Module 11 - Manipulating and Mapping Geospatial Data

Saurabh Shinde

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Data Importing

Import the data and packages necessary for analysis

```r
#Clear Workspace
rm(list = ls(all = TRUE))

#Load Libraries
library(tidyverse)
library(sf)
library(ggspatial)

#Read .shp files and transform to 32119
counties <- read_sf("data/spatial_data/counties.shp") %>%
  st_transform(crs = 32119)
shelters <- read_sf("data/spatial_data/Potential_Emergency_Shelters.shp") %>%
  st_transform(crs = 32119)
state_bounds <- read_sf('data/spatial_data/state_bounds.shp') %>%
  st_transform(crs = 32119)
ncdot <- read_sf("data/spatial_data/NCDOT_Smoothed_Urban_Boundaries_simple.shp") %>%
  st_transform(crs = 32119)
```

Part 1

How many shelters are located within 50 km of the Capital Area Metropolitan Organization (the name given to the Raleigh metropolitan area)?
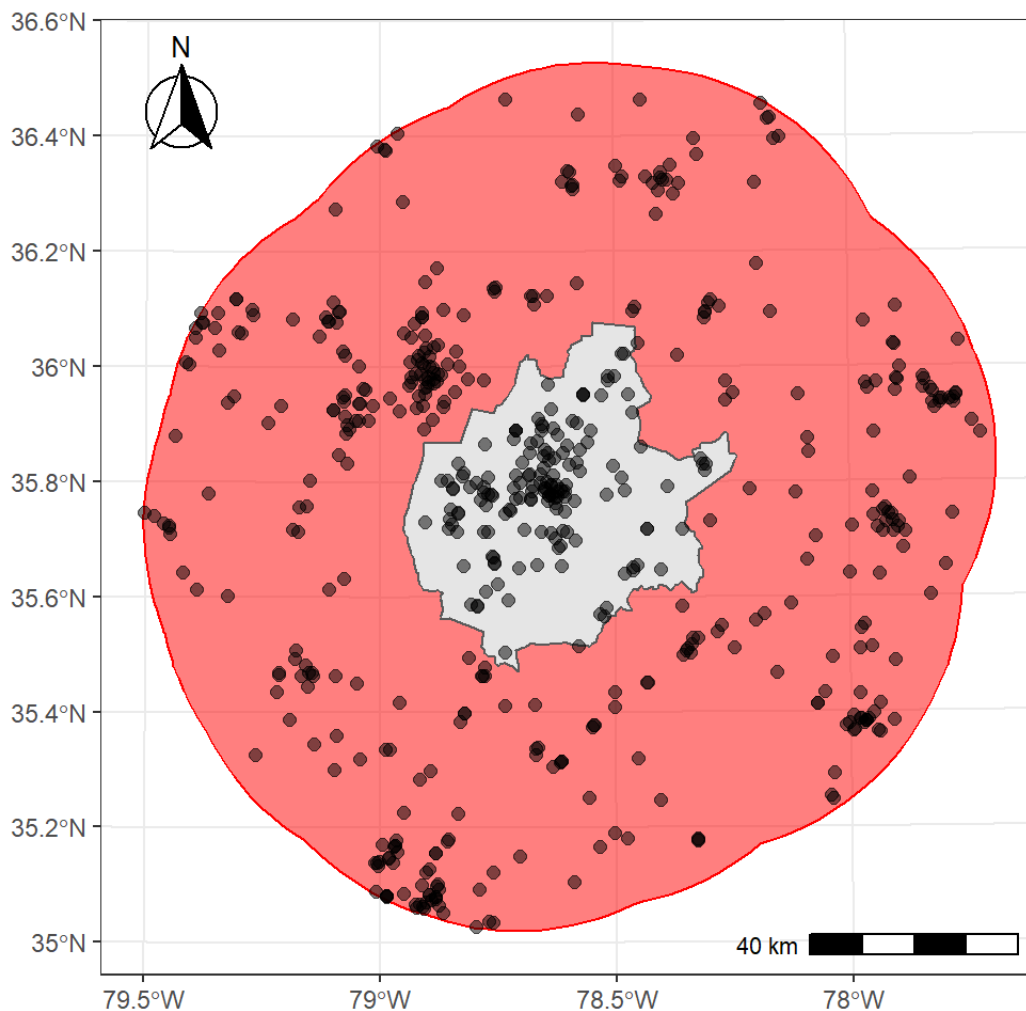
```
#Filter Urban Area in Raleigh
cap_area <- ncdot %>%
   filter(NAME == "Capital Area Metropolitan Organization")

#Create 50km buffer
cap_area_buffer <- st_buffer(cap_area, dist = (50*10^3))
cap_shelter <- st_intersection(shelters, cap_area)
buffer_points <- st_intersection(cap_area_buffer, shelters)

#Plot
ggplot()  +
   geom_sf(data = cap_area_buffer, fill = 'red', color = 'red', alpha = 0.5) +
   geom_sf(data = cap_area) +
   geom_sf(data = buffer_points, size = 2, alpha = 0.5) +
   annotation_scale(location = 'br') +
   annotation_north_arrow(style = north_arrow_fancy_orienteering, location = 'tl') +
   theme_bw()
```

Part 2

How many potential shelters are there per county in NC?

```r
#Create NC state bound
nc <- state_bounds %>%
  filter(NAME == 'North Carolina')

#Summarise no. of shelters per county
shelter_counties <- st_join(counties, shelters)
shelter_counties_sum <- shelter_counties %>%
  group_by(CO_NAME) %>%
  count()

#Plot
ggplot() +
  geom_sf(data = shelter_counties) +
  geom_sf(data = shelter_counties_sum, aes(fill = n)) +
  annotation_scale(location = 'bl') +
  scale_fill_viridis_c() +
  labs(fill = 'No. of shelters') +
  theme_bw()
```