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

APR 10 2015

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

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

SUBJECT: Project Instruction for TJ-15-01
Approaches to Charleston

Attached is the final Project Instruction for TJ-15-01, Approaches to Charleston, which is scheduled aboard NOAA Ship *Thomas Jefferson* during the period of April 11 – June 22, 2015. Of the 62 DAS scheduled for this project, 62 days are funded by Line Office Allocation. This project is estimated to exhibit a High 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: March, 30, 2015

APR 10, 2015

Platform: NOAA Ship *Thomas Jefferson*

Project Number: TJ-15-01 (OMAO)

Project Title: Approaches to Charleston

Project Dates: April 11, 2015 to June 22, 2015

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

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

Approved by: _____ Dated: 4/10/15
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 April 2015 and end in June 2015. This project is being conducted in support of NOAA's Office of Coast Survey to provide contemporary hydrographic data in order to update the nautical charting products and reduce survey backlog in the area.

B. Days at sea (DAS)

Of the 62 DAS scheduled for this project, 0 DAS are funded by an OMAO allocation, 62 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 High Operational Tempo.

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

The project area is located in the Approaches to Charleston, SC. A layout of the project area can be found with the detailed project instructions appended to these instructions.

D. Summary of Objectives

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.

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
Faulkes, Tyanne	PS	4/6/15	5/8/15	F	NOAA/OCS	US
Johnson, Kayla	PS	4/6/15	5/8/15	F	NOAA/OCS	US
Wilson, Matt	PS	5/11/15	6/11/15	M	NOAA/OCS	US
Short, Bobby	PS	6/15/15	6/22/15	M	NOAA/OCS	US

CO has the authority to embark additional scientist and other personnel in order to accomplish the mission and other goals of the ship and NOAA.

G. Administrative

1. 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
Michael.Gonsalves@noaa.gov

Project Coordinator:

Kathryn Pridgen
Physical Scientist, Operations Branch
Hydrographic Surveys Division
1315 East West Hwy, #6603
Silver Spring, MD 20910
(301) 713-4567 x.145
Kathryn.pridgen@noaa.gov

Chief Scientist:

CAPT Shepard Smith, NOAA
Commanding Officer, NOAA Ship *Thomas Jefferson*
439 West York Street
Norfolk, VA 23510-1114
(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

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:

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

T&G:	4/11/2015	Sat	Norfolk, VA	Touch-And-Go for Personnel Transfer
ARR:	4/24/2015	Fri	Charleston, SC	Approaches to Charleston, SC
DEP:	4/27/2015	Mon	Charleston, SC	TJ-15-01 Leg 2
ARR:	5/8/2015	Fri	Wilmington, NC	Approaches to Charleston, SC
DEP:	5/11/2015	Mon	Wilmington, NC	TJ-15-01 Leg 3
ARR:	5/22/2015	Fri	Wilmington, NC	Approaches to Charleston, SC
DEP:	5/26/2015	Tue	Wilmington, NC	TJ-15-01 Leg 4
ARR:	6/11/2015	Thu	Charleston, SC	Approaches to Charleston, SC
DEP:	6/15/2015	Mon	Charleston, SC	TJ-15-01 Leg 5
T&G:	6/22/2015	Mon	Norfolk, VA	Touch-And-Go for Personnel Transfer

B. Staging and Destaging: N/A

C. Operations to be Conducted:

Hydrographic survey operations per the appended project instructions using two survey launches up to 10 hr/day for data acquisition and project field support. Additionally, the ability to run concurrent 24 hr ship survey operations for short periods of time or for extended periods of time with reduced launch operations.

D. Dive Plan

Dives are not planned for this project

E. Applicable Restrictions

Conditions which preclude normal operations:

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

III. Equipment

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

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

2. Ship fully-outfitted with hydrographic survey equipment to support multibeam and side scan survey operations.

3. Personnel to staff and operate the ship's survey equipment for 24 hr/day operations and a minimum of 2 survey launches and equipment for up to 10 hr per day concurrently, at the discretion of the command to ensure the most efficient survey operations.

