H10927

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-10-19-99

Registry No. H-10927

LOCALITY

State Alaska

General Locality Southwest Prince William Sound

Sublocality Approach to Gibbon Anchorage

1999

CHIEF OF PARTY
Commander Daniel R. Herlihy, NOAA

NOAA FORM 77-28 (11-72)

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

HYDROGRAPHIC TITLE SHEET

REGISTER NO. H-10927

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-10-19-99

State: Alaska

General locality: Southwest Prince William Sound

Locality: Approach to Gibbon Anchorage

Scale: 1:10,000 Date of survey: 8/26/99 - 10/20/99

Instructions dated: July 30, 1999 Project No.: OPR-P139-RA-99

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

Chief of party: Commander Daniel R. Herlihy, NOAA

Surveyed by: RAINIER Personnel

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

Graphic record scaled by: RAINIER Personnel

Graphic record checked by: RAINIER Personnel

Evaluation by: ~~Processed by~~ I. Almacen Automated plot by: HP Design Jet 750C

Verification by: E. Domingo, D. Doles, R. Mayor, R. Davies, I. Almacen

Soundings in fathoms ~~feet~~ at ~~MLW~~ MLLW and tenths (data collected in meters)

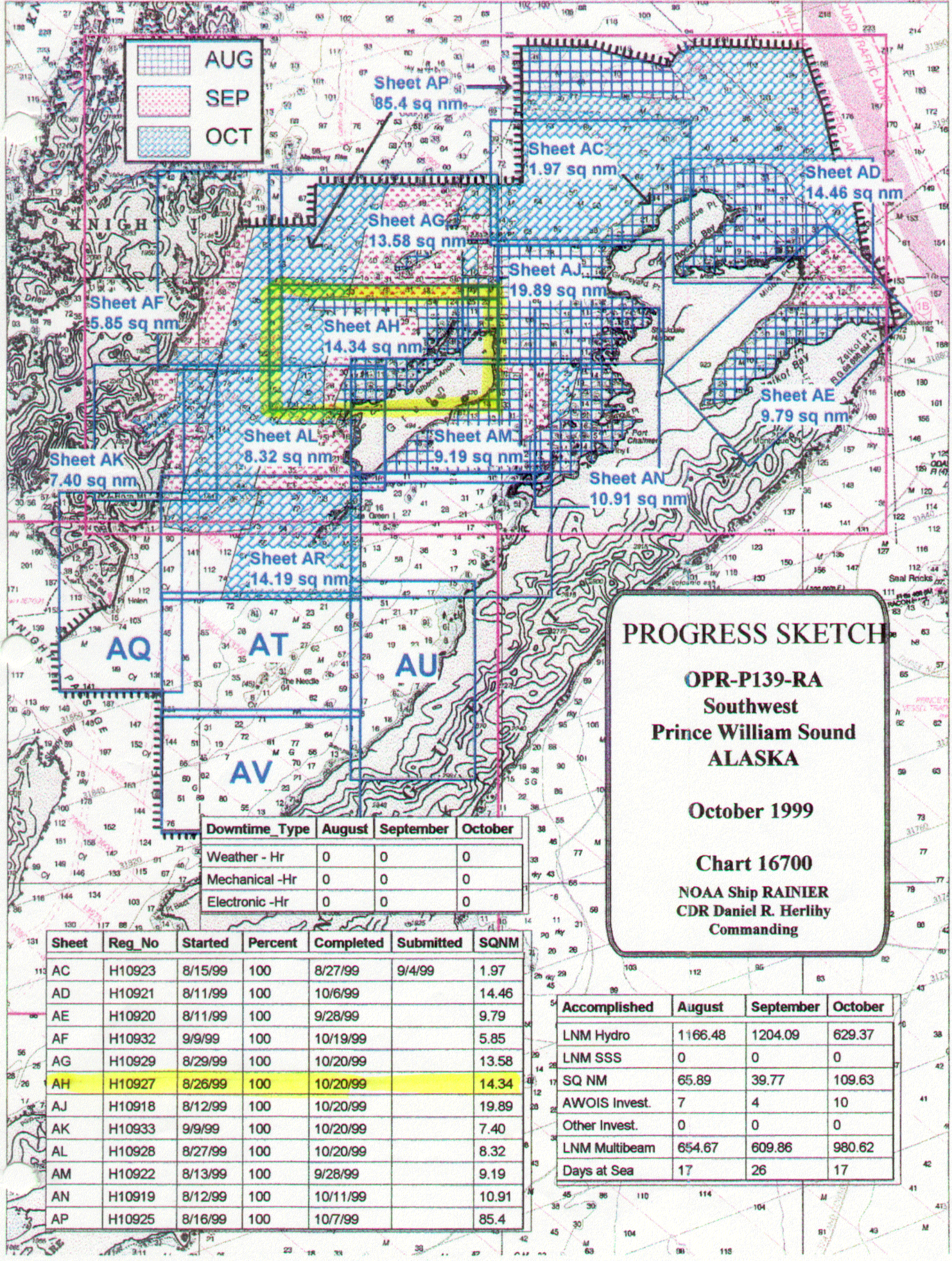
REMARKS: All times are UTC, revisions and marginal notes in black were generated during office processing. All separates are filed with the hydrographic data, as a result page numbering may be interrupted or non-sequential.

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

AWOIS/SURF 4/17/01 DAS MCR

NOAA FORM 77-28 SUPERSEDES FORM C&GS-537.

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



PROGRESS SKETCH

OPR-P139-RA
Southwest
Prince William Sound
ALASKA

October 1999

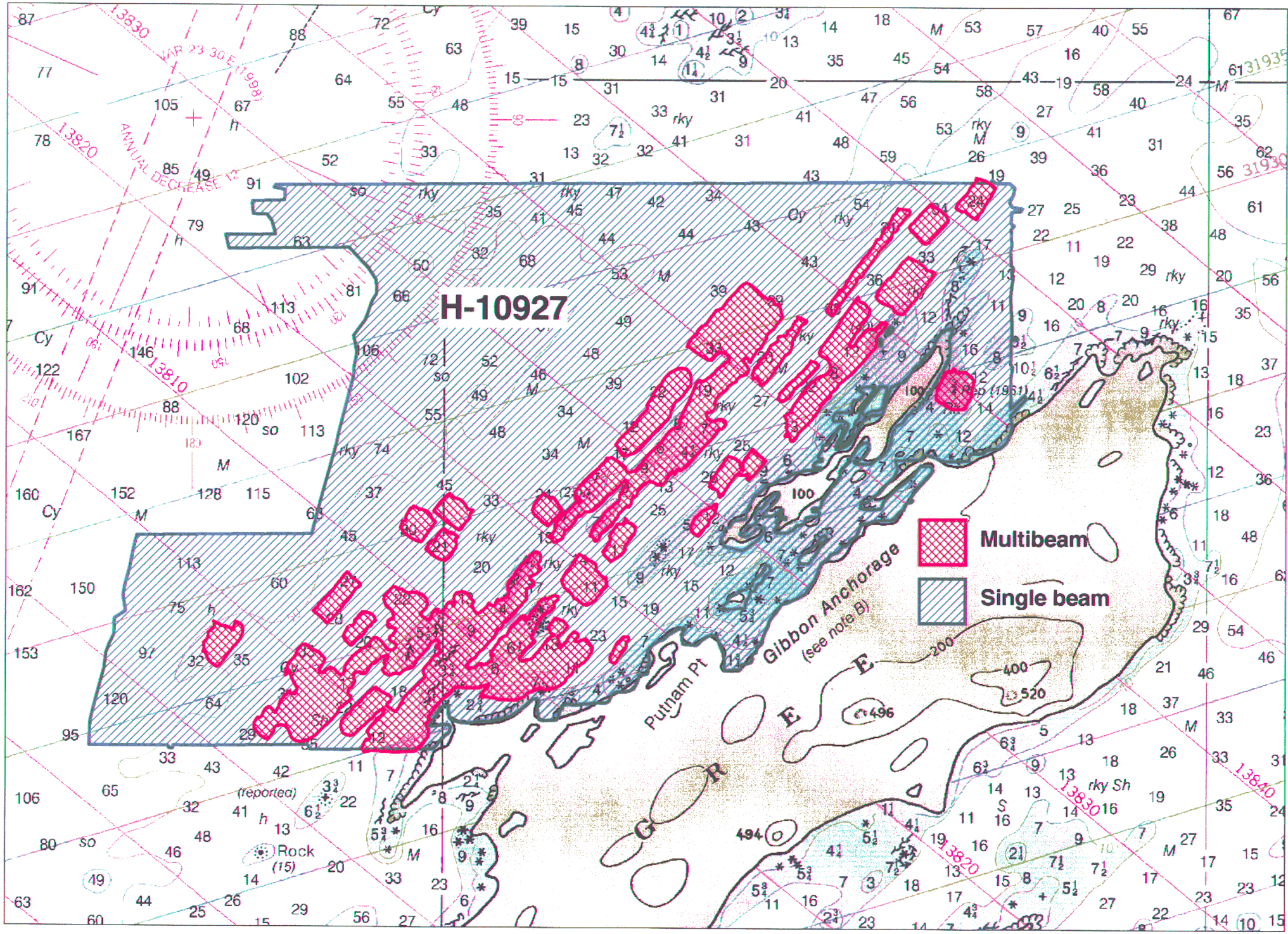
Chart 16700

NOAA Ship RAINIER
CDR Daniel R. Herlihy
Commanding

Downtime_Type	August	September	October
Weather - Hr	0	0	0
Mechanical -Hr	0	0	0
Electronic -Hr	0	0	0

Sheet	Reg_No	Started	Percent	Completed	Submitted	SQNM
AC	H10923	8/15/99	100	8/27/99	9/4/99	1.97
AD	H10921	8/11/99	100	10/6/99		14.46
AE	H10920	8/11/99	100	9/28/99		9.79
AF	H10932	9/9/99	100	10/19/99		5.85
AG	H10929	8/29/99	100	10/20/99		13.58
AH	H10927	8/26/99	100	10/20/99		14.34
AJ	H10918	8/12/99	100	10/20/99		19.89
AK	H10933	9/9/99	100	10/20/99		7.40
AL	H10928	8/27/99	100	10/20/99		8.32
AM	H10922	8/13/99	100	9/28/99		9.19
AN	H10919	8/12/99	100	10/11/99		10.91
AP	H10925	8/16/99	100	10/7/99		85.4

Accomplished	August	September	October
LNM Hydro	1166.48	1204.09	629.37
LNM SSS	0	0	0
SQ NM	65.89	39.77	109.63
AWOIS Invest.	7	4	10
Other Invest.	0	0	0
LNM Multibeam	654.67	609.86	980.62
Days at Sea	17	26	17


H-10927
Multibeam
Single beam
Gibbon Anchorage
(see note B)
Putnam Pt
Rock
(15)
(reported)
rky Sh
VAR 23°30'E (1998)
ANNUAL DECREASE 12'
13830
13820
13810
13840
31935
31930

