UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NOAA Marine and Aviation Operations
Marine Operations Center
439 W. York Street
Norfolk, VA 23510-1114

MEMORANDUM FOR: Commander Marc Moser, NOAA
Commanding Officer, NOAA Ship *Ferdinand Hassler*

FROM: Captain Anne K. Lynch, NOAA
Commanding Officer, NOAA Marine Operations Center-Atlantic

SUBJECT: Project Instruction for FH-15-03 / OPR-B307
Rhode Island Sound and Approaches

Attached is the final Project Instruction for FH-15-03/OPR-B307 Rhode Island Sound and Approaches, scheduled aboard NOAA Ship *Ferdinand Hassler* during the period of 26 May to 26 July2015. Of the 47 DAS scheduled for this project, 47 days are funded by Line Office Allocation. This project is estimated to exhibit a Medium Operational Tempo. Acknowledge receipt of these instructions via e-mail to **OpsMgr.MOA@noaa.gov** at Marine Operations Center-Atlantic.

Attachment

cc:
LCDR Michael Gonsalves
CAPT Eric Berkowitz

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: May 22, 2015

Platform: NOAA Ship *Ferdinand R. Hassler*

Project Number: OPR-B307-FH-15

Project Title: Rhode Island Sound and Approaches

Project Dates: May 26, 2015 to July 26, 2015

Prepared by: _____ Dated: 22-May-2015
LCDR Michael Gonsalves, NOAA
Chief, Operations Branch
Hydrographic Surveys Division

Approved by: _____ Dated: 22-May-2015
CAPT Eric W. Berkowitz, NOAA
Chief, Hydrographic Surveys Division
Office of Coast Survey

Approved by: _____ Dated: 29 May 2015
CAPT Anne K. Lynch, NOAA
Commanding Officer
Marine Operations Center - Atlantic

I. Overview

A. Brief Summary and Project Period

This survey is scheduled to begin in May 2015 and end in July 2015. This project is being conducted in support of NOAA's Office of Coast Survey to provide contemporary hydrographic data in order to update the nautical charting products and reduce survey backlog in the area.

B. Days at Sea (DAS)

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

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

The project area is located in the Rhode Island Sound. A map of the project area can be found with the detailed project instructions appended to these instructions.

D. Summary of Objectives

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

E. Participating Institutions

N/A

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

Name (Last, First)	Title	Date Aboard	Date Disembark	Gender	Affiliation	Nationality
Wilson, Matt	PS	7/14/2015	7/25/2015	M	NOAA	USA
Short, Robert	PS	5/26/2015	7/2/2015	M	NOAA	USA
McGovern,Meghan	LT	6/8/2015	6/19/2015	F	NOAA	USA
Faulkes, Tyanne	PS	6/22/2015	7/2/2015	F	NOAA	USA
Mortimer, Kolleen	PS	7/14/2015	7/26/2015	F	NOAA	USA

G. Administrative

Points of Contacts:

Principal Investigator:
LCDR Michael Gonsalves, NOAA Chief, Operations
Branch Hydrographic Surveys Division 1315 East
West Hwy, #6854
Silver Spring, MD 20910
301-713-2702 x112

Project Manager:
Kathryn Pridgen
Physical Scientist, Operations Branch
Hydrographic Surveys Division
1315 East West Hwy, #6709
Silver Spring, MD 20910
301-713-4567 x145
Kathryn.Pridgen@noaa.gov

Chief Scientist:
CDR Marc S. Moser, NOAA
Commanding Officer, NOAA Ship *Ferdinand R. Hassler*
P.O. Box 368
New Castle, NH 03854
603-812-8748
CO.Ferdinand.Hassler@noaa.gov

1. Diplomatic Clearances

None Required.

2. 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/

In addition, the Office of Coast Survey has issued a letter to Ms. Beth Casoni of the Massachusetts Lobstermen's Association and Mr. Lanny Dellinger of the Rhode Island Lobsterman's Associationnotifying them to the location of planned survey activities. Operations will exercise every caution while surveying to avoid entanglement of fishing gear. If fishing gear is entangled, operations will cease and gear will be cleared. In the event entangled gear becomes damaged or lost, there is relevant information in the notification letter for the Tort Claims process.

II. Operations

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

A. Project Itinerary

dep	5/26/2015	Tue	New Castle, NH	FH-15-02 Leg 1
arr	6/5/2015	Fri	Woods Hole, MA	Rhode Island Sound
dep	6/8/2015	Mon	Woods Hole, MA	FH-15-02 Leg 2
arr	6/19/2015	Fri	Woods Hole, MA	Rhode Island Sound
dep	6/22/2015	Mon	Woods Hole, MA	FH-15-02 Leg 3
arr	7/2/2015	Thu	New Castle, NH	Rhode Island Sound
dep	7/14/2015	Tue	New Castle, NH	FH-15-02 Leg 4
arr	7/26/2015	Sun	Woods Hole, MA	Rhode Island Sound

B. Staging and Destaging:

HSTP personnel will deliver a GPS tide buoy dockside prior to 8-May departure from Baltimore. Ship's force will be needed for craning the gear on the vessel. No destaging will be required as the NOAA Ship *Thomas Jefferson* will recover the buoy.

