

H110645

NOAA FORM 76-35A	
U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION NATIONAL OCEAN SURVEY	
DESCRIPTIVE REPORT	
Type of Survey	Hydrographic
Field No.	RA-10-19-95
Office No.....	H-10645
LOCALITY	
State	Alaska
General Locality	Prince William Sound
Locality	Southern Portion of Blackstone Bay
1995	
CHIEF OF PARTY CAPT Dean R. Seidel, NOAA	
LIBRARY & ARCHIVES	
DATE	MAR 26 1997

HYDROGRAPHIC TITLE SHEET

H-10645

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-10-19-95

State Alaska

General locality Prince William Sound

Locality Southern Portion of Blackstone Bay

Scale 1:10,000 Date of survey September 9 - October 8, 1995

Instructions dated 7/18/95, Change #1-8/30/95 Project No. OPR-P125-RA

Vessel NOAA Ship RAINIER, 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 LT D.Haines, LT M.Larsen, LTJG C.George, ENS S.Smith, ENS S. Maenner,
ENS E.Christensen, ENS N.Bennett, ENS J.Becker, CST F. Paranada, SST J. Fleischmann,
ST R.Baum, ST N.Quanbeck

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

Graphic record scaled by RAINIER Personnel

Graphic record checked by RAINIER Personnel

Evaluated by: L. Deodato Automated plot by HP Design Jet 650C

Verification by R. Mayor, D. Doles, J. Stringham, L. Deodato

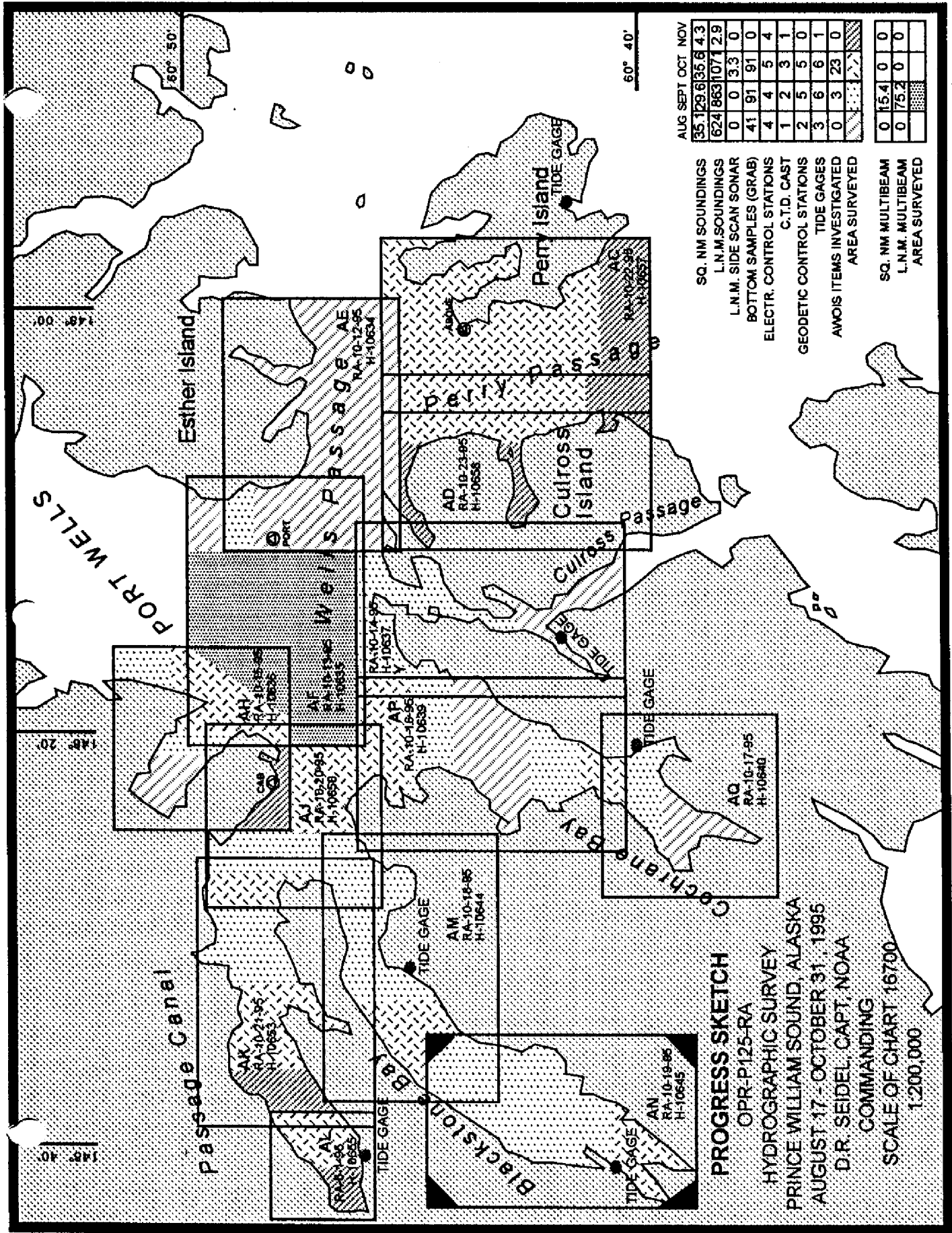
Soundings in fathoms ~~feet~~ at MHW ~~MLLW~~ and tenths of fathoms

