Generating a 3D Image from DEM DMTI File Using ArcMap/ArcScene 8.3

The following set of instructions walks you through the process of generating a 3D image from a DMTI DEM file using ESRI's ArcScene, starting with the process of importing the ASCII file into GRID format using ArcToolbox.

1. **Converting DMTI DEM ASCII text file to ArcGIS Grid format using ArcToolbox.**

   - Launch ArcToolbox (***Start Menu > Programs > ArcGIS > ArcToolbox***)

   - Under ***Conversion Tools > Import to Raster***, select ***ASCII to Grid***.

Figure 1.

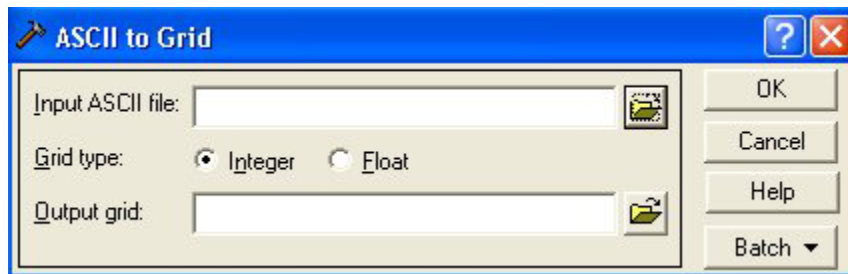   - In the ***ASCII to Grid*** dialogue box, navigate to the DMTI DEM for the ***Input ASCII File***.
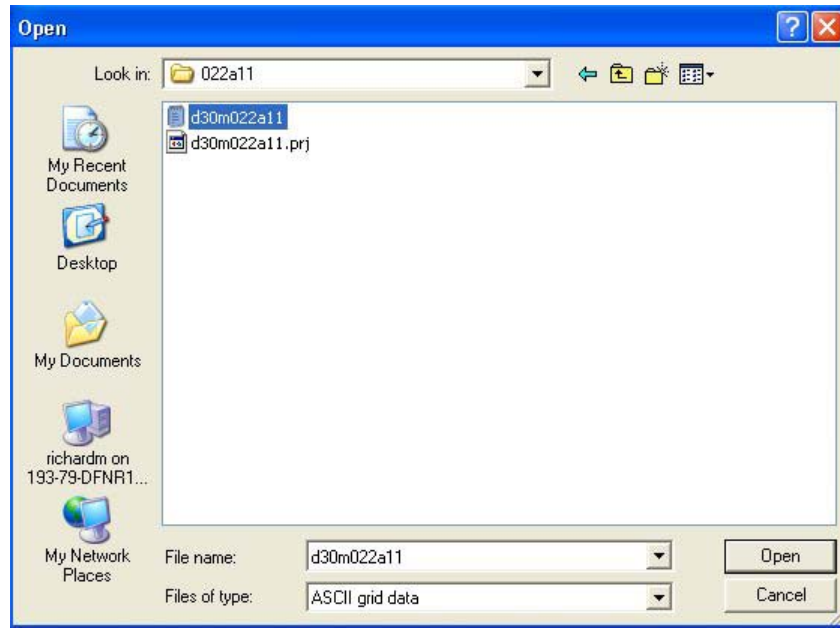

Figure 2.

Figure 3.

- Browse to your project directory and enter a name for the output Grid.

- Click **OK** to convert the file.

2. **Opening the newly converted Grid file in ArcScene.**

- Launch **ArcScene** (***Start Menu > Programs > ArcGIS > ArcScene***)

- Add the Grid file using the Add data button on the toolbar: You may need to establish a connection to your project folder using the "Connect to Folder" button:

