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

Final Project Instructions

Date Submitted: April 1st, 2016

Platform: NOAA Ship *Rainier*

Project Number: RA-16-01 (OMAO)

Project Title: IOCM Olympic Coast NMS Mapping Project

Project Dates: **April 20th, 2016 to May 5th, 2016**

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Prepared by: _____ Dated: _____
Paul Turner
Operations Branch
Hydrographic Surveys Division
Office of Coast Survey

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Date: 2016.04.08 16:21:22 -04'00'

Approved by: _____ Dated: _____
Ashley Chappell
Program Coordinator
Integrated Ocean and Coastal Mapping
Office of Coast Survey

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

I. Overview

A. Brief Summary and Project Period

This survey is scheduled to begin in April 2016 and end in May 2016. This project is being conducted in support of NOAA's Integrated Ocean and Coastal Mapping Program to provide data and products to address and support sustainable fisheries, climate change, nautical charting, regulatory review, and jurisdictional economies associated with hard-bottom ecosystems (e.g. tourism and recreational fishing).

B. Days at Sea (DAS)

Of the 16 DAS scheduled for this project, 0 DAS are funded by an OMAO allocation, 12 DAS are funded by a Line Office Allocation, 4 DAS are Program Funded, and 0 DAS are Other Agency funded.

C. Operating Area

The main project area is located along Washington's Pacific coast within the Olympic Coast National Marine Sanctuary. There is a secondary project site located in SE Alaska in Dixon Entrance where the ship will deviate from its Seattle to Kodiak transit to acquire reconnaissance survey data over a newly discovered mud volcano. A map of the project areas can be found with the detailed project instructions appended to these instructions.

D. Summary of Objectives

The purpose of the project is to maximize Rainier acquisition potential and collect swath bathymetry, acoustic backscatter and water column data to characterize seafloor habitats within high priority areas of the Olympic Coast National Marine Sanctuary. The objective of this project is to collect an IOCM multibeam bathymetry dataset with 100% seafloor ensonification, along with multibeam backscatter suitable for seafloor characterization for multipurpose use. Multibeam bathymetry data will be collected to conform to NOAA HSSD accuracy standards.

In addition to high resolution mapping coverage, exploratory transit and reconnaissance mapping data will be acquired during the transit to and from the primary working grounds.

E. Participating Institutions

NOAA - Office of Coast Survey, National Centers for Coastal and Ocean Science, Office of National Marine Sanctuaries, and the National Marine Fisheries Service, and University of Washington.

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

Name (Last, First)	Title	Date Aboard	Date Disembark	Gender	Affiliation	Nationality
Sutherland, Mike	Physical Scientist	4/20/16	5/5/16	M	NOAA	US
Stubbs, Chris	Hydrographer	4/20/16	5/5/16	M	College of Charleston	US
Sampaga, Erica	Student	4/20/16	5/5/16	F	Uni of Washington	US
Brandi Black	Subject Matter Expert	4/20/16	5/5/16	F	Oregon State University	US

G. Administrative

1. Points of Contacts:

Principal Investigator:
Ashley Chappell
Integrated Ocean and Coastal Mapping, Program Coordinator
Office of Coast Survey
1315 East West Hwy, #6813
Silver Spring, MD 20910
301-713-2702 x110
Ashley.Chappell@noaa.gov

Project Manager:
Paul Turner
Physical Scientist, Operations Branch
Hydrographic Surveys Division
1315 East West Hwy, #6854
Silver Spring, MD 20910
301-713-2702 x106
Paul.Turner@noaa.gov

Project Manager:
LT Adam Reed, NOAA
Integrated Ocean and Coastal Mapping, Assistant Coordinator
Office of Coast Survey
1315 East West Hwy, #6848
Silver Spring, MD 20910
301-713-2702 x114
Adam.Reed@noaa.gov

Chief Scientist:
Chris Stubs
College of Charleston
66 George Street
Charleston, SC 29424
843-906-6220
geostubbs@gmail.com

Ship's Commanding Officer:
CDR Edward J. Van Den Ameele, NOAA
Commanding Officer, NOAA Ship *Rainier*
2002 SE Marine Science Drive
Newport, Oregon 97365-5229
(206) 660-8747
CO.Rainier@noaa.gov

2. Diplomatic Clearances

None Required.

3. Licenses and Permits

The Office of Coast Survey is sensitive to the potential effects of its operations on the physical, biological, and cultural marine environment. In accordance with the National Environmental Protection Act, Coast Survey prepared a Programmatic Environmental Assessment to gauge the environmental impacts resulting from surveying and other data-gathering activities. As a result, the National Ocean Service has published a Finding of No Significant Impact (FONSI) for the Office of Coast Survey program of conducting hydrographic surveys for the calendar years 2013 - 2018. For further information, please refer to:
http://www.nauticalcharts.noaa.gov/Legal/

Discharge of materials (e.g., XBTs) are usually prohibited within OCNMS unless a permit from the Sanctuary is in hand. This project is covered by the sanctuary's Superintendent's Permit (OCNMS-2014-001) for essential use of expendable equipment, a copy of which will be provided to the Chief Scientist and Ship's Commanding Officer for this project.

