

10060

Diagram No. 8202-3

NOAA FORM 76-35A

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

DESCRIPTIVE REPORT

Type of Survey Navigable Area Hydrographic
Field No. DA-10-5-82
Office No. H-10060

LOCALITY

State Alaska
General Locality Chatham Strait
Locality Whitestone Harbor to Hawk
Inlet

1982

CHIEF OF PARTY
CDR J.M. Wintermyre

LIBRARY & ARCHIVES

DATE August 13, 1984

☆U.S. GOV. PRINTING OFFICE: 1980-766-230

Area 6
CHTS
17300
17316
LAST

- to sign off all
pieces of equipment

HYDROGRAPHIC TITLE SHEET

H-10060

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.

DA-10-5-82

State AlaskaGeneral locality Chatham StraitLocality Whitestone Harbor to Hawk InletScale 1:10,000Date of survey October 13-18, 1982Instructions dated July 9, 1982 w/4 changesProject No. OPR-0362-DA-82Vessel Ship (3130), DA-1 (3131), DA-2 (3132)Chief of party CDR J. M. WintermyreSurveyed by CDR J. Wintermyre, LCDR D. MacFarland, LT D. Dreves, LTJG N. Bogue,
ENS J. Duggan, ENS E. Hawk, ENS J. Waddell and Ship's personnel.Soundings taken by echo sounder, hand lead, pole Ross Fathometer, Model 5000 and Line Scan
Recorder Model /SN C340Graphic record scaled by Ship's PersonnelGraphic record checked by Ship's Personnel

Verification

~~XXXXXXXX~~ by L. DeodatoAutomated plot by PMC Xynetics Plotter

Evaluation

~~XXXXXXXX~~ by B. A. OlmsteadSoundings in fathoms ~~XXXX~~ at ~~XXXX~~ MLLW and tenths of fathomsREMARKS: Time Zone: GMTSurvey is completeMarginal notes in black were added by the Evaluator.STANDARDS EK'D 8-16-84C. LoyAWOIS - 8/30/84 [Signature]SURF - 8/30/84 [Signature]

135°00'

134°40'

58°20'

58°20'

PROGRESS SKETCH

OPR-0362-DA-82

HAWK INLET, ALASKA

SCALE: CHART 17300

NOAA SHIP DAVIDSON (S-331)

CDR J. M. WINTERMYRE Comdg.



MANSFIELD PENINSULA

STEPHENS PASSAGE

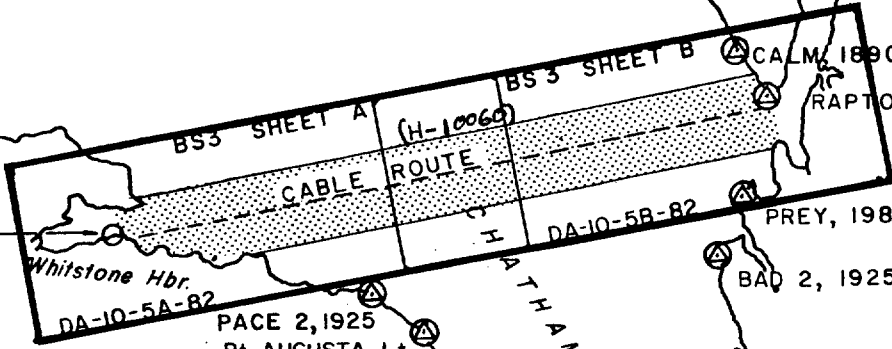
ICY STRAIT

⊙ HANUS REEF Lt., 1979

HAWK INLET

ADMIRALTY ISLAND

T.M.S. & TIDE GAGE 945-



⊙ CALM, 1890

⊙ RAPTOR, 1982

DA-10-5B-82

⊙ PREY, 1982

⊙ BAD 2, 1925

DA-10-5A-82

⊙ PACE 2, 1925
⊙ Pt. AUGUSTA Lt. 1979

CHICHAGOF ISLAND

ATHAM STRAIT

58°00'

+

+

58°00'

OCT. STATISTICS

65.6	L. N. M. SOUNDING LINE
3.0	SQ. N. M. SOUNDING
7.3	BS3 SQ. N. M. SOUNDING
0	TRIANGULATION STA ESTABLISHED
7	TRIANGULATION STA RECOVERED
4	BOTTOM SAMPLES
1/2/2	NANSEN CAST/SOUND VELOCITY/X.S.T.D.
0/0	BENCH MARKS ESTABLISHED/RECOVERED
0	L. N. M. FIELD EDIT OF SHORELINE
1/1	TIDE GAGE/T.M.S.

135°00'

135°40'

DESCRIPTIVE REPORT
OPR-0362-DA-82
H-10060 DA-10-5-82
CHATHAM STRAIT, AK

A. PROJECT

The project was conducted in accordance with project instructions for OPR-0362-DA-82, dated July 9, 1982, as amended by Change No. 1, dated September 14, 1982; Change No. 2, dated October 1, 1982; and Change No. 3, dated October 12, 1982. (Change No. 1, dated September 14, 1982 was superseded) ✓

Change No. 2 specified a Bathymetric Swath Survey System (BSSS) survey of a proposed cable route across Chatham Strait. This project was designed to exercise the BSSS, test modifications to BSSS software, and maintain levels of BSSS operator training and proficiency. ✓

B. AREA SURVEYED

Change No. 2 to the project instructions gave the highest priority to the BSSS survey of the proposed route of a submarine power cable across Chatham Strait from Hawk Inlet to Whitestone Harbor. The location of the proposed cable route was determined from consultation with Mr. Robert Cross, administrator of the Alaska Power Administration. The proposed route is a straight line connecting the western endpoint at approximate latitude 58°03'51"N, longitude 135°04'45"W, to the eastern endpoint at approximate latitude 58°05'31"N, longitude 134°46'58"W. The area surveyed was a corridor 2,000 meters wide centered on the proposed cable route. The BSSS corridor survey was supplemented by launch (HYDROPLOT) hydrography in the approaches to Hawk Inlet and Whitestone Harbor to delineate submarine topography near the ends of the proposed cable route. No survey work was performed in Hawk Inlet. ✓

Reference
Evaluation
Report
Section 1

Survey operations began October 13, 1982, and were completed October 18, 1982. ✓

C. SOUNDING VESSEL

All soundings were obtained by the NOAA Ship DAVIDSON (Electronic Data Processing Number 3130), Launch DA-1 (3131) and Launch DA-2 (3132). ✓

No unusual sounding vessel configurations were used; no problems were encountered.

D. SOUNDING EQUIPMENT AND CORRECTIONS TO ECHO SOUNDINGS

Echo-sounding instruments used by the survey vessels are listed below.

DAVIDSON (3130)

Ross Model 5000

Recorder S/N 1048
Digitizer S/N 1077
Transceiver S/N 1077 ✓

Raytheon PTR-105B

Recorder (LSR) S/N C340
Transceiver S/N 166

General Instruments "Bosun"
(Sonar component of BSSS)

S/N 213846

DA-1 (3131)

Ross Model 5000

Recorder S/N 1077
Digitizer S/N 1081
Transceiver S/N 1081

DA-2 (3132)

Ross model 5000

Recorder S/N 1080
Digitizer S/N 1048
Transceiver S/N 1036

DAVIDSON conducted BSSS operations in depths from 50 fathoms to 370 fathoms. The GI Bosun sonar performed well in all depths. The ship ran a crossline along the proposed cable route with the ship's HYDROPLOT system. The Ross fathometer performed adequately in depths from 0 to 250 fathoms. Deeper depths were scaled from the analog (LSR) output of the Raytheon PTR-105B, annotated with event marks at each position number. Event marks on the LSR record were entered manually via a push-button on the unit.

Reference
Addendum
to
Descriptive
Report

Launch DA-1's Ross fathometer performed adequately in depths from 0 - 150 fathoms. Results were poor at deeper depths; fathogram quality was marginal and digitization was sporadic and inaccurate. ✓

Launch DA-2's Ross fathometer performed satisfactorily in depths from 0 - 150 fathoms. The steep topography of the bottom on the west side of Chatham Strait forced the launches to run at reduced speed to obtain reasonable analog traces at deeper depths. Gaps in the analog record caused several soundings to be missed off Whitestone Harbor in depths greater than 150 fathoms. These appear as gaps in sounding lines and are listed below. ✓

<u>Missed Sounding</u>	<u>Fix No.</u>	<u>Note</u>
1st out	4074	
1st out	4095	
last out	4102	Fix No. 4103 moved ahead one sounding
last out	4110	Fix No. 4111 moved ahead one sounding
3rd out	4146	
4th out	4146	
1st out	4150	

Pre-operation check and adjustment procedures on the Ross fathometers were performed daily as specified in the PMC OPORDER, Appendix B. Fathometer initials were maintained at zero as required during survey operations. ✓

Reference
Evaluation
Report
Section 1

Sound velocity casts were made on October 13, 1982 (JD 286), at latitude 58°03'42"N, longitude 134°53'36"W, using a variety of instruments. A Nansen cast was made and sound velocity determined by traditional techniques. Temperature was measured by reversing thermometers and conductivity of water samples measured by a Bissett/Berman Portable Salinometer, Model No. 6230, Serial No. 4989. Data from the Nansen cast was used to create BSSS velocity table VEL. VEL. A Grundy portable sound velocity system was used to a depth of 130 m concurrently with the Nansen cast. Data from both techniques agreed favorably. Data and details of these casts are contained in the Correction to Echo Soundings Report.

Bar checks were performed on the launches at least daily, and a TRA of +0.3 fathoms determined. This was applied to all soundings obtained by the survey launches.

Settlement and squat correctors for the survey launches were determined on May 12, 1982, in the Bay of Pillars, AK. The maximum corrector was found to be less than 0.1 fathom, hence settlement and squat correctors were not applied to soundings on H-10060.

Soundings on the final field sheets are corrected for predicted tides based on Juneau, AK, corrected to Hawk Inlet as specified in the project instructions. Tidal data was acquired by a Bristol Bubbler tide gage and BSSS Tide Measurement Subsystem (TMS) installation at Whitestone Harbor. Details can be found in the Field Tide Note for OPR-0362-DA-82.

Real time tide data was acquired by the TMS as required by the project instructions. This data cannot be applied in real time, however, unless the relationship between the marigram (gage) zero and the chart datum (MLLW) is known. This was not the case on this project, hence BSSS soundings were corrected with predicted tides.

