H10853

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-10-11-98

Registry No. H-10853

LOCALITY

State Alaska

General Locality Southwest Prince William Sound

Sublocality Herring Bay

1998

CHIEF OF PARTY
CAPT A.D. Anderson

NOAA FORM 77-28 (11-72)	U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION	REGISTER NO.
	HYDROGRAPHIC TITLE SHEET	**H-10853**
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-10-11-98**

State **Alaska**

General Locality **Southwest Prince William Sound**

Sublocality **Herring Bay**

Scale **1:10,000** Date of Survey **July 21 - October 9, 1998**

Instructions Date **7/10/1998 *** Project No. **OPR-P139-RA**

Vessel **NOAA Ship Rainier (2120), RA-1 (2121), RA-2 (2122), RA-3 (2123), RA-4 (2124), RA-5 (2125), RA-6 (2126)**

Chief of Party **CAPT A.D. Anderson, NOAA**

Surveyed by **Rainier Personnel**

Soundings taken by echo sounder **Single Beam: DSF-6000N, Knudsen 320M; SWMB: Reson 8101; Intermediate Depth MB: IDSSS**

Graphic record scaled by **Rainier Personnel**

Graphic record checked by **Rainier Personnel**

Evaluation by **CJ Barry** Automated plot by **HP Design Jet 650C**

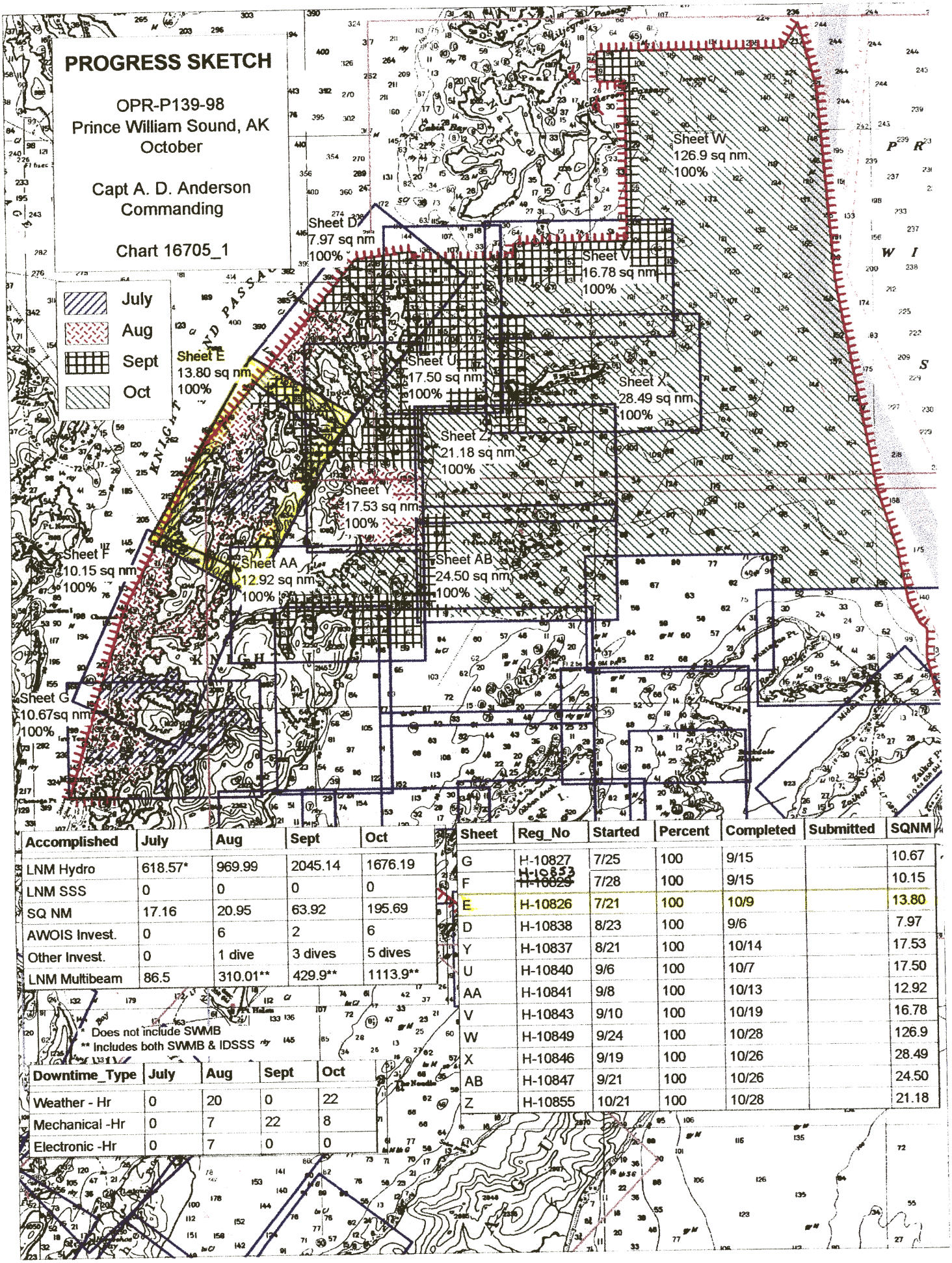
Verification by **J Ferguson, G Nelson, M Bigelow, R Mayor, E Domingo, CJ Barry**

Soundings in **Fathoms and tenths at MLLW** **Data Collected in Meters**

REMARKS: **Time in UTC. Revisions and marginal notes in black were generated during office processing. All separates are filed with the hydrographic data. As a result page numbering may be interrupted or non-sequential.**

All depths listed in this report are referenced to mean lower low water unless otherwise noted. SURF/AWOIS 4/3/00 mcr

*** Change No. 1 dated 9/8/98**

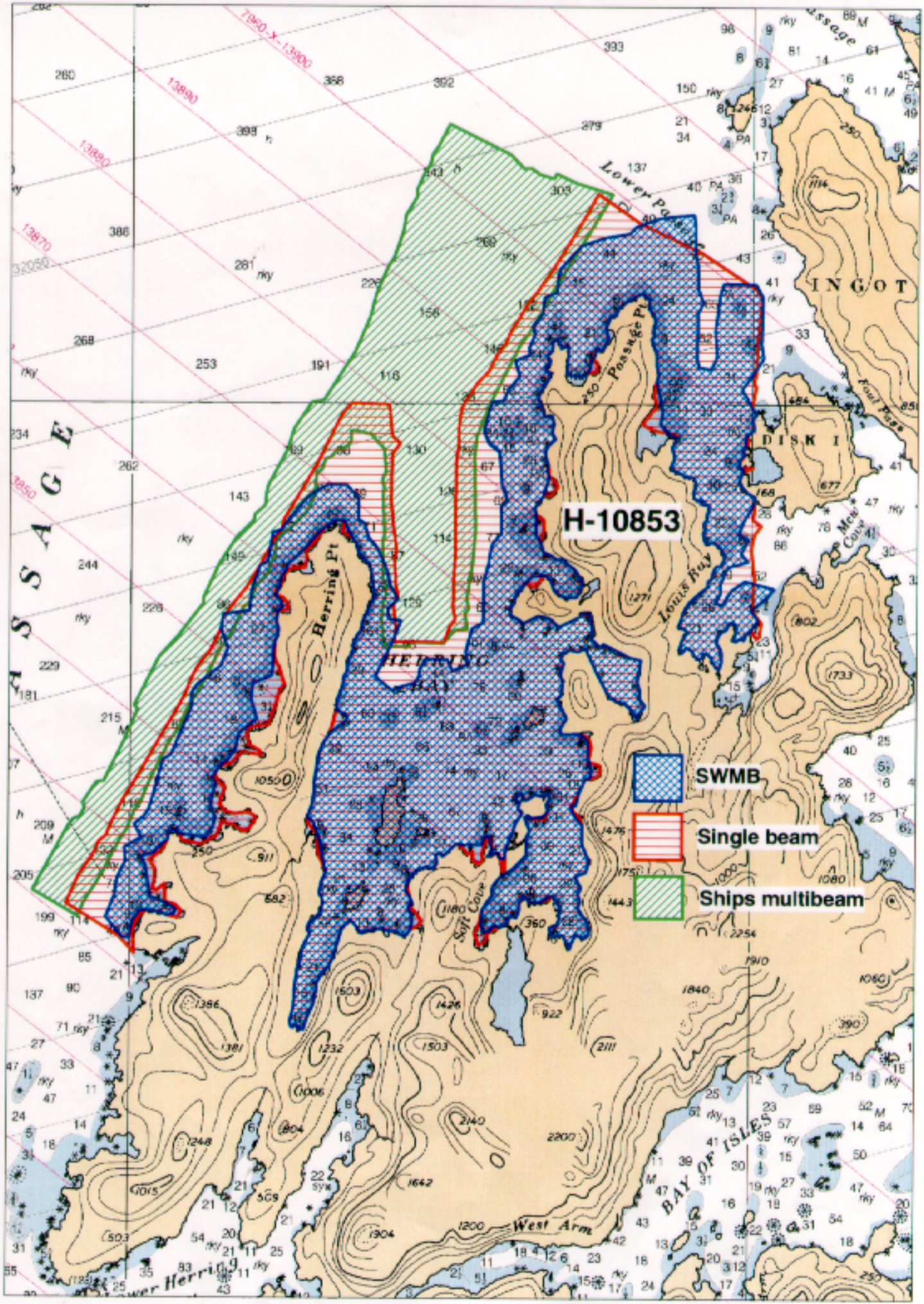


Accomplished	July	Aug	Sept	Oct
LNM Hydro	618.57*	969.99	2045.14	1676.19
LNM SSS	0	0	0	0
SQ NM	17.16	20.95	63.92	195.69
AWOIS Invest.	0	6	2	6
Other Invest.	0	1 dive	3 dives	5 dives
LNM Multibeam	86.5	310.01**	429.9**	1113.9**

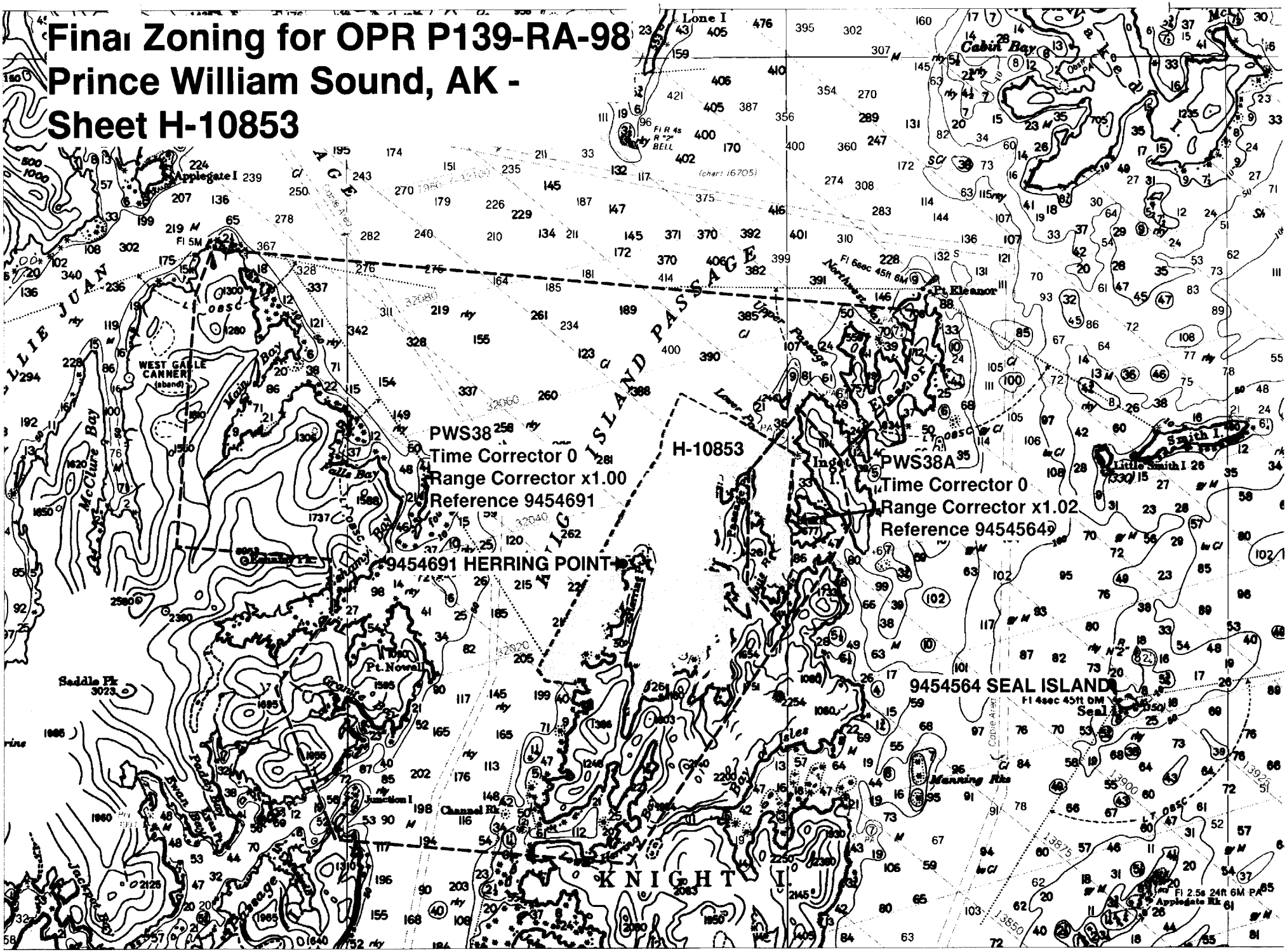
* Does not include SWMB
** Includes both SWMB & IDSSS

Downtime_Type	July	Aug	Sept	Oct
Weather - Hr	0	20	0	22
Mechanical -Hr	0	7	22	8
Electronic -Hr	0	7	0	0

Sheet	Reg_No	Started	Percent	Completed	Submitted	SQNM
G	H-10827	7/25	100	9/15		10.67
F	~~H-10853~~ ~~H-10829~~	7/28	100	9/15		10.15
E	H-10826	7/21	100	10/9		13.80
D	H-10838	8/23	100	9/6		7.97
Y	H-10837	8/21	100	10/14		17.53
U	H-10840	9/6	100	10/7		17.50
AA	H-10841	9/8	100	10/13		12.92
V	H-10843	9/10	100	10/19		16.78
W	H-10849	9/24	100	10/28		126.9
X	H-10846	9/19	100	10/26		28.49
AB	H-10847	9/21	100	10/26		24.50
Z	H-10855	10/21	100	10/28		21.18


H-10853
SWMB
Single beam
Ships multibeam
INGOT
DISKI
Herring Pt
HERRING BAY
Louis Bay
Soft Cove
West Arm
BAY OF ISLES
Lower Herring

Final Zoning for OPR P139-RA-98 Prince William Sound, AK - Sheet H-10853



Descriptive Report to Accompany Hydrographic Survey H-10853

Field Number RA-10-11-98
Scale 1:10,000
September 1998
NOAA Ship RAINIER
Chief of Party: Captain Alan D. Anderson, NOAA

A. PROJECT

This basic hydrographic survey was completed in the southwest portion of Prince William Sound, Alaska as specified by Project Instructions OPR-P139-RA dated July 10, 1998 and change #1 dated September 8, 1998. Survey H-10853 corresponds to sheet E as defined in the sheet layout. This survey will provide data to supersede prior surveys performed from 1907 through 1910 and will affect Charts 16701, 16705 and 16700. 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.

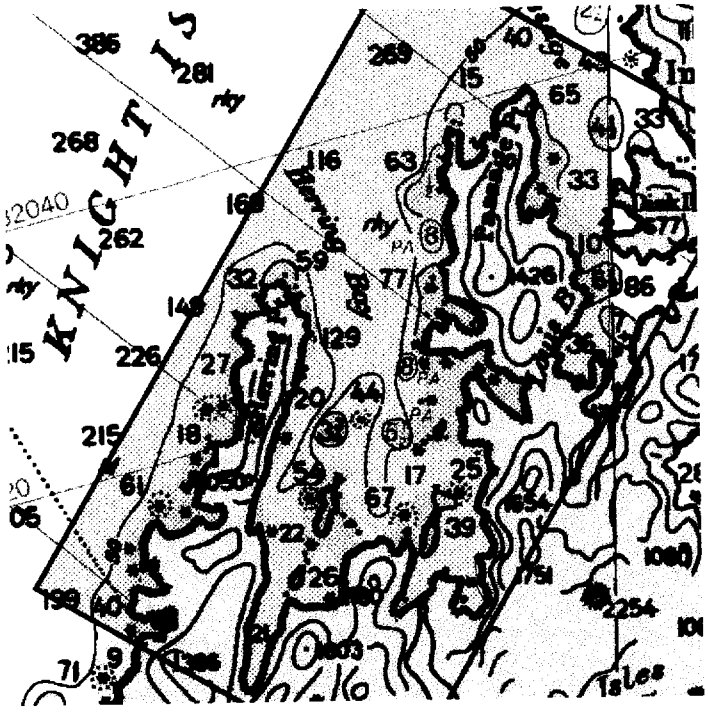
Within the 1998 project area is the western side of Knight Island, which is transited by 850-foot cruise line vessels drawing 30 feet of water, and carrying more than 2000 tourists. The Seventeenth U.S. Coast Guard District reported that large cruise ships presently sail through Knight Island Passage an average of three times a week from May to September. Cruise ship traffic is projected to increase 34-percent in the next five years. Due to this type of traffic, the Southwest Alaska Pilots Association has expressed concern over the age and lack of charted soundings in Knight Island Passage.

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

B. AREA SURVEYED

SEE EVAL. REPT., SECTION B

The survey area is Herring Bay. The survey's northern limit is latitude 60-32-12.63 N. The survey's southern limit is 60-25-03.65 N, with the survey being at a northeast/southwest 60 degree angle. The western limit is 147-51-35.29 W and the eastern limit is 147-39-48.51 W. Survey limits are shown below on a detail of Chart 16705.



