H10730

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-10-29-96

Registry No. H-10730

LOCALITY

State Alaska

General Locality Southwest Prince William Sound

Sublocality Crafton Island and Vicinity

1996

CHIEF OF PARTY
CAPT Dean R. Seidel, NOAA

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DATE APR 20 1998

NOAA FORM 77-28 (11-72)

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

REGISTER NO.

H-10730

HYDROGRAPHIC TITLE SHEET

FIELD NO.

RA-10-29-96

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: Southwest Prince William Sound

Locality: Crafton Island and Vicinity

Scale: 1:10,000 Date of survey: October 17-November 1, 1996

Instructions dated: 8/23/96 Project No.: OPR-P139-RA

Vessel: NOAA Ship RAINIER, Launches (2122),(2123),(2124),(2125),(2126)

Chief of party: CAPT Dean R. Seidel, NOAA

Surveyed by: CAPT D.Seidel,LT S.LaBossiere,LT G.Noll,LT M.Larsen, LT S.Lemke,LT S.Meador
LTJG J.Crocker,LTJG E.Christensen, CST J.Fleichmann, SST J.Jacobson

Soundings taken by echo sounder, ~~hand lead, pole~~ DSF-6000N, MOD III Diver Dept Gauge

Graphic record scaled by: RAINIER Personnel

Graphic record checked by: RAINIER Personnel

Evaluation by: R. Davies ~~Protracted by~~ Automated plot by: HP 650C Design Jet Plot

Verification by: R. Davies

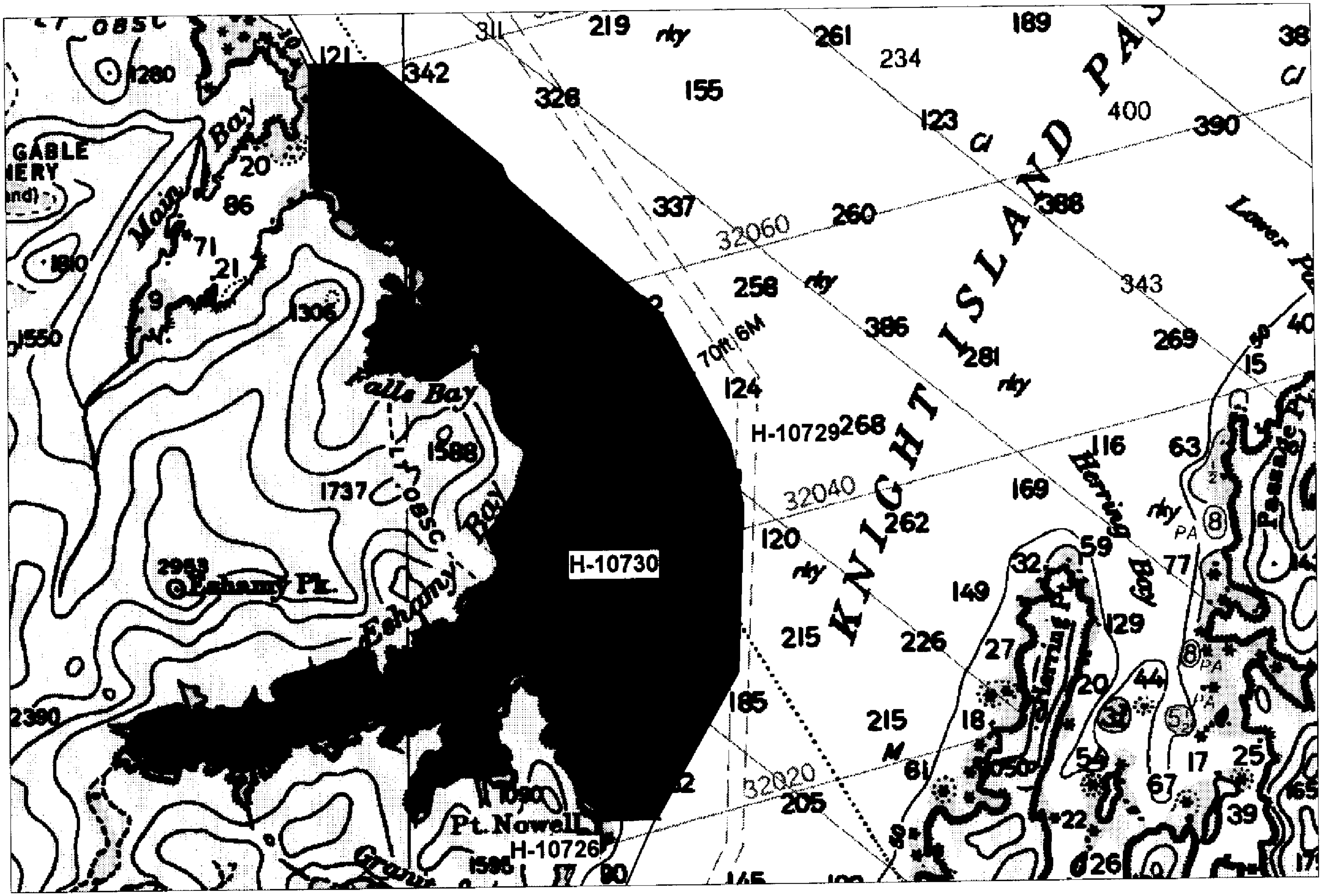
Soundings in fathoms ~~feet~~ at ~~MLW~~ MLLW and tenths

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 1/9/98 mcR

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


KNIGHT ISLAND PA
Lower Pt
Herring Bay
Falls Bay
Eshamy Bay
Eshamy Pt.
Main Bay
Pt. Nowell
Passage
GABLE
H-10730
H-10729
H-10726
OBSC
32060
32040
32020
70ft 6M

Descriptive Report to Accompany Hydrographic Survey H-10730

Field Number RA-10-29-96
Scale 1:10,000
October-November 1996
NOAA Ship RAINIER
Chief of Party: Captain Dean R. Seidel, NOAA

A. PROJECT ✓

This hydrographic survey was completed as specified by Project Instructions OPR-P139-RA dated August 23, 1996. Survey H-10730 corresponds to sheet B as defined in the sheet layout. This survey will provide data to supersede two surveys performed in 1913. Requests for hydrographic surveys and updated charts in this area have been received from the Defense Mapping Agency, the U.S. Coast Guard, the Southwest Alaska Pilot's Association, cruise ship lines, and local fishermen.