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

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

Surf/Amies ck 3/26/97 mcr

SC 4-7-97



AUG	SEPT	OCT	NOV
35	129	635	843
624	863	1071	29
0	0	3	0
41	91	91	0
4	4	5	4
1	2	3	1
2	5	5	0
3	6	6	1
0	3	23	0

SQ. NM SOUNDINGS
 L.N.M. SOUNDINGS
 L.N.M. SIDE SCAN SONAR
 BOTTOM SAMPLES (GRAB)
 ELECTR. CONTROL STATIONS
 C.T.D. CAST
 GEODETIC CONTROL STATIONS
 TIDE GAGES
 AWOIS ITEMS INVESTIGATED
 AREA SURVEYED

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

PROGRESS SKETCH

OPR-P125-RA

HYDROGRAPHIC SURVEY

PRINCE WILLIAM SOUND, ALASKA

AUGUST 17 - OCTOBER 31, 1995

D.R. SEIDEL, CAPT, NOAA

COMMANDING

SCALE OF CHART 16700

1:200,000

Descriptive Report to Accompany Hydrographic Survey H-10645

Field Number RA-10-19-95
Scale 1:10,000
September - October 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-10645 corresponds to "sheet AN" 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 Report, Section B*

The survey area is located in the southern end of Blackstone Bay. The survey's northern limit is 60° 44.3'N and the rest is bounded by the shoreline of Blackstone Bay.

Data acquisition was conducted from September 9, 1995 (DN 252) to October 8, 1995 (DN 281).

C. SURVEY VESSELS ✓

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

Vessel	EDP #	Operation
RAINIER	2120	Sound Velocity Casts
RA-2	2122	Hydrography
RA-3	2123	Hydrography
RA-4	2124	Hydrography Shoreline Verification

Vessel	EDP #	Operation
RA-5	2125	Hydrography Shoreline Verification Bottom Samples
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 264, 265, and 267 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

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

* Filed with the hydrographic data.

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.

Problems ✓

When the data was first collected, HYPMENU incorrectly dead reckoned positions, created duplicate fix numbers, and produced a number of other problems. After the problems with HYPMENU were resolved, the data was reconverted and reprocessed, so no errors remain in the digital data submitted. *Data was analyzed during office processing and found to contain no significant 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. *Data was analyzed during office processing 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-10645.

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 hydrographic data.*

Velocity Table #	Cast #	DN	Cast Position	Deepest Depth (m)	Applicable DN
3	2	253	60° 47' 12" N 148° 13' 42" W	535	252-258
5	3	264	60° 47' 38" N 148° 19' 15" W	546	262-268
7	4	278	60° 48' 06" N 148° 16' 57" W	525	269-281

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. *Velocity Casts 2, 3 and 4 plot outside the Survey Area.*

A printout of the Sound Velocity Corrector Table used in the HDAPS Post Survey program is included in the "Separates to be Included with Survey Data, IV. Sounding Equipment Calibrations and Corrections".

Static Draft ✓

A transducer depth was determined using FPM Fig 2.2 for RAINIER and vessels 2122-2129 in the spring of 1995. These values were entered into the offset tables* for each survey platform.

Settlement and Squat ✓

Correctors were computed in accordance with Hydrographic Manual Section 4.9.4.2., using FPM Fig. 2.3, and are included with project data for OPR-P125-RA. The data for 2123-2126 was collected in Shilshole Bay, Washington in the Spring of 1995. The data for 2122 were collected in Windham Bay, Alaska, in May 1995 (OPR-O136).

Offset Tables ✓

Offset tables* contain offsets for the GPS antenna, as well as static draft measurements, and settlement and squat data. Offset tables 2-9 correspond to the number of the vessel. 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 hydrographic data.*

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-10645 are:

	<u>Time Correction</u>	<u>Range Ratio</u>
Blackstone Bay	0 hr 0 min	X 0.94

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

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

RAINIER personnel installed 8200 digital gages at Blackstone Bay (945-4907) and Southern Blackstone Bay (945-4952) on September 8, 1995. The staffs were each connected to five benchmarks during opening levels conducted September 8-9, 1995. The Blackstone Bay (945-4907) tide gage ran without problems during data acquisition.

The station description, field tide record, preliminary 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.

Problems ✓

The Southern Blackstone Bay (945-4952) tide gage operated continuously until it shut off on October 7, 1995 at 1807 UTC. The problem was not noticed and resolved until October 11, 1995 at 1937 UTC. The gage was removed the following day. No other problems were observed. *Tide Notes dated April 18, 1996 and May 13, 1996 are attached to this report. The May 13, 1996 Tide Note amends the initial data of 4/18/96.*

H. CONTROL STATIONS *See Eval Report, Section H*

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

DGPS stations were installed on existing stations PORT and CAB. Station PORT is located

** Filed with the hydrographic data.*

on Esther Rock, and station CAB is located on a prominent point west of Pigot Point light. These stations were recovered in accordance with methods stated in Section 5.2.4 of the FPM. 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 Report, Section I*

Method of Position Control ✓

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

Ashtech GPS ✓

VHF differential shore stations were established at stations CAB and PORT. The difference between the computed location and the published positions at station CAB and PORT were recorded by the MONITOR 3.0 program on a PC. Data from a 24-hour period were recorded and examined for signs of multi-path signal reflection, which was not evident at any station. Scatterplot results are included in the "Project related data for OPR-P125-RA".