E. HYDROGRAPHIC SHEETS

Survey H-10060 consists of two 1:10,000 scale computer sheets, the western half, Field No. DA 10-5A-82, and the eastern half, Field No. DA 10-5B-82. The field sheets were prepared on DAVIDSON's PDP 8/e HYDROPLOT system; plotting was performed on the Houston Instruments DP-3 plotter.

Field records will be sent to the NOS Pacific Marine Center. Processing will be required of the BSSS data before smooth plotting is possible. The current version of the Combined Offline Program (COP) can not handle the raw data tape format produced by the real-time data acquisition program, SURVEY, version 7.0. The raw data format was modified to accommodate MiniRanger signal strength data, but the corresponding changes were not made to COP. This deficiency was noted by Mr. Thomas Stepka, BSSS software specialist, while aboard the DAVIDSON during OPR-0362-DA-82. A print-out of the attempt to run COP and a listing of the diagnostic file COPLOG.BS3 is included with the BSSS data.

BSSS data was processed to the point of production of a position plot. This is shown on the final field sheets. The position plot program (POP) duplicates position numbers by assigning the last position number on a line to the beginning of the next line. The BSSS assigns position numbers only at designated time intervals (even half-minute, whole minute, etc.), and does not necessarily assign a position number at the beginning of a line. The

duplicate position number plotted at the beginning of each line should be disregarded; succeeding position numbers on the line are unaffected. The position plot is shown to depict the vessel's track and is presented for orientation only.

F. CONTROL STATIONS

The following control stations were recovered to control hydrography. All are at least third-order, class I accuracy.

CALM, 1890
 PACE 2, 1925
 POINT AUGUSTA LIGHT, 1979
 HANUS REEF LIGHT, 1979

Reference
 Evaluation
 Report
 Section 2

The positions used for POINT AUGUST LIGHT and HANUS REEF LIGHT were field geographic positions computed by the NOAA Ship RAINIER in 1979. The positions were communicated to the DAVIDSON via radio from PMC in June, 1982. ✓

New stations RAPTOR and PREY, shown on the final field sheets, were established in June, 1982, to third-order, class I accuracy standards by personnel of the DAVIDSON. They were established to provide a basis for future work in Hawk Inlet and were not used to control hydrography on H-10060. Details are contained in the Horizontal Control Report for OPR-0362-DA-82, submitted to PMC in August 1982. ✓

G. HYDROGRAPHIC POSITION CONTROL

The Motorola MiniRanger III electronic navigation system was used in range-range mode to control the position of soundings on H-10060. Serial numbers of MiniRanger III components are listed below.

Reference
 Evaluation
 Report
 Section 2

Vessel Components

<u>Vessel</u>	<u>Console S/N</u>	<u>Receiver/Transmitter S/N</u>
DAVIDSON (3130)	716*	1545
	713166**	1545 ✓
DA-1 (3131)	710	M409
DA-2 (3132)	707	SM314

*Console modified for faster display rate and with reset to zero option, used for BSSS survey.

**Used for HYDROPLOT crossline

Shore Stations

<u>S/N (Code)</u>	<u>Station (Signal Number)</u>	<u>Julian Dates of Deployment</u>
1606 (1)	HANUS REEF LIGHT (101)	287-291
1572 (2)	CALM 1890 (102)	287-289
	PACE 2 1925 (107)	290-291 ✓
4950 (3)	POINT AUGUSTA LIGHT (106)	287-291
3376 (4)	CALM 1890 (102)	289-291
B1413 (5)	HANUS REEF LIGHT (101)	287-291

<u>S/N (Code)</u>	<u>Station (Signal Number)</u>	<u>Julian Dates of Deployment</u>
911723 (6)	CALM 1890 (102)	287-291
B1215 (7)	POINT AUGUSTA LIGHT (106)	287-291

MiniRanger III equipment was calibrated on a 276 meter baseline at Juneau, AK on October 11, 1982. Procedures were as described in the PMC OPCODE. The results of this baseline calibration were applied to all MiniRanger III navigation data on H-10060. Details and calibration records are contained in the Electronic Control Report for OPR-0362-DA-82. ✓

System checks were performed by each vessel before and after each day's hydrography. The baseline crossing method described in Appendix Q of the PMC OPCODE was used successfully in all cases. ✓

Low MiniRanger signal strengths plagued all vessels throughout the survey. Survey operations were often conducted near the minimum acceptable signal strengths determined at the October 11, 1982 baseline calibration. Reference Evaluation Report Section 2

The low signal strengths experienced on the ship's system were probably due to a variety of causes. The ship's console had been factory modified to permit faster-than-normal display rates and to reset to zero upon failure of range interrogation. These modifications had an unknown effect on the signal strengths. The position of the ship's receiver/transmitter unit raised questions also. The proximity of the ship's mast creates blind areas. The presence of steel in the structure of the mast may lessen the effectiveness of the R/T's magnetron. The skip zone problem is also exacerbated by the height of the R/T antenna on the ship. ✓

The skip zone problem was partially relieved by the deployment of two transponders at different elevations at each shore station. The BSSS has the ability to change control and navigation correctors while on line. This ability was exploited to keep the ship on line while in the skip zone of one shore station. ✓

Low signal strengths in the launch MiniRanger III systems were initially caused by line-of-sight problems due to the distance from the shore station and relative heights of the transponder and launch R/T unit. This was relieved by elevating the transponders and working at low stages of tide. However, some hydrography was run with MiniRanger III signal strengths below the minimum acceptable values determined at the October 11, 1982, baseline calibration. In those cases correctors were applied on a case-by-case basis using the appropriate corrector determined from the baseline calibration as described below. This data is tabulated below. ✓

<u>Vessel</u>	<u>Julian Day</u>	<u>Position Nos.</u>	<u>Location</u>
3130	290	254-256	HYDROPLOT cross-line on cable route ✓
3130	290	256-257	HYDROPLOT cross-line on cable route ✓
3132	290/291	4190-4266	Mouth of Whitestone Harbor

Data from fix numbers 254-256 were plotted with the corrector determined for the ship's system with code 1 at signal strength 4 (+8 meters). Data from fix

number 256-257 were plotted with the corrector determined for the ship's system with code 1 at signal strength 5 (+2 meters). Data from fix numbers 4190-4266 were plotted with correctors determined for DA-2's system applied individually to each sounding's navigation data. In all the above cases, correctors determined at the October 11, 1982 baseline calibration were used.

Reference
Evaluation
Report
Section 4

H. SHORELINE

The shoreline shown on the final field sheets at the western end of the survey area (entrance to Whitestone Harbor) was scaled and transferred from NOS Chart No. 17300, 1:209,978 scale, 22nd Edition, 26 September 1981. It is depicted for orientation and reference only. Shoreline is shown at the eastern edge of the survey area (entrance to Hawk Inlet) for reference only. It was traced from a 1:10,000 scale blow-up of a 1:40,000 scale inset on Chart No. 17316, 13th edition, dated June 10, 1978. ✓

No verification or investigation of shoreline features was attempted.

I. CROSSLINES

Crosslines constituted 11.1% of mainscheme HYDROPLOT hydrography and 23.3% of mainscheme BSSS hydrography. In addition, a HYDROPLOT crossline was run along the proposed route of the submarine power cable. This provided a profile of the cable route and BSSS comparison data for verification purposes. ✓

BSSS agreement at crosslines is impossible to judge without a sounding plot. The inability to run COP prevented production of a sounding plot. ✓

Crossline comparisons were made in the areas surveyed with the HYDRO-PLOT system aboard the launches. ✓

On DA-10-5A-82, near the entrance to Whitestone Harbor, crosslines were run parallel to the proposed cable route and obliquely to the contours. The bottom rises steeply in the region, in some areas from depths greater than 200 fathoms to depths less than 100 fathoms in less than 0.1 nautical miles. Agreement with the mainscheme was generally good, however, where direct comparisons were possible, 31 were made; 6 (19%) agreed exactly, 21 (68%) agreed within one fathom and 3 (10%) agreed within two fathoms. One crossline sounding differed by 5 fathoms (201 fathoms vs. 206 fathoms). This occurs in an area of steeply sloping bottom and is not thought significant. In areas of steep bottom topography or where direct comparisons were not possible, the crossline soundings were consistent with mainscheme depth contours. ✓

On DA-10-5B-82, near the entrance to Hawk Inlet, crosslines were run parallel to the depth contours in depths between 20 and 40 fathoms. Agreement with mainscheme soundings is excellent. Forty-one direct comparisons were made; 24 (59%) agreed exactly, 16 (39%) agreed within 1 fathom, and 1 (12%) agreed within 2 fathoms. The two fathom discrepancy exists in an area where the bottom drops sharply from 30 fathoms to 60 fathoms, and is not considered significant. ✓

J. JUNCTIONS

Survey H-10060 does not junction with any prior or contemporary surveys. ✓

Field sheet DA-10-5A-82 junctions with field sheet DA-10-5B-82 at an 8 sounding overlap on the HYDROPLOT crossline run along the proposed cable route. The depths in the junction area are about 300 fathoms. The overlapping soundings agreed well: 2 (25%) agreed exactly, 5 (62.5%) agreed within 1 fathom, and 1 (12.5%) agreed within 2 fathoms.

As before, it is impossible to examine the 10-5A to 10-5B junction of BSSS data without a sounding plot.

K. COMPARISON WITH PRIOR SURVEYS

No pre-survey review items lie within the survey area.

Reference
Evaluation Report
Section 6

Soundings on H-10060 near the entrance to Hawk Inlet were compared with soundings from H-2063, 1890, Hawk Inlet, 1:10,000 scale. General agreement of these soundings was excellent. Thirty direct comparisons were made; 16 (53%) agreed exactly, 11 (37%) agreed within 1 fathom, and 3 (10%) agreed within 2 fathoms. The contours agreed well. There were no significant features on the prior survey which required investigation. No attempt was made to verify or disprove shoreline details.

Soundings on H-10060 in Chatham Strait and near the entrance to White-stone Harbor were compared with soundings from H-2055, 1890, Chatham Strait, 1:80,000 scale. General agreement of these soundings was good. Six direct comparisons were made; 4 agreed within 10% of the depth. This is considered good agreement given the limitations of these comparisons: (1) inaccuracies in scaling and transferring positions of soundings from a 1:80,000 scale survey to a 1:10,000 scale survey, (2) the datum shift from the 1890 survey datum to the North American 1927 Datum, (3) the steeply sloping bottom in the area where comparisons were made. Two soundings differed by more than 10% of the depth. These are listed below.