C. Operations to be Conducted:

1. Hydrographic survey operations shall be conducted per the appended project instructions. The Commanding Officer may elect to run 24 hr ship survey operations for extended periods of time.

2. In addition to hydrographic survey operations, the ship will assist with the deployment and recovery of a GPS tide buoy. The preliminary location for the deployment of the buoy, approximately 3 km south of Martha's Vineyard, is depicted in the attached Primary Project Instructions. The buoy will be deployed at least three hours prior to the commencement of hydrographic survey operations (on ~27 May). The final determination of the duration and location of the buoy deployment will be coordinated with HSD, HSTP and CO-OPS personnel. Servicing of the tide buoy will be required. The ship will recover the buoy at the conclusion of Leg 3 (~1 July) and transport back to New Castle, NH where HSTP personnel will assist with the recharging and maintenance of the buoy. Ship personnel will later redeploy the buoy in the previous location (~15 July) before resuming survey operations. Servicing of the buoy may require the ship to divert from survey operations mid-leg. At the conclusion of the project, the buoy will be left in a deployed state for the NOAA Ship Thomas Jefferson to recover. Please refer to the Section "Additional Task: Tide Buoy Deployment" in the attached Primary Project Instructions.

D. Dive Plan

Dives are not planned for this project.

E. Applicable Restrictions

Conditions which preclude normal operations:

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

III. Equipment

A. Equipment and Capabilities provided by the ship (itemized)

1. Ship fully-outfitted with hydrographic survey equipment to support shallow and mid-water multibeam and/or side scan sonar survey operations.

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

3. The Office of Coast Survey may staff the survey department with rotating physical scientists to efficiently manage the project's data processing requirements.

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

GPS Tide Buoy

1. Dimensions
    i. Diameter: 0.6m
    ii. Weight: 156 lbs.
    iii. Telemetry: Iridium (WiFi available)
2. Charging Requirements
    i. Standard 120V AC Outlet
    ii. 12 hours charge time
    iii. 60 "D-Cell" Lithium non-rechargeable batteries (Supplied by HSTP)
3. Assembly/Hardware
    i. 11 mm torque wrench
    ii. 12 bolts around equator
4. 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

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

B. Radioactive Materials

No Radioactive Isotopes are planned for this project

V. Additional Projects

A. Supplementary ("Piggyback") Projects

No Supplementary Projects are planned

B. NOAA Fleet Ancillary Projects

No NOAA Fleet Ancillary Projects are planned.

VI. Disposition of Data and Reports

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

VII. Meetings, Vessel Familiarization, and Project Evaluations

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

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

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

D. Project Evaluation Report

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

VIII. Miscellaneous

A. Meals and Berthing

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

Berthing requirements, including number and gender of the scientific party, will be provided to the 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: Include only the Pacific OR Atlantic Office as applicable.

Regional Director of Health Services
Marine Operations Center – Atlantic
439 W. York Street
Norfolk, VA 23510
Telephone 757-441-6320

Fax 757-441-3760
EmailMOA.Health.Services@noaa.gov

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

C. Shipboard Safety

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

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

D. Communications

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

E. IT Security

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

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

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

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

F. Foreign National Guests Access to OMAO Facilities and Platforms

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

VIII. Appendices

1. Primary Project Instructions: OPR-B307-FH-15, Rhode Island Sound and Approaches

Hydrographic Survey Project Instructions

Project Name:	Rhode Island Sound and Approaches
Project Number:	OPR-B307-FH-15
Assigned Field Unit:	NOAA Ship Ferdinand R. Hassler
Assigned Processing Branch:	Atlantic Hydrographic Branch
Signed Date:	05/22/2015
Project Instructions Version:	Final
Planned Acquisition Time:	Start Date: 05/2015 End Date: 07/2015
Delivery Dates:	120 days from completion of data acquisition.

Purpose and Location:
To support safe navigation through the acquisition and processing of hydrographic survey data for updating nautical charts and by the identification and dissemination of dangers to navigation as identified during the course of survey operations.
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), May 2015
NOS Hydrographic Surveys Specifications and Deliverables Manual (HSSD), May 2015
Hydrographic Survey Technical Directive (HTD) 2015-1: Configuration Management

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

Registry Details:

General Locality: Rhode Island Sound

Registry Number	*Priority*	*Sublocality*	*State or Territory*	*Scale*	*Estimated SNM*	*Instructions*
H12703	1	20NM South of Sakonnet Point	Rhode Island	40000	72	
H12705	2	10NM SW of Normans Land	Rhode Island	40000	74	
H12801	3	Normans Land	Rhode Island	20000	51	
H12802	4	6 NM South of Normans Land	Rhode Island	40000	61	

Limits & Coverage:

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

Coverage Type: Complete Coverage

Coverage Water Depth	*Coverage Required*
All waters in survey area	A) Complete MBES with backscatter, or B) 100% SSS with concurrent set line spacing MBES with backscatter. Note: Complete MBES is sufficient for both determination of least depth identified with SSS and for disproving a feature - 100% SSS is insufficient to disprove a feature. Refer to Section 6.1.2 of the HSSD to confirm proper SSS acquisition parameters. Gaps in SSS coverage should be treated as gaps in MBES coverage and addressed accordingly.

