

H10658

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-10-23-95
Registry No. H-10658

LOCALITY

State Alaska
General Locality Prince William Sound
Sublocality Western Portion of Perry Passage

1995

CHIEF OF PARTY
CAPT Dean R. Seidel, NOAA

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DATE APR 29 1997

HYDROGRAPHIC TITLE SHEET

H-10658

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-10-23-95

State Alaska

General locality Prince William Sound

Locality Western Portion of Perry Passage

Scale 1:10,000 Date of survey October 21 - November 1, 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)

Chief of party CAPT Dean R. Seidel, NOAA

Surveyed by CAPT D. Seidel, LT M. Larsen, ENS S. Smith, ENS E. Christensen, ENS N. Bennett, ENS J. Becker, ENS J. Crocker, CST F. Paranada, ST N. Quanbeck

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 Plot

Verification by D. Doles, J. Stringham, R. Mayor, E. Domingo

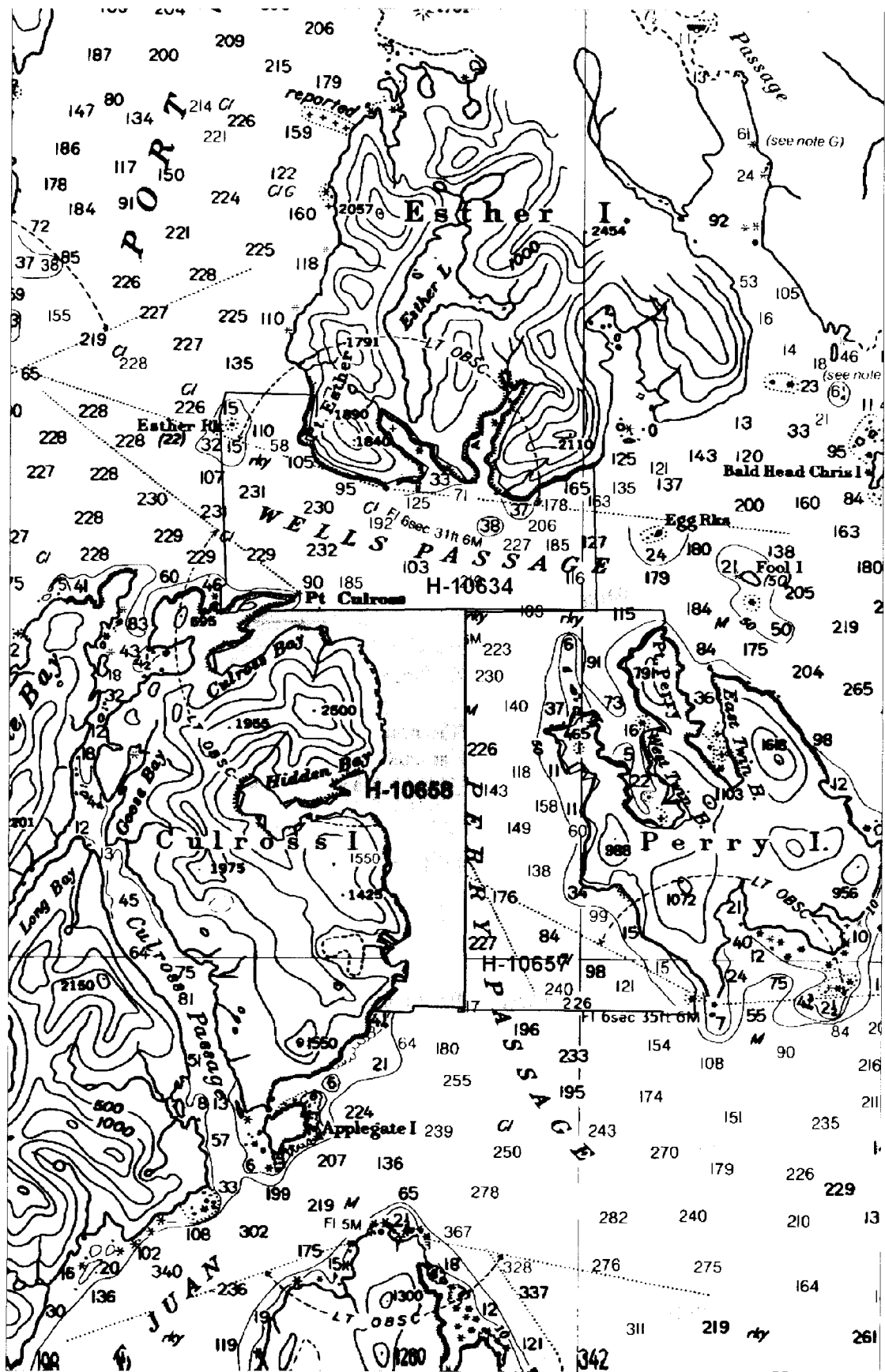
Soundings in fathoms ~~KXX~~ at ~~MHW~~ MLLW and tenths of fathoms

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.

