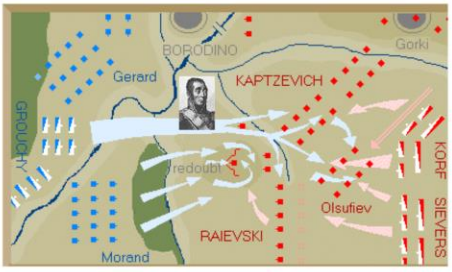
Map Design

GIS II: Data Management

Learning Objectives

- Take a closer look at labels on the map
- Consider proportional symbols and their effective use
- Explore some cartographic techniques for mapping multiple layers of data



Discuss how consistent and legible labeling can greatly improve map readability

Consider proportional symbols as a useful tool for showing differences in magnitude

Introduce several handy techniques for showing multiple variables on a single map

Labeling: General Guidelines

- Clarity is the goal
  - Label unambiguously
    - Location
    - Style
  - Avoid label overlap
- Labeling is an iterative process, and can be very time consuming

https://imusgeographics.com/

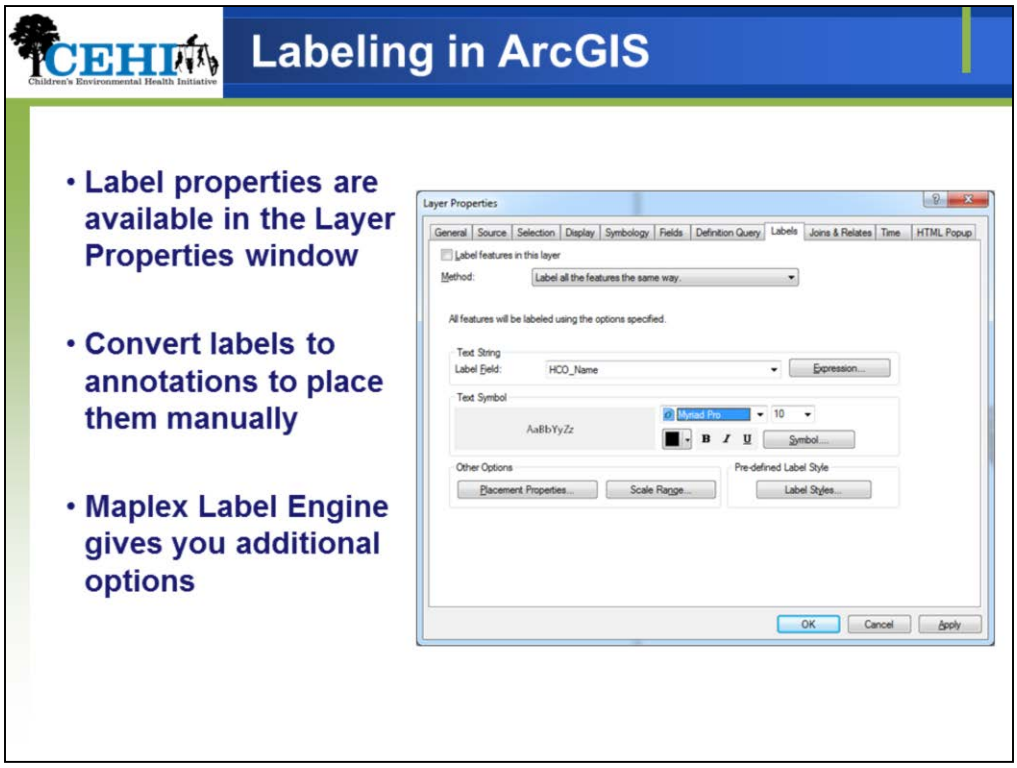
Legible names are important.

Names should be clearly associated with the features they refer to (i.e., they should be placed in an unambiguous position).

General Guidelines: Fonts

- Use sans-serif fonts for cultural features (cities, counties, hospitals); use serif fonts for geographic features (rivers, mountains, oceans)
- Try to use no more than three fonts on a map
- Vary font sizes by at least two points for different categories
- Try to avoid using fonts smaller than 6 points

These are some standard guidelines for label fonts that you should adhere to.