<u>Position</u>	<u>H-2055 Depth</u>	<u>H-10060 Depth</u>
58°04'00"N ✓ 135°02'30"W	169 fms ✓	198 fms ✓
58°04'04.5"N ✓ 135°02'54"W	107 fms ✓	163 fms ✓

These discrepancies are due to displacement of soundings in areas of steeply sloping bottom. Discrepancies can also be accounted for in differences of data collection methods.

In addition, one direct comparison was made at latitude 58°05'15"N, longitude 134°49'36"W. A 185 fathom sounding from H-2055 lies between surveyed depths of 187 fathoms and 194 fathoms, as determined on H-10060. This is considered a good comparison.

Other comparisons are impossible due to a lack of BSSS sounding plot.

L. COMPARISON WITH CHART

As above, the only comparisons possible are with data acquired with the HYDROPLOT system.

Near the entrance to Hawk Inlet, east of longitude 134°48'30"W, com-

parisons were made with a 1:10,000 scale blow-up of NOS Chart No. 17316, 1:40,000 scale inset, 13th Edition, June 10, 1978. Agreement with charted soundings was excellent. The contours agree well. Sixteen direct comparisons were made; 5 (31%) agreed exactly, 7 (44%) agreed within 1 fathom, and 2 (12.5%) agreed within 2 fathoms. Two soundings (12.5%) differed by more than 2 fathoms. These are tabulated below.

<u>Position</u>	<u>Charted Depth</u>	<u>H-10060 Depth</u>	<u>Note</u>
58°05'10"N ✓ 134°48'13"W	52 fms ✓	41 fms ✓	1
58°04'58"N ✓ 134°47'45"W	16 fms ✓	19 fms ✓	2

Notes

- (1) This is an area of steeply sloping bottom. About 50 meters west ✓
of the charted sounding is a surveyed depth of 53 fathoms.
- (2) About 50 meters west of the charted sounding is a surveyed depth ✓
(inserted peak) of 16 fathoms.

These two discrepancies could be evidence of a general position displacement of charted soundings of about 50 meters east of their true position. It is possible this is only noticeable in areas of steeply sloping bottom or by comparison with special features. It is also possible that the discrepancies are merely due to displacement of soundings in areas of steeply sloping bottom. In either case, the magnitude of displacement will not be noticeable at the scale of the chart. ✓

In Chatham Strait and near the entrance to Whitestone Harbor, sounding comparisons were made with NOS Chart No. 17300, 1:209,978 scale, 22nd Edition 26 September 1981. Eight soundings shown on Chart 17300 lie in the survey area; five are in areas surveyed with the BSSS and direct comparisons are not possible, but three lie in the area surveyed with HYDROPLOT. These are listed below. ✓

<u>Position</u>	<u>Chart No. 17300</u>	<u>H-10060</u>	<u>Notes</u>
58°04'06"N ✓ 135°02'36"W	107 fms ✓	205 fms ✓	1
58°04'18"N ✓ 135°04'00"W	40 fms ✓	33 fms ✓	2
58°04'00"N ✓ 135°04'24"W	63 fms ✓	60 fms ✓	3

Notes

- (1) This occurs in an area of steeply sloping bottom, where a small position displacement produces a large depth discrepancy. The position displacement may be due to inaccuracies in scaling and transferring positions from a 1:209,978 scale chart to a 1:10,000 scale survey. ✓

- (2) The charted depth falls between surveyed depths of 33 fathoms and 46 fathoms. This is satisfactory agreement. ✓
- (3) This is an adequate comparison given the limitations described in Note (1) above. ✓

No pre-survey review items lie in the survey area. No special investigations were conducted or hazards to navigation discovered. No Dangers to Navigation Report was issued.

M. ADEQUACY OF SURVEY *A Danger to Navigation Report was submitted by the NOAA Ship Fairweather for Junctional Survey H-10067 (1983). This letter contains soundings common to H-10060 and is attached for reference purposes. An additional Dangers to Navigation letter was generated during preliminary office processing.*

Further processing of BSSS data is required to produce a sounding plot. When completed, the survey will be adequate to meet the needs of the Alaska Power Administration for planning the submarine cable route from Hawk Inlet to Whitestone Harbor. BSSS line spacing provided 100% bottom coverage in all survey areas with beams 0-9. In depths greater than 340 fathoms, 100% overlap was obtained with beams 0-6.

Reference Addendum to Descriptive Report paragraph M.

The areas surveyed by conventional methods are adequate to supersede prior surveys for charting purposes. As detailed in Section G, Hydrographic Position Control, several lines of hydrography were run at less than minimum acceptable MiniRanger signal strengths, particularly in the entrance to Whitestone Harbor. Fathogram quality was marginal in areas where the bottom dropped sharply from 100 fathoms to more than 200 fathoms. Many depths were scaled by hand and the hydrographer's judgment was required in several instances. Gaps in the fathograms caused several soundings to be missed, as listed in Section D, Sounding Equipment and Corrections to Echo Soundings.

Reference Evaluation Report Section 4

N. AIDS TO NAVIGATION

There are no aids to navigation in the survey area. ✓

O. STATISTICS

<u>Vessel</u>	<u>Type</u>	<u>No. of Positions</u>	<u>L.N.M.</u>	<u>S.N.M.</u>
DAVIDSON (3130)	BS3 HYDROPLOT	228 508	35.0	8.1
DA-1 (3131)	HYDROPLOT Bottom Sam- ples	269 4*	32.9 -	1.1 -
DA-2 (3132)	HYDROPLOT	253 2	25.1	1.0

* Mailed to Department of Paleobiology, Natural History Museum, Washington, D. C. on October 22, 1982.

Other

<u>Type</u>	<u>Number</u>
Tide Stations*	1
Nansen Casts	1
XSTD Casts	2
Portable Sound Velocity System Casts	1

* Included TMS installation

P. MISCELLANEOUS

Comments on BSSS performance and recommendations for software modifications are contained in Section Q, Recommendations. ✓

Q. RECOMMENDATIONS

The following comments and recommendations are offered.

- (1) The CombinedOutput Program (COP) and all other BSSS processing software must be modified to be compatible with the current version of SURVEY. Without these changes, shipboard data processing is not possible. ✓
- (2) The real-time data acquisition program SURVEY was modified by the addition of a navigation filter to accommodate MiniRanger III electronic navigation data. The filter worked well for isolated spurious ranges by substituting rates linearly extrapolated from preceding valid rates. The filter failed during ship passes through MiniRanger III skip (null) zones. The filter became saturated with bad navigation data, closed down, and was useless until the navigation data became strong again. The BSSS does not have the ability to edit raw data or plot soundings on the basis of time and course between points with valid navigation data. This is a significant drawback when the BSSS is used with a "dirty" navigation system like the MiniRanger III. ✓
- (3) SURVEY was modified in the field by Mr. Thomas Stepka to plot swath limits on the swath plot every 30 seconds, rather than as a function of distance travelled by the survey vessel. The time interval between swath plots should be a function of vessel speed, survey scale, and the desires of the operator. ✓

R. AUTOMATED DATA PROCESSING

The following programs were used to gather and process survey data.

<u>Program</u>	<u>Version Date</u>	
RK 112	Real Time R/R Plot	8/04/81
RK 211	Non-Real Time R/R Plot	2/02/81
RK 300	Utility Computations	10/21/80
RK 330	Reformat and Data Check	5/04/76
RK 407	Geodetic Direct/Inverse	9/25/78
AM 500	Predicted Tides Generator	11/10/72
RK 530	Layer Correction for Velocity	5/10/76
AM 602	Extended Line Oriented Editor	5/20/75

BSSS

<u>Program</u>	<u>Version(Date)</u>
SURVEY	7 (October 11, 1982)
TABGEN	3.1 (February 1980)

<u>Program</u>	<u>Version (Date)</u>
ABSTR	5.0 (February 1981)
LARD	3.0 (July 1981)
MTUTIL	1.0 (December 1, 1978)
SURF	7 (February 1982)
POP	2.1 (July 1981)
TIDLST	2 (March 1982)
TIDGEN	2 (March 1982)
MT1EOF, MT1E0F	1.0 (December 1, 1978)
GULP	New Version - No date available

S. REFERRAL TO REPORTS

Horizontal Control Report for OPR-0362-DA-82
 (Submitted to PMC in August 1982)
 Field Tide Note
 Electronic Control Report

Respectfully submitted,

Neil M. Bogue
 Neil M. Bogue
 LTJG, NOAA

Approved and forwarded,

James M. Wintermyre
 James M. Wintermyre, CDR NOAA
 Commanding Officer
 NOAA Ship DAVIDSON

OPR-0362-DA-82
DA-10-5-82(H-10060)
PARAMETER TAPE PRINTOUT

DA-10-5A-82
FEST=20000
CLAT=6431072
CMER=134/50/00
GRID=30
PLSCL=10000
PLAT=58/02/12
PLON=135/07/45
VESNO=3130
YP=82
ANDIST=00.0

SKEW: 10,20,54

DA-10-5B-82
FEST=20000
CLAT=6431072
CMER=134/50/00
GRID=30
PLSCL=10000
PLAT=58/03/10
PLON=134/57/15
VESNO=3130
YP=82
ANDIST=00.0

SKEW: 10,20,54

✓
FIELD TIDE NOTE
OPR-0362-DA-82
DA-10-5-82
H-10060
HAWK INLET, ALASKA

Tide data was collected for application to Hydroplot and Bathymetric Swath Survey System (BS³) soundings in the vicinity of the proposed cable route between Hawk Inlet, Alaska and Whitestone Harbor, Alaska. Change No. 1 to Project Instructions OPR 0362-DA-82 required the installation of the Tide Measurement Subsystem (TMS) in conjunction with the required tide gage.

Project Instructions called for a tide gage installation in the vicinity of Hawk Inlet. Because the Hawk Inlet side of Chatham Strait offers no protected sites suitable for the gage/TMS installation permission to use an alternate site in Whitestone Harbor was requested; permission was granted through CPML on 13 October 1982.

