

H10637

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-10-14-95
Registry No. H-10637

LOCALITY

State Alaska
General Locality Prince William Sound
Sublocality Northern Portion of Culross
Passage

1995

CHIEF OF PARTY
CAPT Dean R. Seidel, NOAA

LIBRARY & ARCHIVES

DATE APR 29 1997

DIAGRAM 8551-4

Charts

HYDROGRAPHIC TITLE SHEET

H-10637

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-10-14-95

State Alaska
General locality Prince William Sound
Locality Northern Portion of Culross Passage
Scale 1:10,000 Date of survey August 25 - September 25, 1995

Instructions dated July 18, 1995 Project No. OPR-P125-RA
Change #1 - August 30, 1995

Vessel NOAA Ship RAINIER (2120), RA-2 (2122), RA-3 (2123), RA-4 (2124), RA-5 (2125), RA-6 (2126), RA-9 (2129)

Chief of party CAPT Dean R. Siedel, NOAA

Surveyed by LCDR A. Francis, LT D. Haines, LT M. Larsen, ENS S. Smith, ENS S. Maenner, ENS N. Bennett, ENS J. Becker, CST F. Paranada, ST N. Quanbeck, ST B. Baum

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

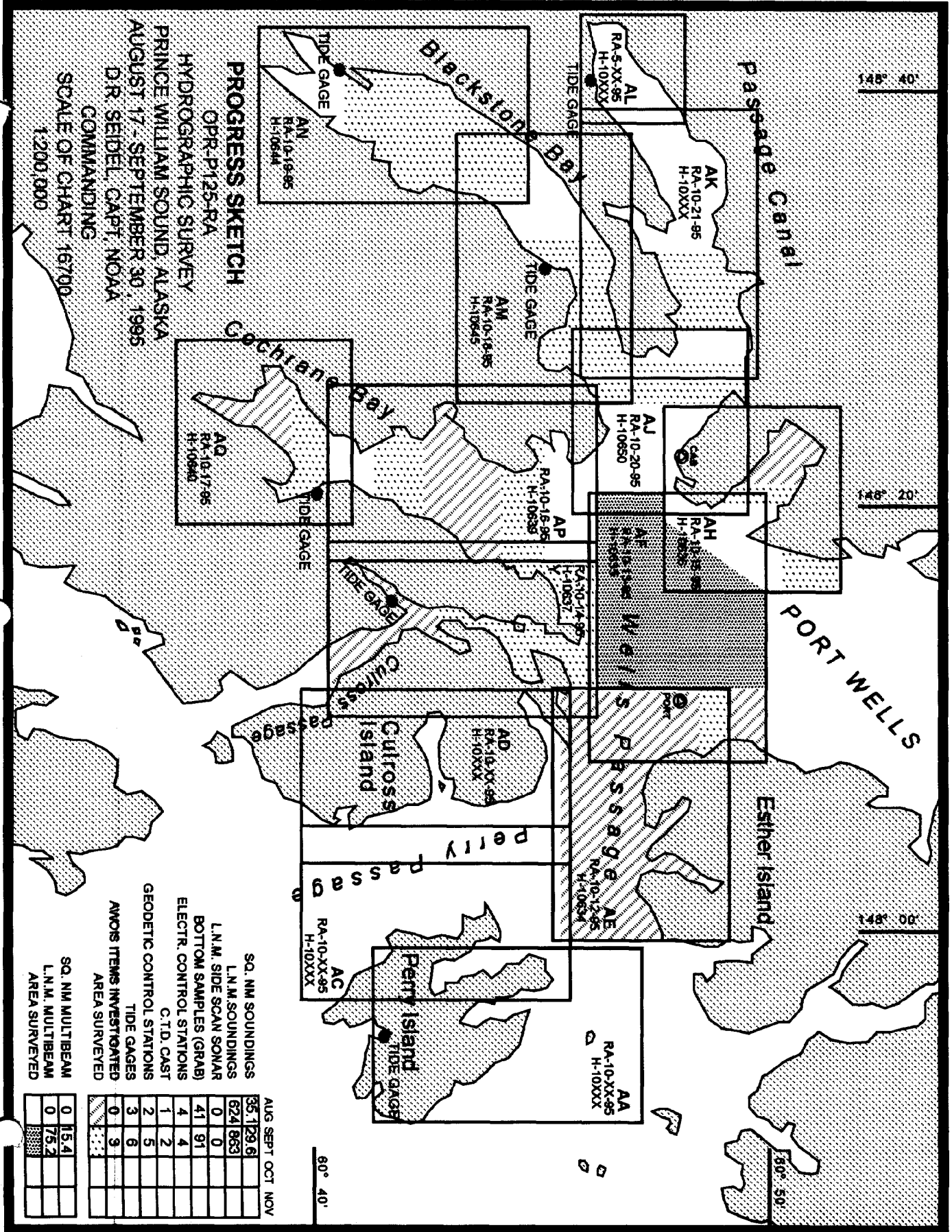
Verification by D. Doles, J. Stringham, R. Mayor, I. Almacen

Soundings in fathoms ~~XXXX~~ at ~~MLW~~ 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.

AWBIS/SURF 4/23/97 mkr

SA 4-29-97



PROGRESS SKETCH
 OPR-P125-RA
 HYDROGRAPHIC SURVEY
 PRINCE WILLIAM SOUND, ALASKA
 AUGUST 17 - SEPTEMBER 30, 1995
 DR. SEIDEL, CAPT, NOAA
 COMMANDING

SCALE OF CHART 16700
 1:200,000

		AUG			SEPT			OCT			NOV		
SO. NM SOUNDINGS	36	129	6										
L.N.M. SOUNDINGS	624	863											
L.N.M. SIDE SCAN SONAR	0	0											
BOTTOM SAMPLES (GRAB)	41	91											
ELECTR. CONTROL STATIONS	4	4											
C.T.D. CAST	1	2											
GEODETIC CONTROL STATIONS	2	5											
TIDE GAGES	3	6											
AMOS ITEMS INVESTIGATED	0	3											
AREA SURVEYED													
SO. NM MULTIBEAM	0	15.4											
L.N.M. MULTIBEAM	0	75.2											
AREA SURVEYED													

60° 40'

148° 40'

148° 20'

148° 00'

80° 50'

Descriptive Report to Accompany Hydrographic Survey H-10637

Field Number RA-10-14-95

Scale 1:10,000

August - September 1995

NOAA Ship RAINIER

Chief of Party: Captain Dean R. Seidel, NOAA

A. PROJECT ✓

This basic hydrographic survey was completed in Northwest Prince William Sound, Alaska, as specified by Project Instructions OPR-P125-RA dated July 18, 1995, and Change Number 1 dated August ~~25~~₃₀, 1995.

Survey H-10637 corresponds to "sheet Y" as defined in the Project Instructions.

This survey will provide contemporary hydrographic survey data for updating existing nautical charts. Requests for hydrographic surveys and updated charts have been received from the Defense Mapping Agency, the Southwest Alaska Pilot's Association, and private interests such as cruise ship lines and local fishermen.

B. AREA SURVEYED ✓

The survey area is located in the northern end and the northern approaches to Culross Passage. The survey's eastern limit is bounded by 148° 11.0'W, and the western limit bounded by 148° 18.0'W. The northern limit is bounded by 60° 46.3'N, and the southern limit is 60° 40.5'N in the main Culross Passage and the south shore in Long Bay.

Data acquisition was conducted from August 25, 1995 (DN 237) to September 25, 1995 (DN 268).

C. SURVEY VESSELS ✓

Data were acquired by six survey launches and RAINIER as noted below:

Vessel	EDP #	Operation
RAINIER	2120	Bottom Samples Sound Velocity Casts
RA-2	2122	Hydrography Shoreline Verification
RA-3	2123	Hydrography Shoreline Verification

Vessel	EDP #	Operation
RA-4	2124	Hydrography Shoreline Verification
RA-5	2125	Hydrography Shoreline Verification Bottom Samples
RA-6	2126	Hydrography Shoreline Verification
RA-9	2129	Shoreline Verification

D. AUTOMATED DATA ACQUISITION AND PROCESSING

HDAPS

Data were acquired and processed using HDAPS Programs. A complete listing is included in Appendix VI. *

Problems

One line from DN 243, VN 2126 was mistakenly edited as a DP line. Since the soundings were flagged as DPs, they were not excessed and plotted with the soundings. The problem was not caught until the final plots had been made. The digital data is correct. *This problem was corrected during the final processing.*

HYPACK

Data were acquired with RA-2 and RA-9 using Coastal Oceanographics' HYPACK. Data acquired on DN 237 were collected using HYPACK for Windows, v. 5.2, with the following program updates.

