Geography 380: Map Interpretation & Analysis

Fall 2018 | California State University, Long Beach | Instructor: Hyowon Ban

Lab 1: Planning a Cartography Project

Assigned date: 9/11/2018 | Due date: 9/18/2018
Total credit: 40 points

Introduction

In Lab 1 you will learn how to make a basic map using ArcGIS in section **A** and also learn how to create a bivariate map in section **B**.

A. The 15-Minute Maps: Begin designing a map & Explore and organize data by ESRI

The section A provides useful exercises to create maps by using ArcGIS. They are part of an e-learning course provided by ESRI, entitled "**Planning a Cartography Project**". The course includes three exercises and the first two exercises, "**Begin designing a map**" and "**Explore and organize data**" are requited for this lab. The 3rd exercise "Generalize data" is out of the scope of the lab. In this lab you will follow an instruction provided by ESRI to complete the exercises. The instruction consists of very specific and detailed steps to follow and datasets necessary for the exercises.

How to access the online course

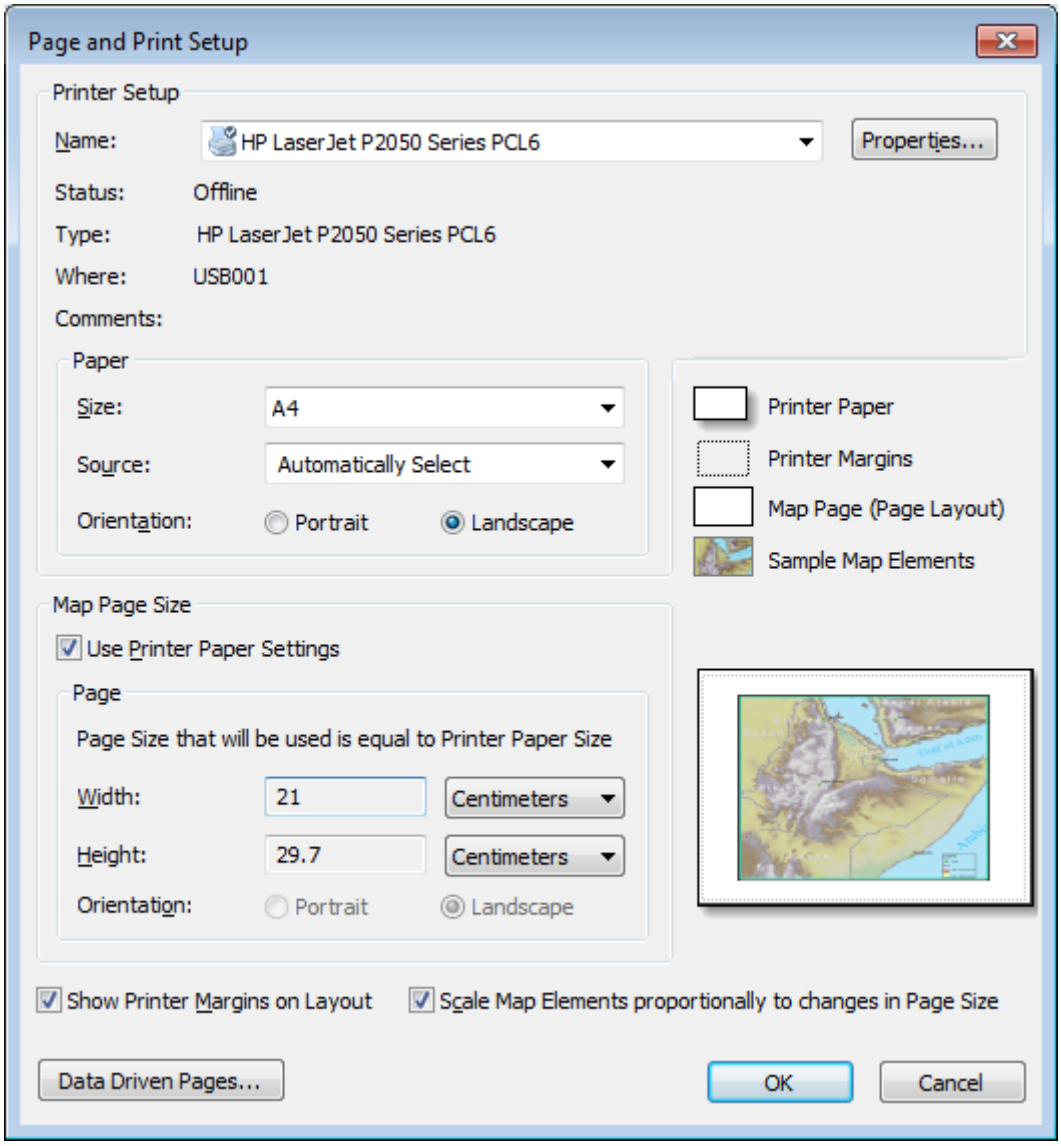
Refer "**Esri ELearning Instructions.pdf**" posted under the Lab1 folder on the BeachBoard. There are 12 steps you can follow to start taking the ESRI e-learning course for this lab. Especially, in the **Step 9** use key words "**planning a cartography project**" to find the course for the lab. Then continue to follow the rest of the steps 10-12.

