

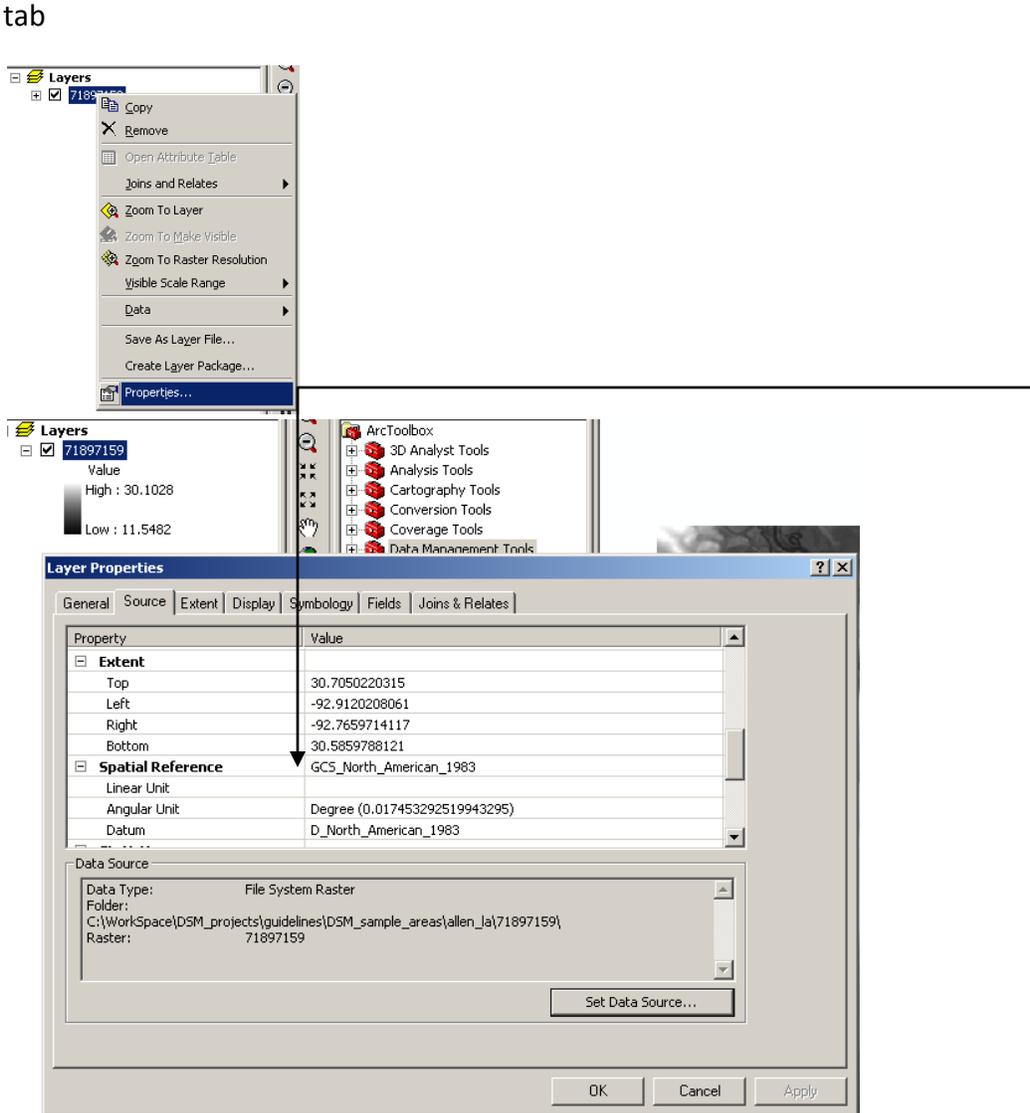
# Projecting DEMs

## Background

Elevation data from the USGS download sites and the elevation data contained in the CORE datasets by MO are provided in geographic coordinates. This data needs to be projected to a Cartesian system like UTM, State Plane or other accepted coordinate system for useful output of derivative layers like slope and curvature. Elevation data downloaded from the NRCS Data Gateway is in UTM. It is assumed that vertical units will be the same as the horizontal units before development of terrain derivatives.