Program Name	Version	Date Installed
WDESIGN	8/7/95	16 August 1995
WSETUP	3/22/95	16 August 1995
WSHORE	8/2/95	16 August 1995
WSURVEY	7/14/95	16 August 1995
DSF6000.DLL	8/20/95	21 August 1995
INN_NOAA.DLL	8/9/95	21 August 1995

* Filed with the survey records.

Program Name	Version	Date Installed
NMEA.DLL	7/25/95	16 August 1995

Processing was conducted using the HDAPS HP system. HYPACK for Windows files were translated to an HDAPS format using a Visual Basic program HYPMENU version 2.28 provided by N/CS 32. The files were then loaded into HDAPS and processed in the same manner as HDAPS data.

Data acquired on DN 238-252 were collected using HYPACK (DOS), v. 5.2, with the following program updates:

Program Name	Version	Date Installed
HYSPEED	3/24/95	1 April, 1995
IOTEST	3/17/95	1 April, 1995

Processing was conducted using the HDAPS HP system. HYPACK (DOS) files were translated to a PC_DAS format using a Power Basic program CONV_HYP.EXE (11/11/95) provided by N/CS 32 and modified by RAINIER personnel. The files were then loaded into HDAPS and processed in the same manner as PC_DAS data.

In addition GPSINIT.BAT (5/19/94), was used to initialize the Ashtech GPS receiver.

Problems (*See attached copy of memorandum addressed to the chief, Hydrographic Survey Division concerning HYPACK problems in the field.*)

Data collected with HYPACK for Windows on DN 237 contained discrepancies between the records on the Raw Master Printout produced by HYPACK and the digital records produced for HDAPS by HYPMENU. HYPMENU uses the raw sensor data to compile records for HDAPS, and the algorithm used differed from the algorithm used by HYPACK for record selection. The result was slightly different positions and/or depths in the digital record than appeared on the RMPO. The position difference depends on vessel speed, but the average time difference was about one second, which corresponds to 3 meters at 6 knots.

Additionally, the dead-reckoning algorithm built into HYPMENU's convert program did not function correctly when lines ended without positioning.

RAINIER considered these problems serious enough to cease data collection with HYPACK (Windows) and revert to HYPACK (DOS) until the problems could be resolved. Hydrographic Surveys Division was notified of the problems by a memo on August 27, 1995.

All data collected with HYPACK (Windows) was scanned for the above problems, comparing

the depth, position and time of the RMPO produced on line to a RMPO produced after the fact in HDAPS. Depths in the HDAPS RMPO differing materially from the original RMPO were changed. Records which differed in time by more than two seconds were rejected.

HYPACK (Windows) Raw Master Printouts do not contain the HDOP or number of satellites used. The HDOP was monitored on-line and any time HDOP exceeded the threshold (3.75 for USCG beacon or 6.0 for fly-away stations), data acquisition was suspended. High HDOP was flagged by HDAPS during processing, and the data abstracts were checked for any suspect positions.

VELOCITY

Velocity corrections were determined using:

Program Name	Version	Date Installed
VELOCITY	2.11	5 Mar 1995

E. SONAR EQUIPMENT

Sonar equipment was not used on H-10637.

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.

An INNERSPACE 448, Serial Number 300, is a single frequency (208kHz) thermal paper trace depth sounder recorder, and was used on 2129.

G. CORRECTIONS TO ECHO SOUNDINGS

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

Velocity Table #	Cast #	DN	Cast Position	Deepest Depth (m)	Applicable DN
1	1	239	60° 45' 42" N 148° 09' 48" W	600	235-244
3	2	253	60° 47' 12" N 148° 13' 42" W	535	248-258
4*	2	253	60° 47' 12" N 148° 13' 42" W	535	248-258
5	3	264	60° 47' 38" N 148° 19' 15" W	546	262-268

*Note: Table 4 used for RAINIER (2120).

The sound velocity casts were acquired with SBE SEACAT Profiler (S/N 811), calibrated 03/31/95. 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 Table 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 RAINIER and vessels 2122-2129 in the spring of 1995. These values were entered into the offset tables for each survey platform.

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 for 2123-2126 was collected in Shilshole Bay, Washington in the Spring of 1995. The data for 2122 were collected in Windham Bay, Alaska, in May 1995 (OPR-O136). The data for RAINIER was determined during the Southern Alaska Peninsula project (OPR-P180) in the Summer of 1994.

Offset Tables ✓

Offset tables contain offsets for the GPS antenna, as well as static draft measurements, and settlement and squat data. Offset tables 2-9 correspond to the number of the vessel, offset table 1 is used for RAINIER. The offset tables are contained in the "Separates to be Included with Survey Data".

* Filed with the survey records .

Heave ✓

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

Bar Check and Lead Lines ✓

Bar check lines were calibrated by RAINIER personnel during the winter inport 1994-1995. 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 through N/CS31 for the Cordova, Alaska reference station (945-4050). Tidal correctors as provided in the original project instructions were ambiguous. The tide zones as described did not cover the entire survey area and overlapped in some areas. The zones were modified by phone conversation with William M. Gibson, N/OES231 on August 24, 1995 and described in Change Number 1 to Project Instructions. Tidal correctors used by RAINIER for this sheet differ slightly from Change Number 1, but since acquisition had already begun, RAINIER didn't change corrector tables. Tidal correctors used on this sheet are:

Definition of Applicable Area	Tide Table*	Height Correction	Time Correction
North of 60° 45' 30" N, Outside of Passage	1,11	X0.96	0 hr 0 min
Inside Passage, South of 60° 41' 30" N and between 60° 43' 48" N and 60° 45' 30" N	2,12	X0.94	0 hr 18 min
Inside Passage, between 60° 41' 30" N and 60° 43' 48" N	3,13	X0.92	0 hr 18 min

*Note: Tables 1-3 are for August, Tables 11-13 are for September.

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

Valdez, AK (945-4240) was used as the primary control station for datum determination at all subordinate stations.

RAINIER personnel installed 8200 digital gages at Perry Island, South Bay (945-4721) on August 22, 1995 and Long Bay Entrance, Culross Passage (945-4825) on August 24, 1995. The staff was connected to five benchmarks at both stations during opening levels. Opening levels were conducted August 22, 1995 at Perry Island and August 24, 1995 at Long Bay.

* Filed with the survey records.

Both tide gages ran without problems during data acquisition.

The station descriptions, field tide records, preliminary field tide notes and data (Appendix V) have been forwarded to N/OES212 in accordance with HSG 50 and FPM 4.3. A request for approved tides was forwarded to N/OES23 in accordance with FPM 4.2.3.

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

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

DGPS stations were installed on existing stations PORT and CAB. Station PORT is located on Esther Rock, and station CAB is located on a prominent point west of Pigot Point light. These stations were recovered in accordance with methods stated in Section 5.2.4 of the FPM.

For further information see the "Fall 1995 Horizontal Control Report" that will be submitted at the end of the project.

I. HYDROGRAPHIC POSITION CONTROL *(See EVAL RPT., Sec. I)*

Method of 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 ✓

VHF differential shore stations were established at stations CAB and PORT. The difference between the computed location and the published positions at station CAB and PORT were recorded by the MONITOR 3.0 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 station. Scatterplot results are included in the "Project related data for OPR-P125-RA". *

Calibrations & Systems Check Methods ✓

System checks were performed in accordance with Section 3.4.4 of the FPM. Two observations of position were made from two independent DGPS base stations. The results were transferred to forms which are included in the project data for OPR-P125-RA. 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". *

** Filed with the survey records.*

Problems

HYPACK (Windows) Raw Master Printouts do not contain HDOP or number of satellites. For launch to launch system checks, the HDOP and number of satellites were assumed to be the same for both boats. RAINIER is pursuing other ideas for working around this problem until the printout is corrected.

