9835

Diagram 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-20-2-79

Office No. H-9835

LOCALITY

State Alaska

General Locality Cook Inlet

Locality Southwest of Cape Ninilchik

1979

CHIEF OF PARTY
Captain W.L.Mobley

LIBRARY & ARCHIVES

DATE April 6, 1982

☆U.S. GOV. PRINTING OFFICE: 1980—668-537

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CHART
16640 INSET
16013
1500

To sign off see record of application

NOAA FORM 77-28 (11-72)

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

REGISTER NO.

H-9835

HYDROGRAPHIC TITLE SHEET

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-20-2-79

State ALASKA

General locality COOK INLET

Locality SOUTHWEST OF CAPE NINILCHIK

Scale 1:20,000 Date of survey 7/11/79 - 8/15/79

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

Vessel NOAA Ship RAINIER S221, RA-3 (2123), RA-5 (2125), RA-6 (2126)

Chief of party Capt. Wayne L. Mobley

Surveyed by Lt. Alan Anderson, LT. (JG) Michael McCluskey, Lt. (JG) Bruce Hillard
Sst. Richard L. Hastings, Cart. Dennis J. Hill

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

Graphic record scaled by RAINIER Survey Department

Graphic record checked by RAINIER Survey Department

Positions ~~Protracted~~ by Thelma O. Jones Automated plot by PMC Xynetics Plotter

Sounding Verification by Thelma O. Jones

Soundings in fathoms feet at MLW MLLW (and Tenths of fathoms)

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

Time Meridian 0° (GMT)

Misc. data culled from the D.R. are filed with the survey records.

STANDARDS CK'D 1-20-84

C. Loy

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

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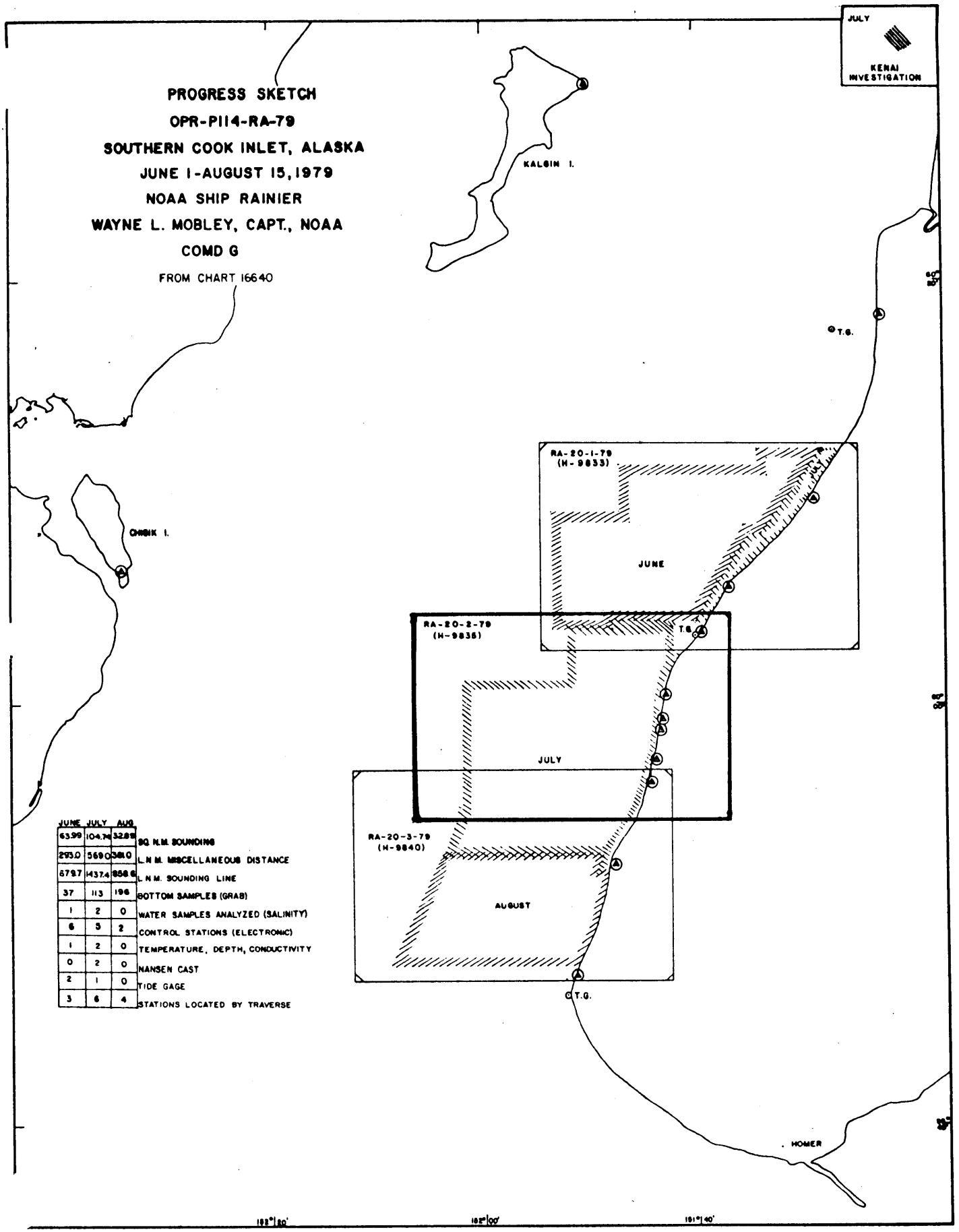


JUNE	JULY	AUG	
63.98	104.76	32.85	SQ. N.M. SOUNDING
293.0	569.0	381.0	L.N.M. MISCELLANEOUS DISTANCE
679.7	1437.4	858.6	L.N.M. SOUNDING LINE
37	113	196	BOTTOM SAMPLES (GRAB)
1	2	0	WATER SAMPLES ANALYZED (SALINITY)
6	3	2	CONTROL STATIONS (ELECTRONIC)
1	2	0	TEMPERATURE, DEPTH, CONDUCTIVITY
0	2	0	NANSEN CAST
2	1	0	TIDE GAGE
3	6	4	STATIONS LOCATED BY TRAVERSE

A. PROJECT

This survey was conducted in accordance with Project Instructions OPR-P114-RA-79 dated March 2, 1979. It is also in compliance with changes #1-4 to these instructions dated March 30 (#1), March 29 (#2), July 18 (#3), and August 6 (#4).

B. AREA SURVEYED

The irregular shaped area surveyed included that part of lower Cook Inlet bounded by latitude 59° 55' 18" to the south, and 60° 01' 00" to the north. Between these latitudes, the eastern shore of Cook Inlet provided a third boundary and the line of longitude at 152° 02' 00" delineated the western boundary. North of 60° 01' 00" and until reaching latitude 60° 02' 18" the western boundary is the longitude line at 151° 52' 00" and the shoreline remains as the eastern boundary. North of 60° 02' 18" and until reaching the final northern limit at latitude 60° 03' 38" the eastern boundary exists at longitude 151° 42' 18" and the western limit remains at 151° 52' 00".

