

# Calculating the Acreage of Wetlands per Tax Parcel

Updated: February 4, 2008  
Software: ArcMap 9.2

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## Background

In order to perform this analysis, you will need two layers: Parcels and Wetlands. LCGIS currently has two wetlands layers available: National Wetlands Inventory & DEQ Wetlands. Both of the wetlands layers were created by outside agencies and have not been field verified.

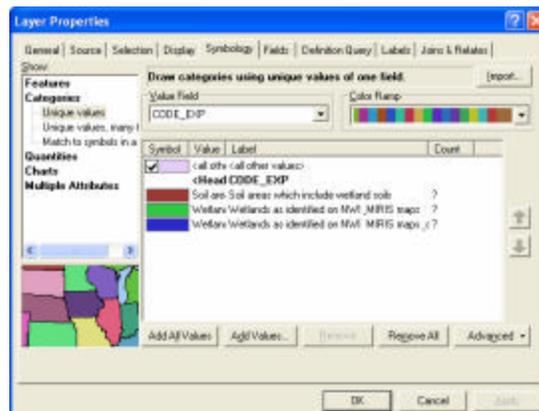
The National Wetlands Inventory (NWI) data are records of location of wetlands and classification as defined by the U.S. Fish & Wildlife Service in 1973. The data provide consultants, planners, and resource managers with information on wetland location and type. The purpose of this survey was not to map all wetlands and deepwater habitats, but rather, to use aerial photo-interpretation techniques to produce thematic maps that show, in most cases, the larger types that can be identified by such techniques. The objective was to provide better geospatial information on wetlands than found on the USGS topo-quads.

The Wetland Inventories developed by the State of Michigan depict candidate areas where wetlands may exist. These Inventories may not depict all areas that wetlands will occur and are subject to limitations of the data. This data is intended to help in planning and land development to reduce the potential for impact to precious State of Michigan natural resources.

The analysis can be performed using either wetlands layer. The accuracy of each layer cannot be determined because they have not been field verified. The DEQ Wetlands layer was used for the analysis described below because it was developed more recently.

## Procedures

1. Open ArcMap with a new, empty document
2. Add the Parcel and Wetlands\_DEQ layer to the new ArcMap document
3. Symbolize the Parcel layer as Hollow
4. Symbolize the Wetlands\_DEQ layer according to CODE\_EXP



*Hint:*

*Open the Layer Properties window by double-clicking on the layer name in the Table of Contents.*

*Click Categories → Unique Values*

*Select CODE\_EXP from the Value Field drop-down*

*Click Add All Values*

*Click OK to exit the window*

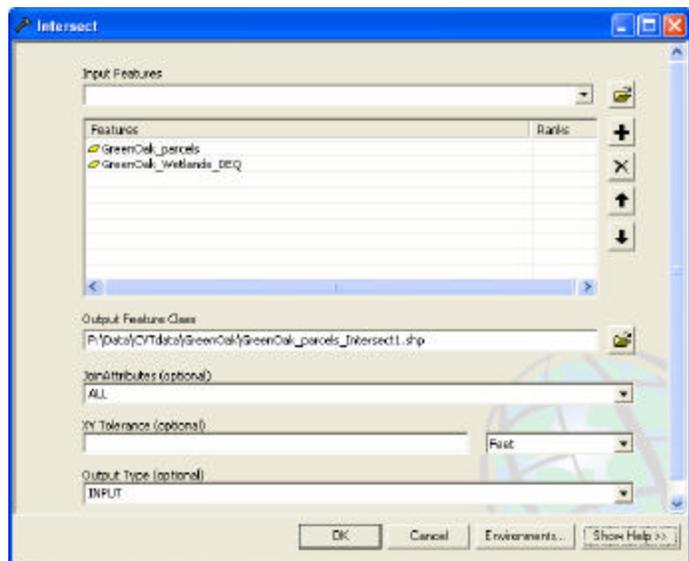
5. If necessary, move the parcel layer in the Table of Contents so it displays on top of the wetlands layer

The geoprocessing tool that must be run to complete the analysis is called the Intersect tool. The Intersect tool computes the geometric intersection of all input layers. ArcView users can intersect two layers per command. Features or portions of features that overlap in all layers will be written to the output feature class.