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

Shoreline map DM-10188 was supplied by N/CS341 in mylar and Standard Digital Data Exchange Format (SDDEF). The digital files were projected to the survey grid with OPR-P125-RA geodetic parameters using program Shore version 1.5, provided by N/CS32, and stored in HYPACK (*.DIG) format. Shoreline was plotted at survey scale on boat sheets and processing sheets.

Method of Shoreline Verification ✓

Shoreline verification was conducted near predicted lower low water in accordance with FPM 7.1 except as noted below.

Shoreline verification was accomplished by assigning sequential reference numbers or taking detached positions (DPs), as explained later in this section.

Shoreline and DM 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 DM. 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 DM when deemed necessary. The annotated photocopies of the DM and the reference forms are included with the survey data. DPs taken during shoreline verification were recorded on DP forms. These indicate significant DM features and features not found on the DM. Where possible, positions of some DM features were verified during inshore hydrography and annotated on the RMPO. ✓

Detailed 1:10,000 "Bottom Sample and Detached Position Plots" are provided showing all reference numbers, detached positions, and notes relating to each feature. The information from these plots was transferred to a final field plot where possible. ✓

Verified DM features were retained and shown in black. Changes to the shoreline features are shown in red and the new features are depicted in black. Field cartographic codes were assigned using the HDAPS DP editor. Heights are recorded in meters and decimeters and are corrected to predicted MLLW. ✓

Changes and New Features ✓

There were numerous changes and some new features found during shoreline verification. DM rocks were often identified as high points of ledges or reefs.

Sea grass was common between 1-3m below MLLW throughout the project area. Grass symbols appear on the DP and BS plot in the area where the grass was a hazard to navigation or was unusually thick. ✓

Disprovals ✓

A charted rock and two DM rocks outside of Culross Passage fall within the search radius of AWOIS# 52243. See Section N for discussion.

A DM rock at position 60° 45' 15" N 148° 11' 03"W was not found. The item was investigated (Pos# 7800, DN 237, VN 2126) by visual and echosounder search. The average depth at the reported position is 5 m, search time 15 min, search radius 50m, visibility 5m (bottom visible); fifty meter line spacing was run in the area. The hydrographer recommends that the rock symbol from the shoreline manuscript not be charted. *Concur.*

A DM rock at position 60° 45' 16" N 148° 11' 06"W was not found. The item was investigated (Pos# 7804, DN 237, VN 2126) by visual and echosounder search. The average depth at the reported position is 5 m, search time 15 min, search radius 50m, visibility 5m (bottom visible); fifty meter line spacing was run in the area. The hydrographer recommends that the rock symbol from the shoreline manuscript not be charted. *Concur.*

A DM obstruction is shown on the mylar at position 60° 40' 52" N 148° 12' 57"W; a small dot and the word "obstruction" is the only information given. The item was investigated (Pos# 5603, DN 241, VN 2125) by visual and echosounder search. The reported position is near the high water line and could not be reached with the boat. No obstructions were observed in the water or on the beach; search time 15 min, visibility 5m (see bottom); fifty meter line spacing was run in the area. The hydrographer recommends that the obstruction symbol from the shoreline manuscript not be charted. *Concur. Chart the area based on the present survey.*

A DM rock at position 60° 41' 24" N 148° 13' 59"W was not found. The item was investigated (Pos# 5605, DN 241, VN 2125) by visual and echosounder search. Search time 15 min, visibility 6m, average depth 25m; fifty meter line spacing was run in the area, and no indication was observed on the echogram. The hydrographer recommends that the rock symbol from the shoreline manuscript not be charted. *Concur. Chart the 3.7 fathoms shoal sounding found in the area at Lat 60/41/18.37N, Long 148/12/58.82W.*

Two ledges originating on the mylar DM plot (approx 60° 41' 57" N 148° 15' 40"W) were not found during an investigation on DN 256, VN 2123. Dense grass beds were noted in the location of the DM ledges; DPs 1775-1777 mark the extent of the grass beds. While this grass was especially thick, sea grass is common throughout the survey between 1-3m below MLLW;

the hydrographer recommends that the ledge symbols from the shoreline manuscript not be charted, and that no grass symbol be charted either. *Concur. Chart approx. limit of grass in the area. This cannot be depicted at chart scale.*

Problems

In the southern extension of Long Bay and in the small cove just north of Goose Bay, the entrances were blocked at low tide, so shoreline verification was conducted at high tide. Neither area is recommended for navigation except by ~~shoat~~ draft vessels at high tide. *Concur. Shallow*

Recommendations

The hydrographer recommends that the shoreline as depicted on the ~~final field~~ sheet from the survey be used to ^{update} ~~supersede~~ shoreline information compiled on DM-10188. *Concur. Use the final Smooth Sheet.*

Charted Features (Chart 16705)

Charted rocks were either identified as new rocks, high points or extensions of DM ledges and reefs, with the following exceptions:

Three charted rocks at the head of Goose Bay (approx 60° 43' 02" N, 148° 13' 30"W) originate from T-9137 (1:20,000, 1949). The source mark-up states that T-9137 has been superseded. No prior surveys exist in Goose Bay, so the rocks are unverified. None of the charted rocks were observed during two separate investigations at MLLW (DN 239, VN 2129 and DN 240, VN 2122). Thick sea grass was noted in the area. To further disprove the rocks, 10m splits were run over the charted position of each rock to a 40m radius. The water clarity was excellent, with the bottom visible for 5-10m on either side of the launch. A lookout was posted during the development. No features were observed on either the fathogram or visually. The positions of two of the charted rocks lie on the drying line, while the third plots on a steep slope running from 1 to 10 meters of water. The hydrographer recommends deleting all three rock symbols from the chart. *Concur. Chart the area based on the present survey.*

A charted rock at position 60° 44' 55" N 148° 14' 34"W was not found. The rock does not appear on H-8608, and the chart markup shows no other source. The item was investigated (Pos# 11468, DN 238, VN 2122) by visual and echosounder search. The depth at the charted position is ^{7.3 m (13.5m)} 17.3 m, search time 10 min, search radius 50m, visibility 5m; fifty meter line spacing was run in the area. The hydrographer recommends deleting the rock symbol from the chart. *Concur. Chart the area based on the present survey.*

A charted rock at position 60° 43' 20" N 148° 14' 36"W was not found. The item was investigated (Pos# 23889, DN 252, VN 2122) by visual and echosounder search. The depth at the charted position is approximately 10 m; fifty meter line spacing was run in the area. A DM rock is located approximately 40 m away to the northeast. The rock is quite obvious, being exposed at all but high tide. The hydrographer recommends moving the charted rock symbol to the DM rock location at 60° 43' 21.5" N 148° 14' 34.0"W. *Do not concur. Delete the charted rock and chart the reef from DM at Lat 60/43/21.5N, Long 148/14/34.0 W. Also, delete the submerged rock charted 150m SW of the reef and the rock west of Lat 60/43/16.09N, Long. 148/14/39.55W, located during this survey.*

A charted rock at position 60° 43' 43" N 148° 14' 32"W was not found. The item was investigated (Pos# 1865, DN 256, VN 2123) by visual and echosounder search. The depth at the charted position is ^{3.3}12.3 m, ^(4.2 fm) water visibility 3 m, search radius 50m, search time 15 minutes; fifty meter line spacing was run in the area in both E-W and N-S directions. There is a ledge protruding off of the island to the south, approximately 50 meters from the charted position. Accurate depiction on the chart is limited by numerous features in the area. The hydrographer recommends deleting the charted rock symbol. *Concur. Chart the area as depicted on the Smooth Sheet.*

A charted rock at position 60° 42' 34" N 148° 15' 12"W was not found. The item was investigated (Pos# 3220, DN 240, VN 2124) by visual and echosounder search. The depth at the charted position is ^{3.1 (3.9 fm)}8.8 m, water visibility 8 m (bottom visible), search radius 20m, search time 10 minutes; fifty meter line spacing was run in the area. There is a ledge protruding off of the islands to the east and west, and a new rock lies to the south, approximately 65 meters from the charted position. Accurate depiction on the chart is limited by numerous features in the area. The hydrographer recommends deleting the charted rock symbol. *Concur. Chart the area based on the present survey.*

A charted submerged rock at position 60° 45' 28" N 148° 16' 23"W was not found. The source of the item is unknown. The item was investigated (Pos# 3391, DN 268, VN 2124) by visual and echosounder search; search time 15 minutes; twenty-five meter line spacing was run in both directions in the area. No indication of shoaling was seen on the echogram. The area is a steep slope from 100m to 20m. The hydrographer recommends deleting the charted submerged rock symbol. *Concur. Chart the area based on the present survey.*

Problems ✓

On several occasions significant discrepancies were noted when comparing the digital shoreline (in SDDEF) with the DM's provided by N/CS341. In some cases rocks were depicted on the DM but were not included in the digital records. To resolve this problem, the boat sheet was overlaid on the DM and any features that were not included in the digital dataset were manually transferred to the boat sheet.

