

Making a Scene

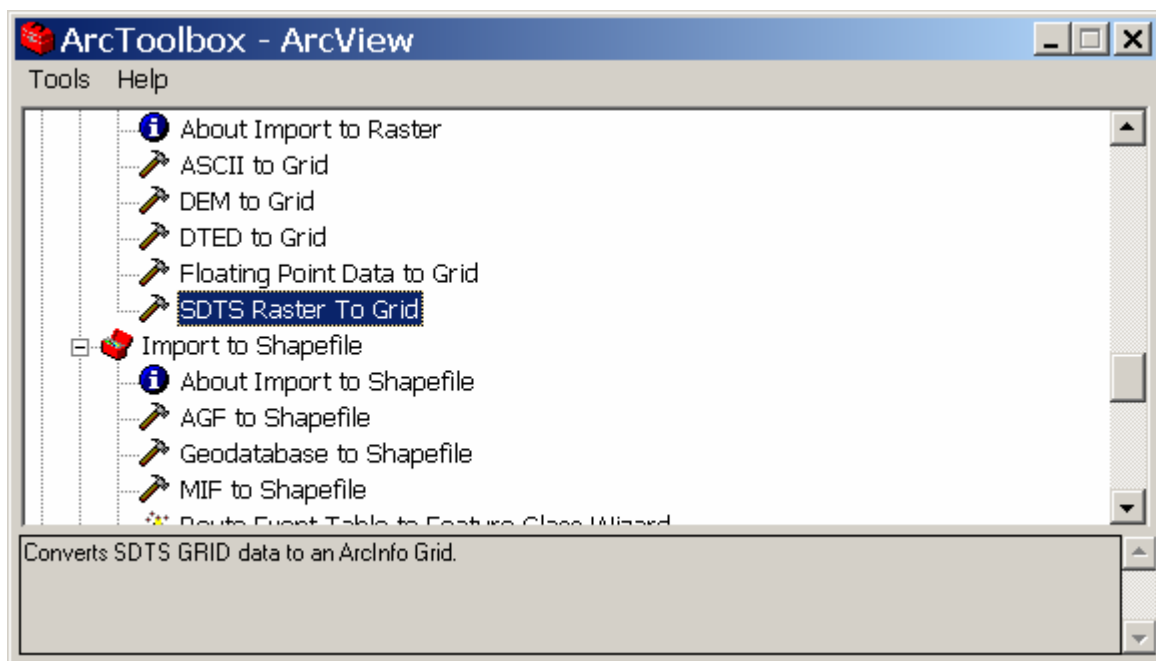
Overview

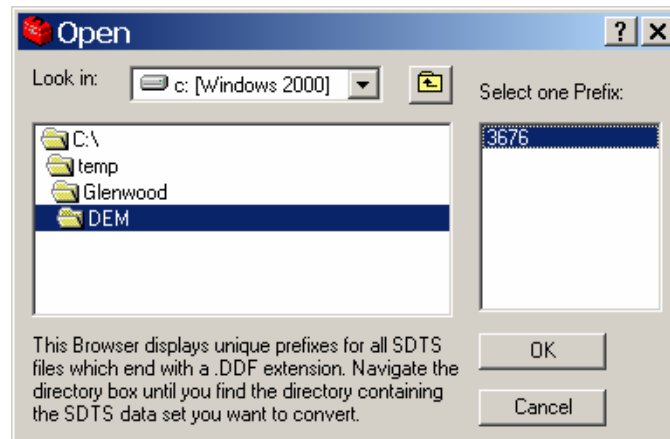
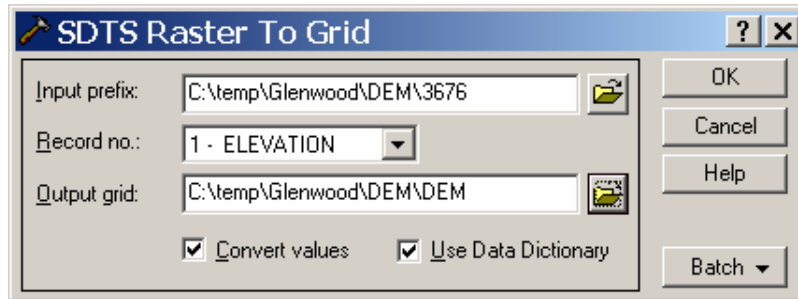
As my late colleague, Prof. Wayne A. Pryor, an excellent artist, used to observe, “You can convince anybody of anything with good graphics”. I’m not sure that I entirely agree but there’s no doubt that good graphics facilitate good communication. I must say that when I see a presentation, particularly in ground water, that has fantastic computer graphics, I immediately start wondering if the underlying science is sound (otherwise why would the presenter be trying to dazzle me with fancy graphics)... but that’s probably just me. In any case, in this, our last topic, we’ll be using ArcScene to drape a shapefile. You may recall that we looked at ArcScene earlier in the course and I opined (as I am too apt to do) that 3D diagrams don’t convey as much useful information as do contour maps... but they were good for “wowing” the layman.