Access to this course expires 100 days from the date when you started taking the course. Upon expiration, you will no longer be able to access the course materials.

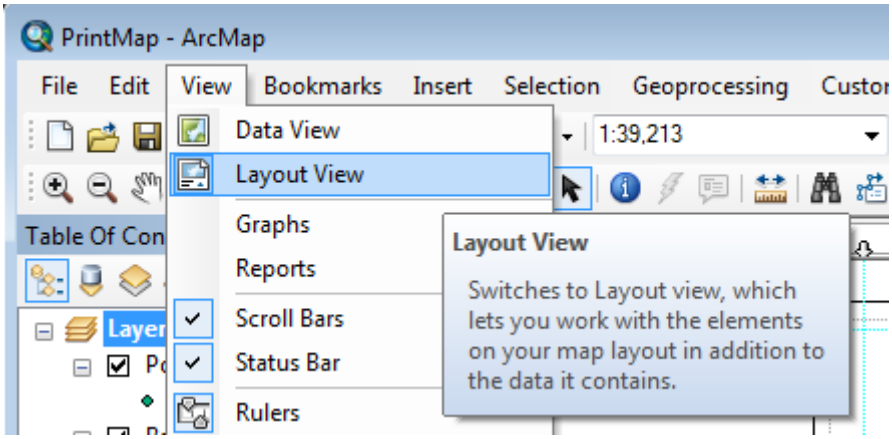
Exercise 1: Begin designing a map

Note: on page 1 of the ESRI instruction, it says that an A1 size wall map will be created. However, in our lab set the size as A4 which is similar to letter size.

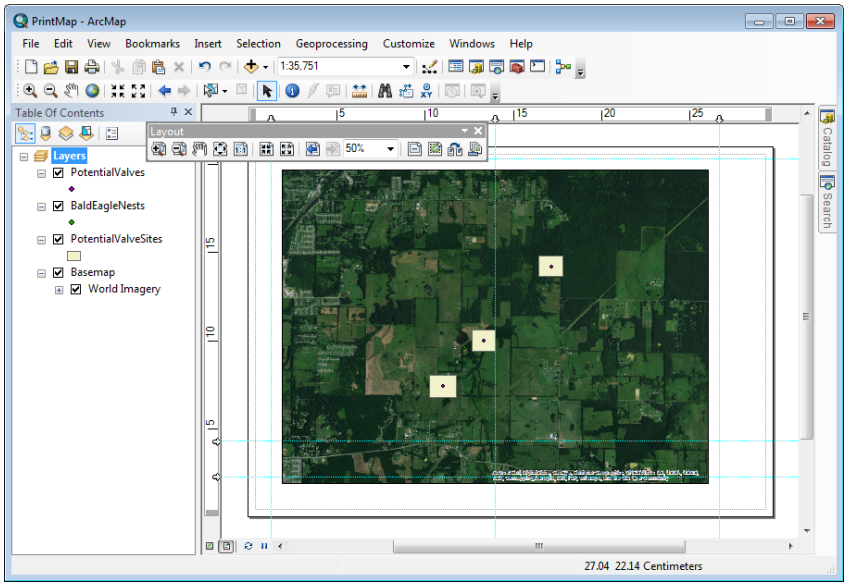
Beginning of addition:
In **Step 4**, use the image below rather thant the image included in the ESRI instruction. Since we are using **A4**-size paper in the Lab 1, the settings for the Page and Print Setup windows would be like this:



