UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NOAA Marine and Aviation Operations
Marine Operations Center - Atlantic
Norfolk, Virginia 23510-1114

October 12, 2016

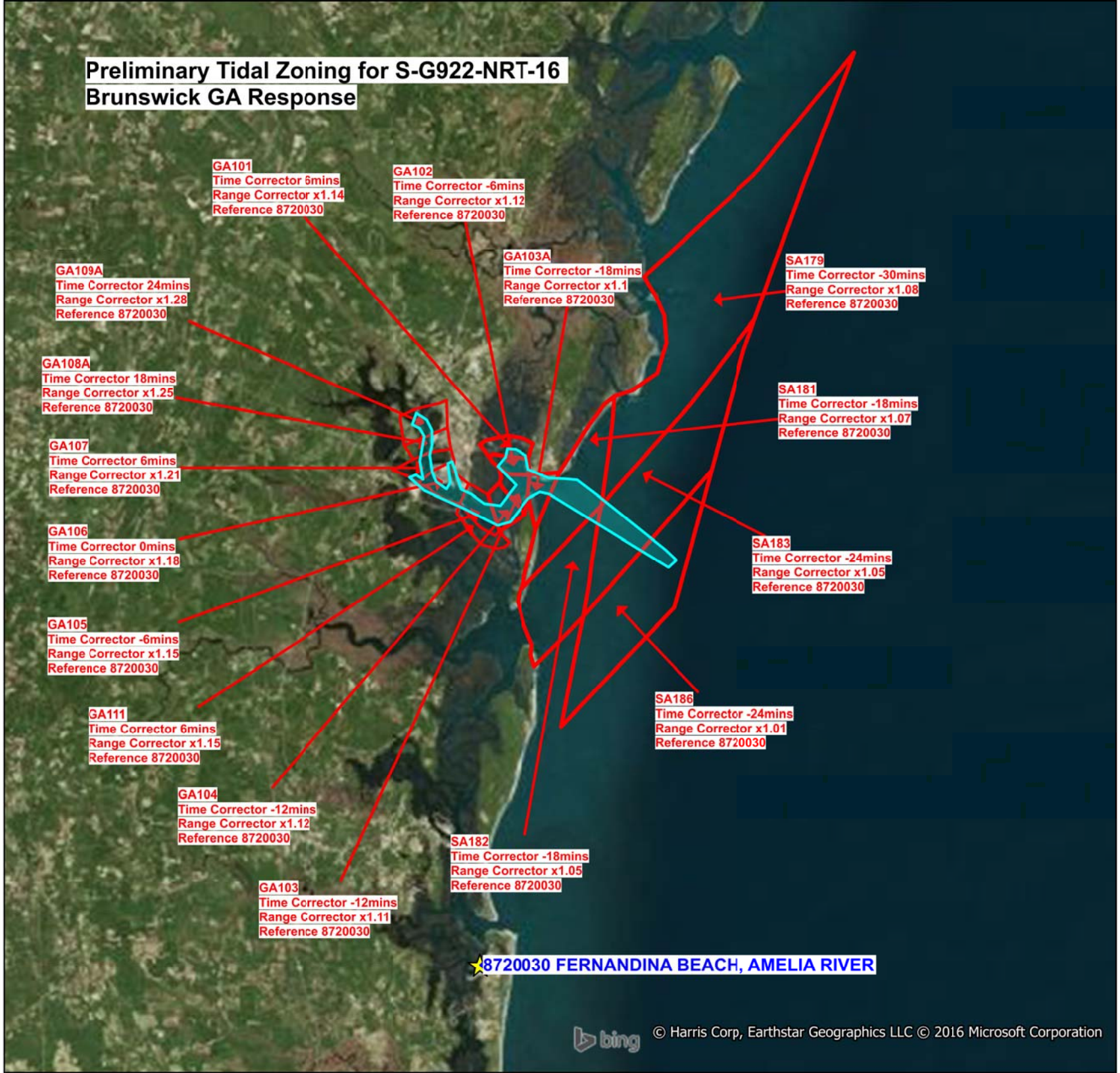
MEMORANDUM FOR: Lieutenant Commander Matthew Jaskoski, NOAA
Commanding Officer, NOAA Ship *Ferdinand Hassler*

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

SUBJECT: Project Instruction for S-G922-FH-16
Hurricane Matthew Sea Buoy to Jetty Channel Clearance, Approaches to Brunswick, GA

This memorandum serves as authorization to sail on S-G922-FH-16 for Hurricane Matthew Sea Buoy to Jetty Channel Clearance, Approaches to Brunswick, GA, scheduled aboard NOAA Ship *Ferdinand Hassler*. Days at Sea 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 **chiefops.moa@noaa.gov** at Marine Operations Center-Atlantic.

