

C. HORIZONTAL AND VERTICAL CONTROL

A complete description of horizontal and vertical control for survey H12142 can be found in the *OPR-0351-FA-09 Horizontal and Vertical Control Report*, submitted under separate cover. A summary of horizontal and vertical control for this survey follows.

C.1. Horizontal Control

The horizontal datum for this project is the North American Datum of 1983 (NAD83). Single Base Post Processed Kinematic (PPK) was the primary method of positioning of MBES soundings on H12142. Precise Point Positioning (PPP) was used as a secondary method of positioning MBES soundings. Differential correctors from the U.S. Coast Guard beacon at Gustavus (288 kHz) were used during real-time acquisition when not otherwise noted in the acquisition logs, and were the sole method of positioning of detached positions (DP) and bottom samples as there is currently no functionality for applying Single Best Estimated Trajectory (SBET) files to these types of data.

During data acquisition on H12142 a static Global Positioning System (GPS) base station “SOG 1970” was used to compute all PPK solutions until static GPS base station “BRIE” was installed on DN 308. Due to incomplete datafiles on DN 307 and DN 308 at both stations, PPP was used for positioning on those days. See Table 7 for a listing of correctors by day number.

Method	<i>Fairweather</i> S220	Launch 1010	Launch 1018	Launch 2801	Launch 2802
PPK w/ SOG 1970	293,296, 299, 302, 303			302	302
PPP	307			308	308
PPK w/ BRIE	312 - 314	309	308 - 310	309 - 314	309 – 312, 314

Table 7: Horizontal correctors for vessels.

Vessel POS/MV files were post processed into SBET files using Applanix POSPac software and applied to the MBES data along with their associated error files (smrmsg files) in CARIS HIPS for increased horizontal positioning accuracy. For further detail and a discussion of quality control checks see the Acquisition and Processing logs for the particular days located in the Separates I folder. All raw base station files are submitted with the HVCR digital data for this project.

C.2. Vertical Control

The vertical datum for this project is Mean Lower Low Water (MLLW) as specified in the Project Instructions. The operating National Water Level Observation Network (NWLON) primary tide station at

Elfin Cove, AK (945-2634), served as control for datum determination and as the preliminary primary source for water level correctors for survey H12142.

Fairweather personnel installed Sutron 8210 “bubbler” tide gauges at the tertiary stations listed below in Table 8. The gauges were installed in order to provide information to the Center for Operational Oceanographic Products and Services (CO-OPS N/OPS1) for the determination of time and height correctors, in accordance with the Project Instructions.

Station Name	Station Number	Type of Gauge	Date of Installation	Date of Removal	Gauge #	S/N
Composite Island	945-2682	Tertiary 30 Day	September 25, 2009	Nov 6, 2009	12	85173
Muir Inlet	945-2584	Tertiary 30 Day	September 26, 2009	Nov 7, 2009	10	97043
Wachusett Inlet	945-2632	Tertiary 30 Day	October 12, 2009	Nov 9, 2009	17	79049
Tarr Inlet	945-2749	Tertiary 30 Day	October 8, 2009	Nov 8, 2009	14	86002

Table 8: Tide Gauge Information.

Refer to the OPR-O351-FA-09 Horizontal and Vertical Control Report for further information about the tide stations.

A request for delivery of final approved (smooth) tides for survey H12142 was forwarded to N/OPS1 on November 20, 2009 in accordance with the Field Procedures Manual (FPM), dated April 2009. A copy of the request is included in Appendix IV.

As per the final *Tide Note for Hydrographic Survey* dated March 26, 2010, and received April 6, 2010, all data were reduced to MLLW using the final approved water levels (smooth tides) from the following stations in order of precedence: Composite Island, Glacier Bay, AK (9452682); Tarr Inlet, Glacier Bay, AK (9452749); Wachusett Inlet, Glacier Bay, AK (9452632); and Juneau, Gattineau Channel, Stephens Pass, AK (9452210). The stations were used by applying the tide files 9452682.tid, 9452749.tid, 9452632.tid, and 9452210.tid in addition to time and height correctors through the zone corrector file H12142CORF.zdf.²¹ **It will not be necessary for the Atlantic Hydrographic Branch to reapply the final approved water levels (smooth tides) to the survey data during final processing.**²²