

9089

CAT.2

Diagram No. 1212-2

NOAA FORM 76-35A

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL OCEAN SURVEY

DESCRIPTIVE REPORT

Type of Survey *Hydrographic*
Field No. *WH-20-5-69*
Office No. *H-9089 Cat. 2*

LOCALITY

State *Connecticut-New York*
General Locality *Long Island Sound*
Locality *Branford Reef to Kimberly*
..... *Reef*

.....
1969

CHIEF OF PARTY

..... *CDR W.L. Mobley & LCDR. R.J. Land*

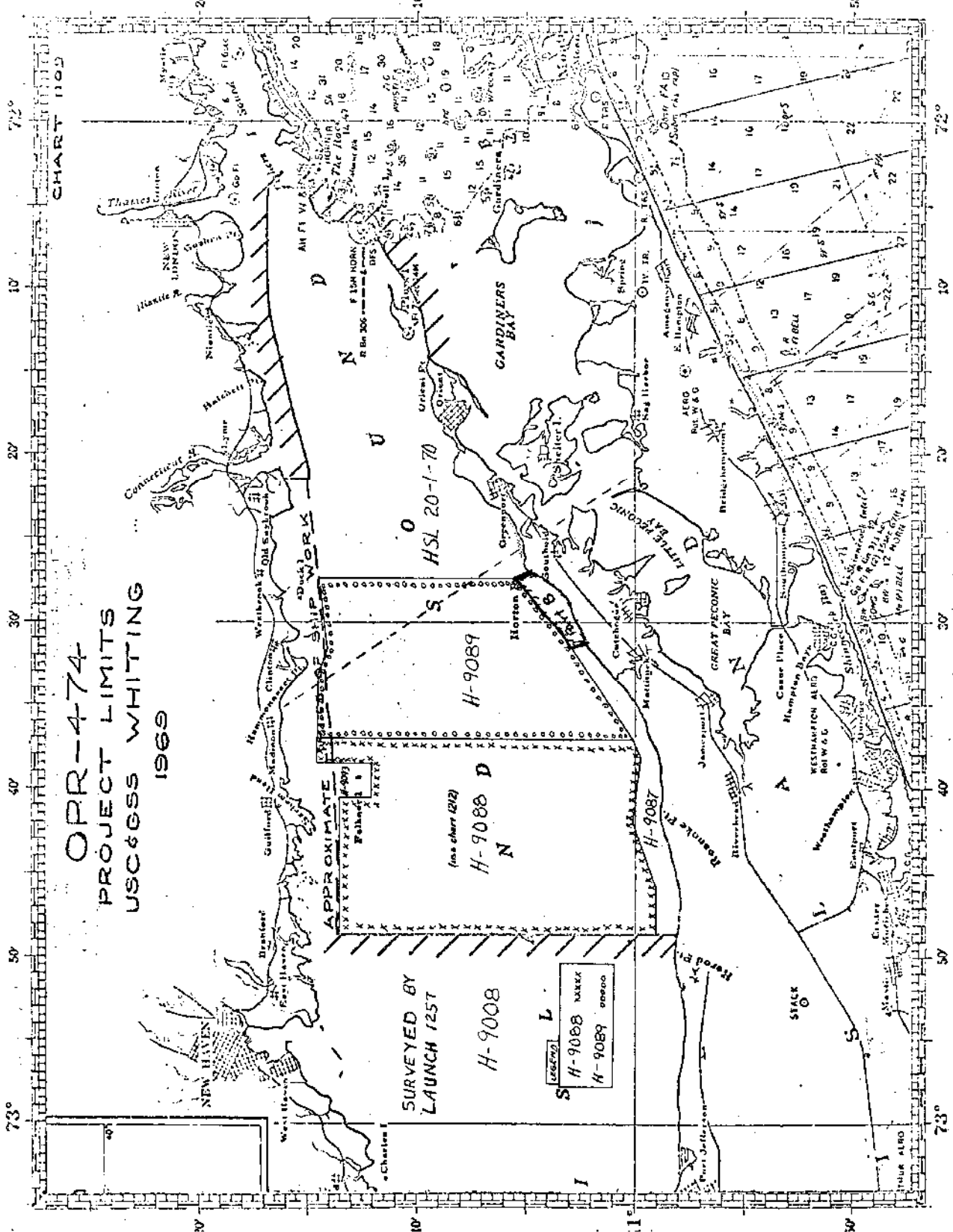
LIBRARY & ARCHIVES

DATE *October 18, 1984*

9089
CAT.2

CHART 1103

OPR-474
PROJECT LIMITS
USCGS WHITING
1969



SURVEYED BY
LAUNCH 1257

H-9008

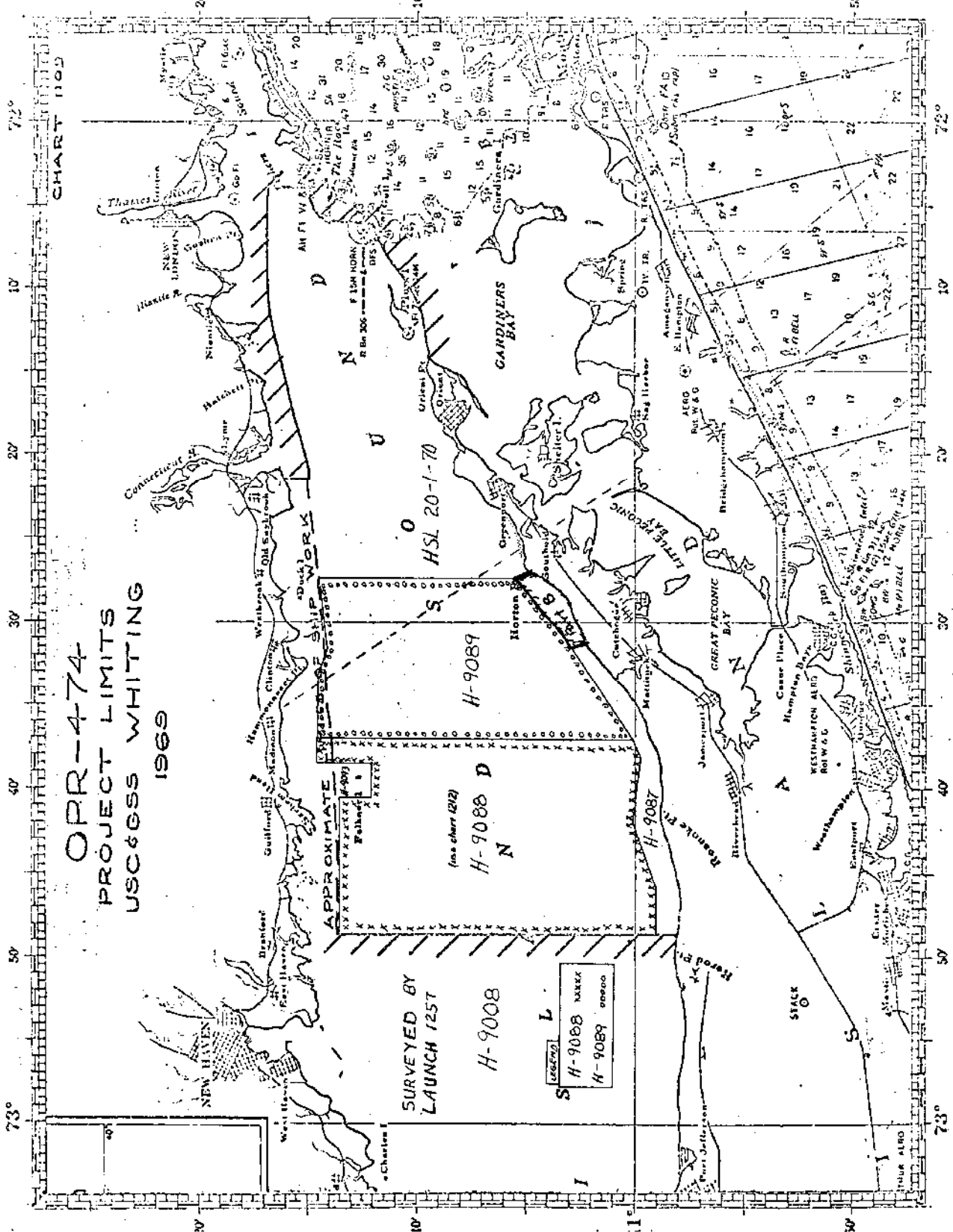
(see chart 1212)
H-9088 D N

H-9089

L
H-9088 MAXXX
H-9089 00000

APPROXIMATE
PROJECT LIMITS

HSL 20-1-70



BP 79854-7

FORM C&GS-537
(5-68)

U.S. DEPARTMENT OF COMMERCE
ENVIRONMENTAL SCIENCE SERVICES ADMINISTRATION
COAST AND GEODETIC SURVEY

REGISTER NO.

HYDROGRAPHIC TITLE SHEET

H-9089

INSTRUCTIONS - The Hydrographic Sheet should be accompanied by this form, filled in as completely as possible, when the sheet is forwarded to the Office.

FIELD NO.

WH 20-5-69

State Connecticut-New York

General locality Long Island Sound

Locality Branford Reef to Kimberley Reef

Scale 1:20,000

Date of survey 10/11/69 - 11/4/69

Instructions dated 3 June 1969

Project No. OPR-474

Vessel NOAA Launch 1257

Chief of party Ralph J. Land, LCDR, NOAA

LCDR Ralph J. Land, LT C. D. North, Jr.,

Surveyed by Franklin L. Saunders, and Walter B. Morris

Soundings taken by echo sounder, hand lead, pole Raytheon DE-723 (Digital)

LCDR Ralph J. Land,

Graphic record scaled by LT C. Dale North, Jr., and Franklin L. Saunders

Graphic record checked by LCDR Ralph J. Land and Charles L. Brown

Protracted by _____ Automated plot by Complot Plotter

Soundings ~~provided~~ by Automated Plot

Soundings in ~~Xfthbrxx~~ feet at MLW ~~MKKXX~~

REMARKS: All hydrography accomplished using the automated Hydroplot System on Launch 1257.

