



## **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.

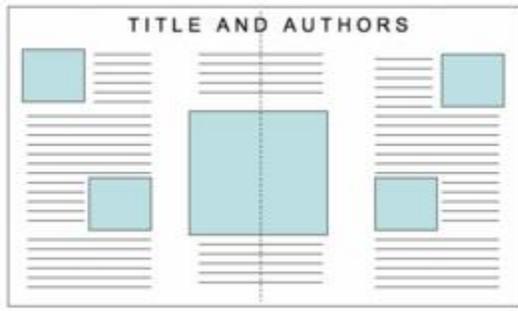
All these items are arranged on the map sheet (using the guidelines) to create a final GIS poster to present your GIS analysis professionally, accurately, comprehensively, and visually-pleasing.

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.

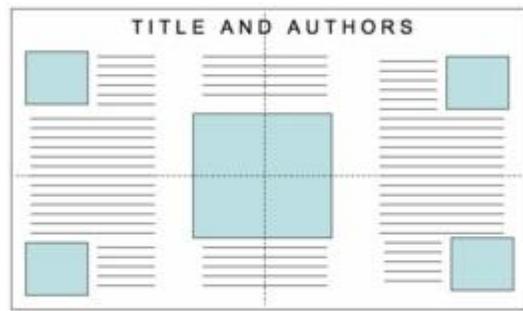


There are language-specific ways in which most people read. In English, it is top-to-bottom and left-to-right. Wheildon (1995) called this "reader gravity." You should not use organizational constructs that defy reader gravity - it will confuse viewers, which is not what you want to happen.

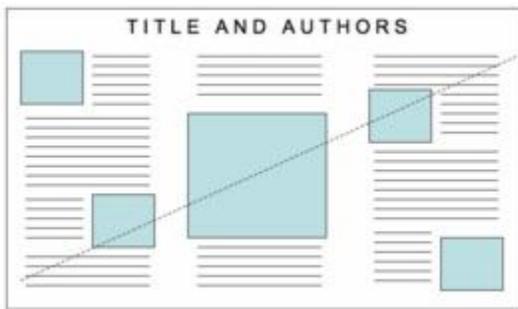
Your poster should have a good visual balance of figures and text, separated by white space. Balance occurs when images and text are reflected (at least approximately) across a central horizontal, vertical, or diagonal axis. This axis is known as the axis of symmetry.



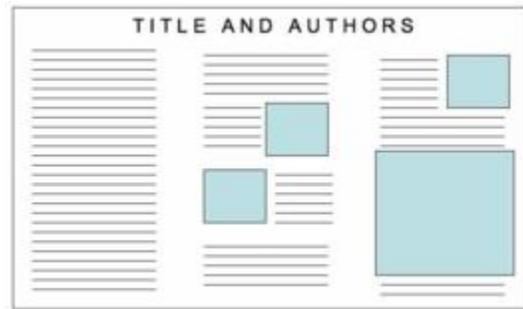
Horizontal Symmetry



Vertical Symmetry



Diagonal Symmetry



Asymmetry: text-heavy on the left side, image-heavy on the right side

After: <http://www.ncsu.edu/project/posters/NewSite/CreatePosterLayout.html>

### More Information

- Map and Page Layouts  
[http://resources.arcgis.com/en/help/main/10.1/index.html#/A\\_quick\\_tour\\_of\\_page\\_layouts/00s900000007000000/](http://resources.arcgis.com/en/help/main/10.1/index.html#/A_quick_tour_of_page_layouts/00s900000007000000/)
- More about map design, fonts, colors, etc.:  
<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  
[http://resources.arcgis.com/en/help/main/10.1/index.html#/Map\\_elements/00s90000002000000/](http://resources.arcgis.com/en/help/main/10.1/index.html#/Map_elements/00s90000002000000/)