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

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

Hydrographic Surveys Division 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 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.

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:

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 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-G380-TJ-15, Approaches to Charleston

Hydrographic Survey Project Instructions

Project Name:	Approaches to Charleston
Project Number:	OPR-G380-TJ-15
Assigned Field Unit:	NOAA Ship *Thomas Jefferson*
Assigned Processing Branch:	Atlantic Hydrographic Branch
Signed Date:	04/09/2015
Project Instructions Version:	Final
Planned Acquisition Time:	Start Date: 04/2015 End Date: 06/2015
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 support of a new nautical chart in this area and in response to a harbor deepening project in the Port of Charleston which will better serve deeper draft ships transiting the area. This project will cover approximately 281 square nautical miles (snm) of which 225 snm are categorized as Resurvey area as defined in the 2012 NHSP.
Supporting Documents:
Hydrography shall consist of Navigable Area Surveys in accordance with the following support documents. Data from surveys is intended to supersede all prior survey data in the common area.
NOS Field Procedures Manual for Hydrographic Surveying (FPM), May 2014
NOS Hydrographic Surveys Specifications and Deliverables Manual (HSSD), April 2014
Hydrographic Survey Technical Directive (HTD): 2014-1 Configuration Management

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

Registry Details:

General Locality: Southeast Atlantic Ocean

Registry Number	*Priority*	*Sublocality*	*State or Territory*	*Scale*	*Estimated SNM*	*Instructions*
H12766	1	Approaches to Charleston Harbor Entrance Channel	South Carolina	20000	18	
H12792	2	Due east of Harbor Channel Entrance	South Carolina	20000	14	
H12767	3	9 NM East of Charleston Harbor Channel Buoy	South Carolina	20000	12	
H12793	4	13 NM East of Charleston Harbor Channel Buoy	South Carolina	20000	10	
H12768	5	3 NM South of Charleston Harbor Channel Buoy	South Carolina	20000	11	
H12794	6	4 NM Southeast of Charleston Harbor Channel Buoy	South Carolina	20000	11	
H12769	7	6 NM South of Charleston Harbor Channel Buoy	South Carolina	20000	13	
H12795	8	7 NM Southeast of Charleston Harbor Channel Buoy	South Carolina	20000	12	
H12779	9	Charleston Harbor Entrance Channel Anchorage	South Carolina	20000	14	Sheet plus a 0.5 NM buffer along either side of the channel, but not the channel itself

Registry Number	*Priority*	*Sublocality*	*State or Territory*	*Scale*	*Estimated SNM*	*Instructions*
H12770	10	5 NM North of Charleston Harbor Channel Buoy	South Carolina	20000	15	
H12771	11	11 NM Northeast of Charleston Harbor Channel Buoy	South Carolina	20000	34	
H12772	12	10 NM Southeast of Charleston Harbor Channel Buoy	South Carolina	20000	20	
H12773	13	12 NM Southeast of Charleston Harbor Channel Buoy	South Carolina	20000	21	
H12774	14	13 NM Southeast of Folly Island	South Carolina	20000	14	
H12775	15	14 NM Southeast of Folly Island	South Carolina	20000	23	
H12776	16	15 NM East of Isle of Palms	South Carolina	20000	27	
H12777	17	23 NM East of Isle of Palms	South Carolina	20000	34	

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: None Specified

Coverage Water Depth	*Coverage Required*
For Sheets H12766-H12771, H12774, H12779 and H12792-H12795: All waters in survey area	Object Detection : Either A) 200% SSS with concurrent set line spacing SBES or MBES with backscatter, or B) Object detection MBES with Backscatter

Limits & Coverage:	
Coverage Water Depth	*Coverage Required*
For Sheets H12772-H12773 and H12775-H12777: All waters in survey area	Complete Coverage: 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 Kathryn Pridgen 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):

There are no Maritime Boundary investigation requirements for this project.

