9833

Diag. Cht. No. 8554-2

NOAA FORM 76-35A

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

DESCRIPTIVE REPORT

Type of Survey Hydrographic

Field No. RA-20-1-79

Office No. H-9833

LOCALITY

State Alaska

General Locality Cook Inlet

Locality North of Ninilchik

1979

CHIEF OF PARTY
W.L.Mobley

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DATE Jan. 28, 1981

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NOAA FORM 77-28 (11-72)

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

HYDROGRAPHIC TITLE SHEET

REGISTER NO.: H-9833

FIELD NO.: RA-20-1-79

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

State: ALASKA

General locality: Cook Inlet

Locality: Northwest of Ninilchik

Scale: 1:20,000 Date of survey: June 13 - August 3, 1979

Instructions dated: March 2, 1979 Project No.: OPR-P114-RA-79

Vessel: NOAA Ship RAINIER Launches RA-3(2123), RA-6(2126), and RA-5(2125)

Chief of party: CAPT Wayne L. Mobley

Surveyed by: LT Alan Anderson, LTJG Michael McCluskey, Cartographer Dennis Hill
Senior Survey Technician Richard Hastings

Soundings taken by echo sounder, hand lead, ~~pole~~

Graphic record scaled by: RAINIER Personnel

Graphic record checked by: RAINIER Personnel

Position Verification ~~Plotted~~ by: Gordon E. Kay Automated plot by: PMC/Xynetics Plotter

Sounding verified ~~Verification~~ by: Gordon E. Kay

Soundings in fathoms / feet and tenths at MLW MLLW

REMARKS: This survey is complete and adequate to supersede all prior surveys.

Time meridian 0° (GMT)

200-meter line spacing considered inadequate by "Quality Evaluation" (O.C. Report)

Saulsbury Appl To Stds 4-19-82 Ltr

RWW 6/29/92

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

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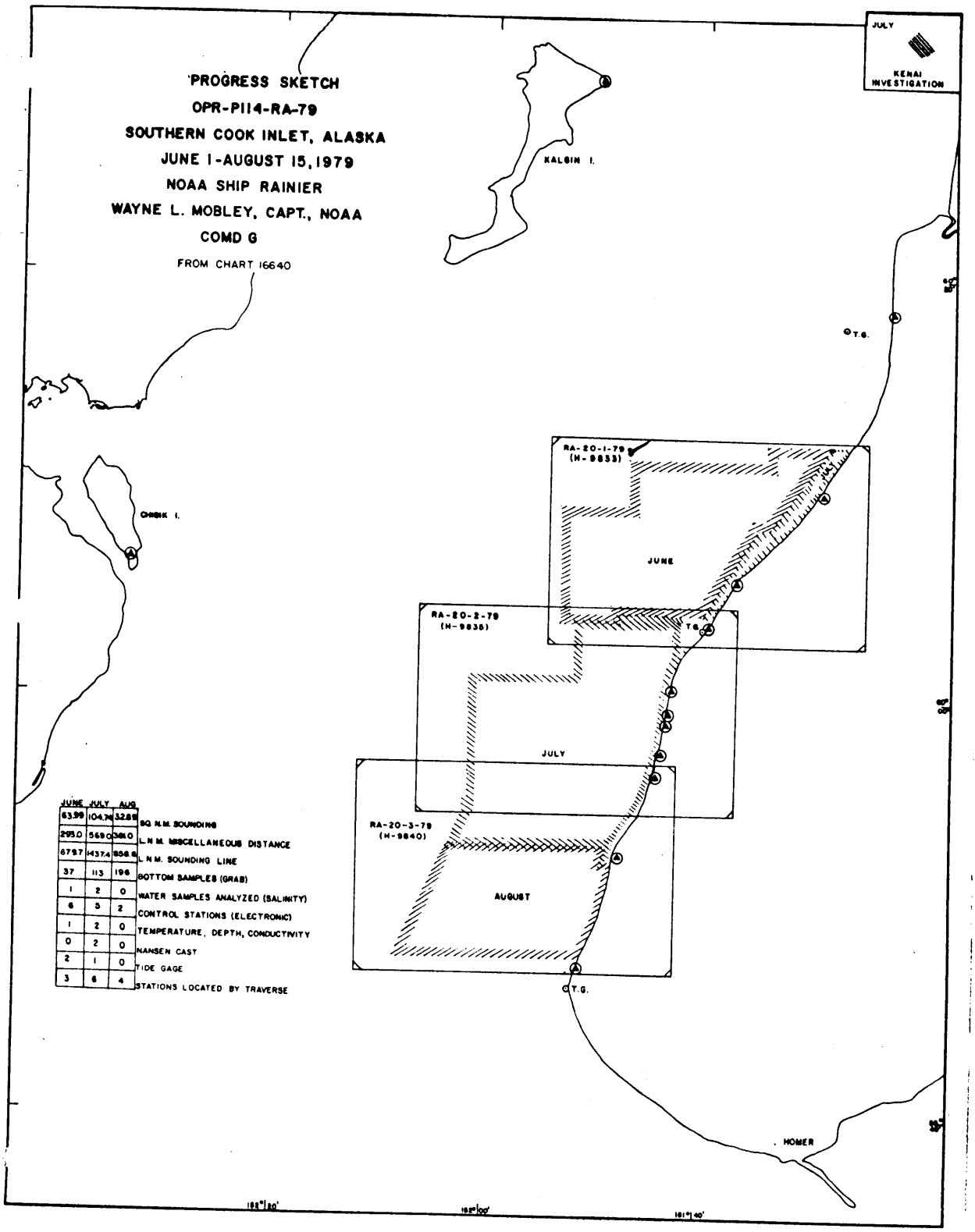


JUNE	JULY	AUG	
63.99	104.7	32.8	SQ. N.M. SOUNDING
295.0	569.0	381.0	L.N.M. MISCELLANEOUS DISTANCE
679.7	1437.4	856.6	L.N.M. SOUNDING LINE
37	113	196	BOTTOM SAMPLES (GRAB)
1	2	0	WATER SAMPLES ANALYZED (SALINITY)
6	5	2	CONTROL STATIONS (ELECTRONIC)
1	2	0	TEMPERATURE, DEPTH, CONDUCTIVITY
0	2	0	NANSEN CAST
2	1	0	TIDE GAGE
3	6	4	STATIONS LOCATED BY TRAVERSE

A. PROJECT

Hydrographic survey H-9833 was conducted in accordance with Project Instructions OPR-P114-RA, FA-1979, Southern Cook Inlet, Alaska, dated March 2, 1979; Change No. 1, Supplement to Instructions, dated March 30, 1979; Change No. 2, Amendment to Instructions, dated March 29, 1979; Change No. 3, Amendment to Instructions, dated July 18, 1979; ~~and Change No. 4, Amendment to Instructions, dated August 6, 1979~~.

B. AREA SURVEYED

The area of hydrographic survey H-9833 lies on the east coast of Cook Inlet. The northern and southern boundaries are 60° 12' 15" N, and 60° 03' 45" N respectively. The western boundary is 151° 54' 00" W with the eastern boundary being the shoreline of Kenai Peninsula. Hydrographic survey operations began on June 19, 1979 (J.D. 170) and were completed on August 3, 1979 (J.D. 215).

C. SOUNDING VESSEL

The RAINIER's aluminum launches RA-3 (2123, hull 1007), and RA-6 (2126, hull 1013) were used to conduct the hydrographic survey. Aluminum launch RA-5 (2125, hull 1003) was used to obtain bottom samples. Boston Whaler RA-10 (2129) was used to obtain detached positions of rocks during hydrographic/field edit operations.

D. SOUNDING EQUIPMENT AND CORRECTIONS TO ECHO SOUNDINGS

SOUNDING EQUIPMENT

Echo soundings obtained during OPR-P114-RA-79 were taken with Ross Fineline fathometer systems which included the following components: Ross Model 4000 Transceiver, Ross Model 5000 Analog Recorder, Ross Model 6000 Digitizer and 100 kHz transducer. Table 1 summarizes the serial numbers of the various components used in each vessel:

Table 1

Echo Sounder Component Serial Numbers

Component	RA-3 (2123)	RA-5 (2125)	RA-6 (2126)
Transceiver	1080	1040	1042
Analog Recorder	1070	1040	1042
Digitizer	1080	1040	1041-4

CORRECTIONS TO ECHO SOUNDINGS

The following echo sounding corrections are discussed: Sound velocity corrections, launch draft corrections, settlement and squat corrections, and instrument corrections for blanking, initial, phase and sea swell errors.

Sound Velocity Corrections: Sound velocity corrections for echo soundings were derived from Martek TDC (S/N 358) water casts that were checked against an initial Nansen Cast (see H.O. 607, Instruction Manual for Obtaining Oceanographic Data, Third Edition, U.S. Naval Oceanographic Office, 1968). Three Marteks and one Nansen Cast were performed during OPR-P114-RA-79 and the details of each are presented in Table 2:

Table 2
Nansen/Martek Cast Data, OPR-P114-RA-79

Cast Type	Date Time	Location	Applicable Survey	Velocity Table No.
Martek TDC	6/20/79 2200Z	Lat 60/08/48.0 Long 151/38/12.0	RA-20-1-79 RA-20-2-79 RA-20-3-79	1
Martek TDC/ Nansen Cast	7/8/79 2400Z	Lat 60/07/00.0 Long 151/41/00.0	RA-20-1-79 RA-20-2-79 RA-20-3-79	1
Martek TDC	8/5/79 2000Z	Lat 60/00/00.0 Long 151/57/00.0	RA-20-1-79 RA-20-2-79 RA-20-3-79	1

Samples from these casts (Nansen bottle on surface Martek cast) were analyzed for salinity using standard laboratory procedures (see H.O. 607). The salinometer used for these analyses was a Bissett/Berman Model 6210, S/N 1043, which was last calibrated in March 1979, by the Northwest Regional Center, Bellevue, Washington. The Martek was also calibrated there in January of 1979.

Results from the Nansen and Martek TDC casts along with the data from the salinometer, were input into computer program RK-530-Velocity Correction Computations, and run on RAINIER's PDP-8/e Digital Computer; S/N 1015.

The sound velocity computations and subsequent velocity corrections revealed a uniform water column with excellent mixing. To obtain accurate velocity corrections, all four observations (including Nansen Cast) were coplotted on a velocity graph. Together, they revealed a single, consistent velocity curve from which correctors for all three surveys were scaled. This explains the single velocity corrector tape for all of OPR-114-RA-79. The Nansen Cast was used to verify that seawater samples at the bottom of the water column were, indeed, identical to surface samples -- both in temperature and salinity.

Launch Draft Corrections: Corrections for launch draft were determined from standard bar checks (see Hydrographic Manual). Bar checks were performed each day by each launch prior to and at the completion of sounding operations. (Graduations on bar hand lines were compared with steel measuring tapes prior to and at the completion of OPR-P114-RA-79 and were found to be accurate).

The mean values were subtracted from the corresponding mean true bar depths to obtain a series of "bar check correctors". Bar check correctors were not co-plotted on the sound velocity correction curve in that velocity corrections were insignificant. These bar check correctors alone, therefore, represent the computed corrections for launch draft. ✓

Since these corrections were not available until completion of the project, an estimated launch draft correction of 0.3 fathoms was used for plotting of boat, semi-smooth, and smooth field sheets. Computed launch draft corrections were supplied to PMC in TC/TI tapes.

Launch Settlement and Squat Corrections: Settlement and squat of all three launches (RA-3, RA-5 and RA-6) were measured prior to OPR-P114-RA-79 in Lake Washington, Seattle, Washington on March 20 (J.D. 079), 1979, by the following method: A level rod, graduated in feet, was held above the transducer in each launch. A self-leveling Zeiss Ni 2 (S/N 103453) level was set up on stable ground and readings were taken at different speeds as the launch(es) headed directly toward the level operator. These readings were made relative to a zero heading as the launch was dead in the water. Since the tests were run on an inland lake, no tidal effects need be considered. The speeds utilized were the same used by RAINIER Personnel in the field.

