

H11134

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-20-01-03

Registry No. H-11134

LOCALITY

State Alaska

General Locality Sitka Sound

Sublocality Northern Offshore Approaches

2003

CHIEF OF PARTY

..... CDR John W. Humphrey, NOAA

LIBRARY & ARCHIVES

DATE

NOAA FORM 77-28 (11-72)		U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION		REGISTER NO. H11134
HYDROGRAPHIC TITLE SHEET				
INSTRUCTIONS The hydrographic sheet should be accompanied by this form, filled in as completely as possible, when the sheet is forwarded to the office.				FIELD NO. RA-20-01-03
State <u>Alaska</u>				
General Locality <u>Sitka Sound</u>				
Sublocality <u>Northern Offshore Approaches</u>				
Scale <u>1:20,000</u>		Date of Survey <u>5/17/2003-6/26/2003</u>		
Instructions Date <u>4/21/2003</u>		Project No. <u>OPR-O112-RA-03</u>		
Vessel <u>NOAA Ship Rainier launches 2121, 2122, 2124, 2125 and 2126</u>				
Chief of Party <u>Commander John W. Humphrey, NOAA</u>				
Surveyed by <u>RAINIER Personnel</u>				
Soundings taken by echo sounder <u>Knudsen 320M, Reson SeaBat 8101, 8125, Seabeam/Elac 1180</u>				
Graphic record scaled by <u>RAINIER Personnel</u>		<u>Seabeam/Elac 1050D</u>		
Graphic record checked by <u>RAINIER Personnel</u>				
Evaluation by <u>R. Davies</u>		Automated plot by <u>HP Designjet 1050C</u>		
Verification by <u>R. Davies, E. Domingo</u>				
Soundings in <u>Fathoms and tenths</u>		at <u>MLLW</u>		
REMARKS: <u>Time in UTC. UTM Projection Zone 8</u>				
Revisions and annotations appearing as endnotes were				
generated during office processing.				
All separates are filed with the hydrographic data.				
As a result, page numbering may be interrupted or non-sequential				

Descriptive Report to Accompany Hydrographic Survey H11134

Project OPR-O112-RA-03

Sitka Sound, Alaska

Scale 1:20,000

May-June 2003

NOAA Ship RAINIER

Chief of Party: Commander John W. Humphrey, NOAA

A. AREA SURVEYED

This hydrographic survey was completed as specified by Hydrographic Survey Letter Instructions OPR-O112-RA-03, dated April 21, 2003, and the Draft Standing Project Instructions dated March 21, 2001. The survey area is located from Salisbury Sound, North of Sitka to Sitka Sound Southwest of Sitka. This survey corresponds to sheet “AD” in the sheet layout provided with the Letter Instructions. An additional section was added to the west end of the sheet to fully include a marine protected area (MPA).

One hundred percent shallow-water multibeam (SWMB) coverage was obtained in the survey area in waters containing significant features. A five-meter depth overlap, where feasible, between LIDAR (W00034) soundings and SWMB was obtained nearshore. A VBES buffer line was completed to aid in determining the inshore limit of safe navigation. Shoreline verification of LIDAR shoal and negative soundings was completed where conditions permitted.¹ Additional coverage was obtained to obtain least depths over features or shoals.

Data acquisition including LIDAR (W00034) was conducted from May 17, 2003 to June 26, 2003 (Dn 137 to 177).²

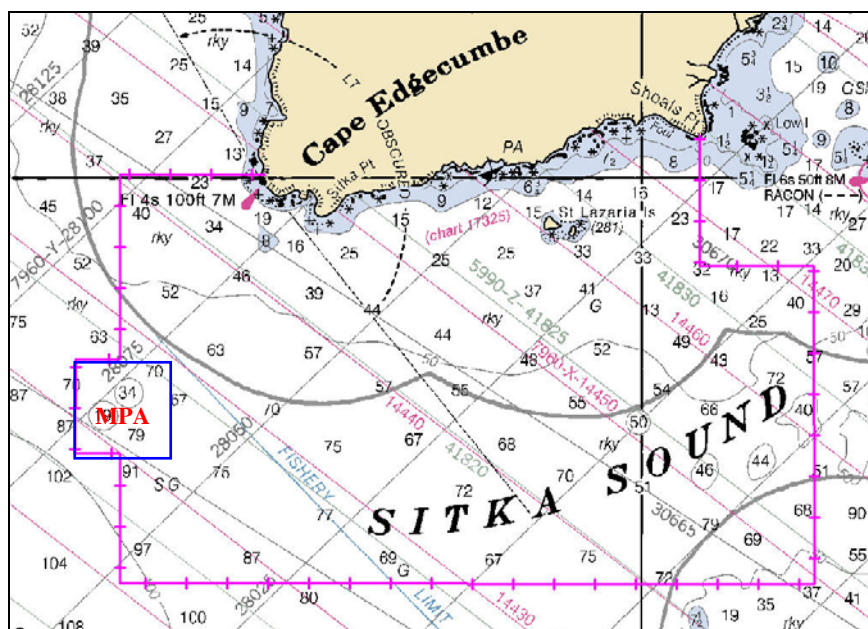


Figure 1. H11134 Survey Limits.

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-O112-RA-03 Data Acquisition and Processing Report* (DAPR),³ submitted under separate cover. Items specific to this survey, and any deviations from the aforementioned report are discussed in the following sections.

B1. Equipment and Vessels

Data were acquired by RAINIER and her survey launches RA1, RA2, RA4, RA5, and RA6. RAINIER, RA4, RA5, and RA6 were used to acquire shallow-water multibeam (SWMB) soundings and sound velocity profiles. Vessels RA1 and RA2 were used to acquire vertical-beam echo soundings (VBES) and detached positions (DPs) for shoreline verification. Vessel RA2 was also used to collect bottom samples.

No unusual vessel configurations were used for data acquisition.⁴

B2. Quality Control

Crosslines

Shallow-Water Multibeam (SWMB) crosslines totaled 79.37 nautical miles, comprising 6.45% of SWMB hydrography. The main scheme bathymetry was manually compared to the crossline nadir beams in CARIS subset mode and agreed well with differences averaging approximately 0.5 meters.

A statistical Quality Control Report has been conducted on representative data collected with each system used on this survey and is included in the *OPR-O112-RA-03 DAPR*. All systems collect data that meet IHO order 2 specifications.⁵

Through manual examination of the data, the hydrographer believes that data accuracy standards have been met.⁶

Junctions

There are no contemporary survey junctions with survey H11134.⁷

This survey junctions with a demo LIDAR survey conducted by Tenix LADS Inc., submitted under registry number W00034. The junction consisted of a VBES buffer line and SWMB coverage to approximately a 5-meter depth overlap, where feasible. LIDAR soundings corresponded with SWMB soundings within 1.0m.⁸

The Report on the Collection of Data South of Kruzof Island for NOAA Ship RAINIER by Tenix LADS Inc. is included in with this report.⁹

Data Quality Factors ¹⁰

During post acquisition/processing of RAINIER SWMB data, a heading error was discovered for data collected on Dn147 through Dn160. This error indicated a maximum difference between heading and course made good was approximately 8°. Using a conservative value for the allowable horizontal position error budget (5m), all affected data was filtered to accept only data within 35m of nadir. Thus, 100% SWMB coverage of the survey area was obtained and all indications of shoaling were investigated, however, only soundings meeting specifications were retained. Outer beams (>35m off nadir) were reviewed and inspected for indications of shoaling. If in fact shoaling was noted, additional lines were run to obtain valid least depths. In all instances, depths exceeded 90m. Figure 2 contains the coverage obtained by using the above method of filtering.