C. SOUNDING VESSELS

All soundings were obtained with the following RAINIER launches:

Launch	Hull No.
RA-3	1007
RA-6	1013

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 include 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	June 20, 1979 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	July 8, 1979 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	August 5, 1979 - 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 Nortwest 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-P114-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 coplotted 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 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 separate velocity corrector tape was made with zero corrections for this purpose.

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

E. HYDROGRAPHIC SHEETS

Field sheet preparation for this survey was accomplished aboard RAINIER using the PDP 8/e computer (S/N 01015) with a Complot plotter model DP-3 (S/N 5848-18). Rough plots were made on a daily basis and a semi-smooth sounding plot was collated as the work progressed.

Four expansion sheets (three at 1;5,000 scale and one at 1;2,500 scale) were prepared in order to clarify closely spaced soundings in areas of extensive development and the areas covered by these expansions are indicated on the smooth field sheet.

The boat sheets that were used were of standard .003 inch mylar drafting film, had zero skew, and were based on a modified transverse mercator projection.

Velocity, TRA, and predicted tide correctors were applied to all fathometer soundings on the smooth field sheet. All data was transferred to Pacific Marine Center for verification.

F. CONTROL STATIONS

Horizontal control for this survey was provided by the recovery of eight stations from prior surveys and the establishment of nine new control stations. The recorded stations are as follows: Sis 1963, Pt-3 1963, Ninilchik 1908, Deep 1964, Starisky Microwave Tower (center), Lee 1968, Hump 2 1978 Ecc, Red Raydist 1978, E. Kalgin 3 Ecc, Green Raydist Stake 1978. The two Raydist sites were again used as Raydist antenna sites this year. The G.P.'s were obtained from a 1978 descriptive report from the RAINIER for H-9777, RA-20-1-78.

Those new stations that were established are as follows: 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 MiniRanger equipment, and to extend control southward along the eastern shore of the inlet.

All stations were referenced to the North American 1927 Datum. For further information concerning the methods used for this work refer to Horizontal Control Report OPR-P114-RA-79.

Photogrammetrically located signals are plotted on the smooth field sheets. They were however used for field edit only.

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. SEE SEC. I of V.R.

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 thirty-five-foot whip antenna. The station was on a flat hilltop approximately 15.9 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 thirty-five-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 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
111	Ninilchik	2	4708	189-194	M/R & Raydist
		4	1569	199-217	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
115	Miller Time	1	4950	201-222	M/R & Raydist
		3	1570	220-222	Hydro
116	Ninilchik Entrance Lt.	3	1570	214-216	Raydist Hydro
117	Lee	3	1570	217	Raydist Hydro
		4	1569	218-222	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° and 150°. 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" 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 side band station #232 on Chisik Island.
156	Installed green side band 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.
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 be 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. On julian days 218 and 219, interference from an outside source, presumably another non-NOAA MiniRanger system known to be operating north of the survey area with long-range directional antennae, caused very poor and erratic reception of our shore station signals, preventing any hydrography during this period. 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 (Electronic Data Processing no. 2125), and RAINIER launch RA-6 (Electronic Data Processing 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 the project. On a few occasions lane gain/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 system checks 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 average around ten nautical miles which is considerably less than advertised and could normally be expected. This short range occured 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,

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^{o} and 120^{o}) 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 obtained 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 except one this visual system checked 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 four and two 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 main-scheme development and crossline, (plotted using initial baseline correctors), 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) fixes, strong intersections for calibration, and frequent system checks of MiniRanger.

When MiniRanger was used for hydrographic position control, visual calibration 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 5 meters.

All electronic control and calibration for both Raydist and MiniRanger are considered correct and acceptable for controlling hydrography on H-9835. 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 calibration methods a table (Daily Operations 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 this survey was transferred to the preliminary field sheet from Class III manuscripts TP-00796, TP-00797 and TP-00798. The zero fathom curve was established throughout the survey area and indicates that the topographic sheets accurately describe the nature of shoreline contours. Field edit was accomplished between July 11 and August 1979.

Rocks not visible on the field edit photographs were positioned by the field editor using hydrographic methods at or below MLLW.

The data was then transferred to the hydrographic records and deleted from field edit records. An abstract of these rocks is included in the separates. Photo pricked rocks were submitted with field edit records and also plotted approximately on the smooth field sheets in red. Contact was maintained between the field editor and hydrographer to prevent duplication of information.

Some duplicate locations of rocks were noted.

I. CROSSLINES

A total of 77 miles of crosslines were run and this comprises 10.8% of total mainscheme mileage. Crosslines were run at or near periods of low tide, the majority of crosslines occuring between one-half hour before until one-half hour after low water. Excellent agreement is noted between mainscheme and crossline soundings with over 95% of the crossings being within one fathom of agreement. Numerical rounding could account for crossing soundings in over ten fathoms which differ by one fathom. No inconsistencies were noted that warranted a further development of any crossing areas.

J. JUNCTIONS

A total of five junctions with adjacent surveys were evaluated. A junction with contemporary survey H-9840 along the southern edge of this survey area shows good agreement between overlapping soundings with the exception of those that differ by one to two fathoms. These one to two fathom discrepancies are noted as being in an area of extensive sandwave development and are indicative of the shifting nature of the bottom in each area. The western side of this survey area junctions with H-9708 1:40,000, 1977 and H-9776 1:20,000, 1978. Good agreement is noted as over 90% of compared soundings agree to within one fathom. A small number of two to three fathom discrepancies are noted but are not unreasonable in lieu of the high current activity characteristically seen in the area. In all cases the shoaler of any two disagreeing soundings is the sounding from this survey and should be considered the controlling depth for that specific area.

See Sec. 5 of V.R.

Junctions along the northern and northeast sections of our survey area are provided by contemporary survey H-9833 and by H-8856 Again good agreement is noted between overlapping soundings and no gross inconsistencies are noted

A partial butt junction was affected with H-9633 because of sdg. conflict. Also a butt junction was affected with H-8556 because of sdg. conflict. Areas of butt junctions are superseded by the present survey.

K. COMPARISON WITH PRIOR SURVEYS

A comparison was made between the present survey and two prior surveys: H-3205, 1910, 1:40,000 scale and H-3206, 1910, 1:120,000 scale. Generally good agreement is noted between

these and the present survey, with discrepancies of no more than one to two fathoms being noted. Considering the extreme currents of Cook Inlet, these findings are not unreasonable and the present survey (H-9835) is judged adequate to supersede both prior surveys in their entirety. concur

As required by paragraph 4.7 of the project instructions, the following soundings from H-8865 56 were investigated.

Sounding	Latitude	Longitude
10 feet/1.7 fm	60° 02.35'	151° 42.45' (not charted)
15 feet/2.5 fm	60° 02.39'	151° 42.27' (not charted)
14 feet/2.3 fm	60° 02.24'	151° 42.62' (not charted)
13 feet/2.2 fm	60° 02.81'	151° 42.36' (not chtd)

SEE SEC 5, Para. 6 of V.R.

In all cases the investigations found no shoaler soundings. Unless these soundings originated from fathometer traces resembling rocks, it is recommended that they be removed in favor of the slightly deeper soundings found in the area. A blowup of these investigations has been provided.

Do not concur, these sdgs may be depths on rocks and should be considered valid until proven otherwise. They are described in H-8556 D.R. as pinnacles.

