

U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Ocean Service

DESCRIPTIVE REPORT

Type of Survey: Navigable Area

Registry Number: F00833

LOCALITY

State(s): Alaska

General Locality: West Prince of Wales Island, AK

Sub-locality: Dawes Glacier

2021

CHIEF OF PARTY
Olivia A. Hauser, CDR\NOAA

LIBRARY & ARCHIVES

Date:

F00833

HYDROGRAPHIC TITLE SHEET

F00833

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

State(s): **Alaska**

General Locality: **West Prince of Wales Island, AK**

Sub-Locality: **Dawes Glacier**

Scale: **20000**

Dates of Survey: **07/20/2021 to 07/20/2021**

Instructions Dated: **07/01/2021**

Project Number: **OPR-O190-RA-21**

Field Unit: **NOAA Ship *Rainier***

Chief of Party: **Olivia A. Hauser, CDR/NOAA**

Soundings by: **Kongsberg Maritime EM 2040 (MBES)**

Imagery by: **Kongsberg Maritime EM 2040 (MBES Backscatter)**

Verification by: **Pacific Hydrographic Branch**

Soundings Acquired in: **meters at Mean Lower Low Water**

Remarks:

Any revisions to the Descriptive Report (DR) applied during office processing are shown in red italic text. The DR is maintained as a field unit product, therefore all information and recommendations within this report are considered preliminary unless otherwise noted. The final disposition of survey data is represented in the NOAA nautical chart products. All pertinent records for this survey are archived at the National Centers for Environmental Information (NCEI) and can be retrieved via <https://www.ncei.noaa.gov/>. Products created during office processing were generated in NAD83 UTM 8N, MLLW. All references to other horizontal or vertical datums in this report are applicable to the processed hydrographic data provided by the field unit.

DESCRIPTIVE REPORT SUMMARY

A. Area Surveyed

The survey area is referred to as F00833, "Dawes Glacier" in the Project Instructions. The survey area is approximately 0.72 square nautical miles and is located in Endicott Arm south of Tracy Arm, AK.

This hydrographic survey was acquired in accordance with the requirements defined in the Project Instruction OPR-O190-RA-21, dated July 1, 2021.

Data were acquired within the following survey limits:

Northwest Limit	Southeast Limit
57° 30' 32.57" N 132° 51' 27.75" W	57° 29' 57.03" N 132° 47' 15.38" W

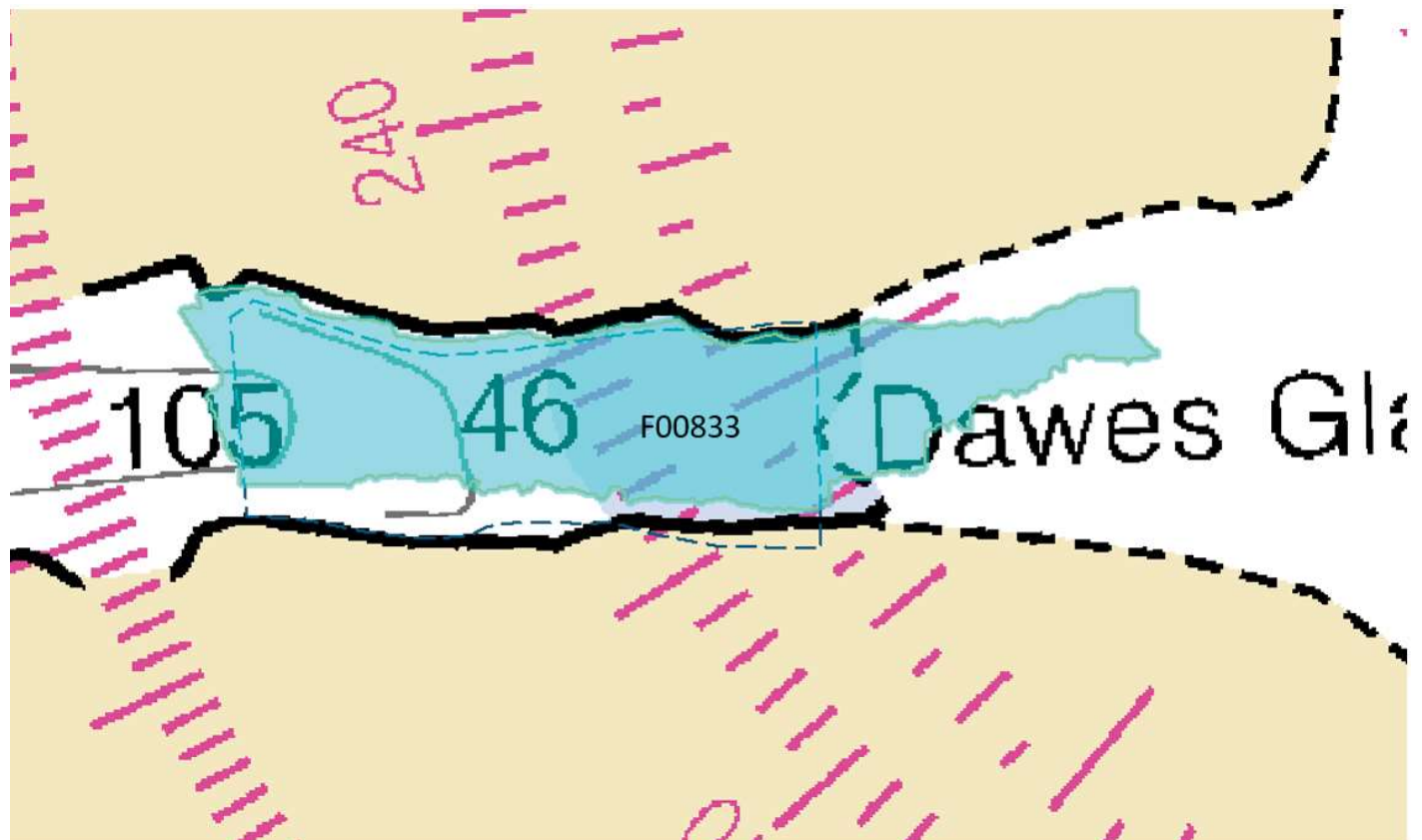


Figure 1: F00833 assigned survey area (Chart 17360).