Assigned Tasks

Acknowledgement:

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

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):

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

Number of MBPs provided for Full Investigation: *(when safety permits, search inshore of the NALL line for these maritime boundary features)*	15
Number of MBPs provided for Information Only:	23

Bottom Samples:

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

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 identified in the field and explain them in the Descriptive Report. The charts, listed below, were used in the preparation of these project instructions and accompanying project files.

Affected Raster Charts

Chart Number	*Scale*	*Edition Number*	*Edition Date*	*LNM Date*	*NM Date*
13233	40000	19	01/2011	03/31/2015	04/11/2015
13218	80000	42	07/2013	03/31/2015	04/11/2015

Affected ENCs

ENC Name	*Scale*	*Edition*	*Update Application Date*	*Issue Date*	*Preliminary*
US4MA23M	80000	27	04/07/2015	04/07/2015	NO
US5MA29M	40000	7	01/26/2015	01/26/2015	NO

Coast Pilot:

Review and make recommendations for changes to the Coast Pilot. Coast Pilot excerpts can be downloaded from the Coast Pilot website (http://www.nauticalcharts.noaa.gov/nsd/cpdownload.htm). In addition, address any directed questions found in the Coast Pilot Investigation Items document, included with the project files. Submit both documents, or a report stating no changes are recommended, via email to Coast.Pilot@noaa.gov and OCS.NDB@noaa.gov with a courtesy copy to the HSD OPS project planner. The report should be submitted as soon as possible following field work for the 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:

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

Registry Number	*Scale*	*Year*	*Platform*	*Relative Location*
H12707	40000	2014	NOAA Ship *Ferdinand R. Hassler*	N
H12702	40000	2014	NOAA Ship *Ferdinand R. Hassler*	W
H11922	10000	2008	NOAA Ship *Thomas Jefferson*	N
H11920	10000	2008	NOAA Ship *Thomas Jefferson*	N

Progress Reports:

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

Survey Outlines:

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

Special Data Handling Requirements:

ATTENTION: 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.

PPK

Horizontal control may be enhanced by performing a post-processed kinematic (PPK) 'POSPac Singlebase' processing routine, as per the Elipsoidal Referenced Survey (ERS) standard operation procedure report version 1.1. Post-processing of the daily logged 'POSPac' data will produce the statistical best estimate of trajectory (SBET) file. Redundant control stations will be established by HSD/CAB/NGS personnel at the Menemsha USCG facility on Martha's Vineyard. Data will be available for download at a location to be determined.

Vertical Control Requirements:

Comply with the vertical control requirements in section 4 of the HSSD. A GPS tide buoy will also be installed in lieu of a subordinate water level station.

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.

VDatum

This project has a requirement to reference the survey data to the ellipse. Realization of the ellipse will be achieved through a single base solution using the NOAA-installed control station the USCG Menemsha base on Martha's Vineyard. At the commencement of operations, check lines should be run across the entirety of the project to confirm the operational status of the station, and to measure the anticipated uncertainties of the single base station. The results of these check lines should be reported back to HSD Operations. All survey lines shall be delivered with SBET/RMS files applied and GPS tides computed. Delivered grids at chart datum shall be derived via the ellipse using the separation model provided by HSD Operations. Within 60 days of the completion of acquisition, the field unit will prepare an ERS Capability Memorandum, submitted to HSD Operations, summarizing the degree to which ERS surveying was successful. Should the field experience difficulty in realizing chart datum via the ellipse, then, after pursuing technical assistance, the field shall coordinate with HSD Operations for guidance on how to proceed.

VDatum Version	Geoid	Area	Area Version	Separation Uncertainty
TBD	2015	TBD	TBD	0.00 meters

ERZT

The field shall be required to test the Ellipsoid Referenced Zoned Tides (ERZT) SOP and provide feedback on the procedures. This feedback can be included within the ERS Capability Memorandum. It is suggested the ERZT model is run after both the initial check lines discussed in the "VDatum" section of these instructions and at the conclusion of operations, when all survey lines are in hand.

TBD

NWLON Gauges

Operating Water Level Station	*Station ID*
Newport, RI	8452660
Woods Hole, MA	8447930
Nantucket Island, MA	8449130
New London, CT	8461490
Montauk, NY	8510560

Subordinate Gauges

Operating Water Level Station	*Station ID*	*Leveling Required*	*Installation Required*	*Pre-Existing Benchmarks*
GPS Tide Buoy: Southern Marthas	844AAAA	NO	YES	NO

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

Shoreline and Nearshore Features:
Conduct a limited shoreline verification using the composite source file (CSF). All features with attribute 'asgnmt' populated with 'Assigned' shall be addressed even if they are inshore of the HSD Operations delivered NALL. In Sheet H12801, 100% SSS with concurrent multibeam is not sufficient for the disproval of a charted feature. Either 200% SSS or complete multibeam coverage, with a search radius of 60 meters, is sufficient to disprove a charted feature within H12801.