II. Operations

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

1. Project Itinerary:

DEP: 04/20/2016 ARR: 05/5/2016	Weds. Newport, OR Thurs. Seattle, WA	RA-16-01 Leg 1 Olympic Coast NMS

Timing dependent upon dry-dock and repair period completion.

2. Staging and Destaging:

Staging and destaging are not planned for this project.

C. Operations to be Conducted:

Seafloor mapping operations shall be conducted per the appended project instructions. The Ship's Commanding Officer in consultation with the Chief Scientist may elect to run 24 hr ship survey operations for extended periods of time.

D. Dive Plan

Dives are not planned for this project.

E. Applicable Restrictions

Conditions which preclude normal operations:

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

III. Equipment

Equipment and Capabilities provided by the ship (itemized)

1. Ship fully-outfitted and calibrated per NOAA HSSD with hydrographic survey equipment to support multibeam sonar survey operations.

2. Personnel to staff and operate the ship's survey equipment for 24 hr/day operations.

3. Visiting scientists will assist the survey department to efficiently manage the project's data processing requirements. NOAA Ship *Rainier* is not required to process or create any mapping, backscatter or water column products.

IV. Hazardous Materials

A. Policy and Compliance

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

B. Radioactive Materials

No Radioactive Isotopes are planned for this project.

V. Additional Projects

A. Supplementary ("Piggyback") Projects

Rainier is requested to acquire trackline data while underway in U.S. waters wherever possible outside of the direct project areas and submit raw bathy/backscatter data to NCEI per Section VI.

B. NOAA Fleet Ancillary Projects

No NOAA Fleet Ancillary Projects are planned.

VI. Disposition of Data and Reports

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

VII. Meetings, Vessel Familiarization, and Project Evaluations

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

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

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

D. Project Evaluation Report

Within seven days of the completion of the project, a Customer Satisfaction Survey is to be completed by the Chief Scientist.

The form is available at: http://www.omao.noaa.gov/fleeteval.html and provides a "Submit" button at the end of the form. Submitted form data is deposited into a spreadsheet used by OMAO management to analyze the information. Though the complete form is not shared with the ships', specific concerns and praises are followed up on while not divulging the identity of the evaluator.

VIII. Miscellaneous

A. Meals and Berthing

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

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

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

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

B. Medical Forms and Emergency Contacts

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

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

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

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

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

Contact information:

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

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

C. Shipboard Safety

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

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

D. Communications

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

E. IT Security

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

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

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

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

F. Foreign National Guests Access to OMAO Facilities and Platforms

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

VIII. Appendices

1. Primary Project Instructions: M-N908-RA-16 IOCM Mapping Project

Hydrographic Survey Project Instructions

Project Name:	IOCM Olympic Coast NMS Mapping Project
Project Number:	M-N908-RA-16
Assigned Field Unit:	NOAA Ship *Rainier*
Assigned Processing Branch:	Pacific Hydrographic Branch
Signed Date:	04/08/2016
Project Instructions Version:	Final
Planned Acquisition Time:	Start Date: 04/2016 End Date: 05/2016
Delivery Dates:	120 days from completion of data acquisition.

Purpose and Location:
This project is being conducted in collaboration with the National Ocean Service - Office of Coast Survey's (OCS) Integrated Ocean and Coastal Mapping Program (IOCM) and the Olympic Coast National Marine Sanctuary (OCNMS) and their partners in order to collect swath bathymetry, acoustic backscatter data and water column data within high priority areas of the OCNMS. The data from this project will provide seafloor habitat information to support fishery and resource protection mandates and will be further used to update National Ocean Service nautical charting products within the area. This project will cover a total of 632 SNM all within the OCNMS. Survey data from this project is intended to supersede all prior survey data in the common area.
Supporting Documents:
Hydrography shall consist of Navigable Area Surveys in accordance with the following support documents.
NOS Hydrographic Surveys Specifications and Deliverables Manual (HSSD), March 2016
NOS Field Procedures Manual for Hydrographic Surveying (FPM), April, 2014
Hydrographic Survey Technical Directive (HTD) 2015-1: Configuration Management
Hydrographic Survey Technical Directive (HTD): 2013-5: DR Requirements for Non-Standard Surveys

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 Coast

Registry Number	*Sheet Number*	*Sublocality*	*State or Territory*	*Scale*	*Estimated SNM*	*Instructions*
W00306	1	Quinault Canyon	Washington	80000	378	
W00304	2	Willapa Canyon	Washington	80000	189	
W00305	3	Juan De Fuca Canyon	Washington	80000	65	
D00207	4	Offshore Transit Survey from Newport, OR to OCNMS	Oregon Washington	80000	75	It is not expected that NOAA Ship Rainier will acquire data for the entire trackline; these are tracklines of opportunity and partial acquisition is acceptable. There is no vertical control component for D00207.
D00208	5	Dixon Entrance	Alaska	100000	40	It is not expected that NOAA Ship Rainier will acquire data for the entire survey-line; this is a reconnaissance survey over a newly discovered mud volcano and partial acquisition is acceptable.

