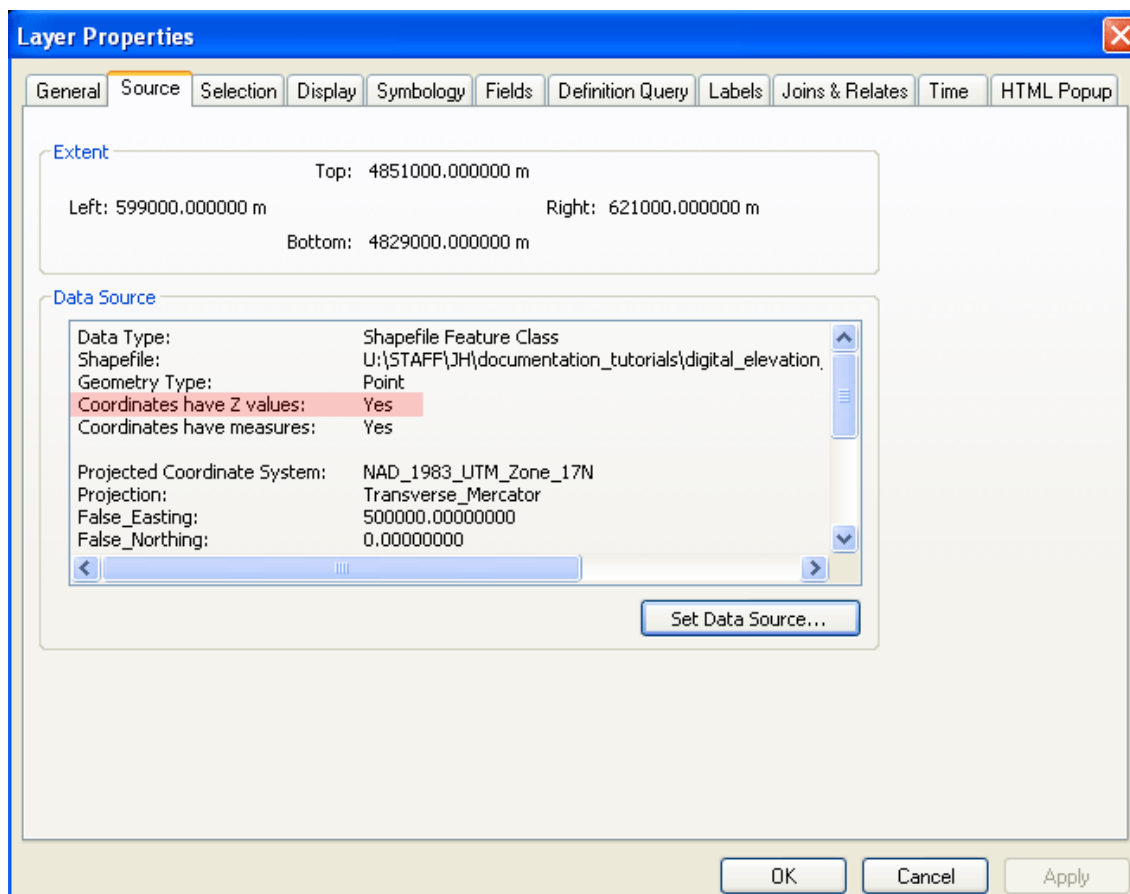


Working with digital elevation models in ArcGIS

Digital elevation models (DEMs) are geospatial datasets that contain elevation values sampled according to a regularly spaced rectangular grid. They can be used in terrain analysis, 3D visualizations, and hydrological modelling, among other applications. DEMs can be stored in several different formats, however conversion into a raster dataset is often required for many processes. This tutorial explains how to derive DEM rasters in ArcGIS from several different sources.

