

H10985

NOAA FORM 76-35A

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

DESCRIPTIVE REPORT

Type of Survey Hydrographic

Field No. RA-20-07-00

Registry No. H-10985

LOCALITY

State Alaska

General Locality Icy Bay

Sublocality Point Riou Spit

2000

CHIEF OF PARTY
Commander D.R. Herlihy, NOAA

LIBRARY & ARCHIVES

DATE

HYDROGRAPHIC TITLE SHEET

H-10985

INSTRUCTIONS The hydrographic sheet should be accompanied by this form, filled in as completely as possible, when the sheet is forwarded to the office.

FIELD NO.

RA-20-07-00

State **Alaska**

General Locality **Icy Bay**

Sublocality **Point Riou Spit**

Scale **1:20,000**

Date of Survey **Aug. 24 - Sept.10, 2000**

Instructions Date **8/10/00**

Project No. **OPR-O309-RA**

Vessel **NOAA Ship Rainier 2120 and launches 2121, 2122, 2123, 2125, 2126**

Chief of Party **Commander D. R. Herlihy, NOAA**

Surveyed by **Ship personnel**

Soundings taken by echo sounder, hand lead, pole **Knudson 320M, Reson 8101, Seabeam1050D and 1180**

Graphic record scaled by **Ship personnel**

Graphic record checked by **Ship personnel**

Evaluation by **R. Davies** Automated plot by **HP Designjet 1050C**

Verification by **R. Davies**

Soundings in **Fathoms** at **MLLW**

REMARKS: **Time in UTC.**

Revisions and annotations appearing as endnotes were generated during office processing.

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

Descriptive Report to Accompany Hydrographic Survey H10985

Project OPR-O309-RA-00 Icy Bay

Scale 1:20,000

August -September 2000

NOAA Ship RAINIER

Chief of Party: Commander Daniel R. Herlihy, NOAA

A. AREA SURVEYED

This hydrographic survey was completed as specified by Hydrographic Survey Letter Instructions OPR-O309-RA-00, dated August 10, 2000, and the Draft Standing Project Instructions dated April 6, 1998. The purpose of this project is to provide contemporary hydrography with full-bottom multibeam coverage in a portion of Icy Bay and Riou Bay, Alaska. This project responds to requests from the Southeast Stevedoring Corporation, Alaska Board of Marine Pilots and Southwest Alaska Pilots Association. It addresses concerns for the safety of increased commercial traffic in the area and approaches surrounding Point Riou Spit and Moraine Island in Icy Bay, Alaska. The survey specifically addresses concerns of shoaling in Riou Bay and areas surrounding the inner anchorage. The survey's northern limit is latitude 60°01'20"N and the southern limit is latitude 59°53'04"N. The survey's western limit is longitude 141°40'33"W and the eastern limit is longitude 141°14'18"W.¹

Data acquisition was conducted from August 24, 2000 to September 10, 2000 (DN 237 to DN 254).

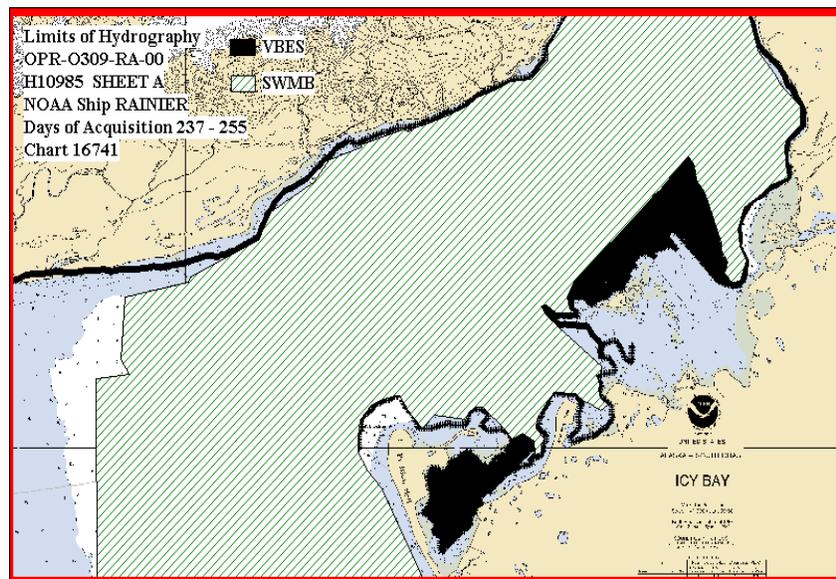


Figure 1. H10985 Survey Limits

B. DATA ACQUISITION AND PROCESSING

A complete description of data acquisition and processing systems, survey vessels, quality control procedures and data processing methods can be found in the *OPR-O309-RA-00 Data Acquisition and Processing Report* submitted under separate cover. Items specific to this survey, and any deviations from the aforementioned report, are discussed in the following sections.²

B1. Equipment and Vessels

Data were acquired by RAINIER and her survey launches (vessel numbers 2120, 2121, 2122, 2123, 2124, 2125, and 2126). RAINIER was used to acquire shallow-water multibeam soundings and sound velocity profiles. Vessels 2121, 2123, 2124 and 2126 were used to acquire shallow-water multibeam soundings and sound velocity profiles. Vessels 2122 and 2125 were used to acquire vertical-beam echo soundings. Vessel 2125 was also used to collect bottom samples.

B2. Quality Control

Crosslines

Vertical-beam echo sounder (VBES) crosslines totaled 9.46 nautical miles, comprising 8% of mainscheme hydrography. Crosslines agreed within one meter of mainscheme hydrography.³

Shallow-water multibeam (SWMB) crosslines totaled 43.26 nautical miles, comprising 5.0% of multibeam mainscheme hydrography. Two CARIS HIPS Quality Control Reports (QCRs) for the checkline files were prepared, one for the Reson-equipped vessels, and the other for the SeaBeam/Elac-equipped vessels. The Reson QCR averaged 94.073% and the SeaBeam/Elac QCR averaged 86.914%. Both QCRs were prepared with a depth tolerance of 0.013, which conforms to International Hydrographic Organization (IHO) Order 1 specifications and NOAA accuracy standards as set forth in the Hydrographic Surveys Specifications and Deliverables Manual. See Appendix V⁴ for the detailed report

Junctions

No contemporary surveys junction with H10985.⁵

Data Quality Factors

Prior to conducting this survey, a firmware revision was installed on the Version 3 POS/MV electronics on vessels 2123 and 2124. An error was later detected by the POS/MV manufacturer, TSS, that inadvertently reversed the polarity of the analog heave supplied by the POS/MV. As a result, heave data collected up to the time of discovery contained a reversed +/- sign. Collected data were repaired through a utility, "corrHeave," supplied by N/CS11, which reversed the sign of the HDCS heave data. Subsequently collected data were obtained with the correct heave sign by reversing the polarity in the POS/MV configuration. When utilized, the "corrHeave" program adds an entry to the HDCS log file for each survey line, thus enabling viewing and tracking of the corrections.