Surf/Alwols 4/23/97 mcr

SC4-29-97



Descriptive Report to Accompany Hydrographic Survey H-10658

Field Number RA-10-23-95

Scale 1:10,000

October - November 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 30, 1995.

Survey H-10658 corresponds to "sheet AD" 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 (See EVAL RPT., Sec. B)

The survey area is located in the western portion of Perry Passage. The survey's eastern limit is bounded by 148° 03.6' W, and the western limit is bounded by the shoreline of Culross Island. The northern limit is bounded by 60° 45.2' N, and the southern limit is bounded by 60° 39.3' N.

Data acquisition was conducted from October 21, 1995 (DN 294) to November 1, 1995 (DN 305).

C. SURVEY VESSELS ✓

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

Vessel	EDP #	Operation
RAINIER	2120	Sound Velocity Cast Bottom Samples
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 Sound Velocity Cast
RA-6	2126	Hydrography 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

None

HYPACK ✓

Data were acquired with RA-2 on DNs 298 and 299 using Coastal Oceanographics' 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
NMEA.DLL	7/25/95	16 August 1995

✱ Filed with the survey records.

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 2.36 provided by N/CS 32. The files were then loaded into HDAPS and processed in the same manner as HDAPS data. HYPMENU produces a conversion abstract which shows the converted depth for the first depth of each line, any positions which were dead reckoned, and any other error condition encountered during conversion. The abstracts were checked against the Raw Master Printout,* and appropriate edits made. The files were then loaded into HDAPS and processed in the same manner as HDAPS data. *Data was analyzed during office processing and found to contain no significant problems.*

Problems

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-10658.

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. *The smooth sheet is plotted in fathoms based on actual tides. Depth range from 0 to 239.0 fathoms.*

G. CORRECTIONS TO ECHO SOUNDINGS ✓

Correctors for the velocity of sound through water were determined from the casts listed below. Sound velocity table # 11 was applied only to data collected within Hidden Bay while sound velocity table # 9 was applied to all other data collected. Sound velocity table # 10 was applied to bottom samples and velocity cast data acquired by the ship.

* Filed with the survey records.

Velocity Table #	Cast #	DN	Cast Position	Deepest Depth (m)	Applicable DN
9	5	296	60° 40' 50" N 148° 03' 02" W	440	264-305
10	5	296	60° 40' 50" N 148° 03' 02" W	571	291-306
11	6	304	60° 42' 30" N 148° 09' 30" W	60	298-304

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". *It appears that the position for cast #6 entered in the Velocity computation was in error. The depth at this location is only about 10m. (55 fathoms).*
Static Draft ✓

A transducer depth was determined using FPM Fig 2.2 for RAINIER and vessels 2122-2126 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 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 2-6 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". *

Heave ✓

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

** Filed with the survey records.*

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 project instructions for H-10658:

	<u>Time Correction</u>	<u>Range Ratio</u>
Entire Survey Area	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.

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

RAINIER personnel installed an 8200 digital gage at Perry Island (945-4721) on August 22, 1995. The staff was connected to five benchmarks during opening and closing levels conducted on August 24, 1995 and October 31, 1995, respectively. The gage was removed on November 2, 1995. The tide gage ran without problems during data acquisition.

The station description, field tide record, final field tide note 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. *Approved TIDE NOTE dated April 18, 1996 is attached.*

Problems ✓

Hidden Bay is a large enclosed bay with only a few narrow entrances to the bay. These entrances are relatively shallow, depth less than 2 m at MLLW, and have tidal currents up to 4 kts as observed by the hydrographer. Due to time constraints a tide gage was not installed in Hidden Bay. ✓

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 ABOVE. Station PORT is located on Esther Rock, and station ABOVE is located on Tipping Point, on the northwest shore of Perry Island. These stations were recovered in accordance with methods stated in Section 5.2.4 of the FPM. In addition, Coast Guard differential beacon stations Cape Hinchinbrook and Potato Point were used according to specifications listed in Section 6.2 of the Project Instructions.

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 ABOVE and PORT. The difference between the computed location and the published positions at station ABOVE 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". *

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. *Data was analyzed during office processing and found to contain no significant problems.* ✓

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

Shoreline maps DM-10188 and DM-10189 were supplied by N/CS341 in Standard Digital Data Exchange Format (SDDEF) and on mylar.