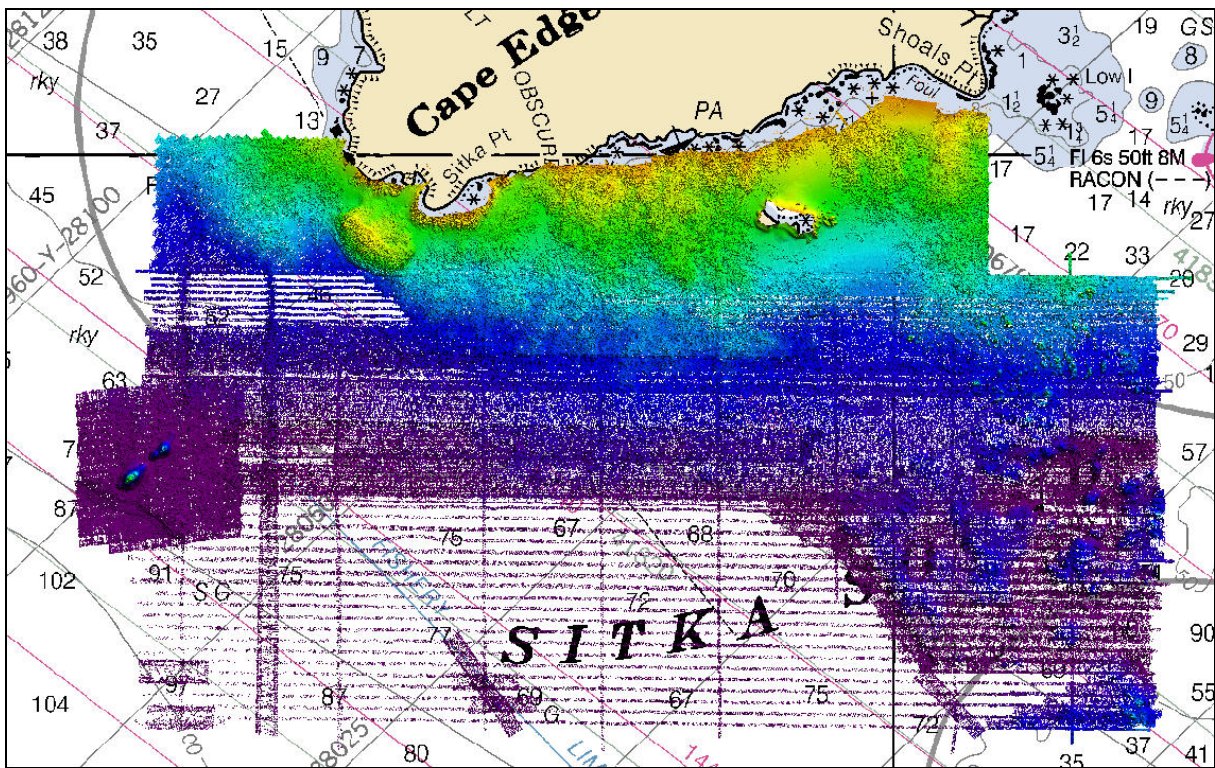


Figure 2 - H11134 2m 9p Digital Terrain Model

Sound velocity problems occurred throughout survey H11134. After correction for sound velocity in Caris HIPS and SIPS, most lines still exhibited characteristic “smiles and frowns,” indicating inaccurate sound velocity corrections. To help correct these sound velocity problems, correctors were applied based on geographic position as well as time constraints for sound velocity casts taken within 3 hours of the acquired data. This correction was applied to all RAINIER (RAHF) data. If the time between casts extended beyond 3 hours, individual lines were corrected using the sound velocity cast taken within 4 hours of acquisition.

Dn 155 sound velocity casts were taken on the eastern and western edges of the survey hydro limits. RAINIER (RAHF) survey lines that extended the length of the sheet hydrographic

limits, approximately 8 nautical miles were cut in half and the appropriate sound velocity cast was applied to the data.

Dn 169 sound velocity cast taken at 1201 (03169120.1) was applied to all lines acquired from 1201 until 2309. Due to the application of one cast, Dn 169 shows a vertical shift of approximately 3-5m, in 100m of water.

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. To compensate for sound velocity issues, 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 offshore Sitka Sound would be continuous sound velocity profiling, or water column “zoning.”

B3. Data Reduction

Data reduction procedures for survey H11134 conform to those detailed in the *OPR-O112-RA-03 DAPR*. Due to time stamp errors, the gyro data from ELAC systems, RA4, RA6, and RAINIER were reconverted using an updated version of ELAC Converter (Caris v5.3, sp3 hf3).

C. VERTICAL AND HORIZONTAL CONTROL

A complete description of vertical and horizontal control for survey H11134 can be found in the *OPR-O112-RA-03 Horizontal and Vertical Control Report*,¹¹ 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 (DGPS) was the sole method of positioning. Differential corrections from U.S. Coast Guard beacon at Biorka Island (305 kHz) were utilized during this survey. Launch-to-launch DGPS performance checks using U.S. Coast Guard beacons Level Island (295 kHz) and Gustavus (288 kHz) as the check stations were performed weekly in accordance with Section 3.2 of the FPM. Copies of the performance checks are included in the *OPR-O112-RA-03 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 Sitka, AK (945-1600) served as control for datum determination and as the primary source for water level reducers for survey H11134.

RAINIER personnel installed Sutron 8210 “bubbler” tide gauges at the following subordinate stations to provide information for N/OPS1 to determine time and height correctors in accordance with the Project Instructions:

Station Name	Station Number	Type of Gauge	Date of Installation	Date of Removal
Scraggy Island	945-1805	3-day	April 21, 2003	June 24, 2003
Golf Island	945-1421	30-day	May 8, 2003	June 26, 2003

All data were reduced to MLLW using unverified observed tides from station Sitka, AK using the tide file 9451600.tid and time and height correctors using the zone corrector file 0112RA2003CORP.zdf.

The Pacific Hydrographic Branch will apply final approved (smooth) tides to the survey data during final processing.¹² A request for delivery of final approved (smooth) tides for survey H11134 was forwarded to N/OPS1 on June 26, 2003.¹³ A copy of the request is included with this report.¹⁴

D. RESULTS AND RECOMMENDATIONS

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

One (1) AWOIS item was located within the limits of H11134 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 with this report.¹⁵

D.2 Chart Comparison

Survey H11134 was compared with the following charts:

17320 (16th Ed.; December, 2003, 1:217,828)¹⁶
 17325 (7th Ed.; October 13, 1990, 1:40,000)¹⁷
 17326 (13th Ed.; August 5, 2000, 1:40,000)¹⁸

Depths from survey H11134 generally agreed with charted depths within one or two fathoms for charts 17320, 17325 and 17326 except for the following. Depths on chart 17320 in the area bounded by 56° 53’ 22.4” N 135° 49’ 25.1” W and 56° 55’ 29.4” N 135° 41’ 07.8 ‘ W are two to five fathoms shoaler than those obtained during this survey.¹⁹

The Hydrographer has determined that data accuracy standards and bottom coverage requirements have been met and survey data are adequate to supersede charted data in their common areas.²⁰

Final chart comparisons will be made at the Pacific Hydrographic Branch after the application of smooth tides.²¹

D.3 Shoreline

Shoreline Source

Vector photogrammetric projects AK9703A, AK9703B, and AK902A were supplied by N/NGS3 in the form of cartographic feature files (CFF) however; they were not used for field verification.²² In lieu of the CFF shoreline, RAINIER conducted limited field shoreline verification of a LIDAR survey (W00034) provided by Tenix LADS Inc.²³ This preliminary LIDAR was provided by RSD for reference purposes to evaluate applications for hydrographic survey operations and nautical chart updates. An evaluation report was submitted to NGS and N/CS34 on July 12, 2003 under separate cover.²⁴

Due to the high resolution, LIDAR MHW and MLLW could not be converted into *.dxf files that allow them to be displayed in HYPACK, therefore, they were traced using MapInfo and the traced files were displayed in HYPACK for field verification. Boat sheets, however, maintained the original LIDAR resolution. In addition, features shown on the current editions of charts 17325 and 17320 that were not depicted on the LIDAR shoreline documents were digitized in MapInfo by RAINIER personnel and displayed in HYPACK for field verification.

Shoreline Verification

Limited LIDAR shoreline verification was conducted near predicted low water in accordance with the Standing Project Instructions and FPM sections 6.1 and 6.2. Detached positions (DPs) taken during shoreline verification were recorded in HYPACK and on DP forms,²⁵ and processed in Pydro. These indicate revisions to features and features not found on the verified LIDAR shoreline. In addition, annotations describing shoreline were recorded on hard copy plots of digital shoreline. DP forms are included in Section I of the *Separates to be Included with Survey Data*.

A detailed Detached Position and Bottom Sample plot²⁶ in 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. Verified LIDAR shoreline that did not require revision is in MapInfo tables "H11134_Lidar_shore_mhw", "H11134_Lidar_shore_mllw", and "H11134_ledge" and is shown in black. Changes to MHW shoreline are displayed in red; and all other shoreline and foul line updates are displayed in pink. The new, MHW and MLLW features as well as changes to the MLLW shoreline are saved in the MapInfo table "H11134_ShorelineUpdates". In many instances, LIDAR MLLW features located along shore were ledges, and those that were verified were updated and put into the MapInfo table "H11134_ShorelineUpdates" as noted on the detailed Detached Position and Bottom Sample plot.²⁷

The LIDAR data was evaluated against the CFF shoreline following LIDAR verification in the field. The Hydrographer found the LIDAR data to be accurate and in numerous locations more detailed than the CFF shoreline provided.²⁸ The Hydrographer believes a RSD reviewed LIDAR shoreline data set is a viable alternative to a CFF shoreline derived from photogrammetry.

Source Shoreline Changes and New Features

Negative soundings and shoal soundings examined during verification of LIDAR data were determined to be rocks or shoal soundings accordingly. These soundings were digitized into rock symbols and saved in MapInfo table "H11134_LIDAR_Rocks."

All LIDAR MLLW detached from main MLLW shoreline were found to be rocks. ²⁹

Four charted (17325) rocks centered around position 57° 00' 49.73" N, 135° 40' 21.53" W were represented as MLLW in the LIDAR survey, however during hydrographic LIDAR verification it was visually determined that they were large reefs. ³⁰

Two charted (17325) rocks centered around position 56° 59' 27.69" N, 135° 48' 49.36" W were represented by MLLW and negative soundings. Both rocks were visually verified during LIDAR verification, and plotted as LIDAR rocks. ³¹

Two charted (17325) rocks centered around position 56° 59' 13.01" N, 135° 41' 57.47" W were represented as MHW and MLLW in the LIDAR survey. Both rocks were visually verified to be islets during LIDAR verification. ³²

The charted (17325) ledge between positions 56° 59' 22.00" N, 135° 49' 19.60" W and 56° 59' 34.33" N, 135° 48' 58.25" W was visually verified during LIDAR verification to be MLLW. ³³

The charted (17325) ledge at 56° 59' 41.46" N, 135° 50' 30.73" W was visually verified during LIDAR verification to be MLLW. ³⁴

LIDAR shoreline located at the following positions were visually verified as reefs during hydrographic LIDAR verification:

57° 00' 38.96" N, 135° 39' 17.40" W ³⁵
57° 00' 49.24" N, 135° 40' 22.51" W ³⁶
57° 00' 49.21" N, 135° 40' 34.36" W ³⁷
57° 00' 24.61" N, 135° 41' 29.28" W ³⁸
56° 59' 14.42" N, 135° 42' 19.17" W ³⁹
57° 00' 00.00" N, 135° 45' 57.39" W ⁴⁰