Calibrations & Systems Check Methods ✓

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

Problems ✓

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

J. SHORELINE *See Eval Report, Section J.*

Shoreline map D-10186^M was supplied by N/CS341 in Standard Digital Data Exchange Format (SDDEF). The digital files were projected to the survey grid with OPR-P125-RA geodetic parameters using program Shore version 2.0, provided by N/CS32, and stored in HYPACK (*.DIG) format. Shoreline was plotted at survey scale on boat sheets and processing sheets.

* Filed with the hydrographic data.

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 taking detached positions (DPs) 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 boat sheet. Reference numbers, descriptions, and heights corrected to MLLW using predicted tides are recorded on the reference form. Corresponding notes were annotated on the photocopies of the boat sheet 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 Printouts and DP forms are included with the Survey data.*

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. **Field values have been changed after application of actual tides and shown on the smooth sheet in feet.*

Changes and New Features ✓

There were numerous changes and 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. *New features and revisions have been shown on the smooth sheet as warranted.*

Disprovals ✓

A DM rock at position $60^{\circ} 41' 37''$ N $148^{\circ} 36' 29''$ W was not found. The position of the DM rock placed the rock on a gravel beach. The item was investigated (Pos# 7818, DN 253, VN 2126) by visual and echosounder search. The average depth at the search area is 3 m, search time 15 min, search radius 50 m, visibility 5 m (bottom visible); fifty meter line spacing was run in the area. The rock was not visible on the gravel beach. The hydrographer recommends that the rock symbol from the shoreline manuscript not be charted. *concur*

Problems ✓

None were encountered during this survey.

Recommendations ✓

The hydrographer recommends that the shoreline as depicted on the final field sheet from the survey be used to supersede shoreline information compiled on DM-10186. *CONCUR*

Charted Features ✓

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

Two charted rocks at the northern end of Willard Island fall within the search radius of AWOIS # 52242. See section N for discussion.

A charted rock at position 60° 42' 45" N 148° 35' 30"W was not found. The rock does not appear on H-7732, and the chart markup shows USGS survey BP-108565, 1:20,000, 1979 as the source. The item was investigated (Pos# 4678, DN281, VN 2124) by visual and echosounder search. The depth at the charted position is 32 m, search time 15 min, search radius 50 m, visibility 1 m; fifty meter line spacing was run in the area. The hydrographer recommends deleting the rock symbol from the chart. *CONCUR* A rock was found approximately 50 meters east of the charted feature and uncovers 7 feet at MLW. As the present survey rock/plots very near the mean high water line, recommend not to chart.

A charted rock at position 60° 42' 11" N 148° 36' 42"W was not found. The rock is located outside the survey area of H-7732, and the chart markup shows USGS survey BP-108565, 1:20,000, 1979 as the source. The item was investigated by visual and echosounder search (Pos# 8722-8779, DN276, VN 2126). The area, 330 m by 350 m, surrounding the rock's charted position was developed with 10 m line spacing with hydrography run from northeast to southwest. The depth at the charted position is 4.8 m. The hydrographer recommends deleting the rock symbol from the chart. *CONCUR* Depths of 1.5 - 2.7 fathoms plot within fifty meters of the charted rock. The charted rock symbol was likely portrayed to convey the nature of the area as a terminal mooring which rises very near the surface. Chart this area based on the present survey information.

A charted reef at position 60° 40' 15" N 148° 39' 00"W was not found. The reef is located outside the survey area of H-7732, and the chart markup shows USGS survey BP-108565, 1:20,000, 1979 as the source. The item was investigated (Pos# 4707, DN281, VN 2124) by visual and echosounder search. A wagon wheel pattern was run over the charted position with the echosounder. The least depth observed was 7.6 m. The depth at the charted position is 19.0 m, search time 15 min, search radius 40 m, visibility 1 m; fifty meter line spacing was run in the area. The hydrographer recommends deleting the reef symbol from the chart. *CONCUR* Chart this area based on the present survey data.

Problems ✓

None

K. CROSSLINES ✓

Crosslines agreed to within 1 meter with mainscheme hydrography. Total mileage was 15.9 nautical miles or 10.0 % of total mainscheme hydrography. *concur*

L. JUNCTIONS ✓ *See Eval Report, Section J.*

This survey junctions with survey H-10644 (1:10,000, 1995) at the northeast 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 Report, Section M*

One prior survey was compared: H-7732 (1:40,000, 1948). Soundings were found to be in general agreement. Final comparisons will be done at PHB.

N. ITEM INVESTIGATIONS ✓

One AWOIS item was assigned to this survey.

AWOIS # 52242 ✓

1. Area of Investigation

State: Alaska
Locality: Blackstone Bay, Prince William Sound, AK
Reported Latitude: 60° 43' 26.5" N
Reported Longitude: 148° 37' 27.0" W
Datum: NAD 83
Depth: N/A
Feature: Rock Awash (PD)

2. Description of Source Item ✓

The item was reported in the above location in 1948. The item is described as a rock baring at low tide, that lies two hundred yards north of Willard Island. Two charted rocks were contained within the search area. Both rocks were addressed during the item investigation.

3. Survey Requirements ✓

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

4. Method of Investigation

A visual search of the area and a 25 m line spacing echosounder development of the search radius was conducted and the charted rock, position doubtful, was not found. The depths as found by this survey range from 38-51 meters (21-28 Fms). However, a rock was located approximately 150 meters southeast of the charted Area Item and is discussed below.

