H10922

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-10-17-99

Registry No. H-10922

LOCALITY

State Alaska

General Locality Southwest Prince William Sound

Sublocality South Portion of Green Island

1999

CHIEF OF PARTY

Commander D.R. Herlihy, NOAA

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DATE MAY 18 2001

NOAA FORM 77-28 (11-72)

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

REGISTER NO.

HYDROGRAPHIC TITLE SHEET

H-10922

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-10-17-99

State Alaska

General locality Southwest Prince William Sound

Locality Southern Portion of Green Island and Vicinity

Scale 1:10,000 Date of survey August 13 to Sept. 28, ~~2000~~ 1999

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 CDR D.R. Herlihy, NOAA

Surveyed by Rainier Personnel

Soundings taken by echo sounder, ~~XXXXXXX, XXX~~ DSF 6000N, Knudsen 320M, Reson 8101 MB

Graphic record scaled by Rainier Personnel

Graphic record checked by Rainier Personnel

Verification by: ~~Xxxxxxxxx~~ B.A. Olmstead Automated plot by HP-650C

Evaluation by: ~~Xxxxxxxxxx~~ B.A. Olmstead

Soundings in fathoms ~~XXX~~ at ~~MKW~~ MLLW and tenths

REMARKS: All times are UTC, revisions and marginal notes in black were generated during office processing. All separates are filed with the hydrographic data, as a result page numbering may be interrupted or non-sequential. All depths listed in this report are referenced to meam lower low water unless otherwise noted.

Smooth Sheet Parameters:

UTM (Zone 6) Central Meridian 147/00/00W, Scaling Factor 0.9996

AWOIS/SURF 5/4/01 MCR

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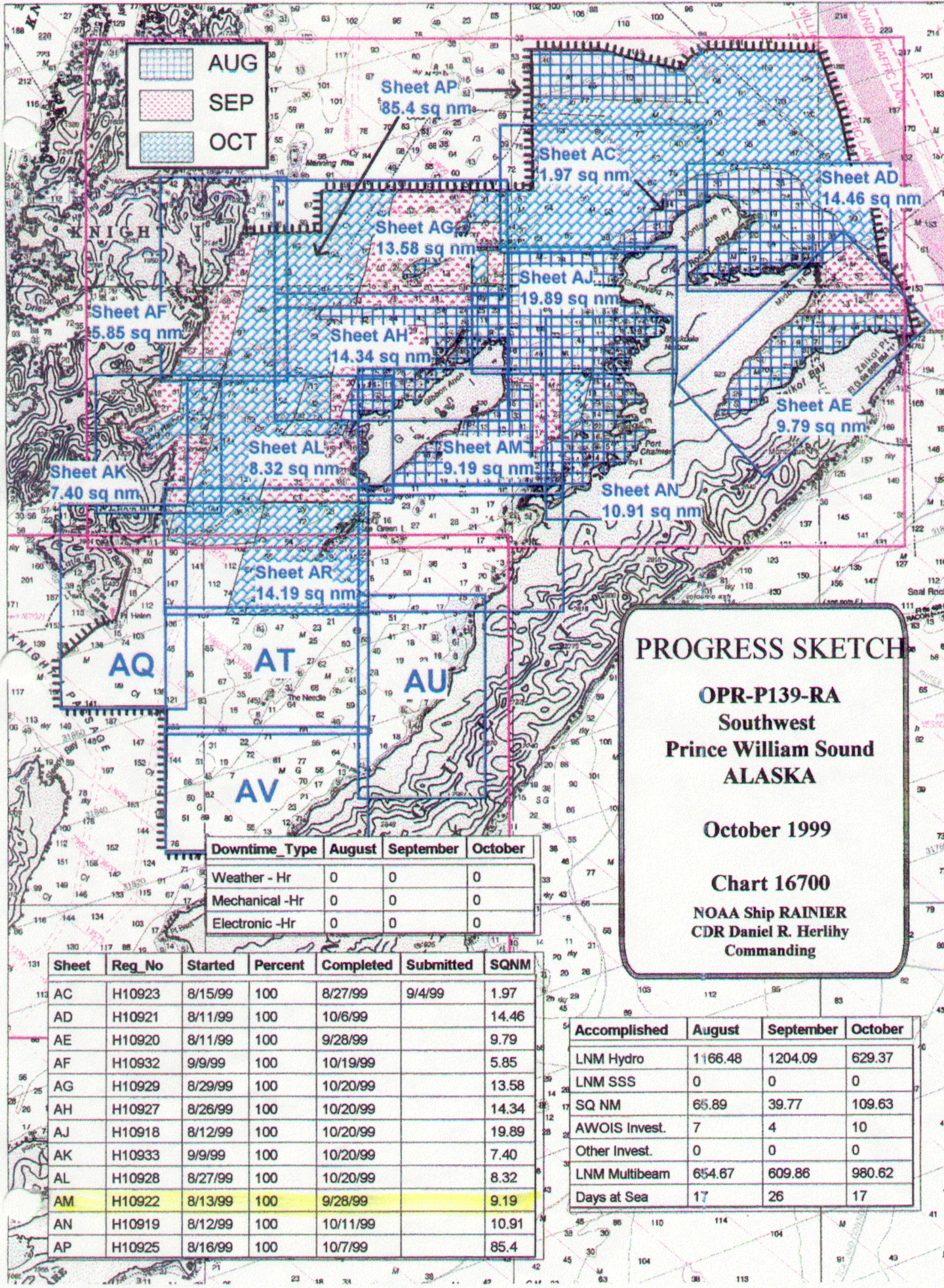


PROGRESS SKETCH

OPR-P139-RA
Southwest
Prince William Sound
ALASKA

October 1999

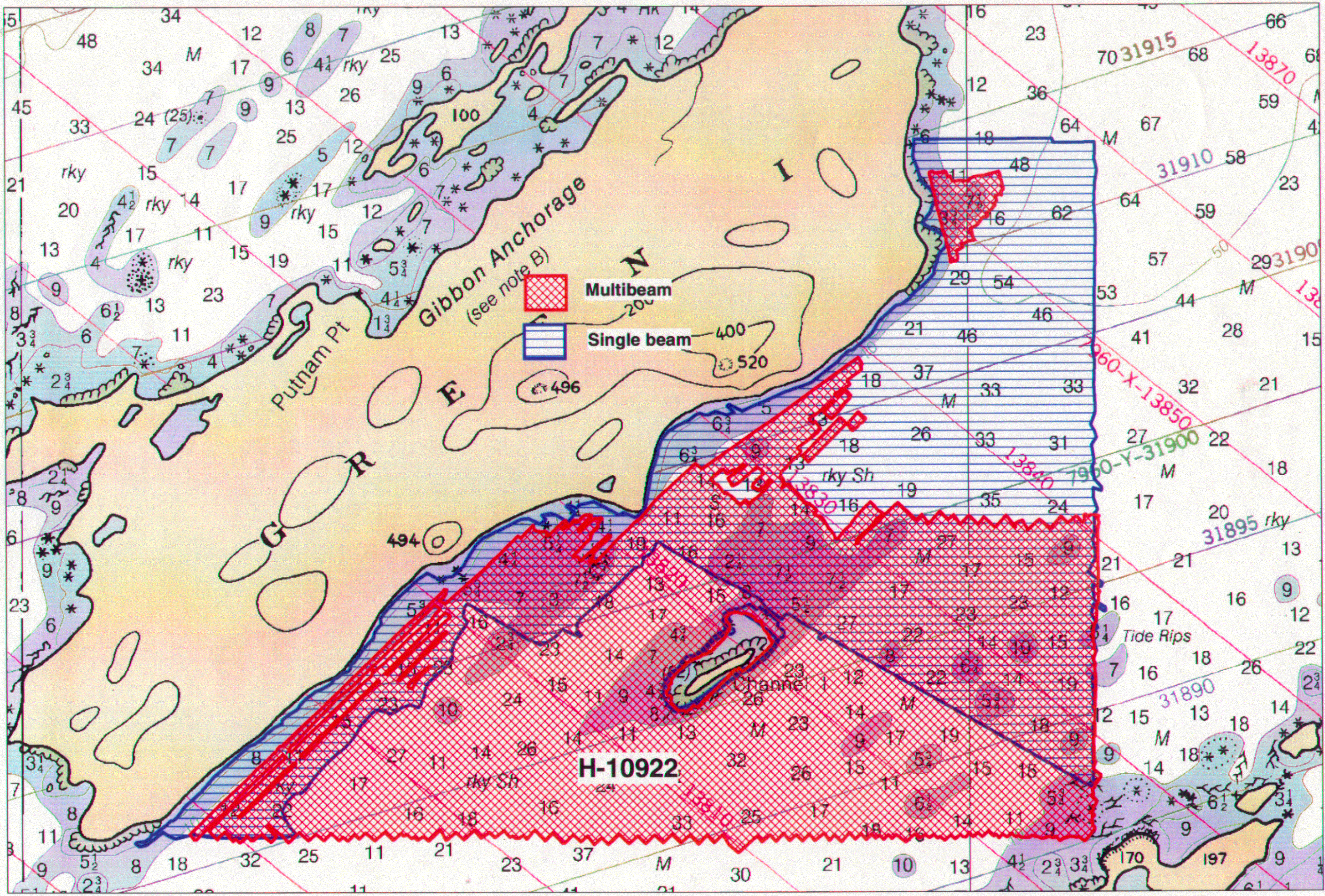
Chart 16700

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



Gibbon Anchorage
(see note B)
Multibeam
Single beam
Putnam Pt
GREN I
H-10922
Tide Rips
Channel

Descriptive Report to Accompany Hydrographic Survey H10922

Field Number RA-10-17-99
Scale 1: 10,000
August - September 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-99, dated July 20, 1999, and the Draft Standing Project Instructions dated April 6, 1999. Survey H10922 corresponds to sheet AM 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, 16701, and 16709. 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 Evl Rpt., Section B.

The survey area is located along the southern portion of Green Island in Prince William Sound, Alaska, and covers approximately 9.3 square nautical miles. The survey limits are depicted below in Figure 1 on a detail of Chart 16701. The survey's northern limit is latitude 60° 17'10"N and the southern limit is latitude 60°13'33"N. The survey's eastern limit is longitude 147°18'44"W and the western limit is Green Island shoreline. Data acquisition was conducted from August 13 to September 28, 1999 (DN 225 to 271).

