NOS Oceanographic Circulatory Survey Report No. 1

Tide and Tidal Current Observations from 1965 through 1967 in Long Island Sound, Block Island Sound, and Tributaries

Rockville, Md.
January 1978

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Ocean Service

NOS Oceanographic Survey Reports

This series of reports presents information on circulation surveys by the National Ocean Service. Normal activity includes measurements of water flow (currents), tides, temperature, salinity, and occasionally other parameters needed for understanding the physical processes. These surveys are made primarily for the Nation's navigational waterways; however, data are also obtained to describe the circulation patterns of estuaries and harbors.

These reports offer information on sampling locations, measurement techniques, processing and analysis routines, data formats, and general information on the survey area. They do not present technical interpretations of hydrodynamics of the areas.

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Juanita M. Kreps, Secretary
National Oceanic and Atmospheric Administration
Richard A. Frank, Administrator
National Ocean Survey
Allen L. Powell, Director

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TIDE AND TIDAL CURRENT OBSERVATIONS FROM 1965 THROUGH 1967 IN LONG ISLAND SOUND, BLOCK ISLAND SOUND, AND TRIBUTARIES

Elmo E. Long
Oceanographic Division
National Ocean Survey
National Oceanic and Atmospheric Administration
Rockville, Maryland

ABSTRACT. During the period between May 1965 and September 1967, an extensive tidal current survey was made in Block Island Sound, Fisher Island Sound, Long Island Sound, and their major tributaries. The study was carried out by the Coast and Geodetic Survey, now known as the National Ocean Survey. The report includes tables listing the findings in detail, graphs, and maps of the areas with the 163 selected sites specified. The investigative methodology is discussed, and the equipment for data gathering is described.

1.0 INTRODUCTION

Between May 1965 and September 1967, the Coast and Geodetic Survey (C&GS), now known as the National Ocean Survey (NOS), made an extensive tidal current survey of Block Island Sound, Fisher Island Sound, Long Island Sound, and their major tributaries to update previous tidal current data going back to 1929. The survey extended from Point Judith, R.I., in Block Island Sound to Throgs Neck, N.Y., in Long Island Sound. The main purpose of this survey was the observation of tidal currents, although several permanent stations already existed for the measurement of tide height. Several temporary stations also were installed. The Office of Hydrography and Oceanography, Marine Data Division of C&GS, provided the planning, processing, analyses, and dissemination of the collected data. The C&GS Engineering Division provided the instrumentation and systems design to accomplish the objective.

The observations were collected by use of the U.S. C&GS Ship MARMER whose home port was the Atlantic Marine Center, Norfolk, V.

2.0 TIDAL CURRENT OBSERVATIONS

Beginning May 1965 and ending September 1967, 163 sites were observed for speed and direction of the tidal current. The locations of the tidal current stations are shown in figures 1 to 5. The instruments described below were used for the observations.

The Roberts Radio Current Meter uses radiotelemetry and a chronograph waxed tape output with manual tape scaling for data recovery (fig. 6). The Geodyne Photographic Current Meter uses photographic light pipes to record information on film with data recovery from a scanner-decoder (fig. 7). The Tidal Current Survey System Mark I (TICUS-I) uses telemetry and Flexowriter paper-tape output, with computer processing necessary to obtain average sampling values (fig. 8). Table 1 outlines manufacturers' specifications for these instruments.

The observational processing and analysis information is described in table 2. The method of referring a subordinate station to a primary or control station is illustrated in table 3. Several subordinate stations exhibited double phases of flood or ebb current; these stations are listed in table 4. Site 48 at The Race, Long Island Sound, and site 154 at Throgs Neck, N.Y., were chosen as control stations. Yearly prediction of these sites will be published in the NOS publication "Tidal Current Tables, Atlantic Coast of North America." Harmonic constants derived for selected sites are discussed and tabulated in Appendix I.

Tidal current observations obtained with the Roberts Radio Current Meter were limited to about 100 hours. Observations made with the other systems were usually for periods of 15 to 29 days. (For data and other information not given here, see Appendixes II, III, and IV.)

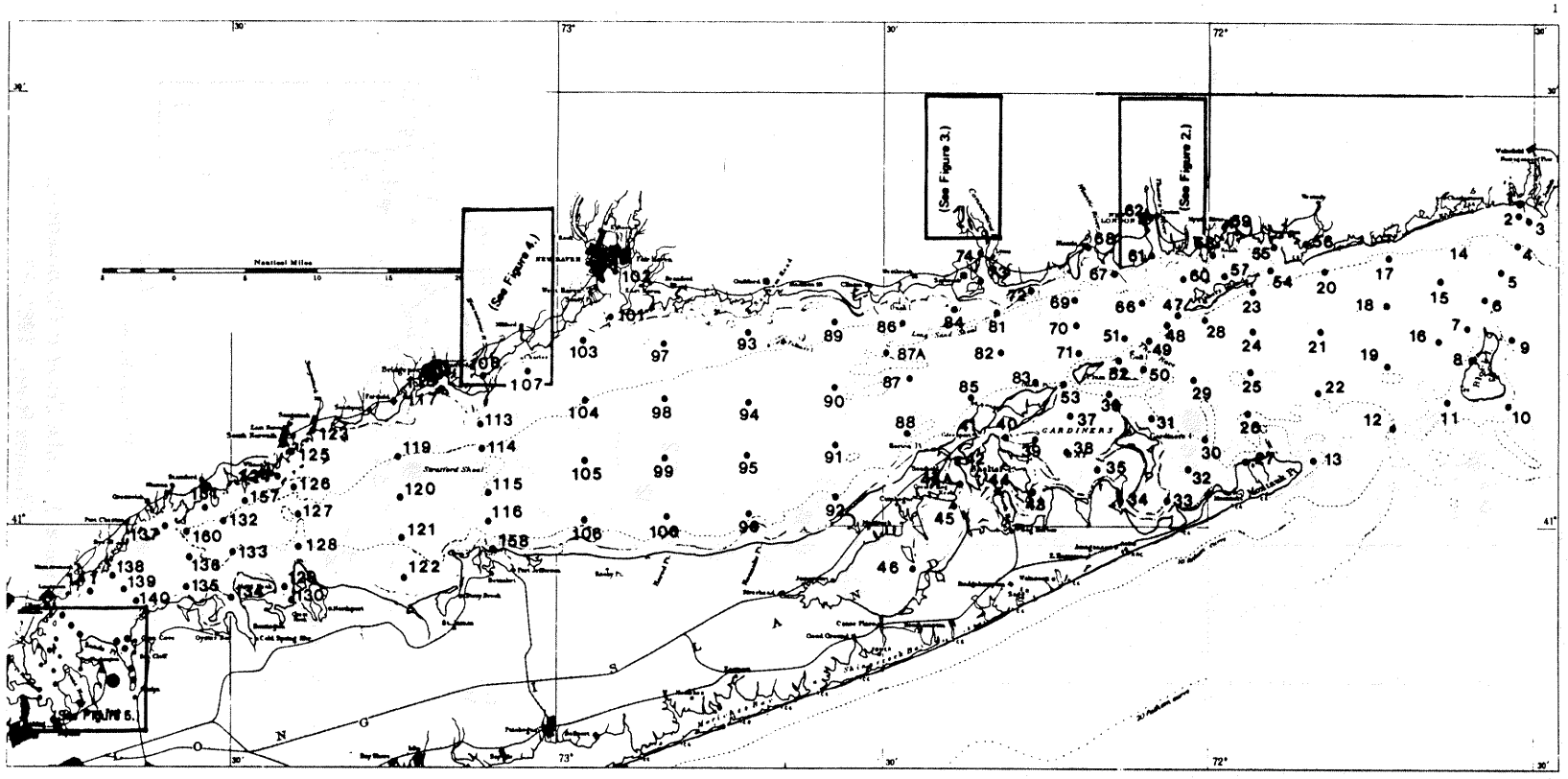

Figure 1.—Tidal Current Observations, 1965-67

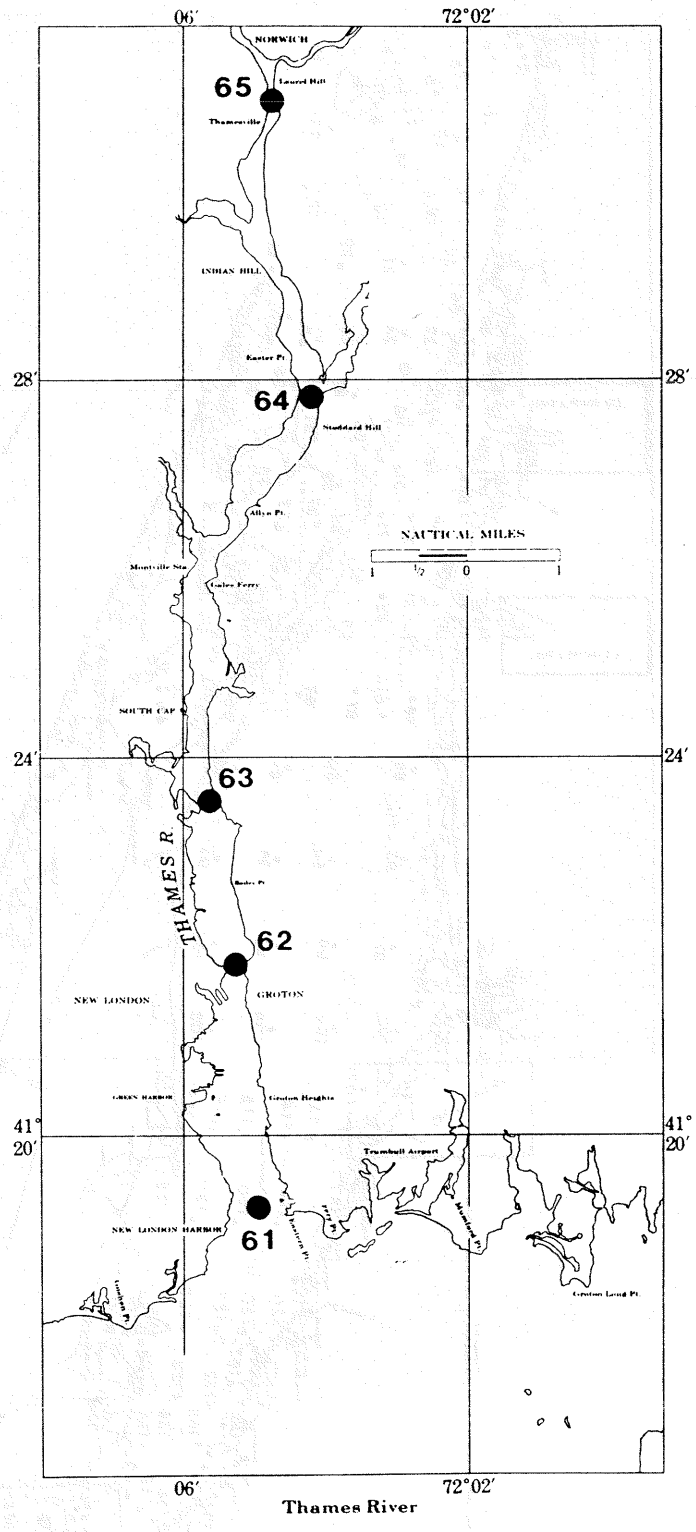

Figure 2.—Tidal Current Observations, Thomas River, 1965-67

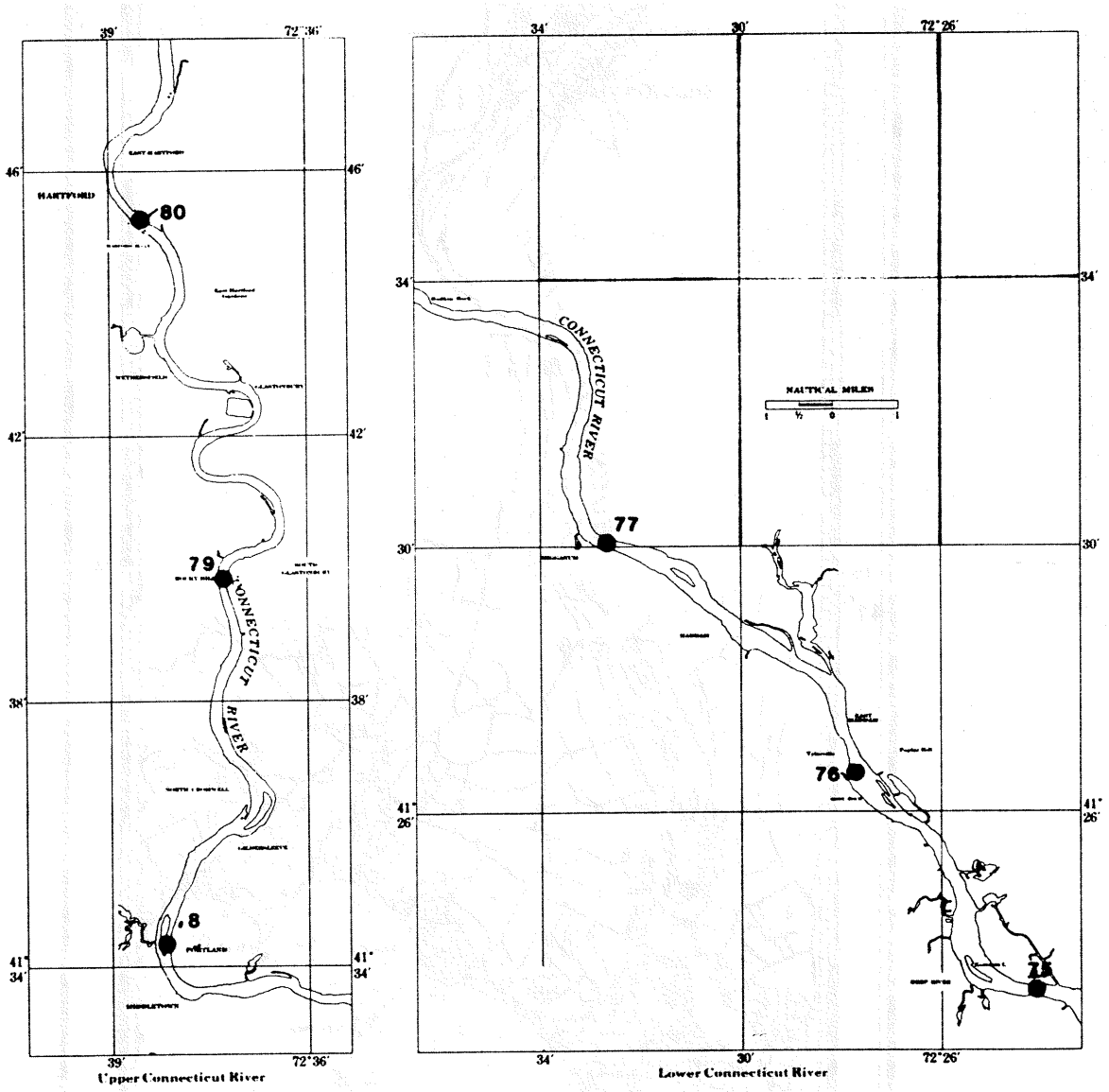

Figure 3.—Tidal Current Observations, Connecticut River, 1965-67

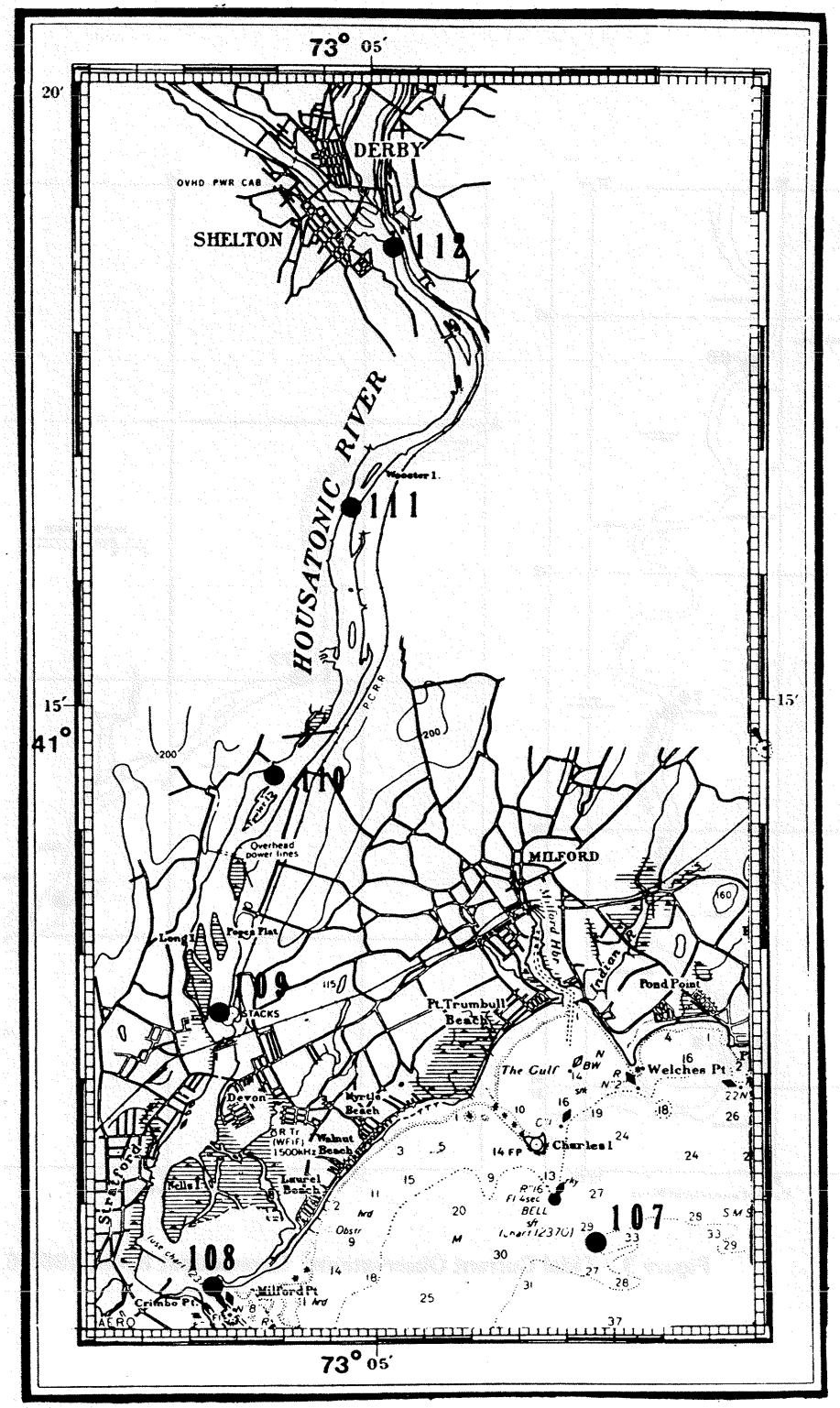

Figure 4.—Tidal Current Observations, Housatonic River, 1965-67

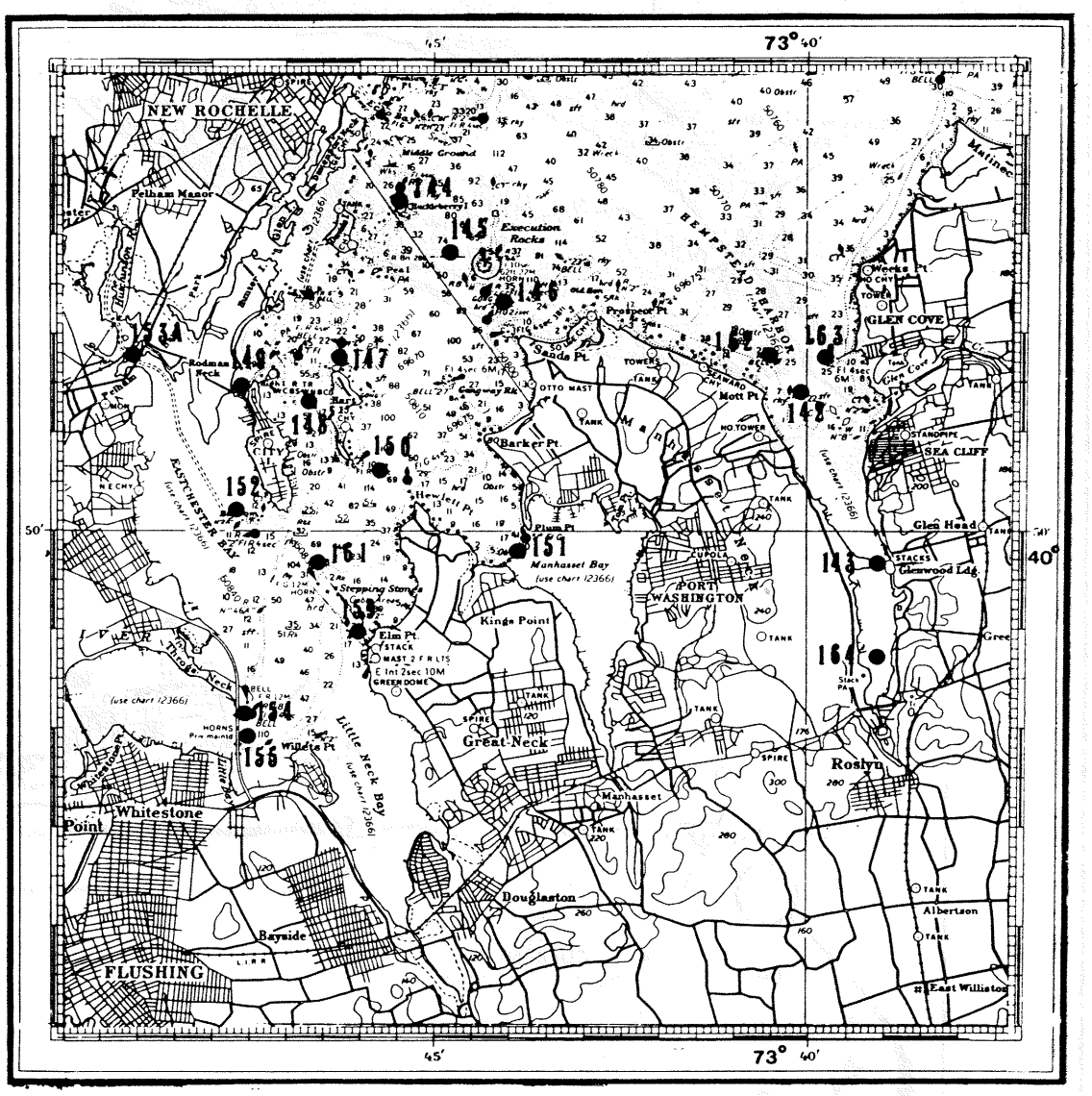

Figure 5.—Tidal Current Observations, West Long Island Sound, 1965-67

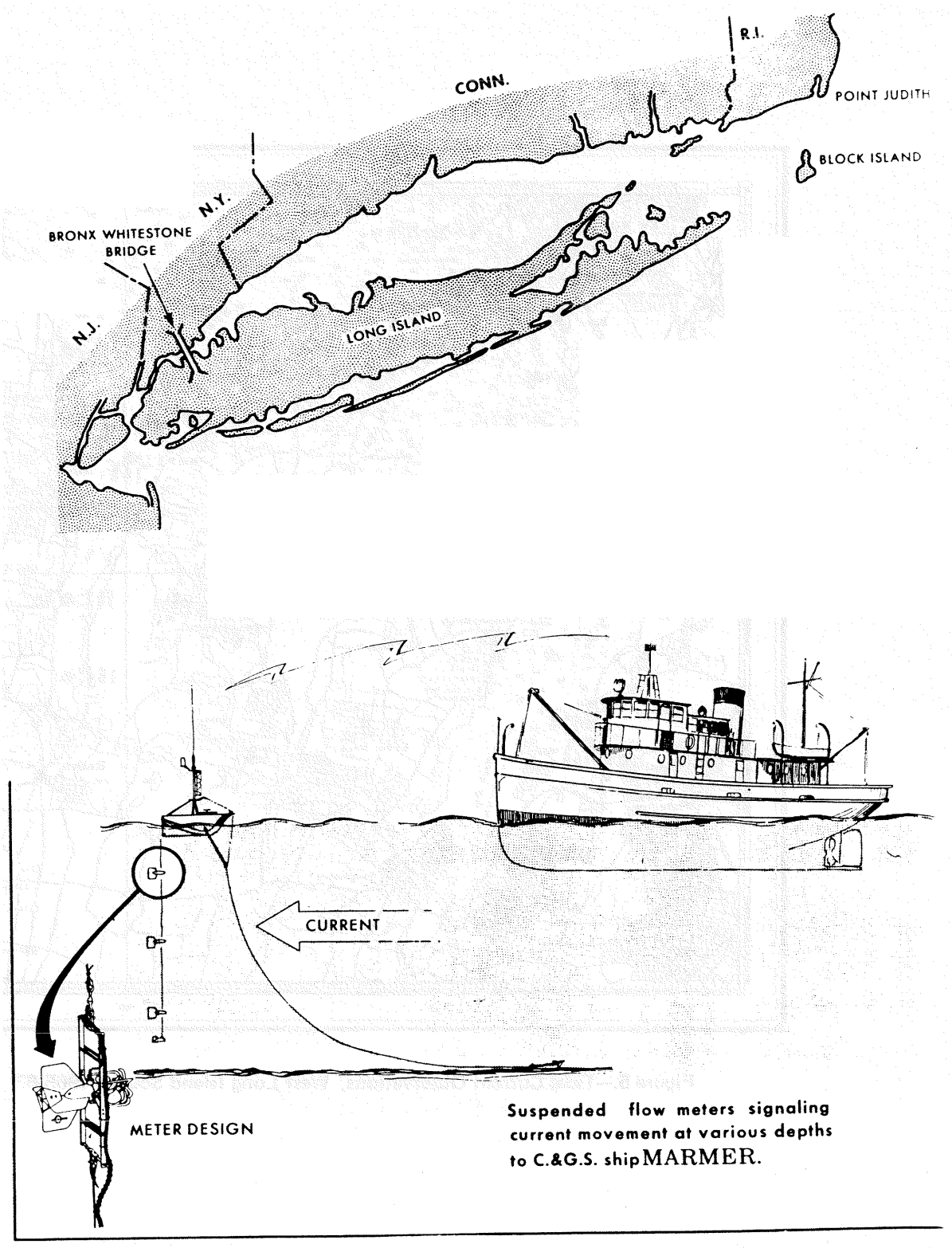

Figure 6.-Roberts Radio Current Meter System

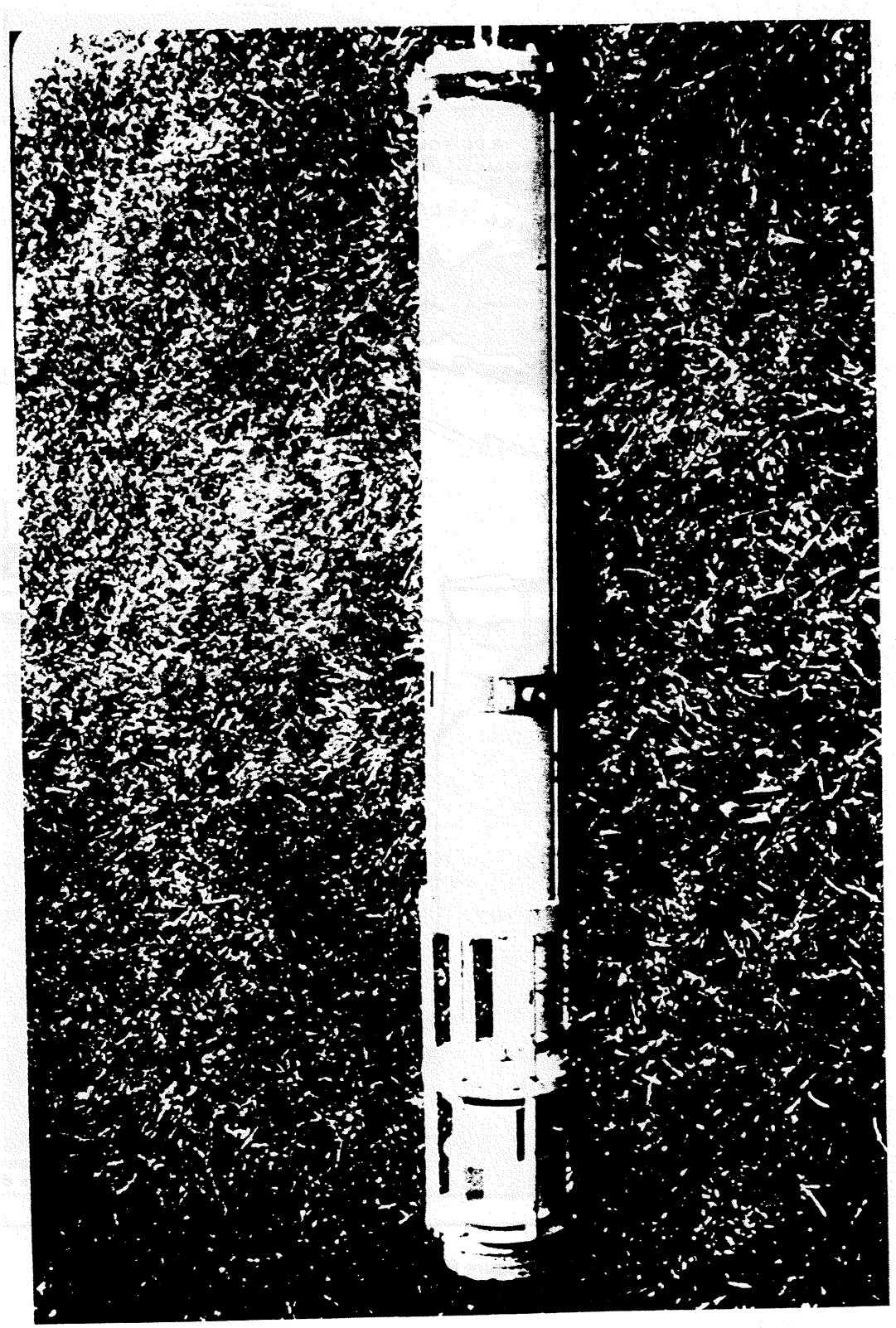

Figure 7.—Geodyne Photographic Current Meter

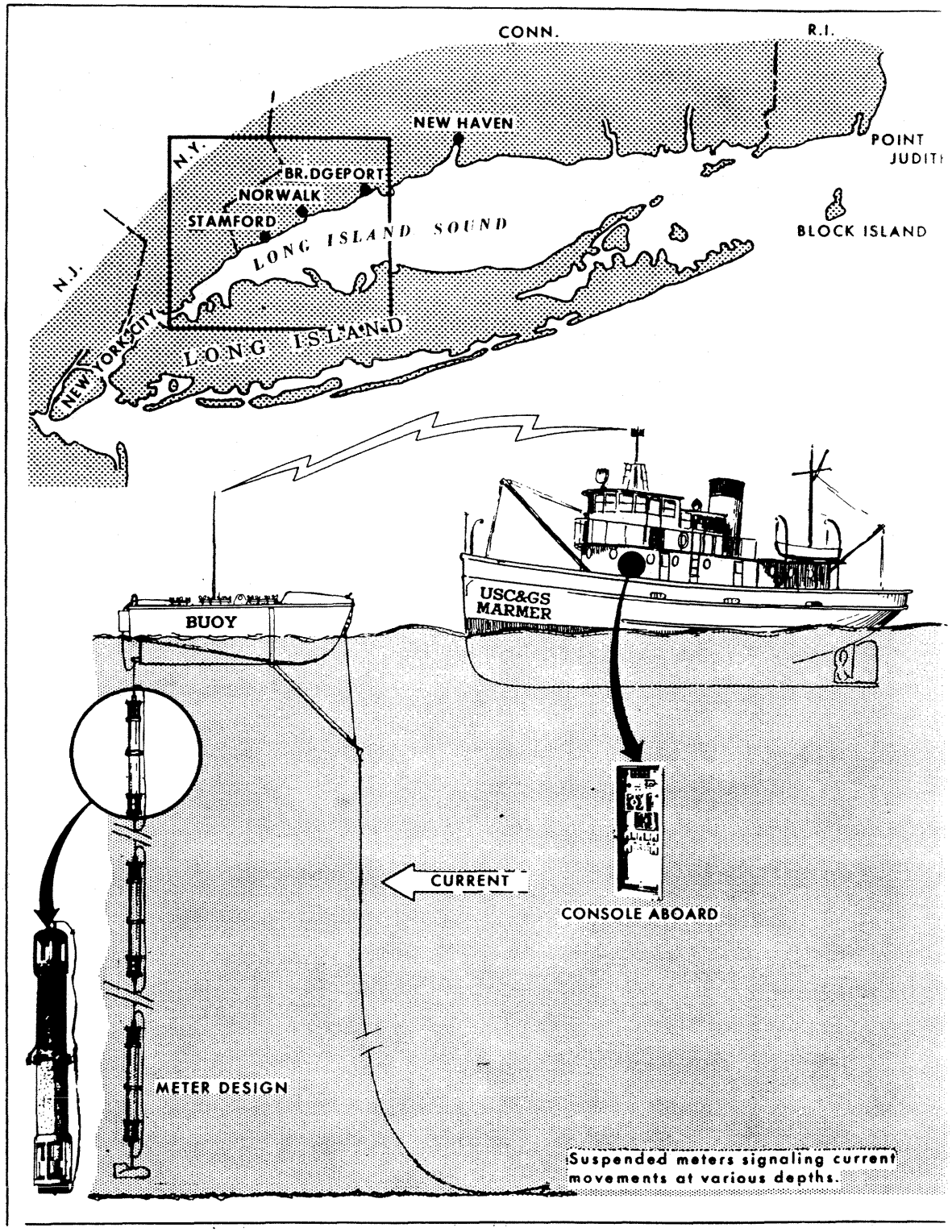

Figure 8.—Tidal Current Survey System

Table 1. -- Manufacturers' Specifications

Common name: Roberts Radio Current Meter
Manufacturer: American Instrument Company
Parameters measured: Current speed and direction

