

NOAA FORM 78-35A

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

## DESCRIPTIVE REPORT

Type of Survey ..... Hydrographic  
Field No. .... RA-10-4-94  
Registry No. .... H-10543

### LOCALITY

State ..... Alaska  
General Locality ..... Alaska Peninsula  
Sublocality ..... Kumlik Island & Vicinity

1994

CHIEF OF PARTY  
CAPT Russell C. Arnold, NOAA

### LIBRARY & ARCHIVES

DATE ..... NOV 21 1995

H10543

HYDROGRAPHIC TITLE SHEET

H-10543

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

FIELD NO.

RA-10-4-94

State Alaska

General locality Alaska Peninsula

Locality Kumlik Island & Vicinity

Scale 1:10,000 Date of survey May 27, 1994-June 18, 1994

Instructions dated May 5, 1994 Project No. OPR-P180-RA

Vessel NOAA Ship RAINIER (2120), RA-3(2123), RA-4(2124), RA-5(2125), RA-6(2126)

Chief of party CAPT Russell C. Arnold, NOAA

Surveyed by CAPT R. Arnold, LT D. Neander, LT D. Haines, ENS J. Graham, ENS A. Caron,  
ENS G. Glover, ENS S. Smith, CST F. Paranada, SST J. Fleischmann, ST J. Jacobson,  
ST B. Roraback

Soundings taken by echo sounder, hand lead, pole DSF-6000

Graphic record scaled by RAINIER Personnel

Graphic record checked by RAINIER Personnel

Evaluation by: R. Mihailov Automated plot by HP Design Jet 550L

Verification by E. Domingo, J. Stringham, D. Doles, R. Shipley, B. Mihailov

Soundings in ~~meters~~ ~~feet~~ meters & decimeters at MLW MLLW

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

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

SURF/AWOLS MCR 11/28/95

12/19/96  
NOV 21 1995

EAGLE I. A. PROGRESS TITCH

OPERATION  
HYDROGRAPHIC SURVEY  
SOUTHERN ALASKA PENINSULA, ALASKA

MAY 27-31, 1994

NOAA SHIP RAINIER  
R. C. ARNOLD, CAPT., NOAA  
COMMANDING

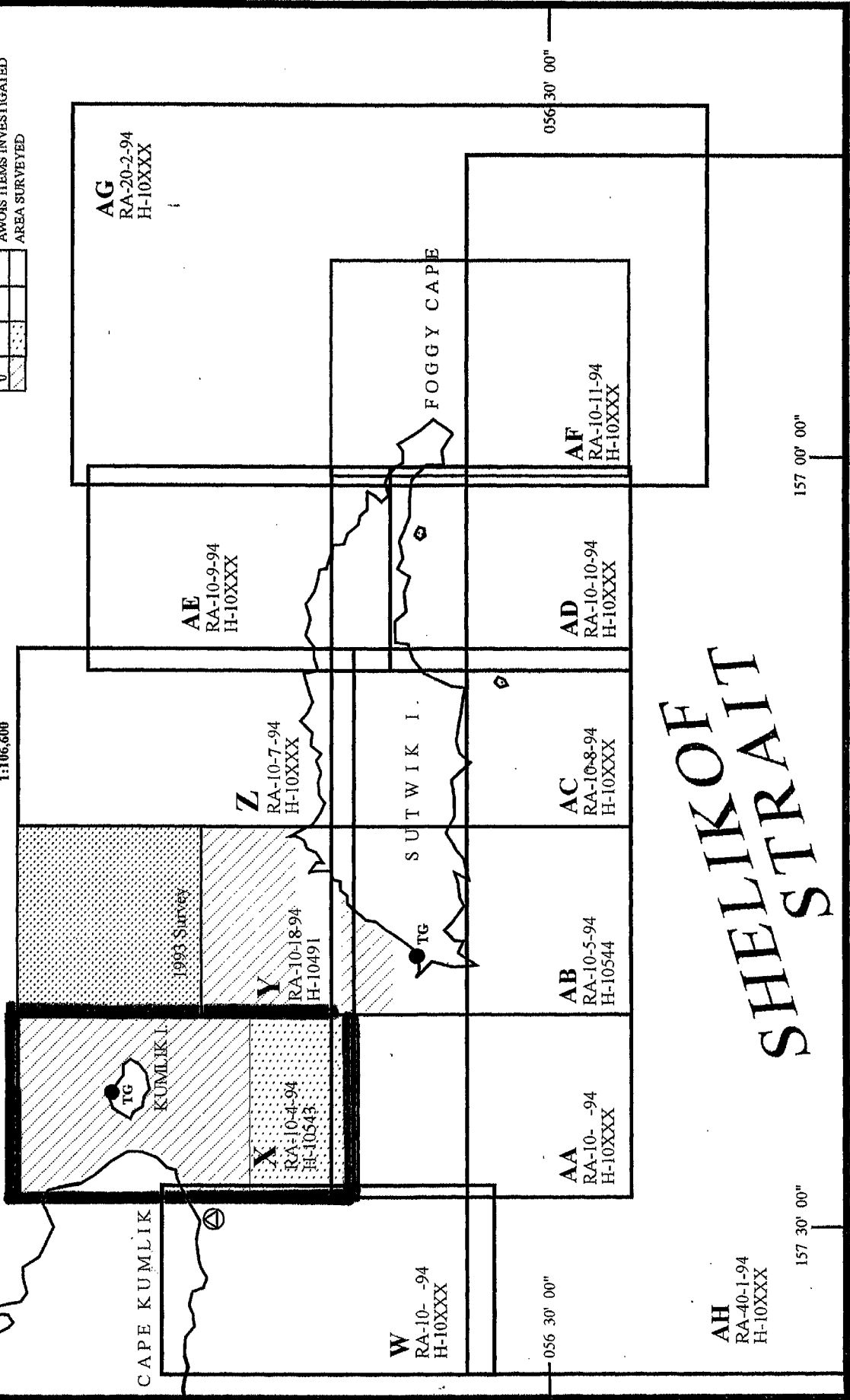
SCALE OF CHART 16568  
1:106,600

157 00' 00"

HYDRA I.

SQ. M. SOUNDINGS	
192	593
193	0
194	0
195	3
196	0
197	3
198	3
199	0

- LNM SOUNDINGS
- LNM SIDE SCAN SOUNDINGS
- BOTTOM SAMPLES (GRAB)
- ELECTRONIC CONTROL STATIONS
- TEMP. DEPTH, SOUND VEL. CAST
- TIDE GAGES
- GEO. CONT. STATIONS EST./REC.
- AWOIS ITEMS INVESTIGATED
- AREA SURVEYED



SHELLIKOFF STRAIT

AH  
RA-40-1-94  
H-10XXXX

157 30' 00"

W  
RA-10- -94  
H-10XXXX

056 30' 00"

AA  
RA-10- -94  
H-10XXXX

AB  
RA-10-5-94  
H-10544

AC  
RA-10-8-94  
H-10XXXX

AD  
RA-10-10-94  
H-10XXXX

AF  
RA-10-11-94  
H-10XXXX

157 00' 00"

056 30' 00"

AG  
RA-20-2-94  
H-10XXXX

AE  
RA-10-9-94  
H-10XXXX

Z  
RA-10-7-94  
H-10XXXX

Y  
RA-10-18-94  
H-10491

X  
RA-10-4-94  
H-10543

CAPE KUMLIK

SUTWIK I.

FOGGY CAPE

# Descriptive Report to Accompany Hydrographic Survey H-10543

Field Number RA-10-4-94

Scale 1:10,000

May - June 1994

NOAA Ship RAINIER  
Chief of Party: Captain Russell C. Arnold

## A. PROJECT ✓

This basic hydrographic survey was completed along the Southern Alaska Peninsula, Alaska, as specified by Project Instructions OPR-P180-RA dated May 5, 1994.

Survey H-10543 corresponds to "sheet X" as defined in the Project Instructions.

This survey will provide contemporary hydrographic survey data for updating existing nautical charts, and for constructing two 1:100,000 scale metric charts. The new charts will cover inshore and offshore areas between Sutwik Island and Mitrofanina Island along the Southern Alaska Peninsula. Requests for hydrographic surveys and updated charts have been received from the U.S. Coast Guard, Alaska congressional delegates, NOAA, Defense Mapping Agency, and local fishermen.