## 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:

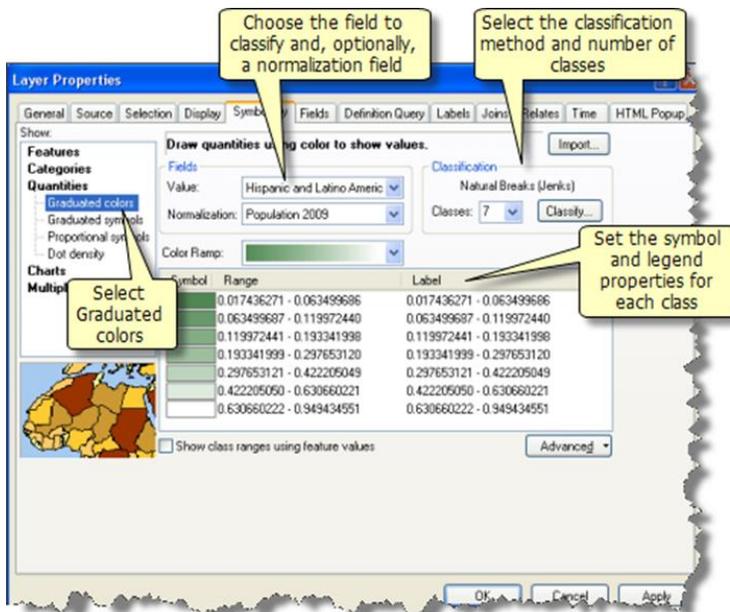
- Select the appropriate classification method (Equal Interval, Quantile, Natural Breaks, Custom, etc.)
- Select the appropriate number of classes (1 to ???)
- Select appropriate break-points
- Select appropriate color ramp (monochromatic, panchromatic)
- Select sorting (normal or reversed)

