

H10940

NOAA FORM 76-35A

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

DESCRIPTIVE REPORT

Type of Survey Hydrographic

Field No. RA-10-24-99

Registry No. H-10940

LOCALITY

State Alaska

General Locality Southwest Prince William Sound

Sublocality Little Green Island and Vicinity

1999

CHIEF OF PARTY

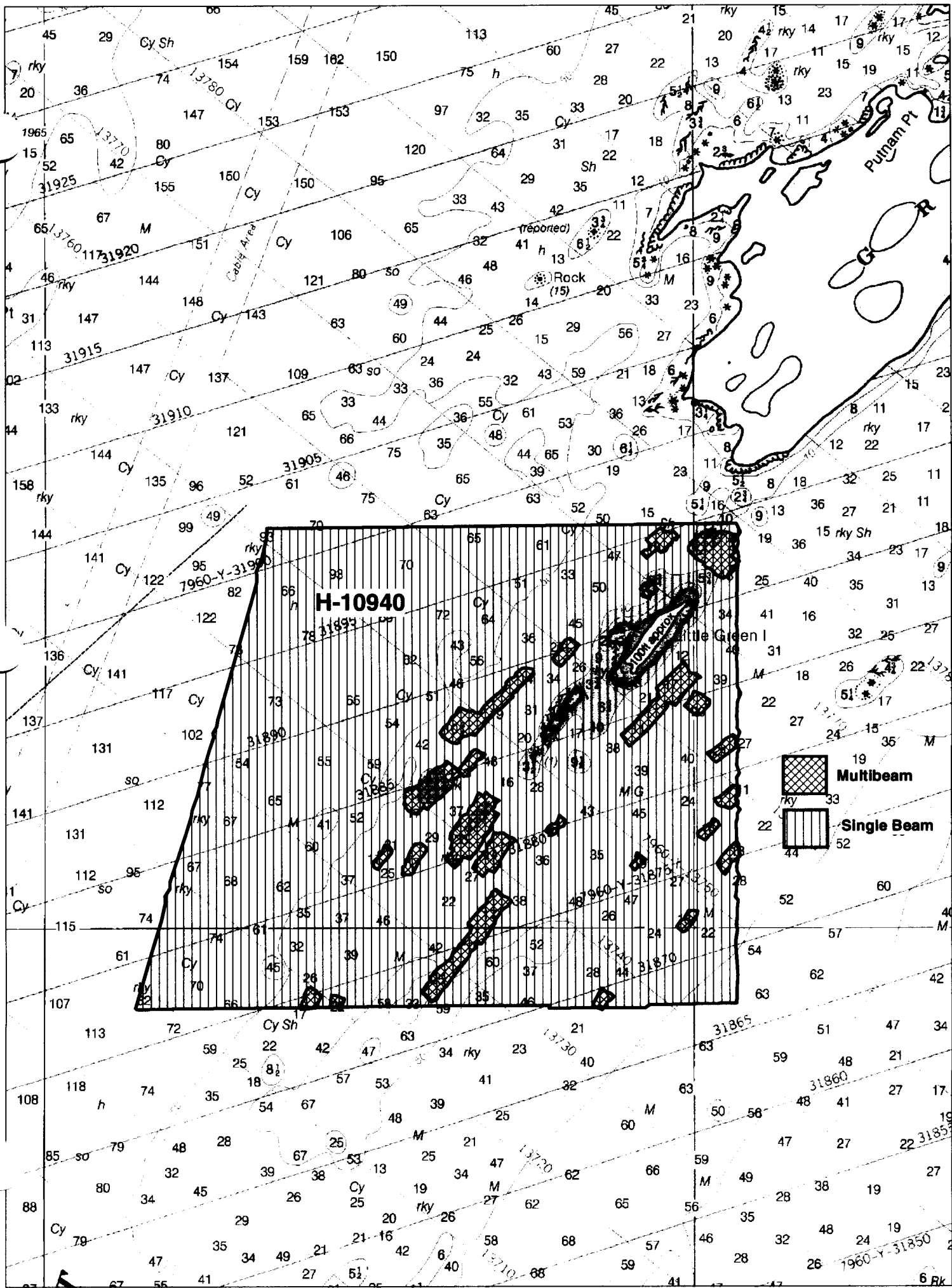
Commander D.R. Herlihy, NOAA

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DATE

December 6, 2001

NOAA FORM 77-28 (11-72)	U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION	REGISTER NO.
HYDROGRAPHIC TITLE SHEET		H-10940
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. RA-10-24-99
State <u>Alaska</u>		
General Locality <u>Southwest Prince William Sound</u>		
Sublocality <u>Little Green Island and Vicinity</u>		
Scale <u>1:10,000</u>		Date of Survey <u>9/27/99-10/20/99</u>
Instructions Date <u>July 30, 1999</u>		Project No. <u>OPR-P139-RA-99</u>
Vessel <u>RA-2 (2122), RA-3 (2123), RA-4 (2124), RA (2125), RA-6 (2126)</u> <u>RA-6 (2126)</u>		
Chief of Party <u>Commander Dan R. Herlihy, NOAA</u>		
Surveyed by <u>RAINIER Personnel</u>		
Soundings taken by echo sounder, h		<u>DSF 6000N, RESON 8101 MB</u>
<u>KNUDSON 320M</u>		
Graphic record scaled by <u>RAINIER Personnel</u>		
Graphic record checked by <u>RAINIER Personnel</u>		
Evaluation by <u>R. Shipley</u>		Automated plot by <u>HP Design Jet 750+</u>
Verification by <u>D. Doles, R. Mayor, E. Domingo, R. Shipley</u>		
Soundings in <u>Fathoms</u>		at <u>MLLW</u>
REMARKS: <u>Time in UTC. Revisions and marginal notes in black</u> <u>were generated during office processing. All separates</u> <u>are filed with the hydrographic data. As a result, page</u> <u>numbering may be interrupted or non-sequential.</u>		
<u>All depths listed in this report are referenced to</u> <u>mean lower low water unless otherwise noted.</u>		
<u>AWOIS/SURE 11/30/01</u> <u>MLR</u>		



H-1094

 **Multibeam**
 **Single Beam**

Descriptive Report to Accompany Hydrographic Survey H10940

Field Number RA-10-24-99

Scale 1:10,000

September - October 1999

NOAA Ship RAINIER

Chief of Party: CDR Daniel R. Herlihy, NOAA

A. PROJECT ✓

This basic hydrographic survey was completed as specified by Hydrographic Survey Letter Instructions OPR-P139-RA dated July 30, 1999, and Draft Standing Project Instructions dated April 6, 1999. Survey H10940 corresponds to Sheet AR as defined in the sheet layout. This survey will provide data to supersede prior surveys conducted in the early to mid 1900s, and will affect Charts 16700 and 16701. Requests for hydrographic surveys and updated charts in this area have been received from the National Imagery and Mapping Agency (NIMA), the U.S. Coast Guard, the Southwest Alaska Pilot's Association, cruise ship lines, and local fishermen.

Significant changes in depths and shoreline may have occurred in the project area as a result of the earthquake of March 27, 1964. *Concur*

B. AREA SURVEYED ✓ SEE EVAL REPORT, SECTION B

The survey area is located ^{around and in} the vicinity of Little Green Island. Little Green Island is located southeast of Green Island between Knight Island and Montague Island in Prince William Sound, Alaska. The survey limits identified in the original sheet layout were revised to include the offshore portion of sheet AR on sheet AP (H10925, RA-40-2-99). The survey encompasses approximately 13.5 nautical miles. The survey's northern limit is latitude $60^{\circ}13'02.5''$ N and the southern limit is latitude $60^{\circ}09'26.7''$ N. The survey's western limit is longitude $147^{\circ}32'56.9''$ W and the eastern limit is longitude $147^{\circ}29'26.7''$ W. Data acquisition was conducted from September 27 to October 20, 1999 (DN 270 to 293). *Concur*

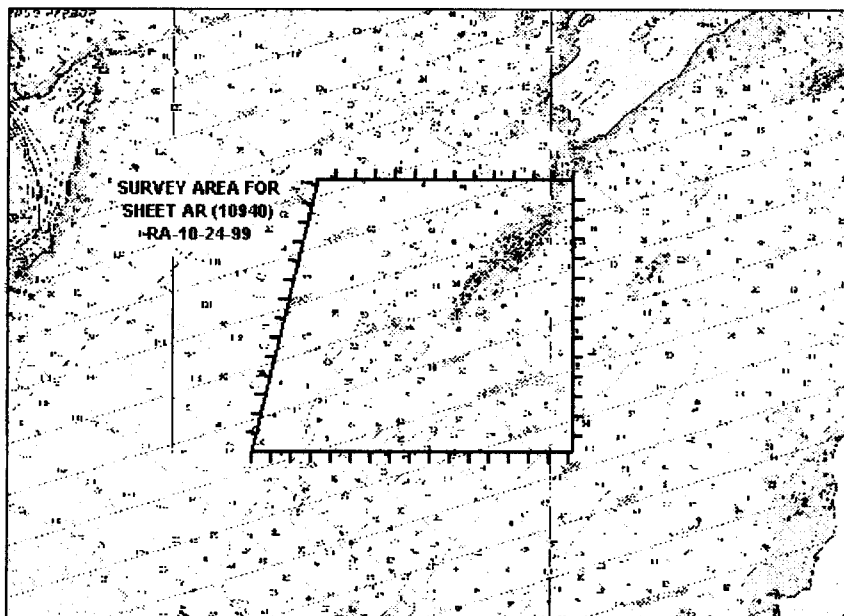


Figure 1 - Survey Area for H10940

C. SURVEY VESSELS ✓

Data were acquired by RAINIER survey launches (vessel numbers 2122, 2123, 2124, 2125 and 2126) as noted in the Survey Information Summary included with this report. Vessels 2122, 2124, and 2125 were used for the acquisition of vertical beam echo sounder (VBES) data. Vessel number 2125 was also used to collect bottom sample. Vessels 2123 and 2126 were used for acquisition of shallow-water multibeam data and sound velocity profiles. See the Project Related Data for OPR-P139-RA-99 for vessel descriptions. No unusual vessel configurations or problems were encountered on this survey.

