mapping

Chi Zhang

2020/10/27

#usmap plot-11 Floyd-1999

```
rain_99 <- filter(rain,storm_id == "Floyd-1999")
rain_99 <- group_by(rain_99, fips)
rain_99 <- summarise(rain_99,sum_rain = sum(precip))
```

```
## `summarise()` ungrouping output (override with `.groups` argument)
```

```
rain_99 <- as.data.frame(rain_99)
rain_99$rainfall <- NA
for (i in 1:dim(rain_99)[1]){
  rain_99$rainfall[i] <- rain_99$sum_rain[i]%/%25
}
rain_99$rainfall <- ordered(rain_99$rainfall,labels = c("[0.25]","(25,50]","(50,75]", "(75,100)","(100,125]","(125,150]","(150,175]","(175,200)","(200,222]"))


line_99 <- filter(hurr_tracks, storm_id == "Floyd-1999")
line_99 <-  separate(line_99, storm_id,c("id","year"),"-")
line_99$date <-  ymd_hm(line_99$date)
line_99 <- line_99[23:45,]


dt <- select(line_99,longitude, latitude)
data <- data.frame(
  lon = dt$longitude,
  lat = dt$latitude
```

```
)
dt <- usmap_transform(data)
```

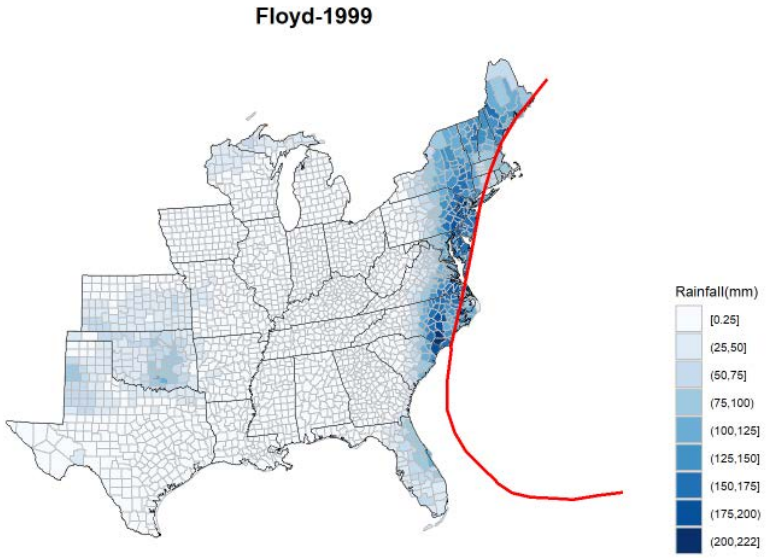
```
## Warning in showSRID(uprojargs, format = "PROJ", multili
ne = "NO", prefer_proj =
## prefer_proj): Discarded datum unknown in CRS definition
```

```
dt99 <- dt


region <-  fips_info(rain_99$fips)
MainStates <- map_data("state",region = region$full)


MainStates <- data.frame(
  lon = MainStates$long,
  lat = MainStates$lat,
  group = MainStates$group,
  order = MainStates$order,
  region = MainStates$region
)
MainStates <- usmap_transform(MainStates)
```

```
## Warning in showSRID(uprojargs, format = "PROJ", multili
ne = "NO", prefer_proj =
## prefer_proj): Discarded datum unknown in CRS definition
```

```
p11 <- plot_usmap(data = rain_99, values = "rainfall", colo
r = "grey", include = rain_99$fips) +
  geom_polygon( data=MainStates, aes(x=lon.1, y=lat.1, gro
up=group),
                color="black",  size = 0.05, alpha = 0) +
  scale_fill_brewer(palette = "Blues", name = "Rainfall(m
m)") +
  labs(title = "Floyd-1999") +
  theme(plot.title = element_text(face = "bold", size = 14,
 hjust = 0.5)) +
  theme(legend.position = "right")+
```

```
  geom_path(data = dt, aes(x = lon.1, y = lat.1),
            color = "red", size = 1)
p11
```