Limits & Coverage:

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

Coverage Requirements:

Coverage Water Depth	*Coverage Required*
All waters in survey area	Complete coverage MBES depth, backscatter data and water column data. Refer to HSSD Section 5.2.2.3. The Descriptive Report shall follow the DR Summary description as defined in HTD 2013-5.
All waters in survey area	For D00207 Only -- Transit Survey specifications apply with water column

Limits & Coverage:	
Coverage Water Depth	*Coverage Required*
	data. Refer to HSSD Section 5.2.2.5.1. The Descriptive Report shall follow the DR Memo description as defined in HTD 2013-5. The maximum time between sound speed profiles shall be four hours.
All waters in survey area	For D00208 Only -- Reconnaissance Survey specifications apply with water column data. Refer to HSSD Section 5.2.2.5.2. The Descriptive Report shall follow the DR Memo description as defined in HTD 2013-5. The maximum time between sound speed profiles shall be four hours.

Assigned Tasks

Acknowledgement:

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

Environmental Compliance Requirements

Comply with the marine mammal observation and reporting requirements in Section 1.4 of the HSSD.

Aids to Navigation (ATONs):

There are no ATONs specifically assigned for this project. Any ATONs located within the survey area should be verified so that they serve their intended purpose in accordance with Section 7.2 of the HSSD.

AWOIS Items:

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

Maritime Boundary Points (MBPs):

There are no Maritime Boundary investigation requirements for this project.

Bottom Samples:

There is no Bottom Sample requirement for this project.

Chart Comparison:

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

Affected Raster Charts

Chart Number	*Scale*	*Edition Number*	*Edition Date*	*Kapp Number*	*LNM Date*	*NM Date*
18480	176253	32	01/2013	1726	01/19/2016	02/19/2016
18500	180789	30	05/2008	1730	01/19/2016	02/19/2016
17400	229376	18	09/2013	2715	02/16/2016	02/20/2016

Affected ENCs

ENC Name	*Scale*	*Edition*	*Update Application Date*	*Issue Date*	*Preliminary*
US3WA03M	180789	18	11/18/2015	11/18/2015	NO
US3WA01M	176253	18	07/08/2013	06/03/2015	NO
US3AK40M	229376	8	11/16/2015	11/16/2015	NO

Coast Pilot:

There is no Coast Pilot requirement for this project.

Dangers to Navigation (DTONs):

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

Junctions:

No junctioning surveys have been provided for this project.

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

Survey Outlines:
Generate a survey outline for only W00304, W00305 and W00306 in accordance with Section 8.1.2 of the HSSD. Submit survey outlines to survey.outlines@noaa.gov.

Special Data Handling Requirements:
ATTENTION: Field Unit Acquisition and delivery of raw backscatter are required for this project. The NOAA Ship Rainier is not required to process or create any additional backscatter products.
ATTENTION: Field Unit Acquisition and delivery of water column data is required for survey sheet W00306, D00207 and D00208. Water column data archival proceedures will be provided to the NOAA Ship Rainier prior to the start of this project. The NOAA Ship Rainier is not required to process or create any additional water column products.
ATTENTION: Field Unit Submit all Conductivity Temperature and Depth (CTD) data to the National Oceanographic Data Center (NODC) ensuring data are in an appropriate file format as outlined on the NODC website at http://www.nodc.noaa.gov/access/dataformats.html.

Horizontal Control Requirements:
Comply with the horizontal control requirements in Section 3 of the HSSD.

Vertical Control Requirements:

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

Discrete Zoning

Discrete Zoning assigned for D00208 only. 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.

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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*
LaPush, WA	9442396
Garibaldi, WA	9437540
Neah Bay, WA	9443090
Port Angeles, WA	9444090
Sitka, AK	9451600

Orthometric Imagery:

No Orthometric Imagery has been provided for this project.

Shoreline and Nearshore Features:

All features with attribute asgnmt populated with 'Assigned' shall be addressed in accordance with Section 7 of the HSSD, even if they are inshore of NALL.

Additional Task: *Sound Speed Profiles*

Expendable Bathythermograph's (XBT's) will be provided to the Rainier for collecting sound velocity data for sheets W00304, W00305, W00306, D00207 and D00208.

Additional Task: *Exploritary Dixon Entrance Survey - D00208*

This is a targeted exploratory survey to obtian seafloor imagery and data over a newly discovered mud volcano in the upper continental slope offshore of Dixon Entrance in Alaska. Data from this survey will be used to analyze the seafloor morphology and assess the area for potential tsunami's and identify unique biological communities.

User Contacts

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

Project Manager
Paul Turner
NOAA, Office of Coast Survey, Hydrographic Surveys Division
Phone: 301-713-2700*106
Fax: .
Email: paul.turner@noaa.gov
Obligation: Mandatory

Project Manager
Adam Reed, LT NOAA
NOAA, Office of Coast Survey, IOCM Program
Phone: 301-713-2702*114
Fax: .
Email: adam.reed@noaa.gov
Obligation: Mandatory

Chief Scientist for IOCM Mapping Project
Chris Stubbs
College of Charleston
Phone: 843-906-6220
Fax:
Email: geostubbs@gmail.com
Obligation: For Reference

