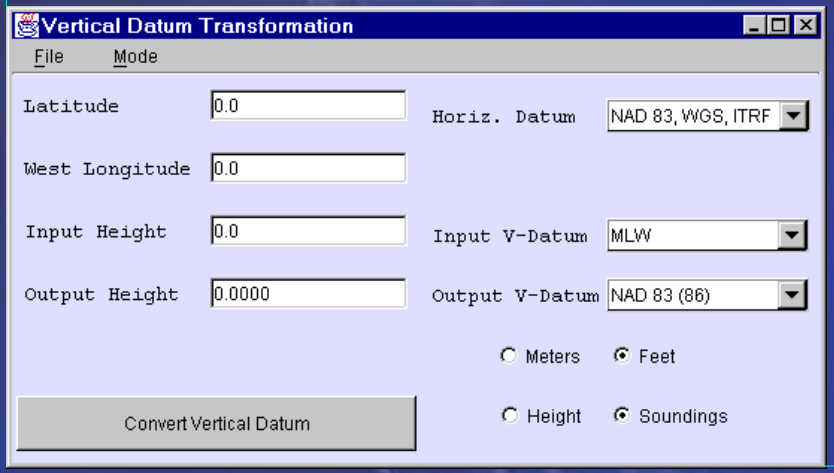
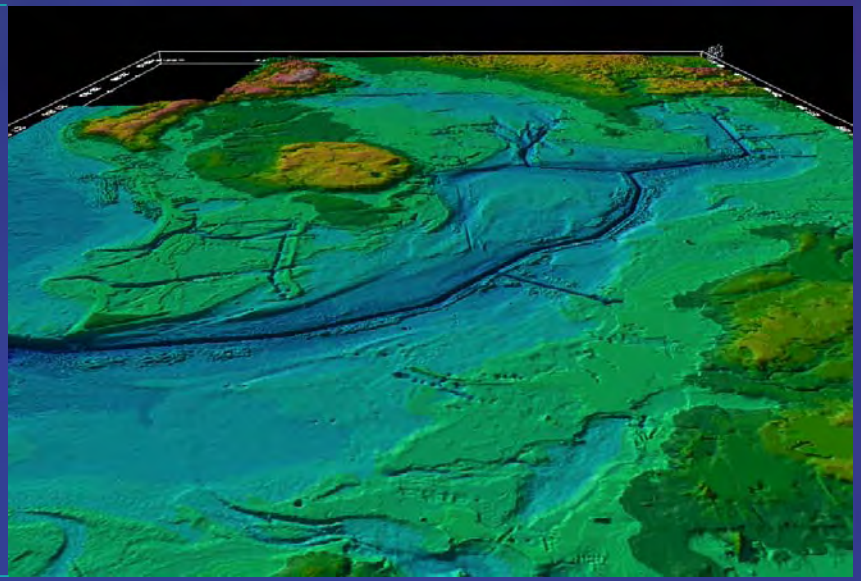
Update on VDatum in the Gulf of Mexico

NOAA's

National Geodetic Survey
Coast Survey Development Laboratory
Center for Operational Oceanographic Products and Services