Some multibeam data, particularly data from vessels 2123 and 2124, collected outside of Pt. Riou Spit and at the entrance to Icy Bay, exhibited heave artifacts. At times, a ground swell of up to four meters was present near the spit and bay entrance. These heave artifacts were apparently due to the inability of the Version 3 POS-MV to fully measure heave caused by longer period swell. These artifacts were generally on the order of 0.3-0.5 meters in magnitude, although they approached one meter in some rare cases. The artifacts, although smaller, were still present following correction through the "corrHeave" utility. Heave artifacts were not cleaned out of the data because they were usually small in magnitude, and it was difficult to discern if corrected sounding data were true features or artifacts. RAINIER has forwarded data to TSS and N/CS11 for further testing and troubleshooting.⁶

Due to melting glacial ice, river runoff, and the effects of tidal currents, a sharp demarcation of water masses was often observed in the field. This proved to be problematic in the acquisition and application of sound velocity correctors. After correction for sound velocity in HDCS, some lines still exhibited the characteristic "smiles" and "frowns" indicative of inaccurate sound velocity corrections. To correct these

sound velocity problems, correctors were often applied based on the geographic position of the cast, rather than the time the cast was collected. Such application was performed on a line-by-line basis only on individual lines that exhibited profound sound velocity problems. Despite the best efforts of the Hydrographer to conduct sufficient sound velocity casts distributed both spatially and temporally, and to correct for sound velocity errors in post processing through methods previously mentioned, sound velocity errors were still noticeable in several regions. To compensate, the Hydrographer, where possible, rejected soundings obviously in error on the outer beams. The Hydrographer feels that the only viable solutions in an area such as Icy Bay would be continuous sound velocity profiling, or by water column “zoning.” RAINIER has forwarded data from Icy Bay to N/CS11 and Caris in order to develop methods for the latter.

B3. Data Reduction

Data reduction procedures for survey H10985 conform to those detailed in the *OPR-O309-RA-00 Data Acquisition and Processing Report*.

C. VERTICAL AND HORIZONTAL CONTROL

A complete description of vertical and horizontal control for survey H10985 can be found in the *OPR-O309-RA-00 Horizontal and Vertical Control Report* submitted under separate cover. A summary of horizontal and vertical control for this survey follows.

Horizontal Control

The horizontal datum for this project is the North American Datum of 1983 (NAD83). Differential GPS was the sole method of positioning. RAINIER personnel established a portable DGPS reference station at station RIOU that was used as the primary source of correctors for this project. The U.S. Coast Guard Beacon at Hinchinbrook, AK, when available, was also a source of differential correctors. Launch-to-launch DGPS performance checks were performed weekly in accordance with Section 3.2 of the FPM. Copies of the performance checks are included in the *OPR-O309-RA-00 Horizontal and Vertical Control Report*.

Vertical Control

The vertical datum for this project is Mean Lower-Low Water (MLLW). The operating National Water Level Observation Network (NWLON) primary tide station at Yakutat, AK (945-3220) serves as control for datum determination. RAINIER personnel installed Sutron 8200 “bubbler” tide gauges at the following subordinate stations in accordance with the Project Instructions:

Station Name	Station Number	Type of Gauge	Date of Installation	Date of Removal
Kichyatt Point	945-3444	30-day	23 August 2000	11 Sept 2000
Pt. Riou	945-3456	30-day	23 August 2000	11 Sept 2000

Raw water level data from these gauges were forwarded to N/OPS1 throughout the project period, with the final package submitted on November 7, 2000 in accordance with HSG 50 and FPM 4.7. The Pacific Hydrographic Branch will apply final approved (smooth) tides to the survey data during final processing. A request for delivery of final approved (smooth) tides for survey H10985 was forwarded to N/OPS1 on September 18, 2000 in accordance with FPM 4.8. The 30-day requirement for these gauges was not met because the period of hydrography was less than 30 days.⁷

D. RESULTS AND RECOMMENDATIONS

D.1 Automated Wreck and Obstruction Information System (AWOIS) Investigations

A total of two AWOIS items were located within the limits of H10985 and investigated during this survey. Investigation methods, results, and charting recommendations have been entered into the Microsoft Access AWOIS database and are submitted with the digital data. Printouts of the AWOIS Database Forms are included in this report.⁸

D.2 Chart Comparison⁹

Survey H10985 was compared with chart 16741 (9th Ed.; January 1,1998, 1:40000), and chart 16016 (19th Ed.; July, 10,1993, 1:969,756).¹⁰

Depths from Chart 16741 were generally one half to one fathom deeper than survey depths.¹¹ Notable differences are addressed below:

Point Riou Spit has migrated approximately 750-800 meters towards the northwest. As a result, significant shoaling has occurred both north and west of the entire length of the spit. For example, at the northern end of the spit, the present survey revealed a 1.2-fathom sounding at 59°55'39.66"N, 141°28'46.19"W (Easting 473,196.5, Northing 6,643,454.5), in the vicinity of a charted 28-fathom sounding. In addition to major shoaling, the movement of Point Riou Spit has also resulted in a small region where depths have increased 1-2 fathoms. This region is offshore of the spit and has an approximate 600 meter radius, centered at 59°53'27.29"N, 141°28'32.25"W (Easting 473,383.6, Northing 6,639,358.2).¹²

The gravel bar at the mouth of the Caetani River has progressed seaward approximately 300 to 400 meters. As a result, significant shoaling has occurred in the waters bounded by the river's bar to the east and the mud flats surrounding Gull Island to the east and south. Shoaling by as much as five fathoms can be observed as far as four kilometers north of the river mouth.¹³

An elliptical region (approximately 1600 meters wide east-west, 900 meters wide north-south) centered on 59°58'10.74"N, 141°31'43.89"W displays shoaling between two and nine fathoms. For example, a 17.7-fathom depth was located at 59°58'18.41"N, 141°32'05.57"W (Easting 470,140.4, Northing 6,648,389.1), in the vicinity of a charted 25-fathom sounding. The 30-fathom curve has migrated approximately 700 meters seaward in this area.¹⁴

The present survey revealed a 4.8-fathom depth at 60°00'24.4"N, 141°16'52.86"W (Easting 484,310.2, Northing 6,652,199.4), in the vicinity of a charted 4-fathom 3-foot sounding. This area is close to shore and was covered by 100% SWMB. The Hydrographer recommends charting an appropriate least depth from H10985 once approved tides have been applied.¹⁵

The present survey revealed a 5.7-fathom depth at 59°59'03.54"N, 141°25'56.8"W (Easting 475,868.0, Northing 6,649,743.4), in the vicinity of a charted 5-fathom 3-foot sounding. The area was covered with 100% SWMB. The Hydrographer recommends charting an appropriate least depth from H10985 once approved tides have been applied.¹⁶

The present survey revealed a 13.9-fathom depth at 59°58'31.41"N, 141°26'09.0"W (Easting 475,672.3, Northing 6,648,750.7), in the vicinity of a charted 13-fathom sounding. The area was covered with 100% SWMB. The Hydrographer recommends charting an appropriate depth from H10985 once approved tides have been applied.¹⁷

The present survey revealed a 1.8-fathom depth at 59°55'58.50" N, 141°22'47.94" W (Easting 478,762.7, Northing 6,644,001.3), in the vicinity of a charted 1-fathom 4-foot sounding. This area was too close to shore to be covered by multibeam, but was developed with 25-meter single beam splits. The Hydrographer recommends retaining the sounding as charted.¹⁸

D.3 Shoreline

There were no photogrammetric source data available for this project. Features and shoreline shown on the current edition of NOS chart 16741 were digitized in MapInfo by RAINIER personnel and displayed in Hypack for field verification.¹⁹

Shoreline verification was conducted near predicted low water in accordance with the Project Instructions and FPM 6.1 and 6.2. For this survey the general limit of safe navigation of a survey launch was five to several hundred meters offshore of apparent low tide. Water depths along this limit of safe navigation were approximately four meters at Mean Lower-Low Water (MLLW). Features unreachable by survey launch are depicted on the Detached Position and Bottom Sample Plot²⁰ as the Hydrographer's approximate representation of the shoreline.

