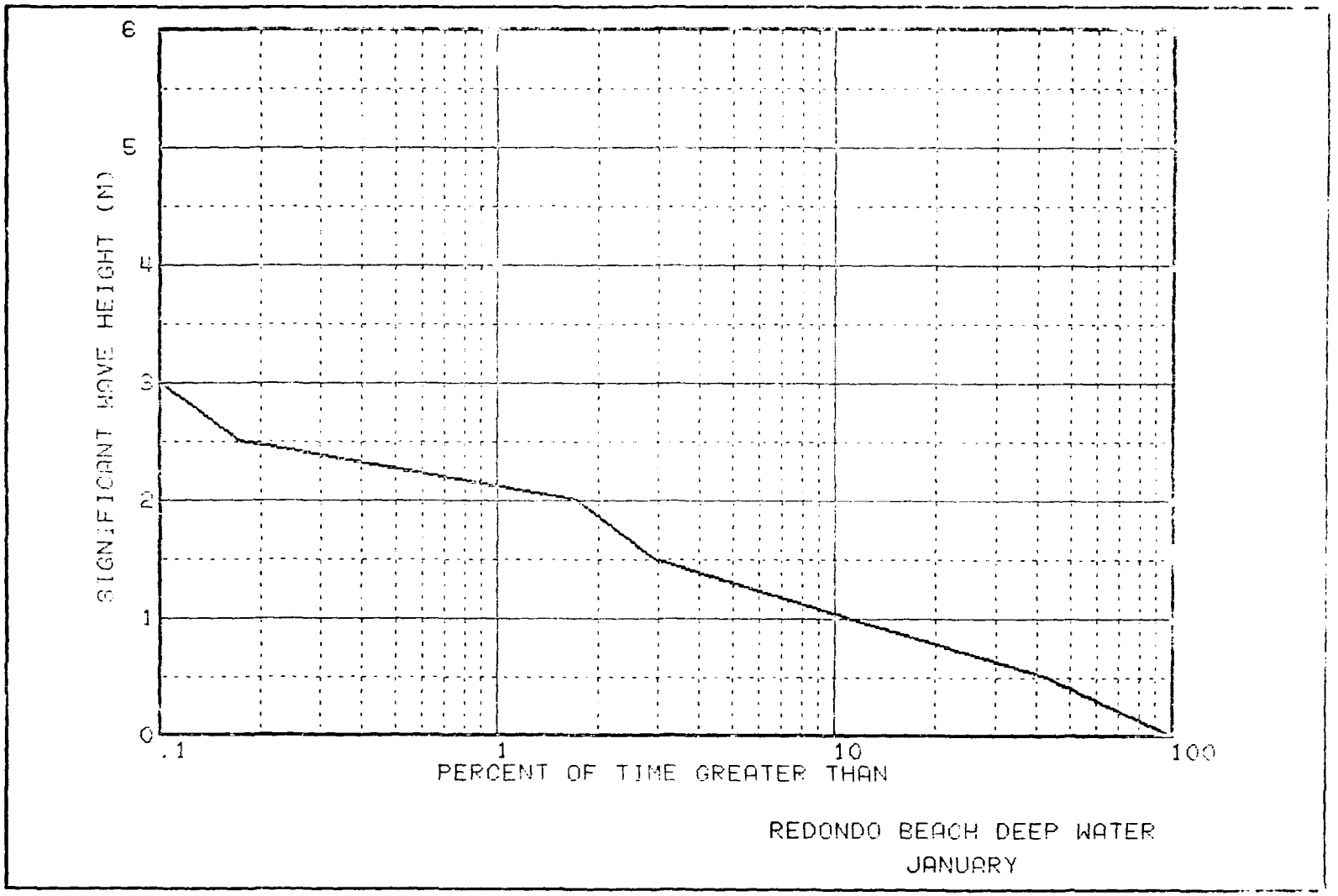
b. Tabulations of annual percent occurrence by azimuth direction of wave-height/period combinations.

c. Plots of monthly significant wave-height occurrence in terms of the total percent time per month that these heights are exceeded.

REDONDO BEACH DEEP WATER

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR JANUARY

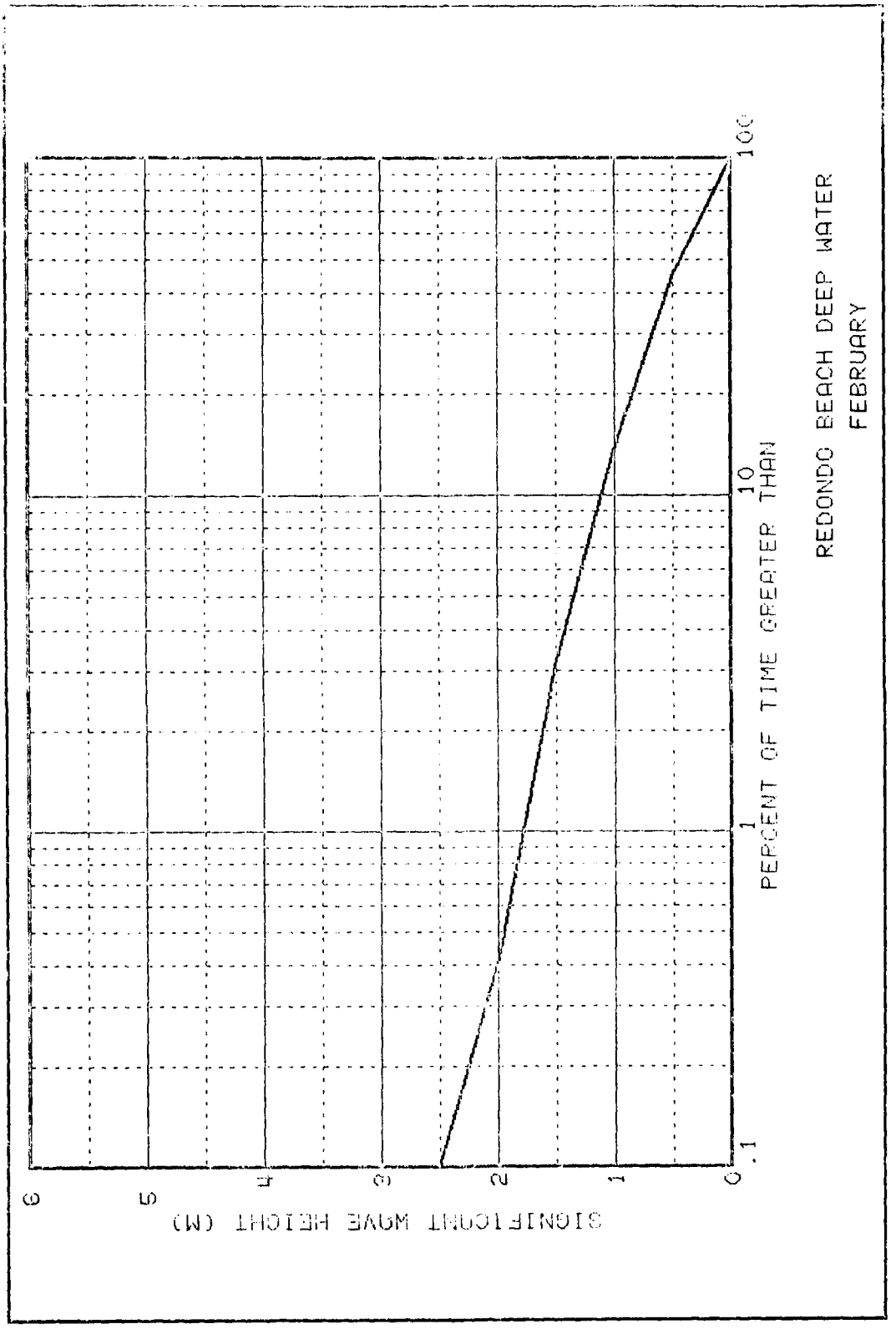
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|
| | <4-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | >18 | |
| 0.0-0.5 | 2.72 | 2.72 | 3.24 | 4.42 | 25.71 | 13.46 | 5.62 | 0.00 | 57.90 |
| 0.5-1.0 | 10.05 | 4.61 | 1.70 | 2.22 | 4.77 | 4.77 | 3.07 | 0.00 | 31.17 |
| 1.0-1.5 | 3.59 | 2.06 | 1.36 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 8.01 |
| 1.5-2.0 | 0.00 | 1.03 | 0.00 | 0.17 | 0.00 | 0.00 | 0.00 | 0.00 | 1.20 |
| 2.0-2.5 | 0.00 | 1.03 | 0.52 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.55 |
| 2.5-3.0 | 0.00 | 0.00 | 0.17 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.17 |
| 3.0-3.5 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 16.37 | 12.44 | 6.99 | 6.81 | 30.48 | 18.22 | 8.69 | 0.00 | |


SIGNIFICANT WAVE HEIGHT (M)
6
5
4
3
2
1
0
.1
1
10
100
PERCENT OF TIME GREATER THAN
REDONDO BEACH DEEP WATER
JANUARY

REDONDO BEACH DEEP WATER

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR FEBRUARY

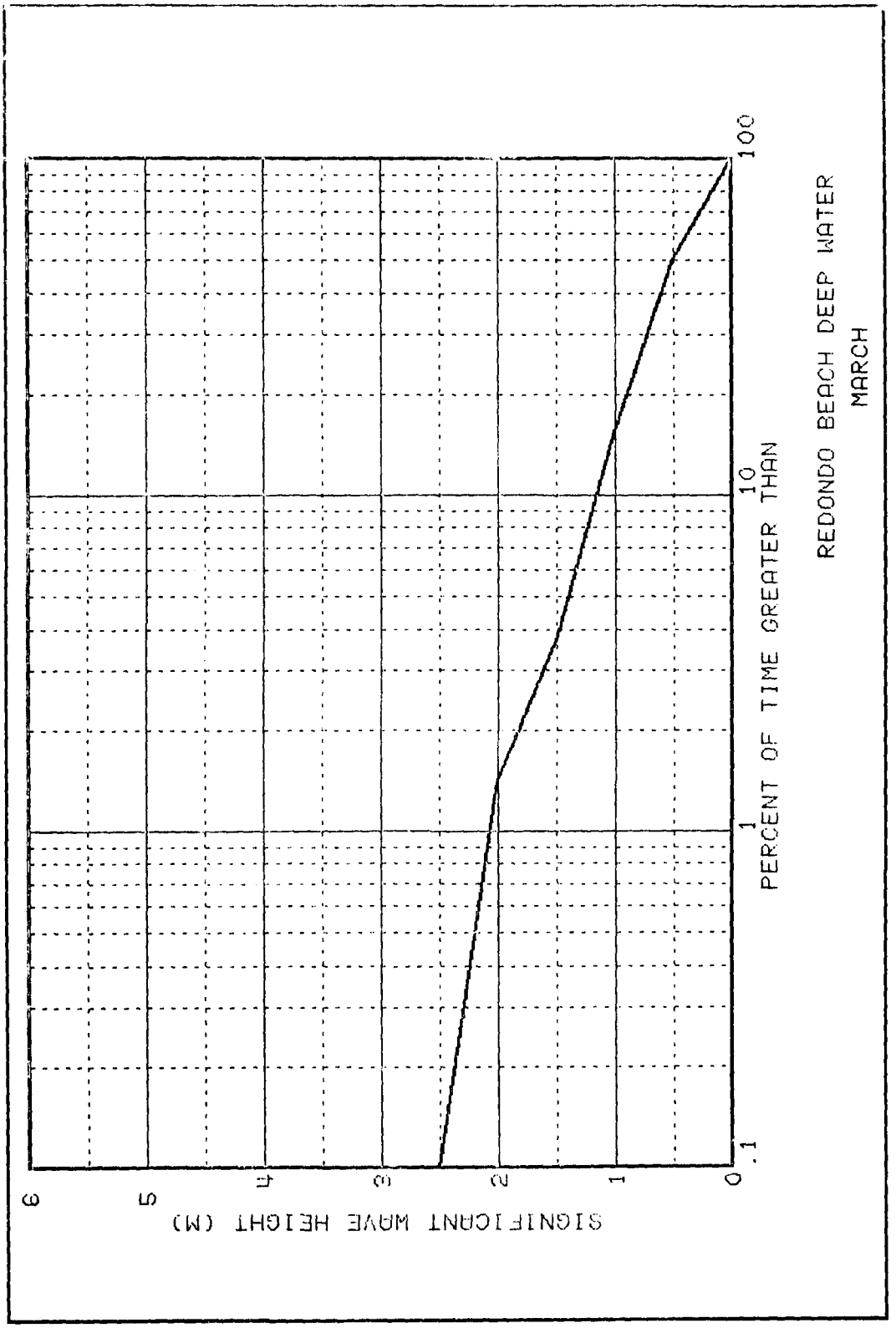
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|
| | <4-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | >18 | |
| 0.0-0.5 | 0.78 | 4.68 | 1.36 | 5.07 | 26.90 | 11.31 | 5.46 | 0.00 | 55.56 |
| 0.5-1.0 | 11.88 | 2.52 | 2.74 | 2.15 | 4.29 | 6.04 | 1.18 | 0.00 | 30.80 |
| 1.0-1.5 | 3.30 | 6.04 | 1.18 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 10.52 |
| 1.5-2.0 | 0.40 | 1.94 | 0.20 | 0.00 | 0.20 | 0.00 | 0.00 | 0.00 | 2.74 |
| 2.0-2.5 | 0.20 | 0.20 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.40 |
| 2.5-3.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3.0-3.5 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 16.55 | 15.38 | 5.47 | 7.23 | 31.38 | 17.35 | 6.63 | 0.00 | |


REDONDO BEACH DEEP WATER
FEBRUARY
PERCENT OF TIME GREATER THAN
100
10
1
.1
SIGNIFICANT WAVE HEIGHT (M)
0
1
2
3
4
5
6

*REDONDO BEACH DEEP WATER*

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR MARCH

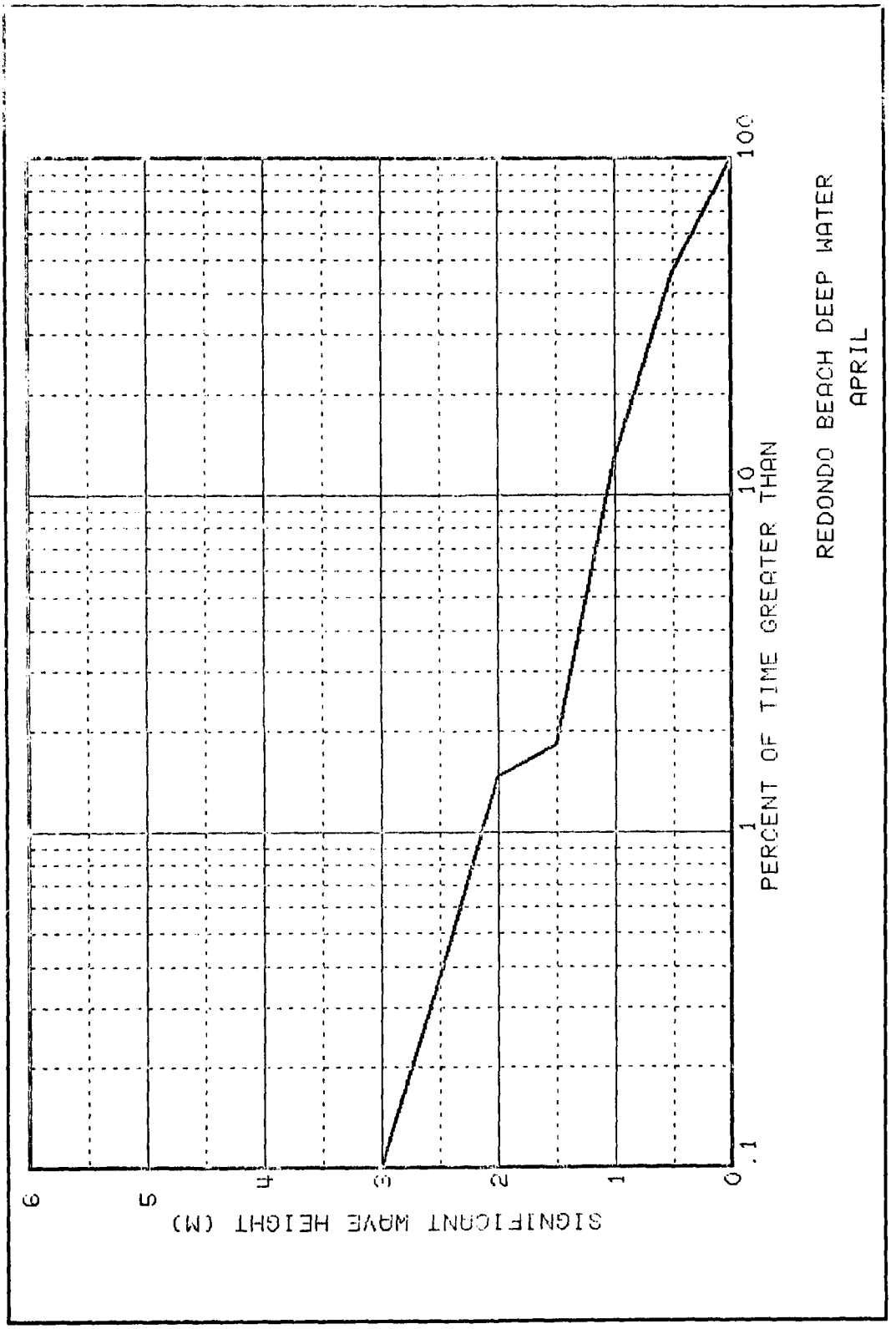
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|
| | <4-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | >18 | |
| 0.0-0.5 | 2.12 | 9.00 | 2.89 | 3.89 | 21.19 | 9.53 | 0.89 | 0.00 | 49.45 |
| 0.5-1.0 | 16.78 | 6.69 | 1.25 | 1.28 | 2.66 | 3.53 | 2.84 | 0.00 | 34.98 |
| 1.0-1.5 | 5.13 | 5.13 | 0.18 | 0.18 | 0.00 | 0.00 | 1.28 | 0.00 | 11.84 |
| 1.5-2.0 | 0.00 | 2.30 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2.30 |
| 2.0-2.5 | 0.00 | 0.72 | 0.71 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.43 |
| 2.5-3.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3.0-3.5 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 24.02 | 23.84 | 4.96 | 5.31 | 23.85 | 13.06 | 4.96 | 0.00 | |


REDONDO BEACH DEEP WATER
MARCH
PERCENT OF TIME GREATER THAN
100
10
1
.1
0
1
2
3
4
5
6
SIGNIFICANT WAVE HEIGHT (M)

REDONDO BEACH DEEP WATER

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR APRIL

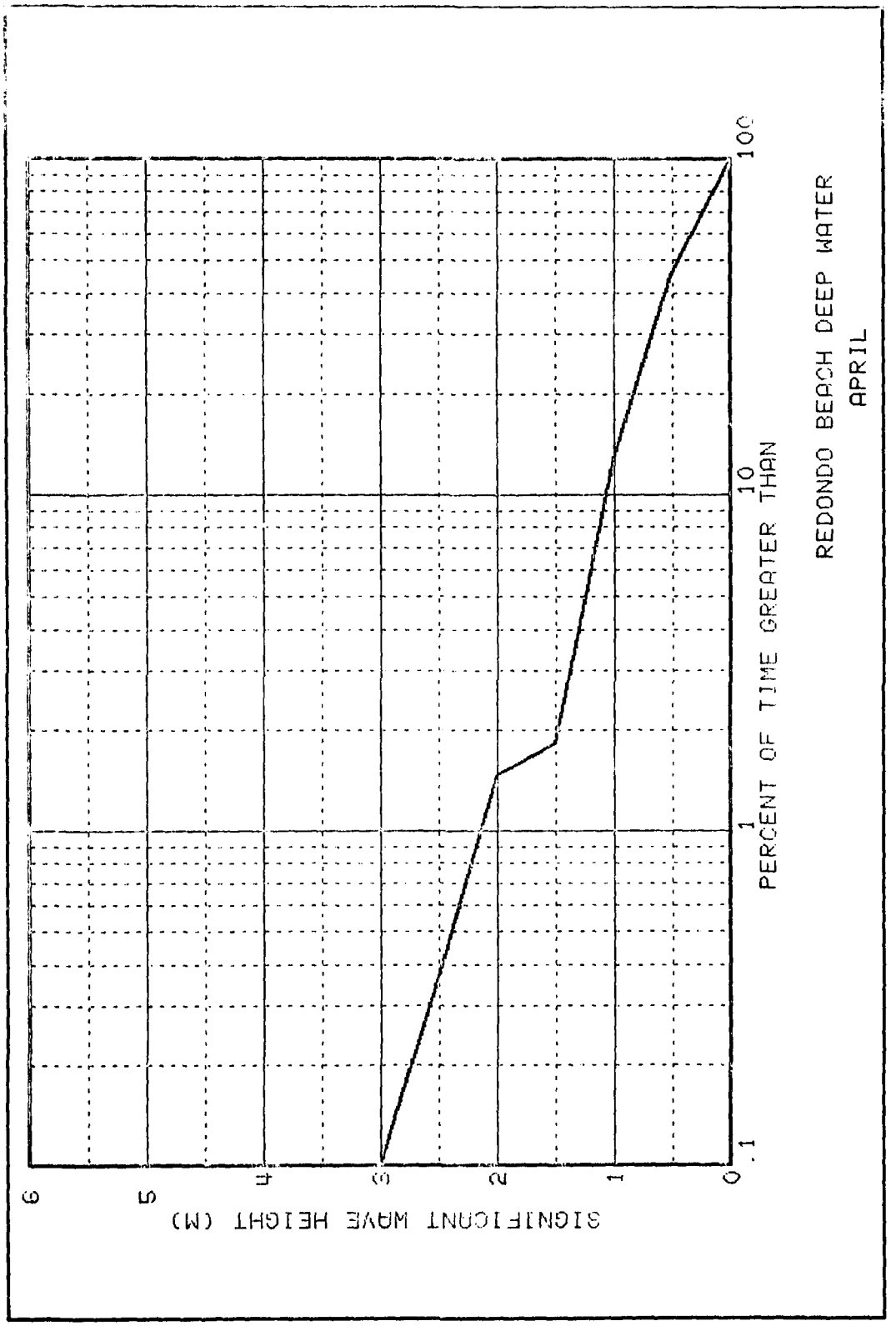
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|
| | <4-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | >18 | |
| 0.0-0.5 | 2.34 | 16.37 | 3.76 | 3.23 | 19.59 | 7.73 | 0.90 | 0.00 | 53.92 |
| 0.5-1.0 | 20.50 | 5.03 | 2.69 | 0.92 | 1.25 | 2.88 | 0.00 | 0.00 | 33.27 |
| 1.0-1.5 | 6.82 | 3.42 | 0.18 | 0.00 | 0.18 | 0.00 | 0.37 | 0.00 | 10.98 |
| 1.5-2.0 | 0.00 | 0.37 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.37 |
| 2.0-2.5 | 0.00 | 0.73 | 0.37 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.10 |
| 2.5-3.0 | 0.00 | 0.00 | 0.37 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.37 |
| 3.0-3.5 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 29.66 | 25.92 | 7.37 | 4.14 | 21.03 | 10.60 | 1.27 | 0.00 | |


REDONDO BEACH DEEP WATER
APRIL
PERCENT OF TIME GREATER THAN
100
10
1
.1
SIGNIFICANT WAVE HEIGHT (M)
0
1
2
3
4
5
6

REDONDO BEACH DEEP WATER

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR MAY

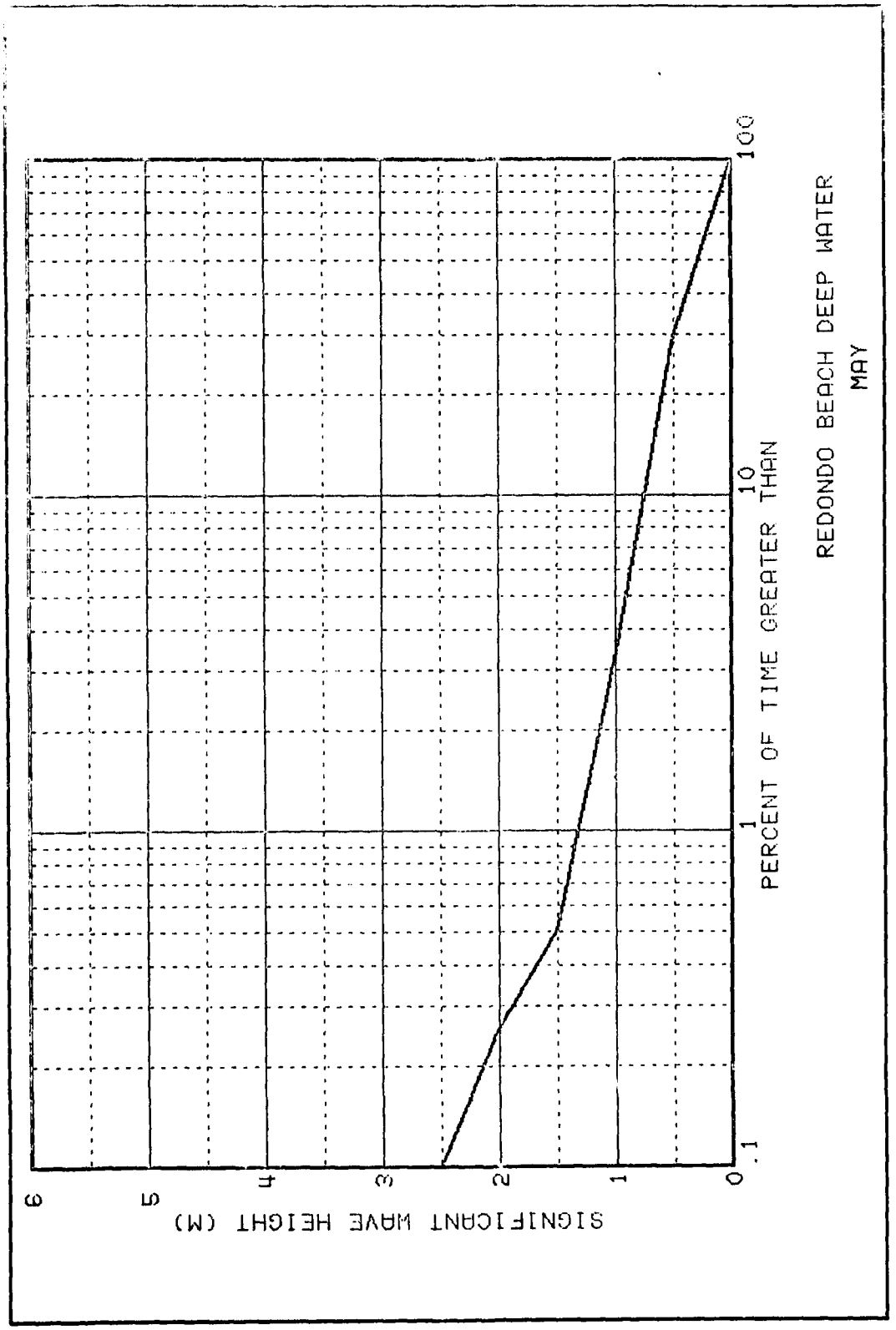
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|
| | <4-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | >18 | |
| 0.0-0.5 | 0.82 | 12.54 | 8.93 | 0.50 | 20.69 | 23.38 | 7.14 | 1.14 | 70.15 |
| 0.5-1.0 | 14.54 | 3.01 | 1.13 | 0.19 | 3.51 | 3.09 | 0.96 | 0.14 | 26.58 |
| 1.0-1.5 | 1.82 | 0.88 | 0.00 | 0.06 | 0.00 | 0.00 | 0.00 | 0.00 | 2.76 |
| 1.5-2.0 | 0.00 | 0.25 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.25 |
| 2.0-2.5 | 0.00 | 0.13 | 0.13 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.26 |
| 2.5-3.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3.0-3.5 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 17.18 | 16.81 | 5.21 | 0.76 | 24.20 | 26.48 | 8.09 | 1.28 | |


REDONDO BEACH DEEP WATER
APRIL
PERCENT OF TIME GREATER THAN
.1
1
10
100
SIGNIFICANT WAVE HEIGHT (M)
0
1
2
3
4
5
6

REDONDO BEACH DEEP WATER

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR MAY

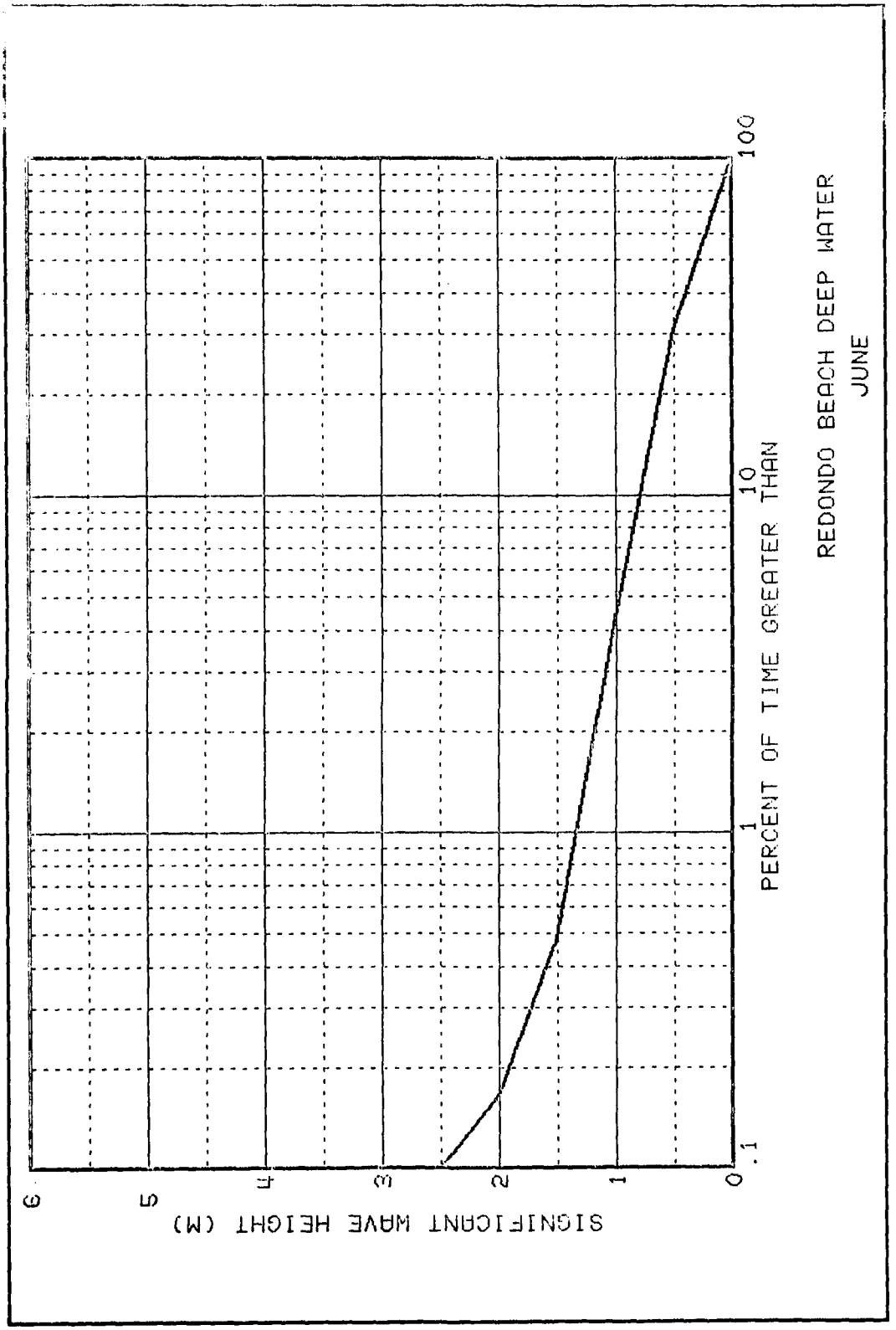
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|
| | <4-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | >18 | |
| 0.0-0.5 | 0.82 | 12.54 | 8.85 | 0.50 | 20.69 | 23.38 | 7.14 | 1.14 | 70.15 |
| 0.5-1.0 | 14.54 | 3.01 | 1.13 | 0.19 | 3.51 | 3.09 | 0.96 | 0.14 | 26.58 |
| 1.0-1.5 | 1.82 | 0.88 | 0.00 | 0.06 | 0.00 | 0.00 | 0.00 | 0.00 | 2.76 |
| 1.5-2.0 | 0.00 | 0.25 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.25 |
| 2.0-2.5 | 0.00 | 0.13 | 0.13 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.26 |
| 2.5-3.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3.0-3.5 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 17.18 | 16.81 | 5.21 | 0.76 | 24.20 | 26.48 | 8.09 | 1.28 | |


REDONDO BEACH DEEP WATER
MAY
PERCENT OF TIME GREATER THAN
.1
1
10
100
SIGNIFICANT WAVE HEIGHT (M)
0
1
2
3
4
5
6

REDONDO BEACH DEEP WATER

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR JUNE

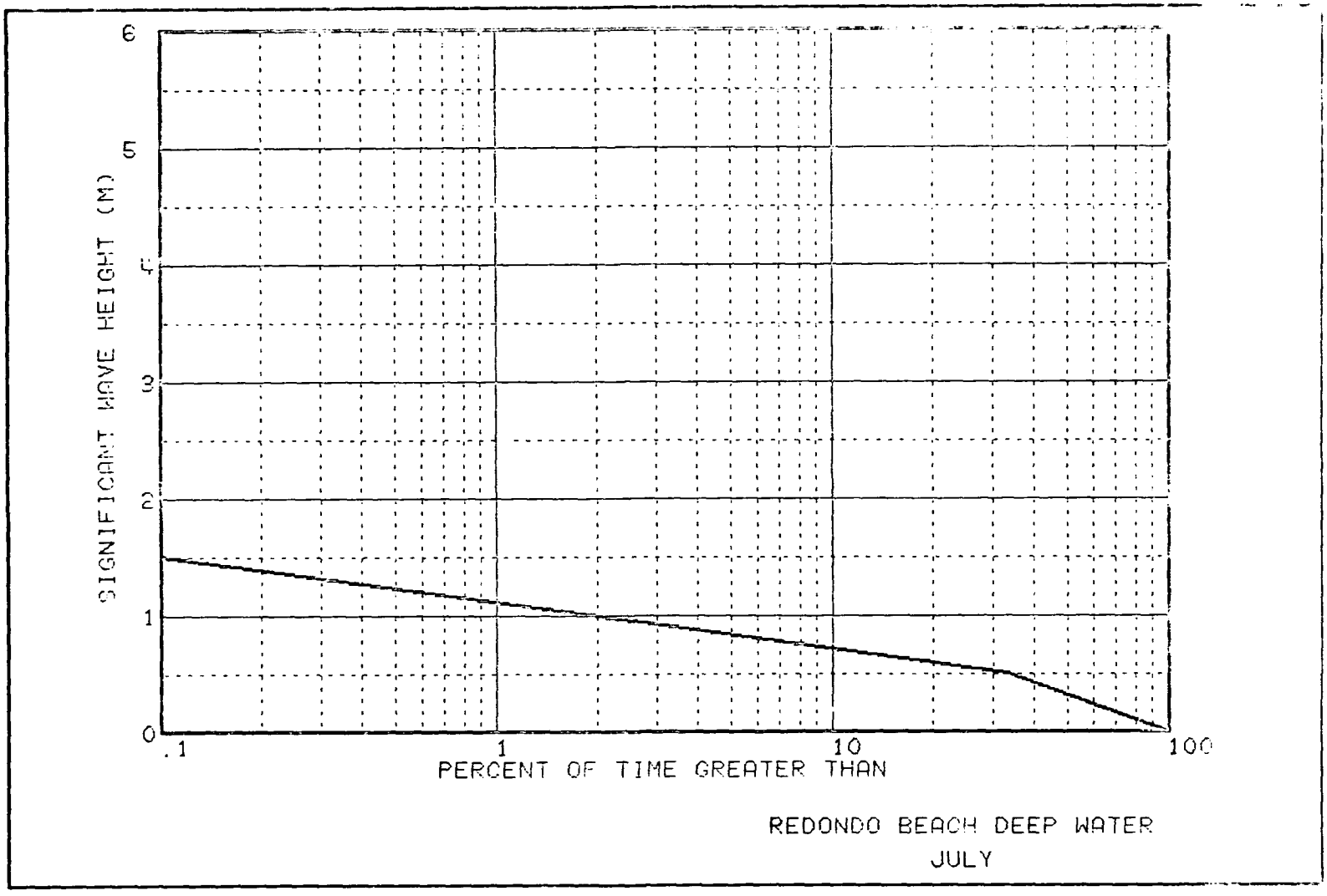
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|
| | <4-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | >18 | |
| 0.0-0.5 | 1.77 | 18.89 | 3.55 | 0.00 | 14.88 | 21.82 | 5.98 | 2.17 | 69.06 |
| 0.5-1.0 | 15.09 | 3.47 | 1.61 | 0.25 | 2.17 | 3.10 | 0.88 | 0.00 | 26.57 |
| 1.0-1.5 | 2.75 | 1.13 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3.88 |
| 1.5-2.0 | 0.00 | 0.32 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.32 |
| 2.0-2.5 | 0.00 | 0.00 | 0.08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.08 |
| 2.5-3.0 | 0.00 | 0.08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.08 |
| 3.0-3.5 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 19.61 | 23.89 | 5.24 | 0.25 | 17.05 | 24.92 | 6.86 | 2.17 | |


