GIS Seminar Session 2

1. The login for the lab computers is your NetID and password. Open ArcMap using the Taskbar or from the Menu. This week we will continue using the shapefiles from ESRIDATA, which should be on the desktop. If not, open Chrome and go to the seminar web page: http://www.geo.umass.edu/courses/geo592b/. Click on the ESRI Data link and you will see link at the bottom left corner of Chrome. Click on the icon after the blue circle animation stops and drag the ESRIDATA folder to the desktop.
2. Again, all of the menu and tool icons will self-identify if you hover the mouse pointer over them for a second or two. There are several dozen toolbars (accessed from the Customize menu) that can be turned on and off, but we will only open the ones we need to avoid confusion. To open a toolbar, click on Customize/Toolbars and put a √ in front of the Editor toolbar. When it appears, it may be *floating* and should be *docked* by clicking on the gray bar at the top and dragging it to the top of the window, where the gray bar will disappear, and release it. If it appears in a new row in the toolbar area, pick it up by pointing the mouse at the 4 vertical dots (far left side of the toolbar) and move it to the right of the standard toolbar.
3. As we did last week, we will add data to the map by clicking on the **+** Add Data icon. Choose Desktop from the Look in: drop-down menu and then click on ESRIDATA and then WORLD. Hold down the Control key (to make multiple selections) and click on Cities, Rivers, Country, Lakes and World30. In the TOC, drag the Lakes layer above Country so they will show up. If C:\Users\gisuser\Desktop is not one of the choices, you will need to click on the Connect To: Folder icon and choose Desktop.
4. We should always start out a new session by correcting colors and other qualities, so click on the small diamond below Cities and change to Circle 1 and change the size to 3. Change Rivers to the River line type and Lakes to the Lake polygon. Change World30 (the 30 means that every 30 degrees of lat and long are shown) to Blue with the black outline (not the solid blue square at the top) and Country to Beige. Starting to look like a map?
5. Now we are going to dig a bit deeper in to appearances. Start by right clicking (RC) on Country and selecting the bottom choice, Properties then choosing the Symbology tab. Right now the Show: box has Features/Single symbol highlighted – click on Categories and Unique values. Now move over to the Value Field drop-down and change FIPS\_CNTRY to CNTRY\_NAME. Move down and uncheck the <all other values> box and then click on Add All Values. Click on Apply and then move the dialog box around so that you can see the map. The default color ramp on my computer was a pastel, which is OK, but there may be something better. Move up to the Color Ramp drop-down and try out a few until you find the one that you like. Remember to click on Apply instead of OK until you are ready to accept one of the choices. Generally, bold colors are not very effective in a map like this, and I sometimes go to the Display tab and in the upper left corner, fill in 25 or 30 % in the Transparent: box.
6. If we want to show something other than just a random color for each country, we could switch from Categories to Quantities. In the Fields/Value drop-down, change from none to POP\_CNTRY, and then move down and choose a fairly dark single-color color ramp and click Apply. We now have a population map of the world. Take a look at the island of New Guinea and notice that the left half is in the heaviest class while the right half is in the lightest. Click on the Identify tool about halfway down the Tools toolbar and click on the dark half. The dialog box shows that this is the country of Indonesia, and when you click you will notice that the whole country briefly turns dark green. The other half of the island is Papua New Guinea, which includes only a few nearby islands. If we go back to Properties/Symbology, we can change the display to population density by normalizing POP\_CNTRY to SQKM\_CNTRY in the Normalization drop-down. Now take another look at New Guinea and click Apply; there is not as much difference between the two parts of the island now. In fact, there seems to be very little difference in most of the world. In order to show more of a difference, we need to move over to Classification and change the number of Classes from 5 to 30 and click OK this time.
