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

JUL 15 2015

MEMORANDUM FOR: Captain Shepard M. Smith, NOAA
Commanding Officer, NOAA Ship *Thomas Jefferson*

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

SUBJECT: Project Instruction for TJ-15-03
Buzzards Bay and Vicinity

Attached is the final Project Instruction for TJ-15-03, Buzzards Bay and Vicinity, which is scheduled aboard NOAA Ship *Thomas Jefferson* during the period of July 21 – September 3, 2015. Of the ~~48~~ 41 DAS scheduled for this project, 41 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.

cc:
LCDR Michael Gonsalves
CAPT Eric W. 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: July 9, 2015

Platform: NOAA Ship *Thomas Jefferson*

Project Number: TJ-15-03 (OMAO)
OPR-B367-TJ-15 (OCS)

Project Title: Buzzards Bay and Vicinity

Project Dates: 07/21/2015 – 09/03/2015

Prepared by: _____ Dated: 2015.07.09 16:55:53 -04'00'
LCDR Michael Gonsalves, NOAA
Chief, Operations Branch
Hydrographic Surveys Division

Approved by: _____ Dated: 10July2015
CAPT Eric W. Berkowitz, NOAA
Chief, Hydrographic Surveys Division
Office of Coast Survey

JUL 15 2015

Approved by: _____ Dated: 15 July 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 July 2015 and end in September 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 ~~48~~ 41 DAS scheduled for this project, ~~48~~ 41 DAS are funded by a Line Office Allocation. This project is estimated to exhibit a Medium Operational Tempo.

C. Operating Area

The project area is located in the vicinity of Buzzards Bay, MA. A map of the project area may be found with the detailed project instructions appended to these instructions.

D. Summary of Objectives

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

E. Participating Institutions

N/A

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

Name (Last, First)	Title	Date Aboard	Date Disembark	Gender	Affiliation	Nationality
Bongiovanni, Cassandra	IOCM			F	Earth Resources Technology	USA
Chaveau, Brian	PS	07/~~13~~21/2015	07/30/2015	M	NOAA	USA
Lathrop, Mark	PS	08/25/2015	09/03/2015	M	NOAA	USA
Short, Robert	PS	08/03/2015	08/14/2015	M	NOAA	USA
Wilson, Matthew	PS	07/~~13~~21/2015	07/30/2015	M	NOAA	USA

G. Administrative

1. Points of Contacts

Principal Investigator:
LCDR Michael Gonsalves, NOAA
Chief, Operations Branch
Hydrographic Surveys Division

1315 East-West Hwy
Silver Spring, MD 20910
(301) 713-2702 x112
Michael.Gonsalves@noaa.gov

Project Manager:

Corey Allen
Physical Scientist, Operations Branch
Hydrographic Surveys Division
1315 East-West Hwy
Silver Spring, MD 20910
(301) 713 – 2702 x 119
Corey.Allen@noaa.gov

Chief Scientist:

CAPT Shepard M. Smith, NOAA
Commanding Officer, NOAA Ship *Thomas Jefferson*
Marine Operations Center, Atlantic
439 York Street
Norfolk, VA 23510-1145
(757) 647-0187
CO.Thomas.Jefferson@noaa.gov

2. Diplomatic Clearances

None Required.

3. Licenses and Permits

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

II. Operations

For this project, the Commanding Officer will act as the Chief Scientist. Therefore, the Commanding Officer will be responsible for ensuring the scientific staff are trained in planned operations and are knowledgeable of project objectives and priorities. The Commanding Officer is responsible for ensuring all operations conform to the ship's accepted practices and procedures.

A. Project Itinerary:

07/~~13~~21/2015 - 07/30/2015	Norfolk, VA-Boston, MA	TJ-15-03 Leg 1
08/03/2015 - 08/14/2015	Boston, MA-Woods Hole, MA	TJ-15-03 Leg 2
08/17/2015 - 09/03/2015	Woods Hole, MA – Norfolk, VA	TJ-15-03 Leg 3

B. Staging and Destaging:

N/A

C. Operations to be Conducted:

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

D. Dive Plan

All dives are to be conducted in accordance with the requirements and regulations of the NOAA Diving Program (http://www.ndc.noaa.gov/dr.html) and require the approval of the ship's Commanding Officer.

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

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

B. Equipment and Capabilities provided by the scientists

The Office of Coast Survey's Hydrographic Surveys Division may provide Physical Scientists for hydrographic data acquisition, processing, training, and data quality assurance support during project survey operations. Additionally, shore-based technical

support may be provided for survey systems and data acquisition and processing software.

IV. Hazardous Materials

A. Policy and Compliance

No hazardous materials are being brought aboard the ship for this project.

B. Radioactive Materials

No radioactive isotopes are planned for this project.

V. Additional Projects

A. Supplementary ("Piggyback") Projects

No supplementary projects are planned.