REDONDO BEACH DEEP WATER
JUNE
PERCENT OF TIME GREATER THAN
.1
1
10
100
SIGNIFICANT WAVE HEIGHT (M)
0
1
2
3
4
5
6

REDONDO BEACH DEEP WATER

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR JULY

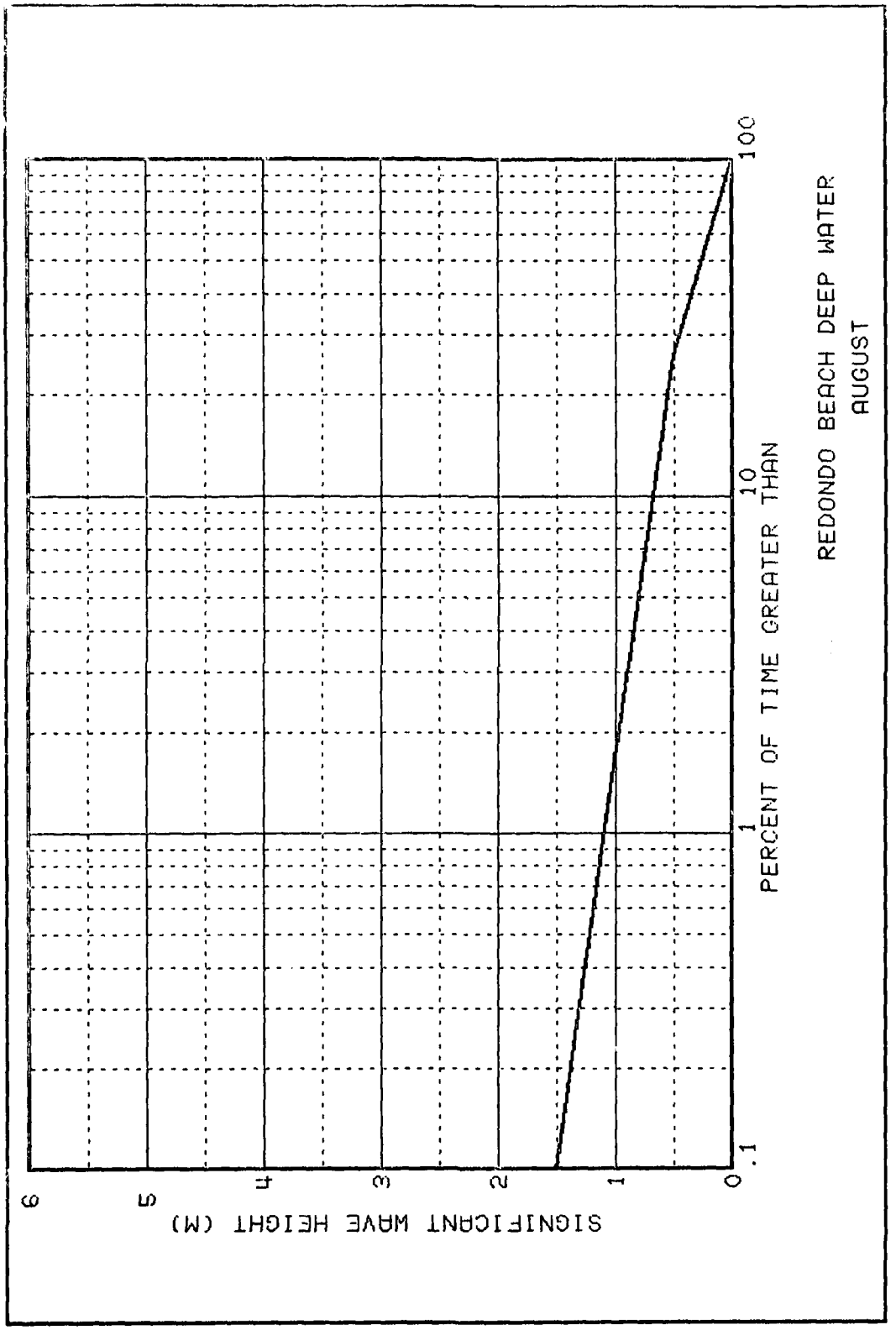
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|
| | <4-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | >18 | |
| 0.0-0.5 | 1.69 | 16.95 | 2.74 | 0.07 | 31.66 | 12.06 | 1.43 | 0.13 | 66.74 |
| 0.5-1.0 | 10.42 | 3.38 | 0.84 | 0.07 | 8.34 | 7.21 | 0.97 | 0.13 | 31.36 |
| 1.0-1.5 | 1.34 | 0.56 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.90 |
| 1.5-2.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2.0-2.5 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2.5-3.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3.0-3.5 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 13.44 | 20.90 | 3.58 | 0.14 | 40.00 | 19.28 | 2.40 | 0.26 | |


SIGNIFICANT WAVE HEIGHT (M)
0
1
2
3
4
5
6
.1
1
10
100
PERCENT OF TIME GREATER THAN
REDONDO BEACH DEEP WATER
JULY

REDONDO BEACH DEEP WATER

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR AUGUST

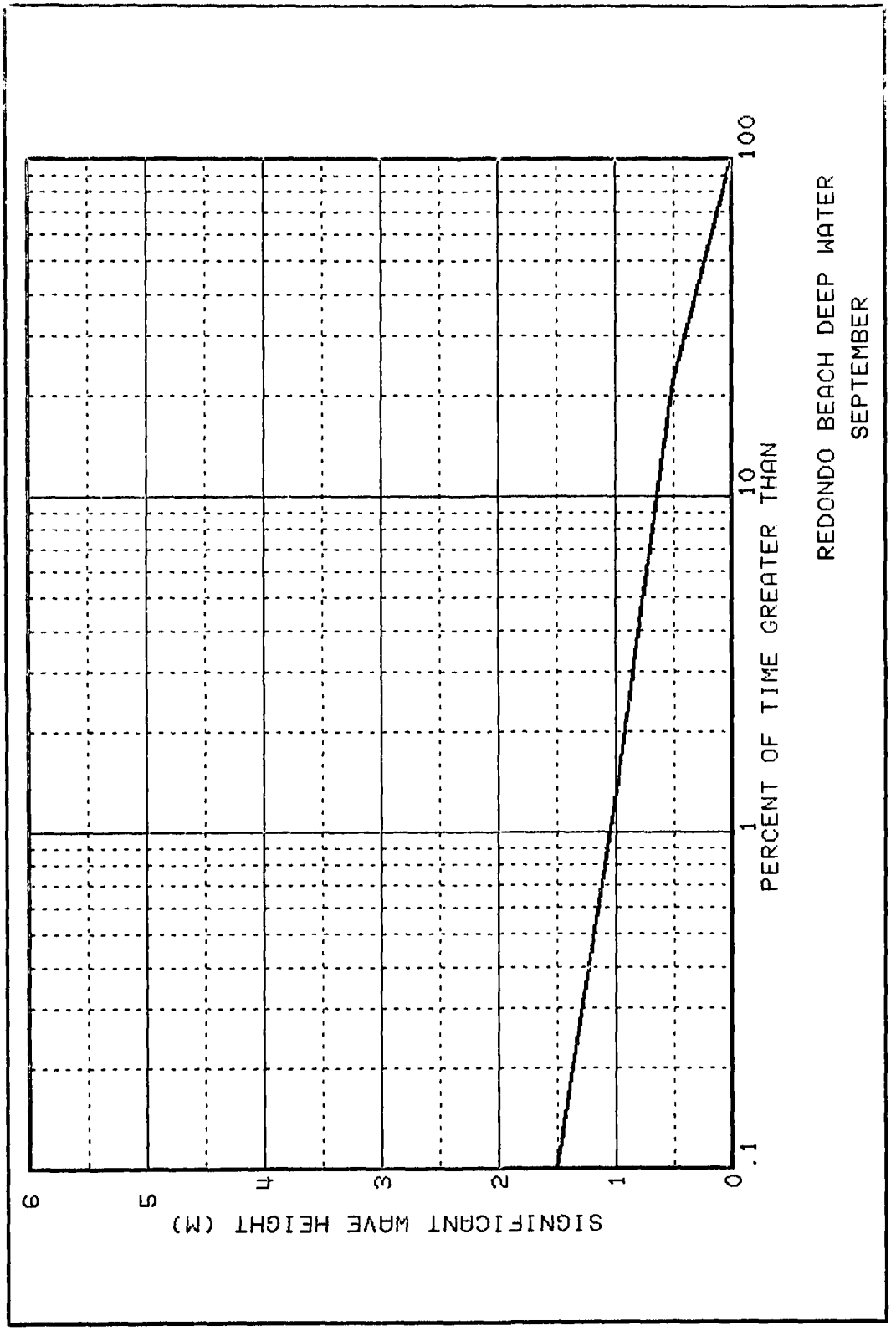
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|
| | <4-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | >18 | |
| 0.0-0.5 | 1.94 | 17.77 | 2.91 | 0.16 | 23.91 | 22.49 | 4.08 | 0.47 | 73.73 |
| 0.5-1.0 | 8.24 | 2.10 | 0.72 | 0.24 | 7.12 | 4.07 | 1.96 | 0.12 | 24.58 |
| 1.0-1.5 | 1.05 | 0.65 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.69 |
| 1.5-2.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2.0-2.5 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2.5-3.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3.0-3.5 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 11.22 | 20.52 | 3.63 | 0.41 | 31.03 | 26.56 | 6.04 | 0.59 | |


REDONDO BEACH DEEP WATER
AUGUST
PERCENT OF TIME GREATER THAN
100
10
1
.1
SIGNIFICANT WAVE HEIGHT (M)
0
1
2
3
4
5
6

REDONDO BEACH DEEP WATER

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR SEPTEMBER

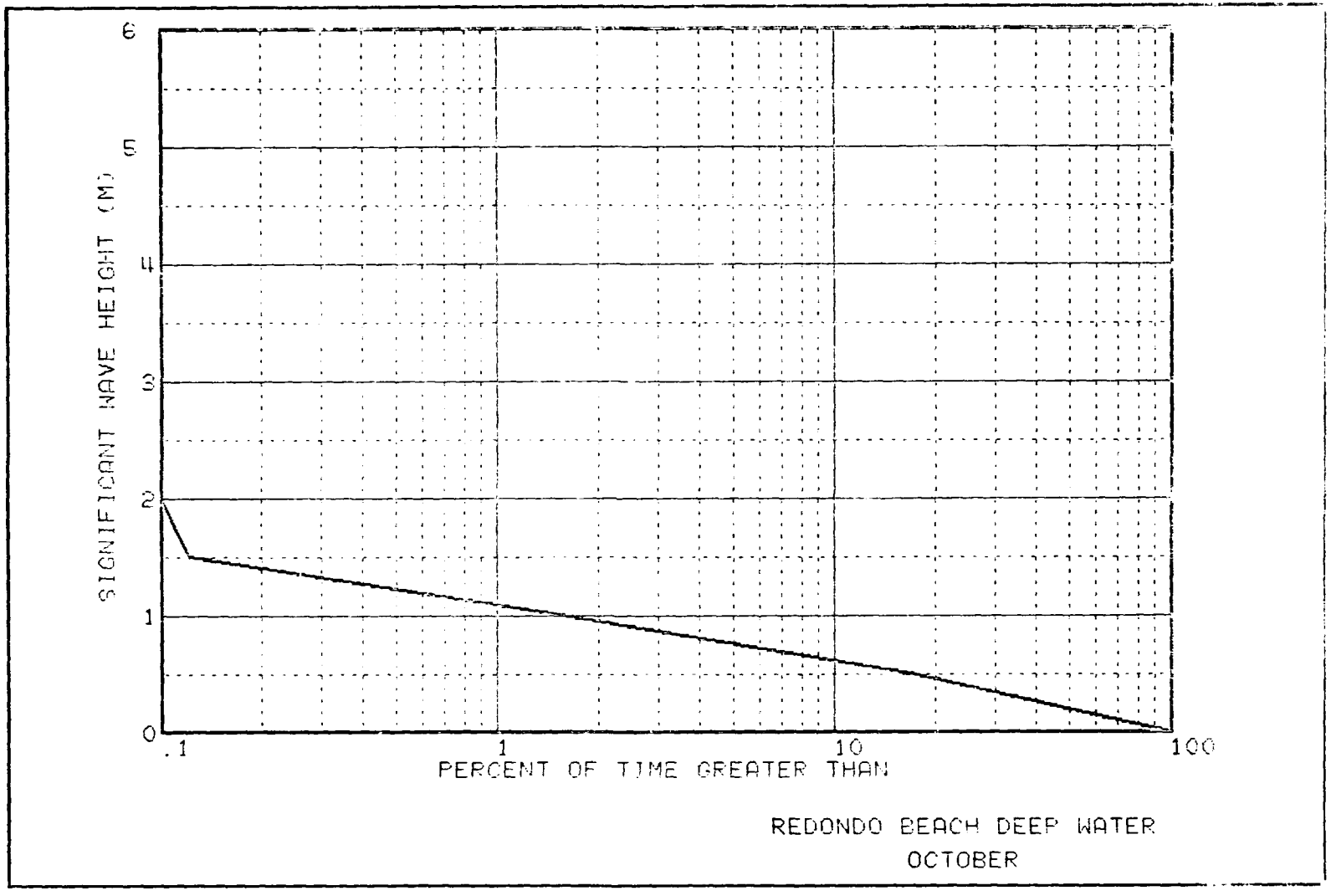
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|
| | <4-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | >18 | |
| 0.0-0.5 | 1.54 | 9.24 | 1.23 | 0.46 | 32.82 | 23.76 | 8.04 | 0.87 | 77.96 |
| 0.5-1.0 | 7.08 | 1.08 | 0.16 | 0.16 | 6.60 | 3.29 | 1.92 | 0.53 | 20.81 |
| 1.0-1.5 | 0.77 | 0.39 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.15 |
| 1.5-2.0 | 0.00 | 0.08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.08 |
| 2.0-2.5 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2.5-3.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3.0-3.5 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 9.38 | 10.78 | 1.39 | 0.62 | 39.42 | 27.05 | 9.96 | 1.40 | |


REDONDO BEACH DEEP WATER
SEPTEMBER
PERCENT OF TIME GREATER THAN
.1
1
10
100
SIGNIFICANT WAVE HEIGHT (M)
0
1
2
3
4
5
6

REDONDO BEACH DEEP WATER

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR OCTOBER

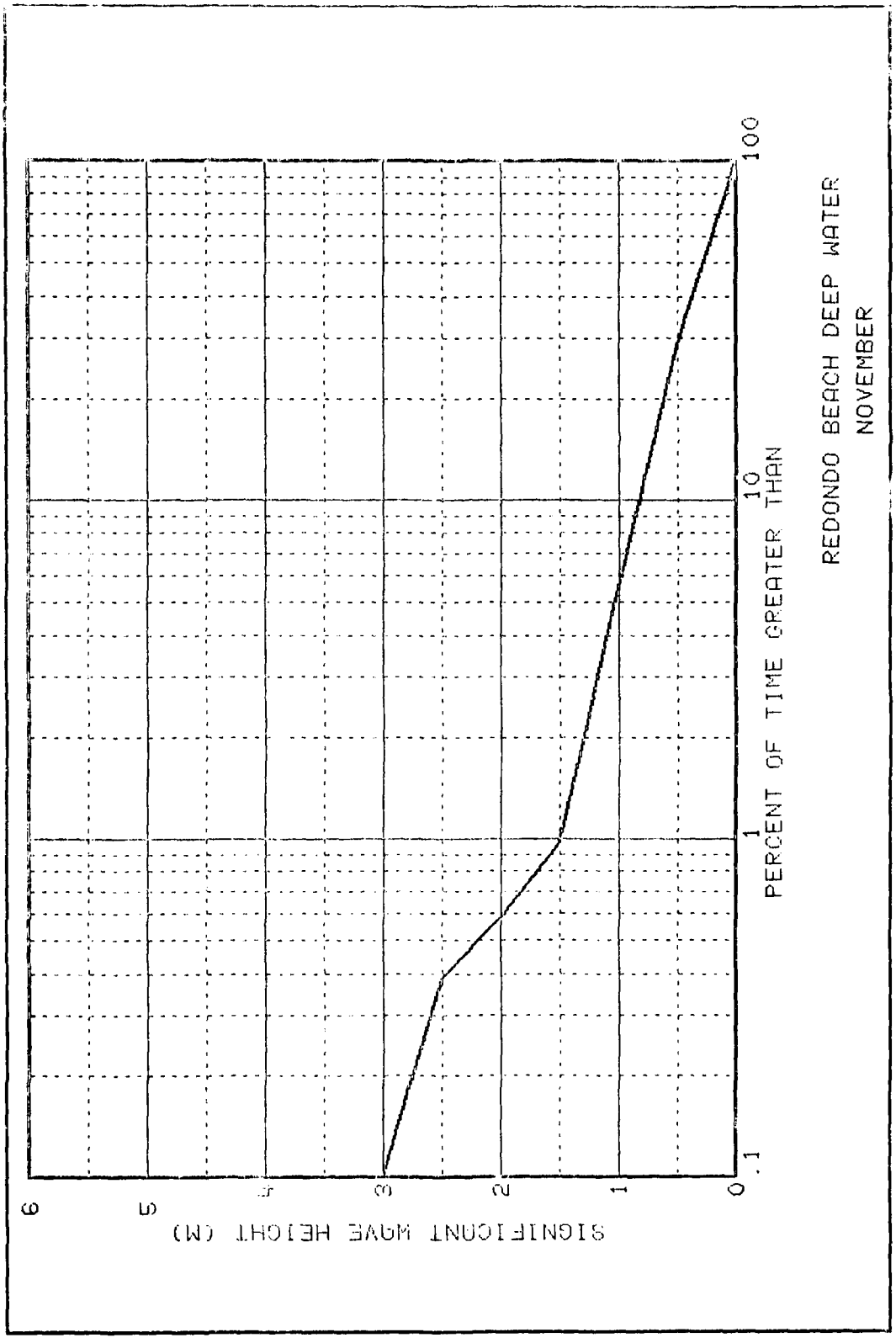
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|
| | <4-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | >18 | |
| 0.0-0.5 | 0.60 | 5.01 | 1.67 | 2.51 | 48.68 | 19.75 | 4.63 | 0.35 | 83.18 |
| 0.5-1.0 | 6.21 | 0.48 | 0.12 | 0.24 | 5.21 | 2.28 | 0.56 | 0.17 | 15.27 |
| 1.0-1.5 | 1.08 | 0.36 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.43 |
| 1.5-2.0 | 0.00 | 0.12 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.12 |
| 2.0-2.5 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2.5-3.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3.0-3.5 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 7.88 | 5.96 | 1.79 | 2.75 | 53.88 | 22.03 | 5.18 | 0.52 | |


SIGNIFICANT WAVE HEIGHT (M)
0
1
2
3
4
5
6
.1
1
10
100
PERCENT OF TIME GREATER THAN
REDONDO BEACH DEEP WATER
OCTOBER

REDONDO BEACH DEEP WATER

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR NOVEMBER

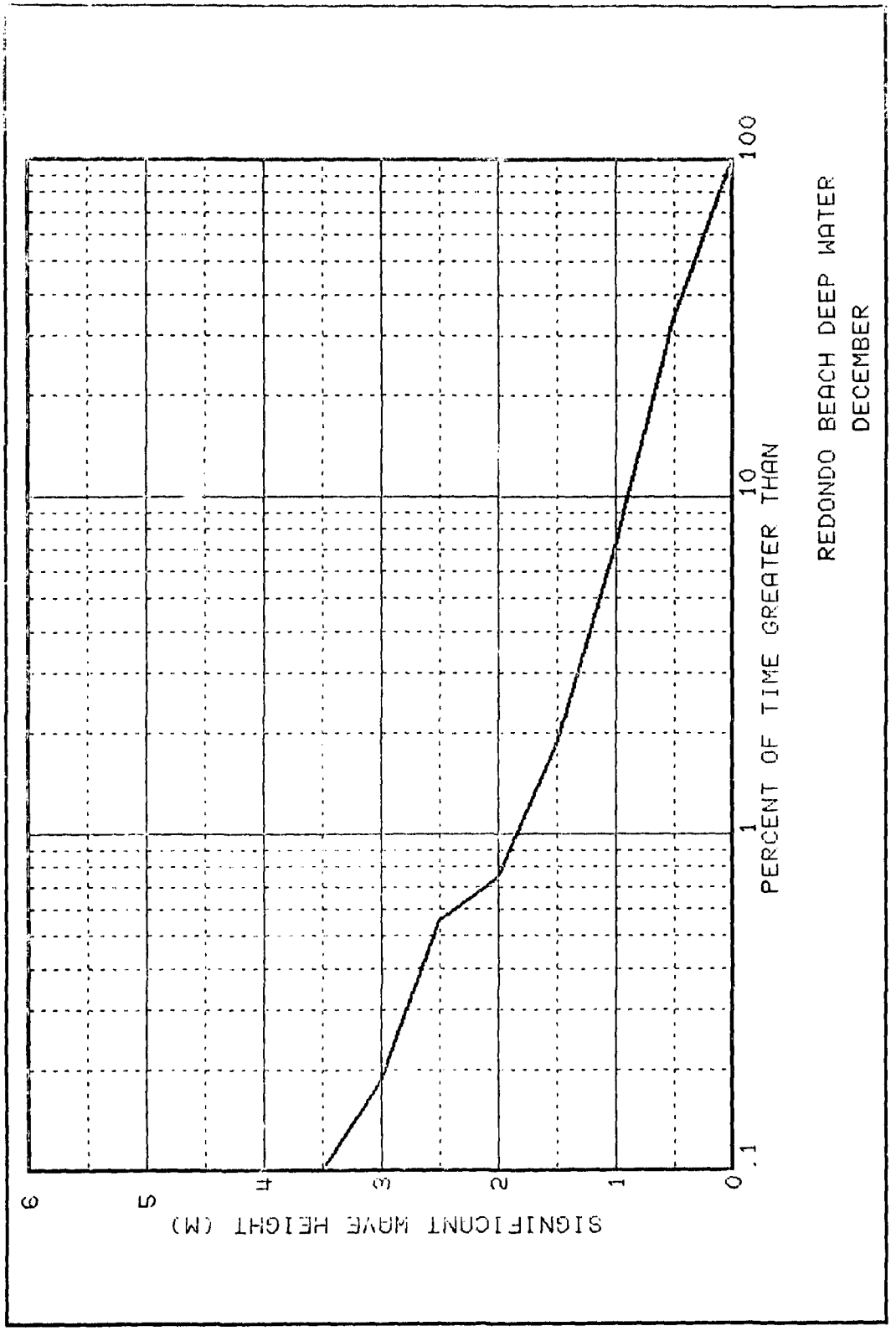
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|
| | <4-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | >18 | |
| 0.0-0.5 | 1.34 | 10.27 | 1.13 | 4.93 | 32.50 | 17.67 | 3.23 | 0.00 | 71.08 |
| 0.5-1.0 | 11.01 | 2.28 | 0.76 | 1.71 | 3.61 | 3.80 | 0.19 | 0.00 | 23.37 |
| 1.0-1.5 | 1.52 | 2.23 | 0.58 | 0.19 | 0.00 | 0.00 | 0.00 | 0.00 | 4.59 |
| 1.5-2.0 | 0.00 | 0.39 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.39 |
| 2.0-2.5 | 0.00 | 0.19 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.19 |
| 2.5-3.0 | 0.00 | 0.19 | 0.19 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.39 |
| 3.0-3.5 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 13.87 | 15.61 | 2.67 | 6.84 | 36.11 | 21.47 | 3.43 | 0.00 | |


REDONDO BEACH DEEP WATER
NOVEMBER
PERCENT OF TIME GREATER THAN
.1
1
10
100
SIGNIFICANT WAVE HEIGHT (M)
0
1
2
3
4
5
6

REDONDO BEACH DEEP WATER

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR DECEMBER

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|
| | <4-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | >18 | |
| 0.0-0.5 | 1.99 | 2.92 | 1.99 | 5.09 | 33.33 | 15.97 | 4.90 | 0.00 | 66.18 |
| 0.5-1.0 | 8.71 | 3.27 | 1.99 | 2.73 | 4.54 | 4.17 | 1.27 | 0.00 | 26.68 |
| 1.0-1.5 | 2.74 | 1.99 | 0.55 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 5.29 |
| 1.5-2.0 | 0.00 | 0.92 | 0.18 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.11 |
| 2.0-2.5 | 0.00 | 0.00 | 0.18 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.18 |
| 2.5-3.0 | 0.00 | 0.18 | 0.18 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.37 |
| 3.0-3.5 | 0.00 | 0.00 | 0.18 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.18 |
| TOTAL | 13.45 | 9.29 | 5.28 | 7.82 | 37.87 | 20.13 | 6.16 | 0.00 | |


REDONDO BEACH DEEP WATER
DECEMBER
PERCENT OF TIME GREATER THAN
100
10
1
.1
SIGNIFICANT WAVE HEIGHT (M)
0
1
2
3
4
5
6

REDONDO BEACH DEEP WATER

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD

WAVE DIRECTION = 210

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|
| | <4-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | >18 | |
| 0.0-0.5 | 0.29 | 0.07 | 0.02 | 0.00 | 12.42 | 8.94 | 2.77 | 0.54 | 25.04 |
| 0.5-1.0 | 0.32 | 0.25 | 0.04 | 0.00 | 0.55 | 0.69 | 0.32 | 0.06 | 2.23 |
| 1.0-1.5 | 0.02 | 0.29 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.32 |
| 1.5-2.0 | 0.00 | 0.02 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.04 |
| 2.0-2.5 | 0.00 | 0.02 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.04 |
| 2.5-3.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3.0-3.5 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 0.62 | 0.64 | 0.12 | 0.00 | 12.97 | 9.64 | 3.08 | 0.60 | |

REDONDO BEACH DEEP WATER

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD

WAVE DIRECTION = 240

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|
| | <4-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | >18 | |
| 0.0-0.5 | 0.01 | 0.03 | 0.02 | 0.01 | 5.97 | 5.01 | 0.76 | 0.12 | 11.93 |
| 0.5-1.0 | 0.27 | 0.30 | 0.06 | 0.04 | 3.30 | 2.01 | 0.69 | 0.03 | 7.30 |
| 1.0-1.5 | 0.53 | 0.37 | 0.03 | 0.02 | 0.00 | 0.00 | 0.03 | 0.00 | 1.03 |
| 1.5-2.0 | 0.02 | 0.19 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.21 |
| 2.0-2.5 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2.5-3.0 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 |
| 3.0-3.5 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 |
| TOTAL | 1.43 | 1.00 | 0.21 | 0.07 | 9.27 | 7.02 | 1.52 | 0.15 | |

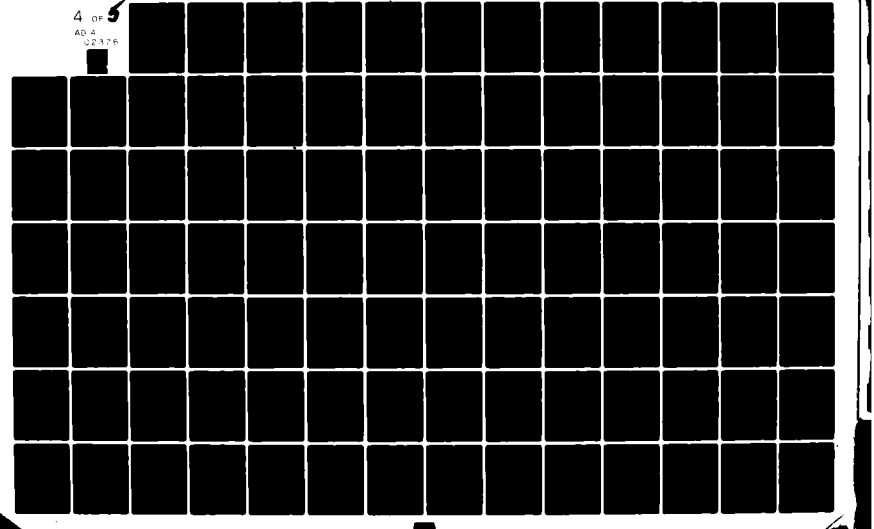
REDONDO BEACH DEEP WATER

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD

WAVE DIRECTION = 270

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|
| | <4-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | >18 | |
| 0.0-0.5 | 0.41 | 2.14 | 0.62 | 0.86 | 6.98 | 0.96 | 0.38 | 0.00 | 12.36 |
| 0.5-1.0 | 3.52 | 2.20 | 0.42 | 0.49 | 1.05 | 1.33 | 0.26 | 0.00 | 9.26 |
| 1.0-1.5 | 0.42 | 0.96 | 0.05 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 1.43 |
| 1.5-2.0 | 0.00 | 0.19 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.20 |
| 2.0-2.5 | 0.00 | 0.05 | 0.08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.13 |
| 2.5-3.0 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 |
| 3.0-3.5 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 4.35 | 5.54 | 1.18 | 1.35 | 8.04 | 2.29 | 0.64 | 0.00 | |

AD-A102 376 ARMY ENGINEER WATERWAYS EXPERIMENT STATION VICKSBURG MS F/G 8/3
BEACH NOURISHMENT TECHNIQUES. REPORT 4. WAVE CLIMATES FOR SELEC--ETC(U)
APR 81 D L DURHAM, L Z HALES, T W RICHARDSON
UNCLASSIFIED WES-TR-H-76-13-4-APP NL



REDONDO BEACH DEEP WATER

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD

WAVE DIRECTION = 300

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|
| | <4-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | >18 | |
| 0.0-0.5 | 0.85 | 9.19 | 1.90 | 0.75 | 2.66 | 3.55 | 0.89 | 0.00 | 19.80 |
| 0.5-1.0 | 2.59 | 0.12 | 0.56 | 0.14 | 0.02 | 0.00 | 0.01 | 0.00 | 3.44 |
| 1.0-1.5 | 0.45 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.45 |
| 1.5-2.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2.0-2.5 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2.5-3.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3.0-3.5 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 3.89 | 9.31 | 2.47 | 0.89 | 2.67 | 3.55 | 0.90 | 0.00 | |

REDONDO BEACH DEEP WATER

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD

WAVE DIRECTION = 330

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|
| | <4-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | >18 | |
| 0.0-0.5 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 0.5-1.0 | 3.77 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3.77 |
| 1.0-1.5 | 0.79 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.79 |
| 1.5-2.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2.0-2.5 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2.5-3.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3.0-3.5 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 4.56 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |

REDONDO BEACH FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR JANUARY

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|
| | <4-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | >18 | |
| 0.0-0.5 | 5.00 | 3.59 | 3.49 | 4.56 | 25.75 | 12.83 | 5.87 | 0.00 | 61.09 |
| 0.5-1.0 | 8.47 | 5.38 | 2.43 | 2.07 | 4.73 | 5.38 | 2.82 | 0.00 | 31.31 |
| 1.0-1.5 | 2.89 | 2.27 | 0.48 | 0.06 | 0.00 | 0.00 | 0.00 | 0.00 | 5.69 |
| 1.5-2.0 | 0.00 | 1.08 | 0.32 | 0.12 | 0.00 | 0.00 | 0.00 | 0.00 | 1.52 |
| 2.0-2.5 | 0.00 | 0.17 | 0.10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.27 |
| 2.5-3.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3.0-3.5 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 16.37 | 12.44 | 6.00 | 6.81 | 30.48 | 18.22 | 8.69 | 0.00 | |



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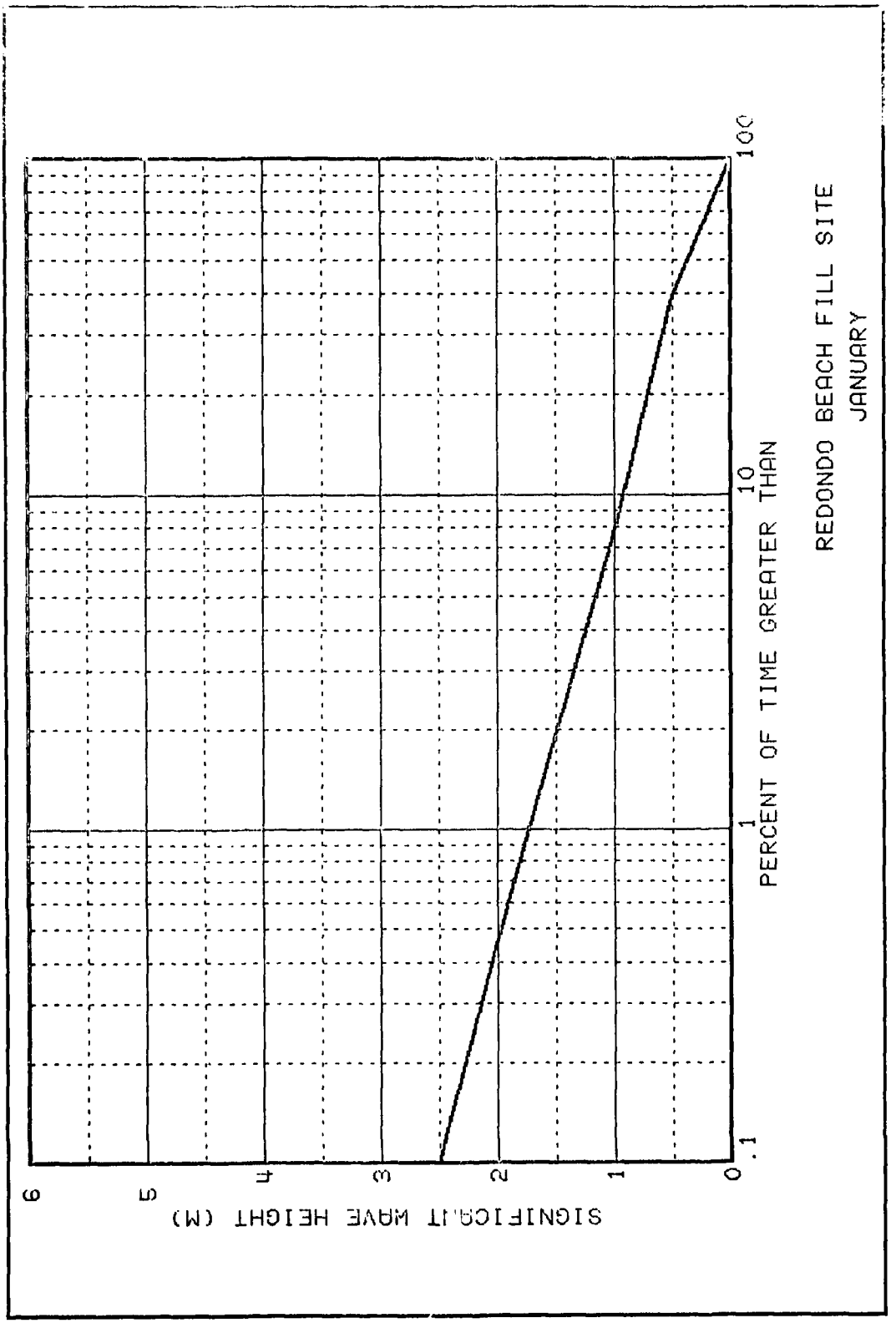
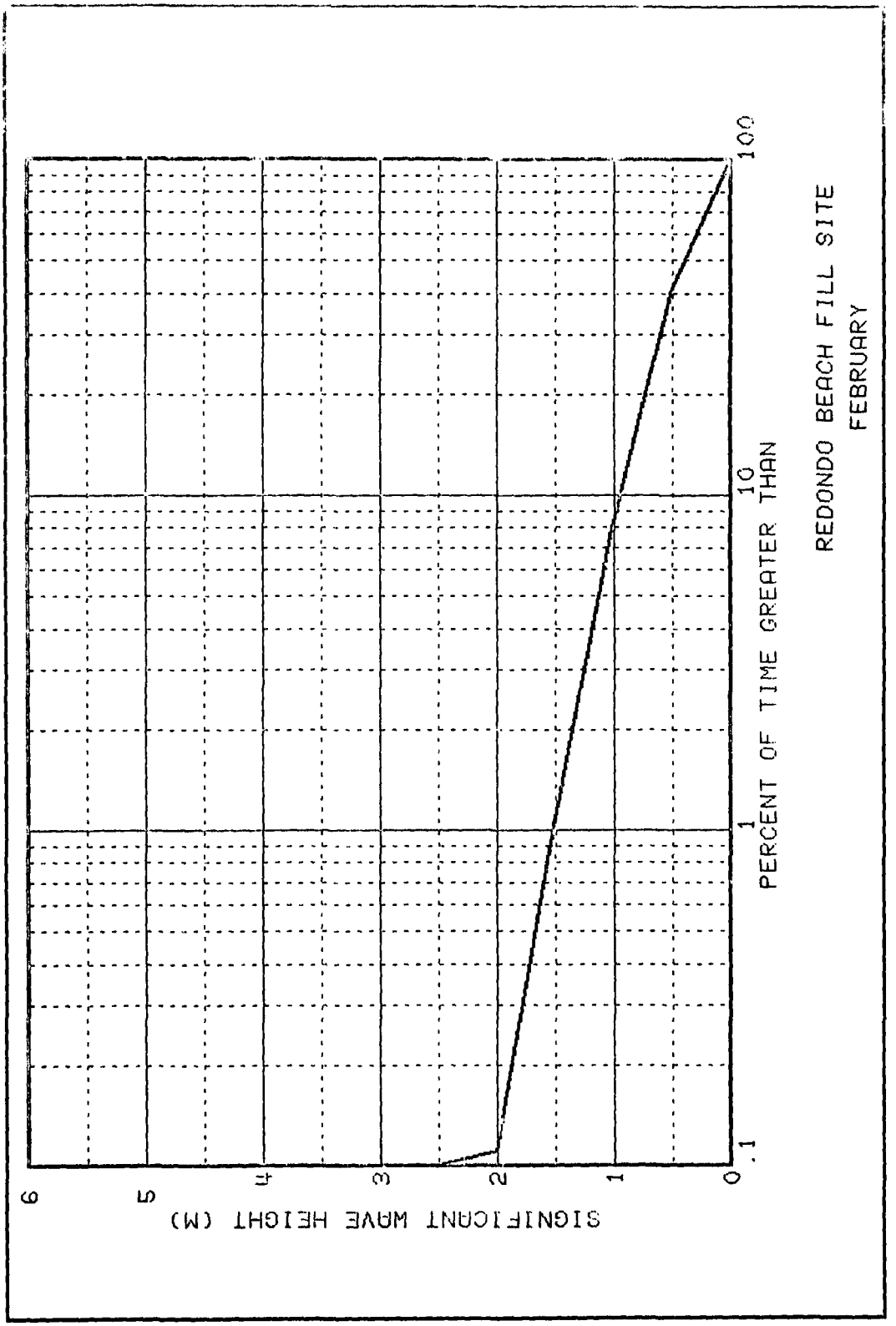

