Final Project Instructions

Date Submitted: March 28, 2016

Platform: NOAA Ship *Fairweather*

Project Number: FA-16-01 (OMAO)

Project Title: West Prince of Wales Island, AK

Project Dates: April 19, 2016 to June 17, 2016

Prepared by: _____ Dated: 30 March 2016
Lieutenant Commander Michael Gonsalves,
NOAA Chief, Operations Branch Hydrographic
Surveys Division

Approved by: _____ Dated: 30 March 2016
Captain Eric W. Berkowitz, NOAA
Chief, Hydrographic Surveys Division
Office of Coast Survey

Approved by: _____ Dated: 05APR2016
Digitally signed by PARKER.BRIAN.W.1076514042
DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=NOAA, cn=PARKER.BRIAN.W.1076514042
Date: 2016.04.05 13:31:53 -07'00'
Commander Brian Parker, NOAA
Commanding Officer
Marine Operations Center – Pacific

I. Overview

A. Brief Summary and Project Period

This survey is scheduled to begin in April 2016 and end in June 2016. This project is being conducted in support of NOAA's Office of Coast Survey to provide contemporary hydrographic data in order to update the nautical charting products and reduce survey backlog in the area.

B. Days at Sea (DAS)

Of the 43 DAS scheduled for this project, 0 DAS are funded by an OMAO allocation, 43 DAS are funded by a Line Office Allocation, 0 DAS are Program Funded, and 0 DAS are Other Agency funded.

C. Operating Area (include optional map/figure showing op area)

The project area is located in West Prince of Wales Alaska. A map of the project area can 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
Herzog, Martha	PS	5/3/2016	5/30/2016	F	PHB	US
Mueller, Kurt	PS	6/6/2016	7/1/2016	M	PHB	US

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 x112
Michael.Gonsalves@noaa.gov

Project Manager:
Kathryn Pridgen
Physical Scientist, Operations Branch
Hydrographic Surveys Division
1315 East West Hwy, #6854
Silver Spring, MD 20910
301-713-2702 x178
Kathryn.Pridgen@noaa.gov

Chief Scientist:
CDR David Zezula, 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 it 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. For further information, please refer to:
http://www.nauticalcharts.noaa.gov/Legal/

II. Operations

The Commanding Officer 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:

DEP:	4/22/2016	Underway	FA-16-01	Leg 1	7
ARR:	4/28/2016	Ketchikan, AK	OPR-O190-FA-16 South East AK		
DEP:	5/3/2016	Ketchikan, AK	FA-16-01	Leg 2	16
ARR:	5/18/2016	Petersburg, AK	OPR-O190-FA-16 South East AK		
DEP:	5/23/2016	Petersburg, AK	FA-16-01	Leg 3	8
ARR:	5/30/2016	Juneau, AK	OPR-O190-FA-16 South East AK		
DEP:	6/6/2016	Juneau, AK	FA-16-01	Leg 4	12
ARR:	6/17/2016	Ketchikan, AK	OPR-O190-FA-16 South East AK		

B. Staging and Destaging:

Office of Coast Survey personnel will deliver a Tide Buoy dockside in Seattle before April 18, 2016 and destage at the end of the field season. Ship's force will be needed for craning the gear on and off the vessel.

C. Operations to be Conducted:

Hydrographic survey operations shall be conducted per the appended project instructions using four survey launches up to 10 hr/day for data acquisition and project field support. Alternatively, the Commanding Officer may elect to run concurrent 24 hr ship survey operations for short periods of time or for extended periods of time with reduced launch operations.

D. Dive Plan

All dives are to be conducted in accordance with the requirements and regulations of the NOAA Diving Program (http://www.ndc.noaa.gov/dr.html) and require the approval of the ship's Commanding Officer.
The Dive Plans encompassing all legs of FA-16-01 will be prepared by ship's force.

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 fully-outfitted and operational survey launches to support shallow water survey operations utilizing multibeam and vertical beam sonar systems.
- Ship fully-outfitted with hydrographic survey equipment to support multibeam survey operations
- Personnel and staff to operate the ship's survey equipment for 24 hr/day operations and a minimum of 2 survey launches and equipment for up to 10 hr/day concurrently, at the discretion of the command to ensure the most efficient survey operations
- A fully-staffed survey department to efficiently manage the project's data processing requirements

B. Equipment and Capabilities provided by the scientists (itemized)

1. Tide Buoy
    a. Dimensions
        i. Diameter: 0.6m
        ii. Weight: 156 lbs.
        iii. Telemetry: Iridium (WiFi available)
    b. Charging Requirements
        i. Standard 120V AC outlet
        ii. 12 hours charge time
        iii. 60 "D-Cell" Lithium non-rechargeable batteries (Supplied by Coast Survey)
    c. Assembly / Hardware
        i. 11mm torque wrench
        ii. 12 bolts around equator

