

H10840

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-10-16-98
Registry No. H-10840

LOCALITY

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

19 98

CHIEF OF PARTY
CAPT Alan D. Anderson, NOAA

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DATE MAR 24 2000

HYDROGRAPHIC TITLE SHEET

H-10840

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-10-16-98

State Alaska

General locality Southwest Prince William Sound

Locality Entrance Island to Point Eleanor

Scale 1:10,000 Date of survey 9/6/98 - 10/7/98

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

Vessel 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, pot, DSF-6000N, Knudsen 320M, RESON 8101 Multibeam~~

Graphic record scaled by RAINIER Personnel

Graphic record checked by RAINIER Personnel

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

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

Soundings in fathoms ~~FEET~~ at ~~MEW~~ MLLW data collected in Meters

REMARKS: All times are 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.





AWOIS/SURF 3/10/00
MLR

PROGRESS SKETCH

OPR-P139-98
Prince William Sound, AK
October

Capt A. D. Anderson
Commanding

Chart 16705_1

-  July
-  Aug
-  Sept
-  Oct

Sheet E
13.80 sq nm
100%

Sheet D
7.97 sq nm
100%

Sheet W
126.9 sq nm
100%

Sheet V
16.78 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%

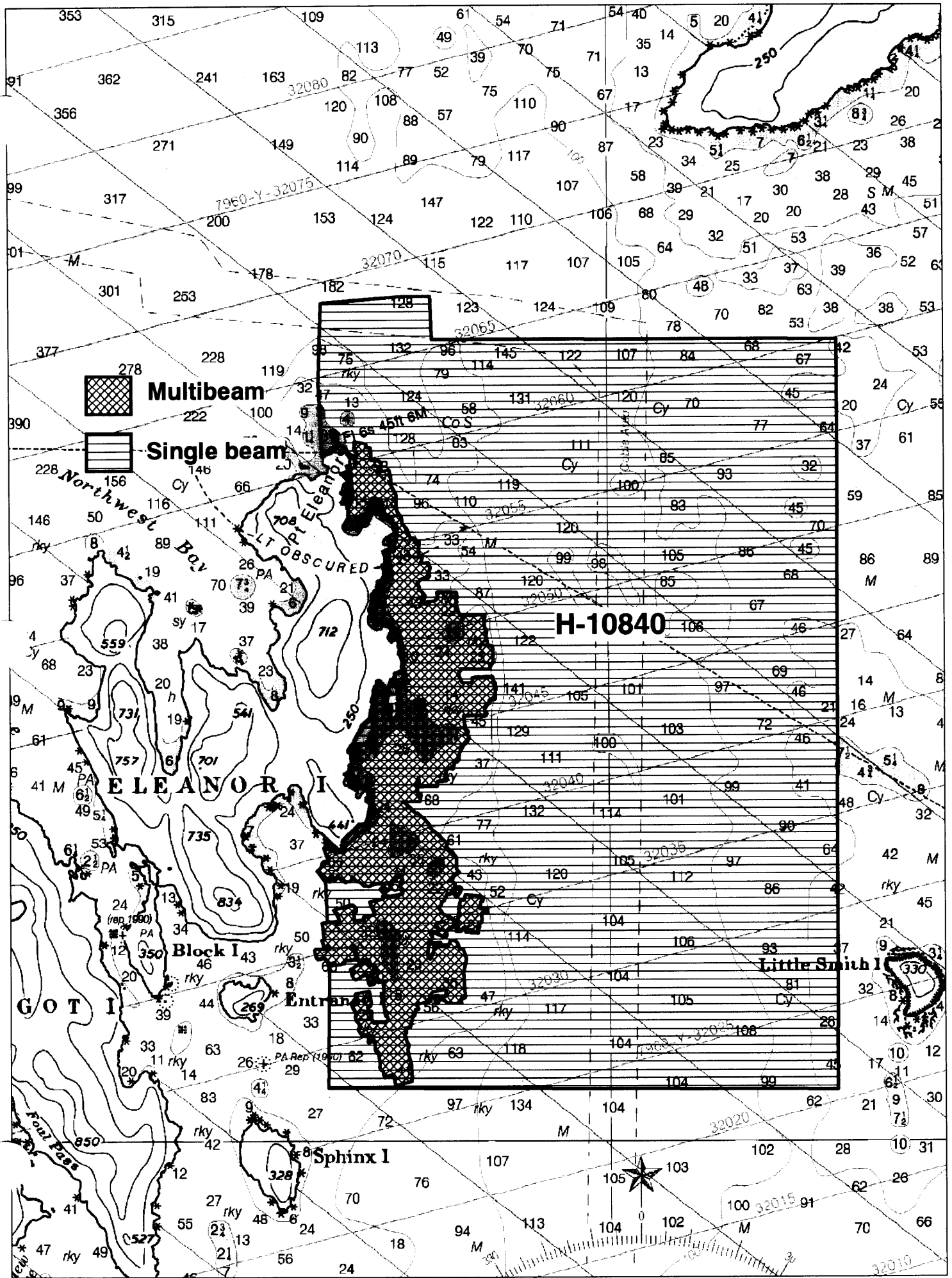
Sheet G
10.67 sq nm
100%

Accomplished	July	Aug	Sept	Oct
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**

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	9/6		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

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



Multibeam



Single beam

H-10840

ELEANOR I.

