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- Contributors:**
- Daniel Fitz (Sanchez)

0.1 Assessment

- Two Projects
 - Visualization
 - Graphics
- Each has 3 components
 - Proposal (pass/fail)
 - Presentation (inadequate/poor/good/excellent)
 - Report (1-7)

For the visualization project, show that you can analysis, understand, and/or communicate or teach about data

- Multiple independent variables
- Multiple dependent variables
- Complex behavior over space
- Complex behavior over time

Chapter 1

Lecture Notes

1.1 Data Visualization

The use of images to provide insight into phenomena. Should reveal data:

- show the data, honestly
- thought-provoking (not distracting)
- efficient (many data in little space)
- encourage comparison
- expose comparison
- serve a purpose
- link closely to descriptive statistics/text

1.1.1 Visualisation Procedure

Iterative process:

- Locate/acquire data
- Parse data
- Filter data
- Clean/analyse/derive
- Map to geometry
- Render
- Interact

1.1.2 Data acquisition

Access considerations:

- Need a reliable (credible) source (e.g. govt/university)
- Need the right to use the data
- Acknowledge source
- May need to register/pay
- May have to apply in writing
- Download directly/automatically?
- Dataset[s] may be huge/dynamic
- Can their server cope?
- Be a good internet citizen (... or get blocked)

1.2 Univariate data

Univariate data: multiple measurements for one thing

Bivariate data: multiple measurements of two things, *temperature and windspeed at a station*

Multivariate data: multiple measurements of 3 or more things

1.2.1 Descriptive Statistics

Measures of variation

Ranges: max-min, inter-quartile, boxplots

Standard Deviation: $s = \sqrt{\frac{1}{n-1} \sum_{i=1}^n (x_i - \bar{x})^2}$

Variance: s^2