H10807

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-10-4-98

Registery No. H-10807

LOCALITY

State Alaska

General Locality Lynn Canal

Sublocality Mud Bay to Katzehin River and Vicinity

1998

CHIEF OF PARTY
CAPT Alan D. Anderson, NOAA

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

NOAA FORM 77-28 (11-72) | U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION | REGISTER NO.

HYDROGRAPHIC TITLE SHEET

H-10807

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

FIELD NO. RA-10-4-98

State: Alaska

General locality: Lynn Canal

Locality: Mud Bay to Katzehin River and Vicinity

Scale: 1:10,000 Date of survey: May 5-27, 1998

Instructions dated: March 5, 1998 * Project No.: OPR-0340-RA

Vessel: RAINIER(2120),RA-2(2122),RA-4(2124),RA-5(2125),RA-6(2126)

Chief of party: CAPT Alan D. Anderson, NOAA

Surveyed by: CAPT A. Anderson, LT R.Fletcher,ST J.Lazar, ST F.Lozier, ST P.McAnally, ST M. Stecher

Soundings taken by echo sounder, ~~hand lead, pole~~ DSF-6000N, Knudsen 320M, IDSSS Multibeam, RESON 8101 Multibeam

Graphic record scaled by: RAINIER Personnel

Graphic record checked by: RAINIER Personnel

Evaluation by: R. Shipley Automated plot by: HP Design Jet 650C

Verification by: M. Bigelow, D. Doles, R. Mayor, R. Shipley

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

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

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

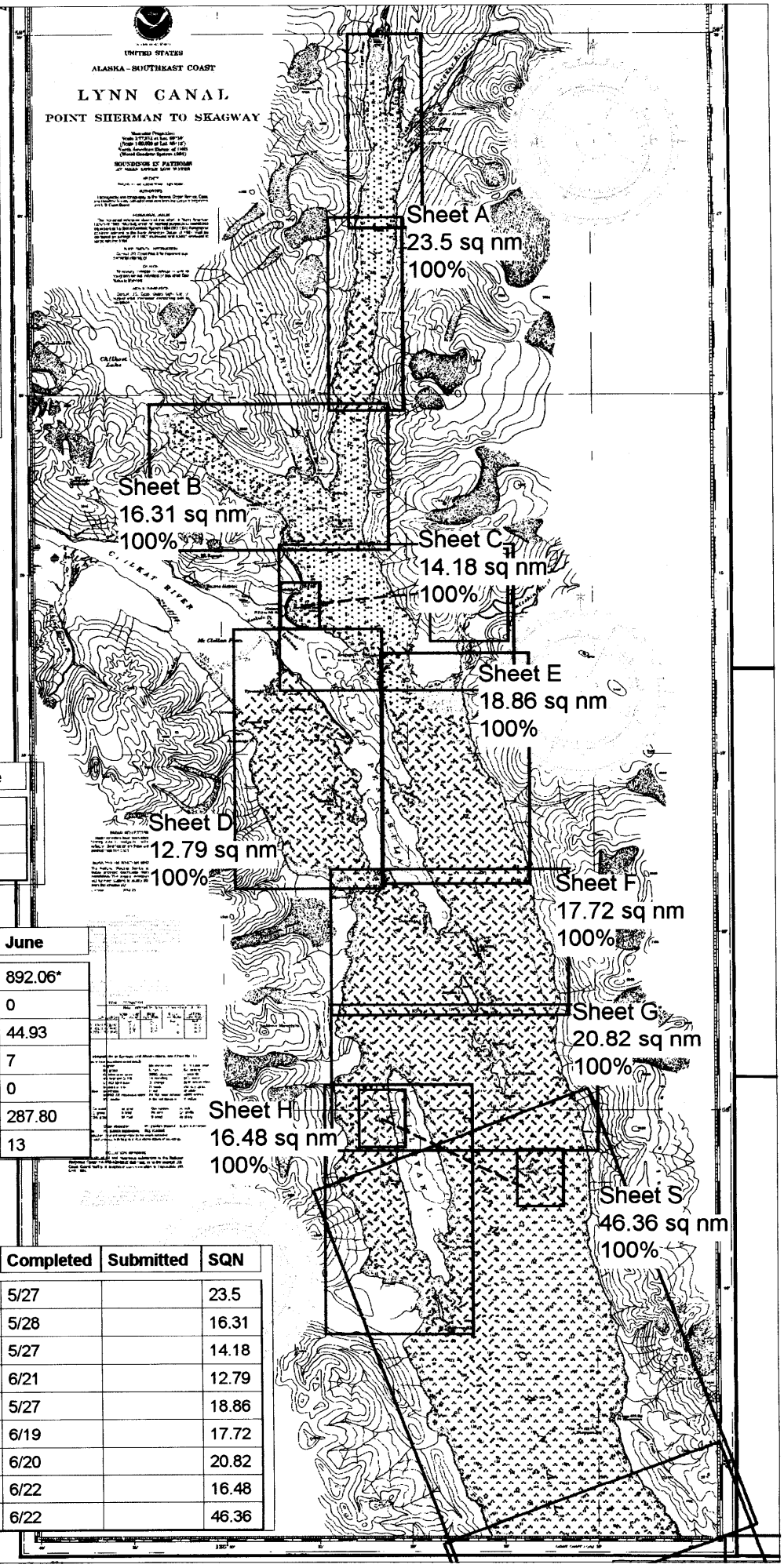
AWOIS & SURF 6/3/99 mcR

* Change No. 1 dated 3/30/98

PROGRESS SKETCH

OPR-O340-RA
Lynn Canal, Alaska
April - June 1998
Capt. A. D. Anderson, NOAA
Commanding

