H10855

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-10-21-98

Registry No. H-10855

LOCALITY

State ..... Alaska

General Locality ..... SW Prince William Sound

Sublocality Three NM South of Smith Island

1998

CHIEF OF PARTY

CAPT. A.D. Anderson, NOAA

NOAA FORM 77-28
(11-72)

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

REGISTER NO.

HYDROGRAPHIC TITLE SHEET

H-10855

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-10-21-98

State **Alaska**

General Locality **Southwest Prince William Sound**

Sublocality **Three NM South of Smith Island**

Scale **1:10,000** Date of Survey **October 21 - 27, 1998**

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

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

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

Surveyed by **RAINIER Personnel**

Soundings taken by echo sounder,hand lead,pole **Singlebeam: DXF 6000N, KNUDSEN 320M; Intermediate Depth Multibeam: IDSSS**

Graphic record scaled by **RAINIER Personnel**

Graphic record checked by **RAINIER Personnel**

Evaluation by **K. Sampadian, C. Barry** Automated plot by **HP Design Jet 650C**

Verification by **M. Bigelow, K. Sampadian, C. Barry**

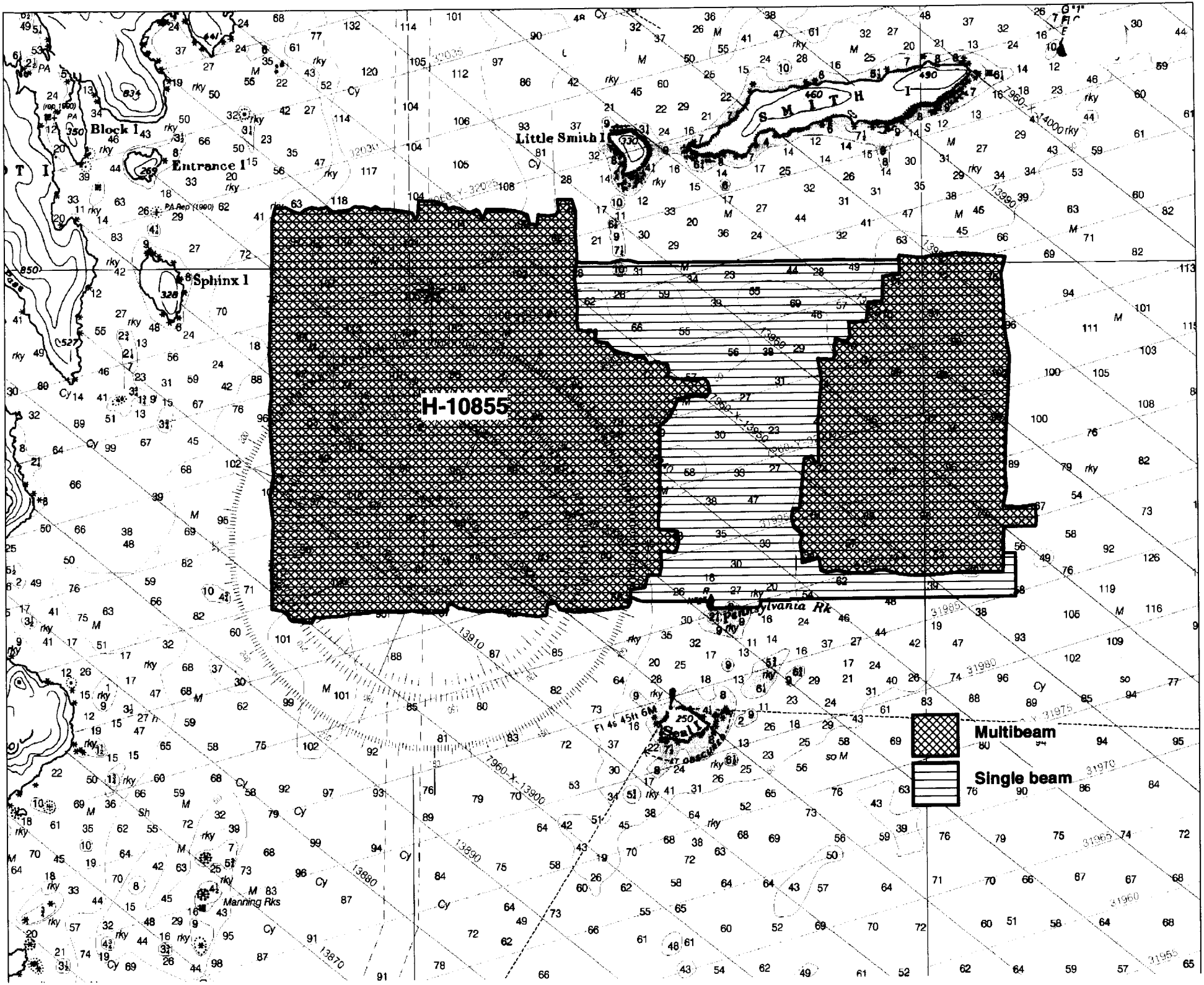
Soundings in **Fathoms** at **MLLW**

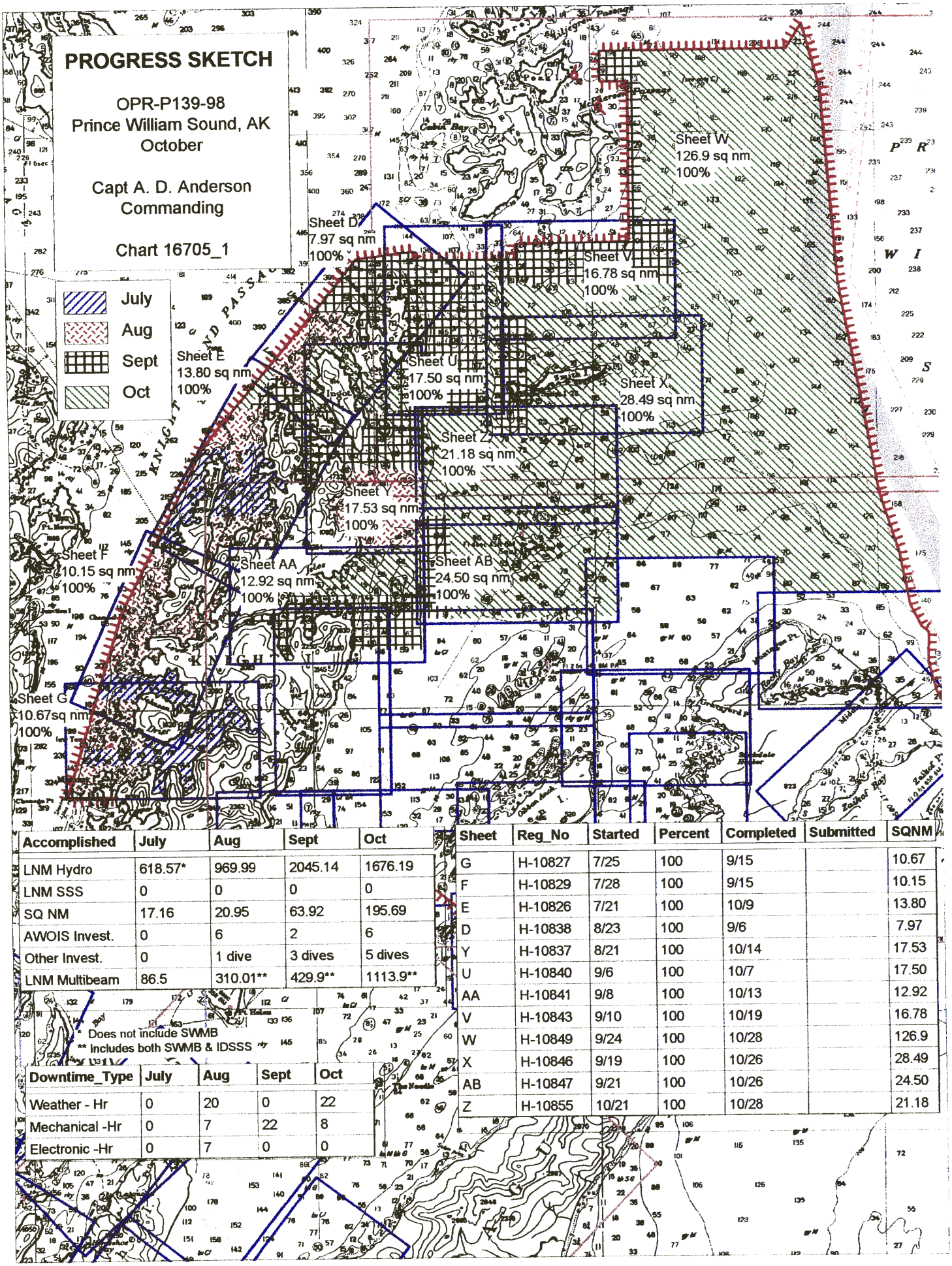
AWOIS / SURF 3/15/00 mcr

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

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

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


H-10855
Block I
Entrance I
Sphinx I
Little Smith I
S M I T H I
Sylvania Pk
Seal I
Manning Rks
Multibeam
Single beam



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-10855

Field Number RA-10-21-98
Scale 1:10,000
November 1998
NOAA Ship RAINIER
Chief of Party: Captain Alan D. Anderson, NOAA