REDONDO BEACH FILL SITE
JANUARY
PERCENT OF TIME GREATER THAN
.1
1
10
100
SIGNIFICANT WAVE HEIGHT (M)
0
1
2
3
4
5
6

REDONDO BEACH FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR FEBRUARY

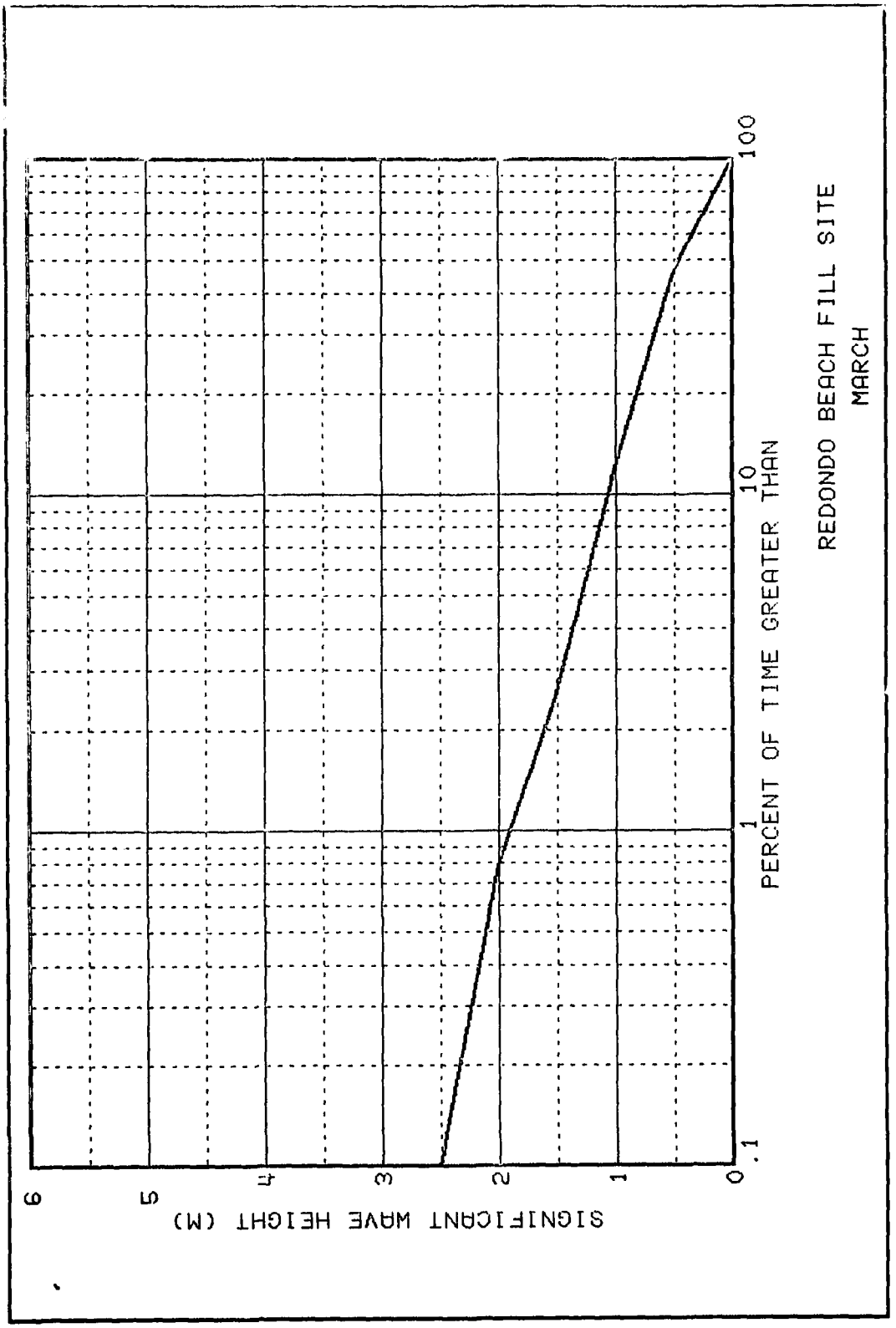
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|
| | <4-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | >18 | |
| 0.0-0.5 | 3.09 | 5.41 | 1.68 | 5.20 | 26.94 | 11.43 | 5.37 | 0.00 | 59.12 |
| 0.5-1.0 | 10.11 | 5.96 | 2.97 | 2.03 | 4.25 | 5.92 | 1.26 | 0.00 | 32.51 |
| 1.0-1.5 | 2.89 | 3.57 | 0.82 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 7.29 |
| 1.5-2.0 | 0.35 | 0.43 | 0.00 | 0.00 | 0.19 | 0.00 | 0.00 | 0.00 | 0.97 |
| 2.0-2.5 | 0.11 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.11 |
| 2.5-3.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3.0-3.5 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 16.55 | 15.38 | 5.47 | 7.23 | 31.38 | 17.35 | 6.63 | 0.00 | |


REDONDO BEACH FILL SITE
FEBRUARY
PERCENT OF TIME GREATER THAN
.1
1
10
100
SIGNIFICANT WAVE HEIGHT (M)
0
1
2
3
4
5
6

REDONDO BEACH FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR MARCH

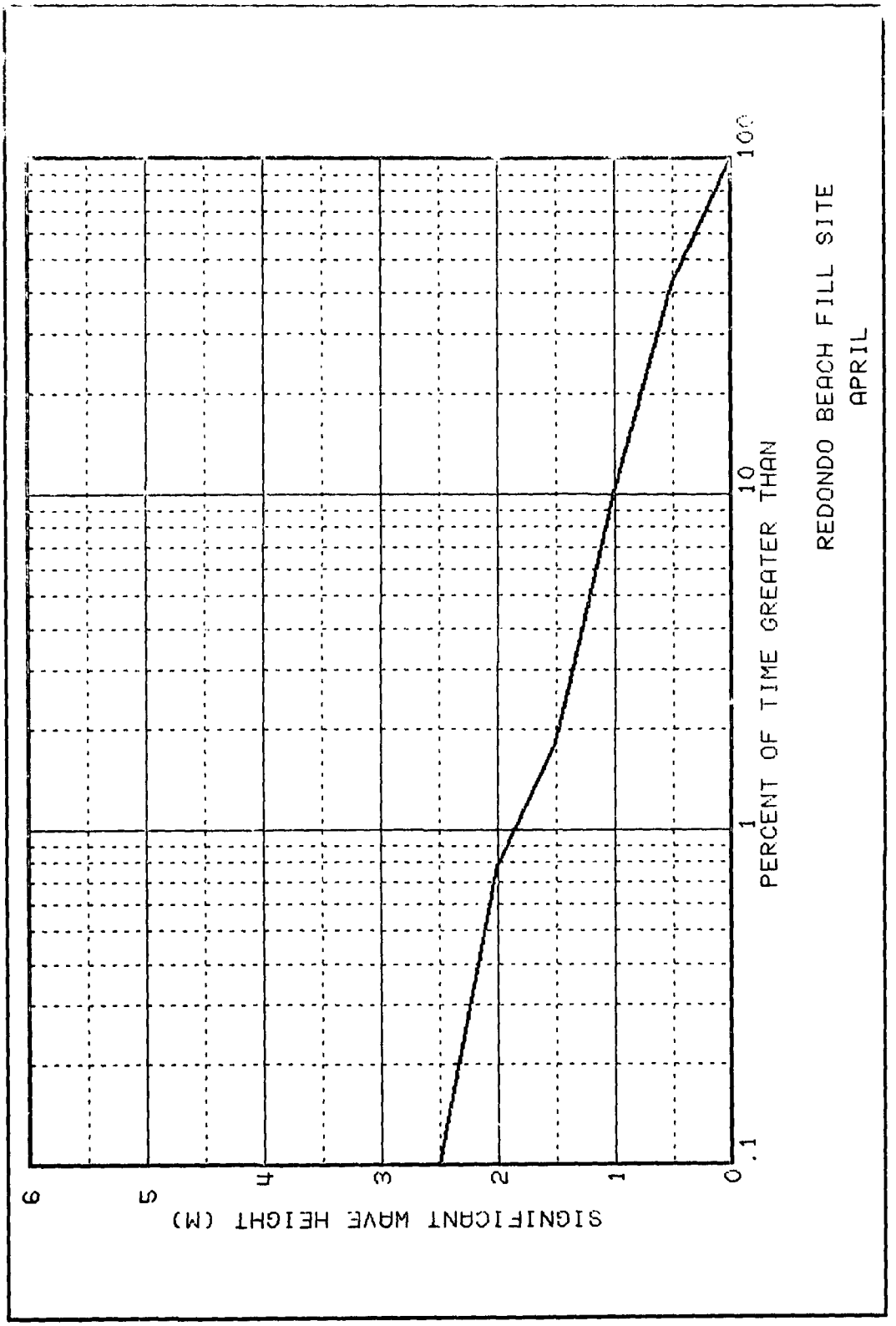
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|
| | <4-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | >18 | |
| 0.0-0.5 | 4.81 | 10.00 | 2.94 | 3.94 | 21.22 | 9.16 | 1.28 | 0.00 | 53.35 |
| 0.5-1.0 | 15.38 | 7.43 | 1.22 | 1.22 | 2.63 | 3.91 | 2.78 | 0.00 | 34.58 |
| 1.0-1.5 | 3.83 | 4.52 | 0.09 | 0.14 | 0.00 | 0.00 | 0.90 | 0.00 | 9.47 |
| 1.5-2.0 | 0.00 | 1.53 | 0.28 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.81 |
| 2.0-2.5 | 0.00 | 0.35 | 0.43 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.78 |
| 2.5-3.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3.0-3.5 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 24.02 | 23.84 | 4.96 | 5.31 | 23.85 | 13.06 | 4.96 | 0.00 | |


REDONDO BEACH FILL SITE
MARCH
PERCENT OF TIME GREATER THAN
.1
1
10
100
SIGNIFICANT WAVE HEIGHT (M)
0
1
2
3
4
5
6

REDONDO BEACH FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR APRIL

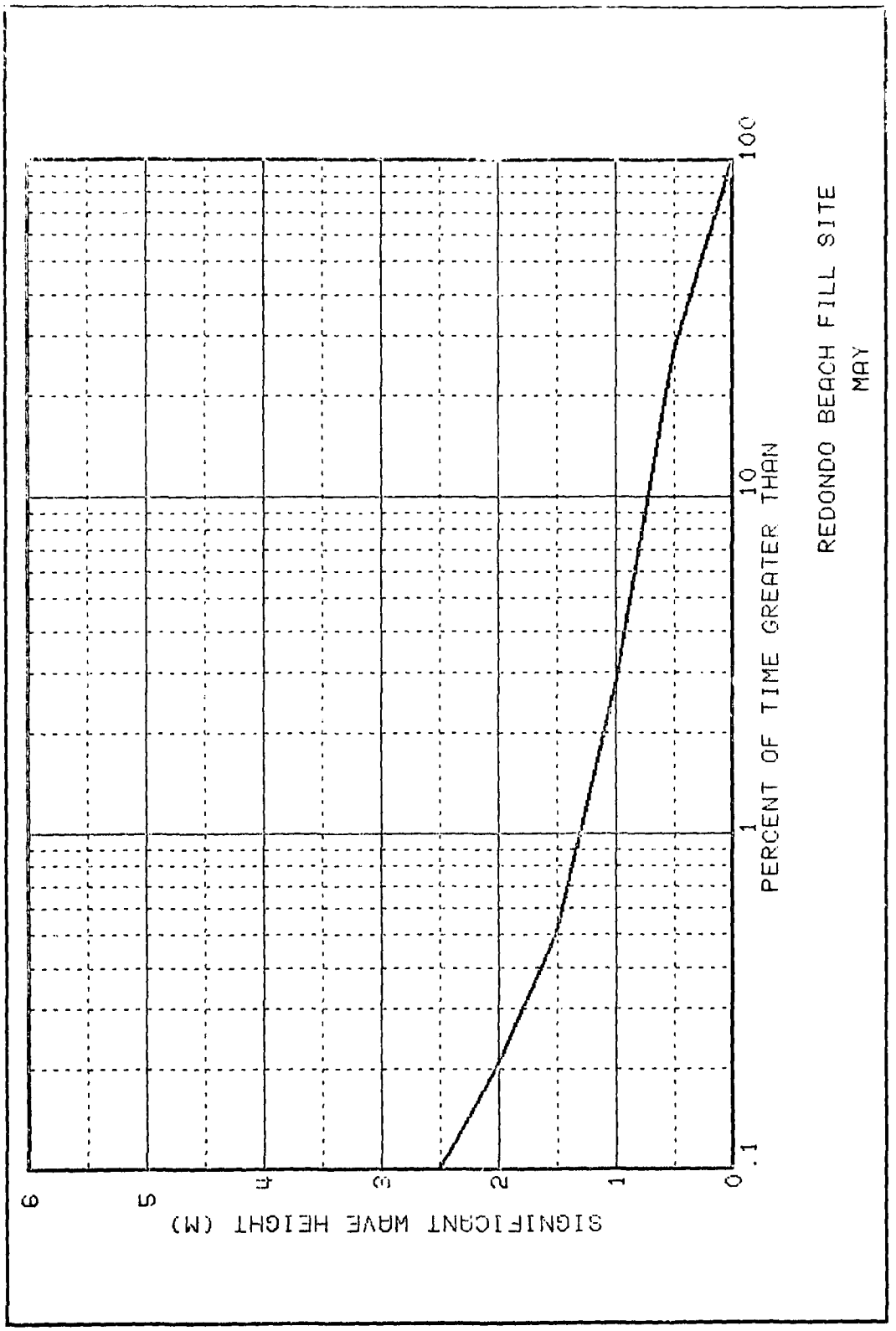
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|
| | <4-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | >18 | |
| 0.0-0.5 | 5.00 | 17.37 | 3.76 | 3.32 | 19.58 | 7.32 | 0.87 | 0.00 | 57.22 |
| 0.5-1.0 | 19.74 | 4.69 | 2.62 | 0.82 | 1.27 | 3.28 | 0.13 | 0.00 | 32.56 |
| 1.0-1.5 | 4.92 | 2.76 | 0.26 | 0.00 | 0.18 | 0.00 | 0.27 | 0.00 | 8.38 |
| 1.5-2.0 | 0.00 | 0.73 | 0.32 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.05 |
| 2.0-2.5 | 0.00 | 0.37 | 0.41 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.78 |
| 2.5-3.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3.0-3.5 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 29.66 | 25.92 | 7.37 | 4.14 | 21.03 | 10.60 | 1.27 | 0.00 | |


REDONDO BEACH FILL SITE
APRIL
PERCENT OF TIME GREATER THAN
0.1
1
10
100
SIGNIFICANT WAVE HEIGHT (M)
0
1
2
3
4
5
6

REDONDO BEACH FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR MAY

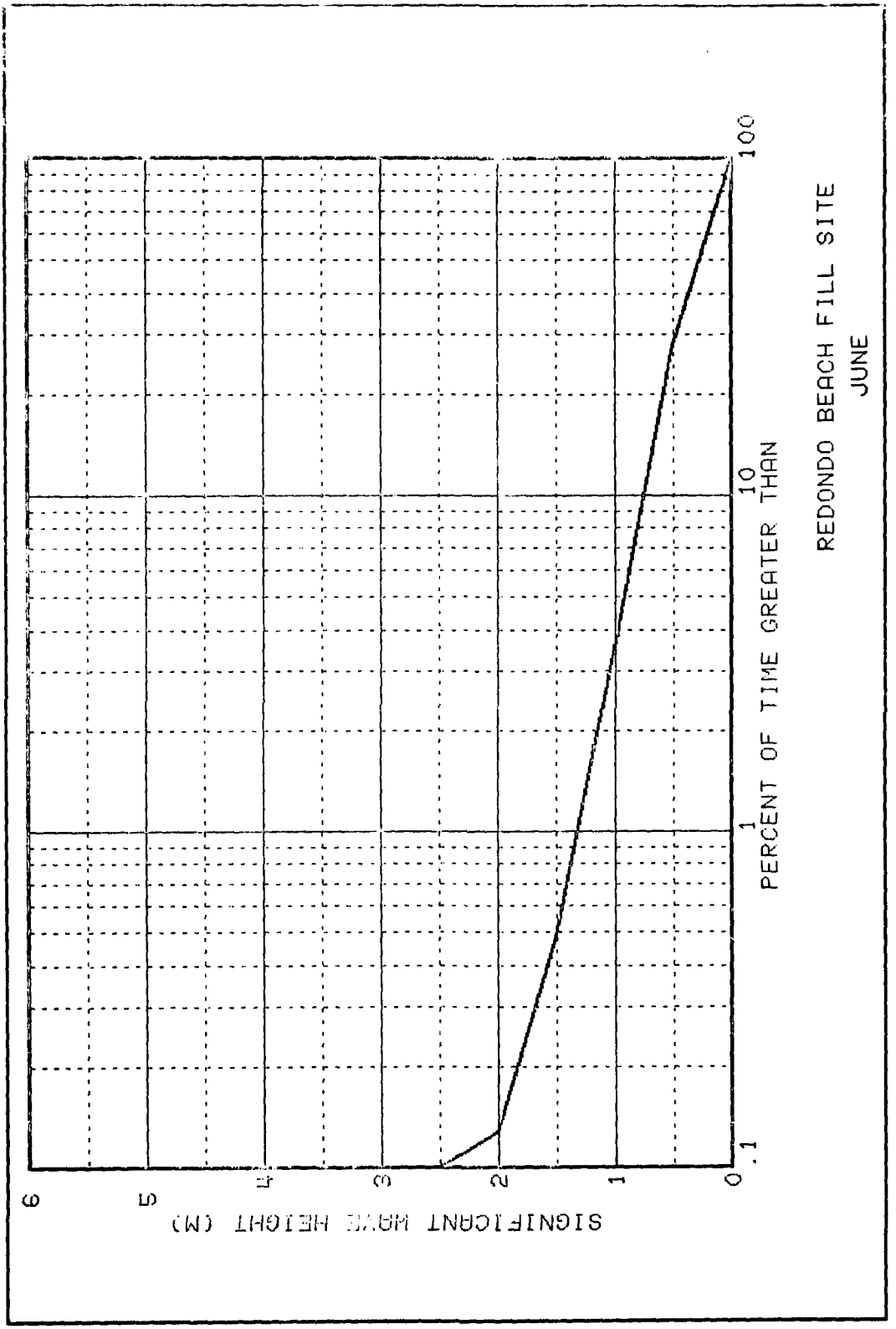
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|
| | <4-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | >18 | |
| 0.0-0.5 | 2.63 | 12.61 | 3.89 | 0.52 | 21.13 | 24.23 | 7.12 | 1.03 | 73.15 |
| 0.5-1.0 | 13.19 | 3.08 | 1.14 | 0.18 | 3.07 | 2.25 | 0.97 | 0.24 | 24.11 |
| 1.0-1.5 | 1.36 | 0.75 | 0.05 | 0.06 | 0.00 | 0.00 | 0.01 | 0.00 | 2.23 |
| 1.5-2.0 | 0.00 | 0.25 | 0.05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.30 |
| 2.0-2.5 | 0.00 | 0.13 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.20 |
| 2.5-3.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3.0-3.5 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 17.18 | 16.81 | 5.21 | 0.76 | 24.20 | 26.48 | 8.09 | 1.28 | |


REDONDO BEACH FILL SITE
MAY
PERCENT OF TIME GREATER THAN
0.1
1
10
100
SIGNIFICANT WAVE HEIGHT (M)
0
1
2
3
4
5
6

REDONDO BEACH FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR JUNE

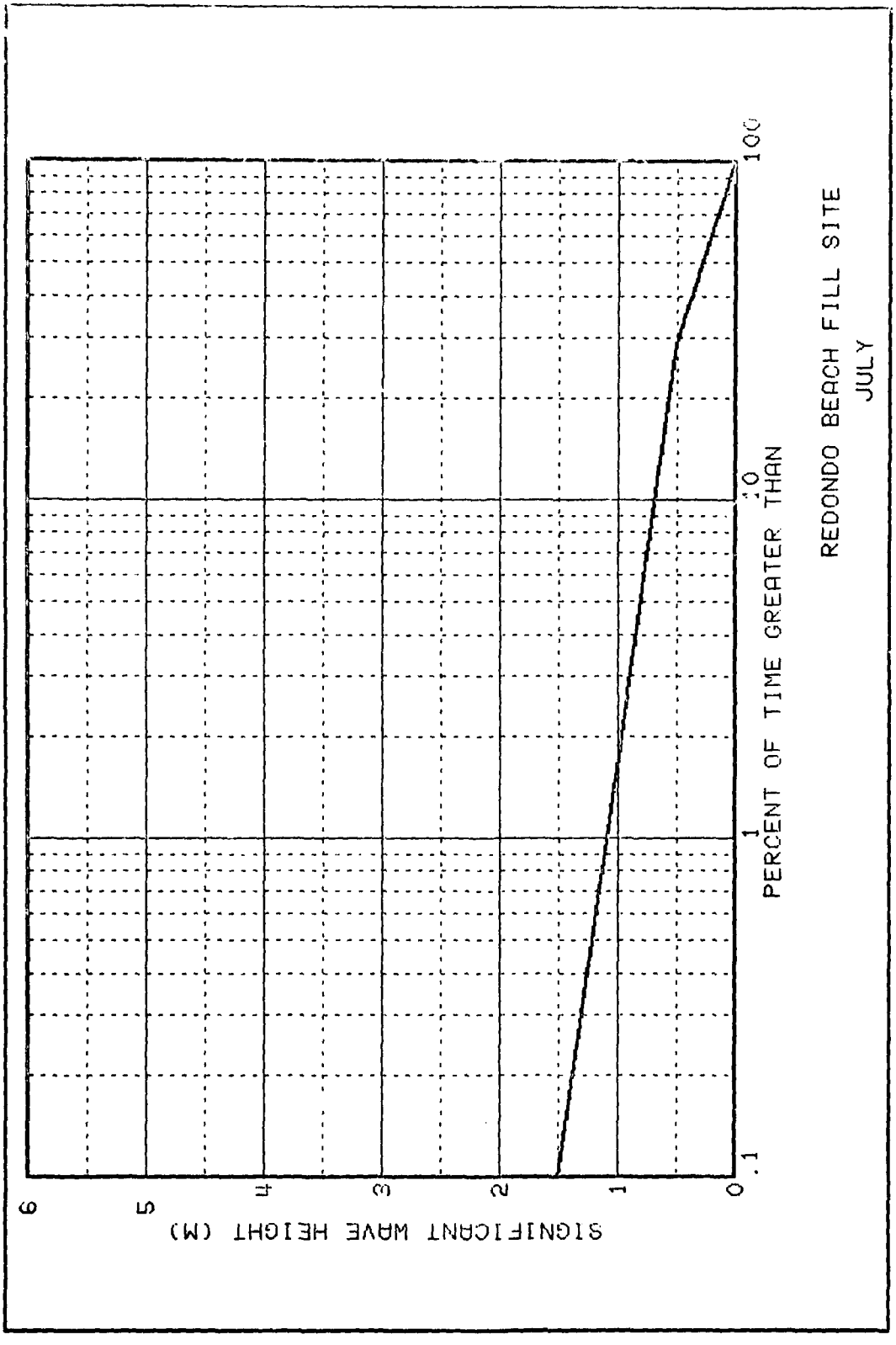
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|
| | <4-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | >18 | |
| 0.0-0.5 | 3.68 | 18.89 | 3.51 | 0.03 | 15.18 | 23.00 | 5.87 | 1.67 | 71.82 |
| 0.5-1.0 | 14.02 | 3.55 | 1.59 | 0.22 | 1.88 | 1.82 | 0.89 | 0.50 | 24.55 |
| 1.0-1.5 | 1.90 | 1.05 | 0.07 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 3.04 |
| 1.5-2.0 | 0.00 | 0.33 | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.36 |
| 2.0-2.5 | 0.00 | 0.08 | 0.05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.13 |
| 2.5-3.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3.0-3.5 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 19.61 | 23.89 | 5.24 | 0.25 | 17.05 | 24.82 | 6.06 | 2.17 | |


REDONDO BEACH FILL SITE
JUNE
PERCENT OF TIME GREATER THAN
100
10
1
.1
SIGNIFICANT WAVE HEIGHT (M)
0
1
2
3
4
5
6

REDONDO BEACH FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR JULY

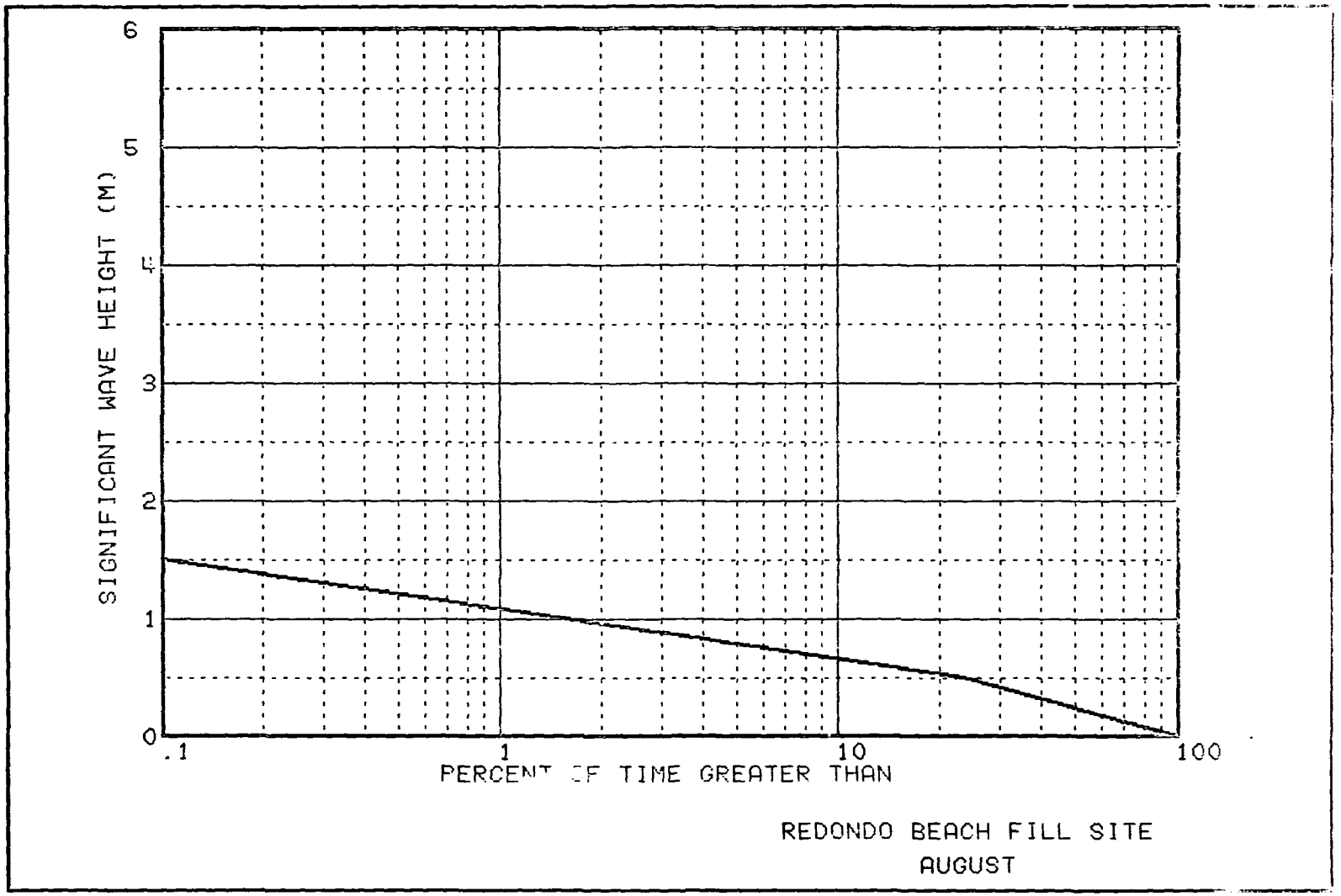
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|
| | <4-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | >18 | |
| 0.0-0.5 | 2.76 | 16.95 | 2.70 | 0.08 | 32.66 | 14.44 | 1.48 | 0.14 | 71.22 |
| 0.5-1.0 | 9.68 | 3.38 | 0.86 | 0.06 | 7.33 | 4.83 | 0.91 | 0.12 | 27.17 |
| 1.0-1.5 | 1.00 | 0.56 | 0.03 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 1.62 |
| 1.5-2.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2.0-2.5 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2.5-3.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3.0-3.5 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 13.44 | 20.90 | 3.59 | 0.14 | 40.00 | 19.28 | 2.40 | 0.26 | |


REDONDO BEACH FILL SITE
JULY
PERCENT OF TIME GREATER THAN
.1
1
10
100
SIGNIFICANT WAVE HEIGHT (M)
0
1
2
3
4
5
6

REDONDO BEACH FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR AUGUST

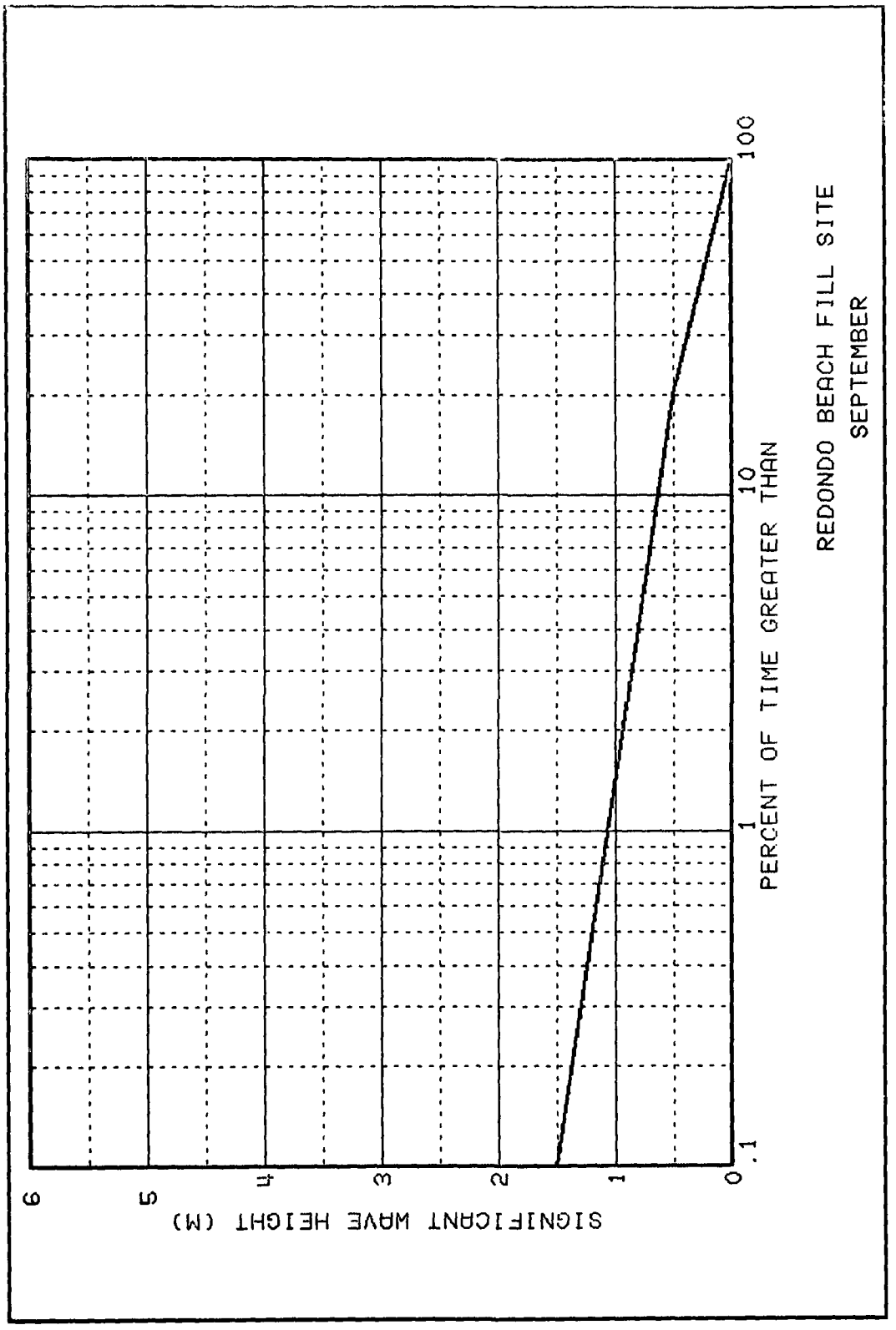
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|
| | <4-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | >18 | |
| 0.0-0.5 | 2.86 | 17.77 | 2.87 | 0.20 | 24.77 | 23.55 | 4.24 | 0.40 | 76.65 |
| 0.5-1.0 | 7.50 | 2.10 | 0.74 | 0.20 | 6.27 | 3.02 | 1.78 | 0.19 | 21.80 |
| 1.0-1.5 | 0.86 | 0.65 | 0.03 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 1.55 |
| 1.5-2.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2.0-2.5 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2.5-3.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3.0-3.5 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 11.22 | 20.52 | 3.63 | 0.41 | 31.03 | 26.56 | 6.04 | 0.59 | |