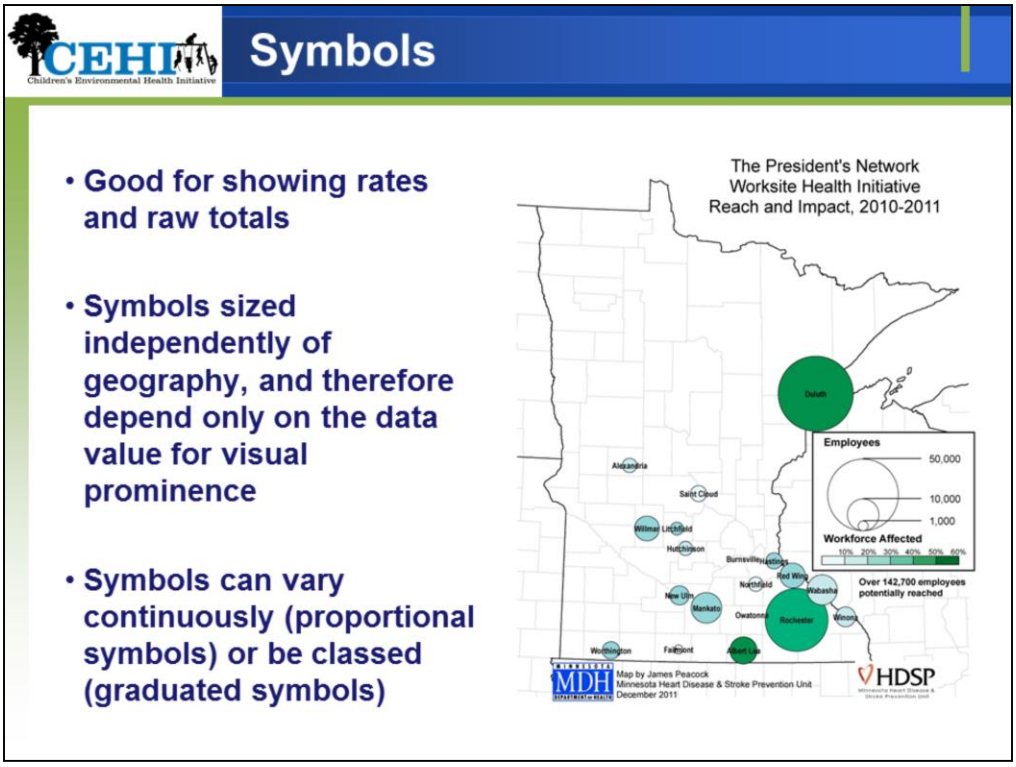
Once labels are converted to annotation, they are no longer dynamically linked to the features they represent so they will not move or scale as you adjust your map.

When you use the Maplex Label Engine, you have access to a new set of label placement properties that let you control the following:

- How labels will be oriented and placed
- How labels will be formatted
- How labels will be placed in congested areas
- How ArcMap will resolve conflicts between labels

In addition to the standard feature types, the Maplex Label Engine provides label placement options for features such as streets, contours, rivers, boundaries, and land parcels.

You can access the Maplex Label Engine by turning on the Labeling Toolbar (Customize>Toolbars>Labeling).

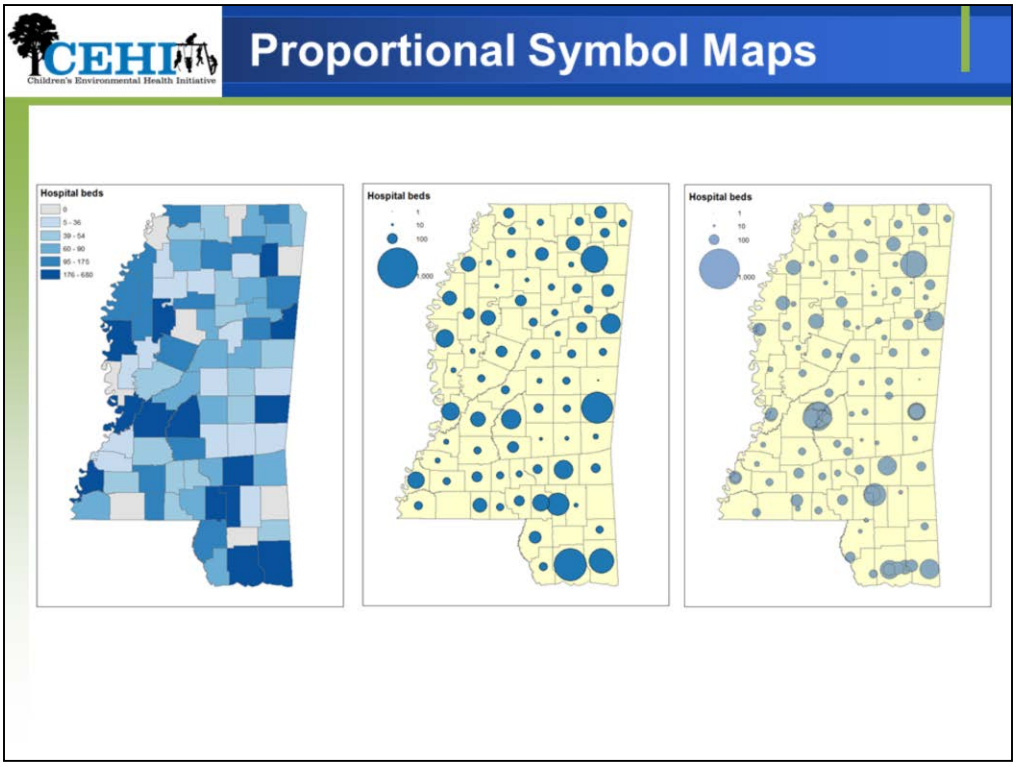


Choropleth maps are good for showing rates, but not as good for showing raw totals. Symbol maps can be used effectively for both.

