

# tropical\_cyclone\_figures

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```
library(tidyverse)

## -- Attaching packages ----- tidyverse 1.3.0 --
## v ggplot2 3.3.3      v purrr  0.3.4
## v tibble  3.0.6      v dplyr  1.0.4
## v tidyr   1.1.2      v stringr 1.4.0
## v readr   1.4.0      v forcats 0.5.1

## -- Conflicts ----- tidyverse_conflicts() --
## x dplyr::filter() masks stats::filter()
## x dplyr::lag()    masks stats::lag()

library(sf)

## Linking to GEOS 3.8.1, GDAL 3.1.4, PROJ 6.3.1

library(tigris)

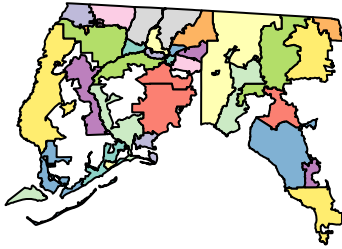
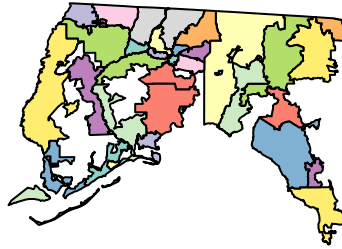
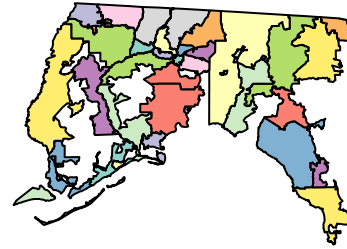
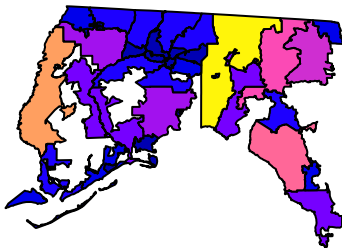
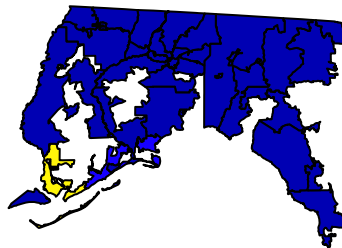
## To enable
## caching of data, set `options(tigris_use_cache = TRUE)` in your R script or .Rprofile.

Point Location Image

# Creating a map of the Florida panhandle including Tallahassee

florida_zip <- zctas(cb = TRUE, starts_with = "323",
                    class = "sf")

## ZCTAs can take several minutes to download. To cache the data and avoid re-downloading in future R s
## |
plot(florida_zip)
```

**ZCTA5CE10****AFFGEOID10****GEOID10****ALAND10****AWATER10**

```
# Creating a small dataframe with latitude and longitude points in Florida panhandle.
```

```
lon <- c(-84.365908,-84.469249,-83.928361,-84.264767)
lat <- c(29.918281,30.281365,30.087633,30.425467)
coordinates <- data.frame(lon, lat)
coordinates
```

```
##      lon      lat
## 1 -84.36591 29.91828
## 2 -84.46925 30.28137
## 3 -83.92836 30.08763
## 4 -84.26477 30.42547
```

