H10847

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-10-20-98

Registry No. H-10847

LOCALITY

State Alaska

General Locality Southwest Prince William Sound

Sublocality Seal Island and Vicinity

1998

CHIEF OF PARTY
CAPT Alan D. Anderson, NOAA

NOAA FORM 77-28 (11-72)

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

REGISTER NO.

H-10847

HYDROGRAPHIC TITLE SHEET

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-10-20-98

State: Alaska

General locality: Southwest Prince William Sound

Locality: Seal Island and Vicinity

Scale: 1:10,000 Date of survey: 9/21/98 - 10/26/98

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: NOAA Ship RAINIER Personnel

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

Graphic record scaled by: RAINIER Personnel

Graphic record checked by: RAINIER Personnel

Evaluation by: ~~Processed by~~: L. Deodato Automated plot by: HP Design Jet 750C

Verification by: M. Bigelow, D. Doles, R. Mayor, J. Ferguson, L. Deodato

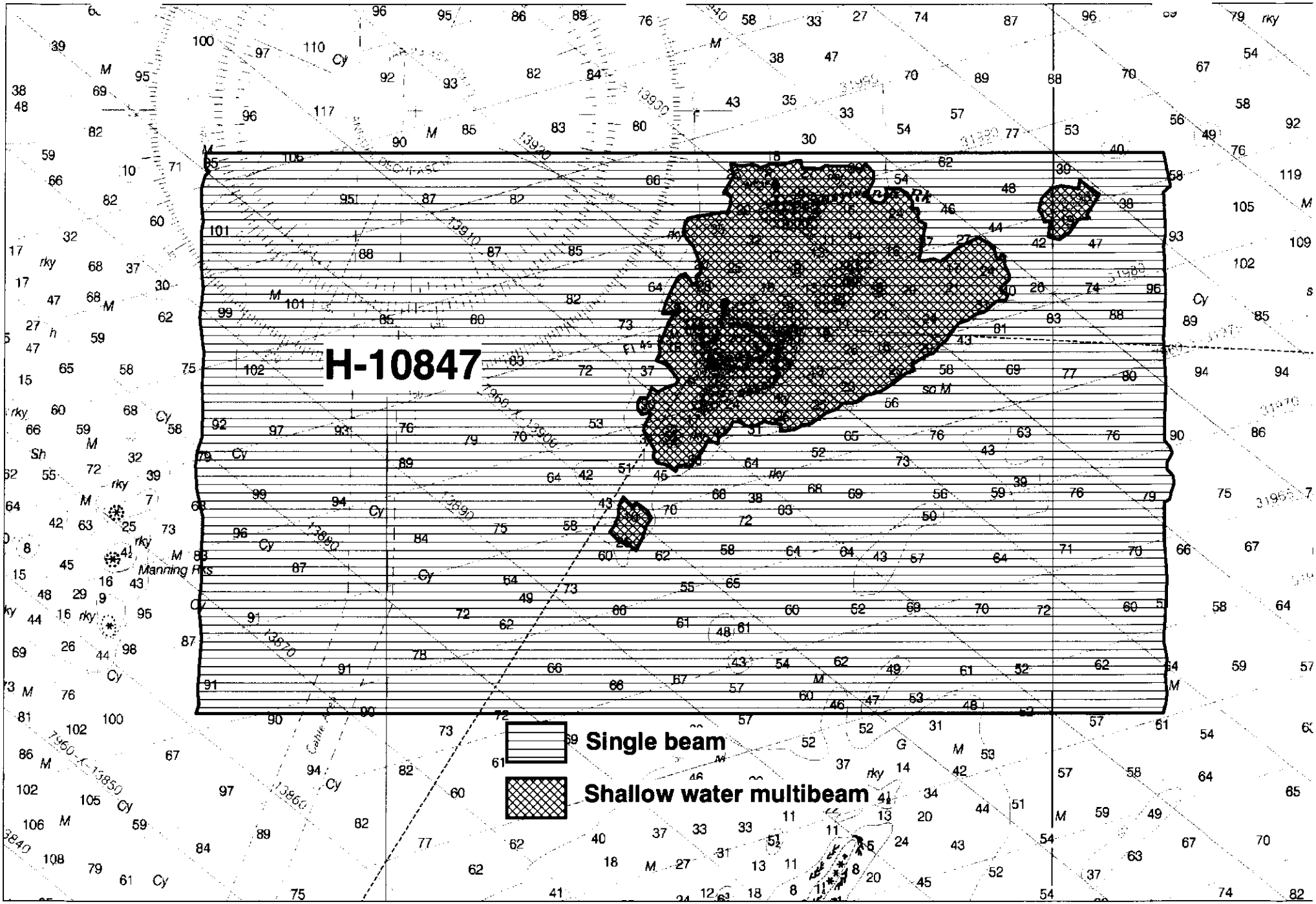
Soundings in fathoms ~~feet~~ at ~~MLW~~ MLLW and tenths

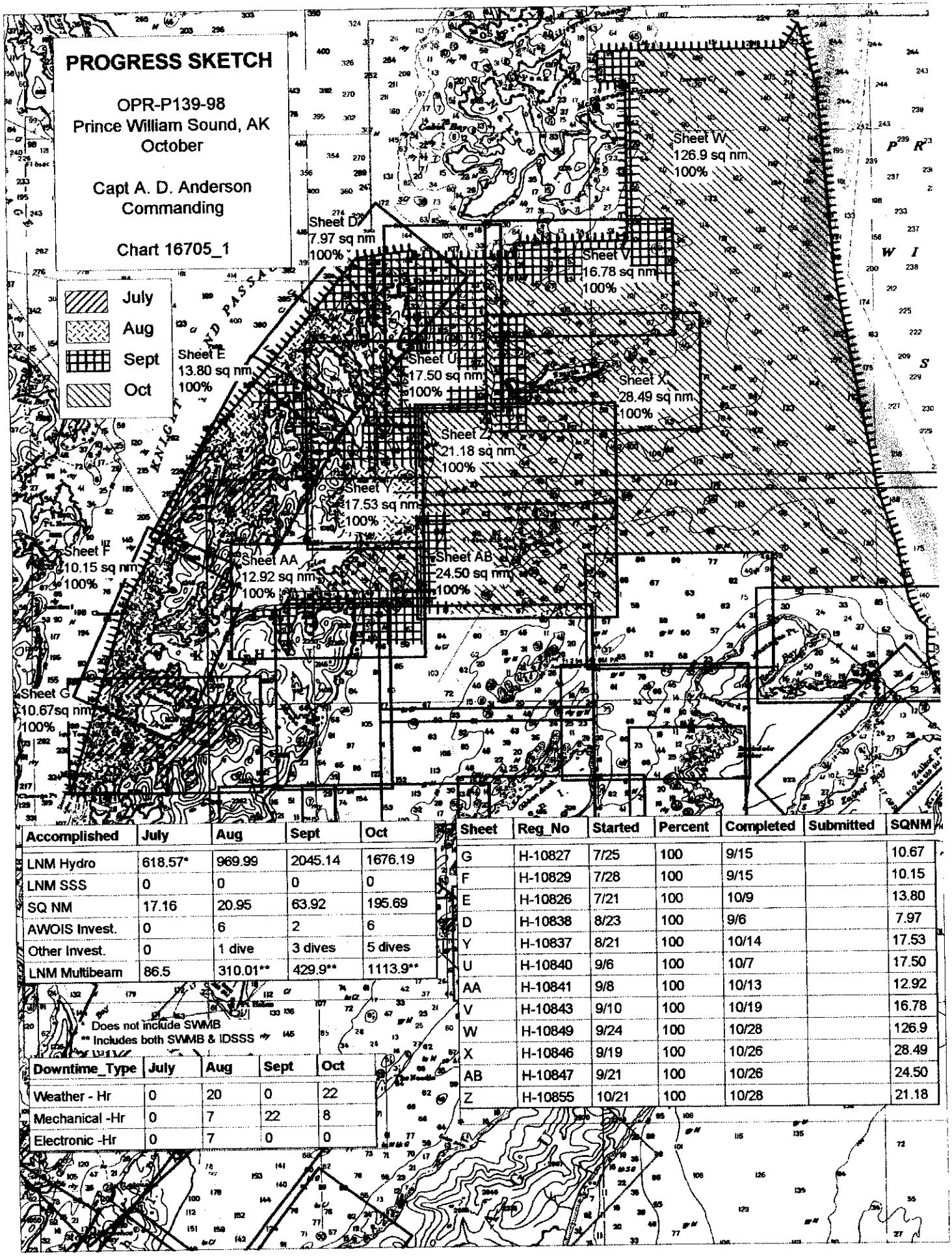
REMARKS: All times are UTC, revisions and marginal notes in black were generated during office processing. All separates are filed with the hydrographic data, as a result page numbering may be interrupted or non-sequential.

All depths listed in this report are referenced to mean lower low water unless otherwise noted.