2. 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

No Supplementary Projects are planned

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 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.omao.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-O190-FA-16 West Prince of Wales, Alaska

Hydrographic Survey Project Instructions

Project Name:	West of Prince of Wales Island
Project Number:	OPR-O190-FA-16
Assigned Field Unit:	NOAA Ship Fairweather
Assigned Processing Branch:	Pacific Hydrographic Branch
Signed Date:	03/28/2016
Project Instructions Version:	Final
Planned Acquisition Time:	Start Date: 04/2016 End Date: 06/2016
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 66 SNM of navigationally significant waters, of which 60 SNM are Priority 2 and 6 SNM are Priority 3, in accordance with the National Hydrographic Survey Priorities Edition 2012.
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
Hydrographic Survey Technical Directive (HTD): HTD 2015-1 Configuration Management
NOS Field Procedures Manual for Hydrographic Surveying (FPM), April, 2014

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: Southwest Alaska Coast

Registry Number	*Sheet Number*	*Sublocality*	*State or Territory*	*Scale*	*Estimated SNM*	*Instructions*
H12865	1	Vicinity of Nichols Islands	Alaska	20000	16	
H12880	2	Vicinity of Corlies Islands	Alaska	20000	17	
H12881	3	Vicinity of McFarland Islands	Alaska	20000	14	
H12882	4	Baldy Bay	Alaska	20000	19	

Limits & Coverage:

Inshore Limit: The inshore limit of hydrography will be the farthest offshore of the following: (1) the 4-meter depth contour or (2) the line defined by the distance seaward from the MHW line which is equivalent to 0.8 millimeters at the scale of the largest scale nautical chart. See Section 1.2.2 of the HSSD.

Coverage Requirements:

Coverage Water Depth	*Coverage Required*
Inshore limit to 8 meters water depth	Complete coverage MB with backscatter (Section 5.2.2.3) or Set Line Spacing at 100 meters (Section 5.2.2.4).
Greater than 8 meters water depth	Complete Coverage MBES with Backscatter. Refer to HSSD Section 5.2.2.3

Assigned Tasks

Acknowledgement:

The project manager for this project is Kathryn Pridgen. 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.

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 7.2 of the HSSD.

AWOIS Items:

There are no AWOIS investigation requirements for this project. For reference, a dataset containing all AWOIS items can be accessed within the GIS files located within the project folder or found in multiple formats at http://www.nauticalcharts.noaa.gov/hsd/wrecks_and_obstructions.html

Maritime Boundary Points (MBPs):

There are no Maritime Boundary investigation requirements for this project.

Bottom Samples:

Obtain bottom samples in accordance with Section 7.2.2 of the HSSD in areas designated by the feature object class springs (SPRING) in the Project Reference File (PRF).

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

Chart Number	*Scale*	*Edition Number*	*Edition Date*	*Kapp Number*	*LNM Date*	*NM Date*
17407	40000	16	12/2014	2726	01/01/2015	01/01/2015
17408	40000	9	12/2014	2727	02/25/2016	02/25/2016

Affected ENCs

ENC Name	*Scale*	*Edition*	*Update Application Date*	*Issue Date*	*Preliminary*
US5AK4DM	40000	2	05/12/2015	05/12/2015	NO
US5AK4EM	40000	1	05/14/2015	05/14/2015	NO
US5AK4IM	40000	3	05/14/2015	05/14/2015	NO

Coast Pilot:

Review and make recommendations for changes to the Coast Pilot. Coast Pilot excerpts can be downloaded from the Coast Pilot website (http://www.nauticalcharts.noaa.gov/nsd/cpdownload.htm). Submit the revised Coast Pilot section or a report stating no changes are recommended, via email to Coast.Pilot@noaa.gov and ocs.ndb@noaa.gov with a courtesy copy to the HSD OPS project planner and the appropriate Processing Branch. The report should be submitted as soon as possible following field work for the project. Refer to section 8.1.3 of the HSSD for more information.

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:

Junction with data from the surveys listed below. Refer to section 8.1.4 Junction Guidance of the HSSD. Please ensure adequate overlap with junctioning surveys from OPR-O190-FA-15.

Registry Number	*Scale*	*Year*	*Platform*	*Relative Location*
H11993	10000	2008	NOAA Ship *Rainier*	E
H12744	20000	2015	NOAA Ship *Fairweather*	W

Progress Reports:

Submit a weekly acquisition progress report during field operations in accordance with Section 8.1.1 of the HSSD.

Survey Outlines:

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

Special Data Handling Requirements:

ATTENTION: Field Unit

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 the HSSD for further details.