```
# Turning the latitude and longitude coordinates into sf objects.
```

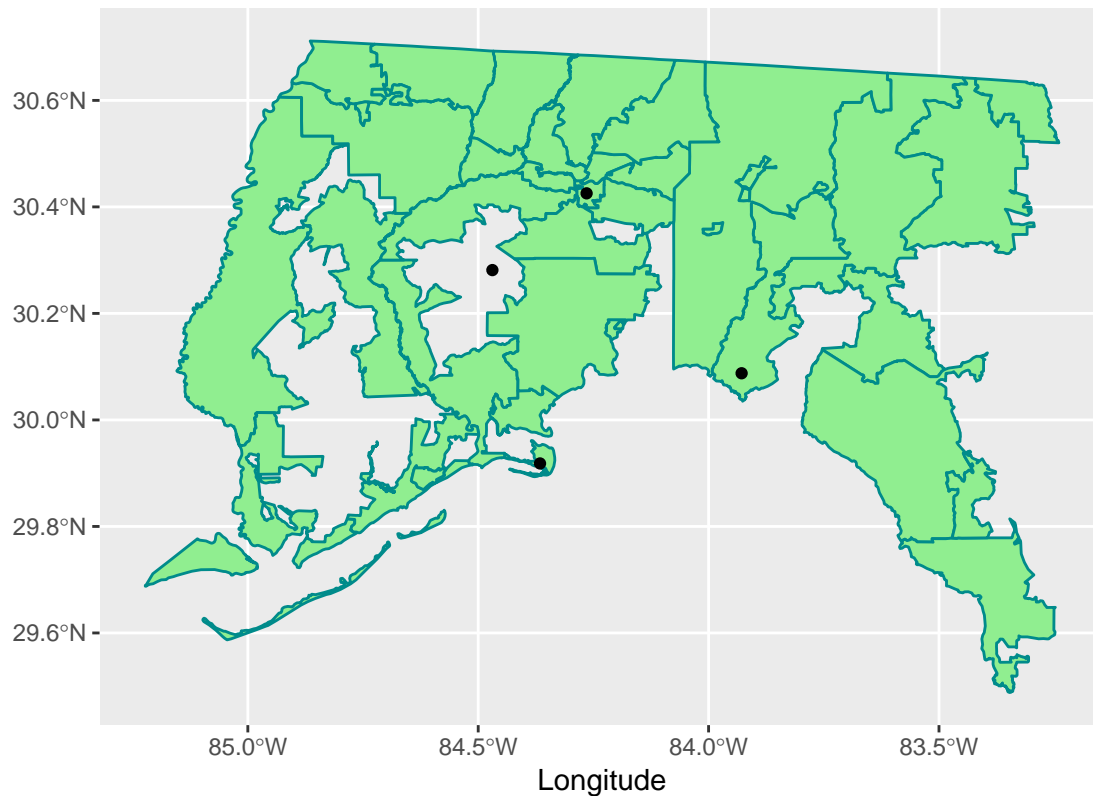
```
florida_sf <- coordinates %>%
  st_as_sf(coords = c("lon", "lat")) %>%
  st_set_crs(4269)
```

```
# Create map of Florida panhandle with point locations using the latitude and longitude dataframe.
```

```
florida_map <- ggplot() +
  geom_sf(data = florida_zip, fill = "light green", color = "darkcyan") +
  geom_sf(data = florida_sf) +
  ggtitle("Point Locations in Florida Panhandle") +
  labs(x = "Longitude", "Latitude")
```

```
florida_map
```

## Point Locations in Florida Panhandle



### Zip

Code Shaded Image ###

```
# Creating an image of a zip code in Florida panhandle that is shaded dark blue.
class(florida_zip)
```

```
## [1] "sf"          "data.frame"
```

```
head(florida_zip)
```

```
## Simple feature collection with 6 features and 5 fields
## geometry type:  MULTIPOLYGON
## dimension:      XY
## bbox:           xmin: -85.15402 ymin: 29.77036 xmax: -83.29295 ymax: 30.68532
## geographic CRS: NAD83
##      ZCTA5CE10      AFFGEOID10 GEOID10      ALAND10  AWATER10
## 1217      32340 86000000US32340    32340  604741760 12703955
## 1692      32347 86000000US32347    32347  273984174   624646
## 2100      32334 86000000US32334    32334  428174924  3218809
## 2102      32312 86000000US32312    32312  270084836 45351284
## 2214      32348 86000000US32348    32348   825116998 43174569
## 2902      32321 86000000US32321    32321 1053250827 16063801
##
##              geometry
## 1217 MULTIPOLYGON (((-83.59191 3...
## 1692 MULTIPOLYGON (((-83.7531 30...
## 2100 MULTIPOLYGON (((-84.88401 3...
## 2102 MULTIPOLYGON (((-84.35949 3...
## 2214 MULTIPOLYGON (((-83.79738 2...
## 2902 MULTIPOLYGON (((-85.15381 3...
```