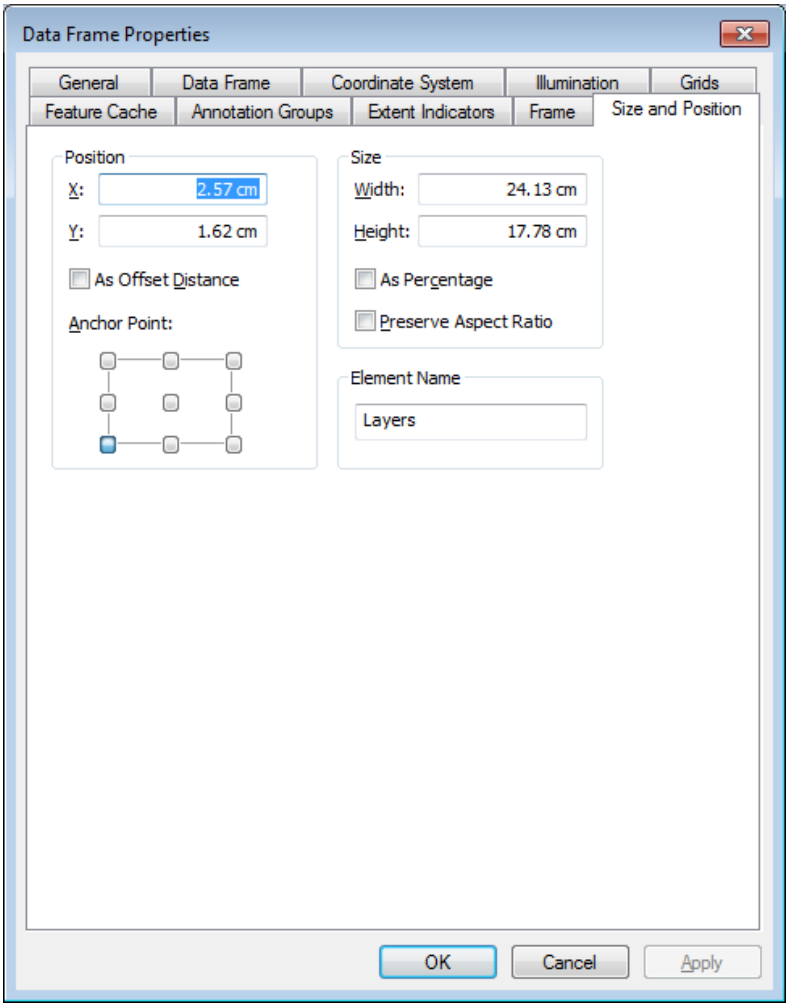
When you are finished the step above, change your view of your ArcMap from Data View mode (current view) to Layout View mode by clicking on **View > Layout View**. Refer the image below:



In the Layout View mode, your map will look like a map page like the image below. Note that the spacing on the left, right, top, and bottom are all different and they do not make the map look good. In the steps below you will modify the parameters of spacing to make your map better.



