Shiny and Interactive Graphs

Fall 2022

October 28 2022

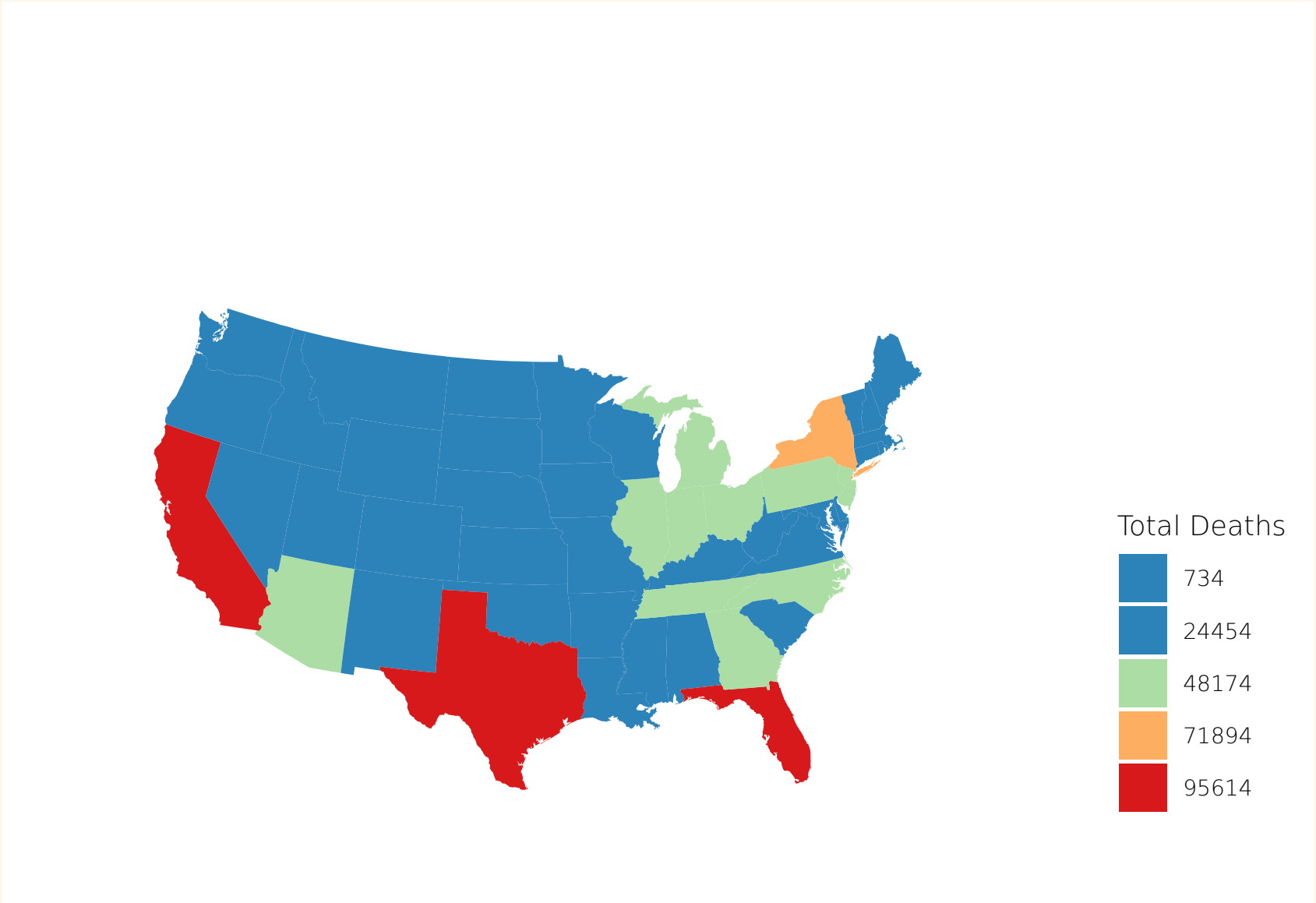
Data Scraping and Cleaning

```
table_usafacts <- bow(url = "https://usafacts.org/visualizations/coronavirus-covid-19-spreac
  scrape() %>%
  html_elements(css = "table") %>%
  html_table()

covid <- table_usafacts[[2]]
covid_clean <- covid %>% drop_na() %>%  janitor::clean_names() %>%
  mutate_at(4:5, parse_number) %>% mutate(state = str_to_lower(state))

states <- map_data("state")
covid_data <- left_join(states, covid_clean, by = c("region" = "state"))
```

