

FE341

Diagram No. 1212-2

NOAA FORM 76-35A

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

DESCRIPTIVE REPORT

Type of Survey .. Field Examination ..
Field No. HE-10-14-89 ..
Registry No. FE-341 ..

LOCALITY

State Connecticut--New York ..
General Locality Long Island Sound ..
Sublocality Vicinity of Stratford Shoal ..
..... to Long ^{Sand} Sound Shoal ..

19 89

CHIEF OF PARTY
LCDR S.R. Iwamoto

LIBRARY & ARCHIVES

DATE December 12, 1990 ..

FE341

12375

10319

HYDROGRAPHIC TITLE SHEET

FE -341

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.

HE 10-14-89

State NEW YORK -/- CONNECTICUT

General locality LONG ISLAND SOUND

Locality VICINITY OF STRATFORD SHOAL TO LONG SAND SHOAL

Scale 1:10,000 Date of survey SEPT 20 TO NOV. 27th 1989

Instructions dated _____ Project No. ~~HE 10-14-89~~ OPR-3664-HE-89

Vessel NOAA SHIP HECK S-591

Chief of party LCDR STANLEY R. IWAMOTO, C.O.

Surveyed by G.T., L.W., H.B., W.M.

Soundings taken by echo sounder, ~~and by pole~~ DSF 6000

Graphic record scaled by HADAPS

Graphic record checked by G.T., L.W., H.B., W.M.

Protracted by HADAPS Automated plot by HADAPS

Verification by Atlantic Hydrographic Section personnel XYNETICS 1241 Plotter (AMS)

Soundings in ~~XXXXXX~~ feet at MLW MLLW

REMARKS: Remarks; All times are UTC.