D. AUTOMATED DATA ACQUISITION AND PROCESSING ✓

All vertical beam echo sounder (VBES) data were acquired using Coastal Oceanographic's HYPACK version 8.9 and processed with the Hydrographic Processing System (HPS) version 9.3 and MapInfo 5.0. Final detached positions, features, and soundings based on unverified observed tides were saved in MapInfo format. *Concur*

Shallow-water multibeam (SWMB) echo sounder data were acquired using Triton-Elics' ISIS software version 4.32 and processed using Universal Systems Limited's CARIS HIPS software version 4.3. *Concur*

Shallow-water multibeam data were reviewed with the CARIS Hydrographic Data Cleaning System (HDCS). Depth fliers were identified and manually flagged as "rejected". Vessel positioning and attitude data from each system were similarly displayed and manually cleaned. Additionally, instantaneous speed as computed from the positioning data was checked for speed jumps exceeding 3 knots as an indication of potential position fliers. For this survey, all mainscheme soundings beyond a maximum angle of 60° off nadir and all development soundings beyond a maximum angle of 45° were rejected in accordance with the Project Instructions.

After review and cleaning, depth, position and attitude data were merged with sound velocity, unverified observed tide and dynamic draft correctors to compute the corrected depth and position of each sounding. Processed soundings were read into a CARIS Workfile by selecting shoal-biased "line-by-line" binning at a two densities; one at 3m x 3m, the other at 1.5mm x 1.5mm at survey scale. The former was used to create digital terrain models (DTMs) that were used to demonstrate multibeam coverage and perform multibeam quality-assurance, while the latter was used to export soundings into HPS through HPTools. Unverified observed tides were applied in the Hydrographic Processing System (HPS) and the processed soundings were excessed using a 3mm character size, and plotted at a 2 mm character size to produce the final sounding plot. Final selected soundings were saved and plotted in MapInfo. Raster images registered in MapInfo facilitated chart and prior survey comparisons.

Survey H10940 is defined as sheet 14 in HPS. The CARIS workfile name for the 3m x 3m DTM is defined as "h10940_3m;" the CARIS workfile name for the soundings exported at 1.5mm at the scale of the survey is defined as "h10940_15m;" the CARIS workfile name for the QC report is "h10940_qc;" and the project name is identified as "P139_SheetAR" in HDCS.

All final plots were created in MapInfo using UTM Zone 6 projection. *Concur*

A complete listing of software is included in Appendix H.* A data flow diagram is included in Appendix G.*

E. SONAR EQUIPMENT ✓

Side Scan Sonar (SSS) equipment was not used on this survey. However, it should be noted that the Reson SeaBat 8101 SWMB system provides a low-resolution digital SSS record of the SWMB swath. This SSS imagery is primarily used during final processing of SWMB depth data to aid in determining whether anomalous soundings are true features or noise. *CONCUR*

F. SOUNDING EQUIPMENT ✓

Two different categories of echo sounder systems were used and are described below. The individual system(s) chosen for use in a given area were decided at the discretion of the Hydrographer using the guidance stated in the Project Instructions and depended upon the limitations of each system, bottom topography, water depth, and the ability of the platform vessel to safely navigate the area.

1. Launch Vertical Beam Echo Sounder (VN 2122, 2124 and 2125) ✓

The vertical beam echo sounders (VBES) utilized for this survey were the Raytheon DSF-6000N (VN 2122, 2124, 2125), which are dual frequency (100 kHz, 24 kHz), digital recording single beam fathometers with analog paper records. Soundings were acquired in meters for both frequencies, with high frequency utilized as the primary frequency. VBES serial numbers are included in Appendix H. ✱

VBES data were also acquired concurrently with shallow-water multibeam (SWMB) data and were compared to nadir beams of the shallow-water multibeam in real-time during data acquisition to assure SWMB data quality. In addition, digital VBES depth data are used by Isis to assist the Reson 8101 in tracking the bottom.

The latter is extremely helpful in areas of extreme relief, when the shallow-water multibeam tends to lose bottom lock. VBES data acquired during SWMB were not used for final sounding plot compilation, and are not included with the digital survey data. *CONCUR*

2. Launch Shallow-water multibeam (SWMB) (VN 2123, 2126) ✓

The shallow-water multibeam (SWMB) system utilized for this survey was the Reson SeaBat 8101, which is a 240-kHz multibeam system that measures relative water depths across a wide swath perpendicular to the vessel's heading. The Reson 8101 has a 150° swath, consisting of 101 individual 1.5° x 1.5° beams. A TSS POS/MV Position and Orientation Sensor was used to correct for the effects of vessel motion during survey operations. Serial numbers for the Reson 8101 and POS/MV are included in Appendix H. ✱

SWMB was used to develop shoal areas and acquire least depths over significant features identified during VBES data acquisition (see figure 3). *CONCUR*

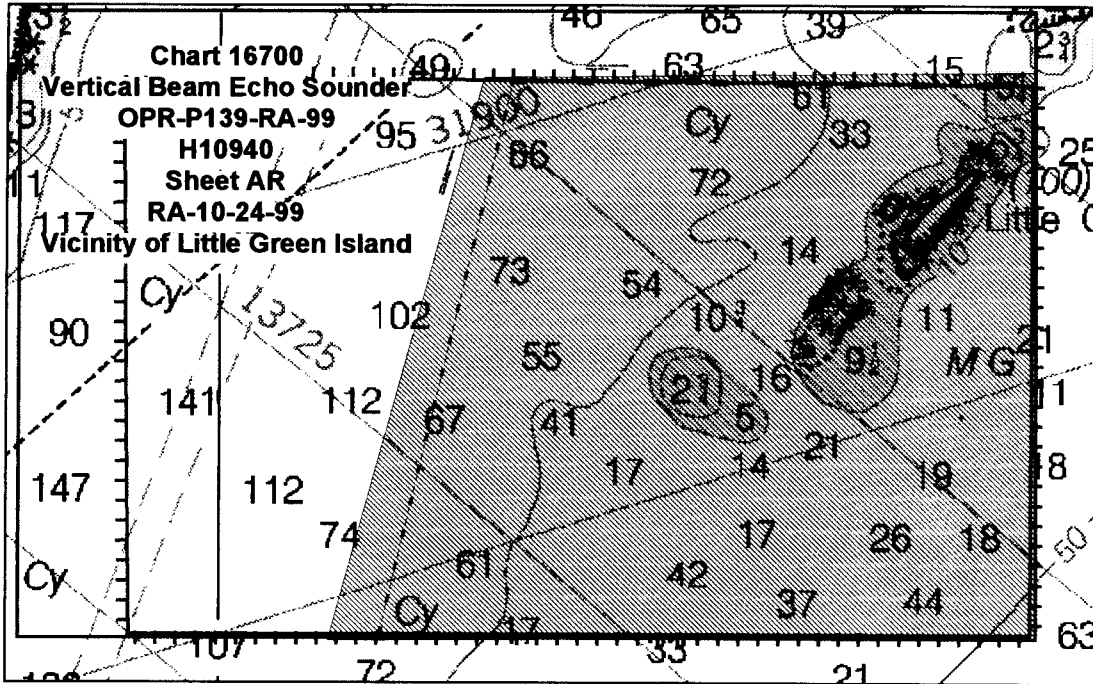


Figure 2 - Vertical Beam Echo sounder Survey Limits

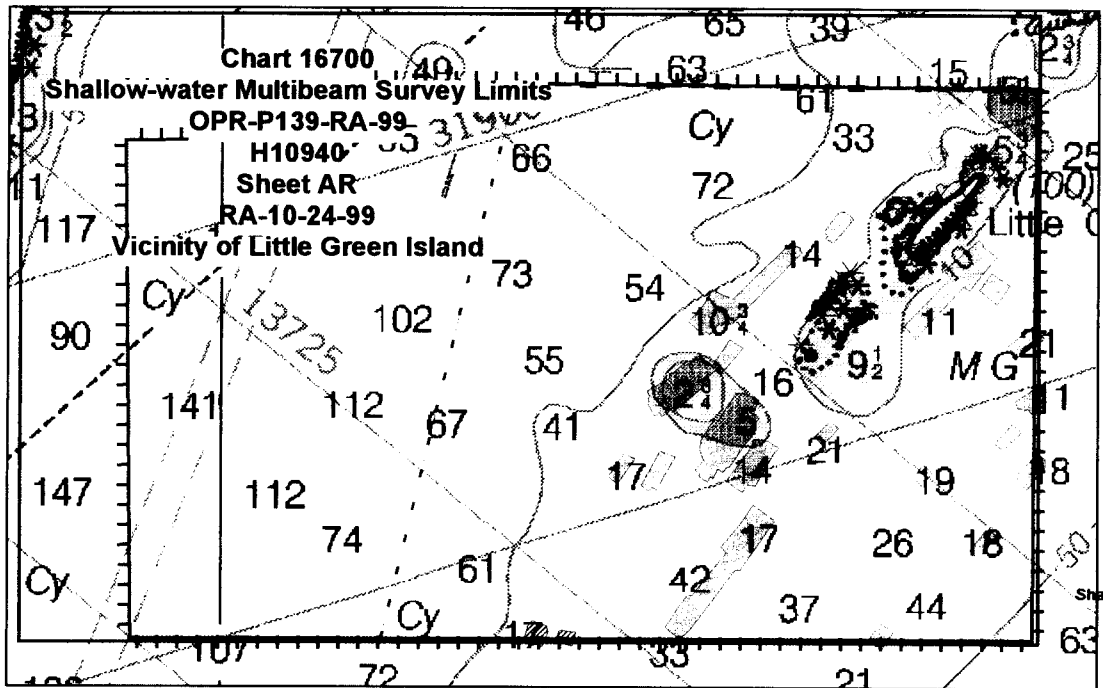


Figure 3 - Shallow-water Multibeam Survey Limits

G. CORRECTIONS TO ECHO SOUNDINGS ✓

Water Level Correctors ✓

Soundings were reduced to Mean Lower-Low Water (MLLW) using unverified observed tide data for station Cordova, AK (945-4050) obtained from the Center for Operational Oceanographic Products and Services (CO-OPS) web site. These data were used in creating HPS tide table #1.

Listings of HPS tide tables used for H10940 and tidal correctors as provided in the Project Instructions for H10940 are contained in the Survey Information Summary included with this report. *CONCUR*

The operating National Water Level Observation Network (NWLON) primary tide stations at Cordova, Alaska (945-4050) and Valdez, Alaska (945-4240) will serve as control for datum determination at four subordinate stations. Because a Next Generation Water Level Measurement System (NGWLMS) Aquatrak sensor is the only sensor installed at these primary stations, RAINIER personnel were neither required nor able to inspect and perform leveling at these stations.

RAINIER personnel installed Sutron 8200 "bubbler" tide gauges (Table 1) at the following subordinate stations:

Station Name	Station Number	Type of Gauge	Date of Installation	Date of Removal
Zaikof Point	945-4411	30-day	10 August 1999	14 October 1999
Port Chalmers	945-4511	30-day	10 August 1999	20 October 1999
Snug Harbor **	945-4662	30-day	11 August 1999	20 October 1999
Montague Island	945-4616	30-day	31 August 1999	20 October 1999

** Used For Final approved tides on H-10940.

Refer to the Field Tide Notes and supporting data in Appendix D for individual gauge performance and level closure information.