Chart 17317

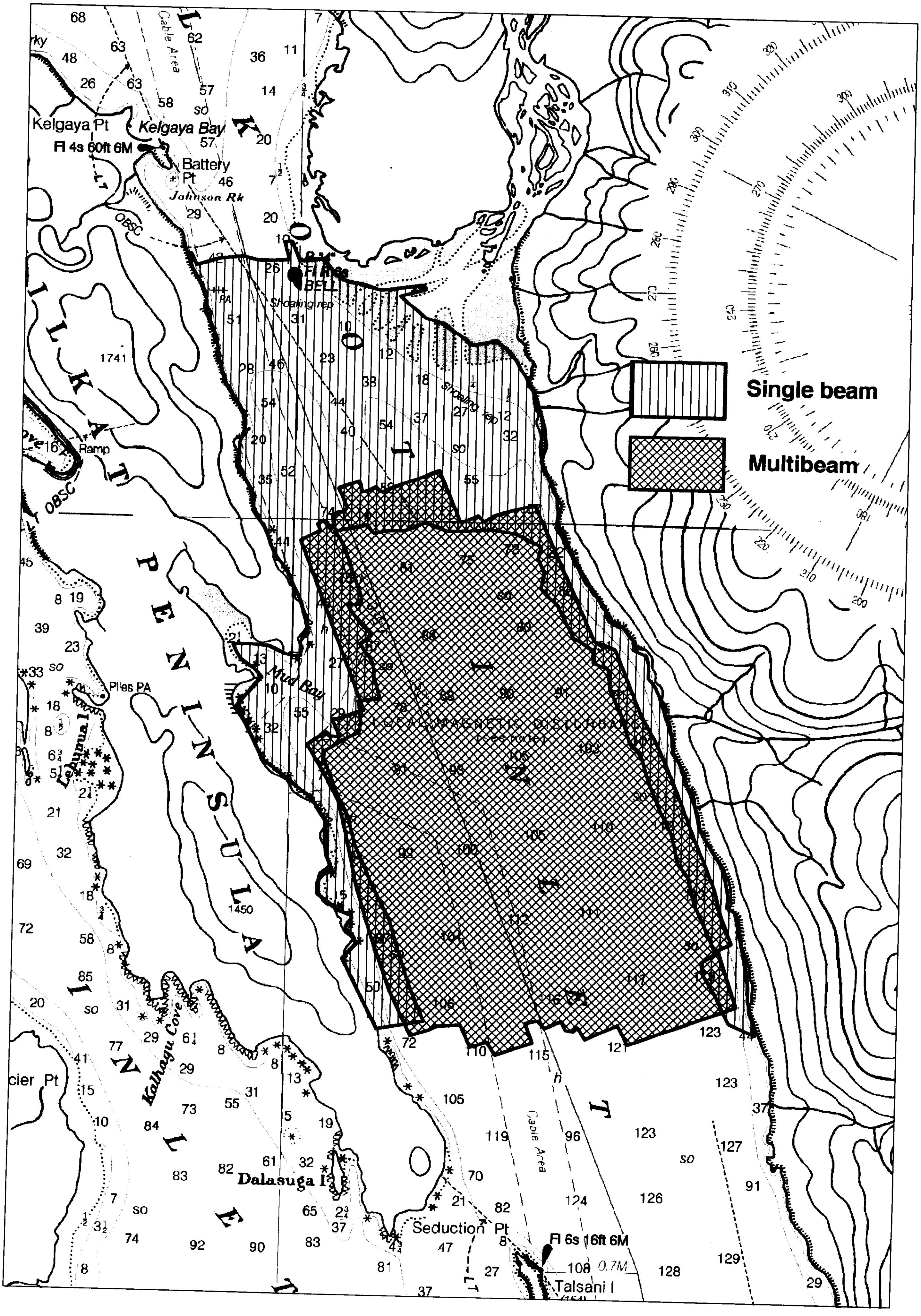


Downtime_Type	April	May	June
Weather - Hr	0	0	0
Mechanical -Hr	0	0	0
Electronic -Hr	1	0	0

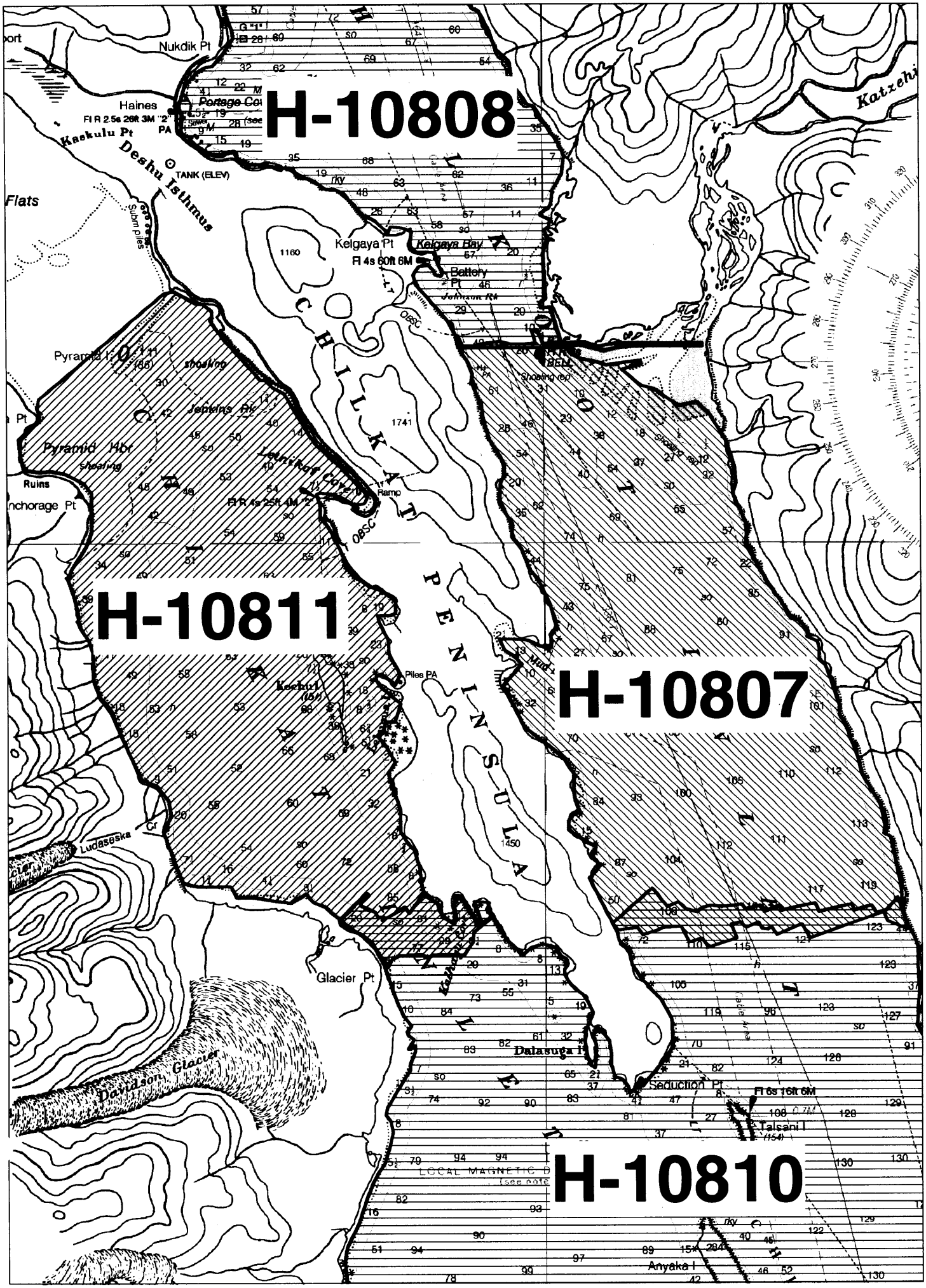
Accomplished	April	May	June
LNM Hydro	745.57*	1787.8*	892.06*
LNM SSS	0	0	0
SQ NM	43.89	98.20	44.93
AWOIS Invest.	0	16	7
Other Invest.	0	2	0
LNM Multibeam	59.7	395.3	287.80
Days at Sea	15	25	13

* Does not include SWMB

Sheet	Reg_No	Started	Percent	Completed	Submitted	SQN
A	H-10806	4/29	100	5/27		23.5
B	H-10736	4/22	100	5/28		16.31
C	H-10808	4/24	100	5/27		14.18
D	H-10811	5/11	100	6/21		12.79
E	H-10807	4/28	100	5/27		18.86
F	H-10810	5/6	100	6/19		17.72
G	H-10812	5/12	100	6/20		20.82
H	H-10815	5/21	100	6/22		16.48
S	H-10816	5/28	100	6/22		46.36



Single beam
Multibeam
Kelgaya Pt
Kelgaya Bay
Fl 4s 60ft 6M
Battery Pt
Johnson Rk
Cable Area
OBSC
Fl R 6s BELL
Shoaling rep
LOCAL MAGNETIC DISTURBANCE (see note)
Ramp
Piles PA
Mud Bay
Lebuana I
Kalhagu Cove
Dalasuga I
Seduction Pt
Fl 6s 16ft 6M
Talsani I
PENINSULA
INLET


H-10808
H-10811
H-10807
H-10810
Nukdik Pt
Haines
Kaskulu Pt
Deshu Isthmus
TANK (ELEV)
Flats
Subm piles
Kelgaya Pt
Kelgaya Bay
Fl 4s 60ft 6M
Battery Pt
Johnson Rk
CHILKAT PENINSULA
Pyramid Hbr
Shoaling
Jenkins Pt
Lighthouse Cove
Ruins
Anchorage Pt
Fl R 4s 25ft 4M
Ramp
OBSC
Kochul
Piles PA
Cr
Ludaseska
Glacier Pt
Davidson Glacier
Seduction Pt
Fl 6s 16ft 6M
Talsani I
Dalasuca I
Anyaka I
LOCAL MAGNETIC D
(see note

