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

# FINAL Project Instructions

**Date Submitted:** March 27, 2015

**Platform:** NOAA Ship *Rainier*

**Project Number:** RA-15-01 (OMAO)
OPR-O322-RA-15 (OCS)

**Project Title:** Chatham Strait

**Project Dates:** April 13, 2015 to June 5, 2015

Prepared by: _____ Dated: 9-Apr-2015
LCDR Michael Gonsalves, NOAA
Chief, Operations Branch
Hydrographic Surveys Division
Office of Coast Survey

Approved by: _____ Dated: 9-Apr-2015
for CAPT Eric W. Berkowitz, NOAA
Chief, Hydrographic Surveys Division
Office of Coast Survey

Approved by: _____ Dated: _____
CAPT Douglas D. Baird, Jr., NOAA
Commanding Officer
Marine Operations Center – Pacific

## I. Overview

### A. Brief Summary and Project Period

This survey is scheduled to begin in April 2015 and end in June 2015. 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 49 DAS scheduled for this project, 49 DAS are funded by a Line Office Allocation. This project is estimated to exhibit a medium Operational Tempo.

### C. Operating Area

The project area is located in Chatham Strait, Alaska. A map of the project area may be found with the detailed project instructions appended to these instructions.

### D. Summary of Objectives

The primary objective of this survey is to support safe navigation. Hydrographic data will be acquired and processed to update nautical charts and all dangers to navigation observed during survey operations will be identified and disseminated.

### E. Participating Institutions

N/A

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

| Name (Last, First) | Title | Date Aboard | Date Disembark | Gender | Affiliation | Nationality |
|---|---|---|---|---|---|---|
| Raymond, Annie | PS | 4/13/2015 | 5/15/2015 | F | NOAA | USA |
| Fandel, Christina | PS | 5/4/2015 | 6/5/2015 | F | NOAA | USA |
| Reser, Katie | PS | 5/18/2015 | 6/10/2015 | 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
Silver Spring, MD 20910
(301) 713-2702 x112
Michael.Gonsalves@noaa.gov

Project Manager

Christina Fandel
Physical Scientist, Operations Branch
Hydrographic Surveys Division
1315 East-West Hwy
Silver Spring, MD 20910
(301) 713 – 2702 x 178
Christina.Fandel@noaa.gov

Chief Scientist

CDR Edward J. Van Den Ameele, NOAA
Commanding Officer, NOAA Ship *Rainier*
2002 SE Marine Science Drive
Newport, OR 97365-5229
(206) 660-8747
CO.Rainier@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. For further information, please refer to http://www.nauticalcharts.noaa.gov/Legal/

## II. Operations

For this project, the Commanding Officer will act as the Chief Scientist. Therefore, the Commanding Officer will be 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 | 04/13/2015 | Mon | Newport, OR | RA-14-01 Leg 1 |
| ARR | 04/30/2015 | Thu | Juneau, AK | OPR-O322-RA-15 Chatham Strait |
| DEP | 05/04/2015 | Mon | Juneau, AK | RA-14-01 Leg 2 |
| ARR | 05/15/2015 | Fri | Juneau, AK | OPR-O322-RA-15 Chatham Strait |
| DEP | 05/18/2015 | Mon | Juneau, AK | RA-14-01 Leg 3 |
| ARR | 06/05/2015 | Fri | Kodiak, AK | OPR-O322-RA-15 Chatham Strait |

* To maintain maximum flexibility, RA-15-03 Shumagin Islands, AK may be initiated prior to the scheduled end date of RA-15-01 Chatham Strait, AK.

B. Staging and Destaging:

N/A

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.

Dive operations may occur to support the installation, servicing, and removal of a subordinate water level station. Due to the dynamic schedule of survey operations, the specific dates of the dives are not known well in advance. All dives will be conducted by ship's personnel. All dive plans, will be prepared and submitted by ship's personnel as soon as reasonable, and in accordance with the requirements and regulations of the NOAA Diving Program.

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

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

To maintain maximum flexibility, RA-15-03 Shumagin Islands, AK may be initiated prior to the scheduled end date of RA-15-01 Chatham Strait, AK

B. 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 Commanding Officer will conduct a meeting of all relevant stakeholders 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.

