SOC 4650/5650: Lab-13

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Directions

Please complete all steps below. All four maps should be uploaded to your GitHub assignment repository by 4:20pm on Tuesday, April 18th, 2017. This lab uses data from `MOBoundary` and `USInfra`.

Merge Missouri and Illinois

We do not have a file that contains only the state boundaries for Missouri and Illinois. We'll start this lab by creating a single file that contains these data.

1. In ArcCatalog, create a new geodatabase in the directory named `SOC5650/Data/CourseData/USInfra`.
2. In a new map document, add the Illinois and Missouri state boundary data from `MOBoundary`.
3. Set the projected coordinate system to `USA Contiguous Albers Equal Area Conic` projected coordinate system.[1]
4. Use either the attribute `state` or the attribute `mstafips` to select all coal mines in Illinois and then create a new layer.
5. Merge these two state boundary layers into a new feature class, saving these new data to the geodatabase you created above.
6. Open the attribute table for your new layer and note how disorganized it has become. Delete the set of columns that apply only to Missouri.[2] Delete all of the attributes except `OBJECTID`, `Shape`, `GEOID`, `STUSPS`, `NAME`, `Shape_Length`, and `Shape_Area`.
7. Using the Editor Toolbar[3], turn on an edit session.[4]
8. Fill in the appropriate values for `GEOID`, `STUSPS`, and `NAME` for Missouri. Missouri's state `GEOID` is '29'.
9. Save your edits[5] and end the edit session.[6]
10. Label the two states with the `NAME` attribute.
11. Remove the individual Missouri and Illinois layers so that only the merged file remains.

[1] The State Plane and UTM zones do not provide a single projection that covers both states. Using Albers is therefore a good alternative.

[2] Right click on each attribute name at the top of the attribute's column and choose Delete Field.

[3] Customize ▷ Toolbars ▷ Editor

[4] Editor ▷ Start Editing

[5] Editor ▷ Save Edits

[6] Editor ▷ Stop Editing

12. Export the map image as a `pdf` at `300dpi`.

Coal Fields in Missouri and Illinois

Another neighboring state, Kentucky, has even more coal mines than Illinois does. This section of the lab is designed to identify all of those coal mines using their spatial location.

13. In the same map document, add the data on coal fields from `/USInfra`.
14. Intersect the merged Illinois and Missouri state boundary data with the coal fields data.
15. Symbolize the coal fields layer using qualitative categories. The Value Field should identify coal fields by state (a number of attributes will do this).
16. Make sure the coal fields are symbolized in a way that makes them easy to distinguish from the states layer, and remove the national data on coal fields from your map document.
17. Export the map image as a `pdf` at `300dpi`.

Areas Without Coal Fields in Missouri and Illinois

There are two types of coal fields in Missouri, bituinous coal (which causes high amounts of air pollution) and lignite coal (which has limited potential to create heat when burned). Bituinous coal is used in coal-fired power plants. Create a map showing bituinous coal fields symbolized as a *single* polygon.

18. Using the same map document as the previous section, copy the layers into a new data frame.
19. Union the regional coal fields layer you created in the previous section with the data on the Illinois and Missouri state boundaries.
20. Use a query to select the observations of the field `FID_US_GEO_CoalFieldsIntersect` that are equal to '-1'. These will show you the areas of both states that *do not* have coal fields under the surface.
21. Make sure the non-coal fields data are symbolized in a way that makes them easy to distinguish from the states layer. Also remove the intersected layer created in the previous section.
22. Export the map image as a `pdf` at `300dpi`.