B. NOAA Fleet Ancillary Projects

No NOAA fleet ancillary projects are planned.

VI. Disposition of Data and Reports

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

VII. Meetings, Vessel Familiarization, and Project Evaluations

A. Pre-Project Meeting: The Principal Investigator and Commanding Officer will conduct a meeting of all relevant stakeholders to discuss required equipment, planned operations, concerns, and establish mitigation strategies for all concerns. This meeting shall be conducted before the beginning of the project with sufficient time to allow for preparation of the ship and project personnel.

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

C. Post-Project Meeting: The Commanding Officer is responsible for 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 all relevant stakeholders.

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

VIII. Miscellaneous

A. Meals and Berthing

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

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

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

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

B. Medical Forms and Emergency Contacts

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

All NHSQs submitted after March 1, 2015 must be accompanied by NOAA Form (NF) 57-10-02 - Tuberculosis Screening Document in compliance with OMAO Policy 1008 (Tuberculosis Protection Program).

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

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

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

Contact information:

Regional Director of Health Services
Marine Operations Center – Atlantic
439 W. York Street
Norfolk, VA 23510
Telephone 757-441-6320
Fax 757-441-3760
Email MOA.Health.Services@noaa.gov

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

C. Shipboard Safety

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

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

D. Communications

A progress report on operations prepared by the Commanding Officer may be relayed to the program office. Sometimes it is necessary to communicate with another vessel, aircraft, or shore facility. Through various means of communications, the ship can usually accommodate this. Special radio voice communications requirements should be listed in the project instructions. The ship's primary means of communication with the Marine Operations Center is via email and the Very Small Aperture Terminal (VSAT) link. Standard VSAT bandwidth at 128kbs is shared by all vessels staff and the science team at no charge. Increased bandwidth in 30 day increments is available on the VSAT systems at increased cost to the scientific party. If increased bandwidth is being considered, program accounting is required and it must be arranged through the ship's Commanding Officer at least 30 days in advance.

E. IT Security

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

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

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

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

F. Foreign National Guests Access to OMAO Facilities and Platforms

Foreign National access to the NOAA ship or federal facilities is not required for this project.

VIII. Appendices

1. Primary Project Instructions: OPR-B367-TJ-15, Buzzards Bay and Vicinity

Hydrographic Survey Project Instructions

Project Name:	Buzzards Bay and Vicinity
Project Number:	OPR-B367-TJ-15
Assigned Field Unit:	NOAA Ship *Thomas Jefferson*
Assigned Processing Branch:	Atlantic Hydrographic Branch
Signed Date:	07/09/2015
Project Instructions Version:	Final
Planned Acquisition Time:	Start Date: 07/2015 End Date: 09/2015
Delivery Dates:	120 days from completion of data acquisition.

Purpose and Location:
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 within Buzzards Bay and Nantucket Sound and reduce the survey backlog. This high traffic area of Massachusetts and Rhode Island has an increasing need for updated soundings due expanding commerce and modernization of vessel traffic. Single-hull petroleum barges were prohibited, as of January 1, 2015, which will increase the use of larger deeper draft double-hull barges. In addition, this area has been identified for possible installation of marine transmission cable routes, while offshore waters have been designated for wind energy development. Updated hydrographic surveys will help advance these projects as well as provide updated soundings for related commerce activities, such as equipment transport. Approximately 79 square nautical miles (SNM) along the north shore of Buzzards Bay have been assigned as a Navigable Area survey. An additional 126 SNM have been assigned as Field Examination Surveys, in order to investigate the use outside data sources for nautical charting purposes. This data sources include previously acquired United State Geologic Survey (USGS) data in Buzzards Bay and satellite derived bathymetry (SDB) in Nantucket Sound. Finally, 66 SNM of Navigable Area have been identified as a contingency for ship acquisition only. This project will cover approximately 108 square nautical miles of “critical” survey area as identified in 2012 NOAA Hydrographic Survey Priorities. 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 and Field Examinations in accordance with the following support documents.
NOS Hydrographic Surveys Specifications and Deliverables Manual (HSSD), May 2015
NOS Field Procedures Manual for Hydrographic Surveying (FPM), April 2014
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: Buzzards Bay and Nantucket Sound

Registry Number	*Priority*	*Sublocality*	*State or Territory*	*Scale*	*Estimated SNM*	*Instructions*
H12642	1	Approaches to New Bedford	Massachusetts	10000	15	Extend inshore limit of hydrography to 4m in the entrance channel to New Bedford in the area north of Clarks Pt. Due to future dredging plans, DO NOT acquire data within the limits of the maintained New Bedford Harbor Channel.
H12643	2	Great Hill Pt to Converse Pt	Massachusetts	10000	12	
H12644	3	Converse Pt to Mattapoisett Neck	Massachusetts	10000	7	
H12645	4	Nasketuckett Bay	Massachusetts	10000	8	
H12646	5	Round Hill Pt to Gooseberry Neck	Massachusetts	10000	10	
H12647	6	Gooseberry Neck to Quicksand Pt	Massachusetts	10000	5	
H12652	7	Stony Pt to Warren Pt	Rhode Island	10000	8	
H12653	8	Sakonnet to Newport	Rhode Island	10000	14	
F00654	9	North Shore of Buzzards Bay	Massachusetts	20000	5	Acquire data to meet the objectives described in the United States Geological Survey (USGS) Reference Data Comparison task.
F00659	10	Buzzards Bay	Massachusetts	10000	105	Acquire checklines in order to investigate the validity of using the USGS dataset for

