

H10569

NOAA FORM 76-35A

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

DESCRIPTIVE REPORT

Type of Survey Hydrographic
Field No. RA-10-16-94
Registry No. H-10569

LOCALITY

State Alaska
General Locality Prince William Sound
Sublocality Eastern Portion of Glacier
..... Island and Vicinity

1994

CHIEF OF PARTY
CAPT Russell C. Arnold, NOAA

LIBRARY & ARCHIVES

DATE FEB 21 1996

HYDROGRAPHIC TITLE SHEET

H-10569

INSTRUCTIONS - The Hydrographic Sheet should be accompanied by this form, filled in as completely as possible, when the sheet is forwarded to the Office.

FIELD NO.

RA-10-16-94

State Alaska

General locality Prince William Sound

Locality Eastern Portion of Glacier Island and Vicinity

Scale 1:10,000 Date of survey Sept. 5-29, 1994

Instructions dated July 25, 1994 Project No. OPR-P125-RA

Vessel NOAA Ship RAINIER (2120), 2123(RA-3), 2124(RA-4), 2125(RA-5)

Chief of party CAPT Russell C. Arnold, NOAA

Surveyed by CAPT R. Arnold, LT D. Neander, LT D. Haines, LTJG D. Lemke, LTJG G. Glover, ENS S. Smith, ENS S. Maenner, ENS J. Becker, SST J. Fleischmann, ST B. Judson

Soundings taken by echo sounder, hand lead, pole DSF-6000N

Graphic record scaled by RAINIER Personnel

Graphic record checked by RAINIER Personnel

Evaluation by: I. Almacen Automated plot by HP Design Jet 650C Plotter

Verification by L. Deodato, E. Domingo, D. Doles, G. Kay, J. Stringham

Soundings in ~~fathoms~~ Meters & Decimeters at ~~MLLW~~ MLLW

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

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

AWOIS/SURF 2/21/96 MUR

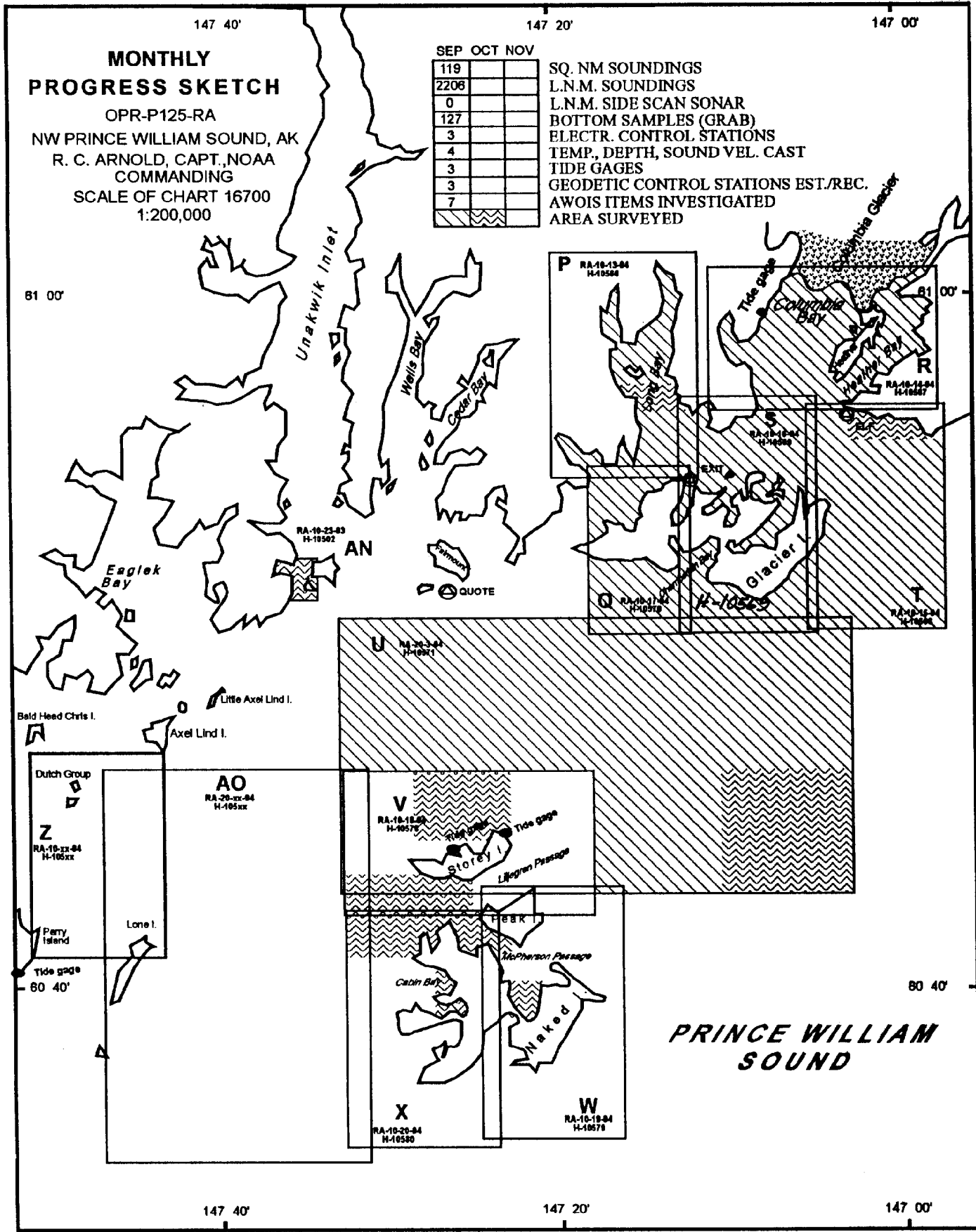
FEB 21 1996 *DAK*

**MONTHLY
PROGRESS SKETCH**

OPR-P125-RA
NW PRINCE WILLIAM SOUND, AK
R. C. ARNOLD, CAPT., NOAA
COMMANDING
SCALE OF CHART 16700
1:200,000

	SEP	OCT	NOV
SQ. NM SOUNDINGS	119		
L.N.M. SOUNDINGS	2208		
L.N.M. SIDE SCAN SONAR	0		
BOTTOM SAMPLES (GRAB)	127		
ELECTR. CONTROL STATIONS	3		
TEMP., DEPTH, SOUND VEL. CAST	4		
TIDE GAGES	3		
GEODETIC CONTROL STATIONS EST./REC.	3		
AWOIS ITEMS INVESTIGATED	7		
AREA SURVEYED			

SQ. NM SOUNDINGS
L.N.M. SOUNDINGS
L.N.M. SIDE SCAN SONAR
BOTTOM SAMPLES (GRAB)
ELECTR. CONTROL STATIONS
TEMP., DEPTH, SOUND VEL. CAST
TIDE GAGES
GEODETIC CONTROL STATIONS EST./REC.
AWOIS ITEMS INVESTIGATED
AREA SURVEYED



**PRINCE WILLIAM
SOUND**

Descriptive Report to Accompany Hydrographic Survey H-10569

Field Number RA-10-16-94

Scale 1:10,000

September 1994

NOAA Ship RAINIER

Chief of Party: Captain Russell C. Arnold, NOAA

A. PROJECT

This basic hydrographic survey was completed in Northwestern Prince William Sound, Alaska, as specified by Project Instructions OPR-P125-RA dated July 25, 1994. ✓

Survey H-10569 corresponds to "sheet S" as defined in the Project Instructions.

