



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
Office of Coast Survey
Silver Spring, Maryland 20910-3282

FINAL Project Instruction

Date Submitted: October 4, 2016

Platform: NOAA Ship *Fairweather*

Project Number: FA-16-04

Project Title: OPR-O393-FA-16
Southeast Alaska, Behm Canal

Project Dates: October 3, 2016 – November 23, 2016

Prepared by: _____ Dated: 4 Oct 2016
Lieutenant Commander Michael O. Gonsalves, NOAA
Chief, Operations Branch
Hydrographic Surveys Division
Office of Coast Survey

Approved by: _____ Dated: 5 Oct 2016
Captain Richard T. Brennan, NOAA
Chief, Hydrographic Surveys Division
Office of Coast Survey

Approved by: _____ Dated: _____
Commander Brian W. Parker, NOAA
Commanding Officer
Marine Operations Center - Pacific



I. Overview

A. Brief Summary and Project Period

This survey is scheduled to occur between October 3, 2016 and November 23, 2016. This project is being conducted in support of NOAA’s Office of Coast Survey to provide contemporary hydrographic data to update nautical charting products.

B. Days at Sea (DAS)

Of the 47 DAS scheduled for this project, 0 DAS are funded by an OMAO allocation, 47 DAS are funded by a Line Office Allocation, 0 DAS are Program Funded, and 0 DAS are Other Agency funded. This project is estimated to exhibit a medium Operational Tempo.

C. Operating Area

This project area is located in Behm Canal, Alaska. An image of the project area may be found with the detailed project instructions appended to these instructions.

D. Summary of Objectives

This project will support the following primary mission:

To support safe navigation through the acquisition and processing of hydrographic survey data for updating nautical charts and by the identification and dissemination of dangers to navigation as identified during the course of survey operations.

E. Participating Institutions

Office of Coast Survey

F. Personnel/Science Party: name, title, gender, affiliation, and nationality

Name (Last, First)	Title	Date Aboard	Date Disembark	Gender	Affiliation	Nationality
Reser, Katie	PS	10/24/2016	11/04/2016	F	NOAA	USA
Fandel, Christina	PS	11/07/2016	11/24/2016	F	NOAA	USA

G. Administrative

1. Points of Contacts:

Principal Investigator:

LCDR Michael Gonsalves, NOAA
Chief, Operations Branch
Hydrographic Surveys Division
1315 East-West Hwy, #6854
Silver Spring, MD 20910
301-713-2702 x 112
Michael.Gonsalves@noaa.gov

Project Managers:

Jacklyn James
Physical Scientist, NOAA
Operations Branch, Hydrographic Surveys Division
1315 East-West Hwy, #6725
Silver Spring, MD 20910
301-713-2702 x 120
Jacklyn.C.James@noaa.gov

Back Up: Christina Fandel
Physical Scientist, NOAA
Operations Branch, Hydrographic Surveys Division
1315 East-West Hwy, #6725
Silver Spring, MD 20910
301-713-2702 x 133
Christina.Fandel@noaa.gov

Chief Scientist:

CDR Mark Van Waes, NOAA
Commanding Officer
NOAA Ship *Fairweather*
2002 SE Marine Science Drive
Newport, OR 97365
907-254-2842
co.fairweather@noaa.gov

2. Diplomatic Clearances

None Required.

3. Licenses and Permits

The Office of Coast Survey is sensitive to the potential effects of its operations on the physical, biological, and cultural marine environment. In accordance with the National Environmental Protection Act, Coast Survey

prepared a Programmatic Environmental Assessment to gauge the environmental impacts resulting from surveying and other data-gathering activities. As a result, the National Ocean Service has published a Finding of No Significant Impact (FONSI) for the Office of Coast Survey program of conducting hydrographic surveys for the calendar years 2013 - 2018.

In addition The Office of Coast Survey has implemented Best Management Practices (BMPs) based on the ESA mitigation and monitoring measures agreed to between the OCS Hydrographic Services Division (HSD) and the NMFS Office of Protected Resources (OPRESA) and documented in the April 30, 2013 Biological Opinion. They were adopted in the context of the ESA, but include BMPs for marine mammals listed in the ESA (“depleted” under MMPA).

For further information on the BMPs, please refer to the Environmental Compliance Section of the Hydrographic Survey Project Instructions. For further information on OCS Regulations and Policies go to: <http://www.nauticalcharts.noaa.gov/Legal/>

II. Operations

The Chief Scientist is responsible for ensuring the scientific staff are trained in planned operations and are knowledgeable of project objectives and priorities. The Commanding Officer is responsible for ensuring all operations conform to the ship’s accepted practices and procedures.

A. Project Itinerary:

10/03/2016	Mon	Seward, AK	FA-16-04 Southeast Alaska, Behm Canal Leg 1
10/20/2016	Thu	Ketchikan, AK	FA-16-04 Southeast Alaska, Behm Canal Leg 1
10/24/2016	Mon	Ketchikan, AK	FA-16-04 Southeast Alaska, Behm Canal Leg 2
11/04/2016	Fri	Ketchikan, AK	FA-16-04 Southeast Alaska, Behm Canal Leg 2
11/07/2016	Mon	Ketchikan, AK	FA-16-04 Southeast Alaska, Behm Canal Leg 3
11/23/2016	Wed	Seattle, WA	FA-16-04 Southeast Alaska, Behm Canal Leg 3

Staging and destaging are not planned for this project.

