

H10867

NOAA FORM 76-35A U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION NATIONAL OCEAN SERVICE	
DESCRIPTIVE REPORT	
<i>Type of Survey</i>	HYDROGRAPHIC/SIDE SCAN SONAR
<i>Field No.</i>	RU-10-3-99
<i>Registry No.</i>	H10867
LOCALITY	
<i>State</i>	MAINE
<i>General Locality</i>	PENOBSCOT BAY
<i>Sublocality</i>	SEARSPORT TO TURTLE HEAD
19 99	
CHIEF OF PARTY	
LCDR. JAMES S. VERLAQUE, NOAA	
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DATE	OCT 2 2000

HYDROGRAPHIC TITLE SHEET

H10867

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.

RU-10-3-99

State Maine

General locality Penobscot Bay

Localities Searsport to Turtle Head

Scale 1:10,000

Date of survey April 12, 1999 to May 28, 1999

Instructions dated 4-16-99

Project No. OPR-A343-RU-99

Vessel NOAA Ship RUDE EDP#9040

Chief of party LCDR James S. Verlaque, NOAA

Surveyed by LCDR J. Verlaque, LT. E. Berkowitz, ENS Slover, PS C. Parker, S. Rooney, M. Chandler

Soundings taken by echo sounder, hand lead, pole Reson Sebat 9003, Odom Echotrac Echosounder

Graphic record scaled by RUDE Personnel

Graphic record checked by RUDE Personnel

Protracted by N/A

Automated plot by HP 2500CP - office HP 750C; HP2500CP Design Jet

Verification by Atlantic Hydrographic Branch

Soundings in ~~fathoms~~ feet at ~~MLLW~~ ^{Feet} MLLW ~~Meters~~ at MLLW

REMARKS: All times referenced to UTC.

Notes in the Descriptive Report were made during office processing.

AW013/SURF 9/13/50 SJV

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SEPARATES *

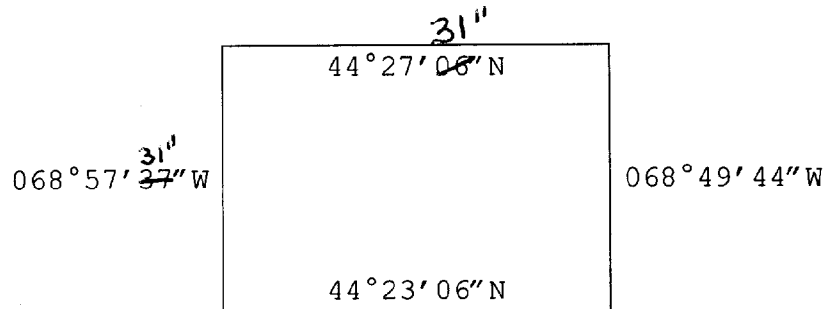
* Data filed with original field records

A. PROJECT

- A.1 This survey was conducted in accordance with Hydrographic Project Instructions OPR-A343-RU-99, Penobscot Bay and Penobscot River, Maine.
- A.2 The original instructions are dated April 16, 1999.
- A.3 There are no amendments to the instructions.
- A.4 This survey is designated registry number H10867.
- A.5 This project responds to requests from the Penobscot Bay and River Pilots Association, Down East Pilots, and the Maine Department of Environmental Protection. Modern hydrographic surveys are required in the project area to ensure safe and efficient navigation of commercial shipping. Vessel traffic includes tankers of up to 60,000 tons and drafts up to 35 feet. The possibility of expansion of the Seaport's marine terminal and the west side of Sears Island requires up to date hydrographic surveys.

B. AREA SURVEYED

- B.1 Survey H10867 is a basic hydrographic survey under the navigable area concept with 200% side scan sonar coverage. The survey area encompasses portions of Penobscot Bay that includes the Seaport Marine Terminal, the west, south, and southeast sides of Sears Island, and Squaw Head; proceeding southward to Turtle Head and westward toward Steel Ledge Light. The survey area covers approximately 42.45 square kilometers or 12.4 square nautical miles.
- B.2 The survey is comprised of one sheet with the following survey boundaries: (approximate and not to scale):



- B.3 Data acquisition for this survey began on April 12, 1999 (DN 102) and ended on May 28, 1999 (DN 148).

C. SURVEY VESSELS

- C.1 All hydrography, side scan, and multibeam investigations for this were conducted from NOAA Ship *RUDE* (S-590, EDP #9040) and NOAA Launch 0517. The *RUDE* conducted side scan, multibeam, and single beam hydrography in the areas from approximately the 30 foot contour seaward to the offshore survey limits. Launch 517 collected side scan data and single beam data from the 30 foot contour shoreward to the 18 foot contour. General functions include side scan sonar and multibeam sounding operations, velocity of sound determinations, bottom sampling, and navigational aid positioning.
- C.2 The transducer for the multibeam sonar was deployed on a pivoting pole mounted on the port side, approximately amidships. The multibeam transducer was rotated into the water only during times of data acquisition. Single beam transducers are hull mounted on both survey vessels.
- C.3 Survey H10867 is unique in that it contains a mixture of hydrographic data. The *RUDE* collected multibeam sounding data, single beam sounding data, and side scan data; while Launch 517 collected side scan data and single beam data. The final sounding data set contains single beam data from Launch 517 and multibeam data and single beam data from the *RUDE* combined together on one field sheet.

D. AUTOMATED DATA ACQUISITION AND PROCESSING - See also *Evaluation Report*

- D.1a Coastal Oceanographics' HYPACK for Windows Version 7.1a (12/02/97) was used for data acquisition on this survey. Post processing included the use of HPTools Version 9.4.0 and 9.4.8 (04/22/99) for all Hypack data conversion data. Data processing was conducted using Hydrographic Processing System (HPS) Version 8.9 (09/98) supplied by Atlantic Hydrographic Branch Computer Support Group on the HydroSoft CD (version 8.9). MapInfo Version 5.0 (08/18/98) was utilized for data display during the valuation process and completion of the field sheet. All

software versions used for data processing are listed in
*Appendix H.

- D.1b Triton Corporation's ISIS software Versions 4.28 (04/23/99) was used to acquire SeaBat multibeam and digital side scan sonar data. SeaBat data was processed on the CARIS-HIPS System Version 4.2.7 (01/17/97).
- D.1c The SEABIRD SBE-19 sound velocity profiler unit was utilized with SEASOFT 3.3M (11/27/89) and SEACAT 3.1 (02/25/98) software. The program VELWIN Version 4.0 (03/1/99) was used to process the acquired data and calculate velocity corrections.
- D.2a Multibeam and side scan sonar data (XTF Format) conversion within the CARIS-HIPS System entailed specific conversion selections. Conversion selection for origin of sensor information differs between the two types of data. Multibeam data conversion utilized the standard or default selections. Default selections with CARIS software included "Ship Nav" from Sensor; "Ship Gyro" from Attitude; "Fish Nav" from Sensor; "Fish Gyro" from Attitude. Data decimation was not selected and image correction was selected during conversion.
- Side scan sonar data conversion entailed selecting "Ship Nav" from Sensor; "Ship Gyro" from Ship or Attitude; "Fish Nav" from Ship; "Fish Gyro" from Ship or Attitude. Data decimation was not selected and image correction was selected during conversion.
- D.2b SeaBat depth data were monitored using ISIS during acquisition and processed utilizing CARIS-HIPS multibeam data cleaning programs. Digital multibeam depth profiles were visually reviewed and fliers were identified and manually flagged as "rejected"; no SeaBat quality flags were used to automatically "reject" data. Vessel navigation data from DGPS and attitude data from heave, pitch, roll, and gyro sensors were displayed and manually cleaned (see Sections G and I).
- D.2c After reviewing and cleaning, the depth, navigation, and attitude data were merged with sound velocity, tide, and vessel configuration data to compute the true depth and position of each sonar beam footprint. Work file processing for survey evaluation included importing the multibeam depths into the work file, selecting the "extended no key" sounding attribute and "group by beam number" grouping option. Processed depths were thinned by

*Data filed with field records
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shoal bias binning with 3 m X 3 m sounding grid determined by selecting the "Line by Line Binning" method. Soundings were not suppressed; the sounding level yields data points approximately every three meters.

Work file processing for data submission to Atlantic Hydrographic Branch (N/CS33) included binning the same processed multibeam data set at a grid level of 20 meters at survey scale of 1:10,000; this yields soundings approximately every 20 meters and is compatible for HPS sounding density. Grid size of 15 meters created a memory problem during final processing. This obstacle was due to the file size of the imported final data set. Therefore, the hydrographer chose to grid the final data set at 20 meters.

CARIS Workfile Processing for cross-data comparisons (see Section J.2) was not conducted as the survey was not 100% multibeam survey. Finally, the CARIS Workfile Processing soundings were transferred into HPS (using HPTools) and MapInfo databases.

D.2d Sounding evaluation included the use of a text file (.txt) created during the multi-beam sounding export process. This text file was used to display the soundings within MapInfo. The dat file (.dat) created during the sounding export process was converted into HPS via HPTools, generating a HPS multibeam only data file for each day of acquisition. Final field sheet selected soundings originate from these HPS multibeam only data files, Launch 517's single beam soundings, and RUDE's single beam soundings chosen to fill in holiday gaps during office processing.

The conversion software translating HYPACK data and the suppressed multibeam soundings into HPS compatible format was supplied by NOAA's Atlantic Hydrographic Branch Computer Support Group. The HPTools Version 9.4.0 and 9.4.8 was used for data conversion and management.

D.2e Final plots were created in MapInfo, a PC-based GIS package, with assistance from HPS-MI MapInfo tools supplied by NOAA's Hydrographic Survey Division (HSD). These tools produced depth, track and swath plots from HPS data and allowed plotting on a HP750C and 2500CP DesignJet plotter. Data could also be overlaid on a raster image of the applicable chart.

D.2f The total number of multibeam soundings used and processed

during post processing evaluation does not reflect the total number of multibeam soundings provided to N/CS33. Verification sounding grid size of 20 meters at survey scale was selected with no sounding suppression within HIPS. Sounding excessing will be conducted during the verification process using HPS.