SIGNIFICANT WAVE HEIGHT (M)
0
1
2
3
4
5
6
.1
1
10
100
PERCENT OF TIME GREATER THAN
REDONDO BEACH FILL SITE
AUGUST

REDONDO BEACH FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR SEPTEMBER

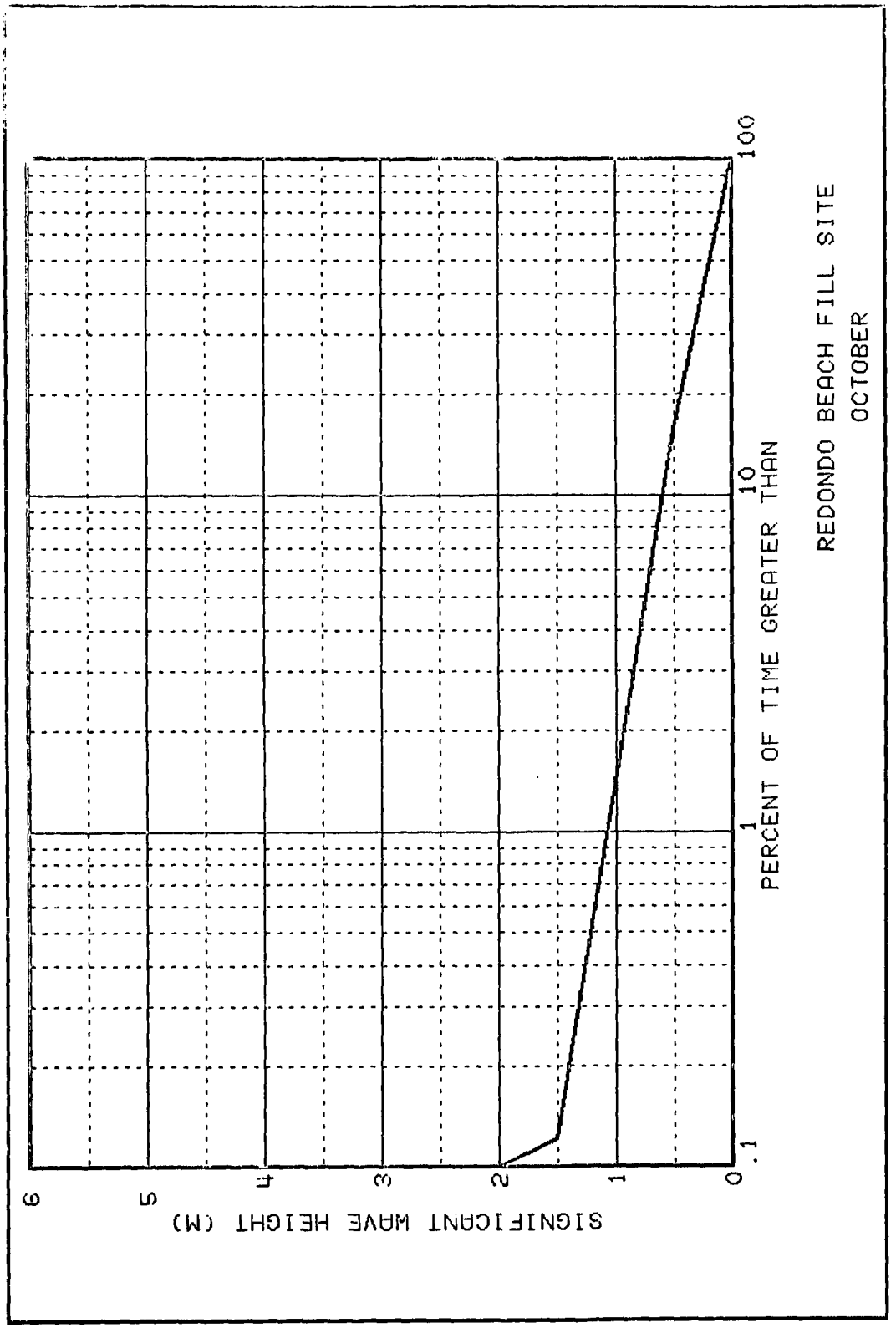
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|
| | <4-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | >18 | |
| 0.0-0.5 | 2.26 | 9.24 | 1.20 | 0.47 | 33.63 | 24.63 | 8.03 | 0.69 | 80.15 |
| 0.5-1.0 | 6.51 | 1.08 | 0.18 | 0.15 | 5.79 | 2.42 | 1.89 | 0.46 | 18.48 |
| 1.0-1.5 | 0.62 | 0.33 | 0.01 | 0.00 | 0.00 | 0.00 | 0.04 | 0.25 | 1.30 |
| 1.5-2.0 | 0.00 | 0.08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.08 |
| 2.0-2.5 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2.5-3.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3.0-3.5 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 9.38 | 10.78 | 1.39 | 0.62 | 39.42 | 27.05 | 9.96 | 1.40 | |


REDONDO BEACH FILL SITE
SEPTEMBER
PERCENT OF TIME GREATER THAN
.1
1
10
100
SIGNIFICANT WAVE HEIGHT (M)
0
1
2
3
4
5
6

REDONDO BEACH FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR OCTOBER

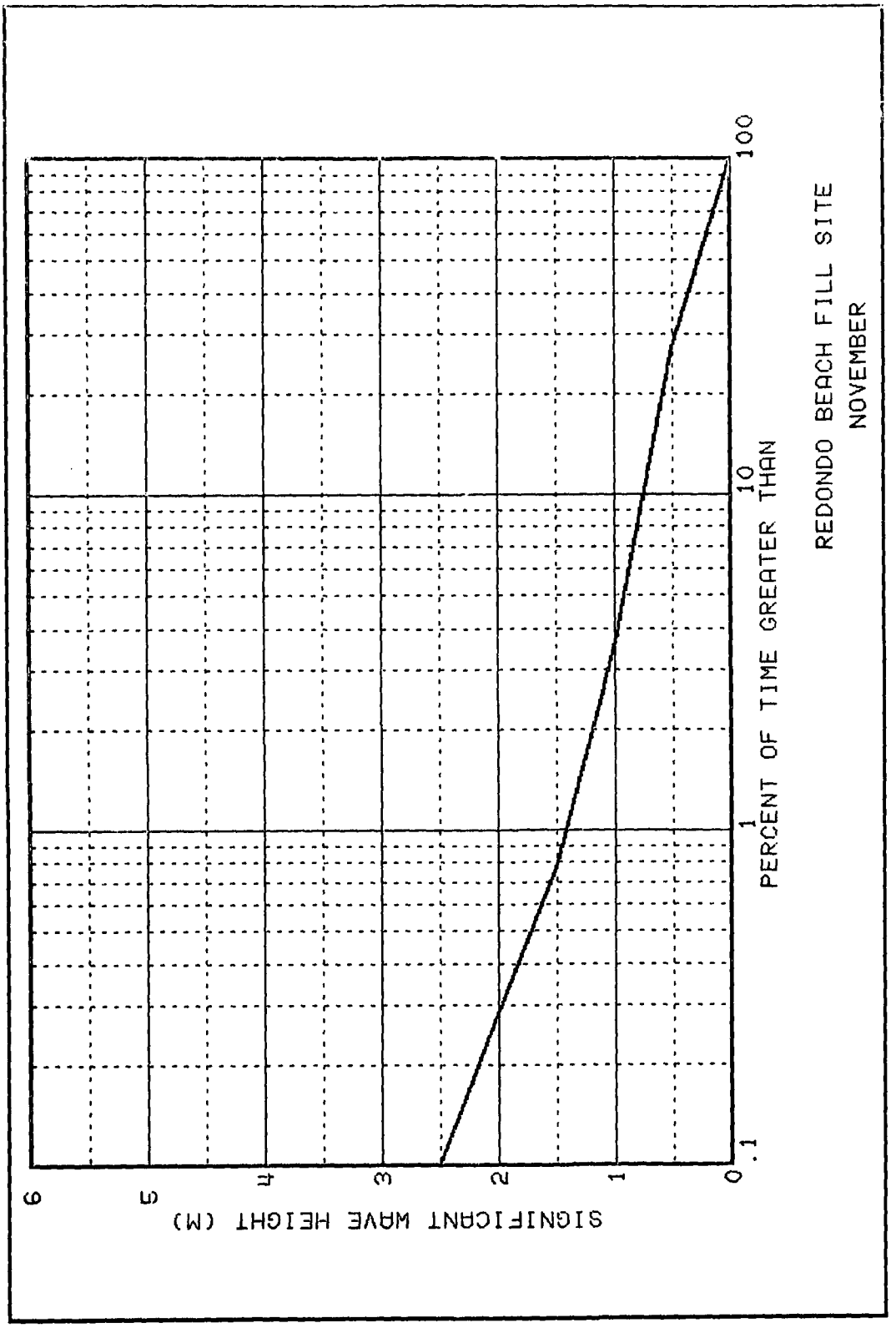
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|
| | <4-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | >18 | |
| 0.0-0.5 | 1.51 | 5.13 | 1.64 | 2.52 | 49.15 | 19.48 | 4.55 | 0.31 | 84.29 |
| 0.5-1.0 | 5.56 | 0.36 | 0.14 | 0.23 | 4.73 | 2.55 | 0.61 | 0.13 | 14.31 |
| 1.0-1.5 | 0.31 | 0.36 | 0.01 | 0.00 | 0.00 | 0.00 | 0.03 | 0.08 | 1.28 |
| 1.5-2.0 | 0.00 | 0.12 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.12 |
| 2.0-2.5 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2.5-3.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3.0-3.5 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| *TOTAL* | 7.38 | 5.96 | 1.79 | 2.75 | 53.88 | 22.03 | 5.19 | 0.52 | |


REDONDO BEACH FILL SITE
OCTOBER
SIGNIFICANT WAVE HEIGHT (M)
PERCENT OF TIME GREATER THAN
0
1
2
3
4
5
6
.1
1
10
100

REDONDO BEACH FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR NOVEMBER

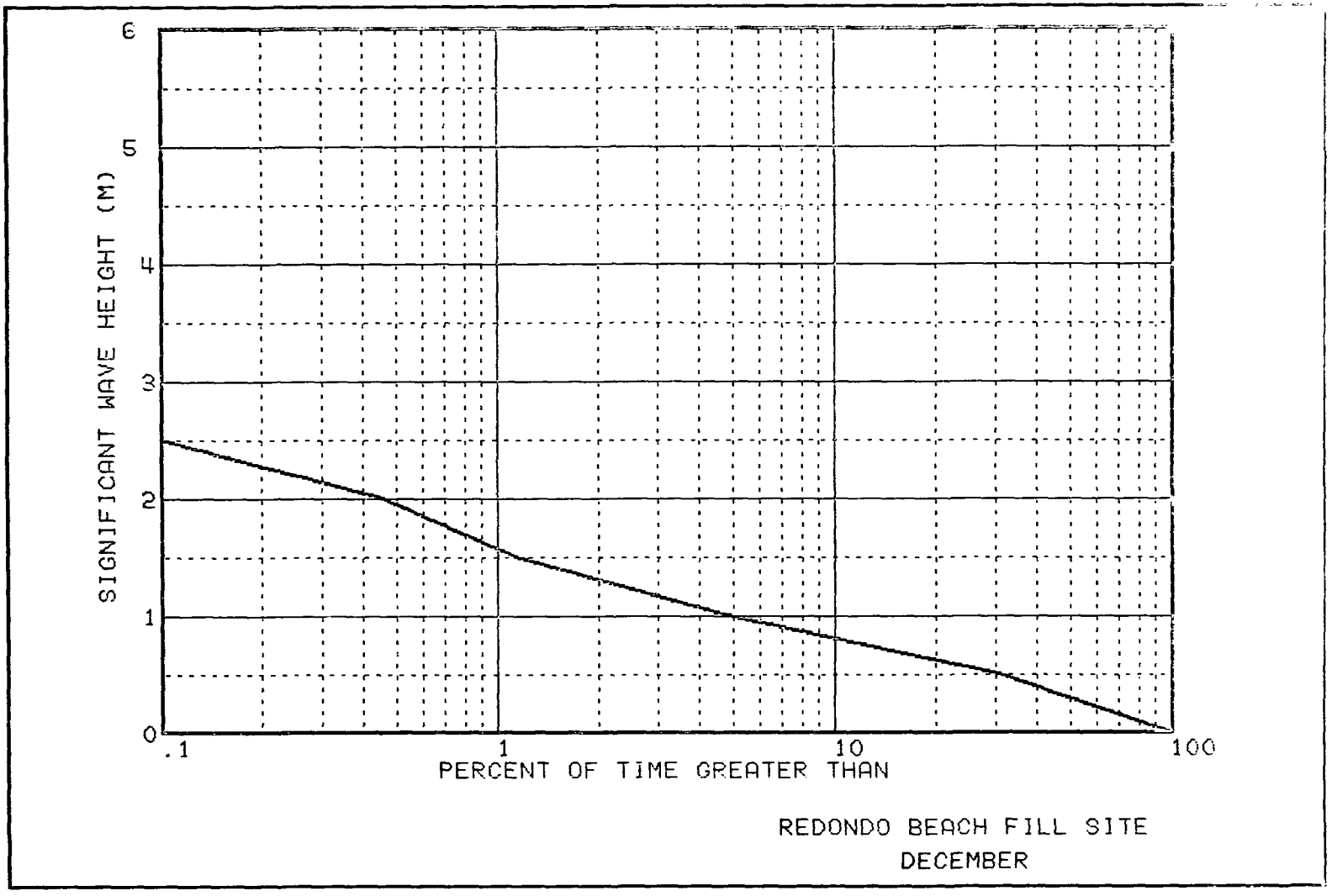
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|
| | <4-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | >18 | |
| 0.0-0.5 | 3.48 | 11.37 | 1.19 | 5.03 | 32.48 | 15.87 | 3.05 | 0.00 | 72.46 |
| 0.5-1.0 | 9.23 | 2.53 | 1.03 | 1.66 | 3.63 | 5.60 | 0.38 | 0.00 | 24.05 |
| 1.0-1.5 | 1.17 | 1.13 | 0.26 | 0.15 | 0.00 | 0.00 | 0.00 | 0.00 | 2.71 |
| 1.5-2.0 | 0.00 | 0.40 | 0.09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.49 |
| 2.0-2.5 | 0.00 | 0.18 | 0.10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.28 |
| 2.5-3.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3.0-3.5 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 13.87 | 15.61 | 2.67 | 6.84 | 36.11 | 21.47 | 3.43 | 0.00 | |


REDONDO BEACH FILL SITE
NOVEMBER
PERCENT OF TIME GREATER THAN
100
10
1
.1
0
1
2
3
4
5
6
SIGNIFICANT WAVE HEIGHT (M)

REDONDO BEACH FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR DECEMBER

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|
| | <4-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | >18 | |
| 0.0-0.5 | 4.48 | 4.21 | 2.40 | 5.26 | 33.32 | 14.70 | 4.85 | 0.00 | 69.23 |
| 0.5-1.0 | 7.02 | 3.09 | 2.01 | 2.56 | 4.54 | 5.43 | 1.31 | 0.00 | 25.98 |
| 1.0-1.5 | 1.84 | 1.36 | 0.36 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3.56 |
| 1.5-2.0 | 0.00 | 0.46 | 0.22 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.68 |
| 2.0-2.5 | 0.00 | 0.17 | 0.25 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.42 |
| 2.5-3.0 | 0.00 | 0.00 | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 |
| 3.0-3.5 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 13.45 | 9.29 | 5.28 | 7.82 | 37.87 | 20.13 | 6.16 | 0.00 | |


SIGNIFICANT WAVE HEIGHT (M)
0
1
2
3
4
5
6
.1
1
10
100
PERCENT OF TIME GREATER THAN
REDONDO BEACH FILL SITE
DECEMBER

REDONDO BEACH FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD

WAVE DIRECTION = 210

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|
| | <4-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | >18 | |
| 0.0-0.5 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 0.5-1.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1.0-1.5 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1.5-2.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2.0-2.5 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2.5-3.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3.0-3.5 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |

REDONDO BEACH FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD

WAVE DIRECTION = 240

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|
| | <4-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | >18 | |
| 0.0-0.5 | 0.73 | 0.47 | 0.08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.28 |
| 0.5-1.0 | 0.89 | 0.73 | 0.14 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.76 |
| 1.0-1.5 | 0.42 | 0.34 | 0.05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.80 |
| 1.5-2.0 | 0.01 | 0.12 | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.16 |
| 2.0-2.5 | 0.00 | 0.02 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.04 |
| 2.5-3.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3.0-3.5 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 2.05 | 1.67 | 0.32 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |

REDONDO BEACH FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD

WAVE DIRECTION = 270

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|
| | <4-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | >18 | |
| 0.0-0.5 | 0.56 | 2.14 | 0.67 | 0.90 | 25.86 | 16.05 | 3.99 | 0.54 | 50.70 |
| 0.5-1.0 | 3.40 | 2.20 | 0.38 | 0.50 | 4.40 | 2.90 | 1.18 | 0.19 | 15.16 |
| 1.0-1.5 | 0.38 | 0.96 | 0.04 | 0.01 | 0.01 | 0.00 | 0.07 | 0.03 | 1.50 |
| 1.5-2.0 | 0.00 | 0.19 | 0.03 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.24 |
| 2.0-2.5 | 0.00 | 0.05 | 0.06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.10 |
| 2.5-3.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3.0-3.5 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 4.35 | 5.54 | 1.18 | 1.42 | 30.28 | 18.95 | 5.24 | 0.76 | |

REDONDO BEACH FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD

WAVE DIRECTION = 300

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|
| | <4-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | >18 | |
| 0.0-0.5 | 0.98 | 3.19 | 1.05 | 0.77 | 2.63 | 2.99 | 0.82 | 0.00 | 19.28 |
| 0.5-1.0 | 2.50 | 0.12 | 0.59 | 0.12 | 0.04 | 0.57 | 0.08 | 0.00 | 4.02 |
| 1.0-1.5 | 0.40 | 0.00 | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.43 |
| 1.5-2.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2.0-2.5 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2.5-3.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3.0-3.5 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 3.89 | 3.31 | 2.47 | 0.89 | 2.67 | 3.55 | 0.90 | 0.00 | |

REDONDO BEACH FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD

WAVE DIRECTION = 330

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|
| | <4-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | >18 | |
| 0.0-0.5 | 0.83 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.83 |
| 0.5-1.0 | 3.29 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3.29 |
| 1.0-1.5 | 0.45 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.45 |
| 1.5-2.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2.0-2.5 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2.5-3.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3.0-3.5 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 4.56 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |

# APPENDIX J: AVERAGE WAVE CLIMATE AT INDIANA DUNES, IND.

1. Appendix J contains the following information for the Indiana Dunes, Ind., fill site:

   a. Tabulations of monthly percent occurrence of wave-height/period combinations.

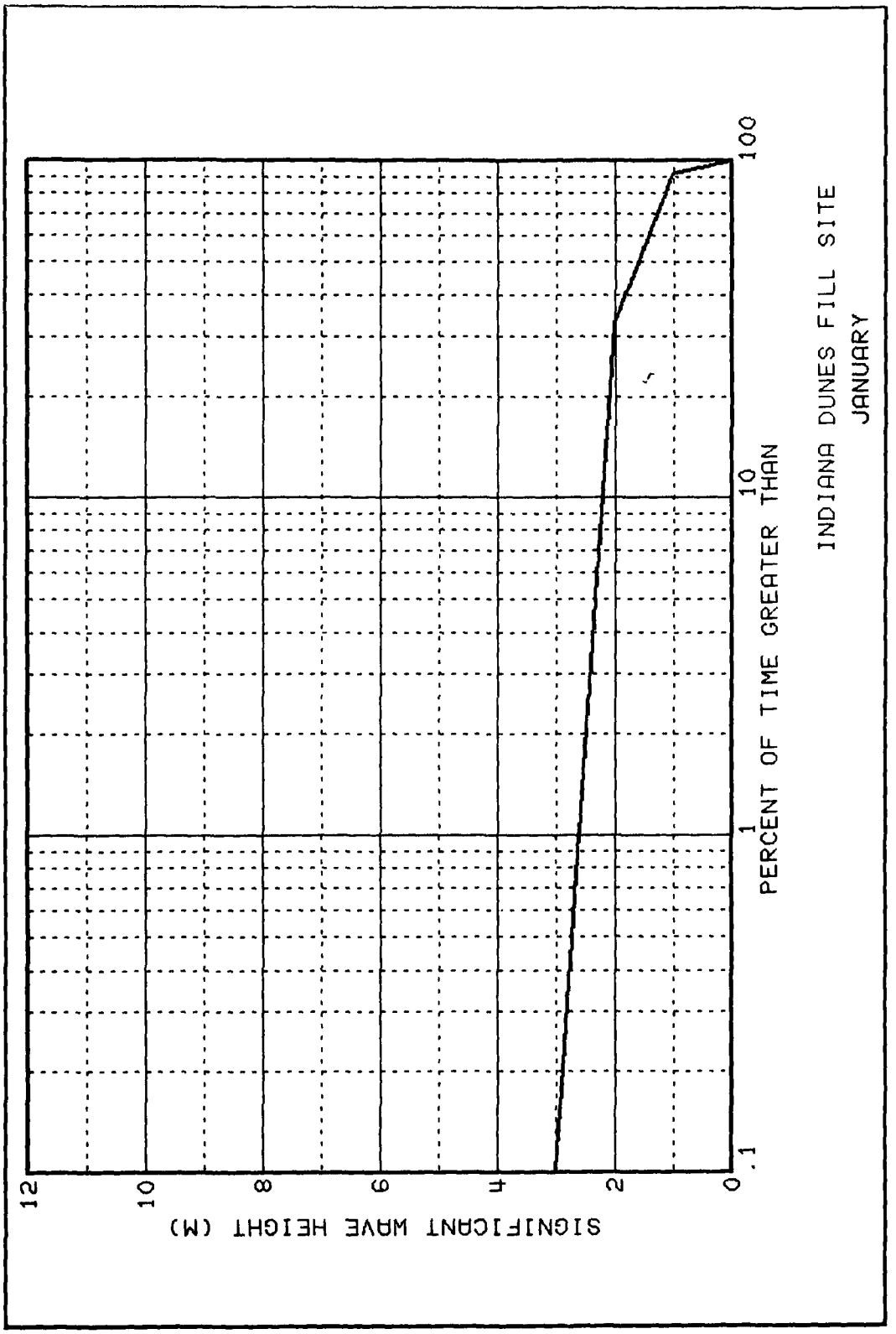
   b. Tabulations of annual percent occurrence by azimuth direction of wave-height/period combinations.

   c. Plots of monthly significant wave-height occurrence in terms of the total percent time per month that these heights are exceeded.

INDIANA DUNES FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR JANUARY

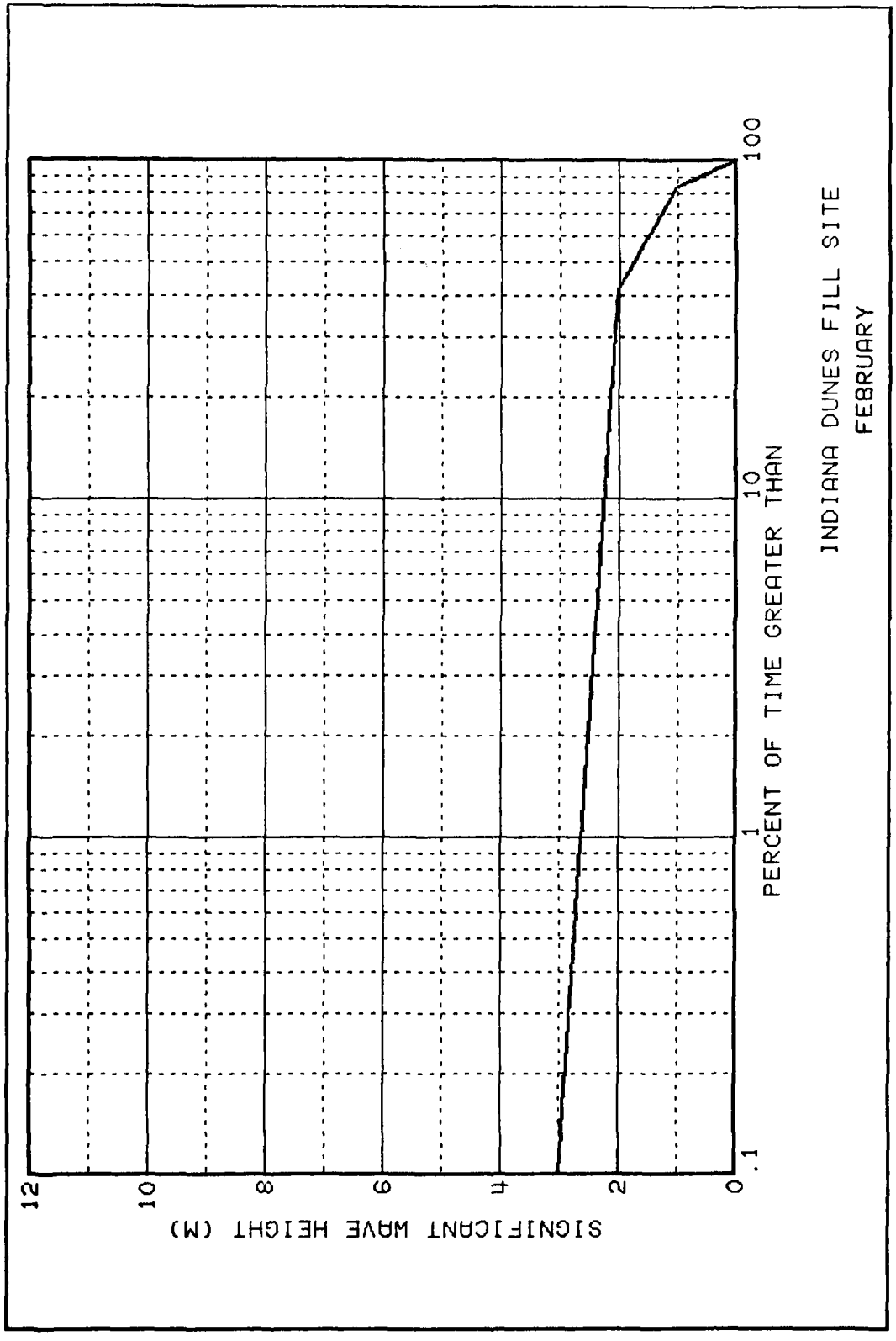
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 8.76 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 8.76 |
| 01-02 | 53.03 | 5.31 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 58.34 |
| 02-03 | 8.58 | 16.31 | 7.41 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 32.90 |
| 03-04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 70.37 | 22.22 | 7.41 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |


INDIANA DUNES FILL SITE
JANUARY
PERCENT OF TIME GREATER THAN
.1
1
10
100
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12

INDIANA DUNES FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR FEBRUARY

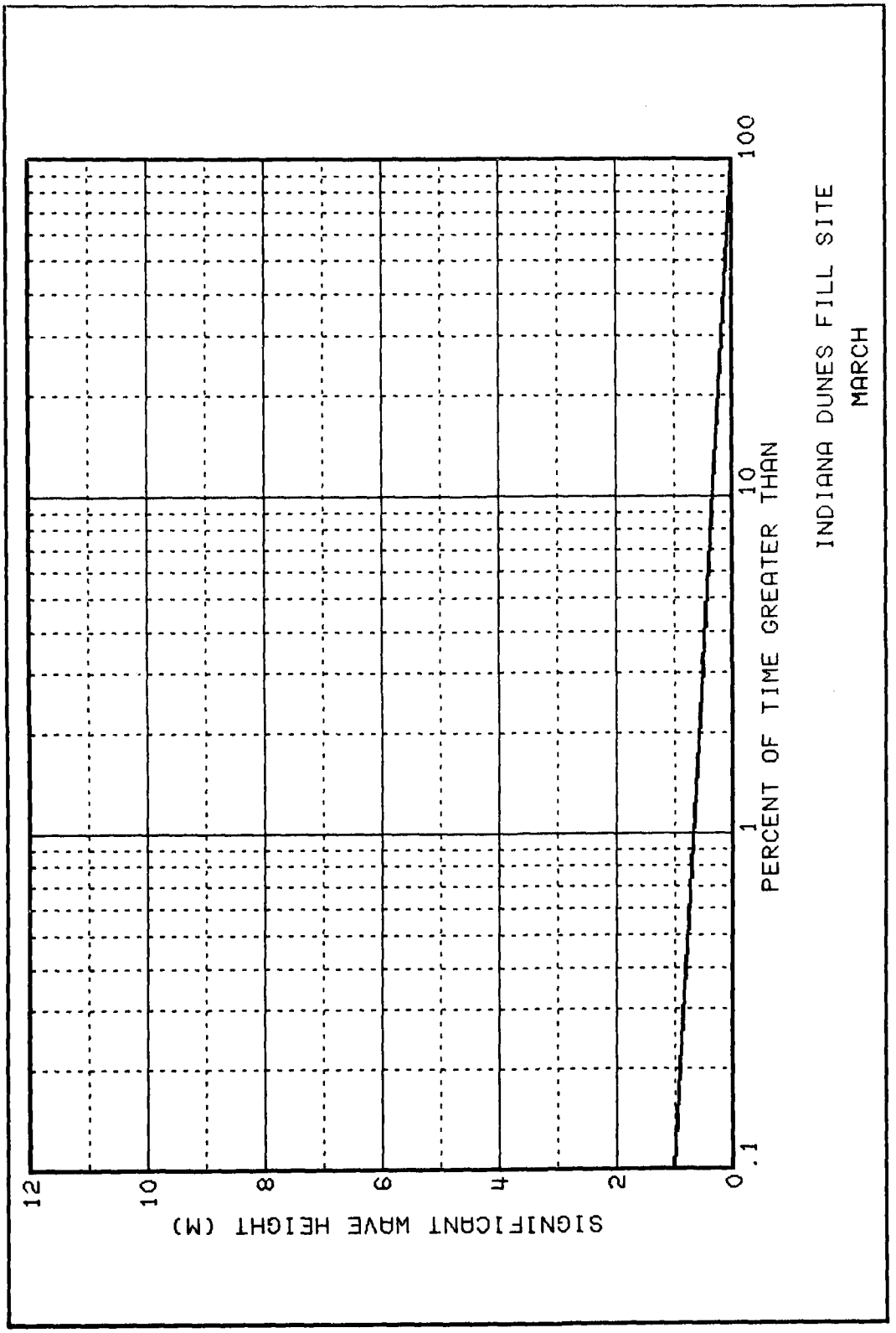
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 16.54 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 16.54 |
| 01-02 | 33.46 | 7.95 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 41.41 |
| 02-03 | 0.00 | 25.38 | 0.00 | 0.00 | 16.67 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 42.05 |
| 03-04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 50.00 | 33.33 | 0.00 | 0.00 | 16.67 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |


INDIANA DUNES FILL SITE
FEBRUARY
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12
PERCENT OF TIME GREATER THAN
.1
1
10
100

INDIANA DUNES FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR MARCH

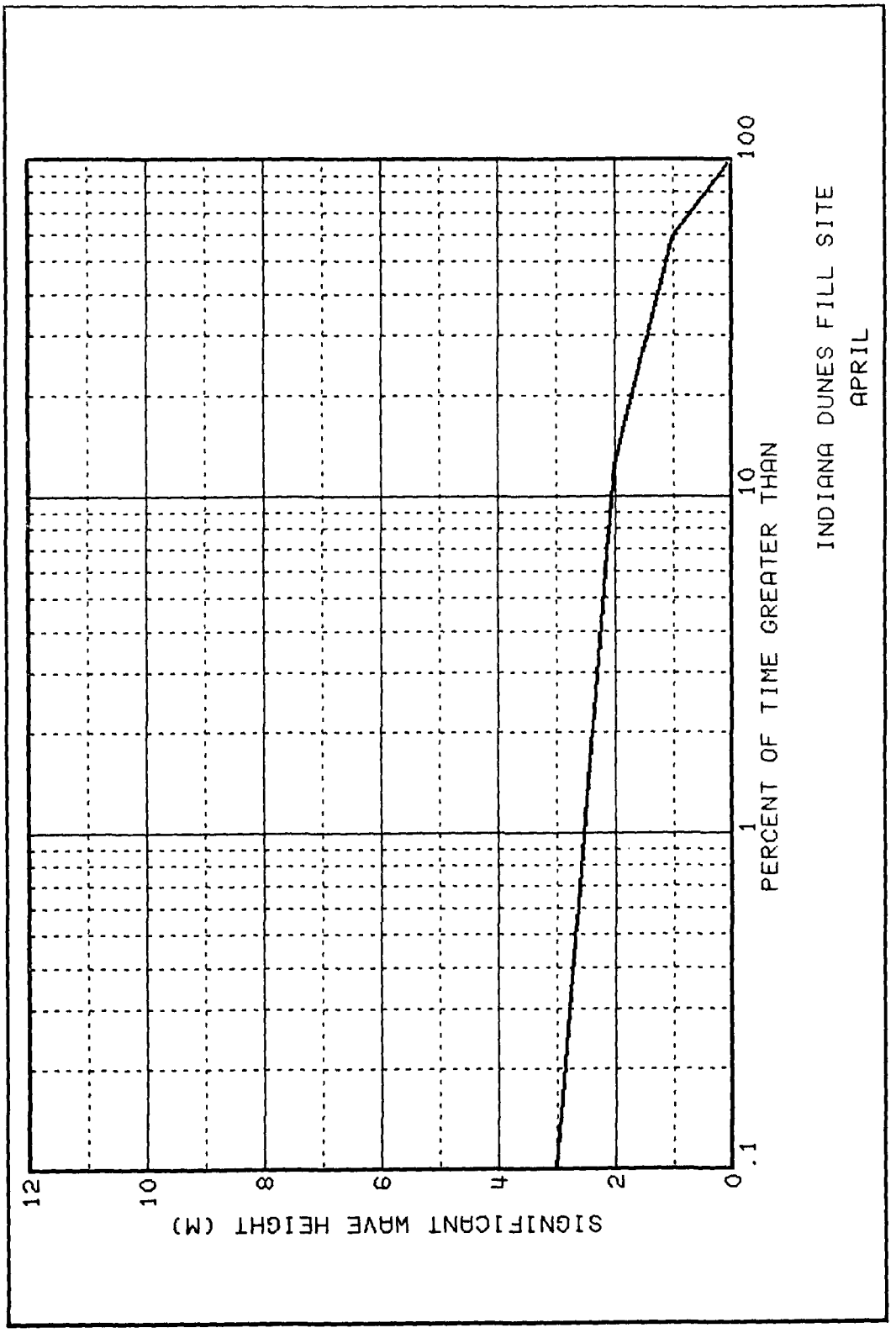
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 01-02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 02-03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 03-04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |


INDIANA DUNES FILL SITE
MARCH
PERCENT OF TIME GREATER THAN
.1
1
10
100
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12

