C. Vertical and Horizontal Control

Multibeam:

Multibeam vertical control for OPR-A366-KR-17 was provided by way of a Tidal Constituent And Residual Interpolation (TCARI) grid based on verified tide data from Portland (8418150), and Bar Harbor (8413320), ME.

During field operations, all sounding data were initially reduced to MLLW using a combination of preliminary and verified tidal data along with a zone definition file (ZDF) that was based on tidal data from the Portland, ME station. This station is owned and operated by NOAA's National Ocean Service (NOS) through the Center for Operational Oceanographic Products and Services (CO-OPS). Preliminary and verified tidal data was assembled by CO-OPS and accessed through NOAA's Tides&Currents website (http://tidesandcurrents.noaa.gov/). A cumulative file for the gauge in use was updated daily by appending the new data as it became available. It should be noted that these unverified tides were used in the field for preliminary processing only.

On October 26, 2017, the final TCARI grid was acquired from CO-OPS and applied to all sounding data using the TCARI GUI (version 16.8) and merged in CARIS HIPS. Verified tidal data were used for all final CUBE Surfaces, soundings, and S-57 Feature files.

LiDAR:

LiDAR vertical control for OPR-A366-KR-17 was GPS-derived. POS files logged during data acquisition on each flight were post-processed using Applanix POSPac SmartBase routine to create a smoothed best estimate of trajectory (SBET) file. Following creation, the SmartBase SBETs were then applied to the data in SHOALS GCS, replacing the real-time GPS navigation position with a post-processed GPS position. The separation model was created with NOAA's VDatum v3.6. This model also allowed for topographic data to be referenced to MLLW through the use of DTM-derived interpolation.

Data was initially referenced to the ITRF00 (WGS84) ellipsoid using the Applanix Smart Base routine. A smoothed best estimate of trajectory (SBET) solution was processed using a network of CORS stations, with MEOW, as control. It should be noted that the LiDAR data was maintained on the ellipsoid during processing.

All depth soundings were eventually reduced to MLLW in CARIS using this Fugro-created VDatum model. Topographic heights detected by LiDAR were also related to MLLW through the same method. The model was applied to the data, using the compute GPS tides utility, and then merged.