This survey will provide contemporary hydrographic survey data for updating existing nautical charts, and for constructing two 1:50,000 scale charts covering the fiords and bays within the project area. Requests for hydrographic surveys and updated charts have been received from the Defense Mapping Agency, the Southwest Alaska Pilot's association, cruise ship lines and local fishermen. ✓

B. AREA SURVEYED (See EVAL RPT., Sec. B)

The survey area is located in Northwest Prince William Sound, in the vicinity of Glacier Island. The survey's eastern limit is bounded by 147°06.0'W, and the western limit is bounded by 147°12.3' W. The northern limit is bounded by latitude 60°56.8' N, and the southern limit is bounded by 60°50.4' N. ✓

Data acquisition was conducted from September 5, 1994, Day Number (DN) 248, through September 29, 1994, DN 272. ✓

C. SURVEY VESSELS

Data were acquired by the NOAA SHIP RAINIER and three survey launches as noted below:

<u>Vessel</u>	<u>EDP #</u>	<u>Operation</u>
RAINIER	2120	Sound Velocity Casts Bottom Samples
RA-3	2123	Hydrography Shoreline Verification ✓
RA-4	2124	Hydrography Shoreline Verification
RA-5	2125	Hydrography Bottom Samples Shoreline Verification

D. AUTOMATED DATA ACQUISITION AND PROCESSING

Data acquisition and processing were accomplished with the following HDAPS programs:

<u>Program Name</u>	<u>Version</u>	<u>Date Installed</u>
BACKUP	2.00	3/7/94
BASELINE	1.14	3/7/94
BIGABST	2.07	3/7/94
BIGAUTOST	3.01	3/7/94
BLKEDIT	2.02	3/7/94
CARTO	2.15	8/29/94
CLASSIFY	1.05	3/7/94
CONVERT	3.63	8/29/94
DAS_SURV	6.74	8/29/94
DIAGNOSE	3.05	8/29/94
DISC-UTIL	1.00	3/7/94
DP	2.15	8/29/94
EXCESS	4.31	8/29/94
FILESYS	3.27	8/29/94
GRAFEDIT	1.06	3/7/94
LISTDATA	1.02	3/7/94
LOADNEW	2.10	3/7/94
LSTAWOIS	3.07	5/12/94
MAINMENU	1.20	3/7/94
MAN_DATA	2.01	3/7/94
NEWPOST	6.12	8/29/94
PLOTALL	2.30	8/29/94
POINT	2.10	3/7/94
PREDICT	2.01	3/7/94
PRESURV	7.09	8/29/94
PRINTOUT	4.04	8/29/94
QUICK	2.05	8/29/94
RAMSAVER	1.02	3/7/94
REAPPLY	2.11	8/29/94
SCANNER	1.00	3/7/94
SELPRINT	2.05	8/29/94
SYMBOLS		3/7/94
VERSIONS	1.00	3/7/94
ZOOMEDIT	2.30	8/29/94

Velocity corrections were determined using:

<u>Program Name</u>	<u>Version</u>	<u>Date Installed</u>
VELOCITY	2.10	15 Mar 1994

E. SONAR EQUIPMENT

Sonar equipment was not used on ~~sheet 8~~ *survey H-10563*

F. SOUNDING EQUIPMENT

The Raytheon DSF-6000N is a dual frequency (100 kHz, 24 kHz), paper trace echo sounder. Serial numbers are included on the headers of the daily Raw Master Printouts.* No problems which affect survey data were encountered. All DSF-6000N soundings were acquired using the High + Low, high frequency digitized setting. ✓

G. CORRECTIONS TO ECHO SOUNDINGS

Correctors for the velocity of sound through water were determined from the casts listed below.

<u>Velocity Table #</u>	<u>Cast#</u>	<u>DN</u>	<u>Cast Position</u>	<u>Deepest Depth</u>	<u>Applicable DN</u>
1,11	1	253	60°55'16" N 147°11'56" W	311	249 - 258
2,12	2	253	60°49'11" N 147°19'05" W	579	249 - 258
3,13	3	268	60°49'25" N 147°19'05" W	565	263 - 272
4,14	4	268	60°55'03" N 147°13'36" W	314	263 - 272

Casts 2, 3 & 4 plot outside the survey limits.

RAINIER used velocity tables 11-14, while tables 1-4 were used by the launches. Velocity tables 1 and 4 were used for data collected on the north side of Glacier Island, and tables 2 and 3 were applied to data collected on the south side of Glacier Island. ✓

The sound velocity casts were acquired with SBE SEACAT Profiler (S/N 811), calibrated 12/17/93. Velocity correctors were computed using the PC program VELOCITY in accordance with Hydrographic Survey Guideline (HSG) No. 69. A printout of the Sound Velocity Corrector Tables used in the HDAPS Post Survey program is included in the "Separates to be Included with Survey Data, IV. Sounding Equipment Calibrations and Corrections". * ✓

Static Draft

A transducer depth was determined using FPM Fig 2.2 for launches 2123, 2124, and 2125 in the spring of 1994. RAINIER's transducer depth was determined during the 1990 winter inport. These depths were entered into the offset tables for each launch. ✓

Settlement and Squat

Correctors were computed in accordance with Hydrographic Manual Section 4.9.4.2., using FPM Fig. 2.3, and are included with project data for OPR-P125-RA.* The data used was collected in Shilshole Bay, Washington in March of 1994. ✓

** Filed with the survey records.*

Offset Tables

Offset tables* contain offsets for the GPS antenna, as well as static draft measurements, and settlement and squat data. Offset table 1 corresponds to the RAINIER. Offset tables 3-5 correspond to the number of the launch. The offset tables were compiled with new measurements in the spring of 1994 and are contained in the "Separates to be Included with Survey Data". *



Heave

The launches are not equipped with heave, pitch and roll sensors.



Bar Check and Lead Lines

Bar check and lead lines were calibrated by RAINIER personnel during the winter inport 1993-1994. Calibration forms are included with project data for OPR-P125-RA.*Bar checks were performed weekly and served as a functional check of the DSF-6000N.



Tide Correctors

Predicted tides for the project were provided on diskette by N/OES334 for the Cordova, Alaska reference station (945-4050).