Date: DN 255
Time (UT): 16:32
Feature: Rock
Position Number: 3433
Latitude: 60° 43' 24.08" N ✓
Longitude: 148° 37' 21.24" W

Position of this rock is very near 2nd charted rock shown at Lat. 60/43/24N, long. 148/37/24 W. See recommendation below.

The rock was located and the detached position was taken during shoreline verification conducted on DN 255. Echosounder development of the search radius was conducted on DN 280 to locate the second charted rock. The charted rock at position 60° 43' 27" N 148° 37' 30" W was not found. The rock was further investigated (Pos# 3433, DN281, VN 2124) by visual and echosounder search. The depth at the charted position is 35.0 m.

Discussion moved to item 4 above.

6. Comparison with Prior Surveys ✓

The rocks do not appear on any prior surveys. The source of the rocks are USC&GS T-9135, 1:20,000, 1949.

7. Comparison with the Chart and Charting Recommendations ✓

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

This investigation did not warrant a Danger to Navigation.

Recommendation

The hydrographer recommends removing the rocks at the charted locations (approx 60° 43' 24" N 148° 37' 24" W and 60° 43' 27" N 148° 37' 30" W) and charting a rock at position 60° 43' 24.08" N 148° 37' 21.24" W. (Position # 3433) Concur

O. COMPARISON WITH THE CHART ✓ See Eval Report, Section O

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

Ten meter splits run with the echosounder over a shoal extending from the west shore of Willard Island to west shore of Blackstone Bay established a 200 m channel with a 5.4 m (3 FM) controlling depth. The development of the shoal measured a least depth of 3.5 m (2 FM) east of the channel and 4.1 m (2 FM) west of the channel. This shoal corresponds to the charted shoal represented by 1/2, 1 1/4, and 1 1/2 FM soundings and is positioned approximately 150 m south of the surveyed shoal's location. *The channel portion of this gravel moraine plots at Lat 60°42'39" N, Long 148°40'09" W. The channel thru this moraine is as discussed above and contains the same controlling depth after application of approved tides.*

The gravel moraine extending southwest from the eastern shore of Willard Island is separated by a 80 m wide channel from the gravel moraine extending northwest from the eastern shore of Blackstone Bay. Ten meter splits with the echosounder were run for the extent of the of the channel establishing a 5.4 m (3 1/4 FM) controlling depth. *The channel portion of this gravel moraine plots at Lat 60°42'09" N, Long 148°36'45" W. The channel thru this moraine was found to contain a controlling depth of 3.2 fathoms after application of approved tides.*

1/2 FM sounding at charted position 60° 41' 22" N 148° 39' 24" W was shallower than the corresponding depths of this survey. Twenty five meter line spacing was run with the echosounder to the 0 m curve in this area with a corresponding least depth of 6.3 m (3 1/4 FM). *Concur. Chart this area based on the present survey information. 1/2 FM sounding originates from miscellaneous source, SP-108565 (1979) USGS and is likely displaced for charting purposes.*

The difference in the soundings ~~above~~ could be a result of inaccurate tidal predictions or zoning in either the present survey or the prior survey. The sounding discrepancy might also be explained by ~~subsidence~~ *bottom uplift* in the area during the 1964 earthquake. See Eval Rpt, Section O.

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 ✓

Fourteen dangers to navigation within the limits of H-10645 were reported to the Seventeenth Coast Guard District, October 30, 1995. Copies of the correspondence can be found in ~~Appendix I~~ of this report. *Letter attached to this report.*

P. ADEQUACY OF SURVEY ✓ *See Eval Report, Section P*

Survey H-10645 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	347.2
Velocity Casts	3
Detached Positions	91
Selected Soundings	16014
Bottom Samples	21
Tide Stations	2
NM ² Hydrography	9.8
Dives	0

S. MISCELLANEOUS ✓

Bottom samples^{*} were collected and not retained in accordance with Project Instructions.

Predicted currents are weak and variable. Observations are in agreement with predictions. The chart shows tide rips between the southwest shore of Willard Island and the shore of Blackstone Bay. Rip tides were not observed by the hydrographer in this area during times of survey operations. The hydrographer recommends that the rip tides note on the chart be removed. *Concur*

The southern end of Blackstone Bay contained two tide water glaciers, Blackstone Glacier and Beloit Glacier to the west and east respectively. Hydrographic survey lines were run as close to the face of the glaciers as considered safely navigable.

No unusual magnetic variations were noted.

T. RECOMMENDATIONS ✓

None

U. REFERRAL TO REPORTS ✓

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

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

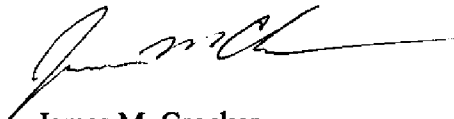
** Filed with the hydrographic data.*

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



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

NOAA Ship RAINIER

October 29, 1995

**ADVANCE
INFORMATION**

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

Dear Sir:

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

Sincerely,

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

Dean R. Seidel
Captain, NOAA
Commanding Officer

Enclosures





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

NOAA Ship RAINIER

October 29, 1995

**ADVANCE
INFORMATION**

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

Dear Sir:

Attached is a confirmation copy of the radio messages sent to your office regarding the dangers to navigation which I recommend for inclusion in the Local Notice to Mariners for the Seventeenth Coast Guard District. A copy of the chart showing the areas in which the dangers exist is also attached.

Sincerely,

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

Dean R. Seidel
Captain, NOAA
Commanding Officer

Enclosures

cc: DMAHTC
N/CS26
PMC



ADVANCE
INFORMATION

NMC DE WTEF

T

PTTUZYUW RUWNTEF3041 3041940-UUUU--RUWNSUU.