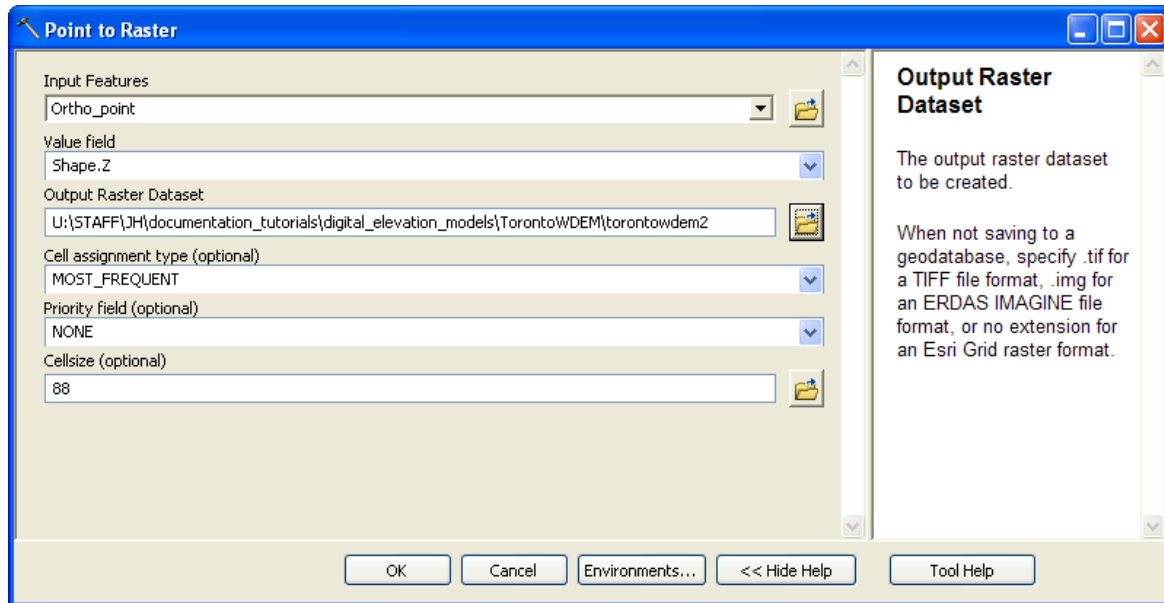
DEMs stored as point shapefiles

1. Add your DEM point dataset to your map document. Open up the Layer Properties window and click on the Source tab. You should see the line “Coordinates have Z values: Yes” in the Data Source section of the window. This indicates that elevation or height values are included in the spatial reference information for each entity in the dataset.



Click OK or Cancel to return to the map document.

2. In ArcToolbox, expand Conversion Tools, then To Raster, and double-click on Point to Raster.



In the Input Features dropdown menu, select the shapefile of elevation points. In the Value field dropdown, select Shape.Z. Indicate the desired location and filename for your output dataset in the Output Raster Dataset field, noting the specifications for particular raster file formats in the Tool Help pane. ArcMap will set a cell size for the output raster based on the extent of the input dataset, which can be adjusted in the Cellsize field – depending on your desired cell size, you may wish to adjust the Cell assignment type and Priority field settings accordingly. Click OK to begin the conversion process.

3. The resulting raster dataset will automatically be added to your map document. It can now be used in raster-based spatial analysis, or as an elevation surface in ArcScene.

DEMs stored as floating-point value (.flt) files

Newer versions of ArcGIS handle .flt files like any other raster datasets, allowing them to be added directly to a map document via the Add Data button, or used in Spatial Analyst operations, without the need for conversion. However, should you need to convert your .flt into another format, you can use the Float to Raster tool (ArcToolbox > Conversion Tools > To Raster > Float to Raster) to convert it, simply by specifying the input dataset and the output path and filename. Note that the output raster dataset will not have a projection associated with it – in order to assign one, use the Define Projection tool (ArcToolbox > Data Management Tools > Projections and Transformations > Define Projection).

DEMs stored as band interleaved by line (.bil) files

Similar to the .flt example above, .bil files can now be read and analyzed by ArcGIS without conversion. Should you wish to convert your file into a raster grid or other format, you can use either the Raster to Other Format function (ArcToolbox > Conversion Tools > To Raster > Raster to Other Format (multiple)) or the Copy Raster tool (ArcToolbox > Data Management Tools > Raster > Raster Dataset > Copy Raster) to save your DEM as another type of raster dataset.

DEMs stored as ASCII files

Some older elevation datasets are stored as ASCII text files (with the extensions .txt or .asc). In order to properly convert this to a raster DEM, use the ASCII to Raster tool in ArcToolbox (ArcToolbox > Conversion Tools > To Raster > ASCII to Raster). You will need to let the tool know whether your elevations should be saved as integers or floating-point decimal values using the Output data type dropdown menu.