Awois | surf 9/29/99
MCR

U.S. GOVERNMENT PRINTING OFFICE: 1986 - 652-007/41215


H-10847
Single beam
Shallow water multibeam
Manning Rks



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

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

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

Sheet	Reg_No	Started	Percent	Completed	Submitted	SQNM
G	H-10827	7/25	100	9/15		10.67
F	H-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

Descriptive Report to Accompany Hydrographic Survey H-10847

Field Number RA-10-20-98
Scale 1:10,000
February 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-10847 corresponds to sheet AB as defined in the sheet layout. This survey will provide data to supersede prior surveys performed from 1911 through 1933 and will affect Charts 16700, 16701 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 Rpt, Section B

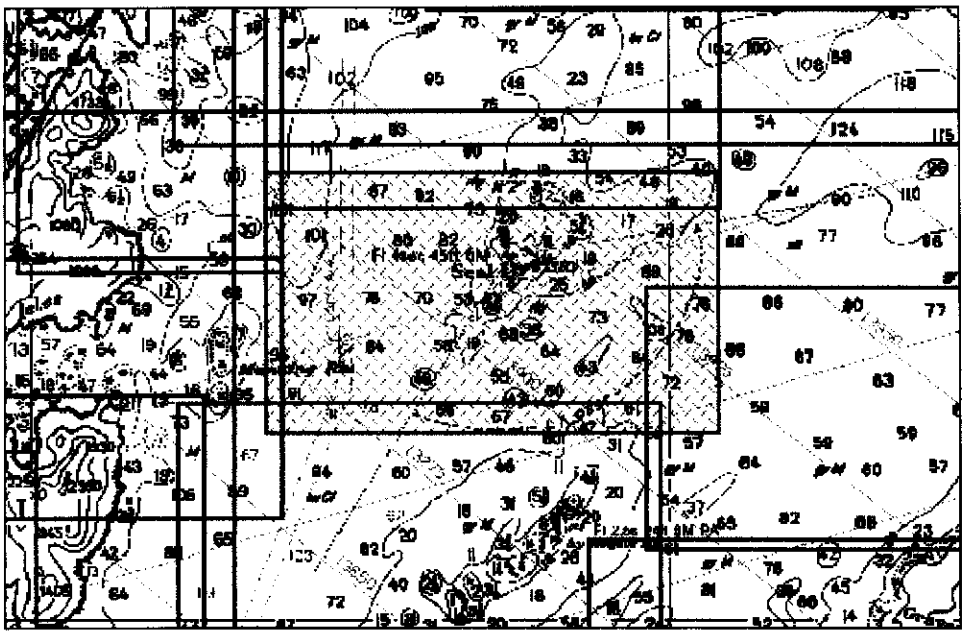


Figure 1. Survey area of H-10847

The survey area is in the vicinity of Seal Island. Survey limits are (60°26'59.75"N,147°32'~~40.52~~45.00"W; 60°26'59.75"N,147°18'~~28.63~~21.99"W; 60°22'54.49"N,147°18'~~28.63~~21.99"W; 60°22'54.49"N,147°32'~~40.52~~45.00"W). The largest volume of marine traffic in this area consists of commercial fishing vessels and fishing charter boats, the Alaska Marine Highway ferries, and barge traffic. Data acquisition was conducted from September 21 to October 26, 1998 (DN 264 to DN 299).

C. SURVEY VESSELS ✓

Data were acquired by 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). 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. 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 ✓

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 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.

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

* Filed with the hydrographic data.

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

G. CORRECTIONS TO ECHO SOUNDINGS ✓

Sound Velocity Correctors: ✓

Nine sound velocity casts were used for this survey. Five casts were used as singlebeam correctors, four casts were used to correct SWMB data. Information on the cast used for singlebeam data acquisition is included in the Survey Information Summary Report.

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: ✓

Table 1. Dates and methods of measurements for vessel offset correctors* used in survey H-10847.

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

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. A static draft and transducer offset for launches 2121, 2122, 2123, 2124, 2125, and 2126 were measured on March 26, 1998. 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

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 without adjusting for zoning.

* Filed with the hydrographic data.

Table 2. Tide correctors used for survey H-10847.

Zone Station	Time Corrector (min)	Range Ratio	HPS Tide Table No.
PWS 8	0	x0.95	Table No. 1
PWS 37	0	x0.94	Table No. 1

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.

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 3. Tide station information for survey H-10847.

Station name	Station Number	GOES XMTR	Type of gauge	Date Established	Date Removed
Seal Island	945-4564	Yes	30-day	8-5-98	10-30-98
Snug Harbor	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.

H. HYDROGRAPHIC POSITION CONTROL See Eval Rpt., Section H.

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

All soundings were positioned using differential GPS (DGPS). The VHF differential reference station at SEAL 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.

* Filed with the hydrographic data.

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 Evtl Rpt., section J.

No photogrammetric shoreline was available for use as source shoreline. Seal Island shoreline was digitized from prior survey H-5421 in Mapinfo by RAINIER personnel. The traced 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 digitized 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

Digitized shoreline and field features were compared to an enlargement of Chart 16700 24th Ed., Chart 16701 16th Ed. and Chart 16705 17th Ed. There was general agreement between the charted and digitized prior survey shoreline and what the hydrographer found on this survey. There are, however, numerous differences (approximately 18) when analyzing the present features such as rocks and ledges. The differences fall into two categories: mis-charted rocks and uncharted 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 or this area has risen since the initial survey, due to the effects of the 1964 earthquake, exposing new rocks. Discrepancies between charted and field shoreline should thus be resolved in favor of the 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. Shoreline verification data was analyzed during office processing and shown on the smooth sheet as warranted. Concur

Table 4. Detached Positions taken on new features. It is recommended that they be added to the chart. concur

FIX_NUMBER	CHARTED FEATURE	POSITION OF DP	OBSERVED FEATURE Smooth Sheet	
20073	None	60°25'48.44"N 147°24'37.90"W	Rock covs islet	Chart ✻
20074	Islet	60°25'45.88"N 147°24'02.02"W	~~Ledge~~ islet (2)	Chart islet
20077	None	60°25'34.31"N 147°24'02.34"W	Rock (1)	Chart ✻
20078	None	60°25'26.56"N 147°24'56.76"W	Ledge ✓(5)	Chart ✻
20079	None	60°25'33.11"N 147°25'10.47"W	Rock (1)	Chart ✻
20080	None	60°25'39.05"N 147°25'15.71"W	Rock (1)	Chart ✻
20082	None	60°25'43.43"N 147°25'12.77"W	Ledge ✓(1)	Chart ✻

Detached Position number 20074, a ledge that is charted as an islet, is connected to Seal Island at MLLW. Detached Position number 20079 (new rock) is connected to Seal Island by a ledge.

Table 5. Detached Positions that are charted rock disaprovals. It is recommended that they be removed from the chart. Concur

FIX_NUMBER	CHARTED FEATURE	POSITION OF DP	OBSERVED FEATURE
20083	Rock	60°25'40.83"N 147°25'18.48"W	None ✓ concur
20084	Rock	60°25'36.53"N 147°25'15.34"W	None ✓ concur
20085	Rock	60°25'27.40"N 147°25'10.14"W	None ✓ concur
20086	Rock	60°25'26.62"N 147°25'05.01"W	None ✓ concur
20087	Rock	60°25'25.89"N 147°24'50.74"W	None ✓ concur
20088	Rock	60°25'29.67"N 147°24'23.74"W	None ✓ concur
20089	Rock	60°25'31.44"N 147°24'08.38"W	None ✓ concur
20090	Rock	60°25'32.04"N 147°23'53.59"W	None } Fix is 100 m to 200 m away from charted rocks. Rocks will be charted at prior survey rock position.
20091	Rock	60°25'34.86"N 147°23'51.02"W	None
20092	Rock	60°25'38.34"N 147°23'50.09"W	None
20093	Rock	60°25'41.57"N 147°23'48.22"W	None ✓ concur

A visual search was conducted for the charted rocks. A search time of approximately 10 minutes per charted rock was allowed. The visibility was approximately 6m.

J. CROSSLINES ✓

Crosslines agreed very well with mainscheme hydrography. Depths generally agreed within one to five meters. See Section F, Sounding Equipment, for more details. There were a total of 24.5 nautical miles of crosslines, comprising 6.8% of mainscheme hydrography.

K. JUNCTIONS ✓ See Eval Rpt., section L.

The following surveys junction with H-10847:

Registry #	Scale	Date	Junction side
H-10837	1:10,000	1998	Northwest
H-10855	1:10,000	1998	North
H-10841	1:10,000	1998	Southwest

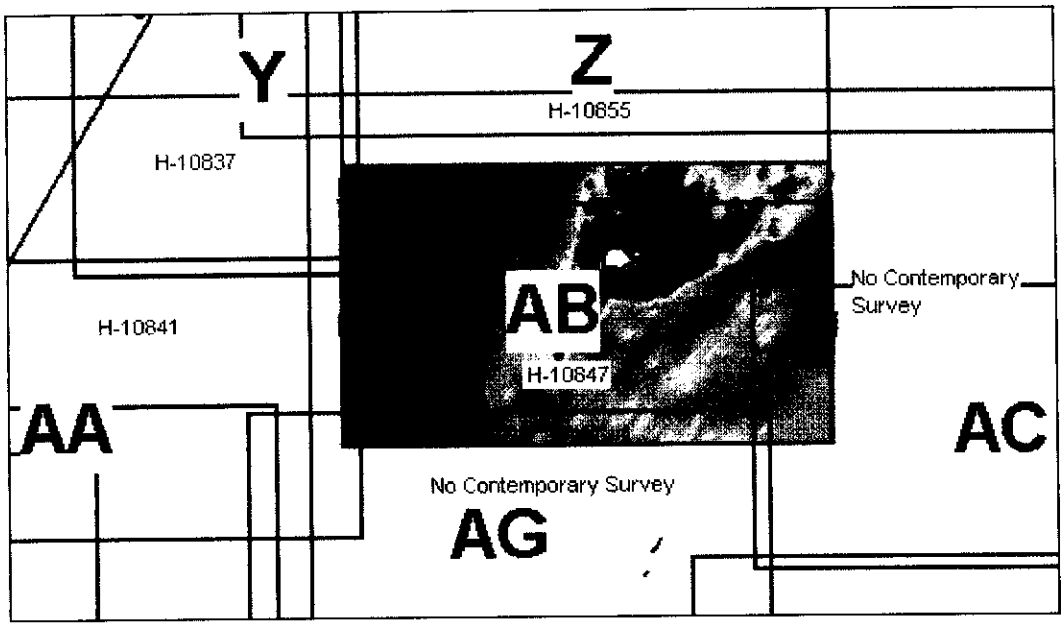


Figure 2. Surveys that junction with H-10847. Sheets AC and AG are scheduled to be surveyed during the 1999 field season.

Soundings on these 1998 surveys were found to be in good agreement, generally matching within 1 to 5 meters. See section F., Sounding Equipment, for further details. Final comparisons will be made at the Pacific Hydrographic Branch (PHB) after reduction to final vertical datum.

