H10657

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-10-22-95

Registery No. H-10657

LOCALITY

State Alaska

General Locality Prince William Sound

Sublocality Eastern Portion of Perry Passage

1995

CHIEF OF PARTY
CAPT Dean R. Seidel, NOAA

☆U.S. GOV. PRINTING OFFICE: 1985—566-054

DIAGRAM 8551-4

Charts

NOAA FORM 77-28 (11-72) | U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

HYDROGRAPHIC TITLE SHEET

REGISTER NO. H-10657

FIELD NO. RA-10-22-95

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

State: Alaska

General locality: Prince William Sound

Locality: Eastern Portion of Perry Passage

Scale: 1:10,000 Date of survey: October 18-November 1, 1995

Instructions dated: July 18, 1995 * Project No.: OPR-P125-RA

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 S. 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, E. Domingo, R. Mayor, J. Stringham

Soundings in ~~fathoms~~ ~~feet~~ x at ~~MLW~~ MLLW and tenths -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.

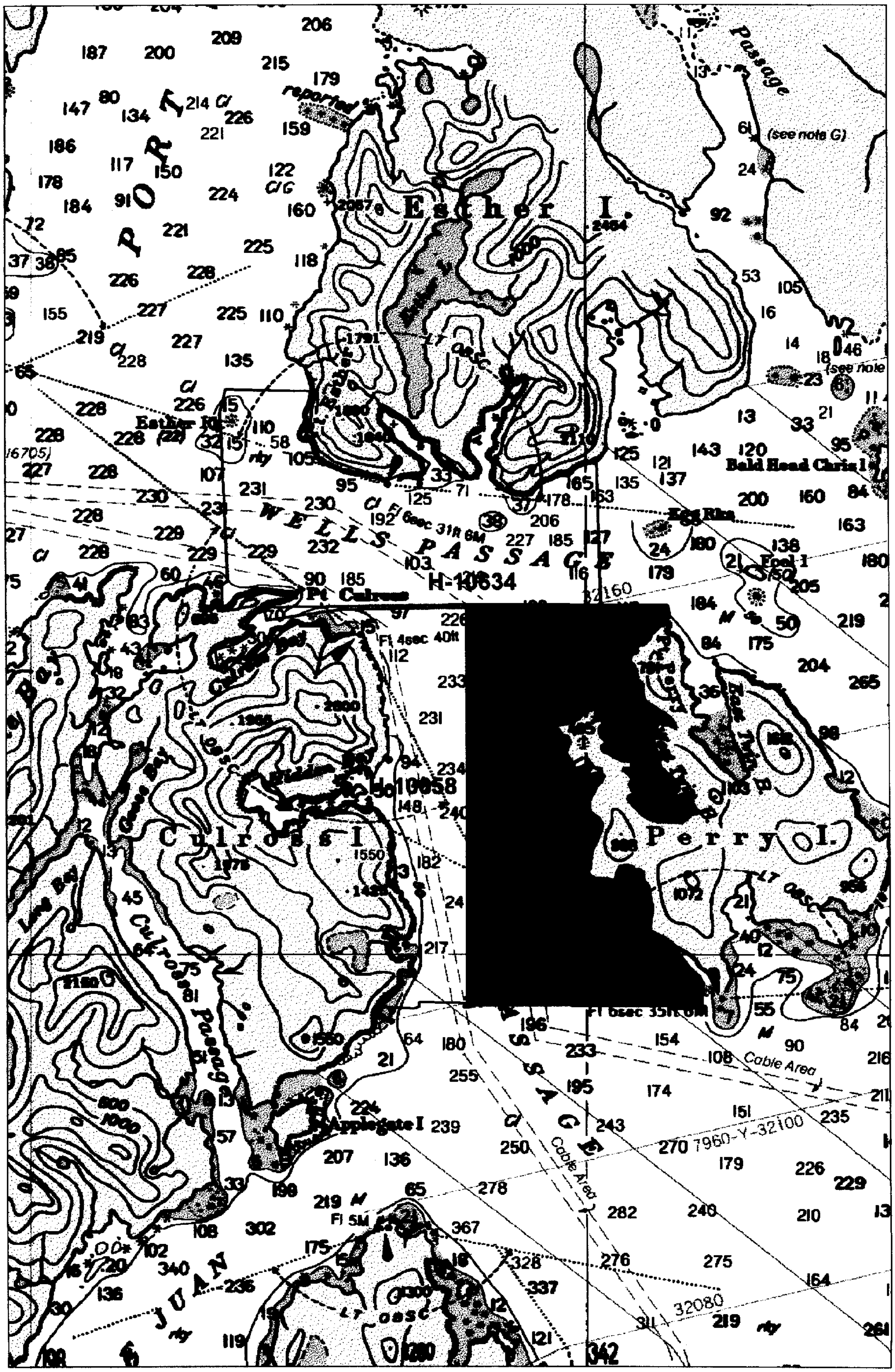
AWOIS/ SURF 4/24/97 mcR

* Change No. 1, dated August 30, 1995

SC 4-29-97

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

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


Esther I.
PORT
WELLS PASSAGE
H-10634
Pt Culross
Fl 4sec 40ft
H-10658
Culross I
Culross Passage
Perry I.
Bald Head Chris I
Foul I
Passage
(see note G)
Applegate I
Cable Area
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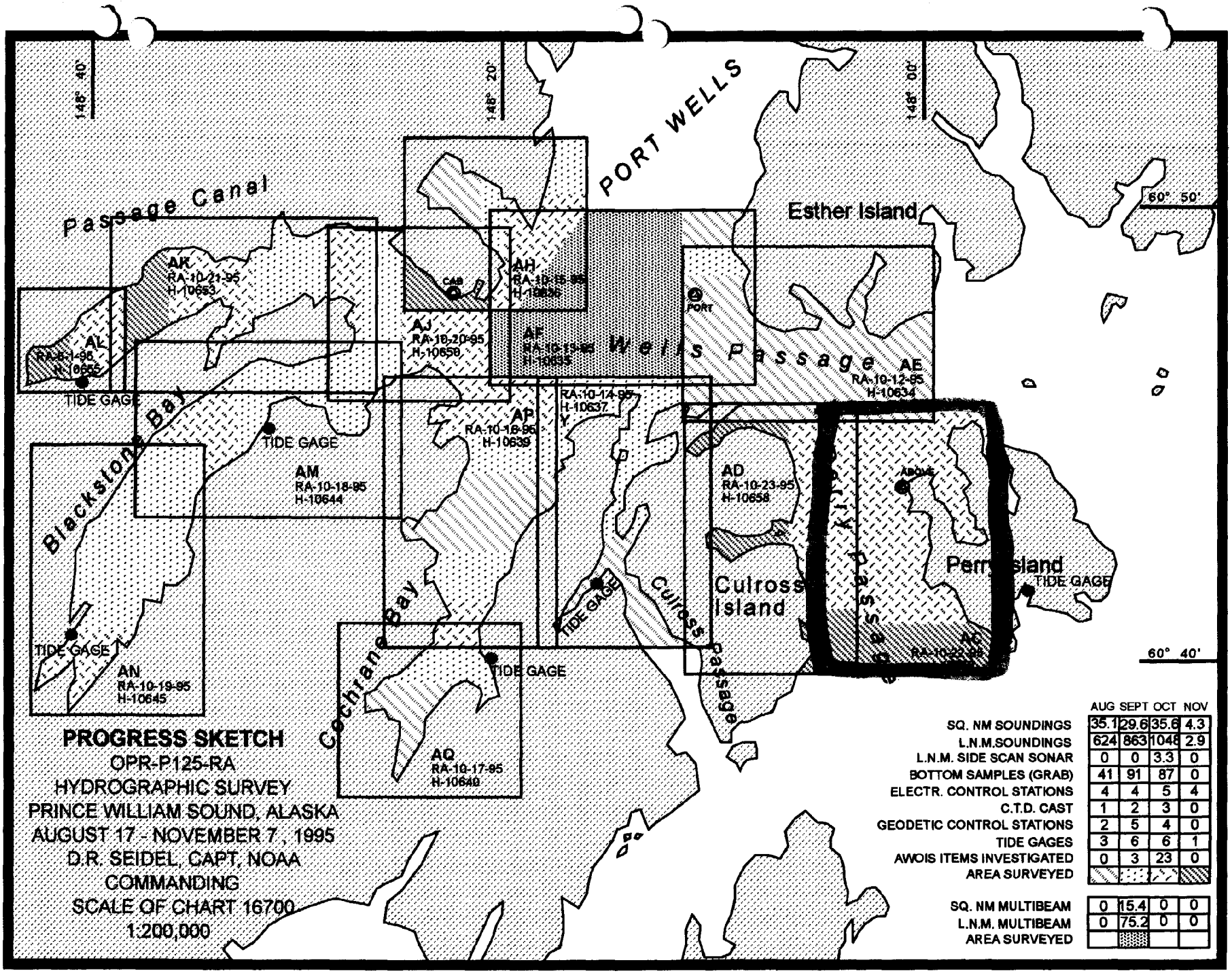