## B. AREA SURVEYED *See Eval Rpt, Section B.*

The survey area is located along the Southern Alaska Peninsula, southwest of Kodiak Island. The survey's northern and southern limits are bounded by latitudes 56°41.0' N and 56°34.5' N, the eastern and western limits by longitudes 157°22.0' W and 157°28.5' W. The north and west limits at the northwestern corner of the survey are latitude 56°40.0' N and longitude 157°28.0' W. The extreme eastern portion of Cape Kumlik, and Kumlik Island in its entirety, are included on this sheet.

Data acquisition was conducted from May <sup>27</sup>~~25~~, 1994, Day Number (DN) <sup>147</sup>~~145~~; through June 18, 1994, DN 169.

## C. SURVEY VESSELS

Data were acquired by the NOAA SHIP RAINIER and four survey launches as noted below:

<u>Vessel</u>	<u>EDP #</u>	<u>Operation</u>
RAINIER	2120	Sound Velocity Cast Bottom Samples
RA-3	2123	Hydrography Shoreline Verification
RA-4	2124	Hydrography Shoreline Verification

RA-5	2125	Hydrography Bottom Samples Shoreline Verification
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RA-6	2126	Hydrography Shoreline Verification
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**D. AUTOMATED DATA ACQUISITION AND PROCESSING ✓**

Data acquisition and processing were accomplished with the following HDAPS programs:

<u>Program Name</u>	<u>Version</u>	<u>Date Installed</u>
BACKUP	2.00	3/7/94
BASELINE	1.14	3/7/94
BIGABST	2.07	3/7/94
BIGAUTOST	3.01	3/7/94
BLKEDIT	2.02	3/7/94
CARTO	2.13	5/12/94
CLASSIFY	1.05	3/7/94
CONVERT	3.62	3/7/94
DAS_SURV	6.70	5/12/94
DIAGNOSE	3.04	5/12/94
DISC-UTIL	1.00	3/7/94
DP	2.14	3/7/94
EXCESS	4.21	3/7/94
FILESYS	3.24	5/12/94
GRAFEDIT	1.06	3/7/94
INVERSE	2.01	3/7/94
LISTDATA	1.02	3/7/94
LOADNEW	2.10	3/7/94
LSTAWOIS	3.07	5/12/94
MAINMENU	1.20	3/7/94
MAN_DATA	2.01	3/7/94
NEWPOST	6.01	3/7/94
PLOTALL	2.27	5/12/94
POINT	2.10	3/7/94
PREDICT	2.01	3/7/94
PRESURV	7.08	5/12/94
PRINTOUT	4.03	5/3/94
QUICK	2.05	5/12/94
RAMSAVER	1.02	3/7/94
REAPPLY	2.10	3/7/94
RECOMP	1.02	3/7/94
SCANNER	1.00	3/7/94
SELPRINT	2.04	3/7/94
SYMBOLS		3/7/94
VERSIONS	1.00	3/7/94
ZOOMEDIT	2.24	5/12/94

Velocity corrections were determined using:

<u>Program Name</u>	<u>Version</u>	<u>Date Installed</u>
VELOCITY	2.10	3/15/94

**E. SONAR EQUIPMENT** ✓

Sonar equipment was not used on sheet X.

**F. SOUNDING EQUIPMENT** ✓

The Raytheon DSF-6000N is a dual frequency (100 kHz, 24 kHz), paper trace echo sounder. Serial numbers are included on the headers of the daily Raw Master Printouts.\* No problems which affect survey data were encountered. All soundings were acquired using the High + Low, High frequency digitized setting.

**Problems**

None

**G. CORRECTIONS TO ECHO SOUNDINGS** ✓

Correctors for the velocity of sound through water were determined from the cast listed below:

<u>Velocity Table #</u>	<u>Cast #</u>	<u>DN</u>	<u>Cast Position</u>	<u>Deepest Depth (m)</u>	<u>Applicable DN</u>	
1	1	152	56°39'16" N 157°22'58" W	156.7	145 - 169	Plots within survey limits.

The sound velocity cast was acquired with SBE SEACAT Profiler (S/N 811), calibrated 12/17/93. Velocity correctors were computed using the PC program VELOCITY in accordance with Hydrographic Survey Guideline (HSG) No. 69. A printout of the Sound Velocity Corrector Tables used in the HDAPS Post Survey program is included in the "Separates to be Included with Survey Data, IV. Sounding Equipment Calibrations and Corrections". \*

**Static Draft** ✓

A transducer depth was determined using FPM Fig 2.2 for launches 2123, 2124, 2125 and 2126 in the spring of 1994 and was entered into the offset tables for each launch. \*

**Settlement and Squat** ✓

Correctors were computed in accordance with Hydrographic Manual Section 4.9.4.2., using FPM Fig. 2.3, and are included with project data for OPR-P180-RA. The data used was collected in Shilshole Bay, Washington in March of 1994.

\* Filed with the hydrographic records.

**Offset Tables ✓**

Offset tables contain offsets for the GPS antenna, as well as static draft measurements, and settlement and squat data. Offset tables 3-6 correspond to the number of the launch. The offset tables were compiled with new measurements in the spring of 1994 and are contained in the "Separates to be Included with Survey Data". \*

**Heave ✓**

The launches are not equipped with heave, pitch and roll sensors. No significant sea action was encountered during this survey.

**Bar Check and Lead Lines ✓**

Bar check and lead lines were calibrated by RAINIER personnel during the winter 1993-1994 inport. Calibration forms are included with the project data for OPR-P180-RA. Bar checks were performed on a weekly basis and served as a functional check of the DSF-6000N.

**Tide Correctors ✓**

Predicted tides for the project were provided on diskette by N/OES334 for the Ugaishak, Alaska reference station (945-8553).

Tidal correctors as provided in the project instructions for this sheet are:

<u>Time Correction</u>	<u>Height Correction</u>
0 hr 0 min.	<u>Range Ratio</u>
	X0.94

HDAPS listings of the data used in generating tide corrector tables are included in Appendix V of this report. \*

Two tide gages were installed by RAINIER personnel at Kumlik Island (945-8704) on May 26, 1994, DN 146. Two 8200 digital gages were placed at the site, and opening levels of the staff were conducted upon installation. A problem was noted during the initial three hour observation, the two gages' pressure readings were not in agreement. One gage had an improper slope and offset entered, while the other gage had pressure sensor problems. The slope and offset problem was corrected, and the gage was put back on line. The gage with the faulty pressure sensor was returned to N/OES214. Closing levels will be completed by RAINIER personnel at the conclusion of the project.

The control station was Sand Point, Alaska (945-9450). Opening levels of the control station were performed by RAINIER personnel on May 21 and 22, 1994. Closing levels at Sand Point, Alaska will be completed by the Pacific Operation Section N/OES214 during their annual visit in late July as per phone conversation with Mr. Mike Gibson (OES).

The station description, field tide records, and Field Tide Note (Appendix V) \* will be forwarded to N/OES212 monthly in accordance with HSG 50 and FPM 4.3, and at the end of the project. Requests for approved tides will be forwarded to N/OES2 at the beginning of July when bracketing levels will be completed. *Approved tide note dated Oct. 28, 1994 is attached.*

*\* Filed with the hydrographic records.*

## H. CONTROL STATIONS ✓ *See Eval Rpt, section H*

A listing of the geodetic stations used to control this survey is included in ~~Appendix III~~ of this report.

Two DGPS base stations were setup on the existing stations LAND and CLAY 2. Station LAND is on an islet in Aniakchak Bay, five nautical miles north of the survey area. Station CLAY 2 is located on an islet south of Cape Kumlik, less than one nautical mile from the western limit of this survey. The horizontal datum for this project is NAD 83. All existing stations were recovered in accordance with methods stated in Section 5.2.4 of the FPM. Additional information is contained in the "Summer 1994 Horizontal Control Report", which will be submitted at the end of the project.