Descriptive Report to Accompany Hydrographic Survey H10927

Field Number RA-10-19-99
Scale 1:10,000
October 1999
NOAA Ship RAINIER
Chief of Party: CDR Daniel R. Herlihy, NOAA

A. PROJECT ✓

This basic hydrographic survey was completed as specified by Hydrographic Survey Letter Instructions OPR-P139-RA, dated July 20, 1999, and the Draft Standing Project Instructions dated April 6, 1999. Survey H10927 corresponds to sheet AH as defined in the sheet layout. This survey will provide data to supersede prior surveys conducted in the early to mid 1900s, and will affect Charts 16700 and 16701. 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, Sec. B)

The survey area encompasses the approach to Gibbon Anchorage, Green Island. Green Island is located west of Montague Island and east of Knight Island in Prince William Sound, Alaska. The survey limits identified in the original sheet layout were revised to include the offshore portion of sheet AH on sheet AP (H10925, RA-40-2-99). The survey's northern limit is latitude 60°19'19.85"N and the southern limit is latitude 60°15'40.55"N. The revised survey's western limit is longitude 147°35'31.67"W and the eastern limit is the shoreline of Green Island. Data acquisition was conducted from August 26 to October 20, 1999 (DN 238 to 293). ✓

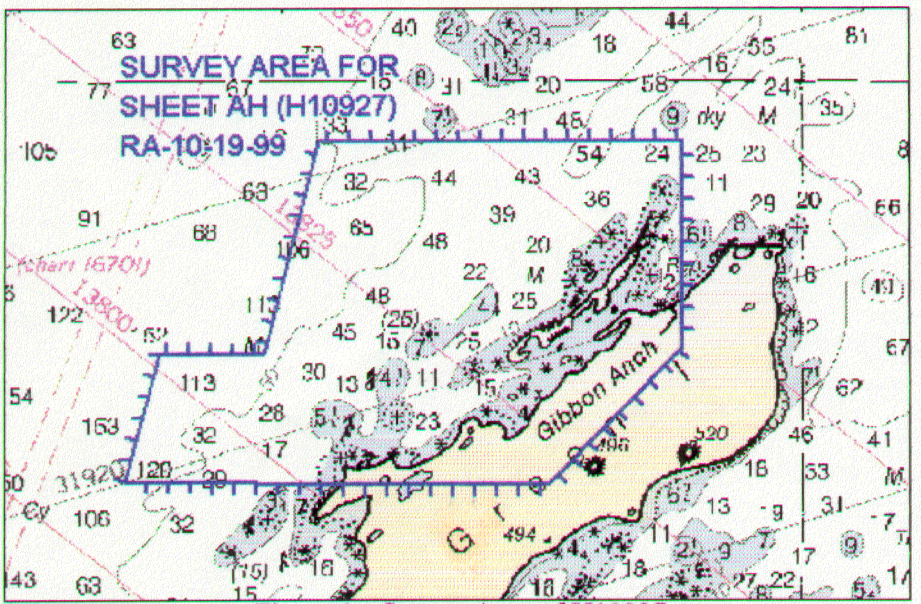


Figure 1 - Survey Area of H10927

C. SURVEY VESSELS ✓

Data were acquired by RAINIER survey launches (vessel numbers 2121, 2122, 2123, 2124, 2125 and 2126) as noted in the Survey Information Summary included with this report. Vessels 2121, 2123 and 2126 were used for acquisition of shallow-water multibeam data and sound velocity profiles. Vessels 2122, 2124 and 2125 were used for acquisition of VBES data and for shoreline verification. In addition, vessel 2125 was used to collect bottom samples. See the Project Related Data for OPR-P139-RA-99 for vessel descriptions. No unusual vessel configurations or problems were encountered on this survey.

D. AUTOMATED DATA ACQUISITION AND PROCESSING ✓

All vertical beam echo sounder (VBES) data were acquired using Coastal Oceanographic's HYPACK version 8.9 and processed with the Hydrographic Processing System (HPS) version 9.3 and MapInfo 5.0. Final detached positions, features, and soundings based on unverified observed tides were saved in MapInfo format.

Shallow-water multibeam (SWMB) echo sounder data were acquired using Triton-Elics' ISIS software version 4.32 and processed using Universal Systems Limited's CARIS HIPS software version 4.3.

Shallow-water multibeam data were reviewed with the CARIS Hydrographic Data Cleaning System (HDCS). Depth fliers were identified and manually flagged as "rejected". Vessel positioning and attitude data from each system were similarly displayed and manually cleaned. Additionally, instantaneous speed as computed from the positioning data was checked for speed jumps exceeding 3 knots as an indication of potential position fliers. For this survey, SWMB data were acquired for developments over shoal regions. A maximum angle of 45° off nadir were rejected in an attempt to reduce the noise and refraction errors observed in the outer beams. ✓

After review and cleaning, depth, position and attitude data were merged with sound velocity, predicted tide and dynamic draft correctors to compute the corrected depth and position of each sounding. Processed soundings were read into a CARIS Workfile by selecting shoal-biased "line-by-line" binning at a two densities; one at 3m x 3m, the other at 1.5mm x 1.5mm at survey scale. The former was used to create digital terrain models (DTMs) which were used to demonstrate multibeam coverage and perform multibeam quality assurance, while the latter was used to export soundings into HPS through HPTools. Unverified observed tides were applied in the Hydrographic Processing System (HPS) and the processed soundings were excessed using a 3mm character size, and plotted at a 2 mm character size to produce the final sounding plot. Final selected soundings were saved and plotted in MapInfo. Raster images registered in MapInfo facilitated chart and prior survey comparisons. ✓

Survey H10927 is defined as sheet 06 in HPS. The CARIS workfile name for the 3m x 3m DTM is defined as "h10927_3m". The CARIS workfile name for the soundings exported at 1.5mm at the scale of the survey is defined as "h10927_15m". The CARIS workfile name for the QC report is "h10927_qc" and the project name is identified as P139_SheetAH in HDCS.

All final plots were created in MapInfo using UTM Zone 6 projection.

A complete listing of software is included in Appendix H.* A data flow diagram is included in Appendix G. *

* Filed with the hydrographic data.

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 during final processing of SWMB depth data to aid in determining whether anomalous soundings are true features or noise. ✓

F. SOUNDING EQUIPMENT ✓

Two different categories of echo sounder 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 survey vessel to safely navigate the area.

1. Launch Vertical Beam Echo Sounder (VN 2122, VN 2123, VN2124, VN 2125, and VN 2126) ✓

The vertical beam echo sounders (VBES) utilized for this survey were the Raytheon DSF-6000N (VN 2122, 2124, 2125) and Knudsen 320M (VN2123, VN2126), which are dual frequency (100 kHz, 24 kHz), digital recording single beam fathometers with analog paper records. Soundings were acquired in meters for both frequencies, and high frequency was utilized as the primary frequency. VBES serial numbers are included in Appendix H. *

VBES data were also acquired concurrently with SWMB data and were compared to nadir beams of the shallow-water multibeam in real-time during data acquisition to assure SWMB data quality. In addition, digital VBES depth data are used by Isis to assist the Reson 8101 in tracking the bottom. The latter is extremely helpful in areas of extreme relief, when the shallow-water multibeam tends to lose bottom lock. VBES data acquired during SWMB were not used for final sounding plot compilation, and are not included with the digital survey data. concur.

2. Launch Shallow-Water Multibeam (VN 2121, 2123 and 2216) ✓

The shallow-water multibeam (SWMB) system utilized for this survey was the Reson SeaBat 8101, which is a 240 kHz multibeam system that measures relative water depths across a wide swath perpendicular to the vessel's heading. The Reson 8101 has a 150° swath, consisting of 101 individual 1.5° x 1.5° beams. A TSS POS/MV Position and Orientation Sensor was used to correct for the effects of vessel motion during survey operations. Serial numbers for the Reson 8101 and POS/MV are included in Appendix H. *

SWMB was used to develop shoal areas and acquire least depths over significant features identified during VBES data acquisition. Concur.

G. CORRECTIONS TO ECHO SOUNDINGS ✓

Water Level Correctors

Soundings were reduced to Mean Lower-Low Water (MLLW) using unverified observed data for station Cordova, AK (945-4050) obtained from the Center for Operational Oceanographic Products and Services (CO-OPS) web site. These data were used in creating HPS tide table #1.

* Filed with the hydrographic data.

Listings of HPS tide tables used for H10927 and tidal correctors as provided in the Project Instructions for H10927 are contained in the Survey Information Summary included with this report.

The operating National Water Level Observation Network (NWLON) primary tide stations at Cordova, Alaska (945-4050) and Valdez, Alaska (945-4240) will serve as control for datum determination at four subordinate stations. Because a Next Generation Water Level Measurement System (NGWLMS) Aquatrak sensor is the only sensor installed at these primary stations, RAINIER personnel were neither required nor able to inspect and perform leveling at these stations.

RAINIER personnel installed Sutron 8200 "bubbler" tide gauges at the following subordinate stations:

Station Name	Station Number	Type of Gauge	Date of Installation	Date of Removal
Zaikof Point	945-4411	30-day	10 August 1999	14 October 1999
Port Chalmers	945-4511	30-day	10 August 1999	20 October 1999
Snug Harbor **	945-4662	30-day	11 August 1999	20 October 1999
Montague Island	945-4616	30-day	31 August 1999	20 October 1999

** Snug Harbor tide gage was used for H-10927.

Refer to the Field Tide Notes and supporting data in Appendix D* for individual gauge performance and level closure information.

Raw water level data from these gauges were forwarded to N/OPS1 throughout the project period, with the final package submitted on October 29, 1999 in accordance with HSG 50 and FPM 4.7. 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 was forwarded to N/OPS1 on October 29, 1999 in accordance with FPM 4.8. Approved Tide Note dated May 15, 2000 is attached to this report.

Sound Velocity Correctors

The velocity of sound through water was determined by a minimum of one cast every four hours of acquisition for SWMB data, in accordance with the Draft Standing Project Instructions. The velocity of sound through water was determined by five casts for VBES data, in accordance with the one cast per week minimum required by the NOS Hydrographic Surveys Specifications and Deliverables (April 23, 1999). Cast information is included in the Survey Information Summary and in Appendix I.*

The sound velocity casts were acquired with SBE SEACAT Profilers (S/N 2543, 2044, and 219). Calibration reports and dates are included with the Project Related Data for OPR-P139-RA-99. Velocity correctors were computed using the program VELOCWIN version 4 beta 2, which generates correction tables for both CARIS and HPS. For VBES data, sound velocity correctors were applied in HPS during post processing. For SWMB data, sound velocity correctors were applied in CARIS during post processing.

Settlement and Squat and Static Draft Correctors

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

* Filed with the hydrographic data.

