Cookbook 4 September 2013

A Professional Map!

Overview

1. A Professional Map!
2. Course Logistics
3. Homework Assignment #1

Damn, President Dobelle just called… he needs the following map ASAP:

A map of the 351 towns in MA where the towns are colored based on population in 2000. He wants this map printed in black/white and sent to him as a PDF file.

Details

- 8.5 by 11, landscape, professional map layout and map design.

You have 30 minutes to complete your map. Then, we print our maps, put them on the large table, and discuss them. The goal: make a simple, yet professional map with all the necessary map elements.
1) A Professional Map!

GIS, starts with making meaningful and intelligent maps!

To me, the map sheet starts as an empty canvas (or poster board) on which you display the results of your GIS analysis. You can present these results in a variety of ways, including maps (i.e. data frames), graphs, tables, text, and photographs. An intelligent map combines all of the above so that the GIS analysis is presented professionally, accurately, comprehensively, and visually-pleasing.

Map Sheet
That’s the piece of paper that the map is printed on. The size of the map obviously impacts the size and number of your data frames, graphs, tables, text, etc. Common sheet paper sizes are: 8.5 by 11 inches, 18 by 24 inches, and 24 by 36 inches. In addition, larger color printers print using rolls of paper, typically 3 feet wide.

Data Frames
Your map sheet will typically show a series of data frames – each showing a map consisting of a series of map layers containing your GIS analysis. One data frame may show an overview map, whereas other data frames show the data analysis.

Graphs
Often, it is better to illustrate the relationship between variables as graphs, for example line graphs, scatter plots, bar graphs, pie charts, etc. It is usually best to create these graphs in MS Excel and copy them into your map. This is especially useful if you are quantifying the correlation between two variables.

Tables
Often, it is useful to summarize your data or results as a table (= data arranged as rows and columns). It is usually best to create the table in MS Excel and copy it into your map. In some cases you may include the actual data mapped in the data frames as a table.

Text
Don’t forget to use text to convey information. An intelligent map typically includes a few sentences or paragraphs of text to explain your GIS analysis.

Photographs
Photographs can be very useful to illustrate an important aspect of your GIS analysis.

All these items are arranged on the map sheet (using the guidelines) to create a final GIS poster to present your GIS analysis professionally, accurately, comprehensively, and visually-pleasing.

This GIS Poster shows the results of a land use change analysis between 1971 and 1999 for West Springfield (MA). Overall, this is not really a map, but rather a canvas or poster compiling various ways you can present your data and analysis.
• 5 data frames with 5 maps.
• 1 table summarizing the results, created in MS Excel.
• 2 pie charts illustrating one important aspect of the results, created in MS Excel.
• Text explaining the analysis and the results.
• The GIS Poster is accompanied by a written report documenting the analysis, presenting the results, and discussing the implications.

The entire poster with the 5 data frames and associated legends was created in ArcGIS. The table and pie charts were created in MS Excel and copied/pasted into ArcGIS.

Your GIS poster should be able to ‘stand-alone’ and be understandable without additional explanations or an accompanying written report. Think of it as being displayed on the wall outside of Bates 22 – a normal person walking by should be able to fully understand your poster.

Poster Design Tips

• [http://www.ncsu.edu/project/posters/NewSite/index.html](http://www.ncsu.edu/project/posters/NewSite/index.html)
• [http://www.kumc.edu/SAH/OTEd/jradel/Poster_Presentations/PstrStart.html](http://www.kumc.edu/SAH/OTEd/jradel/Poster_Presentations/PstrStart.html)
There are language-specific ways in which most people read. In English, it is top-to-bottom and left-to-right. Wheildon (1995) called this "reader gravity." You should not use organizational constructs that defy reader gravity - it will confuse viewers, which is not what you want to happen.

Your poster should have a good visual balance of figures and text, separated by white space. Balance occurs when images and text are reflected (at least approximately) across a central horizontal, vertical, or diagonal axis. This axis is known as the axis of symmetry.

After: [http://www.ncsu.edu/project/posters/NewSite/CreatePosterLayout.html](http://www.ncsu.edu/project/posters/NewSite/CreatePosterLayout.html)

**More Information**

- Map and Page Layouts
- More about map design, fonts, colors, etc.:
  [http://www.westfield.ma.edu/cbraun/resources/gis-resources/](http://www.westfield.ma.edu/cbraun/resources/gis-resources/)
1.1) Map Elements

The following are mandatory map elements that have to be always included on any map for legality, clarity, and beauty.