Entrance

Sphinx I

Little Smith I

GOT I

Block I

Northwest Bay

Point Eleanor

OBSCURED

Four Pass



Descriptive Report to Accompany Hydrographic Survey H-10840

Field Number RA-10-16-98

Scale 1:10,000

November 1998

NOAA Ship RAINIER

Chief of Party: Captain Alan D. Anderson, NOAA

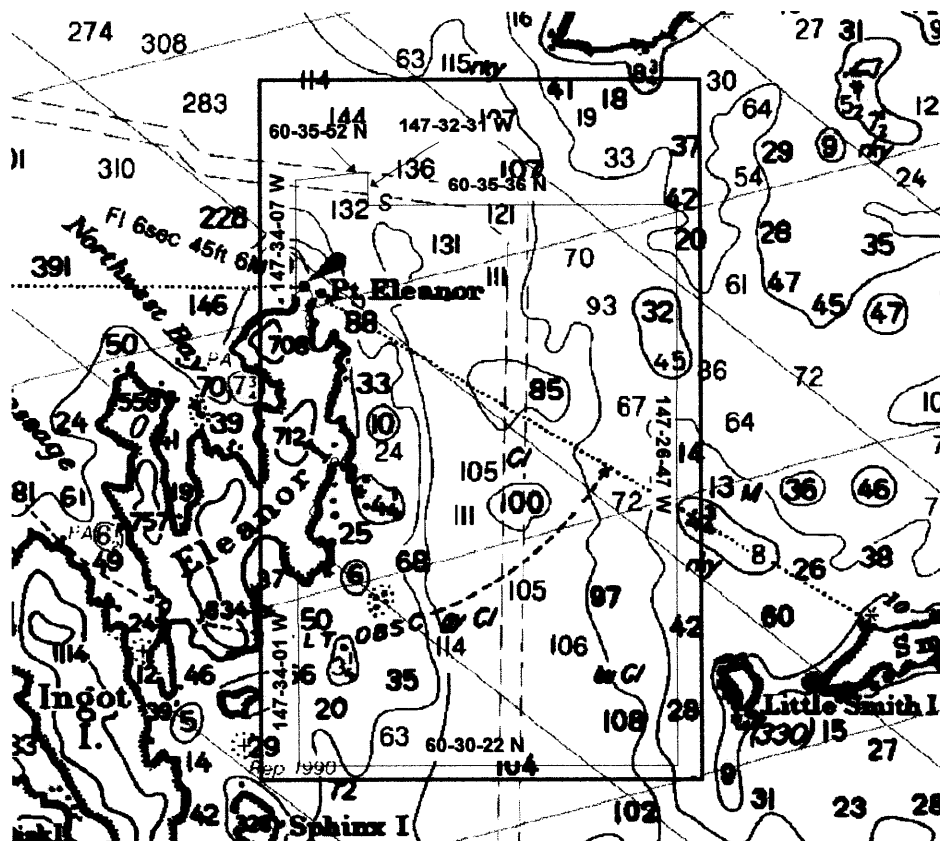
A. PROJECT ✓

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 July 14, 1998. Survey H-10840 corresponds to Sheet U as defined in the sheet layout. This survey will provide data to supersede prior surveys performed from 1911 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.

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.

The survey area is Entrance Island to Point Eleanor, which is in Prince William Sound on the east side of Eleanor Island. Survey limits are $60^{\circ}35'52''$ N, $147^{\circ}26'47''$ W, $60^{\circ}30'22''$ N and $147^{\circ}34'07''$ W, shown below on a detail of Chart 16700:



Occasional traffic was seen within H-10840's survey limits consisting of mid-sized cruise ships, barges, tugs, and small recreational and fishing vessels. The only floatplanes observed were those bringing supplies to the Rainier, which was anchored near Smith Island. Data acquisition was conducted from September 6 to October 7, 1998 (DN 249 to 280).

C. SURVEY VESSELS ✓

Data were acquired by 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). Shallow water multibeam (SWMB) echosounder data were acquired using the Reson SeaBat 8101 with ISIS version 3.41 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. ✕

F. SOUNDING EQUIPMENT ✓

Two 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 2121, 2122, 2123, 2124, 2125, 2126):

The singlebeam sounding instruments for this survey was the Raytheon DSF-6000N, which is a dual frequency (100 kHz, 24 kHz), digital recording singlebeam fathometer with an analog paper trace. Soundings were acquired in meters using the High + Low, high frequency digitized setting. Serial numbers are included in the Separates. Singlebeam launches were used to collect mainscheme hydrography and to perform all shoreline verification.

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.

Explanatory Note about Survey Depth Discrepancies in Steep and Deep Areas:

The automated bottom tracking function of the 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*

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. *CONCUR*

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
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

OTF - ON THE FLY

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. For singlebeam launches, offset tables were applied to the raw sounding data in HPS during post-acquisition processing. For SWMB launches, offsets were applied during Caris processing. *CONCUR*

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

*** FILED WITH THE SURVEY 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. *CONCUR*

For Launch Singlebeam soundings, HPS tide tables were applied to raw sounding data during shipboard processing in HPS without adjusting for zoning. 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. *CONCUR*

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 project 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
Seal Island	945-4564	Yes	30-day	8-5-98	10-30-98
Snug Harbour	945-4662	No	30-day	8-5-98	10-30-98

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 TO THIS REPORT.*

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

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 stations at ROCK and TUFT RESET were 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

** FILED WITH THE SURVEY RECORDS*

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. **CONCUR**

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 editions 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. **CONCUR**

Shoreline manuscript and field features were compared to an enlargement of 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 22) 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 hydrographer's representation of the features seen inshore of the NALL while slowly transiting along the shore, and are intended to aid chart compilation. **SHORELINE VERIFICATION HAS BEEN ANALYZED DURING OFFICE PROCESSING AND SHOWN ON THE SMOOTH SHEET AS WARRANTED**

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

FIX NUMBER	REMARK (with raw depth in meters)	POSITION Of DP	DEPTH (m) (corrected with predicted tides)	SMOOTH SHEET
20036 ✓	Rock, new rng 5m brg 300M ✓ (0.3)m 20036	60-34-44.7 N ✓ 147-33-36.6 W ✓	0.1	* (0)
20037 ✓	Rock, new rng 6m brg 240M ✓ (0.1)m 20037	60-34-42.0 N ✓ 147-33-40.0 W ✓	0.3	* COV 1 ft
20038 ✓	Rock, new rng 0m ✓ 1.3m 20038	60-34-41.4 N ✓ 147-33-41.4 W ✓	1.7	ORR
20039 ✓	Rock, new rng 4.5m brg 210M ✓ (1.5)m 20039	60-34-39.2 N ✓ 147-33-40.0 W ✓	-1.0	LEDGE (4)
20069 ✓	Rock, new rng 5m brg 180M ✓ (0.1)m 20069	60-34-32.9 N ✓ 147-33-11.9 W ✓	0.4	* COV 1 ft
20070 ✓	Rock, new rng 4.5m brg 090M ✓ (0.1)m 20070	60-34-24.8 N ✓ 147-33-23.6 W ✓	0.4	* COV 1 ft

