

9893

Diagrams 8552-2 & 8554-3

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-10-3-80
Office No. H-9893

LOCALITY

State Alaska
General Locality Kachemak Bay
Locality Sadie Cove to Tutka Bay

1980

CHIEF OF PARTY
CAPT W.L. Mobley

LIBRARY & ARCHIVES

DATE October 21, 1982

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

9893

Area 5
CHTS
(66-57)
16640 TO ...
16013-12 RECORD OF ADMINISTRATION

HYDROGRAPHIC TITLE SHEET

H-9893

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

FIELD NO.

RA-10-3-80

State Alaska

General locality Kachemak Bay

Locality Sadie Cove and Tutka Bay

Scale 1:10,000 Date of survey July 16 to August 12, 1980

Instructions dated April 10, 1980 Project No. OPR-P114-RA,FA-80

Vessel NOAA Ship RAINIER, Launches 2123, 2125, 2126, ^{(RA-3), (RA-5), (RA-6)} Zodiac inflatable boat ^(RA-11) 2129

Chief of party CAPT W. L. Mobley

Surveyed by LT T. Clark; ENS J. Gordon, ENS D. Kruth, AST B. Reiss

Soundings taken by echo sounder, hand lead, pole Raytheon Depth Recorder DE-719B
Ross Finline Model 5000 Fathometer & Leadline

Graphic record scaled by Ship's Personnel

Graphic record checked by Ship's Personnel

Verified ~~Reviewed~~ by T. O. Jones Automated plot by PMC Xynetics Plotter

Evaluated ~~Reviewed~~ by K. M. Scott

Soundings in fathoms feet at MLW MLLW and tenths of fathoms
Sdgs in Tutka Bay Lagoon are in fms and tenths at L.W Datum

REMARKS: Time Meridian: 0° (GMT)

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

AWOIS and SURF ✓ 2WD 3/86

R. W. W. 8/21/92

PROGRESS SKETCH

OPR-PI14-RA-80

SOUTHERN COOK INLET, ALASKA

MAY 1 - AUGUST 18, 1980

NOAA SHIP RAINIER

WAYNE L. MOBLEY, CAPT. NOAA

COMD'S

From chart 16640

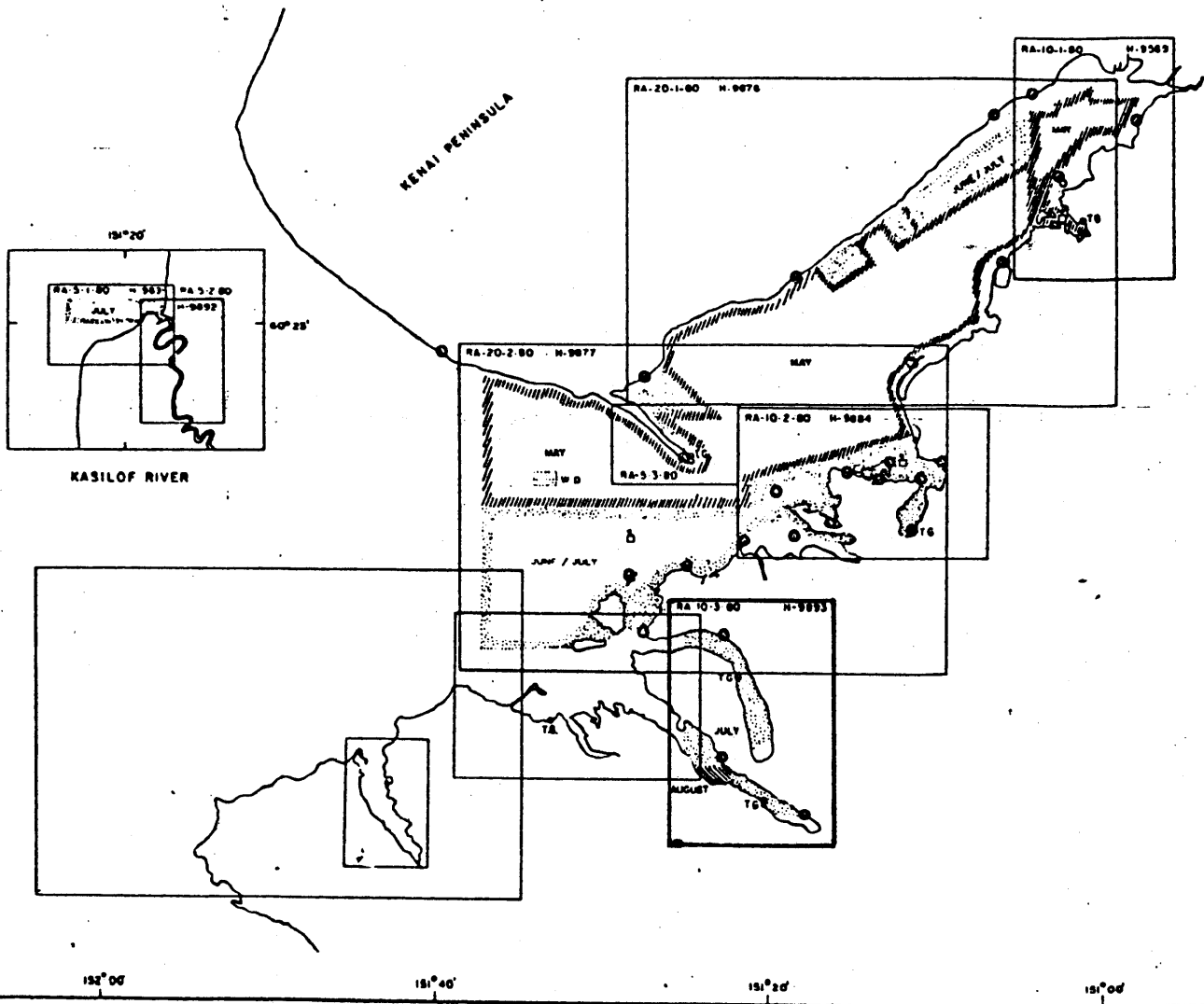
HYDROGRAPHIC SURVEY

LEGEND

MAY	JUNE	JULY	AUG
80.67	3908	1768	230
868.95	5966	416.9	100.6
824.9	1073	637.5	697.5
13	11	23	22
0	24	15	0
18	20	5	7
107	64	188	215
16	1	3	10
4	1	3	1
2	0	0	1
2	1	6	6
		0.23	

- 50 NM SOUNDINGS
- LN M. SOUNDING LINE
- LN M. MISCELLANEOUS DISTANCE [⊗]
- CONTROL STATIONS (ELECTRONIC)
- STATIONS LOCATED
- STATIONS RECOVERED
- BOTTOM SAMPLES (GRAB)
- WATER SAMPLES ANALYZED (SALINITY)
- TEMPERATURE, DEPTH, CONDUCTIVITY
- HANSEN CAST - δ
- TIDE GAGE - \circ
- WIRE DRAG, 50 NM

[⊗] INCLUDES DISTANCE TO AND FROM δ



NOAA FORM 76-40
(8-74)

Replaces C&GS Form 567.

TO BE CHARTED
 TO BE REVISED
 TO BE DELETED

REPORTING UNIT
(Field Party, Ship or Office)

NOAA SHIP RAINIER

STATE

ALASKA

LOCALITY

KACHEMAK BAY

DATE

9/80

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

NONFLOATING AIDS TO NAVIGATION FOR CHARTS

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

OPR PROJECT NO.

OPR-P114-RA-80

JOB NUMBER

H-9893

SURVEY NUMBER

H-9893

DATUM

N.A. 1927

POSITION

CHARTING NAME

NONE

DESCRIPTION
(Record reason for deletion of landmark or aid to navigation.
Show triangulation station names, where applicable, in parentheses.)

LATITUDE

0 /

D.M. Meters

LONGITUDE

0 /

D.P. Meters

METHOD AND DATE OF LOCATION
(See instructions on reverse side)

OFFICE

FIELD

8/80

CHARTS
AFFECTED

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)

RESPONSIBLE PERSONNEL	
TYPE OF ACTION	NAME
OBJECTS INSPECTED FROM SEAWARD	RICHARD L. HASTINGS, SST
POSITIONS DETERMINED AND/OR VERIFIED	
FORMS ORIGINATED BY QUALITY CONTROL AND REVIEW GROUP AND FINAL REVIEW ACTIVITIES	
INSTRUCTIONS FOR ENTRIES UNDER 'METHOD AND DATE OF LOCATION' (Consult Photogrammetric Instructions No. 64.)	
OFFICE I. OFFICE IDENTIFIED AND LOCATED OBJECTS Enter the number and date (including month, day, and year) of the photograph used to identify and locate the object. EXAMPLE: 75E(C)6042 8-12-75 FIELD I. NEW POSITION DETERMINED OR VERIFIED Enter the applicable data by symbols as follows: F - Field L - Located V - Verified 1 - Triangulation 2 - Traverse 3 - Intersection 4 - Resection A. Field positions* require entry of method of location and date of field work. EXAMPLE: F-2-6-L 8-12-75 *FIELD POSITIONS are determined by field observations based entirely upon ground survey methods.	FIELD (Cont'd) B. Photogrammetric field positions** require entry of method of location or verification, date of field work and number of the photograph used to locate or identify the object. EXAMPLE: P-8-V 8-12-75 74L(C)2982 II. TRIANGULATION STATION RECOVERED When a landmark or aid which is also a triangulation station is recovered, enter 'Triang. Rec.' with date of recovery. EXAMPLE: Triang. Rec. 8-12-75 III. POSITION VERIFIED VISUALLY ON PHOTOGRAPH Enter 'V-Vis.' and date. EXAMPLE: V-Vis. 8-12-75 **PHOTOGRAMMETRIC FIELD POSITIONS are dependent entirely, or in part, upon control established by photogrammetric methods.

NOAA FORM 76-40
(8-74)

Replaces C&GS Form 567.

