

**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 5**  
**Land Use/Land Cover Mapping, Part II**

**Introduction**

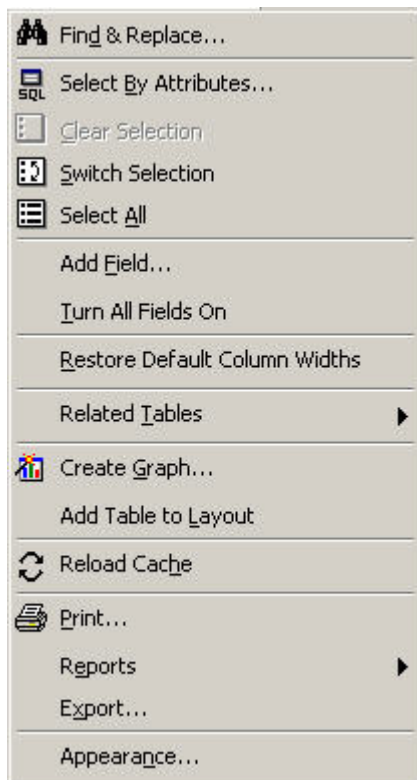
This week's lab will focus on completing the updated land use/cover map for the Indian Town quadrangle. Therefore continue working with the data in your Lab 4 folder. Finish delineating your land use/cover polygons if you haven't yet done so. Once these polygons are delineated and attributed, you will focus on a more detailed interpretation within the wetlands polygons.

**Entering Complete Attribute Data**

Entering attribute data is time consuming, tedious and prone to errors. Hence approaches to entering and checking attributes that are time efficient help keep project costs constrained and maintain quality data.

Check that you have entered the correct land use/cover code for all of the polygons. This can be accomplished by first checking that there are no empty cells in the **Code** column. Secondly use the **SQL (Sequencal Query Language)** to select all of the polygons within each class. The **SQL** menu is accessed by opening the attribute table and clicking on the **Options** button. The menu

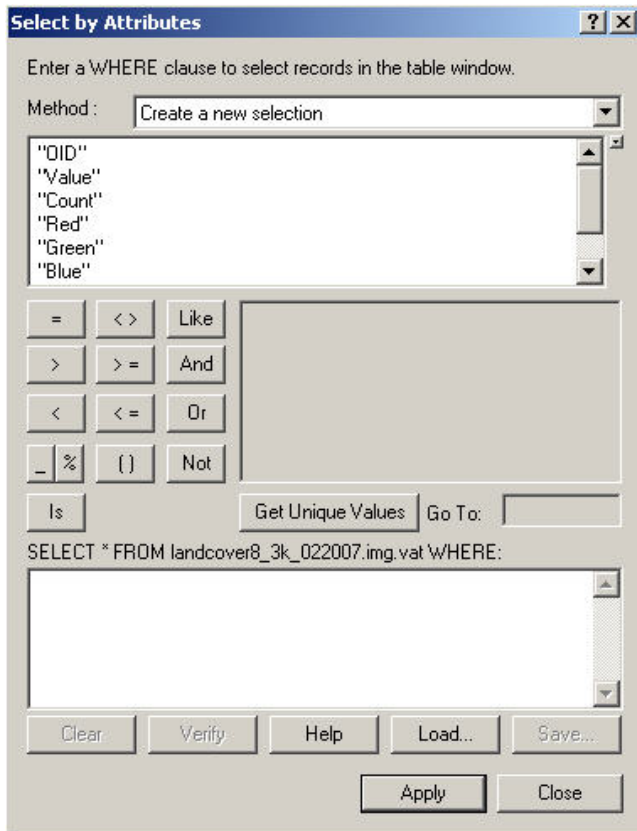
shown below will open; **SQL or Select by Attributes** is the second choice on the list.



