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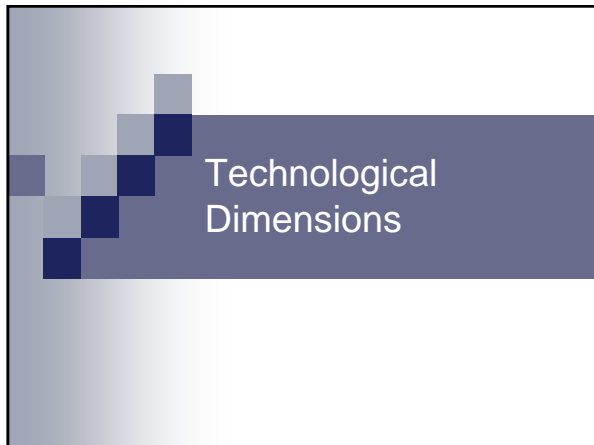
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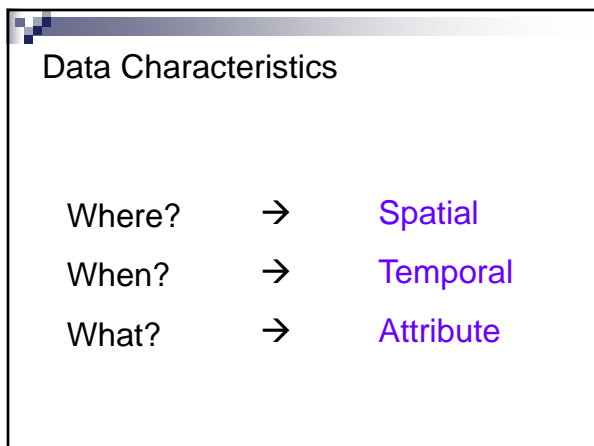
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- Where? → Spatial
- When? → Temporal
- What? → Attribute

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## Two Basic Ways to Get Data

- Ground surveying
- Remote sensing



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## Ground Surveying

- Location
  - Land surveying
  - Global Positioning System (GPS)
  - Geocoding



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### Navigation



### Search & Rescue



### Maintenance



### Geocaching



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Oops

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## Ground Surveying

- Attributes
  - ☐ Sensors
  - ☐ Direct observation
  - ☐ Surveys




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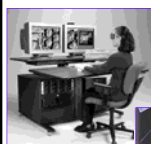
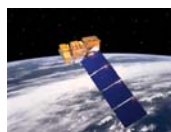
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## Remote Sensing

- Data collected from air or space
  - ☐ Pictures are just raw images
  - ☐ Data are *classified* into information




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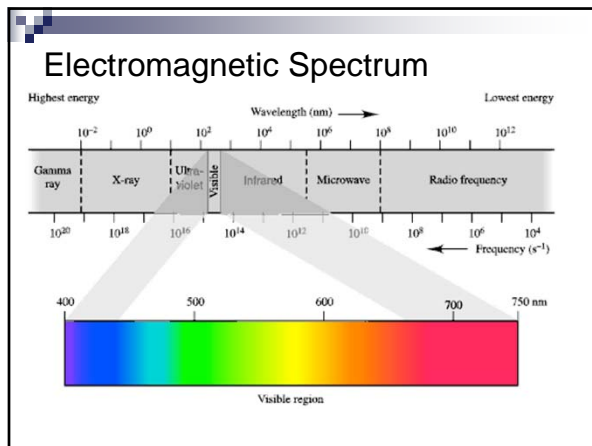
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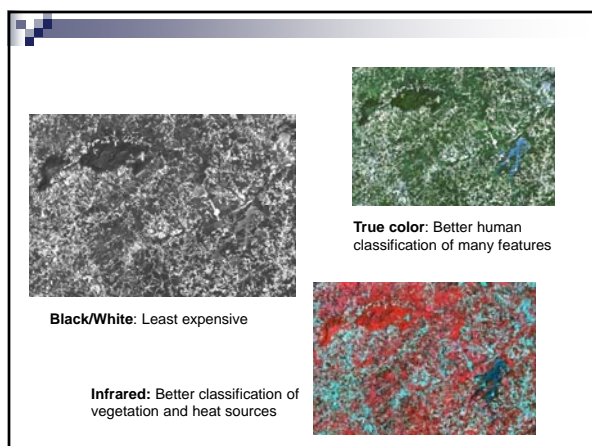
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## Data Concepts

- Space, Time, Attributes
- Scale
- Metadata
  - Accuracy
    - How well do reported data match reality?
  - Consistency
    - Conform over space, time, attributes...
  - Resolution
    - How fine are the data reported?
  - Interoperability
    - How well do data work together?




