

H10838

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-10-15-98
Registry No. H-10838

LOCALITY

State Alaska
General Locality Southwest Prince William Sound
Sublocality Disk Island to Point Eleanor

1998

CHIEF OF PARTY
CAPT Alan D. Anderson, NOAA

LIBRARY & ARCHIVES

DATE JAN 9 2000

HYDROGRAPHIC TITLE SHEET

H-10838

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-10-15-98

State Alaska

General locality Southwest Prince William Sound

Locality Disk Island to Point Eleanor

Scale 1:10,000 Date of survey 8/23/98 - 9/4/98

Instructions dated July 10, 1998* Project No. OPR-P139-RA

Vessel RAINIER (2120), RA-1(2121), RA-2(2122), RA-3(2123), RA-4(2124), RA-5(2125)
RA-6(2126)

Chief of party CAPT Alan D. Anderson, NOAA

Surveyed by RAINIER Personnel

Soundings taken by ~~echo sounder, hand lead, pole~~ DSF-6000N, Knudsen 320M, IDSSS MB, RESON 8101 MB

Graphic record scaled by RAINIER Personnel

Graphic record checked by RAINIER Personnel

Evaluation by: R. Shipley Automated plot by HP 1050C

~~Processed by~~ M. Bigelow, D. Doles, R. Mayor, E. Domingo, R. Shipley

Verification by

Soundings in fathoms ~~feet~~ at ~~MLLW~~ MLLW (data collected in Meters)

REMARKS: All times 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 reference to mean lower low
water unless otherwise noted.

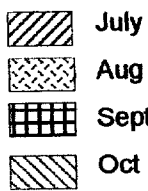
* Change #1 dated 9/8/98 Jweil/SURF
11/10/99 MCR

PROGRESS SKETCH

OPR-P139-98
Prince William Sound, AK
October

Capt A. D. Anderson
Commanding

Chart 16705_1



Sheet E
13.80 sq nm
100%

Sheet D
7.97 sq nm
100%

Sheet V
16.78 sq nm
100%

Sheet W
126.9 sq nm
100%

Sheet U
17.50 sq nm
100%

Sheet X
28.49 sq nm
100%

Sheet Z
21.18 sq nm
100%

Sheet Y
17.53 sq nm
100%

Sheet AA
12.92 sq nm
100%

Sheet AB
24.50 sq nm
100%

Sheet F
10.15 sq nm
100%

Sheet G
10.67 sq nm
100%

Accomplished	July	Aug	Sept	Oct
LNH Hydro	618.57*	969.99	2045.14	1676.19
LNH 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
LNH Multibeam	86.5	310.01**	429.9**	1113.9**

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

Sheet	Reg No	Started	Percent	Completed	Submitted	SQNM
G	H-10827	7/25	100	9/15		10.67
F	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	9/5/4		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

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

H-10838

Multibeam

Single beam

ELEANOR I

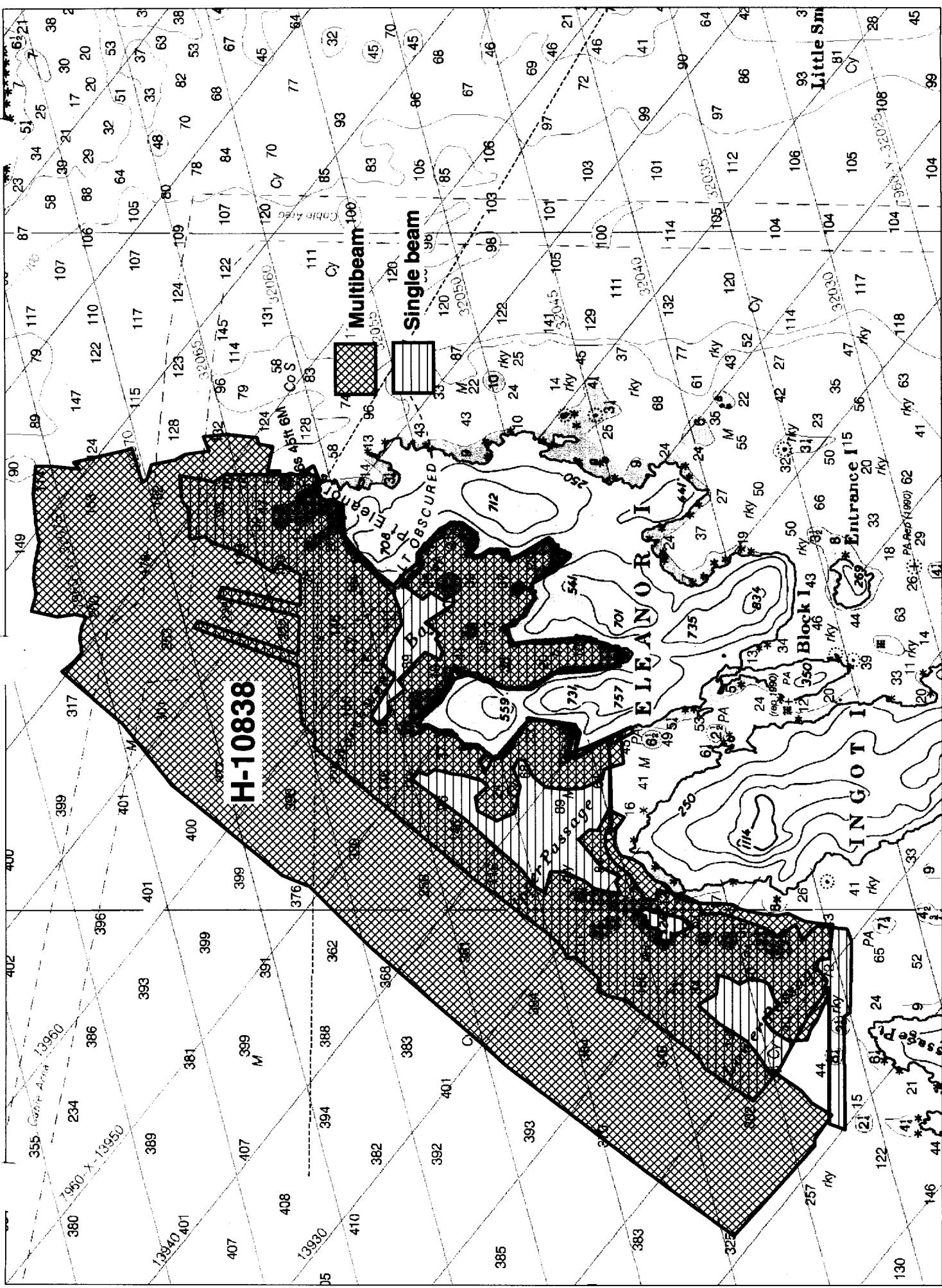
INGOT I

Block I 43

Entrance I 15

Entrance I 5

Little Sm



Descriptive Report to Accompany Hydrographic Survey H-10838

Field Number RA-10-15-98

Scale 1:10,000

November 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-10838 corresponds to sheet D as defined in the sheet layout. This survey will provide data to supersede prior surveys performed from 1907 through 1949 and will affect Charts 16700 and 16705. 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 REPORT, SECTION B.

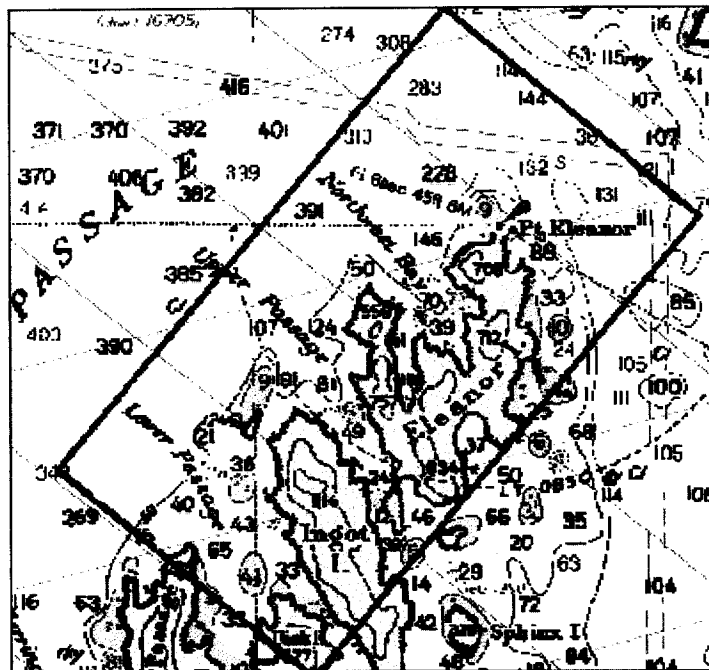


Figure 1. Survey area of H-10838.

The survey area is from Disk Island to Point Eleanor. The survey area is between 60°31'00"N and 60°37'00"N latitude, 147°~~34'30"~~^{33'00"}W and 147°~~44'00"~~^{44'35"}W longitude. Pleasure boats, fishing vessels and cruise ships have been sighted in this area. Though not observed, Northwest Bay may be used as an anchorage. Data acquisition was conducted from August 23 to September ~~6~~⁴, 1998 (DN 235 to 249). 7

C. SURVEY VESSELS ✓

Data were acquired by the RAINIER and The RAINIER survey launches 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. *SOFTWARE LISTINGS NOT 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, and 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. *Concur*

* FILED WITH THE SURVEY RECORDS

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. Concur

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 Hydrochart II sonar system with a depth capability of 10 to 1,000 meters. Rainier generally restricts the use of IDSSS to depths greater than 100m due to the inaccuracies associated with the IDSSS. These problems include the noise of the Hippy (especially when maneuvering in tight quarters), the use of real-time beamforming with no ability to re-apply incorrect sound velocity correctors, and the beam width/positioning/vertical resolutions of the system. The Hydrochart II sonar system utilizes two 36 kHz projector arrays to produce an athwartship transmitted fan of 17 beams covering a total of 135 degrees, a coverage swath of approximately 2.5 times the water depth.

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.

