

CueTip™

County Coordinate Transformations

Applies to GeoCue, versions 2011 and above.



GeoCue Group Support
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Introduction

When working with data in county coordinate systems, the definitions of datum transformations are important. The steps in this CueTip provide recommendations and an example of such a project; beginning from project setup, to selecting appropriate Coordinate Reference Systems (CRSs), to properly defining the coordinate transformations. **Please consult with your surveyor to determine the appropriate coordinate transformations to use for your project.**

Steps

1. Create a new project and select a standard coordinate system such as the state plane or UTM zone for your project (Figure 1). Later you can establish the county coordinate system as your default coordinate system.

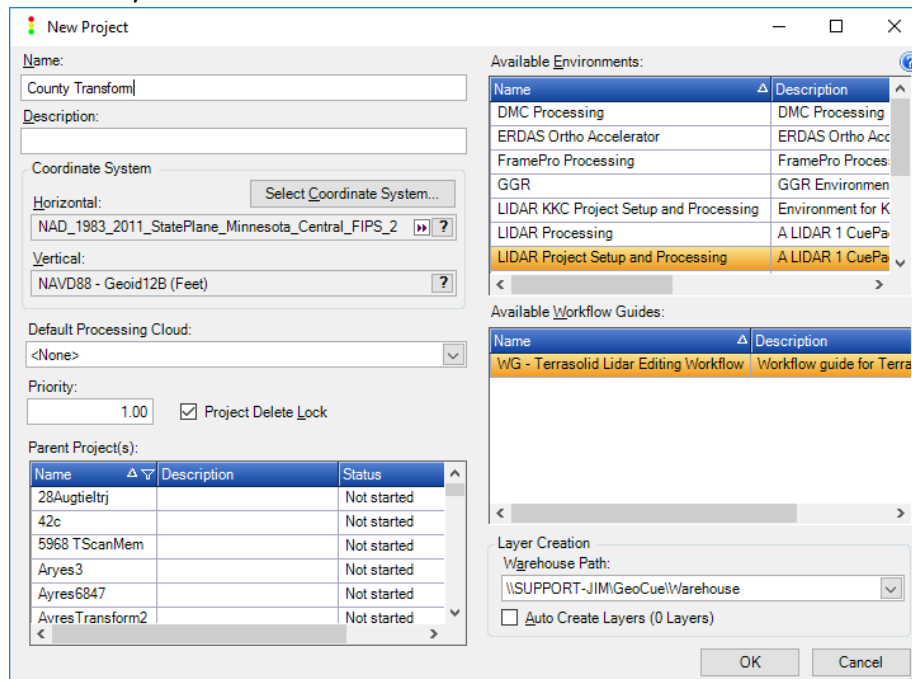


Figure 1: New Project dialog

2. Open the **Map Coordinate Systems** dialog by selecting the button, or right-click in the TOC and select Map Coordinate Systems (Figure 2).

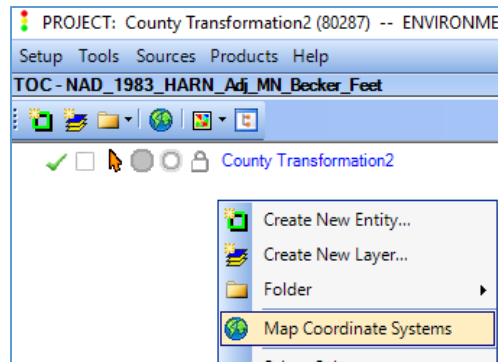


Figure 2: Prompting the Map Coordinate Systems dialog

3. Define additional coordinate systems as appropriate and required depending on the data you will encounter during your processing (Figure 3). For a typical LIDAR workflow in county coordinate systems, the following datums usually need to be defined: NAD83, NAD83 HARN, NAD83 (2011), WGS84, which can usually be done by selecting the applicable geographic, state and county coordinate systems. These are only examples. Please consult with your surveyor to determine the appropriate coordinate transformations to use for your project.

