Checking VDatum Offshore With Bottom Mounted Pressure Gauge Geodetically Referenced with GNSS ASV

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All The warning by the National Oceanic and Atmospheric Administration (NOAA) of the large uncertainties in the VDatum grid for the southeastern Louisiana, and western Mississippi coastal waters has resulted in several studies to determine the regions where these large uncertainties prevail. In the previous studies using USGS coastal water level gauges and an offshore buoy, errors in the Great diurnal range (Gt) tidal datum and the topography of sea surface (TSS) were determined in some of the study areas. For the latter case, repeated vandalism of the surface buoy limited the duration of the water level record. In this study, a novel technique was adopted to reduce the chances of vandalism and obtain a minimum 30 day water level record for tidal datum transfer. It involved the use of a bottom-mounted pressure gauge, deployed for more than 30 days, and an autonomous surface vehicle (ASV), equipped with both survey grade and low cost global navigation satellite systems (GNSS), deployed for 7 hours, to tie the sea level data to the ellipsoid. Tidal datums were computed using the modified range ratio technique and compared to VDatum results to determine the fidelity of the VDatum tool in estimating tidal datums over the study area.