```

zipcode <- florida_zip %>%
  filter(ZCTA5CE10 == "32340")
zipcode

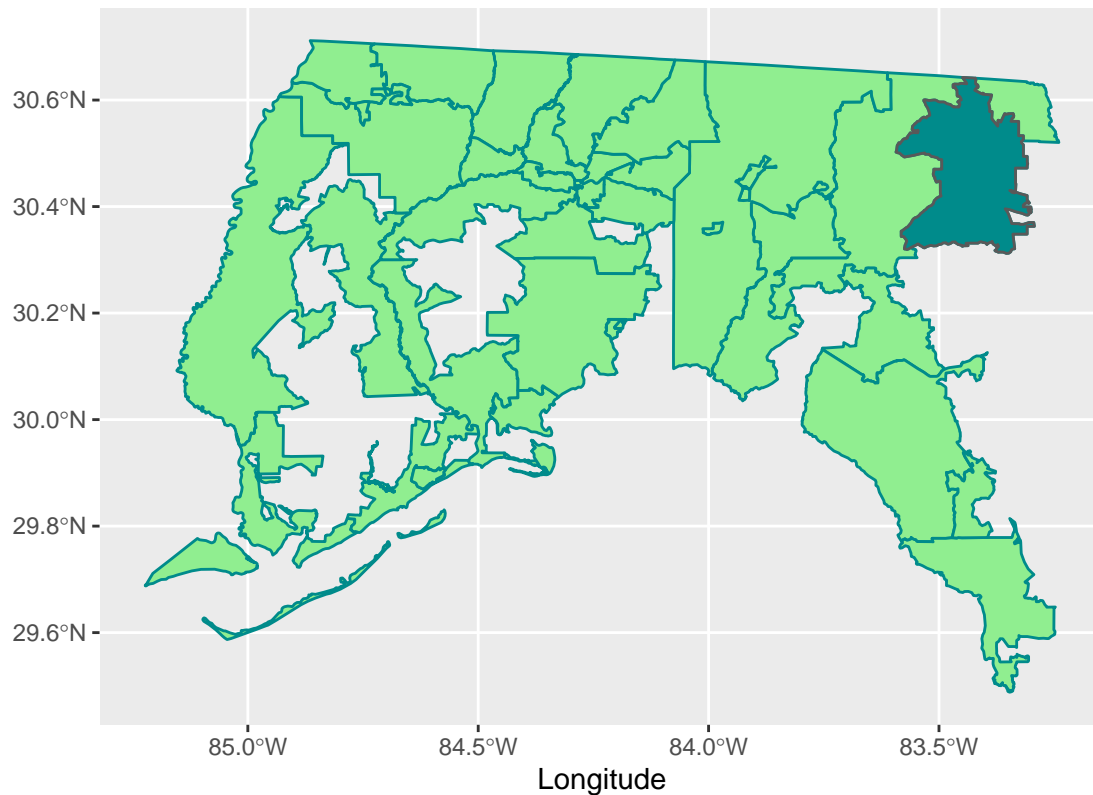
## Simple feature collection with 1 feature and 5 fields
## geometry type: MULTIPOLYGON
## dimension: XY
## bbox: xmin: -83.59328 ymin: 30.31212 xmax: -83.29295 ymax: 30.64241
## geographic CRS: NAD83
## ZCTA5CE10 AFFGEOID10 GEOID10 ALAND10 AWATER10
## 1 32340 86000000US32340 32340 604741760 12703955
## geometry
## 1 MULTIPOLYGON (((-83.59191 3...

zipcode_map <- ggplot() +
  geom_sf(data = florida_zip, fill = "light green", color = "darkcyan") +
  geom_sf(data = zipcode, fill = "darkcyan") +
  ggtitle("A Zip Code in the Florida Panhandle") +
  labs(x = "Longitude", "Latitude")

