Vertical Coordinate System Harmonization

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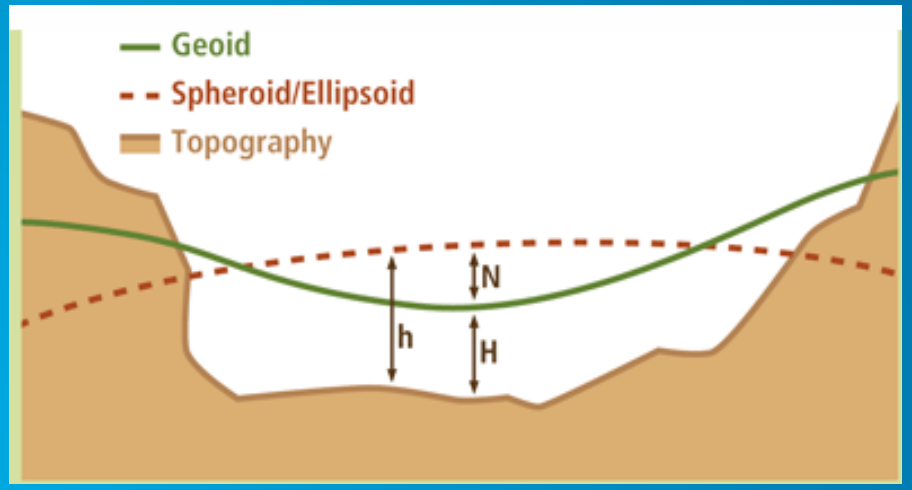
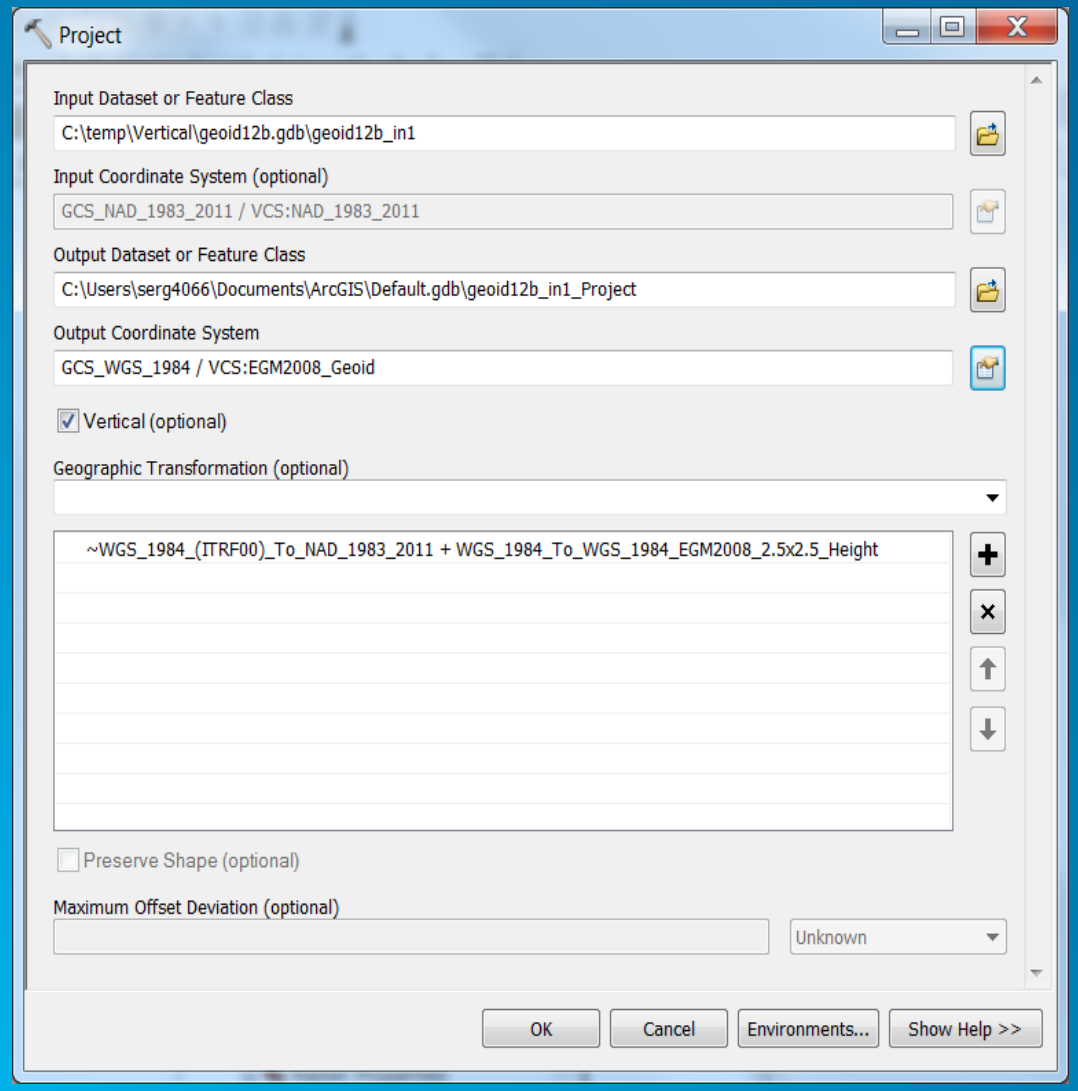
Elliposidal versus Geoidal Vertical Coordinate Systems