LIDAR shoreline located around the following positions were visually verified as ledges during LIDAR verification:

57° 00' 54.01" N, 135° 40' 15.34" W ⁴¹
57° 00' 54.00" N, 135° 40' 41.00" W ⁴²
57° 00' 41.00" N, 135° 41' 14.00" W ⁴³
57° 00' 40.54" N, 135° 39' 02.56" W ⁴⁴
57° 00' 38.00" N, 135° 38' 28.00" W ⁴⁵

57° 00' 31.50" N, 135° 42' 04.38" W ⁴⁶
 57° 00' 23.49" N, 135° 42' 13.13" W ⁴⁷
 57° 00' 18.00" N, 135° 42' 19.00" W ⁴⁸
 57° 00' 12.00" N, 135° 42' 51.00" W ⁴⁹
 57° 00' 10.54" N, 135° 44' 22.02" W ⁵⁰
 57° 00' 10.51" N, 135° 44' 32.63" W ⁵¹
 57° 00' 08.56" N, 135° 43' 20.29" W ⁵²
 57° 00' 06.96" N, 135° 45' 12.63" W ⁵³
 57° 00' 05.00" N, 135° 45' 59.00" W ⁵⁴
 56° 59' 50.00" N, 135° 47' 40.00" W ⁵⁵
 56° 59' 50.00" N, 135° 47' 00.00" W ⁵⁶
 56° 59' 44.74" N, 135° 48' 01.47" W ⁵⁷
 56° 59' 42.40" N, 135° 48' 40.30" W ⁵⁸
 56° 59' 37.73" N, 135° 51' 05.34" W ⁵⁹
 56° 59' 36.00" N, 135° 50' 54.00" W ⁶⁰
 56° 59' 33.09" N, 135° 50' 32.08" W ⁶¹
 56° 59' 20.00" N, 135° 49' 34.00" W ⁶²

Shoreline verification indicated that charted kelp areas for all affected charts correspond well. ⁶³

The difference between rocks, reefs, islets, and islands, etc., is at the discretion of the cartographer. ⁶⁴ Several LIDAR MHW lines between the main MHW and MLLW or ledges are large boulders on the beach.

Several MHW and MLLW disprovals by 100% SWMB occurred to the west, north, and northeast of St. Lazaria Island. ⁶⁵ These digitized features can be attributed to many boats, waves, and floating objects during LIDAR acquisition. See *Photo 1 100% SWMB Disproval*.



*Photo 1 - 100% SWMB Disproval***Charted Features**

Charted rocks were verified and in almost all cases were superseded by LIDAR rocks, unless otherwise noted on the Detached Position and Bottom Sample plot. ⁶⁶

Recommendations

The Hydrographer recommends that the shoreline as depicted on the Detached Position and Bottom Sample plot and final sounding plot in the MapInfo digital files supersede and complement shoreline information compiled on the LIDAR, CFF and charts as noted. ⁶⁷ In addition, field notes made by the Hydrographer, including verification of LIDAR features or charted features, if no LIDAR shoreline was available, are submitted in the digital MapInfo file "H11134_ShorelineNotes." ⁶⁸

D.4 Dangers to Navigation

One (1) danger to navigation was found and reported to the Marine Chart Division (MCD) for verification and final submission to the Seventeenth Coast Guard District on June 7, 2003 in the form of a digital XML file "DTON_H11134.xml". A copy of the preliminary Danger to Navigation file is included with the digital data and this report. ⁶⁹

D.5 Aids to Navigation

One aid to navigation (ATON) is located within the limits of H11134. No GPS static surveys were conducted for Survey H11134 due to rugged terrain, however bearings and ranges taken during shoreline verification indicate Cape Edgecumbe Light (LLN 24910) to be charted correctly and serving its intended purpose. ⁷⁰

D.6 Miscellaneous

Bottom samples were collected and are depicted on the Detached Position and Bottom Sample Plot. ⁷¹

In February 2004, RAINIER was informed of a bug in Caris SBEdit that incorrectly changes the Observed depths if the VBES data is processed in the following manner: SVP correct (at least once), followed by depth edits (includes accept/reject flagging), followed by an additional SVP correct and merge. By reconverting the raw VBES lines on survey H11134 and copying the SLRange, SLRangeLineSegments, SLRangeTmIdx files into the original processed line file folders, and re-merging, the errors from the Sbedit bug were removed. The submitted HDACS_DATA for this survey includes the corrected VBES depths and meets requirements.

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, Hydrographic Survey Guidelines, Field Procedures Manual and the NOS Hydrographic Surveys Specifications and Deliverables, as updated for 2003.

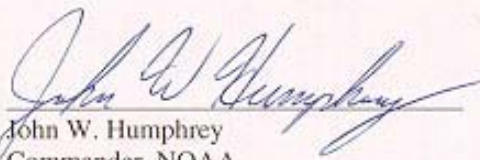
The digital data and supporting records have been reviewed by me, are considered complete and adequate for charting purposes, and are approved. All records are forwarded for final review and processing to N/CS34, Pacific Hydrographic Branch.

Survey H11134 is complete and adequate to supersede charted soundings⁷² in their common areas.⁷³ No additional work is required for this survey.⁷⁴

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


<u>Title</u>	<u>Date Sent</u>	<u>Office</u>
Data Acquisition and Processing Report for OPR-O112-RA-03	October 9, 2003	N/CS34
Horizontal and Vertical Control Report for OPR-O112-RA-03	September 8, 2003	N/CS34
Tides and Water Levels Package for OPR-O112-RA-03	August 1, 2003	N/OPS1
Coast Pilot Report for OPR-O112-RA-03	October 10, 2003	N/CS26

Approved and Forwarded:

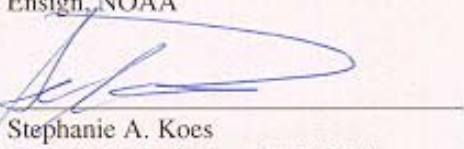

John W. Humphrey
Commander, NOAA
Commanding Officer

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

Survey Sheet Manager:


Amanda M. Bittinger
Ensign, NOAA

Field Operations Officer:


Stephanie A. Koes
Lieutenant (junior grade), NOAA

Revisions Compiled During Office processing and Certification

¹ During office processing, the LIDAR data was only used to verify charted features along shore and should be used to supplement official RSD shoreline. The sounding data was not used because the data was only a test and not certified by TENIS LADS. A digital file of this LIDAR data will be sent to MCD, labeled W00034.dgn.

² Dates without the LIDAR is 5/27/03 – 6/26/03

³ Filed with the project records.

⁴ Concur

⁵ After office review this survey meets IHO order 1 in depths less than 100 meters and meets IHO order 2 in depths greater than 100 meters.

⁶ Concur

⁷ There are three surveys that junction survey H11134; H11135 (2005), H11270 (2005) and H11271 (2005). These surveys have not been received by the Pacific Hydrographic Branch. The junctions with survey H11134 will be discussed in their Descriptive Reports.

⁸ Soundings from W00034 were not compared with during office processing. This data was not completely processed by TENIX LADS and therefore was not used. Only shoreline features were used to supplement RSD shoreline.

⁹ Filed with the hydrographic records.

¹⁰ See attached Review of Hydrographic Survey H11134, dated March 18, 2005

¹¹ Filed with the project records.

¹² Concur

¹³ Approved tide note dated October 15, 2003 is attached.

¹⁴ Filed with the hydrographic records.

¹⁵ See attached Pydro forms for AWOIS item

¹⁶ Chart 17320, 17th Edition, Nov. 1, 2005

¹⁷ Chart 17325, 8th Edition, June 1, 2004

¹⁸ Chart 17326, 14th Edition, June 1, 2005

¹⁹ Concur

²⁰ Concur

²¹ With the application of smooth tides, no changes to the comparison were noticed. This survey is adequate to supersede all charted soundings and features except where noted in this report and as noted on the detached position and bottom sample plot.

²² Vector photogrammetric projects AK9703A and AK902A were used for survey H11134.

²³ See endnote 1

²⁴ Filed with the hydrographic records.

²⁵ Filed with the hydrographic records.

²⁶ Filed with the hydrographic records.

²⁷ See smooth sheet for depiction of area

²⁸ Only verified LIDAR features are shown on the smooth sheet in black, level 7 and red on the HDrawing.

²⁹ Do not concur, these LIDAR features are not only rocks, but in some instances isolated reefs. See smooth sheet for depiction of these areas.

³⁰ Concur, chart as a reef.

³¹ These rocks have been drawn in brown at their charted because the hydrographer verified their existence but did not take a detached position.

³² Concur, see smooth sheet for depiction of these features.

³³ Concur, chart as MLLW.

³⁴ Concur, retain as charted.

³⁵ Chart as reef, see smooth sheet for depiction.

³⁶ Chart as reef, see smooth sheet for depiction.

³⁷ Chart as reef, see smooth sheet for depiction.

³⁸ Chart as reef, see smooth sheet for depiction.

³⁹ Chart as ledge, see smooth sheet for depiction.

⁴⁰ Due to scale of the chart, retain rock.

⁴¹ Retain charted ledge, see smooth sheet for depiction.

⁴² Retain charted ledge, see smooth sheet for depiction.

⁴³ Chart new ledge, see smooth sheet for depiction.