ZNR UUUUU

P 311940Z OCT 95

FM NOAA S RAINIER

TO CCGDSEVENTEEN JUNEAU AK

DMAHTCCNAVWARN WASHINGTON DC//MCNM//

INFO NOAAMOP SEATTLE WA

ACCT CM-VCAA

BT

UNCLAS

NOAA SHIP RAINIER HAS LOCATED 14 DANGERS TO NAVIGATION IN NORTHWESTERN PRINCE WILLIAM SOUND, ALASKA (PROJECT OPR-P125-RA) WITHIN THE LIMITS OF HYDROGRAPHIC SURVEY H-10645. THE FOLLOWING INFORMATION IS PROVIDED FOR PUBLICATION IN LOCAL NOTICE TO MARINERS:

DEPTHS ARE REDUCED TO MLLW BASED ON PREDICTED TIDES.

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

ITEM	DANGER	DEPTH	LATITUDE	LONGITUDE
A.	SHOAL	COVERS 8 FMS	60/43/41.2N	148/36/53.3W 4655+3 14.7
B.	SHOAL	COVERS 1 1/2 FMS	60/42/11.2N	148/36/50.4W 8742+4 3.1
C.	SHOAL	COVERS 1 1/4 FMS	60/42/06.8N	148/36/42.8W 8778+5 2.5
D.	SHOAL	COVERS 4 3/4 FMS	60/39/53.1N	148/40/28.0W 4426+3 8.7
E.	SHOAL	COVERS 2 FMS	60/40/26.8N	148/40/19.2W 4256+1 3.8
F.	SHOAL	COVERS 3 FMS	60/40/17.1N	148/40/26.9W 4244+2 5.8
G.	SHOAL	COVERS 2 FMS	60/40/09.2N	148/40/42.1W 10326+0 4.1
H.	SHOAL	COVERS 3 FMS	60/39/34.7N	148/42/29.3W 4341+1 5.7
I.	SHOAL	COVERS 2 1/2 FMS	60/39/52.2N	148/42/32.1W 4293+1 5.0
J.	SHOAL	COVERS 1/2 FMS	60/40/56.6N	148/39/48.6W 5734+3 1.2
K.	SHOAL	COVERS 2 3/4 FMS	60/41/06.2N	148/39/51.1W 5750+3 5.4
L.	SHOAL	COVERS 4 1/2 FMS	60/41/22.3N	148/39/35.3W 5775+2 8.3
M.	SHOAL	COVERS 4 1/2 FMS	60/41/35.3N	148/39/28.1W 4782+3 8.3
N.	SHOAL	COVERS 3/4 FMS	60/42/46.6N	148/39/09.4W 1394+1 1.4

THIS IS ADVANCE INFORMATION SUBJECT TO OFFICE REVIEW. QUESTIONS CONCERNING THIS MESSAGE SHOULD BE DIRECTED TO THE CHIEF, PACIFIC HYDROGRAPHIC BRANCH AT (206)526-6835. A

LETTER WITH ATTACHED CHARTLET WILL BE MAILED TO CONFIRM
THIS MESSAGE.

BT

3041

NNNN

KKKK?

003669990 NMC

12114 WTEF X +?

QSL TFC+ 1970 BYTES

GA+?



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

September 30, 1996

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

Dear Sir:

Two additional dangers to navigation have been identified by Pacific Hydrographic Branch regarding Project OPR-P125-RA (NOAA Ship RAINIER 1995) within the limits of H-10645. These dangers affect the following Charts:

<u>Chart</u>	<u>Edition/Date</u>	<u>Scale</u>	<u>Datum</u>
16700	24th/Jan 11, 1992	1:200,000	NAD83
16705	15th/Sept 1, 1990	1:80,000	NAD83

The attached information is provided for publication in the Local Notice to Mariners.

Questions concerning this report should be directed to the Pacific Hydrographic Branch at (206) 526-6853.

Sincerely,

Kathryn Timmons
Commander, NOAA
Chief, Pacific Hydrographic Branch

Enclosures

cc: DMAHTC
N/CS261
PMC



HYDROGRAPHIC SURVEY REGISTRY NUMBER: H-10645

Survey Title: State: Alaska
 Locality: Prince William Sound
 Sublocality: Southern Portion of Blackstone Bay

Project Number: OPR-P125-RA

Survey Date: Sept-Oct 1995

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

Charts affected: 16700 24th Edition/Jan 11, 1992 1:200,000 NAD83
 16705 15th Edition/Sept 1, 1990 1:80,000 NAD83

<u>ITEM</u>	<u>DANGER</u>	<u>DEPTH</u>	<u>LATITUDE(N)</u>	<u>LONGITUDE(W)</u>
A.	Sounding	1 3/4fms	60/42/37.8	148/39/41.8
B.	Sounding	3/4fms	60/39/56.9	148/42/27.7

Questions concerning this report should be directed to the Chief, Pacific Hydrographic Branch at (206) 526-6853.