Tidal correctors as provided in the project instructions for this sheet are:

<u>Time Correction</u>	<u>Height Correction Range Ratio</u>
0 hr 0 min.	X 0.96



HDAPS listings of the data used in generating tide corrector tables are included in Appendix V of this report. *

RAINIER personnel installed an 8200 digital gage at Columbia Bay (945-4476) and Storey Island (945-4553) on September 4, 1994. Opening levels to the staff and all bench marks were conducted upon installation. A new staff was installed and leveled at Columbia Bay, when the staff was destroyed by ice on September 9. Columbia Bay tide data were continuous from installation to September 6, when the orifice tubing was removed by ice. The orifice was reinstalled on September 6 and the gage ran continuously through September 18, when it was again destroyed by ice. On September 21, 1994, the orifice was repaired and a secondary gage and orifice was installed at Columbia Bay. Tide data were collected continuously at the Storey Island during data acquisition. On September 21, 1994, a new station was installed on the north side of Storey Island (945-4571) to serve as a secondary gage for Storey Island (945-4553). Opening levels were conducted on September 22. Bracketing levels were completed by RAINIER personnel at the end of September at all three gages. Closing levels were completed at the Columbia Bay gage on October 9 and closing levels at both Storey Island gages will be conducted at the end of the project.



The control station was Valdez, Alaska (945-4240). Opening levels of the control station were performed by RAINIER personnel on September 16, 1994. Closing levels at Valdez, Alaska will be completed by RAINIER personnel during the final inport October 28-31, 1994.



The station description, field tide records, and Preliminary Field Tide Note (Appendix V)* were forwarded to N/OES212 in accordance with HSG 50 and FPM 4.3 at the end of September. The final tide package will be forwarded to N/OES212 at the end of the project. A request for approved tides was forwarded to N/OES2 in accordance with FPM 4.2.3. *Approved tide note dated January 17, 1995 is attached.*



* Filed with the survey records.

H. CONTROL STATIONS *(See EVAL RPT., Sec. H)*

A listing of the geodetic stations used to control this survey is included in Appendix III of this report. The horizontal datum for this project is NAD83.

DGPS stations were installed on existing stations QUOTE, EXIT and ELF. Station QUOTE is located on a small islet east of Outpost Island, station EXIT is located on small islet at the entrance to Jackson Hole, and ELF is located on Elf Point on the east side of Columbia Bay. These stations were recovered in accordance with methods stated in Section 5.2.4 of the FPM. *Control stations QUOTE and EXIT were used during this survey.*

For further information see the "Fall 1994 Horizontal Control Report" that will be submitted at the end of the project. *

I. HYDROGRAPHIC POSITION CONTROL

All soundings and features were positioned using differential GPS. Serial numbers for Ashtech GPS equipment are annotated on the data printouts. *

Ashtech GPS

Method of Position Control

VHF differential shore stations were established at stations QUOTE, EXIT and ELF. The difference between the computed location and the station's published position was recorded by the MONITOR program on a PC. Data from a 24-hour period were recorded and examined for signs of multi-path signal reflection, which was not evident at any of the stations. Scatterplot results are included in the "Project related data for OPR-P125-RA". *The scatterplot results for station QUOTE were obtained last year. The area around station QUOTE remains undeveloped, and the geography unchanged.

Calibrations & Systems Check Methods

System checks were performed in accordance with Section 3.4.4 of the FPM. Two observations of position were made using correctors from two independent DGPS base stations. The results were transferred to forms which are included in the project data for OPR-P125. An abstract of the system checks is included in the "Separates to be Included with Survey Data, III. Horizontal Position Control and Corrections to Position Data". *

Problems

None

Offset

The launch GPS antenna offsets are stored in the HDAPS Offset Tables as listed in Section G. Copies of the Offset Tables are included in the "Separates to be Included with Survey Data". *

J. SHORELINE *(See EVAL RPT., Sec. J)*

The shoreline map (T-sheet) used to transfer shoreline detail to the final sheets was TP-00265 and DM-10061.

** Filed with the survey records.*

Method of Shoreline Verification

Shoreline verification was conducted near predicted lower low water in accordance with FPM 7.1. Shoreline verification was accomplished by assigning sequential reference numbers and taking detached positions (DPs), as explained later in this section. ✓

Shoreline and T-sheet features verified via visual inspection were assigned sequential reference numbers, described, and recorded in the field using reference forms and corresponding 1:10,000 photocopies of the T-sheet. Reference numbers, descriptions, and heights corrected to MLLW using predicted tides are recorded on the reference form. Corresponding notes were annotated on the photocopies of the T-sheet when deemed necessary. The annotated photocopies of the T-sheet and the reference forms are included with the survey data. ✓

DPs taken during shoreline verification were recorded on the master printouts* and on the DP forms.* These indicate significant T-sheet features and features not found on the T-sheet. Where possible, positions of some T-sheet features were verified during inshore mainscheme hydrography and annotated on the master printouts. ✓

Detailed 1:10,000 "Rough Bottom Sample and Detached Position Plots" are provided showing all DPs, reference numbers, and notes relating to each feature. The information from these plots was transferred to a final field plot where possible. Where such information would interfere with the legibility of the final plot the appropriate cartographic symbol has been transferred, but height and position number information remains on the rough plot, which serves as an overlay (FPM 6.1.2.5). Verified T-sheet features were retained and shown in black. Changes to the shoreline were shown in red, and new features are depicted in black. Field cartographic codes were assigned using the HDAPS DP editor. Heights are recorded in meters and are corrected to predicted MLLW. *Field values have been changed after application of actual tides and shown on the smooth sheet. There were no revisions to the mean high water line.* ✓

Shoreline verification north of Glacier Island was hampered by poor water visibility due to the proximity of Columbia Glacier. Silt in the water combined with poor lighting often reduced visibility to less than 1 meter. ✓

New Features

Many new features were found and are depicted in black on the final field plot. T-sheet rocks were often identified as high points of new ledges or reefs. *Concur* ✓

Recommendations

The hydrographer recommends that the shoreline from this survey be used to supersede prior shoreline information compiled on TP-00265 and DM-10061. *Concur.* ✓

Charted Features

Charted rocks were either identified as T-sheet rocks, high points or extensions of ledges and reefs except as noted below. ✓

A charted rock in the vicinity of 60°54'30"N, 147°10'02"W was searched for on DN 252 and not found (position 808). Visual and echo sounder searches were conducted for 10 minutes, with a search radius of 50 meters. The water visibility was 3 meters and the average depth was ~~6.5~~ ^{5.0} meters. *This rock is likely part of a ledge found approximately 100 meters to the east.* ✓

A charted rock in the vicinity of 60°54'23"N, 147°08'03"W was searched for on DN 252 and not found (position 813). Visual and echo sounder searches were conducted for 10 minutes, with a search radius of 50 meters. The water visibility was 3 meters and the average depth was 20 meters. ✓

** Filed with the survey records.*

A charted rock in the vicinity of 60°54'02"N, 147°08'50"W was searched for on DN 250 and not found (reference R4-15). Visual and echo sounder searches were conducted for 7 minutes, with a search radius of 40 meters. The scaled position of the charted rock was above the zero meter curve. The water visibility was 2.5 meters and the average depth was 2-3 meters. There was an insignificant lone rock (1 M x 0.5 M) set back on the gravel beach near the high water line. On DN 252, VN 2123, a line of hydrography ended in the vicinity of the charted rock (position 929). No significant rock was noted. ✓