Seventy-fifth meridian time (EST) used throughout this survey.

DESCRIPTIVE REPORT (PART A)

TO ACCOMPANY

HYDROGRAPHIC SURVEY H-9089

(FIELD NO. WH 20-5-69)

SCALE: 1:20,000

YEAR: 1969

-----oOo-----

NOAA Launch 1257

Ralph J. Land, LCDR, NOAA
Officer-in-Charge

Wayne L. Mobley, CDR, NOAA
Chief of Party

A. PROJECT

All hydrography was conducted under the guidelines of "Amended Instructions--Project OPR-474--LONG ISLAND SOUND", dated 3 June 1969, and "Instructions--SP-AMC-11-68--HIGH SPEED LAUNCH HYDROGRAPHY, LONG ISLAND SOUND".

B. AREA SURVEYED

The area surveyed by Launch 1257 lies between the south shore of Connecticut and the north shore of Long Island, New York, on Long Island Sound between Kimberley Reef on the northwest, Long Sand Shoal on the northeast, Northville, L. I., on the southwest, and Horton Point on the southeast. More specifically, the area of hydrography is bound by the meridians $72^{\circ}37'W$ and $72^{\circ}27'.1W$; on the north by latitude $41^{\circ}14'.7N$ to $72^{\circ}34'W$, then on a straight line to $41^{\circ}14'N$ at $72^{\circ}30'.5W$, and then generally northeastward to $41^{\circ}14'.6N$; on the south by a northeastwardly line from $41^{\circ}00'N$ to $41^{\circ}05'.4N$.

Hydrography was accomplished during the period 11 October 1969 through 4 November 1969 - Julian Day 284 through 308, inclusively.

Junctions were made with contemporary Survey H-9088 and the Ship WHITING's inshore launch survey of this sheet (see Part B).

C. SOUNDING VESSEL

Soundings in the area described above were taken by NOAA Launch 1257.

D. SOUNDING EQUIPMENT

A Raytheon DE-723 digital fathometer was used throughout the survey. The recorder unit is marked by S/N 1904.

Echo sounder corrections were obtained by bar check and T.D.C. (Temperature-Depth-Conductance) observations using a Martek 100S instrument.

Bar checks were taken as sea conditions and wind conditions permitted.

D. SOUNDING EQUIPMENT (Cont'd)

T.D.C. observations were taken on Julian Days 256, 267, 269, 274, 283, 285, and 302. The results of the velocity correction graphs are shown as tabulations (included).

A bar check comparison made dockside against a calibrated tape measure is contained in the "Report on Corrections to Echo Soundings" submitted separately.

Settlement and squat determinations were run in September 1969 by the conventional method of sounding at a buoy placed in an area of flat bottom and observing the soundings, alternately laying-to and passing the same area at various RPM's. A -0.3 correction was used at 1850 RPM. 1850 RPM was used the majority of time, which represented a sounding speed of 20 knots. Exceptions were noted for development when speeds of 1100 RPM and 525 RPM were used:

<u>Day</u>	<u>RPM</u>	<u>Fix No.</u>
301	525	2337 - 23 ⁷ 7
302	1100	2625 - 2722
300	1100	2199 - 2204
307	1100	4133 - 4270

A mean TRA correction, determined from bar checks and physical measurement, of seven-tenths (+0.7) foot was used to arrive at the final TRA.

-0.3 foot	- Settlement and squat at 1850 RPM
<u>+0.7</u>	- TRA correction by measure- ment and bar check

FINAL TRA: +0.4 foot - at 1850 RPM

A 2.0 foot initial setting was maintained throughout the survey.

Because the recorded Hydroplot soundings from the digital output do not have the mechanical corrections inherent in soundings relying on the analogue fathometer record, no raw data soundings have fathometer correctors other than those soundings scanned directly from the fathometer record as inserts or corrections. Adjusted or inserted soundings

D. SOUNDING EQUIPMENT (Cont'd)

were determined by comparing the fathometer record before and after the applicable sounding with the digital print-out, and applying the difference to the scanned sounding.

Slow chart speed was used, except on Day 287 when fast chart speed was used - Fix 460 through 484. Some difficulty keeping the trace on the proper scale was experienced with this survey because of the nature of the bottom. A considerable number of steeply rising sand ridges, shoals, submarine banks, and ledges required strict attention and dexterity on the fathometer operator's part in order not to lose the trace on rapidly changing depths.

E. SMOOTH SHEET

A smooth sheet has not been plotted. It is anticipated that the smooth sheet will be plotted by computer-controlled plotter at the Atlantic Marine Center.

F. CONTROL

DECCA Hi-Fix in the hyperbolic mode was used for electronic positioning throughout the survey. Each sounding was plotted using its unique G.P. computed from the Hi-Fix readings automatically fed to the computer upon sounding interval demand from the Digital Control Unit. However, only position soundings have the control data recorded as Hi-Fix lanes.

<u>Station</u>	<u>Location</u>
Slave 1 (Pattern 1)	Lat: 40°57'54".41N Long: 72°46'24".98W
Slave 2 (Pattern 2)	Lat: 41°15'42".93N Long: 72°23'16".71W
Master	Lat: 41°14'39".00N Long: 72°52'39".35W

Each electronic control (Hi-Fix) station was located by Ship WHITING personnel using mostly second-order triangulation and traverse methods, resulting in at least third-order accuracy.

F. CONTROL (Cont'd)

Objects used for calibration from sextant fixes were from either established triangulation or from third-order triangulation and traverse performed by Ship WHITING. A print-out of the visual station table is included after the main text.

Most of the fixes for calibrating the Hi-Fix consisted of three-point sextant fixes taken, except for Faulkner Island hydro signals, from established triangulation on the Connecticut shore and hydro signals established by the WHITING on the Long Island Shore. Usually, the morning calibration was taken on the Connecticut side of the Sound, and afternoon calibrations were taken on the Long Island side. There was generally a 0.06 difference in the calibrations of Pattern 2 in the two areas. The Connecticut side had the lower Hi-Fix recordings.

A mean of each calibration set was meaned with other sets of the same day to arrive at the final Hi-Fix correctors for each day. An abstract of daily calibrations is appended to this report.

G. SHORELINE

No Connecticut shoreline was in the project limits. The north shore of Long Island was surveyed by the WHITING's launches on WH 20-5-69 and WH 20-3-69.

H. CROSSLINES

Approximately five per cent of all sounding lines were run as crosslines. Examination indicates excellent agreement.

I. JUNCTIONS

This survey junctions with H-9088 (1969) and with the contemporary WHITING launch work on WH 20-5-69. Junction with the contemporary Launch 1257 work on WH 20-4-69 (H-9088) is excellent. Periodic visual comparison with the contemporary WHITING launch work on WH 20-5-69 indicated good agreement with their work as both segments progressed. The soundings taken from the WHITING boat sheet and shown on WH 20-5-69 (HSL) have been reduced for smooth tides, TRA, and velocity. These soundings are in good agreement when the reducers are considered. Considerable overlap occurs at this junction.

J. COMPARISON WITH PRIOR SURVEYS

Presurvey Review Items 16, 18, and 19, all wrecks, were not discernible on the fathograms. Item 17 was developed (1:5,000 overlay), and the 1962 work of the WAINWRIGHT and HILGARD was verified. A 24-foot sounding obtained on the shoal and shown on the boat sheet will probably, with reducers, be a 25-foot sounding. Item 20 of the Presurvey Review, a 31-foot sounding, was substantiated; and, in fact, a development of Six Mile Reef indicates substantial changes in the reef. The 19-foot and 22-foot soundings on Chart 1212 were not found, but shoaler soundings than those shown on the chart over a wider area indicate a continuation of the sand ridge along the southern face of Six Mile Reef, which suggests that the reef has undergone some changes in its configuration.

Prior surveys used for comparison with WH 20-5-69 (H-9089) are listed below with comment:

H-1603c (1883, 1:10,000): Generally good agreement, particularly around SW Reef. However, a more thorough development in the future is indicated.

H-1637a (1884, 1:10,000): Very little of this survey overlaps, but good agreement exists where it does.

H-1591 (1883, 1:40,000): Soundings differ as much as 10 feet. The more modern survey is shoaler on the southern part of H-9089 and delineates more shoals. For example, the western extension of Six Mile Reef is much more pronounced on the modern survey around 72°32'. On H-1591, there is scant indication of the extent of the shoal at this longitude. In fact, the entire sounding line approximately on 72°32' is in serious conflict with the modern survey. The shoalest area of Six Mile Reef seems to have generally shoaler soundings than those found in 1969. However, Six Mile Reef is depicted in the new survey as having shoaler soundings than those shown on H-1591 over the rest of its area and apparent extension.

The 30-, 90-, and 120-foot depth curves are in generally satisfactory agreement, but in those areas away from shore, individual sounding agreement is less than satisfactory. In all areas offshore, large differences may be attributable to sedimentation. At least three NE-SW trending shoals in echelon across the Sound are not as pronounced on H-1591 as the modern survey. Long Sand Shoal has grown towards the west.

J. COMPARISON WITH PRIOR SURVEYS (Cont'd)

It must be stated what is apparent, the 1969 work was run with much closer line spacing; and, it is believed to have better positioning control.

K. COMPARISON WITH THE CHART

Chart 1212, 12th edition, February 10, 1969, was used for comparison with H-9089. Approximately one-half of the charted soundings compare satisfactorily. The extremes appear to have changed. The 19-foot charted sounding on Six Mile Reef was not found. However, the reef has shoaler soundings over a wider area than shown on the chart. A 162-foot sounding 0.7 mile SE of the RB Bell Buoy, marking a rock in the middle of the Sound, falls in an area of 130-135-foot soundings.

It is rather obvious from the chart comparison that control problems on the prior survey caused some displacement, and that sedimentation and closer spaced hydrographic lines have caused shoaler soundings to appear on the 1969 survey than were evident from the 1883-1885 surveys. While shoaler soundings were found, none were considered dangers to navigation either by their proximity to known shoals or their position in relation to known deep-draft ship routes.

