

IntroductionToNeighborhoods

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Preliminaries

This workshop will involve a large collection of R packages and will provide a basic run through for accessing spatial data, spatial plotting and integrating with the ‘ggplot’ packages. Last we will perform some simple spatial statistics.

From CRAN

Required

```
install.packages("sp")
install.packages("rgeos")
install.packages("maptools")
install.packages("spdep")
install.packages("ggplot2")
install.packages("devtools")
install.packages("plyr")
install.packages("dplyr")
install.packages("ggmap")
install.packages("rjson")
install.packages("rgeos")
```

Recommended

```
install.packages("rgdal")
```

US Census Packages

In this workshop we will use a series of different packages, including the US Census suite of software. The most recent versions are available https://r-forge.r-project.org/R/?group_id=2022. We will need only three of the packages:

```
install.packages("UScensus2010", repos = "http://R-Forge.R-project.org")
install.packages("UScensus2010county", repos = "http://R-Forge.R-project.org")
install.packages("UScensus2010tract", repos = "http://R-Forge.R-project.org")
install.packages("UScensus2010cdp", repos = "http://R-Forge.R-project.org")
```

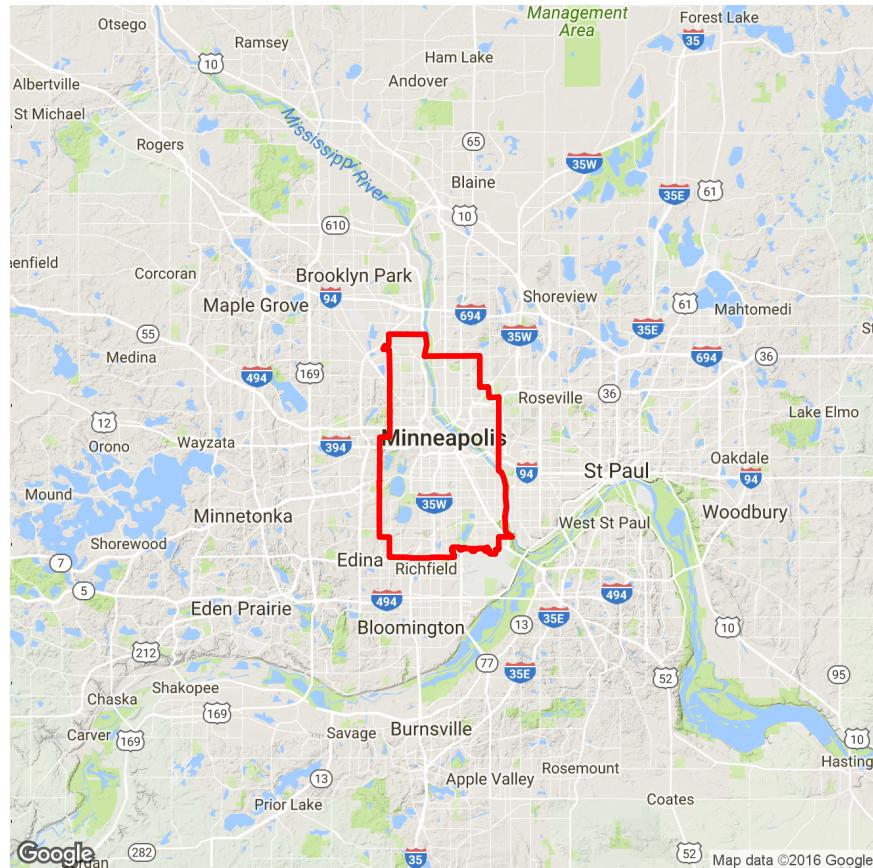
Introduction to Minneapolis

Google Maps

```
library(UScensus2010)
library(UScensus2010cdp)
library(ggmap)

## Build city boundary
mpls <- city("minneapolis", "MN")
mpls_boundary <- fortify(mpls)

## Plot MPLS and Boundary
qmap(location = "Minneapolis, MN", zoom = 10) + geom_polygon(data = mpls_boundary,
  aes(x = long, y = lat), color = "red", alpha = 0, size = 1) +
  coord_map()
```