20071 ✓	Rock, new rng 5m brg 150M ✓ (1.5)m 20071	60-34-22.0 N ✓ 147-33-29.9 W ✓	-1.0	* (4)
20119 ✓	Rock, new rng 0m ✓ 1.3m 20119	60-33-50.3 N ✓ 147-33-18.3 W ✓	1.6	0 ⁷ RK
20120 ✓	Rock, new rng 5m brg 180M ✓ (1.0)m 20120	60-33-41.1 N ✓ 147-33-20.8 W ✓	-0.6	* (3)
20148 ✓	Rock, new rng 4.5m brg M ✓ (0.5)m 20148	60-33-13.2 N ✓ 147-32-57.7 W ✓	-0.2	* (2)
20149 ✓	Rock, new rng 4.5m brg 210M ✓ (0.6)m 20149	60-33-14.6 N ✓ 147-32-58.9 W ✓	-0.4	* (2)
20152 ✓	Rock, new rng 2m brg 210M ✓ 0m 20152	60-33-17.2 N ✓ 147-32-56.5 W ✓	-0.2	* (0)
20153 ✓	Rock, new rng 5m brg 190M ✓ (0.8)m 20153	60-33-10.2 N ✓ 147-33-01.0 W ✓	-0.7	* (4)
50110 ✓	Rock, new rng 0m ✓ 2.5m 50110	60-32-46.6 N ✓ 147-33-34.4 W ✓	0.5	* COV 1 ft
50142 ✓	Rock, new rng 3.5m brg 345M ✓ (1.5)m 50142	60-33-23.9 N ✓ 147-33-42.4 W ✓	-1.0	* (4)
50149 ✓	Ledge, new rng 3.5m brg 110M ✓ 0.3m 50149	60-33-01.3 N ✓ 147-32-42.3 W ✓	0.8	LEDGE COV 1 ft
50165 ✓	Rock, new rng 3.5m brg 240M ✓ (0.5)m 50165	60-32-53.1 N ✓ 147-32-43.7 W ✓	0.0	* (3)
50167 ✓	Rock, new rng 0m ✓ 1.8m 50167	60-33-04.1 N ✓ 147-33-11.1 W ✓	2.3	1 RK
50168 ✓	Rock, new rng 0m ✓ 0.3m 50168	60-32-55.4 N ✓ 147-33-21.5 W ✓	0.7	* (0)
50189 ✓	Rock, new rng 0m ✓ 1.5m 50189	60-32-47.1 N ✓ 147-33-23.5 W ✓	1.8	0 ⁶ RK

The following is a list of all Detached Positions taken on features that were verified to be correctly shown on the DM shoreline manuscript. It is recommended that their current charting depictions be retained:

FIX_NUMBER	REMARK (with raw depth in meters)	POSITION Of DP	DEPTH (m) (corrected with predicted tides)	
50150 ✓	Rock, DM rng 3.5m brg 250M ✓ (3.0)m 50150	60-32-59.7 N ✓ 147-32-39.8 W ✓	-2.5	* (10)
50166 ✓	Rock, DM rng 3.5m brg 240M ✓ (3.5)m 50166	60-32-59.1 N ✓ 147-32-50.0 W ✓	-3.0	* (12)

J. CROSSLINES ✓

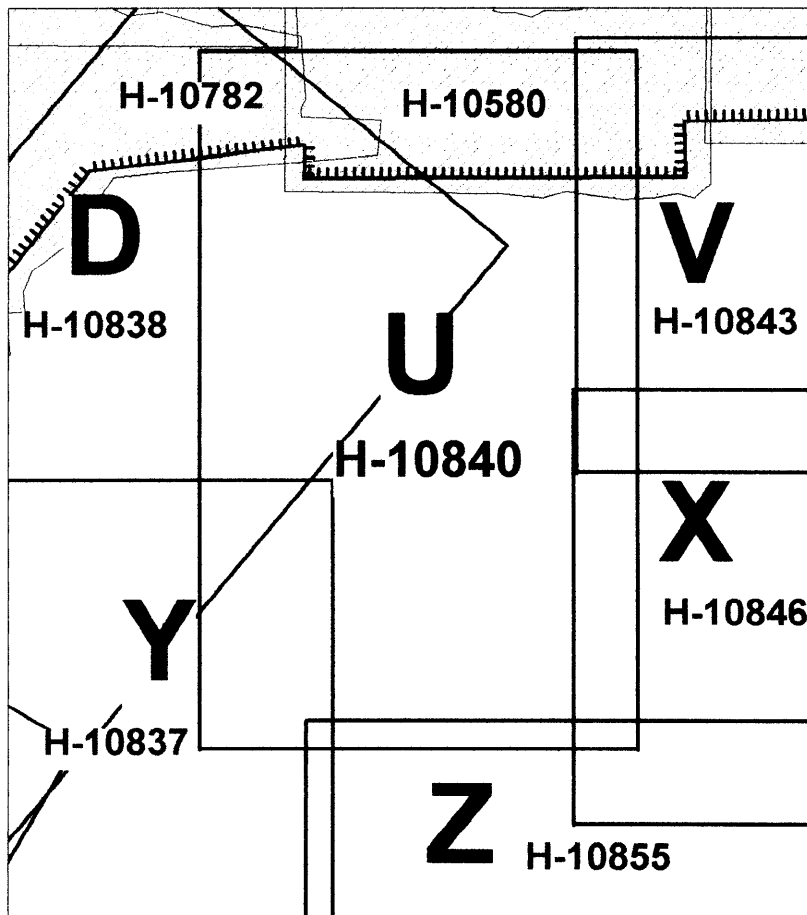
Crosslines agreed very well with mainscheme hydrography. Depths generally agreed within one meter. There were a total of 35.13 nautical miles of crosslines, comprising 10.4% of mainscheme hydrography.