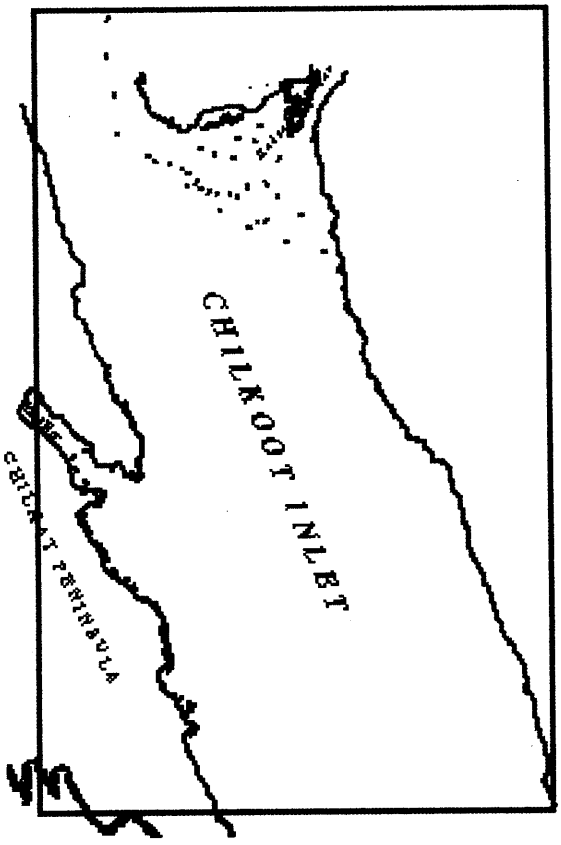
Descriptive Report to Accompany Hydrographic Survey H-10807

Field Number RA-10-04-98
Scale 1:10,000
May 1998
NOAA Ship RAINIER
Chief of Party: Captain Alan D. Anderson, NOAA

A. PROJECT ✓

This basic hydrographic survey was completed in Lynn Canal as specified by Project Instructions OPR-O340-RA dated March 5, 1998 and change #1 dated March 30, 1998. Survey H-10807 corresponds to sheet E as defined in the sheet layout. This survey will provide data to supersede surveys performed in 1905 and 1922. 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 REPORT, SECTION B



The survey area is Chilkoot Inlet from south of Mud Bay to the Katzehin River. The survey's northern limit is latitude 59° ~~12~~ 11' ~~47~~ 54" N. The survey's southern limit is 59° ~~04~~ 06' ~~41~~ 13" N, the western limit is 135° ~~13~~ 21' ~~30~~ 50" W and the eastern limit is 135° 13' 30" W. Data acquisition was conducted from May 5 to May 27, 1998 (DN 125-147).

C. SURVEY VESSELS ✓

Data were acquired by RAINIER and the Rainier survey launches as noted in the Survey Information Summary printout appended to this report. No unusual vessel configurations were used.

D. AUTOMATED DATA ACQUISITION AND PROCESSING ✓

Single beam echosounder data were acquired using Hypack version 8.1 from Coastal Oceanographics and processed using Hydrographic Processing System (HPS). Swath data collected by the RAINIER were acquired and processed using Intermediate Depth Swath Survey System (IDSSS) and Hydrochart II (Seabeam Inc.) programs. Shallow water multibeam echosounder data were acquired using the Reson SeaBat 8101 with ISIS version 3.21 and processed using CARIS software. Raster image and shoreline data in MapInfo facilitated charted and prior survey comparisons. Final Detached Positions and soundings based on predicted tides were saved in MapInfo 4.5 format. A complete listing of software for HYPACK and HPS is included in Appendix VI. *

E. SONAR EQUIPMENT ✓

Concur

Side Scan Sonar was not used on this survey. However, the Triton ISIS digital sonar images acquired during shallow-water multibeam acquisition were used in the investigation of AWOIS item 52396. CONCUR

F. SOUNDING EQUIPMENT ✓

The primary sounding instrument for this survey was a Raytheon Model 6000N Digital Survey Echosounder. Both high (100 kHz) and low (24 kHz) frequency sounding data were recorded during data acquisition. DSF-6000N soundings were acquired in meters using the High + Low, high frequency digitized setting, but in depths over 300 meters, low frequency was scanned in place of the high when the fathometer lost its high frequency trace. The Knudsen 320M is a dual frequency, digital depth sounder using the same transducer frequencies.

The IDSSS data acquisition system (DAS) consists of a Digital Equipment Corporation's (DEC) VAX Station 4000-90 computer system interfaced with a Seabeam Instruments Inc. Hydrochart II sonar system, Datawell heave-roll-pitch sensor (HIPPY), Sperry gyrocompass, a Trimble P-code GPS system, and Ashtech DGPS system. Hydrochart II is a multibeam sonar system that uses two transducer arrays (at 36 kHz) to produce an athwartship swath of bathymetric data approximately 2.5 times the water depth. The DEC VAX Station 4000-90 computer collected input from the Hydrochart II, HIPPY, gyrocompass, and the navigation system. It also provided guidance to the helmsman and plotted a near real time contour map. The DAS consisted of the following equipment:

DAS EQUIPMENT
Hydrochart II Sonar System
DEC Server DSRVW-7C
DEC VAX Station 4000-90 (DAS)
TTi 8212 Tape Drive
Sperry MK 227 Gyrocompass
DATAWELL Hippy
ZETA 24" Plotter
DEC monitor

The ship speed was reduced to provide full ensonification of the sea floor and provide a minimum of 4 pings

* FILED WITH SURVEY RECORDS

per plotable unit area (PUA). A PUA of 50 meters was used during processing of the Hydrochart II data.

The DEC VAX Station 4000-90 computer was used to process the data and create corrected merge files and selected sounding files which were exported and combined with SWMB and single-beam data in HPS and in MapInfo.

Supplemental soundings around AWOIS item 52396 were acquired with the Reson SeaBat 8101 Shallow Water Multibeam (SWMB) system employed on Launch 2123. The Reson SeaBat 8101 ensonifies the seafloor with a 150° swath consisting of 101 individual 1.5° x 1.5° beams. The system was designed to meet International Hydrographic Organization standards to measure the seafloor at a maximum range of 320 meters. Prior to beginning SeaBat data acquisition on this survey, the RA-3 CARIS Vessel Configuration File was updated to define the physical relationship between the various components that comprise the system, including the SeaBat transducer head, POS-MV heave, roll and pitch sensor, and GPS antenna. In addition, this offset file contains heave, roll and pitch biases determined during a "Patch Test" conducted off Port Angeles, WA on March 24, 1998. A copy of the Vessel Configuration File is contained in Separate III. The center of launch 2123's keel was cut and modified to house the transducer. The originally installed DSF-6000N singlebeam transducer remained installed as before. The new configuration is included in Separate III.*

FINAL PLOTTED SOUNDINGS HAVE BEEN SHOWN ON THE SMOOTH SHEET IN FATHOMS.

G. CORRECTIONS TO ECHO SOUNDINGS ✓

Six sound velocity casts were acquired and applied to the sounding data as shown in the appended Survey Information Summary report. The sound velocity casts taken off the Rainier were acquired with SBE SEACAT Profiler (S/N 219), calibrated February, 1998. The single cast taken prior to shallow-water multibeam ensonification was from SBE SEACAT Profiler (S/N 2247). Velocity correctors were computed using the PC programs SEACAT and VELOCITY, version 3.3 (1997), in accordance with Field Procedures Manual (FPM) section 2.4.3. Printouts of the sound velocity profile, data, and correctors used in field processing are included in the "Separates to be Included with Survey Data, IV. Sounding Equipment Calibrations and Corrections". The following casts supplied the correctors for this survey.

Cast Number	Cast Name	HPS Table	Applied to Days
1	SV125171	11	125-127
2	SV128190	12	128-131
3	SV132163	13	132-138
4	SV139170	5	139-143
5	SV144164	14	144-147
6	98147182.R3Q	N/A	147 MB **

✓

Casts plot outside the survey limits

** Shallow water multibeam cast taken in area of AWOIS investigation (Item 52396)

RAINIER'S static transducer depth was determined during dry-dock in April 1998 using the form in Field Procedures Manual (FPM) Fig. 2.2.

Offsets for GPS antennas, static draft, and settlement and squat correctors were tabulated in the HPS Offset Tables. Printouts of these tables are included with project data for OPR-O340-RA-98. Static draft and transducer offsets for launches 2122, 2123, 2124, 2125 and 2126 were measured on March 26, 1998. Offset table #7 was used for the RAINIER

* FILED WITH SURVEY RECORDS

Settlement and squat values for launch 2122 were last measured on June 11, 1998** at Shakan Strait, AK.
Settlement and squat values for launch 2123 were last measured on March 24, 1998 at Port Angeles, WA.
Settlement and squat values for launch 2124 were last measured on June 11, 1998** at Shakan Strait, AK.
Settlement and squat values for launch 2125 were last measured on June 21, 1998** at Chilkat Inlet, AK.
Settlement and squat values for launch 2126 were last measured on June 10, 1998** at Shakan Strait, AK.
Settlement and squat values for the RANIER were last measured on September 21, 1997 at Kings Bay, AK.
** Applied to Final data.

