C. VERTICAL AND HORIZONTAL CONTROL

There were no specific vertical or horizontal control requirements for this project.

All horizontal and vertical data for this project were acquired on the NAD83 (2011) ellipsoid. During processing data were transformed to Universal Transverse Mercator Zone 18N in meters and to MLLW. The vertical transformation was conducted using VDatum and Geoid12A.

Four GPS reference points were established for use during project acquisition. Of these, only two points, along with established CORS data, were used for final system trajectory processing.

Each point established was observed over multiple sessions on different days and coordinates for each session computed via the NGS OPUS website. The average of these coordinates was used for trajectory data processing.

Table 12. GPS Reference Stations Established in NAD83 (2011)

Point	Latitude (N)	Longitude (W)	Height	Comment
84980850	38° 10'54.38789"	84° 54' 10.53167"	201.943	Used for Calibration
OCS_NJ_01	39° 51' 21.56179"	74° 07' 57.11542"	-31.721	Not Used
OCS_NJ_02	39° 46' 32.45195"	74° 11' 11.94764"	-32.243	Used
OCS_NJ_03	39° 39' 04.49093"	74° 11' 06.98918"	-32.653	Not Used
DN8307	39° 24' 45.56553"	74° 29' '29.95957"	-32.567	Used

Trajectory data were processed using IGI AEROoffice_v5.3e, which included GrafNav 8.40 for GPS processing. All trajectory data had an Average Easting/Northing Position StDev of less than 0.025 meters and an Average Height Position StDev less than 0.053 meters. Final trajectory data were used for processing of the lidar data in LSS.

C.1 Vertical Control

The vertical datum for this project is MLLW. All data were acquired relative to the ellipsoid and LAS format data were converted to MLLW using VDatum. During this conversion Geoid12A was used.

LAS data were also converted to MHW using VDatum in order to inspect the difference between the MHW and MLLW across each of the areas and to generate a MHW line. It is important to note that this difference varies across each of the areas. Average values for MHW above MLLW are:

Area1 = 0.14 meters
Area2 = 0.15 meters
Area6 = 1.24 meters

Area 1 has a low variance (StDev=0.01) with the value being consistent across the area. Area 2 also has a low variance throughout the survey area, with the exception of two sections on the eastern boundary as shown in Figure 5, where the MHW-MLLW difference changes to approximately 0.30 meters. Area 6 has a low variance (StDev=0.01) with the value being consistent across the area.

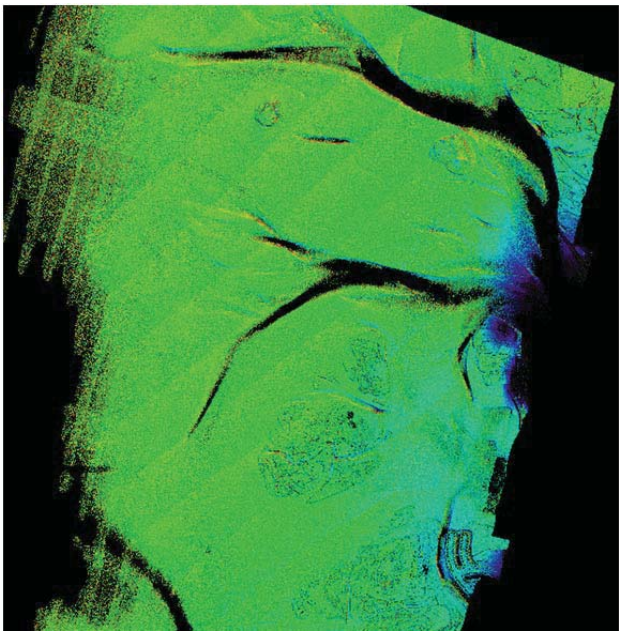

Figure 5. Area 2 MHW-MLLW Difference increases on eastern boundary (Blue, Purple)

In all cases the MHW contour was generated from the MHW data, so that it correctly represents the location of the MHW line for the datasets.

C.2 Horizontal Control

The horizontal datum for this project is North American Datum of 1983 (NAD83) 2011 projected in Universal Transverse Mercator (UTM) Zone 18 North. All data were acquired in NAD83 (2011) and converted to UTM Zone 18N in meters during processing.

D. RESULTS AND RECOMMENDATIONS

The results for H12606 accompany this report in the format of an S-57 feature file, BAG, BASE Surface, georeferenced imagery and intensity images.

D.1 Chart Comparison

The majority of the chart comparison was performed by comparing H12606 depths to a digital surface generated from electronic navigational charts (ENCs) covering the survey area. ENCs at the same scale band were merged prior to surface creation in an attempt to build a continuous model over the survey area. A 50-meter product surface was then generated from a triangular irregular network (TIN) created from the soundings, depth contours, and depth features for each ENC scale. A 50-meter HIPS product surface for Areas 1, 2 and 6 was generated from the finalized 1 meter BASE surface. The chart comparison was conducted by creating and reviewing the resultant difference surface.