L. ADEQUACY OF SURVEY

This survey is complete and adequate to supersede prior surveys.

The following areas or fathogram indications should be further or completely developed when the inshore area is, as expected, surveyed by a shore-based hydrographic party:

<u>Day</u>	<u>Fix</u>	<u>Out</u>
288	676	3-1/2
288	855	3-1/2
288	857	1/2
297	1626	1-1/2
All of SW Reef	41°14'.2N	72°29'.4W

M. AIDS TO NAVIGATION

The following floating aids adequately serve the purpose for which they were established:

<u>Fix</u>	<u>Description</u>	<u>Comment</u>
1834	"3A" Bell	LL. Page 162
4085	RB Bell	LL. No. 947
4131	R"8C"	LL. No. 949
4253	RB Bell	LL. No. 950

All were located as a D.P. and marked on the fathogram.

N. STATISTICS

4540 positions were obtained on 1211.2 nautical miles of sounding line, equaling 98.2 square miles of hydrography.

Bottom samples were obtained by Ship WHITING during the last part of the season while both parties were in the area. The data was forwarded with the WHITING's OPR-474, 1969 survey data.

O. MISCELLANEOUS

Large sandwaves rising steeply from the bottom were encountered throughout much of this survey. It was most difficult to distinguish between sandwaves and rocks except for location. The sandwaves were located in the deeper mid-Sound area. Rocks presumably account for the irregular bottom found closer inshore, particularly along the Connecticut shore.

P. RECOMMENDATIONS

Because of the nature of the bottom of Long Island Sound, it is recommended that all shoals in areas of deep-draft navigation be wire dragged as early as practicable. Shifting sandwaves and apparent shoaling has taken place over the last 90 years. Sharply rising, narrow crests make it difficult to determine least depths with a lead line, especially on long shoals with continuous crests as that on Six Mile Reef.

Q. REFERENCE TO REPORTS

Reports submitted on OPR-474, particularly on Boat Sheet WH 20-5-69 and launch work submitted by the Ship WHITING on the inshore area joining H-9089, are pertinent.

"M" Sheets, Oceanographic Data Logs, were forwarded with the OPR-474 data from Ship WHITING containing the bottom sample information for this survey.

"A Report on Corrections to Echo Soundings" and "Hi-Fix Calibration Report" for work done by Launch 1257 on OPR-474 are being submitted as separate reports.

SEPARATES FOLLOWING TEXT

	<u>Page</u>
Tide Note	10
Letter on Automated Tidal Zoning	11
Abstract of Corrections to Echo Soundings; including Velocity Table Printout, Settle- ment and Squat Chart, and Abstract of Bar Checks	17
Abstract of Corrections to Distance Measurements	22
Parameters for Digital Computing Polyconic Projection	26
Computer Parameters for Electronically Controlled Surveys	27
Abstract of Hydrographic Data Located on Survey	28
Abstract of Daily Position Numbers Used	29
Approval Sheet	30

TIDE NOTE

A computer program, written by LTjg L. T. Gillman, and approved by the Rockville Tide Section, allows each position to be treated separately for tide reduction by its relationship to five tide stations established for this survey. A copy of correspondence is appended.

Tide stations were established at the following locations:

Northville, L. I.	40°58'.9N	72°38'.7W
Mattituck, L. I.	41°00'.9N	72°33'.7W
Horton Beach, L. I.	41°03'.7N	72°28'.0W
Sachem Head, Conn.	41°14'.7N	72°42'.5W
Westbrook, Conn.	41°16'.4N	72°28'.5W

Smooth tides to be applied to this survey will be generated by the Electronic Data Processing Branch. All soundings with position numbers have had the Hi-Fix positions computed in terms of X and Y components in meters. The tape with the patterns-to-meters (TIMMET) conversion is being submitted with the corrector tapes.

Memorandum

TO : Chief, Tide Section

FROM : Chief, Processing Division

SUBJECT: Tide Approval and Zoning

DATE: 27 February 1970

In reply refer to: CFN2

Attached are the tide corrections determined by computer for Falkner Island OPR-474 Sheet WH 10-1-69 (H-9093).

Also attached is the documentations and flow chart for the methods used to determine the corrections for this survey (WH 10-1-69) and also for Sheets WH 20-3-69, WH 20-4-69 and WH 20-5-69. These corrections will be forwarded at a later date.

Approval is herewith requested for Sheet WH 10-1-69 (H-9093).

Wayne L. Mobley
Wayne L. Mobley
CDR USESSA

Enclosures



FALKNER ISLAND
SMOOTH TIDES
WH-18-1-69
H-9093

<u>EST</u> <u>TIME</u>	<u>Conn</u> <u>+ ft</u>	<u>JULIAN</u> <u>DAY</u>
084040	0 1040	0000 249 000000 000000
085000	0 1038	
091500	0 1036	
092500	0 1034	
092900	0 1032	

Reference Tide
Stations at:
Sachem Head, Conn.
and Westbrook, Conn.

090200	0 1046	0000 250 000000 000000
092200	0 1044	
094000	0 1042	
095100	0 1040	
100700	0 1038	
101400	0 1036	
114540	0 1024	
115600	0 1022	
121800	0 1020	
123400	0 1018	
125900	0 1016	
143300	0 1014	
150700	0 1016	
151540	0 1018	
170700	0 1034	
171700	0 1036	
173120	0 1038	
174200	0 1040	
175540	0 1042	
180700	0 1044	
182600	0 1046	
183120	0 1048	

130300	0 1022	0000 251 000000 000000
131640	0 1020	
133430	0 1018	
140750	0 1016	
143320	0 1014	
144210	0 1012	

080100 0 1038 0000 253 000000 000000
081600 0 1040
082740 0 1042
084400 0 1044
090200 0 1046
091650 0 1048
093900 0 1050
102940 0 1052
105604 0 1050
115300 0 1042
120200 0 1040
121800 0 1038
122600 0 1036
124300 0 1034
124900 0 1032
130240 0 1030
131920 0 1028
132400 0 1026
132540 0 1024

083400 0 1040 0000 254 000000 000000
084700 0 1042
085700 0 1044
091031 0 1046
091700 0 1048
092900 0 1050
094400 0 1052
101700 0 1054
103800 0 1056

074230 0 1028 0000 262 000000 000000
075700 0 1026
081420 0 1024
082440 0 1022
084300 0 1020
084700 0 1018
093731 0 1014
103050 0 1012

123300 0 1058 0000 288 000000 000000
125600 0 1060
134940 0 1062
142000 0 1060
143140 0 1058
151210 0 1050
152050 0 1048
153030 0 1046
153530 0 1044

AUTOMATED TIDAL ZONING
BY
LTJG LYNN T. GILLMAN

Because of the arrangement of our tide gages and the nature of the survey, a new method of tidal zoning was used by the WHITING and LAUNCH 1257 in Long Island Sound (OPR-474) in 1969.

There were five tide gages used, two on the Connecticut side of the sound, and two on the Long Island side. These gages were arranged in such a way as to bracket our survey area.

X
SACHEM HEAD, CONN.

X
WESTBROOK, CONN.

S U R V E Y A R E A

X
HORTON BEACH, L. I.

X
NORTHVILLE, L. I.

X
MATTITUCK, L. I.

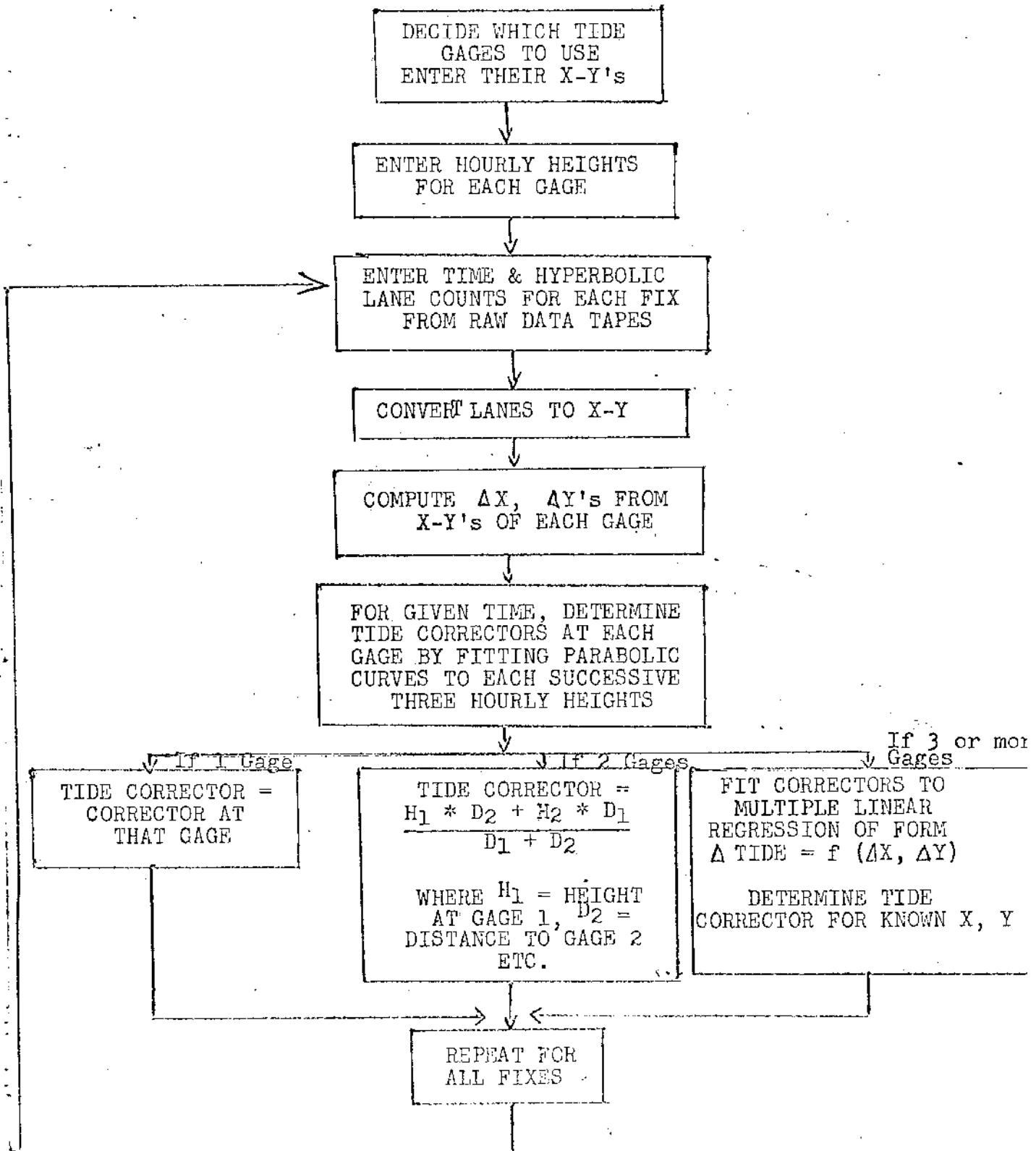
It was observed that, at any given time, the differences in the hourly heights at these gages could be as great as 1.5-2.0 feet. Because Launch 1257 was crossing the sound in relatively short time intervals, it was undesirable to have it pass from one tide zone into another at a discreet time and have a sizeable jump in tide correctors at that point. And since all of the 1969 WHITING hydrography junctioned with that of Launch 1257, it was decided to use one method of tidal zoning for both vessels.

