GEOL 452/552
-
GIS for Geoscientists I

Lecture 7 - chapter 3

Lecture Plan

- Chapter 3 - Presenting Data (as a map, poster, ...)
- Map design process (Layout mode)
- Use of colors, balanced layout
- Some books about maps - you're welcome to borrow them (I especially like Making Maps)
- Look at (color brewer) http://colorbrewer2.org/
- Labeling options
- Lab: Ch 3 tutorial (1 - 48)

Map Design Process

In Data view

- Determine the objectives of the map
- Who is its user or audience? (Examples?)
- What's your goal? What needs to be communicated?
- Data layers needed for the objective)?
- (Perform analysis - creates additional layers)
- Choose colors and symbols for layers to "visualize" the data
- Put layers into data frame (decide on data frame scale)
- (optional: add lat/long graticule or UTM coordinate grid)
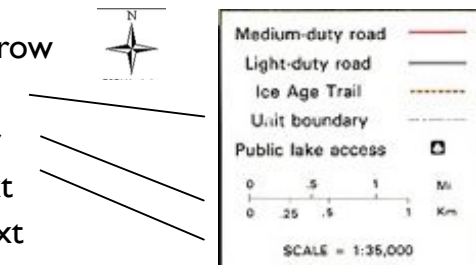- Decide on "physical" paper size (go to layout mode)

In Layout view

- Add more map elements (depending on need of audience!) :
  - north arrow
  - legend,
  - scale bar
  - scale text
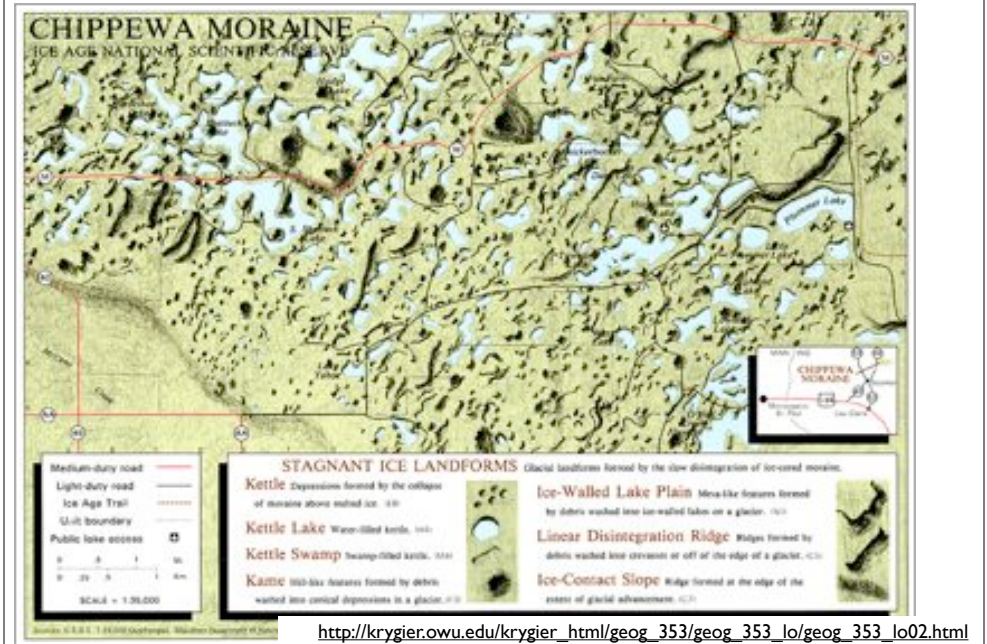 - other text
  - images

- **layout** the data frame(s) and map elements on the "physical paper" (balance elements)
- Check for readability of text (labels) - adjust size
- Print map or make pdf/jpg (File - export map)
- Let's look a some examples of maps

Slide 5

Big Bear Lake

www.neatline.net/Pictures/cartography.html

Slide 6

Comments about the map elements? Layout? Anything missing?