C. Operations to be Conducted:

Hydrographic survey operations shall be conducted per the appended project instructions.

The ship and/or survey launches shall operate for a combined total of 40 hr/day for data acquisition and project field support. To achieve this, the Commanding Officer may elect to run 24 hr ship survey operations for short or extended periods of time with reduced launch operations as long as the total hours per day are achieved.

D. Dive Plan

Dives are not planned for this project.

E. Applicable Restrictions

Conditions which preclude normal operations:

- Poor weather conditions
- Equipment failure
- Safety concerns
- Personnel shortages

III. Equipment

A. Equipment and Capabilities provided by the ship

- Four survey launches fully-outfitted with hydrographic survey equipment to support multibeam and/or side scan and/or vertical beam sonar survey operations.
- Ship fully-outfitted with hydrographic survey equipment to support multibeam and/or side scan sonar survey operations.
- Personnel to staff and operate the survey equipment on the launches and ship for the required operational hours/day described in Section II. C. Operations to be Conducted.
- A fully-staffed survey department to efficiently manage the project's data processing requirements.

B. Equipment and Capabilities provided by the scientists

- Hydrographic Surveys Division may provide physical scientists for hydrographic data acquisition, processing, training, and data quality assurance support during project survey operations. Additionally, shore-based technical support may be provided for survey systems and data acquisition and processing software.

IV. Hazardous Materials

A. Policy and Compliance

No Hazardous Materials are being brought aboard the ship for this project.

B. Radioactive Materials

No Radioactive Isotopes are planned for this project.

V. Additional Projects

A. Supplementary ("Piggyback") Projects

B. NOAA Fleet Ancillary Projects

No NOAA Fleet Ancillary Projects are planned.

VI. Disposition of Data and Reports

Disposition of data gathered aboard NOAA ships will conform to NAO 216-101 *Ocean Data Acquisitions* and NAO 212-15 *Management of Environmental Data and Information*. To guide the implementation of these NAOs, NOAA's Environmental Data Management Committee (EDMC) provides the *NOAA Data Documentation Procedural Directive* (data documentation) and *NOAA Data Management Planning Procedural Directive* (preparation of Data Management Plans). OMAO is developing procedures and allocating resources to manage OMAO data and Programs are encouraged to do the same for their Project data.

VII. Meetings, Vessel Familiarization, and Project Evaluations

A. Pre-Project Meeting: The Principal Investigator and the Commanding Officer will conduct a meeting of pertinent members of the scientific party and ship's crew to discuss required equipment, planned operations, concerns, and establish mitigation strategies for all concerns. This meeting shall be conducted before the beginning of the project with sufficient time to allow for preparation of the ship and project personnel. The ship's Operations Officer usually is delegated to assist the Chief Scientist in arranging this meeting.

B. Vessel Familiarization Meeting: The Commanding Officer is responsible for ensuring scientific personnel are familiarized with applicable sections of the standing orders and vessel protocols, e.g., meals, watches, etiquette, drills, etc. A vessel familiarization meeting shall be conducted in the first 24 hours of the project's start and is normally presented by the ship's Operations Officer.

C. Post-Project Meeting: The Commanding Officer is responsible for conducting a meeting no earlier than 24 hrs before or 7 days after the completion of a project to discuss the overall success and short comings of the project. Concerns regarding safety, efficiency, and suggestions for future improvements shall be discussed and mitigations for future projects will be documented for future use. This meeting shall be attended by the ship's officers, applicable crew, the Commanding Officer, and members of the scientific party and is normally arranged by the Operations Officer.

D. Project Evaluation Report

Within seven days of the completion of the project, a Customer Satisfaction Survey is to be completed by the Commanding Officer. The form is available at <http://www.oma.noaa.gov/fleeteval.html> and provides a "Submit" button at the end of the form. Submitted form data is deposited into a spreadsheet used by OMAO management to analyze the information. Though the complete form is not shared with

the ships, specific concerns and praises are followed up on while not divulging the identity of the evaluator.

VIII. Miscellaneous

A. Meals and Berthing

The ship will provide meals for the scientists listed above. Meals will be served 3 times daily beginning one hour before scheduled departure, extending throughout the project, and ending two hours after the termination of the project. Since the watch schedule is split between day and night, the night watch may often miss daytime meals and will require adequate food and beverages (for example a variety of sandwich items, cheeses, fruit, milk, juices) during what are not typically meal hours. Special dietary requirements for scientific participants will be made available to the ship's command at least seven days prior to the project.

Berthing requirements, including number and gender of the scientific party, will be provided to the Commanding Officer by the Principal Investigator. The Commanding Officer will work on a detailed berthing plan to accommodate the gender mix of the scientific party taking into consideration the current make-up of the ship's complement.

All NOAA scientists will have proper travel orders when assigned to any NOAA ship. The Principal Investigator will ensure that all non NOAA or non-Federal scientists aboard also have proper orders. It is the responsibility of the Principal Investigator to ensure that the entire scientific party has a mechanism in place to provide lodging and food and to be reimbursed for these costs in the event that the ship becomes uninhabitable and/or the galley is closed during any part of the scheduled project.