E. SONAR EQUIPMENT

- E.1 All side scan sonar data were acquired with an Edgetech (EG&G) model 272 towfish (S/N 16697, 12106, and 11904) and an Edgetech Model 260-TH slant-range correcting side scan sonar recorder (S/N 16670, 12106). Additionally, all side scan sonar data were recorded digitally using the Triton ISIS software and archived in the Extended Triton Format (*.XTF) files.
- E.2 The side scan towfish used a 50° vertical beam width tilted down 20° from horizontal.
- E.3 The 100 kHz frequency was used throughout the survey.
- E.4a The 75 meter range scale was used with line spacing of 60 meters in deeper areas which allowed operators to maintain proper side scan fish altitude. In areas with shallower depths, the 50 meter range scale was utilized with 40 meter line spacing. Coverage was checked to ensure 200% side scan sonar coverage. Some of the inshore areas surveyed by Launch 517 did not acquire the second 100% coverage due to equipment and vessel safety factors. Sounding data in these inshore areas was determined to be more critical than contact development. Submerged rocks located in the inshore areas increased as the depth became shallower.
- E.4b Confidence checks were conducted by means of verifying identifiable benthic features. These features included submerged rocks, methane gas pock marks, anchor scours, and scallop trawl scours. Graphic record annotations identify these features from inner to outer limits of the range scale. The hydrographer's confidence in side scan sonar area coverage was continuously verified.
- E.4c Two hundred percent side scan sonar coverage was conducted in the offshore area. Holiday coverage was run to fill in any gaps. All coverage was checked with on-screen zoomable coverage displays in MapInfo, to ensure proper overlap between lines.

- E.4d The towfish was deployed exclusively from the stern on the *RUDE*. An electronic cable counter (M/D Totco) was employed to determine the amount of side scan cable deployed. The towfish was deployed on the port quarter of Launch 517 utilizing manual cable count to determine towfish layback.
- E.5 Sonar records were monitored on-line and reviewed by two persons during processing to identify contacts. Contact offsets and shadow heights were measured on analog sonar records, checked, and entered into the HPS Contact Table to compute contact heights and positions.
- E.6 All side scan contacts with computed heights equal to or greater than 1.0 meter off the bottom in water depths less than or equal to 20 meters were deemed significant. In water depths greater than 20 meters, contacts with computed heights greater than 10% of the water depth and all contacts which appeared man-made were deemed significant. All significant contacts were developed with multibeam sonar coverage.

F. SOUNDING EQUIPMENT

- F.1a Single-frequency (455 kHz) multibeam data were acquired with a Reson SeaBat 9003 (S/N 10496-447020) shallow-water sonar system. The 9003's combined transmit and receive beams yield forty (40) soundings per ping, each formed from a 3° crosstrack x 1.5° alongtrack bottom footprint. During multibeam data processing, the outermost two beams on each side of the swath (beam numbers 1, 2, 39, and 40) were not processed, reducing the effective swath width to 108° (3° x 36 beams). Proper overlap between multibeam sonar coverage lines was verified using a conservative swath width assumption of 100°.
- F.1b SeaBat 9003 (455 kHz) multibeam data were continuously recorded during data acquisition and served as a primary source for *RUDE*'s digital soundings. Sounding depths ranged from 16 to 20¹⁰⁰ feet of water, utilizing multibeam range scales of 10, 25, and 50 meters. Item investigation line spacing were based upon contact positions for nadir beam development.
- F.1c Vessel speed during the mainschmeme sounding collection consisted of maintaining standards for side scan

operations. Multibeam development included vessel speeds between 4 and 7 knots; item and contact investigation speeds were generally slower (3 to 5 kts); slower speeds increase the data density along track over the feature.

- F.2a Dual-frequency (24 and 100 kHz) vertical beam echo sounding data were acquired with a Odom Echotrac echo sounder. The *RUDE's* Echotrac echo sounder S/N 9643 was used from beginning through survey completion. Echo-sounder S/N 9643 did not record the low frequency depths; survey data using this echo sounder recorded only high frequency returns. NOAA Launch 517 used a single vertical beam echo sounder. Innerspace Echo sounder Model 448 was used for all Launch 517's data collection (S/N 241).
- F.2b High (100 kHz) frequency vertical single beam data were recorded during data acquisition. Single beam echograms were monitored on-line. Anomalous echogram traces were immediately cross-referenced to the ISIS multibeam acquisition display online.
- F.2c Manual edits were made to the Odom Echotrac data; only missed depths (9999.9) and holiday sounding data were scanned and edited during field processing of main scheme data. Single beam vertical correctors were applied to the raw single beam digital soundings (see Section G). The archived HPS fixes of single beam soundings do not represent the entire character of the seafloor because not all shoal bias inserts were selected; graphic records were not scanned for depth edits unless utilized as holiday soundings or cross comparison. Single beam data collected during crossline comparison was scanned and edited in order to make a valid comparison with mainscheme data.

Note: *RUDE's* single beam sounding data from the following HPS files were utilized to fill in multibeam sounding holidays. Selected portions of the data files were scanned and edited. All other portions of data within these specified files listed below were flagged as "NSP" (Not for Smooth Plot) and remains within the data set.

Day Number	HPS File Name
119	D4011900
124	D4012400
125	D4012510

Day Number	HPS File Name
126	D4012620

All single beam data files within the project data set except those listed above **should not be included** on the final field sheet. **All final field soundings originate from RUDE multibeam data, 517 single beam data, and RUDE single beam holiday soundings.**

- F.3 Diver investigation was performed during this survey for positive identification of an uncharted wreck. Least depth determination was observed with the MOD III Diver Least Depth Gauge and included with survey data.

A calibrated lead line was used for direct comparison of single beam echo sounder.

- F.5 The RUDE's multibeam Isis system experienced a computer malfunction on DN 117 (04/27/99). The system was operational from DN 110 (04/20/99) to DN 117 (04/27/99). An Isis unit was provided by Nautical Charting Development Lab and became operational on DN 120 (04/30/99) and remained operational through survey completion.

Survey operations from DN 117 to DN 119 maintained production via side scan sonar operations with single beam data collection. Multibeam soundings were acquired at a later time to provide soundings in these common areas.

G. CORRECTIONS TO SOUNDINGS

- G.1a Sound velocity correctors were computed from a SeaBird SBE19 SEACAT Profiler (S/N 196723-1251). Data quality assurance tests using the CAT program were performed for each cast. The profiler is calibrated at the beginning and end of each field season. See *Separate IV for data records.

The following velocity casts were used for this survey:

CAST #	DAY NUMBER
1	102
3	106

CAST #	DAY NUMBER
6,7,8,9	110
10,11,12,13 14,15,16,17	111
18,19,20	112
21,22,23	113
24,25,26	116
27,28	117
29	119
30,31,32,33 34	120
35,36,37	124
38,39,40	125
41,42,43,44 45,46,47	126
49	127
50,51,52	130
53,54,55,56 57,58	131
59,60	132
61,62	137
63,64	140
65,66,67	141
68,69,70	144
71,72,73,74 75,76	146
77	148

Sound velocities were applied to the SeaBat data in HIPS (incorporating the Nautical Charting Development Lab REFRACT algorithm). Sound velocity correctors for the vertical beam soundings were computed using VELWIN and applied to the single beam data using HPS.

G.1b Sound velocity comparison was conducted on DN 106 (04/16/99) at five different locations within the survey limits. These areas include locations within the Penobscot River and Penobscot Bay environments. Comparison is consistent in deeper water in all five casts. Comparison in the upper limits of the water column results with greater degree of variance between river and bay locations. Velocity and density variance in the upper portion of the water column differ due to diurnal

temperature fluctuations and river dynamics; water mass mixing and sediment transport versus the open bay tidal influences.

- G.1c A single beam to lead line direct comparison for Launch 517 was conducted during the 1999 field season. A comparison was conducted on DN 156 (06/05/99) and is included in ~~*Appendix E.~~

A single beam to lead line direct comparison for the *RUDE*'s sounding equipment was conducted during the 1999 field season and provided with H10867 documentation listed in ~~*Appendix E.~~ Comparison dates included 04/26/99 (DN116) and 05/03/99 (DN 126). Comparison between single beam and Seabat multibeam depths were monitored continuously during field acquisition. Sounding comparisons are discussed in Section J.

A single beam to multibeam comparison was conducted on DN 137 (05/17/99), Fix 42464-42475. The comparison was conducted by means of sounding data collection within an area where the benthic profile was consistent and level. Sounding data was processed normally and compared visually using MapInfo. Results yield excellent agreement with sounding variance of 0.0 feet. A page size plot with comparison results is included with comparison data in ~~*Appendix E.~~

- G.1d Sensor offsets and transducer static drafts were measured during the December 1996 dry-dock period. Sensor offsets were stored in the CARIS-HIPS Vessel Configuration File and HPS Offset Table for use in data processing. See ~~*Appendix E~~ for data records.

- G.1e Transducer dynamic draft was measured for the NOAA Ship *RUDE* on March 5, 1999 (DN 064) during the opening calibration "Patch Test" utilizing the Real Time Kinematic On The Fly settlement and squat method. Dynamic draft for NOAA Launch 517 was determined using the level method on March 4, 1999 (DN 063). Dynamic draft correctors were stored in the CARIS-HIPS Vessel Configuration File and HPS Offset Table for use in data processing. HPS Offset Table for the *RUDE* is Table 01, while Launch 517 is Table 02. See ~~*Separate IV~~ for data records.

- G.1f NOAA Ship *RUDE*'s heave, pitch, and roll data were acquired with a Seatex Seapath Motion Reference Unit (MRU-5) (S/N 0544). Heave, pitch, and roll data were applied to SeaBat multibeam data; only heave data were applied to vertical

single beam data during post processing.

- G.1g Heading data (\$INHTD message "gyro input") were acquired with the Seatex Seapath and applied to determine both multibeam transducer and side scan towfish position. Multibeam heave, pitch, roll, and heading sensor data were adjusted using biases as determined during a patch test completed on March 5, 1999 (DN 064). See the CARIS-HIPS Vessel Configuration File in ~~X~~Appendix E for data records.
- G.2 No unusual or unique methods or instruments were used to correct sounding data.
- G.3 Tide zoning for this survey is consistent with the Project Instructions. During data collection tide station Portland, Maine (8418150) was used as the reference station utilizing predicted tides.

Subordinate tide station Fort Point, Maine (8414721) was used to provide tide reducers within the prescribed zones and to resolve possible differing tidal characteristics due to topographic and bathymetric features within these zones. Final tide correctors applied to survey data was provided by Oceanographic Products and Services Division (N/CS41) in the form of verified or "smooth tides". Actual tide data was zoned corrected and tidal values were computed in CARIS-HIPS and HPS for re-application to multibeam and single beam data.

Approved tides and zoning were applied during office processing.

The following table indicates the tide zones that were applied during post-processing application of verified water levels:

Zone Station	Time Corrector (min)	Range Ratio
ME130	+6	X0.98
ME131	0	X0.98
ME131A	0	X1.0

- G.4 The MOD III Diver Least Depth Gauge was used for this survey. Standard field procedures were followed for data collection. Daily DQA, pre-dive pressure, least depth pressure, and post dive pressure were recorded for data processing. Calibration data is provided in Appendix E. Dive investigation log is provided with survey data.

- G.5 No significant systematic errors were detected.
- G.6a The vertical reference surface for this survey is Mean Lower Low Water (MLLW).
- G.6b Tide data were acquired at Fort Point, Maine (Station 8414721) by N/OES231. A request for verified tides was mailed on June 7, 1999.
- G.6c Note that multibeam and single beam data processing was accomplished using predicted tide values during acquisition and verified "smooth tide" values during post processing.

