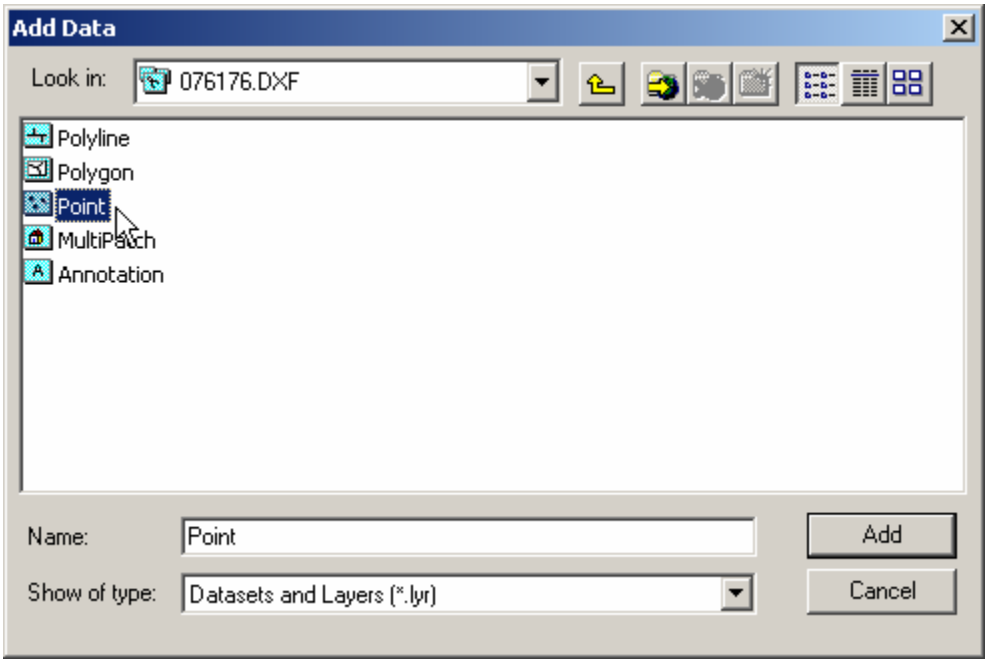
Using Vermont Mapping Program DEM Files

The Vermont Mapping Program published Digital Elevation Models (DEMs) files for the whole state of Vermont on three different CDs. DEMs are comprised of a mass points file, each point with a coordinate value and an elevation. These 1:5,000 DEMs for are available on CD-ROM from the Vermont Mapping Program. UVM students, staff, and faculty also have access to these DEMs from the Bailey Howe Map Room. Once you convert the elevation points to a raster surface, these DEMs can be used to generate slope, aspect, perspective view and contours in ArcGIS. However, the DEMs do not meet *National Map Accuracy Standards*. More information is available about DEMs (and digital orthophoto quads (DOQs)) on the Vermont Mapping Program web site http://www.state.vt.us/tax/mapping.shtml. The three DEM CDs cover north-to-south swaths:

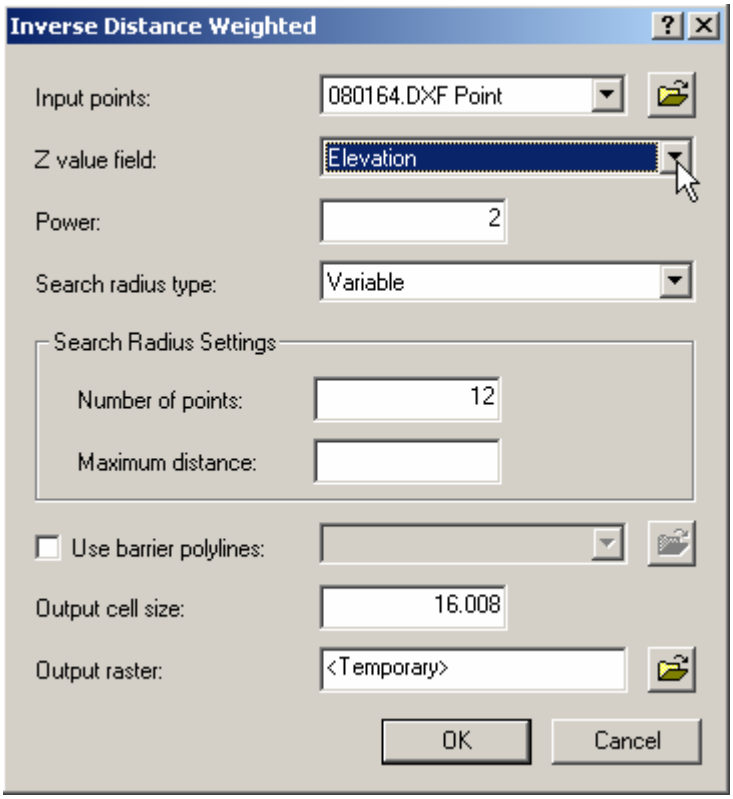
CD #1: western side of VT
CD #2: center of VT
CD #3: eastern side of VT