Bristol Bubbler S/N 64A 11032 and TMS Box E, S/N 212027 were deployed on the south shore of Whitestone Harbor near a log dumping facility at 50° 03.8'N., 135° 05.5'W. Station reference number 945-2296 originally assigned to the Hawk Inlet station was used at this location.

Slight difficulty was encountered when installing the gage since the pen could not be adjusted to read zero. Some manipulation of the pen recording linkage was necessary to bring the pen closer to the zero line; final adjustments were then made with the adjusting screw. This apparently solved the problem. However, post-project scanning of the marigram showed that for several high tides the tidal maxima had not been recorded, and a straight line was drawn instead of the typical sinusoidal curve. The missing part of the curve was a small fraction of the total marigram data (less than 1.0 feet of tidal difference). The missing portions of the marigram were easily interpolated. The cause of the problem has not been resolved.

Hourly heights of tide were abstracted from the marigram. The gage clock was four minutes slow when the gage was removed after 5 days of operation. The time error was distributed linearly throughout the period.

Based on 4 staff to gage comparisons for the JD 286 - JD 291 observation period, including the mean of 13 observations made during the gage installation test, a marigram reading of 13.5 feet corresponds to 0.0 feet on the tide staff.

Three temporary benchmarks consisting of 3/8" eyebolts screwed into 1/2" lead shields set in holes drilled into bedrock were established on JD 286. Third order class 1 levels were run from the tide staff to the benchmarks prior to the start of survey operations. The benchmarks were again leveled at the completion of survey operations, and removed. Elevations agreed with JD 286 results.

Field reduction of Hydroplot and BS³ soundings for DA-10-5-82 are based on daily predicted tides for Juneau, Alaska (Reference Station 945-2210). Program AM 500, "Predicted Tides Generator", 11/10/72 version) was used to produce ASCII and BINARY Predicted Tide Tapes for Hydroplot operations. Hydroplot soundings on the final field sheet are corrected for predicted tides at 0.2 fathom intervals.

The following tide correctors were applied to the reference station at Juneau for use as preliminary tidal zoning as directed in the Project Instructions:

<u>Time Corrector</u>		<u>Height</u>
<u>High Water</u>	<u>Low Water</u>	<u>Ratio</u>
0 minutes	+6 minutes	x0.92

The tide staff at the reference tide station at Juneau, AK was connected to three benchmarks by third order, class 1 levels on 8 October 1981. Benchmarks 22, 19 and 8 were observed and results compared with historical data provided by Pacific Tides Party. The observed differences of elevation between the staff stop and BM 22, and between BM 22 and BM 19 agrees with historic values. The difference of elevation between BM 19 and the primary benchmark (BM 8) continues to increase, suggesting that BM 22 and 19 are settling. The most recent results show a difference of elevation that is 4 cm greater than the 1975 values, the earliest data provided.

TMS Operation

The Tide Measurement Subsystem (TMS) is a tide telemetry system utilizing a standard Bristol bubbler-type tide gage as input and which permits the BS³ to apply actual tide corrections in real time. The TMS is connected to the orifice tubing leading from a bubbler gage to its submerged orifice. Tide information is transmitted continually by the unit to a shipboard TMS receiver. TMS data was not applied during data acquisition because a datum is required in order to meaningfully reduce observed depths. Predicted tides were used during data acquisition, but the TMS was permitted to operate in order to exercise the system. The ship board TMS receiver

failed after one day of BS³ operations. It is suspected that radio transmissions made from the ship's Sunair transmitter during TMS data acquisition overloaded the system, leading to receiver failure (the shore station continued to operate). The receiver was quickly repaired by ship's ET's.

Two additional systems were air freighted to the DAVIDSON from PMC, but were received in a damaged condition and were not available for use.

Respectfully submitted,

Donald A. Sawyer

for Eric G. Hawk, ENS., NOAA
Tides Officer

Approved and forwarded,

James M. Wintermyre

James M. Wintermyre, CDR
Commanding Officer
NOAA Ship DAVIDSON

GEOGRAPHIC NAMES

H-10060

Name on Survey	Source of Name										
	A	B	C	D	E	F	G	H	K		
	ON CHART NO.	ON PREVIOUS SURVEY NO.	ON U.S. QUADRANGLE MAPS	FROM LOCAL INFORMATION	ON LOCAL MAPS	P.O. GUIDE OR MAP	RAND McNALLY ATLAS	U.S. LIGHT LIST			
Alaska (Title)											1
Chatham Strait											2
Hawk Inlet											3
Hawk Point											4
Whitestone Harbor											5
											6
											7
											8
											9
											10
											11
											12
											13
											14
											15
											16
											17
											18
										Approved:	19
										<i>Charles B. Hamington</i>	20
										Chief Geographer - N/CG 2x3	21
										14 Feb 1984	22
											23
											24
											25

✓
ELECTRONIC CORPECTOR ABSTRACT

VESSEL : 3130

SHEET : DA-10-5-82

TIME	DAY	PATTERN 1	PATTERN 2
005933	289	+00002	+00000
192933	290	+00007	+00001
204313	290	+00007	+00001

✓
ELECTRONIC CORRECTOR ABSTRACT

VESSEL : 3131

SHEET : DA-10-5-82

TIME	DAY	PATTERN 1	PATTERN 2
180701	288	-00001	-00004
215235	288	-00001	-00004
174858	290	+00007	-00005

✓
ELECTRONIC CORRECTOR ABSTRACT

VESSEL : 3132

SHEET : DA-10-5-82

TIME	DAY	PATTERN 1	PATTERN 2
182400	290	+00008	+00000
235219	290	+00000	-00007
235234		+00007	-00007
235249		+00007	-00015
235304		+00000	-00007
235319		+00000	-00015
235334		+00007	-00015
235404		+00000	-00007
235419		+00004	-00007
235434		+00000	-00007
235449		+00007	-00015
235622		+00000	-00015
235652		+00007	-00015
235707		+00000	-00015
235722		+00007	-00015
235953		+00000	-00007
000008	291	+00000	-00007
000038		+00007	-00015
000053		+00007	-00007
000108		+00000	-00007
000153		+00007	-00007
000208		+00007	-00015
000238		+00000	-00015
000253		+00007	-00015
000422		+00000	-00015
000437		+00007	-00015
000507		+00000	-00007
000522		+00007	-00007
000537		+00007	-00015
000552		+00007	-00007
000622		+00007	-00015
000803		+00000	-00007
000818		+00007	-00015
000833		+00007	-00007
000848		+00000	-00007
000903		+00007	-00007
000948		+00007	-00005
001003		+00000	-00007
001018		+00007	-00007
001033		+00007	-00015
001226		+00007	-00007
001256		+00007	-00015
001311		+00007	-00007
001341		+00007	-00015
001452		+00007	-00007

DB ✓
ELECTRONIC CORRECTOR ABSTRACT

VESSEL : 3132

SHEET : DA-10-5-82

TIME	DAY	PATTERN 1	PATTERN 2
004029	291	+00007	-00007
004053		+00007	-00005
004105		+00007	-00007
004141		+00007	-00005
004152		+00007	-00007
004207		+00000	-00007
004222		+00007	-00007
004450		+00007	-00005
004505		+00007	-00007
004550		+00007	-00005
004707		+00007	-00007
004752		+00007	-00005
004807		+00007	-00007
005039		+00007	-00005
005533		+00007	-00007
005548		+00007	-00005
005618		+00007	-00007
005633		+00007	-00005
010151		+00007	-00007
010239		+00000	-00007
010251		+00007	-00015
010303		+00007	-00007
010327		+00000	-00007
010339		+00007	-00007
010351		+00007	-00005
010402		+00007	-00007
010417		+00000	-00007
010432		+00000	-00005
010447		+00000	-00007
010502		+00007	-00007
010517		+00000	-00007

✓
ELECTRONIC CORRECTOR ABSTRACT

VESSEL : 3132

SHEET : DA-10-5-22

TIME	DAY	PATTERN 1	PATTERN 2
001507	291	+00000	-00005
001522		+00007	-00007
001552		+00007	-00015
001622		+00007	-00007
001637		+00000	-00007
001652		+00007	-00007
001722		+00000	-00007
001737		+00007	-00007
001814		+00007	-00015
001829		+00000	-00007
001844		+00007	-00007
001914		+00007	-00015
001929		+00007	-00007
001944		+00007	-00015
002014		+00007	-00007
002044		+00007	-00015
002059		+00007	-00007
002217		+00000	-00007
002232		+00007	-00005
002247		+00007	-00007
002332		+00007	-00005
002347		+00007	-00007
002417		+00000	-00007
002432		+00007	-00005
002508		+00007	-00007
002523		+00007	-00015
002553		+00007	-00007
002723		+00007	-00015
002830		+00007	-00005
002845		+00007	-00007
002930		+00007	-00005
002945		+00000	-00007
003000		+00007	-00005
003030		+00007	-00015
003104		+00007	-00007
003449		+00004	-00005
003504		+00007	-00007
003519		+00007	-00005
003534		+00007	-00007
003604		+00007	-00005
003619		+00007	-00007
003649		+00007	-00005
003720		+00007	-00007
003850		+00007	-00005
003905		+00007	-00007
003950		+00007	-00005

✓
CPR-0362-DA-82
DA-10-5-82(H10060)
SIGNAL TAPE PRINTOUT

101	1	58	07	51544	134	59	53276	250	0000	000000	HANUS REEF LIGHT, 1979
102	4	58	06	17401	134	47	58469	250	0006	000000	CALM, 1890
103	1	58	05	46920	134	47	04634	139	0004	000000	RAPTOR, 1982
104	6	58	04	15693	134	47	51091	139	0002	000000	PREY, 1982
105	7	58	03	24910	134	48	33049	139	0005	000000	BAD 2, 1925
106	5	58	02	23620	134	57	01954	250	0000	000000	PT. AUGUSTA LIGHT, 1979
107	5	58	02	49872	134	58	01700	250	0002	000000	PACE 2, 1925

OCEANOGRAPHIC LOG SHEET - M
BOTTOM SEDIMENT DATA

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

VESSEL	SERIAL NO.	DATE	PROJ. NO.		YEAR	DEPTH (Fathoms)	WEIGHT OF SAM- PLER	AP- PROX. PENE- TRA- TION	LENGTH OF CORE	COLOR OF SEDI- MENT	FIELD DESCRIPTION	CHECKED BY	DATE CHECKED	REMARKS (Unusual conditions, cohesiveness, density, color, stat. no., type of bottom soil, etc.)	OBS. INIT.
			LATITUDE	LONGITUDE											
3131 (OA-1)			OPR-0362-DA-82		1982						HAWK INLET, ALASKA	11/22/82	ED		
2176	JP 288	58/05/14	134/47/25		22.2	10.6	3 cm	-	gray	fine S, brk Sh, Sal P				ONE PEBBLE WITH BUBBLE IMPRESSION	Of
2178	"	58/05/05	134/47/55		24.6	"	"	-	-	brk /				small pebbles on 3 attempts	Of
2179	"	58/04/55	134/47/55		28.3	"	"	-	-	fine-med P					Of
2182	"	58/05/50	134/47/55		36.1	"	"	-	-	lg G, P					Of

Use more than one line per sample if necessary.