* Filed with the survey records. 6

The digital files were projected to the survey grid with OPR-P125-RA geodetic parameters using program Shore version 2.0, provided by N/CS32, and stored in HYPACK (*.DIG) format. Shoreline was plotted at survey scale on boat sheets and processing sheets. The shoreline not represented on SDDEF that was on the mylar T-sheets was transferred to the boat sheets, processing sheets, and the final field 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. (Raw Master Printout)

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. The area of unverified shoreline is represented on the final field sheet in blue. Field cartographic codes were assigned using the HDAPS DP editor. Heights are recorded in meters and decimeters and are corrected to predicted MLLW. *Features have been corrected on the smooth sheet for approved tides. Heights of features are depicted in FEET. Minor shoreline revisions to the mean high water line have been shown on the smooth sheet.*
Changes and New Features ✓

There were several changes and some new features found during shoreline verification. These are depicted on the "Bottom Sample and Detached Position Plot." DM rocks were often identified as high points of ledges or reefs. *Revisions to features offshore of the MHWL have been shown on the smooth sheet.*

Disprovals

A DM / T-Sheet rock at position 60° 42' 10.139" N 148° 06' 09.973" W was not found. The item was investigated (Pos# 3895, DN 298, VN 2124) by visual and echosounder search. *A rock was found about 100m SW inshore of this T-sheet rock (pos # 3894)*
* Filed with survey records. 7

The average depth at the search area is 25 m, search time 15 min, search radius 30 m, visibility 5 m (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.*

*The investigation is not adequate to disprove manuscript rock. However, it is likely this feature was compiled in error on the DM/T-sheet and is actually part of the ledge feature shown on the smooth sheet. Also see page 9 for A DM/T-Sheet rock at position 60° 44' 22.464" N 148° 11' 13.711" W was not found. The charted rock search item was investigated (Pos# 5603, DN 298, VN 2125) by visual and echosounder search. The average depth at the search area is 5 m, search time 10 min, search radius 50 m, visibility 5 m (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.**

Problems

A small portion of shoreline on the central eastern shore of Culross Island between latitude 60° 40' 30" N and 60° 41' 00" N was not verified during this survey. This area will be verified when RAINIER returns to this project.

The digital shoreline DM-10188 and DM-10189 in SDDEF, were found to differ from the mylar copy of the same manuscript. 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. To eliminate source confusion, the mylar shoreline was referred to as the T-Sheet and the digital shoreline was referred to as DM. The boat sheet was overlaid on the mylar and any features that were not included in the digital data set were manually transferred to the boat sheet. In many cases "DM" rocks were high points of "T-Sheet" ledges and reefs. In these cases only ledges were addressed. In the few cases that a rock appeared on the "DM" shoreline and not the "T-Sheet" shoreline, the rocks were addressed as "DM" rocks.

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 included in ~~Appendix VI~~ *this report.*

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 and DM-10189 with the exception of the portion of shoreline, mentioned above, not verified during this survey. *concur.*

Charted Features

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

A charted rock at position 60° 42' 51" N 148° 06' 20"W was not found.

The item was investigated (Pos# 8046, DN295, VN 2126) by visual and echosounder search. The average depth at the charted position is 20 m, search time 10 min, search radius 50 m, visibility 3 m; fifty meter line spacing was run in the area. The hydrographer recommends deleting the rock symbol from the chart. *concur. This rock is likely part of the ledge which plots on the smooth sheet.*

A charted rock at position 60° 42' 07" N 148° 06' 11" W was not found. The item was investigated (Pos# 3896, DN298, VN 2124) by visual and echosounder search. The average depth at the charted position is 18 m, search time 15 min, search radius 30 m, visibility 5 m; fifty meter line spacing was run in the area. The hydrographer recommends deleting the rock symbol from the chart. *A rock was found about 100 m. NW of the charted rock at Lat 60° 42' 05.5" N, Long. 148° 06' 20.0" W and is likely the same item previously charted.*

A charted anchorage area is located within Culross Bay, position 60° 44' 45" N 148° 10' 12". The bottom type was found to be sticky gray mud from bottom samples in this area. The hydrographer recommends retaining the anchorage as charted. *concur.*

Problems ✓

None.

K. CROSSLINES ✓

Crosslines agreed to within 1 meter with mainscheme hydrography. The crosslines were acquired in areas of deep water, over 100 m, and flat bathymetry with the except of Hidden Bay. Total mileage was 13.17 nautical miles or 10.5 % of total mainscheme hydrography.

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

This survey junctions with surveys H-10634 (1:10,000, 1995) at the north limit and H-10657 (1:10,000, 1995) at the east 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-3408 (1:20,000, 1912), H-3570 (1:20,000 and 1:40,000, 1913) and H-7678 (1:20,000, 1947-1948). The soundings from the prior surveys were in general agreement with the present survey. Final comparisons will be done at PHB.

N. ITEM INVESTIGATIONS ✓

This survey contained no AWOIS item investigations. *concur*

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

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

The charted cable area located within this survey was not investigated and should remain as charted. *Concur.*

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

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

Dangers to Navigation ✓

(10)

Ten dangers to navigation within the limits of H-10658 were reported to the Seventeenth Coast Guard District, January 9, 1996. Copies of the correspondence ^{is attached} can be found in Appendix I of this report.