Occasional commercial and recreational marine traffic was observed in Louis Bay and South Herring Bay and transiting Lower Passage and west side of Herring Point. Data acquisition was conducted from July 21 to ~~September 16, 1998~~ (DN 202 to 282).
OCTOBER 9, 1998

C. SURVEY VESSELS

Data were acquired by RAINIER and The Rainier survey launches (vessel numbers 2121, 2122, 2123, 2124, 2125 and 2126) as noted in the Survey Information Summary print out appended to this report.

This project included the use of a new vessel configuration. Launches 2121, 2123, and 2126 were recently configured with a Reson SeaBat 8101 Shallow Water Multibeam (SWMB) system. (See Section F., Sounding Equipment, for details.) The center of the launch keels were cut and modified to house the transducers. The originally installed DSF-6000N single beam transducers remained installed as before.

D. AUTOMATED DATA ACQUISITION AND PROCESSING

Single beam echosounder data were acquired using HYPACK version 7.1a from Coastal Oceanographics and processed using Hydrographic Processing System (HPS). Swath data collected by the RAINIER were acquired and processed using Intermediate Depth Swath Survey System (IDSSS) and Hydrochart II (Seabeam Inc.) programs. Shallow water multibeam (SWMB) echosounder data were acquired using the Reson SeaBat 8101 with ISIS version 3.24 and processed using CARIS software. Raster image and shoreline data in MapInfo facilitated charted and prior survey comparisons. Final Detached Positions and soundings based on predicted tides were saved in MapInfo 4.5 format. A complete listing of software for HYPACK and HPS is included in Appendix VI.

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 to aid in final processing of the SWMB depth data but can also be used to provide imagery of features such as wrecks, rocks, and obstructions. CONCUR

F. SOUNDING EQUIPMENT

Three different categories of echosounder 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, the bottom topography, the water-depth, and the ability of the platform vessel to safely navigate the area.

1. Launch Singlebeam (VN 2122, 2124, 2125):

The singlebeam sounding instruments for this survey were the Raytheon DSF-6000N and Knudsen 320M, which are dual frequency (100 kHz, 24 kHz), digital recording singlebeam fathometers with analog paper traces. Soundings were acquired in meters using the High + Low, high frequency digitized setting, but in depths over 300 meters, low frequency was scanned in place of the high when the fathometer lost its high frequency trace. Serial numbers are included in the Separates.* Singlebeam launches were used to collect mainscheme hydrography in areas that were considered too hazardous or too shallow for shipboard IDSSS coverage, generally areas less than 150 meters of depth. In addition, singlebeam launches were used to perform all shoreline verification.

* FILED WITH THE HYDROGRAPHIC DATA

2. Launch Shallow Water Multibeam (SWMB) (VN 2121, 2123, 2126): ✓

The Reson SeaBat 8101 is a multibeam echosounder system that measures relative water depths across a wide swath perpendicular to the vessel's path. The Reson SeaBat 8101 ensonifies the seafloor with a 150° swath consisting of 101 individual 1.5° x 1.5° beams. The system was designed to meet International Hydrographic Organization standards to measure the seafloor at a maximum range of 320 meters. The system's maximum depth range under actual field conditions has proven to be much less. RAINIER has discovered that maximum attainable depths are approximately 80-150 meters, depending on sea conditions and bottom topography. Serial numbers are included in the Separates. SWMB launches were used to collect full-bottom coverage of select areas identified during singlebeam hydrography, generally all areas determined to be less than 60 meters deep that could safely be investigated without the risk of damaging the SWMB transducer. SWMB launches were not use for shoreline verification due to the extremely high risk of damaging the SWMB transducers on submerged rocks.

3. Shipboard Intermediate Depth Multibeam (IDSSS) (VN 2120): ✓

The IDSSS data acquisition system (DAS) consists of a Digital Equipment Corporation's (DEC) VAX Station 4000-90 computer system interfaced with a Seabeam Instruments Inc, for use in acquiring full-bottom coverage in navigable areas deeper than 150 meters. Hydrochart II sonar system, Datawell heave-roll-pitch sensor (HIPPY) is a multibeam sonar system that uses two transducer arrays (at 36 kHz) to produce an athwartship swath of bathymetric data approximately 2.5 times the water depth. The DEC VAX Station 4000-90 computer collected input from the Hydrochart II, HIPPY, gyrocompass, and the navigation system. It also provided guidance to the helmsman and plotted a near real time contour map. The DAS consisted of the following equipment:

DAS EQUIPMENT

Hydrochart II Sonar System
DEC VAX Station 4000-90 (DAS)
Sperry MK 227 Gyrocompass
ZETA 24" Plotter
DEC Server DSRVW-7C
TTi 8212 Tape Drive
DATAWELL Hippy
DEC monitor

The ship speed was reduced to provide full ensonification of the sea floor and provide a minimum of 4 pings per plotable unit area (PUA). A PUA of 50 meters was used during processing of the Hydrochart II data. The DEC VAX Station 4000-90 computer was used to process the data and create corrected merge files and selected sounding files which were exported and combined with single-beam data in HPS and in MapInfo.

G. CORRECTIONS TO ECHO SOUNDINGS ✓

Sound Velocity Correctors: ✓

Sound velocity casts were acquired with SBE SEACAT Profiler (S/N 219), calibrated January 27, 1998, and (S/N 2543), calibrated January 10, 1998 and (S/N 2477), calibrated February 6, 1998. Velocity correctors were computed using the PC programs SEACAT and VELOCITY, version 3.1 (1997), in accordance with Field Procedures Manual (FPM) section 2.1.2 and Hydrographic Survey Guideline (HSG) No. 69. For singlebeam launches, sound velocity correctors were applied to the raw sounding data in HPS during post-acquisition processing. For SWMB launches, sound velocity correctors were applied in Caris during post-acquisition processing. For RAINIER IDSSS data, sound velocity correctors were applied on line during acquisition.

Vessel Offset Correctors ✓

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

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
2120	April, 1998 (ship dry-dock)	Rod leveling	September 21, 1997	Kings Bay, AK.
2121	March 26, 1998	OTF	July, 1998	Shilshole, WA
2122	March 26, 1998	Rod leveling	June 11, 1998	Shakan Strait, AK
2123	March 26, 1998	OTF	July, 1998	Shilshole, WA
2124	March 26, 1998	Rod leveling	June 11, 1998	Shakan Strait, AK
2125	March 26, 1998	Rod leveling	June 21, 1998	Chilkat Inlet, AK
2126	March 26, 1998	OTF	July, 1998	Shilshole, WA

Settlement and squat correctors were computed in accordance with Hydrographic Manual Section 4.9.4.2, using FPM Fig. 2.4, and are included with project data for OPR-P139-RA-98. All offset tables* contain offsets for the GPS antenna, as well as static draft measurements, and settlement and squat data. Offset tables # 1-6 correspond to the last digit of the vessel number. Offset table #7 was used for the RAINIER (VN 2120). For singlebeam launches, offset tables were applied to the raw sounding data in HPS during post-acquisition processing. For SWMB launches, offsets were applied in Caris during post-acquisition processing. For RAINIER IDSSS data, offsets were applied on-line during data collection.

The offset tables are included with project data for OPR-P139-RA-98.*

Predicted Tidal Correctors: ✓

The Oceanographic Products and Services Division, User Services Branch (N/CS41), through N/CS31, provided predicted tides for the project on diskette for the Cordova reference station (945-4050). The predicted tides at Cordova were entered into HPS and applied to the soundings without adjusting for zoning.

For Launch Singlebeam soundings, HPS tide tables were applied to raw sounding data during shipboard processing in HPS.

For Launch SWMB soundings, six-minute interval predicted tide data from the Cordova reference station (945-4050) were imported directly into CARIS (without adjusting for zoning) from commercial Tides and Currents software and applied to raw sounding data during shipboard processing in CARIS.

For RAINIER IDSSS soundings, predicted tides from the Cordova reference station (945-4050) were imported from commercial Tides and Currents software into the DAS VAX computer (without adjusting for zoning) and applied during processing.

Real Tidal Correctors: ✓

The operating tide stations at Cordova (945-4050) and Valdez (945-4240) served as control for datum determination. A Next Generation Water Level Measurement System (NGWLMS) Aquatrak is the only sensor at these stations. Consequently, RAINIER was not required to inspect or perform leveling of these stations.

The following Sutron 8200 Bubbler tide stations were established for this survey in order to provide information on zoning, tidal datums (reducers), and harmonic constants for predictions:

Station name	**Station Number**	**GOES XMTR**	**Type of gauge**	**Date Established**	**Date Removed**
Herring Point	945-4691	Yes	30-day	7-20-98	10-16-98
Louis Bay	945-4642	Yes	3-day	7-26-98	10-15-98

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Refer to the Field Tide Notes and supporting data in Appendix V* for individual gauge performance and level closure information. Raw waterlevel data from these gauges has been forwarded to N/CS41 in accordance with HSG 50 and FPM 4.7 where it will be processed into final approved (smooth) tides. 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 has been forwarded to N/OES23 in accordance with FPM 4.8. APPROVED TIDE NOTE DATED MARCH 26, 1999 IS ATTACHED

H. HYDROGRAPHIC POSITION CONTROL ✓ SEE EVAL. REPT., SECTION H

The horizontal datum for this project is NAD 83. Station ROCK was used to verify and establish local geodetic control for this survey. See the OPR-P139-RA-98 Horizontal Control Report for more information.

All soundings were positioned using differential GPS (DGPS). The VHF differential reference stations at ROCK, MATE, QUACK and TUFT were the primary sources for differential correctors for this survey. The USCG beacons located at Cape Hinchinbrook, AK, Kenai, AK and Potato Point, AK were used when the VHF reference station was unavailable.

Launch-to-launch DGPS performance checks were performed in accordance with Section 3.4.4 of the FPM. Two observations of position were made from two different DGPS base stations while the launches were rafted together with their GPS antennae within 2-3 meters of each other. RAINIER also used SHIPDIM, version 2.2R (April 1996) with a Trimble Centurion P-code receiver and an Ashtech sensor (both differentially-corrected) to monitor the performance of the USCG Beacon. Periodic comparisons and occasional performance checks were logged with the SHIPDIM system. Some outliers were noted, but none indicated systematic or continuous errors in the beacons. The SHIPDIM OUTLIER.SUM results are included in the project data for OPR-P139-RA-98.

I. SHORELINE ✓ SEE EVAL. REPT., SECTION J

N/NGS3 supplied photogrammetric shoreline in MapInfo format for DM-10294 ✓ and DM-10297 ✓ for use as source shoreline. The DM shoreline was imported into Hypack for field verification. In addition, features shown on the current editions of Charts 16701, 16704, and 16705 that are not depicted on the provided DM shoreline were traced in MapInfo by RAINIER personnel and were also imported into Hypack for field verification.

Limited shoreline verification was conducted in accordance with the Project Instructions and FPM 6.2. For this survey, the NALL (Navigable Area Limit Line) was defined by the limit of safe navigation of a survey launch during a period of extreme low (negative) tide. The NALL runs at a distance of 5-50 meters offshore of the apparent low water line. Depths along the NALL are generally 2-15 m MLLW. Features seen off-shore of the NALL were positioned with the launch's DGPS by taking Detached Positions. Features seen inshore of the NALL were not positioned.

Shoreline manuscript and field features were compared to an enlargement of charts 16700 24th ed., 16701 16th ed. and 16705 17th ed. There was general agreement between the charted and manuscript shoreline and what the hydrographer found on this survey. There are, however, numerous differences (approximately 101) when analyzing the present features such as rocks, islets, ledges, and reefs. The differences fall into three categories: mis-charted rocks, uncharted features, and mis-named digital manuscript features. The launches disproved mis-charted rocks by taking fixes at the charted locations at negative tide levels and observing the surrounding water for indications of rocks near the surface. It is likely that these rocks were either mis-positioned initially or moved by the cartographer for representation purposes. The reason for the discovery of numerous uncharted features is uncertain. It is possible that portions of the initial survey were performed during positive tides when the rocks were submerged; the digital shoreline photography was flown at positive tides when the rocks were submerged; or this area has risen since the initial survey, due to the effects of the 1964 earthquake, exposing new rocks. The mis-named digital manuscript features were likely the result of

*FILED WITH THE HYDROGRAPHIC DATA

the different perspectives of the hydrographer and the digitizer. Discrepancies between charted and field shoreline should thus be resolved in favor of the manuscript shoreline and field work as shown on the final field Detached Position and Bottom Sample plot provided to PHB. Handwritten notes and features shown on the accompanying SHORELINE NOTES plot are the hydrographer's representation of the features seen inshore of the NALL while slowly transiting along the shore, and are intended to aid chart compilation.

The following is a list of all Detached Positions taken on new features. It is recommended that they be added to the chart:

Fix #	Remark (raw depth in meters)	Latitude North	Longitude East	Depth (m) corrected *	Notes
21263	Rock, new rng 3m brg 030M (.3)m 21263	60:29:44.200	147:43:47.667	0.3	Danger to Navigation
21295	Rock, new rng 5m brg 080M (1)m 21295	60:30:23.511	147:43:23.453	-0.3	
21296	Rock, new rng 3m brg 105m (1.5)m 21296	60:30:24.676	147:43:22.491	-0.8	
21297	Rock, new rng 3m bg 090M (1.5)m 21297	60:30:24.053	147:43:20.364	-0.8	
21322	Rock, new rng 4m brg 075M (.5)m 21322	60:29:43.119	147:43:17.844	0.1	Chd rk is ~40m SW
21323	Rock, new rng 7m brg 350M (2.5)m 21323	60:29:48.862	147:43:15.165	-1.9	Islet is ~30m N.
21902	Rock, new rng 3m brg 060M .5m 21902	60:29:08.754	147:43:32.709	0.9	
21976	Rock, new rng 3m brg 120 1m 21976	60:28:41.839	147:43:27.449	1.5	
22029	Rock, new rng 3m brg 330M AWASH 22029	60:28:14.547	147:42:57.474	0.5	
22909	Rock, new rng 3m brg 160M 0.5m 22909	60:29:07.606	147:46:35.343	0.3	Same rk as 51911
22910	Rock, new rng 2.5m brg 135M 0.5m 22910	60:29:07.612	147:46:35.762	0.3	Same rk as 51911
22911	Rock, new rng 4m brg 175M (.25)m 22911	60:29:05.846	147:46:36.559	-0.3	
22912	Rock, new rng 5.5m brg 135M (1)m 22912	60:29:05.954	147:46:38.956	1	Same rk as 51913
22913	Rock, new rng 5.5m brg 130M (.25)m 22913	60:29:06.651	147:46:43.867	-0.3	Same rk as 51912
22914	Reef, new rng 5.0m brg 110M (.25)m 22914	60:29:05.473	147:46:49.691	-0.1	
22915	Reef, new rng 5.5m brg 150M (.25)m 22915	60:29:05.797	147:46:47.788	-0.2	
22940	Rock, new rng 4.5m brg 090M AWASH 22940	60:28:52.757	147:47:13.386	-0.1	
22941	Rock, new rng 5.0m brg 190M 4.5m 22941	60:28:53.210	147:47:11.328	4.4	
22942	Rock, new rng 5.0m brg 210M (1.5)m 22942	60:28:52.616	147:47:11.100	-1.6	
22943	Rock, new rng 4.5m brg 110M (1.5)m 22943	60:28:43.634	147:47:34.942	-1.6	Chd rk ~40m SE, Same rk as 41361
** 23009	Rock, new rng 5.0m brg 110M (1)m 23009	60:27:13.286	147:48:31.910	-1.1	Chd rk is ~30m S
23010	Rock, new rng 3.5m brg 090M AWASH 23010	60:27:48.089	147:47:56.088	-0.1	
23278	Rock, new rng 3.5m brg 250M 1m 23278	60:28:33.472	147:46:07.396	-1.6	
23450	Rock, new rng 4.5m brg 350M 5.4m 23450	60:25:48.959	147:43:11.628	6.2	
23451	Ledge, new rng 3m brg 310M (1.2)m 23451	60:25:50.753	147:43:09.777	-0.8	Islet is chd in ledge position
23485	Rock, new rng 3m brg 110M 1.1m 23485	60:25:57.300	147:43:47.666	1.6	
23488	Rock, new rng 3.0m brg 025M 1.5m 23488	60:25:59.736	147:43:43.937	2	
23567	Rock, new rng 4.5m brg 120M 0.2m 23567	60:27:02.860	147:45:34.544	0.1	
23583	Ledge, new rng 5m brg 210M (1)m 23583	60:26:46.564	147:45:31.556	-0.9	
23584	Rock, new rng 4.5m brg 330M (0.2)m 23584	60:26:51.515	147:45:36.272	0	
23585	Rock, new rng 4.5m brg 280M 0.2m 23585	60:26:51.567	147:45:34.689	0.4	
23605	Rock, new rng 4.5m brg 260M (0.4)m 23605	60:26:34.175	147:45:37.474	0	
23606	Rock, new rng 4.5m brg 280M AWASH 23606	60:26:39.373	147:45:29.563	0.4	
23607	Rock, new rng 0m brg 160M (0.2)m 23607	60:26:38.124	147:45:31.973	0.2	
23673	Rock, new rng 0m brg 0M 1.3m 23673	60:26:30.284	147:45:22.671	2.5	
23704	Rock, new rng 1.0m brg 140M (1.0)m 23704	60:26:10.995	147:46:22.322	-0.3	
23715	Ledge, new rng 4.5m brg 240M (2.5)m 23715	60:25:07.878	147:47:19.605	-1.9	
23740	Ledge, new rng 1.0m brg 030M AWASH 23740	60:25:53.739	147:46:24.799	0.6	