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 1999	OTF	March 1999	Port Angeles, WA
2122	March 1999	Rod leveling	March 1999	Port Angeles, WA
2123	March 1999	OTF	March 1999	Port Angeles, WA
2124	March 1999	Rod leveling	March 1999	Port Angeles, WA
2125	March 1999	Rod leveling	March 1999	Port Angeles, WA
2126	March 1999	OTF	March 1999	Port Angeles, WA

Settlement and squat correctors, static draft measurements and vessel offsets are included with the Project Related Data for OPR-P139-RA-99. *

Heave, Pitch, Roll and Heading, Including Biases and Navigation Timing Errors

SWMB launches (VN 2121, 2123, and 2126) utilize a TSS POS/MV Model 320 Position and Orientation System (POS), which provides accurate navigation and attitude data to correct for the effects of heave, pitch, roll and heading. The POS generates attitude data in three axes (roll, pitch and heading) to an accuracy of 0.05° or better. Heave measurements supplied by the POS maintain an accuracy of 5% of the measured vertical displacement for movements that have a period of up to 10 seconds. The POS delivers heading measurements by two distinct methods. First, the Dynamic Heading Alignment determines the vessels heading by using the data supplied by the Internal Measurement Unit (IMU) and GPS receivers to achieve heading that is, at best, accurate to within 0.35°. This method suffers from drift but is relatively unaffected by noise. Second, the GPS Azimuth Measurement System (GAMS) determines the geographic vector between two GPS antennas fixed to the vessel by comparing the phase of satellite signals they receive. The error from this method is largely due to noise, but exhibits no drift. The POS uses the advantages of each method to compensate for the disadvantages of the other to arrive at an optimal accuracy of 0.05°. Serial numbers are located in Appendix H. *

Heave, roll, pitch, and navigation latency biases were determined during Patch Tests conducted at Port Angeles, WA on March 26-28, 1999 for vessels 2126 and 2123, and at Shilshole, WA, on July 7, 1999 for vessel 2121. SWMB vessel offsets, dynamic draft correctors, and system bias values are contained in CARIS Vessel Configuration Files (VCF's) and were created using the program "VCFEDIT" in CARIS. These offsets and biases are applied to the sounding data during processing in CARIS. A printout of each VCF is contained in the Project Related Data for OPR-P139-RA-99, and the VCF's themselves are included with the digital HDCS data. Concur.

H. HYDROGRAPHIC POSITION CONTROL (See OPAC APT, Secs H & I)

The horizontal datum for this project is NAD 83. Differential GPS was the sole method of positioning. The US Coast Guard Beacons at Cape Hinchinbrook (ID# 894) and Potato Point (ID# 883) were the sources of differential correctors.

Launch-to-launch DGPS performance checks were performed in accordance with Section 3.2 of the FPM. Copies of the performance checks are included in the Project Related Data for OPR-P139-RA-99. *

* Filed with the hydrographic data.

I. SHORELINE ✓ (See EVAL RPT., Sec. J)

Method of Shoreline Verification ✓

N/NGS3 supplied photogrammetric shoreline in MapInfo format for T-12709 and T-12710 for use as source shoreline. The T-sheet shoreline was imported into Hypack for field verification. In addition, features shown on the current editions of charts 16700 and 16701 were digitized in MapInfo by RAINIER personnel and displayed in Hypack for field verification.

Shoreline verification was conducted near predicted low water in accordance with the Project Instructions and FPM 6.1 and 6.2. For this survey the general limit of safe navigation of a survey launch was 5-30 meters offshore of apparent low tide. Water depths along this limit of safe navigation are generally 2-5 meters at Mean Lower Low Water (MLLW). Features unreachable by survey launch shown inshore of the Navigable Area Limit Line (NALL) are the hydrographer's approximate representation of the shoreline.

Detached positions taken during shoreline verification were recorded within HYPACK and on DP forms, and processed in HPS. These indicate revisions to features, and features not found on the T-sheet or chart.

A detailed "DP and BS Plot" is provided showing all detached positions and bottom samples with notes relating to each feature. Updated shoreline and features are also depicted on the final sounding plot.

Source Shoreline Changes and New Features ✓

Several changes and new features were found and are depicted on the final DP plot. T-sheet rocks were often identified as high points or extents of new ledges or reefs.

Four Detached Positions (Pos. # 20906-20923) define a foul area at position 60°16'06.4"N, 147°27'37.1"W. The Hydrographer recommends that the digitized foul limit line and text be added to the chart. concur.

A T-sheet rock at 60°18'21.8"N, 147°23'09.2"W was not found (Pos. #50100, DN238, VN2125). Depths in the vicinity are approximately 20 meters, water visibility 3 meters. A 50-meter radius visual search was conducted at low water for 5 minutes. The Hydrographer recommends that this T-sheet rock not be used for chart compilation. Concur. Delete rock & chart the area based on the present survey.

Three Detached Positions (Pos. # 50097-50099) define a foul area at position 60°18'27.52"N, 147°23'14.9"W. The Hydrographer recommends that the digitized foul limit line and text be added to the chart. concur. Only the word "Foul" was incorporated during chart compilation.

A Detached Position (Pos. # 42460) defines the southwestern most extent of a foul area at position 60°17'51.6"N, 147°24'56.6"W. The Hydrographer recommends that the digitized foul limit line and text be added to the chart. Concur. Only the word "Foul" was incorporated during chart compilation.

Two Detached Positions (Pos. # 53750-53751) define a foul area at position 60°17'23.6"N, 147°25'37.1"W. The Hydrographer recommends that the digitized foul limit line and text be added to the chart. Concur. Only the word "Foul" was incorporated during chart compilation.

On DN 239, VN2125 conducted a 10-minute visual search (50-meter radius) for three T-sheet rocks (Pos. # 52039-52041) in the vicinity of 60°17'40.3"N, 147°25'03.7"W. The rocks were not found. These rocks

are depicted as a single rock on Chart 16701, and the Hydrographer recommends removing the rock from the chart. Concur. Chart the area based on the present survey.

Recommendations

The Hydrographer recommends that the shoreline as depicted on the DP and BS plot and final sounding plot supersede and complement shoreline information compiled on the T-sheets as noted. These revisions are recorded in the MapInfo digital files named "H10927_shoreline" and "H10927_Shoreline_Update". Concur. Shoreline verification records has been analyze during office processing and applied to the smooth sheet as warranted.

Charted Features

Charted rocks were identified as T-sheet rocks or high points or extensions of T-sheet ledges and reefs with the following exceptions.

Detached Positions (Pos. # 40000-40001) bound an islet that is charted as a rock at position 60°17'19.3"N, 147°28'06.0"W. The islet is covered with vegetation and is approximately 120 meters long by 30 meters wide and rises approximately 15 meters above the low-water line. The Hydrographer recommends changing the charted rock to an islet. Concur.

A charted rock awash at 60°16'23.3"N, 147°28'41.6"W was not found (Pos. #40003, DN238, VN2124). Depths in the vicinity are approximately 22 meters, water visibility 2 meters. A 75-meter radius visual search was conducted at MLLW for 5 minutes. The Hydrographer recommends deleting this charted rock. Do not concur. There is no rock charted at this location. The presently charted rock is shown about 200 m. north of this position (#40003)

A charted subm rock at 60°16'27.4"N, 147°28'53.6"W was not found (Pos. #40004, DN238, VN2124). Depths in the vicinity are approximately 3 meters, water visibility 2 meters. A 75-meter radius visual search was conducted at MLLW for 5 minutes. The Hydrographer recommends deleting this charted subm rock. Concur. Chart the area based on the present survey.

A charted islet at 60°17'06.3"N, 147°26'22.4"W was not found (Pos. #60476, DN284, VN2126). Depths in the vicinity are approximately 22 meters, water visibility 3 meters. A 50-meter radius visual search and echo sounder search was conducted at MLLW for 10 minutes. The Hydrographer recommends deleting this charted islet. Concur. Chart the area based on the present survey.

A charted rock (Chart 16700) at 60°18'17.4"N, 147°22'57.0"W was not found (Pos. #50102, DN238, VN2125). Depths in the vicinity are approximately 20 meters. A 50-meter radius visual search was conducted at low water for 5 minutes. The Hydrographer recommends deleting this charted rock. Concur.

A charted rock at 60°18'48.3"N, 147°23'00.5"W was not found (Pos. #51876, DN239, VN2125). Depths in the vicinity are approximately 12 meters. A 10-minute visual search was conducted at low water. The Hydrographer recommends deleting this charted rock. Concur. Charted rock falls in the immediate vicinity of a rock and subm reef located during this survey. Chart the area based on this latest survey.

Recommendations

The charted shoreline should be revised using the T-sheet shoreline and fieldwork notes as recorded in the MapInfo digital files named "H10927_shoreline" and "H10927_Shoreline_Updates". Concur.

J. CROSSLINES ✓

VBES crosslines totaled 13.52 nautical miles, comprising 4.6% of mainscheme hydrography. Crosslines generally agreed within 1 meter of mainscheme hydrography.

SWMB crosslines totaled 3.49 nautical miles, comprising 3.8% of SWMB hydrography. A total of 3 crosslines were selected and imported into the workfile h10927_qc as checklines against 7 mainscheme lines. See Appendix E for the detailed report. The Quality Control Report (CARIS HIPS) for the checkline file averaged 91.9%, with a depth tolerance of 0.023. Additional crossline comparison would have had little value since most SWMB data were developments over features of extreme relief. concur.

K. JUNCTIONS (See EVAL RPT, Sec. L)

The following contemporary surveys junction with H10927:

Registry #	Scale	Date	Junction side
H10918 ✓	1:10,000	1999	East
H10929 ✓	1:10,000	1999	North
H10925 ✓	1:40,000	1999	West
H10928 ✓	1:10,000	1999	South

Soundings from these 1999 surveys agreed well. Depths that junction with survey H10927 from the west are ship multibeam and are generally in depths between 93 and 275 meters. At this junction of Seabeam data and VBES data, depths agree within 2 meters In comparing depths to the North and South of H10927, bathymetric relief ranged from 2 to 190 meters and depths generally compared to within 1 meter. Data analysis for H10918 was not complete at the time of writing this report. A full discussion on this junction comparison will be part of the submitted Descriptive Report for H10918. Junction comparison with survey #- 10918 was accomplished during office processing and found in good agreement. Final comparisons will be made at the Pacific Hydrographic Branch (PHB) after application of smooth tides.