Explanatory Notes about Survey Depth Discrepancies in Steep and Deep Areas: ✓

Note 1: Discrepancies between the Knudsen and DSF-6000N echosounders can be noted in deep areas with extremely steep slopes, with DSF-6000N soundings usually being shoaler than Knudsen soundings. Inherent differences between the two measurement systems such as beam width, frequency, power output, receiver sensitivity, bottom tracking functions, and timing latency are greatly exaggerated in such areas, and consequently, differing depths between the two systems can be expected. Due to the extremely steep slopes and deepness of these areas, such differences are not significant to navigation and it is recommended that the shoaler of the soundings be charted. Concur with clarification (See Eval Rpt., Section P)

Note 2: The automated bottom tracking function of either singlebeam echosounder can begin following a relatively strong side lobe return and lose track of the weaker main beam return. Therefore, in steep areas, even when using a single, exclusive echosounder system, lines run in the off-shore direction can be shoaler than lines run in the in-shore direction. This is not significant to navigation as the difference is in the conservative direction and occurs in deep water and it is again recommended that the shoaler of the soundings be charted. Concur with clarification (See Eval Rpt., Section P)

* FILED WITH THE HYDROGRAPHIC DATA.

Note 3: It should be noted that throughout the 1998 Field Season, Rainier's Intermediate Depth Swath System (IDSSS) tended to compare well with the Knudsen in steep areas of overlapping coverage. It was also observed that the launch SWMB systems tended to compare well with the Knudsen in steep areas of overlapping coverage. All echosounding systems compared extremely well in flat areas and in areas with moderate slope. *CONCUR*

G. CORRECTIONS TO ECHO SOUNDINGS ✓

Sound Velocity Correctors: ✓

Seven sound velocity casts were used for this survey. Six were used for SWMB data, and the seventh was used for single beam and IDSSS data. Information on the cast used for singlebeam and IDSSS data acquisition is included in the Survey Information Summary Report. (ATTACHED)

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. *CONCUR*

Vessel Offset Correctors: ✓

Table 1. Dates and methods of measurements for vessel offset correctors used in survey H-10838.

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). A static draft and transducer offset for launches 2121, 2122, 2123, 2124, 2125, and 2126 were measured on March 26, 1998. RAINIER'S static transducer depth was determined during dry-dock in April 1998 using the form in Field Procedures Manual (FPM) Fig. 2.3. Offsets were applied on-line during data collection for RAINIER'S IDSSS data. For SWMB launches, offset tables were applied during CARIS processing. For singlebeam launches, offset tables were applied to the raw sounding data in HPS during post-acquisition processing. The offset tables are included with project data for OPR-P139-RA-98. Launches 2122, 2124 and 2125 are not equipped with heave, roll, and pitch sensors. *CONCUR*

* Filed with the hydrographic records.

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 were applied 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.

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

Table 2. Tide station information for survey H-10838.

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

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 25, 1999 IS ATTACHED.*

** Filed with the hydrographic records.*

H. HYDROGRAPHIC POSITION CONTROL ✓ SEE EVAL REPORT, 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.

THE CONTROL STATIONS USED FOR THIS SURVEY ARE LISTED IN THIS REPORT

All soundings were positioned using differential GPS (DGPS). The VHF differential reference station at ROCK was the primary source 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. REPORT, SECTION J.

N/NGS3 supplied photogrammetric shoreline in MapInfo format for DM-10294 for use as source shoreline. The DM shoreline was imported into Hypack for field verification. In addition, features shown on the current edition of Chart 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 offshore of the NALL were positioned with the launch's DGPS by taking Detached Positions. Features seen inshore of the NALL were not positioned. SHORELINE VERIFICATION DATA HAS BEEN ANALYZED DURING OFFICE PROCESSING AND SHOWN ON THE SMOOTH SHEET AS WARRANTED. Shoreline manuscript and field features were compared to an enlargement of Chart 16700 24th Ed. and Chart 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 17) 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 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 hydrographers representation of the features seen in-shore of the NALL while slowly transiting along the shore, and are intended to aid chart compilation.

Concur

Table 3. Detached Positions taken on new features.

FIX_NUMBER	CHARTED FEATURE	POSITION OF DP	OBSERVED FEATURE
40068	None	60°32'58.63"N 147°37'46.33"W ✓	Rock (2) ✓
40145	None	60°34'06.17"N 147°37'01.97"W ✓	Rock (2) ✓
20028	None	60°33'38.51"N 147°34'48.20"W ✓	Rock (3) ✓
20035	None	60°33'46.27"N 147°34'47.61"W ✓	Rock (2) ✓
20064	None	60°34'00.20"N 147°34'37.86"W ✓	Ledge ✓
20065	None	60°34'00.86"N 147°34'40.49"W ✓	Ledge ✓
20066	None	60°34'02.82"N 147°34'40.95"W ✓	Rock (1) ✓
20127	None	60°34'42.87"N 147°34'17.68"W ✓	Rock (3) ✓
20128	None	60°34'16.87"N 147°35'17.02"W ✓	Ledge ✓
20129	None	60°34'28.53"N 147°34'58.34"W ✓	Rock (3) ✓
41176	None	60°33'28.09"N 147°36'03.63"W ✓	Rock (5) ✓
41223	None	60°33'25.34"N 147°35'19.09"W ✓	Rock (3) ✓
41236	None	60°33'41.71"N 147°35'50.67"W ✓	Ledge ✓
41237	None	60°33'46.35"N 147°35'50.97"W ✓	Rock (3) ✓
40135	None	60°34'06.89"N 147°37'24.31"W ✓	Ledge ✓

Table 4. Detached Positions of features found during shoreline verification that differ from the DM manuscript.

FIX_NUMBER	DM FEATURE	POSITION OF DP	OBSERVED FEATURE
20065	None	60°34'00.86"N 147°34'40.49"W ✓	Ledge ✓
40135	None	60°34'06.89"N 147°37'24.31"W ✓	Ledge ✓

Concur
Concur

Table 5. Detached Positions of features found during shoreline verification that differ from the chart.

FIX_NUMBER	CHARTED FEATURE	POSITION OF DP	OBSERVED FEATURE
20065	None	60°34'00.86"N 147°34'40.49"W ✓	Ledge ✓
41081	Rock	60°33'57.47"N 147°36'39.27"W ✓	None ✓
40135	None	60°34'06.89"N 147°37'24.31"W ✓	Ledge (Islet) ✓

Concur
Concur
Concur

Detached Position number 41081 is the disapproval of a charted rock. It is recommended that the feature be removed from the chart.¹ Detached Position number 20065 is a ledge that surrounds a DM rock. The DM rock is actually part of the ledge.² Detached Position number 40135 is an offshore ledge of a DM islet.³ The DM islet, which was verified to be O.K. as charted, grades into a ledge that is connected to shore by a short gravel spit.

1. Concur
2. Concur
3. Concur

J. CROSSLINES ✓

Crosslines agreed very well with mainscheme hydrography. Depths generally agreed within one to five meters. An exception is on the west side of the survey and in other areas of extremely steep bathymetry, where relatively larger differences were seen as expected due to the inherent differences in the various measurement systems used. See Section F, Sounding Equipment, for more details. There were a total of 7.97 nautical miles of crosslines, comprising 9.9% of mainscheme hydrography.

K. JUNCTIONS ✓ SEE EVAL REPORT, SECTION L.

The following surveys junction with H-10838:

Registry #	Scale	Date	Junction side
H-10782 ✓	1:40,000	1997	North, Northwest, Northeast
H-10729	1:40,000	1996	Southwest
H-10840	1:10,000	1998	East
H-10837	1:10,000	1998	Southeast
H-10853	1:10,000	1998	South

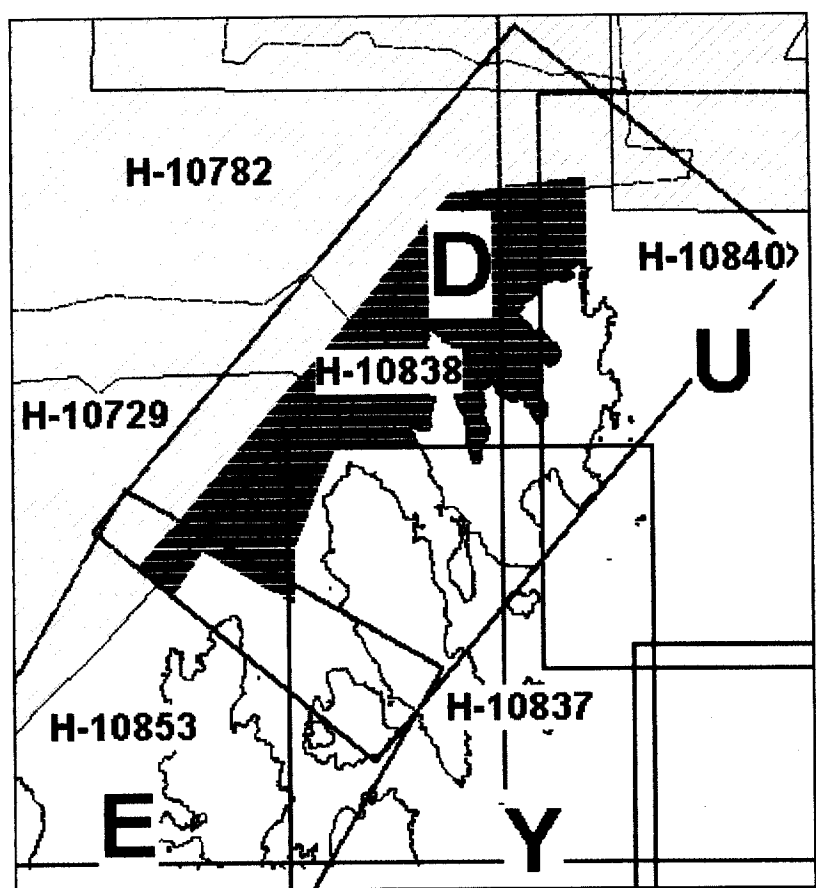


Figure 2. Surveys that junction with H-10838. Junction surveys H-10782 and H-10729 were conducted in 1997 and 1996 respectively. *Concur*

Soundings on these 1998 surveys were found to be in good agreement, generally matching within 1 to 2 meters. In areas greater than 200 meters where these surveys junction, the difference between coinciding soundings averaged 8.5 meters. In areas less than 100 meters, an average difference of 1.04 meters was calculated by taking random pairs of soundings from survey H-10838 and from junction surveys. Final comparisons will be made at the Pacific Hydrographic Branch (PHB) after reduction to final vertical datum.