When the hydrography was overlaid over the plotted DM and the mylar copy of the same manuscript, it was apparent that the mylar copy depicted the shoreline more accurately than the digital copy. Therefore, the mylar copy was considered to be our source document for shoreline verification. A memorandum addressing these problems in detail was sent to N/CS31 for resolution. A copy of the memo (dated August 27, 1995) has been ^{attached to this report.} included in Appendix VI.

K. CROSSLINES ✓

It is difficult to compare mainscheme to crosslines on this survey due to generally complex bathymetry. Crosslines agreed to within 1 meter with mainscheme hydrography in over 100m of water, which was the only area flat enough to do accurate crossline comparisons. Total mileage was 12.6 nautical miles or 8.9 % of total mainscheme hydrography.

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

This survey junctions with surveys H-10634 (1:10,000, 1995) at the northeast limit, H-10635 (1:10,000, 1995) at the northern limit, and H-10639 (1:10,000, 1995) at the western limit. There is no contemporary survey at the southern limit. Soundings were found to be in general agreement. Final comparison will be made at the Pacific Hydrographic Branch (PHB).

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

Three prior surveys were compared: H-7618 (1:20,000, 1947-1948), H-8608 (1:10,000, 1961), and H-7732 (1:40,000, 1948). Due to a higher density of sounding data in the present survey, many least depths were found to be shoaler. Preliminary comparisons revealed three prior least depths shoaler than the current survey. These will be discussed in section O, Comparison with the Chart. Final comparisons will be done at PHB.

N. ITEM INVESTIGATIONS ✓

There were three AWOIS item investigations assigned to this survey.

AWOIS ITEM 52225 ✓

1. Area of Investigation

State: Alaska
Locality: Long Bay, Culross Passage, Prince William Sound, AK
Reported Latitude: 60° 40' 37.8" N
Reported Longitude: 148° 17' 28.4" W
Datum: NAD 83
Depth: N/A
Feature: Floating Obstruction (Forest Service public use mooring buoy)

2. Description of Source Item

The item was reported in the above location in 1986.

3. Survey Requirements

Verify or disprove. The required techniques to be used were visual search or salvage documentation.

4. Method of Investigation

A visual search was done in the area.

5. Results of Investigation

Date: DN 256
Time (UT): 1650
Feature: Disproval
Position Number: 1740
Latitude: 60° 40' 38.0" N
Longitude: 148° 17' 30.3" W

The buoy is no longer located at the reported position. Survey launches visited the area numerous times at all tides, and no mooring buoy was observed. The area is a popular anchorage for small pleasure boats, however.

6. Comparison with Prior Surveys

The mooring buoy does not appear on any prior surveys.

7. Comparison with the Chart and Charting Recommendations

The buoy is charted on NOS chart 16705, 15th Edition, September 1, 1990 1:80,000 (NAD83).

This investigation did not warrant a Danger to Navigation.

Recommendation

The hydrographer recommends deleting the charted mooring buoy symbol at the charted location (approx 60° 40' 37.8" N 148° 17' 28.4" W). *Concur.*

AWOIS ITEM 52226 ✓

1. Area of Investigation

State: Alaska
Locality: Culross Passage, Prince William Sound, AK
Reported Latitude: 60° 41' 41.8" N
Reported Longitude: 148° 14' 02.4" W
Datum: NAD 83
Depth: N/A
Feature: Floating Obstruction (Forest Service public use mooring buoy)

2. Description of Source Item

The item was reported in the above location in 1986.

3. Survey Requirements

Verify or disprove. The required techniques to be used were visual search or salvage documentation.

4. Method of Investigation

A visual search was done in the area.

5. Results of Investigation

Date: DN 241
Time (UT): 1549
Feature: Mooring Buoy, cylindrical, 8ft diameter, 2 ft high, unlighted.
Position Number: 12443
Latitude: 60° 41' 42.3" N
Longitude: 148° 14' 03.9" W
Datum: NAD 83

A detached position was taken on the buoy.

6. Comparison with Prior Surveys

The mooring buoy does not appear on any prior surveys.

7. Comparison with the Chart and Charting Recommendations

The buoy is charted on NOS chart 16705, 15th Edition, September 1, 1990 1:80,000 (NAD83).

This investigation did not warrant a Danger to Navigation.

Recommendation

The hydrographer recommends moving the mooring buoy ^{symbol} from its charted position to *the new location at* 60° 41' 42.3" N 148° 14' 03.9" W. *Concur.*

AWOIS ITEM 52243 ✓

1. Area of Investigation

State: Alaska
Locality: Cochrane Bay, Prince William Sound, AK
Reported Latitude: 60° 44' 51.5" N
Reported Longitude: 148° 17' 15.0" W
Datum: NAD 83
Depth: 2ft (1/4 FM)
Feature: Submerged Rock

2. Description of Source Item

The owner of a 40 ft vessel reported to USC&GSS PATHFINDER a rock about two feet below low water was located approximately 200 ft west of the point 3.8 miles 146.5 degrees from Point Pigot. "He was unable to provide a more accurated position, but the rock is definite as he stranded his boat, a 40 footer, and lost it."

3. Survey Requirements

Verify or disprove, determine least depth and position. The required techniques to be used were visual search or echosounder search.

4. Method of Investigation

A visual search and echosounder search was conducted in the area. In addition, twenty-five meter splits were run in the area. A dive was conducted over a shoal located approximately 200 m south of the charted rock.

5. Results of Investigation

Point Feature Disprovals

Detached positions were taken at the location of the charted rock and at the location of each of two DM rocks located within the search radius of the AWOIS item.

Date: DN 239
Feature: Charted Rock Disproval
Position Number: 1190
Latitude: 60° 44' 51.4" N
Longitude: 148° 17' 14.6" W
Datum: NAD 83

Feature: DM Rock Disproval
Position Number: 1191
Latitude: 60° 44' 51.4" N
Longitude: 148° 17' 22.0" W
Datum: NAD 83

Feature: DM Rock Disproval
Position Number: 1192
Latitude: 60° 44' 50.9" N
Longitude: 148° 17' 11.6" W
Datum: NAD 83

Twenty minutes was spent searching for the rocks inside the AWOIS circle. No rocks were observed, and the echogram indicated no sign of abnormal shoaling in the area. The search radius includes a steep slope going up toward land. Depths in the area range from 20 to 70 meters. Examination of the echograms collected during MS hydro and 25 m splits reveals no indication of shoaling.

Dive Investigation

Date: DN 262
Feature: Dive investigation on shoal
Position Number: 8649
Latitude: 60° 44' 44.7" N
Longitude: 148° 17' 15.4" W
Datum: NAD 83
Raw Depth: 5.0m
Tide Corrector: -2.5m
Corrected Depth: 2.5m (1 1/4 FM)

6. Comparison with Prior Surveys

No rocks were found in the area in prior surveys.

7. Comparison with the Chart and Charting Recommendations

The rock is charted on NOS chart 16705, 15th Edition, September 1, 1990 1:80,000 (NAD83).

A submerged rock, depth 2.5m (1 1/4 FM), was reported to the Seventeenth Coast Guard District as a Danger to Navigation on September 24, 1995.