PROGRESS SKETCH
OPR-P125-RA
HYDROGRAPHIC SURVEY
PRINCE WILLIAM SOUND, ALASKA
AUGUST 17 - NOVEMBER 7 , 1995
D.R. SEIDEL, CAPT, NOAA
COMMANDING
SCALE OF CHART 16700
1:200,000

	AUG	SEPT	OCT	NOV
SQ. NM SOUNDINGS	35.1	29.6	35.6	4.3
L.N.M.SOUNDINGS	624	863	1048	2.9
L.N.M. SIDE SCAN SONAR	0	0	3.3	0
BOTTOM SAMPLES (GRAB)	41	91	87	0
ELECTR. CONTROL STATIONS	4	4	5	4
C.T.D. CAST	1	2	3	0
GEODETIC CONTROL STATIONS	2	5	4	0
TIDE GAGES	3	6	6	1
AWOIS ITEMS INVESTIGATED	0	3	23	0
AREA SURVEYED				

SQ. NM MULTIBEAM	0	15.4	0	0
L.N.M. MULTIBEAM	0	75.2	0	0
AREA SURVEYED				

Descriptive Report to Accompany Hydrographic Survey H-10657

Field Number RA-10-22-95
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-10657 corresponds to "sheet AC" 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., Section B

The survey area is located in the eastern portion of Perry Passage. The survey's northern limit is bounded by 60° 45' 18" N. The eastern limit is bounded by 147° 57' 39" W north of Perry Island, by the eastern shoreline of West Twin Bay and by 147° 56' 30" W south of Perry Island. The survey's southern limit is bounded by 60° 39' 15" N and the western limit by 148° 03' 45" W.

Data acquisition was conducted from October 18, 1995 (DN 291) to November 1, 1995 (DN 305).

C. SURVEY VESSELS ✓

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

Vessel	EDP #	Operation
RAINIER	2120	Sound Velocity Casts 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
RA-6	2126	Hydrography Shoreline Verification Dive Investigations

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 was acquired with RA-2 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/CS32. 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. Field data were adequately checked for suspected positioning errors and found to contain no significant problems.

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-10657. Concur

F. SOUNDING EQUIPMENT

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

G. CORRECTIONS TO ECHO SOUNDINGS

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

* 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	571	291-306
10	5	296	60° 40' 50" N 148° 03' 02"W	571	291-306

Table 9 was applied to data collected by vessels 2122-2126 and table 10 was applied to data collected by RAINIER.

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 2122-2126 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 were collected in Shilshole Bay, Washington in the Spring of 1995. The data for 2122 was 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 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 sheet H-10657 are:

Time Correction	Range Ratio
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, 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.

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

A listing of the geodetic stations used to control this survey is ~~included in Appendix III of~~ attached to this report. The horizontal datum for this project is NAD 83.

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 side 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 at Cape Hinchinbrook and Potato Point were used according to specifications listed in Section 6.2 of the Project Instructions. ✓

* Filed with the survey records.

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 either 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 ✓

None

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

Shoreline map DM-10189 was supplied by N/CS341 in Standard Digital Data Exchange Format (SDDEF) as well as on mylar. The digital file was 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.

Method of Shoreline Verification ✓

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

* Filed with the survey records.

Shoreline verification was accomplished by taking detached positions (DP's) and assigning sequential reference numbers.

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. Some positions of DM features were verified during inshore hydrography and annotated on the RMPO (ie: Line ends at cliff face, etc.). RMPO (Raw Master Printouts)

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. Survey features have been corrected on the smooth sheet based on approved tides. Heights are depicted in feet. There were no revisions to the mean high water line.

Changes and New Features

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

Disprovals

A DM rock in the vicinity of position 60° 41' 05" N, 147° 58' 21" W, was not found. The rock was searched for on DN 295 (tide 0.6 m) by visual search. The average depth at the reported position (position # 11341) is 3 m, search time 20 min, search radius 50 m and water visibility 4 m. The hydrographer recommends the rock symbol from the digital shoreline manuscript not be charted. Concur. Chart the area based on the present survey. The mylar copy of DN-10189 shows no rock at the position above. Reference section on "Problems", Page 9.

Two DM rocks in the vicinity of position 60° 40' 22" N, 147° 58' 11" W, were not found. The rocks were searched for on DN 295 (tide 0.9 m) by visual search. The average depth at the reported positions (positions # 11334 and 11336) is 2 m, search time 30 min, search radius 50 m and water visibility 1 m. The hydrographer recommends the rock symbols from the digital shoreline manuscript not be charted. Concur. Chart the area based on this survey. The mylar copy of DN-10189 shows no rocks at the position above. Reference section on "Problems", page 9.

