

C. HORIZONTAL AND VERTICAL CONTROL

NOAA tide station 8720030 Fernandina Beach, FL was the source of verified water level heights for determining correctors to soundings. The primary means for analyzing the adequacy of zoning was observing zone boundary crossings in the navigated swath editor, SAIC's **Multi View Editor (MVE)**. In addition, sun illuminated coverage plots were examined on screen for adequacy of zoning. Comparisons between overlapping crossline data and outer swath data (in deeper water) were also used to assess potential tidal zoning impacts. There were a few instances where overlapping data had an observed vertical offset of 10 to 15 centimeters. This observed vertical offset between adjacent lines was likely due to minor tidal zoning impacts caused by differing environmental conditions between the survey area and the primary tide gauge location in Fernandina Beach, FL. The water level zoning parameters provided by NOS, Table C-1, were adequate for application of the observed verified water levels.

Table C-1. Water Level Zoning Parameters Applied on Sheet H12098

Zone	Time Corrector (minutes)	Range Ratio	Reference Station
SA192	-36	0.95	8720030
SA195	-36	0.91	8720030
SA196	-48	0.91	8720030

SA197	-48	0.88	8720030
-------	-----	------	---------

The survey data for sheet H12098 were collected in horizontal datum NAD-83, using geodetic coordinates, while data display and products used the UTM Zone 17 projection. The following equipment was used for positioning on the *M/V Atlantic Surveyor*:

- TSS POS/MV, Serial Number 2575 with a Trimble Probeacon Differential Receiver (primary sensor)
- Trimble 7400 DSi GPS Receiver, Serial Number 3713A18839 with a Trimble Probeacon Differential Receiver (secondary sensor)

Differential correctors used for online data were from the U.S. Coast Guard Stations at Cape Canaveral, FL; Savannah, GA; and Kensington, SC. The differential receiver was programmed to only receive differential correctors data from these three stations.

Daily position confidence checks were conducted using the independent Trimble DGPS. A real-time **ISS-2000** survey monitor also raised an alarm to alert the survey watch if the position differences exceeded the maximum allowable distance. All positioning confidence checks were within an inverse distance of five meters.

Please refer to the Horizontal and Vertical Control Report for detailed descriptions of the procedures and systems used to attain hydrographic positioning. This report will be delivered with the Descriptive Report for the last sheet of this task order.

APPENDIX IV. TIDES AND WATER LEVELS

The on-line times for acquisition of valid hydrographic data are presented in the Abstract of Times of Hydrography, H12098 (Table Appendix IV-1).

Project: OPR-G443-KR-09

Registry No.: H12098

Contractor Name: Science Applications International Corporation

Date: 04 May 2010

Sheet Letter: D

Inclusive Dates: 07 November 2009 – 04 May 2010

Field work is complete.

Table Appendix IV-1. Abstract Times of Hydrography, H12098

Begin Date	Begin Julian Day	Begin Time	End Date	End Julian Day	End Time
11/07/2009	311	03:01:48	11/08/2009	312	06:23:04
11/16/2009	320	23:44:47	11/17/2009	321	16:54:34
11/22/2009	326	05:42:26	11/24/2009	328	19:07:12
11/30/2009	334	07:33:15	12/01/2009	335	12:16:12
12/03/2009	337	16:35:26	12/05/2009	339	12:47:47
12/10/2009	344	14:22:40	12/11/2009	345	01:29:50
12/13/2009	347	17:21:57	12/16/2009	350	11:37:04
04/30/2010	120	00:51:34	05/01/2010	121	12:50:16
05/04/2010	124	11:45:38	05/04/2010	124	12:51:52

Final Tide Note

Observed verified water levels were downloaded from the [NOAA Tides and Currents](#) web site for the station in Fernandina Beach, FL (8720030). Water Level correctors were prepared for each zone using the **Create Water Level Files** routine in the **SABER** software. The **Apply Correctors** routine within **SABER** applied these files to the multibeam data according to the zone containing the nadir beam of each ping.

The H12098 survey fell entirely within preliminary water level zones SA192, SA195, SA196, and SA197 on Fernandina Beach, FL, 8720030. The zoning parameters are outlined in Table Appendix IV-2.

Table Appendix IV-2. Tide Zone Parameters

Zone	Minutes Time Corrector	Range Ratio	Reference Station
SA192	-36	0.95	8720030
SA195	-36	0.91	8720030
SA196	-48	0.91	8720030
SA197	-48	0.88	8720030

Analysis of the multibeam data collected in all three surveys was performed in SAIC's **SABER** and **MVE** tools. Swath editor views and CUBE depth layers revealed minimal depth changes across the junction of the zones. A spreadsheet analysis of the water level correctors for each zone and the differences observed at the boundaries of adjacent zones also confirmed the adequacy of zoning correctors based on Fernandina Beach, FL (8720030). For the analysis, observed verified water levels from 01 October 2009 through 17 December 2009 and 29 April 2010 through 06 May 2010 were processed in SABER to generate water level corrector files. The correctors for each zone were entered into the spreadsheet. Correctors were computed at six minute intervals for each zone. Differences were computed at six minute intervals across the zone boundaries and summarized in Table Appendix IV-3.

As a result, the NOAA preliminary zone boundaries and zoning parameters for Fernandina Beach, FL (8720030) were accepted as final and applied to all multibeam data for H12098.

Table Appendix IV-3. Differences in Water Level Correctors between Adjacent Zones Using Zoning Parameters for Station 8720030 for 2009 - 2010

Zone Boundary	SA196 – SA195	SA192 – SA195	SA196 – SA197
Minimum Difference	-0.119	-0.014	-0.011
Maximum Difference	0.134	0.100	0.075
Average Difference	0.000	0.047	0.035
Standard Deviation	0.059	0.026	0.020