P. ADEQUACY OF SURVEY (See EVAL RPT., Sec. P)

Survey H-10658 is complete and adequate to supersede charted depths and features in their common areas with exception of the area of shoreline noted in section J and three soundings where further development is recommended. Two of the soundings have been reported as *Concur.* Dangers to Navigation. The soundings are listed below:

Fix	Easting	Northing	Lat/Long	** Depth
3655+2	40452.5	37277.5	60° 40' 01.996" N 148° 05' 50.559" W	10.4 m (5.5 fm.)
3628+0	40754.8	37494.6	60° 40' 09.043" N 148° 05' 30.746" W	12.1 m (5.7 fm.)
3798+7	40600.7	36594.2	60° 39' 39.920" N 148° 05' 40.508" W	0.7 m (0.1 fm.)

*** Depths based on actual tides.*

Q. AIDS TO NAVIGATION

There was one fixed aid to navigation on H-10658. It was positioned to third order accuracy with GPS on DN 266. The surveyed position was found to be 70 meter, bearing 172 deg T, from the position published in the Light List. The light's charted characteristics, white flashing 4 sec with obscured arc of visibility from 154° to 308°, were observed in the field. A summary is provided in Appendix VI. Detailed information is contained in the "Fall 1995 Horizontal Control Report for OPR-P125-RA."

** Filed with the survey records.*

R. STATISTICS ✓

NM Hydrography	196.4
Velocity Casts	2
Detached Positions	77
Selected Soundings	9637
Bottom Samples	6
Tide Stations	1
NM ² Hydrography	10.5
Dives	0

S. MISCELLANEOUS ✓

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

Predicted currents for Perry Passage are weak and variable. Observations are in agreement with predictions. Culross Bay does not have predicted currents but were observed to be weak and variable. The currents within Hidden Bay were significant with currents reaching up to 4 kts in some of the narrow passages at the entrance of the bay.

No unusual magnetic variations were noted.

T. RECOMMENDATIONS ✓

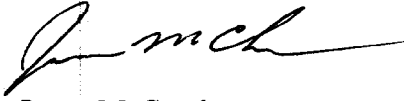
None

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.	December, 1995	N/CS34
Fall 1995 Coast Pilot Report for OPR-P125-RA.	December, 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,



James M. Crocker
Ensign, NOAA

Approved and Forwarded,



Dean R. Seidel
Captain, NOAA
Commanding Officer

Section Q: Descriptive Report Insert

Name of Aid: Culrose Point Light
Light List #: 25865

Method of Positioning GPS: DGPS: Other: _____

Positioning Information

	<u>Latitude (N)</u>	<u>Longitude (W)</u>
Charted Pos.	60 44 48.0	148 06 48.0
Survey Pos.	60 44 50.22	148 06 48.70

	<u>Easting</u>	<u>Northing</u>
Charted Pos.	39640.4	46136.1
Survey Pos.	39630.5	46204.9

Difference between Charted and Surveyed Position: Distance: 70 meters
(Bearing from Surveyed to Charted Position) Bearing: 172 deg T

Characteristics

Do characteristics match Light List? Yes No

If no, what are the characteristics? _____

Does the aid adequately serve its apparent purpose? Yes No

If no, why not? _____

New/Uncharted Aids (if information is known or easily obtained)

Date Est: _____

Maintained By: _____ Private? Yes No

Is aid seasonally maintained? Yes No

Frequency of Maintenance: _____

Apparent Purpose: _____


Other Information:



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

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 (11-10634), 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 currently 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 IIDAPS, 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 IIDAPS takes the bogus depth.

The only way to check for discrepancies is to print out another RMPO in IIDAPS 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 IIDAPS 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 IISB'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
PIB - 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 98102-3767

NOAA Ship RAINIER

**ADVANCE
INFORMATION**

January 9, 1996

Commander
Seventeenth Coast Guard District
Post Office Box 3-5000
Juneau, Alaska 99802

Dear Sir:

During the processing of hydrographic survey H-10658, in Northwest Prince William Sound ten dangers to navigation have been discovered. These dangers affect the following charts:

<u>Chart</u>	<u>Edition/Date</u>	<u>Datum</u>
16705	15th Ed., Sept 1/90 1:80,000	NAD83
16700	24th Ed., Jan 11/92 1:200,000	NAD83

It is recommended that these dangers to navigation be included in the Local Notice to Mariners.