zipcode_map

```

A Zip Code in the Florida Panhandle



County Shaded Image ###

*# Create in image of a county in the Florida panhandle that is shaded in.*

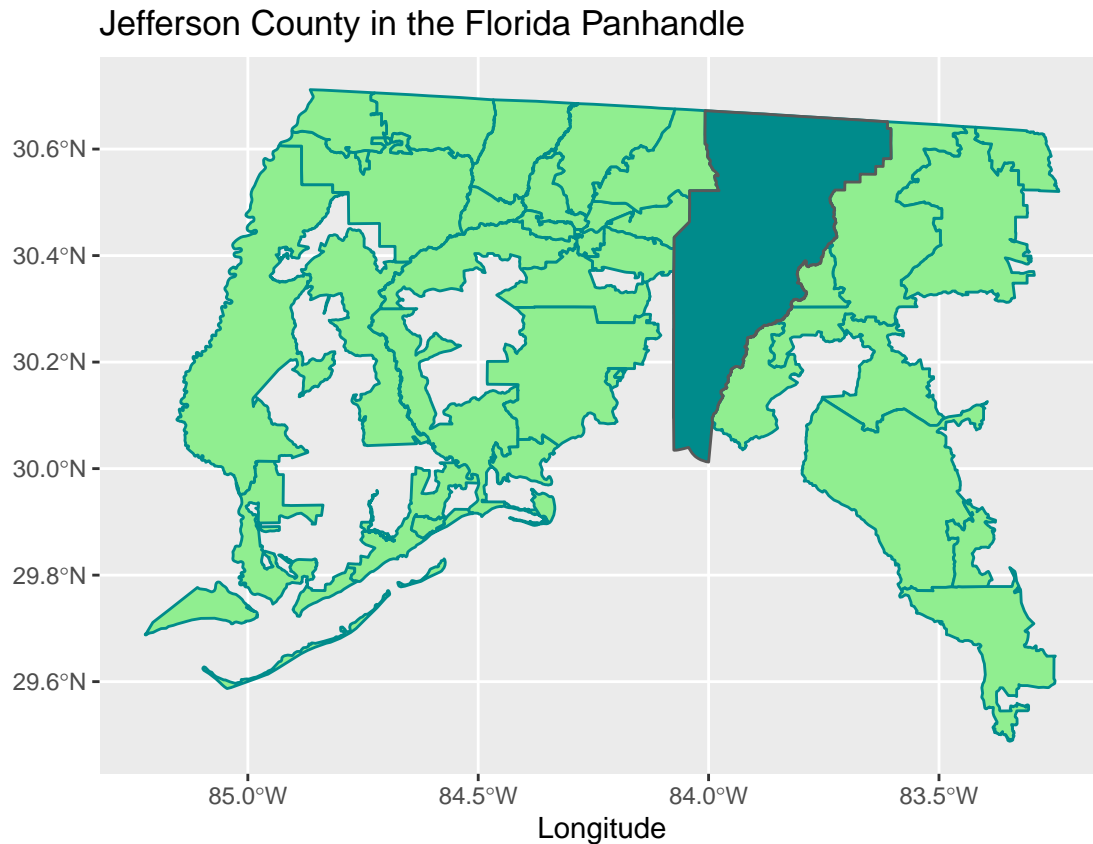
```