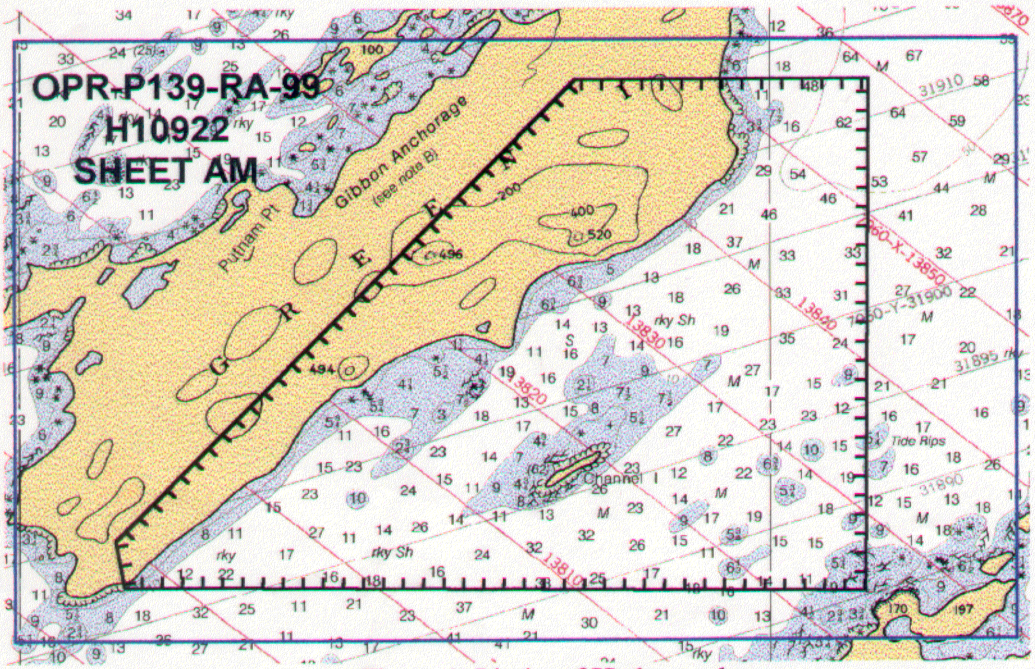


Figure 1: Limits of Hydrography

C. SURVEY VESSELS ✓

Data were acquired by RAINIER's 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 exclusively for acquisition of shallow-water multibeam (SWMB) data and sound velocity profiles. Vessels 2122 and 2124 were used for acquisition of vertical beam echosounder (VBES) data, shoreline verification and taking detached positions. Vessel 2125 was used to acquire bottom samples. See 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 observed tides were saved in MapInfo format.

Shallow water multibeam (SWMB) echosounder 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, all soundings beyond a maximum angle of 60° off nadir were rejected in an attempt to reduce the noise and refraction errors observed in these outer beams. Concur

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 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. Preliminary 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 H10922 is defined as sheet 10 in HPS. The CARIS workfile for the 3m x 3m DTM is defined as "h10922_3m"; the CARIS workfile for the exported soundings at 1.5mm at the scale of the survey is defined as "h10922_15m"; and the CARIS workfile used for quality control report is defined as "h10922_qc". The project name is identified as "P139_SheetAM" in HDCS.

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

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. 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 Vertical Beam Echo Sounder (VN 2122, 2124, and 2125) ✓

The vertical beam echo sounders (VBES) utilized for this survey were the Raytheon DSF-6000N (VN 2122, 2124, 2125) and Knudsen 320M (VN2121, 2123, 2126), which are dual frequency (100 kHz, 24 kHz), digital recording singlebeam fathometers with analog paper records.* Soundings were acquired in meters for both frequencies, and high frequency was utilized as the primary frequency. One hundred meter line spacing was used for initial VBES acquisition and then reduced to 50 meter spacing in areas inside the 50-meter depth curve with the exception being the areas covered by SWMB. VBES developments were used to determine least depths in areas that were considered unsafe for the SWMB vessels. 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 2126) ✓

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. Within these areas nearly 100% shallow water multibeam coverage was attained. See Statement in Section F, item 1, regarding unsafe areas

* Filed with the hydrographic records.

G. CORRECTIONS TO ECHO SOUNDINGS ✓

Water Level Correctors ✓

Soundings were reduced to Mean Lower-Low Water (MLLW) using unverified tide 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. All tide correctors were fully adjusted for the MapInfo tidal zoning scheme supplied with the project files.

A listing of HPS tide zone information used for H10922 as provided in the Project Instructions are provided 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	October 14, 1999
Port Chalmers **	945-4511	30-day	10 August 1999	October 19, 1999
Snug Harbor	945-4662	30-day	11 August 1999	October 19, 1999
Montague Island	945-4616	30-day	31 August 1999	October 19, 1999

** Used For H-10922

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 was 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. Concur Approved Tide Note dated May 15, 2000 is attached.

Sound Velocity Correctors ✓

The velocity of sound through water was determined by a minimum of one cast every four hours of SWMB acquisition, and one cast every week for VBES acquisition, in accordance with the Draft Standing Project Instructions.

The sound velocity casts were acquired with SBE SEACAT Profilers (S/N 2543, 219, and 2044). 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. Cast information for VBES is listed in the Survey Information Summary and captured

* Filed with the hydrographic data

graphically on a chartlet included in Appendix I.* Cast information (list and graphic) for SWMB is included in Appendix I.*

Settlement and Squat and Static Draft Correctors ✓

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

Vessel No.	Date of Static Draft and Transducer Offset Measurements	Method of Settlement and Squat Measurement	Date of Settlement and Squat Measurement	Location of Settlement and Squat Measurement
2121	March 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 2123 and 2126, 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 Project Related Data for OPR-P139-RA-99, and the VCF's themselves are included with the digital HDCS data.

* Filed with the hydrographic data.

H. HYDROGRAPHIC POSITION CONTROL See Eval Rpt., Section H and 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 Project Related Data for OPR-P139-RA-99.

I. SHORELINE See Eval Report, Section J

Method of Shoreline Verification

N/NGS3 supplied photogrammetric shoreline in MapInfo format for T-12709, T-12710, T-12712, T-12713, and T-12714 for use as source shoreline. The T-sheet shoreline was geographically referenced, digitized in MapInfo, and imported into Hypack for field verification. In addition, features shown on the current edition of chart 16701 that differed from the T-sheet shoreline 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 30-200 meters offshore of apparent low tide. Water depths along this limit of safe navigation are generally 2-3 fathoms 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. These areas pertain to the foul limit lines which the hydrographer has delimited during shoreline verification and portrayed on the smooth sheet.
Detached positions taken during shoreline verification were recorded within HYPACK and on DP forms,* and processed in HPS. These indicate revisions and verification of features 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. Concur

Source Shoreline Changes and New Features

Minimal changes and new features to the source shoreline were found and are depicted on the final DP plot. The changes are generally extents of foul areas and ledges. T-sheet rocks were often identified as high points or extents of ledges. New features include four rocks and two reefs. One of the two reefs (Pos. #40177 and 40178) is an extension of a T-sheet rock. Concur A rock, covEr has been shown on the smooth sheet to delimit the ends of this feature.
A T-sheet rock located at 60°13'41.29" N, 147°18'46.07" W was verified by survey H10919. Concur This rock has been transferred in color to the smooth sheet.

Recommendations

The Hydrographer recommends that the shoreline features as depicted on the DP and BS plot supersede and complement shoreline information compiled on the T-sheets as noted. These revisions are recorded in the MapInfo digital files named "H10922_shoreline"and "H10922_shoreline_updates". Concur
This data was analyzed during office processing and shown on the smooth sheet as warranted.

* Filed with the hydrographic data.

Charted Features ✓

One ~~charted~~ rock (Pos. #40172) differed slightly from the T-sheet shoreline and was verified seaward of its charted position. Concur with clarification. The rock, cov 25ft, is a new feature. The charted rock has been slightly displayed from an original shoreline map rock. Chart new rock ft.

Recommendations ✓

The charted shoreline should be revised using the T-sheet shoreline and fieldwork notes as recorded in the MapInfo digital files named "H10922_shoreline"and "H10922_shoreline_updates", and as graphically portrayed on the smooth sheet.

J. CROSSLINES ✓

VBES crosslines totaled 7.2 nautical miles, comprising 7% of mainscheme hydrography. Crosslines agreed within 1 meter of mainscheme hydrography. Concur

SWMB crosslines totaled 10 nautical miles, comprising 5% of SWMB hydrography. The Quality Control Report (CARIS HIPS) for the checkline file averaged 99.01%, with a depth tolerance of 0.023. See Appendix E for the detailed report.

K. JUNCTIONS See Eval Rpt, Section L.

The following contemporary surveys junction with H10922:

Registry #	Scale	Date	Junction side
H10918 ✓	1:10,000	1999	North
H10919 ✓	1:10,000	1999	East
H10928 ✓	1:10,000	1999	Southwest Corner

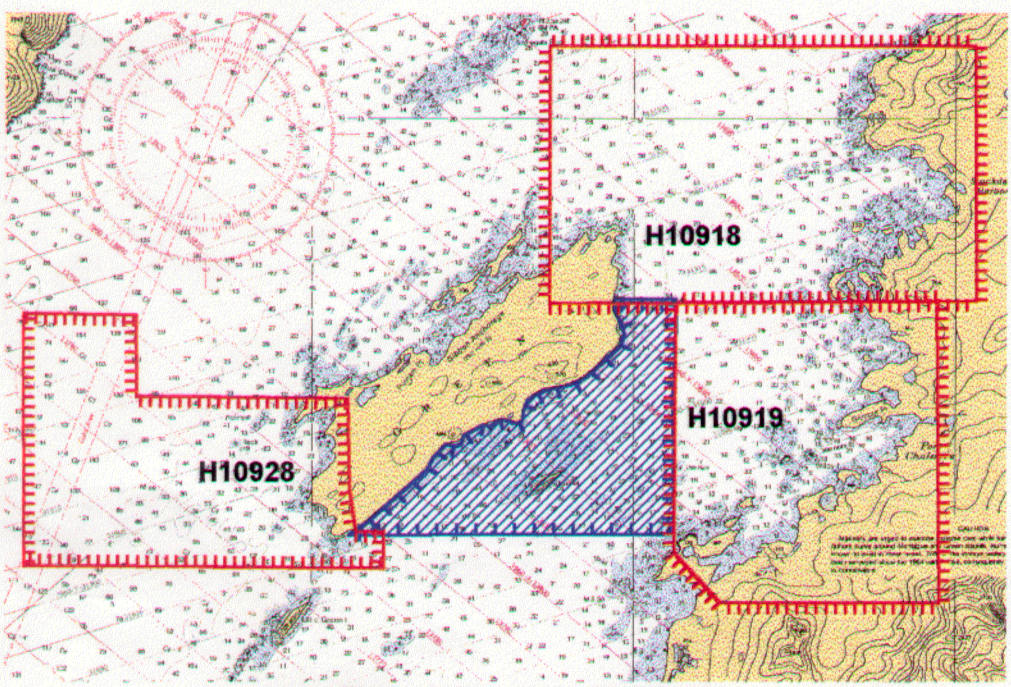


Figure 2: Junctions with H10922

Soundings from H10919 and H10928 agreed well with H10922, generally within 1-2 meters in depth. At the time of this report, the final processing for H10918 was not complete and a comparison was not made. The discussion of the comparison between H10922 and H10918 will be submitted in the Descriptive Report for H10918. Final comparisons will be made at the Pacific Hydrographic Branch (PHB) after application of smooth tides. Concur

