Mosaicing Elevation Data in ArcGIS

To access the elevation data, go to http://datagateway.nrcs.usda.gov/ and click the green GET DATA button. Follow the prompts to select your state and county. There is a lot of data available, but you are interested in the **Elevation>National Elevation Dataset 10m.** It will greatly help you to also download the latest orthoimagery (aerial photos) mosaic for your county to orient yourself in ArcMAP. Make sure FTP is the delivery method. Enter your information, then click PLACE ORDER. An email will be sent to you when your order is ready. Follow the links in the email to download your data. (It is best to save your data in a folder easy to remember, such as "Your County")

To get a 60 day free trial of ArcGIS to complete these steps, go to http://www.esri.com/software/arcgis and follow their directions to download and install. Once you have ArcGIS installed, follow these steps.

1. Start ArcMAP – this will take a few moments
2. In the left hand pane, click New Maps
3. Double click Blank Map – This will provide a blank map area with no layers
4. ArcGIS toolbars are customizable and moveable. The toolbars are accessed by clicking Customize > Toolbars. For this operation you will need the following toolbars: Draw, Standard, and Tools. Place them where you wish.
5. To load your data, click the Add Data button (yellow triangle with a black + sign) Browse to the folder where you saved your elevation data.
6. To load all of the TIFF files for a county, simply click the first one, then scroll to the end and SHIFT+click the last one, then click ADD
7. The TIFF tiles will appear on your map. (Depending on the size of your county, this may take a few moments). Note that each tile has different z-values. Black depicts the lowest point and white the highest for each tile, but as each geographic area has different highs and lows, the z-values don't match the adjacent tiles. The mosaicing process will eliminate this problem, showing the minimum and maximum z-values for the whole county.
8. To mosaic the tiles, first click on the ArcToolboxicon (window with a red toolbox). Open the Data Management toolbox, then the Raster toolbox, then the Raster Dataset toolbox. Double click the Mosaic tool.
9. Next, click the Folder button in the upper right next to "Input Rasters". Make sure you are in the same folder that your elevation files are in, and again click the first file and SHIFT+click the last file and click ADD.
10. Click the Folder button next to "Target Raster" and select the FIRST file on the list and click ADD.
11. Use the default values for the rest of the options, and click OK.
12. The software will begin processing. Again, depending on the size of your county, this may take a while. (A county with 10-15 files should take about 5 minutes, while a county with 50+ files may take up to an hour)
13. When finished, you will have a seamless elevation profile for the whole county. This will add a layer (in the **TABLE OF CONTENTS)** to your map named the same as the first file on the list, but it will not have .tif after it. It helps to rename this to "Your County" in the **TABLE OF CONTENTS** window.
14. To choose a specific area, it is helpful to add the aerial orthophotos for the county as well.

15. Close the ArcToolbox window, click the Add Data button, browse to the folder where your orthophotos are, and highlight the .sid file, then click ADD.

16. Zoom in so that you can see your area of interest. You can use the Zoom In tool to draw a rectangle around the area you want, and the Pan tool to move the map around.

17. Once you can see the area you want to use, click the Rectangle tool in the **DRAWING** toolbar to select your area. Don't worry if it's not exact, you can fine tune it in the next step.

18. Once you have a rectangle drawn, right click within the area of your rectangle and click Properties. Click Fill Color and select No Color, then click Outline Color and choose a bright color that you will be able to see against a grayscale background.

19. Use the blue tabs on the edges and corners of the rectangle to fine tune your area.

20. Once your rectangle is where you want it, make sure it is selected, then click Drawing in the **DRAWING** toolbar and select Convert Graphics to Features. Use the Folder button to browse to a location you want to save this (easiest to create a folder named "Your County") and click OK. Click YES to add to your map as a layer.

21. In the **TABLE OF CONTENTS,** uncheck the orthophoto to turn off this layer as it is not needed unless you wish to re-size your rectangle.

22. Open the ArcToolbox window again, and open the Raster Processing toolbox. Double click Clip.

23. Use the dropdown arrow next to "Input Raster" to choose "Your County"

24. Use the dropdown arrow next to "Output Extent" and choose the "converted graphics" rectangle you drew.

25. IMPORTANT** Check the box Use Input Features for Clipping Geometry.

26. Use the Folder button next to "Output Raster Dataset" to save the file in the "Your County" folder and click OK

27. A new TIFF file showing the minimum and maximum for your area will be created. Uncheck or remove all OTHER layers in the **TABLE OF CONTENTS** window.

28. The new TIFF may seem blurry. Right click the new file in the **TABLE OF CONTENTS** window and go to Properties. Under the Symbology tab, change the "Stretch Type" from Standard Deviations to Minimum-Maximum.

29. The final step is to convert the TIFF file to a bitmap that can be used in DeskProto. NOTE** You will want to take note of the High and Low Values of the TIFF to determine your Bitmap Z levels in DeskProto.

30. Right click the clipped "Your County" layer in the **TABLE OF CONTENTS** window and go to Data>Export Data

31. Keep the defaults for "Extent" and "Spatial Reference", check the Use Renderer box, and change the "Format" from TIFF to BMP and click SAVE. Click YES to add to the map as a layer if you want to preview the bitmap. It should look exactly like the TIFF, but now it can be used in DeskProto to machine a relief.