-
- ⁴⁴ Chart ledge as shown on photogrammetric manuscript, AK9703a, see smooth sheet for depiction.
- ⁴⁵ Chart ledge as shown on photogrammetric manuscript, AK9703a, see smooth sheet for depiction.
- ⁴⁶ Chart as a reef, see smooth sheet for depiction.
- ⁴⁷ Chart as a new ledge, see smooth sheet for depiction.
- ⁴⁸ Chart as a new ledge, see smooth sheet for depiction.
- ⁴⁹ Chart as a new ledge, see smooth sheet for depiction.
- ⁵⁰ Chart as a new ledge, see smooth sheet for depiction.
- ⁵¹ Chart as a new ledge, see smooth sheet for depiction.
- ⁵² Chart as a new ledge, see smooth sheet for depiction.
- ⁵³ Chart as a new ledge, see smooth sheet for depiction.
- ⁵⁴ Chart as a new ledge, see smooth sheet for depiction.
- ⁵⁵ No charted feature at this location, retain as charted.
- ⁵⁶ Chart as a new ledge, see smooth sheet for depiction.
- ⁵⁷ Chart as a new ledge, see smooth sheet for depiction.
- ⁵⁸ Not enough information to change MLLW to ledge, retain as charted.
- ⁵⁹ Retain ledge as charted.
- ⁶⁰ Chart as a new ledge, see smooth sheet for depiction.
- ⁶¹ Chart as a new ledge, see smooth sheet for depiction.
- ⁶² Retain ledge as charted.
- ⁶³ Concur, retain charted kelp symbols.
- ⁶⁴ See smooth sheet for depiction of the survey area.
- ⁶⁵ See smooth sheet for depiction of the survey area.
- ⁶⁶ See smooth sheet for depiction of the survey area.
- ⁶⁷ Concur, see smooth sheet for the depiction of the area.
- ⁶⁸ Shoreline verification conducted by the hydrographer and portrayed on the detached position plot has been analyzed during office processing and shown on the smooth sheet as warranted.
- ⁶⁹ Concur, no additional Dangers to Navigation were found during office processing.
- ⁷⁰ The evaluator recommends that MCD use the latest information to chart aids to navigation.
- ⁷¹ Bottom characteristics have been shown on the smooth sheet as positioned by the present survey.
- ⁷² And features
- ⁷³ Except where mention in this report.
- ⁷⁴ Concur

Hydrographic Survey Registry Number H11134

Survey Title: Approaches to Sitka

State: Alaska

Locality: Sitka Sound

Sub-locality: Northern Offshore Approaches

Project Number: OPR-O112-RA-03

Survey Dates: May 27, 2003 - June 26, 2003

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

CHARTS AFFECTED:

<u>Chart</u>	<u>Scale</u>	<u>Edition</u>	<u>Date</u>
17320	1:217,828	15 th	March 6, 1999
17325	1:40,000	7 th	October 13, 1990
17326	1:40,000	13 th	August 5, 2000

DANGERS TO NAVIGATION:

<u>Feature</u>	<u>Depth(ftms)</u>	<u>Latitude</u>	<u>Longitude</u>
Shoal Sounding	2.4	56°59'21.54"N	135°42'10.29"W

COMMENTS:

Questions concerning this report should be directed to the Commanding Officer, NOAA Ship RAINIER, at (206) 553-4794 (inport November through mid-March), (877) 665-6533 (at sea, mid-March through November), or by e-mail at co.rainier@noaa.gov.

H11134 AWOIS Report

Registry Number: H11134
State: AK
Locality: Approaches to Sitka
Sub-locality: Northern Offshore Approaches
Project Number: OPR-O112-RA-03
Survey Dates: 06/04/2003 - 06/20/2003

Charts Affected

Number	Version	Date	Scale
17325	7th Ed.	10/13/90	1:40000
17320	15th Ed.	03/06/99	1:217828
16016	19th Ed.	07/10/93	1:969756
531	21st Ed.	02/02/02	1:2100000
500	7th Ed.	06/01/96	1:3500000
530	30th Ed.	03/23/02	1:4860700
50	5th Ed.	07/30/94	1:10000000

Features

No.	Feature Type	Survey Depth	Survey Latitude	Survey Longitude	AWOIS Item
1.1	AWOIS	[no data]	[no data]	[no data]	---
1.2	Wreck	-3.63 m	57.00317719° N	135.74928698° W	---
2.1	Shoal	4.69 m	56.98931854° N	135.70285923° W	---

1.1) AWOIS #52928 - UNKNOWN

Search Position: 57.00130833° N, 135.74125278° W

Historical Depth: [None]

Search Radius: 300

Search Technique: SD, VS, ES, DI, S2, SWMB

Technique Notes: [None]

History Notes:

History Charted visible wreck PA. LNM 1/77-- Add visible wreck PA at 57/00/06N, 135/44/22W. CL1797/76--Coast pilot inspection, 7 June - 18 August, 1976, A barge with a 150 ft. crane sunk in the winter of 1974-1975. Comments on chartlet indicate the wreck "won't last much longer". (ENT DAS 02/15/2002)

Survey Summary

Charts Affected: 17325_1, 17320_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

AWOIS #52928 Charted visible wreck. PA.

100% SWMB was not obtained within the AWOIS radius due to sea conditions and the charted terrain. There was no visible sign of the wreck within the AWOIS radius. Most of the area was not accessible, as seen with the singlebeam buffer line and a majority of the area was ledge as shown on the DPBS plot.

A wreck (metal hull) was found at 57°00'11.408"N , 135°44'57.459"W (454486.37E ,6317988.28N), see DP #217403 during shoreline verification at high water.

This wreck is not within AWOIS radius, however, the hydrographer recommends removing the PA wreck (AWOIS #52928) and charting the position of the wreck (metal hull) using DP#217403.

The crane base is represented by LIDAR MLLW at position latitdue 57/00/4.08N, longitude 135/44/52.93W (454560.99E, 6317761.59N).

Feature Correlation

Address	Feature	Range	Azimuth	Status
OPR-O112-RA-03_AWOIS	AWOIS # 52928	0.00	000.0	Primary

Hydrographer Recommendations

This wreck is not within AWOIS radius, however, the hydrographer recommends removing the PA wreck (AWOIS #52928) and charting the position of the wreck (metal hull) using DP#217403. Chart crane wreckage at LIDAR position.

Office Notes

Concur, chart visible wreck at survey position. Chart obstruction (crane) at survey position.



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

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE: October 15, 2003

HYDROGRAPHIC BRANCH: Pacific
HYDROGRAPHIC PROJECT: OPR-0112-RA-2003
HYDROGRAPHIC SHEET: H11134

LOCALITY: Approaches to Sitka, Alaska
TIME PERIOD: May 17 - June 26, 2003

TIDE STATION USED: 945-1600 Sitka
Lat. 57° 03.1' N Lon. 135° 20.5' W
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 2.791 meters

REMARKS: RECOMMENDED ZONING
Use zone(s) identified as: SEA200, PAC294

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 on the new 1983-2001 National Tidal Datum Epoch (NTDE).

Thomas V. Meyer 10/17/03
CHIEF, REQUIREMENTS AND DEVELOPMENT DIVISION



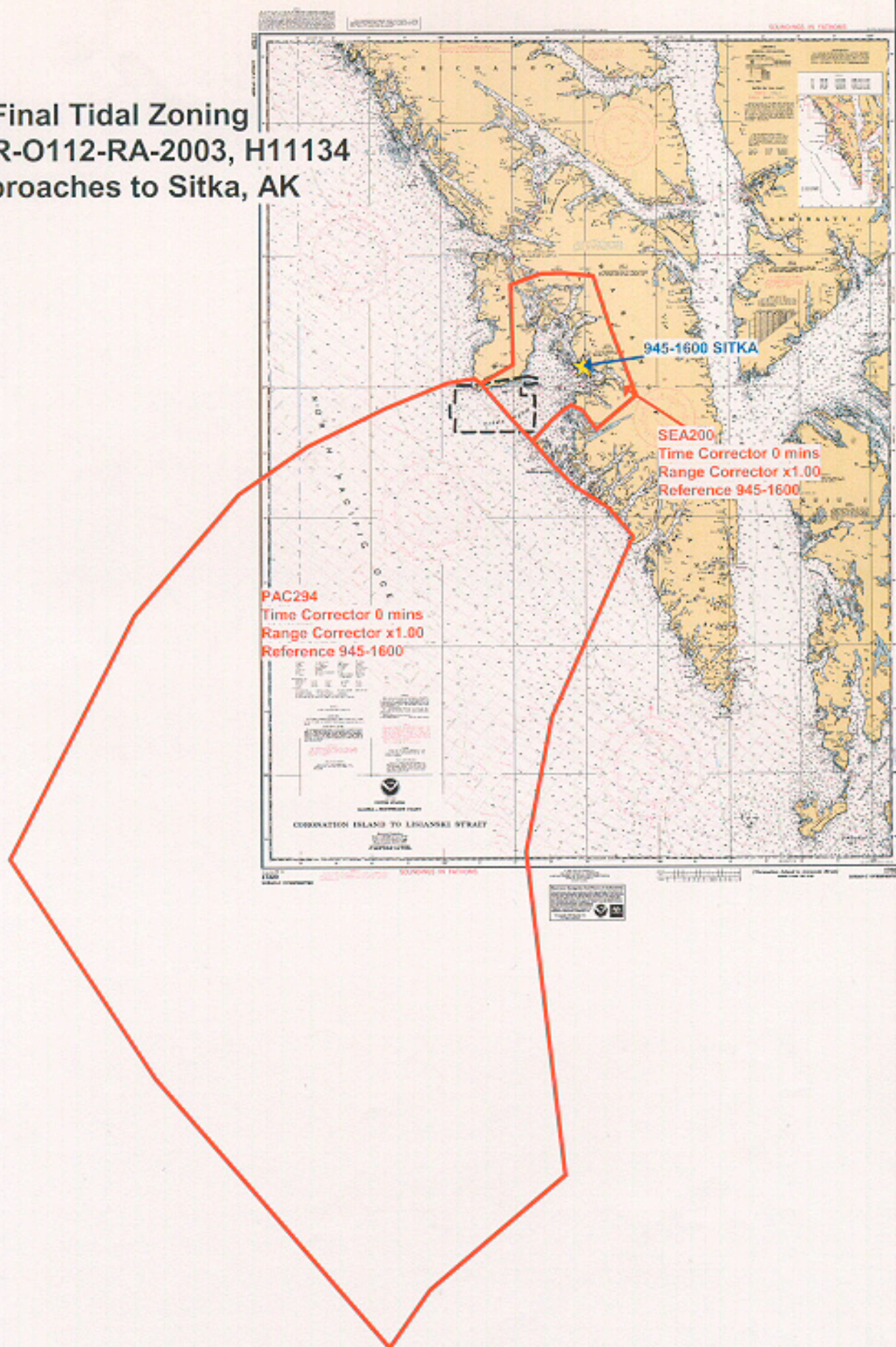
Final tide zone node point locations for OPR-O112-RA-2003, H11134