Bottom Samples:

No Bottom Sample are required for this project. Existing samples will be retained as charted

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*
11528	40000	1	07/2014	02/17/2015	02/21/2015

Affected ENCs

ENC Name	*Scale*	*Edition*	*Update Application Date*	*Issue Date*	*Preliminary*
US5SC25M	40000	1	10/06/2014	10/06/2014	NO

Coast Pilot:

Review and make recommendations for changes to the Coast Pilot excerpts provided with these instructions in accordance with section 7.4 of the HSSD. In addition, address the directed questions stated within the Coast Pilot Investigation Items. Submit both documents, or a report stating no changes are recommended, via email to coast.pilot@noaa.gov and ocs.ndb@noaa.gov, with a courtesy copy to the HSD Operations project planner (kathryn.pridgen@noaa.gov). The report should be submitted as soon as possible following field work for the project. Refer to sections 3.5.7 and 5.2.2.2.5 of the FPM for more information

Dangers to Navigation (DTONs):

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

Prior Surveys:

The following surveys are prior surveys and shall be resurveyed and a junction analysis should be performed.

Registry Number	*Scale*	*Year*	*Platform*	*Relative Location*
H10670	10000	1996	NOAA Ship *Whiting*	W
H10671	10000	1996	NOAA Ship *Whiting*	W
H10669	10000	1996	NOAA Ship *Whiting*	W
H10674	10000	1996	NOAA Ship *Whiting*	S
S00006	10000	1996	NOAA Ship *Whiting*	S

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.

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

Vertical Control Requirements:

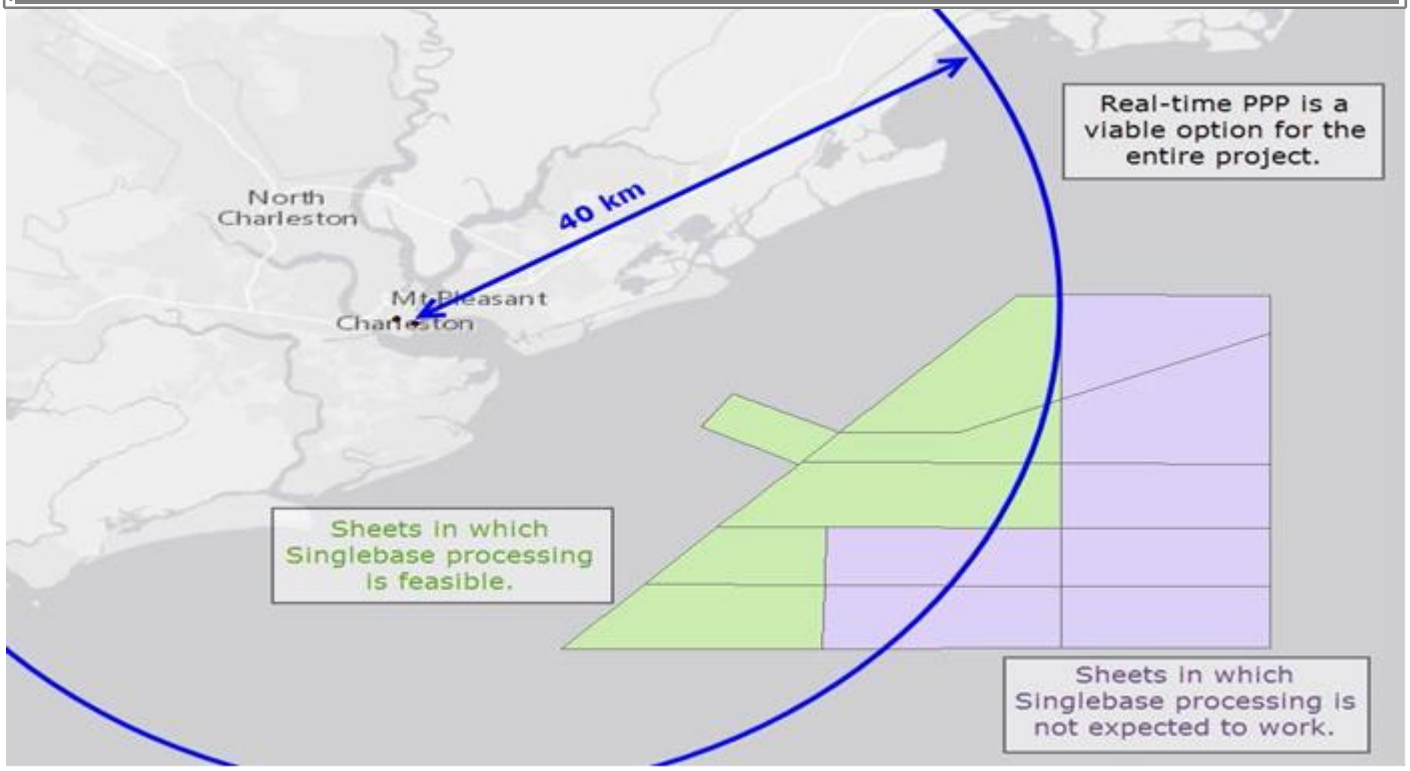
This project has a requirement to reference the survey data to the ellipse. Realizing the ellipse will be achieved in one of two manners: A) for sheets H12766, H12770, H12774, H12775, H12776 and H12779 a single base solution should be pursued using CORS station SCHA (see image below). At the commencement of survey operations, check lines should be run across the entirety of these sheets to confirm the operational status of the CORS station, and to measure the anticipated uncertainties of the single base solution. The results of these check lines should be reported back to HSD Operations. B) For the remainder of the project (in addition to the preceding sheets), HSD Operations is investigating the procurement of a real-time Precise Point Positioning satellite-based corrector service to be integrated into the Thomas Jefferson's ship acquisition system. 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 a 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 with HSD Operations for guidance on how to proceed.

