Extended Mapping Assignment

Background

Last Sunday (1-NOV-2020), the TA's and I reviewed the midterm assignments from the class. While the data handling and computational aspects of the submitted projects were generally good-to-excellent the presentations, reports, and Shiny web pages in the projects often had major deficiencies. Delivery of presentations, reports and exploration websites is essential in statistical practice and there many R packages that are useful for communicating process and results. For MA615, my goal is to include the basics: Markdown with html/css for browser-based presentation and Shiny applications; and, Markdown with LaTeX for print and pdf reports. As you have seen the the presentations and documents I have used in class, these tools are sufficient for producing reports, presentations and web pages that include

- text structured as headings, paragraphs, lists, and tables
- a variety of raster image formats
- equations
- programming code
- plots and other encoded graphics

Furthermore, Shiny applications give you a way to deliver operational models with dynamic interfaces.

Reproducibility

Reports, presentations, and web pages produced with R are not merely matters of attractive presentation, they play a key part in supporting reproducible research. The *CRAN Task View: Reproducible Research* [1] puts it like this, "The goal of reproducible research is to tie specific instructions to data analysis and experimental data so that scholarship can be recreated, better understood and verified."

Using R and github, you can document your data sources and every step you have taken to acquire, clean, organize, explore, analyze, and model your data. By delivering documents, presentations, and web pages that have been produced with R packages that programmaticly connect data and models to client-centric work products, you establish and maintain the reproducibility of your work.

Your assignment

The purpose of this assignment is to make sure that you know the basics of using R to produce documents, presentations, and shiny apps. These are basic skills that every data scientists must have. Use the mapping project you have just completed as a starting point. I have provided additional county level data from FEMA and FEC so that you can produce maps with more features.

Using this data, produce a document using rmarkdown, a presentation using revealjs, and a Shiny application that you publish on shinyapps.io. Your document should include structure elements such as headings, lists, tables. Your presentation should also include these elements. Your Shiny application should allow users to select of adjust the display of maps and data plots. All of these deliverables should contain maps and data plots. You don't need to go overboard. Do enough to demonstrate your skill.

For this assignment you will work in groups of two or three students. As usual, I encourage you to collaborate, but you must each turn in an assignment.

1. Blischak, J. and Hill, A. (2020) *CRAN Task View: Reproducible Research*. Available at: https://cran.r-project.org/web/views/ReproducibleResearch.html (Accessed: 05 Nov 2020).]鈸