L. COMPARISON WITH PRIOR SURVEYS See Evel Rpt., Section M.

The following prior surveys share common area with survey H10922:

Registry #	Scale	Date	Area covered
H5427	1:20,000	1933	Entire Survey
H3353	1:20,000	1911	Western

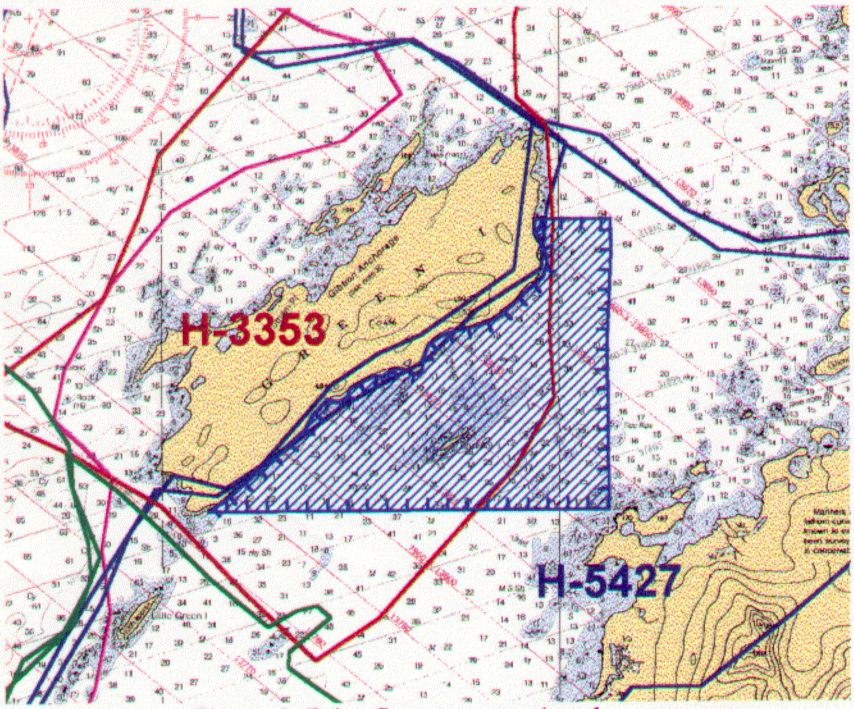


Figure 3: Prior Surveys covering the survey area

Prior survey H5427 covers the entire area of present survey H10922. The prior survey agrees well with the present survey in deeper areas with gentle slope. In these areas, the present survey is shoaler than the prior survey, generally within one fathom. In shoaler and near shore areas, the comparison between the present and prior survey is poor. Generally the present survey is 2-5 fathoms shoaler than the prior survey. The shoreline from H5427 compares well with current survey. Concur with clarification

Prior survey H3353 is superceded by H5427 in the area southeast of Green Island. However, a few soundings from H3353 fall within the survey area. The present soundings are generally 10-30 feet shoaler than the prior soundings. H-3353 has been superseded within the common area of H-5427 and the present survey.

Differences between the current and prior surveys can most likely be attributed to improvements in positioning methods, advances in technology and equipment, and as a result of the 1964 earthquake. Final comparisons will be made at PHB after application of smooth tides. Concur

M. ITEM INVESTIGATIONS ✓

There were no Automated Wreck and Obstruction Information System (AWOIS) items within the survey area. Concur

N. COMPARISON WITH THE CHART See Evel Rpt., Section O.

This survey was compared with the following charts:

Chart	Scale	Edition Number	Date	Datum
16700	1:200,000	26th	September 19, 1998	NAD 83
16701	1: 81,436	17th	July 25, 1998	NAD 83
16709	1: 80,000	21st	June 29, 1996	NAD 83

} Largest Scale Full Coverage

This survey covers a small portion of the western edge of chart 16709. Of those soundings, the current survey was consistently 2-3 fathoms shoaler. Current survey depths are also generally 2-3 fathoms shoaler than depths on chart 16701, and 1-3 fathoms shoaler than depths on chart 16700. Differences from these general trends are noted below and likely due to the extreme uplift of this region during the 1964 earthquake. Concur

A 3.~~7~~-fathom sounding located at 60°14'18.67" N ✓ 147°23'57.19" W ✓ (Pos. #235401) near a charted (16701) 11-fathom sounding and between a charted (16700) 15-fathom sounding and a 10-fathom depth curve. This is also near 2-fathom and 6 ¼-fathom soundings that were submitted as Dangers to Navigation. Concur

A 7.7-fathom sounding located at 60°14'49.11" N ✓ 147°23'19.7" W ✓ (Pos. #218569) is the shoalest sounding in the area of a charted (16700) 18-fathom sounding and between a charted (16701) 13 and 17-fathom sounding. This is also located midway between 4 ½ -fathom and 7 ½ -fathom soundings that were submitted as Dangers to Navigation. Concur

A 9.9-fathom sounding located at 60°15'43.64" N, ✓ 147°21'11.27" W ✓ (Pos. #251275) is the shoalest sounding in the area near a charted (16700 and 16701) 18-fathom sounding. Concur

A 10.6-fathom sounding located at 60°14'38.02" N, ✓ 147°20'13.1" W ✓ (Pos. #95115) is the shoalest sounding near charted (16700 and 16701) 22-fathom sounding. This sounding is located near several shoaler soundings that were submitted as Dangers to Navigation. Concur

A 12.1-fathom sounding located at 60°14'07.93" N ✓ 147°19'17.66" W ✓ (Pos. #125142) near a charted (16701 and 16709) 18-fathom sounding.

A 26-fathom sounding located at 60°17'00.86" N ✓ 147°19'28.23" W ✓ (Pos. #40324) near a charted (16701 and 16709) 48 fathom sounding.

Dangers to Navigation ✓

Thirty-two dangers to navigation were discovered during survey H10922 and reported to the Seventeenth Coast Guard District. A copy of the Danger to Navigation report is included in ~~Appendix A~~ this report.

(1) ✓ A rock that uncovers was discovered at 60°14'58.~~73~~ 81" N, ✓ 147°22'~~24.77~~ 25.13" W ✓ (Pos. # 40187). This danger is not charted but lies near a 2 ¼-fathom sounding on Chart 16700 and 16701. Chart ✓

A rock awash (9) discovered at 60°15'04.94" N, 147°24'43.60" W (Pos. # 40176) is not charted. This danger lies near a 4 ¼-fathom sounding on Chart 16700 and between a 4 ¼ and 5 ½-fathom sounding on Chart 16701. Concur Chart it.

A 0.5-fathom shoal (submitted as ½-fathom shoal) was discovered at 60°14'30.6" N, 147°24'55.2" W (Pos. #156640). Chart 16700 and 16701 show a 2 ¾-fathom sounding near this danger. Chart ½ Fm Sndg

A 0.8-fathom shoal (submitted as ¾-fathom shoal) was discovered at 60°14'16.8" N, 147°19'44.3" W (Pos. #258014). Chart 16701 and 16709 show a 5 ¾-fathom sounding near this danger. Chart 16700 shows a 5 ¼-fathom sounding near this danger. Chart ¾ Fm Sndg

A 0.8-fathom shoal (submitted as ¾-fathom shoal) was discovered at 60°15'09.6" N, 147°23'45.4" W (Pos. #45980). Chart 16701 shows a 4 ¼-fathom sounding near this danger. Chart ¾ Fm Sndg.

A 1.4-fathom shoal (submitted as 1 ¼-fathom shoal) was discovered at 60°14'53.0" N, 147°24'50.8" W (Pos. #181400). Chart 16701 shows this danger lying between a 4 ¼, 5 ¾, and 7-fathom sounding and Chart 16700 shows a 4 ¼-fathom sounding. Chart 1 ¼ Fm Sndg.

A 1.6-fathom shoal (submitted as 1 ½-fathom shoal) was discovered at 60°14'45.9" N, 147°24'27.7" W (Pos. #242210). Chart 16701 shows a 3-fathom sounding near this position. Chart 1½ Fm Sndg.

A 1.8-fathom shoal (submitted as 1 ¾-fathom shoal) was discovered at 60°14'27.5" N, 147°19'59.0" W (Pos. #105247). Chart 16701 shows a 6 ¾-fathom sounding near this position. Chart 1 ¾ Fm Sndg

A 2.1-fathom shoal (submitted as 2-fathom shoal) was discovered at 60°14'12.8" N, 147°23'49.4" W (Pos. #200379). Chart 16701 shows an 11 and 9-fathom sounding near this position. Chart 2 Fm Sndg

A 2.5-fathom shoal (submitted as 2 ½-fathom shoal) was discovered at 60°14'02.8" N, 147°21'05.5" W (Pos. #255413). Chart 16701 shows a 9-fathom sounding and Chart 16700 shows an 18-fathom sounding near this position. Chart 2½ Fm Sndg.

A 2.4-fathom shoal (submitted as 2 ½-fathom shoal) was discovered at 60°14'35.9" N, 147°23'11.1" W (Pos. #239931). Chart 16701 shows a 4 ¾-fathom sounding near this position. Chart 2 ¼ Fm Sndg

A 2.8-fathom shoal (submitted as 2 ¾-fathom shoal) was discovered at 60°13'44.7" N, 147°20'35.9" W (Pos. #255705). Chart 16701 shows a 6 ½-fathom sounding near this position. Chart 2 ¾ Fm Sndg

A 2.7-fathom shoal (submitted as 2 ¾-fathom shoal) was discovered at 60°13'47.3" N, 147°19'07.3" W (Pos. #140943). Chart 16701 shows a 5 ¾-fathom sounding near this position. Do not chart Chart this area based on the present survey which portrays shoaler data to the east of 2.7 Fm sounding.

A 2.7-fathom shoal (submitted as 2 ¾-fathom shoal) was discovered at 60°15'04.5" N, 147°21'57.7" W (Pos. #199377). Chart 16701 shows a 9, 7 ½., and 7-fathom sounding near this position. Do not chart Chart this area based on the present survey which portrays shoaler data to west of 2.7 Fm Sounding.

A 2.8-fathom shoal (submitted as 2 ¾-fathom shoal) was discovered at 60°14'47.8" N, 147°21'46.9" W (Pos. #245953). Chart 16701 shows a 5 ½ -fathom sounding near this position. Do not chart Chart this area based on the present survey which portrays shoaler data to west and South of 2.8 Fm Sounding.

A 3.0-fathom shoal was discovered at 60°13'56.3" N, 147°20'26.3" W (Pos. #115649). Chart 16701 shows a 5 ¾-fathom sounding near this position. Chart 3 Fm Sndg.