Parameter	Range	Accuracy
Current speed	0.1 to 7 kt	±0.1 kt (low range)
Current direction	0 to 360 degrees	±5 degrees

Recorder: Chronograph with waxed paper tape
Record format: Indentation on wax tape
Sampling rage: Variable
Duration: 30 days plus
Processing: Scaling wax tape for speed and direction
Mode of operation: Radiotelemetry

Common name: Geodyne Photographic Current Meter
Manufacturer: EG&G International
Parameters measured: Current speed and direction

Parameter	Range	Accuracy
Current speed	Optional	
	0.05 to 4.0 kt	±0.05 kt, starting speed to 1 kt
	0.05 to 8.0 kt	±0.1 kt, 1 kt to full speed
Current direction	0 to 360 degrees	±5 degrees at 0.5 kt

Recorder: 16-mm film
Record format: Gray binary
Sampling rate: Variable
Duration: 10,000 reading sets in 14 months (maximum)
Processing: Developed film-to-film scanner to magnetic tape
Mode of Operation: Part of an ocean-mooring system; battery powered and self-contained
Operating depth: To 17,700 feet

Table 1. -- Manufacturers' Specifications (cont)

Common name: Tidal Current Survey System (TICUS I)
Manufacturer: EG&G International
Parameters measured: Current speed and direction

Parameter	Range	Accuracy
Current speed	0.05 to 8 kt	±0.05 kt up to 1 kt ±0.1 kt up to 8 kt
Current direction	0 to 360 degrees	±5 degrees

Recorder: Punch paper tape with magnetic tape backup
Record format: 8-channel program indication code
Sampling rate: Variable
Duration: 10,000 reading sets
Processing: Paper tape to cards and cards to magnetic tape
Mode of Operation: Radiotelemetry and part of an ocean-mooring system

Table 2.—Tidal Current Information

Station No.	OBSERVATION INFORMATION					PARAMETER(S) OBSERVED						PROCESSING AND ANALYSIS					
	Latitude Longitude	Dates of Observations	Duration (Days)	Instrument	Depth of Instrument	Speed	Direction	Temperature	Conductivity	Pressure	Salinity	Data Quality Good/Bad	Data Edited	Time Plot	Rotary Reduction	Reversing Reduction	Harmonic Analysis
1	41°22'37"N 71°30'51"W	9/11-15/65	4	R	6	✓	✓					G	✓	✓		✓	
2	41°21'46"N 71°30'55"W	9/10-14/65	4	R	6,12	✓	✓					G	✓	✓		✓	
3	41°21'29"N 71°29'45"W	9/10-14/65	4	R	10,20	✓	✓					G	✓	✓		✓	
4	41°19'52"N 71°30'39"W	9/10-14/65	4	R	10,20	✓	✓					G	✓	✓		✓	
5	41°17'57"N 71°32'42"W	8/14-30/65 8/14-9/10/65	16.2 28	R G	15 15	✓ ✓	✓ ✓					G G	✓ ✓	✓ ✓	✓ ✓	✓ ✓	✓ ✓
6	41°15'51"N 71°34'00"W	9/22-26/65	4	R	15	✓	✓					G	✓	✓		✓	
7	41°13'48"N 71°35'08"W	9/22-26/65	4	R	15	✓	✓					G	✓	✓		✓	
8	41°11'58"N 71°35'30"W	9/23-27/65	4.2	R	8,16	✓	✓					G	✓	✓		✓	
9	41°13'21"N 71°31'51"W	9/22-26/65	4	R	15	✓	✓					G	✓	✓	✓		
10	41°08'26"N 71°31'50"W	9/22-26/65	4.5	R	15	✓	✓					G	✓	✓	✓		
11	41°08'12"N 71°37'18"W	6/14-18/65	4	R	10,20	✓	✓					G	✓	✓		✓	
12	41°06'48"N 71°43'00"W	6/15-8/2/65	18	G	15	✓	✓					G	✓	✓	✓	✓	✓
13	41°04'30"N 71°49'48"W	7/14-18/65	4	R	10,20	✓	✓					G	✓	✓		✓	
14	41°20'54"N 71°35'46"W	9/10-14/65	4	R	10,20	✓	✓					G	✓	✓		✓	
15	41°17'06"N 71°38'00"W	9/15-27/65	12	G	15	✓	✓					G	✓	✓		✓	

Table 2.—Tidal Current Information (Cont.)

Station No.	OBSERVATION INFORMATION					PARAMETER(S) OBSERVED						PROCESSING AND ANALYSIS					
	Latitude Longitude	Dates of Observations	Duration (Days)	Instrument	Depth of Instrument	Speed	Direction	Temperature	Conductivity	Pressure	Salinity	Data Quality Good/Bad	Data Edited	Time Plot	Rotary Reduction	Reversing Reduction	Harmonic Analysis
16	41°12'22"N 71°38'12"W	8/17-20/65	4	R	15	✓	✓					G	✓	✓	✓		
17	41°18'48"N 71°42'49"W	7/29-8/3/65	4	R	10,20	✓	✓					G	✓	✓		✓	
18	41°16'21"N 71°43'00"W	7/29-8/1/65	4.2	R	15	✓	✓					G	✓	✓		✓	
19	41°11'36"N 71°44'12"W	8/17-21/65	4.2	R	15	✓	✓					G	✓	✓		✓	
20	41°18'10"N 71°48'48"W	7/29-8/2/65	4.2	R	10,20	✓	✓					G	✓	✓		✓	
21	41°13'12"N 71°49'00"W	8/18-22/65	4.5	R	15	✓	✓					G	✓	✓		✓	
22	41°09'33"N 71°49'29"W	8/17-21/65	4.2	R	15	✓	✓					G	✓	✓		✓	
23	41°16'30"N 71°54'48"W	6/9-13/65	4	R	10,20	✓	✓					G	✓	✓		✓	
24	41°13'24"N 71°55'30"W	7/29-8/2/65	4.2	R	15	✓	✓					G	✓	✓		✓	
25	41°10'27"N 71°55'10"W	6/23-27/65	4.2	R	15	✓	✓					G	✓	✓		✓	
26	41°07'54"N 71°55'30"W	7/14-18/65	3.5	R	10,20	✓	✓					G	✓	✓		✓	
27	41°04'47"N 71°56'21"W	6/23-27/65	4.2	R	6	✓	✓					G	✓	✓		✓	
28	41°14'45"N 71°59'48"W	5/27-31/65	4	R	15,60 100	✓	✓					G	✓	✓		✓	
29	41°10'42"N 72°02'06"W	6/9-13/65	4	R	15	✓	✓					G	✓	✓	✓	✓	
30	41°07'03"N 71°59'48"W	6/23-27/65	4	R	10,20	✓	✓					G	✓	✓		✓	
31	41°07'07"N 72°04'51"W	5/24-28/66	4.2	R	6,18,30	✓	✓					G	✓	✓		✓	

Table 2.—Tidal Current Information (Cont.)

Station No.	OBSERVATION INFORMATION					PARAMETER(S) OBSERVED						PROCESSING AND ANALYSIS					
	Latitude Longitude	Dates of Observations	Duration (Days)	Instrument	Depth of Instrument	Speed	Direction	Temperature	Conductivity	Pressure	Salinity	Data Quality Good/Bad	Data Edited	Time Plot	Rotary Reduction	Reversing Reduction	Harmonic Analysis
32	41°03'24"N 72°01'48"W	5/26-6/11/66 5/28-6/2/66	15	G	25,40	✓	✓					G	✓ ✓	✓ ✓		✓	✓
33	41°01'29"N 72°03'37"W	5/24-28/66	4.2	R	5,15,25	✓	✓					G	✓	✓		✓	
34	41°01'18"N 72°07'24"W	5/2-6/66	4.2	R	8,16	✓	✓					G	✓	✓		✓	
35	41°04'13"N 72°09'43"W	5/11-12/66	1.2	R	6,18,30	✓	✓					B					
36	41°09'30"N 72°08'50"W	6/5-9/65	4	R	10,20	✓	✓					G	✓	✓		✓	
37	41°07'30"N 72°12'18"W	5/14-19/66	5	R	6,18,30	✓	✓					G	✓	✓		✓	
38	41°04'42"N 72°13'48"W	5/28-6/2/66	5	R	10,20	✓	✓					G	✓	✓		✓	
39	41°05'48"N 72°15'48"W	6/7-12/66	4.8	R	6,12	✓	✓					G	✓	✓		✓	
40	41°06'06"N 72°18'18"W	6/12-16/66	4	R	36,60	✓	✓					G	✓	✓		✓	
	41°06'15"N 72°18'24"W	6/12-27/66	10	G	15	✓	✓					G	✓	✓		✓	
41	41°06'39"N 72°20'26"W	6/11-16/66	4.8	R	8,25,41	✓	✓					G	✓	✓		✓	
42	41°04'29"N 72°22'57"W	6/20-24/66	4.2	R	13,38, 65	✓	✓					G	✓	✓		✓	
43	41°02'23"N 72°06'04"W	6/7-11/66	4.2	R	7,18	✓	✓					G	✓	✓		✓	
44	41°02'28"N 72°19'15"W	6/27-7/1/66	4.2	R	7,21,35	✓	✓					G	✓	✓		✓	
44A	41°02'53"N 72°22'34"W	6/20-24/66	4.3	R	13,38, 65	✓	✓					G	✓	✓		✓	
45	41°01'35"N 72°23'05"W	6/27-7/1/66	4.2	R	19	✓	✓					G	✓	✓		✓	

Table 2.—Tidal Current Information (Cont.)

Station No.	OBSERVATION INFORMATION					PARAMETER(S) OBSERVED						PROCESSING AND ANALYSIS					
	Latitude Longitude	Dates of Observations	Duration (Days)	Instrument	Depth of Instrument	Speed	Direction	Temperature	Conductivity	Pressure	Salinity	Data Quality Good/Bad	Data Edited	Time Plot	Rotary Reduction	Reversing Reduction	Harmonic Analysis
45	41°01'35"N 72°23'05"W	6/25-7/9/66	14+	G	15	✓	✓					B					
46	40°56'59"N 72°27'11"W	6/27-7/1/66	4	R	7,14	✓	✓					G	✓	✓		✓	
47	41°14'42"N 72°02'36"W	5/18-22/65	4.5	R	10,20	✓	✓					G	✓	✓		✓	
48	41°14'12"N 72°03'36"W	5/18-6/16/65	29.8	R	10,20	✓	✓					G	✓	✓		✓	✓
49	41°13'06"N 72°05'06"W	5/18-22/65	4.5	R	10,20	✓	✓					G	✓	✓		✓	
50	41°11'48"N 72°06'24"W	5/28-6/1/65	4	R	20,34	✓	✓					G	✓	✓		✓	
	41°11'40"N 72°06'14"W	5/31-6/5/65	4.5	R	8,25,42	✓	✓					G	✓	✓		✓	
51	41°13'06"N 72°06'56"W	5/31-6/5/65	4.5	R	15	✓	✓					Q	✓	✓		✓	
52	41°11'40"N 72°08'01"W	5/22-27/65	4.5	R	8,16	✓	✓					G	✓	✓		✓	
53	41°10'00"N 72°12'48"W	7/15-8/12/75	29	G	15	✓	✓					G	✓	✓		✓	✓
	41°10'00"N 72°12'50"W	5/22-27/65	4.5	R	10,20	✓	✓					G	✓	✓		✓	
54	41°17'55"N 71°54'00"W	7/19-23/65	4	R	10,30, 50	✓	✓					G	✓	✓		✓	
55	41°19'54"N 71°53'53"W	8/11-15/65	4.2	R	4	✓	✓					G	✓	✓		✓	
56	41°19'54"N 71°50'44"W	8/11-15/65	4.2	R	6	✓	✓					G	✓	✓		✓	
57	41°17'53"N 71°58'32"W	7/19-23/65	4	R	15,40, 67	✓	✓					G	✓	✓		✓	
58	41°19'07"N 71°59'18"W	8/11-15/65	4	R	4	✓	✓					G	✓	✓		✓	

Table 2.—Tidal Current Information (Cont.)

Station No.	OBSERVATION INFORMATION					PARAMETER(S) OBSERVED						PROCESSING AND ANALYSIS					
	Latitude Longitude	Dates of Observations	Duration (Days)	Instrument	Depth of Instrument	Speed	Direction	Temperature	Conductivity	Pressure	Salinity	Data Quality Good/Bad	Data Edited	Time Plot	Rotary Reduction	Reversing Reduction	Harmonic Analysis
59	41°21'15"N 71°58'11"W	8/11-15/65	4.2	R	6	✓	✓					G	✓	✓		✓	
60	41°17'34"N 72°01'41"W	7/19-23/65	4.2	R	10,20	✓	✓					G	✓	✓		✓	
		6/2-20/66	18	G	15	✓	✓					B					
61	41°19'05"N 72°05'01"W	9/4-8/65	4.1	R	5,17,28	✓	✓					Q	✓	✓		✓	
62	41°21'38"N 72°05'18"W	9/4-8/65	4.2	R	5,17,28	✓	✓					G	✓	✓		✓	
63	41°23'59"N 72°05'11"W	8/4-8/65	4.5	R	5	✓	✓					G	✓	✓		✓	
64	41°27'39"N 72°04'07"W	8/4-8/65	4.2	R	15	✓	✓					G	✓	✓		✓	
65	41°30'53"N 72°04'43"W	8/4-5/65	1	R	15	✓	✓					Q					
66	41°16'00"N 72°06'18"W	5/27-31/65	4	R	15	✓	✓					G	✓	✓		✓	
67	41°17'52"N 72°08'28"W	8/30-9/3/65	4.2	R	11,32, 54	✓	✓					G	✓	✓		✓	
68	41°19'24"N 72°10'37"W	8/30-9/2/65 9/7-9/65	2.5 2.0	R R	5 5	✓ ✓	✓ ✓					G G	✓ ✓	✓ ✓		✓ ✓	
69	41°16'38"N 72°12'30"W	8/30-9/3/65	4	R	8,25,42	✓	✓					G	✓	✓		✓	
	41°16'24"N 72°12'30"W	8/19-9/1/65	13.5	G	15	✓	✓					G	✓	✓		✓	
70	41°14'00"N 72°12'18"W	6/9-13/65	4	R	15	✓	✓					G	✓	✓		✓	
71	41°11'52"N 72°11'55"W	6/5-9/65	4	R	10,20	✓	✓					G	✓	✓		✓	
72	41°16'21"N 72°16'55"W	7/11-15/66	4	R	13,26	✓	✓					G	✓	✓		✓	

Table 2.—Tidal Current Information (Cont.)

Station No.	OBSERVATION INFORMATION					PARAMETER(S) OBSERVED						PROCESSING AND ANALYSIS					
	Latitude Longitude	Dates of Observations	Duration (Days)	Instrument	Depth of Instrument	Speed	Direction	Temperature	Conductivity	Pressure	Salinity	Data Quality Good/Bad	Data Edited	Time Plot	Rotary Reduction	Reversing Reduction	Harmonic Analysis
73	41°17'01"N 72°20'52"W	7/11-16/66	5	R	7 14	✓ ✓	✓ ✓					G B	✓	✓		✓	
74	41°19'00"N 72°20'46"W	7/16-8/10/66	25.5	G	15	✓	✓					G	✓	✓		✓	✓
75	41°23'18"N 72°24'14"W	7/15-19/66	4	R	7,14	✓	✓					G	✓	✓		✓	
76	41°26'34"N 72°27'47"W	7/15-20/66	5.2	R	15	✓	✓					G	✓	✓		✓	
77	41°30'01"N 72°32'37"W	7/25-29/66	4	R	7,14	✓	✓					G	✓	✓		✓	
78	41°34'20"N 72°38'53"W	7/26-29/66	4.2	R	7,14	✓	✓					G	✓	✓		✓	
79	41°39'49"N 72°37'44"W	7/25-29/66	4.2	R	9	✓	✓					G	✓	✓		✓	
80	41°45'04"N 72°39'01"W	7/25-29/66	4	R	9	✓	✓					G	✓	✓		✓	
81	41°14'47"N 72°19'03"W	7/11-17/66	5.8	R	8,16	✓	✓					G	✓	✓		✓	
82	41°12'00"N 72°19'05"W	8/18-9/15/65	29	G	15	✓	✓					G	✓	✓		✓	✓
83	41°10'01"N 72°15'07"W	6/6-16/66	4.5	R	10,20	✓	✓					G	✓	✓		✓	
84	41°14'39"N 72°23'24"W	8/22-9/3/66	12	G	15	✓	✓					G	✓	✓		✓	
	41°14'37"N 72°23'36"W	5/18-21/67	4	G	15	✓	✓					G	✓	✓		✓	
85	41°08'38"N 72°21'25"W	8/20-9/3/66	15	G	15	✓	✓					G	✓	✓		✓	✓
86	41°14'06"N 72°27'56"W	8/1-5/66	4.3	R	10,20	✓	✓					G	✓	✓		✓	
87	41°10'50"N 72°26'54"W	8/1-2/66 8/8-12/66	1.5 4	R	10,20 10,20	✓ ✓	✓ ✓					G G	✓ ✓	✓ ✓		✓ ✓	

Table 2.—Tidal Current Information (Cont.)

Station No.	OBSERVATION INFORMATION					PARAMETER(S) OBSERVED						PROCESSING AND ANALYSIS					
	Latitude Longitude	Dates of Observations	Duration (Days)	Instrument	Depth of Instrument	Speed	Direction	Temperature	Conductivity	Pressure	Salinity	Data Quality Good/Bad	Data Edited	Time Plot	Rotary Reduction	Reversing Reduction	Harmonic Analysis
87A	41°12'40"N 72°28'52"W	8/19-23/66	4	R	10,20	✓	✓					G	✓	✓		✓	
88	41°06'18"N 72°27'24"W	8/1-5/66	4.2	R	10,20	✓	✓					G	✓	✓		✓	
89	41°14'13"N 72°34'00"W	9/2-19/66	16.8	G	15	✓	✓					G	✓	✓		✓	✓
90	41°09'48"N 72°34'10"W	8/24-9/8/66	15	G	15	✓	✓					G	✓	✓		✓	✓
91	41°05'21"N 72°34'06"W	9/7-22/66	15	G	15	✓	✓					B					
92	41°01'41"N 72°34'13"W	8/24-9/22/66	29	G	15	✓	✓					G	✓	✓		✓	✓
93	41°13'39"N 72°42'18"W	8/19-24/66	4.9	R	10,20	✓	✓					G	✓	✓		✓	
		5/5-6/3/67	29	G	15	✓	✓					G	✓	✓	✓		✓
94	41°08'44"N 72°42'18"W	8/19-23/66	4.2	R	15	✓	✓					G	✓	✓		✓	
95	41°04'22"N 72°42'32"W	8/8-12/66	4.2	R	15	✓	✓					G	✓	✓		✓	
96	41°00'55"N 72°42'58"W	8/8-11/66	3	R	10,20	✓	✓					G	✓	✓		✓	
97	41°12'34"N 72°49'50"W	5/17-6/5/67	19	G	15	✓	✓					G	✓	✓		✓	✓
98	41°08'39"N 72°49'40"W	9/22-10/12/66	20.5	G	15	✓	✓					G	✓	✓	✓	✓	✓
99	41°04'39"N 72°49'48"W	9/26-10/11/66	15	G	15	✓	✓					G	✓	✓		✓	✓
100	41°00'58"N 72°49'56"W	9/14-10/3/66	19	G	15	✓	✓					G	✓	✓	✓	✓	
101	41°14'26"N 72°55'00"W	8/29-9/2/66	4	R	6,15,24	✓	✓					Q	✓	✓		✓	

Table 2.—Tidal Current Information (Cont.)

Station No.	OBSERVATION INFORMATION					PARAMETER(S) OBSERVED						PROCESSING AND ANALYSIS					
	Latitude Longitude	Dates of Observations	Duration (Days)	Instrument	Depth of Instrument	Speed	Direction	Temperature	Conductivity	Pressure	Salinity	Data Quality Good/Bad	Data Edited	Time Plot	Rotary Reduction	Reversing Reduction	Harmonic Analysis
102	41°17'50"N 72°54'25"W	8/29-9/2/66	4	R	5,10	✓	✓					G	✓	✓		✓	
103	41°12'52"N 72°58'00"W	9/7-11/66	4	R	10,20	✓	✓					Q	✓	✓		✓	
104	41°08'36"N 72°58'05"W	9/7-11/66	4.2	R	10,20	✓	✓					G	✓	✓		✓	
105	41°04'31"N 72°58'26"W	9/7-14/66 9/11-14/66	7 3	R R	10 20	✓ ✓	✓ ✓					G G	✓ ✓	✓ ✓		✓ ✓	
106	41°00'20"N 72°58'27"W	9/7-14/66	5.2	R	10,20	✓	✓					G	✓	✓		✓	
107	41°10'46"N 72°02'38"W	9/12-16/66	4	R	10,20	✓	✓					G	✓	✓		✓	
108	41°10'21"N 73°06'49"W	9/12-16/66 9/19-21/66	4 2	R R	5,10 5,10	✓	✓ ✓					G G	✓ ✓	✓ ✓		✓ ✓	
109	41°12'32"N 73°06'40"W	9/22-27/66	4.5	R	5	✓	✓					G	✓	✓		✓	
110	41°14'24"N 73°06'14"W	9/24-28/66	3.8	R	5	✓	✓					G	✓	✓		✓	
111	41°16'40"N 73°05'12"W	9/22-27/66	4.5	R	5	✓	✓					G	✓	✓		✓	
112	41°18'44"N 73°04'47"W	9/22-28/66	6	R	5,10	✓	✓					Q	✓	✓		✓	
113	41°06'45"N 73°07'08"W	5/3-6/2/67	29	T	15	✓	✓					G	✓		✓		
114	41°04'46"N 73°06'40"W	5/3-6/2/67	29	T	15,60	✓	✓					G	✓		✓		
115	41°02'58"N 73°05'48"W	5/3-6/2/67	29	T	15,51	✓	✓					G	✓		✓		
116	41°00'14"N 73°05'42"W	5/3-18/67	15	T	15,40	✓	✓					G	✓		✓		
117	41°09'10"N 73°10'47"W	5/4-21/67	17	R	15,27	✓	✓					B	✓	✓			

Table 2.—Tidal Current Information (Cont.)

Station No.	OBSERVATION INFORMATION					PARAMETER(S) OBSERVED						PROCESSING AND ANALYSIS					
	Latitude Longitude	Dates of Observations	Duration (Days)	Instrument	Depth of Instrument	Speed	Direction	Temperature	Conductivity	Pressure	Salinity	Data Quality Good/Bad	Data Edited	Time Plot	Rotary Reduction	Reversing Reduction	Harmonic Analysis
118	41°10'22"N 73°10'55"W	5/4-9/67	5	R	15,27	✓	✓					G	✓	✓			
119	41°05'03"N 73°14'24"W	6/8-18/67	10	G	15	✓	✓					G	✓	✓	✓	✓	
120	41°01'42"N 73°14'02"W	6/6-22/67	15.8	G	15	✓	✓					G	✓	✓	✓		
121	40°59'00"N 73°13'52"W	6/6-22/67	16	G	15	✓	✓					G	✓	✓	✓		✓
122	40°56'18"N 73°13'52"W	6/6-20/67	13.8	G	15	✓	✓					G	✓	✓	✓		
123	41°06'16"N 73°21'55"W	6/1-17/67	15.5	R	15	✓	✓					G	✓	✓	✓	✓	
124	41°03'19"N 73°25'15"W	6/24-7/10/67	16	G	12	✓	✓					G	✓	✓	✓	✓	
		6/11-21/67	11	T	12	✓	✓					G	✓		✓		
125	41°05'12"N 73°24'13"W	6/2-18/67	16.8	R	15	✓	✓					G	✓	✓		✓	✓
126	41°01'58"N 73°24'20"W	6/26-7/12/67	15.6	G	15	✓	✓					G	✓	✓	✓	✓	
		6/26-7/12/67	13.3	G	60	✓	✓					G	✓	✓	✓		
127	41°00'23"N 73°23'48"W	6/26-7/11/67	14.6	R	15,40 170	✓	✓					G	✓	✓	✓		
128A	40°58'36"N 73°23'46"W	7/31-8/15/67	15.8	G	15	✓	✓					G	✓	✓	✓		✓
129	40°55'36"N 73°25'03"W	6/10-25/67	15.2	T	15,30	✓	✓					G	✓		✓		
130	40°54'32"N 73°24'27"W	6/9-25/67	16	T	15	✓	✓					G	✓		✓		
131	41°00'53"N 73°32'12"W	7/11-30/67	18.8	G	12	✓	✓					G	✓	✓	✓		✓

Table 2.—Tidal Current Information (Cont.)

Station No.	OBSERVATION INFORMATION					PARAMETER(S) OBSERVED						PROCESSING AND ANALYSIS					
	Latitude Longitude	Dates of Observations	Duration (Days)	Instrument	Depth of Instrument	Speed	Direction	Temperature	Conductivity	Pressure	Salinity	Data Quality Good/Bad	Data Edited	Time Plot	Rotary Reduction	Reversing Reduction	Harmonic Analysis
132	40°59'59"N 73°31'02"W	7/14-19/67	5.5	G	40	✓	✓					G	✓	✓		✓	
132A	40°59'54"N 73°31'00"W	9/19-30/67	11	G	15	✓	✓					G	✓	✓	✓		
133	40°57'57"N 73°29'42"W	7/14-30/67	15.8	G	15,40	✓	✓					G	✓	✓	✓	✓	✓
134	40°55'09"N 73°30'02"W	6/25-7/10/67	15	R	15 55	✓ ✓	✓ ✓					G B	✓ ✓	✓ ✓	✓	✓	
135	40°59'30"N 73°35'40"W	6/30-7/20/67	20	T	15,30	✓	✓					G	✓	✓	✓		
136	40°57'36"N 73°33'41"W	6/30-7/20/67	20	T	15,55	✓	✓					G	✓	✓	✓		
137	40°59'30"N 73°35'40"W	6/30-7/20/67	20	T	15,20	✓	✓					G	✓		✓		
138II	40°56'19"N 73°40'30"W	7/19-8/5/67	16.3	G	15	✓	✓					G	✓	✓		✓	✓
138IV	40°56'19"N 73"40'30"W	9/8-10/7/67	29	G	15	✓	✓					G	✓	✓	✓		✓
139	40°55'29"N 73°39'22"W	5/19-6/18/67	29	G	15	✓	✓					G	✓	✓	✓		✓
140	40°54'48"N 73°38'24"W	8/4-9/2/67	29	G	15,40	✓	✓					G	✓	✓	✓		✓
141	40°55'00"N 73°42'44"W	7/29-8/14/67	15	R	15,33	✓	✓					G	✓	✓		✓	
142	40°51'30"N 73°39'59"W	7/29-8/11/67	15	R	15	✓	✓					G	✓	✓		✓	
143	40°49'41"N 73°39'00"W	7/29-8/13/67	15	R	10	✓	✓					G	✓	✓		✓	✓
144A	40°53'26"N 73°45'26"W	9/9-24/67	15.5	G	15	✓	✓					G	✓	✓	✓		
145	40°52'48"N 73°44'45"W	8/1-20/67	29	T	15,40, 70	✓	✓					G	✓		✓		

Table 2.—Tidal Current Information (Cont.)

Station No.	OBSERVATION INFORMATION					PARAMETER(S) OBSERVED						PROCESSING AND ANALYSIS					
	Latitude Longitude	Dates of Observations	Duration (Days)	Instrument	Depth of Instrument	Speed	Direction	Temperature	Conductivity	Pressure	Salinity	Data Quality Good/Bad	Data Edited	Time Plot	Rotary Reduction	Reversing Reduction	Harmonic Analysis
146	40°52'24"N 73°44'00"W	8/1-39/67	29	T	15,40, 100	✓	✓					G	✓	✓	✓		
147A	40°51'49"N 73°46'16"W	9/14-29/67	15	G	15	✓	✓					G	✓	✓	✓		
148A	40°51'22"N 73°46'44"W	9/14-30/67	15	G	15	✓	✓					G	✓	✓	✓		
149	40°51'28"N 73°47'28"W	9/4-20/67	16	G	10	✓	✓					G	✓	✓	✓		
150	40°50'37"N 73°45'46"W	9/3-10/1/67	29	T	15,90	✓	✓					G	✓		✓		
151	40°49'45"N 73°43'47"W	8/19-9/3/67	15	G	15	✓	✓					G	✓	✓	✓		✓
152	40°50'12"N 73°47'43"W	8/21-9/5/67	15	R	5	✓	✓					G	✓	✓		✓	
153	40°51'42"N 73°48'48"W	8/22-29/67	7	R	5	✓	✓					G	✓	✓		✓	
153A	40°51'42"N 73°49'00"W	8/29-9/14/ 67	15.8	R	5	✓	✓					G	✓	✓		✓	✓
154	40°48'07"N 73°47'29"W	9/3-10/1/67	29	T	15,50	✓ ✓	✓ ✓					G	✓ ✓	✓ ✓	✓ ✓	✓ ✓	✓
155	40°47'54"N 73°47'27"W	9/3-10/1/67	29	T	15,60	✓	✓					G	✓	✓	✓		
157	41°01'35"N 73°28'41"W	6/11-25/67	15	T	15,27	✓	✓					G	✓	✓	✓		
158	40°58'28"N 73°05'48"W	5/10-24/67	14.5	R	15,22	✓	✓					G	✓	✓	✓		
159	40°48'55"N 73°46'01"W	9/6-21/67	15	G	15	✓	✓					G	✓	✓	✓		✓
160	40°59'01"N 73°34'01"W	7/1-20/67	20	T	15,55	✓	✓					G	✓	✓	✓		
161	40°59'43"N 73°46'28"W	9/3-10/1/67	29	T	15,30	✓	✓					G	✓	✓	✓		

Table 2.—Tidal Current Information (Cont.)

Station No.	OBSERVATION INFORMATION					PARAMETER(S) OBSERVED						PROCESSING AND ANALYSIS					
	Latitude Longitude	Dates of Observations	Duration (Days)	Instrument	Depth of Instrument	Speed	Direction	Temperature	Conductivity	Pressure	Salinity	Data Quality Good/Bad	Data Edited	Time Plot	Rotary Reduction	Reversing Reduction	Harmonic Analysis
162	40°51'43"N 73°40'28"W	8/2-7/67	4.5	R	15	✓	✓					Q	✓	✓		N.A.	
163	40°51'40"N 73°39'45"W	8/7-11/67	4.5	R	15	✓	✓					G	✓	✓		✓	
164	39°48'47"N 73°39'05"W	7/29-8/2/67	4.3	R	5	✓	✓										

T = TICUSI Current Meter
R = Roberts Radio Current Meter
G = Geodyne Photographic Current Meter

G = Good
B = Bad
Q = Questionable

Table 3. -- Obtaining Differences and Ratios for the Subordinate Station

The following example illustrates how subordinate stations are referred to the basic control station or station for which daily predictions exist. This illustration uses "THE RACE" Long Island Sound as the basic control station and station 113 Long Island Sound as the subordinate station.

	Time Differences				Velocity Ratios
	Slack	Flood	Slack	Ebb	
Subordinate	1019	0058	0409	0704	Flood = 1.27/2.9 = 0.438
Control	1049	0104	0417	0705	Ebb = 1.17/3.5 = 0.334
Differences	-0030	-0006	-0008	-0001	

- indicates the phase occurs before that of the control station.