INDIANA DUNES FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR APRIL

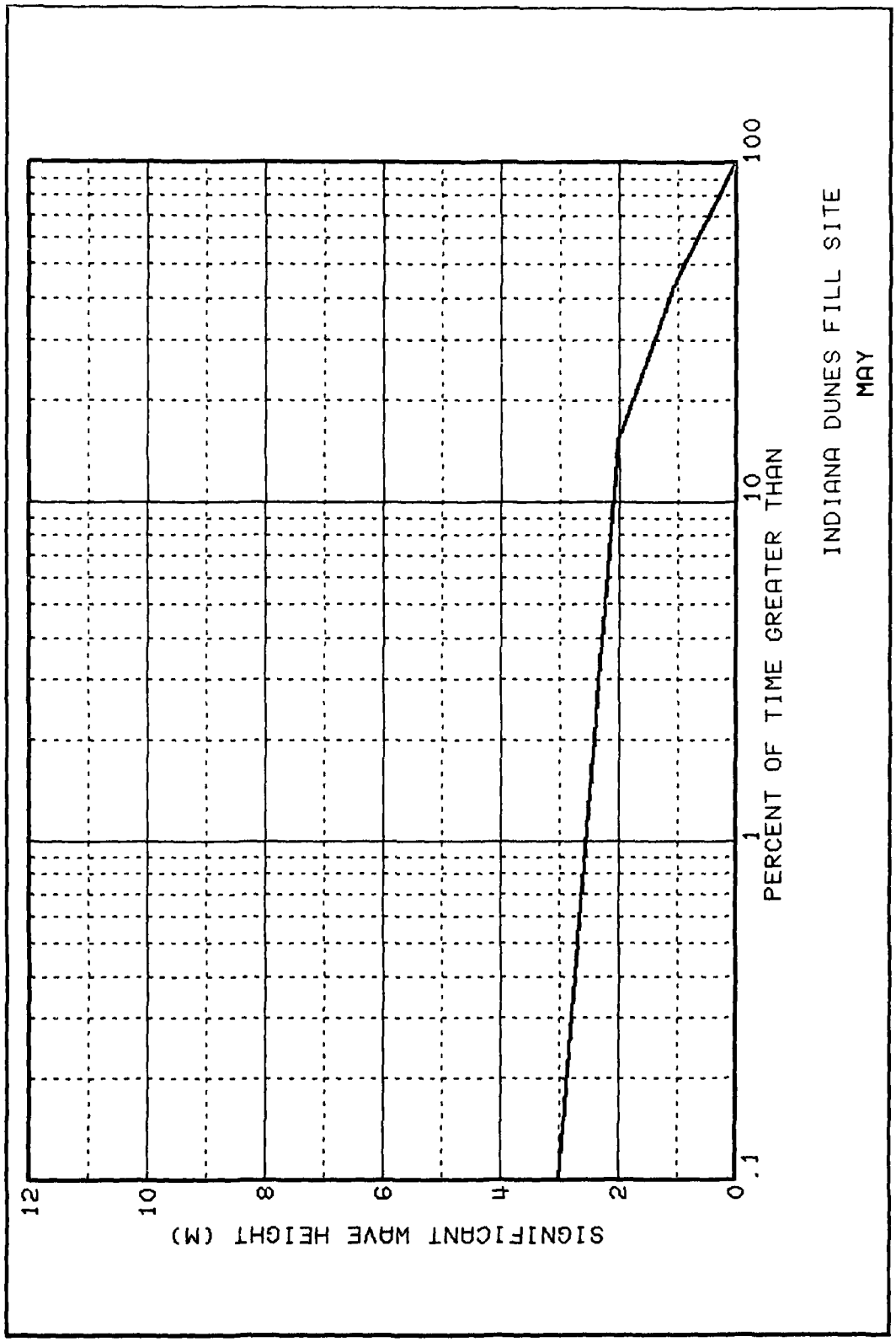
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 31.10 | 4.99 | 3.14 | 1.21 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 40.43 |
| 01-02 | 36.17 | 6.20 | 4.17 | 0.61 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 47.14 |
| 02-03 | 0.00 | 7.00 | 5.42 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 12.42 |
| 03-04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 67.27 | 18.18 | 12.73 | 1.82 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |


INDIANA DUNES FILL SITE
APRIL
PERCENT OF TIME GREATER THAN
.1
1
10
100
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12

INDIANA DUNES FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR MAY

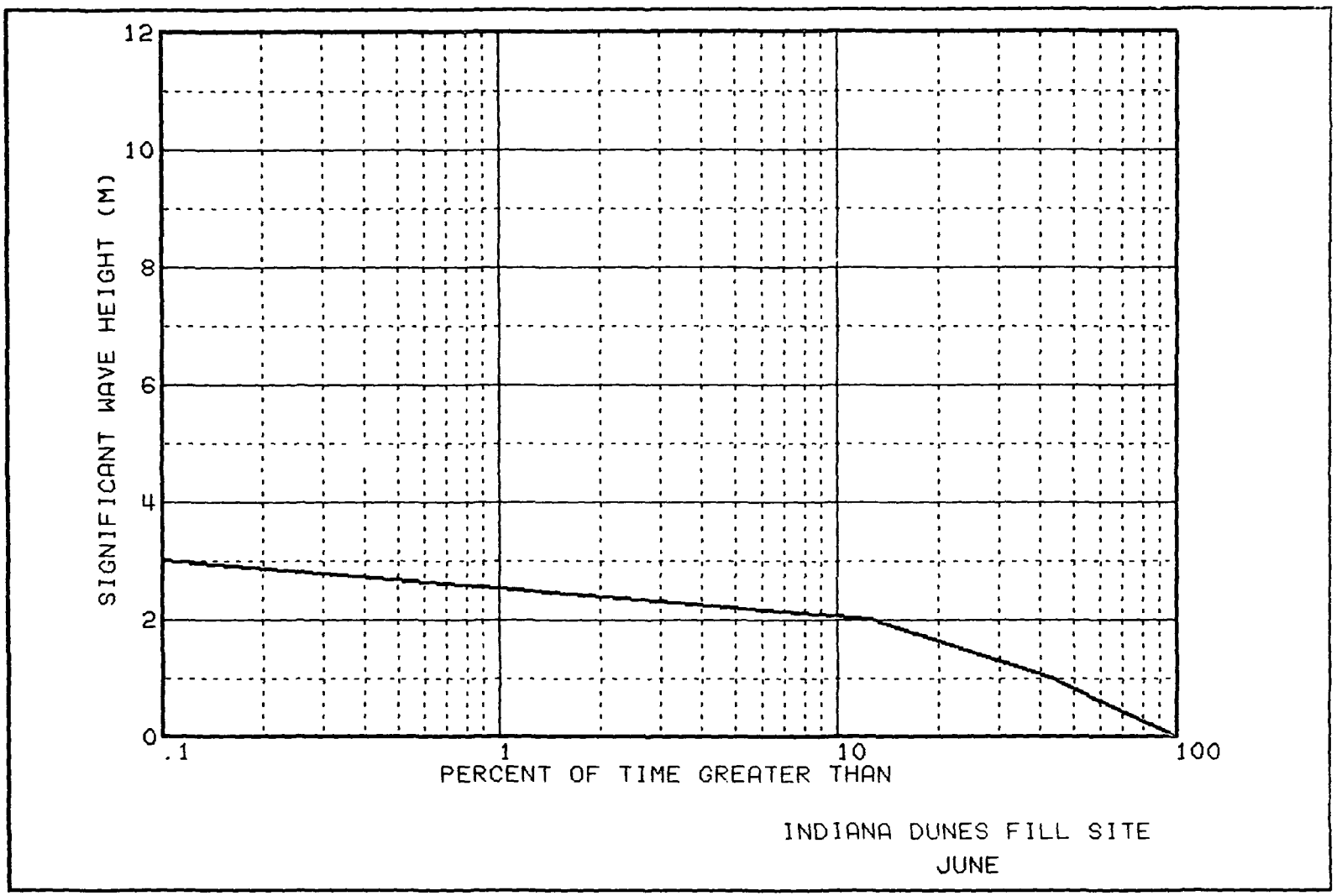
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 51.29 | 1.89 | 0.81 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 53.99 |
| 01-02 | 27.20 | 1.68 | 1.73 | 0.22 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 30.83 |
| 02-03 | 2.00 | 4.56 | 3.97 | 4.66 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 15.18 |
| 03-04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 80.49 | 8.13 | 6.50 | 4.88 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |


INDIANA DUNES FILL SITE
MAY
PERCENT OF TIME GREATER THAN
100
10
1
.1
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12

INDIANA DUNES FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR JUNE

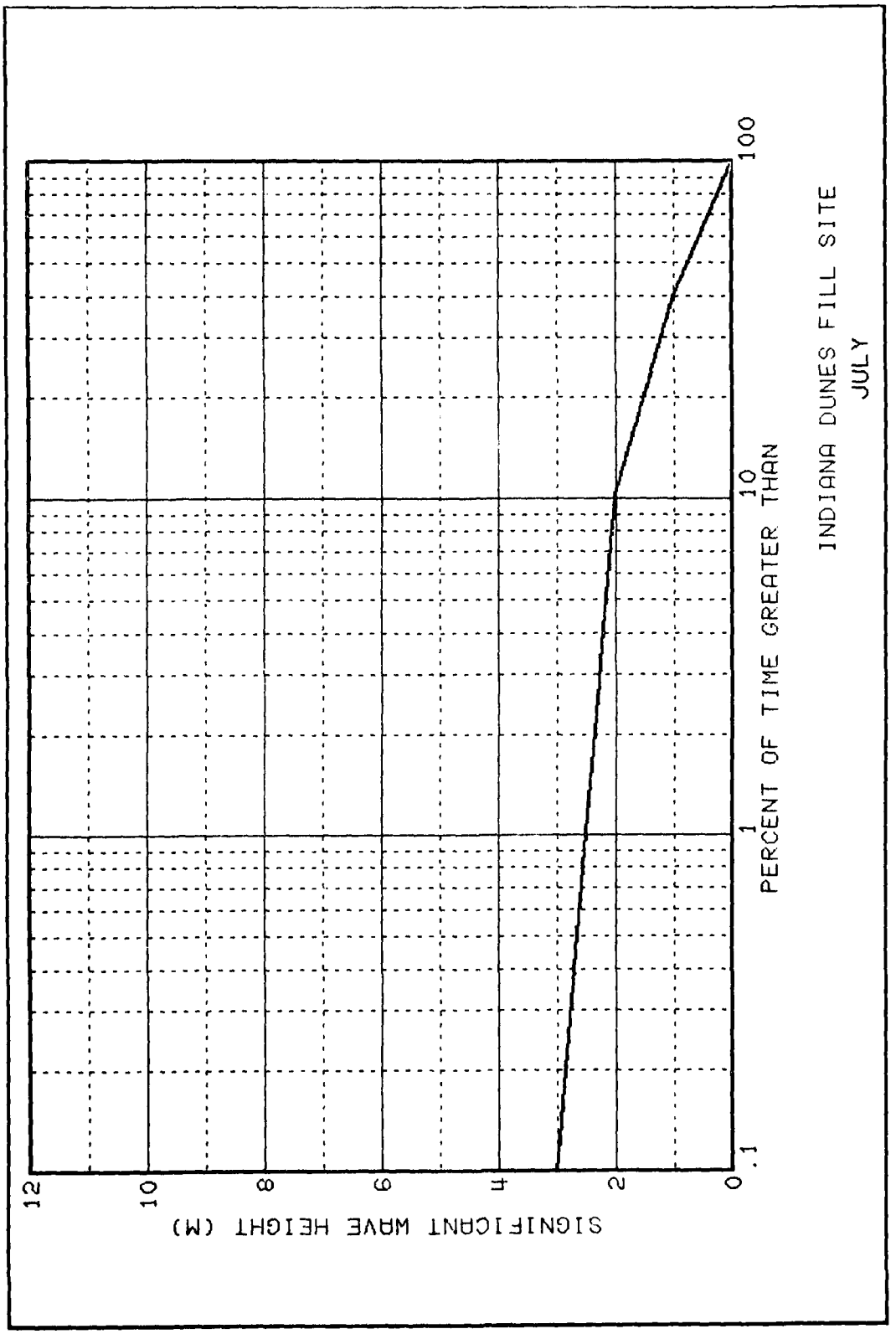
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 55.08 | 2.41 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 57.49 |
| 01-02 | 25.01 | 4.17 | 0.32 | 0.00 | 0.43 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 29.94 |
| 02-03 | 2.98 | 6.50 | 2.76 | 0.00 | 0.34 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 12.57 |
| 03-04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 83.08 | 13.07 | 3.08 | 0.00 | 0.77 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |


12
10
8
6
4
2
0
SIGNIFICANT WAVE HEIGHT (M)
.1
1
10
100
PERCENT OF TIME GREATER THAN
INDIANA DUNES FILL SITE
JUNE

INDIANA DUNES FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR JULY

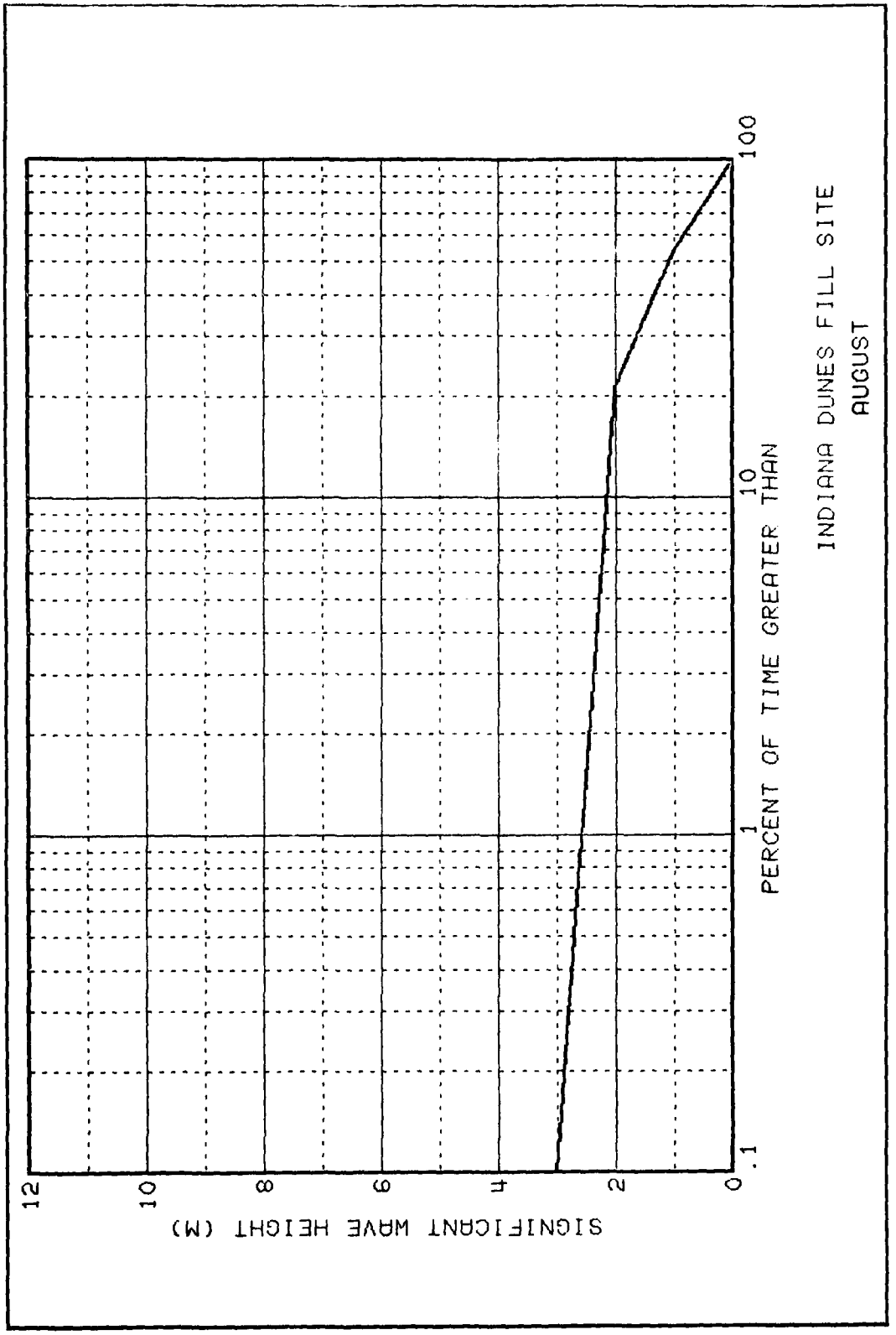
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 57.39 | 2.42 | 0.54 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 60.35 |
| 01-02 | 26.98 | 1.53 | 0.60 | 0.22 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 29.33 |
| 02-03 | 2.73 | 4.12 | 2.08 | 1.39 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 10.32 |
| 03-04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 87.10 | 8.07 | 3.22 | 1.61 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |


INDIANA DUNES FILL SITE
JULY
PERCENT OF TIME GREATER THAN
100
10
1
.1
SIGNIFICANT WAVE HEIGHT (M)
12
10
8
6
4
2
0

INDIANA DUNES FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR AUGUST

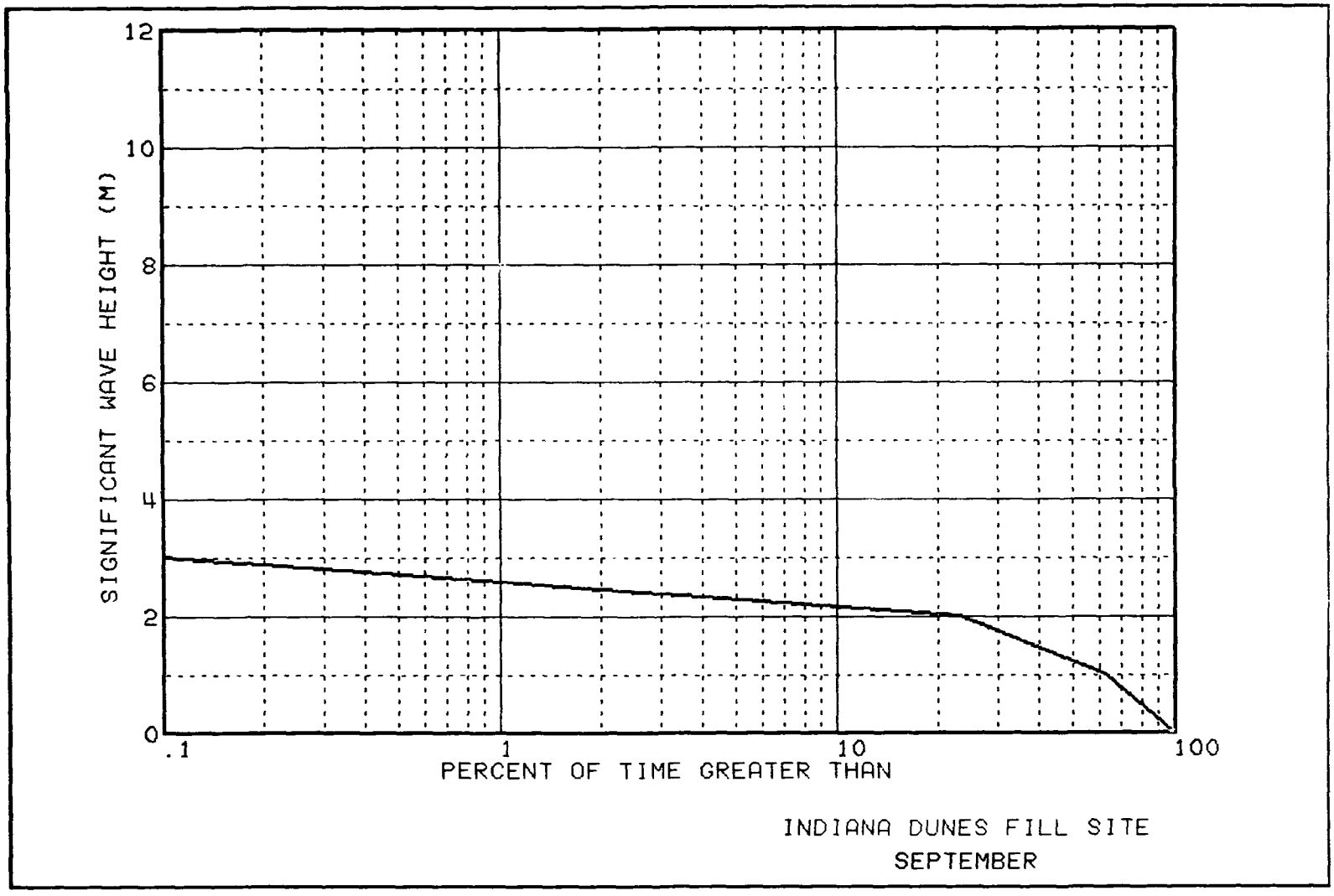
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 42.76 | 2.52 | 0.69 | 0.39 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 46.36 |
| 01-02 | 25.54 | 5.16 | 1.48 | 0.36 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 32.54 |
| 02-03 | 3.30 | 10.07 | 3.74 | 3.39 | 0.59 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 21.10 |
| 03-04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 71.60 | 17.75 | 5.91 | 4.15 | 0.59 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |


INDIANA DUNES FILL SITE
AUGUST
PERCENT OF TIME GREATER THAN
.1
1
10
100
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12

INDIANA DUNES FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR SEPTEMBER

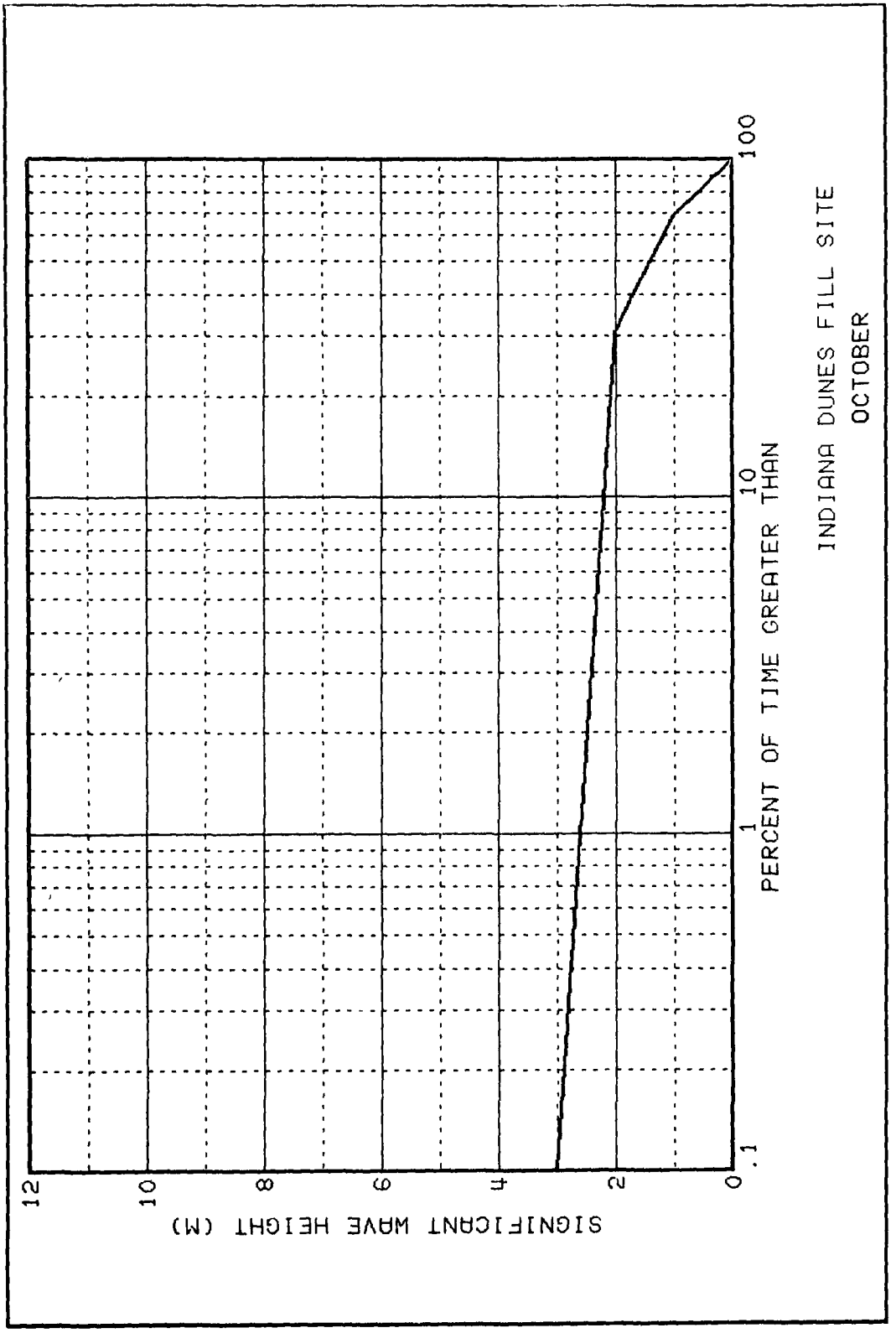
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 34.54 | 2.90 | 0.13 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 37.57 |
| 01-02 | 32.82 | 3.12 | 2.05 | 1.11 | 0.07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 39.16 |
| 02-03 | 5.10 | 11.37 | 3.62 | 0.34 | 0.66 | 0.73 | 0.73 | 0.72 | 0.00 | 0.00 | 23.27 |
| 03-04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 72.47 | 17.39 | 5.80 | 1.45 | 0.72 | 0.73 | 0.73 | 0.72 | 0.00 | 0.00 | |


12
10
8
6
4
2
0
SIGNIFICANT WAVE HEIGHT (M)
.1
1
10
100
PERCENT OF TIME GREATER THAN
INDIANA DUNES FILL SITE
SEPTEMBER

INDIANA DUNES FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR OCTOBER

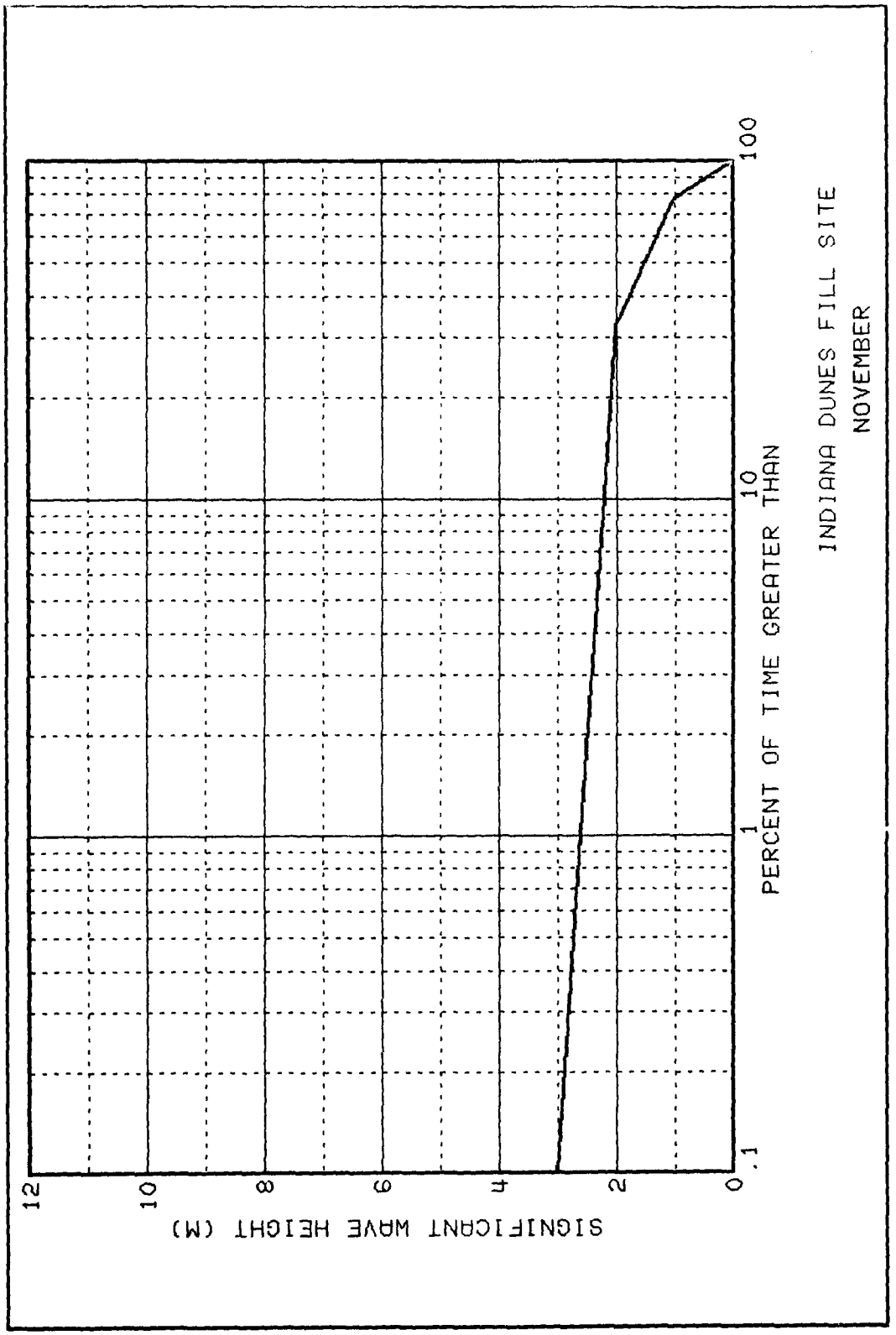
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 29.75 | 1.77 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 31.52 |
| 01-02 | 32.64 | 4.25 | 0.99 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 37.88 |
| 02-03 | 8.63 | 12.09 | 8.98 | 1.45 | 0.00 | 1.45 | 0.00 | 0.00 | 0.00 | 0.00 | 30.60 |
| 03-04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 71.01 | 18.11 | 7.97 | 1.45 | 0.00 | 1.45 | 0.00 | 0.00 | 0.00 | 0.00 | |


INDIANA DUNES FILL SITE
OCTOBER
PERCENT OF TIME GREATER THAN
100
10
1
.1
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12

INDIANA DUNES FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR NOVEMBER

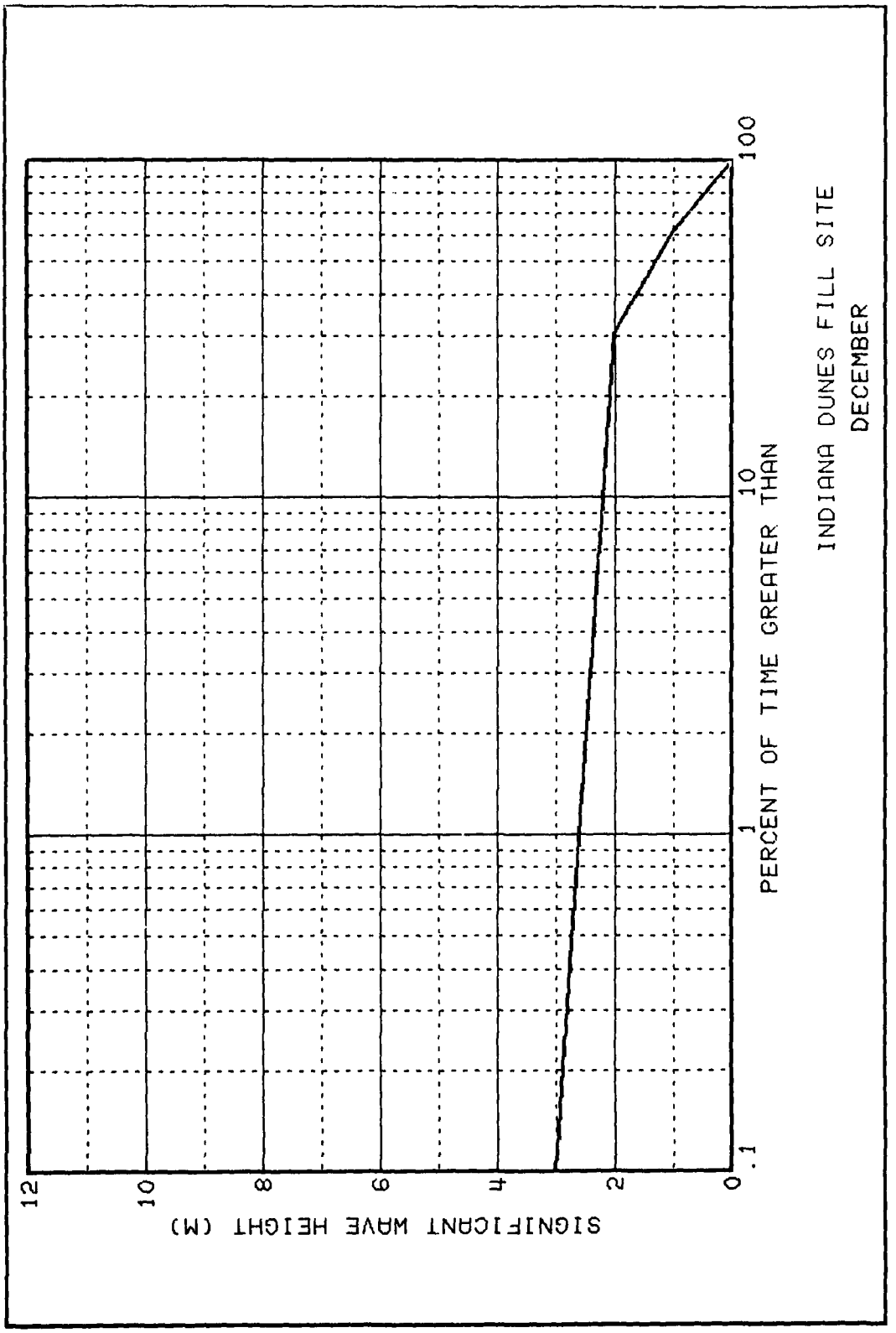
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 20.87 | 1.06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 21.93 |
| 01-02 | 37.62 | 3.59 | 3.41 | 0.71 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 45.32 |
| 02-03 | 7.47 | 12.37 | 5.10 | 5.67 | 0.71 | 0.71 | 0.71 | 0.00 | 0.00 | 0.00 | 32.74 |
| 03-04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 65.96 | 17.02 | 8.51 | 6.38 | 0.71 | 0.71 | 0.71 | 0.00 | 0.00 | 0.00 | |


INDIANA DUNES FILL SITE
NOVEMBER
PERCENT OF TIME GREATER THAN
.1
1
10
100
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12

INDIANA DUNES FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR DECEMBER

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 29.73 | 7.46 | 1.49 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 38.68 |
| 01-02 | 26.43 | 4.07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 30.50 |
| 02-03 | 9.51 | 12.35 | 4.48 | 4.48 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 30.82 |
| 03-04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 65.67 | 23.88 | 5.97 | 4.48 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |


INDIANA DUNES FILL SITE
DECEMBER
PERCENT OF TIME GREATER THAN
.1
1
10
100
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12

INDIANA DUNES FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD

WAVE DIRECTION = 300

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 6.04 | 0.05 | 0.06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 6.15 |
| 01-02 | 7.95 | 0.46 | 0.15 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 8.56 |
| 02-03 | 1.04 | 1.81 | 0.59 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3.44 |
| 03-04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 15.03 | 2.32 | 0.80 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |

INDIANA DUNES FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD

WAVE DIRECTION = 330

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 6.04 | 0.17 | 0.00 | 0.12 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 6.33 |
| 01-02 | 7.40 | 0.86 | 0.36 | 0.06 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 8.69 |
| 02-03 | 1.59 | 3.71 | 0.89 | 0.71 | 0.26 | 0.09 | 0.00 | 0.09 | 0.00 | 0.00 | 7.34 |
| 03-04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 15.03 | 4.74 | 1.25 | 0.89 | 0.27 | 0.09 | 0.00 | 0.09 | 0.00 | 0.00 | |

INDIANA DUNES FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD

WAVE DIRECTION = 0

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 9.38 | 0.58 | 0.45 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 10.36 |
| 01-02 | 7.54 | 2.11 | 1.01 | 0.30 | 0.05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 11.01 |
| 02-03 | 1.24 | 3.80 | 2.74 | 1.67 | 0.13 | 0.27 | 0.18 | 0.00 | 0.00 | 0.00 | 10.02 |
| 03-04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 18.15 | 6.44 | 4.20 | 1.97 | 0.18 | 0.27 | 0.18 | 0.00 | 0.00 | 0.00 | |

INDIANA DUNES FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD

WAVE DIRECTION = 30

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 17.59 | 1.79 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 19.39 |
| 01-02 | 7.52 | 0.27 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 7.78 |
| 02-03 | 0.92 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.92 |
| 03-04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 26.03 | 2.06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |

INDIANA DUNES FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD

WAVE DIRECTION = 60

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 01-02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 02-03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 03-04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |

# APPENDIX K: AVERAGE WAVE CLIMATE AT PRESQUE ISLE, PA.

1. Appendix K contains two sets of the following information. One set is for the sand borrow area at Presque Isle, Pa., (deep water), and the other set is for the fill area:

a. Tabulations of monthly percent occurrence of wave-height/period combinations.