On the eastern shoreline at the south end of West Twin Bay, 31 DM rocks were not found. The rocks were searched for on DN 298 (tide 0.6 m) by visual search. The average depth at the reported positions (positions # 2215, 2217, 2221, 2222, 2223 and 2224) is 3 m, total search time 105 min and water visibility 5 m. For individual disproval information, see detached position forms. The hydrographer recommends the rock symbols from the digital shoreline manuscript not be charted. Concur. Chart the area based on the present survey. See comments from previous page regarding "Problems".

A DM rock in the vicinity of position 60° 44' 43" N, 147° 58' 34" W, was not found. The rock was searched for on DN 299 (tide 0.5 m) by visual search. The average depth at the reported position (position # 5910) is 5 m, search time 15 min, search radius 30 m and water visibility 2 m. The hydrographer recommends the rock symbol from the digital shoreline manuscript not be charted. Concur. Chart the area based on the present survey. See statement above.

A T-Sheet rock in the vicinity of position 60° 43' 23" N, 148° 01' 12" W, was not found. The rock was searched for on DN 297 (tide 0.7 m) by visual search. The average depth at the reported position (position # 3857) is 9 m, search time 15 min, search radius 30 m and water visibility 1 m. The hydrographer recommends the rock symbol from the shoreline manuscript not be charted. Concur. Chart the area based on the present survey.

A T-Sheet rock in the vicinity of position 60° 43' 42" N, 148° 00' 28" W, was not found. The rock was searched for on DN 295 (tide 0.8 m) by visual search. The average depth at the reported positions (positions # 1927) is 10 m, search time 15 min, search radius 30 m and water visibility 1 m. The hydrographer recommends the rock symbols from the shoreline manuscript not be charted. Concur. Chart the area based on the present survey.

A T-Sheet rock in the vicinity of position 60° 43' 31" N, 148° 00' 49" W, was not found. The rock were searched for on DN 295 (tide 0.6 m) by visual search. The average depth at the reported positions (position # 1929) is 5 m, search time 15 min, search radius 30 m and water visibility 1 m. The hydrographer recommends the rock symbols from the shoreline manuscript not be charted. Concur. Chart the area based on the present survey.

A T-Sheet islet in the vicinity of position 60° 44' 00" N, 147° 58' 30" W, was not found. The islets were searched for on DN 299 (position # 8254, tide 0.5 m) by visual search. The position of the T-Sheet islet is on a T-Sheet ledge. The ledge was verified and the shoreline was described as continuous. There was no indication of an islet in this area, search time 20 min, search radius 150 m. The hydrographer recommends the islet symbol from the digital shoreline manuscript not be charted. Concur

Two T-Sheet islets in the vicinity of position 60° 42' 50" N, 147° 58' 48" W, were not found. The islets were searched for on DN 304 (tide 3.0 m) by visual search. The average depth at the reported position (positions # 8420) is 1 m, search time 20 min, search radius 75 m and water visibility 1 m. The hydrographer recommends the islet symbols from the shoreline manuscript not be charted. Concur. These islets are not depicted on the smooth sheet and will not be charted based on the hydrographer's findings.

A DM rock in the vicinity of position 60° 43' 05" N, 147° 59' 27" W, was not found. The shoreline was investigated on DN 297 (tide 0.7 m) by visual search but the rock was not identified or disproved. The hydrographer recommends the rock symbol be charted as depicted on the final field sheet. ~~Do not concur. Rock cannot be shown due to scale of the chart.~~ Concur

Two DM rocks in the vicinity of position 60° 43' 14" N, 147° 59' 32" W, were not addressed. The small cove that contains the rocks was not accessible even at high tide (investigated on DN 304, tide 3.0 m). The rock positions are above the high waterline. The hydrographer recommends the rock symbols be charted as depicted on the final field sheet. Do not concur. Rocks cannot be shown due to scale of the chart.

Problems (See attached copy of memo for the chief, HSD, regarding problems with shoreline manuscripts, dated August 27, 1995)

The digital shoreline DM-10189 in SDDEF, was 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 dataset were manually transferred to the boat sheet. In many cases "DM" rocks were highpoints 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.

Thirty-six rocks that appeared on the digital (DM) version of the shoreline and not on the mylar (T-Sheet) version were not found. In most cases, they were depicted above the high water line and on gravel beaches. These rocks are addressed in the section above.