A 3.4-fathom shoal (submitted as 3 ¼-fathom shoal) was discovered at 60°14'36.9" N, 147°18'44.2" W (Pos. #120982). Chart 16701 shows a 5 ¼-fathom sounding near this position. Chart 3 ¼ Fm Sndg.

A 3.9-fathom shoal (submitted as 3 ¾-fathom shoal) was discovered at 60°14'41.3" N, 147°25'41.1" W (Pos. #144185). Chart 16701 shows an 11-fathom sounding near this position. Chart 3 ¾ Fm Sndg.

A 3.8-fathom shoal (submitted as 3 ¾-fathom shoal) was discovered at 60°14'15.6" N, 147°25'27.2" W (Pos. #156440). Chart 16701 shows a 10-fathom sounding near this position. Chart 3 ¾ Fm Sndg.

A 3.8-fathom shoal (submitted as 3 ¾-fathom shoal) was discovered at 60°14'14.9" N, 147°20'53.0" W (Pos. #255371). Chart 16701 shows a 10-fathom depth curve near this position. Chart 3 ¾ Fm Sndg

A 3.8-fathom shoal (submitted as 3 ¾-fathom shoal) was discovered at 60°14'51.7" N, 147°21'26.1" W (Pos. #188068). Chart 16701 shows a 7 ½-fathom sounding near this position. Chart 3 ½ Fm Sndg.

A 4.5-fathom shoal (submitted as 4 ½-fathom shoal) was discovered at 60°14'29.3" N, 147°20'41.2" W (Pos. #92613). Chart 16700 and 16701 show a 10-fathom depth curve and a 22-fathom sounding near this position. Chart 4 ½ Fm Sndg.

A 4.5-fathom shoal (submitted as 4 ½-fathom shoal) was discovered at 60°14'34.5" N, 147°19'53.4" W (Pos. #103577). Chart 16701 shows a 14-fathom sounding near this position. Chart 16700 shows a 17-fathom and 22-fathom sounding near this position. Chart 4 ½ Fm Sndg.

A 4.5-fathom shoal (submitted as 4 ½-fathom shoal) was discovered at 60°16'54.6" N, 147°19'51.5" W (Pos. #211066). Chart 16701 shows a 7 ½-fathom sounding near this position. Chart 4 ½ Fm Sndg

A 4.5-fathom shoal (submitted as 4 ½-fathom shoal) was discovered at 60°14'37.1" N, 147°23'31.1" W (Pos. #235890). Chart 16701 shows a 14, 17, and 18-fathom sounding near this position. Chart 16700 shows an 18-fathom sounding near this position. Chart 4 ½ Fm Sndg.

A 4.9-fathom shoal (submitted as 4 ¾-fathom shoal) was discovered at 60°15'07.1" N, 147°20'53.5" W (Pos. #213524). Chart 16701 shows a 7-fathom sounding near this position. Chart 4 ¾ Fm Sndg.

A 5.5-fathom shoal (submitted as 5 ½-fathom shoal) was discovered at 60°15'15.7" N, 147°23'00.9" W (Pos. #222190). Chart 16701 shows an 11, 16, and 14-fathom sounding near this position. Chart 5 ½ Fm Sndg.

A 6.3-fathom shoal (submitted as 6 ¼-fathom shoal) was discovered at 60°14'26.1" N, 147°24'15.9" W (Pos. #237647). Chart 16701 shows a 14, 23, and 15-fathom sounding near this position. Chart 16700 shows a 15-fathom sounding near this position. Chart 6 Fm Sndg.

A 7.2-fathom shoal (submitted as 7 ¼-fathom shoal) was discovered at 60°14'29.3" N, 147°19'22.9" W (Pos. #113873). Chart 16701 shows a 10-fathom sounding near this position. Chart 7 Fm Sndg

A 7.5-fathom shoal (submitted as 7 ½-fathom shoal) was discovered at 60°14'54.9" N, 147°23'06.1" W (Pos. #218681). Chart 16701 shows a 13, 15, and 16-fathom sounding near this position. Chart 16700 shows an 11-fathom sounding near this position. Chart 7 ½ Fm Sndg.

A 7.7-fathom shoal (submitted as 7 ¾-fathom shoal) was discovered at 60°15'09.8" N, 147°19'08.6" W (Pos. #99200). Chart 16701 shows a 10-fathom depth curve and a 15-fathom sounding near this position. Chart 7 ½ Fm Sndg.

A 7.7-fathom shoal (submitted as 7 ¾-fathom shoal) was discovered at 60°14'20.3" N, 147°21'15.0" W (Pos. #175173). Chart 16701 shows a 12 and 14-fathom sounding near this position. Chart 7 ½ Fm Sndg.

O. ADEQUACY OF SURVEY See Eval Rpt., Section P.

Survey H10922 is complete and adequate to supersede charted soundings and features in their common areas. Concur

P. AIDS TO NAVIGATION ✓

No aids to navigation were located within the H10922 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 in accordance with the Hydrographic Survey Letter Instructions. Approximate areas of eel grass are delineated on the DP and BS plot as request in the Hydrographic Survey Letter Instructions. No unusual tidal currents or magnetic variations were found during this survey. During the time of acquisition, commercial and charted fishing vessels frequented the area around Channel Island. Concur

S. RECOMMENDATIONS ✓

The Hydrographer recommends retaining "Caution" notes on Chart 16700 and 16701 referencing the area between Montague Island and Green Islands until the area south of H10922 and east of H10940 is surveyed. Concur

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	December 1999	N/CS34

Respectfully Submitted,

Kimberley Sampadian

Kimberley Sampadian
Physical Scientist, NOAA

Approved and Forwarded,

Daniel R. Herlihy

Daniel R. Herlihy
Commander, NOAA
Commanding Officer

Survey Information Summary

Project: OPR-P139-RA-99 **Project Name:** Southwest Prince William Sound

Instructions Dated: 30-Jul-99 **Project Change Info:**

Change #	Dated
n/a	n/a

Sheet Letter: AM **Registry Number:** H10922
Sheet Number: RA-10-17-99

Survey Title: Southern Portion of Green Island and Vicinity

Data Acquisition Dates: **From:** 8-13-99 (225) **To:** 9-28-99 (271)

Vessel Usage Summary

VesNo	MS	Splits	Dev	XL	S/L	DP	BS	SWMB
2121								5
2122	1		2			1		
2123								1
2124	3	3	1	1	2	2		
2125							1	
2126								2

Sound Velocity Cast Information

HPS Table #	Cast DN	Max Depth	Position	Applicable DN
2	224	187.1	60/21/00 147/18/00	223-235
4	243	183.1	60/19/01 147/17/30	236-253
6	254	209.1	60/24/30 147/07/10	254-260
9	266	142	60/16/51 147/17/21	261-267
12	270	329.3	60/11/00 147/41/10	268-274

Plot outside survey limits

Tide Zone Information

Zone #	Time Corr.	Height Corr.
PWS8	-00 hr 06 min	0.95
PWS15	-00 hr 06 min	0.93
PWS16	-00 hr 06 min	0.91

Tide Gauge Information

Tide Gauge #	Gauge Name	Installed	Removed
945-4511	Port Chalmers *	8/10/99	10/20/99
945-4616	Montague Island	8/31/99	10/20/99
945-4662	Snug Harbor	8/11/99	10/20/99
945-4411	Zaikof Point	8/10/99	10/14/99

* Used for H-10922

Statistics Summary

Type	Total	Type	Total	Type	Total
BS	24	MS	103.45	XL	7.22
DP	28	SPLIT	71.11		
S/L	8.0	SWMB	207.21		

Percent X 7%
SQNM 9.19

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

October 29, 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 H10922 in Prince William Sound, Alaska, in August through September 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
16709	1:80,000	21st	29-Jun-96

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	Uncovers	60-14-58.73	147-22-24.77	-0.3
Rock	Awash	60-15-04.94	147-24-43.60	0.0
Shoal	½	60-14-30.57	147-24-55.20	0.9
Shoal	¾	60-14-16.82	147-19-44.26	1.5
Shoal	¾	60-15-09.62	147-23-45.40	1.5
Shoal	1 ¼	60-14-53.04	147-24-50.82	2.6
Shoal	1 ½	60-14-45.89	147-24-27.73	3.0
Shoal	1 ¾	60-14-27.52	147-19-59.03	3.4
Shoal	2	60-14-12.79	147-23-49.37	3.9
Shoal	2 ½	60-14-02.77	147-21-05.53	4.5
Shoal	2 ½	60-14-35.95	147-23-11.11	4.5
Shoal	2 ¾	60-13-44.72	147-20-35.91	5.1
Shoal	2 ¾	60-13-47.34	147-19-07.25	5.1
Shoal	2 ¾	60-15-04.53	147-21-57.69	5.0
Shoal	2 ¾	60-14-47.81	147-21-46.98	5.1
Shoal	3	60-13-56.31	147-20-26.31	5.5
Shoal	3 ¼	60-14-36.91	147-18-44.24	5.9
Shoal	3 ¾	60-14-14.92	147-20-53.04	7.0
Shoal	3 ¾	60-14-15.59	147-25-27.16	7.0
Shoal	3 ¾	60-14-41.28	147-25-41.11	7.0
Shoal	3 ¾	60-14-51.69	147-21-26.10	7.0
Shoal	4 ½	60-14-29.26	147-20-41.19	8.4
Shoal	4 ½	60-14-34.54	147-19-53.39	8.3
Shoal	4 ½	60-16-54.65	147-19-51.53	8.4

Shoal	4 ½	60-14-37.14	147-23-31.05	8.4
Shoal	4 ¾	60-15-07.07	147-20-53.47	8.7
Shoal	5 ½	60-15-15.76	147-23-00.88	10.1
Shoal	6 ¼	60-14-26.14	147-24-15.89	11.6
Shoal	7 ¼	60-14-29.32	147-19-22.96	13.3
Shoal	7 ½	60-14-54.91	147-23-06.14	13.8
Shoal	7 ¾	60-15-03.82	147-19-08.65	14.2
Shoal	7 ¾	60-14-20.28	147-21-15.02	14.2

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-17-99. More information on current RAINIER survey projects may be obtained by e-mail; contact the Field Operations Officer at FOO.RAINIER@NOAA.GOV.