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

Sincerely,

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

Enclosure

cc: DMA/HTC
PMC
N/CS262



**ADVANCE
INFORMATION**

Hydrographic Survey Registry Number: H-10658

Survey Title: State: Alaska
 Locality: Prince William Sound
 Sublocality: Western Portion of Perry Passage

Project Number: OPR-P125-RA

Survey Date: October-November, 1995

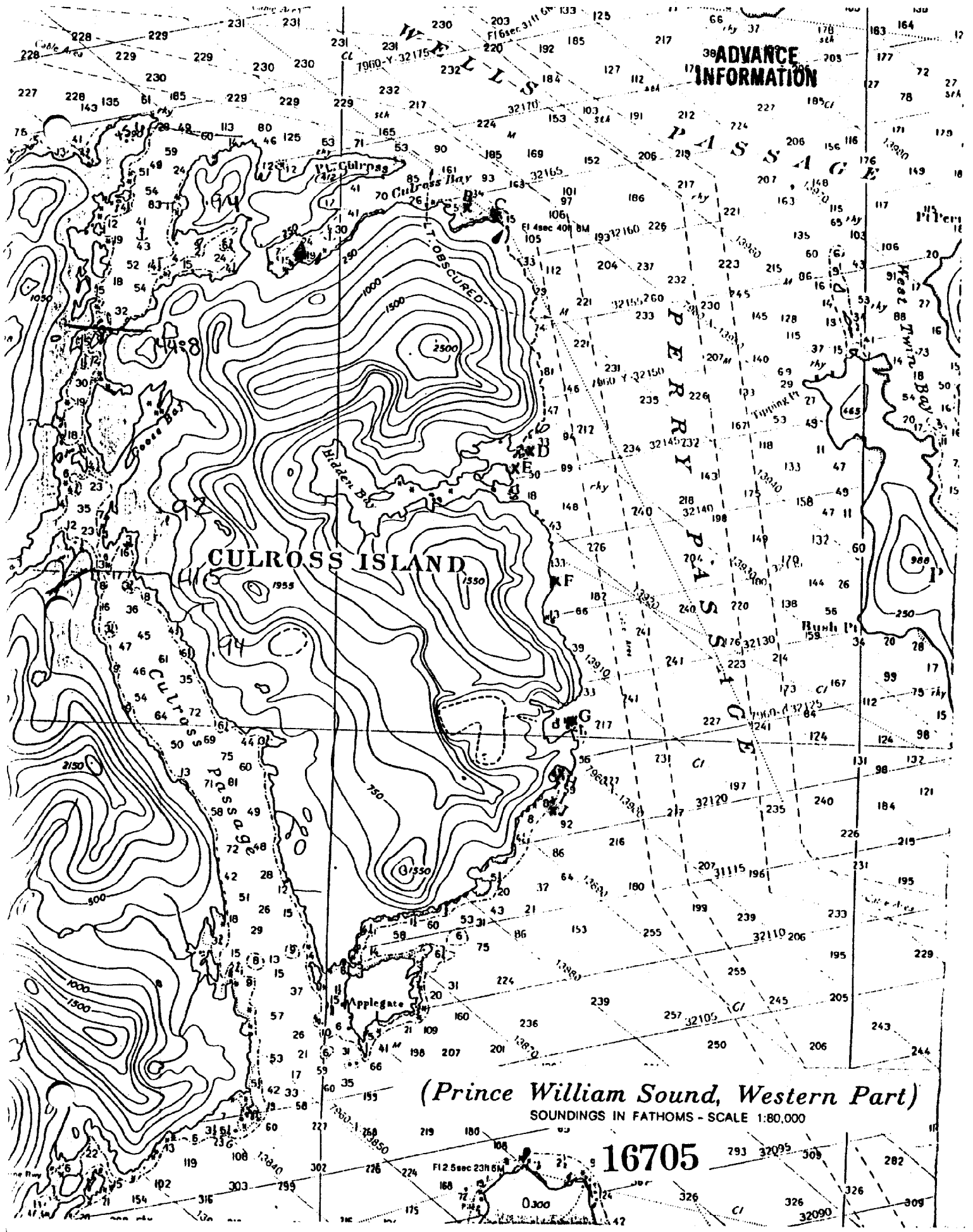
Features are reduced to Mean Lower Low Water using predicted tides.

Affected Nautical Charts:

<u>Chart</u>	<u>Edition/Date</u>	<u>Datum</u>
16705	15th Ed., Sept 1/90 1:80,000	NAD83
16700	24th Ed., Jan 11/92 1:200,000	NAD83

