GIS 4 Geomorphology

Geomorphometry of Mountain Landscapes &
Upland Watersheds…a little Wildlife, too

Tips for ArcGIS

Every year I see one or two things I've never seen before in my Intro to GIS labs. You gotta hand it to them: Students are creative. Review this list when ArcGIS gives you problems.

aa.) Don't use Geodatabases. In 18 years of using ArcGIS for projects of all sorts, I've never needed to use a geodatabase. Ever. Store your data layers and an .mxd inside a project folder. Add the layers to the .mxd from tl folder. Or don't, and fight with the software all day.

a.) Turn off Background Processing (Geoprocessing menu > Geoprocessing options > uncheck the box next to "Enable background processing"). Inexplicably, this is not the default. There is no good reason to enable background processing. Ever.

b.) Check that the program isn't still running/processing the data. Sometimes checking ArcCatalog or the destination folder for the new file (Add Data) will show you that the file was created or is still in the works. A LOC file may be present, indicating processing is still under way (look for this temporary file in Windows).

c.) License Errors? Have you turned the required Extension on? Customize > Extensions.

d.) Tool failure? Change filename of output slightly and re-run tool ("slope" –> "slope1").

e.) Tool failure? Change drive and/or destination folder and re-run tool.

f.) Tool failure? Check for spaces in filename/path to your working folder (Good: "working_folder", Bad: "working folder"). One work around is to create a new temporary folder on your Desktop (called "aaa") and save the outpu file there. If successful, then you've got a file or folder name problem (likely there are spaces in the name). Open ArcCatalog and copy/paste the new file from the temp folder back to your working folder. Add the file to your ma from the working folder. Remove the one added from "aaa". Delete the "aaa" folder in Catalog. Save.

g.) Tool failure? Check to see that things are not selected (selections = bright blue). Click the Clear Selection but

h.) Might help: Set the Workspace and Scratch Space to your working folder in Environments. I never do this.

i.) Good idea: After an extended session, save your .mxd, close ArcMap, and restart the program. This often

resolves strange problems.

j.) Strange software behavior? Check to see if your harddrive is full.

k.) Strange software behavior? If working in a lab setting (i.e., university lab or networked PC cluster), sometimes switching computers remedies the problem. Occasionally hardware fails, a cord gets frayed, a connection break or a PC needs cleaning. Rare, but it happens.

l.) LOCK warning? Check if Excel (or another program) is open and/or running the same file you have open in ArcMap.

m.) LOCK warning? Check to see that the data layers are not located on a write-protected drive (this is the read only G-drive in my classes). Always copy data from G-driveto H-drive, add files from the H-drive, then begin you work.

n.) USB thumbdrives (flash drives) can be very slow and tend to cause tools to fail more often than network or lo harddrives. Not always, but USB drives are consistently a source of failed processing in my lab. Use a fast USB you must.

o.) Processing taking too long? Evaluate whether a processing command should take a long time or whether Ar not responding. Usually, if Arc runs for more than a few minutes, I get suspicious. This kind of judgement takes t to develop. You get a feel for it after a while.

p.) Good idea: Increase the RAM dedicated to “processing” in Windows.

q.) Excel problems? Remove any trailing spaces in header row. Close Excel if table is open in Arc. Check that ce formatting matches correctly. See ArcUser article on Excel from c. 2012.

r.) Stop using geodatabases. Someone tell Meribeth.

s.) Weird problems? Is you local network undergoing maintenance? Call the administrator or try again later.

t.) Stuck? Email me for help or check the ESRI Forum or the StackExchange forum.

u.) Raster Calculator errors? “No module named NumPy” error when running Raster Calculator. Network admin choices are the cause. See fix described below.

v.) Good idea: Slope rasters require projected coordinate space. Either set the Data Frame to a PCS or project t DEM prior to running Slope tool.

w.) Weird software behavior? Make sure you are not in an open Editing session. Close the editing session (Customize > Toolbars > Editor toolbar).

x.) Administrative withdrawal: I once had a student that changed the selection color in ArcMap from the default

(bright blue) to black. It was impossible to see what was being selected. She was a hair dresser. Still is.

TIP: Improve Your Hillshade

Sometimes ArcGIS creates a lousy looking hillshade. Too much contrast. Too bumpy in flat areas. Easy to fix if y add a Z-factor.

1.) Create a Hillshade raster from the DEM (Spatial Analyst > Surface > Hillshade tool).

2.) Adjust the Z-factor using this table of values:

Approximate Latitude Z-factors

0-deg 0.00000898
10-deg 0.00000912
20-deg 0.00000956
30-deg 0.00001036
40-deg 0.00001171
50-deg 0.00001395
60-deg 0.00001792
70-deg 0.00002619
80-deg 0.00005156

For example, say your DEM covers an area located on the Idaho-Utah border. This is about 40 degrees N, so choose the Z-factor of 0.00001171.

3.) Further improvements you might make to the hillshade display:
– Set the Hillshade Display to BILINEAR (Properties > Display > Resample during display…).
– Adjust Transparency to about 50%.
– Move Hillshade above DEM layer.
– Change DEM color ramp to Elevation #1 (Properties > Symbology > Right-click color ramp bar > uncheck Graphic view > names of color ramps appear).
– Change the Stretch Type for the DEM to Standard Deviation (Properties > Symbology).

TIP: Find ArcToolbox Tools Quickly

ArcMap > Windows tab > Search > click the Tools link. Type in name of tool. Copy often-used tools to your own Favorites folder inside ArcToolbox.

TIP: Projecting DEMs Correctly

Use the BILINEAR method when projecting DEM data (ArcUser Fall, 2013).

TIP: NumPy Module Error Fix

PROBLEM: The ArcGIS 10.1 Raster Calculator is consistently failing in our university-managed computer labs. T reported error is “No module named NumPy”. However, we know both Python and NumPy exist on the machine because they came with the ArcGIS 10.x install. We suspect ArcGIS just needs to be pointed to the correct fold containing NumPy for Raster Calculator (Spatial Analyst extension) to function properly.

NumPy is located here on our install:
C:\Python27\ArcGIS10.1\Lib\site-packages

SOLUTION: 1.) From the Start button > Computer > System Properties > Advanced tab > Environmental Variab button > New button under USER variables (not SYSTEM variables unless you own/administer the PC) > enter t following:

Variable name: NUMPYPATH
Variable value: C:\Python27\ArcGIS10.1\Lib\site-packages

2.) Click OK to point Arc to Numpy via the new filepath.
3.) Log off (or reboot).
4.) Log back on.
5.) Open your ArcGIS project.
6.) Try Raster Calculator. It should now work.

TIP: Import71 is now a Conversion Tool (.e00)
Unzip the coverage interchange format files (.e00), a compressed format similar to .zip or .tar, with ArcToolbox > Conversion tools > To Coverage > Import from E00 tool. More info here: LINK