Sincerely,

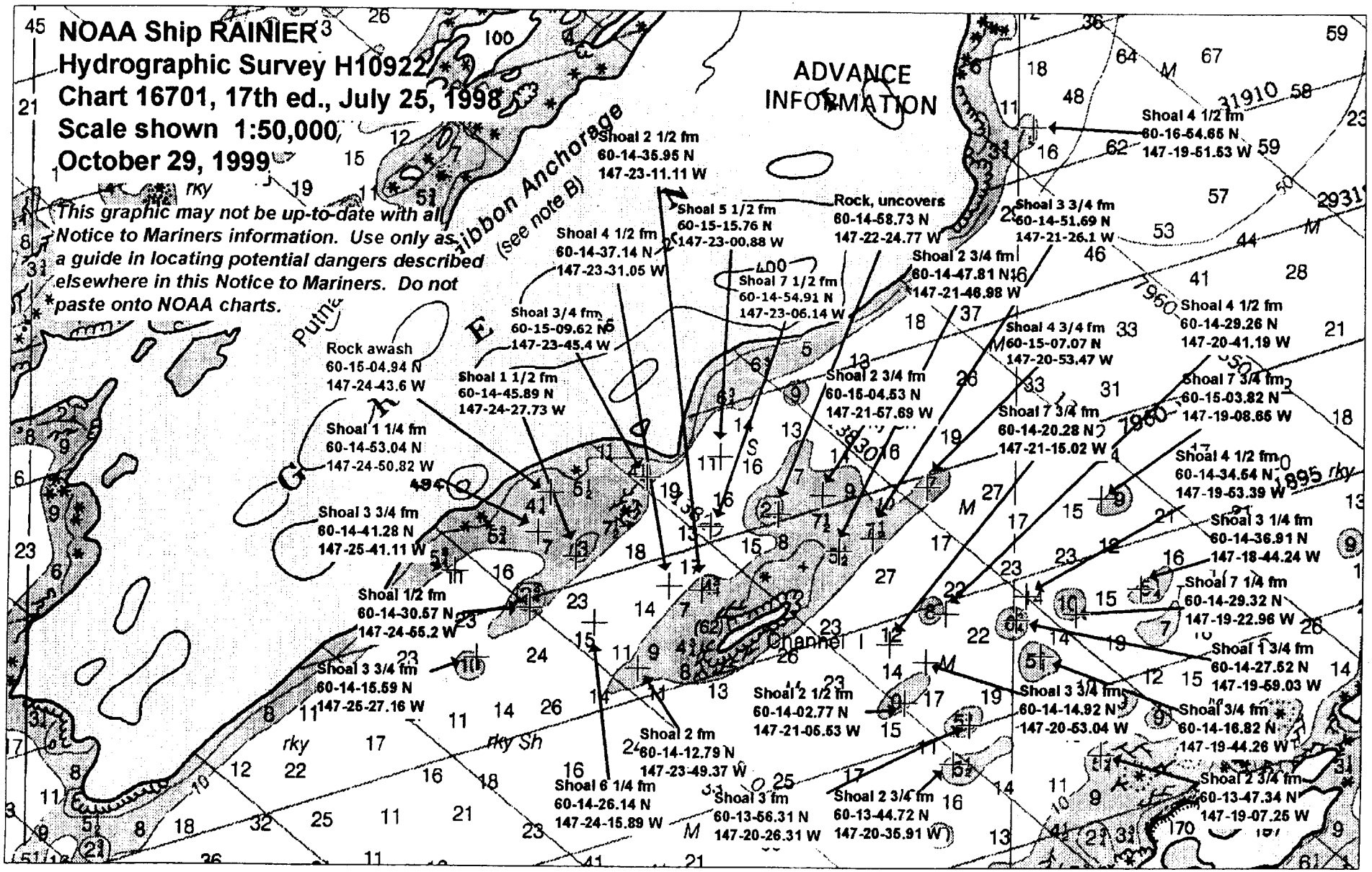
Daniel R. Herlihy

Daniel R. Herlihy
Commander, NOAA
Commanding Officer

Attachment

cc: NIMA
N/CS261
PMC
N/CS34

ADVANCE
INFORMATION


NOAA Ship RAINIER
Hydrographic Survey H10922
Chart 16701, 17th ed., July 25, 1998
Scale shown 1:50,000
October 29, 1999
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.
ADVANCE INFORMATION
Ribbon Anchorage (see note B)
Channel
Rock awash
60-15-04.94 N
147-24-43.6 W
Shoal 1 1/4 fm
60-14-53.04 N
147-24-50.82 W
Shoal 3 3/4 fm
60-14-41.28 N
147-25-41.11 W
Shoal 1/2 fm
60-14-30.57 N
147-24-55.2 W
Shoal 3 3/4 fm
60-14-15.59 N
147-25-27.16 W
Shoal 1 1/2 fm
60-14-45.89 N
147-24-27.73 W
Shoal 3/4 fm
60-15-09.62 N
147-23-45.4 W
Shoal 2 1/2 fm
60-14-35.95 N
147-23-11.11 W
Shoal 4 1/2 fm
60-14-37.14 N
147-23-31.05 W
Shoal 5 1/2 fm
60-15-15.76 N
147-23-00.88 W
Shoal 7 1/2 fm
60-14-54.91 N
147-23-06.14 W
Shoal 2 fm
60-14-12.79 N
147-23-49.37 W
Shoal 6 1/4 fm
60-14-26.14 N
147-24-15.89 W
Shoal 3 fm
60-13-56.31 N
147-20-26.31 W
Shoal 2 1/2 fm
60-14-02.77 N
147-21-06.53 W
Shoal 2 3/4 fm
60-13-44.72 N
147-20-35.91 W
Rock, uncovers
60-14-58.73 N
147-22-24.77 W
Shoal 2 3/4 fm
60-14-47.81 N
147-21-46.98 W
Shoal 2 3/4 fm
60-15-04.53 N
147-21-57.69 W
Shoal 4 3/4 fm
60-15-07.07 N
147-20-53.47 W
Shoal 7 3/4 fm
60-14-20.28 N
147-21-15.02 W
Shoal 3 3/4 fm
60-14-51.69 N
147-21-26.1 W
Shoal 4 1/2 fm
60-16-54.65 N
147-19-51.53 W
Shoal 4 1/2 fm
60-14-29.26 N
147-20-41.19 W
Shoal 7 3/4 fm
60-15-03.82 N
147-19-08.65 W
Shoal 4 1/2 fm
60-14-34.54 N
147-19-53.39 W
Shoal 3 1/4 fm
60-14-36.91 N
147-18-44.24 W
Shoal 7 1/4 fm
60-14-29.32 N
147-19-22.96 W
Shoal 1 3/4 fm
60-14-27.52 N
147-19-59.03 W
Shoal 3 3/4 fm
60-14-14.92 N
147-20-53.04 W
Shoal 3/4 fm
60-14-16.82 N
147-19-44.26 W
Shoal 2 3/4 fm
60-13-47.34 N
147-19-07.25 W

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 H10922 in Prince William Sound, Alaska, in August through September 1999. The following dangers to navigation affect charts 16700 (scale 1:200,000; 26th edition; 19-Sep-98), 16701 (scale 1:81,436; 17th edition; 25-Jul-98), and 16709 (scale 1:80,000; 21st edition; 29-Jun-96).

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

Feature: Rock
Depth: Uncovers
Latitude: 60-14-58.73 N
Longitude: 147-22-24.77 W

Feature: Rock
Depth: Awash
Latitude: 60-15-04.94 N
Longitude: 147-24-43.60 W

Feature: Shoal
Depth: 1/2 fathoms
Latitude: 60-14-30.57 N
Longitude: 147-24-55.20 W

ADVANCE INFORMATION

Feature: Shoal
Depth: 3/4 fathoms
Latitude: 60-14-16.82 N
Longitude: 147-19-44.26 W

Feature: Shoal
Depth: 3/4 fathoms
Latitude: 60-15-09.62 N
Longitude: 147-23-45.40 W

Feature: Shoal
Depth: 1 1/4 fathoms
Latitude: 60-14-53.04 N
Longitude: 147-24-50.82 W

Feature: Shoal
Depth: 1 1/2 fathoms
Latitude: 60-14-45.89 N
Longitude: 147-24-27.73 W

Feature: Shoal
Depth: 1 3/4 fathoms
Latitude: 60-14-27.52 N
Longitude: 147-19-59.03 W

Feature: Shoal
Depth: 2 fathoms
Latitude: 60-14-12.79 N
Longitude: 147-23-49.37 W

Feature: Shoal
Depth: 2 1/2 fathoms
Latitude: 60-14-02.77 N

Longitude: 147-21-05.53 W

Feature: Shoal
Depth: 2 1/2 fathoms
Latitude: 60-14-35.95 N
Longitude: 147-23-11.11 W

Feature: Shoal
Depth: 2 3/4 fathoms
Latitude: 60-13-44.72 N
Longitude: 147-20-35.91 W

Feature: Shoal
Depth: 2 3/4 fathoms
Latitude: 60-13-47.34 N
Longitude: 147-19-07.25 W

Feature: Shoal
Depth: 2 3/4 fathoms
Latitude: 60-15-04.53 N
Longitude: 147-21-57.69 W

Feature: Shoal
Depth: 2 3/4 fathoms
Latitude: 60-14-47.81 N
Longitude: 147-21-46.98 W

Feature: Shoal
Depth: 3 fathoms
Latitude: 60-13-56.31 N
Longitude: 147-20-26.31 W

Feature: Shoal
Depth: 3 1/4 fathoms
Latitude: 60-14-36.91 N
Longitude: 147-18-44.24 W

Feature: Shoal
Depth: 3 3/4 fathoms
Latitude: 60-14-14.92 N
Longitude: 147-20-53.04 W

Feature: Shoal
Depth: 3 3/4 fathoms
Latitude: 60-14-15.59 N
Longitude: 147-25-27.16 W

Feature: Shoal
Depth: 3 3/4 fathoms
Latitude: 60-14-41.28 N
Longitude: 147-25-41.11 W

Feature: Shoal
Depth: 3 3/4 fathoms
Latitude: 60-14-51.69 N
Longitude: 147-21-26.10 W

Feature: Shoal
Depth: 4 1/2 fathoms
Latitude: 60-14-29.26 N

Longitude: 147-20-41.19 W

Feature: Shoal
Depth: 4 1/2 fathoms
Latitude: 60-14-34.54 N
Longitude: 147-19-53.39 W

Feature: Shoal
Depth: 4 1/2 fathoms
Latitude: 60-16-54.65 N
Longitude: 147-19-51.53 W

Feature: Shoal
Depth: 4 1/2 fathoms
Latitude: 60-14-37.14 N
Longitude: 147-23-31.05 W

Feature: Shoal
Depth: 4 3/4 fathoms
Latitude: 60-15-07.07 N
Longitude: 147-20-53.47 W

Feature: Shoal
Depth: 5 1/2 fathoms
Latitude: 60-15-15.76 N
Longitude: 147-23-00.88 W

ADVANCE
INFORMATION

Feature: Shoal
Depth: 6 1/4 fathoms
Latitude: 60-14-26.14 N
Longitude: 147-24-15.89 W

Feature: Shoal
Depth: 7 1/4 fathoms
Latitude: 60-14-29.32 N
Longitude: 147-19-22.96 W

Feature: Shoal
Depth: 7 1/2 fathoms
Latitude: 60-14-54.91 N
Longitude: 147-23-06.14 W

Feature: Shoal
Depth: 7 3/4 fathoms
Latitude: 60-15-03.82 N
Longitude: 147-19-08.65 W

Feature: Shoal
Depth: 7 3/4 fathoms
Latitude: 60-14-20.28 N
Longitude: 147-21-15.02 W

This is advance information subject to office review. Questions concerning this message 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-17-99. More information on current RAINIER survey projects may be obtained by e-mail; contact the Field Operations Officer at FOO.RAINIER@NOAA.GOV.