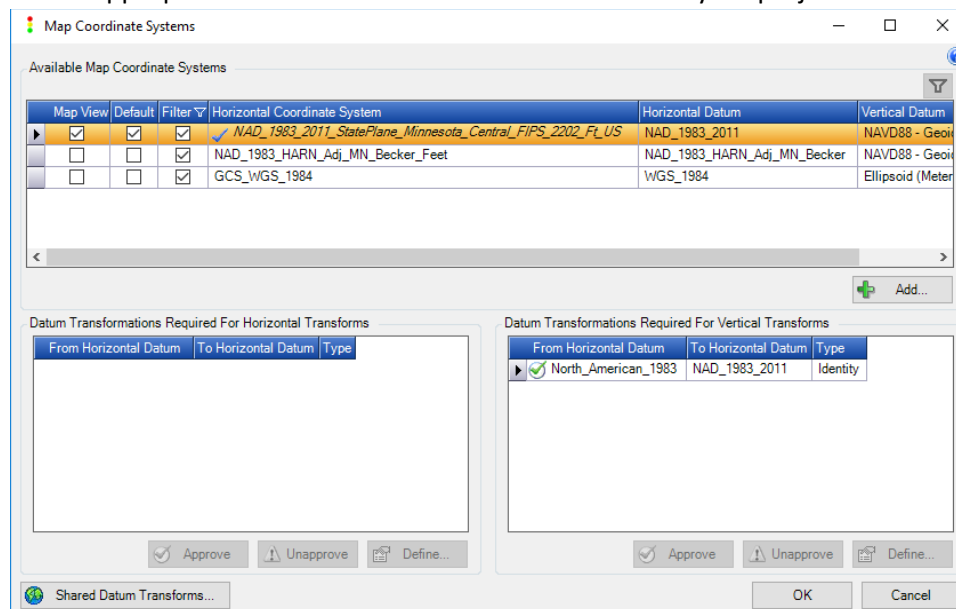


Figure 3: Map Coordinate Systems dialog with necessary CRS mad available

4. In the Map Coordinate Systems dialog, select each CRS and ensure that both the horizontal and vertical transformations are defined, or approved if a suggested transformation exists. For a typical LIDAR workflow, the following transformations would need to be defined:
 - a. NAD3 HARN to NAD83
 - b. NAD83 (2011) to county datum
 - c. NAD83 (2011) to NAD83
 - d. NAD83 (2011) to NAD83 HARN
 - e. WGS84 to NAD83 (2011)

These are only examples. Please consult with your surveyor to determine the appropriate CRSs transformations for your data.

In the example provided (Figure3), these transformations need to be defined:

- i. For use by the Vertical transform: North_American_1983 to NAD_1983_2011
- ii. Horizontal: NAD_1983_2011 to NAD_1983_HARN_Adj_MN_Becker
- iii. For use by the Vertical transform: North_American_1983 to NAD_1983_HARN_Adj_MN_Becker
- iv. Horizontal: NAD_1983_2011 to WGS_1984
- v. For use by the Vertical: North_American_1983 to WGS_1984

Transformations i-iii involve moving between NAD83 realizations where the differences are insignificant when compared to the accuracy and precision of the data. The NAD83 datum itself is used by the vertical transform, where in the instance of NAVD88 the geoid models are of a 7.5' resolution so the difference between the NAD83 original realization and the more current ones will not have a significant impact on the geoid adjustment being made. Hence, for all these cases, we will use the "Identity" Transformation (Figure 4). The Identity Transformation says to treat these different labels as the same datum, so do not apply any datum transformation.

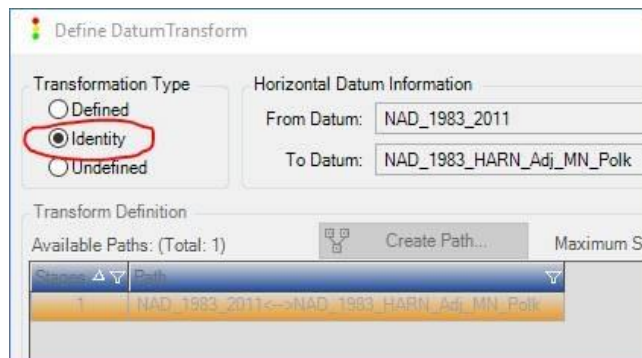


Figure 4: Define DatumTransform dialog- Identity

Transformations iv-v involve moving from NAD83 datums to/from WGS_1984. Specific transformation definitions need to be selected because the differences between these datums are significant (Figure 5). In the case of the example, we are assigning a transform stage through WGS_1984_epoch2010. The latest standard definition by NGS. You can define more accurate time dependent transformations (HTDP) in GeoCue if required. See [CueTip - Horizontal Time Dependent Positioning](#).