Detached positions (DPs) taken during shoreline verification were recorded in HYPACK and on DP forms,²¹ and processed in HPS. These indicate revisions to features, and features not found on the chart.

A detailed "DP and BS Plot," in both paper copy and MapInfo format, is provided showing all detached positions and bottom samples with notes relating to each feature. The updated shoreline and features are also depicted on the final sounding plot.

Significant changes to the shoreline and several new features were discovered during shoreline investigation and SWMB and VBES hydrography. Point Riou Spit has migrated west and north up to eight hundred meters, resulting in a significant change to the Mean High Water line. Significant shoaling was also found near the Caetani River mouth. Most of the charted rocks on Point Riou Spit and Moraine Reef were not found during low water, as the reef is now largely covered with sand and has grown larger. Many charted features were unreachable with a survey launch even during mid to high tides, particularly in the vicinity of Gull Island. In many instances, DPs were taken from the nearest possible location when feature were deemed significant to navigation. These rocks are noted as such, in blue on the DP and BS Plot, and the Hydrographer, unless otherwise noted, recommends retaining them as charted.²²

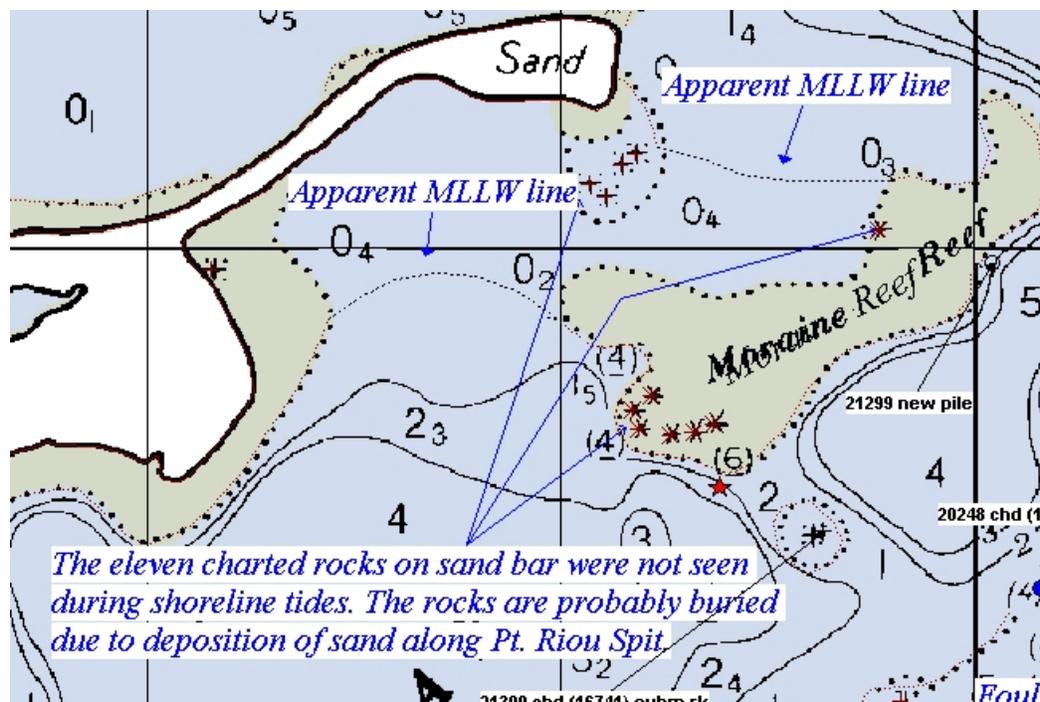
Much of the shoal area east and south of Gull Island now exposes at Mean Lower-Low Water (MLLW). An approximate MLLW line based on field observations during times of low water is depicted on the DP and BS Plot. The Hydrographer recommends revising the charted MLLW line to an approximate line as depicted in the vicinity of the Caetani River, as well as the region east and west of Gull Island.²³

New source shoreline data were collected by National Geodetic Survey, Remote Sensing Division (RSD) concurrently with this project. Synthetic Aperture Radar imagery, along with photogrammetric data, were collected, and the Hydrographer expects that the changes to the charted shoreline will be addressed with this new source data.²⁴

Charted Features (Chart 16741)

The charted rock at 59°53'54.3"N, 141°26'13.1"W (Easting 475,552.5, Northing 6,640,180.0, Fix #22896) was disproved using a 20-minute echosounder and visual search in a grid pattern, with a 10-meter line spacing (fixes 22818 – 22895) over a 100-meter radius. The Hydrographer recommends removing it from the chart.²⁵

The 11 charted rocks on Moraine Reef, see image below, centered at 59°54'57.38"N, 141°25'43.28"W were not seen during shoreline verification due to the heavy deposition of sand. Because sand movement in this area is highly dynamic, which could cause the reef to uncover again, the Hydrographer recommends retaining the rocks as charted.²⁶



A search for three submerged charted rocks at 59°54'52"N, 141°24'44"W (Easting 476,948.0, Northing 6,641,954.9), 59°54'55"N, 141°24'38"W (Easting 477,041.7, Northing 6,642,047.1), and 59°55'03"N, 141°24'24"W (Easting 477,260.7, Northing 6,642,293.2) was conducted using a 20-minute echosounder and visual search in a grid pattern with 10-meter line spacing over a 700 x 200 meter area. The rocks were not located by RAINIER. The positions and depths of these rocks originate from diver investigations conducted on prior survey H-9630 (1976). Time constraints precluded further investigation of these items. Because the line spacing was not reduced sufficiently to fully disprove them, the Hydrographer recommends retaining the rocks as charted.²⁷

The five charted rocks at 59°55'26"N, 141°22'25.5"W (Easting 479,104.7, Northing 6,642,992.5) were determined to be the high points of a reef (fix #'s 21443, 21444, 21445, 21446). The Hydrographer recommends charting a reef.²⁸

The Hydrographer searched for the charted rock at 59°57'57"N, 141°20'07"W (Easting 481,269.3, Northing 6,647,653.5, Fix #50591) using a 20-minute echosounder and visual search in a grid pattern over a 300-meter radius. Water clarity was poor. This item appears to have originated with prior survey H-9634. Although a disproval DP was taken, the Hydrographer recommends retaining it as charted.²⁹

The charted rock at 59°59'34.83"N, 141°29'13.56"W (Easting 472,825.1, Northing 6,650,731.6, Fix #22344) was disproved using a 10-minute visual search. The charted location was 100 meters inshore of the apparent MLLW line, and the rock was not observed on the beach. The Hydrographer recommends removing it from the chart.³⁰

The two charted rocks at 59°59'41.06"N, 141°28'32.49"W (Easting 473,462.9, Northing 6,650,920.6, Fix #22342) and 59°59'41.0"N, 141°28'28.8"W (Easting 473,520.1, Northing 6,650,918.4, Fix #22341) were disproved using a 10-minute visual search. Their charted locations were 100 meters inshore of the

apparent MLLW line, and the rocks were not observed on the beach. The Hydrographer recommends removing them from the chart.³¹

The charted jetty and groin at 59°59'11.38"N, 141°30'46.83"W (Easting 471,374.5, Northing 6,650,018.0, Fix #51320) no longer exist, although the lumber camp remains (see photograph in figure 2). The Hydrographer recommends removing the feature from the chart.³²



Figure 2. Charted jetty disapproval (DP #51320)