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 ~~supersede~~ update shoreline information compiled on DM-10189. Concur.

Charted Features

Charted rocks were either identified as rocks, high points or extensions of DM ledges and reefs. All other charted features were identified as charted except as noted below.

The foul area in the south end of West Twin Bay was thoroughly investigated and was not found to be foul. Hydrography was conducted using 50m (or less) line spacing and identified least depths ranging from 0-9 m. (0-5 Fms) An islet and a new rock (position #2213) were identified more then 200m offshore. Three ledges on the southern shore were found to extend approximately 150 m offshore. Hydrographer recommends deleting the foul area depicted at the south end of West Twin Bay and charting the features depicted on the ~~final field sheet~~ Smooth Sheet. Concur. Chart the area based on the present survey.

Chart 16705, 15th Edition, September 1, 1990, 1:80,000, (NAD 83) was enlarged to 1:10,000 for comparison purposes. Gross differences between the charted and field verified DM high waterline were detected on the western shoreline of Perry Island south of latitude 60° 43' 00" N. The maximum shift was noted east of Bush point where the Charted shoreline seemed to shift ~~north~~ South approximately 550 m. These differences were not found in West Twin Bay. Concur. The difference in the shoreline configuration were noted throughout the western South of Perry Island, including minor differences in West Twin Bay.

Problems ✓

None.

K. CROSSLINES ✓

Crosslines agreed to within 1 meter with mainscheme hydrography. Total mileage was 19.1 nautical miles or 10% of total mainscheme hydrography.

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

This survey junctions with surveys H-10634 (1:10,000, 1995) at the northern limit and H-10658 (1:10,000, 1995) at the western 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. Generally, on the western shore of Perry Island, the hydrography did not go inside of the 15 fm. Final comparisons will be done at PHB.

N. ITEM INVESTIGATIONS ✓

Survey H-10657 contained no AWOIS items. Concur.

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

This survey was compared to NOS chart 16705, 15th Edition, September 1, 1990 1:80,000, (NAD 83). The charted soundings were found to be in general agreement. Final comparisons will be made at PHB.

Dangers to Navigation ✓

Twenty-one (21) dangers to navigation within the limits of H-10657 were reported to the Seventeenth Coast Guard District, December 1, 1995. Copies of the correspondence ~~can be found in Appendix I of~~ are attached to this report.

P. ADEQUACY OF SURVEY ✓

Survey H-10657 is complete and adequate to supersede charted depths and features in their common areas. Concur.

Q. AIDS TO NAVIGATION ✓

No Aids to Navigation exist within the survey area. Concur.

R. STATISTICS ✓

NM Hydrography	354.9
Velocity Casts	1
Detached Positions	99
Selected Soundings	15703
Bottom Samples	24
Tide Stations	1
NM^2 Hydrography	13.5
Dives	8

S. MISCELLANEOUS ✓

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

No unusual magnetic variations or tidal currents were noted.

T. RECOMMENDATIONS ✓

None

U. REFERRAL TO REPORTS ✓

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

Title	Date Sent	Office
Fall 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,

Stacy Maenner
Ensign, NOAA

Approved and Forwarded,

Dean R. Seidel
Captain, NOAA
Commanding Officer

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~~	~~061:07:24.000~~	~~146:41:48.000~~	~~0~~	~~250~~	~~0.0~~	~~0.0~~	~~08/22/95~~	~~POTATO PT(BEACON)~~
102	F	060:48:12.825	148:23:17.976	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)

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
Office of NOAA Corps Operations
Pacific Marine Center
1801 Fairview Avenue East
Seattle, Washington 98102-3767

NOAA Ship RAINIER

December 1, 1995

ADVANCE INFORMATION

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

Dear Sir:

During the processing of hydrographic survey H-10657, in Northwest Prince William Sound twenty-one dangers to navigation have been discovered. These dangers affect the following charts:

Chart	Edition/Date	Datum
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

Hydrographic Survey Registry Number: H-10657

ADVANCE INFORMATION

Survey Title: State: Alaska
Locality: Prince William Sound
Sublocality: Eastern 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.

