

D00247

NOAA Form 76-35A

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

DESCRIPTIVE REPORT

Type of Survey: Navigable Area

Registry Number: D00247

LOCALITY

State: Alaska

General Locality: Bering Strait

Sub-locality: 11.6 NM NW of King Is. to 38.7 NM NW of King Is.

2018

CHIEF OF PARTY
CDR Marc Moser

LIBRARY & ARCHIVES

Date:

HYDROGRAPHIC TITLE SHEET

D00247

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: **Alaska**

General Locality: **Bering Strait**

Sub-Locality: **11.6 NM NW of King Is. to 38.7 NM NW of King Is.**

Scale: **1: 40,000**

Dates of Survey: **07/19/2018 to 08/17/2018**

Instructions Dated: **06/07/2018**

Project Number: **OPR-S347-FA-18**

Field Unit: **NOAA Ship *Fairweather***

Chief of Party: **CDR Marc Moser**

Soundings by: **Multibeam Echo Sounder**

Imagery by: **Multibeam Echo Sounder**

Verification by: **Pacific Hydrographic Branch**

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

Remarks:

The purpose of this survey is to provide contemporary surveys to update National Ocean Service (NOS) nautical charts. All separates are filed with the hydrographic data. Any revisions to the Descriptive Report (DR) generated during office processing are shown in bold red italic text. The processing branch maintains the DR as a field unit product, therefore, all information and recommendations within the body of the DR are considered preliminary unless otherwise noted. The final disposition of surveyed features is represented in the OCS nautical chart update products. All pertinent records for this survey, including the DR, are archived at the National Centers for Environmental Information (NCEI) and can be retrieved via <http://www.ncei.noaa.gov/>.

DESCRIPTIVE REPORT MEMO

November 09, 2018

MEMORANDUM FOR: Pacific Hydrographic Branch

FROM: CDR Marc Moser
Chief of Party, NOAA Ship FAIRWEATHER

SUBJECT: Submission of Survey D00247

This survey for the Port Access Route Study (PARS) is a section of the six two-way routes and six precautionary areas jointly proposed by the United States and Russian Federation and approved by the International Maritime Organization (IMO) to safeguard shipping traffic and the environment in the Bering Sea and Bering Strait. As traffic increases in the Arctic due to ice melt in polar regions it is becoming increasingly important to encourage these vessels to travel in well-charted offshore waters to protect the ecologically rich area and reduce the chance of vessel collision. Of particular concern are the potential impacts increased shipping could have on subsistence activities throughout western Alaska. The United States Coast Guard's Seventeenth Coast Guard District, with additional support from NOAA, completed a detailed report of the area to determine the specific routes based on AIS tracking data and the likelihood that ships in the vicinity would follow the proposed routes to decrease their overall risk. The routes are intended to be voluntary for all ships of 400 gross tonnage and above.

Products created include an 8 meter finalized surface, a 6 meter backscatter mosaic, applied SBET files, the project DAPR and HVCR, compiled sound speed casts, compiled acquisition logs, a data log, a backscatter processing log and a SBET processing log. These products are created for, and are hereby provided to, PHB.

Soundings were initially reduced to Mean Lower Low Water (MLLW) using observed tides from Nome, Norton Sound (946-8756). Tide zones were provided by CO-OPS using the tide file D00247.tc. Following the successful application of SBETs and computation of an Ellipsoidally Referenced Zone Tide (ERZT) separation model, ERS methods were used for reducing data to MLLW.

All survey systems and methods utilized during this survey were as described in OPR-S347-FA-18_DAPR.

There were no DTONs created for this survey.

All data were acquired by a NOAA or NOAA Contractor field unit

Results and Recommendations

Chart Comparison

A comparison was performed between survey D00247 and the largest scale ENC available, US3AK89M (8th ed, 5/30/2017, Scale: 1:315,350) and the corresponding RNC, chart 16220 (6th ed, 5/1/2013, Scale: 1:315,350), using CARIS HIPS and SIPS sounding and contour layers derived from the 8 meter combined surface. The contours and soundings were overlaid on the charts to assess differences between the surveyed soundings and charted depths. The ENC was compared to an 8 meter combined grid by extracting the soundings from the chart and creating an interpolated TIN surface which could be differenced with the combined surface from D00247. All data from D00247 should supersede charted data. In general, surveyed soundings agree with the sparse charted depths. However, there are three notable areas of disagreement. Near the southwestern edge of the survey, soundings were 5 fathoms deeper than charted depths. On the western edge of the survey, soundings were 4 fathoms deeper than charted depths. Finally, at the northern point of the survey, soundings were 3 fathoms deeper than charted depths.