Success - Survey Added				
Survey Number	F00689			
Project Number	S-G922-FH-16			
Survey Type	F			
Locality	Approaches to Brunswick			
Sub Locality	Approaches to Brunswick			
State	Georgia,			
Scale	10000			
Sheet	1			
Max/North Latitude (DDMMSS.S)	310802.5		Min/South Latitude (DDMMSS.S)	310310.9
Max/West Longitude (DDDMMSS.S)	0812423.5		Min/East Longitude (DDDMMSS.S)	0811506.9
Affected Charts	Verify that the coordinates you have entered are correct; no affected charts could be found.			
ESNM	10			
Field Unit	NOAA SHIP FERDINAND R. HASSLER			
Processing Center	AHB			
Comments	Hurricane Matthew sea buoy to jetty channel clearance.			
Add another survey				
Back To Search Results				


Preliminary Tidal Zoning for S-G922-NRT-16
Brunswick GA Response
GA101
Time Corrector 6mins
Range Corrector x1.14
Reference 8720030
GA102
Time Corrector -6mins
Range Corrector x1.12
Reference 8720030
GA103A
Time Corrector -18mins
Range Corrector x1.1
Reference 8720030
SA179
Time Corrector -30mins
Range Corrector x1.08
Reference 8720030
GA109A
Time Corrector 24mins
Range Corrector x1.28
Reference 8720030
GA108A
Time Corrector 18mins
Range Corrector x1.25
Reference 8720030
SA181
Time Corrector -18mins
Range Corrector x1.07
Reference 8720030
GA107
Time Corrector 6mins
Range Corrector x1.21
Reference 8720030
GA106
Time Corrector 0mins
Range Corrector x1.18
Reference 8720030
SA183
Time Corrector -24mins
Range Corrector x1.05
Reference 8720030
GA105
Time Corrector -6mins
Range Corrector x1.15
Reference 8720030
SA186
Time Corrector -24mins
Range Corrector x1.01
Reference 8720030
GA111
Time Corrector 6mins
Range Corrector x1.15
Reference 8720030
GA104
Time Corrector -12mins
Range Corrector x1.12
Reference 8720030
SA182
Time Corrector -18mins
Range Corrector x1.05
Reference 8720030
GA103
Time Corrector -12mins
Range Corrector x1.11
Reference 8720030
8720030 FERNANDINA BEACH, AMELIA RIVER
bing
© Harris Corp, Earthstar Geographics LLC © 2016 Microsoft Corporation

WATER LEVEL INSTRUCTIONS
S-G922-NRT-16 Brunswick GA Response
(10/06/2016 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 http://tidesandcurrents.noaa.gov/hydro.shtml, or through regular communications with CO-OPS/Oceanographic Division (OD) personnel before and during operations. During traditional non-duty hours, the Commanding Officer/Team Leader may contact the Continuous Operational Real-Time Monitoring System (CORMS) watch stander who is available 24 hours/day - 7 days/week for assistance in assessing the status of applicable water level station operation. The CORMS watch stander may be contacted either by phone at 301-713-2540 or by email: CORMS@noaa.gov. Problems or concerns regarding the acquisition of valid water level data identified by the Commanding Officer/Team Leader shall be communicated with CO-OPS/OD (nos.coops.hpt@noaa.gov) to coordinate the appropriate course of action to be taken such as gauge repair and/or developing contingency plans for hydrographic survey operations. In addition, CO-OPS is required to coordinate with the Commanding Officer (or Team Leader) before interrupting the acquisition of water level data for the NWLON stations mentioned above for any reason during periods of hydrography.

1.2.2. The Hydro Hot List (HHL)

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

Station	Station ID	Residual Control	Type (NWLON, PORTS©, etc.)	Comment
Fernandina Beach, FL	8720030	Residual Control	NWLON	

Table 1: All stations that need to be added to the HHL in support of S-G922-NRT-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 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 Fernandina Beach, FL (8720030), 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 Fernandina Beach, FL (8720030) by NOAA's Navigation Response Team 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 Brunswick, GA is 0.19 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 Fernandina Beach, FL (8720030) is the reference station for preliminary tides for hydrography in Brunswick, GA. The time and height correctors listed below for applicable zones should be applied to the preliminary data at Fernandina Beach, FL (8720030) 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 (min)	Range Ratio	Predicted Reference Station
GA101	+6	x1.14	8720030
GA102	-6	x1.12	8720030
GA103	-12	x1.11	8720030
GA103A	-18	x1.1	8720030
GA104	-12	x1.12	8720030
GA105	-6	x1.15	8720030
GA106	0	x1.18	8720030
GA107	+6	x1.21	8720030
GA108A	+18	x1.25	8720030
GA109A	+24	x1.28	8720030
GA111	+6	x1.15	8720030

Zone	Time Corrector (min)	Range Ratio	Predicted Reference Station
SA179	-30	x1.08	8720030
SA181	-18	x1.07	8720030
SA182	-18	x1.05	8720030
SA183	-24	x1.05	8720030
SA186	-24	x1.01	8720030

1.4.2. Polygon nodes and water level corrections referencing Fernandina Beach, FL (8720030) are provided in CARIS® format denoted by a *.zdf extension file name.

NOTE: The tide corrector values referenced to Fernandina Beach, FL (8720030) are provided in the zoning file "G922NRT2016CORP" for this project and are in the fourth set of correctors designated as TS4. Longitude and latitude coordinates are in decimal degrees. Negative (-) longitude is a representation of West longitude.

"Preliminary" data for the control water level station, Fernandina Beach, FL (8720030), are available in near real-time and verified data will be available on a weekly basis for the previous week. **These water level data may be obtained from the CO-OPS SOAP web services at http://opendap.co-ops.nos.noaa.gov/axis/text.html.**

1.4.3 Zoning Diagram(s)

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

1.4.4 Final Zoning

Upon completion of project S-G922-NRT-16, 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.