H. HYDROGRAPHIC POSITION CONTROL - *See also Evaluation Report*

- H.1 The horizontal reference surface for this survey is the North American Datum of 1983 (NAD 83). No horizontal control stations were established for this survey.
- H.2 Positioning for this survey was obtained from the NAVSTAR Global Positioning System (GPS) augmented with the U.S. Coast Guard Differential GPS (DGPS) service. The following USCG reference station beacons were used:

USCG DGPS RadioBeacon Broadcast Site	Freq kHz	Rate BPS	Latitude N	Longitude W	Range nm	Beacon ID #
Brunswick, ME	316	100	43°53.4'	069°56.8'	200	800, 42
Penobscot, ME	290	200	44°27.1'	068°46.3'	65	799, 44

- H.3 Accuracy requirements were met as specified by the Hydrographic Manual, sections 1.3 and 3.1, and Field Procedures Manual, section 3.4.
- H.4 GPS and DGPS signals were acquired with the following hardware equipment:

GPS and DGPS Hardware	SERIAL #
Seatex SeaPath 200	0347
MRU-5	0544
StarLink Model MBA2 DNAV 212	848

H.5 The GPS Horizontal Dilution of Precision (HDOP) was recorded during survey operations and manually checked via the Detailed Data Abstract in HPS, raw data printout, and queried within MapInfo. The maximum allowable HDOP value of 4.0 was rarely exceeded. Anomalous position data were either manually smoothed or flagged "rejected", depending on the extent of the affected data.

DGPS performance checks were not conducted for NOAA Ship *RUDE*. The necessity for control checks is eliminated when using the Seatex Seapath 200; quality positioning is supported by the continuous calibration routine inherent of SeaPath.

A performance check was conducted for Launch 517 on 05/28/99 (DN 148). Horizontal positional check consisted of comparing the vessel position to that of a known third order fixed navigational aid. The check station used was "Steel Ledge Monument Light", located at 44°25'09.469"N 068°58'20.579"W. This procedure involved aligning the survey launch as close to the light as possible and acquiring a detached position. Offsets (distance and azimuth) were applied to the detached position within the acquisition system. Results yielded an inverse distance from vessel location to check station of 0.6199 meters with an azimuth of 166°13'53.823".

DGPS monitor and scatter plots for USCG beacons are not required as per guidelines mentioned in FPM 3.2.2.1

H.6 Calibration data are not required for differential GPS.

H.7a There were unusual methods while operating the positioning equipment during H10867. Navigation control using the Seapath Seatex appeared to record incorrect or old differential corrector ages. While monitoring navigation control on a designated monitor, the system would start to dead reckon (DR) when the corrector age reached a long time interval. It was the responsibility of survey equipment operator to terminate sounding line when control was in the "dead reckoning" mode for more than 30 seconds. Throughout data collection this proved to be a hindrance; terminating the sounding line and waiting for quality control to return. Not only was data collection hindered, but post processing required additional efforts. Ship personnel tracked the problem back to the firmware version that Seapath Seatex utilized to determine DGPS corrected positions.

In order to maintain quality positioning, it was decided by ship personnel and System Support Branch to utilize the Starlink DGPS receiver for positional control in conjunction with attitude information parsed from Seapath. Attitude information includes inertial computed gyro input with motion reference data (heave, pitch, and roll). This data was parsed to the Isis system to provide quality differential positioning with attitude data packets required for the multibeam system.

Data collection utilizing the Starlink DGPS receiver began on May 10, 1999 (DN 130) and remained in operation through survey completion. Positional editing was limited after making the hardware and firmware change. Seapath later forwarded a version update to account for the differential corrector age. This new firmware version was not used on survey H10867.

- H.7b There were no unusual atmospheric conditions noted which might have affected data quality.
- H.7c Offsets for the GPS antenna were applied from the CARIS-HIPS Vessel Configuration File (VCF) to compute the position of the SeaBat transducer. See ^{*}Appendix E for CARIS VCF and HPS Echotrac offset data records.
- H.7d A-frame position (tow point), cable length, towfish height, and depth of water were applied to navigation data to compute the position of the towfish. This correction is applied in HPS via offset table and Reapply Sounding Corrections.

I. SHORELINE - See also *Evaluation Report*

Shoreline verification was not conducted during this survey.

J. CROSS COMPARISONS

- J.1 A total of 28.3 nm of crosslines were acquired for this survey; equating to over 12.7% of the total 100% side scan linear coverage; 11.1% of the total hydro miles collected by the *RUDE*, and 19.5% of the total hydro miles collected by Launch 517.
- J.2 Caris crossline comparison computations do not work well with surveys that are not 100% multibeam. The gaps

between sounding lines of this survey inhibits the comparison of a digital terrain model (DTM) to a checkline file. With this in mind, the hydrographer segregated the survey data by vessel and line classification, then generated a MapInfo table that could be used to make a visual comparison.

- J.3 *RUDE's* main scheme multibeam soundings compared to cross line multibeam soundings yielded excellent agreement. Sounding variance was between zero and one foot except where the profile was steep and irregular.
- J.4 Launch 517's single beam main scheme soundings compare well with 517's single beam crosslines soundings. Sounding variance was between zero and one foot except where the profile was steep and irregular.
- J.5 No anomalous crossline comparisons were noted.
- J.6 The main scheme and crossline data were collected with the same suite of survey equipment respectively for each vessel used on this survey.

K. JUNCTIONS

Survey H10867 does not junction with any other survey. However, there was a junction area between the two survey platforms. Comparison between the two vessels was difficult as the junction area is rocky and extremely uneven; this junction area is located near the *RUDE's* inshore limits. *RUDE's* main scheme multibeam soundings compared well to 517's single beam soundings and agree within zero to two feet. Soundings with larger discrepancies are due to steep and irregular profiles.

L. COMPARISON WITH PRIOR SURVEYS

Comparison with prior surveys are not required when 200 percent (or greater) side scan sonar coverage is acquired over the entire survey area. Refer to Section L. of *NOS Hydrographic Surveys Specifications and Deliverables*.

M. ITEM INVESTIGATION REPORTS - See also Evaluation Report

- M.1 Survey H10867 contains no AWOIS items within survey limits.
- M.2 An uncharted wreck was located on DN 126 during side scan operations. Detached position (FX 37476) acquired on DN 127 positioned the wreck at 44°26'17.906"N, 068°54'03.083"W. The dive investigation included least depth confirmation with the Diver Least Depth Gauge MOD III. Detached position FX 37476 with a corrected least depth of 36.4⁷⁶ feet confirmed the multibeam sounding of 36 feet (FX 154788) obtained on DN 126 during sounding ⁸⁰³ development. The 36 foot multibeam sounding (FX 154788) was located 3.58 meters with an azimuth of 191.5° from DP 37476. (Dive operation log is included with survey data in cahier.) The hydrographer recommends charting a sounding of 36 "feet on wreck" (cartographic code ¹⁰¹~~260~~) at 44°26'17.9"N, 068°54'03.1"W.

N. COMPARISON WITH THE CHART

- N.1 Two charts are affected by this survey:
- Chart 13309, 26th Ed., 17 April 1993 1:40,000 scale
 - Chart 13302, 20th Ed., 28 November 1998 1:80,000 scale
- N.2 Chart 13302 has approximately 103 soundings charted; survey depths agree with 98% of the charted soundings. Agreement is excellent between zero and two feet. *Concur*
- N.2a Two soundings from Chart 13302 have agreement greater than two feet. A sounding of 58 feet is charted at 44°23'30.65"N, 068°56'32.13"W. Survey depths position several ~~610~~ feet soundings in the immediate area. The hydrographer recommends sounding revision within the common area. *Concur*
- N.2b Chart 13302 has a sounding of 129 feet charted at 44°23'36.92"N, 068°55'41.49"W. Survey data indicates depths ranging from 73⁴ feet to ~~125~~¹⁰⁶ feet within a 150 meter radius from the center of the charted sounding. The hydrographer recommends sounding revision within the common area. *Concur*
- N.2c Charted notation in the general vicinity of 44°26'53"N, 068°53'51"W on chart 13302 has a notation of "35 feet 1992" indicating depth and date of the most recent control

survey or dredging. Survey data indicates a sounding of 31 feet located at $44^{\circ}27'02.13''N$, $068^{\circ}53'54.72''W$. This sounding is clearly within the charted limits. The hydrographer recommends deleting the chart notation and revising chart with survey soundings within the common area. *CONCUR - Revise depths inside channel limits to reflect present survey findings.*

N.2d Chart 13302 has dolphins located in the vicinity of $44^{\circ}27'14''N$, $068^{\circ}53'43''W$. This charted feature is located outside the survey limits. Side scan graphic record indicate written and visual records of the existence of an oil boom. This oil boom was visually identified by the hydrographer as being attached to the two dolphins. The hydrographer recommends retaining the two dolphins as charted. *CONCUR*

N.2e Chart 13302 has a sounding of 33 feet charted at the general location of $44^{\circ}24'47''N$, $068^{\circ}55'06''W$. Current survey data indicates this feature requires sounding revision. Multibeam development data reveals a depth of 32 feet positioned at $44^{\circ}24'50.28''N$, $068^{\circ}55'05.48''W$. The hydrographer recommends updating the chart with survey soundings within the common area. *CONCUR*

N.2f Two oil transfer areas maintained by the state of Maine are positioned on Chart 13302. The west transfer area is centrally located at the $44^{\circ}24'16.95''N$, $068^{\circ}55'28.11''W$; the eastern transfer area is centrally located at $44^{\circ}25'01.14''N$, $068^{\circ}50'44.17''W$. The hydrographer recommends retaining the present charted positions of these two features. *CONCUR*

N.2g Chart 13302 positions a sounding of 23 feet located at $44^{\circ}25'09''N$, $068^{\circ}52'30''W$. Current survey data indicates a multibeam sounding of 22 feet positioned at $44^{\circ}25'10.32''N$, $068^{\circ}52'30.85''W$. The hydrographer recommends updating the chart with survey soundings within the common area. *CONCUR*

N.2h Chart 13302 positions a shoal of 15 feet southeast of Squaw Head located at $44^{\circ}26'15''N$, $068^{\circ}51'19''W$. Survey data indicates a sounding of 16 feet located at $44^{\circ}26'21.1''N$, $068^{\circ}51'19.7''W$. Sounding data has correlation between single beam echo sounder search with 5 meter line spacing and multibeam main scheme sounding data. The hydrographer recommends updating the chart with survey soundings within the common area. *CONCUR*

N.2i A shoal of 18 feet is charted at $44^{\circ}25'01''N$, $068^{\circ}57'11''W$. Survey depths did not match or exceed the charted depths.