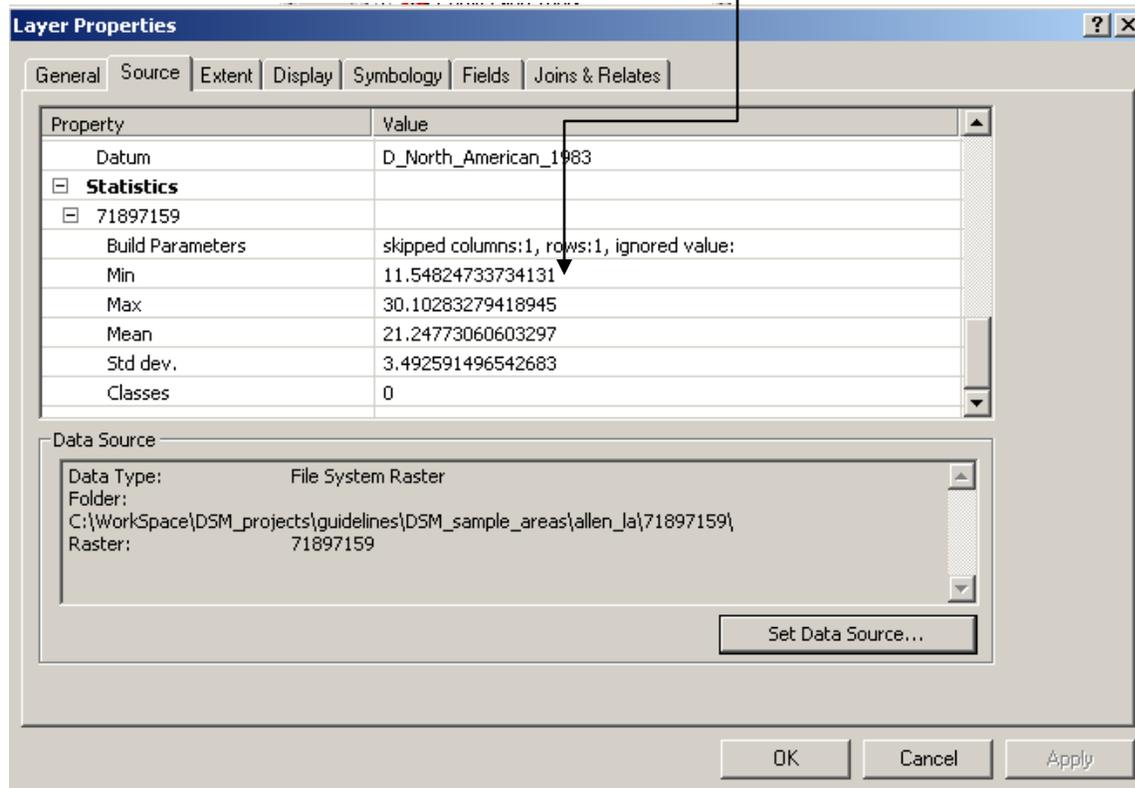
## Check your data

Right-click the DEM data layer, select Properties and look for **Spatial Reference** on the **Source** tab



This data has a Spatial Reference of GCS\_North\_American\_1983, and a Datum of North\_American\_1983.