L. COMPARISON WITH PRIOR SURVEYS ✓ See Eval/Rpt, section M

The following prior surveys share common area with H-10847:

Registry #	Scale	Date	Area covered
H-2741	1:40,000	1911	Northwest
H-5421	1:20,000	1933	East
H-5431	1:20,000	1933	Southwest
H-5430	1:20,000	1933	Northern portion

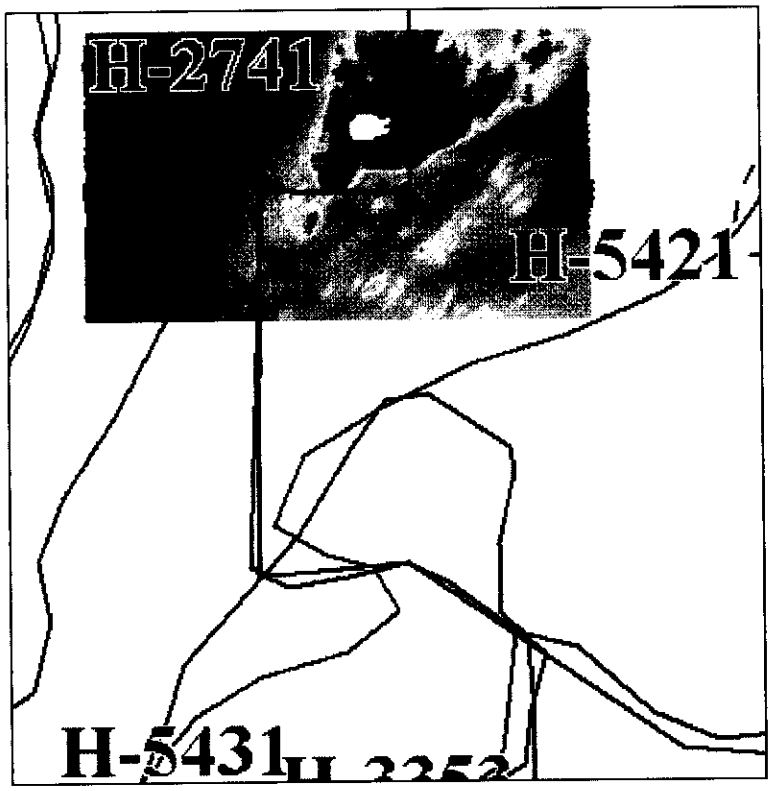


Figure 3. Prior survey coverage that pertains to survey H-10847.

Prior survey H-5421 covers the water surrounding Seal Island and the eastern region of the present survey H-10847. The prior soundings agreed well with the present survey. Generally, depths shoaler than 20 fathoms on the prior were compared with contemporary SWMB data and singlebeam data were compared with depths deeper than 20 fathoms. In areas where there are significant differences between the prior and contemporary surveys, the current soundings were found to be shoaler than the prior soundings (table 6). Differences between the current survey and priors can probably be attributed to scale and improved modern positioning and sounding equipment. Concur

Prior survey H-5431 depths are in good agreement and cover the southwestern portion of H-10847. Depths generally agreed to within 1 fathom in areas of 20 fathoms or shoaler. Few 5 fathom differences were found when comparing depths greater than 50 fathoms. Final comparisons will be done at PHB after reduction to final sounding datum using tidal information collected concurrently with this survey. Concur

Prior survey H-2741 proved impossible to compare with H-10847 due to its poor quality. The few soundings that did prove legible could not be compared with the present survey since the lack of any latitude, longitude or shoreline made it impossible to orient this prior. See Eval Rpt., Section M.

Table 6. Depth comparison of H-10847 with prior survey H-5421.

Prior H-5421 (Fm)	H-10847 (Fm)	Position	Fix # H-10847	Type of Hydro
75	70.9	60°24'31.70" 147°25'5.63"	23755	singlebeam
26	26.2	60°25'12.28" 147°23'31.44"	45977	singlebeam
12	6.2	60°25'52.85" 147°23'38.63"	81445	SWMB
5.8	3.9	60°26'12.39" 147°22'52.91"	80988	SWMB
21	20	60°26'24.87" 147°23'8.92"	11442	singlebeam
19	14.4	60°26'32.99" 147°19'47.12"	80190	SWMB

Table 7. Depth comparison of H-10847 with prior survey H-5431.

Prior H-5431 (Fm)	H-10847 (Fm)	Position	Fix # H-10847	Type of Hydro
49	48.3	60°23'43.03" 147°27'53.41"	33910	singlebeam
49	44.1	60°23'27.18" 147°24'59.52"	32637	singlebeam
68	64.3	60°24'15.53" 147°25'46.65"	22367	singlebeam
26	32.6	60°24'9.12" 147°26'23.92"	21876	singlebeam
19	15.6	60°24'20.94" 147°26'18.23"	81531	SWMB
55	52.8	60°24'39.83" 147°26'48.78"	60903	singlebeam

M. ITEM INVESTIGATIONS

No item investigations accompany this report. Concur

N. COMPARISON WITH THE CHART See Eval Rpt., section O

CHART	EDITION	SCALE
16700	25th Ed. September 21, 1996	1:200,000
16701	15th Ed. July 21, 1990	1:81,436
16705	17th Ed. September 27, 1993	1:80,000

The survey was compared with Charts 16700, 16701 and 16705 and was in good agreement, generally within one fathom. Areas of significant differences are listed as DTON's. It should be noted that survey H10847 developed the area around Seal Island far more extensively than is shown on the chart. Consequently, shoaler soundings exist around Seal Island than those currently shown on Chart 16705. In general, soundings on the contemporary survey agree, or are shoaler by several fathoms. Concur

A small region of AB is greater than 100 fathoms. In comparing these depths with Chart 16705, it was found that the agreement was excellent with the exception of a 10 fathom difference between acquired shoaler soundings and a charted 101 fathom sounding at Lat. 60°26'28.16" Long. 147°32'35.43".

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 ✓ See Eval Rpt., Section O.

Three dangers to navigation were reported to the Seventeenth Coast Guard District on November 1, 1998. Copies of the correspondence can be found in Appendix I of this report. The dangers to navigation features are shoals. Copy attached to this report. Additional dangers were reported during office processing.

O. ADEQUACY OF SURVEY ✓

Survey H-10847 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 in ~~the Appendices~~ this report for more information on the discrepancy between the charted position and the surveyed position.

Name	Light List No.	Survey H10847 Position
Seal Island Light	25840	60-25-47.07 N 147-24-56.83 W *
N "2"	25835	60/26/45.17N, 147/24/10.66W

* Copy attached to this report.

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 ✓

The vicinity of Seal Island and Pennsylvania Rock demonstrate high relief bathymetry. It is recommended that these areas retain a greater concentration of soundings for use to the mariner. It is also recommended by

the hydrographer that shoreline manuscripts be compiled from photogrammetry at MLLW. It allows for quicker progression of shoreline verification and drastically reduces the complexity of the survey field records. Concur.

T. REFERRAL TO REPORTS ✓

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

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

Respectfully Submitted,

Paul Jay McAnally

Paul Jay McAnally
Senior Survey Technician

Approved and Forwarded,

Alan D. Anderson

Alan D. Anderson
Captain, NOAA
Commanding Officer

Survey Information Summary

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

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

Change #	Dated
1	9/8/98

Sheet Letter: AB **Registry Number:** H-10847

Sheet Number: RA-10-20-98

Survey Title: VICINITY OF SEAL ISLAND

Data Acquisition Dates: **From:** 21-Sep-98 264 **To:** 26-Oct-98 299

Vessel Usage Summary

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

Sound Velocity Cast Information

Launch Table #	Ship Table #	Cast DN	Max Depth	Position	Applicable DN
9		261	294.2	60/30/20	260-264
				147/31/15	
10		265	286.2	60/30/18	265-278
				147/31/36	
12		281	276.6	60/29/50	279-ldh
				147/14/35	

Tide Zone Information

Zone #	Time Corr.	Height Corr.
PWS8	0 hr 0 min	0.96
PWS37	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

Statistics Summary

Type	Total:
BS	19
DP	22
MS	587.29
S/L	1.98
SPLIT	135.86
SWMB	55.62
XL	39.66

Percent XL:	6.8%
SQNM:	24.5

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

Section Q: Descriptive Report Insert

Name of Aid: Seal Island Light
Light List #: 25840

Method of Positioning GPS: [X] DGPS: [ ] Other: _____

Positioning Information

	Latitude (N)	Longitude (W)
Charted Pos.	60/25/46.8	147/24/57.6
Survey Pos.	60/25/47.07	147/24/56.83

	Easting	Northing
Charted Pos.	34626.2	47873.7
Survey Pos.	34638	47882.1

Difference between Charted and Surveyed Position: Distance: 14 meters
(Bearing from Surveyed to Charted Position) Bearing: 235 deg T

Characteristics
Do characteristics match Light List? Yes [X] No [ ]
If no, what are the characteristics? _____

Does the aid adequately serve its apparent purpose? Yes [X] No [ ]
If no, why not? _____

New/Uncharted Aids (if information is known or easily obtained)
Date Est: _____
Maintained By: _____ Private? Yes [ ] No [ ]
Is aid seasonally maintained? Yes [ ] No [ ]
Frequency of Maintenance: _____

Apparent Purpose: _____

Other Information:

Designation: SEAL

Position: 60° 25' 47.07484" N 147° 24' 56.82688" W

Horizontal Datum: NAD 83 Vertical Datum: NGVD 88

Elevation: 14.3 meters 45 feet (USCG Light List)

Geoid Height: 13.817 meters (Geoid 96)

Ellipsoidal Height: 28.08 meters

Horizontal Order: 3rd Order Mark

Station mark is a lighted navigation aid atop a steel tower frame; mark is suitable for GPS observations. Stability Code: D Set by NOAAS RAINIER in 1998, Chief of Party A.D.A.

Stamping: (none)

STATION IS IN PRINCE WILLIAM SOUND ON THE NORTHWESTERN SIDE OF SEAL ISLAND, ON A GRASS COVERED ROCK OUTCROP ABOUT 55 NAUTICAL MILES EAST- SOUTHEAST OF WHITTIER.

STATION IS A COAST GUARD LIGHTED AID TO NAVIGATION (SEAL ISLAND LIGHT) ATOP A STEEL FRAME TOWER, SET ON AN OUTCROPPING OF BEDROCK.

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 10, 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. All positions are on the NAD 83 datum and depths have been corrected to Mean Lower Low Water using predicted tides.