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

The following prior surveys share common area with H-10838:

<u>Registry #</u>	<u>Scale</u>	<u>Date</u>	<u>Area covered</u>
H-3028	1:20,000	1909	Entire Survey
H-2916	1:40,000	1907	Central
H-7766	1:40,000	1949	Northern
H-7764	1:20,000	1949	Northern

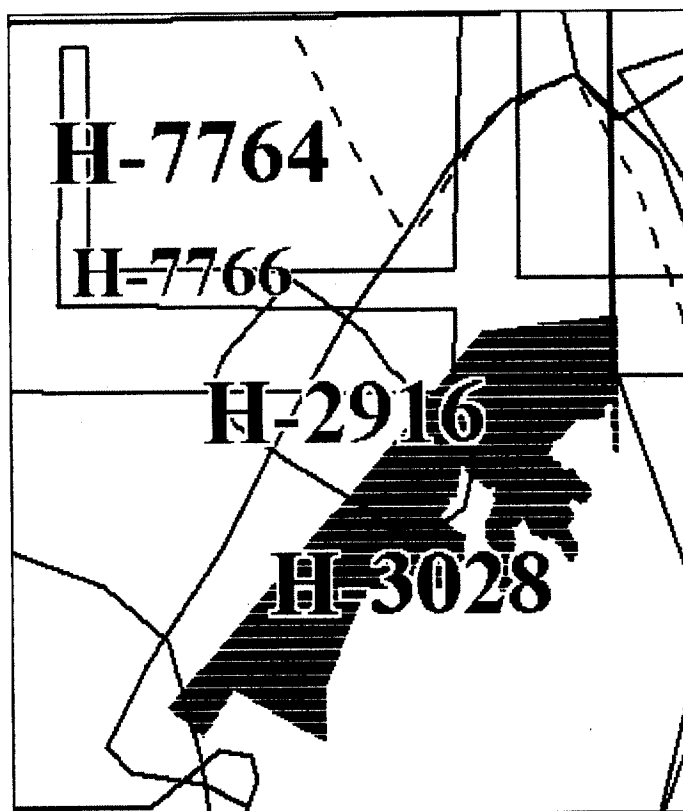


Figure 3. Prior survey coverage that pertains to survey H-10838.

Prior survey H-3028 covers the entire area of present survey H-10838. The prior soundings agreed well with the present survey, except below the 100 fathom (600ft) curve where the soundings from this survey vary from within 1 fathom (6ft) of the prior survey depths to greater than 6 fathoms (36ft). In these areas where there is significant differences between the prior and contemporary surveys, the current soundings were found to be shoaler than the prior soundings. *Concur*

Prior survey H-2916 depths are in ^{ADEQUATE} ~~good~~ agreement and only covers the northern portion of H-10838. Eight lead-line soundings are the only comparison. *REFER to TABLE 7 below*

The soundings from prior survey H-7764 tended to agree well with the data collected from singlebeam, Shallow Water MultiBeam, and ship hydrography for H-10838. However, at locations where soundings coincide, SWMB consistently obtained shoaler soundings. (see table 8). *Concur*

The digital version of prior survey H-7766 is, for the most part, illegible. However, one sounding was able to be compared to survey H-10838. The comparison agreed well (see table 9). *Concur*

Table 6. Depth comparison of H-10838 with prior survey H-3028.

Prior H-3028 (ft)	H-10838 (ft)	Position	Fix #	Type of Hydro
2002	2007 ✓ 334.5 Fms	60°34'03.18" ✓ 147°40'0.06" ✓	-----	IDSSS
1332	1302 ✓ 217 fms	60°35'2.35" ✓ 47°35'54.08" ✓	-----	IDSSS
475	424 ✓ 70.6 Fms	60°33'22.26" ✓ 47°39'11.77" ✓	22696	singlebeam
526	520 ✓ 86.6 Fms	60°33'2.71" ✓ 47°39'16.28" ✓	41856	singlebeam
107	64 ✓ 10.6 Fms	60°32'15.28" ✓ 47°40'31.85" ✓	86189	SWMB
132	72 ✓ 12 Fms	60°32'40.69" ✓ 47°40'14.42" ✓	86436	SWMB
137	134 ✓ 22.3 Fms	60°33'17.82" ✓ 47°34'53.69" ✓	81149	SWMB

Table 7. Depth comparison of H-10838 with prior survey H-2916.

Prior H-2916 (Fm)	H-10838 (Fm)	Position	Fix #	Type of Hydro
90	98	60°34'30.03" ✓ 147°37'36.30" ✓	43825	singlebeam
391	393.2	60°34'55.42" ✓ 147°38'31.63" ✓	-----	IDSSS
365	368	60°34'45.93" ✓ 147°39'27.95" ✓	-----	IDSSS
101	94.3	60°33'57.83" ✓ 147°38'21.76" ✓	43382	singlebeam
200	211.1	60°34'18.52" ✓ 147°39'01.90" ✓	-----	IDSSS

Table 8. Depth comparison of H-10838 with prior survey H-7764.

Prior H-7764 (Fm)	H-10838 ✕ (Fm)	Position	Fix #	Type of Hydro
115	109.4 ✓	60°35'34.03" 147°34'18.15"	-----	IDSSS
31	25.1 ✓	60°35'20.27" 147°34'00.42"	50606	singlebeam
237	238.4 ✓	60°35'42.63" 147°35'07.89"	-----	IDSSS
227	222.0 ✓	60°35'50.78" 147°35'06.27"	-----	IDSSS
49	45.1 ✓	60°35'23.27" 147°34'4.91"	84963	SWMB
101	100.6 ✓	60°35'9.07" ✓ 147°34'53.49" ✓	23305	singlebeam
164	165.1 ✓	60°35'5.28" ✓ 147°35'18.17" ✓	-----	IDSSS
39	13.1 ✓	60°34'52.56" ✓ 147°34'40.70" ✓	84269	SWMB
35	22.5 ✓ 23.0	60°34'57.88" ✓ 147°34'39.18" ✓	84222	SWMB

* Based on approved tide correctors

Table 9. Depth comparison of H-10838 with prior survey H-7766.

Prior H-7766 (Fm)	H-10838 (Fm)	Position	Fix #	Type of Hydro
464	465.7 ✓	60°35'43.19" 147°38'21.97"	-----	IDSSS

Differences between the current survey and priors can probably be attributed to scale and improved modern positioning and sounding equipment. It is also possible that this area has uplifted slightly. Final comparisons will be done at PHB after reduction to final sounding datum using tidal information collected concurrently with this survey.

Concur

M. ITEM INVESTIGATIONS ✓ SEE Eval. REPORT, SECTION N.

There were four AWOIS items assigned for survey H-10838. CONCUR

Item Investigation #1 ✓

AWOIS #: 52307 ✓	DN: 248
CHART #: 16705 (1:80,000, 17 th edition, 9/27/93)	VESNO: 2123
ITEM DESCRIPTION: 7 ¾ fathom shoal (PA)	
SOURCE: NOAA Ship RAINIER Recon Survey, May 1989	

Geographic Position

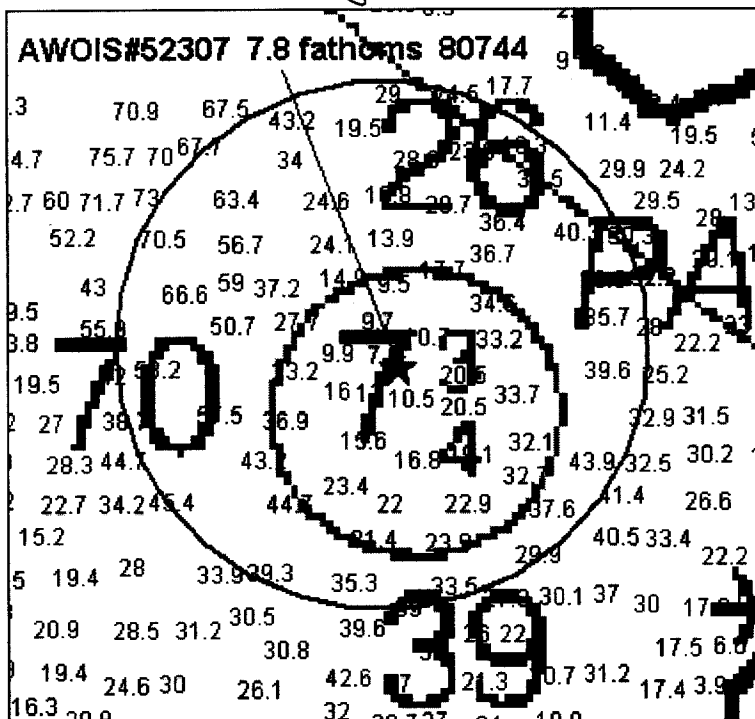
	LATITUDE	LONGITUDE	POSITION #
CHARTED:	60° 33' 55.78" N	147° 35' 15.15" W	
OBSERVED:	60° 33' 55.409" N ✓	147° 35' 14.977" W ✓	80744
POSITIONED BY:	DGPS	DATUM:	MLLW (NAD 83)
METHOD OF INVESTIGATION: 100% bottom coverage using Shallow Water MultiBeam			
FINDINGS: A 7.8 fathom shoal was determined by SWMB in Northwest Bay, Eleanor Is.			

8.1*

* Based on approved tide correctors.

Charting Recommendations

Hydrographer recommends removing the Position Approximate (PA) designation and charting the area as surveyed. Chart 8 Fm Sounding from present survey



Detail area of AWOIS item 52307.

