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

Final Project Instruction

Date Submitted: April 1, 2013

Platform: NOAA Ship *Rainier*

Project Number: RA-13-01

Project Title: Chatham Strait, Alaska

Project Dates: **April 30, 2013 to July 3, 2013**

Prepared by: _____ Dated: April 1, 2013
Digitally signed by MOSER.MARC.STANTON.1163193902
DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=NOAA, cn=MOSER.MARC.STANTON.1163193902
Date: 2013.04.01 08:13:25 -04'00'
LCDR Marc S. Moser, NOAA
Chief, Operations Branch
Hydrographic Surveys Division

Approved by: _____ Dated: _____
Date: 2013.04.01 08:21:39 -04'00'
Jeffrey Ferguson
Chief, Hydrographic Surveys Division
Office of Coast Survey

Approved by: _____ Dated: _____
Digitally signed by BLAKE.WADE.JAMES.1025936538
DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=NOAA, cn=BLAKE.WADE.JAMES.1025936538
Date: 2013.04.19 08:53:23 -07'00'
Captain Wade J. Blake, NOAA
Commanding Officer
Marine Operations Center – Pacific

I. Overview

A. Brief Summary and Project Period

B. Service Level Agreements

Of the 48 DAS scheduled for this project, 48 DAS are base funded in support of NOS, 0 DAS are program funded. This project is estimated to exhibit a high Operational Tempo.

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

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

D. Summary of Objectives

To support safe navigation though 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

N/A

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

Name (Last, First)	Title	Date Aboard	Date Disembark	Gender	Affiliation	Nationality
Froelich, Grant	Physical Scientist	04/22/13	05/16/13	Male	OCS	US
Faulkes, Tyanne	Physical Scientist	05/20/13	05/31/13	Female	OCS	US
Scharff, David	Physical Scientist	05/20/13	05/31/13	Male	OCS	US
Argento, Adam	Physical Scientist	06/16/13	07/18/13	Male	OCS	US
Lathrop, Mark	Physical Scientist	06/16/13	06/28/13	Male	OCS	US

G. Administrative

1. Points of Contacts:

Principle Investigator:

LCDR Marc S. Moser, NOAA
Chief, Operations Branch
Hydrographic Surveys Division
1315 East West Hwy, #6854
Silver Spring, MD 20910
(301) 713-2702 x112
Marc.S.Moser@noaa.gov

Project Coordinator:

Megan Greenaway
Physical Scientist, Operations Branch
Hydrographic Surveys Division
1315 East West Hwy
Silver Spring, MD 20910
(757)-446-6746 x209
Megan.Greenaway@noaa.gov

Chief Scientist:

CDR Richard T. Brennan, NOAA
Commanding Officer, NOAA Ship *Rainier*
2002 SE Marine Science Drive
Newport, OR 97365
206-660-8747
CO.Rainier@noaa.gov

2. Diplomatic Clearances

N/A

3. Licenses and Permits

Planned hydrographic surveys are included in the OCS National Environmental Policy Act (NEPA) analysis and the Programmatic Environmental Assessment for the Office of Coast Survey Hydrographic Survey Projects, dated June 2012.

II. Operations

A. Project Itinerary

Itinerary will be based upon the ship's schedule and executed under the direction of the Commanding Officer. Every effort shall be made by the Commanding Officer to maximize the operational efficiency of assigned projects.

B. Staging and Destaging

N/A

C. Operations to be Conducted

Hydrographic survey operations per the appended project instructions using four survey launches up to 10 hr/day for data acquisition and project field support. Additionally, the ability 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.

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 (itemized)

1 Four fully outfitted and operational survey launches to support shallow water survey operations utilizing hull mounted side scan sonar, multibeam, and vertical beam sonar systems.

2 Ship fully outfitted with hydrographic survey equipment to support multibeam survey operations.

3 Personnel to staff and 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 per day concurrently, at the discretion of the command to ensure the most efficient survey operations.

4 A fully staffed survey department to efficiently manage the project's data processing requirements.

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

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

IV. Hazardous Materials

A. Policy and Compliance

The Chief Scientist is responsible for complying with FEC 07 Hazardous Materials and Hazardous Waste Management Requirements for Visiting Scientific Parties (or the OMAO

procedure that supersedes it). By Federal regulations and NOAA Marine and Aviation Operations policy, the ship may not sail without a complete inventory of all hazardous materials by name and the anticipated quantity brought aboard, MSDS and appropriate neutralizing agents, buffers, or absorbents in amounts adequate to address spills of a size equal to the amount of chemical brought aboard, and a chemical hygiene plan. Documentation regarding those requirements will be provided by the Chief of Operations, Marine Operations Center, upon request.

Per FEC 07, the scientific party will include with their project instructions and provide to the CO of the respective ship 60 to 90 days before departure:

- A list of hazardous materials by name and anticipated quantity
- Include a chemical spill plan the addresses all of the chemicals the program is bringing aboard. This shall include:
    - Procedures on how the spilled chemicals will be contained and cleaned up.
    - A complete inventory (including volumes/amounts) of the chemical spill supplies and equipment brought aboard by the program. This must be sufficient to clean and neutralize all of the chemicals brought aboard by the program.
    - A list of the trained personnel that will be accompanying the project and the training they've completed.

Upon embarkation and prior to loading hazardous materials aboard the vessel, the scientific party will provide to the CO or their designee:

- An inventory list showing actual amount of hazardous material brought aboard
- An MSDS for each material
- Confirmation that neutralizing agents and spill equipment were brought aboard sufficient to contain and cleanup all of the hazardous material brought aboard by the program.

Upon departure from the ship, scientific parties will provide the CO or their designee an inventory of hazardous material indicating all materials have been used or removed from the vessel. The CO's designee will maintain a log to track scientific party hazardous materials. MSDS will be made available to the ship's complement, in compliance with Hazard Communication Laws.

Scientific parties are expected to manage and respond to spills of scientific hazardous materials. Overboard discharge of scientific chemicals is not permitted during projects aboard NOAA ships.

B. Radioactive Isotopes

The Chief Scientist is responsible for complying with OMAO 0701-10 Radioactive Material aboard NOAA Ships. Documentation regarding those requirements will be provided by the Chief of Operations, Marine Operations Center, upon request.

At least three months in advance of a domestic project and eight months in advance of a foreign project start date the shall submit required documentation to MOC-CO, including:

1. NOAA Form 57-07-02, Request to Use Radioactive Material aboard a NOAA Ship

2. Draft Project Instructions
3. Nuclear Regulatory Commission (NRC) Materials License (NRC Form 374) or a state license for each state the ship will operate in with RAM on board the ship.
4. Report of Proposed Activities in Non-Agreement States, Areas of Exclusive Federal Jurisdiction, or Offshore Waters (NRC Form 241), if only state license(s) are submitted).
5. MSDS
6. Experiment or usage protocols, including spill cleanup procedures.

Scientific parties will follow responsibilities as outlined in the procedure, including requirements for storage and use, routine wipe tests, signage, and material disposal as outline in OMAO 0701-10.

All radioisotope work will be conducted by NRC or State licensed investigators only, and copies of these licenses shall be provided per OMAO 0701-10 at least three months prior to the start date of domestic projects and eight months in advance of foreign project start dates.

C. Inventory (itemized) of Radioactive Materials

V. Additional Projects

A. Supplementary ("Piggyback") Projects

1. S-M921-FARA-13 Offshore Washington and Oregon

2. OPR-O373-RA-13 Sumner Strait and Affleck Canal, AK

3. OPR-O193-RA-13 Behm Canal, AK

B. NOAA Fleet Ancillary Projects

VI. Disposition of Data and Reports

A. Data Responsibilities

B. Pre and Post Project Meeting

Prior to departure, the Chief Scientist will conduct a meeting of the scientific party to train them in sample collection and inform them of project objectives. Some vessel protocols, e.g., meals, watches, etiquette, etc. will be presented by the ship's Operations Officer.

Post-Project Meeting: Upon completion of the project, a meeting will normally be held at 0830 (unless prior alternate arrangements are made) and attended by the ship's officers, the Chief Scientist and members of the scientific party to review the project. Concerns regarding safety, efficiency, and suggestions for improvements for future projects should be discussed. Minutes of the post-project meeting will be distributed to all participants by email, and to the Commanding Officer and Chief of Operations, Marine Operations Center.

C. Ship Operation Evaluation Report

Within seven days of the completion of the project, a Ship Operation Evaluation form is to be completed by the Chief Scientist. The preferred method of transmittal of this form is via email to omao.customer.satisfaction@noaa.gov. If email is not an option, a hard copy may be forwarded to:

Director, NOAA Marine and Aviation Operations
NOAA Office of Marine and Aviation Operations
8403 Colesville Road, Suite 500
Silver Spring, MD 20910

VII. 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 survey.

Berthing requirements, including number and gender of the scientific party, will be provided to the ship by the Chief Scientist. The Chief Scientist and 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. The Chief Scientist is responsible for ensuring the scientific berthing spaces are left in the condition in which they were received; for stripping bedding and linen return; and for the return of any room keys which were issued. The Chief Scientist is also responsible for the cleanliness of the laboratory spaces and the storage areas utilized by the scientific party, both during the project and at its conclusion prior to departing the ship.

All NOAA scientists will have proper travel orders when assigned to any NOAA ship. The Chief Scientist will ensure that all non NOAA or non Federal scientists aboard also have proper orders. It is the responsibility of the Chief Scientist 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 7, 1999 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, Revised: 02 JAN 2012) must be completed in advance by each participating scientist. The NHSQ can be obtained from the Chief Scientist or the NOAA website http://www.corporateservices.noaa.gov/~noaaforms/eforms/nf57-10-01.pdf. The completed form should be sent to the Regional Director of Health Services at Marine Operations Center. The participant can mail, fax, or scan the form into an email using the contact information below. The NHSQ should reach the Health Services Office no later than 4 weeks prior to the project to allow time for the participant to obtain and submit additional information that health services might require before clearance to sail can be granted. Please contact MOC Health Services with any questions regarding eligibility or completion of the NHSQ. Be sure to include proof of tuberculosis (TB) testing, sign and date the 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.