The ten, fifteen and thirteen foot soundings have been charted on the 1979 edition of the chart. Similar recommendations have been made concerning these soundings under section L of this report. As stated above, these three sdgs are not charted, have been brought fwd. to the present survey from H-8856 & should be charted.

L. COMPARISON WITH THE CHART

A comparison was made with chart #16640 17th edition, April 7, 1979. The following items are worthy of note:

(1) The twelve fathom sounding, charted from H-3206 (1910), at position 59° 56' 26", 151° 53' 28" on the chart is on the west (NE) slope of the seven and eight fathom shoal that runs diagonally (NE & SW) across the sheet in that area. A more representative sounding would be the seven fathom ones just east of there. The charted isolated rises shown here are shown on the pres. survey as continuous. Chart the area as shown on the pres. survey

(2) The seven fathom sounding plotted on the chart at 59° 55' 30", 151° 53' 27" was not found. It is near an 8.7 fathom sounding on a sand shoal that is shifting. A probable cause of this discrepancy is sediment transported by high current. Delete seven fathom sounding. concur

(3) A 2.3 fathom sounding at 60° 02' 14.0", 151° 42' 37" was not found but a 2.8 fathom sounding is noted at 60° 02' 14.5" 151° 42' 38. Recommend charting of present survey sounding. (lat. 60°02.24'N, long 151°42.62'W)

SEE SEC. 5, Para. 6 of V.R.

Do not concur. The 14 ft. sdg on H-8556 (1964) may be a depth on a rock & is considered valid until proven otherwise. The 14 ft. sdg. is not charted now, but should be charted on the next chart edition.

(10 ft. sdg on H-8856/1964) (10ft. sdg may be depth on rock)

(4) A 1.7 fathom sounding at 60° 02' 21", 151° 42' 27" was not found. The immediate area plots at 2.1 to 3.1 fathoms. Recommend chartjng of present survey sounding. Do not concur SEE SEC. 5 Para 6 of V.R. This sdg, originating with H-8856(1964) & charted out of pos. should be charted in its correct position.

(5) A 2.5 fathom sounding at 60° 02' 23", 151° 42' 16" was not found. The area plots at 2.8 to 3.0 fathoms. Recommend charting of present survey soundings. Do not concur, may be rock 2.5 fm sdg. is considered valid. SEE SEC.5, Para 6 of V.R. (2.5 fm sdg on H8856 (1964) is a 15 ft sdg.)

(6) A 2.5 fathom sounding at 60° 02' 49", 151° 42' 21" was not found. The area plots at 2.8 to 3.0 fathoms. Recommend charting of present survey sounding. Do not concur. The 2.5 fm sdg. from H-8856(1964) is not charted. It may be a depth on a rock & is considered valid. SEE SEC.5 Para 6 of V.R. Given the past earthquake activity in the Cook Inlet area, the high currents, and tremendous amount of sediment transported back and forth each day it is expected that such differences should occur. It is recommended that in all cases the soundings from the present survey supersede the charted soundings. Since some shoal prior survey sdgs may be depths on rocks, they were brought fwd to the pres. survey during QC1.

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-9835 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 the charted location. Original source was available & should have been used in rock investigation.

Two submerged rocks 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-20-2A-79.

M. ADEQUACY OF SURVEY

With the bringing fwd of some shoal sdgs from H-8856 (1964) in the area of a butt junction Survey H-9835 is complete and adequate to supersede all prior surveys in its entirety.

N. AIDS TO NAVIGATION

There are no floating aids to navigation in this survey area. A large antenna located at position 59° 52' 54", 151° 47' 02" is the only fixed aid in the area and its position is correctly noted on chart #16640. Antenna is located on H-9840(1979) SEE SEC. 7, Para. 7 of V.R.

O. STATISTICS

Launch	Linear N.M.	Positions	Bottom Samples
RA-3	469	1699	0
RA-5	0	131	131
RA-6	508	1330	0

P. MISCELLANEOUS

It should be noted that adjacent mainscheme lines were run on alternate tidal cycles. i.e. if one line was run on a rising tide, the lines adjacent were run when the tide was falling. This served as an added check on the accuracy of the predicted tides for the survey area. *This procedure invites trouble!*

Sandwaves were detected in varying heights and concentrations during the completion on this survey. Further development was conducted of these areas, (see expansion sheets). It was not possible to effectively contour the waves because of their size and the line spacing of the development. It is also thought that these waves shift quite readily in the strong currents.

When conditions permitted, the ASI logger on RA-6 was used to collect MiniRanger fixes simultaneously with the hydroplot which was collecting Raydist fixes. This extra data was used to catch Raydist lane jumps and justify keeping the affected hydro. This data was submitted with the printouts in the event that someone in the future would want to analyze the accuracy of the two systems in relation to each other. At other times on the RA-3 launch also MiniRanger rates were periodically taken and recorded on the printouts. This precaution enabled the hydrographer to justify the system calibration before and after lane jumps thus saving a considerable amount of data during this project.

Q. RECOMMENDATIONS

It is recommended that the applicable areas of this survey be charted as sand wave areas. *Deferred to compilation for decision on charting.*

R. DATA PROCESSING PROCEDURES

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

Sounding 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
RK211	RANGE-RANGE NON-REAL TIME PLOT	01/15/76
RK 212	VISUAL STATION TABLE LOAD	04/01/74
RK 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 Control 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,

Michael McCluskey

Michael McCluskey
LTJG, NOAA

APPROVAL SHEET

DESCRIPTIVE REPORT TO ACCOMPANY

HYDROGRAPHIC SURVEY

H-9835

OPR-P114-RA-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 the accompanying records have been examined by me, are considered complete and adequate for charting purposes, and are approved.

Wayne L. Mobley
Captain NOAA
Commanding

RA-20-2-79 (H-9835)

ROCK FIX POSITION #	MEANS OF POSITIONING	PHOTO IDENTIFIABLE	GEOGRAPHIC POSITION	HEIGHT & TIME DATA	CHARTED	RECOMMENDATIONS
0181	VISUAL FIX	NO	60/03/41.646 151/39/49.521	BARE 2 FT. 2055Z, 11 JUL 79	CHART 16640	CHART NEW POSITION
0182	"	"	60/03/40.668 151/39/49.081	BARE 1.0 FT 2056Z, 11 JUL 79	NO	TO BE CHARTED
0183	"	"	60/03/37.734 151/39/48.237	BARE 1.0 FT 2059 11 JUL 79	"	" " "
0184	"	"	60/03/32.426 151/39/54.596	BARE 3 FT 2103Z, 11 JUL 79	"	" " "
0185	"	"	60/03/29.742 151/40/14.938	BARE 2 FT 2020Z, 12 JUL 79	CHART 16640	CHART NEW POSITION
0186	"	"	60/03/16.567 151/40/06.823	BARE 12 FT 2032Z, 12 JUL 79	NO	TO BE CHARTED
0187	"	"	60/03/14.749 151/40/09.171	BARE 10FT 2038Z, 12 JUL 79	"	" " "
0188	"	"	60/03/13.509 151/40/13.718	BARE 4 FT. CLUSTER OF 5 RKS. 20M. DIAM. 2043Z, 12 JULY 79	"	" " "
0189	"	"	60/03/11.542 151/40/28.168	BARE 3 FT. INSHORE FOUL SOUTH THE POINT. 2053Z, 12 JUL 79	CHART 16640	CHART NEW POSITION
0190	"	"	60/03/14.673 151/40/33.798	AWASH. 2102Z, 12 JUL 79	NO	TO BE CHARTED
0191	"	"	60/03/14.928 151/41/13.050	BARES 1.0FT 2112Z, 12 JUL 79	CHART 16640	CHART NEW POSITION
0192	"	"	60/03/06.078 151/41/40.242	BARE 1.0 FT 2119Z, 12 JUL 79	NO	TO BE CHARTED
0193	"	"	60/03/01.632 151/41/46.722	BARES 4 FT 2123Z, 12 JUL 79	CHART 16640	CHART NEW POSITION
0194	"	"	60/02/58.331 151/40/39.112	AWASH. INSHORE SOUTH FOUL. 2132Z, 12 JUL 79	NO	TO BE CHARTED
0195	"	"	60/02/55.353 151/40/52.123	BARE 1 FT. INSHORE SOUTH FOUL. 2140Z, 12 JUL 79	"	" " "
0196	"	"	60/02/53.771 151/40/56.663	BARE 2 FT. INSHORE SOUTH FOUL. 2143Z, 12 JUL 79	CHART 16640	CHART NEW POSITION

