ENVIRONMENTAL DATA ANALYTICS: M6 – CRAFTING REPORTS
(R Markdown, Knitting, & Interactive docs)

Course Projects…

- Import, explore, wrangle, analyze, & present using a dataset of your choice (or one we've provided).

- Work in groups (3-4 students).

- *Present your progress in last week of classes.**

- Deliver your report (knitted doc) on *April 30th.**

*subject to change

Course Projects…

Past topics…

- Evaluating temperature trends at US Army basic training sites

- Soil Moisture & Precipitation Trends in Coweeta Basin LTER Site

- Is air pollution correlated to inter-state migration in the US?

- An Analysis of the Drivers of Harmful Algal Blooms in Lake Erie

- Analysis of Large Wildland Fires in California, Nevada, and Idaho

- Hurricane Trends Along the East Coast

- Effective Pest Treatment That Protects Pollinators

Course Projects…

On the course website…

- ☐ Choosing a dataset…
- ☐ Setting up & using a group GitHub repository
- ☐ Report format and requirements
- ☐ Project rubric
- ☐ Project template

M6.1- R Markdown

- Basic elements
- YAML
- The knitting process
- Code chunk settings
- Markdown
- Tables

M6.2a - Interactive R-Markdown

- Using variables in *ggplot*:
  →Tidy eval helpers `!!sym(…)`
- Writing plotting *functions*
- Interactive "Shiny" widgets
  - <u>Inputs</u> (types, labels, values)
  - <u>Renderers</u> (formats, values)
  - Links between inputs & renderers

M6.2b - Dashboards

- Structure of `app.R` code:
  - `ui` function...
  - `server` function...
  - *fluidpage* object
  - *titlePanel*
  - *sidebarLayout*
- The flow of R/Shiny apps
  - Widgets: input vs output
  - Events and event listeners

M6 – Lab/Assignment

- Basic Markdown/R code chunk options

- Tables with `kable` (knitr package)

- Managing & captioning plots

- Knitting options: Table of Contents

A06 - Output

Item Name	Value
Source	EPA Air Quality SYstem (AQS)
Date	2018-2019
Filename	EPAair_O3_PM25_NC1819_Processed.csv

Table 2: Mean Particulates (2.5mm)

County	$\mu g/m^3$
Haywood	13.98400
New Hanover	15.60681
Avery	18.27941
Edgecombe	26.06503
Pitt	27.37166
Guilford	29.14163
Swain	30.62780
Johnston	33.02695
Durham	33.53770
Mecklenburg	33.63038
Forsyth	35.09282
Wake	37.45423

`"$\\mu g/m^3$"`

A06 - Output

Task 3: Plots

Create two separate code chunks that create boxplots of the distribution of Ozone levels by month using, one for only records collected in 2018 and one for records in 2019. Customize the chunk options such that the final figures are displayed but not the code used to generate the figures. In addition, the plots aligned on the left side of the page and set the figure heights so both plots fit on the same page with minimal space remaining. Lastly, add a fig.cap chunk option to add a caption (title) to your plot that will display underneath the figure.
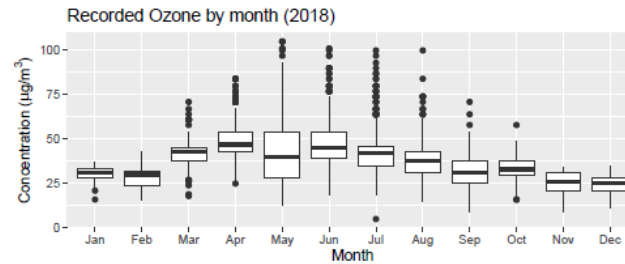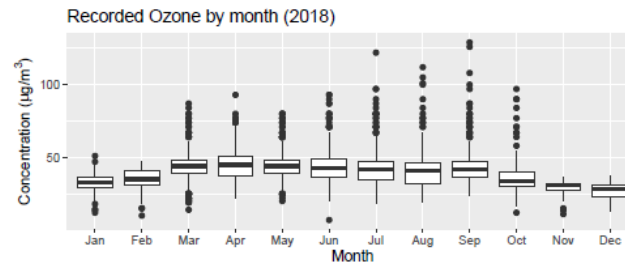
Figure 1: Monthly Ozone, 2018

Figure 2: Monthly Ozone, 2019