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

January 13, 2000

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

Dear Sir:

During office review of hydrographic survey H-10922, Alaska, Southwest Prince William Sound, South of Green Island, thirteen shoal depths were found and are considered to be potential dangers to navigation.

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

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

Sincerely,

James C. Gardner

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

Enclosure

cc: NIMA
N/CS261
NOAA Navigation Advisor, Alaska

REPORT OF DANGERS TO NAVIGATION

Hydrographic Survey Registry Number: H-10922

Survey Title:
State: ALASKA
Locality: SOUTHWEST PRINCE WILLIAM SOUND
Sublocality: SOUTH OF GREEN ISLAND

Project Number: OPR-P139-RA

Survey Date: AUGUST 13, - SEPTEMBER 28, 1999

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

Charts affected: 16709 21st Edition June 29, 1996, scale 1:80,000, NAD 83
16701 17th Edition July 25, 1998, scale 1:81,436, NAD 83

DANGER TO NAVIGATION	LATITUDE(N)	LONGITUDE(W)
8.5 fathom sounding	60/13/56.16	147/25/38.90
7.4 fathom sounding	60/14/04.85	147/25/15.27
8.7 fathom sounding	60/14/19.96	147/25/53.19
3.2 fathom sounding	60/14/22.13	147/25/14.41
6.6 fathom sounding	60/14/02.68	147/23/23.68
2.6 fathom sounding	60/15/05.20	147/24/12.34
7.3 fathom sounding	60/15/33.35	147/22/13.49
6.3 fathom sounding	60/15/17.77	147/22/08.71
9.7 fathom sounding	60/15/35.96	147/21/34.30
9.5 fathom sounding	60/14/50.28	147/20/11.25
6.3 fathom sounding	60/14/53.02	147/18/57.24
7.8 fathom sounding	60/14/38.88	147/19/14.30
7.5 fathom sounding	60/14/00.50	147/19/14.92

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

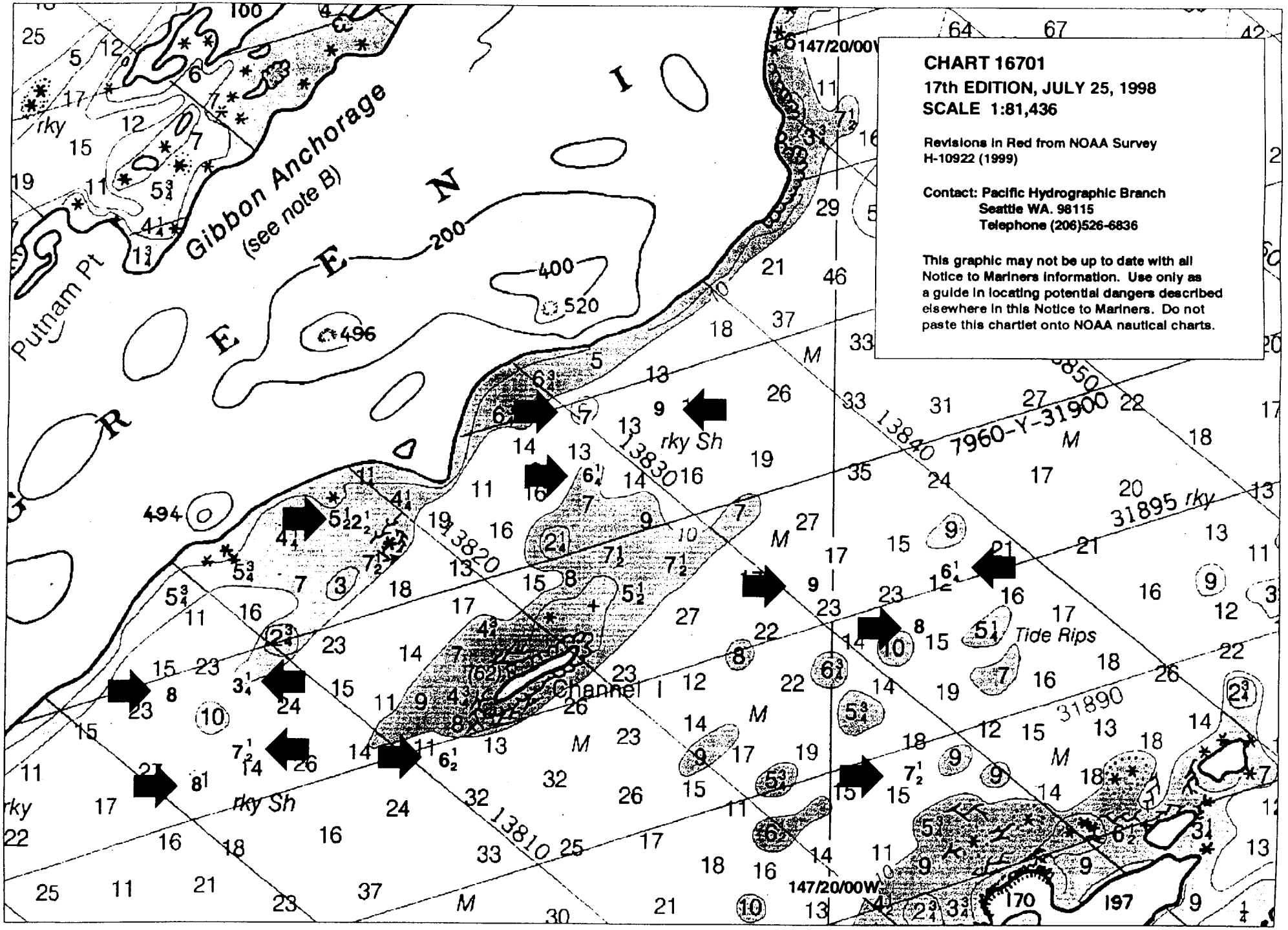


CHART 16701
17th EDITION, JULY 25, 1998
SCALE 1:81,436
Revisions in Red from NOAA Survey H-10922 (1999)
Contact: Pacific Hydrographic Branch
Seattle WA. 98115
Telephone (206)526-6836
This graphic may not be up to date with all Notice to Mariners information. Use only as a guide in locating potential dangers described elsewhere in this Notice to Mariners. Do not paste this chartlet onto NOAA nautical charts.
Gibbon Anchorage
(see note B)
Putnam Pt
Channel
Tide Rips
rky
rky Sh
147/20/00W
13840
13830
13820
13810
7960-Y-31900
31895
31890

APPROVAL SHEET

for

H10922

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

The digital data and supporting records have been reviewed 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-10922

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
CHANNEL ISLAND	X		X							2
~~GIBBON ANCHORAGE~~	X		X							3
GREEN ISLAND	X		X							4
PRINCE WILLIAM SOUND	X		X							5
~~PUTNAM POINT~~	X		X	[redacted]						6
										7
										8
										9
Montague Island										10
										11
										12
										13
										14
										15
										16
										17
										18
										19
										20
										21
										22
										23
										24
										25

Dennis J. Dawkins
MAY 26 2000

5/8/01

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-10922

LOCALITY: South of Green Island,
Southwest Prince William Sound, AK

TIME PERIOD: August 13 - September 28, 1999

TIDE STATION USED: 945-4511 Port Chalmers
Lat. 60° 14.5'N Lon. 147° 14.9'W
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 3.321 meters

REMARKS: RECOMMENDED ZONING
Use zone(s) identified as: PWS44 & PWS45.

Refer to attachments for zoning information.

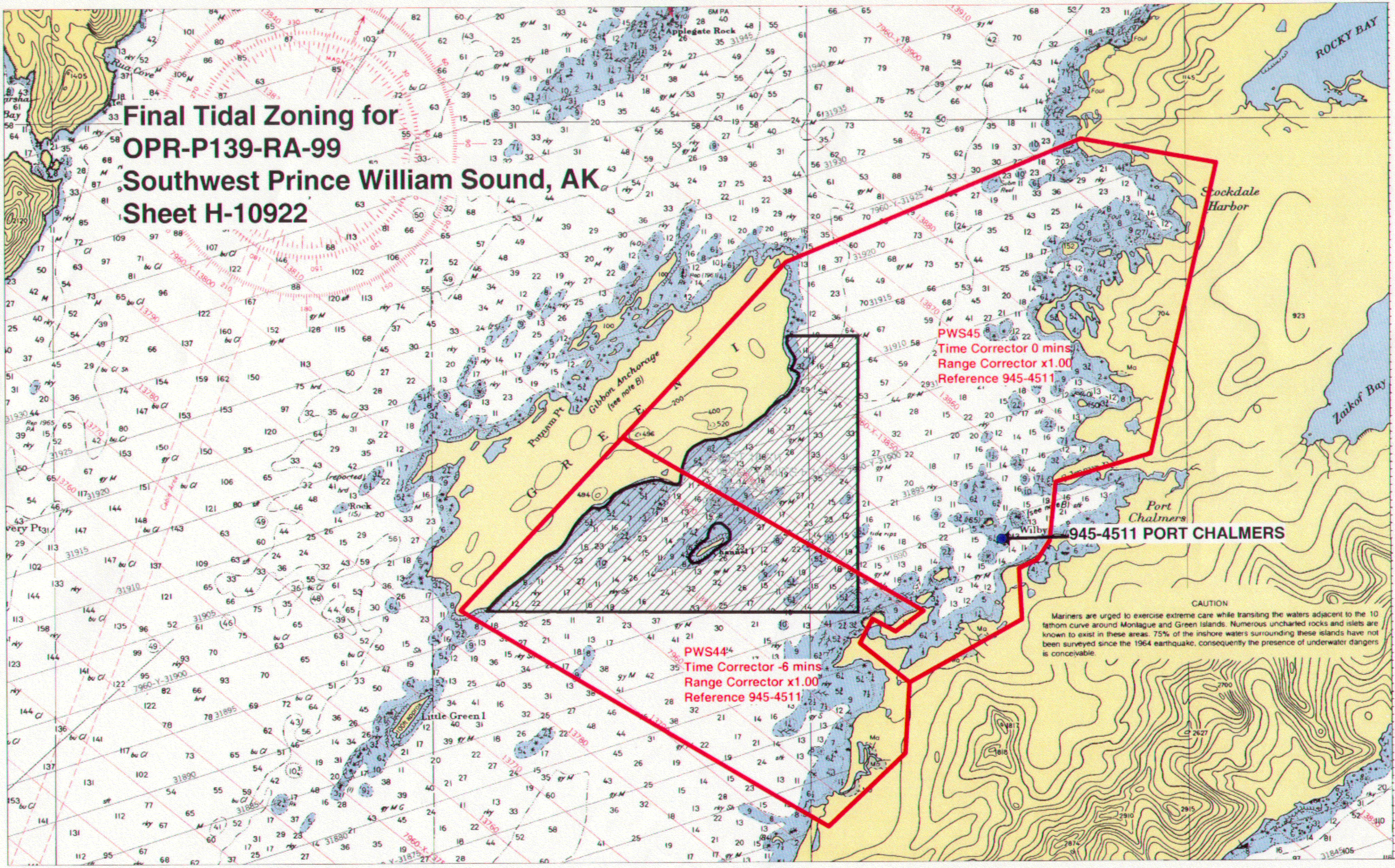
Note 1: Provided time series data are tabulated in metric units (Meters), relative to MLLW and on Greenwich Mean Time.