TO BE CHARTED
 TO BE REVISED
 TO BE DELETED

REPORTING UNIT
(Field Party, Ship or Office)

NOAA SHIP RAINIER

STATE

ALASKA

LOCALITY

KACHEMAK BAY

DATE

9/80

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

~~NAVIGATION AIDS~~ 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)

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

JOB NUMBER

H-9893

DATUM

N.A. 1927

POSITION

LATITUDE LONGITUDE
° / ' ° / ' D.M. Meters D.P. Meters

CHARTING NAME

DESCRIPTION
(Record reason for deletion of landmark or aid to navigation.
Show triangulation station names, where applicable, in parentheses.)

NONE

METHOD AND DATE OF LOCATION
(See instructions on reverse side)

FIELD

8/80

CHARTS
AFFECTED

RESPONSIBLE PERSONNEL	
TYPE OF ACTION	NAME
OBJECTS INSPECTED FROM SEAWARD	RICHARD L. HASTINGS, SST
POSITIONS DETERMINED AND/OR VERIFIED	
FORMS ORIGINATED BY QUALITY CONTROL AND REVIEW GROUP AND FINAL REVIEW ACTIVITIES	

INSTRUCTIONS FOR ENTRIES UNDER 'METHOD AND DATE OF LOCATION'
(Consult Photogrammetric Instructions No. 64.)

OFFICE	FIELD (Cont'd)
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NOAA FORM 76-40
(8-74)

Replaces C&GS Form 567.

TO BE CHARTED
 TO BE REVISED
 TO BE DELETED

REPORTING UNIT
(Field Party, Ship or Office)

NOAA SHIP RAINIER

STATE

ALASKA

LOCALITY

KACHEMAK BAY

DATE

9/80

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

~~NOAA FORM 76-40~~ 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)

The following objects HAVE BEEN INSPECTED FROM SEAWARD TO DETERMINE THEIR VALUE AS LANDMARKS.
OPR PROJECT NO. OPR-P114-RA-80

JOB NUMBER

H-9893

DATUM

N.A. 1927

POSITION

LATITUDE	LONGITUDE
° / ' "	° / ' "
D.M. Meters	D.P. Meters

DESCRIPTION

(Record reason for deletion of landmark or aid to navigation.
Show triangulation station names, where applicable, in parentheses)

NONE

METHOD AND DATE OF LOCATION
(See instructions on reverse side)

OFFICE

FIELD

8/80

CHARTS
AFFECTED

CHARTING
NAME

RESPONSIBLE PERSONNEL	
TYPE OF ACTION	NAME
OBJECTS INSPECTED FROM SEAWARD	RICHARD L. HASTINGS, SST
POSITIONS DETERMINED AND/OR VERIFIED	
FORMS ORIGINATED BY QUALITY CONTROL AND REVIEW GROUP AND FINAL REVIEW ACTIVITIES	
<input type="checkbox"/> PHOTO FIELD PARTY <input checked="" type="checkbox"/> HYDROGRAPHIC PARTY <input type="checkbox"/> GEODETIC PARTY <input type="checkbox"/> OTHER (Specify)	
FIELD ACTIVITY REPRESENTATIVE	
OFFICE ACTIVITY REPRESENTATIVE	
<input type="checkbox"/> REVIEWER <input type="checkbox"/> QUALITY CONTROL AND REVIEW GROUP REPRESENTATIVE	

INSTRUCTIONS FOR ENTRIES UNDER 'METHOD AND DATE OF LOCATION'
 (Consult Photogrammetric Instructions No. 64.)

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A. PROJECT

This survey was accomplished in accordance with project instructions OPR-P114-RA,FA-80, Southern Cook Inlet, Alaska, dated April 10, 1980 and change 1, supplement to instructions, dated April 11, 1980.

B. AREA SURVEYED

Survey H-9893 was conducted in Sadie Cove and Tutka Bay, adjacent to Kachemak Bay, Alaska from July 16, 1980 (J.D. 198) to August 12, 1980 (J.D. 225). The survey covers approximately 6 sq miles, from the longitude line 151°25'30" east to the heads of Sadie Cove and Tutka Bay. The area is characterized by bluff type shorelines.

C. SOUNDING VESSELS

The RAINIER's aluminum hydrographic launches and a Zodiac inflatable boat were used for the survey. They are listed as follows:

<u>Vessel</u>	<u>Hull No.</u>	<u>Use</u>
RA-3 (2123)	1007	Range/Azimuth Hydrography
RA-5 (2125)	1003	Range/Azimuth - Bottom Samples
RA-6 (2126)	1013	Range/Azimuth Hydrography
RA-11(2129)	Zodiac	"See Boat Sheet" Hydrography (Tutka Bay Lagoon)

D. SOUNDING EQUIPMENT AND CORRECTIONS TO ECHO SOUNDINGS

Introduction

The corrections to echo soundings contained in this report are to be applied to Hydrographic Survey RA-10-3-80. The following corrections to echo soundings are discussed: sound velocity corrections, launch draft corrections, settlement and squat corrections, and instrument corrections for blanking, phase and initial drift errors. Sea and swell errors were not found to be significant during this survey and were not corrected for.

Sounding Equipment

Echo soundings obtained during RA-10-3-80 were taken by the RAINIER's three survey launches (RA-3, RA-5 and RA-6) using Ross Fineline Fathometer systems which included the following components: Ross Model 4000 Transceiver, Ross Model 5000 Analog Recorder, Ross Model 6000 Digitizer and a 100 kHz Transducer. A Zodiac inflatable boat using a Raytheon portable fathometer Model DE-719B, S/N 5833, was also used for areas inaccessible to the launches. Table I summarizes the serial numbers of the various components used in each vessel.

Table I
Echo Sounder Component Serial Numbers

<u>Component</u>	<u>RA-3 (2123)</u>	<u>RA-5 (2125)</u>	<u>RA-6 (2126)</u>
Transceiver	1041	1047	1042
Analog Recorder	1070	1040	1071
Digitizer	1080	1040	1044

Sound Velocity Corrections

Sound velocity corrections for echo soundings were derived from data obtained from two Martek TDC casts and one Nansen cast performed in the survey area during this survey. The details relating to these casts are presented in table two. ✓

Table II
Nansen & Martek Cast Data, RA-10-3-80

<u>Cast Type</u>	<u>Date Time</u>	<u>Location</u>	<u>Applicable Survey Dates</u>	<u>Velocity Table No.</u>
Martek	July 24, 1980	Lat. 59°36'12" Lon. 151°24'12"	July 14 - Aug. 19	3 ✓
Martek/ Nansen	Aug. 15, 1980	Lat. 59°33'45" Lon. 151°28'54"	July 14 - Aug. 19	3

Samples from the Nansen 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 28298, which was last calibrated in April 1980, by the Northwest Regional Center, Bellevue, Washington. The Martek S/N 358, was also calibrated there in February 1980. ✓

Results from the Nansen and Martek TDC casts were input into computer program RK-530-Velocity Correction Computations, and run on RAINIER's PDP-8/E digital computer; S/N 1015, to yield velocity corrections for each cast. Data from the above casts were meant to provide the correctors used for this survey (Tables 3 and 5). Table 5 is for Tutka Bay Lagoon only. It is measured in feet. Velocity Corrector Tables are included in the separates following this report. ✓

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 survey operations. Graduations on bar hand lines were compared with steel measuring tapes prior to and at the completion of OPR-P114-RA-80 and were found to be accurate. ✓

The mean fathometer depth values were subtracted from the corresponding true bar depths to obtain a series of "bar check correctors". Bar check correctors were co-plotted on the sound velocity correction curve. The sound velocity correction was subtracted from the bar check data to obtain the true TRA value. These were then averaged to obtain the final launch draft corrections. ✓

Since these corrections were not available until completion of the project an estimated launch draft corrections to 0.3 fathoms was used for plotting of boat, semi-smooth and smooth field sheets. ✓

The TRA corrector for the portable Raytheon fathometer in the Zodiac (2129) was measured by morning and evening sounding pole checks on the day this system was used. These morning and evening checks gave TRA correctors of -0.1 foot and -0.4 foot respectively. A TRA of +0.2 foot was used to plot the field data as this corresponds to the observed draft of the transducer. However, it is recommended the smooth sheet be plotted using a TRA of -0.2 foot as determined by averaging the sounding pole checks, as this value includes a correction for instrument error (See the Sounding Volume for Boat 2129, JD 221).

There are two separate calibration adjustments and one for the initial (tide and draft) on the Raytheon portable fathometer. During the above survey, the initial and calibration adjustments were all set 0.2 to 0.3 foot high on the paper which accounts for the negative TRA values obtained.

Launch Settlement and Squat Corrections

Settlement and squat characteristics of RA-3, RA-5, RA-6 were measured prior to OPR-P114-RA-80 in Lake Washington, Seattle, Washington on April 11, 1980 (J.D. 102). The corrections determined by these tests were found to be insignificant and were not applied to soundings on this survey.

Sounding Instrument Corrections

During survey operations the "blanking" was normally set at 0 fathoms. This was adjusted as needed. Analog depths were substituted for missed digital soundings during on-line or end-of-day field record scanning.

The initial trace on the analog recorder was continuously monitored and adjusted to prevent errors due to a drifting initial.

To prevent belt length error or stylus paper misalignment on the analog recorders, RAINIER personnel performed "phase calibrations" of the fathometers each day in accordance with the calibration procedures contained in the PMC OPRDER.

Manual Sounding Corrections

Where manual soundings needed to be taken, hand-held lead-lines were used which had been compared with a steel measuring tape prior to OPR-P114-RA-80 and were found to be accurate. Special care was taken to prevent application of sound velocity corrections to lead line depths.

For further information on corrections to echo soundings, refer to the "Corrections to Echo Soundings" report, OPR-P114-RA-80.

E. HYDROGRAPHIC SHEETS

All field sheets including smooth field sheets were prepared aboard the Ship RAINIER by RAINIER personnel, using a PDP 8/e digital computer and complot plotter system. The sheets were constructed using a modified transverse mercator projection. For a list of parameters used to define the hydrographic sheets refer to the separates following the text.