& Notes in the Descriptive Report were made in red during office processing

G.T. - G.H. Tuell

L.W. - L.D. Weiner

H.B. - H.W. Bonnah

W.M. - W.H. Morris

XWW 12/12/90 AWOIS/SURF M&B 2/28/91

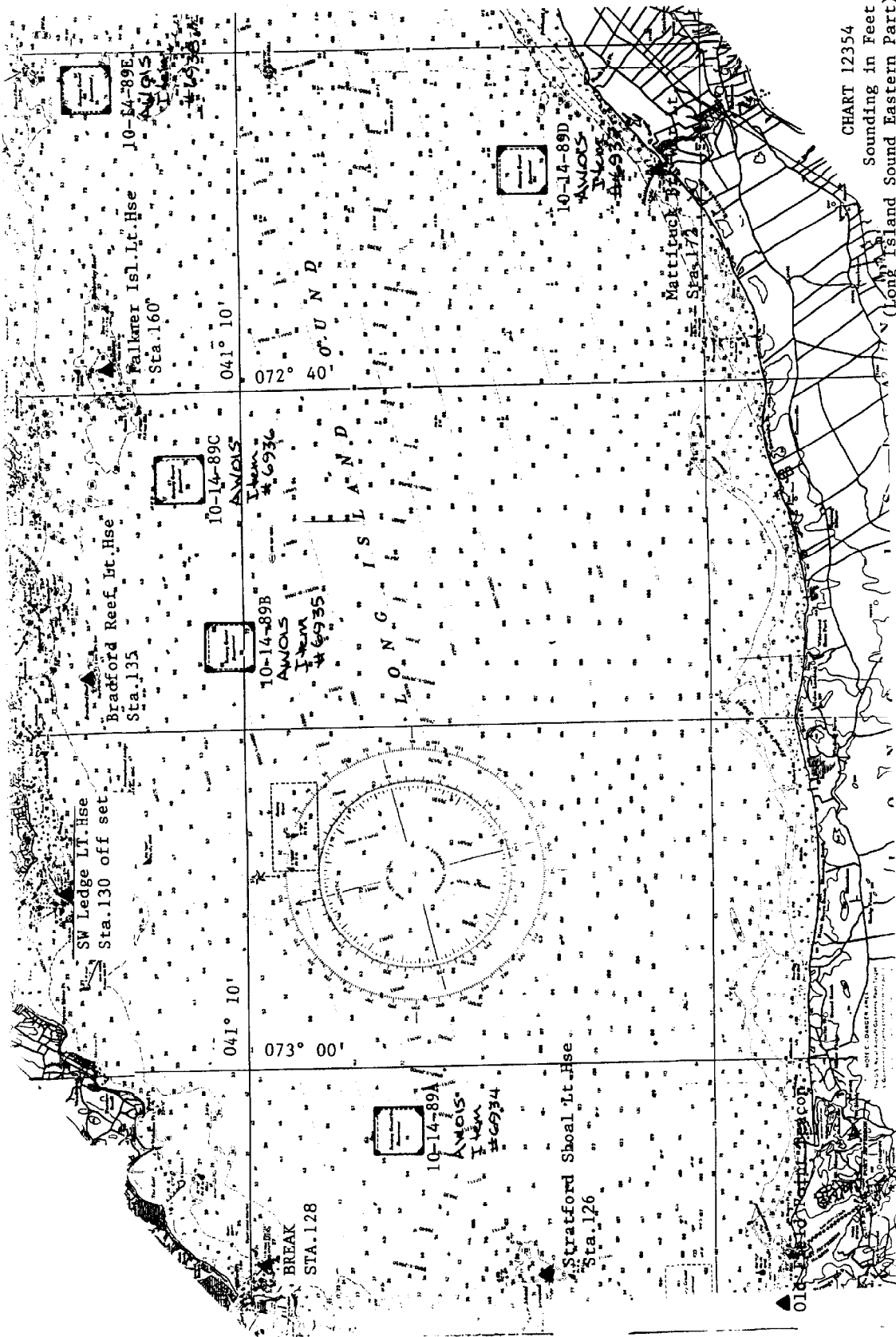


CHART 12354
 Sounding in Feet
 (Long Island Sound Eastern Part)
 Scale 1:80,000

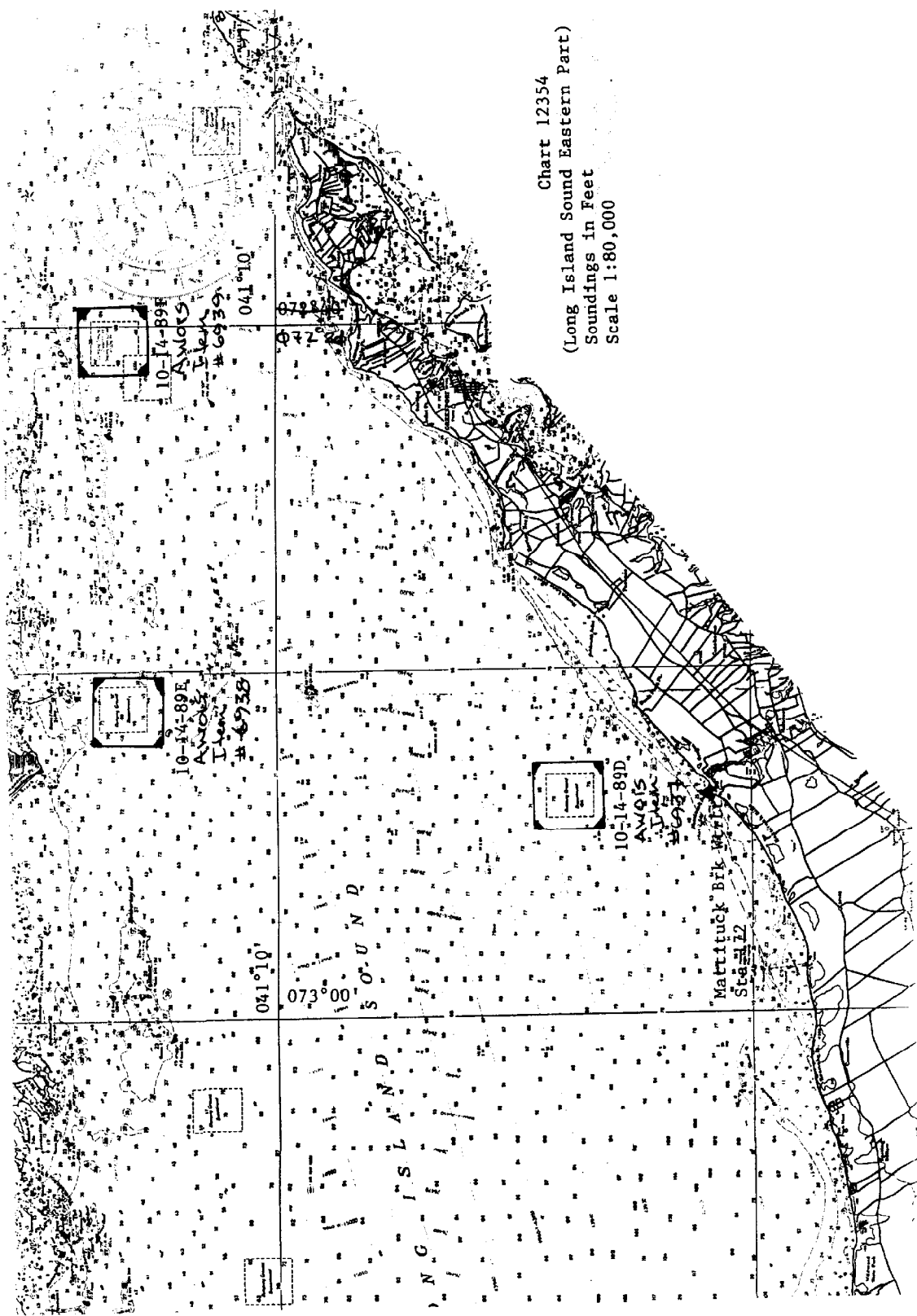


Chart 12354
(Long Island Sound Eastern Part)
Soundings in Feet
Scale 1:80,000

DESCRIPTIVE REPORT TO ACCOMPANY
SURVEY FE-341
FIELD NUMBER HE-10-14-89
CONNECTICUT--NEW YORK
LONG ISLAND SOUND
VICINITY OF STRATFORD SHOAL TO LONG SAND SHOAL
Scale 1:10000
NOAA SHIP HECK S-591
LCDR Stanley R. Iwamoto, CMDG

A. PROJECT

This survey was conducted in accordance with Hydrographic Project Instructions OPR-B660-HE, Southern New England Coast, dated August 21, 1989, and Change NO. 1, dated September 13, 1989. The project was accomplished in order to provide updated hydrographic survey data for the construction of new charts. Specifically, hydrographic survey operations were conducted on several discontinued dumping grounds in order to determine critical controlling depths.

B. AREA SURVEYED

This report includes the results of hydrographic surveys conducted over six discontinued dumping grounds located in eastern Long Island Sound. These dumping grounds were specified in the Presurvey Review as the following AWOIS items: 6934, 6935, 6936, 6937, 6938, and 6939. This survey lies in eastern Long Island Sound. The dumpsites are each one square mile discrete areas which range from Stratford Shoal, eastward for approximately thirty miles, to Long Sand Shoal.

Survey operations began on September 20, 1989, and continued until November 27, 1989.

C. SURVEY VESSELS

All hydrographic data were collected by the NOAA Ship HECK (EDPN 9140).

A 17 foot Boston Whaler skiff was used for installation and maintenance of MINI-RANGER shore stations and for general utility work.

D. AUTOMATED DATA ACQUISITION AND PROCESSING

Survey data acquisition and processing were accomplished utilizing the HDAPS system hardware and the latest version of the NAVITRONIC NAVISOFT 300 software provided to the ship by N/CG24. The versions and dates of the system software surveyed with were:

<u>Name</u>	<u>Date</u>	<u>Function</u>
SYSTEM-BAS	21 Jul 1989	BASIC Operating System
SURVEY 2.45	01 Aug 1989	Pre Survey & Survey Files
POSTSUR 2.46	01 Aug 1989	Post Survey Processing

E. SONAR EQUIPMENT

No side scan sonar operations were undertaken in support of this field examination.

F. SOUNDING EQUIPMENT

Raytheon DSF 6000N Echosounder

All hydrographic soundings for this survey were acquired using a Raytheon DSF echosounder (S/N A107). System performance was checked daily with an Electronic Depth Simulator Instrument (EDSI) provided by AMC's EEB. The daily tests are included as part of each day's raw data records. Both low and high frequency depths were digitized, but only the high frequency depths were used for survey operations. The automatic gain function was utilized. Operations were conducted using both 40 and 80 range scale settings. The auto phase function was used. The digitizing gate was set at 10 percent of depth.

F2. EG&G Model 260 Side Scan Sonar

No side scan sonar records are submitted in this survey.

F3. Leadline and Pneumofathometer

No diver determined least depths are submitted in this survey.

G CORRECTIONS TO ECHO SOUNDINGS

G1. Velocity Correctors

The following table shows the dates and locations that velocity correction data were obtained by either making direct readings of either sound velocity using the ODDM Digibar sound velocimeter; or temperature, depth, and conductivity measurements using a MARTEK unit:

<u>DATE</u>	<u>LOCATION</u>	
09/07/89 (DOY 250)	41° 00' 54"N ; 73° 06' 18"W	MARTEK
10/06/89 (DOY 279)	41° 02' 48"N ; 73° 03' 00"W	DIGIBAR
10/31/89 (DOY 304)	41° 03' 36"N ; 72° 34' 15"W	DIGIBAR
11/27/89 (DOY 331)	41° 14' 00"N ; 72° 19' 00"W	DIGIBAR

NOTE: MARTEK S/N = 177 DIGIBAR S/N = 168

The velocity cast data were reduced and velocity corrections calculated using program VELOCITY. The computed velocity correctors were then applied online to echosounder depths (both high and low frequency) by entering the correction data into the HDAPS sound velocity table.

The velocity cast conducted on DOY 331 was taken on the last day of survey operations and was not used to correct online data.

On DOY 250, velocity correctors were verified by conducting a dual leadline comparison of echosounder and leadline depths. Digital depths agreed with leadline depths within one half foot.

G2. Vessel Draft Corrector

During a February 1988 drydock period, an exact measurement of 19.0 feet was taken from the DSF transducers to a fixed point on each bridge wing of the ship. After refloating the ship, the height above the waterline was determined for this point. The ship's static draft was calculated to be exactly 6.9 feet (2.10 meters).

This draft was applied online to hydrographic soundings by entering the value of .21 meters as the high frequency transducer height in the HDAPS offset table.

No new stations were established. However, one station offset was established. Southwest Ledge Lighthouse Offset (station 130) was derived using sextant angles, a tape measured distance and a horizontal control computational routine for direct/inverse computations. A list of the horizontal control stations and the control work associated with station 130 (SW Ledge Lighthouse Offset) used in support of this survey can be found in Appendix III, LIST OF HORIZONTAL CONTROL STATIONS>

I. HYDROGRAPHIC POSITION CONTROL

Vessel survey navigation was accomplished by the range-range method, utilizing Motorola MINI-RANGER Falcon 484 system shore station installations placed directly over Third Order Class I or better geodetic stations. Control station positions were entered into the HDAPS Control Station Tables. (See APPENDIX III, LIST OF HORIZONTAL CONTROL STATIONS). The appropriate MINI-RANGER codes were attached to the station number on this table. Each time the survey navigation configuration was altered, the control station and C-D tables were modified so that they reflected the correct MINI-RANGER code placement/Baseline Corrector values.