Contours from D00247 are in general agreement with charted contours on ENC US3AK89M. While the exact extent of the single 50 meter contour line is difficult to determine given the 1 kilometer line spacing, the overall location is roughly in agreement.

Uncertainty

The surface was analyzed using the Pydro QC Tools Grid QA feature to determine compliance with specifications. Overall, 99.5+% of nodes within the surface meet NOAA Allowable Uncertainty specifications for D00247. Density requirements were achieved with at least 99.5+% of surface nodes containing five or more soundings as required by HSSD Section 5.2.2.3.

Line Plan

Due to the close proximity of the sheet limits to the border with the Russian Federation, it was decided to run a line plan that avoided any possibility of crossing the border. Two lines, spaced 1 and 2 kilometers parallel to the border, were run to give the ship a large enough turning buffer for the other lines running the length of the sheet limits.

Sound Speed

As both shipborne SVP-70 sound velocity probes were not functioning throughout acquisition of D00247, realtime surface sound speed measurements were instead generated from the SBE 45 Thermosalinograph (TSG) which is part of the SCS package. These readings were visually checked against realtime sound speed measurements from the Moving Vessel Profiler (MVP) to ensure the measurements were within an expected range. At times the TSG was observed to deviate, at which point the associated seawater pump was temporarily stopped to clear the intake.

Surface Generation

As all depths observed in this survey area were greater than 40 meters, per section 5.2.2.5.1 of the Specifications and Deliverables, the coarsest gridding resolution shall be 16m but if warranted the field unit may submit finer resolution grids. In this case, an 8m surface is submitted as the data was of a high enough quality to warrant a finer resolution.

Holidays

A holiday exists in the data when the EM710 lost bottom tracking for a short period of time and was not reacquired due to the trackline acquisition technique of this survey. The holiday is located in the southwestern portion of the sheet and is roughly 137 meters long. There is no indication that any shoaling or significant features occur within the gap in data.

ATON's

No ATON's exist in the survey area.

Features

No charted features exist for this survey and no uncharted features were discovered during acquisition.

Backscatter

Raw backscatter was logged in the Kongsberg EM710 .all file. All data have been processed by the field unit and GSF files and a floating point mosaic have been submitted to the Pacific Hydrographic Branch.

Horizontal Control

The horizontal datum for this project is North American Datum of 1983 (NAD83). The projection used for this project is UTM Zone 02 North. During real-time acquisition, S220 received correctors from the Wide Area Augmentation System (WAAS) for increased accuracies similar to USCG DGPS stations. WAAS and Smoothed Best Estimate of Trajectory (SBET) were the sole methods of positioning for D00247 as no DGPS stations were available for real-time horizontal control. Vessel kinematic data were post-processed using Applanix POSPac processing software and RTX methods described in the DAPR. SBET and associated error (RMS) data were applied to all MBES data in CARIS HIPS and SIPS.

This survey does meet charting specifications and is adequate to supersede prior data. 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 Descriptive 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 and Specifications Deliverables Manual, Field Procedures Manual, 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 Descriptive Report.

During branch review it was discovered that the waterline was not applied appropriately causing the bathymetry to be approximately 5 meters deeper than MLLW. The issue was addressed during branch review. Ultimately the offset will impact the chart review in this document.

Metadata for Survey D00247	
Project	OPR-S347-FA-18
Survey	D00247
State	Alaska
Locality	Bering Strait
Sub-Locality	11.6 NM NW of King Is. to 38.7 NM NW of King Is.
Scale of Survey	1:40000
Sonars Used	Kongsberg Maritime EM 710 (MBES)
Horizontal Datum	North American Datum 1983
Vertical Datum	Mean Lower Low Water
Vertical Datum Correction	ERZT
Projection	Projected UTM 2N
Field Unit	NOAA Ship FAIRWEATHER
Survey Dates	07/19/2018 - 08/17/2018
Chief of Party	CDR Marc Moser
Submission Date	11/09/2018