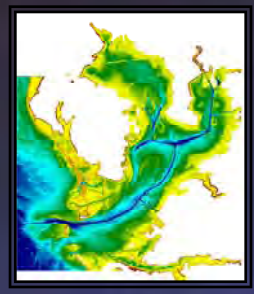
Mapping the Land-Sea Interface





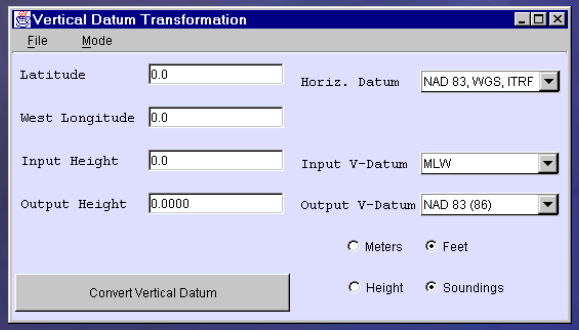
VDatum Usage Supports

Topography

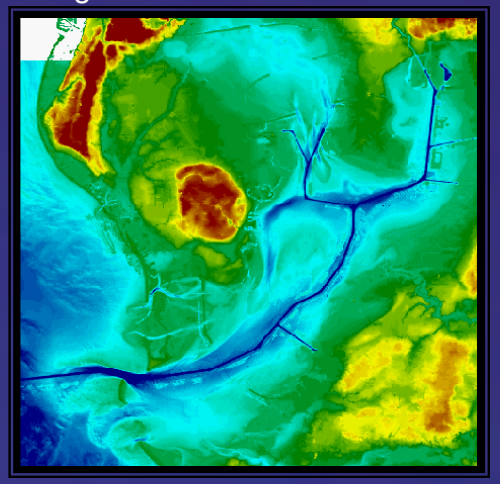


Bathymetry

VDatum



Bathy/Topo
Digital Elevation Model



- Inundation modeling from storm surge, tsunamis, and sea level rise.
- Erosion, accretion, renourishment
- Analyzing storm impacts
- Determining setback lines
- Determining local, state, and national boundaries
- Navigation Products and Services
- Habitat restoration
- Shoreline Change Analysis
- Analyzing environmental and natural resources
- Permitting

All elevation data are referenced to a vertical datum.

***BUT* there are many different vertical datums in use**

Relationship of vertical datums for Tampa Bay:

86.39 ft	WGS 84 (G873)	26.33 m
81.33 ft	NAD 83 (86)	24.79 m
0.792 ft	MHHW	0.241 m
0.409 ft	MHW	0.125 m
0.0 ft	NAVD 88	0.0 m
-0.535 ft	LMSL	-0.163 m
-0.850 ft	NGVD 29	-0.259 m
-1.495 ft	MLW	-0.456 m
-1.919 ft	MLLW	-0.585 m

Ellipsoid Datums

WGS 84, NAD 83 (86), 17 others

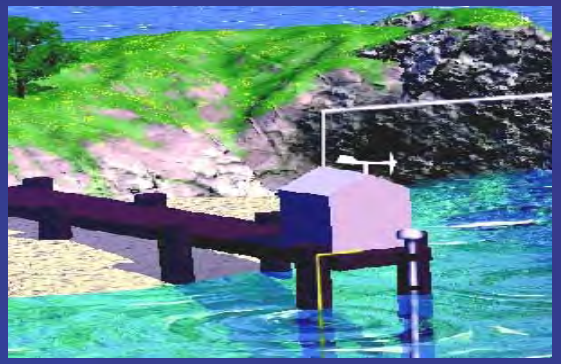
Orthometric Datums

(MSL)