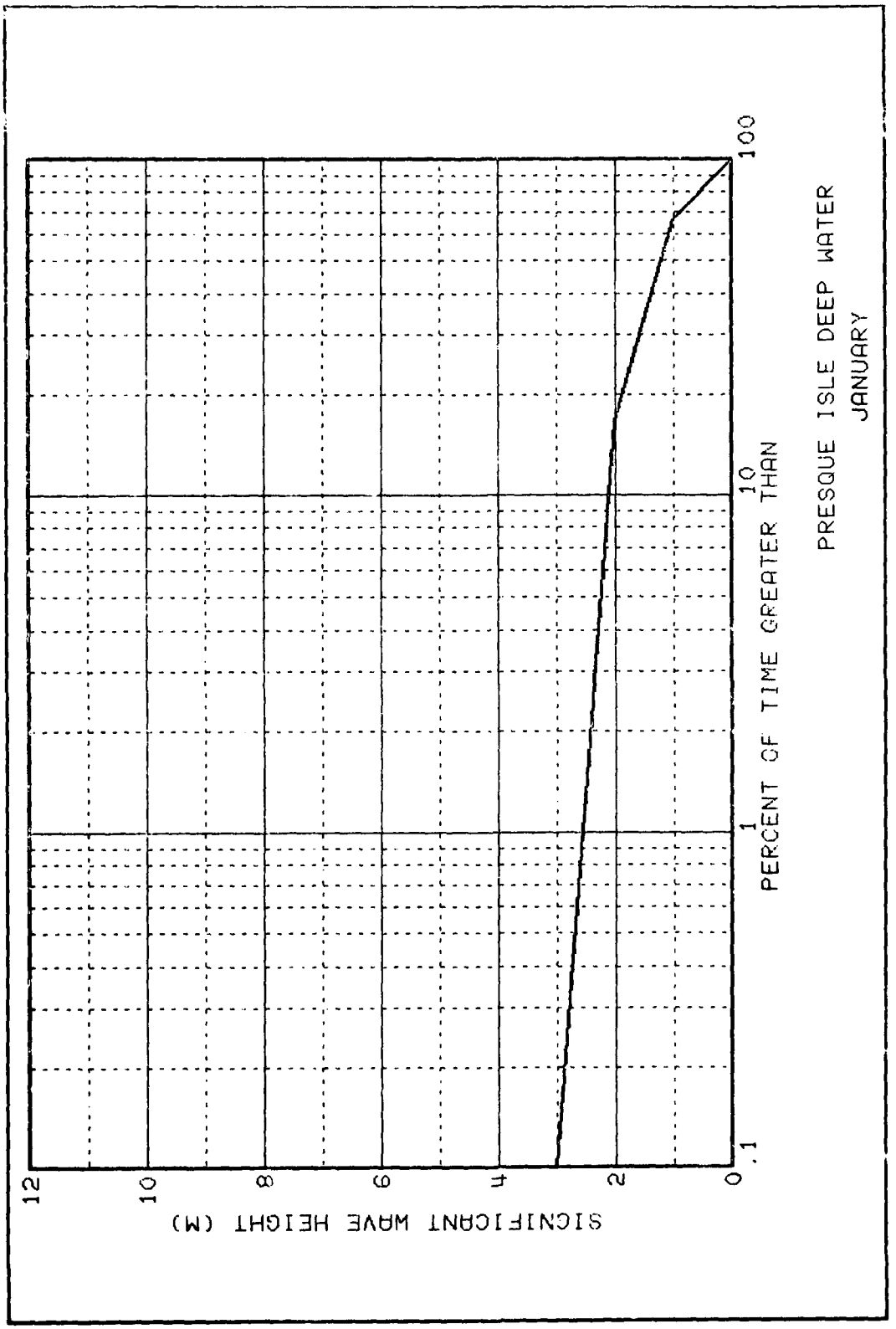
b. Tabulations of annual percent occurrence by azimuth direction of wave-height/period combinations.

c. Plots of monthly significant wave-height occurrence in terms of the total percent time per month that these heights are exceeded.

PRESQUE ISLE DEEP WATER

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR JANUARY

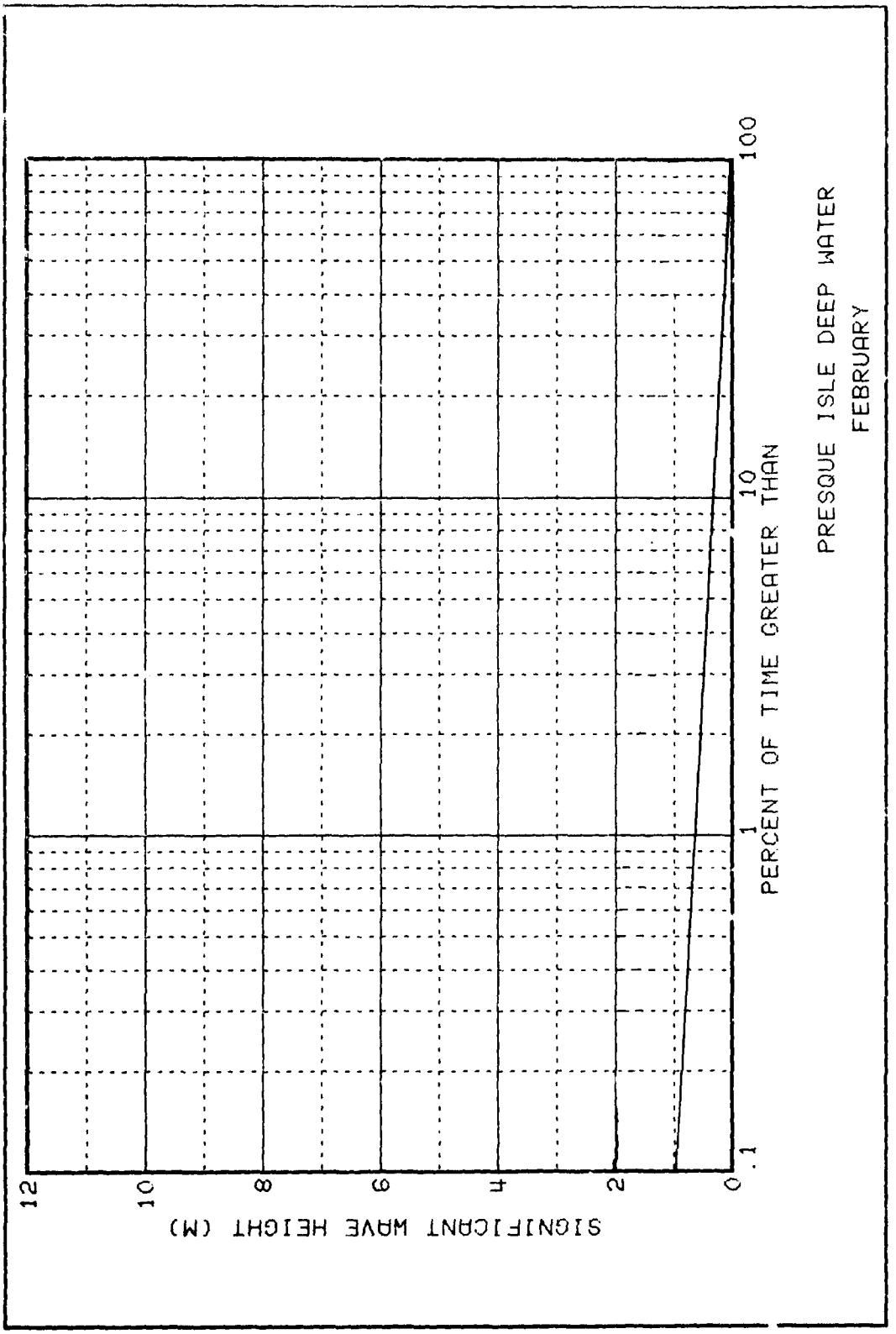
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 33.33 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 33.33 |
| 01-02 | 50.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 50.00 |
| 02-03 | 0.00 | 16.67 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 16.67 |
| 03-04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 83.33 | 16.67 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |


PRESQUE ISLE DEEP WATER
JANUARY
PERCENT OF TIME GREATER THAN
.1
1
10
100
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12

PRESQUE ISLE DEEP WATER

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR FEBRUARY

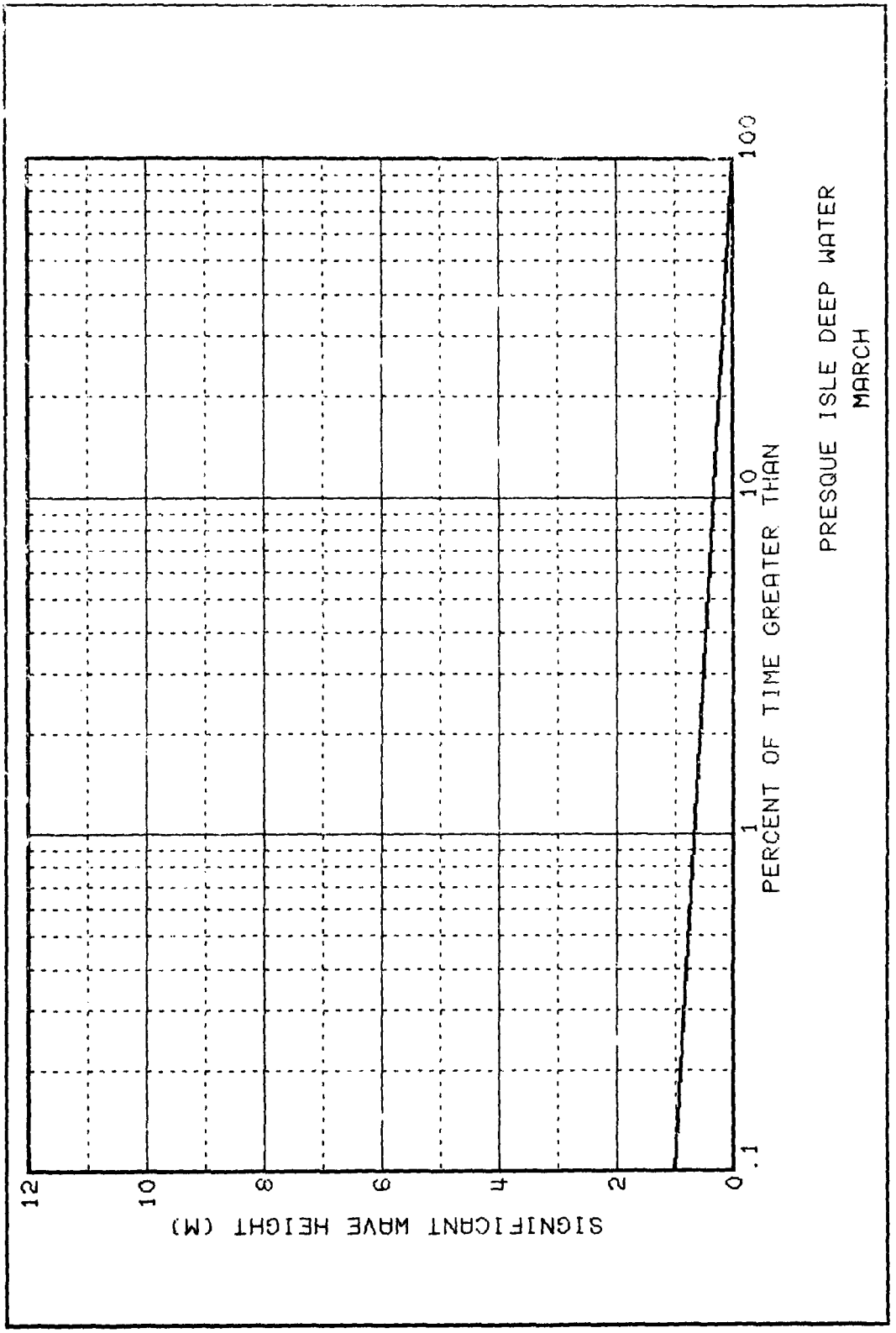
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 01-02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 100.00 | 100.00 |
| 02-03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 03-04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 100.00 | |


PRESQUE ISLE DEEP WATER
FEBRUARY
PERCENT OF TIME GREATER THAN
0
.1
1
10
100
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12

PRESQUE ISLE DEEP WATER

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR MARCH

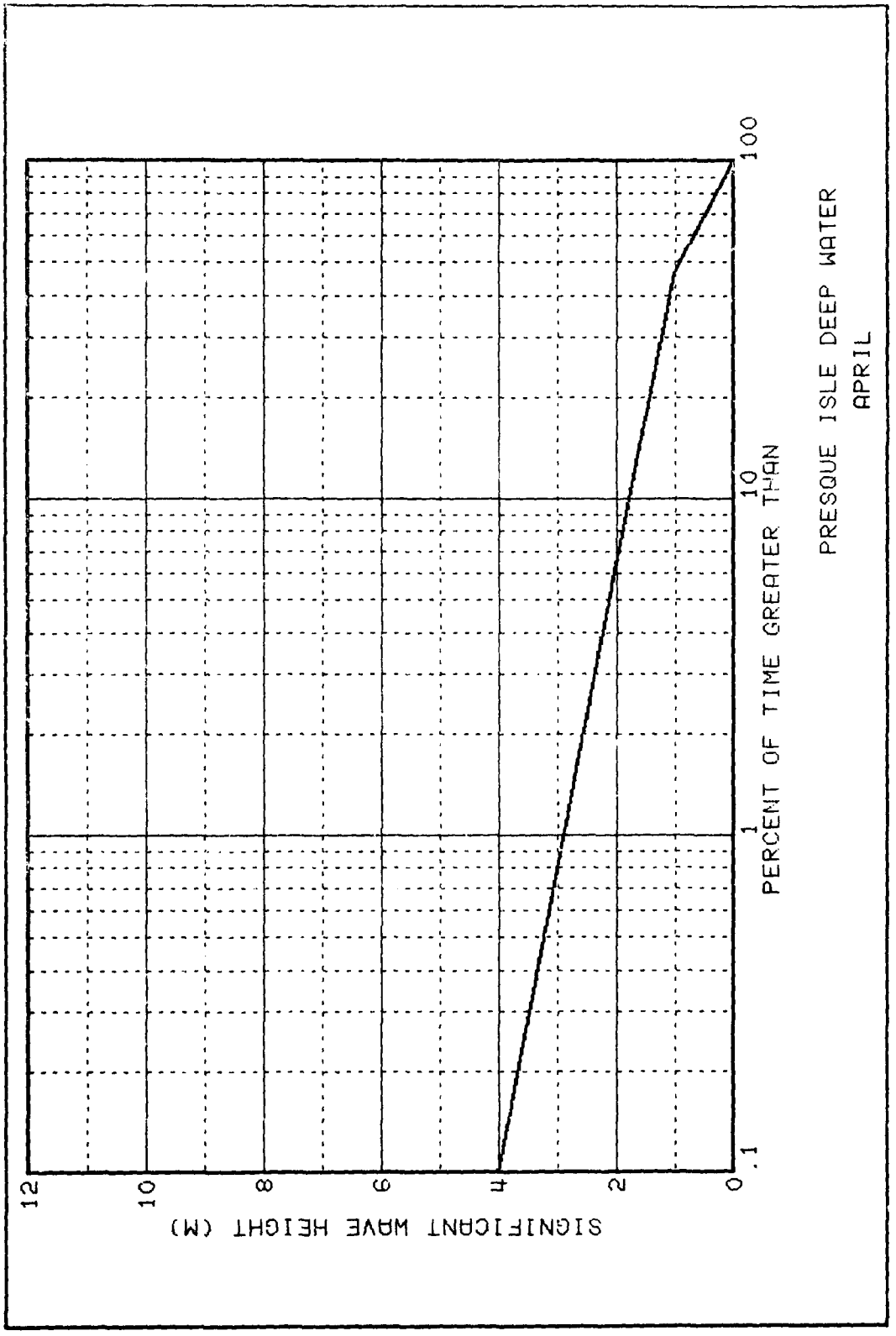
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 100.00 |
| 01-02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 02-03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 03-04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |


PRESQUE ISLE DEEP WATER
MARCH
PERCENT OF TIME GREATER THAN
.1
1
10
100
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12

... DEEP WATER

CUMULATIVE SEA ... SWELL ... FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR APRIL

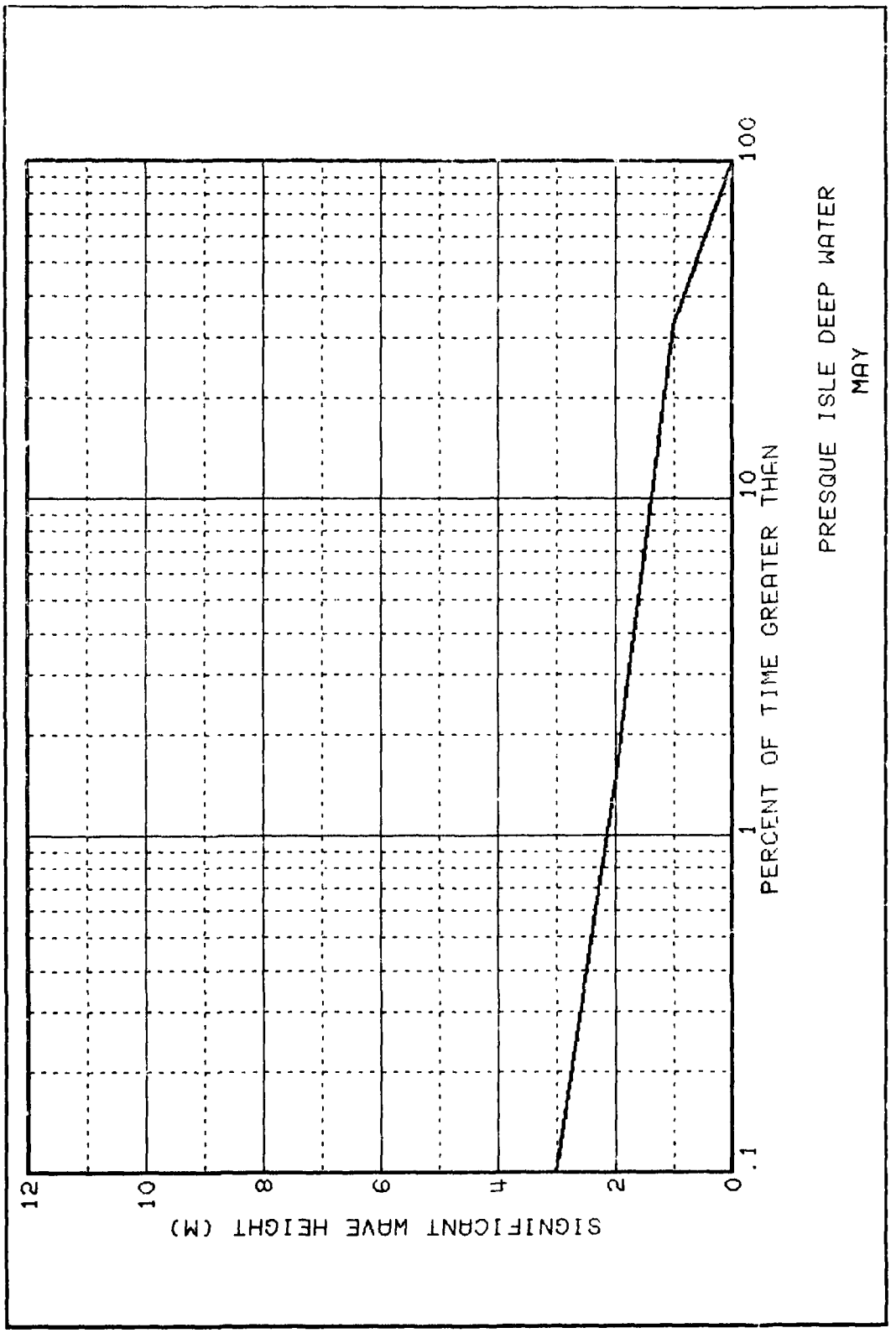
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 52.38 | 0.00 | .00 | 0.79 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 53.17 |
| 01-02 | 38.68 | 0.79 | 1.19 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 40.48 |
| 02-03 | 3.97 | 1.59 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 5.56 |
| 03-04 | 0.79 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.79 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 96.82 | 2.38 | 0.00 | 0.79 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |


PRESQUE ISLE DEEP WATER
APRIL
PERCENT OF TIME GREATER THAN
.1
1
10
100
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12

PRESQUE ISLE DEEP WATER

CUMULPTIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR MAY

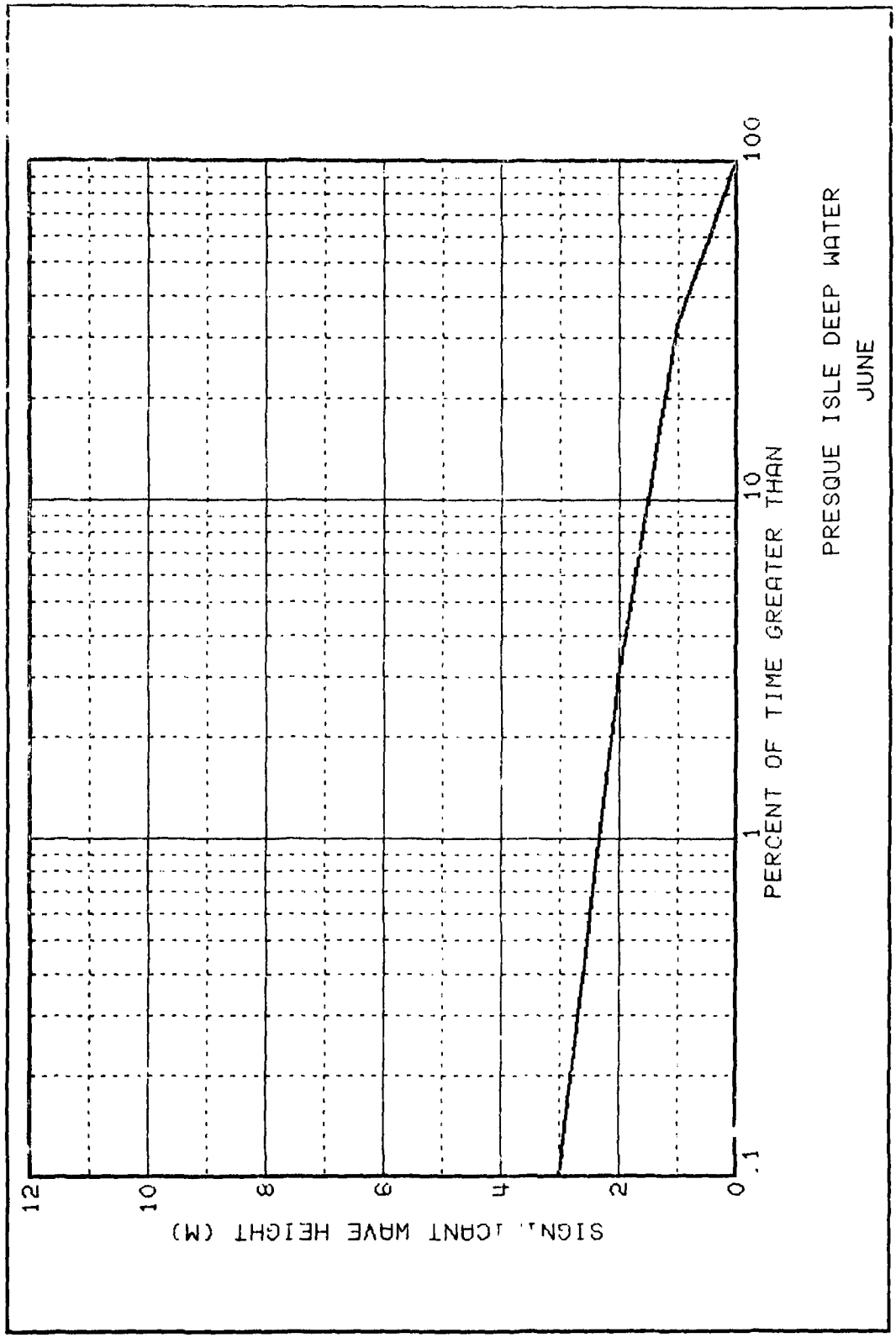
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 65.57 | 1.89 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 67.45 |
| 01-02 | 27.36 | 2.33 | 0.00 | 0.47 | 0.47 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 31.13 |
| 02-03 | 0.94 | 0.47 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.41 |
| 03-04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 93.87 | 5.19 | 0.00 | 0.47 | 0.47 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |


PRESQUE ISLE DEEP WATER
MAY
PERCENT OF TIME GREATER THAN
.1
1
10
100
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12

PRESQUE ISLE [illegible] WATER

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR JUNE

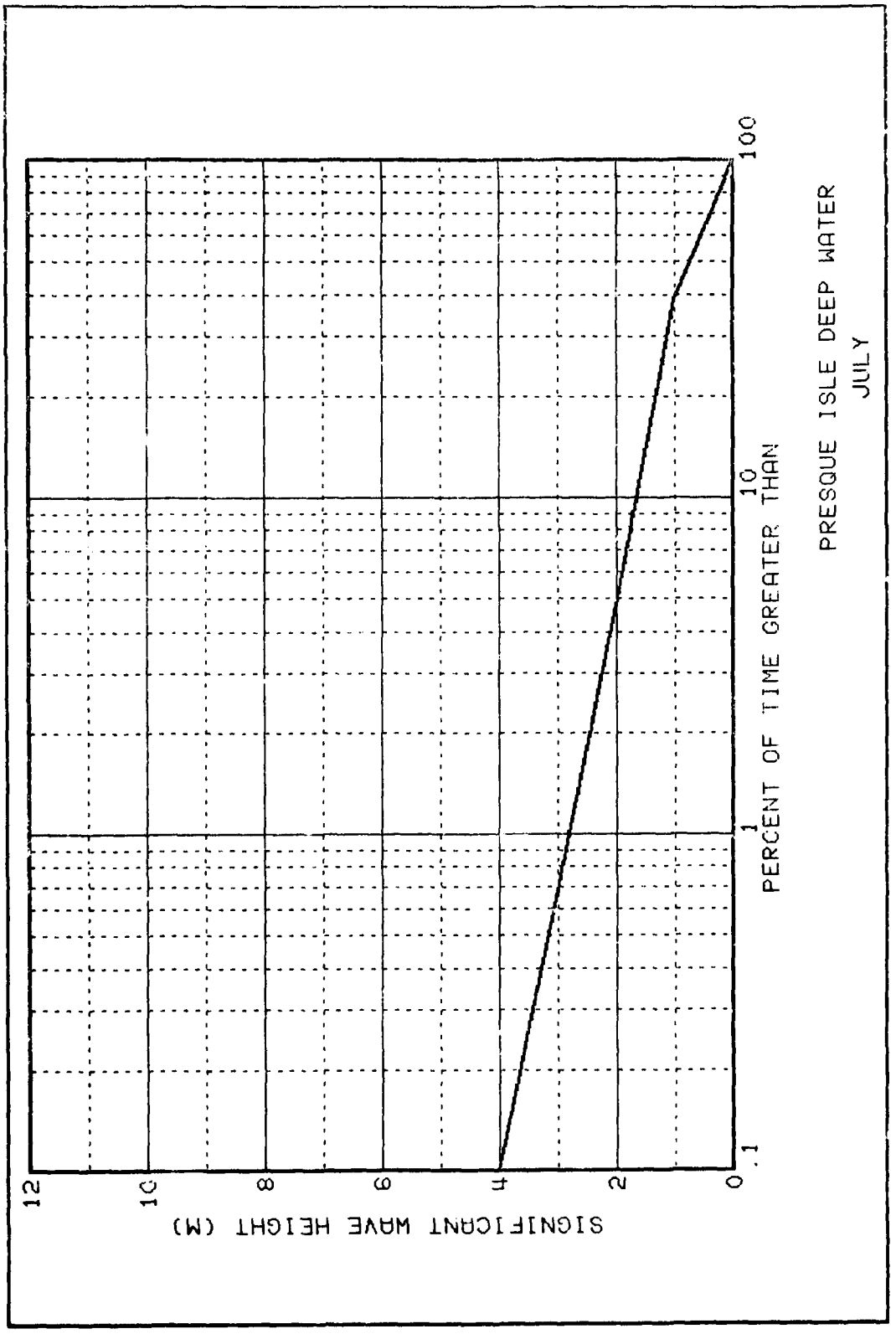
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 63.48 | 1.87 | 0.37 | 0.37 | 0.00 | 0.00 | 0.00 | 0.00 | 0.75 | 0.37 | 67.16 |
| 01-02 | 26.12 | 2.61 | 1.12 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 29.84 |
| 02-03 | 1.12 | 0.75 | 0.75 | 0.37 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2.99 |
| 03-04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 90.67 | 5.22 | 2.24 | 0.75 | 0.00 | 0.00 | 0.00 | 0.00 | 0.75 | 0.37 | |


PRESQUE ISLE DEEP WATER
JUNE
PERCENT OF TIME GREATER THAN
100
10
1
.1
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12

PRESQUE ISLE DEEP WATER

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR JULY

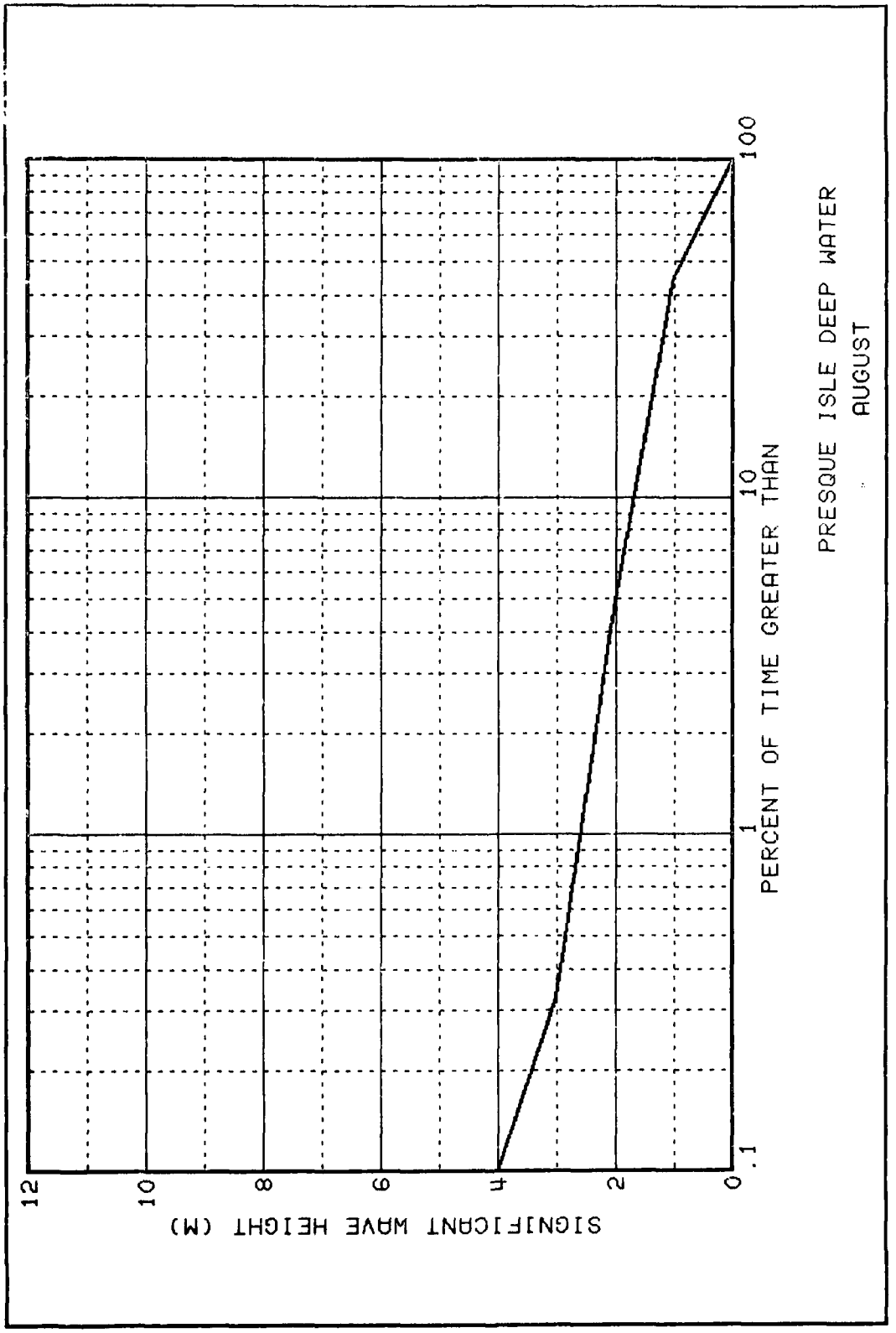
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 58.98 | 2.03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.34 | 61.35 |
| 01-02 | 30.17 | 3.05 | 0.34 | 0.34 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 33.90 |
| 02-03 | 2.71 | 1.36 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 4.07 |
| 03-04 | 0.68 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.68 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 92.54 | 6.44 | 0.34 | 0.34 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.34 | |


PRESQUE ISLE DEEP WATER
JULY
PERCENT OF TIME GREATER THAN
100
10
1
.1
SIGNIFICANT WAVE HEIGHT (M)
12
10
8
6
4
2
0

PRESQUE ISLE DEEP WATER

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR AUGUST

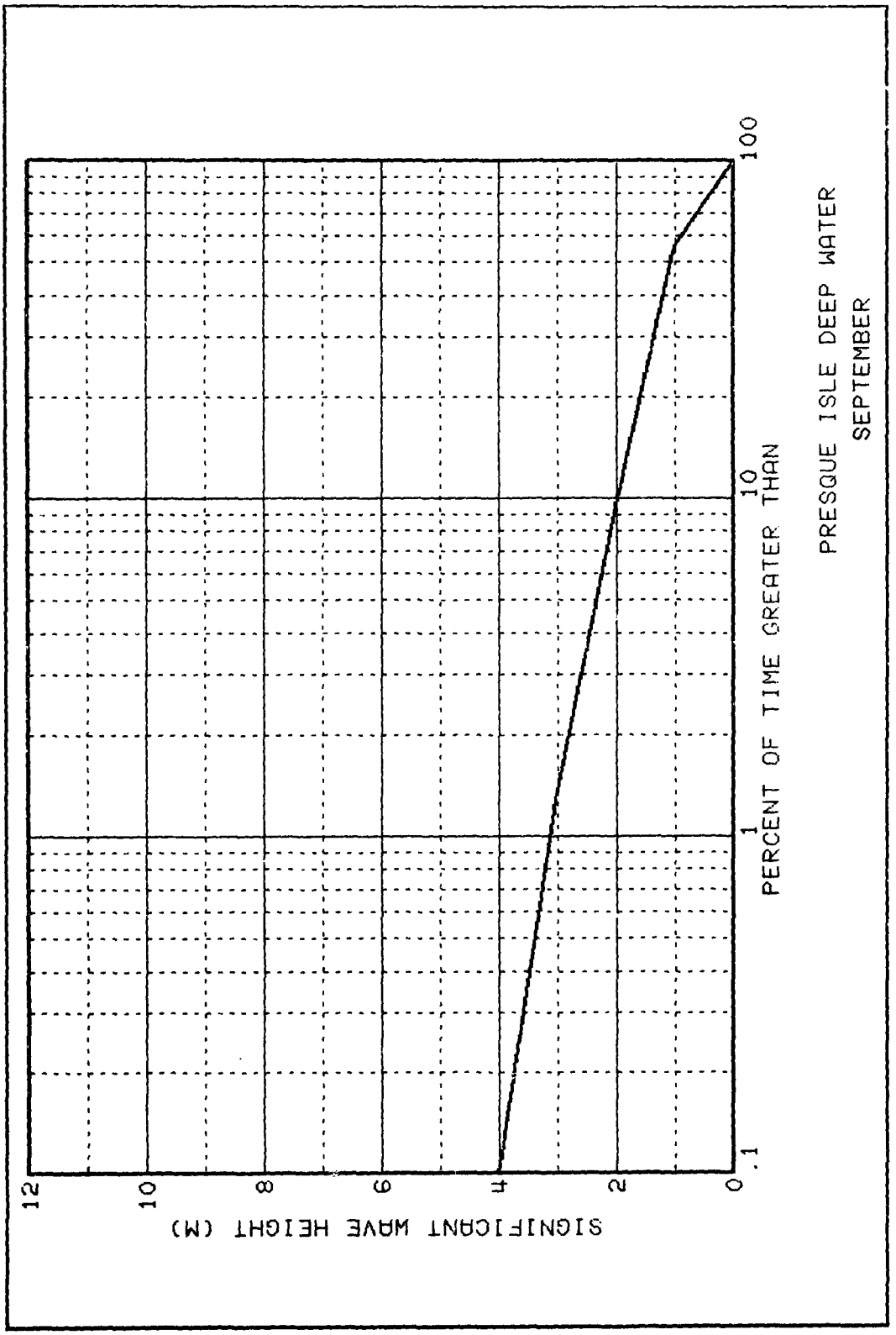
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 52.15 | 0.99 | 0.33 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.32 | 0.00 | 54.79 |
| 01-02 | 33.99 | 4.95 | 1.32 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 40.26 |
| 02-03 | 3.63 | 0.00 | 0.33 | 0.66 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 4.62 |
| 03-04 | 0.00 | 0.00 | 0.33 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.33 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 89.77 | 5.94 | 2.31 | 0.66 | 0.00 | 0.00 | 0.00 | 0.00 | 1.32 | 0.00 | |


PRESQUE ISLE DEEP WATER
AUGUST
PERCENT OF TIME GREATER THAN
.1
1
10
100
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12