## I. HYDROGRAPHIC POSITION CONTROL ✓

### Method of Position Control

All soundings and features were positioned using differential GPS. Serial numbers for Ashtech GPS equipment are annotated on the data printouts. \*

### Calibrations & Systems Check Methods ✓

System checks were performed by launch to launch comparisons of position. Three observations of position were made by each launch using correctors from two independent DGPS base stations. System checks were performed on a weekly basis. The results were transferred to forms which are included in the project data for OPR-P180. An abstract of the system checks is included in the "Separates to be Included with Survey Data, III. Horizontal Position Control and Corrections to Position Data".-\*

### Problems ✓

None

### Ashtech GPS ✓

VHF differential shore stations were established at stations LAND and CLAY 2. The difference between the computed location and the station's published position was recorded by the MONITOR program on a PC. Data from a 24-hour period were recorded and examined for signs of multi-path signal reflection, which was not evident at either station. Scatterplot results are included in the "Project related data for OPR-P180-RA". The scatterplot results provided with this survey for station LAND were obtained last year. The area around station LAND remains undeveloped, and the geography unchanged.

### Problems ✓

None

### Offset ✓

The launch GPS antenna offsets are stored in the HDAPS Offset Tables as listed in Section G. Copies of the Offset Tables are included in the "Separates to be Included with Survey Data". \*

\* Filed with the hydrographic records.



## J. SHORELINE *See Eval Report, section J.*

The shoreline map (T-sheet) used to transfer shoreline detail to the final sheets was TP-01157 (enlarged to 1:10,000 from 1:20,000, NAD 27).

Shoreline verification was conducted near predicted lower low water in accordance with FPM 7.1. Shoreline verification was accomplished by assigning sequential reference numbers and taking detached positions (DPs), as explained later in this section.

Shoreline and T-sheet features verified via visual inspection were assigned sequential reference numbers, described, and recorded in the field using reference forms and corresponding 1:10,000 photocopies of the T-sheet. Reference numbers, descriptions, and heights corrected to MLLW using predicted tides are recorded on the reference form. Corresponding notes were annotated on the photocopies of the T-sheet when deemed necessary. The annotated photocopies of the T-sheet and the reference forms are included with the survey data.

DPs taken during shoreline verification were recorded on the master printouts and on the DP forms. \* These indicate significant T-sheet features, features not found on the T-sheet, and locations of disprovals. \* Where possible, positions of some T-sheet features were verified during inshore mainscheme hydrography and annotated on the master printouts.

Detailed 1:10,000 "Rough Bottom Sample and Detached Position Plots" are provided showing all DPs, reference numbers, and notes relating to each feature. The information from these plots was transferred to a final field plot where possible. Where such information would interfere with the legibility of the final plot the appropriate cartographic symbol has been transferred, but height and position number information remains on the rough plot, which serves as an overlay (FPM 6.1.2.5). Verified T-sheet features were retained and shown in black. Changes to the shoreline were shown in red. Field cartographic codes were assigned using the HDAPS DP editor. Heights are recorded in meters and are corrected to predicted MLLW. *No MHW changes to the shoreline are shown on the smooth sheet. Heights of alongshore and offshore features appearing on the smooth sheet are corrected for approved tides.* Inshore hydrography and DP's taken during shoreline verification showed a discrepancy between photogrammetric and hydrographic positioning at many points on sheet X. The mismatch is apparently due to a shift in the island's position on the T-sheet, possibly due to datum shift inaccuracies from NAD27 on the T-sheet to NAD83 on the survey. Since the shoreline is shifted in position only, and the general configuration was not changed, it is depicted in black on the final field plot, at the shifted position. Where the shoreline has changed from the original configuration, it is depicted in red. T-sheet TP-01157 was shifted southwest in the direction of 233° true (south 20 meters and west 30 meters) to match the hydrography. It is recommended that the shoreline defined in this survey supersede prior shoreline information compiled on T-sheet TP-01157.

### Disprovals

The T-sheet rock in the vicinity of latitude 56°38'07"N, longitude 157°23'29"W, was not found. A search of a 40m radius around the alleged position (Position No. 6058) was conducted for 15 min. by depth sounder and visual means. A large mass of kelp was seen in the area. The visibility of the water in the area was 2 meters, and the average depth was 10 to 20 meters.

Recommendations: The hydrographer recommends that the T-sheet rock be deleted from TP-01157.

\* Filed with the hydrographic records.

### Changes

Many changes to the T-sheet shoreline were found and depicted in red on the final field plot. The large number of changes are a result of an inaccurate shoreline manuscript. The errors are probably a result of the T-sheet position shift discussed in this section, and of photography being flown at a high tide. In many cases, ledges or reefs extend further than their depicted positions on the T-sheet, and T-sheet rocks are depicted as high points of ledges or reefs. No MLLW changes are shown on the smooth sheet in red.

Recommendations: The hydrographer recommends that the shoreline changes from this survey be used to supersede prior shoreline information compiled on T-sheet TP-01157. **Concur**

**New Features** - Refer to the smooth sheet for correct shoreline depiction.

Twenty-three new features were found and are depicted on the final field plot. Depths <sup>/heights</sup> are referenced to MLLW.

Item	Approx. Position	Position No.	Depth (m)/HT	Remarks
Rock	56°38'54"N 157°25'40"W	1080	0.3 <del>-0.1</del>	COV <del>Below</del>
Rock	56°38'39"N 157°24'00"W	1086	0.4 <del>-0.2</del>	COV <del>Below</del>
Rock	56°39'29"N 157°26'45"W	1090	-0.8 <del>-1.1</del>	UNCOV <del>Exposed</del>
Rock	56°39'58"N 157°26'41"W	1091	0.3 <del>-0.0</del>	COV
Rock	56°39'56"N 157°28'20"W	1093	0.5 <del>-0.2</del>	COV <del>Below</del>
Rock	56°40'00"N 157°28'33"W	1094	0.1 <del>-0.2</del>	COV <del>Exposed</del>
Rock	56°38'52"N 157°27'19"W	1096	-0.3 <del>-0.7</del>	UNCOV <del>Exposed</del>
Foul Area Limits	56°37'45"N 157°27'29"W	3457, 3458, 3459		
Rock	56°38'27"N 157°25'56"W	3465	-1.4 <del>-1.7</del>	UNCOV <del>Exposed</del>
Foul Area Limits	56°38'26"N 157°25'45"W	3724, 3725		
Rock	56°38'02"N 157°25'24"W	3740	-1.9 <del>-2.0</del>	UNCOV <del>Exposed</del>

Foul Area Limit	56°37'58"N 157°24'18"W	6211		
Rock	56°37'56"N 157°24'55"W	6214	- 0.1	UN COV <del>Exposed</del>
Reef	56°36'08"N 157°25'39"W	6218, 6219	0.1	COV <del>Below</del>
Rock	56°38'10"N 157°23'25"W	9184	1.7 <del>+6</del>	Submerged <del>Below</del>
Rock	56°35'36"N 157°22'35"W	6271	1.6	Submerged <del>Below</del>

(19)  
Position No. 803 depicts a T-sheet rock in the vicinity of latitude 56°38'40"N, longitude 157°26'00"W, and marks the limit of a new foul area. The foul area is further defined by Pos. Nos 801 and 802. Rock has been incorporated into foul area.

Position No. 1087 depicts a new rock in the vicinity of latitude 56°38'39"N, longitude 157°23'46"W, that marks the limit of a new foul area. CONCUR

Position No's 1091 and 1092 depict the limits of a kelp bed in the vicinity of latitude 56°39'55"N, longitude 157°26'50"W.

Position No. 1095 depicts the northeastern limit of a new reef in the vicinity of latitude 56°39'36"N, longitude 157°28'02"W.

A new foul area in the vicinity of latitude 56°37'20"N, longitude 157°27'55"W is outlined by Position No's 3447, 3448, 3450, 3453, 3454, and 3455. Position No. 3447 also depicts a new rock, No. 3448 a T-sheet islet, No. 3450 a T-sheet rock, No. 3453 a new rock, and No. 3454 a new rock. Position No. 3455 is strictly a foul area limit mark. Position No. 3451 depicts a new rock that lies inside the foul area.

A new rock exposed 0.7 m at MLLW was found in the vicinity of latitude 56°38'20"N, longitude 157°23'15"W, by hydrography. Two hydrographic lines terminate at the rock from different sides of the feature (Position No's 1810 and 1812, RA-10-4C, VN 2123, DN152). The raw master printouts for each line of hydrography are annotated to describe the rock. In addition, a DP form was filled out with pertinent information.