A charted rock in the vicinity of 60°54'08"N, 147°08'52"W was searched for on DN 252 and not found (reference R3-16). Visual and echo sounder searches were conducted for 10 minutes, with a search radius of 40 meters. The scaled position of the charted rock was on the zero meter curve. The water visibility was 3 meters and the average depth was 2 meters. On DN 252, VN 2123, a line of hydrography ended in the vicinity of the charted rock (position 940) and the rock was not observed at this time. ✓

A charted rock in the vicinity of 60°52'23"N, 147°11'01"W was searched for on DN 252 and not found (position 3375). Visual and echo sounder searches were conducted for 10 minutes, with a search radius of 50 meters. The water visibility was 3-4 meters and the average depth was 12 meters. ✓

A charted rock in the vicinity of 60°52'01"N, 147°11'20"W was searched for on DN 252 and not found (position 3376). Visual and echo sounder searches were conducted for 6 minutes, with a search radius of 50 meters. The water visibility was 3-4 meters and the average depth was 10 meters. ✓

A charted rock in the vicinity of 60°51'23"N, 147°09'51"W was searched for on DN 252 and not found (position 3381). Visual and echo sounder searches were conducted for 8 minutes, with a search radius of 30 meters. The water visibility was 3-4 meters and the average depth was 9 meters. This rock is likely part of a ledge found approximately 100 meters to the east. ✓

A charted rock in the vicinity of 60°56'18"N, 147°08'30"W was searched for on DN 254 and not found (position 3458). Visual and echo sounder searches were conducted for 15 minutes, with a search radius of 50 meters. The water visibility was 1 meter and the average depth was 2-3 meters. The closest shoreline is a boulder beach with boulders varying from 0.5 M to 2.5 M. This rock likely was used to portray the characteristics of the foreshore area. Area is described as a boulder beach on the smooth sheet. ✓

A charted rock in the vicinity of 60°54'38"N, 147°09'08"W was searched for on DN 263 and not found (position 5964). Visual and echo sounder searches were conducted for 10 minutes, with a search radius of 40 meters. The water visibility was 1 meter and the average depth was 20 meters. ✓

Recommendations

The hydrographer recommends deleting the rocks discussed above from the chart. *Concur.*

Two charted rocks in the vicinity of 60°54'45"N, 147°09'48"⁵⁰W were not found during shoreline verification. No disprovals were taken. However, hydrography in the area (mainscheme and 10 m splits) revealed a rocky shoal area extending to the north and east. The smooth sheet portrays a 0.4m and 0.3m sounding near the charted features. ✓

Recommendations

The hydrographer recommends that the two rocks remain as charted. The two rocks, in conjunction with the hydrography, will define the rocky shoal area. *Do not concur. Chart surrounding area based on the present survey. (See EVAL RPT., Sec 0)* ✓

The charted rock in the vicinity of 60°54'49"N, 147°10'52"W was not found during shoreline verification. However, 10 m line spacing (DN 258, VN2123, positions 1245 - 1280) revealed a least depth of 1 ~~7~~⁵ m (position 1271.3). ✓

Recommendation

The hydrographer recommends that a submerged rock be charted in the location of the 1 ~~7~~⁵ m sounding noted above. *concur. Chart as " $\frac{3}{4}$ RK ". Delete charted rock.*

K. CROSSLINES

Crosslines are within 1-2 meter agreement with mainscheme hydrography except in areas of complex bathymetry. Crosslines totaled 19.2 nautical miles, representing 8.0% of the total mainscheme hydrography. ✓

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

This survey junctions with survey H-10567 (1:10,000, 1994) at the northern limit, H-10566 (1:10,000, 1994) and H-10570 (1:10,000) at the western limit, H-10568 (1:10,000, 1994) at the eastern limit and H-10571 (1:20,000) at the southern limit. These soundings were found to be in general agreement with this survey. ✓

Final comparisons will be made at the Pacific Hydrographic Section (PHS).

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

One prior survey on the south side of Glacier Island was compared: H-9637 (1:10,000, 1976). Soundings from the prior survey were in general agreement with the present survey. However, the present survey, due to much greater sounding density, revealed numerous shoal soundings not found during the prior survey. There were no instances where prior survey soundings were shoaler in a corresponding area. Charted soundings for the north side of Glacier Island within the present survey area originate from BP-43214, 1:200,000, 1947, USCGS and BP-104500, 1:20,000, 1978, USGS and are addressed in Section O, Comparison with the Chart. ✓

Final comparisons will be made at PHS.

N. ITEM INVESTIGATIONS

Two AWOIS item were assigned to survey H-10569. ✓

AWOIS ITEM 52013 ✓

1. Area of Investigation

State: Alaska
Locality: Prince William Sound
Reported Latitude: 60°56'34.54"N
Reported Longitude: 147°07'53.37"W
Datum: NAD83
Depth: 7 FT (1 FM, 2.13 M)
Feature: Obstruction (*position approximate*)

2. Description of Source Item

USGS Survey, BP104500, 1978, 7 FT (1 FM, 2.13 M) depth shown in approximate position. ✓

3. Survey Requirements

Verify or disprove, determine least depth and position. The technique to be used is an echo sounder search with a 200 M search radius.

4. Method of Investigation

An echo sounder search was conducted using mainscheme hydrography combined with 10 M line spacing.

5. Results of Investigation

Date: DN 252
Time (UTC): 21:08:09
Least Depth: 0.8 M (2.6 FT, 0.4 FM)
Position Number: 4524.4
Latitude: 60°56'31.35"N
Longitude: 147°07'55.04"W
Vessel: 2123

6. Comparison with Prior Surveys

No contemporary prior surveys cover this area.

7. Comparison with the Chart and Charting Recommendations

The item was compared to NOS chart 16708, 20th Edition, May 5, 1993, 1:79,291 (NAD 83).

This item was submitted as a danger to navigation.

Recommendation:

Delete charted depth of 1 FM and use survey H-10569 to supersede charted depth. *Concur. Chart 1/2 FM.*

AWOIS ITEM 52016 ✓

1. Area of Investigation

State: Alaska
Locality: Prince William Sound
Reported Latitude: 60°55'27.00"N
Reported Longitude: 147°07'24.00"W
Datum: NAD83
Depth: 74 fathom (135 M)
Feature: Sounding *(existence doubtful)*

2. Description of Source Item

USC&GS Ship Derickson reported, during a 1947 track-line type reconnaissance survey (BP43214), a 74 fathom (135 M) sounding. The position was scaled from NOS Chart 16708, 20th ED, 5/93. A letter from Austin Post stated that the depth is in error and that surveys in the area have shown the depth to be approximately 130 fathom (237 M).

3. Survey Requirements

Verify or disprove, determine least depth and position. The technique to be used is an echo sounder search with a 500 M search radius. ✓

4. Method of Investigation

An echo sounder search was conducted using 100 M line spacing.

5. Results of Investigation

Date: DN 271
Time (UTC): 21:10:16 ✓
Least Depth: 70 FM (129 M)
Position Number: 855.1
Latitude: 60°55'23.94"N
Longitude: 147°07'15.45"W
Vessel: 2124

6. Comparison with Prior Surveys

No contemporary prior surveys cover this area.

