

Integrating America's Elevation Data Efficiently and Accurately

Vertical Datum Transformation (VDatum) is a free software tool being developed jointly by NOAA's National Geodetic Survey (NGS), Office of Coast Survey (OCS) and Center for Operational Oceanographic Products and Services (CO-OPS). VDatum is designed to vertically transform geospatial data among a variety of tidal, orthometric and ellipsoidal vertical datums - allowing users to convert their data from different vertical references into a common system and enabling the fusion of diverse geospatial data in desired reference levels.

Where available and uncertainties are established, VDatum converts the following:

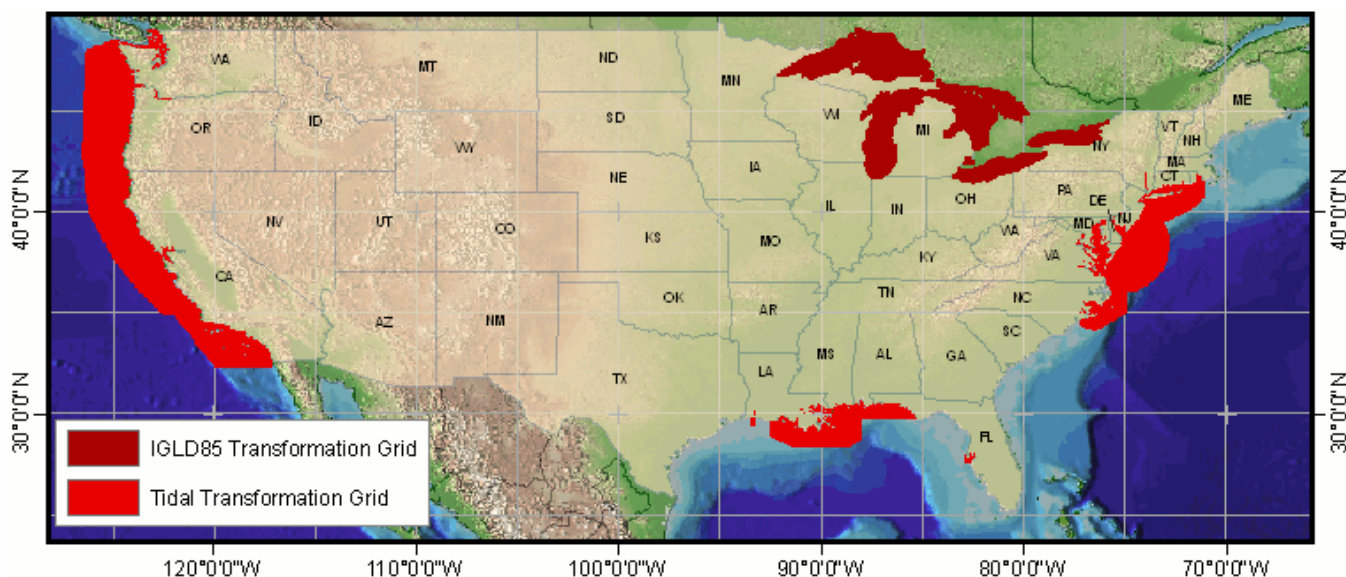
Horizontal datums: Among NAD 27, NAD 83(1986), NAD 83(HARN).

NAD 83(HARN) is currently considered as being equivalent to NAD 83(CORS96/NSRS2007), WGS 84 or ITRF.

Vertical datums: Among 3 vertical groups: tidal, orthometric and ellipsoidal datums.

- Transforms data among orthometric and ellipsoidal datums are available throughout the United States.
- Transforms data from or to tidal datums are currently available in 29 VDatum project areas.

Current VDatum project areas supporting tidal transformations





A Brief History

VDatum was first introduced to support a seamless bathymetric - topographic digital elevation model (DEM) for Florida's Tampa Bay region by merging the "best available" NOAA bathymetric and USGS topographic data. The best available bathymetric data were selected from the NOAA / NOS Hydrographic Survey database. For the Tampa bay region, approximately half of the sounding data collected were referenced to a mean low water (MLW) vertical datum, and the other half to a mean lower low water (MLLW) vertical datum. The best available topographic data were selected from the USGS National Elevation Dataset (NED). The NED dataset is horizontally referenced to NAD 83 and vertically referenced to NAVD 88. Prior to merging, both datasets were transformed to a common reference coordinate system, both horizontally and vertically, using VDatum.

The seamless bathy-topo DEM resulting from the VDatum Demonstration Project in Tampa Bay has not only proved to solve the problem of inconsistency among diverse datasets of bathymetry, topography and shorelines that causes difficulty in mapping coastal regions, but also provides consistent geospatial data for multiple applications. Applications benefiting from VDatum include:

- Inundation modeling: storm surge, tsunami, sea level rise impacts
- Ecosystem modeling and coastal management
- Hydrographic survey depths using Kinematic GPS for vertical referencing
- Shoreline extraction from LiDAR data

The VDatum Demonstration Project in Tampa Bay, Florida