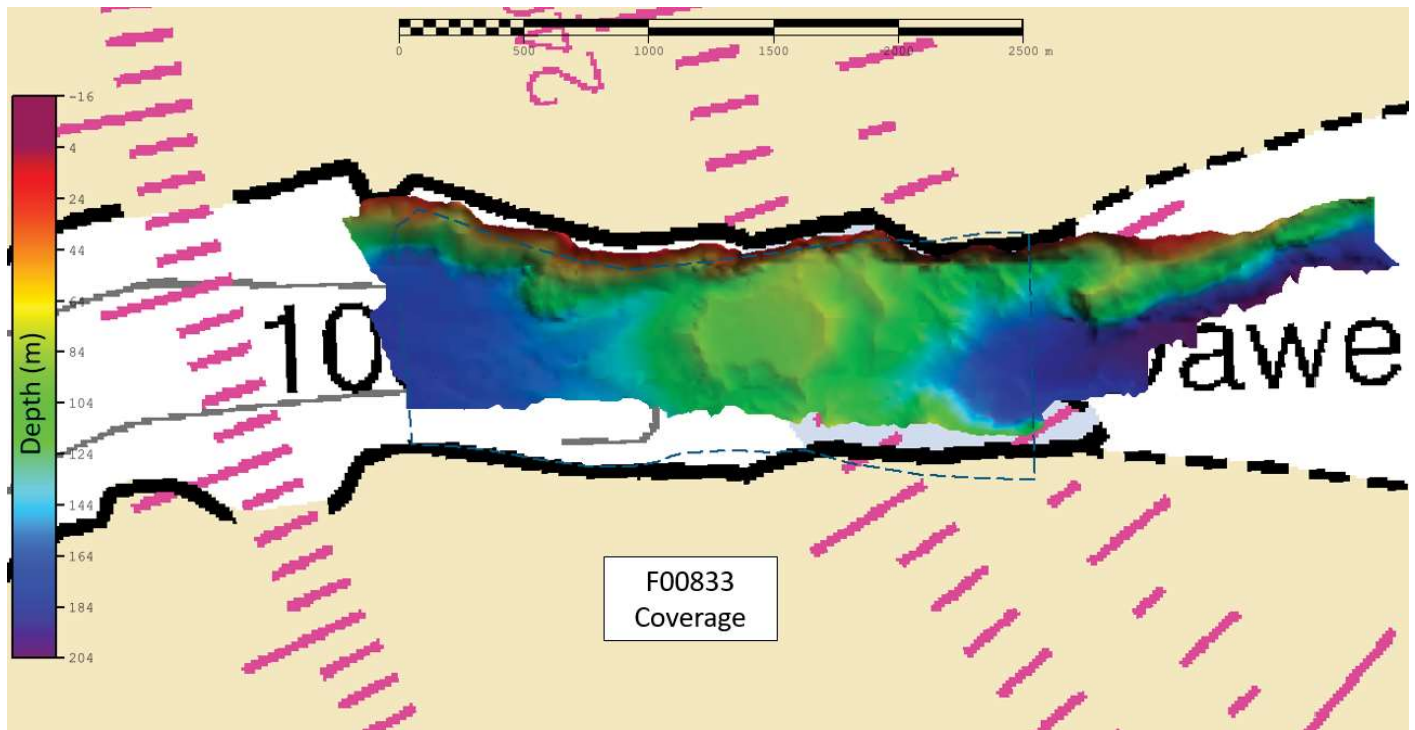


Figure 2: F00833 MBES Coverage and assigned survey limits (Chart 17360).

B. Survey Purpose

Dawes Glacier, located at the head of Endicott Arm fjord, receives heavy tour boat traffic. As the glacier has continued to recede, possible new hazards may have been revealed, especially within the expanded uncharted area at the glacier's face.

This project will provide contemporary data to update National Ocean Service (NOS) nautical charting products and services, improving the safety of the maritime traffic and services available to these communities by reducing the current risk that is present due to unknown bathymetry.



Figure 3: Dawes Glacier in survey area of F00833.

C. Intended Use of Survey

The entire survey is adequate to supersede previous data.

D. Data Acquisition and Processing

Refer to the Data Acquisition and Processing Report (DAPR) for a complete description of data acquisition and processing systems, survey vessels, quality control procedures and data processing methods. Additional information to supplement sounding and survey data, and any deviations from the DAPR are discussed below.

All data for survey F00833 was acquired by NOAA Ship RAINIER launches 2802 and 2803. The vessels acquired MBES bathymetry, backscatter, and sound velocity profiles.

Four sound speed profiles were acquired for this survey at discrete locations within the survey area at least once every four hours, when significant changes in surface sound speed were observed, or when operating in a new area. Sound speed profiles were obtained using Sea-Bird 19plus SEACAT Profilers. All casts were concatenated into a master file and applied to MBES data using the "Nearest distance within time" (4 hours) profile selection method.

The junction with 2007 survey H11759 encompassed 0.29 square nautical miles along the western boundary of F00833. A finalized 16m single-resolution surface from F00833 was compared to a 20m single-resolution surface from H11759. Pydro's Compare Grids results showed that 23% of nodes in the overlapping surfaces met NOAA allowable error standards. Analysis of the difference indicates that there is a 7.71 average difference between these two junctioned surveys. The pattern of the difference between the two surveys suggests sedimentation, scouring, and real world changes to the seafloor near Dawes Glacier.