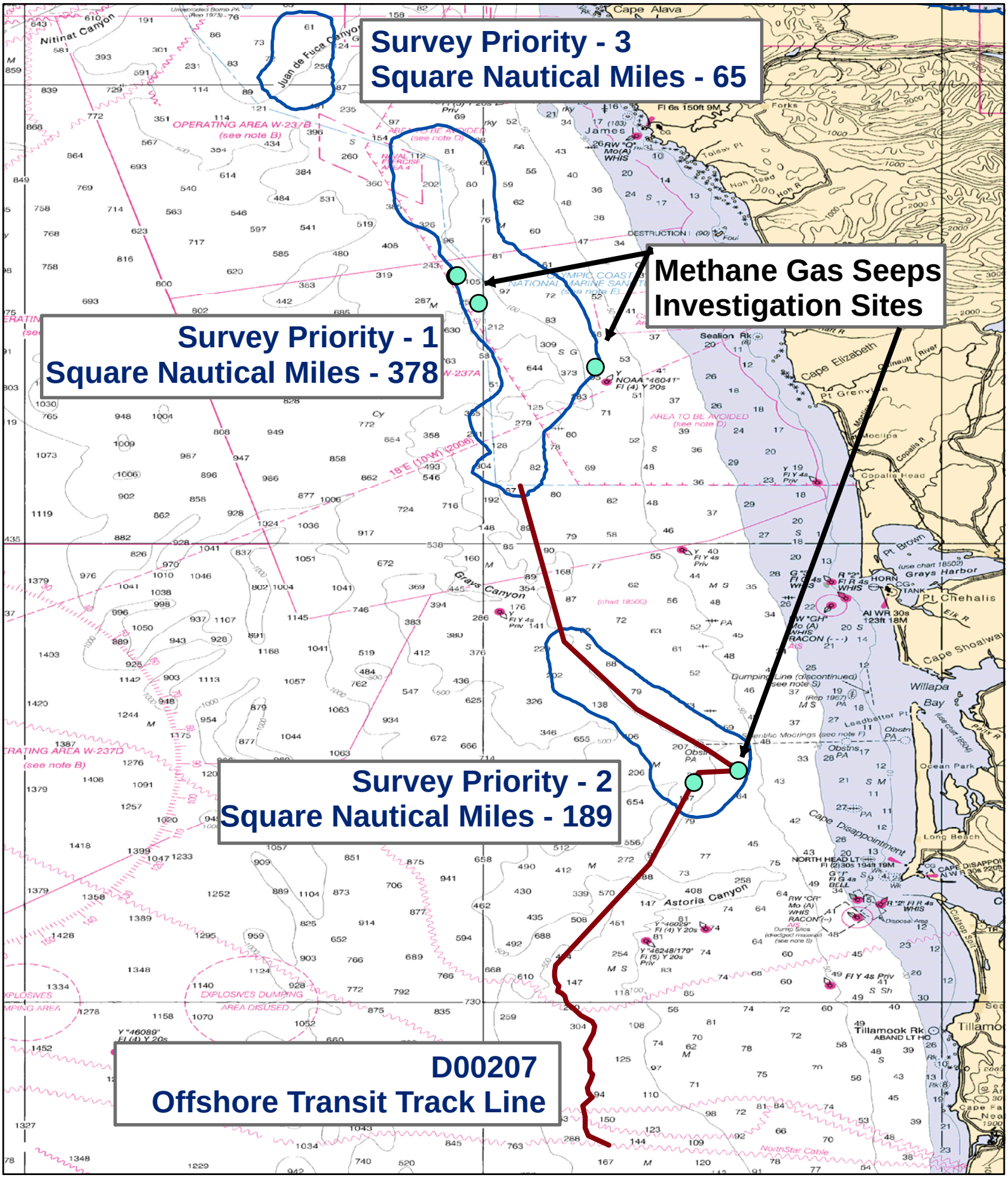
Marine Geographer, Primary Data Requestor for W00306 and D00207
Nancy Wright
NOAA, Olympic Coast National Marine Sanctuary
Phone: 360-457-6622*20
Fax: .
Email: nancy.wright@noaa.gov
Obligation: Mandatory

Marine Geologist, Primary Data Requestor for D00208
Dr. Gary H. Greene
California State University
Phone:
Fax: .
Email: greene@mlml.calstate.edu
Obligation: Mandatory