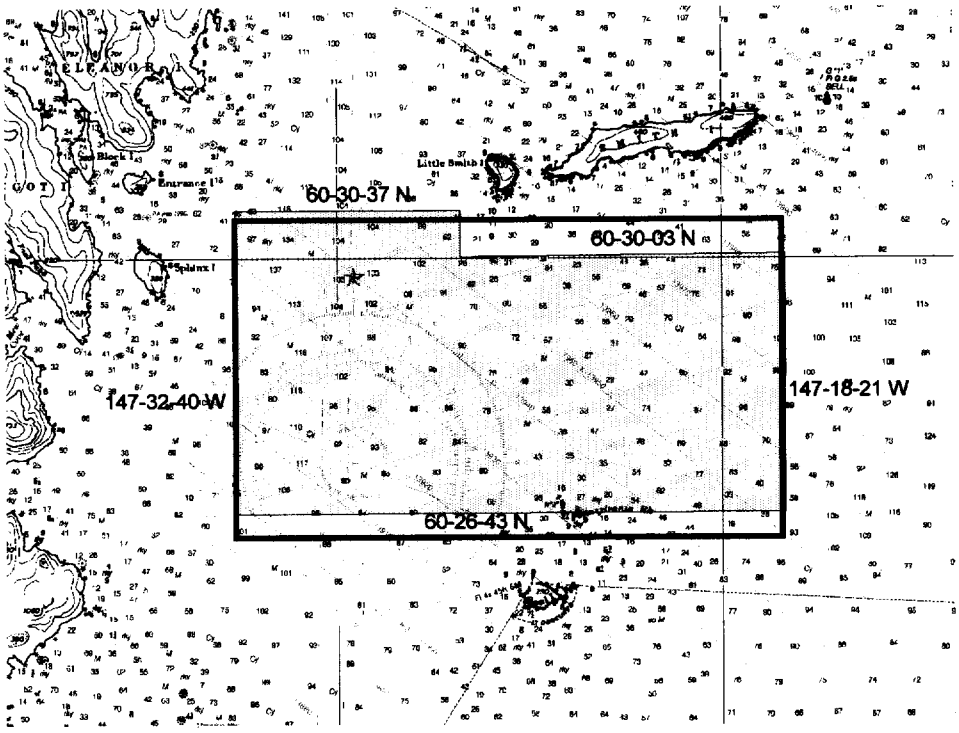
A. PROJECT ✓

This basic hydrographic survey was completed in the southwest portion of Prince William Sound, Alaska as specified by Project Instructions OPR-P139-RA-98 dated July 10, 1998 and change #1 dated September 8, 1998. Survey H-10855 corresponds to sheet Z 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 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 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 3NM South of Smith Island. The survey's approximate northern limit is latitude 60°30'37" N, the southern limit is 60°26'43"N, the western limit is longitude 147°32'40" W and the eastern limit is 147°18'21" W. These approximate survey limits are shown below on a detail of Chart 16705.



During survey operations, the observed vessel traffic were tugboats with tows and trawlers. Data acquisition was conducted from October 21 to October 27, 1998 (DN 294 to 300). CONCUR

C. SURVEY VESSELS ✓

Data were acquired by RAINIER (vessel number 2120) and the Rainier survey launches (vessel numbers 2121, 2122, 2123, 2124, and 2125) as noted in the Survey Information Summary print out appended to this report.
Vessel number 2121and 2123 are configured to acquire either shallow water multi-beam or single-beam data. During this survey both vessels were used only for single-beam data acquisition. CONCUR

D. AUTOMATED DATA ACQUISITION AND PROCESSING ✓ (SEE EVAL. REPORT, SECTION D.)

Single beam echosounder data were acquired using HYPACK version 7.1a from Coastal Oceanographics and processed using Hydrographic Processing System (HPS). Swath data collected by the RAINIER were acquired and processed using Intermediate Depth Swath Survey System (IDSSS) and Hydrochart II (Seabeam Inc.) programs. Raster images in MapInfo facilitated charted and prior survey comparisons. Final soundings are based on predicted tides and were saved in MapInfo 4.5 format. ~~A complete listing of software for HYPACK and HPS is included in Appendix VI.~~ (not included)

E. SONAR EQUIPMENT ✓

Side Scan Sonar (SSS) equipment was not used on this survey. 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 2121, 2122, 2123, 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. 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.

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

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

DAS EQUIPMENT

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

* FILED WITH HYDROGRAPHIC DATA

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

G. CORRECTIONS TO ECHO SOUNDINGS ✓ (SEE EVAL. REPORT, SECTION G)

Sound Velocity Correctors: ✓

Sound velocity casts were acquired with SBE SEACAT Profiler (S/N 219), calibrated January 27, 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 RAINIER IDSSS data, sound velocity correctors were applied on-line during acquisition.

Vessel Offset Correctors: ✓

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

VESSEL NO.	DATE OF STATIC DRAFT AND TRANSDUCER OFFSET MEASUREMENTS	METHOD OF SETTLEMENT AND SQUAT MEASUREMENT	DATE OF SETTLEMENT AND SQUAT MEASUREMENT	LOCATION OF SETTLEMENT AND SQUAT MEASUREMENT
2120	April, 1998 (ship dry-dock)	Rod leveling	September 21, 1997	Kings Bay, AK.
2121	March 26, 1998	OTF	July, 1998	Shilshole, WA
2122	March 26, 1998	Rod leveling	June 11, 1998	Shakan Strait, AK
2123	March 26, 1998	OTF	July, 1998	Shilshole, WA
2124	March 26, 1998	Rod leveling	June 11, 1998	Shakan Strait, AK
2125	March 26, 1998	Rod leveling	June 21, 1998	Chilkat Inlet, AK

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 # 1-5 correspond to the last digit of the vessel number. Offset table #9 was used for the RAINIER (VN 2120). For singlebeam launches, offset tables were applied to the raw sounding data in HPS during post-acquisition processing. For RAINIER IDSSS data, offsets were applied on-line during data collection.

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

Predicted Tidal Correctors: ✓

The Oceanographic Products and Services Division, User Services Branch (N/CS44), through N/CS31, provided predicted tides for the project on diskette for the Cordova reference station (945-4050). The predicted tides at Cordova were entered into HPS and applied to the soundings without adjusting for zoning. For Launch Singlebeam soundings, HPS tide tables were applied to raw sounding data during post-acquisition processing in HPS.