PRESQUE ISLE DEEP WATER

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR SEPTEMBER

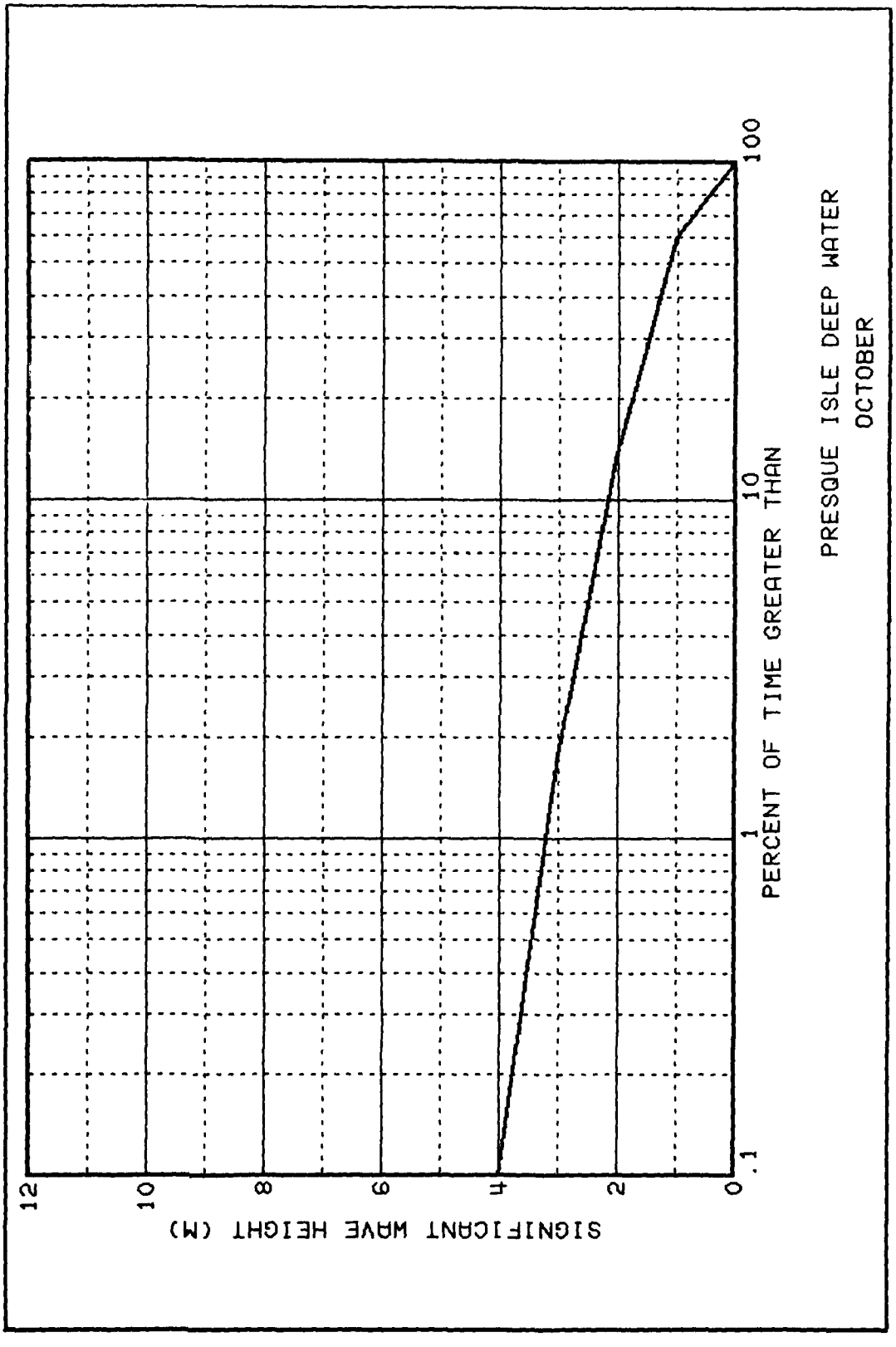
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 41.64 | 1.37 | 1.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 44.03 |
| 01-02 | 38.93 | 4.78 | 1.36 | 0.34 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 46.42 |
| 02-03 | 5.80 | 2.05 | 0.00 | 0.34 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 8.19 |
| 03-04 | 0.00 | 1.37 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.37 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 87.37 | 9.56 | 2.38 | 0.68 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |


PRESQUE ISLE DEEP WATER
SEPTEMBER
PERCENT OF TIME GREATER THAN
100
10
1
.1
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12

PRESQUE ISLE DEEP WATER

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR OCTOBER

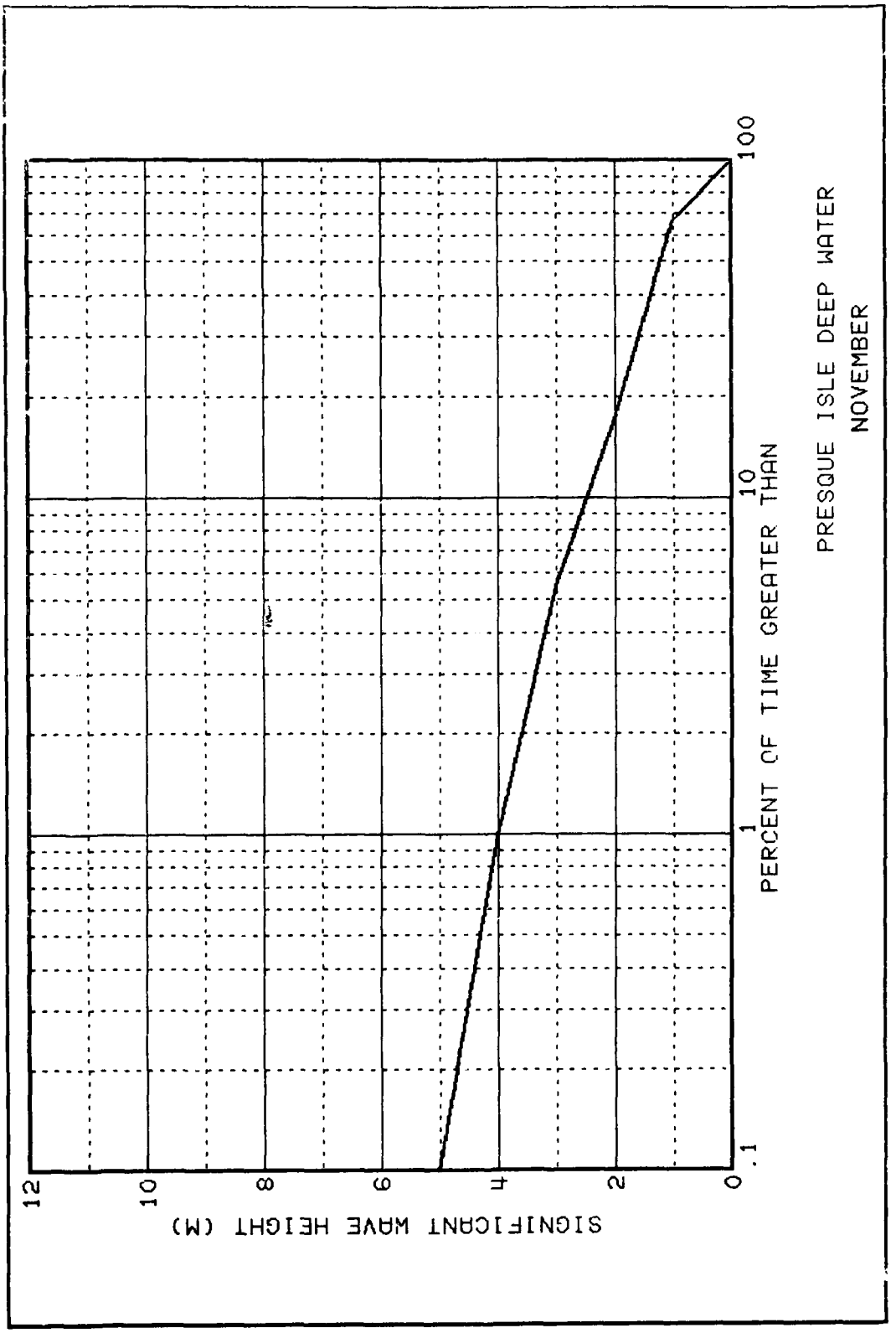
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 39.44 | 0.00 | 0.00 | 0.00 | 0.35 | 0.00 | 0.00 | 0.00 | 0.00 | 0.35 | 40.14 |
| 01-02 | 38.38 | 4.23 | 2.46 | 1.06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 46.13 |
| 02-03 | 6.69 | 2.46 | 1.76 | 1.06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 11.97 |
| 03-04 | 1.41 | 0.35 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.76 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 85.92 | 7.04 | 4.23 | 2.11 | 0.35 | 0.00 | 0.00 | 0.00 | 0.00 | 0.35 | |


PRESQUE ISLE DEEP WATER
OCTOBER
PERCENT OF TIME GREATER THAN
100
10
1
.1
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12

PRESQUE ISLE DEEP WATER

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR NOVEMBER

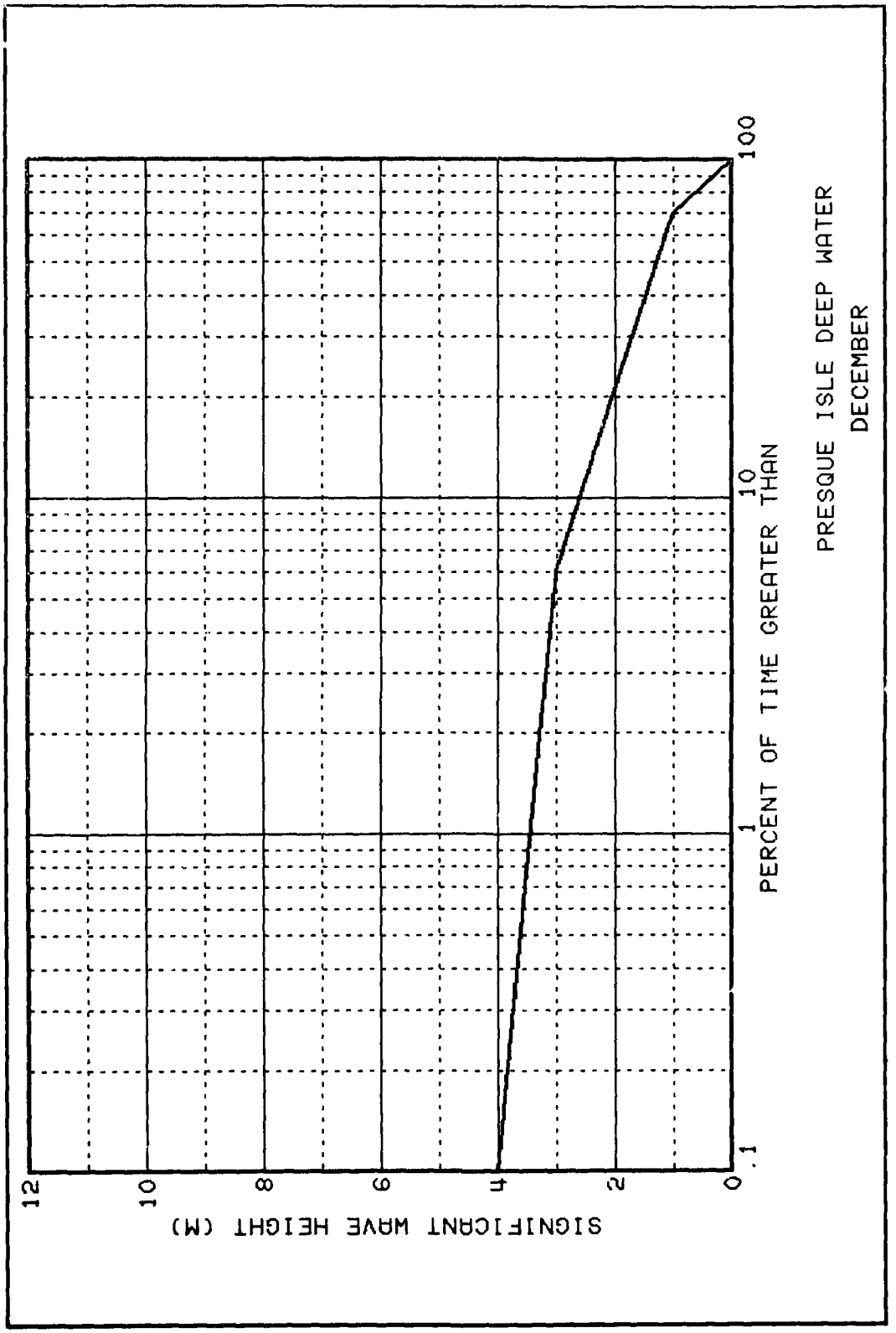
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 32.84 | 0.75 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 33.58 |
| 01-02 | 42.54 | 4.97 | 0.75 | 0.75 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.25 | 49.25 |
| 02-03 | 5.72 | 3.98 | 1.74 | 0.00 | 0.25 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 11.69 |
| 03-04 | 0.50 | 2.74 | 0.99 | 0.25 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 4.48 |
| 04-05 | 0.00 | 0.25 | 0.25 | 0.00 | 0.25 | 0.25 | 0.00 | 0.00 | 0.00 | 0.00 | 0.99 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 81.59 | 12.68 | 3.73 | 0.99 | 0.50 | 0.25 | 0.00 | 0.00 | 0.00 | 0.25 | |


PRESQUE ISLE DEEP WATER
NOVEMBER
PERCENT OF TIME GREATER THAN
100
10
1
.1
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12

PRESQUE ISLE DEEP WATER

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR DECEMBER

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 30.40 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 30.40 |
| 01-02 | 42.57 | 4.73 | 0.67 | 0.00 | 0.68 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 48.65 |
| 02-03 | 7.43 | 5.41 | 1.35 | 0.68 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 14.87 |
| 03-04 | 4.05 | 2.03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 6.08 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 84.46 | 12.17 | 2.03 | 0.68 | 0.68 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |


PRESQUE ISLE DEEP WATER
DECEMBER
PERCENT OF TIME GREATER THAN
100
10
1
.1
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12

PRESQUE ISLE DEEP WATER

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD

WAVE DIRECTION = 270

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 11.13 | 0.09 | 0.04 | 0.00 | 0.04 | 0.00 | 0.00 | 0.00 | 0.21 | 0.00 | 11.51 |
| 01-02 | 9.38 | 0.98 | 0.30 | 0.17 | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 10.87 |
| 02-03 | 1.75 | 0.77 | 0.26 | 0.08 | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2.90 |
| 03-04 | 0.38 | 0.47 | 0.04 | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.94 |
| 04-05 | 0.00 | 0.04 | 0.00 | 0.00 | 0.04 | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.13 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 22.64 | 2.34 | 0.64 | 0.30 | 0.17 | 0.04 | 0.00 | 0.00 | 0.21 | 0.00 | |

PRESQUE ISLE DEEP WATER

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD

WAVE DIRECTION = 300

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 7.08 | 0.13 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.04 | 7.25 |
| 01-02 | 6.82 | 0.98 | 0.34 | 0.04 | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 8.23 |
| 02-03 | 0.98 | 0.68 | 0.17 | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.88 |
| 03-04 | 0.13 | 0.09 | 0.13 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.34 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 15.00 | 1.88 | 0.64 | 0.09 | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.04 | |

PRESQUE ISLE DEEP WATER

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD

WAVE DIRECTION = 330

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 6.44 | 0.21 | 0.09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 6.74 |
| 01-02 | 5.67 | 0.47 | 0.04 | 0.09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.09 | 6.35 |
| 02-03 | 0.26 | 0.09 | 0.13 | 0.09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.55 |
| 03-04 | 0.04 | 0.09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.13 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 12.40 | 0.85 | 0.25 | 0.17 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.09 | |

PRESQUE ISLE DEEP WATER

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD

WAVE DIRECTION = 0

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 5.75 | 0.26 | 0.00 | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 6.05 |
| 01-02 | 3.20 | 0.34 | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3.58 |
| 02-03 | 0.21 | 0.04 | 0.00 | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.30 |
| 03-04 | 0.00 | 0.09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.09 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 9.16 | 0.73 | 0.04 | 0.09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |

PRESQUE ISLE DEEP WATER

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD

WAVE DIRECTION = 30

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 7.84 | 0.17 | 0.04 | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.04 | 0.04 | 8.18 |
| 01-02 | 4.35 | 0.51 | 0.00 | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 4.90 |
| 02-03 | 0.26 | 0.13 | 0.09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.47 |
| 03-04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 12.45 | 0.81 | 0.13 | 0.08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.04 | 0.04 | |

PRESQUE ISLE DEEP WATER

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD

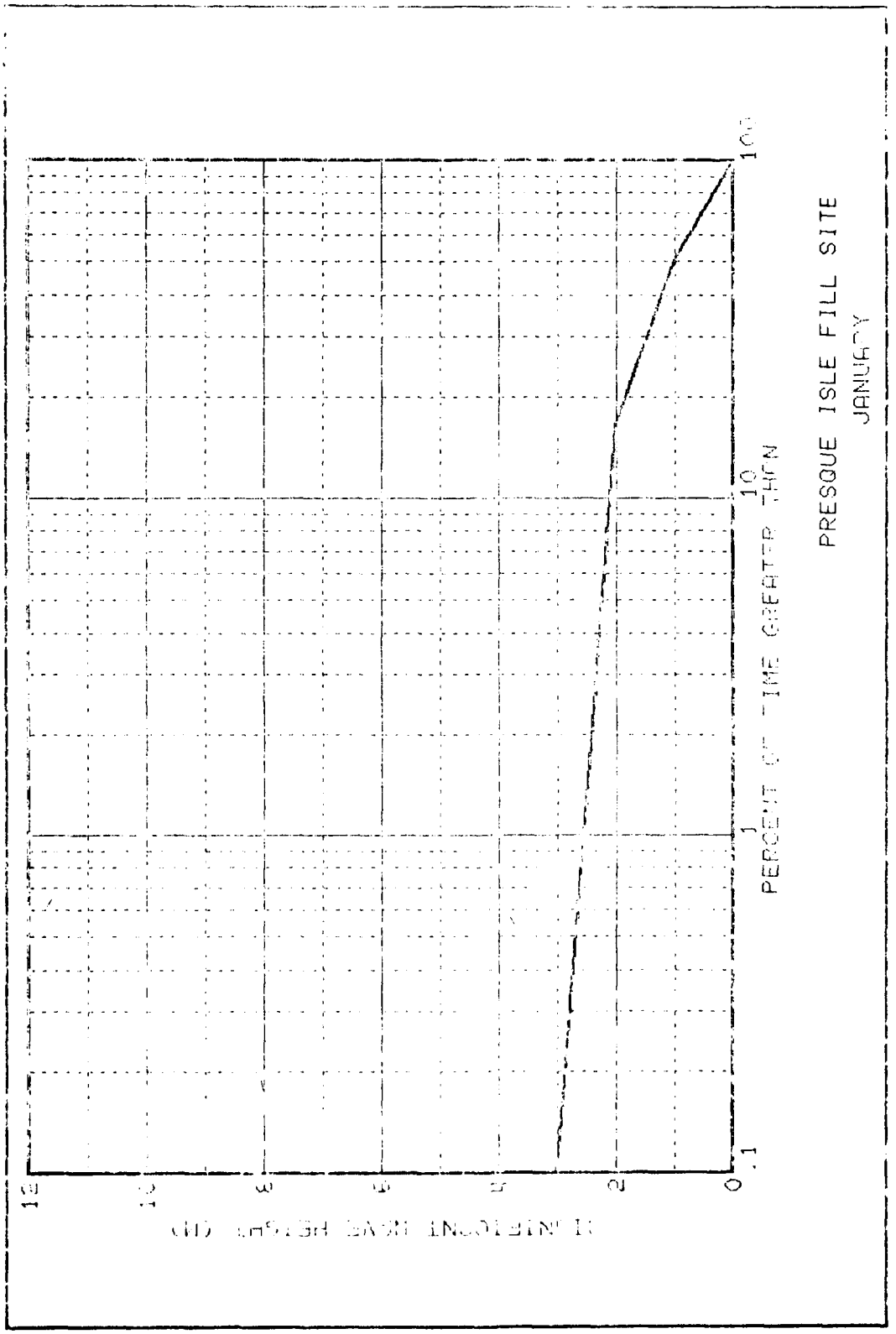
WAVE DIRECTION = 60

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 9.68 | 0.21 | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.04 | 9.97 |
| 01-02 | 6.22 | 0.50 | 0.26 | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 7.12 |
| 02-03 | 0.77 | 0.34 | 0.09 | 0.09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.29 |
| 03-04 | 0.09 | 0.09 | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.21 |
| 04-05 | 0.00 | 0.00 | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.04 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 16.75 | 1.24 | 0.47 | 0.13 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.04 | |

PRESQUE ISLE FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR JANUARY

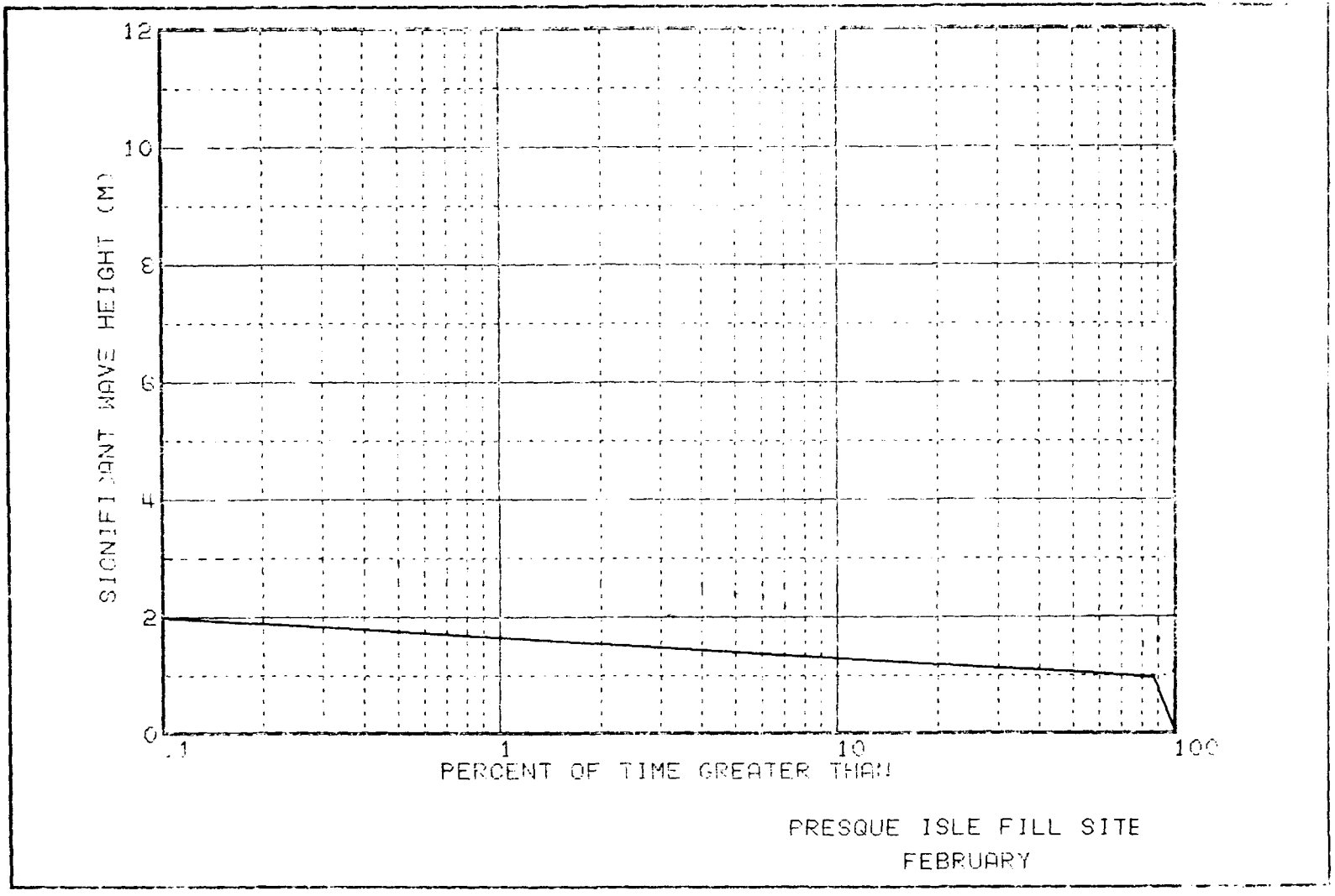
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 49.36 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 49.36 |
| 01-02 | 33.97 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 33.97 |
| 02-03 | 0.00 | 16.67 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 16.67 |
| 03-04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 83.33 | 16.67 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 100.00 |


PRESQUE ISLE FILL SITE
JANUARY
PERCENT OF TIME GREATER THAN
100
10
1
.1
0
1
2
3
4
5
6

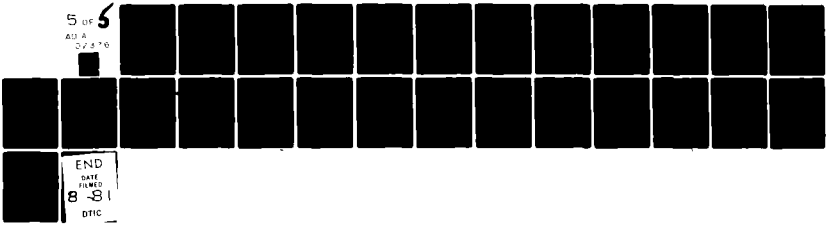
PRESQUE ISLE FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR FEBRUARY

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 01-02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 12.86 | 12.86 |
| 02-03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 87.14 | 87.14 |
| 03-04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 100.00 | |


SIGNIFICANT WAVE HEIGHT (M)
12
10
8
6
4
2
0
.1
1
10
100
PERCENT OF TIME GREATER THAN
PRESQUE ISLE FILL SITE
FEBRUARY

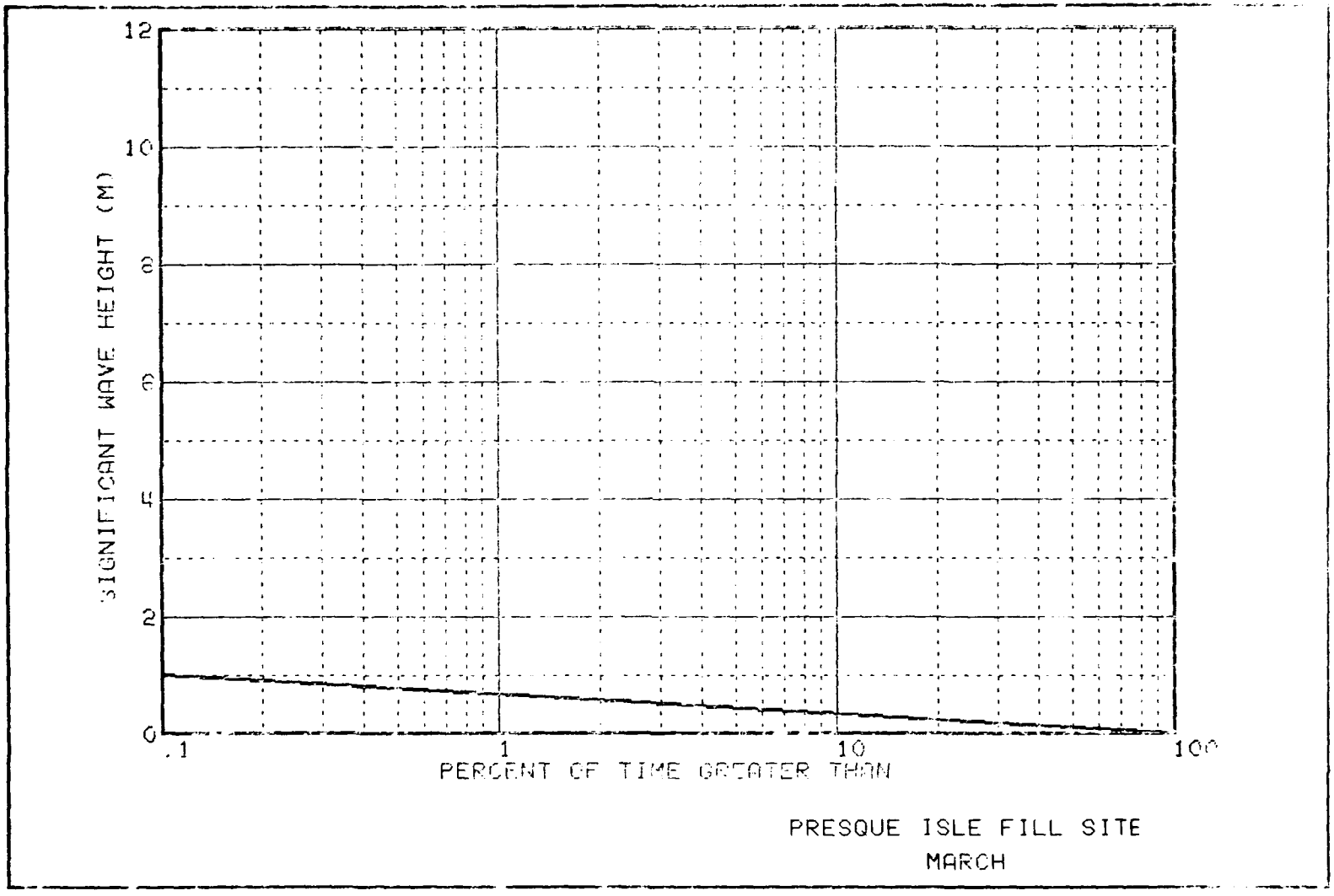
AD-A102 376 ARMY ENGINEER WATERWAYS EXPERIMENT STATION VICKSBURG MS F/G 8/3
BEACH NOURISHMENT TECHNIQUES. REPORT 4. WAVE CLIMATES FOR SELEC--ETC(U)
APR 81 D L DURHAM, L Z HALES, T W RICHARDSON
UNCLASSIFIED WES-TR-H-76-13-4-APP NL



PRESQUE ISLE FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR MARCH

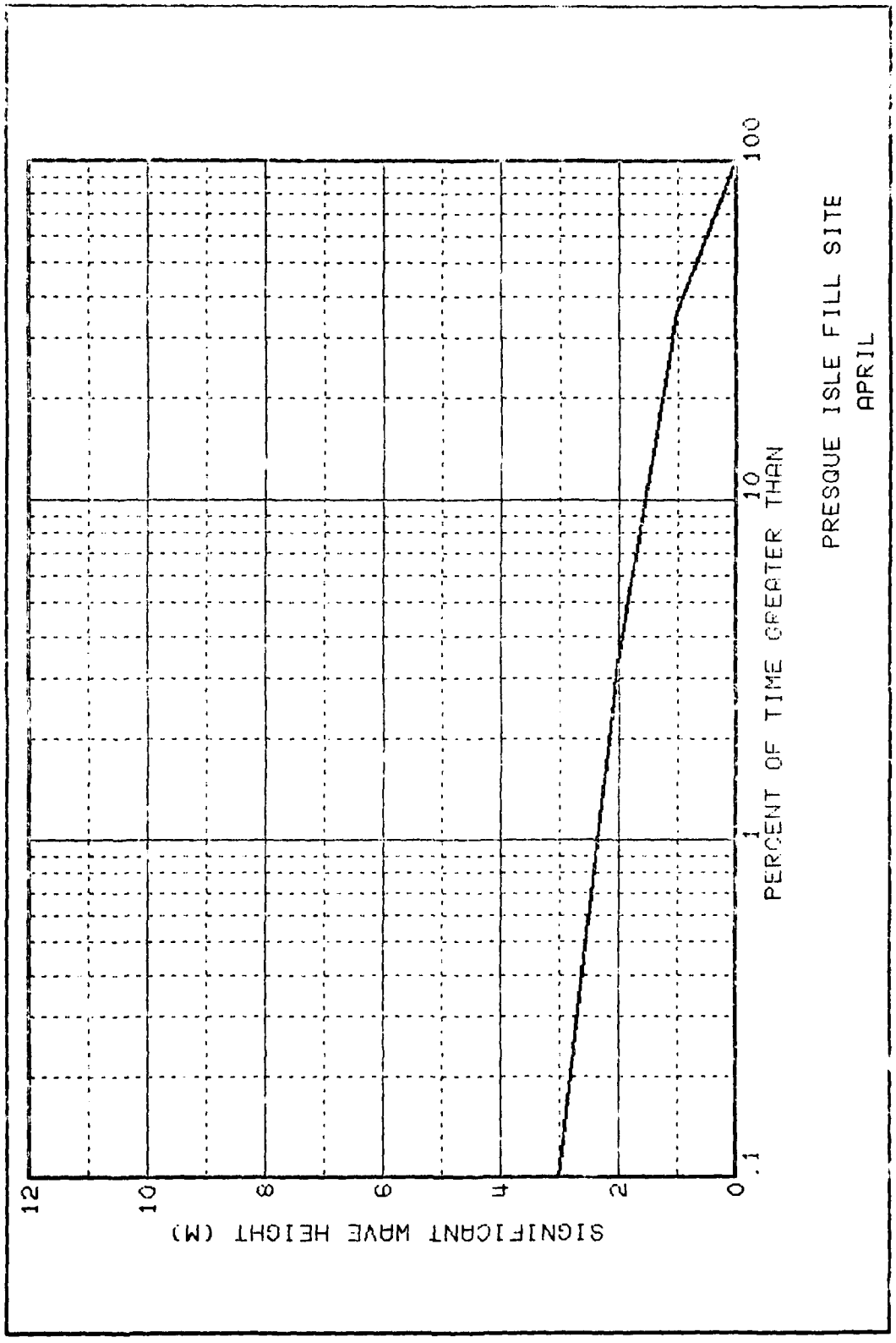
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 100.00 |
| 01-02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 02-03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 03-04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| TOTAL | 100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |


12
10
8
6
4
2
0
SIGNIFICANT WAVE HEIGHT (M)
.1
1
10
100
PERCENT OF TIME GREATER THAN
PRESQUE ISLE FILL SITE
MARCH

PRESQUE ISLE FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR APRIL

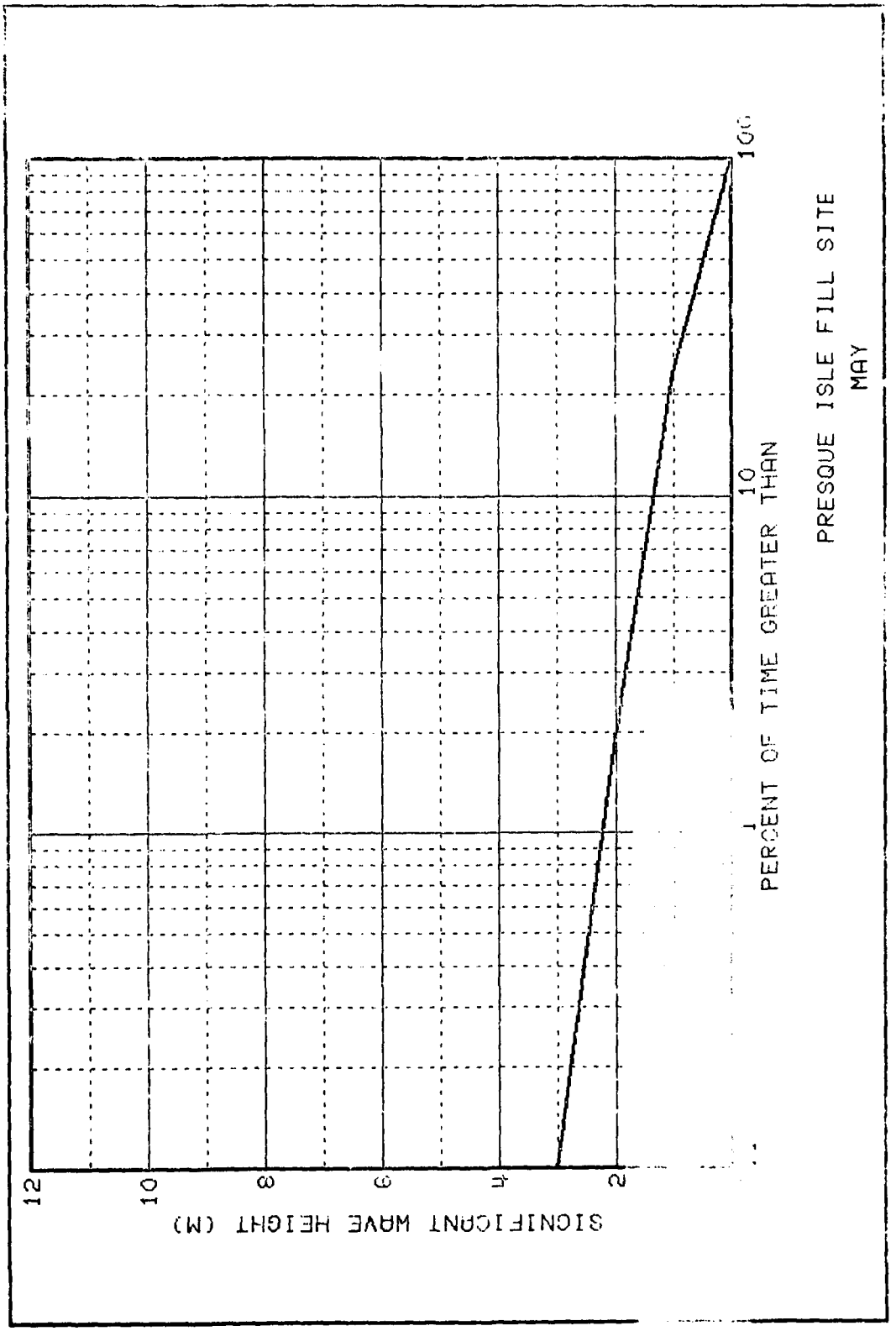
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 63.46 | 0.00 | 0.00 | 0.74 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 64.20 |
| 01-02 | 30.04 | 2.34 | 0.00 | 0.06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 32.44 |
| 02-03 | 3.32 | 0.05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3.36 |
| 03-04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 96.82 | 2.39 | 0.00 | 0.79 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 100.00 |