Table 4.—Block Island Sound and Long Island Sound Greenwich Intervals Double Phases

No.	LOCATION		OBSERVATIONS				Slack	FLOOD STRENGTH			Slack	EBB STRENGTH			Mean current hour	VELOCITY RATIO	
	Latitude (N)	Longitude (W)	Date	Period	Method	Depth		Time	Direction (true)	Velocity		Time	Direction (true)	Velocity		Flood	Ebb
	° ′ ″	° ′ ″		Days		Feet	Hours	Hours	°	Knots	Hours	Hours	°	Knots	Hours		
3	41 21 29	71 29 45	9/10-14/65	4 1/4	R	10	8.65	10.21	328	0.69	1.88	3.71	154	0.86	10.94		
												4.36	152	0.44			
												5.08	144	0.76			
				4 1/4	R	20	8.22	11.04	330	0.55	1.80	3.46	146	0.81	11.02		
												4.44	116	0.47			
												5.21	134	0.71			
27	41 04 47	71 56 21	6/23-27/65	4 1/4	R	6	8.41	10.70	226	1.16	1.08	2.27	033	0.59	10.80		
												4.54	011	0.25			
												6.35	340	0.52			
41	41 06 39	72 20 26	6/11-16/66	4 3/4	R	8	11.10	1.43	194	1.48	5.08	6.27	015	1.21	1.61		
												7.63	359	0.66			
												8.54	358	0.90			
				4 3/4	R	25	10.94	1.36	222	1.51	5.21	6.19	031	1.09	1.62		
												7.81	028	0.50			
												8.78	027	0.76			
				4 3/4	R	41	10.61	1.59	199	1.33	5.09	6.46	033	0.80	1.54		
												7.60	023	0.32			
												8.45	018	0.52			
50	41 11 40	72 06 14	5/31-6/5/65	4 1/2	R	8	8.70	0.21	317	1.37	3.81	4.12	101	0.51	12.02		
												5.18	252	0.10			
												6.60	174	0.67			
				4 1/2	R	25	8.33	0.25	345	1.19	3.65	3.97	109	0.59	11.89		
												5.17	252	0.19			
												6.48	174	0.50			
				4 1/2	R	42	8.69	0.17	315	0.95	3.35	3.82	095	0.47	11.86		
												5.11	259	0.12			
												6.56	152	0.39			
	41 11 48	72 06 24	5/28-6/1/66	4	R	20	9.10	0.43	329	1.11	3.69	4.04	045	0.47	12.38		
												5.18		0.00			
												6.50	188	0.69			
				4	R	34	9.02	0.75	264	0.91	3.50	3.82	039	0.48	12.39		
												5.21		0.00			
												6.67	139	0.51			
55	41 19 54	71 53 53	8/11-15/65	4	R	4	8.25	10.20	035	1.07	1.87	3.39	227	1.04	11.06		
												5.57	243	0.20			
												6.96	234	0.53			
56	41 19 54	71 50 44	8/11-15/65	4 1/4	R	6	8.89	10.79	058	0.57	2.00	3.42	265	0.53	11.45		
												5.94	243	0.06			
												7.14	263	0.22			
58	41 19 07	71 59 18	8/11-15/65	4	R	4	9.22	10.23	340	0.49	0.11	2.58	173	0.26	11.04		
												5.68		0.03			
												7.40	162	0.48			
59	41 21 15	71 58 11	8/11-15/65	4 1/4	R	6	8.79	10.65	039	0.51	2.17	3.43	231	0.36	11.36		
												5.42	234	0.16			
												6.74	232	0.32			

Table 4.—Block Island Sound and Long Island Sound Greenwich Intervals Double Phases (Cont.)

No.	LOCATION		OBSERVATIONS				Slack	FLOOD STRENGTH			Slack	EBB STRENGTH			Mean current hour	VELOCITY RATIO	
	Latitude (N)	Longitude (W)	Date	Period	Method	Depth		Time	Direction (true)	Velocity		Time	Direction (true)	Velocity		Flood	Ebb
	° ′ ″	° ′ ″		Days		Feet	Hours	Hours	°	Knots	Hours	Hours	°	Knots	Hours		
62	41 21 38	72 05 18	9/4-8/65	4 1/4	R	5	10.15	12.27	001	0.34	3.38	4.55	187	0.53	0.21		
												6.18	193	0.22			
												7.52	191	0.44			
			9/4-8/65	4 1/4	R	17	8.92	10.74	022	0.40	3.21	4.44	174	0.28	11.54		
												5.72	180	0.11			
												6.78	179	0.25			
63	41 23 59	72 05 11	8/4-8/65	4 1/2	R	5	9.52	11.15	019	0.74	2.79	5.18	199	0.49	12.10		
												5.58	202	0.23			
												7.30	198	0.61			
64	41 27 39	72 04 07	8/4-8/65	4 1/4	R	15	9.53	11.11	332	0.71	3.61	4.60	164	0.36	12.22		
												5.90	165	0.16			
												7.52	161	0.51			
74	41 19 00	72 20 46	7/16-8/10/66	25 1/2	G	15	11.26	0.64	360	1.03	5.19	8.18	198	0.99	1.91		
								1.65	359	0.60							
								2.59	356	0.93							
83	41 10 01	72 15 07	6/6-11/66	4 1/2	R	10	9.70	11.49	261	1.32	3.80	5.81	080	3.04			
								0.12	266	0.76							
								0.95	257	2.06							
				4 1/2	R	20	9.64	11.41	233	1.56	3.67	5.88	026	3.08			
								0.05	245	0.86							
								0.90	229	2.15							
108	41 10 21	73 06 49	9/12-16/66	4	R	5	11.30	1.07	342	1.26	4.58	5.42	130	1.38	1.27		
			9/19-21/66	2	R							6.66	129	1.20			
												8.18	126	1.57			
145	40 52 48	73 44 45	8/1-30/67	29	T	40	6.48	8.07	021	0.15	11.76	1.26	224	0.40	9.74		
								8.97	015	0.12		2.75	208	0.27			
								10.39	034	0.19		4.10	205	0.34			
				29	T	15	5.50	10.59	025	0.39	0.16	2.00	226	0.27	9.22		
				29	T	70	6.29	7.51	025	0.17	10.92	1.21	213	0.51	8.04		
												3.37	219	0.40			
146	40 52 24	73 44 00	8/1-30/67	29	T	15	5.28	7.93	058	0.59	12.01	1.76	246	0.40	8.29		
				29	T	40	5.63	7.66	061	0.40	11.85	1.18	250	0.42	8.13		
								9.48	057	0.24		3.55	225	0.19			
								10.19	054	0.30		3.86	226	0.22			
				29	T	100						0.90	224	0.34			
												3.54	237	0.10			
												3.94	235	0.14			
147A	40 51 49	73 46 16	9/14-29/67	15	G	15	5.54	7.06	098	0.18	10.54	1.24	264	0.26	7.65		
												3.81	283	0.13			
												4.01	283	0.16			
148A	40 51 22	73 46 44	9/14-30/67	16	G	15	6.11	8.13	349	0.22	0.08	1.95	143	0.21	9.84		
								8.33	348	0.19							
								10.52	349	0.37		4.03	150	0.27			

Table 4.—Block Island Sound and Long Island Sound Greenwich Intervals Double Phases (Cont.)

No.	LOCATION		OBSERVATIONS				Slack	FLOOD STRENGTH			Slack	EBB STRENGTH			Mean current hour	VELOCITY RATIO	
	Latitude (N)	Longitude (W)	Date	Period	Method	Depth		Time	Direction (true)	Velocity		Time	Direction (true)	Velocity		Flood	Ebb
	° ′ ″	° ′ ″		Days		Feet	Hours	Hours	°	Knots	Hours	Hours	°	Knots	Hours		
149	40 51 28	73 47 36	9/4-20/67	16	G	10		2.55	323	0.05	10.37	0.18	198	0.46	6.34		
							4.94	6.11	352	0.20		3.95	196	0.16			
							9.40	9.82	327	0.13	7.63	8.48	168	0.05			
150	40 50 37	73 45 46	9/3-10/1/67	29	T	15	6.18	10.86	032	0.58	0.87	4.31	216	0.38	10.21		
				29	T	90	6.56	7.98	025	0.11	12.07	1.44	214	0.40	9.91		
								8.63	027	0.08		2.45	222	0.31			
								10.75	023	0.30		4.05	227	0.44			
159	40 48 55	73 46 01	9/6-21/67	15	G	15	6.36	7.72	026	0.19	0.60	4.19	213	0.56	10.16		
								8.16	028	0.14							
								10.84	024	0.65							
161	40 49 43	73 46 28	9/3-10/1/67	29	T	15	6.64	10.24	038	0.50	11.83	0.95	251	0.43	9.82		
												2.30	233	0.25			
												4.36	233	0.50			
				29	T	30	6.66	10.02	053	0.32	11.57	0.98	243	0.37	9.72		
												2.35	245	0.23			
												4.42	243	0.48			

2.1 Data processing and analysis

Data processing and analysis include five considerations.

1. Data Verification: The calibration of the instrument was rechecked following retrieval to verify data accuracy.
2. Data Editing: Data recovery was maximized by editing to correct obvious errors without resorting to filtering techniques.
3. Time Plot: Parameters were plotted versus time.
4. General Time Plot: General time plots were performed to illustrate the major trend of each parameter and to allow visual correlation between parameters.
5. Special Time Plot: Expanded plots were drawn to illustrate small variations and to allow for visual reading of actual data values versus time.

2.2 Analyses

The data were analyzed by harmonic, rotary, and reversing techniques; tidal predictions were also produced.

2.3 Rotary Plot

A polar plot of current speed and direction was drawn; this depicted the mean current variation over one tidal cycle for both the tidal and total regimes.

2.4 Current meter data products[1]

The study yielded five current meter data products.

1. Computer listings of data
2. Magnetic tape copy of edited data
3. Photocopy of general time plot
4. Special request plot (including 35-mm film)
5. Photocopy of rotary or reversing plot

2.5 Greenwich intervals

A Greenwich Interval is an interval of time referred to the transit of the Moon over the meridian of Greenwich as distinguished from the local interval which is referred to the Moon's transit over the local meridian. The relationship in hours between Greenwich and local interval is

$$\text{Greenwich Interval} = \text{Local Interval} + 0.068L$$

in which L is the west longitude of the local meridian in degrees.

By referring the several current phases at all stations to the times of the Moon's transit of the meridian of Greenwich, the results are directly comparable and relations between the times of the current in different localities may be obtained simply by taking the difference between their Greenwich Intervals.

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[1]Except for the fifth product listed, most Roberts Radio Current Meter data are available only as copies of hand-plotted graphs.

After obtaining the average difference between the subordinate current phase and the reference current phase as described above, it is applied to the Greenwich Interval for the reference station to obtain a corresponding Greenwich Interval for the subordinated current phase. This is accomplished by establishing the Greenwich Intervals for the reference station and daily predictions, then comparing the daily predicted data of the reference station to the actual observations of the subordinate station to obtain the time difference of the phases.

The Mean Current Hour (MCH) is the interval for the flood phase as modified by the intervals for the other current phases. It is computed by taking the average of the intervals for the following modified phases: flood strength, slack before flood increased by 3.10 hours, slack after flood decreased by 3.10 hours, and ebb strength increased or decreased by 6.21 hours. Before taking the average, the several items must be made comparable by the addition or rejection of the tidal period 12.42 hours when necessary.

Accepted Greenwich Intervals and constants for the control stations of concern are shown in table 5. The average Greenwich Intervals and constants for the subcrdinate stations are presented in table 6.

3.0 TIDE OBSERVATIONS

During the survey period, seven permanent control tide stations were in operation. In figure 9, these are designated 4, 8, 9, 10, 11, and 12; not shown is station 1 located at Norwich, Conn. Temporary station designates are 2, 3, 6, and 7; not shown on the map is station 5 located at Newport, R.I. These temporary stations operated only during some portion of the survey period. The permanent stations are operating at present. Numerous other stations were observed at some time before or during the 1965-67 survey period. The observational and processing information for each tide station is described in table 7. Four types of tide gages were used during the survey: the Standard Automatic, the Bubbler, the Analog-Digital Recorder, and the Portable Automatic. The gages are described in table 8.

In paragraph 3.2 below, those stations referred to one of the basic control stations are discussed and the tidal differences and other constants are enumerated. With these differences and constants and the daily predictions of high and low water, tidal data may be obtained for those secondary stations for any year, providing that the daily predictions are for the year in question. The daily predictions for any year through 1976 may be found in the NOS publication "Tide Tables, High and Low Water Prediction, East Coast of North and South America (including Greenland)". Daily predictions are provided for Willets Point, N.Y.; Newport, R.I.; and Bridgeport and New London, Conn.

In paragraph 3.3 below, computation of the height of the tide at any time is discussed.

Table 5. -- Tidal Currents Basic Control Stations

Station	Greenwich Intervals				Average Maximum Velocities (kt)		Direction		Spring Ratio
	Slack (h.m.)	Flood (h.m.)	Slack (h.m.)	Ebb (h.m.)	Flood	Ebb	Flood	Ebb	
(48) The Race	1049	0104	0417	0705	2.9	3.5	295	100	1.15
(154) Throgs Neck	0740	1050	0213	0423	0.64	0.76	089	287	1.514

Table 6.—Block Island Sound and Long Island Sound Greenwich Intervals

No.	LOCATION		OBSERVATIONS				Slack	FLOOD STRENGTH			Slack	EBB STRENGTH			Mean current hour	VELOCITY RATIO	
	Latitude (N)	Longitude (W)	Date	Period	Method	Depth		Time	Direction (true)	Velocity		Time	Direction (true)	Velocity		Flood	Ebb
	° ′ ″	° ′ ″		Days		Feet	Hours	Hours	°	Knots	Hours	Hours	°	Knots	Hours		
1	41 22 37	71 30 51	9/11-15/65	4	R	6	7.43	10.46	351	1.82	1.02	3.22	186	1.53	10.19		
2	41 21 46	71 30 55	9/10-14/65	4	R	6	8.96	0.54	212	0.54	2.46	5.60	132	0.46	12.15		
						12	9.16	0.48	231	0.50	2.56	5.45	085	0.41	12.18		
3	41 21 29	71 29 45	9/10-14/65	4 1/4	R	10,20		(see double phase tables)									
4	41 19 52	71 30 39	9/10-14/65	4	R	10	9.85	1.01	273	0.72	4.57	6.57	088	0.55	0.84		
						20	10.19	1.09	242	0.72	4.58	6.81	093	0.60	1.01		
5	41 17 57	71 32 42	8/14-9/10/65	28	G	15	10.63	1.64	270	0.66	4.73	6.49	078	0.72	1.22		
			8/14-30/65	16 1/4	R	15	10.52	1.75	268	0.62	4.64	6.94	077	0.66	1.30		
6	41 15 51	71 34 00	9/22-26/65	4	R	15	10.97	0.18	296	1.03	3.79	6.37	066	1.72	0.67		
7	41 13 48	71 35 08	9/22-27/65	4 1/4	R	10	(weak and variable)					5.54	014	0.69			
						20						5.47	008	0.65			
8	41 11 58	71 35 30	9/23-27/65	4 1/8	R	8	6.68	9.95	156	0.29	0.62	2.67	332	0.38	9.64		
						16	6.37	9.84	174	0.27	0.81	2.76	321	0.28	9.60		
9	41 13 21	71 31 51	9/22-26/65	4	R	15	8.48	11.95	298	0.70	3.66	6.16	164	0.46	0.01		
10	41 08 26	71 31 50	9/22-26.65	4 1/2	R	15		1.48	239	0.23		7.90	205	0.72	1.58		
11	41 08 12	71 37 18	6/14-18/65	4	R	10	9.16	12.36	303	2.06	3.82	5.89	156	1.99	0.04		
						20	9.23	12.34	294	1.82	3.63	5.84	115	1.61	0.00		
12	41 06 48	71 43 00	7/15-8/2/65	18	G	15	10.86	1.24	354	1.46	4.29	6.40	168	1.88	1.04		
13	41 04 30	71 49 48	7/14-18/65	4	R	10	9.29	12.21	349	2.65	3.50	5.16	162	2.66	12.20		
						20	9.33	0.03	343	2.86	3.46	5.23	162	2.89	12.28		
14	41 20 54	71 35 46	9/10-14/65	4	R	10	9.62	0.26	267	0.56	3.85	6.27	072	0.40	12.20		
						20	9.82	0.29	249	0.57	3.60	6.05	068	0.46	12.28		
15	41 17 06	71 38 00	9/15-27/65	12	G	15	10.75	1.26	270	0.73	4.65	7.15	084	0.61	1.30		
16	41 12 22	71 38 12	8/17-20/65	4	R	15		11.40	260	0.09		4.90	036	0.66	11.26		
17	41 18 48	71 42 49	7/29-8/3/65	4	R	10	10.14	1.17	245	1.11	4.97	6.92	080	0.43	1.14		
						20	9.77	1.16	250	1.11	4.82	6.58	076	0.40	0.92		
18	41 16 21	71 43 00	7/29-8/1/65	4 1/4	R	15	10.73	0.96	243	0.67	4.77	7.22	058	0.63	1.26		
19	41 11 36	71 44 12	8/17-21/65	4 1/4	R	15	11.67	1.73	286	0.60	4.39	7.66	097	1.18	1.70		
20	41 18 10	71 48 36	7/29-8/2/65	4 1/6	R	10	10.30	1.01	273	1.20	4.90	6.73	082	0.72	1.08		
						20	10.11	0.88	248	1.20	4.83	6.75	089	0.69	0.98		
21	41 13 12	71 49 00	8/18-22/65	4 1/2	R	15	11.26	1.37	265	1.15	4.77	7.28	064	1.17	1.51		
22	41 09 33	71 49 29	8/17-21/65	4 1/4	R	15	11.23	1.02	279	1.10	3.49	7.21	079	1.62	1.08		
23	41 16 30	71 54 48	6/9-13/65	4	R	10	9.80	0.75	245	1.44	4.88	6.95	084	0.83	0.94		
						20	9.76	1.05	254	1.62	4.98	6.98	062	0.74	1.04		
24	41 13 24	71 55 30	7/29-8/2/65	4 1/4	R	15	11.52	1.60	236	0.92	4.44	7.29	073	1.84	1.56		
25	41 10 27	71 55 10	6/23-27/65	4 1/4	R	15	10.43	0.82	256	1.12	3.73	6.22	092	1.77	0.64		
26	41 07 54	71 55 30	7/14-18/65	3 1/2	R	10	10.19	0.31	234	1.78	3.72	6.14	050	1.75	0.43		
						20	10.16	0.27	248	1.93	3.68	6.11	063	1.85	0.40		
27	41 04 47	71 56 21	6/23-27/65	4 1/4	R	6	(see double phase table)										
28	41 14 45	71 59 48	5/27-31/65	4	R	15	10.11	0.96	275	1.69	4.29	6.10	054	1.65	0.71		
						60	9.53	0.66	258	1.82	4.40	5.92	068	1.37	0.47		
						100	8.84	0.53	214	1.70	4.38	5.68	055	1.23	0.20		
29	41 10 42	72 02 06	6/9-13/65	4	R	15	10.07	0.68	265	0.79	3.53	7.13	118	1.60	0.70		
30	41 07 03	71 59 48	6/23-27/65	4	R	10	9.71	12.06	238	1.06	3.80	6.12	112	1.11	0.16		
						20	9.63	12.06	254	0.94	3.70	6.00	080	0.93	0.08		
31	41 07 07	72 04 51	5/24-28/66	4 1/6	R	6	8.33	11.61	302	1.10	3.02	4.87	117	1.00	11.61		

Table 6.—Block Island Sound and Long Island Sound Greenwich intervals (cont.)

No.	LOCATION		OBSERVATIONS				Slack	FLOOD STRENGTH			Slack	EBB STRENGTH			Mean current hour	VELOCITY RATIO	
	Latitude (N)	Longitude (W)	Date	Period	Method	Depth		Time	Direction (true)	Velocity		Time	Direction (true)	Velocity		Flood	Ebb
	° ′ ″	° ′ ″		Days		Feet	Hours	Hours	°	Knots	Hours	Hours	°	Knots	Hours		
31	41 07 07	72 04 51	5/24-28/66	4 1/6	R	18	7.92	11.67	296	1.03	2.99	4.68	108	0.75	11.47		
						30	7.54	11.65	271	0.84	2.96	4.56	108	0.53	11.34		
32	41 03 24	72 01 48	5/28-6/2/66	4 5/6	R	25	8.97	11.86	264	0.25	2.58	6.01	067	0.19	12.01		
						40	8.30	11.13	269	0.18	2.90	4.70	099	0.15	11.42		
33	41 01 29	72 03 37	5/24-28/66	4 1/6	R	5	8.96	11.04	223	1.22	2.67	4.62	007	1.59	11.48		
						15	8.90	11.03	223	1.15	2.69	4.59	014	1.47	11.46		
						25	8.90	11.11	226	1.27	2.73	4.50	015	1.68	11.47		
34	41 01 18	72 07 24	5/2-6/66	4 1/6	R	8	9.14	11.25	356	1.36	3.06	4.58	151	1.16	11.66		
						16	9.08	11.40	338	1.35	3.00	4.58	132	1.17	11.67		
35	41 04 13	72 09 43	5/11-12/66	1	R	6,18,30		(weak and variable)									
36	41 09 30	72 08 50	6/5-9/65	4	R	10	10.58	0.77	259	1.19	3.94	7.04	057	1.84	0.92		
						20	10.38	0.81	282	1.20	4.00	7.24	075	1.75	0.95		
37	41 07 30	72 12 18	5/14-19/66	5	R	6	10.52	0.59	236	0.39	5.21	6.32	017	0.41	1.00		
						18	11.47	0.40	263	0.42	5.40	6.79	037	0.28	1.36		
						30	9.57	0.28	253	0.38	5.33	6.46	027	0.18	0.75		
38	41 04 42	72 13 48	5/28-6/2/66	5	R	10	10.42	1.00	234	0.23	4.28	7.15	067	0.29	1.06		
						20	10.31	0.31	270	0.21	3.48	6.60	114	0.28	0.52		
39	41 05 48	72 15 48	6/7-12/66	4 3/4	R	6	11.02	1.11	223	0.44	4.46	7.48	069	0.67	1.36		
						12	10.37	0.98	254	0.39	4.00	7.23	082	0.44	0.99		
40	41 06 06	72 18 18	6/12-16/66	4	R	36	11.12	0.85	320	1.20	4.73	7.03	104	1.98	1.28		
						60	10.93	0.91	301	1.22	4.72	7.04	099	1.90	1.24		
41	41 06 39	72 20 26	6/11-16/66	4 3/4	R		(see double phase table)										
42	41 04 29	72 22 57	6/20-24/66	4 1/6	R	13	11.21	1.21	290	1.62	4.74	7.13	056	1.54	1.41		
						38	11.02	1.31	275	1.77	4.91	7.09	049	1.64	1.42		
						65	10.96	1.36	280	1.92	5.00	6.98	080	1.63	1.42		
43	41 02 23	72 16 04	6/7-11/66	4 1/4	R	7	10.49	0.87	197	1.79	4.56	6.47	004	1.56	0.94		
						18	10.51	0.74	197	1.71	4.63	6.43	002	1.57	0.90		
44	41 02 28	72 19 15	6/27-7/1/66	4 1/6	R	7	10.90	0.55	238	2.28	4.76	6.54	027	1.99	1.03		
						21	10.88	0.58	223	2.43	4.76	6.49	040	2.15	1.02		
						35	10.73	0.78	237	2.39	4.79	6.60	032	2.09	1.07		
44A	41 02 53	72 22 34	6/20-24/66	4 1/3	R	13	11.11	1.11	147	1.51	4.86	7.19	344	1.51	1.41		
						38	11.11	1.10	105	1.63	4.97	7.24	315	1.60	1.45		
						65	11.10	1.10	139	1.50	5.03	7.33	344	1.54	1.48		
45	41 01 35	72 23 05	6/27-7/1/66	4 1/6	R	19	11.26	1.08	239	1.58	5.00	7.44	016	1.49	1.54		
46	40 56 59	72 27 11	6/27-7/1/66	4	R	7	11.27	0.86	265	1.72	4.96	7.69	090	0.69	1.54		
						14	11.27	0.87	224	1.61	5.14	7.62	039	0.61	1.54		
47	41 14 42	72 02 36	5/18-22/65	4 1/2	R	10	10.45	0.49	308	2.65	3.54	6.35	148	3.64	0.55		
						20	10.38	0.49	268	2.53	3.60	6.32	122	3.42	0.54		
48	41 14 12	72 03 36	5/18-6/16/65	29 3/4	R	10	10.86	1.07	303	2.79	4.27	7.12	112	3.41	1.17		
						20	10.76	1.05	292	3.05	4.30	7.05	087	3.55	1.13		
49	41 13 06	72 05 06	5/18-22/65	4 1/2	R	10	10.73	0.88	282	4.01	4.28	6.43	137	4.76	0.92		
						20	10.66	0.87	320	4.07	4.32	6.23	123	4.55	0.86		
50	41 11 48	72 06 24	5/28-6/1/66	4	R	20		(see double phase table)									
			5/11-15/66	4	R	34											

Table 6.—Block Island Sound and Long Island Sound Greenwich Intervals (Cont.)

No.	LOCATION		OBSERVATIONS				Slack	FLOOD STRENGTH			Slack	EBB STRENGTH			Mean current hour	VELOCITY RATIO	
	Latitude (N)	Longitude (W)	Date	Period	Method	Depth		Time	Direction (true)	Velocity		Time	Direction (true)	Velocity		Flood	Ebb
	° ′ ″	° ′ ″		Days		Feet	Hours	Hours	°	Knots	Hours	Hours	°	Knots	Hours		
51	41 13 06	72 06 56	5/31-6/5/65	4 1/2	R	15	11.11	12.18	258	1.93	1.80	6.32	043	2.93	0.09		
52	41 11 40	72 08 01	5/22-27/65	4 1/2	R	8	10.04	0.58	304	2.77	3.79	5.39	152	3.39	0.29		
						16	9.88	0.45	294	2.53	3.72	5.37	114	3.04	0.20		
53	41 10 00	72 12 48	7/15-8/12/65	29	G	15	9.68	11.88	312	3.31	3.41	5.24	118	3.72	12.21		
	41 10 00	72 12 50	5/22-27/65	4 1/2	R	10	9.45	11.97	340	3.30	3.24	5.05	155	4.09	12.08		
						20	9.45	12.01	307	3.66	3.29	4.96	097	4.58	12.08		
54	41 17 55	71 54 00	7/19-23/65	4	R	10	9.96	12.37	283	1.68	3.38	5.79	118	2.17	12.53		
						30	9.80	12.35	286	1.72	3.28	5.76	108	2.22	12.46		
						50	9.73	12.34	300	1.65	3.23	5.76	112	2.06	12.42		
55	41 19 54	71 53 53	8/11-15/65	4 1/4	R	4	(see double phase tables)										
56	41 19 54	71 50 44	8/11-15/65	4 1/4	R	6	(see double phase tables)										
57	41 17 53	71 58 32	7/19-23/65	4	R	15	10.12	0.25	264	1.36	3.62	5.83	035	1.86	0.30		
						40	10.03	0.33	253	1.44	3.64	5.82	042	1.84	0.30		
						67	9.92	0.38	262	1.29	3.75	6.06	054	1.57	0.37		
58	41 19 07	71 59 18	8/11-15/65	4	R	4	(see double phase tables)										
59	41 21 15	71 58 11	8/11-15/65	4 1/4	R	6	(see double phase tables)										
60	41 17 34	72 01 41	7/19-23/65	4 1/6	R	10	9.76	0.55	255	1.55	4.00	5.50	088	1.27	0.30		
						20	9.71	0.73	260	1.41	3.97	5.44	075	1.15	0.30		
61	41 19 05	72 05 01	9/4-8/65	4 1/8	R	5	9.45	11.99	004	0.09	2.08	5.83	211	0.33	12.00		
						17		11.27	333	0.20	(weak and variable)						
						28		10.49	352	0.13	(weak and variable)						
62	41 21 38	72 05 18	9/4-8/65	4 1/4	R	5	(see double phase tables)										
						17	(see double phase tables)										
63	41 23 59	72 05 11	8/4-8/65	4 1/2	R	5	(see double phase tables)										
64	41 27 39	72 04 07	8/4-8/65	4 1/4	R	15	(see double phase tables)										
65	41 30 53	72 04 43	8/4-5/65	1	R	15	(weak and variable)										
66	41 16 00	72 06 18	5/27-31/65	4	R	15	9.73	0.06	285	1.21	3.24	5.26	062	1.62	12.34		
67	41 17 52	72 08 28	8/30-9/3/65	4 1/4	R	11	9.72	12.04	267	1.18	3.56	5.39	099	1.57	12.34		
						32	9.62	11.87	288	1.15	3.47	5.50	120	1.47	12.27		
						54	9.60	12.11	292	1.11	3.52	5.41	102	1.31	12.32		
68	41 19 24	72 10 37	8/30-9/2/65	2 1/2	R	5	9.94	12.43	352	1.62	3.24	6.25	178	0.81	0.29		
			9/7-9/65	2													
69	41 16 38	72 12 30	8/30-9/3/65	4	R	8	9.14	12.11	268	1.51	3.26	5.15	083	1.42	12.07		
						25	9.07	12.16	249	1.31	3.14	5.05	077	1.18	12.01		
						42	8.92	12.35	257	1.19	3.17	5.02	068	1.04	12.02		
70	41 14 00	72 12 18	6/9-13/65	4	R	15	11.24	1.13	236	2.13	4.76	7.51	076	2.43	1.50		
71	41 11 52	72 11 55	6/5-9/65	4	R	10	10.96	0.88	247	1.75	3.07	6.42	070	2.47	0.68		
						20	10.81	0.71	191	1.68	3.06	6.38	060	2.34	0.58		
72	41 16 21	72 16 55	7/11-15/66	4	R	13	8.34	12.41	239	1.48	3.48	4.48	041	1.42	11.84		
						26	8.06	12.18	245	1.21	3.37	4.44	048	1.07	11.67		
73	41 17 01	72 20 52	7/11-16/66	5	R	7	11.40	1.91	355	1.47	5.06	7.59	160	1.51	1.83		
74	41 19 00	72 20 46	7/16-8/10/66	25 1/2	G	15	(see double phase tables)										
75	41 23 18	72 24 14	7/15-19/66	4	R	7	0.31	2.66	295	1.13	5.58	8.48	066	1.40	2.71		
						14	0.26	2.73	284	1.11	5.76	8.57	073	1.39	2.78		
76	41 26 34	72 27 47	7/15-20/66	5 1/5	R	15	0.09	3.34	350	0.80	6.30	8.42	154	0.56	2.98		

Table 6.—Block Island Sound and Long Island Sound Greenwich Intervals (Cont.)

No.	LOCATION		OBSERVATIONS				Slack	FLOOD STRENGTH			Slack	EBB STRENGTH			Mean current hour	VELOCITY RATIO	
	Latitude (N)	Longitude (W)	Date	Period	Method	Depth		Time	Direction (true)	Velocity		Time	Direction (true)	Velocity		Flood	Ebb
	° ′ ″	° ′ ″		Days		Feet	Hours	Hours	°	Knots	Hours	Hours	°	Knots	Hours		
77	41 30 01	72 32 37	7/25-29/66	4	R	7	1.51	3.96	252	0.83	6.84	10.18	078	1.09	4.07		
						14	1.48	3.91	287	0.79	6.90	10.03	078	1.01	4.03		
78	41 34 20	72 38 53	7/26-29/66	4 1/6	R	7	2.52	4.69	345	0.90	7.42	10.68	159	1.07	4.78		
						14	2.48	4.63	006	0.81	7.39	10.66	164	0.93	4.74		
79	41 39 49	72 37 44	7/25-29/66	4 1/6	R	9	3.09	4.69	335	0.57	7.64	10.59	134	0.76	4.95		
80	41 45 04	72 39 01	7/25-29/66	4	R	9	4.15	5.71	288	0.10	7.65	11.56	096	0.66	5.72		
81	41 14 47	72 19 03	7/11-17/66	5 3/4	R	8	9.94	12.30	254	1.90	3.38	5.12	063	2.06	12.22		
						16	9.19	12.31	265	1.89	3.33	5.14	074	1.89	12.15		
82	41 12 00	72 19 05	8/18-9/15/66	29	G	15	10.72	12.41	269	1.92	4.19	6.68	066	2.27	0.74		
83	41 10 01	72 15 07	6/6-11/66	4 1/2	R	10	(see double phase tables)										
						20											
84	41 14 38	72 23 30	8/22-9/3/66	11 1/2	G	15	9.82	12.05	292	1.34	3.42	5.13	106	1.55	12.26		
			5/18-21/67	3 1/2													
85	41 08 38	72 21 25	8/20-9/3/66	15	G	15	10.37	0.04	279	1.76	3.26	6.62	041	2.06	0.42		
86	41 14 06	72 27 56	8/1-5/66	4 1/3	R	10	10.17	0.05	271	1.49	3.40	6.17	076	1.85	0.29		
						20	10.31	0.03	248	1.47	3.35	6.01	068	1.78	0.27		
87	41 10 50	72 26 54	8(1-2)-(8-12)	5 1/2	R	10	10.30	1.06	222	1.62	4.18	6.60	024	2.16	0.85		
			66			20	10.14	0.66	244	1.52	4.14	6.40	054	2.08	0.68		
87A	41 12 40	72 28 52	8/19-23/66	4	R	10	10.64	0.94	285	1.02	3.92	6.39	086	1.32	0.82		
						20	10.44	0.80	300	1.03	3.88	6.40	103	1.32	0.72		
88	41 06 18	72 27 24	8/1-5/66	4 1/4	R	10	11.01	1.28	268	1.46	4.34	6.79	046	2.19	1.20		
						20	10.76	1.12	251	1.37	4.13	6.76	038	1.82	1.04		
89	41 14 13	72 34 00	9/2-19/66	16 5/6	G	15	9.83	12.24	287	0.98	3.55	5.56	106	0.97	0.03		
90	41 09 48	72 34 10	8/29-9/8/66	15	G	15	10.76	1.01	284	1.35	3.89	6.98	090	1.53	1.00		
92	41 01 41	72 34 13	8/24-9/22/66	29 1/4	G	15	10.46	0.82	241	0.94	4.15	6.65	053	0.98	0.86		
93	41 13 39	72 42 18	8/19-24/66	4 7/8	R	10	10.16	0.42	259	1.08	3.76	6.11	068	0.99	0.46		
						20	10.21	0.51	250	1.04	3.65	5.99	061	1.01	0.43		
94	41 08 44	72 42 18	8/19-23/66	4 1/4	R	15	11.30	1.46	262	0.61	4.09	7.02	063	0.93	1.31		
95	41 04 22	72 42 32	8/8-12/66	4 1/4	R	15	10.78	1.04	256	0.73	4.04	6.69	051	0.88	0.98		
96	41 00 55	72 42 58	8/8-11/66	3	R	10	9.24	0.70	283	0.92	3.96	6.63	075	0.72	0.48		
						20	9.75	0.70	252	0.90	4.26	6.56	063	0.72	0.66		
97	41 12 34	72 49 50	5/17-6/5/67	19	G	15	10.60	0.83	272	0.75	4.14	6.78	068	0.70	0.93		
98	41 08 39	72 49 40	9/22-10/12/66	20 1/2	G	15	10.80	1.21	260	0.73	4.47	7.14	074	0.75	1.25		
99	41 04 39	72 49 48	9/26-10/11/66	15	G	15	10.36	1.16	254	0.86	4.48	6.97	070	0.73	1.09		
100	41 00 58	72 49 56	9/14-10/3/66	19	G	15	10.34	0.78	290	0.43	3.84	6.99	090	0.57	0.83		
101	41 14 26	72 55 00	8/29-9/2/66	4	R	6	9.42	11.86	052	0.22		7.28	152	0.42	12.62		
						15	9.87	11.66	043	0.30		6.92	162	0.29	12.59		
						24	9.36	11.69	032	0.28		6.46	163	0.28	12.27		
102	41 17 50	72 54 25	8/29-9/2/66	4	R	5	11.40	1.58	020	0.36	4.88	7.57	221	0.41	1.70		
						10	10.61	1.54	011	0.32	4.79	6.87	212	0.38	1.30		
103	41 12 52	72 58 00	9/7-11/66	4	R	10	10.26	0.89	256	0.35	3.70	6.37	059	0.34	0.65		
						20	10.50	0.76	256	0.30	3.64	6.23	059	0.32	0.62		
104	41 08 36	72 58 05	9/7-11/66	4 1/4	R	10	10.49	1.08	275	0.61	4.22	6.75	066	0.60	0.98		
						20	10.46	1.18	257	0.56	4.20	6.95	060	0.55	1.04		
105	41 04 31	72 58 26	9/7-14/66	7	R	10	10.81	1.02	270	0.55	4.17	6.95	068	0.59	1.08		
						20	10.85	1.04	258	0.60	4.16	6.94	053	0.60	1.09		

Table 6.—Block Island Sound and Long Island Sound Greenwich Intervals (Cont.)

