

# ggplot map test

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# Demo of making maps with R

# Call the libraries

library(ggplot2) # beautiful graphs

## Warning: package 'ggplot2' was built under R version 4.1.3
library(dplyr) # data wrangling

## Warning: package 'dplyr' was built under R version 4.1.3
##
## Attaching package: 'dplyr'
## The following objects are masked from 'package:stats':
##
##   filter, lag
## The following objects are masked from 'package:base':
##
##   intersect, setdiff, setequal, union
library(sf) # simple (spatial) features

## Warning: package 'sf' was built under R version 4.1.3
## Linking to GEOS 3.9.1, GDAL 3.2.1, PROJ 7.2.1; sf_use_s2() is TRUE
library(readr) # import csv

## Warning: package 'readr' was built under R version 4.1.3
library(here) # where am I?

## Warning: package 'here' was built under R version 4.1.3
## here() starts at C:/Users/agrogan/Desktop/GitHub/dataviz
setwd(here()) # set the working directory

# use read_sf to open shapefiles
# getting the directory and filename right is important

city_boundary <- read_sf("./mapping/shapefiles/AA_City_Boundary/AA_City_Boundary.shp")

buildings <- read_sf("./mapping/shapefiles/AA_Building_Footprints/AA_Building_Footprints.shp")

trees <- read_sf("./mapping/shapefiles/a2trees/AA_Trees.shp")
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parks <- read_sf("./mapping/shapefiles/AA_Parks/AA_Parks.shp")

university <- read_sf("./mapping/shapefiles/AA_University/AA_University.shp")

WashtenawRoads <- read_sf("./mapping/shapefiles/Roads/RoadCenterlines.shp")

AnnArborRoads <- st_crop(WashtenawRoads,
                        city_boundary) # crop to only get A2 roads

## Warning: attribute variables are assumed to be spatially constant throughout all
## geometries

# watersheds <- read_sf("./mapping/shapefiles/watersheds/Watersheds.shp")

# use read_csv to read text file with client data

clients <- read_csv("./mapping/location-data/clients.csv")

## Rows: 453 Columns: 10

## -- Column specification -----
## Delimiter: ","
## chr (3): gender, race_ethnicity, program
## dbl (7): ID, age, family_income, mental_health_T1, mental_health_T2, latitud...
##
## i Use `spec()` to retrieve the full column specification for this data.
## i Specify the column types or set `show_col_types = FALSE` to quiet this message.

# only clients in Ann Arbor area

clients <- clients %>%
  filter(latitude <= 42.35 &
         latitude >= 42.2 &
         longitude >= -83.8 &
         longitude <= -83.65)

# convert clients to sf object while denoting CRS

# 4326 -> WGS1984

# point <- st_as_sf(clients,
#                   coords = c("longitude", "latitude"),
#                   crs = 4326)

# 4269 -> NAD1983 (A2 is NAD1983)

point <- st_as_sf(clients,
                  coords = c("longitude", "latitude"),
                  crs = 4269)

# use ggplot to make the map

# NB RE Macs: the plotting device on Macs is actually pretty slow
# we notice this with all the detail that is involved in maps
# maps can be REALLY slow on Macs

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# so--inconveniently--we write directly to PDF on a Mac
# and don't see the graph in our RStudio window
# we have to manually open the PDF to see the created map

# Note, haven't figured out how to add clients w/o goofing up the map

# Apparently, the first layer is important for setting the CRS of the map

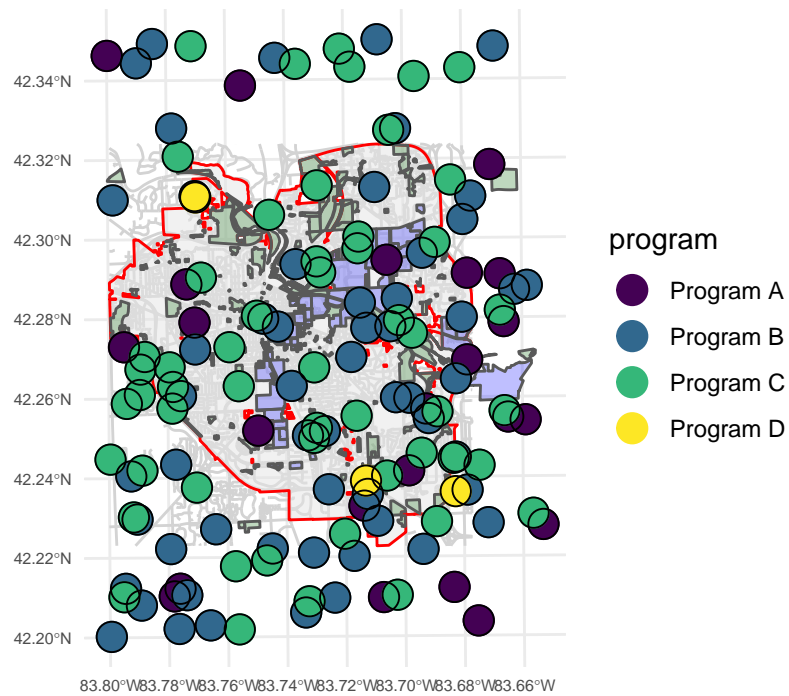
# pdf("./mapping/ggplot-map-test.pdf") # open PDF device (uncomment on Mac)

ggplot(city_boundary) +
  # geom_sf(data = buildings,
  #         fill = "lightgrey") +
  geom_sf(data = AnnArborRoads,
          color = "lightgrey") +
  geom_sf(color = "red", alpha = .5) +
  geom_sf(data = university,
          fill = "blue",
          alpha = .25) +
  geom_sf(data = parks,
          fill = "darkgreen",
          alpha = .25) +
  geom_sf(data = point,
          aes(color = program),
          size = 5,
          alpha = 1.0) +
  geom_sf(data = point,
          size = 5,
          pch = 21) + # 21 is outlines
  # geom_sf(data = trees,
  #         size = .1,
  #         color = "darkgreen") +
  labs(title = "Ann Arbor",
       subtitle = "Locations of Clients",
       caption = "Simulated Social Service Agency Data") +
  scale_color_viridis_d() +
  scale_fill_viridis_d() +
  theme_minimal() +
  theme(plot.title = element_text(size = rel(2)),
        axis.text = element_text(size = rel(.5)))

```

# Ann Arbor

## Locations of Clients



Simulated Social Service Agency Data

```
ggsave("./mapping/social-service-agency.png",  
        height = 11,  
        width = 8.5)  
  
ggsave("./mapping/social-service-agency.pdf",  
        height = 11,  
        width = 8.5)  
  
# dev.off() # turn off PDF device (uncomment on Mac)
```