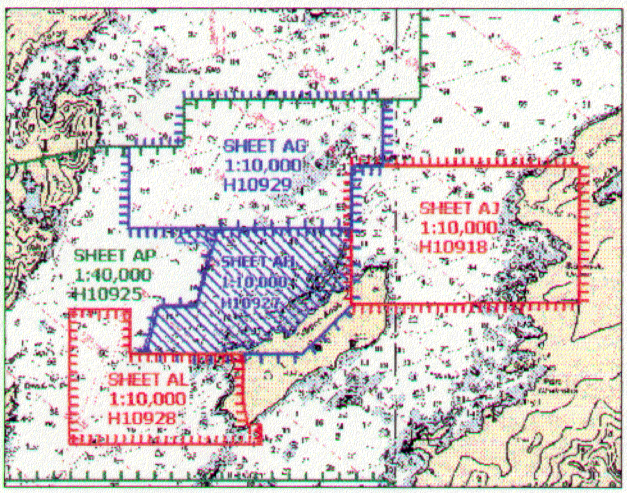


Figure 2 - Junction Surveys

L. COMPARISON WITH PRIOR SURVEYS (See EVAL RPT, Sec. M)

The following prior survey shares common area with survey H10927:

Registry #	Scale	Date	Area covered
H-~~3353~~ 3553	1:20,000 ✓	19~~09~~ 13	All but western area
H-5431 ✓	1:20,000 ✓	1933 ✓	North and West
H-2741 ✓	1:40,000 ✓	1911 ✓	Illegible

Many least depths from the current survey were found to be shoaler than the prior depths from surveys H-3353 and H-5431, and several new features were located. This is most likely due to the higher density of sounding data generated by modern sounding and positioning equipment, as well as the possible uplift in this area as a result of the 1964 earthquake. Comparisons revealed no prior least depth shoaler than the current survey except in areas of very steep bathymetry. Concur.

In deeper waters in the western section of the survey area, agreement with priors H-3353 and H-5431 improved, with agreement generally within 1-2 fathoms.

A comparison of survey H-2741 was not conducted. The scans are of very poor quality; no least depths were discernable and annotations on the priors were illegible. Concur.

Final comparisons will be made at the Pacific Hydrographic Branch after application of smooth tides.

M. ITEM INVESTIGATIONS ✓

There was one Automated Wreck and Obstruction Information System (AWOIS) item investigated within the survey area.

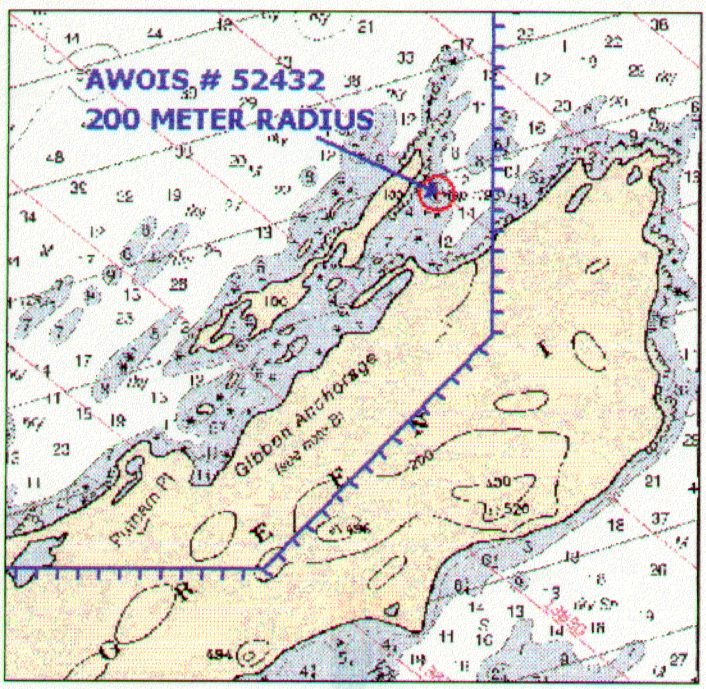


Figure 3 – Location of AWOIS item.

AWOIS 52432 ✓

1. Area of Investigation:

AWOIS Number:	52432
State and Locality:	Prince William Sound, AK
Reported Position:	Latitude: 60/18/00.67N
	Longitude: 147/23/18.82W
Datum:	NAD83
Type of Feature:	Pinnacle Rock ✓
Reported Depth:	5 feet ✓

2. Description and Source of Item:

NM36/61--A PINNACLE ROCK COVERED 5 FEET AT MLW REPORTED IN APPROX. LAT.60-18-03N, 147-23-12W (NAD27)

3. Survey Requirements: Shallow-water multibeam. 200m search radius. Update least depth.

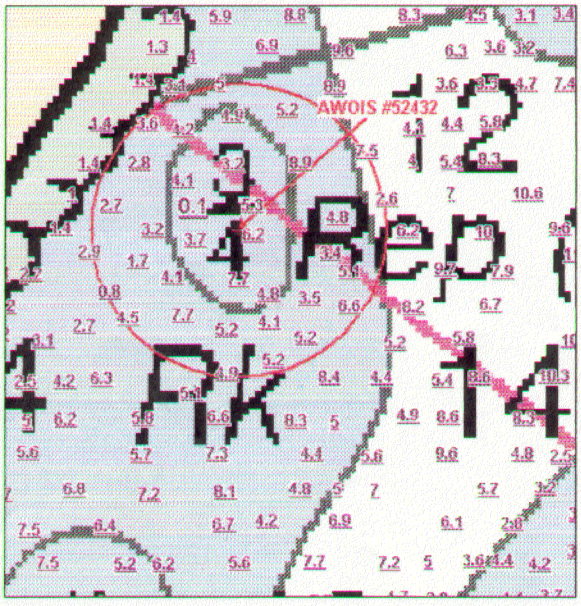
4. Method of Investigation: 100% SWMB coverage was obtained within the search area.

5. Results of Investigation: On DN 284, VN 2123 conducted a 100% coverage SWMB investigation within a 200 m radius of 60°18'01"N 147°23'19"W. This investigation resulted in a least depth of 0.1 fathom (0.3 meters) at MLLW for AWOIS item # 52432. (shown on SS as rock awash) *(0)

6. Comparison with Prior Surveys: Compared with prior survey H-3353; 1909; 1:20,000. The prior survey shows no depths in the vicinity of the item.

7. Comparison with the Chart and Charting Recommendation: Compared with chart 16701; 17th Ed.; July 25, 1998; 1:81,436. The chart shows a ¾-fathom rock reported in 1961 at 60°18'01.53"N 147°23'19.18"W.

The Hydrographer recommends charting a submerged rock at 60°18'01.75"N, 147°23'22.74"W. concur.



N. COMPARISON WITH THE CHART (See EVAL RPT., Sec. O)

Survey H10927 was compared to Chart 16700 (26th Ed.; September 19, 1998, 1:200,000) and Chart 16701 (17th Ed.; July 25,1998; 1:81,436). All soundings on Chart 16700 within the region of the current survey are a subset of the soundings from Chart 16701.

Depths were found to agree well, generally within one fathom, when comparing Charts 16700 and 16701 to the contemporary survey H10927. Exceptions are noted below:

Chart 16701 depicts a 31-fathom sounding at 60°16'00.6"N, 147°32'05.2"W, while the present survey revealed a depth of 21 fathoms. This area was partially covered with SWMB.

Chart 16701 depicts a 22-fathom sounding at 60°16'37.1"N, 147°30'34.2"W, while the present survey revealed a depth of 12.4 fathoms. This area was covered by 100% SWMB.

Chart 16701 depicts a 21-fathom sounding in the approach to Gibbon Anchorage at 60°16'59.8"N, 147°29'58.6"W, while the present survey revealed a depth of 12.7 fathoms. This area was covered by 100% SWMB.

Chart 16701 depicts a 54-fathom sounding offshore of Gibbon Anchorage at 60°19'9.9"N, 147°24'30.3"W, while the present survey revealed a depth of 43 fathoms. This area was covered by VBES.

Chart 16701 depicts a 48-fathom sounding offshore of Gibbon Anchorage at 60°17'41.5"N, 147°29'22.3"W, while the present survey revealed a depth of 28 fathoms. This area was covered by VBES.

The Hydrographer recommends that soundings and shoreline detail from survey H10927 be used to update the chart in their common areas. Non-sounding features are discussed in Section J - Shoreline.

Final sounding comparisons will be made at the Pacific Hydrographic Branch after application of smooth tides.

Dangers to Navigation

Thirty-five dangers to navigation were discovered during survey H10927 and reported to the Seventeenth Coast Guard District. A copy of the Danger to Navigation report is included in Appendix A.

A rock with a least depth of 0.1 fathoms was discovered at 60°18'01.75"N, 147°23'22.74"W, in the vicinity of a reported ¾-fathom rock. This corresponds to AWOIS item 52432 described in section M.

A shoal depth of 0.5 fathoms was discovered at 60°16'52.6"N, 147°28'49.2"W, in the vicinity of a charted 4.5-fathom sounding.

A shoal depth of 1.7 fathoms was discovered at 60°17'34.3"N, 147°26'51.6"W, in the vicinity of a charted $4^1/_4$-fathom sounding.

A shoal depth of 6.6 fathoms was discovered at 60°17'30.5"N, 147°27'21.3"W, in the vicinity of a charted 9-fathom sounding.

A shoal depth of 6.6 fathoms was discovered at 60°18'55.7"N, 147°22'52.8"W, in the vicinity of a charted 17-fathom sounding.

A shoal depth of 5.3 fathoms was discovered at 60°17'21.0"N, 147°27'33.4"W, in the vicinity of a charted 9-fathom sounding.

A shoal depth of 8.1 fathoms was discovered at 60°17'01.3"N, 147°27'41.3"W, in the vicinity of a charted 17-fathom sounding.

A shoal depth of 0.7 fathoms was discovered at 60°16'33.4"N, 147°29'13.4"W, in the vicinity of a charted 4-fathom sounding.

A shoal depth of 7.9 fathoms was discovered at 60°17'44.7"N, 147°27'28.6"W, in the vicinity of a charted 12-fathom sounding.

A shoal depth of 6.2 fathoms was discovered at 60°16'02.5"N, 147°31'15.0"W, in the vicinity of a charted 17-fathom sounding.

A shoal depth of 2.2 fathoms was discovered at 60°17'25.1"N, 147°27'55.0"W, in the vicinity of a charted 7-fathom sounding.

A shoal depth of 6.5 fathoms was discovered at 60°18'21.1"N, 147°25'54.7"W, between charted 20 and 29-fathom soundings.

A shoal depth of 2.8 fathoms was discovered at 60°16'24.9"N, 147°29'43.8"W, in the vicinity of a charted 9-fathom sounding.

A shoal depth of 2.2 fathoms was discovered at 60°18'26.4"N, 147°23'42.9"W, in the vicinity of a charted 12-fathom sounding.

A shoal depth of 2.6 fathoms was discovered at 60°18'02.1"N, 147°23'05.6"W, in the vicinity of a charted 12-fathom sounding.

A shoal depth of 2.6 fathoms was discovered at 60°17'41.0"N, 147°23'10.1"W, in the vicinity of a charted 12-fathom sounding. A 2¼ fms. shoal was compiled in the vicinity of this reported shoal.

A shoal depth of 5.8 fathoms was discovered at 60°17'43.9"N, 147°26'58.4"W, in the vicinity of a charted 8-fathom sounding.