Survey data reveals ^{two} ~~three~~ soundings of 19 feet positioned at $44^{\circ}25'02.68''\text{N}$, $068^{\circ}057'10.08''\text{W}$, ~~$44^{\circ}25'03.13''\text{N}$, $068^{\circ}57'10.29''\text{W}$~~ , and $44^{\circ}25'03.09''\text{N}$, $068^{\circ}57'10.84''\text{W}$. The hydrographer recommends chart revision with soundings common to this area. *Concur*

N.2j Chart 13302 displays a sounding of 58 feet at $44^{\circ}23'30''\text{N}$, $068^{\circ}56'32''\text{W}$. Survey data indicates the shallowest depth within this common area is ~~51~~⁶¹ feet. This area included 100% multibeam coverage and 200% side scan coverage. The hydrographer recommends revising this common area with survey depths. *Concur - See also N.2a.*

N.2k Chart 13302 positions notation "Disposal Area Depths from survey of 1983" in the general vicinity of $44^{\circ}25'08''\text{N}$, $068^{\circ}55'30''\text{W}$. This area was surveyed during 1999 with 200% side scan coverage and multibeam sounding coverage. The hydrographer recommends removal of the chart notation from the chart. *Concur with conditions. See E+A Report Section 0.2*

N.2l Refer to Section N.3j. Comments apply to Chart 13302 as well as Chart 13309.

N.3 Chart 13³09 has approximately 331 soundings charted within the survey limits. H10867 soundings compare well with 99.8% of the total charted soundings. Agreement is excellent between zero and one foot. *Concur*

N.3a Chart 13³09 has two dolphins located in the vicinity of $44^{\circ}27'14.55''\text{N}$, $068^{\circ}53'44.44''\text{W}$. These charted features are located outside the survey limits. Side scan graphic record indicate written and visual records of the existence of an oil boom. This oil boom was visually identified by hydrographer as being attached to the two dolphins. The hydrographer recommends retaining the two dolphins as charted. *Concur - No changes to charting needed.*

N.3b Charted limits and a notation positioned at $44^{\circ}26'51.17''\text{N}$, $068^{\circ}53'50.28''\text{W}$ on chart 13309 has a notation of "33 feet Feb 1988" indicating depth and date of the most recent control survey or dredging. Survey data indicates sounding of 31 feet located at $44^{\circ}27'02.13''\text{N}$, $068^{\circ}53'54.72''\text{W}$. This sounding is clearly within the charted limits. The hydrographer recommends deleting the chart notation and revising chart with survey soundings. *Concur - update chart using present survey data -*

N.3c Chart 13309 positions a sounding of 25 feet at $44^{\circ}26'40.09''\text{N}$, $068^{\circ}53'39.94''\text{W}$. Survey data indicates soundings in the range from 37 feet to 43 feet. The

hydrographer recommends sounding revision from survey data within the common area. *Concur*

N.3d Chart 13309 positions a sounding of 23 feet at 44°25'09"N, 068°52'30"W. Current survey data indicates a multibeam depth of 22 feet located at 44°25'10.32"N, 068°52'30.85"W. The hydrographer recommends sounding revision within the common area. *Concur*

N.3e Chart 13309 positions a shoal of 15 feet southeast of Squaw Head, located at 44°26'22.15"N, 068°51'19.51"W requiring sounding revision. Survey data indicates a sounding of 16 feet positioned at 44°26'21.42"N, 068°51'19.23"W. Sounding data has correlation between a single beam echo sounder search with 5 meter line spacing and multibeam mainshceme sounding data. The hydrographer recommends updating the chart with survey soundings within the common area. *Concur*

N.3f Chart 13309 has a sounding of 33 feet charted at 44°24'50.77"N, 068°55'05.36"W. Current survey data indicates this feature requires sounding revision. Multibeam development data reveals a depth of 32 feet positioned at 44°24'50.28"N, 068°55'05.48"W. The hydrographer recommends updating the shoal with survey soundings. *Concur*

N.3g Chart 13309 is missing a navigational aid that marks the shoal mention in N.3f. The navigation aid is listed as Light List #4452, Moose Point Isolated Lighted Buoy "DMP". The hydrographer recommends charting a navigational aid at 44°24'51.014"N, 068°55'05.264"W. *Concur*

N.3h Two oil transfer areas maintained by the state of Maine are positioned on Chart 13309. The west transfer area is centrally located at 44°24'16.95"N, 068°55'28.11"W; the eastern transfer area is centrally located at 44°25'01.14"N, 068°50'44.17"W. The hydrographer recommends retaining the present charted positions of these two features. *Concur*

N.3i Chart 13309 positions a discontinued spoil area in the general vicinity of 44°24'02.8"N, 068°55'31.2"W. This area was surveyed with 200% side scan coverage and multibeam sounding coverage. The hydrographer recommends removing the discontinued spoil area from the chart. *Concur w/ conditions. See E+A Report Section 0.1.*

N.3j The southwestern survey area exhibits an extremely irregular profile and contains deep circular or conical

holes scattered throughout this region. This area can be delineated by drawing lines from the general vicinity of 44°25'37"N, 068°55'04"W at the north apex; 44°23'13"N, 068°54'20"W at the southeastern corner; 44°25'08"N, 068°55'30"W at the southwestern corner. This region contains soundings that require revision. *Concur*

Professors from the University of Maine have been studying this location for several years. Information provided for comparison of their previous studies indicated that this region is geologically active. The pock marks or holes are the results of methane gas vent eruptions. Approximately 14,000 years ago an advancing glacier covered decomposing sediments. With time these sediments accumulated methane gas as a by product of the decomposing material. As the gas accumulated, the pressure reached terminal capacity of the overlying sediment and was released with explosive characteristics. The outcome of the gas release is characterized by the pock marks scattered along the bottom. The explosive gas release allowed the overlying sediment to be dispersed within the water column, ultimately settling to the bottom of the bay. Survey data has evidence of several pock marks reaching over 20 meters in depth. The hydrographer recommends revising Chart 13309 as depicted by hydrographic data collected during this survey. See Figure 1 (next page). *Concur*

- N.3k Chart 13309 displays a sounding of 58 feet located at 44°23'29.49"N, 068°56'33.37"W. Survey data indicates the shallowest depth within this common area is ~~510~~ feet. This area included 100% multibeam coverage and 200% side scan coverage. The hydrographer recommends revising this common area with survey depths. *Concur - See also N.2j of this Report*
- N.3l A shoal with a sounding of 18 feet is charted at 44°25'01.72"N, 068°57'11.9"W. Survey depths did not match or exceed the charted depths. Survey data reveals three soundings of 19 feet positioned at 44°25'02.68"N, 068°057'10.08"W, 44°25'03.13"N, 068°57'10.29"W, and 44°25'03.09"N, 068°57'10.84"W. The hydrographer recommends chart revision with survey H10867 soundings common to this area. *Concur See also N.2.i. of this Report*
- N.3m Sears Island Ledge and Long Cove Ledge were not fully investigated. These two features were located outside the survey limits. Long Cove Ledge was investigated by Launch 517 from approximately the 12 foot contour seaward. The hydrographer recommends maintaining charted status for

OPR-A343-RU-99

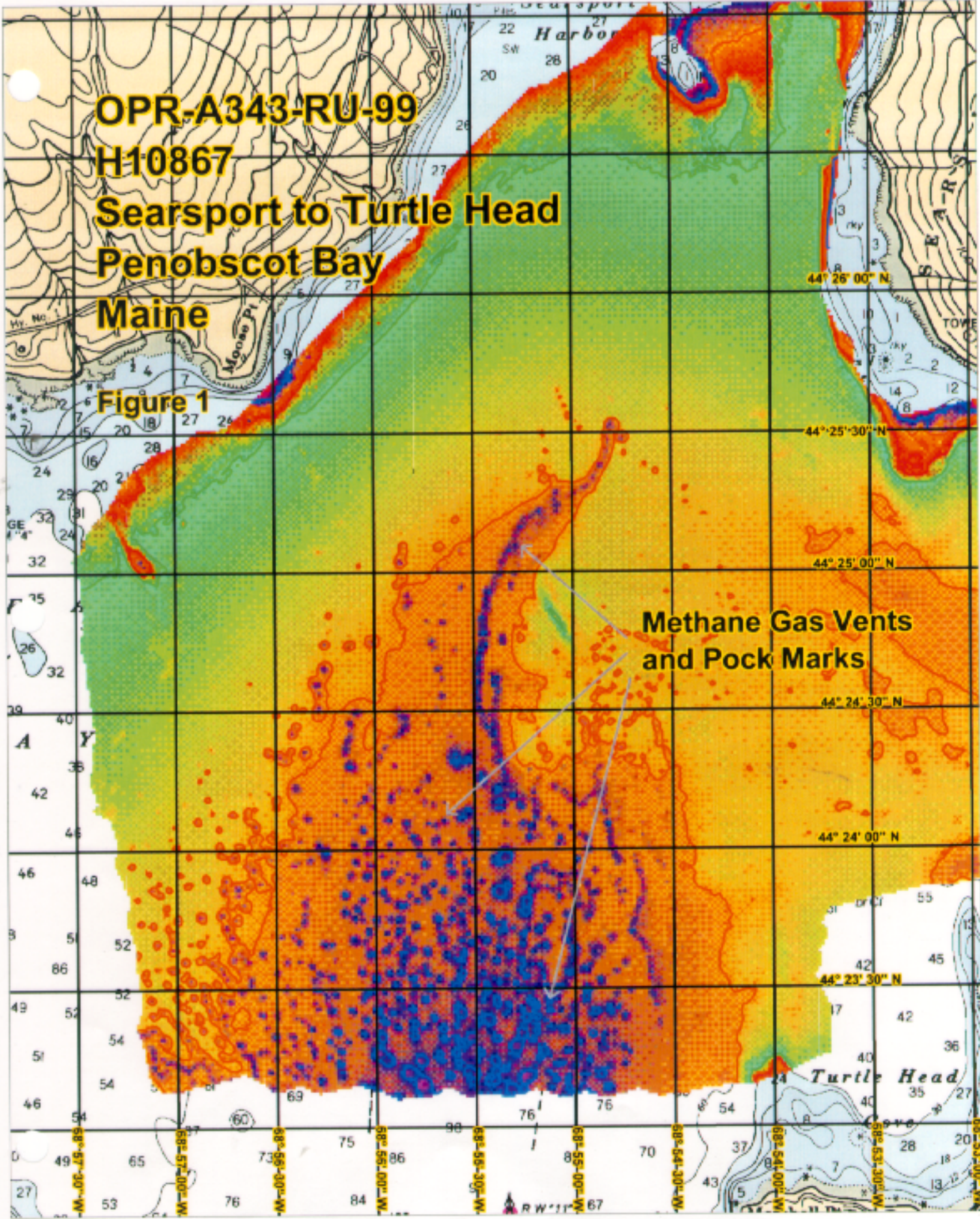
H10867

**Searsport to Turtle Head
Penobscot Bay**

Maine

Figure 1

**Methane Gas Vents
and Pock Marks**



these features not common to survey H10867. *Concur*

N.3n Survey H10867 identified a sounding of ~~38~~³⁹ feet located at 44°25'36.94"N, 068°~~57~~⁵²'08.00"W. This sounding is out of context with the immediate surrounding survey depths between 50 and 51 feet. A depth of 39 feet is positioned on Chart 13309 with a range of 90 meters and an azimuth of 246° from the survey depth of 38 feet. Side scan sonar revealed four contacts within a 60 meter radius of the 38 foot depth. Sounding investigation reveals a multibeam depth obtained from multiple beams on two distinct pings (Beam 4; Pr# 6711,6713; Time 162019; DN 140). The hydrographer recommends confidence swath over the sounding area for sounding verification (see Section S). Charting recommendations include sounding revision within the common area. *Concur - Chart Project survey soundings in area, Present Survey data adequate to supersede Charted data.*

N.4 All soundings from survey H10867 supersede charted soundings. *Concur*

O. ADEQUACY OF SURVEY - *See also Evaluation Report*

Survey H10867 was completed using single beam hydrography, 200% side scan sonar and multibeam mainscheme with development hydrography. It is recommended that H10867 should supersede all prior surveys in common areas. *Concur*

P. AIDS TO NAVIGATION - *See also Evaluation Report*

P.1 A comparison of floating aids ^{was} were made between the detached positions of navigational aids and the largest scale chart of the area.