ABSTRACT OF POSITIONS
DA-10-5-82

Launch DA-1 (3131)

<u>DAY</u>	<u>POSITIONS</u>	<u>CNTRL</u>	<u>S1</u> <u>M</u> <u>S2</u>	<u>REMARKS</u>
288	2001-2028	042	106---101	Shoreline
288	2029-2131	042	106---101	Mainscheme
288	2132-2133	042	106---101	Fill-in
288	2134-2158	042	106---101	Mainscheme
288	2159-2160	042	106---101	Split
288	2161-2175	042	106---101	Crosslines
288	2176-2182	042	106---101	Bottom Samples
290	2183-2229	042	101---102	Shoreline
290	2232-2277	042	101---102	Mainscheme

Launch DA-2 (3132)

290	4001-4016	042	101---107	Shoreline
290	4017-4168	042	101---107	Mainscheme
290	4169-4188	042	101---107	Crosslines
290	4190-4198	042	101---102	Mainscheme
291	4199-4262	042	101---102	Mainscheme
291	4263-4266	042	101---102	Crossline

Ship (3130)

289	230-253	042	106---101	
290	254-261	042	101---102	Cable Route Lines
290	271-288	042	101---102	

SURVEY APPROVAL SHEET

H-10060
OPR-O362-DA-82

- A. Amount and degree of personal supervision of field work and frequency of record and sheet inspection:

The records were inspected by the F00 daily. I checked them at random intervals. The sheets were inspected daily by me.

- B. State whether the survey is complete and adequate, or if additional field work is recommended:

The survey is complete and adequate for supplementing charted information.

- C. Cite additional information or references that may be of assistance for verifying and reviewing the survey:

The necessary software was not available to process the BS³ data.

- D. Signed statement of approval of the field sheet and all accompanying records:

Date: 2 December 1982

Approved and forwarded by:



J. M. Wintermore
CDR, NOAA
Commanding Officer

ADDENDUM TO DESCRIPTIVE REPORT
OPR-0362-DA-82
H-10060 DA-10-5-82
CHATHAM STRAIT, AK

The following changes and additions are to be applied to the Descriptive Report for OPR-0362-DA-82, Chatham Strait, Alaska H-10060. The addendum is in response to a letter from N/MOP dated March 4, 1983, which required shipboard processing of BSSS data. The changes and/or additions correspond to the appropriate letter heading and title. ✓

A. PROJECT

The project was also conducted in accordance with Change No. 4, dated November 10, 1982. ✓

D. SOUNDING EQUIPMENT AND CORRECTIONS TO ECHO SOUNDINGS

DAVIDSON conducted BSSS operations in depths from 49 fathoms to 419 fathoms, not 50 to 370 fathoms. Operational depths could not be determined until BSSS data was processed. ✓

BSSS soundings were reduced with predicted tides data for Juneau, AK, from magnetic tapes generated by the Marine Predictions Branch, N/OMS132 with tide corrections of 0 minutes for high water, plus 6 minutes for low water, and a height ratio of 0.92. A TRA of 1.9 fms and sound velocity corrections were applied to all BSSS soundings. ✓

E. HYDROGRAPHIC SHEETS

Field records, final field sheets, and reports were sent to the NOS Pacific Marine Center on December 2, 1982. Processing of the BSSS data was not possible with the Combined Offline Program (COP). COP could not handle the raw data tape format produced by the real-time data acquisition program, SURVEY version 7.0. The raw data format was modified to accommodate Mini-Ranger signal strength data, but the corresponding changes had not been made to COP. The deficiency was noted by Mr. Thomas Stepka, BSSS software specialist, while aboard the DAVIDSON during OPR-0362-DA-82. ✓

BSSS data was processed to the point of production of a position plot. This was shown on the final field sheets along with the HYDROPLOT final soundings. The final field sheets consisted of two 1:10,000 scale computer sheets, the western half, Field No. DA-10-5A-82, and the eastern half, ✓

Field No. DA-10-5B-82. Originally, the Position Plot Program (POP) duplicated position numbers by assigning the last position number on the line to the beginning of the next line. The new version of POP depicts the position numbers in a new format. The change will be discussed later in this section. The BSSS assigned position numbers at designated time intervals (even half-minute, whole minute, etc.), and does not necessarily assign a position number at the beginning of a line. The position plot is shown to depict the vessel's track and is presented for orientation only. ✓

On March 4, 1983, a letter from N/MOP required DAVIDSON personnel to process the BSSS data with a new version of COP which would accommodate Mini-Ranger signal strengths. A copy of this letter has been attached. ✓

Two additional 1:10,000 scale final field sheets, the western half, Field No. DA-10-5A-82 (BSSS), and the eastern half, Field No. DA-10-5B-82 (BSSS) were prepared on DAVIDSON's PDP 8/e HYDRO PLOT system; plotting was performed on the Houston Instrument DP-3 plotter. BSSS hydrography was COPed with version 7 and depicted on the above final field sheets. ✓

Two additional 1:10,000 Position Plots (POP) sheets with the new change was generated to depict the vessel's track. The new version of POP does not duplicate position numbers. It will begin and end the line with a position number, which in some cases will not represent the true extent of hydrographic data. Secondly, POP will plot the position number based upon unsmoothed navigation rates which consist of Mini-Ranger range spikes and poor signal strength. To represent the true position of the ship, programs SMOOTH and NAVPLT were run on the raw data tapes. SMOOTH reads raw data tapes generated by the SURVEY program, filters navigation range spikes and replaces them with Dead Reckoning values. It writes an output tape in raw data format containing the filtered navigation LOP's. NAVPLT reads the SMOOTH data tapes, converts LOP's to X-Y coordinates using the Survey Summary File and Station Table data and plots the position of the ship (in black) on the field sheet. To depict the entire true range of hydrography on the position plot, NAVPLT lines were drawn in red and smooth Mini-Ranger lines were drawn in blue. ✓

The BSSS soundings plotted on the final field sheet represent the minimum depth. The plot option used for producing the final BSSS sounding sheet was "0" - to plot minimum depth only. Program SPLOT has the capability of plotting the minimum depths, the maximum depths, or all depths. ✓

I. CROSSLINE

Crossline comparisons were made in areas surveyed with the BSSS aboard the ship. On DA-10-5A-82, agreement with the HYDROPLOT crossings and BSSS mainscheme was generally good. However, two crossline soundings differed by 12 fathoms (246 fathoms vs. 258 fathoms at 58/04/09 N, 135/01/24 W) and a second differed by 9 fathoms (222 fathoms vs. 231 fathoms at 58/04/20 N, 134/59/34 W).

On DA-10-5B-82, agreement with the HYDROPLOT crossline and BSSS mainscheme was fair, with differences generally ranging from 2 -13 fathoms. Five 100 fathom blunders are located between 58/04/50 N, 134/54/10 W and 58/04/48 N, 134/54/23 W, fix No. 0018-0022. The hydroplot soundings were scaled incorrectly from the Raytheon PTR-1058 fathogram. The following soundings should be changed from:

248 fm to 353 fm ✓

253 fm to 353 fm ✓

257 fm to 357 fm ✓

274 fm to 374 fm ✓

275 fm to 375 fm ✓

The shoaler crossline soundings could not be changed since the data is already at the Pacific Marine Center.

BSSS crosslines are impossible to compare with mainscheme hydrography, as all soundings are plotted in the same color and orientation on the sounding plot. However, inspection of the soundings in the vicinity of the crosslines (from overlay of the position plot) shows good agreement with differences ranging from 1 to 3 fathoms. ✓

J. JUNCTIONS

BSSS and HYDROPLOT soundings were compared in 200 to 300 meter overlap areas in the vicinity of Whitestone Harbor for sheet DA-10-5A-82 and the entrance to Hawk Inlet for sheet DA-10-5B-82. For sheet DA-10-5A-82, sounding comparisons in the junction areas, depths ranged from 138 to 253 fathoms. BSSS soundings compared well to HYDROPLOT soundings with differences ranging from 1 to 4 fathoms. The differences are probably due to the mechanical limits of the Ross Fathometer. Under ideal conditions, Ross systems can sound in depths up to slightly greater than 150 fathoms. (Hydrographic Manual, Fourth Addition). ✓

For sheet DA-10-5B-82, depths in the junction area ranged from 49 to 67 fathoms. The overlapping BSSS sounding agreed quite well with the HYDROPLOT soundings, with the greatest difference being 2 fathoms. A 1 fathom difference between the 50 fathom curve for the BSSS soundings and the same contour from the HYDROPLOT soundings was noted in the vicinity of 58/05/24.0 N, 134/48/21.0 W. The difference is ✓

probably a result of using predicted tides

H. COMPARISON WITH PRIOR SURVEYS

BSSS soundings on H-10060 in Chatham Strait were compared with soundings from H-2055, 1890, Chatham Strait, 1:80,000 scale. Agreement between soundings was fair. Twenty-nine direct comparisons were made; twenty seven agreed within 10% of the depth. Differences ranged from 1 to 35 fathoms, except for the following two soundings:

<u>Position</u>	<u>H-2055 Depth</u>	<u>H-10060 Depth</u>
58°04'20" N ✓ 134°56'29" W	359 fms ✓	290 fms ✓
58°04'29" N ✓ 134°55'30" W	272 fms ✓	350 fms ✓

The difference in soundings between prior survey H-2055 and survey H-10060 are a result of: 1) The method used to obtain soundings in 1890, 2) inaccuracies in scaling and transferring positions of soundings from a 1:80,000 scale survey to a 1:10,000 scale survey, 3) the datum shift from the 1890 survey datum to the North American 1927 Datum.