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 Chief Scientist must provide an electronic listing of emergency contacts to the Executive Officer for all members of the scientific party, with the following information: contact name, address, relationship to member, and telephone number.

C. Shipboard Safety

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. Steel-toed shoes are required to participate in any work dealing with suspended loads, including CTD deployments and recovery. The ship does not provide steel-toed boots. Hard hats are also 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.

D. Communications

A progress report on operations prepared by the Chief Scientist may be relayed to the program office. Sometimes it is necessary for the Chief Scientist to communicate with another vessel, aircraft, or shore facility. Through various means of communications, the ship can usually accommodate the Chief Scientist. 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 e-mail 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 it must be arranged at least 30 days in advance.

E. IT Security

Any computer that will be hooked into the ship's network must comply with the *NMAO 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 these 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

All foreign national access to the vessel shall be in accordance with NAO 207-12 and RADM De Bow's March 16, 2006 memo (http://deemedexports.noaa.gov). National Marine Fisheries Service personnel will use the Foreign National Registration System (FRNS) to submit requests for access to NOAA facilities and ships. The Departmental Sponsor/NOAA (DSN) is responsible for obtaining clearances and export licenses and for providing escorts required by the NAO. DSNs should consult with their designated NMFS Deemed Exports point of contact to assist with the process.

The following are basic requirements. Full compliance with NAO 207-12 is required.

Responsibilities of the Chief Scientist:

1. Provide the Commanding Officer with the e-mail generated by the FRNS granting approval for the foreign national guest's visit. This e-mail will identify the guest's DSN and will serve as evidence that the requirements of NAO 207-12 have been complied with.
2. Escorts – The Chief Scientist is responsible to provide escorts to comply with NAO 207-12 Section 5.10, or as required by the vessel's DOC/OSY Regional Security Officer.
3. Ensure all non-foreign national members of the scientific party receive the briefing on Espionage Indicators (NAO 207-12 Appendix A) at least annually or as required by the servicing Regional Security Officer.
4. Export Control - Ensure that approved controls are in place for any technologies that are subject to Export Administration Regulations (EAR).

The Commanding Officer and the Chief Scientist will work together to implement any access controls necessary to ensure no unlicensed export occurs of any controlled technology onboard regardless of ownership.

Responsibilities of the Commanding Officer:

1. Ensure only those foreign nationals with DOC/OSY clearance are granted access.
2. Deny access to OMAO platforms and facilities by foreign nationals from countries controlled for anti-terrorism (AT) reasons and individuals from Cuba or Iran without written NMAO approval and compliance with export and sanction regulations.
3. Ensure foreign national access is permitted only if unlicensed deemed export is not likely to occur.
4. Ensure receipt from the Chief Scientist or the DSN of the FRNS e-mail granting approval for the foreign national guest's visit.
5. Ensure Foreign Port Officials, e.g., Pilots, immigration officials, receive escorted access in accordance with maritime custom to facilitate the vessel's visit to foreign ports.
6. Export Control - 8 weeks in advance of the project, provide the Chief Scientist with a current inventory of OMAO controlled technology onboard the vessel and a copy of the vessel Technology Access Control Plan (TACP). Also notify the Chief Scientist of any OMAO-sponsored foreign nationals that will be onboard while program equipment is aboard so that the Chief Scientist can take steps to prevent unlicensed export of Program controlled technology. The Commanding Officer and the Chief Scientist will work together to implement any access controls necessary to ensure no unlicensed export occurs of any controlled technology onboard regardless of ownership.
7. Ensure all OMAO personnel onboard receive the briefing on Espionage Indicators (NAO 207-12 Appendix A) at least annually or as required by the servicing Regional Security Officer.

Responsibilities of the Foreign National Sponsor:

1. Export Control - The foreign national's sponsor is responsible for obtaining any required export licenses and complying with any conditions of those licenses prior to the foreign national being provided access to the controlled technology onboard regardless of the technology's ownership.
2. The DSN of the foreign national shall assign an on-board Program individual, who will be responsible for the foreign national while on board. The identified individual must be a U.S. citizen, NOAA (or DOC) employee. According to DOC/OSY, this requirement cannot be altered.
3. Ensure completion and submission of Appendix C (Certification of Conditions and Responsibilities for a Foreign National

Appendices

1. Primary Project Instructions: OPR-O322-RA-13, Chatham Strait, AK

2. Piggyback Project Instructions: S-M921-FARA-13 Offshore Washington and Oregon

3. Piggyback Project Instructions: OPR-O373-RA-13 Sumner Strait and Affleck Canal, AK

4. Piggyback Project Instructions: OPR-O193-RA-13 Behm Canal, AK

Hydrographic Survey Project Instructions

Project Name:	Chatham Strait, AK
Project Number:	OPR-O322-RA-13
Assigned Field Unit:	NOAA Ship *Rainier*
Assigned Processing Branch:	Pacific Hydrographic Branch
Signed Date:	04/01/2013
Project Instructions Version:	Final
Planned Acquisition Time:	Start Date: 04/2013 End Date: 06/2013
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, tug and barges use the waterway on a regular basis as do larger ships when avoiding storms in the Gulf of Alaska. The project will cover approximately 183 square nautical miles of critical and category one areas as identified in the 2010 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 2012
NOS Field Procedures Manual for Hydrographic Surveying (FPM), April 2012
Hydrographic Survey Technical Directive (HTD) 2011-03: XML Reports
Hydrographic Survey Technical Directive (HTD) 2012-2: Configuration Management
Hydrographic Survey Technical Directive (HTD) 2012-5: CARIS 7.1

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

Registry Number	*Priority*	*Sublocality*	*State or Territory*	*Scale*	*Estimated SNM*	*Instructions*
H12531	1	Cape Ommaney	Alaska	5000	20	
H12532	2	Hoggatt Bay to Patterson Pt	Alaska	10000	13	
H12533	3	Red Bluff Bay and Vicinity	Alaska	10000	9	
H12534	4	Offshore SW Chatham Strait	Alaska	40000	30	
H12535	5	Offshore SE Chatham Strait	Alaska	40000	31	
H12536	6	Pt Sullivan to Pt Ellis	Alaska	10000	15	
H12537	7	Offshore NW Chatham Strait	Alaska	40000	44	
H12538	8	Offshore NE Chatham Strait	Alaska	40000	27	
H12541	9	Vicinity of Washington Bay	Alaska	5000	5	
H12539	10	Security Bay and Vicinity	Alaska	20000	12	
H12540	11	Murder Cove and Vicinity	Alaska	10000	11	

Coverage & Limits:

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: Complete Coverage

Instructions:

Coverage Water Depth	*Coverage Required*
Inshore limit to 8 meters water depth	25 m spaced Set Line Spacing SBES or MBES with Time Series Backscatter
Greater than 8 meters water depth	Multibeam with Time Series Backscatter

Assigned Tasks

Acknowledgement:
Acknowledge receipt of these instructions and submit any comments or questions via email to Megan Greenaway at Megan.Greenaway@noaa.gov.

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.

Feature Investigations:	
Investigate AWOIS items in accordance with section 2.2.2.2 and 2.5.4.1 of the FPM. Investigate Maritime Boundary Points in accordance with section 3.5.6 of the FPM.	
Number of assigned AWOIS Items for Information Only:	0
Number of assigned AWOIS Items for Full Investigation:	2
Number of assigned Maritime Boundary Claim Items: *(when safety permits, search inshore of the NALL line for these maritime boundary features)*	9

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). The field unit should review the recommended bottom sample locations with the survey data acquired. Contact HSD Operations Branch to discuss modifying the bottom sample plan if the data suggest more appropriate locations for the bottom samples to better differentiate varying bottom characteristics within the survey area when compared to the sample plan provided. This may increase or decrease the sample density but should closely maintain the same numbers of samples per survey as originally assigned.

Chart Comparison:

Use only the latest editions of the largest scale NOS charts covering the project area. These charts are listed below and will be included with project data from Operations Branch. Compare in accordance with section 4.5 of the FPM and section 8.1.4, D.1 of the HSSD. Resolve any discrepancies in the field and explain them in the Descriptive Report.

Affected Raster Charts

Chart Number	*Scale*	*Edition Number*	*Edition Date*	*LNM Date*	*NM Date*
17320	217828	18	03/2008	03/04/2008	03/01/2008
17330	20000	9	11/2007	11/13/2007	11/17/2007
17331	10000	8	06/2007	05/29/2007	06/09/2007
17335	20000	8	11/2011	10/25/2011	11/12/2011
17336	20000	9	03/2007	02/13/2008	03/03/2007
17368	40000	7	08/2006	08/22/2006	08/26/2006
17370	10000	11	06/2006	06/06/2006	06/17/2006

Affected ENCs

ENC Name	*Scale*	*Edition*	*Update Application Date*	*Issue Date*	*Preliminary*
US3AK4PM	217828	9	03/21/2011	09/20/2012	NO
US5AK07E	20000	99999	02/25/2013	02/25/2013	YES
US5AK08E	10000	99999	02/25/2013	02/25/2013	YES
US5AK2XE	20000	99999	02/25/2013	02/25/2013	YES
US5AK2YE	20000	99999	02/25/2013	02/25/2013	YES
US5AK3TM	40000	5	06/01/2012	10/04/2012	NO
US5AK0FE	10000	99999	02/25/2013	02/25/2013	YES

Coast Pilot:

Review and make recommendations for changes to the U.S. Coast Pilot 8. 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 with a copy to the project planner and the assigned Processing Branch. The report should be submitted as soon as possible following field work for the project. NOAA field units should 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 2.2.2.6 and 4.5.2 of the FPM.