No.	LOCATION		OBSERVATIONS				Slack	FLOOD STRENGTH			Slack	EBB STRENGTH			Mean current hour	VELOCITY RATIO	
	Latitude (N)	Longitude (W)	Date	Period	Method	Depth		Time	Direction (true)	Velocity		Time	Direction (true)	Velocity		Flood	Ebb
	° ′ ″	° ′ ″		Days		Feet	Hours	Hours	°	Knots	Hours	Hours	°	Knots	Hours		
106	41 00 20	72 58 27	9/7-14/66	5 1/4	R	10	10.72	0.93	277	0.96	4.06	6.70	077	0.93	0.94		
						20	10.80	1.00	266	0.88	4.01	6.64	072	0.90	0.96		
107	41 10 46	73 02 38	9/12-16/66	4	R	10	9.94	0.49	253	0.41	3.79	6.32	068	0.45	0.48		
						20	10.00	0.43	244	0.40	3.76	6.06	071	0.40	0.40		
108	41 10 21	73 06 49	9/(12-16) &	4	R	5	(see double phase tables)										
			(19-21)/66	2	R	10	10.72	1.08	331	1.20	4.54	6.16	133	1.17	0.96		
109	41 12 32	73 06 40	9/22-27/66	4 1/2	R	5	11.39	1.28	349	1.11	4.77	6.16	186	1.32	1.24		
110	41 14 24	73 06 14	9/24-28/66	3 3/4	R	5	11.61	1.23	041	1.09	4.79	7.88	270	1.11	1.72		
111	41 16 40	73 05 12	9/22-27/66	4 1/2	R	5	12.13	1.61	021	0.64	4.61	7.45	221	0.70	1.79		
112	41 18 44	73 04 47	9/22-28/66	6	R	5	(weak and variable)					7.08	093	0.42			
						10	(weak and variable)					6.90	093	0.46			
113	41 06 45	73 07 08	5/3-6/2/67	15	T	15	10.32	0.97	251	1.27	4.15	7.06	074	1.17	0.97		
114	41 04 46	73 06 40	5/3-6/2/67	29	T	15	11.02	1.38	254	0.96	4.36	7.32	075	1.01	1.36		
						60	10.21	0.92	291	0.65	3.90	7.34	078	0.75	0.94		
115	41 02 58	73 05 48	5/3-6/2/67	29	T	15	10.52	1.12	267	0.95	4.55	7.59	080	0.81	1.29		
						51	10.10	0.55	279	0.87	3.71	6.89	087	0.88	0.66		
116	41 00 14	73 05 42	5/3-18/67	15	T	15	11.34	1.26	266	0.95	4.07	8.02	092	1.12	1.52		
						40	11.16	1.17	236	0.48	4.06	7.74	081	0.65	1.38		
117	41 09 10	73 10 47	5/4-21/67	17	T	15	9.68	0.14	303	0.11	3.48	5.57	098	0.08	0.06		
						27	9.45	0.73	345	0.15	4.83	6.99	166	0.11	0.84		
118	41 10 22	73 10 50	5/4-9/67	5	R	5	(weak and variable)										
						27	(weak and variable)										
119	41 05 13	73 14 10	4/30-5/5/65	4 5/8	R	10	10.29	0.94	261	0.80	5.23	6.58	056	0.45	1.10		
						20	10.26	1.17	265	0.72	4.76	6.63	060	0.52	1.05		
	41 05 03	73 14 24	6/8-18/67	10	G	15	10.39	1.07	272	0.68	4.54	7.38	084	0.57	1.19		
120	41 01 42	73 14 02	6/6-22/67	15	G	15	11.20	1.54	232	0.40	5.00	8.01	047	0.40	1.78		
121	40 59 00	73 13 52	6/6-22/67	15	G	15	10.60	1.09	261	0.50	3.86	7.23	079	0.58	1.04		
122	40 56 18	73 13 52	6/6-20/67	13 5/6	G	15	9.10	0.37	066	0.42	3.70	6.60	232	0.36	0.28		
123	41 06 16	73 21 55	6/1-17/67	15 1/2	R	15	10.61	0.39	265	0.49	4.61	7.25	080	0.43	1.06		
124	41 03 19	73 25 15	6/11-21/67	11	T	12	8.08	9.53	229	0.22	0.63	4.84	042	0.38	10.42		
125	41 05 12	73 24 13	6/2-18/67	16 3/4	R	15	10.61	0.72	322	0.63	4.76	7.58	155	0.51	1.26		
126	41 01 58	73 24 20	6/26-7/12/67	15 2/3	G	15	11.34	1.70	283	0.90	5.24	7.62	081	0.75	1.82		
						60	10.35	1.45	269	0.61	5.27	7.67	076	0.54	1.53		
127	41 00 23	73 23 48	6/26-7/11/67	14 2/3	R	15	11.48	1.57	253	0.70	4.88	7.36	046	0.92	1.66		
						40	11.10	1.29	264	0.58	4.72	7.55	078	0.60	1.51		
						170	10.19	0.70	188	0.63	5.72	7.82	054	0.46	1.45		
128A	40 58 36	73 23 46	7/31-8/15/67	15 3/4	G	15	11.16	1.41	283	1.40	4.36	7.44	075	1.41	1.44		
129	40 55 36	73 25 03	6/10-25/67	15 1/4	T	15	10.68	1.27	190	0.51	4.49	7.91	014	0.49	1.43		
						30	9.88	1.20	179	0.37	4.33	6.79	007	0.28	0.89		
130	40 54 32	73 24 27	6/9-25/67	15	T	15	10.64	1.30	100	0.40	4.49	7.59	267	0.40	1.35		
131	41 00 53	73 32 12	7/11-30/67	18 3/4	G	12	9.24	12.13	329	0.36	2.09	6.64	134	0.83	12.18		
132A	41 59 56	73 31 01	9/19-30/67	11	G	15	11.22	1.12	239	0.92	4.43	7.28	055	0.90	1.36		
			7/14-19/67	5 1/2	G	40	10.98	1.25	247	0.73	5.05	6.92	071	0.77	1.39		
133	40 57 57	73 29 42	7/14-20/67	15 3/4	G	15	12.02	1.90	255	1.00	5.55	8.10	055	0.91	2.24		
						40	10.68	1.28	269	0.98	5.40	7.70	053	0.74	1.61		
134	40 55 09	73 30 02	6/25-7/10/67	15	R	15	11.00	1.40	117	0.62	4.52	7.79	306	0.51	1.52		

Table 6.—Block Island Sound and Long Island Sound Greenwich Intervals (Cont.)

No.	LOCATION		OBSERVATIONS				Slack	FLOOD STRENGTH			Slack	EBB STRENGTH			Mean current hour	VELOCITY RATIO	
	Latitude (N)	Longitude (W)	Date	Period	Method	Depth		Time	Direction (true)	Velocity		Time	Direction (true)	Velocity		Flood	Ebb
	° ′ ″	° ′ ″		Days		Feet	Hours	Hours	°	Knots	Hours	Hours	°	Knots	Hours		
135	40 55 30	73 34 01	6/30-7/20/67	20	T	15	1.11	3.11	260	0.51	6.53	9.46	072	0.65	3.50		
						30	11.58	2.74	300	0.51	5.80	9.14	090	0.50	2.66		
136	40 57 36	73 33 41	6/30-7/20/67	20	T	15	11.46	1.31	242	0.74	5.05	7.75	052	0.68	1.74		
						55	9.57	1.08	256	0.48	3.66	7.00	079	0.37	0.67		
137	40 59 39	73 35 40	6/30-7/20/67	20	T	15	12.16	2.84	312	0.61	5.89	9.24	118	0.70	2.88		
						30	12.00	2.33	319	0.52	5.04	9.20	142	0.67	2.48		
138	40 56 19	73 40 30	7/19-8/5/67	16 1/3	G	15	11.80	1.56	249	0.74	5.48	7.67	036	0.70	1.97		
			9/8-10/7/67	29	G												
139	40 55 29	73 39 22	5/19-6/18/67	29	G	15	11.94	2.06	234	0.39	5.15	8.24	055	0.41	2.19		
140	40 54 48	73 38 24	8/4-9/2/67	29	G	15	11.75	1.43	233	0.62	5.52	7.72	046	0.58	1.95		
						40	11.19	1.18	262	0.73	5.58	7.54	053	0.46	1.72		
141	40 55 00	73 42 44	7/29-8/14/67	15	R	15	11.44	1.30	244	0.53	5.35	7.20	059	0.39	1.66		
						30	11.24	1.25	239	0.41	5.27	6.64	069	0.26	1.34		
142	40 51 30	73 39 59	7/29-8/11/67	15	R	15	11.14	1.15	157	0.26	5.30	6.76	331	0.13	0.85		
143	40 49 41	73 39 00	7/29-8/13/67	15	R	10	10.18	0.96	142	0.90	4.24	6.40	333	0.68	0.79		
			8/13-17/67	4 1/6													
144A	40 53 26	73 45 26	9/9-24/67	15 1/2	G	15	4.67	6.86	069	0.22	11.12	0.73	234	0.25	7.40		
145	40 52 48	73 44 45	8/1-39/67	29	T	15	5.50	10.59	025	0.39	0.16	2.00	226	0.27	9.22		
146	40 52 24	73 44 00	8/1-30/67	29	T	15	5.28	7.93	058	0.59	12.01	1.76	246	0.40	8.29		
						40 & 100		(see double phase tables)									
147A	40 51 49	73 46 16	9/14-29/67	15	G	15		(see double phase tables)									
148A	40 51 22	73 46 44	9/14-30/67	16	G	15		(see double phase tables)									
149	40 51 28	73 47 36	9/4-20/67	16	G	10		(see double phase tables)									
150	40 50 37	73 45 56	9/3-10/1/67	29	T	15	6.18	10.86	032	0.58	0.87	4.31	216	0.38	10.21		
						90		(see double phase tables)									
151	40 49 45	73 43 47	8/19-9/3/67	15	G	15	10.89	1.02	115	0.38	4.85	7.46	307	0.32	1.40		
152	40 50 12	73 47 43	8/21-9/5/67	15	R	5	10.70	1.17	294	0.38	4.83	7.13	097	0.33	1.30		
153	40 51 42	73 48 48	8/22-29/67	7	R	5	10.22	1.14	294	0.66	4.32	6.56	066	0.38	0.90		
			8/29-9/14/67	15 3/4													
154	40 48 07	73 47 29	9/3-10/1/67	29	T	15	7.91	10.99	090	0.62	2.40	4.61	289	0.76	11.41		
						50	7.18	10.60	067	0.53	1.86	4.48	262	0.82	10.69		
155	40 47 54	73 47 27	9/3-10/1/67	29	T	15	8.52	11.28	090	0.80	2.74	4.71	278	0.59	11.47		
						60	8.72	11.10	068	0.50	0.97	4.57	276	0.55	11.00		
157	41 01 41	73 28 41	6/11-25/67	15	T	15	9.48	0.98	252	0.81	5.51	7.27	073	0.50	1.15		
						27	9.74	0.94	257	0.76	5.48	7.24	080	0.47	1.19		
158	40 58 28	73 05 48	5/10-24/67	14 1/2	R	15	1.84	3.59	105	0.24	6.70	9.01	308	0.64	3.73		
						22	1.10	2.96	110	0.24	6.56	8.81	296	0.54	3.26		
159	40 48 55	73 46 01	9/6-21/67	15	G	15		(see double phase tables)									
160	40 59 01	73 34 01	7/1-20/67	20	T	15	12.04	2.12	258	0.71	5.94	8.30	073	0.77	2.44		
						55	12.08	2.00	265	0.55	4.97	8.33	069	0.45	2.19		
161	40 49 43	76 46 28	9/3-10/1/67	29	T	15		(see double phase tables)									
						30											
162	40 51 43	73 40 28	8/2-7/67	5	R	15		(weak and variable)									
163	40 51 40	73 39 45	8/7-11/67	4 1/2	R	15	10.34	0.80	213	0.32	4.63	6.41	004	0.23	0.89		
164	39 48 47	73 39 05	7/29-8/2/67	4 1/3	R	5		0.70	196	0.38	(weak and variable)						

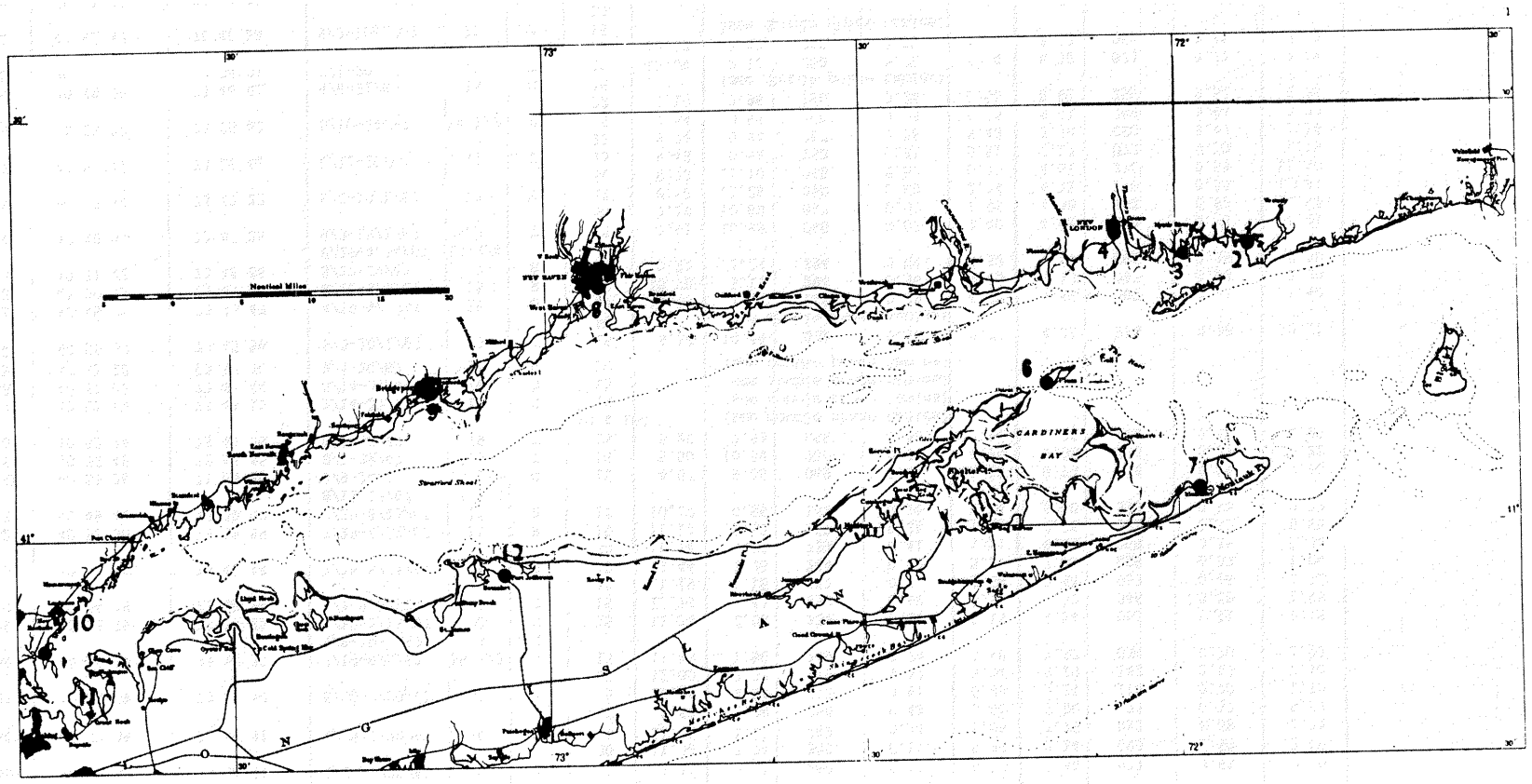

Figure 9.—Tide Observations, 1965-67

Table 7.—Observational and Processing Information for Several Stations

STATION NUMBER	STATION NAME	LATITUDE LONGITUDE	OBSERVATION INFORMATION				PROCESSING AND ANALYSIS					
			DATES OF OBSERVATIONS	TYPE OF GAGE	DATUM PLANES	BENCH MARK DESCRIPTION	HOURLY HEIGHTS	HIGH AND LOW WATER TABULATIONS	HARMONICS	DAILY PREDICTIONS	DATA AUTOMATION	TIME PLOT
1	Newport, R.I.	41°30'N 71°20'W	Continuous	S ADR	✓	✓	✓	✓	✓	✓	✓	
2	Stonington, Conn.	41°21'N 71°54'W	1967 1/6-2/15	P	No	No	✓	✓				✓
3	Noank, Conn.	41°19'N 71°59'W	1966 4/29-9/27 1967 6/9-10/30	B	✓	✓	✓	✓				✓
4	New London, Conn.	41°22'N 72°06'W	Continuous	S ADR	✓	✓	✓	✓	✓	✓	✓	✓
5	Thames River, Norwich, Conn.	41°31'N 72°05'W	1967 7/6-10/25	B	✓	✓	✓	✓			✓	✓
6	Plum Island, N.Y.	41°10'N 72°12'W	1965-1967	S ADR	✓	✓	✓	✓			✓	✓
7	Montauk, N.Y. (Fort Pond Bay)	41°03'N 71°58'W	1965-1967	S ADR	✓	✓	✓	✓			✓	✓
8	New Haven, Conn. (City Dock)	41°18'N 72°55'W	Only 1968-1969	P	✓	✓	✓	✓				✓
9	Bridgeport, Conn.	41°10'N 73°11'W	Continuous	ADR	✓	✓	✓	✓	✓	✓	✓	✓
10	New Rochelle, N.Y.	40°54'N 73°47'W	Continuous	ADR	✓	✓	✓	✓			✓	✓
11	Willets Pt., N.Y.	40°48'N 73°47'W	Continuous	S ADR	✓	✓	✓	✓	✓	✓	✓	✓
12	Port Jefferson, N.Y.	40°58'N 73°05'W	Continuous	S ADR	✓	✓	✓	✓			✓	✓

ADR = Analog-Digital Recorder
S = Standard
B = Bubbler
P = Portable

Table 8.--Tide Gage Specifications

Bubbler	
Manufacturer	Bristol
Range	0-10 and 0-50 feet
Precision	±1% of full scale
Recorder	6-inch strip chart
Record format	Analog (curvilinear)
Sampling rate	Continuous
Duration	
Chart	1 month
Chart drive	8 days (spring wound)
Processing	Visual
Operational principle	Compressed nitrogen is purged through the system, actuating a pressure-sensitive element which measures water level fluctuations.

Analog-Digital Recorder (ADR)	
Manufacturer	Fischer & Porter
Range	0-99.99 feet
Precision	±½ binary count
Recorder	Foil-backed paper tape (punch)
Record format	Binary (decimal code)
Sampling rate	6-minute intervals
Duration	
Chart	3 months
Chart drive	3 months (battery)
Processing	Mechanical translator
Operational principle	A float movement is translated into binary code and recorded on paper tape.

Table 8 (cont).--Tide Gage Specifications

Standard Tide Gage

Manufacturer	D. Ballauf
Range	0-48 feet
Precision	±0.1 foot
Recorder	13-inch strip chart
Record format	Analog (rectilinear)
Sampling rate	Continuous
Duration	
Chart	1 month
Chart drive	8 days (spring wound)
Processing	Visual or mechanical scanner
Operational principle	A float-operated gravity-counterpoised system is employed in a stilling well which measures fluctuations.

Portable Automatic Tide Gage

Manufacturer	D. Ballauf
Range	0-25 feet (scale gear ratio of 1:45)
Precision	±0.1 foot
Recorder	6-inch strip chart
Record format	Analog (rectilinear)
Sampling rate	Continuous
Duration	
Chart	48 hours
Chart drive	8 days (spring wound)
Processing	Visual
Operational principle	A float-operated counterpoised system is employed in a stilling well which measures water level fluctuations.

3.1 Data processing and analysis

Data processing and analysis consists of eight items or steps from which tide data products are developed.

1. Manual or mechanical scanning and recording of hourly heights
2. High and low water tabulations
3. Calculation of tidal datums[2]
4. Description of tidal bench marks
5. Data automation
6. Time plot[3]
7. Tidal analysis[4]
8. Input to tide tables

3.2 Tide data products

The data resulting from the processing and analysis procedure break conveniently into two categories.

3.2.1 Tide station records and products

1. Copy of original marigram
2. High and low water tabulations
3. Hourly heights abstract
4. Summary table of monthly means
5. Photocopy of general time plot
6. Special request plot (including 35-mm film)
7. Tidal harmonic constants

3.2.2 Tidal bench mark records and services

1. State index maps
2. Tidal bench mark descriptions and elevations
3. Tidal datum relationships and determinations

3.3 Tidal differences and other constants

The publication of full daily predictions is necessarily limited to a comparatively small number of stations. Tide predictions for many other place however, can be obtained by applying certain differences to the predictions. These "subordinate stations" for which such predictions can be made are listed in table 9 together with the differences and ratios to be used. These differences and ratios are to be applied to that control station which is listed in bold face type above the differences for the subordinate stations (which are arranged in geographic order). The table is discussed in detail below.

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[2]Values are computed for mean high water and mean low water, mean tide level, and times of high and low water referred to a basic control station.
[3]The sea surface height is plotted versus time.
[4]Tidal analysis involves the calculation of tidal harmonic constants.

Table 9.—Tidal Differences and Other Constants

PLACE	POSITION		DIFFERENCES				RANGES		Mean Tide Level
	Lat.	Long.	Time		Height		Mean	Spring	
			High water	Low water	High water	Low water			
	° ′	° ′	h. m.	h. m.	feet	feet	feet	feet	feet
RHODE ISLAND, Outer Coast	N.	W.	on NEWPORT						
Point Judith Harbor of Refuge-------	41 22	71 29	-0 07	+0 22	-0.4	0.0	3.1	3.9	1.5
Block Island (Great Salt Pond)------	41 11	71 35	+0 05	+0 12	-0.9	0.0	2.6	3.2	1.3
Block Island (Old Harbor)----------	41 10	71 33	-0 14	+0 17	-0.6	0.0	2.9	3.6	1.4
Watch Hill Point----------	41 18	71 52	+0 44	+1 21	-0.9	0.0	2.6	3.2	1.3
			on NEW LONDON						
Westerly, Pawcatuck River----------	41 23	71 50	-0 27	+0 02	+0.1	0.0	2.7	3.2	1.3
CONNECTICUT, Long Island Sound									
Stonington, Fishers Island Sound----	41 20	71 54	-0 33	-0 41	+0.1	0.0	2.7	3.2	1.3
Noank, Mystic River entrance--------	41 19	71 59	-0 23	-0 08	-0.3	0.0	2.3	2.7	1.2
West Harbor, Fishers Island, N. Y---	41 16	72 00	-0 01	-0 06	-0.1	0.0	2.5	3.0	1.2
Silver Eel Pond, Fishers I., N. Y---	41 15	72 02	-0 17	-0 04	-0.3	0.0	2.3	2.7	1.1
Thames River									
NEW LONDON, State Pier----------	41 22	72 06	Daily predictions				2.6	3.1	1.3
Smith Cove entrance----------	41 24	72 06	-0 01	+0 10	-0.1	0.0	2.5	3.0	1.2
Norwich----------	41 31	72 05	+0 09	+0 20	+0.4	0.0	3.0	3.6	1.5
Millstone Point----------	41 18	72 10	+0 08	+0 01	+0.1	0.0	2.7	3.2	1.3
Connecticut River									
Saybrook Jetty----------	41 16	72 21	+1 10	+0 45	+0.9	0.0	3.5	4.2	1.7
Saybrook Point----------	41 17	72 21	+1 10	+0 53	+0.6	0.0	3.2	3.8	1.6
Lyme, highway bridge----------	41 19	72 21	+1 24	+1 10	+0.5	0.0	3.1	3.7	1.5
Essex----------	41 21	72 23	+1 38	+1 38	+0.4	0.0	3.0	3.6	1.5
Hadlyme†----------	41 25	72 26	+2 18	+2 23	+0.1	0.0	2.7	3.2	1.3
East Haddam----------	41 27	72 28	+2 41	+2 53	+0.3	0.0	2.9	3.5	1.4
Haddam†----------	41 29	72 30	+2 47	+3 08	-0.1	0.0	2.5	3.0	1.2
Higganum Creek----------	41 30	72 33	+2 54	+3 25	0.0	0.0	2.6	3.1	1.3
Portland†----------	41 34	72 38	+3 50	+4 28	-0.4	0.0	2.2	2.6	1.1
Rocky Hill†----------	41 39	72 38	+4 43	+5 44	-0.6	0.0	2.0	2.4	1.0
Hartford†----------	41 46	72 40	+5 29	+6 52	-0.7	0.0	1.9	2.3	1.0
			on BRIDGEPORT						
Westbrook, Duck Island Roads--------	41 16	72 28	-0 23	-0 34	-2.6	0.0	4.1	4.7	2.0
Duck Island----------	41 15	72 29	-0 25	-0 37	-2.2	0.0	4.5	5.2	2.2
Madison----------	41 16	72 36	-0 20	-0 32	-1.8	0.0	4.9	5.6	2.4
Falkner Island----------	41 15	72 39	-0 13	-0 27	-1.5	0.0	5.4	6.2	2.7
Sachem Head----------	41 15	72 42	-0 10	-0 17	-1.3	0.0	5.4	6.2	2.7
Money Island----------	41 15	72 45	-0 11	-0 25	-1.1	0.0	5.6	6.4	2.8
Branford Harbor----------	41 16	72 49	-0 07	-0 20	-0.8	0.0	5.9	6.8	2.9
New Haven Harbor entrance----------	41 14	72 55	-0 08	-0 16	-0.5	0.0	6.2	7.1	3.1
New Haven (city dock)----------	41 18	72 55	+0 02	-0 03	-0.7	0.0	6.0	6.9	3.0
Milford Harbor----------	41 13	73 03	-0 07	-0 12	-0.1	0.0	6.6	7.6	3.3
Stratford, Housatonic River---------	41 11	73 07	+0 27	+0 59	-1.2	0.0	5.5	6.3	2.7
Shelton, Housatonic River----------	41 19	73 05	+1 36	+2 42	-1.7	0.0	5.0	5.8	2.5
BRIDGEPORT----------	41 10	73 11	Daily predictions				6.7	7.7	3.4
Black Rock Harbor entrance----------	41 09	73 13	-0 03	-0 05	+0.2	0.0	6.9	7.9	3.4
Saugatuck River entrance----------	41 06	73 22	-0 01	-0 01	+0.3	0.0	7.0	8.0	3.5
South Norwalk----------	41 06	73 25	+0 10	+0 13	+0.4	0.0	7.1	8.2	3.5
Greens Ledge----------	41 03	73 27	-0 01	-0 03	+0.5	0.0	7.2	8.3	3.6
Stamford----------	41 02	73 33	+0 04	+0 06	+0.5	0.0	7.2	8.3	3.6
Cos Cob Harbor----------	41 01	73 36	+0 06	+0 09	+0.5	0.0	7.2	8.3	3.6
Greenwich----------	41 01	73 37	+0 02	-0 01	+0.7	0.0	7.4	8.5	3.7
Great Captain Island----------	40 59	73 37	+0 01	-0 01	+0.6	0.0	7.3	8.4	3.6

† Tidal information applies only during low river stage

Table 9.—Tidal Differences and Other Constants (Cont.)