All persons boarding NOAA vessels give implied consent to comply with all safety and security policies and regulations which are administered by the Commanding Officer. All spaces and equipment on the vessel are subject to inspection or search at any time. All personnel must comply with OMAO's Drug and Alcohol Policy dated May 17, 2000 which forbids the possession and/or use of illegal drugs and alcohol aboard NOAA Vessels.

B. Medical Forms and Emergency Contacts

The NOAA Health Services Questionnaire (NHSQ, NF 57-10-01 (3-14)) must be completed in advance by each participating scientist. The NHSQ can be obtained from <http://www.corporateservices.noaa.gov/noaaforms/eforms/nf57-10-01.pdf>.

All NHSQs submitted after March 1, 2014 must be accompanied by [NOAA Form \(NF\) 57-10-02](#) - Tuberculosis Screening Document in compliance with [OMAO Policy 1008](#) (Tuberculosis Protection Program).

The completed forms should be sent to the Regional Director of Health Services at the applicable Marine Operations Center. The NHSQ and Tuberculosis Screening Document

should reach the Health Services Office no later than 4 weeks prior to the start of the project to allow time for the participant to obtain and submit additional information should health services require it, before clearance to sail can be granted. Please contact MOC Health Services with any questions regarding eligibility or completion of either form. Ensure to fully complete each form and indicate the ship or ships the participant will be sailing on. The participant will receive an email notice when medically cleared to sail if a legible email address is provided on the NHSQ.

The participant can mail, fax, or email the forms to the contact information below. Participants should take precautions to protect their Personally Identifiable Information (PII) and medical information and ensure all correspondence adheres to DOC guidance (http://ocio.os.doc.gov/ITPolicyandPrograms/IT_Privacy/PROD01_008240).

The only secure email process approved by NOAA is [Accellion Secure File Transfer](#) which requires the sender to setup an account. [Accellion's Web Users Guide](#) is a valuable aid in using this service, however to reduce cost the DOC contract doesn't provide for automatically issuing full functioning accounts. To receive access to a "Send Tab", after your Accellion account has been established send an email from the associated email account to accellionAlerts@doc.gov requesting access to the "Send Tab" function. They will notify you via email usually within 1 business day of your approval. The "Send Tab" function will be accessible for 30 days.

Contact information:

Regional Director of Health Services
Marine Operations Center – Pacific
2002 SE Marine Science Dr.
Newport, OR 97365
Telephone 541-867-8822
Fax 541-867-8856
Email MOP.Health-Services@noaa.gov

Prior to departure, the Executive Officer will obtain an electronic listing of emergency contacts for all members of the scientific party, with the following information: contact name, address, relationship to member, and telephone number.

C. Shipboard Safety

Hard hats are required when working with suspended loads. Work vests are required when working near open railings and during small boat launch and recovery operations. Hard hats and work vests will be provided by the ship when required.

Wearing open-toed footwear or shoes that do not completely enclose the foot (such as sandals or clogs) outside of private berthing areas is not permitted. At the discretion of the ship CO, safety shoes (i.e. steel or composite toe protection) may be required to participate in any work dealing with suspended loads, including CTD deployment and recovery. The ship does not provide safety-toed shoes/boots. The ship's Operations

Officer should be consulted by the Principal Investigator to ensure members of the scientific party report aboard with the proper attire.

D. Communications

A progress report on operations prepared by the Commanding Officer may be relayed to the program office. The ship's primary means of communication with the Marine Operations Center is via email and the Very Small Aperture Terminal (VSAT) link. Standard VSAT bandwidth at 128kbs is shared by all vessels staff and the science team at no charge. Increased bandwidth in 30 day increments is available on the VSAT systems at increased cost to the scientific party. If increased bandwidth is being considered, program accounting is required and it must be arranged through the ship's Commanding Officer at least 30 days in advance.

E. IT Security

Any computer that will be hooked into the ship's network must comply with the *OMAO Fleet IT Security Policy* 1.1 (November 4, 2005) prior to establishing a direct connection to the NOAA WAN. Requirements include, but are not limited to:

- (1) Installation of the latest virus definition (.DAT) file on all systems and performance of a virus scan on each system.
- (2) Installation of the latest critical operating system security patches.
- (3) No external public Internet Service Provider (ISP) connections.

Completion of the above requirements prior to boarding the ship is required.

Non-NOAA personnel using the ship's computers or connecting their own computers to the ship's network must complete NOAA's IT Security Awareness Course within 3 days of embarking.

F. Foreign National Guests Access to OMAO Facilities and Platforms

Foreign National access to the NOAA ship or Federal Facilities is not required for this project.

VIII. Appendices

1. Primary Project Instructions: OPR-O393-FA-16 Behm Canal, Alaska

Hydrographic Survey Project Instructions

Project Name:	Southeast Alaska, Behm Canal
Project Number:	OPR-0393-FA-16
Assigned Field Unit:	NOAA Ship <i>Fairweather</i>
Assigned Processing Branch:	Pacific Hydrographic Branch
Signed Date:	10/04/2016
Project Instructions Version:	Final
Planned Acquisition Time:	Start Date: 10/2016 End Date: 11/2016
Delivery Dates:	120 days from completion of data acquisition.