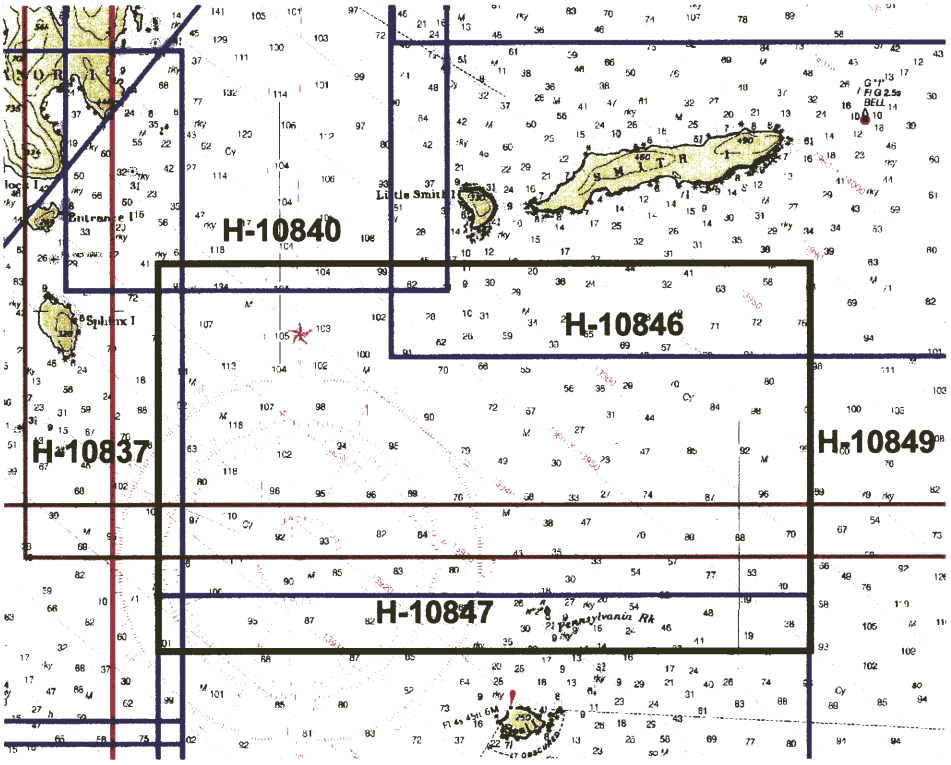
For RAINIER IDSSS soundings, predicted tides from the Cordova reference station (945-4050) were imported from commercial Tides and Currents software into the DAS VAX computer (without adjusting for zoning) and applied during processing.

* FILED WITH HYDROGRAPHIC DATA

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

The following contemporary surveys junction with H-10855:

Registry #	Scale	Date	Junction side
H-10840	1:10,000	1998	Northwest
H-10837	1:10,000	1998	West
H-10846	1:10,000	1998	North
H-10849	1:40,000	1998	East
H-10847	1:10,000	1998	South



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

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
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 water level 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/CS41 on November 1, 1998 in accordance with FPM 4.8. APPROVED TIDE NOTE DATED MARCH 25, 1999 IS ATTACHED.

H. HYDROGRAPHIC POSITION CONTROL ✓ (SEE EVAL. REPORT, SECTION H)

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

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

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

I. SHORELINE ✓

No shoreline is associated with the survey area. CONCUR

J. CROSSLINES ✓

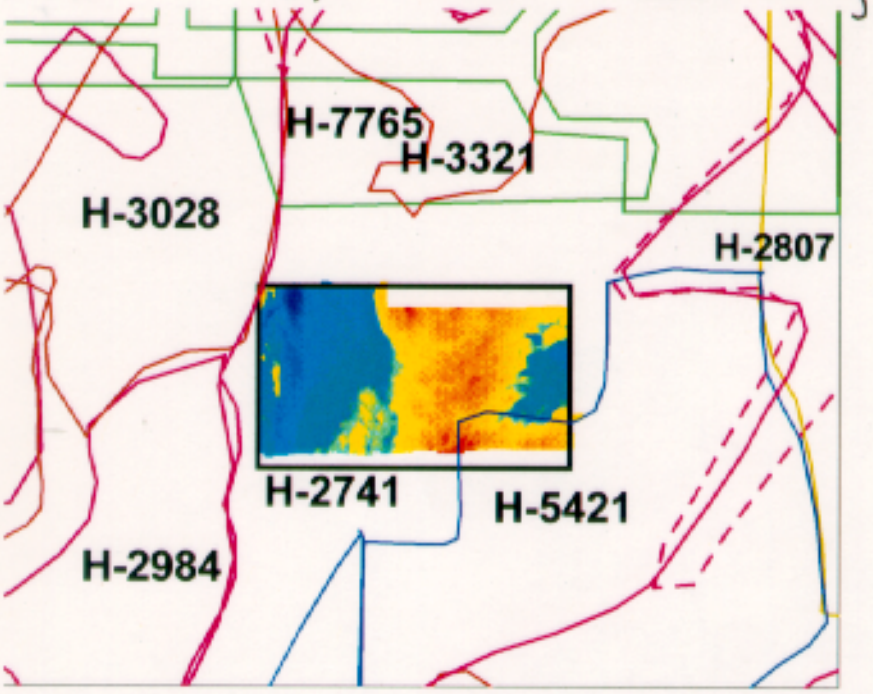
Crosslines agreed very well with mainscheme hydrography. Depths generally agreed within two or three meters. There are a total of 40.9 nautical miles (30.82 single-beam and 10.06 ships multi-beam) of crosslines, comprising 15.8% of mainscheme hydrography.

* FILED WITH HYDROGRAPHIC DATA

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

The following prior surveys share common area with H-10855:

Registry #	Scale	Date	Area covered	DATUM
H-2741	1:40,000	1911	Entire Survey	VALDEZ
H-5421	1:20,000	1933	Southeast	VALDEZ
H-5430	1:20,000	1933	Entire Survey	VALDEZ



Prior survey H-2741 covers the entire area of present survey H-10855. Unfortunately, a valuable comparison between the two surveys proved impossible due to the poor quality of the prior survey raster image. 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 survey. Because of the inability to compare the present survey with this prior survey, it was necessary to rely on the comparison with the most recent edition of chart 16705.

Prior survey H-5421 covers the southeast corner of present survey H-10855. Although a minimal area for comparison, the prior soundings agreed well with the present survey, generally shoaler. The following list is representative of the compared soundings.

