

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

## MEMORANDUM FOR: Commander Christiaan Van Westendorp, NOAA Commanding Officer, NOAA Ship *Thomas Jefferson*

FROM:

Captain Scott M. Sirois, NOAA Commanding Officer, NOAA Marine Operations Center-Atlantic

SUBJECT:

Project Instruction for TJ-16-05 Approaches to Savannah

Attached is the final Project Instruction for TJ-16-05, Approaches to Savannah, which is scheduled aboard NOAA Ship *Thomas Jefferson* during the period of September - November, 2016. Of the 45 DAS scheduled for this project, 45 days are funded by a 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.





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

## **Final Project Instructions**

Date Submitted: August 29, 2016

Platform: NOAA Ship Thomas Jefferson

Project Number: TJ-16-05 (OMAO)

**Project Title:** 

Approaches to Savannah, GA

September 2016 – November 2016

**Project Dates:** 

Dated: \_8 Sep 2016

Prepared by:

LCDR Michael O. Gonsalves, NOAA Chief, Operations Branch Hydrographic Surveys Division

Dated: 8 Sep 2016 Approved by:

CAPT Richard T. Brennan, NOAA Chief, Hydrographic Surveys Division Office of Coast Survey

Approved by:

Dated: \_16 Sept. 2016

CAPT Scott M, Sirois, NOAA Commanding Officer Marine Operations Center - Atlantic

## I. Overview

A. Brief Summary and Project Period

This survey is scheduled to begin September 2016 and end in November 2016. 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 41 DAS scheduled for this project, 0 DAS are funded by an OMAO allocation, 41 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 off the coast of South Carolina and Georgia, approaching Savannah. A map of the project area can be found with the detailed project instructions appended to these instructions.

D. Summary of Objectives

This project will support the following primary mission: 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

Office of Coast Survey

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

Name (Last, First)	Title	Date Aboard	Date Disembark	Gender	Affiliation	Nationality
TBA						

- 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 <u>Michael.Gonsalves@noaa.gov</u>

Project Manager: Starla Robinson Physical Scientist, Operations Branch Hydrographic Surveys Division 1315 East West Hwy, #6709 Silver Spring, MD 20910 301-713-2702 x125 Starla.Robinson@noaa.gov

Chief Scientist: CDR Christiaan Van Westendorp, NOAA Commanding Officer, NOAA Ship Thomas Jefferson 439 West York Street Norfolk, VA 23510-1114 (757) 647-0187 <u>CO.Thomas.Jefferson@noaa.gov</u>

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 Policy 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.

In addition The Office of Coast Survey has implemented Best Management Practices (BMPs) based on the ESA mitigation and monitoring measures agreed to between the OCS Hydrographic Services Division (HSD) and the NMFS Office of Protected Resources (OPR-ESA) and documented in the April 30, 2013 Biological Opinion. They were adopted in the context of the ESA, but include BMPs for marine mammals listed in the ESA ("depleted" under MMPA).

For further information on the BMPs, please refer to the Environmental Compliance Section of the Hydrographic Survey Project Instructions. For further information on OCS Regulations and Policies go to: <u>http://www.nauticalcharts.noaa.gov/Legal/</u>

## 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 in SDAL or by contacting the Marine Center Atlantic Chief of Operations at chiefops.moa@noaa.gov or by phone at 757-441-6842.

- B. Staging and Destaging: N/A
- C. Operations to be Conducted:

Hydrographic survey operations shall be conducted per the appended project instructions. The ship and/or survey launches shall operate for a total of 24 hr/day for data acquisition and project field support. To achieve this, the Commanding Officer may elect to run 24 hr ship survey operations for short or extended periods of time with reduced launch operations as long as the total hours per day are achieved.

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 survey launches fully-outfitted with hydrographic survey equipment to support multibeam and/or side scan and/or vertical beam sonar survey operations.
  - 2. Ship fully-outfitted with hydrographic survey equipment to support multibeam and/or side scan sonar survey operations.
  - 3. Personnel to staff and operate the survey equipment on the launches and ship for the

required operational hours/day described in Section II. C. Operations to be Conducted.

- 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 survey operations shall be conducted per the appended project instructions. The ship and/or survey launches shall operate for a total of 24 hr/day for data acquisition and project field support. To achieve this, the Commanding Officer may elect to run 24 hr ship survey operations for short or extended periods of time with reduced launch operations as long as the total hours per day are achieved.

## 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. <u>Pre-Project Meeting</u>: 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. <u>Vessel Familiarization Meeting</u>: 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. <u>Post-Project Meeting</u>: 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. <u>Project Evaluation Report</u>

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 <a href="http://www.omao.noaa.gov/fleeteval.html">http://www.omao.noaa.gov/fleeteval.html</a> 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 <u>http://www.corporateservices.noaa.gov/noaaforms/eforms/nf57-10-01.pdf</u>.

All NHSQs submitted after March 1, 2014 must be accompanied by <u>NOAA Form (NF)</u> <u>57-10-02</u> - Tuberculosis Screening Document in compliance with <u>OMAO Policy 1008</u> (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 <u>Accellion Secure File Transfer</u> which requires the sender to setup an account. <u>Accellion's Web Users Guide</u> 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.

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

## **VIII.** Appendices

1. Primary Project Instructions: OPR-G329-TJ-17, Approaches to Savannah.

# **Hydrographic Survey Project Instructions**

Project Name:	Approaches to Savannah
Project Number:	OPR-G329-TJ-17
Assigned Field Unit:	NOAA Ship Thomas Jefferson
Assigned Processing Branch:	Atlantic Hydrographic Branch
Signed Date:	09/07/2016
Project Instructions Version:	Final
Planned Acquisition Time:	Start Date: 09/2017 End Date: 11/2017
Delivery Dates:	120 days from completion of data acquisition.