http://krygier.owu.edu/krygier_html/geog_353/geog_353_lo/geog_353_lo02.html

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Slide 7
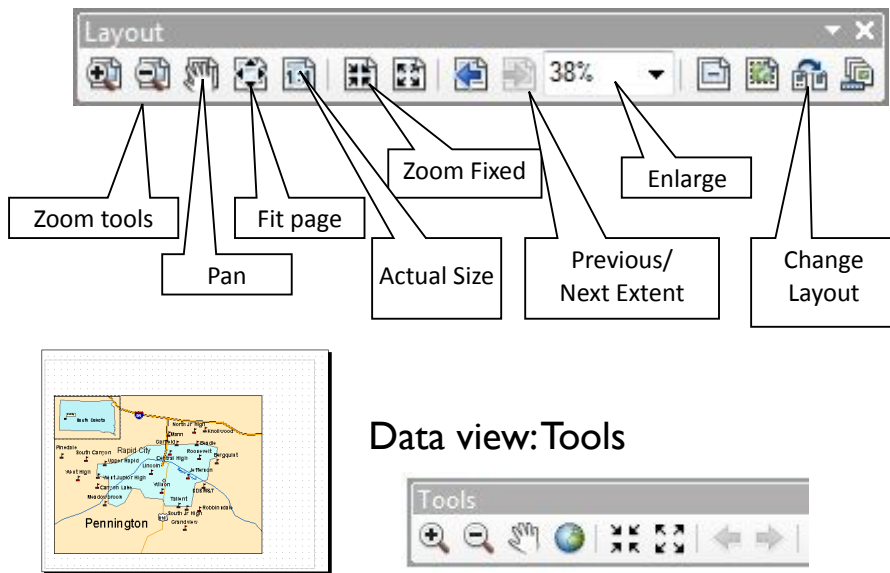
Assembling a map - some tips

- Be **selective** about the amount of information

- Too many layers: visual clutter!

- Have the **important** elements stand out (via: color, size)

- Spread different layers over different data frames:

- Tell a story: Here's the overall situation (Frame A),
  here's the problem (Frame B), here's a solution (Fr. C), etc.

- Add charts, images and text to support your story

- **Do not make the reader work needlessly!**

- Provide **spatial (geographic) context**: (show roads, zoom-in
  from big-picture, schematics)

- Add a grid, helps if coordinates must be looked up

Slide 8

- Use "round" map scale
  (1:24,000 not 1:23,766)

- Use reasonable scale bar divisions (1 - 2 - 5, 1 - 7 - 5, 1 - 2 - 5)

- Add coordinate system info, author, date (can be very small)

- Use clear layer names (attributes) in legend:
  Population in 1990 not just **POP90** (pop vs soda? pop music?)

- Legend: use nice value ranges: 100 - 120 not 102 -123

- Aim for **even distribution** of all map elements

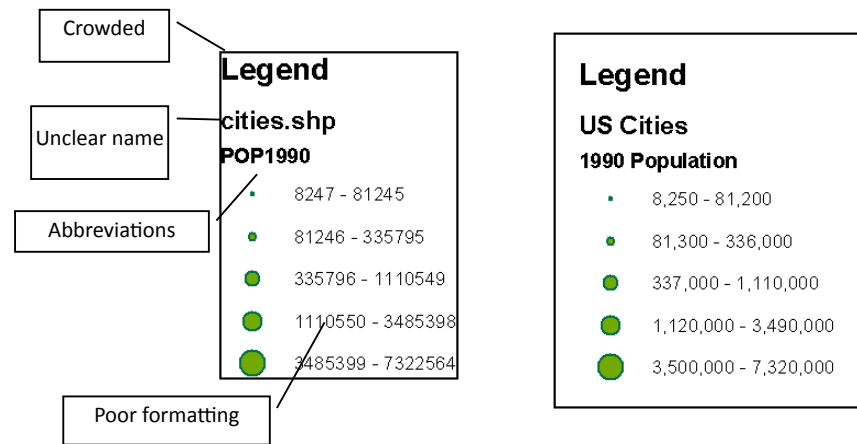- Zoom/pan in Data view is different from Layout view (tool bar)

The Layout toolbar

Layout

Zoom tools
Pan
Fit page
Actual Size
Zoom Fixed
Previous/ Next Extent
Enlarge
Change Layout

38%

Data view: Tools

Tools

Fixing up the Legend

Crowded

Unclear name

Abbreviations

Poor formatting

Legend

cities.shp
POP1990

- 8247 - 81245
- 81246 - 335795
- 335796 - 1110549
- 1110550 - 3485398
- 3485399 - 7322564

Legend

US Cities
1990 Population

- 8,250 - 81,200
- 81,300 - 336,000
- 337,000 - 1,110,000
- 1,120,000 - 3,490,000
- 3,500,000 - 7,320,000

Basic principles for balance

- (Disclaimer: I'm not a graphics designer!)
- Balance elements on the page:
  - aim for a even distribution (visually pleasant)
  - avoid cluttered areas
  - manage blank areas (empty or "negative" space)
- Align straight edges (data frames, text boxes, images)

Transportation and Land Use
Prince George's County, Maryland

Transportation and Land Use
Prince George's County, Maryland

Empty space

from:
Designing better Maps
(Cynthia Brewer)