The method decided upon was to determine the tide at any point on the survey as a junction of the relative distances from all tide gages used. The tide at the nearest gage has the greatest weight, the next nearest gage has the next most weight, and so forth to the farthest gage, which has the least effect.

The actual method used to determine these weights differed depending on whether we had tide data from one, two, or three or more stations, as is illustrated by the following flow diagram. This was necessary because we did not have tidal data from all gages for all days which we ran hydrography. For example, the Horton Beach tide gage was not even installed until late in the season when we got near that area. Comparisons were made using data from one to five gages, and the resulting correctors did not differ appreciably except in the case of one gage, where we had no choice but to use data from that gage as absolute. As a general rule we utilized all data available to us for a given day.

See the accompanying flow diagram for details of the system. This system was programmed and run on the WHITING's PDP-8 computer, and each part tested separately. The method of determining correctors by fitting parabolas to successive sets of three hourly heights compared almost exactly with points picked off a curve by hand. And the linear extrapolation of tides appeared to be quite reasonable. While this method may have some weaknesses, it appears to be better than using only one gage in each discreet area, and we would propose to use the same or an improved method on future surveys.

APPENDIX A



ABSTRACT OF CORRECTIONS TO ECHO SOUNDINGS

The following pages contain an abstract in tabular form of the velocity corrections which are to be applied automatically by AMC computer to echo soundings contained in this survey.

An Abstract of Bar Checks and Settlement and Squat Table are also included.

Attention is directed to the "Special Report on Corrections to Echo Soundings, OPR-474, 1969", submitted for this project.

VELOCITY CORRECTORS

H-9088 & H-9089

OPR-474

DEPTH	VEL. CORR.	VEL. TABLE					
000073	0	0000	0001	000	000000	000000	- Julian Days 294-308
000162	0	0002					
000243	0	0004					
000327	0	0006					
000412	0	0003					
000495	0	0010					
000582	0	0012					
000665	0	0014					
000750	0	0016					
000832	0	0018					
000918	0	0020					
001002	0	0022					
001035	0	0024					
001170	0	0026					
001257	0	0028					
001338	0	0030					
001423	0	0032					
001503	0	0034					
199999	0	0000					
000063	0	0000	0002	000	000000	000000	- Julian Days 278-290
000122	0	0002					
000180	0	0004					
000238	0	0006					
000295	0	0003					
000350	0	0010					
000408	0	0012					
000463	0	0014					
000523	0	0016					
000580	0	0018					
000635	0	0020					
000695	0	0022					
000743	0	0024					
000803	0	0026					
000860	0	0028					
000913	0	0030					
000977	0	0032					
001030	0	0034					
001088	0	0036					
001145	0	0038					
001202	0	0040					
001258	0	0042					
001313	0	0044					
001370	0	0046					
001428	0	0048					
001485	0	0050					
199999	0	0000					
000060	0	0000	0003	000	000000	000000	- Julian Days 248-277
000115	0	0002					
000170	0	0004					
000220	0	0006					
000275	0	0008					
000325	0	0010					
000380	0	0012					
000430	0	0014					
000480	0	0016					

000595 0 0020
000640 0 0022
000690 0 0024
000740 0 0026
000795 0 0028
000845 0 0030
000900 0 0032
000950 0 0034
001005 0 0036
001055 0 0038
001110 0 0040
001160 0 0042
001215 0 0044
001265 0 0046
001320 0 0048
001370 0 0050
001420 0 0052
199999 0 0000

← 000535 0 0018

SETTLEMENT AND SQUAT
LAUNCH 1257
SEPTEMBER 7, 1969

<u>RPM</u>	<u>CORRECTION</u>
525	+0.2 FT.
900	+0.3
1100	+0.5
1400	+0.6
1600	+0.3
1850	-0.3

DIGITAL BAR CHECKS

21

WH-20-5-69

LAUNCH 1257

ABSTRACT

DATE	5'	10'	15'	20'	25'	30'	35'	40'	45'
10/12	4.3 +0.7	9.1 +0.7	14.0 +1.0	18.8 +1.2	23.6 +1.4	28.4 +1.6	33.2 +1.8	38.2 +1.8	
10/15	4.3 +0.7	9.2 +0.8	13.9 +1.1	18.8 +1.2	23.5 +1.5	28.2 +1.8	32.8 +2.2		
10/16	4.3 +0.7	9.1 +0.9	13.9 +1.1	18.8 +1.2	23.6 +1.4	28.4 +1.6	32.9 +2.1	37.9 +3.1	42.65 +2.3
10/26	4.4 +0.6 10: 9.1 0.9	9.2 +0.8 20: 19.0 +1.0	14.2 +0.8 30: 28.6 +1.4	18.8 +1.2 40: 35.5 +1.5	23.7 +1.3 50: 48.1 +1.9	28.7 1.3 60: 57.7 +2.3	33.4 1.6 70: 67.5 +2.5	38.4 1.6 80: 77.1 +2.9	43.2 1.8
10/28	4.4 +0.6	9.2 +0.8	14.0 +1.0	18.7 +1.3	23.8 +1.2 50: 48.0 +2.0	28.8 +1.2 60: 57.7 +2.3	33.4 +1.6 70: 67.3 +2.7	38.6 +1.4	42.9 +2.1
10/30					23.7 +1.3 50: 48.1 +1.9	28.7 +1.3 60: 57.9 +2.1	33.5 +1.5 70: 67.5 +2.5	38.4 +1.6 80: 77.1 +2.6	43.4 +1.6
11/1	4.4 +0.6		14.1 +0.9	18.7 +1.3			33.3 +1.7	38.3 +1.7	43.1 +2.0
11/4	4.3 +0.7	9.1 +0.9	14.1 +0.9	19.0 +1.0 45: 42.9 +2.1	23.8 +1.2 50: 47.9 +2.1	28.5 +1.5 60:	33.4 +1.6	38.4 +1.6	42.9 +2.1

NOAA LAUNCH 1257
 ABSTRACT OF CORRECTIONS
 TO DISTANCE MEASUREMENTS
 OPR-474 LONG ISLAND
 SOUND

22

LOCATION	DATE	JULIAN DAY	CORR. P I	COER P II	MEAN CORR P I	MEAN CORR P II
NORTH OF FALKNER IS.	9/7/69	250	+0.49	+0.53	+0.49	+0.53
"	9/8/69	251	+0.51	+0.51	+0.51	+0.51
"	9/11/69	254	+0.52	+0.52	+0.52	+0.52
"	9/12/69	255	+0.56	+0.51	+0.56	+0.51
"	9/13/69	256	+0.58	+0.52	+0.58	+0.52
"	9/14/69	257	+0.57	+0.54		
OUTER IS.	"	"	+0.52 ³	+0.50	+0.55	+0.52
NORTH OF FALKNER IS.	9/15/69	258	+0.56	+0.53		
OUTER IS.	"	"	+0.52	+0.48	+0.54	+0.50
FALKNER IS. (N)	9/18/69	261	+0.61	+0.54		
OUTER IS.	"	"	+0.54	+0.50	+0.58	+0.52
FALKNER IS. (N)	9/23/69	266	+0.54	+0.53	+0.54	+0.53
"	9/24/69	267	+0.60	+0.54	+0.60	+0.54
"	9/25/69	268	+0.61	+0.54		
OUTER IS.	"	"	+0.59	+0.51	+0.60	+0.52
FALKNER IS. (N)	9/26/69	269	+0.64	+0.53		
OUTER IS.	"	"	+0.59	+0.46	+0.62	+0.50
FALKNER IS. (N)	9/27/69	270	+0.60	+0.52	+0.60	+0.52
FALKNER IS. (N)	9/28/69	271	+0.59	+0.49		
FALKNER IS (S)	"	"	+0.56	+0.51	+0.58	+0.50

LOCATION	DATE	JULIAN DAY	CORR PI	CORR PII	MEAN CORR PI	MEAN CORR PII
MADISON	9/29/69	272	+ .49	+ .44		
FALKNER IS. (N)	"	"	+ .57	+ .55		
MADISON	"	"	+ .50	+ .46	+ .52	+ .49
"	9/30/69	273	+ .49	+ .38		
SACHEM HEAD	"	"	+ .51	+ .48	+ .50	+ .43
"	10/1/69	274	+ .54	+ .45		
FALKNER IS. (S)	"	"	+ .49	+ .55	+ .52	+ .50
FALKNER IS. (N)	10/2/69	275	+ .59	+ .55		
NORTHVILLE (W)	"	"	+ .55	+ .56		
FALKNER (S)	"	"	+ .47	+ .49	+ .54	+ .53
FALKNER (S)	10/6/69	279	+ .46	+ .48		
NORTHVILLE (W)	"	"	+ .50	+ .5 ^b	+ .48	+ .52
NORTHVILLE	10/7/69	280	+ .53	+ .54		
FALKNER IS. (S)	"	"	+ .46	+ .52	+ .50	+ .53
MADISON (S)	10/9/69	282	+ .52	+ .45		
NORTHVILLE	"	"	+ .51	+ .50	+ .52	+ .48
MADISON	10/10/69	283	+ .51	+ .46		
NORTHVILLE	"	"	+ .50	+ .5 ^h	+ .50	+ .50
FALKNER IS. (N)	10/11/69	284	+ .54	- .10		
MADISON	"	"	+ .51	- .13		
NORTHVILLE (E)	"	"	+ .52	- .08	+ .52	- .10