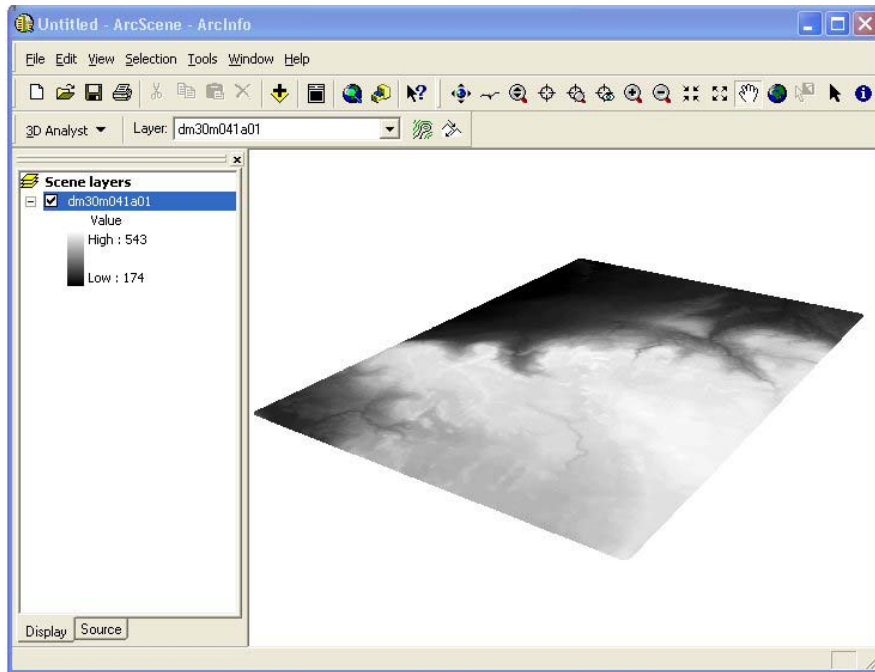- The DEM will appear in the window without 3D effects:

Figure 4.

3. **Adding base heights to be used for 3D effect.**

- Right click the layer in the Table of Contents and from the Context Menu select *Properties*. Click on the *Base Heights* tab, select *Obtain Heights* from *Surface Elevation* option, and click *Apply*:
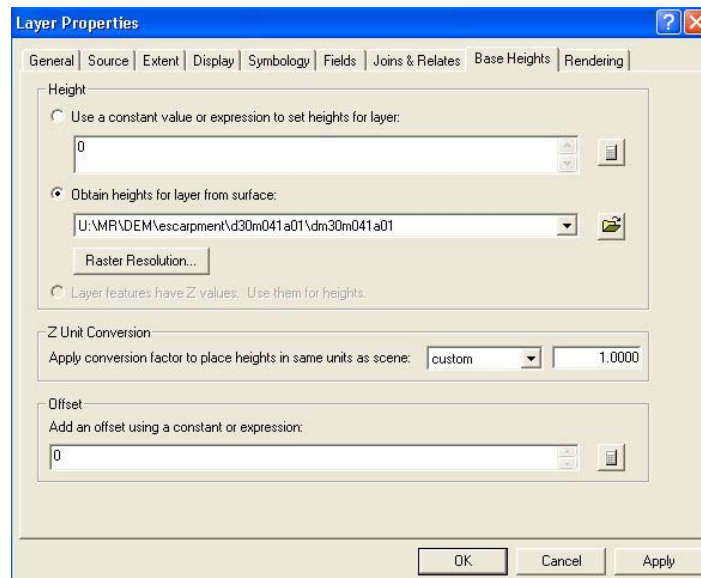

Figure 5.

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4. Adding a vertical exaggeration to get the 3D effect:

- Vertical exaggeration can be used to discern subtle topographic features if the horizontal extent of the map is very large compared to the change in relief. It refers to the ratio of the horizontal scale to the vertical scale. A vertical exaggeration of 2x means that the vertical scale is 2 times larger than the horizontal scale (e.g., vertical scale 1cm = 1000m and horizontal scale 1cm = 2000m).