Simon Swart - NOAA Federal <simon.e.swart@noaa.gov>

Fwd: D00247 Request for Final Tides

1 message

OPS Fairweather <ops.fairweather@noaa.gov>
To: Simon Swart - NOAA Federal <simon.e.swart@noaa.gov>

Fri, Oct 26, 2018 at 9:58 AM

Very Respectfully,

LT Steve MoultonOperations Officer
NOAA Ship *Fairweather*
1010 Stedman Street
Ketchikan, Alaska 99901Ship Cell: 907.254.2842
Iridium: 808.659.0054
OPS.Fairweather@noaa.gov

----- Forwarded message -----

From: ChiefST Fairweather - NOAA Service Account <chiefst.fairweather@noaa.gov>
Date: Mon, Aug 20, 2018 at 9:02 AM
Subject: D00247 Request for Final Tides
To: Final Tides - NOAA Service Account <final.tides@noaa.gov>
Cc: CO Fairweather - NOAA Service Account <co.fairweather@noaa.gov>, _OMAO MOP OPS Fairweather <ops.fairweather@noaa.gov>, Christina Belton - NOAA Federal <christina.belton@noaa.gov>

Greetings,

Attached is the request for final tides for sheet D00247 from the Lisburne Peninsula, AK project, OPR-S347-FA-18. This is the final sheet for this project.

Please let me know if you have any questions or issues with the files.

--

Sam Candio
Chief Survey Technician
NOAA Ship Fairweather (S-220)
1010 Stedman St
Ketchikan, AK 99901
Ship Cell: 907-254-2842
Iridium: 808-659-0054
ChiefST.Fairweather@noaa.gov

 **D00247_Tides_Request.zip**
193K



Tyanne Faulkes - NOAA Federal <tyanne.faulkes@noaa.gov>

Fwd: D00247 question

11 messages

Olivia Hauser - NOAA Federal <olivia.hauser@noaa.gov> Mon, Dec 16, 2019 at 3:07 PM
To: Tyanne Faulkes <tyanne.faulkes@noaa.gov>, Peter Holmberg <peter.holmberg@noaa.gov>

Tyanne,

Can you look into this? Did we miss something? Thanks.

V/R, Olivia

----- Forwarded message -----

From: **Andrew Kambia - NOAA Federal** <andrew.kambia@noaa.gov>
Date: Mon, Dec 16, 2019 at 12:15 PM
Subject: D00247 question
To: Olivia Hauser <olivia.hauser@noaa.gov>, Peter Holmberg <peter.holmberg@noaa.gov>

Olivia/Pete,

I never do this, but D00247 has triggered my skepticism into the accuracy of the depths. It just doesn't fit cartographically and appears to contradict other contemporary overlapping surveys. I attached an explanation that I hope piques your curiosity as well.


Please take a look and then we can discuss how to proceed. Hopefully, there is an easy answer, such as a 2.5 meter correction was subtracted when it should have been added. If we conclude that's not the case and the depths appear to be completely accurate, then it will be a difficult cartographic application.

Respectfully and Thanks!

--
Andy Kambia
Chief, Products Branch A (Alaska)
Marine Chart Division - Office of Coast Survey
240-533-0116

--

CDR Olivia Hauser, NOAA
Chief, Pacific Hydrographic Branch
Office: 206-526-6835
Cell: 302-229-3368
NOAA/NOS/OCS/HSD/PHB
olivia.hauser@noaa.gov

 **D00247.docx**
965K

Tyanne Faulkes - NOAA Federal <tyanne.faulkes@noaa.gov> Mon, Dec 16, 2019 at 3:59 PM
To: Jack Riley <jack.riley@noaa.gov>

Hey Jack,

Andy Campia brought up an issue with a Fairweather survey from 2018 (see the email below). I was able to confirm that the survey is about 5 meters deeper than its junctions (which were all collected in 2012 and were unfortunately not analyzed during review). I have done a little digging. When I subset the data I am able to switch between "Tide" and "GPS Tide" in CARIS because they used TACARI as an interim product and I found when viewing in TCARI tides the data shifts up about 5 meters. I am thinking that the culprit may be the NSPMVD model.

What should be our next step? Do you need the old NSPMVD files that were used in the field? Would you like the surface in MLLW via TCARI and at the Ellipsoid via shifting the HDCS data?