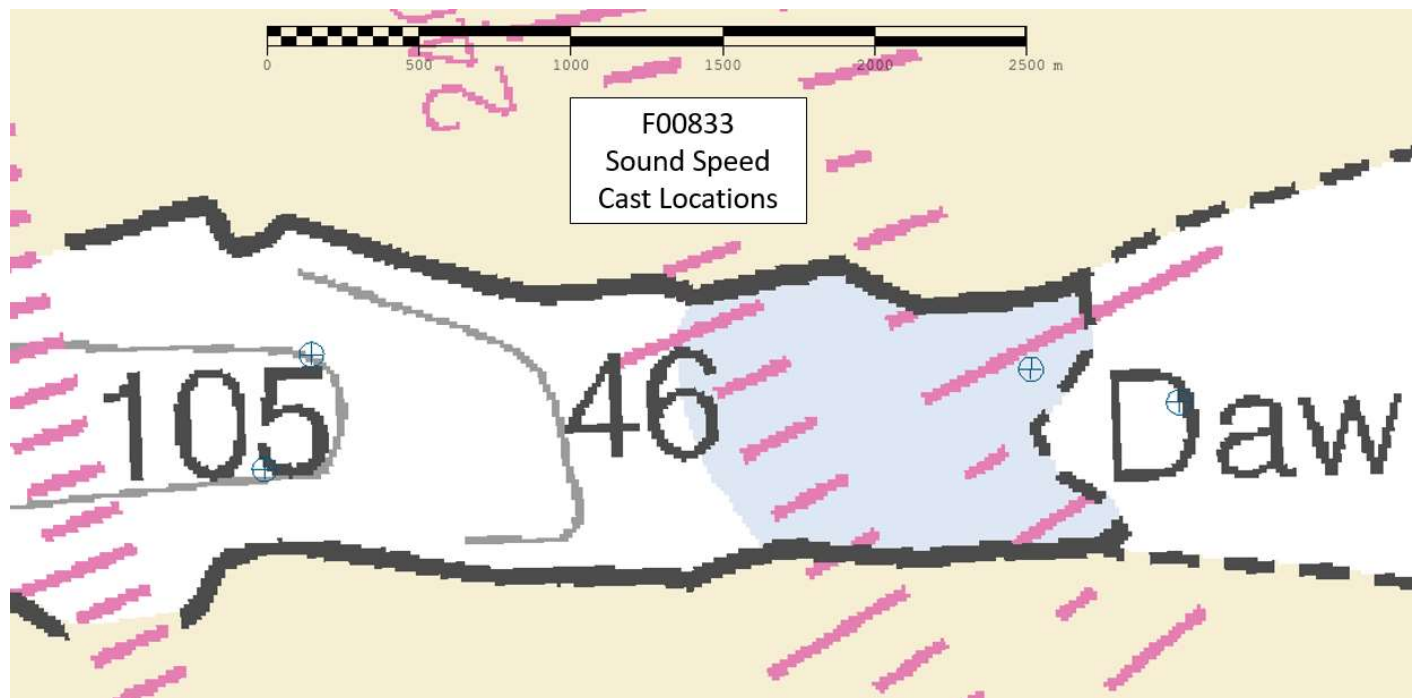


Figure 4: F00833 sound speed cast locations.

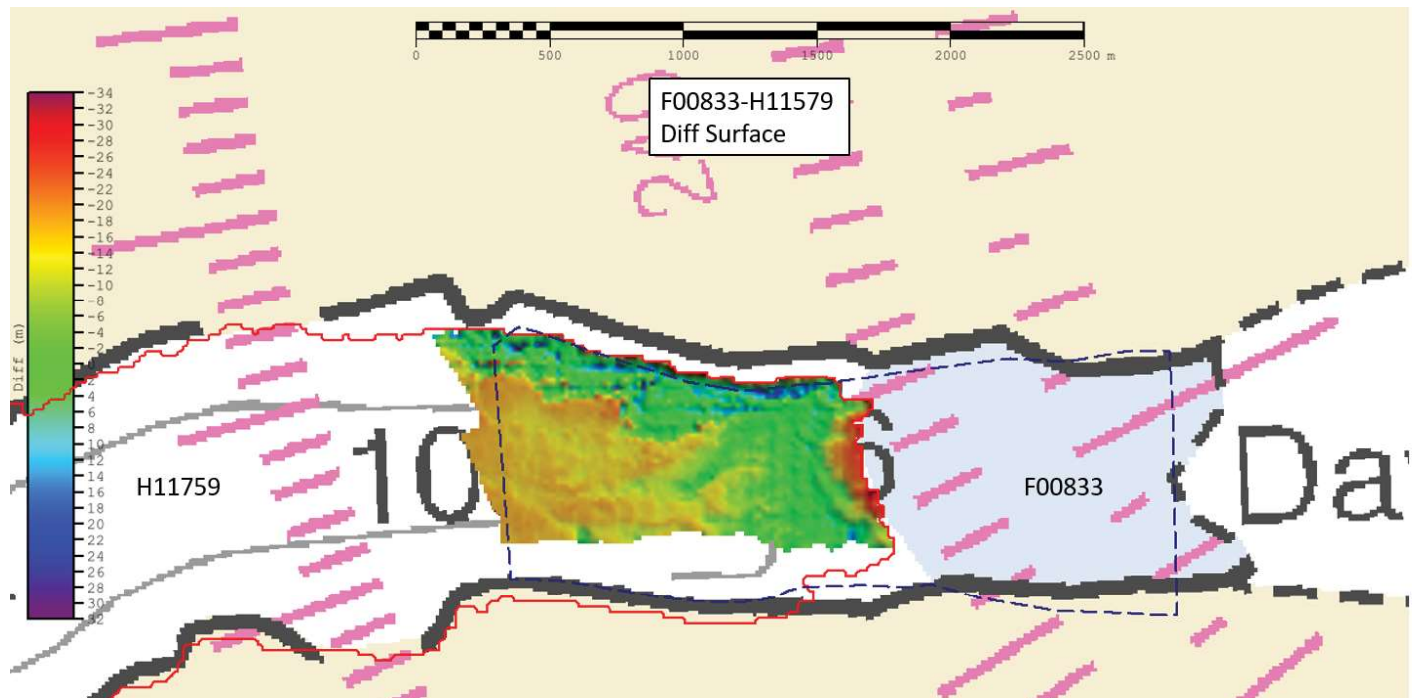


Figure 5: F00833/ H11759 Junction Comparison (Chart 17360).