Two baseline calibrations were performed for this field examination. The first, was a mid-season BLC performed on 20 May 1989 (DOY 140). MINI-RANGER system performance was satisfactory except for: Code C (S/N C-2067) failed on DOY 269 while installed at Branford Reef Light. Code 2 (S/N F-3296) failed on DOY 265 while installed at New Haven Breakwater Light. Code 4 (S/N E-2923) failed on DOY 279 while installed at Branford Reef Light. Code 6 (S/N F-3242) failed on DOY 283 while installed at Stratford Shoal Middle Ground. On DOY 286 HECK received four new MINI-RANGER reference stations. On 14 October 1989 (DOY 287) HECK performed the second BLC for this field examination. No further problems were encountered with survey navigation equipment.

Personnel errors propagated the following C-D table problems:

1) DOY 271, fixes 275-502, tape 26310; Station 130 (Southwest Ledge Lighthouse) was used for positioning while not having been entered into the proper C-D table (table 4). This mistake meant that no BLC corrector was applied to code A and introduced an error of 6.7 meters. Station 130 was manually deselected, however, and this error had no detrimental effect in the position computations.

2) DOYs 298-306, fixes 754-1013, tape 28910; Station 172 (Mattituck Inlet Light) was used for positioning while not having been entered into the proper C-D table (table 8). This mistake meant that no BLC corrector was applied to code 3 and introduced an error of 3.45 meters. Station 172 was manually deselected, however, and this error had no detrimental effect in the position computations.

The hydrographer must specify each of three interactive parameters which "tune" the positioning algorithm. The following parameters were entered into the Offset Table:

- 1) acceleration limit 0.2 meters second⁻²
- 2) angle limit 0.3 degrees second⁻¹
- 3) crabbing limit 0.4 degrees

NOTE: All survey offsets were applied on-line using the HDAPS "Offset Table"

The algorithm simultaneously uses up to four electronic lines of position (LOPs). Additionally, the ship's gyro heading and speed are used to predict a position. Whenever more than two acceptable LOPs are measured, the position computation is mathematically over-determined. In order to utilize all available information, a least squares adjusted position is computed.

Three measures of the quality of navigation position are: the magnitude of the residuals on each range; the size and orientation of the error ellipse; and the radius of the 95% confidence error circle. HDAPS provides the hydrographer with a continuous graphic display of this survey geometry information. The HDAPS system, while on-line, routinely was within specified tolerance. The required survey navigation positional accuracies are specified in the terms of the maximum residual and the Error Circle Radius (ECR). These requirements are stated in the Project Instructions. At no time during this project did the maximum residual consistently exceed 0.5 mm at the survey scale (5 meters). The 95% confidence ECR very rarely exceeded 1.5 mm at the survey scale (15 meters). This continuous fulfillment of specified positional tolerances validated the range corrector values obtained from both of the BLCs to be accurate and adequate.

Field Procedures Manual Memorandum #89-01, dated 08 August 1989, negated the requirement for sextant fixes when HDAPS is routinely operated in the multiple LOP mode and when positional accuracies are within specified tolerances.

J. SHORELINE

NOT APPLICABLE.

K. CROSSLINES - See section 3.2. of the Evaluation Report.

See discussion under section N. COMPARISON WITH THE CHART for crossline agreement on each dumpsite.

L. JUNCTIONS

NOT APPLICABLE

M. COMPARISON WITH PRIOR SURVEYS - See section 6. of the Evaluation Report.

NOT APPLICABLE

N. COMPARISON WITH THE CHART

N.1 INVESTIGATION REPORT FOR AWOIS ITEM 6934

AWOIS ITEM DESCRIPTION: Item is charted as discontinued Milford Dumping Ground, a one nautical mile square with sides running north-south and east-west. Dumping grounds originally established in 1950 and discontinued in 1977.

AREA OF INVESTIGATION:

State: Connecticut
City: Milford
Locality: 4 NM SE of Stratford Pt.
Latitude: 41-06-48.00
Longitude: 73-01-54.00

CHART COMPARISON: Charts used for comparison purposes:

CHART No.	TITLE	SCALE	ED.No.	DATE
12354	L I Sound, Eastern Part	1:80K	29th	JUL 89

SURVEY PROCEDURES:

Positioning: Falcon MINI-RANGER
Side Scan Sonar Search: none
Diver Investigation: none
Echosounder Investigation: DOYs: 263
264

The dumpsite was surveyed using fifty meter hydrographic line spacing. All hydrographic data are shown on the various copies of sheet HE-10-14-89A submitted with this survey. - Plot 1 of 6

RESULTS: No significant contacts, shoaling or unusual protrusions were noted on the echosounder records. Five percent of the hydrographic sounding lines were crosslines and the soundings agreed within 1 foot of the main-scheme soundings. No items within the dumpsite were considered hazards to navigation.

RECOMMENDATIONS: No change to charted depths is recommended within the boundaries of this dumping ground. Delete boundaries and remove note for the discontinued dumping ground charted at latitude 41-06-48, Longitude 073-01-54. - Concur. See also section 7.2. of the Evaluation Report.

N.2 INVESTIGATION REPORT FOR AWOIS ITEM 6935

AWOIS ITEM DESCRIPTION: Item is charted as discontinued Branford Dumping Ground, a one nautical mile square with sides running north-south and east-west. Dumping grounds originally established in 1950 and discontinued in 1977.

AREA OF INVESTIGATION:

State: Connecticut
City: Branford
Locality: 2.8 NM S of Branford Reef
Latitude: 41-10-15.00
Longitude: 72-47-30.00

CHART COMPARISON: Charts used for comparison purposes:

CHART No.	TITLE	SCALE	ED.No.	DATE
12354	L I Sound, Eastern Part	1:80K	29th	JUL 89

SURVEY PROCEDURES:

Positioning: Falcon MINI-RANGER
Side Scan Sonar Search: none
Diver Investigation: none
Echosounder Investigation: DOY: 271

The dumpsite was surveyed using fifty meter hydrographic line spacing. All hydrographic data are shown on the various copies of sheet HE-10-14-89B submitted with this survey. Plot 2 of 6.

RESULTS: No significant contacts or unusual protrusions were noted on the echosounder records. However, general shoaling is occurring in the vicinity of the charted depth at survey position 424.2 (Lat= 41-10.0 Long= 072-47.7). The charted depth is 70 feet while the surveyed depths in the area are 65⁶ feet. All other charted soundings in the remaining areas compare to within one foot of charted depths. Five percent of the hydrographic sounding lines were crosslines and the soundings agreed within 1 foot of the main-scheme soundings. No items within the dumpsite were considered hazards to navigation. - See section 7.2. of the Evaluation Report.

RECOMMENDATIONS: Delete the 70 foot sounding and chart a 65⁶ foot sounding at Latitude 41-10.0 Longitude 72-47.7. Delete boundaries and remove note for the discontinued dumping ground charted at latitude 41-10-15, longitude 72-47-30. - Concur. See section 7.2. of the Evaluation Report.

N.3 INVESTIGATION REPORT FOR AWOIS ITEM 6936

AWOIS ITEM DESCRIPTION: Item is charted as discontinued Falkner Island Dumping Ground, a one nautical mile square with sides running north-south and east-west. Dumping grounds originally established in 1950 and discontinued in 1977.

AREA OF INVESTIGATION:

State: Connecticut
City: Guilford
Locality: 2.5 NM SW of Falkner Island
Latitude: 41-11-18.00
Longitude: 72-42-36.00

CHART COMPARISON: Charts used for comparison purposes:

CHART No.	TITLE	SCALE	ED.No.	DATE
12354	L I Sound, Eastern Part	1:80K	29th	JUL 89
12373	Guilford Harbor to Farm River	1:20K	12th	MAY 81

SURVEY PROCEDURES:

Positioning: Falcon MINI-RANGER
Side Scan Sonar Search: none
Diver Investigation: none
Echosounder Investigation: DOYs: 289,290,298

The dumpsite was surveyed using fifty meter hydrographic line spacing. All hydrographic data are shown on the various copies of sheet HE-10-14-89C submitted with this survey. Plot 3 of 6

RESULTS: No significant contacts or unusual protrusions were noted on the echosounder records. However, general shoaling is occurring in the vicinity of the charted depth at survey position 640.1 (Lat= 41-~~12~~¹¹-21 Long= 072-41-57). The charted depth is 73 feet while the surveyed depths in the area are ~~82~~⁸³ feet. Also, general shoaling is occurring in the vicinity of the charted depth at survey position 518.6 (Lat= 41-~~11~~¹⁰-48 Long= 072-42-16). The charted depth is 84 feet while the surveyed depths in the area are ~~76~~⁷⁹⁻⁸⁰ feet. All other charted soundings in the remaining areas compare to within one foot of charted depths. Five percent of the hydrographic sounding lines were crosslines and the soundings agreed within 2 foot of the main-scheme soundings. No items within the dumpsite were considered hazards to navigation.