PRIOR SURVEY DEPTH (FATHOMS)	PRESENT SURVEY DEPTH (FATHOMS)	FIX NUMBER	GEOGRAPHIC SURVEY POSTION	Corr. Depth (fm)
79	75	IDSSS	60-27-38N 147-18-36 W ✓	73
37	34	IDSSS	60-27-03 N 147-19-37 W ✓	34
53	49	40478	60-27-00 N 147-20-01 W ✓	48
96	85	IDSSS	60-27-29 N 147-20-43 W ✓	85
35	33	10060	60-27-05 N 147-22-45 W ✓	32
17	14	10626	60-26-45 N 147-23-30 W ✓	13⁹
20	16	40270	60-26-53 N 147-22-59 W ✓	16⁴

Differences between the current survey and priors can probably be attributed to scale and improved modern positioning and sounding equipment. Final comparisons will be done at PHB after reduction to final sounding datum using tidal information collected concurrently with this survey. CONCUR

M. ITEM INVESTIGATIONS ✓

No AWOIS items fall within the survey area of H-10855. CONCUR

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

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

Chart 16705
17th Ed. September 27, 1997 → 18th Ed. March 27, 1999
Scale: 1:80,000

The survey was compared with Chart 16700 and was in good agreement, generally within one fathom. Survey H-10855 also compared well with Chart 16705, often shoaler, with the exception of the following noted differences. Final sounding comparisons will be made at PHB after reduction to final vertical datum.

CHARTED DEPTH (FATHOM)	SURVEY DEPTH (FATHOM)	FIX NUMBER	GEOGRAPHIC SURVEY POSITION	COMMENT	Corr. Depth (fm)
9	12	10611	60-26-46 N 147-23-47 W	Verified by SWMB on junction survey H-10847 ✓	12'
28	53	52087	60-29-56 N 147-26-40 W	A 28 fathom sounding is located approximately 100-m east of charted depth ✓	52
26	35	51852	60-29-43 N 147-25-51 W	A 24 fathom sounding is located approximately 75-m east of charted depth ✓	35
117	101	IDSSS	60-27-22 N 147-30-48 W	Assume sounding originated from prior survey H-~~2741~~ 5430	101
118	111	IDSSS	60-28-18 N 147-31-05 W	Assume sounding originated from prior survey H-~~2741~~ 5430	111

Dangers to Navigation ✓

No dangers to navigation were found in this survey. CONCUR

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

Survey H-10855 is complete and adequate to supersede prior soundings in the common area. CONCUR

P. AIDS TO NAVIGATION ✓

No navigational aids exist within the survey area. CONCUR

Q. STATISTICS ✓

Refer to the Survey Information Summary attached to this report.

R. MISCELLANEOUS ✓ (SEE EVAL. REPORT, SECTION S.)

Ten bottom samples were collected and sent to the Smithsonian in accordance with Project Instructions. No unusual tidal currents or magnetic variations were found during this survey.

S. RECOMMENDATIONS ✓ (SEE EVAL. REPORT, SECTION T.)

Prior survey data is a valuable resource and every effort should be taken to provide higher quality scans, particularly on the older, hand drawn surveys that have proven to be difficult to compare with contemporary soundings.

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	November 2,1998	N/CS34
Project related data for OPR-P139-RA	Incremental	N/CS34

Respectfully Submitted,

Kimberley Sampadian
Rotating Hydrographer

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

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

Change #	Dated
1	9/8/98

Sheet Letter: Z **Registry Number:** H-10855

Sheet Number: RA-10-21-98

Survey Title: 3 NM South of Smith Island

Data Acquisition Dates: **From:** 21-Oct-98 294 **To:** 28-Oct-98 301

Vessel Usage Summary

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

Sound Velocity Cast Information

Launch Table #	Ship Table #	Cast DN	Max Depth	Position	Applicable DN
11		279	241.6	60/21/50 147/35/40	279-298
13		299	0		299-idh

Tide Zone Information

Zone #	Time Corr.	Height Corr.
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	10
DEV	3.19
MBMS	112.74
MBSP	0.6
MBXL	10.06
MS	146.63
SPLIT	64.52
XL	30.82

Percent XL:	21.0%
SQNM:	21.18

APPROVAL SHEET

for

H-10855

RA-10-21-98

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

The field sheet and accompanying records have been examined by me, are considered complete and adequate for charting purposes, and are approved. All records are forwarded for final review and processing to N/CS34, Pacific Hydrographic Branch.

Approved and Forwarded,

Alan D. Anderson

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-10855

LOCALITY: Prince William Sound, AK
3 NM South of Smith Island
TIME PERIOD: Sep 21 - Oct 28, 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. Neu 3/25/99