PRESQUE ISLE FILL SITE
APRIL
PERCENT OF TIME GREATER THAN
.1
1
10
100
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12

PRESQUE ISLE FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR MAY

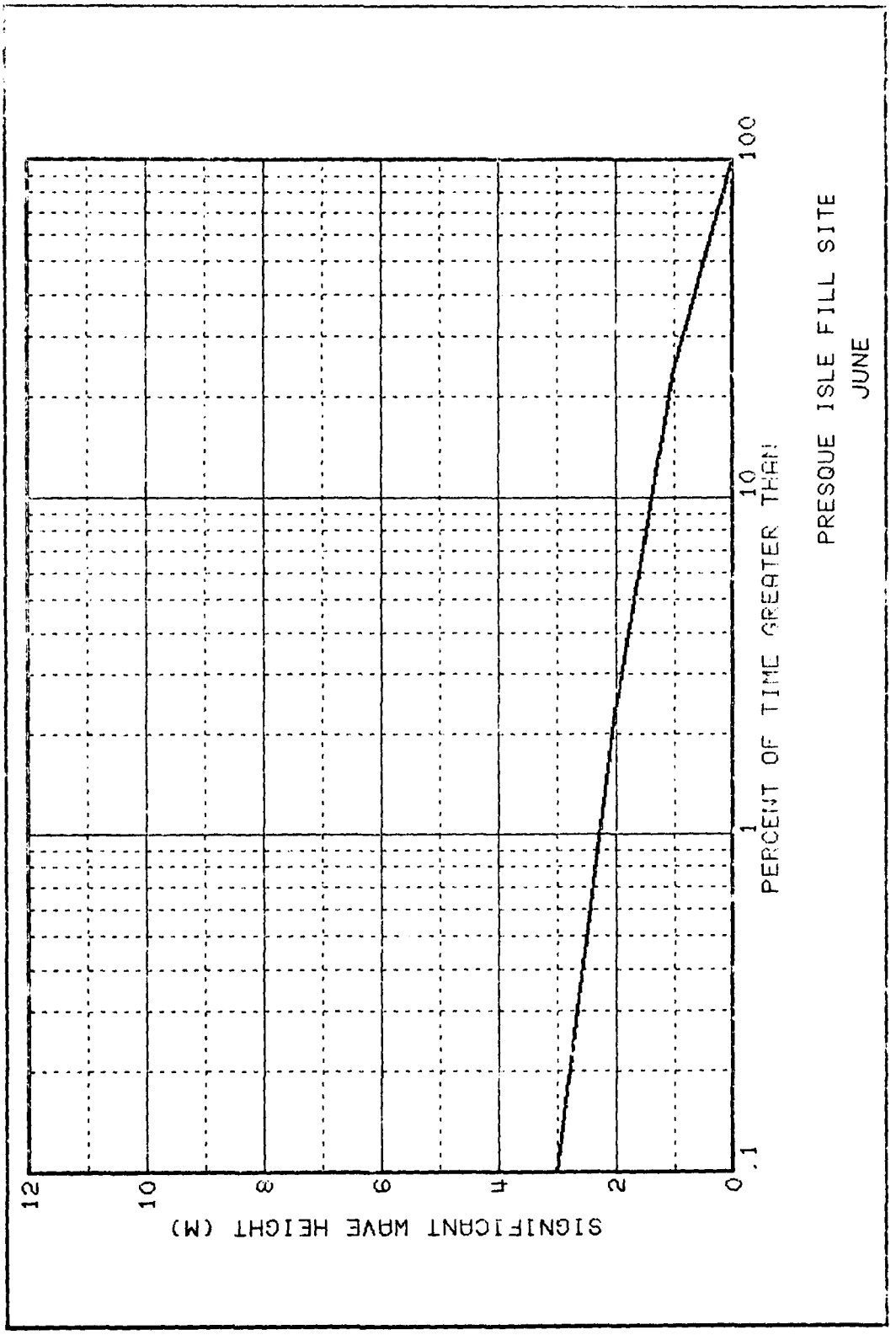
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 74.13 | 2.59 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 76.72 |
| 01-02 | 19.27 | 1.66 | 0.00 | 0.33 | 0.10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 21.35 |
| 02-03 | 0.47 | 0.94 | 0.00 | 0.14 | 0.37 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.92 |
| 03-04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 93.87 | 5.19 | 0.00 | 0.47 | 0.47 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |


PRESQUE ISLE FILL SITE
MAY
PERCENT OF TIME GREATER THAN
1
10
100
SIGNIFICANT WAVE HEIGHT (M)
2
4
6
8
10
12

PRESQUE ISLE FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR JUNE

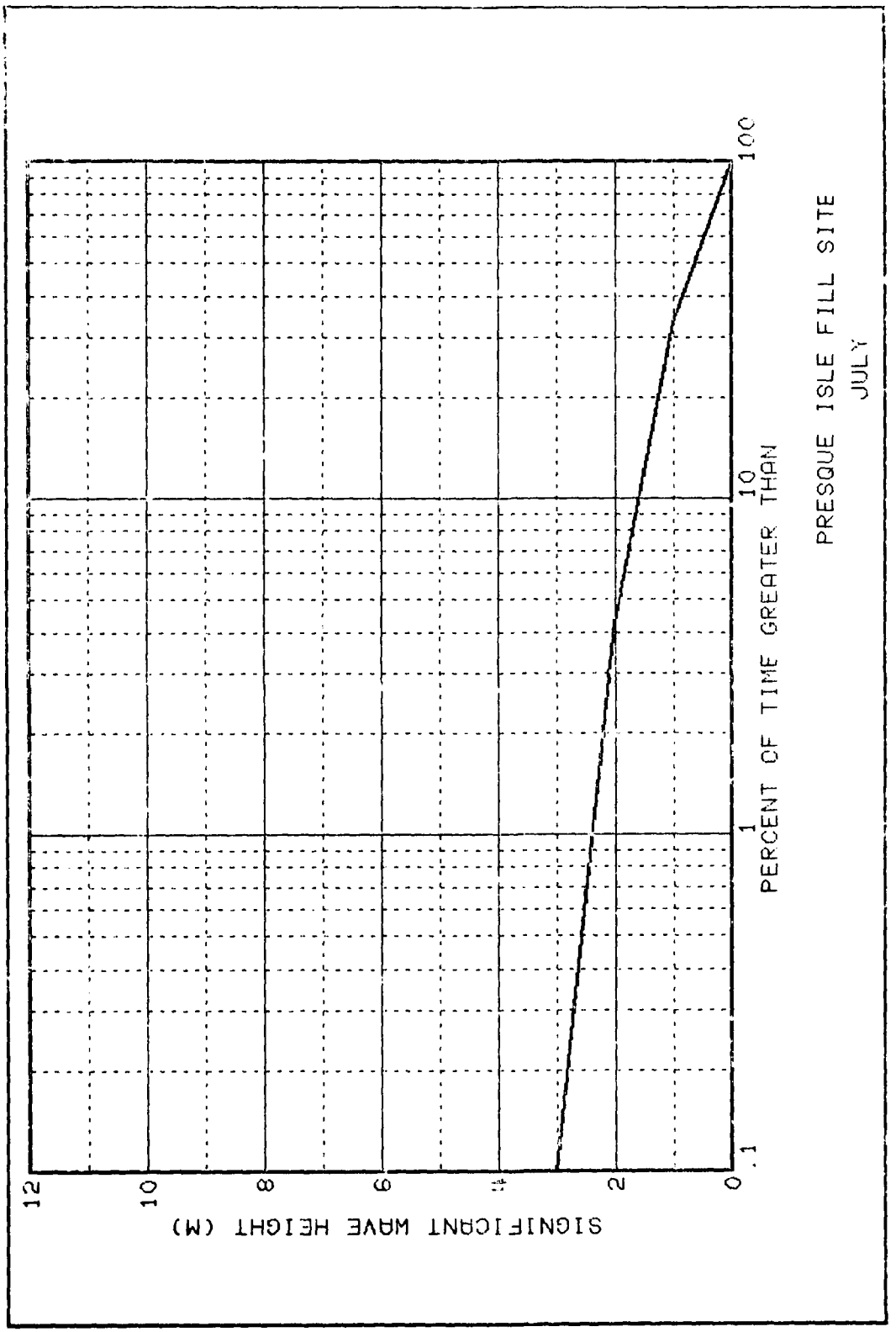
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 72.13 | 2.73 | 0.26 | 0.32 | 0.00 | 0.00 | 0.00 | 0.00 | 0.49 | 0.26 | 76.17 |
| 01-02 | 17.88 | 1.76 | 1.16 | 0.32 | 0.00 | 0.00 | 0.00 | 0.00 | 0.26 | 0.12 | 21.49 |
| 02-03 | 0.57 | 0.74 | 0.82 | 0.11 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2.24 |
| 03-04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 90.67 | 5.22 | 2.24 | 0.75 | 0.00 | 0.00 | 0.00 | 0.00 | 0.75 | 0.37 | |


PRESQUE ISLE FILL SITE
JUNE
PERCENT OF TIME GREATER THAN
.1
1
10
100
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12

PRESQUE ISLE FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR JULY

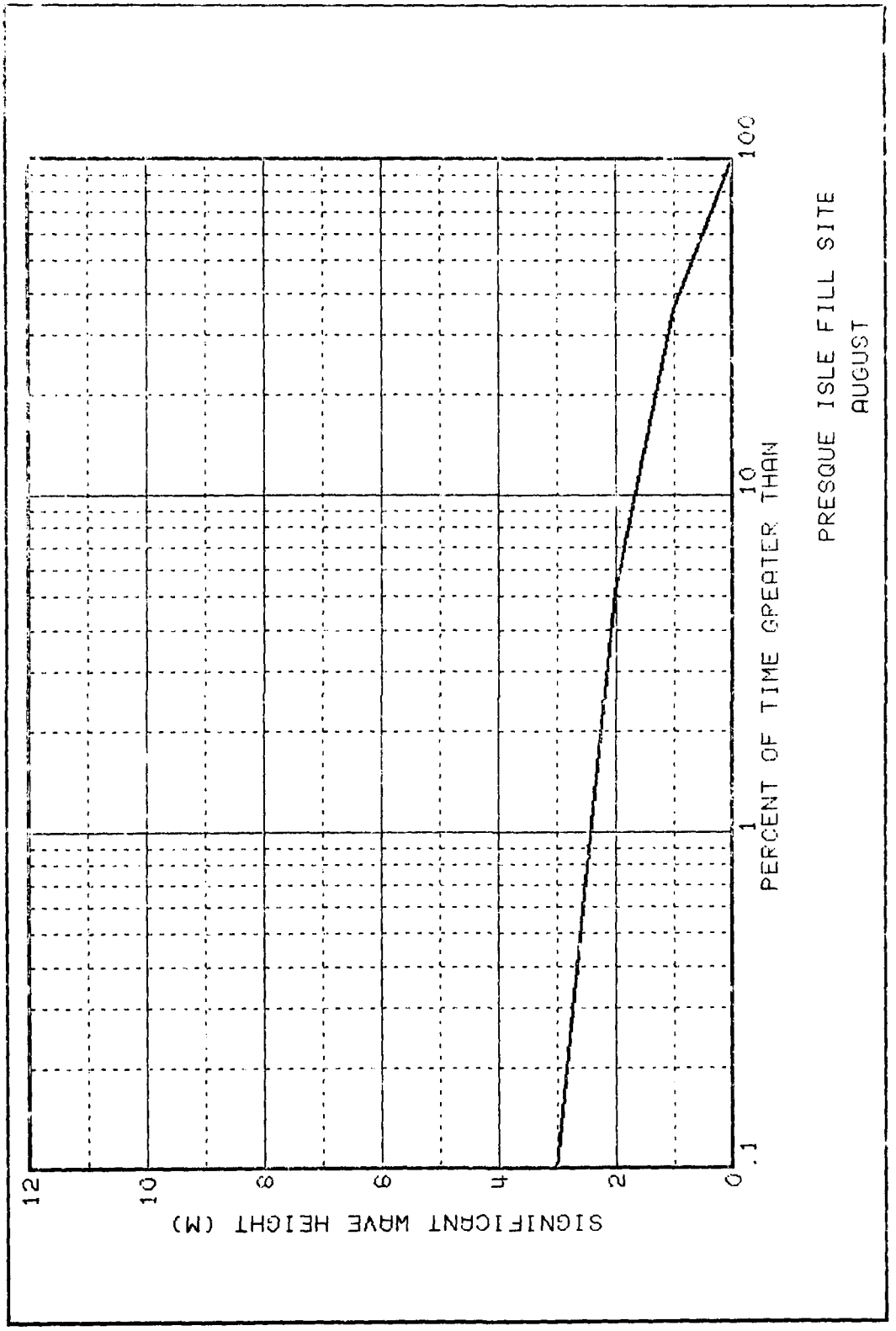
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 64.15 | 2.31 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.34 | 66.80 |
| 01-02 | 25.99 | 2.62 | 0.13 | 0.20 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 29.94 |
| 02-03 | 2.40 | 1.31 | 0.21 | 0.14 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 4.26 |
| 03-04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 92.54 | 6.44 | 0.34 | 0.34 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.34 | |


PRESQUE ISLE FILL SITE
JULY
PERCENT OF TIME GREATER THAN
.1
1
10
100
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12

PRESQUE ISLE FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR AUGUST

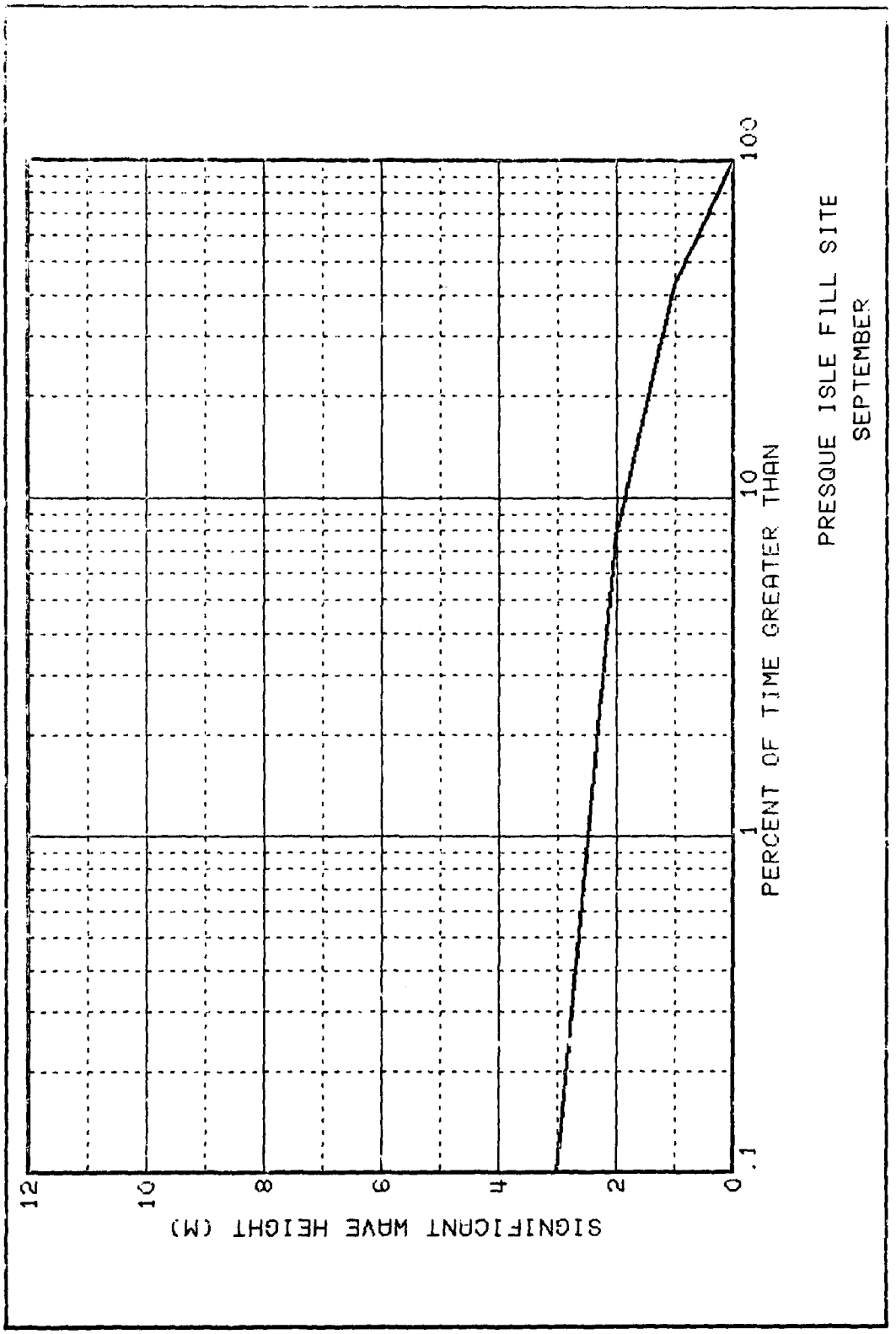
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 61.56 | 1.73 | 0.33 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.78 | 0.00 | 64.40 |
| 01-02 | 25.55 | 3.77 | 0.60 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.54 | 0.00 | 30.46 |
| 02-03 | 2.56 | 0.44 | 1.38 | 0.66 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 5.14 |
| 03-04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 89.77 | 5.94 | 2.31 | 0.66 | 0.00 | 0.00 | 0.00 | 0.00 | 1.32 | 0.00 | |


PRESQUE ISLE FILL SITE
AUGUST
PERCENT OF TIME GREATER THAN
.1
1
10
100
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12

PRESQUE ISLE FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR SEPTEMBER

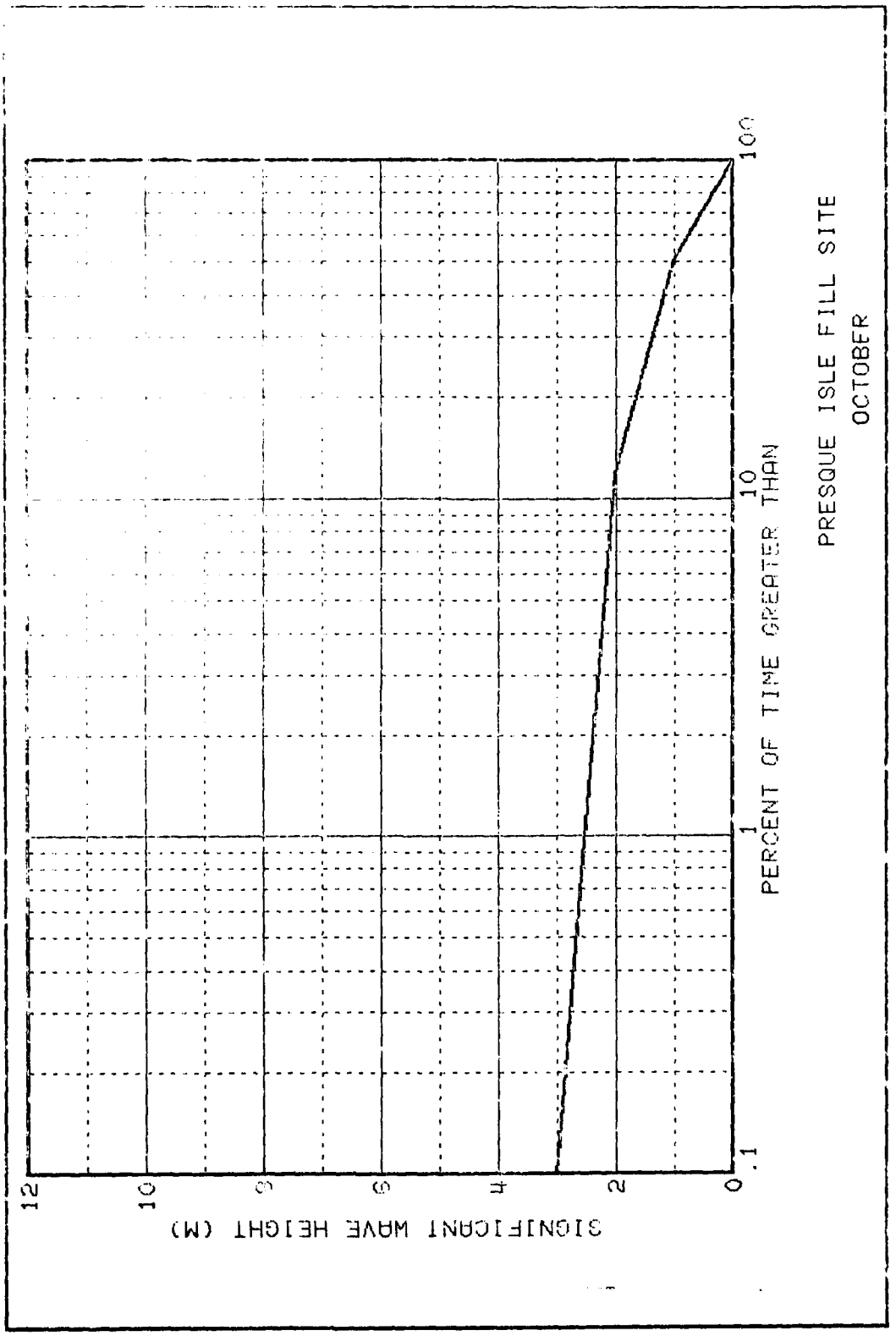
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 54.12 | 2.00 | 1.14 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 57.26 |
| 01-02 | 29.48 | 4.50 | 0.81 | 0.20 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 35.00 |
| 02-03 | 3.77 | 3.06 | 0.43 | 0.48 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 7.74 |
| 03-04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 87.37 | 9.56 | 2.38 | 0.68 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |


PRESQUE ISLE FILL SITE
SEPTEMBER
PERCENT OF TIME GREATER THAN
100
10
1
.1
SIGNIFICANT WAVE HEIGHT (M)
12
10
8
6
4
2
0

PRESQUE ISLE FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR OCTOBER

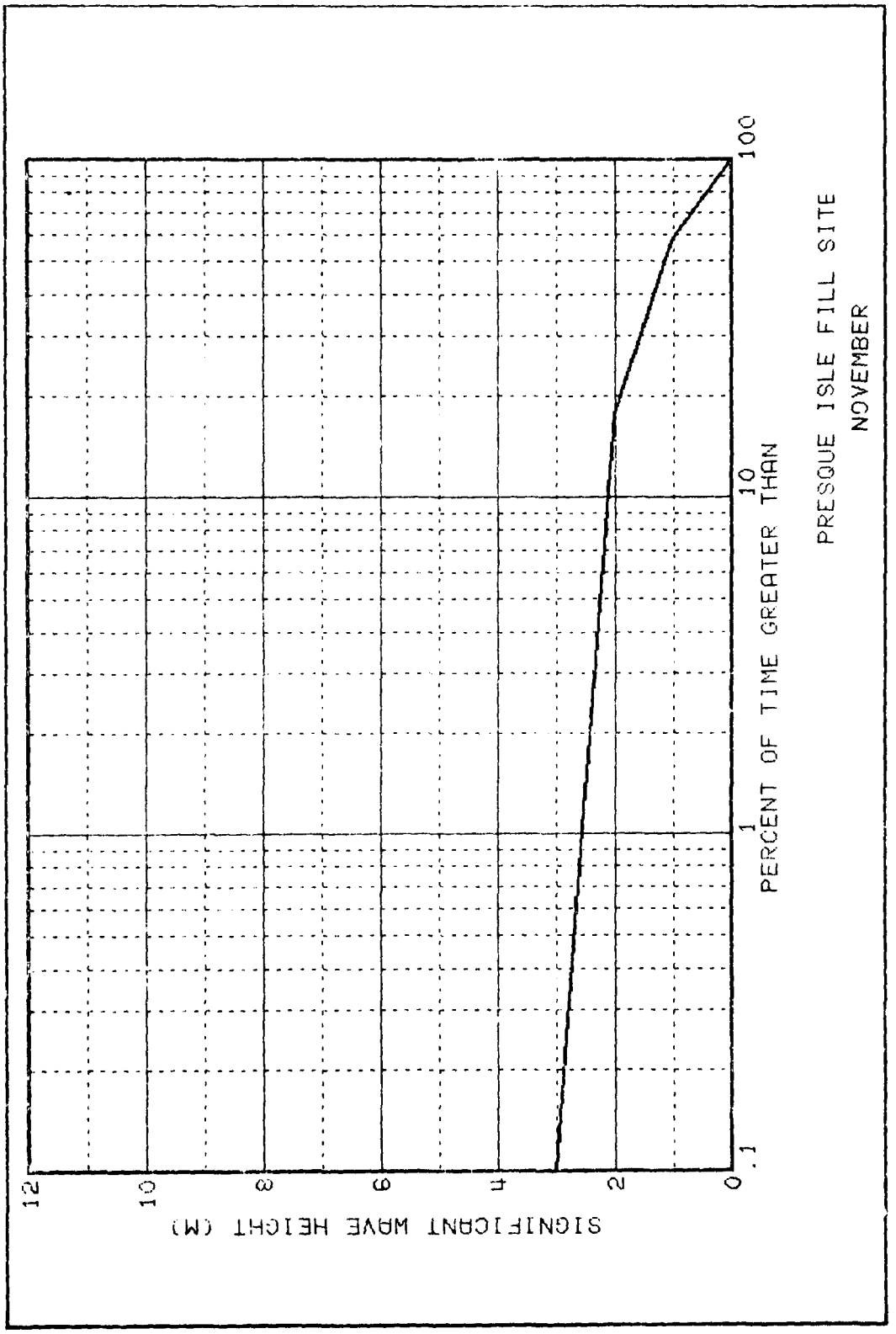
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 47.90 | 0.58 | 0.47 | 0.12 | 0.21 | 0.00 | 0.00 | 0.00 | 0.00 | 0.20 | 49.49 |
| 01-02 | 32.19 | 3.60 | 2.00 | 0.50 | 0.14 | 0.00 | 0.00 | 0.00 | 0.00 | 0.15 | 38.59 |
| 02-03 | 5.82 | 2.86 | 1.75 | 1.49 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 11.93 |
| 03-04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 85.92 | 7.04 | 4.23 | 2.11 | 0.35 | 0.00 | 0.00 | 0.00 | 0.00 | 0.35 | |


PRESQUE ISLE FILL SITE
OCTOBER
PERCENT OF TIME GREATER THAN
.1
1
10
100
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12

PRESQUE ISLE FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR NOVEMBER

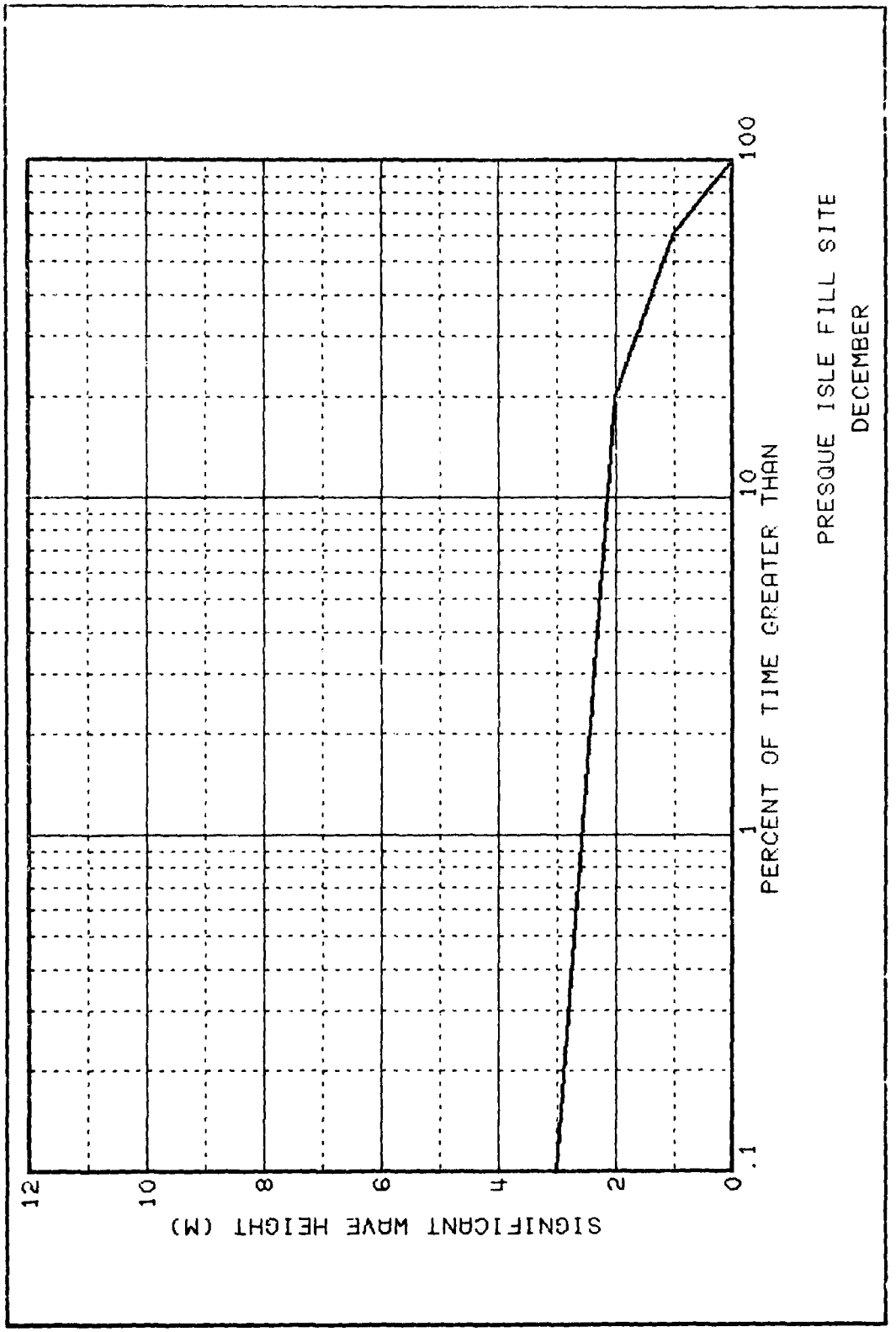
| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 40.45 | 0.98 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 41.43 |
| 01-02 | [illegible] | 4.09 | 0.58 | 0.14 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | [illegible] |
| 02-03 | [illegible] | 7.61 | [illegible] | [illegible] | [illegible] | [illegible] | 0.00 | 0.00 | 0.00 | [illegible] | [illegible] |
| 03-04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | [illegible] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | [illegible] | [illegible] |
| 06-07 | [illegible] | 0.00 | 0.00 | [illegible] | 0.00 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 07-08 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | |
| 08-09 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 09-10 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| TOTAL | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | |


PRESQUE ISLE FILL SITE
NOVEMBER
PERCENT OF TIME GREATER THAN
.1
1
10
100
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12

PRESQUE ISLE FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD FOR DECEMBER

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 38.38 | 1.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 39.38 |
| 01-02 | 36.52 | 3.35 | 0.25 | 0.47 | 0.32 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 40.71 |
| 02-03 | 0.78 | 7.30 | 1.73 | 0.20 | 0.35 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 10.31 |
| 03-04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 84.46 | 12.17 | 2.03 | 0.68 | 0.68 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |


PRESQUE ISLE FILL SITE
DECEMBER
PERCENT OF TIME GREATER THAN
.1
1
10
100
SIGNIFICANT WAVE HEIGHT (M)
0
2
4
6
8
10
12

PRESQUE ISLE FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD

WAVE DIRECTION = 270

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 11.13 | 0.07 | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 11.22 |
| 01-02 | 9.38 | 0.58 | 0.12 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 10.08 |
| 02-03 | 2.13 | 1.69 | 0.48 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 4.31 |
| 03-04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 22.64 | 2.34 | 0.64 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |

PRESQUE ISLE FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD

WAVE DIRECTION = 300

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 7.44 | 0.12 | 0.00 | 0.00 | 0.03 | 0.00 | 0.00 | 0.00 | 0.12 | 0.02 | 7.73 |
| 01-02 | 6.56 | 0.96 | 0.24 | 0.06 | 0.05 | 0.00 | 0.00 | 0.00 | 0.09 | 0.02 | 7.88 |
| 02-03 | 1.00 | 0.80 | 0.40 | 0.32 | 0.14 | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 | 2.80 |
| 03-04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 15.00 | 1.88 | 0.64 | 0.38 | 0.21 | 0.04 | 0.00 | 0.00 | 0.21 | 0.04 | |

PRESQUE ISLE FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD

WAVE DIRECTION = 330

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 6.74 | 0.21 | 0.07 | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 7.05 |
| 01-02 | 5.40 | 0.45 | 0.08 | 0.05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 5.19 |
| 02-03 | 0.27 | 0.20 | 0.14 | 0.16 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.07 | 0.85 |
| 03-04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 12.40 | 0.85 | 0.30 | 0.26 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.08 | |

PPRESQUE ISLE FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD

WAVE DIRECTION = 0

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 16.12 | 0.56 | 0.04 | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 | 0.03 | 16.81 |
| 01-02 | 5.33 | 0.78 | 0.00 | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 6.17 |
| 02-03 | 0.16 | 0.20 | 0.09 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.46 |
| 03-04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 21.61 | 1.54 | 0.13 | 0.08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.04 | 0.04 | |

PRESQUE ISLE FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD

WAVE DIRECTION = 30

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 15.19 | 0.66 | 0.13 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.04 | 15.04 |
| 01-02 | 1.54 | 0.53 | 0.23 | 0.09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2.30 |
| 02-03 | 0.02 | 0.04 | 0.11 | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.20 |
| 03-04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 16.75 | 1.24 | 0.47 | 0.13 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.04 | |

PRESQUE ISLE FILL SITE

CUMULATIVE SEA / SWELL FREQUENCIES OF WAVE HEIGHT AND PERIOD

WAVE DIRECTION = 60

| HEIGHT (M) | PERIOD (SEC) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | >22 | |
| 00-01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 01-02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 02-03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 03-04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 04-05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 05-06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 06-07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07-08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 08-09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 09-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |

In accordance with letter from DAEN-RDC, DAEN-ASI dated 22 July 1977, Subject: Facsimile Catalog Cards for Laboratory Technical Publications, a facsimile catalog card in Library of Congress MARC format is reproduced below.

Durham, Donald L.
Beach nourishment techniques : Report 4 : Wave climates for selected U.S. Offshore Beach Nourishment Projects : Appendixes A-K / by Donald L. Durham, Lyndell Z. Hales, Thomas W. Richardson (Hydraulics Laboratory, U.S. Army Engineer Waterways Experiment Station.) -- Vicksburg, Miss. : The Station, 1981.
407 p. in various pagings : ill. ; 27 cm. -- (Technical report / U.S. Army Engineer Waterways Experiment Station ; H-76-13, Report 4, App. A-K.)
Cover title.
"April 1971."
"Prepared for Office, Chief of Engineers, U.S. Army."

1. Beach erosion. 2. Dredging. 3. Water waves. I. Hales, Lyndell S. II. Richardson, Thomas W. III. United States. Army. Corps of Engineers. Office of the Chief of Engineers. IV. United States. Army

Durham, Donald L.
Beach nourishment techniques : Report 4: App. A-K : ... 1981.
(Card 2)

Engineer Waterways Experiment Station. Hydraulics Laboratory. V. Title VI. Series: Technical report (United States. Army Engineer Waterways Experiment Station) ; H-76-13, Report 4, App. A-K.
TA7.W34 no.H-76-13 Report 4 App. A-K