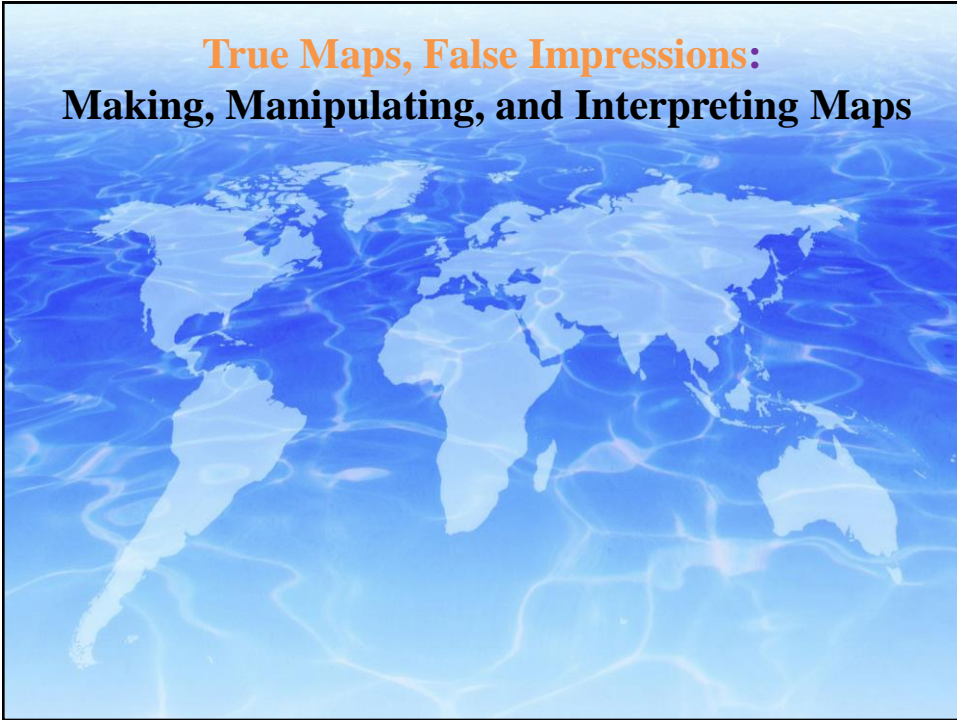


True Maps, False Impressions: Making, Manipulating, and Interpreting Maps



Notes

- ArcGIS Copy Available
 - ✓ ask via email
 - ✓ see the announcement
- ArcGIS Availability on Campus
 - ✓ the PC computers in the Center for Information Management on King Library 1st floor
 - ✓ also available on the PC computers in BEST Library in Laws Hall
- ESRI GIS Dictionary
 - ✓ <http://support.esri.com/en/knowledgebase/Gisdictionary/browse>