A shoal depth of 4.0 fathoms was discovered at 60°17'36.8"N, 147°27'01.3"W, in the vicinity of a charted 6-fathom sounding.

A shoal depth of 2.6 fathoms was discovered at 60°17'44.1"N, 147°26'31.1"W, in the vicinity of a charted 7-fathom sounding.

A shoal depth of 5.1 fathoms was discovered at 60°17'10.2"N, 147°28'21.3"W, in the vicinity of a charted 7-fathom sounding.

A shoal depth of 3.8 fathoms was discovered at 60°17'05.3"N, 147°27'59.8"W, in the vicinity of a charted 7-fathom sounding.

A shoal depth of 7.3 fathoms was discovered at 60°16'45.9"N, 147°28'09.0"W, in the vicinity of a charted 11-fathom sounding.

A shoal depth of 4.3 fathoms was discovered at 60°16'19.0"N, 147°28'09.3"W, between charted 11- and 23-fathom soundings.

A shoal depth of 6.7 fathoms was discovered at 60°16'37.6"N, 147°29'42.4"W, in the vicinity of a charted 13-fathom sounding. A 2½ fms. shoal was compiled in the immediate vicinity of this reported shoal.

A shoal depth of 9.1 fathoms was discovered at 60°16'26.0"N, 147°31'05.9"W, in the vicinity of a charted 20-fathom sounding. A. 7.8 fm. sndg. located about 120m. SW of the 9.1 fm. shoal.

A shoal depth of 5.5 fathoms was discovered at 60°15'49.7"N, 147°30'49.1"W, in the vicinity of a charted 12-fathom sounding.

A shoal depth of 5.8 fathoms was discovered at 60°16'50.6"N, 147°26'26.7"W, in the vicinity of a charted 12-fathom sounding. A 4¼ fms. shoal sounding was located close to this reported shoal.

A shoal depth of 6.9 fathoms was discovered at 60°18'14.1"N, 147°24'35.1"W, in the vicinity of a charted 12-fathom sounding. A 4¾ fms. shoal was located close to this reported shoal.

A shoal depth of 2.2 fathoms was discovered at 60°18'40.9"N, 147°22'45.1"W, in between charted 11- and 13-fathom soundings.

A shoal depth of 1.7 fathoms was discovered at 60°16'11.6"N, 147°29'21.5"W, in the vicinity of a charted 6-fathom sounding.

A shoal depth of 1.2 fathoms was discovered at 60°16'23.2"N, 147°30'19.7"W, in the vicinity of a charted 5½-fathom sounding.

A shoal depth of 4.8 fathoms was discovered at 60°18'05.8"N, 147°24'54.9"W, in the vicinity of a charted 8-fathom sounding.

A shoal depth of 2.1 fathoms was discovered at 60°17'48.4"N, 147°25'22.7"W, in the vicinity of a charted 13-fathom sounding.

A shoal depth of 1.6 fathoms was discovered at 60°17'10.6"N, 147°26'34.3"W, in the vicinity of a charted 12-fathom sounding.

A shoal depth of 1.8 fathoms was discovered at 60°18'15.3"N, 147°22'36.2"W, between charted 8- and 6½-fathom soundings. A ¾ fm. shoal carried forward from Survey #-10918 was located about 80 m. SW of the reported shoal. this report.

A copy of the Danger to Navigation report is included in ~~Appendix A~~.

O. ADEQUACY OF SURVEY ✓

Survey H10927 is complete and adequate to supersede charted soundings and features in their common areas. Concur.

P. AIDS TO NAVIGATION ✓

There are no aids to navigation within the survey area. Concur.

Q. STATISTICS ✓

Refer to the Survey Information Summary attached to this report.

R. MISCELLANEOUS ✓

Bottom samples were collected and sent to the Smithsonian Institute in accordance with the Project Instructions.

No unusual tidal currents or magnetic variations were found during this survey.

During data acquisition, small boats and fishing vessels infrequently visited the survey area. Gibbon Anchorage is a suitable small vessel anchorage.

S. RECOMMENDATIONS ✓

None.

T. REFERRAL TO REPORTS ✓

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

Title	Date Sent	Office
OPR-P139-RA-99 1999 Coast Pilot Report	TBD	N/CS26
Project Related Data for OPR-P139-RA-99	November 1999	N/CS34

Respectfully Submitted,

Paul Jay McAnally

Paul Jay McAnally
Senior Survey Technician, NOAA

Approved and Forwarded,

Daniel R. Herlihy

Daniel R. Herlihy
Commander, NOAA
Commanding Officer

Survey Information Summary

Project: OPR-P139-RA
Project Name: SOUTHWEST PRINCE WILLIAM SOUND
Instructions Dated: 7/30/99
Project Change Info:
Sheet Letter: AH
Registry Number: H10927
Sheet Number: RA-10-19-99

Survey Title: Approach to Gibbon Anchorage
Data Acquisition Dates: **From:** 26-Aug-99 238 **To:** 20-Oct-99 293

Vessel Usage Summary

VESNO	MS	SPLITS	DEV	XL	S/L	DP	BS	SWMB	DIVE
2121								1	
2122	6	1			3	3			
2123		2		1				3	
2124	2	2		1	2	2			
2125	5	1			1	4	2		
2126	3			1		1		3	

Sound Velocity Cast Information

Cast	Vessel	Day Applicable	Depth (m)	Latitude	Longitude
99258171	2123	258	86	60/17/17 N	147/27/56 W
99258204	2123	258	59.8	60/15/48 N	147/31/39 W
99259165	2123	259	84.8	60/17/45 N	147/30/29 W
99259202	2123	259	77.8	60/17/03 N	147/30/29 W
99268154	2126	268	91.7	60/16/20 N	147/33/10 W
99268202	2126	268	64.2	60/18/20 N	147/25/09 W
99280161	2121	280	125.7	60/20/01 N	147/23/52 W
99284223	2126	284	103.1	60/16/42 N	147/33/43 W
99284220	2123	284	29.5	60/18/17 N	147/23/11 W
99285222	2126	285	76.4	60/19/09 N	147/23/42 W
99292191	2123	292	80.4	60/17/48 N	147/28/23 W
99292220	2123	292	92.7	60/18/22 N	147/26/48 W

Cast	Vessel	Day Applicable	Depth (m)	Latitude	Longitude	HPS
99243014	2120	243	183	60/19/01 N	147/17/30 W	4
99254174	2120	254	209	60/24/30 N	147/07/10 W	6
99270224	2120	270	329	60/11/00 N	147/41/10 W	12
99277214	2120	277	293	60/27/24 N	147/09/36 W	13
99286165	2120	286	370	60/17/18 N	147/35/24 W	14

Tide Zone Information

Zone #	Time Corr.	Height Corr.
PWS10	-00 hr 06 min	0.90
PWS11	-00 hr 06 min	0.88

Tide Gage Information

Tide Gauge #	Gauge Name	Installed	Removed
945-4511	Port Chalmers	8/10/1999	10/20/1999
945-4616	Montague Island	8/31/1999	10/20/1999
945-4662	Snug Harbor	8/11/1999	10/20/1999
945-4411	Zaikof Point	8/10/1999	10/14/1999

Statistics Summary

Type	Total
BS	21
DP	111
MS	293.53
S/L	19.25
SPLIT	128.12
SWMB	98.09
XL	13.52

Percent XL	4.61
SQNM	14.34

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

December 3, 1999

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

ADVANCE INFORMATION

Dear CDR Hamblett:

It is requested that the following dangers to navigation be included in the Local Notice to Mariners. The NOAA Ship RAINIER positioned these features while conducting hydrographic survey H10927 in Prince William Sound, Alaska, in August through October 1999. The dangers are shown graphically on the attached chartlet.

The following dangers to navigation affect the following charts:

Chart	Scale	Edition	Date
16700	1:200,000	26th	19-Sep-98
16701	1:81,436	17th	25-Jul-98

The positions are on the NAD 83 datum and depths have been corrected to Mean Lower Low Water.

Feature	Depth (fm)	Latitude (N)	Longitude (W)	Depth (m)
Rock	0.1	60/18/01.75	147/23/22.74	0.3
Shoal	0.5	60/16/52.64	147/28/49.20	0.9
Shoal	0.7	60/16/33.40	147/29/13.41	1.3
Shoal	1.2	60/16/23.17	147/30/19.67	2.2
Shoal	1.5	60/17/34.29	147/26/51.62	2.7
Shoal	1.6	60/17/10.57	147/26/34.33	2.9
Shoal	1.7	60/16/11.58	147/29/21.51	3.1
Shoal	1.8	60/18/15.27	147/22/36.21	3.4
Shoal	2.1	60/17/48.41	147/25/22.66	3.8
Shoal	2.2	60/17/25.10	147/27/55.00	4.0
Shoal	2.2	60/18/26.39	147/23/42.94	4.0
Shoal	2.2	60/18/40.93	147/22/45.10	4.0
Shoal	2.6	60/17/41.05	147/23/10.06	4.8
Shoal	2.6	60/17/44.08	147/26/31.07	4.8
Shoal	2.6	60/18/02.13	147/23/05.63	4.8
Shoal	2.8	60/16/24.94	147/29/43.88	5.1
Shoal	3.8	60/17/05.31	147/27/59.79	6.9
Shoal	4.1	60/17/36.81	147/27/01.33	7.5
Shoal	4.3	60/16/18.95	147/28/09.34	7.9
Shoal	4.8	60/18/05.81	147/24/54.87	8.8
Shoal	5.1	60/17/10.16	147/28/21.30	9.3
Shoal	5.3	60/17/20.95	147/27/33.37	9.7
Shoal	5.5	60/15/49.68	147/30/49.13	10.1
Shoal	5.8	60/17/43.86	147/26/58.40	10.6
Shoal	5.8	60/16/50.63	147/26/26.70	10.6
Shoal	6.2	60/16/02.50	147/31/14.96	11.3
Shoal	6.5	60/18/21.09	147/25/54.71	11.9

Shoal	6.6	60/18/55.73	147-22-52.83	12.2
Shoal	6.6	60/17/30.48	147/27/21.32	12.1
Shoal	6.7	60/16/37.61	147/29/42.35	12.3
Shoal	6.9	60/18/14.09	147/24/35.05	12.6
Shoal	7.5	60/16/45.89	147/28/00.87	13.7
Shoal	7.9	60/17/44.68	147/27/28.64	14.4
Shoal	8.1	60/17/01.27	147/27/41.25	14.8
Shoal	9.1	60/16/26.04	147/31/05.92	16.6

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-99 and Danger to Navigation message RA-23-99. More information on current RAINIER survey projects may be obtained by e-mail; contact the Field Operations Officer at FOO.RAINIER@NOAA.GOV.