Registry Number	*Scale*	*Year*	*Platform*	*Relative Location*
H10677	40000	1996	NOAA Ship *Rainier*	NE
H10679	10000	1996	NOAA Ship *Rainier*	NE
H11707	10000	2007	Fugro Pelagos, Inc.	N
H11708	20000	2007	Fugro Pelagos, Inc.	N
H12064	20000	2010	NOAA Ship *Fairweather*	S
H12185	20000	2010	NOAA Ship *Fairweather*	SE
H12370	10000	2011	NOAA Ship *Fairweather*	S
H12372	10000	2011	NOAA Ship *Fairweather*	S
H12373	10000	2011	NOAA Ship *Fairweather*	S
H12374	10000	2011	NOAA Ship *Fairweather*	S

Progress Reports:

Email monthly progress reports in accordance with section 5.2.2.2.1 of the FPM to progress.sketches@noaa.gov with a copy to the chief of the assigned Processing Branch. The submittal is due within 5 days after the end of each month.

Survey Outlines:

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

Horizontal Control Requirements:

Horizontal control shall meet requirements in Section 3 of the HSSD.

Vertical Control Requirements:

Note the subordinate gauge, Red Bluff Bay, installation is pending due to USFS permit approval.

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.

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*
Red Bluff Bay, AK	9451467	YES	YES	YES

Orthometric Imagery:

The following orthometric imagery has been included on the project CD for reference:

File Name	*Source*	*Source Image Date*
01JUN11WV02.tif	NGA	06/01/2011
01JUN11WV02_p003.tif	NGA	06/01/2011
01JUN11WV02_P004.tif	NGA	06/01/2011
07JUN10WV01.tif	NGA	06/07/2010
07JUN10WV01_P001.tif	NGA	06/07/2010
08apr12qb02_p003.tif	NGA	04/08/2012
08APR12QB02_sub1.tif	NGA	04/08/2012
08APR12QB02_sub2.tif	NGA	04/08/2012
13MAY11WV01.tif	NGA	05/13/2011
13MAY11WV02.tif	NGA	05/13/2011

Shoreline and Nearshore Features:

A limited shoreline verification will be accomplished using the composite source file (CSF). The CSF was compiled from GC 10948, 10569, Preliminary ENCs and ENCs. Preliminary analysis of the nautical chart and imagery was conducted at HSD OPS. All other submerged or visible cultural features inside the limit of survey shall be verified. All features with attribute asgnmt populated with 'Assigned' shall be verified even if they are inshore of NALL. For reference, prior survey features are provided in S57 format on the project CD. See section 3.5.5.2.2 of the FPM.

Number of Assigned Features:	884

GC Number	*Horizontal Position Accuracy*
10948	10 meters
GC Number	*Horizontal Position Accuracy*
10569	10 meters

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).

NOAA Navigation Manager, AK
LT Matthew Forney
NOAA
4230 University Blvd #102
Anchorage, Alaska 99508
Phone: 907-271-3327
Fax: 206-491-8913
Email: Matthew. Forney@noaa.gov
Obligation: Mandatory

Seventeeth U.S. Coast Guard District, Commander (DPW)
Jim Helfinstine
USCG
P.O. Box 25517
Juneau, Alaska 99802
Phone: 907-463-2268
Fax:
Email: James.N.Helfinstine@uscg.mil
Obligation: For Reference

U.S. Army Corps of Engineers Alaska District, Office of the District Engineer
Col. Christopher D. Lestochi
USACE
P.O. Box 6898
Joint Base Elmendorf-Richardson, Alaska 99506
Phone: 907-753-2522
Fax:
Email:
Obligation: For Reference

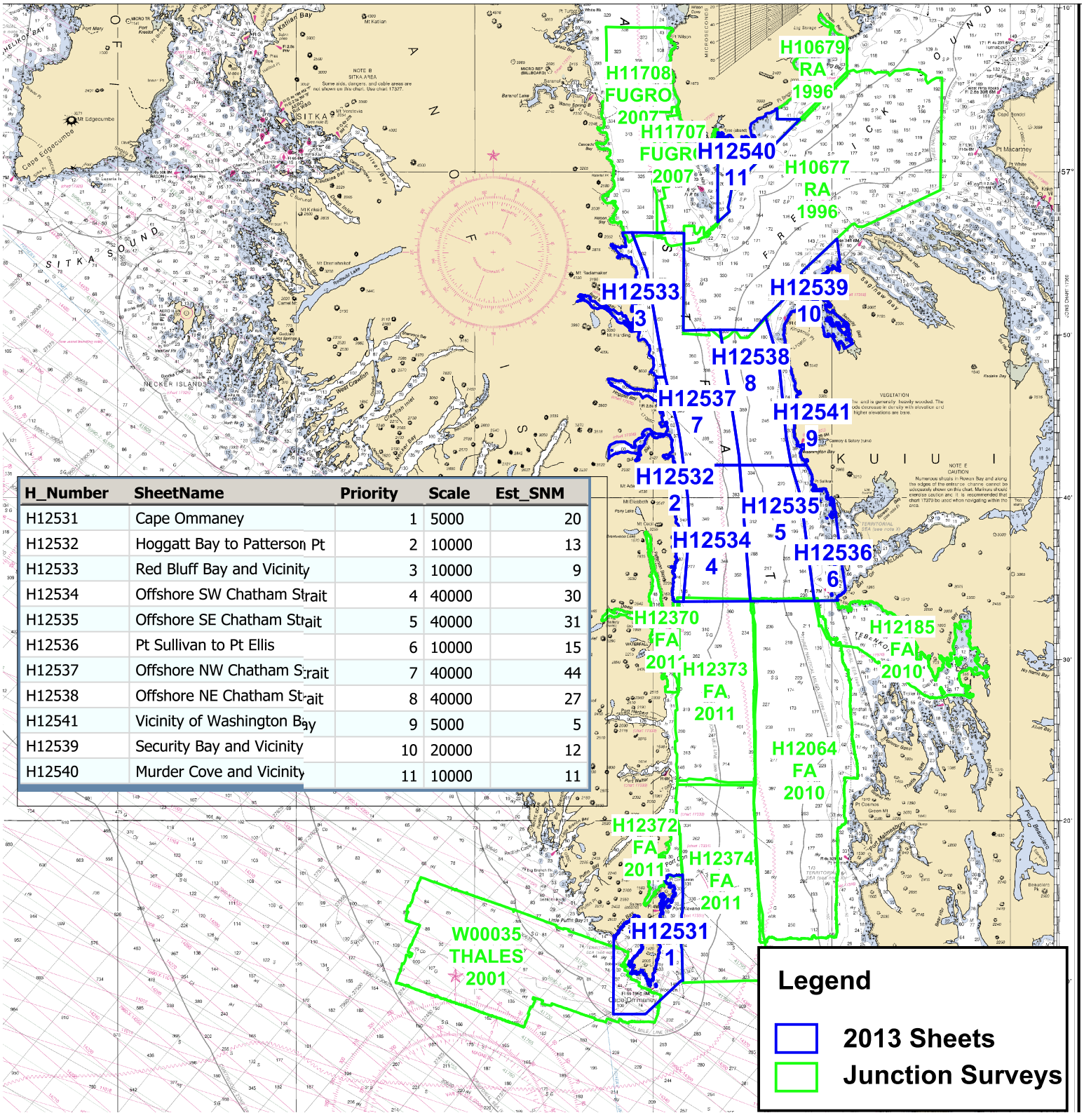
Southeast Alaska Pilots' Association
Capt. Larry Pullin, President
1621 Tongass Avenue
Suite 300
Ketchikan, Alaska 99901
Phone: 907-225-9696
Fax: 907-247-9696
Email: pilots@seapa.com
Obligation: For Reference

Alaska State Historical Preservation Officer (HPPOC)

Judith E. Bittner
Alaska DNR, Office of History and Archaeology
550 West 7th Avenue
Suite 1310
Anchorage, Alaska 99501
Phone: 907-269-8721
Fax: 907-269-8908
Email: judy.bittner@alaska.gov
Obligation: For Reference

OPR-O322-RA-13
Chatham Strait, AK
Sheet Layout
03/14/13

Total SNM: 217
Critical Area SNM: 34



H_Number	SheetName	Priority	Scale	Est_SNM
H12531	Cape Ommaney	1	5000	20
H12532	Hoggatt Bay to Patterson Pt	2	10000	13
H12533	Red Bluff Bay and Vicinity	3	10000	9
H12534	Offshore SW Chatham Strait	4	40000	30
H12535	Offshore SE Chatham Strait	5	40000	31
H12536	Pt Sullivan to Pt Ellis	6	10000	15
H12537	Offshore NW Chatham Strait	7	40000	44
H12538	Offshore NE Chatham Strait	8	40000	27
H12541	Vicinity of Washington Bay	9	5000	5
H12539	Security Bay and Vicinity	10	20000	12
H12540	Murder Cove and Vicinity	11	10000	11

WATER LEVEL INSTRUCTIONS
OPR-O322-RA-2013 Revised Chatham Strait, AK
(3/5/2013 CFL)

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 2012, and OCS Field Procedures Manual (FPM), dated May 2012. 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, email data transmissions through TIDEBOT, or through regular communications with CO-OPS/Engineering Division (ED) 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/ED (Colleen Roche, 301-713-2897 ext. 137, Email: nos.coops.oetteam@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	

Table 1: All stations that need to be added to the HHL in support of O322-RA-2013

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 eyeball icon 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.