Below the image in the ESRI instruction, **parameters for Position X, Position Y, Size With, and Size Height** are provided. However, use the following parameters for the Lab1 since again we are using **A4-size paper**. By using the parameters you will see how they work in your map's layout view.



Position X: 2.57 cm
Position Y: 1.62 cm
Size Width: 24.13 cm
Size Height: 17.78 cm

(End of addition)

Q1. Export your map after completion of the Step 4 as a **PNG** image file with at least **300 DPI** resolution. To export your map use **File > Export Map…** menu of ArcMap. To define the resolution and image file type, look at the Options section in the Export Map window. Save your map image in your USB drive.
Include the exported map image in your lab report. To insert the image in your lab1 report, open a new document in Word, click on Insert tab in Word > Picture button > and choose the image from your USB drive. Then the image will be inserted in your word document. **(9 points)**

Q2. Submit your MXD file to the dropbox. **(1 point)**

Exercise 2: Explore and organize data

Q3. Export your map after completion of the Step 4 as a **PNG** image file with at least **300 DPI** resolution. To export your map use **File > Export Map…** menu of ArcMap. To define the resolution and image file type, look at the Options section in the Export Map window. Save your map image in your USB drive.
Include the exported map image in your lab report. To insert the image in your lab1 report, open a new document in Word, click on Insert tab in Word > Picture button > and choose the image from your USB drive. Then the image will be inserted in your word document. **(9 points)**

Q4. Submit your MXD file to the dropbox. **(1 points)**

B. Bivariate mapping

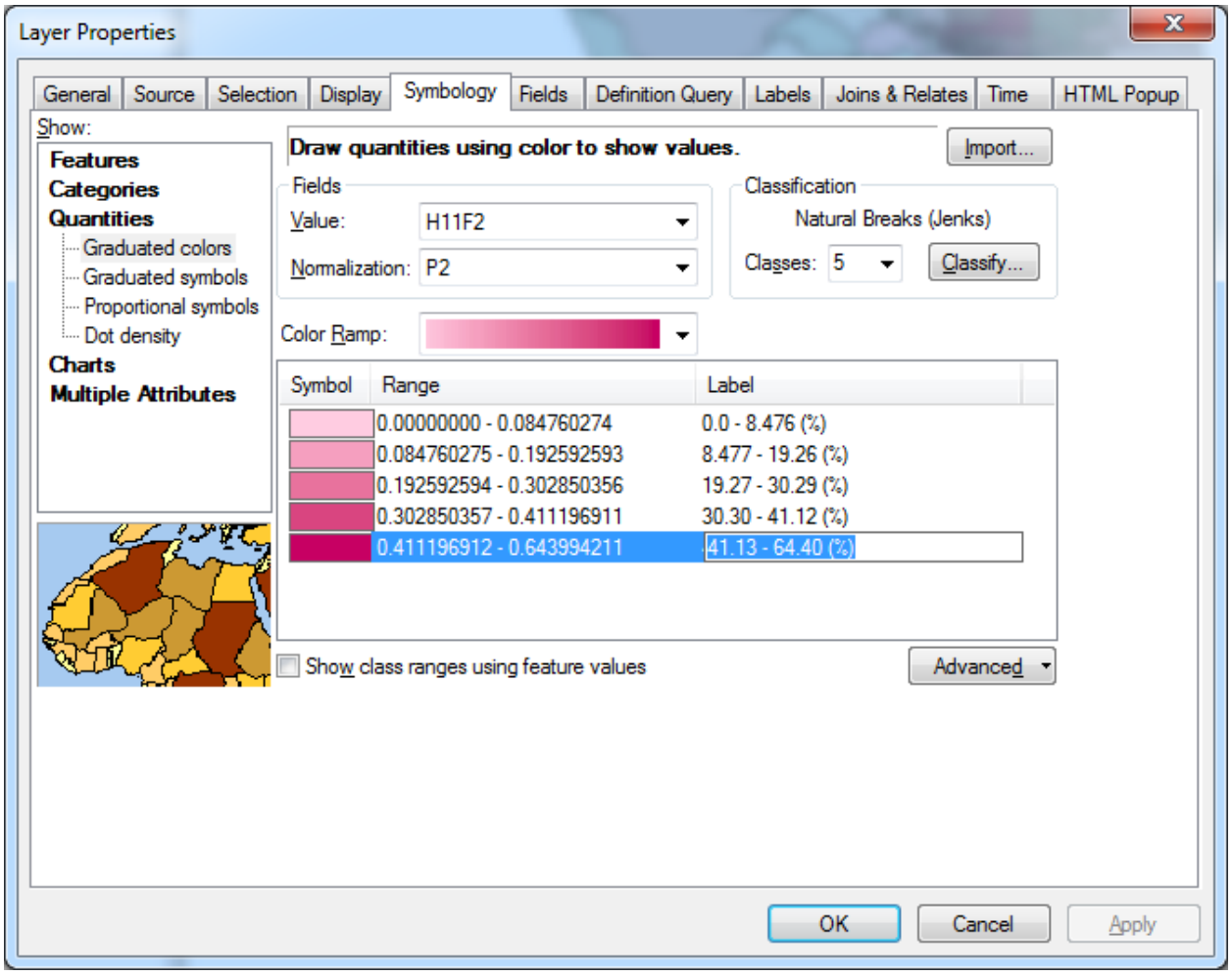
The dataset, lab1_dataB includes demographic data of LA County. Attribute table of the given shapefile **LA_Census2010** includes population of 8 categories of ethnicity and total population for all census tract in LA County. You will create a bivariate map showing distribution of two categories of ethnicity in LA County in the section B. **Choose two variables that you are interested among H11A2~H11H2** below to make your bivariate map.