Raw water level data from these gauges was forwarded to N/OPS1 throughout the project period, with the final package submitted on October 29, 1999 in accordance with HSG 50 and FPM 4.7. The Pacific Hydrographic Branch will apply final approved (smooth) tides to the survey data during final processing. A request for delivery of final approved (smooth) tides to the Pacific Hydrographic Branch was forwarded to N/OPS1 on October 30, 1999 in accordance with FPM 4.8. *APPROVED TIDE NOTE DATED MAY 15, 2000 IS ATTACHED TO THIS REPORT*

Sound Velocity Correctors ✓

The velocity of sound through water was determined by a minimum of one cast every four hours of acquisition for SWMB data, in accordance with the Draft Standing Project Instructions. The velocity of sound through water for VBES data was determined once per week as required by the NOS Hydrographic Surveys Specifications and Deliverables (April 23, 1999). Cast information is included in the Survey Information Summary *(attached)* and in Appendix I*.

The sound velocity casts were acquired with SBE SEACAT Profilers (S/N 219, 2543, and 2477). Calibration reports and dates are included with the Project Related Data for OPR-P139-RA-99. Velocity correctors were computed using the program VELOCWIN version 4 beta 2, which generates correction tables for both CARIS and HPS. For VBES data, sound velocity correctors were applied to the raw sounding data in HPS during post-acquisition processing. For SWMB data, sound velocity correctors were applied in CARIS during post-acquisition processing. *CONCUR*

Settlement and Squat Correctors ✓

The following table shows when the vessel offset correctors used for this survey were determined:

Vessel No.	Date of Static Draft and Transducer Offset Measurements	Method of Settlement and Squat Measurement	Date of Settlement and Squat Measurement	Location of Settlement and Squat Measurement
2121	March 1999	OTF	March 1999	Port Angeles, WA
2122	March 1999	Rod leveling	March 1999	Port Angeles, WA
2123	March 1999	OTF	March 1999	Port Angeles, WA
2124	March 1999	Rod leveling	March 1999	Port Angeles, WA
2125	March 1999	Rod leveling	March 1999	Port Angeles, WA
2126	March 1999	OTF	March 1999	Port Angeles, WA

Settlement and squat correctors, static draft measurements and vessel offsets are included with the Project Related Data for OPR-P139-RA-99.

Heave, Pitch, Roll Biases and Heading, including Biases and Navigation Timing Errors ✓

SWMB launches (VN 2121, 2123, and 2126) utilize a TSS POS/MV Model 320 Position and Orientation System (POS), which provides accurate navigation and attitude data to correct for the effects of heave, pitch, roll and heading. The POS generates attitude data in three axes (roll, pitch and heading) to an accuracy of 0.05° or better. Heave measurements supplied by the POS maintain an accuracy of 5% of the measured vertical displacement for movements that have a period of up to 10 seconds. The POS delivers heading measurements by two distinct methods. First, the Dynamic Heading Alignment determines the vessels heading by using the data supplied by the Internal Measurement Unit (IMU) and GPS receivers to achieve heading that is, at best, accurate to within 0.35°. This method suffers from drift but is relatively unaffected by noise. Second, the GPS Azimuth Measurement System (GAMS) determines the geographic vector between two GPS antennas fixed to the vessel by comparing the phase of satellite signals they receive. The error from this method is largely due to noise, but exhibits no drift. The POS uses the advantages of each method to compensate for the disadvantages of the other to arrive at an optimal accuracy of 0.05°. Serial numbers are located in Appendix H. *

Heave, roll, pitch, and navigation latency biases were determined during Patch Tests conducted at Port Angeles, WA on March 26-28, 1999 for vessels 2126 and 2123, and at Shilshole, WA, on July 7, 1999 for vessel 2121. SWMB vessel offsets, dynamic draft correctors, and system bias values are contained in CARIS Vessel Configuration Files (VCF's) and were created using the program "VCFEDIT" in CARIS. These offsets and biases are applied to the sounding data during processing in CARIS. A printout of each VCF is contained in the Project Related Data for OPR-P139-RA-99, and the VCF's themselves are included with the digital HDCS data. *Conway*

H. HYDROGRAPHIC POSITION CONTROL ✓ *SEE EVAL REPORT, SECTION H.*

The horizontal datum for this project is NAD 83. Differential GPS was the sole method of positioning. The US Coast Guard Beacons at Cape Hinchinbrook (ID# 894) and Potato Point (ID# 883) were the sources of differential correctors. *Conway*

Launch-to-launch DGPS performance checks were performed in accordance with Section 3.2 of the FPM. Copies of the performance checks are included in Project Related Data for OPR-P139-RA-99.

* FILED WITH THE SURVEY RECORDS 6

I. SHORELINE ✓ SEE EUAL REPORT, SECTION J.**Method of Shoreline Verification** ✓

N/NGS3 supplied photogrammetric shoreline in MapInfo format for T-12712 for use as source shoreline. The T-sheet shoreline was imported into HYPACK for field verification. In addition, features shown on the current editions of charts 16700 and 16701 were digitized in MapInfo by RAINIER personnel and displayed in Hypack for field verification.

Shoreline verification was conducted near predicted low water in accordance with the Project Instructions and FPM 6.1 and 6.2. For this survey the general limit of safe navigation of a survey launch was 5-30 meters offshore of apparent low tide. Water depths along this limit of safe navigation are generally 2-5 meters at Mean Lower Low Water (MLLW). Features unreachable by survey launch shown inshore of the Navigable Area Limit Line (NALL) are the hydrographer's approximate representation of the shoreline. CONCUR

Detached positions taken during shoreline verification were recorded within HYPACK and on DP forms, and processed in HPS. These indicate revisions to features, and features not found on the T-sheet or chart. ^{*} Shoreline verification data was analyzed during office processing and shown on the smooth sheet as warranted. A detailed DP and BS plot is provided showing all detached positions and bottom samples with notes relating to each feature. Updated shoreline and features are also depicted on the final sounding plot. CONCUR

Source Shoreline Changes and New Features ✓

Several changes and new features were found and are depicted on the final DP plot. T-sheet rocks and islets were often identified as high points of new ledges, reefs, or extents of islands or islets. Some T-sheet rocks were also represented on the charts. A few exceptions were found: CONCUR

A new reef was found at the southern end of the survey area. The northern extent of the reef was found at 60°11'48.167"N, 147°31'44.436"W (Pos. #42924). The southern extent of the reef was found at 60°11'38.096"N, 147°32'5.868"W (Pos. #42925). The Hydrographer recommends charting the reef as surveyed. CONCUR

A new reef was found at the southern end of the survey area. The northern extent of the reef was found at 60°11'35.946"N, 147°32'1.801"W (DP# 42922). The southern extent of the reef was found at 60°11'29.083"N, 147°32'11.558"W (Pos. #42920). The Hydrographer recommends charting the reef as surveyed.

Recommendations ✓

The Hydrographer recommends that the shoreline as depicted on "H10940_DP and BS plot" and "H10940_Final Sounding plot" ^{map(T-12712)} supersede and ^{supplement} complement shoreline information ^{as} compiled on the T-sheets as noted. These revisions are recorded in the MapInfo digital files named "H10940_Shoreline" and "H10940_Shoreline_Update". CONCUR

Charted Features ✓

Charted rocks were identified as T-sheet rocks, reefs, islands, islets, high points, or extensions of T-sheet ledges, with the following exceptions: CONCUR

* Filed with the survey records

A charted rock at 60°12'27.12"N, 147°29'50.49"W (chart 16700) was not found (Position #20120, DN 270, VN 2122). Depths in the vicinity of the charted rock are approximately 12 meters. A 100-meter VBES search was conducted at low water. The Hydrographer recommends deleting this charted rock. *Do not concur. This rock has been generalized from the ledge shown on Chart 16701.*

A charted rock at 60°12'07.24"N, 147°30'23.5"W (chart 16700) was not found (Position #20147, DN 270, VN 2122). Depths over the charted position varied from approximately 5 to 11 meters. A 75-meter VBES search was conducted at MLLW. The Hydrographer recommends deleting the charted rock. *Do not concur. See generalization statement above.*

Recommendations

The charted shoreline should be revised using the T-sheet shoreline and fieldwork notes as recorded in the MapInfo digital files named "H10940_Shoreline" and "H10940_Shoreline_Update". *Concur*

J. CROSSLINES

VBES crosslines totaled 28.83 nautical miles, comprising 10.3% of mainscheme hydrography. Crosslines generally agreed within 1 meter of mainscheme hydrography. *Concur*

SWMB crosslines totaled 0.13 nautical miles, comprising 0.4% of SWMB hydrography. The Quality Control Report (CARIS HIPS) for the checkline file averaged 69.27% with a depth tolerance of 0.023. The crossline was run over highly irregular terrain, which is likely to have caused the below average comparison. See Appendix E for the detailed report.

K. JUNCTIONS

See Eval Rpt, section L

There are two contemporary surveys that junction with H10940 as shown below and in Figure 4

<u>Registry #</u>	<u>Sheet Name</u>	<u>Scale</u>	<u>Date</u>	<u>Junction side</u>
H10928	Sheet AL	1:10,000	1999	North ✓
H10925	Sheet AP	1:40,000	1999	West ✓

Soundings from H10928 compare well with this survey, agreeing within 2 meters. H10925 agrees well with this survey, generally between 1 and 5 meters. *Concur*

Final comparisons will be made at the Pacific Hydrographic Branch (PHB) after the application of smooth tides. *Concur*

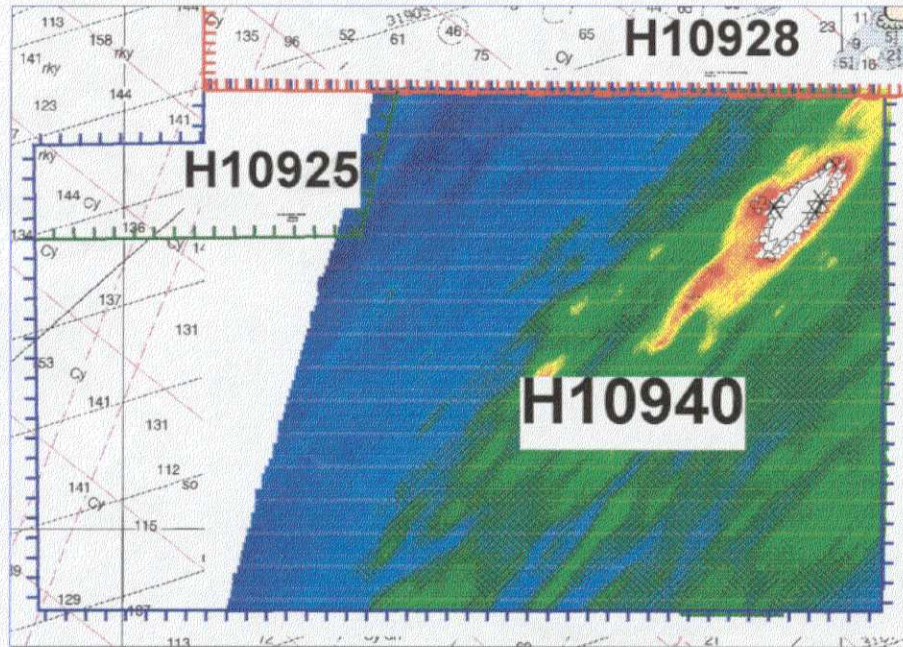


Figure 4 – Junctions with survey H10940

L. COMPARISON WITH PRIOR SURVEYS ✓ SEE EVAL REPORT, SECTION M

Prior surveys conducted in the H10940 area are shown below and in Figure 5.