Using ESRI to work with DEM’s

By now you’re very familiar with my affection for Global Mapper for working with GIS data. For this exercise, however, I’m going to confine myself to only using ESRI software to work with DEM’s (we’ve already used Global Mapper to do the same thing in a previous lecture).

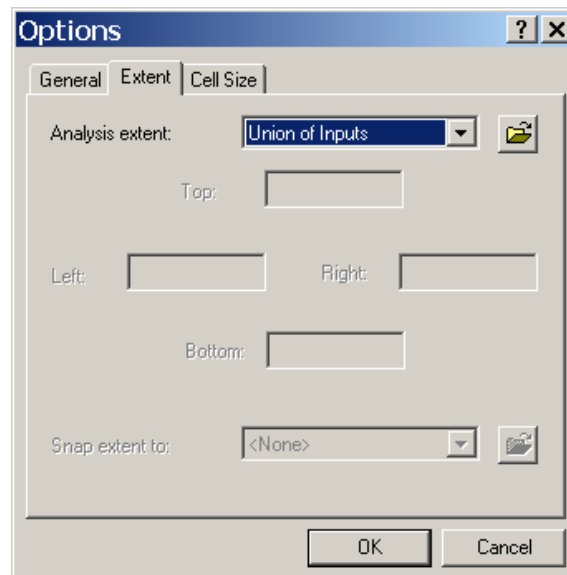
Let’s start by getting the Glenwood Springs (Garfield County) 10m spacing DEM from the [Geocommunity](#) website. Note that both 30m and 10m spacing are available, we’ll use the 10m spacing (although it’s nine times larger). Make sure to download the dataset to a directory without spaces or special characters in the pathname. Decompress the data. To convert this SDTS matrix data to an ESRI grid, open ArcToolbox and select **Import to Raster>SDTS Raster to Grid**.





After toolbox has finished processing the data, open it with ArcMap. If you had two or more contiguous DEMs, you would want to mosaic (aka merge) the maps. This, of course, would be quite straightforward with Global Mapper but let's do it with ArcMap.

- Convert all of the SDTS DEM's you into ESRI grids
- Add all the grids to an ArcMap projects
- Invoke **Spatial Analyst>Options** and click the **Extent** tab
- Select **Union of Inputs** from the **Analysis extent** pull down and click **OK**