Position No. 7760 depicts a new reef in the vicinity of latitude 56°35'42"N, longitude 157°22'10"W, at the position of a rock transferred from prior survey H-4495.

Recommendations: The hydrographer recommends that the shoreline detail from this survey be used to supersede prior shoreline information. — CONCUR

#### K. CROSSLINES ✓

Crosslines are within 1 meter agreement with mainscheme hydrography. Crosslines totaled 34.4 nautical miles, representing 8.8% of the total mainscheme hydrography.

**L. JUNCTIONS** See Eval Report, section L.

This survey junctions with survey H-10491 (1:10,000, 1993) to the east, H-10486 (1:10,000, 1993) to the north, H-10490 (1:10,000, 1993) at the <sup>West</sup> northeast corner, and H-10545 (1:10,000, 1994) to the south, and H-10557 (1994, 1:10,000) to the SW. These soundings were found to be in general agreement with this survey, except in the areas of complex bathymetry.

Final comparisons will be made at the Pacific Hydrographic Section (PHS).

**M. COMPARISON WITH PRIOR SURVEYS** See Eval Report, section M.

Three prior surveys were compared: H-4495 (1:20,000, 1925), H-4497 (1:20,000, 1925), and H-4506 (1:60,000, 1925). Sparse soundings from these prior surveys were in general agreement with the present survey. However, the present survey, due to much greater sounding density, revealed numerous shoal soundings not found during the prior surveys. There were no instances where prior survey soundings were shoaler in a corresponding area.

Final comparisons will be conducted by PHS.

**N. ITEM INVESTIGATIONS** ✓

There were no item investigations on sheet X.

**O. COMPARISON WITH THE CHART** See Eval Report, section O.

This survey was compared to NOS chart 16568, 9th Edition, March 21, 1992, 1:106,600 (NAD83), and NOS chart 16566, 7th Edition, October 28, 1989, 1:77,477 (NAD83). The charted soundings were found to be in general agreement with this survey. Final comparisons will be made at PHS.

Charted rocks were either identified as T-sheet rocks, high points or extensions of T-sheet ledges and reefs except as noted below.

One rock in the vicinity of latitude 56°34'52"N, longitude 157°22'10"W shown on NOS Chart 16568 is not shown on NOS Chart 16566. Mainsecheme hydrography (100-m line spacing) revealed no indication of this rock. Depths in the vicinity were 35 - 40 meters. A chart mark-up for this portion of Chart 16568 was not available, hence the origin was unknown. After discussion with Mike Riddle (N/CG241) it was determined that this rock originated from USGS Quad Sutwik Island, C-5, 1:63,360, 1963. A memorandum dated June 5, 1994 was sent to N/CG241 and is included in ~~Appendix VI of~~ this report. ~~In addition, a "Supplement to Chart Mark-Up" for Chart 16568 was faxed by N/CG241 to RAINIER on June 15, 1994 and is also included in Appendix VI.~~

Recommendation: The hydrographer recommends that the rock noted above be deleted from Chart 16568. - CONCUR

**Dangers to Navigation**

Seven dangers to navigation within the limits of this survey were reported to the Seventeenth Coast Guard District on June 21, 1994. Copies of the correspondence can be found in ~~Appendix I of~~ this report.

**P. ADEQUACY OF SURVEY** ✓

Prior to final approval, survey H-10543 is complete and adequate to supersede charted depths and features in their common areas. **CONCUR**

**Q. AIDS TO NAVIGATION** ✓

None

**R. STATISTICS** ✓

<u>Vessel:</u>	<u>2120</u>	<u>2123</u>	<u>2124</u>	<u>2125</u>	<u>2126</u>	<u>Total</u>
Number of Positions	39	1216	823	1016	1508	4602
NM Hydrography	0	206.6	152.3	121.6	202.1	682.6
Velocity Casts	1					
Detached Position	84					
Bottom Samples	72					
Tide Stations	1					
NM <sup>2</sup> Hydrography	24					

**S. MISCELLANEOUS** ✓

Bottom samples were sent to the Smithsonian Institution in accordance with the Project Instructions.

Coast Pilot current current comparisons were made in accordance with Project Instructions.

No tidal current predictions are available within the sheet limits.

**T. RECOMMENDATIONS** ✓

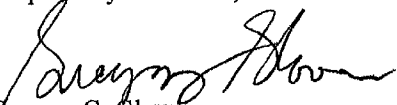
None

**U. REFERRAL TO REPORTS** ✓


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

<u>Title</u>	<u>Date Sent</u>	<u>Office</u>
Summer 1994 Horizontal Control Report for OPR-P180-RA	August 1994	N/CG2333
Summer 1994 Coast Pilot Report for OPR-P180-RA	August 1994	N/CG245
Project related data for OPR-P180-RA	Incremental	N/CG245

Respectfully Submitted,

  
Gregory G. Glover  
Ensign, NOAA

Approved and Forwarded,

  
Russell C. Arnold  
Captain, NOAA  
Commanding Officer



UNITED STATES DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration  
Office of NOAA Corps Operations  
Pacific Marine Center  
1801 Fairview Avenue East  
Seattle, Washington 98102-3767

NOAA Ship RAINIER

June 26, 1994

**ADVANCE  
INFORMATION**

Commander  
Seventeenth Coast Guard District  
Post Office Box 25517  
Juneau, Alaska 99802

Dear Sir:

Attached is a confirmation copy of the radio messages sent to your office regarding the dangers to navigation which I recommend for inclusion in the Local Notice to Mariners for the Seventeenth Coast Guard District. A copy of the chart showing the areas in which the dangers exist is also attached.

Sincerely,

Russell C. Arnold  
Captain, NOAA  
Commanding Officer

Enclosures

cc: DMAHTC  
N/CG221  
PMC



P 14 Z JUN 94  
FM NOAA S RAINIER  
TO CCGDSEVENTEEN JUNEAU AK  
MAHTCCNAVWARN WASHINGTON DC//MCNM//  
INFO NOAA MOP SEATTLE WA  
ACCT CM-VCAA

**ADVANCE  
INFORMATION**

BT  
UNCLAS

NOAA SHIP RAINIER HAS LOCATED 7 DANGERS TO NAVIGATION IN SOUTHERN ALASKA PENINSULA, ALASKA (PROJECT OPR-P180-RA) WITHIN THE LIMITS OF HYDROGRAPHIC SURVEY H-10543. THE FOLLOWING INFORMATION IS PROVIDED FOR PUBLICATION IN LOCAL NOTICE TO MARINERS:

CHARTS AFFECTED: 16568 9TH ED MAR 21/92 1:106,600 (NAD83)  
16566 7TH ED OCT 28/89 1:77,477 (NAD83)

DEPTHS ARE REDUCED TO MLLW BASED ON PREDICTED TIDES.

ITEM	DANGER	CHART	DEPTH	LATITUDE	LONGITUDE
A.	SHOAL	BOTH	5 1/4 fms	56/40/21.7N	157/27/35.1W
B.	SHOAL	BOTH	3 1/4 fms	56/39/36.3N	157/27/22.7W
C.	SHOAL	BOTH	3 3/4 fms	56/39/41.3N	157/25/51.4W
D.	SHOAL	BOTH	2 1/4 fms	56/36/58.5N	157/27/47.1W
E.	SHOAL	BOTH	1 1/2 fms	56/35/53.5N	157/25/52.0W
F.	SHOAL	BOTH	7 fms	56/35/41.5N	157/26/45.0W
G.	ROCK	BOTH	3/4 fms	56/35/35.5N	157/22/35.1W

THIS IS ADVANCE INFORMATION SUBJECT TO OFFICE REVIEW. QUESTIONS CONCERNING THIS MESSAGE SHOULD BE DIRECTED TO THE CHIEF, PACIFIC HYDROGRAPHIC SECTION AT (206)526-6835. A LETTER WITH ATTACHED CHARTLET WILL BE MAILED TO CONFIRM THIS MESSAGE.