Sincerely,

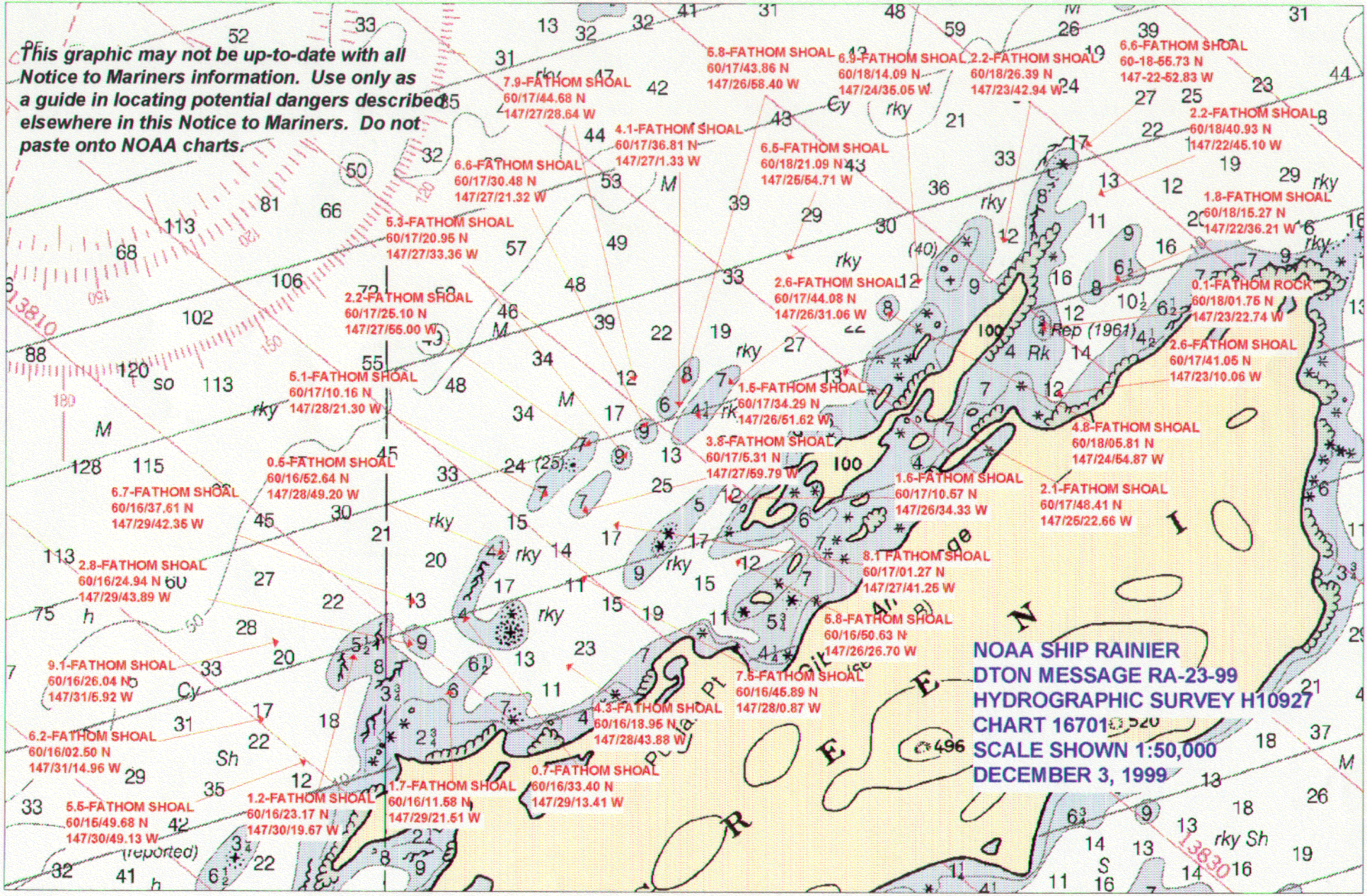
Daniel R. Herlihy

Daniel R. Herlihy
Commander, NOAA
Commanding Officer

Attachment

cc: NIMA
N/CS261
PMC
N/CS34

ADVANCE
INFORMATION


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 onto NOAA charts.
5.8-FATHOM SHOAL 60/17/43.86 N 147/26/58.40 W
6.9-FATHOM SHOAL 60/18/14.09 N 147/24/35.05 W
2.2-FATHOM SHOAL 60/18/26.39 N 147/23/42.94 W
6.6-FATHOM SHOAL 60-18-55.73 N 147-22-52.83 W
7.9-FATHOM SHOAL 60/17/44.68 N 147/27/28.64 W
4.1-FATHOM SHOAL 60/17/36.81 N 147/27/1.33 W
6.5-FATHOM SHOAL 60/18/21.09 N 147/25/54.71 W
2.2-FATHOM SHOAL 60/18/40.93 N 147/22/45.10 W
6.6-FATHOM SHOAL 60/17/30.48 N 147/27/21.32 W
1.8-FATHOM SHOAL 60/18/15.27 N 147/22/36.21 W
5.3-FATHOM SHOAL 60/17/20.95 N 147/27/33.36 W
2.6-FATHOM SHOAL 60/17/44.08 N 147/26/31.06 W
0.1-FATHOM ROCK 60/18/01.75 N 147/23/22.74 W
2.2-FATHOM SHOAL 60/17/25.10 N 147/27/55.00 W
Rep (1961)
2.6-FATHOM SHOAL 60/17/41.05 N 147/23/10.06 W
5.1-FATHOM SHOAL 60/17/10.16 N 147/28/21.30 W
1.5-FATHOM SHOAL 60/17/34.29 N 147/26/51.62 W
4.8-FATHOM SHOAL 60/18/05.81 N 147/24/54.87 W
3.8-FATHOM SHOAL 60/17/5.31 N 147/27/59.79 W
0.5-FATHOM SHOAL 60/16/52.64 N 147/28/49.20 W
1.6-FATHOM SHOAL 60/17/10.57 N 147/26/34.33 W
6.7-FATHOM SHOAL 60/16/37.61 N 147/29/42.36 W
2.1-FATHOM SHOAL 60/17/48.41 N 147/25/22.66 W
8.1-FATHOM SHOAL 60/17/01.27 N 147/27/41.25 W
2.8-FATHOM SHOAL 60/16/24.94 N 147/29/43.89 W
5.8-FATHOM SHOAL 60/16/50.63 N 147/26/26.70 W
9.1-FATHOM SHOAL 60/16/26.04 N 147/31/5.92 W
7.5-FATHOM SHOAL 60/16/45.89 N 147/28/0.87 W
4.3-FATHOM SHOAL 60/16/18.95 N 147/28/43.88 W
6.2-FATHOM SHOAL 60/16/02.50 N 147/31/14.96 W
0.7-FATHOM SHOAL 60/16/33.40 N 147/29/13.41 W
1.7-FATHOM SHOAL 60/16/11.58 N 147/29/21.51 W
1.2-FATHOM SHOAL 60/16/23.17 N 147/30/19.67 W
5.5-FATHOM SHOAL 60/15/49.68 N 147/30/49.13 W (reported)
NOAA SHIP RAINIER
DTON MESSAGE RA-23-99
HYDROGRAPHIC SURVEY H10927
CHART 16701
SCALE SHOWN 1:50,000
DECEMBER 3, 1999
ADVANCE INFORMATION

ADVANCE INFORMATION

Date: 12/6/1999
Sender: FOO Rainier
To: Chief Survey Technician Rainier, Lynn [NDS-NCG22] Preston, navinfonet@nima.mil, lnm@cgalaska.uscg.mil, Dennis.Hill@noaa.gov
Priority: Normal
Subject: DTON Message RA-23-99

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 survey H10927 in Prince William Sound, Alaska, in August through October 1999.

The following dangers to navigation affect charts 16700 (scale 1:200,000; 26th edition, 19-Sep-98) and 16701 (scale 1:81,436; 17th edition, 25-Jul-98).

The positions are on the NAD 83 datum and depths have been corrected to Mean Lower Low Water.

Feature: Rock
Depth: 0.1 fathoms
Latitude: 60/18/01.75 N
Longitude: 147/23/22.74 W

Feature: Shoal
Depth: 0.5 fathoms
Latitude: 60/16/52.64 N
Longitude: 147/28/49.20 W

Feature: Shoal
Depth: 0.7 fathoms
Latitude: 60/16/33.40 N
Longitude: 147/29/13.41 W

Feature: Shoal
Depth: 1.2 fathoms
Latitude: 60/16/23.17 N
Longitude: 147/30/19.67 W

Feature: Shoal
Depth: 1.5 fathoms
Latitude: 60/17/34.29 N
Longitude: 147/26/51.62 W

Feature: Shoal
Depth: 1.6 fathoms
Latitude: 60/17/10.57 N
Longitude: 147/26/34.33 W

Feature: Shoal
Depth: 1.7 fathoms
Latitude: 60/16/11.58 N
Longitude: 147/29/21.51 W

Feature: Shoal
Depth: 1.8 fathoms
Latitude: 60/18/15.27 N
Longitude: 147/22/36.21 W

Feature: Shoal
Depth: 2.1 fathoms

ADVANCE
INFORMATION

Latitude: 60/17/48.41 N
Longitude: 147/25/22.66 W

Feature: Shoal
Depth: 2.2 fathoms
Latitude: 60/17/25.10 N
Longitude: 147/27/55.00 W

Feature: Shoal
Depth: 2.2 fathoms
Latitude: 60/18/26.39 N
Longitude: 147/23/42.94 W

Feature: Shoal
Depth: 2.2 fathoms
Latitude: 60/18/40.93 N
Longitude: 147/22/45.10 W

Feature: Shoal
Depth: 2.6 fathoms
Latitude: 60/17/41.05 N
Longitude: 147/23/10.06 W

Feature: Shoal
Depth: 2.6 fathoms
Latitude: 60/17/44.08 N
Longitude: 147/26/31.07 W

Feature: Shoal
Depth: 2.6 fathoms
Latitude: 60/18/02.13 N
Longitude: 147/23/05.63 W

Feature: Shoal
Depth: 2.8 fathoms
Latitude: 60/16/24.94 N
Longitude: 147/29/43.88 W

Feature: Shoal
Depth : 3.8 fathoms
Latitude: 60/17/05.31 N
Longitude: 147/27/59.79 W

Feature: Shoal
Depth: 4.1 fathoms
Latitude: 60/17/36.81 N
Longitude: 147/27/01.33 W

Feature: Shoal
Depth: 4.3 fathoms
Latitude: 60/16/18.95 N
Longitude: 147/28/09.34 W

Feature: Shoal
Depth: 4.8 fathoms
Latitude: 60/18/05.81 N
Longitude: 147/24/54.87 W

Feature: Shoal
Depth: 5.1 fathoms

Latitude: 60/17/10.16 N
Longitude: 147/28/21.30 W

Feature: Shoal
Depth: 5.3 fathoms
Latitude: 60/17/20.95 N
Longitude: 147/27/33.37 W

Feature: Shoal
Depth: 5.5 fathoms
Latitude: 60/15/49.68 N
Longitude: 147/30/49.13 W