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

	Tide Station Order	AVG Time Correction	Range Correction
Zone SEA200	945-1600	0	1.00
-135.578921 56.858887			
-135.484815 56.914845			
-135.434312 56.939104			
-135.398646 56.951288			
-135.345146 56.937479			
-135.283101 56.889312			
-135.096503 56.976245			
-135.219418 57.152377			
-135.294235 57.2785			
-135.435854 57.285735			
-135.536277 57.284567			
-135.677763 57.256337			
-135.665367 57.054404			
-135.816846 57.006056			
-135.678821 56.918667			
-135.578921 56.858887			
Zone PAC294	945-1600	0	1.00
-135.440188 54.935465			
-135.614954 55.795537			
-135.492618 56.147404			
-135.115122 56.61479			
-135.225608 56.687147			
-135.384031 56.742995			
-135.483657 56.799068			
-135.578921 56.858887			
-135.678821 56.918667			
-135.816846 57.006056			
-135.846324 57.019177			
-135.973296 57.007633			
-136.264491 56.943316			
-136.624163 56.848139			
-136.947944 56.725833			
-137.436839 56.413838			

-138.019247 55.780057
-137.347411 55.196148
-136.26123 54.471396
-136.071777 54.627221
-135.440188 54.935465

Final Tidal Zoning
for OPR-O112-RA-2003, H11134
Approaches to Sitka, AK





UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
OFFICE OF COAST SURVEY
Pacific Hydrographic Branch
Seattle, Washington 98115-6349

March 18, 2005

MEMORANDUM TO:

Lieutenant Commander Donald W. Haines, NOAA
Chief, Pacific Hydrographic Branch

DWH

FROM:

Keith H. Toepfer, Physical Scientist

SUBJECT:

Review of Hydrographic Survey H11134
OPR-O112-RA-03

I have reviewed hydrographic survey H11134 with regard to data integrity and completeness of the data submission package, survey field procedures, data processing and quality assurance methods, and overall data accuracy and data quality. Survey H11134 complies with specifications and requirements set forth in the NOS Hydrographic Surveys Specifications and Deliverables Manual, the Field Procedures Manual, and the Standing and Letter Project Instructions with the following exceptions:

1. Although 100% multibeam coverage was obtained, significant portions of the survey area do not contain valid data for use in updating the chart. It is the reviewer's opinion that the achievement of 100% coverage is to be interpreted as 100% coverage by valid and useable data. A heading error, as much as eight degrees, was discovered during post-acquisition processing for all data collected using the Rainier's Elac from Dn 147 through Dn 160. Subsequently, the outer beams beyond 35 meters from nadir were rejected. However, before rejecting any data, the survey party reviewed all soundings for shoaling and collected additional survey lines where needed to ensure coverage and least depths. As a result of rejecting the outer beam soundings, there are areas of the survey where there is insufficient data to update the chart.
2. The DR also noted "a vertical shift of approximately 3-5m, in 100m of water" on RAHF survey lines collected on day number 169. It attributes this to the application of a single sound velocity profile taken at 1201 to all lines acquired during an eleven hour period on that day. Examination of the Multibeam Processing Checklist for the RAHF (Elac) data shows an annotation for seven of those lines stating "24-hours wrong—must have put in the wrong date or the date didn't change after midnight on the name." An additional notation for these lines on the same Checklist page is "No SVP for these lines. Cast was lost or deleted. Used cast previous in time." The noted shift was observed on some, but not all,



lines acquired during the eleven hours period, including all seven of the lines referenced by the Processing Checklist annotation.

3. Because of the data problems noted in items 1 and 2, above, the reviewer conducted a thorough and careful examination of the affected area, including rejected soundings, and observed no indications of significant shoaling anywhere in the area of the survey containing RAHF survey lines. All areas affected by these problems did not exhibit depths shoaler than 40 meters. In the course of the examination, both problems cited above were noted. After thorough comparisons in Caris Subset Editor throughout the survey area, the reviewer identified 42 survey lines, all from RAHF, exhibiting levels of vertical and/or horizontal disagreement in excess of that allowable under the standards of IHO Order 1 (in water depths up to 100m) or IHO Order 2 (in water depths greater than 100m). The affected lines were acquired on days 147 (4), 148 (3), 155 (1), 158 (3), 159 (1), 160 (13) and 169 (17), where the number in parentheses is the number of individual problematic survey lines on the specified day. Those lines from the period bounded by days 147 through 160 appeared superficially consistent with a heading error. However, in the case of survey lines crossing at right angles, one would expect a heading error to produce maximum differences near the edges of the cross-track line that converge to a noticeable minimum near the nadir of that line. The observed result was quite different, in that where horizontal differences were noted they were of essentially constant magnitude all the way across the cross-track line. After the reviewer consulted with other physical scientists in the branch and with the Hydrographic Team Lead, a decision was made to reject the affected 42 lines and compute a new DTM. Relevant details of this process are contained below in the discussion of additional processing.
4. The reviewer believes that the data remaining in the dataset after the rejection of the 42 problematic survey lines meets the standards and specifications for accuracy and coverage as specified in the HSSDM, Standing and Letter Instructions, and is adequate to supersede charted data in their common areas.

The following additional processing was performed by the reviewer:

1. Based on the findings discussed in items 1 and 2 above, the reviewer created a new field sheet in the QA copy of the Caris session. The existing field sheets were removed from this session. The reviewer cut the 42 lines from the local HDCS_Data folder and copied them to day-numbered folders under a sibling folder named OutOfSpec_HDCS. The remaining data were used to compute a revised 2 meter, 9 pixel swath-angle-weighted BASE surface. This was contoured in Caris and a corrected perimeter was exported to MapInfo Table H11134_Office_SurveyOutline.TAB, located at:

N:\Active\OPRO112RA03\Surveys\H11134\Plots\Office QA\

The reduced set of lines exists under HDCS_Data, the newly rejected lines under OutOfSpec_HDCS, in the expected Caris folder structure located at:

N:\Active\OPRO112RA03\Surveys\H11134\Caris\

2. During review a DP line consisting of one DP, a NonReport new rock awash (DP number 2155409) was found to have been inadvertently removed from the original HDCS_Data on N:\Incoming. The original target file was found in the PreProcess data, and was reinserted into the PSS as a Hypack DP, having referred to the original DP Form and the original settings in Pydro for that DP.
3. To ensure a correct PSS following removal of the 42 lines, the reviewer created a new Pydro PSS named by copying the existing PSS for this survey. The reviewer ran *Data>Stats>Line Info*, verified that the 42 removed lines were offline and the remaining lines were online, removed the references to the 42 offline sounding lines, and saved the resulting PSS. This PSS, named H11134_QA_Office, remapped to the appropriate data paths and tested, is located in:

N:\Active\OPRO112RA03\Surveys\H11134\Smooth_Sheet\Preliminary\PSS\Field\

4. The reviewer placed a copy of the final session Caris Session file, named H11134_Office_QAFinal, on N:\Active at the following location:

N:\Active\OPRO112RA03\Surveys\H11134\Caris\session

Special attention should be given to the following:

1. Because the original line data on N:\Active has been removed to a separate folder named Original_Field_H11134 as a sibling to HDCS_Data, the original Caris Sessions and Pydro PSS will exhibit errors because of the missing 42 lines. The revised PSS, referenced in item 3 of the preceding section, is correctly pointed at the revised HDCS_Data, images and vessel configuration files, also located on N:\Active. The copy of Caris Session file H11134_Office_QAFinal has also had its directory paths repointed to the data on N:\Active.
2. Because the review of this survey predates the issuance of the current procedure, QA checklist and certification memo template, final tides have not yet been applied to the data for this survey.
3. DP 2155409 was reinserted using the same vessel configuration file as was indicated in the original Pydro PSS, namely R2SB_2003. However, because the target file contains only one position, Caris does not handle it correctly, causing an immediate program crash upon selection of a subset in Subset Editor. The reviewer retained the single point survey "line" in the Caris Session file

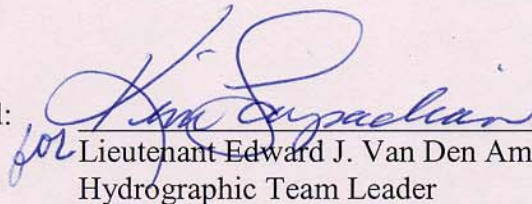
(H11134_Office_QAFinal.hsf), however, should it be necessary to use Caris Subset Editor on this dataset in future, it will very likely be necessary to close that line from the session, at least temporarily, to avert crashes.