Item Investigation #2 ✓

AWOIS #: 52311 ✓	DN: 249
CHART #: 16705 (1:80,000, 17 th edition, 9/27/93)	VESNO: 2121
ITEM DESCRIPTION: 4 fathom shoal (PA)	
SOURCE: NOAA Ship RAINIER Recon Survey, May 1989	

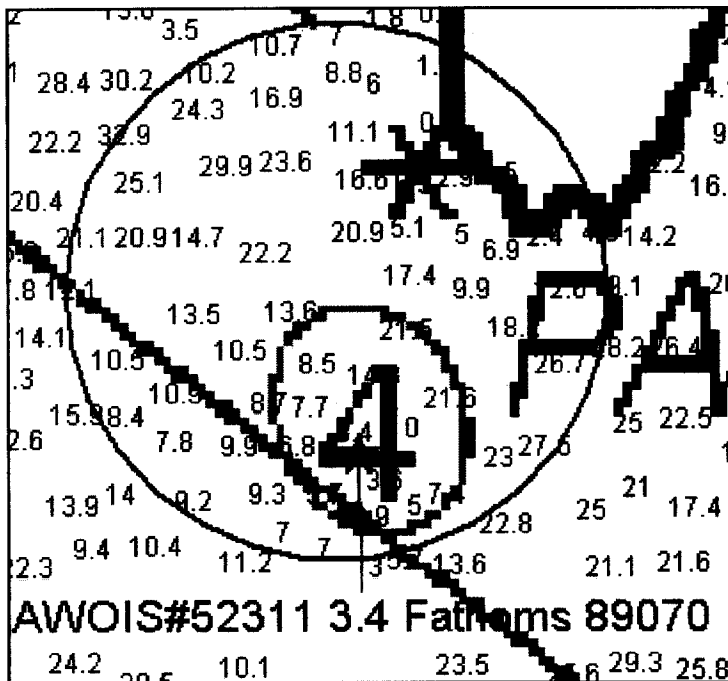
Geographic Position

	LATITUDE	LONGITUDE	POSITION #
CHARTED:	60° 32' 07.85" N	147° 40' 28.23" W	
OBSERVED:	60° 32' 03.588" N ✓	147° 40' 27.075" W ✓	89070
POSITIONED BY:	DGPS	DATUM:	MLLW (NAD 83)
METHOD OF INVESTIGATION: 100% bottom coverage using Shallow Water MultiBeam			
FINDINGS: A 3.4 fathom shoal was determined by SWMB in Lower Passage, West of Ingot Island.			

3.5 * Based on approved tide correctors.

Charting Recommendations

Hydrographer recommends removing the 4 fathom (PA) and charting of the area as surveyed. Concur
 Chart 3 4 Fm Sounding from present survey.



Detail Area of AWOIS item 52311.

Item Investigation #3

AWOIS #: 52312	DN: 249
CHART #: 16705 (1:80,000, 17 th edition, 9/27/93)	VESNO: 2121
ITEM DESCRIPTION: 2 3/4 fathom shoal (PA)	
SOURCE: NOAA Ship RAINIER Recon Survey, May 1989	

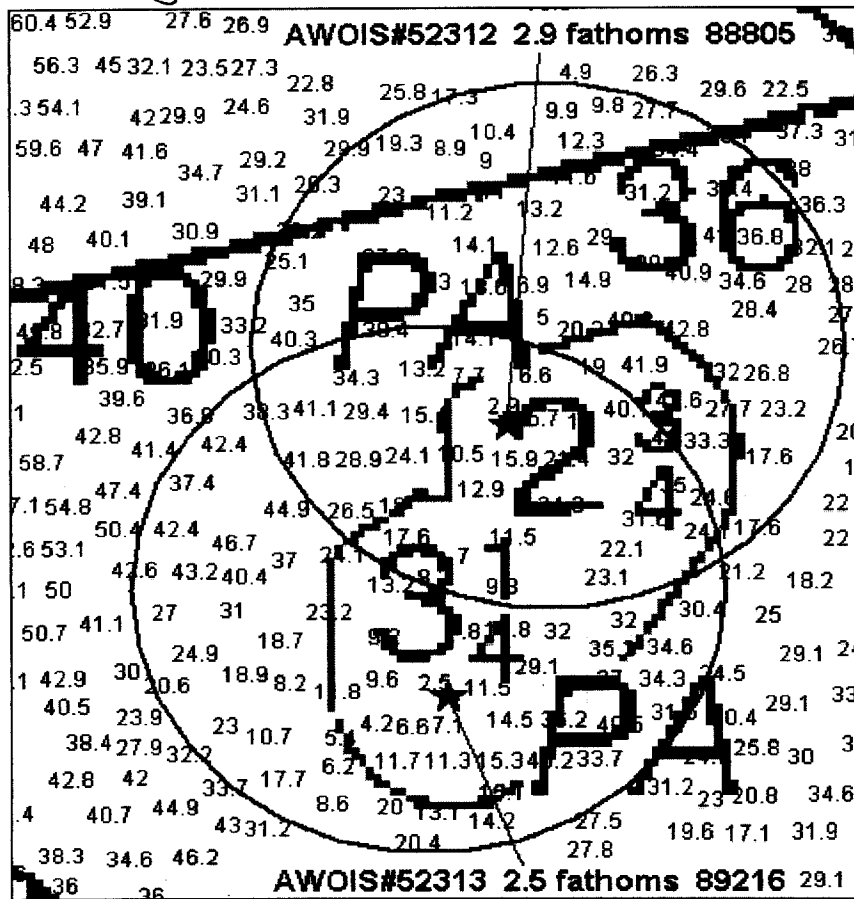
Geographic Position

	LATITUDE	LONGITUDE	POSITION #
CHARTED:	60° 31' 42.85" N	147° 40' 29.23" W	
OBSERVED:	60° 31' 40.592" N	147° 40' 32.111" W	88805
POSITIONED BY:	DGPS	DATUM:	MLLW (NAD 83)
METHOD OF INVESTIGATION: 100% bottom coverage using Shallow Water MultiBeam			
FINDINGS: A 2.9 fathom shoal was determined by SWMB in Northwest Bay, Eleanor Is.			

2.8* * Based on approved tide correctors.

Charting Recommendations

Hydrographer recommends removing the 2 3/4 fathom (PA) and charting the area as surveyed. Concur
Chart 2 3/4 Fm Sounding from present survey.



Detail area of AWOIS item 52312

Item Investigation #4 ✓

AWOIS #: 52313 ✓	DN: 249
CHART #: 16705 (1:80,000, 17 th edition, 9/27/93)	VESNO: 2121
ITEM DESCRIPTION: 3 ¼ fathom shoal (PA)	
SOURCE: NOAA Ship RAINIER Recon Survey, May 1989	

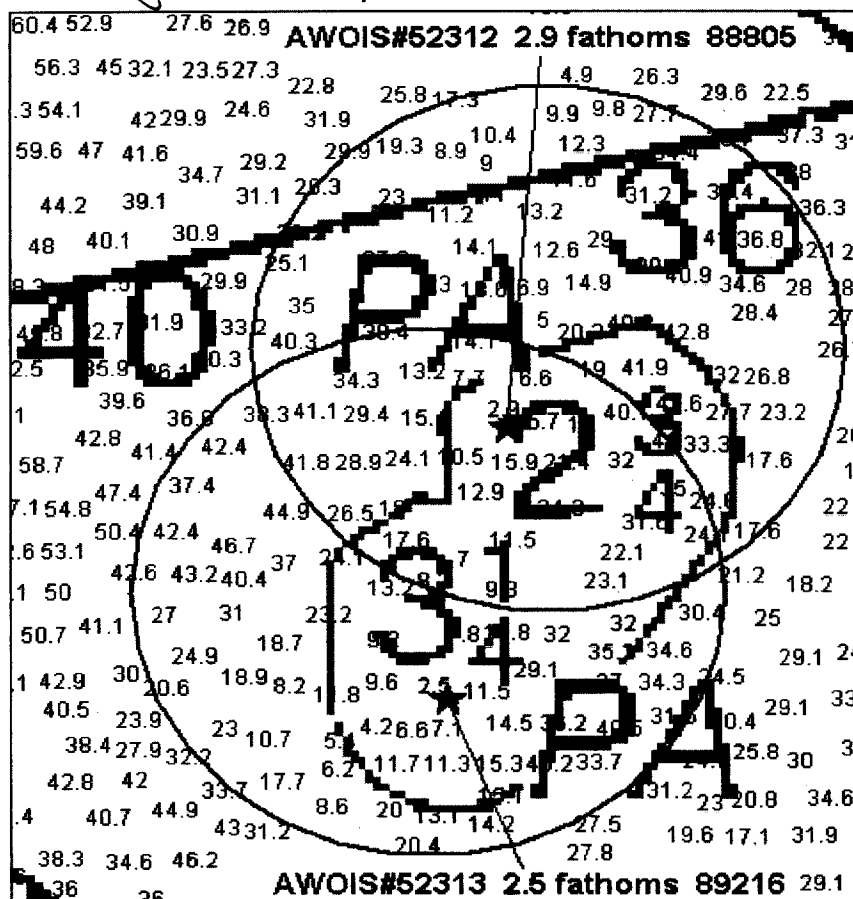
Geographic Position

	LATITUDE	LONGITUDE	POSITION #
CHARTED:	60° 31' 33.85" N	147° 40' 37.23" W	
OBSERVED:	60° 31' 30.392" N ✓	147° 40' 36.862" W ✓	89216
POSITIONED BY:	DGPS	DATUM:	MLLW (NAD 83)
METHOD OF INVESTIGATION: 100% bottom coverage using Shallow Water MultiBeam			
FINDINGS: A 2.5 fathom shoal was determined by SWMB in Northwest Bay, Eleanor Is.			

2.9* * Based on approved tide correctors.

Charting Recommendations

Hydrographer recommends removing the 3 ¼ fathom (PA) and charting the area as surveyed. Concur
 Chart 2 ¼ Fm Sounding From present Survey.