Additional Task: *Tide Buoy Deployment*
In addition to hydrographic survey operations, the ship will assist with the deployment and recovery of a GPS tide buoy. The preliminary location for the deployment of the buoy, approximately 3 km south of Martha's Vineyard, is depicted in the attached Primary Project Instructions. The buoy will be deployed at least three hours prior to the commencement of hydrographic survey operations (on ~27 May). The final determination of the duration and location of the buoy deployment will be coordinated with HSD, HSTP and CO-OPS personnel. Servicing of the tide buoy will be required. The ship will recover the buoy at the conclusion of Leg 3 (~1 July) and transport back to New Castle, NH where HSTP personnel will assist with the recharging and maintenance of the buoy. Ship personnel will later redeploy the buoy in the previous location (~15 July) before resuming survey operations. Servicing of the buoy may require the ship to divert from survey operations mid-leg. At the conclusion of the project, the buoy will be left in a deployed state for the NOAA Ship Thomas Jefferson to recover. Please refer to the Section "Additional Task: Tide Buoy Deployment" in the attached Primary Project Instructions.

Additional Task: *Environmental Compliance and Marine Mammal Reporting*
Comply with the marine mammal observation and reporting requirements in Section 7.6 of the HSSD.

User Contacts

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

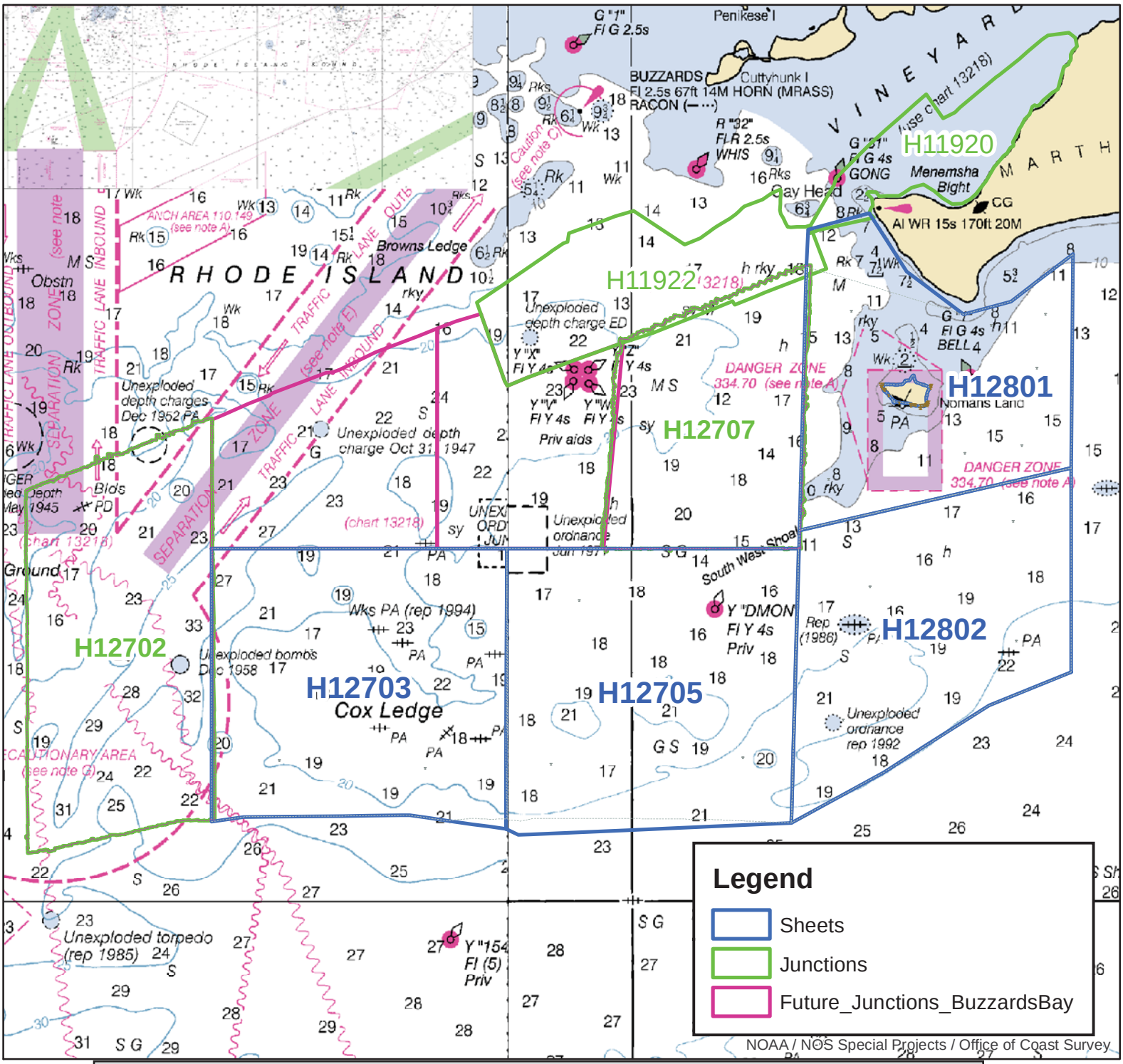
Project Manager
Kathryn Pridgen
NOAA/NOS/OCS/HSD
Phone: 301-713-4567 x145
Email: kathryn.pridgen@noaa.gov
Obligation: Mandatory