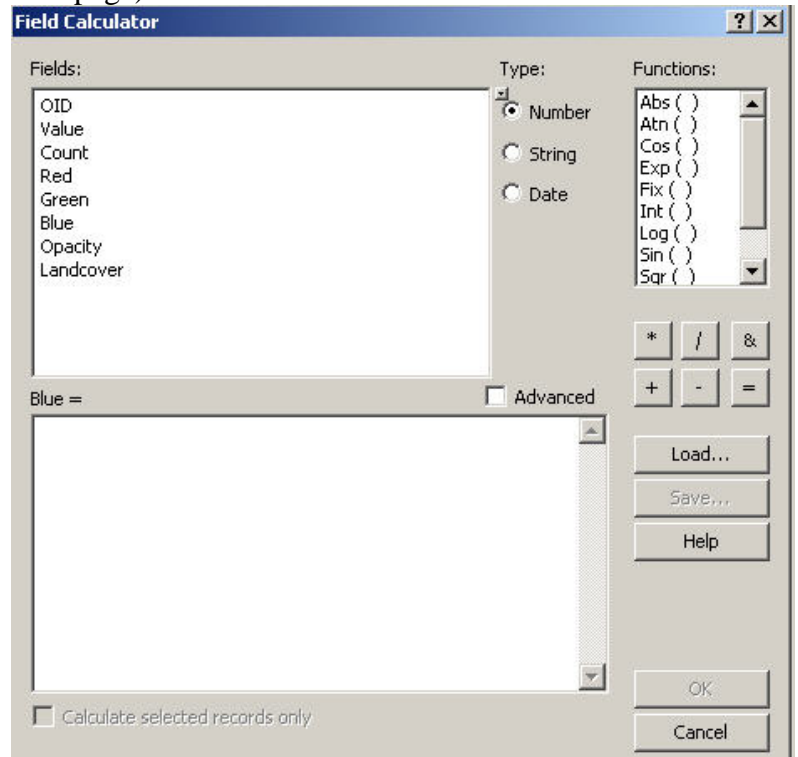
Click on **Select by Attributes**. The menu shown on the next page will open. Double click on **Code**, then choose **=**. Click on **Get Unique Values** and chose one of the land use/cover classes by double clicking in the list. Click **Apply**. All the polygons with that specific Land Use/Cover code will be selected in the attribute table and highlighted (outlined) in the ArcMap Window. Visually check the interpretation. Overlaying it on the orthophotos mosaic and the MRLC will help you correct codes and make changes as needed.

Add a new field in the attribute table named '**Description**' which will be a text or 'string'. Return to the SQL menu and choose each code individually, or in GIS lingo "**Query for each of the land use/cover values**". Use the **Field Calculator** to type in the complete name, as listed by the MRLC, of the land use/cover associated with that code number.

The Field Calculator is accessed by right clicking the field (column name). Note all text must be enclosed by double quotes



when typing it in the **Field Calculator** window (see next page).



In the **Field Calculator** window, note the top window lists all of the field names in the attribute table. Directly above the lower window is the field name you clicked on when opening the **Field Calculator** and this is the **ONLY** field that will be acted upon. Also note the presence of the “=” sign. The only information to be typed in the lower window is the calculation itself.

### Refining the Wetlands Classification

Display the NWI wetlands layer beneath your land use/cover interpretation. Use the NWI\_Code to create the symbology in the Table of Contents. Modify the transparency of your interpretation so you can see the NWI classification. Use this classification to add and refine the wetland polygons of your map. In other words, you are incorporating the NWI classification into your land use/cover thematic layer.

Add another field to your land use/cover map called NWI\_Code and populate accordingly. Polygons which are not wetlands will receive a “U” designation for uplands.

The interpretation is complete when all of the wetland polygons are delineated to the level of the NWI\_Code and the upland polygons are delineated to the 2 digit MRLC code.

### Clipping the Interpretation

Next, CLIP the land use/cover thematic layer so polygon outlines do not extend beyond the boundary of the quadrangle. Refer to last week’s lab handout for a review of using the **CLIP** command.

## Calculating Area

Open the attribute table of the clipped land use/cover thematic layer. Create 2 new fields to labeled **Acres** and **Hectares**. Use the **Field Calculator** to determine **acres** and **hectares** for each polygon. It is important for you to remember that the shape\_length and shape\_area fields contain values expressed in the same distance units of the coordinate system. So UTM would be in meters, while State Plane would be in feet.

**Handy facts: hectares = square meters / 10000**

**1 hectare = 2.471 acres, so acres = square meters \* .0002471**

**NOTE:** If you ever need to check what this map unit value is, you can use ArcCatalog to examine the properties of the layer, or simply right-click on the layer in the Table of Contents in ArcMap, choose Properties... and look at the Source tab. The map unit value is listed under Linear Unit.

Next week you will create a cartographically correct map of your land use/cover map thematic layer.

Due in lab next week:

Flowchart of the polygon digitizing (outlining) process

Flowchart for using the SQL(sequential query language) and the Field Calculator