B. AREA SURVEYED ✓ See Eval Rpt., section B

The survey area is Eshamy Bay and Lagoon, its approaches, and Falls Bay, including all of the area from south of Main Bay to Point Nowell offshore of Crafton Island. The survey's northern limit is latitude 60° 34' 02" N. The survey's southern limit is 60° 26' 30" N, the western limit is longitude 148° 05' 46" W and the eastern limit is 147° 53' 21" W. Data acquisition was conducted from October 17 to November 1, 1996 (DN 291-306).

C. SURVEY VESSELS ✓

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

Vessel	EDP #	Operations
RA-2	2122	Hydrography, Shoreline Verification
RA-3	2123	Hydrography, Shoreline Verification
RA-4	2124	Hydrography, Shoreline Verification, Dive Vessel
RA-5	2125	Hydrography, Shoreline Verification, Bottom Samples, SV Casts
RA-6	2126	Hydrography, Shoreline Verification
RAINIER	2120	Sound Velocity casts

D. AUTOMATED DATA ACQUISITION AND PROCESSING ✓

All data were acquired and processed using the Hydrographic Data Acquisition and Processing System (HDAPS.) A complete listing of software for HDAPS is included in Appendix VI. *

E. SONAR EQUIPMENT ✓

Neither Side Scan Sonar nor multi-beam echo sounder equipment were used on this survey. Concur

* Filed with the hydrographic data

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 new problems which affect survey data were encountered. All DSF-6000N soundings were acquired in meters using the High + Low, high frequency digitized setting.

G. CORRECTIONS TO ECHO SOUNDINGS ✓

Four sound velocity casts were acquired within the survey limits:**

TABLE	DN	CAST POSITION	DEPTH (M)	APPLICABLE AREA
12	291	60° 32' 00" N, 147° 48' 12"W	910	Offshore Eshamy Bay
13	292	60° 20' 27" N, 147° 58' 36"W	230	Inside Eshamy Bay
14	298	60° 27' 45" N, 148° 02' 00"W	107	Eshamy Lagoon
None	306	60° 27' 45" N, 148° 02' 00"W	107	Eshamy Lagoon

**Casts 12 and 13 plot outside the survey area.

The sound velocity casts were acquired with SBE SEACAT Profiler (S/N 219), calibrated January 16, 1996. Velocity correctors were computed for the extrapolated casts using the PC programs SEACAT and VELOCITY, version 2.11 (1995), 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".* The second sound velocity cast for Eshamy Lagoon was acquired to confirm the first cast results, due to the large discrepancy between the Lagoon and Bay sound velocity profiles.

A static transducer depth was determined using FPM Fig 2.2 for vessels 2122-2126 in the spring of 1996. 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-P139-RA. The data for vessels 2122-2126 were collected in Shilshole Bay, Washington in the spring of 1996. All 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 last digit of the vessel number. The offset tables are included with project data for OPR-P139-RA. The launches are not equipped with heave, roll and pitch sensors.

Predicted tides for the project were provided on diskette by the Coastal and Estaurine Oceanography Branch (N/OES334) through N/CS31 for the Cordova, Alaska reference station (945-4050). HDAPS listings of the data used in generating tide corrector tables are included in Appendix V* of this report. Tidal correctors as provided in the project instructions for H-10730 are:

ZONE ID	ZONE NO.	TIME CORRECTION	HEIGHT CORRECTION
24	38	-0 hr 00 min	X0.95

Valdez, Alaska (945-4240) and Cordova, Alaska (945-4050) are the primary control stations for datum determination at all subordinate stations. RAINIER personnel installed Sutron 8200 tide gages at

* Filed with the hydrographic data

Herring Point (945-4691) on September 27, 1996 and Eshamy Lagoon (945-4757) on October 24, 1996, these gages were removed November 2, 1996.

Refer to the Field Tide Notes and supporting data in Appendix V* for individual gage performance and level closure information. This information has 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 January 16, 1997 is attached.

H. CONTROL STATIONS ✓ See Eval Rpt., Section H

The horizontal datum for this project is NAD 83. One new station, NUKEM, was established on the northernmost rock of the Pleiades Islands using static GPS observations from station ROCK, with a check to station DUKE. The control stations used for this survey are listed in ~~Appendix III~~ this report. See the OPR-P139-RA-96 Horizontal Control Report for more information.

I. HYDROGRAPHIC POSITION CONTROL ✓ See Eval Rpt., Section I

All soundings were positioned using differential GPS. Primary control was the US Coast Guard Beacon at CAPE HINCHINBROOK. The VHF differential reference stations at NUKEM was repeated on a second VHF frequency by the ship and used when possible until DN 297, when the VHF equipment at station DUKE was moved to station ROCK. The correctors broadcast from ROCK were repeated by the ship after this day. Launch-to-launch DGPS performance checks were performed in accordance with Section 3.4.4 of the FPM. Two observations of position were made from two different DGPS base stations, ROCK and CAPE HINCHINBROOK, while the launches were rafted together with their GPS antennae within 2-3 meters of each other. RAINIER also used SHIPDIM, version 2.2R (April 1996) with a Trimble Centurion P-code receiver and an Ashtech sensor (both differentially-corrected) to monitor the performance of the USCG Beacon. ROCK was compared to CAPE HINCHINBROOK during 8-hour daily comparisons and occasional performance checks. Some outliers were noted, but none indicated systematic or continuous errors in the CAPE HINCHINBROOK beacon. The SHIPDIM OUTLIER.SUM results are included in the project data for OPR-P139-RA.

J. SHORELINE ✓ See Eval Rpt., Section J

The shoreline manuscript from Coastal Mapping survey CM-92012 was supplied by N/CS341 in Standard Digital Data Exchange Format (SDDEF). The digital files from DM-10295 and DM-10296 were projected to the survey grid with OPR-P139-RA-96 geodetic parameters using program Shore version 2.0, provided by N/CS32, and plotted on the survey using HDAPS.

Limited shoreline verification was conducted in accordance with the Project Instructions. For this survey the general limit of safe navigation of a survey launch is 5-50 meters offshore of apparent low tide, generally 3-5 meters of depth at Mean Lower Low Water. Features shown in pencil inshore of the NALL are the hydrographer's representation of the shoreline while slowly transiting along the shore, and are intended to aid chart compilation. Features and notes portrayed on the Detached Position Plot were analyzed during office processing and shown on the smooth sheet as warranted.
Shoreline manuscript and field features were compared to an enlargement of chart 16705, supplied by N/CS31. Many charted features, specifically the foul area and rocks near Crafton Island, were quite

different from the current survey. The source of charted shoreline appears to be the 1913 hydrographic survey, which is at reconnaissance density by today's standards, so discrepancies between charted and field shoreline should be resolved in favor of the manuscript shoreline and field work as shown on the final field Detached Position and Bottom Sample plot. Concur. The updated photography, DN-10295 & DN-10296, should be used for the shoreline for the next edition of the chart.