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 conducted 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 all relevant stakeholders.

D. Project Evaluation Report : Within seven days of the completion of the project, a Customer Satisfaction Survey is to be completed by the HSD Operations Branch. 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 ship by the Principal Investigator. The Commanding Officer will work together 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 Commanding Officer will ensure that all non-NOAA or non-Federal scientists aboard also have proper orders. It is the responsibility of the Commanding Officer 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 the Commanding Officer or the NOAA website http://www.corporateservices.noaa.gov/noaaforms/eforms/nf57-10-01.pdf.

All NHSQs submitted after March 1, 2015 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
Newport, OR 97365
Telephone 541-867-8822
Fax 541-867-8856
Email MOP.Health-Services@noaa.gov

Prior to departure, the Executive Officer will assemble 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 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. Sometimes it is necessary to communicate with another vessel, aircraft, or shore facility. Through various means of communications, the ship can usually accommodate this. Special radio voice communications requirements should be listed in the project instructions. 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-O322-RA-15 Chatham Strait, AK

# Hydrographic Survey Project Instructions

| | |
|---|---|
| **Project Name:** | Chatham Strait |
| **Project Number:** | OPR-O322-RA-15 |
| **Assigned Field Unit:** | NOAA Ship *Rainier* |
| **Assigned Processing Branch:** | Pacific Hydrographic Branch |
| **Signed Date:** | 03/27/2015 |
| **Project Instructions Version:** | Final |
| **Planned Acquisition Time:** | Start Date: 04/2015<br>End Date: 06/2015 |
| **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. Other vessels such as cruise liners, ferries, USCG cutters, US Navy vessels, tugs, and barges use the waterway on a regular basis as do larger ships when avoiding storms in the Gulf of Alaska. This project will cover approximately 24 square nautical miles of navigationally significant and priority one areas as identified in the 2012 NOAA Hydrographic Survey Priorities (NHSP). |
| **Supporting Documents:** |
| Hydrography shall consist of Navigable Area Surveys in accordance with the following support documents. Data from surveys is intended to supersede all prior survey data in the common area. |
| NOS Hydrographic Surveys Specifications and Deliverables Manual (HSSD), April 2014 |
| NOS Field Procedures Manual for Hydrographic Surveying (FPM), May 2014 |
| Hydrographic Survey Technical Directive 2014-1: Configuration Management |

**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:*** Chatham Strait, AK

| *Registry Number* | *Sheet* | *Sublocality* | *State or Territory* | *Scale* | *Estimated SNM* | *Instructions* |
|---|---|---|---|---|---|---|
| H12750 | 1 | Security Bay | Alaska | 20000 | 12 | |
| H12749 | 2 | Murder Cove | Alaska | 10000 | 12 | |

**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.

***Coverage Type:***

| *Coverage Water Depth* | *Coverage Required* |
|---|---|
| Inshore limit to 8 meters water depth | Either complete MBES coverage with backscatter, or set line spacing using a SBES/MBES (100 m spacing in restricted areas and around rocky points, 200 m along open coasts). Please ensure the following: (1) Set Line spacing must be sufficiently close that shoaling of the type expected for the area will not fall wholly between main scheme lines (2) Indications of shoaling falling between set line spacing main scheme lines must be investigated (3) Set Line Spacing Line orientation should be approximately perpendicular to isobaths whenever possible |
| Greater than 8 meters water depth | Complete MBES coverage with backscatter |

## *Assigned Tasks*

**Acknowledgement:**

The project manager for this project is Christina Fandel. 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.

**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:**

AWOIS items have been provided for information only. Please refer to the GIS files located within the project folder for reference.

**Maritime Boundary Points (MBPs):**

Investigate Maritime Boundary Points in accordance with section 3.5.6 of the FPM.

| | |
|---|---|
| *Number of MBPs provided for Full Investigation:*<br>*(when safety permits, search inshore of the NALL line for these maritime boundary features)* | 5 |
| *Number of MBPs provided for Information Only:* | 29 |

**Bottom Samples:**

Obtain bottom samples in accordance with section 7.1 of the HSSD in areas designated by the feature object class springs (SPRING) in the Project Reference File (PRF). Review the recommended bottom sample locations with regards to the acquired survey data. Contact the project manager if it is determined that modifying the bottom sample plan would better differentiate the varying bottom characteristic within the survey area. Any modification to the bottom sample plan shall closely maintain the number and density of samples as originally assigned in the PRF.