7. Comparison with the Chart and Charting Recommendations

The item was compared to NOS chart 16708, 20th Edition, May 5, 1993, 1:79,291 (NAD 83). ✓

Recommendation:

Delete charted depth of 74 FM and use survey H-10569 to supersede charted depth. *CONCUR. Chart ⁷⁴⁶ "70 FM" found during this survey. Chart the surrounding area based on the present survey. (129 meters)*

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

This survey was compared to NOS chart 16508, 20th Edition, May 1, 1993, 1:79,291 (NAD 83) and to chart 16505, 15th Edition, September 1, 1990. The charted soundings were found to be in general agreement with the present survey, with the exception of the two items discussed in Section N. ✓

Non-sounding charted features are discussed in Section J, Shoreline.

Final comparisons will be made at PHS.

Dangers to Navigation

Thirteen dangers to navigation were within the limits of this survey were reported to the Seventeenth Coast Guard District on October 14, 1994. Copies of the correspondence *is attached to* can be found in Appendix I of this report.

P. ADEQUACY OF SURVEY

Except as noted in Section J and prior to final approval, survey H-10569 is complete and adequate to supersede charted depths and features in their common areas. *CONCUR.*

Q. AIDS TO NAVIGATION ✓

None

R. STATISTICS

Vessel:	2120	2123	2124	2125	Total
Number of Positions	12	2767	1612	1567	5946
NM Hydrography	0	164.38	153.99	158.73	477.1

Velocity Casts	4
Detached Positions	75
Bottom Samples	38
Tide Stations	2
NM ² Hydrography	13.4

S. MISCELLANEOUS

Due to the fact that Columbia Glacier is undergoing a period of drastic retreat, prodigious quantities of ice are flowing out of Columbia Bay. The direction and amount of ice flow is ever changing, determined daily by wind and current conditions. Small bays along the north side of Glacier Island and entrance to Long Bay would at times be blocked off by large ice flows. In addition, large ice bergs the size of houses would routinely hang up on shoals along the shoreline. ✓

Bottom samples were collected in accordance with Project Instructions. ✓

No tidal current predictions are available within the sheet limits. ✓

No unusual magnetic variations were noted. ✓

T. RECOMMENDATIONS

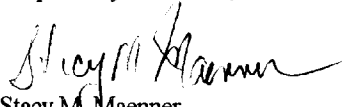
None

U. REFERRAL TO REPORTS

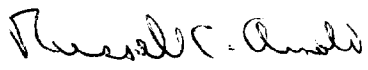
The following supplemental reports contain additional information relevant to this survey:

Title	Date Sent	Office
Fall 1994 Horizontal Control Report for OPR-P125-RA	November 1994	N/CG245
Fall 1994 Coast Pilot Report for OPR-P125-RA	November 1994	N/CG245
Project related data for OPR-P125-RA	Incremental	N/CG245

Respectfully Submitted,


Stacy M. Maenner
Ensign, NOAA

Approved and Forwarded,


Russell C. Arnold
Captain, NOAA
Commanding Officer

CONTROL STATIONS as of 12 Oct 1994

No	Type	Latitude	Longitude	H Cart	Freq	Vel Code	MM/DD/YY	Station Name
101	G	060:50:49.581	147:27:05.696	13	250	0.0	0.0	09/04/94 QUOTE 1947(DGPS)
102	G	060:50:23.798	147:17:24.812	5	250	0.0	0.0	09/04/94 EXIT 1947(DGPS)
103	G	060:56:36.616	147:03:24.109	6	250	0.0	0.0	09/05/94 ELF 1947(DGPS)
104	G	060:42:51.179	147:21:43.053	16	250	0.0	0.0	10/04/94 LUMPY 1947(DGPS)
105	G	060:14:18.000	146:30:48.000	0	250	0.0	0.0	10/04/94 CAPE HINCHINBROOK(DGPS BEACON)
106	G	061:03:00.000	146:42:00.000	0	250	0.0	0.0	10/04/94 POTATO PT(DGPS BEACON)



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 14, 1994

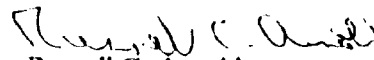
**ADVANCE
INFORMATION**

Commander
Seventeenth Coast Guard District
Post Office Box 25517
Juneau, Alaska 99802

Dear Sir:

NOAA Ship RAINIER has located eighteen dangers to navigation in Northwest Prince William Sound (Project OPR-P125-RA) within the limits of hydrographic surveys H-10568 and H-10569. The attached information is provided for publication in the Local Notice to Mariners for the Seventeenth Coast Guard District. A copy of the chart showing the areas in which the dangers exist is also attached.

Sincerely,


Russell C. Arnold
Captain, NOAA
Commanding Officer

Attachments

cc: DMAHTC
N/CG221
PMC



**ADVANCE
INFORMATION**

Hydrographic Survey Registry Number: H-10568

Survey Title: State: Alaska
 Locality: Northwest Prince William Sound
 Sublocality: Two Nautical Miles East of Glacier Island

Hydrographic Survey Registry Number: H-10569

Survey Title: State: Alaska
 Locality: Northwest Prince William Sound
 Sublocality: Central Glacier Island

Project Number: OPR-P125-RA

Survey Date: September - October 1994

Features are reduced to mean lower low water using predicted tides.

Affected Nautical Charts:

<u>Chart</u>	<u>Edition/Date</u>	<u>Scale</u>	<u>Datum</u>
16700	24th Ed., 1/11/92	1:200,000	NAD83
16708	20th Ed., 5/1/93	1:79,291	NAD83
16705	15th Ed., 9/1/90	1:80,000	NAD83

Danger to Navigation Latitude (N) Longitude (W)

Survey H-10568

			<u>Pos.</u>	<u>Depth(m)</u>
A.	Rock, uncovers 4 FT	60° 55' 56.8"	146° 59' 12.8"	5420. (1) ²
B.	Shoal, covers 3 3/4 FM	60° 56' 16.4"	147° 01' 50.2"	1233 ⁺² 7 ²
C.	Shoal, covers 4 1/2 FM	60° 56' 15.9"	147° 02' 40.2"	1353 ⁺² 8 ⁶
D.	Shoal, covers 5 1/2 FM	60° 53' 36.2"	147° 03' 56.8"	3253 ⁺¹ 10 ³
E.	Shoal, covers 6 1/4 FM	60° 53' 09.5"	147° 04' 09.0"	6976 ⁺² 11 ⁵