Purpose and Location:
The purpose of this project is to provide contemporary surveys to update National Ocean Service (NOS) nautical charting products. Survey areas will address 177 SNM of navigationally significant waters
Supporting Documents:
Hydrography shall consist of Navigable Area Surveys in accordance with the following support documents.
NOS Hydrographic Surveys Specifications and Deliverables Manual (HSSD), March 2016
NOS Field Procedures Manual for Hydrographic Surveying (FPM), April, 2014
Hydrographic Survey Technical Directive (HTD): HTD 2016-2 Configuration Management
Hydrographic Survey Technical Directive (HTD): HTD 2016-3 Horizontal Datums

PERSONNEL SAFETY AND DATA QUALITY SHALL ALWAYS BE EMPHASIZED OVER DATA QUANTITY! THE HYDROGRAPHER SHALL NEVER SUBJECT PERSONNEL OR BOATS TO UNDUE RISKS AND HAZARDS.

Registry Details:						
General Locality: Southeast Alaska, Behm Canal						
<i>Registry Number</i>	<i>Sheet Number</i>	<i>Sublocality</i>	<i>State or Territory</i>	<i>Scale</i>	<i>Estimated SNM</i>	<i>Instructions</i>
H12971	1	Spacious Bay	Alaska	20000	46	
H12972	2	Neets Bay	Alaska	40000	18	
H12973	3	Behm Canal	Alaska	40000	26	
H12974	4	Naha Bay	Alaska	10000	30	
H12975	5	Clover Passage	Alaska	10000	57	

Limits & Coverage:	
Inshore Limit: The inshore limit is the navigable area limit (refer to HSSD 1.2.2)	
Coverage Requirements:	
<i>Coverage Water Depth</i>	<i>Coverage Required</i>
All waters in survey area	Complete Coverage. Refer to HSSD Section 5.2.2.3 (Option A)

Assigned Tasks

Acknowledgement:
The project manager for this project is Jacklyn James. Contact information for the project manager may be found in the User Contacts section of this document. The field unit shall acknowledge receipt of these instructions and submit any comments or questions via email to the project manager. Additionally, the project manager shall be included on all discussions or correspondence involving issues concerning the project.

Environmental Compliance Requirements
Comply with the marine mammal observation and reporting requirements in Section 1.4 of the HSSD and all Best Management Practices (BMPs) listed at the end of these project instructions.

Aids to Navigation (ATONs):
There are no ATONs specifically assigned for this project. Any ATONs located within the survey area should be verified so that they serve their intended purpose in accordance with Section 7.3.5 of the HSSD.

Maritime Boundary Points (MBPs):
There are no Maritime Boundary investigation requirements for this project.

Bottom Samples:

There is no Bottom Sample requirement for this project.

Chart Comparison:

Perform a chart comparison in accordance with Section 4.5 of the FPM and Sections 8.1.4 and D.1 of the HSSD. Use only the latest editions of the largest scale NOS charts covering the project area. Resolve any discrepancies identified in the field and explain them in the Descriptive Report. The charts, listed below, were used in the preparation of these project instructions and accompanying project files, however, this list is for reference only and not exhaustive. Some charts listed may have larger scale sections to which survey data must be compared.

Affected Raster Charts

<i>Chart Number</i>	<i>Scale</i>	<i>Edition Number</i>	<i>Edition Date</i>	<i>Kapp Number</i>	<i>LNK Date</i>	<i>NM Date</i>
17422	79334	10	03/2015	2730	06/28/2016	07/02/2016
17423	20000	15	09/2013	2734	08/23/2016	08/16/2016

Affected ENC's

<i>ENC Name</i>	<i>Scale</i>	<i>Edition</i>	<i>Update Application Date</i>	<i>Issue Date</i>	<i>Preliminary</i>
US5AK40M	20000	2	08/11/2015	08/11/2015	NO
US5AK43M	40000	2	10/20/2015	10/20/2015	NO
US4AK43M	79334	4	10/20/2015	10/20/2015	NO

Coast Pilot:

Submit a Coast Pilot Review Report in accordance with section 8.1.3 of the HSSD.

Dangers to Navigation (DTONs):

Generate DTON reports in accordance with Section 1.5 of the HSSD. DTON reports should be sent to ocs.ndb@noaa.gov with a courtesy copy to the project manager. It is of paramount importance that DTONs be reported as soon as possible.

Junctions:

Perform a junction analysis with the surveys listed below and between current project sheets. Refer to HSSD Section 8.1.4 Junction guidance.

<i>Registry Number</i>	<i>Scale</i>	<i>Year</i>	<i>Platform</i>	<i>Relative Location</i>
H12518	40000	2013	NOAA Ship <i>Rainier</i>	NE
H10967	10000	2000	Terrasond, Ltd.	SE

Progress Reports:

Submit weekly (refer to HSSD Section 8.1.1.1) and monthly (refer to HSSD 8.1.1.2) progress reports.

Survey Outlines:

Generate a survey outline in accordance with Section 8.1.2 of the HSSD. Submit survey outlines to survey.outlines@noaa.gov.