PLACE	POSITION		DIFFERENCES				RANGES		Mean Tide Level
	Lat.	Long.	Time		Height		Mean	Spring	
			High water	Low water	High water	Low water			
	° ′	° ′	h. m.	h. m.	feet	feet	feet	feet	feet
NEW YORK			on WILLETS POINT						
Long Island Sound, North Side			*Time meridian, 75°W.*						
Port Chester	41 00	73 40	-0 09	-0 12	+0.1	0.0	7.2	8.5	3.6
Rye Beach	40 58	73 40	-0 28	-0 29	+0.1	0.0	7.2	8.4	3.6
Mamaroneck	40 56	73 44	-0 08	-0 11	+0.2	0.0	7.3	8.6	3.6
New Rochelle	40 54	73 47	-0 24	-0 17	+0.1	0.0	7.2	8.6	3.6
Davids Island	40 53	73 46	-0 02	-0 07	+0.1	0.0	7.2	8.5	3.6
City Island	40 51	73 47	-0 03	-0 03	+0.1	0.0	7.2	8.5	3.6
Throgs Neck	40 48	73 48	+0 02	+0 14	-0.1	0.0	7.0	8.2	3.5
Long Island Sound, South Side									
WILLETS POINT	40 48	73 47	Daily predictions				7.1	8.3	3.5
Hewlett Point	40 50	73 45	-0 03	-0 03	0.0	0.0	7.1	8.3	3.5
Port Washington, Manhasset Bay	40 50	73 42	-0 01	+0 11	+0.2	0.0	7.3	8.6	3.6
Execution Rocks	40 53	73 44	-0 06	-0 08	+0.2	0.0	7.3	8.6	3.6
Glen Cove, Hempstead Harbor	40 52	73 39	-0 11	-0 06	+0.2	0.0	7.3	8.6	3.6
			on BRIDGEPORT						
Oyster Bay									
Oyster Bay Harbor	40 53	73 32	+0 08	+0 11	+0.6	0.0	7.3	8.4	3.6
Bayville Bridge	40 54	73 33	+0 13	+0 18	+0.7	0.0	7.4	8.5	3.7
Cold Spring Harbor	40 52	73 28	+0 08	+0 06	+0.7	0.0	7.4	8.5	3.7
Eatons Neck Point	40 57	73 24	+0 03	+0 06	+0.4	0.0	7.1	8.2	3.6
Lloyd Harbor ent., Huntington Bay	40 55	73 26	+0 03	+0 01	+0.7	0.0	7.4	8.5	3.7
Northport, Northport Bay	40 54	73 21	+0 03	+0 06	+0.6	0.0	7.3	8.4	3.6
Nissequogue River entrance	40 54	73 14	-0 03	-0 06	+0.3	0.0	7.0	8.0	3.5
Stony Brook, Smithtown Bay	40 55	73 09	+0 08	+0 08	-0.6	0.0	6.1	7.0	3.0
Stratford Shoal	41 04	73 06	-0 05	-0 09	-0.1	0.0	6.6	7.6	3.3
Port Jefferson Harbor entrance	40 58	73 05	+0 03	-0 01	-0.1	0.0	6.6	7.6	3.3
Port Jefferson	40 57	73 05	+0 06	+0 03	-0.1	0.0	6.6	7.6	3.3
Setauket Harbor	40 57	73 06	+0 04	+0 09	0.0	0.0	6.7	7.7	3.3
Conscience Bay ent. (Narrows)	40 58	73 07	+0 02	+0 02	0.0	0.0	6.7	7.7	3.3
Mount Sinai Harbor	40 58	73 02	+0 05	+0 16	-0.7	0.0	6.0	6.9	3.0
Herod Point	40 58	72 50	-0 07	-0 16	-0.8	0.0	5.9	6.8	2.9
Northville	40 59	72 39	-0 02	-0 05	-1.3	0.0	5.4	6.2	2.7
Mattituck Inlet	41 01	72 34	+0 05	-0 06	-1.5	0.0	5.2	6.0	2.6
Horton Point	41 05	72 27	-0 20	-0 35	*0.60	*0.60	4.0	4.6	2.0
Hashamomuck Beach	41 06	72 24	+0 04	-0 15	*0.63	*0.63	4.2	4.8	2.1
Truman Beach	41 08	72 19	-0 42	-0 52	*0.51	*0.51	3.4	3.9	1.7
			on NEW LONDON						
Plum Gut Harbor, Plum Island	41 10	72 12	+0 27	+0 16	0.0	0.0	2.6	3.1	1.3
Little Gull Island	41 12	72 06	+0 12	-0 22	-0.4	0.0	2.2	2.6	1.1
Shelter Island Sound									
Orient	41 08	72 18	+0 36	+0 36	-0.1	0.0	2.5	3.0	1.2
Greenport	41 06	72 22	+1 04	+0 49	-0.2	0.0	2.4	2.9	1.2
Southold	41 04	72 25	+1 43	+1 33	-0.3	0.0	2.3	2.7	1.1
Noyack Bay	41 00	72 20	+2 05	+1 44	-0.3	0.0	2.3	2.7	1.1
Sag Harbor	41 00	72 18	+0 59	+0 48	-0.1	0.0	2.5	3.0	1.2
Cedar Point	41 02	72 16	+0 44	+0 27	-0.1	0.0	2.5	3.0	1.2
Peconic Bays									
New Suffolk	41 00	72 28	+2 26	+2 11	0.0	0.0	2.6	3.1	1.3
South Jamesport	40 56	72 35	+2 32	+2 40	+0.1	0.0	2.7	3.2	1.3
Shinnecock Canal	40 54	72 30	+2 33	+2 31	-0.2	0.0	2.4	2.9	1.2
Threemile Hbr. ent., Gardiners Bay	41 02	72 11	+0 21	+0 02	-0.2	0.0	2.4	2.9	1.2
Promised Land, Napeague Bay	41 00	72 05	-0 14	-0 08	-0.3	0.0	2.3	2.7	1.1
Montauk Harbor entrance	41 04	71 56	-0 25	-0 16	-0.7	0.0	1.9	2.3	0.9
Montauk, Fort Pond Bay	41 03	71 58	-0 29	-0 24	-0.5	0.0	2.1	2.5	1.1
Montauk Point, north side	41 04	71 52	-1 13	-1 31	-0.6	0.0	2.0	2.4	1.0

* Ratios

3.3.1 Time difference

To determine the time of high water or low water at any station listed in table 9, the column headed "Differences" gives the hours and minutes to be added to or subtracted from the time of high or low water at some reference station. A plus sign indicates that the tide at the subordinate station is later than that at the reference station and the difference should be added; a minus sign indicates that it is earlier and should be subtracted.

The time obtained by the application of the time differences will be that indicated by the time meridian shown above the name of the subordinate station. (Daylight saving time is not used in the tide tables.)

To obtain the tide at a subordinate station on any date, the difference to the tide at the reference station for that same date is applied, except that, in some cases, to obtain an A.M. tide, it may be necessary to use the preceding day's P.M. tide at the reference station or to obtain a P.M. tide it may be necessary to use the following day's A.M. tide. For example, if a high water occurs at a reference station at 2200 on July 2 and the tide at the subordinate station occurs 3 hours later, then high water will occur at 0100 on July 3 at the subordinate station. For the second case, if a high water at a reference station occurs at 0200 on July 17 and the tide at the subordinate station occurs 5 hours earlier, the high water at the subordinate station will occur at 2100 at July 16.

3.3.2 Height differences

The height of the tide referred to the datum of charts is obtained by means of the height differences or ratios. A plus sign indicates that the difference should be added to the height at the reference station and a minus sign that it should be subtracted.

3.3.3 Ratio

For some stations, height differences would give unsatisfactory predictions. In such cases, these have been omitted and one or two ratios are given. Where two ratios are given, one in the "height of high water" column and one in the "height of low water" column, the high waters and low waters at the reference station should be multiplied by these respective ratios. Where only one is given, the omitted ratio is either unreliable or unknown.

For certain stations, a ratio given in parentheses is to be applied to the heights of high and low waters at the reference station; a correction in feet to be applied to that product is also given. As an example, opposite Execution Rock, the values in the height difference columns are +0.2 and 0.0; the values of the time difference are -0006 and -0008 referred to Willets Point. On a given morning, the heights of high and low water at Willets Point are 6.9 and 0.3, respectively, at times 0430 and 1101. Predicted times and heights for Execution Rock are obtained as follows.

	High (time)	High (height)	Low (time)	Low (height)
Willets Point	0430	6.9	1101	0.3
Correction	-0006	+0.2	-0008	0.0
Execution Rock	0424	7.1 feet	1053	0.3 feet

3.3.4 Ranges

The "mean range" is the difference in height between mean high water and mean low water. The "spring range" is the average semidiurnal range occurring semimonthly when the Moon is either new or full. It is larger than the mean range where the type of tide is either semidiurnal or mixed and is of no practical significance where the type of tide is diurnal. Where the tide is chiefly of the diurnal type, the tables give the diurnal range, which is the difference in height between mean higher high water and mean lower low water.

3.3.5 Datum

The datum of the predictions obtained through the height differences or ratios is also the datum of the largest scale chart for the locality. To obtain the depth at the time of high or low water, a positive predicted height should be added to the depth on the chart and a negative predicted height should be subtracted. (To find the height at times between high and low water, see paragraph 3.4 below.) On some foreign charts, the depths can be reduced to meters by multiplying by 0.3048 before being applied to the charted depths. The chart datum for the east coast of the United States and for a part of the West Indies is mean low water. For the rest of the area covered by these tables, the datums generally used are approximately mean low water, mean low water springs, Indian spring low water, or the lowest possible low water.

3.3.6 Mean tide level

The mean tide level -- or half tide level -- is a plane midway between mean low water and mean high water. Tabular values are reckoned from chart datum.

3.4 Height of tide at any time

In general, the footnote to table 10 provides sufficient guidance for determining the height of the tide at any time; several examples are given here to illustrate its use.

3.4.1 Tabular method

Assume that the height of the tide at 7^h55^m is required at Willets Point on a day when the predicted tides from the tables are as follows.

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[5] Caution: For stations where the tide is chiefly diurnal, the time differences and the height differences and ratios are intended primarily for predicting the higher high and lower low waters. When the lower high water and the higher low water at the reference station are nearly the same height, the corresponding tides often cannot be obtained satisfactorily by means of the tidal differences.

Table 10.—Height of Tide at Any Time

Duration of rise or fall, see footnote	Time from the nearest high water or low water														
h. m.	h. m.	h. m.	h. m.	h. m.	h. m.	h. m.	h. m.	h. m.	h. m.	h. m.	h. m.	h. m.	h. m.	h. m.	h. m.
4 00	0 08	0 16	0 24	0 32	0 40	0 48	0 56	1 04	1 12	1 20	1 28	1 36	1 44	1 52	2 00
4 20	0 09	0 17	0 26	0 35	0 43	0 52	1 01	1 09	1 18	1 27	1 35	1 44	1 53	2 01	2 10
4 40	0 09	0 19	0 28	0 37	0 47	0 56	1 05	1 15	1 24	1 33	1 43	1 52	2 01	2 11	2 20
5 00	0 10	0 20	0 30	0 40	0 50	1 00	1 10	1 20	1 30	1 40	1 50	2 00	2 10	2 20	2 30
5 20	0 11	0 21	0 32	0 43	0 53	1 04	1 15	1 25	1 36	1 47	1 57	2 08	2 19	2 29	2 40
5 40	0 11	0 23	0 34	0 45	0 57	1 08	1 19	1 31	1 42	1 53	2 05	2 16	2 27	2 39	2 50
6 00	0 12	0 24	0 36	0 48	1 00	1 12	1 24	1 36	1 48	2 00	2 12	2 24	2 36	2 48	3 00
6 20	0 13	0 25	0 38	0 51	1 03	1 16	1 29	1 41	1 54	2 07	2 19	2 32	2 45	2 57	3 10
6 40	0 13	0 27	0 40	0 53	1 07	1 20	1 33	1 47	2 00	2 13	2 27	2 40	2 53	3 07	3 20
7 00	0 14	0 28	0 42	0 56	1 10	1 24	1 38	1 52	2 06	2 20	2 34	2 48	3 02	3 16	3 30
7 20	0 15	0 29	0 44	0 59	1 13	1 28	1 43	1 57	2 12	2 27	2 41	2 56	3 11	3 25	3 40
7 40	0 15	0 31	0 46	1 01	1 17	1 32	1 47	2 03	2 18	2 33	2 49	3 04	3 19	3 35	3 50
8 00	0 16	0 32	0 48	1 04	1 20	1 36	1 52	2 08	2 24	2 40	2 56	3 12	3 28	3 44	4 00
8 20	0 17	0 33	0 50	1 07	1 23	1 40	1 57	2 13	2 30	2 47	3 03	3 20	3 37	3 53	4 10
8 40	0 17	0 35	0 52	1 09	1 27	1 44	2 01	2 19	2 36	2 53	3 11	3 28	3 45	4 03	4 20
9 00	0 18	0 36	0 54	1 12	1 30	1 48	2 06	2 24	2 42	3 00	3 18	3 36	3 54	4 12	4 30
9 20	0 19	0 37	0 56	1 15	1 33	1 52	2 11	2 29	2 48	3 07	3 25	3 44	4 03	4 21	4 40
9 40	0 19	0 39	0 58	1 17	1 37	1 56	2 15	2 35	2 54	3 13	3 33	3 52	4 11	4 31	4 50
10 00	0 20	0 40	1 00	1 20	1 40	2 00	2 20	2 40	3 00	3 20	3 40	4 00	4 20	4 40	5 00
10 20	0 21	0 41	1 02	1 23	1 43	2 04	2 25	2 45	3 06	3 27	3 47	4 08	4 29	4 49	5 10
10 40	0 21	0 43	1 04	1 25	1 47	2 08	2 29	2 51	3 12	3 33	3 55	4 16	4 37	4 59	5 20

Range of tide, see footnote	Correction to height														
Ft.	Ft.	Ft.	Ft.	Ft.	Ft.	Ft.	Ft.	Ft.	Ft.	Ft.	Ft.	Ft.	Ft.	Ft.	Ft.
0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2
1.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.5
1.5	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.3	0.4	0.4	0.5	0.6	0.7	0.8
2.0	0.0	0.0	0.0	0.1	0.1	0.2	0.3	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
2.5	0.0	0.0	0.1	0.1	0.2	0.2	0.3	0.4	0.5	0.6	0.7	0.9	1.0	1.1	1.2
3.0	0.0	0.0	0.1	0.1	0.2	0.3	0.4	0.5	0.6	0.8	0.9	1.0	1.2	1.3	1.5
3.5	0.0	0.0	0.1	0.2	0.2	0.3	0.4	0.6	0.7	0.9	1.0	1.2	1.4	1.6	1.8
4.0	0.0	0.0	0.1	0.2	0.3	0.4	0.5	0.7	0.8	1.0	1.2	1.4	1.6	1.8	2.0
4.5	0.0	0.0	0.1	0.2	0.3	0.4	0.6	0.7	0.9	1.1	1.3	1.6	1.8	2.0	2.2
5.0	0.0	0.1	0.1	0.2	0.3	0.5	0.6	0.8	1.0	1.2	1.5	1.7	2.0	2.2	2.5
5.5	0.0	0.1	0.1	0.2	0.4	0.5	0.7	0.9	1.1	1.4	1.6	1.9	2.2	2.5	2.8
6.0	0.0	0.1	0.1	0.3	0.4	0.6	0.8	1.0	1.2	1.5	1.8	2.1	2.4	2.7	3.0
6.5	0.0	0.1	0.2	0.3	0.4	0.6	0.8	1.1	1.3	1.6	1.9	2.2	2.6	2.9	3.2
7.0	0.0	0.1	0.2	0.3	0.5	0.7	0.9	1.2	1.4	1.8	2.1	2.4	2.8	3.1	3.5
7.5	0.0	0.1	0.2	0.3	0.5	0.7	1.0	1.2	1.5	1.9	2.2	2.6	3.0	3.4	3.8
8.0	0.0	0.1	0.2	0.3	0.5	0.8	1.0	1.3	1.6	2.0	2.4	2.8	3.2	3.6	4.0
8.5	0.0	0.1	0.2	0.4	0.6	0.8	1.1	1.4	1.8	2.1	2.5	2.9	3.4	3.8	4.2
9.0	0.0	0.1	0.2	0.4	0.6	0.9	1.2	1.5	1.9	2.2	2.7	3.1	3.6	4.0	4.5
9.5	0.0	0.1	0.2	0.4	0.6	0.9	1.2	1.6	2.0	2.4	2.8	3.3	3.8	4.3	4.8
10.0	0.0	0.1	0.2	0.4	0.7	1.0	1.3	1.7	2.1	2.5	3.0	3.5	4.0	4.5	5.0
10.5	0.0	0.1	0.3	0.5	0.7	1.0	1.3	1.7	2.2	2.6	3.1	3.6	4.2	4.7	5.2
11.0	0.0	0.1	0.3	0.5	0.7	1.1	1.4	1.8	2.3	2.8	3.3	3.8	4.4	4.9	5.5
11.5	0.0	0.1	0.3	0.5	0.8	1.1	1.5	1.9	2.4	2.9	3.4	4.0	4.6	5.1	5.8
12.0	0.0	0.1	0.3	0.5	0.8	1.1	1.5	2.0	2.5	3.0	3.6	4.1	4.8	5.4	6.0
12.5	0.0	0.1	0.3	0.5	0.8	1.2	1.6	2.1	2.6	3.1	3.7	4.3	5.0	5.6	6.2
13.0	0.0	0.1	0.3	0.6	0.9	1.2	1.7	2.2	2.7	3.2	3.9	4.5	5.1	5.8	6.5
13.5	0.0	0.1	0.3	0.6	0.9	1.3	1.7	2.2	2.8	3.4	4.0	4.7	5.3	6.0	6.8
14.0	0.0	0.2	0.3	0.6	0.9	1.3	1.8	2.3	2.9	3.5	4.2	4.8	5.5	6.3	7.0
14.5	0.0	0.2	0.4	0.6	1.0	1.4	1.9	2.4	3.0	3.6	4.3	5.0	5.7	6.5	7.2
15.0	0.0	0.2	0.4	0.6	1.0	1.4	1.9	2.5	3.1	3.8	4.4	5.2	5.9	6.7	7.5
15.5	0.0	0.2	0.4	0.7	1.0	1.5	2.0	2.6	3.2	3.9	4.6	5.4	6.1	6.9	7.8
16.0	0.0	0.2	0.4	0.7	1.1	1.5	2.1	2.6	3.3	4.0	4.7	5.5	6.3	7.2	8.0
16.5	0.0	0.2	0.4	0.7	1.1	1.6	2.1	2.7	3.4	4.1	4.9	5.7	6.5	7.4	8.2
17.0	0.0	0.2	0.4	0.7	1.1	1.6	2.2	2.8	3.5	4.2	5.0	5.9	6.7	7.6	8.5
17.5	0.0	0.2	0.4	0.8	1.2	1.7	2.2	2.9	3.6	4.4	5.2	6.0	6.9	7.8	8.8
18.0	0.0	0.2	0.4	0.8	1.2	1.7	2.3	3.0	3.7	4.5	5.3	6.2	7.1	8.1	9.0
18.5	0.1	0.2	0.5	0.8	1.2	1.8	2.4	3.1	3.8	4.6	5.5	6.4	7.3	8.3	9.2
19.0	0.1	0.2	0.5	0.8	1.3	1.8	2.4	3.1	3.9	4.8	5.6	6.6	7.5	8.5	9.5
19.5	0.1	0.2	0.5	0.8	1.3	1.9	2.5	3.2	4.0	4.9	5.8	6.7	7.7	8.7	9.8
20.0	0.1	0.2	0.5	0.9	1.3	1.9	2.6	3.3	4.1	5.0	5.9	6.9	7.9	9.0	10.0

Obtain from the predictions the high water and low water, one of which is before and the other after the time for which the height is required. The difference between the times of occurrence of these tides is the duration of rise or fall, and the difference between their heights is the range of tide for the above table. Find the difference between the nearest high or low water and the time for which the height is required.

Enter the table with the duration of rise or fall, printed in heavy-faced type, which most nearly agrees with the actual value, and on that horizontal line find the time from the nearest high or low water which agrees most nearly with the corresponding actual difference. The correction sought is in the column directly below, on the line with the range of tide.

When the nearest tide is high water, subtract the correction.

When the nearest tide is low water, add the correction.

Time (h m)	Height (ft)	Time (h m)	Height (ft)
11 14	4.2	5 22	0.1
23 10	4.1	17 41	0.6

An inspection of the above times of tide shows that the given time is between two morning tides.

The duration of the rise is $11^h\ 14^m - 5^h22^m = 5^h52^m$.

The time after low water for which the height is required is $7^h55^m - 5^h22^m = 2^h33^m$.

The range of tide is 4.2 - 0.1 = 4.1 feet.

The duration of rise or fall in table 10 is given in heavy-faced type for each 20 minutes from 4^h00^m to 10^h40^m. The nearest tabular values to 5^h52^m (the duration of the rise specified above) is 6^h; and on the horizont line of 6^h, the nearest tabular time to 2^h33^m after low water for which the height is required is 2^h36^m. Going down the column containing 2^h36^m to its intercept with the line of the range 4.0 feet (which is the nearest tabular value to the above range of 4.1 feet), the correction is found to be 1.6 fe Since this figure is reckoned from low water, it must be added to the low water value, giving 0.1 + 1.6 = 1.7 feet, which the required height above mean low water, the datum for Willets Point.

When the duration of rise and fall is greater than 10^h40^m, enter the table with one-half of the given duration and with one half of the time fron the nearest high or low water. If the duration of rise and fall is less than 4 hours, enter the table with double the given duration and with double the time from the nearest high or low water.

Similarly, when the range of tide is greater than 20 feet, enter the table with one-half of the given range. The tabular correction should then be doubled before applying it to the given high or low water height. If the range of tide is greater than 40 feet, take one-third of the range and multi the tabular correction by three.

If the height at any time is desired for a place listed in table 9, predictions of the high and low waters for the day in question should be obtained by the use of the differences given for the place in that table. With these predictions, the height for any intermediate time is obtained in the same manner as illustrated in foregoing examples.

3.4.2 Graphical method

If the height of the tide is required for a number of times on a certai day, the full tide curve for that day may be obtained by the one-quarter, one-tenth rule. The procedure is described below.

1. On cross-section paper, plot the high and low water points in the order of their occurrence for the day, measuring time horizontally and height vertically. These are the basic points for the curve.

2. Draw light straight lines connecting the points representing successive high and low waters.

3. Divide each of these straight lines into four equal parts. The halfway point of each line gives another point for the curve.

4. At the quarter point adjacent to high water, draw a vertical line about the point and, at the quarter point adjacent to low water, draw a vertical line below the point, making the length of these lines equal to one tenth of the range between the high and low waters used. The points marking the ends of these vertical lines give two additional intermediate points for the curve.

5. Draw a smooth curve through the points of high and low waters and the intermediate points, making the curve well rounded near high and low waters. This curve will closely approximate the actual tide curve, and heights for any time of the day may be readily scaled from it.[6]

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[6]Caution: Both methods presented are based on the assumption that the rise and fall conform to simple cosine curves. Therefore, the heights obtained will be approximate. The roughness of approximation will vary as the tide curve differs from a cosine curve.

Appendix I

HARMONIC CONSTANTS

Appendix I

Harmonic Constants

Although the complexity of the tidal movement it too great to permit a theoretical computation based upon the astronomical conditions only, it is possible through the analysis of observational data at any place to obtain certain constants which can be introduced into the theoretical formulas and thus adapt them for computation of the tide for any desired time. The process by which the observed data at any place are separated into a number of harmonic constituents is known as "harmonic analysis." The quantities sought in the harmonic analysis are the amplitudes (H) and the phase lag (EPOCH). Together, these are called Harmonic Constants.

The amplitude is a mean value for an entire node period whose cycle is complete in 18.6 years.

The phase lag is the phase difference between a tidal constituent and its equilibrium argument.

The units of measure for H and EPOCH in the following tables are knots and degrees, respectively.

The tables consist of harmonic constants which are derived from a 15- or 29-day harmonic analysis. The 15-day analyses are identified by parentheses enclosing the harmonic constants of the constituent N_2. The harmonic analysis are adjusted to either the 4th or 5th time zone indicating 60°W or 75°W, respectively. The number 4 or 5 enclosed in parentheses and following the station number identifies the time zone.

HARMONIC CONSTANTS

Constituent	STA. 5 (4) L 41°17'57"N λ 71°32'42"W 8/14/65 0h		STA. 12 (4) L 41°06'48"N λ 71°43'00"W 7/18/65 0h		STA. 48 (4) L 41°14'12"N λ 72°03'18"W 5/19/65 0h		STA. 53 (4) L 41°10'00"N λ 72°12'50"W 7/16/65 0h		STA. 74 (4) L 41°19'00"N λ 72°20'46"W 7/17/66 0h		STA. 82 (4) L 41°08'38"N λ 72°21'25"W 8/20/66 0h	
	(H)	EPOCH	(H)	EPOCH	(H)	EPOCH	(H)	EPOCH	(H)	EPOCH	(H)	EPOCH
J_1	0.002	350.8	0.006	355.7	0.009	20.0	0.007	348.4	0.009	45.2	0.002	353.2
K_1	0.095	321.0	0.137	14.9	0.201	33.6	0.118	3.5	0.116	54.5	0.091	8.0
K_2	0.025	349.1	0.014	243.4	0.142	264.3	0.126	252.4	0.046	265.0	0.092	245.4
L_2	0.017	312.4	0.041	244.4	0.086	277.7	0.097	235.1	0.028	263.3	0.054	241.6
M_1	0.002	291.2	0.005	34.1	0.008	47.2	0.006	18.6	0.008	63.9	0.002	22.9
M_2	0.597	270.1	1.453	245.6	3.082	249.3	3.470	214.6	1.013	261.3	1.936	237.2
M_4	0.130	240.6	0.101	231.3	0.052	124.4	0.074	173.6	0.082	74.5	0.057	165.2
M_6	0.020	276.2	0.064	263.9	0.020	182.5	0.284	147.6	0.073	237.4	0.088	191.9
M_8	0.018	280.0	0.051	341.5	0.068	152.7	0.034	45.3	0.022	156.7	0.022	245.0
N_2	(0.116	227.8)	(0.282	246.8)	0.743	220.9	0.687	194.1	(0.197	259.3)	(0.376	232.7)
$2N_2$	0.015	185.4	0.038	248.0	0.099	192.5	0.091	173.6	0.026	257.3	0.050	228.3
O_1	0.028	261.4	0.071	53.3	0.117	60.8	0.086	33.7	0.112	73.3	0.034	37.8
$2O_1$	0.001	20.6	0.003	336.5	0.005	6.4	0.004	333.3	0.005	35.8	0.002	338.3
P_1	0.031	321.0	0.045	14.9	0.067	33.6	0.039	3.5	0.039	54.5	0.030	8.0
Q_1	0.005	231.6	0.014	72.5	0.023	74.4	0.017	48.8	0.022	82.6	0.007	52.6
$2Q_1$	0.001	201.8	0.002	91.7	0.003	88.0	0.002	63.8	0.003	92.0	0.001	67.5
R_2	0.001	349.1	0.000	243.4	0.004	264.3	0.004	252.4	0.001	265.0	0.003	245.4
S_2	0.092	349.1	0.052	243.4	0.523	264.3	0.462	252.4	0.168	265.0	0.339	245.4
S_4	0.006	135.2	0.010	240.7	0.012	213.3	0.014	175.8	0.014	331.3	0.029	2.5
S_6	0.011	270.4	0.014	271.6	0.012	127.3	0.003	105.9	0.011	173.4	0.006	131.7
T_2	0.005	349.1	0.003	243.4	0.031	264.3	0.027	252.4	0.010	265.0	0.020	245.4
λ_2	0.004	306.7	0.010	244.6	0.022	256.3	0.024	232.2	0.007	263.0	0.014	241.0
ν_2	0.022	233.4	0.055	246.7	0.144	224.7	0.133	196.8	0.038	259.5	0.073	233.3
ρ_1	0.001	235.8	0.003	69.8	0.004	72.5	0.003	46.6	0.004	81.3	0.001	50.6

HARMONIC CONSTANTS

Constituent	STA. 85 (4) L 41°08'38"N λ 72°21'25"W 8/20/66 0h		STA. 89 (4) L 41°14'13"N λ 72°34'00"W 9/3/66 0h		STA. 90 (4) L 41°09'48"N λ 72°34'10"W 8/26/66 0h		STA. 92 (4) L 41°01'41"N λ 72°34'13"W 8/25/66 0h		STA. 93 (5) L 41°13'39"N λ 72°42'18"W 5/5/67 1100h		STA. 97 (4) L 41°12'34"N λ 72°49'50"W 5/20/67 0h	
	(H)	EPOCH	(H)	EPOCH	(H)	EPOCH	(H)	EPOCH	(H)	EPOCH	(H)	EPOCH
J_1	0.006	25.2	0.002	354.3	0.001	355.8	0.002	346.8	0.002	339.6	0.003	336.2
K_1	0.088	14.6	0.035	17.0	0.058	25.3	0.047	15.3	0.053	4.5	0.036	7.6
K_2	0.121	235.7	0.030	264.4	0.076	253.3	0.036	270.4	0.046	258.4	0.042	235.1
L_2	0.057	231.6	0.027	242.4	0.034	249.3	0.026	272.0	0.029	255.6	0.020	238.1
M_1	0.006	3.9	0.002	39.6	0.001	54.9	0.002	43.7	0.002	29.3	0.002	39.0
M_2	2.029	226.9	0.974	216.9	1.231	244.7	0.923	241.8	1.036	232.0	0.728	241.6
M_4	0.223	113.8	0.025	85.6	0.058	136.2	0.014	215.0	0.037	193.1	0.029	119.7
M_6	0.131	152.1	0.082	152.7	0.017	103.7	0.031	206.5	0.024	217.6	0.006	314.1
M_8	0.054	86.1	0.011	89.8	0.004	285.5	0.006	341.1	0.007	315.0	0.001	135.2
N_2	(0.394	222.1)	(0.189	191.4)	(0.239	240.1)	0.139	211.6	0.255	208.3	(0.141	245.1)
$2N_2$	0.052	217.4	0.025	66.0	0.032	235.5	0.018	181.3	0.034	184.5	0.019	248.6
O_1	0.078	353.2	0.026	62.2	0.018	84.5	0.030	72.1	0.023	54.2	0.033	70.4
$2O_1$	0.003	35.9	0.001	331.7	0.001	326.2	0.001	318.4	0.001	314.8	0.001	304.8
P_1	0.029	14.6	0.012	17.0	0.019	25.3	0.016	15.3	0.018	4.5	0.012	7.6
Q_1	0.015	342.6	0.005	84.8	0.004	114.1	0.006	100.5	0.004	79.0	0.006	101.8
$2Q_1$	0.002	331.9	0.001	107.4	0.001	143.6	0.001	128.9	0.001	103.9	0.001	133.2
R_2	0.004	235.7	0.001	264.4	0.002	253.3	0.001	270.4	0.001	258.4	0.001	235.1
S_2	0.445	235.7	0.110	264.4	0.281	253.3	0.133	270.4	0.168	258.4	0.156	235.1
S_4	0.036	134.9	0.008	141.2	0.021	162.2	0.009	171.6	0.014	177.1	0.008	123.3
S_6	0.009	278.1	0.006	52.0	0.006	132.1	0.006	221.8	0.002	309.8	0.014	310.5
T_2	0.026	235.7	0.006	264.4	0.017	253.3	0.008	270.4	0.010	258.4	0.009	235.1
λ_2	0.014	231.0	0.007	238.6	0.009	248.7	0.006	255.1	0.007	244.2	0.005	238.6
ν_2	0.076	222.8	0.037	194.9	0.046	240.7	0.027	215.6	0.049	211.5	0.027	244.6
ρ_1	0.003	344.1	0.001	81.6	0.001	109.9	0.001	96.5	0.001	75.6	0.001	97.4

HARMONIC CONSTANTS

Constituent	STA. 140B (4) L 40°54'48"N λ 73°38'24"W 8/4/67 16h		STA. 143 (4) L 40°49'41"N λ 73°39'00"W 7/29/67 10.3h		STA. 151 (4) L 40°49'45"N λ 73°43'47"W 8/19/67 16.2h		STA. 153A (5) L 40°51'42"N λ 73°49'00"W 8/30/67 0.3h		STA. 154T (5) L 40°48'07"N λ 73°47'29"W 9/2/67 23.0h		STA. 154B (5) L 40°48'07"N λ 73°47'29"W 9/2/67 23h	
	(H)	EPOCH	(H)	EPOCH	(H)	EPOCH	(H)	EPOCH	(H)	EPOCH	(H)	EPOCH
J_1	0.001	70.8	0.003	83.8	0.001	296.4	0.001	30.8	0.001	271.4	0.001	132.4
K_1	0.013	61.5	0.046	61.5	0.009	349.4	0.019	48.9	0.016	193.8	0.027	196.1
K_2	0.016	241.0	0.014	287.0	0.012	272.3	0.015	269.4	0.020	212.6	0.018	193.1
L_2	0.012	245.3	0.012	280.1	0.008	262.0	0.011	244.6	0.017	189.4	0.016	166.2
M_1	0.001	52.3	0.003	39.2	0.001	42.3	0.001	67.0	0.001	116.1	0.001	259.9
M_2	0.432	250.2	0.426	272.2	0.298	250.0	0.403	215.8	0.608	175.2	0.553	162.6
M_4	0.044	105.9	0.160	64.5	0.015	103.6	0.111	99.1	0.082	148.4	0.080	121.8
M_6	0.121	351.0	0.243	89.1	0.048	343.3	0.184	286.4	0.074	119.7	0.112	133.9
M_8	0.012	187.8	0.100	305.6	0.009	165.1	0.056	161.4	0.014	93.4	0.029	92.4
N_2	(0.084	255.2)	(0.083	264.4)	(0.058	238.1)	(0.078	187.1)	0.164	161.0	0.182	158.9
$2N_2$	0.011	260.1	0.011	265.5	0.008	226.2	0.010	158.3	0.022	146.7	0.024	155.3
O_1	0.012	43.0	0.042	16.8	0.008	95.2	0.013	85.2	0.014	38.5	0.007	323.7
$2O_1$	-----	-----	0.002	106.1	-----	-----	0.001	12.7	0.001	349.0	-----	-----
P_1	0.004	61.5	0.015	61.5	0.003	349.4	0.006	48.9	0.005	193.8	0.009	196.1
Q_1	0.002	33.8	0.008	354.5	0.002	148.2	0.002	103.3	0.003	320.8	0.001	27.5
$2Q_1$	-----	-----	0.001	332.2	-----	-----	-----	-----	-----	-----	-----	-----
R_2	0.001	241.0	-----	-----	-----	-----	-----	-----	0.001	212.6	0.001	193.1
S_2	0.057	241.0	0.051	287.0	0.044	272.3	0.055	269.4	0.075	212.6	0.068	193.1
S_4	0.003	32.8	0.025	128.5	0.002	130.8	0.001	272.0	0.008	148.0	0.013	312.8
S_6	0.008	186.2	0.010	270.8	0.005	113.4	0.012	34.2	0.002	70.0	0.018	87.9
T_2	0.003	241.0	0.003	287.0	0.003	272.3	0.003	269.4	0.004	212.6	0.004	193.1
λ_2	0.003	246.0	0.003	279.1	0.002	260.4	0.003	240.7	0.004	192.6	0.004	176.7
ν_2	0.016	254.5	0.016	265.4	0.011	239.7	0.015	190.9	0.032	162.9	0.035	159.4
ρ	-----	-----	0.002	357.6	-----	-----	-----	-----	-----	-----	-----	-----

