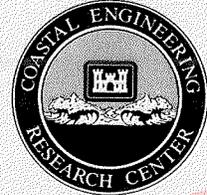




Coastal Engineering Technical Note



COMPUTER PROGRAM: TIDEHT (MACE-2)

PURPOSE: The program TIDEHT estimates the elevation of the water surface at any time or the time at increments of elevation based on the predictions of the National Oceanic and Atmospheric Administration (NOAA) "Tide Tables."

PROGRAM CAPABILITY: This program is written in Microsoft BASIC and produces a tabular printout of time and tidal elevation (feet and meters) for specific days of interest with a graphics option. The calculations are based upon the assumption of a sinusoidal variation between high water and low water elevations and times predicted by NOAA in the "Tide Tables" or vice versa. Corrections for both the time and height at subordinate stations can be incorporated by TIDEHT. The resulting predicted tidal elevations can be presented at 15-, 20-, 30-, or 60-minute intervals. The user can also select any height interval and display the associated time.

PROGRAM APPLICATION: This program is applicable to both reference stations and subordinate stations under calm weather conditions. The predicted tidal elevations do not account for storm surge, wave setup, localized hydraulic effects or other nonastronomical influences, and significant variations between predicted and measured tides are common. Particular care should be used in applying these predicted elevations in tidal current studies where the tidal elevation curve is critical. Users should consult the references listed at the end of this CETN for technical explanation of tides and related coastal phenomena.

PROGRAM AVAILABILITY: TIDEHT is available for the IBM PC on a 5-1/4-in. diskette or as a printed program listing and may be obtained from Ms. Gloria J. Naylor at (601) 634-2581 (FTS 542-2581), Engineering Computer Programs Library Section, Technical Information Center, U.S. Army Engineer Waterways Experiment Station, P.O. Box 631, Vicksburg, Mississippi 39180-0631. Questions concerning the application of TIDEHT can be directed to Mr. Doyle L. Jones at (601) 634-2069 (FTS 542-2069) of the Coastal Engineering Research Center's Coastal Design Branch.

INPUT:

1. Predicted time and elevation (feet or meters) for high and low water at an appropriate reference station.
2. High and low water time differences for the subordinate station of interest.
3. High and low water elevation differences (feet or meters) for the subordinate station of interest.
4. Time interval at which predicted elevations are desired. (Optional)
5. Height interval (feet or meters) at which predicted times are desired. (Optional)
6. Type of graphics, i.e., Hercules, medium resolution, high resolution (optional).

OUTPUT: A table of predicted tidal elevations at regular intervals of time over specified periods and/or graphics display (optional).

SAMPLE PROBLEM:

RUN
APPROXIMATE HEIGHT OF TIDE
AT ANY TIME
VERSION 9-86

OUTPUT TO:
1 - PRINTER
2 - SCREEN
3 - DATA FILE

SELECT 1, 2, OR 3 ? 2
INPUT HEIGHTS CAN BE IN EITHER FEET OR METERS
OUTPUT HEIGHTS ARE IN BOTH FEET AND METERS

NOTE: INPUT OF EQUIVILANT DATA IN FEET AND METERS MAY
RESULT IN MINOR DISCREPANCIES DUE TO ROUNDING OFF.

PRESS ANY KEY TO CONTINUE

DO YOU NEED INSTRUCTIONS (Y OR N) ? N

DO YOU WISH TO SEE AN EXAMPLE (Y OR N) ? N

PRESS ANY KEY TO CONTINUE

HOW MANY SETS OF TIME AND HEIGHT MEASUREMENTS
FOR HIGH AND LOW WATER ? 11

FEET (F) OR METERS (M) ? F

1 TIME AND HEIGHT ? 513,1.8
2 TIME AND HEIGHT ? 1159,.2
3 TIME AND HEIGHT ? 1709,1
4 TIME AND HEIGHT ? 2256,-.1
5 TIME AND HEIGHT ? 604,1.9
6 TIME AND HEIGHT ? 1254,.2
7 TIME AND HEIGHT ? 1800,.9
8 TIME AND HEIGHT ? 2345,-.1
9 TIME AND HEIGHT ? 653,2
10 TIME AND HEIGHT ? 1350,.2
11 TIME AND HEIGHT ? 1855,.9