Horizontal Control Requirements:

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

PPK

This project has a requirement to reference the survey data to the ellipse, which may require field-installed control stations, using either a single base or smartbase processing solution.
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.

Vertical Control Requirements:

Comply with the vertical control requirements in Section 4 of the HSSD. The field unit shall deploy the GPS water level buoy in northern Carroll Inlet for a minimum of 14 days, 30 if practicable, to clarify vertical control requirements for the George and Carroll Inlet survey scheduled for fall 2016. All shore-based, subordinate water level stations listed below are optional, and may be installed at the field's discretion. Deployment of a tide buoy in lieu of a shore station is sufficient for this project.

Discrete Zoning

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. If the field unit wishes to deliver a survey product derived via the ellipse, and can demonstrate the data to be free of any ERS-related bias, then the surveys may be delivered without final approved water levels applied.

ERZT

This project has a requirement to reference the survey data to the ellipse. Based on the analysis of existing CORS and PBO stations, this will most likely be achieved through a combination of PBO stations or through a field-installed control station. At the commencement of survey operations, check lines should be run across the entirety of these sheets to confirm the operational status of the control stations, and to measure the anticipated uncertainties of the single base solution. The results of these check lines should be reported back to HSD Operations. All survey lines shall be delivered with SBET/RMS files applied and GPS tides computed. The field shall be required to use the Ellipsoid Referenced Zoned Tides (ERZT) model. Should the ERZT method prove successful, all delivered grids at chart datum shall be derived via the ellipse. Within 60 days of the completion of acquisition, the field unit shall prepare an ERS Capability Memorandum, submitted to HSD Operations, summarizing the degree to which ERS surveying campaign was successful.

NWLON Gauges

Operating Water Level Station	*Station ID*
Port Alexander	9451054

Subordinate Gauges

Operating Water Level Station	*Station ID*	*Leveling Required*	*Installation Required*	*Pre-Existing Benchmarks*
Northern George Inlet- Tide Buoy I	945-AAAA	NO	YES	NO
Dunbar Inlet - Tide Buoy II	945-BBBB	NO	YES	NO
Entrance to Windy Cove	945-0251	NO	YES	NO

Orthometric Imagery:
No Orthometric Imagery has been provided for this project.

Shoreline and Nearshore Features:
Conduct a limited shoreline verification using the composite source file (CSF) in accordance with Section 7.3 of the HSSD. All features with attribute 'asgnmt' populated with 'Assigned' shall be addressed even if they are inshore of the HSD Operations delivered NALL. Please contact the HSD Operations Branch Project Manager if there are any questions regarding feature assignment.

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).

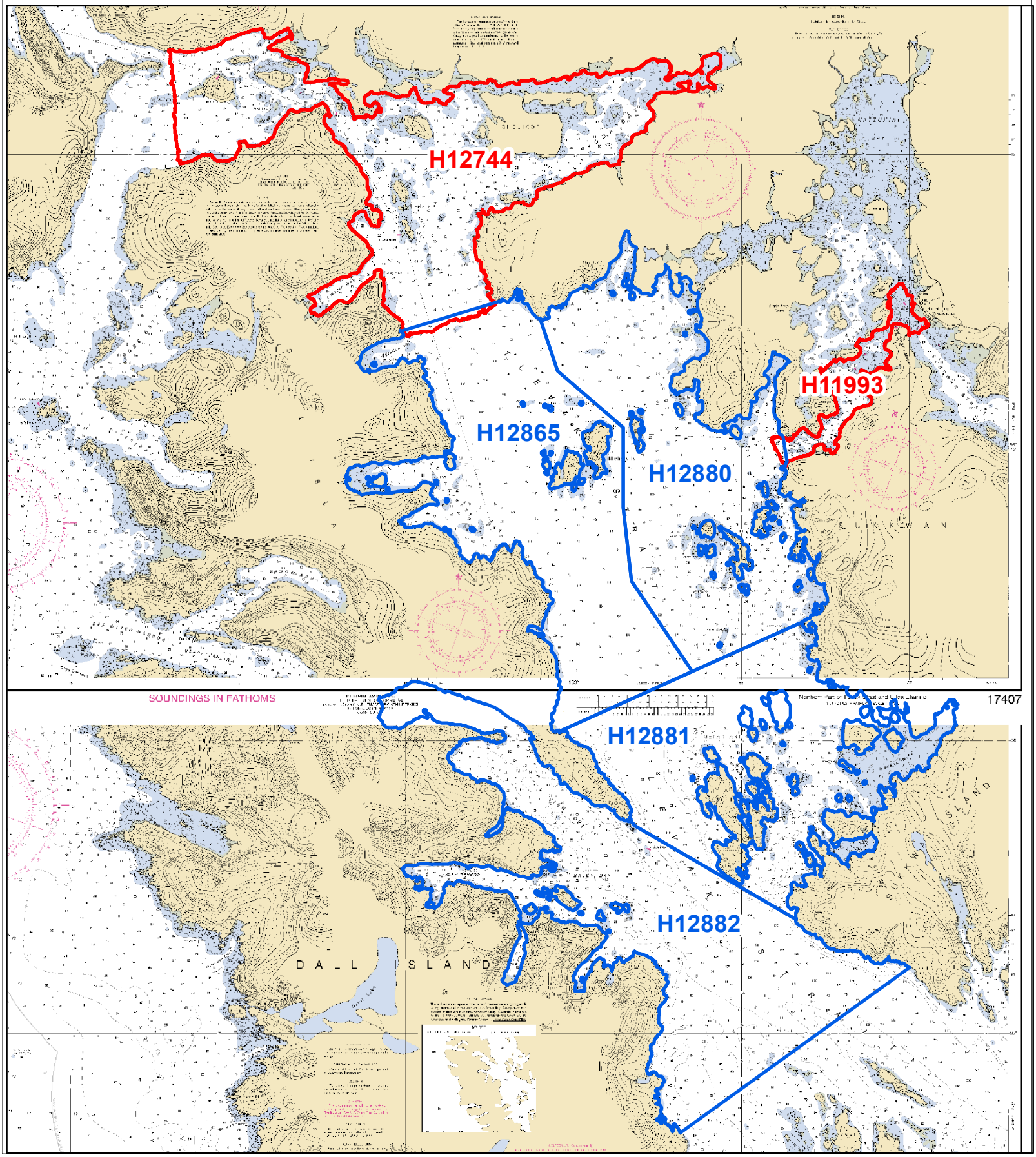
Project Manager
Kathryn Pridgen
NOAA
Phone: 301-713-2702 x178
Fax:
Email: kathryn.pridgen@noaa.gov
Obligation: Mandatory