CONTROL STATIONS as of 4 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)

H-10645

GEOGRAPHIC NAMES

Name on Survey	A CHART NO. 16705, 18700 B ON PREVIOUS SURVEY 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										
	A	B	C	D	E	F	G	H	K		
ALASKA (title)	X		X							1	
BELOIT GLACIER	X		X							2	
BLACKSTONE BAY	X		X							3	
BLACKSTONE GLACIER	X		X							4	
PRINCE WILLIAM SOUND	X		X							5	
(title)										6	
WILLARD ISLAND	X		X							7	
										8	
										9	
										10	
										11	
										12	
										13	
										14	
										15	
										16	
										17	
										18	
										19	
										20	
										21	
										22	
										23	
										24	
										25	

Approved

Arthur C. Long
Chief Geographer

MAR 27 1996



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

TIDE NOTE FOR HYDROGRAPHIC SURVEY

ORIGINAL

DATE: April 18, 1996

*This Tide Note is superseded
by amended correspondence
dated 5/13/96. (Attached)*

HYDROGRAPHIC SECTION: Pacific

HYDROGRAPHIC PROJECT: OPR-P125-RA

HYDROGRAPHIC SHEET: H-10645

LOCALITY: Southern Portion of Blackstone Bay, Prince William
Sound, Alaska

TIME PERIOD: September 9 - October 8, 1995

TIDE STATION USED: 945-4907 Blackstone Bay, Ak.
Lat. 60° 45.9'N Lon. 148° 31.4'W

PLANE OF REFERENCE (MEAN LOWER LOW WATER): -0.29 ft.

HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 11.1 ft.

TIDE STATION USED: 945-4952 Southern Blackstone Bay, Ak.
Lat. 60° 41.0'N Lon. 148° 40.4'W

PLANE OF REFERENCE (MEAN LOWER LOW WATER): -3.37 ft.

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



REMARKS: RECOMMENDED ZONING

1. In Blackstone Bay, north of a line between points $60^{\circ} 42.5'N/148^{\circ} 40.5'W$, $60^{\circ} 42.5'N/148^{\circ} 37.2'W$, and $60^{\circ} 41.8'N/148^{\circ} 36.0'W$, times and heights are direct on Blackstone Bay, Ak. (945-4907).
2. In Blackstone Bay, south of a line between points $60^{\circ} 42.5'N/148^{\circ} 40.5'W$, $60^{\circ} 42.5'N/148^{\circ} 37.2'W$, and $60^{\circ} 41.8'N/148^{\circ} 36.0'W$, times and heights are direct on Southern Blackstone Bay, Ak. (945-4952).

Where data are not available for Southern Blackstone Bay, Ak. (945-4952), times and heights are direct on Blackstone Bay, Ak. (945-4907).

Note: Times are tabulated in Greenwich Mean Time.



CHIEF, DATUMS SECTION



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

TIDE NOTE FOR HYDROGRAPHIC SURVEY

ORIGINAL

DATE: May 13, 1996

HYDROGRAPHIC SECTION: Pacific

HYDROGRAPHIC PROJECT: OPR-P125-RA

HYDROGRAPHIC SHEET: H-10645 (amended)

LOCALITY: Southern Portion of Blackstone Bay, Prince William
Sound, Alaska

TIME PERIOD: September 9 - October 8, 1995

TIDE STATION USED: 945-4907 Blackstone Bay, Ak.
Lat. 60° 45.9'N Lon. 148° 31.4'W

PLANE OF REFERENCE (MEAN LOWER LOW WATER): -0.29 ft.

HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 11.1 ft.

TIDE STATION USED: 945-4952 Southern Blackstone Bay, Ak.
Lat. 60° 41.0'N Lon. 148° 40.4'W

PLANE OF REFERENCE (MEAN LOWER LOW WATER): -3.37 ft.

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



page 2 of 2 for H-10645 (amended)

REMARKS: RECOMMENDED ZONING

1. In Blackstone Bay, north of a line between points
60° 42.7'N/148° 41.0'W, 60° 42.5'N/148° 37.5'W, and
60° 41.5'N/148° 35.5'W, times and heights are direct on
Blackstone Bay, Ak. (945-4907).
2. In Blackstone Bay, south of a line between points
60° 42.7'N/148° 41.0'W, 60° 42.5'N/148° 37.5'W, and
60° 41.5'N/148° 35.5'W, times and heights are direct on Southern
Blackstone Bay, Ak. (945-4952).

Where data are not available for Blackstone Bay, Ak. (945-4907),
times and heights are direct on Southern Blackstone Bay, Ak.
(945-4952).

Note: Times are tabulated in Greenwich Mean Time.


-----*Cheryl B. Wong*-----
for CHIEF, DATUMS SECTION



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

August 27, 1995

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

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

SUBJECT: Problems with shoreline manuscript and HYPACK

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

Shoreline Manuscript Problems

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

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

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

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



HYPACK Conversion Problems

1) When there is no GPS positioning at the end of a line, the convert program disregards all depths after the last good position and reassigns the fix number of the end of the line to this position. The depth corresponds to the position. However, the line on the 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
PIIB - Timmons

