

C.1 Vertical Control

C.1.1 Vertical Datum

The 17USM01 Gulfport Survey used Mean Lower Low Water (MLLW) National Tidal Datum Epoch (NTDE) 1983-2001 as the sounding datum. All vertical and horizontal positions were referenced to North American Datum of 1983 (NAD83) (2011/MA11/PA11) Epoch 2010.00. This excludes any updates to ENC's, which utilized the WGS-84 datum and ellipsoid.

C.1.2 Existing Tidal Infrastructure

Three primary benchmarks were utilized for various tidal analyses: Bay Waveland Yacht Club (ID 874737, about 25 km from Gulfport survey area), Pascagoula (ID 8471533, about 50 km from Gulfport survey area), and Shell Beach (ID 8761305, about 75 km from Gulfport Survey Area). These primary tide gauges have 19-year accepted datum and are maintained by NOS.

An established bench mark (ID 8745557) was available at the Gulfport Municipal Marina whose datum were published on 03 September 2015 and whose data span from 2006-2007 and 2009-2010. A MLLW datum and separation value between the benchmark and ellipsoid allows for an existing SEP value to be determined.

C.1.3 Tide Gauge Calibration

The In-Situ Level TROLL 700 tide gauge was calibrated in a three meter tall cylindrical tube filled with freshwater at John C. Stennis Space Center both before and after tide gauge deployment at Gulfport. The resulting calibration revealed a resolution that met NOAA's 1-mm resolution specification. A linear least-squares fit designed by York et al. 2004 was utilized to compare simultaneous observations as well as calibration data. Since the Level TROLL 700 does not record salinity, data from a USGS buoy was utilized to correct the pressure readings to an appropriate depth value. The buoy was located 12 km away from the site, so a comparison between the salinity from the buoy and some sparse salinity profiles from the 17USM01 SVP casts was performed. See the 17USM01 HVCR Sec. B for more information on uncertainties and calibration.

C.1.4 Tidal Zoning

The Gulfport survey area covers a small area but has an extensive length offshore for PA03. The established tide gauge in Gulfport is 25 km from Bay Waveland, MS, 50 km from Pascagoula, MS, and 75 km from Shell Beach, LA tide gauges. These three stations have NOAA-published datums for water levels referenced to the NTDE Epoch 1983-2001 as seen in Table 16. These three stations were utilized to triangulate a cotidal zoning scheme. However, High Water Interval (HWI) and Low Water Interval (LWI) accepted values are not available for these primary tide stations; relative HWI and LWI values were determined by pairing extrema values between a primary tide station and the 17USM01 subordinate tide gauge. In turn, a cotidal phase model was developed for the region with timing with respect to 17USM01 tides (Figure 12). The model assumes a linear interpolation relationship between the stations, which may be an erroneous assumption as the contours approach Shell Beach and the embayment of southeast Louisiana. The cotidal model

suggests that the 17USM01 survey only needs 1 SEP value since the survey area is within each of the sets of cotidal curves as defined by NOAA (Figure 19). For more information on the cotidal analysis, see the 17USM01 HVCR .