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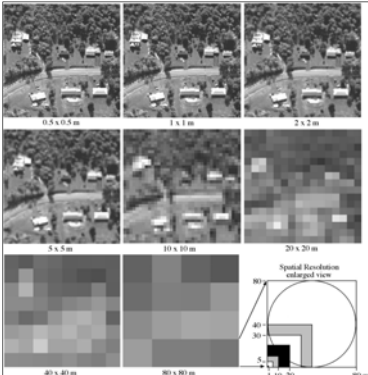
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Spatial resolution:  
What is the smallest thing or area measured?




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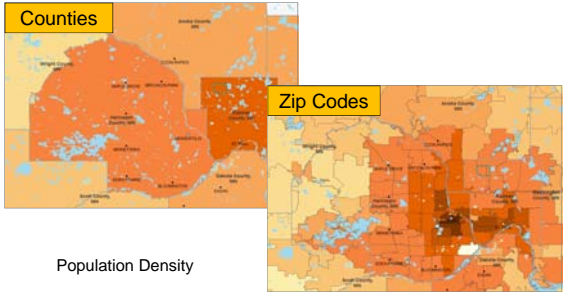
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Spatial resolution: What kind of area is being reported?

Counties

Zip Codes

Population Density




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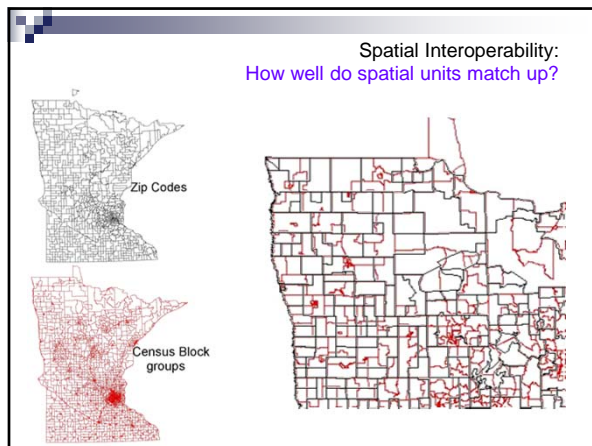
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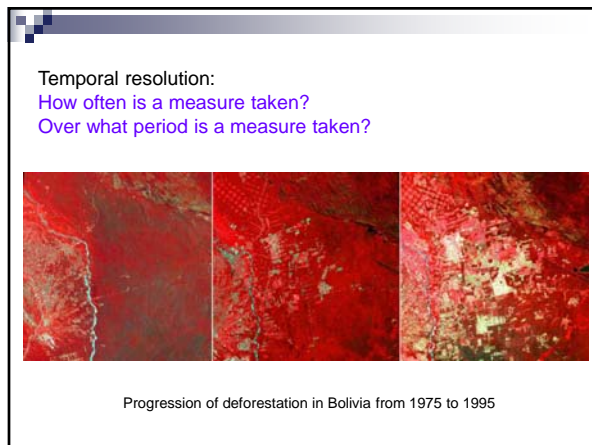
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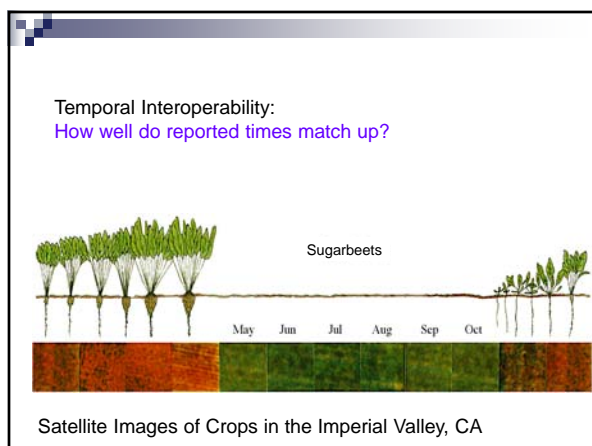
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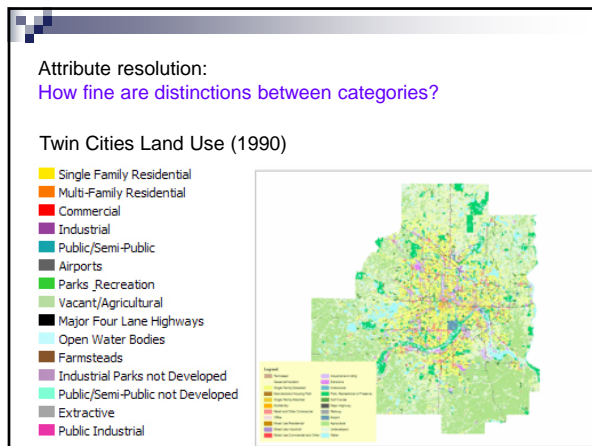
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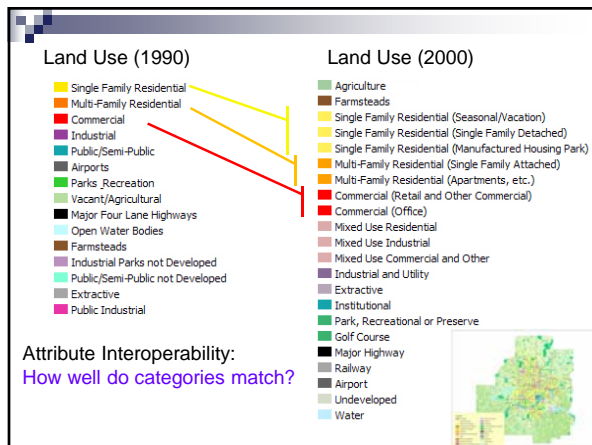
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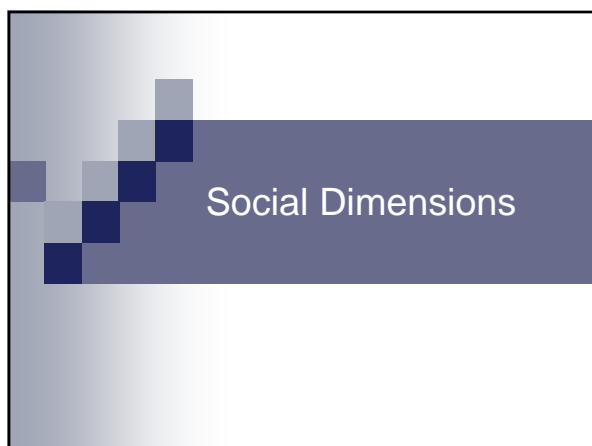
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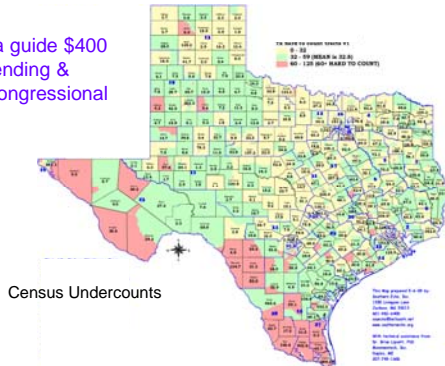
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## Political