NOAA Navigation Manager: Alaska
LT Tim Smith
NOAA
Phone: 907-271-3327
Fax:
Email: timothy.m.smith@noaa.gov
Obligation: Mandatory

Project Manager Back Up
Katrina Wyllie
NOAA
Phone: 301-713-2702 x141
Fax:
Email: katrina.wyllie@noaa.gov
Obligation: For Reference

OPR-O190-FA-16
"West of Prince of Wales Island"
Sheet Layout
03/09/2016

Total SNM - 66
Critical - 0
Emerging Crit - 0



WATER LEVEL INSTRUCTIONS
OPR-O190-FA-2016 West of Prince of Wales Island
(3/25/2016 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 May 2015, 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/Team Leader before interrupting the acquisition of water level data for the NWLON gauges 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 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 stations, as well as any required subordinate stations, are 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 and subordinate station numbers. The notification must be sent to both teams as OET is responsible

for configuring the station in the CO-OPS data base and HPT manages the addition and removal of stations from the HHL.

Station	Station ID	Residual or Datum Control or Subordinate Installation	Type (NWLON, PORTS©, etc.)	Comment
Port Alexander	9451054	Residual	NWLON	
Sitka	9451600	Datum	NWLON	
Ketchikan	9450460	Datum	NWLON	
Entrance to Windy Cove	945AAAA	Subordinate		

Table 1: All stations that need to be added to the HHL in support of O190-FA-2016

This project requires subordinate installations. Therefore, please contact OET and HPT via e-mail at least three business days before the subordinate stations are installed and send the site report listing the DCP and sensor serial numbers and GOES satellite information so that stations can be configured in the database and added to HHL. For station removal, inform OET and HPT 3 business days prior to the actual removal of a station and confirm with OET upon final station removal.

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 not 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 the 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 and Datum Control Stations

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

The NWLON Port Alexander, AK (9451054) 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.

The operating NWLON stations at Port Alexander, AK (9451054), Sitka, AK (9451600) and Ketchikan, AK (9450460) may serve as datum control stations for the subordinate installations. Therefore, it is critical that they remain in operation during all periods of hydrography.

No leveling is required at Port Alexander, AK (9451054) 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

For this project, it will be necessary to install and continuously operate water level measurement systems (tide gauges) at one or more approved subordinate station locations. These subordinate stations identified for hydrography are required to be installed to provide the tidal datums, water level reducers, refinement of final zoning, and harmonic constituents for predictions needed to meet NOS hydrographic specifications' accuracies as well as to support other NOAA objectives. The stations listed in the second paragraph of Section 1.3.1. will provide control for datum computations at subordinate stations by using the NOS method of comparison of simultaneous observations.