L. COMPARISON WITH CHART

BSSS sounding comparisons were made with NOS Chart No. 17300. 1:209,978, 22 No. Edition, dated 26 September 1981. Nine direct comparisons were made; seven agreed within 10% of the depth. Differences ranged from 2 to 36 fathoms, except for the following two soundings:

<u>Position</u>	<u>Chart Depth</u>	<u>H-10060 Depth</u>
58/05/18 ✓ 134/56/28	248 ✓	300 ✓
58/04/12 ✓ 135/02/30	107 ✓	211 ✓

The difference in soundings between Chart No. 17300 and survey H-10060 is a result of: 1) The method used to obtain soundings in 1890, 2) inaccuracies in scaling and transferring positions of soundings from a 1:290,978 scale chart to a 1:10,000 scale survey, 3) the datum shift from the 1890 survey datum to the North American 1927 Datum.

M. ADEQUACY OF SURVEY

BSSS data was processed using beam 0-7. Change No. 2, dated ✓

October 1, 1982, required the data to be processed with beams 0-6. Beam number seven was used to obtain the necessary coverage needed along the proposed cable route.

Even with the additional beam, BSSS line spacing did not provide 100% bottom coverage in all survey areas. Holidays on Sheet DA-10-5A-82 are located in the vicinity of 1) 58/04/40 N, 134/59/25 W, 2) 58/04/40 N, 134/58/45 W, and 3) 58/04/45 N, 134/57/55 W. On sheet DA-10-5A-82, holidays are located at 4) 58/05/10 N, 134/54/40 W, 5) 58/05/40 N, 134/48/50 W, and 6) 58/04/45 N, 134/49/50 W. Holidays 1 through 3, 5 and 6 are a result of the ship not receiving Change No. 2 until after completion of the survey. Sounding line spacing was established using the requirements from Change No. 1, dated September 14, 1982. Complete bottom coverage was to be obtained with sounding swaths of width roughly 2.5 times the water depth. Change No. 2 required sounding swaths spaced at 1.28 times the water depth. Holiday number 4 was a result of poor Mini-Ranger rates at the beginning of the line. Portions of the data was rejected between fix number 39 and 42.

This survey is adequate to meet the needs of the Alaska Power Administration for planning the submarine cable route from Hawk Inlet to Whitestone Harbor.

R. AUTOMATED DATA PROCESSING

<u>Program</u>	<u>BSSS Version (Date)</u>
TABGEN	3.1 (Feb 1980)
TIDGEN	2 (Mar 1982)
SURVEY	7 (Oct 1982)
MTUTIL	2 (Feb 1983)
SMOOTH	1 (Feb 1983)
SMITEN	6 (Feb 1983)
ABSTRT	6 (Feb 1983)
SURF	8 (Feb 1983)
NAVPLT	1 (Feb 1983)
COP, COP7B	7 (Feb 1983)
MTOEOF, MTIEOF	1 (Dec 1983)
POP	4 (Feb 1983)
SPLIT	5 (Feb 1983)

S. REFERRAL TO REPORT

Descriptive Report for OPR-0362-DA-82

Respectfully submitted,

Gerald E. Wheaton

Gerald E. Wheaton
LT, NOAA

Approved and forwarded,

James M. Wintermyre

James M. Wintermyre, CDR, NOAA
Commanding Officer
NOAA Ship DAVIDSON

HYDROGRAPHIC SURVEY STATISTICS

H-10060

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

RECORD DESCRIPTION		AMOUNT	RECORD DESCRIPTION		AMOUNT
SMOOTH SHEET		1	SMOOTH OVERLAYS: POS. ¹ ARC ² EXCESS		3
DESCRIPTIVE REPORT		1	FIELD SHEETS AND OTHER OVERLAYS		3
DESCRIP-TION	DEPTH/POS RECORDS	HORIZ. CONT. RECORDS	SONAR-GRAMS	PRINTOUTS	ABSTRACTS/SOURCE DOCUMENTS
ACCORDIAN FILES	3				
ENVELOPES					
VOLUMES				/ / / / /	
CAHIERS					
BOXES				1	

SHORELINE DATA / / / / /

SHORELINE MAPS (List):

PHOTOBATHYMETRIC MAPS (List):

NOTES TO THE HYDROGRAPHER (List):

SPECIAL REPORTS (List): Horizontal Control, Electronic Control, Echo Sounders, Geo Names

NAUTICAL CHARTS (List):

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	/ / / / /	/ / / / /	1030
POSITIONS REVISED	0	0	0
SOUNDINGS REVISED	43	0	43
CONTROL STATIONS REVISED	0	0	0
/ / / / /	TIME - HOURS		
	VERIFICATION	EVALUATION	TOTALS
PRE-PROCESSING EXAMINATION	2		2
VERIFICATION OF CONTROL	2		2
VERIFICATION OF POSITIONS	17	2	19
VERIFICATION OF SOUNDINGS	86	8	94
VERIFICATION OF JUNCTIONS	1	8	9
APPLICATION OF PHOTOBATHYMETRY	NA	NA	NA
SHORELINE APPLICATION/VERIFICATION	NA	NA	NA
COMPILATION OF SMOOTH SHEET	15	1	16
COMPARISON WITH PRIOR SURVEYS AND CHARTS	NA	4	4
EVALUATION OF SIDESCAN SONAR RECORDS	NA	NA	NA
EVALUATION OF WIRE DRAGS AND SWEEPS	NA	NA	NA
EVALUATION REPORT		32	32
OTHER Familiarization, Digitization	10	6	16
TOTALS	133	61	194

Pre-processing Examination by	Beginning Date	Ending Date
Verification of Field Data by L. T. Deodato	8/20/83	3/1/84
Verification Checks by S. H. Otsubo	Time (Hours) 36	Ending Date 7/16/84
Evaluation and Analysis by B. A. Olmstead	4/25/84	Ending Date 5/29/84
Inspection by	Time (Hours)	Ending Date

PACIFIC MARINE CENTER
EVALUATION REPORT

REGISTRY NO: H-10060

FIELD NO: DA-10-5-82

Alaska, Chatham Strait, Whitestone Harbor to Hawk Inlet

SURVEYED: October 13-18, 1982

SCALE: 1:10,000

PROJECT NO: OPR-0362-DA-82

SOUNDINGS: Ross Fineline 5000
Raytheon PTR-105B
Bosun Sonar
(Fathoms and tenths of fathoms)

CONTROL: Motorola Mini-Ranger III
Range-Range

Chief of Party.....CDR J. M. Wintermyre

Surveyed by.....CDR J. M. Wintermyre
LCDR D. MacFarland
LT D. Dreves
LTJG N. Bogue
ENS J. Duggan
ENS E. Hawk
ENS J. Waddell

Automated Plot by.....PMC Xynetics Plotter

Verified by.....L. T. Deodato

Evaluated by.....B. A. Olmstead

1. INTRODUCTION

H-10060 is a navigable area survey conducted in accordance with the following:

- Project Instructions OPR-0362-DA-82
- Change 1 dated September 14, 1982
- Change 2 dated October 1, 1982
- Change 3 dated October 12, 1982
- Change 4 dated November 10, 1982

H-10060, a 1:10,000 scale survey, encompasses portions of Chatham Strait from Whitestone Harbor to Hawk Inlet. The survey coverage comprises a 2,000 meter corridor centered on a proposed route for laying a submarine power cable.

The Bathymetric Swath Survey System (BS³) and Hydroplot were utilized during survey operations. Several operational deficiencies were noted during the Preprocessing Examination Critique and the following items were recommended for inclusion in the descriptive report and to be drafted on the smooth sheet (see attached letter dated August 8, 1983):

The sounding limits of the Bathymetric Swath Survey System were exceeded in the central portions of Chatham Strait.

Inshore hydrography around Whitestone Harbor (0.4 fathoms to 200 fathoms) was collected using below minimum acceptable signal strengths.

100 percent bottom coverage using beams 0-6 was not obtained throughout the survey area.

A subordinate tide gage at Whitestone Harbor* was installed and operated concurrently with sounding operations. The Whitestone Harbor tide gage was utilized to zone the survey for reduction of sounding data on the smooth sheet. Soundings on the Final Field Sheet were reduced using predicted tides from Juneau, Alaska, with applied time and range ratios. Further information is available in the Field Tide Note.

The Projection Parameters, Signal List and Velocity Tables were amended during office processing. All corrected data is listed in the smooth printouts to accompany the final PMC plot. Numerous abstracts and supplements not relevant to the user of the final processed data were removed from the Descriptive Report and filed with the field records.

*The ship requested an alternate site from N/MOP2 and approval was given.

2. CONTROL AND SHORELINE

All horizontal control stations used for controlling hydrography were established in accordance with Third Order Class I methods or better. The smooth sheet was plotted using published NGS coordinates and Preliminary Adjusted Field Positions.

Hydrographic positioning was conducted using the Motorola Mini-Ranger III system (range-range). Correctors for the survey were derived from the baseline measurements conducted October 11, 1982. Daily systems checks to confirm the baseline values were conducted using the baseline crossing method.

All remaining information affecting the positioning and station control of this survey is listed in paragraphs F and G of the Descriptive Report, the Horizontal Control Report and the Electronic Control Report for OPR-0362-DA-82.

There are no shoreline manuscripts. Charted shoreline was not transferred to the smooth sheet because of scale differences. No verification or investigation of shoreline features was attempted.

3. HYDROGRAPHY

Generally, depths at crossings are in good agreement. However, in depths over 333 fathoms, more significant differences in depths become apparent. (Differences are attributed to BS³ limitations).

The bottom configuration and all standard depth curves are complete and satisfactorily defined, in most cases. However, several inshore areas in/near Whitestone Harbor and Hawk Inlet are not delineated by the 2-fathom, 3-fathom and parts of the 5-fathom depth curves. As such, numerous shoal soundings in these areas were not further investigated. The most significant of these are as follows:

<u>Survey Depth</u>	<u>Latitude</u>	<u>Longitude</u>
1 6.3*	58°05'52"N	134°47'28"W ✓
2 4.3	58°03'33.5"N ✓	135°02'06"W -
3 5.0	58°03'42.5"N ✓	135°03'45"W -
4 5.2	58°03'35"N ✓	135°01'57"W ✓
5 1.3	58°03'39"N ✓	135°03'18"W ✓
6 1.7	58°03'40"N ✓	135°03'33"W ✓

* A 3.1 fathom sounding from junctional survey H-10087 at latitude 58°05'52"N, longitude 134°47'26"W was transferred to the smooth sheet.