## **Purpose and Location:**

The purpose of this project is to provide contemporary surveys to update National Ocean Service (NOS) nautical charting products in the approach to the Savannah Outer Harbor Channel. In order to allow deeper draft ships such as Panamax ships which could draft 39.5 feet, the Savannah Harbor channels are being deepened to 49 feet (at MLLW), with a controlling depth of 47 feet. The main driver for this project based on a request from the Savannah Pilots Association. The survey area is 181 SNM and will also address concerns about migrating sand shoals.

## **Supporting Documents:**

Hydrography shall consist of Navigable Area Surveys in accordance with the following support documents.

NOS Hydrographic Surveys Specifications and Deliverables Manual (HSSD), March 2016

NOS Field Procedures Manual for Hydrographic Surveying (FPM), April, 2014

Hydrographic Survey Technical Directive HTD 2016-2

Hydrographic Survey Technical Directive HTD 2016-3

## 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: Approaches to Savannah								
Registry Number	Sheet Number	Sublocality	State or Territory	Scale	Estimated SNM	Instructions		
H12960	1	Approaches to Savannah	South Carolina	20000	40	Object Detection		
H12961	2	West Savannah	Georgia South Carolina	20000	27	Object Detection		
H12962	3	South Savannah	Georgia South Carolina	20000	54	Complete Coverage		
H12963	4	East Savannah	Georgia South Carolina	20000	60	Complete Coverage		

Limits & Coverage:				
Inshore Limit: There is no inshore limit defined for this survey.				
Coverage Requirements:				
Coverage Water Depth	Coverage Required			
H12960, H12961	Object Detection Coverage accomplished using either: A) Object detection MBES depth and backscatter data, or B) 200% SSS coverage with concurrent set line spacing SBES depth data or MBES depth and backscatter data. Refer to HSSD Section 5.2.2.1			
H12962, H12963	Complete Coverage accomplished using either: A) Complete coverage MBES depth and backscatter data, or B) 100% SSS coverage with concurrent set line spacing MBES with concurrent backscatter data. Refer to HSSD Section 5.2.2.2			

# Assigned Tasks

## Acknowledgement:

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

## **Environmental Compliance Requirements**

Comply with the Environmental Compliance requirements and Best Management Practices (BMPs) in Section 1.4 of the HSSD and the Environmental Review Memo included with the project data in the Consults folder.

## Aids to Navigation (ATONs):

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

## AWOIS Items:

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

## Maritime Boundary Points (MBPs):

There are no Maritime Boundary investigation requirements for this project.

#### **Bottom Samples:**

There is no Bottom Sample requirement for this project.

## Chart Comparison:

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

	Affected Raster Charts							
Chart Number	Scale		lition mber	Edition	Date	Kapp Number	LNM Date	NM Date
11512	40000	6	64	64 08/2014		231	06/21/2016	07/02/2016
11505	40000		5	08/2014 290		290	06/21/2016	07/02/2016
	Affected ENCs							
ENC Name Scale Edition					Jpdate plication Date	Issue Date	Preliminary	
US5GA20N	1 4000	C	4	42 06/0		/07/2016	06/07/2016	NO
US4SC22M	1 8000	C	1	7	05/	/17/2016	05/17/2016	NO

## **Coast Pilot:**

Perform a Coast Pilot Review as described in HSSD Section 8.1.3.

## Dangers to Navigation (DTONs):

Generate DTON reports in accordance with Section1.5 of the HSSD. DTON reports should be sent to ocs.ndb@noaa.gov with a courtesy copy to the project manager. It is of paramount importance that DTONs be reported as soon as possible.

#### Junctions:

No junctioning surveys have been provided for this project.

## **Progress Reports:**

Submit weekly (refer to HSSD 8.1.1.1) and monthly (refer to HSSD 8.1.1.2) progress reports.

## **Survey Outlines:**

Generate and submit a survey outline in accordance with Section 8.1.2 of the HSSD.

## **Horizontal Control Requirements:**

Comply with the horizontal control requirements in Section 3 of the HSSD.

## Post-Processed Precise Point Positioning (5P)

This project has a requirement to acquire survey data vertically-referenced to the ellipse. Based on analysis of existing infrastructure, this will most likely be achieved through a SBAS subscription using a 5P processing solution. At the commencement of survey operations, check lines should be acquired across the entirety of the survey to identify any systematic procedural, hardware, or configuration errors prior to the bulk of data acquisition. The results of the checklines should be reported back to HSD Operations. Refer to ERZT Section below.

## Vertical Control Requirements:

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

## Discrete Zoning

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

#### VDatum

Vertical control will either be the CO-OPS provided model or VDATUM, and will officially be decided on upon delivery of interim deliverable products.

VDatum Version	Geoid	Area	Area Version	Separation Uncertainty
3.6.1	2012	Georgia/South Carolina – Sapelo Island GA to the SC/NC border	3.1	14.8 centimeters

ERZT

This project has a requirement to acquire survey data vertically-referenced to the ellipse. Based on analysis of existing infrastructure, this will most likely be achieved through a SBAS subscription using a 5P processing solution. The field unit shall use a VDatum separation model to realize chart datum via the ellipse.

At the commencement of survey operations, check lines should be acquired across the entirety of the survey to identify any systematic procedural, hardware, or configuration errors prior to the bulk of data acquisition. To determine the quality of the 3D trajectory, the checkline crossline analysis shall be performed between the ERZT separation model and the VDatum separation model.

If the field's recommendation on the method of acquiring 3D trajectories and the method of reducing the ellipse-referenced data to chart datum is accepted, all survey lines shall be delivered with 3D trajectory and associated uncertainty files applied (i.e. SBETs and RMS) and GPS tides computed. All delivered grids shall be derived via the ellipse. If at any point the field unit experiences difficulty in realizing chart datum via the ellipse, the field shall communicate with the HSD Project Manager for guidance on how to proceed. Within 60 days of the completion of acquisition, the field unit shall prepare an ERS Capability Memorandum, summarizing the degree to which ERS surveying campaign was successful.

The ERS Checkline and ERS Capability Memo requirements are detailed in the ERS Capability Requirements document. The ERS deliverables shall be submitted to the HSD Project Manager with a CC to ERS.Deliverables@noaa.gov. Project specific data quality issues or departures form standard processing approaches shall be captured in the DAPR or DR.