Discrepancies between the photogrammetric shoreline and the hydrographer's field work indicate that the compilation of shoreline features was hindered by lack of low tide during the photography. A considerable amount of hydrography on this survey was dedicated to the resolution of items missing from the shoreline manuscript, and more importantly, launches performed hydrography in areas which were best described as foul after low water revealed the dangerous rocks hidden beneath the tide. ~~The hydrographer's recommendations to remedy this situation are included in Section T.~~ See page 3, Shoreline, for comments pertaining to shoreline verification and smooth sheet portrayal.

The following table summarizes shoreline features disproved by this survey:

Feature	Depth (Fm)	Day/Fix Number	Latitude (N)	Longitude (W)
Rock	20.86 11.2	302/20617	60:27:52.645	148:00:26.738
Rock*	6.82 3.4	302/41148	60:30:43.878	147:56:35.347
Rock*	2.4 1.3	302/41170	60:29:46.400	147:56:34.498

* These rocks plot very near ledges as displayed on the smooth sheet and are likely submerged portions of these features based on actual tides.

The following table summarizes new shoreline features not shown on the chart or manuscript:

Feature	Depth (Height) (Fm) meters (FT)	Day/Fix Number	Latitude (N)	Longitude (W)
Rock ✓	(.8) (5)	298/20625	60:28:47.785	147:58:27.756
Rock ✓	(.3) (3)	298/20627	60:29:09.282	147:58:13.457
Rock ✓	.1 (2)	298/20628	60:29:05.378	147:58:13.114
Ledge ✓	.3 (2)	298/20629	60:30:59.238	147:58:31.853
Rock ✓	0.8Rk 1.7	298/20630	60:31:15.441	147:58:28.648
~~Rock~~ Rock ✓	(1.7) (9)	297/30682	60:29:34.854	147:56:03.880
~~Rock~~ Reef ✓	(1.3) (6)	297/30681 & 293/60514	60:29:31.127	147:55:46.375
~~Rock~~ Reef (N) ✓	(0.4) (4)	297/30715	60:30:06.784	147:56:47.650
~~Rock~~ Reef (S) ✓	(0.4) (4)	297/30716	60:30:05.391	147:56:46.826
~~Rock~~ Reef (S) ✓	0.2 (2)	297/30718	60:30:07.023	147:56:54.914
~~Rock~~ Reef (N) ✓	0.2 (2)	297/30719	60:30:07.960	147:56:54.631
Reef ✓	(2.2) (7)	294/40696-40698	60:30:48.196	147:56:31.578
Part of reef Rock ✓	(0.2)	302/41143	60:30:22.279	147:56:36.748
Rock ✓	0' RK 1.0	302/41149	60:30:41.142	147:56:36.872
Rock ✓	(0.8) (2)	302/41153	60:30:40.234	147:55:49.508
Part of reef Rock ✓	(1.2) (4)	302/41171	60:29:30.038	147:56:18.782
Part of reef Rock ✓	0' 1.1	291/60002	60:28:03.798	147:58:00.873

	(Fm)	(FT)		
Reef (S) ✓	(1.4) (5)		293/60504	60:29:39.568	147:56:08.278
Reef (E) ✓	(1.4) (5)		293/60505	60:29:40.673	147:56:02.466
Rock ✓	(1.4) (5)		293/60511	60:29:32.608	147:56:15.215
Rock ✓	(1.4) (5)		293/60512	60:29:30.297	147:56:13.975
Reef (SW) ✓	(1.6) (6)		293/60516	60:29:41.720	147:55:26.178
Reef (NE) ✓	(1.4) (5)		293/60517	60:29:42.882	147:55:24.060
Ledge ✓	(1.2) (4)		293/20084	60:27:08.483	147:59:38.983
Ledge ✓	(1.2) (4)		293/20085	60:27:07.927	147:59:38.859
Rock ✓	0.3 cov1ft		293/20090	60:27:07.188	147:58:44.227
Rock ✓	0.1 cov1ft		293/20091	60:27:06.691	147:58:43.626
Rock ✓	0.1 cov1ft		293/20149	60:27:15.659	147:58:38.452
Rock (Ledge) ✓	(0.1) (1)		298/20161	60:28:10.853	147:59:58.462
Rock ✓	(0.7) (3)		302/20618	60:27:56.810	148:00:22.524
Reef ✓	(0.5) (3)		302/20619-20621	60:28:08	148:00:08
Rock ✓	(0.4) (2)		302/20622	60:28:28.684	147:59:31.428
Rock ✓	(0.3) (2)		302/20623	60:28:25.481	147:59:12.807
~~Reef~~ (Ledge) ✓	(0.3) 1		302/~~20633~~-20636	60:27:32.9	148:00:25.0
Rock ✓	(0.8) (2)		302/20649	60:27:31.767	148:00:03.867
Rock ✓	0'RK 1.2		302/20661	60:27:24.217	147:59:20.453
Ledge ✓	(1.8) (6)		302/20678-20679	60:26:56.249	147:59:18.723
Rock ✓	0.5 cov2ft		303/~~51494~~ 33514	60:31:05.868	148:00:44.237
Rock ✓	0'RK 1.4		303/51518	60:32:26.821	148:00:53.083
Rock ✓	(1.6) (5)		303/20860	60:27:52.818	148:00:52.324
Rock ✓	(1.1) (3)		303/20885	60:27:37.911	148:04:23.692
Rock ✓	(1.4) (4)		303/20886	60:27:23.188	148:03:21.182

K. CROSSLINES ✓

Crosslines agreed within 1 meter with mainscheme hydrography, except in areas of steep bathymetry. There was a total of 36.8 nautical miles of crosslines, comprising 9.9% of mainscheme hydrography.