Discrete Zoning

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

NWLON Gauges

Operating Water Level Station	*Station ID*
Charleston	8665530



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

Shoreline and Nearshore Features:
Verify all assigned features within the composite source file (CSF). All other submerged or visible cultural features inside the limit of survey shall be verified. All features with attribute asgnmt populated with 'Assigned' shall be addressed even if they are inshore of NALL. All other submerged or visible cultural features inside the limit of survey shall be verified. Please note, in some cases, offshore features outside of the sheet limits have the 'Assigned' flag. For management purposes, the sheet with which each of these features is associated is populated in the "remrks" field. Coverage over these features will be commensurate with those described in the Limits & Coverage section of these instructions.

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).

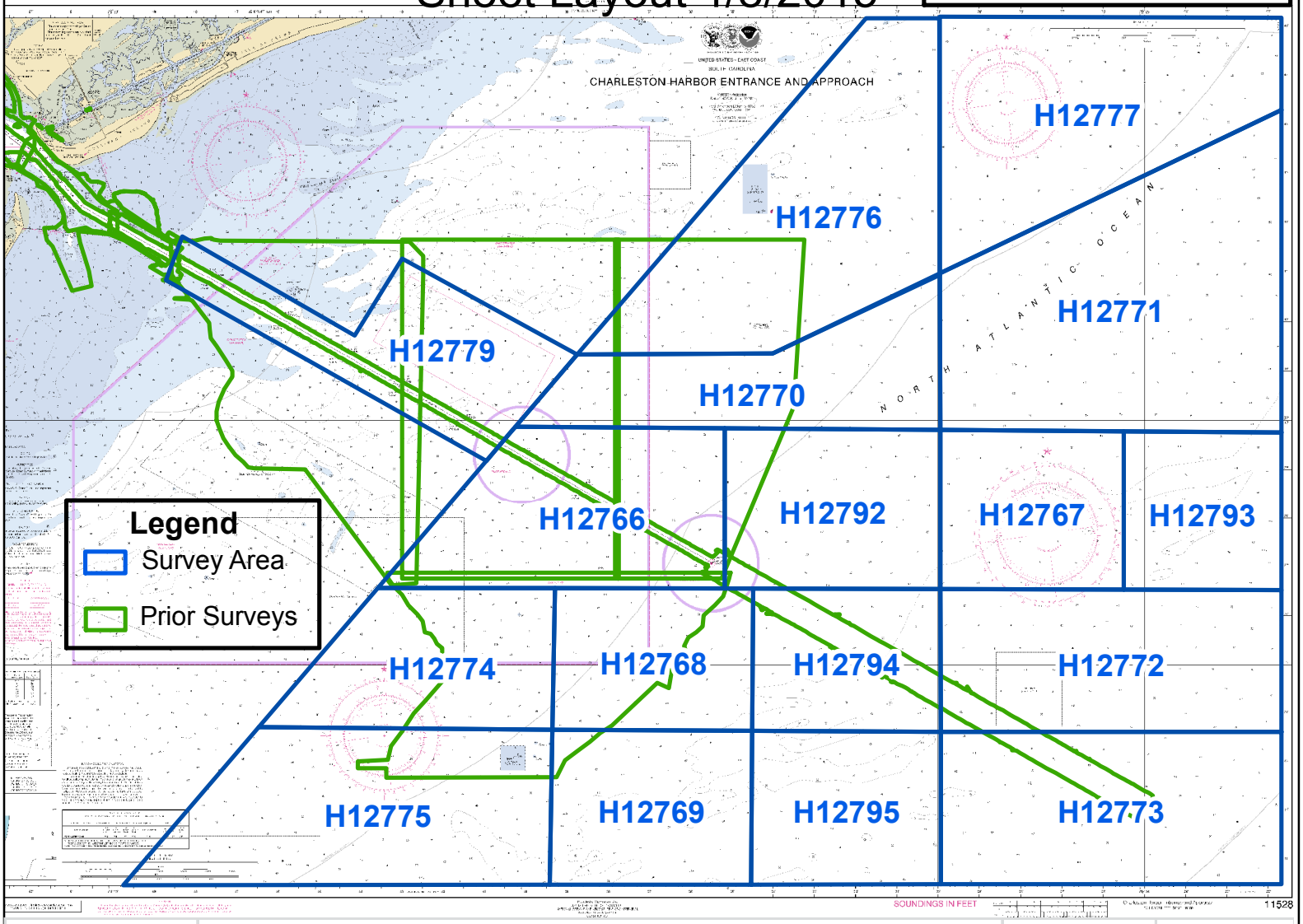
Southeast Navigation Manager
Kyle Ward
NOAA
Phone: 843-740-1153, cell 301-651-4852
Fax: 843-740-1329
Email: kyle.ward@noaa.gov
Obligation: Mandatory

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