Thomas N. Mero 5/16/00
CHIEF, REQUIREMENTS AND DEVELOPMENT DIVISION

Final tide zone node point locations for OPR-P139-RA-99,
Sheet H-10922.

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 PWS44			
-147.325832 60.179367	945-4511	-6	1.00
-147.291846 60.195367			
-147.289814 60.210781			
-147.311642 60.219369			
-147.306057 60.224673			
-147.295905 60.221895			
-147.283464 60.226381			
-147.41572 60.264551			
-147.487763 60.226861			
-147.325832 60.179367			
Zone PWS45			
-147.212948 60.329021	945-4511	0	1.00
-147.343216 60.302686			
-147.41572 60.264551			
-147.283464 60.226381			
-147.295905 60.221895			
-147.306057 60.224673			
-147.311642 60.219369			
-147.289814 60.210781			
-147.240065 60.224421			
-147.241203 60.235531			
-147.233297 60.237325			
-147.227624 60.241526			
-147.224706 60.254395			
-147.182745 60.260462			
-147.15325 60.323765			
-147.212948 60.329021			


Final Tidal Zoning for
OPR-P139-RA-99
Southwest Prince William Sound, AK
Sheet H-10922
PWS45
Time Corrector 0 mins
Range Corrector x1.00
Reference 945-4511
PWS44
Time Corrector -6 mins
Range Corrector x1.00
Reference 945-4511
945-4511 PORT CHALMERS
Port Chalmers
Stockdale Harbor
Rocky Bay
Zaikof Bay
Gibbon Anchorage
Porpoise Pt
Applegate Rock
Little Green I
CAUTION
Mariners are urged to exercise extreme care while transiting the waters adjacent to the 10 fathom curve around Montague and Green Islands. Numerous uncharted rocks and islets are known to exist in these areas. 75% of the inshore waters surrounding these islands have not been surveyed since the 1964 earthquake, consequently the presence of underwater dangers is conceivable.

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

U.S. DEPARTMENT OF COMMERCE

REGISTRY NUMBER

H-10922

HYDROGRAPHIC SURVEY STATISTICS

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

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

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

SHORELINE DATA

SHORELINE MAPS (List): T-12709, T-12710, T-12712, T-12713, T-12714

PHOTOBATHYMETRIC MAPS (List): NA

NOTES TO THE HYDROGRAPHER (List): NA

SPECIAL REPORTS (List): NA

NAUTICAL CHARTS (List): Chart 16701 17th Ed., July 25, 1998, 16709 21st Ed., June 29, 1996

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	105		105
COMPARISON WITH PRIOR SURVEYS AND CHARTS			
EVALUATION OF SIDE SCAN SONAR RECORDS			
EVALUATION OF WIRE DRAGS AND SWEEPS			
EVALUATION REPORT		10	10
GEOGRAPHIC NAMES			
OTHER: (Chart Compilation)		88	88
USE OTHER SIDE OF FORM FOR REMARKS — TOTALS	105	98	203

Pre-processing Examination by: R. Davies	Beginning Date: 1/12/2000	Ending Date: 1/18/2000
Verification of Field Data by: B.A. Olmstead	Time (Hours): 105	Ending Date: 11/9/2000
Verification Check by: L. Deodato	Time (Hours): 16	Ending Date: 4/2/2001
Evaluation and Analysis by: B.A. Olmstead	Time (Hours): 10	Ending Date: 11/9/2000
Inspection by: L. Deodato	Time (Hours): 8	Ending Date: 4/4/2001

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

EVALUATION REPORT

H-10922

A. PROJECT

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

B. AREA SURVEYED

The survey area is adequately described in the hydrographers' report except as follows.

The hydrographer has determined the inshore limits of safe navigation by defining a Navigable Area Limit Line (NALL) throughout the survey area. Charted features and soundings inshore of this limit line have not been specifically addressed during survey operations and should be retained as charted. A page-size plot of the charted area depicting the specific limits of supersession accompanies this report as Attachments 1 and 2.

The bottom consists mainly of sand, shells, and pebbles with areas of dense kelp found around Channel Island and the several rocky pinnacle areas found throughout the survey area. Depths generally range from one fathom along the shoreline and in areas of shoal developments, to 67 fathoms in the northeast corner of the survey area.

C. SURVEY VESSELS

The hydrographers' report contains adequate information relating to survey vessels.

D. AUTOMATED DATA ACQUISITION AND PROCESSING

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

Office processing of survey data was conducted using the same Computer Aided Resource Information System (CARIS) and Hydrographic Processing System (HPS) used by the hydrographer. MicroStation 95 was used during office processing to compile the smooth sheet.

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

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

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

E. SONAR EQUIPMENT

Side scan sonar equipment was not used during survey H-10922.

F. SOUNDING EQUIPMENT

Sounding equipment has been adequately addressed in the hydrographers' report.

G. CORRECTIONS TO SOUNDINGS

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

Predicted tides were used for reduction of soundings during field processing. During office processing, soundings and elevations have been reduced to Mean Lower Low Water (MLLW) or Mean High Water (MHW) as appropriate with verified tide correctors obtained from the Center for Operational Oceanographic Products and Services (CO-OPS). The correctors are zoned from tide gage Port Chalmers, Southwest Prince William Sound, Alaska, 945-4511.

H. CONTROL STATIONS

Section H of the hydrographers' report contains adequate discussion 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 27adjustment 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:	-2.316 seconds	(-71.665 meters)
Longitude:	6.864 seconds	(105.584 meters)

The prior survey work in common with the present survey is plotted on Valdez datum. To convert from the Valdez datum to NAD 83 the user must apply +8.28 seconds to the latitude and –21.12 seconds to the longitude.

I. HYDROGRAPHIC POSITION CONTROL

Differential GPS (DGPS) was used to control this survey. A horizontal dilution of precision (HDOP) not to exceed 3.75 for 1:10,000 was computed for survey operations. There were no positions that exceeded limits in terms of HDOP. NAD 83 is used as the horizontal datum for plotting and position computations.

DGPS performance checks were not conducted in the field. Additional information concerning specific control system type, calibrations and system checks, can be found in the hydrographers' report and the separates related to horizontal position control and corrections to position data. The evaluation report, section P, contains information regarding performance check requirements.

J. SHORELINE

Shoreline maps T-12709, T-12710, T-12712, T-12713, and T-12714, scale 1:20,000, were compiled on NAD 27 and apply to this survey. Shoreline drawn on the smooth sheet in black originates from the above digital data as provided by the Coastal Mapping Program. The shoreline data and the hydrographic data were merged in Micro Station during the compilation of the smooth sheet.

There were no MHW revisions delineated during this survey.

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

K. CROSSLINES

Crosslines are adequately discussed in the hydrographers' report.

L. JUNCTIONS

Survey	Scale	Year	Area
H-10918	1:10,000	1999	North
H-10919	1:10,000	1999	East
H-10928	1:10,000	1999	Southwest

The junctions with surveys H-10918, H-10919 and H-10928 are complete. Soundings and depth curves are in good agreement. A few soundings and features have been transferred within the common area to better delineate the bottom configuration. A "Joins" note has been added to the smooth sheet where applicable.

There are no contemporary junctions along latitude 60/13/30N, east of longitude 147/27/40W. Future surveys are planned in this area and the junction with H-10922 will be discussed in the evaluation report(s) for that survey(s).

M. COMPARISON WITH PRIOR SURVEYS

The following prior survey falls within the common area of the present survey and has been compared with during office processing.

Survey	Year	Scale	Datum
H-5427	1933	1:20,000	Valdez

Prior survey H-5427 is the source data for the existing chart. This survey was conducted using early single beam echo sounders and visual positioning. Comparison with H-5427 was made using a digital copy. The registration and legibility of this prior work to the present survey was good. Prior survey H-3353 was listed for comparison by the hydrographer but has been superseded within the common area of H-5427 and does not require discussion.

A more thorough coverage of the area utilizing the shallow water multibeam system has provided better definition of the bottom along the southern portion of Green Island and vicinity. Present survey depths generally reflect a consistently shoal bias from 1-3 fathoms throughout the survey area. However, the present survey found several additional pinnacles ranging from 6-8 fathoms shoaler than depths portrayed in 1933. The depth differences with H-5427 can mostly be attributed to the result of earthquake activity since the prior work. The evaluator feels the smaller changes with the prior work are most likely associated with improved sounding and and positioning techniques, and relative accuracy of the data acquisition methods. A comparison with the mean high water line shown in 1933 reflects good agreement. Additional information can be found in the hydrographers' report sections L and N.

In accordance with Hydrographic Survey 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-10922 is adequate to supersede the prior survey within the common area.

N. ITEM INVESTIGATIONS

There were no AWOIS items assigned for investigation within the survey area.

O. COMPARISON WITH CHART

Survey H-10922 was compared with the following charts.

Chart	Edition	Date	Scale
16701	17th	July 25, 1998	1:81,436
16709	21st	June 29,1996	1:80,000

a. Hydrography

Charted hydrography originates with the previously discussed prior survey and contemporary photogrammetric shoreline. Items have been adequately addressed in sections I and L of the hydrographers' report and section M of the evaluation report. No additional discussion is required.

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

Survey H-10922 is adequate to supersede charted hydrography within the common area.

b. Dangers To Navigation

Thirty-two (32) potential dangers to navigation were identified during survey operations. An additional thirteen (13) potential dangers to navigation were reported during office processing.. These potential dangers were reported to the USCG, NIMA, N/CS261, N/CS 34, and the NOAA Navigation Advisor, Alaska dated October 29, 1999 and January 13, 2000. A copy of both reports is attached.