LOCATION	DATE	JULIAN DAY	COOR. PI	COOR. PII	MEAN COOR. PI	MEAN COOR. PII
MADISON	10/12/69	285	+51	+30		
NORTHVILLE (E)	"	"	+52	+35	+52	+32
SACHEM HEAD	10/13/69	286	+52	+42		
MADISON	"	"	+50	+40		
MATTITUCK (W)	"	"	+50	+45	+51	+42
"	10/14/69	287	+50	+47		
MADISON	"	"	+48	+34	+49	+40
CLINTON	10/15/69	288	+50	+29		
MATTITUCK	"	"	+49	+36	+50	+32
HAMMONASSET PARK	10/16/69	289	+52	+29		
MATTITUCK	"	"	+53	+36	+52	+32
CLINTON	10/24/69	297	+55	+45		
DUCK POND PT.	"	"	+57	+54	+56	+50
CLINTON	10/25/69	298	+53	+45	* +53	+48
"	10/26/69	299	+52	+53		
DUCK POND PT.	"	"	+59	+57		
CLINTON (INSHORE)	"	"	+5 8	+ 7		
CLINTON (W)	"	"	+53	+42	+55	+51
L.I. SOUND	196.5 290.0	"	"	+48	+44	
"	183.5 307.5	"	"	+4 ² ₈	+42	
"	165.0 335.0	"	"	+53	+50	
"	159.0 346.0	"	"	+54	+44	

LOCATION	DATE	JULIAN DAY	CORR PI	CORR PII	MEAN CORR PI	MEAN CORR PII
MADISON	10/27/69	300	+1.56	+1.45	+1.56	+1.45
CLINTON	10/28/69	301	+1.53	+1.39		
DUCK POND PT.	"	"	+1.62	+1.46	+1.58	+1.42
CLINTON	10/29/69	302	+1.57	+1.48		
DUCK POND PT.	"	"	+1.56	+1.56	+1.56	+1.52
CLINTON	10/30/69	303	+1.52	+1.51		
DUCK POND - HORTON NECK	"	"	+1.58	+1.56	+1.55	+1.54
CLINTON - WESTBROOK	10/31/69	304	+1.56	+1.73		
"	"	"	+1.56	+1.47		
DUCK POND - HORTON NECK	"	"	+1.58	+1.56	+1.57	+1.52
WESTBROOK - CLINTON	11/1/69	305	+1.56	+1.48		
HORTON PT.	"	"	+1.44	+1.51	+1.50	+1.50
CLINTON	11/3/69	307	+1.53	+1.46		
HORTON PT	"	"	+1.67 ²	+1.55	+1.58	+1.50
DUCK POND PT. (W)	11/4/69	308	+1.55	+1.57	* +1.55	+1.54

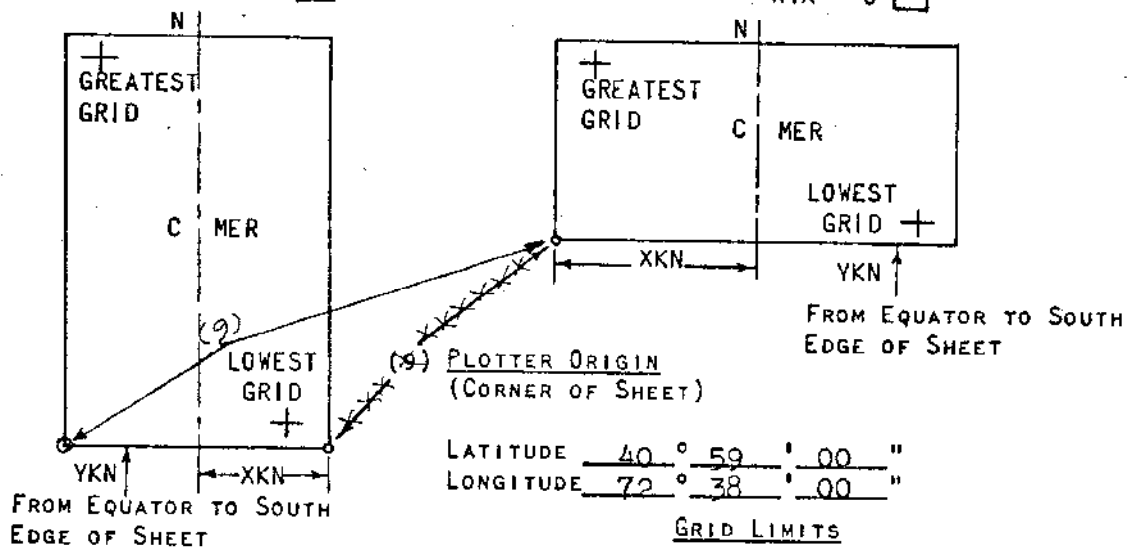
* INFERRED - 0.06 LANE DIFF. BETWEEN CONN. & L.I. SHORE ON PAT. II

FORM # 1

FIG. 15

PARAMETERS FOR DIGITAL COMPUTING
POLYCONIC PROJECTION

- (1) PROJECT No. OPR-474 (4) REQUESTED BY _____
- (2) H No. 9089 (5) SHIP OR OFFICE NOAA Launch 1257
- (3) FIELD No. WH 20-5-69 (6) DATE REQUIRED _____
- (7) VISUAL (8) ELECTRONIC (FILL OUT FORM #3)
- (10) XKN (SP 5) DISTANCE FROM CMER TO EAST EDGE (NYX = 1)
OR WEST EDGE (NYX = 0). N/A METERS
- (11) YKN (SP 241) DISTANCE FROM EQUATOR TO SOUTH EDGE
OF SHEET. N/A METERS
- (12) CENTRAL MERIDIAN 72° 35' 00"
- (13) SURVEY SCALE 1: 20,000
- (14) SIZE OF SHEET (CHECK ONE) 36x54 42x60 OTHER
- (15) NYX, ORIENTATION OF SHEET (CHECK ONE)
NYX = 1 NYX = 0



LIST G.P. OF ALL STATIONS TO BE PLOTTED ON THIS PROJECTION ON THE BACK OF THIS FORM. (DEG., MIN., SEC.)

- GRID LIMITS
- (16) GREATEST LATITUDE ° N/A' " (PROJECTION LINE
 - (17) LOWEST LATITUDE ° ' " INTERVAL, PAGE 4
 - (18) DIFFERENCE ° ' " HYDRO MANUAL)
 - (19) " "
 - (20) YSN
 - (21) GREATEST LONGITUDE ° N/A' "
 - (22) LOWEST LONGITUDE ° ' "
 - (23) DIFFERENCE ° ' "
 - (24) " "
 - (25) XSN

Deemed N/A by Chief, Processing Branch

FORM # 3

FIG. 7

COMPUTER PARAMETERS FOR ELECTRONICALLY CONTROLLED SURVEYS

~~ORBITAL~~ HYPERBOLIC

- (1) PROJECT No. OPR-474 (2) H- No. 9089 (3) FIELD No. WH 20-5-69
- (4) TYPE OF CONTROL: SHORAN, RAYDIST, XX HI-FIX, RADAR
 FREQUENCY (FOR CONVERSION OF RAYDIST OR HI-FIX LANES TO METERS) _____
- (5) RANGE ONE (R1) LATITUDE 40° 57' 54.41N
 STATION NAME PATTERN 1 LONGITUDE 72° 46' 24.98W
- (6) RANGE TWO (R2) LATITUDE 41° 15' 42.93N
 STATION NAME PATTERN 2 LONGITUDE 72° 23' 16.71W
- (7) AZIMUTH FROM R1 TO R2 _____ " "
- (8) BASELINE LENGTH IN METERS _____ M.
- (9) LOCATION OF SURVEY WITH RESPECT TO ELECTRONIC BASELINE: CHECK ONE
 (TO DETERMINE: IMAGINE AN OBSERVER STANDING AT R1 AND LOOKING DIRECTLY
 AT R2 — IF THE SURVEY AREA IS TO THE OBSERVER'S LEFT THEN A IS
NEGATIVE; IF THE SURVEY AREA IS TO THE OBSERVER'S RIGHT THEN A IS
POSITIVE.)
- _____ -A (MINUS) _____ +A (PLUS)
- (10) IF SHORAN CORRECTIONS ARE APPLIED BY THE EQUATION, $K(X) + C = D$,
 WHERE X IS SHORAN DISTANCE AND D IS TRUE DISTANCE, ENTER THE CONSTANT
 COEFFICIENTS OF THE EQUATIONS HERE:
 K(R1) _____, C(R1) _____, K(R2) _____, C(R2) _____
- (11) NUMBER OF VELOCITY TABLES TO BE USED:
 _____ NONE, _____ ONE, XX MORE THAN ONE.
- (12) _____ THIS FORM IS SUBMITTED ONLY AS AN AID IN PREPARING A BOAT
 SHEET PROJECTION.
 _____ THIS FORM APPLIES TO ALL DATA ON THIS SURVEY.
XX _____ THIS FORM APPLIES TO PART OF THE DATA ON THIS SURVEY - Launch 1257vs.
 Ship WHITING
 TIME AND DATE LIMITATIONS: FROM 284 To 308
 POSITION NUMBER LIMITATIONS: FROM 6927 To 7177
001 To 4290
 THIS IS FORM #3 SHEET # 1 OF 1 SHEETS FOR THIS SURVEY.
- (13) OTHER REMARKS:
 Master Station Location: $41^{\circ} 14' 39.00N$
 $72^{\circ} 52' 39.35W$

ABSTRACT OF HYDROGRAPHIC DATA LOCATED ON
SURVEY WH 20-5-69 (H-9089)

<u>Position No.</u>	<u>Description</u>	<u>Comment</u>
1834	"3A" Bell	LL. Page 162
4085	RB Bell	LL. No. 947
4131	R"8C"	LL. No. 949
4253	RB Bell	LL. No. 950

ABSTRACT OF DAILY POSITION NUMBERS USED
SHEET H-9089

<u>Julian Day</u>	<u>Position Numbers Used</u>
284	6927-7128
285	7129-7177; 0001-0342
286	0343-0437
287	0438-0674
288	0675-0941
289	0942-1274
297	1275-1682
298	1683-1721
299	1722-2150
300	2151-2307
301	2308-2508
302	2509-2777
303	2778-3257
304	3258-3578
305	3579-4001
307	4002-4235
308	4236-4390

APPROVAL SHEET

The Officer-in-Charge participated in all phases of this survey.