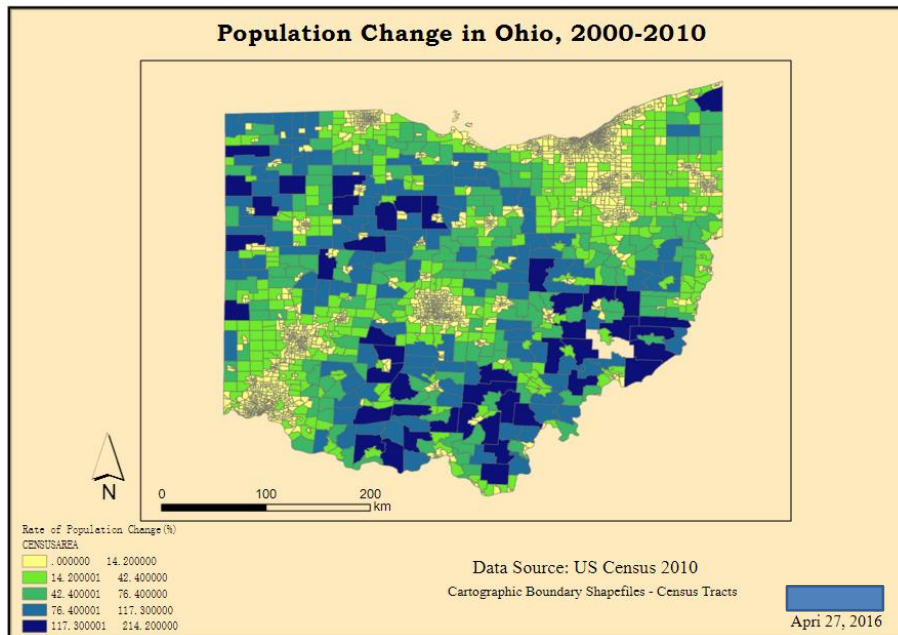
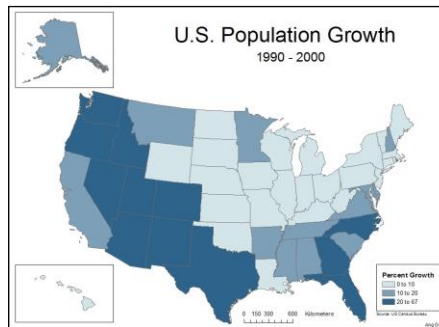
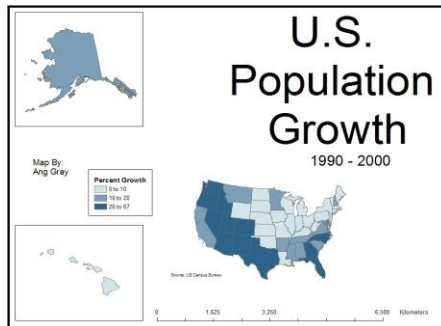
Sinclair Drone Visit

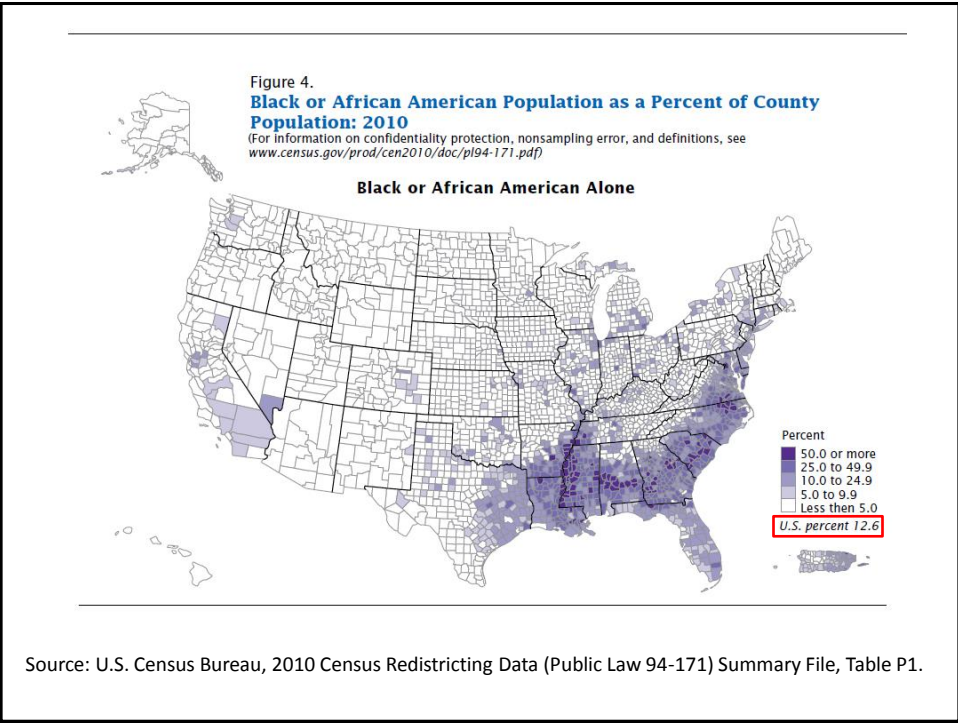
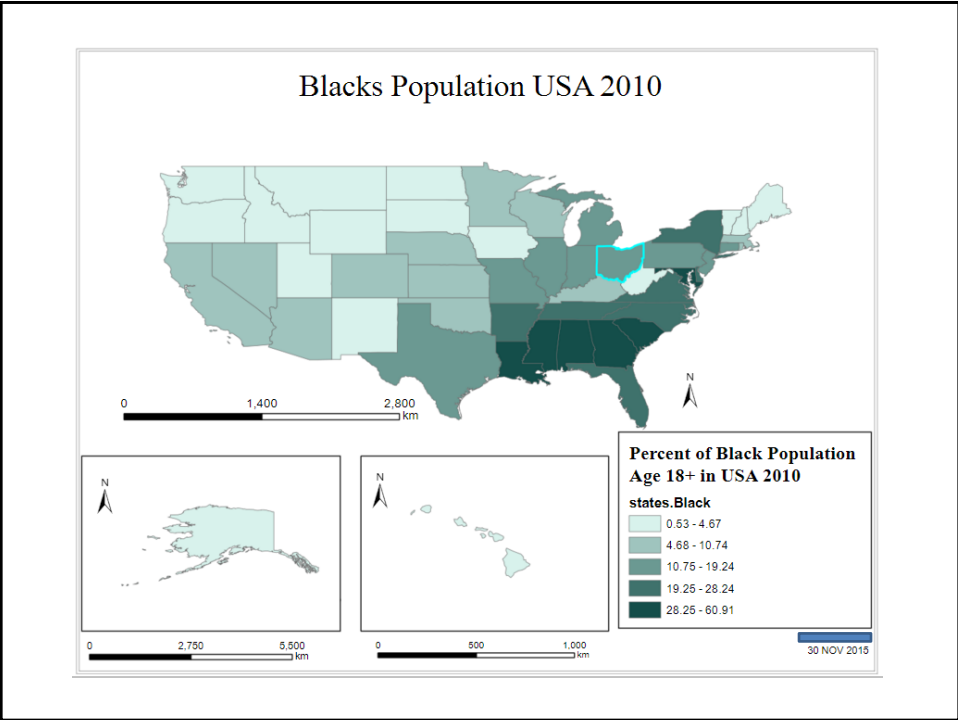
- <http://workforce.sinclair.edu/focus/unmanned-aerial-systems/>
- Mar. 10th
 - ✓ 3:30 – 5:00pm