4. The original submission contained LIDAR-derived depth data, which represents a separate, contracted junctioning survey. There is no reference to it in the Fieldsheets or the Session files. It has been deleted from the dataset for this survey.

To improve the quality of future survey submissions the following recommendations are made:

- The DR specifically states that “most lines still exhibited characteristic ‘smiles and frowns,’” after correction for sound velocity. The reviewer found precious few examples of smiles and frowns in any of the data surveyed. That which was observed was found mostly near shore where one might expect significant influence from tides and fluctuations in fresh water influx from nearby mountains. This suggests that the writer of the DR relied inappropriately on “boilerplate” text in drafting the DR. Despite this, the reviewer strongly concurs in the need for acquisition of a means of continuous sound velocity profiling as the longer term solution to the problems of temporal and spatial variability in sound speed profiles.
- The discussion in the DR of both problems was cursory. This was particularly the case with the Dn 169 SVP problem. Where annotations of problems are found in boat sheets or processing logs, sufficient discussion should be included in the DR to make clear the nature of the problem, especially including how the problem was dealt with during processing. Lacking information as to how the problem was resolved, it is virtually impossible for the reviewer to make an informed estimate of the adequacy of the solution.
- The LIDAR data submitted with the survey package is from a junctioning survey and, therefore, should not be included as part of the survey submission .

Reviewed and approved:


for Lieutenant Edward J. Van Den Ameele
Hydrographic Team Leader

Date: 3/18/05

QA Certification Attachment

Survey H11134

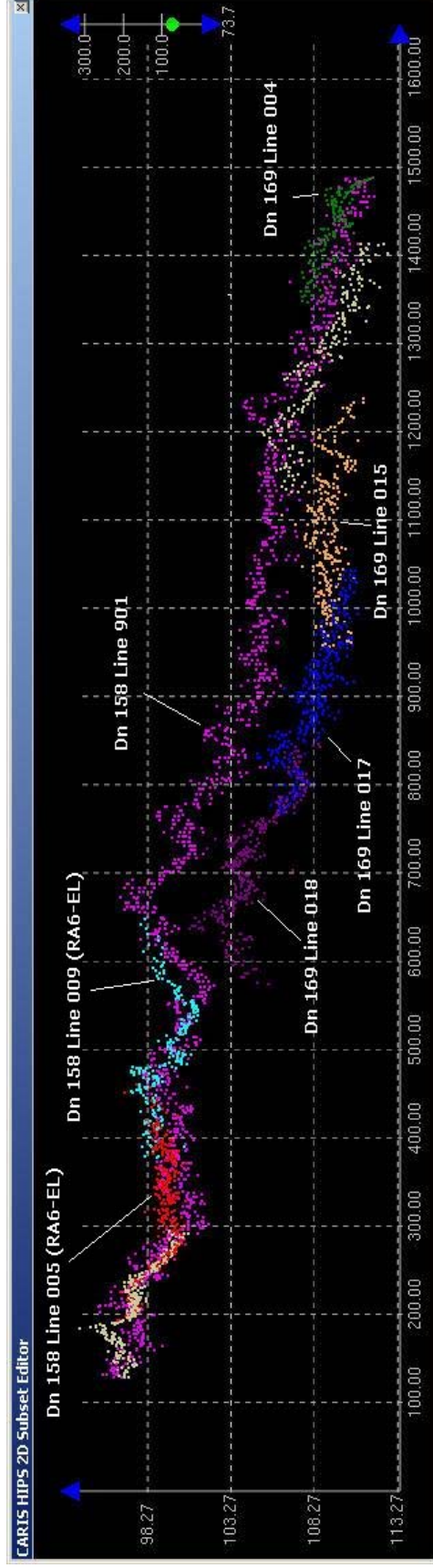


Figure 1. Bottom profile looking eastward across track of cross-check line 901. Data are from 2003 from NOAA's Rainier from day 158 and day 169, illustrating 3m-5m vertical offset of three day 169 main scheme lines from bottom surface as delineated by line 901 and other main scheme lines, including Rainier day 169 lines labeled. View displays a North-South slice lying along 135-46-17W centered about 56-56-40N. Main scheme lines are approximately perpendicular to cross-check line.

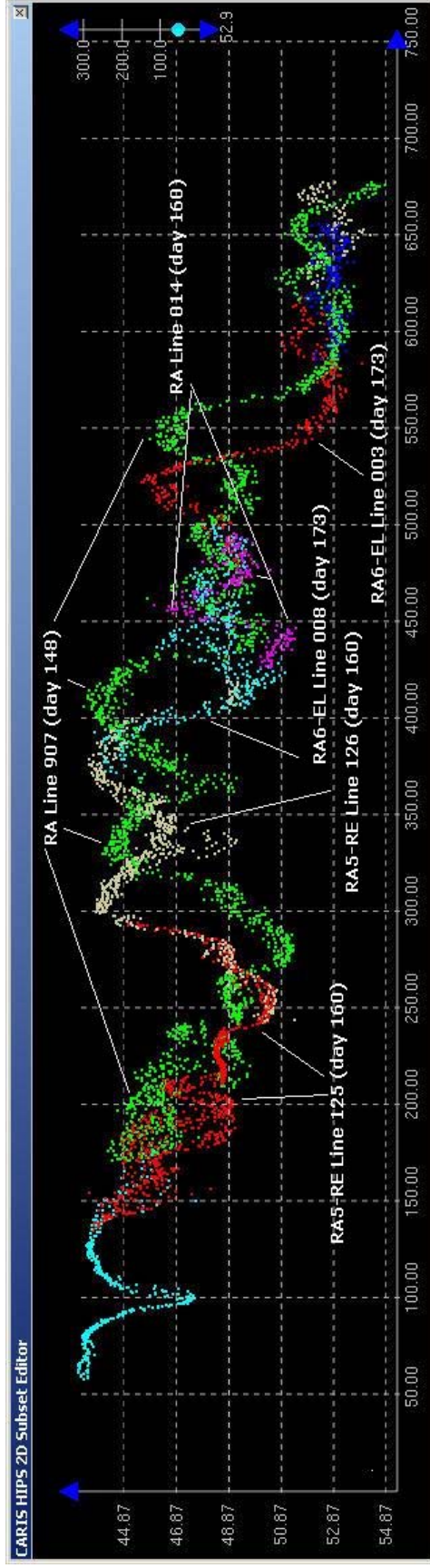


Figure 2. Bottom profile looking eastward across track of cross-check line 907. Data are from 2003 from NOAA Ship Rainier and its launches RA5 and RA6 from days 148, 160 and 173. The light green line is cross-check line 907 from Rainier, day 148, the other segments are main scheme lines from RA5 (Reson), day 160, and from RA6 (Elac), day 173. Maximum horizontal offset between cross-check line and main scheme lines is very close to 30m. Area depicted is a narrow slice of soundings lying along 135-43-53W, centered at about 56-58-37N. Main scheme lines are approximately perpendicular to cross-check line.

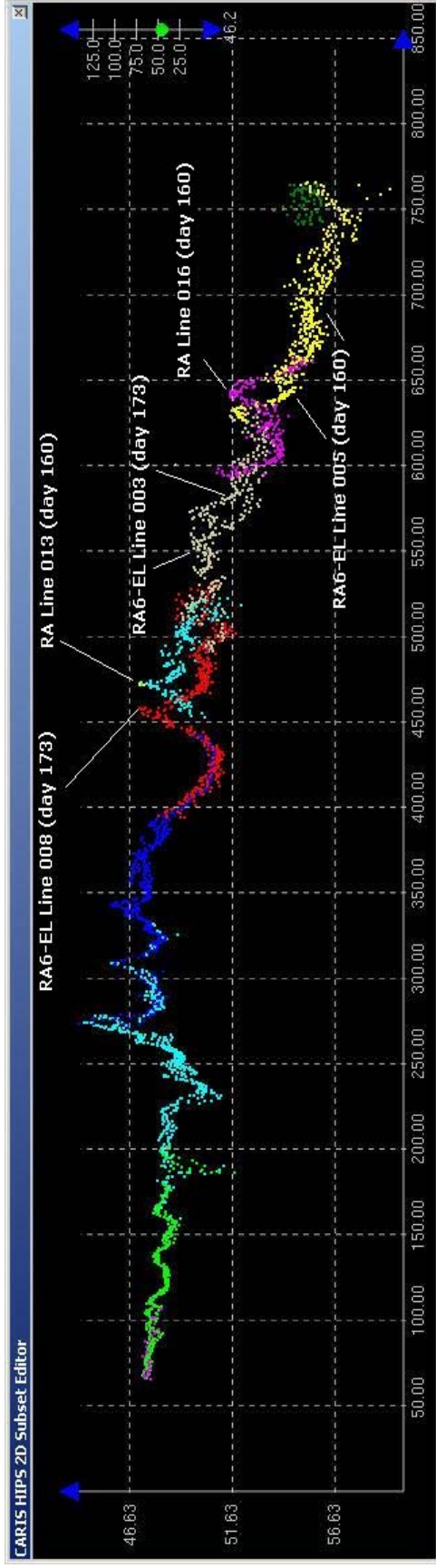


Figure 3. Bottom profile looking eastward (along tracks) through a narrow slice of soundings centered about 56-58-29N 135-45-58.5W. Notice the 15 to 17 meter apparent southward shift of Rainier profiles relative to RA6 Elac lines.