P. ADEQUACY OF SURVEY

Hydrography contained on survey H-10922 is adequate to:

a. Delineate the bottom configuration, determine least depths, and draw the required depth curves;
b. Reveal there are no significant discrepancies or anomalies requiring further investigation; and
c. Show the survey was properly controlled and soundings are correctly plotted.

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

Prior sounding and feature comparisons already mentioned in section L, Comparison with Prior Surveys, does not require further discussion in section N. Discussion in section N should be limited to miscellaneous data not originating from prior surveys. Reference the FPM, Figure 5.3, Descriptive Report Checkoff List.

Q. AIDS TO NAVIGATION

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

There were no features of landmark value located and or recommended for charting within the area of this survey.

R. STATISTICS

Statistics are adequately itemized in the hydrographers' report.

S. MISCELLANEOUS

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

T. RECOMMENDATIONS

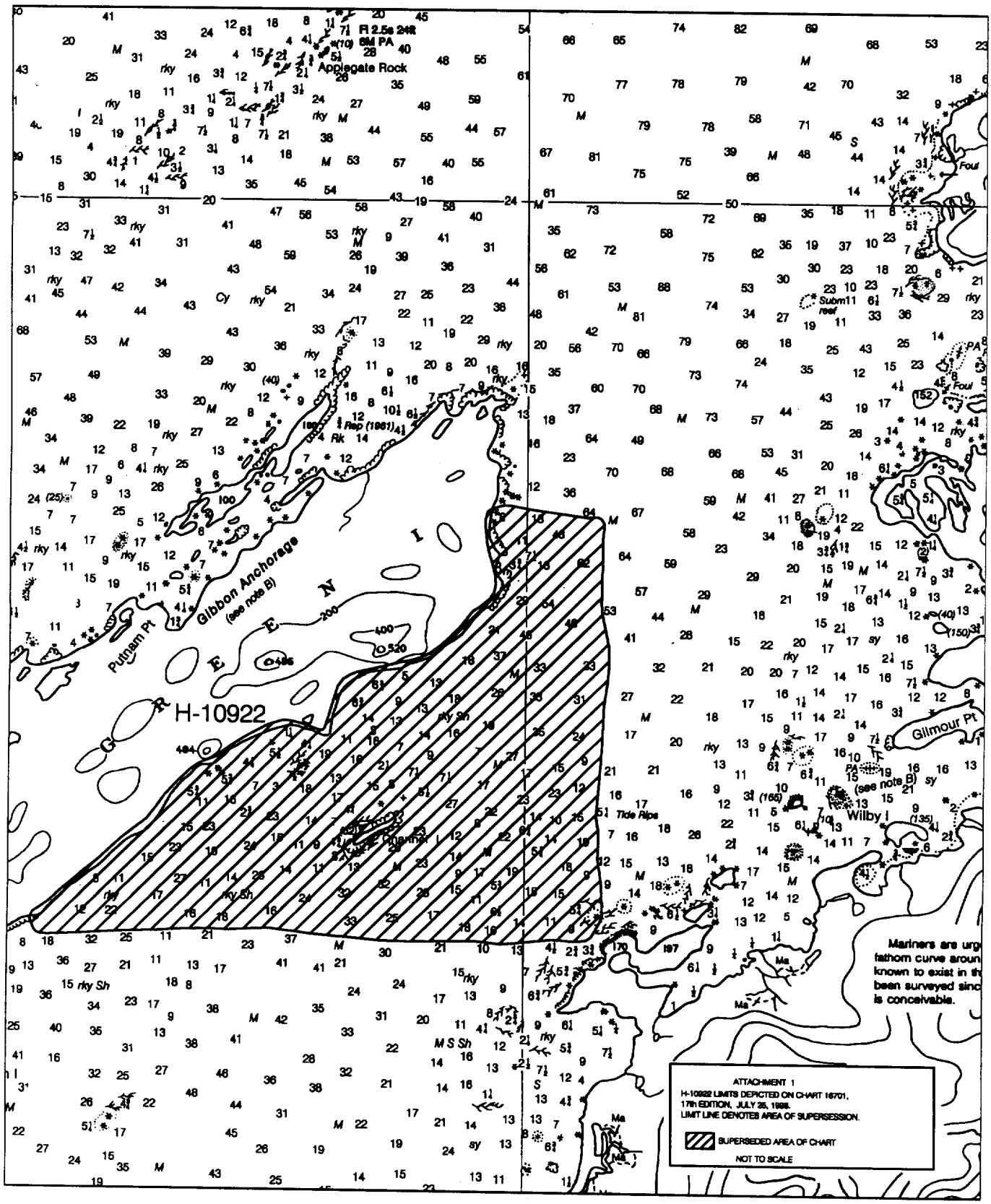
This is a good hydrographic survey. No additional work is recommended. Additional information regarding recommendations is found in the hydrographers' report.

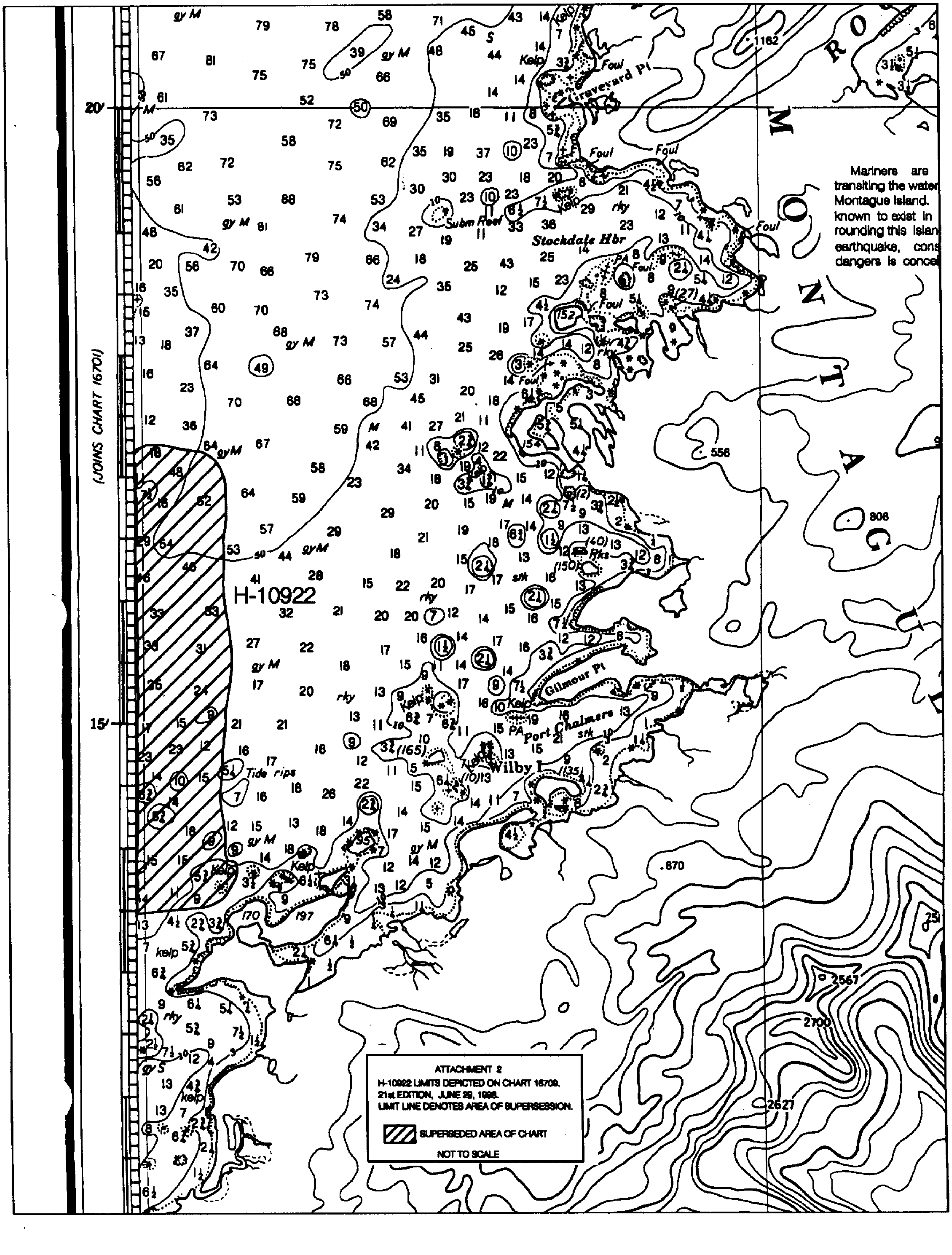
U. REFERRAL TO REPORTS

Referral to reports is adequately discussed in the hydrographers' report.

Bruce A. Olmstead

Bruce A.Olmstead
Cartographer


Fl 2.5s 24ft
9M PA
Applegate Rock
Gibbon Anchorage
(see note B)
Putnam Pt
H-10922
Rep (1961)
Rk
Tide Rips
Wilby I
Gilmour Pt
Subm11
reef
Foul
Mariners are urg
fathom curve aroun
known to exist in th
been surveyed sinc
is conceivable.
ATTACHMENT 1
H-10922 LIMITS DEPICTED ON CHART 16701,
17th EDITION, JULY 25, 1998.
LIMIT LINE DENOTES AREA OF SUPERSESSION.
SUPERSEDED AREA OF CHART
NOT TO SCALE


ATTACHMENT 2
H-10922 LIMITS DEPICTED ON CHART 16709, 21st EDITION, JUNE 29, 1996.
LIMIT LINE DENOTES AREA OF SUPERSESSION.
SUPERSEDED AREA OF CHART
NOT TO SCALE
H-10922
(JOINS CHART 16701)
Graveyard Pt
Stockdale Hbr
Gilmour Pt
Port Chalmers
Wilby I
Subm Reef
Tide rips
Foul
Kelp
20'
15'
Mariners are
transiting the water
Montague Island.
known to exist in
rounding this Islan
earthquake, cons
dangers is conce

APPROVAL SHEET
H-10922

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 Leonardo J. Verdato Date: 4/4/2001
Dennis J. Hill
Chief, Cartographic Team
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: 4-26-01
James C. Gardner
Captain, NOAA
Chief, Pacific Hydrographic Branch

****

Final Approval

Approved:

Samuel P. De Bow Jr. Date: May 18, 2001
Samuel P. De Bow Jr.,
Captain, NOAA
Chief, Hydrographic Surveys Division

NOAA FORM 75-96
(10-83)

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

MARINE CHART BRANCH

RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H-10922

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	11/13/2000	B. Olmstead	Full ~~Part~~ ~~Before~~ After Marine Center Approval Signed Via
			Drawing No. Full application of soundings and features from
			smooth sheet and thru Chart 16709.
16709	11/13/2000	B. Olmstead	Full ~~Part~~ ~~Before~~ After Marine Center Approval Signed Via
			Drawing No. Full application of soundings and features from
			smooth sheet.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
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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.