NOAA Navigation Manager, Northwest Region

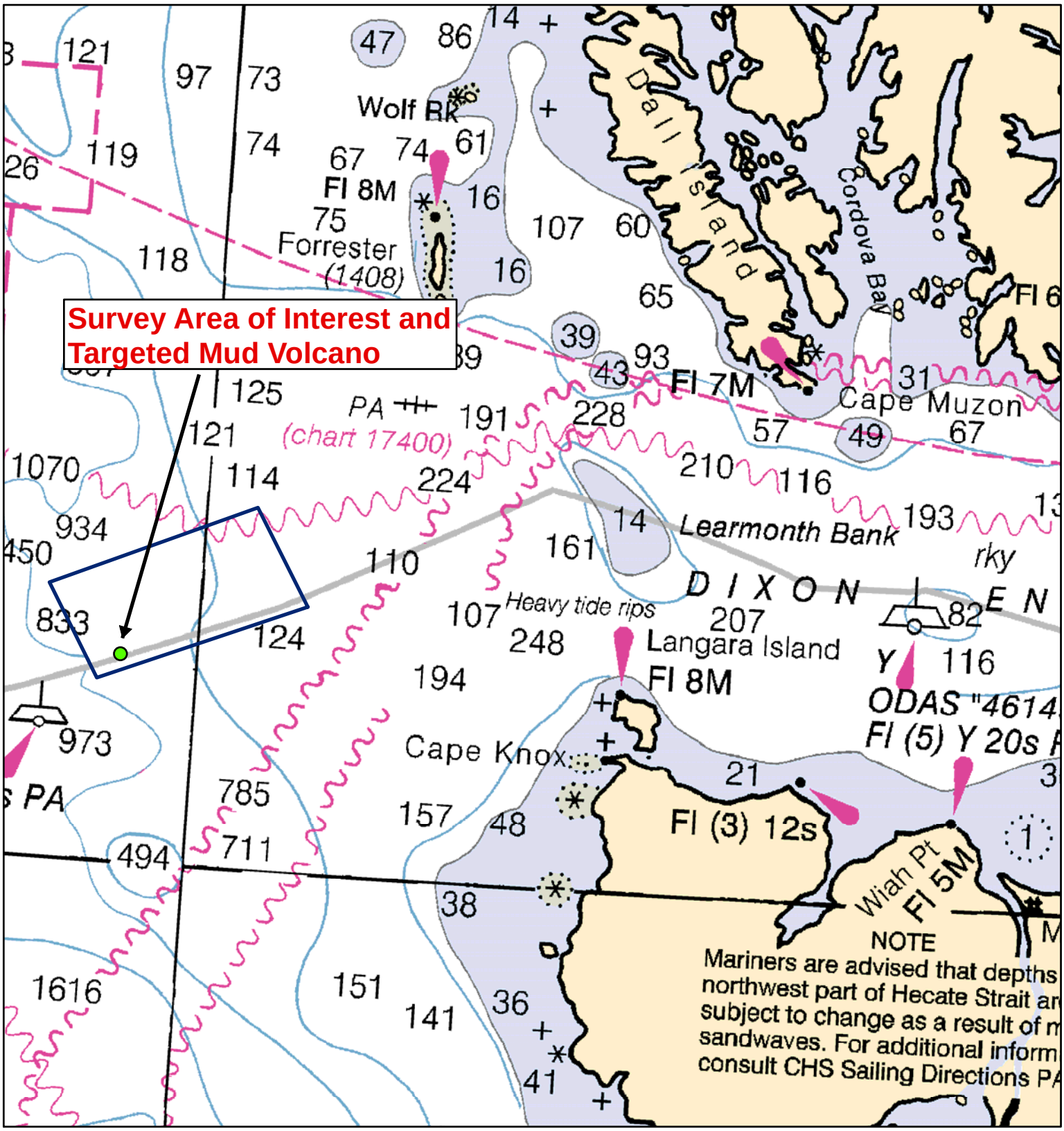
Crescent Moegling
NOAA, Office of Coast Survey, Navigation Services Division
Phone: 206-526-6840
Fax: .
Email: crescent.moegling@noaa.gov
Obligation: For Reference

IOCM Olympic Coast NMS Mapping Project
M-N908-RA-16
Project Layout
Total SNM - 632



M-N908-RA-16
IOCM Mapping Project
Dixon Entrance Survey
Survey D00208

Actual survey will consist of development lines directly over the target.



WATER LEVEL INSTRUCTIONS
RA-16-01-IOCM IOCM_OCNMS_WA
(04/05/2016 HY)

1.0. TIDES AND WATER LEVELS

1.1. Specifications

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

1.2. Vertical Datums

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

1.2.1. Water Level Data Acquisition Monitoring

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

1.2.2. The Hydro Hot List (HHL)

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

Station	Station ID	Residual Control/Subordinate	Type (NWLON, PORTS©, etc.)	Comment
Westport, WA	9441102	Residual Control	NWLON	
La Push, WA	9442396	Residual Control	NWLON	
Neah Bay, WA	9443090	Residual Control	NWLON	
Port Angeles, WA	9444090	Residual Control	NWLON	

Table 1: All stations that need to be added to the HHL in support of RA-16-01-IOCM

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

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

1.3. Operating Tide Reducer Stations

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

The NWLON stations Westport, WA (9441102), La Push, WA (9442396), Neah Bay, WA (9443090), and Port Angeles (9444090) will provide water level reducers for this project. Therefore it is critical that they remain in operation during the survey. See Sections 1.1. and 1.2. concerning responsibilities.

No leveling is required at Westport, WA (9441102), La Push, WA (9442396), Neah Bay, WA (9443090), and Port Angeles (9444090) by NOAA's 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

No subordinate water level stations are required for this project, however, supplemental and/or back-up water level stations may be necessary depending on the complexity of the hydrodynamics and/or the

severity of the environmental conditions of the project area. The installation and continuous operation of water level measurement systems (tide gauges) at subordinate station locations is left to the discretion of the Commanding Officer (or Team Leader), subject to the approval of CO-OPS. If the Commanding Officer (or Team Leader) decides to install additional water level stations, then a 30-day minimum of continuous data acquisition is required. For all subordinate stations, data must be collected throughout the entire survey period for which they are applicable, and not less than 30 continuous days. This is necessary to facilitate the computation of an accurate datum reference as per NOS standards.