Registry #	Scale	Date	Junction side
H-5427 ✓	1:20,000	1933	East half of survey area
H-5431 ✓	1:20,000	1933	West half of survey area
H-2741 ✓	1:40,000	1911	Mid-section of survey area
H-9513 ✓	1:20,000	1975	West half of survey area
H-9512 ✓	1:20,000	1975	East half of survey area

General agreement with H-5427 was excellent, generally within 1 to 5 fathoms. An exception to this was found in the southeastern portion of survey H10940, where present survey depths were up to 10 fathoms shoaler than the prior survey.

General agreement with H-5431 was also excellent, generally within 1 to 4 fathoms. CONCUR

A comparison with H-2741 was not possible due to poor quality of the scanned prior survey image. *Image was found to be legible during office processing. See Eval Rpt., Section M. Do not concur*

Agreement with both H-9512 and H-9513 is excellent, generally within 2 fathoms. One exception is noted at 60°10'25.56" N, 147°32'24.03" W, where H-9512 depicts a depth of 36 fathoms. This survey found a least depth of 42 fathoms at this location, although a 33-fathom soundings were obtained approximately 220 meters to the north. *Chart this area based on the present survey information.*

In many instances, least depths from the current survey were found to be shoaler than soundings from prior

surveys. This is attributed to the increase bottom coverage and sounding density obtained with modern survey equipment. Differences between the prior survey and H10940 are also attributable to possible changes in the seafloor resulting from the 1964 earthquake. *Concur* Earthquake activity in 1964 directly effects the comparisons with H-9512 and H-9513. Final comparisons will be made at the Pacific Hydrographic Branch after the application of smooth tides. *Concur*

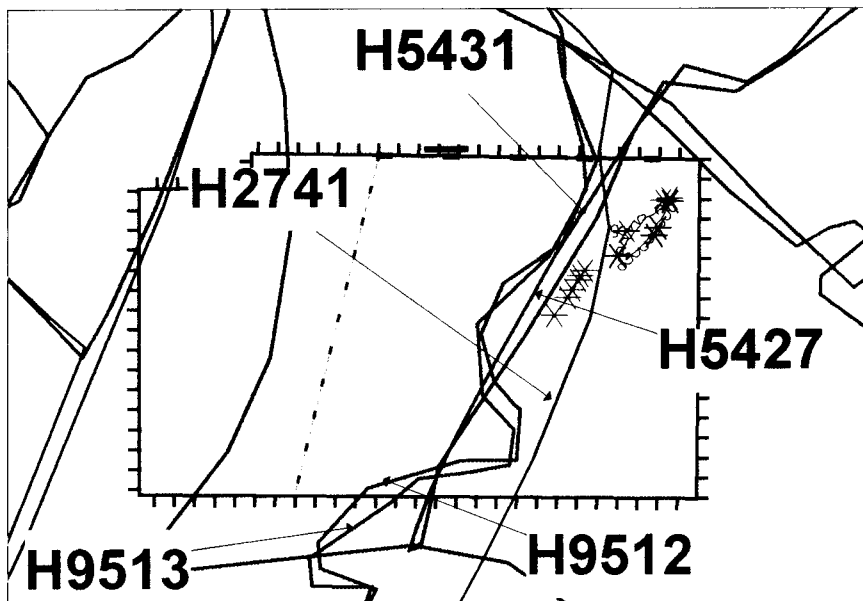


Figure 5 – Prior surveys covering the H10940 survey area

M. ITEM INVESTIGATION REPORTS ✓

There was one Automated Wreck and Obstruction Information System (AWOIS) item investigated within the survey area (see Figure 6).

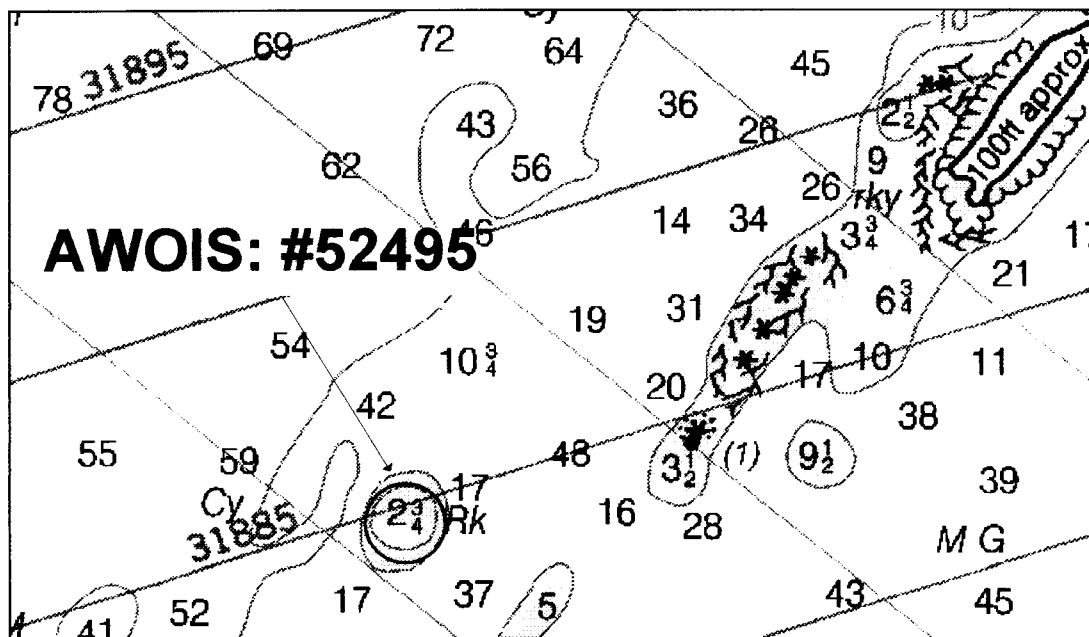


Figure 6 - AWOIS item location for H10940

AWOIS 52495 ✓

1. Area of Investigation:

AWOIS #: 52495
 State and Locality: Little Green Island, Alaska
 Reported Position: Latitude: 60°11'05.22N ✓
 Longitude: 147°34'02.06W ✓
 Datum: NAD83
 Type of Feature: Shoal
 Reported Depth: 2.9 fathoms ✓

2. Description of Source Item: HISTORY: H-9512/75--SP-PMC-4-DA-75; ROCK LOCATED, DIVER LEAST DEPTH WAS 2.9 FMS, MLLW PREDICTED. ENTERED 7/99 MCR

3. Survey Requirements: Shallow-water multibeam. 200-meter search radius. Update least depth.

4. Method of Investigation: The search area was covered with 100% shallow-water multibeam.

5. Results of Investigation: On DN 287, VN 2123 conducted a SWMB investigation within a 200-meter radius of 60°11'05"N, 147°34'02"W. This investigation resulted in a least depth of 3.7 fathoms (6.8 meters) at MLLW for AWOIS item # 52495. *Concur*

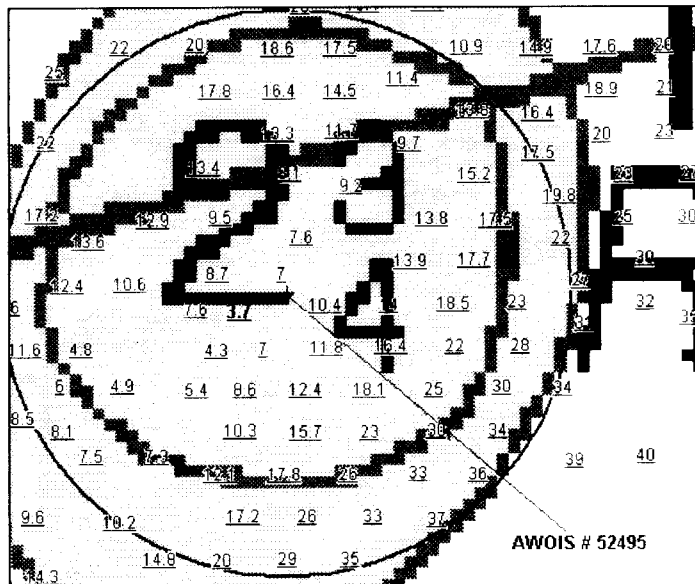
6. Comparison with Prior Surveys: AWOIS 52495 was investigated by prior survey H9512. The shoalest depth on the prior was not discernable due to the quality of the scanned image. However, inside a 200-meter radius of the AWOIS item, contemporary survey depths agreed within 1 to 2 fathoms of the prior survey H9512. *Concur*

7. Comparison with the Chart and Charting Recommendation: Compared with chart 16701; 17th Ed.; July 25, 1998; 1:81,436. The chart shows a 2 3/4-fathom shoal reported at 60°11'07.03"N, 147°34'01.72"W.

The Hydrographer recommends charting the shoal at 60°11'04.85"N, 147°34'04.15"W using contemporary survey depths. *concur*

Chart 3 1/2 rky

See Eval Rpt, Section IV



N. COMPARISON WITH THE CHART ✓ *SEE EVAL REPORT SECTION O.*

Survey H10940 was compared to Chart 16700 (26th Ed.; September 19, 1998, scale 1:200,000) and Chart 16701 (17th Ed.; July 25, 1998, scale 1:81,436).

Agreement with chart 16701 was excellent, generally within 1 to 2 fathoms. In many instances, soundings up to 10 fathoms shoaler than those charted were located at the same position or in close proximity to charted depths. This is generally attributable to increased bottom coverage and sounding density from modern survey equipment, as well as possible changes due to the 1964 earthquake. Exceptions are addressed below.