* DEPTH PRIOR TO APPLICATION OF APPROVED TIDES

** SAME ROCK AS FIX 43319 (NOT LISTED IN THIS REPORT)

				*	
23745	Rock, new rng 4.5m brg 170M 0.5m 23745	60:25:50.027	147:46:16.754	1	
23762	Rock, new rng 3.0m brg 065M 1.5m 23762	60:25:52.403	147:45:44.160	2	
23764	Ledge, new rng 4.5m brg165M (0.3)m 23764	60:25:50.167	147:45:52.287	0.1	
24622	Rock, new rng 6m brg 190M (.7)m 24622	60:25:51.234	147:45:37.039	-0.8	
24624	Ledge, new rng 5m brg 150M .5m 24624	60:25:51.484	147:45:24.607	0.6	
24708	Rock, new rng 5m brg 130M (1)m 24708	60:26:20.035	147:43:58.301	-0.4	SAME ROCK AS 23537 (?)
24709	Rock, new rng 3.5m brg 150M 0.5m 24709	60:26:29.723	147:44:04.504	1.1	
24711	Rock, new rng 4.5m brg 170M (0.5)m 24711	60:26:37.335	147:44:08.417	0.1	
24712	~~Islet~~, new rng 4.5m brg 180M (4)m 24712 ROCK * (12)	60:26:37.824	147:44:11.926	-3.3	New position and size
24713	Rock, new rng 4m brg 070M (0.1)m 24713	60:26:40.634	147:44:13.954	0.6	
24715	~~Islet~~, new rng 4.5m brg 070M (4)m 24715 ROCK * (12)	60:26:38.237	147:44:15.892	-3.3	New position and size
24718	Rock, new rng 6.5m brg 180M (0.7)m 24718	60:26:29.434	147:44:27.082	0	DM/chd rk ~50m away
24743	Rock, new rng 3m brg 180M 1.0m 24743	60:27:50.690	147:43:37.160	1.7	
24744	Rock, new rng 2.5m brg 200M 1.0m 24744	60:27:52.160	147:43:37.255	1.7	
24745	Rock, new rng 2.5m brg 180M 1.0m 24745	60:27:52.429	147:43:37.067	1.7	DANGER TO NAV
25570	Rock, new rng 3.5m brg 035M 0.5m 25570	60:26:09.592	147:49:42.027	-0.7	Chd rk ~70m SE
25572	Ledge, new rng 7m brg 070M 1.0m 25572	60:25:57.659	147:49:14.045	0.5	
25573	Rock, new rng 4.5m brg 100M (0.8)m 25573	60:25:55.821	147:49:16.870	-1.2	
25574	Rock, new rng 6m brg 065M (3.0)m 25574	60:25:46.320	147:50:00.769	-3.4	
25575	Rock, new rng 4.5m brg 330M 0.5m 25575	60:25:46.881	147:50:01.127	0.1	
25576	Rock, new rng 5.5m brg 115M (0.3)m 25576	60:25:42.963	147:49:59.427	-0.7	
27076	Rock, new rng 0m brg n/a 1.0m 27076	60:29:56.537	147:41:11.488	-1.7	Same rk as 53903
27077	Rock, new rng 0m brg n/a 1.0m 27077	60:29:56.977	147:41:11.602	-1.7	Same rk as 53903
40445	Rock, new rng 3.5m brg 025M (.2)m 40445	60:26:55.658	147:48:34.476	-0.2	Same rk as 43342
41361	Rock, new rng 0m brg 0M 1.2m 41361	60:28:43.735	147:47:34.511	-1.7	Chd rk ~40m SE, same rk as 22943
42455	Rock, new rng 4.5m brg 080M .5m 42455	60:26:59.274	147:42:43.965	0.7	
42470	Rock, new rng 3.5m brg 000M 1.2m 42470	60:26:43.016	147:42:49.908	1.5	DM rk ~20m inshore
42471	Ledge, new rng 4.5m brg 070M .5m 42471	60:26:42.086	147:42:47.509	0.9	
42472	Rock, new rng 2.5m brg 010M 2m 42472	60:26:41.300	147:42:46.091	2.4	
42490	Ledge, new rng 4.5m brg 105M (2)m 42490	60:26:18.990	147:42:41.414	-1.5	
42491	Rock, new rng 4.5m brg 070M (.5)m 42491	60:26:17.817	147:42:41.138	0	
42514	Ledge, new rng 5.5 brg 290M 1m 42514	60:25:53.384	147:42:39.182	1.6	
42520	Rock, new rng 4.5m brg 080M .5m 42520	60:25:48.753	147:42:39.322	1.1	
42545	Ledge, new rng 4.5 brg 270M 1m 42545	60:26:44.945	147:43:13.452	1.7	New ledge extends from DM/chd ledge
42547	Ledge, new rng 6.5m brg 225M (3)m 42547	60:26:42.836	147:43:14.844	-2.4	
42546	Reef, new rng 0 brg 180M 1.88m 42546	60:26:46.429	147:43:08.838	2.6	
42589	Ledge, new rng 6.5m brg 200M 1m 42589	60:26:56.304	147:43:39.233	1.5	
43342	Rock, new rng 3.5m brg 55M (1.5)m 43342	60:26:55.704	147:48:34.255	-1.2	Same rk as 40445
43395	Rock, new rng 3.5m brg 095M (.3)m 43395	60:26:39.234	147:48:40.206	0.3	
43397	Rock, new rng 4m brg 120M AWASH 43397	60:26:38.723	147:48:35.990	0.7	
43439	Ledge, new rng 4m brg 150M (2)m 43439	60:26:23.468	147:49:39.879	-1.3	
43440	Ledge, new rng 4m brg 120M (1.5)m 43440	60:26:20.801	147:49:41.702	-0.8	
51911	Rock, new rng 3m brg 060M 1m 51911	60:29:07.253	147:46:36.008	1.5	Same rk as 22909 & 22910
51912	Rock, new rng 3m brg 150M AWASH 51912	60:29:06.552	147:46:43.407	0.5	Same rk as 22913
51913	Rock, new rng 3m brg 150M (1)m 51913	60:29:05.954	147:46:38.963	-0.5	Same rk as 22912
51932	Rock, new rng 3m brg 240M (.5)m 51932	60:28:50.217	147:46:17.976	0.1	
51942	Rock, new rng 3m brg 240M (3)m 51942	60:28:38.036	147:46:06.589	-2.3	
51943	Rock, new rng 3m brg 210M (1)m 51943	60:28:43.586	147:46:08.795	-0.3	

* DEPTH PRIOR TO APPLICATION OF APPROVED TIDES

				*	
51977	~~Reef~~, NW ext new rng 3m brg 150M (10)m ISLET O (21) 51977	60:27:39.179	147:45:01.275	-9.4	Larger than chd
53634	~~Reef~~, N ext new rng 4.5m brg 90M (12)m ISLET O (28) 53634	60:28:11.415	147:42:37.983	-11.8	
53635	~~Reef~~, S ext new rng 4.5m brg 330M (12)m ISLET O (28) 53635	60:28:07.613	147:42:37.120	-11.8	
53701	Reef, N ext new rng 5m brg 90M (1)m 53701	60:28:05.619	147:42:37.160	-0.5	
53795	Islet, new rng 5.5m brg 150M (4.5)m 53795	60:30:32.640	147:43:03.517	-4.4	
53816	Rock, new rng 4.0m brg 100M (1.0)m 53816	60:30:16.900	147:42:33.653	-0.7	
53903	Rock, new rng 4.5m brg 200M (2.0)m 53903	60:29:57.346	147:41:10.870	-1.4	Same rk as 27076 & 27077 ALSO, A DANGER TO NAVIGATION
53906	Reef, new rng 5.5m brg 185M (1.0)m 53906	60:29:50.851	147:41:26.967	-0.3	N. ext of foul area
53908	Reef, SE ext new rng 30m brg 180M (1.5)m 53908	60:29:46.330	147:41:27.837	-0.8	SE. ext of foul area
53931	Rock, new rng 0m brg 040M 1.0m 53931	60:29:28.005	147:41:07.951	1.6	
56210	Rock, new rng 4.5m brg 170M 0.5m 56210	60:28:42.404	147:40:27.862	1	
56211	Rock, new rng 5m brg 330M (0.8)m 56211	60:28:41.738	147:40:28.127	-0.8	
56272	Rock, new rng 4.5m brg 030M (0.4)m 56272	60:28:09.598	147:40:33.570	1.3	
56280	Rock, new rng 2.0m brg 120M 0.4m 56280	60:28:13.258	147:40:31.940	1.4	
56311	Rock, new rng 2.5m brg 080M (0.1)m 56311	60:28:15.923	147:40:25.095	0.2	

The following is a list of all Detached Positions taken on features that are shown on the chart but are not shown on the DM shoreline manuscript:

Fix #	Remark (raw depth in meters)	Latitude North	Longitude East	Depth (m) corrected *	Notes
23560	Rock, chd rng 0m brg 0M 3.6m 23560	60:27:05.097	147:45:36.956	3.9	
52557	Rock, chd rng 3m brg 030M (3)m 52557	60:27:26.565	147:46:31.429	-2.6	DM rk ~30m away
52558	Rock, chd rng 3m brg 250M (.3)m 52558	60:27:27.519	147:46:28.015	0.1	
52559	Rock, chd rng 3m brg 200M (3)m 52559	60:27:30.623	147:46:28.597	-1.5	
52607	Rock, chd rng 10m brg 240M (2)m 52607	60:26:28.032	147:46:49.341	-1.5	DM rk ~30m away
53688	Rock, chd rng 2m brg 150M 1.3m 53688	60:27:52.298	147:42:22.134	1.7	
57857	Islet, chd rng 4.0m brg 220M (3.0)m 57857	60:25:46.557	147:43:12.416	-5.6	Islet is chd ~110m NE of actual position
57858	Islet, chd rng 4.5m brg 160M (3.0)m 57858	60:25:46.740	147:43:13.234	-5.7	

The following is a list of all Detached Positions taken on features that are shown incorrectly on the DM shoreline manuscript and the chart. There were two charted rocks disproved during H-10853. Both of these disproved rocks have close by either a new or DM rock. Rock disproval 23537 appears to be depicted on the chart in its position due to the scale of the chart, and the hydrographer believes is actually located at fix 24708. It is recommended that their current charted feature be changed and depicted as follows:

Fix #	Remark (raw depth in meters)	Latitude North	Longitude East	Depth (m) corrected *	Notes
21298	Rock, chd disproval 10.7m 21298	60:30:30.620	147:43:17.696	11.4	DM rock found ~60m SW of disproval
23537	Rock, chd disproval 15.9m 23537 SEE FIX 24708	60:26:14.057	147:43:58.298	16.8	Search radius ~100m, Water vis. ~10ft
23619	~~Rock~~, DM rng 4.5m brg 035M (7.0)m 23619 ISLET? (11)	60:26:20.240	147:46:03.098	-6.5	DM only, should be charted
23705	~~Is~~, DM rng 4.5m brg 120M (4.0)m 23705 ROCK * (13)	60:26:10.376	147:46:28.306	-3.3	Islet is larger than DM

* DEPTH PRIOR TO APPLICATION OF APPROVED TIDES

				*	
24643	Reef, chd rk rng 4.5m brg 090M (3)m 24643	60:26:16.426	147:45:29.322	-2.8	DM/chd rk is a reef
24710	Ledge, chd rk rng 4.5m brg 160M (1.5)m 24710	60:26:34.889	147:44:08.635	-0.9	Chd rk is ledge
ROCK *(12) 24714	~~Islet,~~ chd rk rng 4.5m brg 115M (4)m 24714	60:26:39.726	147:44:14.190	-3.3	New position and size, DM/chd rk is an Islet
24716	~~Islet,~~ DM rk rng 4.5m brg 050M (4)m 24716 ROCK *(12)	60:26:35.443	147:44:17.219	-3.3	
25571	Reef, DM rk rng 4.5m brg 060M (4)m 25571	60:26:04.472	147:49:32.359	-4.5	DM/chd rk is reef
40440	Ledge, DM rk rng 5m brg 340M (3)m 40440	60:26:44.707	147:48:37.394	-2.8	DM/chd rk is ledge
40442	Rf, DM rk S ext rng 3.5m brg 300M (1.5)m 40442	60:26:41.859	147:49:13.682	-1.3	DM/chd rk is a reef
40443	Reef, DM rk N ext rng 3.5m brg 170M (1.5)m 40443	60:26:47.144	147:49:11.367	-1.4	DM/chd rk is a reef
43374	Reef, DM rk rng 4m brg 020M (4)m 43374	60:26:45.389	147:48:43.103	-3.5	DM/chd rk is a reef
43441	Reef, DM rk rng 4m brg 100M (2)m 43441	60:26:23.796	147:49:51.227	-1.3	DM/chd rk is a reef
43442	Reef, DM rk rng 4m brg 145M (0.5)m 43442	60:26:25.178	147:49:48.834	0.1	
43443	Reef, DM rk rng 4m brg 270M (0.5)m 43443	60:26:23.108	147:49:45.904	0.1	
43444	Reef, DM rk rng 3.5m brg 345M AWASH 43444	60:26:21.156	147:49:49.833	0.6	
51978	Reef, new S ext rng 3m brg 000M (.5)m 51978	60:27:35.222	147:45:02.481	0.1	Reef is larger than DM/chd
52557	Rock, chd rng 3m brg 030M (3)m 52557	60:27:26.565	147:46:31.429	-2.6	Chd rk ~40-80m away
52558	Rock, chd rng 3m brg 250M (.3)m 52558	60:27:27.519	147:46:28.015	0.1	
52559	Rock, chd rng 3m brg 200M (3)m 52559	60:27:30.623	147:46:28.597	-1.5	
52607	Rock, chd rng 10m brg 240M (2)m 52607	60:26:28.032	147:46:49.341	-1.5	DM rk ~30m away
53633	~~Reef,~~ W ext DM rk rng 4.5m brg 30M (12)m ISLET *(28) 53633	60:28:07.788	147:42:38.843	-11.9	DM/chd rk is a reef
53702	Reef, N ext DM rk rng 5.5m brg 260M (1)m 53702	60:28:04.617	147:42:35.628	-0.5	
53786	Rock, DM rng 0m brg 245M 2.5m 53786	60:30:29.124	147:43:19.534	2.5	Chd rk , new position
53904	Islet, DM rk rng 5.5m brg 170M (5.0)m 53904	60:30:11.021	147:41:12.180	-4.4	DM/chd rk is an islet, larger than depicted
53905	Islet, DM rk rng 25m brg 000M (5.0)m 53905	60:30:07.711	147:41:13.596	-4.3	
53907	Reef, NW ext chd rk rng 7.5m brg 120M (4.0)m 53907	60:29:48.166	147:41:36.036	-3.3	NW. ext of foul area, chd as a rk
57857	Islet, chd rng 4.0m brg 220M (3.0)m 57857	60:25:46.557	147:43:12.416	-5.6	Islet is chd in wrong positon
57858	Islet, chd rng 4.5m brg 160M (3.0)m 57858	60:25:46.740	147:43:13.234	-5.7	

J. CROSSLINES ✓

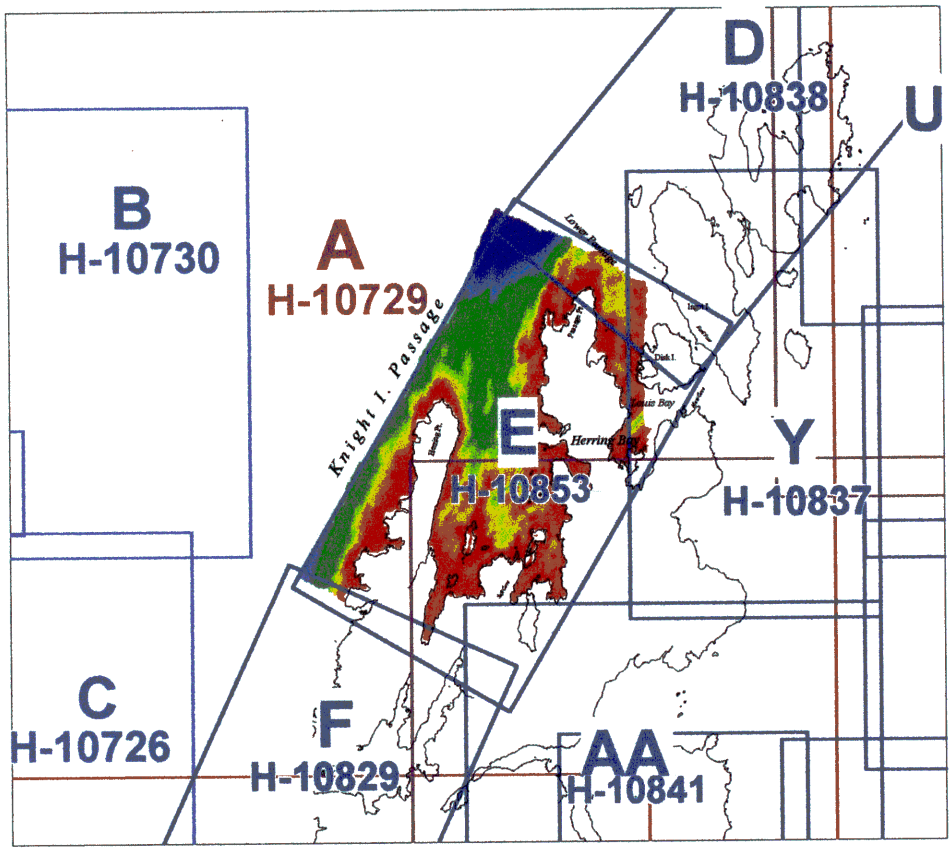
Crosslines agreed very well with mainscheme hydrography. Depths generally agreed within one to three meters. There were a total of 20.82 nautical miles of crosslines, comprising 10.5% of mainscheme hydrography.

K. JUNCTIONS ✓ SEE EVAL. REPT., SECTION L

The following contemporary surveys junction with H-10853.

Registry #	Scale	Date	Junction side
H-10838	1:10,000	1998	Northeast ✓
H-10837	1:10,000	1998	NorthEast ✓
H-10829	1:10,000	1998	Southwest ✓
H-10729	1:40,000	1996	West ✓

* DEPTH PRIOR TO APPLICATION OF APPROVED TIDES



Soundings on these 1998 surveys were found to be in good agreement, generally matching within one to three meters. CONCUR Final comparisons will be made at the Pacific Hydrographic Branch (PHB) after reduction to final vertical datum.

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

The following prior surveys share common area with H-10853.