Recommendation

The hydrographer recommends deleting the charted rock at the reported position, not charting the two DM rocks from the shoreline manuscript, and charting a new submerged rock (1 1/4 FM) at position 60° 44' 44.7" N, 148° 17' 15.4" W. (pos # 8649) *Concur.*

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

This survey was compared to NOS chart 16705, 15th Edition, September 1, 1990 1:80,000, (NAD83). With the following exceptions, charted soundings were found to be in general agreement.

A dive on a shoal at position 60° 44' 25.1" N, 148° 13' 19.5" W (DN 262, VN 2126, Pos # 8652) measured a least depth of 9.8m (5 1/2 FM). Ten meter splits were run over the high point as well. There is a charted 4 1/2 FM sounding at approximately the same position. *Two (2) other features were found in the area, a 6 1/2 Rk at Lat 60/44/24.9, Long 148/13/28.5 and a 4 1/2 FM shoal mentioned below.*

A dive on a shoal at position 60° 44' 28.3" N, 148° 13' 09.9" W (DN 262, VN 2126, Pos # 8653) measured a least depth of 8.4m (4 1/2 FM). Ten meter splits were run over the high point as well. There is a charted 4 FM sounding at approximately the same position. *Chart 4 1/2 Fms from present survey.*

Ten meter splits over a shoal at position 60° 42' 14.7" N, 148° 15' 04.7" W (DN 250, VN 2126, Pos # 8327+7) measured a least depth of 8.3m (4 1/2 FM). There is a charted 4 3/4 FM sounding at approximately the same position. *A shoal depth of 4 1/2 fathoms was found in the area of the charted shoal at the above location. Chart 4 1/2 Fms from present survey.*

The difference in the soundings above could be a result of inaccurate tidal predictions or zoning in either the present survey or the prior survey. Culross Passage contains several narrow places which constrict tidal flow and make tides unpredictable. The sounding discrepancy might also be explained by subsidence in the area during the 1964 earthquake. *and the accuracy of positioning & sounding determination used during this survey.*

The hydrographer recommends that the soundings from the current survey be used to supersede the least depths from the chart. *Concur*

The anchorage marked on the chart in the northern part of Culross Passage at position 60° 44.7' N, 148° 13.8' W was used frequently by RAINIER and had good holding bottom with *stk gy M*. The hydrographer recommends retention of the charted anchorage symbol. *Concur.*

Non-sounding charted features are discussed in Section J, Shoreline. Final comparisons to be made at PHB.

Dangers to Navigation ✓

Six dangers to navigation within the limits of H-10637 were reported to the Seventeenth Coast Guard District, September 24, 1995. Copies of the correspondence can be found in

attached to
Appendix I of this report.

P. ADEQUACY OF SURVEY ✓

Survey H-10637 is complete and adequate to supersede charted depths and features in their common areas. *Concur.*

Q. AIDS TO NAVIGATION (See ENR RPT., Sec. Q.)

No Aids to Navigation exist within the survey area. *A mooring buoy was located during this survey of lat 60°41'42.3" N, Long. 148°14'03.7" W.*

R. STATISTICS ✓

NM Hydrography	251.3
Velocity Casts	2
Detached Positions	140
Selected Soundings	1290 ⁶⁸ 7
Bottom Samples	24
Tide Stations	2
NM ² Hydrography	7.1
Dives	6

S. MISCELLANEOUS ✓

Bottom samples were collected and not retained in accordance with Project Instructions.

Currents to a maximum of around one half knot were noted in narrow passages. Predicted currents are weak and variable. Observations are in agreement with predictions.

No unusual magnetic variations were noted.

T. RECOMMENDATIONS ✓

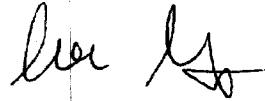
None

U. REFERRAL TO REPORTS ✓

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

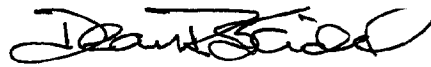
<u>Title</u>	<u>Date Sent</u>	<u>Office</u>
Fall 1995 Horizontal Control Report for OPR-P125-RA.	November, 1995	N/CS34
Fall 1995 Coast Pilot Report for OPR-P125-RA.	November, 1995	N/CS26
Project related data for OPR-P125-RA.	Incremental	N/CS34
Secchi Disk Observations for OPR-P125-RA	November, 1995	N/CS31

Respectfully Submitted,



Shepard M. Smith
Ensign, NOAA

Approved and Forwarded,



Dean R. Seidel
Captain, NOAA
Commanding Officer

CONTROL STATIONS as of 20 Sep 1995


No	Type	Latitude	Longitude	H	Cart	Freq	Vel	Code	MM/DD/YY	Station Name
100	F	060:14:18.000	146:38:48.000	0	250	0.0	0.0		08/22/95	CAPE HINCHINBROOK (BEACON)
101	F	061:03:24.000	146:41:48.000	0	250	0.0	0.0		08/22/95	POTATO PT (BEACON)
102	F	060:48:12.825	148:23:12.976	19	250	0.0	0.0		08/22/95	CAB (GPS STATION)
103	F	060:48:05.091	148:10:45.240	17	250	0.0	0.0		08/22/95	PORT (GPS STATION)



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

August 27, 1995

MEMORANDUM FOR: Captain Andrew A. Armstrong III
Chief, Hydrographic Survey Division

FROM: 
Captain Dean R. Seidel
Commanding Officer, NOAA Ship RAINIER

SUBJECT: Problems with shoreline manuscript and HYPACK

While starting the fall project in Prince William Sound, AK (OPR-P125) RAINIER has encounter several problems with shoreline manuscript and HYPACK. RAINIER requests HSD address the following problems as soon as possible.

Shoreline Manuscript Problems

RAINIER currently has mylar copies of the DM's and the digital data sent by HSD at the beginning of the project. The mylar copies have ledges and reefs depicted on them. The digital data either neglects to show the ledges or uses a single rock symbol to represent the ledge. The mylar copies depict rocks that are not in the digital data. But, the converse is also true with the digital data showing rocks, usually on the shore above MLLW., not shown on the mylar copies.

While conducting shoreline RAINIER personnel have found the mylar copies better represent the area and contain the most accurately depicted shoreline features. In a comparison of the mylar copies to the digital data on sheet AE (H-10634), a shift of 20m between the two sources was found. The mylar copy appears to better fit the data. Also, during hydro on sheet AE and Y areas were discovered where the high water line was off by 100m, for a distance of 500m along the shore. This problem is the same from both sources.

RAINIER does not have mylar copies for the entire survey area. Currently features from both sources are being investigated and referenced or disproved. When RAINIER begins work in areas where mylar copies are unavailable, there is sure to be features that are not in the digital data and therefore, may not be investigated properly.

RAINIER would like to know the origin of both the sources and request direction on which data should be used as the field manuscript. RAINIER is curenly expending large quantities of time verifying shoreline.



HYPACK Conversion Problems

1) When there is no GPS positioning at the end of a line, the convert program disregards all depths after the last good position and reassigns the fix number of the end of the line to this position. The depth corresponds to the position. However, the line on the fathos corresponds to the time of the line break, not of the position that bears its name. There is no indication that this condition exists. The operator changes the depth to correspond to the RMPO, and typically a shoal sounding is moved offshore.

RAINIER had the same problem last fall with the Power Basic convert program, and reported the same problem this spring with the Visual Basic conversion program. RAINIER personnel modified the Power Basic program to test for this condition and removed all data back to the last good fix. There is an extensive discussion of this problem in the RAINIER end of year HYPACK report from field season 1994. RAINIER recommends either eliminating all data after the last good fix, as has been past practice, or DR-ing based on course and speed, using the last depth of the line, corresponding to the fathos trace.

2) HYPACK's RMPO does not correspond with the digital data. RAINIER's launch RA-2 uses a RMPO on line as is common practice in RAINIER boats. This printout is produced by HYPACK, and uses HYPACK's depth selection and position interpolation algorithms. This printout is used as the base document for comparison of soundings with the fathos trace. However, once the data has been converted and loaded into HDAPS, somewhat different depths and positions are observed. The positions vary by as much as five meters. The depths tend to vary the most on the first and last fixes of the line. This occurs when there is a bogus depth, either a very small depth (<0.5) or a missed depth, in the first or last depth record in the HYPACK raw data. HYPACK seems to window out this bogus depth and take the next depth, while HDAPS takes the bogus depth.