### 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.

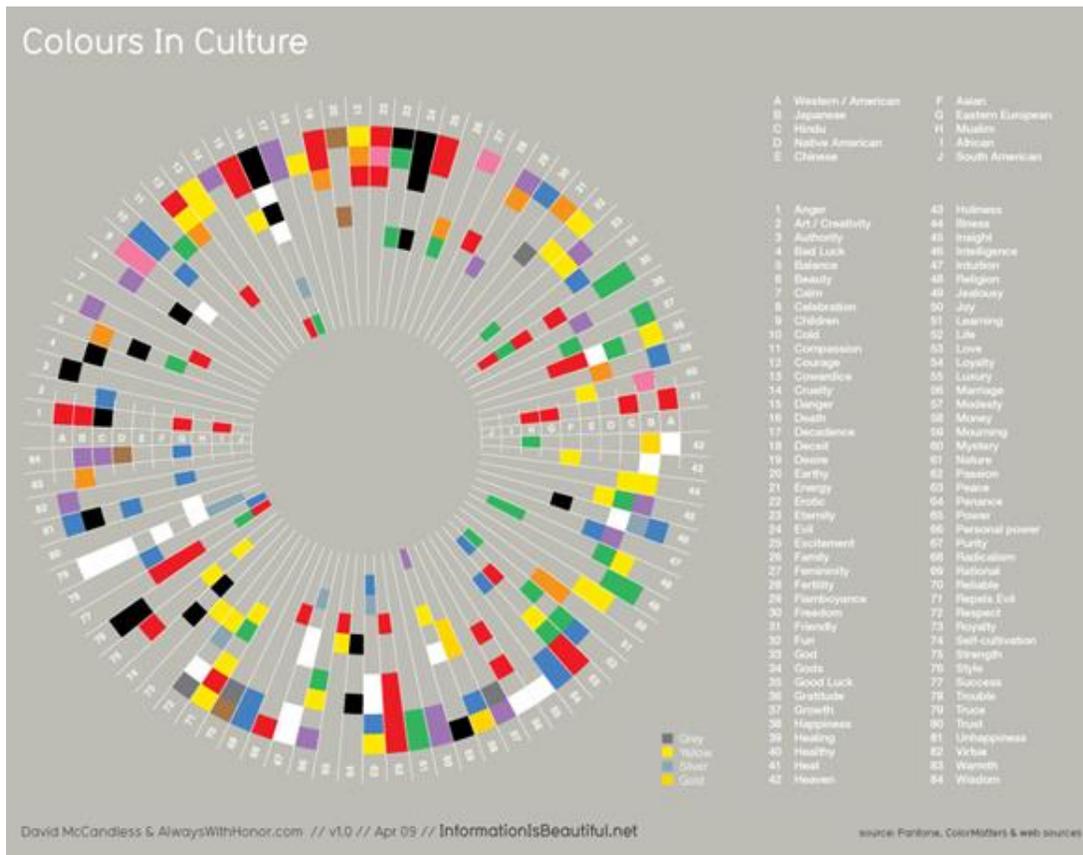


## Additional Information

- Using Graduated Colors  
[http://resources.arcgis.com/en/help/main/10.1/index.html#/Using\\_graduated\\_colors/00s500000029000000/](http://resources.arcgis.com/en/help/main/10.1/index.html#/Using_graduated_colors/00s500000029000000/)
- Using Graduated Symbols  
[http://resources.arcgis.com/en/help/main/10.1/index.html#/Using\\_graduated\\_symbols/00s500000024000000/](http://resources.arcgis.com/en/help/main/10.1/index.html#/Using_graduated_symbols/00s500000024000000/)
- About Classification for Choropleth Maps  
[http://resources.arcgis.com/en/help/main/10.1/index.html#/Classifying\\_numerical\\_fields\\_for\\_graduated\\_symbolology/00s50000001r000000/](http://resources.arcgis.com/en/help/main/10.1/index.html#/Classifying_numerical_fields_for_graduated_symbolology/00s50000001r000000/)
- About Classification Legends  
[http://resources.arcgis.com/en/help/main/10.1/index.html#/Working\\_with\\_the\\_Classification\\_Legend/00s500000028000000/](http://resources.arcgis.com/en/help/main/10.1/index.html#/Working_with_the_Classification_Legend/00s500000028000000/)

## About Colors

- Colours in Culture explained:  
<http://www.informationisbeautiful.net/visualizations/colours-in-cultures/>
- Interactive color advice for cartography at <http://colorbrewer2.org/>



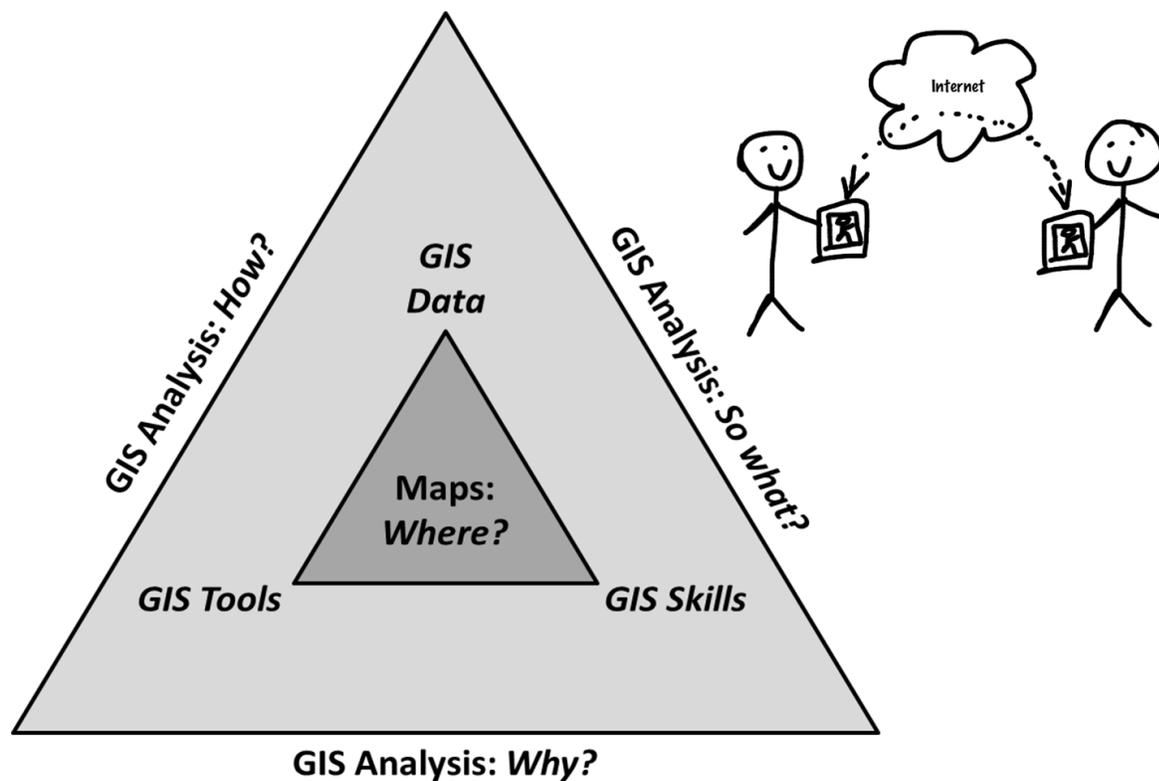
## 2) Course Logistics

### 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 e 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.
4. Create yourself an Esri 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.***