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	3.6	60:25:47.509	147:35:29.870	98193	6.7	H-10837
Shoal	9.9	60:24:18.109	147:40:18.955	23534	18.2	H-10841
Shoal	7.5	60:22:18.056	147:35:55.819	26835	13.8	H-10841
Shoal	3.8	60:23:30.991	147:34:49.821	40575	7.1	H-10841
Rock	0.4	60:24:53.088	147:37:07.565	45754	0.7	H-10841
Shoal	10.0	60:24:30.646	147:36:24.056	46254	18.4	H-10841
Rock	0.2	60:23:54.311	147:34:07.379	47199	0.4	H-10841
Shoal	4.9	60:23:32.613	147:35:57.377	47777	9.0	H-10841
Shoal	3.6	60:23:22.716	147:36:49.759	48006	6.6	H-10841
Shoal	5.7	60:24:20.069	147:38:08.923	53097	10.5	H-10841
Shoal	3.7	60:24:28.412	147:39:29.949	21112	6.9	H-10841
Shoal	5.9	60:24:20.931	147:33:36.670	46490	10.9	H-10841
Rock Awash	-0.6	60:22:57.526	147:42:19.292	21421	-1.1	H-10841
Shoal	6.2	60:22:50.318	147:36:06.033	27776	11.4	H-10841
Shoal	6.9	60:26:05.397	147:22:28.544	40436	12.6	**H-10847**
Shoal	2.0	60:25:39.547	147:23:33.973	41620	3.6	**H-10847**
Shoal	6.5	60:25:16.938	147:23:48.111	43496	12.0	**H-10847**
Shoal	6.7	60:30:24.298	147:26:00.596	51036	12.3	H-10846
Shoal	7.5	60:30:10.133	147:25:53.909	51068	13.8	H-10846
Shoal	6.0	60:30:46.134	147:23:49.449	51823	6.0	H-10846
Shoal	8.2	60:30:58.745	147:20:42.597	24322	15.1	H-10846
Rock Awash	0.0	60:31:48.779	147:18:37.474	40268	0.0	H-10846
Shoal	6.0	60:32:06.203	147:16:59.527	30495	11.1	H-10846

ADVANCE INFORMATION

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

Feature	Depth (fm)	Latitude (N)	Longitude (W)	Position #	Depth (m)	Survey #
Shoal	4.8	60:26:54.003	147:33:39.497	103551	8.8	H-10837
Shoal	2.0	60:27:03.600	147:37:44.481	92942	3.7	H-10837
Shoal	2.3	60:28:10.662	147:37:19.334	45757	4.2	H-10837
Shoal	2.7	60:29:22.063	147:35:34.292	103697	5.0	H-10837
Shoal	4.3	60:30:22.427	147:34:57.878	94321	8.0	H-10837
Rock	1.1	60:30:47.308	147:36:04.709	61731	2.0	H-10837
Shoal	3.7	60:31:15.045	147:34:29.242	51785	6.7	H-10837
Rock	1.8	60:31:27.814	147:37:02.670	73709	3.3	H-10837
Rock Awash	0.0	60:27:58.387	147:39:49.513	20078	0.0	H-10837
Rock Awash	-0.3	60:29:30.686	147:40:21.799	20636	-0.5	H-10837

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-11-98. More information on current RAINIER survey projects may be obtained by e-mail; contact the Field Operations Officer at FOO.RAINIER@NOAA.GOV.

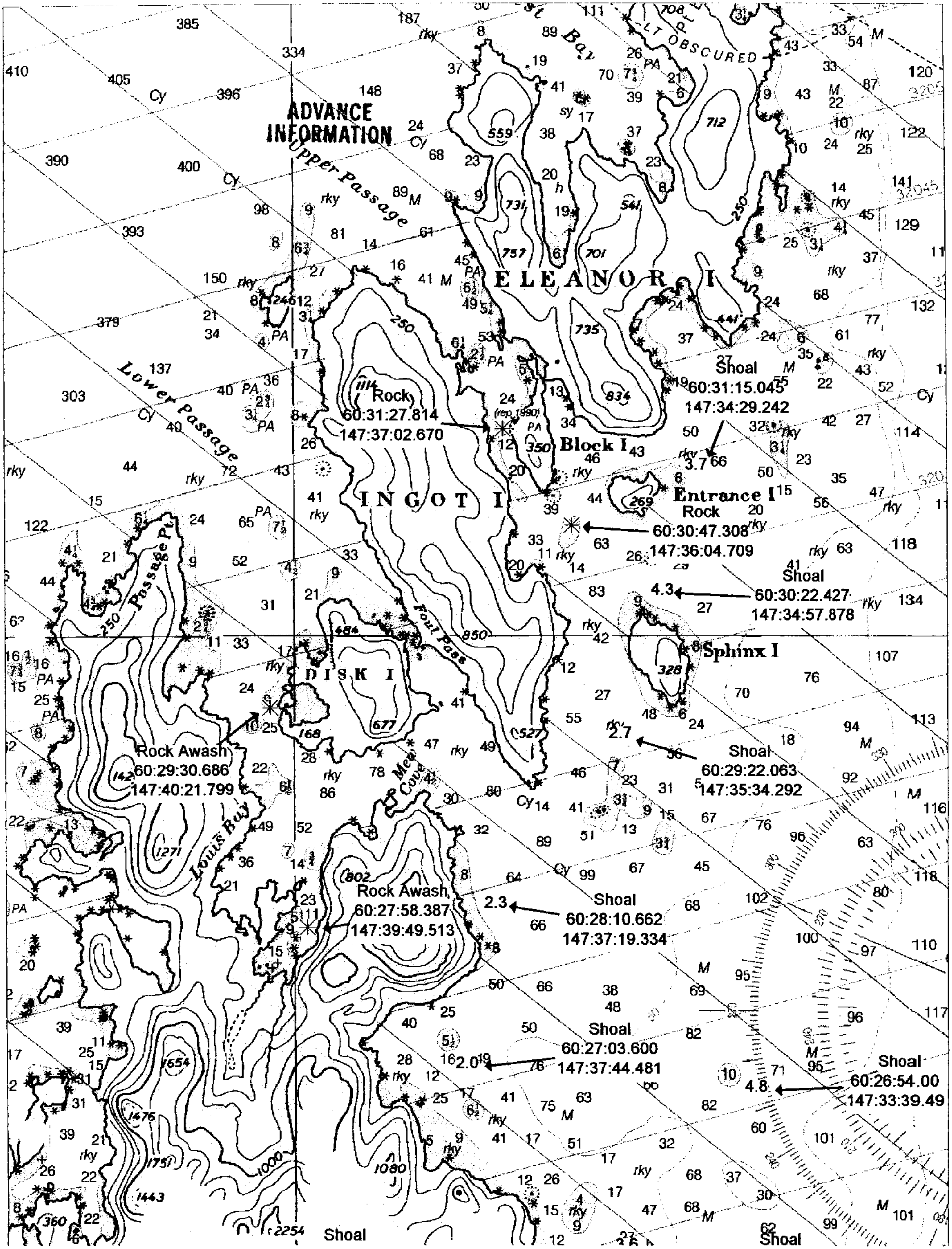
Sincerely,

Alan D Anderson

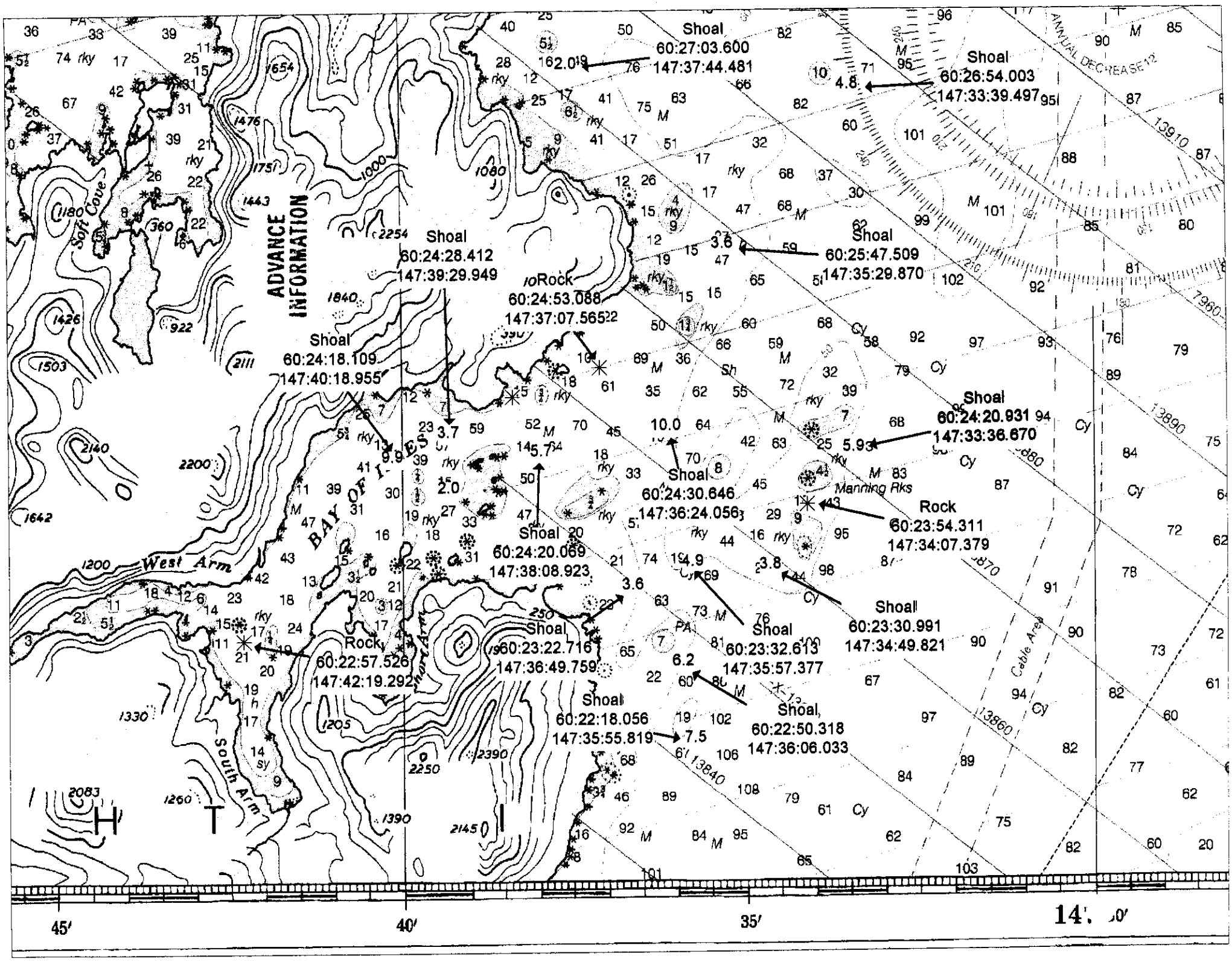
Alan D. Anderson
Captain, NOAA
Commanding Officer