florida_counties <- counties(state = "FL", class = "sf") %>%
  filter(NAME == "Jefferson")

```

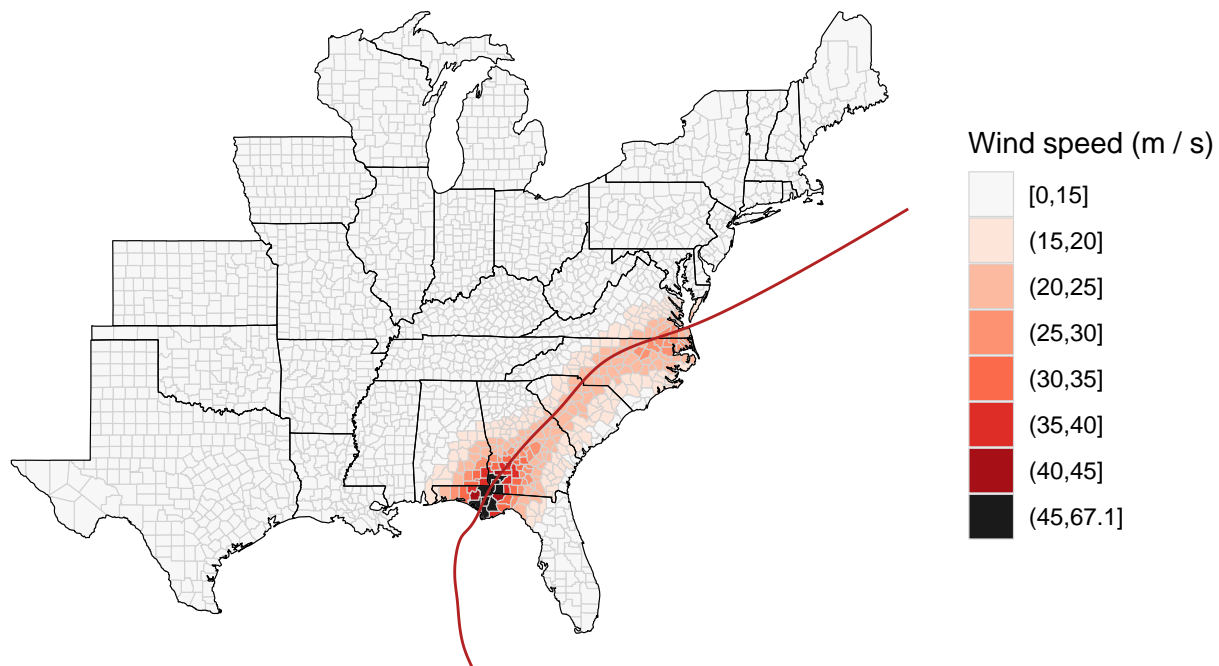
```
## |
florida_county_map <- ggplot() +
  geom_sf(data = florida_zip, fill = "light green", color = "darkcyan") +
  geom_sf(data = florida_counties, fill = "darkcyan") +
  ggtitle("Jefferson County in the Florida Panhandle") +
  labs(x = "Longitude", "Latitude")
```

```
florida_county_map
```



```
library(hurricaneexposedata)
library(hurricaneexposure)

map_counties(storm = "Michael-2018", metric = "wind")
```



```
library(tidyverse)
data("county_centers")
michael_fl_winds <- county_wind(counties = county_centers %>%
                                filter(state_name == "Florida") %>%
                                pull(fips),
                                start_year = 2018, end_year = 2018,
                                wind_limit = 0) %>%
  filter(storm_id == "Michael-2018")
head(michael_fl_winds)
```

```
##      storm_id fips vmax_sust vmax_gust sust_dur gust_dur usa_atcf_id
## 1: Michael-2018 12001 13.107294 19.529868      0      0      AL142018
## 2: Michael-2018 12003 14.431641 21.503145      0    375      AL142018
## 3: Michael-2018 12005 56.130560 83.634535    765   1155      AL142018
## 4: Michael-2018 12007 13.069499 19.473554      0      0      AL142018
## 5: Michael-2018 12009  5.383048  8.020741      0      0      AL142018
## 6: Michael-2018 12011  2.961056  4.411974      0      0      AL142018
## closest_time_utc storm_dist      local_time closest_date
## 1: 2018-10-10 22:45  285.92563 2018-10-10 18:45  2018-10-10
## 2: 2018-10-11 01:30  255.94270 2018-10-10 21:30  2018-10-10
## 3: 2018-10-10 17:45   23.51171 2018-10-10 12:45  2018-10-10
## 4: 2018-10-11 00:30  284.21471 2018-10-10 20:30  2018-10-10
## 5: 2018-10-10 17:45  507.04336 2018-10-10 13:45  2018-10-10
## 6: 2018-10-09 18:45  621.40911 2018-10-09 14:45  2018-10-09
```

```
library(viridis)
```

```
## Loading required package: viridisLite
```

```
all_fl_counties <- counties(state = "FL", cb = TRUE, resolution = "20m") %>%
  mutate(fips = paste0(STATEFP, COUNTYFP)) %>%
  full_join(michael_fl_winds, by = "fips")
```

```
## |
```

```
|
```

```
florida_county_map2 <- ggplot() +  
  geom_sf(data = all_fl_counties, aes(fill = vmax_sust)) +  
  scale_fill_viridis() +  
  theme_void()  
florida_county_map2
```