RA-20-2-79 (H-9835)

ROCK FIX POSITION #	MEANS OF POSITIONING	PHOTO IDENTIFIABLE	GEOGRAPHIC POSITION	HEIGHT & TIME DATA ROCK	CHARTED	RECOMMENDATIONS
0197	RANGE-AZ	NO	59/59/29.795 151/43/35.685	BARES 2 FT 1857Z, 23 JUL 79	NO	TO BE CHARTED
0198	RANGE-AZ	"	59/59/28.190 151/43/39.578	BARES 3FT 1900Z, 23 JUL 79	CHART 16640	CHART NEW POSITION
0200	"	"	59/58/53.542 151/43/39.459	BARE 2FT 1906Z, 23 JUL 79	"	" " "
0201	"	"	59/58/52.851 151/43/36.593	BARE 4FT 1908Z, 23 JUL 79	NO	TO BE CHARTED
0202	"	"	59/58/45.712 151/43/40.113	BARE 4FT 1909Z 23 JUL 79	"	"
0203	"	"	59/58/46.079 151/43/45.506	AWASH. 1910Z, 23 JUL 79	"	"
0205	"	"	59/58/27.302 151/43/48.144	BARE 1FT. INSHORE FOUL SOUTH OF RK. 1912Z 23 JUL 79	"	"
0206	"	"	59/58/20.560 151/43/49.485	AWASH. INSHORE FOUL NORTH OF RK. 1914Z, 23 JUL 79	"	"
0207	"	"	59/58/10.474 151/43/50.026	BARE. 1 FT. 1916Z, 23 JUL 79	"	"
0209	"	"	59/57/57.913 151/43/57.733	AWASH. 1919Z, 23 JUL 79	"	"
0210	"	"	59/57/49.572 151/43/59.962	BARE. 1FT. 1921Z, 23 JUL 79	"	"
0213	"	"	59/57/33.119 151/44/06.658	AWASH. 1928Z, 23 JUL 79	"	"
0214	"	"	59/57/34.860 151/44/05.831	BARE 1 FT. 1929Z, 23 JUL 79	"	"
0215	"	"	59/57/26.170 151/44/09.545	BARE 4FT 1931Z 23 JUL 79	"	"
0219	"	"	59/56/24.106 151/44/39.724	BARE 2FT. INSHORE FOUL. 1941Z 23 JUL 79	"	"
0220	"	"	59/56/11.553 151/44/48.590	LARGE RK BARE 8FT. 1944Z, 23 JUL 79	NO	TO BE CHARTED.

RA-20-2-79 (H-9835)

ROCK FIX POSITION #	MEANS OF POSITIONING	PHOTO IDENTIFIABLE	GEOGRAPHIC POSITION	HEIGHT & TIME DATA	CHARTED	RECOMMENDATIONS
				ROCK		
0222	RANGE-AZI	NO	59/52/11.443 151/44/51.693	SUBMERGED 1 FT. 1949Z, 23 JUL 79	NO	TO BE CHARTED.
0223	"	"	59/52/05.602 151/44/52.666	BARE 1 FT. SOUTH INSHORE FOUL LIMIT. 1950Z, 23 JUL 79	NO	TO BE CHARTED.

LEAST DEPTH INVESTIGATIONS
(SHOALS,WRECKS,ROCKS,ETC.....)

REGISTRY NO.

OPR- P114-RA-79

RA- 20 - 2A - 79

H- 9835

JULIAN DAY	VESSEL NO.	FIX NO.	LEAST DEPTH OBTAINED (FOR FATHO, ADD TRA!)	TIDE CORRECTION	L.L./FATHO-DEPTH	REMARKS
203	2123	4114	Sunken Rock 793546 9.0 + 0.3 = 9.3	-0.6 = 8.7		
203	2123	4198	Sunken Rock 233109Z 112 + 0.3 =	11.5 - 3.0 = 8.5		

VELOCITY COFFECTOF TAPE LISTING
FA-20-1-79(H-9833)
FA-20-2-79(H-9835)
FA-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 TENTHS, FATHOMS

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

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

DEPTH RANGE (FM)	CORRECTIONS (FM)
UP TO 3.3	0.0
9.8	0.1
16.2	0.2
22.2	0.3
28.3	0.4
35.3	0.5
DEEPER	0.6

DEPTHS IN FATHOMS

5 10 15 20 25 30 35 40

(For deep water add a 0 to these figures

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

FINAL VERSION

101 3 60 06 21437 152 33 53267 254 0159 329646
/RED BAYDIST

102 3 60 29 03334 151 50 03037 254 0020 329646
/GREEN BAYDIST

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 14039 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 14705 151 33 22918 139 0067 000000
/SUE 1979

111 4 60 00 33292 151 42 49781 250 0089 000000
/NINILCHIK 1903 601513(1011)

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

113 4 59 57 23336 151 43 58039 139 0051 000000
/ANIMAL HILL 1979

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

115 4 59 52 24073 151 48 03029 250 0001 000000
/MILLER TIME 1979

116 4 60 03 19062 151 39 45389 250 0000 000000
/NINILCHIK CHANNEL ENTR. LIGHT 1

```
 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
/NIKILCHIK 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 15381 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 15348 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
```

312 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

NOAA FORM 76-40
(8-74)

Replaces C&GS Form 567.

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

NONFLOATING AIDS ~~OR LANDMARKS FOR CHARTS~~

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

(See reverse for responsible personnel)

☐ TO BE CHARTED ☒ TO BE REVISED ☐ TO BE DELETED	REPORTING UNIT *(Field Party, Ship or Office)*	STATE	LOCALITY	DATE
	NOAA SHIP RAINIER	ALASKA	COOK INLET, NINILCHIK	12/01/79

The following objects HAVE ☒ HAVE NOT ☐ been inspected from seaward to determine their value as landmarks.