7. In addition to being able to identify countries (and cities, rivers and lakes - try them out), we can label features by going to (yet again) Country/Properties – but this time we go to the Labels tab and click on the Label features in this layer box. When you hit Apply, it is evident that we need to set a scale range for the labels. Click on the Scale Range button, check the Don’t show labels when zoomed: button and click on the Out Beyond: drop-down, go to the bottom where it says <Customize This List…> and add 1:25,000,000, click Add and OK and finally OK to the Layer Properties box. Zoom in to Western Europe to see the results. Now try labeling the cities and choosing (and setting) the minimum scale on your own. **However;** this time right-click on Cities to find a way to turn on labels, and use the UK and Western Europe to determine the minimum scale.
8. Click on the globe in the Tools toolbar to zoom to the full extent of the map. If you forgot the scale you used, use the blue arrow that points to the left to take you back to the previous zoom. (I just tricked you into learning a new tool.) Let’s try out a few different projections to see if we can make this into a more pleasing looking map. First, re-apply whatever color ramp that you decided looked best back in step 5. Here’s another cool tip: if you click the – sign in front of Country, the long list of countries will disappear and you can see all of your layers. Right-click on Layers at the top of the TOC and go to Properties and the Coordinate System tab. It will open with the current projected shown, so you have to scroll up to get to the choices. Click the minus sign (-) in front of Geographic Projections then go down to the Projected Coordinate Systems and click on World. Try out at least a dozen different projections by clicking Apply after each choice, and then go back to your favorite and click OK.
9. CaptureThe last feature for today is very handy if you have a shapefile with more information than you need. Assume that all that you really want to work with is Africa, but you don’t have an Africa shapefile. Zoom in to Africa and then right click on Country and choose Selection and (in the Selection fly-out), Make This The Only Selectable Layer. Change to the Selector tool and draw a box around as much of Africa as you can without including countries from any other continent. The counties selected will have a cyan outline. Hold down the Shift key and click any countries that you missed. If you got some extra countries, click them, and the cyan outline should disappear.
10. When you are happy with your selection, right click on Country, go down to Data and choose Export Data from the fly-out. At the top of the dialogue box it has an Export: drop-down menu, which we will leave as Selected features. We will use the same coordinate system, but (***and this is very important***) ArcMap seldom wants to save anything where you want it saved! Click the little folder icon to the right of the Output feature class: box and in the dropdown menu find C\:Users\gisuser\Desktop, then click on ESRIDATA. Change the Name: to Africa, and change the Save as type: dropdown menu to Shapefile. Click on Save, then OK, then Yes when asked if you want to add the shapefile to the existing map. Right click on Country and choose Remove, and you are left with Africa and a bunch of rivers, lakes, and cities floating around the ocean. You can go through the same process for the cities, rivers and lakes if you like.
11. The other half of this removal process is in the amount of information there is available in the database that is part of the shapefile. Right click on your new Africa shapefile in the TOC but this time we aren’t going to Properties, instead we will choose the third category: Open Attribute Table. We added the Editor toolbar earlier, and now we shall use it to delete some of the columns in the Attribute Table. Click on the little drop down Editor, click on Start Editing and look for Africa. If you don’t see it, look at the bottom section of the dialog box and check to see if there is more than one Source listed. Only one source can be active, and the one with a little pencil on the icon is the active source. Click on the other one to see if Africa shows up in the top box. If you still can’t find it, you weren’t paying attention to where you saved the Africa shapefile you created. (Actually, if you agreed to add the new shapefile after you created it, it will add the source automatically.) Now click OK and then Continue when the error message shows up. Let’s assume that the only information we are interested in for our project is the name of the countries, their population, and the area in square miles. We can’t delete the first two columns, but we can delete any of the others. Right click on the column heading FIPS\_CNTRY and choose Turn Field Off, and then do the same to all of the columns (fields) except CNTRY\_NAME, POP\_CNTRY, and SQMI\_CNTRY. Finally, in the Editor drop down, choose Save Edits and then Stop Editing, and you are done!