Slide 13

Neatlines (boxes): help to convey the visual structure
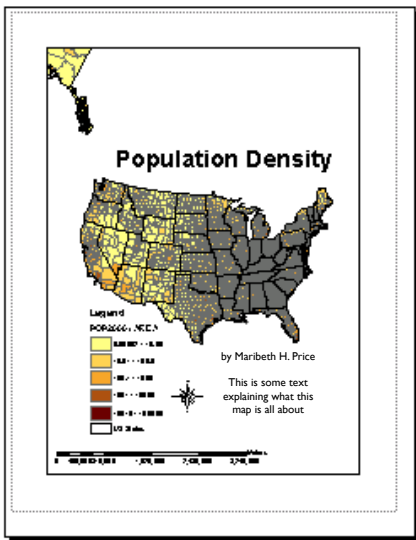
Neatlines

no visual structure
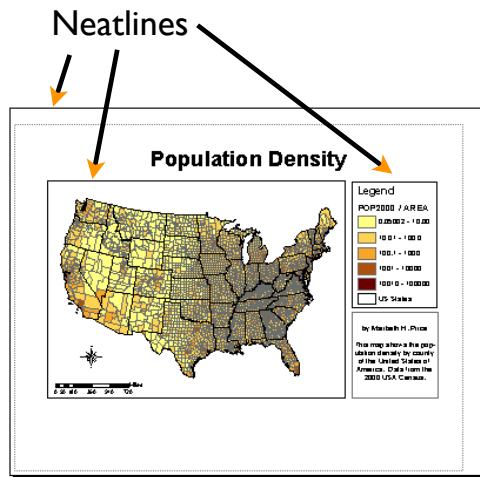
Neatlines enable visual structure

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Ghost Towns of Knox County, Ohio

Fleaville Jog Route

Ghost Towns & Cemeteries Attribute Query

Elevations of Knox Cemeteries

In Feet

Towns	Lakes
Ghost Towns	Classified Hydrologic Features
Cemeteries	H01 Perennial Shoreline
U.S. Highway	H11 Perennial Stream
State Highway	H12 Intermittent Stream
Geocoded Route	H70 Nonvisible Boundary
	H71 USGS Closure Line

Created By:
Annette Harpster
Paul Johnson
Todd Mitchell

Geography 306
Professor Craine
NAD_1983_UTM_Zone_17N
Projection: Transverse_Mercator

www.neatline.net/projects.html

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Finding Stars in the Glow

Note: space between elements, neatline boxes, alignments along edges

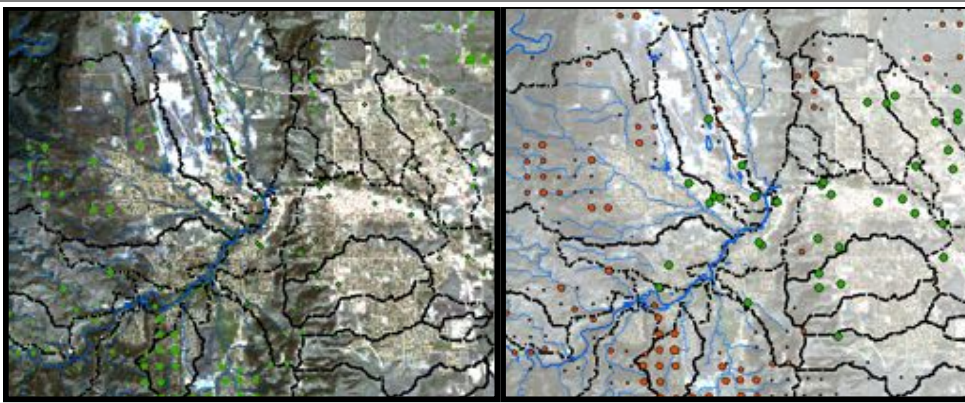http://www.neatline.net/projects.html

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Slide 16

Choosing colors and symbols

- Natural earth tones usually look better than clashing (loud, obtrusive) colors (exception: emphasis!)