Interpolating .dxf files to a Raster Surface

Two different extensions (.dxf and .brk) were used in the generation of the Vermont DEMs. In Rutland and Windsor counties, a ".brk" extension was used. The remaining portion of the Vermont DEMs are coded as ".dxf" files. You will need to convert the .brk file to a .dxf file for use in ArcGIS. The ".brk" files will not be easily read unless you add column headers as follows: Open the ".brk" file in **WordPad** and add the following line to the top of the columns: **Type,x_coord,y_coord,z_value,code** Then **save** the file in a text (.txt) format. This will create a file that can be read as a ".dxf" (CAD) file. Finally, add the .dxf file to ArcMap using the "**Add Data**" button. Be sure to add the point file under the colored icon respective to the number of the image tile.



Now make sure the Spatial Analyst extension in turned on (**Tools→Extensions**…). In the Spatial Analyst toolbar, the third option down is "**Interpolate to Raster→**". Select to interpolate by **Inverse Distance Weighted** (IDW). The follow window will appear:



Be sure to change the **Z value field** to **Elevation**. This is the attribute that the software will use to interpolate a continuous surface from these elevation points. Press **OK**.

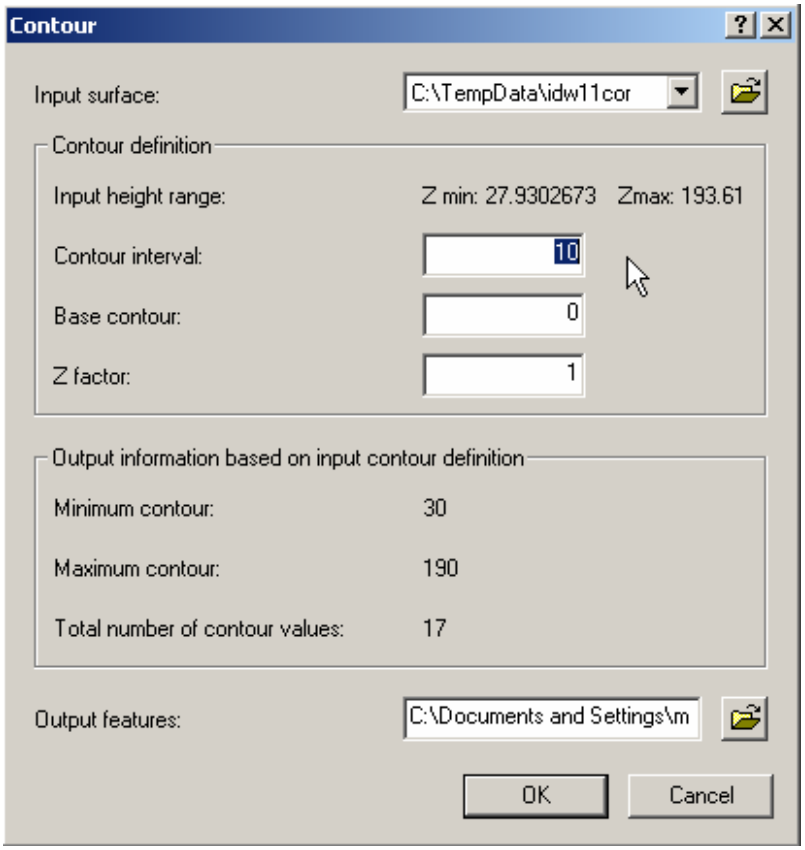
The new raster grid will be added to ArcMap automatically. This is only a temporary layer and needs to be made permanent by right clicking on the layer in the table of contents and going to "**Make Permanent**".

You now have an interpolated DEM of the tile. This is the file that will be used to create all of the other features (contours, slope, aspect, etc.).

Generating DEM Derivatives

Creating Contour Lines

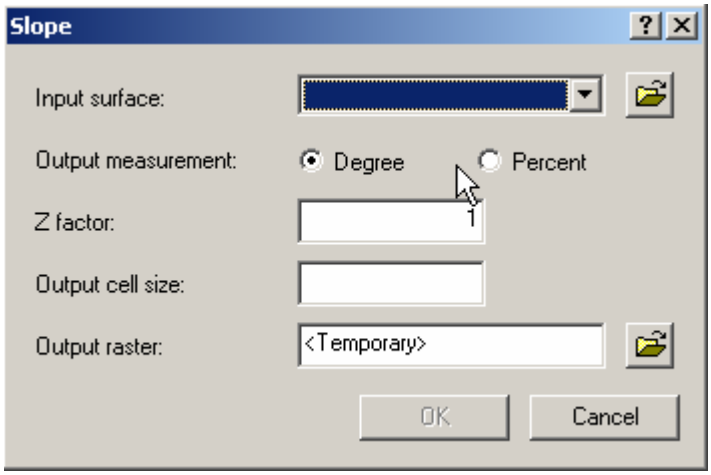
To create contour lines, load the DEM into ArcMap. With the Spatial Analyst extension on (see previous section), go to **Spatial Analyst → Surface Analysis → Contours**…