Attachment

cc: NIMA
PMC
N/CS261
N/CS34



ADVANCE INFORMATION
Upper Passage
Lower Passage
ELEANOR I
INGOT I
DISK I
Block I
Entrance I
Sphinx I
Passage Pt
Foul Pass
Louis Bay
LT OBSCURED
Rock
60:31:27.814
147:37:02.670
Shoal
60:31:15.045
147:34:29.242
Rock
60:30:47.308
147:36:04.709
Shoal
60:30:22.427
147:34:57.878
Rock Awash
60:29:30.686
147:40:21.799
Shoal
60:29:22.063
147:35:34.292
Rock Awash
60:27:58.387
147:39:49.513
Shoal
60:28:10.662
147:37:19.334
Shoal
60:27:03.600
147:37:44.481
Shoal
60:26:54.00
147:33:39.49
Shoal
Shoal


ADVANCE INFORMATION
BAY OF ISLES
West Arm
South Arm
East Arm
Soft Cove
Manning Rks
Cable Area
Shoal 60:27:03.600 147:37:44.481
Shoal 60:26:54.003 147:33:39.497
Shoal 60:24:28.412 147:39:29.949
Rock 60:24:53.088 147:37:07.565
Shoal 60:25:47.509 147:35:29.870
Shoal 60:24:18.109 147:40:18.955
Shoal 60:24:20.931 147:33:36.670
Shoal 60:24:30.646 147:36:24.056
Rock 60:23:54.311 147:34:07.379
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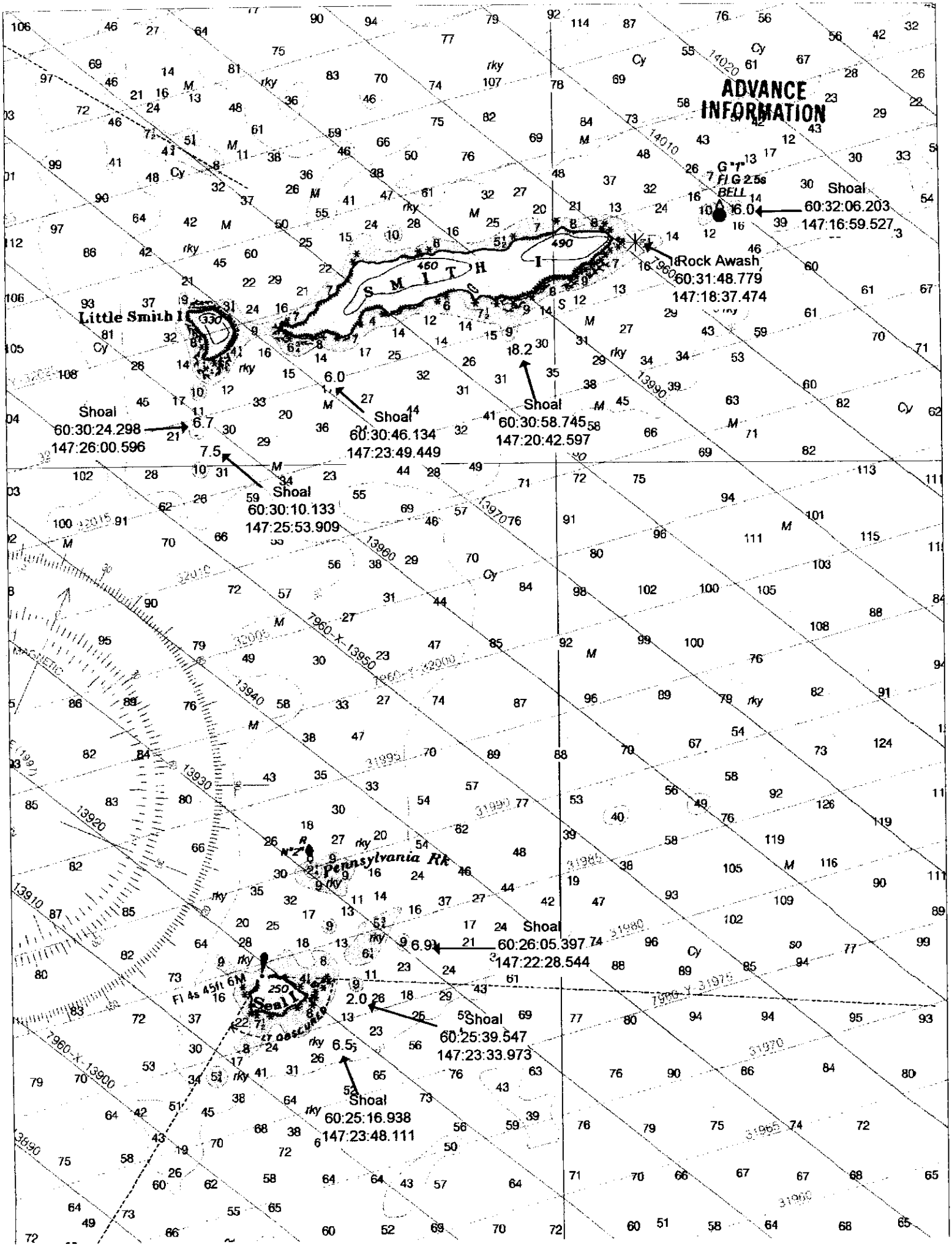
Shoal 60:23:30.991 147:34:49.821
Rock 60:22:57.526 147:42:19.292
Shoal 60:23:22.716 147:36:49.759
Shoal 60:23:32.613 147:35:57.377
Shoal 60:22:18.056 147:35:55.819
Shoal 60:22:50.318 147:36:06.033
45′
40′
35′


ADVANCE INFORMATION
Shoal
16.0
60:32:06.203
147:16:59.527
Rock Awash
60:31:48.779
147:18:37.474
Little Smith I
Shoal
60:30:24.298
147:26:00.596
6.7
Shoal
60:30:46.134
147:23:49.449
6.0
Shoal
60:30:58.745
147:20:42.597
18.2
7.5
Shoal
60:30:10.133
147:25:53.909
Pennsylvania Rk
Shoal
60:26:05.397
147:22:28.544
6.9
Seal I
Shoal
60:25:39.547
147:23:33.973
2.0
6.5
Shoal
60:25:16.938
147:23:48.111

ADVANCE INFORMATION

Lotus cc:Mail for FOO Rainier

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

It is requested that the following dangers to navigation be included in the Local Notice to Mariners. The NOAA Ship RAINIER positioned these features while conducting hydrographic surveys in southwestern Prince William Sound, Alaska. All positions are on the NAD 83 datum and depths have been corrected to Mean Lower Low Water using predicted tides.

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.

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Shoal	4.9	60:23:32.613	147:35:57.377	47777	9.0	H-10841
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Shoal	6.9	60:26:05.397	147:22:28.544	40436	12.6	H-10847
Shoal	2.0	60:25:39.547	147:23:33.973	41620	3.6	H-10847
Shoal	6.5	60:25:16.938	147:23:48.111	43496	12.0	H-10847
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Feature	Depth (fm)	Latitude (N)	Longitude (W)	Position #	Depth (m)	Survey #
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Shoal	2.0	60:27:03.600	147:37:44.481	92942	3.7	H-10837
Shoal	2.3	60:28:10.662	147:37:19.334	45757	4.2	H-10837
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Rock Awash	0.0	60:27:58.387	147:39:49.513	20078	0.0	H-10837
Rock Awash	-0.3	60:29:30.686	147:40:21.799	20636	-0.5	H-10837

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-11-98. More information on current RAINIER survey projects may be obtained by e-mail; contact the Field Operations Officer at FOO.RAINIER@NOAA.GOV.

/s/ Alan D. Anderson
Captain, NOAA

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
OFFICE OF COAST SURVEY
Pacific Hydrographic Branch
Seattle, Washington 98115-0070

May 17, 1999

Commander (OAN)
Seventeenth Coast Guard District
P.O. Box 25517
Juneau, AK 99802

Dear Sir:

During office review of hydrographic survey H-10847, Alaska, Prince William Sound, Vicinity of Seal Island, additional shoal soundings were found and are considered to be a potential danger to navigation. In addition, a reported danger to navigation dated November 10, 1998 contained an erroneous depth.

It is recommended that the enclosed Report of Dangers to Navigation be included in the Local Notice to Mariners.

Questions concerning this report should be directed to the Pacific Hydrographic Branch at (206) 526-6836.

Sincerely,

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

Enclosure

cc: NIMA
NCS/261

REPORT OF DANGERS TO NAVIGATION

Hydrographic Survey Registry Number: H-10847

Survey Title: State: ALASKA
Locality: Prince William Sound
Sublocality: Vicinity of Seal Island

Project Number: OPR-P139-RA, NOAA Ship RAINIER

Survey Date: September 21 –October 26, 1998

Soundings are reduced to Mean Lower Low Water using real tides and are positioned on NAD 83.

Chart affected: 16705, 17TH Edition, September 27, 1997, scale 1:80,000, NAD 83

The following is a correction to a previously reported danger:

A danger to navigation was reported by the NOAA Ship RAINIER on November 10, 1998 for survey H-10847 with an incorrect depth. A shoal depth of 2.0 fathoms was incorrectly reported at latitude 60/25/39.5 N, longitude 147/23/33.9 W. The correct depth at this position is 5 ¼ fathoms.