Nav Aid	Light List #	Light List or Charted Position	Survey Position
Red Nun #2	4480	44°26'44.6"N 068°54'30.8"W	44°26'43.6"N 068°54'32.6"W ✓
Green Can #7	4475	44°26'45.0"N 068°54'11.0"W	44°26'45.1"N 068°54'11.1"W ✓
Mack Pt. Channel Lighted #5	4465	44°26'36"N 068°54'06"W	44°26'34.9"N 068°54'07.7"E ✓

Nav Aid	Light List #	Light List or Charted Position	Survey Position
Mack Pt. Channel Lighted #6	4470	44°26'42.7"N 068°53'44.3"W	44°26'42.8"N 068°53'41.0"W ✓
Red Nun #4	4460	44°26'09.9"N 068°53'51.2"W	44°26'09.4"N 068°53'51.5"W ✓
Sears Isl. Bell Buoy #2	4455	44°25'21.5"N 068°53'32.1"W	44°25'21.4"N 068°53'32.6"W ✓
Ent. Shoal Lighted Gong Buoy #1	4485	44°25'06"N 068°52'24"W	44°25'03.2"N 068°52'27.0"W ✓
Green Can #3	4490	44°25'38.0"N 068°52'04.2"W	44°25'37.8"N 068°52'03.8"W ✓
Red nun Green Can #4	4495	44°26'15.7"N 068°51'39.7"W	44°26'15.5"N 068°51'39.6"W
Green Can #5	4500	44°26'27.0"N 068°51'58.8"W	44°26'26.4"N 068°51'58.3"W
Moose Pt. Isolated Lt. Buoy "DMP"	4452	44°24'54"N 068°55'06"W	44°24'51.0"N 068°55'05.3"W <i>NOT charted</i>

P.1a All navigational aids adequately serve the apparent purpose for which they were established. All navigational aids were considered "on station" with the exception of Long Cove Ledge Buoy #2 and Mack Point channel Lighted Buoy #6. The hydrographer recommends chart revisions for both of these navigational aids. *Concur*

P.1b Chart 13309 is missing ~~the~~ navigational aid that marks the shoal mentioned in N.3f. The navigational aid is listed as Light List #4452, Moose Point Isolated Lighted Buoy "DMP". The hydrographer recommends charting a navigational aid at the geographic location of 44°24'51.014"N, 068°55'05.264"W. *Concur*

P.2 One fixed navigational aid was positioned during survey H10867. Steel Ledge Light was used as horizontal calibration control for the fixed point DGPS confidence check location. Detached positions were collected allowing for vessel offsets. Computed positional error was 0.6199 meters inverse with an azimuth of

166°13'53.823" from survey launch to the light's listed third order position. (See Section H.5) *Concur*

P.3 There were no submarine or overhead pipelines, cables, tunnels, bridges, or ferry routes found in the survey area. *Concur*

Q. STATISTICS - *See also Evaluation Report*

Q.1 Lineal Nautical Miles of Sounding Lines	758.4
Q.2a Square Nautical Miles of Hydrography	12.4
Q.2b Days of Production	23
Q.2d Bottom Samples	65
Q.2e Tide Stations.	1
Q.2f Velocity Casts	73
Q.2g SEABAT Item Investigations	176

R. MISCELLANEOUS

R.1 No evidence of silting or magnetic anomalies were detected during this survey. Unusual submarine features were observed during survey H10867. These features are discussed in Section N.3j. *Concur*

R.2 Bottom samples were required as per project instructions and submitted to the Smithsonian Institution. *Concur*

S. RECOMMENDATIONS - *See also Evaluation Report*

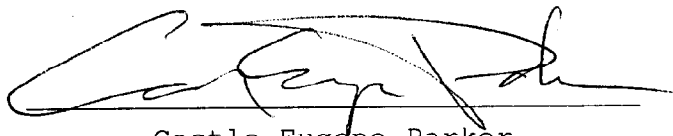
The hydrographer recommends sounding confidence swaths over multibeam soundings listed in table below. Confidence swaths would confirm the current edited status of the soundings. No additional field work is required.

Survey Depth	Latitude N	Longitude W
28	44°26'47.41"	068°54'42.64" <i>charted</i>
30	44°25'36.94"	068°52'08.00" <i>charted</i>
27	44°25'17.23"	068°57'01.22" <i>charted</i>
30	44°25'10.85"	068°56'57.20" <i>charted</i>
30	44°25'53.95"	068°55'57.80" <i>charted</i>
34	44°26'16.91"	068°54'14.11" <i>charted</i>

T. REFERRAL TO REPORTS

A copy of the Coast Pilot Report will be included in the Separates. *CONUR*

This report and the accompanying field sheets are respectfully submitted.



Castle Eugene Parker
Physical Scientist
NOAA Ship RUDE

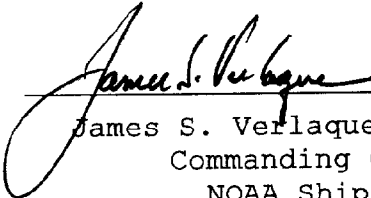
APPENDIX K

APPROVAL SHEET

LETTER OF APPROVAL
FOR
DESCRIPTIVE REPORT TO ACCOMPANY
HYDROGRAPHIC SURVEY, H10867
OPR-A343-RU-99
FIELD NUMBER: RU-10-03-99
SCALE: 1:10,000
NOAA SHIP RUDE
Commanding Officer
LCDR James S. Verlaque, NOAA

Field operations contributing to the accomplishment of this Navigable Area survey were conducted under my direct supervision with frequent personal checks of progress and adequacy. All field sheets and reports were reviewed in their entirety and all supporting records were checked as well.

This is more than adequate to support survey H10867 data in common areas. This survey is considered complete and adequate for nautical charting.


James S. Verlaque, LCDR, NOAA
Commanding Officer
NOAA Ship RUDE



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
Silver Spring, Maryland 20910

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE: August 12, 1999

HYDROGRAPHIC BRANCH: Atlantic

HYDROGRAPHIC PROJECT: OPR-A343-RU-99
HYDROGRAPHIC SHEET: H-10867

LOCALITY: Searsport to Turtle Head, Penobscot Bay, ME

TIME PERIOD: April 12 - May 28, 1999

TIDE STATION USED: 841-4721 Fort Point, ME
Lat. $44^{\circ} 28.3'N$ Lon. $68^{\circ} 48.7'W$

PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 3.287 meters

REMARKS: RECOMMENDED ZONING
Use zone(s) identified as: ME130, ME131 & ME131A

Refer to attachments for zoning information.

Note 1: Provided time series data are tabulated in metric units
(Meters), relative to MLLW and on Greenwich Mean Time.

[Handwritten Signature]

CHIEF, REQUIREMENTS AND DEVELOPMENT DIVISION



Printed on Recycled Paper

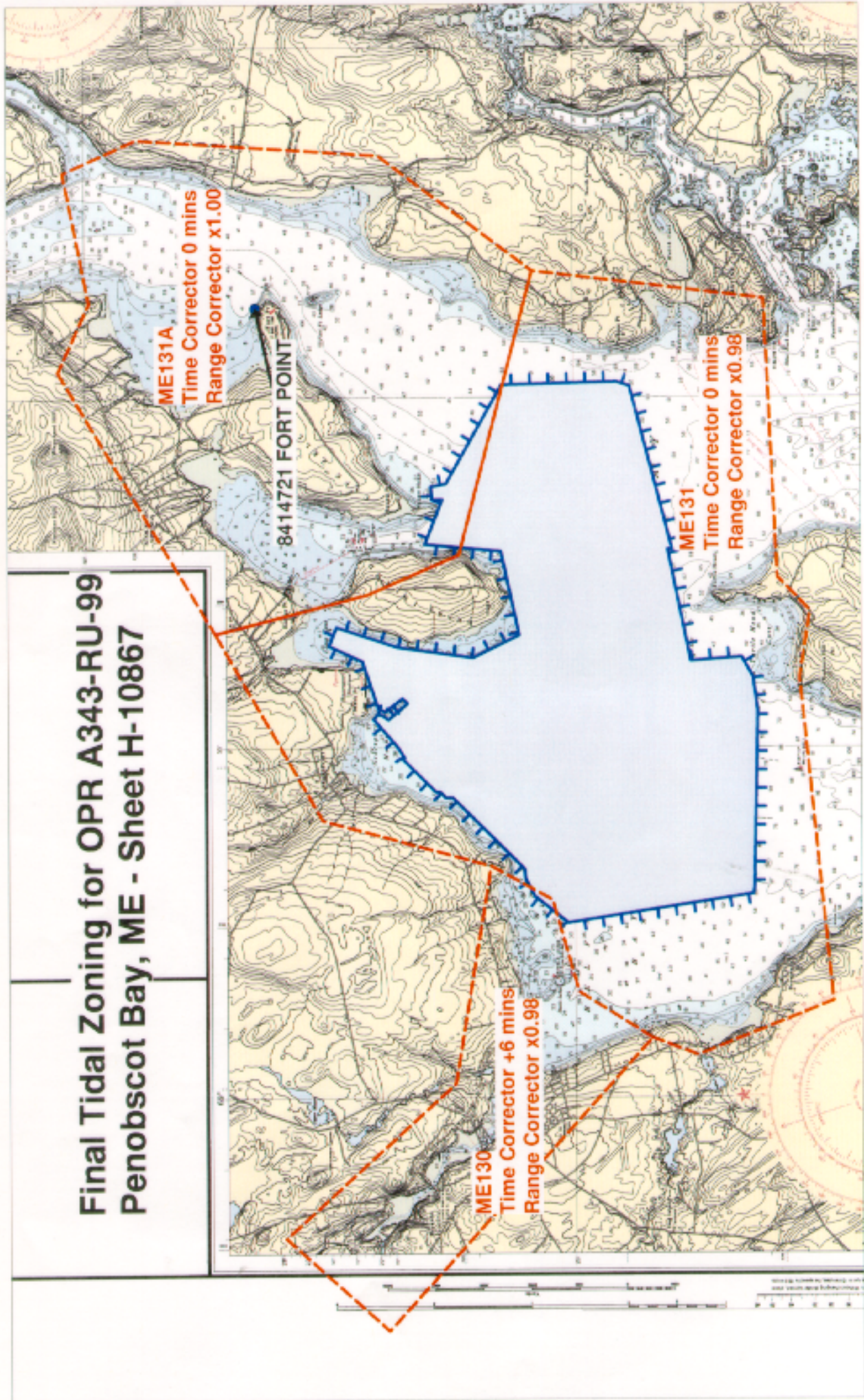


Final tide zone node point locations for OPR A343-RU-99,
Sheet H-10867.