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

The following contemporary surveys junction with H-10840:

Registry #	Scale	Date	Junction side
H-10580	1:10,000	1994	North
H-10782	1: 10,000 40,000	1997	Nothwest
H-10837	1:10,000	1998	Southwest
H-10838	1:10,000	1998	West
H-10843	1:10,000	1998	Northeast
H-10846	1:10,000	1998	Southeast
H-10855	1:10,000	1998	South

Soundings on these 1998 surveys were found to be in good agreement, matching within 2 meters, except at the southwestern edge of this survey where a 50.8 meter sounding was detected on H-10837 and only the slope of this feature was detected on H-10840, at 65.5 meters. Final comparisons will be made at the Pacific Hydrographic Branch (PHB) after reduction to final vertical datum. CONCUR

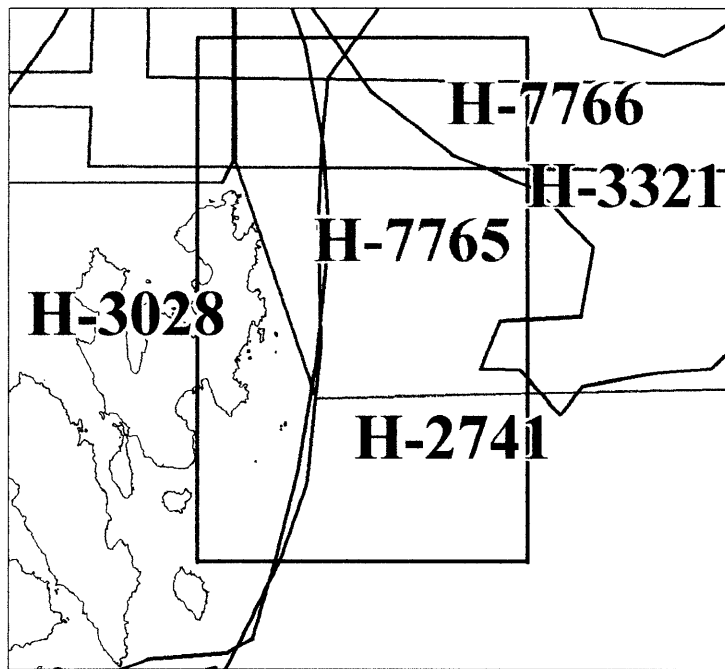


L. COMPARISON WITH PRIOR SURVEYS ✓ SEE EVAL. REPORT, SECTION M.

The following prior surveys share common area with H-10840:

Registry #	Scale	Date	Area covered
H-2741	1:40,000	1911	Southeast Quarter
H-3028	1:20,000	1909	Western Half
H-3321	1:20,000	1911	Northeast Corner <i>SUPERCEDED by H-7765</i>
H-7765	1:20,000	1949	Northern Half
H-7766	1:40,000	1949	Northern Edge

Significant differences between soundings on H-3028 and H-7765 and the present survey are listed below. Due to the illegibility of soundings on the provided digital copies, no comparisons were made with prior surveys H-2741 and H-7766. H-3321 is registered in such a way as to make a comparison with the present survey impossible. This survey covers only the extreme northeast corner of H-10840. Many sounding discrepancies between the current survey and priors can 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.



H-3028 depth in feet	H-10840 depth in feet	Fix Number	Geographic Location
41	30	83481	60°32'08.4" N, 147°33'35.1" W
42	24	82939	60°32'00.8" N, 147°33'01.9" W
42	27	83071	60°32'04.5" N, 147°33'02.1" W
47	30	83149	60°32'07.7" N, 147°33'02.4" W
48	24	83065	60°32'01.0" N, 147°33'05.5" W
50	28	81943	60°33'56.3" N, 147°33'03.2" W
55	21	80814	60°31'27.8" N, 147°33'08.6" W
55	24	21953	60°32'55.9" N, 147°32'45.5" W
55	31	81822	60°33'45.0" N, 147°33'19.2" W

H-3028 depth in feet	H-10840 * depth in feet	Fix Number	Geographic Location
59	23	83068	60°32'02.2" N, 147°33'01.6" W
61	37	84832	60°33'21.7" N, 147°32'48.1" W
65	22	82930	60°32'01.9" N, 147°32'51.7" W
65	33	64802	60°32'04.1" N, 147°32'53.2" W
67	9	84300	60°32'53.2" N, 147°32'16.0" W
78	32 29	31424	60°35'06.6" N, 147°33'37.4" W ✓
78	57	83144	60°32'08.2" N, 147°32'58.9" W
89	31	31441	60°35'03.4" N, 147°33'41.3" W
92	32	85861	60°31'03.0" N, 147°32'57.6" W
93	47 44	31425	60°35'06.5" N, 147°33'40.9" W
95	42	61426	60°35'06.5" N, 147°33'44.3" W
101	83	32335	60°32'02.5" N, 147°32'26.0" W
113	76	83333	60°32'14.1" N, 147°32'58.9" W
159	101	83258	60°31'57.9" N, 147°33'34.6" W
163	123 ✓	42147	60°33'34.6" N, 147°32'40.0" W ✓
229	137 139	51318	60°31'18.8" N, 147°33'48.1" W ✓
265	198 ✓	33769	60°33'39.4" N, 147°32'27.4" W ✓
451	397 ✓	30411	60°35'29.1" N, 147°33'49.6" W ✓
519	371 369	61982	60°34'11.6" N, 147°32'28.0" W ✓
558	482 479	31402	60°35'06.6" N, 147°32'17.8" W ✓
598	521 ✓	10201	60°32'25.1" N, 147°31'43.4" W ✓
634	531 ✓	63131	60°34'40.8" N, 147°32'22.7" W ✓
646	577 575	31908	60°34'53.7" N, 147°31'59.0" W ✓
741	612 615 643	31141	60°35'13.2" N, 147°32'31.2" W ✓
787	443 440	50457	60°32'47.6" N, 147°31'37.4" W ✓
953	864 861	31382	60°35'06.6" N, 147°31'06.6" W ✓