Registry Number	Priority	Sublocality	State or Territory	Scale	Estimated SNM	Instructions
						chart updates. See the United States Geological Survey (USGS) Reference Data Comparison task for more information.
F00660	11	Wasque and Tuckernuck Shoals	Massachusetts	20000	8	Acquire data to meet the objectives described in the Satellite Derived Bathymetry (SDB) Assigned task.
H12837	12	17 NM Southwest of Martha's Vineyard	Massachusetts Rhode Island	40000	67	Ship acquisition - contingency plan -- acquire data only in the event that launches are unable to work.

Limits & Coverage:

Inshore Limit:The inshore limit of hydrography will be the farthest offshore of the following: (1) the 6-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: None Specified

Coverage Water Depth	Coverage Required
H12642-H12647, H12652, H12653, H12837, and F00654: all waters in the survey area	Complete coverage, as defined in section 5.2.2 of the HSSD.
F00660: all waters in the survey area	A combination of set line spacing and complete coverage, as defined in section 5.2.2 of the HSSD in order to delineate and determine the least depths on shoals in the survey area.
F00659: all waters in survey area	Acquire checklines as per the USGS proposal. See the United States Geological Survey (USGS) Reference Data Comparison task for more information.

Assigned Tasks

Acknowledgement:

Acknowledge receipt of these instructions and submit any comments or questions via email to Corey Allen at Corey.Allen@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, AWOIS wrecks and obstructions have been provided in KML format in the GIS folder of the project file and can also be obtained from http://www.nauticalcharts.noaa.gov/hsd/wrecks_and_obstructions.html.

Maritime Boundary Points (MBPs):

Investigate Maritime Boundary Points in accordance with section 7.4 of the HSSD.

Number of MBPs provided for Full Investigation: *(when safety permits, search inshore of the NALL line for these maritime boundary features)*	3
Number of MBPs provided for Information Only:	9

Bottom Samples:

Obtain bottom samples in accordance with section 7.1 of the HSSD in areas designated by the feature object class springs (SPRING) in the Project Reference File (PRF). Review the recommended bottom sample locations with regards to the acquired survey data. Contact HSD Operations Branch 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 may increase or decrease the sample density but should closely maintain the same numbers of samples per survey as originally assigned. NOTE: areas of unexplored ordnance are located within the survey area for H12837. Take prudence to avoid these areas when acquiring bottom samples.

Chart Comparison:

Use only the latest editions of the largest scale NOS charts covering the project area. Perform a chart comparison in accordance with section 4.5 of the FPM and section 8.1.4, D.1 of the HSSD. Resolve any discrepancies identified in the field and explain them in the Descriptive Report. The charts, listed below, were used in the preparation of these project instructions and accompanying project files and should not be considered a complete listing of charts required for chart comparison purposes.

Affected Raster Charts

Chart Number	*Scale*	*Edition Number*	*Edition Date*	*LNM Date*	*NM Date*
13223	20000	43	06/2013	01/20/2015	01/31/2015
13232	20000	5	11/2009	01/27/2015	02/07/2015
13228	20000	12	11/2009	01/20/2015	01/31/2015
13236	20000	31	04/2012	02/03/2015	02/14/2015
13221	40000	60	03/2014	02/03/2015	02/14/2015
13230	40000	51	04/2014	01/27/2015	02/07/2015
13218	80000	42	06/2013	02/03/2015	02/14/2015
13233	40000	19	01/2011		05/16/2015
13235	5000	7	07/2015		05/23/2015
13241	40000	18	03/2014		05/02/2015

Affected ENCs

ENC Name	*Scale*	*Edition*	*Update Application Date*	*Issue Date*	*Preliminary*
US5RI20M	40000	14	09/16/2014	09/16/2014	NO
US5RI22M	20000	23	02/02/2015	02/02/2015	NO
US5MA24M	20000	12	12/16/2014	12/16/2014	NO
US5MA26M	20000	15	07/23/2014	02/03/2015	NO
US5MA27M	20000	23	09/30/2014	01/27/2015	NO
US5MA25M	40000	20	09/24/2014	09/24/2014	NO
US5MA20M	40000	8	02/02/2015	02/11/2015	NO
US4MA23M	80000	27		02/10/2015	NO
US5MA41M	40000	9		03/10/2015	NO
US5MA29M	40000	7		05/18/2015	NO
US5MA28M	5000	7		01/12/2015	NO