In the vicinity of a charted 20-fathom depth at 60°11'39.53" N, 147°29'57.02" W, the current survey located a depth of ^{26.5 to} 33 fathoms, although a least depth of 17.8 fathoms was obtained approximately 100 meters to the north. The area was covered with 100% SWMB. *Concur Chart this area based on the present survey information.*

In the vicinity of a charted 24-fathom depth at 60°10'58.33" N, 147°30'04.67" W, the current survey obtained a sounding of 39 fathoms, although a least depth of 22 fathoms was obtained approximately 100 meters to the south. The area was covered with 100% SWMB. *Chart 23 fm sounding as shown on the smooth sheet.*

In the vicinity of a charted 17-fathom sounding at 60°10'52.41" N, 147°34'19.1" W, the current survey obtained a sounding of 21 fathoms, although this sounding is located on the slope of a large shoal which has a least depth of 3.7 fathoms. The area was covered with 100% SWMB. *The present survey found depths of 10.1 - 18.9 fathoms within 100 meters north of the charted 17. Chart this area based on the present survey information.*

In the vicinity of a charted 41-fathom sounding at 60°10'47.18" N, 147°35'41.69" W, the current survey obtained a least depth of 43 fathoms. These soundings appear to be over a feature, which the current survey obtained only with VBES at 100-meter line spacing. Because current survey soundings confirm the existence of a feature at this location, the Hydrographer recommends retaining the 41-fathom sounding on chart 16701. *Concur 41 fm depth has been transferred to the smooth sheet in color from H-9512.*

Agreement with chart 16700 was excellent, generally within 1 to 2 fathoms. Again, in many instances, several soundings shoaler than those charted were located at the same position or in close proximity to charted depths, for the same reasons stated above. The 41-fathom sounding (mentioned above) depicted on chart 16701 is also depicted on chart 16700. Because the current survey only obtained a least depth of 43 fathoms over this feature, the Hydrographer recommends retaining the 41-fathom sounding as charted. *Concur*

Non-sounding features are discussed in Section I - Shoreline. Final sounding comparisons will be made at the Pacific Hydrographic Branch after the application of smooth tides. *Concur*

Dangers to Navigation ✓

*
Nine dangers to navigation were discovered during survey H10940 and reported to the Seventeenth Coast Guard District. A copy of the Danger to Navigation report is included in *this report* Appendix A.

A shoal depth of ³ 2.7 fathoms (Pos. #53566) was discovered at 60°11'55.440"N, 147°31'36.443"W, near a charted 3 3/4 -fathom sounding (Charts 16701, 16700).

A shoal depth of 4.2 fathoms (Pos. #70112) was discovered at 60°13'0.542"N, 147°29'46.579"W, near a charted 5 1/4 -fathom sounding (Charts 16701, 16700).

A shoal depth of ^{5.9} 4.8 fathoms (Pos. #21694) was discovered at 60°12'26.136"N, 147°30'57.537"W, near a charted 9 1/2 -fathom sounding (Charts 16701, 16700).

* Corrected for approved tides

A shoal depth of 5.7⁸ fathoms (Pos. # 46951) was found at 60°11'36.540" N, 147°31'28.050" W, near a charted soundings of 10 fathoms and 6 3/4 fathoms (chart 16701).

A shoal depth of 8.7 fathoms (Pos. #72019) was discovered at 60°11'52.852"N, 147°30'08.874"W, near a charted 17-fathom sounding (Charts 16701, 16700).

A shoal depth of 9.5 fathoms (Pos. #70162) was discovered at 60°12'57.783"N, 147°29'28.886"W, near a charted 12-fathom sounding (Charts 16701, 16700).

A shoal depth of 9.7 fathoms (Pos. #71746) was discovered at 60°10'38.275"N, 147°33'28.248"W, near a charted 23-fathom sounding (Charts 16701, 16700).

A shoal depth of 10.7 fathoms (Pos. #70373) was discovered at 60°11'53.724"N, 147°32'38.679"W, near a charted 14-fathom sounding (Charts 16701, 16700).

A shoal depth of 5.9 fathoms (Pos. #70301) was discovered at 60°12'37.665"N, 147°30'37.114"W, near a charted 6 3/4-fathom sounding (Charts 16701, 16700).

A copy of the Danger to Navigation report is included in ^{this report} ~~Appendix A~~.

O. ADEQUACY OF SURVEY ✓ See Eval Rpt., sections M and P

Apart from the one deficiency noted in section N, survey H10940 is complete and adequate to supersede charted soundings and features in their common areas. *Concur with clarification*

P. AIDS TO NAVIGATION ✓

There are no fixed navigational aids within the survey area. *Concur*

Q. STATISTICS ✓

Refer to the Survey Information Summary attached to this report.

R. MISCELLANEOUS ✓

Bottom samples were collected and sent to the Smithsonian Institution in accordance with the Project Instructions.

No unusual tidal currents or magnetic variations were found during this survey.

S. RECOMMENDATIONS ✓

None

T. REFERRAL TO REPORTS ✓

The following supplemental reports contain additional information relevant to this survey:

<u>Title</u>	<u>Date Sent</u>	<u>Office</u>
OPR-P139-RA-99 1999 Coast Pilot Report Project Related Data for OPR-P139-RA-99	TBD December, 1999	N/CS26 N/CS34

Respectfully Submitted,

E. J. Van Dusen LT/NOAA
FIELD OPERATIONS OFFICER

for Paul J. McAnally
Senior Survey Technician, NOAA

Approved and Forwarded,

Daniel R. Herlihy

Daniel R. Herlihy
Commander, NOAA
Commanding Officer

Survey Information Summary

Project	OPR-P139-RA	Project Name	SOUTHWEST PRINCE WILLIAM SOUND
Instructions Dated	7/30/99	Project Change Info	
Sheet Letter	AR	Registry Number	H10940
Sheet Number	RA-10-24-99		
Survey Title	VICINITY OF LITTLE GREEN ISLAND AND VICINITY		
Data Acquisition Dates	From:	27-Sep-99 270	To: 20-Oct-99 293

Vessel Usage Summary

VESNO	MS	SPLITS	DEV	XL	S/L	DP	BS	SWMB	DIVE
2121								1	
2122	2	2			1	1			
2123				1				1	
2124	4	1		1	1	1			
2125	3	1		1			2		
2126	1	1		1				1	

Sound Velocity Cast Information

HPS Table	Cast DN	Max Depth	Position	Applicable DN
12	270	329.3	60/11/00 147/41/10	268-274
13	277	293.2	60/27/24 147/09/36	278-285
14	286	369.9	60/17/18 147/35/24	286-293

}

Plot outside the Survey limits.

Tide Zone Information

Tide Gauge Information

Zone #	Time Corr.	Height Corr.	Tide Gauge #	Gauge Name	Installed	Removed
PWS16	-00 hr 06 min	0.91	945-4411	ZAIKOFF POINT	8/10/99	10/14/99
			945-4511	PORT CHALMERS	8/10/99	10/20/99
			945-4662	SNUG HARBOR	8/11/99	10/20/99

Statistics Summary

Type	Total
BS	17
DP	21
MS	284.15
S/L	5
SPLIT	75.76
SWMB	27.23
XL	28.83

Percent	
XL:	10.15
SQNM:	14.19



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
Office of NOAA Corps Operations
Pacific Marine Center
 1801 Fairview Avenue East
 Seattle, Washington 98102-3767

NOAA Ship RAINIER

January 3, 2000

**ADVANCE
 INFORMATION**

Commander (mon)
 Seventeenth Coast Guard District
 Post Office Box 25517
 Juneau, Alaska 99802-5517

Dear CDR Hamblett:

It is requested that the following dangers to navigation be included in the Local Notice to Mariners. The NOAA Ship RAINIER positioned these features while conducting hydrographic survey H10940 in Prince William Sound, Alaska, in September through October 1999. The dangers are shown graphically on the attached chartlet.

The following dangers to navigation affect the following charts:

<u>Chart</u>	<u>Scale</u>	<u>Edition</u>	<u>Date</u>
16700	1:200,000	26 th	19-Sep-98
16701	1:81,436	17 th	25-Jul-98

The positions are on the NAD 83 datum and depths have been corrected to mean lower-low water (MLLW).

<u>Feature</u>	<u>Depth (fm)</u>	<u>Latitude (N)</u>	<u>Longitude (W)</u>	<u>Depth (m)</u>
Shoal	2.2	60°11'55.440"	147°31'36.443"	4.0
Shoal	4.2	60°13'00.542"	147°29'46.579"	7.7
Shoal	4.8	60°12'26.136"	147°30'57.537"	8.8
Shoal	5.7	60°11'36.540"	147°31'28.050"	10.4
Shoal	5.9	60°12'37.665"	147°30'37.114"	10.8
Shoal	8.7	60°11'52.852"	147°30'06.874"	15.9
Shoal	9.5	60°12'57.783"	147°29'28.886"	17.3
Shoal	9.7	60°10'38.275"	147°33'28.248"	17.7
Shoal	10.7	60°11'53.724"	147°32'38.679"	19.5

This is advance information subject to office review. Questions concerning this letter should be directed to the Chief, Pacific Hydrographic Branch, (206) 526-6835. Refer to survey project OPR-P139-RA-99 and Danger to Navigation message RA-01-00. More information on current RAINIER survey projects may be obtained by e-mail; contact the Field Operations Officer at FOO.RAINIER@NOAA.GOV.