Last Time

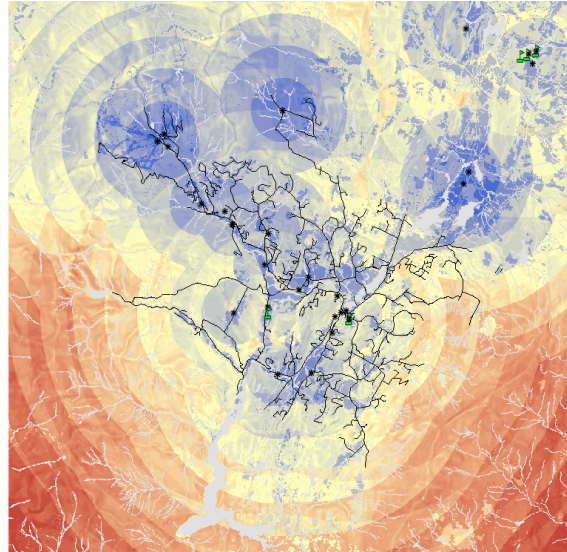
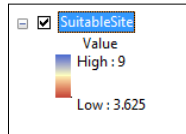
- What is a good map?
 - ✓ balance, size, color, ...
- Lie with a map or data?
 - ✓ easy to lie or can't but to lie?
- What a map conveys
 - ✓ ask a good question

Good map or bad map?





Suitable Sites



- Total area of land with suitability 8.5 or greater for new school?
: _____ m²

Today in Class

- Thematic Mapping & Geographic Concepts
 - ✓ about maps, generally
 - ✓ kinds of (thematic) maps
 - ✓ and a little more

Modes of Knowledge Representation

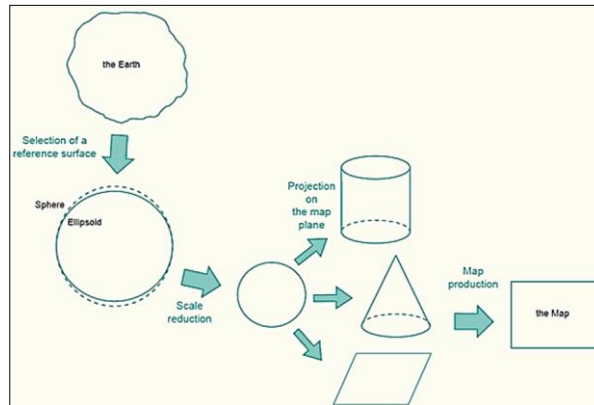
- **Literacy** – use of written language
- **Articulacy** – use of spoken language
- **Numeracy** – communication via mathematics (and symbols)
- **Graphicacy** – use of graphics (e.g., maps and graphs) for communication

