Making Maps

Unit 3 - Lab 7

Directions: Follow along with the slides and answer the questions in **BOLDED** font in your journal.

# Informative and Fun!

* Maps are some of the funnest plots to make because the info represents:
* Where we live.
* Where we go.
* Places that interest us.
* Maps are also helpful to display geographic information.
* John Snow (the physician, not the character from *Game of Thrones*...) once famously used [a map to discover how cholera was transmitted.](http://commons.wikimedia.org/wiki/File:Snow-cholera-map-1.jpg#mediaviewer/File:Snow-cholera-map-1.jpg)

# Load and go!

* In the previous labs, we scraped a tall mountains data file.
* In the *Files* pane, click on your data to load it or run:

library(XML)  
data\_url <-   
 "http://web.ohmage.org/mobilize/resources/ids/data/mountains.html"   
var\_classes <- c(rep('factor', 3),  
 rep('numeric', 7))  
tables <- readHTMLTable(data\_url,   
 colClasses=var\_classes)  
mountains <- tables[[1]]  
names(mountains) <- gsub("[\n]\*[[:space:]]",  
 "",names(mountains))

# Latitudes & Longitudes

* To make a map, you need data with some *latitudes* & *longitudes*.
* *Latitude* describes your North/South location. Positive values mean you're north of the Equator. Negative values mean you're south of it.
* *Longitude* describes your East/West location. Positive values mean you're east of the Prime Meridian. Negative values mean you're west of it.
* Los Angeles is -118.25 degrees longitude and 34.05 degrees latitude.

# Making a basic map

* Using our mountains long and lat values, we can make:

make\_map(latitude=lat, longitude=long,   
 data=mountains)

* **Are the 200 tallest peaks evenly distributed across the U.S.? Or are they concentrated? If so, where are the highest concentrations?**

# California mountains

* Suppose we wanted to get a better look at our California moutnains.
* To subset our data, run:

ca\_mtns <- subset(mountains,   
 state=="California")

* And then make a map of just these mountains:

make\_map(latitude=lat, longitude=long,   
 data=ca\_mtns)

# Using colors

* Maybe you'll want to change the color of the points.
* To do so, add in the col argument

make\_map(latitude=lat, longitude=long,   
 data=ca\_mtns, col="red")

* Even better though, is when you select the color to be a categorical variable

make\_map(latitude=lat, longitude=long,   
 data=ca\_mtns, col=range)

* **How many mountain ranges are in California?**

# Scaling points

* Besides coloring points based on a categorical variable, we can also scale the points based on a numerical variable.
* The 5th largest mountain in California has a rank of 34. Let's look at just the top 5 tallest mountains in CA by first subsetting:

tall\_mtns <- subset(ca\_mtns, rank <= 34)

* And then scaling them by their prominence in meters.

make\_map(latitude=lat, longitude=long,   
 data=tall\_mtns, scaleby=prominence\_m)

# Points too big?

* You can shring the size of the points by adding the size argument.

make\_map(latitude=lat, longitude=long,   
 data=tall\_mtns, scaleby=prominence\_m,  
 size=75)

* The size=75 argument means make the points 75% of their normal width.

# Putting everything together

* We can combine scaling, sizing and color to make our final product:

make\_map(latitude=lat, longitude=long,   
 data=tall\_mtns, scaleby=prominence\_m,  
 size=75, col=range)

# On your own

* Create a subset for the 10 smallest mountains in the entire data set and name the object short\_mtns. Then answer the following questions by making appropriate maps:
* **What code did you run to create the short\_mtns subset?**
* **Which states are the 10 shortest mountains in?**
* **How many mountain ranges are these mountains in?**