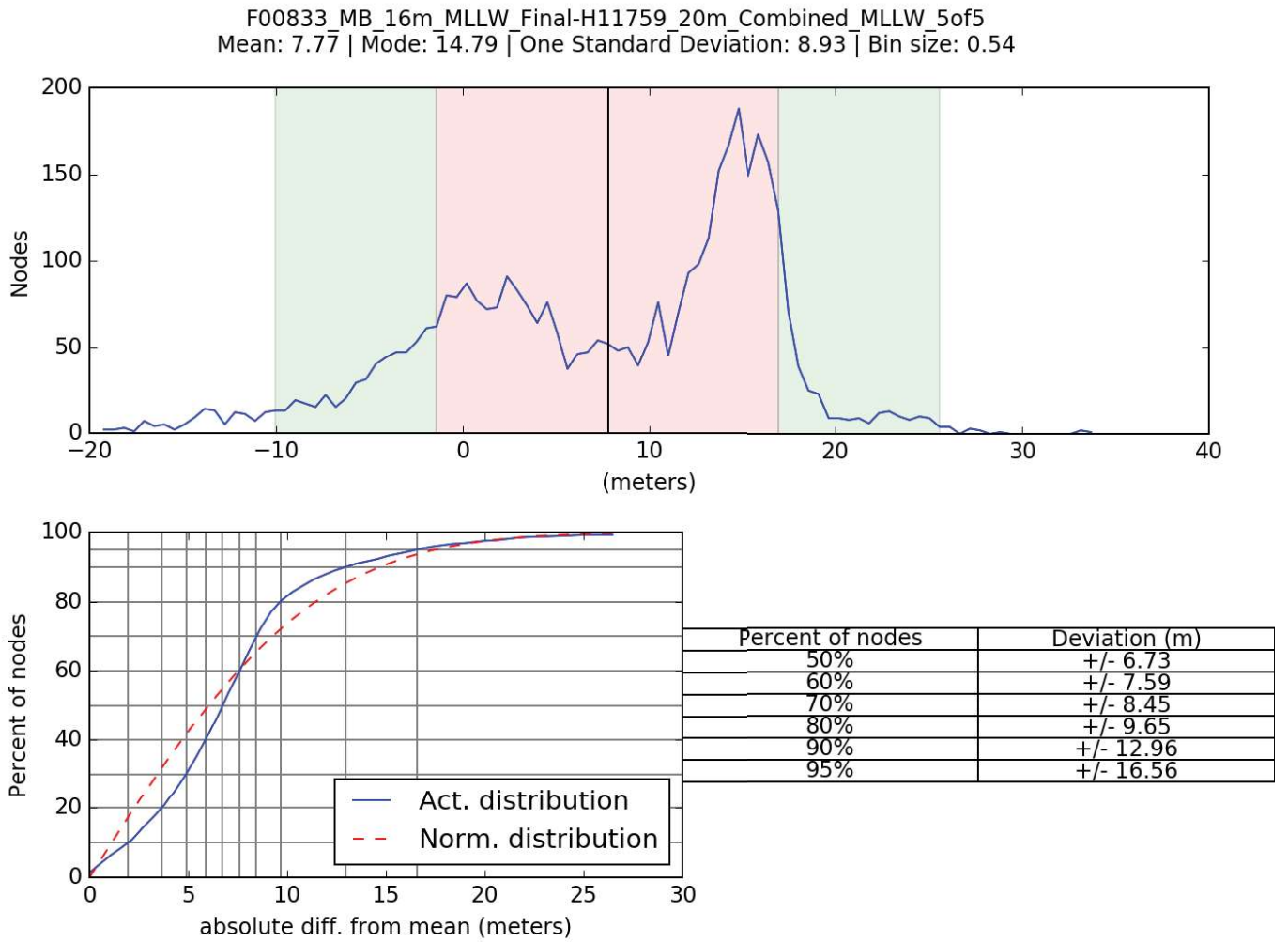


Figure 6: Pydro derived plot showing absolute difference statistics of F00833 to H11759.

Comparison Distribution

Per Grid: F00833_MB_16m_MLLW_Final-H11759_20m_Combined_MLLW_5of5_fracAllowErr.csar

23% nodes pass (888), min=0.0, mode=2.7 mean=2.6 max=32.9

Percentiles: 2.5%=0.1, Q1=1.1, median=2.4, Q3=2.8, 97.5%=9.3

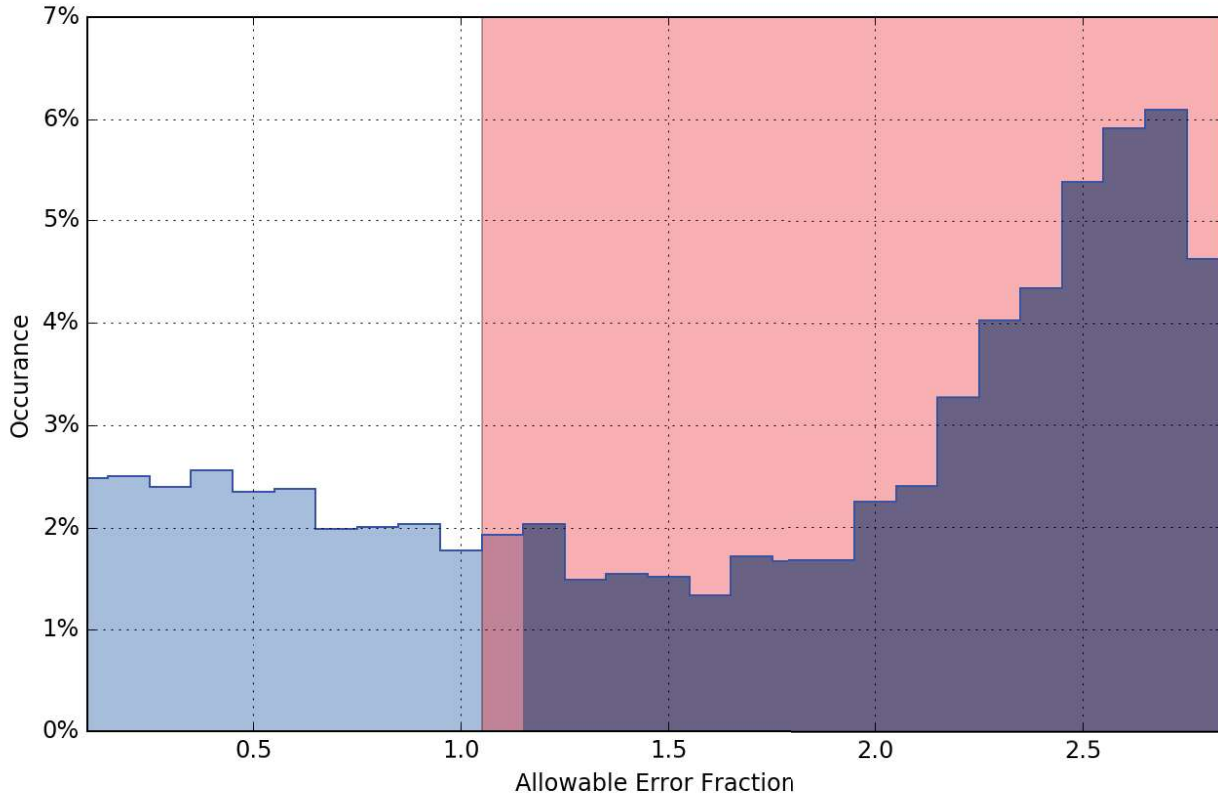


Figure 7: Pydro derived plot showing percentage-pass value of F00833 to H11759.

E. Uncertainty

Total Propagated Uncertainty (TPU) values for survey F00833 were derived from a combination of fixed values for equipment and vessel characteristics, as well as from field assigned values for sound speed uncertainties. Tidal uncertainty was provided in the project instructions for NOAA vertical datum transformation model used in this survey.

In addition to the usual a priori estimates of uncertainty, real-time and post-processed uncertainty sources were also incorporated into the depth estimates of this survey. Real-time uncertainties for position, navigation, attitude, and vessel motion data from Applanix POS MV were applied during acquisition and initially in post-processing. We later applied POSpac SBET and RMS files in CARIS HIPS to supersede POS MV uncertainties associated with GPS height and position.

Uncertainty values of the submitted finalized grids were calculated in Caris using "Greater of the Two" of uncertainty and standard deviation (scaled to 95%). Grid QA v5 within Hydro QC Tools was used to analyze F00833 TVU compliance. F00833 met HSSD requirements in over 99 percent of grid nodes, which is shown in the histogram plot below.