The only way to check for discrepancies is to print out another RMPO in HDAPS and compare the two. This is time consuming (approx 2 person-hours per boat day) and leads to a confusing data record. The other option for checking is to wait until the end of the day and print out a raw master printout with HDAPS to use as the master RMPO. This is more time consuming yet (4 person-hours extra). The best solution would be to compare the sounding selection and record rectifying algorithms in HSB's convert program vs the algorithms used by HYPACK. If HYPACK's is less rigorous, then we could suggest a change to their software. If ours is less rigorous, then we should change our routines. If they are equally rigorous, we should consider adopting HYPACK's algorithm so that the data is consistent. While this may not be important for other field units that do not use an on-line printout, it is very important to RAINIER.

3) The DP conversion routine is not working on our data. Positions produced by HYPMENU 2.28 are nonsensical (one data set had one position in Kansas, and one at -93° latitude). HYPMENU 2.29 gives a substring out of range error. A sample file is attached for troubleshooting.

4) The rocks are now displayed in HYPACK survey, but no other point features are displayed. RAINIER has used other point features to represent charted rocks (currently we are using tide

gages). This is a critical safety item in addition to providing the basis for shoreline verification of charted features.

There are ways to work around any of the above problems except the first, but the combination of them all puts an extraordinary burden on RAINIER personnel and jeopardizes data quality. The problem is exacerbated by RAINIER's isolated location, rendering communications with HSB difficult and file transfers expensive via Inmarsat. Consequently, RAINIER has decided to temporarily suspend using the Windows version of HYPACK and revert to the DOS version of HYPACK and the Power Basic version of convert until such time as the problems are resolved.

RAINIER requests that LTJG Chris George spend the next leg (Sept. 4-14) aboard to resolve the above issues and get HYPACK for windows back on line.

cc: PMC - Albright
PHB - Timmons



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
Office of NOAA Corps Operations
Pacific Marine Center
1801 Fairview Avenue East
Seattle, Washington 98102-3787

NOAA Ship RAINIER

September 25, 1995

Director
DMAHTC
ATTN: MCNM
6500 Brookes lane
Washington, DC 20315-0030

Dear Sir:

While conducting hydrographic survey operations in Northwestern Prince William Sound, Alaska, NOAA Ship RAINIER discovered seven dangers to navigation. They have been reported to DMAHTCNAVWARN and the Seventeenth Coast Guard District. A copy of the correspondence describing the dangers is enclosed.

Sincerely,

A handwritten signature in black ink, appearing to read "Dean R. Seidel".

Dean R. Seidel
Captain, NOAA
Commanding Officer

Enclosures





UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
Office of NOAA Corps Operations
Pacific Marine Center
1801 Fairview Avenue East
Seattle, Washington 98102-3787

NOAA Ship RAINIER

September 24, 1995

**ADVANCE
INFORMATION**

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

Dear Sir:

Attached is a confirmation copy of the radio messages sent to your office regarding the dangers to navigation which I recommend for inclusion 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.

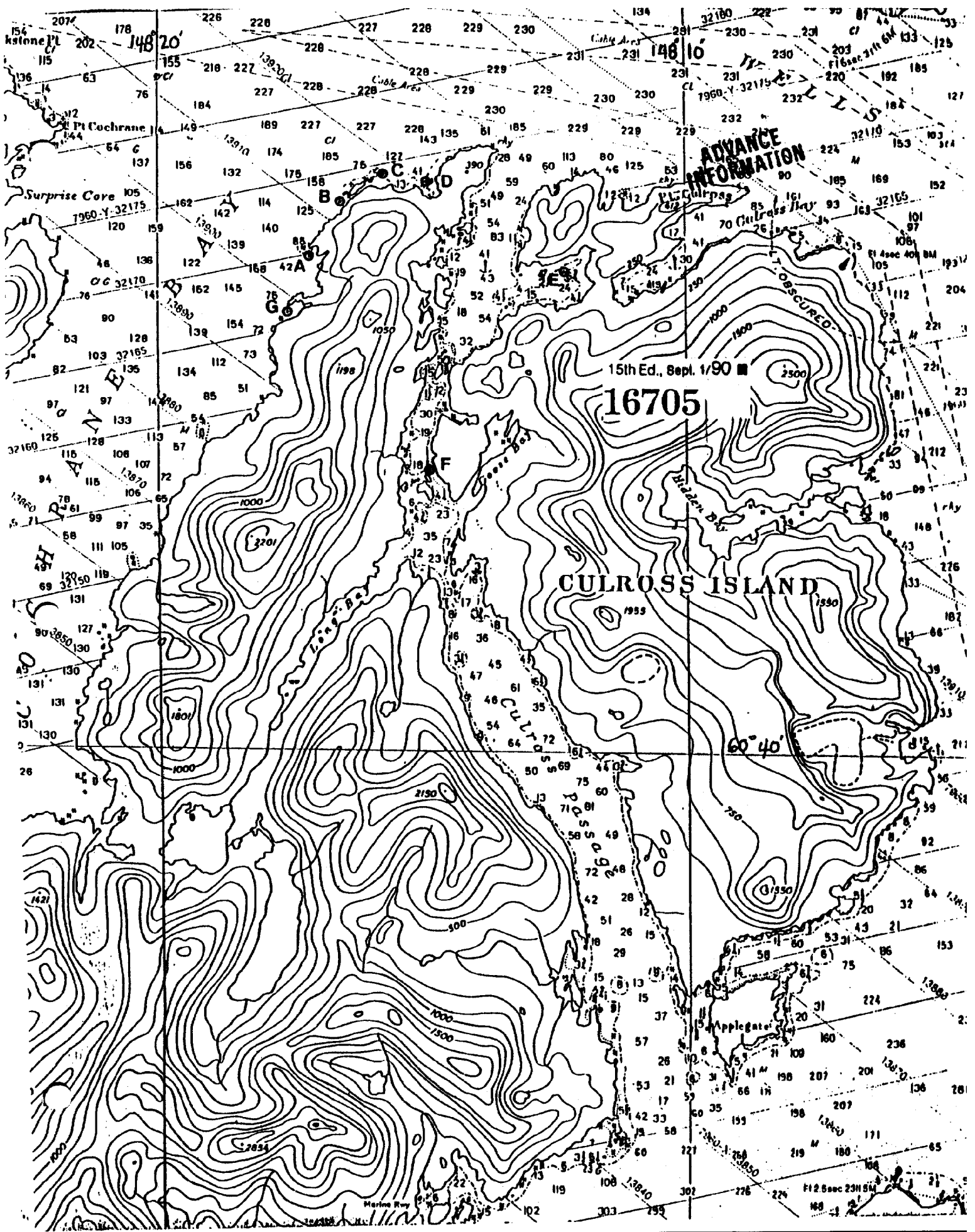
Sincerely,

Dean R. Seidel
Captain, NOAA
Commanding Officer

Enclosures

cc: DMAHTC
N/CG221
PMC





P 241439Z SEP 95
 FM NOAA S RAINIER
 TO CCGDSEVENTEEN JUNEAU AK
 DMAHTCCNAVWARN WASHINGTON DC//MCNM//
 INFO NOAAMOP SEATTLE WA
 ACCT CM-VCAA

ADVANCE
 INFORMATION

BT

UNCLAS

NOAA SHIP RAINIER HAS LOCATED 7 DANGERS TO NAVIGATION IN
 NORTHWESTERN PRINCE WILLIAM SOUND, ALASKA (PROJECT
 OPR-P125-RA) WITHIN THE LIMITS OF HYDROGRAPHIC SURVEY H-10637.
 THE FOLLOWING INFORMATION IS PROVIDED FOR PUBLICATION IN
 LOCAL NOTICE TO MARINERS:

DEPTHS ARE REDUCED TO MLLW BASED ON PREDICTED TIDES.