Coast Pilot:
Review and make recommendations for changes to the Coast Pilot in accordance with section 7.5 of the HSSD. Coast Pilot excerpts can be downloaded from the Coast Pilot website (http://www.nauticalcharts.noaa.gov/nsd/cpdownload.htm). No additional directed questions have been submitted from the Coast Pilot Branch. However, the field unit shall pay particular attention to features such as aids to navigation, landmarks, ferries, geographic names, dangers, channels, bridges, anchorages, etc. In addition, changes to shoreline, including condition, additions, and deletions of wharves, piers, and other waterfront structures, shall be noted. Finally, high-definition sea-level photography to supplement the Coast Pilot narrative (i.e. major lighthouses, harbors, or views that would assist the mariner in location or orientation) is requested. Recommendations for photos include (but are not limited to) the Buzzards Bay Entrance Light (41°23'49"N., 71°02'05"W), New Bedford Harbor and waterfront, the radio tower at New Bedford, the western entrance to Cape Cod Canal, Nobska Point Light (41°30'57"N., 70°39'18"W), and the Juniper Point Lighthouse. Submit the revised Coast Pilot section or a report stating no changes are recommended, via email to Coast.Pilot@noaa.gov and ocs.ndb@noaa.gov with a courtesy copy to the HSD OPS Project Manager. 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. Junction comparisons are required for both standard hydrographic surveys and field examinations. Refer to sections 2.2.2.3 and 4.5.2 of the FPM for additional information.

Registry Number	*Scale*	*Year*	*Platform*	*Relative Location*
H10434	10000	1992	NOAA Ship *Rude*	N
F00373	10000	1992	NOAA Ship *Rude*	N
F00378	20000	1992	NOAA Ship *Rude*	N
F00406	10000	1994	NOAA Ship *Rude*	S
H10458	20000	1992	NOAA Ship *Rude*	S
H10461	10000	1993	NOAA Ship *Rude*	NE
H10496	10000	1993	NOAA Ship *Rude*	NE
H10511	10000	1993	NOAA Ship *Rude*	NE
H10530	10000	1994	NOAA Ship *Rude*	NE
H10520	10000	1994	NOAA Ship *Rude*	NE
H10548	10000	1994	NOAA Ship *Rude*	N
H10575	10000	1995	NOAA Ship *Rude*	N
H10605	10000	1995	NOAA Ship *Rude*	W
H10711	10000	1996	NOAA Ship *Rude*	NW
H11076	5000	2004	NOAA Ship *Thomas Jefferson*	S
H11318	10000	2004	NOAA Ship *Rude*	S
H11319	10000	2004	NOAA Ship *Rude*	N
H11922	10000	2008	NOAA Ship *Thomas Jefferson*	SE
H11995	10000	2008	NOAA Ship *Thomas Jefferson*	SW
H11996	10000	2008	NOAA Ship *Thomas Jefferson*	SW
H12707	40000	2014	NOAA Ship *Ferdinand R. Hassler*	N
H12702	40000	2014	NOAA Ship *Ferdinand R. Hassler*	N
H12324	10000	2011	NOAA Ship *Thomas Jefferson*	S

Progress Reports:

Submit weekly and monthly progress reports in accordance with section 8.1.1 of the HSSD.

Survey Outlines:

Generate a survey outline in accordance with the HSSD, section 8.1.2.

Special Data Handling Requirements:
ATTENTION: NOAA Ship Thomas Jefferson Provide data, acquired during the USGS validation task, to the UNH-Integrated Ocean and Coastal Mapping (IOCM) team for analysis. A member from this team is planned to join Thomas Jefferson during the first leg of this project. The IOCM team will consult with HSD in order to determine the applicability of the USGS data for charting. Data acquired during this task shall also be submitted to the Atlantic Hydrographic Branch, as required in the HSSD.
ATTENTION: NOAA Ship Thomas Jefferson Provide processed grids, generated during the SDB validation task, to the HSD OPS Project Manager. HSD will consult with the Marine Charting Division (MCD) to determine the applicability of the SDB data for charting. Data acquired during this task shall also be submitted to the Atlantic Hydrographic Branch, as required in the HSSD.