Expansion sheets were plotted for those areas in which developments were run. A 1:5,000 scale inset of Tutka Bay Lagoon is also included on the smooth field sheet. ✓

All field records will be sent to PMC for verification. ✓

F. CONTROL STATIONS

Horizontal control for this survey was provided by the recovery of four existing stations and the establishment of thirteen new stations. All stations were positioned by Third Order Class I geodetic methods. A listing of the recovered and newly established stations follows: ✓

<u>Recovered</u>	<u>Established</u>
NEAL, 1966	POWER, 1980
GRASS ISLAND, 1975 ¹⁹⁷⁵	ODIN, 1980
GRASS ISLAND AZIMUTH, 1975	CHINOOK, 1980
SNACK, 1965	*TP3, 1980
	DOUBT, 1980
	BATH, 1980 ✓
	TP4, 1980
	TUT, 1980
	ARNIE, 1980
	BUSH, 1980
	AMOS, 1980
	CASCADE, 1980
	JULIA, 1980

*indicates a no-check position.

All new stations, with the exception of TP3 and TP4, 1980, were monumented and described. For further information relating to the positioning of all new stations refer to Horizontal Control Report, OPR-P114-RA-80. ✓

G. HYDROGRAPHIC POSITION CONTROL

Electronic range-azimuth methods were used exclusively for hydrographic position control during this survey. A Motorola Miniranger III system and Wild T-1 Theodolite were employed. ✓

Description of Miniranger Shore Stations

There were nine shore stations established for hydrographic positioning operations. Data on the use of the stations is as follows: ✓

RA-10-3-80 (H-9893)

<u>Station #</u>	<u>Name</u>	<u>Code/Transponder</u>	<u>Dates</u>
124	ODIN 1980	D/777	198-200 ✓
		A/001	219-220
		E/824281	222-223

125	TP3 1980	D/777 C/776 A/001	200 207-208 219-220
128	JULIA 1980	E/824281	209-211 213 220-223
129	CASCADE 1980	E/824281	209-210 219-221
130	AMOS 1980	D/777 E/824281	213 220-221 221-222
131	AMOS ECC1	D/777	210
132	AMOS ECC2	D/777	211
133	BUSH 1980	D/777	219-220
219	ARNIE 1980	E/824281	219-222 225

The Minirangers and Theodolites were positioned over Third Order Class I control stations. The transponders were two to four feet above the stations. See the "Master Station List" for station elevations above MSL. Power for the shore stations was provided by two 12 volt auto batteries in series to provide 24 volts DC.

Miniranger Shore Station Performance

There were no shore station failures during survey operations. Miniranger operation during collection of all data was good. The code C transponder (#776) failed on the final baseline calibration on August 18.

Description of Miniranger Mobile Stations

Three vessels used Miniranger equipment during survey operations. They are as follows:

<u>Vessel</u>	<u>Console</u>	<u>R/T Unit</u>
RA-3 (2123)	720	720
RA-5 (2125)	711	727
RA-6 (2126)	715	713302

There were no failures of the mobile Miniranger equipment during hydrography on this field sheet. Signal strengths were generally well above the cutoff values. No skip- or null- zones were encountered. Overall performance was good.

Description of Baseline Calibrations

The two calibrations which encompass this survey were on 21 June (JD 173) and 18 Aug (JD 231). The calibrations were performed at Homer Airport, Homer, AK. The beginning baseline calibration provided correctors for plotting all field data and determined low signal strength cutoff values of each Miniranger console, R/T unit and transponder combination. A final corrector, computed by averaging the beginning and end calibrations, was used to smooth plot the data. ✓

Vessel RA-5 had failed previously, was repaired, and was used on this survey without a beginning calibration. It was used for bottom samples. Daily system checks were made, and end calibration was accomplished on 18 Aug, confirming proper system operation. ✓

There are some large correctors for vessels RA-5 and RA-6 during this period. This is because, after the repair of a failing unit the console calibration potentiometers were not readjusted at the baseline calibration. ✓

Due to the failure of Code C (S/N 776) on 18 Aug (JD 231) there is no end baseline calibration for it. Initial correctors, confirmed by daily system checks, were used to plot data acquired with this code. ✓

Description of Daily Calibrations

Visual sextant fixes were used to check Miniranger accuracy. Signals for these fixes were positioned over Third Order Class I stations. This check was done twice a day, morning and evening, and each check consisted of at least five visual fixes. On a few occasions bad weather made it impossible to get an end check. ✓

H. SHORELINE

Shoreline was transferred to the field sheet from Class III photo manuscripts TP-00812 and TP-00813. Shoreline details were field edited during this survey. There were no major discrepancies or changes needed as found by the field edit of the area. Field edit information has been transferred to the smooth sheet. See the field edit reports, OPR-P114-RA-80 for more information. ✓

*See
Ver/Eval
Report
Section 2
for list of
T-sheets*

One control station, TP3 is located on a rock to seaward of the mean high water line in Sadie Cove. (*signal 2525*) ✓

I. CROSSLINES

A total of 13% or 21.6 nautical miles of hydrography run was crosslines. A comparison of 224 soundings that overlapped was made. 71% (159) of the crossings agreed within less than 1 fm, 27% (61) were within 2 fm and 2% (4) within 3 fm in depths ranging from the zero fathom curve to 60 fm. All crosslines were found to have very close agreement and showed excellent consistency in bottom contour trends. ✓

Do not concur. See Q.C. Report

J. JUNCTIONS

H-9893 does ~~not~~ junction with ~~any~~ ~~prior~~ contemporary surveys.

See Ver/Eval Report Section 5 (Joins H-9941/1981) not in Rockville 3/4/85

K. COMPARISON WITH PRIOR SURVEYS

Survey H-9893 was compared with prior survey, Register No. 3204 dated 1910, scale 1:40,000. In the comparison the prior survey was shown to be incomplete and inadequate. Only two soundings lines were run inside Sadie Cove and a zig-zag pattern down Tutka Bay. **CONCUR**

Roughly twenty depth soundings were compared. Approximately 80%, were within 8 fm of each other, both in shallow and deep water. The rest of the soundings were off by considerably more, up to 30-50 fms. These disagreeing soundings were close to shore for the most part. The soundings in the prior survey were generally shoaler than those of this survey. Near the shore the steeply sloping bottom contour could cause a small error in position to result in a large error in depth. The difference in scales between the two surveys and the different datum used on the 1910 survey could cause plotting errors resulting in discrepancies in sounding positions. **CONCUR**

There were no rocks shown on the prior survey in the area of this survey. Examination of the shoreline on the prior survey revealed some discrepancies in the general positions of the two bodies of water relative to the latitude longitude grid. This shift is probably the result of the change of horizontal control datums in 1927. **CONCUR**

One presurvey review item, No. 22, 3/16/79, a reported rock, fell within the survey area. An investigation by the field editor at low tide turned up a ledge in the approximate area. For more information see the Field Edit Report, TP-00812, OPR-P114-RA-80. No other rocks were found in this area.

See Ver/Eval Report Sections 4 & 6 (Section 6, paragraph 4)

It is recommended that this survey supersede all prior surveys for charting. **CONCUR**

L. COMPARISON WITH THE CHART

A 1:10,000 scale blow up of chart No. 16645, 12th ed., dated 10/21/78 (scale 1:82662), was used for comparison with this survey. Thirty two soundings were compared. Disagreements averaged 3 to 7 fathoms with four differing by 20-30 fm and one differing by 51 fm. Most of these comparisons with large differences were near the shore with the charted soundings being shoaler. The chart is similar to the prior survey (see paragraph K) in its disagreement with this survey. It is recommended that this survey supersede the charted information in this area. **CONCUR**

There was one reef found awash by the hydrographer. Detached positions of the reef were made. The fix numbers were 4584 and 4585 at 59°26'14.945"N, 151°22'11.403"W and 59°26'15.146"N, 151°22'11.288"W respectively. The reef is approximately 40 m. long and corresponds to the depth sounding of 9 fm on the chart at 59°26.3N, 151°22.3W. This reef should be charted. *With final tide reducers the reef has a least depth of 0.7 fms at MLLW and is shown on the smooth sheet.*

M. ADEQUACY OF SURVEY

This survey is complete and adequate to supersede all prior surveys for charting. *CONCUR*

N. AIDS TO NAVIGATION

There were no aids to navigation within the area surveyed. *CONCUR*

O. STATISTICS

Statistics are as follows for each launch:

<u>Launch</u>	<u>Positions</u>	<u>N. Miles</u>	<u>Sq. Miles</u>	<u>Bottom Samples</u>	<u>Type Control</u>
RA-3	2324	363.6	4	0	Range/Azimuth
RA-5	74	25.0	-	71	" "
RA-6	946	95.8	1.5	0	" "
Zodiac	37	17.2	.2	0	See Boat Sheet
Total	3381 3344	501.6 481.4	5.7 5.5	71	

Three tide gages were operated within the survey area during the project. They are listed as follows:

	<u>Lat.</u>	<u>Long.</u>	<u>Dates</u>
Tutka Bay	59°25.9'N	151° ^{20'19"} 21.4 'W	7/14/80-8/14/80
Tutka Bay Lagoon (Temp)	59°26.4'N	151°21.4'W	8/8/80-8/9/80
Sadie Cove	59°29.4'N	151° 21.9 ^{22.14"} 'W	6/27/80-8/14/80

See the Field Tide Note for details.

No Martek TDC casts were taken within the immediate survey area. Instead a cast taken in Kasitsna Bay July 24, 1980 at 59°28'36"N latitude 151°32'48"W longitude was used for this survey. See paragraph "D" for details.