The charted rock at 60°00'43.52"N, 141°16'49.31"W (Easting 484,369.7, Northing 6,652,774.0) was disproved using a 10-minute visual search. The rock in question is not depicted on prior survey H-9634. A rock was found 116 meters south of the charted location at 60°00'40.25"N, 141°16'44.92"W (Fix # 50330, Easting 484,435.2, Northing 6,652,689.2). The Hydrographer recommends deleting the charted rock and charting a rock at the surveyed position.³³

The charted rock at 59°59'28"N, 141°30'03"W (Easting 471,964.4, Northing 6,650,527.7) was not observed visually. The position of the rock was on the beach, on the approximate Mean Lower-Low Water line. The Hydrographer recommends removing this rock from the chart. This rock is not depicted on prior survey H-9634. Two charted rocks (source: prior survey H-9634) within 120 meters of the rock in question were seen in the surf zone and not reachable by a survey launch. Fixes 22353 and 22354 were taken from the nearest possible location. The Hydrographer recommends retaining these two rocks as charted.³⁴

The Hydrographer recommends that the shoreline as depicted on the DP and BS Plot and Final Field Sheet be used to complement newly acquired source shoreline data, and shoreline information compiled on chart 16741 (9th Ed.; January 10, 1998, 1:4000).³⁵

These revisions are recorded in the MapInfo digital files named "H10985_shoreline" and "H10985_Shoreline_Updates". In addition, field notes made by the Hydrographer, including verification of source features and descriptions of shoreline classification, are submitted in the digital MapInfo file "H10985_Shoreline_Notes."³⁶

D.4 Dangers to Navigation

One hundred and four³⁷ dangers to navigation were found and reported to the Pacific Hydrographic Branch on March 5, 2001, for verification and submission to the U.S. Coast Guard. A copy of the Danger to Navigation Report is included in this report. The final report will be inserted by the Pacific Hydrographic Branch (PHB) following verification and submission to the U.S. Coast Guard.

D.5 Aids to Navigation

There were no aids to navigation within the survey limits.³⁸

D.6 Miscellaneous

Project Instructions for project OPR-O309-RA-00 required 100% multibeam coverage, with an allowance for small holidays in coverage where no indication of shoaling existed. Near 100% SWMB coverage was obtained during this survey; however some bottom coverage gaps exist and were not addressed due to time constraints. Additionally, holidays in coverage were created in the post-processing of data (SWMB cleaning due to poor SV data), and therefore were not avoidable in the field.

Every effort was taken to minimize the impact of not having full bottom coverage. The majority of coverage gaps in the survey area are generally 20 meters or less in width, 150 meters or less in length, and within 500 meters of shore or a foul area. All of these holidays were closely examined by the Hydrographer, and were not deemed significant to navigation.³⁹

Time allotted for this project was not sufficient. Shallow bathymetry, requiring hundreds of narrowly spaced lines to achieve 100% SWMB coverage, and glacial waters necessitating frequent time consuming sound velocity casts further strained resources. RAINIER recommends taking these factors into consideration when planning future projects.⁴⁰

Due to the rapid migration of sand and the shoreline around Point Riou Spit, the size of vessels transiting Icy Bay, and the potential for increased cruise ship traffic, the Hydrographer recommends that this area be designated a “Resurvey Area” in accordance with the National Survey Plan, and resurveyed on a frequent basis.⁴¹

E. APPROVAL

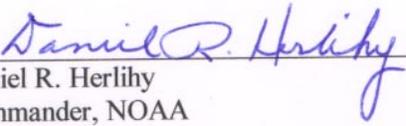
As Chief of Party, I have ensured that standard field surveying and processing procedures were followed in producing this examination in accordance with the Hydrographic Manual, Fourth Edition; the Hydrographic Survey Guidelines; the Field Procedures Manual, and the NOS Hydrographic Surveys Specifications and Deliverables, as updated for 2000.

The digital data and supporting records have been reviewed by me, are considered complete and adequate for charting purposes, and are approved. All records are forwarded for final review and processing to N/CS34, Pacific Hydrographic Branch

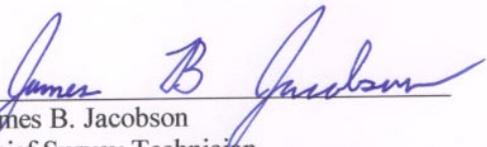
Survey H10985 is complete and adequate to supersede charted soundings and features in their common areas.⁴² There is no additional work required on this survey.⁴³

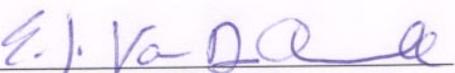
Listed below are supplemental reports submitted separately which contain additional information relevant to this survey:

<u>Title</u>	<u>Date Sent</u>	<u>Office</u>
Data Acquisition and Processing Report for OPR-O309-RA-00	Concurrently	N/CS34
Vertical and Horizontal Report for OPR-O309-RA-00	Concurrently	N/CS34
Tides and Water Levels Package for OPR-O309-RA-00	11/07/2000	N/OPS1
Coast Pilot Report for OPR-O309-RA-00	11/08/2000	N/CS26

Approved and Forwarded: 
 Daniel R. Herlihy
 Commander, NOAA
 Commanding Officer

In addition, the following individuals were also responsible for overseeing data acquisition and processing of this survey:

Survey Sheet Manager: 
 James B. Jacobson
 Chief Survey Technician

Field Operations Officer: 
 Edward J. Van Den Ameele
 Lieutenant, NOAA

Revisions complied during office processing and certification.

¹ PHB Revision –The survey limits should be; northern limit is latitude 60/01/23N, southern limit is latitude 59/52/40N and the eastern limits is longitude 141/15/41W and the western limit is longitude 141/40/35.5W. Depths range from zero to sixty fathoms.

² PHB Revision - The data are plotted using a Universal Transverse Mercator, Zone 07 projection and are depicted on a single sheet.

³ Concur

⁴ PHB Revision – Filed with the hydrographic data

⁵ Concur

⁶ PHB Revision – The sounding data from vessels 2123 and 2124 was reviewed and found to be consistent with surrounding soundings from other vessels and within specifications stated in the Field Procedures Manual and the Specifications and Deliverables, June 2000. No results from N/CS11 testing or troubleshooting have been forward to PHB.

⁷ PHB Revision – Approved tide note dated February 6, 2001 is attached to this report.

⁸ Concur

⁹ PHB Revision – The present survey was compared to the following prior surveys.

<u>Survey</u>	<u>Year</u>	<u>Scale</u>	<u>Datum</u>
H-9630	1976	1:10,000	NAD27
H-9634	1976	1:10,000	NAD27
H-9635	1976	1:20,000	NAD27

Prior surveys H-9630, H-9634 and H-9635 cover the entire area of the present survey. The registration of these prior surveys to the present survey was good. The legibility of the three digital copies was good. This area has experienced earthquakes, possible isostatic rebound and natural accretion and erosional processes. These processes and the greater sounding density and accuracy account for the differences between the present soundings and the prior surveys. Numerous features and soundings were transfer to the present survey to help support the depth contours of the present survey.

With the transfer of soundings and features, survey H10985 is adequate to supersede the above prior surveys within the common area.

¹⁰ PHB Revision – Chart 16741, 9th Edition, dated Jan. 10, 1998 was used for comparison with the present survey.

¹¹ Concur

¹² PHB Revision – Concur, chart area as depicted on the smooth sheet.

¹³ PHB Revision – Concur, chart area as depicted on the smooth sheet.

¹⁴ PHB Revision – Chart area as depicted on the smooth sheet.