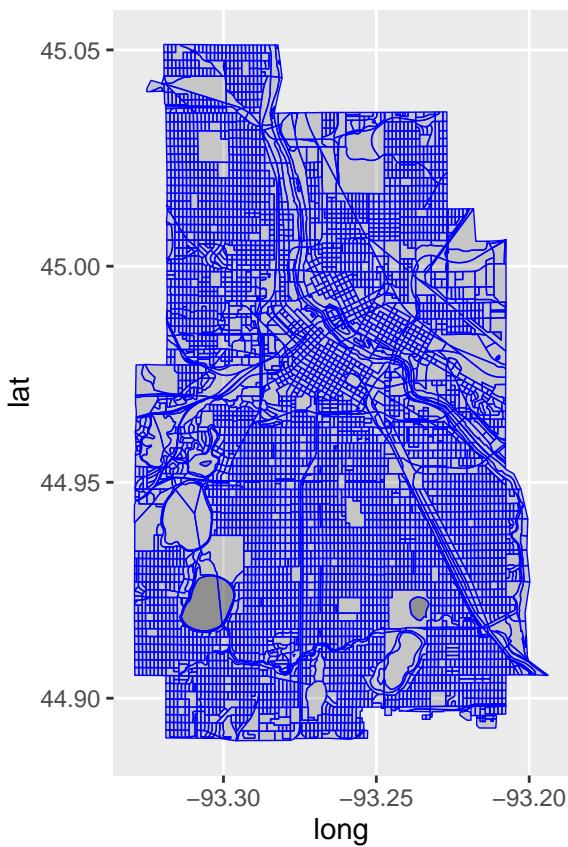


Census Blocks

```
load("data/mpls_blk.rda")
mpls_blk <- fortify(mpls_blk)

ggplot() + geom_polygon(data = mpls_blk, aes(x = long, y = lat,
  group = group), color = "blue", alpha = 0.2, size = 0.25) +
```