HDAPS Programs

<u>Program Name</u>	<u>Version</u>	<u>Date Installed</u>
BACKUP	2.00	4/18/95
BASELINE	1.14	4/18/95
BIGABST	2.07	4/18/95
BIGAUTOST	3.01	4/18/95
BLKEDIT	2.02	4/18/95
CARTO	2.17	4/18/95
CLASSIFY	2.12	4/18/95
CONTACT	2.48	4/18/95
CONVERT	3.66	4/18/95
DAS_SURV	6.80	4/18/95
DIAGNOSE	3.05	4/18/95
DISC-UTIL	1.00	4/18/95
DP	2.18	4/18/95
DPCONVERT	1.03	4/18/95
DSNEDITS	1.04	4/18/95
EXCESS	4.32	4/18/95
FILESYS	3.40	4/18/95
GRAFEDIT	1.06	4/18/95
HIPSTICK	1.01	4/18/95
HPRAZ	1.26	4/18/95
INVERSE	2.02	4/18/95
LISTDATA	1.02	4/18/95
LOADNEW	2.13	4/18/95
LSTAWOIS	3.10	4/18/95
MAINMENU	1.20	4/18/95
MAN_DATA	3.02	4/18/95
NEWPOST	6.13	4/18/95
PLOTALL	2.32	4/18/95
POINT	2.12	4/18/95
PREDICT	2.01	4/18/95
PRESURV	7.11	4/18/95
PRINTOUT	4.04	4/18/95
QUICK	2.07	4/18/95
RAMSAVER	1.02	4/18/95
REAPPLY	2.12	4/18/95
RECOMP	1.04	4/18/95
SCANNER	1.00	4/18/95
SELPRINT	2.05	4/18/95
SYMBOLS	2.00	4/18/95
VERSIONS	1.00	4/18/95
ZOOMEDIT	2.33	4/18/95

APPROVAL SHEET

for

H-10645
RA-10-19-95

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

HYDROGRAPHIC SURVEY STATISTICS

H-10645

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--10186
PHOTOBATHYMETRIC MAPS (List):	
NOTES TO THE HYDROGRAPHER (List):	
SPECIAL REPORTS (List):	
NAUTICAL CHARTS (List):	16705 15th ED

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				
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	278		278	
COMPARISON WITH PRIOR SURVEYS AND CHARTS		10	10	
EVALUATION OF SIDE SCAN SONAR RECORDS				
EVALUATION OF WIRE DRAGS AND SWEEPS				
EVALUATION REPORT		15	15	
GEOGRAPHIC NAMES				
OTHER*				
*USE OTHER SIDE OF FORM FOR REMARKS	TOTALS	278	25	303

Pre-processing Examination by LT Guy Noll	Beginning Date 11/9/95	Ending Date 11/9/95
Verification of Field Data by R. Mayor, D. Doles, J. Stringham, L. Deodato	Time (Hours) 278	Ending Date 9/13/96
Verification Check by B. Olmstead	Time (Hours) 6	Ending Date 9/5/96
Evaluation and Analysis by L. Deodato	Time (Hours) 25	Ending Date 9/13/96
Inspection by B. Olmstead	Time (Hours) 18	Ending Date 9/19/96

EVALUATION REPORT

H-10645

A. PROJECT

Project information is discussed in the hydrographer's report.

B. AREA SURVEYED

This survey was conducted in Alaska, and is located in the southern portion of Blackstone Bay. Specifically, the surveyed area is bounded by latitude 60/44/15N to the north and latitude 60/39/00N to the south. The eastern limit is longitude 148/42/51W and the western limit is longitude 148/34/21W. Depths range from -1.4 to 191 fathoms.

The survey area is characterized by several valley glaciers which descend into the southwest portions of Blackstone Bay. Blackstone Glacier is presently active and discharges numerous small icebergs at the head of the bay. The seafloor as defined by the depths on this survey portray several terminal moraines resulting from historical glacial activity. The mariner should be aware that these terminal moraines rise up rapidly to near the surface in surrounding depths of 30-50 fathoms. Of note, the navigable routes on the east and west sides of Willard Island to the head of Blackstone Bay are greatly affected by submerged terminal moraines containing numerous pinnacles. Although the routes as defined by the hydrographer in Section O of the hydrographer's report will permit small craft access to the head of Blackstone Bay, extreme caution should be exercised when navigating this area.

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 12.0.

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 was created with .dbf (extension) and enhanced using the AutoCad system, are filed both in the AutoCad drawing format, .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 Hydrographic Survey Guideline No. 75.

The field sheet parameters have been revised to center the hydrography on the office plot. The 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-10645.

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 an actual tide, dynamic draft, and sound velocity. These reducers have been reviewed and are consistent with NOS specifications. Actual tide reduction is derived from Blackstone Bay, Alaska, gage 945-4907 and Southern Blackstone Bay, Alaska, gage 945-4952.

H. CONTROL STATIONS

Control stations are discussed in the hydrographer's report and separates. A list of control stations used on survey H-10645 is attached to this report.

The positions of horizontal control stations used during hydrographic operations are field and office values based on NAD 83. The geographic positions of all survey data are based on NAD 83. The smooth sheet is annotated with an NAD 27 adjustment tick based on values determined with the NGS program NADCON.

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

Latitude: -2.141 seconds (-66.260 meters)
Longitude: 7.604 seconds (115.391 meters)

I. HYDROGRAPHIC POSITION CONTROL

Differential GPS (DGPS) was used to control this survey. A horizontal dilution of precision (HDOP) not to exceed 3.75 was computed for survey operations. The quality of several positions exceeds limits in terms of horizontal dilution of precision (HDOP). These positions are isolated and occur randomly throughout the survey area. A review of the data, however, suggests that none of these fixes are used to position dangers to navigation. The features or soundings located by these fixes are consistent with the surrounding information. These fixes are considered acceptable. Performance checks were accomplished by DGPS to DGPS system check (Launch to Launch).

J. SHORELINE

DM-10186 is the source document for shoreline on this survey and was supplied in digital form by the Coastal Mapping Program. This file has been merged with the survey file during ACAD processing. Changes along the shoreline and new features in the area were noted on this survey. Some of the islets and rocks depicted on the map were identified in the field as part of reefs, high points or extension of newly located ledges. The previously compiled configuration of ledges and islands were updated to conform to the present hydrography. Revisions to the mean high water line are shown as listed below.