CHARTS AFFECTED: 16705 15TH ED SEPT 1/90 1:80,000 (NAD83)
 16700 24TH ED JAN 11/92 1:200,0

00 (NAD83)

ITEM	DANGER	COVERS	DEPTH	Depth(m)	LATITUDE	LONGITUDE	Fix
A.	ROCK	COVERS 1	1/4fms	2 ⁸	60/44/44.7N	148/17/15.4W	8649
B.	ROCK	COVERS 1	1/2fms	2 ⁹	60/45/17.2N	148/16/35.6W	8650
C.	SHOAL	COVERS 3	1/4fms	6 ³	60/45/33.1N	148/15/49.5W	5938 ⁺⁴
D.	SHOAL	COVERS 2	3/4fms	5 ²	60/45/28.1N	148/14/56.2W	1699 ⁺¹
E.	SHOAL	COVERS 6	1/4fms	11 ⁹	60/44/37.2N	148/12/13.3W	8565
F.	ROCK	COVERS 1	1/2fm	0 ⁹	60/42/38.6N	148/14/52.7W	8658
G.	SHOAL	COVERS 4	fms	7 ⁵	60/44/11.9N	148/17/38.5W	8630 ⁺³

THIS IS ADVANCE INFORMATION SUBJECT TO OFFICE REVIEW.
 QUESTIONS CONCERNING THIS MESSAGE SHOULD BE DIRECTED TO THE
 CHIEF, PACIFIC HYDROGRAPHIC SECTION AT (206)526-6835. A
 LETTER WITH ATTACHED CHARTLET WILL BE MAILED TO CONFIRM
 THIS MESSAGE.

BT

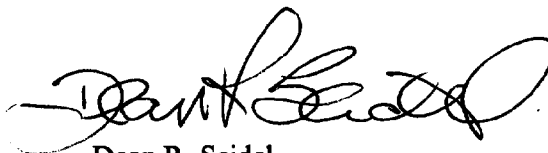
APPROVAL SHEET

for

H-10637
RA-10-14-95

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.



Dean R. Seidel
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

TIDE NOTE FOR HYDROGRAPHIC SURVEY

ORIGINAL

DATE: May 13, 1996

HYDROGRAPHIC SECTION: Pacific

HYDROGRAPHIC PROJECT: OPR-P125-RA

HYDROGRAPHIC SHEET: H-10637 (amended)

LOCALITY: Northern Portion of Culross Passage, Prince William
Sound, Alaska

TIME PERIOD: August 25 - September 19, 1995

TIDE STATION USED: 945-4825 Long Bay, Culross Passage, Ak.
Lat. $60^{\circ} 41.5'N$ Lon. $148^{\circ} 15.8'W$

PLANE OF REFERENCE (MEAN LOWER LOW WATER): 3.20 ft.

HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 11.2 ft.

TIDE STATION USED: 945-4721 Perry Island, (South Bay), Ak.
Lat. $60^{\circ} 40.8'N$ Lon. $147^{\circ} 55.5'W$

PLANE OF REFERENCE (MEAN LOWER LOW WATER): -1.42 ft.

HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 10.9 ft.



page 2 of 2 for H-10637 (amended)

REMARKS: RECOMMENDED ZONING

1. South of a line between the two points $60^{\circ} 45.5'N / 148^{\circ} 12.0'N$ and $60^{\circ} 45.5'N / 148^{\circ} 14.3'N$, times and heights are direct on Long Bay, Ak. (945-4825).

Where data are not available for Long Bay, Ak. times are direct, and apply a X1.02 range ratio to heights using Perry Island, Ak. (945-4721).

2. North of a line between the two points $60^{\circ} 45.5'N / 148^{\circ} 12.0'N$ and $60^{\circ} 45.5'N / 148^{\circ} 14.3'N$, times are direct, and apply a X1.02 range ratio to heights using Perry Island, Ak. (945-4721).

Note: Times are tabulated in Greenwich Mean Time.

Ray R. W. Long
for CHIEF, DATUMS SECTION



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: April 18, 1996

HYDROGRAPHIC SECTION: Pacific

HYDROGRAPHIC PROJECT: OPR-P125-RA

HYDROGRAPHIC SHEET: H-10637

LOCALITY: Northern Portion of Culross Passage, Prince William Sound, Alaska

TIME PERIOD: August 25 - September 19, 1995

TIDE STATION USED: 945-4825 Long Bay, Culross Passage, Ak.
Lat. 60° 41.5'N Lon. 148° 15.8'W

PLANE OF REFERENCE (MEAN LOWER LOW WATER): 3.20 ft.

HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 11.2 ft.

REMARKS: RECOMMENDED ZONING

In Culross Passage, times and heights are direct on Long Bay, Ak. (945-4825).

- Notes:**
1. Times are tabulated in Greenwich Mean Time.
 2. The survey was illustrated to be in Culross Passage only. Zoning for Wells Passage and Cochrane Bay are provided on H-10635 and H-10639.

William M. Holm
CHIEF, DATUMS SECTION



H-10637

GEOGRAPHIC NAMES

Name on Survey	A ON CHART NO. 16705, 16700 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 GRAND McNALLY ATLAS		H U.S. LIGHT LIST		K
ALASKA (title)	X		X												1
COCHRANE BAY	X		X												2
CULROSS ISLAND	X		X												3
CULROSS PASSAGE	X		X												4
GOOSE BAY	X		X												5
LONG BAY	X		X												6
PRINCE WILLIAM SOUND	X		X												7
(title)															8
WELLS PASSAGE	X		X												9
															10
															11
															12
															13
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															22
															23
															24
															25

Approved

Chris C. Boy

Chief Geographer

MAR 29 1996

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

RECORD DESCRIPTION		AMOUNT	RECORD DESCRIPTION		AMOUNT
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-10188**

PHOTOBATHYMETRIC MAPS (List): **NA**

NOTES TO THE HYDROGRAPHER (List): **None**

SPECIAL REPORTS (List): **None**

NAUTICAL CHARTS (List): **16705, 15th Ed., Sept. 1, 1990**

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

PROCESSING ACTIVITY	AMOUNTS		
	VERIFICATION	EVALUATION	TOTALS
POSITIONS ON SHEET			
POSITIONS REVISED			
SOUNDINGS REVISED on Sheet			12,968
CONTROL STATIONS REVISED			
	TIME-HOURS		
	VERIFICATION	EVALUATION	TOTALS
PRE-PROCESSING EXAMINATION			
VERIFICATION OF CONTROL			
VERIFICATION OF POSITIONS			
VERIFICATION OF SOUNDINGS			
VERIFICATION OF JUNCTIONS			
APPLICATION OF PHOTOBATHYMETRY			
SHORELINE APPLICATION VERIFICATION			
COMPILATION OF SMOOTH SHEET	312.0		312.0
COMPARISON WITH PRIOR SURVEYS AND CHARTS			
EVALUATION OF SIDE SCAN SONAR RECORDS			
EVALUATION OF WIRE DRAGS AND SWEEPS			
EVALUATION REPORT		28.0	28.0
GEOGRAPHIC NAMES			
OTHER*			
*USE OTHER SIDE OF FORM FOR REMARKS	TOTALS	312.0	28.0
			340.0

Pre-processing Examination by	Beginning Date	Ending Date
Verification of Field Data by D. Doles, J. Stringham, R. Mayor, I. Almacen	Time (Hours) 312.0	Ending Date 9/13/96
Verification Check by D. Hill	Time (Hours) 4	Ending Date 11/25/96
Evaluation and Analysis by I. Almacen	Time (Hours) 28.0	Ending Date 9/18/96
Inspection by D. Hill	Time (Hours) 4	Ending Date 11/25/96

EVALUATION REPORT

H-10637

A. PROJECT

Project information is discussed in the hydrographer's report.

B. AREA SURVEYED

This basic hydrographic survey was conducted in Prince William Sound, Alaska. It covers the area around the northern portion of Culross Passage including the uncharted areas of Long Bay and Goose Bay. The inshore area is generally comprised of islets, ledges, scattered rocks and reefs. The bottom is mainly composed of gravel, sand and mud mixed with shells. Depths range from 0.0 to 231.0 fathoms.

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 plot 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 PHB until data transfer protocols are developed and approved.