NWLON Gauges					
Operating Water Level Station	Station ID				
Fort Pulaski	8670870				

## **Orthometric Imagery:**

No Orthometric Imagery has been provided for this project.

## Shoreline and Nearshore Features:

The CSF for this project is composed from ENC US5GA20M, with assigned features originating from Chart 11505 and BP-189175. All other submerged or visible cultural features inside the limit of survey shall be verified. Submit a Final Feature File in accordance with Section 7 of the HSSD. Contact the HSD Project Manager if there are any questions regarding feature assignments and feature management.

## **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).

## **Primary Project Manager**

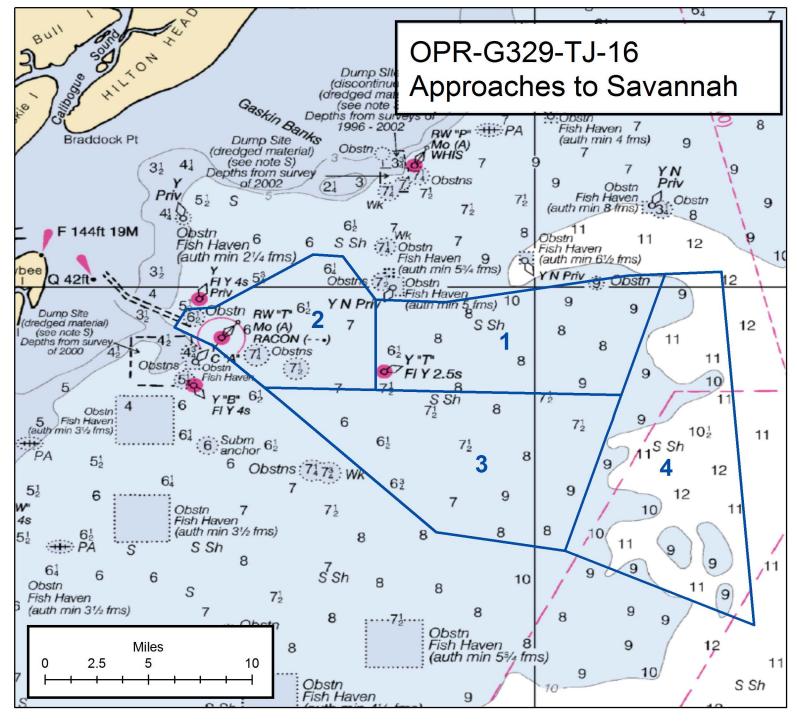
Starla Robinson NOAA *Phone:* 301-713-2700\*125 *Fax: Email:* starla.robinson@noaa.gov *Obligation:* Mandatory

## **Project Manager Back-up**

Patrick Keown NOAA *Phone:* 301-713-2700\*107 *Fax: Email:* patrick.keown@noaa.gov *Obligation:* Mandatory

## NOAA Navigation Manager, Southeast Atlantic Region

Kyle Ward NOAA *Phone:* 843-740-1153 *Fax:* 301-651-4852 *Email:* kyle.ward@noaa.gov *Obligation:* For Reference



Total	SNM	- 120	

Survey Area		Survey Area
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Registry Number	Sheet Priority	Sub-Locality	Area (SNM)	Survey Scale
H12960	1	Approaches to Savannah	40.7	20000
H12961	2	Northwest Savannah	27.2	20000
H12962	3	South Savannah	53.6	20000
H12963	4	East Savannah	59.8	20000



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

**Deputy Director** 

AUG 2 3 2016

TO:

FROM:

The Record

**REFERENCE:** Environmental Revie

Environmental Review of the Proposed Hydrographic Survey of the Approaches to Savannah, September 12, 2016 (OPR-G329-TJ-16)

Sections 1 and 2 of this memorandum summarize a proposed hydrographic survey of the approaches to Savannah on board the NOAA Ship *Thomas Jefferson*, and serve as the "Memorandum for the Record for EA/EIS inclusion" for the proposed survey.<sup>1</sup> The purpose of these sections is to determine if the proposed survey falls within the scope of the Coast Survey Programmatic Environmental Assessment (PEA),<sup>2</sup> which was prepared pursuant to the National Environmental Policy Act (NEPA).

Section 3 of this memorandum documents the compliance steps that the Office of Coast Survey (OCS) has taken with regard to the Endangered Species Act (ESA), the Migratory Bird Treaty Act (MBTA), the Marine Mammal Protection Act (MMPA), Section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA), the National Historic Preservation Act (NHPA), and the Coastal Zone Management Act (CZMA).

## 1.0 Description of the Proposed Survey

The *Thomas Jefferson* would leave port from Norfolk, Virginia, and proceed to the 120 square nautical mile survey area located off the coast of Georgia near the City of Savannah, as shown in Appendix A.

The survey would begin on or about September 12, 2016. As with all activities at sea, the date of the proposed survey could be affected by poor weather, equipment difficulties, or other unforeseen circumstances.

During the proposed survey, OCS would not operate echo sounders at frequencies lower than 50 kHz. The listed equipment would be used along with sound speed measurements via a Conductivity, Temperature, and Depth instrument for profiling the water column. The ship may anchor during the survey, in an area with a known bottom type that is free from any known obstructions or protected marine resources. No bottom sampling would be performed. No benchmarks, tide gauges, or GPS tide buoys would be installed.

<sup>&</sup>lt;sup>2</sup> Final Programmatic Environmental Assessment for The Office of Coast Survey Hydrographic Survey Projects, May 2013





<sup>&</sup>lt;sup>1</sup> as defined in Section 4.02 of NOS Policy 0300-01, Environmental Compliance Program Policy

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In the course of the proposed survey, OCS would adhere to Best Management Practices (BMPs) agreed to in an Endangered Species Act section 7 consultation that concluded in April 2013 (see Appendix B).