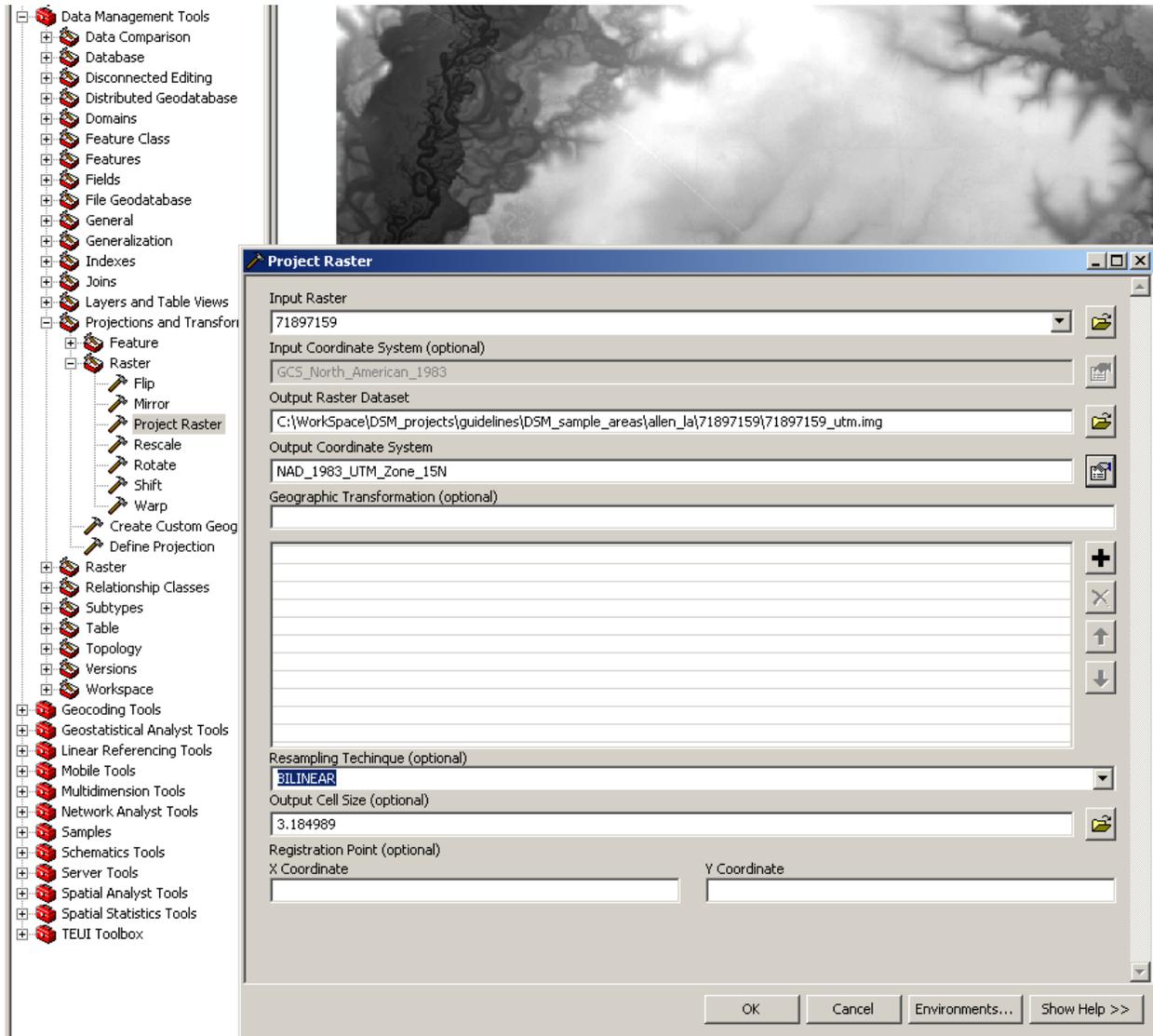
Check the elevation values by scrolling to the Statistics section:



The elevation units are in meters.