**Chart Comparison:**

Use only the latest editions of the largest scale NOS charts covering the project area. Perform a chart comparison in accordance with section 4.5 of the FPM and section 8.1.4, D.1 of the HSSD. 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.

***Affected Raster Charts***

| *Chart Number* | *Scale* | *Edition Number* | *Edition Date* | *LNM Date* | *NM Date* |
|---|---|---|---|---|---|
| 17368 | 40000 | 8 | 09/2014 | 02/03/2015 | 02/14/2015 |
| 17336 | 20000 | 10 | 01/2013 | 02/03/2015 | 02/14/2015 |
| 17320 | 217828 | 19 | 11/2013 | 02/03/2015 | 02/14/2015 |

***Affected ENCs***

| *ENC Name* | *Scale* | *Edition* | *Update Application Date* | *Issue Date* | *Preliminary* |
|---|---|---|---|---|---|
| US5AK3TM | 40000 | 5 | 06/01/2012 | 10/04/2012 | YES |
| US5AK2YM | 20000 | 1 | 04/16/2013 | 04/16/2013 | NO |
| US3AK4PM | 217828 | 10 | 03/06/2014 | 03/06/2014 | NO |
| US3AK3UM | 217828 | 3 | 06/14/2013 | 06/14/2013 | NO |

**Coast Pilot:**

Review and make recommendations for changes to the Coast Pilot in accordance with section 7.4 of the HSSD. In addition, address any directed questions found in the Coast Pilot Investigation Items document, included with the project files. Submit both documents, 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 Operations project manager. Refer to sections 3.5.7 and 5.2.2.2.5 of the FPM for more information.

**Dangers to Navigation (DTONs):**

Generate DTON reports in accordance with the HSSD, section 8.1.3. DTON reports should be sent to ocs.ndb@noaa.gov. It is of paramount importance that DTONs be reported as soon as possible.

**Junctions:**

Junction with data from the surveys listed below. Refer to sections 2.2.2.3 and 4.5.2 of the FPM.

| *Registry Number* | *Scale* | *Year* | *Platform* | *Relative Location* |
|---|---|---|---|---|
| H12536 | 5000 | 2013 | NOAA Ship *Rainier* | S |
| H12537 | 40000 | 2013 | NOAA Ship *Rainier* | W |
| H11707 | 10000 | 2007 | Fugro Pelagos, Inc. | NW |

**Progress Reports:**

Submit a weekly acquisition progress report during field operations, no later than Monday (close-of-business), each week of field acquisition, to the assigned HSD Operations project manager with a brief narrative summarizing the past week's activities and the anticipated plans for the coming week. This narrative shall discuss such all activities related to mobilization/demobilization, control station installation, and data acquisition progress. Also, disscuss any other major issues (e.g. significant weather delays, equipment failures, etc.) that may affect acquisition milestones. In addition, provide a graphic shall be provided showing an up-to-date coverage map, the project sheet limits, an appropriate chart, and a simple title block indicating the project name and date of coverage.

**Survey Outlines:**

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

**Special Data Handling Requirements:**

*ATTENTION:* NOAA Ship Rainier

Submit all Conductivity, Temperature, and Depth (CTD) data to the National Oceanographic Data Center (NODC) ensuring data are in an appropriate file format as outlined on the NODC website at http://www.nodc.noaa.gov/access/dataformats.html

**Horizontal Control Requirements:**

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

**Vertical Control Requirements:**

Comply with the vertical control requirements in section 4 of the HSSD. Please note: the installation of the subordinate tide station will be dependent on the results from the GPS buoy data analysis.

***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.

***ERZT***

This project has a requirement to reference the survey data to the ellipse. Based on analysis of existing CORS and PBO stations, this will most likely be achieved through a field-installed control station, using a single base 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 control station, 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 test the Ellipsoid Referenced Zoned Tides (ERZT) SOP and provide feedback on the procedures. Should the ERZT method prove successful, then 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 was successful.