BT



ORAN LINEAR INTERPOLATOR

CAPE AYUTKA

CAPE KUNMIK

Waterfall

EAGLE I

GARDEN

ADVANCE INFORMATION

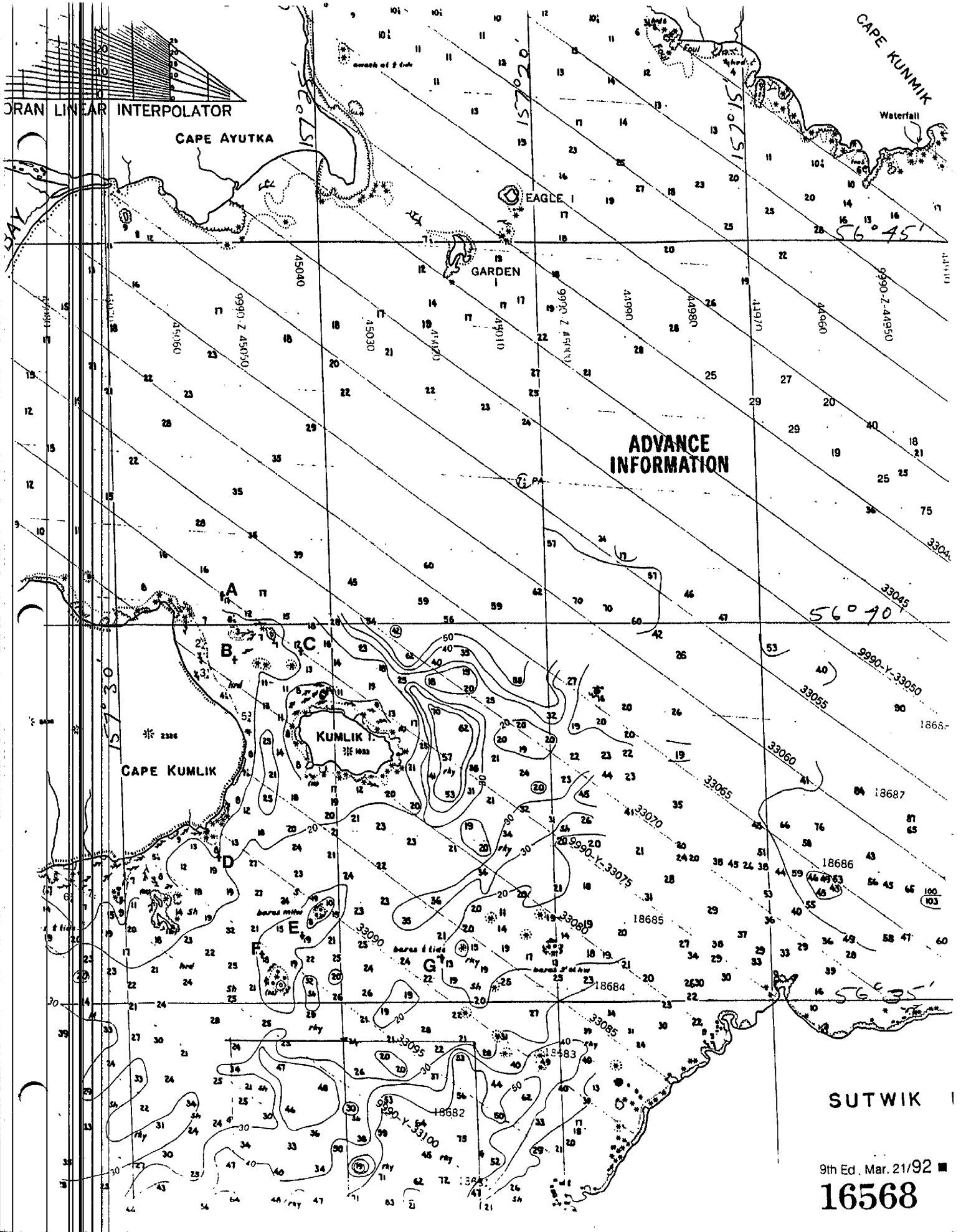
CAPE KUMLIK

KUMLIK I.

SUTWIK

9th Ed. Mar. 21/92

16568





UNITED STATES DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration  
NATIONAL OCEAN SERVICE  
OFFICE OF CHARTING AND GEODETIC SERVICES  
Seattle, Washington 98115-0070

November 15, 1995

**ADVANCE  
INFORMATION**

Commander  
Seventeenth Coast Guard District  
P.O. Box 25517  
Juneau, AK 99802

Dear Sir:

During office review of hydrographic survey H-10543, Alaska Peninsula, four miles east of Foggy Cape, six soundings were found and are considered potential dangers to navigation affecting the following chart.

<u>Chart</u>	<u>Edition/date</u>	<u>Datum</u>
16568	10th, 02/18/95	NAD83
16566	7th 10/28/89	NAD83

It is recommended that the enclosed Report of Dangers to Navigation be included in the Local Notice to Mariners. Questions concerning this report should be directed to the Pacific Hydrographic Branch at (206) 526-6853.

Sincerely,

*Kathy A. Timmons*

Kathy A. Timmons  
Commander, NOAA  
Chief, Pacific Hydrographic Branch

Enclosure

cc: DMA/HTC  
NCS/261



REPORT OF DANGERS TO NAVIGATION

**ADVANCE  
INFORMATION**

Hydrographic Survey Registry Number: H-10543  
Survey Title: State: ALASKA  
Locality: ALASKA PENINSULA  
Sublocality: FOUR MILES EAST OF FOGGY CAPE

Project Number: OPR-P180-RA, NOAA Ship Rainier

The following depths were discovered during hydrographic surveying operations and indicate significantly shoaler depths than those currently charted:

Charts Affected: 16566 7th Edition/October 28, 1989 1:77,477 NAD83  
16568 10th Edition/February 18, 1995 1:106,000 NAD83

Depth	Datum	Geographic Position	
		Latitude(N)	Longitude(W)
6 1/4 fathoms	NAD83	56/37/31.0	157/27/08.0
rock, cov 1/4 fathom	NAD 83	56/37/23.0	157/27/25.0
12 fathoms	NAD 83	56/35/25.0	157/24/50.0
11 fathoms	NAD 83	56/35/22.5	157/22/54.0
4 1/4 fathoms	NAD 83	56/35/23.0	157/22/27.0

Depths reduced to Mean Lower Low Water using approved tides.

Questions concerning this report should be directed to the Pacific Hydrographic Branch at (206) 526-6853.

CONTROL STATIONS as of 23 Jun 1994

No	Type	Latitude	Longitude	H	Cart	Freq	Vel	Code	MM/DD/YY	Station Name
100	F	056:45:19.732	157:29:28.737	42	250	0.0	0.0		05/24/94	LAND(DGPS) 1945
<del>101</del>	<del>F</del>	<del>056:44:35.925</del>	<del>157:00:57.249</del>	<del>50</del>	<del>250</del>	<del>0.0</del>	<del>0.0</del>		<del>05/24/94</del>	<del>HYDRA(DGPS)</del>
102	F	056:36:08.811	157:29:12.200	44	250	0.0	0.0		05/24/94	CLAY 2(DGPS) 1982
<del>103</del>	<del>F</del>	<del>056:31:22.546</del>	<del>157:11:42.067</del>	<del>35</del>	<del>250</del>	<del>0.0</del>	<del>0.0</del>		<del>06/03/94</del>	<del>TWIK(DGPS)</del>



UNITED STATES DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration  
Office of NOAA Corps Operations  
Pacific Marine Center  
1801 Fairview Avenue East  
Seattle, Washington 98102-3767