I have checked the other surveys from this project and they have a different NSPMVD and do not appear to have the same characteristics (shifting when I switch from "Tides" to "GPS Tides").

Thanks for the help.

Tyanne

[Quoted text hidden]

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Tyanne Faulkes
Physical Scientist
NOAA's National Ocean Service
Office of Coast Survey, Hydrographic Surveys Division
Pacific Hydrographic Branch
(w) 206.526.6434



D00247.docx

965K

Olivia Hauser - NOAA Federal <olivia.hauser@noaa.gov>

Mon, Dec 16, 2019 at 5:06 PM

To: Andrew Kampia - NOAA Federal <andrew.kampia@noaa.gov>, Tyanne Faulkes <tyanne.faulkes@noaa.gov>

Cc: Peter Holmberg <peter.holmberg@noaa.gov>

We think we may have found the culprit. Stay tuned!!

V/R, Olivia

[Quoted text hidden]

Jack Riley - NOAA Federal <jack.riley@noaa.gov>

Tue, Dec 17, 2019 at 6:56 AM

To: Tyanne Faulkes - NOAA Federal <tyanne.faulkes@noaa.gov>

Hi Tyanne,

The NSPMVD MLLW SEP I sent HSD/FA for that part of PARS (OPR-S347-FA-18-PARS_NSMPVD_NAD83-MLLW.csar[0]) has an average value around -3.7 m. That means the MLLW datum elevation is above NAD83 by -3.7 m there on average. Check the logfile(s) (Charlene or otherwise HIPS) to make sure the SEP was used in the GPS Tide calculation. Applying a zero SEP in GPS Tide would show all MLLW depths as being deeper by 3.7 m (on average).

Jack

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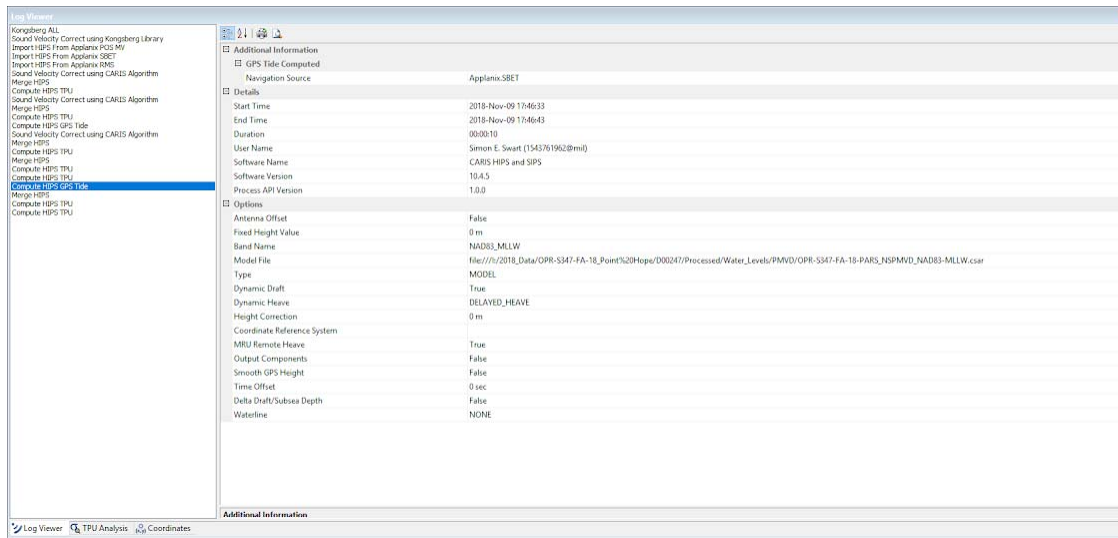
Jack L. Riley
Coast Survey Development Lab
240-847-8271

[Quoted text hidden]

Tyanne Faulkes - NOAA Federal <tyanne.faulkes@noaa.gov>
To: Jack Riley - NOAA Federal <jack.riley@noaa.gov>

Tue, Dec 17, 2019 at 9:26 AM

So I looked at the CARIS processing log and they applied the correct SEP.