1.3.3. Tide Component Error Estimation

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

1.3.4. GOES Satellite Enabled Subordinate Stations

This section is not applicable for this project.

1.3.5. Benchmark Recovery and GPS Requirements

This section is not applicable for this project.

1.3.6. Residual Water Level Station(s) Data

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

The operating stations at Westport, WA (9441102), La Push, WA (9442396), Neah Bay, WA (9443090), and Port Angeles (9444090) will provide residuals for this project and must remain in operation during all periods of hydrography.

Station Number	Station Name	Latitude(N)	Longitude(W)
9441102	**Westport, WA**	**46° 54.2'**	**124° 6.3'**
9442396	**La Push, WA**	**47° 54.8'**	**124° 38.2'**
9443090	**Neah Bay, WA**	**48° 22.0'**	**124° 36.7'**
9444090	**Port Angeles, WA**	**48° 7.5'**	**123° 26.5'**

1.4. Tidal Constituent and Residual Interpolation (TCARI)

1.4.1. For hydrography in the area of IOCM_OCNMS_WA, apply the TCARI grid "RA1601IOCM.tc" supplied in conjunction with the water level data from Section 1.3.6 to produce a seamless tide correction. Refer to the TCARI Field SOP for detailed TCARI instructions.

1.4.2. This section is not applicable for this project.

1.4.3. TCARI Graphic

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

1.4.4. TCARI Final Solutions

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

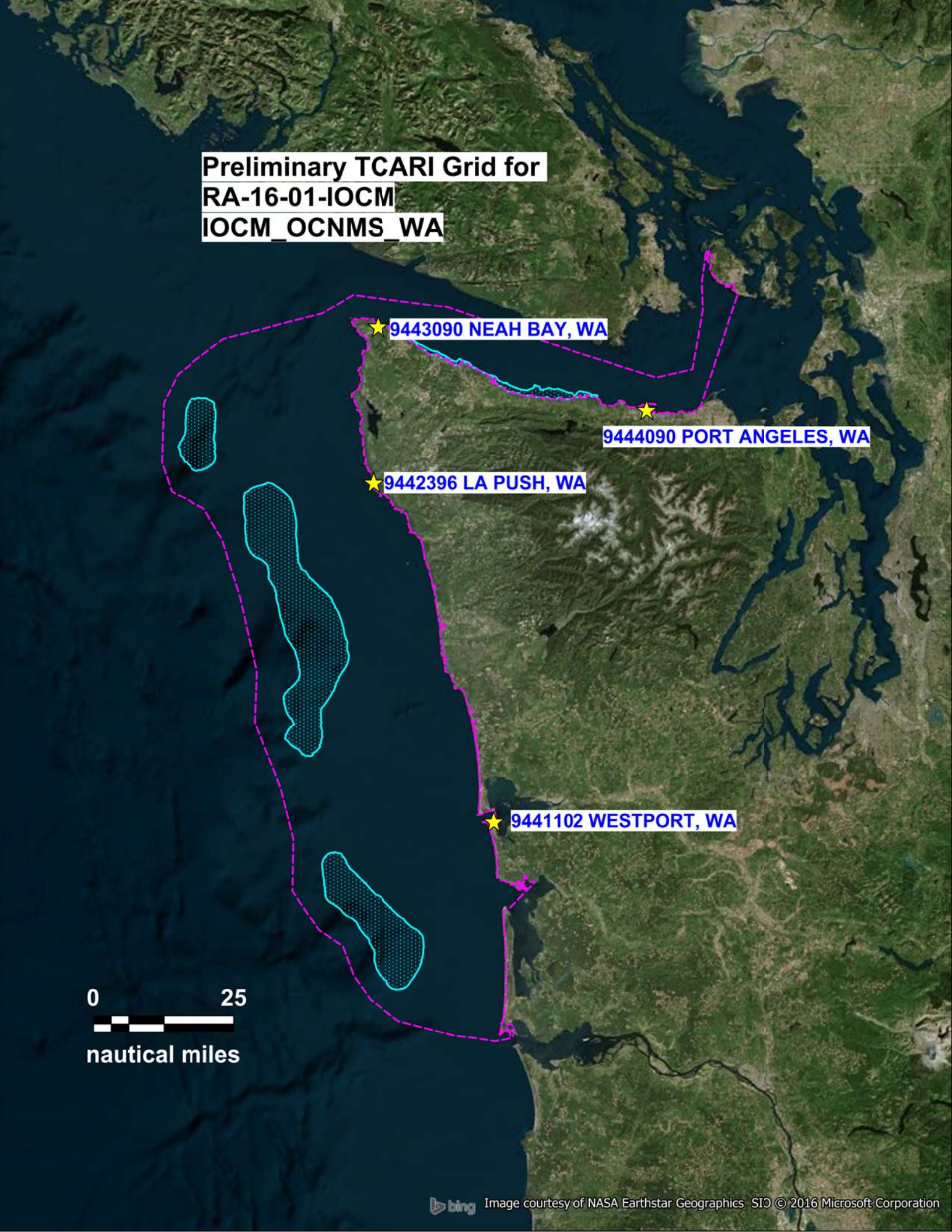
CO-OPS will review the times of hydrography, final tracklines, and six-minute water level data from all applicable water level gauges. If there are any discrepancies, CO-OPS will make the appropriate adjustments and forward a revised TCARI grid and solutions to the field group and processing branch for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

1.5. Fetchtides

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

1.6 Water Level Records

This section is not applicable for this project.


