

EVS 427 / 527

Exercise 7 – River Tools

RiverTools is a delightful product that will enable you to derive a stream set from a DEM. You might ask whether a DEM is the best place from which to start to derive a stream network, but what else is there? (The answer, of course, is a TIN, but DEMs are easier to visualize). It is not difficult to use, but it can be time-consuming. In this exercise, you will derive the stream network for an area in or around the quadrangle with which you have been working. Your first step is to get a DEM. The easiest place to get this is the OGRIP site from which you downloaded your DLGs in EVS 425/525. Try to make sure you have the complete watershed for whatever stream you want to follow. You may have to mosaic several DEMs together in order to get a complete watershed! You can do this in ERDAS Imagine. To use RiverTools, here's the process.

1. When you've saved your DEM in ERDAS, export it to a GeoTIFF. You should use all of the default settings, but be sure to save the WorldFile.
2. Open RiverTools and accept the settings from the ini file. The RT window will open.
3. Click on File -> Import DEM -> GeoTIFF. Choose the file you saved in step 1. Check the responses in the dialog box that opens and hit OK.
4. When you get the message, "Current DEM file is: . . ." you know that your DEM file has been loaded.
5. To look at your DEM, click Display -> Density Plot. Choose the defaults and click Start. When you have ogled it sufficiently, click Close.
6. Click Extract -> Flow Grid (D8). You will doubtless get the message that you are missing the raw DEM grid file. Click Yes. When the raw DEM grid file has been created, the Extract Flow Grid Dialog window opens. You can accept the defaults and click Start. This step may take a while, depending on the complexity of your DEM.
7. Click Extract -> Basin Outlet. The Extract Outlet Dialog opens. Extracting the outlet is a somewhat complicated process that you will likely have to do a couple of times before you get it right. Click Start on the dialog box. An image of your DEM opens. Click somewhere on the upper reaches of your watershed; the downstream path will be shown. Holding the left mouse button down, click on the slider bar and move it a bit to the right. When you let it up, part of the flow path will change from white to red. Move the slider bar back and forth until you find the point you wish to consider as the outlet of your drainage basin, and it lies at the junction of the white and red portions of the flow line. Click on Save Outlet, then Close.
8. Click Extract -> RT Treefile. Assuming you want to limit yourself to the basin you defined in step 7, click Start.
9. Click Extract -> River Network. Choose Strahler Order as the pruning method. The default pruning threshold is 3. This means that if a RiverTools order is less than 3 it will not be retained in the database. Choose this, and hit OK. If you had changed the 3 to 0, you would develop the entire flow network from every pixel in the image. You should plan to do this later.
10. Now look at your river network. Click on Display -> River Network; choose the "links" file. Does it look like you thought it would? Note that you can change the colors and widths of your stream segments. Try it. See what happens when you "change several" and choose "Width = Order."
11. Click on Tools in the Display window. Choose some of the tools. Click on the river system to

see what it shows you. Some of the tools require that you extract additional information. You should do that.

12. Now go back to Step 9. Instead of choosing 3 as the pruning threshold, choose 0. What is different?
13. Click on Extract -> D8-based Grid and choose one of the grids. Experiment with what you can find.
14. Click on File -> Export Vector to export the boundaries and the stream segments as vector shapefiles. Open them in ArcGIS to make sure that you can do it if and when you want to.

Portfolio

- 7-1 The DEM you used to extract your river or other drainage
- 7-2 The most meaningful image of the drainage patterns (i.e. stream segments) in your basin
- 7-3 The image of the outline of your basin with stream segments shown inside of it.