Format: Longitude in decimal degrees (negative value denotes
Longitude West),
Latitude in decimal degrees
Tide Station (in recommended order of use)
Average Time Correction (in minutes)
Range Correction

		Tide Station Order	AVG Time Correction	Range Correction
Zone ME130				
-68.986059	44.403484	841-4721	+6	0.98
-68.975158	44.415978			
-68.953201	44.420474			
-68.945097	44.430964			
-68.996843	44.437148			
-69.033551	44.466182			
-69.055729	44.448654			
-68.986059	44.403484			
Zone ME131				
-68.986059	44.403484	841-4721	0	0.98
-68.975158	44.415978			
-68.953201	44.420474			
-68.945097	44.430964			
-68.934133	44.459609			
-68.889616	44.477858			
-68.880408	44.451921			
-68.870927	44.436207			
-68.803401	44.423614			
-68.810093	44.384079			
-68.876362	44.381857			
-68.884413	44.376304			
-68.900206	44.378081			
-68.977314	44.372526			
-68.990132	44.395758			
-68.986059	44.403484			
Zone ME131A				
-68.827068	44.504505	841-4721	0	1.00
-68.889616	44.477858			
-68.880408	44.451921			
-68.870927	44.436207			
-68.803401	44.423614			
-68.775829	44.449748			
-68.771856	44.491087			
-68.779629	44.503584			
-68.810648	44.499134			
-68.827068	44.504505			

**Final Tidal Zoning for OPR A343-RU-99
Penobscot Bay, ME - Sheet H-10867**



GEOGRAPHIC NAMES

H-10867

Name on Survey	A		B		C		D		E		F		G		H		K	
	ON CHART NO.	ON PREVIOUS SURVEY	ON CHART NO.	ON PREVIOUS SURVEY	CON U.S. QUADRANGLE MAPS	FROM LOCAL INFORMATION	ON LOCAL MAPS	P.O. GUIDE OR MAP	GRAND McNALLY ATLAS	U.S. LIGHT LIST								
BELFAST BAY	X			X														1
BLOCKHOUSE POINT	X			X														2
CAPE JELLISON	X			X														3
LONG COVE	X			X														4
LONG COVE LEDGE	X			X														5
MACK POINT	X			X														6
MAINE (title)	X			X														7
MOOSE POINT	X			X														8
PENOBSCOT BAY	X			X														9
PERKINS POINT	X			X														10
SEARS ISLAND	X			X														11
SEARSPORT	X			X														12
SEARSPORT HARBOR	X			X														13
SEARSPORT STATION	X																	14
SQUAW HEAD	X			X														15
SQUAW POINT	X			X														16
STEETS LEDGE	X			X														17
TURNER POINT	X			X														18
TURTLE HEAD	X			X														19
TURTLE HEAD COVE	X			X														20
WADSWORTH COVE	X			X														21
																		22
																		23
																		24
																		25

James J. Ramsey
Chief Geographer

JAN 19 2000

LETTER TRANSMITTING DATA

N/CS33-62-2000

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

ORDINARY MAIL AIR MAIL

REGISTERED MAIL EXPRESS

GBL (Give number) _____

TO:

CHIEF, DATA CONTROL GROUP, N/CS3X1
NOAA/NATIONAL OCEAN SERVICE
STATION 6815, SSMC3
1315 EAST-WEST HIGHWAY
SILVER SPRING, MARYLAND 20910-3282

DATE FORWARDED

SEP 8, 2000

NUMBER OF PACKAGES

ONE TUBE

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.

H10867

MAINE, PENOBSCOT BAY, SEARSPORT TO TURTLE BAY

ONE TUBE CONTAINING THE FOLLOWING:

- 1 SMOOTH SHEET FOR H10867
- 1 ORIGINAL DESCRIPTIVE REPORT FOR H10867
- 1 DRAWING HISTORY FORM (NOAA FORM #76-71) FOR NOS CHART 13309
- 1 RECORD OF APPLICATION TO CHART (NOAA FORM 76-96) FOR SURVEY H10867
- 1 H-DRAWING FOR NOS CHART 13309
- 1 COMPOSITE DRAWING FOR NOS CHART 13309

FROM: (Signature)

DEBORAH A. BLAND



RECEIVED THE ABOVE

(Name, Division, Date)

Return receipted copy to:

ATLANTIC HYDROGRAPHIC BRANCH
N/CS33
439 WEST YORK STREET
NORFOLK, VA 23510-1114

08/30/2000

HYDROGRAPHIC SURVEY STATISTICS
REGISTRY NUMBER: H10867

NUMBER OF CONTROL STATIONS		2
NUMBER OF POSITIONS		199436
NUMBER OF SOUNDINGS		199436
	TIME-HOURS	DATE COMPLETED
PREPROCESSING EXAMINATION	106.0	11/05/1999
VERIFICATION OF FIELD DATA	523.5	08/18/2000
QUALITY CONTROL CHECKS	15.0	
EVALUATION AND ANALYSIS	37.5	
FINAL INSPECTION	13.0	06/01/2000
COMPILATION	146.0	08/25/2000
TOTAL TIME	841.0	
ATLANTIC HYDROGRAPHIC BRANCH APPROVAL		07/12/2000

**ATLANTIC HYDROGRAPHIC BRANCH
EVALUATION REPORT FOR H10867 (1999)**

This Evaluation Report has been written to supplement and/or clarify the original Descriptive Report. Sections in this report refer to the corresponding sections of the Descriptive Report.

D. AUTOMATED DATA ACQUISITION AND PROCESSING

The following software was used to process data at the Atlantic Hydrographic Branch:

Hydrographic Processing System (HPS)
NADCON, version 2.10
SITEWORKS 02.01
MicroStation 95, version 5.05
I/RAS B, version 5.01

The smooth sheet was plotted using a HEWLETT-PACKARD 2500CP plotter.

H. CONTROL STATIONS

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. The smooth sheet has been annotated with ticks showing the computed mean shift between the NAD 83 and the North American Datum of 1927 (NAD 27).

To place this survey on the NAD 27 datum move the projection lines 0.274 seconds (8.465 meters or 0.847 mm at the scale of the survey) north in latitude, and 1.885 seconds (41.688 meters or 4.17 mm at the scale of the survey) east in longitude.

I. SHORELINE

Brown shoreline originates with National Ocean Survey (NOS) chart 13309 (26th Edition, April 17, 1993) and is for orientation purposes only.

M. COMPARISON WITH PRIOR SURVEYS

A comparison with prior surveys was not performed. This is in accordance with Section 4. of the memorandum titled, "Changes to Hydrographic Survey Processing," dated May 24, 1995.

O. COMPARISON WITH CHART 13309 (26th Edition, APR 17/93)
13302 (20th Edition, NOV 28/98)

Hydrography

The charted hydrography originates with prior surveys and miscellaneous sources. The hydrographer makes adequate chart comparisons in Sections N. and O. of the Descriptive Report. The following should be noted:

1. NOS chart 13309 has a notation Steels Ledge in the area of Latitude 44°25'10"N, Longitude 68°58'40"W. According to the NOS Chief Geographer in Silver Spring, MD, this area is actually named Steets Ledge. It is recommended that this change be made to all charts affected.

2. NOS chart 13309 has a notation "Disposal Area Depths from Survey of 1983 Discontinued" and limits in Latitude 44°24'00"N, Longitude 68°55'30"W. It is recommended that the Disposal Area notation and its limits be removed from the chart in this area, since this is the second time that this area has been surveyed. In the vicinity of Latitude 44°23'08"N, Longitude 68°55'35"W a small portion of the disposal area was not covered by the present survey. It is recommended that this area be labeled "Disposal Area Depths from Survey of 1993 Discontinued" and that the limits be revised to cover only this area.

P. ADEQUACY OF SURVEY

This is an adequate hydrographic survey. No additional work is recommended except as noted in the Descriptive Report Section S.

Q. AIDS TO NAVIGATION

One fixed aid and eleven floating aids to navigation were located by the field unit and are shown on the present survey. These aids appear adequate to serve their intended purpose. The following should be noted:

1. NOS chart 13309 and has the notation Steels Ledge Monument Light and the latest edition of U.S. Coast Guard (USCG) *Light List Volume I* show Steels Ledge Monument Light

(LL#4440) and Steets Ledge Bell Buoy 2 (LL#4445). The light is located in Latitude 44°25'09.469"N, Longitude 68°58'20.579"W and the buoy is charted in the vicinity of Latitude 44°25'03"N, Longitude 68°58'16.5"W. According to the NOS Chief Geographer in Silver Spring, MD, these aids should be called Steets Ledge Monument Light and Steets Ledge Bell Buoy 2. He also said this revision has been marked in the *Light List* and that the changes should be shown in the next edition of the *Light List*. No changes to charting are recommended at this time. Contact the USCG for further directions.

2. Moose Point Isolated Lighted Buoy "DMP", Light List Number 4452, was found by this survey to be marking a shoal depth in the vicinity of Latitude 44°24'50.77"N, Longitude 68°55'05.36"W. The buoy is presently not shown on NOS Chart 13309. It is recommended that Moose Point Isolated Lighted Buoy "DMP" be charted in the present survey location of Latitude 44°24'51.014"N, Longitude 68°55'05.264"W.