Sincerely,

Daniel R. Herlihy
 Commander, NOAA
 Commanding Officer

Attachment
 cc: NIMA
 N/CS261
 PMC
 N/CS34

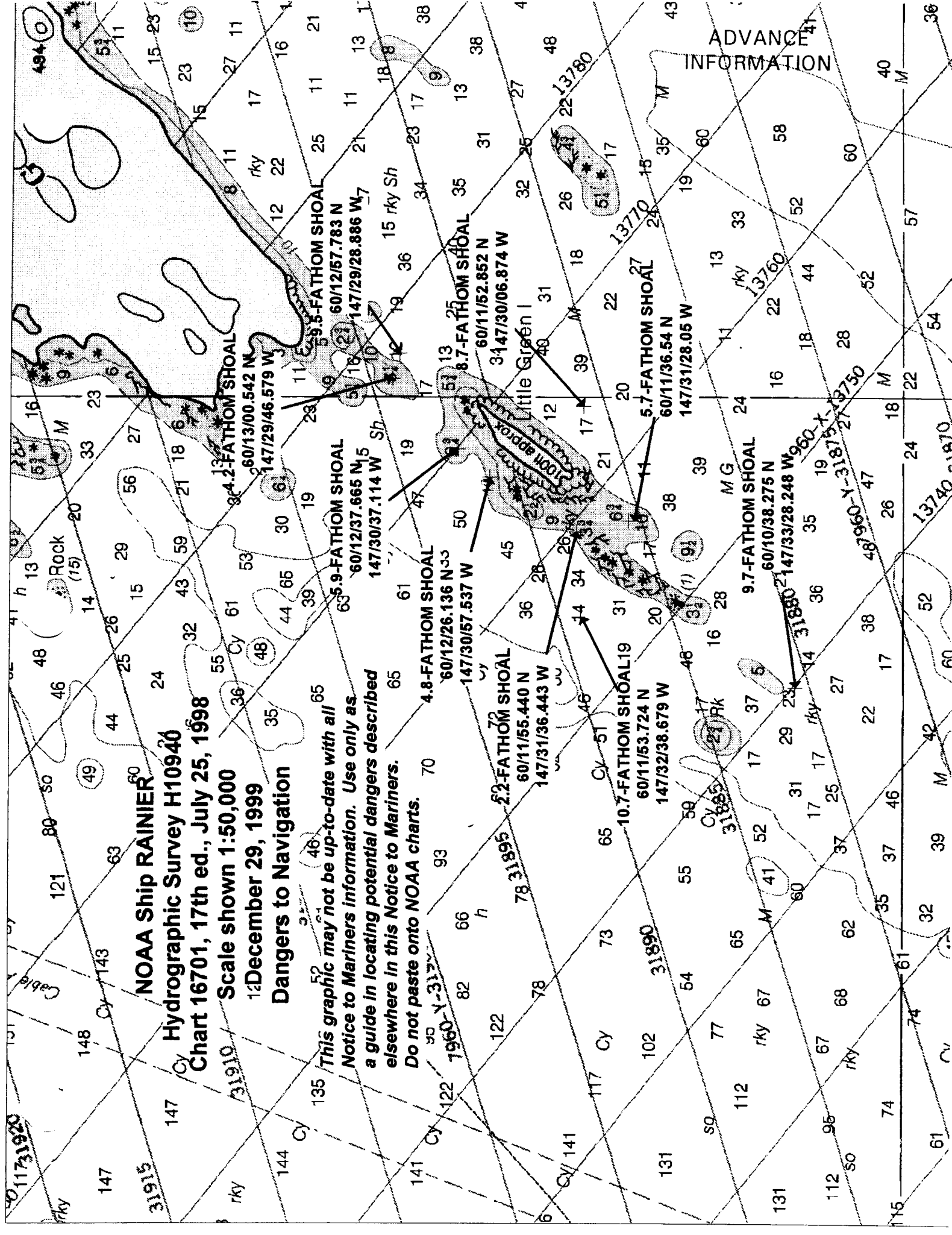


NOAA Ship RAINIER
Hydrographic Survey H10940
Chart 16701, 17th ed., July 25, 1998

Scale shown 1:50,000
Decem 29, 1999
Dangers to Navigation

*This graphic may not be up-to-date with all
Notice to Mariners information. Use only as
a guide in locating potential dangers described
elsewhere in this Notice to Mariners.
Do not paste onto NOAA charts.*

ADVANCE
INFORMATION



Date: 1/7/2000 12:57 PM
Sender: FOO Rainier
To: Chief Survey Technician Rainier; Lynn [NDS-NCG22] Preston; navinfonet@nima.mil;
Inm@cgalaska.uscg.mil; Dennis.Hill@noaa.gov
Priority: Normal
Subject: DTON Message RA-01-00

Author: FOO Rainier at Rainier
Date: 1/7/2000 12:57:43 PM
Priority: Normal
To: Chief Survey Technician Rainier
To: Lynn [NDS-NCG22] Preston at RDC
To: navinfonet@nima.mil at RDC
To: Inm@cgalaska.uscg.mil at RDC
To: Dennis.Hill@noaa.gov at RDC
Subject: DTON Message RA-01-00

It is requested that the following dangers to navigation be included in the Local Notice to Mariners. The NOAA Ship RAINIER positioned these features while conducting hydrographic survey H10940 in Prince William Sound, Alaska, in September through October 1999.

The following dangers to navigation affect charts 16700 (scale 1:200,000; 26th edition, 19-Sep-98) and 16701 (scale 1:81,436; 17th edition, 25-Jul-98).

The positions are on the NAD 83 datum and depths have been corrected to mean lower-low water (MLLW).

Feature: Shoal
Depth: 2.2 fathoms
Latitude: 60/11/55.440 N
Longitude: 147/31/36.443 W

Feature: Shoal
Depth: 4.2 fathoms
Latitude: 60/13/00.542 N
Longitude: 147/29/46.579 W

Feature: Shoal
Depth: 4.8 fathoms
Latitude: 60/12/26.136 N
Longitude: 147/30/57.537 W

Feature: Shoal
Depth: 5.7 fathoms
Latitude: 60/11/36.540 N
Longitude: 147/31/28.050 W

Feature: Shoal
Depth: 5.9 fathoms
Latitude: 60/12/37.665 N
Longitude: 147/30/37.114 W

Feature: Shoal
Depth: 8.7 fathoms
Latitude: 60/11/52.852 N
Longitude: 147/30/06.874 W

Feature: Shoal
Depth: 9.5 fathoms

ADVANCE
INFORMATION

Latitude: 60/12/57.783 N
Longitude: 147/29/28.886 W

Feature: Shoal
Depth: 9.7 fathoms
Latitude: 60/10/38.275 N
Longitude: 147/33/28.248 W

Feature: Shoal
Depth: 10.7 fathoms
Latitude: 60/11/53.724 N
Longitude: 147/32/38.679 W

This is advance information subject to office review. Questions concerning this letter should be directed to the Chief, Pacific Hydrographic Branch, (206) 526-6835. Refer to survey project OPR-P139-RA-99 and Danger to Navigation message RA-01-00. More information on current RAINIER survey projects may be obtained by e-mail; contact the Field Operations Officer at FOO.RAINIER@NOAA.GOV.

APPROVAL SHEET

for

⁴⁰
H-10948

Standard field surveying and processing procedures were followed in producing this examination in accordance with the Hydrographic Manual, Fourth Edition; the Hydrographic Survey Guidelines; and the Field Procedures Manual, as updated for 1998.

The digital data and supporting records have been reviewed by me, are considered complete and adequate for charting purposes, and are approved. All records are forwarded for final review and processing to N/CS34, Pacific Hydrographic Branch.

Approved and Forwarded,

Daniel R. Herlihy

Daniel R. Herlihy
Commander, NOAA
Commanding Officer
NOAA Ship RAINIER

Final tide zone node point locations for OPR-P139-RA-99,
Sheet H-10940.

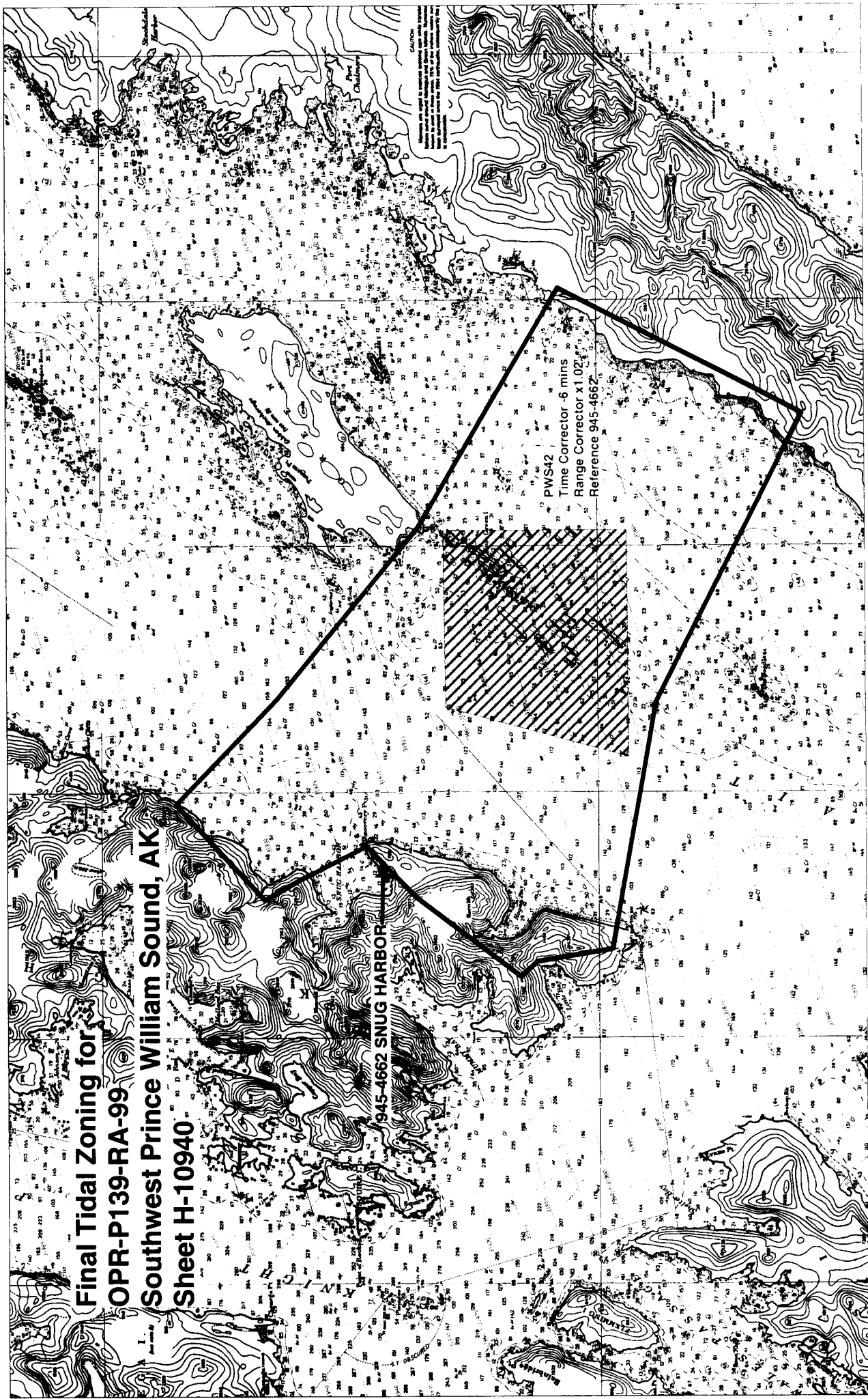
Format: Longitude in decimal degrees (negative value denotes
Longitude West),
Latitude in decimal degrees
Tide Station (in recommended order of use)
Average Time Correction (in minutes)
Range Correction

	Tide Station Order	AVG Time Correction	Range Correction
Zone PWS42			
-147.703642 60.244653	945-4662	-6	1.02
-147.738627 60.227865			
-147.792175 60.19276			
-147.781996 60.187238			
-147.773635 60.161998			
-147.606335 60.147238			
-147.411023 60.097978			
-147.325832 60.179367			
-147.487763 60.226861			
-147.604351 60.274729			
-147.674795 60.308452			
-147.740374 60.278784			
-147.726093 60.266771			
-147.703642 60.244653			

**Final Tidal Zoning for
OPR-P139-RA-99
Southwest Prince William Sound, AK
Sheet H-10940**

945-4662 SNUG HARBOR

PWS42
Time Corrector -6 mins
Range Corrector x1.02
Reference 945-4662





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

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE: May 15, 2000

HYDROGRAPHIC BRANCH: Pacific
HYDROGRAPHIC PROJECT: OPR-P139-RA-99
HYDROGRAPHIC SHEET: H-10940

LOCALITY: Vicinity of Little Green Island,
Southwest Prince William Sound, AK

TIME PERIOD: September 27 - October 20, 1999

TIDE STATION USED: 945-4662 Snug Harbor
Lat. 60° 14.4'N Lon. 147° 43.2'W

PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 3.218 meters

REMARKS: RECOMMENDED ZONING
Use zone(s) identified as: PWS42.