Detail area of AWOIS item 52313.

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

Chart 16700
25th ed. September 21, 1996
Scale: 1:200,000

Chart 16705 ✓
17th ed. September 27, 1993
Scale: 1:80,000

(Largest scale chart with full survey coverage)

The survey was compared with Charts 16700 and 16705 and was in good agreement, generally within one fathom. One exception is in central Northwest Bay where the contemporary survey exhibits significantly shoaler soundings than the chart. The charted soundings at the entrance to Northwest Bay, in particular a 111 fathom sounding (and bordering charted soundings) exhibit a trend that is an average of 20-25 fathoms deeper than the contemporary survey. This 111 fathom sounding originated from prior survey H-3028 that was conducted in 1909 using lead lines. It should be noted that survey H-10838 developed the area in Northwest Bay far more extensively than is shown on Chart 16705. **CONCUR**

Soundings also exist in the center of Northwest Bay that are significantly shoaler than those currently shown on Chart 16705. An example of this is contemporary soundings ranging from 59 to 19.5 fathoms in the area of a 70 fathom sounding from the chart. **CONCUR** 13.6

Offshore in areas of 200 fathoms or deeper, the contemporary soundings agree well with the chart. (1-2 Fms)

North of Eleanor Island, near Pt. Eleanor, two different 3.0 fathom soundings from the contemporary survey supersede a 9 and 8 fathom sounding from Chart 16705. 100% bottom coverage of this area was acquired by SWMB.

Northwest of Ingot Island, a 1.9 fathom sounding was acquired by a singlebeam launch in the same region a 9 fathom shoal is charted. Areas of significant differences such as this are listed as DTON's or have been investigated as the AWOIS items described above. Non-sounding features are discussed in Section I. Final sounding comparisons will be made at PHB after reduction to final vertical datum.

Dangers to Navigation ✓

*
Nine dangers to navigation were reported to the Seventeenth Coast Guard District on November 1, 1998. Copies of the correspondence can be found in ~~Appendix F~~ of this report. The dangers to navigation features are shoals. (FILED WITH THIS REPORT)

* BASED ON PREDICTED TIDES

O. ADEQUACY OF SURVEY ✓ SEE EVAL REPORT, SECTION P.

Survey H-10838 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. **CONCUR**

P. AIDS TO NAVIGATION See Eval Rpt., section P.

There are no Aids to Navigation that accompany this survey. Note that Point Eleanor Light (25850) was positioned on survey H-10840. **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 ✓

The areas northwest of Point Eleanor and northwest of Ingot Island, in particular, demonstrate high relief bathymetry. It is recommended that these areas retain a greater concentration of soundings, due to the frequency of small boats, sailboats, and power yachts observed in the area. *CONCUR*

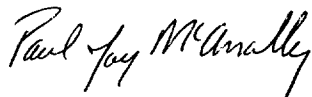
It is apparent, based on the number of rocks that did not appear on the digital shoreline maps, that the related photogrammetry was not tide coordinated. It is recommended that shoreline manuscripts be compiled from photographs taken at MLLW. It allows for quicker progression of shoreline verification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

<u>Title</u>	<u>Date Sent</u>	<u>Office</u>
OPR-P139-RA-1998 Horizontal Control Report	11/1/98	N/CS34
Project related data for OPR-P139-RA	Incremental	N/CS34

Respectfully Submitted,



Paul Jay McAnally
Senior Survey Technician

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



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

**ADVANCE
INFORMATION**

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

Dear CDR Hamblett:

It is requested that the following dangers to navigation be included in the Local Notice to Mariners. The NOAA Ship RAINIER positioned these features while conducting hydrographic 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.

<u>Feature</u>	<u>Depth (fm)</u>	<u>Latitude (N)</u>	<u>Longitude (W)</u>	<u>Position #</u>	<u>Depth (m)</u>	<u>Survey #</u>
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.

<u>Feature</u>	<u>Depth (fm)</u>	<u>Latitude (N)</u>	<u>Longitude (W)</u>	<u>Position #</u>	<u>Depth (m)</u>	<u>Survey #</u>
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.

<u>Feature</u>	<u>Depth (fm)</u>	<u>Latitude (N)</u>	<u>Longitude (W)</u>	<u>Position #</u>	<u>Depth (m)</u>	<u>Survey #</u>
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,