- **Ellipsoidal**
  - Closely related to a specific geographic coordinate system
  - Geometric quantity
  - No real physical sense
  - May not reflect movement due to gravity



- **Geoidal:**
  - Gravity-related
  - Only loosely connected to a geographic coordinate system – can be used with multiple
  - Sets zero by a benchmark
  - Physical sense is logical to human interaction with the world

Project Geoprocessing Tool

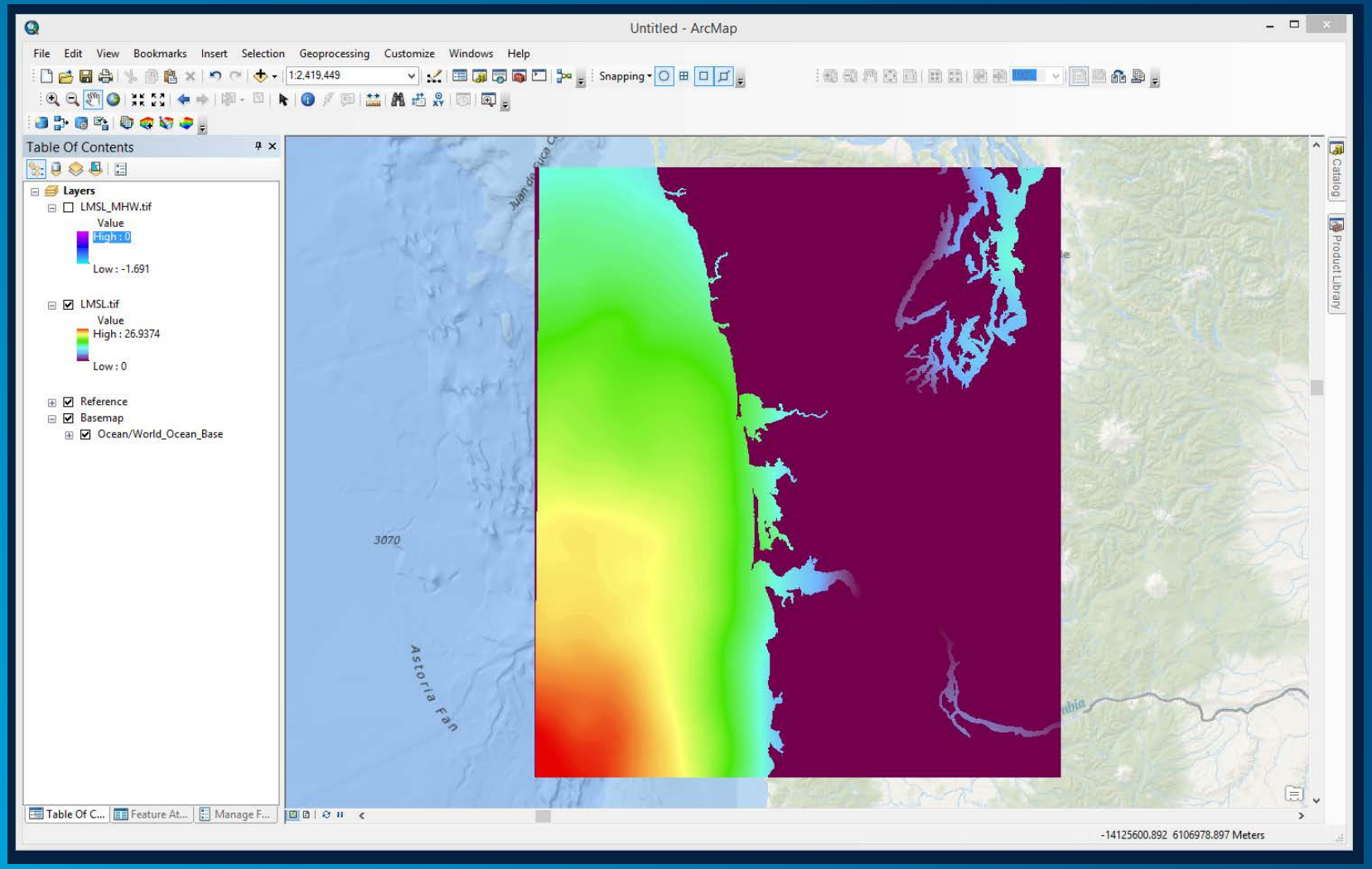


- **Pros:**
  - Access to large transformation engine
  - Vertical and horizontal transformation
  - Able to select which transformation you want to use
  - Scriptable, batch processing possible
  - Works on vector and raster data
- **Cons:**
  - Not “on-the-fly”
  - Have to run it for each dataset
  - Write a new feature class, data duplication
  - Doesn’t have all transformations globally

So what other options do you have?

Map Algebra

Let’s take a Separation Grid….



