SOC 4650/5650: Lab-12 - Coal Fields in Missouri and Illinois

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Spring 2019

Directions

Using data accessed from the course data release, create the following maps describing coal geology in Missouri and Illinois. Your entire project folder system, including data and map output, should be uploaded to GitHub by **Monday, April 15th** at 4:15pm.

Analysis Development

The goal of this section is to create a self contained project directory with all of the data, map documents, results, and documentation a project needs. Make sure to include all relevant directories and a README that traces the changes you make to all of your data. You will need to create a new File Geodatabase in your data/ directory as well.

Part 1: 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 a new map document, add the Illinois and Missouri state boundary data from MOBoundary.

2. Set the projected coordinate system for the map to one appropriate for mapping multiple states at once.

3. Merge these two state boundary layers into a new feature class, saving these new data to the geodatabase you created above.

4. Open the attribute table for your new layer and note how disorganized it has become. Delete the set of columns that apply only to Illinois.

5. Using the Editor Toolbar[1], turn on an edit session.[2]

[1] Customize ▷ Toolbars ▷ Editor
[2] Editor ▷ Modify

6. Fill in the appropriate values for PSTATENAME, PSTATEABBR, and PSTATEFIPS for Illinois. Illinois's state PSTATEFIPS is '17'.

7. Save your edits[3].

[3] Editor ▷ Save

8. Remove the individual Missouri and Illinois layers so that only the merged file remains.

9. Export the map image as a pdf at 300dpi.

Part 2: Coal Fields in Missouri and Illinois

10. In the same map document, add the data on coal fields from USInfra/.

11. Intersect the merged Illinois and Missouri state boundary data with the coal fields data.

12. Once again, open up the attribute table and note how it has changed (there is no need to complete any "housekeeping" this time, however).

13. Symbolize the coal fields layer using qualitative categories. The PSTATENAME variable should identify coal fields by state (though a number of attributes will do this).

14. 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.

15. Export the map image as a pdf at 300dpi.

Part 3: Areas Without Coal Fields in Missouri and Illinois

16. Using the same map document as the previous section, copy the layers into a new data frame.

17. Union the regional coal fields layer you created in the previous section with the data on the Illinois and Missouri state boundaries.

18. Use a query to select the observations of the field FID_CoalFields that are equal to -1.[4] If you do not have a variable with this name, select another that has -1 values for areas with no coal. Selecting based on this attribute will show you the areas of both states that *do not* have coal fields under the surface. Your query should look like this:

[4] Go to the Definition Query tab under Layer Properties.

```
FID_CoalFields = -1
```

19. 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.

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