

C. HORIZONTAL AND VERTICAL CONTROL *SEE ALSO THE H-CELL REPORT*

NOAA tide station 8651370 Duck, NC was the source of verified water level heights for determining correctors to soundings. The primary means for analyzing the adequacy of zoning was by entering the tidal data from adjacent zones into a spread sheet and conducting comparative analysis. Adequacy of zoning was also carried out by analyzing zone boundary crossings in the navigated swath editor, SAIC's **Multi View Editor (MVE)** and examining sun illuminated coverage plots within **SABER**. 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 H12091

Zone	Time Corrector (minutes)	Range Ratio	Reference Station
SA45	0	1.05	8651370
SA46A	0	1.08	8651370

The survey data for sheet H12091 were collected in horizontal datum NAD-83, using geodetic coordinates, while data display and products used the UTM Zone 18 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 GPS Receiver with a Trimble Probeacon Differential Receiver (secondary sensor)

Differential correctors used for online data were from the U.S. Coast Guard Stations at Driver, VA, Annapolis, MD, Reedy Point, DE, and New Bern, NC. The differential receiver was programmed to only receive differential correctors' data from these four 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. ***Concur with clarification. The Horizontal and Vertical Control Report was added to the submitted field records for this survey upon its submission.***

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, H12091, Table Appendix IV-1.

Project: OPR-D302-SA-09

Registry No.: H12091

Contractor Name: Science Applications International Corporation

Date: 23 June 2010

Sheet Letter: O

Inclusive Dates: 19 September 2009 – 23 June 2010

Field work is complete.

Table Appendix IV-1. Abstract Times of Hydrography, H12091

Begin Date	Begin Julian Day	Begin Time	End Date	End Julian Day	End Time
09/19/2009	262	01:14:53	09/19/2009	262	15:29:31
09/20/2009	263	14:43:27	09/25/2009	268	13:44:34
09/30/2009	273	12:18:50	10/07/2009	280	06:28:49
04/15/2010	105	14:56:27	04/17/2010	107	04:02:05
04/19/2010	109	01:07:13	04/21/2010	111	23:36:48
06/21/2010	172	18:35:21	06/21/2010	172	20:09:08
06/23/2010	174	16:53:50	06/23/2010	174	20:50:41

Final Tide Note

Observed verified water levels were downloaded from the [NOAA Tides and Currents](#) web site for the station in Duck, NC (8651370). Water Level correctors were prepared for each zone of the project 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 H12091 multibeam data fell entirely within the SA45 and SA46A NOAA supplied tide zones. Analysis of the H12091 multibeam data in the **SABER Multi-View Editor** and in bathymetry grids revealed minimal depth changes across the junction of supplied zones based on the preliminary zoning parameters and data from the tide station in Duck, NC (8651370). A statistical analysis also confirmed the adequacy of zoning correctors based on this station. Refer to the DAPR for this project for a complete, detailed description of the analysis. The verified water level zoning correctors, based entirely on Duck, NC (8651370), were applied to all multibeam data for H12091 (Table Appendix IV-2).

Table Appendix 0-1. Tide Zone Parameters for H12091

Zone	Time Corrector (minutes)	Range Ratio	Reference Station
SA45	0	1.05	8651370
SA46A	0	1.08	8651370