Codes for column names in the attribute table of the data:

Total population (H11A2): White alone
Total population (H11B2): Black or African American alone
Total population (H11C2): American Indian and Alaska Native alone
Total population (H11D2): Asian alone
Total population (H11E2): Native Hawaiian and Other Pacific Islander alone
Total population (H11F2): Some other race alone
Total population (H11G2): Two or more races
Total population (H11H2): Hispanic or Latino
Total population (P2): All races

1. Open a New ArcMap.
2. Add LA_Census2010 shapefile twice in ArcMap. In the New Document window, choose My Templates > Blank Map.
3. Create a bivariate map by following the steps 4~8 below. You can choose any race group among the 8 groups (H11A2~H11H2) in the data to do this lab.
4. Symbolize the upper layer to symbolize the 1st variable that you chose with one color scheme, and the lower layer to symbolize the 2nd variable using another color scheme.
5. To do so, open **Layer Properties** window of the upper layer by right clicking on the name of the **upper layer > Properties… > Symbology tab > Quantities > Graduated colors**.
6. To normalize your data you can define the **Value: field** as your new column for the 1st variable you chose and the Normalization: field as **P2** (total population).
7. Values from #6 should show **rate (%),** however the current values appearing in the Label section are not showing % values. To make the values as %, you can adjust the values in the Label section manually. To do so, **click the first range values in the Label section and type in 100-time larger value ranges. Do the same for all other value ranges in the Label section**.

   Refer the image below to change the range values in the Label section.