Feature: Shoal
Depth: 5.8 fathoms
Latitude: 60/17/43.86 N
Longitude: 147/26/58.40 W

Feature: Shoal
Depth: 5.8 fathoms
Latitude: 60/16/50.63 N
Longitude: 147/26/26.70 W

Feature: Shoal
Depth: 6.2 fathoms
Latitude: 60/16/02.50 N
Longitude: 147/31/14.96 W

Feature: Shoal
Depth: 6.5 fathoms
Latitude: 60/18/21.09 N
Longitude: 147/25/54.71 W

Feature: Shoal
Depth: 6.6 fathoms
Latitude: 60/18/55.73 N
Longitude: 147-22-52.83 W

Feature: Shoal
Depth: 6.6 fathoms
Latitude: 60/17/30.48 N
Longitude: 147/27/21.32 W

Feature: Shoal
Depth: 6.7 fathoms
Latitude: 60/16/37.61 N
Longitude: 147/29/42.35 W

Feature: Shoal
Depth: 6.9 fathoms
Latitude: 60/18/14.09 N
Longitude: 147/24/35.05 W

Feature: Shoal
Depth: 7.5 fathoms
Latitude: 60/16/45.89 N
Longitude: 147/28/00.87 W

Feature: Shoal
Depth: 7.9 fathoms

ADVANCE INFORMATION

Latitude: 60/17/44.68 N
Longitude: 147/27/28.64 W

ADVANCE INFORMATION

Feature: Shoal
Depth: 8.1 fathoms
Latitude: 60/17/01.27 N
Longitude: 147/27/41.25 W

Feature: Shoal
Depth: 9.1 fathoms
Latitude: 60/16/26.04 N
Longitude: 147/31/05.92 W

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-99 and Danger to Navigation message RA-23-99. More information on current RAINIER survey projects may be obtained by e-mail; contact the Field Operations Officer at FOO.RAINIER@NOAA.GOV.

APPROVAL SHEET

for

H10927

RA-10-19-99

Standard field surveying and processing procedures were followed in producing this survey in accordance with the NOS Hydrographic Surveys Specifications and Deliverables; 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,

Daniel R. Herlihy

Daniel R. Herlihy
Commander, NOAA
Commanding Officer
NOAA Ship RAINIER

NOAA FORM 76-155
(11-72)

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

GEOGRAPHIC NAMES

SURVEY NUMBER

H-10927

Name on Survey	A ON CHART NO. 16700, 16701	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
GIBBON ANCHORAGE	X		X							2
GREEN ISLAND	X		X							3
PUTNAM POINT	X		X							4
PRINCE WILLIAM SOUND	X		X							5
				Approved:						6
				Dennis J. Romeskurs						7
										8
							APR 24 2000			9
										10
										11
										12
										13
										14
										15
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NOAA FORM 76-155 SUPERSEDES C&GS 197

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
Silver Spring, Maryland 20910

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE: May 15, 2000

HYDROGRAPHIC BRANCH: Pacific
HYDROGRAPHIC PROJECT: OPR-P139-RA-99
HYDROGRAPHIC SHEET: H-10927

LOCALITY: Approach to Gibbon Anchorage,
Southwest Prince William Sound, AK

TIME PERIOD: August 26 - October 20, 1999

TIDE STATION USED: 945-4662 Snug Harbor
Lat. 60° 14.4'N Lon. 147° 43.2'W
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 3.218 meters

REMARKS: RECOMMENDED ZONING
Use zone(s) identified as: PWS42 & PWS47.

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.

Thomas W. Moon 5/16/00

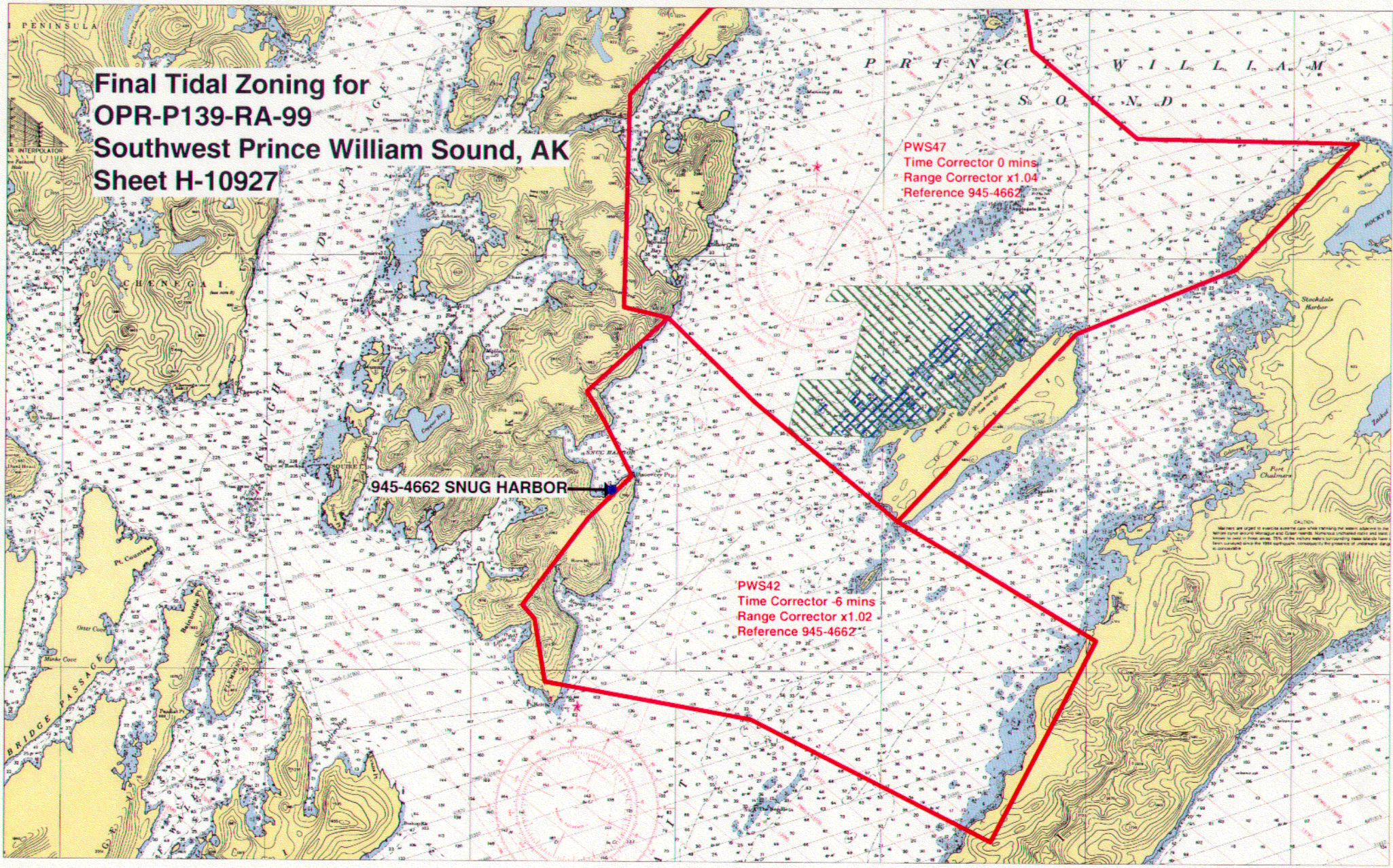
CHIEF, REQUIREMENTS AND DEVELOPMENT DIVISION

Final tide zone node point locations for OPR-P139-RA-99,
Sheet H-10927.

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 PWS42			
-147.703642 60.244653	945-4662	-6	1.02
-147.738627 60.227865			
-147.792175 60.19276			
-147.781996 60.187238			
-147.773635 60.161998			
-147.606335 60.147238			
-147.411023 60.097978			
-147.325832 60.179367			
-147.487763 60.226861			
-147.604351 60.274729			
-147.674795 60.308452			
-147.740374 60.278784			
-147.726093 60.266771			
-147.703642 60.244653			
Zone PWS47			
-147.385584 60.525438	945-4662	0	1.04
-147.474011 60.505541			
-147.572046 60.469896			
-147.706768 60.397587			
-147.710815 60.312655			
-147.674795 60.308452			
-147.604351 60.274729			
-147.487763 60.226861			
-147.343216 60.302686			
-147.212948 60.329021			
-147.115049 60.379232			
-147.294086 60.380883			
-147.38032 60.416307			
-147.394959 60.462944			
-147.324788 60.528831			

-147.385584 60.525438


Final Tidal Zoning for
OPR-P139-RA-99
Southwest Prince William Sound, AK
Sheet H-10927
PWS47
Time Corrector 0 mins
Range Corrector x1.04
Reference 945-4662
945-4662 SNUG HARBOR
PWS42
Time Corrector -6 mins
Range Corrector x1.02
Reference 945-4662
PRINCE WILLIAM SOUND
CHENEGA I.
KNIGHT ISLAND PASSAGE
BRIDGE PASSAGE
Stockdale Harbor
Fort Chalmers

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

U.S. DEPARTMENT OF COMMERCE

HYDROGRAPHIC SURVEY STATISTICS

REGISTRY NUMBER: H-10927

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	1					
ENVELOPES						
VOLUMES						
CAHIERS						
BOXES						

SHORELINE DATA

SHORELINE MAPS (List):	T-12709, T-12710
PHOTOBATHYMETRIC MAPS (List):	None
NOTES TO THE HYDROGRAPHER (List):	None
SPECIAL REPORTS (List):	None
NAUTICAL CHARTS (List):	16701, 17th Ed., July 25, 1998

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 (Selected)			22,728
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	148.5		
COMPARISON WITH PRIOR SURVEYS AND CHARTS		22.0	22.0
EVALUATION OF SIDE SCAN SONAR RECORDS			
EVALUATION OF WIRE DRAGS AND SWEEPS			
EVALUATION REPORT		30.0	30.0
GEOGRAPHIC NAMES			
OTHER (Chart Compilation)		44.5	44.5
*USE OTHER SIDE OF FORM FOR REMARKS — TOTALS	148.5	96.5	245.0

Pre-processing Examination by	*Beginning Date*	*Ending Date*
Verification of Field Data by E. Domingo, R. Mayor, R. Davies, D. Doles, I. Almacen	*Time (Hours)* 148.5	*Ending Date* 2/13/01
Verification Check by Lee Dunbar	*Time (Hours)* 7.0	*Ending Date* 3/27/01
Evaluation and Analysis by I. Almacen	*Time (Hours)* 52.0	*Ending Date* 2/15/01
Inspection by Lee Dunbar	*Time (Hours)*	*Ending Date* 3/27/01

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

EVALUATION REPORT
H-10927

A. PROJECT

Project information is adequately discussed in the hydrographer's report.

B. AREA SURVEYED

The survey area is adequately described in the hydrographer's report. A page-size plot of the area on chart 16701 depicting the specific limits of supersession accompanies this report as Attachments 1.