A 30-day minimum of continuous data acquisition is required for all required subordinate station installations. If the data is collected for less than 30 days at the required subordinate stations, then according to the operating guidelines and business rules, CO-OPS may not publish tidal datums and bench marks sheet. This means CO-OPS may not be able to provide final tides (tide reducers) for less than 30 days of valid and good data. Since all data including water level data collected for hydrographic or photogrammetry surveys is used to derive products that support various NOS multipurpose applications, collection of minimum of 30-days of data is a crucial requirement.

For all subordinate stations, data must be collected throughout the entire survey period in specified areas for which they are applicable, from 4 hours before to 4 hours after the period of hydrography and not less than 30 continuous days. If the subordinate tide gauges are required to support the TCARI process, then all the gauges are required to collect the data for the entire period of the survey (in addition to the 30 day requirement) because the TCARI tidal grid is developed based upon all the gauges. This is necessary not only to facilitate the computation of an accurate datum reference as per NOS hydro graphic specifications (http://www.nauticalcharts.noaa.gov/hsd/specs/specs.htm), but also to ensure a functional data set that meets CO-OPS' multi-purpose products use and dissemination standards. If the subordinate station has a currently published datum, every effort must be made to set the station datum for the new installation to the historic station datum, so that all newly collected observations are on the same zero reference as the currently accepted datum. If the length of the new series of observations is shorter than that of the accepted datum time series, the newly submitted datum may be validated as acceptable for the hydrographic survey but may not supersede the longer already published datum.

Additionally, supplemental and/or back-up stations may also be necessary based upon the complexity of the hydrodynamics and/or the severity of environmental conditions at the project area. If the Commanding Officer (or Team Leader) determines that additional or alternative water

level stations are necessary to those required by CO-OPS, then he or she must coordinate with CO-OPS to obtain CO-OPS' approval and to define the timing and location of the additional or alternative subordinate station(s). For all subordinate stations that are approved and installed, minimum 30 continuous days of data must be collected throughout the entire survey period for which they are applicable. If the minimum 30-day data collection requirement is not met, CO-OPS may not be able to provide the tide reducers for the survey.

Since NOS uses the data and products derived from the operational NOS Hydrographic Surveys Program, installation of training gauges is discouraged during the operations. Also for training purposes, only Temporary Bench Marks (TBM) shall be installed and permanent bench marks shall not be installed. CO-OPS will not publish water level datums on TBM and CO-OPS is not required to provide data processing for training gauges. Any gauges required for providing tide reducers either via TCARI or discreet tidal zoning shall not be considered training gauges.

All additions and modifications to the original subordinate gauge installation requirements shall be documented via an amendment to the Project Instructions. Delivery of the amended Project Instructions to OCS's Hydrographic Surveys Division Operations Branch will signify CO-OPS' approval of the additions and/or modifications to the gauge installations requirements.

The following subordinate stations are required:

Station Number	Station Name	Approximate Latitude (N)	Approximate Longitude (W)
9450251**	Entrance to Windy Cove	55° 2.1'	133° 1.4'

** Conduct reconnaissance of the area to establish a suitable location for the placement of the water level gauge and provide the CO-OPS personnel listed in Section 1.2.1 with the proposed name and location. CO-OPS/Engineering Division (ED) will confirm this and then assign a station number. **Do not install these subordinate gauges prior to receiving assigned station numbers. If it is necessary to change the location of a gauge by more than ¼ mile from its assigned location and a station number has already been assigned, then contact CO-OPS/ED personnel at nos.coops.oetteam@noaa.gov prior to the installation of the gauge.**

1.3.3. Tide Component Error Estimation

The estimated tidal error contribution to the total survey error budget in the vicinity of West of Prince of Wales Island is 0.19 meters at the 95% confidence level, and includes the estimated gauge measurement error, tidal datum computation error, and tidal zoning error. It should be noted that the tidal error component can be significantly greater than stated if a substantial meteorological event or condition should occur during time of hydrography.

A subordinate installation is required at Windy Cove due to potential tidal changes at the narrow entrance of the Cove. The tidal error cannot be estimated at Windy Cove due to a lack of observed data.

1.3.4. GOES Satellite Enabled Subordinate Stations

In the event that water level stations with Geostationary Operational Environmental Satellite (GOES) capability are utilized, information about the station is needed at CO-OPS so that the

stations can be configured in CO-OPS' Data Management System (DMS) before GOES data transmission is started. A minimum of two weeks prior to initiating data transmission, please contact CO-OPS' Operational Engineering Team (OET) at nos.coops.oetteam@noaa.gov and Hydrographic Planning Team (HPT) at nos.coops.hpt@noaa.gov and provide the station number, platform ID, transmit time and channel. In addition, FAX a copy or email a digital copy of the site report before beginning transmission.