## Projection example 1 – Geographic Coordinate system to UTM, elevations units are in meters

Open Data Management Tools  
Projections and Transformations  
Raster  
Project Raster  
Fill out dialog



Make sure you select **Bilinear** or **Cubic** for Resampling Technique. Nearest Neighbor or Majority should **never** be selected when using continuous data. There are mathematical differences between the Bilinear and Cubic methods, with Cubic being more complex. As a result, processing time can be longer for the Cubic method. In addition, the Cubic method has a greater potential to extrapolate elevation values compared to the Bilinear method. The Cubic

method yields a smoother surface than Bilinear. The differences between the two methods are probably not detectable for soil survey purposes.

If you have determined an optimal cell size, set your output cell size at this point.

In this example, the output file was saved as an Imagine file. The most robust extension available for developing terrain derivatives, ArcSIE, requires raster data in GRID format. To save as a GRID, do not put a file extension in the name, and restrict the length of file name to less than 13 characters, with NO spaces.

### Projection example 2 – Geographic Coordinate system to UTM, elevations units are in feet

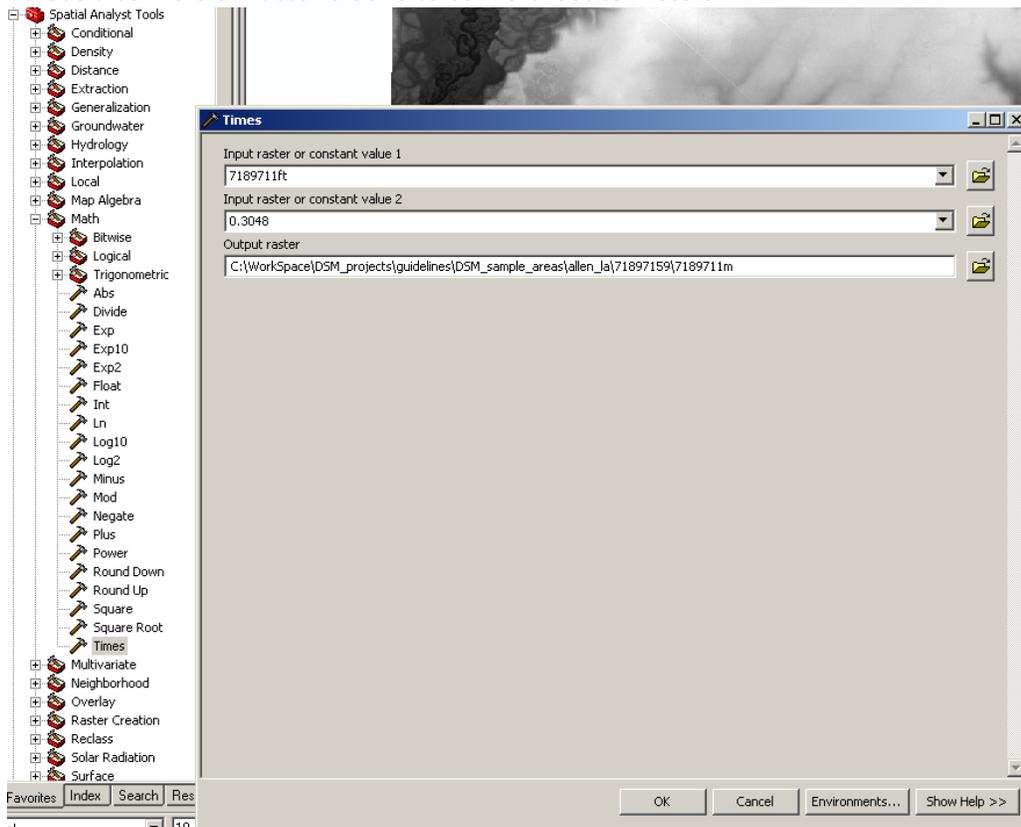
Follow all steps as in example 1 and produce an interim layer with x,y units in meters, and z units in feet.

Open Spatial Analyst Tools

Math

Times

Use a conversion factor 0.3048 to convert feet to meters



The resulting file has all coordinates in meters and is ready for further analyses.