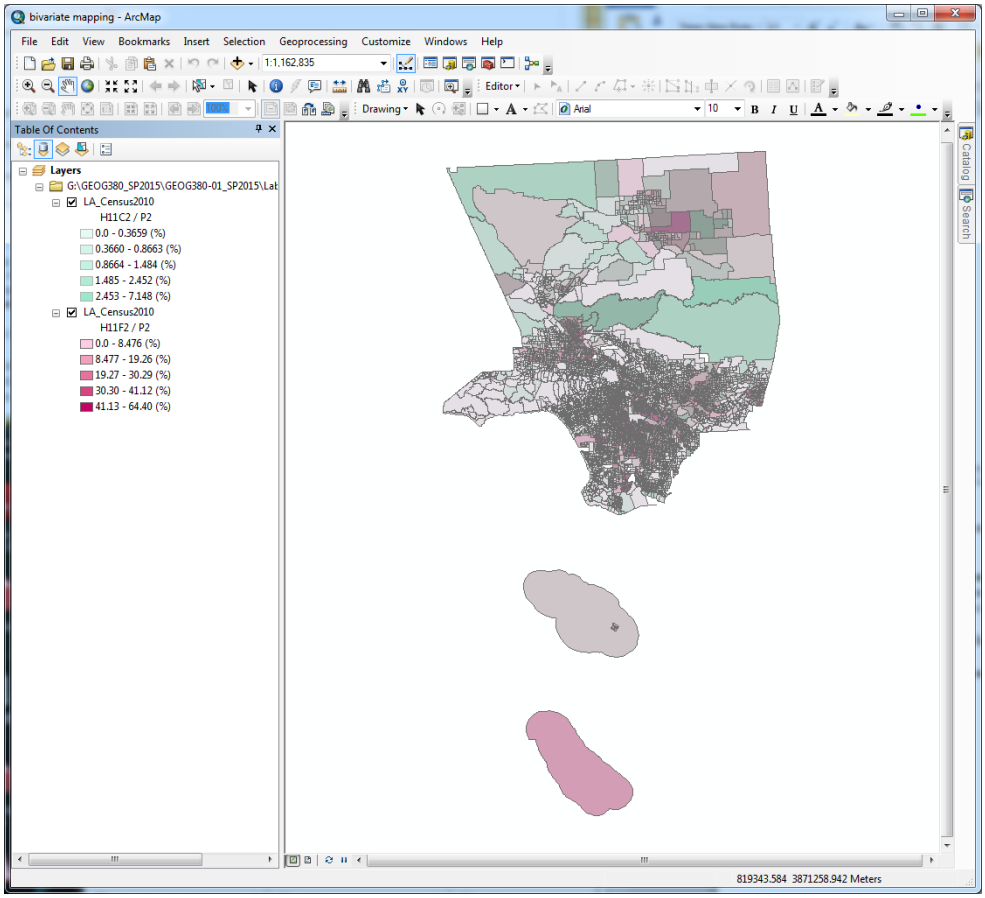


8. Repeat #4~#7 for the lower layer to **symbolize your 2nd variable**. Make sure to use **two complementary colors from the color wheel** for the upper layer and the lower layer to have gray-scaled effect for areas that have similar values of the two variables. Refer the lecture note #4, p.21 for details.
9. Give the upper layer some **transparency** so that the colors between the two layers mix together to create a bivariate color scheme. To do so, bring up the **Layer Properties window of the upper layer > Display tab > set the transparency** about **50%.**

Q5. Make a screen capture of your ArcMap that shows your results of the #9 and insert it in your lab1 report. (**20 points**).

Tips: To make a screen capture: select your ArcMap window > press Alt+Prnt Scrn keys from your keyboard > open MS Word or other word processor > paste (Ctrl+V keys) > Save the write-up document to your USB drive.

Your map may look similar to the map below. FYI, you can use other pair of colors in your map as far as they provide gray color scheme, too. Just make sure to choose two complementary colors on the color wheel.



Lab Deliverables:

Submit your completed **lab 1 report** and **two MXD files** to the BeachBoard "Lab1" dropbox by the due date. Your lab1 report should include your answers for Q1, Q3, and Q5.

- **Please DO NOT use other file formats than Word, Open Office, or PDF**.
- Please use a separate document for your lab report. **DO NOT directly insert your answers to this lab instruction.**

If you have any questions feel free to let me know.

Good job! You finally finished Lab 1!