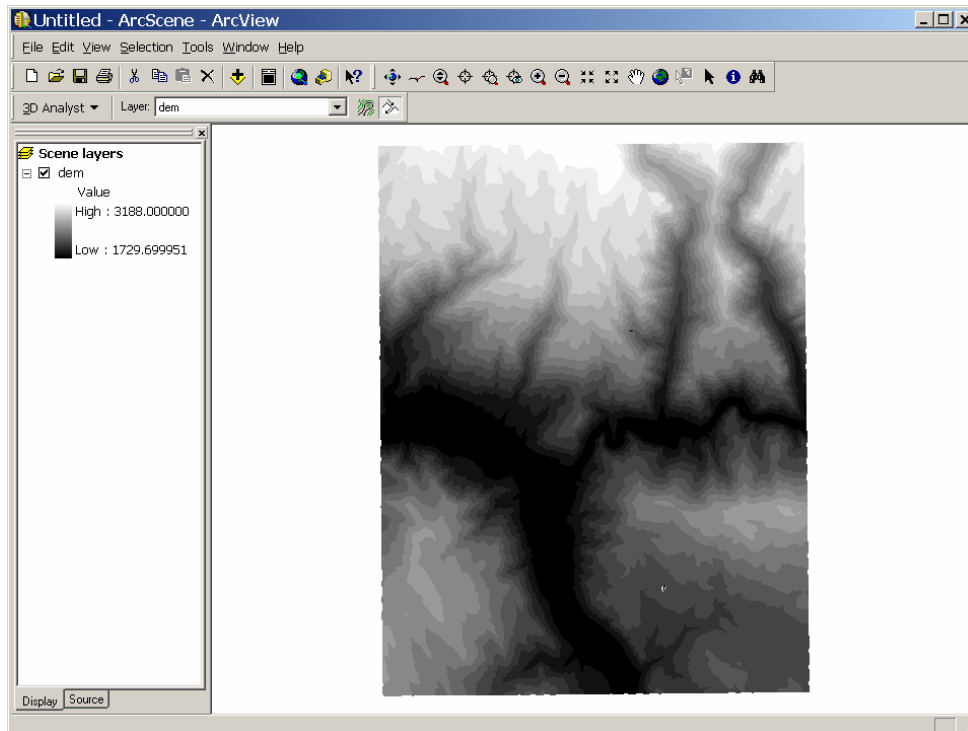
- Select ***Spatial Analyst>Raster Calculator...***
- In the lower dialog box type “merge(“ Leave dialog box open for next step.
- Click on the name of the first quad to mosaic in the upper dialog box.
- Type a “,” after the map name when it appears in the lower dialog box.
- Repeat steps until all of the maps have been added then type “)”
- Press the ***Evaluate*** button. The mosaic of the maps will be added to the currently opened project.
- Make the mosaic “permanent” by right clicking on the theme in the table of contents and selecting ***Make Permanent***