OPR PROJECT NO.	JOB NUMBER	SURVEY NUMBER	DATUM
OPR-P114-RA-79	CM-7412	TP-00797	N.A. 1927

CHARTING NAME	DESCRIPTION *(Record reason for deletion of landmark or aid to navigation. Show triangulation station names, where applicable, in parentheses)*	POSITION LATITUDE ° ′	POSITION LATITUDE // D.M. Meters	POSITION LONGITUDE ° ′	POSITION LONGITUDE // D.P. Meters	METHOD AND DATE OF LOCATION *(See instructions on reverse side)* OFFICE	METHOD AND DATE OF LOCATION FIELD	CHARTS AFFECTED
LIGHT	NINILCHIK ~~HARBOR~~ CHANNEL ENTRANCE LIGHT 1	60 03	19.062	151 39	45.889		3RD ORDER Traverse July 1979	16640

NOAA FORM 76-40
(8-74)

Replaces C&GS Form 567.

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

~~NONFLOATING AIDS OR~~ LANDMARKS FOR CHARTS

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

(See reverse for responsible personnel)

☐ TO BE CHARTED ☒ TO BE REVISED ☐ TO BE DELETED	REPORTING UNIT (Field Party, Ship or Office)	STATE	LOCALITY	DATE
	NOAA SHIP RAINIER	ALASKA	COOK INLET, NINILCHIK	12/01/79

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

OPR PROJECT NO.	JOB NUMBER	SURVEY NUMBER	DATUM
OPR-P114-RA-79	CM-7412	TP-00797	N.A. 1927

CHARTING NAME	DESCRIPTION (Record reason for deletion of landmark or aid to navigation. Show triangulation station names, where applicable, in parentheses)	POSITION LATITUDE ° ′	POSITION LATITUDE // D.M. Meters	POSITION LONGITUDE ° ′	POSITION LONGITUDE // D.P. Meters	METHOD AND DATE OF LOCATION (See instructions on reverse side) OFFICE	FIELD	CHARTS AFFECTED
CUPOLA	(NINILCHIK CHURCH CUPOLA 1909)	60 03	03.0415 94.1	2 151 39	47.0401 728.0	JULY 9, 1975 75 E (T)-889	Verified July 1979	16640

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° 03' 17.0" N and longitude 151° 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

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.

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.

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.

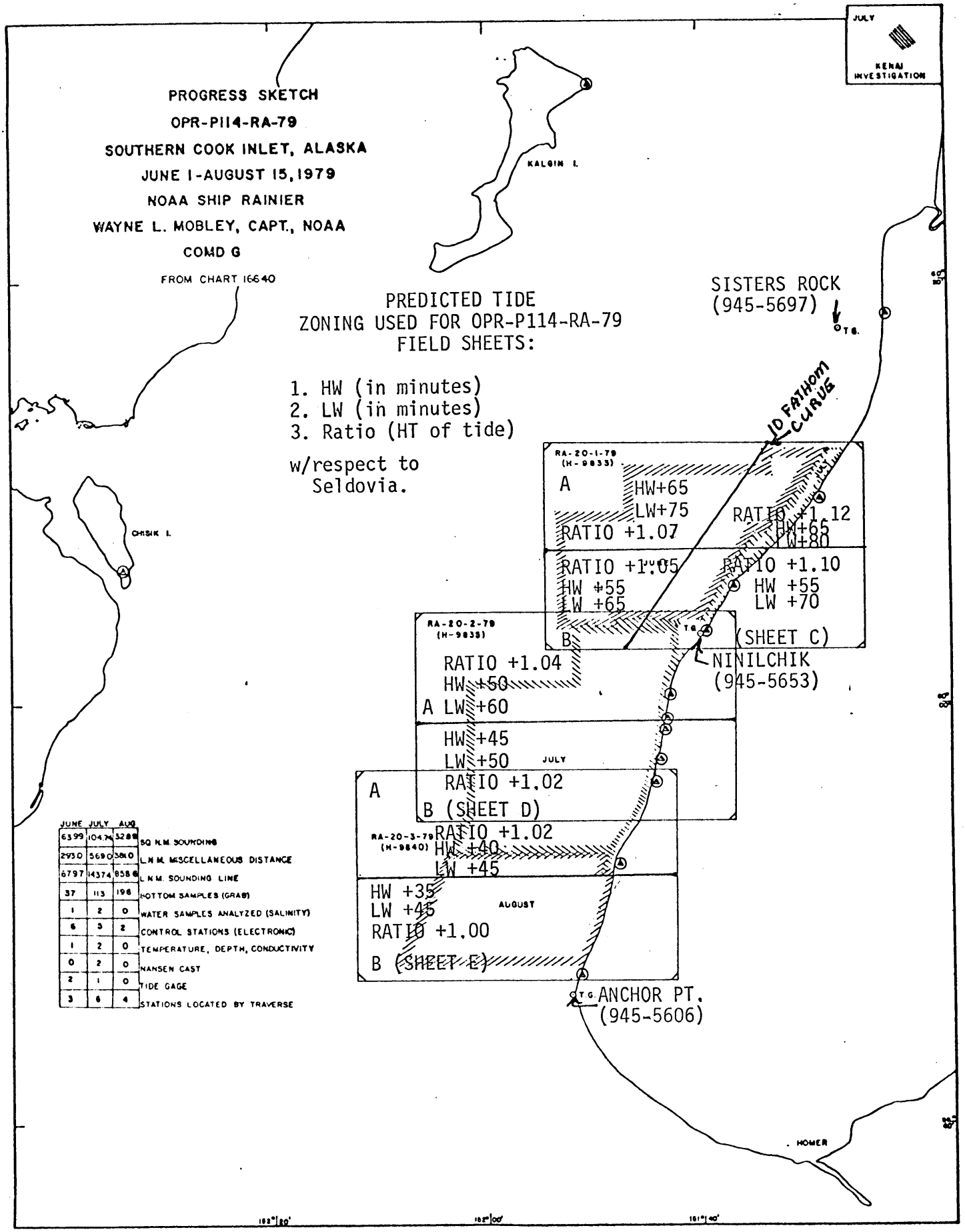
RECOMMENDED ZONING

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.

Why invite trouble?



JUNE	JULY	AUG	
6399	10474	3288	SQ N.M. SOUNDING
2930	5690	3810	L.N.M. MISCELLANEOUS DISTANCE
6797	14374	8586	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

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: July 11 - August 15, 1979

HYDROGRAPHIC SHEET: H-9835

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°00'
1. West of 151°54' apply -15 minute time correction and range ratio x 0.93.