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.

Thomas V. Mero 5/16/00

CHIEF, REQUIREMENTS AND DEVELOPMENT DIVISION

GEOGRAPHIC NAMES

H-10940

Name on Survey	A PART NO. 16700, 16701 B ON PREVIOUS SURVEY C ON U.S. QUADRANGLE MAPS D FROM LOCAL INFORMATION E ON LOCAL MAPS F P.O. GUIDE OR MAP G RAND McNALLY ATLAS H U.S. LIGHT LIST K										
	ALASKA (title)	X		X							
LITTLE GREEN ISLAND	X		X								2
MONTAGUE STRAIT	X		X								3
PRINCE WILLIAM SOUND *	X		X								4
											5
											6
											7
											8
* Plots outside the survey limits.											9
											10
											11
											12
											13
											14
											15
											16
											17
											18
											19
											20
											21
											22
											23
											24
											25

Dennis J. Parshley
 MAY 18 2000

NOAA FORM 77-27(H) (9-83)		U.S. DEPARTMENT OF COMMERCE			REGISTRY NUMBER		
HYDROGRAPHIC SURVEY STATISTICS					H-10940		
RECORDS ACCOMPANYING SURVEY: To be completed when survey is processed							
RECORD DESCRIPTION			AMOUNT	RECORD DESCRIPTION		AMOUNT	
SMOOTH SHEET			1	SMOOTH OVERLAYS: POS., ARC, EXCESS		NA	
DESCRIPTIVE REPORT			1	FIELD SHEETS AND OTHER OVERLAYS		NA	
DESCRIP- TION	DEPTH/POS RECORDS	HORIZ. CONT. RECORDS	SONAR- GRAMS	PRINTOUTS	ABSTRACTS/ SOURCE DOCUMENTS		
ACCORDION FILES	1						
ENVELOPES							
VOLUMES							
CAHIERS							
BOXES							
SHORELINE DATA							
SHORELINE MAPS (List): T-12712							
PHOTOBATHYMETRIC MAPS (List): NA							
NOTES TO THE HYDROGRAPHER (List): NA							
SPECIAL REPORTS (List): NA							
NAUTICAL CHARTS (List): Chart 16701, 17th Edition, July 25, 1998							
OFFICE PROCESSING ACTIVITIES <i>The following statistics will be submitted with the cartographer's report on the survey</i>							
PROCESSING ACTIVITY				AMOUNTS			
				VERIFICATION	EVALUATION	TOTALS	
POSITIONS ON SHEET							
POSITIONS REVISED							
SOUNDINGS REVISED							
CONTROL STATIONS REVISED							
				TIME-HOURS			
				VERIFICATION	EVALUATION	TOTALS	
PRE-PROCESSING EXAMINATION							
VERIFICATION OF CONTROL							
VERIFICATION OF POSITIONS							
VERIFICATION OF SOUNDINGS							
VERIFICATION OF JUNCTIONS							
APPLICATION OF PHOTOBATHYMETRY							
SHORELINE APPLICATION VERIFICATION							
COMPILATION OF SMOOTH SHEET				184		184	
COMPARISON WITH PRIOR SURVEYS AND CHARTS							
EVALUATION OF SIDE SCAN SONAR RECORDS							
EVALUATION OF WIRE DRAGS AND SWEEPS							
EVALUATION REPORT					129.5	129.5	
GEOGRAPHIC NAMES							
OTHER Chart Compilation					95	95	
*USE OTHER SIDE OF FORM FOR REMARKS							
				TOTALS	184	224.5	408.5
Pre-processing Examination by R. Davies				Beginning Date 1/06/2000	Ending Date 3/03/2000		
Verification of Field Data by R. Davies, R. Mayor, E. Domingo, R. Shipley				Time (Hours) 184	Ending Date 3/18/2001		
Verification Check by B. Olmstead				Time (Hours) 50	Ending Date 7/29/2001		
Evaluation and Analysis by R. Shipley				Time (Hours) 224.5	Ending Date 5/11/2001		
Inspection by B. Olmstead				Time (Hours) 17	Ending Date 7/03/2001		

**EVALUATION REPORT
H-10940**

A. PROJECT

The hydrographer's report contains an adequate discussion of the project information.

B. AREA SURVEYED

The survey area is adequately described in the hydrographer's report.

The hydrographer has determined the inshore limits of safe navigation by defining Navigable Area Limit Line (NALL) throughout the survey area. Charted features and soundings inshore of this limit line have not been specifically addressed during survey operations and should be retained as charted.

A page-size plot of the charted area depicting the specific limit of supersession accompanies this report as Attachment 1.

The bottom consists mainly of mud. Depths range from the 0 to 108 fathoms.

C. SURVEY VESSELS

The hydrographer's report contains adequate information relating to survey vessels.

D. AUTOMATED DATA ACQUISITION AND PROCESSING

The acquisition and processing of data in the field has been discussed in the hydrographer's report, section D.

Office processing of survey data was conducted using the same Computer Aided Resource Information System (CARIS) and Hydrographic Processing System (HPS) used by the hydrographer. MicroStation 95 was used during office processing to compile the smooth sheet.

Processed digital data for this survey exists in the standard HPS format, a database format using the .dbf extension. In addition, the smooth sheet drawing is filed in the MicroStation format, i.e., dgn extension. Copies of these files have been forwarded to the Hydrographic Surveys Division and a backup copy retained at PHB. Database records forwarded are in the Internal Data Format (IDF) and are in compliance with specifications in existence at the time of survey processing.

The drawing files necessarily contain information that is not part of the HPS data set such as geographic name text, line-type data, and minor symbolization. In addition, those soundings deleted from the drawing for clarity purposes remain unrevised in the HPS digital files to preserve the integrity of the original hydrographic data set. Cartographic codes used to describe the digital data are those authorized by the Specifications and Deliverables, April 1999.

The data are plotted using a UTM, Zone 6 projection and are depicted on a single sheet.

E. SONAR EQUIPMENT

Side scan sonar was not used during survey operations.

F. SOUNDING EQUIPMENT

Sounding equipment has been adequately addressed in the hydrographer's report.

G. CORRECTIONS TO SOUNDINGS

Soundings and elevations below Mean High Water (MHW) have been reduced to Mean Lower Low Water (MLLW). The reducers include corrections for an actual tide, static draft, dynamic draft (settlement and squat), and sound velocity. Additional reducers for multibeam survey data include corrections for heave, pitch and roll. These reducers have been reviewed and are consistent with NOS specifications.

Predicted tides were used for reduction of soundings during field processing. During office processing, soundings and elevations were reduced to Mean Lower Low Water (MLLW) or Mean High Water (MHW) as appropriate with verified tide correctors obtained from the Center for Operational Oceanographic Products and Services (CO-OPS). The correctors are zoned direct from tide gage, Snug Harbor, Southwest Prince William Sound, Alaska, 945-4662.

H. CONTROL STATIONS

Section H of the hydrographer's report contains adequate discussion of horizontal control and hydrographic positioning.

The positions of horizontal control stations used during hydrographic operations are published values based on NAD83. The smooth sheet is annotated with an NAD27 adjustment tick based on values determined with the NGS program NADCON. Geographic positions based on NAD27 may be plotted on the smooth sheet utilizing the NAD83 projection by applying the following corrections:

Latitude: -2.226 seconds (-68.899 meters)
Longitude: 7.122 seconds (109.747 meters)

The prior survey work conducted in 1905 and 1933 is plotted on Valdez Datum. To convert to NAD 83 the user must apply +8.28 seconds to the latitude and -21.12 seconds to the longitude.

I. HYDROGRAPHIC POSITION CONTROL

Differential GPS (DGPS) was used to control this survey. A horizontal dilution of precision (HDOP) not to exceed 3.75 for 1:10,000 was computed for survey operations. Eleven positions exceed this limit and were rejected by the hydrographer.

The reference site confirmation test and daily DGPS performance checks were conducted in the field and found adequate. Additional information concerning calibrations and system checks can be found in the hydrographer's report and in the separates related to horizontal position control and corrections to position data.

J. SHORELINE

Shoreline map T-12712, scale 1:20,000 was compiled on NAD 27 and applies to this survey. Shoreline drawn on the smooth sheet in black originates from the above digital raster data as provided by the Remote Sensing Division, NGS. The shoreline data and the hydrographic data were merged during MicroStation processing.

The shoreline map and results of the fieldwork as portrayed on the smooth sheet should supersede charted shoreline. There were no revisions to the mean high water line delineated during survey operations.

K. CROSSLINES

Crosslines are adequately discussed in the hydrographer's report.

L. JUNCTIONS

Survey H-10940 junctions with the following surveys:

<u>Survey</u>	<u>Year</u>	<u>Scale</u>	<u>Area</u>
H-10925	1999	1:40,000	Northwest

H-10928 1999 1:10,000 North

The junctions with surveys H-10925 and H-10928 are complete. A "Joins" note has been added to the smooth sheet where applicable. A few soundings have been transferred from junction survey H-10928 within the common area to better delineate the bottom configuration.

M. COMPARISON WITH PRIOR SURVEYS

The present survey was compared to the following prior survey work.

<u>Survey</u>	<u>Year</u>	<u>Scale</u>	<u>Datum</u>
H-2741	1905	1:40,000	Valdez
H-5427	1933	1:20,000	Valdez
H-5431	1933	1:20,000	Valdez

Prior survey H-2741 was listed by the hydrographer for comparison but has been superseded within the common area of H-5431 and H-9513 and does not require further discussion.

The remaining prior surveys cover the entire area of the present survey and are the source data for depths, bottom characteristics, and associative information shown on Chart 16701. Digital copies of the above surveys were used to make the comparison. Registration and legibility was good.