[Quoted text hidden]

Jack Riley - NOAA Federal <jack.riley@noaa.gov>
To: Tyanne Faulkes - NOAA Federal <tyanne.faulkes@noaa.gov>

Tue, Dec 17, 2019 at 9:57 AM

Sanity-checked options with Eric -- Waterline should be VESSEL not NONE; so it's the draft of the ship that wasn't applied in the GPS Tide calculation, and that will also cause depths to be erroneously deep by about 5 m.

Jack L. Riley
Coast Survey Development Lab
240-847-8271

[Quoted text hidden]

Tyanne Faulkes - NOAA Federal <tyanne.faulkes@noaa.gov>
To: Jack Riley - NOAA Federal <jack.riley@noaa.gov>

Tue, Dec 17, 2019 at 9:58 AM

Ok let me try that and I'll get back to you.

Tyanne

[Quoted text hidden]

Tyanne Faulkes - NOAA Federal <tyanne.faulkes@noaa.gov>
To: Jack Riley - NOAA Federal <jack.riley@noaa.gov>

Tue, Dec 17, 2019 at 11:32 AM

Yeah that was the culprit! Thanks for the help!

Tyanne

[Quoted text hidden]

Jack L. Riley <jack.riley@noaa.gov>
To: Tyanne Faulkes - NOAA Federal <tyanne.faulkes@noaa.gov>

Tue, Dec 17, 2019 at 11:54 AM

Great!

FYSA/can advise Olivia: Charlene fully encapsulates these details now; it wasn't actually used by FA for the 2018 PARS (log would have shown 'batch processing')-- even if it would have been, not 100% sure if Eric had it in a state back then to automatically drive that setting.

[Quoted text hidden]

Olivia Hauser - NOAA Federal <olivia.hauser@noaa.gov>

Tue, Dec 17, 2019 at 2:48 PM

To: Andrew Kambia - NOAA Federal <andrew.kambia@noaa.gov>, Tyanne Faulkes <tyanne.faulkes@noaa.gov>, Jessica Murphy - NOAA Federal <Jessica.Murphy@noaa.gov>, Brooke Maser - NOAA Federal <Brooke.Maser@noaa.gov>
Cc: Peter Holmberg <peter.holmberg@noaa.gov>, Tara Wallace <tara.wallace@noaa.gov>, Brian Mohr - NOAA Federal <brian.mohr@noaa.gov>

Hi Andy,

Thanks for your patience. After careful re-examination, it looks like the ship's waterline was not applied properly to the data. Once applied, the data matched within decimeters of the overlapping data. Thanks for bringing it to our attention and having us address it at the source. We will certainly discuss it at our branch meeting tomorrow to help prevent it from happening again. We will re--package the updated grids and deliverables and submit them to HSD tomorrow morning. Have a good evening.

V/R, Olivia

[Quoted text hidden]

Andrew Kambia - NOAA Federal <andrew.kambia@noaa.gov>

Tue, Dec 17, 2019 at 7:36 PM

To: Olivia Hauser - NOAA Federal <olivia.hauser@noaa.gov>
Cc: Tyanne Faulkes <tyanne.faulkes@noaa.gov>, Jessica Murphy - NOAA Federal <Jessica.Murphy@noaa.gov>, Brooke Maser - NOAA Federal <Brooke.Maser@noaa.gov>, Peter Holmberg <peter.holmberg@noaa.gov>, Tara Wallace <tara.wallace@noaa.gov>, Brian Mohr - NOAA Federal <brian.mohr@noaa.gov>

Excellent!

I assume that submitting them to HSD will then be followed by the corrected files being sent to both NDB and NCEI. I'll let NDB know they are coming.

Thanks

[Quoted text hidden]

APPROVAL PAGE

D00247

Data meet or exceed current specifications as certified by the OCS survey acceptance review process. Descriptive Report and survey data except where noted are adequate to supersede prior surveys and nautical charts in the common area.

The following products will be sent to NCEI for archive

- Descriptive Report
- Collection of Bathymetric Attributed Grids (BAGs)
- Collection of backscatter mosaics
- Processed survey data and records
- GeoPDF of survey products

The survey evaluation and verification has been conducted according current OCS Specifications, and the survey has been approved for dissemination and usage of updating NOAA's suite of nautical charts.

Approved: _____

Commander Olivia Hauser, NOAA
Chief, Pacific Hydrographic Branch