## 2.0 Environmental Impacts of the Proposed Survey

## 2.1 Impacts to Marine Mammals

Marine mammals in the survey areas could be affected by vessel interactions (i.e., vessel strike) or by echo sounder operation. The Coast Survey PEA addressed the potential impacts to marine mammals from all aspects of a hydrographic survey, including the operation of multi beam echo sounders operating at frequencies between 50 and 500 kHz. The proposed survey would not require echo sounder use outside of this range.

OCS would observe the BMPs specified in Appendix B to further reduce the potential impacts to marine mammals.

## 2.2 Impacts to Threatened or Endangered Species

## 2.2.1 ESA-Listed Species Administered by NMFS

In a Biological Opinion dated April 30, 2013,<sup>3</sup> the NMFS Office of Protected Resources indicated that the following threatened and endangered species and critical habitat could be adversely affected by OCS hydrographic surveys:

- Cook Inlet beluga whale (and its critical habitat)
- Southern Resident killer whale (and its critical habitat)
- Steller sea lion, western DPS (and its critical habitat)
- Guadalupe fur seal
- Ringed seal (Arctic DPS)
- Bearded seal (Beringia DPS)
- Johnson's seagrass (and its critical habitat)

Following a review of the ranges of these species,<sup>4</sup> the proposed survey area does not overlap with the known range of any of these species. Therefore, the proposed survey is considered unlikely to adversely affect threatened or endangered species administered by NMFS.

OCS would observe the BMPs specified in Appendix B to further reduce the potential impacts to threatened or endangered species.

<sup>&</sup>lt;sup>3</sup> Biological and Conference Opinion, Nationwide Hydrographic Survey of Coastal Waters, PCTS# FPR-2013-9029

<sup>&</sup>lt;sup>4</sup> At <u>http://www.nmfs.noaa.gov/pr/species/esa/listed.htm</u>. Range of the southern resident killer whale from <u>http://www.nmfs.noaa.gov/stories/2016/02/docs/southern\_resident\_killer\_whale\_spotlight\_species\_5\_year\_action\_plan\_final\_web.pdf</u>

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## 2.2.2 ESA-Listed Species Administered by FWS

OCS reviewed a species list produced from the FWS Information for Planning and Conservation website<sup>5</sup> to determine if the proposed survey could have an impact on ESA species administered by FWS.

No ESA-listed species or critical habitats were located in the proposed survey area. OCS has therefore determined that the proposed survey would have no effect on ESA-listed species administered by FWS.

## 2.3 Impacts to Essential Fish Habitat

The proposed survey would take place within the geographic area covered in the Coast Survey PEA, and would involve the operation of the vessels and equipment addressed in the PEA. All applicable BMPs in the Coast Survey PEA would be followed. Therefore, OCS concludes that there would be no significant effect on essential fish habitat from the proposed survey.

## 2.4 Impacts to Cultural Resources

The proposed survey would take place within the geographic area covered in the Coast Survey PEA, and would involve the operation of the vessels and equipment addressed in the PEA. All applicable BMPs in the Coast Survey PEA would be followed. Therefore, OCS concludes that there would be no significant effect on cultural resources from the proposed survey.

## 2.5 Conclusion on the Applicability of the Coast Survey PEA

Based on the information in Sections 2.1 - 2.4 of this memorandum, OCS has determined that the proposed survey falls within the scope of the Coast Survey PEA and its Finding of No Significant Impact. Therefore, no additional NEPA analysis for the proposed survey is required.

## 3.0 Compliance with Other Environmental Laws

## 3.1 Endangered Species Act

OCS completed a formal ESA section 7 consultation in 2013 for our survey operations, as documented in the April 30, 2013 Biological Opinion issued by NMFS. The Biological Opinion mandated the BMPs listed in Appendix B of this memorandum, which would be adhered to during the course of the survey. This concludes the ESA process for those species administered by NMFS.

No ESA-listed species or critical habitat administered by FWS were located in the proposed survey area. Based on this information, OCS has made a "no effect" determination, concluding the ESA process for those species administered by FWS.

## 3.2 Migratory Bird Treaty Act

Based on the nature of the proposed survey, no impacts to migratory birds are anticipated. No aspect of the proposed survey (ship operation, echo sounder use, anchoring, or sound speed data collection) would attract, repel, or otherwise affect migratory birds in a manner that differs from other existing marine

<sup>&</sup>lt;sup>5</sup> https://ecos.fws.gov/ipac/

Environmental Review of the Survey of the Approaches to Savannah Page 4

traffic (cargo ships, cruise ships, recreational boaters, etc.). Therefore, OCS has not consulted with the FWS on the subject of impacts to migratory birds from the proposed survey.

## 3.3 Marine Mammal Protection Act

OCS is currently preparing an application for a Letter of Authorization under the Marine Mammal Protection Act. As an interim measure, OCS is following the BMPs listed in Appendix B of this document, which are broadly protective of marine mammals.

# 3.4 Magnuson-Stevens Fishery Conservation and Management Act Section 305(b) (Essential Fish Habitat)

The Coast Survey PEA functions as an EFH assessment and consultation for all OCS surveys through 2018. No additional requirements apply to the proposed survey under Section 305(b) of the MSA.

## 3.5 National Historic Preservation Act

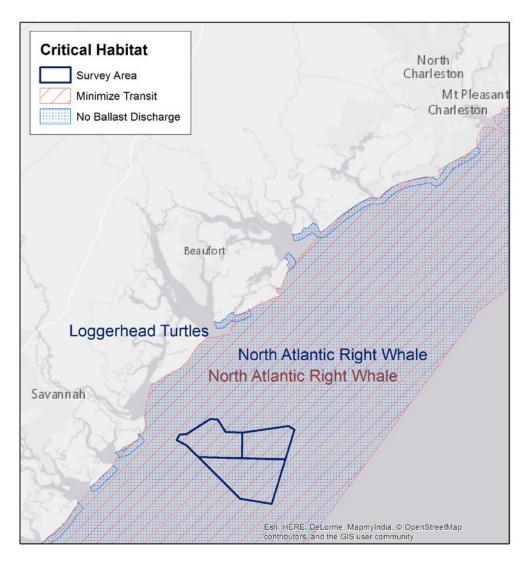
Based on the negligible level of interaction with the seafloor during a hydrographic survey and on the presence of OCS protocols designed to eliminate the potential for an impact to submerged historic properties (such as shipwrecks), OCS has come to a "no historic properties affected" determination for the proposed survey. OCS has requested a concurrence with this determination from the State Historic Preservation Officer. This concurrence request is included in Appendix C.