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

Vertical Control Requirements:

A GPS buoy (8448875) was deployed in support of B307FH2015 off of the southern coast of Martha's Vineyard. If it is necessary to retrieve the buoy and redeploy more than 1/4 mile from its original location, please contact CO-OPS personnel at nos.coops.oetteam@noaa.gov and nos.coops.hpt@noaa.gov. Reference survey data to the ellipse using a real-time Precise Point Positioning (PPP) satellite-based corrector service. Acquire check lines at the commencement of survey operations in order to confirm the ERS infrastructure and measure the anticipated positioning uncertainties throughout the project area. In addition, process these check lines using one of the operating CORS stations in the area (MADA, MAFA, ACU6, or the Menemsha control station) in order to further validate the real-time PPP service for future viability of OCS projects. Report the results of the check lines to the HSD Operations Project Manager. Deliver all survey lines with SBET/RMS files applied and GPS tides computed. Within 60 days of the completion of acquisition, submit an ERS Capability Memorandum to the HSD Operations Project Manager, summarizing the degree to which ERS surveying was successful. HSD OPS Project Manager will provide final guidance for vertical control, based on the results of the ERS Capability Memorandum. Should the field experience difficulty in realizing chart datum via the ellipse, first pursue technical assistance. If this proves unsuccessful, contact the HSD Operations Project Manager for guidance on how to proceed. Registration, via the MaCORS website, allows for the receipt of outage-related alerts RINEX products for the MADA and MAFA stations. Information about registering for MaCORS can be found at http://macors.massdot.state.ma.us/spiderweb/frmIndex.aspx.

TCARI

Comply with the requirements from CO-OPS which are included with the project data from the Operations Branch. Submit surveys with final approved water levels applied. Contact the HSD OPS Project Manager if this causes the survey to miss a submission deadline.

VDatum

Delivered grids at chart datum shall be derived via the ellipse using the separation model provided by HSD Operations.

VDatum Version	Geoid	Area	Area Version	Separation Uncertainty
3.2	2012	NY, CT, RI	2	10.2 centimeters

NWLON Gauges

Operating Water Level Station	*Station ID*
Newport, RI	8452660
Nantucket Island, MA	8449130
Woods Hole, MA	8447930
New London, CT	8441490
Montauk, NY	8510560

Subordinate Gauges

Operating Water Level Station	*Station ID*	*Leveling Required*	*Installation Required*	*Pre-Existing Benchmarks*
Southern Martha's Vineyard	8448875	NO	NO	NO

Orthometric Imagery:

For reference, images from the "2009 NOAA Ortho-rectified Mosaic of Massachusetts: Buzzards Bay" dataset were downloaded from the from NOAA's Digital Coast website (http://coast.noaa.gov/dataservices/Metadata/TransformMetadata?u=http://coast.noaa.gov/data/Documents/Metadata/Imagery/no_harvest/dss_iocm_rgb_mhw_buzzards_2009.xml&f=html). This data set contains ortho-rectified mosaic tiles, created as a product from the NOAA Integrated Ocean and Coastal Mapping (IOCM) initiative. The source imagery was acquired from 20090810 - 20091021. The images were acquired with an Applanix Digital Sensor System (DSS). The original images were acquired at a higher resolution than the final ortho-rectified mosaic. Because of the large size of the dataset, imagery files will be provided on physical media, and will be transmitted separately from the main project files.

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 NALL. All other submerged or visible cultural features inside the limit of survey shall be verified. Please note that 100% sidescan coverage is not sufficient for feature disproval. In situations where a feature falls solely within 100% sidescan coverage areas disprovals shall be performed using the following guidance: Known charted features -- 1mm at largest scale chart or 50 meter search radius, whichever is larger (e.g. 50m radius on 1:40,000, 80m radius on 1:80,000) Questionable features (i.e. charted features labeled with a "PA" or "Rep") -- 2mm at largest scale chart or 100 meter search radius, whichever is larger (e.g. 100m radius on 1:40,000, 160m radius on 1:80,000) Doubtful features (i.e. charted features labeled with a "PD" or "ED") : 3mm at largest scale chart of 150 meter search radius, whichever is larger (e.g. 150m radius on 1:40,000, 240m radius on 1:80,000)will have a search radius of 100 meters in survey H12761 and 160 meters in all other areas. All other features will have a disproval radius of 50 meters. Refer to HSSD section 5.2.1.2 for further guidance.