Basic Definitions

- What is a map?
 - ✓ graphic representation of the cultural and/or physical environment
 - ✓ maps comprise the basic tools for exploring geographic data (describing both the locations & characteristics of spatial features) using visualization techniques
 - ✓ elements of the map: scale, projection, and symbol
- What is cartography?
 - ✓ art, science, and technology of making and using maps
 - ✓ a unique facility for the creation and manipulation of visual or virtual representations of geospace – maps – to permit the exploration, analysis, understanding and communication of information about that space
- <http://icaci.org/mission>

Ways Cartographers Manipulate Maps

- Projection: Feb. 6th
- Simplification
- Scale
- Aggregation
- Type of Map



the process of representing the Earth on a flat map

Map Simplification

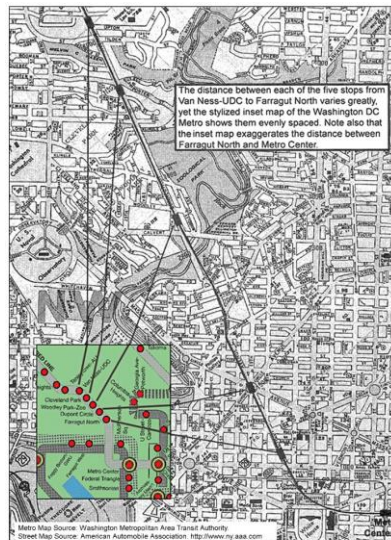


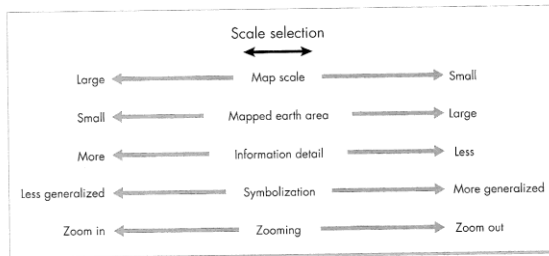
Figure 1.2

Map Scale

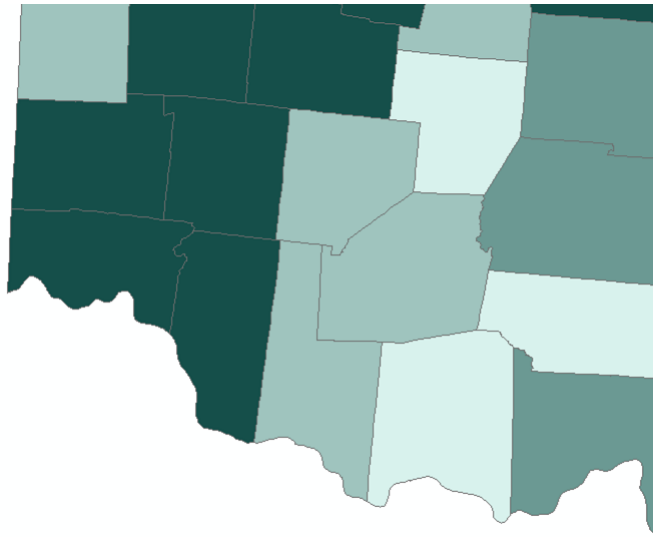
- **Large scale** maps show less area with more detail.
- **Small scale** maps show large areas with less detail.
- Map scale often “decides” what amount of cartographic abstraction is necessary.

FIGURE 1.14 MAP SCALE AND ITS EFFECT ON MAPPED EARTH AREA, MAP INFORMATION, AND SYMBOLIZATION.

The selection of a map scale has definite consequences for map design. For example, small-scale maps contain large earth areas and less specific detail and must use symbols that are more generalized. Selection of map scale is a very important design consideration because it will affect other map elements.