1. Map Title. Every map needs a title = a short and meaningful description of the map, usually located above the map.
2. Your name, affiliation, and date. Example: Map prepared by Carsten Braun, Westfield State University, 02/25/2013.
3. Data Credits = extremely important: You always have to cite the source(s) of all data you are using in a map.
4. Scale Bar. Use meaningful units and meaningful ranges depending on the size and scale of your map. For example, the scale bar for a driving map is probably best shown in miles.
5. North Arrow. That’s your classic map element…you need to orient your map in space by providing a North Arrow.
6. Map Legend. Meaningful, comprehensive, and well-designed. Good legends are the key to a good map. Always use an appropriate classification system with reasonable break points.
7. Text. Every map needs helpful, well-written explanatory text = a description of map and the information it conveys.

Optional map elements that can be included on map:

- Neat Lines (= a frame around all map elements) to tie all map elements together.
- Logos of your company, business, or agency. For example, you could add the Westfield State University logo to your maps.

Finally:

- A map should be visually-appealing, aka beautiful.
- A map should be neat and error-free.
- A map should be well-organized.

Suggestions:

- Use simple fonts with appropriate font sizes (not too small, not too big).
- Use italics, bold, underline as appropriate.
- Align your map elements using guide lines.
- Your north arrow and scale bar should be readable, but not too large.
- Your legend should be readable, but not too large.
- Map Elements
1.2) Choropleth Maps

Understand your data: Look at the histogram!

1. Explore the histogram = how are the data distributed?
2. Are there any meaningful break-points for the map user?
3. How do you handle outliers?

How to select your classification and break-points:

- Select the appropriate classification method (Equal Interval, Quantile, Natural Breaks, Custom, etc.)
- Select the appropriate number of classes (1 to ???)
- Select appropriate break-points
- Select appropriate color ramp (monochromatic, panchromatic)
- Select sorting (normal or reversed)

Demographic data are usually not evenly-spread, but rather highly-skewed. For example:

- Many states/counties/cities with a small number of Hispanics.
- Few states/counties/cities with a large number of Hispanics.

Understand your data: Choose your break-points!

- Choose even/round break-points.
- Zero can be a useful break-point as it separates gains from losses.
- The national (state) average can be a useful break-point when showing state (local) data.
Additional Information

- Using Graduated Colors
- Using Graduated Symbols
- About Classification for Choropleth Maps
  http://resources.arcgis.com/en/help/main/10.1/index.html#/Classifying_numerical_fields_for_graduated_symbology/00s50000001r00000000/
- About Classification Legends
  http://resources.arcgis.com/en/help/main/10.1/index.html#/Working_with_the_Classification_Legend/00s50000002800000000/

About Colors

- Colours in Culture explained:
  http://www.informationisbeautiful.net/visualizations/colours-in-cultures/
- Interactive color advice for cartography at http://colorbrewer2.org/
2) Course Logistics

Course Website
http://www.westfield.ma.edu/cbraun/teaching/advanced-gis/

GIS Resources
http://www.westfield.ma.edu/cbraun/resources/gis-resources/

We will use an online collaboration tool = a discussion forum or blog so we can collaborate, share data, and exchange information in an informal but effective manner.

I will not answer any individual questions for help, explanation, or clarification! Instead:

1) Ask Dr. ArcGIS Help!
2) Ask Dr. Esri Resource Center!
3) Ask Dr. Google!
4) Ask the Team!

What communication tool to use? PLATO, Facebook, Blogger, Yammer ???
3) Homework Assignment #1

The objectives for this assignment are pretty simple: 1) to get ready for the next two weeks of Online GIS and the rest of the semester, and 2) to practice and further improve your mapping skills. This assignment consists of eight tasks as detailed below.

1. Read the syllabus and decide if this class is for you!
2. Get the required course resources as specified in the syllabus.
3. Create yourself a Google Account.
5. Make your map from today perfect and send it to me as a PDF file from your official Westfield State Email account.
6. Read Jerry’s Crime Mapping Tips and consider the following:
   - Sort Jerry’s ten tips from most important to least important and explain the reasoning behind your sorting.
   - Ten is an arbitrary number. Add your own two tips and explain why you think these two tips should be included in a top-twelve list.
7. Define the five things that you want to learn in this semester – be specific!
8. Watch this video (~14 minutes):
   http://www.youtube.com/watch?v=SS81rq1MI5Y&feature=share&list=PL4412589C6E9CD867

Deliverables

Please submit professional report using proper English language and professional formatting and layout. Think in terms of using it as a sample of your work for a job interview. Include:

- Jerry’s Tips: sorted, explained, and expanded (1-2 pages)
- Your five things (~0.5 page)
- Your perfected map (exported as a JPG image and inserted as the last page of your report).
- Due Date: Monday 9 September 2013 at the beginning of class.

Please include a cover page and page numbers in the page footer of all pages.

➤ Contact me for help or clarification of this assignment or my expectations as needed.