ESM 244 Winter 2021 Assignment 3

Due Thursday 2021-02-25 at 5:00pm PST

Task 1: Spatial data visualization (interactive map & chloropleth)

Download data from CA DFW Oil Spill Incident Tracking (dataset ds394; also available HERE). You should also find and download shapefile data for borders of California counties (we have used this data in ESM 206 and 244, or you can find your own source for California county polygons from another source or R package).

For Task 1, read in the spatial data, and create a professionally formatted and prepared HTML (showing all of your code directly or making it available with code-folding) from an .Rmd in which you:

(1) Make an exploratory **interactive map in tmap** showing the location of oil spill events included in the data.
(2) Make a **finalized** static chloropleth map **in ggplot** in which the fill color for each county depends on the **count** of **inland** oil spill events by county for the 2008 oil spill data

Save the file as a3_task1_lastname_firstname.html (e.g. a3_task1_horst_allison.hmtl). Upload the HTML to GauchoSpace. You may also decide to add this to your personal website as an example of spatial analysis skills (not required).

Task 2: Working w/ raster data

Download and unzip the `ca_cetaceans.zip` file of rasters (on GauchoSpace) subsetted from AquaMaps (Kaschner, K., Rius-Barile, J., Kesner-Reyes, K., Garilao, C., Kullander, S., Rees, T., & Froese, R. (2016). *AquaMaps: Predicted range maps for aquatic species*. www.aquamaps.org), showing the probability of occurrence (based on relative environmental suitability, including species preferences for water temperature, depth, salinity, and distance to land) of 35 cetacean species that can be found in the California Bight. The extent of the rasters is 125° W to 115°W (which R considers -125 to -115) and 32°N to 38°N.

For Task 2, create a professionally formatted and prepared HTML (showing all of your code directly or making it available with code-folding) from an .Rmd in which you:

- Create a raster of species richness of cetacean species off the coast of California. Species richness is simply the number of species that occur in a particular location.
    - With probability of occurrence data such as AquaMaps, it is common to decide on a threshold value above which a species is considered "present." Choose a probability threshold (a threshold of .6, or higher will result in more interesting maps), and use your threshold to reclassify each probability layer to a "presence" layer of either 0 (not present) or 1 (present).
    - With many layers such as here, you may want to avoid rasterizing each individual layer, and instead work with `raster::stack()`, and giving the function a list of all the files to include in the stack. A handy function for this is:

      ```
      my_files <- list.files(path = 'x', full.names = TRUE)
      ```

      with an option argument of `pattern` to identify only files that contain that pattern (e.g., to limit the results to specific file extensions).
- Use your species richness raster to create a professionally formatted static map using ggplot. Include a shapefile of the coastline for reference, for example from the `rnaturalearth` package. You can use `coord_sf()` to define the boundaries of the map to match the raster extent.
- Include a caption that explains your map, including the threshold you chose to determine "presence" for each species.

Save the file as a3_task2_lastname_firstname.html (e.g. a3_task2_horst_allison.hmtl). Upload the HTML to GauchoSpace. You may also decide to add this to your personal website as an example of spatial analysis skills (not required).

Task 3: Text wrangling and analysis (coder's choice)

For Task 3, prepare a professionally formatted HTML (showing all of your code directly or making it available with code-folding) from an .Rmd in which you:

- Import text of your choosing (from a PDF, text file, or otherwise) - I encourage you to find some text that is of interest to you, but some suggestions for places to look are listed below this task. You can also import **two** text files if you want to do a comparison of most frequent words or sentiment analysis.
- Wrangle the data to get tokens into tidy format, removing stop words

- Find and make a finalized visualization of counts for the most frequently used words in the text (this can be split up by chapter / section for comparison, or for the entire document), for example in a column graph or wordcloud, or both.
- Perform sentiment analysis using one of the lexicons introduced in Lab Week 7 (your choice), and present in a final visualization.
- Make sure to add a citation for the text data you use

Save the file as a3_task3_lastname_firstname.html Upload the HTML to GauchoSpace. You may also decide to add this to your personal website as an example of text analysis skills (not required).

Some places where you can find text:

- Internet Archive (texts)
- CA digital archive
- You can also just copy & paste text from other sources online (like websites, news/journal articles, transcripts, etc.) and save as a .txt file to read in

Task 4: Personal website term project

For Task 4, update your distill website.

- Start finalizing theming, presentation and content
- Add at least one project (from Task 1 in this assignment) as part of your "portfolio," but you can also start adding other projects, either to the "blog" part of your site or as separate pages linked in the navigation bar

That's it. We should already have the link to your website, so will check progress. The idea is that by the time you submit this assignment, you should have *most* of the website ready to go - and can spend the last week and a half of the course making it awesome and fine-tuning the additional projects you'll feature on your website.

Task 5: Shiny app term project

For Task 5, update your Shiny app.

- Work on finalizing the Introduction/Summary/Overview page of your app
- Update so that all widgets and reactive outputs (tables, graphs, maps, etc.) are functioning correctly

- Start finalizing the little things (citations, formatting graphs/tables & figures), work on usability for and app user, make this nice & professional to look at

That's it. Allison should be added to your app repo already, so will check progress. The idea is that by the time you submit this assignment, you should have the last week and a half to work mostly on making it awesome (adding bells & whistles, fine-tuning, theming, etc.).

Task 6: Sign up for a Shiny demos session

During Week 10, we'll have FOUR 2-hour sessions during which each group will have ~12 minutes to present your Shiny app. You'll get more details later on about what you're expected to present on, but for now, **find a session that works for your group and sign up.** You are expected to stay for the 2-hour window to watch presentations from other groups on their apps (there is some flexibility - i.e. if one of your group members can only attend for 90 minutes of the session, you can still show up and they can attend 30 minutes of another session).

Add your name(s) HERE, along with the name of your Shiny app.