The corrections obtained from the tests are included in the report for reference but they were not placed on TC/TI tapes or applied to

field plotting sheets. The corrections are not necessary for this survey in accordance with PMC OPORDER 3-03.06x1, page 3-31.

> "Settlement and squat errors are commonly ignored when operating in areas of irregular bottom, at various speeds, as this error is usually insignificant if the sounding unit is fathoms."

Sounding Instrument Corrections: During survey operations, if miscellaneous returns were causing misdigitizing, the "blanking" depth was set to a value slightly shoaler than the shoalest bottom depth expected, and was adjusted as the depth changed. Corresponding analog depths were substituted for missed digital soundings during field scanning operations.

The initial trace on the analog recorder was frequently monitored and was adjusted, when necessary, to prevent errors.

To prevent belt length error or stylus paper misalignment on the analog recorders, RAINIER personnel performed "phase calibrations" of the records each day. ✓

Seas were not always calm in Cook Inlet, therefore, sea/swell corrections were applied, and should not be confused with obvious sand waves on the fathograms.

Manual Sounding Corrections: Manual soundings were taken with hand-held lead lines on those shoals with least depths shoaler than seven fathoms. Depth markings on these lead lines were compared with a steel measuring tape before and after OPR-P114-RA-79, and were found to be accurate. Since the recordings of lead line soundings were interspersed with fathometer soundings, special care was taken to prevent the application of sound velocity corrections to lead line depths. A seperate velocity corrector tape was made with zero corrections for this purpose.

For further information concerning echo sounding correction computations refer to Corrections to Echo Soundings Report, OPR-P114-RA-79.

E. HYDROGRAPHIC SHEETS

All hydrographic field sheets including the smooth field sheet were prepared via the PDP 8/e Complot system onboard the ship RAINIER. A modified transverse mercator projection was used for plotting of the hydrographic data. The list of parameters used to define the hydrographic sheets are included in the separates following the text. ✓

Soundings on the smooth field sheets were corrected for predicted tides, launch draft, and preliminary velocity of sound corrections. No discernible distortion of mylar sheets was observed during smooth field plotting of hydrographic data.

Two field sheets were used to cover the area of H-9833, RA-20-1A-79 and RA-20-1B-79. Two 1:20,000 smooth field sounding plots were submitted with the field data. Also transmitted were two 1:5,000 scale expansion sheets for RA-20-1A-79, two 1:5,000 expansion sheets for RA-20-1B-79, and two 1:20,000 overlays containing bottom samples and D.P.'s. ✓

All data and accompanying records were transferred to Pacific Marine Center, Seattle, Washington, for verification.

F. CONTROL STATIONS

Horizontal control for this survey was provided by the recovery of eight existing stations and the establishment of nine new control stations. The recovered stations are as follows: SIS 1963, PT-3 1963, NINILCHIK 1908, DEEP 1964, STARISKY MICROWAVE TOWER CENTER AXIS, LEE 1968, HUMP 2 1978 ECC (RED RAYDIST 1978) and E. KALGIN 3, 1978 ECC. (GREEN RAYDIST ~~1979~~). The two Raydist sites were again utilized as Raydist antenna sites throughout the course of the survey, their G.P.'s were obtained from the 1978 descriptive report by the RAINIER for H-9777, RA-20-1-78. The new stations established were: PAT 1979, SUE 1979, PIT (T.P.), HAYNES 1979, DOONE (T.P.), GREISS 1979, ANIMAL HILL 1979, TUBBS 1979, and MILLER TIME (T.P.). These stations served as positions for MiniRangers, visual hydro signals, and to extend control southward along the eastern shore of the inlet.

marked with a post

The new stations were established by Third Order Class I methods and, with the exception of PIT (T.P.), DOONE (T.P.) and MILLER TIME (T.P.), all were described and monumented. All stations are referred to the North American 1927 datum. Two field edit signals (203, 301) plot outside the high water line. Both are rocks used for visual and range-azimuth control of field edit and rock D.P.'s. Rock 301 was located photogrammetrically while 203 was located by horizontal control methods. Other photo picked hydro signals are plotted on the smooth field sheets but were used for field edit only. ✓

See QC Report for additional data on 319's 301's 203 JPS

Refer to Horizontal Control Report OPR-P114-RA-79 for additional information.

G. HYDROGRAPHIC POSITION CONTROL

Electronic range-range methods were used for hydrographic position control during this survey. A Teledyne Hastings-raydist system and a Motorola MiniRanger III system were both employed.

DESCRIPTION OF RAYDIST SHORE STATIONS

Two raydist shore stations were recovered and used during this survey: Red Raydist ~~1978~~ and Green Raydist Stake ~~1978~~.

The red station was located at Red Raydist ~~1978~~ on Chisik Island, latitude 60° 06' 21.437" N, longitude 152° 33' 53.267" W. The antenna consisted of four ten-foot sections of structural tower topped with a 35-foot whip antenna. The station was on a flat hilltop approximately 159 meters above MSL.

The green station was located at Green Raydist Stake 1978 on Kalgin Island, latitude 60° 29' 08.334" N, longitude 151° 50' - 08.087" W. The antenna consisted of four ten-foot sections of structural tower topped with a 35-foot whip antenna. The station was on a hilltop approximately 20 meters above MSL.

Power for both raydist shore stations was provided by propane-fueled teledyne Hastings thermal generators. The raydist was operated on a frequency of 3296.46 kHz. The raydist arc intersections throughout the survey area were between 30° and 150°.

DESCRIPTION OF MINIRANGER SHORE STATIONS

During this survey two shore stations were recovered and seven established for MiniRanger range-range hydrographic operations. MiniRanger was also used to calibrate the raydist for hydrography as explained below. Shore station numbers, transponder codes and numbers and other relevant data are as follows:

Station Number	Station Name	M/R Code	M/R Transponder	Dates on Station	Remarks
103	PIT	3	1570	170-194	M/R & Raydist Hydro
104	PAT	4	1569	170-194	M/R & Raydist Hydro
109	PT 3	1	4950	170-174	M/R & Raydist Hydro
111	NINILCHIK	1	4950	177-180	Raydist Hydro
		2	4708	170-176 189-194	M/R & Raydist Hydro
		4	1569	199-217	Raydist Hydro
112	GREISS	3	1570	199-201	Raydist Hydro
113	ANIMAL HILL	2	4708	199-218	M/R & Raydist Hydro
114	TUBBS	3	1570	201-204	M/R & Raydist Hydro

Station Number	Station Name	M/R Code	M/R Transponder	Dates on Station	Remarks
115	MILLER TIME	1	4950	201-222	M/R & Raydist Hydro
		3	1570	220-222	Raydist Hydro
116	NINILCHIK CHANNEL ENTRANCE LT 1	3	1570	214-216	Raydist Hydro

MiniRanger was used for hydrographic position control only on days 170 through 176 and 204. On days 170 through 172 and 178 through 222 it was used to calibrate the raydist system as described below. It was also used to control bottom samples and Martek Casts. When used in the range-range mode all pairs provided an arc intersection of between 30^{0} and 150^{0}, except day 170 when RA-6 exceeded 30^{0} for the offshore positions of fixes 6001 through 6098. These soundings were however kept and submitted because of good agreement with subsequent splits and crosslines. All stations were positioned over Third Order Class I geodetic control stations. For a breakdown of MiniRanger locations by field sheet and day see "Daily Operations Tables".

At each station, the MiniRanger transponder was two to four meters above the station. See "Master Station List", attachment 2 for station elevations above MSL. Power for each shore station was provided by two 12 volt batteries arranged in series to provide 24 volts DC.

RAYDIST SHORE STATION PERFORMANCE

Both red and green sideband stations gave some trouble during survey operations, necessitating a halt in hydrography or a switch to MiniRanger control while the stations were repaired. The following log summarizes raydist shore station problems and activity:

Julian Date	Remarks
156	Installed red sideband station #232 on Chisik Island.
156	Installed green sideband station #242 on Kalgin Island.
159	Poor red signal. Checked station.
163	Thermal generator overvoltage output damaged crystal oven. Replaced oven and adjusted generator and transmitter.
176	Poor red signal. Transmitter replaced with #121.
188	Changed propane bottles at red and green stations.

Julian Date	Remarks
203	Poor green signal.
205	Replaced green transmitter with #233.
206	Checked all connections and cut back weed growth in ground plane area to improve green signal.
219	Bad green signal. Removed non-NOAA MiniRanger transponder which had been attached to green transmitter tower.
228	Removed both shore stations.

In spite of these various problems with raydist shore stations, their operation was acceptable for 1:20,000 scale surveying during the major periods of hydrography. The system however was not working properly and could not have been used on a larger scale survey because of position inaccuracies caused by a wavering signal. ✓

MINIRANGER SHORE STATION PERFORMANCE

There were no MiniRanger shore station failures during survey operations with the exception of a few transponder shut-offs caused by low battery voltage. The code two transponder failed to operate during the third baseline calibration on August 10 thus preventing a final calibration of this code. The performance of all shore stations during survey operations was good, with the following exceptions. Occasional null zones and skip zones were encountered (see "Description of Daily Calibrations"), causing low signal strengths and requiring occasional repointing of shore transponder antennae. MiniRanger operation during collection of all non-rejected data was good. ✓

DESCRIPTION OF RAYDIST MOBILE STATIONS

Three vessels used raydist positioning equipment during this survey: RAINIER launch RA-3 (Electronic Data Processing No. 2123), RAINIER launch RA-5 (EDP No. 2125) and RAINIER launch RA-6 (EDP No. 2126). Positioning equipment used aboard these vessels was as follows:

Vessel	Transmitter	Navigator	Position Indicator	Panalogic
2123	170	114	121	12
2125	166	117	117	17
2126	167	115	118	3

✓

Mobile raydist positioning equipment operated nearly flawlessly during this project. On a few occasions lane gains/losses were experienced during operations, but most of these problems can be attributed to poor shore station signals. For a daily breakdown of vessels used, equipment problems and other pertinent data see "Daily Operations Tables".

DESCRIPTION OF MINIRANGER MOBILE STATIONS

The above three vessels also employed MiniRanger positioning equipment during survey operations. Equipment used aboard these vessels was as follows:

Vessel	Console	R/T Unit
2123	715	727
2125	720	720
2126	711	718

There were no failures of the mobile MiniRanger equipment during the project. There were several occasions on which weak signals were received in certain areas, probably caused by operating in a transponder null-zone (a zone of poor signal coverage), and one occasion on which the systems check of the MiniRanger gave an unusually large corrector, believed to be caused by a skip zone (see "Description of Daily Calibrations").

The maximum ranges obtained from the MiniRangers during this survey averaged around ten nautical miles, which is considerably less than advertised and could normally be expected. This short range occurred even though the transponders were located on high bluffs with visibility up to 30 miles.

DESCRIPTION OF BASELINE CALIBRATIONS

Three MiniRanger baseline calibrations were performed during the project: The first on June 16 before the start of hydrography, the second mid-project on July 16 and the third on August 10 after the conclusion of MiniRanger field work. All baseline calibrations were performed at the Homer, Alaska Airport.

Due to the failure of the code 2 transponder (S/N 4708) on August 10, a final calibration of code 2 was not possible on that date.

The initial baseline calibration determined low signal strength cut-off values for each MiniRanger console, R/T unit and transponder combination. When low signal strengths occured during survey operations, data collection in the affected area was discontinued until transponder orientation could be changed or a different station could be found.

The correctors obtained from the initial June 16 baseline calibration were applied to all MiniRanger data during survey operations and were used to plot all field data. Correctors from subsequent calibrations did not differ appreciably from the initial values. Individual and mean correctors are shown in the separates attached to this report. For more information on the baseline calibrations, see the Electronic Control Report, OPR-P114-RA-79.

DESCRIPTION OF DAILY CALIBRATIONS

When raydist was used for hydrographic position control, it was calibrated prior to the beginning of a day's hydrographic operations, during lunch break, whenever positioning equipment failures were suspected and at the completion of the day's operations. In addition, MiniRanger data was collected simultaneously with raydist data all through the day to serve as calibration checks.