No additional recommendations other than stated elsewhere in this Descriptive Report are pertinent.

Ralph J. Land
LCDR, NOAA

orig

FORM C&GS-504

U.S. DEPARTMENT OF COMMERCE
ENVIRONMENTAL SCIENCE SERVICES ADMINISTRATION
COAST AND GEODETIC SURVEY

DESCRIPTIVE REPORT

PART B

Type of Survey Hydrographic

Field No. WH 20-5-69 Office No. H-9089

LOCALITY

State New York

General locality Long Island Sound

Locality Duck Pond Point to

Horton Point

19 69

CHIEF OF PARTY

CDR Wayne L. Mobley, C.O., WHITING

LIBRARY & ARCHIVES

DATE

APPROVAL SHEET

H-9089

Daily progress and guidance on the novel methods of automated hydrography was under my direct supervision. Developing and programming the system, along with surveying, placed an excessive workload on all officers aboard the WHITING. An area which was not fully developed was the manufacture of a conventional boat sheet. Daily progress, however, was determined from the various plots, and validity of the survey could be determined as work progressed. A composite boat sheet was not made until after the completion of the project due to the lack of adequate programs.

Novel methods used on this survey include:

1. Two-man launch.
2. Electronic hyperbolic control to the beach. Adequate calibration and checks were made daily, using the computer.
3. Two or more tide gages to be used for automated zoning.
4. Temperature-depth-conductivity measurements for determination of velocity correction. Draft and settlement and squat determined and applied separately. Checks were made on fathometer correction daily, using bar check or lead line in only ideal conditions. See TDC Report.
5. Use of DCU-Digital Fathometer system for the collection of hydrographic data, and the PDP-8 Computer-Calcomp Plotter for the display of the data.
6. Use of traverse and triangulation of third-order, or better, for visual calibration control.
7. Verification of data in the field was performed on a scale of 1:10,000 to obtain a greater degree of accuracy when smooth plotted on 1:20,000.

Wayne L. Mobley

Wayne L. Mobley
CDR, USESSA

HYDROGRAPHIC TITLE SHEET
PART B

H-9089

INSTRUCTIONS - The Hydrographic Sheet should be accompanied by this form,
filled in as completely as possible, when the sheet is forwarded to the Office.

FIELD NO.

WH 20-5-69

State New York

General locality Long Island Sound

Locality Duck Pond Point to Horton Point

Scale 1:20,000 Date of survey 10-22-69 - 11-1-69

Instructions dated 3 June 1969 Project No. OPR 474

Vessel USC&GSS WHITING

Chief of party Wayne L. Mobley, CDR, USESSA

Surveyed by Wayne L. Mobley, CDR, USESSA

Soundings taken by echo sounder, ~~bank log, plotter~~ Raytheon DE-723 D

Graphic record scaled by Automated

Graphic record checked by Ship's Personnel

Protracted by N.A. Automated plot by Hydroplot-AMC

Soundings penciled by N.A.

Soundings in ~~xxxxx~~ feet at MLW XXXX

REMARKS: All hydrography collected using automated launches equipped
with Digital Fathometers and DCU.

Individual sheets of each day's hydro were plotted using
ship's Hydroplot System. These were verified prior to making com-
posite at 1:10,000.

There are no boat sheets per se.

DESCRIPTIVE REPORT (PART B)
TO ACCOMPANY
HYDROGRAPHIC SURVEY H-9089
(FIELD NO. WH 20-5-69)
SCALE: 1:20,000
YEAR: 1969

-----OO-----

USC&GSS WHITING
Wayne L. Mobley, CDR, USESSA
Commanding

A. PROJECT

The number for this project is OPR 474 (Long Island Sound). The instructions utilized were dated 3 June 1969 and superseded all previous instructions.

B. AREA SURVEYED

The area surveyed lies between Duck Pond Point and Horton Point along the north shore of Long Island. The survey junctions with the HSL 1257 on the north (see Part A) and contemporary Survey H-9088 to the west.

C. SOUNDING VESSEL

The inshore hydrography was obtained using the WHITING's Launch No. II.

D. SOUNDING EQUIPMENT

The WHITING's Launch No. II was equipped with a Raytheon Digital Fathometer (Model No. 723-D, Serial No. 37019). Fathometer corrections were obtained from temperature and salinity data determined daily using a Martek TDC instrument and frequent Nansen casts. For further details see the Fathometer Report.

E. SMOOTH SHEET

The "smooth sheet" will be plotted at the Atlantic Marine Center.

F. CONTROL

Decca Hi-Fix was used exclusively for control. It was used in the hyperbolic mode, and the three shore stations were located using second-order methods, resulting in at least third-order accuracy. The coordinates are:

<u>STATION</u>	<u>LATITUDE</u>	<u>LONGITUDE</u>
MASTER	41°14'39.00"	72°52'39.35"
SLAVE 1	40°57'54.40"	72°46'24.98"
SLAVE 2	41°15'42.93"	72°23'16.71"

Frequent calibrations were obtained using visual sextant angles and simultaneous Hi-Fix readings.

G. SHORELINE

The shoreline was obtained from topographic sheets T-11726 and T-12400.

H. CROSSLINES

Approximately three per cent of the soundings obtained were in crosslines. When the crossline soundings were compared with the regular soundings, they agreed within a foot or less except in a few instances. Approximately ten per cent of the crossline soundings agreed within 2.0 feet with the regular soundings. This seemingly large inconsistency was introduced by rounding and the use of predicted tides.

I. JUNCTIONS

The junction on the west with WH 20-3C-69 was in almost complete agreement. The soundings did not vary by more than 1.0 foot. The northern junction of WHITING's Launch II work with the offshore work of the High-Speed Launch 1257 compares with good agreement.

J. COMPARISON WITH PRIOR SURVEYS

This area was not compared (see Part A).

K. COMPARISON WITH THE CHART

After application of smooth tides and velocity correction, the agreement with the chart is very good. The general features of the chart remain the same. The most significant changes are along the shoreline due to erosion.

L. ADEQUACY OF THE SURVEY

The survey is adequate to supersede all prior surveys.

M. AIDS TO NAVIGATION

There were no floating aids to navigation in the area covered by WHITING's Launch II.

N. STATISTICS

Area covered approximately four square miles.

	<u>Day</u>	<u>Positions</u>		
Launch II	302	5373-5551		
	303	5552-5820		
	304	5821-5917		
	295	8000-8025		
	298	8030-8092		
	299	8095-8299		
	300	8305-8375		
	305	8380-8525		
	WHITING	305	9955-9959	Bottom Samples

O. MISCELLANEOUS

See Tide Note and documentation in Part A for application of tides.

P. RECOMMENDATIONS

This portion of the survey is adequate for charting, and should supersede all prior surveys.

Q. REFERENCE TO REPORTS

See Part A of this report.

Settlement and Squat Corrections

Settlement and squats correction for the WHITING launches prior to transducer relocation based on tests dated 30 April 1965 are as follows:

Stopped:	0.0 ft.
Reduced Speed:	+0.2 ft.
Full Speed:	0.0 ft.

Settlement and squat corrections after the transducer relocation for Launch I on day 277 (1969) and Launch II on day 272 (1969), based on tests conducted on 24 and 26 November 1969 are as follows:

	Deep	Shallow Water (less than 120 ft.)
Stopped (or less than 1000 rpm)	0.0	0.0
Reduced Speed	0.2	0.2
Full Speed	0.6	0.8

Draft Corrections

280 1969

The Digital (100KC) Transducers and Hi-Fix antennas were relocated near stern of each launch to permit more accurate calibrations as well as visual Hydro.

The change in location also changes the static transducer draft i.e.:

Launch 1 (1204)

Prior to 277 Day = 2.2 ft.

After 277 Day = 1.5 ft.

(with initial set on 2.0 (Digital and analog)

Additional TRA Draft = 0.2 before 277 day.
-0.5 after 277 day.

Launch 2 (1205)

Prior to 272 Day = 2.3 ft.

After 272 Day = 1.5 ft.

(with initial set on 2.0 (Digital and analog)

Additional TRA Draft = 0.3 before 272 day.
-0.5 after 272 day.

Note: Drafts within ± 0.1 foot depending on amount and placement of load in launch.