HARMONIC CONSTANTS

Constituent	STA. 133T (4) L 40°57'57"N λ 73°29'42"W 7/15/67 0h		STA. 133B (4) L 40°56'19"N λ 73°29'42"W 7/15/67 0h		STA. 138II (4) L 40°56'19"N λ 73°40'30"W 7/21/67 0h		STA. 138IV (4) L 40°56'19"N λ 73°40'30"W 9/8/67 12h		STA. 139 (4) L 40°55'29"N λ 73°39'22"W 5/27/67 0h		STA. 140T (4) L 40°54'48"N λ 73°38'24"W 8/4/67 16h	
	(H)	EPOCH	(H)	EPOCH	(H)	EPOCH	(H)	EPOCH	(H)	EPOCH	(H)	EPOCH
J_1	0.001	41.2	0.002	349.4	0.002	56.5	0.001	14.2	0.001	357.0	0.001	349.3
K_1	0.038	25.6	0.043	9.6	0.030	73.5	0.032	360.0	0.022	64.3	0.045	12.0
K_2	0.032	332.8	0.028	299.9	0.043	332.9	0.015	299.3	0.024	285.0	0.029	306.6
L_2	0.022	306.8	0.020	279.0	0.023	307.6	0.013	274.0	0.012	286.8	0.013	287.3
M_1	0.001	10.0	0.002	29.8	0.002	90.5	0.001	346.6	0.001	131.5	-----	-----
M_2	0.780	276.9	0.701	254.9	0.818	278.5	0.463	263.4	0.412	289.0	0.475	268.5
M_4	0.043	185.6	0.042	73.6	0.010	224.4	0.042	142.8	0.014	198.4	0.021	134.5
M_6	0.162	62.9	0.119	24.1	0.124	3.6	0.072	331.2	0.032	25.6	0.096	345.2
M_8	0.035	8.6	0.027	305.2	0.008	264.1	0.022	185.0	0.006	167.8	0.015	221.9
N_2	(0.151	247.0)	(0.136	230.8)	(0.159	249.3)	0.078	252.7	(0.080	291.1)	0.140	249.7
$2N_2$	0.020	217.0	0.018	206.8	0.021	220.1	0.010	242.0	0.011	293.2	0.019	230.8
O_1	0.014	354.4	0.026	49.9	0.023	107.5	0.008	332.8	0.012	198.7	0.006	57.3
$2O_1$	0.001	56.8	0.001	329.3	0.001	39.5	-----	-----	-----	-----	-----	-----
P_1	0.012	25.6	0.014	9.6	0.010	73.5	0.011	360.0	0.007	64.3	0.015	12.0
Q_1	0.003	338.8	0.005	70.1	0.004	124.6	0.002	319.1	0.002	265.9	0.001	80.0
$2Q_1$	-----	-----	0.001	90.3	0.001	141.6	-----	-----	-----	-----	-----	-----
R_2	0.001	332.8	0.001	299.9	0.001	332.9	-----	-----	0.001	285.0	0.001	306.6
S_2	0.116	332.8	0.104	299.9	0.157	332.9	0.055	299.3	0.088	285.0	0.106	306.6
S_4	0.009	260.5	0.028	168.6	0.013	161.7	0.007	124.2	0.005	307.1	0.005	144.0
S_6	0.013	214.9	0.004	163.3	0.015	154.7	0.018	69.4	0.011	77.7	0.001	91.4
T_2	0.007	332.8	0.006	299.9	0.009	332.9	0.003	299.3	0.005	285.0	0.006	306.6
λ_2	0.006	302.8	0.005	275.8	0.006	303.7	0.003	280.0	0.003	287.1	0.003	286.2
ν_2	0.029	251.0	0.026	234.1	0.031	253.2	0.015	254.1	0.016	290.8	0.027	252.2
ρ_1	0.001	340.9	0.001	67.3	0.001	122.2	-----	-----	-----	-----	-----	-----

HARMONIC CONSTANTS

Constituent	STA. 98 (4) L 41°08'39"N λ 72°49'40"W 9/27/66 0h		STA. 99 (4) L 41°04'39"N λ 72°49'48"W 9/26/66 16h		STA. 121 (4) L 40°59'00"N λ 73°13'52"W 6/7/67 0h		STA. 125 (4) L 41°05'12"N λ 73°24'13"W 6/2/67 .3h		STA 128A (4) L 40°58'36"N λ 73°23'46"W 7/31/67 12h		STA. 131 (4) L 41°00'53"N λ 73°29'42"W 7/12/67 0h	
	(H)	EPOCH	(H)	EPOCH	(H)	EPOCH	(H)	EPOCH	(H)	EPOCH	(H)	EPOCH
J_1	0.003	44.6	0.002	356.2	0.002	307.4	0.002	279.1	0.001	336.4	0.002	322.1
K_1	0.047	50.0	0.045	16.9	0.021	342.4	0.005	321.5	0.038	6.2	0.011	340.2
K_2	0.039	278.2	0.040	262.6	0.048	327.8	0.027	265.5	0.066	263.4	0.023	239.7
L_2	0.020	262.7	0.019	246.3	0.009	287.0	0.012	267.0	0.034	253.1	0.014	222.2
M_1	0.002	55.4	0.002	37.6	0.002	17.4	0.001	4.0	0.001	36.0	0.002	358.2
M_2	0.726	244.9	0.689	227.4	0.331	240.1	0.432	268.6	1.226	241.2	0.495	202.0
M_4	0.020	119.2	0.006	109.2	0.017	30.9	0.090	78.3	0.101	168.6	0.090	301.1
M_6	0.028	154.1	0.012	110.9	0.017	163.9	0.050	62.7	0.069	290.8	0.084	346.9
M_8	0.008	40.1	0.008	214.8	0.014	202.0	0.007	235.2	0.078	171.2	0.010	343.6
N_2	(0.141	227.0)	(0.134	208.6)	(0.064	193.2)	0.084	270.3	(0.238	229.3)	(0.096	181.8)
$2N_2$	0.019	209.2	0.018	189.7	0.008	146.3	0.011	272.0	0.032	217.5	0.013	161.6
O_1	0.036	60.8	0.028	58.4	0.026	52.4	0.019	46.4	0.016	65.8	0.021	16.3
$2O_1$	0.002	39.2	0.001	335.5	0.001	272.4	0.001	236.6	0.001	306.6	0.001	304.0
P_1	0.016	50.0	0.015	16.9	0.007	342.4	0.002	321.5	0.012	6.2	0.004	340.2
Q_1	0.007	66.2	0.006	79.1	0.005	87.4	0.004	88.9	0.003	95.6	0.004	34.4
$2Q_1$	0.001	71.5	0.001	99.8	0.001	122.4	0.001	131.3	-----	-----	-----	-----
R_2	0.001	278.2	0.001	262.6	0.001	327.7	0.001	265.5	0.002	263.4	0.001	239.7
S_2	0.142	278.2	0.148	262.6	0.175	327.7	0.098	265.5	0.241	263.4	0.085	239.7
S_4	0.006	147.9	0.004	36.0	0.018	63.8	0.011	110.9	0.010	210.9	0.012	104.6
S_6	0.011	272.7	0.012	196.2	0.024	45.6	0.005	312.7	0.001	307.9	0.008	305.3
T_2	0.008	278.2	0.009	262.6	0.010	327.7	0.006	265.5	0.014	263.4	0.005	239.7
λ_2	0.005	260.3	0.005	243.8	0.002	280.8	0.003	267.2	0.009	251.5	0.004	219.5
ν_2	0.027	229.4	0.026	211.1	0.012	199.5	0.016	270.1	0.046	230.9	0.019	184.5
ρ_1	0.001	65.4	0.001	76.2	0.001	82.5	0.001	82.9	0.001	91.5	0.001	31.8

HARMONIC CONSTANTS

Constituent	STA. 159 L 40°48'55"N λ 73°46'01"W 9/6/67 8h											
	(H)	EPOCH	(H)	EPOCH	(H)	EPOCH	(H)	EPOCH	(H)	EPOCH	(H)	EPOCH
J_1	0.001	149.1										
K_1	0.026	215.2										
K_2	0.018	158.4										
L_2	0.013	154.1										
M_1	0.001	281.4										
M_2	0.456	149.1										
M_4	0.058	51.9										
M_6	0.133	166.1										
M_8	0.029	294.9										
N_2	(0.088	144.1)										
$2N_2$	0.012	139.1										
O_1	0.015	347.5										
$2O_1$	0.001	83.0										
P_1	0.008	215.2										
Q_1	0.003	53.6										
$2Q_1$	-----	-----										
R_2	0.001	158.4										
S_2	0.067	158.4										
S_4	0.006	128.8										
S_6	0.007	275.8										
T_2	0.004	158.4										
λ_2	0.003	153.4										
ν_2	0.017	144.8										
ρ_1	0.001	44.4										

Appendix II

DATA DISSEMINATION

Appendix II

Data Dissemination

Tide and tidal current data for this survey are available through the National Ocean Survey. Tidal current data prior to late 1966 are not in a digitized form. Photostatic copies of hand-plotted graphs and reductions can be obtained for these data. Data after late 1966 are available in three forms.

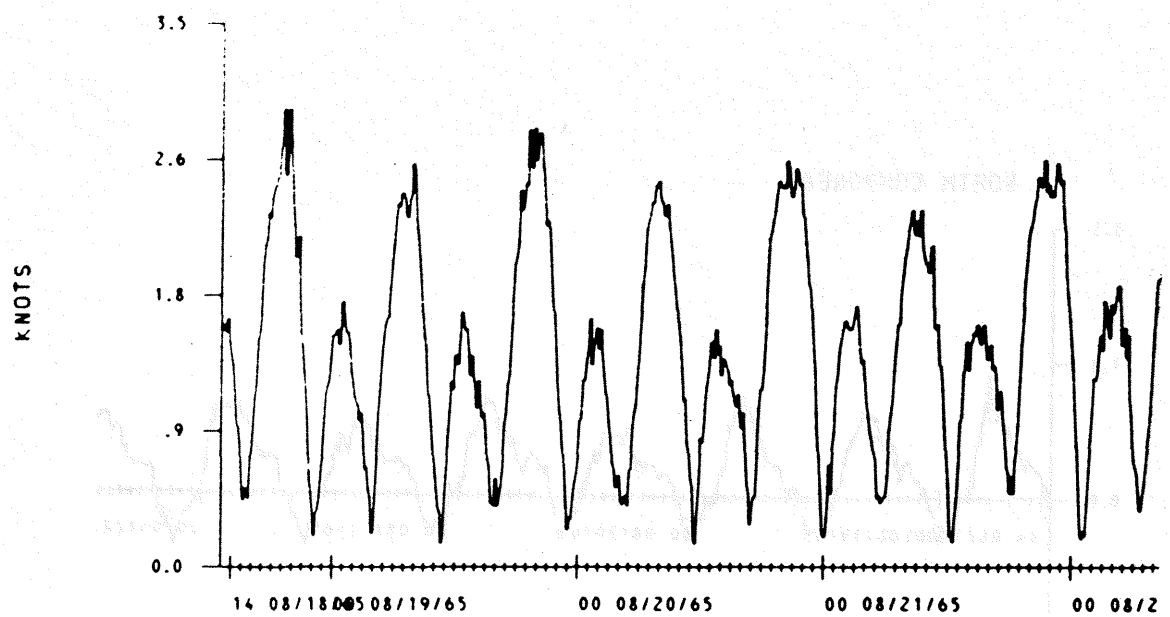
1. Original copies
2. Tabulation and summaries
3. Special products (35-mm film)

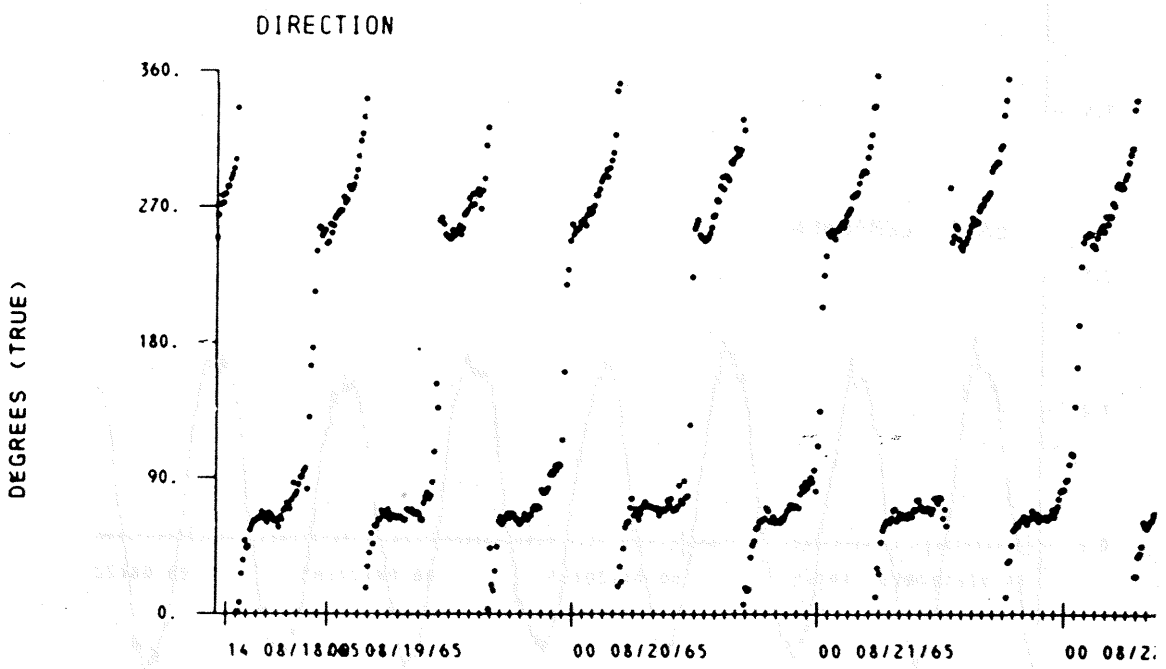
Examples of these data and products are illustrated in Appendixes III and IV. Data retrieval and reproduction costs will be assessed per type and size of request. For more information regarding these data and products, write or call

Director
NOAA, National Ocean Survey
Oceanographic Division, Code C33
6001 Executive Boulevard
Rockville, MD 20852
301-443-8487

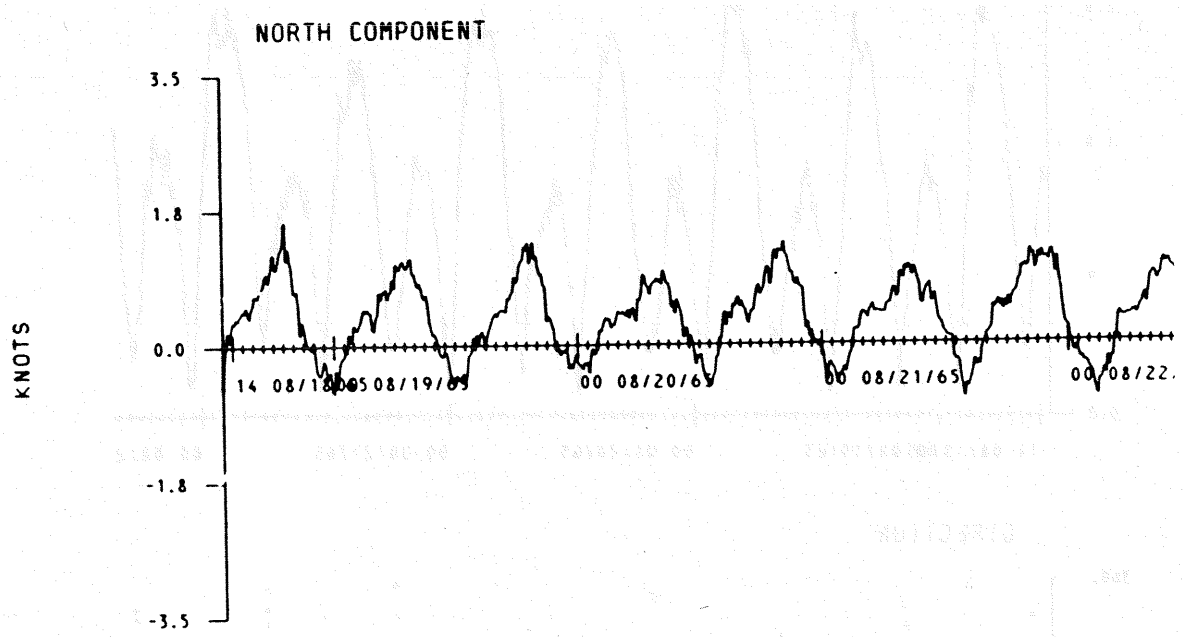
Appendix III

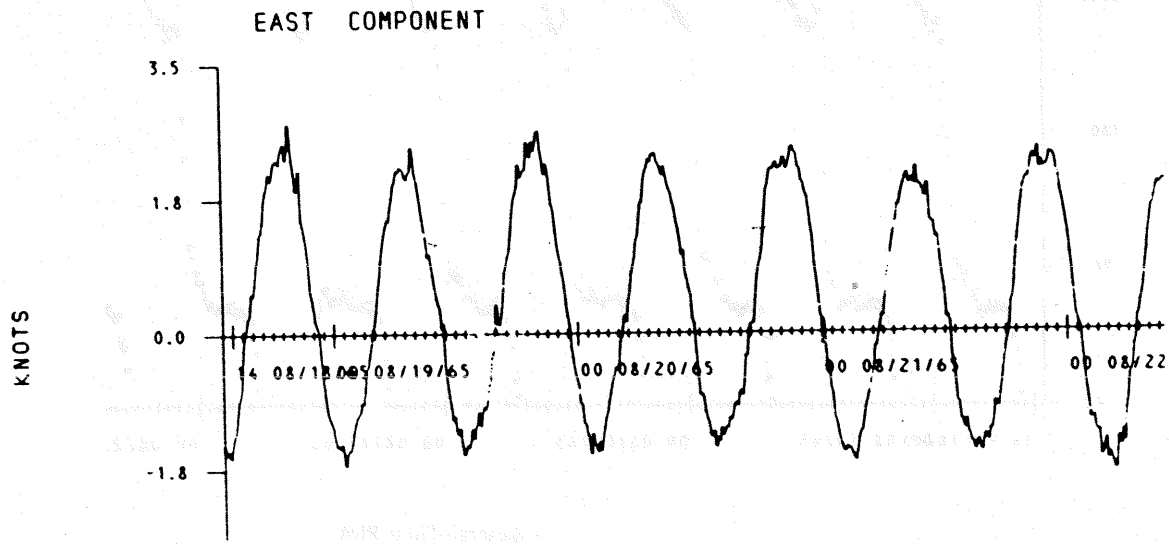
TIDAL CURRENT DATA PRODUCTS



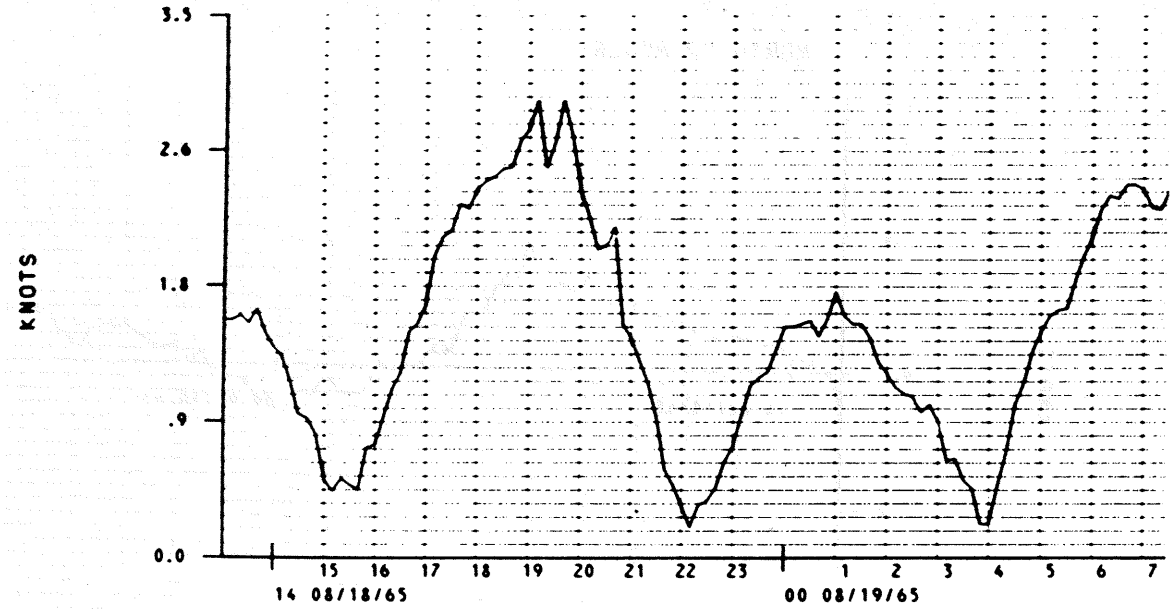


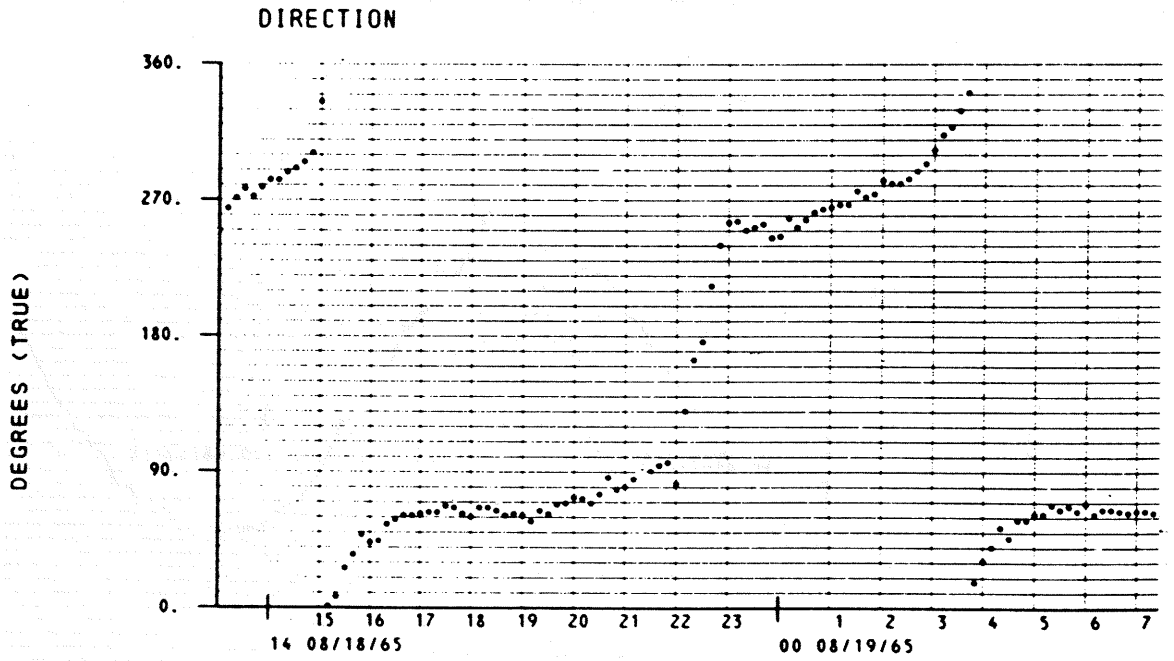
General Time Plot



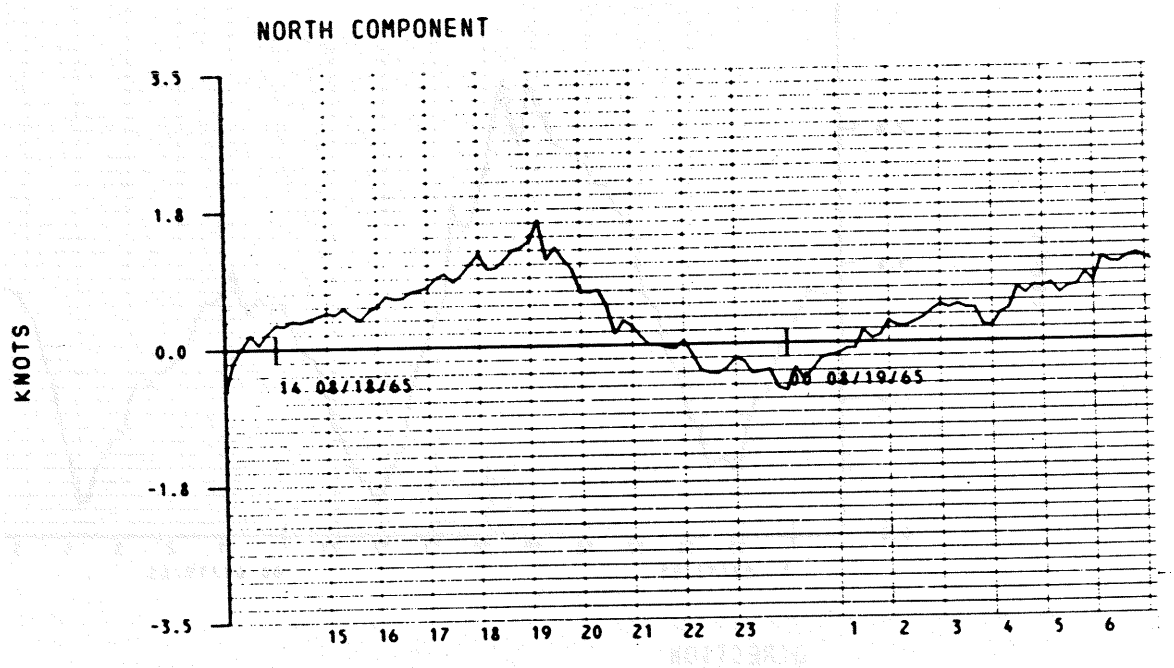


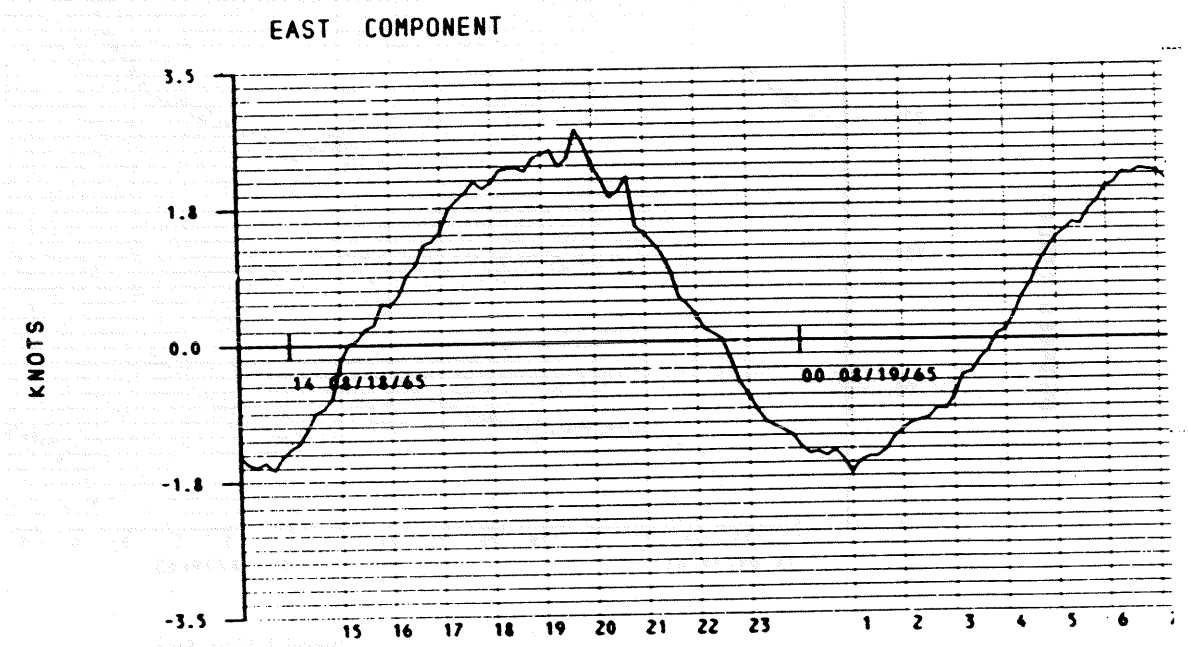
General Time Plot (Cont.)



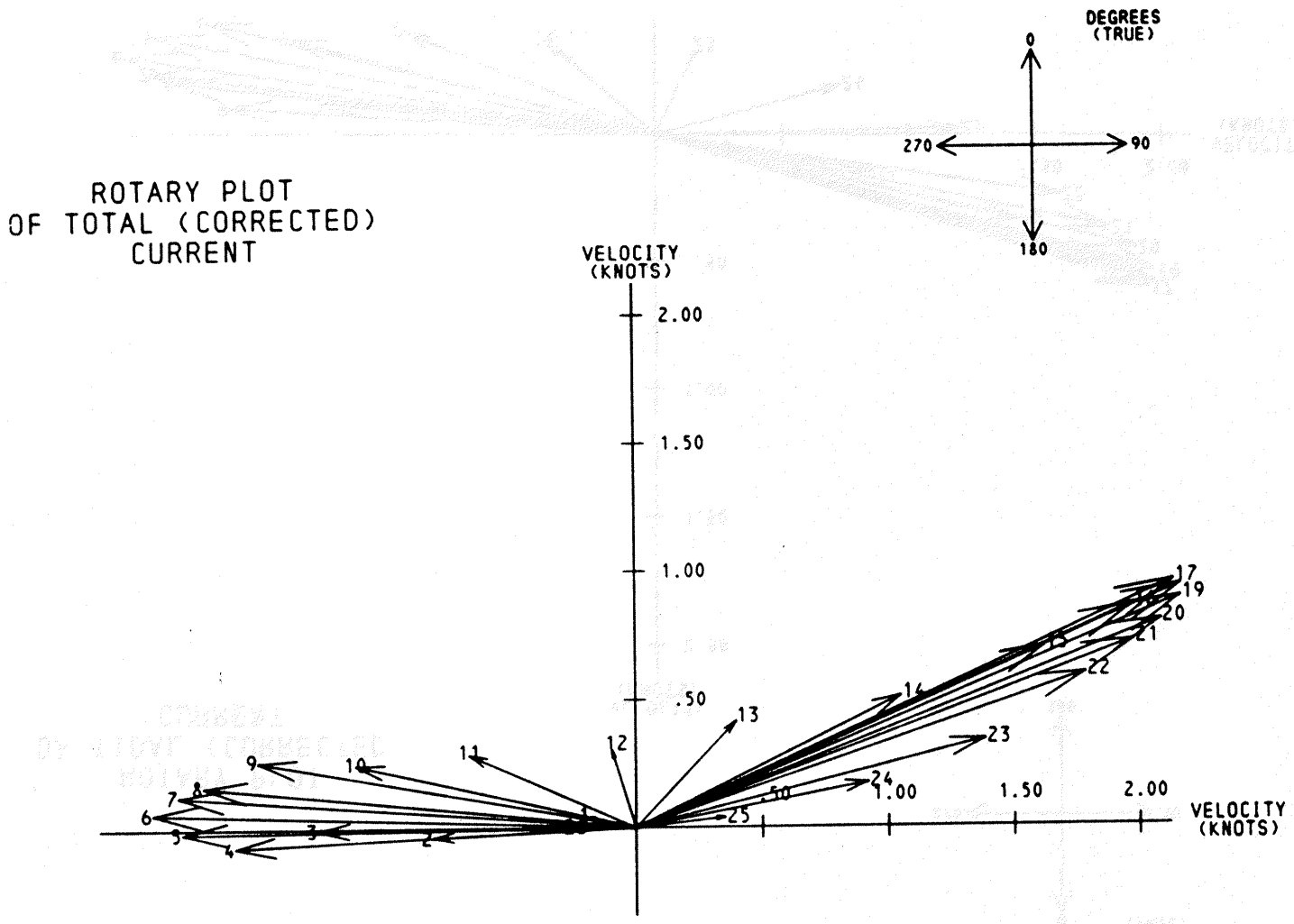


Special Time Plot

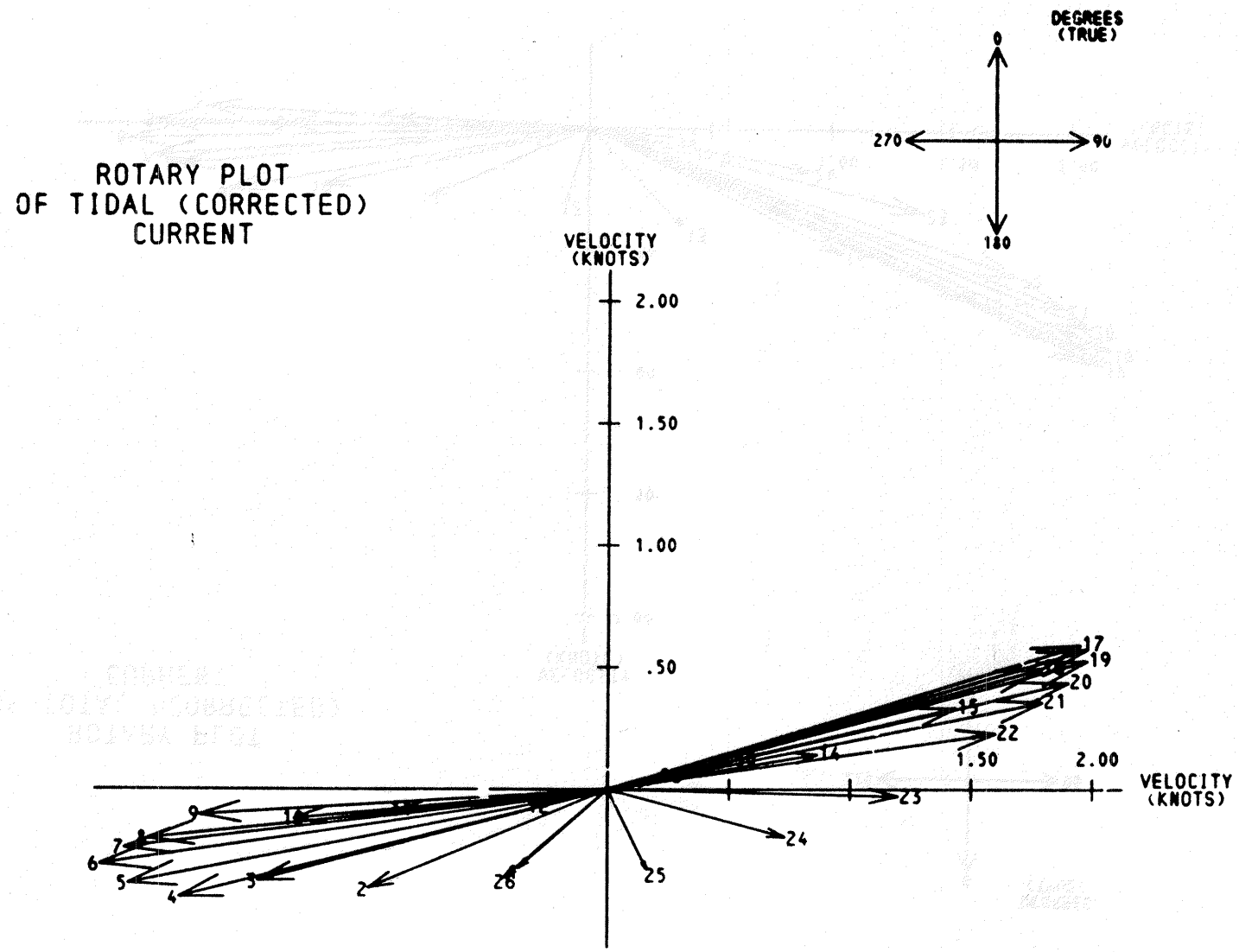




Special Time Plot (Cont.)



