### 5/31

* General introduction to program and final project
* Meet with groups and find general project direction

HW: Look for public data sets on marine biology topics

### 6/3

* Read over Dr. Kelly’s suggestions for
  + Narrow topic
  + Begin thinking about questions to potentially investigate within larger topic
* Look over ‘Global Bleaching’ dataset: <https://www.bco-dmo.org/dataset/773466>
  + Might consider subsetting to a specific location
  + Consider topics to compare dataset with - look for datasets
  + Think of possible questions to answer
    - How does the severity and frequency of coral bleaching events vary across different oceanic regions (e.g., Pacific vs. Atlantic vs. Indian Ocean)?
    - Are certain coral reefs more resilient to bleaching events than others, and if so, what factors contribute to this resilience?
    - Comparison between the years and see the long term effect of how much is being damaged overtime
    - How have coral bleaching events changed over time, both in terms of frequency and severity?
    - How do ocean variables affect severity of coral bleaching?
    - How does coral bleaching severity vary with depth across different reef ecosystems?
* Thoughts about topic
  + If coral dies → ecosystem dies → food source is unsustainable → affects humans
  + How fast can coral dying affect the food chain?
  + Are there examples where it has affect food chain for human population in an area

### 6/5

* ‘Global Bleaching’ dataset has good amount of data for several locations in Florida
* Suggestion: looking into fish populations and how they might be affected from coral bleaching
  + <https://www.st.nmfs.noaa.gov/SASLogon/login?service=https%3A%2F%2Fwww.st.nmfs.noaa.gov%2FSASStoredProcess%2Flogin%2Fcas>

### 6/7

* Continue to look into Florida-local fish to analyze
  + Break fish into two groups: Reef and Pelagic
  + Make a bar graph that displays the three fishes the total catch vs time
* Consider making a map of Florida that displays distribution of plot points

### 6/10

* Found the three species for each category, work on cleaning and uploading data into RStudio
  + Reef
    - **Red snapper**: 9,312,150
    - Pampano:7,093,458
    - Gray triggerfish: 4,758,924
    - Back-up: Pigfish: 7,847,142
  + Pelagic
    - Blackfin Tuna: 327,108
    - **Barracuda**: 2,884,562
    - Greater Amberjack: 1,554,152
    - Back-up: Bluefish
* Working question
  + Coral bleaching affects reef fish populations which have have greater impacts on larger open water fish populations that might feed on them
  + Might have larger impact that can be noticed in heat waves viewed throughout the years

Ended: Trying to upload and read-in all new fish data, left off with some issues in creating new bar graphs for each individual reef fish

### 5/12

* Frontera machine was having work done on it, got all code and data uploaded into Lonstar6
* Visual Presentation from Dr. Kelly
  + Visualization Process
    - Read in the raw data
    - Pre-process the raw data to extract desired information
    - Map the data to graphical elements
    - Output the visualization product
    - Verify the visualization product is a reasonable approximation of the raw data
  + Tricks
    - Bar charts: comparing categories within a single measure
    - Bullet chart: progress against a goal
    - Line graph: connects several distinct data points to visualize changes in one value relative to another
    - Histogram/Box plot: show where your data is clustered and can compare categories
    - Violin plot
    - Maps: method to visualize location-specific questions or aiding geographical exploration
    - Can have bubbles overlaid to represent magnitude/scale/size to something
    - Pie chart: show proportion, can become challenging with the number of variables
    - Discrete/Continuous Color map: distinct colors that differ variables from each other
    - Density/Heat: reveal patterns or concentrations that might otherwise be hidden due to an overlapping mark, identify locations of greater or fewer data points
    - Scatterplots: Investigate relationship between different variables and the density, shows predictors
    - Bubble charts: good to add to other graphs, show relationships between 3+ variables
    - Tree maps: Use of space to show the percent total for each category, proportional

Ended: Got reef fish uploaded and three on to one graph(issue with commas in the total catch values)

* Still need to add in pelagic fish into R, trying to run code template for mapping

### 5/13

* Got pelagic fish uploaded and graphed individually and overlapped
* Darian Haulani Talk
  + Graduate questions need to be able to answer:
    - Why do they need you?
      * Skills that you can bring and add value
    - Why do you need them?
      * Why do you need them?
      * Share research plan and how you want to use them to continue the research
  + Get research experience and a topic that you want to look into (with some already points researched) that can expand on
  + “Land grant school”
* Tried working on getting a bathymetric map with long/lat values of Florida
  + <https://download.gebco.net/> // <https://gebco.net/data_and_products/gridded_bathymetry_data/>

Ended: Continue working on downloading GEBCO file and uploading it into RStudio

### 5/14

* Example batemetric code runs, need to upload Florida data into code and work on code to overlay plot points for reefs
* Began to create scatter plot for percent bleaching over time and temperature of time
  + Conner assisted in working to make graphs interactive to see individual plot points to review during results

### 5/17

* Worked on florida map and working to get individual lat/long on a separate graph, then tried to overlay them
* Finalized and cleaned up scatter plots for percent bleaching and temperature
* Updated all files into Github account
* Began to look at poster draft and adjust formatting

### 5/18

* Started to work on poster introduction/abstract
* Found resources for introduction and background knowledge:
  + <https://myfwc.com/research/habitat/coral/news-information/bleaching/>
  + <https://oceanservice.noaa.gov/facts/coral_bleach.html>

### 5/19

* Continued to work on poster, moved to methods section and collecting visuals to add to poster
* Worked more on Florida map, scrapped old code and attempted a new example code script to overlay plot points onto bathymetric map png file
  + Found leaflet package - Found it to be too clustered with works and colors
  + Adjusted lat/long coordinates to match ratio for bathymetric map png: Success!

### 5/21

* Spent time analyzing the graphs and looking for correlations or key features that would answer my research question
* Began to write out results section, making sure to reference figures and graphs

### 5/24

* Began to transfer information from poster draft into a script format
* Considered how I want to tell the ‘story’
  + Formatting for video recording: Will display large poster but zoom in to individual sections as speaking about them

### 5/25

* Continue to work on and edit poster draft and script
* Dr. Kelly mentioned potentially adding a correlation graph to make final strong argument

HW: Look at data and code example of how to piece together

### 5/26

* Continue to edit and finalize poster draft and script

### 5/27

* Made final edits to poster and script with Dr. Kelly
* Recorded, edited and submitted video!