Preliminary TCARI Grid for
RA-16-01-IOCM
IOCM_OCNMS_WA
9443090 NEAH BAY, WA
9444090 PORT ANGELES, WA
9442396 LA PUSH, WA
9441102 WESTPORT, WA
0
25
nautical miles
bing
Image courtesy of NASA Earthstar Geographics SIO © 2016 Microsoft Corporation


Juneau
Admiralty Island
Admiralty Island National Monument
Tongass National Forest
9451600 Sitka
Assessment for RA-16-01-IOCM
Dixon Entrance, AK
Zoning Scheme: Discrete
Control Station: 9451600 Sitka, AK
Subordinate Station: None
Iphigenia Bay
Tongass National Forest
Prince of Wales Island
Ketchikan
Annette Island I.R.
Graham Island
0
50
nautical miles
Image courtesy of NASA Earthstar Geographics SIO © 2016 Microsoft Corporation © 2010 NAVTEQ

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
OFFICE OF OCEAN AND COASTAL RESOURCE MANAGEMENT
Olympic Coast National Marine Sanctuary
115 East Railroad Avenue, Suite 301
Port Angeles, WA 98362-2925

April 7, 2016

Paul Turner
NOAA/NOS/Office of Coast Survey
1315 East West Hwy
Silver Spring, MD 20910-3282

Dear Paul,

The National Oceanic and Atmospheric Administration, Office of National Marine Sanctuaries (ONMS) authorizes you to conduct seafloor habitat mapping of the Quinault Canyon area and other areas within Olympic Coast National Marine Sanctuary (OCNMS) under the Superintendent's Permit (OCNMS-20014-001). Activities that require permit approval are discharge and abandonment of expendable bathythermographs associated with seafloor mapping activities.

This authorization applies to yourself, Ashley Chappell (Principal Investigator), CDR Edward Van Den Ameele (Chief Scientist and NOAA Ship *Rainier* Commanding Officer), and Chris Stubbs (Hydrographer). An OCNMS representative will not be accompanying the crew on the survey vessel.

Your surveys will be conducted permit number OCNMS-2014-001 (enclosed), and both this Letter of Authorization and the Permit must accompany you while conducting survey work in the sanctuary.

If you have any questions, please contact OCNMS Permit Coordinator Liam Antrim at 360-457-6622 x 16. Thank you for your continued cooperation with the ONMS.

Respectfully,

Carol Bernthal, Superintendent
Olympic Coast National Marine
Sanctuary

Enclosure

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE

Office of National Marine Sanctuaries
1305 East-West Highway
Silver Spring, Maryland 20910

OLYMPIC COAST NATIONAL MARINE SANCTUARY
SUPERINTENDENT'S PERMIT

Permittee:
Ms. Carol Bernthal
Superintendent
NOAA Olympic Coast National Marine Sanctuary
115 East Railroad Avenue
Suite 301
Port Angeles, WA 98362

Permit Number: OCNMS-2014-001
Effective Date: January 1, 2014
Expiration Date: December 31, 2018

Project Title: Superintendent's Permit

This permit is issued for activities in accordance with the National Marine Sanctuaries Act (NMSA), 16 USC §1431 *et seq.*, and regulations thereunder (15 CFR Part 922). All activities must be conducted in accordance with those regulations and law. No activity prohibited in 15 CFR Part 922 is allowed except as specified in the activity description below.

Subject to the terms and conditions of this permit, the National Oceanic and Atmospheric Administration (NOAA), Office of National Marine Sanctuaries (ONMS) hereby authorizes the permittee, along with specific individuals who may be authorized by the permittee, to conduct activities within Olympic Coast National Marine Sanctuary (OCNMS or sanctuary). These activities must be those reasonable and necessary to fulfill management responsibilities consistent with the purposes of the sanctuary management plan, the NMSA, and the regulations cited above.

Permitted Activity Description:
The following activities are authorized by this permit:

1. Alteration of the seabed for the following purposes:
   a. Placement of temporary mooring and buoy anchors and permanent marking devices;
   b. Placement of scientific sampling equipment, measuring devices and related equipment;
   c. Removal of biological and geological samples from the seabed; and
   d. Investigation of benthic habitats for sea floor mapping verification, debris removal and identification and monitoring of sanctuary resources using camera sleds, remotely operated vehicles, submersibles, autonomous underwater vehicles, and a variety of bottom sampling tools and other similar equipment.

2. Overflights of the sanctuary at altitudes less than 2,000 feet (within overflight restriction zones) to conduct resource protection, education and research activities

such as surveys, removal of matter or debris, emergency response, law enforcement and search/rescue training, maintenance of navigation aids, and aerial photography and videography.

3. Marine mammal, sea turtle, and sea bird disturbance during activities (e.g., overflights, approach in boats) that directly support resource protection and research activities, such as population monitoring and data collection. See Special Condition #5.

4. Emergency response, injury assessment, mitigation, restoration, monitoring, and planning as approved by ONMS headquarters, consistent with (where appropriate) NOAA Damage Assessment and Restoration policies and procedures.