The Coastal and Estuarine Oceanography Branch (N/OES334) through N/CS31 provided predicted tides for the project on diskette for the Juneau, Alaska reference station (945-2210). HPS listings of the data used in generating tidal correctors are included in Appendix V* of this report. Tidal correctors as provided in the project instructions for H-10807 are shown on the appended Survey Information Summary report.

Skagway, Alaska (945-2400) and Juneau, Alaska (945-2210) are the primary control stations for datum determination at all subordinate stations. RAINIER personnel installed Sutron 8200 tide gages at Tayasanka Harbor (945-2434), Letnikof Point (945-2421), and Berners Bay (945-2346).

Refer to the Field Tide Notes and supporting data in Appendix V* for individual gauge 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 FEB. 16, 1999 IS ATTACHED

H. CONTROL STATIONS ✓

The horizontal datum for this project is NAD 83. Station TAIYA was used to verify and establish local geodetic control for this survey. See the OPR-O340-RA-98 Horizontal Control Report for more information.

THE CONTROL STATIONS USED FOR THIS SURVEY ARE LISTED IN THIS REPORT.

I. HYDROGRAPHIC POSITION CONTROL ✓ SEE EVAL. REPORT, SECTION I.

All soundings were positioned using differential GPS. A VHF differential reference station at station TAIYA was used as primary hydrographic control. The USCG beacon located at Point Gustavus, AK was also used when the VHF reference station was unavailable.

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 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. Periodic comparisons and occasional performance checks were logged with the SHIPDIM system. Some outliers were noted, but none indicated systematic or continuous errors in the beacons. The SHIPDIM OUTLIER.SUM results are included in the project data for OPR-O340-RA-98.

J. SHORELINE ✓ See Eval Rpt., Section J.

TP-01524

LAT. 59/10/00 N

The shoreline manuscript from Coastal Mapping survey CM-8903 was unavailable above ~~59.0000N.~~ TP-01524 was digitized at the Pacific Hydrographic Branch and used as the shoreline source for the southwest portion of the survey. Due to the poor raster quality and digitization of CRS00198, the remaining shoreline was verified by shoreline digitized off BSB raster chart 17317 by RAINIER personnel.

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-

*FILED WITH SURVEY RECORDS

10 meters of depth at Mean Lower Low Water. Features shown on the SHORELINE NOTES layer in the MapInfo workspace inshore of the NALL are the hydrographer's representation of the shoreline while slowly transitting along the shore, and are intended to aid chart compilation. Shoreline verification data was analyzed during office processing and shown on the smooth sheet as warranted.
Charted shoreline features that were not found on the manuscript were verified by field positions when offshore of the NALL. Discrepancies between charted and field shoreline should thus be resolved in favor of the manuscript shoreline and field work as shown on the final field Detached Position and Bottom Sample plot. Concur

K. CROSSLINES ✓

Crosslines agreed within 1 meter with mainscheme hydrography, except in areas of steep bathymetry. There were a total of 13.79 nautical miles of crosslines, comprising 13.5% of mainscheme hydrography.

L. JUNCTIONS ✓ SEE EVAL. REPORT, SECTION L.

This survey junctions with the following 1998 surveys: H-10808, 1:10,000 on the north and H-10810, 1:10,000 on the south. Soundings on these 1998 surveys were found to be in good agreement, with the exception on the southeast corner. A 14 meter discrepancy exists with H-10810 due to the steep bathymetry in this area of the survey. Final comparisons will be made at the Pacific Hydrographic Branch (PHB) after reduction to final vertical datum. The IDSSS hydrochart soundings junctioned with the single beam soundings smoothly.

M. COMPARISON WITH PRIOR SURVEYS ✓ SEE EVAL. REPORT, SECTION M.

Wire drag H-4226WD, 1922 covers the entire survey area of sheet E. Prior survey H-2057, 1:10,000, 1890-1905 also encompasses this survey. The prior soundings agreed well with the present survey, except where shoal depths were found during this survey with denser sounding coverage. One shoal prior depth of 28 fathoms at 59° 11' 06" N, 135° 20' 43"W was not located. Standard 100 meter line spacing with 50 meter splits was run in the area providing a much greater sounding density than the prior. No indication of the shoal sounding or any feature to develop was seen. Concur The prior lead line sounding is in a fairly steep and deep area and is sufficiently disproved. Concur Soundings acquired along the Katzehin River delta are notably shoaler than the prior. Concur The deposition of sediment over the past ninety years accounts for the shoal depths. Concur Small discrepancies in the southeast corner of this survey have been noted. Steep bathymetry likely accounts for these discrepancies. Concur With the exception of the shoal depths from a denser sounding interval, the prior survey is in good agreement with the findings of this survey. Final comparisons will be done at PHB after reduction to final sounding datum using tidal information collected concurrently with this survey.

N. ITEM INVESTIGATIONS ✓ SEE EVAL. REPORT, SECTION N.

This survey contained four item investigations from the AWOIS list. Each item is discussed in detail in the ~~Appendix to the DR~~ descriptive report as follows:

AWOIS number	Description
52396 ✓	Position approximate wreck
52397 ✓	Shoal obstruction
52398 ✓	Shoal obstruction
52402 ✓	Aquaculture obstruction

REFER TO ATTACHED item INVESTIGATIONS

AWOIS No. 52396 ✓

Item Description: Unknown wreck (PA)

Source: LNM33/93 (8/17/93)

AWOIS Position: 59°11'36.00"N, 135°21'06.00"W

Required Investigation: Full, Echosounder, ~~Side Scan Sonar~~ Triton Elics ISIS Sonar Images, 300 m radius

Charts Affected: 17317

Investigation

Date (s)/DN (s): May 27, 1998 / DN 147

Position Number: N/A

Positioned Determined by: DGPS

Investigation Summary: Investigated using multibeam echosoundings and imagery extending beyond the required 300m radius. No wreck was located. The depth of water in the area of investigation suggests that no hazard is present. shallow water

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Charting Recommendation

Hydrographer recommends updating the chart with the removal of the position approximate wreck at lat 59°11'36.00"N long 135°21'06.00"W. CONCUR

****

COMPILATION NOTES

Remove wreck PA from chart 17317

AWOIS No. 52397 and 52398 ✓

Item Description: Reported shoaling, obstruction

Source: CL1338/63 and CL1825/76

AWOIS Position: 59°11'30.00"N, 135°20'00.00"W and 59°10'48.00"N, 135°17'30.00"W

Required Investigation: Full, Echosounder

Charts Affected: 17317

Investigation

Date (s)/DN (s): May 5, 1998 to May 27, 1998; DN 125- DN 147

Position Number: N/A

Positioned Determined by: DGPS

Investigation Summary: Investigated using single beam echosounding at 25m spacing along the extent of the shoal axis. The extent of the sediment deposition was determined extensively enough to update the chart.

Charting Recommendation

Hydrographer recommends updating the chart with the current soundings and deleting "shoaling reported" at lat 59°11'30.00"N long 135°20'00.00"W and lat 59°10'48.00"N long 135°17'30.00"W. Concur

****

COMPILATION NOTES

Remove shoaling reported noted and chart area based on the present survey.