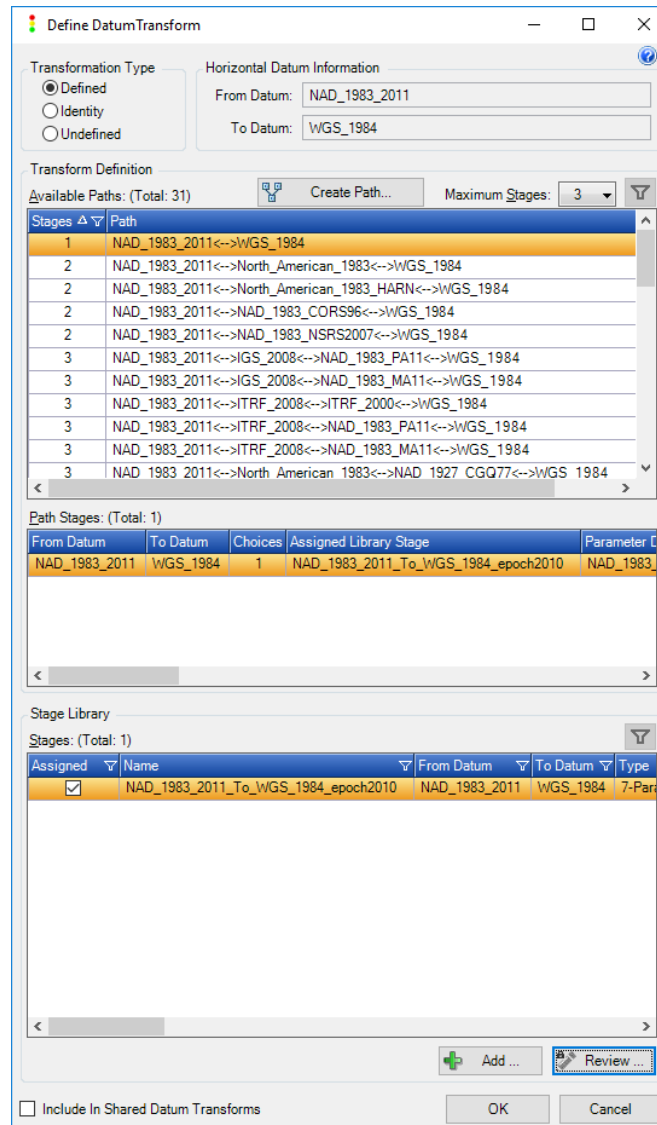


Figure 5: Define Datum Transform dialog – Defined

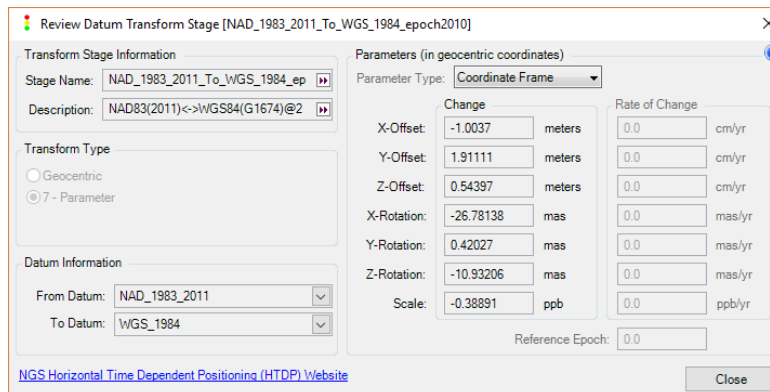


Figure 6 - Datum Transform Stage Information