In addition, the 20-fathom shoal centered at latitude 58°05'00"N, longitude 134°47'45"W should have been better delineated.

4. CONDITION OF SURVEY

The hydrographic records and reports are adequate and conform to the requirements of the Hydrographic Manual with the following exceptions:

a. A 2-meter/second discrepancy in observations between the Nansen cast and the portable sound velocity system was not resolved by the field. The mean data resulted in a discontinuity in the sound velocity profile and in the corrector profile. This error was corrected during office processing. (Hydrographic Manual, sections 4.9.5.1.2 and 4.9.5.1.3).

b. Positions 4190-4266, day 290-291 (Launch 3132) were gathered using signal strengths below minimum acceptable levels. This data was collected in/around Whitestone Harbor and there is no assurance that the resulting positions meet accuracy standards for 1:10,000 scale surveys. Baseline correctors for this data were selected considering signal strength and exceed 1 mm at survey scale. (Hydrographic Manual, section 4.4.3.3).

c. A total of four bottom samples was taken in the area of Hawk Inlet. As prescribed by sections 1.6.3 and 4.7.1 of the Hydrographic Manual, the hydrographer should have taken bottom samples at 6 cm intervals (to 100 fathoms) throughout the survey area. A greater interval of distance is permitted for sampling in offshore areas in depths greater than 100 fathoms.

d. A number of inshore shoal soundings along with the additional development of the 20-fathom depth curve approximately 1000 meters southwest of Hawk Inlet should have been investigated. The development of all shoals and dangers to navigation within the sounding area of navigable area surveys is a requirement. (Hydrographic Manual, sections 1.4.3 and 4.5.9).

5. JUNCTIONS

H-10060 junctions with the following contemporary survey:

H-10087 (1983) - This survey joins the present survey on the east at the entrance to Hawk Inlet. Standard depth curves are in agreement and have been inked within the common areas. The charted depth curves in other junction areas are consistent with this survey.

6. COMPARISON WITH PRIOR SURVEYS

H-2055 (1890) 1:40,000, 1:80,000
H-2063 (1890) 1:80,000

There were no PSR items within the limits of the present survey.

Generally, the depths since 1890 differ by ± 5 to ± 10 fathoms. The inshore standard depth curves in Hawk Inlet compare well with the prior data. However, the 50-fathom and 100-fathom depth curves in Whitestone Harbor reveal 125-250 meter displacement shoreward since 1890. These differences are attributed to the data collection methods and types of equipment between the prior and present surveys.

The present survey is adequate to supersede the prior surveys within the common area.

7. COMPARISON WITH CHART

17300, 22nd Edition, September 26, 1981
17316 13th Edition, June 10, 1978

a. Hydrography - A chart comparison indicates that most offshore/inshore hydrography originates with the prior surveys. All charted features were satisfactorily disposed of and discussed in the Descriptive Report. Chart 17316, although not mentioned in the Project Instructions, was also compared to the survey since chart 17300 does not completely cover the survey area.

The area covered by H-10060 was examined for unreported dangers to navigation. Three items of immediate charting importance have been submitted (copies attached).

The present survey is adequate to supersede the charted hydrography within the common area.

b. Controlling Depths - There are no controlling depths within the survey limits.

c. Aids to Navigation - There are no aids to navigation within the survey limits. However, two fixed aids, Point Augusta Light, 1979, and Hanus Reef Light, 1979, were used to control hydrography. These structures were compared to the charted positions and adequately serve the purpose intended.

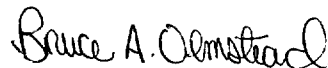
8. COMPLIANCE WITH INSTRUCTIONS

H-10060 adequately complies with the Project Instructions except as noted in section 4, Condition of Survey.

9. ADDITIONAL FIELD WORK

H-10060 is a good navigable area survey. Operational deficiencies previously cited do not seriously compromise its acceptability to supersede prior surveys and charted soundings. No additional field work is required. The least depths noted for further development in Section 3 should be considered for future project planning in Chatham Strait.

Respectfully submitted,



Bruce A. Olmstead
Senior Cartographer
May 29, 1984

This survey has been verified and evaluated. I have examined the survey and it meets Charting and Geodetic Services survey standards and requirements for use in nautical charting except as noted in the Evaluation Report. The survey is recommended for approval.



James S. Green *for*
Supervisory Cartographer



U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
 National Ocean Service
 Pacific Marine Center
 1801 Fairview Avenue East
 Seattle, Washington 98102

March 4, 1983

V.D. JBM
F. GP.

MOP21/NCA

TO: Commanding Officer
 NOAA Ship DAVIDSON

FROM: *Charles K. Townsend*
 N/MOP - Charles K. Townsend

SUBJECT: Hydrographic Survey H-10060, Hawk Inlet/Whitestone Harbor, Alaska

The preprocessing examination of hydrographic survey H-10060, Hawk Inlet/Whitestone Harbor, Alaska, has been deferred until shipboard processing of BS³ data for the survey is completed and submitted to PMC with an amended Descriptive Report. The Descriptive Report shall be amended in a manner which provides a complete discussion of the BS³ and hydroplot work for this survey.

All data and reports for this survey shall be submitted to N/MOP21 for Marine Center processing by April 5, 1983. *Hood Canal is still 1st Priority.*

I guess will do the best we can. However, in talking w/ the Adm. I indicated we may take it north with us. It would be good to get it off before we sail, but I don't want to interfere with sailing preparations.

W
Any questions or problems?

We must not interfere with Hood Canal.
 XO

what does this mean?



DATE: January 6, 1983

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

TIDE NOTE FOR HYDROGRAPHIC SHEET

Processing Division: Pacific Marine Center:

Hourly heights are approved for

Tide Station Used (NOAA Form 77-12): 945-2296 Whitestone Harbor, Alaska

Period: October 15-17, 1982

HYDROGRAPHIC SHEET: H-10060

OPR: 0362

Locality: Hawk Inlet, Alaska

Plane of reference (mean lower low water): -3.60 ft.

Height of Mean High Water above Plane of Reference is 13.9 ft.

REMARKS: Recommended Zoning:

Zone Direct

James R. Hubbard
Chief, Tidal Datums and Information Branch



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
 NATIONAL OCEAN SERVICE
 CHARTING AND GEODETIC SERVICES
 Rockville, Md. 20852

RECEIVED

AUG 11 1983

PACIFIC MARINE CENTER

AUG 8 1983

N/CG241:TWR

MOP 21 action ✓
copy to 2x1
done
8/12/83

TO: N/MOP - Charles K. Townsend *M K*
 FROM: *for* N/CG2 - C. William Hayes *S.R. Peters*
 SUBJECT: Survey H-10060 (1982), Hawk Inlet, Alaska
 REF: N/MOP21:NCA memo, 6/24/83

Because of the special nature of this survey, additional field work on hydrographic survey H-10060 (1982) is not required.

It is recommended that appropriate statements be included in the Evaluation Report and annotations be drafted on the smooth sheet of this survey indicating that depths obtained in excess of 333 fathoms are beyond the design capability of the Bathymetric Swath Survey System (BS³) and their accuracy cannot be certified; that 100-percent bottom coverage with beams 0-6 of the BS³ was not obtained throughout the area surveyed; and that positional accuracy standards for a 1:10,000-scale survey may not have been met in the vicinity of Whitestone Harbor.



RECEIVED

MAY 26 1983

PACIFIC MARINE CENTER



U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SURVEY

NOAA Ship FAIRWEATHER S220
1801 Fairview Avenue East
Seattle, Washington 98102

23 May 1983

Commander
17th Coast Guard District
P.O. Box 3-5000
Juneau, Alaska 99802

Dear Sir:

The NOAA Ship FAIRWEATHER has recently completed hydrographic survey operations of Hawk Inlet on the west side of Admiralty Island. During this project the following hazards to navigation were found on charts 17300 and 17316.

1. A 5.9 fathom shoal at Mean Lower Low Water 0.7 NM 024°T from Hawk Inlet East Shoal Light #2. Shoal extends from 58°06'27"N, 134°45'48"W to 58°06'53"N, 134°45'48"W with the least depth located at 58°06'51"N, 134°45'45"W.

2. A 3.2 fathom shoal at MLLW 0.58 NM 160°T from Hawk Point at 58°05'14"N, 134°46'43"W.

3. A 1.8 fathom shoal at MLLW 0.66 NM 165°T from Hawk Point at 58°05'09"N, 134°46'46"W.

A 0 fathom shoal at MLLW 0.7 NM 174°T from Hawk Point at 58°05'05"N, 134°46'56"W. *Transferred to H-10060 (1982)*

5. A 8.4 fathom shoal at MLLW at 1.1 NM 183°T from Hawk Point at 58°04'42"N, 134°47'12"W.

6. Revised limits of a reef which bears at MLLW 1.1 NM 181°T from Hawk Point. Reef extends north from 58°04'37"N, 134°47'23"W to 58°04'43"N, 134°47'29"W.

7. Rock awash at MLLW 1.1 NM 200°T from Hawk Point at 58°04'39"N, 134°47'49"W.

8. Revised limits of a reef 1.63 NM 201°T from Hawk Point. Reef extends from 58°04'15"N, 134°48'05"W to 58°04'19"N, 134°48'07"W.

9. A 9.8 fathom shoal at MLLW 1.53 NM 205°T from Hawk Point at 58°04'24"N, 134°48'18"W.

10. A ~~5.5 fathom shoal~~ at MLLW ~~1.1 NM~~ 200°T from Hawk Point at 58°04'45"N, 134°47'44"W.

11. A 7.0 fathom shoal at MLLW 0.24 NM 294°T from Hawk Point at 58°05'52"N, 134°47'28"W. *Reference a 3.2 Fathom sounding found during preliminary office review which plots at 58°05'54"N, 134°47'26"W.*

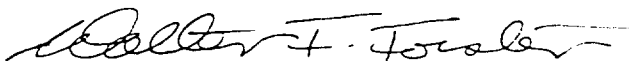
A 6.3 Fm sdg was found by H-10060 (1982)

12. An uncharted rock which is visible at Mean Higher High Water (MHHW), 1.2 NM 317°T from Hawk Point at 58°06'39"N, 134°48'35"W.