	TIME	HEIGHT
1 -	513	1.8
2 -	1159	.2
3 -	1709	1
4 -	2256	-.1
5 -	604	1.9
6 -	1254	.2
7 -	1800	.9
8 -	2345	-.1
9 -	653	2
10 -	1350	.2
11 -	1855	.9

ENTER 0 IF ALL VALUES ARE CORRECT, OTHERWISE ENTER A NUMBER BETWEEN 1 AND 11

ENTER A NUMBER ? 0

LOCATION CHESTER RIVER, QUEENSTOWN, MD

DATE(S) 1-3 JUNE 1985

IS THIS A PRIMARY STATION (Y OR N) ? N

HIGH WATER TIME CORRECTION ? -4

LOW WATER TIME CORRECTION ? -14

HEIGHT DIFFERENCE(H), HEIGHT RATIO(R), OR HEIGHT RATIO AND DIFFERENCE(B).
ENTER H,R, OR B ? H

HIGH WATER HEIGHT CORRECTION ? .2

LOW WATER HEIGHT CORRECTION ? 0

INTERVALS OF TIME (T) OR INCREMENTS IN TIDE HEIGHT (H)? T

TIME INTERVAL (15,20,30 OR 60 MIN) ? 30

1 - UNITS = FEET
2 - LOCATION = CHESTER RIVER, QUEENSTOWN, MD
3 - DATES(S) = 1-3 JUNE 1985
4 - HIGH WATER TIME CORRECTION = -4
5 - LOW WATER TIME CORRECTION = -14
6 - HIGH WATER RATIO = 0
7 - LOW WATER RATIO = 0
8 - HIGH WATER HEIGHT CORRECTION = .2
9 - LOW WATER HEIGHT CORRECTION = 0
10 - INTERVAL OF TIME(T) OR INCREMENT IN TIDE HEIGHT (H) = T
11 - TIME INTERVAL = 30

IF ALL DATA IS CORRECT ENTER 0, OTHERWISE ENTER AN INTEGER BETWEEN 1 AND 11 TO INDICATE THE INCORRECT DATA

ENTER A NUMBER ? 0

TIDE WATER SURFACE ELEVATIONS

CHESTER RIVER, QUEENSTOWN, MD
1-3 JUNE 1985

TIME HEIGHT(FT) HEIGHT(M)

0509 2.00 0.61
0530 1.99 0.61
0600 1.93 0.59
0630 1.82 0.55
0700 1.67 0.51
0730 1.49 0.46
0800 1.29 0.39
0830 1.08 0.33
0900 0.87 0.26
0930 0.67 0.20
1000 0.49 0.15
1030 0.35 0.11
1100 0.26 0.08

PRESS ANY KEY TO CONTINUE

1130 0.21 0.06
1145 0.20 0.06
1200 0.21 0.06

. . .
. . .
. . .
. . .
. . .

PRESS ANY KEY TO CONTINUE

PLOT TIDE HEIGHTS ON A GRAPH (Y OR N) ? Y

HOW MANY DAYS ? 3

ENTER NUMBER OF DAY 1 ? 1

ENTER NUMBER OF DAY 2 ? 12

ENTER NUMBER OF DAY 3 ? 3

ENTER NUMBER OF MONTH OF DAY 1 ? 6

ENTER NUMBER OF MONTH OF DAY 2 ? 6

ENTER NUMBER OF MONTH OF DAY 3 ? 6

YOU CAN CREATE THE GRAPH IN ONE OF THE FOLLOWING GRAPHICS MODES:

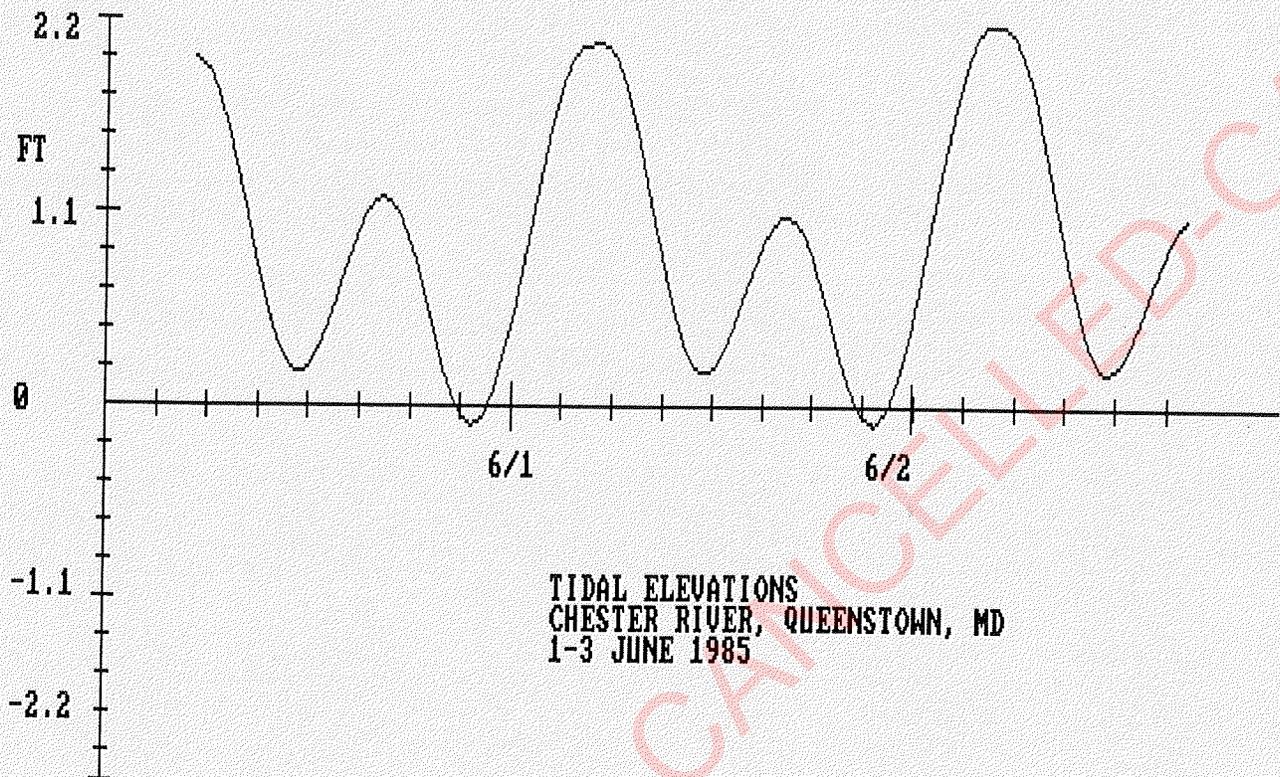
- 1 - HERCULES GRAPHICS (monochrome 720 x 348)
- 2 - HIGH RESOLUTION (640 x 200)

ENTER THE NUMBER (1 OR 2) FOR THE GRAPHICS MODE.? 2

***** NOTICE *****

AFTER GRAPH HAS BEEN DRAWN, UPON PRESSING ANY KEY
GRAPH WILL REMAIN ON SCREEN FOR APP. 2 MINUTES TO
ALLOW USER TO GET A HARD COPY.

PRESS ANY KEY TO CONTINUE



REFERENCES:

Defant, A. 1961. Physical Oceanography, Vol. 2, Pergamon Press, Elmsford, New York.

Harris, D. L. 1961. "Tides and Tidal Datums in the United States," CERC Special Report No. 7, U.S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi.

Ippen, A. T. 1966. Estuary and Coastline Hydrodynamics, McGraw-Hill, Inc., New York.

National Oceanic and Atmospheric Administration. 1984. "Tide Tables, 1985, High and Low Water Predictions," National Ocean Service, Rockville, Maryland.

Shore Protection Manual. 1984. 4th ed., 2 vols, US Army Engineer Waterways Experiment Station, Coastal Engineering Research Center, US Government Printing Office, Washington, D.C.