June 5, 1994

MEMORANDUM FOR: Captain Dean Seidel, NOAA  
Chief, Hydrographic Surveys Branch

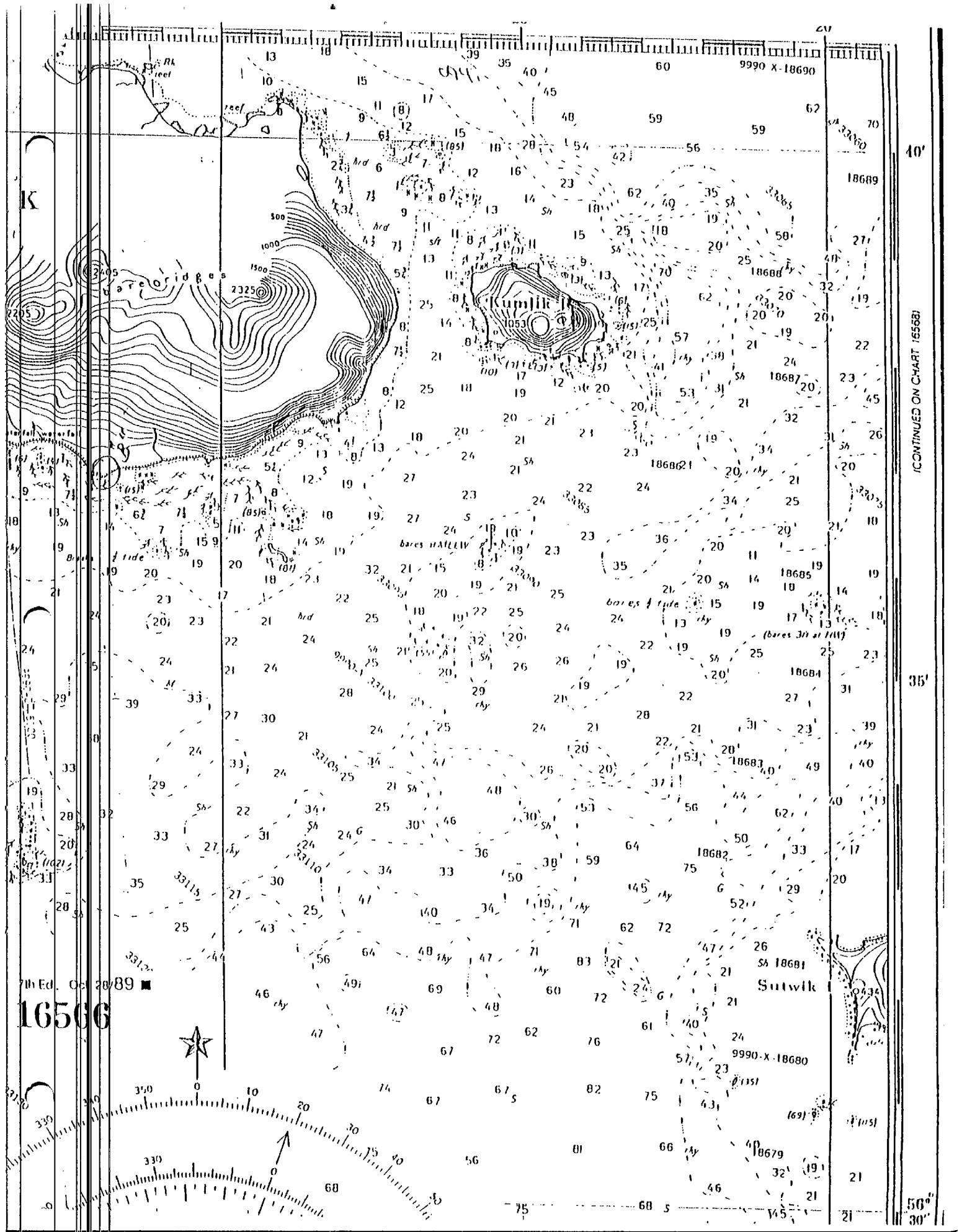
FROM: *Russell C. Arnold*  
Captain Russell C. Arnold, NOAA  
Commanding Officer, NOAA Ship RAINIER

SUBJECT: Differences between Chart 16566 and 16568

RAINIER has started conducting surveys in the vicinity of the western end Sutwik Island and has noticed numerous differences between NOS Chart 16566 (1:77,477, 7<sup>th</sup>Ed., October 28, 1989, NAD83) and NOS Chart 16568 (1:106,600, 9<sup>th</sup>Ed., March 21, 1992, NAD83). Numerous rocks are depicted on Chart 16568 that are not shown on Chart 16566. Investigation of these rocks during surveys II-10491, II-10543, and II-10544 has revealed that the rocks depicted on Chart 16566 are correct and the origin the rocks shown on Chart 16568 is unknown. A chartlet of each chart is attached with the rocks in question highlighted.

Attachments





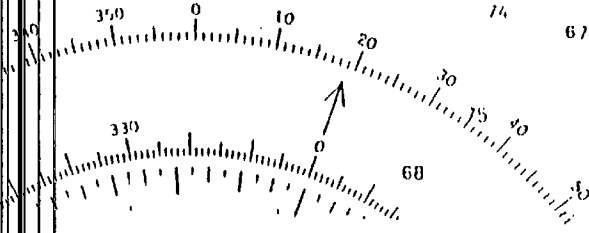
40'

35'

30'

(CONTINUED ON CHART 16568)

7th Ed. Oct 20/89  
**16506**



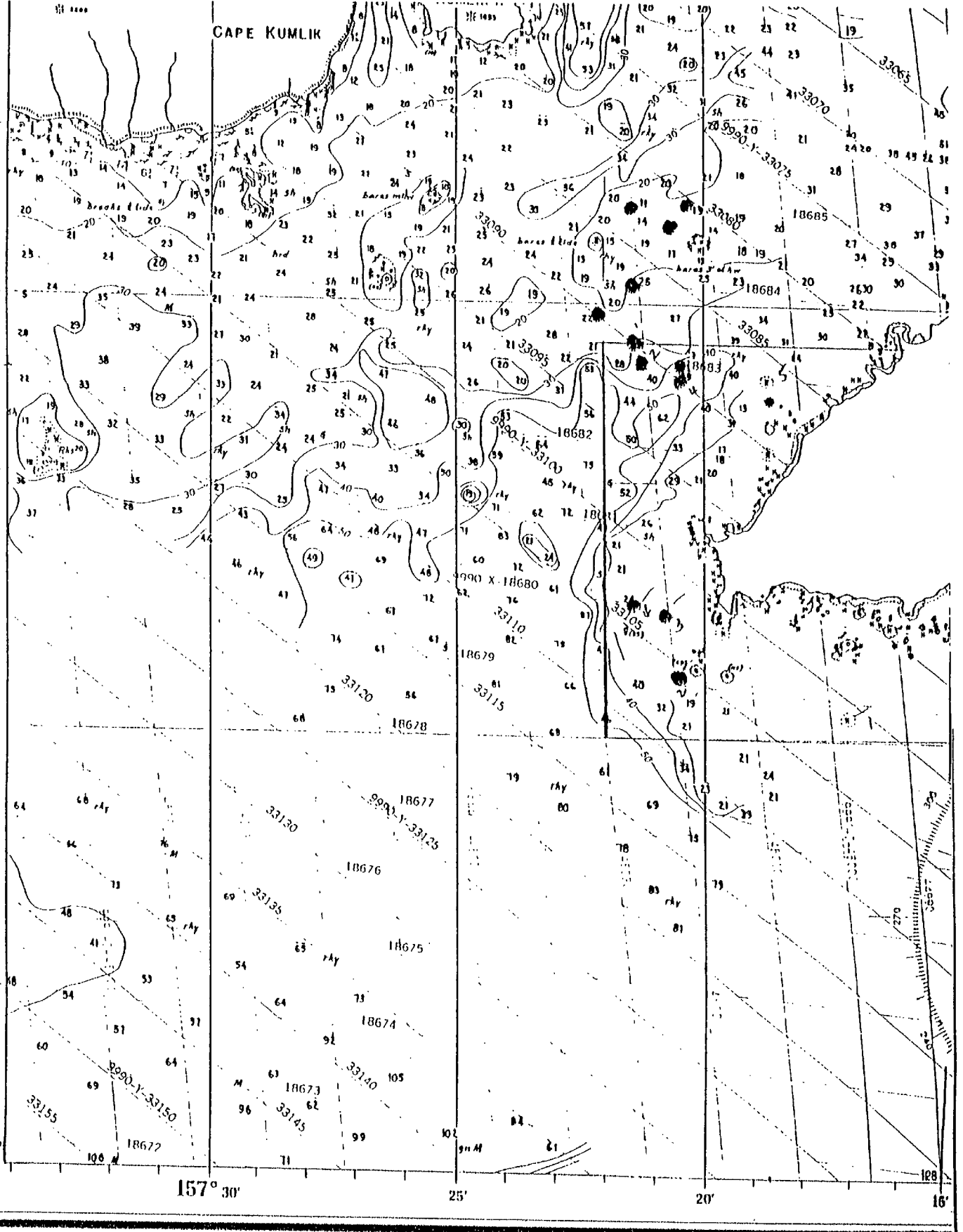
Sutwik

9990-X-18680

18679

165

CONTINUED ON CHART 16566



91st Ed. Mar. 21/92

**16568**  
LORAN-C OVERPRINTED

**CAUTION**

This chart has been corrected from the Notice to Mariners published weekly by the Defense Mapping Agency Hydrographic/Topographic Center and the Local Notice to Mariners issued periodically by each U.S. Coast Guard district to the date shown in the lower left hand corner.