H-7765 Depth in fathoms	H-10840 * Depth in fathoms	Fix Number	Geographic Location
12.5	9.2	83950	60°32'54.4" N, 147°32'11.7" W
20	14.8 6	20643	60°33'07.0" N, 147°32'13.0" W ✓
34	29.8 3	33343	60°33'29.8" N, 147°31'44.6" W ✓
50	40.7	84103	60°33'09.0" N, 147°31'38.9" W
55	43.1 2	63400	60°33'45.8" N, 147°32'26.9" W ✓
55	49.8 6	30908	60°35'19.5" N, 147°33'49.8" W ✓
63	57.2 0	30798	60°35'19.5" N, 147°27'24.5" W ✓
70	61	40556	60°33'21.4" N, 147°27'35.0" W ✓
71	63.4 8	40877	60°35'21.1" N, 147°27'26.0" W ✓

M. ITEM INVESTIGATIONS ✓

There were no AWOIS items on this sheet. *concur*

* CORRECTED FOR APPROVED TIDES

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

Chart 16700
26th Ed. September 19, 1998
Scale: 1:200,000

Chart 16705 *18TH Ed. MARCH 27, 1999*
~~17th Ed. September 27, 1997~~
Scale: 1:80,000

The survey was compared with Chart 16705 and was in good agreement, generally within one fathom. Several exceptions to this occur in the rocky area off Eleanor Island. The 100% multibeam coverage found many rocks that were not detected in prior surveys. Most significantly, an 11 fathom sounding was found in the southern part of the survey where 35 fathoms are presently charted. Two offshore DPs were taken on rocks awash which were not charted. See Section I for a detailed description of uncharted rocks. Some soundings at the offshore edge of the survey were found to be in a slightly different location, which can be attributed to the improvement in modern positioning systems. Final sounding comparisons will be made at PHB after reduction to final vertical datum. *CONCUR*

Dangers to Navigation ✓

No Dangers to Navigation were reported. *CONCUR*

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

Survey H-10840 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 ✓

The following fixed navigational aid is within the survey area. It was located and a Spur position was obtained with static GPS. The light is charted adequately on chart 16705. Refer to Section ~~Q~~ ^{*P (OR INSERT)*} in the ~~Appendices~~ for more information on the comparison between the charted position and the surveyed position.

<u>Name</u>	<u>Light List No.</u>	<u>Survey H-10840 Position</u>
Point Eleanor Light	25850	60-34-50.98196 N 147-33-47.52275 W

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. *CONCUR*

S. RECOMMENDATIONS ✓

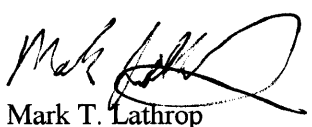
It is apparent, based on the number of rocks that did not appear on the digital shoreline maps, that the related photogrammetry was not tide coordinated. It is recommended that shoreline manuscripts be compiled from photographs taken at MLLW. It allows for quicker progression of shoreline verification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

T. REFERRAL TO REPORTS ✓

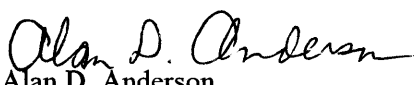
The following supplemental reports contain additional information relevant to this survey:

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

Respectfully Submitted,


Mark T. Lathrop
Rotating Hydrographer, 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

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
2121	3	2		1				
2122	1	1			1	1		
2123	2							
2124		3		2				
2125	1	1			2	1	1	
2126	2	1						

Sound Velocity Cast Information

Launch Table #	Ship Table #	Cast DN	Max Depth	Position	Applicable DN
7		251	432.3	60/35/50	249-259
				147/33/55	
9		261	294.2	60/30/20	260-264
				147/31/15	
10		265	286.2	60/30/18	265-278
				147/31/36	
11		279	241.6	60/21/50	279-298
				147/35/40	

Tide Zone Information

Zone #	Time Corr.	Height Corr.
PWS37	0 hr 0 min	0.94
PWS52	0 hr 0 min	0.94

Tide Gage Information

Tide Gage #	Gage Name	Installed	Removed
945-4564	SEAL ISLAND	8/5/98	10/30/98
945-4662	SNUG HARBOR	8/5/98	10/30/98
945-4691	HERRING POINT	7/20/98	10/16/98

Statistics Summary

Type	Total:
BS	29
DP	20
MS	337.57
S/L	6.28
SPLIT	132.96
SWMB	38.47
XL	35.13

Percent XL:

SQNM:



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

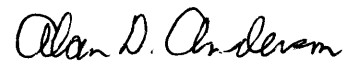
H-10840

RA-10-16-98

Standard field surveying and processing procedures were followed in producing this survey in accordance with the Hydrographic Manual, ~~Fourth~~ 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-10840

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

TIME PERIOD: Sep 06 - Oct 08, 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: 945-4652 South Arm, Knight Island, AK
Lat. $60^{\circ} 21.9'N$ Lon. $147^{\circ} 41.7'W$
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 3.320 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

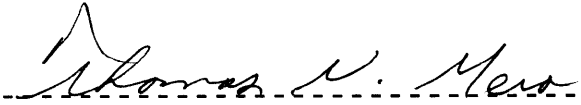
REMARKS: RECOMMENDED ZONING
Use zone(s) identified as: PWS37, PWS37A & PWS52.