Calibration of the raydist was either by three-point sextant fixes (visual) or MiniRanger range-range fixes. All visual calibration signals used were located over Third Order Class I or better triangulation stations. Each visual calibration consisted of at least five sextant fixes which agreed within 0.10 lanes. If a check angle was used, the fix was rejected if the inverse distance between fix and check fix positions exceeded five meters. All angles were measured from the stern of the launch.

MiniRanger was used to calibrate the raydist quite often during this project. This allowed calibration when visual signals were not visible (during fog or at night), and while collecting hydrographic data, by collecting MiniRanger ranges simultaneously with the hydroplot raydist fixes. Aside from this information which was actually collected on line, the regular calibration of raydist by MiniRanger consisted of at least five and often ten MiniRanger range-range fixes which agreed within 0.10 lane. These were taken with the MiniRanger shore stations near right angles (between 60^{0} and 120^{0}) as seen from the launch. Applicable MiniRanger baseline correctors were applied to the ranges before determining the raydist lane count, and signal strengths below the cut-off values were not allowed. On days when MiniRanger was used to calibrate raydist, it was attempted that at least one launch obtain at least one visual calibration of MiniRanger per day to act as a MiniRanger system check and validate the raydist calibration technique. On all occasions exept one this visual systems check agreed well with the MiniRanger baseline data. The exception occured on day 202 when launch RA-3 (EDP No. 2123) obtained

MiniRanger correctors of -15 and -13 for codes 4 and 2 with a visual calibration. It is believed that the launch was in a MiniRanger skip zone at the time of this calibration and obtained these large correctors because of the longer indirect (reflected) path of the MiniRanger signal. The hydrography this boat collected this day was mainscheme development and crossline (plotted using initial baseline corrector), all of which junctioned well with other days work on the same sheet, affirming that this calibration was a singular inaccurate incident. It is felt that the MiniRanger calibrations of raydist in general are as accurate if not more accurate than the horizontal angle method given the effort taken to insure the strength of the MiniRanger fix (i.e. frequent baseline calibrations, multiple (5-10) calibration fixes, strong intersections for calibration and frequent system checks of MiniRanger.

When MiniRanger was used for hydrographic position control, visual calibration the system checks were obtained by each launch twice a day (before and after data collection) weather permitting. On some days weather or darkness precluded obtaining the second calibration. These visual calibrations were obtained in the same manner as visual raydist calibrations. Each calibration consisted of at least five visual fixes agreeing within five meters.

All electronic control and calibration for both raydist and MiniRanger are considered correct and acceptable for controlling hydrography on H-9833. Data collection was discontinued when problems did occur and was not resumed until the problems were corrected.

Because of the varied use of electronic control systems and different calibration methods a table (Daily Operation Table) was constructed to provide the details of each days operations. These tables are located in the separates attached to this report.

H. SHORELINE

Shoreline for H-9833 was transferred from Class III manuscripts TP-00795, TP-00796 (1:20,000) and TP-00797 (1:5,000). TP-00795 was field edited in 1978. TP-00796 and TP-00797 were field edited during the course of this survey. Rocks not visible on field edit photos were positioned by the Field Editor at or below MLLW using hydrographic methods. The data was then transferred to the hydrographic records and deleted from the field edit records. An abstract of the rocks transferred to the hydro records is included in the separates to this report. Photoidentified rocks that did not appear on the Class III manuscripts were pricked on the photos and plotted in an approximate position (in red) on the smooth field sheet.

Contact was maintained between the Field Editor and Hydrographer to prevent duplication of information.

I. CROSSLINES

Cross lines for H-9833 total 81.2 nautical miles of 8.4% of all sounding lines. All but three crosslines were run normal to the mainscheme lines. The three crosslines that run at 55° to the mainscheme lines and parallel to shore were to be continued to shore as buffer lines, but they were changed to crosslines and the mainscheme lines were extended to shore. All crosslines are smooth plotted in red ink. ✓

Crossline soundings agree very well with mainscheme soundings. The following table shows the comparison of 1611 crossline soundings with mainscheme soundings:

Crossline Agreement

Depth (FM)	Exact	1 Fathom	2 Fathom	E
0-5 FM	156 (9.7%)	329 (20.4%)	0	30.1%
5-10 FM	108 (6.7%)	162 (10.0%)	0	16.7%
10-15 FM	160 (9.9%)	73 (4.5%)	1 (0.2%)	14.6%
15-20 FM	403 (25.0%)	90 (5.6%)	0	30.6%
> 20 FM	111 (6.9%)	18 (1.1%)	0	8.0%
	58.2%	41.6%	0.2%	

J. JUNCTIONS

H-9833 consists of two field sheets, an A and B sheet. The two field sheets junction along latitude 60° 08' 00" N. RA-3 (2123) and RA-6 (2126) sounded on sheets A and B respectively. One sounding line overlaps between the two sheets. Of 205 sounding comparisons 192 or 93.7% differed less than one fathom; 13 or 6.3% differed by more than one fathom.

H-9833 junctions along the southern boundary at latitude 60° 03' - 33" N with contemporary survey H-9835 (RA-20-2A-79). Of 100 sounding comparisons 95% agree within less than one fathom; 5% agree within one to two fathoms. (Not in office - 4-3-81)

H-9833 junctions in the southwest corner with H-8856 1:5,000 scale 1965. Of 88 sounding comparisons 87 (98.9%) agree between zero and one fathom; 1 (1.1%) agreed between one and two fathoms.

H-9833 junction with H-9436 (1:20,000) 1974 along the northern boundry from longitude 151° 34' 00" W to the western boundary.

Of 430 sounding comparisons 269 (62.5%) differed less than than one fathom; 156 (36.3%) differed between one and two fathoms; and 5 (1.1%) differ by two fathoms. The soundings of H-9833 appear to be shoaler than those of H-9436 by approximately one fathom. The soundings of H-9833 used for comparisons had not been corrected for velocity of sound. The corrector approaches +.5 fathom in 33.5 fathoms. It is also possible that the tide control for H-9436 is in error. See QC Report

H-9833 junctions on the west with H-9776, 1:20,000 1978. Of 313 sounding comparisons 272 (86.9%) agree exactly; 41 (13.1%) differ by one fathom. ✓

H-9833 junctions on the northwest side with H-9777, 1:20,000, 1978. Of 69 sounding comparisons 66 (95.7%) differ by 0.5 fathoms or less; 3 (4.3%) differ by 0.6 to 0.7 fathom. The largest difference being 0.7 fathom.

The Hydrographer recommends that in the junction areas, the soundings from this contemporary survey be charted. Do not concur, normal compilation procedures should be followed HPS

K. COMPARISON WITH PRIOR SURVEYS

PRE SURVEY REVIEW ITEM #3 is a wreck PA charted at latitude 60° 08.5' N, longitude 151° 39.5' W. from LNM #33(1976)

Indications of two obstructions were found during mainscheme hydrography. Further development indeed verified the fact and two detached positions were obtained 250 meters apart. See the following table:

J.D.	Vessel	Pos.	Depth @ MLLW	Latitude	Longitude
190	2123	4455	6~~.7~~ 9 FM	60° 08' 26.~~619~~ .53"	151° 39' 21.~~884~~ .77"
190	2123	4464	~~7.9~~ 8.1 FM	60° 08' 22.~~376~~ .29"	151° 39' 35.~~911~~ .79"

L.D. 8.1fm pos 22-23 - Cmsdq out

A diving investigation was not conducted because of high currents and zero visibility. It is recommended that the ~~position of the wreck symbol be moved to mean fix and the~~ letters "PA" be removed on chart 16640. This information is also located on the D.P. Log sheet for RA-20-1A-79 in the separates. ~~SEE Parker's Report Sect 6.~~ Chart the wrecks as shown on the present survey ✓

PRESURVEY REVIEW ITEM - unnumbered 4¼ fathom sounding charted at latitude 60° 04.5' N and longitude 151° 45.0' W. This item was not developed further than mainscheme lines. A 4~~.6~~ fathom sounding was obtained within 40 meters of the PSR sounding. It is recommended that the 4¼ sounding remain charted. ~~SEE Parker's Report Sect 6.~~ from H-3205(1910) concur HPS

PRIOR SURVEYS

H-3205	1:40,000	1910
H-3206	1:120,000	1910
~~H-3196~~	~~1:40,000~~	~~1910~~

H-3196 - 1:40,000 1910 overlaps with H-9833 by less than 0.1 nautical mile. Of the five soundings compared, all agreed within 0.7 fathom, with a mean difference of 0.3 fathom. Do not concur JPS
H-3196 does not overlap H-9833

H-3205 - 1:40,000 1910 Of 48 sounding comparisons, 36 (75%) were within one fathom; 10 (21%) were within one to two fathoms; and 2 (4%) differed by more than two fathoms. The mean difference was 0.8 fathom. The majority of H-9833 soundings compared were shoaler than H-3205.

The shallow area in the vicinity of latitude 60° 04.8'N, longitude 151° 40.8'W is still in existence with soundings agreeing within 0.5 fathom.

H-3206 - 1:120,000 1910 Of 47 sounding comparisons, 31 (66%) were within one fathom; 7 (15%) between one and two fathoms; 5 (11%) between two and three fathoms; and 4 (8%) differed by three fathoms or more. The mean difference was 1.1 fathoms.
With the finding of a few shoal sdgs & several rks awash H3205 is superseded by the present survey JPS

The majority of H-9833 soundings compared were shoaler than H-3206. Attributed to sdg lead versus fathometer sdgs. Also some bottom change. Present survey adequate to supersede H-3206 JPS

L. COMPARISON WITH THE CHART

A 1:20,000 scale mylar enlargement of chart 16640, 15th Edition, November 27, 1976 was used for comparison with H-9833. The current edition of chart 16640 is the 17th edition, April 7, 1979. The following table shows the three changes made between the 15th and 17th editions of chart 16640 within the limits of H-9833:

15th Edition-16640 1:5,000 Enlargement	17th Edition 16640	Latitude	Longitude
1	Removed	60° 04.4'	151° 41.4'
4¼	4	60° 04.6'	151° 40.0'
7½	7	60° 04.5'	151° 42.4'

The 17th edition of chart 16640 and the 19th edition of chart 16660 were also compared with only insignificant differences found within the limits of H-9833.

The comparison of H-9833 and the 1:20,000 scale enlargement of chart 16640, 15th edition was in general agreement with three significant differences. Of 48 charted soundings at less than ten fathoms, the mean difference was 0.4 fathom with a maximum difference of 1.1 fathoms. Of 34 charted soundings ten fathoms

and greater, the average difference was 1.2 fathoms. The maximum difference was five fathoms with a fourteen fathom sounding in nineteen fathoms of water. The following table shows the comparison of charted soundings that have significant differences with H-9833 soundings:

15th Edition-16640 Enlargement	H-9833	Latitude	Longitude
from H3206 (1910) 17 fathom sdg	134	60° 11.0'	151° 38.0'
from H3206 (1910) 16 fathom sdg	20	60° 08.3'	151° 45.5'
from H3206 (1910) 14 fathom sdg	19	60° 07.7'	151° 48.1'

The only explanation of the large differences appears to be an actual change in the bottom. Distortion of the enlarged chart section does not appear to be a factor. These are fathom sdgs. and are considered unreliable JPS

No specific investigation other than field edit was conducted to disprove or verify charted rocks. Distortion of the enlarged chart section is a definite factor in comparing charted rocks with hydro rocks of H-9833 and field edit. It is recommended that charted rocks plotting in the vicinity of an edited rock be moved to the edited location. Charted rocks that do not lie near an edited rock should be retained in charted location. See G & C. Report

Four submerged rocks, one submerged peak and one sand shoal were positioned by RA-3 (2123), by investigating muddy water trails in the current that were noticed by the field editor. These items are plotted on the smooth field sheets and the necessary charting information is located in the separates on the D.P. log sheet for RA-20-1A-79.