P. MISCELLANEOUS

Sadie Cove and Tutka Bay are areas of strong tidal activity. Both bodies have very steep bottom contours that drop off rather quickly from the shore making development of a zero fathom curve almost impossible. *With the addition of the topo dotted low water curve most areas of the survey contain a MLLW delineation.*

Hydrography of Tutka Bay Lagoon was done using time and course navigation making reference to the shore with RA-11. Control was by "see boat sheet" hydrography scaled off by ship personnel after completion of field work to allow computer plotting of data.

See Ver/Eval Report Section 3

Tutka Bay Lagoon does not fit on the smooth sheet. Because it was found to be navigable a 1:5,000 scale inset is included on the smooth field sheet to show this lagoon. Soundings on this insert are in feet. See the Tide Note (attached) for a discussion Tide control in this lagoon.

Tutka Bay Lagoon is shown on the smooth sheet at 1:10,000 is plotted in fathoms and tenths and sdgs are referenced to Low Water Datum. Tutka Bay & Sadie Cove sdgs are referenced to MLLW.

Some position numbers were used twice during this survey. See the abstract of positions (attached) for details. ✓

Q. RECOMMENDATIONS

Due to high volume of small boat traffic in these bays, it is recommended that they be charted at a larger scale, either on a separate chart or as an inset to chart 16645. It is recommended that this survey supersede all prior surveys for this charting. **CONCUR** ✓

R. AUTOMATED DATA PROCESSING

Data acquisition and processing were accomplished per instructions in the Hydrographic Manual (4th Edition), Manual of Automated Hydrographic Surveys and the PMC OORDER. ✓

Soundings and positions were taken by a hydrolog system using range-azimuth program FA 181. Master tapes and corresponding corrector tapes, which include the TRA for the launches, M/R baseline correctors and all depth corrections were cut daily. Velocity correctors were generated from Martek TDC cast data. The following is a list of all computer programs and version dates used for data acquisition or processing: ✓

<u>PDP 8/e Programs</u>	<u>Version Dates</u>
FA 181 RANGE AZIMUTH LOGGER	2/23/78
RK 201 GRID, SIGNAL & LATTICE PLOT	4/18/75
RK 212 VISUAL STATION TABLE LOAD	4/01/74
RK 216 RANGE-AZIMUTH NON-REAL TIME PLOT	2/05/76
RK 300 UTILITY COMPUTATIONS	2/05/76
RK 330 REFORMAT AND DATA CHECK	5/04/76
PM 360 ELECTRONIC CORRECTOR ABSTRACT	2/02/76
AM 500 PREDICTED TIDE GENERATOR	11/10/72
RK 530 LAYER CORRECTION FOR VELOCITY	5/10/76
RK 561 GEODETIC H/R CALIBRATION	2/19/75
AM 602 ELINORE-LINE ORIENTED EDITOR	5/20/75
AM 603 TAPE CONSOLIDATOR	10/10/72
RK 606 TAPE DUPLICATOR	8/22/74

The Wang series 700 and two Hewlett Packard calculators were used to compute geographic positions of electronic control stations and visual signals for calibrations. ✓

S. REFERENCE TO REPORTS

The following reports contain information pertaining to this survey:

- Horizontal Control Report, OPR-P114-RA-80
- Field Edit Report, OPR-P114-RA-80
- Electronic Control Report, OPR-P114-RA-80
- Corrections to Echo Soundings, OPR-P114-RA-80
- Tide Note and Tide Station Report, OPR-P114-RA-80
- Coast Pilot Report, OPR-P114-RA-80

Respectfully submitted,

Rose A. Morris
Jay Fernandez
NOAA Corps Student Trainee

VELOCITY CORRECTOR TAPE LISTING
OPR-P114-RA-80
SOUTHERN COOK INLET, ALASKA

TABLE NO. 1

RA-10-1-80(H-9569)
RA-20-1-80(H-9876)
RA-20-2-80(H-9877)
000138 0 0000 0001 001 000000 000000 ✓
000368 0 0001
000630 0 0002
000870 0 0003
001087 0 0004
001300 0 0005
999999 0 0006

TABLE NO. 2

RA-10-1-80(H-9569)
RA-10-2-80(H-9884)
RA-20-1-80(H-9876)
RA-20-2-80(H-9877)
000070 0 0000 0002 001 000000 000000 ✓
000215 0 0001
000350 0 0002
000485 0 0003
000630 0 0004
000760 0 0005
000885 0 0006
001000 0 0007
001120 0 0008
001250 0 0009
001370 0 0010
999999 0 0011

TABLE NO. 3

RA-5-3-80(H-9900)
RA-10-1-80(H-9569)
RA-10-2-80(H-9884)
RA-10-3-80(H-9893)
RA-20-1-80(H-9876)
RA-20-2-80(H-9877)
000045 0 0000 0003 001 000000 000000 ✓
000125 0 0001
000205 0 0002
000280 0 0003
000370 0 0004
000450 0 0005
000530 0 0006
000610 0 0007
000690 0 0008
000775 0 0009
000855 0 0010
000940 0 0011
001020 0 0012
001100 0 0013
999999 0 0014

TABLE NO. 4
KASILOF RIVER PROJECT
RA-5-1-80(H-9891)
RA-5-2-80(H-9892)
000035 0 0000 0004 001 000000 000000 ✓
000110 0 0001
000190 0 0002
000275 0 0003
999999 0 0004

TABLE NO. 5
SCALE - FEET
TUTKA BAY LAGOON *Not used*
RA-10-3-80(H-9893)
000055 0 0000 0005 000 000000 000000 ✓
000144 0 0001
000233 0 0002
000325 0 0003
000419 0 0004
000513 0 0005
000611 0 0006
999999 0 0007

TC/TI TAPE LISTING
RA-10-3-80(H-9893)

VESSEL: 2123(RA-3)

212902	0	0003	0003	198	212300	000000	✓
182527	0	0000	0000	211	000000	000000	
185452	0	0003	0003	211	000000	000000	
203410	0	0000	0000	213	000000	000000	
204310	0	0003	0003	213	000000	000000	
001000	0	0003	0003	223	000000	000000	

VESSEL: 2126(H-9893)

190226	0	0003	0003	210	212600	000000	✓
184046	0	0000	0000	211	000000	000000	
192906	0	0003	0003	211	000000	000000	
233500	0	0003	0003	225	000000	000000	

VESSEL: 2129(ZODIAK)
TUTKA BAY LAGOON

214540	0	000 ¹	0005	221	212900	000000	✓ not used
233000	0	000 ²					

VESSEL: 2125(RA-5)
BOTTOM SAMPLES ONLY

185628	0	0000	0000	219	212500	000000	✓
050000	0	0000	0000	221	000000	000000	

MASTER STATION LIST
 OPR-P114-RA-80
 SOUTHERN COOK INLET, ALASKA

FINAL VERSION

101	1	59	38	39094	151	27	28932	250	0005	000000	
/WADE 1923								PUBLISHED		591511	
102	1	59	35	06778	151	19	38031	250	0022	000000	
/GULL 1910-1923								PUBLISHED		591511	
103	3	59	43	39342	151	03	11457	250	0009	000000	
/CHRISTINA 1980										591511	
104	4	59	43	11046	151	01	13890	250	0003	000000	
/SARAH 1980										591511	
105	6	59	32	33360	151	28	26375	250	0018	000000	
/COHEN 2 1951								PUBLISHED		591511	
106	4	59	39	01744	151	11	32834	250	0012	000000	
/GLACIER 3 1980										591511	
107	1	59	41	40467	151	18	36074	250	0035	000000	
/DANA 2 1980										591511	
108	4	59	42	07707	151	06	26592	250	0009	000000	
/AURORA 1923								PUBLISHED		591511	
109	3	59	36	09212	151	25	09347	254	0010	000000	
/HOMER SPIT SALTY DAWG TWR ECC											
110	1	59	47	16508	151	05	01131	250	0008	000000	
/JEFF 1966										591511	
111	0	59	40	37313	151	06	52201	250	0005	000000	
/LOST 3 1980										591511	
112	4	59	33	46035	151	11	27520	250	0000	000000	
/LAGOON 1980										591511	
113	0	59	34	48047	151	17	34228	250	0002	000000	
/TBOLL 1980										591511	
114	6	59	34	06289	151	15	46949	250	0000	000000	
/PETER 1980										591511	
*115	6	59	34	28787	151	16	11884	250	0003	000000	
/SON 1980										591511	
116	6	59	33	37045	151	15	45032	250	0001	000000	
/CHICAGO 1980										591511	
*117	4	59	29	57436	151	29	31824	250	0019	000000	
/GRASS ISLAND 1975								PUBLISHED		591512	

* Stations used for calibration only

118	1	59	29	21048	151	29	11056	250	0019	000000
/GRASS ISLAND AZ MARK 1975 PUBLISHED 591512										
119	3	59	30	33728	151	30	25245	250	0007	000000
/SNACK 1965 PUBLISHED 591514										
*	120	4	59	30	45560	151	27	38838	250	0003
/NEAL 1966 PUBLISHED 591511										
121	4	59	31	21320	151	30	47939	250	0016	000000
/YUKON 1965 PUBLISHED 591514										
122	1	59	39	37645	151	39	44572	250	0241	000000
/BLUFF POINT 2 1976 PUBLISHED 591514										
*	123	3	59	30	15593	151	26	57558	250	0003
/POWER 1980 591511										
*	124	4	59	30	41909	151	22	54163	250	0011
/ODIN 1980 591511										
*	125	3	59	29	32093	151	22	06205	254	0000
/TP 3 1980 000000										
126	1	59	30	35922	151	26	59763	250	0007	000000
/CHINOOK 1980 591511										
127	3	59	36	16472	151	24	45824	250	0005	000000
/HOMER BREAKWATER LIGHT 1975 PUBLISHED 591511										
*	128	3	59	25	36270	151	20	20813	250	0000
/JULIA 1980 591512										
*	129	4	59	25	15503	151	17	56312	250	0000
/CASCADE 1980 591512										
*	130	3	59	26	53564	151	24	53113	250	0000
/AMOS 1980 591512										
*	131	3	59	26	53514	151	24	52707	254	0000
/AMOS ECC 1 000000										
*	132	3	59	26	53523	151	24	52645	254	0000
/AMOS ECC 2 000000										
*	133	1	59	28	02820	151	24	50874	250	0000
/BUSH 1980 591512										
200	1	59	36	04186	151	24	26883	139	0007	000000
/HOMER SPIT LIGHT 1964 PUBLISHED 591511										
201	1	59	36	09213	151	25	09280	250	0010	000000
/HOMER SPIT SALTY DAWG TOWER 1975 PBLSHD 591511										
202	6	59	43	24332	151	03	07774	139	0000	000000
/CHRISTINA AZI STN 1980 591511										
203	6	59	32	52262	151	24	50370	139	0002	000000
/RUG 2 1965 PUBLISHED 591511										