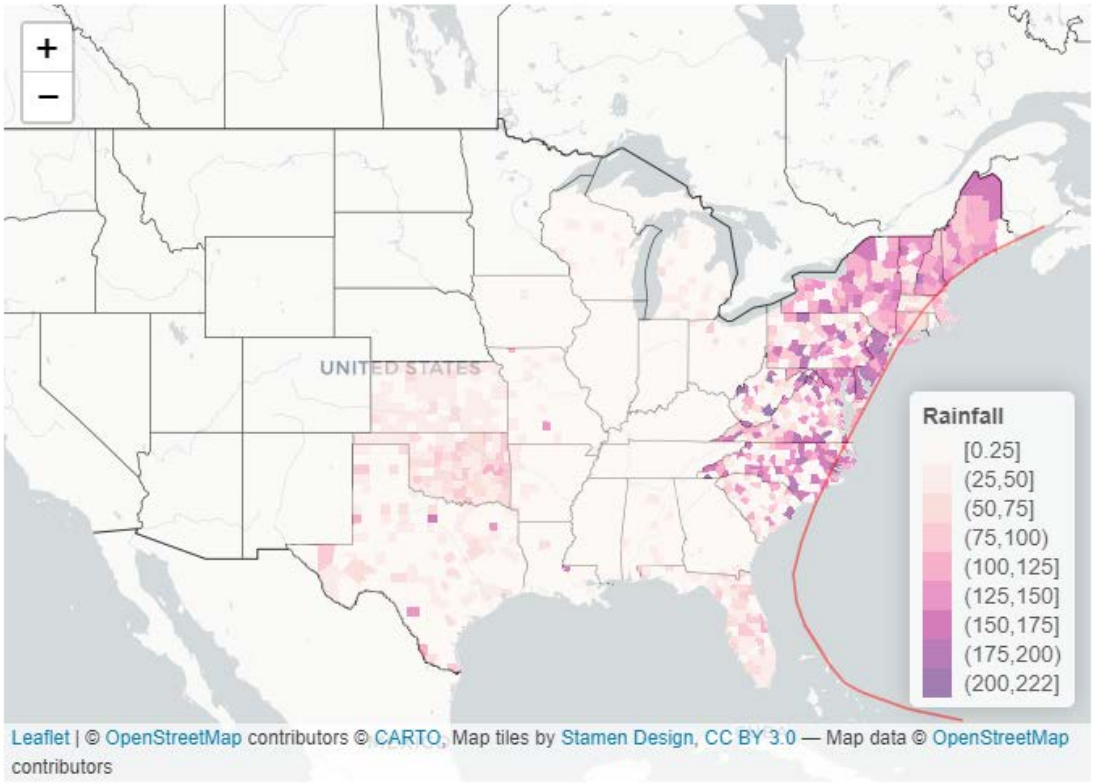
#leaflet plot-21 Floyd-1999

```
library(leaflet)
```

```
## Warning: package 'leaflet' was built under R version 4.
0.3
```

```
library(htmlwidgets)
library(htmltools)


factpal <- colorFactor("RdPu", rain_99$rainfall)


mapCounty = map("county", region = region$full, fill = TRU
E, plot = FALSE)


p12 <- leaflet(data = rain_99) %>%
  addProviderTiles("CartoDB.Positron") %>%
  addProviderTiles(providers$Stamen.TonerLines,
                   options = providerTileOptions(opacity = 0.
75)) %>%
```

```
  setView(-89.275673, 37.098, zoom = 4) %>%
  addPolygons(data = mapCounty,
              color = ~factpal(rain_99$rainfall),
              fillOpacity  = 0.5,
              smoothFactor = 0.1,
              weight = 1,
              stroke = FALSE) %>%
  addPolylines(data = dt99,~lon, ~lat,
               color="red",
               weight = 1.5)%>%
  addLegend(pal = factpal,
            values = rain_99$rainfall,
            position="bottomright",
            title = "Rainfall")
p12
```



usmap plot-21 Allison-2001

```
rain_01 <- filter(rain, storm_id == "Allison-2001")
rain_01 <- filter(rain_01, lag>-5 & lag <3)
rain_01 <- group_by(rain_01, fips)
rain_01 <- summarise(rain_01,sum_rain = sum(precip))
```

```
## `summarise()` ungrouping output (override with `.groups
` argument)
```

```
rain_01 <- as.data.frame(rain_01)
rain_01$rainfall <- NA


rain_limit <-  175


for (i in 1:dim(rain_01)[1]){
  if ( rain_01$sum_rain[i] < rain_limit) {
    rain_01$rainfall[i] <- 0
  }
```

```
  else rain_01$rainfall[i] <- 1
}

rain_01$rainfall <- ordered(rain_01$rainfall,labels = c("U
nexposed","Exposed"))



line_01 <- filter(hurr_tracks, storm_id == "Allison-2001")
line_01 <-  separate(line_01, storm_id,c("id","year"),"-")
line_01$date <-  ymd_hm(line_01$date)
line_01 <- line_01[1:55,]

dt <- select(line_01,longitude, latitude)
data <- data.frame(
  lon = dt$longitude,
  lat = dt$latitude
)
dt <- usmap_transform(data)
## Warning in showSRID(uprojargs, format = "PROJ", multili
ne = "NO", prefer_proj =
## prefer_proj): Discarded datum unknown in CRS definition
dt01 <- dt

region <-  fips_info(rain_01$fips)
MainStates <- map_data("state",region = region$full)

MainStates <- data.frame(
  lon = MainStates$long,
  lat = MainStates$lat,
  group = MainStates$group,
  order = MainStates$order,
```

