

C.1 Vertical Control

The vertical datum for this project is Mean Lower Low Water.

ERS Datum Transformation

The following ellipsoid-to-chart vertical datum transformation was used:

Method	Ellipsoid to Chart Datum Separation File
ERS via VDATUM	OPR-J311-KR-19_VDatum2_xyNAD83- MLLW_geoid12b.csar

Table 13: ERS method and SEP file

The separation model listed in Table 13 was provided with the Project Instructions and used for sounding correction within the assigned survey area. Realtime navigation for all MBES survey lines were overwritten with post-processed navigation solutions in SBET format. Post-processed solutions were generated using Applanix POSpac MMS using the Trimble CenterPoint RTX option which relies on precise satellite orbit and timing information to create centimeter level positioning and elevation without the use of traditional local base stations. Information on survey control is detailed in the DAPR.

C.2 Horizontal Control

The horizontal datum for this project is North American Datum of 1983 (NAD 83).

The projection used for this project is Universal Transverse Mercator (UTM) Zone 16.

DGPS

The following DGPS Stations were used for horizontal control:

DGPS Stations
English Turn, LA (293 kHz)

Table 14: USCG DGPS Stations

Real-time positioning for side scan sonar operations was provided by differential GPS using corrections received from the US Coast Guard National Differential GPS (NDGPS) coverage network from differential beacons at English Turn, LA (293 kHz). From July 18, 2019 (DN 199) through July 22, 2019 (DN 203) the POS M/V inadvertently received RTK corrections from DEA's nearby GNSS base station rather than USCG differential corrections described in the OPR-J311-KR-19 DAPR. This change was an oversight in equipment configuration that occurred after survey operations resumed following Hurricane Barry. The base station, which was installed on an abandoned U.S. Airforce tower adjacent to the OPR-J311-KR-19 project area to support a survey for another client of DEA, required maintenance after the hurricane. When resuming survey operations after the hurricane, the Blake transited to the tower to check the base station. After confirming that RTK corrections were being broadcast, the S/V Blake's POS M/V was not reconfigured to accept USCG DGPS corrections before acquiring data in the H13264 survey area on July 18, 2019. The POS M/V was properly configured prior to acquiring data on July 23, 2019 (DN 204). The base station, designated with the identification code TWER, was a temporary base station installed to support hydrographic surveys for the United States Army Corps of Engineers (USACE) Mississippi Coastal Improvement Program (MsCIP). This station was previously used to support DEA's NOAA project OPR-J348-KR-17 for positioning in some areas through an integration with the Louisiana State University (LSU) C4G real time network. Equipment included a Trimble Net R5 GNSS Receiver (SN 4750K11594), Trimble Model 2 Zephyr Geodetic GNSS Antenna (SN 30765531), and Trimble TrimMark3 Radio Modem (SN 440103092). The NAD83 (2011) coordinates used for the base station were obtained from an average of four 24-hour OPUS (Online Positioning User Service) solutions. A copy of the OPUS solution reports are included with the H13264 survey deliverables. Use of this station, which improved positional accuracies when compared to using USCG differential corrections, only impacted the side scan sonar data collected from July 18, 2019 (DN 199) through July 22, 2019 (DN 203). Navigation data for all multibeam collected during this time period were overwritten with post processed solutions; the standard practice for all multibeam data described in the DAPR. The maximum distance from the base station to the H13264 project area is 43 kilometers. While this distance exceeds the maximum-baseline length of 40 kilometers set in the HSSD for single base processing for ERS surveys, the baseline length is more than adequate to support the horizontal positioning of side scan sonar data. While performing quality control checks of the navigation data, it was determined that on July 21, 2019 (DN 202) one survey line was acquired in autonomous mode. This line, 2019BL2022005.XTF, was rejected and reacquired on November 23, 2019 (DN 327) with line 2019BL3271520.XTF following horizontal and vertical control methods described in the DAPR. This only impacted side scan positioning as MBES data was positioned using Trimble Centerpoint RTX.