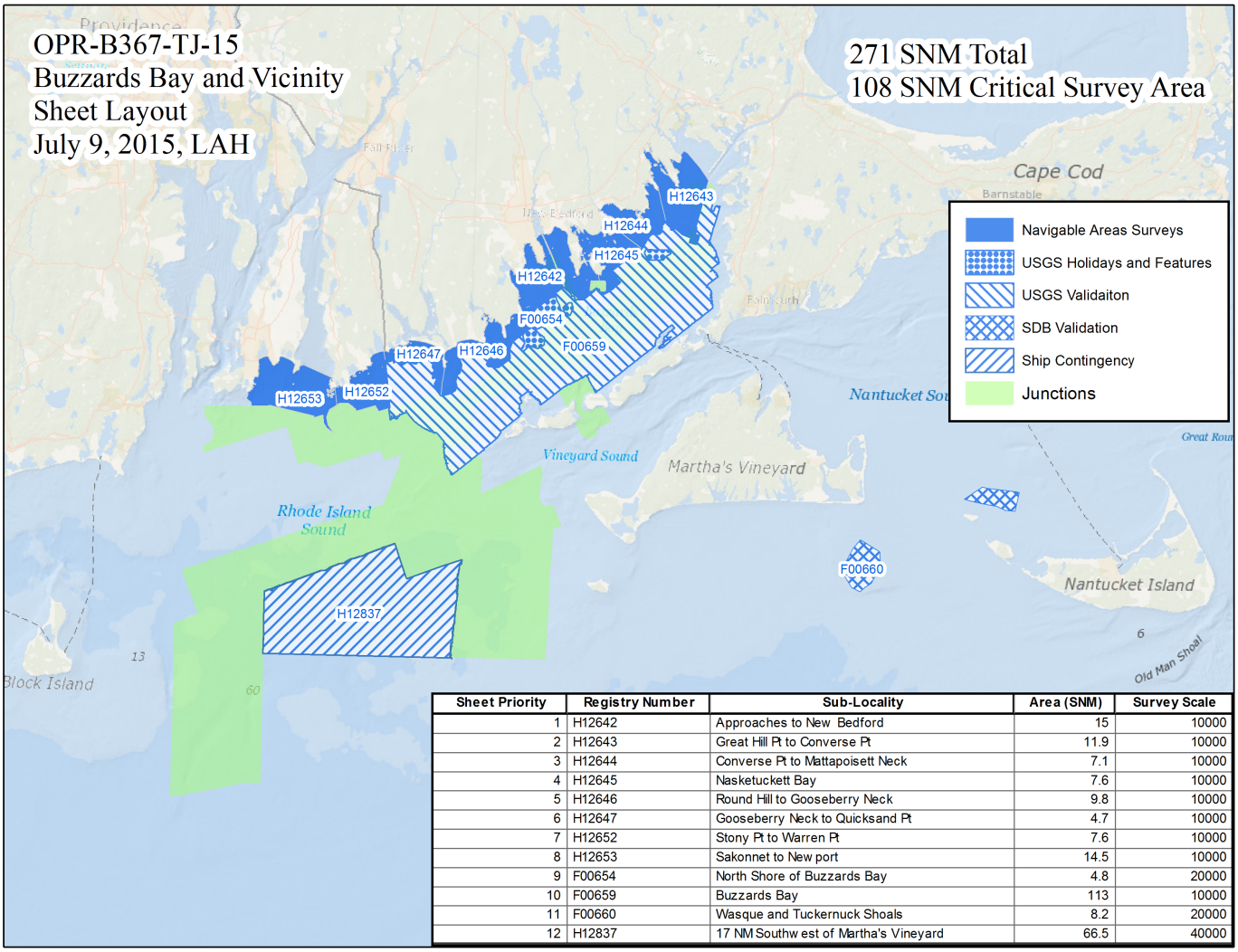
GC Number	*Horizontal Position Accuracy*
11102	3.0 meters

Additional Task: *Satellite Derived Bathymetry (SDB) Validation*

Acquire data in the areas designated as F00660 in order to meet the following objectives: (1) Delineate the extent of shoals. SDB indicates the possibility of shoal migration in this area. Determine the current extent of any shoals in the area and obtain a least depth for each shoal. In the event that a shoal has migrated, it may be necessary to acquire soundings over the charted shoal for disproval. See HSSD section 5.2.2.3 for guidance on set line spacing requirements and the use of splits to develop shoals, contours, and deeps. If necessary, contact the HSD Ops Project Manager and the Atlantic Hydrographic Branch for further clarification. (2) Investigate the validity of using the SDB for chart updates. While the vertical component of the SDB is not accurate enough to convert the data to charted soundings, it may be used for charting contours. Running a series of survey lines across the entire area will help to further constrain the vertical

component of the SDB and allow for more accurate contours. A minimum of six survey lines are required. Four survey lines shall be run around the periphery of the survey area. In addition, a minimum of two survey lines shall be run across the entire survey area in a manner which provides a large range of bathymetry. (3) Test and evaluate Thomas Jefferson's small commercial unmanned surface vehicle as per the field-provided test plan. A total days of five (5) at sea (DAS) has been budgeted for this task. The field unit is not required nor expected to perform any analysis on the SDB dataset. Images from high-resolution SDB (Landsat8 and Digital Globe's Worldview-2 and Worldview-3) have been provided for reconnaissance and situational awareness purposes.

Additional Task: *Environmental Compliance and Marine Mammal Reporting*
Comply with the environmental compliance and reporting requirements in section 7.6 of the HSSD.