The following items are new:

DANGER TO NAVIGATION	LATITUDE(N)	LONGITUDE(W)
3 ¾ fathoms	60/25/41.9	147/23/29.6
4 ½ fathoms	60/25/46.3	147/23/11.3

Questions concerning this report should be directed to the Chief, Pacific Hydrographic Branch at (206)526-6836.

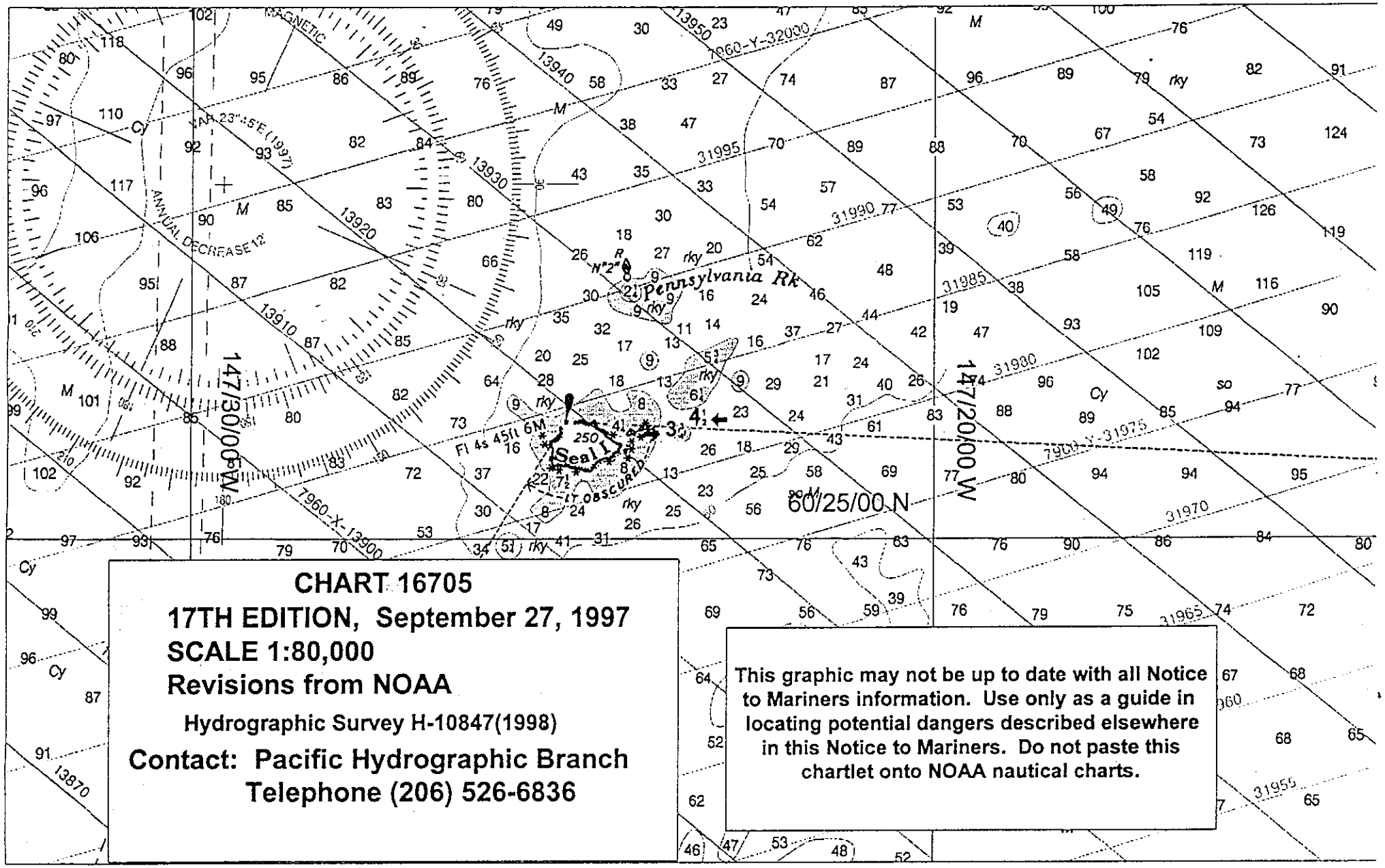


CHART 16705
17TH EDITION, September 27, 1997
SCALE 1:80,000
Revisions from NOAA

Hydrographic Survey H-10847(1998)

Contact: Pacific Hydrographic Branch
Telephone (206) 526-6836

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

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
OFFICE OF COAST SURVEY
Pacific Hydrographic Branch
Seattle, Washington 98115-0070

June 29, 1999

Commander (OAN)
Seventeenth Coast Guard District
P.O. Box 25517
Juneau, AK 99802

Dear Sir:

During office review of hydrographic survey H-10847, Alaska, Southwest Prince William Sound, Vicinity of Seal Island, eighteen additional shoal soundings were found and are considered to be potential dangers to navigation.

It is recommended that the enclosed Report of Dangers to Navigation be included in the Local Notice to Mariners.

Questions concerning this report should be directed to the Pacific Hydrographic Branch at (206) 526-6836.

Sincerely,

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

Enclosures

cc: NIMA
N/CS261

REPORT OF DANGERS TO NAVIGATION

Hydrographic Survey Registry Number: H-10847

Survey Title: State: ALASKA
Locality: SOUTHWEST PRINCE WILLIAM SOUND
Sublocality: VICINITY OF SEAL ISLAND

Project Number: OPR-P139-RA

Survey Date: Sept. 21-Oct. 26, 1998

Soundings are reduced to Mean Lower Low Water using approved tides and are positioned on NAD 83.

Chart affected: 16705 18th Edition/March 27, 1999, scale 1:80,000, NAD 83

DANGER TO NAVIGATION	LATITUDE(N)	LONGITUDE(W)
Shoal, covers 4 ½ fathoms	60/24/54.580	147/25/43.961
Shoal, covers 6 ¼ fathoms	60/25/06.209	147/25/20.843
Shoal, covers 2 ¼ fathoms	60/25/21.100	147/25/09.005
Shoal, covers 1 ½ fathoms	60/25/24.446	147/24/25.856
Shoal, covers 7 fathoms	60/25/11.342	147/24/19.372
Shoal, covers 5 ½ fathoms	60/25/16.493	147/23/49.910
Shoal, covers 4 ¾ fathoms	60/25/38.826	147/23/32.917
Shoal, covers 5 ½ fathoms	60/25/46.750	147/23/11.437
Shoal, covers 3 ½ fathoms	60/25/58.037	147/23/19.125
Shoal, covers 3 ½ fathoms	60/25/53.298	147/23/48.610
Shoal, covers 5 ½ fathoms	60/25/59.022	147/24/08.557
Shoal, covers 6 ¼ fathoms	60/25/53.304	147/25/35.949
Shoal, covers 3 ¼ fathoms	60/26/09.492	147/22/53.980
Shoal, covers 7 ¾ fathoms	60/26/10.336	147/23/40.959
Shoal, covers 6 ½ fathoms	60/26/22.573	147/23/22.219
Shoal, covers 3 ½ fathoms	60/26/29.227	147/23/52.472
Shoal, covers 5 fathoms	60/26/39.614	147/23/30.349
Shoal, covers 7 fathoms	60/26/48.858	147/23/34.844

Questions concerning this report should be directed to the Chief, Pacific Hydrographic Branch at (206) 526-6836.