Symbols can be used for point data or polygon data.

In a choropleth map, large geographic areas (big counties) can have visual prominence and appear more important to a reader. Symbols are independent of geography and thus help avoid this issue.

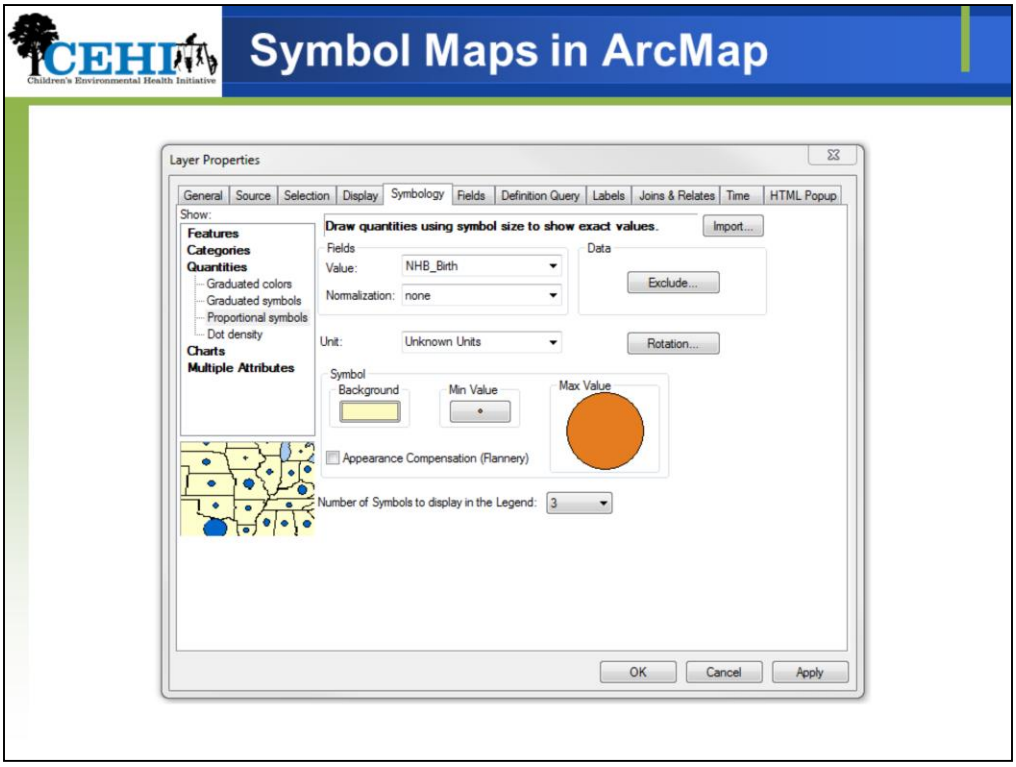
Be aware: Map users may mistakenly assign geographic meaning to the symbols.



These three maps show the same data: by county as a choropleth map, by county as a proportional symbol map, and by hospital as a proportional symbol map.

You an see how different patterns and stories emerge depending on the method of display.

Symbol Maps in ArcMap



In the Symbology tab, select Quantities from the Show menu.

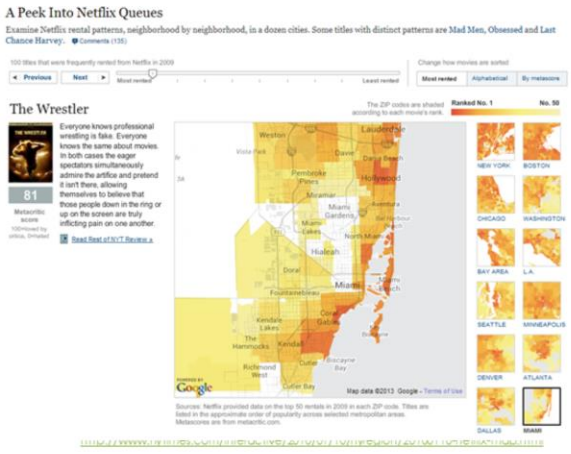
You can choose from graduated or proportional symbols.