***NWLON Gauges***

| *Operating Water Level Station* | *Station ID* |
|---|---|
| Port Alexander, AK | 9451054 |

***Subordinate Gauges***

| *Operating Water Level Station* | *Station ID* | *Leveling Required* | *Installation Required* | *Pre-Existing Benchmarks* |
|---|---|---|---|---|
| 945AAAA** | Southern end of Security Bay, AK | YES | 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). All features with attribute asgnmt populated with 'Assigned' shall be addressed even if they are inshore of NALL. THE CSF was compiled from ENCs US5AK2YM, US5AK3TM (preliminary), US3AK4PM, and US3AK3UM. Preliminary analysis of the nautical chart and imagery from Google Earth was conducted at HSD OPS. Google Earth imagery revealed multiple potential nearshore outcrops within the vicinity of Security Bay and Murder Cove. The field unit is advised to proceed with caution in this area. |

## *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).*

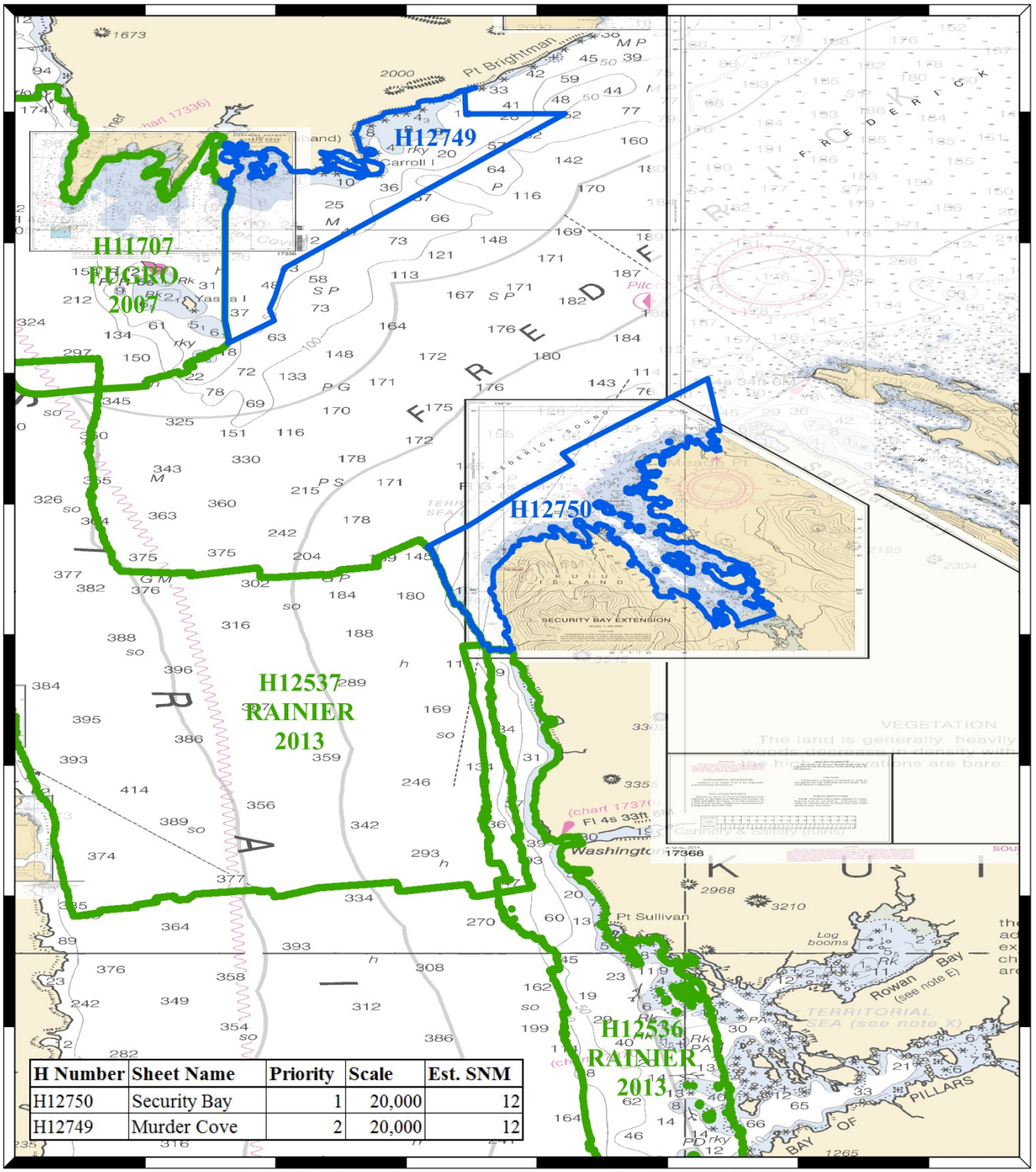
**Project Manager**
Christy Fandel
NOAA
*Phone:* 301-713-2702 ext 178
*Fax:*
*Email:* Christina.Fandel@noaa.gov
*Obligation:* Mandatory