HSD/OPS Back-up Project Manager
Jacklyn James
NOAA/NOS/OCS/HSD
Phone: 301-713-2702 x120
Fax:
Email: jacklyn.james@noaa.gov
Obligation: For Reference

OPR-G380-TJ-15
Approaches to Charleston
Sheet Layout 4/8/2015

Total SNM=281
225 SNM Resurvey areas



H Number	Sheet Name	Priority	SNM
H12766	Approaches to Charleston Harbor Entrance Channel east	1	18
H12792	Due east of Harbor Channel Entrance	2	14
H12767	9 NM East of Charleston Harbor Channel Buoy	3	12
H12793	13 NM East of Charleston Harbor Channel Buoy	4	10
H12768	3 NM South of Charleston Harbor Channel Buoy	5	11
H12794	4 NM Southeast of Charleston Harbor Channel Buoy	6	11
H12769	6 NM South of Charleston Harbor Channel Buoy	7	13
H12795	7 NM Southeast of Charleston Harbor Channel Buoy	8	12
H12779	Charleston Channel Buoy Anchorage + Channel Buffer	9	14
H12770	5 NM North of Charleston Harbor Channel Buoy	10	15
H12771	11 NM Northeast of Charleston Harbor Channel Buoy	11	34
H12772	10 NM Southeast of Charleston Harbor Channel Buoy	12	20
H12773	12 NM Southeast of Charleston Harbor Channel Buoy	13	21
H12774	13 NM Southeast of Folly Island	14	14
H12775	14 NM Southeast of Folly Island	15	23
H12776	15 NM East of Isle of Palms	16	27
H12777	23 NM East of Isle of Palms	17	24