5. The returning of confiscated sanctuary resources to their natural environment in coordination with appropriate federal, tribal or state resource agencies.

6. Small scale manipulation or removal of sanctuary resources for educational, conservation or sanctuary research purposes, consistent with and benefiting sanctuary goals and purposes.

7. Sampling and removal of exotic species in coordination with other federal, tribal and state resources agencies, as appropriate.

8. Participation in permitted activities of other sanctuary users.

9. Discharge of materials or other matter necessary and incidental to the training of persons or entities for valid search and rescue, emergency response and law enforcement responsibilities in the sanctuary.

10. Discharge and/or abandonment of materials incidental to the conduct of research activities in the sanctuary, such as expendable bathythermographs (XBTs) used in oceanographic studies or discrete, permanent markers.

11. Movement or recovery of historical or cultural resources or archaeological site disturbance under time-sensitive emergency situations to protect cultural, historical, or archeological resources from loss, destruction or injury. See Special Condition #7.

No further violation of sanctuary regulations is allowed.

Permitted Activity Location:
The permitted activity is allowed only in the following location(s):

Throughout the Olympic Coast National Marine Sanctuary.

Special Terms and Conditions:

1. The permittee is responsible for all management activities within the sanctuary that are authorized by this permit and must approve any such activities prior to their execution.

2. Any ONMS staff member (including contract employees) may conduct activities under this permit if authorized to do so by the permittee. Authorized staff must carry a copy of this permit while conducting any such activities.

3. Any non-ONMS staff member may conduct work under this permit if they have a letter from the permittee stating that their activities are being carried out under permit number OCNMS-2014-001 and stipulating the scope and duration of the authorization. These individuals must carry a copy of this permit and the authorizing letter while conducting any such activities. Copies of any letters authorizing others to act under this permit shall be uploaded to the OSPREY database under permit record OCNMS-2014-001.

4. Any activities taken under the authority of this permit (including both staff and non-staff activities) shall be recorded and uploaded to the OSPREY database under permit record OCNMS-2014-001.

5. Any activities that may result in marine mammal, sea turtle, or seabird disturbance are to be conducted only in coordination with NOAA Fisheries, the U.S. Fish and Wildlife Service, and other resource trustees, as may be required by law.

6. The activities allowed under this permit were contemplated in and covered by NEPA analyses prepared for the sanctuary when designated and/or during subsequent management plan reviews, or are otherwise categorically excluded from further analysis under NEPA. However, for any actions proposed to occur under this permit for which this may not be the case, the permittee is required to complete any required further assessment under NEPA that may be necessary prior to taking that action. The permittee can contact the ONMS National Permit Coordinator for assistance in making this determination, if needed.

7. In the event that site disturbance or artifact movement or recovery is required for time-sensitive emergency purposes to protect historical or cultural resources, the permittee or designated staff member must first consult with the appropriate tribal historic preservation officer(s), a representative from the State Historic Preservation Office and a NOAA/ONMS archeologist to determine the level of threat and the appropriate response. Even when time is of the essence, all activities must be carried out in compliance with the laws, regulations and guidelines of the Federal Archeological Program and under the supervision of a professional archeologist, as designated by a NOAA/ONMS archeologist. Any non-time-sensitive site disturbance or historical or cultural resource movement or recovery must be conducted under a separate permit consistent with the requirements of Section 106 of the National Historic Preservation Act.

8. No activity may result in substantial injury to sanctuary resources and qualities.

General Terms and Conditions:

1. Within 30 (thirty) days of the date of issuance, the permittee must sign and date this permit for it to be considered valid. Once signed, the permittee must send a copy, via mail or email, to the following individuals:

   National Permit Coordinator
   NOAA Office of National Marine Sanctuaries
   1305 East-West Highway (N/NMS-2)
   SSMC4, 11th Floor
   Silver Spring, MD 20910
   Vicki.Wedell@noaa.gov

2. This permit may only be amended by the ONMS Director. Should the permittee wish to have this permit modified to cover activities not previously covered herein, the permittee may apply for an amendment in writing.

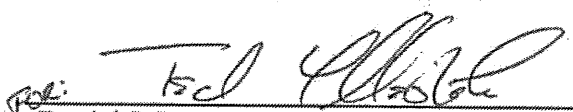
3. This permit is non-transferable; however, the permittee can authorize other individuals to conduct activities under this permit as described in the Special Terms and Conditions.

4. This permit does not authorize the conduct of any activity prohibited by 15 CFR § 922, other than those specifically described in the "Permitted Activity Description" section of this permit.

5. Any publications and/or reports resulting from activities conducted under the authority of this permit must include the notation that the activity was conducted under National Marine Sanctuary Permit OCNMS-2014-001.

6. Any question of interpretation of any term or condition of this permit will be resolved by the ONMS Director.

Your signature below, as permittee, indicates that you accept and agree to comply with all terms and conditions of this permit. This permit becomes valid when you, the permittee, countersign and date below. Please note that the expiration date on this permit is already set and will not be extended by a delay in your signing.



Daniel J. Basta
Director

12/31/13
Date

Carol Bernthal
Superintendent
Olympic Coast National Marine Sanctuary

12/31/13
Date