Secondary Project Manager
Katrina Wyllie
NOAA/NOS/OCS/HSD
Phone: 301-713-2700 x106
Email: katrina.wyllie@noaa.gov
Obligation: For Reference

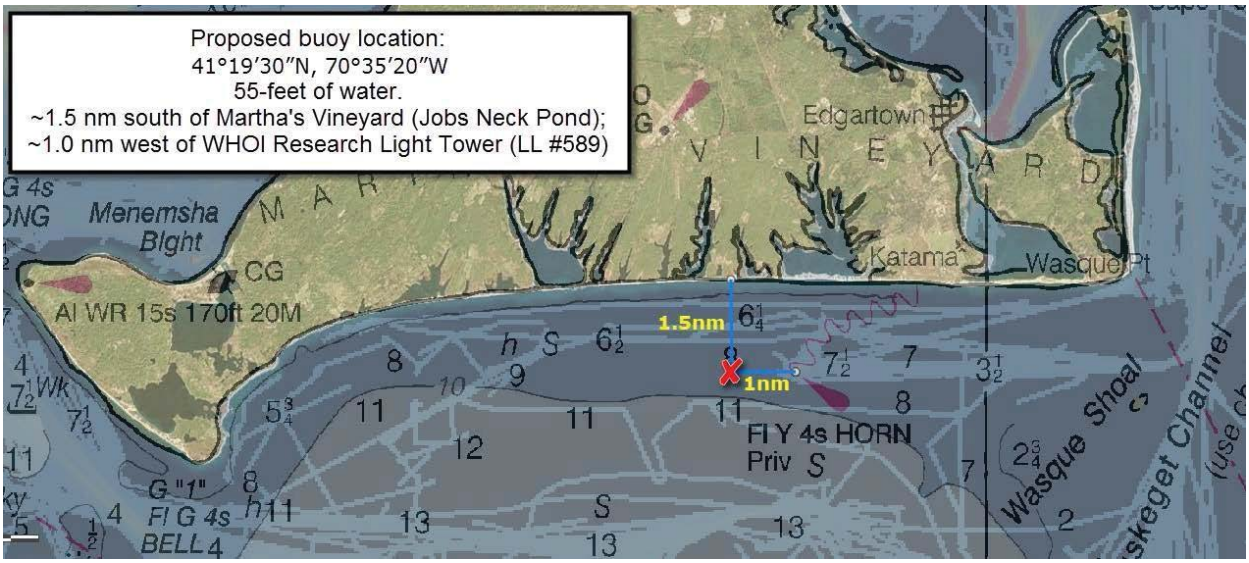
NOAA Navigation Manager, Northeast Region
LT Meghan McGovern
NOAA
Phone: 401-782-3252
Email: Meghan.Mcgovern@noaa.gov
Obligation: Mandatory