L. JUNCTIONS ✓ See Eval Rpt., section L.

This survey junctions with H-10729, 1:40,000, 1996 on the east, and H-10728, 1:10,000, 1996 on the south; there is no contemporary junction on the north. Soundings on these 1996 surveys were found to be in good agreement. Final comparisons will be made at the Pacific Hydrographic Branch (PHB) after reduction to final vertical datum. All junctions are adequate

M. COMPARISON WITH PRIOR SURVEYS ✓ See Eval Rpt., section M

Prior survey H-3573, 1:20,000, 1913, Valdez datum, covers the inshore part of the area surveyed. H-3470. 1:20,000 and 1:40,000, 1913, Valdez datum, cover the offshore portion of this survey. There were large differences in shoal areas between the prior and current surveys. The current survey found shoals to be roughly half as deep previously determined, probably due to increased sounding density and possibly the effects of the 1964 earthquake. Final comparisons will be done at PHB after reduction to final sounding datum using tidal information collected concurrently with this survey. See Evaluation Report, section M

N. ITEM INVESTIGATIONS ✓ No AWOIS items were assigned to this survey. Concur

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

Charts 16705, 1:80,000, 16th edition, ~~September~~ August 24, 1996 and 16701, 1:81,436, 16th edition, June 1, 1996, are the largest scale charts covering the survey area. The 15th edition of chart 16705 was enlarged by N/CS31 and used for comparing features within the survey area. Comparison of soundings is described in Section M, with the exception of the 71* fathom sounding offshore of Crafton Island derived from USC&GS blueprint 66414, 1:80,000, 1964; this sounding was adequately superseded by hydrography. Non-sounding features are discussed in Section J. Final sounding comparisons will be made at PHB after reduction to final vertical datum. See Evaluation Report, section O.

* The 71 fathom sounding charted at latitude 60°29'36"N, longitude 147°53'42"W was adequately developed during the present survey. Present depths of 46-71 fathoms were found to exist in the area.

Dangers to Navigation ✓

Fifteen dangers were reported to the Seventeenth Coast Guard District on November 25, 1996. Copies of the correspondence can be found in ~~Appendix I of~~ this report.

P. ADEQUACY OF SURVEY ✓

Survey H-10730 is complete and adequate to supersede prior soundings and features in their common areas. concur

Q. AIDS TO NAVIGATION ✓

Crafton Island Light was positioned using static GPS methods from station ROCK on October 24, 1996. See the attached Section Q insert for detailed comparison of this position to the charted and Light List positions.

R. STATISTICS ✓

NM Hydrography	753	Tide Stations	2
NM^2 Hydrography	15.4	Bottom Samples	64
Selected Soundings	34,052	Detached Positions	78
Velocity Casts	4	AWOIS Items	0
		Dives	16

S. MISCELLANEOUS ✓

Bottom samples were collected and sent to the Smithsonian in accordance with Project Instructions. No unusual tidal currents or magnetic variations were found during this survey. Secchi disk observations were performed and indicate that water visibility was four to five meters.

T. RECOMMENDATIONS ✓

None.

U. REFERRAL TO REPORTS ✓

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

Title	Date Sent	Office
OPR-P139-RA Horizontal Control Report	November, 1996	N/CS34
OPR-P139-RA 1996 Coast Pilot Report	November, 1996	N/CS26
Project related data for OPR-P139-RA	Incremental	N/CS34
Secchi Disk Observations for OPR-P139-RA	November, 1996	N/CS31

Respectfully Submitted,

Guy T. Noll
Lieutenant, NOAA

Approved and Forwarded,

Dean R. Seidel
Captain, NOAA
Commanding Officer

Section Q: Descriptive Report Insert ✓

Name of Aid: Crafton Island Light
Light List #: 25910

Method of Positioning Static GPS: [X] DGPS: [ ] Other: _____

Positioning Information

	Latitude (N)	Longitude (W)	
Light List Position	60° 30' 42"	147° 56' 06"	
Charted Pos.	60° 30' 42.6"	147° 56' 05.4"	16705, 16th ed., 8/24/96
Survey Pos.	60° 30' 41.6" 61	147° 56' 03.7" 67	

Difference between Charted and Surveyed Position: Distance: 40 meters
Bearing from Surveyed to Charted Position: Bearing: 320 deg T

Characteristics
Do characteristics match Light List? Yes [X]
If no, what are the characteristics? _____

Does the aid adequately serve its apparent purpose? Yes [X] No [ ]
If no, why not? _____

CONTROL STATIONS as of 1 Dec 1999 ✓

No	Type	Latitude	Longitude	H	Cart	Freq	Vel	Code	MM/DD/YY	Station Name
1	G	060:14:26.408	148:00:42.205	18	250	0.0	0.0		09/03/96	NUKEM
2	G	060:15:37.435	148:18:06.007	18	250	0.0	0.0		10/07/96	DUKE
3	L	060:09:11.260	147:45:58.680	27	257	0.0	0.0		10/07/96	PT. HELEN LIGHT LL#25925
4	L	060:18:46.233	147:55:04.532	23	257	0.0	0.0		10/07/96	NEW YEAR ISLAND LIGHT LL#25915
5	L	060:14:22.912	148:00:37.765	26	257	0.0	0.0		10/07/96	PLEIADES LIGHT LL#25920
6	B	060:14:18.000	148:38:48.000	0	250	0.0	0.0		00/00/00	CAPE HINCHENBROOK ✓ USCG BEACON
7	B	061:03:24.000	146:41:48.000	0	250	0.0	0.0		00/00/00	POTATO POINT USCG BEACON
8	L	060:30:41.607	147:56:03.672	36	257	0.0	0.0		10/24/96	CRAFTON ISLAND LIGHT LL#25910
9	G	060:39:13.513	147:55:58.265	18	250	0.0	0.0		10/23/96	ROCK (pub)

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

November 25, 1996

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

ADVANCE INFORMATION

Dear Sir:

During the processing of hydrographic survey H-10730 in Knight Island Passage, Prince William Sound, fifteen dangers to navigation has been discovered. These dangers affect the following charts:

Number	Edition	Date	Scale	Datum
16700	24th ED.	92/01	1:200,000	NAD83
16705	15th ED.	90/09	1:80,000	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,

Alan D. Anderson
Captain, NOAA
Commanding Officer
NOAA Ship RAINIER

Enclosure

cc: DMA/HTC
PMC
N/CS262

DANGERS TO NAVIGATION

OPR-P139-RA **SOUTHWEST PRINCE WILLIAM SOUND, AK**

REGISTRY NUMBER: H-10730 **MESSAGE #:** RA-23-96

AFFECTED CHARTS:

CHART	EDITION NUMBER	DATE	SCALE
16700	24TH ED.	92/01	1:200,000
16705	15TH ED.	90/09	1:80,000

ADVANCE INFORMATION

ITEM	FIX #	DANGER	CHART DEPTH	DEPTH (M)	LATITUDE (N)	LONGITUDE (W)
A	41179+0	SHOAL	9 FM	16.3	060:28:27.223	147:57:28.121
B	41221+0	SHOAL	5 1/2 FM	10	060:29:07.915	147:57:47.352
C	41188+0	SHOAL	4 FM	7.7	060:30:03.879	147:57:22.781
D	60878+3	SHOAL	1 1/2 FM	3.1	060:28:02.231	147:55:31.051
E	41180+0	SHOAL	5 3/4 FM	10.6	060:27:51.546	147:54:57.382
F	41187+0	ROCK	COVERS 1/2 FM	0.8	060:28:46.982	147:55:55.682
G	40433+8	ROCK	COVERS 1/4 FM	0.5	060:28:24.234	147:55:47.240
H	41186+0	SHOAL	2 FM	4	060:28:25.076	147:55:20.755
J	41185+0	SHOAL	3 1/4 FM	6.3	060:29:08.807	147:55:18.083
K	51767+3	SHOAL	3 1/2 FM	6.4	060:27:50.297	148:00:15.783
L	41222+0	SHOAL	5 1/2 FM	10.4	060:28:04.675	147:59:45.622
M	20137+5	SHOAL	2 FM	3.9	060:27:11.725	147:58:45.009
N	41223+0	SHOAL	2 3/4 FM	5.3	060:31:23.491	147:58:55.015
P	20886+0	ROCK	UNCOVERS 2 FT	-1.4	060:27:23.188	148:03:21.182
Q	20977+8	SHOAL	1 3/4 FM	3.4	060:27:38.933	148:00:54.182

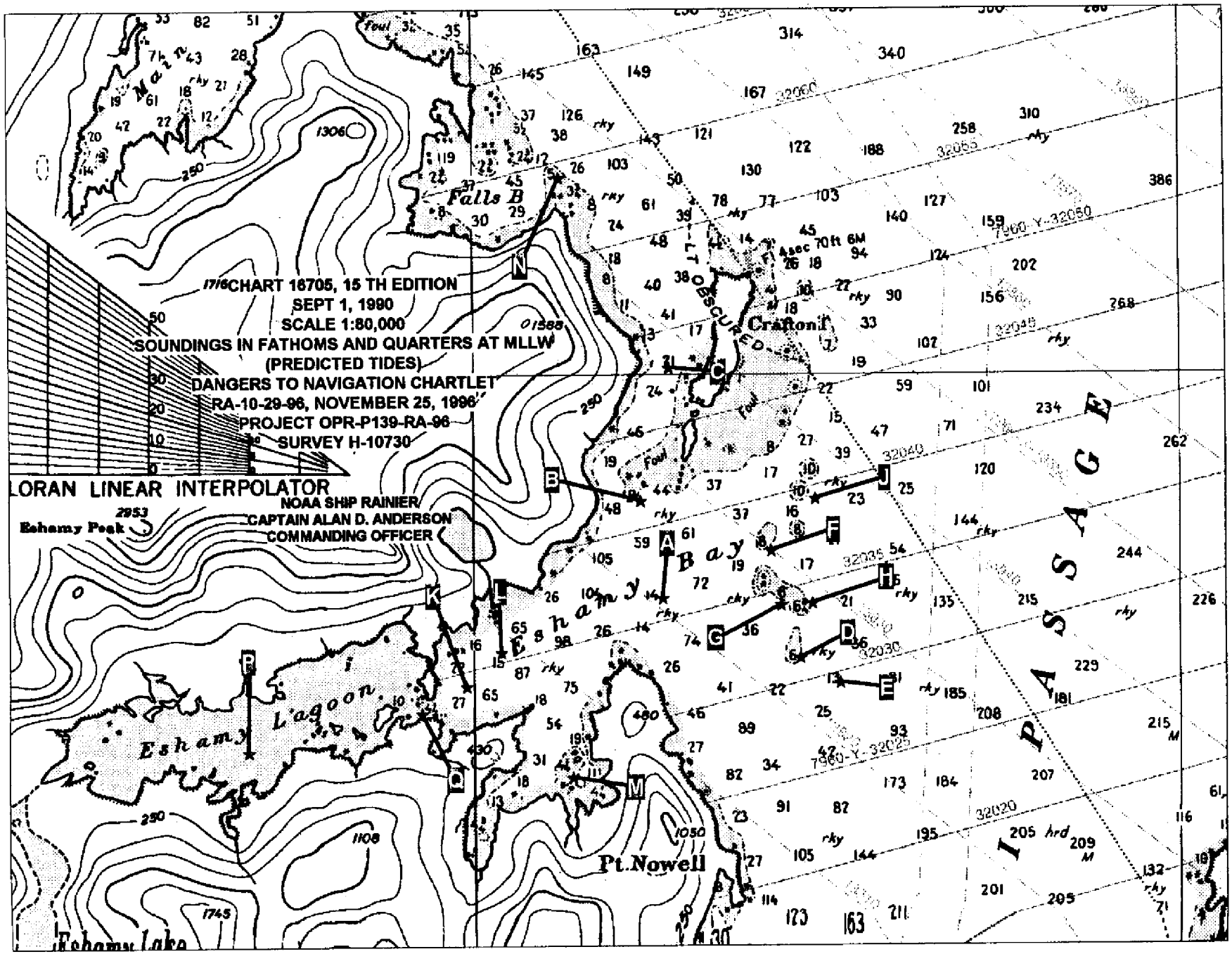


CHART 16705, 15 TH EDITION
SEPT 1, 1990
SCALE 1:80,000
SOUNDINGS IN FATHOMS AND QUARTERS AT MLLW
(PREDICTED TIDES)
DANGERS TO NAVIGATION CHARTLET
RA-10-29-96, NOVEMBER 25, 1996
PROJECT OPR-P139-RA-96
SURVEY H-10730
LORAN LINEAR INTERPOLATOR
NOAA SHIP RAINIER
CAPTAIN ALAN D. ANDERSON
COMMANDING OFFICER
Eshamy Bay
Eshamy Lagoon
Eshamy Lake
Eshamy Peak
Falls B
Crafton I.
Pt.Nowell
PASSAGE
OBSCURED
ADVANCE INFORMATION

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
OFFICE OF CHARTING AND GEODETIC SERVICES
Seattle, Washington 98115-0070

October 9, 1997

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

Dear Sir:

During office review of hydrographic survey H-10730, Alaska, Southwest Prince William Sound, Crafton Island and Vicinity, two rocks and one shoal sounding were found and are considered potential dangers to navigation affecting the following chart.

Chart	Edition/date	Datum
16705	16th, 8/24/96	NAD 83

It is recommended that the enclosed Report of 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) 526-6853.

Sincerely,

Kathy A. Timmons

Kathy A. Timmons
Commander, NOAA
Chief, Pacific Hydrographic Branch

Enclosure

cc: NIMA
NCS/261

REPORT OF DANGERS TO NAVIGATION

Hydrographic Survey Registry Number: H-10730

Survey Title: State: ALASKA
Locality: SOUTHWEST PRINCE WILLIAM SOUND
Sublocality: CRAFTON ISLAND AND VICINITY

Project Number: OPR-P139-RA, NOAA Ship Rainier

Survey Date: October 17 - November 1, 1996

Features are reduced to Mean Lower Low Water using approved tides and are positioned on NAD 83.