Rotary Plots (1)



Rotary Plots (2)

STATION 82, LONG ISLAND SOUND 1965 T.M. 075 W. DEPTH 15 FT. UNITS = KNOTS
LAT. 411200 N. LONG. 721935 W. B 08/18/65 1250 H E 09/02/65 1240H 6/HR 15 DAYS
PROJECT OPR-455-67 USC&GS MARMER RALPH J. LAND C.O. DIRECTIONS - TRUE
ROTARY REDUCTION OF 10-MINUTE SAMPLES AT HALF HOUR INTERVALS FOR 12.5 HOURS
REFERRED TO SLACK BEFORE FLOOD AT THE RACE, LONG ISLAND SOUND 1965 SBF = 10.82 HOURS

**** CORRECTED CURRENT ****

Interval Number	Greenwich Time (HR)	(Total) Speed	(Total) Direction	(Total) North Component	(Total) East Component	(Tidal) Speed	(Tidal) Direction	(Tidal) North Component	(Tidal) East Component
1	10.82	.2371	270.68	.0028	-.2371	.5461	229.17	-.3571	-.4132
2	11.32	.8608	267.52	-.0372	-.8600	1.1096	249.03	-.3970	-1.0361
3	11.82	1.3145	269.89	-.0025	-1.3145	1.5341	256.34	-.3624	-1.4907
4	12.32	1.6167	268.51	-.0421	-1.6161	1.8368	257.36	-.4020	-1.7923
5	12.82	1.8311	270.51	.0162	-1.8310	2.0364	260.28	-.3436	-2.0072
6	13.32	1.9410	272.69	.0912	-1.9389	2.1320	262.76	-.2687	-2.1150
7	13.82	1.8909	275.47	.1804	-1.8823	2.0663	265.02	-.1795	-2.0585
8	14.32	1.7503	277.95	.2421	-1.7335	1.9132	266.47	-.1177	-1.9096
9	14.82	1.5239	280.57	.2796	-1.4980	1.6761	267.25	-.0803	-1.6742
10	15.32	1.1380	284.17	.2786	-1.1034	1.2821	266.37	-.0813	-1.2796
11	15.82	.6967	294.65	.2906	-.6332	.8123	265.11	-.0693	-.8094
12	16.32	.3146	343.79	.3021	-.0878	.2702	257.66	-.0577	-.2640
13	16.82	.5994	46.60	.4118	.4355	.2645	78.67	.0520	.2594
14	17.32	1.2131	63.83	.5351	1.0887	.9293	79.13	.1752	.9126
15	17.82	1.8023	67.04	.7030	1.6596	1.5226	76.98	.3431	1.4834
16	18.32	2.1807	66.83	.8579	2.0048	1.8953	74.76	.4981	1.8287
17	18.82	2.3433	66.38	.9390	2.1469	2.0541	73.62	.5791	1.9708
18	19.32	2.3752	66.88	.9328	2.1844	2.0884	74.08	.5730	2.0083
19	19.82	2.3341	68.16	.8683	2.1666	2.0544	75.67	.5085	1.9905
20	20.32	2.2198	69.84	.7649	2.0839	1.9502	78.01	.4050	1.9077
21	20.82	2.0362	70.61	.6760	1.9207	1.7730	79.73	.3162	1.7446
22	21.32	1.7417	72.26	.5306	1.6589	1.4926	83.43	.1708	1.4828
23	21.82	1.2922	75.65	.3202	1.2519	1.0765	92.11	-.0396	1.0758
24	22.32	.8054	77.97	.1678	.7878	.6411	107.43	-.1920	.6116
25	22.82	.2728	77.21	.0604	.2661	.3127	163.29	-.2995	.0899
26	23.32	.3404	267.75	-.0134	-.3402	.6371	234.14	-.3732	-.5163

**** VELOCITY CORRECTION FACTOR = .92 ****
**** MAXIMUM OBSERVED CURRENT 2.95 UNITS AT 57.00 and 68.00 DEGREES (TRUE) ****

Rotary Reduction

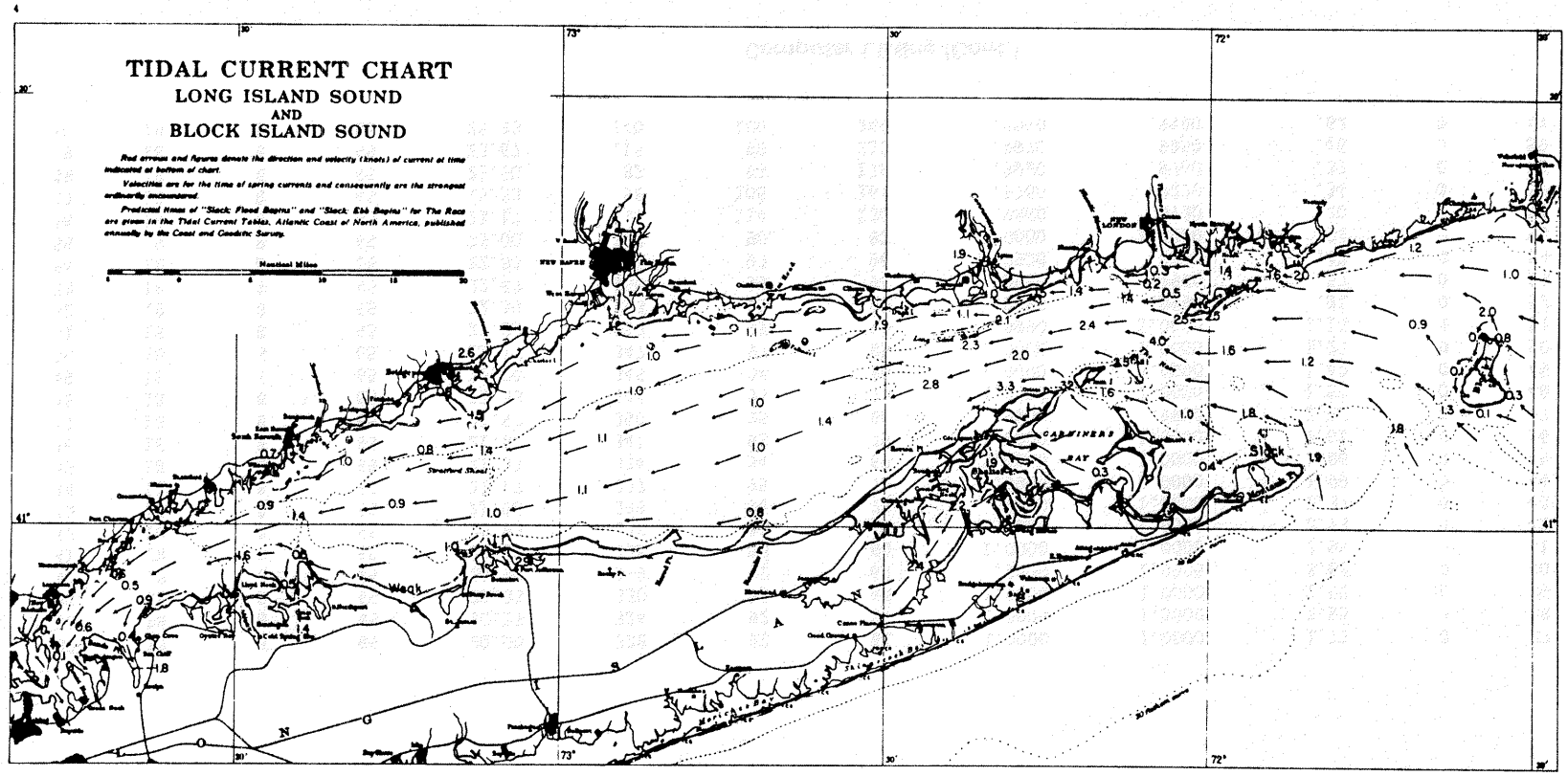
U.S. COAST AND GEODETIC SURVEY
STA. NO. 82, LONG ISLAND SOUND 1965 T.M. 60 W. DEPTH 15 FEET CHART 1212
LAT. 411200 N., LONG. 721905 W., DATA BEGIN 8/18/65 AT 13.8333 HR. 6/HR.
SHIP USC&GS MARMER OPR-455 G.M. POOR - PHOTOMETER
DATA FROM TAPE NOS 0752(3) BLOCKED ON E-TAPE 3796(3)

1	18	8	65	13.83	143	106	249	.9650	.7800	1.13	0	1
2	18	8	65	14.00	165	98	264	1.0000	1.0000	1.53	0	2
3	18	8	65	14.17	171	100	271	.9990	1.0000	1.56	0	3
4	18	8	65	14.33	176	100	277	1.0000	1.0000	1.51	0	4
5	18	8	65	14.50	172	100	272	.9990	1.0000	1.60	0	5
6	18	8	65	14.67	178	100	278	.9990	1.0000	1.45	0	6
7	18	8	65	14.83	181	101	283	.9990	.9990	1.16	0	7
8	18	8	65	15.00	182	100	283	.9990	.9990	1.30	0	8
9	18	8	65	15.17	185	102	288	.9980	.9990	1.14	0	9
10	18	8	65	15.33	184	107	291	.9990	.8140	.93	0	10
11	18	8	65	15.50	192	103	295	.9970	.9980	.90	0	11
12	18	8	65	15.67	199	102	301	.9980	.9980	.80	0	12
13	18	8	65	15.83	229	106	335	.9930	.9900	.50	0	13
14	18	8	65	16.00	252	109	1	.9840	.9840	.43	0	14
15	18	8	65	16.17	265	102	7	.9920	.9930	.51	0	15
16	18	8	65	16.33	283	102	26	.9890	.9940	.47	0	16
17	18	8	65	16.50	291	103	35	.9950	.9920	.44	0	17
18	18	8	65	16.67	306	101	48	.9960	.9930	.71	0	18
19	18	8	65	16.83	305	97	43	.9970	1.0000	.73	0	19
20	18	8	65	17.00	307	97	44	.9990	.9930	.71	0	20
21	18	8	65	17.17	317	97	55	.9990	.9990	1.09	0	21
22	18	8	65	17.33	322	95	58	.9990	.9990	1.19	0	22
23	18	8	65	17.50	327	94	61	.9990	.9990	1.46	0	23
24	18	8	65	17.67	327	93	61	.9990	1.0000	1.51	0	24
25	18	8	65	17.83	326	95	62	.9990	.9990	1.64	0	25
26	18	8	65	18.00	330	92	63	.9990	1.0000	1.95	0	26
27	18	8	65	18.17	329	93	63	.9990	1.0000	2.07	0	27
28	18	8	65	18.33	333	94	67	1.0000	1.0000	2.11	0	28
29	18	8	65	18.50	333	92	66	1.0000	1.0000	2.28	0	29
30	18	8	65	18.67	330	92	62	1.0000	1.0000	2.25	0	30
31	18	8	65	18.83	327	92	60	1.0000	1.0000	2.38	0	31
32	18	8	65	19.00	333	93	66	1.0000	1.0000	2.43	0	32
33	18	8	65	19.17	333	92	66	1.0000	1.0000	2.46	0	33
34	18	8	65	19.33	331	92	64	1.0000	1.0000	2.51	0	34
35	18	8	65	19.50	328	92	61	1.0000	1.0000	2.52	0	35
36	18	8	65	19.83	328	93	62	.9990	1.0000	2.69	0	36

Computer Listing

37	18	8	65	20.00	328	92	61	1.0000	1.0000	1.77	0	37
38	18	8	65	20.17	324	92	57	1.0000	1.0000	2.95	0	38
39	18	8	65	20.33	330	93	64	1.0000	1.0000	2.52	0	39
40	18	8	65	20.50	329	92	62	.9990	1.0000	2.68	0	40
41	18	8	65	20.67	335	93	68	1.0000	1.0000	2.95	0	41
42	18	8	65	20.83	336	93	69	1.0000	1.0000	2.73	0	42
43	18	8	65	21.00	339	94	73	.9990	1.0000	2.37	0	43
44	18	8	65	21.17	337	95	72	.9990	1.0000	1.99	0	44
45	18	8	65	21.33	334	94	69	1.0000	1.0000	1.86	0	45
46	18	8	65	21.50	341	93	75	1.0000	1.0000	2.01	0	46
47	18	8	65	21.67	350	95	86	.9950	.9990	2.13	0	47
48	18	8	65	21.83	344	93	78	1.0000	1.0000	1.51	0	48
49	18	8	65	22.00	345	94	80	1.0000	1.0000	1.42	0	49
50	18	8	65	22.17	347	97	85	1.0000	1.0000	1.27	0	50
51	18	8	65	22.33	353	97	90	.9990	1.0000	1.13	0	51
52	18	8	65	22.50	353	97	90	.9980	.9990	.91	0	52
53	18	8	65	22.67	355	99	94	.9960	.9990	.57	0	53
54	18	8	65	22.83	358	97	96	.9920	.9920	.47	0	54
55	18	8	65	23.00	352	90	82	1.0000	1.0000	.34	0	55
56	18	8	65	23.17	16	114	130	.9860	.9730	.20	0	56
57	18	8	65	23.33	58	105	164	.9760	.9270	.34	0	57
58	18	8	65	23.50	82	93	176	.9920	.9760	.37	0	58
59	18	8	65	23.67	115	98	213	.9970	.9950	.45	0	59
60	18	8	65	23.83	140	100	240	.9990	.9980	.62	0	60

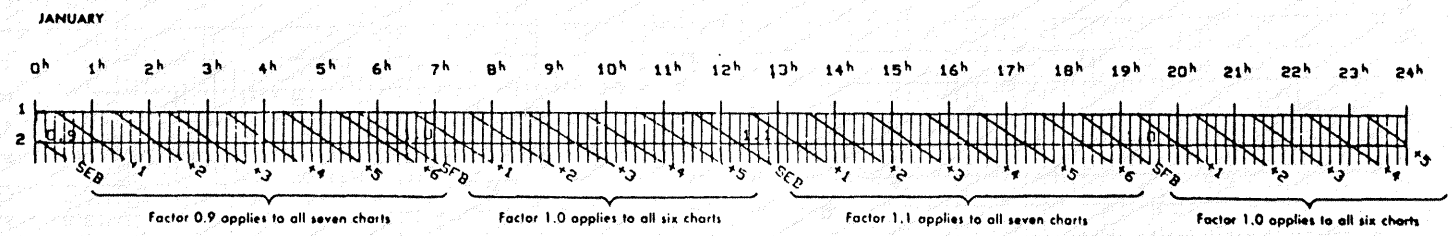
Computer Listing (Cont.)



THREE HOURS AFTER "SLACK; FLOOD BEGINS" AT THE RACE

Tidal Current Chart (Extract)

TIDAL CURRENT DIAGRAMS
FOR
BLOCK ISLAND SOUND AND EASTERN LONG ISLAND SOUND TIDAL CURRENT CHARTS



PREDICTIONS AT "THE RACE"

JANUARY DAY	SLACK WATER TIME H.M.	MAXIMUM CURRENT TIME H.M.	MAXIMUM CURRENT VEL. KNOTS
2	0007	0318	3.7E
SU	0629	0918	3.4F
	1218	1541	4.2E
	1902	2150	3.4F

The Tidal Current Diagrams are a series of 12 monthly diagrams to be used with the tidal current charts. There is one diagram for each month of the year. A new set of diagrams must be purchased each year. The diagrams are to be used instead of using the tidal current tables. The tidal current tables may still be used along with the instructions inside the front cover of the tidal current charts, but it is thought to be more convenient to use the diagram method. The diagram method is a computer constructed graph that indicates the time of each tidal current chart throughout each month. The diagram method indicates directly the chart and the speed correction factor to use at any desired time. The diagrams utilize the tidal current predictions to determine the location of the lines and the speed factors. Thus the required calculations are already done for the user. The diagram for January 2, 1972, is shown at the top of the page. The data used to construct these lines and speed factors are taken from the tidal current tables (see predictions under the diagram.. The times for "Slack; Ebb Begins At The Race" (SEB), occurs at 00:07 and 12:18 EST. The speed factor for all charts related to SEB 00:07 EST is 0.9 and should be applied to the 6 charts referred to it. The factor is 1.1 for the series of charts referred to SEB 12:18 EST. "Slack; Flood Begins At The Race" SFB, occurs at 06:29 and 19:02 EST. The speed factor for both series is 1.0 therefore the speeds on these charts remain unchanged.

The name designation for each chart has been shortened to allow for inclusion in the Tidal Current Diagrams and are listed below.

1. "Slack; Flood Begins" AT THE RACE (SFB)
2. One hour after "Slack; Flood Begins" AT THE RACE (SFB+1)
3. Two hours after "Slack; Flood Begins" AT THE RACE (SFB+2)
4. Three hours after "Slack; Flood Begins" AT THE RACE (SFB+3)
5. Four hours after "Slack; Flood Begins" AT THE RACE (SFB+4)
6. Five hours after "Slack; Flood Begins" AT THE RACE (SFB+5)
7. "Slack; Ebb Begins" AT THE RACE (SEB)
8. One hour after "Slack; Ebb Begins" AT THE RACE (SEB+1)
9. Two hours after "Slack; Ebb Begins" AT THE RACE (SEB+2)
10. Three hours after "Slack; Ebb Begins" AT THE RACE (SEB+3)
11. Four hours after "Slack; Ebb Begins" AT THE RACE (SEB+4)
12. Five hours after "Slack; Ebb Begins" AT THE RACE (SEB+5)
13. Six hours after "Slack; Ebb Begins" AT THE RACE (SEB+6)

INSTRUCTIONS

EXAMPLE: Determine the chart to use at 02:25 A.M. (EST) on January 2, 1972. Determine the direction and speed of the current in Plum Gut (between Plum I. and Orient Pt.) at 02:25 A.M. (EST) on January 2, 1972.

PROCEDURE:

1. Read vertically on the tidal current diagram to January 2, 1972. Then read horizontally to 02:25 A.M. (EST).

2. Chart SEB+2 is the chart to use.

3. Apply a factor 0.9 to all speeds on the chart. (The speed factor appears after each slack line and applies to each chart referred to it.)

   0.9 x 4.7=4.2 knots (Ebbing).

4. For more accuracy interpolate between Charts SEB+2 and SEB+3.

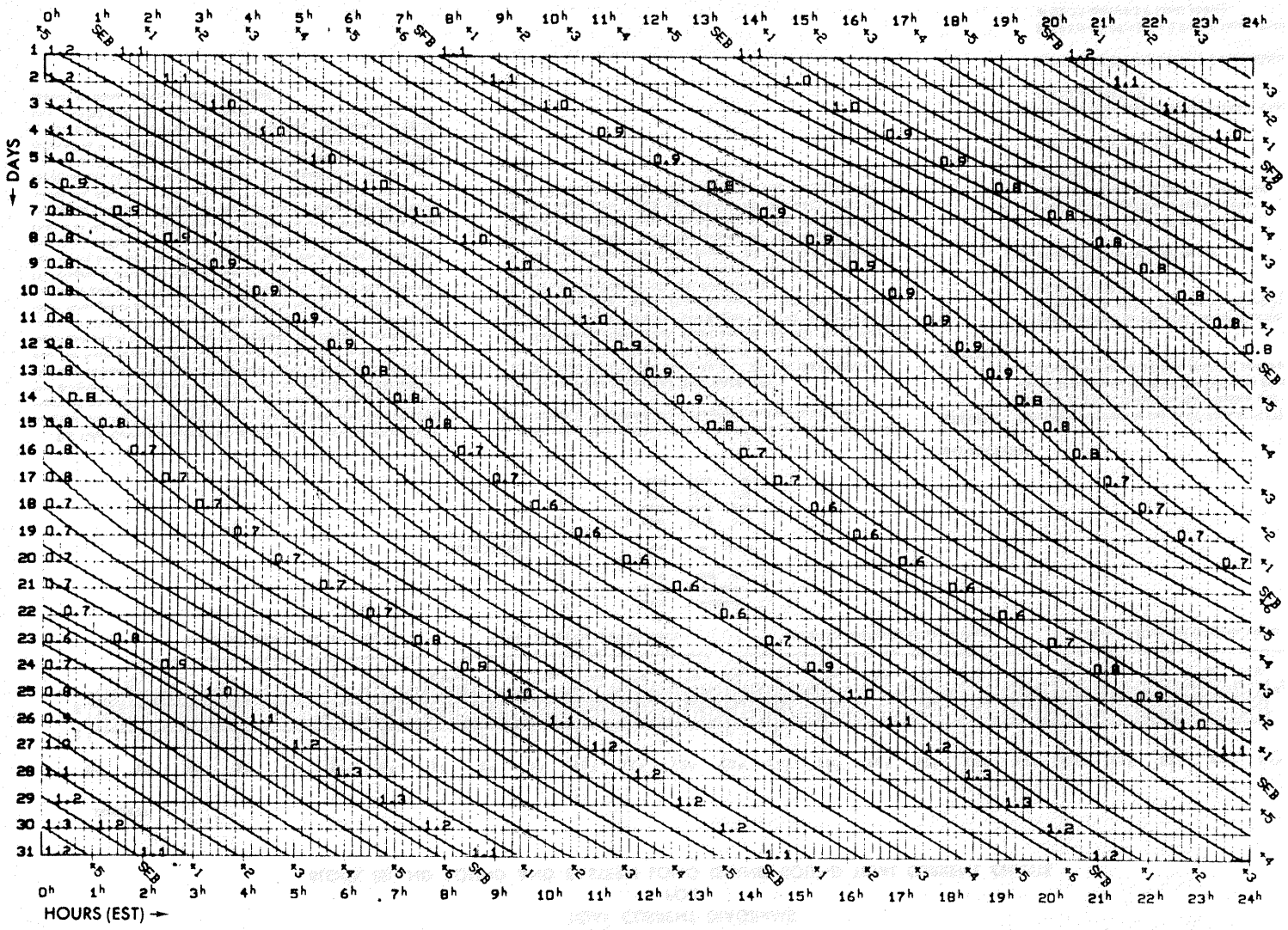
   SEB+2 @ 02:07=4.7 x 0.9=4.2 knots ebbing.

   SEB+3 @ 03:07=3.8 x 0.9=3.4 knots ebbing.
   @ 02:25 speed=3.9 knots ebbing.

A-5653

TIDAL CURRENT CHART DIAGRAM FOR
BLOCK ISLAND SOUND AND EASTERN LONG ISLAND SOUND TIDAL CURRENT CHARTS

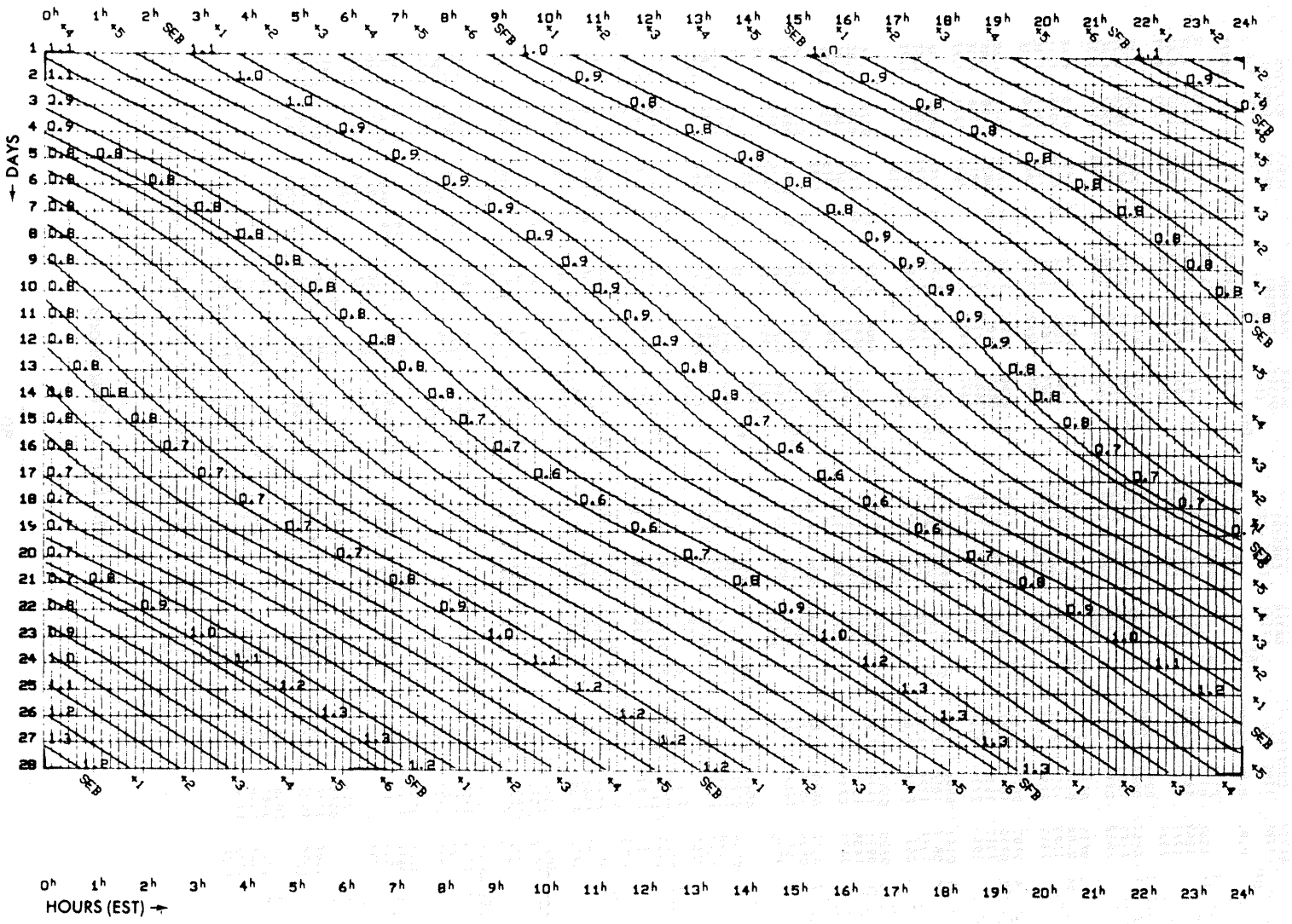
JANUARY 1975



Tidal Current Diagrams (2)

TIDAL CURRENT CHART DIAGRAM FOR
BLOCK ISLAND SOUND AND EASTERN LONG ISLAND SOUND TIDAL CURRENT CHARTS

FEBRUARY 1975



Tidal Current Diagrams (3)

THE RACE, LONG ISLAND SOUND, 1976

F-FLOOD, DIR. 295° TRUE E-EBB, DIR. 100° TRUE

JANUARY

DAY	SLACK WATER TIME H.M.	MAXIMUM CURRENT TIME H.M.	MAXIMUM CURRENT VEL. KNOTS
1		0159	3.9E
TH	0508	0759	3.6F
	1059	1423	4.4E
	1745	2037	3.5F
	2334		
2		0248	3.8E
F	0557	0844	3.5F
	1145	1509	4.3E
	1830	2118	3.4F
3	0019	0334	3.7E
SA	0644	0928	3.3F
	1229	1555	4.0E
	1913	2158	3.3F
4	0103	0420	3.5E
SU	0730	1011	3.0F
	1312	1638	3.7E
	1955	2239	3.0F
5	0145	0504	3.3E
M	0817	1052	2.7F
	1354	1724	3.3E
	2037	2318	2.8F
6	0228	0552	3.0E
TU	0905	1136	2.4F
	1438	1810	3.0E
	2121	2359	2.6F
7	0312	0640	2.8E
W	0956	1221	2.2F
	1525	1858	2.7E
	2206		
8		0047	2.4F
TH	0359	0729	2.7E
	1049	1314	2.0F
	1616	1949	2.5E
	2256		
9		0136	2.3F
F	0448	0824	2.6E
	1146	1407	1.8F
	1711	2043	2.3E
	2348		
10		0229	2.2F
SA	0540	0917	2.7E
	1243	1505	1.8F
	1808	2139	2.3E
11	0043	0324	2.2F
SU	0632	1012	2.8E
	1337	1605	1.9F
	1905	2231	2.3E
12	0135	0415	2.3F
M	0724	1100	3.0E
	1427	1657	2.1F
	1959	2323	2.5E
13	0225	0509	2.5F
TU	0814	1151	3.3E
	1513	1747	2.4F
	2049		
14		0011	2.8E
W	0311	0555	2.8F
	0901	1236	3.5E
	1556	1833	2.7F
	2136		
15		0055	3.0E
TH	0356	0641	3.0F
	0947	1318	3.8E
	1636	1914	3.1F
	2220		

DAY	SLACK WATER TIME H.M.	MAXIMUM CURRENT TIME H.M.	MAXIMUM CURRENT VEL. KNOTS
16		0141	3.3E
F	0439	0727	3.3F
	1031	1401	4.0E
	1716	1957	3.4F
	2303		
17		0224	3.6E
SA	0522	0813	3.5F
	1116	1444	4.2E
	1755	2041	3.6F
	2347		
18		0305	3.8E
SU	0607	0858	3.7F
	1202	1528	4.3E
	1837	2126	3.8F
19	0032	0351	4.0E
M	0654	0946	3.8F
	1249	1613	4.3E
	1921	2213	3.9F
20	0119	0439	4.1E
TU	0745	1035	3.7F
	1338	1702	4.1E
	2008	2302	3.9F
21	0209	0533	4.1E
W	0840	1128	3.6F
	1431	1753	3.9E
	2100	2352	3.7F
22	0303	0628	4.0E
TH	0940	1223	3.3F
	1528	1853	3.7E
	2157		
23		0051	3.6F
F	0400	0730	3.9E
	1045	1323	3.1F
	1630	1955	3.5E
	2259		
24		0150	3.4F
SA	0502	0832	3.8E
	1153	1431	2.9F
	1735	2100	3.3E
25	0006	0255	3.2F
SU	0605	0935	3.8E
	1300	1542	2.9F
	1843	2203	3.3E
26	0112	0405	3.2F
M	0709	1037	3.9E
	1403	1654	3.0F
	1948	2304	3.4E
27	0215	0513	3.2F
TU	0810	1136	4.0E
	1502	1757	3.1F
	2049		
28		0000	3.5E
W	0313	0614	3.3F
	0907	1229	4.1E
	1555	1852	3.3F
	2144		
29		0055	3.6E
TH	0407	0704	3.4F
	0958	1318	4.2E
	1643	1941	3.3F
	2232		
30		0144	3.7E
F	0456	0753	3.4F
	1045	1404	4.1E
	1727	2024	3.3F
	2316		
31		0227	3.7E
SA	0542	0834	3.3F
	1127	1447	4.0E
	1808	2100	3.3F
	2356		