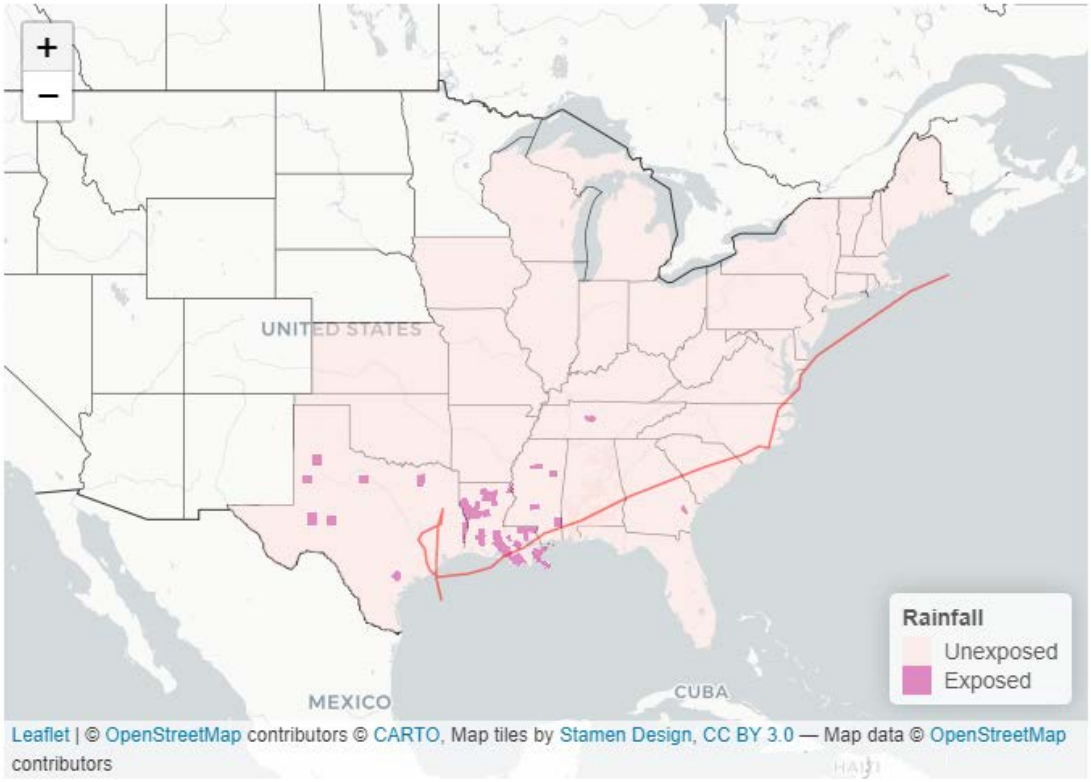
```
  region = MainStates$region
)
MainStates <- usmap_transform(MainStates)
```

```
## Warning in showSRID(uprojargs, format = "PROJ", multili
ne = "NO", prefer_proj =
## prefer_proj): Discarded datum unknown in CRS definition
```

```
p21 <- plot_usmap(data = rain_01, values = "rainfall", colo
r = "grey", include = rain_01$fips) +
  geom_polygon( data=MainStates, aes(x=lon.1, y=lat.1, gro
up=group),
                color="black",  size = 0.05, alpha = 0) +
  scale_fill_brewer(palette = "Blues", name = "Rainfall > 1
75mm") +
  labs(title = "Allison-2001") +
  theme(plot.title = element_text(face = "bold", size = 14,
 hjust = 0.5)) +
  theme(legend.position = "right")+
  geom_path(data = dt, aes(x = lon.1, y = lat.1),
            color = "red", size = 1)
p21
```

leaflet plot-22 Allison-2001

```
pal <- colorFactor("RdPu", rain_01$rainfall)


mapCounty = map("county", region = region$full, fill = TRU
E, plot = FALSE)


p22<- leaflet(data = rain_01) %>%
  addProviderTiles("CartoDB.Positron") %>%
  addProviderTiles(providers$Stamen.TonerLines,
                   options = providerTileOptions(opacity = 0.
75)) %>%
  setView(-89.275673, 37.098, zoom = 4) %>%
  addPolygons(data = mapCounty,
              color = ~pal(rain_01$rainfall),
              fillOpacity  = 0.5,
              smoothFactor = 0.1,
              weight = 1,
              stroke = FALSE) %>%
  addPolylines(data = dt01,~lon, ~lat,
               color="red",
               weight = 1.5)%>%
  addLegend(pal = pal,
            values = rain_01$rainfall,
            position="bottomright",
            title = "Rainfall")
p22
```


+
−
UNITED STATES
MEXICO
CUBA
Rainfall
Unexposed
Exposed
Leaflet | © OpenStreetMap contributors © CARTO, Map tiles by Stamen Design, CC BY 3.0 — Map data © OpenStreetMap contributors