Pydro QC Tools 2 Grid QA was used to analyze F00833 multibeam echosounder (MBES) data density. The submitted F00833 variable-resolution (VR) surface met HSSD density requirements shown in the histograms below.

RAINIER launch 2802 acquired 1.34 lnm and 2803 acquired 0.30 lnm of crosslines across most depth ranges on one boat day for 14.98% of crosslines to mainscheme data. Pydro's Compare Grids results 97% of nodes met allowable uncertainties between finalized variable-resolution surfaces of F00833 mainscheme only and crossline only data. The average difference between the compared surfaces are likely steep relief in bathymetry. Refer to plots below for additional information.

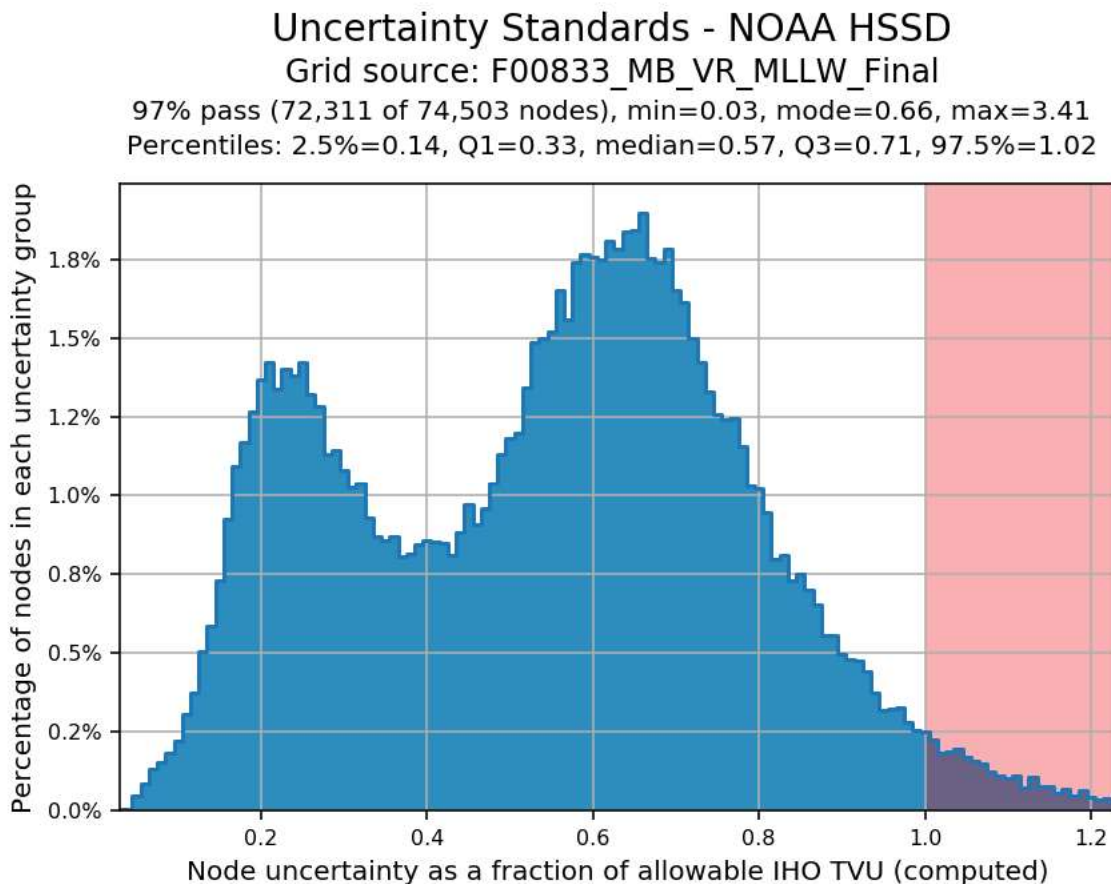


Figure 8: Pydro derived plot showing TVU compliance of F00833 finalized multi-resolution MBES data.

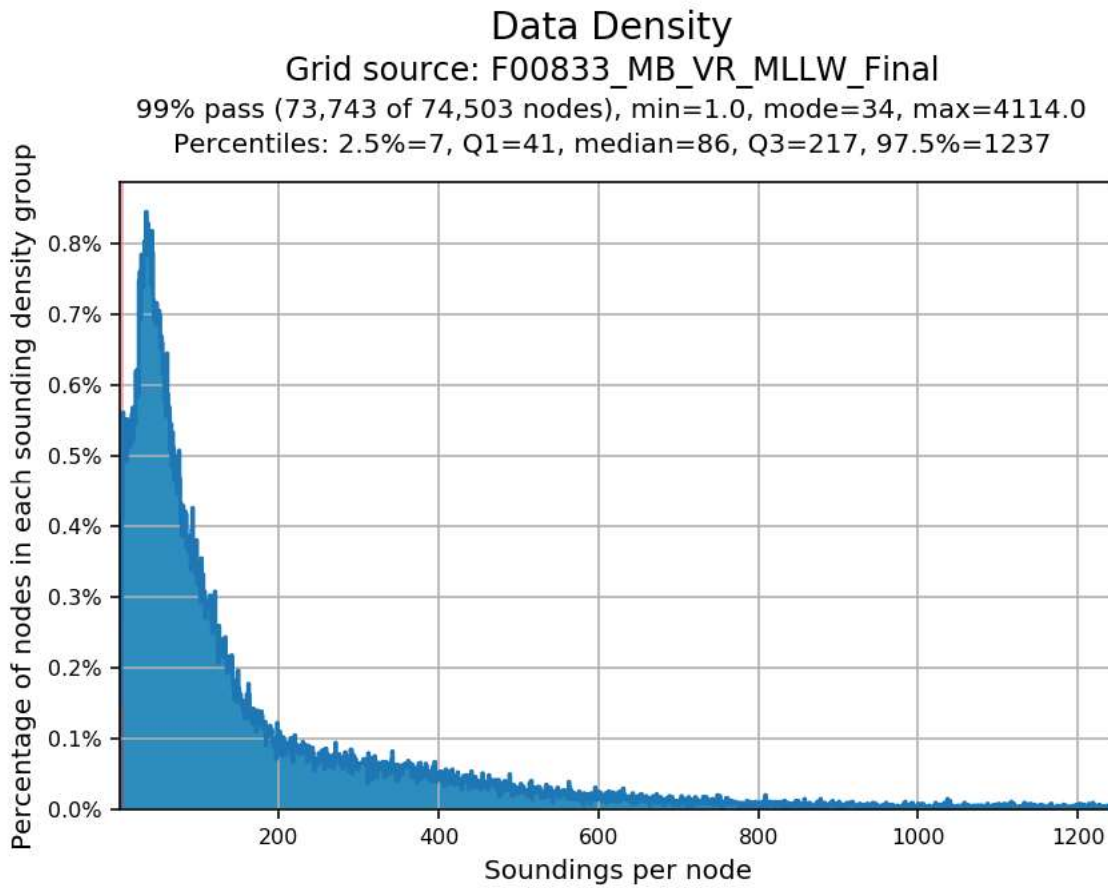


Figure 9: Pydro derived histogram plot showing HSSD density compliance of F00833 finalized variable-resolution MBES data.