RECOMMENDATIONS: Delete the 73 foot sounding and chart a ~~82~~⁷⁰ foot sounding at Latitude 41-~~12~~¹¹-21 Longitude 72-41-57. Delete the 84 sounding and chart a ~~76~~⁷⁹ foot sounding at Latitude 41-~~11~~¹⁰-48 Longitude 72-42-16. Delete the boundaries and remove note for the discontinued dumping ground charted at latitude 41-11-18, longitude 72-42-36 - Concur. See section 7.2 of the Evaluation Report.

N.4 INVESTIGATION REPORT FOR AWOIS ITEM 6937

AWOIS ITEM DESCRIPTION: Item is charted as discontinued Mattituck Dumping Ground, a one nautical mile square with sides running north-south and east-west. Dumping grounds originally established in 1950 and discontinued in 1977.

AREA OF INVESTIGATION:

State: New York
City: Mattituck
Locality: 2.5 NM N Mattituck Inlet
Latitude: 41-03-48.00
Longitude: 72-33-36.00

CHART COMPARISON: Charts used for comparison purposes:

CHART No.	TITLE	SCALE	ED.No.	DATE
12354	L I Sound, Eastern Part	1:80K	29th	JUL 89
12358	Shelter Is.Snd and Peconic Bays	1:40K	15th	DEC 84

SURVEY PROCEDURES:

Positioning: Falcon MINI-RANGER
Side Scan Sonar Search: none
Diver Investigation: none
Echosounder Investigation: DOYs: 304, 306

The dumpsite was surveyed using fifty meter hydrographic line spacing. All hydrographic data are shown on the various copies of sheet HE-10-14-89D submitted with this survey. Plot 4 of 6.

RESULTS: No significant contacts, shoaling or unusual protrusions were noted on the echosounder records. Five percent of the hydrographic sounding lines were crosslines and the soundings agreed within 1 foot of the main-scheme soundings. No items within the dumpsite were considered hazards to navigation.

RECOMMENDATIONS: No change to charted depths is recommended within the boundaries of this dumping ground. Delete boundaries and remove note for discontinued dumping ground charted at latitude 41-03-48, longitude 72-33-36. - Concur. See section 7.2. of the Evaluation Report.

N.5 INVESTIGATION REPORT FOR AWOIS ITEM 6938

AWOIS ITEM DESCRIPTION: Item is charted as discontinued Clinton Harbor Dumping Ground, a one nautical mile square with sides running north-south and east-west. Dumping grounds originally established in 1950 and discontinued in 1977.

AREA OF INVESTIGATION:

State: Connecticut
City: Clinton
Locality: 2.0 NM S Kelsy Point
Latitude: 41-13-12.00
Longitude: 72-31-07.00

CHART COMPARISON: Charts used for comparison purposes:

CHART No.	TITLE	SCALE	ED.No.	DATE
12354	L I Sound, Eastern Part	1:80K	29th	JUL 89
12374	Duck Island to Madison Reef	1:20K	11th	MAY 84

SURVEY PROCEDURES:

Positioning: Falcon MINI-RANGER
Side Scan Sonar Search: none
Diver Investigation: none
Echosounder Investigation: DOYs: 311, 312

The dumpsite was surveyed using fifty meter hydrographic line spacing. All hydrographic data are shown on the various copies of sheet HE-10-14-89E submitted with this survey. - Plot 5 of 6.

RESULTS: No significant contacts or unusual protrusions were noted on the echosounder records. However, shoaling is occurring in three distinct areas:

- i) Area 1; The irregular bottom in the vicinity of survey position 1050.4 (Lat= 41-13-33 Long= 072-30-33) has a charted depth 106 feet. The surveyed depth at this position is 93 feet. Also, this same area has a surveyed sounding of ~~67~~^{38.5} feet at survey position 1035.33 (Lat= 41-13-36.3 Long= 072-30-32).
- ii) Area 2; in the vicinity of the charted depth at survey position 1107.65 (Lat= 41-13-18 Long= 072-30-39). The charted depth is 79 feet while the surveyed depth is 72 feet.
- iii) Area 3; at survey position 1020.7 (Lat= 41-13-~~32~~^{40.35} Long= 072-31-~~34~~^{31.4}). The charted depth near this position is 70 feet while the surveyed depth is ~~60~~⁶² feet.

All other charted soundings in the remaining areas compare to within two feet of charted depths. Five percent of the hydrographic sounding lines were crosslines and the soundings agreed within 2 foot of the main-scheme soundings. No items within the dumpsite were considered hazards to navigation.

RECOMMENDATIONS: Delete the 106 foot sounding and chart a 93 foot sounding at Latitude 41-13-33 Longitude 72-30-33. Chart a 69 foot sounding at latitude 41-13-36, longitude 072-30-37. Delete the 79 foot sounding and chart a 72 foot sounding at Latitude 41-13-18 Longitude 72-30-39. Delete the 70 foot sounding and chart a 60 foot sounding at Latitude 41-13-~~37~~³⁵ Longitude 72-31-31.4. Delete boundaries and remove note for discontinued dumping ground charted at latitude 41-13-12, longitude 72-31-07.

Concur. See section 7.2 of the Evaluation Report.

N.6 INVESTIGATION REPORT FOR AWOIS ITEM 6939

AWOIS ITEM DESCRIPTION: Item is charted as discontinued Cornfield Shoal Dumping Ground, a one nautical mile square with sides running north-south and east-west. Dumping grounds originally established in 1950 and discontinued in 1977.

AREA OF INVESTIGATION:

State: Connecticut
City: Old Saybrook
Locality: 2.5 NM S Saybrook Breakwater
Latitude: 41-13-23.00
Longitude: 72-20-30.00

CHART COMPARISON: Charts used for comparison purposes:

CHART No.	TITLE	SCALE	ED.No.	DATE
12354	L I Sound, Eastern Part	1:80K	29th	JUL 89
12374	Connecticut River	1:20K	17th	APR 84

SURVEY PROCEDURES:

Positioning: Falcon MINI-RANGER
Side Scan Sonar Search: none
Diver Investigation: none
Echosounder Investigation: DOYs: 326, 331

The dumpsite was surveyed using 100 meter hydrographic line spacing. All hydrographic data are shown on the various copies of sheet HE-10-14-89F submitted with this survey. *Plot 6 of 6*

RESULTS: No significant contacts, shoaling or unusual protrusions were noted on the echosounder records. Ten percent of the hydrographic sounding lines were crosslines. The soundings on the crosslines generally agreed within 1 foot of the main-scheme soundings when run on the same day. However, the same crossline soundings differed with the mainscheme soundings by as much as 3 feet when run on different days. This discrepancy is being attributed to variations between predicted and actual tides. No items within the dumpsite were considered hazards to navigation.

RECOMMENDATIONS: No change to charted depths is recommended within the boundaries of this dumping ground. Delete boundaries and remove note for discontinued dumping ground charted at latitude 41-13-23 longitude 72-20-30. - *Concur. See section 7.2 of the Evaluation Report.*

Q. ADEQUACY OF SURVEY

All items addressed in this survey are resolved.