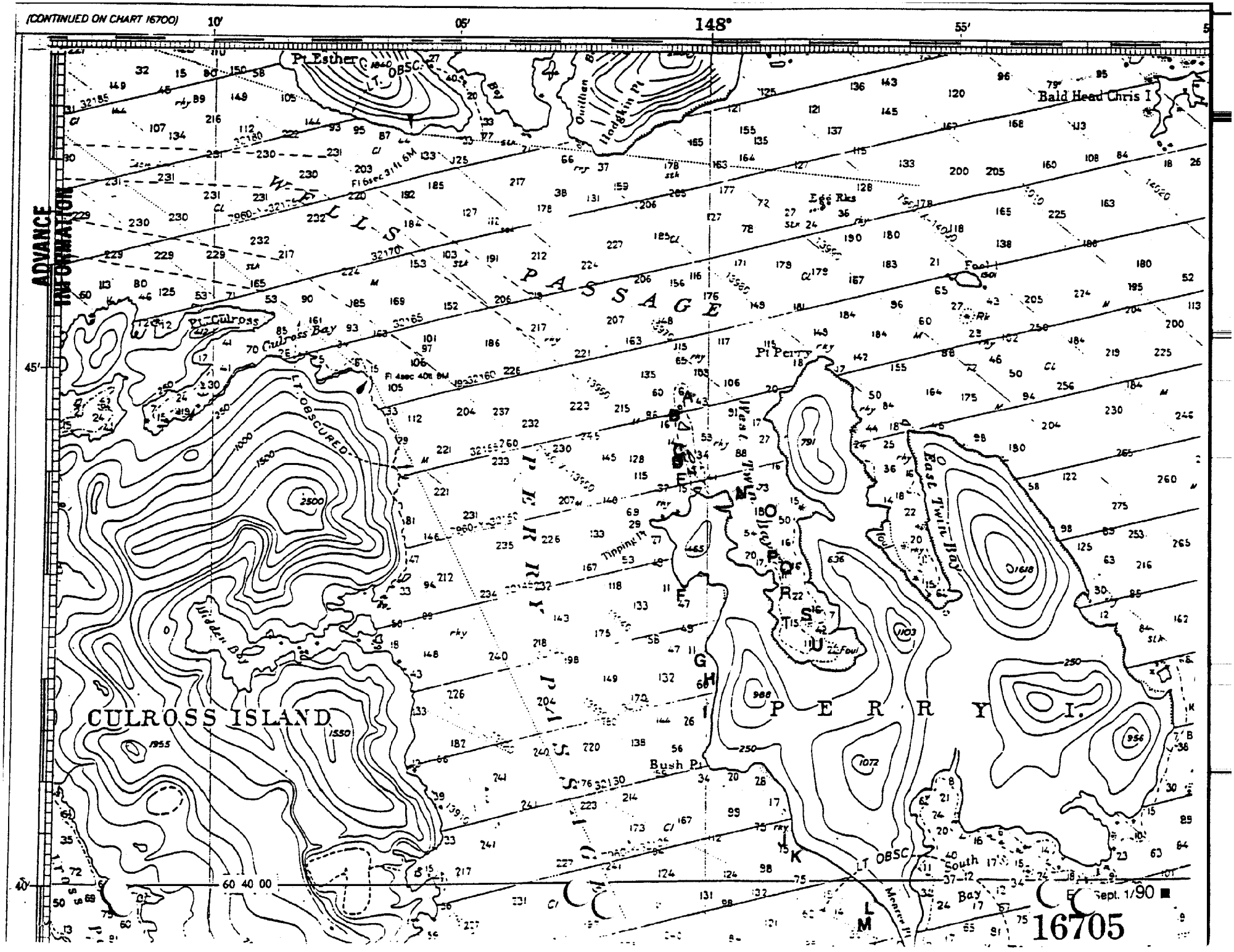
Affected Nautical Charts:

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

Item	Danger	Depth	Latitude(N)	Longitude (W)	Fix #	Depth (m)
A.*	SOUNDING	2 1/2 FM (2 1/4)	60/44/40.5	148/00/33.6	8455+4	5.0
B.	SOUNDING	4 1/4 FM	60/44/36.3	148/00/41.5	8457+5	7.9
C.	SOUNDING	2 1/4 FM	60/44/12.6	148/00/38.7	1574+0	4.3
D.*	SOUNDING	3/4 FM (1 Rk)	60/44/10.0	148/00/36.6	8500+0	1.7
E.*	SOUNDING	5 3/4 FM	60/43/53.1	148/00/28.2	8501+0	10.8
F.*	SOUNDING	4 FM	60/42/47.3	148/00/45.0	8503+0	7.3
G.	SOUNDING	2 1/4 FM	60/42/14.4	148/00/12.0	8122+2	4.3
H.*	SOUNDING	3 3/4 FM (Rk)	60/42/03.9	148/00/04.3	8504+0	7.1
I.	ROCK	AWASH	60/41/48.9	147/59/53.8	8233+0	-0.1
J.	SOUNDING	5 FM	60/40/35.6	147/58/26.4	3995+3	9.6
K.*	SOUNDING	3 3/4 FM (3 1/2)	60/40/18.6	147/58/19.3	10933+0	6.9
L.	SOUNDING	1 1/2 FM	60/39/51.5	147/57/14.8	8301+3	3.1
M.*	SOUNDING	5 1/2 FM (5 1/4)	60/39/47.9	147/57/20.6	3573+8	10.1
N.*	SOUNDING	4 3/4 FM (5 Rk)	60/43/42.0	147/59/19.0	8495+0	8.9
O.	SOUNDING	6 3/4 FM	60/43/31.3	147/58/51.8	1822+4	12.7
P.*	SOUNDING	7 FM (6 3/4 Rk)	60/43/05.7	147/58/45.6	1760+3	12.9
Q.*	SOUNDING	1 1/2 FM	60/43/03.0	147/58/31.3	8493+0	2.9
R.*	SOUNDING	3 1/4 FM	60/42/48.7	147/58/24.7	1270+3	6.3
S.*	SOUNDING	6 FM (6 1/4)	60/42/36.1	147/58/00.7	8485+0	11.4
T.	SOUNDING	6 3/4 FM	60/42/14.8	147/58/16.0	10100+0	12.5
U.*	SOUNDING	5 1/2 FM (5 1/4)	60/42/15.7	147/57/54.2	2072+4	10.2

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

* Corrected for approved tides and depiction on the smooth sheet.


(CONTINUED ON CHART 16700)
10'
05'
148°
55'
ADVANCE INFORMATION
Pt Esther
LT OBSC
Bald Head Chris I
Egg Rks
Pt Culross
Culross Bay
LT OBSCURED
Pt Perry
East Twin Bay
PASSAGE
CULROSS ISLAND
PERRY I.
Bush Pt
South Bay
LT OBSC
45'
40'
60 40 00
Sept. 1/90
16705

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 manuscipt 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 curently expending large quanities 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 fatho 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 fatho 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 fatho 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

APPROVAL SHEET

for

H-10657
RA-10-22-95

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-10657

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

TIME PERIOD: October 18 - November 2, 1995

TIDE STATION USED: 945-4721 Perry Island (South Bay) , Ak.
Lat. 60° 40.8'N Lon. 147° 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).

Notes: Times are tabulated in Greenwich Mean Time.

William M. Hilson
CHIEF, DATUMS SECTION

NOAA FORM 76-155
(11-72)

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

GEOGRAPHIC NAMES

SURVEY NUMBER
H-10657

Name on Survey	A ON CHART NO. 16705	B ON PREVIOUS SURVEY NO. 16700	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
BUSH POINT	X		X							2
PERRY ISLAND	X		X							3
PERRY PASSAGE	X		X							4
PRINCE WILLIAM SOUND	X		X							5
(title)										6
TIPPING POINT	X		X							7
WELLS PASSAGE	X		X							8
WEST TWIN BAY	X		X							9
POINT PERRY *	X		X							10
										11
										12
* Added during final										13
inspection.										14
										15
										16
										17
										18
										19
						Approved				20
										21
						Chief Geographer				22
										23
						MAR 25 1996				24
										25

NOAA FORM 76-155 SUPERSEDES C&GS 197

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

U.S. DEPARTMENT OF COMMERCE

HYDROGRAPHIC SURVEY STATISTICS

REGISTRY NUMBER: H-10657

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	

DESCRIPTION	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-10189
PHOTOBATHYMETRIC MAPS (List):	None
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	AMOUNTS EVALUATION	AMOUNTS TOTALS
POSITIONS ON SHEET			
POSITIONS REVISED			
SOUNDINGS REVISED on Sheet			15,703
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	138.50		138.50
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	138.50	28.0	166.50

Pre-processing Examination by LT Guy Noll	*Beginning Date* 12/5/95	*Ending Date* 12/5/95
Verification of Field Data by D.Doles, E.Domingo, R.Mayor, J.Stringham	*Time (Hours)* 138.50	*Ending Date* 8/15/96
Verification Check by B. Olmstead	*Time (Hours)* 6	*Ending Date* 10/18/96
Evaluation and Analysis by I. Almacen	*Time (Hours)* 28.0	*Ending Date* 9/25/96
Inspection by B. Olmstead	*Time (Hours)* 16.0	*Ending Date* 10/25/96

EVALUATION REPORT

H-10657

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 eastern portion of Perry Passage and up along the western coast of Perry Island from north of Meares Point to Tipping Point and east of Perry Point. It also includes the area around West Twin Bay. The inshore area is generally comprised of islets, ledges, scattered rocks and reefs with patches of gravel and boulder beaches. The bottom is mainly composed of sand, pebble and mud mixed with shells. Depths range from 0.0 to 240.0 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-10657.