- Right click on *Scene Layers* in the Table of Contents and select *Scene Properties*. Under the *General* tab, select the desired level of vertical exaggeration or click the *Calculate from Extents* tab to have ArcScene optimize it for you:
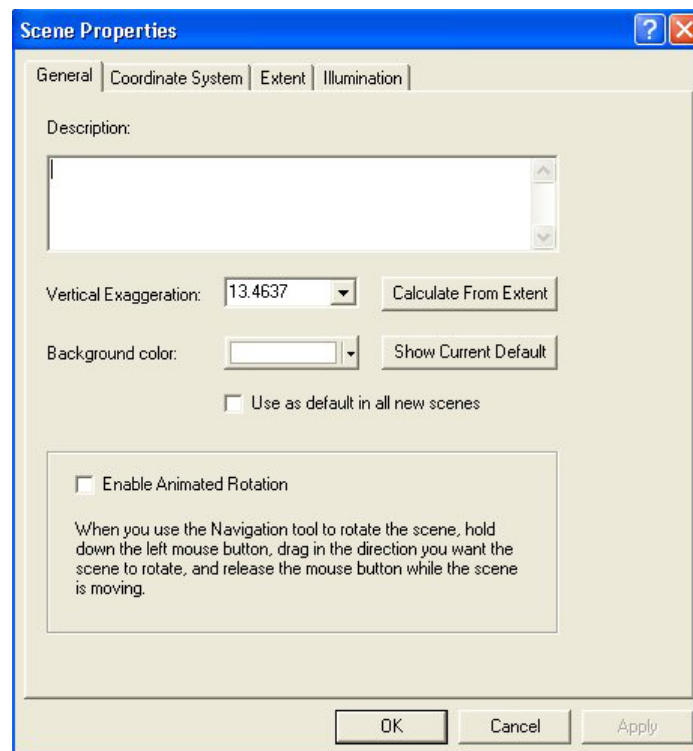

Figure 6.

- The image will now be in 3 dimensions, but you may wish to change the colours used to represent elevation. Click the *Symbology* tab and choose a different colour scheme from the dropdown box (Figure 7).