M. ADEQUACY OF SURVEY

This survey (H-9833), with the addition of items carried fwd from H3205 (1910) is complete and adequate to supersede all prior surveys for charting. JPS

N. AIDS TO NAVIGATION

No aids to navigation exist within the area of H-9833.

O. STATISTICS

The survey contains 3,680 positions and 929.0 nautical miles of hydrography, covering 71.1 square nautical miles. The following is a table of statistics for each launch:

Vessel	Positions	NM of Hydro
RA-3 (2123)	1779	464.3
RA-5 (2125)	149	Bottom Samples Only
RA-6 (2126)	1587	464.7
RA-8 (2128)	165	Rock D.P.'s Only

Three tide stations were maintained during the project.

P. MISCELLANEOUS

Sand waves were found in the southern half of "B" sheet. Further development was conducted in the sand wave areas, see expansion sheets. It was not possible to effectively contour the waves because of their size and the line spacing necessary. It is also thought that these waves shift quite readily in the strong currents. noted "sand waves" on smooth sheet

When conditions permitted, the ASI Logger on RA-6 was used to collect MiniRanger fixes simultaneously with the hydroplot collecting raydist fixes. This information was mainly on RA-20-1B-79 and was used to catch lane jumps on raydist. This data was however submitted in the event that someone in the future would want to analyze the accuracy of the two systems in relation to each other. ✓

Q. RECOMMENDATIONS

It is recommended that the southern area of this survey along with H-9835 and H-9840 be charted as sand wave areas. deferred to the compilers judgement. ✓

R. DATA PROCESSING PROCEDURES

Data acquisition and processing were accomplished per instructions in the Hydrographic Manual, and PMC OPORDER.

Soundings and positions were taken by Hydroplot system using program RK III or manually logged using sextant angles or range-azimuth method. The following is a list of all computer programs and version dates used during the survey. ✓

RK 111	RANGE-RANGE REAL TIME HYDROPLOT	01/30/76
RK 201	GRID, SIGNAL AND LATTICE PLOT	04/18/75
RK 211	RANGE-RANGE NON-REAL TIME PLOT	01/15/76
RK 212	VISUAL STATION TABLE LOAD	04/01/74
R 215	VISUAL NON-REAL TIME PLOT	08/16/74
RK 216	RANGE-AZIMUTH NON-REAL TIME PLOT	02/05/76
RK 300	UTILITY COMPUTATIONS	02/05/76
RK 330	REFORMAT AND DATA CHECK	05/04/76
PM 360	ELECTRONIC CORRECTOR ABSTRACT	02/02/76
RK 407	GEODETIC INVERSE/DIRECT COMPUTATION	09/25/78
RK 409	GEODETIC UTILITY PACKAGE	09/20/78

AM 500	PREDICTED TIDE GENERATOR	11/10/72
RK 530	LAYER CORRECTIONS FOR VELOCITY	05/10/76
RK 561	H/R GEODETIC CALIBRATION	02/19/75
AM 602	ELINORE - LINE ORIENTED EDITOR	05/20/75
AM 603	TAPE CONSOLIDATOR	10/10/72
RK 606	TAPE DUPLICATOR	08/22/74
RK 612	LINE PRINTER LIST	03/22/78

S. REFERRAL TO REPORTS

This report when submitted to Pacific Marine Center was accompanied by the following supplemental reports:

Horizontal Control Report, OPR-P114-RA-79
Electronic Contrl Report, OPR-P114-RA-79
Field Edit Report, TP-00795, TP-00796, TP-00797
Corrections to Echo Sounding Report, OPR-P114-RA-79

Respectfully submitted,

Richard L. Hastings

Richard L. Hastings
Senior Survey Technician

Approved and Forwarded,

for John C. Albright

Wayne L. Mobley
Captain, NOAA
Commanding

VELOCITY CORRECTOR TAPE LISTING
RA-20-1-79(H-9833)
RA-20-2-79(H-9835)
RA-20-3-79(H-9840)

TABLE NO.1
SCALE - FATHOMS

000033 0 0000 0001 001 000000 000000
000098 0 0001
000162 0 0002
000222 0 0003
000283 0 0004
000353 0 0005
999999 0 0006

TABLE NO.0
005000 0 0000 0000 000 000000 000000
999999 0 0001

(Let 1 inch equal 4 fathoms for deep water and 1 inch equal 0.4 fathom for shoal.)

0 0.1 0.2 0.3 0.4 0.5 0.6 0.7

CORRECTIONS IN [redacted] FATHOMS

(For deep water add a 0 to these figures)

DEPTHS IN FATHOMS

0 5 10 15 20 25 30 35 40

LEGEND:

BLACK DOTS-TDC- 6/20/79

GREEN DOTS-TDC- 7/8/79

RED DOTS-NANSEN 7/8/79

BLUE DOTS-TDC 8/5/79

FORM C&GS-117 (11-65)

U.S. DEPARTMENT OF COMMERCE
ESSA
COAST AND GEODETIC SURVEY

VELOCITY CORRECTIONS

Ship RAINIER S221

WAYNE L. MOBLEY, CAPT. NOAA Comdg.

These corrections are to be used

between 19 and 19

in the locality COOK INLET
ALASKA

for hydrographic surveys Nos.
OPR-P114-RA-79

DEPTH RANGE (FM)	CORRECTIONS (FM)
UP TO 3.3	0.0
9.0	0.1
16.2	0.2
22.2	0.3
28.3	0.4
35.3	0.5
DEEPER	0.6

MASTER STATION LIST
OPR-P114-RA-79
LOWER COOK INLET

FINAL VERSION

101 3 60 06 21437 152 33 53267 254 0159 329646
~~/RED RAYDIST~~ HUMP 2 1978 ECC

102 3 60 29 03334 151 50 08087 254 0020 329646
~~/GREEN RAYDIST~~ EAST KALGIN 3 1976 ECC

103 4 60 05 46900 151 36 44515 250 0036 000000
/PIT 1979

104 4 60 09 52776 151 29 20457 250 0045 000000
/PAT 1979

~~105 4 60~~ 12 20461 151 25 46188 250 0076 000000
/PT 4 1963 601512(1012)

~~106 4 60~~ 01 12973 151 42 18039 250 0072 000000
/DEEP 1964 601513(1004)

107 4 60 12 53110 151 24 43974 139 0177 000000
/CLAM (CLAM GULCH MICROWAVE TOWER) 1964 601512(1001)

~~108 4 60~~ 18 03609 151 27 16845 139 0000 000000
/SIS 1963 601512(1013)

~~109 4 60~~ 18 35152 151 22 45041 139 0017 000000
/PT 3 1963 601512(1011)

110 4 60 07 18705 151 33 22918 139 0067 000000
/SUE 1979

111 4 60 00 33292 151 42 49781 250 0089 000000
/NINILCHIK 1908 601513(1011)

~~112 4 59~~ 58 45569 151 43 27865 250 0031 000000
/GRIESS 1979

~~113 4 59~~ 57 23336 151 43 58089 139 0051 000000
/ANIMAL HILL 1979

~~114 3 59~~ 56 07127 151 44 37502 250 0024 000000
/TUBBS 1979

~~115 4 59~~ 52 24078 151 48 03029 250 0001 000000
/MILLER TIME 1979

116 4 60 03 19062 151 39 45889 250 0000 000000
/NINILCHIK CHANNEL ENTR. LIGHT 1, 1979

~~117 4~~ 59 47 46312 151 50 49736 250 0065 000000
/LEE 1968 591514(1013)

~~200 4~~ 59 52 53664 151 47 02441 139 0147 000000
/STARISKY (STARISKY MICROWAVE TOWER) 1964 591514

~~201 4~~ 60 03 03042 151 39 47040 139 0000 000000
/NIVILCHIK CHURCH CUPOLA 601513(1012)

~~202 4~~ 59 59 16810 151 43 17661 139 0000 000000
/DOONE 1979

~~203 4~~ 60 05 54736 151 37 04753 243 0000 000000
/ROCK (TEMPORARY)

~~204 4~~ 60 02 15881 151 41 21115 139 0000 000000
/HAYNES 1979

300 4 60 08 25994 151 31 24624 243 0000 000000
/PHOTO SIGNAL TP-00796

301 4 60 09 03246 151 30 42184 243 0000 000000
/PHOTO SIGNAL TP-00796

303 4 60 09 15848 151 30 15548 243 0000 000000
/PHOTO SIGNAL TP-00796

304 4 60 08 11350 151 31 49050 243 0000 000000
/PHOTO SIGNAL TP-00796

305 4 60 07 53600 151 32 11250 243 0000 000000
/PHOTO SIGNAL TP-00796

306 4 60 06 57660 151 34 10680 243 0000 000000
/PHOTO SIGNAL TP-00796

307 4 60 06 35170 151 34 59280 243 0000 000000
/PHOTO SIGNAL TP-00796

308 4 60 06 14400 151 35 46435 243 0000 000000
/PHOTO SIGNAL TP-00796

310 4 60 04 16934 151 38 32990 243 0000 000000
/PHOTO SIGNAL TP-00796

~~311 4~~ 60 03 04890 151 40 02702 243 0000 000000
/PHOTO SIGNAL TP-00796

~~318 4~~ 60 02 38817 151 40 25261 243 0000 000000
/PHOTO SIGNAL(NW CORNER NINILCHIK SCHOOL)TP-00796

400 4 60 05 36506 151 37 05437 243 0000 000000
/HYDRO SIGNAL

401 4 60 05 06519 151 37 31390 243 0000 000000
/HYDRO SIGNAL

402 4 60 04 46995 151 37 53596 243 0000 000000
/HYDRO SIGNAL

403 4 60 04 01336 151 38 53062 243 0000 000000
/HYDRO SIGNAL

FIELD TIDE NOTE
(OPR)-P-114-RA-79
COOK INLET, ALASKA

Primary gage #945-5500, Seldovia, Alaska was used as the control gage for all hydrography during the project. GMT tide correctors for field reduction of soundings were based on the actual observations obtained from the three gages installed by RAINIER and each boat sheet was zoned for certain tide tapes during on-line hydrography. These predicted tides were generated using program AM 500-Predicted Tide Generator, version: November 10, 1972. Three gages were established as dictated by project instructions.

T1, Sisters Rock, #945-5697

RAINIER experienced setbacks in all of the tide gage installations. The dates given here are those that mark the point where consistent data was being obtained and no damage was done to the gage, staff, etc. That is - the point where an installation was thought to be secure.

A Bristol Bubbler (S/N 68A9337) with a 50 foot scale was installed/secured to the highest point of Sister Rock(s) - a set of four large rocks, 2½ nautical miles southwest of Cape Kasilof. The orifice was fastened to a 2" x 4" that was, in turn, lagged to the rock at low tide using shields. A staff (two sections) was also lagged to the same face of the most easterly rock (near vertical face) on June 20, 1979. The gage was installed on June 14, 1979, and removed on August 2, 1979. The geographical position of T1 is latitude 60° 18' 03.6" N and longitude 151° 27' 16.8" W. The staff was 2 sections of 2" x 4" with staff panels nailed to it - the boards lagged to a vertical rock face. The staff length was 20.0 feet. The staff stop was a lag bolt at 19.52 feet above the staff zero.

Four bench marks were installed and one existing triangulation mark was used. Metric installation levels were run on July 7, 1979 (late due to operational limitations) and removal levels were run on August 2, 1979. All levels were run to Third Order Class One standards. The following table relates the differences in elevation between marks for installation and removal of gage no. 945-5697 (Sisters Rock):

Bench Marks	July 7, 1979	August 2, 1979
(a) - Sis 1963	+3.552 m	+3.558 m
Sis - 5697D 1979	-1.184	-1.189
5697D-5697A 1979	-1.093	-1.103
5697A-5697B 1979	+0.614	+0.625
5697B-5697C 1979	-1.997	-2.013

(a) Denotes staff stop

The staff/gage relationship is an average of the 3 hour observations. The gage read 11.3 feet higher than the staff.