Special Data Handling Requirements:

ATTENTION: NOAA Ship Fairweather

Submit all Conductivity Temperature and Depth (CTD) data to the National Center for Environmental Information (NCEI) ensuring data are in an appropriate file format as outlined on the NODC website at <http://www.nodc.noaa.gov/access/dataformats.html>. See Section 8.3.6 of

Horizontal Control Requirements:

Comply with the horizontal control requirements in Section 3 of the HSSD.

PPK

This project has a requirement to acquire survey data vertically-referenced to the ellipse. At the commencement of survey operations, check lines should be run across the entirety of these sheets to confirm the operational status of the field-installed stations, and to measure the anticipated uncertainties of the positioning solution. The results of these check lines should be reported back to HSD Operations. Refer to ERZT Section below.

User-Installed Base Stations

<i>Station</i>	<i>Name</i>	<i>Position</i>	<i>Ellipsoid Height</i>	<i>Rate</i>	<i>Owner/Agency</i>	<i>Requirement</i>
TBD	TBD	55.7891 N 131.6413 W*	123 meters	123 hertz	NOAA	Recommended
TBD	TBD	55.342 N 131.6458 W*	123 meters	123 megahertz	NOAA	Recommended

****Approximate locations***

Vertical Control Requirements:

Comply with the vertical control requirements in Section 4 of the HSSD.

TCARI

Comply with the requirements from CO-OPS which are included with the project data from the Operations Branch. Submit surveys with final approved water levels applied. Contact the Operations Branch if this causes the survey to miss a submission deadline. Note: The field unit may deliver surveys without final approved water levels only if they demonstrated in the ERS Capability Memo that the data is free of ERS-related bias and only if the final product is derived via the ellipse using the HSD-provided PMVD separation model. If the field unit recommends deriving chart datum via the ellipse using a field-generated ERZT model, final approved water levels must be applied before submission.

ERZT

This project has a requirement to acquire survey data vertically-referenced to the ellipse. Based on analysis of existing infrastructure, this will most likely be achieved through an existing PBO station using a PPK processing solution and use of either a PMVD or ERZT separation model as determined by the results of the following ERS analysis. At the commencement of survey operations, check lines should be acquired across the entirety of the survey to identify any systematic procedural, hardware, or configuration errors prior to the bulk of data acquisition. To determine the quality of the 3D trajectory, the checkline crossline analysis shall be performed between the ERZT separation model and the PMVD separation model. If the field's recommendation on the method of acquiring 3D trajectories and the method of reducing the ellipse-referenced data to chart datum is accepted, all survey lines shall be delivered with 3D trajectory and associated uncertainty files applied (i.e. SBETs and RMS) and GPS tides computed. All delivered grids shall be derived via the ellipse. If at any point the field unit experiences difficulty in realizing chart datum via the ellipse, the field shall communicate with the HSD Project Manager for guidance on how to proceed. Within 60 days of the completion of acquisition, the field unit shall prepare an ERS Capability Memorandum, summarizing the degree to which ERS surveying campaign was successful.

ERS Deliverable

The ERS Checkline and ERS Capability Memo requirements are detailed in the ERS Capability Requirements document. The ERS deliverables shall be submitted to the HSD Project Manager with a CC to ERS.Deliverables@noaa.gov. Project specific data quality issues or departures from standard processing approaches shall be captured in the DAPR or DR.

NWLON Gauges

<i>Operating Water Level Station</i>	<i>Station ID</i>
Ketchikan, AK	9450460

Orthometric Imagery:

No Orthometric Imagery has been provided for this project.

Shoreline and Nearshore Features:

Submit a Final Feature File in accordance with Section 7 of the HSSD.

User Contacts

The following primary offices and persons shall be contacted at or near the beginning and end of the field operations to discuss survey objectives and accomplishment (Mandatory) or are listed for contact at the discretion of the Commanding Officer (Reference).

HSD Project Manager

Jacklyn James

NOAA

Phone: 301-713-2702 x 120

Fax:

Email: jacklyn.c.james@noaa.gov

Obligation: Mandatory

Project Manager Back Up

Christina Fandel

NOAA

Phone: 301-713-2702 x133

Fax:

Email: christina.fandel@noaa.gov

Obligation: For Reference

NOAA: Navigation Manager: Alaska

LT Tim Smith

NOAA

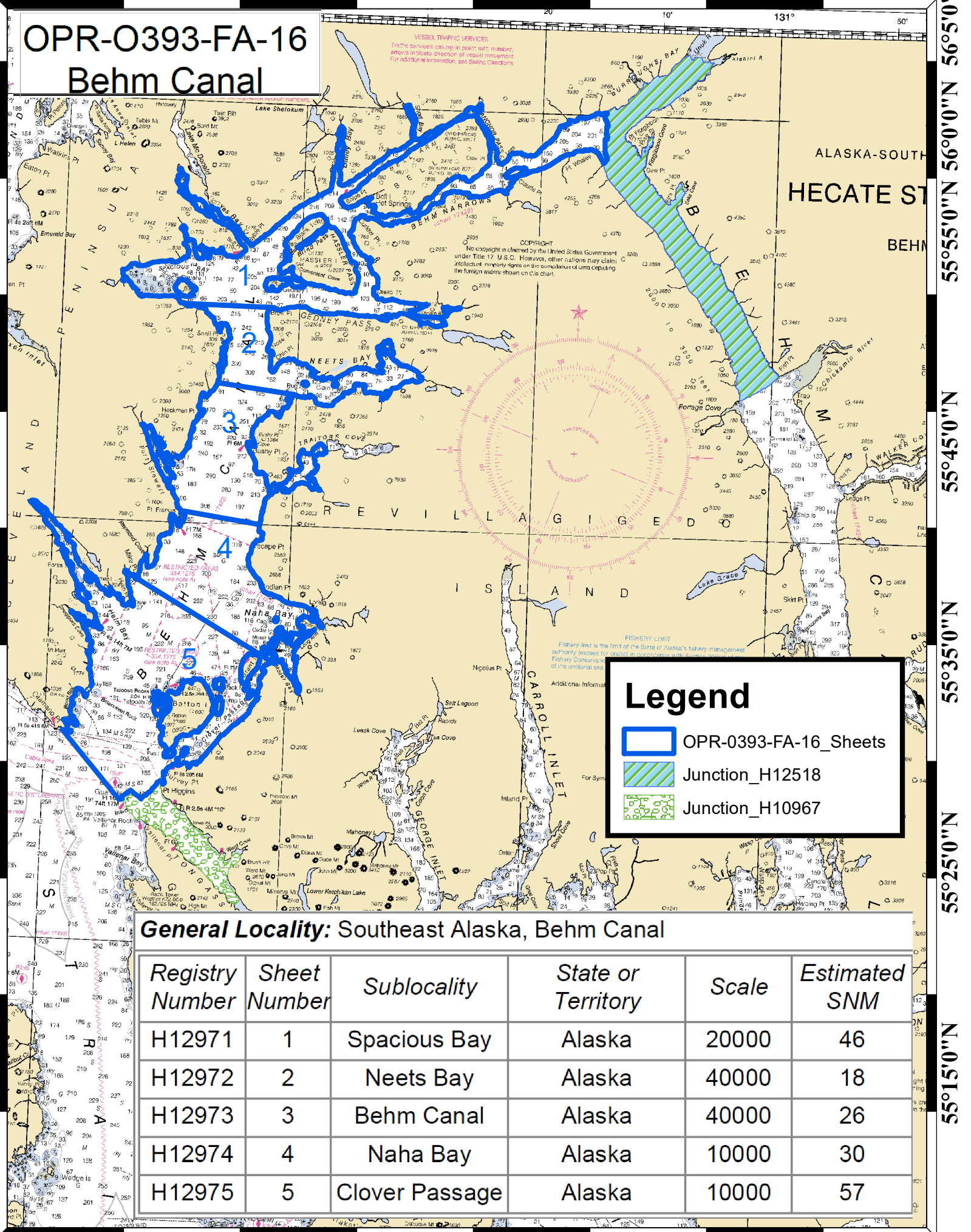
Phone: 907-271-3327

Fax:

Email: timothy.m.smith@noaa.gov

Obligation: For Reference

OPR-O393-FA-16 Behm Canal



Legend

- OPR-0393-FA-16_Sheets
- Junction_H12518
- Junction_H10967

General Locality: Southeast Alaska, Behm Canal

Registry Number	Sheet Number	Sublocality	State or Territory	Scale	Estimated SNM
H12971	1	Spacious Bay	Alaska	20000	46
H12972	2	Neets Bay	Alaska	40000	18
H12973	3	Behm Canal	Alaska	40000	26
H12974	4	Naha Bay	Alaska	10000	30
H12975	5	Clover Passage	Alaska	10000	57

PROPOSED BEST MANAGEMENT PRACTICES (BMPs) FOR HYDROGRAPHIC SURVEY OPR-O393-FA-16

The following BMPs are based on the ESA mitigation and monitoring measures agreed to between the OCS Hydrographic Services Division (HSD) and the NMFS Office of Protected Resources (OPR-ESA) and documented in the April 30, 2013 Biological Opinion. They were adopted in the context of the ESA, but include BMPs for marine mammals listed in the ESA (“depleted” under MMPA). OCS proposes that these BMPs be applied to all OCS hydro work while MMPA compliance is underway. In all cases BMPs will be communicated to ship and boat crews via project instructions. Contractors will additionally be made aware of BMPs via contract RFPs.

Vessel Speed Limits

- Slow speeds (4 – 8 knots) when mapping

Echosounder Restrictions

- Avoid using sonar frequencies < 180 kHz when possible
 - If **multibeam** sonar frequencies < 180 kHz must be employed, use echosounders at ≥ 50 kHz frequencies, with the lowest possible power and ping-rate
 - If **single beam** sonar frequencies < 180 kHz must be employed, use echo sounders at ≥ 30 kHz frequencies, with the lowest possible power and ping-rate and a 12° beam angle.
 - If **single beam** sonar frequencies < 30 kHz must be employed, suspend transmissions of 30 kHz or lower when ESA-listed cetacean species (whales, dolphins, and porpoises) are within hearing range (i.e., the 4.2 meter beam width).