¹⁵ PHB Revision – Concur, with approved tides applied the sounding is 4.4 fathoms. Chart 4 fathoms 2 feet at the survey position.

¹⁶ PHB Revision – Concur, with approved tides applied the sounding is 5.6 fathoms. Chart 5 fathoms 3 feet at the survey position.

¹⁷ PHB Revision – Concur, with approved tides applied the sounding is 13.5 fathoms. Chart a 13 fathoms at the survey position.

¹⁸ PHB Revision – Do not concur. After smooth tides were applied, the 1.8-fathom depth was reduced to a 1.4-fathom depth (1 fathom 2 ft in chart units). Remove the charted 1 fathom 4ft depth and chart 1 fathom 2 ft depth at the above position.

¹⁹ PHB Revision – There were four MHW revisions on this survey. These revisions have been depicted in dashed red on the smooth sheet and are adequate to supersede prior photogrammetric shoreline maps. These revisions are centered at the following positions:

<u>Latitude(N)</u>	<u>Longitude(W)</u>
59/57/30	141/40/00
59/57/33	141/38/24
60/00/04	141/26/00
60/01/20	141/22/54

²⁰ PHB Revision – Concur, filed with the hydrographic data.

²¹ PHB Revision – Concur, filed with the hydrographic data.

²² PHB Revision – Detached positions and shoreline information provided by the hydrographer was evaluated during office processing and shown on the smooth sheet as warranted.

²³ PHB Revision – Chart these approximate zero depth contours as depicted on the smooth sheet.

²⁴ PHB Revision – It is recommended that MCD, N/CS21 use the data from this survey and the most current shoreline available for the next edition of chart 16741.

²⁵ Concur

²⁶ Concur,

²⁷ PHB Revision – Concur, rocks were transferred from prior survey H-9630 (1976) to the present survey.

²⁸ Concur

²⁹ PHB Revision – Do not concur, A charted submerged rock at latitude 59/57/57N, longitude 141/20/07W, was investigated but was not located. Soundings in the area are equal to or less than the 1 fathom 5-foot rock. It is recommended that the submerged rock be removed and soundings from this survey be applied to the chart.

³⁰ Concur

³¹ Concur

³² Concur

³³ Concur

³⁴ PHB Revision – Concur, retain charted rocks at latitude 59/59/28.1N, longitude 141/30/08.2W and latitude 59/59/30.9N, longitude 141/29/59.5W.

³⁵ Concur

³⁶ PHB Revision – The updates to the shoreline have been added to the smooth sheet.

³⁷ PHB Revision – The number of dangers that was submitted by the hydrographer was reviewed by the Pacific Hydrographic Branch and was decreased to forty-five. The danger to navigation letter is attached to this report.

³⁸ Concur

³⁹ PHB Revision – Concur, Data collected during this survey is adequate to supersede the charted data within the common area except where noted in this report.

⁴⁰ Concur

⁴¹ Concur

⁴² Concur

⁴³ PHB Revision – Concur with clarification, additional work is recommended to resolve AWOIS item 52618.

RECRD VESSLTERMS CHART AREA
CARTOCODE SNDINGCODE DEPTH

LAT83 LONG83 NATIVDATUM
LATDEC: LONDEC: GPQUALITY
GPSOURCE

PROJECT ITEMSTATUS SEARCHTYPE
RADIUS INIT ASSIGNED
TECNIQ

Techniqnote

History

HISTORY
REPORTED "SOFT GROUNDING" POSITION OF THE M/V PACSUN, 26 FEBRUARY 2000 AT 59-56N, 141-26W RECEIVED BY E-MAIL FROM LT ERIC A. BAUER, USCG MARINE SAFETY OFFICE, JUNEAU, ALASKA. ANCHORAGE DAILY NEWS ARTICLE, FEB. 27 2000 REPORTS 539 FT. LOG SHIP "PACSUN" WENT AGROUND OVERNIGHT AT ANCHOR WHILE IT WAS IN ICY BAY TO TAKE ON LOGS FROM A CAMP IN THE BAY NORTH OF YAKUTAT. THE SHIP IS OPERATED BY LASOC SHIPPING CO. OF PORTLAND, OREGON. (ENT DAS 7/14/2000)

Fieldnote

INVESTIGATION
DATE(S):08/24/2000 - 09/11/2000 (DN:237 - 255)
VN: RAINIER Survey launches RA-1,RA-2,RA-3,RA-4,RA-5,RA-6 TIME: Ongoing investigation throughout the survey
INVESTIGATION METHODS USED: 100% bottom coverage MB
OBSERVED POSITION: LAT. LON. Significant shoaling in the southern and eastern portion of the search area. There were many depths that would ground a vessel of this size.
POSITION DETERMINED BY: DIFFERENTIAL GPS
INVESTIGATION SUMMARY: LD's over entire search area using zoned preliminary tides.
CHARTING RECOMMENDATION Chart the LD's from H10985 after the application of smooth tides.
EVALUATOR COMMENTS: Concur, chart depths from survey H-10985 (2000)

Proprietary

YEARSUNK NIMANUM

[Print Record](#)

RECRD VESSLTERMS CHART AREA
CARTOCODE SNDINGCODE DEPTH

LAT83 LONG83 NATIVDATUM
LATDEC: LONDEC: GPQUALITY
GPSOURCE

PROJECT ITEMSTATUS SEARCHTYPE
RADIUS INIT ASSIGNED
TECNIQ

Techniqnote

History HISTORY
LNM45/95--17TH CGD, 11/07/95--ADD (TO CHART) SUNKEN WRECK "YAKUTAT EAGLE" IN APPROX. POS. 59 53 00N, 141 32 00W NAD 83.
INTERNET--STATE OF ALASKA - COMMERCIAL FISHERIES ENTRY COMMISSION, 1966; YAKUTAT EAGLE LISTED AS A 32 FT F/V BUILT IN 1984 IN JUNEAU, AK. UNKNOWN IF THIS IS THE SAME VESSEL..
<http://www.cfec.state.ak.us/VESLIST/YR1996/ADFG/A0058.HTM>. ENTERED 8/00 MCR

Fieldnote INVESTIGATION
DATE(S): 8/24/00, 8/26/00, 8/27/00, 8/28/00, 8/29/00, 8/30/00 (DN:237, 239, 240, 241, 242)
VN: 2123 TIME: Several
INVESTIGATION METHODS USED: (IE DI, 200% SIDE SCAN SONAR, ECHO SOUNDER) SWMB (Elac 1180)
OBSERVED POSITION: LAT. LON.
POSITION DETERMINED BY: DIFFERENTIAL GPS
INVESTIGATION SUMMARY: Hydrographer searched in northern half of search radius with SWMB during course of survey. Nothing indicating a wreck was observed in the SWMB data. Time constraints prevented a further search with SSS.
CHARTING RECOMMENDATION (HYDROGRAPHER): Continue search in southern portion of search circle when conducting hydrography on the sheet south of H10985.
EVALUATOR COMMENTS: Concur, the submerged wreck PA charted at latitude 59/53/00N, longitude 141/32/00W, was not completely investigated, 100% SWMB coverage was not achieved for a complete disproval. Retain the charted submerged wreck PA at the charted location above.

Proprietary

YEARSUNK NIMANUM

REPORT OF DANGERS TO NAVIGATION

Hydrographic Survey Registry Number: H10985

Survey Title: State: Alaska
Locality: Icy Bay
Sub-locality: Point Riou Spit

**ADVANCE
INFORMATION**

Project Number: OPR-O309-RA-00

Survey Dates: August - September 2000

Depths are reduced to Mean Lower Low Water using unverified observed tides.
Positions are based on the NAD83 horizontal datum.