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 and No. 35.

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-10637.

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 Perry Island (South Bay), Alaska gage (945-4721) and Long Bay, Culross Passage, Alaska gage (945-4825). Refer to the approved tide note attached to this report concerning recommended tidal zoning.

H. CONTROL STATIONS

The use of Differential Global Positioning System (DGPS) is discussed in the hydrographer's report and a list of DGPS reference stations used during this survey is attached to this report.

The positions of DGPS reference stations used during hydrographic operations are field 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: -2.192 seconds (-67.847 meters)
Longitude: 7.431 seconds (112.682meters)

I. HYDROGRAPHIC POSITION CONTROL

Differential GPS (DGPS) was used to control this survey. NAD83 is used as the horizontal datum for plotting and position computations. A horizontal dilution of precision (HDOP) limits of 3.75 was computed for survey operations. There are a few positions where the maximum allowable HDOP limit has 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 cases are isolated and

occur randomly throughout the survey. None of these positions are used to locate critical soundings or dangers to navigation. The reference site confirmation test using the program MONITOR and the daily DGPS performance checks conducted in the field were adequate.

J. SHORELINE

Shoreline map DM-10188 is the photogrammetric source available for this survey. This shoreline map compiled on mylar apparently portrayed a more complete and accurate shoreline information than its digital copy in SDDEF format provided by N/CS341. A memorandum addressing this discrepancy was forwarded by the ship to the Chief, Hydrographic Survey Branch and a copy of the memorandum is attached to this report.

Some changes and new features in the area not depicted on the shoreline map were noted on this survey. There are also a few rocks shown on the map that were not found during the field investigations. In some cases, the rocks portrayed on the shoreline map were identified in the field as high point of ledges or reefs. With the exception of the two (2) rocks shown on the DM map at latitude 60/44/44.0N, longitude 148/15/14.0W and latitude 60/45/16.0N, longitude 148/14/12.5W, all shoreline features have been adequately investigated, located and depicted on the AutoCad generated smooth sheet based on the latest survey information. A discussion concerning shoreline changes and the disapproval of some of the features searched for during this survey is included in the hydrographer's report. There were no significant changes noted to the mean high water line except along a small section of the shore in the vicinity of latitude 60/41/48.0N and longitude 148/14/11.0W. The shoreline along this area is shown in red on the smooth sheet.

K. CROSSLINES

Crosslines are discussed in the hydrographer's report.

L. JUNCTIONS

Survey H-10637 junctions with the following surveys.

<u>Survey</u>	<u>Year</u>	<u>Scale</u>	<u>Area</u>
H-10634	1995	1:10,000	Northeast
H-10635	1995	1:10,000	North
H-10639	1995	1:10,000	Northwest

The junctions with surveys H-10634, H-10635 and H-10639 are complete. The depth curves and soundings within the junction areas are in satisfactory agreement.

M. COMPARISON WITH PRIOR SURVEYS

Survey H-10637 was compared with the following prior surveys.

H-3408 (19123), scale 1:20,000
H-7618 (1947-48), scale 1:20,000
H-7732 (1948), scale 1:40,000
H-8608 (1961), scale 1:10,000

The above listed prior surveys cover the area around the entrance and the northern portion of Culross Passage. Survey H-8608 in 1961 covers the northern section of Culross Passage with the exception of the areas of Long Bay and Goose Bay. Comparisons with the above prior surveys are considered satisfactory. There are no significant indications of subsidence or uplifting noted within the survey area, however, most of the least depths determined on this survey were found to be slightly shoaler than the prior least depths. The present depths generally differ by about 0.5 to 5.0 fathoms in most areas of the survey. These differences are primarily attributed to the accuracy of the present positioning and sounding methods used, increase in bottom coverage and the natural effects of past earthquakes around the area of Prince William Sound.

H-10637 is adequate to supersede the prior surveys within the common area.

N. ITEM INVESTIGATIONS

There are three AWOIS items for investigation assigned to survey H-10637. Discussion and disposition of these items are included in the hydrographer's report.

O. COMPARISON WITH CHART

Survey H-10637 was compared with the following charts.

<u>Chart</u>	<u>Edition</u>	<u>Date</u>	<u>Scale</u>	<u>Datum</u>
16705	15th	Sept.1, 1990	1:80,000	NAD83

a. Hydrography

Charted hydrography originates with the previously mentioned prior surveys and miscellaneous sources. The prior surveys are discussed in the preceding section of this report and require no further discussion. Other charted information originates from USC&GS topographic surveys T-9132 (1948-51), T-9136 (1949) and T-9137 (1949). These documents mainly contain the charted nearshore rocks, reefs and ledge information compiled

from the 1948 to 1951 surveys. No other prior surveys have ever been undertaken around the areas of Long Bay and Goose Bay. The charted soundings were found to be in satisfactory agreement with the present survey.

Survey H-10637 is adequate to supersede charted hydrography within the common area of coverage.

b. Dangers to Navigation

Seven (7) dangers to navigation were reported to the USCG, DMAHTC, N/CG221 and N/CS34 on September 24, 1995. A copy of the report is attached. No additional dangers were found during office processing.

P. ADEQUACY OF SURVEY

The hydrography on survey H-10637 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.

Hydrography on survey H-10637 was acquired in the field in metric units while the AutoCAD generated smooth sheet for this survey was compiled in fathoms to conform to the sounding unit of the existing NOS charts of the area.

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

Survey H-10637 adequately complies with the project instructions.

Q. AIDS TO NAVIGATION

There is one (1) mooring buoy found within the survey area at latitude 60/41/42.3 N, longitude 148/14/03.9 W. The buoy was found in good condition and adequately serves its intended purpose.

R. STATISTICS

Statistics are itemized in the hydrographer's report.

S. MISCELLANEOUS

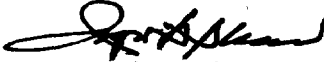
Miscellaneous information concerning this survey is discussed in the hydrographer's report. No additional miscellaneous items were noted during office processing.

T. RECOMMENDATIONS

Survey H-10637 is a good hydrographic survey and no additional field work is required.

U. REFERRAL TO REPORTS

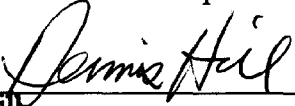
Referral to reports is discussed in the hydrographer's report.


Isagani A. Almacén
Cartographer

APPROVAL SHEET
H-10637

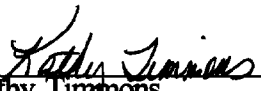
Initial Approvals:

The completed survey has been inspected with regard to survey coverage, delineation of the depth curves, development of critical depths, cartographic symbolization, comparison with prior surveys and verification or disproval of charted data. The survey records and digital data comply with NOS requirements except where noted in the Evaluation Report.



Dennis Hill
Chief, Cartographic Section
Pacific Hydrographic Branch
Date: 11/25/96

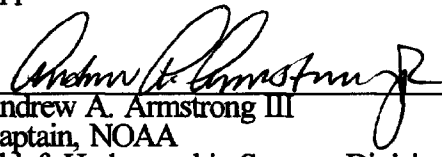
I have reviewed the smooth sheet, accompanying data, and reports. This survey and accompanying digital data meet or exceed NOS requirements and standards for products in support of nautical charting except where noted in the Evaluation Report.



Kathy Timmons
Commander, NOAA
Chief, Pacific Hydrographic Branch
Date: 11/27/96

Final Approval

Approved:



Andrew A. Armstrong III
Captain, NOAA
Chief, Hydrographic Surveys Division
Date: Apr 28, 1997

MARINE CHART BRANCH
RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H-10637

INSTRUCTIONS

- A basic hydrographic or topographic survey supersedes all information of like nature on the uncorrected chart.
1. Letter all information.
 2. In "Remarks" column cross out words that do not apply.
 3. Give reasons for deviations, if any, from recommendations made under "Comparison with Charts" in the Review.

CHART	DATE	CARTOGRAPHER	REMARKS
16705	10/30/96	<i>[Signature]</i>	Full Part Before After Marine Center Approval Signed Via <i>Full application of</i> Drawing No. <i>sndgs. & features from smooth sheet.</i>
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
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