- Mimic nature tones, such as using blue to represent water

- Use pastels or subdued colors for most of the map; use bold colors only for **emphasis**

- Make ramps easy to understand (single "main" color)

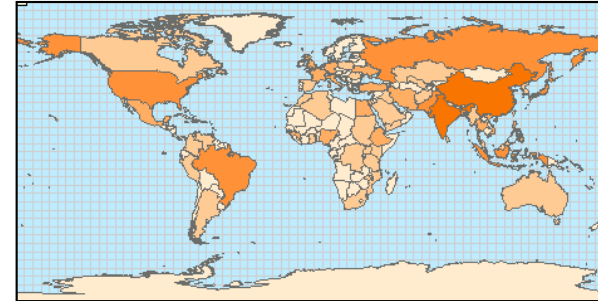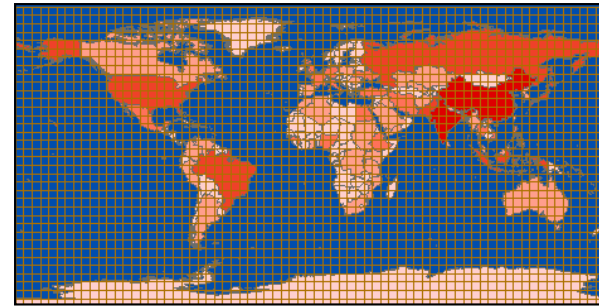- Symbols: emphasis with color, size, and thickness

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Compare these two maps:

• How many layers in each map?
• How is the data "within" the points and lines expressed visually?
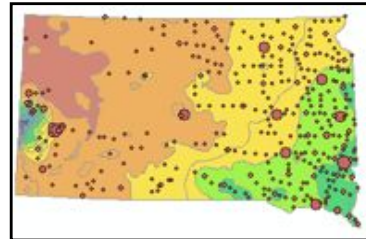•Contrast?
•Choice of colors?
•Labels?

•Pastels and natural colors

•(light-dark) color ramp to indicate increasing population
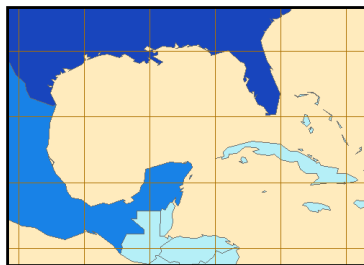
•Grid with subtle color

Color choice - what does the map need to communicate?

Simple Overview

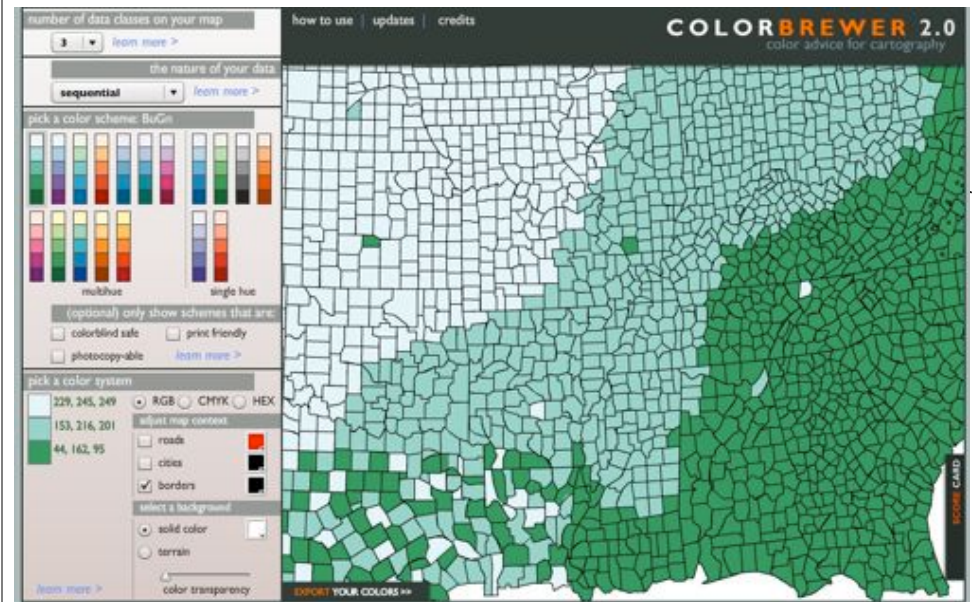Distributions: Where is rainfall higher? Which towns have more people?