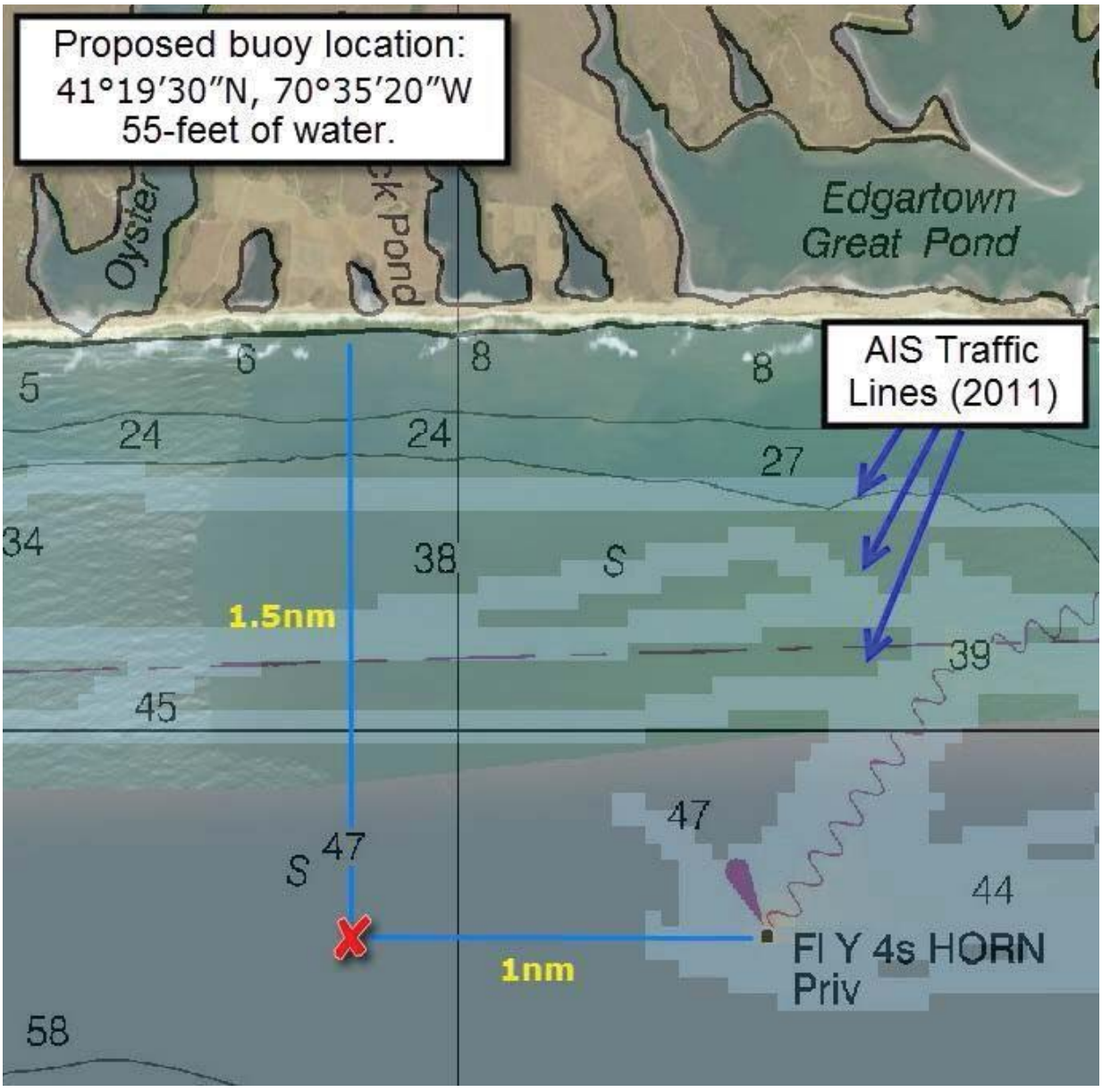
OPR-B307-FH-15
"Rhode Island Sound and Approaches"
Sheet Layout

Total SNM - 258



H Number	Sheet Name	Priority	SNM
H12703	20 NM South of Sakonnet Point	1	72
H12705	10 NM SW of Normans Land	2	74
H12801	Normans Land	3	51
H12802	6 NM South of Normans Land	4	61


Proposed buoy location:
41°19′30″N, 70°35′20″W
55-feet of water.
~1.5 nm south of Martha's Vineyard (Jobs Neck Pond);
~1.0 nm west of WHOI Research Light Tower (LL #589)
Edgartown
Menemsha Bight
CG
Al WR 15s 170ft 20M
Katama
Wasque Pt
1.5nm
1nm
Fl Y 4s HORN
Priv
Wasque Shoal
G "1"
Fl G 4s
BELL


Proposed buoy location:
41°19′30″N, 70°35′20″W
55-feet of water.
Edgartown
Great Pond
AIS Traffic
Lines (2011)
1.5nm
1nm
Fl Y 4s HORN
Priv

WATER LEVEL INSTRUCTIONS
OPR-B307-FH-2015 Rhode Island Sound and Approaches, MA
(03/27/2015 HY)

1.1. TIDES AND WATER LEVELS

1.2. Specifications

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

1.3. 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.

1.3.1. Water Level Data Acquisition Monitoring

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

1.3.2. The Hydro Hot List (HHL)

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

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

Station	Station ID	Residual or Datum Control or Subordinate Installation	Type (NWLON, PORTS©, etc.)	Comment
Newport, RI	8452660	Residual and Datum Control	NWLON	
Woods Hole, MA	8447930	Datum Control	NWLON	
Nantucket Island, MA	8449130	Datum Control	NWLON	
New London, CT	8461490	Datum Control	NWLON	
Montauk, NY	8510560	Datum Control	NWLON	
Southern Martha's Vineyard, MA	844AAAA	Subordinate Installation		

Table 1: All stations that need to be added to the HHL in support of B307-FH-2015

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 added to HHL. For station removal, inform OET and HPT 3 business days prior to the actual removal of a station and confirm with OET upon final station removal.