## 3.6 Coastal Zone Management Act

The proposed testing area is located outside the coastal zones established by the Georgia Department of Natural Resources and the South Carolina Office of Ocean and Coastal Resource Management. The acoustic impacts of the echo sounders listed in Table 1 are not expected to reach beyond the immediate vicinity of the ship; therefore, no effects to coastal zones or their resources are expected from the proposed survey, and no Federal Consistency Determination is required.

Appendix A:

Map of the Proposed Survey Area



**Relevant CFR Passage Links for critical habitats in the vicinity:** 

**North Atlantic Right Whale** – Avoid entering when possible during the core calving season (December through March).

CFR: <u>https://federalregister.gov/a/2016-01633</u> Map Source: <u>http://www.fisheries.noaa.gov/pr/species/mammals/whales/north-atlantic-right-whale.html</u>

## Loggerhead Turtles – Nearshore reproductive habitat, unlikely to encounter

CFR: http://www.nmfs.noaa.gov/pr/pdfs/fr/fr77-4170.pdf

Map Source: <u>https://www.federalregister.gov/articles/2014/07/10/2014-15748/endangered-and-threatened-species-critical-habitat-for-the-northwest-atlantic-ocean-loggerhead-sea</u>

Appendix B:

Best Management Practices for Marine Mammals and ESA Species for the Project

#### **Vessel Speed Limits**

- Slow speeds (4 8 knots) when mapping
- Reduced speeds (<13 knots) when transiting outside of the Great Lakes

#### **Echosounder Restrictions**

- Avoid using sonar frequencies < 180 kHz when possible
  - If <u>multibeam</u> sonar frequencies < 180 kHz must be employed, use echosounders at  $\ge$  50 kHz frequencies, with the lowest possible power and ping-rate
  - If <u>single beam</u> sonar frequencies < 180 kHz must be employed, use echo sounders at  $\ge$  30 kHz frequencies, with the lowest possible power and ping-rate and a 12° beam angle.
    - If <u>single beam</u> sonar frequencies < 30 kHz must be employed, suspend transmissions of 30 kHz or lower when ESA-listed cetacean species (whales, dolphins, and porpoises) are within hearing range (i.e., the 4.2 meter beam width).</li>

#### **Vessel Maintenance Requirements**

- Meet all EPA Vessel General Permits and Coast Guard requirements
- Use anti-fouling coatings
- Clean hull regularly to remove aquatic nuisance species
- Avoid cleaners with nonylphenols
- Rinse anchor with high-powered hose after retrieval

#### **Anchoring Restrictions**

- Use designated anchorage area when available
- Use mapping data to anchor in mud or sand, to avoid anchoring on corals
- Minimize anchor drag

#### **Visual Monitoring Requirements**

- Maintain trained observers aboard all vessels; 100% observer coverage
- Make species identification keys (for marine mammals, sea turtles, corals, abalone, and seagrasses) available on all vessels

#### **Animal Approach Restrictions**

- Avoid approaching within 200 yards of cetaceans (whales, dolphins, and porpoises), 500 yards for right whales
- Suspend single beam sonar transmissions of 30 kHz when ESA-listed cetaceans (whales, dolphins, and porpoises) are within hearing range (i.e., within the 4.2 meter beam width).
- Avoid approaching within 100 yards of in-water seals and walrus

- When possible, suspend single beam sonar transmissions when ESA-listed seals and walruses are within hearing range (i.e., within the 4.2 meter beam width).
- Avoid approaching within 50 yards of sea turtles
- Maintain a distance of at least 15 meters from any seabird that is at rest on the water. Should a seabird move within 15 meters of the vessel, the vessel should slow down.

#### Additional, Survey-specific BMPs:

#### **Discharge Restrictions**

• Avoid discharge of ballast water and hull cleaning in designated critical habitat

#### **Animal Approach Restrictions**

• Avoid cetacean (whales, dolphins, and porpoises) critical habitat, when possible

Appendix C

National Historic Preservation Act Section 106 Consultation Letter for the Proposed Survey

MEMORANDUM FOR:	Ms. Jennifer Dixon Environmental Review & Preservation Planning Program Manager jennifer.dixon@dnr.ga.gov 770-389-7851
FROM:	Paul Turner Physical Scientist NOAA Office of Coast Survey
SUBJECT:	National Historic Preservation Act Section 106 Consultation Request and SHPO Survey Notice for Historic Resources

Ms. Dixon:

The National Oceanic and Atmospheric Administration's Office of Coast Survey (OCS) plans to conduct a hydrographic survey of a 120 square nautical mile area off the coast of Georgia near the City of Savannah beginning on or about October 1, 2016.<sup>1</sup> The *Thomas Jefferson* will leave port from Norfolk, Virginia, and proceed to the survey location shown in Appendix A. It is possible that the limits of the survey area could change slightly, but such changes would not affect the nature of the work or the findings of this Section 106 determination.

The purpose of this notice is to request any information your office many have on the location and nature of any historic properties located in or near the survey area before operations begin. As stated in Section 5.0 of this letter, OCS believes that our operational protocols will prevent any impacts to any historical properties, should they be present.

#### **1.0 Echo Sounder Use**

Coast Survey conducts hydrographic survey operations with high-frequency side scan sonar, single beam and multibeam echo sounders, which use sound waves to identify objects on the seafloor and to determine water depth. During a survey, a vessel equipped with one or more echo sounders operates within a given area to ensonify (or visualize) the seafloor and ensure full data coverage of the seafloor within each project area (Figure 1). Single beam and multibeam echo sounders are mounted either underneath the vessel or on a pole to the side of the vessel, while side scan sonars are either mounted underneath or towed via cable behind the vessel. Towed acoustic equipment is in no case allowed to make contact with the seafloor.