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 and published values based on NAD 83. The geographic positions of all survey data are also based on NAD 83. The AutoCAD generated smooth sheet is annotated with an NAD 27 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: -2.085 seconds (-64.539 meters)
Longitude: 7.408 seconds (112.375 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 map DM-10189 covers the area of this survey. This shoreline map compiled in mylar apparently portrayed a more complete and accurate shoreline information than its digital copy in SDDEF format provided by N/CS341. A memorandum concerning this descrepancy 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 were noted during shoreline verification. There are several rocks shown either on mylar or on the digital copy of the shoreline map that were not found during field investigations. In some cases, rocks shown on the shoreline maps were identified in the field as high point of ledges or reefs. These features have been adequately investigated, located and depicted on the AutoCad generated smooth sheet based on the latest survey information. A discussion concerning the disproval of the features searched for during this survey is included in the hydrographer's report.

There were no significant changes to the mean high water line noted between the present and the previously compiled shoreline map DM-10189. However, a comparison with the presently charted shoreline on Chart 16705 shows significant differences in the mean high water line configuration. A considerable shift of several hundred meters was noted during this survey around the area of Bush Point and south of Tipping Point. The charted shoreline appears to be shifted in an easterly direction along the west side of Perry Island. However, there are also shoreline shifts to the north and south around Bush Point and Tipping Point respectively. These changes could be attributed to the differences in the source data accuracy of the MHWL determination, and or the effects of frequent earthquakes in the area since the last USC&GS topographic surveys of Prince William Sound and an error in shoreline compilation to the chart.

K. CROSSLINES

Crosslines are discussed in the hydrographer's report.

L. JUNCTIONS

Survey H-10657 junctions with the following survey.

Survey	Year	Scale	Area
H-10634	1995	1:10,000	North
H-10658	1995	1:10,000	West

The junctions with H-10634 and H-10658 are complete. Agreement of depth curves and soundings within the junction areas are considered satisfactory.

M. COMPARISON WITH PRIOR SURVEYS

Survey H-10657 was compared with the following prior surveys.

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

The above listed prior surveys cover the area offshore and along the western coast of Perry Island. Comparisons with these prior surveys undertaken between 1912 and 1949 are considered satisfactory. The present survey appears to be generally shoaler by about 1.0 to 10.0 fathoms, particularly around the area of West Twin Bay. These differences could be primarily attributed to the accuracy of the present positioning and sounding methods used, more complete bottom coverage and the natural effects of the past Alaska earthquakes around this area of Prince William Sound. Determination as to the specific effects of the 1964 Prince William Sound Earthquake cannot be made. However, comparison with the prior surveys seems to indicate an uplifting trend common to the geographic area..

H-10657 is adequate to supersede the prior surveys within the common area.

N. ITEM INVESTIGATIONS

There are no items for investigation assigned to survey H-10657.

O. COMPARISON WITH CHART

Survey H-10657 was compared with the following chart.

Chart	Edition	Date	Scale	Datum
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 a prior USC&GS survey BP-65971 (1964). The charted soundings reveal the same differences with the present survey as discussed in section M. Charted miscellaneous source data was adequately addressed during survey operations.

Survey H-10657 is adequate to supersede charted hydrography within the common area of coverage.

b. Dangers to Navigation

Twenty-one (21) dangers to navigation were reported to the USCG, DMAHTC, N/CG221 and N/CS34 on December 1,1995. A copy of the report is attached. No additional dangers were found during office processing.

P. ADEQUACY OF SURVEY

The hydrography on survey H-10657 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-10657 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-10657 adequately complies with the project instructions.

Q. AIDS TO NAVIGATION

There are no existing aids to navigation found within the survey area.

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-10657 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. Almacen
Cartographer

APPROVAL SHEET
H-10657

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: 10/31/96
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: 10/31/96
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

NOAA FORM 75-96
(10-83)

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

MARINE CHART BRANCH

RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H-10657

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	10/2/96	[illegible signature]	Full ~~Part~~ ~~Before~~ After Marine Center Approval Signed Via Full application of
			Drawing No. Sndgs. & features from smooth sheet.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
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			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.

SUPERSEDES C&GS FORM 8352 WHICH MAY BE USED.