1.3. Tide Reducer Stations

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

The NWLON station at 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 (9451054) by NOAA Ship 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 stations are required:

Station Number	Station Name	Approximate Latitude (N)	Approximate Longitude (W)
9451467 *	Red Bluff Bay, AK	56° 51.4'	134° 43.4'

* Historical water level station information has been provided for this station.

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 station is needed at CO-OPS so that the station(s) 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 the CO-OPS/ED (Colleen Roche) at 301-713-2897 ext. 137 or FAX 301-713-4465 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 Operational Engineering Team (OET; nos.coops.oetteam@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**
9451467	ELEV. 25.3°

AZIMUTH(T) 180.3°

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 Approaches to Fernandina Beach, apply the TCARI grid "O322RA2013.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 Pydro, 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. TideBot

Preliminary and verified six minute water level time series data may be retrieved from the CO-OPS database via TideBot application. TideBot delivers timely preliminary/verified tidal and Great Lakes six minute water level observations via email to users on a scheduled, recurring basis. To access TideBot through an email account, send an email to TideBot@noaa.gov with the word "help" as the subject. An email reply will be sent with instructions on how to subscribe to TideBot for time series data retrieval. Six minute preliminary and verified data may also 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 by clicking on "Six Minute Data".

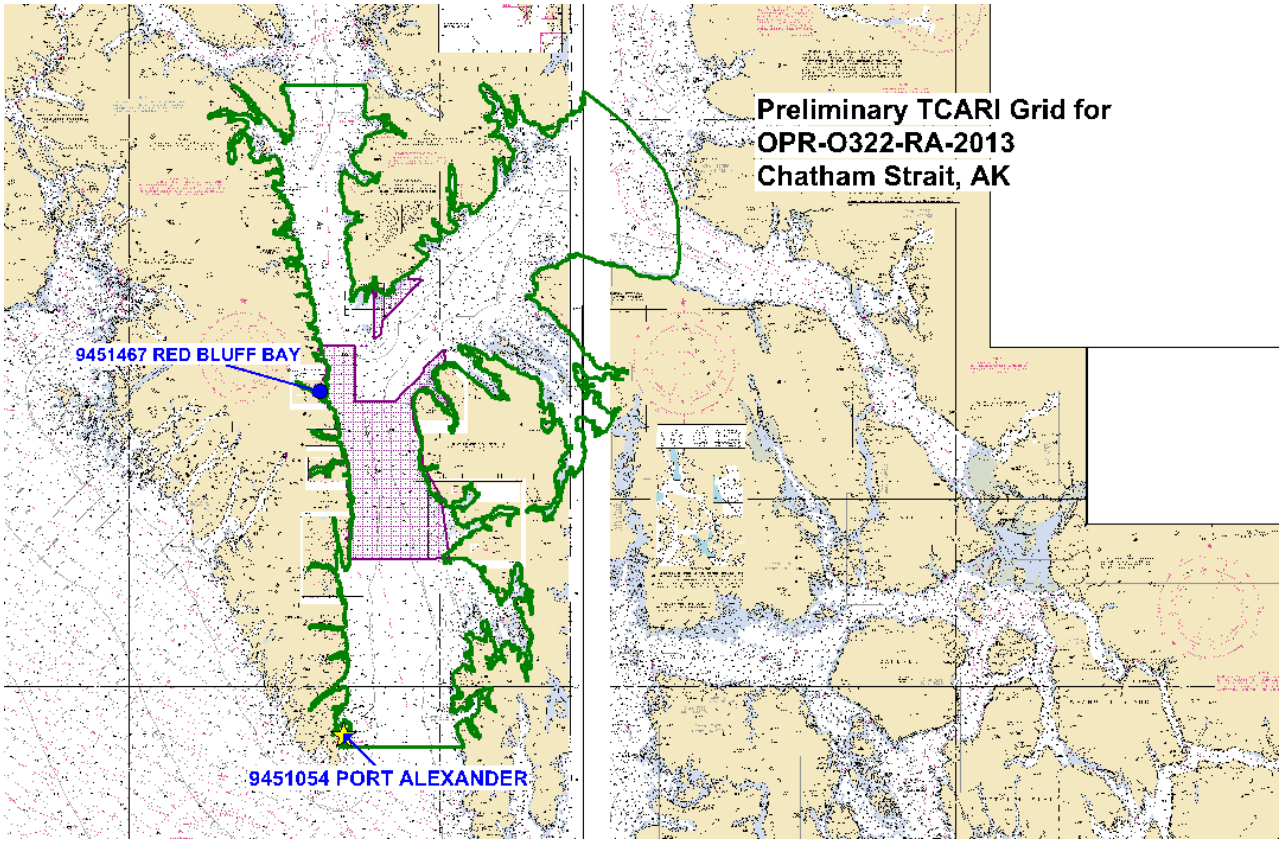
Alternately, users may download preliminary and verified six minute water level time series data from the CO-OPS database via the Fetchtides application. Fetchtides provides a mechanism to store imported data locally and combine multiple days worth of data into one CARIS readable tide (.tid) file. Fetchtides 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-2013
Chatham Strait, AK
9451467 RED BLUFF BAY
9451054 PORT ALEXANDER

Hydrographic Survey Project Instructions

Project Name:	Offshore Washington and Oregon
Project Number:	S-M921-FARA-13
Assigned Field Unit:	NOAA Ship *Rainier*
Assigned Processing Branch:	Pacific Hydrographic Branch
Signed Date:	03/21/2013
Project Instructions Version:	Final
Planned Acquisition Time:	Start Date: 03/2013 End Date: 12/2013
Delivery Dates:	120 days from completion of data acquisition.

Purpose and Location:
The purpose of this project is to acquire multibeam backscatter data during RAINIER's transits from their home port of Newport, OR and their working grounds in Washington and Alaska.
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 Field Procedures Manual for Hydrographic Surveying (FPM), April 2012
NOS Hydrographic Surveys Specifications and Deliverables Manual (HSSD), April 2012
Hydrographic Survey Technical Directive (HTD): 2011-3 XML Reports
Hydrographic Survey Technical Directive (HTD): 2012-5 CARIS 7.1
Hydrographic Survey Technical Directive (HTD): 2012-2 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: Offshore Washington and Oregon

Registry Number	*Priority*	*Sublocality*	*State or Territory*	*Scale*	*Estimated SNM*	*Instructions*
D000175	2	Oregon - Washington Coast	Oregon Washington	40000	400	

Coverage & Limits:

Inshore Limit:There is no inshore limit defined for this survey.

Coverage Type: None Specified
Instructions:Acquire multibeam backscatter data in assigned areas

Coverage Water Depth	*Coverage Required*
All waters in survey area	Multibeam and Backscatter

Assigned Tasks

Acknowledgement:

Acknowledge receipt of these instructions and submit any comments or questions via email to Lori Powdrell at Lori.Knell@noaa.gov.

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.

Feature Investigations:

There are no AWOIS or Maritime Boundary requirements for this project.

Bottom Samples:

There is no Bottom Sample requirement for this project.

Chart Comparison:

There is no Chart Comparison requirement for this project.

Coast Pilot:

There is no Coast Pilot requirement for this project.

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:
No junctioning surveys have been provided for this project.

Progress Reports:
Email monthly progress reports in accordance with section 5.2.2.2.1 of the FPM to progress.sketches@noaa.gov with a copy to the chief of the assigned Processing Branch. The submittal is due within 5 days after the end of each month.

Survey Outlines:
Generate a survey outline in accordance with the HSSD, section 8.1.2. Survey outlines should be sent to survey.outlines@noaa.gov.

Special Data Handling Requirements:
ATTENTION: Field Unit and Processing Branch The raw data shall be submitted to NGDC at the end of the year. The HVF shall be e-mailed to Dr. Waldo W. Wakefield II. Survey Outline should be submitted as normal.

Horizontal Control Requirements:
There is no Horizontal Control requirement for this project.

Vertical Control Requirements:
There is no Vertical Control requirement for this project.

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

Shoreline and Nearshore Features:
There is no Shoreline Verification requirement for this project.