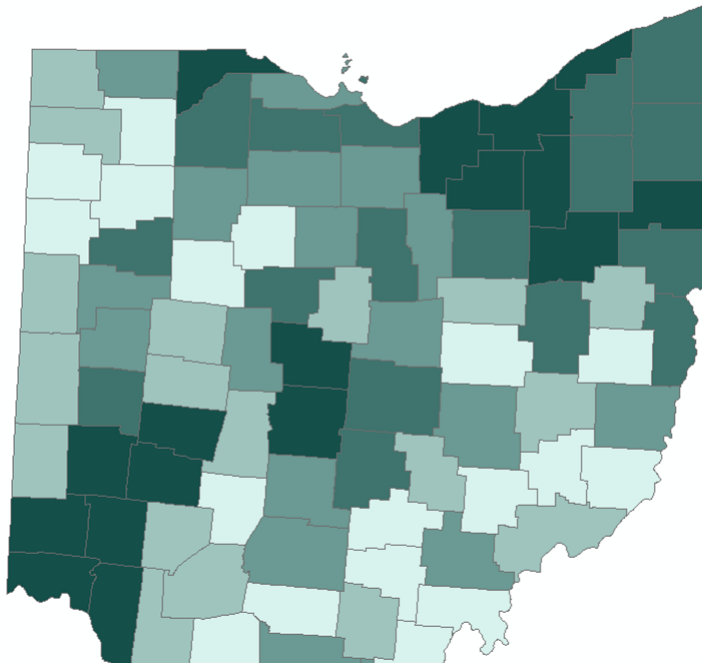


- Is the statement “*the scale of a map refers to the size of the area covered by that map, i.e., a small area covered would be a large-scale map*” true or false?



- Look at the map. Southwestern part of Ohio. The scale is 1:1000,000.

- How about this one? Almost whole area of Ohio. The scale now is 1:2000,000.



- Before we decide if the statement is true or false, one more to think about. Which one is larger, 1/1M or 1/2M?
- Yes, $1/1M > 1/2M$.
- Now, time to go back to the Q. Is the statement "*the scale of a map refers to the size of the area covered by that map, i.e., a small area covered would be a large-scale map*" true or false?

Questions 1.1 to 1.3 assume a scale of 1:25,000.

1.1. Suppose that City A is 4 centimeters away from City B on the map. How many *centimeters* apart are they on the surface of the Earth?

$$4 \times 25,000 = 100,000 \text{ cm}$$

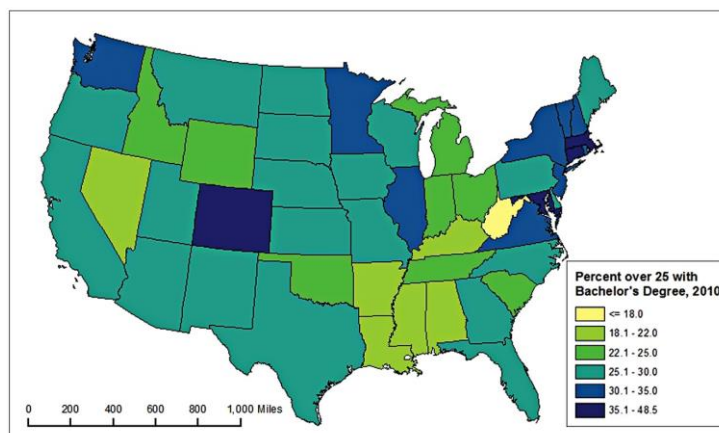
1.2. How many *kilometers* apart are Cities A and B on the surface of the Earth?

$$100,000 \text{ cm} = 1,000 \text{ m} = 1 \text{ km}$$

1.3. A bakery needs to supply bread to every store within a 6-kilometer radius. How many centimeters will this radius be when drawn on the map? *Hint:* First convert 6km to cm, and then multiply by the representative fraction: 1/25,000.