**SOU**


APPROVAL SHEET

for

H-10543  
RA-10-4-94

Standard procedures were followed in accordance with the Hydrographic Manual, Fourth Edition; the Hydrographic Survey Guidelines; and the Field Procedures Manual in producing this survey. The data were examined daily during data acquisition and processing.

The field sheet and accompanying records have been examined by me, are considered complete and adequate for charting purposes, and are approved.



Russell C. Arnold  
Captain, NOAA  
Commanding Officer





UNITED STATES DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration  
NATIONAL OCEAN SERVICE  
Office of Ocean and Earth Sciences  
Silver Spring, Maryland 20910

ORIGINAL

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE: October 28, 1994

MARINE CENTER: Pacific

OPR: P180

HYDROGRAPHIC SHEET: H-10543

LOCALITY: Kumlik Island and vicinity, Shelikof Strait, Alaska

TIME PERIOD: May 27 - June 19, 1994

TIDE STATION USED: 945-8665 West Sutwik Island, Alaska  
Lat.  $56^{\circ} 32.4'N$  Lon.  $157^{\circ} 19.6'W$

PLANE OF REFERENCE (MEAN LOWER LOW WATER): = 1.40 feet  
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: = 8.6 feet

TIDE STATION USED: 945-8704 Cape Kumlik (Kumlik Island), Ak.  
Alaska  
Lat.  $56^{\circ} 38.8'N$  Lon.  $157^{\circ} 25.5'W$

PLANE OF REFERENCE (MEAN LOWER LOW WATER): = -1.15 feet  
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: = 8.9 feet

REMARKS: RECOMMENDED ZONING

Times and heights are direct on Cape Kumlik (Kumlik Island), Ak. (945-8704). Where data for Cape Kumlik is not available, use West Sutwik Island, Ak. (945-8665) with times direct, and apply a X1.03 range ratio to the heights.

NOTES: Hourly heights are tabulated on Greenwich Mean Time. The data for Cape Kumlik (Kumlik Island), Ak. (945-8704) and West Sutwik Island, Ak. (945-8665) are stored in the Next Generation Water Level Measurement System temporary files #745-8704 and #745-8665 respectively.

*William M. Hobbs*  
CHIEF, DATUMS SECTION



GEOGRAPHIC NAMES

H-10543

Name on Survey	ON CHART NO. 16568 ON PREVIOUS SURVEY NO TP-001157 ON U.S. QUADRANGLE MAPS FROM LOCAL INFORMATION ON LOCAL MAPS P.O. GUIDE OR MAP RAND McNALLY ATLAS U.S. LIGHT LIST										
	A	B	C	D	E	F	G	H	K		
ALASKA (title)	X	X									1
ALASKA PENINSULA (title)	X										2
CAPE KUMLIK	X	X									3
KUMLIK ISLAND	X	X									4
NORTH PACIFIC OCEAN	X										5
											6
											7
											8
											9
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											24
											25

Approved:

*Chris C. Loy*

Chief Geographer

MAR 2 1995

**HYDROGRAPHIC SURVEY STATISTICS**

H-10543

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

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

**SHORELINE DATA**

- SHORELINE MAPS (List):
- PHOTOBATHYMETRIC MAPS (List):
- NOTES TO THE HYDROGRAPHER (List):
- SPECIAL REPORTS (List):
- NAUTICAL CHARTS (List):

**OFFICE PROCESSING ACTIVITIES**

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

PROCESSING ACTIVITY	AMOUNTS			
	VERIFICATION	EVALUATION	TOTALS	
POSITIONS ON SHEET			4602	
POSITIONS REVISED				
SOUNDINGS REVISED				
CONTROL STATIONS REVISED				
	TIME-HOURS			
	VERIFICATION	EVALUATION	TOTALS	
PRE-PROCESSING EXAMINATION				
VERIFICATION OF CONTROL				
VERIFICATION OF POSITIONS	56		56	
VERIFICATION OF SOUNDINGS	160		160	
VERIFICATION OF JUNCTIONS				
APPLICATION OF PHOTOBATHYMETRY				
SHORELINE APPLICATION/VERIFICATION				
COMPLIATION OF SMOOTH SHEET	79		79	
COMPARISON WITH PRIOR SURVEYS AND CHARTS		3.0	3	
EVALUATION OF SIDE SCAN SONAR RECORDS				
EVALUATION OF WIRE DRAGS AND SWEEPS			46	
EVALUATION REPORT		46.0		
GEOGRAPHIC NAMES				
OTHER*				
USE OTHER SIDE OF FORM FOR REMARKS	TOTALS	295	49.0	344

Pre-processing Examination by LT M. Larsen	Beginning Date 5/25/94	Ending Date 7/21/94
Verification of Field Data by R. Shipley, B. Mihailov, E. Domingo, J. Stringham, D. Dole	Time (Hours) 295	Ending Date 5/23/95
Verification Check by B.A. Olmstead	Time (Hours) 4	Ending Date 11/3/95
Evaluation and Analysis by B. Mihailov	Time (Hours) 49	Ending Date 8/25/95
Inspection by B.A. Olmstead	Time (Hours) 32	Ending Date 11/14/95

**EVALUATION REPORT  
H-10543**

**A. PROJECT**

Project information is discussed in the hydrographer's report.

**B. AREA SURVEYED**

This survey was conducted in Alaska, and is located along the Alaska Peninsula, approximately 80 nautical miles southwest of Kodiak Island. Specifically, the surveyed area resides four nautical miles northwest of Sutwik Island and includes all of Kumlik Island to the shoreline along Cape Kumlik. The area is characterized by alongshore ledges, isolated reefs, and rocks. Rocky pinnacles that rise up very near the surface were found throughout the survey area. The bottom consists mainly of sand, mud and broken shells. Depths range from 0 meters along the shoreline to 126 meters offshore.

**C. SURVEY VESSELS**

Survey vessel information is found in the hydrographer's report.

**D. AUTOMATED DATA ACQUISITION AND PROCESSING**

Survey data were processed using the same Hydrographic Data Acquisition/Processing System (HDAPS) software used by the hydrographer, the Hydrographic Processing System (HPS) and AutoCad, Version 12.0.

At the time of the survey certification the format for transmission of digital data had not been formally approved. In the interim, digital data for this survey exists in the standard HPS format which is a database format using the .dbf extension. In addition, the sounding plot was created with .dbf (extension) and enhanced using the AutoCad system, are filed both in the AutoCad drawing format, .dwg (extension); and in the more universally recognized graphics transfer format, .dxf (extension). Copies of these files will be retained at PHB until data transfer protocols are developed and improved.

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

The field sheet parameters have been revised to center the hydrographer on the office plot. The data is plotted using a Modified Transverse Mercator projection and are depicted on a single sheet.

#### **E. SONAR EQUIPMENT**

Side scan sonar was not used on survey H-10543.

#### **F. SOUNDING EQUIPMENT**

Sounding equipment is discussed in the hydrographer's report.

#### **G. CORRECTIONS TO SOUNDINGS**

The sounding data have been reduced to Mean Lower Low Water (MLLW). The reducers include corrections for actual tides, dynamic draft, and sound velocity. These reducers have been reviewed and are consistent with NOS specifications. Actual tide reduction is derived from the West Sutwik Island, Alaska gage (945-8665) and Cape Kumlik (Kumlik Island), Alaska gage (945-8704).

#### **H. CONTROL STATIONS**

Control stations are discussed in the hydrographer's report and separates. A list of control stations used on survey H-10543 is attached to this report.