Working with GQs

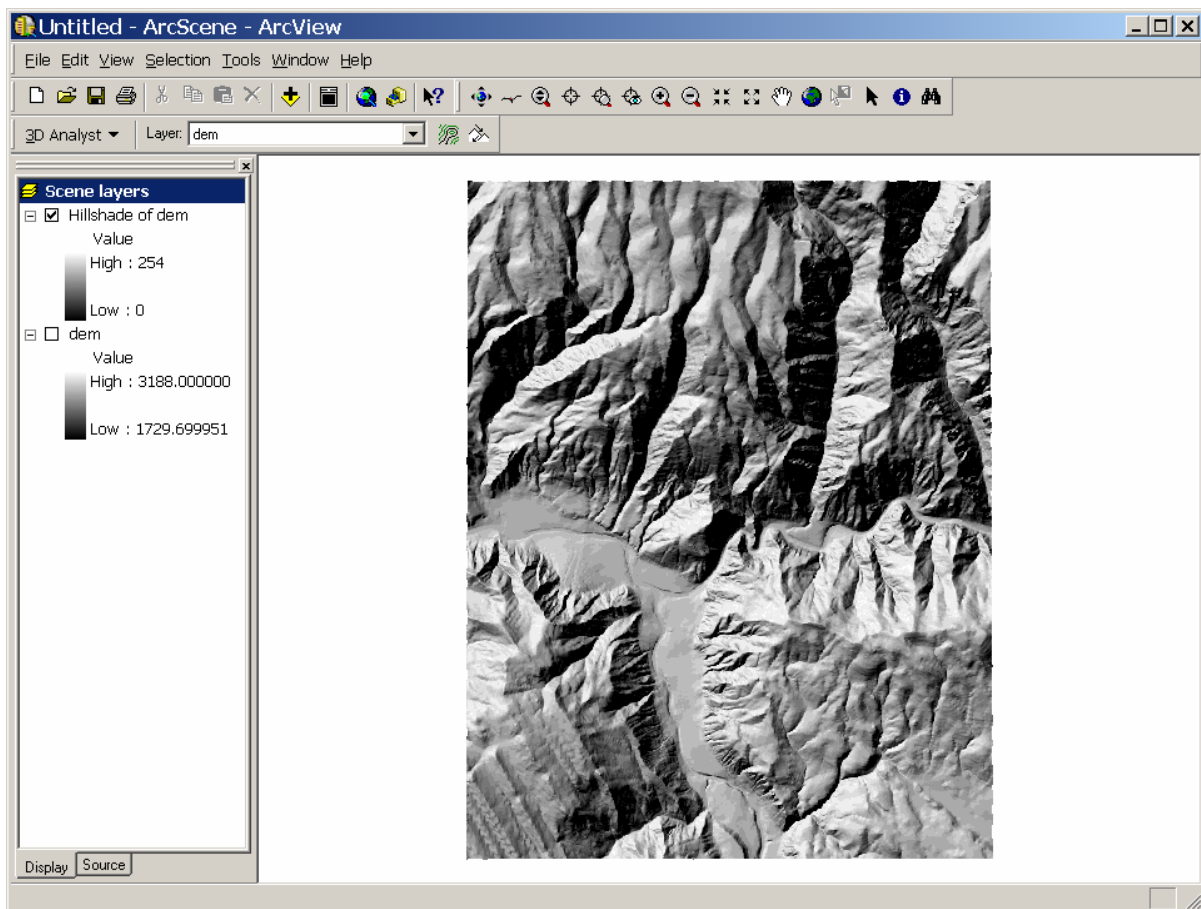
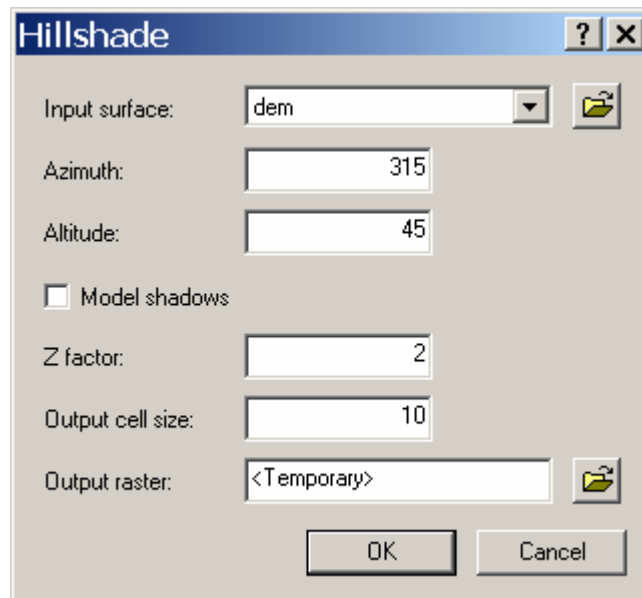
A number of 7.5' Geological Quadrangle maps (GQs) are now available as shapefiles. I reckon even more will be available in this format in the near future. A GQ is available for Glenwood Springs at this [site](#). These shapefiles can be added to an ArcMap or ArcScene project. Unfortunately, the Glenwood Springs dataset doesn't have a legend file (*.avl) so the user will have to construct a legend from a given units age and lithology (see the pdf pamphlet available from the same download site for a complete description of the [units](#)).