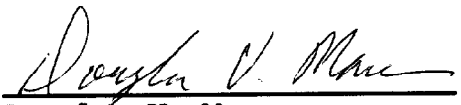
S. MISCELLANEOUS

Chart compilation using the present survey was done by Atlantic Hydrographic Branch personnel in Norfolk, Virginia. Compilation data has been forwarded to Marine Chart Division, Silver Spring, Maryland.

The following NOS chart was used for compilation of the present survey:

13309 (26th Edition, APR 17/93) 1:40,000

H10867

A handwritten signature in cursive script, reading "Douglas V. Mason", is written over a solid horizontal line.

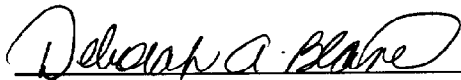
Douglas V. Mason

Cartographic Technician
Verification of Field Data
Evaluation and Analysis

APPROVAL SHEET
H10867

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 digital data for this survey. The survey records and digital data comply with NOS requirements except where noted in the Evaluation Report.



Deborah A. Bland
Cartographer,
Atlantic Hydrographic Branch

Date: 12 July 2000


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.



Andrew L. Beaver
Lieutenant Commander, NOAA
Chief, Atlantic Hydrographic Branch

Date: 14 July 00

Final Approval:

Approved: 

Samuel P. De Bow, Jr.
Captain, NOAA
Chief, Hydrographic Surveys Division

Date: October 2, 2000

Samuel P. De Bow, Jr.
Captain, NOAA
Chief, Hydrographic Surveys Division



**U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
Office of NOAA Corps Operations
NOAA Ship RUDE S-590
439 W. York Street
Norfolk, VA 23510-1114**

May 26, 1999

MEMORANDUM FOR: N/CS261, Source Data Section
SSMC3, Room 7317
1315 East West Highway
Silver Springs, MD 20910-3282

FROM: *James S. Verlaque*
Lieutenant Commander James S. Verlaque, NOAA
Commanding Officer, NOAA Ship RUDE

SUBJECT: Coast Pilot Report, OPR-A343-RU-99

A cursory review of the United States Coast Pilot 1, 31st Edition, for information relevant to the surveyed area of Project OPR-A343-RU-99, northern Penobscot Bay oil transfer areas, Searsport anchorage, and southern Penobscot River off of Fort Point yields the following comment:

Page 165, paragraph 458, line 4 - Change: "An unmarked rocky ledge..." to "A rocky ledge of 33 feet marked with the isolated danger buoy "DMP" is approximately 1.5 nautical miles southeast of Moose Point at the northern end of the western Oil Transfer Area.

Attachments

cc: N/CS 27
N/CS 31
N/CS 33





U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
Office of NOAA Corps Operations
NOAA Ship RUDE S-590
439 W. York Street
Norfolk, VA 23510-1114

May 26, 1999

MEMORANDUM FOR: Lieutenant Donald W. Haines, NOAA
Chief, Operations Branch, N/CS31

FROM: Lieutenant Commander *James S. Verlaque*, NOAA
Commanding Officer, NOAA Ship RUDE

SUBJECT: User Evaluation Report, OPR-A343-RU-99,
Chart Inspection Report, OPR-A343-RU-99

Comments concerning the accuracy of NOAA chart 13302, 20th Ed., Nov 20/98 and NOAA chart 13309, 26th Edition, Apr 17/93 - covering the surveyed area of OPR-A343-RU-99, northern Penobscot Bay oil transfer areas, Searsport anchorage, and southern Penobscot River off Fort Point are listed below:

Boundary omitted on southern end of disposal area (between RED ARROWS).

CHART: 13309/ 13302

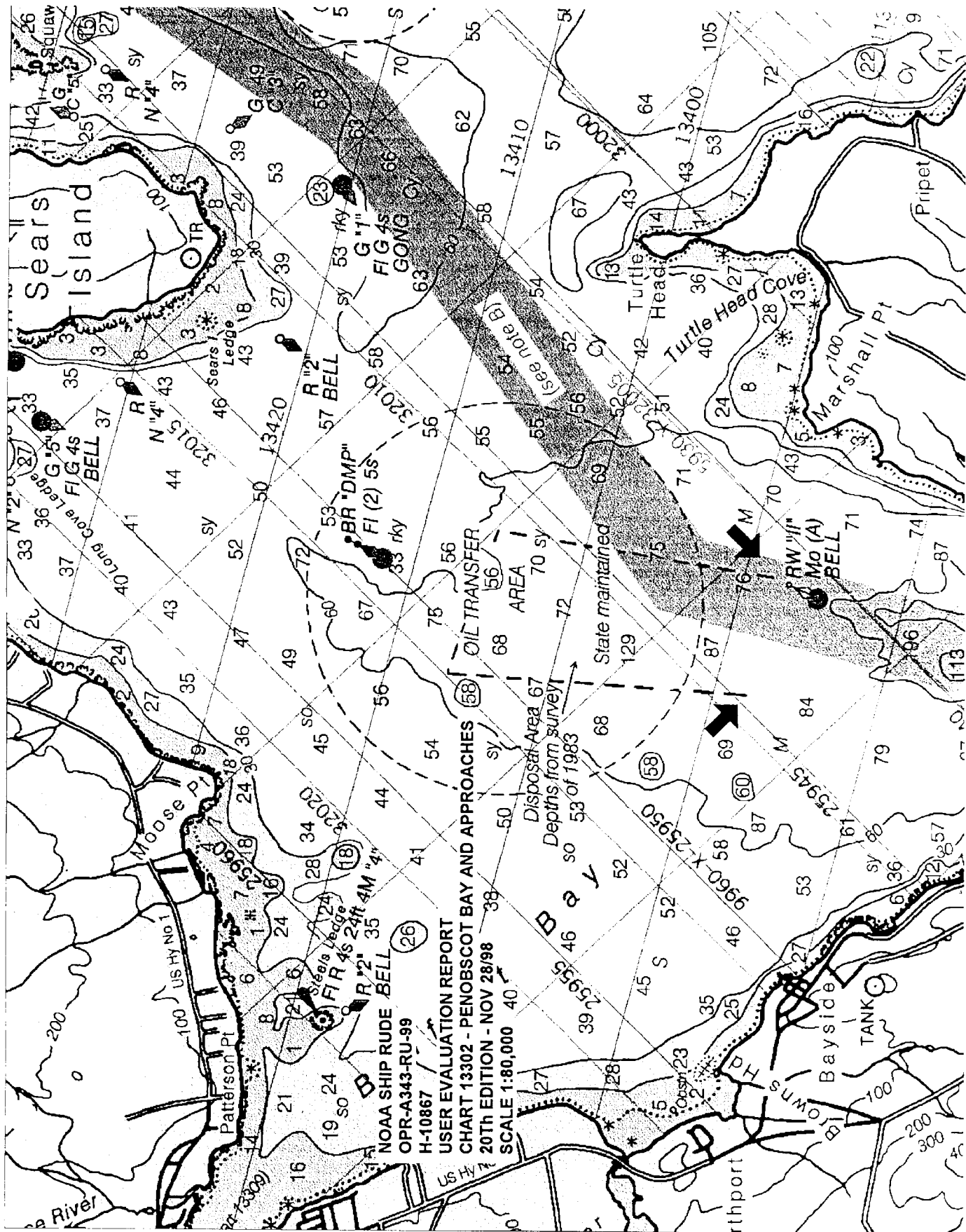
LATITUDE: 44 22' 55" N
LONGITUDE: 068 55' 47" W

LATITUDE: 44 22' 58" N
LONGITUDE: 068 56' 58" W

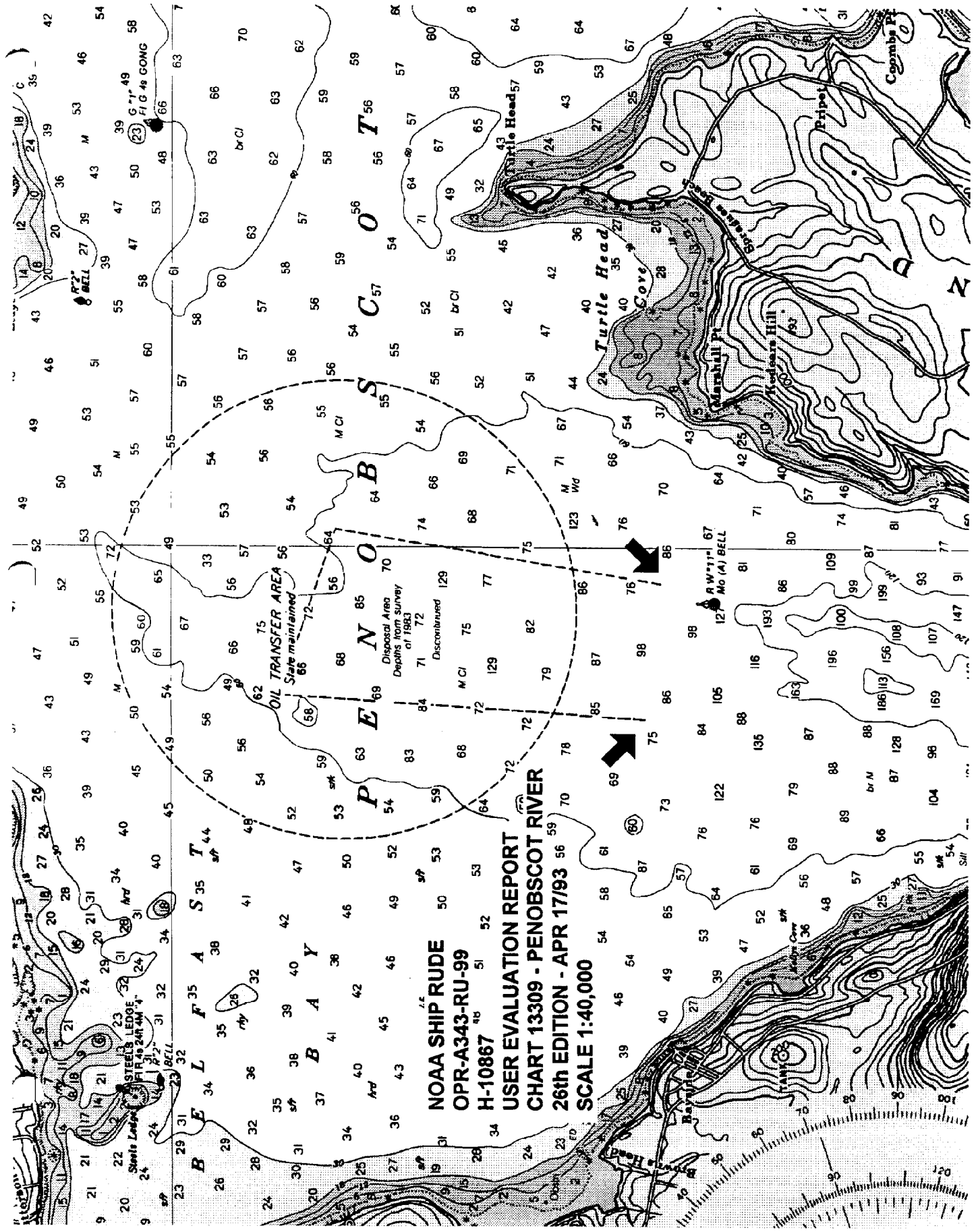
Attachments

cc: N/CS 27
N/CS 33





NOAA SHIP RUDE BELL (26)
 OPR-A343-RU-99
 H-10867
 USER EVALUATION REPORT
 CHART 13302 - PENOBSCOT BAY AND APPROACHES (58)
 20TH EDITION - NOV 28/98
 SCALE 1:80,000 40