<u>Item</u>	<u>Danger</u>	<u>Depth</u>	<u>Latitude(N)</u>	<u>Longitude (W)</u>	
A.	SOUNDING	3 3/4 FM	60/44/33.8	148/10/56.7	4358+2
B.*	SOUNDING	2 FM (2 1/4 FM)	60/45/04.8	148/07/39.8	4412+1
C.*	SOUNDING	1 FM (3/4 FM)	60/44/58.0	148/07/10.5	5619+1
D.	SOUNDING	3/4 FM'	60/42/44.2	148/06/22.1	1199+2
E.	SOUNDING	4 FM'	60/42/34.7	148/06/38.9	5842+4
F.	SOUNDING	1 FM	60/41/29.7	148/05/54.5	7982+0 Excessed for # (2)
G.	SOUNDING	6 FM	60/40/09.0	148/05/30.7	3628+0 Rock # (10) plots near depth.
H.*	SOUNDING	1/4 FM (0.5 FM)	60/39/39.9	148/05/40.5	3798+7
I.*	SOUNDING	3 FM (2 3/4 FM)	60/39/23.0	148/05/51.0	8075+2
J.	SOUNDING	4 1/4 FM	60/39/16.8	148/05/50.7	8081+4

* Corrected on smooth sheet for approved tides. Items F and G plot near rocks found during survey operations. Questions concerning this report should be directed to the Pacific Hydrographic Branch at (206) 526-6835.



NOAA FORM 76-40
(8-74)

Replaces C&GS Form 567

TO BE CHARTED
 TO BE REVISED
 TO BE DELETED

REPORTING LIMIT
(Field Party, Ship or Office)

NOAA Ship RAINIER

STATE

Alaska

LOCALITY

Western Portion of Perry Passage

DATE

11/3/95

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

ORIGINATING ACTIVITY

- HYDROGRAPHIC PARTY
- GEODETIC PARTY
- PHOTO FIELD PARTY
- COMPILATION ACTIVITY
- FINAL REVIEWER
- QUALITY CONTROL & REVIEW GRP.
- COAST PILOT BRANCH

(See reverse for responsible personnel)

The following objects HAVE HAVE NOT been inspected from seaward to determine their value as landmarks.

OPR PROJECT NO.
OPR-P125-RA

JOB NUMBER

H-10658

DATUM

NAD83

POSITION

DESCRIPTION

*(Record reason for deletion of landmark or aid to navigation.
Show triangulation station names, where applicable, in parentheses)*

CULROSS ISLAND LIGHT

CHARTING
NAME

L.L. NO.
25865

LATITUDE

° ' "

D.M. Meters

LONGITUDE

° ' "

D.P. Meters

OFFICE

METHOD AND DATE OF LOCATION

(See instructions on reverse side)

CHARTS
AFFECTED

16700
16705

F - 7 - L

RESPONSIBLE PERSONNEL	
TYPE OF ACTION	NAME
OBJECTS INSPECTED FROM SEAWARD	CAPT D. R. Seidel
POSITIONS DETERMINED AND/OR VERIFIED	CAPT D. R. Seidel
FORMS ORIGINATED BY QUALITY CONTROL AND REVIEW GROUP AND FINAL REVIEW	CAPT D. R. Seidel
INSTRUCTIONS FOR ENTRIES UNDER 'METHOD AND DATE OF LOCATION' <i>(Consult Photogrammetric Instructions No. 64)</i>	
OFFICE 1. OFFICE IDENTIFIED AND LOCATED OBJECTS Enter the number and date (including month, day, and year) of the photograph used to identify and locate the object. EXAMPLE: 75E (C) 6042 8 - 12 - 75 FIELD 1. NEW POSITION DETERMINED OR VERIFIED Enter the applicable data by symbols as follows: F - Field L - Located V - Verified 1 - Triangulation 2 - Traverse 3 - Intersection 4 - Resection A. Field positions* require entry of method of location and date of field work. EXAMPLE: F - 2 - 6 - L 8 - 12 - 75 *FIELD POSITIONS are determined by field observations based	FIELD (Cont.) B. Photogrammetric field positions** require entry of method of location or verification, date of field work and number of the photograph used to locate or identify the object. EXAMPLE: P - 8 - V 8 - 12 - 75 74L (C) 2982 II. TRIANGULATION STATION RECOVERED When a landmark or aid which is also a triangulation station is recovered, enter 'Triang. Rec.' with date of recovery. EXAMPLE: Triang. Rec. 8 - 12 - 75 III. POSITION VERIFIED VISUALLY ON PHOTOGRAPH Enter 'V-Vis.' and date. EXAMPLE: V-Vis. 8 - 12 - 75 ** PHOTOGRAMMETRIC FIELD POSITIONS are
<input type="checkbox"/> PHOTO FIELD PARTY <input checked="" type="checkbox"/> HYDROGRAPHIC PARTY <input type="checkbox"/> GEODETIC PARTY <input type="checkbox"/> OTHER	ORIGINATOR
FIELD ACTIVITY REPRESENTATIVE	
OFFICE ACTIVITY REPRESENTATIVE	
<input type="checkbox"/> REVIEWER <input type="checkbox"/> QUALITY CONTROL AND REVIEW GROUP REPRESENTATIVE	