S-M921-FARA-13
Offshore Washington and Oregon
Sheet Layout
1/8/13 LK

Total SNM 400
Critical Area SNM 0

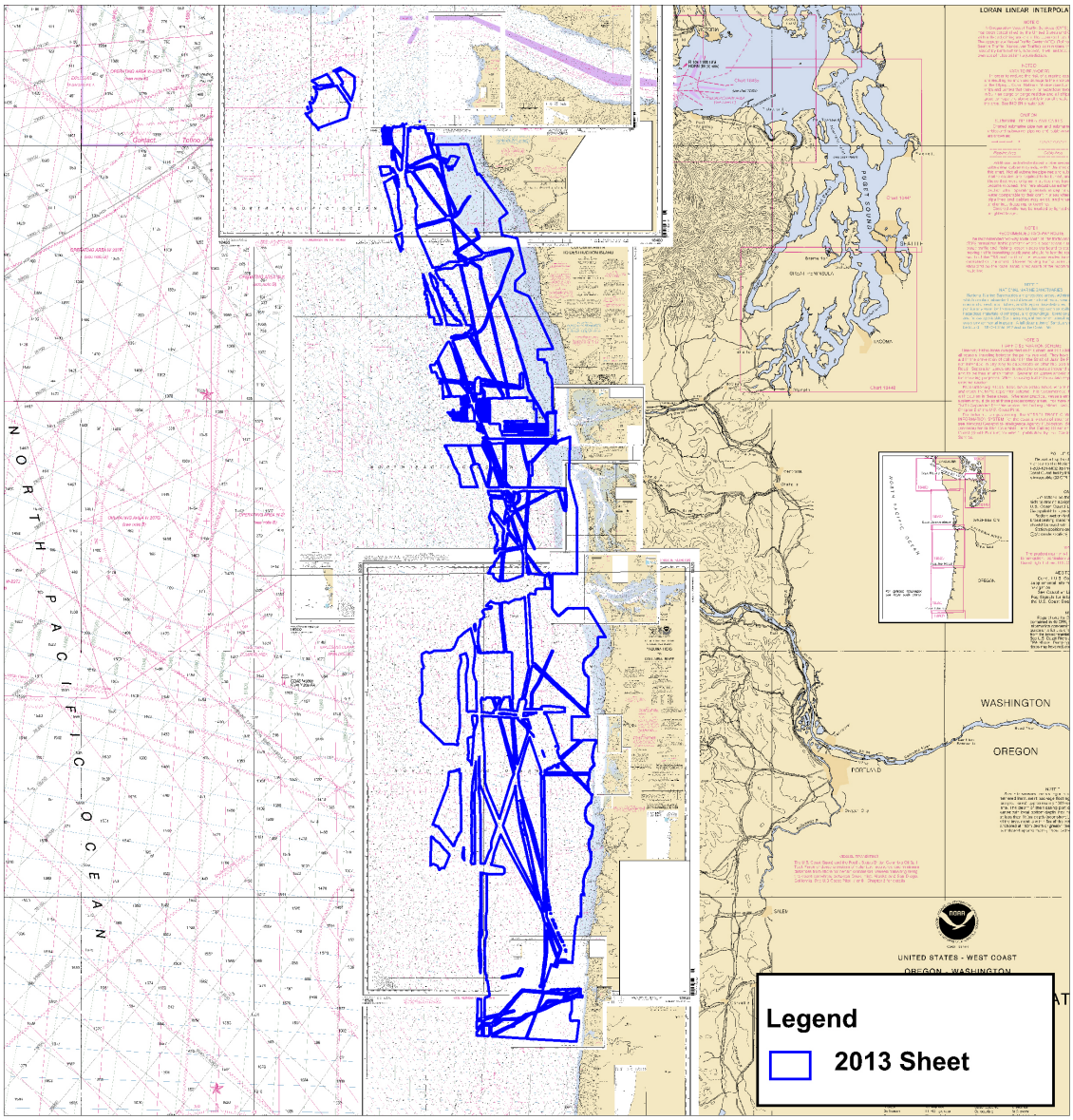


Figure: 1 - S-M921-FARA-13

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).

Research Fish Biologist
Dr. Waldo W. Wakefield II
National Marine Fisheries Service
2032 SE OSU Drive
Newport, Oregon 97365
Phone: 541-867-0542
Fax: 541-867-0505
Email: waldo.wakefield@noaa.gov
Obligation: Mandatory

Northwest Navigation Manager
Crescent Moegling
NOAA
7600 Sandy Point Way NE
Building 3
Seattle, Washington 98115
Phone: 206-526-4514
Fax:
Email: crescent.moegling@noaa.gov
Obligation: Mandatory

Hydrographic Survey Project Instructions

Project Name:	Behm Canal, AK
Project Number:	OPR-O193-RA-13
Assigned Field Unit:	NOAA Ship *Rainier*
Assigned Processing Branch:	Pacific Hydrographic Branch
Signed Date:	03/21/2013
Project Instructions Version:	Final
Planned Acquisition Time:	Start Date: 04/2013 End Date: 06/2013
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. This project will cover approximately 70 square nautical miles of critical 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 2012
NOS Field Procedures Manual for Hydrographic Surveying (FPM), April 2012
Hydrographic Survey Technical Directive (HTD): 2012-2 Configuration Management
Hydrographic Survey Technical Directive (HTD): 2012-5 CARIS 7.1
Hydrographic Survey Technical Directive (HTD): 2011-3 XML Reports

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: Behm Canal

Registry Number	*Priority*	*Sublocality*	*State or Territory*	*Scale*	*Estimated SNM*	*Instructions*
H12518	1	Vicinity of Burroughs Bay	Alaska	40000	31	
H12519	2	Chickamin River to Sargent Bay	Alaska	40000	39	

Coverage & Limits:

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: Complete Coverage

Instructions:

Coverage Water Depth	*Coverage Required*
Inshore limit to 8 meters water depth	25 m spaced Set Line Spacing SBES or MBES with backscatter
Greater than 8 meters water depth	Complete Multibeam with Backscatter

Assigned Tasks

Acknowledgement:

Acknowledge receipt of these instructions and submit any comments or questions via email to Lori Powdrell at Lori.Knell@noaa.gov.

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.

Feature Investigations:

Investigate AWOIS items in accordance with section 2.2.2.2 and 2.5.4.1 of the FPM. Investigate Maritime Boundary Points in accordance with section 3.5.6 of the FPM.

Number of assigned AWOIS Items for Information Only:	0
Number of assigned AWOIS Items for Full Investigation:	0
Number of assigned Maritime Boundary Claim Items: *(when safety permits, search inshore of the NALL line for these maritime boundary features)*	0

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). The field unit should review the recommended bottom sample locations with the survey data acquired. Contact HSD Operations Branch to discuss modifying the bottom sample plan if the data suggest more appropriate locations for the bottom samples to better differentiate varying bottom characteristics within the survey area when compared to the sample plan provided. This may increase or decrease the sample density but should closely maintain the same numbers of samples per survey as originally assigned.

Chart Comparison:

Use only the latest editions of the largest scale NOS charts covering the project area. These charts are listed below and will be included with project data from Operations Branch. Compare in accordance with section 4.5 of the FPM and section 8.1.4, D.1 of the HSSD. Resolve any discrepancies in the field and explain them in the Descriptive Report.

Affected Raster Charts

Chart Number	*Scale*	*Edition Number*	*Edition Date*	*LNM Date*	*NM Date*
17424	80000	9	10/2009	12/25/2013	01/05/2013
17422	80000	9	02/2006	01/01/2013	01/12/2013
17420	229376	28	03/2007	12/25/2013	01/05/2013
16016	969756	22	08/2012	01/01/2013	01/12/2013

Affected ENCs

ENC Name	*Scale*	*Edition*	*Update Application Date*	*Issue Date*	*Preliminary*
US4AK43M	80000	2	09/20/2012	09/20/2012	NO
US4AK44M	80000	2	12/12/2011	12/12/2011	NO
US3AK4RM	229376	5	07/20/2012	09/20/2012	NO
US1WC02M	2100000	21	04/28/2011	09/21/2012	NO

Coast Pilot:

Review and make recommendations for changes to the Coast Pilot excerpts downloaded from the Coast Pilot web site (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 with a copy to the project planner and the assigned Processing Branch. The report should be submitted as soon as possible following field work for the project. NOAA field units should 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 2.2.2.6 and 4.5.2 of the FPM.

Registry Number	*Scale*	*Year*	*Platform*	*Relative Location*
H11369	10000	2004	NOAA Ship *Fairweather*	S
H11335	10000	2004	NOAA Ship *Fairweather*	SE

Progress Reports:

Email monthly progress reports in accordance with section 5.2.2.2.1 of the FPM to progress.sketches@noaa.gov with a copy to the chief of the assigned Processing Branch. The submittal is due within 5 days after the end of each month.

Survey Outlines:

Generate a survey outline in accordance with the HSSD, section 8.1.2. Survey outlines should be sent to survey.outlines@noaa.gov

Horizontal Control Requirements:

Horizontal control shall meet requirements in Section 3 of the HSSD.

Vertical Control Requirements:

The Burroughs Bay subordinate gauge installation requires the use of a USFS land use permit, see the Tides folder on the project CD for installation restrictions.

Discrete Zoning

Due to particularly challenging logistics for this project, the standard staff to gauge observations as required in the specifications and deliverables are waived with respect to the required subordinate station. In the alternative, NOAA Ship Rainier must collect at least 3 hours of staff to gauge observations at station installation, station removal, after the period of data acquisition completion but prior to departure from the area, and whenever the NOAA Ship Rainier otherwise visits the subordinate installation. Additionally, before departing the project area after data acquisition, the NOAA Ship Rainier should acquire bracketing levels. A station package should be sent to CO-OPS following installation, performance of bracketing levels, and removal as required by Section 4.6.1 of NOAA HSSD.

NWLON Gauges

Operating Water Level Station	*Station ID*
Ketchikan, AK	9450460

Subordinate Gauges

Operating Water Level Station	*Station ID*	*Leveling Required*	*Installation Required*	*Pre-Existing Benchmarks*
Burroughs Bay, AK	9450917	YES	YES	YES

Orthometric Imagery:

No Orthometric Imagery has been provided for this project.

Shoreline and Nearshore Features:

A limited shoreline verification will be accomplished using the composite source file (CSF). Preliminary analysis of the nautical chart and imagery from Bing was conducted at HSD OPS. Analysis showed good comparison between the imagery and the chart. All other submerged or visible cultural features inside the limit of survey shall be verified. All features with attribute asgnmt populated with 'Assigned' shall be verified even if they are inshore of NALL. For reference, prior survey features are provided in S57 format. See section 3.5.5.2.2 of the FPM.