NAVD 88, NGVD 29

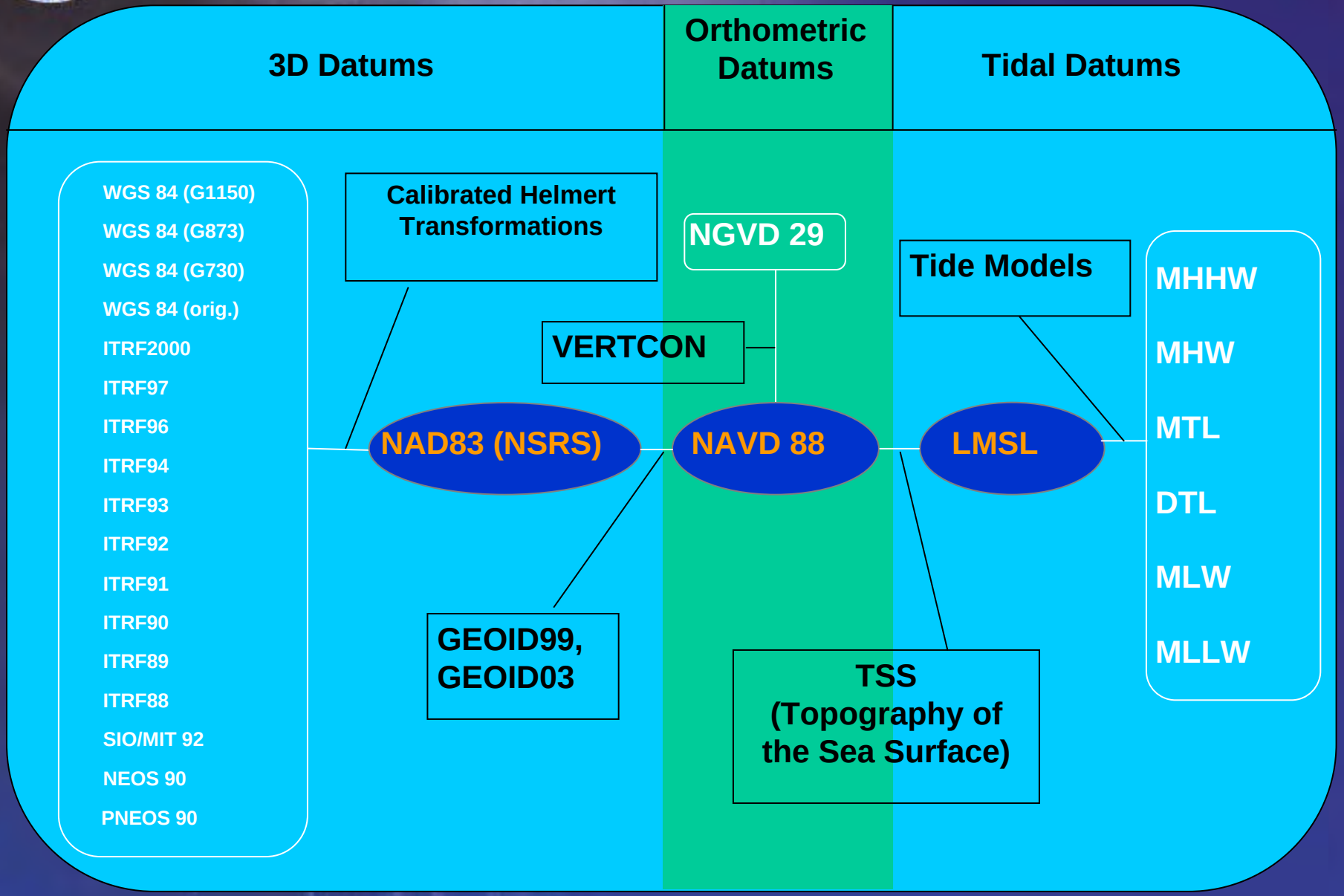
Tidal Datums

MHHW, MHW, MTL, DTL, LMSL, MLW, MLLW



For elevation data sets to be blended together they must be referenced to same vertical datum.