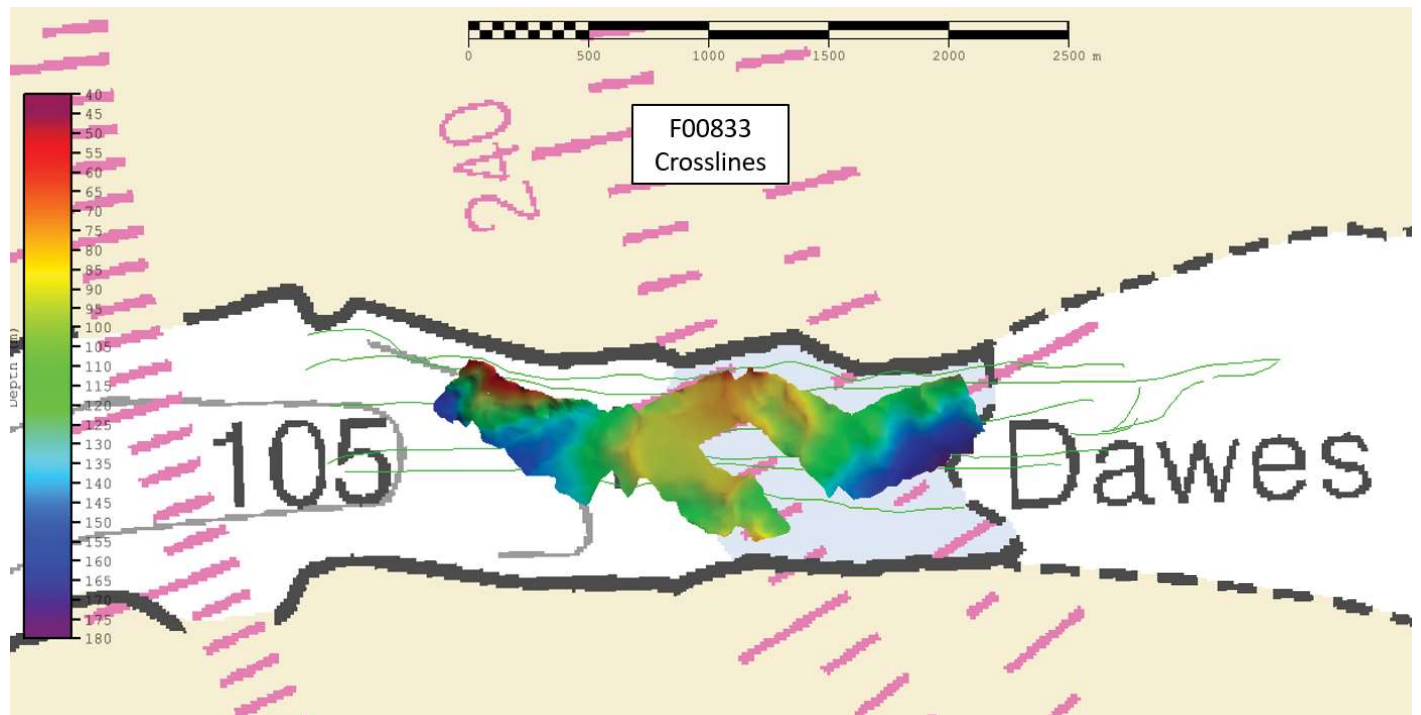


Figure 10: F00833 crossline surface overlaid in mainscheme tracklines (Chart 17360).