**Secondary Project Manager**
Katrina Wyllie
NOAA
*Phone:* 301-713-2702 ext 141
*Fax:*
*Email:* Katrina.Wyllie@noaa.gov
*Obligation:* For Reference

**NOAA Navigation Manager, Alaska Region**
LT Timothy Smith
NOAA
*Phone:* 907-271-3327
*Fax:*
*Email:* timothy.m.smith@noaa.gov
*Obligation:* For Reference

# OPR-O322-RA-15
# Chatham Strait, AK
# Sheet Layout
# 3/3/2015

**Total SNM: 24**
**Total Priority One SNM: 24**




| H Number | Sheet Name | Priority | Scale | Est. SNM |
|---|---|---|---|---|
| H12750 | Security Bay | 1 | 20,000 | 12 |
| H12749 | Murder Cove | 2 | 20,000 | 12 |

# WATER LEVEL INSTRUCTIONS
**OPR-O322-RA-2015 Chatham Strait, AK**
**(1/26/2015 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 April 2014, 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' Hydrographic Planning Team (HPT) at 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 CO-OPS' Hydrographic Planning Team (HPT) at nos.coops.hpt@noaa.gov and CO-OPS' 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(s), as well as any required subordinate station(s), is/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 | Control or Subordinate | Type (e.g. NWLON, PORTS©, etc) | Comment |
|---|---|---|---|---|
| Port Alexander | 9451054 | Control | NWLON | |
| Southern End of Security Bay | 945AAAA | Subordinate | | |

Table 1: All stations that need to be added to the HHL in support of O322-RA-2015

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 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. Tide Reducer Stations

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

The NWLON station Port Alexander, AK (9451054) will provide water level reducers for this project. Therefore it is critical that it remain in operation during the survey. See Sections 1.1. and 1.2. concerning responsibilities.

No leveling is required at Port Alexander, AK (9451054) by NOAA's Rainier 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 or photogrammetry 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 Section 1.2. 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 smooth 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.

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, a minimum of 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 discrete 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 station is required pending on the GPS buoy data analysis:

| Station Number | Station Name | Approximate Latitude (N) | Approximate Longitude (W) |
|---|---|---|---|
| 945AAAA ** | Southern end of Security Bay, AK | 56° 49.5' | 134° 18.2' |

** 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/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/Engineering Division personnel at nos.coops.oetteam@noaa.gov prior to the installation of the gauge.**

### 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.

### 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 stations 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 CO-OPS' 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 CO-OPS' 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/Engineering Division (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 |
|---|---|
| 945AAAA | ELEV. 25.3°<br>AZIMUTH(T) 180.8° |

**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. 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 Port Alexander, AK (9451054) will provide residuals for this project and must remain in operation during all periods of hydrography.

| Station Number | Station Name | Latitude(N) | Longitude(W) |
|---|---|---|---|
| **9451054** | **Port Alexander, AK** | **56° 14.8'** | **134° 38.8'** |

**1.4. Tidal Constituent and Residual Interpolation (TCARI)**

**1.4.1.** For hydrography in the area of Chatham Strait, AK, apply the TCARI grid "O322RA2015.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 Diagram(s)**

A diagram created in Mapinfo, 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