Whenever a station number needs to be assigned, the field party should provide the latitude and longitude of the location where a tide gauge will be installed to the CO-OPS/Operational Engineering Team (OET) at nos.coops.oetteam@noaa.gov and Hydrographic Planning Team (HPT) at nos.coops.hpt@noaa.gov at least 3 days before the installation. OET will assign a new tide station number and provide that promptly (within 1 business day) to the field party.

GOES data transmissions must use a message format identical to the format currently implemented in NOS' Next Generation Water Level Measurement System (NGWLMS). Refer to Section 1.1. for information on the NGWLMS data format. The document**, NGWLMS GOES MESSAGE FORMATTING,** found under the Publications option of the CO-OPS web site at http://tidesandcurrents.noaa.gov/ will give an explanation of the NGWLMS GOES message format.

The following preliminary satellite antenna pointing angles are provided for the stations in Sections 1.3.1. to facilitate GOES satellite transmission. Complete GOES information will be provided after the station location is finalized and reported to CO-OPS/ED. If a suitable site for transmitting via satellite cannot be found within the required area, then a station should be established within the area and the data downloaded onto diskette/CD and forwarded to CO-OPS/ED. As a backup for all stations, data must be forwarded to CO-OPS/ED on diskette.

STATION	GOES West
9450251	ELEV. 27.2° AZIMUTH (T) 182.4°

1.3.5. Benchmark Recovery and GPS Requirements

Recover all historical bench marks at each required subordinate water level station. If a total of five benchmarks cannot be found, install the number of benchmarks necessary for the subordinate station to have the total five benchmarks. In the event of a new station with no historical marks, installation of a minimum of five bench marks will be required. Third-order levels from the tide staff or sensor to a minimum of five bench marks (including the primary bench mark) are required at the beginning and end of the survey period. See Section 1.1. for clarification of requirements.

1.3.5.1. Hand-held GPS latitude and longitude positions on all historical subordinate water level station bench marks are required. In addition, one of the subordinate water level station bench marks shall be selected for high accuracy static differential GPS observations to obtain ties between the tidal datums and GPS derived datums. Refer to Section 1.1 for further details on the GPS positioning requirements.

1.3.6. Operate the water level stations listed in Section 1.3.2. of these Project Instructions for the following hydrographic area(s) or zone(s):

Station Number	Hydrographic Area(s) or Zone(s)
9450251	Zones SA35 and SA36

1.4. Discrete Tidal Zoning

1.4.1. The water level station at Port Alexander, AK (9451054) is the reference station for preliminary tides for hydrography in West of Prince of Wales Island. The time and height correctors listed below for applicable zones should be applied to the preliminary data at Port Alexander, AK (9451054) during the acquisition and preliminary processing phases of this project. Preliminary data may be retrieved in one month increments over the Internet from the **CO-OPS SOAP web services at http://opendap.co-ops.nos.noaa.gov/axis/text.html.** The Commanding Officer (or Team Leader) must notify CO-OPS/ED personnel immediately of any problems concerning the preliminary tides. Preliminary data are six-minute time series data relative to MLLW in metric units on Greenwich Mean Time. For the time corrections, a negative (-) time correction indicates that the time of tide in that zone is earlier than (before) the preliminary tides at the reference station. A positive (+) time correction indicates that the time of tide in that zone is later than (after) the predicted tides at the reference station. For height corrections, the water level heights **relative to MLLW** at the reference station are multiplied by the range ratio to estimate the water level heights relative to MLLW in the applicable zone.

Zone	Time Corrector(mins)	Range Ratio	Predicted Reference Station
SA35	-6	x1.22	9451054
SA36	-6	x1.23	9451054

1.4.2. Polygon nodes and water level corrections referencing Port Alexander, AK (9451054) are provided in CARIS® format denoted by a *.zdf extension file name.

NOTE: The tide corrector values referenced to Port Alexander, AK (9451054) are provided in the zoning file "O190FA2016CORP" for this project and are in the fourth set of correctors designated as TS4. Longitude and latitude coordinates are in decimal degrees. Negative (-) longitude is a representation of West longitude.

"Preliminary" data for the control water level station, Port Alexander, AK (9451054), are available in near real-time and verified data will be available on a weekly basis for the previous week. **These water level data may be obtained from the CO-OPS SOAP web services at http://opendap.co-ops.nos.noaa.gov/axis/text.html.**

1.4.3 Zoning Diagram(s)

Zoning diagrams are provided in both digital format to assist with the zoning in section 1.4.1.

1.4.4 Final Zoning

Upon completion of project OPR-O190-FA-2016, submit a Pydro generated request for final 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 a 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. After review, CO-OPS will send a notice indicating that the tidal zoning scheme sent with the project instructions has been approved for final zoning. If there are any discrepancies, CO-OPS will make the appropriate adjustments and forward a revised tidal zoning scheme to the field group and processing branch for final processing.