Maintenance of the Sister's Rock involved the changing of several Bubbler Gage components. The paper on several of RAINIER's gages would jump off of the sprockets causing the chart drive unit to jam. The installed unit (S/N 68A9337) was replaced by S/N 741438 on July 10, 1979. Then on July 12, 1979 it became necessary to replace the box itself as field personnel could not obtain a bubbler rate other than closed or open stream. No other problems were encountered for the duration of the gage.

There were notable discrepancies between installation and removal levels. This occurred only between bench marks. The staff showed no movement. We attributed the differences to unbalanced level shots (difficult to arrange on the rocks) and also orientation of the rod. (Two different rodmen were used). RAINIER believes these marks to be stable. Unfortunately, operational time limitations prevented our returning to the gage site to rerun these levels.

The chart paper at Sisters Rock jumped off the chart drive sprockets several times, causing errors in the recorded times and heights on the marigram. This data is still usable, since the sprockets left marks on the marigram whenever they became misaligned with the paper sprocket holes.

The data was scanned using a portion of the same chart paper as a moveable scale. The scale was cut so that the sprocket hole used for scale alignment corresponds to an even hour. The time on the marigram was determined by counting sprocket marks and was marked in hours on the marigram border, ignoring the time marks originally printed on the paper. The moveable scale was then placed with its alignment hole over the hour marks on the marigram, and the hourly tide heights read off the scale.

Scales used are attached to the appropriate marigrams.

T2, Ninilchik Harbor, #945-5653

A Bristol Bubbler gage (S/N 68A9332) with a 40 foot scale was secured by chain to a concrete embankment that parallels the access road to the Cannery. About 1500 feet of bubbler tubing was laid out to reach the lowest negative tide. This tubing was anchored using chain and winch cable - fastened with line and plastic ties. The orifice was banded (with stainless steel banding) to a piece of angle iron which was placed in a concrete/cement anchor. The orifice, when positioned, was marked with a green buoy. The geographic position of the orifice was latitude 60^{o} 03' 17.0" N and longitude 151^{o} 40' 53.2" W. A 14 foot fiberglass staff was erected inside the boat harbor of the cannery. As all pilings were made of steel, the following was the manner in which the staff was secured: The bottom of a 16' 2" x 4" was

sharpened and driven 2 feet into the bottom. The top of the board (to which the tide staff was fastened) was nailed to a cross-support of the cannery loading pier. This support was revealed because the cannery was installing a crane. After installation, a rod stop was placed 1.51 feet above the 14.0 mark on the staff - this consisted of a lag driven into the deck planking of the pier. As the harbor is secluded at low water, 3 hour observations were conducted at high water.

Installation levels were run to 5 historic marks on June 4, 1979. As it took time to effectively get the gage on-line a check level was run to the closest mark (B.M. No. 9, 1973) to the rod stop. A small difference showed the stop to be lower than before by 1 cm. However, during the rerun - a cement truck and the new crane were both on the small pier. This suggests that the stop could only be depressed by the excess weight.

The gage went "on-line" on June 12, 1979. Removal levels were run on August 15, 1979 and the gage, itself, was removed on August 15, 1979. All levels were run to Third Order Class One standards.

The following table relates the differences in elevation between marks for installation and removal of gage No. 945-5653:

Bench Marks	June 4, 1979	August 15, 1979
(a) B.M. No. 9 1973	* +0.533	+0.537
B.M. No. 9-B.M. No. 8 1973	-0.507	Destroyed (B.M.8)
B.M. No. 8-B.M. No. 7 1973	-0.284	Destroyed (B.M.7)
B.M. No. 7-B.M. No. 6 1973	+1.819	Destroyed (B.M.7)

Midway through the operating period of the Ninilchik gage, it was discovered the 2 of the installation marks had been bulldozed over, making them unusable. Four new marks were installed on July 31, 1979 and levels run to these.

Bench Marks	July 31, 1979	August 15, 1979
(a) 5653C 1979	+0.008 m	+0.007
5653C-5653B 1979	+1.362	+1.364
5653B-5653A 1979	-0.050	-0.049
5653A-5653D 1979	-0.783	-0.785

*This was the check value on June 12, 1979 - upon installation of the gage.

Again, the staff/gage relationship was an average of the 3 hour observations. The gage read 19.3 feet higher than the staff.

T3, Anchor Point, #945-5606

A Bristol Bubbler gage (S/N 73A227) with a 50 foot scale was installed very near the Anchor Point Navigation Light. The gage box was secured by chain to a set of trees near a referenced telephone pole. The installation was finished on July 13, 1979 and the position of the orifice was fixed at latitude 59° 46' 12" N and longitude 151° 52' 42" W. The tubing was anchored by about 2000 feet of cable, fastened with plastic "ty-wraps". The orifice anchor was a trash can filled with cement with the orifice being steel-banded to a piece of angle-iron, imbedded in the cement. There was no possible location for a tide staff, so levels were run from a reference point (equivalent staff stop) to the waters edge. During installation of the gage, RAINIER personnel encountered the same "sprocket-jump" problem. The initial chart drive component was replaced with the serial number mentioned above.

Installation levels were run to 6 historic bench marks that surround the Anchor Point Light, on July 12, 1979. The marks were located on the bluff with the light and were referenced to the cement reference point (staff stop) on the beach. This stop was given an arbitrary value of 100 feet in order to obtain positive observation values to compare with the gage. Removal levels were run to the same 6 marks on August 15, 1979. All levels were run to Third Order Class One standards.

The following table relates the differences in elevation between marks for installation and removal of gage number 945-5606:

Bench Marks	July 12, 1979	August 15, 1979
(a) - 5606E 1977	+4.490 m	+4.490 m
5606E 1977-BM 5 1973	+0.160	+0.160
BM 5-BM 4 1973	-0.083	-0.082
BM 4-BM 7 1973	-0.431	-0.430
BM 7-BM 6 1973	+0.077	+0.077
BM 6-BM 8 1973	-0.048	-0.048

For the information of Rockville Tides Branch, an attempt was made to use a 40 foot "Tide Monster" platform to support an ADR tide gage. The currents, floating seaweed and a storm proved to be too much for the structure. RAINIER was forced to use Bubbler gages in all three locations.

A gage/staff comparison was obtained by running levels from the reference mark (on beach) to the estimated waters edge. The staff read 65.4 feet higher than the gage. The reference mark was given an arbitrary value of 100 feet (i.e. water levels were consistently below the reference mark).

The Anchor Point gage suffered a 2½ day lapse in data due to local vandalism. An inshore piece of tubing and cable was stolen (cut) on Julian Day 202 (July 20).

The following table compares the correctors (Rockville's suggested ones) used in the field versus those obtained directly from the Anchor Point Gage:

Date (J.D.)	Anchor Point Values			*Predicted Values		
	Time High	Time Low	Range	Time High	Time Low	Range
8/5/79 (217)	2350 (28.3) 1315 (27.1)	0630 (10.7) 1840 (14.5)	17.6	2345 (17.2) 1304 (15.8)	0638 (-0.1) 1843 (3.8)	17.3
8/8/79 (220)	0215 (32.5) 1520 (31.8)	0845 (6.1) 2100 (10.0)	26.4	0223 (21.5) 1517 (20.4)	0856 (-4.7) 2111 (-0.7)	26.2
8/12/79 (224)	0540 (30.3) 1820 (31.1)	1151 (9.4) 0020 (10.7)	21.7	0538 (19.6) 1810 (20.0)	1152 (-1.6) 0027 (-0.4)	21.6

All times are local, (corrected for daylight savings) as seen in the Tide Tables.

Predicted Correctors used: High = +30 Minutes
Low = +36 Minutes
Ratio= 1.00

*These correctors were not used by field personnel as our southernmost boatsheet did not encompass the Anchor Point gage. Instead, the correctors were taken from the Preliminary Tidal Zoning Sheet (Quadrangles) given to us by Rockville.

Also, no comparisons were made with the Sisters Gage as it was too far north to make a comparison feasible.

The following table compares the field correctors used by RAINIER versus the actual data obtained from the Ninilchik Tide gage site. All correctors are referenced to the Seldovia Primary Gage:

Date (J.D.)	Ninilchik Values				*Predicted Values			
	Time High		Time Low	Range	Time High		Time Low	+Range
8/5/79 (217)	0005Z	(26.7)	0710 (7.7)	19.0	0007	(17.2)	0704 (-0.1)	18.0
	1330	(25.9)	1905 (12.2)		1326	(15.8)	1909 (3.8)	
8/8/79 (220)	0245	(31.3)	0930 (3.1)	28.2	0245	(21.5)	0922 (-4.7)	26.8
	1545	(30.7)	2140 (7.7)		1539	(20.4)	2137 (-0.7)	
8/12/79 (224)	0605	(29.4)	1220 (6.7)	23.6	0600	(19.6)	1218 (-1.6)	22.5
	1830	(30.3)	0100 (8.3)		1832	(20.0)	0053 (-0.4)	

+-Range = Range x 1.04

Predicted Correctors used: High = +52 Minutes
Low = +62 Minutes
Ratio= 1.04

*These correctors are an average of those used for RA-20-1B-79 and RA-20-2A-79. This was done because the gage site is half-way between the correctors. (Junction of the surveys).

GENERAL REMARKS

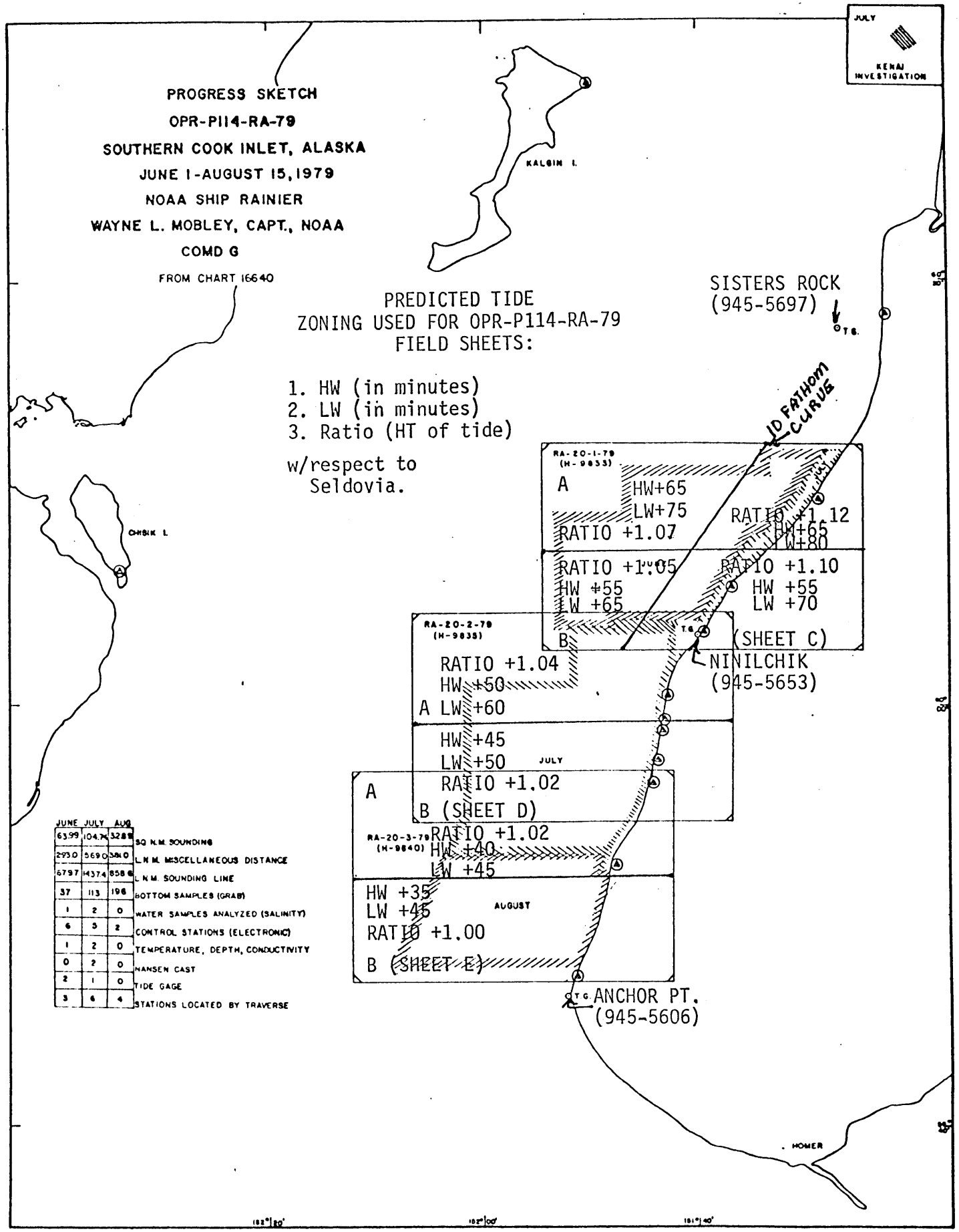
It should be noted that several gages had broken (sproket problems) chart drive mechanisms and others had bad gasline systems (possibly from silicone oil in the needle valve). In the case of the latter, it became difficult to adjust the bubbler rate - i.e. only full stream or nothing. Hence, RAINIER personnel combined parts of various gages to make working combinations. The serial numbers listed are the longest running systems and the number is that of the chart drive mechanism.