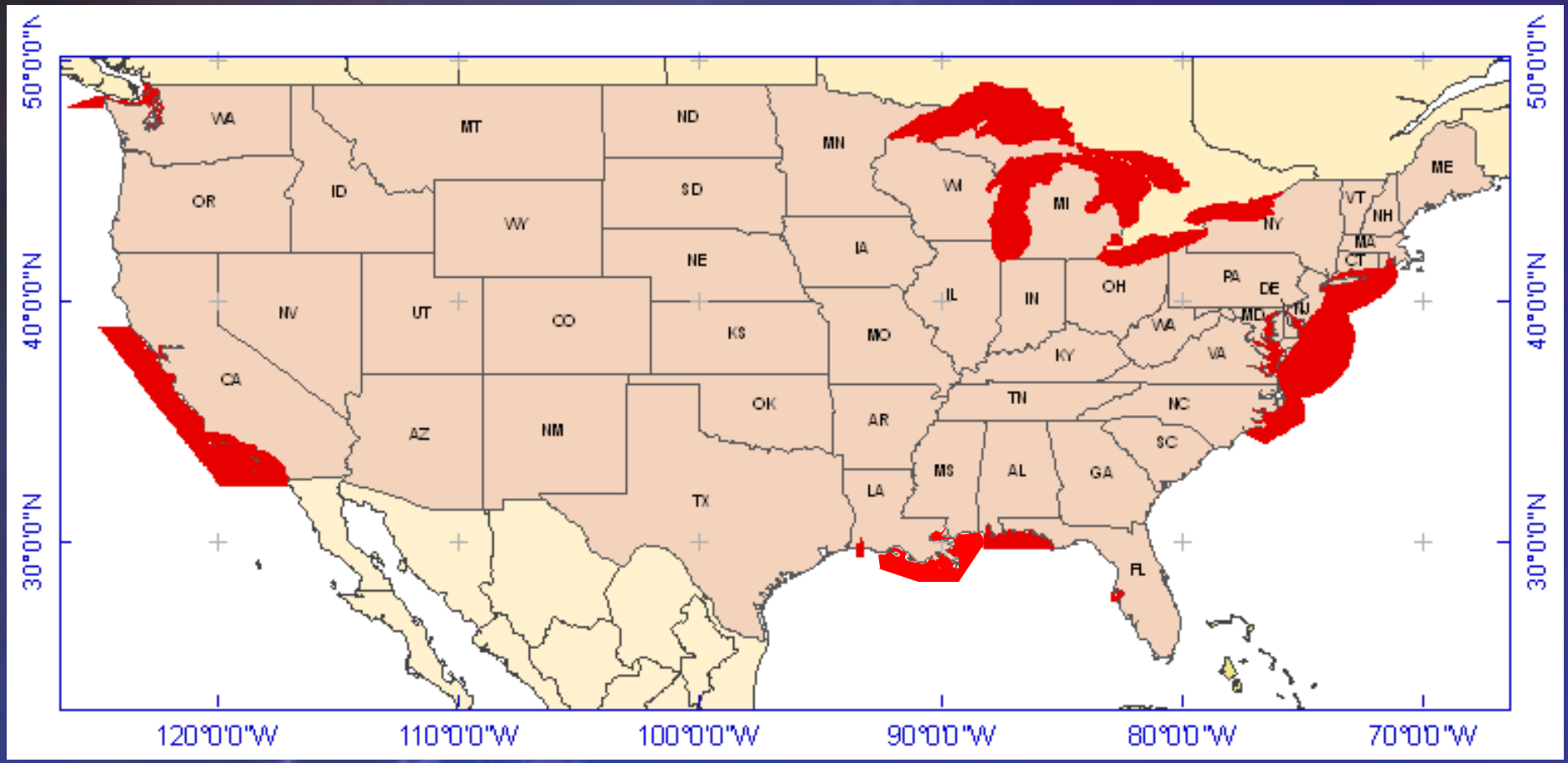
Vertical Datum Transformation "Roadmap"