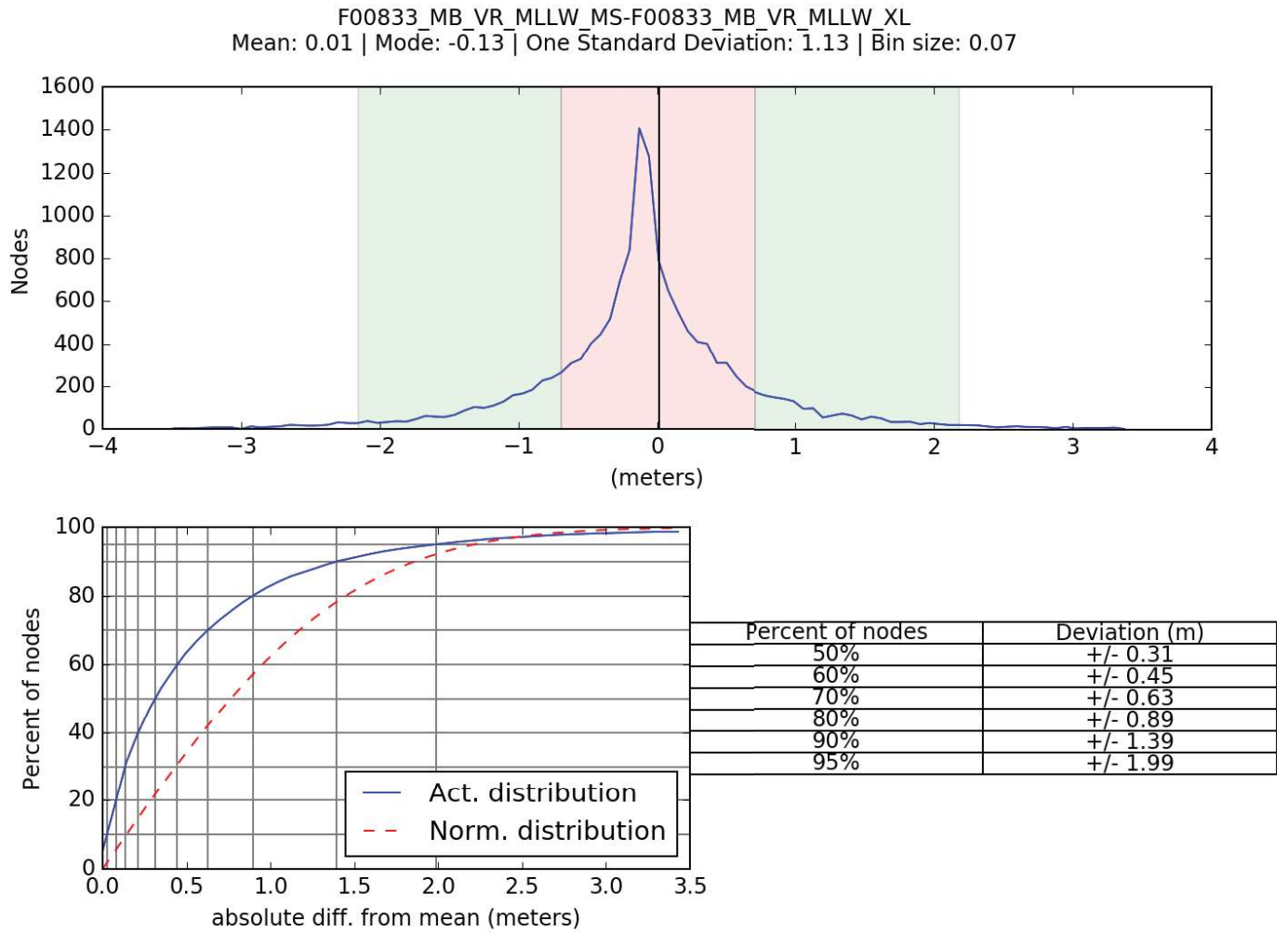


Figure 11: Pydro derived plot showing absolute difference statistics of F00833 mainscheme to crossline data.

Comparison Distribution

Per Grid: F00833_MB_VR_MLLW_MS-F00833_MB_VR_MLLW_XL_fracAllowErr.csar

96% nodes pass (14415), min=0.0, mode=0.1 mean=0.2 max=12.5

Percentiles: 2.5%=0.0, Q1=0.0, median=0.1, Q3=0.3, 97.5%=1.2

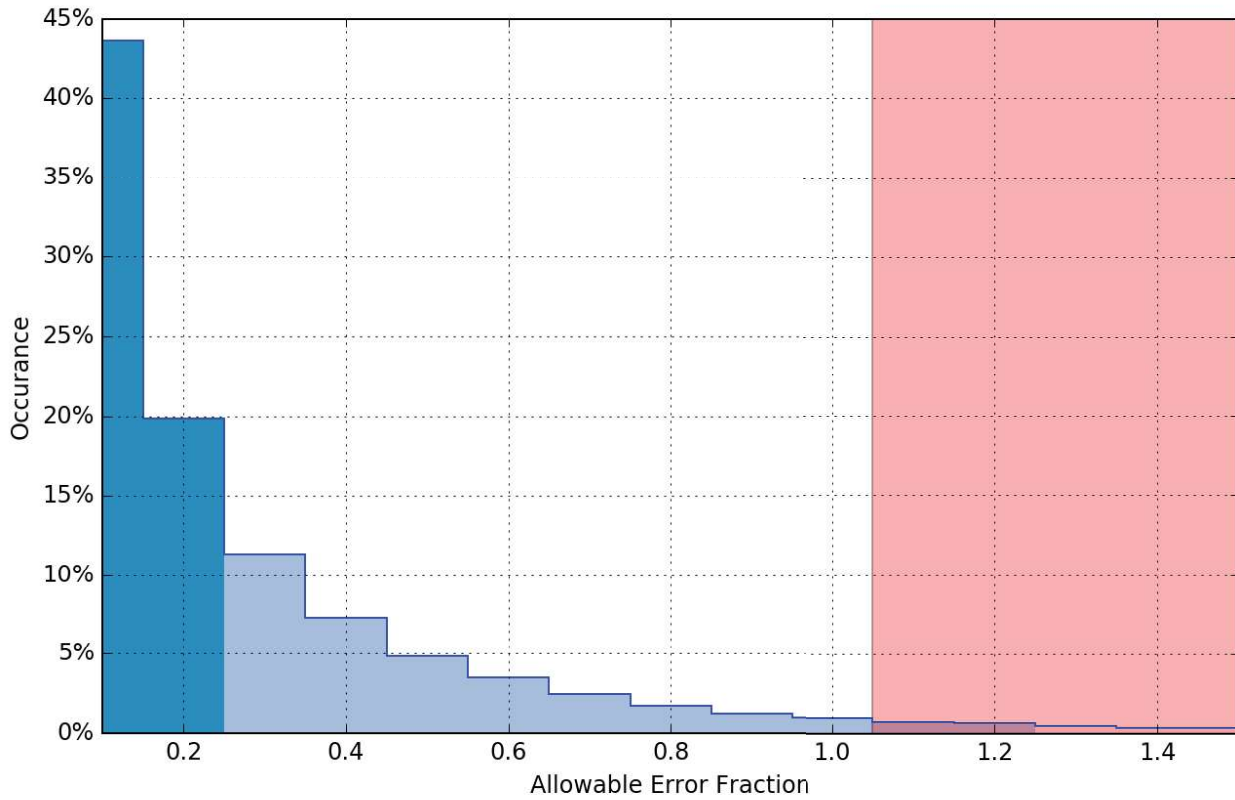


Figure 12: Pydro derived plot showing percentage-pass value of mainscheme to crossline data.

F. Results and Recommendations

The following are the largest scale ENC's, which cover the survey area:

ENC	Scale	Edition	Update Application Date	Issue Date
US3AK3UM	1:217828	9	08/09/2018	01/11/2021

The following surfaces and/or BAGs were submitted to the Processing Branch:

Surface Name	Surface Type	Resolution	Depth Range	Surface Parameter	Purpose
F00833_MB_VR_MLLW_Final	CARIS VR Surface (CUBE)	Variable Resolution m	3.37 m - 203.91 m	NOAA_VR	Complete MBES
F00833_MB_VR_MLLW	CARIS VR Surface (CUBE)	Variable Resolution m	3.37 m - 203.91 m	NOAA_VR	Complete MBES

Submitted surfaces were generated using the recommended parameters for depth-based (Ranges) Caris variable-resolution bathymetric grids specified in the 2021 HSSD.

Pydro QC Tools Detect Fliers was used with default settings to find fliers in a finalized VR surface. Obvious noise was rejected by the hydrographer in Caris Subset Editor. After data cleaning, Detect Fliers was run again and found one potential flier in the Complete Coverage surface. The flier was investigated and found to be false.

Pydro QC Tools Holiday Finder was used with the default settings to find holidays in a finalized VR surface. Holiday Finder detected no holidays.

The NALL was achieved in areas where it was navigational safe, including areas where the presence of icebergs prevented hydrographers from pushing further inshore. Also, POS MV positioning experienced drop outs due to the high glacier face walls. This may be surpassable with less ice in the area to maneuver into areas that can support connection before data is collected closer to the glacial wall. Sound speed made acquisition closer to the glacier difficult without suffering in quality due to fresh water runoff and glacial melt. This may be surpassable during times when snow melt is low and in the presence of fewer ice.