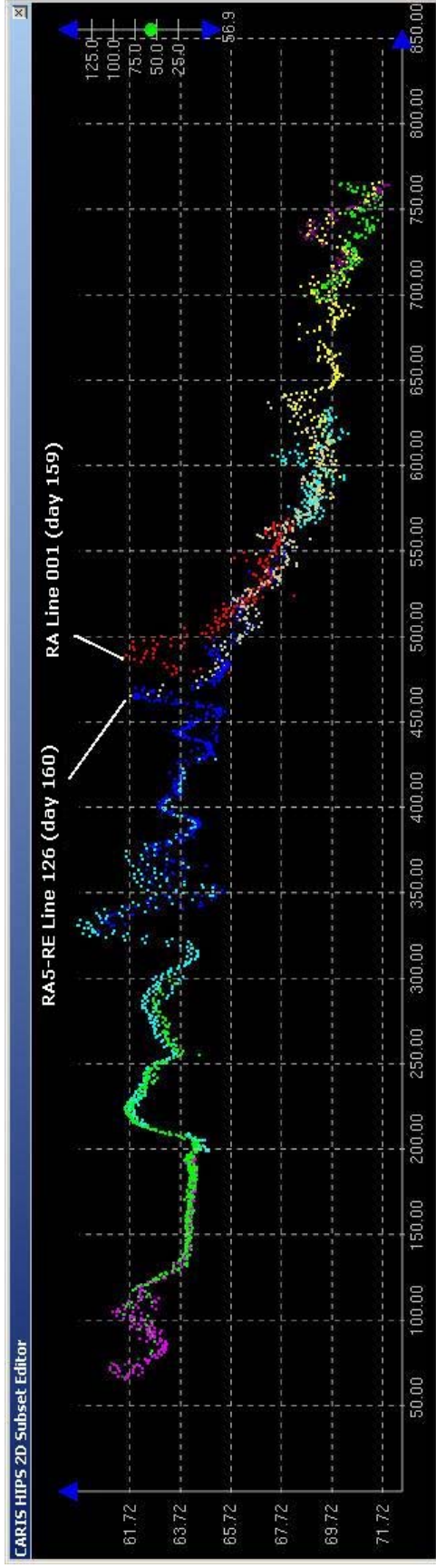


Figure 4. Bottom profile looking eastward through narrow slice of soundings. Labeled points are at 56-58-37N 135-39-54W. RA5 survey lines are oriented E-W, RA line oriented NW-SE. Note apparent horizontal difference in identified feature of the order of 22 meters. Rainier's position for feature is again southward relative to RA5's position.

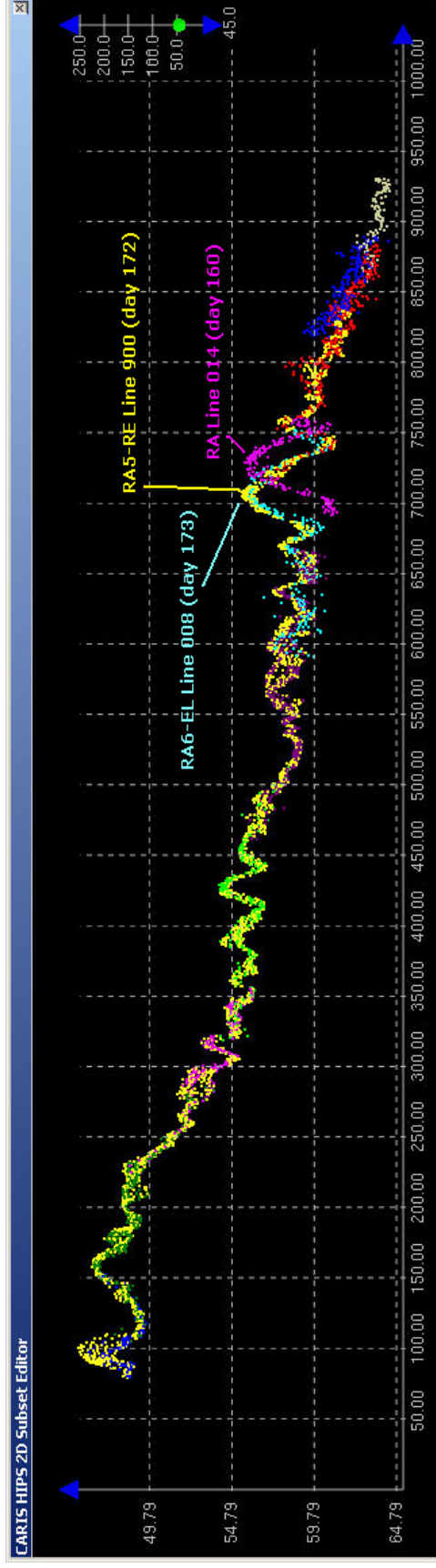


Figure 5. Bottom profile looking eastward across cross-check line from RA5-RE. Narrow slice of bottom soundings lies along 135-38-15W, with features located near 15-38-33N. Note very good agreement between RA6-EL and RA5-RE, and apparent southward horizontal displacement of feature by about 24 meters in Rainier data relative to other survey lines.

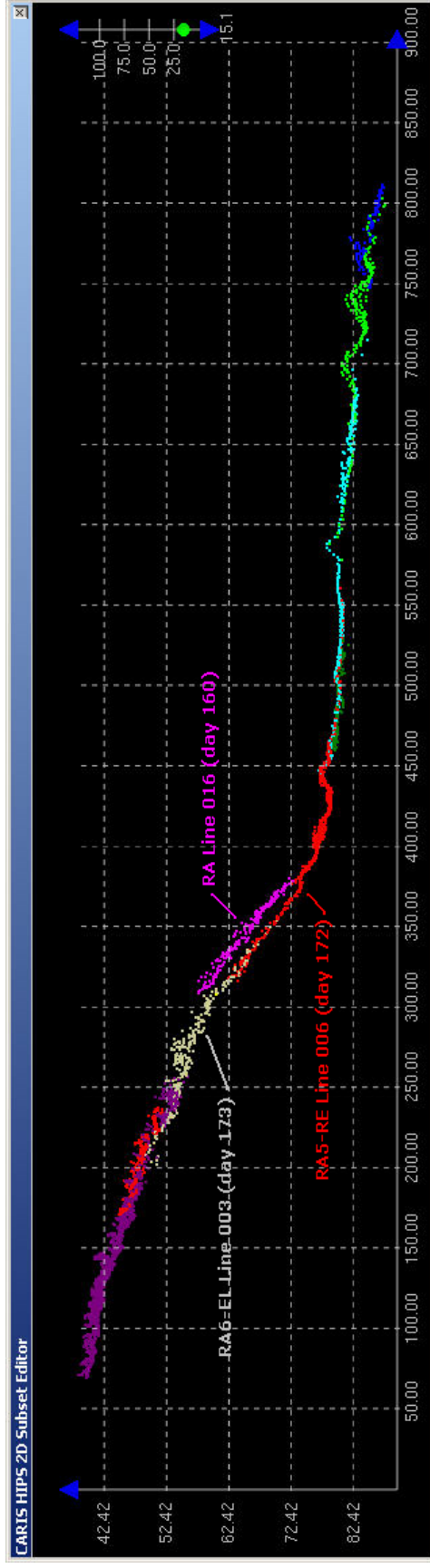


Figure 6. Bottom profile looking eastward along E-W survey lines near 56-58-30N 135-50-52W. Note 3.4-4 meter vertical offset of Rainier's line relative to parallel lines from RA5 and RA6.