Sheet Priority	Registry Number	Sub-Locality	Area (SNM)	Survey Scale
1	H12642	Approaches to New Bedford	15	10000
2	H12643	Great Hill Pt to Converse Pt	11.9	10000
3	H12644	Converse Pt to Mattapoisett Neck	7.1	10000
4	H12645	Nasketuckett Bay	7.6	10000
5	H12646	Round Hill to Gooseberry Neck	9.8	10000
6	H12647	Gooseberry Neck to Quicksand Pt	4.7	10000
7	H12652	Stony Pt to Warren Pt	7.6	10000
8	H12653	Sakonnet to New port	14.5	10000
9	F00654	North Shore of Buzzards Bay	4.8	20000
10	F00659	Buzzards Bay	113	10000
11	F00660	Wasque and Tuckernuck Shoals	8.2	20000
12	H12837	17 NM Southw est of Martha's Vineyard	66.5	40000

Figure 1: OPR-B367-TJ-15 Sheet Layout

User Contacts

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

HSD/OPS Project Manager
Corey Allen
NOAA/NOS/OCS/HSD
Phone: 301-713-2700 x 141
Fax:
Email: Corey.Allen@noaa.gov
Obligation: Mandatory

NOAA Navigation Manager, Northeast
LT Meghan McGovern
National Marine Fisheries Service's, Narragansett Laboratory
Phone: 401-782-3252
Fax: 701-782-3292
Email: Meghan.McGovern@noaa.gov
Obligation: Mandatory

WATER LEVEL INSTRUCTIONS
OPR-B367-TJ-2015 Buzzards Bay, RI & MA (Revised)
(06/24/2015 LH)

1.0. TIDES AND WATER LEVELS

1.1. Specifications

Tidal data acquisition, data processing, tidal datum computation and final tidal zoning shall be performed utilizing sound engineering and oceanographic practices as specified in National Ocean Service (NOS) Hydrographic Surveys Specifications and Deliverables (HSSD), dated May 2015, and OCS Field Procedures Manual (FPM), dated April 2014. Specifically reference Chapter 4 of the HSSD and Sections 1.5.8, 1.5.9, 2.4.3, and 3.4.2 of the FPM.

1.2. Vertical Datums

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

1.2.1. Water Level Data Acquisition Monitoring

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

1.2.2. The Hydro Hot List (HHL)

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

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

Station	Station ID	Residual or Datum Control or Subordinate Installation	Type (NWLON, PORTS©, etc.)	Comment
Newport, RI	8452660	Residual and Datum Control	NWLON	
Nantucket Island, MA	8449130	Residual and Datum Control	NWLON	
Woods Hole, MA	8447930	Datum Control	NWLON	
New London, CT	8441490	Datum Control	NWLON	
Montauk, NY	8510560	Datum Control	NWLON	
Southern Martha's Vineyard, MA	8448875	Subordinate Installation	Buoy	

Table 1: All stations that need to be added to the HHL in support of B367-TJ-2015_Rev

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.

1.3. Operating Tide Reducer and Datum Control Stations

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

The NWLON stations Newport, RI (8452660) and Nantucket Island, MA (8449130) 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.

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 Thomas Jefferson personnel.

CO-OPS/FOD is responsible for the operation and maintenance of all NWLON primary control stations. If a problem is identified at an NWLON primary control station, FOD shall make all reasonable efforts to repair the malfunctioning station. However, CO-OPS may request assistance from the NOAA ship or NRT personnel in the actual repair of the water level station to facilitate a rapid repair. CO-OPS/FOD and the Commanding Officer (or Team Leader) shall maintain the required communications until the repairs to the water level station have been completed.

1.3.2. Subordinate Station Requirements

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

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

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

observations is shorter than that of the accepted datum time series, the newly submitted datum may be validated as acceptable for the hydrographic survey but may not supersede the longer already published datum.

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

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

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

The following subordinate station is required:

Station Number	Station Name	Approximate Latitude (N)	Approximate Longitude (W)
8448875*	Southern Martha's Vineyard	41° 20.0	70° 36.2

*** A GPS buoy was deployed in support of B307FH2015 off of the southern coast of Martha's Vineyard. If it is necessary to retrieve the buoy and redeploy more than ¼ mile from its original location, please contact CO-OPS personnel at nos.coops.oetteam@noaa.gov and nos.coops.hpt@noaa.gov.**

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

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
8448875	ELEV. 42.0° AZIMUTH (T) 186.6°

1.3.5. Benchmark Recovery and GPS Requirements

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

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

1.3.6. Residual Water Level Station(s) Data

The 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 stations for all periods of survey.

The operating stations at Newport, RI (8452660) and Nantucket Island, MA (8449130) will provide residuals for this project and must remain in operation during all periods of hydrography.

Station Number	Station Name	Latitude(N)	Longitude(W)
8452660	**Newport, RI**	**41° 30.3'**	**71° 19.6'**
8449130	**Nantucket Island, MA**	**41° 17.10'**	**70° 05.8'**

1.4. Tidal Constituent and Residual Interpolation (TCARI)

1.4.1. For hydrography in the area of Buzzards Bay, apply the TCARI grid "B367TJ2015.tc" supplied in conjunction with the water level data from Section 1.3.6 to produce a seamless tide correction. Refer to the TCARI Field SOP for detailed TCARI instructions.