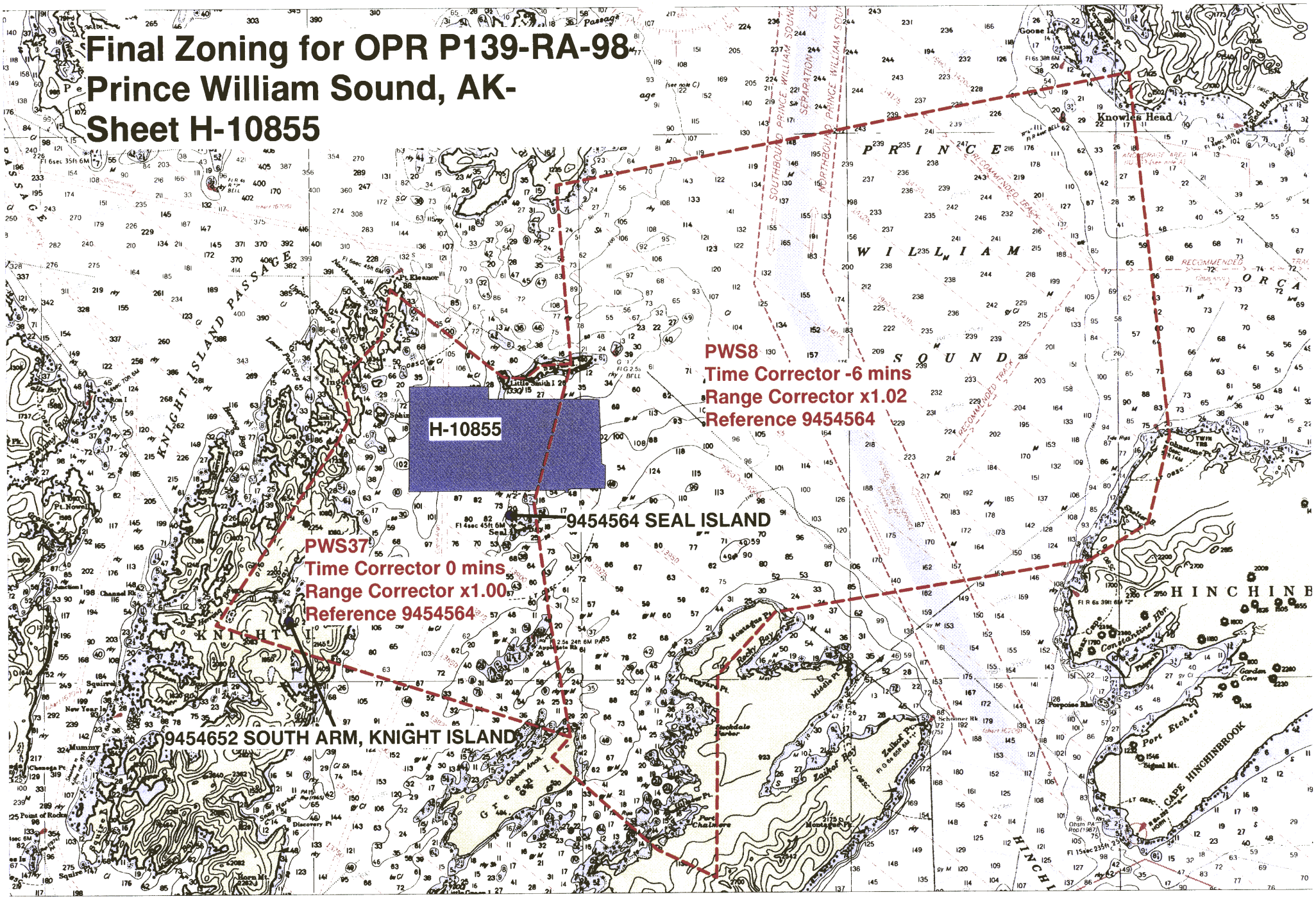
CHIEF, REQUIREMENTS AND DEVELOPMENT DIVISION

Final tide zone node point locations for OPR P139-RA-98,
Sheet H-10855.

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-10855
H-10855
PWS8
Time Corrector -6 mins
Range Corrector x1.02
Reference 9454564
9454564 SEAL ISLAND
PWS37
Time Corrector 0 mins
Range Corrector x1.00
Reference 9454564
9454652 SOUTH ARM, KNIGHT ISLAND
PRINCE WILLIAM SOUND
KNIGHT ISLAND PASSAGE
HINCHINBROOK
CAPE HINCHINBROOK
Knowles Head

(11-72) NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

GEOGRAPHIC NAMES

SURVEY NUMBER: H-10855

Name on Survey	A ON CHART NO. 16705	B ON PREVIOUS SURVEY NO.	C ON U.S. QUADRANGLE MAPS	D FROM LOCAL INFORMATION	E ON LOCAL MAPS	F P.O. GUIDE OR MAP	G RAND MCNALLY ATLAS	H	K U.S. LIGHT LIST	
ALASKA (title)	X		X							1
~~PENNSYLVANIA ROCK~~	~~X~~		~~X~~							2 ~~NS~~ *
PRINCE WILLIAM SOUND	X		X							3
SMITH ISLAND (title)	X		X		Removed					4
										5
										6
					Chief Cartographer				MAR 5 1999	7
										8
										9
										10
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										24
										25

NOAA FORM 76-155 SUPERSEDES C&GS 197

* SEE EVALUATION REPORT

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

U.S. DEPARTMENT OF COMMERCE

HYDROGRAPHIC SURVEY STATISTICS

REGISTRY NUMBER: H-10855

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

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

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

SHORELINE DATA

SHORELINE MAPS (List): n/a

PHOTOBATHYMETRIC MAPS (List): n/a

NOTES TO THE HYDROGRAPHER (List): n/a

SPECIAL REPORTS (List): n/a

NAUTICAL CHARTS (List): Chart 16705, 18th Ed., 3-27-99

OFFICE PROCESSING ACTIVITIES

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

PROCESSING ACTIVITY	AMOUNTS VERIFICATION	AMOUNTS EVALUATION	AMOUNTS TOTALS
POSITIONS ON SHEET			
POSITIONS REVISED			
SOUNDINGS REVISED			
CONTROL STATIONS REVISED			

	TIME-HOURS VERIFICATION	TIME-HOURS EVALUATION	TIME-HOURS 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	190.5		190.5
COMPARISON WITH PRIOR SURVEYS AND CHARTS			
EVALUATION OF SIDE SCAN SONAR RECORDS			
EVALUATION OF WIRE DRAGS AND SWEEPS			
EVALUATION REPORT		84	84
GEOGRAPHIC NAMES			
OTHER: (Chart Compilation)		55	55
USE OTHER SIDE OF FORM FOR REMARKS — TOTALS	190.5	139	329.5

Pre-processing Examination by: Bigelow, Nelson, Sampadian	*Beginning Date*: 1-21-99	*Ending Date*: 4-14-99
Verification of Field Data by: Barry, Sampadian	*Time (Hours)*: 190.5	*Ending Date*: 12-22-99
Verification Check by: Hill	*Time (Hours)*: 10	*Ending Date*: 12-23-99
Evaluation and Analysis by: Barry, Sampadian	*Time (Hours)*: 84	*Ending Date*: 01-05-00
Inspection by: Hill	*Time (Hours)*: 10	*Ending Date*: 12-23-99

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

EVALUATION REPORT

H-10855

A. PROJECT

The hydrographer's report contains a complete discussion of the project information.