CONTROL STATIONS as of 24 Oct 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 1914 (GPS STATION)
103	F	060:48:05.091	148:10:45.240	17	250	0.0	0.0	08/22/95	PORT 1914 (GPS STATION)
104	F	060:43:26.498	148:01:11.543	19	250	0.0	0.0	10/20/95	ABOVE(GPS STATION)

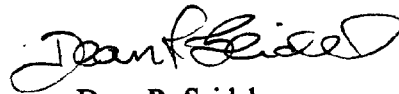
APPROVAL SHEET

for

H-10658
RA-10-23-95

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

ORIGINAL

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE: April 18, 1996

HYDROGRAPHIC SECTION: Pacific

HYDROGRAPHIC PROJECT: OPR-P125-RA

HYDROGRAPHIC SHEET: H-10658

LOCALITY: Western Portion of Perry Passage, Prince William Sound,
Alaska

TIME PERIOD: October 21 - November 1, 1995

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.

REMARKS: RECOMMENDED ZONING

Times and heights are direct on Perry Island, Ak. (945-4721).

Note: Times are tabulated in Greenwich Mean Time.

William M. Gibson
CHIEF, DATUMS SECTION

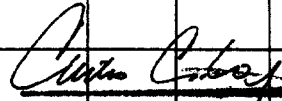


GEOGRAPHIC NAMES

H-10658

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 RAND McNALLY ATLAS		H U.S. LIGHT LIST		K		
ALASKA (title)	X			X															1
CULROSS BAY	X			X															2
CULROSS ISLAND	X			X															3
CULROSS, POINT	X			X															4
HIDDEN BAY	X			X															5
PERRY PASSAGE	X			X															6
PRINCE WILLIAM SOUND	X			X															7
(title)																			8
WELLS PASSAGE	X			X															9
																			10
																			11
																			12
																			13
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																			24
																			25

Approved



Chief Geographer

MAR 25 1996

HYDROGRAPHIC SURVEY STATISTICS

H-10658

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, DM-10189

PHOTOBATHYMETRIC MAPS (List): None

NOTES TO THE HYDROGRAPHER (List): None

SPECIAL REPORTS (List):

NAUTICAL CHARTS (List): Chart 16705, 15th Ed, September 1, 1990, 1:80,000

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			9637
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	133.0		133.0
COMPARISON WITH PRIOR SURVEYS AND CHARTS			
EVALUATION OF SIDE SCAN SONAR RECORDS			
EVALUATION OF WIRE DRAGS AND SWEEPS			
EVALUATION REPORT		27.0	27.0
GEOGRAPHIC NAMES			
OTHER*			
*USE OTHER SIDE OF FORM FOR REMARKS	TOTALS	133.0	27.0
			160.0

Pre-processing Examination by LT Guy Noll	Beginning Date 1/16/96	Ending Date 1/16/96
Verification of Field Data by D. Doles, E. Domingo, R. Mayor, J. Stringham	Time (Hours) 133.0	Ending Date 9/27/96
Verification Check by B. Olmstead	Time (Hours) 6	Ending Date 10/30/96
Evaluation and Analysis by I. Almacen	Time (Hours) 27.0	Ending Date 10/10/96
Inspection by B. Olmstead	Time (Hours) 10	Ending Date 11/1/96

EVALUATION REPORT

H-10658

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 western portion of Perry Passage up along the eastern coast of Culross Island including the area of Hidden Bay. The inshore area is generally comprised of small coves, islets, ledges, scattered rocks and reefs. The bottom is mainly composed of mud, pebble and sand mixed with broken shells. Depths range from 0.0 to 239.0 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 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-10658.

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). 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: -2.174 seconds (-67.297 meters)
Longitude: 7.396 seconds (112.181 meters)

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 maps DM-10188 and DM-10189 are the photogrammetric source available for this survey. The shoreline maps DM-10188 and DM-10189 compiled in mylar apparently portrayed a more complete and accurate shoreline information than its digital copy in SDDEF format provided by N/CS32. A memorandum dated August 27, 1995 concerning this discrepancy was forwarded by the ship to the Chief, Hydrographic Survey Division. A copy of the memorandum is attached to this report.

Some changes and new features in the area not depicted on the shoreline maps were noted during this survey. In some cases, rocks shown on the shoreline maps were often identified in the field as high point of ledges or reefs. These features have been adequately located and depicted on the AutoCad generated smooth sheet based on the latest survey information. A discussion concerning shoreline changes and the disproval of some of the features searched for during this survey is included in the hydrographer's report.

A portion of the shoreline along the eastern shore of Culross Island between latitude 60/40/30N and 60/41/00N, was not verified during this survey. It is recommended that the area be shown as depicted on the latest shoreline map until an adequate verification is accomplished in the future.

K. CROSSLINES

Crosslines are discussed in the hydrographer's report.

L. JUNCTIONS

Survey H-10658 junctions with the following survey.