It is important to know that the addition of a water level station to the HHL ensures the station is monitored by CORMS and any problems are reported daily. However, platforms should view the HHL each morning of active survey operations and click on the "Plot" to double check that there are not problems with the required stations on that day. If a platform notices problems with data on their survey day of operation, please contact HPT at nos.coops.hpt@noaa.gov, CORMS at CORMS@noaa.gov, and the respective headquarters point of contact at HSD or NSD. Stations on the HHL are given priority for maintenance should a station cease normal operation during scheduled times of hydrography. CO-OPS will notify a field unit within 1 business day if a HHL water level station ceases operation during scheduled times of hydrography. This is in addition to the daily CORMS report that CORMS sends to NOAA field units, if the field unit's e-mail address is added to the CORM's daily e-mail list. To be added to the CORMS daily HHL report, the platform should contact CO-OPS' Data Monitoring and Analysis Team (DMAT) at nos.co-ops.dmat@noaa.gov and request to be added.

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

1.4. Operating Tide Reducer and Datum Control Stations

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

The NWLON station Newport, RI (8452660) will provide water level reducers for this project. Therefore it is critical that it remains in operation during the survey. See Sections 1.1. and 1.2. concerning responsibilities.

The operating NWLON stations at Newport, RI (8452660), Woods Hole, MA (8447930), Nantucket Island, MA (8449130), New London, CT (8461490), and Montauk, NY (8510560) may serve as datum control stations for the subordinate installation. Therefore, it is critical that they remain in operation during all periods of hydrography.

No leveling is required at Newport, RI (8452660), Woods Hole, MA (8447930), Nantucket Island, MA (8449130), New London, CT (8461490), and Montauk, NY (8510560) by NOAA's Ferdinand Hassler 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.

1.4.2. Subordinate Station Requirements

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

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

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

Additionally, supplemental and/or back-up stations may also be necessary based upon the complexity of the hydrodynamics and/or the severity of environmental conditions at the project area. If the Commanding Officer (or Team Leader) determines that additional or alternative water level stations are necessary to those required by CO-OPS, then he or she must coordinate with CO-OPS to obtain CO-OPS' approval and to define the timing and location of the additional or alternative subordinate station(s). For all subordinate stations that are approved and installed, minimum 30 continuous days of data must be collected throughout the entire survey period for which they are applicable. If the minimum 30-day data collection requirement is not met, CO-OPS may not be able to provide the tide reducers for the survey.

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

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

The following subordinate stations are required:

Station Number	Station Name	Approximate Latitude (N)	Approximate Longitude (W)
844AAAA**	Southern Martha's Vineyard	41° 20.0	70° 36.2

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

1.4.3. Tide Component Error Estimation

The estimated tidal error contribution to the total survey error budget in the Rhode Island Sound and Approaches, MA is 0.50 meters at the 95% confidence level, and includes the estimated gauge measurement error, tidal datum computation error, and tidal zoning error. Based on this analysis, a station will be required at Southern Martha's Vineyard, MA (844AAAA). 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.

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

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

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

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

STATION	GOES East
844AAAA	ELEV. 42.0° AZIMUTH (T) 186.6°

1.4.5. 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.

1.4.5.1. 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 station listed in Section 1.3.2. of these Project Instructions for the following hydrographic area(s) or zone(s):

Station Number	Hydrographic Area(s) or Zone(s)
844AAAA	Zones NA569, NA570, NA599-NA605, NA607, NA608, NA609, and NA610

1.4. Discrete Tidal Zoning

1.4.1. The water level station Newport, RI (8452660) is the reference station for preliminary tides for hydrography in Rhode Island Sound and Approaches, MA. The time and height correctors listed below for applicable zones should be applied to the preliminary data at Newport, RI (8452660) 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
NA569	-6	x0.86	8452660
NA570	+6	x0.86	8452660
NA599	+84	x0.79	8452660
NA600	+66	x0.82	8452660
NA601	+48	x0.84	8452660
NA602	+30	x0.85	8452660
NA603	+24	x0.85	8452660
NA604	+12	x0.86	8452660
NA605	0	x0.86	8452660
NA607	-6	x0.86	8452660
NA608	-12	x0.86	8452660
NA609	-6	x0.86	8452660
NA610	0	x0.86	8452660
NA630	-12	x0.86	8452660
NA630A	-18	x0.86	8452660

1.4.2. Polygon nodes and water level corrections referencing Newport, RI (8452660) are provided in CARIS® format denoted by a *.zdf extension file name.

NOTE: The tide corrector values referenced to Newport, RI (8452660) are provided in the zoning file "B307FH2015CORP" for this project and are in the fourth set of correctors designated as TS4. Longitude and latitude coordinates are in decimal degrees. Negative (-) longitude is a representation of West longitude.

"Preliminary" data for the control water level station, Newport, RI (8452660), are available in near real-time and verified data will be available on a weekly basis for the previous week. **These**

water level data may be obtained from the CO-OPS SOAP web services at http://opendap.co-ops.nos.noaa.gov/axis/text.html.

1.4.3 Zoning Diagram(s)

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

1.4.4 Final Zoning

Upon completion of project OPR-B307-FH-2015, submit a Pydro generated request for final tides, with times of hydrography abstract and mid/mif tracklines attached. Forward this request to Final.Tides@noaa.gov . Provide the project number, as well as a sheet number, in the subject line of the email.

