

## Tools

# Creating a NAVD88 Geoid Correction File

TerraScan, versions 019.001 and above



GeoCue Support

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Revision 1.1

Summary: This workflow contains step by step instructions for converting NGS geoid data files to a format that TerraScan can use.

The NGS geoid data files are not directly compatible with TerraScan. Also, the Convert Geoid File utility does not recognize this format. Hence, one must convert it to and “E N dz” format for use in TerraScan.

Note: dz is not the geoid value, but the required adjustment to go from ellipsoidal to orthometric values.

From the NGS website, <https://www.ngs.noaa.gov/GEOID/GEOID18/downloads.shtml>, download the INTG and associated binary geoid files for the project. *Note: Grid #0 binary file represents all of CONUS.*

- 1) Load the overview file for your project
- 2) Create a rectangular bounding box around your project data
- 3) Select the rectangular box
- 4) Create grid model: TScan->Output->Lattice Model

Class: Any  
Value: doesn't matter, lowest hit z is fine  
Export elected rectangles  
Expand if desire  
Grid spacing: 100'  
Fill gaps: 3 pixels  
File Format: XYZ text  
Outside points: Output  
Outside Z: 0.0  
Z decimals: 0  
File naming: Enter name for each: zone\_grid.txt

- 5) Close the overview file and open the exported grid to verify coverage. *Note: change “Files of Type” to “All Files”, so that you can choose the created grid file.*
- 6) Create a projection change transformation:

- a. TScan->Settings->Coordinate transformations->US State Planes

Choose (don't check) the appropriate state plane and Copy

- b. TScan->Settings->Coordinate transformations->User projection systems

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Paste chosen state plane, click edit, and chose the desired units for this project. *Note: the unit commonly used is the appropriate foot (US Survey or International) unit for the state plane chosen.*

- c. TScan->Settings->Coordinate transformations->Transformations
    - Name: Any
    - Type: Projection change
    - From: the user projection system you just created.
    - To: WGS84 lon & lat
    - Modify: Xy
    - E has zone: 0
  - d. TScan->Settings->File formats->User point formats
    - i. Input: Delimited, Space, format: dd.dddddddd, Field 1: Latitude, Field 2: Longitude, Field 3: Elevation. Name: LATLONGELEV
    - ii. Output: Delimited, Space, format: dd.dddddddd, Field 1: Latitude, Field 2: Longitude. Name: LATLONG
- 7) TScan->File->Save points as...
- i. Choose: Points: All points, Format: LATLONG, Transform: choose the created transformation from 6)c in the instructions. Name: LatLon.txt
- 8) Use a text editor to make DMS dz file as space delimited and positive west
- a. Search/Replace the negative symbol with space
- 9) Run INTG
- b. Select the applicable geoid (Be sure to have downloaded the applicable geoid binary grid files from NGS)
  - c. Return to find geoid files in the same folder as the INTG program or specify the folder location
  - d. By File
  - e. Format 2
  - f. Positive west

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- g. Drag your LatLon.txt file as input.
  - h. Drag your LatLon.txt file as output and rename as geoid: LatLon\_Geoid.txt.
  - i. Open the LatLon\_Geoid.txt file produced above in a text editor or Excel.
  - j. Cut and paste the geoid values into the original grid file - zone\_grid.txt (with projected eastings and northings) as a third column, replacing the existing values, save as: SP\_Geoid.txt. *Note: The geoid value from INTG is in meters. If the project unit is in feet, this will need to be converted. Also, double check spacing for TerraScan import. Values must be separated by a single space.*
- 10) Back in Terrascan, create a “-dz” transform to negate the geoid file (ellipsoidal minus geoid separation = orthometric height, hence the adjust to geoid correction grid needed for TerraScan is the inverse of the geoid values produced by IntG). The value that is used in TerraScan is the orthometric adjustment value.
- i. TScan->Settings->Coordinate transformations->Transformations
  - ii. Name: -dz, Type: Linear, Add a negative one as the Multiply by Z value *Note: If converting to International Feet - 3.2808 or US Survey feet - 3.28083333 use these for Multiply by Z value.*
- b. Read SP\_Geoid.txt into TerraScan, apply the “-dz” transform, review coverage and the geoid adjustment grid. View by elevation.
  - c. Save as your project geoid, “projectgeoid.txt”, E N Z format, space delimited with no transform applied.

For additional information about creating a NAVD88 geoid correction file in Terrasolid, please contact the GeoCue Group Support at [support@geocue.com](mailto:support@geocue.com).