Vessel Maintenance Requirements

- Meet all EPA Vessel General Permits and Coast Guard requirements
- Use anti-fouling coatings
- Clean hull regularly to remove aquatic nuisance species
- Avoid cleaners with nonylphenols
- Rinse anchor with high-powered hose after retrieval

Anchoring Restrictions

- Use designated anchorage area when available
- Use mapping data to anchor in mud or sand, to avoid anchoring on corals
- Minimize anchor drag

Visual Monitoring Requirements

- Maintain trained observers aboard all vessels; 100% observer coverage

- Make species identification keys (for marine mammals, sea turtles, corals, abalone, and seagrasses) available on all vessels

Animal Approach Restrictions

- Avoid approaching within 200 yards of cetaceans (whales, dolphins, and porpoises), 500 yards for right whales
- Suspend single beam sonar transmissions of 30 kHz when ESA-listed cetaceans (whales, dolphins, and porpoises) are within hearing range (i.e., within the 4.2 meter beam width).
- Avoid approaching within 100 yards of in-water seals and walrus
- When possible, suspend single beam sonar transmissions when ESA-listed seals and walrus are within hearing range (i.e., within the 4.2 meter beam width).
- Avoid approaching within 50 yards of sea turtles

WATER LEVEL INSTRUCTIONS
OPR-O393-FA-2016 Behm Canal, AK
(2/25/2016 LH)

1.0. TIDES AND WATER LEVELS

1.1. Specifications

Tidal data acquisition, data processing, tidal datum computation and final tidal zoning shall be performed utilizing sound engineering and oceanographic practices as specified in National Ocean Service (NOS) Hydrographic Surveys Specifications and Deliverables (HSSD), dated March 2016, and OCS Field Procedures Manual (FPM), dated April, 2014. Specifically reference Chapter 4 of the HSSD and Sections 1.5.8, 1.5.9, 2.4.3, and 3.4.2 of the FPM.

1.2. Vertical Datums

The tidal datums for this project are referenced to Chart Datum, Mean Lower Low Water (MLLW) and Mean High Water (MHW). Soundings are referenced to MLLW and heights of overhead obstructions (bridges and cables) are referenced to MHW.

1.2.1. Water Level Data Acquisition Monitoring

The Commanding Officer (or Team Leader) and the Center for Operational Oceanographic Products and Services (CO-OPS) are jointly responsible for ensuring that valid water level data are collected during periods of hydrography. The Commanding Officer (or Team Leader) is required to monitor the pertinent water level data via the CO-OPS Web site at <http://tidesandcurrents.noaa.gov/hydro.shtml>, or through regular communications with CO-OPS/Oceanographic Division (OD) personnel before and during operations. During traditional non duty hours, the Commanding Officer/Team Leader may contact the Continuous Operational Real-Time Monitoring System (CORMS) watch stander who is available 24 hours/day - 7 days/week for assistance in assessing the status of applicable water level station operation. The CORMS watch stander may be contacted either by phone at 301-713-2540 or by email: CORMS@noaa.gov. Problems or concerns regarding the acquisition of valid water level data identified by the Commanding Officer/Team Leader shall be communicated with CO-OPS/OD (nos.coops.hpt@noaa.gov) to coordinate the appropriate course of action to be taken such as gauge repair and/or developing contingency plans for hydrographic survey operations. In addition, CO-OPS is required to coordinate with the Commanding Officer (or Team Leader) before interrupting the acquisition of water level data for the NWLON stations mentioned above for any reason during periods of hydrography.

1.2.2. The Hydro Hot List (HHL)

Please contact the CO-OPS/Hydrographic Planning Team (HPT) at nos.coops.hpt@noaa.gov and the Operational Engineering Team (OET) at nos.coops.oetteam@noaa.gov at least three business days before survey operations begin, and within 1 business day after survey operations are completed so that the appropriate CO-OPS National Water Level Observation Network (NWLON) control water level station is added to or removed from the CO-OPS Hydro Hotlist (HHL) (<http://tidesandcurrents.noaa.gov/hydro>). Include start and end survey dates, full project number (e.g. OPR-H355-TJ-10), and control station numbers. The notification must be sent to both teams as OET is responsible for configuring the stations in the CO-OPS data base and HPT manages the addition and removal of stations from the HHL.

Station	Station ID	Residual Control	Type (NWLON, PORTS [®] , etc.)	Comment
Ketchikan	9450460	Residual Control	NWLON	

Table 1: All stations that need to be added to the HHL in support of OPR-0393-FA16

It is important to know that the addition of a water level station to the HHL ensures the station is monitored by CORMS and any problems are reported daily. However, platforms should view the HHL each morning of active survey operations and click on the “Plot” to double check that there are no problems with the required stations on that day. If a platform notices problems with data on their survey day of operation, please contact HPT at nos.coops.hpt@noaa.gov, CORMS at CORMS@noaa.gov, and their respective headquarters point of contact at HSD or NSD. Stations on the HHL are given priority for maintenance should a station cease normal operation during scheduled times of hydrography. CO-OPS will notify a field unit within 1 business day if a HHL water level station ceases operation during scheduled times of hydrography. This is in addition to the daily CORMS report that CORMS sends to NOAA field units, if the field unit's e-mail address is added to the CORM's daily e-mail list. To be added to the CORMS daily HHL report, the platform should contact CO-OPS' Data Monitoring and Analysis Team (DMAT) at nos.co-ops.dmat@noaa.gov and request to be added.

