Discovering GIS and ArcGIS **Name: _____**
Chapter 22

Question 22.1: Without doing any further hydrologic modeling, and just from visual inspection, how are the streams in the Columbiana County area distributed with respect to slope?

Question 22.2: Why are there values other than 1, 2, 4, 8, 16, 32, 64, and 128 in your flow direction grid? (*Hint:* You may wish to refer to the ArcGIS Desktop Help entry for "Flow Direction (Spatial Analyst)" to answer this question.)

Question 22.3: How many sinks are in the Columbiana County NED layer?

Question 22.4: What is the total number of cells that make up the sinks?

Question 22.5: Keeping in mind that flowaccum is showing only the accumulation of overland water flow, how does it compare with the streams layer? What differences are there between the two datasets? What does this say about the channels shown in the streams layer? (*Hint:* Select some of the areas on the flowaccum grid that have the highest values and zoom in closely to see those areas in relation to the streams layer.)

Question 22.6: How does the threshold layer compare with the streams layer? What differences are there between the two datasets? (*Hint:* Select some of the areas on the threshold grid and zoom in closely to see those areas in relation to the streams layer.)

Question 22.7: What orders of magnitude streams are represented by both the Strahler and Shreve stream-ordering methods?

Question 22.8: How many watersheds are extracted?

Question 22.9: How does the vector version of McCormick Run (from the National Hydrology Dataset layer from The National Map) compare with its 30-m-resolution counterpart derived from the NED?

Question 22.10: What order of magnitude stream is McCormick Run according to both the Strahler method and the Shreve method of stream ordering? (*Hint:* Turn on your strahstream and shrevestream grids to answer this question.)

Question 22.11: Which watershed number (in terms of its OBJECTID value) has been computed for McCormick Run?

Question 22.12: How large (in terms of acreage) is the McCormick Run watershed? (Hint: The size of each grid cell is 900 m^2—because they are 30-m-resolution grid cells—and one square meter is equal to 0.000247105 acres.) Show your work.

Step 22.13:
Print a layout according to the guidelines presented here. Add a graphic of the final model workflow and include it on the layout.