P. AIDS TO NAVIGATION

A detached position was taken to validate the location of buoy G "3A", an unlit can buoy 1 NM north of Mattituck Inlet. The survey coordinates for this buoy are: Easting= 192518.0, Northing= 31770.4. *latitude 41° 01' 51.42" N, longitude 72° 33' 59.42" W*

Q. STATISTICS

<u>ITEM</u>	<u>for... NOAA Ship HECK</u>	<u>AMOUNT</u>
1. Total No. of Positions		1437 Fixes
2. Lineal NM of Soundings		232 NM
3. Square NM Hydrography		6 NM ²
4. Days of Production		12 Days
5. Bottom Samples		2
6. Tide Stations Established		None
7. Current Stations Established		None
8. Velocity Casts Performed		4 Casts
9. Magnetic Stations Established		None
10. Detached Positions		1

R. MISCELLANEOUS

R1. ANOMALOUS TIDAL OR CURRENT CONDITIONS

No anomalies in either tide or current, other than mentioned in the individual ITEM INVESTIGATIONS, were noted.

R2. BOTTOM SAMPLE SUBMISSIONS

No bottom samples taken were submitted to the Smithsonian Institution.

S. RECOMMENDATIONS

No recommendations, other than those mentioned in the individual Item Investigations, are necessary.

T. REFERRAL TO REPORTS

<u>Report Submitted Separately</u> -----	<u>Date Sent</u>
1. Coast Pilot for New York, Long Island north shore from Montauk Point to Sands Point. Sent to N/MOA23	16 JUN 89
2. Coast Pilot for Connecticut/New York north shore Long Island Sound from New London to Throgs Neck. Sent to N/MOA23	23 JUN 89
3. Electronic Control Data Report, all three baseline calibrations. Sent to N/MOA23	October 1989

DESCRIPTIVE REPORT APPENDICES

- I. DANGER TO NAVIGATION REPORTS
- II. NON-FLOATING AIDS AND LANDMARKS FOR CHARTS
- III. LIST OF HORIZONTAL CONTROL STATIONS
- IV. GEOGRAPHIC NAMES (FIELD)
- V. TIDES AND WATER LEVELS *
- VI. SUPPLEMENTAL CORRESPONDENCE
- VII. APPROVAL SHEET

** Removed from original Descriptive Report; filed with field records.*

LIST OF HORIZONTAL CONTROL STATIONS

<u>NUMBER</u>	<u>NAME</u>	<u>POSITION</u>
123.	OLD FIELD POINT BEACON	40° 58' 37.19911" 73° 07' 06.81994"
124.	STRATFORD SHOAL LTHSE	41° 03' 35.72832" 73° 06' 40. 58926" φ4
128.	BREAK	41° 09' 38.60716" 73° 05' 34.90260"
130.	SW LEDGE LTHSE OFFSET	41° 14' 03.95879" 72° 54' 43.54241"
135.	BRANFORD REEF LTHSE	41° 13' 16.66935" 72° 48' 19.16645"
160.	FALKNER ISLAND LIGHTHOUSE	41° 12' 43.05452" 72° 39' 12.94416"
165.	DUCK ISLAND W BRKWTR LT	41° 15' 22.63226" 72° 29' 06.62158"
<i>not used</i> 166.	SAYBROOK BREAKWATER LIGHT	41° 15' 47.53600" 72° 17' 15.35859" 2φ 33.912
172.	MATTITUCK BREAKWATER LT	41° 00' 55.69774" 72° 33' 39.79092"
255.	HORTON POINT LTHSE	41° 05' 06.49732" 72° 26' 44.04724"

No	Type	Latitude	CONTROL STATIONS		Freq	Vel	Code	MM/DD/YY
			Longitude	H Cart				
117	F	040:58:57.548	073:37:22.022	0	250	0.0	0.0	03/17/89
118	F	040:54:29.434	073:35:19.277	0	250	0.0	0.0	03/17/89
120	F	041:00:49.147	073:32:33.278	0	250	0.0	0.0	03/17/89
119	F	040:56:41.572	073:29:14.429	0	250	0.0	0.0	03/17/89
121	F	041:02:53.827	073:27:27.363	0	250	0.0	0.0	03/17/89
111	F	041:03:19.730	073:26:00.295	0	250	0.0	0.0	03/17/89
122	F	040:57:13.070	073:23:50.097	40	250	0.0	0.0	03/17/89
110	F	040:54:09.444	073:37:59.012	0	250	0.0	0.0	03/17/89
112	F	040:55:34.604	073:20:07.468	0	250	0.0	0.0	03/17/89
125	F	041:05:01.402	073:21:19.649	13	250	0.0	0.0	05/05/89
109	F	041:06:37.521	073:19:49.359	0	250	0.0	0.0	03/17/89
124	F	041:08:13.536	073:13:02.055	7	250	0.0	0.0	03/17/89
123	F	040:58:37.199	073:07:06.820	23	250	0.0	0.0	05/03/89
126	F	041:03:35.728	073:06:04.589	18	250	0.0	0.0	10/16/89
129	F	041:09:07.149	073:06:11.967	0	250	0.0	0.0	03/17/89
132	F	041:13:15.782	072:56:31.793	0	250	0.0	0.0	03/17/89
135	F	041:13:16.669	072:48:19.166	10	250	0.0	0.0	10/12/89
135	F	040:57:12.610	072:55:48.313	0	250	0.0	0.0	03/17/89
151	F	040:57:38.729	072:49:36.719	0	250	0.0	0.0	03/17/89
154	F	040:57:46.999	072:45:40.369	0	250	0.0	0.0	03/17/89
157	F	040:58:23.667	072:42:11.060	0	250	0.0	0.0	03/17/89
160	F	041:12:43.054	072:39:12.943	0	250	0.0	0.0	A 10/12/89
163	F	041:14:36.680	072:30:29.169	0	250	0.0	0.0	03/17/89
316	F	040:56:24.004	073:41:50.864	0	250	0.0	0.0	04/09/89
162	F	041:15:47.536	072:20:33.912	0	250	0.0	0.0	03/17/89
167	F	040:58:44.893	072:38:50.822	0	250	0.0	0.0	03/17/89
172	F	041:00:55.698	072:33:39.791	0	250	0.0	0.0	10/30/89
175	F	041:08:19.847	072:21:09.425	0	250	0.0	0.0	03/17/89
213	V	040:54:22.762	073:34:00.340	0	250	0.0	0.0	03/17/89
215	V	040:57:14.345	073:23:43.781	0	250	0.0	0.0	03/17/89
216	V	041:02:29.935	073:26:37.871	0	250	0.0	0.0	03/17/89
217	V	041:02:07.135	073:37:23.192	0	250	0.0	0.0	03/17/89
225	V	041:07:01.512	073:13:19.526	0	250	0.0	0.0	10/30/89
227	V	041:04:38.393	073:22:11.290	0	250	0.0	0.0	03/17/89
227	V	041:08:00.195	073:17:15.358	0	250	0.0	0.0	03/17/89
229	V	041:09:33.146	073:09:50.370	0	250	0.0	0.0	03/17/89
231	V	040:55:27.546	073:08:33.248	0	250	0.0	0.0	03/17/89
228	V	041:07:10.364	073:22:02.055	0	250	0.0	0.0	03/17/89
232	V	040:57:10.623	073:01:06.092	0	250	0.0	0.0	03/17/89
234	V	041:15:33.715	072:58:17.785	0	250	0.0	0.0	03/17/89
237	V	041:14:56.275	072:54:13.606	0	250	0.0	0.0	03/17/89
240	V	041:17:07.498	072:54:10.805	0	250	0.0	0.0	03/17/89
243	V	040:57:49.315	072:48:21.983	0	250	0.0	0.0	03/17/89
246	V	041:15:08.623	072:41:17.246	0	250	0.0	0.0	03/17/89
252	V	041:16:47.795	072:36:11.254	0	250	0.0	0.0	03/17/89
255	F	041:05:07.387	072:26:44.287	30	250	0.0	0.0	B 10/30/89
258	V	041:16:54.976	072:26:14.803	0	250	0.0	0.0	03/17/89
261	V	041:06:14.418	072:22:25.113	0	250	0.0	0.0	03/17/89
264	V	041:18:01.955	072:12:36.869	0	250	0.0	0.0	03/17/89
267	V	041:10:57.196	072:11:45.905	0	250	0.0	0.0	03/17/89
270	V	041:18:34.900	072:09:56.744	0	250	0.0	0.0	03/17/89
273	V	041:16:28.285	072:08:14.021	0	250	0.0	0.0	03/17/89
276	V	041:12:23.027	072:06:24.558	0	250	0.0	0.0	03/17/89
279	V	041:14:36.509	072:02:49.680	0	250	0.0	0.0	03/17/89
282	V	041:17:45.595	072:01:59.727	0	250	0.0	0.0	03/17/89
285	V	041:17:16.285	072:01:09.350	0	250	0.0	0.0	03/17/89
288	V	041:18:58.706	071:59:13.875	0	250	0.0	0.0	03/17/89
127	F	041:09:17.352	073:10:36.457	2	250	0.0	0.0	06/06/89