Registry #	Scale	Date	Area covered	Description	
H-3187	1:20,000	1910	Herring Point to Herring Bay	Soundings (feet)	✓
H-3028	1:20,000	1909	Louis Bay area	Soundings (feet)	✓
H-2916	1:40,000	1907	Entire Survey	Wire drag/soundings (fms)	✓

Prior survey H-3028 covers a small portion of the present survey H-10853, while prior survey H-3187 covers a good portion of H-10853 survey. The soundings, features and shoreline from these priors agree well with the present survey. Prior survey H-2916 covers the entire survey, but does not include all of the shoreline, and is also in generally good agreement. Portions of prior survey H-2916 included wire drag. Differences between the current survey and priors can probably be attributed to scale and improved modern positioning and sounding equipment. Final comparisons will be done at PHB after reduction to final sounding datum using tidal information collected concurrently with this survey. There are numerous isolated areas where shoaler soundings were discovered because of the increased sounding densities from this survey. Several of these shoals were reported as Dangers to Navigation. (See Section N) CONCUR

Representative samples of selected soundings from the prior surveys are compared with the current survey.

The following are examples of H-10853 soundings west of Herring Point to Herring Bay that are considered good matches with prior H-3187:

Prior Survey Registry Number	Fix Number	Prior Depth (feet)	H-10853 Depth (feet-corrected) *	Geographic Survey Position
H-3187	40654	56	53	60-27-18.61 N 147-48-25.41 W
	89550 (SWMB)	49	45	60-27-47.22 N 147-48-12.48 W
	IDSSS	554	554.461	60-28-40.85 N 147-47-57.11 W
	IDSSS	383 (very steep)	360.392	60-28-35.27 N 147-45-52.9 W
	52362	67	67	60-26-36.84 N 147-45-27.54 W
	21093	128	126	60-27-14.3 N 147-43-05.15 W
	25276	148	142	60-29-55.63 N 147-43-40.93 W

The prior survey H-3028 had soundings averaging about 2-10 feet deeper in areas shoaler than approximately 150 feet, where beyond that depth the prior depths are approximately 4 to 30 feet deeper. CONCUR

Prior Survey Registry Number	Fix Number	Prior Depth (feet)	H-10853 Depth (feet) *	Geographic Survey Position
H-3028	53997	71	66	60-28-08.86 N 147-40-43.44 W
	57353 **	243 **	161 **	60-28-59.04 N 147-40-01.07 W
	98545 (SWMB)	250	219	60-29-30.7 N 147-40-50.47 W
	26995	85	84	60-30-03.28 N 147-41-03.26 W
	82235 (SWMB)	287	297	60-31-17.32 N 147-41-30.34 W
	26068	277	273	60-31-24.02 N 147-42-23.52 W

** PRIOR = 40.5 FMS, SMOOTH SHEET = 26 FMS

Prior survey H-2916 covers the entire survey, but does not include all of the shoreline, and is also in generally good agreement. Portions of prior survey H-2916 included wire drag. CONCUR

Prior Survey Registry Number	Fix Number	Prior Depth (fathoms)	H-10853 Depth (fathoms) *	Geographic Survey Position
H-2916	55264	9	8.4	60-29-10.45 N 147-46-57.29 W
	IDSSS	139	135.6	60-29-51.17 N 147-45-02.05 W
	IDSSS	114	114.2	60-26-03.22 N 147-50-44.64 W
	IDSSS	259	257	60-31-14.88 N 147-44-15.96 W
	25618	24	23.1	60-25-59.02 N 147-49-59.66 W

* DEPTH PRIOR TO APPLICATION OF APPROVED TIDES

M. ITEM INVESTIGATIONS ✓

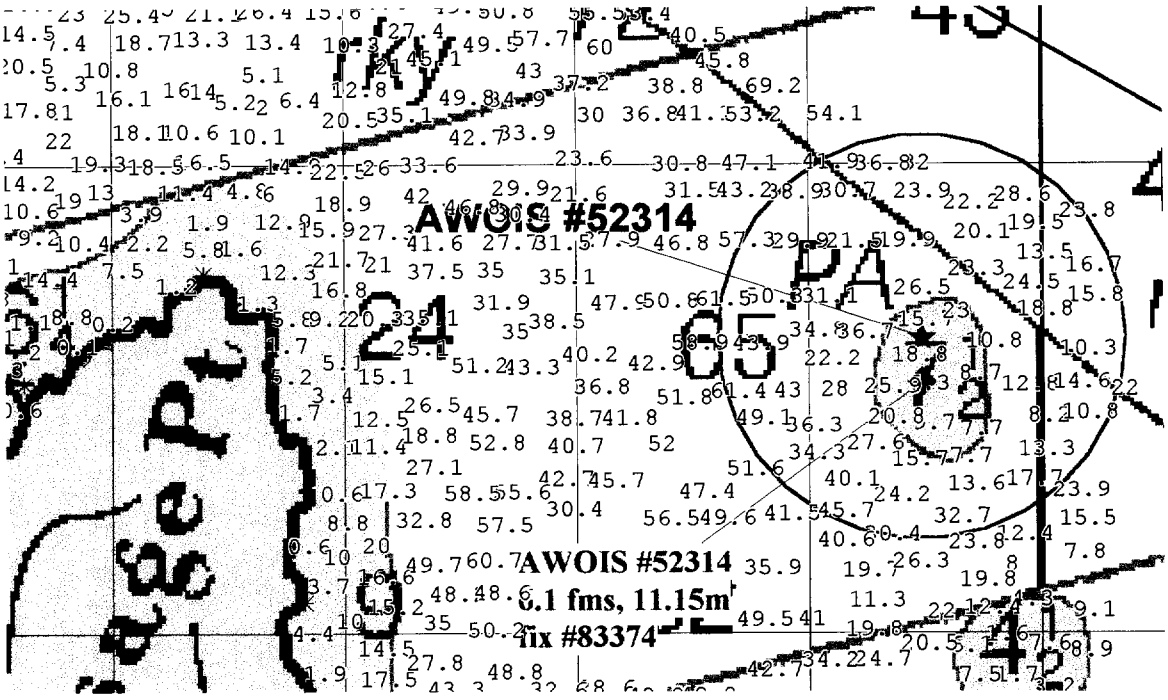
There were six AWOIS items assigned for survey H-10853.

INVESTIGATION #1 ✓

AWOIS # : 52314	**DN:** 234
CHART #: 16705, 17th edition	**VESNO:** 2123
ITEM DESCRIPTION: Sounding (7 ½ fathom shoal)	
SOURCE: CL542/89—NOAA Ship Rainier	

Geographic Position

	LATITUDE	LONGITUDE	POSITION #
CHARTED:	60-30-46.11 N	147-40-11.45 W	none
REPORTED AWOIS POSITION:	60-30-48.84 N	147-40-15.21 W	none
OBSERVED:	60-30-45.94 N	147-40-15.22 W	83374
POSITIONED BY:	DGPS	**DATUM:**	MLLW (NAD 83)
METHOD OF INVESTIGATION: Echo Sounder, SWMB			
FINDINGS: AWOIS item number 52314 was located approximately 90 meters to the south of the described AWOIS position. 6.1 fathoms (SWMB)-CARIS tides, 6.3 fathoms-HPS tides			



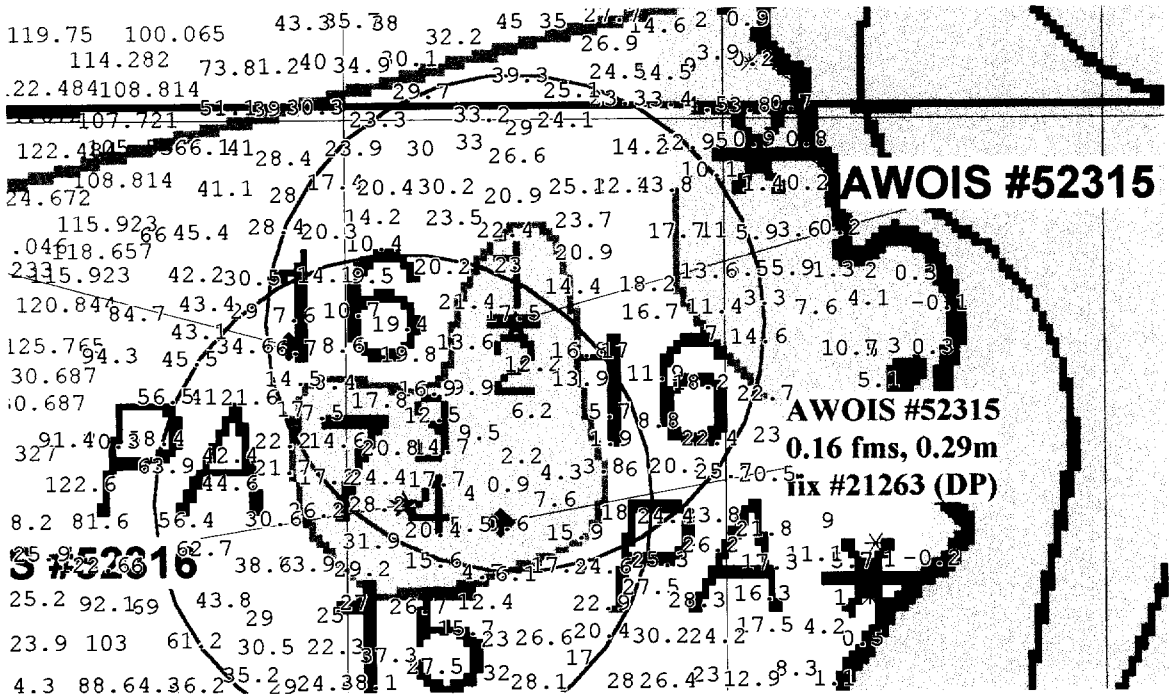
Charting Recommendation: The hydrographer recommends removing the 7 ½ fathom shoal at 60-30-46.11 N 147-40-11.45 W, and chart as surveyed the sounding at 60-30-45.94 N 147-40-15.22 W, as determined with the SWMB. CONCUR REMOVE CHARTED 7½ FM SHOAL AND CHART SUITABLE SMOOTH SHEET SOUNDING

INVESTIGATION #2 ✓

AWOIS # : 52315	**DN:** 204 DP, 238 SWMB
CHART #: 16705, 17th edition	**VESNO:** 2122, 2126
ITEM DESCRIPTION: Sounding (½ fathom shoal)	
SOURCE: CL542/89—NOAA Ship Rainier	

Geographic Position

	LATITUDE	LONGITUDE	POSITION #
CHARTED:	60-29-51.69 N	147-43-46.78 W	none
REPORTED AWOIS POSITION:	60-29-51.93 N	147-43-46.31 W	none
OBSERVED:	60-29-44.14 N	147-43-47.63 W	DP #21263, 84670
POSITIONED BY:	DGPS	**DATUM:**	MLLW (NAD 83)
METHOD OF INVESTIGATION: Echo Sounder, SWMB, Visual Search, Detached Position			
FINDINGS: AWOIS item number 52315 was located approximately 240 meters to the south of the described AWOIS position. 0.16 fathoms (DP), 0.6 fathoms (SWMB)-HPS tides			



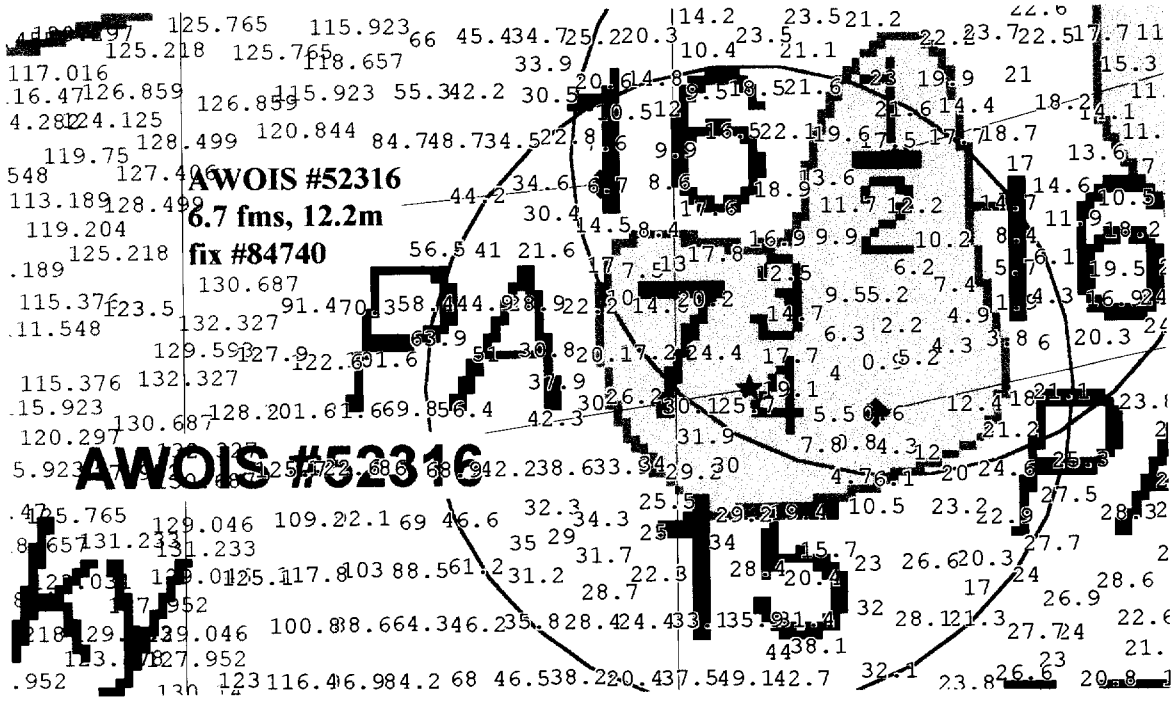
Charting Recommendation: The hydrographer recommends removing the ½ fathom shoal at 60-29-51.69 N 147-43-46.78 W, and chart a rock at 60-29-44.14 N 147-43-47.63 W with a depth of 0.16 fathoms, as determined during this survey. CONCUR REMOVE CHARTED ½FM SHOAL AND CHART NEARBY ROCK (* COV 1 ft)
THIS ITEM IS ALSO A DANGER TO NAVIGATION AND NEW ROCK (FIX # 21263)

INVESTIGATION #3 ✓

AWOIS # : 52316	**DN:** 238
CHART #: 16705, 17th edition	**VESNO:** 2126
ITEM DESCRIPTION: Sounding (7 ¾ fathom shoal)	
SOURCE: CL542/89—NOAA Ship Rainier	

Geographic Position

	LATITUDE	LONGITUDE	POSITION #
CHARTED:	60-29-46.44 N	147-43-56.66 W	none
REPORTED AWOIS POSITION:	60-29-44.93 N ✓	147-43-~~46.31~~ 55.31 W mcR	none
OBSERVED:	60-29-51.09 N	147-44-04.28 W	84740
POSITIONED BY:	DGPS	**DATUM:**	MLLW (NAD 83)
METHOD OF INVESTIGATION: Echo Sounder, SWMB			
FINDINGS: AWOIS item number 52316 was located approximately 236 meters to the north-west of the described AWOIS position. 6.8 fathoms (SWMB)-CARIS tides, 6.7 fathoms-HPS tides			



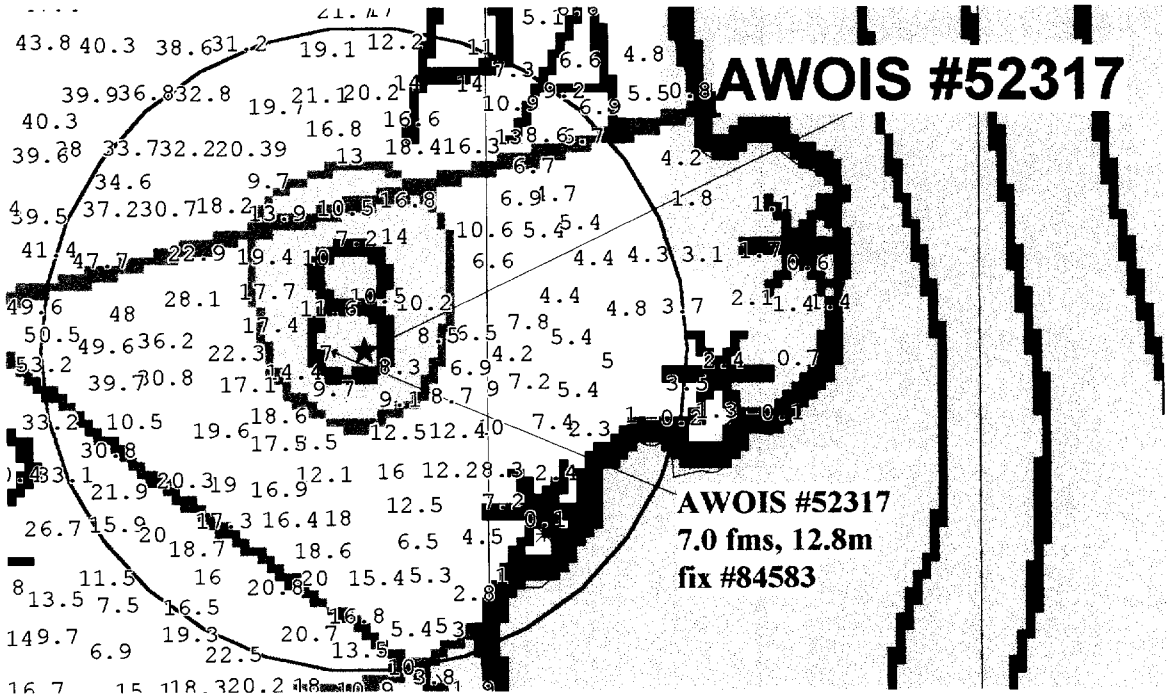
Charting Recommendation: The hydrographer recommends removing the 7 ¾ fathom shoal at 60-29-46.44 N 147-43-56.66 W, and chart as surveyed a sounding at 60-29-51.09 N 147-44-04.28 W as determined with the SWMB. CONCUR REMOVE 7¾ FM SHOAL AND CHART SUITABLE SMOOTH SHEET SOUNDING

INVESTIGATION #4 ✓

AWOIS # : 52317	**DN:** 238
CHART #: 16705, 17th edition	**VESNO:** 2126
ITEM DESCRIPTION: Sounding (8 fathom shoal)	
SOURCE: CL542/89—NOAA Ship Rainier	