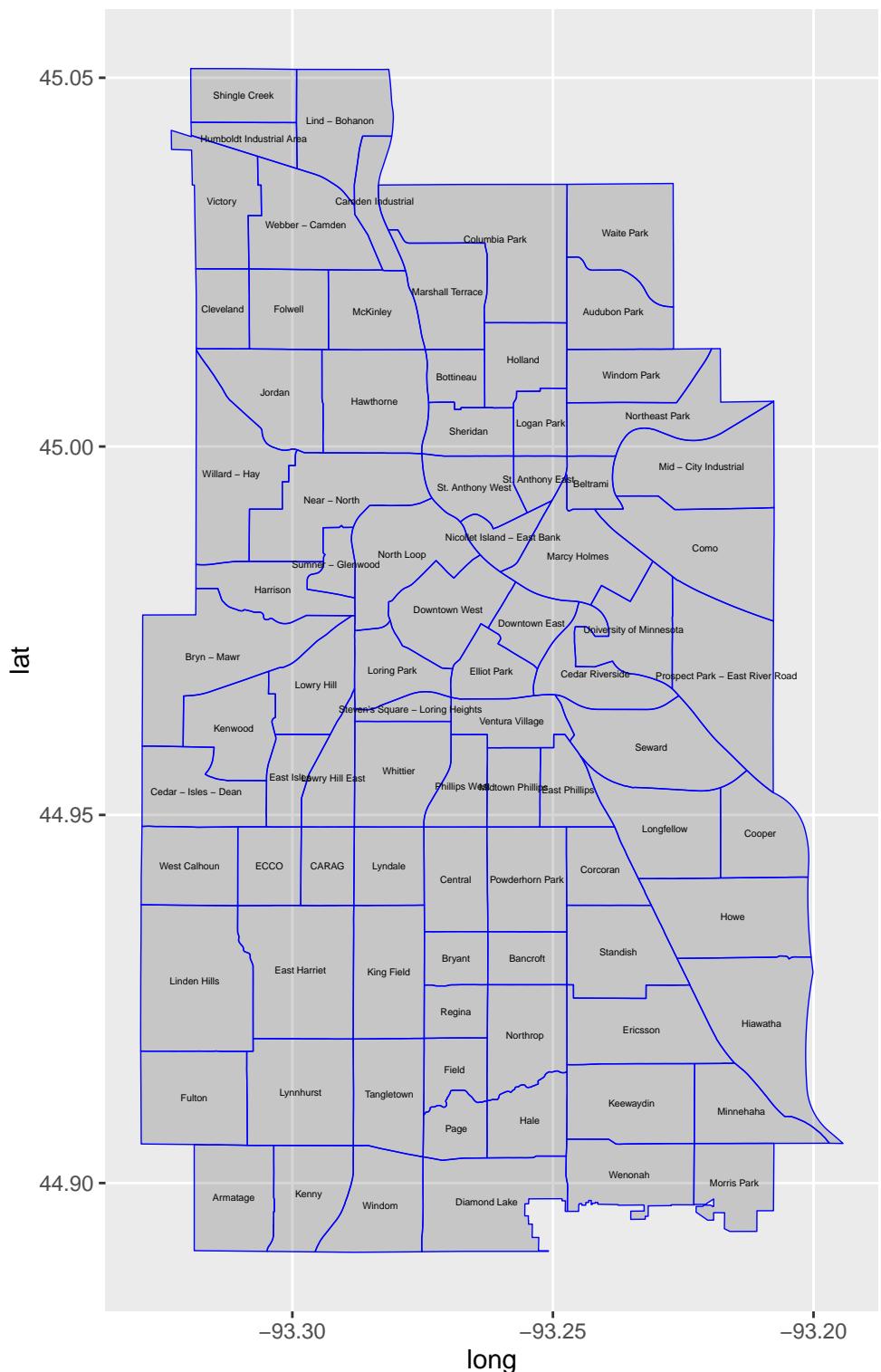
```
coord_map()
```



Neighborhoods

```
load("data/mpls_neighborhoods.rda")
mpls_nb <- fortify(mpls_neighborhoods)
mpls_nb_centroid <- data.frame(coordinates(mpls_neighborhoods),
  name = mpls_neighborhoods$BDNAME, stringsAsFactors = FALSE)

ggplot() + geom_polygon(data = mpls_nb, aes(x = long, y = lat,
  group = group), color = "blue", alpha = 0.2, size = 0.25) +
  geom_text(aes(x = X1, y = X2, label = name), size = 1.5,
  color = "black", data = mpls_nb_centroid) + coord_map()
```



School Districts

```
load("data/school_attendance_dists.rda")
mpls <- spTransform(mpls, proj4string(school_attendance_dist))
```

```

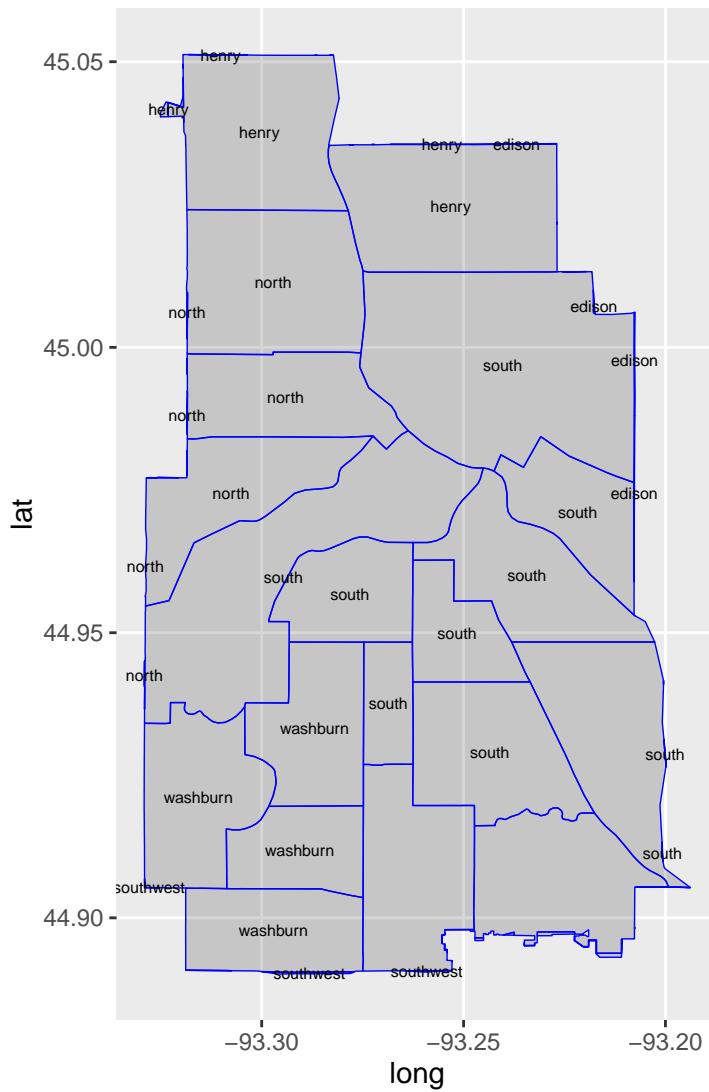
mpls_sad <- gIntersection(school_attendance_dist, mpls, byid = TRUE,
                           drop_lower_td = TRUE)
mpls_sad <- as(mpls_sad, "SpatialPolygonsDataFrame")
data <- over(mpls_sad, school_attendance_dist)
mpls_sad@data <- data

mpls_sad_centroid <- data.frame(coordinates(mpls_sad), name = tolower(mpls_sad$HIGH_NAME),
                                   stringsAsFactors = FALSE)
mpls_sad <- fortify(mpls_sad)

ggplot() + geom_polygon(data = mpls_sad, aes(x = long, y = lat,
                                               group = group), color = "blue", alpha = 0.2, size = 0.25) +
  geom_text(aes(x = X1, y = X2, label = name), size = 2, color = "black",
            data = mpls_sad_centroid) + coord_map() + ggtitle("High School Districts Minneapolis, MN")