Natural: Which polygon is water?
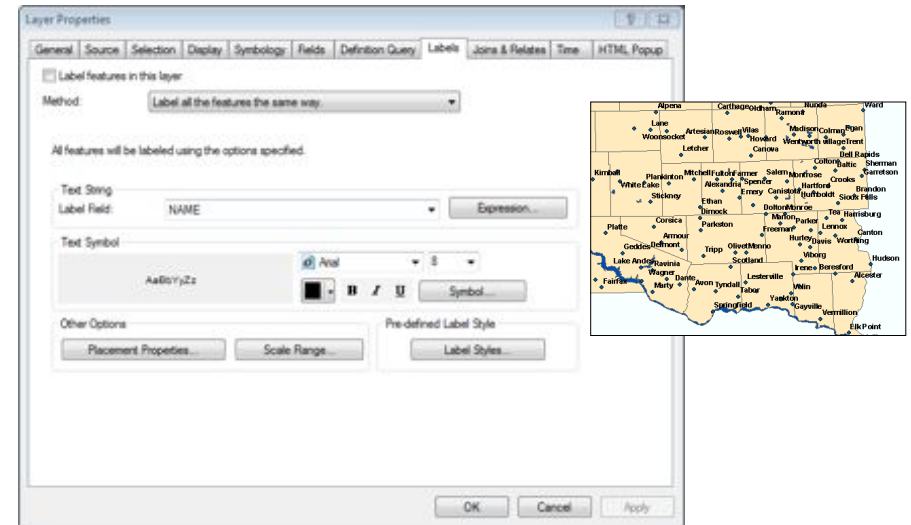
Hi-light: Where's the danger?

Color Brewer: http://colorbrewer2.org/
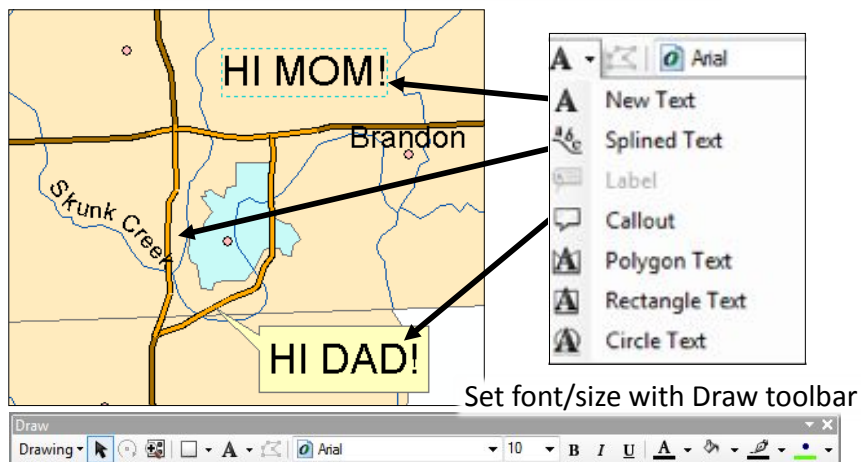
Labeling Options

- Dynamic labels (introduced in Chapter 2)
  - Layer property set for each layer
  - Placed automatically for an entire layer
- Graphic text
  - Simple graphics placed/edited on layout
  - Saved as part of map document
- Annotation

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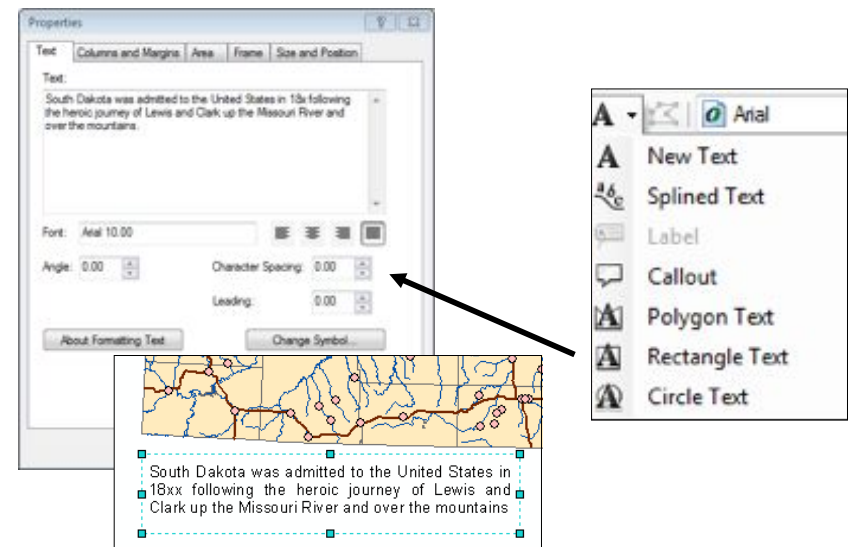
Dynamic labels

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Graphic text (manual)

Graphic text must be placed in Layout View

Set font/size with Draw toolbar

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Multi-line labels

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Lab

- Ch 3, tutorial 1 - 48

- Blackboard problems with handing in HW2?

- We'll start mini project 1 (HW 3) on Thurs. lecture

- HW3: Graduated color, different classifications + map layout