AWOIS No. 52402 ✓

Item Description: Obstruction, fish pens

Source: CL1205/96

AWOIS Position: 59°09'00.00"N, 135°20'30.00"W

Required Investigation: Full, Echosounder, Visual Search, Personal Communication

Charts Affected: None

Investigation

Date (s)/DN (s): May 21, 1998 / DN 141

Position Number: N/A

Positioned Determined by: DGPS

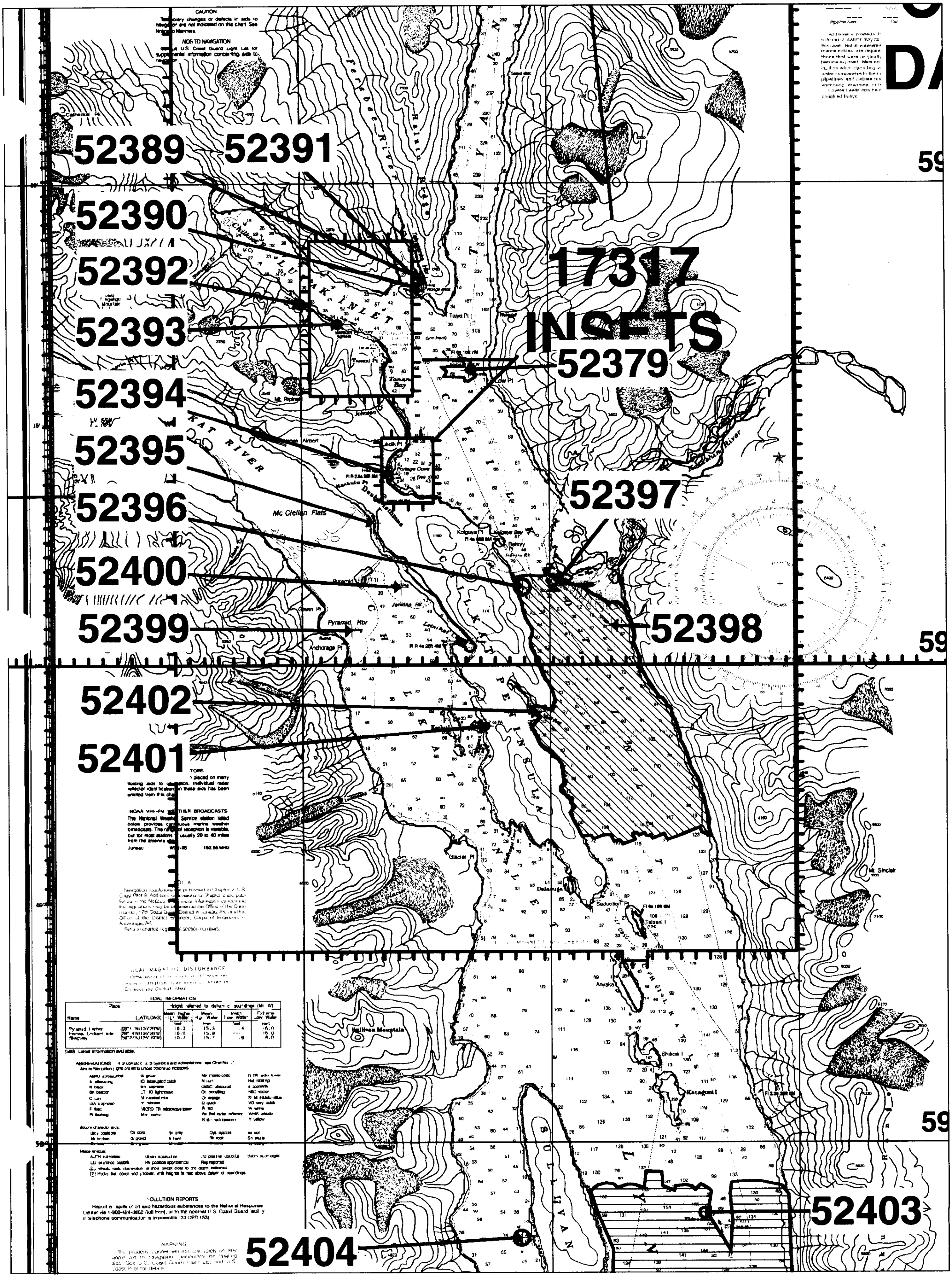
Investigation Summary: Investigated initially with 5m line spacing and visual search at negative tide. Verbal communication with Mr. John Brainard confirmed that no obstruction is present. Mr. Brainard stated that the mussel farm was terminated in 1996 and that everything was removed. The communication took place on May 21, 1998 with the hydrographer. Mr. Brainard can be contacted for further questioning at 907. 766.2505.

Charting Recommendation

N/A DO NOT CHART

****

COMPILATION NOTES


17317
INSETS
52389
52391
52390
52392
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52394
52395
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52400
52399
52379
52397
52398
52402
52401
52403
52404
CAUTION
AIDS TO NAVIGATION
Mc Clellan Flats
Pyramid Hbr
Anchorage Pt
Portage Cove
Tsaya Pt
Low Pt
Kalgaya Pt
Seduction Pt
Talsani I
Anyaka
Katagunl I
Mt. Sinclair
Sullivan Mountain
POLLUTION REPORTS
WARNING
NOAA VHF-FM WEATHER BROADCASTS
Juneau
162.55 MHz
TIDAL INFORMATION

O. COMPARISON WITH THE CHART ✓ SEE EVAL. REPORT, SECTION O.

Chart 17317, 1:77,812 , 18th edition, 6/14/97 is the largest scale charts covering the survey area. As with the comparison to the prior, this survey found shoaler depths along the Katzehin River delta. The charted 28 fathom sounding carried over from the prior also differed with the findings of this survey. The southeast corner of this survey showed minor discrepancies in the area of steep bathymetry. With these exceptions, the chart is in good agreement with this survey's findings. Non-sounding features are discussed in Section J. Final sounding comparisons will be made at PHB after reduction to final vertical datum.

CONCUR

CONCUR

Dangers to Navigation ✓

None.

P. ADEQUACY OF SURVEY ✓ SEE EVAL. REPORT, SECTION P.

Survey H-10807 is complete and adequate to supersede prior soundings and features in their common areas.

Q. AIDS TO NAVIGATION ✓ SEE EVAL REPORT, SECTION Q.

One navigational aid exists within the survey limits marking the Katzehin River delta shoal. This aid is currently charted as a floating aid with a bell. The aid is characterized in Volume VI of the Light List for the Pacific Coast and Pacific Islands as item #23900. It has a flashing red light every six seconds (FL R 6s) on a tripod piling with a red triangle marked with the number "4". It stands 28 feet tall and has a range of four miles. Position of the aid was verified with two detached positions recorded on two different days.

R. STATISTICS ✓

Refer to the Survey Information Summary attached to this report.

S. MISCELLANEOUS ✓

Bottom samples were collected and sent to the Smithsonian in accordance with Project Instructions. The samples collected were in good agreement with the chart except for two; Charted "hard" at lat 59-10-01.0 long 135-19-03.0 and lat 59-07-52.0 long 135-19-06.5, green mud was collected at both sights during this survey. No unusual tidal currents were observed during this survey. However, charted magnetic variations of up to 20 degrees were confirmed. A copy of LOG SHEET M, BOTTOM SEDIMENT DATA (NOAA FORM 75-44), filed with SURVEY RECORDS. Supersede prior "hard" bottom characteristics with present survey information.

T. RECOMMENDATIONS ✓

CRS scanned images were of a very poor quality. In the future if digital shoreline cannot be provided then CONCUR the field unit would rather digitize their own from the chart. The Hydrographer believes adequate dual beam and multibeam ensonification has been completed to warrant removing the wire drag tint from the chart.

U. REFERRAL TO REPORTS ✓

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

Title	Date Sent	Office
OPR-O340-RA Horizontal Control Report	June, 1998	N/CS34
OPR-O340-RA 1998 Coast Pilot Report	June, 1998	N/CS26
Project related data for OPR-O340-RA	Incremental	N/CS34

Respectfully Submitted,

Jay Lazar
Senior Survey Technician, NOAA

Approved and Forwarded,

Alan D. Anderson
Captain, NOAA
Commanding Officer

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

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE: February 16, 1999

HYDROGRAPHIC BRANCH: Pacific

HYDROGRAPHIC PROJECT: OPR-O340-RA
HYDROGRAPHIC SHEET: H-10807

LOCALITY: Mud Bay to Katzehin River, Alaska
TIME PERIOD: April 28 - May 28, 1998

TIDE STATION USED: 945-2400 Skagway, AK
Lat. 59° 27.0'N Lon. 135° 19.5'W
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 4.799 meters

REMARKS: RECOMMENDED ZONING
Use zone(s) identified as: SEA1, SEA1L.

Refer to attachments for zoning information.