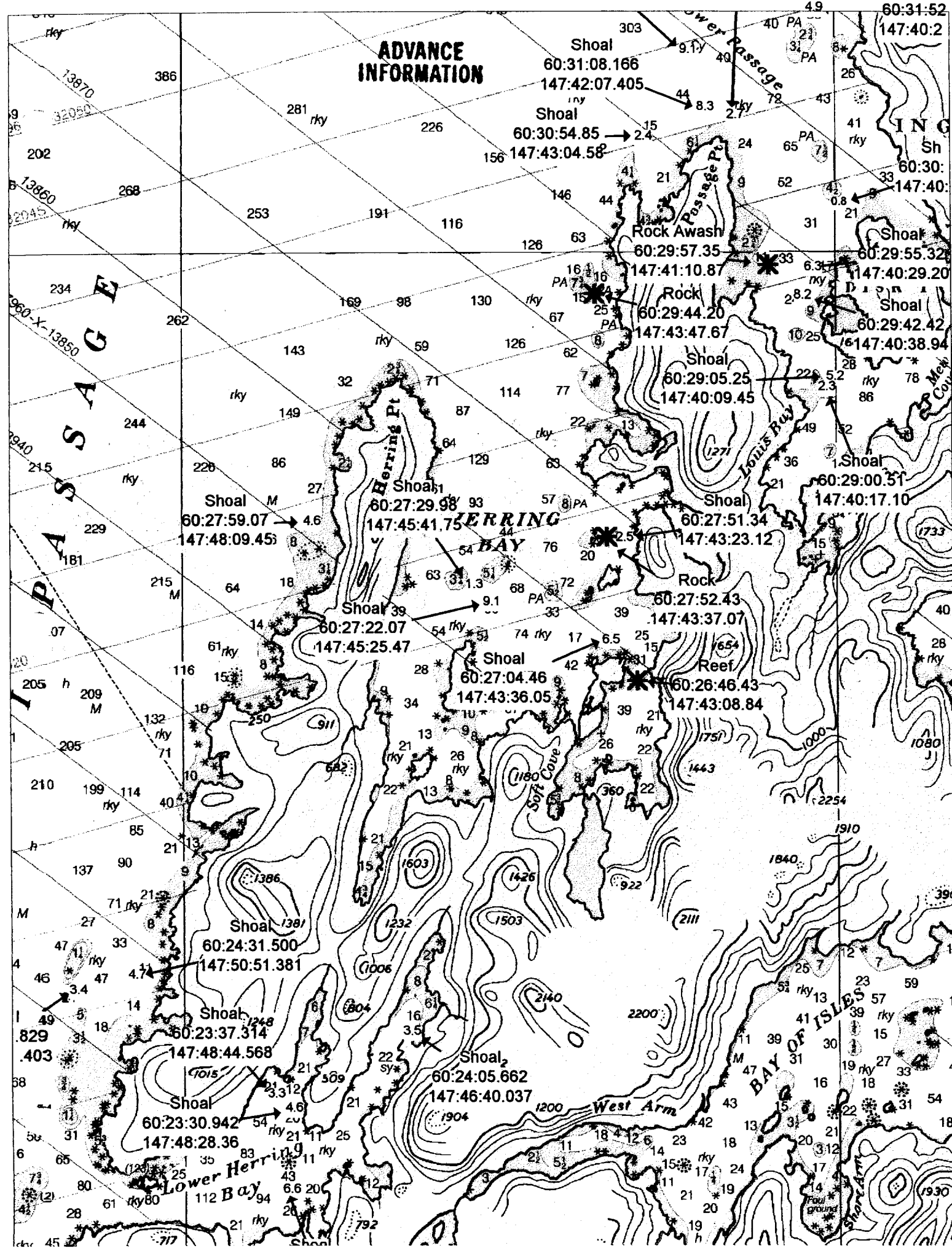


Alan D. Anderson
Captain, NOAA
Commanding Officer

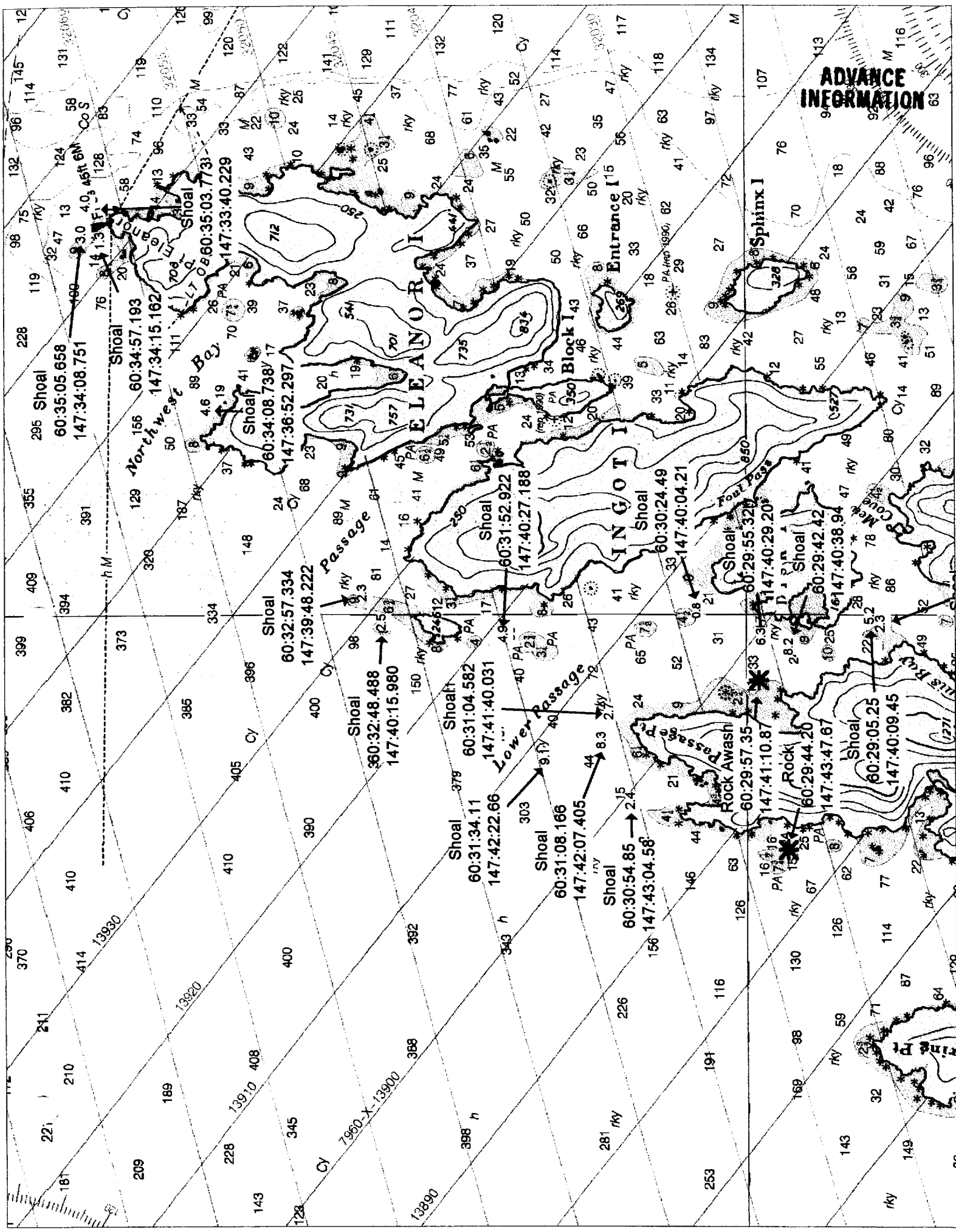
Attachment

cc: NIMA
PMC
N/CS261
N/CS34

ADVANCE INFORMATION



**ADVANCE
INFORMATION**



Lotus cc:Mail for FOO Rainier

Date: 11/2/98
Sender: FOO Rainier
To: Inm@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

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

Survey Information Summary

Project: **Project Name:**

Instructions Dated: **Project Change Info:**

Change #	Dated
1	9/8/98

Sheet Letter: **Registry Number:**

Sheet Number:

Survey Title:

Data Acquisition Dates: **From:** **To:**

Vessel Usage Summary

VESNO	MS	SPLITS	DEV	XL	S/L	DP	BS	DIVE
2120	3							
2121								
2122	4	4			1	1		
2123								
2124	3	1			2	2		
2125		1		1			1	
2126	1							

Sound Velocity Cast Information

Launch Table #	Ship Table #	Cast DN	Max Depth	Position	Applicable DN
5		235	850.2	60/32/24 147/42/42	235-248

Tide Zone Information

Zone #	Time Corr.	Height Corr.
PWS38	0 hr 0 min	0.94
PWS52	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	13
DP	16
MBMS	33
MS	119.65
S/L	10.9
SPLIT	91
SWMB	59.2
XL	11.79

Percent XL:	9.9%
SQNM:	7.97



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

MEMORANDUM FOR: CDR James Gardner
Chief, Pacific Hydrographic Branch

THROUGH: RADM John Albright
Director, Pacific Marine Center

FROM: CAPT Alan D. Anderson
Commanding Officer

SUBJECT: Survey Data Transmittal Delay

There will be a delay in the transmission of survey data for project OPR-P139-RA-98. The transmission of data will exceed four weeks from completion of field work.

The surveys affected are H-10853 (RA-10-11-98), H-10852 (RA-10-12-98), H-10829 (RA-10-13-98), H-10837 (RA-10-14-98), H-10838 (RA-10-15-98), H-10840 (RA-10-16-98), and H-10841 (RA-10-17-98). There are numerous reasons for this delay including, but not limited to, use of untested software for the acquisition of data, lack of experienced personnel, and the need to efficiently use the vessels as acquisition platforms while processing data already collected.

The four week submittal of survey data recommendation noted in the Field Procedures Manual (FPM) does not reflect knowledge of current data acquisition and processing timelines. As you know, the shallow water multibeam (SWMB) systems allow for extremely large data sets to be collected in a very short amount of time. The processing of these data sets takes a much longer amount of time than does the processing of single beam data. In fact, the ratio of time processing SWMB data to time collecting SWMB data is 6:1. In comparison, the ratio of processing single beam data to the collection of single beam data is 1:3. The FPM should be updated to recognize the larger amount of time needed to process SWMB data by the field units. It is recommended that the FPM be changed to allow eight weeks for the submittal of survey data from the date of field work completion.

The anticipated transmittal date for the above mentioned surveys is the middle of December 1998.



APPROVAL SHEET

for

H-10838

RA-10-15-98

Standard field surveying and processing procedures were followed in producing this survey in accordance with the Hydrographic Manual, Fifth 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 25, 1999

HYDROGRAPHIC BRANCH: Pacific

HYDROGRAPHIC PROJECT: OPR-P139-RA-98

HYDROGRAPHIC SHEET: H-10838

LOCALITY: Prince William Sound, AK
Disk Island to Point Eleanor

TIME PERIOD: Aug 23 - Sep 06, 1998

TIDE STATION USED: 945-4050 Cordova, AK
Lat. $60^{\circ} 33.5'N$ Lon. $145^{\circ} 45.2'W$
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. $61^{\circ} 07.5'N$ Lon. $146^{\circ} 21.7'W$
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. $60^{\circ} 25.8'N$ Lon. $147^{\circ} 25.3'W$
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. $60^{\circ} 28.4'N$ Lon. $147^{\circ} 47.6'W$
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 3.326 meters

REMARKS: RECOMMENDED ZONING

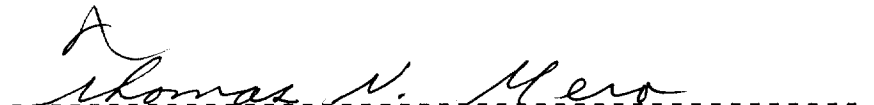
Use zone(s) identified as: PWS37A, PWS38, PWS38A & PWS52.

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.



CHIEF, REQUIREMENTS AND DEVELOPMENT DIVISION

Final tide zone node point locations for OPR P139-RA-98,
Sheet H-10838.

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 PWS37A			
-147.4175 60.67054	9454564	0	1.02
-147.435879 60.634506	9454240	0	0.99
-147.564875 60.574827	9454050	0	0.94
-147.567302 60.56881			
-147.428357 60.514658			
-147.401054 60.514056			
-147.381578 60.52174			
-147.344431 60.522683			
-147.360641 60.632173			
-147.4175 60.67054			
Zone PWS38			
-147.785618 60.363112	9454691	0	1.00
-147.667831 60.449911	9454240	0	0.98
-147.696614 60.466536	9454050	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			

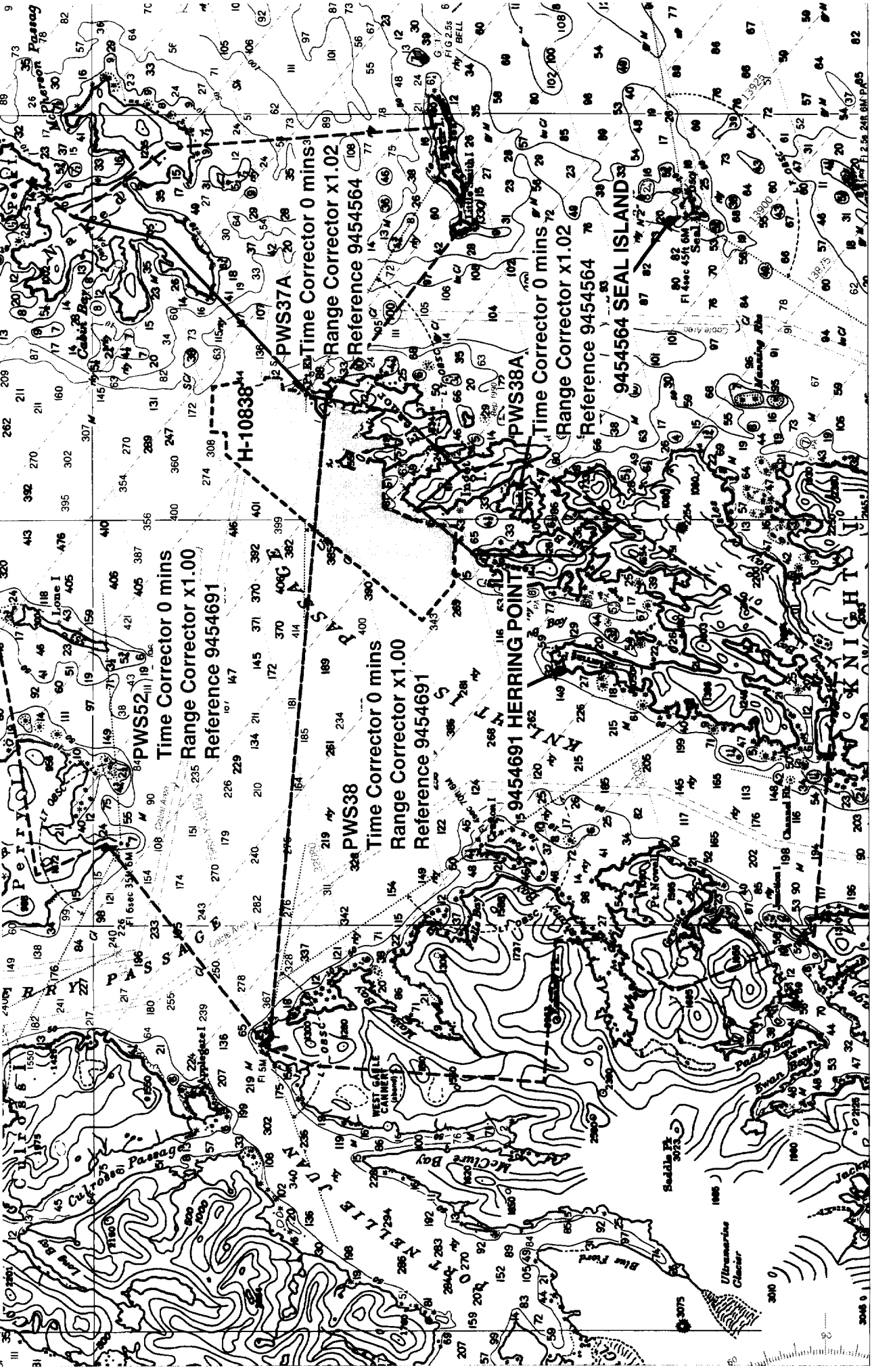
Zone PWS38A

-147.618284 60.490075	9454564	0	1.02
-147.634898 60.474627	9454691	0	1.01
-147.667831 60.449911	9454240	0	0.99
-147.696614 60.466536	9454050	0	0.95
-147.695431 60.508907			
-147.656563 60.531857			
-147.626594 60.514644			
-147.618284 60.490075			

