R Class Project Proposal

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Geospatial Data Analysis

I have been uploading shapefiles (.shp), which are ArcGIS files and contain spatial data, to R and plotting them on a map. We could also use a data set with addresses or coordinates and create geosaptial data in R and plot them. Another idea is for us to use rasters, which is also a type of geospatial data, but is tiles imagery rather than points/lines/polygons. An example of this is aerial imagery, land use, and elevation data.

Abstract

One of my projects with Dr. Dumas involves examining if property sale prices over time have any correlation to changes in water quality. This dataset is the readings from over 400 water quality stations throughout North Carolina. The property value file, which is over half a million rows, is not yet ready to be utilized, but may eventually be examined as part of this project. Regardless, the water quality station readings are cleaned and ready to be utilized. My hope with this project isn't necessarily creating specific figures for a report, but rather creating figures and other data visualizations with this data to practice with.

Goals

1. Create tables and figures of water quality data for coastal areas (within maybe two miles of the ocean front (I have an oceanfront geospatial data file to use for this))
2. Plot water quality over time, between counties, fresh vs. brackish vs. salt water areas
3. Find trends between population centers and water quality

```
WQSdata<- read.csv("WaterQualityDataCombinedCleaned.csv")
head(WQSdata)
```

```
##   Day Month Year Hour Minute Area Site AreaSite   County
## 1   2    12 2002   14     35    C    1       C1 Carteret
## 2  13    11 2002   13     15    C    1       C1 Carteret
## 3  15    10 2002   15      0    C    1       C1 Carteret
## 4   8    10 2002   14      5    C    1       C1 Carteret
## 5  16     9 2002   15      0    C    1       C1 Carteret
## 6   5     9 2002   15     35    C    1       C1 Carteret
##                 Description                          Run Location Tier
## 1 Beaufort Inlet Rock Jetty Atlantic Ocean / Bogue Banks    Ocean    I
## 2 Beaufort Inlet Rock Jetty Atlantic Ocean / Bogue Banks    Ocean    I
## 3 Beaufort Inlet Rock Jetty Atlantic Ocean / Bogue Banks    Ocean    I
## 4 Beaufort Inlet Rock Jetty Atlantic Ocean / Bogue Banks    Ocean    I
## 5 Beaufort Inlet Rock Jetty Atlantic Ocean / Bogue Banks    Ocean    I
## 6 Beaufort Inlet Rock Jetty Atlantic Ocean / Bogue Banks    Ocean    I
##   Precipitation_24hr Salinity Water_Temp        Tide Current Wind Entero_MPN1
## 1               0.00       33         58     1/2 Ebb       S   SW          NA
## 2               0.45       30         70 Last of Ebb      SW   NE          NA
## 3               0.01       32         75   First Ebb       S   NE          NA
```

```
## 4              0.00       32         78   3/4 Flood       N   NE          NA
## 5              0.01       32         80     1/2 Ebb       S   SW          NA
## 6              0.01       32         80     1/2 Ebb       S   NW          NA
##   Entero_MPN2 Entero_MPN3 Entero_SSM Entero_GM Entero.CFU1 Entero_CFU2
## 1          NA          NA          9      29.0          NA          NA
## 2          NA          NA        111      34.0          NA          NA
## 3          NA          NA        254      21.0          NA          NA
## 4          NA          NA          9      10.8          NA          NA
## 5          NA          NA         NA        NA          NA          NA
## 6          NA          NA         NA        NA          NA          NA
##   Entero_CFU3 Entero_SSM_CFU Entero_GM2 Entero_GM_Number_of_Days E.Coli_MPN1
## 1          NA             NA         NA                     1245          NA
## 2          NA             NA         NA                     1234          NA
## 3          NA             NA         NA                     1212          NA
## 4          NA             NA         NA                     1211          NA
## 5          NA             NA         NA                       NA          NA
## 6          NA             NA         NA                       NA          NA
##   E.Coli_MPN2 E.Coli_MPN3 E.Coli_SSM E.Coli_GM E.Coli_GM_Number_of_Days
## 1          NA          NA         NA        NA                      NA
## 2          NA          NA         NA        NA                      NA
## 3          NA          NA         NA        NA                      NA
## 4          NA          NA        2.0       2.3                      48
## 5          NA          NA        1.7       2.2                      34
## 6          NA          NA        6.8       7.1                      24
##   Fecal_MPN1 Fecal_MPN2 Fecal_MPN3 Fecal_SSM Fecal_GM Fecal_GM_Number_of_Days
## 1         NA         NA         NA        NA       NA                     NA
## 2         NA         NA         NA        NA       NA                     NA
## 3         NA         NA         NA        NA       NA                     NA
## 4         NA         NA         NA       2.0      1.8                     48
## 5         NA         NA         NA       1.7      1.7                     34
## 6         NA         NA         NA       1.8      6.8                     24
##   E.Coli_CFU1 E.Coli_CFU2 E.Coli_CFU3 E.Coli_SSF E.Coli_GM2 Fecal_CFU1
## 1          NA          NA          NA         NA         NA         NA
## 2          NA          NA          NA         NA         NA         NA
## 3          NA          NA          NA         NA         NA         NA
## 4          NA          NA          NA         NA         NA         NA
## 5          NA          NA          NA         NA         NA         NA
## 6          NA          NA          NA         NA         NA         NA
##   Fecal_CFU2 Fecal_CFU3 Fecal_SSC Fecal_GM2
## 1         NA         NA        NA        NA
## 2         NA         NA        NA        NA
## 3         NA         NA        NA        NA
## 4         NA         NA        NA        NA
## 5         NA         NA        NA        NA
## 6         NA         NA        NA        NA
```

```
WQSlocations<-read.csv("WQSCoordinates.csv")
head(WQSlocations)
```

```
##   AreaSite Latitude Longitude  X X.1 X.2 X.3 X.4 X.5 X.6
## 1       C1 34.69417 -76.67661 NA  NA  NA  NA  NA  NA  NA
## 2    C100A 35.10307 -77.03494 NA  NA  NA  NA  NA  NA  NA
## 3      C10 34.64829 -77.09567 NA  NA  NA  NA  NA  NA  NA
## 4     C102 35.04261 -76.98856 NA  NA  NA  NA  NA  NA  NA
## 5     C100 35.09878 -77.02001 NA  NA  NA  NA  NA  NA  NA
```

```
## 6    C102A 35.08536 -77.02550 NA  NA  NA  NA  NA  NA  NA
```