116	F	041:09:24.106	073:10:47.893	17	250	0.0	0.0	05/13/89
128	F	041:09:38.607	073:05:34.903	8	250	0.0	0.0	09/07/89
130	F	041:14:03.959	072:54:43.542	18	250	0.0	0.0	10/16/89
81	F	041:02:28.000	073:02:42.000	28	250	0.0	0.0	05/13/89
82	F	041:07:28.900	073:02:21.080	0	250	0.0	0.0	05/13/89
751	V	040:58:48.000	072:52:23.000	0	254	0.0	0.0	09/24/89
999	V	041:13:20.779	072:52:02.791	0	254	0.0	0.0	05/15/89
3	F	041:14:45.631	072:51:28.221	2	250	0.0	0.0	10/23/89
422	V	041:03:48.000	072:33:36.000	0	254	0.0	0.0	00/00/00
165	F	041:15:22.632	072:29:06.622	7	250	0.0	0.0	3 11/06/89
166	F	041:15:47.536	072:20:33.912	18	250	0.0	0.0	not B ^{co} 11/08/89
998	V	041:14:20.283	072:25:21.524	0	0	0.0	0.0	11/20/89

ENS Harrie W. Bonnah

Submitted by: ENS Harrie W. Bonnah, NOAA
Survey Officer
NOAA Ship HECK

VII. LETTER OF APPROVAL

Field operations contributing to the accomplishment of this survey were conducted under my direct supervision with frequent personal checks of progress and data quality. This report, field sheets, and data records have been closely reviewed and are complete and adequate for charting.

SRW

Stanley R. Iwamoto, LCDR, NOAA
Commanding Officer
NOAA Ship HECK

N/CG244-72-90

LETTER TRANSMITTING DATA

DATA AS LISTED BELOW WERE FORWARDED TO YOU BY (Check):

- ORDINARY MAIL AIR MAIL
 REGISTERED MAIL EXPRESS
 OBL (Give number) _____

TO:

Chief, Data Control Section, N/CG243
 Room 151, WSC-1
 Hydrographic Surveys Branch
 National Ocean Service
 Rockville, MD 20852

DATE FORWARDED

6 Dec. 1990

NUMBER OF PACKAGES

two (2)

NOTE: A separate transmittal letter is to be used for each type of data, as tidal data, seismology, geomagnetism, etc. State the number of packages and include an executed copy of the transmittal letter in each package. In addition the original and one copy of the letter should be sent under separate cover. The copy will be returned as a receipt. This form should not be used for correspondence or transmitting accounting documents.

FE-341 (HE-10-14-89), OPR-B660
CONNECTICUT--NEW YORK, LONG ISLAND SOUND

Pkg. 1: (Tube)

- 1 Original Descriptive Report containing six (6) Smooth Sheets.
- 6 Smooth Field Sheets.

Pkg. 2: (Box)

- 12 Envelopes containing echograms and raw data printouts for Year Days 263, 264, 271, 289, 290, 298, 304, 306, 311, 312, 326, and 331.
- 1 Envelope containing Sounding Correctors (Tides, Velocity, & TRA).
- 1 Envelope containing Smooth Accompanying Position and Excess Sounding Overlays (a total of 12 overlays).
- 1 Envelope containing data removed from the Descriptive Report and a binder containing the "Separates" included with the survey data.
- 1 Envelope containing Horizontal Control Data.
- 1 Cahier containing Final Printouts (Position, Control, Sounding, and L-File listings)

FROM: (Signature)

Maurice B. Hickson III
 Maurice B. Hickson, III

RECEIVED THE ABOVE
 (Name, Division, Date)

Return receipted copy to:

Chief, Atlantic Hydrographic Section
 N/CG244
 Atlantic Marine Center
 439 W. York Street
 Norfolk, VA 23510-1114

D. S. Clark
 12/12/90

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

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE: MARCH 27, 1990

MARINE CENTER: ATLANTIC

OPR: B660-HE-89

HYDROGRAPHIC SHEET: FE-341-SS

LOCALITY: Long Island Sound; Vicinity of Stratford Shoal to
Long Sand Shoal, Connecticut and New York.

TIME PERIOD: September 20 to November 27, 1989

TIDE STATION USED: 846-1490 New London, Conn.
846-7150 Bridgeport, Conn.

PLANE OF REFERENCE (MEAN LOWER LOW WATER):

New London(846-1490) = 3.34 ft.

Bridgeport(846-7150) = 1.81 ft.

HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE:

New London(846-1490) = 2.8 ft.

Bridgeport(846-7150) = 7.0 ft.

ORP: B660-HE-89

FE-341-SS

REMARKS: RECOMMENDED ZONING

AWOIS ITEM

- 10-14-89-A - times are direct and apply a X0.98 range ratio to Bridgeport, Conn.(846-7150).

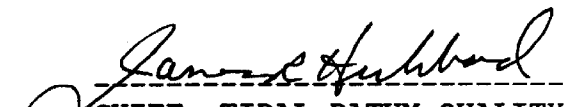
- 10-14-89-B - times are direct and apply a X0.85 range ratio to Bridgeport, Conn.(846-7150).

- 10-14-89-C - times are direct and apply a X0.79 range ratio to Bridgeport, Conn.(846-7150).

- 10-14-89-D - times are direct and apply a X0.74 range ratio to Bridgeport, Conn.(846-7150).

- 10-14-89-E - apply a -0 hr 30 min time correction and X0.67 range ratio to Bridgeport, Conn. (846-7150).

- 10-14-89-F - apply a + 0 hr 54 min time correction and X1.36 range ratio to New London, Conn. (846-1490)



CHIEF, TIDAL DATUM QUALITY
ASSURANCE SECTION

11/29/90

HYDROGRAPHIC SURVEY STATISTICS
REGISTRY NUMBER: FE-341

NUMBER OF CONTROL STATIONS	10
NUMBER OF POSITIONS	1401
NUMBER OF SOUNDINGS	8767

	TIME-HOURS	DATE COMPLETED
PREPROCESSING EXAMINATION	36	/ /
VERIFICATION OF FIELD DATA	70	06/29/90
ELECTRONIC DATA PROCESSING	9	
QUALITY CONTROL CHECKS	35	
EVALUATION AND ANALYSIS	46	11/19/90
FINAL INSPECTION	7	11/16/90
TOTAL TIME	203	
ATLANTIC HYROGRAPHIC SECTION APPROVAL		11/29/90

OFFICE OF CHARTING AND GEODETIC SERVICES
ATLANTIC HYDROGRAPHIC SECTION
EVALUATION REPORT

SURVEY NO.: FE-341

FIELD NO.: HE-10-14-89

Connecticut--New York, Long Island Sound, Vicinity of Stratford Shoal To Long Sand Shoal

SURVEYED: September 20 through November 27, 1989

SCALE: 1:10,000

PROJECT NO.: OPR-B660-HE-89

SOUNDINGS: RAYTHEON DSF-6000N Echosounder

CONTROL: MOTOROLA Mini-Ranger Falcon 484 (Range/Range)

Chief of Party.....S. R. Iwamoto

Surveyed by.....G. H. Tuell
.....H. W. Bonnah
.....L. D. Weiner
.....W. R. Morris

Automated Plots by.....XYNETICS 1201 Plotter(AHS)

1. INTRODUCTION

a. The purpose of this survey and the areas surveyed is adequately discussed in the Descriptive Report.

b. This survey is comprised of six (6) AWOIS items. The data collected for the six (6) items is plotted on six (6) 1:10,000 scale page size plots. The plots have been inserted into the Descriptive Report.

c. No unusual problems were encountered during the office processing of this survey.

d. Notes in the Descriptive Report were made in red during office processing.