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

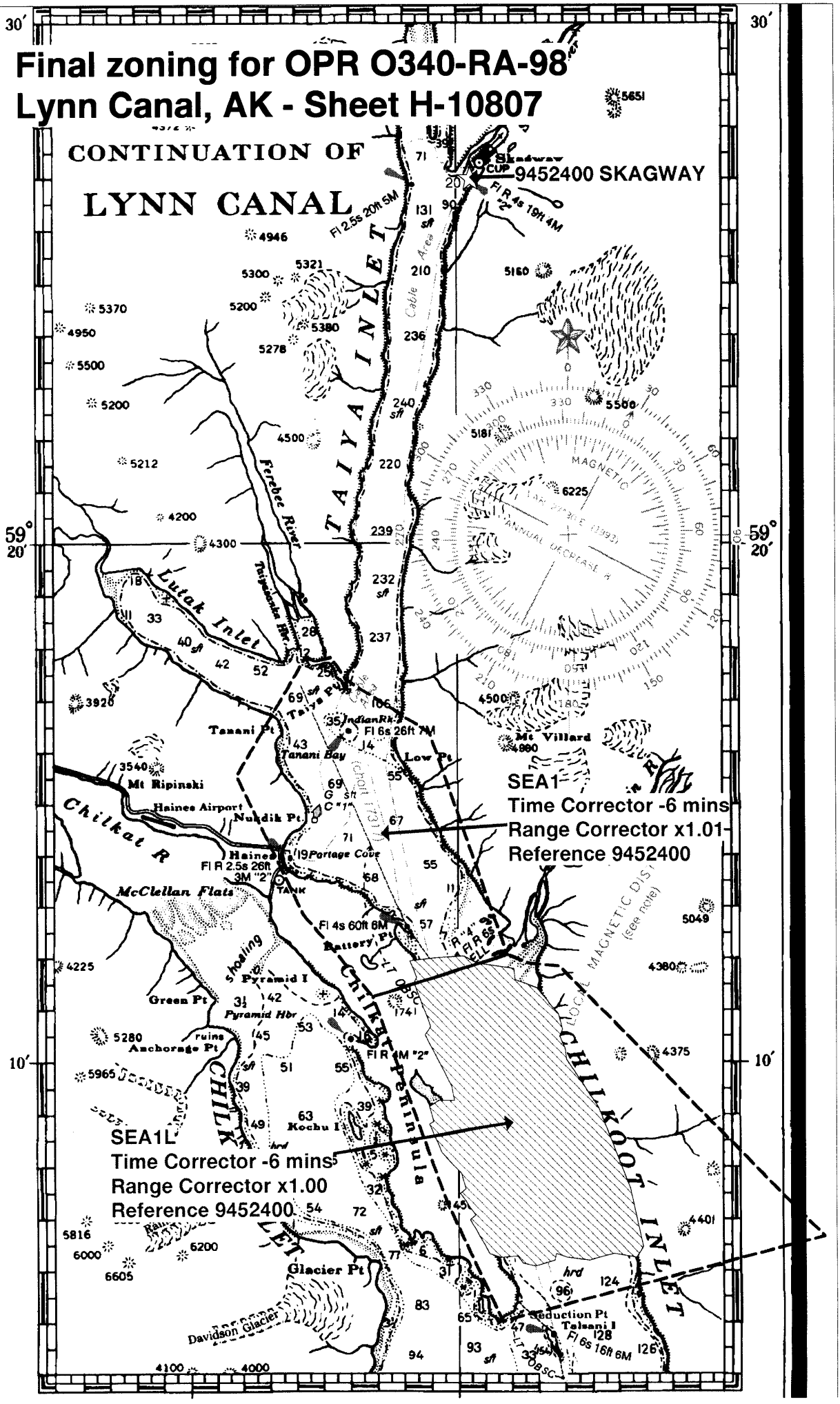
Thomas N. Neu 2/17/99
CHIEF, REQUIREMENTS AND ENGINEERING BRANCH

Final tide zone node point locations for OPR O340-RA-98, Sheet H-10807.

Format: Longitude in decimal degrees (negative value denotes Longitude West),
Latitude in decimal degrees
Tide Station (in recommended order of use)
Average Time Correction (in minutes)
Range Correction

	Tide Station Order	AVG Time Correction	Range Correction
Zone SEA1			
-135.430336 59.213684	945-2400	-6	1.01
-135.387161 59.18722			
-135.303335 59.200565			
-135.351351 59.272134			
-135.403119 59.288988			
-135.412317 59.296248			
-135.421584 59.295129			
-135.428148 59.296314			
-135.471448 59.258189			
-135.430336 59.213684			
Zone SEA1L			
-135.303335 59.200565	945-2400	-6	1.00
-135.387161 59.18722			
-135.341223 59.121611			
-135.306731 59.082928			
-135.105993 59.11054			
-135.270989 59.19686			
-135.289805 59.19791			
-135.303335 59.200565			

Final zoning for OPR O340-RA-98
Lynn Canal, AK - Sheet H-10807



List of Horizontal Control Stations

NAME	STATE	TYPE	LATITUDE	LONGITUDE	SITEID	DEC_LAT	DEC_LON
ACE	AK	DGPS Flyaway	58 58.2659N	135 13.2729W	n/a	58.97109833	135.22121500
ANNETTE ISLAND	AK	USCG Beacon	55 04.1000N	131 36.0000W	889	55.06833333	131.60000000
GUSTAVUS	AK	USCG Beacon	58 25.1000N	135 41.8000W	892	58.41833333	135.69666667
LETNIKOF	AK	DGPS Flyaway	59 10.4206N	135 24.0383W	n/a	59.17367667	135.40063833
TAI	AK	DGPS Flyaway	59 17.2739N	135 24.1058W	n/a	59.28789833	135.40176333

Survey Information Summary

Project: OPR-O340-98 **Project Name:** LYNN CANAL

Instructions Dated: 3/5/98 **Project Change Info:**

Change #	Dated
1	3/30/98

Sheet Letter: E **Registry Number:** H-10807

Sheet Number: RA-10-04-98

Survey Title: Mud Bay to Katzehin River

Data Acquisition Dates: **From:** 28-Apr-98 118 **To:** 27-May-98 147

Vessel Usage Summary

VESNO	MS	SPLITS	DEV	XL	S/L	DP	BS	DIVE
2120	3			1				
2122	1	2	1	1				
2124	3	2	2	4	1			
2125		3	1			1	1	
2126	2	2			3	2		

Sound Velocity Cast Information

Launch Table #	Ship Table #	Cast DN	Max Depth	Position	Applicable DN
	20	125	287.8	59/06/42	
				135/16/19	
10	20	118	250.5	59/05/59	
				135/16/28	
11	20	125	287.8	59/06/42	
				135/16/19	
12	20	128	281.3	59/02/42	
				135/18/12	
13	20	132	277.5	59/02/30	
				135/17/48	
5	20	139	311.3	59/00/15	
				135/16/43	
14	20	144	286.3	59/00/17	
				135/16/46	
6	20	148	363.7	58/56/24	
				135/14/39	
8	20	166	374.1	58/48/24	
				135/09/36	
15	20	170	330.4	58/52/55	
				135/12/12	

These casts plot outside the survey limits.

Tide Zone Information **Tide Gage Information**

Statistics Summary

Type	Total:
BS	18
DEV	21.69
DP	2
MBMS	74.3
MBXL	8.1
MS	102.35
S/L	12.85

Percent XL:	13.5%
SQNM:	18.86

APPROVAL SHEET

for

H-10807

RA-10-4-98

Standard field surveying and processing procedures were followed in producing this survey in accordance with the Hydrographic Manual, ~~Fifth~~ Fourth Edition; the Hydrographic Survey Guidelines; and the Field Procedures Manual, as updated for 1998.

The field sheet and accompanying records have been examined by me, are considered complete and adequate for charting purposes, and are approved. All records are forwarded for final review and processing to N/CS34, Pacific Hydrographic Branch.