* Stations used for this Survey * FOR CALIBRATION ONLY

*204	4	59	33	03328	151	27	54887	139	0021	000000	
/COHEN IS. RK. LT. 1975								PUBLISHED		591511	
205	3	59	36	03201	151	12	45058	139	0012	000000	
/HALIBUT COVE LT. 1965								PUBLISHED		591511	
206	4	59	44	52611	151	02	52594	139	0001	000000	
/BEAR 2 1965								PUBLISHED		591511	
207	4	59	46	32779	150	58	13475	139	0000	000000	
/SHEEP 1923								PUBLISHED		591504	
208	4	59	33	21033	151	21	43381	250	0007	000000	
/POOT 1976								PUBLISHED		591511	
209	1	59	35	06807	151	19	38169	139	0030	000000	
/GULL ISLAND LIGHT 1975								PUBLISHED		591511	
210	3	59	35	40842	151	10	42091	250	0016	000000	
/VERTIGO 1980										591511	
*211	4	59	35	56865	151	09	36895	250	0010	000000	
/NUNZIO 1980										591511	
212	6	59	35	36508	151	13	20097	250	0002	000000	
/COVE 1980										591511	
213	6	59	35	47430	151	14	14976	250	0002	000000	
/LISA 1980										591511	
214	4	59	35	52546	151	14	02547	250	0002	000000	
/DIANA 1980										591511	
215	1	59	35	42370	151	14	18503	250	0004	000000	
/TERESA 1980										591511	
216	3	59	35	46952	151	15	15845	250	0007	000000	
/POLE 1980										591511	
217	1	59	33	55930	151	15	57839	139	0002	000000	
/CHINA 1980										591511	
218	4	59	33	59280	151	17	35242	250	0003	000000	
/RESERVATION 1980										591511	
*219	4	59	27	09872	151	23	18004	250	0000	000000	
/ARNIE 1980										591512	
*220	3	59	27	57932	151	26	33222	139	0002	000000	
/TUT 1980										591512	
221	4	59	35	48281	151	12	28559	139	0000	000000	
/HALIBUT COVE DAY BEACON										591511	
301	4	59	42	21983	151	06	21650	243	0000	000000	
/PHOTO SIGNAL										591514	

* Stations used for calibration only

* Stations used for this survey

APPROVAL SHEET

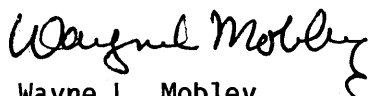
DESCRIPTIVE REPORT TO ACCOMPANY
HYDROGRAPHIC SURVEY

H-9893

OPR-P114-RA-80

In producing this sheet standard procedures were observed in accordance with the Hydrographic Manual, PMC OORDER, 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

FIELD TIDE NOTE

Field tide reduction of soundings for OPR-P114-RA-80 was based on predicted tides from Seldovia, Alaska, corrected to Homer, Alaska, for all hydrographic sheets except RA-5-1-80 (H-9891) and RA-5-2-80 (H-9892). For these two sheets, Seldovia predicted tides were corrected to Kasilof. Correctors were obtained from the Preliminary Zoning, OPR-P114-RA/FA-79. The predicted tides were interpolated using program AM-500 on a PDP-8/E computer. All predicted tide data is based on GMT.

Eleven Bristol Bubbler gages and one ADR gage were installed within the project area. The locations and periods of operation are listed below.

<u>Site</u>	<u>Location</u>	<u>Period</u>
Tutka Bay Lagoon (Temporary Station)	59° 26.4'N 151° 21.4'W	8 August - 9 August
Halibut Cove Lagoon (945-5555)	59° 33.9'N 151° 11.6'W	17 June - 22 July
Tutka Bay (945-5506)	59° 25.9'N 151° 21.4'W 20'19"	27 June - 14 August
Halibut Cove (945-5556)	59° 35.8'N 151° 13.2'W	5 June - 30 June 21 July - 14 August
Bear Cove (945-5595)	59° 43.5'N 151° 01.4'W	6 May - 12 August
Cape Kasilof (945-5711)	60° 20.2'N 151° 22.8'W	9 July - 12 August
Kasitsna Bay (945-5517)	59° 28.1'N 151° 35.9'W	26 June - 14 August
Sadie Cove (945-5514)	59° 29.4'N 151° 21.9'W 22'14"	14 July - 14 August
Coal Point (ADR) (945-5558)	59° 36.2'N 151° 24.5'W	1 May - 18 August
Coal Point (Bubbler) (945-5558)	59° 36.2'N 151° 24.5'W	31 May - 18 August
Kasilof, Kasilof River (945-5715)	60° 21.5'N 151° 16.6'W	1 July - 27 July
Kasilof River Entrance (945-5722)	60° 23.2'N 151° 17.5'W	2 July - 28 July

Seldovia
(945-5500)

59° 26.4'N
151° 43.0'W

CONTROL STATION

Tutka Bay Lagoon

Bubbler Gage (S/N 736620) was installed on 8 August. This was a temporary gage used only while hydrography was run in the lagoon. There was no staff installed or levels run. The gage was removed on 9 August. The gage was set to GMT. This station was installed to record the tides during hydrography in this small lagoon with a restricted entrance. Datums should be somewhat different within this lagoon. *Sdg datum is LOW WATER*

Halibut Cove Lagoon

Bubbler Gage (S/N 64A11031) was installed on 17 June. There were no problems with this gage. The gage was removed on 22 July. There was no tide staff at this gage; levels were run to the water surface to provide a staff reading. TBM-1 served as a staff stop. The gage was set to Alaska Daylight Time (GMT -9hrs). This station was installed to record the significantly different tide within the lagoon (Halibut Cove Lagoon has severely restricted entrance at low tide) during the times of hydrography. The tide range is reduced in the Lagoon, and the datums will differ significantly from those just outside the Lagoon.

Tutka Bay

Bubbler Gage (S/N 67A10291) was installed and levels run on 27 June. It ran accurately until 2 July when it was shut off until needed further, to prevent it running down while unattended. It was re-started on 14 July. On 9 August the clock stopped. Approximately 24 hours of data was lost. The gage was secured and levels run on 14 August. The marigram reads 13.1 ft. greater than the staff. The gage was set to GMT.

Halibut Cove

Bubbler Gage (S/N 63A2921) was installed and levels run on 5 June. The clock was secured on 30 June until required for further data. It was restarted on 21 July. It ran accurately until it was removed and levels run on 14 August. The gage reads 5.7 ft. greater than the staff. The gage was set to GMT.

Bear Cove

Bubbler Gage (S/N 68A9329) was installed and levels run on 6 May. Gage marigrams for 6 May - 3 June were forwarded to Pacific Marine Center on 18 June. The clock was not running accurately, but this did not affect the accuracy of the data. The ink pen came partly off its guide pins on 24 June and read about 5 feet low until replaced on 19 July. Levels were run and the gage removed on 12 August. The gage reads 13.7' above the tide staff. The gage was set to GMT.

Cape Kasilof

Bubbler Gage (S/N 62A297) was installed and levels run on 9 July. There was no tide staff at this station. Levels were run to the waters edge to provide a staff reading. BM1 served as a staff stop. There were no problems with this gage. Levels were run and the gage removed on 12 August. The gage was set to GMT.

Kasitsna Bay

Bubbler Gage (S/N 72A21482) was installed and levels run on 25 June. The gage ran accurately until 15 August when levels were run and the gage was removed. The gage reads 12.5 ft. greater than the tide staff. The gage was set to GMT.

Sadie Cove

Bubbler Gage (S/N 68A-9337) was installed and levels run on 14 July. The chart drive was found defective and replaced on 26 July. From 16 July - 25 July the marigram came off the sprockets. A template was made from a portion of the marigram paper and the marigram interpolated for this data, using the marks left on the paper by the sprockets as a guide. The gage ran satisfactorily from 25 July until levels were run and the gage removed on 14 August. The gage was set to GMT. The gage reads 7.7' greater than the staff.

Coal Point

A Fisher-Porter ADR Gage (S/N 7304A1380M2) was installed and levels run on 1 May. The gage was removed and levels run on 18 August. All leveling data is the same for both Coal Point gages. This gage ran satisfactorily until removal except for the loss of tides lower than -2.5 feet.

Coal Point

Bubbler Gage (S/N 64A-11026) was installed on 31 May as a back up to the ADR at the same location. The ADR gage goes dry at tides less than -2.5 ft. The gage ran accurately until it was removed and levels run on 18 August. The gage reads 8.7 ft. greater than the staff. The gage was set to Alaska Daylight Time (GMT -9hrs).

Kasilof, Kasilof River

Bubbler Gage (S/N 63A-2928) and tide staff were installed on 30 June. Levels were run on 1 July. The gage ran accurately until 27 July when levels were run and the gage removed. The gage reads 13.1 ft. greater than the staff. The gage was set to GMT.

Kasilof River Entrance

Bubbler Gage (S/N 736620) was installed and levels run on 1 July. The marigram came off the sprockets on 5 July and did not advance for 4 days. Slight irregularities in the curve apparently resulted from a low nitrogen flow rate. Levels were run and the gage removed on 27 July. The gage reads 16.7' greater than the staff. The gage was set to GMT.