**ADVANCE
INFORMATION**

<u>Danger to Navigation</u>		<u>Latitude (N)</u>	<u>Longitude (W)</u>	<u>Pos.</u>	<u>Depth (m)</u>
Survey H-10569					
F.	Shoal, covers 1 3/4 FM	60° 56' 27.3"	147° 11' 42.9"	3352 ⁺²	3 ⁵
G.	Shoal, covers 5 FM	60° 55' 45.1"	147° 11' 07.1"	5515 ⁺⁴	9 ⁵
H.	Shoal, covers 7 FM	60° 54' 37.0"	147° 11' 51.0"	3768 ⁺⁷	13 ²
I.	Shoal, covers 2 1/2 FM	60° 54' 25.3"	147° 11' 03.6"	1138 ⁺¹	4 ⁸
J.	Shoal, covers 3 1/4 FM	60° 54' 28.0"	147° 10' 28.2"	5604 ⁺⁰	6 ³
K.	Shoal, covers 1 3/4 FM	60° 52' 11.0"	147° 11' 14.8"	6577 ⁺⁴	3 ⁶
L.	Shoal, covers 1/4 FM	60° 56' 31.4"	147° 07' 55.0"	4524 ⁺⁴	0 ⁸
M.	Shoal, covers 1 1/2 FM	60° 54' 11.2"	147° 09' 29.4"	2564 ⁺²	2 ⁹
N.	Rock, uncovers 4 FT	60° 54' 41.7"	147° 07' 16.1"	3460	(1)
O.	Shoal, covers 1 FM	60° 54' 29.5"	147° 06' 25.5"	4603 ⁺³	2 ²
P.	Shoal, covers 2 1/4 FM	60° 54' 21.3"	147° 06' 18.4"	4643 ⁺⁵	4 ³
Q.	Shoal, covers 3/4 FM	60° 53' 56.6"	147° 06' 42.6"	4683 ⁺³	17 ⁸
R.	Shoal, covers 1/4 FM	60° 52' 54.2"	147° 08' 18.7"	4701 ⁺³	0 ⁸

Questions concerning this report should be directed to the Chief, Pacific Hydrographic Section at (206) 526-6835.

53

147°

057

10'

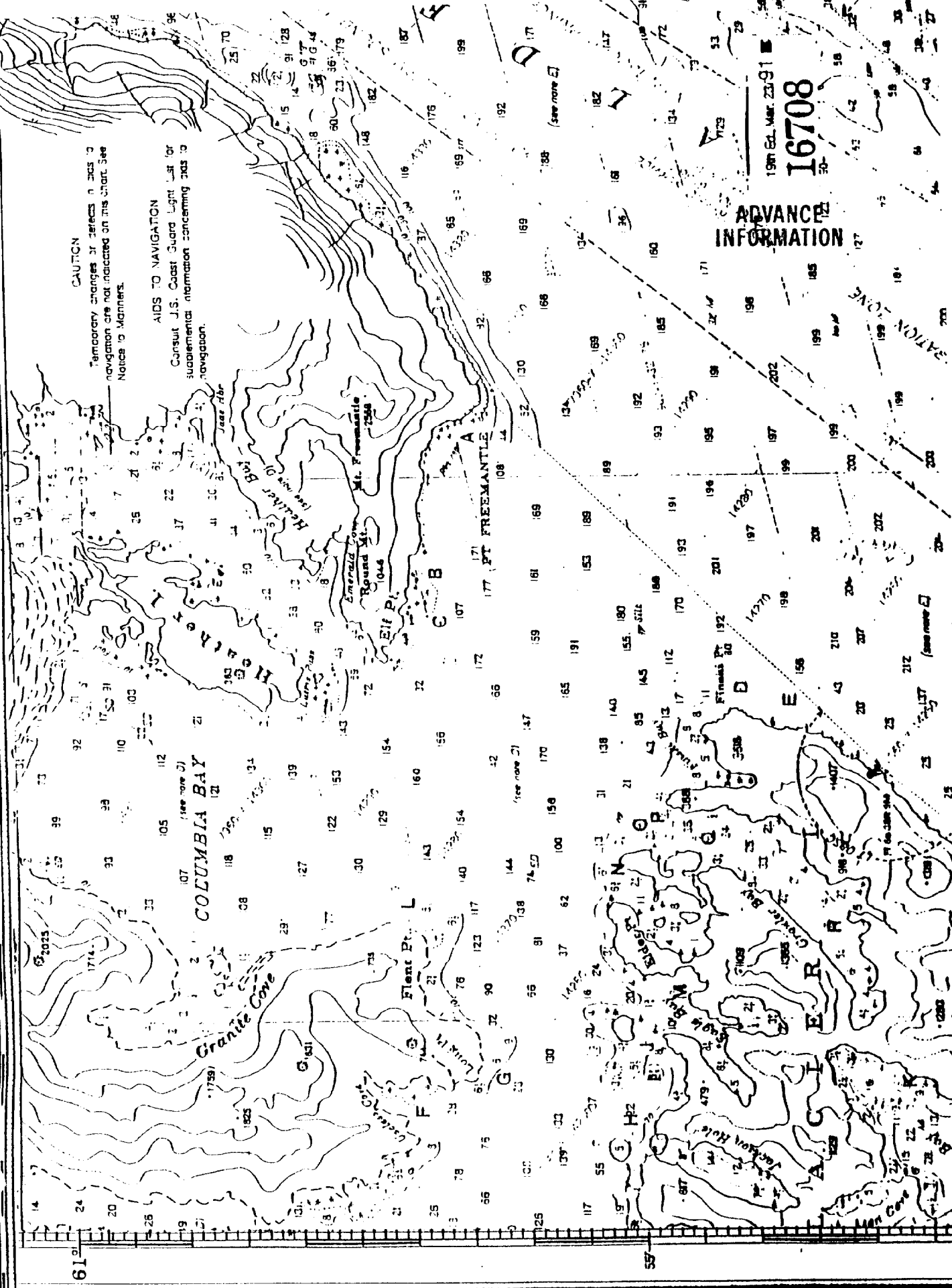
157

CAUTION
 Temporary changes in aids to navigation are not indicated on this chart. See Notices to Mariners.

AIDS TO NAVIGATION
 Consult U.S. Coast Guard Light List for supplemental information concerning aids to navigation.

ADVANCE INFORMATION

1987 Ed. MAR. 23/91
16708



APPROVAL SHEET

for

H-10569
RA-10-16-94

Standard procedures were followed in accordance with the Hydrographic Manual, Fourth Edition; the Hydrographic Survey Guidelines; and the Field Procedures Manual in producing this survey. The data were examined daily during data acquisition and processing.

The field sheet and accompanying records have been examined by me, are considered complete and adequate for charting purposes, and are approved.



Russell C. Arnold
Captain, NOAA
Commanding Officer



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
Office of Ocean and Earth Sciences
Silver Spring, Maryland 20910

ORIGINAL

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE: January 17, 1995

HYDROGRAPHIC SECTION: Pacific

HYDROGRAPHIC PROJECT: OPR-P125-RA

HYDROGRAPHIC SHEET: H-10569

LOCALITY: Central Glacier Island, Prince William Sound,
Alaska

TIME PERIOD: September 5 - 29, 1994

TIDE STATION USED: 945-4240 Valdez, Prince William Sound, Ak.
Lat. $61^{\circ} 7.5'N$ Lon. $146^{\circ} 21.7'W$

PLANE OF REFERENCE (MEAN LOWER LOW WATER): 6.65 ft.
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 11.1 ft.

TIDE STATION USED: 945-4476 Columbia Bay, Prince William Sound,
Ak.
Lat. $60^{\circ} 59.8'N$ Lon. $147^{\circ} 7.1'W$

PLANE OF REFERENCE (MEAN LOWER LOW WATER): -4.29 ft.
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 11.0 ft.