The positions of horizontal control stations used during hydrographic operations are published values based on NAD 83. The geographic positions of all survey data are based on NAD 83. The smooth sheet is annotated with an NAD 27 adjustment tick based on values determined with the NGS program NADCON.

Data based on NAD 27 may be referenced to this survey by applying the following corrections:

Latitude: -2.716 seconds (-84.004 meters)  
Longitude: 7.358 seconds (125.430 meters)

The year of establishment of the control stations originates with the above mentioned horizontal control report and the hydrographer's signal list.

## I. HYDROGRAPHIC POSITION CONTROL

Differential GPS (DGPS) was used to control this survey. A horizontal dilution of precision (HDOP) not to exceed 3.75 was computed for survey operations. No positions exceeded this limit.

## J. SHORELINE

The following registered shoreline map compiled on NAD 27 applies to this survey.

<u>Map Number</u>	<u>Photo Date</u>	<u>Scale</u>
TP-01157	July 1982 August 1983	1:20,000

Shoreline drawn on the smooth sheet originates from a 1:10,000 scale photographic enlargement of the shoreline map.

Shoreline from TP-01157 was digitized at PHB and merged with the survey file during office ACAD processing. No shifting problems were noted as discussed in section J of the hydrographer's report. There were no changes to the photogrammetric mean high water line. Changes to alongshore and offshore features shown on the shoreline manuscript were verified and revised as warranted during survey operations. These changes have been shown on the smooth sheet.

## K. CROSSLINES

Crosslines are discussed in the hydrographer's report.

## L. JUNCTIONS

Survey H-10543 junctions with the following surveys.

<u>Survey</u>	<u>Year</u>	<u>Scale</u>	<u>Area</u>
H-10486	1993	1:10,000	North
H-10490	1993	1:10,000	Northwest
H-10491	1993-94	1:10,000	East
H-10545	1994	1:10,000	South
H-10557	1994	1:10,000	West

The junctions with surveys H-10486, H-10490, H10491 and H-10545 have not been formally completed. These surveys have been previously processed and forwarded for charting. These junctions were made using copies. There is good agreement between depth curves and soundings within the common areas.

Junction with survey H-10557 is complete. There is good agreement between depth curves and soundings within the common area.

Comparison with the chart in areas not covered by a contemporary junction indicates good agreement.

#### **M. COMPARISON WITH PRIOR SURVEYS**

H-4495 (1925) 1:20,000

H-4497 (1925) 1:20,000

H-4506 (1925) 1:60,000

Surveys H-4495, H-4497 and H-4506 cover the entire area of the present survey. The sounding agreement between the present survey and the prior surveys is generally good. Comparison with the prior surveys mostly reveals differences of 1-5 meters (0.5-2.5 fathoms). There is no apparent pattern as to shoaling or an increase in depths. Two significantly shoaler soundings originating from H-4497 (1925) and charted at latitude 56/39/12N, longitude 157/22/40W (18 fathoms) and latitude 56/39/30N, longitude 157/22/30W (40 fathoms) are likely erroneous data. Present hydrography in these areas does not reveal any indication that these shoal depths exist.

Differences between the prior surveys and the present survey can be attributed to increased bottom coverage and less accurate positioning and sounding methods available in 1925.

Survey H-10543 is adequate to supersede the prior surveys within the common area.

#### **N. ITEM INVESTIGATIONS**

There were no item investigations assigned to survey H-10543.

#### **O. COMPARISON WITH CHART**

Survey H-10543 was compared with the following charts.

<u>Chart</u>	<u>Edition</u>	<u>Date</u>	<u>Scale</u>	<u>Datum</u>
16566	7th	October 28, 1989	1:77,477	NAD83
16568	10th	February 18, 1995	1:106,600	NAD83

##### **a. Hydrography**

Charted hydrography originates with the previously discussed prior surveys and miscellaneous source data from survey work conducted between 1925 and 1941. The prior surveys are discussed in section M and requires no further discussion.

Charted miscellaneous source data largely originates from T-8622 (1941), T-4154 (1925) and T-4155 (1925) and is largely comprised of near shore rocks, reefs and ledges. The features have been satisfactorily addressed during survey operations.

Survey H-10543 is adequate to supersede the charted data within the common area.

b. Dangers to Navigation

The hydrographer reported seven dangers to navigation. Five additional dangers were discovered during office processing. These dangers were reported to the local United States Coast Guard District, DMAHTC and N/CG 221. A copy of both reports are attached.

**P. ADEQUACY OF SURVEY**

Hydrography contained on survey H-10543 is adequate to:

- a. delineate the bottom configuration, determine least depths, and draw the required depth curves;
- b. reveal there are no significant discrepancies or anomalies requiring further investigation; and
- c. show the survey was properly controlled and soundings are correctly plotted.

The hydrographic records and reports received for processing are adequate and conform to the requirements of the Hydrographic Manual, 4th Edition, revised through Change No. 3, the Hydrographic Survey Guidelines, and the Field Procedures Manual, April 1994 Edition.

**Q. AIDS TO NAVIGATION**

There are no fixed or floating aids to navigation located within the survey area. There are no features of landmark value located within the area of this survey.

**R. STATISTICS**

Statistics are itemized in the hydrographer's report.

**S. MISCELLANEOUS**

No additional miscellaneous items were noted during office processing.

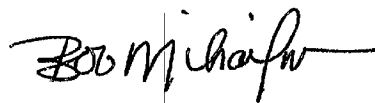
**T. RECOMMENDATIONS**

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



**U. REFERRAL TO REPORTS**

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

A handwritten signature in black ink, appearing to read "Bob Mihailov", with a long horizontal flourish extending to the right.

Bob Mihailov  
Cartographer

APPROVAL SHEET  
· H-10543

Initial Approvals:

The completed survey has been inspected with regard to survey coverage, delineation of the depth curves, development of critical depths, cartographic symbolization, comparison with prior surveys and verification or disproval of charted data. The digital data have been completed and all revisions and processing have been entered in the magnetic tape record for this survey. The survey records and digital data comply with NOS requirements except where noted in the Evaluation Report. Final control, position and sounding printouts have been included with the survey records.

Bruce A. Olmstead Date: 11/15/95  
Bruce A. Olmstead  
Senior Cartographer, Cartographic Section  
Pacific Hydrographic Branch

I have reviewed the smooth sheet, accompanying data, and reports. This survey and accompanying digital data meet or exceed NOS requirements and standards for products in support of nautical charting except where noted in the Evaluation Report.

Kathy Timmons Date: 11/17/95  
Kathy Timmons  
Commander, NOAA  
Chief, Pacific Hydrographic Branch

\*\*\*\*\*

Final Approval

Approved:

Andrew A. Armstrong III Date: 11-24-95  
Andrew A. Armstrong III  
Captain, NOAA  
Chief, Hydrographic Surveys Division

MARINE CHART BRANCH  
**RECORD OF APPLICATION TO CHARTS**

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H-10543

**INSTRUCTIONS**

1. A basic hydrographic or topographic survey supersedes all information of like nature on the uncorrected chart.
2. Letter all information.
3. In "Remarks" column cross out words that do not apply.
4. Give reasons for deviations, if any, from recommendations made under "Comparison with Charts" in the Review.

CHART	DATE	CARTOGRAPHER	REMARKS
16568	6/94	B. M. Harfen	Full <del>Part Before</del> After Marine Center Approval Signed Via Drawing No. 12 Revisions applied to H-16568
16566	6/10/91 13 JAN 96	D. M. Harfen	Full <del>Part Before</del> After Marine Center Approval Signed Via Drawing No. 14 7TH EDITION FULL ATTACHMENT OF SPINGS, DEPTH CURVES ETC THROUGH CHART 16568 BP 15766
16513	6/14/91	D. M. Harfen	Full <del>Part Before</del> After Marine Center Approval Signed Via Drawing No. 36 21TH ED. AUG 92 REVISED SPINGS THRU CHART 16568 H-DRAWING BP 15766
			Full <del>Part Before</del> After Marine Center Approval Signed Via Drawing No.
			Full <del>Part Before</del> After Marine Center Approval Signed Via Drawing No.
			Full <del>Part Before</del> After Marine Center Approval Signed Via Drawing No.
			Full <del>Part Before</del> After Marine Center Approval Signed Via Drawing No.
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