Seldovia

This is the reference station used for all predicted tides in Kachemak Bay. An ADR gage is being operated here by the Pacific Tide Party. Second Order Class One levels were run to three marks at this station on 2 May and again on 15 August. On 28 July RAINIER personnel assisted the Pacific Tide Party in installing a back up Bristol Bubbler Gage at this location, and running levels to five marks.

Levels

Levels were run at each station at installation and removal. Levels were run to three marks at all stations with the following exceptions: Levels were run at Bear Cove to six marks, at Cape Kasilof to five marks, at Coal Pt. to five marks, and at Halibut Cove to 5 marks.

A comparison of installation levels with removal levels showed no significant staff or bench mark movement except at Coal Point. The Coal Point levels show an apparent subsidence of the staff by 0.506m. However the staff at Coal Point is securely attached to a solid pier piling. There is no evidence of the staff having moved at all, and the gage/staff difference did not change. There was certainly not a 1/2m shift in the pier. Although all levels are internally consistent, it is suspected that a canceling error was made by reading the rod 1/2m off twice during the levels. It is not known whether this error occurred during installation or removal levels. The staff is still in place and can be re-checked. It is recommended that the tide data collected at Coal Point be accepted for hydrography, and that it be assumed that the gages and staff there did not move during the period of hydrography. Future levels can confirm the staff/bench mark relative elevations if the staff is still in place.

Recommended Zoning

Little difference was observed in times and heights of tides between Homer and Bear Cove. It is expected that the following zoning will be sufficient for this project:

<u>Boat Sheets</u>	<u>Tide Station(s)</u>
RA-20-1-80 (H-9876)	945-5558
RA-20-2-80 (H-9877)	945-5558
RA-5-3-80 (H-9900)	945-5558
RA-10-1-80 (H-9569)	945-5595
RA-10-2-80 (H-9884)	945-5556
RA-10-2-80 (Halibut Cove Lagoon)	945-5555
RA-10-3-80 (H-9893, Sadie Cove)	945-5514
RA-10-3-80 (H-9893, Tutka Bay)	945-5506
RA-10-3-80 (Tutka Bay Lagoon)	Tutka Bay Lagoon Gage
RA-5-1-80 (H-9891)	945-5711
RA-5-2-80 (H-9892)	945-5722 & 945-5715

Hydrography in the Kasilof River, Halibut Cove Lagoon and Tutka Bay Lagoon must be reduced using actual tides from the gages at these locations. The tides in these areas bear little resemblance to the predicted tides available for nearby stations, due to the restricted nature of the entrances to the areas. All these areas have low water datums which are significantly higher than those just outside. The smooth field sheets for these areas were plotted using predicted tides for stations outside the restricted areas, and replotting the data using the actual local tides should show some differences. In Halibut Cove and Tutka Bay Lagoons, the MLLW datum should be near the observed low, flat portions of the tide curve. The Kasilof River has an additional complication due to seasonal fluctuations in the river level. In fact, the river level (the lower, flat part of the tide curve) can be seen to rise even during the period of operation of the short term gages installed for this project. *Sdgs in Tutka Bay Lagoon are referenced to Low Water Datum rather than MLLW as on the main body of the smooth sheet.*

April 29, 1981

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): 945-5500 - Seldovia, Alaska
945-5506 - Tutka Bay, Alaska ✓
945-5514 - Sadie Cove, Alaska ✓

Period: July 16 - August 12, 1980

HYDROGRAPHIC SHEET: H-9893

OPR: P114

Locality: Kachemak Bay, Cook Inlet, Alaska

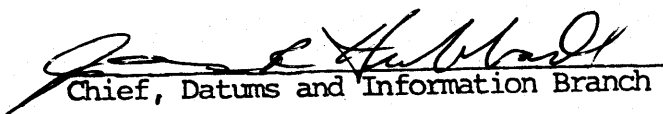
Plane of reference (mean lower low water): 945-5500 = 8.15 ft.
945-5506 = 13.0 ft.
945-5514 = 8.8 ft.

Height of Mean High Water above Plane of Reference is 945-5500 = 17.16 ft.
945-5506 = 17.3 ft.
945-5514 = 17.2 ft.

REMARKS: Recommended Zoning:

1. In Tutka Bay, from longitude 151°26.0' east to the end of the Bay, zone direct on 945-5506, Tutka Bay, Alaska.

In Sadie Cove, from longitude 151°26.0' east to the end of the Cove. Zone direct on 945-5514, Sadie Cove, Alaska, for days 198 through 208, when the gage at Sadie Cove was inoperative zone direct on 945-5500, Seldovia Alaska.


Chief, Datums and Information Branch

DATE: August 26, 1982

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): 945-5507 - Tutka Bay Lagoon, AK

Period: August 8-10, 1982

HYDROGRAPHIC SHEET: H-9893

OPR: P114

Locality: Tutka Bay Lagoon, Alaska

LOW WATER DATUM
(FOR TUTKA BAY LAGOON): 16.9 ft.

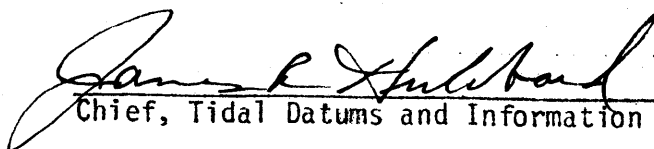
Plane of reference ~~(Mean Lower Low Water)~~

Height of Mean High Water above Plane of Reference is 9.1 ft.

REMARKS: Recommended Zoning:

Additional information for H-9893.

In Tutka Bay Lagoon zone direct on 945-5507, Tutka Bay Lagoon, Alaska.


Chief, Tidal Datums and Information Branch

GEOGRAPHIC NAMES

H-9893

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 I Sheets										
SADIE COVE	/	X								TP-807 TP-808	1
KACHEMAK BAY (title block)										TP-812	2
SAN JUAN COVE	/									TP-812	3
SAN JUAN ISLAND	/									TP-812	4
TUTKA BAY		X								TP-812 TP-813	5
TUTKA BAY LAGOON	/	X								TP-812	6
ALASKA (title block)											7
											8
											9
											10
											11
											12
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											24
											25

Approved:

Charles E. Hartman
Chief Geographer - N/C&S 5

19 July 1983

APPROVAL SHEET
FOR
SURVEY H-9893

- A. This hydrographic survey has been verified, evaluated and inspected. It meets the requirements of the Hydrographic Manual except as noted in the Verification/Evaluation Report. The automated data file has been updated to reflect the data presented on the smoothsheet.

Date: August 4, 1982

Signed: James L. Shingler
Title: Chief, Verification Branch

- B. The verified smooth sheet has been inspected, is complete, and meets the requirements of the Hydrographic Manual. Exceptions are listed in the Verification/Evaluation Report.

Date: August 11, 1982

Signed: Larry M. Mordock
Title: Chief, Marine Surveys Division

HYDROGRAPHIC SURVEY STATISTICS

H-9893

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

RECORD DESCRIPTION		AMOUNT	RECORD DESCRIPTION		AMOUNT
SMOOTH SHEET		1	BOAT SHEETS & PRELIMINARY OVERLAYS		3
DESCRIPTIVE REPORT		1	SMOOTH OVERLAYS: POS. ARC, EXCESS SOUND		9

DESCRIP-TION	DEPTH RECORDS	HORIZ. CONT. RECORDS	PRINTOUTS	TAPE ROLLS	PUNCHED CARDS	ABSTRACTS/SOURCE DOCUMENTS
ENVELOPES						
CAHIERS	1					
VOLUMES	1					
BOXES			1 - smooth Plo - 1-Sounding Vol.			

T-SHEET PRINTS (List) TP-00807, TP-00808, ~~TP-00809~~, TP-00813

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	VERIFICATION	TOTALS
POSITIONS ON SHEET			3245
POSITIONS CHECKED	3245	3245	
POSITIONS REVISED		2	
SOUNDINGS REVISED		44	
SOUNDINGS ERRONEOUSLY SPACED			
SIGNALS (CONTROL) ERRONEOUSLY PLOTTED			
	TIME - HOURS		
CRITIQUE OF FIELD DATA PACKAGE (PRE-VERIFICATION)	8	*(VER)/(EVAL)	08
VERIFICATION OF CONTROL		11/00	11
VERIFICATION OF POSITIONS		138/00	138
VERIFICATION OF SOUNDINGS		246/00	246
COMPILATION OF SMOOTH SHEET		94/00	94
APPLICATION OF TOPOGRAPHY		35/00	35
APPLICATION OF PHOTOBATHYMETRY		00/00	00
JUNCTIONS		00/00	00
COMPARISON WITH PRIOR SURVEYS & CHARTS		00/05	05
VERIFIER'S REPORT		00/26	26
OTHER		03/25	28
	8	527/56	583
TOTALS			
Pre-Verification by J. S. Green	Beginning Date 12/30/80	Ending Date 12/30/80	
Verification by T. O. Jones	Evaluation by K. M. Scott	Beginning Date 5/21/81	Ending Date 7/29/82
Verification Check by J. L. Stringham, J. S. Green	Time (Hours) 67	Date 6/11/82	
Marine Center Inspection by H.I.T.	Time (Hours) 12	Date 8/12/82	
Quality Control Inspection by F.P. Saulsbury	Time (Hours) 68	Date 7/18/83	
Requirements Evaluation by	Time (Hours)	Date	

B. Myura 20 hours 8/25/83

* Time in this column is for verification (VER) and Evaluation (EVAL)

REGISTRY NO. H-9893

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
VERIFICATION/EVALUATION REPORT

REGISTRY NO: H-9893

FIELD NO: RA-10-3-80

Alaska, Kachemak Bay, Sadie Cove and Tutka Bay

SURVEYED: July 16 to August 12, 1980

SCALE: 1:10,000

PROJECT NO: OPR-P114-RA,
FA-80

SOUNDINGS: Ross Fineline Model 5000
Fathometer

CONTROL:
Mini-Ranger Range/Azimuth

Raytheon DE-719B Depth Recorder and Leadline
Chief of Party.....CAPT W. L. Mobley

Surveyed by.....LT T. Clark
ENS J. Gordon
ENS D. Kruth
AST B. Reiss

Automated Plot by.....PMC Xynetics Plotter

Verified by.....T. O. Jones

Evaluated by.....K. M. Scott

1. INTRODUCTION

NOTE: This survey has been processed utilizing a procedure developed to work in conjunction with the Verification Branch realignment, which established an evaluation process. The survey data was first verified and a smooth sheet compiled by a verifier. Then an evaluator reviewed the work of the verifier, made the necessary comparisons with prior surveys and charts and wrote the Verification/Evaluation Report.

