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Final Exam
Geog 191
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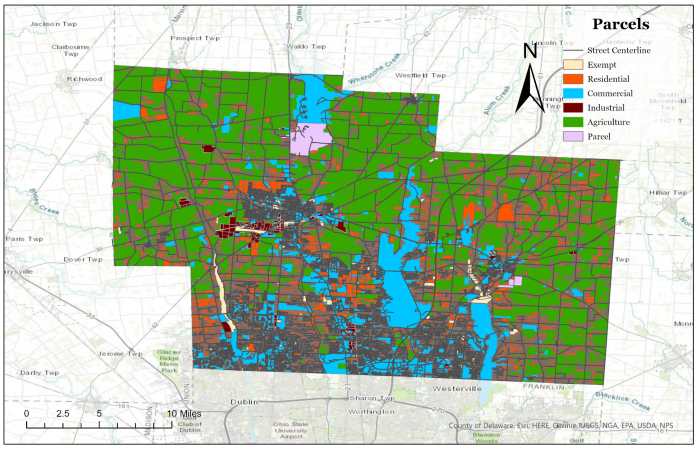
Concept 1 - Selecting and Classifying Land Uses

Create a map that shows the 6 different major categories of land uses (agricultural, mineral, commercial, residential, exempt). These land use codes are in the Parcels data (the class column). Select one of the categories, and create a second map showing all the sub-classifications in that category. Refer to the Delaware County Land Use Codes (below) for category and subcategory information. Symbolize each category with an appropriate color. Add appropriate additional data (such as road centerlines) for reference and make your map look decent. (approx. 1 page description + 2 maps)

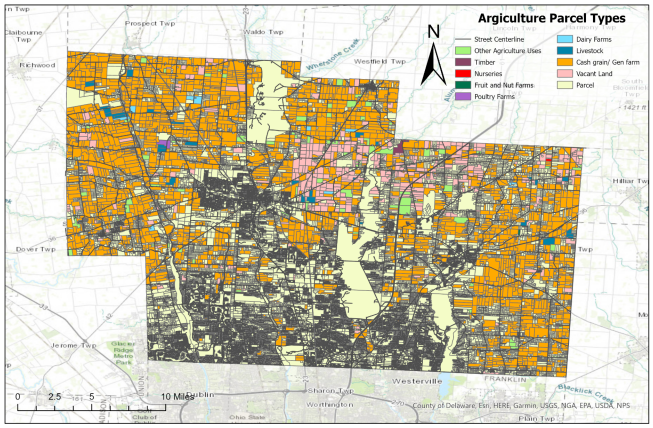
For this concept, we were assigned to sort the parcel data of the Delaware GIS data into the types of parcels that they each represented, and create two separate maps. The first map "Parcels" shows the class of parcels, colored for the category they are assigned to. To make this figure, I opened the attribute table for the Parcels data, and first chose the Select by Attribute function. Under the Select by Attribute function, I created each class by where CLASS is greater than or equal to (lower bound) and CLASS is less than or equal to (upper bound). For example, in order to create the COMMERCIAL parcel, I would select where CLASS is greater than or equal to 400 and CLASS is less than or equal to 499. Once the class was selected, I then right clicked on the Parcel layer in the contents column, and selected Selection, Make Layer with Selected Feature. I then repeated this process for all different subsections of the parcel data, until I was left with 6 separate layers of Agricultural, Industrial, Commercial, Residential, Exempt, and the original parcel. I then created a legend of all of the layers, inserted a scale bar, a north arrow, and a title, then exported the map.

Delaware County Parcels: Type



In order to make the second map, I repeated the same steps as I did when creating the original map. I opened the attribute table for the Parcels data, and first chose the Select by Attribute function.

Delaware County Agricultural Parcels: Type



However, under the Select by Attribute function, instead of creating each class by where CLASS is greater than or equal to (lower bound) and CLASS is less than or equal to (upper bound), I created the function where CLASS is equal to ex: 103 - to produce the parcels that are occupied by dairy farms layer. I performed this function for all of the individual sub sections of the agricultural parcels, to show what kind of agriculture these parcels of land were going towards. Within the agriculture subsections, all subsections are included except vegetable farms, tobacco farms, or greenhouses. I then created a legend of all of the layers, inserted a scale bar, a north arrow, and a title, then exported the map.

Concept 3 - What's Inside?

Review ch. 5 from Mitchell ("Finding What's Inside") and pay particular attention to the section "Three Ways of Finding What's Inside" on pages 145-148. Describe a scenario where this kind of analysis would help solve a particular problem, then perform that analysis using actual Delaware data layers. More creative and sophisticated analyses will be rewarded. Please model what you do after the examples in "Three Ways of Finding What's Inside." (approx. 1 page description + map)