Approved and Forwarded,

Alan D Anderson

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

NOAA FORM 76-155
(11-72)

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

SURVEY NUMBER

H-10807

GEOGRAPHIC NAMES

Name on Survey	A ON CHART NO. 1737	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
CHILKAT PENINSULA	X		X							2
CHILKOOT INLET	X		X							3
KATZEHIN RIVER	X		X							4
LYNN CANAL (title)	X		X							5
MUD BAY	X		X							6
										7
										8
										9
										10
										11
										12
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										23
										24
										25

Approved

Thomas J. Pomeroy

SEP 17 1999

NOAA FORM 76-155 SUPERSEDES C&GS 197

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

U.S. DEPARTMENT OF COMMERCE

HYDROGRAPHIC SURVEY STATISTICS

REGISTRY NUMBER
H-10807

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

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

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

SHORELINE DATA

SHORELINE MAPS (List):	TP-10 /CRS-00198
PHOTOBATHYMETRIC MAPS (List):	NA
NOTES TO THE HYDROGRAPHER (List):	NA
SPECIAL REPORTS (List):	NA
NAUTICAL CHARTS (List):	17317, 18th Ed., June 14, 1997

OFFICE PROCESSING ACTIVITIES

The following statistics will be submitted with the cartographer's report on the survey

PROCESSING ACTIVITY	AMOUNTS VERIFICATION	AMOUNTS EVALUATION	AMOUNTS TOTALS
POSITIONS ON SHEET			
SITIONS REVISED			
SOUNDINGS REVISED			
CONTROL STATIONS REVISED			
	TIME-HOURS VERIFICATION	TIME-HOURS EVALUATION	TIME-HOURS TOTALS
PRE-PROCESSING EXAMINATION			
VERIFICATION OF CONTROL			
VERIFICATION OF POSITIONS (Multi-beam)	37.0		37.0
VERIFICATION OF SOUNDINGS			
VERIFICATION OF JUNCTIONS			
APPLICATION OF PHOTOBATHYMETRY			
SHORELINE APPLICATION/VERIFICATION			
COMPILATION OF SMOOTH SHEET	196.0		196.0
COMPARISON WITH PRIOR SURVEYS AND CHARTS		10.0	10.0
EVALUATION OF SIDE SCAN SONAR RECORDS			
EVALUATION OF WIRE DRAGS AND SWEEPS			
EVALUATION REPORT		30.0	30.0
GEOGRAPHIC NAMES			
OTHER (Chart Compilation)		35.0	35.0
USE OTHER SIDE OF FORM FOR REMARKS — TOTALS	233.0	75.0	308.0

Pre-processing Examination by M. Bigelow	*Beginning Date* 8/5/98	*Ending Date* 2/22/99
Verification of Field Data by D.Doles,M.Bigelow,B.Mihailov.G.Nelson,R.Shipley	*Time (Hours)* 233.0	*Ending Date* 4/30/99
Verification Check by B. Olmstead	*Time (Hours)* 12.0	*Ending Date* 5/12/99
Evaluation and Analysis by R. Shipley	*Time (Hours)* 30.0	*Ending Date* 5/12/99
Inspection by B. Olmstead	*Time (Hours)* 12.0	*Ending Date* 5/17/99

U.S. GOVT. PRINTING OFFICE 1983: 764-006/6061

EVALUATION REPORT

H-10807

A. PROJECT

The hydrographer's report contains a complete discussion of the project information.

B. AREA SURVEYED

The survey area is adequately described in the hydrographer's report.

The hydrographer has determined the inshore limits of safe navigation by defining a Navigable Area Limit Line (NALL) 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. A page-size plot of the charted area depicting the specific limits of supersession accompanies this report as an Attachment 1.

The bottom consists mainly of green mud. Depths range from the Mean Lower Low Water (MLLW) line to 131 fathoms.

C. SURVEY VESSELS

The hydrographer's report contains adequate information relating to survey vessels.

D. AUTOMATED DATA ACQUISITION AND PROCESSING

Field acquisition and processing of survey data has been adequately discussed in the hydrographer's report, section D. Office processing was accomplished using the Hydrographic Processing System (HPS), CARIS/HIPS, the Multibeam Support Vax System, and Microstation 95.

Processed digital data for this survey exists in the standard HPS format, a database format using the .dbf extension. In addition, the smooth sheet drawing is filed in the MicroStation format, i.e., dgn extension. Copies of these files have been forwarded to the Hydrographic Surveys Division and a backup copy retained at PHB. Database records forwarded are in the Internal Data Format (IDF) and are in compliance with specifications in existence at the time of survey processing.

The drawing files necessarily contain information that is not part of the HPS data set such as geographic names text, line-type data, and minor symbolization. In addition, those soundings deleted from the drawing for clarity purposes remain unrevised in the HPS digital files to preserve the integrity of the original hydrographic data set. Cartographic codes used to describe the digital data are those authorized by Hydrographic Survey Guideline No. 35 and No. 75.

The data is plotted using a Modified Transverse Mercator projection and are depicted on a single sheet.

E. SONAR EQUIPMENT

No Side Scan Sonar equipment was used on this survey.

F. SOUNDING EQUIPMENT

Sounding equipment has been adequately addressed in the hydrographer's report.

G. CORRECTIONS TO SOUNDINGS

Soundings and elevations below Mean High Water (MHW) 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 the following tide gage; Skagway, AK, 945-2400.

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:	-1.178 seconds	(-36.445 meters)
Longitude:	6.579 seconds	(104.560 meters)

I. HYDROGRAPHIC POSITION CONTROL

Differential GPS (DGPS) was used to control this survey. A horizontal dilution of precision (HDOP) not to exceed 3.75 was computed for survey operations.

The quality of several positions exceeded limits in terms of HDOP during single beam data collection. 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.

During multibeam data gathering, satellite configuration as indicated by HDOP and the number of satellites, is monitored visually on the IDSSS and Trimble displays, and data are not collected when HDOP exceeds 3.75. In the event that the differential GPS corrector signal is lost, a switch to P-Code is made automatically by the receiver. Although P-Code accuracy is less accurate than DGPS (a maximum of 15 meters), it is an acceptable limit of accuracy for a survey of 1:10,000 scale. This data was analyzed during office processing and found to contain no significant errors.

During Shallow Water MultiBeam (SWMB) data gathering, satellite configuration as indicated by HDOP and the number of satellites, is monitored visually on HYPACK. The final positions are provided by the POS-MV which combines the DGPS position with inertial navigation information. In the event that the differential GPS corrector signal is lost, the POS-MV will continue to provide positions based on inertial navigation. Data was analyzed during processing to ensure it contains no significant errors.

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 specific control system type, 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 map TP-01524 1:20,000, was compiled on NAD83 and applies to this survey. Shoreline shown on the smooth sheet in black originates from TP-01524 and was digitized at the Pacific Hydrographic Branch and merged in Microstation. Shoreline shown on the smooth sheet in brown originates from CRS 00198 (1993) and Chart 17317, 18th Edition, dated June 14, 1997 and are for orientation purposes only. The shoreline data and the hydrographic data were merged in MicroStation during the compilation of the smooth sheet. The shoreline map and the results of the fieldwork as portrayed on the smooth sheet should supersede charted shoreline.

Most of the rocks depicted on the shoreline manuscript were identified in the field and many were found to be high points or extensions of newly located reefs and ledges.

There were no MHW revisions on this survey.

K. CROSSLINES

Crosslines are discussed in the hydrographer's report.

L. JUNCTIONS

Survey H-10807 junctions with the following surveys:

Survey	Year	Scale	Area
H-10808	1998	1:10,000	North
H-10810	1998	1:10,000	South

The junctions with surveys H-10808 and H-10810 are complete. The junctional differences in the hydrographer's report with H-10810 is directly attributed to data collection over steep slopes. This data was further analyzed during office processing and found to contain no significant problems. A few soundings have been transferred from the junctional surveys to better portray the common area resulting in adequate junctions between these contemporary surveys. A "Joins" note has been added to the smooth sheet where applicable.

M. COMPARISON WITH PRIOR SURVEYS

Survey	Year	Scale
H-2057	1890-1905	1:40,000

The above prior surveys cover the entire area of the present survey. A comparison was made using a digital copy of H-2057. The registration and legibility of this prior survey to the present survey was good.