Chart affected: 16705 16th Edition/August 24, 1996, scale 1:80,000, NAD 83

DANGER TO NAVIGATION	LATITUDE(N)	LONGITUDE(W)
Shoal, covers 3 1/2 fathoms	60/28/13.7	147/57/41.3
Rock, covers 7 fathoms	60/29/41.4	147/54/49.4
Rock, covers 5 1/4 fathoms	60/30/33.8	147/55/11.0

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

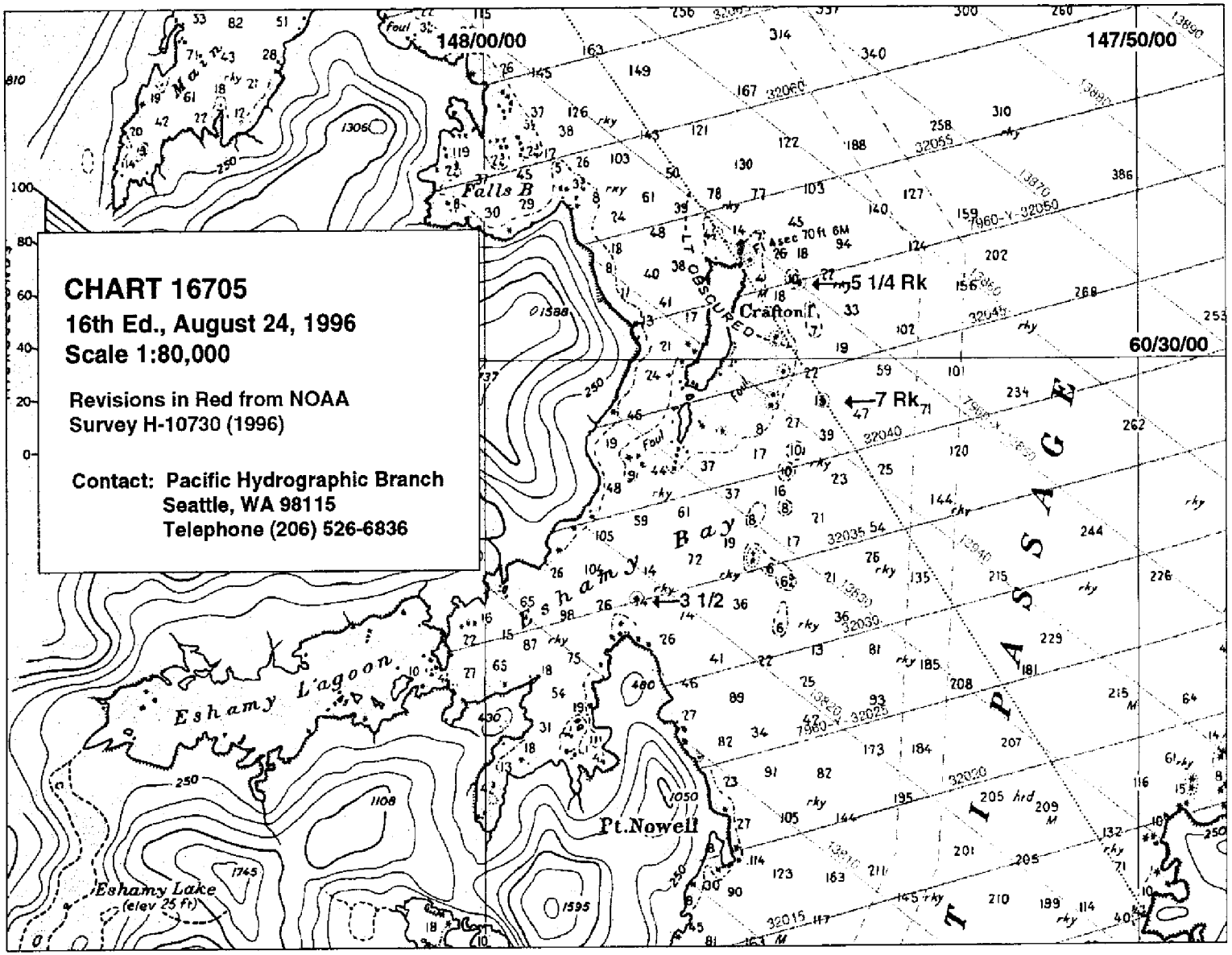


CHART 16705
16th Ed., August 24, 1996
Scale 1:80,000
Revisions in Red from NOAA
Survey H-10730 (1996)
Contact: Pacific Hydrographic Branch
Seattle, WA 98115
Telephone (206) 526-6836
148/00/00
147/50/00
60/30/00
Falls B
Crafton I.
5 1/4 Rk
7 Rk
3 1/2
Eshamy Bay
Eshamy Lagoon
Eshamy Lake
(elev 25 ft)
Pt.Nowell
PASSAGE

NOAA FORM 76-40
(8-74)

Repalces C&GS Form 567

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

NONFLOATING AIDS OR LANDMARKS FOR CHARTS

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

(See reverse for responsible personnel)

- [ ] TO BE CHARTED
- [x] TO BE REVISED
- [ ] TO BE DELETED

REPORTING UNIT *(Field Party, Ship or Office)*	STATE	LOCALITY	DATE
RAINIER	ALASKA	Crafton Island and Vicinity Prince William Sound	24-Oct-96

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

OPR PROJECT NO.	JOB NUMBER	SURVEY NUMBER	DATUM
OPR-P139-RA		H-10730	

CHARTING NAME	DESCRIPTION *(Record reason for deletion of landmark or aid to navigation. Show triangulation station names, where applicable, in parentheses)*	POSITION LATITUDE ° ′	LATITUDE ″ D.M. Meters	LONGITUDE ° ′	LONGITUDE ″ D.P. Meters	METHOD AND DATE OF LOCATION *(See instructions on reverse side)* OFFICE	FIELD	CHARTS AFFECTED
L.L.# 25910	Crafton Island Light Fl W 4s	60 30	41.61 1288	147 56	3.~~26~~ 67 50		F-GPS-L 10/24/96	16700 16705