1.4.2. This section is not applicable for this project.

1.4.3. TCARI Diagram(s)

A diagram created 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. f there are any discrepancies, CO-OPS will make the appropriate adjustments and forward a revised TCARI grid and solutions to the field group and processing branch for final processing.

1.5. Fetchtides

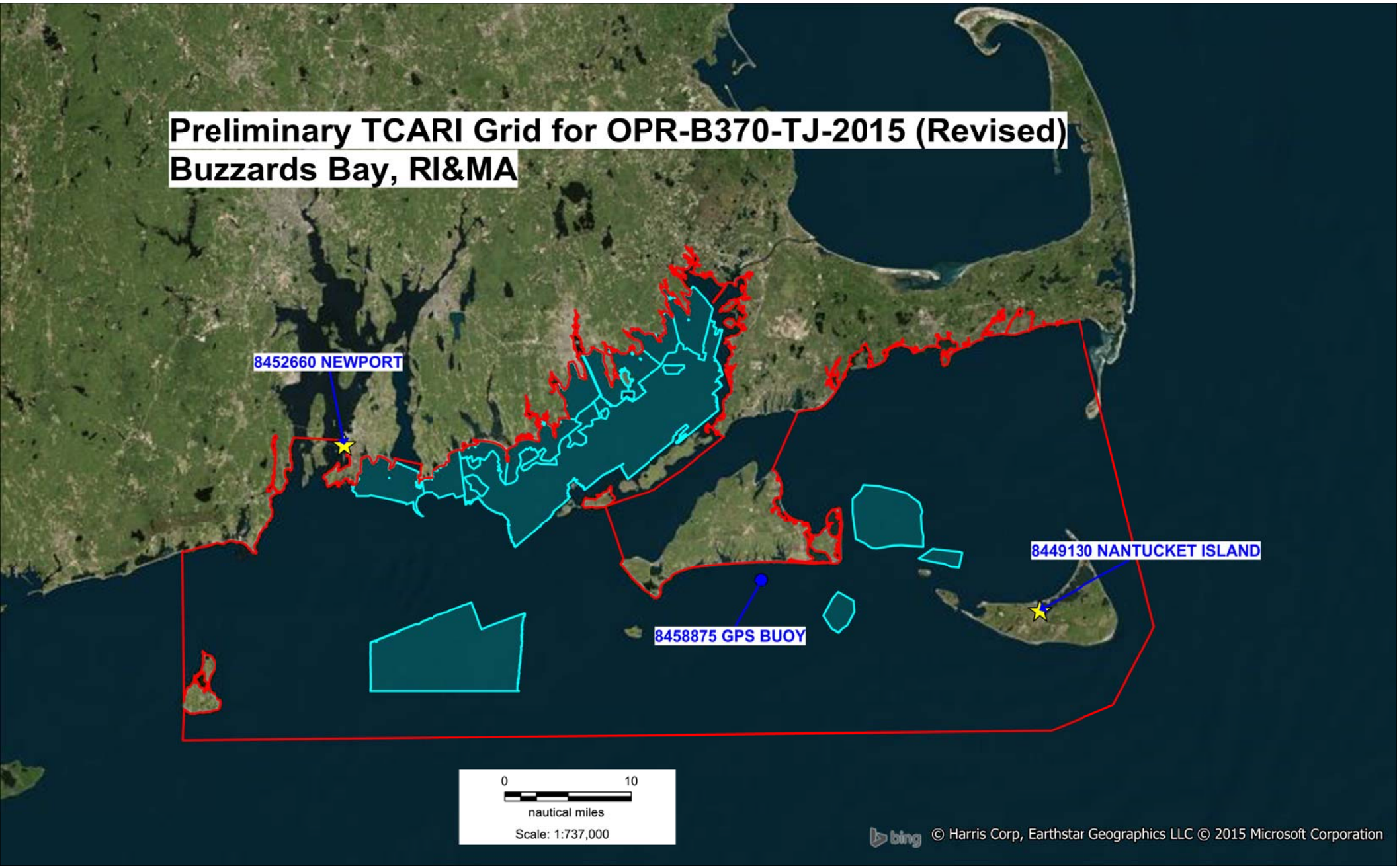
Preliminary and verified six minute water level time series data may be retrieved from the CO-OPS database via the Fetchtides application. Fetchtides provides a mechanism to store imported data locally and combines multiple days of data into one CARIS readable tide (.tid) file. Fetchtides is available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

1.6 Water Level Records

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

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

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


Preliminary TCARI Grid for OPR-B370-TJ-2015 (Revised)
Buzzards Bay, RI&MA
8452660 NEWPORT
8449130 NANTUCKET ISLAND
8458875 GPS BUOY
0
10
nautical miles
Scale: 1:737,000
bing
© Harris Corp, Earthstar Geographics LLC © 2015 Microsoft Corporation