Differences in depths generally range from 1 to 5 fathoms with the present survey. A comparison of standard depth curves with the prior surveys reveal little change in configuration except where present hydrography defined new and or existing shoal areas. The most prominent area of shoaling which has occurred since 1890-1905 is at the mouth of the Katzehin River from latitude 59/10/45N to latitude 59/11/45N and from longitude 135/16/45W to longitude 135/20/00W. Here, shoaling from 12-20 fathoms has taken place over the past 108 years. Deposition of material from the Katzehin River has created a delta across the river mouth which rises up rapidly to Mean Lower Low Water (MLLW) from ten fathom depths. Other than the area discussed above, there appears to be no consistent pattern of shoaling or an

increase in depths since the prior survey. Justification for smaller changes can probably be attributed to better bottom coverage, improved positioning and sounding techniques, and relative accuracy of the data acquisition methods. One specific item merits discussion and is listed below;

The 28 fathom sounding charted at latitude 59/11/06 N, longitude 135/20/45W, originates from H-2057 and likely is the result of an erroneous leadline sounding and or positional error. The present survey found depths of 46-48 fathoms within the common area and no indication of a twenty fathom rise off the bottom. Similar depths with the prior 28 fathom depth were found approximately one hundred meters west. The evaluator recommends removing the charted 28 and charting this area based on the present survey.

Additional discussion of prior survey comparisons is found in the hydrographer's report, section M.

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

Survey	Year	Scale
H-4226WD	1922	1:10,000

The wire-drag survey listed above covers the entire area of the present survey. The comparison was made using a digital copy H-4226. The registration of this prior survey to the present survey was good. The legibility of the digital copy was good.

The few charted soundings originating from this prior survey are located along the mouth of the Katzehin River where dynamic changes have taken place since 1922. Similar differences in depth are readily seen with this prior work as discussed with H-2057. Remaining areas of the prior work reflects wire drag sweeps set to specific depths with no associated sounding information. Charted soundings originating from this prior drag survey has been satisfactorily addressed and should be superseded by the present survey.

N. ITEM INVESTIGATIONS

There were four AWOIS items assigned to this survey. All items were adequately addressed in section N of the hydrographer's report and the attached item investigation reports.

O. COMPARISON WITH CHART

Survey H-10807 was compared with the following chart:

Chart	Edition	Date	Scale
17317	18th	June 14, 1997	1:77,812

a. Hydrography

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

The present survey work combining single beam and multibeam coverage are considered adequate to remove the charted green tint.

The application of this survey to charts of a scale less than 1:40,000 may require the generalization of features such as ledges, and reefs. The recommended charting disposition of specific ledges or reefs is their depiction as isolated rocks. The application of this survey to charts of a scale greater than 1:40,000 may be accomplished without generalization of features.

Survey H-10807 is adequate to supersede charted hydrography within the common area.

b. Dangers To Navigation

No dangers to navigation were discovered during survey operations and/or during office processing.

P. ADEQUACY OF SURVEY

Hydrography contained on survey H-10807 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 1998 Edition except as follows:

In the event that the field units submission of survey data will exceed four weeks from completion of field work, the Chief of Party will submit a written explanation for the delay indicating the anticipated transmittal date to the Chief of the appropriate processing section. Marine Center ships forward their explanation through the Marine Center Director. Field work for survey H-10807 was completed on May 27, 1998 but not received for office processing until August 4, 1998.

Q. AIDS TO NAVIGATION

There is one fixed aid to navigation within the survey area. This aid was positioned at latitude 59/11/43.60N, longitude 135/20/01.45W and adequately serves the intended purpose. See the hydrographer's report, section Q, for additional information.

There were no features of landmark value located and or recommended for charting.

R. STATISTICS

Statistics are adequately itemized in the hydrographer's report.

S. MISCELLANEOUS

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

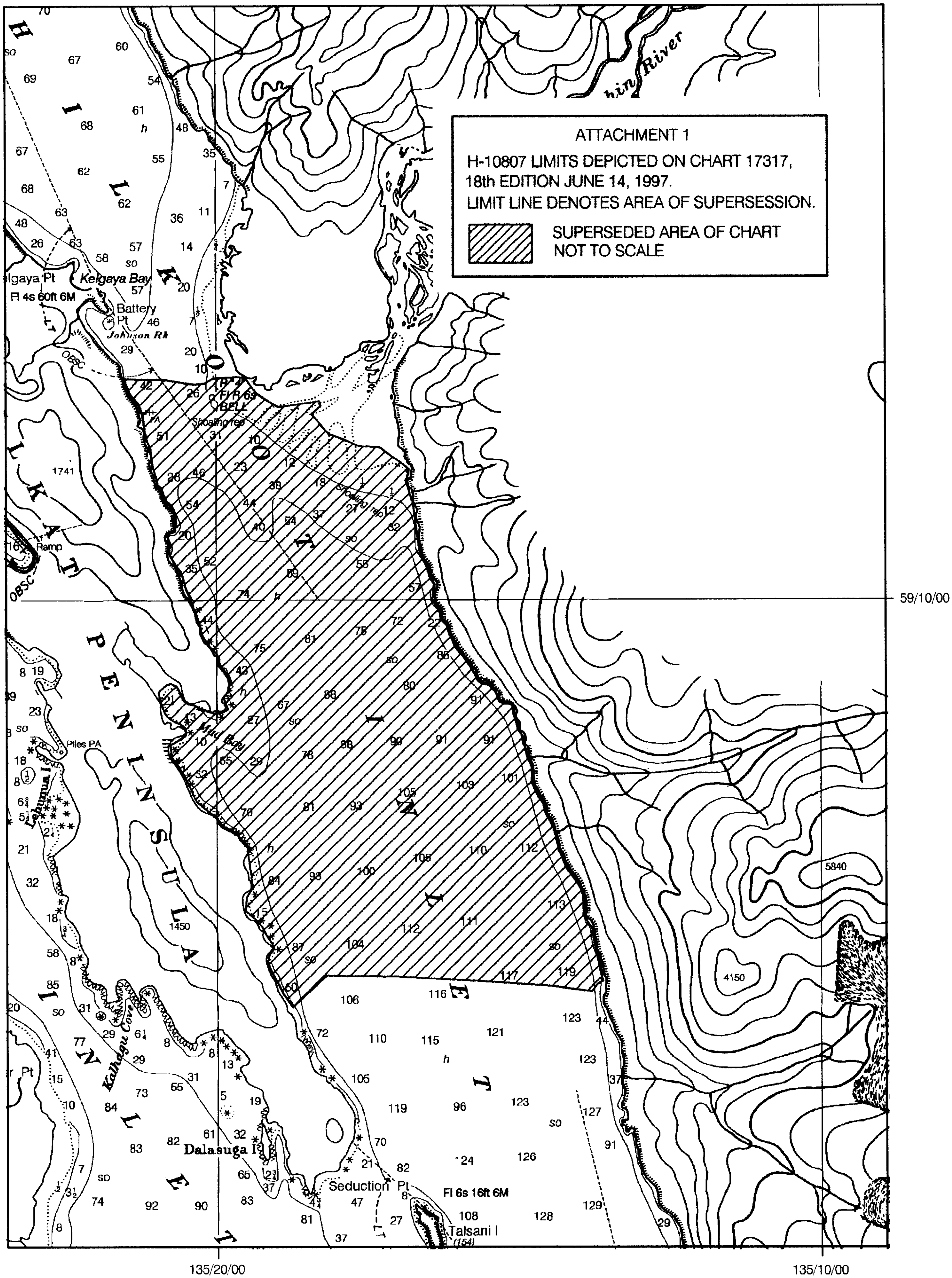
T. RECOMMENDATIONS

This is a good hydrographic survey. No additional work is recommended.

U. REFERRAL TO REPORTS

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

Rick Shipley
Cartographer


ATTACHMENT 1
H-10807 LIMITS DEPICTED ON CHART 17317, 18th EDITION JUNE 14, 1997.
LIMIT LINE DENOTES AREA OF SUPERSESSION.
SUPERSEDED AREA OF CHART
NOT TO SCALE
Kelgaya Bay
Battery Pt
Fl 4s 60ft 6M
Mud Bay
Kalhagu Cove
Dalasuga I
Seduction Pt
Fl 6s 16ft 6M
Talsani I
PENINSULA
59/10/00
135/20/00
135/10/00

APPROVAL SHEET
H-10807

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: 5/18/99
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.

James C. Gardner Date: 5-24-99
James C. Gardner
Commander, NOAA
Chief, Pacific Hydrographic Branch

****

Final Approval

Approved:

Samuel P. De Bow Date: June 10, 1999
Samuel P. De Bow
Commander, 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. ____________

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
17317	5/12/99	Rick Shipley	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.
			Full Part Before After Marine Center Approval Signed Via
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			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.

SUPERSEDES C&GS FORM 8352 WHICH MAY BE USED.