Zone PWS52

-147.93198 60.657934	9454691	0	1.00
-147.957558 60.686216	9454240	0	0.98
-147.848006 60.693887	9454050	0	0.94
-147.48158 60.72734			
-147.456957 60.723688			
-147.422995 60.72893			
-147.385582 60.690765			
-147.4175 60.67054			
-147.435879 60.634506			
-147.564875 60.574827			
-147.567302 60.56881			
-148.101183 60.592465			
-147.93198 60.657934			

Filing Zoning for OPR P139-RA-98 Prince William Sound, AK - Sheet H-10838



GEOGRAPHIC NAMES

H-10838

Name on Survey	Source of Name											
	A	B	C	D	E	F	G	H	K			
	ON CHART NO. 16705	ON PREVIOUS SURVEY NO.	CON U.S. QUADRANGLE MAPS	FROM LOCAL INFORMATION	ON LOCAL MAPS	P.O. GUIDE OR MAP	GRAND McNALLY ATLAS	U.S. LIGHT LIST				
ALASKA (title)	X		X									1
BLOCK ISLAND *	X		X									2
ELEANOR ISLAND	X		X									3
ELEANOR, POINT	X		X									4
INGOT ISLAND	X		X									5
KNIGHT ISLAND PASSAGE	X		X									6
LOWER PASSAGE	X		X									7
NORTHWEST BAY	X		X									8
PRINCE WILLIAM SOUND	X		X									9
UPPER PASSAGE	X		X									10
												11
												12
												13
												14
												15
* NOT WITHIN SURVEY LIMITS												16
												17
												18
												19
												20
												21
												22
												23
												24
												25

Approved:

Dennis J. Roush
Chief Cartographer FEB 16 1999

NOAA FORM 77-27(H) (9-83)		U.S. DEPARTMENT OF COMMERCE		REGISTRY NUMBER	
HYDROGRAPHIC SURVEY STATISTICS				H-10838	
RECORDS ACCOMPANYING SURVEY: To be completed when survey is processed.					
RECORD DESCRIPTION		AMOUNT		RECORD DESCRIPTION	
SMOOTH SHEET		1		SMOOTH OVERLAYS: POS., ARC, EXCESS	
DESCRIPTIVE REPORT		1		FIELD SHEETS AND OTHER OVERLAYS	
DESCRIP-TION	DEPTH/POS RECORDS	HORIZ. CONT. RECORDS	SONAR-GRAMS	PRINTOUTS	ABSTRACTS/SOURCE DOCUMENTS
ACCORDION FILES					
ENVELOPES					
VOLUMES					
CAHIERS					
BOXES					
SHORELINE DATA					
SHORELINE MAPS (List):		DM-10294			
PHOTOBATHYMETRIC MAPS (List):		N/A			
NOTES TO THE HYDROGRAPHER (List):		N/A			
SPECIAL REPORTS (List):		N/A			
NAUTICAL CHARTS (List):		16705 18th Ed., March 27, 1999			
OFFICE PROCESSING ACTIVITIES <i>The following statistics will be submitted with the cartographer's report on the survey</i>					
PROCESSING ACTIVITY			AMOUNTS		
			VERIFICATION	EVALUATION	TOTALS
POSITIONS ON SHEET					
POSITIONS REVISED					
SOUNDINGS REVISED					
CONTROL STATIONS REVISED					
			TIME-HOURS		
			VERIFICATION	EVALUATION	TOTALS
PRE-PROCESSING EXAMINATION					
VERIFICATION OF CONTROL					
VERIFICATION OF POSITIONS					
VERIFICATION OF SOUNDINGS					
VERIFICATION OF JUNCTIONS					
APPLICATION OF PHOTOBATHYMETRY					
SHORELINE APPLICATION/VERIFICATION					
COMPILATION OF SMOOTH SHEET			304.0		304.0
COMPARISON WITH PRIOR SURVEYS AND CHARTS				15.0	15.0
EVALUATION OF SIDE SCAN SONAR RECORDS					
EVALUATION OF WIRE DRAGS AND SWEEPS					
EVALUATION REPORT				35.0	35.0
GEOGRAPHIC NAMES					
OTHER* (Chart Compilation)				38.0	38.0
*USE OTHER SIDE OF FORM FOR REMARKS			TOTALS	304.0	88.0
Pre-processing Examination by M. Bigelow			Beginning Date 12/18/99	Ending Date 4/7/99	
Verification of Field Data by M. Bigelow, D. Doles, E. Domingo, G. Nelson, R. Mayor, R. Shipley			Time (Hours) 304	Ending Date 9/17/99	
Verification Check by B. Olmstead			Time (Hours) 17	Ending Date 9/23/99	
Evaluation and Analysis by R. Shipley			Time (Hours) 88	Ending Date 9/23/99	
Inspection by B. Olmstead			Time (Hours) 12	Ending Date 9/24/99	

EVALUATION REPORT

H-10838

A. PROJECT

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

B. AREA SURVEYED

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

The hydrographer has determined the inshore limits of safe navigation by defining a Navigable Area Limit Line (NALL) throughout the survey. Charted features and soundings inshore of this limit line which have not been specifically addressed during survey operations should be retained as charted. Page-size plots of the charted area depicting the specific limits of supersession accompanies this report as Attachment 1.

The bottom consists mainly of mud and pebbles. Depths range from 0 to 405 fathoms.

C. SURVEY VESSELS

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

D. AUTOMATED DATA ACQUISITION AND PROCESSING

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

Office processing of survey data was conducted using the same Computer Aided Resource Information System (CARIS), Hydrographic Processing System (HPS) and Multibeam Support Vax System used by the hydrographer and MicroStation 95.

Shallow Water Multibeam data sets were processed to reject beams 1,2,3,4,98,99,100 and 101 during office processing. In addition, the beam angle filter was used to reject all data outside of a 65 degree angle from nadir. Refer to the memorandum for the record from the Multibeam Processing Officer dated March 24, 1999 included in the survey records.

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

The drawing files necessarily contain information that is not part of the HPS data set such as geographic name text, line-type data, and minor symbolization. In addition, those soundings deleted from the drawing for clarity purposes remain unrevised in the HPS digital files to preserve the integrity of the original hydrographic data set. Cartographic codes used to describe the digital data are those authorized by Hydrographic Survey Guideline No. 35 and No. 75.

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

E. SONAR EQUIPMENT

Side Scan Sonar was not used during survey operations.

F. SOUNDING EQUIPMENT

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

G. CORRECTIONS TO SOUNDINGS

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

Predicted tides were used for reduction of soundings during field processing. During office processing, soundings and elevations 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 direct from tide gages, Valdez, Alaska, 945-4240 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 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:	-2.150 seconds	(-66.534 meters)
Longitude:	7.220 seconds	(110.010 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 was computed for survey operations. The quality of seventy positions exceeds 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 soundings located by these fixes are consistent with the surrounding information. These fixes are considered acceptable.

During depth 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 which 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.

During intermediate depth multibeam data gathering, satellite configuration as indicated by HDOP and the number of satellites, is monitored visually on the IDSSS and Trimble

displays, and data are not collected when HDOP exceeds 3.75. In the event that the differential GPS corrector signal is lost, a switch to P-Code is made automatically by the receiver. Although P-Code accuracy is less accurate than DGPS (maximum of 15 meters), it is an acceptable limit of accuracy for a survey of 1:10,000 scale. Data was analyzed during office processing and found to contain no significant errors.

NAD 83 is used as the horizontal datum for plotting and position computations.

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

J. SHORELINE

Shoreline map DM 10294, scale 1:20,000, was compiled on NAD83 and applies 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.

There were no MHW revisions on this survey.

The shoreline map and the results of the field work as portrayed on the smooth sheet should supersede charted shoreline.

K. CROSSLINES

Crosslines are adequately discussed in the hydrographer's report.

L. JUNCTIONS

Survey H-10847 junctions with the following surveys:

<u>Survey</u>	<u>Year</u>	<u>Scale</u>	<u>Area</u>
H-10729	1996	1:40,000	Southwest Limit
H-10782	1997	1:40,000	North, Northwest Limit
H-10840	1998	1:10,000	East Limit
H-10837	1998	1:10,000	Southeast Limit
H-10853	1998	1:10,000	South

The junctions with surveys H-10840, H10837 and H-10853 are complete. A "Joins" note has been added to the smooth sheet where applicable. A few soundings from the junctional surveys have been transferred within the common area of H-10838 to better delineate the bottom configuration. The junctions with H-10729 and H-10782 were not formally completed since these surveys were processed previously. However, depths are in good agreement within the common areas. An "Adjoins" note has been added to the smooth sheet.

M. COMPARISON WITH PRIOR SURVEYS

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

<u>Survey</u>	<u>Year</u>	<u>Scale</u>	<u>Datum</u>
H-2916	1907	1:40,000	Valdez
H-3028	1909	1:20,000	Valdez

Prior surveys H-2916 and H-3028 covers the entire area of the present survey and were conducted using leadlines and visual positioning. A comparison to the present survey was made using digital copies of this prior work. The registration and legibility of these prior surveys to the present survey was good.