B. AREA SURVEYED

The survey area is adequately described in the hydrographer's report. A page-size plot of the charted area depicting the specific limits of supersession accompanies this report as Attachment 1.

The bottom consists mainly of mud. The depths in this open water survey generally range from 6 ¼ fathoms to 50 fathoms in the area directly between Smith Island and Pennsylvania Rock. From the fifty-fathom curve the depths increase to 136 fathoms westward and to 112 fathoms eastward.

C. SURVEY VESSELS

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

D. AUTOMATED DATA ACQUISITION AND PROCESSING

Field acquisition and processing of survey data has been adequately discussed in the hydrographer's report, section D. Office processing was conducted using the same Hydrographic Processing System (HPS) and the Multibeam Support Vax System used by the hydrographer, and MicroStation 95.

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

E. SONAR EQUIPMENT

Side scan sonar equipment was not used during survey H-10855.

F. SOUNDING EQUIPMENT

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

G. CORRECTIONS TO SOUNDINGS

Soundings below Mean High Water (MHW) have been reduced to Mean Lower Low Water (MLLW). The reducers include corrections for an actual tide, dynamic draft, and sound velocity. 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, tide reductions were derived from approved hourly heights zoned direct from the following tide gauge: Seal Island, AK. 945-4564 was used for zones PWS8 and PWS37. The following tide gauges listed on the approved tide note were not used for sounding reduction: Cordova, AK. 945-4050, Valdez, AK. 945-4240, and South Arm, Knight Island, AK. 945-4652.

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:	-2.264 seconds	(-70.064 meters)
Longitude:	6.998 seconds	(106.890 meters)

All prior surveys in common with the present survey are plotted on the VALDEZ datum. The smooth sheet is annotated with a VALDEZ adjustment tick based on values provided in the project instructions. Geographic positions based on VALDEZ may be plotted on the smooth sheet utilizing the NAD 83 projection by applying the following corrections:

Latitude:	8.28 seconds	(256.274 meters)
Longitude:	-21.12 seconds	(-322.418 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 used for survey operations. Data was analyzed during office processing and found to contain no values that exceed this limit.

During intermediate depth multibeam data gathering, satellite configuration as indicated by HDOP and the number of satellites, is monitored visually on the IDSSS and Trimble displays, and data are not collected when HDOP exceeds 4.0. In the event that the

differential GPS corrector signal is lost, a switch to P-Code is made automatically by the receiver. Data was analyzed during office processing and found to contain no significant errors.

DGPS performance checks were conducted in the field and found adequate.

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

Additional information concerning specific control system type, calibrations and system checks can be found in the hydrographer's report and in the separates related to horizontal position control and corrections to position data.

J. SHORELINE

There is no shoreline within the limits of survey H-10855.

K. CROSSLINES

Crosslines are discussed in the hydrographer's report.

L. JUNCTIONS

Survey H-10855 junctions with the following survey(s):

Survey	Year	Scale	Area
H-10840	1998	1:10,000	Northwest
H-10837	1998	1:10,000	West
H-10846	1998	1:10,000	North
H-10849	1998	1:40,000	East
H-10847	1998	1:10,000	South

The junctions with surveys H-10840, H-10837, H-10846, H-10847, and H10849 are complete. Soundings and depth curves are in good agreement. A few soundings from the junctional surveys have been transferred within the common areas to better delineate the bottom configuration. A "Joins" note has been added to the smooth sheet where applicable.

M. COMPARISON WITH PRIOR SURVEYS

Survey	Year	Scale	Datum
H-2741	1905	1:40,000	Valdez
H-5430	1933	1:20,000	Valdez
H-5421	1933	1:20,000	Valdez

Prior surveys H-2741, H-5430 and H-5421 cover the entire area of the present survey. Comparisons with these prior surveys were made using a digital copy. The registration of these prior surveys was accomplished by selecting common shoreline points. Legibility of this prior work to the present survey was satisfactory.

Present survey depths show a consistently shoal bias from 2-3 fathoms in those depths less than fifty fathoms and from 1-2 fathoms in depths exceeding fifty fathoms. Aside from the effects of frequent past earthquake activity, the differences in depths may well be attributed to greater sounding coverage, improved positioning, sounding methods and relative accuracy of the data acquisition techniques. 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 depths of water and the differences in data acquisition methods, no reasonable adjustment value for prior soundings could be determined.

Survey H-10855 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-10855 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. The prior surveys have been adequately addressed in section M and require no further discussion.

Survey H-10855 is adequate to supersede charted hydrography within the charted area.

b. Dangers To Navigation

No dangers to navigation were discovered during survey operations. No additional dangers to navigation were found during office processing.

P. ADEQUACY OF SURVEY

Hydrography contained on survey H-10855 is adequate to:

a. Delineate the bottom configuration, determine least depths, and draw the required depth curves;

b. Reveal there are no significant discrepancies or anomalies requiring further investigation; and

c. Show the survey was properly controlled and soundings are correctly plotted.

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

The field unit submission of survey data exceeded the four-week period from the completion of 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 23, 1998 is attached. Fieldwork for survey H-10855 was completed October 27, 1998 and received for office processing on January 21, 1999.

Q. AIDS TO NAVIGATION

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

R. STATISTICS

Statistics are adequately itemized in the hydrographer's report.