CHARTS AFFECTED:

CHART	EDITION	DATE	SCALE
16741	9th	1/10/1998	1:40,000

DANGERS:

	DEPTH	LATITUDE(N)	LONGITUDE(W)
	<u>FEATURE (fathoms)</u>		
Sounding	0½	59° 55' 14.487" N	141° 27' 48.016" W
Sounding	0½	59° 53' 43.580" N	141° 27' 03.031" W
Sounding	0¾	59° 57' 22.498" N	141° 18' 03.168" W
Sounding	0¾	59° 58' 33.574" N	141° 17' 13.222" W
Sounding	1¼	59° 58' 16.345" N	141° 17' 37.720" W
Sounding	1¼	59° 56' 26.022" N	141° 22' 40.497" W
Sounding	1¼	59° 57' 42.817" N	141° 18' 37.153" W
Sounding	1½	59° 57' 56.284" N	141° 19' 20.194" W
Sounding	1½	59° 58' 19.859" N	141° 19' 38.815" W
Sounding	1½	59° 59' 37.780" N	141° 15' 40.900" W
Sounding	1¾	59° 55' 35.906" N	141° 25' 38.876" W
Sounding	1¾	59° 58' 16.424" N	141° 18' 51.635" W
Sounding	2¼	59° 56' 40.607" N	141° 23' 15.529" W
Sounding	2½	59° 58' 07.409" N	141° 20' 59.655" W
Sounding	2½	59° 57' 08.125" N	141° 23' 52.787" W
Sounding	2½	59° 57' 20.955" N	141° 24' 02.403" W
Sounding	3½	59° 55' 27.738" N	141° 27' 41.259" W
Sounding	3¾	59° 58' 56.210" N	141° 20' 07.880" W
Sounding	3¾	59° 56' 17.226" N	141° 23' 37.005" W
Sounding	3¾	59° 58' 14.328" N	141° 32' 30.397" W
Sounding	3¾	59° 57' 56.645" N	141° 21' 38.027" W

REPORT OF DANGERS TO NAVIGATION

Sounding	4	59° 58' 42.271" N	141° 19' 04.109" W
Sounding	4¼	59° 58' 35.346" N	141° 20' 42.155" W
Sounding	4½	59° 57' 31.462" N	141° 21' 48.106" W
Sounding	4½	59° 55' 42.010" N	141° 27' 10.614" W
Sounding	4½	59° 58' 37.016" N	141° 31' 39.794" W
Sounding	4½	59° 57' 29.238" N	141° 33' 56.323" W
Sounding	4¾	59° 59' 13.151" N	141° 19' 52.928" W
Sounding	4¾	59° 54' 33.797" N	141° 29' 30.791" W
Sounding	5¼	59° 57' 51.681" N	141° 17' 37.817" W
Sounding	5½	59° 57' 49.339" N	141° 22' 21.286" W
Sounding	5¾	59° 59' 11.303" N	141° 30' 11.597" W
Sounding	5¾	59° 54' 12.137" N	141° 29' 30.393" W
Sounding	5¾	59° 56' 39.757" N	141° 24' 25.051" W
Sounding	6¼	59° 57' 45.026" N	141° 33' 08.220" W
Sounding	6½	59° 55' 16.281" N	141° 24' 37.615" W
Sounding	7¾	59° 53' 50.111" N	141° 29' 39.565" W
Sounding	7¾	59° 58' 16.420" N	141° 21' 31.535" W
Sounding	8½	59° 53' 27.984" N	141° 29' 47.129" W
Sounding	8¾	59° 58' 45.397" N	141° 18' 11.976" W
Sounding	8¾	59° 59' 01.663" N	141° 18' 58.579" W
Sounding	8¾	59° 58' 04.816" N	141° 32' 34.742" W
Sounding	8¾	59° 55' 49.292" N	141° 25' 04.629" W
Sounding	9¾	59° 59' 24.055" N	141° 19' 16.059" W
Sounding	9¾	59° 57' 37.694" N	141° 23' 28.741" W

**ADVANCE
INFORMATION**

COMMENTS: While conducting hydrographic survey H10985 in the vicinity of Riou Spit near the entrance to Icy Bay, the NOAA Ship *Rainier* found that the zero fathom curve has migrated seaward approximately 900 meters to the north and west. As a result, survey depths are as much as 25 fathoms shoaler than charted depths. It is recommended that this information be included in the Local Notice to Mariners as a danger to navigation. It is also recommended that mariners use extreme caution when navigating this area due to the changing nature of the Riou Spit.

[To view chartlet 1 click here](#)

[To view chartlet 2 click here](#)

[To view chartlet 3 click here](#)

Questions concerning this report should be directed to the Pacific Hydrographic Branch (N/CS34) at (206) 526-6836.