Prior surveys H-5427 and H-5431 were conducted using older echo sounders and visual positioning techniques. Considering the data gathering techniques used in 1933, a comparison of depths generally reflects fair agreement. Present survey depths do however reveal a consistent shoaler bias of 1-3 fathoms with a few extreme differences exceeding 5-8 fathoms. These larger differences are located along the steeper slopes and reflect both a shoal and deep bias. The evaluator believes these discrepancies are the result of erroneous prior echo sounder recordings and or positional errors. In these cases, similar depths with the present survey can be found within 50-100 meters in generally a NE or SW direction. Comparison with the prior shoreline reveals good agreement. Aside from the effects of past earthquake activity, depth differences may well be attributed to improved positioning and sounding methods.

One islet and several kelp symbols were transferred in color to the present survey from the 1933 prior work. These items were not addressed during the present survey work.

<u>Survey</u>	<u>Year</u>	<u>Scale</u>	<u>Datum</u>
H-9512	1975	1:20,000	NAD 27
H-9513	1975	1:20,000	NAD27

These prior surveys were conducted using Raydist positioning and the Ross Fineline Fathometer. Although these prior surveys overlap the 1933 survey work, the more current survey data was not fully applied to the chart. It appears these prior surveys were incomplete and only used to update the chart with critical corrections. The present survey depths reflect a consistent shoal bias of 0.5 to 1 fathom with survey work conducted in 1975. Two soundings (33FM, 41FM) were transferred to the present survey in color from the prior work based on insufficient sounding coverage.

Additional information can be found in the hydrographers' report sections L and N.

In accordance with the Hydrographic Guideline No. 39, the effects of the 1964 Prince William Sound earthquake were considered in the comparison of this survey. Prince William Sound experienced a bottom uplift of 4-32 feet during the 1964 earthquake. However, due to the depths of water and the differences in data acquisition methods, no reasonable adjustment value for prior soundings could be determined.

With the transfer of the items mentioned above, survey H-10940 is adequate to supersede the prior surveys within the common area.

N. ITEM INVESTIGATIONS

There was one AWOIS item assigned to this survey. AWOIS 52495 was adequately addressed in Section M of the hydrographer's report and supplemented as follows; the charted sounding originates from H-9512 (1975) as a 2.9 fathom sounding on a rock resulting from a diver least depth using predicted tides. The evaluator recommends the prior depth be superseded by the present survey information based on 100% shallow water multibeam coverage and application of final approved tides.

O. COMPARISON WITH CHART

Survey H-10940 was compared with the following chart.

<u>Chart</u>	<u>Edition</u>	<u>Date</u>	<u>Scale</u>
16701	17th	July 25, 1998	1:81,436

a. Hydrography

Charted hydrography originates with the previously discussed prior surveys. The prior surveys have been adequately addressed in section M of the evaluation report, the hydrographer's report, section L and require no further discussion.

The application of this survey to charts of a scale less than 1:40,000 may require the generalization of features such as ledges, and reefs. The recommended charting disposition of specific ledges or reefs is their depiction as isolated rocks. The application of this survey to charts of a scale greater than 1:40,000 may be accomplished without generalization of features.

With the exception of those items mentioned in section M of this report, survey H-10940 is adequate to supersede charted hydrography within the common area.

b. Dangers To Navigation

Nine potential dangers to navigation were discovered during survey operations and reported to the USCG on January 3, 2000. No additional dangers to navigation were recommended during office processing.

P. ADEQUACY OF SURVEY

With the exception of the item mentioned below, hydrography contained on survey H-10940 is adequate to:

- Delineate the bottom configuration, determine least depths, and draw the required depth curves;
- Reveal there are no significant discrepancies or anomalies requiring further investigation; and
- Show the survey was properly controlled and soundings are correctly plotted.

The hydrographer did not address a few charted items originating from prior survey work. These items have been addressed in section M of this report and transferred to the smooth sheet.

The hydrographic records and reports received for processing are adequate and conform to the requirements of the Hydrographic Manual, 4th Edition, revised through Change No. 3, the Hydrographic Survey Guidelines, the Field Procedures Manual, April 1998 Edition and the NOS Hydrographic Surveys Specifications and Deliverables, dated April, 1999.

Q. AIDS TO NAVIGATION

There are no fixed or floating aids to navigation within the survey area.

There were no features of landmark value located within the area of this survey.

R. STATISTICS

Statistics are adequately itemized in the hydrographer's report.

S. MISCELLANEOUS

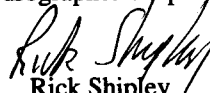
Miscellaneous information is discussed in the hydrographer's report. No additional miscellaneous items were noted during office processing.

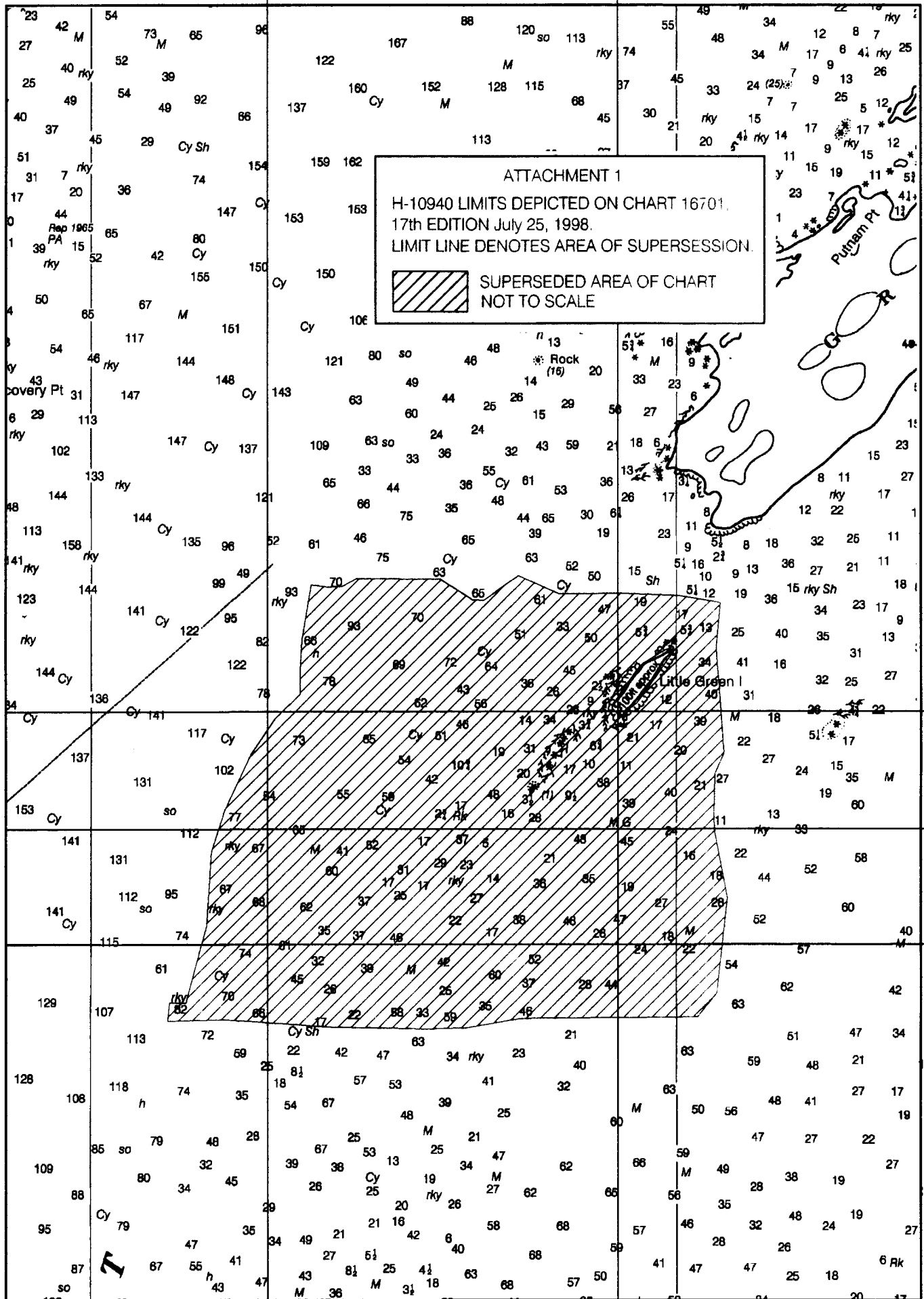
T. RECOMMENDATIONS

This is a good hydrographic survey. No additional work is recommended. Refer to the hydrograper's report for additional information.

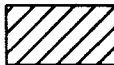
U. REFERRAL TO REPORTS

Referral to reports is adequately discussed in the hydrographer's report.


Rick Shipley
Cartographer



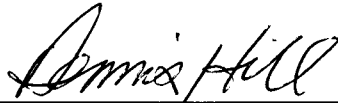
ATTACHMENT 1
 H-10940 LIMITS DEPICTED ON CHART 16701,
 17th EDITION July 25, 1998.
 LIMIT LINE DENOTES AREA OF SUPERSESION.

 SUPERSEDED AREA OF CHART
 NOT TO SCALE

APPROVAL SHEET
H-10940

Initial Approvals:

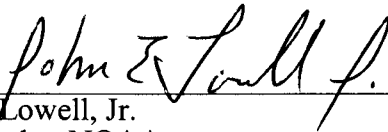
The completed survey has been inspected with regard to survey coverage, delineation of the depth curves, development of critical depths, cartographic symbolization, comparison with prior surveys and verification or disproval of charted data. The survey records and digital data comply with NOS requirements except where noted in the Evaluation Report.



Date: 9-24-01

Dennis Hill,
Chief, Cartographic Team
Pacific Hydrographic Branch

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.



Date: Nov 21 2001

John E. Lowell, Jr.
Commander, NOAA
Chief, Pacific Hydrographic Branch

Final Approval

Approved:



, LCDR, NOAA

Date: 6 Dec 2001

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

MARINE CHART BRANCH
RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H-10940

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
16701	4/3/01	<i>L. K. [Signature]</i>	Full Part Before After Marine Center Approval Signed Via Drawing No. <i>FULL APPLICATION OF SOUNDINGS AND FEATURES FROM SMOOTH SHEET</i>
16701	12/18/01	<i>J. Shery</i>	Full Part Before After Marine Center Approval Signed Via Drawing No. <i>full application of soundings, curves, and features through BP-176169</i>
16700	12/18/01	<i>J. Shery</i>	Full Part Before After Marine Center Approval Signed Via Drawing No. <i>full application of soundings, curves and features through 16701 Ref: BP 176169</i>
			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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