H-9893 is a basic hydrographic survey conducted by NOAA Ship RAINIER's launches in accordance with Project Instructions dated April 10, 1980 and Change 1 dated April 11, 1980.

Sadie Cove and Tutka Bay are inlets on the northern side of the Kenai Peninsula and join Kachemak Bay. These areas are popular fishing grounds with many boat operators dependent on charted information.

During the initial survey verification, hydrography in Tutka Bay Lagoon was rejected because Tides Division, Rockville, informed us that no tide reducers were available for sounding reduction as well as sub-standard positioning procedures (see Section 4.c of this report). Then during the Hydrographic Team Inspection of the smooth sheet, the area was considered to be of significant value and to attempt another resolution. Tides Division was again contacted and they stated that tides were now available. At that point, representative soundings were selected, reduced, verified, and manually plotted. Although positioning is substandard, it is felt that this data is acceptable for charting at the current chart scale. *concur*

Predicted tides based on the Seldovia standard gage with time and range adjustments for Homer, Alaska were utilized during shipboard processing. Tides used for the reduction of final soundings are zoned directly from the Sadie Cove and Tutka Bay gages with tides inferred from the Seldovia gage when Sadie Cove was inoperative. ✓

The projection parameters and signal list have been revised during the verification process. All corrected information is listed in the smooth printouts accompanying the smooth sheet. ✓

2. CONTROL AND SHORELINE

The triangulation stations used to control this survey were recovered or established as stated in Section F of the Descriptive Report. ✓

Mini-ranger employed in a range/azimuth mode controlled hydrography within the survey area. Additional information is provided in the Descriptive Report, Section G. ✓

Shoreline was applied from the following unreviewed Class I manuscripts:

<u>Sheet</u>	<u>Dates of Photography</u>	<u>Dates of Field Edit</u>
TP-00807	July-August 1975-76	July - August 1980
TP-00808	July-August 1975, June 1976	July 1980
TP-00812	July 1975, June 1976	July 1980
TP-00813	July 1975, June 1976	August 1980

3. HYDROGRAPHY

Crosslines incorporated within this survey are in good agreement with soundings, agreeing within .5 fathom. *Do not concur. See Q.C. Report, item 4*

The bottom configuration, determination of least depths and development of all standard depth curves are adequate. Bottom samples were taken during survey operations and adequately portray the bottom composition. *Do not concur. See Q.C. Report items 6 & 7 & 8*

4. CONDITION OF SURVEY

The smooth sheet and accompanying overlays, hydrographic records, and reports are adequate and conform to the requirements of the Hydro-

graphic Manual of July 4, 1976, and Changes 1 and 2 with the following exceptions:

a. Duplicate positions numbered 5000-5074 launch 2123, JD219, and launch 2125, JD219-221; and positions 6716-6775 launch 2126. ✓

b. Presurvey review item 22 was not investigated during hydrography, but the Descriptive Report references a ledge in the vicinity located by the field editor and included in the Field Edit Report TP-00812. No discussion was presented by the ship for use in verification. (See Section 6.) ✓

c. Hydrography in Tutka Bay Lagoon was accomplished using "See Boatsheet" methods. Estimated positions were provided without supporting documentation such as estimates relative to known positions. In this case, the positions do not meet the accuracy requirements of the Hydrographic Manual. *concur*

5. JUNCTIONS

H-9893 joins H-9941 (1:10,000) 1981 at the entrance of both Sadie Cove and Tutka Bay. Due to the preliminary stage of processing, the curves and junction note are penciled reflecting the present survey data only. *H-9941 not in Rockville office as of 3/4/85*

6. COMPARISON WITH PRIOR SURVEYS H-3204 (1910) 1:40,000

Sadie Cove and Tutka Bay were originally surveyed by lead line, ^{*in Bassnett Tube*} in ~~foot~~ ^{units of feet.} increments. The present survey incorporated electronic methods in the fathom mode. These facts only serve to magnify the differences in soundings. The general bottom configuration has not changed appreciably but the prior survey soundings are ^{*generally*} considerably shallower.

An approximate shoreline appears on H-3204, but no rocks were located. That approximate shoreline seems to have been estimated by the hydrographer, disproportionately elongating Sadie Cove. However, an island in Tutka Bay at latitude 59°27'45"N, longitude 151°24'30"W, now called San Juan Island was delineated and ^{*basically*} agrees with the present survey. *concur* ^{*somewhat*}

Datum shift plays an important role in comparing these two surveys. H-3204 was plotted using Valdez datum. North American 1927 datum was considered during evaluation. Features are relatively comparable. *concur*

There is part of one presurvey review item, 22, a rock, ^{*charted*} at latitude 59°27.8'N, longitude 151°24.9'W, originating with the chart letter CL-263/26, which is charted within the survey limits. A reef was located by the field editor at latitude 59°27'47"N, longitude 151°24'55"W. No elevation was provided on TP-00812. This feature should be charted as a reef as portrayed by this survey. *concur*

H-9893 is adequate to supersede all prior surveys within the area of common hydrography. *concur (Only two prior surveys H-3204 (1910) & T-3106 (1910))*

7. COMPARISON WITH CHARTS

16645 (12th Ed., October 21, 1978)

a. Hydrography - All charted information with the exception of the shoreline, a rock at latitude $59^{\circ}27.95'N$ and longitude $151^{\circ}20.6'W$ and PSR 22 originate from the prior survey. The shoreline and rock are from an unidentified source. *concur*

Charted shoreline disagrees with the currently applied shoreline by as much as one nautical mile at the southern end of Sadie Cove. Shoreline should be charted from current source documents. *concur*

from a misc source

The charted rock, in Sadie Cove at latitude $59^{\circ}27.95'N$ and longitude $151^{\circ}20.6'W$ lies inshore of the low water line. The source should be checked and if the location is considered valid, may be so charted with consideration of the conservative aspect of nautical charting. *Deferred to compiler for a charting resolution*

Two objects charted at latitude $59^{\circ}29'45''N$, longitude $151^{\circ}23'55''W$ and latitude $59^{\circ}26'11.5''N$, longitude $151^{\circ}22'19.5''W$ were not located or identified during survey operations. These are not shown on the current chart, Ed. 13, October 4, 1980. No further disposition is required. *(Point of land on present survey)*

H-9893 is adequate to supersede all charted hydrography within the common area. *concur*

b. Controlling Depths - There are no controlling depths within the limits of this survey. *concur*

c. Aids to Navigation - There are no floating or fixed aids to navigation within the limits of H-9893. *concur*

8. COMPLIANCE WITH PROJECT INSTRUCTIONS

H-9893 (RA-10-3-80) adequately complies with Project Instructions OPR-P114-RA/FA-80, Southern Cook Inlet, Alaska. ✓

9. ADDITIONAL FIELD WORK

This is a good basic survey. No additional field work is required.

Respectfully submitted

Karol M. Scott

Karol M. Scott
Cartographer
July 29, 1982

Examined and Approved,

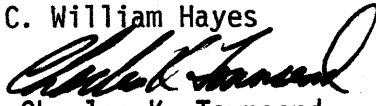
J. S. Green

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

SEP 8 1982

TO: C3 - C. William Hayes
FROM:  CPM - Charles K. Townsend
SUBJECT: Administrative Approval H-9893, Sadie Cove and Tutka Bay,
Kachemak Bay, 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. *concur*

The shift in datums from the Valdez datum on prior survey H-3204 to the North American 1927 datum on H-9893 should be noted by the chart compiler. ✓





UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration

NATIONAL OCEAN SERVICE
OFFICE OF CHARTING AND GEODETIC SERVICES
ROCKVILLE, MARYLAND 20852

N/CG242:FPS

March 5, 1985

TO: Roy K. Matsushige *RKM*
Chief, Hydrographic Surveys Branch

THRU: Chief, Standards Section *am*

FROM: F. P. Saulsbury *F.P. Saulsbury*
Quality Evaluator

SUBJECT: Quality Control Report for Survey H-9893 (1980), Alaska, Kachemak Bay, Sadie Cove and Tutka Bay

A quality control inspection of survey H-9893 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 $\frac{1}{2}$ -scale copy of the survey to be furnished the verifier. In general, the survey was found to conform to National Ocean Service standards and requirements except as stated in the Verifier's Report, the HIT Report, and as follows:

1. Soundings in Tutka Bay Lagoon are referenced to Low Water Datum rather than MLLW. The dotted low waterlines shown on TP-00812 (1975-80) are referenced to MLLW and are not shown on the present survey.

In the event that a larger scale chart of this area is compiled, a charting preference concerning the datum to be used is deferred to the chart compiler.

2. The PA label on the feature in latitude $59^{\circ}26.61'N$, longitude $151^{\circ}21.85'W$ on TP-00812 (1975-80) was removed from the smooth sheet during quality control. The feature is considered to have been accurately located by the field editor as the high point of the ledge shown here and is considered a rock islet. The PA label is considered unnecessary and should not be charted.

3. Triangulation stations established in 1980 have not as yet been accepted by the National Geodetic Survey and therefore are considered field positions.