<sup>&</sup>lt;sup>1</sup> As with all activities at sea, the date of the proposed survey could be affected by poor weather, equipment difficulties, or other unforeseen circumstances.

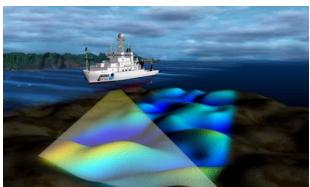


Figure 1: Multibeam swath ensonifying the seafloor

## 1.1 <u>NHPA Section 106 Determination for Echo Sounder Use</u>

Because the use of echo sounders for hydrographic mapping does not include any interactions with the seafloor, OCS finds that this portion of our undertaking has no potential to cause effects to historic properties. This is in accordance with a determination by the Advisory Council on Historic Preservation (ACHP) that the use of acoustic sources in the course of a hydrographic survey is not an activity with the potential to affect historic properties.

## 2.0 Anchoring

When survey ships are not performing survey operations, the vessels may anchor either within the project area or a protected nearby area. NOAA's survey launches (smaller boats that are carried to the survey grounds aboard the survey ship) return to the ship each day and do not require anchoring.

Ships usually anchor within the survey area to reduce the transit time to the working grounds and to save on fuel consumption. Vessel operators select the anchor location based on depth, protection from seas and wind, and bottom type. Preferred bottom types are sticky mud or sand, as those characteristics allow the flukes of the anchor to dig into the bottom and hold the chain in place. When working in an unsurveyed area or in an area that has not been surveyed in many years, the ship will try to anchor in bays where data has already been collected, providing the ship with better information on where to drop the anchor. Vessels will not anchor on coral reefs, shipwrecks, and hard bottom areas as part of their protocol. However, the protocol would permit the use of mooring buoys in such area or anchorage sites identified on NOAA charts. OCS will consult the Automated Wreck and Obstruction Index to ensure that anchors are not used near any potential historic properties.

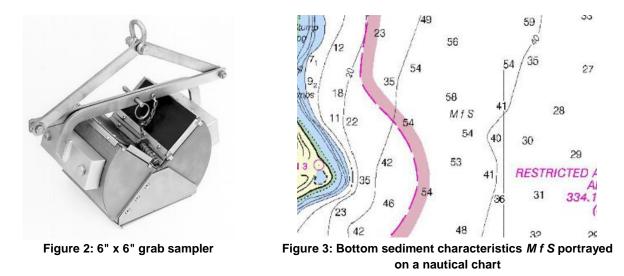
#### 2.1 <u>NHPA Section 106 Determination for Anchoring</u>

Because the survey ship will anchor in surveyed areas or in bays where data has already been collected, OCS will have the required data to prevent the placement of an anchor on any historic properties such as shipwrecks. OCS vessels do not anchor on coral reefs, shipwrecks, obstructions, or hard bottom areas.

For these reasons, OCS has made a determination of "no historic properties affected" for the anchoring portion of the undertaking.

## 3.0 Bottom Sample Collection

Coast Survey collects grab samples of seafloor sediment during survey operations by lowering a grab sampler through the water column. During survey operations, bottom samples are characterized and charted primarily so mariners can better select their anchorages. Typically, surveyors use a clamshell bottom snapper (Figure 2) or similar type of grab sampler to obtain samples of the surface sediment layer (approximately the first two inches of sediment). As the sampler is lowered, two hinged upper lids swing open to let water pass through. When the sampler reaches the bottom, the overlapping spring-loaded scoops are tripped on the line, and the lids close to contain the sediment and prevent sample washout. The line is lowered and raised, at a rate of about one meter per second. After the sediment is collected, analyzed, and photographed, the crew releases it from the sampler underwater. Samples are characterized by color and type of bottom material. For example, a sample of mud with fine sand would be charted as Mf S (Figure 3).



Field units have a bottom sample plan as a guideline of sampling density, although surveyors are given discretion on the exact location of sampling. They do not collect samples in waters deeper than 80 meters. Additionally, in areas surveyed within the last 30 years, the surveyor might not need to collect samples at all. In some cases, the surveyor can use backscatter or side scan data acquired during the survey operation to determine the best place to sample. OCS protocol is to not collect samples on coral reefs, shipwrecks, obstructions or hard bottom areas. OCS will consult the Automated Wreck and Obstruction Index to ensure that bottom samples are not collected near any potential historic properties.

#### 3.1 <u>NHPA Section 106 Determination for Bottom Sample Collection</u>

Based on OCS protocols and the small size of the sampler, there should be no effect on historic properties. If the sample results in the collection of an object that may be eligible for listing, the coordinates will be noted and provided to the SHPO along with photographs of the sample and, if practicable, the recovered object itself. The sample is recovered from the top few inches of sediment and there is likely a significant overburden on any objects. Therefore the potential effect on any potential historic properties such as shipwrecks appears unlikely and negligible. OCS has made a determination of "no historic properties affected" for the bottom sample collection portion of the undertaking.

## 4.0 Sound Speed Data Collection

Surveyors must collect sound speed data throughout the survey, to determine the speed of sound in the water column at a given location and time, and to correct for refraction errors in the echo sounder data. Taken together, the two-way travel time of the acoustic pulse from a single beam or multibeam echo sounder and the speed of sound in water determine seafloor depths.

Sound speed data is collected periodically in one of two ways. In the first scenario, every one to four hours, a survey technician slowly lowers a sound speed profiler – known as a "conductivity, temperature and depth" instrument (Figure 4) – from a stationary vessel, down to the seafloor and back. The second method involves a moving vessel profiler (Figure 5), which is automatically lowered and raised through the water column at regular intervals while the vessel is in motion. OCS protocol is to not have any contact with coral reefs, shipwrecks, obstructions or hard bottom areas.

In either case, the profiler makes only minimal impact to the seafloor (a "touch") at the bottom of its route to the seafloor and back.