RECOMMENDED ZONING

RAINIER experienced good agreement between crossline, rising/falling mainscheme and development soundings using the correctors developed at the start of the project. Field tide records obtained from both the Sisters Rock and Ninilchik gages were compared with a contoured (ranges & times) preliminary tidal zoning sheet furnished by Rockville. There were only slight differences which were used to adjust the contours. Zone correctors were scaled at the middle of each of the areas shown in the attached sketch so as to minimize any errors that could be caused by tides at sheet junctions. RA-20-1-79 was divided in four sections: East and

west as divided by the 10 fathom curve and north and south by the designated "A" and "B" sheets. This zoning and these correctors worked well for RAINIER and it is recommended they be used for final processing of OPR-P114-RA-79.

The surveys were conducted in such a manner that discrepancies in tides will be accented between sounding lines at crosslines and junctions.


JULY
KENAI INVESTIGATION
PROGRESS SKETCH
OPR-P114-RA-79
SOUTHERN COOK INLET, ALASKA
JUNE 1-AUGUST 15, 1979
NOAA SHIP RAINIER
WAYNE L. MOBLEY, CAPT., NOAA
COMD G
FROM CHART 16640
KALGIN I.
OHBIK I.
HOMER
PREDICTED TIDE
ZONING USED FOR OPR-P114-RA-79
FIELD SHEETS:
1. HW (in minutes)
2. LW (in minutes)
3. Ratio (HT of tide)
w/respect to
Seldovia.
SISTERS ROCK
(945-5697)
10 FATHOM CURVE
RA-20-1-79
(H-9833)
A
HW+65
LW+75
RATIO +1.07
RATIO +1.12
HW+65
LW+80
RATIO +1.05
HW +55
LW +65
RATIO +1.10
HW +55
LW +70
B
(SHEET C)
RA-20-2-79
(H-9835)
RATIO +1.04
HW +50
A LW +60
HW +45
LW +50
JULY
A
RATIO +1.02
B (SHEET D)
RA-20-3-79
(H-9840)
RATIO +1.02
HW +40
LW +45
HW +35
LW +45
AUGUST
RATIO +1.00
B (SHEET E)
NINILCHIK
(945-5653)
ANCHOR PT.
(945-5606)
JUNE JULY AUG
63.99 104.7 32.8 SQ N.M. SOUNDING
293.0 569.0 381.0 L N.M. MISCELLANEOUS DISTANCE
679.7 1437.4 858.6 L N.M. SOUNDING LINE
37 113 196 BOTTOM SAMPLES (GRAB)
1 2 0 WATER SAMPLES ANALYZED (SALINITY)
6 3 2 CONTROL STATIONS (ELECTRONIC)
1 2 0 TEMPERATURE, DEPTH, CONDUCTIVITY
0 2 0 NANSEN CAST
2 1 0 TIDE GAGE
3 6 4 STATIONS LOCATED BY TRAVERSE
152°30'
152°00'
151°30'

April 9, 1980

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): 945-5653 Ninilchik Harbor, AK

Period: June 19 - August 2, 1979

HYDROGRAPHIC SHEET: H-9833

OPR: P114

Locality: Lower Cook Inlet, Alaska

Plane of reference (mean lower low water): 8.7 ft.

Height of Mean High Water above Plane of Reference is
18.4 ft. - Ninilchik

REMARKS: Recommended zoning:

(A). South of 60°07'
1. West of 151°46' apply range ratio x 0.96
2. East of 151°46' zone direct.

(B). North of 60°07'
1. West of 151°46' apply +15 minute time correction and range ratio x 0.96
2. East of 151°46' apply +15 minute time correction.

Chief, Datums and Information Branch

APPROVAL SHEET

DESCRIPTIVE REPORT TO ACCOMPANY

HYDROGRAPHIC SURVEY

H-9833

RA-20-1-79

In producing this sheet, standard procedures were observed in accordance with the Hydrographic Manual, PMC OPORDER, and the Instruction Manual for Automated Hydrographic Surveys. The data was examined daily during the execution of the survey.

The boatsheet and accompanying records have been examined and are complete and adequate for charting purposes and are approved.

for Wayne L. Mobley
Captain NOAA

NOAA FORM 76-155
(11-72)

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

SURVEY NUMBER

H-9833

GEOGRAPHIC NAMES

Name on Survey	A ON CHART NO. 16640	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	
COOK INLET	X									1
NINILCHIK										2
~~NINILCHIK POINT~~										3
										4
										5
										6
										7
										8
										9
										10
										11
										12
										13
										14
										15
					Approved:					16
										17
					Chief Geographer - C3x5					18
										19
					13 April 1981					20
										21
										22
										23
										24
										25

NOAA FORM 76-155 SUPERSEDES C&GS 197

APPROVAL SHEET

FOR

SURVEY H-9833

A. All revisions and additions made on the smooth sheet during verification have been entered in the magnetic tape records for this survey. A new final position print-out has been made. A new final sounding print-out has been made.

B. The verified smooth sheet has been inspected, is complete, and meets the requirements of the Hydrographic Manual. Exceptions are listed in the verifier's report.

Date: 12/9/80

Signed: [signature]

Title: Chief, Verification Branch

NOAA FORM 77-27 (5-77) | U. S. DEPARTMENT OF COMMERCE NOAA | HYDROGRAPHIC SURVEY NUMBER

HYDROGRAPHIC SURVEY STATISTICS

H-9833

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

RECORD DESCRIPTION	AMOUNT	RECORD DESCRIPTION	AMOUNT
SMOOTH SHEET	1	BOAT SHEETS & PRELIMINARY OVERLAYS 3 11	14
DESCRIPTIVE REPORT	1	SMOOTH OVERLAYS: POS. ARC, EXCESS	12

DESCRIPTION	DEPTH RECORDS	HORIZ. CONT. RECORDS	PRINTOUTS	TAPE ROLLS	PUNCHED CARDS	ABSTRACTS/ SOURCE DOCUMENTS
ENVELOPES						
CAHIERS	3 With raw printouts					
VOLUMES						
BOXES						

T-SHEET PRINTS (List) TP-00795, TP-00796, TP-00797

SPECIAL REPORTS (List) 2-Contour plot, 1-Sounding analysis plot, 1-Tide plot

OFFICE PROCESSING ACTIVITIES

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

PROCESSING ACTIVITY	AMOUNTS PRE-VERIFICATION	AMOUNTS VERIFICATION	AMOUNTS TOTALS
POSITIONS ON SHEET			
POSITIONS CHECKED		3697	3697
POSITIONS REVISED		8745	
SOUNDINGS REVISED		555	555
SOUNDINGS ERRONEOUSLY SPACED			
SIGNALS (CONTROL) ERRONEOUSLY PLOTTED			
	TIME – HOURS		
CRITIQUE OF FIELD DATA PACKAGE (PRE-VERIFICATION)	10		
VERIFICATION OF CONTROL		8	
VERIFICATION OF POSITIONS		139	
VERIFICATION OF SOUNDINGS		103	
COMPILATION OF SMOOTH SHEET		24	
APPLICATION OF TOPOGRAPHY		24	
APPLICATION OF PHOTOBATHYMETRY			
JUNCTIONS		8	
COMPARISON WITH PRIOR SURVEYS & CHARTS		24	
VERIFIER'S REPORT		19	
OTHER		20	
TOTALS	10	369	379

Pre-Verification by James S. Green	*Beginning Date* March 6, 1980	*Ending Date* March 6, 1980
Verification by Gordon E. Kay	*Beginning Date* April 14, 1980	*Ending Date* Nov. 20, 1980
Verification Check by A. E. Eichelberger, James S. Green	*Time (Hours)* 66	*Date* Nov. 28, 1980
Marine Center Inspection by HIT	*Time (Hours)* 23	*Date* Dec. 23, 1980
Quality Control Inspection by FIP SALISBURY	*Time (Hours)* 109	*Date* 4-13-81
Requirements Evaluation by Stephen J. Kerry	*Time (Hours)* 8	*Date* 1-6-82

Typed 5/8/81 21 hrs

REGISTRY NO. H-9833

The Computer and Excess Sounding Cards for this survey have not been corrected to reflect the changes made to the Computer Card and Excess Card Printouts at this time of the review.

When the cards have been updated to reflect the final results of the survey, the following shall be completed:

CARDS CORRECTED

DATE_____ TIME REQUIRED_____ INITIALS_____

REMARKS:

REGISTRY NO. _____

The magnetic tape containing the data for this survey has not been corrected to reflect the changes made during evaluation and review.

When the magnetic tape has been updated to reflect the final results of the survey, the following shall be completed:

MAGNETIC TAPE CORRECTED

DATE_____ TIME REQUIRED_____ INITIALS_____

REMARKS:

PACIFIC MARINE CENTER
VERIFIER'S REPORT

REGISTRY NO: H-9833 FIELD NO: RA-20-1-79

Alaska, Cook Inlet, Northwest of Ninilchik

SURVEYED: 13 June - 3 August 1979

SCALE: 1:20,000 PROJECT NO: OPR-P114-RA-79

SOUNDINGS: Ross Fineline Fathometer Model 5000

CONTROL: Raydist Range-Range, Miniranger Range-Range

Chief of Party.....CAPT Wayne L. Mobley
Surveyed by.....LT A. Anderson, LTJG M. McCluskey, Cartographer D. Hill, SST R. Hastings
Automated Plot by.....PMC XYNETICS Plotter
Verified by.....Gordon E. Kay 20 November 1980

1. INTRODUCTION

NOAA Ship RAINIER (S221) conducted this basic hydrographic survey of the east side of Cook Inlet, northwest of Ninilchik, Alaska, between June 13, 1979 to August 3, 1979. ✓

Projection parameters used to prepare the field sheet have been revised to center the hydrography on the smooth sheet. Smooth sheet parameters and all correctors used to reduce the soundings by the Pacific Marine Center (PMC) are appended in the smooth printouts. A copy of the tide correctors are in the raw data cahiers. ✓

Field tide reductions are based on Nikishka (945-5760), Alaska predicted tides. See Field Tide Note, Descriptive Report 1979, for an adequate description of tides. Smooth sheet soundings are based on observed tides at Ninilchik Harbor, Alaska (945-5653) at Latitude 60°03'17"N, Longitude 151°40'19.0"W. ✓

There was one non-standard calibration procedure used extensively on this survey, using Motorola Mini-Ranger III to calibrate the Hastings Raydist positioning system. The acceptability of this non-standard calibration method was in question but has since been resolved by an amendment to the PMC OPORDER. (See Ship Descriptive Report, description of daily calibrations.) ✓

2. CONTROL AND SHORELINE

a. See ships Descriptive Report and the Horizontal Control Note for an adequate description of control. ✓

b. The following Class I unreviewed manuscripts were used:

Sheet Number	TP-00795	TP-00796	TP-00797
Date of Photography	July 1975	July 1975	July 1975
Date of Field Edit	Aug. 1978	Jun-July 1979	July-Aug. 1979
Scale	1:20,000	1:20,000	1:5,000

See Ship Descriptive Report paragraph H, Shoreline concerning the rocks that were "not visible on field edit photos and were positioned by the Field Editor at or below MLLW using hydrographic methods." These 180 rocks were put into the hydrographic records as stated but were not deleted from field edit information. So for ease of portrayal, the hydrographic rock information was kept and plotted at PMC with only additional field edit information taken from the Class I manuscripts.