Chart 16741

9th edition, Jan 10, 1998

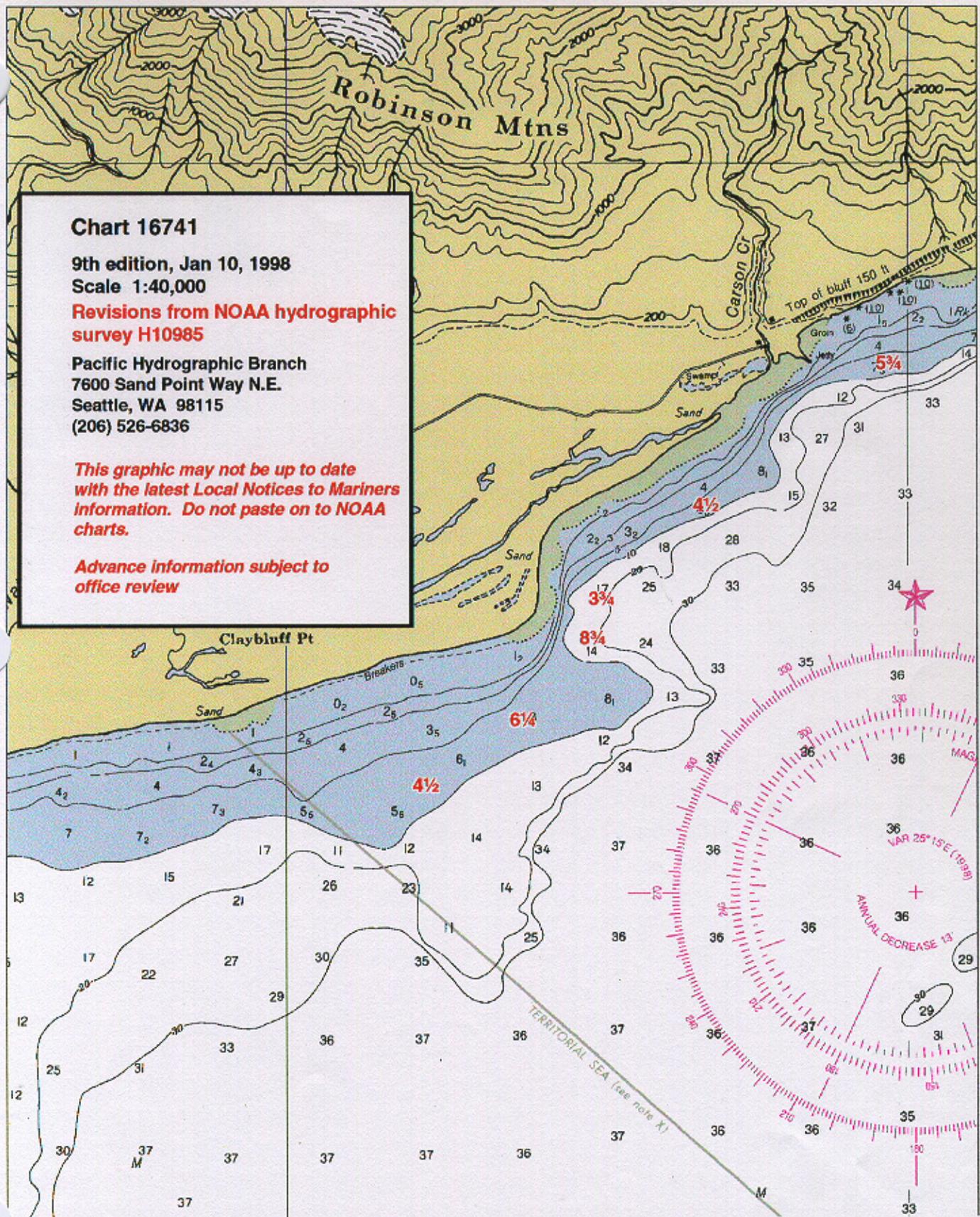
Scale 1:40,000

Revisions from NOAA hydrographic survey H10985

Pacific Hydrographic Branch
7600 Sand Point Way N.E.
Seattle, WA 98115
(206) 526-6836

This graphic may not be up to date with the latest Local Notices to Mariners information. Do not paste on to NOAA charts.