- To enhance the 3D effect, click on the *Rendering* tab, and select *Shade area features relative to the scene's light position*. (Figure 8).
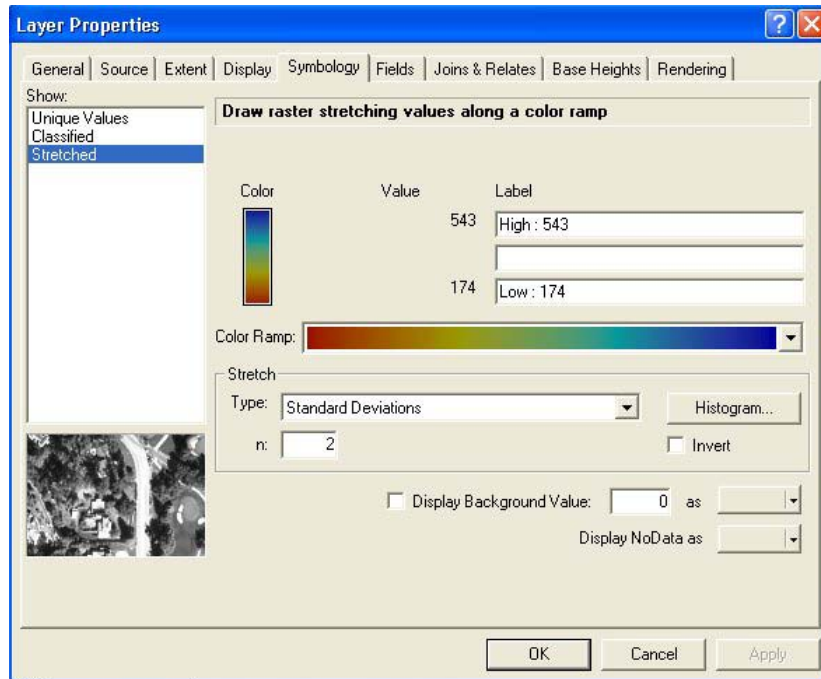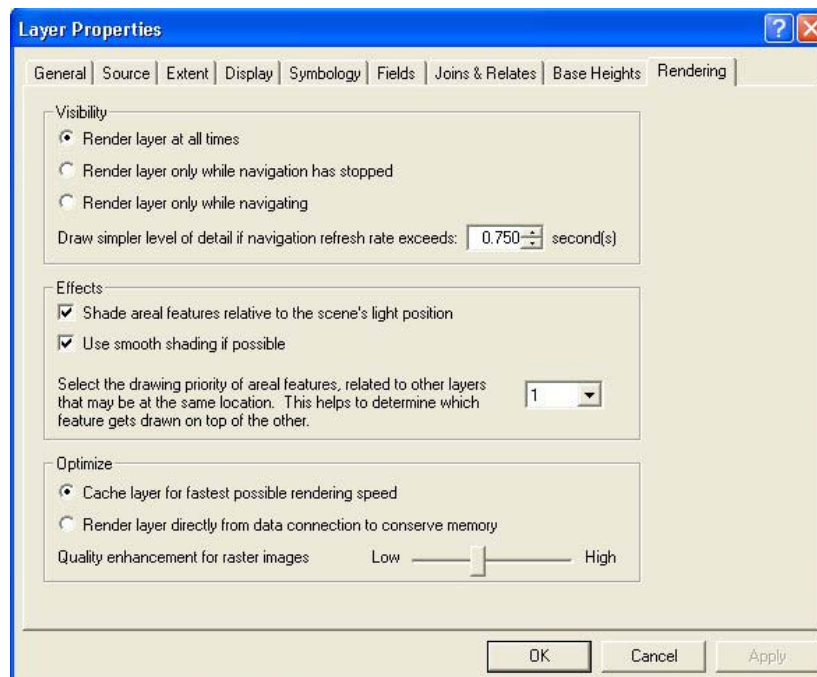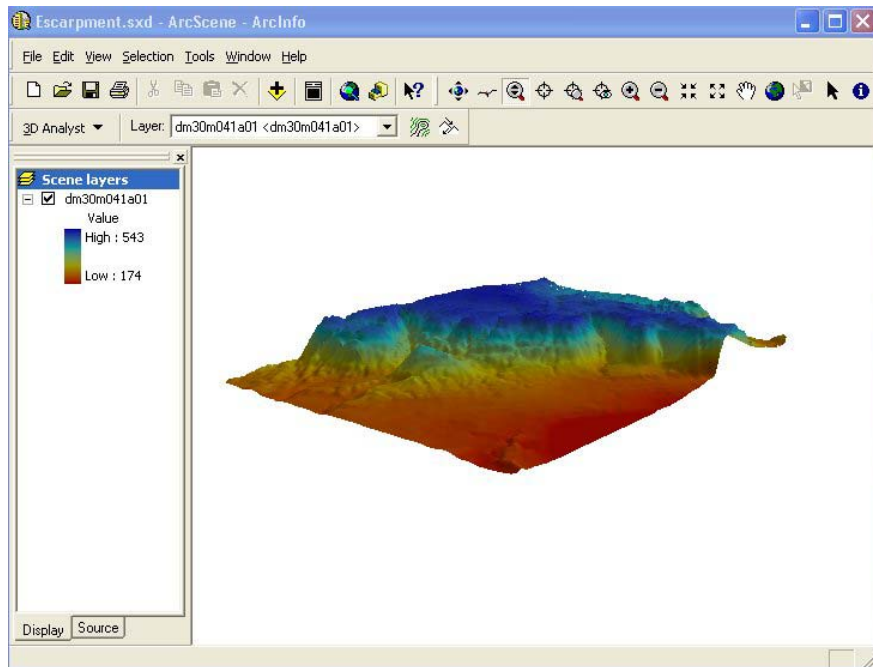
Figure 7.

Figure 8.

Figure 9

5) Adding other data to the 3D image

- Click the Add data ![Add data button] button on the toolbar and navigate to the data file you would like to add to the image. The data will appear below the 3D image you have generated (Figure 10). To "drape" the new data over the 3d image, right-click the layer in the Table of Contents and choose **Properties**. Click the **Base Heights** tab and, as you did for the DEM image, select **Obtain heights for layer from surface**. Click **Apply** or **OK** to return to the ArcScene view.

- Add other data as required.