FEBRUARY

DAY	SLACK WATER TIME H.M.	MAXIMUM CURRENT TIME H.M.	MAXIMUM CURRENT VEL. KNOTS
1		0310	3.6E
SU	0624	0909	3.1F
	1207	1531	3.8E
	1847	2132	3.2F
2	0035	0354	3.5E
M	0705	0945	2.9F
	1245	1610	3.5E
	1924	2205	3.0F
3	0112	0435	3.3E
TU	0746	1021	2.7F
	1324	1651	3.2E
	2000	2242	2.8F
4	0150	0516	3.1E
W	0827	1101	2.5F
	1403	1733	2.9E
	2037	2321	2.7F
5	0229	0559	2.9E
TH	0911	1144	2.3F
	1445	1815	2.6E
	2117		
6		0004	2.5F
F	0312	0645	2.7E
	1000	1232	2.1F
	1531	1900	2.4E
	2202		
7		0051	2.3F
SA	0358	0735	2.6E
	1054	1321	1.9F
	1624	1955	2.2E
	2254		
8		0144	2.2F
SU	0450	0831	2.5E
	1153	1416	1.8F
	1721	2054	2.1E
	2351		
9		0238	2.1F
M	0545	0927	2.6E
	1251	1515	1.9F
	1821	2152	2.2E
10	0050	0333	2.2F
TU	0642	1023	2.8E
	1346	1612	2.1F
	1919	2246	2.4E
11	0147	0430	2.4F
W	0737	1114	3.1E
	1435	1708	2.4F
	2013	2339	2.8E
12	0239	0525	2.8F
TH	0830	1203	3.5E
	1521	1759	2.8F
	2103		
13		0026	3.2E
F	0328	0614	3.1F
	0920	1249	3.8E
	1604	1845	3.2F
	2150		
14		0112	3.6E
SA	0414	0702	3.5F
	1008	1335	4.2E
	1646	1931	3.6F
	2237		
15		0158	4.0E
SU	0501	0749	3.9F
	1055	1421	4.4E
	1729	2016	4.0F
	2322		

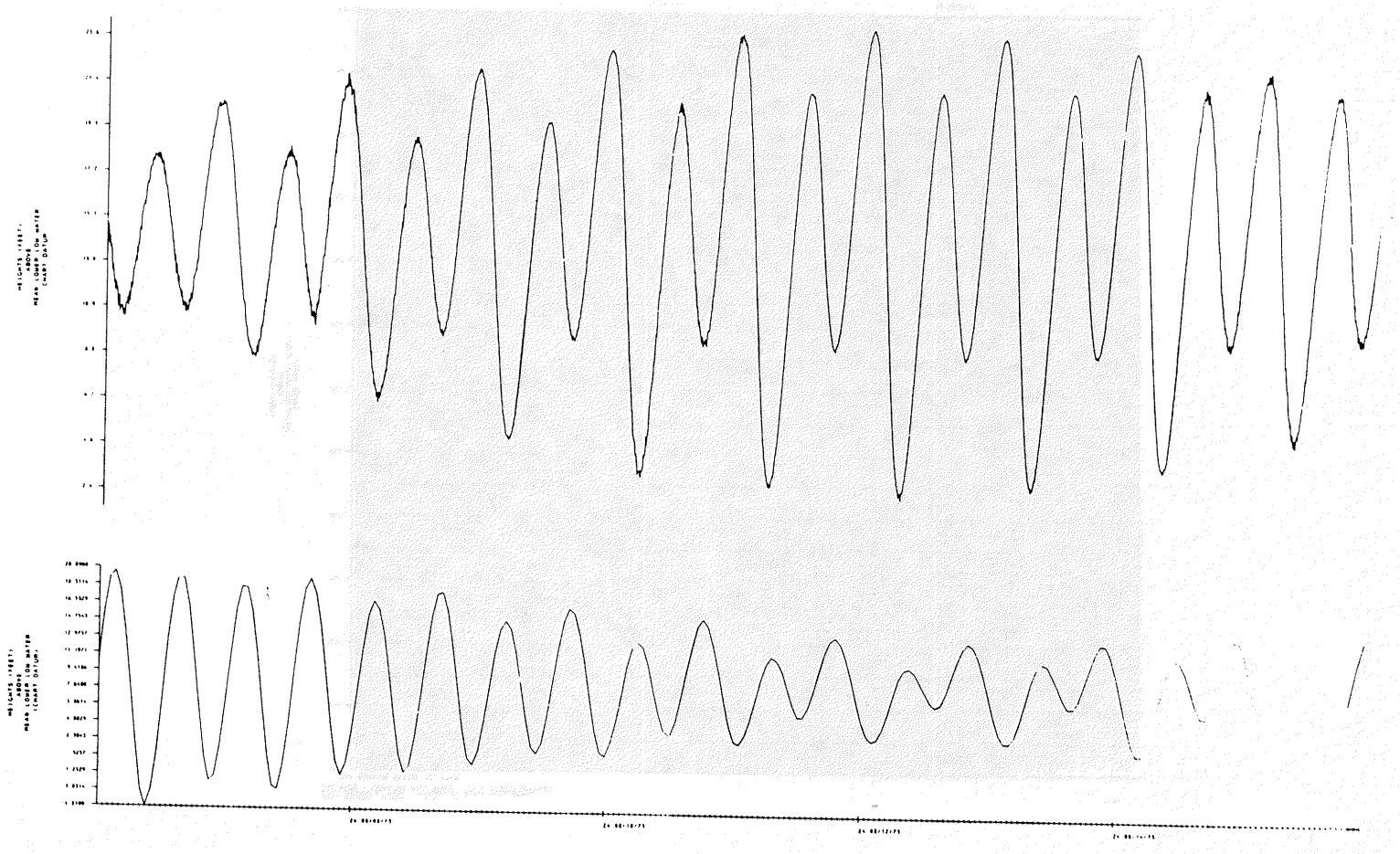
DAY	SLACK WATER TIME H.M.	MAXIMUM CURRENT TIME H.M.	MAXIMUM CURRENT VEL. KNOTS
16		0243	4.3E
M	0548	0838	4.1F
	1143	1507	4.6E
	1812	2102	4.2F
17	0009	0330	4.5E
TU	0636	0925	4.2F
	1231	1552	4.6E
	1858	2151	4.3F
18	0057	0418	4.6E
W	0728	1016	4.1F
	1321	1641	4.4E
	1947	2240	4.2F
19	0148	0511	4.5E
TH	0822	1108	3.8F
	1414	1736	4.1E
	2040	2333	3.9F
20	0242	0608	4.3E
F	0922	1205	3.5F
	1511	1834	3.8E
	2138		
21		0028	3.6F
SA	0339	0707	4.0E
	1026	1306	3.2F
	1613	1935	3.5E
	2242		
22		0132	3.3F
SU	0442	0812	3.8E
	1134	1413	2.9F
	1719	2041	3.3E
	2351		
23		0240	3.0F
M	0547	0917	3.7E
	1242	1532	2.8F
	1827	2145	3.2E
24	0100	0355	2.9F
TU	0654	1018	3.7E
	1346	1645	2.8F
	1934	2248	3.3E
25	0204	0503	3.0F
W	0757	1118	3.7E
	1445	1748	3.0F
	2035	2345	3.4E
26	0302	0606	3.1F
TH	0853	1211	3.8E
	1536	1838	3.1F
	2127		
27		0036	3.5E
F	0354	0655	3.1F
	0943	1302	3.9E
	1623	1921	3.2F
	2212		
28		0123	3.6E
SA	0440	0736	3.1F
	1027	1343	3.8E
	1704	2002	3.2F
	2252		
29		0207	3.6E
SU	0523	0815	3.1F
	1107	1426	3.7E
	1743	2033	3.1F
	2329		

TIME MERIDIAN 75° W. 0000 IS MIDNIGHT. 1200 IS NOON.

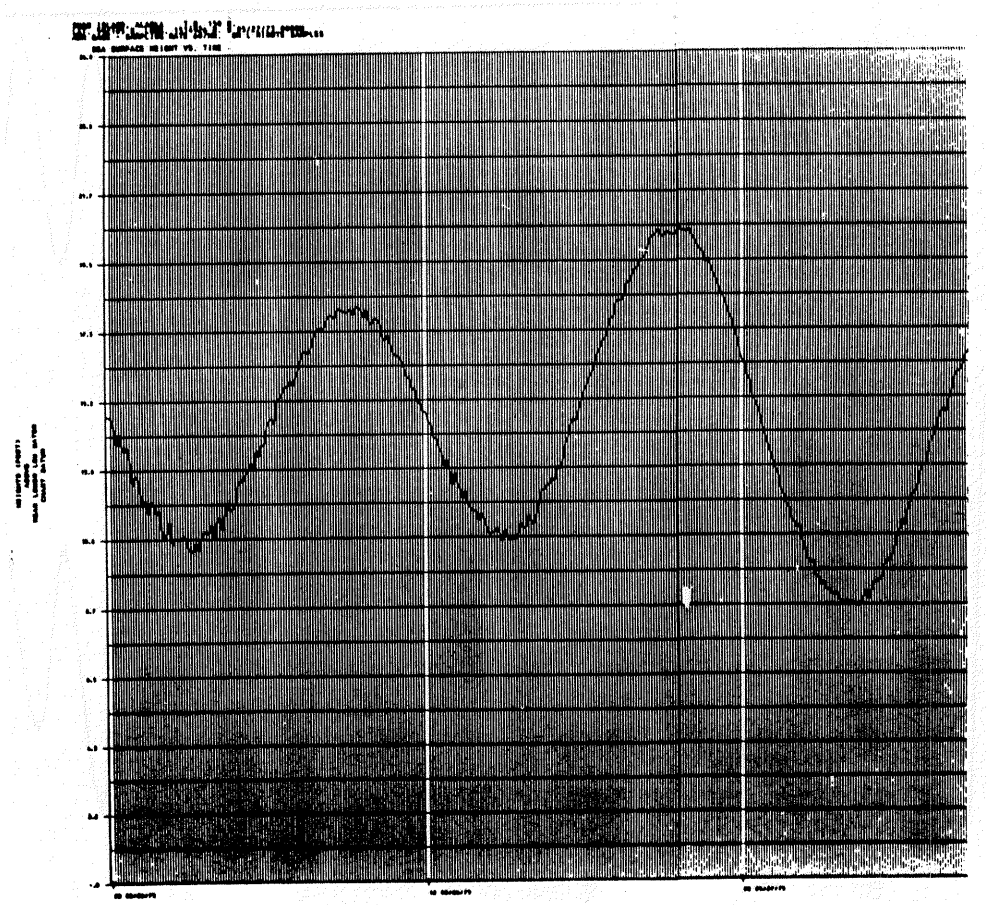
Tidal Current Predictions

Appendix IV

TIDE DATA PRODUCTS



General Time Plots (Seldovia On Top and Shaw Island, Alaska, Below)



Special Time Plot

WILLETS POINT N Y MAY 1975 TM 75.00W

DAY	TIME HIGH	TIME LOW	HEIGHT HIGH	HEIGHT LOW	DAY	TIME HIGH	TIME LOW	HEIGHT HIGH	HEIGHT LOW
1	3.8	10.3	12.11	5.28	17	3.3	10.7	12.55	4.82
	16.2	22.6	11.91	5.88		16.5	23.0	12.30	5.32
2	3.5	11.0	11.85	5.67	18	4.0	11.7	12.25	5.19
	16.5	23.4	12.06	6.12		17.5	—	12.68	—
3	4.9	11.6	11.63	5.91	19	5.9	0.1	12.39	5.40
	17.5	23.6	11.66	6.32		18.8	12.9	12.77	5.20
4	6.2	12.6	11.82	6.32	20	6.1	1.5	12.19	5.05
	19.1	—	12.72	—		19.6	13.9	13.07	5.17
5	6.4	1.5	12.15	7.10	21	7.7	2.6	12.29	4.78
	19.3	14.0	12.63	6.62		20.3	14.7	13.46	4.94
6	7.5	2.2	12.39	6.71	22	8.0	3.6	12.64	4.68
	20.2	14.5	13.01	6.59		21.5	15.6	13.82	4.99
7	8.2	3.1	11.85	6.51	23	8.6	4.5	12.53	4.21
	20.8	15.2	12.74	5.59		22.0	16.3	13.73	4.94
8	9.6	3.8	11.69	5.26	24	10.3	5.3	12.59	3.96
	21.5	15.5	12.59	5.60		21.9	17.2	14.85	4.95
9	9.8	4.7	11.94	4.93	25	10.8	6.2	13.17	4.92
	22.5	16.3	12.79	5.38		23.6	17.9	13.62	5.16
10	11.0	5.3	12.18	4.68	26	12.5	7.0	12.53	4.31
	23.3	17.1	12.93	5.25		—	18.5	—	5.24
11	11.6	6.1	12.15	4.57	27	0.7	7.7	13.62	4.64
	23.8	17.6	13.12	5.16		13.1	19.1	12.71	5.61
12	11.7	6.8	12.20	4.54	28	0.7	8.5	13.41	4.86
	—	18.3	—	5.04		14.0	20.2	12.39	5.74
13	0.6	7.5	13.05	4.43	29	2.2	9.2	12.80	4.86
	12.5	18.8	12.35	5.39		15.0	20.8	12.09	5.87
14	1.2	8.2	13.32	4.71	30	2.3	9.9	12.54	5.42
	13.3	20.0	12.62	5.56		15.7	21.5	12.36	6.20
15	2.0	9.0	13.15	4.71	31	3.5	10.4	12.31	5.85
	14.6	20.8	12.39	5.52		16.4	22.2	12.35	6.31
16	2.6	9.9	12.99	5.05					
	15.7	21.8	12.51	5.37					

MHW 12.61 MLW 5.34 MSL 9.01 MN 7.27 MTL 8.98

MTL-MSL -0.03 MHHW MLLW DHQ DLQ

GT (DRL)TL (DRL)TL-MSL

GMHWI 4.01 HRS GMLWI 10.85 HRS

HIGHEST TIDE 14.85 21.9 HRS MAY 24

LOWEST TIDE 3.96 5.3 HRS MAY 24 DATUM IS .....

S 75W 31 1 31 -6.73 22235.0 * ( ) ARE INFERRED

High and Low Water Tabulations

WILLETS POINT N Y MAY 1975 TM 75.00W

DAY OF MONTH

HOUR	1	2	3	4	5	6	7	8	9	10	11
0	7.80	6.74	6.24	6.34	7.53	7.56	8.72	9.57	10.58	11.65	12.70
1	10.14	8.59	7.09	6.61	7.20	6.90	7.22	7.44	8.34	9.49	11.26
2	11.70	10.60	8.66	7.60	7.20	6.73	6.83	5.95	6.32	7.47	8.95
3	12.00	11.72	10.49	9.03	7.94	6.93	6.52	5.45	5.36	5.79	6.70
4	12.11	11.78	11.44	10.65	9.44	7.98	6.82	5.28	5.09	5.08	5.28
5	11.46	11.54	11.64	11.61	11.04	9.77	8.00	5.91	5.00	4.75	4.94
6	9.83	10.71	11.33	11.81	12.08	11.43	9.86	7.66	6.20	4.95	4.57
7	7.55	9.17	10.71	11.65	12.07	12.33	11.29	9.83	8.55	6.77	5.18
8	6.11	7.47	9.26	10.74	11.71	12.31	11.86	11.37	10.67	9.53	7.61
9	5.69	6.10	7.44	9.29	11.07	11.91	11.76	11.67	11.79	11.35	10.34
10	5.34	5.70	6.22	7.78	9.63	11.15	11.38	11.66	11.93	12.04	11.80
11	5.58	5.67	5.92	6.68	8.11	9.68	10.20	11.09	11.77	12.18	12.10
12	7.26	5.99	5.92	6.37	7.22	8.03	8.25	9.49	10.79	11.81	12.11
13	9.41	7.60	6.39	6.37	6.82	6.89	6.62	7.57	8.86	10.29	11.43
14	11.11	9.50	7.75	6.99	6.62	6.63	5.89	6.17	6.91	8.03	9.55
15	11.68	11.14	9.68	8.68	7.36	6.68	5.59	5.66	5.67	6.10	7.24
16	11.89	12.03	11.21	10.69	9.15	7.69	6.04	5.65	5.40	5.42	5.61
17	11.71	12.02	11.67	11.86	10.89	9.51	7.49	6.30	5.57	5.28	5.24
18	10.50	11.59	11.63	12.50	12.20	11.36	9.58	8.03	6.67	5.63	5.20
19	8.67	10.36	11.44	12.69	12.62	12.68	11.45	10.21	8.89	7.31	6.01
20	7.00	8.65	10.49	12.54	12.55	13.02	12.56	11.94	11.03	9.79	8.14
21	6.14	7.22	8.80	11.41	12.22	12.92	12.73	12.55	12.44	11.78	10.72
22	5.98	6.38	7.25	9.64	10.87	12.14	12.44	12.56	12.77	12.82	12.43
23	5.93	6.15	6.41	8.20	9.11	10.61	11.49	12.11	12.72	12.91	12.99

DATUM IS .....

Hourly Heights (1)

WILLETS POINT N Y MAY 1975 TM 75.00W

DAY OF MONTH

HOUR	12	13	14	15	16	17	18	19	20	21	22
0	13.10	12.93	12.99	12.20	10.34	7.92	5.78	5.42	5.47	5.82	7.52
1	12.45	12.96	13.28	13.02	12.27	10.35	7.57	5.79	5.15	5.33	5.74
2	10.56	11.83	12.97	13.15	12.93	12.00	10.09	7.49	5.21	5.00	5.38
3	8.13	9.76	11.38	12.69	12.96	12.52	11.87	10.04	6.77	4.86	4.91
4	6.04	7.33	9.12	11.05	12.41	12.44	12.25	11.84	9.45	6.47	4.88
5	5.12	5.55	7.20	8.64	10.81	11.77	12.18	12.35	11.58	9.37	6.84
6	4.83	5.00	5.71	6.50	8.64	10.26	11.68	12.40	12.19	11.62	10.03
7	4.55	4.59	5.05	5.34	6.68	8.00	10.18	12.01	12.15	12.27	12.17
8	5.69	4.67	4.76	5.09	5.68	6.14	8.10	10.62	11.88	12.29	12.64
9	8.51	6.58	5.21	4.71	5.41	5.23	6.30	8.42	10.71	12.05	12.59
10	10.95	9.68	7.52	5.52	5.08	5.00	5.48	6.44	8.58	10.80	12.25
11	12.11	11.64	10.51	8.17	6.26	4.87	5.32	5.61	6.48	8.25	10.86
12	12.20	12.31	12.22	10.79	8.82	6.10	5.23	5.45	5.38	6.17	8.47
13	11.98	12.33	12.62	12.12	11.04	8.64	6.29	5.21	5.36	5.18	6.23
14	10.93	11.96	12.53	12.34	12.22	10.90	8.79	6.20	5.19	5.07	5.28
15	8.79	10.49	11.87	12.36	12.39	12.05	11.24	8.80	6.09	5.00	5.14
16	6.59	8.24	10.14	11.78	12.48	12.27	12.40	11.31	8.69	6.31	5.09
17	5.32	6.35	7.81	9.90	11.54	12.23	12.63	12.54	11.34	9.12	6.67
18	5.06	5.47	6.01	7.56	9.35	11.36	12.61	12.67	12.78	11.85	9.76
19	5.24	5.31	5.61	5.97	7.24	9.46	11.72	12.77	13.00	13.21	12.41
20	6.53	5.79	5.56	5.60	5.85	7.34	9.70	12.11	13.04	13.45	13.63
21	8.93	7.30	5.93	5.52	5.44	5.87	7.59	10.12	12.24	13.37	13.78
22	11.25	9.83	7.72	6.07	5.37	5.48	6.12	7.72	10.20	12.37	13.70
23	12.58	12.04	10.35	7.81	5.96	5.32	5.63	5.94	7.60	9.99	12.48

DATUM IS .....

Hourly Heights (2)

WILLETS POINT N Y MAY 1975 TM 75.00W

DAY OF MONTH

HOUR	23	24	25	26	27	28	29	30	31
0	9.97	11.91	13.88	13.62	13.52	13.29	11.72	9.76	8.09
1	7.22	9.26	12.42	13.10	13.58	13.40	12.64	11.63	10.15
2	5.44	6.74	9.75	11.18	12.61	13.22	12.78	12.52	11.72
3	4.98	5.06	7.31	8.41	10.49	12.10	12.61	12.44	12.29
4	4.42	4.81	6.11	6.05	7.91	9.92	11.28	12.01	12.28
5	4.44	4.04	5.73	5.04	5.92	7.50	9.01	10.71	11.81
6	6.66	4.39	4.95	4.77	5.29	5.86	6.88	8.74	10.35
7	10.05	7.04	5.56	4.31	4.94	5.44	5.58	6.88	8.39
8	12.25	10.42	8.28	5.29	4.11	5.03	5.28	5.87	6.86
9	12.46	12.29	11.60	8.38	6.40	5.01	4.90	5.64	6.04
10	12.45	12.54	12.99	11.33	9.56	6.90	5.35	5.43	5.89
11	12.09	12.58	13.15	12.45	11.88	9.93	7.58	6.30	5.96
12	10.60	12.05	13.07	12.48	12.61	11.80	10.15	8.59	7.15
13	8.14	10.33	12.34	12.45	12.70	12.34	11.68	10.75	9.22
14	5.81	7.79	10.16	11.58	12.50	12.39	12.00	12.04	11.20
15	4.97	5.72	7.57	9.45	11.35	12.12	12.09	12.31	12.07
16	4.95	5.04	5.92	6.97	9.06	10.86	11.73	12.34	12.31
17	5.11	4.96	5.37	5.52	6.78	8.64	10.19	11.66	12.25
18	6.75	5.34	5.16	5.29	5.67	6.66	8.01	9.86	11.40
19	9.95	7.45	5.77	5.32	5.64	5.87	6.41	7.81	9.57
20	12.53	10.70	7.95	6.24	5.77	5.76	5.93	6.59	7.82
21	13.52	14.06	11.04	8.64	7.01	5.95	5.88	6.24	6.67
22	13.73	14.84	13.11	11.43	9.40	7.20	6.25	6.25	6.31
23	13.40	14.74	13.56	13.15	11.81	9.53	7.63	6.66	6.40

DATUM IS ..... MSL 9.01

S 75W 31 1 31 -6.73 22235.0 * ( ) ARE INFERRED

Hourly Heights (3)

WILLETS POINT, N.Y., 1976

TIMES AND HEIGHTS OF HIGH AND LOW WATERS

JANUARY						FEBRUARY						MARCH					
DAY	TIME H.M.	HT. FT.	DAY	TIME H.M.	HT. FT.	DAY	TIME H.M.	HT. FT.	DAY	TIME H.M.	HT. FT.	DAY	TIME H.M.	HT. FT.	DAY	TIME H.M.	HT. FT.
1	0513	-0.8	16	0420	-0.2	1	0009	7.2	16	0530	-1.3	1	0603	-0.7	16	0518	-1.6
TH	1114	8.0	F	1009	7.6	SU	0626	-0.7	M	1124	8.2	M	1158	7.2	TU	1109	8.3
	1746	-1.5		1705	-1.0		1218	7.3		1753	-1.5		1820	-0.7		1733	-1.5
	2347	7.2		2245	7.0		1846	-0.9		2350	8.2					2331	8.7
2	0559	-0.8	17	0459	-0.5	2	0041	7.1	17	0616	-1.4	2	0012	7.3	17	0607	-1.8
F	1157	7.8	SA	1054	7.9	M	0703	-0.5	TU	1212	8.2	TU	0639	-0.6	W	1157	8.3
	1830	-1.3		1736	-1.2		1241	7.1		1837	-1.5		1216	7.0		1819	-1.5
				2326	7.4		1918	-0.7					1847	-0.5			
3	0029	7.2	18	0538	-0.8	3	0100	7.1	18	0037	8.4	3	0025	7.3	18	0018	8.8
SA	0643	-0.6	SU	1138	8.0	TU	0737	-0.3	W	0706	-1.5	W	0705	-0.4	TH	0658	-1.7
	1234	7.6		1813	-1.3		1303	6.9		1300	8.0		1231	6.9		1249	8.1
	1911	-1.0					1940	-0.4		1922	-1.4		1855	-0.3		1908	-1.3
4	0106	7.1	19	0009	7.7	4	0121	7.0	19	0127	8.3	4	0044	7.3	19	0108	8.6
SU	0727	-0.4	M	0626	-0.9	W	0756	-0.1	TH	0759	-1.3	TH	0716	-0.2	F	0751	-1.5
	1306	7.2		1224	8.0		1331	6.7		1351	7.6		1258	6.8		1340	7.7
	1951	-0.7		1851	-1.4		1953	-0.2		2012	-1.0		1911	-0.1		2001	-0.9
5	0137	6.9	20	0054	7.8	5	0151	6.9	20	0217	8.1	5	0116	7.2	20	0159	8.3
M	0809	-0.1	TU	0714	-1.0	TH	0817	0.1	F	0905	-1.0	F	0737	-0.1	SA	0854	-1.1
	1334	6.9		1313	7.9		1407	6.5		1446	7.1		1335	6.7		1438	7.2
	2025	-0.4		1937	-1.2		2022	0.0		2113	-0.6		1943	0.0		2107	-0.4
6	0204	6.8	21	0143	7.9	6	0232	6.8	21	0315	7.7	6	0153	7.2	21	0302	7.7
TU	0848	0.2	W	0807	-0.9	F	0852	0.3	SA	1021	-0.6	SA	0812	0.1	SU	1006	-0.6
	1407	6.6		1404	7.5		1449	6.2		1555	6.6		1416	6.5		1555	6.7
	2057	0.0		2027	-1.0		2100	0.3		2234	-0.2		2022	0.2		2227	0.0
7	0236	6.6	22	0236	7.8	7	0315	6.7	22	0429	7.3	7	0236	7.0	22	0421	7.2
W	0933	0.4	TH	0909	-0.7	SA	0939	0.5	SU	1138	-0.4	SU	0857	0.3	M	1117	-0.4
	1446	6.3		1500	7.1		1537	6.0		1730	6.3		1502	6.3		1720	6.4
	2121	0.3		2123	-0.6		2147	0.5		2357	0.1		2109	0.5		2342	0.2
8	0318	6.5	23	0331	7.6	8	0403	6.5	23	0602	7.0	8	0326	6.8	23	0548	6.9
TH	1027	0.6	F	1030	-0.5	SU	1033	0.7	M	1246	-0.4	M	0945	0.4	TU	1227	-0.2
	1531	6.0		1603	6.6		1629	5.7		1853	6.2		1554	6.1		1833	6.4
	2200	0.5		2239	-0.3		2242	0.7					2200	0.7			
9	0403	6.4	24	0440	7.3	9	0457	6.4	24	0109	0.0	9	0418	6.7	24	0050	0.2
F	1133	0.7	SA	1153	-0.4	M	1142	0.7	TU	0718	7.0	TU	1044	0.5	W	0659	6.9
	1622	5.7		1730	6.3		1728	5.6		1349	-0.5		1650	6.0		1325	-0.3
	2251	0.7					2342	0.8		1958	6.4		2259	0.8		1936	6.6
10	0456	6.3	25	0008	-0.1	10	0556	6.5	25	0210	-0.2	10	0517	6.6	25	0150	0.0
SA	1235	0.7	SU	0609	7.2	TU	1331	0.5	W	0821	7.2	W	1154	0.5	TH	0801	6.9
	1721	5.5		1305	-0.5		1833	5.7		1445	-0.7		1751	6.0		1421	-0.4
				1904	6.2					2055	6.7					2031	6.8
11	0008	0.8	26	0121	-0.1	11	0053	0.8	26	0306	-0.4	11	0008	0.7	26	0245	-0.3
SU	0553	6.3	M	0728	7.3	W	0657	6.6	TH	0916	7.3	TH	0620	6.7	F	0855	7.1
	1333	0.5		1408	-0.7		1429	0.2		1535	-0.9		1318	0.3		1510	-0.5
	1827	5.5		2013	6.4		1939	6.0		2146	7.0		1859	6.3		2119	7.1
12	0131	0.8	27	0223	-0.3	12	0216	0.5	27	0356	-0.6	12	0131	0.4	27	0335	-0.5
M	0654	6.5	TU	0834	7.4	TH	0801	6.9	F	1004	7.4	F	0725	7.0	SA	0942	7.2
	1426	0.3		1504	-1.0		1516	-0.3		1623	-1.0		1427	-0.1		1556	-0.6
	1945	5.6		2111	6.6		2043	6.4		2230	7.2		2005	6.8		2204	7.3
13	0223	0.6	28	0322	-0.5	13	0315	0.0	28	0442	-0.8	13	0242	-0.1	28	0419	-0.6
TU	0752	6.7	W	0928	7.6	F	0858	7.3	SA	1049	7.4	SA	0831	7.4	SU	1024	7.2
	1514	-0.1		1556	-1.2		1557	-0.7		1706	-1.0		1519	-0.6		1638	-0.6
	2045	5.9		2203	6.9		2135	6.9		2310	7.3		2104	7.4		2242	7.4
14	0308	0.4	29	0413	-0.7	14	0402	-0.5	29	0525	-0.8	14	0341	-0.7	29	0501	-0.7
W	0840	7.0	TH	1020	7.7	SA	0948	7.7	SU	1126	7.3	SU	0927	7.8	M	1103	7.2
	1556	-0.4		1644	-1.3		1636	-1.1		1744	-0.9		1604	-1.0		1718	-0.5
	2127	6.3		2250	7.1		2220	7.4		2344	7.3		2156	8.0		2316	7.4
15	0346	0.1	30	0500	-0.8	15	0445	-0.9				15	0428	-1.2	30	0539	-0.6
TH	0927	7.3	F	1105	7.7	SU	1038	8.0				M	1020	8.1	TU	1133	7.1
	1631	-0.7		1728	-1.3		1715	-1.4					1650	-1.4		1751	-0.3
	2204	6.6		2332	7.2		2306	7.9					2244	8.4		2339	7.4
			31	0545	-0.8										31	0613	-0.5
			SA	1145	7.6										W	1153	7.0
				1809	-1.1											1814	-0.1
																2349	7.4

TIME MERIDIAN 75° W. 0000 IS MIDNIGHT. 1200 IS NOON.
HEIGHTS ARE RECKONED FROM THE DATUM OF SOUNDINGS ON CHARTS OF THE LOCALITY WHICH IS MEAN LOW WATER.

Tide Predictions (Extract)

6/28/68

CONNECTICUT - 846-1490
U.S. DEPARTMENT OF COMMERCE
ENVIRONMENTAL SCIENCE SERVICES ADMINISTRATION
COAST AND GEODETIC SURVEY

TIDAL BENCH MARKS

New London (State Pier), Thames River
Lat. 41°21.6'; Long. 72°05.5'

BENCH MARK 8 (1917) is a standard disk, stamped "1917 NO 8 ELEV 18.264 FT", located at Soldiers and Sailors monument on State Street just west of Union Station. It is on east side of monument 1/2 foot north of top step and 3 feet higher than pavement, in west end of stone facing or flanking stone at north side of steps. Elevation: 19.23 feet above mean low water.

BENCH MARK 12 (1938) is a standard disk, stamped "12 1938" set on northeast side of railroad tracks, in concrete base of east steel column which supports span over railroad tracks at north end of warehouse on State Pier. Elevation: 10.57 feet above mean low water.

BENCH MARK 13 (1938) is a standard disk, stamped "13 1938", set in concrete base of northeast leg of only water tower in this area, which is on grounds of State Pier. Elevation: 10.27 feet above mean low water.

BENCH MARK 14 (1938) is a standard disk, stamped "14 1938", set in northwest corner of concrete foundation around weighing machine which is located north of office building of Connecticut Terminal Corporation at inshore end of State Pier. Elevation: 10.45 feet above mean low water.

BENCH MARK 15 (1947) is a standard disk, stamped "NO 15 1947", set in top of concrete retaining wall of ramp on west side of concrete road leading from Winthrop Street to State Pier and located just west of Connecticut Terminal Corporation Office. It is about 1/2 foot east of west face of ramp, 3 1/2 feet above ground level, just west of wire fence running along road, about 25 feet north of south end of chain-link guard fence and about 50 yards north of Bench Mark 14. Elevation: 12.59 feet above mean low water

BENCH MARK 17 (1965) is a standard disk, stamped "NO 17 1965", set in east headwall of a concrete underpass leading from Winthrop Street to the State Pier, and about 300 yards northwest of Bench Mark 15, along the private road leading to the pier. Elevation: 32.68 feet above mean low water.

BENCH MARK Y-10 (1935) is a standard disk, stamped "Y-10 1935), set in the top of the east end of second step from the bottom at the State Street entrance to City Hall at the northwest corner of State and Union Streets. It is 30 feet north of the center of line of State Street, 15 feet east of the centerline of Union Street, and about 3 feet higher than State Street. Elevation: 33.55 feet above mean low water.

BENCH MARK Z 10 (1935) is a standard disk, stamped "Z 10 1935", set in top of east corner of concrete base formerly used to support block signal, about 0.2 mile north along New York, New Haven and Hartford Railroad from station at New London, at intersection of Water and Douglas Streets. It is 100 1/2 feet southeast of block signal No. 123.2, 67 feet south of entrance to office of Connecticut Power Company, 24 1/2 feet southeast of extended centerline of Douglas Street, and flush with ground. Elevation: 8.63 feet above mean low water.

BENCH MARK Y 5 (1922) is a standard disk, stamped "Y 5 1922 ELEV 32.575 FT", set in west end of second step from bottom of State Street entrance of city hall at northeast corner of State and Union Streets. Elevation: 33.54 feet above mean low water.

Mean low water at New London is based on 19 years of records, 1941-59, reduced to mean values. Elevations of other tide planes referred to this datum are as follows:

	Feet
Highest tide observed (September 21, 1968)	10.7
Mean high water	2.60
Mean tide level	1.30
Mean low water	0.00
Lowest tide observed (December 11, 1943)	-3.4

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