1.5 Fetchtides

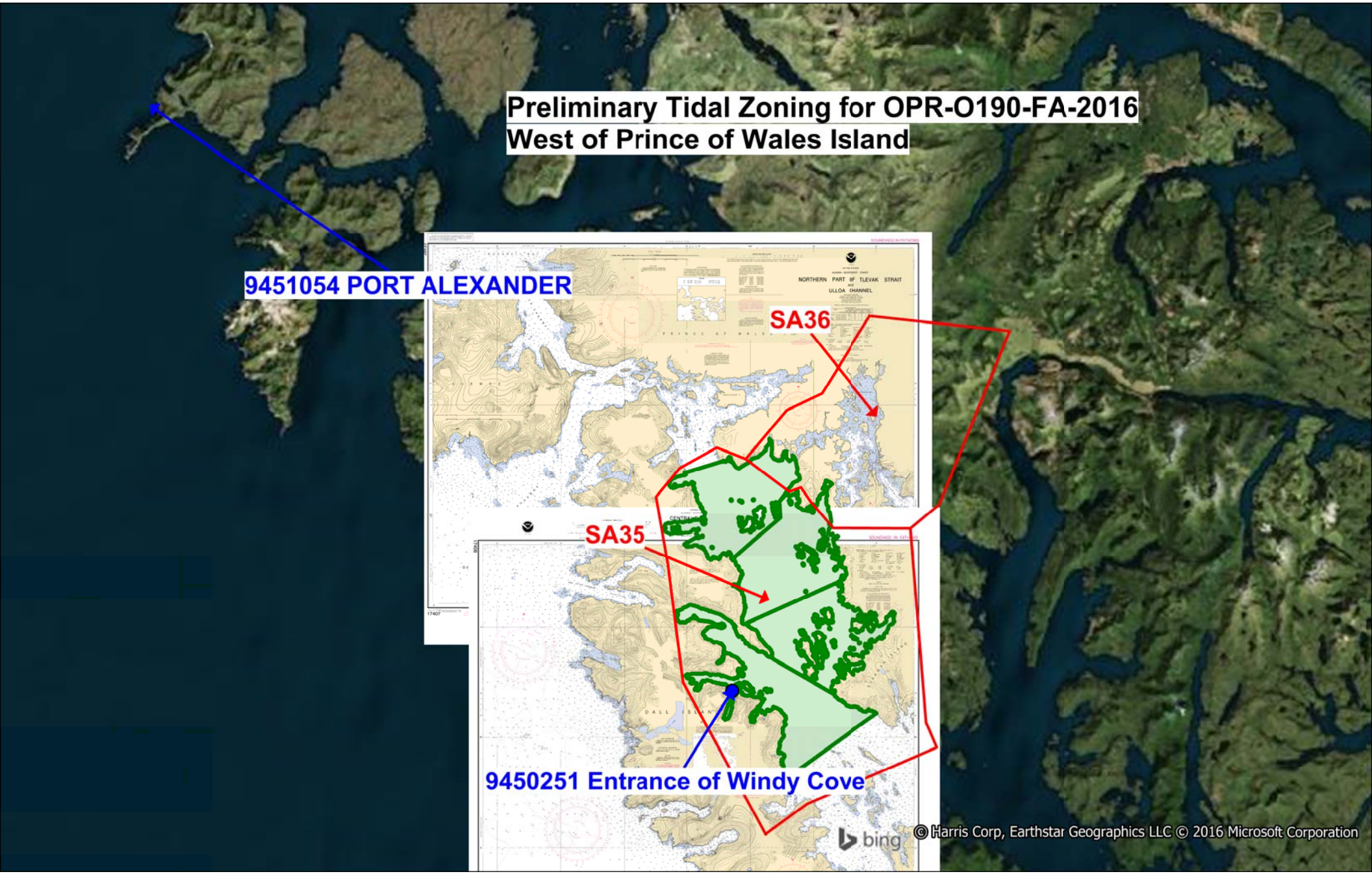
Preliminary and verified six minute water level time series data may be retrieved from the CO-OPS database via the Fetchtides application. Fetchtides provides a mechanism to store imported data locally and combines multiple days of data into one CARIS readable tide (.tid) file. Fetchtides is available 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.