Figures 10 and 11 show two different perspectives of a 3D model of a portion of Ontario's Niagara Escarpment with rivers, contour lines and lakes (Georgian Bay) draped overtop. To change perspectives of the scene, select the **Navigate** ![Navigate button] button on the toolbar, click and hold the cursor anywhere on the view and move in any direction.
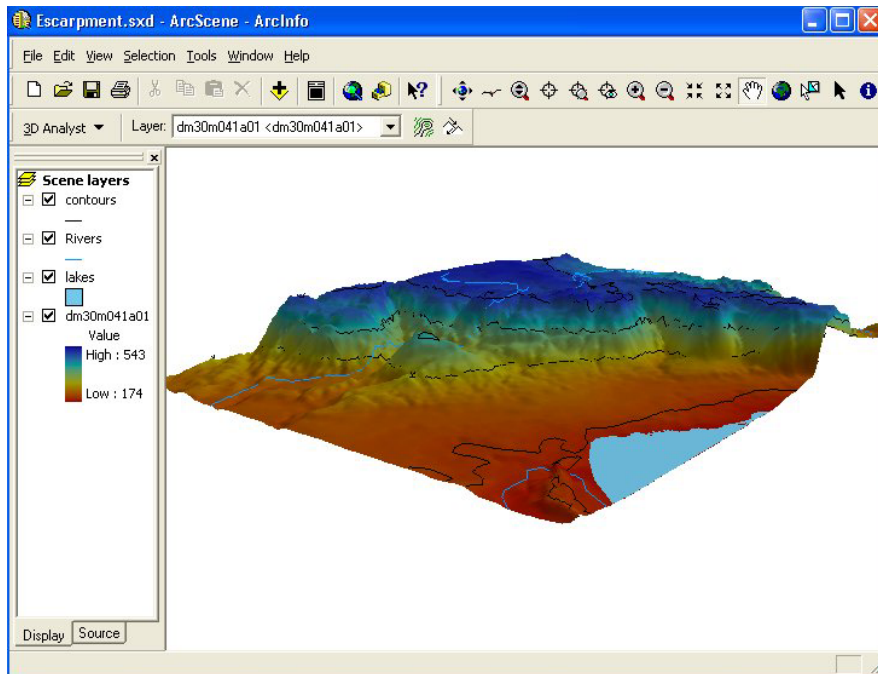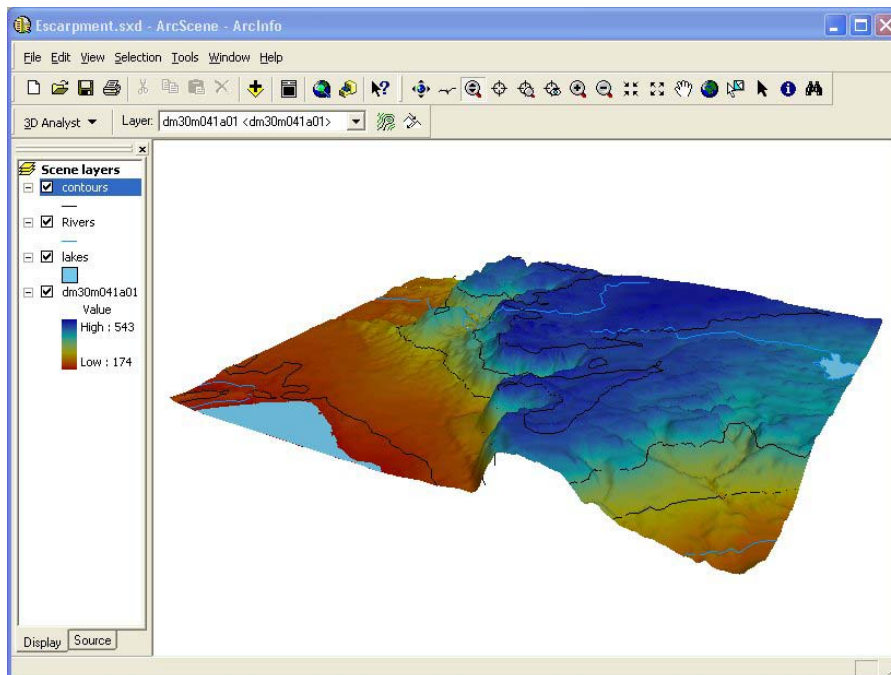
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Figure 10.

Figure 11.

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