Differences in depths generally range from 1-4 fathoms in those areas less than fifty fathoms and from 5-10 fathoms in depths exceeding fifty fathoms. Generally, the present survey depths are consistently shoaler. However, a few prior survey depths plotting along the steep slope and in depths exceeding ninety fathoms differ from 10-20 fathoms reflecting both a shoaler and deeper bias. The evaluator feels these prior depths are likely the result of erroneous leadline depths and or positional errors. Justification for smaller changes can probably be attributed to better bottom coverage, improved positioning and sounding techniques, relative accuracy of the data acquisition methods and earthquake activity since 1890.

Survey H-10838 is adequate to supercede the prior surveys within the common area.

<u>Survey</u>	<u>Year</u>	<u>Scale</u>	<u>Datum</u>
H-7766	1949	1:40,000	NAD27
H-7764	1949	1:20,000	NAD27

Prior survey H-7764 covers the northern area of the present survey. The present survey was compared to a digital copy H-7764. The registration and legibility of H-7764 to the present survey was good with good sounding agreement. The legibility of the digital copy of H-7766 was illegible and could not be used for comparison but a comparison was made using a paper copy of H-7766. Common coverage is limited to a small area in the northern portion of the current survey in depths ranging from 40 to 400 fathoms. Comparison was good with differences ranging from 1-5 fathoms except for an area in the vicinity of latitude 60/35/30N, Longitude 147/34/30W where H-7766 was found to be 10-50 fathoms shoaler than the current survey. Justification for smaller changes can probably be attributed to better bottom coverage, improved positioning and sounding techniques, relative accuracy of the data acquisition methods and earthquake activity since 1890. A comparison of standard depth curves with the prior surveys reveal little change in configuration except where present hydrography defined new and or existing shoal areas. There appears to be no consistent pattern of shoaling or and increase in depths except as noted above.

A more thorough coverage of the area utilizing the Shallow Water Multibeam system has revealed more significantly shallower depths not detected during the earlier prior surveys.

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 differences in data acquisition methods, no reasonable adjustment value for prior soundings could be determined.

Survey H-10838 is adequate to supercede the prior surveys within the common area.

Additional information regarding the above prior survey comparisons can be found in the hydrographer's report, section L.

N. ITEM INVESTIGATIONS

There were four AWOIS items assigned to this survey which have been adequately addressed in section S of the hydrographer's report.

O. COMPARISON WITH CHART

Survey H-10838 was compared with the following chart.

<u>Chart</u>	<u>Edition</u>	<u>Date</u>	<u>Scale</u>
16705	18th	March 27,1999	1:80,000

a. Hydrography

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

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

Survey H-10838 is adequate to supersede charted hydrography within the charted area.

b. Dangers To Navigation

Nine dangers to navigation were identified during survey operations. These dangers were reported to the USCG, NIMA and N/CS261 on November 1, 1998 and November 2, 1998. Copies of these reports are attached.

P. ADEQUACY OF SURVEY

Hydrography contained on survey H-10838 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.

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, and the Field Procedures Manual, April 1998 Edition.

The field unit submission of survey data exceeded the four week period from the completion of field work as required in the Field Procedures Manual (FPM). However, the Chief of

Party submitted a written explanation for the delay indicating the anticipated transmittal date to the Chief, Pacific Hydrographic Branch, through the Director, Pacific Marine Center. A copy of the letter dated November 12, 1998 is attached. Fieldwork for survey H-10838 was completed September 4, 1998 and received for office processing on December 18, 1998.

Some anomalous soundings were acquired during this survey. They originate from the poor performance of the echo sounder on steep slopes. The hydrographer attempted to correct the problem by editing the raw sounding data, however, the quality of the echo sounder trace is so poor in some areas that the edits are likely based on judgement rather than quantifiable data. Office review of the problem has determined that, with the exception of obviously erroneous depths, which have been revised and or rejected, further editing is not reasonable since no corrective action can be taken to improve the quality of the trace. The judgement of the hydrographer has been accepted and generally the data was not altered during office processing.

Q. AIDS TO NAVIGATION

There was one fixed aid and no floating aids to navigation within the survey area. Point Eleanor Light (25850) was positioned on survey H-10840 and shown on H-10838.

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

R. STATISTICS

Statistics are adequately itemized in the hydrographer's report.

S. MISCELLANEOUS


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

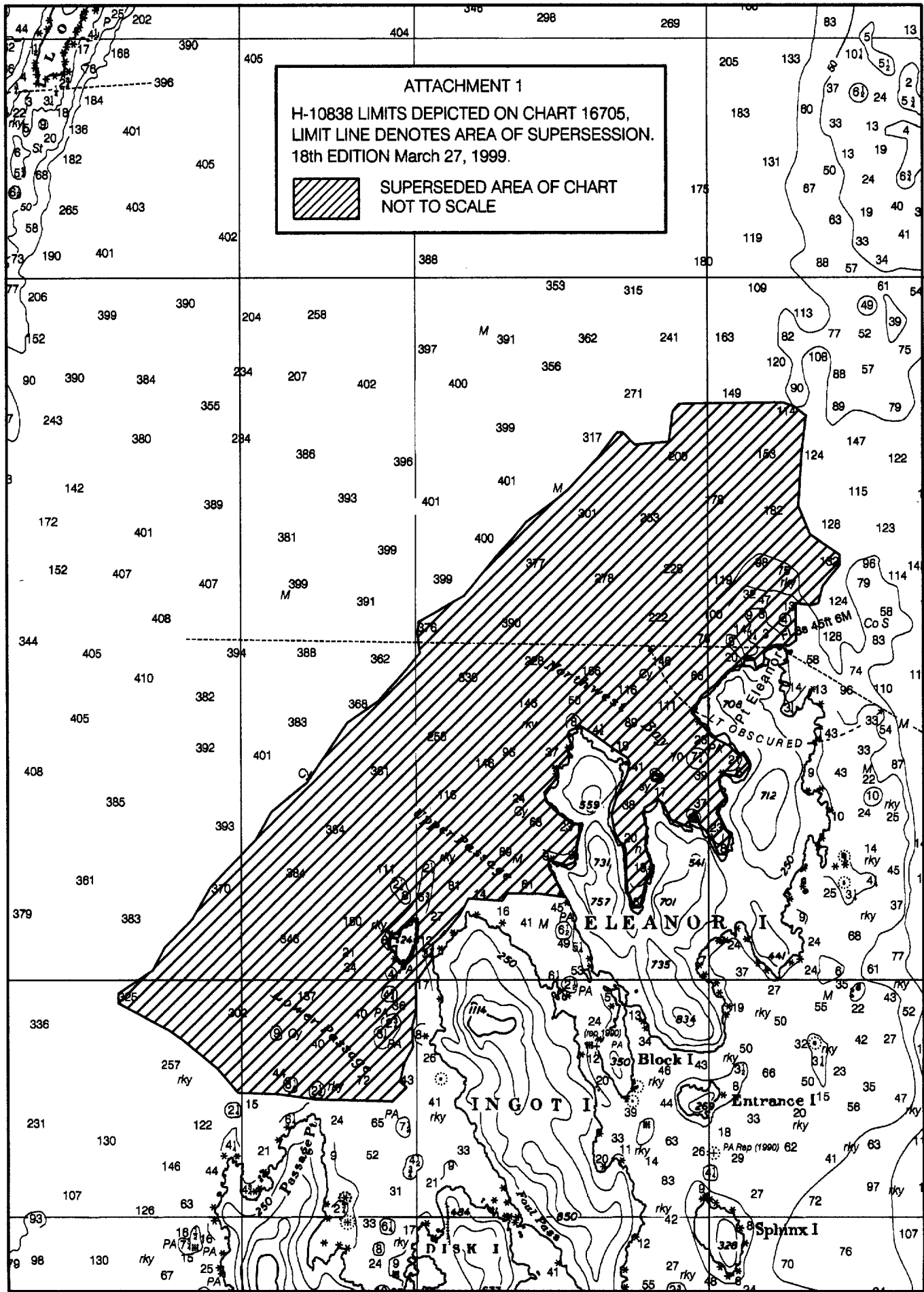
T. RECOMMENDATIONS

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

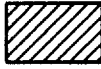
U. REFERRAL TO REPORTS

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


Rick Shipley
Cartographer



ATTACHMENT 1
H-10838 LIMITS DEPICTED ON CHART 16705,
LIMIT LINE DENOTES AREA OF SUPERSESSION.
18th EDITION March 27, 1999.



**SUPERSEDED AREA OF CHART
NOT TO SCALE**

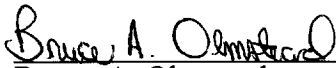
60/38/00

60/30/00

APPROVAL SHEET
H-10838

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.



Bruce A. Olmstead
Senior Cartographer, Cartographic Section
Pacific Hydrographic Branch

Date: 9/30/99

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.



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

Date: 10-19-99

Final Approval

Approved:



Samuel P. De Bow
Commander, NOAA
Chief, Hydrographic Surveys Division

Date: January 9, 2000

MARINE CHART BRANCH
RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H-10838

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	9/23/99	Rick Shupley	Full Part Before After Marine Center Approval Signed Via Drawing No. FULL APPLICATION OF SOUNDINGS AND FEATURES FROM SMOOTH SHEET
16705	3/17/00	J. Ripan	Full Part Before After Marine Center Approval Signed Via Drawing No. Full Application of soundings, curves, and features from BP 170373.
16700	3/20/00	J. Ripan	Full Part Before After Marine Center Approval Signed Via Drawing No. Full applications of soundings, curves, and features from BP through 16705
			Full Part Before After Marine Center Approval Signed Via Drawing No.
			Full Part Before After Marine Center Approval Signed Via Drawing No.
			Full Part Before After Marine Center Approval Signed Via Drawing No.
			Full Part Before After Marine Center Approval Signed Via Drawing No.
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