Number of Assigned Features:	104

OPR-O193-RA-13
Behm Canal, AK
Sheet Layout
3/8/13 LP

Total SNM 70
Critical Area SNM 70
Total LNM

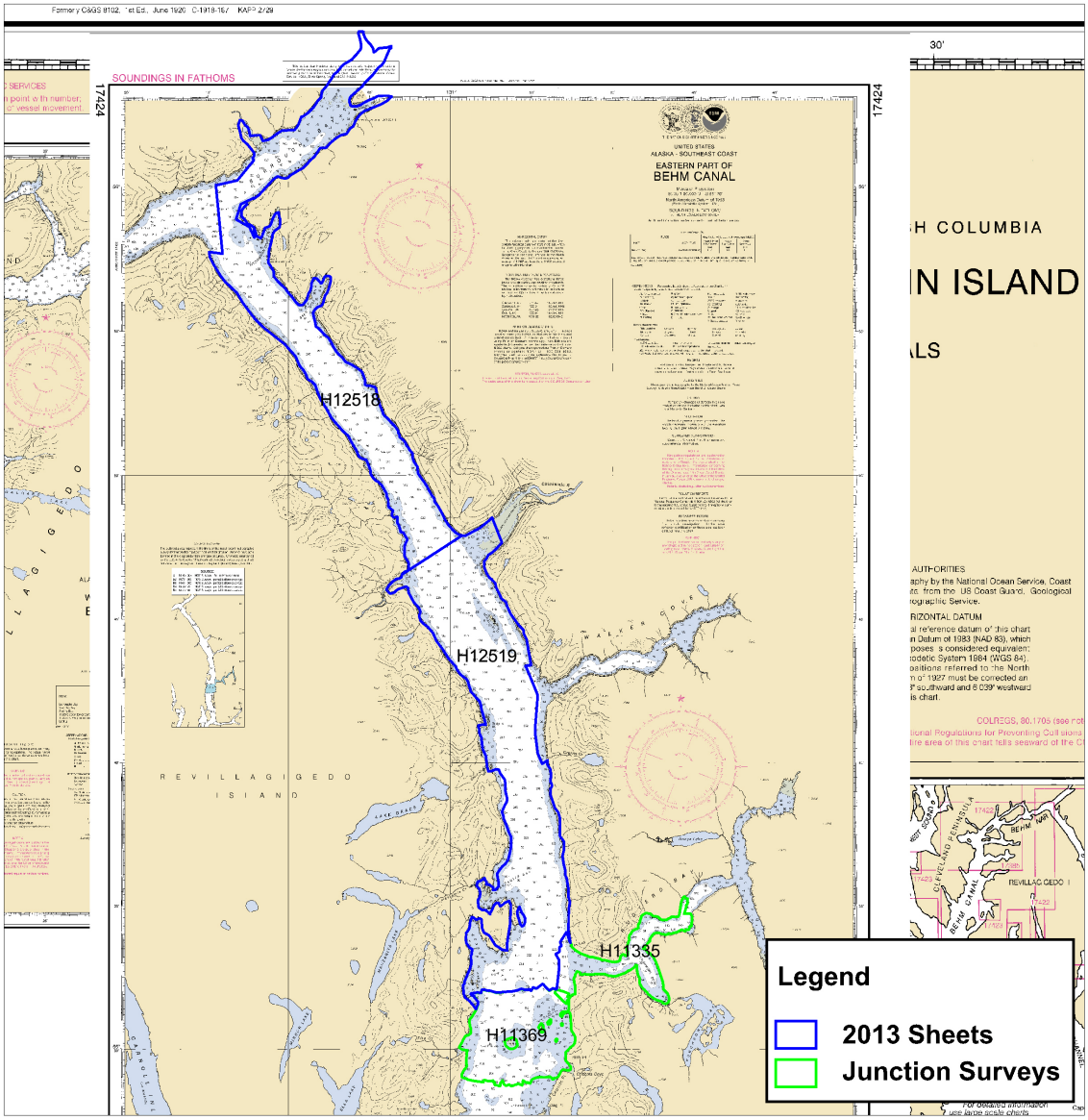


Figure: 1 - OPR-O193-RA-13

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).

NOAA Navigation Manager, AK
LTJG Matt Forney
NOAA
4230 University Blvd #102
Anchorage, Alaska 99508
Phone: 907-491-8913 (Cell)
Fax:
Email: Matthew.Forney@noaa.gov
Obligation: Mandatory

Seventeenth U.S. Coast Guard District, Commander (DPW)
Robert McCormick
USCG
P.O. Box 25517
Juneau, Alaska 99802
Phone: 907-463-2272
Fax:
Email: Robert.P.McCormick@uscg.mil
Obligation: For Reference

U.S. Army Corps of Engineers Alaska District, Office of the District Engineer
James E. Adair
USACE
P.O. Box 6898
Elmendorf Air Force Base
Anchorage, Alaska 99506
Phone: 907-753-5632
Fax:
Email: James.E.Adair@usace.army.mil
Obligation: For Reference

Southeast Alaska Pilots Association
Captain Larry Pullin, President
1621 Tongass Avenue
Suite 300
Ketchikan, Alaska 99901
Phone: 901-225-9696
Fax: 907-247-9696
Email: pilots@seapa.com
Obligation: For Reference

Alaska State Historical Preservation Officer (SHPO)
Judith E. Bittner
Alaska DNR, Office of History and Archaeology
550 West 7th Avenue
Suite 1310
Anchorage, Alaska 99501
Phone: 907-269-8721
Fax: 907-269-8908
Email: judy.bittner@alaska.gov
Obligation: For Reference

WATER LEVEL INSTRUCTIONS
OPR-O193-RA-2013 Behm Canal, AK
(12/13/2012 CFL)

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 2012, and OCS Field Procedures Manual (FPM), dated May 2012. 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, email data transmissions through TIDEBOT, or through regular communications with CO-OPS/Engineering Division (ED) 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/ED (Colleen Roche, 301-713-2897 ext. 137, Email: nos.coops.oetteam@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. Please cc nos.coops.hpt@noaa.gov on all communications with CO-OPS personnel.

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
Ketchikan	9450460	Control	NWLON	
Burrough Bay	9450914	Tertiary	Short-term installation of at least 30 days	Request HHL for monitoring purposes if establish a GOES connection

Table 1: All stations that need to be added to the HHL in support of O193-RA-2013

This project requires a subordinate installation. 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 also can be 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 eyeball icon 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.

1.3. Tide Reducer Stations

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

The NWLON station Ketchikan, AK (9450460), 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 Ketchikan, AK (9450460) by NOAA Ship *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.

Due to particularly challenging logistics for this project, the standard staff to gauge observations as required in the specifications and deliverables are waived with respect to the required subordinate station. In the alternative, NOAA Ship *Rainer* must collect at least 3 hours of staff to gauge observations at station installation, station removal, after the period of data acquisition completion but prior to departure from the area, and whenever the NOAA Ship *Rainer* otherwise visits the subordinate installation. Additionally, before departing the project area after data acquisition, the NOAA Ship *Rainier* should acquire

bracketing levels. A station package should be sent to CO-OPS following installation, performance of bracketing levels, and removal as required by Section 4.6.1 of NOAA HSSD.

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	Latitude(N)	Longitude(W)
9450917 *	Burrough Bay, AK	56° 2.52’	131° 5.57'

* Historical water level station information has been provided for these stations.

1.3.3. Tide Component Error Estimation

The estimated tidal error contribution to the total survey error budget in the vicinity of Behm Canal, AK cannot be computed due to a lack of available water level time series data. After data has been collected at Burrough Bay, we can provide an estimate of the error for the survey area.

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 station(s) 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 the CO-OPS/ED (Thomas Landon) at 301-713-2897 ext. 191 or FAX 301-713-4465 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.

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**
9450917	ELEV. 26.1°
	AZIMUTH(T) 184.7°

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 1.3.1. of these Project Instructions for the following hydrographic area(s) or zone(s):

Station Number	Hydrographic Area(s) or Zone(s)
9450917	Entire Survey

1.4. Discrete Tidal Zoning

1.4.1. The water level station at Ketchikan, AK (9450460) is the reference station for preliminary tides for hydrography in Behm Canal, AK. The time and height correctors listed

below for applicable zones should be applied to the preliminary data at Ketchikan 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
SA78	0	x1.01	9450460
SA79	0	x1.03	9450460
SA83	0	x1.03	9450460
SA84	+6	x1.03	9450460

1.4.2. Polygon nodes and water level corrections referencing Ketchikan, AK (9450460) are provided in CARIS® format denoted by a *.zdf extension file name.

NOTE: The tide corrector values referenced to Ketchikan, AK (9450460) are provided in the zoning file "O193RA2012CORP" 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 MapInfo® representation of West longitude

"Preliminary" data for the control water level station, Ketchikan, AK (9450460), 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, created in MapInfo® and Adobe PDF, 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-O193-RA-2013, 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 TideBot

Preliminary and verified six minute water level time series data may be retrieved from the CO-OPS database via TideBot application. TideBot delivers timely preliminary/verified tidal and Great Lakes six minute water level observations via email to users on a scheduled, recurring basis. To access TideBot through an email account, send an email to TideBot@noaa.gov with the word "help" as the subject. An email reply will be sent with instructions on how to subscribe to TideBot for time series data retrieval. Six minute preliminary and verified data may also 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 by clicking on "Six Minute Data".

