

**Michigan Technological University**  
**School of Forest Resources and Environmental Science**  
**Introduction to Geographic Information Systems and Remote Sensing for**  
**Natural Resource Management**  
**FW3540**  
**Spring Semester 2009**

**Laboratory Exercise 10**  
**GIS Analysis Functions Continued**

**Getting Started**

This lab exercise continues the focus on vector based GIS analysis functions within ArcMap and will once again use thematic data as well as adding more feature classes to your file geodatabase.

**Evaluating and Updating Open Water (lakes and ponds) Feature Class**

Compare the Indian town open water polygons (hydropoly\_clip\lab4, import this layer into your IndianTown.gdb\wetlands) set to the open water polygons from the DLG Hydrography (hydropoly) layer. Which layer appears to be more complete? \_\_\_\_\_

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How did you come to this conclusion? \_\_\_\_\_

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Select all the open water polygons from the DLG hydrography (hydropoly layer) into a new feature class called DLG\_openwater.

Even the more complete open water layer does not have all the open water shown on the orthophoto mosaic mapped. Therefore update DLG\_openwater layer. Refer to your past lab handouts and flowcharts for editing instructions.

How many acres/hectares of open water are within the area of the Indian Town quadrangle based on your updated Hydrography ( DLG\_openwater) layer?

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**Creating Buffers Around the Wetlands**

Many states have enacted wetlands protection legislation. Creating buffers around wetlands is one of the most widely used forms of protection.

Click **AnalysisTools\Proximity\Buffer** to calculate a 500 ft. buffer around all of the wetlands

you mapped in Lab 9 using the DLG and NWI union wetlands as input. Be careful not to build buffers around the uplands.

Once the buffers are calculated, note that some extend beyond the study area boundary (the Indian Town Quadrangle boundary). Therefore, **CLIP** with a “cookie cutter” file. Save the clipped buffer theme to a feature class.

### **Evaluating the Impact of the Buffers on Upland Timber**

Using you land use/cover (inside your Indiantwon.gdb\landusecover) . How many acres of Deciduous Forest (41) and Conifers (42) have you mapped? \_\_\_\_\_

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How would you determine how many acres of deciduous (41) and conifers (42) are located **outside** of the 500 ft. protection buffer around the wetlands (DLG\_NWI\_union) layer? Draw a flowchart showing how you would accomplish this task.

### **A Different Analysis Problem**

You have been hired by the XYZ Coordinates Consulting Co. as a GIS analyst. Since this is a consulting firm, you will be working on a variety of tasks. Complete the analysis outlined below and on the following pages and provide the appropriate information. Take time to look at essential pieces of information such as geographic coordinate systems, data format (raster vs. vector) of each file and attribute tables for each task. Be sure each data set is registered to the same geographic coordinate system and datum. And be sure you have write permissions on all of your files. These tasks are very similar to what you will see on the lab final.

Task 1 (data can be found at P: \fw3540\lab10\task1)

The company has been contacted by a developer in Idaho who wants to develop a hot springs resort. The resort needs to be within 15 miles of a town with a population greater than 5,000. The temperature of the springs must be greater than or equal to 60° C.

Files needed: idcities.shp, snowsite.shp and thermal.shp. Look at the thermal.shp file. It contains information about wells (“w”) and springs (“s”). You are only interested in the springs. The data is in Idaho State Plane coordinates. Map units are in meters.

How many hot springs in Idaho are greater than or equal to 60° C? \_\_\_\_\_

How many springs meet the criteria specified for resort development (outlined above)? \_\_\_\_\_

Name those springs. \_\_\_\_\_

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If the required population size were reduced to 3,000, how many potential sites are there? \_\_\_\_\_

Names of the springs which now meet the criteria specified above.

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If the site requires a 60" diameter sewer pipe, how many sites are eligible? \_\_\_\_\_ List their landuse\_id numbers.

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How many miles of 45" sewer pipe are available? \_\_\_\_\_

How many miles of 60" sewer pipe are available? \_\_\_\_\_