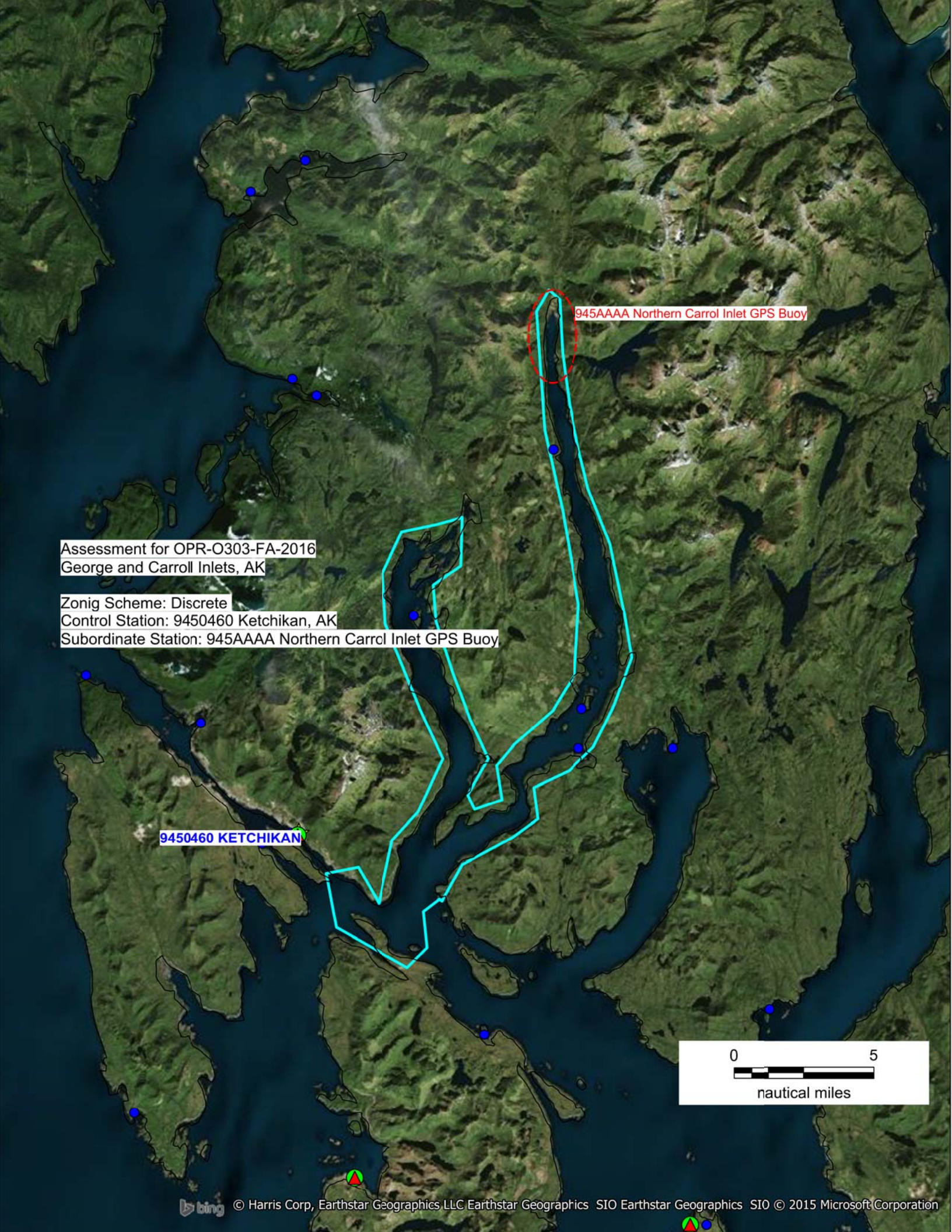
1.6 Water Level Records

Submit water level data, such as leveling records, field reports, and any other relevant data/reports, including the data downloaded onto diskette/CD as specified in the latest version of the NOS Specifications and Deliverables document.

1.6.1 Water level records should be forwarded to the following address:

NOAA/National Ocean Service/CO-OPS
Chief, Engineering Division
N/OPS1 - SSMC4, Station 6531
1305 East-West Highway
Silver Spring, MD 20910


Preliminary Tidal Zoning for OPR-O190-FA-2016
West of Prince of Wales Island
9451054 PORT ALEXANDER
SA36
SA35
9450251 Entrance of Windy Cove
NORTHERN PART OF TLEVAK STRAIT AND ULLOA CHANNEL
bing
© Harris Corp, Earthstar Geographics LLC © 2016 Microsoft Corporation


945AAAA Northern Carrol Inlet GPS Buoy
Assessment for OPR-O303-FA-2016
George and Carroll Inlets, AK
Zonig Scheme: Discrete
Control Station: 9450460 Ketchikan, AK
Subordinate Station: 945AAAA Northern Carrol Inlet GPS Buoy
9450460 KETCHIKAN
0
5
nautical miles
bing
© Harris Corp, Earthstar Geographics LLC Earthstar Geographics SIO Earthstar Geographics SIO © 2015 Microsoft Corporation