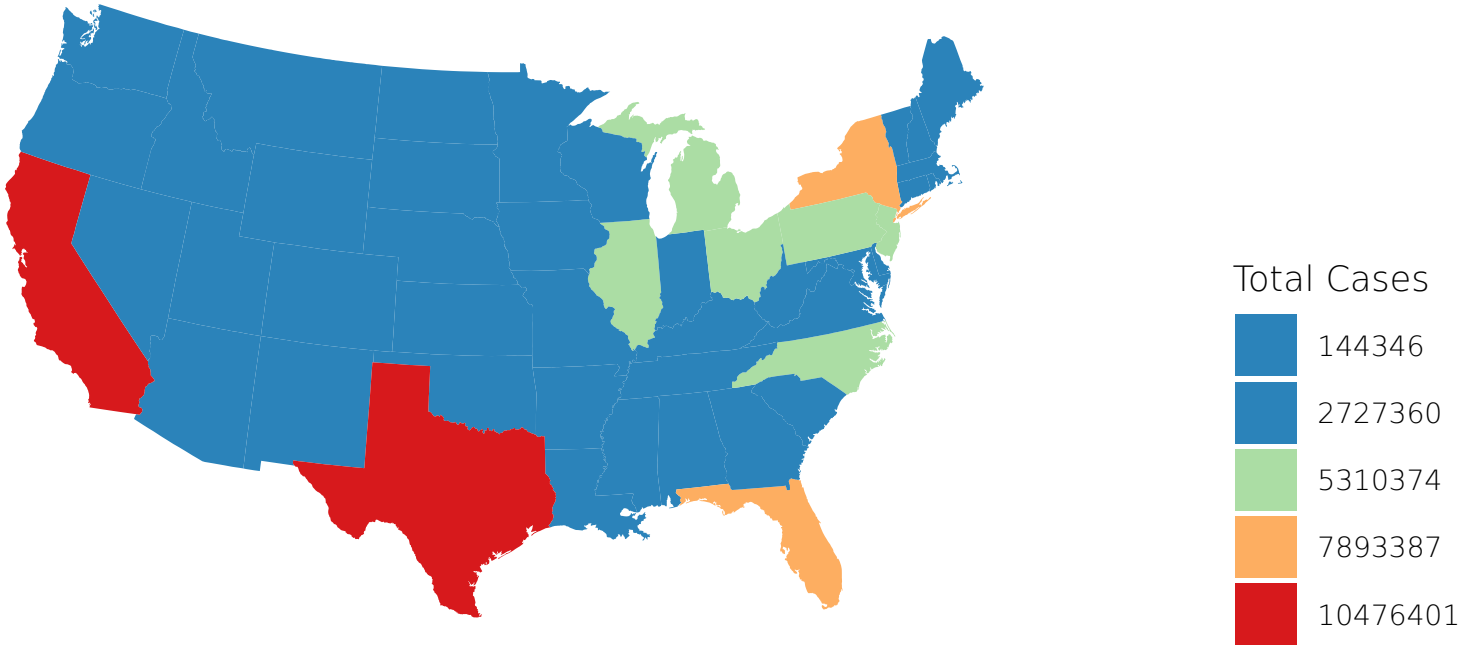
Glimpse of data

```
glimpse(covid_data)
Rows: 15,537
Columns: 12
$ long                                  <dbl> -87.46201, -87.48493, -87.52503, …
$ lat                                   <dbl> 30.38968, 30.37249, 30.37249, 30.…
$ group                                 <dbl> 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, …
$ order                                 <int> 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11…
$ region                                <chr> "alabama", "alabama", "alabama", …
$ subregion                             <chr> NA, NA, NA, NA, NA, NA, NA, NA, N…
$ x7_day_avg_cases                      <int> 366, 366, 366, 366, 366, 366, 366…
$ x7_day_avg_deaths                     <int> 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, …
$ cases                                 <dbl> 1531305, 1531305, 1531305, 153130…
$ deaths                                <dbl> 20533, 20533, 20533, 20533, 20533…
$ x7_day_avg_hospitalizations           <int> 68, 68, 68, 68, 68, 68, 68, 68, 6…
$ x7_day_avg_hospitalizations_per_100k <dbl> 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, …
```