Advance information subject to office review



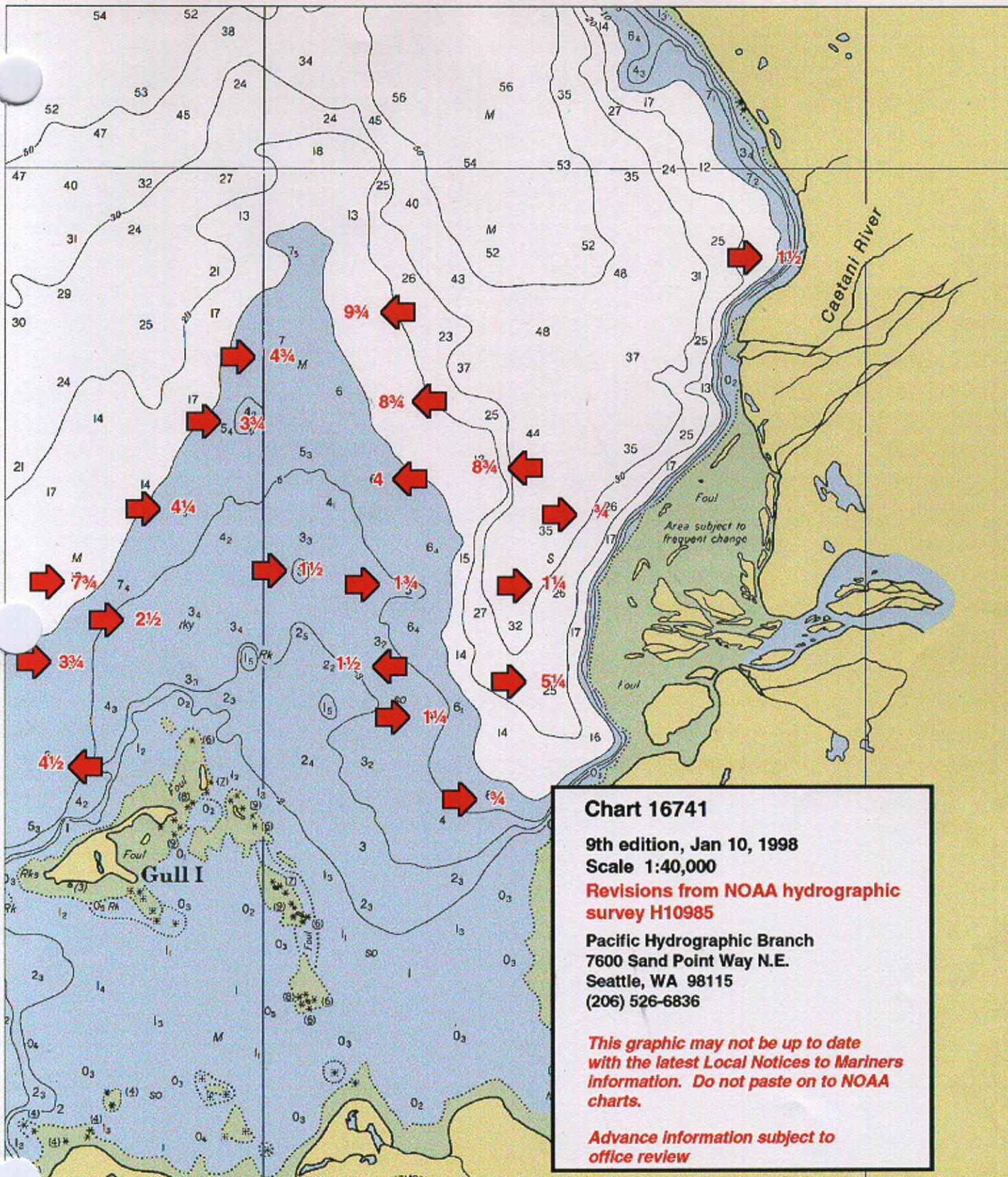


Chart 16741

9th edition, Jan 10, 1998

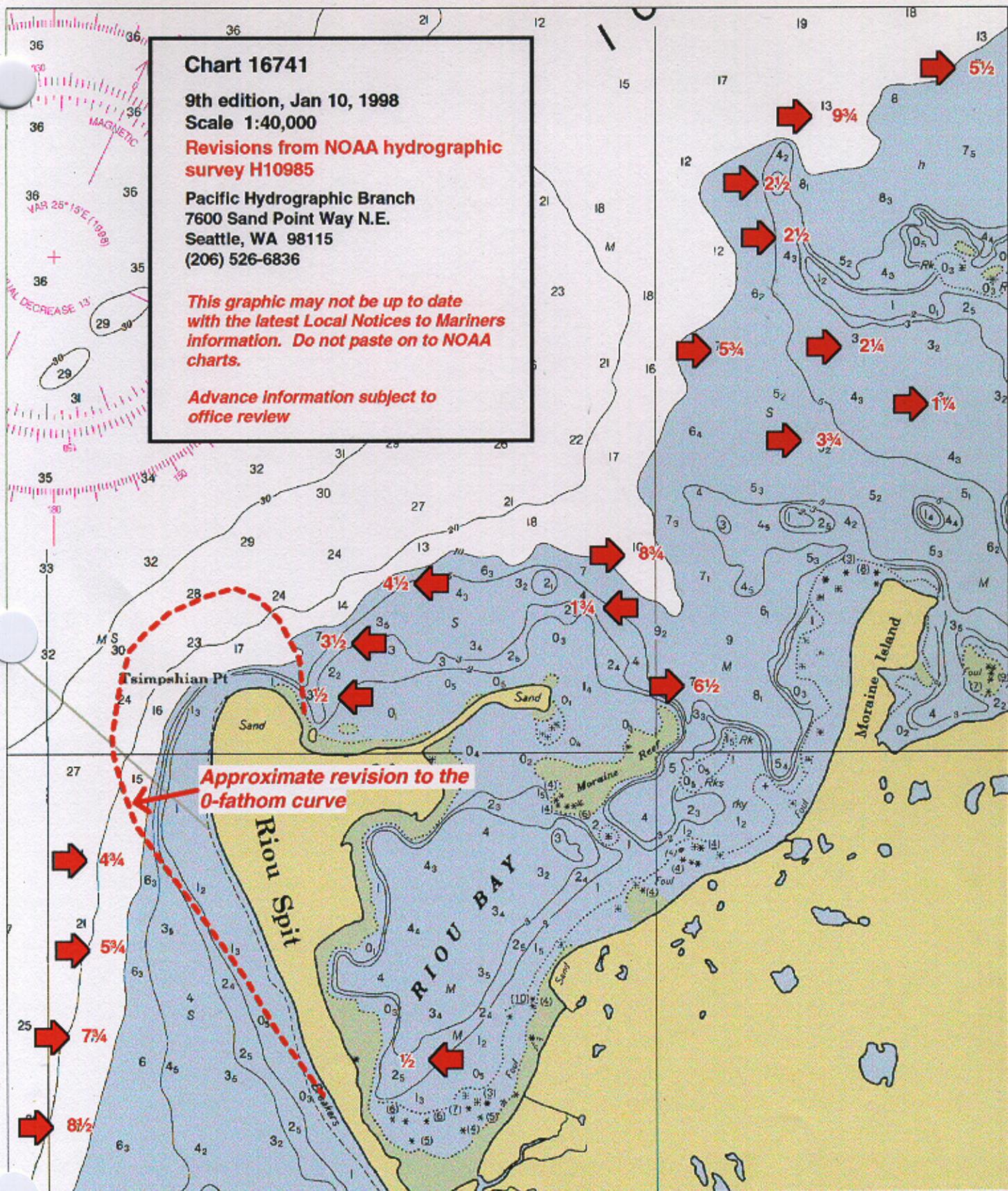
Scale 1:40,000

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UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
Silver Spring, Maryland 20910

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE: February 6, 2001

HYDROGRAPHIC BRANCH: Pacific
HYDROGRAPHIC PROJECT: OPR-O309-RA-2000
HYDROGRAPHIC SHEET: H-10985

LOCALITY: Icy Bay, AK
TIME PERIOD: August 24 - September 11, 2000

TIDE STATION USED: 945-3444 Kichyatt Point, AK
Lat. $60^{\circ} 1.6'N$ Lon. $141^{\circ} 22.1'W$
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 2.743 meters

TIDE STATION USED: 945-3456 Riou Bay, AK
Lat. $59^{\circ} 54.6'N$ Lon. $141^{\circ} 24.8'W$
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 2.714 meters

REMARKS: RECOMMENDED ZONING
Use zone(s) identified as: IB1, IB2, IB3 & CA1

Refer to attachments for zoning information.

Note 1: Provided time series data are tabulated in metric units (meters), relative to MLLW and on Greenwich Mean Time.

Note 2: Use tide data from the appropriate station with applicable zoning correctors for each zone according to the order in which they are listed in the Tidezone corrector files. For example, tide station one (TS1) would be the first choice for an applicable zone followed by TS2, etc. when data are not available.

Note 2: Yakutat, AK was used for datum control in this hydrographic survey. Accepted datums for this station have been updated recently due to anomalous sea level trends to land emergence resulting from glacial retreat. Therefore, the accepted datums at Yakutat, AK (945-7292) are based on the 1994-1998 update of Mean Sea Level (MSL) on the 1960-1978 Epoch.





UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
Silver Spring, Maryland 20910

Thomas V. New 2/6/01

CHIEF, REQUIREMENTS AND DEVELOPMENT DIVISION



Printed on Recycled Paper



Final tide zone node point locations for OPR-0309-RA-2000,
Sheet H-10985.

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

	Tide Station Order	AVG Time Correction	Range Correction
Zone IB1	945-3444	0	0.99
-141.385043 59.927728			
-141.432581 59.920789			
-141.481121 59.945734			
-141.553267 59.96939			
-141.539785 60.002554			
-141.374109 60.023922			
-141.326724 60.026372			
-141.28532 60.02392			
-141.192727 59.969016			
-141.245646 59.926377			
-141.395146 59.904807			
-141.385043 59.927728			
Zone IB2	945-3456	0	0.99
-141.385043 59.927728	945-3444	0	0.98
-141.432581 59.920789			
-141.440576 59.920275			
-141.47064 59.908234			
-141.454772 59.888008			
-141.426092 59.875039			
-141.395146 59.904807			
-141.385043 59.927728			
Zone IB3	945-3444	0	1.00
-141.374109 60.023922			
-141.410872 60.057592			
-141.378875 60.060717			
-141.349084 60.060348			
-141.329219 60.059063			
-141.300765 60.051415			
-141.279281 60.035475			

-141.28532 60.02392
-141.326724 60.026372
-141.374109 60.023922

Zone CA1

945-3444

-6

0.99

-141.333441 59.854078
-141.481205 59.832576
-141.692756 59.801746
-142.2432 59.790485
-142.91907 59.821741
-143.627548 59.885509
-143.939518 60.001806
-142.560678 60.165494
-141.553267 59.96939
-141.481121 59.945734
-141.432581 59.920789
-141.440576 59.920275
-141.47064 59.908234
-141.454772 59.888008
-141.426092 59.875039
-141.333441 59.854078

HYDROGRAPHIC SURVEY STATISTICS

H10985

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	2

DESCRIP-TION	DEPTH/POS RECORDS	HORIZ. CONT. RECORDS	SONAR-GRAMS	PRINTOUTS	ABSTRACTS/SOURCE DOCUMENTS
ACCORDION FILES					
ENVELOPES					
VOLUMES					
CAHIERS					
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			
POSITIONS REVISED			
SOUNDINGS REVISED			
CONTROL STATIONS REVISED			
	TIME-HOURS		
	VERIFICATION	EVALUATION	TOTALS
PRE-PROCESSING EXAMINATION			
VERIFICATION OF CONTROL			
VERIFICATION OF POSITIONS			
VERIFICATION OF SOUNDINGS			
VERIFICATION OF JUNCTIONS			
APPLICATION OF PHOTOBATHYMETRY			
SHORELINE APPLICATION-VERIFICATION			
COMPILATION OF SMOOTH SHEET			109
COMPARISON WITH PRIOR SURVEYS AND CHARTS			
EVALUATION OF SIDE SCAN SONAR RECORDS			
EVALUATION OF WIRE DRAGS AND SWEEPS			
EVALUATION REPORT			44
GEOGRAPHIC NAMES			
OTHER (Chart Compilation)			44
USE OTHER SIDE OF FORM FOR REMARKS			
	TOTALS		197

Pre-processing Examination by	Beginning Date	Ending Date
Verification of Field Data by R. Davies, R. Mayor	Time (Hours) 109	Ending Date
Compilation Check by	Time (Hours)	Ending Date
Evaluation and Analysis by R. Davies	Time (Hours) 44	Ending Date 12/05/2003
Inspection by B. Olmstead	Time (Hours) 41	Ending Date 01/21/2004

APPROVAL SHEET
H10985

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 disproof of charted data. The survey records and digital data comply with NOS requirements except where noted in the Descriptive Report.

Bruce A. Olmstead Date: 1/27/04
Bruce Olmstead
Cartographic Team
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 Descriptive Report.

John E. Lowell, Jr. Date: 3/26/04
John E. Lowell, Jr.
Commander, NOAA
Chief, Pacific Hydrographic Branch

AWOL/SURF
4/15/04 mcr