2. East of 151°54' apply -15 minute time correction and range ratio x 0.96.

(B). North of 60°00'
1. West of 151°54' apply range ratio x 0.93.
2. East of 151°54' apply range ratio x 0.96

James E. Hubbard
Chief, Datums and Information Branch

NOAA FORM 76-155
(11-72)

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

SURVEY NUMBER

H-9835

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 TP-00798		
NINILCHIK ✓	X									1
CAPE NINILCHIK ✓	X									2
COOK INLET ✓	X									3
HAPPY CREEK ✓									X	4
DEEP CREEK ✓									X	5
HAPPY VALLEY (locality) ✓										6
										7
										8
										9
										10
										11
										12
										13
										14
										15
										16
										17
					Approved:					18
										19
					Chas. E. Harrington					20
					Chief Geographer - C3x5					21
					22 April 1982					22
										23
										24
										25

NOAA FORM 76-155 SUPERSEDES C&GS 197

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

HYDROGRAPHIC SURVEY STATISTICS

H-9835

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

RECORD DESCRIPTION	AMOUNT	RECORD DESCRIPTION	AMOUNT
SMOOTH SHEET	1	BOAT 2 SHEETS & PRELIMINARY 12 OVERLAYS	14
DESCRIPTIVE REPORT	1	SMOOTH OVERLAYS: POS. 4 ARC, 1 EXCESS 6	11

DESCRIPTION	DEPTH RECORDS	HORIZ. CONT. RECORDS	PRINTOUTS	TAPE ROLLS	PUNCHED CARDS	ABSTRACTS/ SOURCE DOCUMENTS
ENVELOPES		1				
CAHIERS	X		2-Fath			
VOLUMES						
BOXES			1 - Smooth P/O, 3 - Fld Edit, Echo Sounder Rec.			

T-SHEET PRINTS (List) TP-00796, TP-00797, TP-00798

SPECIAL REPORTS (List)

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			3053
POSITIONS CHECKED		3053	
POSITIONS REVISED		7	
SOUNDINGS REVISED		176	
SOUNDINGS ERRONEOUSLY SPACED		0	
SIGNALS (CONTROL) ERRONEOUSLY PLOTTED		0	
	TIME – HOURS		
CRITIQUE OF FIELD DATA PACKAGE (PRE-VERIFICATION)	6		
VERIFICATION OF CONTROL		16	
VERIFICATION OF POSITIONS		83	
VERIFICATION OF SOUNDINGS		300	
COMPILATION OF SMOOTH SHEET		84	
APPLICATION OF TOPOGRAPHY		34	
APPLICATION OF PHOTOBATHYMETRY N/A			
JUNCTIONS		44	
COMPARISON WITH PRIOR SURVEYS & CHARTS		36	
VERIFIER'S REPORT		49	
OTHER		38	
TOTALS	6	684	690

Pre-Verification by James S. Green	*Beginning Date* 3/18/80	*Ending Date* 3/18/80
Verification by Thelma O. Jones	*Beginning Date* 3/20/81	*Ending Date* 12/18/81
Verification Check by James S. Green and James L. Stringham	*Time (Hours)* 38	*Date* 12/31/81
Marine Center Inspection by H.I.T.	*Time (Hours)* 13	*Date* 2/24/82
Quality Control Inspection by F.P. Saulsbury	*Time (Hours)* 44	*Date* 4-22-82
Requirements Evaluation by RW Derkazarian	*Time (Hours)* 2	*Date* 8-22-83

G. Myers 2 hrs. 5/28/82

REGISTRY NO. H-9835

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-9835 FIELD NO. RA-20-2-79

Alaska, Cook Inlet, SW of Cape Ninilchik

SURVEYED: July 11, 1979 - August 15, 1979

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

SOUNDINGS: Ross Fineline Fathometer CONTROL: Raydist-Range-Range Mini-Ranger

Chief of Party . . . . . Capt. Wayne L. Mobley

Surveyed by . . . . . Lt. Alan Anderson
Lt.(JG) Michael McCluskey
Lt.(JG) Bruce Hillard
Sst. Richard Hastings
Cart. Dennis Hill

Automated Plot by . . . . . PMC Xynetics Plotter

Verified by . . . . . Thelma O. Jones

1. INTRODUCTION

H-9835 is a basic survey conducted in accordance with Project Instructions for OPR-P114-RA-79, Southern Cook Inlet, Alaska, dated March 2, 1979, Change #1 dated March 30, Change #2 dated March 29, Change #3 dated July 18, and Change #4 dated August 6, 1979. ✓

Projection parameters used to prepare the smooth field sheet have been revised to center the hydrography on the smooth sheet. Parameters used by the Pacific Marine Center are appended in the smooth printout. ✓

The master station list as submitted in the Descriptive Report was revised to reflect only those stations used for this survey. Do not concur, Masterstation list was not revised.

Predicted tides referenced from the primary gage at Seldovia were used to reduce soundings on the field sheet. Approved tides from Ninilchik Harbor tide gage were used for final reduction of soundings. ✓

The positions of the Red and Green Raydist stations were determined from field position data. ✓

2. CONTROL AND SHORELINE

Horizontal control is adequately described in Section F of the Descriptive Report.

The shoreline was applied using the following unreviewed Class I manuscripts:

	Dates of Photography	Scale	Date of Field Edit
TP-00796	July 1975	1:20,000	July & Aug. 1979
TP-00797	July 1975	1:5,000 (reduced)	July & Aug. 1979
TP-00798	July 1975	1:20,000	July & Aug. 1979

The rocks designated as "PA" on TP-00798 are probably the same rocks as those found during hydrography. Where two sets of rocks could be plotted on the smooth sheet with no overlap, the verifier took the conservative approach and retained both. For additional information on the "PA" rocks on TP-00798, refer to Attachment "A". *see Approval sheet*

The submerged rock shown on the smooth field sheet (Position 4198, at latitude 60°02'17.69", longitude 151°44'10.97") was not portrayed as a rock on the smooth sheet. The rock has a reduced depth of 8.8 fathoms, and there are shoaler main scheme soundings in the vicinity. *concur*

3. HYDROGRAPHY

Crosslines are in excellent agreement with main scheme soundings, either exactly or within .5 of a fathom.

The bottom configuration and least depths are adequately delineated, and standard depth curves could be adequately drawn.

The ten and twenty fathom depth curves are drawn to only reflect the main sheet soundings in the areas of severe sand wave concentration.

4. CONDITION OF SURVEY

The smooth sheet, accompanying overlays, hydrographic records and reports are adequate and conform to the requirements of the Hydrographic Manual with the exception of the following:

a. There was no geographic names list (NOAA Form 76-155) in the Descriptive Report. *added during verification.*

b. There was insufficient data on raw printout, such as vessel speed and sounding intervals.

c. It would be most beneficial to the verifier if the day, vessel and position numbers were written on the daily Systems Check.

d. The ship's Descriptive Report (see Section N) erroneously lists a large antenna at latitude 59°52'54", longitude 151°47'02", as the only fixed aid to navigation in the survey area. This antenna is not within the survey limits. *concur*

5. JUNCTIONS

H-9835 junctions to the south with H-9840 (1979). Sounding agreement was within .5 fathom. Due to differences in positioning in the overlap area, several soundings had to be transferred from H-9840 in order to effect a junction of the depth curves. *Junction is adequate.*

H-9708 (1977) junctions to the ~~west~~ *east* with H-9835. There was good agreement between soundings. In the vicinity of latitude 59°56'18"N, longitude 152°01'48"W and between latitudes 59°58'00"N-59°59'00"N, longitudes 151°58'00"W-152°00'00"W, the 20 fathom depth curve on H-9708 will have to be adjusted at Quality Control Branch (C352) to conform with this survey. *H-9708 not available 4/19/82*

H-9776 (1978) junctions to the northwest of H-9835. Sounding agreement was within .5 fathom. The 20 fathom curve could be junctioned with no difficulty and was inked accordingly. *O.K.* ✓