WATER LEVEL INSTRUCTIONS
OPR-G380-TJ-2015 Approaches to Charleston, SC
(12/02/2014 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 (or Team Leader) before interrupting the acquisition of water level data for the NWLON stations mentioned above for any reason during periods of hydrography.

1.3.2. The Hydro Hot List (HHL)

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

sent to both teams as OET is responsible for configuring the station in the CO-OPS data base and HPT manages the addition and removal of stations from the HHL.

Station	Station ID	Control or Subordinate	Type (e.g. NWLON, PORTS©, etc)	Comment
Charleston, SC	8665530	Control	NWLON	

Table 1: All stations that need to be added to the HHL in support of OPR-G380-TJ-2015

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

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

1.4. Tide Reducer Stations

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

The NWLON station Charleston, SC (8665530), will provide water level reducers for this project. Therefore it is critical that it remains in operation during the survey. See Sections 1.1. and 1.2. concerning responsibilities.

No leveling is required at Charleston, SC (8665530) 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.

1.4.2. Subordinate Station Requirements

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

1.4.3. Tide Component Error Estimation

The estimated tidal error contribution to the total survey error budget in the Approaches to Charleston, SC is 0.23 meters at the 95% confidence level, and includes the estimated gauge measurement error, tidal datum computation error, and tidal zoning error. It should be noted that the tidal error component can be significantly greater than stated if a substantial meteorological event or condition should occur during time of hydrography.

1.4.4. GOES Satellite Enabled Subordinate Stations

This section is not applicable for this project.

1.4.5. Benchmark Recovery and GPS Requirements

This section is not applicable for this project.

1.4.6. This section is not applicable for this project.

1.5. Discrete Tidal Zoning

1.5.1. The water level station at Charleston, SC (8665530) is the reference station for preliminary tides for hydrography in Approaches to Charleston, SC. The time and height correctors listed below for applicable zones should be applied to the preliminary data at Charleston, SC (8665530) 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
SA138	-24	x0.94	8665530
SA139	-30	x0.90	8665530
SA162	-24	x0.98	8665530

1.5.2. Polygon nodes and water level corrections referencing Charleston, SC (8665530) are provided in CARIS® format denoted by a *.zdf extension file name.

NOTE: The tide corrector values referenced to Charleston, SC (8665530) are provided in the zoning file "G380TJ2015CORP" for this project and are in the fourth set of correctors designated as TS4. Longitude and latitude coordinates are in decimal degrees. Negative (-) longitude is a MapInfo® representation of West longitude.

"Preliminary" data for the control water level station, Charleston, SC (8665530), are available in near real-time and verified data will be available on a weekly basis for the previous week. **These water level data may be obtained from the CO-OPS SOAP web services at http://opendap.co-ops.nos.noaa.gov/axis/text.html.**

1.4.3 Zoning Diagram(s)

Zoning diagrams, created in MapInfo® and Adobe PDF, are provided in digital format to assist with the zoning in section 1.4.1.