Geographic Position

	LATITUDE	LONGITUDE	POSITION #
CHARTED:	60-29-20.08 N	147-43-38.58 W	none
REPORTED AWOIS POSITION:	60-29-18.92 N	147-43-37.30 W	none
OBSERVED:	60-29-18.86 N	147-43-39.77 W	84583
POSITIONED BY:	DGPS	**DATUM:**	MLLW (NAD 83)
METHOD OF INVESTIGATION: Echo Sounder, SWMB			
FINDINGS: AWOIS item number 52317 was located approximately 38 meters to the east of the described AWOIS position. 7.2 fathoms (SWMB)-CARIS tides, 7.0 fathoms-HPS tides			



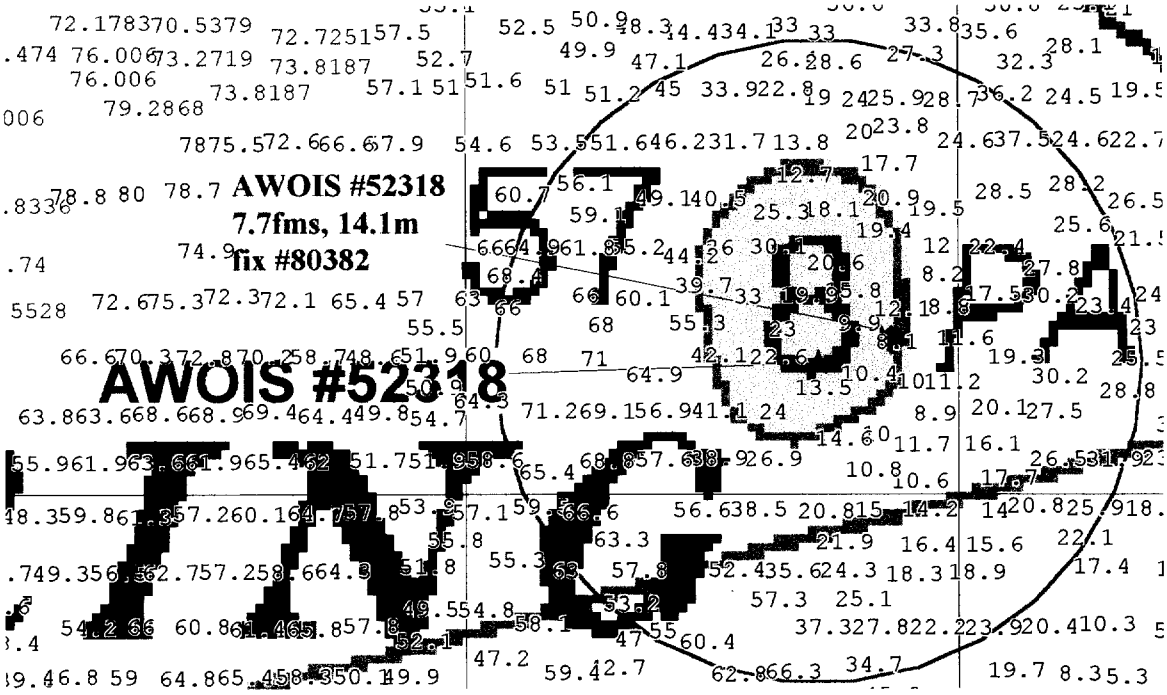
Charting Recommendation: The hydrographer recommends removing the 8 fathom shoal at 60-29-20.08 N 147-43-38.58 W, and chart as surveyed a sounding at 60-29-18.86 N 147-43-39.77 W, as determined with the SWMB. CONCUR REMOVE 8 FM SHOAL AND CHART SUITABLE SMOOTHSHEET SOUNDING

INVESTIGATION #5 ✓

AWOIS # : 52318	**DN:** 238
CHART #: 16705, 17th edition	**VESNO:** 2126
ITEM DESCRIPTION: Sounding (8 fathom shoal)	
SOURCE: CL785/89—NOAA Ship Rainier	

Geographic Position

	LATITUDE	LONGITUDE	POSITION #
CHARTED:	60-28-05.78 N	147-44-09.47 W	none
REPORTED AWOIS POSITION:	60-28-03.93 N	147-44-08.32 W	none
OBSERVED:	60-28-04.56 N	147-44-03.95 W	80382
POSITIONED BY:	DGPS	**DATUM:**	MLLW (NAD 83)
METHOD OF INVESTIGATION: Echo Sounder, SWMB			
FINDINGS: AWOIS item number 52318 was located approximately 136 meters to the north-east of the described AWOIS position. 7.7 fathoms (SWMB)-CARIS tides, 8.1 fathoms-HPS tides			



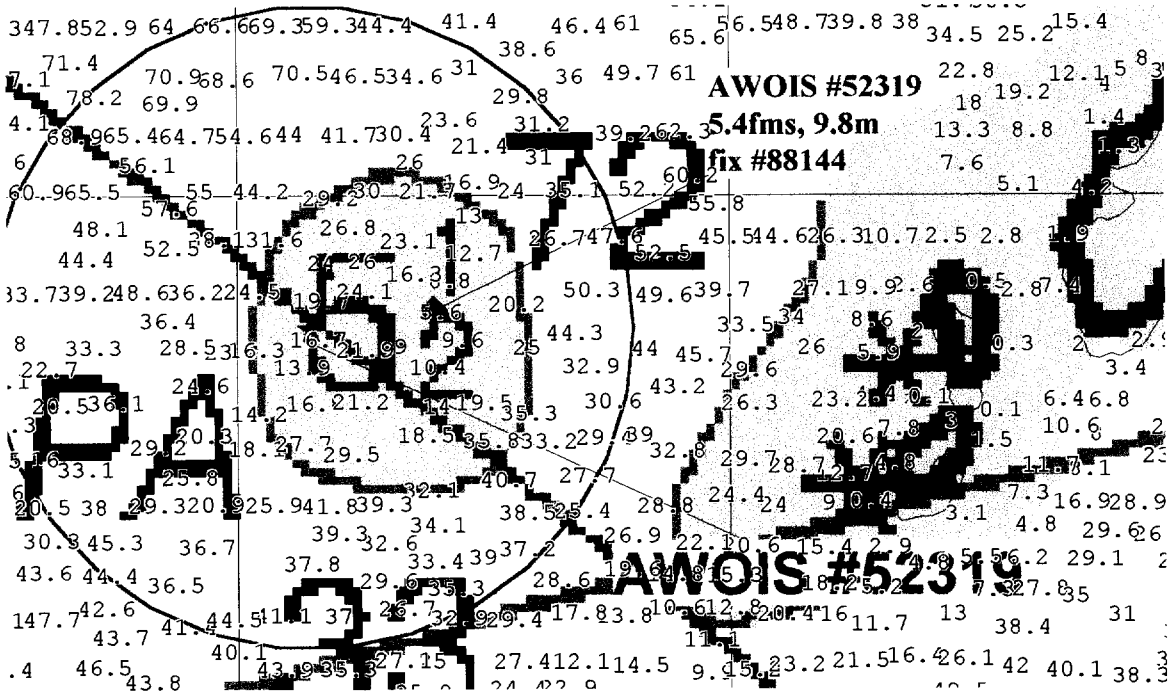
Charting Recommendation: The hydrographer recommends removing the 8 fathom shoal at 60-28-05.78 N 147-44-09.47 W, and chart as surveyed a sounding at 60-28-04.56 N 147-44-03.95 W, as determined with the SWMB. CONCUR REMOVE 8 FM SHOAL AND CHART SUITABLE SMOOTH SHEET SOUNDING

INVESTIGATION #6 ✓

AWOIS # : 52319	**DN:** 246
CHART #: 16705, 17th edition	**VESNO:** 2121
ITEM DESCRIPTION: Sounding (5 ½ fathom shoal)	
SOURCE: CL785/89—NOAA Ship Rainier	

Geographic Position

	LATITUDE	LONGITUDE	POSITION #
CHARTED:	60-27-25.95 N	147-44-20.4 W	none
REPORTED AWOIS POSITION:	60-27-25.94 N	147-44-25.32 W	none
OBSERVED:	60-27-26.54 N	147-44-17.88 W	88144
POSITIONED BY:	DGPS	**DATUM:**	MLLW (NAD 83)
METHOD OF INVESTIGATION: Echo Sounder, SWMB			
FINDINGS: AWOIS item number 52319 was located approximately 116 meters to the north-east of the described AWOIS position. 5.4 fathoms (SWMB)-CARIS tides, 5.6 fathoms-HPS tides			



Charting Recommendation: The hydrographer recommends removing the Position Approximate (PA) designation, a 5½ fathom sounding at 60-27-25.95 N 147-44-20.4 W, and chart as surveyed a sounding at 60-27-26.54 N 147-44-17.88 W, as determined with the SWMB. CONCUR REMOVE 5½ FM SOUNDING AND "PA" DESIGNATION, CHART SUITABLE SMOOTH SHEET SOUNDING

N. COMPARISON WITH THE CHART ✓ SEE EVAL. REPT., SECTION O

Chart 16700
24th Ed. Jan. 11, 1992
Scale: 1:200,000

Chart 16701
16th Ed. June 1, 1997
Scale: 1:81,436

Chart 16705
17th Ed. Sept. 27, 1997
Scale: 1:80,000

The survey was compared with Chart 16700, 16701 and 16705 and was in good agreement, generally within one fathom. Areas of significant differences are listed as DTON's or have been investigated as the AWOIS items described above. In general, soundings on the contemporary survey agree, or are shoaler by several fathoms. It is recommended that soundings from survey H-10853 supersede all prior, and charted soundings. Final sounding comparisons will be made at PHB after reduction to final vertical datum. PHB COMPARISONS MADE TO THE MOST RECENT, LARGEST SCALE CHART WITH FULL COVERAGE: CHART 16705, 18TH EDITION, MARCH 27, 1999, SCALE 1:80,000. TWO ADDITIONAL AREAS OF DISAGREEMENT WERE DISCOVERED DURING OFFICE PROCESSING AND ARE DISCUSSED IN THE EVAL. REPT., SECTION O.

Dangers to Navigation

Fifteen* dangers to navigation were reported to the Seventeenth Coast Guard District for H-10853. Copies of the correspondence can be found in ~~Appendix I of~~ this report. SIXTEEN DANGERS WERE REPORTED, ONE WAS LATER RESCINDED

O. ADEQUACY OF SURVEY ✓

Survey H-10853 is complete and adequate to supersede prior soundings and features in their common areas. As a general rule, areas shoaler than 70 meters were ensonified with SWMB producing 100% bottom coverage. Care was taken to conduct all shoreline investigations during times of negative tides.

P. AIDS TO NAVIGATION ✓

There are no 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 in accordance with Project Instructions. No unusual tidal currents or magnetic variations were found during this survey.

S. RECOMMENDATIONS ✓

It is apparent, based on the number of rocks that did not appear on the digital shoreline maps, that the related photogrammetry was not tide coordinated. It is recommended that shoreline manuscripts be compiled from photographs taken at MLLW. It allows for quicker progression of shoreline verification and drastically reduces the complexity of the survey field records. CONCUR

T. REFERRAL TO REPORTS ✓

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

Title	Date Sent	Office
OPR-P139-RA-1998 Horizontal Control Report	TBA	N/CS34
Project related data for OPR-P139-RA	Incremental	N/CS34

Respectfully Submitted,

Andrea K. Lim
Senior Survey Technician, NOAA

Approved and Forwarded,

Alan D. Anderson
Captain, NOAA
Commanding Officer

List of Horizontal Control Stations

NAME	STATE	TYPE	LATITUDE	LONGITUDE	SITEID	DEC_LAT	DEC_LON
CAPE HINCHINBROOK	AK	USCG Beacon	60 14 18	146 38 48	894	60.23833333	146.64666667
DUKE	AK	DGPS Flyaway	60 15 37.38949	147 18 05.97751	n/a	60.26038597	148.30166042
KENAI	AK	USCG Beacon	60 40 06	151 21 00	896	60.66833333	151.35000000
MATE	AK	DGPS Flyaway	60 17 54.17878	147 54 46.44082	n/a	60.29838299	147.91290023
POTATO POINT	AK	USCG Beacon	61 03 24	146 41 48	895	61.05666667	146.69666667
QUAKE	AK	DGPS Flyaway	60 22 56.96011	147 50 19.81757	n/a	60.38248892	147.83883821
ROCK	AK	DGPS Flyaway	60 39 13.43485	147 55 58.32527	n/a	60.65373190	147.93286813
SEAL	AK	DGPS Flyaway	60 25 47.07484	147 24 56.82688	n/a	60.42974301	147.41578524
TUFT RESET	AK	DGPS Flyaway	60 37 05.94517	147 29 09.09347	n/a	60.61831810	147.48585930

ALL CONTROL STATIONS ARE LOCATED BEYOND THE SHEET LIMITS

Survey Information Summary

Project: OPR-P139-RA **Project Name:** PRINCE WILLIAM SOUND

Instructions Dated: 7/10/98 **Project Change Info:**

Change #	Dated
1	9/8/98

Sheet Letter: E **Registry Number:** H-10853

Sheet Number: RA-10-11-98

Survey Title: Herring Bay

Data Acquisition Dates: **From:** 21-Jul-98 202 **To:** 09-Oct-98 282

Vessel Usage Summary

VESNO	MS	SPLITS	DEV	XL	S/L	DP	BS	DIVE
2120								
2121								
2122	3	10			7	9		
2123								
2124	3	3			2	3		
2125	7	4		4	6	5	3	
2126								

Sound Velocity Cast Information

Launch Table #	Ship Table #	Cast DN	Max Depth	Position	Applicable DN
1		201	671.2	60/31/43	fdh-215
				147/43/14	
3		216	701.8	60/31/24	216-234
				147/47/40	
5		235	850.2	60/32/24	235-248
				147/42/42	

Tide Zone Information

Zone #	Time Corr.	Height Corr.
PWS38	0 hr 0 min	0.94

Tide Gage Information

Tide Gage #	Gage Name	Installed	Removed
945-4691	HERRING POINT	7/20/98	10/16/98

Statistics Summary

Type	Total:
BS	26
DP	164
MBMS	27.8
MBSP	1.7
MS	198.37
S/L	42.26
SPLIT	196.18
SWMB	170.46
XL	20.82

Percent XL:	10.5%
SQNM:	13.8

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
November 1, 1998

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

ADVANCE INFORMATION

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 surveys in southwestern Prince William Sound, Alaska. The dangers are shown graphically on the attached chartlets and are listed below by chart without duplication. The following dangers to navigation affect chart 16701, 17th edition, 1998, 1:81,436, chart 16704, 12th edition, 1998, 1:20,000, and chart 16700, 25th edition, 1996, 1:200,000. All positions are on the NAD 83 datum and depths have been corrected to Mean Lower Low Water using predicted tides.

Feature	Depth (fm)	Latitude (N)	Longitude (W)	Position #	Depth (m)	Survey #
Shoal	5.3	60:19:33.347	147:46:52.605	21904	9.8	H-10852
Shoal	3.0	60:19:26.165	147:44:52.044	22350	5.6	H-10852
Shoal	1.6	60:17:27.773	147:50:49.432	22951	3.0	H-10852
Shoal	0.6	60:19:18.990	147:44:44.332	23307	1.2	H-10852
Shoal	8.8	60:17:48.249	147:56:33.115	42254	16.2	H-10852
Shoal	1.5	60:17:21.387	147:54:02.693	55080	2.8	H-10852
Shoal	5.2	60:20:22.223	147:54:48.370	56007	9.5	H-10852
Shoal	2.9	60:19:14.067	147:48:46.613	60308	5.3	H-10852
Rock Awash	-0.7	60:19:22.305	147:55:03.673	41740	-1.1	H-10852
Shoal	1.0	60:19:19.447	147:54:04.224	41704	1.9	H-10852
Rock Awash	-0.9	60:19:25.471	147:45:01.988	23302	-1.6	H-10852
Rock Awash	-0.2	60:19:14.118	147:44:17.157	23331	-0.4	H-10852
Rock Awash	-0.3	60:17:28.736	147:54:04.540	20203	-0.5	H-10852
Rock Awash	-0.1	60:17:09.226	147:54:16.406	20223	-0.2	H-10852
Rock Awash	-0.6	60:19:27.542	147:47:07.105	21287	-1.1	H-10852
Rock Awash	-1.1	60:20:26.833	147:53:36.296	24402	-2.0	H-10852
Rock Awash	-2.5	60:18:55.218	147:52:59.016	41387	-4.5	H-10852
Rock Awash	-0.1	60:20:55.284	147:51:49.349	43863	-0.2	H-10829
Shoal	3.8	60:20:32.289	147:50:03.077	41140	7.0	H-10829
Shoal	6.6	60:22:53.912	147:48:31.327	46856	12.2	H-10829
Shoal	4.6	60:23:30.942	147:48:28.360	22821	8.4	H-10829
Shoal	3.5	60:24:05.662	147:46:40.037	22240	6.5	H-10829
Rock Awash	-1.2	60:21:26.017	147:52:43.494	42575	-2.2	H-10829

The following dangers to navigation affect chart 16701, 17th edition, 1998, 1:81,436, chart 16705, 17th edition, 1997, 1:80,000, and chart 16700, 25th edition, 1996, 1:200,000.

Feature	Depth (fm)	Latitude (N)	Longitude (W)	Position #	Depth (m)	Survey #
Shoal	4.7	60:24:31.500	147:50:51.381	50534	8.7	H-10829
Shoal	1.6	60:23:10.415	147:52:43.511	42543	2.9	H-10829
Shoal	3.4	60:24:24.829	147:51:45.403	50432	6.3	H-10829
Shoal	3.3	60:23:37.314	147:48:44.568	46918	6.1	H-10829

ADVANCE INFORMATION

The following dangers to navigation affect chart 16705, 17th edition, 1997, 1:80,000, and chart 16700, 25th edition, 1996, 1:200,000.