Figure 4: Conductivity, temperature and depth instrument inside cage



Figure 5: Moving vessel profiler mounted on fantail

#### 4.1 NHPA Section 106 Determination for Sound Speed Data Collection

Based on the protocol to avoid known historic properties and obstructions, the minimal impact to the seafloor, and the fact that any unknown objects are likely located several inches beneath overburden, OCS has made a determination of "no historic properties affected" for the sound speed data collection portion of the undertaking.

# 5.0 Conclusion on Effects to Historic Properties from the Undertaking and Request for Concurrence

Based on the protocols developed to prevent harm to natural and cultural heritage, the negligible interactions with the seafloor from survey operations, OCS has made a determination of "no historic properties affected" for the undertaking and seeks concurrence on this determination from your office.

## 6.0 Advance Notice for Discovery of Potentially Historic Resources

Except for dangers to navigation, which are made known to the public immediately, it is OCS policy to make information regarding possible historic resources available for SHPO review before public dissemination. If the upcoming survey finds information on features that may be historic, OCS will contact your office when this information is available for your review.

Additional questions regarding historic and archeological resources should be directed to the National Ocean Service's Chief Historian:

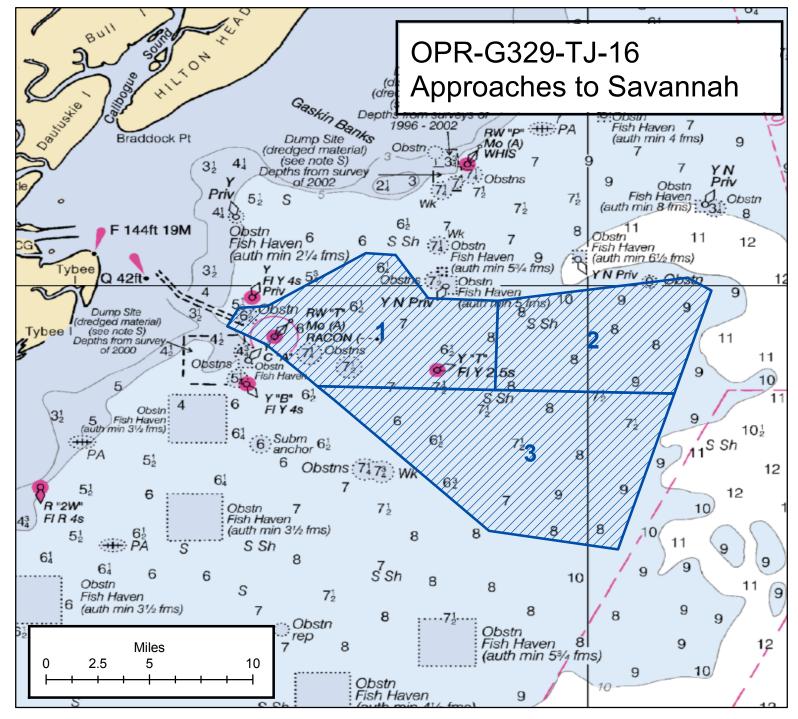
Bruce Terrell Archeologist, NOAA / Maritime Heritage Program 1305 East West Highway Silver Spring, MD 20910 301-713-7255 bruce.terrell@noaa.gov

Please do not hesitate to contact me at paul.turner@noaa.gov with any questions.

Sincerely,

Paul Turner Physical Scientist NOAA Office of Coast Survey

cc: Bruce Terrell, NOAA Maritime Heritage Program



Total SNM - 120	Registry Number	Sheet Priority	Sub-Locality	Area (SNM)	Survey Scale
	HXXXX1	1	Approaches to Savannah	36.4	20000
Survey Area	HXXXX2	2	Approaches to Savannah	30.4	20000
	НХХХХЗ	3	Approaches to Savannah	53.6	20000



HISTORIC PRESERVATION DIVISION

Mark Williams Commissioner DR. DAVID CRASS DIVISION DIRECTOR

August 22, 2016

Bruce Terrell Archaeologist NOAA Maritime Heritage Program 1305 East West Highway Silver Spring, Maryland 20910

#### RE: Conduct Hydrographic Surveys, Coastal and Offshore Waters, near Savannah Statewide, Georgia HP-160801-009

Dear Mr. Terrell:

The Historic Preservation Division (HPD) has received the information submitted concerning the above referenced undertaking. Our comments are offered to assist the National Oceanic and Atmospheric Administration (NOAA) in complying with provisions of Section 106 of the National Historic Preservation Act of 1966, as amended (NHPA).

The subject project consists of conducting hydrographic surveys in coastal and offshore waters near Savannah. In order to identify historic properties within or near the survey area, HPD recommends that NOAA access the Georgia Archaeological Site Files, at the University of Georgia, to retrieve archaeological reports for surveys previously conducted in or near the project boundaries. However, based on the information submitted, HPD concurs that no historic properties that are listed or eligible for listing in the National Register of Historic Places will be affected by this undertaking, as defined in 36 CFR Part 800.4(d)(1), due to the scope of work. Please note that archaeological resources may be located within the project's area of potential effect (APE). However, at this time it has been determined that they will not be impacted by the above-referenced project. Furthermore, any changes to this project as proposed may require further review by our office for compliance with Section 106.

This letter evidences consultation with our office for compliance with Section 106 of the NHPA. It is important to remember that any future changes to this project as it is currently proposed may require additional consultation. HPD encourages federal agencies and project applicants to discuss such changes with our office to ensure that potential effects to historic resources are adequately considered in project planning.

Please refer to project number **HP-160801-009** in any future correspondence regarding this project. If we may be of further assistance, please do not hesitate to contact Meg Richardson, Environmental Review Historian, at meg.richardson@dnr.ga.gov or (404) 389-7852.

Sincerely.