Wayne L. Mobley
Wayne L. Mobley
CDR, USESSA
Commanding USC&GSS WHITING

USC&GSS WHITING
Velocity Corrections
Launch I & II
Long Island Sound (1969)

Table 6

Days 294 thru 308 1969 OPR-474

0 to 6.4	0.0
15.7	0.2
24.5	0.4
33.4	0.6
42.5	0.8
51.2	1.0
59.8	1.2
67.9	1.4
76.0	1.6
84.0	1.8
92.0	2.0
100.0	2.2
108.0	2.4
116.0	2.6
124.0	2.8
132.0	3.0
140.0	3.2
148.0	3.4
156.0	3.6
164.0	3.8
172.0	4.0

OCEANOGRAPHIC LOG SHEET - M
BOTTOM SEDIMENT DATA

I of

Res. Report

VESSEL SERIAL NO.	DATE	PROJ. NO.	YEAR	SAMPLE POSITION		DEPTH (Fathoms)	WEIGHT OF SAMPLER FLER	AP. PROX. PENETRA- TION	LENGTH OF CORE	COLOR OF SEDIMENT	FIELD DESCRIPTION	CHECKED BY	DATE CHECKED	REMARKS (Unusual conditions, cohesion, presence, density, etc., etc., type of bottom relief, etc., etc.)	OBS. INIT.
				LONGITUDE											
				LATITUDE	LONGITUDE										
9900	30 Nov 1969	OPR-474	1969	41-00-46.91	72-37-02.50	56.0	80 lbs			Coarse brown sand, mud, and shells.			310.82	246.85	
9901	Nov 2, 1969			41-02-00.66	72-37-01.50	61.8	"			Coarse brown sand, mud, and shells.			294.51	247.08	
9902	2 Nov. 1969			41-03-15.06	72-37-02.09	71.5	"			Coarse brown sand, mud and shells.			277.02	248.73	
9903	"			41-04-30.13	72-37-00.75	78.0	"			Coarse brown sand, mud and shells.			258.68	250.07	
9904	"			41-05-45.38	72-36-57.75	81.5	"			Coarse brown sand, mud and shells.			240.03	251.92	
9905	"			41-06-58.03	72-37-00.03	80.8	"			Coarse brown sand, mud and shells.			221.72	252.74	
9906	"			41-08-14.22	72-37-00.72	86.8	"			Coarse brown sand, mud and shells.			203.32	254.03	
9907	"			41-09-28.44	72-37-01.31	95.8	"			Coarse brown sand, mud and shells.			105.70	255.41	
9908	"			41-10-43.53	72-37-12.09	95.0	"			Sea weed brown sand, mud and shells.			168.90	256.82	
9909	"			41-11-58.38	72-37-01.63	78.0	"			Brown sand, mud, and shells.			152.69	258.58	
9910	"			41-13-11.91	72-37-01.19	37.3	"			Brown sand, muddy and shells.			197.55	258.63	
9911	"			41-13-16.28	72-34-58.94	56.3	"			Brown sand, shells, and mud.			146.55	294.48	
9912	"			41-13-12.34	72-33-02.13	99.3	"			Sand, shells, pebbles and rock.			154.84	325.66	
9913	"			41-13-11.78	72-31-01.13	100.3	"			Sand, shells, mud and mud.			161.98	358.28	
9914	"			41-13-10.38	72-29-03.50	80.5	"			Shells, and sand.			169.23	389.30	
9915	"			41-12-00.58	72-37-01.66	142.0	"			COARSE BROWN SAND OYSTER SHELLS			184.30	411.98	
9916	"			41-11-58.04	72-29-05.54	70.0	"			COARSE BROWN SAND & SHELLS			179.68	387.98	

Use more than one line per sample if necessary.

OCEANOGRAPHIC LOG SHEET - M
BOTTOM SEDIMENT DATA

Dec - 20 - 1969

I of

VESSEL	SERIAL NO.	DATE	SAMPLE POSITION		DEPTH (Fathoms)	WEIGHT OF SAMPLE FLER	AP. PROF. TRA- TION	LENGTH OF CORE	COLOR OF SEDI- MENT	FIELD DESCRIPTION	CHECKED BY	DATE CHECKED	REMARKS (unusual conditions, cohesion, domed curves, strat. no., type of bottom relief loc., slope, pfln., disposition, etc.)	OBS. INIT.
			LATITUDE	LONGITUDE										
<i>Whiting</i>			PROJ. NO. <i>OPR-474</i>		YEAR <i>1969</i>	LOCATION <i>LONG Island Sound</i>								
<i>9900</i>	<i>9900</i>	<i>Nov 1 1969</i> 11-27-69	<i>41-00-46.91</i>	<i>72-37-02.50</i>	<i>56.0</i>	<i>80 lbs</i>				<i>Coarse brown sand, mud, and shells.</i>			<i>310.02</i>	<i>246.85</i>
<i>9901</i>	<i>9901</i>	<i>Nov 1 1969</i>	<i>41-02-00.66</i>	<i>72-37-01.50</i>	<i>61.8</i>	"				<i>Coarse brown sand, mud, and shells.</i>			<i>294.51</i>	<i>247.08</i>
<i>9902</i>	<i>9902</i>	<i>1 Nov. 1969</i>	<i>41-03-15.06</i>	<i>72-37-02.09</i>	<i>71.5</i>	"				<i>Coarse brown sand, mud and shells</i>			<i>277.02</i>	<i>248.73</i>
<i>9903</i>	<i>9903</i>	"	<i>41-04-30.13</i>	<i>72-37-08.75</i>	<i>78.0</i>	"				<i>Coarse brown sand, mud and shells</i>			<i>258.68</i>	<i>250.07</i>
<i>9904</i>	<i>9904</i>	"	<i>41-05-45.38</i>	<i>72-36-57.75</i>	<i>81.5</i>	"				<i>Coarse brown sand, mud and shells.</i>			<i>240.03</i>	<i>251.92</i>
<i>9905</i>	<i>9905</i>	"	<i>41-06-58.03</i>	<i>72-37-00.03</i>	<i>80.8</i>	"				<i>Coarse brown sand, mud and shells</i>			<i>221.72</i>	<i>252.74</i>
<i>9906</i>	<i>9906</i>	"	<i>41-08-14.22</i>	<i>72-37-00.72</i>	<i>86.8</i>	"				<i>Coarse brown sand, mud and shells.</i>			<i>203.32</i>	<i>254.03</i>
<i>9907</i>	<i>9907</i>	"	<i>41-09-28.44</i>	<i>72-37-01.31</i>	<i>95.8</i>	"				<i>Coarse brown sand, mud and shells</i>			<i>185.70</i>	<i>255.41</i>
<i>9908</i>	<i>9908</i>	"	<i>41-10-43.53</i>	<i>72-37-02.09</i>	<i>95.0</i>	"				<i>Coarse brown sand, mud and shells sea weed</i>			<i>168.90</i>	<i>256.82</i>
<i>9909</i>	<i>9909</i>	"	<i>41-10-43.53</i>	<i>72-37-02.09</i>	<i>95.0</i>	"				<i>sea weed mud and shells</i>			<i>152.64</i>	<i>258.58</i>
<i>9910</i>	<i>9910</i>	"	<i>41-11-58.38</i>	<i>72-37-01.63</i>	<i>78.0</i>	"				<i>Brown sand, mud, and shells</i>			<i>152.69</i>	<i>258.58</i>
<i>9911</i>	<i>9911</i>	"	<i>41-13-11.91</i>	<i>72-37-07.19</i>	<i>37.3</i>	"				<i>Brown sand, mud, and shells</i>			<i>197.55</i>	<i>258.63</i>
<i>9912</i>	<i>9912</i>	"	<i>41-13-16.28</i>	<i>72-34-58.94</i>	<i>56.3</i>	"				<i>Brown sand, shells, and mud.</i>			<i>146.55</i>	<i>294.48</i>
<i>9913</i>	<i>9913</i>	"	<i>41-13-12.34</i>	<i>72-33-02.13</i>	<i>99.3</i>	"				<i>Sand, shells, pebbles and rock.</i>			<i>154.84</i>	<i>325.66</i>
<i>9914</i>	<i>9914</i>	"	<i>41-13-11.78</i>	<i>72-31-01.13</i>	<i>100.3</i>	"				<i>Sand, shells, mud and mud.</i>			<i>161.98</i>	<i>358.28</i>
<i>9915</i>	<i>9915</i>	"	<i>41-13-10.38</i>	<i>72-29-03.50</i>	<i>80.5</i>	"				<i>Shells, and sand</i>			<i>168.23</i>	<i>389.30</i>
<i>9916</i>	<i>9916</i>	"	<i>41-12-00.80</i>	<i>72-37-01.66</i>	<i>142.0</i>	"				<i>COARSE BROWN SAND OYSTER S SHELLS</i>			<i>184.30</i>	<i>411.98</i>
	<i>9916</i>	"	<i>41-11-58.07</i>	<i>72-39-05.74</i>	<i>70.0</i>	"				<i>COARSE BROWN SAND S SHELLS</i>			<i>179.68</i>	<i>387.98</i>

Use more than one line per sample if necessary.

DE of

U.S. DEPARTMENT OF COMMERCE
COAST AND GEODETIC SURVEY

OCEANOGRAPHIC LOG SHEET - M
BOTTOM SEDIMENT DATA

FORM CGS-733A
(6-23-60)

WH-20-5-69 (H.S.B.)