- 13. Revised limits of a 4.6 fathom shoal on the south shore of Hawk Point. Shoal now extends from 58°05'35"N, 134°46'36"W 0.28 NM at 270°T to 58°05'35"N, 134°47'07"W, and northward 0.3 NM at 358°T to 58°05'54"N, 134°46'36"W. Least depth of 0.9 fathom is located at 58°05'40"N, 134°46'37"W, which is 0.59 NM at 199°T from Light #2.
- 14. Revised limits of East Shoal adjacent to Light #2. This shoal which bares 0 fathom at MLLW at 315°T extends from 58°05'47"N, 134°45'58"W 0.25 NM to 58°05'58"N, 134°46'17"W and continues 0.25 NM at 003°T to Light #2.
15. Least depth for centerline of the channel leading into Hawk Inlet adjacent to Light #2 was found to be 6.2 fathoms at MLLW at 58°05'59"N, 134°46'23"W.
16. A revised geographic position for East Shoal Light #2 was found to be 58°06'13.075"N, 134°46'15.877"W.
17. Buoy #1 at the entrance to Hawk Inlet was found to be off the Light List position. The revised position is 58°05'32.36"N, 134°46'41.79"W.

Sincerely,



Cdr. Walter F. Forster, NOAA
Commanding Officer
NOAA Ship FAIRWEATHER

Attachments

cc: Director, Pacific Marine Center
Chart Information Section, N/CG222



**U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration**

National Ocean Service
Pacific Marine Center
1801 Fairview Avenue East
Seattle, Washington 98102-3767

AUG 05 1983

Commander (OAN)
Seventeenth Coast Guard District
P.O. Box 3-5000
Juneau, Alaska 99802

Dear Sir:

During preliminary office review of hydrographic survey H-10087, Alaska, Westside of Admiralty Island, Hawk Inlet, the following dangers to navigation were noted. Questions concerning the survey may be directed to Capt. Ned C. Austin, Chief, Nautical Chart Branch, telephone (206) 527-6835.

The following statements are recommended for the Local Notice to Mariners:

1. A 5.1 fathom predicted MLLW shoal exists at latitude 58°06'48"N, longitude 134°45'45"W on Chart 17316; 0.6 nautical miles, 22 degrees true from the charted position of Hawk Inlet E. Shoal Light 2.
2. A rock covered 0.9 fathom predicted MLLW exists at latitude 58°05'13"N, longitude 134°46'42"W on Chart 17316; 1.1 nautical miles, 196 degrees true from the charted position of Hawk Inlet E. Shoal Light 2.
3. A 3.2 fathom predicted MLLW shoal exists at latitude 58°05'54"N, longitude 134°47'26"W on Chart 17316; 0.75 nautical miles, 244 degrees true from the charted position of Hawk Inlet E. Shoal Light 2.
4. A rock uncovering 3 feet predicted MLLW exists at latitude 58°05'37.5"N, longitude 134°47'01.1"W; .75 nautical miles, 216 degrees true from the charted position of Hawk Inlet E. Shoal Light 2.
5. A submerged dolphin covering 0.4 fathom predicted MLLW at latitude 58°05'11"N, longitude 134°46'21"W; 1.1 nautical miles, 185 degrees true from the charted position of Hawk Inlet E. Shoal Light 2.

Transferred
to Junctional
Sheet H-10060
(1982)

Transferred
to Junctional
Sheet H-10060
(1982)

Sincerely,

Charles K. Townsend
Rear Admiral, NOAA
Director, Pacific Marine Center

bc: N/CG222



ATTACHMENT TO DESCRIPTIVE REPORT FOR H-10060


I have reviewed the smooth sheet, accompanying data, and reports of this hydrographic survey. Except as noted in the Evaluation Report, the hydrographic survey meets or exceeds Charting and Geodetic Services (C&GS) standards, complies with instructions, and is accurately and completely represented by the smooth sheet and digital data file for use in nautical charting.

 7/20/84
Chief, Nautical Chart Branch (Date)

CLEARANCE:

N/MOP2:LWMordock

SIGNATURE AND DATE:

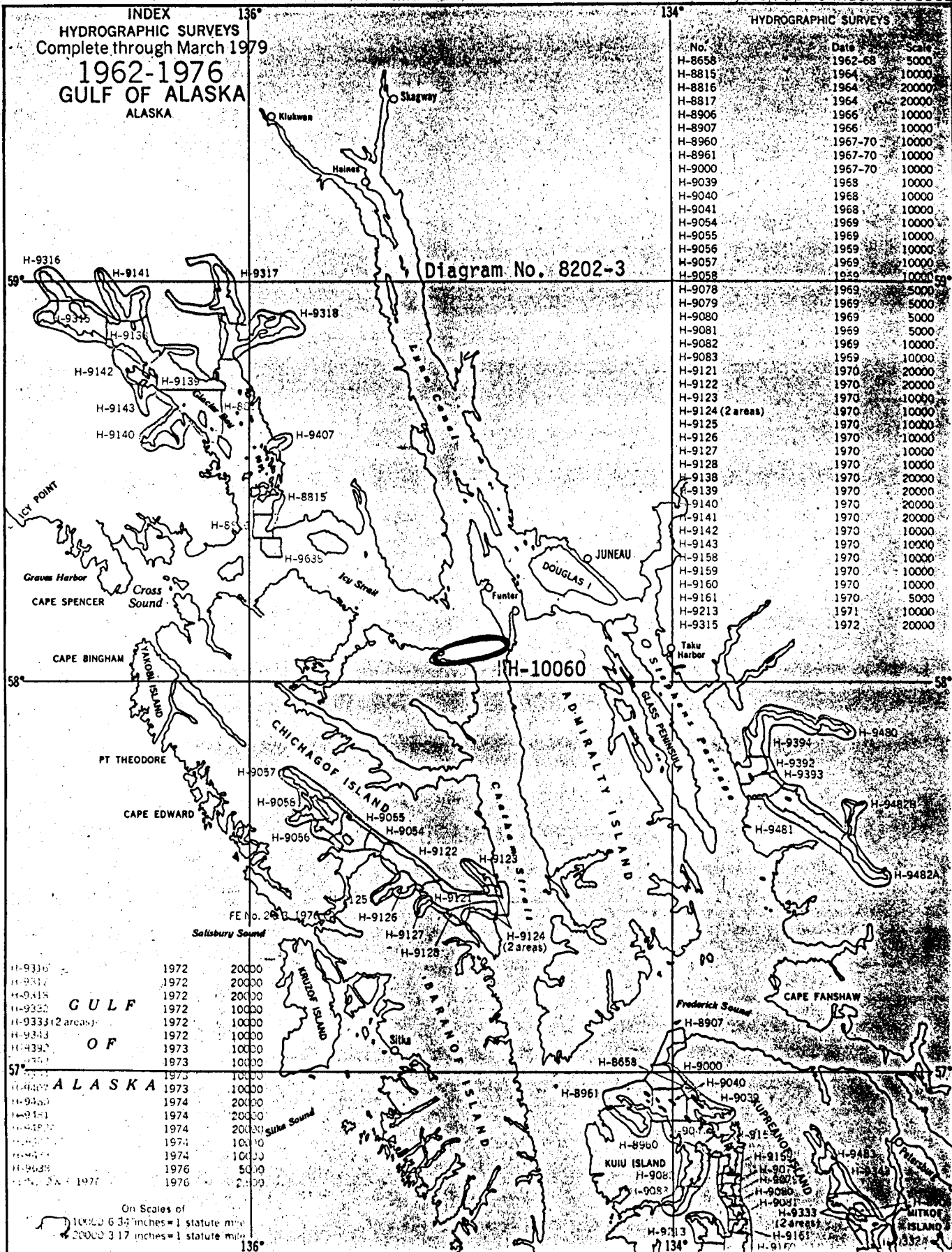
 7/25/84

After review of the smooth sheet and accompanying reports, I hereby certify this survey is accurate, complete, and meets appropriate standards with only the exceptions as noted above. The above recommendations are forwarded with my concurrence.

 7/25/84
Director, Pacific Marine Center (Date)

DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Ocean Survey
Washington, D.C.

Hydrographic Index No. 111E



RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H-10060

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
17300 10060	4/10/85	B. Fernandes	Full Part Before After Verification Review Inspection Signed Via Drawing No. 26. Partially appl. for critical corrections only
17316	4/13/87	R. Bruffield	Full Part Before After Verification Review Inspection Signed Via Drawing No. 13 superseded by part by H-10087
17312	8-6-97	Daniel Rotundo	Full Part Before After Verification Review Inspection Signed Via Drawing No.
			Full Part Before After Verification Review Inspection Signed Via Drawing No.
			Full Part Before After Verification Review Inspection Signed Via Drawing No.
			Full Part Before After Verification Review Inspection Signed Via Drawing No.
			Full Part Before After Verification Review Inspection Signed Via Drawing No.
			Full Part Before After Verification Review Inspection Signed Via Drawing No.
			Full Part Before After Verification Review Inspection Signed Via Drawing No.
			Full Part Before After Verification Review Inspection Signed Via Drawing No.
			Full Part Before After Verification Review Inspection Signed Via Drawing No.
			Full Part Before After Verification Review Inspection Signed Via Drawing No.
			Full Part Before After Verification Review Inspection Signed Via Drawing No.
			Full Part Before After Verification Review Inspection Signed Via Drawing No.
			Full Part Before After Verification Review Inspection Signed Via Drawing No.
			Full Part Before After Verification Review Inspection Signed Via Drawing No.
			Full Part Before After Verification Review Inspection Signed Via Drawing No.
			Full Part Before After Verification Review Inspection Signed Via Drawing No.
			Full Part Before After Verification Review Inspection Signed Via Drawing No.
			Full Part Before After Verification Review Inspection Signed Via Drawing No.
			Full Part Before After Verification Review Inspection Signed Via Drawing No.
			Full Part Before After Verification Review Inspection Signed Via Drawing No.

MARINE CHART BRANCH
RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H-10060

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
17316 <i>69</i>	12/18/90	Stanley C. Suber	Full Part Before After Marine Center Approval Signed Via <i>full application</i> Drawing No. <i>of Sndgs from SS</i>
17380 <i>59</i>	2/23/90	ALMACETY	Full Part Before After Marine Center Approval Signed Via <i>FULL APPLICATION</i> Drawing No. <i>OF SNDGS FROM S.S.</i>
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			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.