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-O193-RA-2013
Behm Canal, AK
SA84
Time Corrector +6 mins.
Range Corrector x1.03
Reference 945-0460
945-0914 BURROUGH BAY
SA83
Time Corrector 0 mins.
Range Corrector x1.03
Reference 945-0460
SA79
Time Corrector 0 mins.
Range Corrector x1.03
Reference 945-0460
SA78
Time Corrector 0 mins.
Range Corrector x1.01
Reference 945-0460
945-0460 KETCHIKAN
bing
Image courtesy of NASA © 2013 Microsoft Corporation

Hydrographic Survey Project Instructions

Project Name:	Sumner Strait & Affleck Canal, AK
Project Number:	OPR-O373-RA-13
Assigned Field Unit:	NOAA Ship *Rainier*
Assigned Processing Branch:	Pacific Hydrographic Branch
Signed Date:	03/25/2013
Project Instructions Version:	Final
Planned Acquisition Time:	Start Date: 04/2013 End Date: 06/2013
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. This project will cover approximately 165 square nautical miles (SNM) of Priority 2 and Priority 3 areas, as identified in the 2012 NOAA Hydrographic Survey Priorities (NHSP) document.
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 2012
NOS Field Procedures Manual for Hydrographic Surveying (FPM), April 2012
Hydrographic Survey Technical Directive (HTD) 2011-03: XML Reports
Hydrographic Survey Technical Directive (HTD) 2012-2: Configuration Management
Hydrographic Survey Technical Directive (HTD) 2012-5: CARIS 7.1

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

Registry Details:

General Locality: Southeast Alaska

Registry Number	*Priority*	*Sublocality*	*State or Territory*	*Scale*	*Estimated SNM*	*Instructions*
HXXXXX	1	Affleck Canal	Alaska	20000	26	
HXXXXX	2	Louise Cove to Port Beauclerc	Alaska	20000	29	
HXXXXX	3	Vicinity of Pt. St. Albans	Alaska	20000	43	
HXXXXX	4	Shakan Bay to Hole in the Wall	Alaska	10000	32	The extents of Chart 17379 shall be surveyed at 1:5000 scale. The remainder of the sheet shall be surveyed at 1:10000 scale.
HXXXXX	5	Shipley Bay and Vicinity	Alaska	20000	35	The extents of Chart 17379 shall be surveyed at 1:5000 scale. The remainder of the sheet shall be surveyed at 1:20000 scale.

Coverage & Limits:

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: Complete Coverage

Instructions:

Coverage Water Depth	*Coverage Required*
4 meters to 8 meters water depth	25 m spaced Set Line Spacing Single Beam Echosounder (SBES) or Multibeam Echosounder (MBES) with concurrent Backscatter
Greater than 8 meters water depth	Complete MBES with concurrent Backscatter

Assigned Tasks

Acknowledgement:

Acknowledge receipt of these instructions and submit any comments or questions via email to Lucy Hick at Lucy.Hick@noaa.gov.

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.

Feature Investigations:

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

Number of assigned AWOIS Items for Information Only:	0
Number of assigned AWOIS Items for Full Investigation:	0
Number of assigned Maritime Boundary Claim Items: *(when safety permits, search inshore of the NALL line for these maritime boundary features)*	12

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). The field unit should review the recommended bottom sample locations with the survey data acquired. Contact HSD Operations Branch to discuss modifying the bottom sample plan if the data suggest more appropriate locations for the bottom samples to better differentiate varying bottom characteristics within the survey area when compared to the sample plan provided. This may increase or decrease the sample density but should closely maintain the same numbers of samples per survey as originally assigned.

Chart Comparison:

Use only the latest editions of the largest scale NOS charts covering the project area. Compare in accordance with section 4.5 of the FPM and section 8.1.4, D.1 of the HSSD. Resolve any discrepancies 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*
17360	217828	35	06/2008	06/03/2008	06/14/2008
17378	20000	14	02/2004	01/27/2004	02/07/2004
17379	10000	1	01/2002	01/01/2013	12/29/2012
17386	40000	5	09/2012	08/21/2012	09/01/2012
17387	40000	13	01/2001	01/01/2013	12/29/2012

Affected ENCs

ENC Name	*Scale*	*Edition*	*Update Application Date*	*Issue Date*	*Preliminary*
US3AK3CM	217828	3	04/14/2011	04/14/2011	NO
US5AK3PM	40000	2	12/21/2010	12/21/2010	NO

Coast Pilot:

Review and make recommendations for changes to the U.S. Coast Pilot 8, Chapter 7. Coast Pilot excerpts can be downloaded from the Coast Pilot Web site (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 with a copy to the project planner and the assigned Processing Branch. The report should be submitted as soon as possible following field work for the project. NOAA field units should 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 2.2.2.6 and 4.5.2 of the FPM.

Registry Number	*Scale*	*Year*	*Platform*	*Relative Location*
H10818	10000	1998	NOAA Ship *Rainier*	E
H11469	20000	2005	NOAA Ship *Fairweather*	SW

Progress Reports:

Email monthly progress reports in accordance with section 5.2.2.2.1 of the FPM to progress.sketches@noaa.gov with a copy to the chief of the assigned Processing Branch. The submittal is due within 5 days after the end of each month.

Survey Outlines:

Generate a survey outline in accordance with the HSSD, section 8.1.2. Survey outlines should be sent to survey.outlines@noaa.gov.

Horizontal Control Requirements:

Horizontal control shall meet requirements in Section 3 of the HSSD.

Vertical Control Requirements:

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.

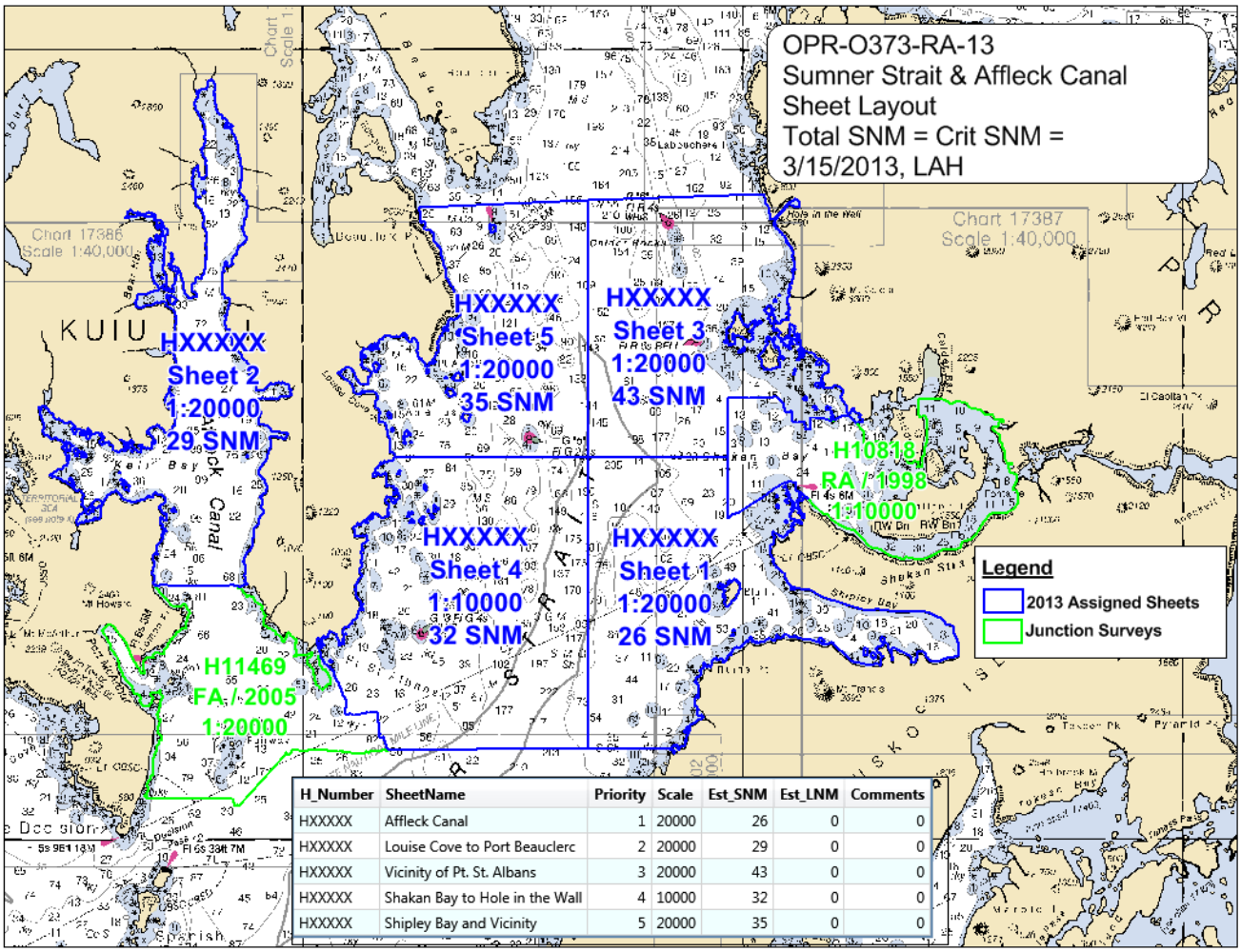
NWLON Gauges

Operating Water Level Station	*Station ID*
Port Alexander	945-1054

Orthometric Imagery:

No Orthometric Imagery has been provided for this project.

Shoreline and Nearshore Features:	
A limited shoreline verification will be accomplished using the composite source file (CSF). Preliminary analysis of the nautical chart and imagery from Bing Maps and Google Earth was conducted at HSD OPS. In many areas slight differences could be seen between the shoreline in the imagery and the S-57 COALNE feature. All other submerged or visible cultural features inside the limit of survey shall be verified. All features with attribute asgnmt populated with 'Assigned' shall be verified even if they are inshore of NALL. For reference, prior survey features are provided in S57 format. See section 3.5.5.2.2 of the FPM.	
Number of Assigned Features:	909



H_Number	SheetName	Priority	Scale	Est_SNM	Est_LNM	Comments
HXXXXX	Affleck Canal	1	20000	26	0	0
HXXXXX	Louise Cove to Port Beauclerc	2	20000	29	0	0
HXXXXX	Vicinity of Pt. St. Albans	3	20000	43	0	0
HXXXXX	Shakan Bay to Hole in the Wall	4	10000	32	0	0
HXXXXX	Shipley Bay and Vicinity	5	20000	35	0	0

Figure: 1 - OPR-O373-RA-13 Sheet Layout

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).