G. Vertical and Horizontal Control

The vertical datum for this project is Mean Lower Low Water. The vertical control method used was VDatum.

The following ellipsoid-to-chart vertical datum transformation was used:

ERS via VDATUM

F00833_Extent_NAD83(2011)-MLLW.csar

An ERS file specific to Dawes Glacier was requested due to the survey operations exceeding the limit of the ERS file provided for OPR-O190-RA-21.

Ellipsoidally referenced GNSS derived heights and applied a separation model to reduce soundings to chart datum. Documentation with Hydrographic Surveys Division (HSD) accompanies the DR summary.

The horizontal datum for this project is North American Datum of 1983 (NAD 83). The projection used for this project is Universal Transverse Mercator (UTM) Zone 8.

Post Processed-Real Time Extended (PP-RTX) processing methods were used in Applanix POSPac MMS 8.5 SP2 software to produce SBETs for post-processing horizontal correction.

H. Additional Results

Chart Update

It is recommended that satellite imagery from Sentinel 2 or other remote sensing methods be used to update shoreline in the new chart. A Final Feature File accompanying the data delineates the unsurveyed area near Dawes Glacier, at the head of Endicott Arm. This was done by using Sentinel 2 imagery taken on the 29th of July 2021 and digitizing between data collected after acquisition of F00833 and visible shoreline.

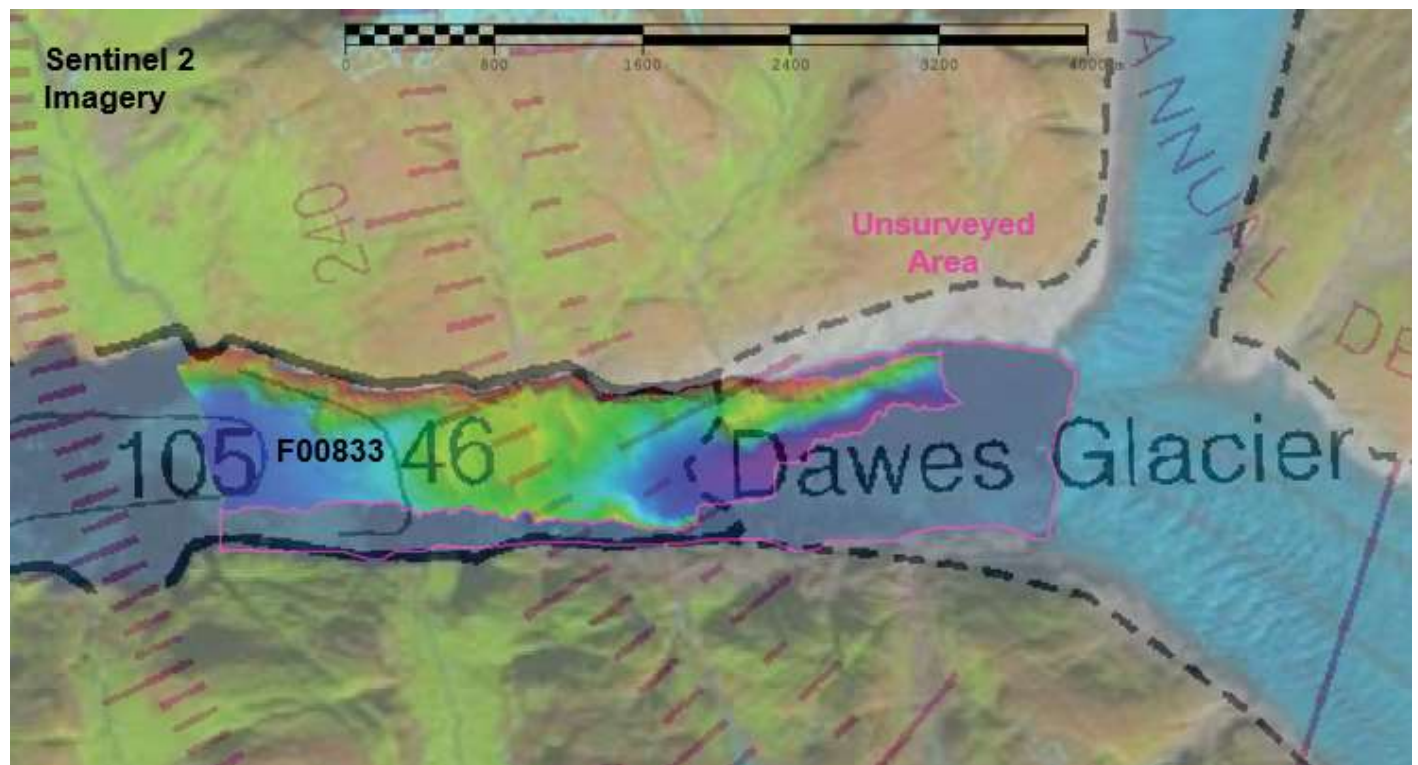


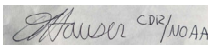



Figure 13: Unsurveyed area near Dawes Glacier (Chart 17360).

I. Approval

As Chief of Party, field operations for this hydrographic survey were conducted under my direct supervision, with frequent personal checks of progress and adequacy. I have reviewed the attached survey data and reports.

All field sheets, this Survey Summary Report, and all accompanying records and data are approved. All records are forwarded for final review and processing to the Processing Branch.

The survey data meets or exceeds requirements as set forth in the NOS Hydrographic Surveys Specifications and Deliverables, Field Procedures Manual, Standing and Letter Instructions, and all HSD Technical Directives. These data are adequate to supersede charted data in their common areas. This survey is complete and no additional work is required with the exception of deficiencies noted in the Survey Summary Report.

Approver Name	Title	Date	Signature
Olivia A. Hauser CDR\NOAA	Commanding Officer	09/03/2021	 HAUSER.OLIVIA.ANN.12756 36009 2021.09.20 12:31:02 -07'00'
Dylan A. Kosten LT\NOAA	Operations Officer	09/03/2021	 Digitally signed by KOSTEN.DYLAN.ANDREW.150452 7405 Date: 2021.09.20 10:08:00 -07'00'
James B. Jacobson	Chief Survey Technician	09/03/2021	 JACOBSON.JAMES.BRYAN.1269 664017 I have reviewed this document 2021.09.20 10:24:49 -07'00'
Christina L. Brooks	Sheet Manager	09/03/2021	 Digitally signed by BROOKS.CHRISTINA.LORRAINE.15 53513177 Date: 2021.09.20 08:25:16 -07'00'