1. Click the ArcToolbox button to display the ArcToolbox panel 
2. In the ArcToolbox panel, expand the Analysis Tools toolbox → Overlay → Intersect
  - a. Click the Show Help >> button for an example of how the Intersect tool works

3. In the Intersect dialog box:

- a. Select the Parcel layer and Wetlands layer from the Input Features drop-down
- b. Click the folder icon to browse to a location where you want to save the output data
- c. Use all other default values
- d. Click OK to run the Intersect tool



4. The processing status window appears while the Intersect command is running (Note: This may take several minutes to complete)
  - a. Click Close after the processing is complete if the window does not close automatically
5. The new shapefile is automatically added to the ArcMap document
6. Turn off the Parcel and Wetlands layers in order to view the results of the Intersect command

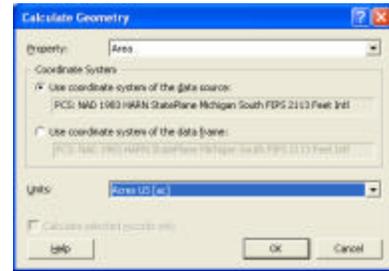
The Intersect output layer will show only the parcels that have wetlands. These parcels have been divided by the type of wetland (CODE\_EXP) found within the parcel. As a result, the attribute table will list multiple records for the same parcel number. Each record is a replica of the original parcel so the acreage of each new polygon is identical. This is not reality as the parcels have been split by the wetlands polygons. Thus, the first step in the summation process is to calculate the acreage of the new parcel/wetlands polygons.

The next steps explain how to summarize the data by tax id number and total the number of acres per parcel. The summary can be completed on the entire output layer OR specific wetlands classifications can be selected before running the summarize command.

1. Open the attribute table for the new layer

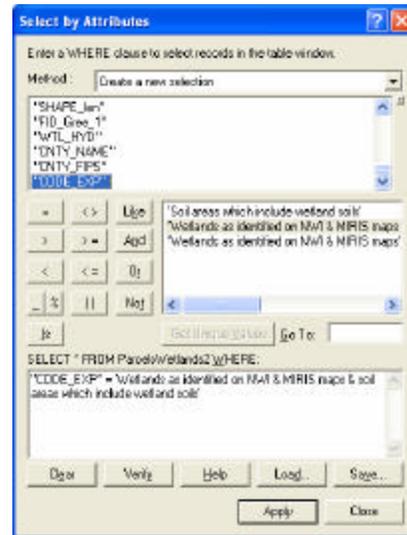
2. Right-click the GIS\_ACRES column → Calculate Geometry

- a. Click Yes in the warning window to perform the calculation outside of an edit session
- b. In the Calculate Geometry dialog box, select Acres from the Units: drop-down
- c. Click OK



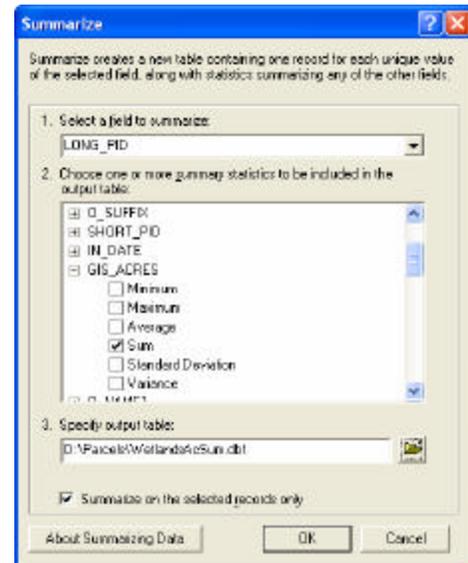
3. OPTIONAL: Select the wetlands class that meets the needs for your analysis

- a. Click Options → Select by Attribute
- b. Enter the query: CODE\_EXP = 'xxxx'
  - i. Double-click "CODE\_EXP" to add it to the query window
  - ii. Click Get Unique Values to display the options
  - iii. Click = button
  - iv. Double-click the code you want to query for
- c. Click Apply
- d. Click Close



4. Right-click the LONG\_PID field name → Summarize

- a. In the Summarize dialog window, expand the GIS\_ACRES field
  - i. Check the box next to Sum
- b. Select an output location for the results table
- c. If records are selected in the table, check the box next to 'Summarize on the selected records only'
- d. Click OK
- e. Click Yes when prompted to add table to the map



The summary table lists each parcel containing a wetland, the number of polygons with the same tax id number, and the total acreage of that area. The table is in .dbf format, which can be opened in ArcMap or in Microsoft Excel.