The bottom consists mainly of mud, sand and pebbles mixed with broken shells. Depths range from 0.0 to 149.0 fathoms.

C. SURVEY VESSELS

Survey vessels are adequately discussed in the hydrographer's report.

D. AUTOMATED DATA ACQUISITION AND PROCESSING

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

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. The smooth sheet was compiled with MicroStation 95.

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 the Specifications and Deliverables, April 1999.

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

E. SONAR EQUIPMENT

Side scan sonar was not utilized during this survey.

F. SOUNDING EQUIPMENT

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

G. CORRECTIONS TO SOUNDINGS

Soundings and elevations of features have been reduced to Mean Lower Low Water (MLLW) or Mean High Water (MHW), with approved tide correctors obtained from the Center For Operational Oceanographic Products and Services. The approved tide correctors are zoned from Snug Harbor, Alaska, gage 945-4662.

Other sounding reducers include corrections for static draft, dynamic draft, sound velocity, heave, roll and pitch. These reducers have been reviewed and are consistent with NOS specification.

H. CONTROL STATIONS

Section H of the hydrographer's report contain information concerning 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 NAD27 adjustment tick based on values determined with the NGS program NADCON. Geographic positions based on NAD27 may be plotted on the smooth sheet utilizing the NAD 83 projection by applying the following corrections.

Latitude: -2.297 seconds (-71.089 meters)
Longitude: 6.908 seconds (106.119 meters)

I. HYDROGRAPHIC POSITION CONTROL

Hydrographic position control has been adequately discussed in the hydrographer's report.

Differential GPS (DGPS) was used to control this survey. In the event that the differential GPS corrector signal is lost, a switch to P-Code is made automatically by the Trimble receiver. The satellite configuration, as indicated by HDOP and number of satellites, is monitored visually on the IDSSS and Trimble displays. The maximum (HDOP) allowable limit of 3.80 has not been exceeded during this survey and the quality of data obtained is good. 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 correction to position data.

J. SHORELINE

The digitized 1:10,000 scale registered topographic manuscripts T-12709 and T-12710 compiled on NAD 83 datum were used during this survey. The digitized shoreline file and the survey file were merged during Microstation processing.

The shoreline maps and the results of the fieldwork as portrayed on the smooth sheet should supersede the presently charted shoreline.

K. CROSSLINES

Crosslines are adequately discussed in the hydrographer's report.

L. JUNCTIONS

Survey H-10927 junctions with the following surveys .

Survey	Year	Scale	Area
H-10918	1999	1:10,000	Eastern Limit
H-10925	1999	1:40,000	Western Limit
H-10928	1999	1:10,000	Southern Limit
H-10929	1999	1:10,000	Northern Limit

The junctions with surveys H-10918, H-10925, H-10928 and H-10929 are complete and "Joins" notes have been added to the smooth sheet where applicable. A few soundings from the junction surveys have been transferred to the present survey to delineate the bottom configuration within their common areas.

M. COMPARISON WITH PRIOR SURVEYS

Survey	Year	Scale	Datum
H-2741	1906	1:40,000	Valdez
H-3553	1913	1:20,000	Valdez
H-5431	1933	1:20,000	Valdez

The legibility of the prior survey digital image files with the exception of the file for survey H-2741 is considered acceptable and was adequately registered to the present survey smooth sheet. The registration was accomplished by matching common identifiable geographic points between the present survey and the prior survey smooth sheets. The digital image file for survey H-2741 was found to be of poor quality and the scanned features were not legible.

Prior surveys H-3553, H-5431 and H-2741 cover the whole area of the survey including Gibbon Anchorage. The soundings from the current survey are generally shallower by about 1 to 5 fathoms. No significant discrepancies were noted during survey comparison. The depth differences may be attributed to improved positioning and sounding methods employed during this recent survey as well as the effect of earthquake activities in the region.

A more thorough coverage of the survey area utilizing the shallow water multibeam (SWMB) system supplemented by single beam echo sounding system has provided a better portrayal of the rough configuration of the bottom particularly in the vicinity of Gibbon Anchorage.

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 difference in data acquisition methods, no reasonable adjustment value for prior soundings could be ascertained.

Survey H-10927 is adequate to supersede the prior surveys within the area of common coverage.

N. ITEM INVESTIGATIONS

AWOIS item 52432 was investigated during this survey. The disposition of this feature is adequately addressed in section M of the hydrographer's report.

O. COMPARISON WITH CHART

Survey H-10927 was compared with the following charts.

Chart	Edition	Date	Scale	Datum
16701	17th	July 25, 1998	1:81,436	NAD 83

a. Hydrography

Charted hydrography originates with the previously discussed prior surveys and adequately addressed in sections L and M of the hydrographer's report, 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 charted 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. Features from survey H-10927 have been generalize on charts 16701 and 16709 along the high water line where applicable.

Charted shoreline changes were noted during this survey. A few charted rocks were identified in the field as part of the reefs and high point or extension of the newly located ledges.

The charted caution to mariners transiting the waters adjacent to the 10-fathom curve around Montague and Green Islands should be retained until such time when the entire area is adequately surveyed and the latest information applied to the current editions of chart 16701.

Survey H-10927 is adequate to supersede charted hydrography within the common area.

b. Dangers to navigation

Thirty-five (35) dangers to navigation (DTON) were found during this survey and reported to the USCG, NIMA, N/CS261 and N/CS3 on December 3, 1999. No additional dangers were identified during office processing. Copy of report is attached.

P. ADEQUACY OF SURVEY

The hydrography contained on survey H-10927 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, the Field Procedures Manual, April 1998 Edition, and the Specifications and Deliverables 1999.

Q. AIDS TO NAVIGATION

There are no aids to navigation located within the survey area.

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

R. STATISTICS

Statistics are adequately itemized in the hydrographer's report.

S. MISCELLANEOUS

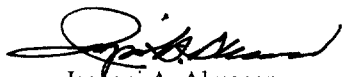
Miscellaneous information is adequately discussed in the hydrographer's report.

T. RECOMMENDATIONS

Survey H-10927 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.



Isagani A. Almacen
Cartographer

APPROVAL SHEET
H-10927

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.

for Howard T. Blodat Date: 3/27/01
Dennis Hill
Supervisory Cartographer
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: 3-28-01
James C. Gardner
Captain, NOAA
Chief, Pacific Hydrographic Branch

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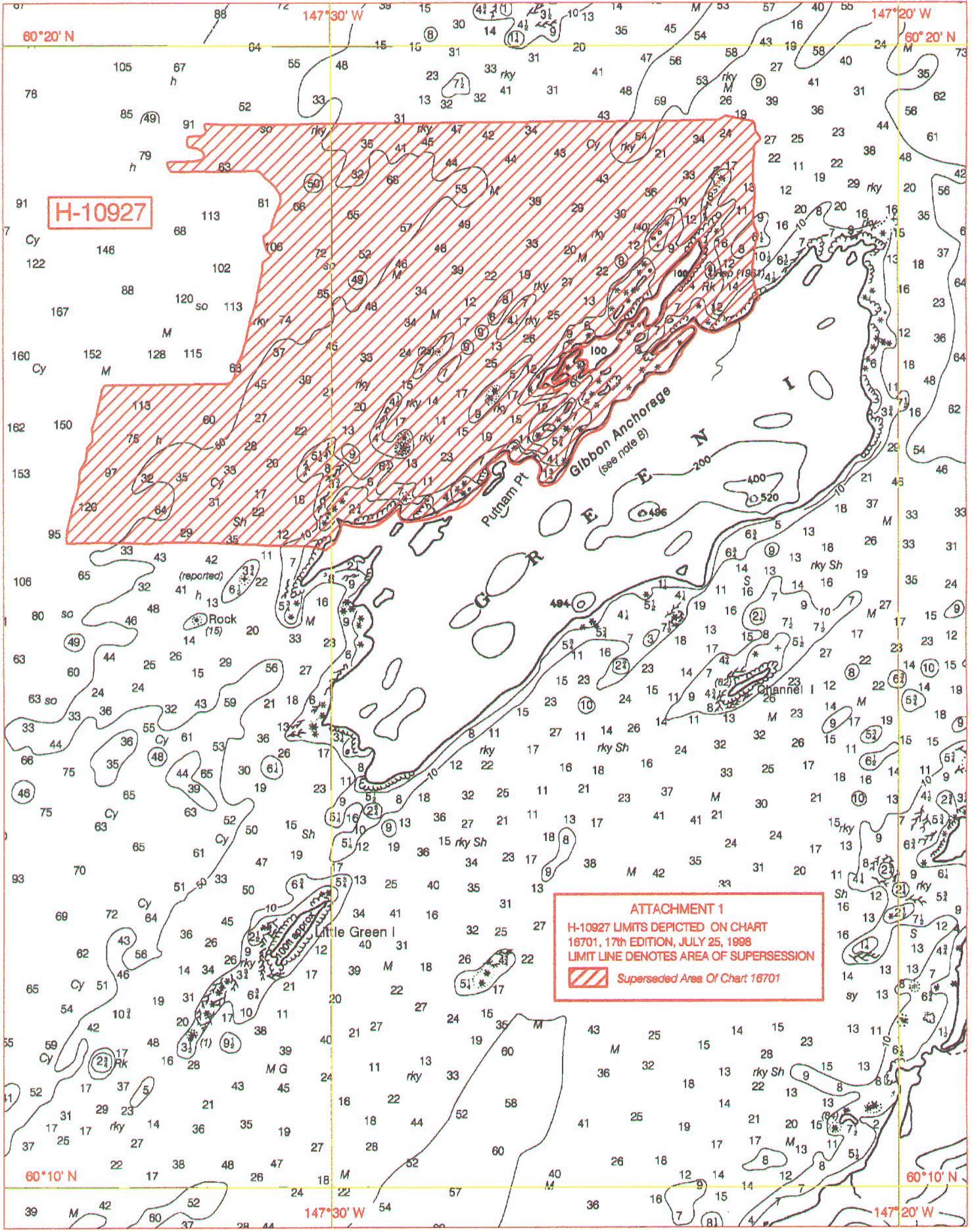
Final Approval

Approved:

Samuel P. De Bow, Jr. Date: May 8, 2001
Samuel P. De Bow, Jr.
Captain, NOAA
Chief, Hydrographic Surveys Division


H-10927
147°30' W
147°20' W
60°20' N
60°10' N
Gibbon Anchorage
(see note B)
Putnam Pt
Rock
(15)
(reported)
Channel I
Little Green I
100m approx
ATTACHMENT 1
H-10927 LIMITS DEPICTED ON CHART
16701, 17th EDITION, JULY 25, 1998
LIMIT LINE DENOTES AREA OF SUPERSESSION
Superseded Area Of Chart 16701

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-10927

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
16701	1/31/01	[signature]	Full ~~Part~~ ~~Before~~ After Marine Center Approval Signed Via Full application of
			Drawing No. soundings & 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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			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.

SUPERSEDES C&GS FORM 8352 WHICH MAY BE USED.