- $6 \text{ km} = 600,000 \text{ cm}$, $600,000/25,000 = 24 \text{ cm}$
- $4 \text{ cm} = 1 \text{ km}$, then $6 \times 4 = 24 \text{ cm} = 6 \text{ km}$

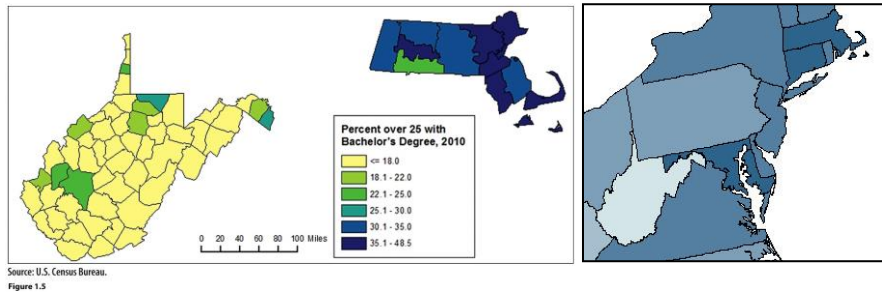
Map Aggregation



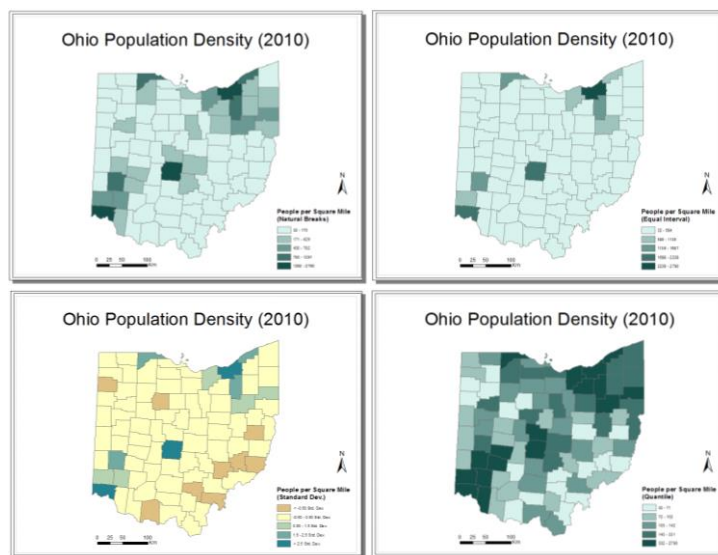
Source: U.S. Census Bureau.
Figure 1.4

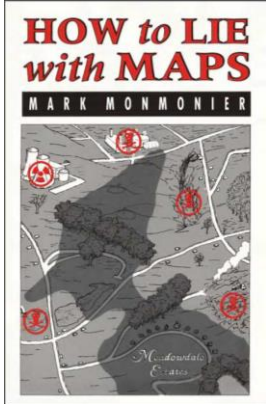

You might be able to see something different

- What can you learn about educational levels within West Virginia and Massachusetts on the local map that you can't see on the national map?



Something different? Don't get fooled!



	<p style="text-align: center;">INTRODUCTION</p> <p style="text-align: center;">  </p> <p>Not only is it easy to lie with maps, it's essential. To portray meaningful relationships for a complex, three-dimensional world on a flat sheet of paper or a video screen, a map must distort reality. As a scale model, the map must use symbols that almost always are proportionally much bigger or thicker than the features they represent. To avoid hiding critical information in a fog of detail, the map must offer a selective, incomplete view of reality. There's no escape from the cartographic paradox: to present a useful and truthful picture, an accurate map must tell white lies.</p> <p>Because most map users willingly tolerate white lies on maps, it's not difficult for maps also to tell more serious lies. Map users generally are a trusting lot: they understand the need to distort geometry and suppress features, and they believe the cartographer really does know where to draw the line, figuratively as well as literally. As with many things beyond their full understanding, they readily entrust map-making to a priesthood of technically competent designers and drafters working for government agencies and commercial firms. Yet cartographers are not licensed, and many map-makers competent in commercial art or the use of computer workstations have never studied cartography. Map users seldom, if ever, question these authorities, and they often fail to appreciate the map's power as a tool of deliberate falsification or subtle propaganda.</p> <p>Because of personal computers and electronic publishing, map users can now easily lie to themselves—and be unaware of it. Before the personal computer, folk cartography consisted largely of hand-drawn maps giving directions. The direction giver had full control over pencil and paper and usually</p>
---	--

Lie with a map?

- Not only is it to lie with maps, but it's essential.

- Mark Monmonier

- Don't lie with your data.

- Mookie