SERIAL NO.	DATE	SAMPLE POSITION		DEPTH (Feet)	WEIGHT OF SAMPLER FLY	AP- PROJ. TER- MIN- ATION	LENGTH OF CORE	COLOR OF SEDI- MENT	FIELD DESCRIPTION	REMARKS (Unusual conditions, cohesiveness, derived cutter, stat. no., type of bottom, relief, etc., slope, plain, disposition, etc.)	OBS. INIT.
		LATITUDE	LONGITUDE								
9917	2 Nov 1969	41-11-58.13	72-30-58.94	81.0	80 lbs				COARSE GREY SAND	PAT. I 179.51	PAT. II 354.18
9918	"	41-12-00.41	72-33-06.31	91.0	"				COARSE GREY SAND MUD & SHELLS	167.93	321.22
9919	"	41-12-01.06	72-35-02.63	87.0	"				FINE BROWN SAND, MUD & SHELLS	160.28	290.96
9920	"	41-10-46.22	72-34-58.34	92.5	"				FINE BROWN SAND, MUD & SHELLS	175.51	288.81
9921	"	41-10-47.13	72-33-07.15	51.0	"				FINE BROWN SAND WITH BLACK SPECKS	181.20	317.14
9922	"	41-10-46.78	72-31-07.65	107.3	"				FINE BROWN SAND, MUD & SHELLS	186.74	346.75
9923	"	41-10-45.66	72-29-01.47	104.5	"				MUD & FINE GREY SAND	191.92	376.55
9924	"	41-10-45.78	72-27-02.69	106.0	"				FINE BROWN SAND & MUD	195.96	402.54
9925	"	41-09-31.03	72-27-16.41	155.0	"				COARSE BROWN SAND PEBBLES, SHELLS	207.66	390.71
9926	"	41-09-26.88	72-28-13.25	121.0	"				COARSE BROWN SAND & SHELLS	205.12	366.12
9927	"	41-09-28.09	72-31-04.09	51.0	"				COARSE BROWN SAND	201.38	341.52
9928	"	41-09-31.84	72-33-05.34	76.0	"				COARSE BROWN SAND & SHELLS	196.13	313.30
9929	"	41-09-29.28	72-35-01.09	97.0	"				COARSE BROWN SAND MUD, SHELLS	191.61	285.10
9930	"	41-08-16.84	72-35-06.44	71.0	"				COARSE BROWN SAND MUD & SHELLS	207.31	281.00
9931	"	41-08-19.00	72-37-03.50	85.5	"				COARSE SAND, MUD & SHELLS	211.05	309.49
9932	"	41-08-16.22	72-31-11.84	119.0	"				COARSE BROWN SAND SHELLS & PEBBLES	214.79	334.21
9933	"	41-08-15.22	72-29-02.22	100.5	"				COARSE BROWN SAND & SHELLS	218.07	361.41

CHECKED BY
LONG Island Sound

YEAR
1969

PROJ. NO.
OPR-474

VESSEL
WHITING

Use more than one line per sample if necessary.

OCEANOGRAPHIC LOG SHEET - M
BOTTOM SEDIMENT DATA

III

VESSEL
WHITING

PROJ. NO.
OPR-474

YEAR
1969

LOCATION
LONG Island Sound

CHECKED BY

DATE CHECKED

SERIAL NO.	DATE	SAMPLE POSITION		DEPTH (Fathoms) FEET	WEIGHT OF SAMPLE FILTER	AP. PROX. FINE- FRACTION	LENGTH OF CORE	COLOR OF SEDI- MENT	FIELD DESCRIPTION	REMARKS (Unusual conditions, cohesion, density, cutter, stat. no., type of bottom, relief, etc.) SLOPE, PLAIN, DISPOSITION, ETC.)	OBS. INIT.
		LATITUDE	LONGITUDE								
9934	Nov. 2, 1969	41-08-15.22	72-26-57.78	126.0	80 lbs				COARSE BROWN SAND PEBBLES & SHELLS	PAT I 220.56 385.37	
9935	"	41-07-01.94	72-27-17.75	110.0	"				COARSE BROWN SAND SHELLS & MUD	232.96 373.68	
9936	"	41-07-01.16	72-28-01.69	120.0	"				FINE BROWN SAND	231.28 359.98	
9937	"	41-06-59.31	72-31-06.06	119.0	"				COARSE BROWN SAND SHELLS & PEBBLES	229.77 329.63	
9938	"	41-07-13.88	72-33-27.81	91.0	"				COARSE SAND, SHELLS & BARRAGES	224.02 300.96	
9939	"	41-07-02.28	72-35-05.78	80.0	"				SAND, SHELLS & SEAWEED	234.06 278.37	
9940	"	41-05-49.97	72-35-06.34	89.0	"				Grey mud, sand, and shells	241.80 274.84	
9941	"	41-05-49.16	72-32-07.94	92.0	"				Fine brown sand and shells.	242.29 300.19	
9942	"	41-05-49.25	72-31-04.44	87.5	"				FINE BROWN SAND AND SHELLS	243.35 324.87	
9943	"	41-05-50.16	72-29-02.00	94.0	"				FINE BROWN SAND, MUD & SHELLS	243.96 348.04	
9944	"	41-05-53.38	72-27-08.87	63.0	"				COARSE SAND, PEBBLES & SHELLS	243.98 368.11	
9945	"	41-04-38.50	72-29-02.84	71.0	"				FINE BROWN SAND, SHELLS & MUD	256.65 341.83	
9946	"	41-04-35.97	72-31-05.03	78.2	"				FINE BROWN SAND MUD & SHELLS	257.50 319.71	
9947	"	41-04-41.28	72-33-04.78	69.5	"				FINE BROWN SAND MUD & SHELLS	256.49 297.33	
9948	"	41-04-33.41	72-35-01.75	78.5	"				COARSE BROWN SAND & SHELLS	258.16 273.99	
9949	"	41-03-14.69	72-34-59.25	88.8	"				FINE BROWN SAND, MUD & SHELLS	275.19 272.03	
9950	"	41-03-15.56	72-33-01.41	69.6	"				COARSE BROWN SAND MUD & SHELLS	273.96 293.82	

Use more than one line per sample if necessary.

IV of

FORM NO. 733M (8-23-60)		U.S. DEPARTMENT OF COMMERCE COAST AND GEODETIC SURVEY											
VESSEL		PROJ. NO.	YEAR	LONGITUDE	DEPTH (Feet)	WEIGHT OF SAMPLER	AP. PROX. TO REVE- TION	LENGTH OF CORE	COLOR OF SEDI- MENT	FIELD DESCRIPTION	CHECKED BY	DATE CHECKED	
SERIAL NO.	DATE	SAMPLE POSITION LATITUDE LONGITUDE										REMARKS (Unusual conditions, cohesiveness, dected cutter, strat. no., type of bottom, relief, etc.)	OBS. INIT.
WHITING		OPR-474		1969		Long Island Sound							
9951	NOV. 2, 1969	40-31-18.63	72-31-41.35	59.5	80 lbs.					COARSE BROWN SAND	271.87	PAT I 315.96	
9952	"	40-01-57.76	72-39-57.63	60.5						COARSE BROWN SAND, MD & SHELLS	291.97	270.00	
9953	"												

Use more than one line per sample if necessary.

WH-20-5-69

VESSEL
USCGC GSS WRITTING
LAUNCH # 2

PROJ. NO.
OPR-474

YEAR
69

LONG Island Sound

OCEANOGRAPHIC LOG SHEET - M
BOTTOM SEDIMENT DATA

U.S. DEPARTMENT OF COMMERCE
COAST AND GEODETIC SURVEY

CHECKED BY

DATE CHECKED

SERIAL NO.	DATE	SAMPLE POSITION		DEPTH (Meters) Feet	WEIGHT OF SAMPLER FLUTTER	APX. PROX. PENETRATION	LENGTH OF CORE	COLOR OF SEDIMENT	FIELD DESCRIPTION	REMARKS (Unusual conditions, observations, depth, cutter, stat. no., bottom, location relative to, slope, plain, disposition, etc.)	OBS. (Initials)
		LATITUDE	LONGITUDE								
9955	1 Nov. 1969	41° 04' 45.44"	72° 27' 22.19"	20.2	5 lbs				Medium brown sand, shells and black particles.	I 255.24 559.37	
9956	"	41° 05' 09.25"	72° 28' 13.79"	15.7	"				Medium brown sand with black particles.	263.16 396.88	
9957	"	41° 05' 22.07"	72° 28' 46.06"	12.0	"				Course brown sand, rocks, and black particles.	268.03 339.38	
9958	"	41° 04' 49.19"	72° 28' 47.41"	12.6	"				Fine Brown sand with black particles.	262.72 341.62	
9959	"	41° 04' 26.56"	72° 28' 28.25"	27.0	"				Fine Brown Sand with black particles.	256.90 347.44	

Use more than one line per sample if necessary.

MARINE CHART BRANCH
RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H-9089

INSTRUCTIONS

A basic hydrographic or topographic survey supersedes all information of like nature on the uncorrected chart.

1. Letter all information.
2. In "Remarks" column cross out words that do not apply.
3. Give reasons for deviations, if any, from recommendations made under "Comparison with Charts" in the Review.

CHART	DATE	CARTOGRAPHER	REMARKS
12374	4-4-90	DM FULINAN	Full Part Before After Marine Center Approval Signed Via Drawing No. <i>EXAMINED ADEQUATELY APPROVED</i>
			Full Part Before After Marine Center Approval Signed Via Drawing No.
			Full Part Before After Marine Center Approval Signed Via Drawing No.
			Full Part Before After Marine Center Approval Signed Via Drawing No.
			Full Part Before After Marine Center Approval Signed Via Drawing No.
			Full Part Before After Marine Center Approval Signed Via Drawing No.
			Full Part Before After Marine Center Approval Signed Via Drawing No.
			Full Part Before After Marine Center Approval Signed Via Drawing No.
			Full Part Before After Marine Center Approval Signed Via Drawing No.
			Full Part Before After Marine Center Approval Signed Via Drawing No.
			Full Part Before After Marine Center Approval Signed Via Drawing No.
			Full Part Before After Marine Center Approval Signed Via Drawing No.
			Full Part Before After Marine Center Approval Signed Via Drawing No.
			Full Part Before After Marine Center Approval Signed Via Drawing No.
			Full Part Before After Marine Center Approval Signed Via Drawing No.
			Full Part Before After Marine Center Approval Signed Via Drawing No.
			Full Part Before After Marine Center Approval Signed Via Drawing No.
			Full Part Before After Marine Center Approval Signed Via Drawing No.
			Full Part Before After Marine Center Approval Signed Via Drawing No.
			Full Part Before After Marine Center Approval Signed Via Drawing No.
			Full Part Before After Marine Center Approval Signed Via Drawing No.
			Full Part Before After Marine Center Approval Signed Via Drawing No.
			Full Part Before After Marine Center Approval Signed Via Drawing No.
			Full Part Before After Marine Center Approval Signed Via Drawing No.
			Full Part Before After Marine Center Approval Signed Via Drawing No.
			Full Part Before After Marine Center Approval Signed Via Drawing No.
			Full Part Before After Marine Center Approval Signed Via Drawing No.
			Full Part Before After Marine Center Approval Signed Via Drawing No.
			Full Part Before After Marine Center Approval Signed Via Drawing No.
			Full Part Before After Marine Center Approval Signed Via Drawing No.

SUPERSEDES C&GS FORM 8352 WHICH MAY BE USED.