Feature	Depth (fm)	Latitude (N)	Longitude (W)	Position #	Depth (m)	Survey #
Shoal	2.7	60:31:04.582	147:41:40.031	20721	4.9	H-10838
Shoal	8.3	60:31:08.166	147:42:07.405	20766	15.2	H-10838
Shoal	4.9	60:31:52.922	147:40:27.188	88872	9.0	H-10838
Shoal	2.5	60:32:48.488	147:40:15.980	85877	4.6	H-10838
Shoal	2.3	60:32:57.334	147:39:48.222	87115	4.2	H-10838
Shoal	4.6	60:34:08.738	147:36:52.297	82638	8.4	H-10838
Shoal	1.3	60:34:57.193	147:34:15.162	85280	2.4	H-10838
Shoal	3.0	60:35:05.658	147:34:08.751	85172	5.5	H-10838
Shoal	4.0	60:35:03.773	147:33:40.229	85470	7.3	H-10838
Shoal	4.6	60:27:59.07	147:48:09.45	41530	8.5	H-10853
Shoal	1.3	60:27:29.98	147:45:41.75	20730	2.4	H-10853
Shoal	9.1	60:27:22.07	147:45:25.47	50663	16.7	H-10853
Shoal	6.5	60:27:04.46	147:43:36.05	22059	11.9	H-10853
Shoal	2.5	60:27:51.34	147:43:23.12	53069	4.7	H-10853
Rock	0.2	60:29:44.20	147:43:47.67	21263	0.3	H-10853
Shoal	2.4	60:30:54.85	147:43:04.58	26488	4.5	H-10853
* Shoal	9.1	60:31:34.11	147:42:22.66	26021	16.7	H-10853
Shoal	0.8	60:30:24.49	147:40:04.21	SWMB	1.4	H-10853
Shoal	6.3	60:29:55.32	147:40:29.20	54546	11.5	H-10853
Shoal	5.2	60:29:05.25	147:40:09.45	57324	9.5	H-10853
Shoal	2.3	60:29:00.51	147:40:17.10	54231	4.2	H-10853
Shoal	8.2	60:29.42.42	147:40:38.94	54446	15.1	H-10853
Rock Awash	-0.8	60:29:57.35	147:41:10.87	53903	-1.4	H-10853
Rock	0.9	60:27:52.43	147:43:37.07	24745	1.7	H-10853
Reef	1.4	60:26:46.43	147:43:08.84	42546	2.6	H-10853

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-98 and Danger to Navigation message RA-10-98. More information on current RAINIER survey projects may be obtained by e-mail; contact the Field Operations Officer at FOO.RAINIER@NOAA.GOV.

Sincerely,

Alan D. Anderson

Alan D. Anderson
Captain, NOAA
Commanding Officer

Attachment

cc: NIMA
PMC
N/CS261
N/CS34

* THIS DANGER RESCINDED IN NOVEMBER 12, 1998 LETTER TO COMMANDER, 17TH COAST GUARD DISTRICT (ATTACHED)

Lotus cc:Mail for FOO Rainier

ADVANCE INFORMATION

Date: 11/2/98
Sender: FOO Rainier
To: lnm@cgalaska.uscg.mil
cc: dhill@pachydro.noaa.gov;navinfonet@nima.mil;Lynn [NDS-NCG22] Preston;Chief Survey Technician Rainier;CO Rainier;Jim [PHS-NCG245] Gardner;jgardner@pachydro.noaa.gov
Priority: Normal
Subject: Dangers to Navigation for PWS 1998

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 surveys in southwestern Prince William Sound, Alaska. The dangers are shown graphically on the attached chartlets and are listed below by chart without duplication. The following dangers to navigation affect chart 16701, 17th edition, 1998, 1:81,436, chart 16704, 12th edition, 1998, 1:20,000, and chart 16700, 25th edition, 1996, 1:200,000. All positions are on the NAD 83 datum and depths have been corrected to Mean Lower Low Water using predicted tides.

Feature	Depth (fm)	Latitude (N)	Longitude (W)	Position #	Depth(m)	Survey #
Shoal	5.3	60:19:33.347	147:46:52.605	21904	9.8	H-10852
Shoal	3.0	60:19:26.165	147:44:52.044	22350	5.6	H-10852
Shoal	1.6	60:17:27.773	147:50:49.432	22951	3.0	H-10852
Shoal	0.6	60:19:18.990	147:44:44.332	23307	1.2	H-10852
Shoal	8.8	60:17:48.249	147:56:33.115	42254	16.2	H-10852
Shoal	1.5	60:17:21.387	147:54:02.693	55080	2.8	H-10852
Shoal	5.2	60:20:22.223	147:54:48.370	56007	9.5	H-10852
Shoal	2.9	60:19:14.067	147:48:46.613	60308	5.3	H-10852
Rock Awash	-0.7	60:19:22.305	147:55:03.673	41740	-1.1	H-10852
Shoal	1.0	60:19:19.447	147:54:04.224	41704	1.9	H-10852
Rock Awash	-0.9	60:19:25.471	147:45:01.988	23302	-1.6	H-10852
Rock Awash	-0.2	60:19:14.118	147:44:17.157	23331	-0.4	H-10852
Rock Awash	-0.3	60:17:28.736	147:54:04.540	20203	-0.5	H-10852
Rock Awash	-0.1	60:17:09.226	147:54:16.406	20223	-0.2	H-10852
Rock Awash	-0.6	60:19:27.542	147:47:07.105	21287	-1.1	H-10852
Rock Awash	-1.1	60:20:26.833	147:53:36.296	24402	-2.0	H-10852
Rock Awash	-2.5	60:18:55.218	147:52:59.016	41387	-4.5	H-10852
Rock Awash	-0.1	60:20:55.284	147:51:49.349	43863	-0.2	H-10829
Shoal	3.8	60:20:32.289	147:50:03.077	41140	7.0	H-10829
Shoal	6.6	60:22:53.912	147:48:31.327	46856	12.2	H-10829
Shoal	4.6	60:23:30.942	147:48:28.360	22821	8.4	H-10829
Shoal	3.5	60:24:05.662	147:46:40.037	22240	6.5	H-10829
Rock Awash	-1.2	60:21:26.017	147:52:43.494	42575	-2.2	H-10829

The following dangers to navigation affect chart 16701, 17th edition, 1998, 1:81,436, chart 16705, 17th edition, 1997, 1:80,000, and chart 16700, 25th edition, 1996, 1:200,000.

Feature	Depth (fm)	Latitude (N)	Longitude (W)	Position #	Depth (m)	Survey #
Shoal	4.7	60:24:31.500	147:50:51.381	50534	8.7	H-10829
Shoal	1.6	60:23:10.415	147:52:43.511	42543	2.9	H-10829
Shoal	3.4	60:24:24.829	147:51:45.403	50432	6.3	H-10829
Shoal	3.3	60:23:37.314	147:48:44.568	46918	6.1	H-10829

The following dangers to navigation affect chart 16705, 17th edition, 1997, 1:80,000, and chart 16700, 25th edition, 1996, 1:200,000.

Feature	Depth (fm)	Latitude (N)	Longitude (W)	Position #	Depth (m)	Survey #
Shoal	2.7	60:31:04.582	147:41:40.031	20721	4.9	H-10838
Shoal	8.3	60:31:08.166	147:42:07.405	20766	15.2	H-10838
Shoal	4.9	60:31:52.922	147:40:27.188	88872	9.0	H-10838
Shoal	2.5	60:32:48.488	147:40:15.980	85877	4.6	H-10838
Shoal	2.3	60:32:57.334	147:39:48.222	87115	4.2	H-10838
Shoal	4.6	60:34:08.738	147:36:52.297	82638	8.4	H-10838
Shoal	1.3	60:34:57.193	147:34:15.162	85280	2.4	H-10838
Shoal	3.0	60:35:05.658	147:34:08.751	85172	5.5	H-10838
Shoal	4.0	60:35:03.773	147:33:40.229	85470	7.3	H-10838
Shoal	4.6	60:27:59.07	147:48:09.45	41530	8.5	H-10853
Shoal	1.3	60:27:29.98	147:45:41.75	20730	2.4	H-10853

ADVANCE
INFORMATION

Lotus cc:Mail for FOO Rainier

	Shoal	9.1	60:27:22.07	147:45:25.47	50663	16.7	H-10853
	Shoal	6.5	60:27:04.46	147:43:36.05	22059	11.9	H-10853
	Shoal	2.5	60:27:51.34	147:43:23.12	53069	4.7	H-10853
	Rock	0.2	60:29:44.20	147:43:47.67	21263	0.3	H-10853
	Shoal	2.4	60:30:54.85	147:43:04.58	26488	4.5	H-10853
*	Shoal	9.1	60:31:34.11	147:42:22.66	26021	16.7	H-10853
	Shoal	0.8	60:30:24.49	147:40:04.21	SWMB	1.4	H-10853
	Shoal	6.3	60:29:55.32	147:40:29.20	54546	11.5	H-10853
	Shoal	5.2	60:29:05.25	147:40:09.45	57324	9.5	H-10853
	Shoal	2.3	60:29:00.51	147:40:17.10	54231	4.2	H-10853
	Shoal	8.2	60:29.42.42	147:40:38.94	54446	15.1	H-10853
	Rock Awash	-0.8	60:29:57.35	147:41:10.87	53903	-1.4	H-10853
	Rock	0.9	60:27:52.43	147:43:37.07	24745	1.7	H-10853
	Reef	1.4	60:26:46.43	147:43:08.84	42546	2.6	H-10853

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-98 and Danger to Navigation message RA-10-98. More information on current RAINIER survey projects may be obtained by e-mail; contact the Field Operations Officer at FOO.RAINIER@NOAA.GOV.

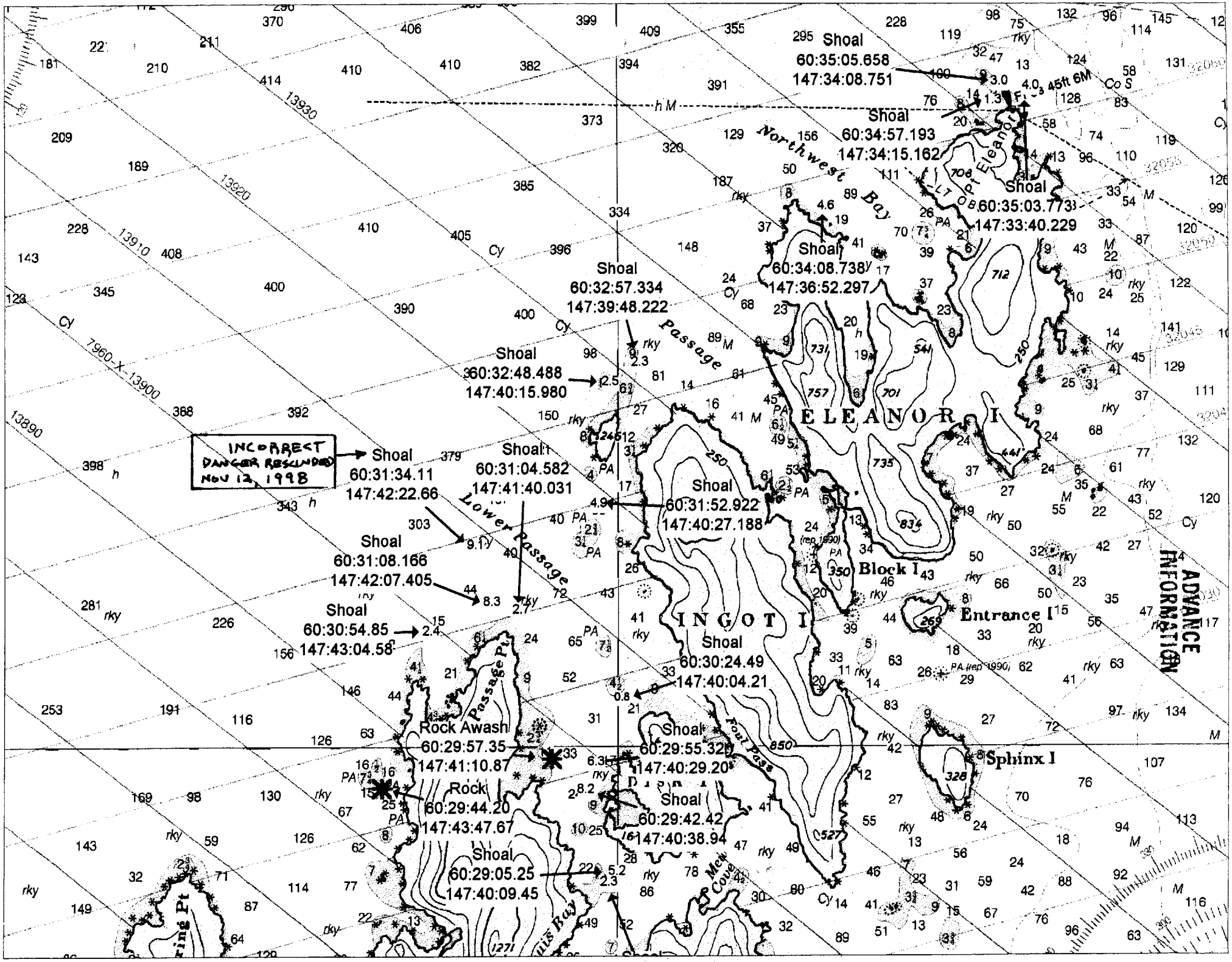
Sincerely,

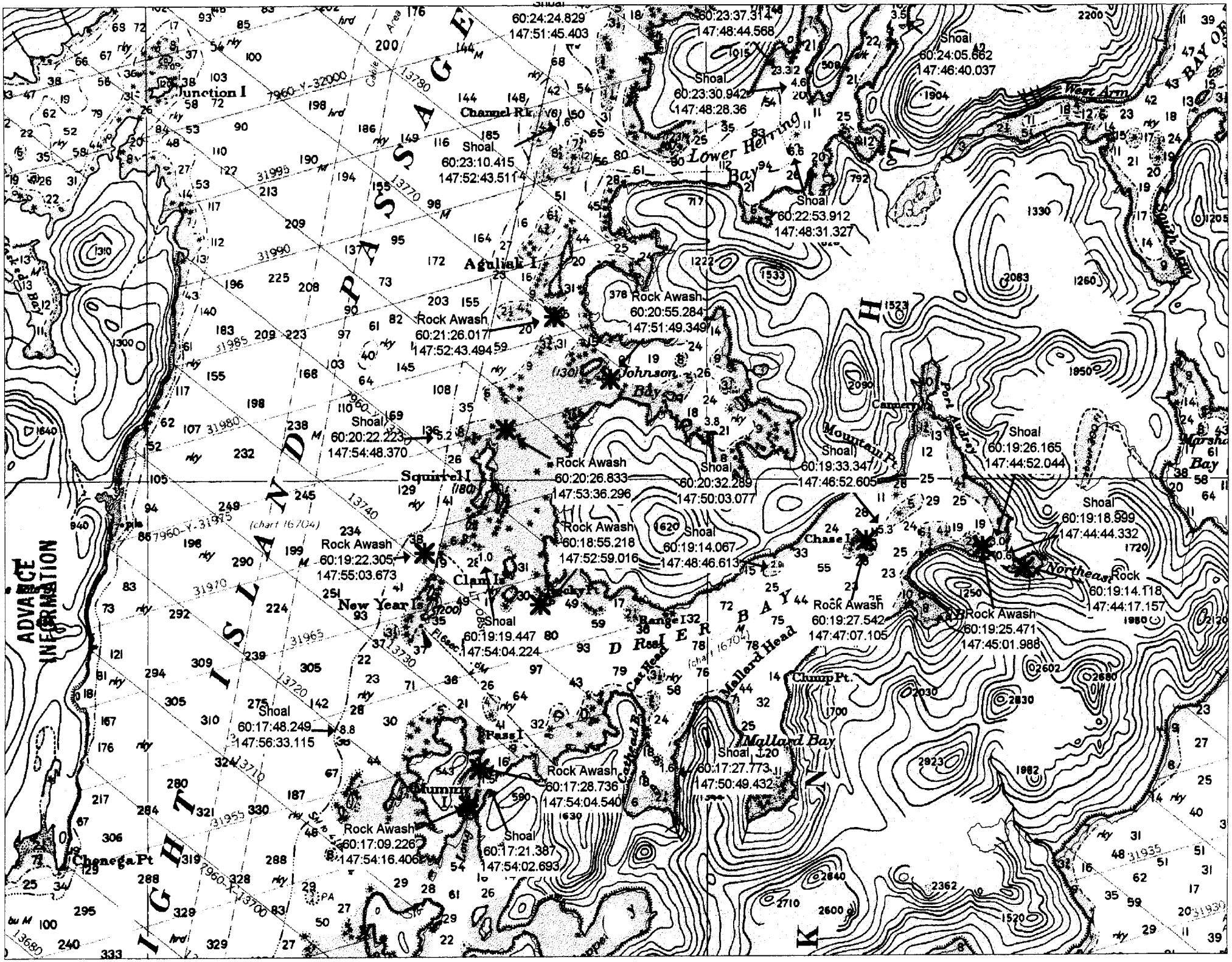
Alan D. Anderson
Captain, NOAA
Commanding Officer