1.4.4 Final Zoning

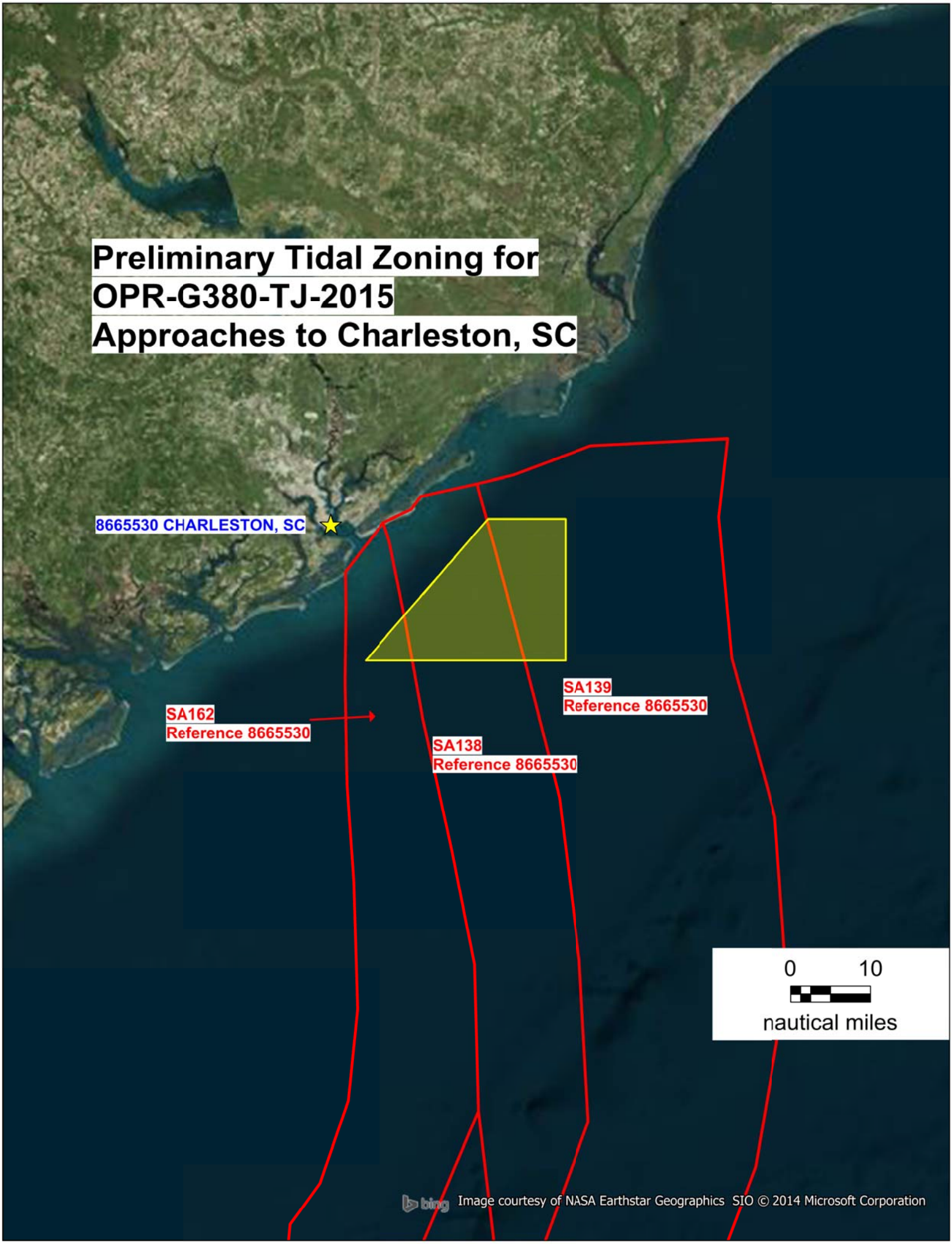
Upon completion of project OPR-G380-TJ-2015, submit a Pydro generated request for final tides, with times of hydrography abstract and mid/mif tracklines attached. Forward this request to Final.Tides@noaa.gov . Provide the project number, as well as a sheet number, in the subject line of the email.
CO-OPS 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 project manager for final processing.

1.5 Fetchtides

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

1.6 Water Level Records

This section is not applicable for this project.


Preliminary Tidal Zoning for
OPR-G380-TJ-2015
Approaches to Charleston, SC
8665530 CHARLESTON, SC
SA139
Reference 8665530
SA162
Reference 8665530
SA138
Reference 8665530
0
10
nautical miles
bing
Image courtesy of NASA Earthstar Geographics SIO © 2014 Microsoft Corporation