Set the "**Contour Interval**" to whatever interval you want the contours to be at in **meters** (since the coordinate system is VT State Plane NAD 83 meters). Be sure to set the correct output file name and location, and Press **OK**.

Creating Slope

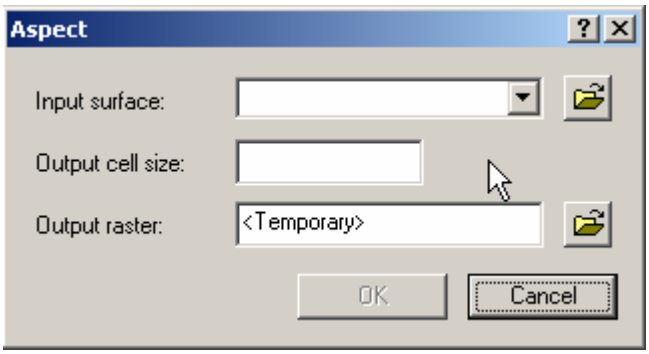
To create a slope image, load the DEM into ArcMap. Go to **Spatial Analyst→Surface Analysis→ Slope…**



Choose the **output measurement** (degree or percent slope) and the output file name and location.

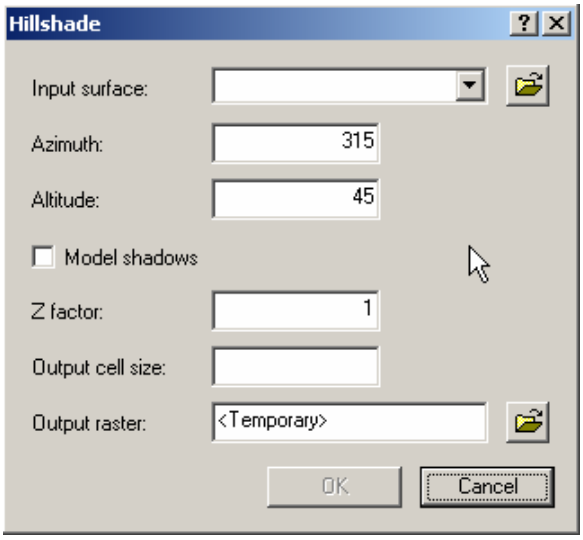
Creating Aspect

To create an aspect image, load the DEM into ArcMap. Go to **Spatial Analyst→Surface Analysis→ Aspect…**



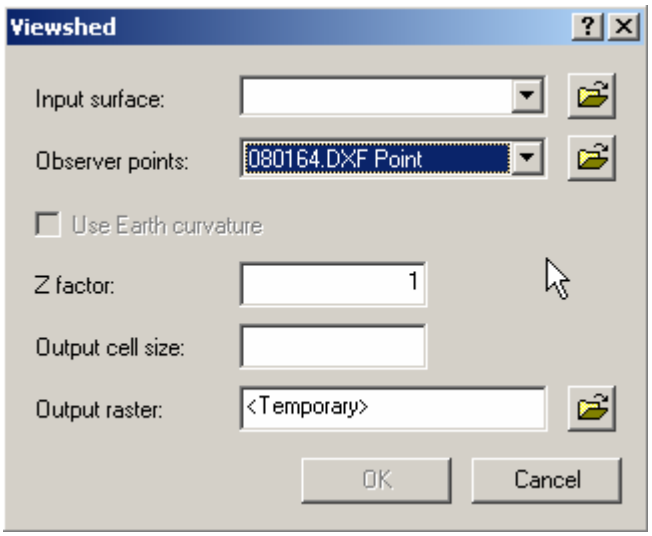
Creating Hillshade

To create a hillshade image, load the DEM into ArcMap. Go to **Spatial Analyst→Surface Analysis→ Hillshade…**



Performing a Viewshed Analysis

To perform a viewshed analysis, load the DEM into ArcMap. Also load the point layer that contains the points from which one is viewing. Go to **Spatial Analyst→Surface Analysis→ Viewshed…**



Input Surface = DEM
Observer points = point layer
Specify the output raster file name and location

Conclusion

There are many other features that can be utilize a DEM in ArcMap, but these are the most common and useful. Hopefully, this short explanation of the tools helps in any geoprocessing you must perform in the future.

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