2. CONTROL AND SHORELINE

a. Horizontal control for the present survey is adequately discussed in section H. of the Descriptive Report.

Horizontal control used for this survey during data acquisition is based upon the North American Datum of 1983 (NAD 83). Office processing of this survey is based on these values. All horizontal control station positions have been adjusted to NAD 83. All geographic positions listed from other sources are on the North American Datum of 1927 (NAD 27) unless otherwise noted. The smooth plots of this survey have been annotated with

datum, NAD 83, and NAD 27. To place the smooth plots on the NAD 1927 move the projection lines 0.354 seconds (10.9 meters or 1.09 mm at the scale of the survey) north in latitude and 1.662 seconds (38.8 meters or 3.88 mm at the scale of the survey) east in longitude.

The horizontal control stations listed in the Descriptive Report of this survey are Third Order, Class I accuracy or better except station SOUTHWEST LEDGE LIGHTHOUSE OFFSET which is a nonrecoverable temporary station.

b. There is no shoreline within the areas of investigation on this survey.

3. HYDROGRAPHY

a. This survey is a hydrographic investigation of specific dumping grounds and crosslines were not specifically required. Items #6934 through #6938 have 5% of the hydrography run as crosslines and item #6939 has 10% as crosslines. There is adequate agreement at crossings.

b. The standard depth curves could be drawn. Brown curves were added in areas where the bottom topography is not adequately depicted by the standard depth curves.

c. The development of the bottom configuration and investigation of features and least depths is considered adequate with the following exceptions:

1) The main scheme of the sounding lines are oriented in an east-west direction on the investigation of all items. This orientation is nearly parallel to the bottom contours in the areas that were investigated. Lines oriented in a north-south direction would be nearly normal to the contours and would provide better delineation the bottom configuration.

2) During the investigation of AWOIS Item #6938 the following areas should have been developed using reduced line spacing:

a) The shoal in the vicinity of Latitude 41°13'41"N, Longitude 72°31'31"W. A bottom sample was taken on this shoal.

b) The isolated shoal in the vicinity of Latitude 41°13'36"N, Longitude 72°30'38"W. A bottom sample should have been taken on this shoal..

c) The isolated shoal in the vicinity of Latitude 41°13'16"N, Longitude 72°30'38"W. A bottom sample should have been taken on this shoal.

3) During the investigation of AWOIS Item #6939 the following areas should have been developed using reduced line spacing:

a) In the vicinity of Latitude 41°13'38"N, Longitude 72°21'08"W where the bottom rapidly shoals to depths less than 120 feet the line spacing during data acquisition was 100 meters, and sounding line orientation was nearly parallel to the depth contour; 50 meter line spacing normal to the bottom contour would have been more desirable.

b) In the vicinity of Latitude 41°13'51"N, Longitude 72°19'59"W where an isolated 120-foot shoal exists.

4. CONDITION OF SURVEY

The smooth sheet and accompanying overlays, hydrographic records, and reports adequately conform to the applicable requirements except as noted in sections 3. and 7. of this report.

5. JUNCTIONS

There are no junctional requirements.

6. COMPARISON WITH PRIOR SURVEYS

HYDROGRAPHIC

H-9008 (1968) 1:20,000
 H-9088 (1969) 1:20,000
 H-9089 (1969) 1:20,000
 H-9181 (1970) 1:20,000

The four (4) prior surveys listed above cover the present survey areas.

The comparison between the prior surveys and the smooth plots reveals that the general topography of the areas surveyed has changed little and is quite stable for AWOIS Items #6934, #6935, #6936, and #6937. Present and prior hydrography, in general, are in excellent agreement with the present and prior survey soundings agreeing within two feet or less within the common area.

The following should be noted:

a) The bottom configuration in the area common to AWOIS Item #6938 is very irregular. The agreement between present and prior hydrography is generally good although significant differences exist. These differences can be attributed to the present survey being a far more comprehensive survey of the area. Differences of particular note are as follows:

1) A shoal found on the present survey with a shoalest sounding of 62 feet in the vicinity of Latitude $41^{\circ}13'42''N$, Longitude $72^{\circ}31'30''W$ is indicated on prior survey H-9089 (1969) with a shoalest sounding of 67 feet.

2) An isolated shoal found on the present survey with a shoalest sounding of 68 feet in the vicinity of Latitude $41^{\circ}13'36''N$, Longitude $72^{\circ}30'36''W$ is indicated on prior survey H-9089 (1969) with a shoalest sounding of 73 feet.

3) An isolated shoal found on the present survey with a shoalest sounding of 69 feet in the vicinity of Latitude $41^{\circ}13'16.2''N$, Longitude $72^{\circ}30'37.2''W$ is indicated on prior survey H-9089 (1969) with a shoalest sounding of 78 feet.

b) In the area common to AWOIS Item #6939, there is generally good agreement (within 1-3 feet) between present and prior hydrography in depths greater than 120 feet except in the area of Latitude $41^{\circ}13'51.6''N$, Longitude $72^{\circ}19'59.4''W$ where an isolated 120-foot shoal exists in prior survey depths of 124-146 feet. In depths less than 120 feet (the northwest corner of this item investigation), agreement is poor and shoaling is indicated. This corner of this item investigation is characterized by an irregular bottom with steep relief. This area of poor agreement is attributed to the possible encroachment of Long Sand Shoal and the present survey being a far more accurate and comprehensive survey of the area.

The present survey is adequate to supersede all prior hydrography within the common areas.

7. COMPARISON WITH CHARTS 12354 (29th Ed., July 29, 1989)
 12358 (16th Ed., May 12, 1990)
 12372 (25th Ed., Feb. 3, 1990)
 12373 (13th Ed., Dec. 30, 1989)
 12374 (11th Ed., June 23, 1984)
 ; 12375 (18th Ed., Nov. 11, 1989)

a. HYDROGRAPHY

The charted hydrography common to AWOIS Items #6934, #6937, and #6939 originates with the previously addressed prior surveys. The previously addressed prior surveys require no further consideration. The charted hydrography common to AWOIS Items #6935, 6936, and 6938 originates with sources not readily available.

The charted hydrography common to the area of AWOIS Item #6935 ranges from 1 to 4 feet deeper than the present survey.

The charted hydrography common to the area of AWOIS Item #6936 ranges from 0 to 5 feet deeper than the present survey.

The charted hydrography common to the area of AWOIS Item #6938 has significant differences. This area has a very irregular bottom configuration and the chart does not adequately reflect the bottom configuration of the area. The differences between present survey and charted hydrography within the common areas are attributed to the present survey being a far more accurate and comprehensive survey of the area.

The present survey is adequate to supersede all charted hydrography within the common areas.

b. AIDS TO NAVIGATION

Nine fixed aids to navigation were used in the horizontal control of this survey and are listed in the control listing (geographic position only). No other fixed aids to navigation were addressed by this survey. One floating aid to navigation was located by the field unit. This aid to navigation, Mattituck Gong Buoy "3A", is not smooth plotted since it is not associated with or near any of the areas investigated. No comments or recommendations were made. This buoy does appear to be on station and serving its intended purpose.