REMARKS: RECOMMENDED ZONING

Times and heights are direct on Columbia Bay, Ak. (945-4476). Where data for Columbia Bay, Ak. (945-4476), is not available, times are direct, and apply a X0.98 range ratio to heights using Valdez, Ak. (945-4240).

Notes: 1. Times are tabulated in Greenwich Mean Time.

2. Data for Valdez, Ak. (945-4240) and Columbia Bay, Ak. (945-4476) are temporarily stored in files #745-4240 and #745-4476 respectively.

[Signature]
CHIEF, DATUMS SECTION



GEOGRAPHIC NAMES

Name on Survey	ON CHART NO. 16708											
	A	B	C	D	E	F	G	H	K			
	ON PREVIOUS SURVEY NO.	CON U.S. QUADRANGLE MAPS	FROM LOCAL INFORMATION	ON LOCAL MAPS	P.O. GUIDE OR MAP	GRAND McNALLY ATLAS	U.S. LIGHT LIST					
ALASKA (title)	X		X									1
BULL HEAD	X		X									2
CAVE POINT	X		X									3
CHAMBERLAIN BAY	X		X									4
EAGLE BAY	X		X									5
ELDER POINT	X		X									6
FLENT POINT	X		X									7
GLACIER ISLAND	X		X									8
GROWLER BAY	X		X									9
LONG POINT	X		X									10
PRINCE WILLIAM SOUND	X		X									11
USELESS COVE	X		X									12
												13
												14
												15
												16
												17
												18
												19
												20
												21
												22
												23
												24
												25

Approved

Charles C. Clay
Chief Geographer

OCT 4 1995

NOAA FORM 77-27(H) (9-83)		U.S. DEPARTMENT OF COMMERCE		REGISTRY NUMBER	
HYDROGRAPHIC SURVEY STATISTICS				H-10569	
RECORDS ACCOMPANYING SURVEY: To be completed when survey is processed.					
RECORD DESCRIPTION		AMOUNT		RECORD DESCRIPTION	
SMOOTH SHEET		1		SMOOTH OVERLAYS: POS., ARC, EXCESS	
DESCRIPTIVE REPORT		1		FIELD SHEETS AND OTHER OVERLAYS	
DESCRIP- TION	DEPTH/POS RECORDS	HORIZ. CONT. RECORDS	SONAR- GRAMS	PRINTOUTS	ABSTRACTS/ SOURCE DOCUMENTS
ACCORDION FILES	2				
ENVELOPES					
VOLUMES					
CAHIERS					
BOXES					
SHORELINE DATA					
SHORELINE MAPS (List):		DM-10061, TP-00265			
PHOTOBATHYMETRIC MAPS (List):		N/A			
NOTES TO THE HYDROGRAPHER (List):		None			
SPECIAL REPORTS (List):		None			
NAUTICAL CHARTS (List):		16705, 15th Ed., Sept. 1, 1990, 16708, 20th Ed., May 1, 1993			
OFFICE PROCESSING ACTIVITIES The following statistics will be submitted with the cartographer's report on the survey					
PROCESSING ACTIVITY			AMOUNTS		
			VERIFICATION	EVALUATION	TOTALS
POSITIONS ON SHEET					5946
POSITIONS REVISED					
SOUNDINGS REVISED					
CONTROL STATIONS REVISED					
			TIME-HOURS		
			VERIFICATION	EVALUATION	TOTALS
PRE-PROCESSING EXAMINATION					
VERIFICATION OF CONTROL					
VERIFICATION OF POSITIONS			12.0		12.0
VERIFICATION OF SOUNDINGS					
VERIFICATION OF JUNCTIONS					
APPLICATION OF PHOTOBATHYMETRY					
SHORELINE APPLICATION VERIFICATION					
COMPILATION OF SMOOTH SHEET			119.0		119.0
COMPARISON WITH PRIOR SURVEYS AND CHARTS					
EVALUATION OF SIDE SCAN SONAR RECORDS					
EVALUATION OF WIRE DRAGS AND SWEEPS					
EVALUATION REPORT				21.0	21.0
GEOGRAPHIC NAMES					
OTHER*					
*USE OTHER SIDE OF FORM FOR REMARKS			TOTALS	131.0	21.0
					152.0
Pre-processing Examination by LT M. Larsen			Beginning Date 10/19/94	Ending Date 11/21/94	
Verification of Field Data by L. Deodato, E. Domingo, D. Doles, G. Kay, J. Stringham			Time (Hours) 116.0	Ending Date 11/22/95	
Verification Check by J. Stringham			Time (Hours) 15.0	Ending Date 5/4/95	
Evaluation and Analysis by I. Almacen			Time (Hours) 21.0	Ending Date 12/12/95	
Inspection by B.A. Olmstead			Time (Hours) 6	Ending Date 12/18/95	

EVALUATION REPORT

H-10569

A. PROJECT

Project information is discussed in the hydrographer's report.

B. AREA SURVEYED

This survey was conducted in Alaska, in the northwestern part of Prince William Sound. It covers the area around the eastern portion of Glacier Island including Growler Bay, Eagle Bay and the inner section of Chamberlain Bay. The coastline is generally comprised of ledges, reefs, isolated off-lying rocks and islets. Some rocky pinnacles that rise up close to the surface and isolated shoals were found throughout the survey area. The bottom is generally made up of sand and mud. Depths range from 0.0 to 428.0 meters.

C. SURVEY VESSELS

Survey vessel information is found in the hydrographer's report.

D. AUTOMATED DATA ACQUISITION AND PROCESSING

Survey data were processed using the same Hydrographic Data Acquisition/Processing System (HDAPS) software used by the hydrographer, the Hydrographic Processing System (HPS) and AutoCad, Version 12.

At the time of the survey certification the format for transmission of digital data had not been formally approved. In the interim, digital data for this survey exists in the standard HPS format which is a database format using the .dbf extension. In addition, the sounding plot, created with .dbf (extension) and enhanced using the AutoCad system, is filed both in the AutoCad drawing format, i.e., .dwg (extension); and in the more universally recognized graphics transfer format, .dxf (extension). Copies of these files will be retained at PHS until data transfer protocols are developed and improved.

The drawing files necessarily contain information which 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 Hydrographic Survey Guideline No. 75.

The field sheet parameters have been revised to center the hydrography on the office plot. Data is plotted using a Modified Transverse Mercator projection and are depicted on a

single sheet.

E. SONAR EQUIPMENT

Side scan sonar was not used on survey H-10569.

F. SOUNDING EQUIPMENT

Sounding equipment is discussed in the hydrographer's report.

G. CORRECTIONS TO SOUNDINGS

The sounding data have been reduced to Mean Lower Low Water (MLLW). The reducers include corrections for actual tide, dynamic draft, and sound velocity. These reducers have been reviewed and are consistent with present NOS specifications. Actual tide reduction is derived from Valdez, Prince William Sound, Alaska gage (945-4240) and Columbia Bay, Prince William Sound, Alaska gage (945-4476). Refer to the approved tide note attached to this report concerning recommended tidal zoning.