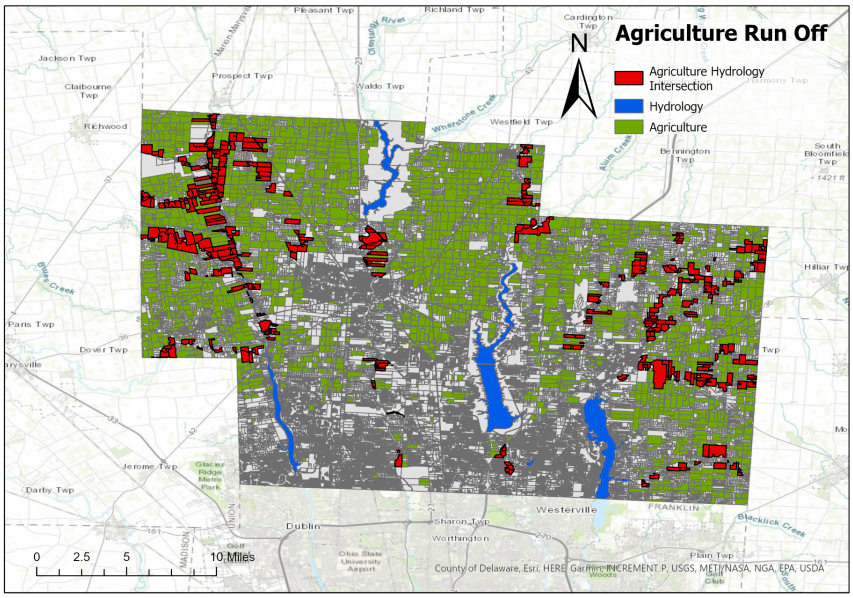
For this exercise, I originally was struggling with how to use this application appropriately. I had to use some creativity in order to use this application correctly. However, I decided to map the intersection of the Hydrology Delaware Data, and the subsection of Agriculture of the Parcels Delaware Data. I then designated which parcels this intersection occurred in, which are most likely to be the parcels that contribute the most to agricultural runoff in Delaware County.

First, I used the same steps as I performed in the first exercise to separate the agriculture parcels of Delaware County from the rest of the parcels. To make this figure, I opened the attribute table for the Parcels data, and first chose the Select by Attribute function. Under the Select by Attribute function, I created each class by where CLASS is greater than or equal to (lower bound) and CLASS is less than or equal to (upper bound). To select the parcels for agriculture, I had to create a selection where CLASS is greater than or equal to 100, and CLASS is less than or equal to 199. This then selected only the agriculture parcels of the data. Once the class was selected, I then right clicked on the Parcel layer in the contents column, and selected Selection, Make Layer with Selected Feature. This then created a separate layer for only the selected agriculture parcels, along with the hydrology layer.

In order to actually select only the parcels that bordered bodies of water in the hydrology database, I had to do a little bit of brainstorming and exploring of applications in ArcGIS Pro, because I don't believe this is ever something we explicitly learned from the textbook. At first, I tried to manually select all of the parcels, but then I realized that there were so many small hydrological sites that were not visible unless you zoomed all the way in on the map, that it was

going to be impossible to select all of the parcels manually. After a little bit of exploring, I figured out that I needed to use the 'select by location' function. The input feature is set as 'Agriculture', using the new layer that I made as a result of the first exercise, the relationship feature I set as 'intersect' and the selecting features I set as 'hydrology'. This then selected all of the agricultural parcels that intersect with any form of the hydrology layer. After these had been selected, I then used the 'Selection', then 'Make Layer with Selected Feature' function to then create a separate layer of 'Agriculture Hydrology Intersection". These identify the parcels of agricultural land in Delaware County that are the most likely to contribute to agricultural run off. All other unselected parcels still likely contribute to local agricultural runoff, but the ones selected come into direct contact with some sort of hydrological site, and have direct contact with runoff.
I then added a legend, scale bar, north arrow, and a title to the figure, and exported the map.

Delaware County, Ohio: Agricultural Run Off



Concept 5 - Mapping Change

Review ch. 7 from Mitchell ("Mapping Change") and create a time-change map of subdivisions in Delaware Co. View the subdivision file (in Delaware Data) and look at the table: there is temporal information here: the date that the subdivision was established (in a peculiar format). Create a graduated color map of subdivisions based on this temporal data. Classify the data so it makes some sense (1850-1900, 1900-1930, etc.) and choose an appropriate color. (1 page description + 1 map)

To begin this exercise, I downloaded, extracted, and imported the subdivisions shapefile into ArcGIS Pro. Both the subdivision shape file, and the parcels shapefile were imported into this map upon this point. In order to show how the subdivisions have been established over time, we needed to make manual changes to the symbology section of the data. Under symbology of 'subdivisions' in the contents pane, we needed to select REC_DATE for 'Field', <None> for 'Normalization', Manual Interval for 'Method', 6 classes, and a gradual fading green color scheme. I decided to have a 40 year interval for the 6 classes, beginning in the year 1800. Therefore, the time frame layers are sectioned as: 1800-1840, 1840-1880, 1880-1920, 1920-1960, 1960-2000, 2000-2023. The darker green colors on the figure are the subdivisions that have been most recently established. The lighter color greens on the figure are some of the more original subdivisions of Delaware County, Ohio.

The only barrier I had to encounter during this exercise was how to determine which column to use for the field imports. If you are looking at a row in the attributes table, the REC_DATE reads as an eight digit number as opposed to a four digit year. I figured out that the recording date consisted of year, month, day, all into one singular eight digit number. For example, a REC_DATE of 18400101 - would read as January 1st, 1840. When making manual adjustments in the symbology pane, in order to make a class listed through 1840 - 1880, you have to make the upper bound of the class 1800000, and the upper bound of the class before 18400000, to get all dates within the years 1840 and 1880. This was the only barrier that I ran into during this exercise. Otherwise, I had no functional problems, and I figured out how to solve this exercise relatively quickly. I then created a legend of all of the layers, inserted a scale bar, a north arrow, and a title, then exported the map.