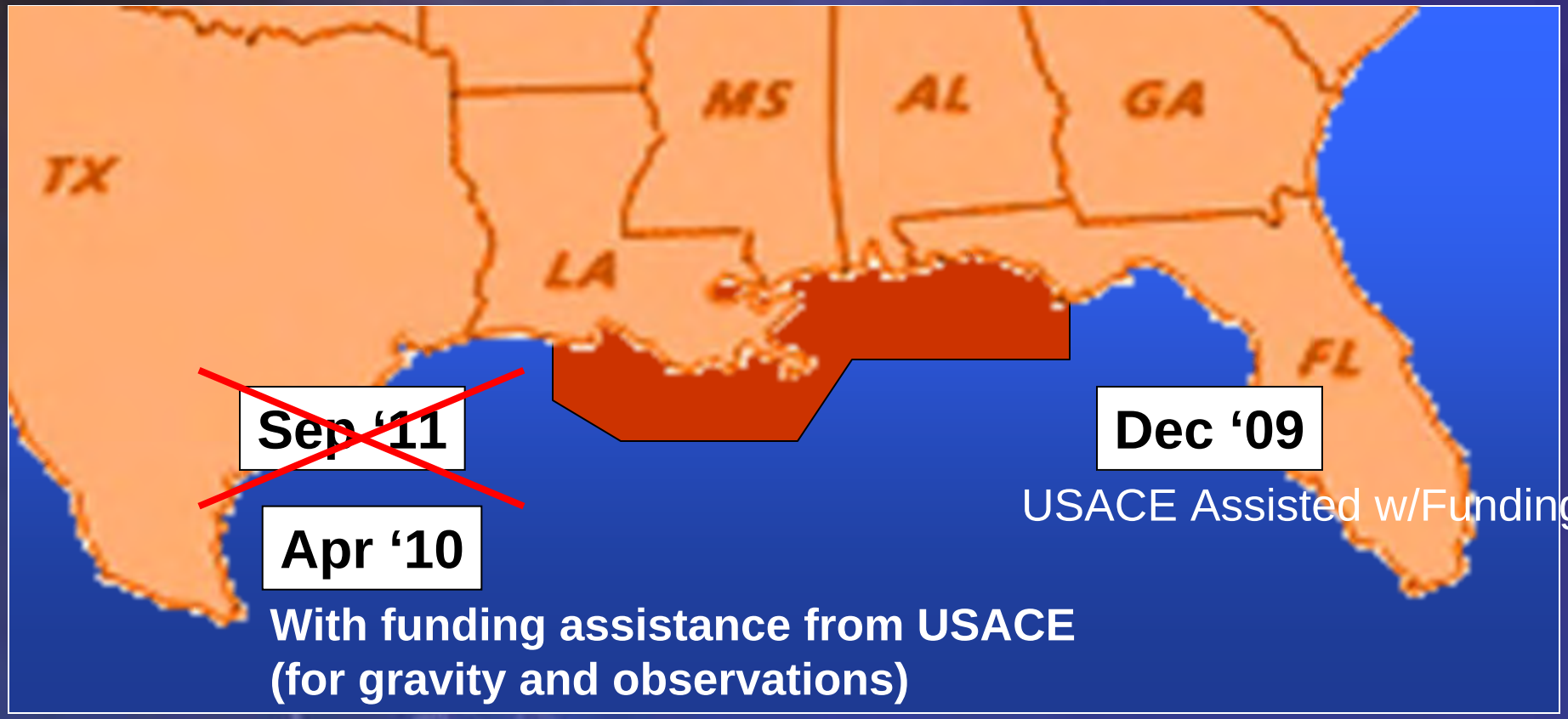
Gulf of Mexico Issues

- Need for updated gravity data in western Gulf
- Need for GPS ties (observations) at tidal benchmarks in western Gulf
- Once data are obtained, time is required to process data and release updated geoid model

VDatum Availability



VDatum Availability



New Website: vdatum.noaa.gov

Vertical Datum Transformation

Integrating America's Elevation Data

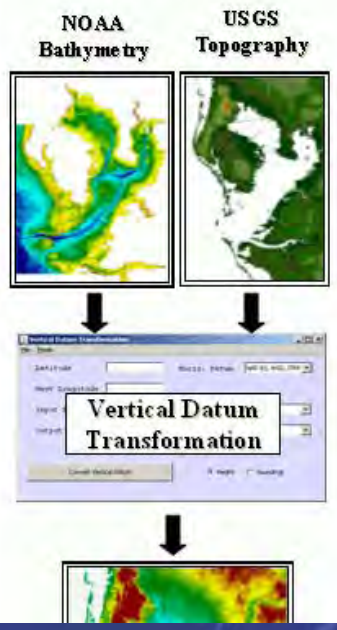
Home | About | Download | Education | Development | Contact Us

Welcome to VDatum!

Overview

- What's New?
- VDatum Features
- **Download VDatum now**
- Online User Guide

The VDatum Demonstration Project in Tampa Bay, Florida



Last updated on August 07th, 2008 NEW!