H. CONTROL STATIONS

Sections H and I of the hydrographer's descriptive report contain adequate discussions of horizontal control and the 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 also based on NAD 83. The AutoCAD generated smooth sheet is annotated with an NAD27 adjustment tick based on values determined with NGS program NADCON.

Data based on NAD 27 may be referenced to this survey by applying the following corrections:

Latitude: -1.959 seconds (-60.638 meters)
Longitude: 7.363 seconds (111.037 meters)

The year of establishment of the control stations originates with the horizontal control records and the hydrographer's signal list. The control station used during this survey plot outside of the sheet limits.

I. HYDROGRAPHIC POSITION CONTROL

Differential GPS (DGPS) was used to control this survey. There are a few positions where the maximum allowable horizontal dilution of precision (HDOP) limits of 3.75 have been exceeded during this survey. A review of the data, however, shows that the positioning of soundings located by these fixes is consistent with the surrounding information and is

considered acceptable. These positions are isolated and occur randomly throughout the survey. None of these survey positions are used to locate critical soundings and dangers to navigation. Daily DGPS performance checks were conducted in the field and found adequate.

J. SHORELINE

The following shoreline maps apply to this survey.

<u>Map Number</u>	<u>Date of Photography</u>	<u>Scale</u>	<u>Datum</u>
DM-10061	July 1989	1:20,000	NAD83
TP-00265	July 1972	1:20,000	NAD27

Some new features in the area were noted during this survey. Most of the islets and rocks depicted on the above maps were identified in the field as reefs, high points or extensions of newly located ledges. These features have been adequately depicted on the AutoCad generated smooth sheet based on the latest survey information. Further discussions concerning the changes noted during this survey is included in the hydrographer's report.

K. CROSSLINES

Crosslines are discussed in the hydrographer's report.

L. JUNCTIONS

Survey H-10569 junctions with the following surveys.

<u>Survey</u>	<u>Year</u>	<u>Scale</u>	<u>Area</u>
H-10566	1994	1:10,000	West
H-10567	1994	1:10,000	North
H-10568	1994	1:10,000	East
H-10570	1994	1:10,000	West
H-10571	1994	1:20,000	South

The junction with survey H-10571 was made using a copy as this survey has been previously processed and mailed to headquarters. The soundings and depth curves are in good agreement.

The junctions with the remaining surveys listed above are complete. The depth curves and soundings within the junction areas are in satisfactory agreement.

M. COMPARISON WITH PRIOR SURVEYS

Survey H-10569 was compared with the following survey.

H-9637 (1976), scale 1:10,000

Comparison with this prior survey is considered satisfactory. Depth agreement between survey H-9637 and the present survey is within 1 to 5 meters (0.5-2.5 fathoms), however, no consistent pattern of either shoaling or deepening were noted within the area of the survey.

Depth differences with this prior survey could be attributed to the more modern data acquisition, surveying methods and increase bottom coverage of the present survey. The effects of the 1964 earthquake could also be considered as another factor for the change in the bottom configuration of the area.

Survey H-10569 is adequate to supersede the prior survey within the common area of coverage.

N. ITEM INVESTIGATIONS

There are two (2) AWOIS items investigated during this survey. Discussion and disposition of these items are included in the hydrographer's report.

O. COMPARISON WITH CHART

Survey H-10569 was compared with the following charts.

<u>Chart</u>	<u>Edition</u>	<u>Date</u>	<u>Scale</u>	<u>Datum</u>
16708	20th	May 1, 1993	1:79,291	NAD83
16705	15th	Sept. 1, 1990	1:80,000	NAD83
16700	24th	Jan. 11, 1992	1:200,000	NAD83

a. Hydrography

Charted hydrography originates with the previously discussed prior survey and miscellaneous sources from surveys conducted in 1947 and 1978. The prior survey is discussed in section M and require no further discussion.

Comparisons with the presently charted depths originating from USCGS and USGS reconnaissance surveys reveal no consistent pattern of changes between the present and the past surveys. Depth comparisons reflect the same general differences as mentioned in section M, except along the middle of Growler Bay where the depths were found generally deeper by more than 20 meters during this survey. Additionally, there are a few charted soundings which are from 15 to 50 meters shoaler than the present survey. However, a one hundred meter shift in either direction brings these charted depths into good agreement with the current survey data. It is likely that either a positioning error or erroneous depth measurement accounts for these discrepancies. Most of the charted rocks were identified in the field as high points or extensions of ledges and reefs along the coast.

Survey H-10569 is adequate to supersede charted hydrography within the common area of coverage.

b. Dangers to Navigation

Thirteen (13) dangers to navigation were reported to the USCG, DMAHTC, and N/CG221, on October 14, 1994. A copy of the report is attached. No additional dangers were found during office processing.

P. ADEQUACY OF SURVEY

Hydrography contained on survey H-10569 is adequate to:

- a. delineate the bottom configuration, determine least depths, and draw the standard depth curves;
- b. reveal there are no significant discrepancies or anomalies requiring further investigation; and
- c. show the survey was properly controlled and soundings are correctly plotted.

The hydrographic records and reports received for processing are adequate and conform to the requirements of the Hydrographic Manual, 4th Edition, revised through Change No.3, the Hydrographic Survey Guidelines, and the Field Procedure Manual, April 1994 Edition.

Survey H-10569 adequately complies with the project instructions.

Q. AIDS TO NAVIGATION

There are no aids to navigation and charted landmarks located within the limits of this survey.

R. STATISTICS

Statistics are itemized in the hydrographer's report.

S. MISCELLANEOUS

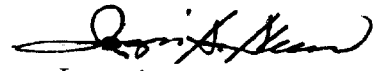
Miscellaneous information concerning this survey is discussed in the hydrographer's report.

T. RECOMMENDATIONS

Survey H-10569 is a good hydrographic survey and no additional field work is required.

U. REFERRAL TO REPORTS

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

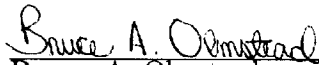


Isagani A. Almacén
Cartographer

APPROVAL SHEET
H-10569

Initial Approvals:

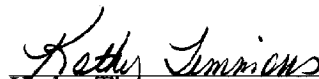
The completed survey has been inspected with regard to survey coverage, delineation of the depth curves, development of critical depths, cartographic symbolization, comparison with prior surveys and verification or disproval of charted data. The digital data have been completed and all revisions and processing have been entered in the magnetic tape record for this survey. Final control, position, and sounding printouts have been made and are included with the survey records. The survey records and digital data comply with NOS requirements except where noted in the Evaluation Report.



Bruce A. Olmstead
Senior Cartographer, Cartographic Section
Pacific Hydrographic Branch

Date: 12/18/95

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.




Kathy Timmons
Commander, NOAA
Chief, Pacific Hydrographic Branch

Date: 12/19/95

Final Approval

Approved:



Andrew A. Armstrong III
Captain, NOAA
Chief, Hydrographic Surveys Division

Date: 2/16/96