If the stations are listed on HHL, then weekly priority processing will occur and, for those water level stations, verified 6-minute water level data will be made available every week on Monday or Tuesday. If Monday happens to be a federal holiday, then the 6-minute verified water level data will be made available on the following Tuesday or Wednesday. In order to ensure that verified data is correctly downloaded please **select a date that is more than 7 days prior to the day of interest** in the 'From' field on the CO-OPS website.

1.3. Operating Tide Reducer Stations

1.3.1. CO-OPS Long Term Water Level Station Operation and Maintenance

The NWLON at Ketchikan, AK (9450460) will provide water level reducers for this project. Therefore it is critical that it remains in operation during the survey. See Sections 1.1. and 1.2. concerning responsibilities.

No leveling is required at Ketchikan, AK (9450460) by NOAA's Fairweather personnel.

CO-OPS/FOD is responsible for the operation and maintenance of all NWLON primary control stations. If a problem is identified at an NWLON primary control station, FOD shall make all reasonable efforts to repair the malfunctioning station. However, CO-OPS may request assistance from the NOAA ship or NRT personnel in the actual repair of the water level station to facilitate a rapid repair. CO-OPS/FOD and the Commanding Officer (or Team Leader) shall maintain the required communications until the repairs to the water level station have been completed.

1.3.2. Subordinate Station Requirements

No subordinate water level stations are required for this project, however, supplemental and/or back-up water level stations may be necessary depending on the complexity of the hydrodynamics and/or the severity of the environmental conditions of the project area. The installation and continuous operation of water level measurement systems (tide gauges) at subordinate station locations is left to the discretion of the Commanding Officer (or Team Leader), subject to the approval of CO-OPS. If the Commanding Officer (or Team Leader) decides to install additional water level stations, then a 30-day minimum of continuous data acquisition is required. For all subordinate stations, data must be collected throughout the

entire survey period for which they are applicable, and not less than 30 continuous days. This is necessary to facilitate the computation of an accurate datum reference as per NOS standards.

1.3.3. Tide Component Error Estimation

This section is not applicable for this project. Tidal Constituent And Residual Interpolator (TCARI) automatically calculates the error associated with water level interpolation. This error is incorporated into the residual/harmonic solutions and included in the Total Propagated Error (TPE) for the survey. Uncertainty values input into TCARI model are 2-sigma. Pydro will automatically supply 1-sigma values to CARIS when computing uncertainty.

1.3.4. GOES Satellite Enabled Subordinate Stations

This section is not applicable for this project.

1.3.5. Benchmark Recovery and GPS Requirements

This section is not applicable for this project.

1.3.6. Residual Water Level Station(s) Data

Tidal Constituent And Residual Interpolation (TCARI) method uses harmonic constituents and residuals from historical and operating water level stations to provide precise water level correction for bathymetric surveys. Download the Preliminary/Verified data at following water level station(s) data for all periods of survey.

The operating station at Ketchikan, AK (9450460) will provide residuals for this project and must remain in operation during all periods of hydrography.

<u>Station Number</u>	<u>Station Name</u>	<u>Latitude(N)</u>	<u>Longitude(W)</u>
9450460	Ketchikan, AK	55° 20.0'	131° 37.5'

1.4. Tidal Constituent and Residual Interpolation (TCARI)

1.4.1. For hydrography in the area of Behm Canal, apply the TCARI grid “O393FA2016.tc” supplied in conjunction with the water level data from Section 1.3.6 to produce a seamless tide correction. Refer to the TCARI Field SOP for detailed TCARI instructions.

1.4.2. This section is not applicable for this project.

1.4.3. TCARI Graphic

A diagram which includes the exported TCARI grid boundary is provided in digital copy format to assist with the information provided in section 1.4.1.

1.4.4. TCARI Final Solutions

Upon completion of project, submit a Pydro generated request for smooth tides, with times of hydrography abstract and mid/mif tracklines attached. Forward this request to final.tides@noaa.gov. Provide the project number, as well as sheet number, in the subject line of the email.

CO-OPS will review the times of hydrography, final tracklines, and six-minute water level data from all applicable water level gauges. If there are any discrepancies, CO-OPS will make the appropriate adjustments and forward a revised TCARI grid and solutions to the field group and processing branch for final processing.

1.5. Fetchtides

Preliminary and verified six minute water level time series data may be retrieved from the CO-OPS database via the Fetchtides application. Fetchtides provides a mechanism to store imported data locally and combines multiple days of data into one CARIS readable tide (.tid) file. Fetchtides is available for download at Hydrosoft Online (<https://inside.nos.noaa.gov/hydrosoft/hydrosoftware.html>). For more information, please see the Fetchtides User Manual in the FPM chapter 3 appendix.

1.6 Water Level Records

This section is not applicable for this project.

Preliminary TCARI Grid for OPR-O393-FA-2016
Behm Canal, AK

9450460 KETCHIKAN, TONGASS NARROWS



Image courtesy of NASA Earthstar Geographics SIO © 2016 Microsoft Corporation