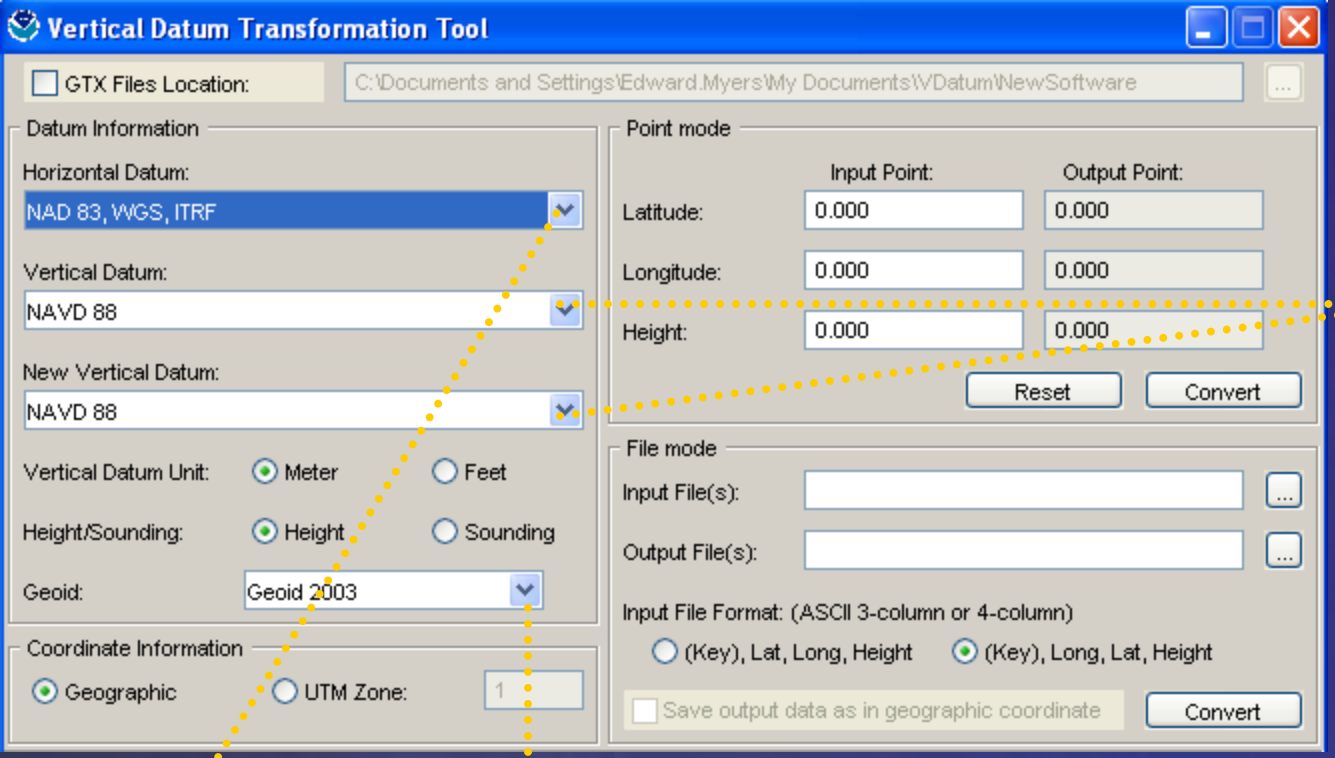
VDatum is a free software tool developed jointly by NOAA's National Geodetic Survey (NGS), Office of Coast Survey (OCS), and Center for Operational Oceanographic Products and Services (CO-OPS). VDatum is designed to vertically transform geospatial data among a variety of tidal, orthometric and ellipsoidal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

Converts the following:

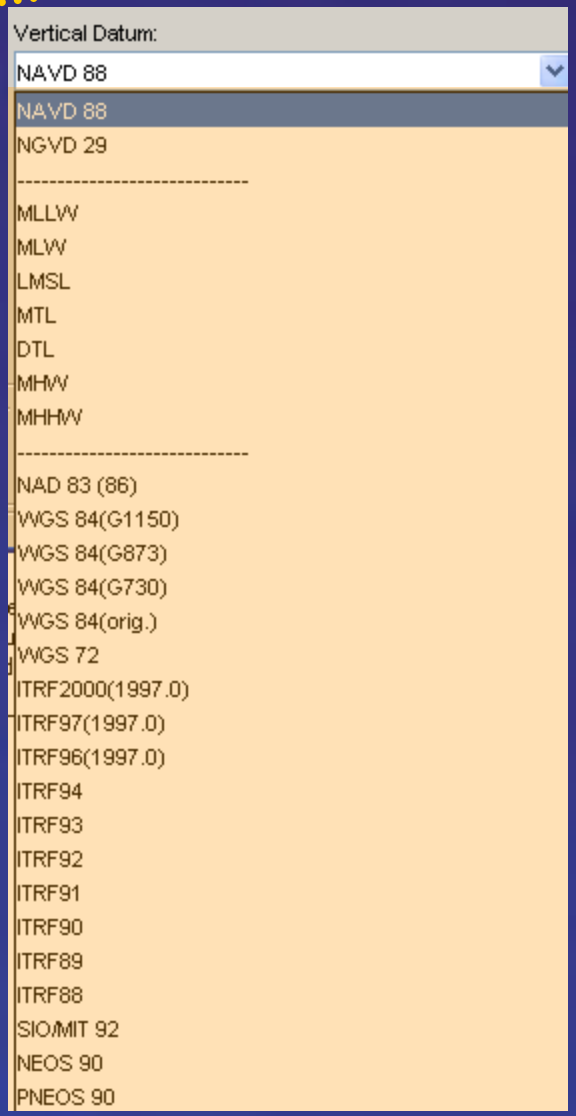
- **Horizontal datums**: from NAD 27 or NAD 83(1986) to NAD 83(HARN). NAD83 (HARN) is currently considered as being equivalent to NAD 83 (NSRS2007/CORS96), WGS 84 or ITRF
- **Vertical datums**: among three vertical groups: tidal datums, orthometric datums and ellipsoidal datums (i.e. three-dimension or 3-D datums), in which:
  - Transforms among ellipsoidal and orthometric datums are available throughout the United States;
  - The HTDP v2.9 is partially utilized to support conversions among ellipsoidal datums;
  - Current GEOID models such as GEOID 99, GEOID 03 and GEOID 06 are used to support direct conversions between the NAD 83 ellipsoidal datum and the NAVD 88 orthometric datum;
  - The VERTCON model is employed to support conversions between the NGVD 29 datum and the NAVD 88 datum;
  - The IGLD 85 model is employed to support conversions between IGLD 85 datum and the NAVD 88 datum;
  - Tidal datums are available in 27 areas.
- **Input elevation data** in geographic (Latitude, Longitude) and UTM coordinates.

A Little History

VDatum was firstly introduced to produce a seamless bathymetric - topographic digital elevation model (DEM) for Florida's Tampa Bay region by merging the "best available" NOAA bathymetric data and USGS topography data. The best available bathymetric

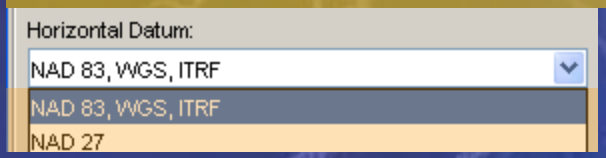


Choose input and output vertical datums:



Choose a geoid model

Choose a horizontal datum



Improvements to VDatum Currently in Development

- Metadata
- Accuracy/uncertainty assessments
- Evaluating extending VDatum tidal datums inland
- Maintenance for tidal datum epoch, geoid and ellipsoid updates
- Analysis of bathymetry changes on tidal datum results
- Outreach and training

Future Developments

- New web-based tools for interacting with VDatum results
- Improvements to downloadable software

Questions?

…Discussion…