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

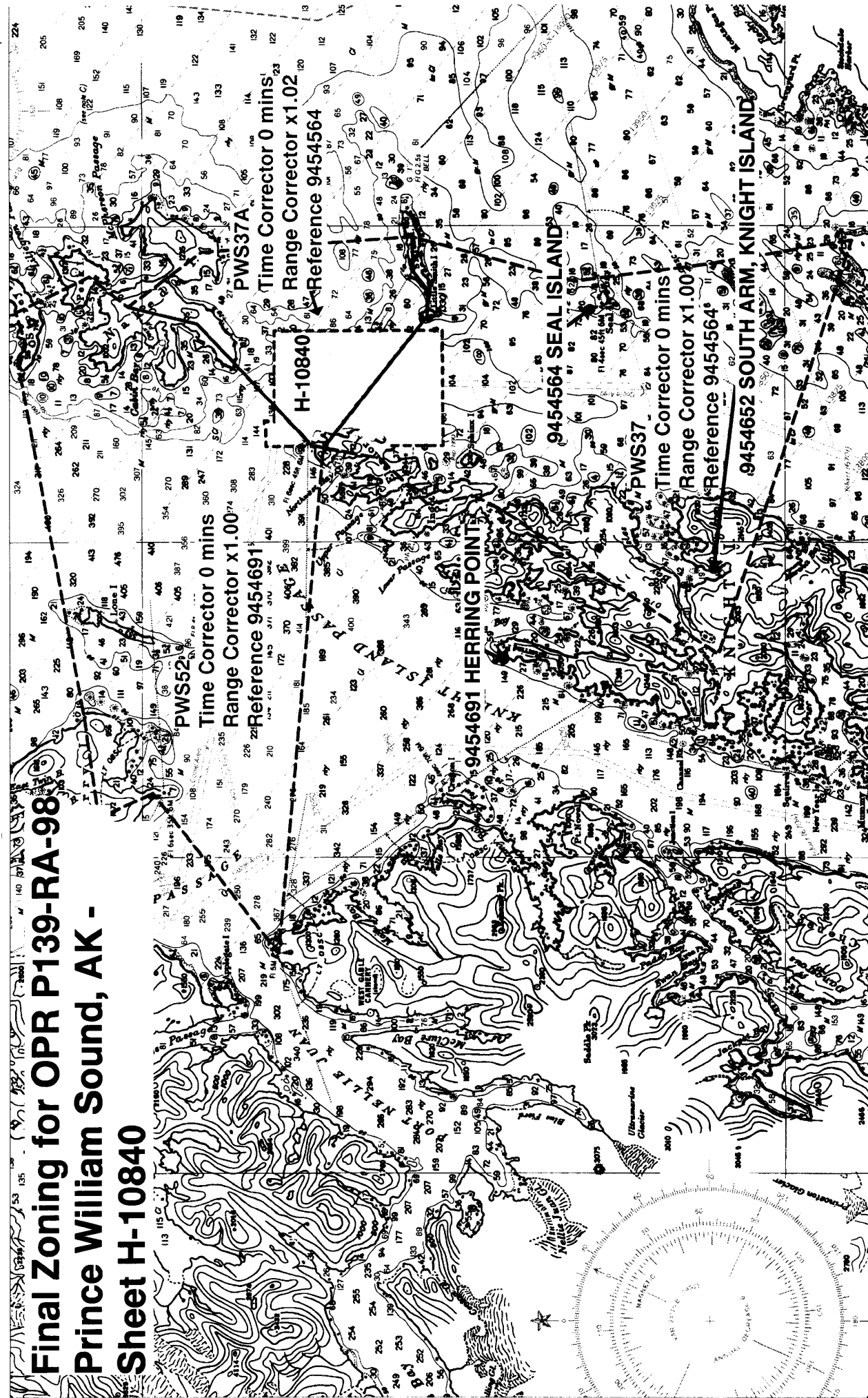
Final tide zone node point locations for OPR P139-RA-98,
Sheet H-10840.

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 PWS37			
-147.348 60.293559	9454564	0	1.00
-147.373205 60.367377	9454652	0	1.00
-147.391163 60.437636	9454240	0	0.97
-147.344431 60.522683	9454050	0	0.93
-147.381578 60.52174			
-147.401054 60.514056			
-147.428357 60.514658			
-147.567302 60.56881			
-147.578232 60.539507			
-147.626594 60.514644			
-147.618284 60.490075			
-147.634898 60.474627			
-147.667831 60.449911			
-147.785618 60.363112			
-147.348 60.293559			
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 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			

Final Zoning for OPR P139-RA-98 Prince William Sound, AK - Sheet H-10840



GEOGRAPHIC NAMES

H-10840

Name on Survey	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
ELEANOR ISLAND	X		X						2
ELEANOR, POINT	X		X						3
ENTRANCE ISLAND	X		X						4
PRINCE WILLIAM SOUND	X		X						5
									6
									7
									8
									9
									10
									11
									12
									13
									14
									15
									16
									17
									18
									19
									20
									21
									22
									23
									24
									25

Approved
Dennis J. Remsburg
APR 9 1999

HYDROGRAPHIC SURVEY STATISTICS

H-10840

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

SHORELINE DATA

SHORELINE MAPS (List):	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
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			

PROCESSING ACTIVITY	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	248.0		248.0
COMPARISON WITH PRIOR SURVEYS AND CHARTS		30.0	30.0
EVALUATION OF SIDE SCAN SONAR RECORDS			
EVALUATION OF WIRE DRAGS AND SWEEPS			
EVALUATION REPORT		36.0	36.0
GEOGRAPHIC NAMES			
OTHER* (Chart Compilation)		50.0	50.0
*USE OTHER SIDE OF FORM FOR REMARKS			
TOTALS	248.0	116.0	364.0

Pre-processing Examination by M. Bigelow	Beginning Date 2/2/99	Ending Date 3/26/99
Verification of Field Data by .Bigelow, D. Doles, E. Domingo, G. Nelson, R. Mayor, R. Shipley	Time (Hours) 248.0	Ending Date 12/20/99
Verification Check by D. Hill	Time (Hours)	Ending Date
Evaluation and Analysis by R. Shipley	Time (Hours) 50.0	Ending Date 12/29/99
Inspection by D. Hill	Time (Hours) 10	Ending Date 1-6-00