Grid produced using VDatum

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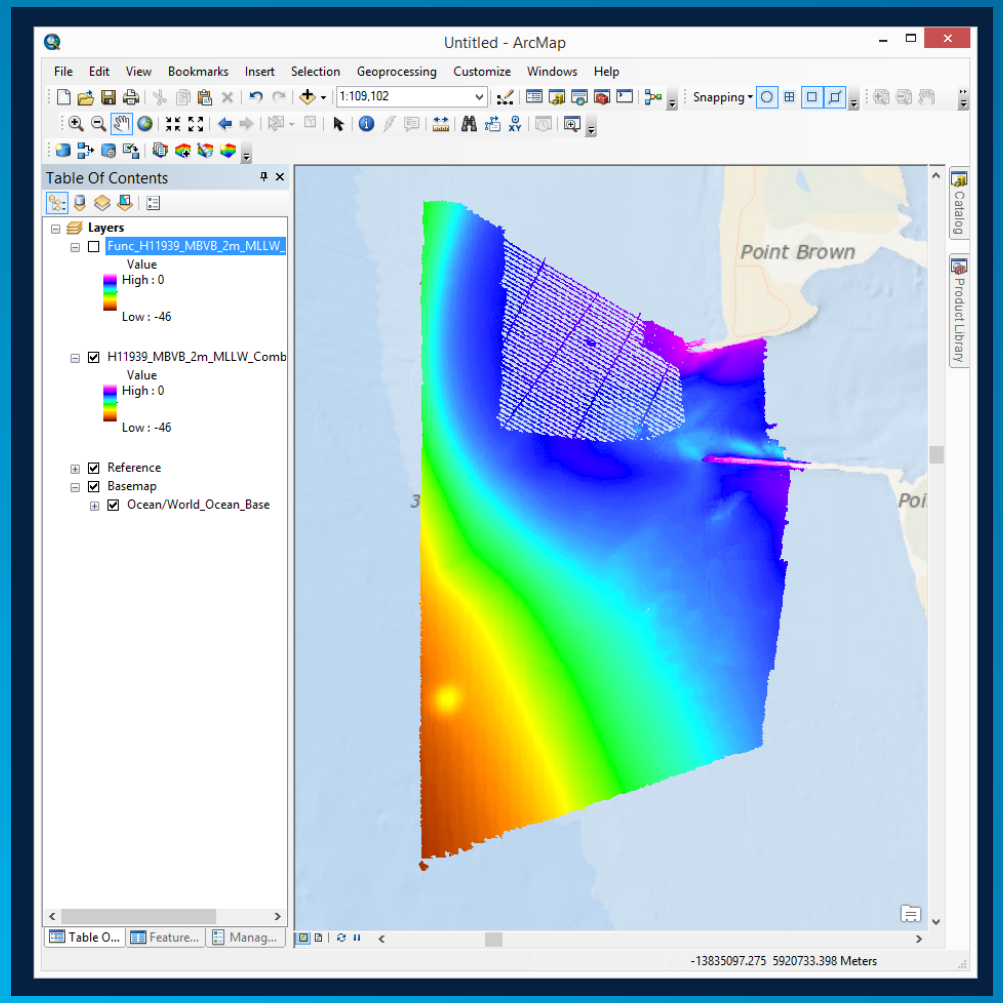
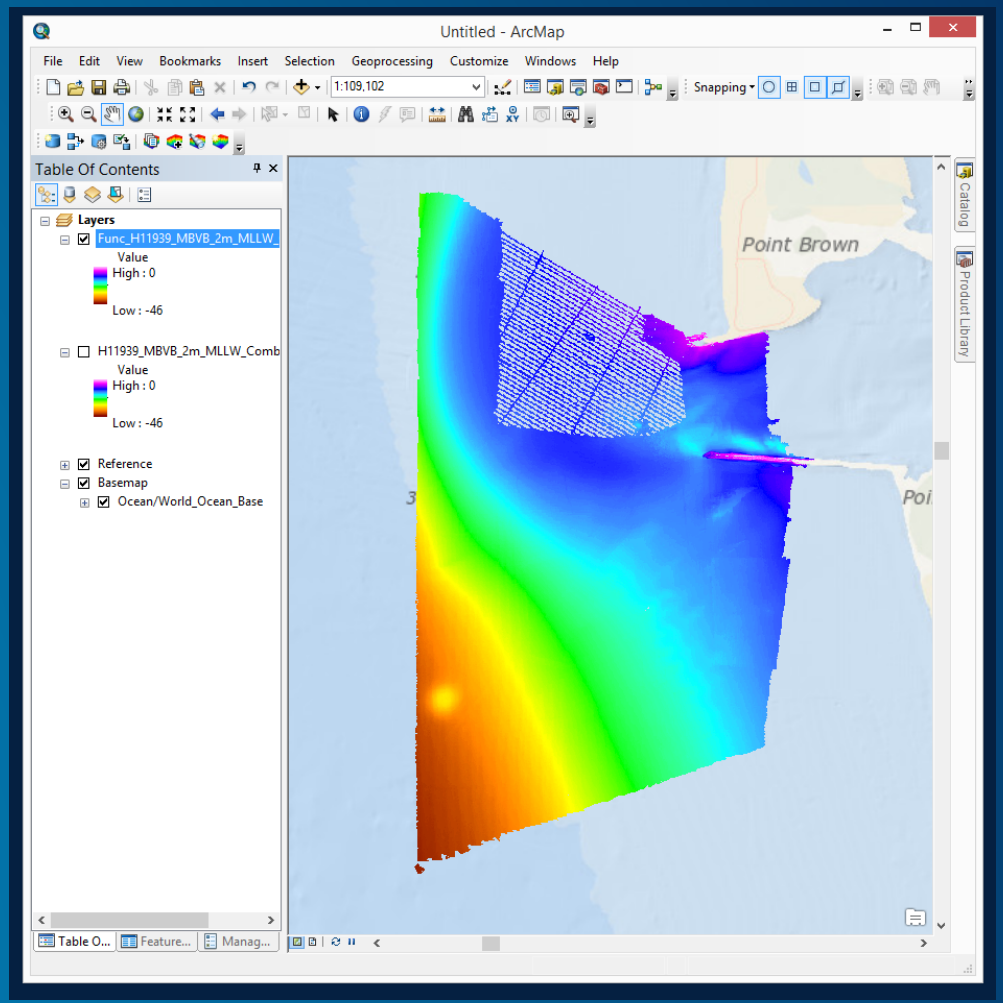
Converting to a New Coordinate System

