GIS Lecture 3: GIS Outputs

U.S. Population by County

- Data obtained from U.S. Census 2000
- Map created by Kitts Kilgore, Carnegie Mellon University
Outline

• Map Output Overview
• Map Audiences
• Map Layouts
• Map Scales
• Multiple Maps
• Reports and Graphs on a Layout
• Exporting Maps
Map Output Overview

- Design maps for appropriate medium
  - Print vs. electronic
- Plan a layout
- Link layouts to map purpose
- Choose appropriate export options
Map Output Overview

• Do I know what my map’s story is?
• Am I using the right map projection?
• Am I using data at the right level of generalization?
• Is my symbology clear?
• Do my symbols match my data?
• Have I used the right text symbols?
• Does my map have figure-ground organization?
• Does my map have good visual hierarchy?
• Do I need to add anything else to my map?
• Have I asked for a critique?

• “Making a Meaningful Map” in ArcUser Fall 2011
# Map Audience

<table>
<thead>
<tr>
<th>Map Use</th>
<th>Exploration</th>
<th>Presentation</th>
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</thead>
<tbody>
<tr>
<td>Audience</td>
<td>Trained Analyst</td>
<td>General Public</td>
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<tr>
<td>Purpose</td>
<td>Visual Thinking</td>
<td>Communication</td>
</tr>
<tr>
<td>Advantages</td>
<td>Graphical</td>
<td>Believable</td>
</tr>
<tr>
<td>Granularity</td>
<td>Fine</td>
<td>Coarse</td>
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</table>

**Symbols:**
- Abstract:
  - capital
  - railroad
- Mimetic:
  - Railroad
  - Capital
Map Layouts
Map Layout Elements

- Main map
- Map title and subtitle
  - what, where, and when
- Legend
- Data sources
- Graphic scale
- North arrow
- Rectangular boundary (neatline)
- Inset (overview) maps
Map Layout Elements

• Other components
  - Data table
  - Chart
  - Additional text
  - Photographs
  - Decorative items (drop shadows, logos, etc.)
Fonts

• Simple and legible
• Formal or informal
• Number of fonts
• Special characters
  - degree symbols, degrees minutes seconds, ESRI symbols
• Placement
• Halos
  - shadows to contrast background
ArcView Layouts
Example of a bad map...
A better map...

Percentage Unemployment - Pittsburgh, PA 2000

% Unemployment By Census Tract
- less than 5%
- 5.1% - 10%
- 10.1% - 20%
- 20.1% - 30%
- 30.1% and greater

Data Obtained from U.S. Census - [http://www.census.gov](http://www.census.gov)
Example of a bad map...
Map Scales
Map Scales

Map Scale Ratios ("scale text")

- Dimensionless
- Used with any linear measurement unit, such as feet, meters, or miles
- For example, 1:24,000
  - Representative fraction
  - 1 inch on the map is 24,000 inches on the ground (or 2,000 feet)

Graphic Scale ("scale bar")

- Graphic representation of map scale
- Places a line on the map with ground distances marked, such as 10 miles, 20 miles, etc.
Map Scales

1:5,000 is *large* scale

1:50,000,000 is *small* scale
Scale 1:100,000 (Medium Scale)
Scale 1:24,000
Scale 1:5,000 (Large Scale)
Map Units

Feet or meters is the map unit for many local government GIS applications.
Multiple Maps, Reports, Graphs
Multiple Maps – Comparing Data
Create a report

Select records for a report

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Reports on a Layout


<table>
<thead>
<tr>
<th>State</th>
<th>Asian</th>
<th>Total</th>
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<tbody>
<tr>
<td>California</td>
<td>3,667,513</td>
<td>33,871,646</td>
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<td>New York</td>
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<td>18,976,457</td>
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<td>Texas</td>
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</table>

Legend
- **ASIAN**
  - 0 - 50,000
  - 50,001 - 100,000
  - 100,001 - 500,000
  - 500,001 - 1,000,000
  - 1,000,001 - 5,000,000
  - 5,000,001 - 10,000,000
  - 10,000,001 and greater

Source: U.S. Census Bureau
Create a graph
Create a graph
Exporting Maps
Export Options

Raster
• .BMP, .TIF, .JPG
• Size/Resolution
• Color options

Vector
• Enhanced Metafile (.emf), Encapsulated PostScript (.eps), Adobe Illustrator (.ai)

Web
• .JPG, .PDF
Export Options
Exporting Images

(.JPG, .BMP, .TIF, etc.)

2009 Hill District Crimes, Pittsburgh PA

Source: City of Pittsburgh Police, City Planning
Exporting PDFs
Exporting Maps (PPT, Word, etc.)

Copy each object
Exporting Maps (PPT, Word, etc.)

Paste into PowerPoint or another application
Summary

- Map Output Overview
- Map Audiences
- Map Layouts
- Map Scales
- Multiple Maps
- Reports and Graphs on a Layout
- Exporting Maps
* Tutorial 3 tip *

• don’t do 3-7 (Data Driven Pages)

• 3-8 optional (Map Animation)