H-9835 junctions to the north with H-9833 (1979). Due to an area of sand waves and positional differences, soundings had to be transferred from H-9833 to support the junction curves. Revisions to H-9833 will have to be made at Quality Control Branch (C352). Included in this report is a copy of the junction area with suggested revisions (see Attachment "B"). *Revisions accomplished during QCI.*

A butt junction with H-8856 (1965) could only be effected. This was due to the consistently shoaler depths on H-9835 in the junction area. It is recommended that the depth curves in the junction area on H-8856 be adjusted to coincide with H-9835 and the overlapped data on H-8856 be superseded by H-9835. *Accomplished during QCI.*

There is some confusion concerning the soundings requiring additional development by paragraph 4.7 of the project instructions. The geographic positions given do not correspond with the depths reflected on H-8856. These areas were developed by the ship, and the listed depths were not found. Refer to descriptive report, paragraphs K and L, items 3, 4, 5, and 6 for disposition of these items. *Do not concur. G.A.'s are correct. See QCI recommendations in referenced paragraphs & items.*

The rocks shown on the smooth sheet in the junction area of H-8856 were field edited by the ship. It is recommended that these rocks be used to supplement the data on H-8856. *concur - Also TP-00797 (1975-79) shows changes in the S.L. & low water line when compared with H-8856*

6. COMPARISON WITH PRIOR SURVEYS

H-3205 (1910) 1:40,000
H-3206 (1910) 1:120,000

The soundings on H-9835 are generally shoaler 0-6 fathoms. The only major differences in shoreline characteristics are the numerous additional rocks on H-9835 and the configuration of the stream in the vicinity of latitude 60°02'00"N, longitude 151°42'00"W. ✓

There are no pre-survey items originating from prior surveys. ✓

H-9835 is adequate to supersede all prior surveys within areas of common hydrography. ✓

7. COMPARISON WITH CHART 16640 (17th EDITION, APRIL 7, 1979)

a. Hydrography

Charted soundings and topographic features, as identified, originate from the prior surveys discussed in Section 6 of this report and are color coded on the chart mark-up included in this report. *Mark-up filed with survey records.*

The 6-1/4 fathom sounding charted in the vicinity of latitude 59°56'00"N, longitude 151°49'00"W, originating from an unknown source, is in an area of development with the least depth being 7.4 fathoms. Recommend retention as charted. *Do not concur 6¼ fm sdg. originates with H-3205 (1910) as a 37ft. sdg. falling on a sloping bottom. Conflict is attributed to bottom change. Chart depths in this area as shown on the pres. survey.* The dashed circle PSR item, the charted 7 fathom depth at latitude 59°55'30"N, longitude 151°53'27"W, was adequately disposed of by the hydrographers. *See D.R. item L.(2)*

In Section L of the Descriptive Report, reference is made to four apparently charted soundings (items 3-6). These are the same soundings mentioned in Section 5, paragraph 6 of this report, and none are charted on this edition of Chart 16640. *See recommendations in Section L of the D.R.*

There are numerous uncharted rocks located during this survey. The verifier recommends that these rocks be charted. *concur - Chart rocks as shown on the present survey.*

b. Controlling Depths

There are no controlling depths governing any area within this survey. ✓

c. Aids to Navigation

Ninilchik Channel Entrance Light is the only aid to navigation in the survey area, and it adequately marks the features intended. Recommend the charting of the Ninilchik Channel Entrance Light be examined and updated with data from this survey. *concur*

With the recommendations included in this section, H-9835 is adequate to supersede charted hydrography of common areas. *concur*

8. COMPLIANCE WITH INSTRUCTIONS

H-9835 adequately complies with Project Instructions OPR-P114-RA-79, dated March 2, 1979, Change #1 dated March 30, Change #2 dated March 29, Change #3 dated July 18, and Change #4 dated August 6, 1979. ✓

9. ADDITIONAL FIELD WORK

This survey is an adequate basic hydrographic survey. No additional field work is required. ✓

Respectfully Submitted

Thelma O. Jones

Thelma O. Jones
Cartographic Technician

Examined & Approved:

James S. Green
Chief, Verification Branch

APPROVAL SHEET

FOR

SURVEY H-9835

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. Six rocks designated as "PA" on TP-00798 were found employing electronic control during field operations, and were not identifiable by photogrammetric methods. These rocks were in all cases in close proximity to ones compiled by photogrammetry, and are probably the same rocks. Both sets of rocks were shown on the smooth sheet if they did not overlap. Where overlap would not permit depiction of both rocks, the more conservative approach was followed in plotting one of the pair. For additional information on the "PA" rocks on TP-00798, refer to Attachment "A", concur No P.A. designations are shown on the smooth sheet

C. 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, the quality control report & as appended notes to items throughout the D.R.

Date: 3/16/82

Chief, Verification Branch

ATTACHMENT (A)

As per your request, I am sending this note about the "PA" on rocks.

F. Mauldin
OA/CAM 52

	② Upon close inspection of all data submitted, it was noticed that the photo positions of Fix # 199, #204, #208, #211, #212, #220 and #223 disagreed with the positions on the computer readout (see G.P.'s listed in enclosure (1)). Fix #199, #204, #208, #211, and #212 are identified on the film ozalid, so, since these were compiled rocks, the height was applied to them. Fix #220 and #223 were not compiled, but were identified on the photography, so that position was used in favor of the computer's. The rocks that were positioned from the computer readout were labeled "position approximate" (PA) in those instances where there was a discrepancy. These rocks are labeled PA on Class I unreviewed topo map TP-00798(1975-79). They are not labeled PA on the smooth sheet.

APPROVAL SHEET

FOR

SURVEY H-9835

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. Six rocks designated as "PA" on TP-00798 were found employing electronic control during field operations, and were not identifiable by photogrammetric methods. These rocks were in all cases in close proximity to ones compiled by photogrammetry, and are probably the same rocks. Both sets of rocks were shown on the smooth sheet if they did not overlap. Where overlap would not permit depiction of both rocks, the more conservative approach was followed in plotting one of the pair. For additional information on the "PA" rocks on TP-00798, refer to Attachment "A", concur No P.A. designations are shown on the smooth sheet.

C. 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, the quality control report & as appended notes to items throughout the D.R.

Date: 3/16/82

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

March 12, 1982 CPM3/JWC

TO: CPM - Charles K. Townsend

FROM: CPM3 - John W. Carpenter

SUBJECT: PMC Hydrographic Inspection Team Report for Survey H-9835

This survey is a basic hydrographic survey of SW of Cape 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 dated March 30, 1979; Change No. 2 dated March 29, 1979; Change No. 3 dated July 18, 1979; and Change No. 4 dated August 6, 1979.

The following items were noted:

1. The Descriptive Report states that sandwaves hindered the effective contouring of certain areas and recommended in Section Q that "the applicable areas be charted as sand wave areas". This was addressed further in the Verifier's Report, Section 3. It appears that the area is defined approximately by a corridor with an axis running from 60°04'00"N/151°48'00"W to 59°55'00"N/151°55'00"W, and having a width of 3600 meters. Sand wave areas are noted on the smooth sheet.

2. Calibration of the Raydist Positioning System was primarily accomplished by using the Mini-Ranger Positioning System in the range-range mode and occasionally by three-point sextant fix. Mini Ranger systems checks as required by PMC OPORDER Appendix M were generally not performed prior to the calibration of the Raydist system. However, variances between day to day Raydist calibrations were small, usually within 0.2 lanes, and therefore, the Mini Ranger calibration method was considered adequate to meet the position accuracy requirements for the scale of survey.