Implementation 1 Code



Implementation 2 Code



Shiny Implementation

```
# Basic ggiraph using Shiny
ui <- fluidPage(
  girafeOutput("plot")
  )

server <- function(input, output) {

  output$plot <- renderGirafe({
    girafe(my_aweesome_plot )
  })
  })
}
```

Leaflet

Leaflet is a JavaScript library for creating dynamic maps that support panning and zooming along with various annotations like markers, polygons, and popups.

```
leaflet() %>%
  addTiles() %>%
  setView(lng = -93.1616, lat = 44.4583, zoom = 14)
```

What can you do with `leaflet`?

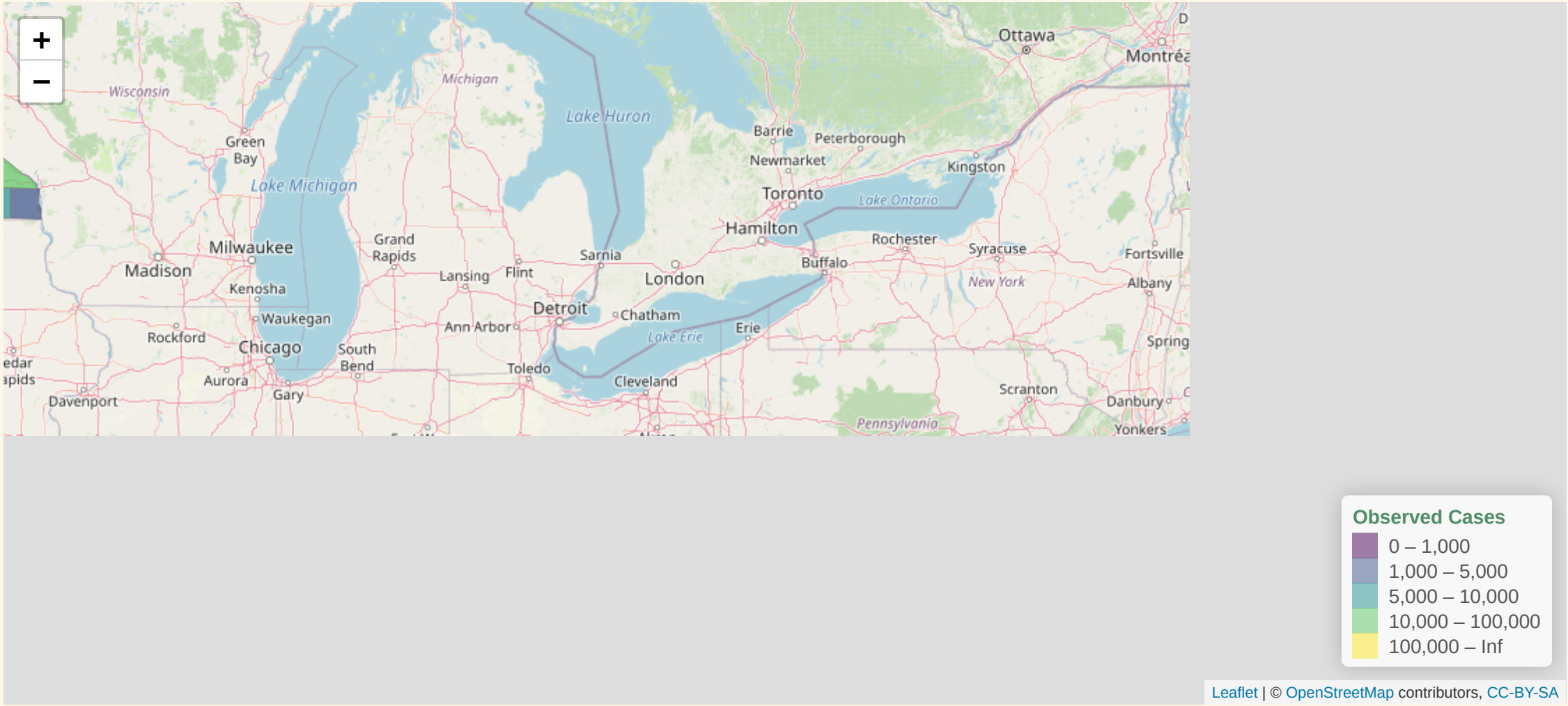
- Make the background map with `leaflet()`, `addTiles()` and `setView()`
- Use `addPolygons()` to add the shape of country/states/county
- Translate a numeric variable to a palette of color
  - Quantile with colorQuantile
  - Numeric with colorNumeric
  - Bin with colorBin