8. COMPLIANCE WITH INSTRUCTIONS

This survey adequately complies with the Project Instructions except five of the six investigations do not completely cover the assigned areas of investigation.

a. The investigation of AWOIS Item #6934 missed covering to the southern limit by approximately 100 meters.

b. The investigation of AWOIS Item #6936 missed covering to the southern limit by approximately 100 meters and the eastern limit by varying distances of up to 90 meters.

c. The investigation of AWOIS Item #6937 missed covering to the northern limit by approximately 200 meters. Also coverage along the western boundary is marginal.

d. The investigation of AWOIS Item #6938 missed covering to the southern limit by approximately 100 meters.

e. The investigation of AWOIS Item #6939 missed covering to the southern limit by approximately 40-50 meters; however, line spacing in this area is only required to be 100 meters.

9. ADDITIONAL FIELD WORK

As previously noted, this survey is adequate to supersede all charted data within the common areas. No additional field work is recommended.

for Robert R. Hill
 Leroy G. Cram
 Supervisory Cartographic
 Technician
 Verification of Field Data

Maurice B. Hickson, III
 Maurice B. Hickson, III
 Cartographer
 Evaluation and Analysis

GEOGRAPHIC NAMES

FE-341

Name on Survey	Source of Name											
	A	B	C	D	E	F	G	H	K			
	ON CHART NO.	ON PREVIOUS SURVEY NO.	ON U.S. QUADRANGLE MAPS	FROM LOCAL INFORMATION	ON LOCAL MAPS	P.O. GUIDE OR MAP	RAND McNALLY ATLAS	U.S. LIGHT LIST				
CONNECTICUT (title)												1
LONG ISLAND SOUND (title)												2
LONG SAND SHOAL (title)												3
NEW YORK (title)												4
STRATFORD SHOAL (title)												5
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Approved:

Charles E. Hamner
Chief Geographer - N/C 4215

SEP 10 1990

APPROVAL SHEET
FE-341

Initial Approvals:

The completed survey has been inspected with regard to survey coverage, delineation of depth curves, development of critical depths, cartographic symbolization, and verification or disproval of charted data. The digital data have been completed and all revisions and additions made to the smooth sheet during survey processing have been entered in the magnetic tape record for this survey. Final control, position, and sounding printouts of the survey have been made. The survey records and digital data comply with NOS requirements except where noted in the Evaluation Report.

Robert G. Roberson
Robert G. Roberson
Chief, Evaluation and Analysis Team
Atlantic Hydrographic Section

Date: 19 November 1990

I have reviewed the smooth sheet, accompanying data, and reports. This survey and accompanying digital data meet or exceed NOS requirements and standards for products in support of nautical charting except where noted in the Evaluation Report.

Christopher B. Lawrence
Christopher B. Lawrence, CDR, NOAA
Chief, Atlantic Hydrographic Section

Date: 29 November 1990

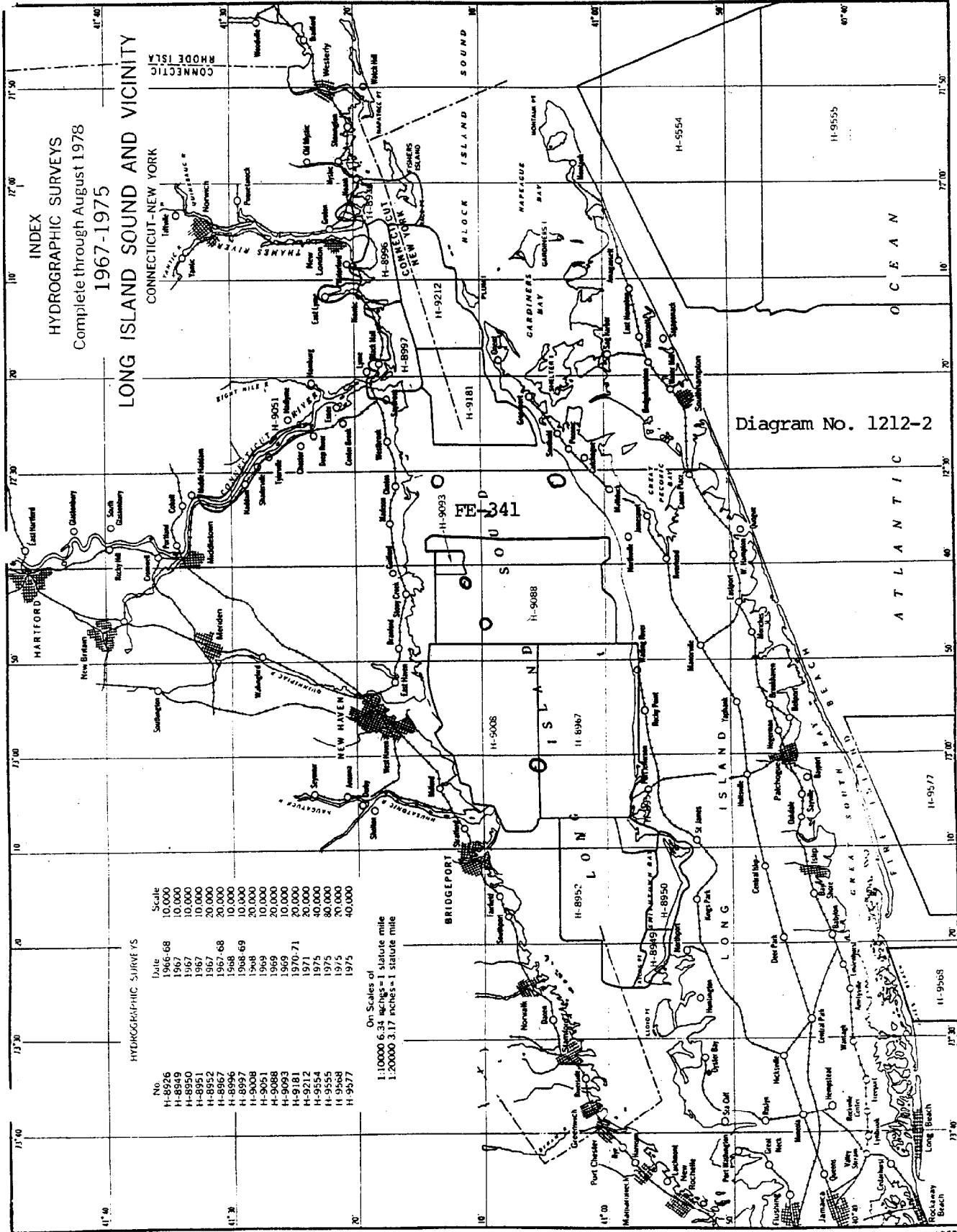
Final Approval:

Approved: J. Austin Yeager
J. Austin Yeager
Rear Admiral, NOAA
Director, Charting and Geodetic Services

Date: 2/15/91

DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Ocean Survey
Rockville, Maryland

Hydrographic Index No. 63 L



53 60 65 69 68 70 71 73 78 77 83 85 85 90 92 96 98 102 113 116 122 125 130 130 140 129 141 140 148 152 144 123 130 123 142
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41° 13' 30"

41° 13' 00"

72° 21' 30"

72° 21' 00"

72° 20' 30"

72° 20' 00"

72° 19' 30"

41° 12' 30"

FE-341
CONNECTICUT -- NEW YORK
LONG ISLAND SOUND
VICINITY OF STRATFORD SHOAL TO LONG SAND SHOAL
22-27 NOV 1989
SCALE : 1:10,000
SOUNDINGS IN FEET AT MLLW
SHEET 6 OF 6.
AWOIS ITEM NUMBER 6939

NRD 27
SYNETICS 1301
V. L. G. 4/68/88