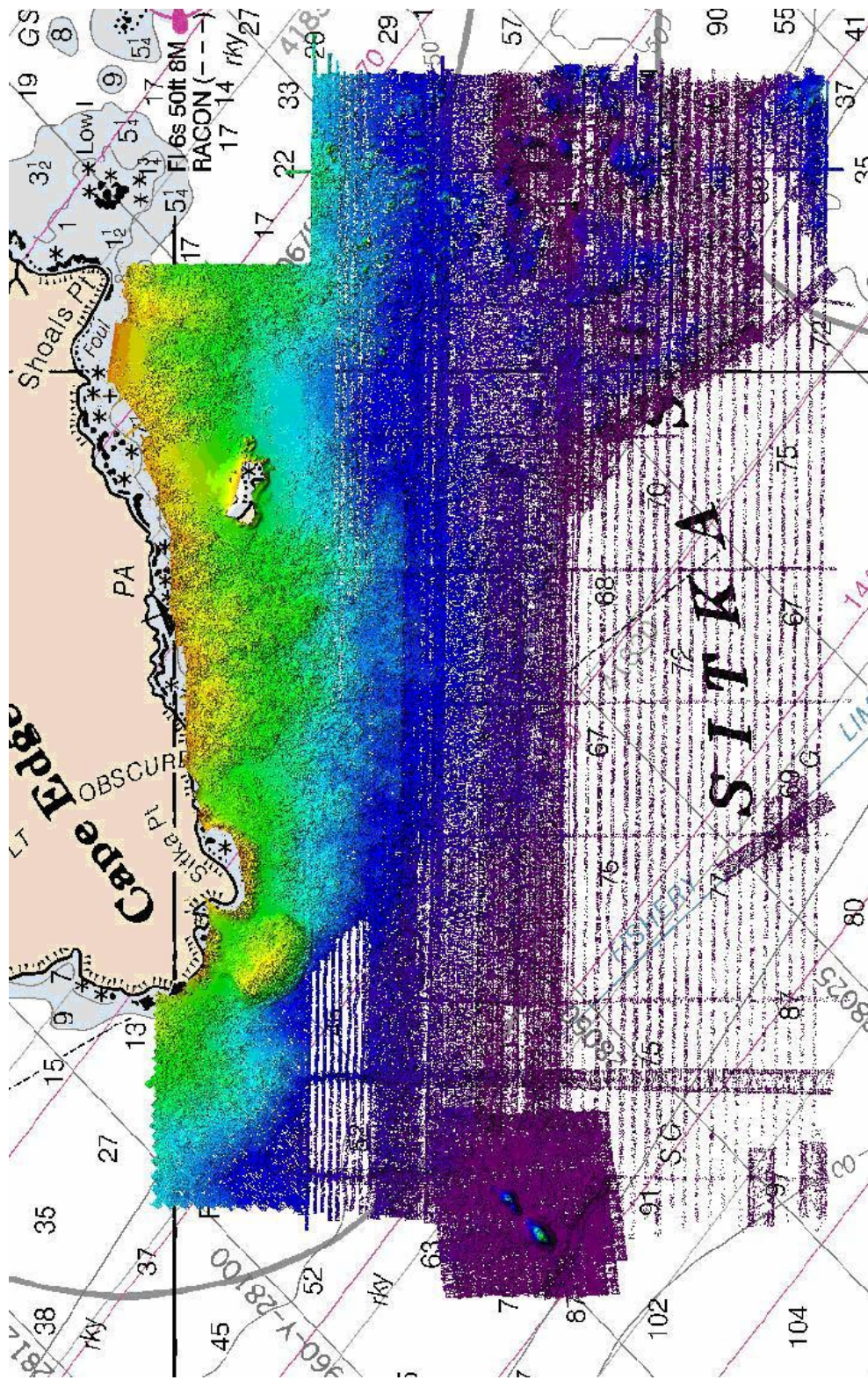


Figure 7. Field DTM (weighted grid) as submitted in the DR. DTM reflects rejection of outer beam data for all RAHF lines collected during days 147 through 160, inclusive.

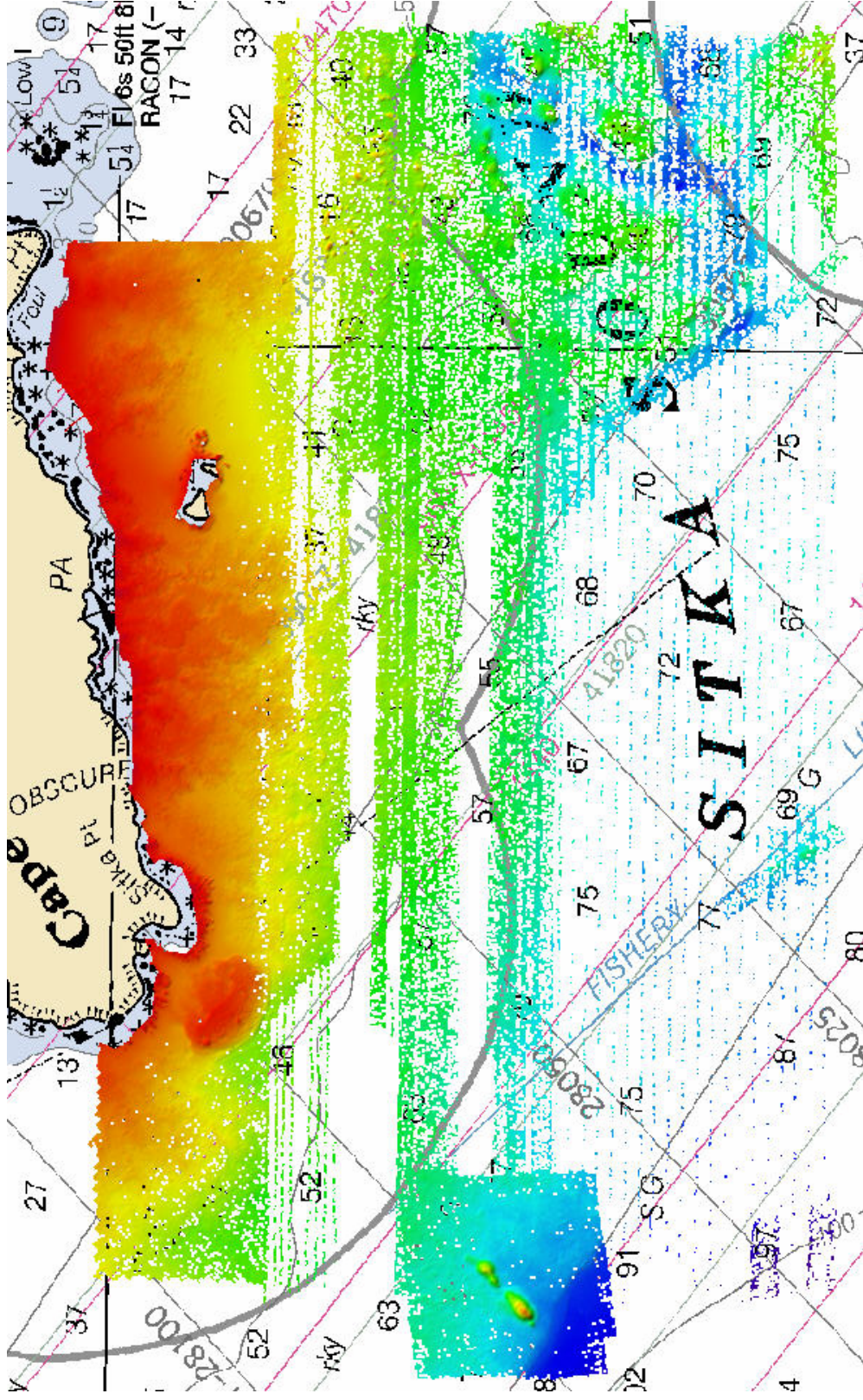


Figure 8. Final DTM (swath-angle weighted BASE Surface) following office processing subsequent to removal of 42 lines of RAHF data identified in Table 1, following.

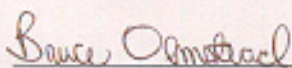
Table 1
Rejected Lines Containing Vertical and/or
Horizontal Displacements

<u>Line</u>	<u>Day</u>	<u>Vessel</u>	<u>Time</u>
20030527145935_905	2003-147	RAHF_2003	14:59:35
20030527152317_904	2003-147	RAHF_2003	15:23:17
20030527154750_909	2003-147	RAHF_2003	15:47:50
20030527162122_909	2003-147	RAHF_2003	16:21:22
20030527020833_902	2003-148	RAHF_2003	02:08:33
20030527030620_907	2003-148	RAHF_2003	03:06:20
20030527050403_909	2003-148	RAHF_2003	05:04:03
20030604214351_919	2003-155	RAHF_2003	21:43:51
20030607164721_901	2003-158	RAHF_2003	16:47:21
20030607175659_902	2003-158	RAHF_2003	17:56:59
20030607185323_903	2003-158	RAHF_2003	18:53:23
20030608161632_001	2003-159	RAHF_2003	16:16:32
20030608011933_013	2003-160	RAHF_2003	01:19:33
20030608020433_014	2003-160	RAHF_2003	02:04:33
20030608055400_019	2003-160	RAHF_2003	05:54:00
20030608073321_022	2003-160	RAHF_2003	07:33:21
20030609093556_027	2003-160	RAHF_2003	09:35:56
20030609102450_028	2003-160	RAHF_2003	10:24:50
20030609124613_031	2003-160	RAHF_2003	12:46:13
20030609135955_032	2003-160	RAHF_2003	13:59:55
20030609170939_034	2003-160	RAHF_2003	17:09:39
20030609194651_038	2003-160	RAHF_2003	19:46:51
20030609202818_039	2003-160	RAHF_2003	20:28:18
20030609222831_040	2003-160	RAHF_2003	22:28:31
20030609224922_041	2003-160	RAHF_2003	22:49:22
20030618001508_024	2003-169	RAHF_2003	00:15:08
20030618004508_025	2003-169	RAHF_2003	00:45:08
20030618011416_026	2003-169	RAHF_2003	01:14:16
20030618014417_027	2003-169	RAHF_2003	01:44:17
20030618022106_028	2003-169	RAHF_2003	02:21:06
20030618025106_029	2003-169	RAHF_2003	02:51:06
20030618032529_030	2003-169	RAHF_2003	03:25:29
20030618161634_014	2003-169	RAHF_2003	16:16:34
20030618170125_015	2003-169	RAHF_2003	17:01:25
20030618174825_016	2003-169	RAHF_2003	17:48:25
20030618180241_017	2003-169	RAHF_2003	18:02:41
20030618190244_018	2003-169	RAHF_2003	19:02:44
20030618203907_019	2003-169	RAHF_2003	20:39:07
20030618213407_020	2003-169	RAHF_2003	21:34:07
20030618214726_021	2003-169	RAHF_2003	21:47:26
20030618223137_022	2003-169	RAHF_2003	22:31:37
20030618230940_023	2003-169	RAHF_2003	23:09:40

APPROVAL SHEET
H11134

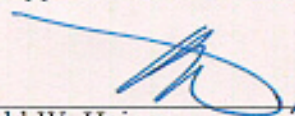
Initial Approvals:

The survey and associated records have been inspected with regard to survey coverage, delineation of the depth curves, development of critical depths, cartographic symbolization, and verification or disproval of charted data. The survey records and digital data comply with NOS requirements except where noted in the Descriptive Report and are adequate to supersede prior surveys and nautical charts in the common area.


Bruce Olmstead
Cartographic Team
Pacific Hydrographic Branch

Date: 4/14/2006

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.


Donald W. Haines
CDR, NOAA
Chief, Pacific Hydrographic Branch

Date: 28 April 2006

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H11134

A basic hydrographic or topographic survey supersedes all information of like nature on the uncorrected chart.

1. Letter all information.
2. In "Remarks" column cross out words that do not apply.
3. Give reasons for deviations, if any, from recommendations made under "Comparison with Charts" in the Review.

SUPERSEDES CAGG FORM 6052 WHICH MAY BE USED