NOAA SHIP RUDE

OPR-A343-RU-99

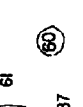
H-10867

USER EVALUATION REPORT

CHART 13309 - PENOBSCOT RIVER

26th EDITION - APR 17/93

SCALE 1:40,000





**U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
Office of NOAA Corps Operations
NOAA Ship RUDE S-590
439 W. York Street
Norfolk, VA 23510-1114**

May 26, 1999

MEMORANDUM FOR: N/CS261, Source Data Section
SSMC3, Room 7317
1315 East West Highway
Silver Springs, MD 20910-3282

FROM: Lieutenant Commander *James S. Verlaque*, NOAA
Commanding Officer, NOAA Ship RUDE

SUBJECT: Coast Pilot Report, OPR-A343-RU-99

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Attachments

cc: N/CS 27
N/CS 31
N/CS 33





**U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
Office of NOAA Corps Operations
NOAA Ship RUDE S-590
439 W. York Street
Norfolk, VA 23510-1114**

May 26, 1999

MEMORANDUM FOR: Lieutenant Donald W. Haines, NOAA
Chief, Operations Branch, N/CS31

FROM: Lieutenant Commander *James S. Verlaque*, NOAA
Commanding Officer, NOAA Ship RUDE

SUBJECT: User Evaluation Report, OPR-A343-RU-99,
Chart Inspection Report, OPR-A343-RU-99

Comments concerning the accuracy of NOAA chart 13302, 20th Ed., Nov 20/98 and NOAA chart 13309, 26th Edition, Apr 17/93 - covering the surveyed area of OPR-A343-RU-99, northern Penobscot Bay oil transfer areas, Searsport anchorage, and southern Penobscot River off Fort Point are listed below:

Boundary omitted on southern end of disposal area (between RED ARROWS).

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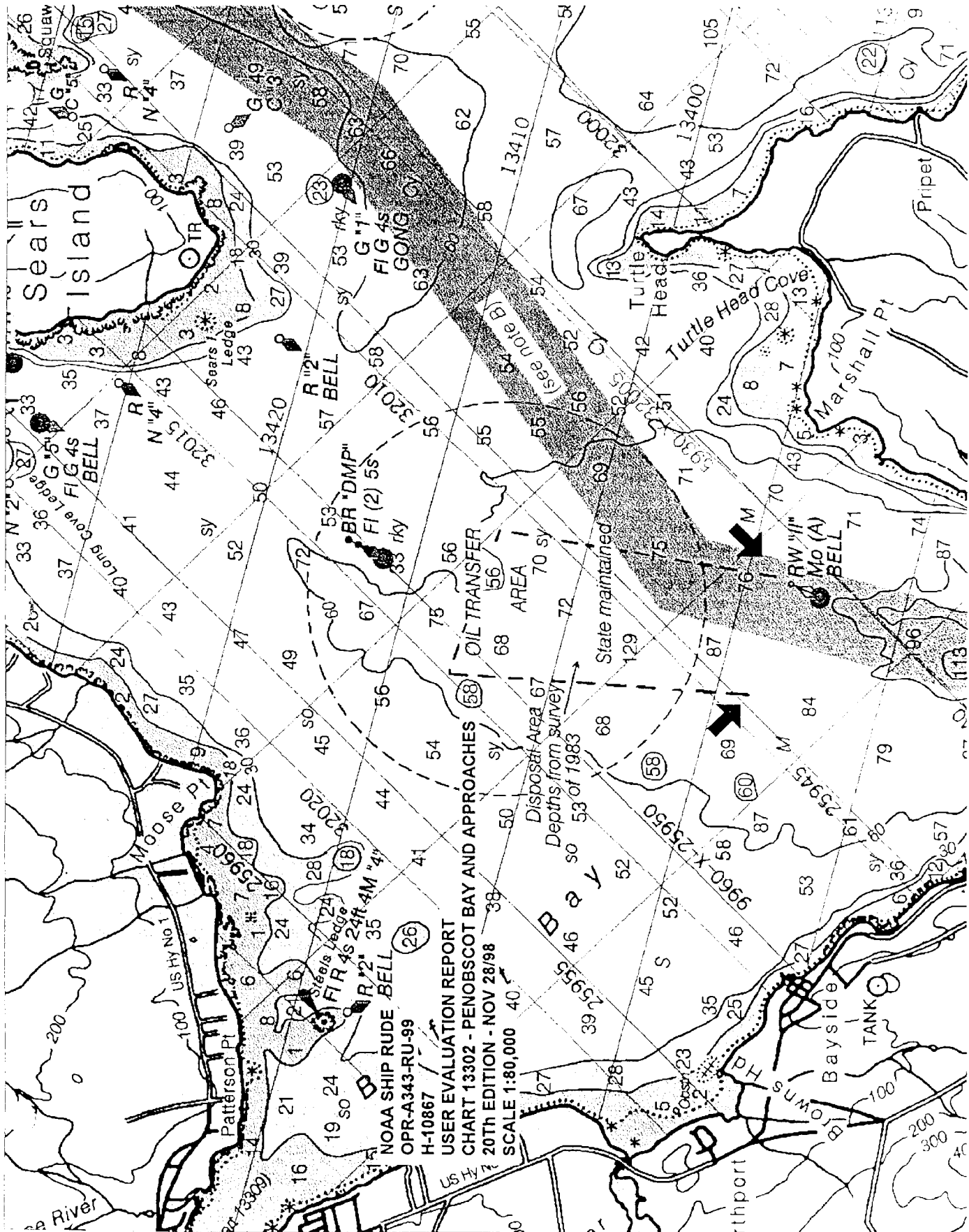
LATITUDE: 44 22' 55" N
LONGITUDE: 068 55' 47" W

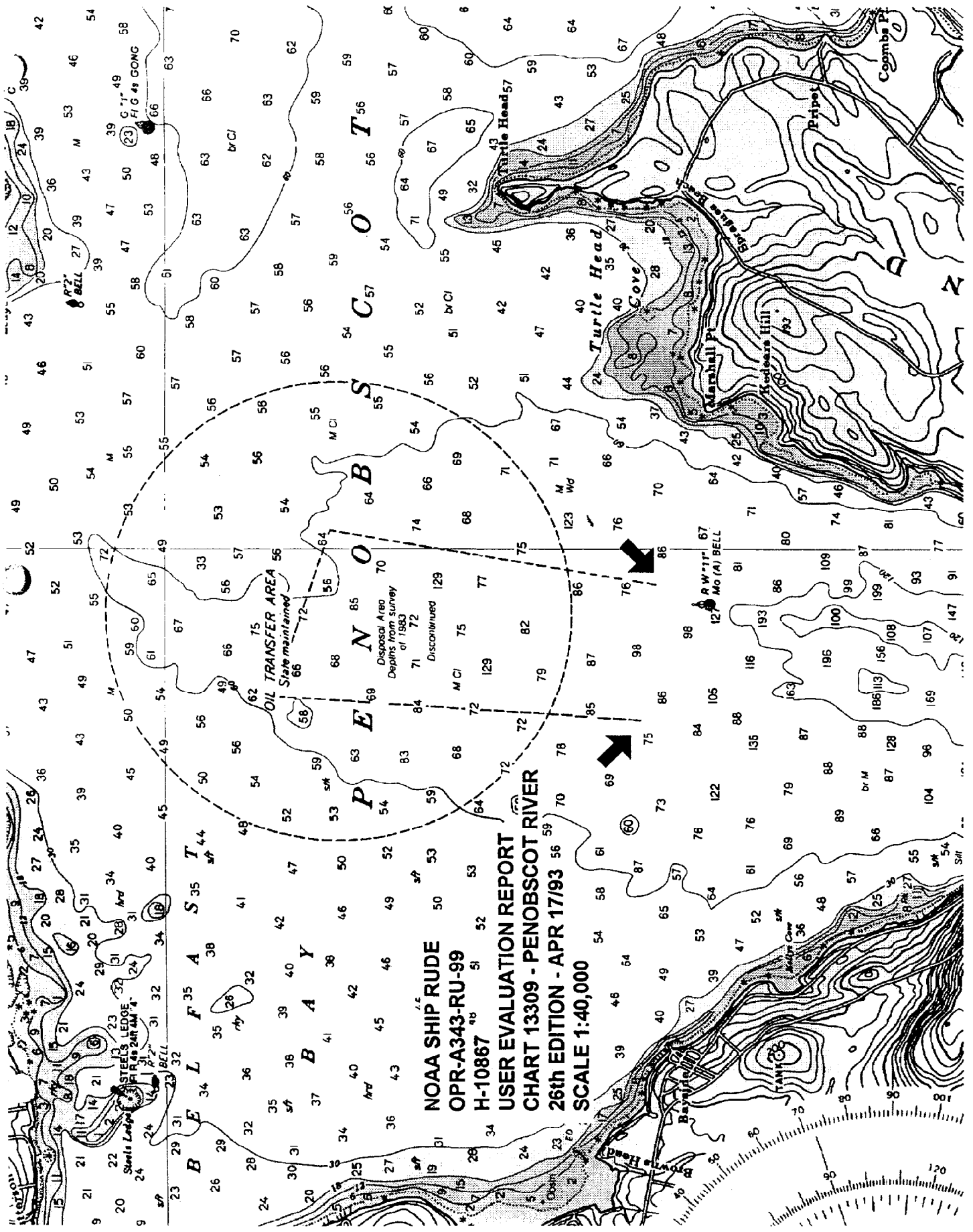
LATITUDE: 44 22' 58" N
LONGITUDE: 068 56' 58" W

Attachments

cc: N/CS 27
N/CS 33

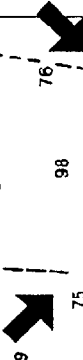






NOAA SHIP RUDE
OPR-A343-RU-99
H-10867
USER EVALUATION REPORT
CHART 13309 - PENOBSCOT RIVER
26th EDITION - APR 17/93
SCALE 1:40,000

OIL TRANSFER AREA
 State maintained
 Disposal Area
 Depths from survey
 of 1983
 Discontinued 129



MARINE CHART BRANCH
RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H10867

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
13309	8/14/2000	D.A. Blund	Full Part 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.
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