Jennifer Dixon, MHP, LEED Green Associate Program Manager Environmental Review & Preservation Planning

JAD/mcr

cc: Lupita McClenning, Coastal Georgia Regional Commission Paul Turner, NOAA

> JEWETT CENTER FOR HISTORIC PRESERVATION 2610 GA HWY 155, SW | STOCKBRIDGE, GA 30281 770.389.7844 | Fax 770.389.7878 | WWW.GEORGIASHPO.ORG

#### WATER LEVEL INSTRUCTIONS OPR-G329-TJ-2016 Approaches to Savannah (03/31/2016 CF)

#### 1.0. TIDES AND WATER LEVELS

#### 1.1. Specifications

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

#### 1.2. Vertical Datums

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

#### 1.2.1. Water Level Data Acquisition Monitoring

The Commanding Officer (or Team Leader) and the Center for Operational Oceanographic Products and Services (CO-OPS) are jointly responsible for ensuring that valid water level data are collected during periods of hydrography. The Commanding Officer (or Team Leader) is required to monitor the pertinent water level data via the CO-OPS Web site at <a href="http://tidesandcurrents.noaa.gov/hydro.shtml">http://tidesandcurrents.noaa.gov/hydro.shtml</a>, 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: <a href="http://commandingOfficer/Team">CORMS@noaa.gov</a>. Problems or concerns regarding the acquisition of valid water level data identified by the Commanding Officer/Team Leader shall be communicated with CO-OPS/OD (nos.coops.hpt@noaa.gov) to coordinate the appropriate course of action to be taken such as gauge repair and/or developing contingency plans for hydrographic survey operations. In addition, CO-OPS is required to coordinate with the Commanding Officer (or Team Leader) before interrupting the acquisition of water level data for the NWLON stations mentioned above for any reason during periods of hydrography.

#### 1.2.2. The Hydro Hot List (HHL)

Please contact the CO-OPS/Hydrographic Planning Team (HPT) at <u>nos.coops.hpt@noaa.gov</u> and the Operational Engineering Team (OET) at <u>nos.coops.oetteam@noaa.gov</u> 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 is added to, or removed from, the CO-OPS Hydro Hotlist (HHL) (<u>http://tidesandcurrents.noaa.gov/hydro</u>). Include start and end survey dates, full project number (e.g. OPR-H355-TJ-10), and control station numbers. The notification must be sent to both teams as OET is responsible for configuring the stations in the CO-OPS data base and HPT manages the addition and removal of stations from the HHL.

Station	Station ID	Residual Control	Type (NWLON, PORTS <sup>©</sup> , etc.)	Comment
Fort Pulaski, GA	8670870	Control	NWLON	

Table 1: All stations that need to be added to the HHL in support of OPR-G329-TJ-2016

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</code> and request to be added.

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

#### **1.3.** Operating Tide Reducer Stations

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

The operating water level station Fort Pulaski, GA (8670870), 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 Fort Pulaski, GA (8670870) 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

No subordinate water level stations are required for this project, however, supplemental and/or back-up water level stations may be necessary depending on the complexity of the hydrodynamics and/or the severity of the environmental conditions of the project area. The installation and continuous operation of water level measurement systems (tide gauges) at subordinate station locations is left to the discretion of the Commanding Officer (or Team Leader), subject to the approval of CO-OPS. If the Commanding Officer (or Team Leader) decides to install additional water level stations, then a 30-day minimum of continuous data acquisition is required. For all subordinate stations, data must be collected throughout the

entire survey period for which they are applicable, and not less than 30 continuous days. This is necessary to facilitate the computation of an accurate datum reference as per NOS standards.

#### **1.3.3.** Tide Component Error Estimation

The estimated tidal error contribution to the total survey error budget in the vicinity of the Approaches to Savannah is 0.20 meters at the 95% confidence level, and includes the estimated gauge measurement error, tidal datum computation error, and tidal zoning error. It should be noted that the tidal error component can be significantly greater than stated if a substantial meteorological event or condition should occur during time of hydrography.

#### 1.3.4. GOES Satellite Enabled Subordinate Stations

This section is not applicable for this project.

#### 1.3.5. Benchmark Recovery and GPS Requirements

This section is not applicable for this project.

**1.3.6.** This section is not applicable for this project.

#### 1.4. Discrete Tidal Zoning

**1.4.1.** The water level station at Fort Pulaski, GA (8670870) is the reference station for preliminary tides for hydrography in the Approaches to Savannah. The time and height correctors listed below for applicable zones should be applied to the preliminary data at Fort Pulaski, GA (8670870) 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 <u>http://opendap.co-ops.nos.noaa.gov/axis/text.html</u>. 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 in the applicable zone.** 

Zone	Time Corrector (min)	Range Ratio	Predicted Reference Station
SA169	-24	x0.85	8670870
SA170	-24	x0.82	8670870
SA172A	-12	x0.88	8670870
SA172B	-12	x0.91	8670870
SA172C	-12	x0.94	8670870
SA172D	-6	x0.97	8670870
SA190	-12	x0.85	8670870
SA191	-12	x0.82	8670870

**1.4.2.** Polygon nodes and water level corrections referencing Fort Pulaski, GA (8670870) are provided in CARIS<sup>®</sup> format denoted by a \*.zdf extension file name.

**NOTE:** The tide corrector values referenced to Fort Pulaski, GA (8670870) are provided in the zoning file "G329TJ2016CORP" for this project and are in the <u>fourth</u> set of correctors designated as **TS4.** Longitude and latitude coordinates are in decimal degrees. Negative (-) longitude is a representation of West longitude.

"Preliminary" data for the control water level station, Fort Pulaski, GA (8670870), 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 <u>http://opendap.co-ops.nos.noaa.gov/axis/text.html</u>.** 

#### 1.4.3 Zoning Diagram(s)

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

## 1.4.4 Final Zoning

Upon completion of project OPR-G329-TJ-2016, submit a Pydro generated request for final tides, with times of hydrography abstract and mid/mif tracklines attached. Forward this request to <u>Final.Tides@noaa.gov</u>. 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 <u>Fetchtides</u>

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 (<u>https://inside.nos.noaa.gov/hydrosoft/hydrosoftware.html</u>. 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.