ArcScene

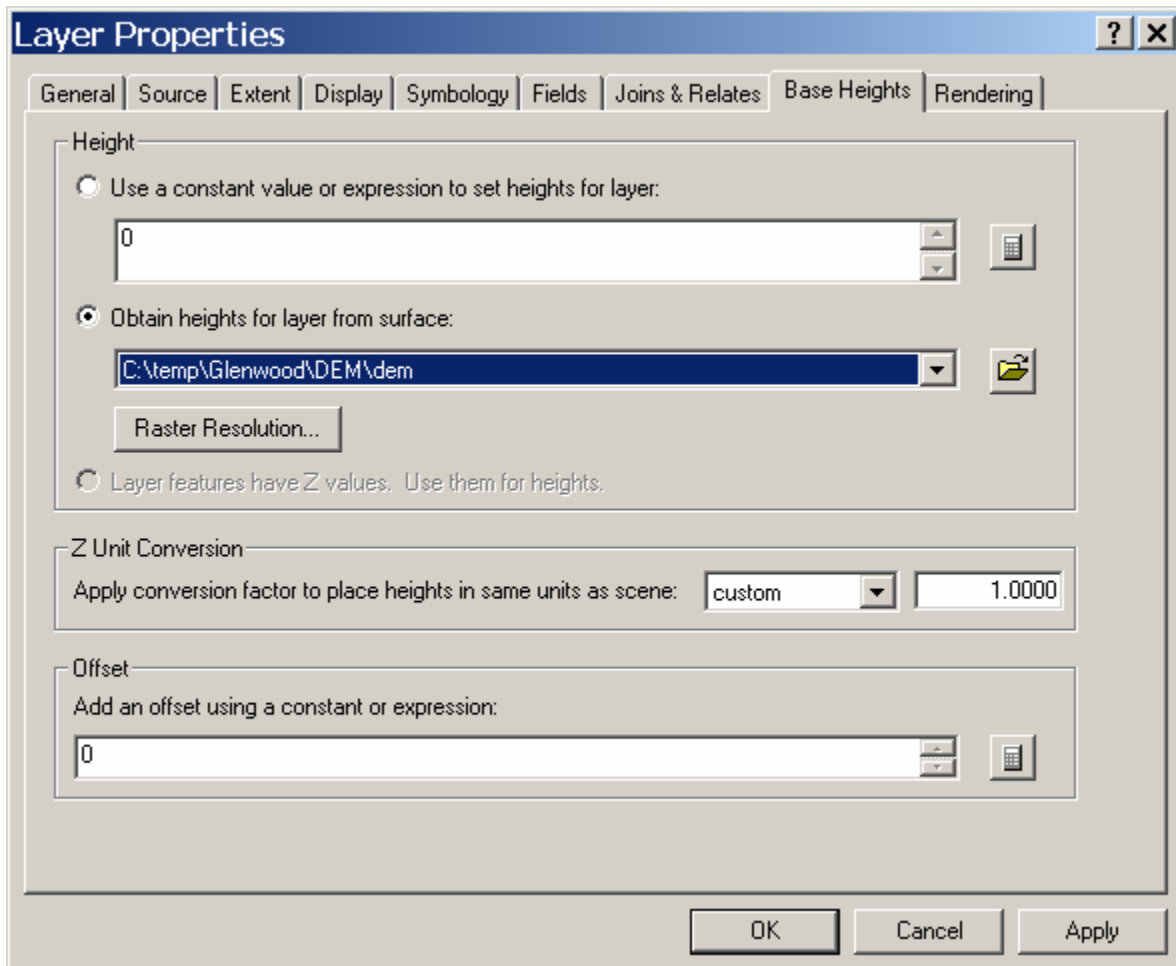
Invoke ArcScene by either clicking on the  icon in ArcMap or launching from ***Start>Programs>....*** When ArcScene is launched, add the ESRI grid theme.