Photo located Signal #301 used for calibration, falls outside the HWL and is not described. Signal 301 is described as a rock in Section F, paragraph 2 of the D.R. See also QC. Report

3. HYDROGRAPHY

a. Main scheme sounding lines and crosslines are in very good agreement. Differences between soundings at points of coincidence are within 0.5 of a fathom in waters five to twenty fathoms deep. In shoaler waters, less than five fathoms, soundings agree within 0.2 of a fathom.

b. Standard depth curves were easily and adequately drawn except for the zero curve in inshore areas. Also portions of the 182 fm curves where 200 meter line spacing compromised their delineation.

c. The hydrography in this survey is adequate to delineate the bottom configuration and determine least depths. Do not concur See Q C Report

d. There are 148 4 bottom samples consisting of grey mud to grey sand with pebbles inshore.

4. CONDITION OF SURVEY

The accompanying overlays and reports adequately conform to the Hydrographic Manual.

5. JUNCTIONS

H-9833 junctions with the following contemporary surveys:

H-8856 1:5,000 (1965) junctions in the southeast corner of H-9833. No problems were encountered in making the junction except the 3 fm. curve. Depth curves and marginal notes have been inked. H-8856 18 ft. curve should be adjusted to agree with updated soundings on H-9833. Do not concur See Q.C. Report

H-9436 1:20,000 (1974) junctions along the northern and western boundary of H-9833. Problems were encountered in making a 20 fathom curve junction. H-9436 was verified at PMC with a whole sounding and

tenths only to 11 fathoms. Presently, soundings at PMC are tenths to 21 fathoms. This produced wide separation in the junction area. H-9833 20 fathom curve in this area has been dashed at the 20.X fathom area to affect a junction. Marginal notes have been inked. This technique provides for a more conservative approach. *Do not concur See Q.C. Report*

The 10 fathom curve at Latitude 60°11.7'N, Longitude 151°35.0'W on H-9436, previously submitted, should be adjusted to the updated and shoaler soundings on H-9833. *This portion of H-9436 was superseded during Q.C.I.*

H-9776 1:20,000 (1978) junctions to the western side of H-9833. No problems were encountered in making the junction. Depth curves and marginal notes have been inked. ✓

H-9777 1:20,000 (1978) junctions to the northeast corner of H-9833. No problems were encountered in making the junction. Depth curves and marginal notes have been inked. ✓

H-9835 1:20,000 (1979) junctions along the southern boundary of H-9833. No junction has been made due to the stage of processing. Depth curves and marginal notes are in pencil. *(not in office 4-2-81)*

See ships Descriptive Report, Section J for a very good quantitative analysis of the junction areas. *Quantitative analysis furnishes very little useful information.*

6. COMPARISON WITH PRIOR SURVEYS

H-9833 was compared with the following prior surveys:

~~H-3196 (1910) 1:40,000~~ *falls outside the limits of the present survey.*
H-3205 (1910) 1:40,000
H-3206 (1910) 1:120,000

H-3196 falls within the extreme northeast limits of H-9833, in depths shoaler than six fathoms. H-3196 is a foot survey, but with a conversion to fathoms for comparison purposes. Soundings agree within .4 fathoms. Due to age, datum shifts, data acquisition techniques, and the changeable nature of the bottom configuration in this area (Cook Inlet), it is recommended that the present survey H-9833 supersede H-3196 over their common areas. *Do not concur. H-3196 sdgs are outside the limits of the present survey.*

H-3205 falls on H-9833 inshore of the 10 fathom curve in depths ranging from .5 fathoms to 10 fathoms. Soundings agree very well with differences of .5 fathoms shoaler on H-9833. Due to age, datum shift, data acquisition technique, and the changeable nature of the bottom configuration in this area (Cook Inlet), it is recommended that the present survey H-9833 supersede H-3205 over their common areas. *A few shoal sdgs & several rocks awash were brought fwd. during Q.C.I.*
With the addition of forwarded items H-9833 supersedes H-3205.
H-3206 falls on H-9833 offshore of the 10 fathom curve in depths ranging from 10 fathoms to 23 fathoms. Sounding in this range (10-23) compare well with differences of up to 1 fathom deeper on H-9833, with

the following exceptions noted:

A . 14 fathom sounding at Latitude 60°07'45"N, Longitude 151°48'15"W. This sounding is 6 fathoms shoaler than on the present survey H-9833, which has depths of 20 fathoms in this locale.

Disregard these sdgs. They were acquired with the Bassnett tube and are considered unreliable. JPS

B . 16 fathom at Latitude 60°08'15"N, Longitude 151°45'45"W. This sounding is 4 fathoms shoaler than on the present survey H-9833, which has depths of 20 fathoms at this locale.

C . 21 fathom at Latitude 60°10'40"N, Longitude 151°46'40"W. This sounding is 4 fathoms deeper than on the present survey H-9833, which has depths of 17 fathoms at this locale.
Due to age, datum shift, data acquisition techniques, and the changeable nature of the bottom configuration in this area (Cook Inlet), it is recommended that the present survey H-9833 supersede H-3206 over their common areas. concur JPS

There are two pre-survey review (PSR) items on H-9833, one numbered PSR and one unnumbered.

PSR #3 a P.A. wreck at Latitude 60°08.5'N, Longitude 151°39.5'W. An intense search was made by the RAINIER and a shoalest sounding (6.9 fms) obtained at position number 4455, Latitide 60°08'26.53"N, Longitude 151°39'21.77"W. Use a 6.9WK notation at this location instead of the "mean" fix data point with the letters "PA" as recommended in Section K of the Descriptive Report.

Disregard, see amended recommendation in section K of the Desc. Report.

PSR unnumbered 4 1/4 fathom sounding charted at Latitude 60°04.5'N, Longitude 151°45.0'W. No search of the area was made but main scheme lines over the area yields a 4.6 fathom sounding at position number 6779/2 at Latitude 60°04'31.17"N, Longitude 151°45'01.17"W. The 4 1/4 fathom sounding comes from H-3205 (1910) 1:40,000. ~~It is the opinion of Verification that the shoal has migrated northeastward and that the above 4.6 supersede the 4 1/4 fathom sounding (see section 6 Verifier's Report H-3205).~~ The minimum depth on the shoal is 3.6 at Latitude 60°05.~~11.83~~33'N and Longitude 151°~~44'06.14"W~~43.93'W, ~~position number 7133/8.~~

Retain the 4¼ fm sdg as charted

7. COMPARISON WITH CHART
16640, 15th Edition, November 1976

Hydrography

Soundings generally agree but do vary between 4 fathoms shoaler to 6 fathoms deeper. This variation is attributed to the changing bottom configuration of a sandy bottom and sand wave movements. The charted soundings originate from the prior surveys and are adequately described in section 6 of the Verifier's Report, also see enclosed chartlet. *A comparison with the shoreline is impossible due to distortion of enlargements used. The Verification Branch concurs with the recommendation in the Descriptive Report, ...

unreliable tube sdgs in 14 to 20 fm depths are considered the principal reason for conflict. Bottom change is considered secondary

* The shoreline north of lat 60°06'N has undergone extensive erosion. A maximum S.L. recession of 200 meters is found in the vicinity of lat 60°12'N.

"that charted rocks plotting in the vicinity of an edited rock be moved to the edited location, and charted rocks that do not lie near an edited rock should be retained in charted position." Do not concur. See O.C. Report

b. Aids to Navigation

There is one fixed aid (Ninilchik Entrance Light 1) that fall within the sheet limits of H-9833. (This aid does not fall within the hydrography limits.) The charted position of this aid adequately marks the feature intended. concur

8. COMPLIANCE WITH INSTRUCTIONS

H-9833 complies with the following project instruction and changes:

Project Instructions OPR-P114-RA,FA-79 Cook Inlet, Alaska, March 2, 1979.
Change No. 1, Supplement to Instructions, March 30, 1979.
Change No. 2, Amendment to Instructions, March 29, 1979.
Change No. 3. Amendment to Instructions, July 18, 1979
Change No. 4, Amendment to Instructions, August 6, 1979

9. ADDITIONAL FIELD WORK

With the addition of items carried fwd from H-3205 (1910)
H-9833 is a good basic hydrographic survey and requires no additional field work at this time.

Respectfully submitted,

Gordon E. Kay

Gordon E. Kay
Cartographic Technician
November 20, 1980

Examined and approved

James S. Green
Chief, Verification Branch

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

December 23, 1980 OA/CPM3/JWC

TO: OA/CPM - Charles K. Townsend

FROM: OA/CPM3 - John W. Carpenter JWC

SUBJECT: PMC Hydrographic Inspection Team Report for Survey H-9833

This survey is a basic hydrographic survey of Northwest of Ninilchik, Cook Inlet, Alaska. This survey was conducted by NOAA Ship RAINIER in 1979 in accordance with Project Instructions OPR-P114-RA-79, dated March 2, 1979; Change No. 1, Supplement to Instructions, dated March 30, 1979; Change No. 2, Amendment to Instructions, dated March 29, 1979; Change No. 3, Amendment to Instructions, dated July 18, 1979; ~~and Change No. 4, Amendment to Instructions, dated August 6, 1979.~~ (after date of survey)

The following items were noted:

1. Mini-Ranger III was utilized in some of the calibrations for the Raydist control. Using such a method is an innovative way to expand our hydrography competence. However, it clearly points out the necessity of clearly integrating such procedures with the PMC OPORDER.

2. Approximately 180 rocks on this sheet were located using hydrographic methods since they were not visible on field edit photos. Flying areas such as Cook Inlet at a minus tide would facilitate the photogrammetric location of such rocks. Strongly endorse this idea. JPS

3. The verifier's conclusion on the wreck notation for PSR #3 is in compliance with the specified instruction for the item. Do not concur. Chart the wrecks as shown on the present survey

4. The Field Edit Note stated a discrepancy in levels run at the Sister's Rock location and that the operational time limitation precluded the rerunning of the levels. This points out the necessity of completing computations and resolving problems before leaving the area of operations.

With the addition of items carried fwd from H-3205 (1910) & the retention of the charted well (4½ fms) in lat 60°12.22'N long 151°31.50'W

The inspection team finds H-9833 to be a basic survey adequate to supersede common areas of prior surveys and charted hydrography.

Administrative approval is recommended.

John W. Carpenter

James W. Wintermyre

James W. Steensland

Stanley H. Otsubo

ADMINISTRATIVE APPROVAL

The smooth sheet and reports of this survey have been examined and the survey is adequate for charting and to supersede common areas of prior surveys.

Charles K. Townsend

Charles K. Townsend, RADM
Director
Pacific Marine Center

12/30/90
Date

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SURVEY
Rockville, Md. 20852

OA/C352:FPS

April 13, 1981

TO: Glen R. Schaefer
Chief, Hydrographic Surveys Division

THRU: Chief, Quality Control Branch

FROM: F. P. Saulsbury
Quality Evaluator

SUBJECT: Quality Control Report for H-9833 (1979), Alaska, Cook Inlet, North of Ninilchik

A quality control inspection of H-9833 was accomplished to monitor the survey for adequacy with respect to data acquisition, delineation of the bottom, determination of least depths, navigational hazards, junctions, sounding line crossings, shoreline transfer, smooth plotting, decisions and actions taken by the verifier, and the cartographic presentation of data. In general, it was found to conform to the National Ocean Survey's standards and requirements except as stated in the Verifier's Report, the HIT Report, and as follows:

1. The following is excerpted from the Descriptive Report of H-3205 (1910) and is considered just as valid today as it was in 1910.