RESPONSIBLE PERSONNEL		
TYPE OF ACTION	**NAME**	**ORIGINATOR**
OBJECTS INSPECTED FROM SEAWARD		☐ PHOTO FIELD PARTY ☒ HYDROGRAPHIC PARTY ☐ GEODETIC PARTY ☐ OTHER
POSITIONS DETERMINED AND/OR VERIFIED	Capt. D.R. Seidel	FIELD ACTIVITY REPRESENTATIVE LT. G.T. Noll OFFICE ACTIVITY REPRESENTATIVE
FORMS ORIGINATED BY QUALITY CONTROL AND REVIEW GROUP AND FINAL REVIEW		☐ REVIEWER ☐ QUALITY CONTROL AND REVIEW GROUP REPRESENTATIVE

INSTRUCTIONS FOR ENTRIES UNDER 'METHOD AND DATE OF LOCATION'

(Consult Photogrammetric Instructions No. 64)

OFFICE

1. OFFICE IDENTIFIED AND LOCATED OBJECTS
   Enter the number and date (including month, day, and year) of the photograph used to identify and locate the object.
   EXAMPLE: 75E (C) 6042
   8 - 12 - 75

FIELD

1. NEW POSITION DETERMINED OR VERIFIED
   Enter the applicable data by symbols as follows:

F - Field	P - Photogrammetric
L - Located	Vis - Visually
V - Verified	
1 - Triangulation	5 - Field identified
2 - Traverse	6 - Theodolite
3 - Intersection	7 - Planetable
4 - Resection	8 - Sextant

A. Field positions* require entry of method of location and date of field work.
   EXAMPLE: F - 2 - 6 - L
   8 - 12 - 75

*FIELD POSITIONS are determined by field observations based entirely upon ground survey methods.

FIELD (Cont.)

B. Photogrammetric field positions** require entry of method of location or verification, date of field work and number of the photograph used to locate or identify the object.
   EXAMPLE: P - 8 - V
   8 - 12 - 75
   74L (C) 2982

II. TRIANGULATION STATION RECOVERED
When a landmark or aid which is also a triangulation station is recovered, enter 'Triang. Rec.' with date of recovery.
EXAMPLE: Triang. Rec.
8 - 12 - 75

III. POSITION VERIFIED VISUALLY ON PHOTOGRAPH
Enter 'V-Vis.' and date.
EXAMPLE: V-Vis.
8 - 12 - 75

**PHOTOGRAMMETRIC FIELD POSITIONS are dependent entirely, or in part, upon control established by photogrammetric methods.

SUPERSEDES NOAA FROM 76-40 (2-71) WHICH IS OBSOLETE, AND
EXISTING STOCK SHOULD BE DESTROYED UPON RECEIPT OF REVISION.

☆ U.S. GPO : 1975-0-665-080/1155

NOAA FORM 76-155
(11-72)

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

GEOGRAPHIC NAMES

SURVEY NUMBER

H-10730

Name on Survey	A ON CHART NO. 16705, 16700	B ON PREVIOUS SURVEY NO.	C ON U.S. QUADRANGLE MAPS	D FROM LOCAL INFORMATION	E ON LOCAL MAPS	F P.O. GUIDE OR MAP	G RAND MCNALLY ATLAS	H U.S. LIGHT LIST	K	
ALASKA (title)	X		X							1
CRAFTON ISLAND	X		X							2
ESHAMY BAY	X		X							3
ESHAMY LAGOON	X		X							4
FALLS BAY	X		X							5
KNIGHT ISLAND PASSAGE	X		X							6
NOWELL, POINT	X		X							7
PRINCE WILLIAM SOUND	X		X							8
(title)										9
										10
										11
										12
										13
										14
										15
										16
										17
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										21
										22
										23
										24
										25

Approved:

Chief Geographer

FEB 28 1997

NOAA FORM 76-155 SUPERSEDES C&GS 197

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

DATE: January 16, 1997

HYDROGRAPHIC BRANCH: Pacific
HYDROGRAPHIC PROJECT: OPR-P139-RA
HYDROGRAPHIC SHEET: H-10730

LOCALITY: Crafton Island and Vicinity, Southwest Prince William Sound, Alaska

TIME PERIOD: October 17 - November 1, 1996

TIDE STATION USED: 945-4777 Chenega Island, Southwest End, AK
Lat. 60° 17.2'N Lon. 148° 07.2'W
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 3.300 meters

TIDE STATION USED: 945-4691 Herring Point, Knight Island Passage, AK
Lat. 60° 28.5'N Lon. 147° 47.5'W
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 3.362 meters

TIDE STATION USED: 945-4757 Eshamy Lagoon, AK
Lat. 60° 27.7'N Lon. 148° 02.7'W
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 3.237 meters

TIDE STATION USED: 945-4240 Valdez, AK
Lat. 61° 07.5'N Lon. 146° 21.7'W
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 3.389 meters

REMARKS: RECOMMENDED ZONING

Use zone(s) identified as: PWS38 & PWS38A

Refer to attachment(s) for zoning information.

Note: Provided time series data are tabulated in metric units (meters) and on Greenwich Mean Time.

CHIEF, TIDAL ANALYSIS BRANCH

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

U.S. DEPARTMENT OF COMMERCE

HYDROGRAPHIC SURVEY STATISTICS

REGISTRY NUMBER: H-10730

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

RECORD DESCRIPTION	AMOUNT	RECORD DESCRIPTION	AMOUNT
SMOOTH SHEET	1	SMOOTH OVERLAYS: POS., ARC, EXCESS	NA
DESCRIPTIVE REPORT	1	FIELD SHEETS AND OTHER OVERLAYS	NA

DESCRIPTION	DEPTH/POS RECORDS	HORIZ. CONT. RECORDS	SONAR-GRAMS	PRINTOUTS	ABSTRACTS/ SOURCE DOCUMENTS	
ACCORDION FILES	3					
ENVELOPES						
VOLUMES						
CAHIERS						
BOXES				1		

SHORELINE DATA

SHORELINE MAPS (List): DM-10295, DM-10296

PHOTOBATHYMETRIC MAPS (List): NA

NOTES TO THE HYDROGRAPHER (List): NA

SPECIAL REPORTS (List): NA

NAUTICAL CHARTS (List): Chart 16705 16th ED., August 24, 1996

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	119		119
COMPARISON WITH PRIOR SURVEYS AND CHARTS			
EVALUATION OF SIDE SCAN SONAR RECORDS			
EVALUATION OF WIRE DRAGS AND SWEEPS			
EVALUATION REPORT		18	18
GEOGRAPHIC NAMES			
OTHER*			
*USE OTHER SIDE OF FORM FOR REMARKS — TOTALS	119	18	137

Pre-processing Examination by M. Bigelow	*Beginning Date* 3/6/97	*Ending Date* 3/18/97
Verification of Field Data by R. Davies, M. Bigelow	*Time (Hours)* 119	*Ending Date* 9/26/97
Verification Check by B. Olmstead	*Time (Hours)* 10	*Ending Date* 10/10/97
Evaluation and Analysis by R. Davies	*Time (Hours)* 18	*Ending Date* 10/8/97
Inspection by B. Olmstead	*Time (Hours)* 8	*Ending Date* 10/9/97

EVALUATION REPORT

H-10730

A. PROJECT

Project information is discussed in the hydrographer's report.