S. MISCELLANEOUS

Miscellaneous information is adequately discussed in the hydrographer's report. Geographic name "Pennsylvania Rock" was deleted from NOAA Form 76-155, Geographic Names because the feature is outside the survey limits.

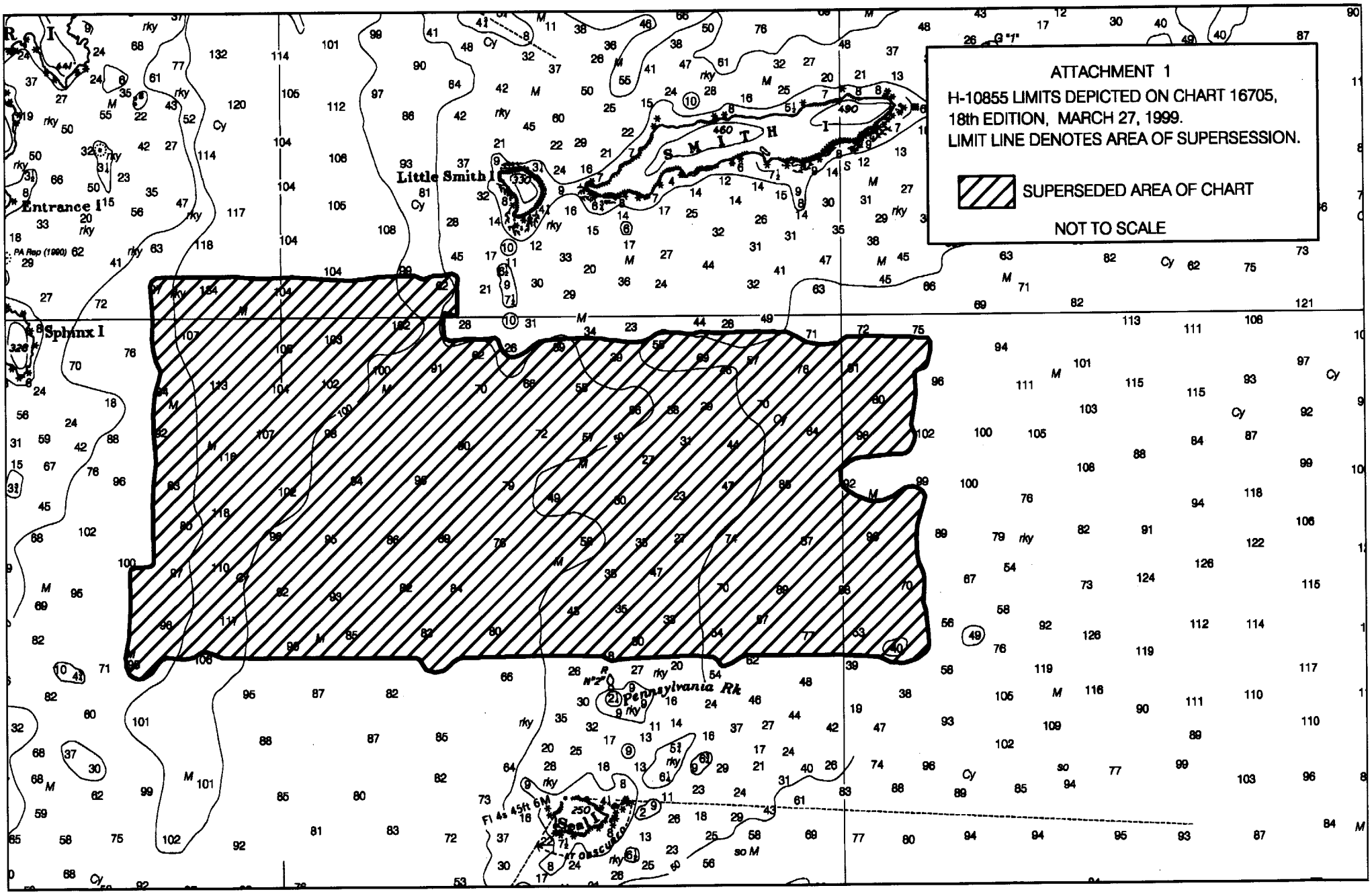
T. RECOMMENDATIONS

This is a good hydrographic survey. No additional work is recommended.

U. REFERRAL TO REPORTS

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

Kimberley Sampadian
Hydrographer


ATTACHMENT 1
H-10855 LIMITS DEPICTED ON CHART 16705,
18th EDITION, MARCH 27, 1999.
LIMIT LINE DENOTES AREA OF SUPERSESSION.
SUPERSEDED AREA OF CHART
NOT TO SCALE
Little Smith I
Entrance I
Sphinx I
SMITH
Pennsylvania Rk
Shell
obscured

APPROVAL SHEET
H-10855

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.

Dennis Hill Date: 12-23-99

Dennis Hill
Chief, Cartographic Section
Pacific Hydrographic Branch

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

James C. Gardner Date: 1-19-00

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

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Final Approval

Approved:

Samuel P. De Bow Date: April 6, 2000

Samuel De Bow
Cdr, NOAA
Chief, Hydrographic Surveys Division

NOAA FORM 75-96
(10-83)

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

MARINE CHART BRANCH

RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H10855

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	12-9-99	K. SAMPADIAN	Full ~~Part Before~~ After Marine Center Approval Signed Via FULL APPLICATION OF
			Drawing No. SOUNDINGS, CURVES AND FEATURES FROM
			SMOOTHSHEET
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
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			Full Part Before After Marine Center Approval Signed Via
			Drawing No.

SUPERSEDES C&GS FORM 8352 WHICH MAY BE USED