The inspection team finds H-9835 to be a basic survey adequate to supersede common areas of prior surveys and charted hydrography. Administrative approval is recommended. → with exceptions noted in the D.R. & QC Report.

John W. Carpenter

William A. Wert

James W. Steensland

Stanley H. Otsubo

ADMINISTRATIVE APPROVAL
H-9835

Cape Ninilchik, Cook Inlet, Alaska

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, with exceptions noted in the D.R. & O.C. Report.

Charles K. Townsend
Director
Pacific Marine Center

3/16/82
Date

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

C352:FPS

April 22, 1982

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-9835 (1979), Alaska, Cook Inlet, Southwest of Cape Ninilchik

A quality control inspection of H-9835 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, smooth plotting, shoreline transfer, decisions made and actions taken by the verifier, and the cartographic presentation of data. Revisions and additions to the smooth sheet, plus helpful comments made to the verifier, are identified on a one-half scale copy of the survey to be furnished the verifier. In general, the survey 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. Foul areas delimited on the smooth sheet were transferred from the field sheets during quality control inspection.

2. The rock awash at MLLW at the entrance to the stream in latitude 59°59.58'N, longitude 151°43.57'W was located by the field editor, is not shown on TP-00798 (1975-79), and was not entered in the survey listings. The rock awash was transferred to the smooth sheet from the field sheet during quality control inspection.

3. 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 in tenths of a fathom, labeled "RK," should have been shown instead of a sunken rock symbol described by the depth of water in feet the feature is covered at MLLW. Since this information is clear with no danger of misinterpretation, it was not revised during quality control inspection.

4. To facilitate and ensure the location of rocks in the approaches to Ninilchik, low water photography (preferably tide-coordinated) is considered a necessity for any future survey of this area.

cc:
C351

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

DEC 30 1983

N/CG241:RWD

TO: N/MOP - Charles K. Townsend

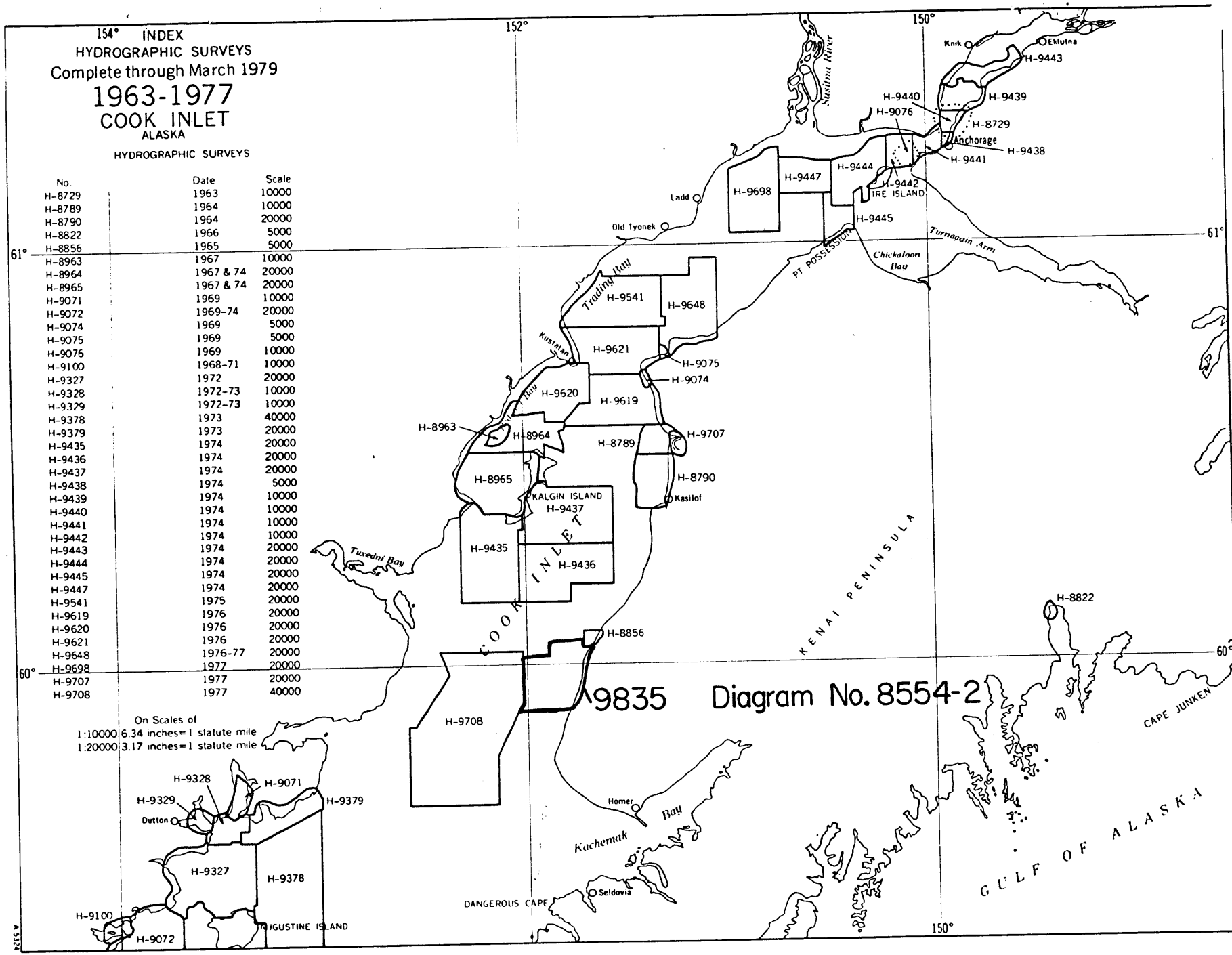
FROM: for N/CG2 - C. William Hayes

SUBJECT: Report of Compliance for Survey H-9835

The smooth sheet and Descriptive Report for survey H-9835 (1979), Alaska, Cook Inlet, Southwest of Cape Ninilchik, have been reviewed. This survey, except as noted in the Quality Control Report, dated April 22, 1982 (copy attached), and the Hydrographic Survey Inspection Team Report, dated March 12, 1982, is complete and adequate for the purposes intended and is in compliance with Project Instructions OPR-P114-RA-78, dated March 2, 1979.

Attachment

cc:
N/CG242 w/o att.



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

Hydrographic Index No. 114E

A 5324

FORM C&GS-8352
(3-25-83)

NAUTICAL CHART DIVISION

RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H-9835

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
16013	6/18/84	J. Bailey	~~Full~~ Part ~~Before~~ After ~~Verification Review~~ Inspection Signed Via
	7/12/84	J. Bailey	Drawing No. 27 Exam. for critical corrs. Added rocks, deleted sndg. "4" Fully appl'd thru 16640
16640	7/6/84	J. Bailey	Full ~~Part Before~~ After ~~Verification Review~~ Inspection Signed Via
		J. Bailey	Drawing No. 22 Revised hydro.
16661	8-24-84	Roy A Desmond	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.
			Full Part Before After Verification Review Inspection Signed Via
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