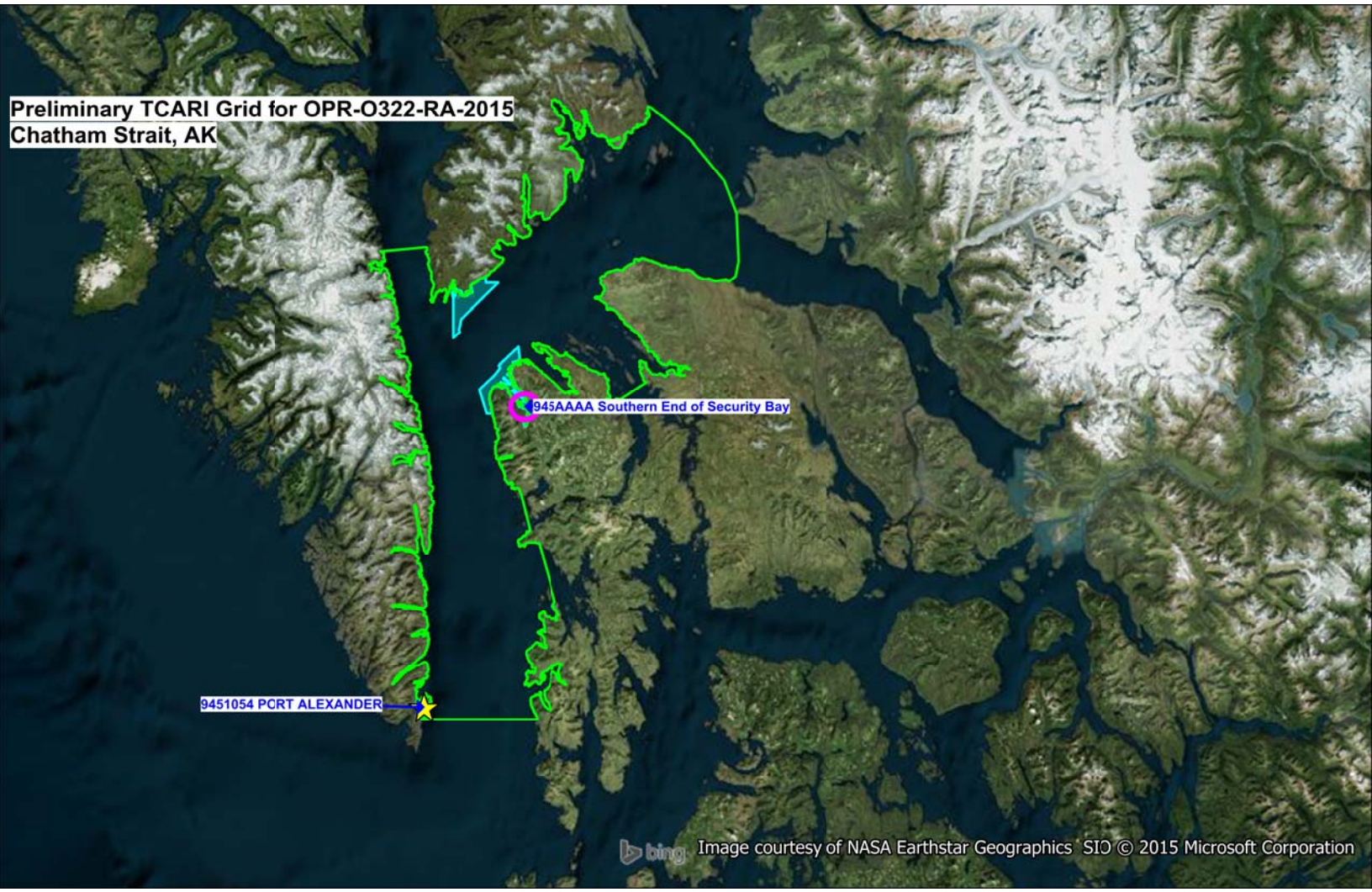
Preliminary and verified six minute water level time series data may be retrieved from the CO-OPS database via the Fetchtides application. Fetchtides provides a mechanism to store imported data locally and combines multiple days of data into one CARIS readable tide (.tid) file. Fetchtides is available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

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 TCARI Grid for OPR-O322-RA-2015
Chatham Strait, AK
945AAAA Southern End of Security Bay
9451054 PORT ALEXANDER
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