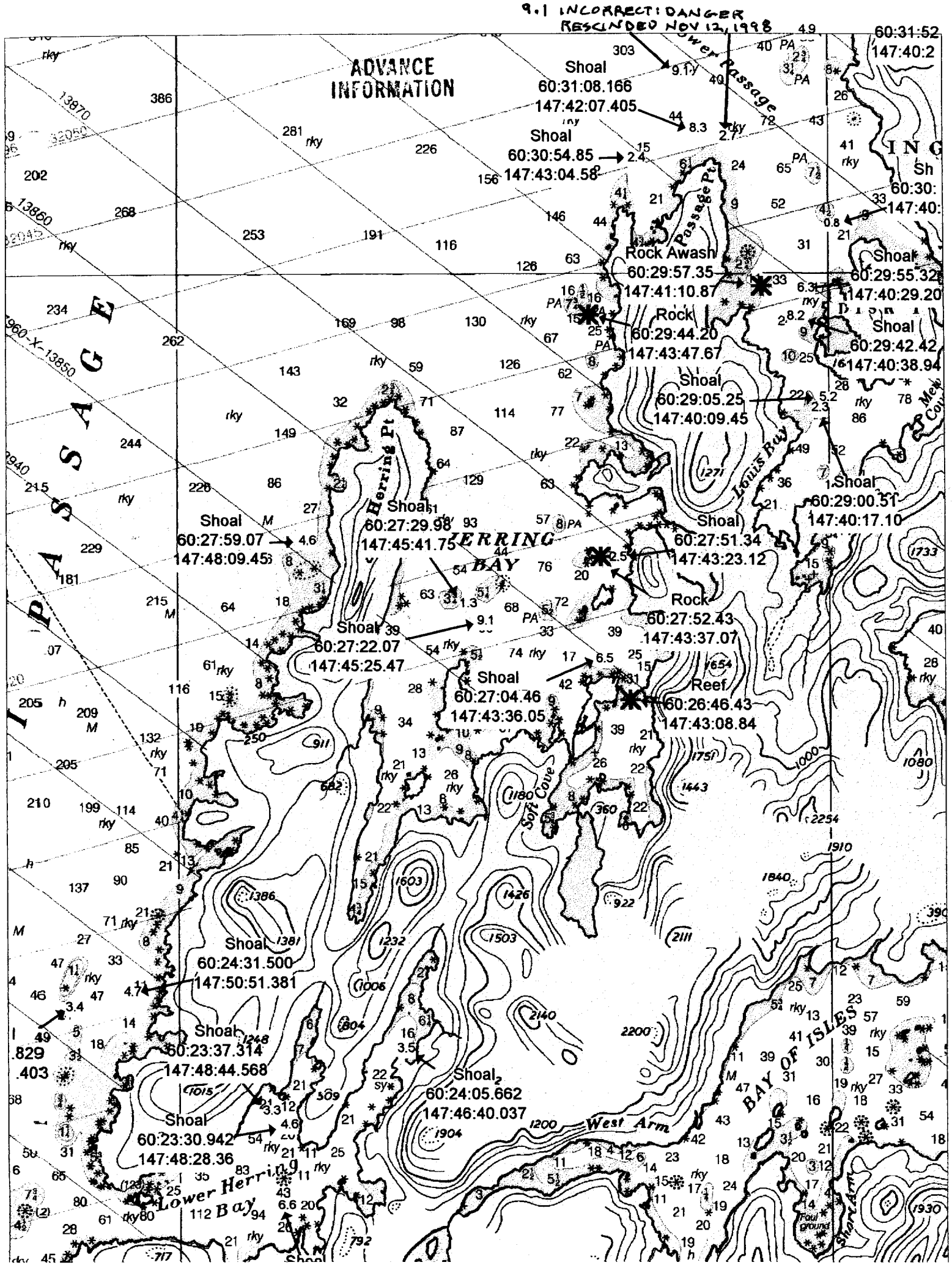
Attachment

cc: NIMA
PMC
N/CS261
N/CS34

* THIS DANGER RESCINDED IN NOVEMBER 12, 1998 LETTER TO COMMANDER, 17TH COAST GUARD DISTRICT (ATTACHED)


Shoal
60:35:05.658
147:34:08.751
Shoal
60:34:57.193
147:34:15.162
Shoal
60:35:03.773
147:33:40.229
Shoal
60:34:08.738
147:36:52.297
Shoal
60:32:57.334
147:39:48.222
Shoal
60:32:48.488
147:40:15.980
INCORRECT
DANGER RESCINDED
NOV 12, 1998
Shoal
60:31:34.11
147:42:22.66
Shoal
60:31:04.582
147:41:40.031
Shoal
60:31:52.922
147:40:27.188
Shoal
60:31:08.166
147:42:07.405
Shoal
60:30:54.85
147:43:04.58
Shoal
60:30:24.49
147:40:04.21
Rock Awash
60:29:57.35
147:41:10.87
Shoal
60:29:55.320
147:40:29.20
Rock
60:29:44.20
147:43:47.67
Shoal
60:29:42.42
147:40:38.94
Shoal
60:29:05.25
147:40:09.45
Northwest Bay
Passage
Lower Passage
Passage Pt
Foul Pass
Mew Cove
ELEANOR I
INGOT I
Block I
Entrance I
Sphinx I
ADVANCE INFORMATION


ADVANCE INFORMATION
PASSAGE
ISLAND
CHANNEL
BAY
Junction I
Channel Rk
Lower Herring Bay
West Arm
BAY OF
Aguliak I
Rock Awash
60:20:55.284
147:51:49.349
Rock Awash
60:21:26.017
147:52:43.494
Johnson Bay
Squirrel I
Rock Awash
60:20:26.833
147:53:36.296
Shoal
60:20:22.223
147:54:48.370
Shoal
60:20:32.289
147:50:03.077
Shoal
60:19:33.347
147:46:52.605
Mountain Pt
Cannery
Port Audley
Shoal
60:19:26.165
147:44:52.044
Shoal
60:19:18.999
147:44:44.332
Northeast Rock
60:19:14.118
147:44:17.157
Rock Awash
60:19:25.471
147:45:01.988
Rock Awash
60:19:27.542
147:47:07.105
Chase I
Shoal
60:19:14.067
147:48:46.613
Rock Awash
60:18:55.218
147:52:59.016
Clam I
New Year I
Shoal
60:19:19.447
147:54:04.224
Range
Rock Awash
60:19:22.305
147:55:03.673
Shoal
60:17:48.249
147:56:33.115
Pass I
Mummy I
Rock Awash
60:17:28.736
147:54:04.540
Shoal
60:17:21.387
147:54:02.693
Rock Awash
60:17:09.226
147:54:16.406
Chenega Pt
Cut Head
Mallard Head
Chump Pt.
Mallard Bay
Shoal
60:17:27.773
147:50:49.432
Shoal
60:23:37.314
147:48:44.568
Shoal
60:24:24.829
147:51:45.403
Shoal
60:24:05.662
147:46:40.037
Shoal
60:23:30.942
147:48:28.36
Shoal
60:23:10.415
147:52:43.511
Shoal
60:22:53.912
147:48:31.327
Cable Area
7960-Y-32000
7960-Y-31975
7960-Y-13700
31995
31990
31985
31980
31970
31965
31955
31935
13780
13770
13740
13730
13720
13710
13680
(chart 16704)


9.1 INCORRECT DANGER RESCINDED NOV 12, 1998
ADVANCE INFORMATION
Shoal
60:31:08.166
147:42:07.405
Shoal
60:30:54.85
147:43:04.58
Rock Awash
60:29:57.35
147:41:10.87
Rock
60:29:44.20
147:43:47.67
Shoal
60:29:05.25
147:40:09.45
Shoal
60:27:59.07
147:48:09.45
Shoal
60:27:29.98
147:45:41.75
Shoal
60:27:22.07
147:45:25.47
Shoal
60:27:04.46
147:43:36.05
Shoal
60:27:51.34
147:43:23.12
Rock
60:27:52.43
147:43:37.07
Reef
60:26:46.43
147:43:08.84
Shoal
60:24:31.500
147:50:51.381
Shoal
60:23:37.314
147:48:44.568
Shoal
60:23:30.942
147:48:28.36
Shoal
60:24:05.662
147:46:40.037
Shoal
60:29:55.32
147:40:29.20
Shoal
60:29:42.42
147:40:38.94
Shoal
60:29:00.51
147:40:17.10
60:31:52
147:40:2
Sh
60:30:
147:40:
PASSAGE
Herring Pt
HERRING BAY
Louis Bay
Soft Cove
West Arm
BAY OF ISLES
Lower Herring Bay
Shan Arm
Passage Pt
Mew Cove

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
November 12, 1998

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

ADVANCE INFORMATION

Dear CDR Hamblett:

On November 2, 1998 a list of dangers to navigation was forwarded for publication in the Local Notice Mariners. It is requested that the following danger to navigation from that list not be included in the Local Notice to Mariners. The NOAA Ship RAINIER has determined that the shoal sounding listed below is erroneous. The sounding is shown graphically on the attached chartlet.

The following sounding was listed as affecting chart 16705, 17th edition, 1997, 1:80,000, and chart 16700, 25th edition, 1996, 1:200,000.

Feature	Depth (fm)	Latitude (N)	Longitude (W)	Position #	Depth (m)	Survey #
Shoal	9.1	60:31:34.11	147:42:22.66	26021	16.7	H-10853

This is advance information subject to office review. Questions concerning this letter should be directed to the Field Operations Officer, (206) 553-4794. Refer to survey project OPR-P139-RA-98 and Danger to Navigation message RA-10-98 (revision). More information on current RAINIER survey projects may be obtained by e-mail; contact the Field Operations Officer at FOO.RAINIER@NOAA.GOV.

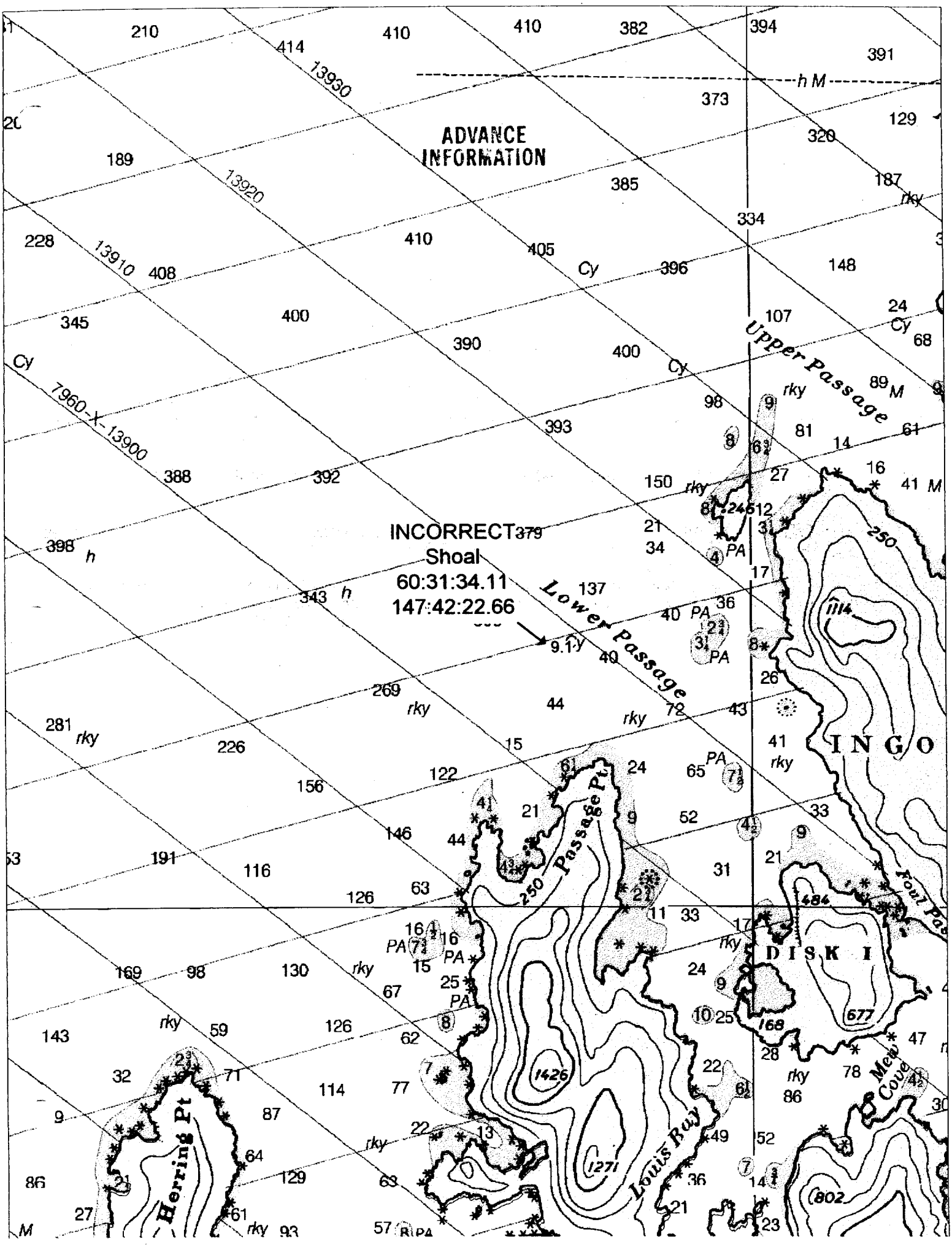
Sincerely,

Alan D Anderson

Alan D. Anderson
Captain, NOAA
Commanding Officer

Attachment

cc: NIMA
PMC
N/CS261
N/CS34


ADVANCE
INFORMATION
INCORRECT
Shoal
60:31:34.11
147:42:22.66
Upper Passage
Lower Passage
250 Passage Pt
Herring Pt
Louis Bay
Foul Pas
Mew Cove
INGO
DISKI
13930
13920
13910
7960-X-13900
h M
Cy
rky
PA
1426
1271
802
677
484
168
1114

ADVANCE
INFORMATION

Date: 11/12/98
Sender: FOO Rainier
To: lnm@cgalaska.uscg.mil
cc: dhill@pachydro.noaa.gov, navinfonet@nima.mil, Lynn [NDS-NCG22] Preston, Chief Survey Technician Rainier, CO Rainier, Jim [PHS-NCG245] Gardner, jgardner@pachydro.noaa.gov
Priority: Normal
Subject: DtoN for PWS 1998 revision

The following danger to navigation listed on a previous e-mail sent by the NOAA Ship RAINIER on 02 November 1998 (Danger to Navigation message RA-10-98) has been found to be an erroneous sounding and should not be included in Notices to Mariners:

The following dangers to navigation affect chart 16705, 17th edition, 1997, 1:80,000, and chart 16700, 25th edition, 1996, 1:200,000.

Feature	Depth (fm)	Latitude (N)	Longitude (W)	Position #	Depth (m)	Survey #
Shoal	9.1	60:31:34.11	147:42:22.66	26021	16.7	H-10853

Please omit any reference to the above noted shoal sounding in the Notice to Mariners. Questions concerning this revision should be directed to the NOAA Ship RAINIER, Field Operations Officer at (206) 553-4794 or FOO.RAINIER@noaa.gov.

APPROVAL SHEET

for

H-10853

RA-10-11-98

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

The field sheet and accompanying records have been examined 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,

Alan D. Anderson
Captain, NOAA
Commanding Officer
NOAA Ship RAINIER

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE: March 26, 1999

HYDROGRAPHIC BRANCH: Pacific

HYDROGRAPHIC PROJECT: OPR-P139-RA-98
HYDROGRAPHIC SHEET: H-10853

LOCALITY: Prince William Sound, AK
Herring Bay
TIME PERIOD: Jul 21 - Oct 09, 1998

TIDE STATION USED: 945-4050 Cordova, AK
Lat. 60° 33.5'N Lon. 145° 45.2'W
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 3.529 meters

TIDE STATION USED: 945-4240 Valdez, AK
Lat. 61° 07.5'N Lon. 146° 21.7'W
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 3.389 meters

TIDE STATION USED: 945-4564 Seal Island, AK
Lat. 60° 25.8'N Lon. 147° 25.3'W
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 3.310 meters

TIDE STATION USED: 945-4691 Herring Point, Knight Island, AK
Lat. 60° 28.4'N Lon. 147° 47.6'W
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 3.326 meters

REMARKS: RECOMMENDED ZONING
Use zone(s) identified as: PWS38 & PWS38A.

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.

Note 2: Use tide data from the appropriate station for each zone according to the order in which they are listed in the Tidezone corrector files (note: this may not be the same order as presented on the Tide Note). For example, tide station one (TS1) would be the first choice for an applicable zone followed by TS2, etc. when data are not available. All zones within a survey sheet may not have the same order of applicable tide stations.

Thomas N. Neu 3/25/99

CHIEF, REQUIREMENTS AND DEVELOPMENT DIVISION

Final tide zone node point locations for OPR P139-RA-98,
Sheet H-10853.

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 PWS38			
-147.785618 60.363112	945-4691	0	1.00
-147.667831 60.449911	945-4240	0	0.98
-147.696614 60.466536	945-4050	0	0.94
-147.695431 60.508907			
-147.656563 60.531857			
-147.626594 60.514644			
-147.578232 60.539507			
-147.567302 60.56881			
-148.101183 60.592465			
-148.114598 60.574838			
-148.128786 60.481602			
-148.012385 60.476742			
-148.011446 60.457767			
-148.054039 60.428791			
-148.008357 60.372318			
-147.785618 60.363112			
Zone PWS38A			
-147.618284 60.490075	945-4564	0	1.02
-147.634898 60.474627	945-4691	0	1.01
-147.667831 60.449911	945-4240	0	0.99
-147.696614 60.466536	945-4050	0	0.95
-147.695431 60.508907			
-147.656563 60.531857			
-147.626594 60.514644			
-147.618284 60.490075			

1998 FINAL FIELD TIDE NOTE

Louis Bay, AK
(945-4642)

Project: OPR-P139, Prince William Sound, Alaska

The operating tide stations at Cordova (945-4050), and Valdez (945-4240) serve as control for datum determination for this project. Louis Bay, Alaska (945-4642) tide station serves to provide information on zoning, tidal reducers, and harmonic constants for predictions. Louis Bay, Alaska (945-4642) serves zones PWS37 and PWS38.

Geographic Locale - 60° 27.6360' N, 147° 40.3394' W (NAD 83)
Determined by DGPS

Installation Date - July 26, 1998

Removal Date - October 15, 1998

Gauge Type - Sutron 8200 digital gauge, Unit A3 (GOES Unit)

Installation - The station was positioned approximately 3-4 m above the apparent high water line. The tide gauge instrument box was secured to trees and rocks with parachute chord and covered with a tarp to protect it from the weather.

The orifice is bolted into a rock ledge face and sits 6-12 inches off the bottom, and is approx 3-4 meters below MLLW.

Staff - A 3.0m staff was made by attaching a vitrified scale to a 2x4 piece of lumber. The staff was secured to the face of a rock ledge using lagbolts and shields. The staff was held at the base with angle iron and braced at the top with 2x4 lumber.

The staff stop was the top of a hex head nut screwed into the staff. The staff stop measured 2.222 meters above staff zero.

Gauge – Staff Comparison - The average gauge – staff difference was 4.290 m during initial three-hour observations. Additional observations totaling 7 hrs were taken from 8-04-98 to 10-15-98. The average gauge – staff difference for these subsequent observations was 4.316 m. The average gauge – staff difference for all observations was 4.305 m.

Gauge Time - Universal Coordinated Time.