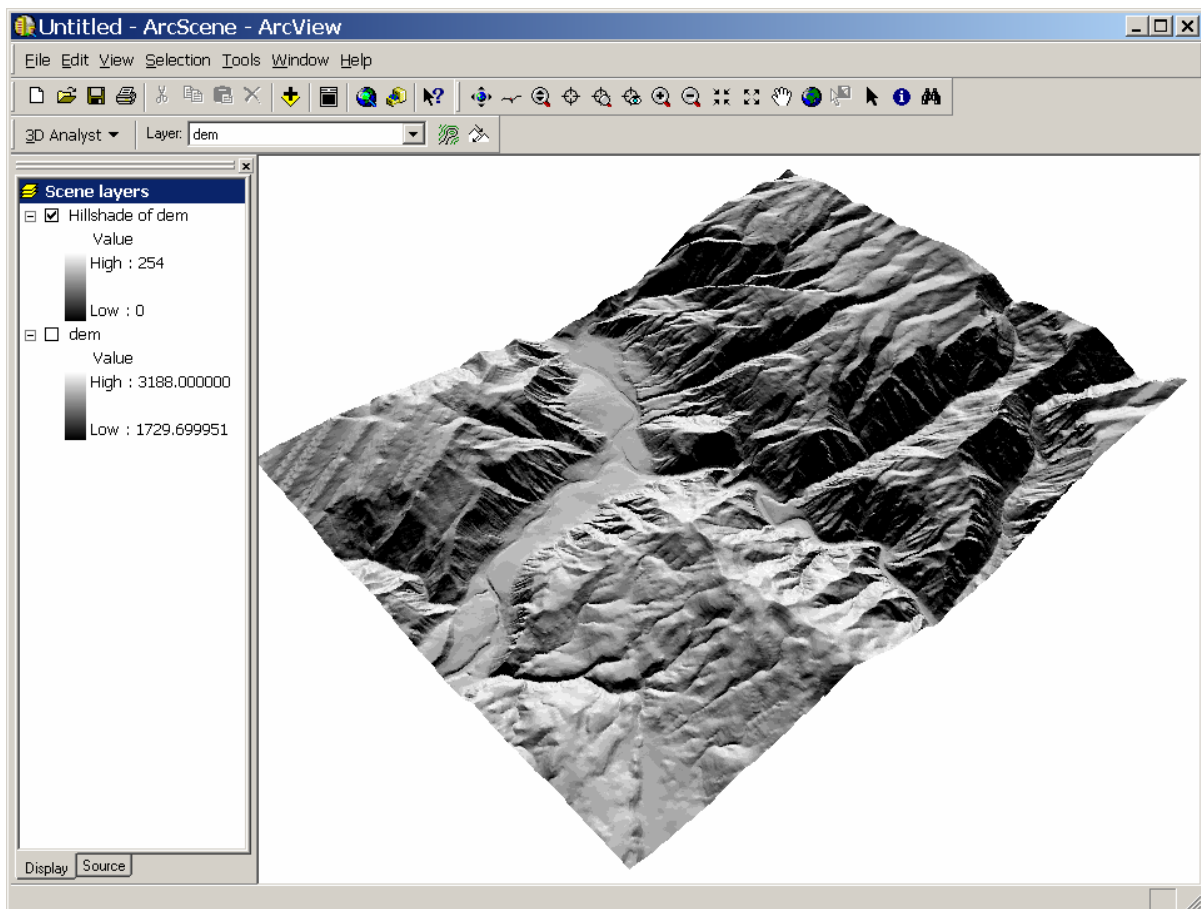
Note that 3D Analyst is available in both ArcScene and ArcMap. Create a hillshade of the DEM by invoking **3D Analyst>Surface Analysis>Hillshade...**






All this should be old hat by now. Let's do something new. Right click on the hillshade then in the table of contents and select the **Base Height** tab.



Select the ***Obtain heights for layer from surface:*** radio button and select the DEM dataset from which the hillshade was created and click ***OK***.



Hoover over the tool icons to find out what they do.  lets you rotate and tilt the image,  lets you zoom in and out,  lets you center the target, etc. Play around with ArcScene... it's fun! Any ESRI raster grid could be treated this way so you could, for instance, add base height to an air photo or satellite image to impress... others. This process is known as "draping".

Vector shapefiles may also be draped. Let's drape the Glenwood Springs geology polygon shapefile over the topography. Add "geology.shp" to the project. It won't look like much because all geologic units are given the same symbology.

You will need to add the correct symbology but I'm not going to do that here... I'm going to let it be done automatically (and quite incorrectly). Right click on "geology" in the table of contents and select properties. Click the **Symbology** tab and specify **Categories** then **Unique values** (just as you'd do in ArcMap). **Don't click OK**, instead click on the **Base Heights** tab on the Properties dialog and specify the **Obtain heights for layer from surface**: radio button and select the DEM dataset for Glenwood Springs. Now you may click "OK". I used two times vertical exaggeration for dramatic effect (as I am wont to do).