Census data guide \$400 billion in spending & determine congressional districts



## Economic

Google Maps



Uganda's Survey Organization



## Social

### Census 1790

Number of free White males aged under 16 years  
Number of free White males aged 16 years and upward  
Number of free White females  
Number of other free persons  
Number of slaves

### Census 1820

Add Colored

White, Black, Mulatto

### Census 1890

White, Black, Mulatto, Quadroon, Octoroon, Chinese, Japanese, or Indian

### Census 1930

Negro, Add Mexican (just this year, though)

### Census 1960

Add Hawaiian, Part-Hawaiian, Aleut, and Eskimo

### Census 1970

Change to "Negro or Black"

### Census Race and Ethnicity Categories

### Census 2000

Is the person Spanish/Hispanic/Latino?

- No, not Spanish/Hispanic/Latino
- Yes, Mexican, Mexican American, Chicano
- Yes, Puerto Rican
- Yes, Cuban
- Yes, other Spanish/Hispanic/Latino (write in group)

What is the person's race?

- White
- Black, African Am., or Negro
- American Indian or Alaska Native (write in tribe)
- Asian Indian
- Chinese
- Filipino
- Japanese
- Korean
- Vietnamese
- Native Hawaiian
- Guamanian or Chamorro
- Samoan
- Other Asian (write in race)
- Other Pacific Islander (write in race)
- Other race (write in race)
- One or more race categories



## Changing Nature of Census

- Decennial Census

- ☐ 1790 onward, every ten years
- ☐ Two types of questions
  - Short form (age, gender, race, own/rent, size, relationships)
  - Long form (much more detailed, many more areas)



- American Community Survey

- ☐ 2003 onward, every year
- ☐ Basically asks long form questions
- ☐ Used to create estimates



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## Conclusion

- Technological dimensions

- ☐ Data sources
- ☐ Data concepts

- Social dimensions

- ☐ Political
- ☐ Economic
- ☐ Social



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