4. The surveyor's comparison of crosslines on page 6 of the Descriptive Report and the evaluator's comparison of crosslines on page 2 of the Verifier's Report



are inaccurate because conflicts in excess of 3 fathoms were found on both the final field sheet and the smooth sheet. Notable examples were found as follows: a 7-fathom conflict in the vicinity of latitude 59°25.42'N, longitude 151°19.50'W; a 13-fathom conflict in the vicinity of latitude 59°26.07'N, longitude 151°21.18'W; and on a sounding line (positions 6203 through 6206) in the vicinity of latitude 59°27.57'N, longitude 151°24.61'W there were 5- to 14-fathom conflicts with four crossing lines. While these conflicts are readily apparent on the final field sheet, they are masked on the smooth sheet by the excessing of conflicting soundings. However, unusual bottom configuration delineated by the depth curves did indicate problems in these areas.

Conflicts in crosslines were reconciled during quality control inspection.

5. Soundings between positions 4660 and 4661 were rejected during quality control inspection because they plotted on an island in latitude 59°25.58'N, longitude 151°20.00'W.

Soundings, in the vicinity of latitude 59°26.07'N, longitude 151°21.18'W (positions 4645 and 4646), were replotted on time and course during quality control inspection to eliminate conflict with adjacent hydrography.

6. Inadequate development compromised the delineation of depth curves in the following areas:

<u>Latitude (N)</u>	<u>Longitude (W)</u>	<u>Affected Depth Curves (in fathoms)</u>
59°30.70'	151°23.00'	1, 2, 3
59°30.40'	151°23.95'	1, 2, 3, 5, 10
59°30.47'	151°22.35'	10
59°29.35'	151°21.20'	2, 3, 5, 10, 20
59°27.92'	151°24.80'	10
59°27.50'	151°24.50'	1, 2, 3, 5, 10, 20, 30, 40, 50
59°27.28'	151°23.40'	5, 10
59°26.15'	151°23.00'	5, 10, 20, 30
59°26.05'	151°20.15'	1, 2, 3, 5, 10, 20, 30
59°25.45'	151°19.65'	3, 5, 10
59°25.25'	151°19.15'	1, 2, 3, 5, 10, 20, 30

7. Inadequate investigation compromised the acquisition of least depths in the following areas:

<u>Latitude (N)</u>	<u>Longitude (W)</u>	<u>Depth (fathoms)</u>
59°27.49'	151°24.21'	22
59°26.88'	151°23.30'	14.2
59°26.12'	151°22.98'	10.1
59°26.34'	151°22.54'	31

8. Occasionally sounding spacing between lines that follow arcs exceed 100 meters because of the configuration of the shoreline. Examples of these deficiencies are found in the vicinity of latitude 59°27.60'N, longitude 151°24.60'W (130-meter spacing) and in the vicinity of latitude 59°26.16'N,

H-9893

3

longitude 151°20.20'W (180-meter spacing). Where this occurred, splits should have been run between the main-scheme sounding lines.

It would have been more advantageous to run a pattern of sounding lines diagonally from shore to shore rather than following concentric arcs centered from a single control station ashore. In some instances, the pattern of sounding arc development compromised a true delineation of bottom relief where sounding lines were run parallel to the depth curves.

cc:
N/CG241



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
OFFICE OF CHARTING AND GEODETIC SERVICES
ROCKVILLE, MARYLAND 20852

FEB 20 1986

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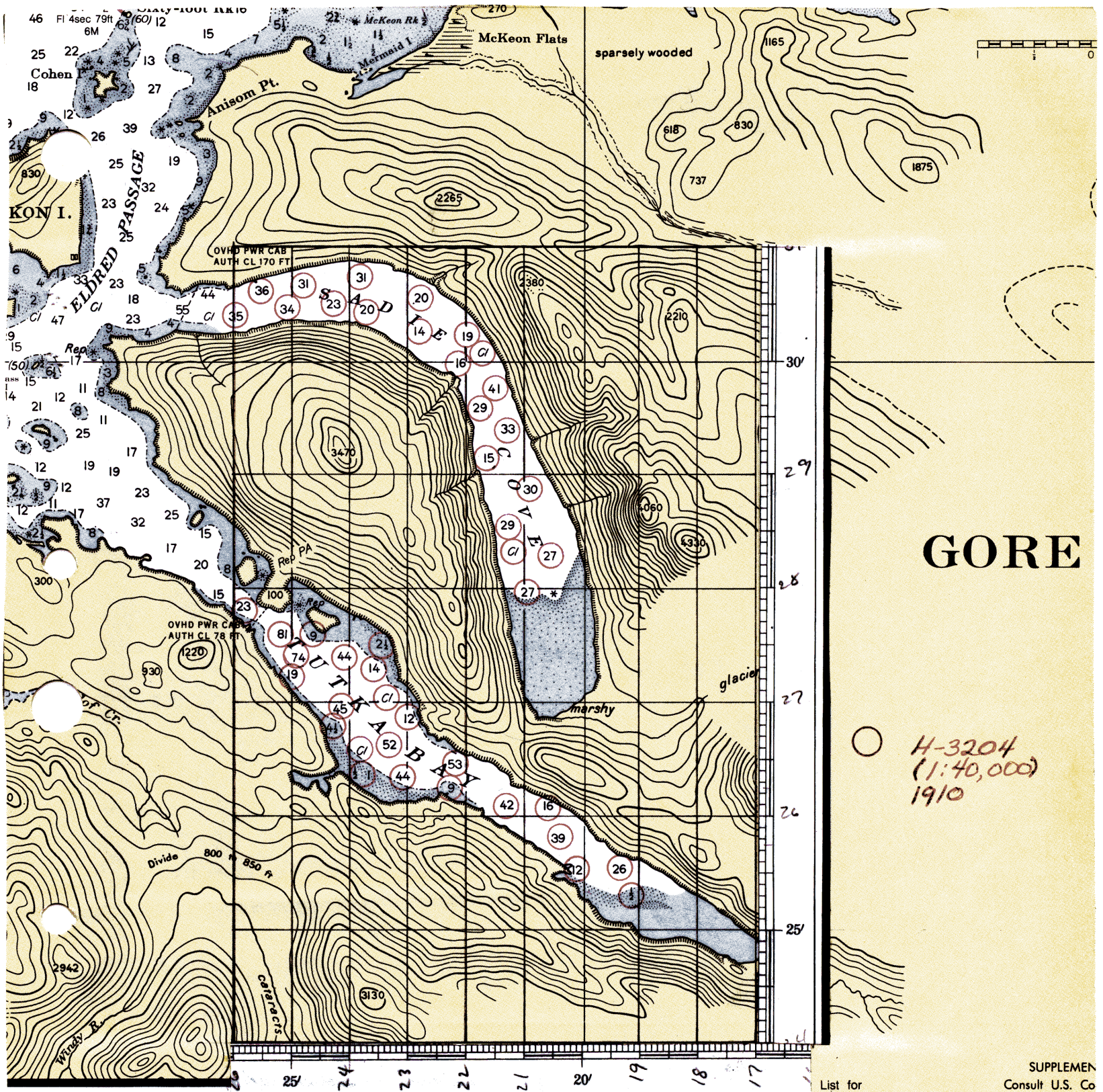
TO: N/MOA - Wesley V. Hull
N/MOP - Robert L. Sandquist
FROM: N/CG2 - *J. Austin Yeager*
SUBJECT: Reports of Compliance for Hydrographic Surveys

I have decided that a special "Report of Compliance" is no longer required for those remaining hydrographic surveys processed under the Verification/Quality Control system in place prior to October 1982. You will no longer receive these reports. Statements made in the Verifier's Reports, modified as necessary by the Quality Control Reports, will suffice with regard to compliance with project instructions.

After their examination of the Descriptive Reports for Automated Wreck and Obstruction Information System (AWOIS) file revisions, Operations Section (N/CG241) personnel will insert a copy of this memorandum into each Descriptive Report to provide appropriate authority for the missing compliance report. In accordance with past practice, we will forward a copy of the Quality Control Report to you for your information.

cc:
N/CG22 - Nortrup





(Gore Point to Anchor Point)
SOUNDINGS IN FATHOMS - SCALE 1:82,662

12th Ed., Oct. 21/78
8531

16645
AUTHORITIES

Hydrography and topography by the National Ocean Survey (formerly the Coast and Geodetic Survey) with additional data from the Geological Survey and U.S. Coast Guard.

CAUTION

Temporary changes or defects in aids to navigation are not indicated on this chart. See Notice to Mariners.

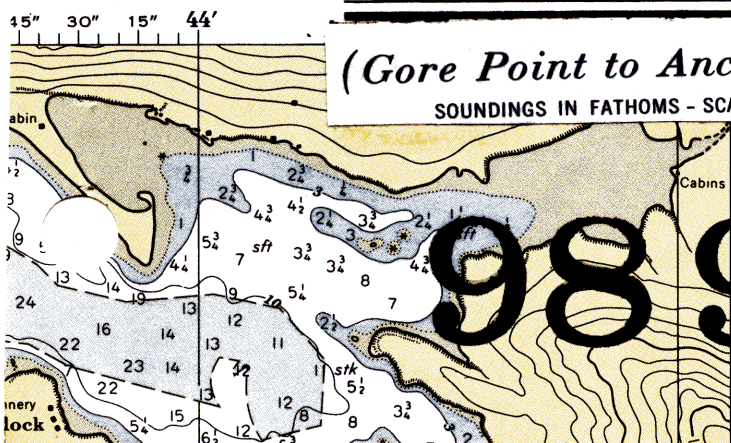
CAUTION

Only marine radiobeacons have been calibrated for surface use. Limitations on the use of certain other radio signals as aids to marine navigation can be found in the U.S. Coast Guard Light Lists and Defense Mapping Agency Hydrographic/Topographic Center Publication

SUPPLEMEN
Consult U.S. Co
supplemental inf

RADAR
Radar reflectors
floating aids to
reflector identifi
omitted from this c

Significant chang
have occurred in th
sult of the earthqu
observations since
tom subsidence of
-3.7 feet at Seld
use extreme cauti
area of this chart
except at these site



9893

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

Hydrographic Index No. 114E