"North of Cape Ninilchik the coast is very foul and should not be approached closer than two miles. Immense boulders, on which no kelp grow, were found along the entire stretch of the coast from one half to one mile from the shore. These boulders are generally of small area and rest apparently on comparatively flat bottom, so that soundings in the near vicinity give no indication of their presence. From the appearance of those found and from the soundings taken alongside of them it seems probable that there are many more in the deeper water than this party found."

In this area general line spacing of 200 meters on the present survey is considered inadequate to ascertain that all dangerous sunken rocks have been located. Presently, wire drag may be the only surveying method that would provide adequate coverage of all dangerous rocks within this area. In view of the likelihood of the existence of unsurveyed rocks, it is recommended that a note be charted to caution the mariner of uncharted dangerous sunken rocks that may exist offshore of the HWL to depths of 4 fathoms.

2. Section L of the Descriptive Report recommends, ". . . that charted rocks plotting in the vicinity of an edited rock be moved to the edited location.

Charted rocks that do not lie near an edited rock should be retained in charted location." This statement is considered too general and necessitated an office interpretation as to how the words "vicinity" and "near" could be used in determining whether charted offshore rocks should be retained. Verification's interpretation is that all charted rocks, even those as distant as 200 meters, were near or in the vicinity and no charted rocks were carried forward to the present survey from their original source. During quality control inspection, charted rocks approximately 100 to 200 meters distant from field edited rocks were carried forward to the present survey from the original source.

Specific comments should be made concerning the existence of charted hazards to navigation by the hydrographer so as to ensure an accurate portrayal of the area for use in charting.

3. Foreshore characteristics charted in the vicinity of latitude 60°07.45'N, longitude151°33.60'W and latitude 60°06.10'N, longitude 151°36.50'W depicted by black solid elliptical shapes are considered to originate with the term Boulders as noted on H-3205 (1910). These shapes appear on the first printing of the chart from the early 1900's and reflect past cartographic practices used to symbolize areas strewn with rocks and boulders which were labeled accordingly on the surveys. The hydrographer made no specific mention of these symbols and no bare rocks are shown on the contemporary topographic survey in these areas. It is recommended that the marks be expunged from the chart and the areas charted as shown on the present survey.

4. The Well (4 1/2 fathoms) charted from Local Notice to Mariners, Special, of January 19, 1968, in latitude 60°12'17"N, longitude 151°31'32"W was not investigated on the present survey and should be retained as charted.

5. The area charted as uncovered at MLLW in the vicinity of latitude 60°04.75'N, longitude 151°40.85'W originates with a rocky shoal noted to "bare at low water" on H-3205 (1910). This feature probably consists of a rock base which is covered by sandy sediments at its ends. Present soundings show the area to be covered at MLLW. The least depth over the shoal is 0.2 fathom about 0.4 mile southwestward in latitude 60°04.44'N, longitude 151°41.23'W. Chart the area as shown on the present survey.

6. The shoreline north of latitude 60°06'N, consisting of bluffs, is undergoing continual erosion. The chart comparison reveals maximum recession of about 200 meters in the northern extremities of the survey.

7. Signal 203, falling offshore of the HWL, in latitude 60°05.90'N, longitude 151°37.08'W was not entered in the station list nor plotted on the smooth sheet during verification since the signal was not used for control. It is described on the field sheet as a rock; however, no elevation is furnished. This feature does not appear on the contemporary topographic survey, and therefore is considered to uncover at MLLW. The rock was transferred to the smooth sheet during quality control inspection as a rock awash at the position shown on the field sheet.

8. Signal 301, falling offshore of the HWL, in latitude 60°09.04'N, longitude 151°30.70'W was simply described as a rock in the survey records. Since this rock is not shown on the contemporary topographic survey, it is considered to uncover at MLLW. A rock awash symbol, at the position of the signal, plus a description "rock" were added during quality control inspection.

9. In the junction on the southeast with H-8856 (1965) some conflicts in depths were noted on the shoal in the vicinity of latitude 60°04.40'N, longitude 151°41.30'W. These differences are attributed to bottom change. The shoal is building in a southwesterly direction so that present depths in the southern part of the rise are now as much as 1 fathom shoaler than counterpart depths on H-8856. A partial butt junction was made during quality control inspection to supersede the earlier depths in this area. Depths are in agreement and curves are coincidental in the remaining area of overlap.

10. In the junctional area on the north with H-9436 (1974) depths are in general agreement except in the vicinity of latitude 60°11.50'N, longitude 151°35.00'W. Here, depths on the present survey are 1 fathom shoaler. These differences are attributed to bottom change. A partial butt junction was made during quality control to supersede the earlier depths in this area.

11. Sunken rocks, with reliable survey depths, covered 3 feet or more at MLLW, are not shown on the present survey as prescribed by the Hydrographic Manual. A sounding augmented by Rk in slanted lettering should have been shown instead of a sunken rock symbol described by the depth of water in feet the rock is covered at MLLW. Since this information is clear with no danger of misinterpretation, it was not revised during quality control inspection.

12. The two rocks awash, PA, on the present survey in the vicinity of latitude 60°12.0'N, longitude 151°28.2'W, originate with TP-00795. In this instance, these features are not identified on the Class III photogrammetric manuscripts but are only depicted by prick marks on the field photos. Therefore, due to a lack of positive control, an accurate plot of these rocks cannot be provided. This method of positioning important features is considered inadequate.

cc:
OA/C351

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SURVEY
Rockville, Md. 20852

APR 5 1982

OA/C351:SJV

TO: OA/CPM - Charles K. Townsend

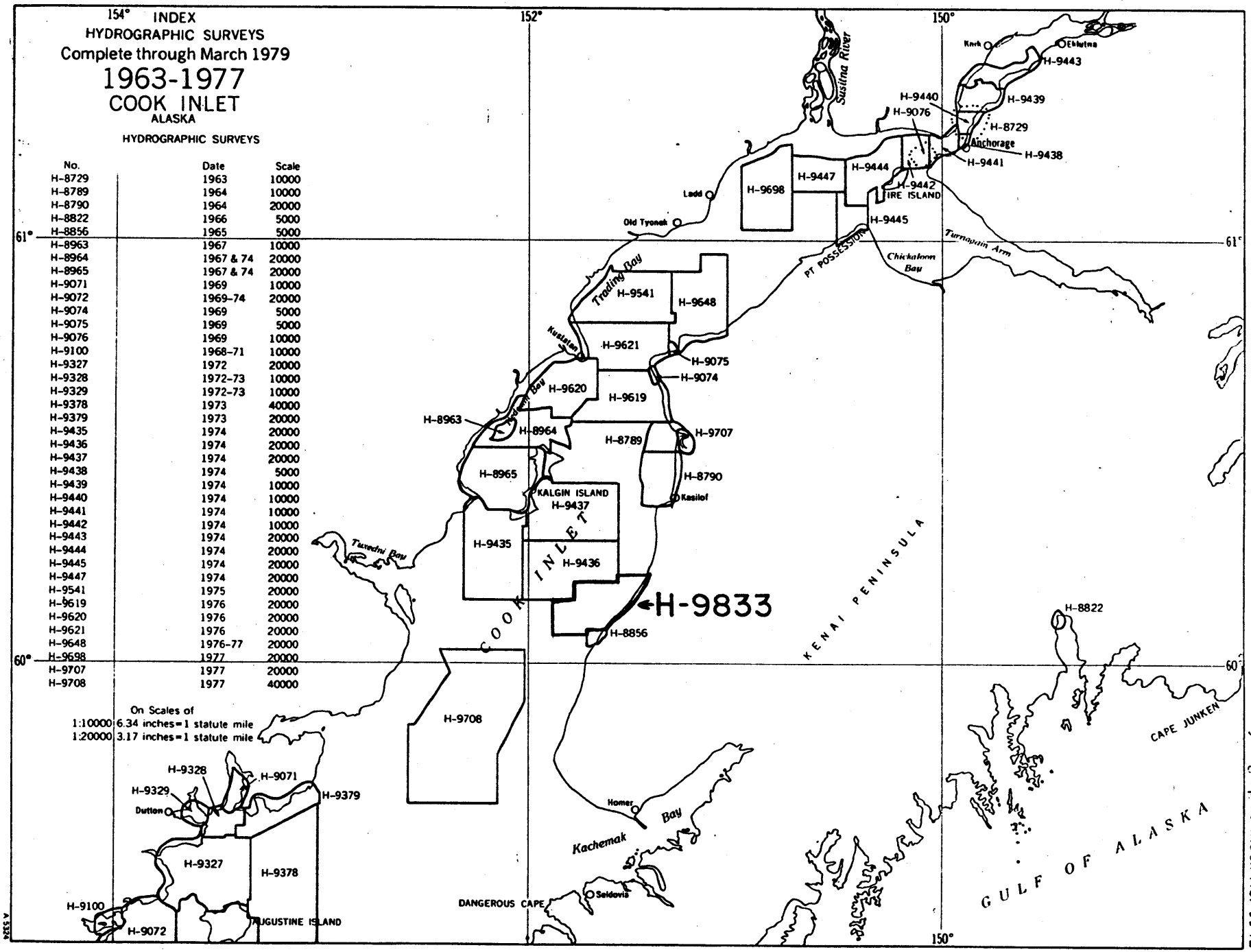
FROM: OA/C3 - Roger F. Lanier

SUBJECT: H-9833 (1979), Alaska, Cook Inlet, North of Ninilchik, Report of Compliance with Project Instructions

The smooth sheet and Descriptive Report for the subject survey have been examined. This survey, except as noted in the Quality Control Report, dated April 13, 1981 (copy attached), and the Hydrographic Survey Inspection Team Report, dated December 23, 1980, is complete and adequate for the purposes intended and is in compliance with Project Instructions OPR-P114-RA, FA-1979, dated March 2, 1979.

Attachment

cc:
OA/C352 w/o att.



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

Hydrographic Index No. 114E

FORM C&GS-8352
(3-25-63)

NAUTICAL CHART DIVISION

RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H-9833

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
1613	5/14/82	R Lachance	Full ~~Part~~ Before After Verification Review Inspection Signed Via
			Drawing No. Fully Appl'd Hydro through Chart 16640
16660	5/26/82	CA Swithick	~~Full~~ Part Before After Verification Review Inspection Signed Via
			Drawing No. 26 PART APPD THRU CHT 16640
16640	5/13/82	R Lachance	Full ~~Part Before~~ After ~~Verification Review~~ Inspection Signed Via
			Drawing No. 21 Fully Appl'd Hydro
500	7/1/82	R Lachance	~~Full~~ PART ~~Part Before~~ After ~~Verification Review~~ QC Inspection Signed Via
			Drawing No. Examined for Critical Corr, None Applied
531	1-20-83	M. Sager	Full ~~Part Before~~ After ~~Verification Review~~ QC Inspection Signed Via
			Drawing No. 18. No application required - area cleared
			consider fully applied.
500	1-20-83	M. Sager	Full ~~Part Before~~ After ~~Verification Review~~ QC Inspection Signed Via
			Drawing No. 5 Fully applied thru chart 16013
			drwg. #27 NC
16660	1/28/83	J. Bailey	Full ~~Part Before~~ After ~~Verification Review~~ Inspection Signed Via
			Drawing No. 26 App'd. thru Drwg. AID PROOF
			16640 # 21 X-Drwg.
16661	8-24-84	Roy A Edmonds	Full [redacted] After Verification Review Inspection Signed Via
			Drawing No. 1
			Full Part Before After Verification Review Inspection Signed Via
			Drawing No.
			Full Part Before After Verification Review Inspection Signed Via
			Drawing No.

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