CO-OPS will review the times of hydrography, final tracklines, and six-minute water level data from all applicable water level gauges. After review, CO-OPS will send a notice indicating that the tidal zoning scheme sent with the project instructions has been approved for final zoning. If there are any discrepancies, CO-OPS will make the appropriate adjustments and forward a revised tidal zoning scheme to the field group and processing branch for final processing.

1.5 Fetchtides

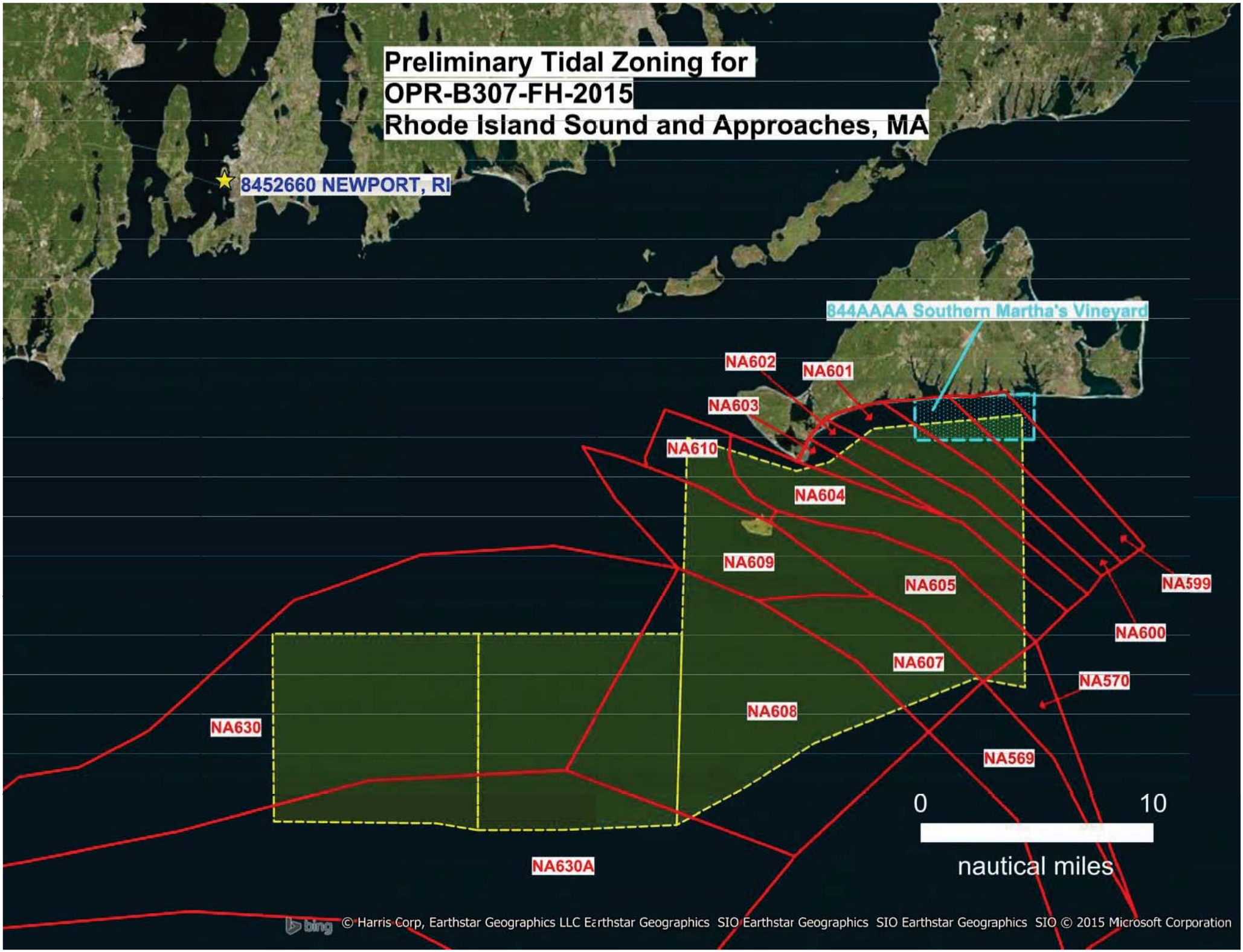
Preliminary and verified six minute water level time series data may be retrieved from the CO-OPS database via the Fetchtides application. Fetchtides provides a mechanism to store imported data locally and combines multiple days of data into one CARIS readable tide (.tid) file. Fetchtides is available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

1.6 Water Level Records

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

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

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


Preliminary Tidal Zoning for
OPR-B307-FH-2015
Rhode Island Sound and Approaches, MA
8452660 NEWPORT, RI
844AAAA Southern Martha's Vineyard
NA602
NA601
NA603
NA610
NA604
NA609
NA605
NA599
NA600
NA607
NA570
NA608
NA630
NA569
NA630A
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