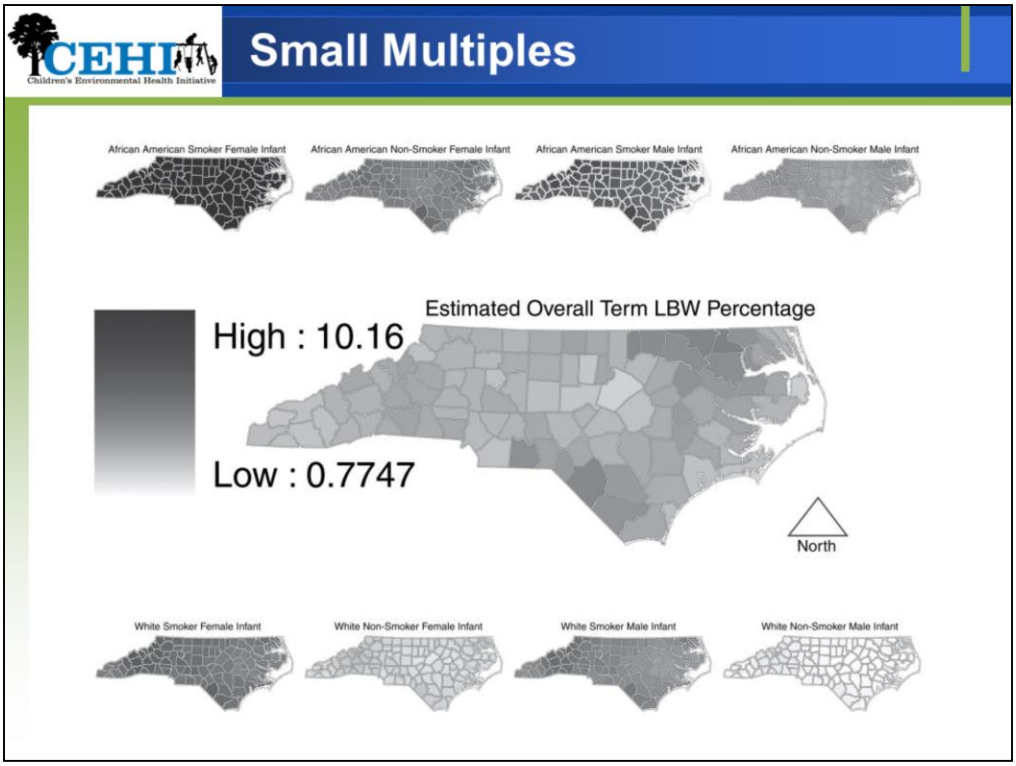
Then set the field you wish to use, color, background, size etc.

*Note: Set the background to hollow/no fill to be able to see features or other layers in your map below the symbols.

Multiple Layers

- General guidelines:
  - Points on top of lines; lines on top of polygons
  - Physical features on top of political boundaries
  - Labels on top of everything else
- Multiple variables:
  - Small multiples
  - Change maps
  - Proportional symbols on top of choropleth maps





Many maps of the same geographic area, each showing a different variable (demographic subgroup, time period).

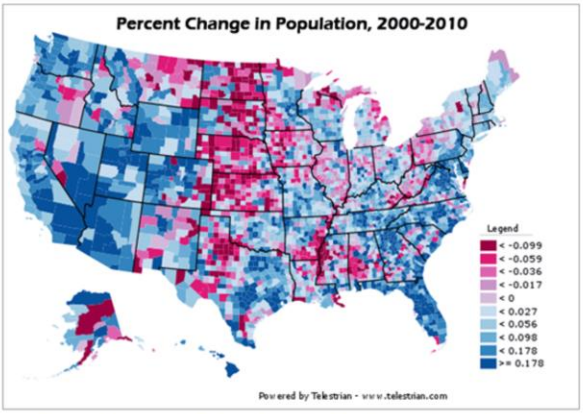
Many maps of different geographic areas, each showing the same variable of interest on same scale.

May have one large map showing: important/composite/summary variable.

Consider carefully whether to keep the classification scheme the same between maps.

Change Maps

- Rather than showing multiple maps for different times, calculate the change and display it directly
- Can show absolute or percentage change
- Good candidates for diverging color schemes



Percentage change in population, 2000-2010. Counties that grew in population in blue, decliners in red. Note: Legend values not multiplied by 100.

http://www.newgeography.com/content/002153-census-2010-offers-portrait-america-transition

Symbols on Choropleth

- Show a variable of interest with symbols
- Provide context with a choropleth map in the background
- Choose scales carefully – symbols can obscure small areas
- Choose colors carefully