<u>Survey</u>	<u>Year</u>	<u>Scale</u>	<u>Area</u>
H-10634	1995	1:10,000	North
H-10657	1995	1:10,000	East

The junctions with surveys H-10634 and H-10657 are complete. The depth curves and soundings within the junction areas are in satisfactory agreement.

M. COMPARISON WITH PRIOR SURVEYS

Survey H-10658 was compared with the following prior surveys.

H-3408 (1912), scale 1:20,000
H-3570 (1913), scale 1:20,000 and 1:40,000
H-7678 (1948-49), scale 1:20,000

The above listed prior surveys cover the area of this survey with the exception of Hidden Bay and the small coves mentioned below. There are no prior hydrographic survey information available for comparison around these areas. Comparisons with prior surveys H-3408, H-3570 and H-7678 are considered satisfactory. The present survey appears to be generally shoaler by about 1.0 to 5.0 fathoms in most areas. Survey H-10658 has been accomplished with greater sounding density utilizing a more accurate positioning and sounding methods and as a result revealed more shoals never before found during the earlier surveys. The changes in the bottom configuration noted during this survey are attributed to more modern data acquisition methods and in part to the effects of past earthquakes around the area of Prince William Sound. The specific effects of the 1964 Alaska earthquake cannot be determined, however, comparisons with the prior surveys seems to indicate the usual uplifting trend common around this particular area.

The two (2) small coves located along the southeast coast of Culross Island in the vicinity of latitude 60/39/40N, longitude 148/05/40W and latitude 60/40/10N, longitude 148/05/40W, were developed during this survey. Three (3) shoal areas were found during field investigation and two (2) of the shoals were reported as dangers to navigation. However, these shoals were not fully investigated on this survey and further developments are recommended.

H-10658 is adequate to supersede the prior surveys within the common area.

N. ITEM INVESTIGATIONS

There are no AWOIS item investigations assigned to this survey.

O. COMPARISON WITH CHART

Survey H-10658 was compared with the following chart.

<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 requires no further discussion. Miscellaneous source data originates from T-9137 (1949), which is comprised of two (2) rocks located at the entrance to Hidden Bay. No previous survey work has ever been undertaken within the area of Hidden Bay. The charted depths were found to be in satisfactory agreement with the present survey.

The cable area charted along Perry Passage within the survey limits was not investigated and should be retained as charted.

The anchorage area charted at latitude 60/44/45N, longitude 148/10/12W, inside Culross Bay was found to be still suitable for safe anchorage. It is recommended that the presently charted anchorage symbol in the area be retained.

With the exception of the items mentioned above, survey H-10658 is adequate to supersede charted hydrography within the common area of coverage.

b. Dangers to Navigation

Ten (10) dangers to navigation were reported to the USCG, DMAHTC, N/CG221 and N/CS34 on January 9, 1996. A copy of the report is attached. No additional dangers were found during office processing.

P. ADEQUACY OF SURVEY

With the exception of the items mentioned in sections J and M of this report, the hydrography on survey H-10658 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-10658 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 Procedure Manual, April 1994 Edition.

Survey H-10658 adequately complies with the project instructions.

Q. AIDS TO NAVIGATION

There is one (1) existing fixed light found within the survey area. The light was located using GPS positioning system. This aid was found in good condition and adequately serves its intended purpose.

<u>Name of Aid</u>	<u>Lt. List#</u>	<u>Latitude(N)</u>	<u>Longitude(W)</u>
Culross Island Light	25865	60/44/50.22	148/06/48.70

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-10658 is an adequate hydrographic survey. Additional field work is required on a non-priority basis to adequately determine the changes along the unverified portion of the shoreline on this survey and to adequately develop the shoal areas mentioned in section M of this report.

U. REFERRAL TO REPORTS

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


Isagani A. Almacén
Cartographer

APPROVAL SHEET
H-10658

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.

Bruce A. Olmstead Date: 11/1/96
Bruce A. Olmstead
Senior Cartographer, Cartographic Section
Pacific Hydrographic Branch

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

Kathy Timmons Date: 11/15/96
Kathy Timmons
Commander, NOAA
Chief, Pacific Hydrographic Branch

Final Approval

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

MARINE CHART BRANCH
RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H-10658

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	11/8/96	<i>[Signature]</i>	Full Part Before After Marine Center Approval Signed Via <i>Full application of</i> Drawing No. <i>edges & features from smooth sheet.</i> <i>Rev 10/3/97 TWA</i>
			Full Part Before After Marine Center Approval Signed Via Drawing No.
			Full Part Before After Marine Center Approval Signed Via Drawing No.
			Full Part Before After Marine Center Approval Signed Via Drawing No.
			Full Part Before After Marine Center Approval Signed Via Drawing No.
			Full Part Before After Marine Center Approval Signed Via Drawing No.
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