Bench Marks – The following benchmarks were recovered at this site:
(Please refer to attached Bench Mark Recovery Forms NOAA 76-89)

BM A, 1978
BM B, 1978
BM C, 1978

The following benchmarks were established at this site:
(Please refer to attached Bench Mark Description Forms NOAA 76-75)

BM D, 1998
BM E, 1998

Levels - Opening levels closed within NOS tolerances on 7-23-98.
Closing levels closed within NOS tolerances on 10-15-98.
Opening and closing levels agreed within 0.0012 meters, except for section BM B to BM D, which differed by .0141 meters. The difference can be attributed to adverse weather conditions during opening levels and the closing levels for section BM B to BM D should be considered more accurate.

Digital Records - Digital data files are stored on compact disk (CD).

File	From	To
94546421.da1	7-26-98 (1949 UTC)	8-04-98 (1725 UTC)
94546421.da2	8-03-98 (0001 UTC)	8-12-98 (1737 UTC)
94546421.da3	8-12-98 (0001 UTC)	8-18-98 (2349 UTC)
94546421.da4	8-18-98 (0001 UTC)	9-02-98 (1925 UTC)
94546421.da5	9-03-98 (0001 UTC)	9-06-98 (0019 UTC)
94546421.da6	9-06-98 (0001 UTC)	9-16-98 (0031 UTC)
94546421.da7	9-16-98 (0001 UTC)	9-24-98 (1919 UTC)
94546421.da8	9-24-98 (0001 UTC)	10-06-98 (1907 UTC)
94546421.da9	10-06-98 (0001 UTC)	10-15-98 (0249 UTC)

Station Comments

Gap in data from 9-02-98 (1925 UTC) to 9-03-98 (0001 UTC) was due to faulty downloading.

NOAA FORM 76-155
(11-72)

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

SURVEY NUMBER

H-10853

GEOGRAPHIC NAMES

Name on Survey	A ON CHART NO. 16705	B ON PREVIOUS SURVEY NO.	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							1
DISK ISLAND	X		X							2
HERRING BAY	X		X							3
HERRING POINT	X		X							4
KNIGHT ISLAND	X		X							5
KNIGHT ISLAND PASSAGE	X		X							6
LOUIS BAY	X		X							7
LOWER PASSAGE	X		X							8
PASSAGE POINT	X		X							9
PRINCE WILLIAM SOUND	X		X							10
SOFT COVE	X		X							11
										12
										13
										14
										15
										16
										17
										18
										19
										20
										21
										22
										23
										24
										25

Approved:

Dennis J. Kroesbury

Chief Cartographer MAR 8 1999

NOAA FORM 76-155 SUPERSEDES C&GS 197

NOAA FORM 77-27(H) (9-83)

U.S. DEPARTMENT OF COMMERCE

HYDROGRAPHIC SURVEY STATISTICS

REGISTRY NUMBER: H-10853

RECORDS ACCOMPANYING SURVEY: To be completed when survey is processed.

RECORD DESCRIPTION	AMOUNT	RECORD DESCRIPTION	AMOUNT
SMOOTH SHEET	1	SMOOTH OVERLAYS: POS., ARC, EXCESS	N/A
DESCRIPTIVE REPORT	1	FIELD SHEETS AND OTHER OVERLAYS	N/A

DESCRIPTION	DEPTH/POS RECORDS	HORIZ. CONT. RECORDS	SONAR-GRAMS	PRINTOUTS	ABSTRACTS/ SOURCE DOCUMENTS	
ACCORDION FILES	2					
ENVELOPES						
VOLUMES						
CAHIERS						
BOXES				1		

SHORELINE DATA

SHORELINE MAPS (List):	DM 10294, DM 10297
PHOTOBATHYMETRIC MAPS (List):	N/A
NOTES TO THE HYDROGRAPHER (List):	N/A
SPECIAL REPORTS (List):	N/A
NAUTICAL CHARTS (List):	Chart 16705, 18th Ed., March 27, 1999

OFFICE PROCESSING ACTIVITIES

The following statistics will be submitted with the cartographer's report on the survey

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	736		736
COMPARISON WITH PRIOR SURVEYS AND CHARTS			
EVALUATION OF SIDE SCAN SONAR RECORDS			
EVALUATION OF WIRE DRAGS AND SWEEPS			
EVALUATION REPORT		52	52
GEOGRAPHIC NAMES			
OTHER* (Chart Compilation)		92	92
*USE OTHER SIDE OF FORM FOR REMARKS — TOTALS	736	144	880

Pre-processing Examination by: J.Ferguson, G.Nelson, M.Bigelow	*Beginning Date*: 2/2/99	*Ending Date*: 10/22/99
Verification of Field Data by: R.Mayor, E.Domingo, CJ Barry, M. Lathrop	*Time (Hours)*: 736	*Ending Date*: 1/31/00
erification Check by: D.Hill	*Time (Hours)*: 10	*Ending Date*: 1/10/00
Evaluation and Analysis by: CJ Barry	*Time (Hours)*: 52	*Ending Date*: 2/7/99
Inspection by: D.Hill	*Time (Hours)*: 5	*Ending Date*: 3/16/00

☆ U.S. GOVT. PRINTING OFFICE 1983: 764-006/6061

EVALUATION REPORT
H-10853

A. PROJECT
The hydrographer's report contains a complete 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 a 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 limits of supersession accompanies this report as Attachment 1.

The bottom consists mainly of mud and sand, with additional components including shells, pebbles and gravel. Depths generally range from less than one fathom along the shoreline and in areas of shoal developments, to 379 fathoms in the northern extreme of the survey area.

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 adequately addressed 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 names 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 Hydrographic Survey Guideline No. 35 and No. 75.

The data are plotted using a Modified Transverse Mercator (MTM) projection and are depicted on a single sheet.

E. SONAR EQUIPMENT
Side scan sonar equipment was not used.

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, dynamic draft, and sound velocity. Additional reducers for multibeam survey data include 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 have been 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 from tide gauges Seal Island, Alaska, 945-4564 and Herring Point, Knight Island, Alaska, 945-4691.

H. CONTROL STATIONS

Section H and I of the hydrographer's report contain adequate discussions of horizontal control and hydrographic positioning.

The positions of horizontal control stations used during hydrographic operations are published and field values based on NAD 83. The geographic positions of all survey data are based on NAD 83. The smooth sheet is annotated with an NAD 27 adjustment tick based on values determined with the NGS program NADCON. Geographic positions based on NAD 27 may be plotted on the smooth sheet utilizing the NAD 83 projection by applying the following corrections:

Latitude:	-2.018 seconds (-62.469 meters)
Longitude:	7.372 seconds (112.618 meters)

I. HYDROGRAPHIC POSITION CONTROL

Differential GPS (DGPS) was used to control this survey. A horizontal dilution of precision (HDOP) not to exceed 4.0 for 1:10,000 was computed for survey operations. The quality of some positions exceeded limits in terms of HDOP. These positions are isolated and occur randomly throughout the survey area. A review of the data, however, suggests that none of these fixes are used to position dangers to navigation. The features or soundings located by these fixes are consistent with the surrounding information. These fixes are considered acceptable. NAD 83 is used as the horizontal datum for plotting and position computations.

During shallow water multibeam (SWMB) data gathering, satellite configuration as indicated by HDOP and the number of satellites, is monitored visually on HYPACK. The final positions are provided by the POS-MV that combines the DGPS position with inertial navigation information. In the event that the differential GPS corrector signal is lost, the POS-MV will continue to provide positions based on inertial navigation. Data was analyzed during processing to ensure it contained no significant errors.

For IDSSS ship's multibeam, the satellite configuration, as indicated by HDOP, and the number of satellites are monitored visually on the IDSSS and receiver displays. Data are not collected when HDOP exceeds 4.0. In the event that the differential GPS corrector signal is lost, the receiver makes a switch to P-Code automatically. Although P-Code accuracy is less than DGPS, at 0.5mm or better it is sufficient for a survey of 1:10,000 scale.

DGPS performance checks were conducted in the field and found adequate. Additional information concerning specific control system type, 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 DM10294 and DM-10297 were compiled on NAD 83 and applied to this survey. Shoreline drawn on the smooth sheet in black originates from the above digital data as provided by the Coastal Mapping Program. The shoreline data and the hydrographic data were merged in MicroStation during the compilation of the smooth sheet.

The shoreline maps and the results of the fieldwork as portrayed in red on the smooth sheet should supersede charted shoreline. GWM 4/18/00

K. CROSSLINES

Crosslines are adequately discussed in the hydrographer's report.

L. JUNCTIONS

Survey H-10853 junctions with the following surveys.

Survey	Year	Scale	Area
H-10729	1996	1:40,000	West
H-10829	1998	1:10,000	Southwest
H-10837	1998	1:10,000	Northeast
H-10838	1998	1:10,000	North

The junctions with surveys H-10729, H-10829, H-10837 and H-10838 were not formally completed since these surveys were processed previously. However, depths are in good agreement within the common areas. "Adjoins" notes have been added to the smooth sheet. Soundings from junctioning surveys have been transferred in color within common areas to better delineate the bottom configuration and to support depth curves common to both surveys.

M. COMPARISON WITH PRIOR SURVEYS

The following prior surveys fall within the common area of the present survey and have been compared with during office processing.

Survey	Year	Scale	Datum
H-2916WD	1907	1:40,000	Valdez
H-3028	1909	1:20,000	Valdez
H-3187	1910	1:20,000	Valdez

Prior survey H-2916 is a wire drag survey, and prior surveys H-3028 and H-3187 were conducted using leadline and visual positioning.

Comparisons with the prior surveys were made using digital copies. The registration and legibility of these prior works to the present survey was fair to marginal. The surveys listed above cover the entire area of the present survey.

Differences in depths generally range from 0-2 fathoms between the prior and present surveys, with differences of up to 10 fathoms in places. There appears to be no consistent trend indicating a shoal or deep bias. However, some differences were found in excess of ten fathoms. There were two soundings with differences of as much as 29 fathoms found on survey H-3187, and four soundings with differences as much as 33 fathoms found on survey H-3028. The evaluator feels these differences are likely the result of erroneous leadline depths, positional errors, and/or sparse bottom coverage on the prior surveys. More thorough coverage of the area utilizing the shallow water multibeam system has revealed numerous shoal areas not detected during the earlier surveys. Smaller differences may be attributed to better bottom coverage, improved positioning and sounding techniques, and relative accuracy of the data acquisition methods.

In accordance with the Hydrographic Guideline No. 39, the effect 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.

Additional information regarding prior survey comparison is found in the hydrographer's report, section L.

Survey H-10853 is adequate to supersede the prior surveys within the common area.

N. ITEM INVESTIGATIONS

There were six AWOIS items assigned and investigated within the survey area. They have been adequately addressed in the hydrographer's report, section M.

O. COMPARISON WITH CHART

Survey H-10853 was compared with the following chart.

Chart	Edition	Date	Scale
16705	18th	March 27, 1999	1:80,000

a. Hydrography

Charted hydrography originates with the previously discussed prior surveys and has been adequately addressed in section M of the evaluation report and in the hydrographer's report, section N.

A charted feature originating from an unascertainable source was not addressed during survey operations. The feature was researched to the limits of PHB office resources. The feature, symbolized as a dangerous rock of unknown depth, is located at Latitude 60°26'19.0"N, Longitude 147°43'37.5"W. Present survey soundings of the area were obtained using shallow water multibeam and show an 8.7-fathom shoal. This feature has been removed from the chart and replaced with the appropriate sounding.

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.

Survey H-10853 adequate to supersede charted hydrography within the common area.

b. Dangers To Navigation

Sixteen dangers to navigation were identified during survey operations. These dangers were reported to the USCG, NIMA, N/CS261, and N/CS 34 on November 1, 1998. One of the reported dangers was revoked with a letter to the USCG, NIMA, N/CS261, and N/CS 3 dated November 12, 1998. There were no additional dangers to navigation found during office processing.

P. ADEQUACY OF SURVEY

Hydrography contained on survey H-10853 is adequate to:

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

With the exception of the following, 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 NOS Hydrographic Surveys Specifications and Deliverables, and the Field Procedures Manual, April 1998 Edition.

1) Excessive overlap with ad/joining surveys was performed. An adequate junction is affected when an overlap of at least one sounding line or equivalent distance is made with an adjoining survey except that, when the survey is continuous in the same year, by the same method, and by the same survey vessel, sounding overlaps are not required.

2) Shallow water multibeam data was insufficiently post-processed upon arrival at PHB. Office processing was required to reject outer beams and steep angle beam data. Additional extensive line-by-line CARIS cleaning was also required to remove erroneous pings originating from ambient and environmental noise, signal scattering and other sources.

3) The approval sheet submitted with the Hydrographer's Report was unsigned by the Rainier's Commanding Officer.

4) The comparison with chart 16705 failed to detect a disagreement between present survey sounding data and a charted feature represented by a dangerous rock of unknown depth symbol, at Latitude 60°26'19.0"N, Longitude 147°43'37.5"W. This discrepancy should have been investigated during survey operations.

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 and/or recommended for charting within the area of this survey.

R. STATISTICS

Statistics are adequately itemized in the hydrographer's report.

S. MISCELLANEOUS

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

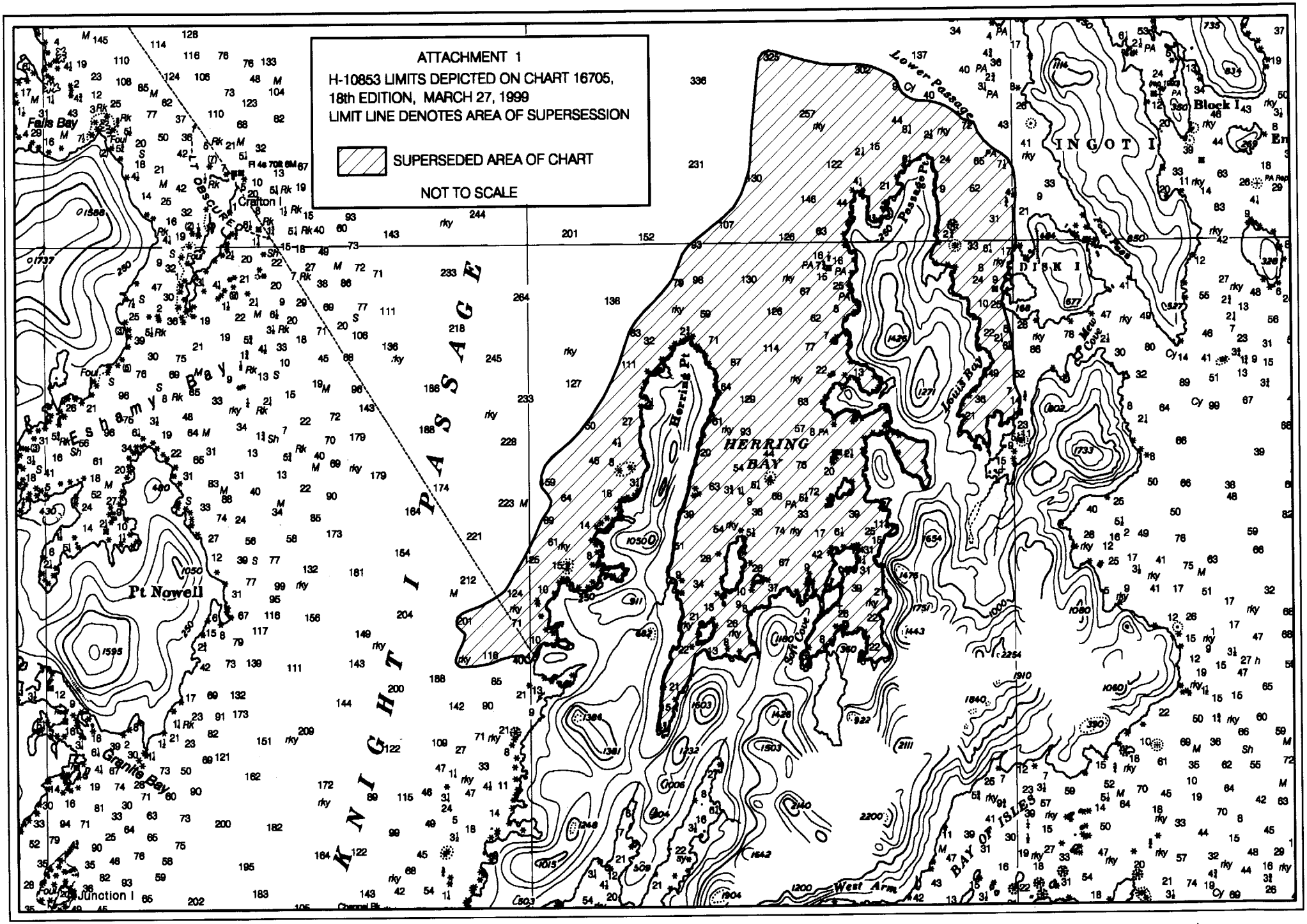
T. RECOMMENDATIONS

This is a good hydrographic survey. Additional work is recommended on a low priority basis to address the disagreement between a charted feature and survey soundings as mentioned in section P.

U. REFERRAL TO REPORTS

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

CJ Barry
Cartographer


ATTACHMENT 1
H-10853 LIMITS DEPICTED ON CHART 16705,
18th EDITION, MARCH 27, 1999
LIMIT LINE DENOTES AREA OF SUPERSESSION
SUPERSEDED AREA OF CHART
NOT TO SCALE
Falls Bay
Crafton I
OBSCURE I
Lower Passage
Block I
INGOT I
DISKI
Mary Cove
Herring Pt
HERRING BAY
Louis Bay
SOUTH PASSAGE
KNIGHT I
Pt Nowell
Granite Bay
Junction I
West Arm
BAY OF ISLES

APPROVAL SHEET
H-10853

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: 3-16-00

Dennis Hill
Chief, Cartographic Section
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: 3-17-00

James C. Gardner
Commander, NOAA
Chief, Pacific Hydrographic Branch

****

Final Approval

Approved:

Date: May 1, 2000

Samuel De Bow
CAPT, ~~Cdr,~~ NOAA
Chief, Hydrographic Surveys Division

NOAA FORM 75-96
(10-83)

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

MARINE CHART BRANCH

RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H-10853

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
16705	2/8/2000	CJ BARRY	Full Part Before After Marine Center Approval Signed Via FULL APPLICATION OF
			~~Drawing No.~~ SOUNDINGS, CURVES AND FEATURES FROM SMOOTH SHT
			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
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SUPERSEDES C&GS FORM 8352 WHICH MAY BE USED.