```

High School Districts Minneapolis, MN



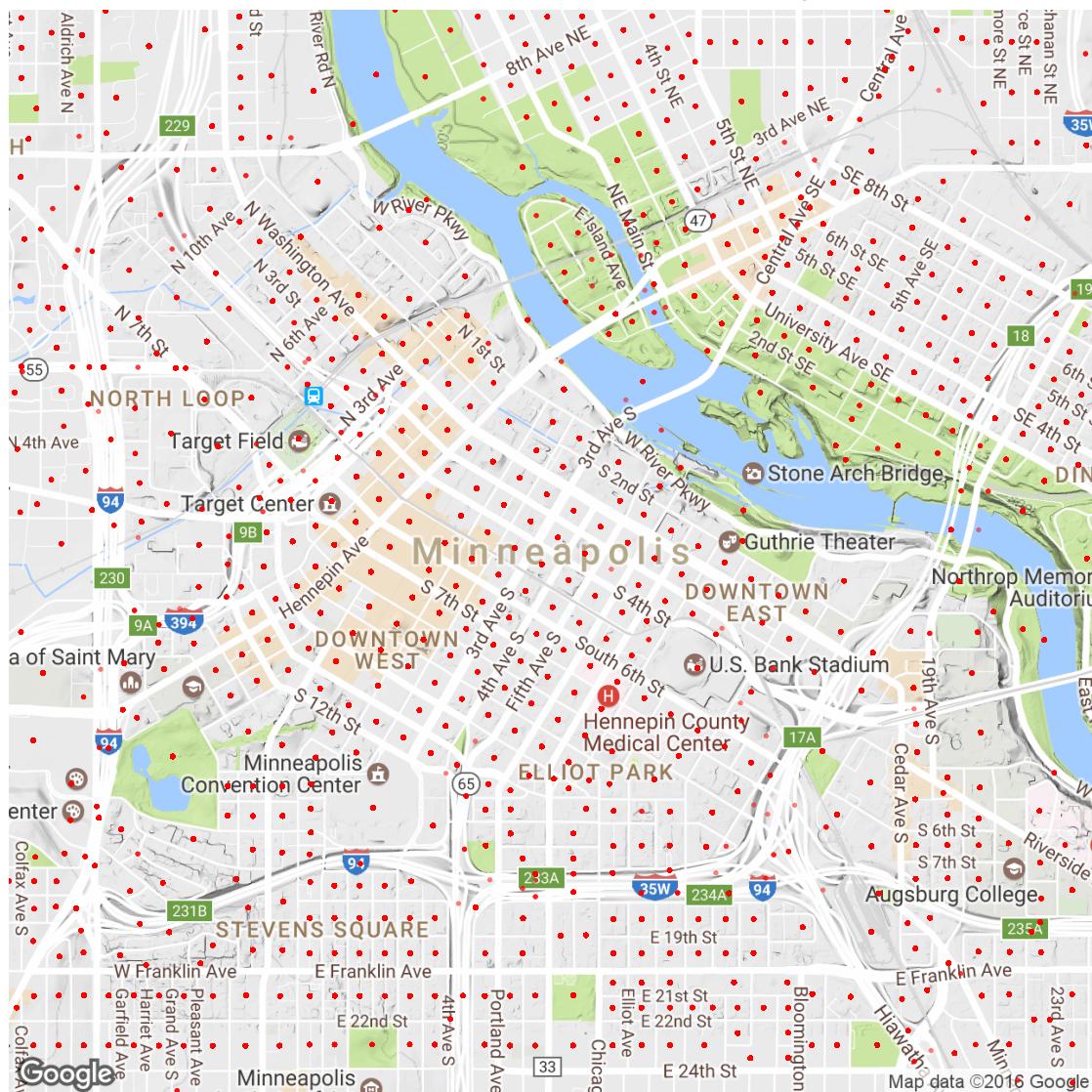
Crime

```
load("data/crime_10_13.rda")

mpls_crime <- data.frame(coordinates(crime_10_13), stringsAsFactors = FALSE)
umn <- qmap(location = "Minneapolis, MN", zoom = 14)

umn + geom_point(data = mpls_crime, aes(x = coords.x1, y = coords.x2),
  color = "red", alpha = 0.5, size = 0.25) + coord_map() +
  ggtitle("Crime Locations from 2010–2013, Minneapolis MN")
```

Crime Locations from 2010–2013, Minneapolis MN



Police Precincts

```
load("data/mpls_PolicePrecincts.rda")
```

```

mpls_pp <- fortify(mpls_PolicePrecincts)
umn <- qmap(location = "Minneapolis, MN", zoom = 10)

umn + geom_polygon(data = mpls_pp, aes(x = long, y = lat, group = group),
color = "red", alpha = 0.5, size = 0.25) + coord_map() +
ggtitle("Police Precincts, MN")

```