<u>Latitude(N)</u>	<u>Longitude(W)</u>
60/43/05	148/40/09
60/42/56	148/40/25
60/41/04	148/40/55
60/39/25	148/42/46
60/39/00	148/41/11

All revisions have been depicted on the ACAD generated smooth sheet as applicable and are adequate to supersede prior photogrammetric shoreline maps.

K. CROSSLINES

Crosslines are discussed in the hydrographer's report.

L. JUNCTIONS

Survey H-10645 junctions with the following survey.

<u>Survey</u>	<u>Year</u>	<u>Scale</u>	<u>Area</u>
H-10644	1995	1:10,000	northeast

The junction with survey H-10644 is complete. Soundings and depth curves are in good agreement within the common area

M. COMPARISON WITH PRIOR SURVEYS

H-7732 (1948) 1:40,000

Prior survey H-7732 covers that area from the northern most portion of Willard Island to latitude 60/44/15N. Comparison with present survey depths reveals general differences of 1-2 fathoms. There appears to be no consistent pattern of shoaling or an increase in depths. These differences can largely be attributed to greater sounding coverage and relative accuracy of data acquisition techniques. All depths originating from the prior survey were adequately addressed during survey operations, except for the following.

A few charted depths originating from H-7732, are suspect as to positioning and depth accuracy. The present survey found similar depths with the 1948 prior work within approximately 100 meyers. Current hydrography provided sufficient bottom coverage in the areas to disprove the questionable depths at their charted locations. Differences are likely attributed to the relative accuracy of the data acquisition techniques between the present and prior survey. The geographic positions of these prior depths are as follows:

<u>Depth (FMS)</u>	<u>Latitude(N)</u>	<u>Longitude(W)</u>
99	60/43/38	148/36/29
97	60/43/00	148/36/48
112	60/43/00	148/36/24

H-10645 is adequate to supersede the prior survey within the common area.

N. ITEM INVESTIGATIONS

AWOIS item 52242 was investigated and has been adequately addressed by the hydrographer.

O. COMPARISON WITH CHART

Survey H-10645 was compared with the following chart.

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

a. Hydrography

Charted hydrography originates with the above mentioned prior survey requires no further discussion. Miscellaneous source data originates from BP-10865(1979), USGS, T-9135 (1949), USC&GS, and CL8/1911, National Geographic Society. These documents comprise the charted depths, rocks and foreshore information from Willard Island to the head of Blackstone Bay. Charted miscellaneous features and depths have been satisfactorily addressed except for the following.

A few charted depths originating from BP-108565 are suspect as to positioning and depth accuracy. The present survey found similar depths with the 1979 data within 100 meters. Current hydrography provided sufficient bottom coverage in the areas to disprove the questioned depths at their charted locations. Differences are likely attributed to the relative accuracy of the data acquisition techniques. The geographic positions of the prior depths are as follows:

<u>Depth(FMS)</u>	<u>Latitude(N)</u>	<u>Longitude(W)</u>
79	60/42/35	148/36/30
31	60/42/10	148/39/38
17	60/41/53	148/40/08
11	60/41/27	148/37/30
47	60/41/26	148/37/54
36	60/40/15	148/39/45

An area charted at latitude 60/39/12N, longitude 148/40/50W is currently charted as being awash at mean lower low water. Present survey depths range from 2.8 to 19 fathoms over this area. Delete the charted feature and chart this area using information from the present survey.

Significant charted shoreline changes with the present survey are noted at the following locations and reflect a shift several hundred meters shoreward. These changes are most likely attributed to glacial activity and the Good Friday Earthquake of 1964.

<u>Latitude(N)</u>	<u>Longitude(W)</u>
60/41/45	148/36/15
60/42/30	148/37/30
60/42/00	148/41/00

In addition , the following is noted. The Spit charted in the vicinity of latitude 60/42/30N, longitude 148/37/30W is no longer present. The shoreline at latitude 60/39/00N, longitude 148/41/00W has accreted seaward several hundred meters and was positioned by hydrographic positioning. This change is likely the result of tectonic processes as Beloit Glacier retreats.

Survey H-10645 is adequate to supersede charted hydrography within the common area.

b. Dangers to Navigation

The hydrographer reported fourteen dangers to navigation during survey operations. These dangers were reported to the local United States Coast Guard District, DMAHTC, and N/CS261. Two additional dangers to navigation were submitted during office processing. Copies of these reports are attached.

P. ADEQUACY OF SURVEY

Hydrography contained on survey H-10645 is adequate to:

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

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-10645 adequately complies with the project instructions.

Q. AIDS TO NAVIGATION

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

R. STATISTICS

Statistics are itemized in the hydrographer's report.

S. MISCELLANEOUS

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

T. RECOMMENDATIONS

This is a good hydrographic survey and no additional work is recommended.

U. REFERRAL TO REPORTS

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

Leonardo T. Deodato
Leonardo T. Deodato
Cartographer

APPROVAL SHEET
H-10645

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: 9/13/96
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: 9/30/96
Kathy Timmons
Commander, NOAA
Chief, Pacific Hydrographic Branch

Final Approval

Approved:

Andrew A. Armstrong III Date: Apr 7, 1997
Andrew A. Armstrong III
Captain, NOAA
Chief, Hydrographic Surveys Division