B. AREA SURVEYED

An adequate discussion of the survey area is found in the hydrographer's report.

The hydrographer has determined the inshore limits of safe navigation by defining a Navigable Area Limit Line throughout the survey area. Charted features and soundings inshore of this limit line have not been specifically addressed during survey operations and should be retained as charted.

The bottom consists mainly of fine to gray mud and sand with components of pebbles, stones, broken shells and coral. Depths range from 0 to 200 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), AutoCad (Version 12.0) and MicroStation 95.

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 that is a database format using the .dbf extension. In addition, the sounding plot was created with .dbf (extension) and enhanced using the MicroStation system, are filed both in the MicroStation drawing format, .dgn (extension); and in the more universally recognized graphics transfer format, .dxf (extension). Copies of these files will be retained at PHB until data transfer protocols are developed and approved.

The drawing files necessarily contain information that is not part of the HPS data set such as geographic name 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. 35 and 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

Sonar equipment was not used on survey H-10730.

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.

Predicted tides were used for reduction of soundings during field processing. During office processing, tide reductions were derived from approved hourly heights zoned direct from the following tide gages: Chenega Island, Southwest End, Alaska, gage 945-4777. Herring Point, Knight Island Passage, Alaska, gage 945-4691, Eshamy Lagoon, Alaska, gage 945-4757 and Valdez, Alaska, gage 945-4240.

H. CONTROL STATIONS

Section H and I of the hydrographer's report contain adequate discussions of horizontal control and hydrographic positioning.

The positions of horizontal control stations used during hydrographic operations are published values based on NAD 83. The geographic positions of all survey data are based on NAD 83. The smooth sheet is annotated with an NAD 27 adjustment tick based on values determined with the NGS program NADCON. Geographic positions based on NAD 27 may be plotted on the smooth sheet utilizing the NAD 83 projection by applying the following corrections:

Latitude:	-1.965 seconds	(-60.831 meters)
Longitude:	7.486 seconds	(114.261 meters)

The year of establishment of control stations originate with the horizontal control records for this survey.

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. DGPS performance checks were conducted in the field and found adequate.

NAD 83 is used as the horizontal datum for plotting and position computations.

Additional information concerning calibrations and system checks can be found in the hydrographer's report and in the separates related to horizontal position control and corrections to position data.

J. SHORELINE

Shoreline maps DM-10295 and DM-10296, scale 1:20,000 were compiled on NAD 83 and apply to this survey. Shoreline drawn on the smooth sheet originates from 1:20,000 scale digital files provided by the Coastal Mapping Program.

There were no mean high water line revisions on this survey.

The hydrographer found several new rocks inshore of the NALL line and near the mean high water line. However, these features were not positioned during survey operations and are insignificant at chart scale. These rocks are of no navigational importance and have not been shown on the smooth sheet.

The shoreline map and the results of the fieldwork as portrayed on the smooth sheet should supersede charted shoreline.

K. CROSSLINES

Crosslines are discussed in the hydrographer's report.

L. JUNCTIONS

Survey H-10730 junctions with the following surveys:

Survey	Year	Scale	Area
H-10729	1996	1:40,000	East
H-10728	1996	1:10,000	South

The junction with surveys H-10728 and H-10729 are complete; soundings and depth curves are in good agreement within the common area. A "Joins" note has been shown on the survey.

M. COMPARISON WITH PRIOR SURVEYS

H-3570 (1913) 1:40,000
H-3573 (1913) 1:20,000

Prior surveys H-3570 and H-3573 cover the entire area of the present survey except for Eshamy Lagoon. Except for a few isolated rocks and islets, Eshamy Lagoon contains no charted depth information. The remainder of the survey area in common with the prior surveys reflects fair agreement with the present survey depths appearing to be shoaler by 5 – 15 fathoms. Many significant shoaler depths were located during the present survey work that were not found in 1913. These differences are likely attributed to greater sounding coverage and more modern data acquisition techniques since 1913. Although earthquakes have been prevalent in this area since 1913, this tectonic activity probably accounts for the lesser amounts of change since the prior surveys. All critical depths and features originating from the prior survey were adequately addressed during survey operations.

In accordance with Hydrographic Survey Guideline No. 39, the effects of the 1964 earthquake in Prince William Sound were considered in the comparison of these surveys. No reasonable adjustment value for prior soundings could be determined.

Survey H-10730 is adequate to supersede the prior surveys within the common area.

N. ITEM INVESTIGATIONS

There were no AWOIS items assigned to this survey.

O. COMPARISON WITH CHART

Survey H-10730 was compared with the following chart.

Chart	Edition	Date	Scale	Datum
16705	16th	Aug. 24, 1996	1:80,000	NAD83

a. Hydrography

Charted hydrography originates with the previously discussed prior surveys and miscellaneous source data. The prior surveys have been adequately addressed in section M and require no further discussion.

Charted miscellaneous source data has been satisfactorily addressed during survey operations.

Survey H-10730 is adequate to supersede charted hydrography within the charted area.

b. Dangers To Navigation

Fifteen dangers to navigation were discovered during survey operations and reported to the USCG and N/CS261 on November 25, 1996. Three additional dangers to navigation were found during office processing. Copies of these reports are attached.

P. ADEQUACY OF SURVEY

Hydrography contained on survey H-10730 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 Procedures Manual, April 1994 Edition.

Q. AIDS TO NAVIGATION

There is one fixed aid, Crafton Island Light, and no floating aids to navigation within the survey area. See the Descriptive Report for details on Crafton Island Light.

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. No additional work is recommended.

U. REFERRAL TO REPORTS

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

Charles R. Davies

C. R. Davies
Cartographer

APPROVAL SHEET
H-10730

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: 10/15/97
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: 10/17/97
Kathy Timmons
Commander, NOAA
Chief, Pacific Hydrographic Branch

****

Final Approval

Approved:

Jack L. Wallace Actg for Date: April 9, 1998
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-10730

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	10/18/97	Russ Davies	Full ~~Part Before~~ After Marine Center Approval Signed Via
			Drawing No. Full application of soundings and 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.
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			Drawing No.

SUPERSEDES C&GS FORM 8352 WHICH MAY BE USED.