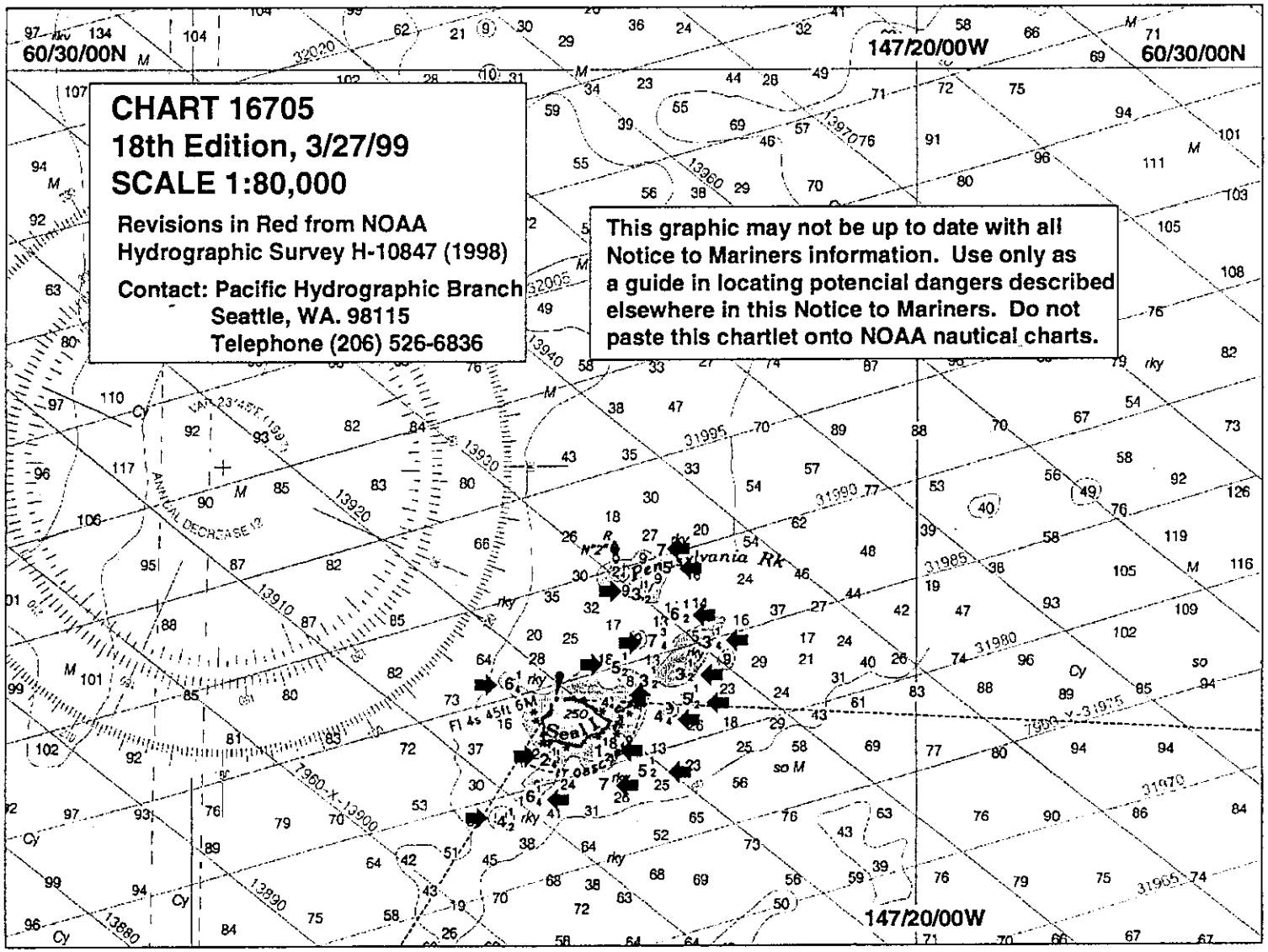


CHART 16705
18th Edition, 3/27/99
SCALE 1:80,000
Revisions in Red from NOAA
Hydrographic Survey H-10847 (1998)
Contact: Pacific Hydrographic Branch
Seattle, WA. 98115
Telephone (206) 526-6836
This graphic may not be up to date with all Notice to Mariners information. Use only as a guide in locating potencial dangers described elsewhere in this Notice to Mariners. Do not paste this chartlet onto NOAA nautical charts.
60/30/00N
147/20/00W
60/30/00N
147/20/00W
Pennsylvania Rk
Seal I
ANNUAL DECREASE 12'
VAR 23°45'E (1997)

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 23, 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 fieldwork. This is the second of two memorandums discussing the delay in submission of survey data and covers the remaining surveys that were conducted by RAINIER during the Prince William Sound project in the summer and fall of 1998.

The surveys affected are H-10843 (RA-10-18-98), H-10849 (RA-40-01-98), H-10846 (RA-10-19-98), H-10847 (RA-10-20-98), and H-10855 (RA-10-21-98). 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 fieldwork completion.

The anticipated transmittal date for the above-mentioned surveys is late-December 1998 or early January 1999.

APPROVAL SHEET

for

H-10847

RA-10-20-98

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

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-10847

LOCALITY: Prince William Sound, AK
Vicinity of Seal Island
TIME PERIOD: Sep 21 - Oct 27, 1998

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

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

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

TIDE STATION USED: 945-4652 South Arm, Knight Island, AK
Lat. 60° 21.9'N Lon. 147° 41.7'W
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 3.320 meters

REMARKS: RECOMMENDED ZONING
Use zone(s) identified as: PWS8 & PWS37.

Refer to attachments for zoning information.

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

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

Thomas N. Mero 3/25/99

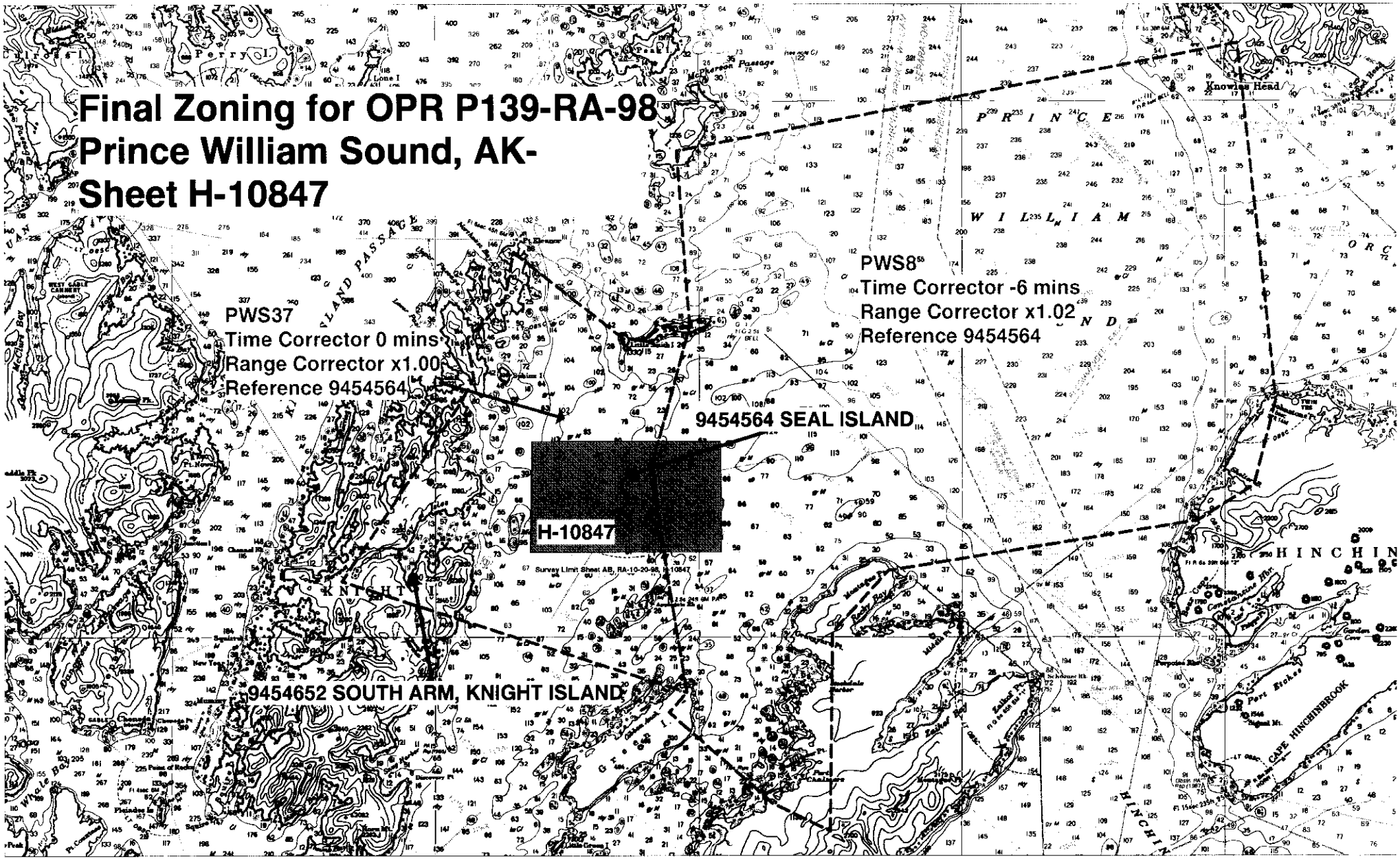
CHIEF, REQUIREMENTS AND DEVELOPMENT DIVISION

Final tide zone node point locations for OPR P139-RA-98,
Sheet H-10847.

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 PWS8			
-147.166932 60.206678	9454564	-6	1.02
-147.164575 60.330933	9454240	-6	0.99
-147.093352 60.369491	9454050	-6	0.95
-146.701487 60.401			
-146.630054 60.423082			
-146.602861 60.476793			
-146.64982 60.699661			
-147.360641 60.632173			
-147.344431 60.522683			
-147.391163 60.437636			
-147.373205 60.367377			
-147.348 60.293559			
-147.37047 60.281064			
-147.239884 60.224039			
-147.166932 60.206678			
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


Final Zoning for OPR P139-RA-98
Prince William Sound, AK-
Sheet H-10847
PWS37
Time Corrector 0 mins
Range Corrector x1.00
Reference 9454564
PWS8[55]
Time Corrector -6 mins
Range Corrector x1.02
Reference 9454564
9454564 SEAL ISLAND
H-10847
9454652 SOUTH ARM, KNIGHT ISLAND
PRINCE WILLIAM SOUND
Knowles Head
HINCHIN
CAPE HINCHINBROOK

NOAA FORM 76-155
(11-72)

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

GEOGRAPHIC NAMES

SURVEY NUMBER

H-10847

Name on Survey	A ON CHART NO.	B ON PREVIOUS SURVEY NO.	C ON U.S. QUADRANGLE MAPS	D FROM LOCAL INFORMATION	E ON LOCAL MAPS	F P.O. GUIDE OR MAP	G RAND MCNALLY ATLAS	H U.S. LIGHT LIST	K	
ALASKA (title)	X		X							1
PENNSYLVANIA ROCK	X		X							2
PRINCE WILLIAM SOUND	X		X							3
SEAL ISLAND	X		X							4
										5
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										7
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										25

[redacted]

Dennis J. Romberg
Chief Cartographer

APR 14 1999

NOAA FORM 76-155 SUPERSEDES C&GS 197

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

U.S. DEPARTMENT OF COMMERCE

HYDROGRAPHIC SURVEY STATISTICS

REGISTRY NUMBER: H-10847

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

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

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

SHORELINE DATA

SHORELINE MAPS (List):	NA
PHOTOBATHYMETRIC MAPS (List):	NA
NOTES TO THE HYDROGRAPHER (List):	NA
SPECIAL REPORTS (List):	NA
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			
OUNDINGS 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	183.5		183.5
COMPARISON WITH PRIOR SURVEYS AND CHARTS	24		24
EVALUATION OF SIDE SCAN SONAR RECORDS			
EVALUATION OF WIRE DRAGS AND SWEEPS			
EVALUATION REPORT		36	36
GEOGRAPHIC NAMES			
OTHER* (Chart Compilation)		66	66
*USE OTHER SIDE OF FORM FOR REMARKS — TOTALS	207.5	102	309.5

Pre-processing Examination by: Pacific Hydrographic Branch	*Beginning Date*: 2/22/99	*Ending Date*: 3/10/99
Verification of Field Data by: M.Bigelow,D.Doles,R.Mayor,J.Ferguson,L.Deodato	*Time (Hours)*: 207.5	*Ending Date*: 8/27/99
Verification Check by: B. Olmstead	*Time (Hours)*: 10	*Ending Date*: 8/30/99
Evaluation and Analysis by: L. Deodato	*Time (Hours)*: 36	*Ending Date*: 9/2/99
Inspection by: B. Olmstead	*Time (Hours)*: 12	*Ending Date*: 9/7/99

EVALUATION REPORT

H-10847

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 sand. Depths range from -0.3 to 111 fathoms.

