Introduction

GeoCue offers limited support for Mean High Water Tidal Datums. In GeoCue 2013, thirty-eight Mean High Water project areas (aka VDatum project areas released by NOAA on 13Aug2013) are supported and others will be added as they become available from NOAA. The twenty-five older VDatum project areas are also still included in the product. Transformation of data to a Mean High Water (MHW) datum is accomplished by creating a layer with its vertical coordinate system set to one of the VDatum project areas, and either populating, or copying geometry (e.g. Create Entity -> Selected Entities’ Geometry) from an existing layer.

The constraints for using these MHW datums are:

1) You may only transform data “to” a Mean High Water datum. You cannot transform MHW data to any other defined vertical coordinate system.

2) The vertical coordinate system that you are transforming “from” must be based on NAVD88. For example, if the input data has ellipsoidal heights, you must first do an intermediate ‘populate’ or ‘copy geometry’ step in GeoCue to convert your data to NAVD88 heights.

3) All data that you wish to transform must be completely contained within the rectangular coverage of the VDatum project area to which you wish to transform.

4) Any given project area will have “invalid regions” within it. Heights for points in these regions will be returned as -999,999, the value used by the VDatum utility. In the case of LIDAR point data, a macro step can be used to easily remove these heights from the LAS files.

As a consequence of the second constraint, any project for which you intend to transform data to a MHW datum should be created with its vertical coordinate system set to NAVD88. This is required because many transforms in GeoCue “go through” the project coordinate system.
Identifying the Coverage of a Project Area

Given the requirement of the third constraint, GeoCue will deliver, via a shapefile, the valid regions for each of the VDatum project areas supported. This shapefile is in the NAD 83 geographic coordinate system, and is located in the `<GeoCue Common folder>\Support Data\Tidal Project Areas\VDatumProjectAreas.shp` and `VDatumProjectAreas_13Aug2013.shp`. Simply create a GeoCue layer of type Polygon_GENERIC, and create entities on that layer using the 'Import Geometry from CAD/SHP file' option. Note the `<GeoCue Common Folder>` is typically located at “`\<GeoCue server>\GeoCue\Common`”, but you may run the GeoCue Database Manager on your GeoCue server to identify your common folder if it is in a different location. The view below (Figure 1) shows the valid regions for each project area.

![Figure 1 VDatum Project Areas](image-url)
A more detailed view showing the project areas along the North Carolina coast is shown below (Figure 2).

Figure 2 North Carolina Coastal Project Areas

Note that the name of each polygon is the same as shown in the VDatum user interface, and in GeoCue’s Coordinate Systems selection dialog, making it easy to graphically identify which MHW datum to use for a given region of interest.

**Raster Image Representations of the VDatum Project Areas**

In addition to the polygons described in the previous section, you may also view the valid coverage areas for the VDatum project areas, as implemented in GeoCue, by importing raster image representations of each.

Create a layer in GeoCue of type: Generic_RASTER. The coordinate system of the layer must be set to NAD 83 geographic. The raster files are located at: `<GeoCue Common folder>\Support Data\Tidal Project Areas\Valid Area Images`. Use the ‘Import Raster’ command to import these files into GeoCue. Be sure to filter to only the ".TIF" extensions. Select the raster layer you created, click ‘Load Footprint and Rasters’ on the ‘Load Options’ tab, and ‘Reference External Files’ on the ‘Raster Files’ tab.
An example dialog is shown below (Figure 3 Import Raster Dialog).

![Import Raster Dialog](image)

Figure 3 Import Raster Dialog

Click the ‘Start’ button. When the images have completed loading, do a ‘Fit’ if necessary.
Your MapView should be similar to that shown below (Figure 4).

![Figure 4 VDatum Valid Area Images](image)

**Limiting the extent of your data to a VDatum Project Area**

As indicated in constraint three above, when transforming to a given MHW datum (identified by a project area, as shown above), you must make sure that your data is completely contained within the coverage for that project area. If your data extends beyond one of those project areas, or overlaps multiple project areas, you can use the GeoCue’s Geometry tools to break up your data into sub-regions, one for each project area.
For example, suppose in the figure below (Figure 5), the brown outline represents the extent of your data. The green lines represent the boundaries between three different VDatum projects areas.

Figure 5 Adjacent VDatum Project Areas
The figure below (Figure 6) shows three polygonal regions created using GeoCue’s geometry tools by intersecting the boundary of your data with the VDatum project boundaries.
An Example using Working Segments

From the sub-regions shown above, you can use GeoCue’s ‘Place Grid of Entities’ method for entity creation to break up each sub-region into working segments, as shown below (Figure 7). Note that three different layers exist for these working segments, one for each project area: Coastal North, Coastal Central, and Pamlico Sound. The vertical coordinate systems for each of these layers are set to correspond to these areas. These MHW coordinate systems are available from the list of vertical coordinate systems in the ‘Tidal\MHW’ folder of GeoCue’s Select Coordinate System dialog (Figure 8).
Populating
Once you have defined your new working segments on the layers with the MHW vertical coordinate systems, simply run the ‘Set Population Parameters’ step on your new working segments and identify the NAVD88 input layer. Then re-store those entities to the working set and run the ‘Populate’ step. The result will be a new LAS file for each working segment, with MHW heights.

For information on this CueTip, contact:
GeoCue Group Support
GeoCue Group, Inc.
9668 Madison Blvd., Suite 202
Madison, AL 35758
support@geocue.com
+1-256-461-8289

Find additional information and participate in our GeoCue Group user forums.
http://support.geocue.com