Original



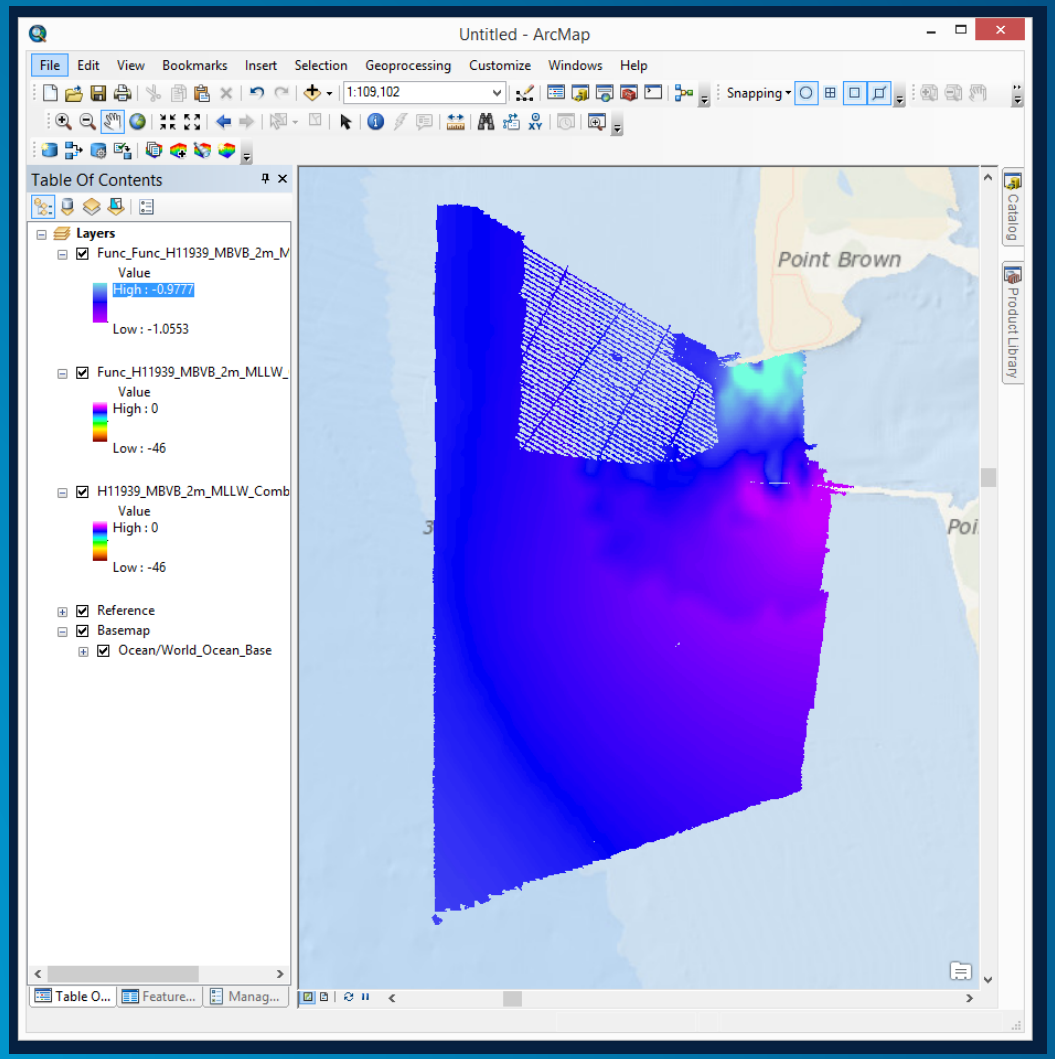
Transformed



Map Algebra Run-Down

- **Pros:**
  - Can use global or local transformations
  - On-the-fly processing
    - Fast
    - Temporary
    - Option to write permanently
  - Scriptable, batch processing possible

Difference



- **Cons:**
  - Really a raster method
    - More complicated to set-up for vector data
    - Vector will always write to disk
  - Separation model is not provided

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