C. SURVEY VESSELS

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

D. AUTOMATED DATA ACQUISITION AND PROCESSING

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

Office processing of survey data was conducted using the same Computer Aided Resource Information System (CARIS), and Hydrographic Processing System (HPS) used by the hydrographer 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 May 11, 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 names text, line-type data, and minor symbolization. In addition, those soundings deleted from the drawing for clarity purposes remain unrevised in the HPS digital files to preserve the integrity of the original hydrographic data set. Cartographic codes used to describe the digital data are those authorized by Hydrographic Survey Guideline No. 35 and No. 75.

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

E. SONAR EQUIPMENT

Multibeam echo sounder was used during survey H-10847.

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 includes 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 gage, Seal Island, Alaska, 945-4564.

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:	-2.274 seconds	(-70.386 meters)
Longitude:	6.976 seconds	(106.616 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 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 analyze during processing to ensure it contained 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

There are no photogrammetric source data for this survey. Shoreline shown in brown on the smooth sheet originates from Chart 16705 18th Edition dated March 27, 1999 for orientation only. 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:

Survey	Year	Scale	Area
H-10837	1998	1:10,000	Western Limit
H-10841	1998	1:10,000	Western Limit
H-10855	1998	1:10,000	Northern Limit

The junctions with surveys H-10837, H-10841, and H-10855 are complete. A "Joins" note has been added to the smooth sheet where applicable. A few soundings from survey H-10855 have been transferred within the common area of H-10847 to better delineate the bottom configuration.

M. COMPARISON WITH PRIOR SURVEYS

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

Survey	Year	Scale	Datum
H-2741	1911	1:40,000	Valdez

Prior survey H-2741 covers the entire area of the present survey and was conducted using leadlines and visual positioning. A comparison was made using a digital copy of H-2741. The registration and legibility of this prior survey to the present survey was good.

Sounding agreement with the 1911 survey work reveals the present survey is generally shoaler from 0-4 fathoms. Aside from the effects of frequent earthquake activities around the area, the differences in depths may well be attributed to improved positioning and sounding methods, including the relative accuracy of the data acquisition process employed during this recent survey.

Four bottom characteristics were transferred in orange to the present survey. With the transfer of these features, the present survey is adequate to supersede prior survey H-2741 within the common area.

Survey	Year	Scale	Datum
H-5421	1933	1:20,000	Valdez
H-5430	1933	1:20,000	Valdez
H-5431	1933	1:20,000	Valdez

Prior surveys H-5421, H-5430, and H-5431 cover the entire area of the present survey. The present survey was compared to the digital copy of H-5421, H-5430, and H-5431. The registration of these prior surveys to the present survey was good. The legibility of the digital copies was good.

The present survey depths reflect a consistently shoaler trend of 1-2 fathoms with the prior work except in the areas of newly discovered shoal areas and/or better bottom definition of existing shoals. In these areas, the present survey found depths shoaler from 2-4 fathoms. Aside from the effects of frequent earthquake activities around the area, the differences in depths may well be attributed to improved positioning and sounding methods, including the relative accuracy of the data acquisition process employed during this recent survey.

Several prior survey rocks were transferred in violet from H-5421 to the present survey. These are located north and east of Seal Island, inshore of the present survey NALL line. With the inclusion of these rocks from H-5421, the present survey is adequate to supersede the prior surveys within their common areas.

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

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.

N. ITEM INVESTIGATIONS

There were no AWOIS items assigned to this survey.

O. COMPARISON WITH CHART

Survey H-10847 was compared with the following chart.

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

a. Hydrography

Charted hydrography originates with the previously discussed prior surveys and miscellaneous source data. The prior surveys have been adequately addressed in section M 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-10847 is adequate to supersede charted hydrography within the charted area.

b. Dangers To Navigation

Three dangers to navigation were identified during survey operations. Two additional dangers to navigation and one correction to a field reported danger were generated during preliminary office processing based on actual tides and unprocessed shallow water multibeam (SWMB) data. Subsequent office processing of survey data found eighteen additional dangers to navigation which were shoaler than the earlier reported dangers dated November 10, 1998 and May 17, 1999. These dangers were reported to the USCG, NIMA and N/CS261 on June 29, 1999. Copies of these reports are attached.

P. ADEQUACY OF SURVEY

Hydrography contained on survey H-10847 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 following item is noted.

The field unit submission of survey data exceeded the four weeks 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 23, 1998 is attached. Fieldwork for survey H-10847 was completed October 26, 1998 and received for office processing on February 22, 1999.

Q. AIDS TO NAVIGATION

Seal Point Light and floating aid N "2" were located and adequately mark the features intended. Refer to sections P and Q (Descriptive Report Insert) of the hydrographer's report for specific positional information and description.

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.

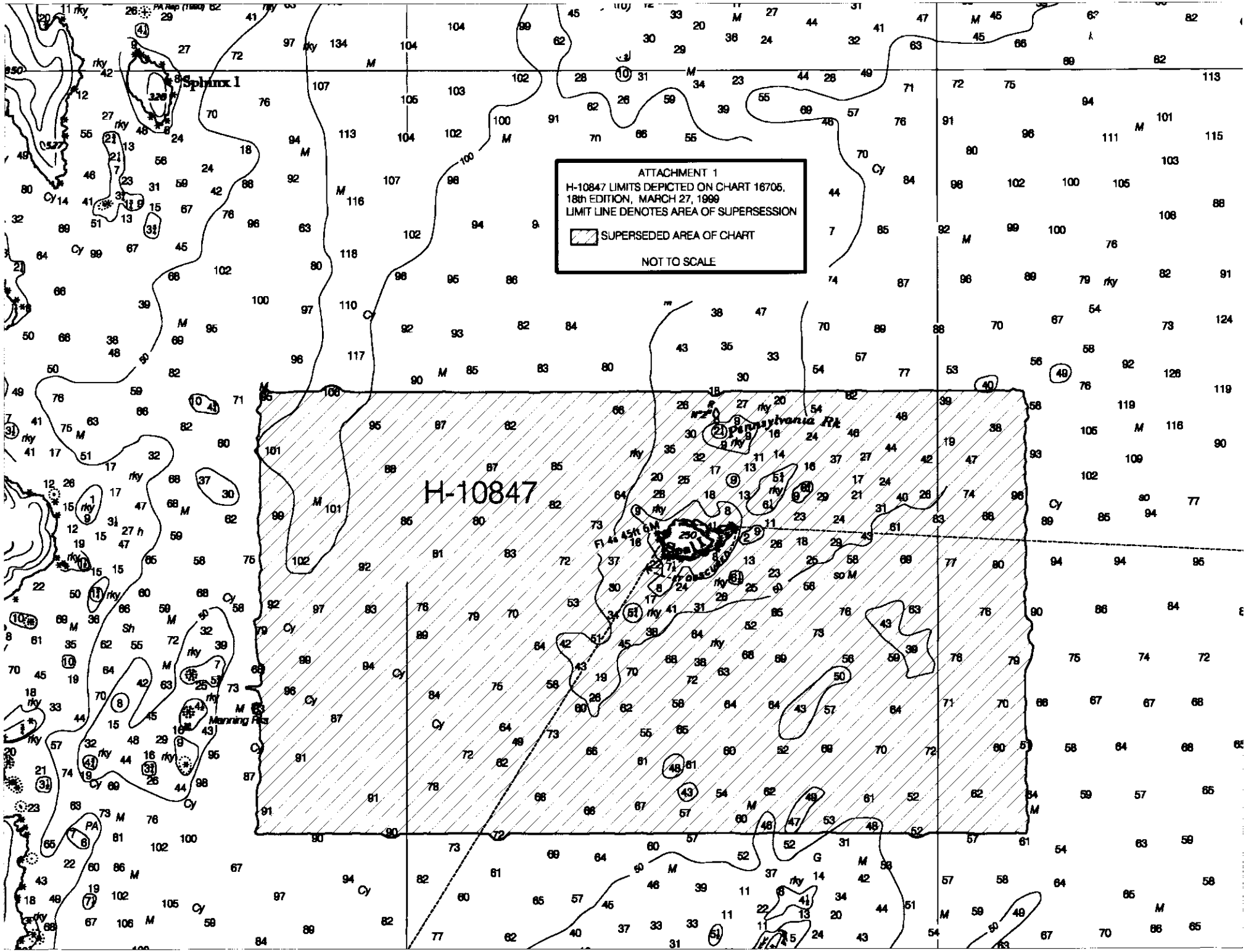
T. RECOMMENDATIONS

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

U. REFERRAL TO REPORTS

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

Leonardo T. Deodato
Cartographer


ATTACHMENT 1
H-10847 LIMITS DEPICTED ON CHART 16705,
18th EDITION, MARCH 27, 1999
LIMIT LINE DENOTES AREA OF SUPERSESSION
SUPERSEDED AREA OF CHART
NOT TO SCALE
H-10847
Sphinx I
Pennsylvania Rk
Shell
Manning Rks

APPROVAL SHEET
H-10847

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 Date: 9/20/99
Bruce A. Olmstead
Senior Cartographer, Cartographic Section
Pacific Hydrographic Branch

I have reviewed the smooth sheet, accompanying data, and reports. This survey and accompanying digital data meet or exceed NOS requirements and standards for products in support of nautical charting except where noted in the Evaluation Report.

James C. Gardner Date: 9-23-99
James C. Gardner
Commander, NOAA
Chief, Pacific Hydrographic Branch

****

Final Approval

Approved:

Samuel P. De Bow Date: 10-18-99
Samuel P. De Bow
Commander, NOAA
Chief, Hydrographic Surveys Division

NOAA FORM 75-96
(10-83)

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

MARINE CHART BRANCH

RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H-10847

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	8/30/99	[illegible]	Full ~~Part~~ ~~Before~~ After Marine Center Approval Signed Via
			Drawing No. Application of soundings and features from smooth sheet.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
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			Full Part Before After Marine Center Approval Signed Via
			Drawing No.

SUPERSEDES C&GS FORM 8352 WHICH MAY BE USED