**EVALUATION REPORT
H-10840**

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. Depths range from the Mean Lower Low Water (MLLW) line to 201 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 were reduced to Mean Lower Low Water (MLLW) or Mean High Water (MHW) as appropriate with verified tide correctors obtained from the Center for Operational Oceanographic Products and Services (CO-OPS). The correctors are zoned direct from tide gages, 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 values based on NAD83. The geographic positions of all survey data are based on NAD83. The smooth sheet is annotated with an NAD27 adjustment tick based on values determined with the NGS program NADCON. Geographic positions based on NAD27 may be plotted on the smooth sheet utilizing the NAD83 projection by applying the following corrections:

Latitude: -2.234 seconds (-69.135 meters)
Longitude: 7.109 seconds (108.319 meters)

Three prior surveys in common with the present survey are plotted on the Valdez datum. To convert from the Valdez datum to NAD83, the user must apply the following corrections:

Latitude: 8.28 seconds (256.3 meters)
Longitude: -21.12 seconds (-323.1 meters)

I. HYDROGRAPHIC POSITION CONTROL

Differential GPS (DGPS) was used to control this survey. A horizontal dilution of precision (HDOP) not to exceed 3.75 was computed for survey operations.

The quality of several 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 SWMB data collection, 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 DGPS corrector signal is lost, the POS-MV will continue to provide positions based on inertial navigation. Data was analyzed during processing to ensure it did not contain significant errors.

During intermediate depth multibeam data collection, 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, the receiver makes a switch to P-Code automatically. 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 processing to ensure it did not contain significant errors.

NAD83 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

Photogrammetric shoreline map DM10294, scale 1:20,000, was compiled on NAD83 and applies to this survey. Shoreline depicted 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.

No changes to the MHW were observed during this survey.

The shoreline map and the results of the fieldwork 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-10840 junctions with the following surveys:

<u>Survey</u>	<u>Year</u>	<u>Scale</u>	<u>Area</u>
H-10782	1997	1:40,000	Northwest
H-10580	1996	1:10,000	North
H-10837	1998	1:10,000	Southwest, south
H-10838	1998	1:10,000	West, northwest
H-10843	1998	1:10,000	Northeast
H-10846	1998	1:10,000	Southeast
H-10855	1998	1:10,000	South

The junctions with surveys H-10838, H-10846, H-10855 and H-10843 are complete. A "Joins" note has been added to the smooth sheet where applicable. Numerous soundings from the junctional surveys have been transferred within the common area to better delineate the bottom configuration. The junctions with surveys H-10782, H-10580, and H-10837 were not formally completed since these surveys were processed previously. However, depths are in good agreement within the common areas except as follows: four soundings observed in the vicinity of Latitude 60/32/05 N, Longitude 147/32/22 W during survey H-10840 are shoaler by 20-30 fathoms than depths originating with survey H-10837. An examination of the echograms from survey H-10840 reveals this to be an area of very steep sloping bottom. There appears to be no error in the digitized values. Depths from survey H-10837 were collected in the same area using SWMB and reveal no obvious system errors. The evaluator recommends superseding the four depth discrepancies from survey H-10837. Depth curves have been drawn on the survey H-10840 smooth sheet in consideration of the above junctional data sets and should be used within the common areas. "Adjoins" notes have been added to the smooth sheet where applicable.

M. COMPARISON WITH PRIOR SURVEYS

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

<u>Survey</u>	<u>Year</u>	<u>Scale</u>	<u>Datum</u>
H-2741	1911	1:40,000	Valdez
H-3028	1909	1:20,000	Valdez

These prior surveys cover the entire area of the present survey. A comparison to the present survey was made using digital copies of the prior work except as noted below.

The registration and legibility of the smooth sheet digital imagery for prior surveys H-2741 and H-3028 was good although the lack of legible grid lines on survey H-2741 required selecting common shoreline points for registration.

Prior surveys H-2741 and H-3028 have been mostly superseded by survey H-7765. These older prior surveys were conducted using leadlines and visual positioning and reveal general differences of 1-4 fathoms.

<u>Survey</u>	<u>Year</u>	<u>Scale</u>	<u>Datum</u>
H-7765	1949	1:20,000	NAD27
H-7766	1949	1:40,000	NAD27

Prior survey H-7765 is common with the present survey north of Latitude 60/32/30 N and east of Longitude 147/32/00 W. The present survey smooth sheet was compared to a digital copy of that for survey H-7765. The registration and legibility of the digital imagery for this prior survey was satisfactory and the soundings are in good agreement. The digital image of the survey H-7766 smooth sheet was illegible and could not be used for comparison. Instead, a comparison was made using a paper copy of this prior survey smooth sheet. Common coverage is limited to a small area in the northern portion of the present survey in depths ranging from 40 to 120 fathoms. Comparison was good with the present survey reflecting a shoaler trend of 1-4 fathoms.

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 between the present and prior survey smooth sheets reveals little change in bottom configuration.

A more thorough coverage of the area utilizing the SWMB system has resulted in a much better definition of bottom topography than that obtained during prior surveys. As a result the present survey not only better defines previously located shoals but also discloses previously undetected shoals of a significant nature.

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.

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

Survey H-10840 is adequate to supersede the prior surveys within the common area.

N. ITEM INVESTIGATIONS

There were no AWOIS items assigned to this survey.

O. COMPARISON WITH CHART

Survey H-10840 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. The prior surveys 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-10840 is adequate to supersede charted hydrography within the charted area.

b. Dangers To Navigation

No dangers to navigation were discovered during survey operations and/or during office processing.