NOAA Navigation Manager, AK
LTJG Matthew Forney
NOAA
4230 University Blvd #102
Anchorage, Alaska 99508
Phone: 907-271-3327
Fax: 206-491-8913
Email: Matthew.Forney@noaa.gov
Obligation: Mandatory

Seventeeth U.S. Coast Guard District, Commander (DPW)
Robert McCormick
USCG
P.O. Box 25517
Juneau, Alaska 99802
Phone: 907-463-2272
Fax:
Email: Robert.P.McCormick@uscg.mil
Obligation: For Reference

U.S. Army Corps of Engineers Alaska District, Office of the District Engineer
James E. Adair
USACE
P.O. Box 6898
Elmendorf Air Force Base
Anchorage, Alaska 99506
Phone: 907-753-5632
Fax:
Email: James.E.Adair@usace.army.mil
Obligation: For Reference

Southeast Alaska Pilots' Association
Capt. Larry Pullin, President
1621 Tongass Avenue
Suite 300
Ketchikan, Alaska 99901
Phone: 907-225-9696
Fax: 907-247-9696
Email: pilots@seapa.com
Obligation: For Reference

Alaska State Historical Preservation Officer (SHPO)
Judith E. Bittner
Alaska DNR, Office of History and Archaeology
550 West 7th Avenue
Suite 1310
Anchorage, Alaska 99501
Phone: (907) 269-8721
Fax: 907-269-8908
Email: judy.bittner@alaska.gov
Obligation: For Reference

WATER LEVEL INSTRUCTIONS
OPR-O373-RA-2013 Sumner Strait and Affleck Canal
(03/11/2013 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 2012, and OCS Field Procedures Manual (FPM), dated April 2012. 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, email data transmissions through TIDEBOT, or through regular communications with CO-OPS/Engineering Division (ED) 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/ED (Colleen Roche at 301-713-2897 x137, Email: nos.coops.oetteam@noaa.gov) to coordinate the appropriate course of action to be taken such as gauge repair and/or developing contingency plans for hydrographic survey operations. In addition, CO-OPS is required to coordinate with the Commanding Officer (or Team Leader) before interrupting the acquisition of water level data for the NWLON stations mentioned above for any reason during periods of hydrography.

1.2.2. The Hydro Hot List (HHL)

Please contact 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	

Table 1: All stations that need to be added to the HHL in support of O373-RA-2013

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

If the stations are listed on HHL, then weekly priority processing will occur and, for those water level stations, verified 6-minute water level data will be made available every week on Monday or Tuesday. If Monday happens to be a federal holiday, then the 6-minute verified water level data will be made available on the following Tuesday or Wednesday.

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 remains 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

No subordinate water level stations are required for this project, however, supplemental and/or back-up water level stations may be necessary depending on the complexity of the hydrodynamics and/or the severity of the environmental conditions of the project area. The installation and continuous operation of water level measurement systems (tide gauges) at subordinate station locations is left to the discretion of the Commanding Officer (or Team Leader), subject to the approval of CO-OPS. If the Commanding Officer (or Team Leader) decides to install additional water level stations, then a 30-day minimum of continuous data acquisition is required. For all subordinate stations, data must be collected throughout the entire survey period for which they are applicable, and not less than 30 continuous days. This is necessary to facilitate the computation of an accurate datum reference as per NOS standards.

1.3.3. Tide Component Error Estimation

The estimated tidal error contribution to the total survey error budget in the vicinity of Sumner Strait and Affleck Canal is 0.20 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.

1.3.4. GOES Satellite Enabled Subordinate Stations

This section is not applicable for this project.

1.3.5. Benchmark Recovery and GPS Requirements

This section is not applicable for this project.

1.3.6. This section is not applicable for this project.

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 the Sumner Strait and Affleck Canal. 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
SA204	-12	x1.14	9451054

SA205	-12	x1.12	9451054
SA206	-12	x1.10	9451054
SA217	-12	x1.08	9451054
SA217a	-12	x1.09	9451054
SA218	-12	x1.05	9451054
SA219	-6	x1.03	9451054
SA220	-12	x1.03	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 "O373RA2013CORP" 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 MapInfo® 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, created in MapInfo® and Adobe PDF, are provided in digital format to assist with the zoning in section 1.4.1.

1.4.4 Final Zoning

Upon completion of project OPR-O373-RA-2013, 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 project manager for final processing.

1.5 TideBot and Fetchtides

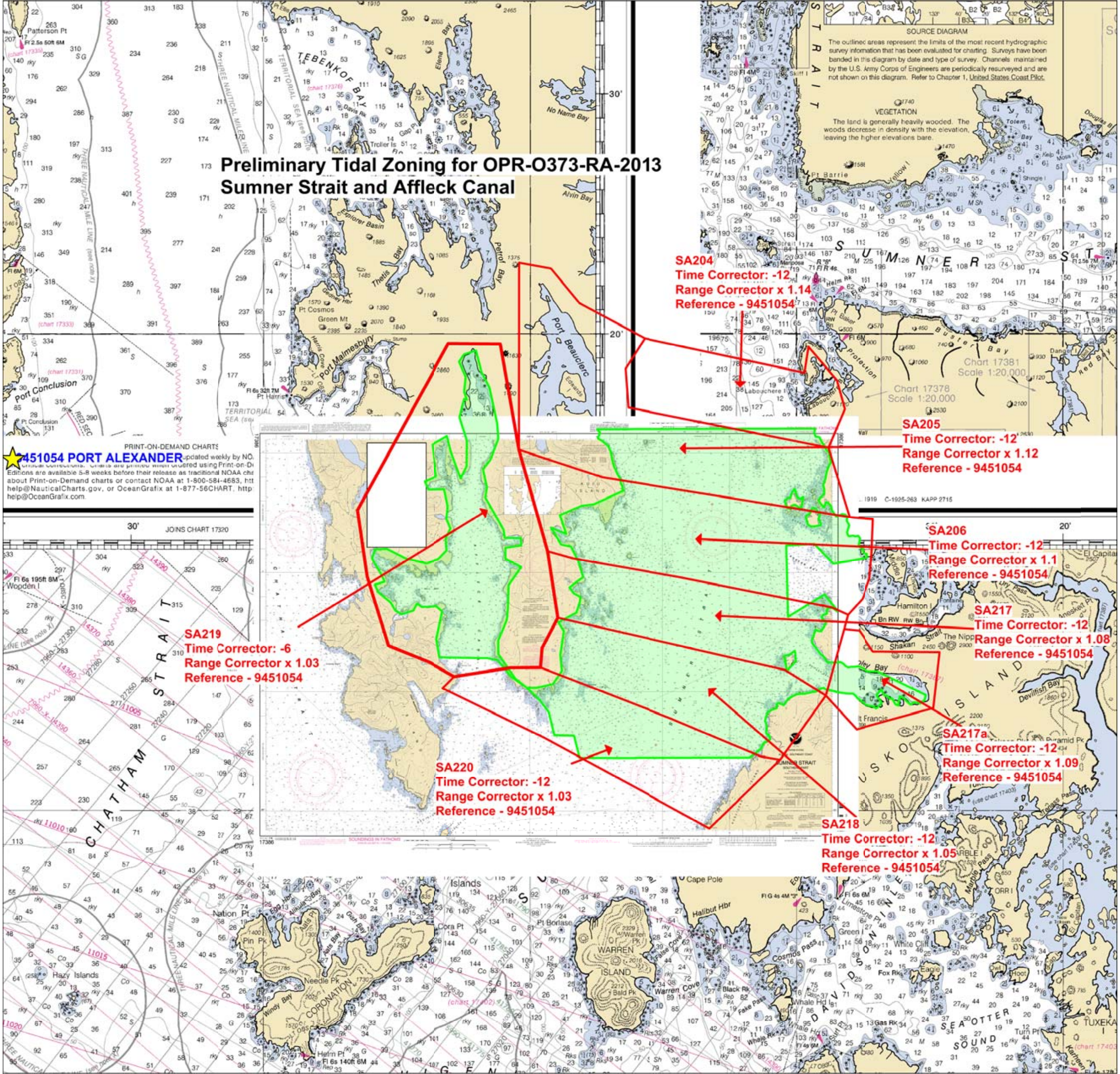
Preliminary and verified six minute water level time series data may be retrieved from the CO-OPS database via the TideBot application. TideBot delivers timely preliminary/verified tidal and Great Lakes six minute water level observations via email to users on a scheduled, recurring basis. To access TideBot through an email account, send an email to TideBot@noaa.gov with the word "help" as the subject. An email reply will be sent with instructions on how to subscribe to TideBot for time series data retrieval.

Alternately, users may download preliminary and verified six minute water level time series data from the CO-OPS database via the Fetchtides application. Fetchtides provides a mechanism to

store imported data locally and combine multiple days worth of data into one CARIS readable tide (.tid) file. Fetchtides is available for download at Hydrosoft Online (https://inside.nos.noaa.gov/hydrosoft/hydrosoftware.html). For more information, please see the Fetchtides User Manual in the FPM chapter 3 appendix.

1.6 Water Level Records

This section is not applicable for this project.



Preliminary Tidal Zoning for OPR-O373-RA-2013
Sumner Strait and Affleck Canal
9451054 PORT ALEXANDER
SA204
Time Corrector: -12
Range Corrector x 1.14
Reference - 9451054
SA205
Time Corrector: -12
Range Corrector x 1.12
Reference - 9451054
SA206
Time Corrector: -12
Range Corrector x 1.1
Reference - 9451054
SA217
Time Corrector: -12
Range Corrector x 1.08
Reference - 9451054
SA217a
Time Corrector: -12
Range Corrector x 1.09
Reference - 9451054
SA218
Time Corrector: -12
Range Corrector x 1.05
Reference - 9451054
SA219
Time Corrector: -6
Range Corrector x 1.03
Reference - 9451054
SA220
Time Corrector: -12
Range Corrector x 1.03
Reference - 9451054