For more information, click here

Objects needed for plotting

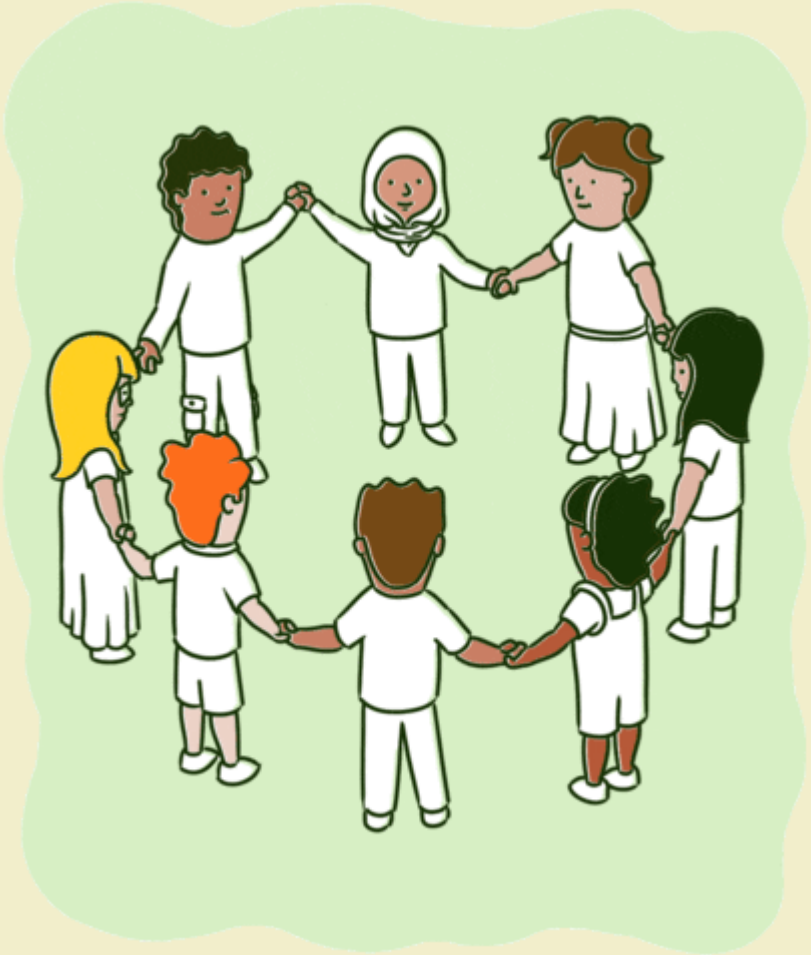
```
library(leaflet)  # for leaflet maps
library(maps)  # for map data
library(sp)  # for spatial polygons
library(maptools)  # for sp polygon data frame


MNcounty <- map("county", "Minnesota", plot=FALSE, fill=TRUE)
MNmap <- map2SpatialPolygons(MNcounty, IDs = MNcounty$names)
map <- SpatialPolygonsDataFrame(MNmap, covidMN_final, match.ID = FALSE)

pal <- colorNumeric(palette = "magma", alpha = TRUE, domain = map$cases)
bins <- c(0, 1000, 5000, 10000, 100000, Inf)
pal <- colorBin("viridis", domain = map$cases, bins = bins)

labels <- sprintf("<strong> %s </strong> <br/> Observed: %s", map$county, map$cases) %>%
  lapply(htmltools::HTML)

l <- leaflet(map) %>% addTiles() %>% setView(lng = -93.1616, lat = 44.4583, zoom = 5)

l %>% addPolygons(color = "grey", weight = 1,
                  fillColor = ~pal(cases), fillOpacity = 0.7,
                  highlightOptions = highlightOptions(weight = 5),
                  label = labels) %>%
  addLegend(pal = pal, values = ~cases, opacity = 0.5,
            title = "Observed Cases",
            position = "bottomright")
```

Interactive leaflet map



Group Activity 1

15:00



- Let's go over to maize server/ local Rstudio and our class moodle
- Get the class activity 20.Rmd file
- Work on activity 1
- Ask me questions