P. ADEQUACY OF SURVEY

Hydrography contained on survey H-10840 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, and the Field Procedures Manual, April 1998 Edition. Section L, Comparison with Prior Surveys, of the hydrographer's report contains two tables listing point-by-point comparison between surveys H-3028, H-7765 and the present survey. The table contains numerous errors in latitude, longitude, fix number and depth. The erroneous information has been lined out and should be disregarded. A comparison between the present survey and these priors is discussed in this report, section M.

The field unit submission of survey data exceeded the four-week period from the completion of fieldwork 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-10840 was completed October 7, 1998 and received for office processing on February 22, 1999.

Q. AIDS TO NAVIGATION

There was one fixed aid and no floating aids to navigation within the survey area. Point Eleanor Light (LL# 25850) was positioned and adequately serves the intended purpose. See section P of the hydrographer's report and the descriptive report insert for section P (attached), for additional information. 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

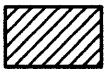
This is a good hydrographic survey. No additional work is recommended. Refer to the hydrograper's report for additional information.

U. REFERRAL TO REPORTS

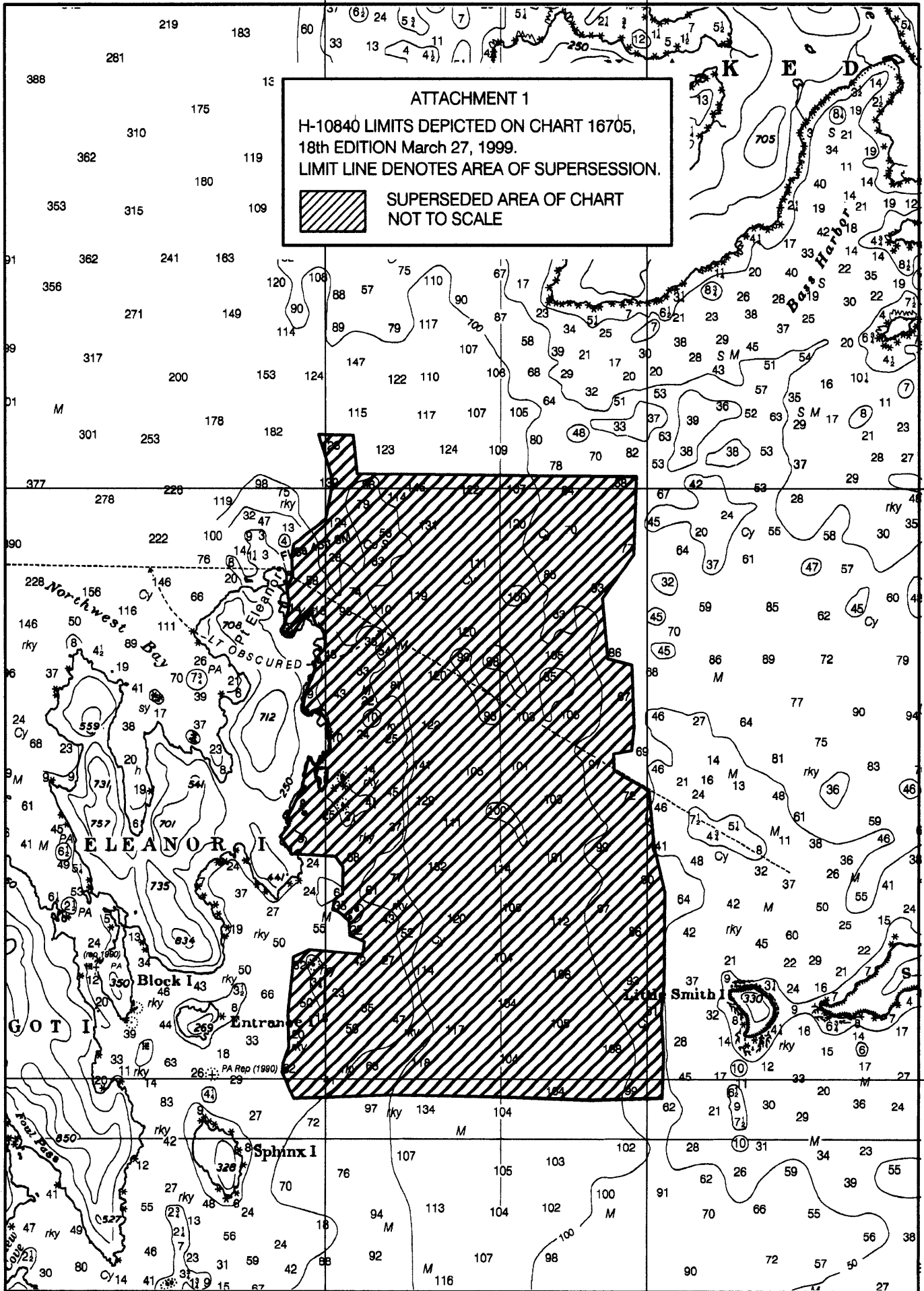
Referral to reports is adequately discussed in the hydrographer's report.


Rick Shipley
Cartographer

ATTACHMENT 1
 H-10840 LIMITS DEPICTED ON CHART 16705,
 18th EDITION March 27, 1999.
 LIMIT LINE DENOTES AREA OF SUPERSESION.



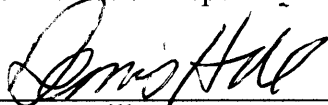
SUPERSEDED AREA OF CHART
 NOT TO SCALE



APPROVAL SHEET
H-10840

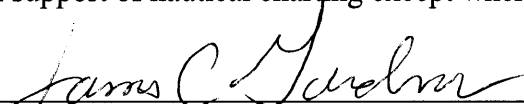
Initial Approvals:

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 disproof of charted data. The survey records and digital data comply with NOS requirements except where noted in the Evaluation Report.



Dennis J. Hill
Chief, Cartographic Team
Pacific Hydrographic Branch
Date: 1-6-00


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: 1-25-00

Final Approval

Approved:



Samuel P. De Bow
Captain, NOAA
Chief, Hydrographic Surveys Division
Date: March 29, 2000

