

Introduction to leaflet

INTERACTIVE MAPS WITH LEAFLET IN R



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leaflet

- Open-source JavaScript library
- Popular option for creating interactive mobile-friendly maps
- Can be created using only R code via the `htmlwidgets` package

Trusted by the best

GitHub

FOURSQUARE

Pinterest

facebook



EVERNOTE

Etsy

flickr

500

DATA.GOV



The Washington Post

FT.com
FINANCIAL TIMES

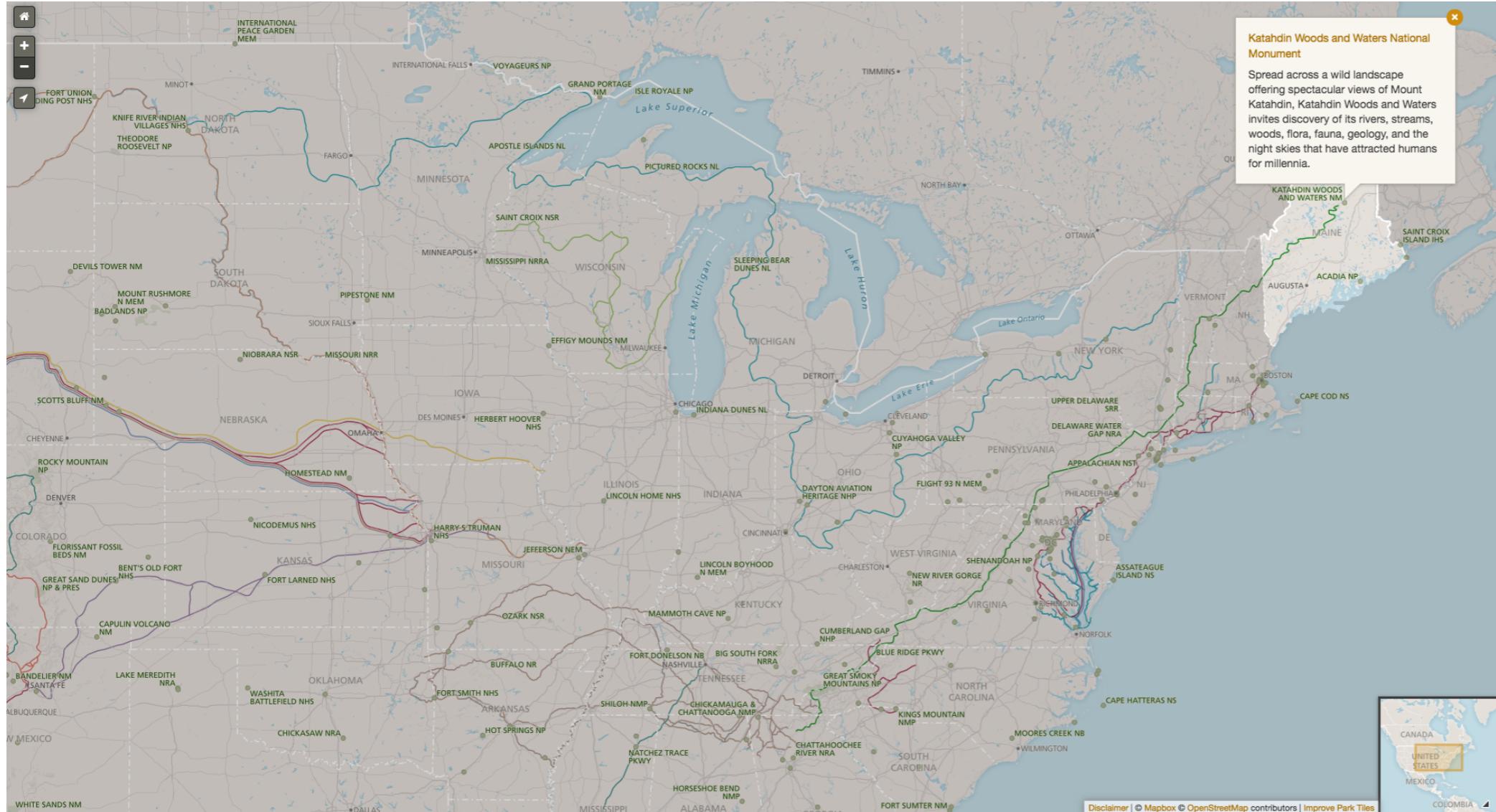
npr

USA TODAY

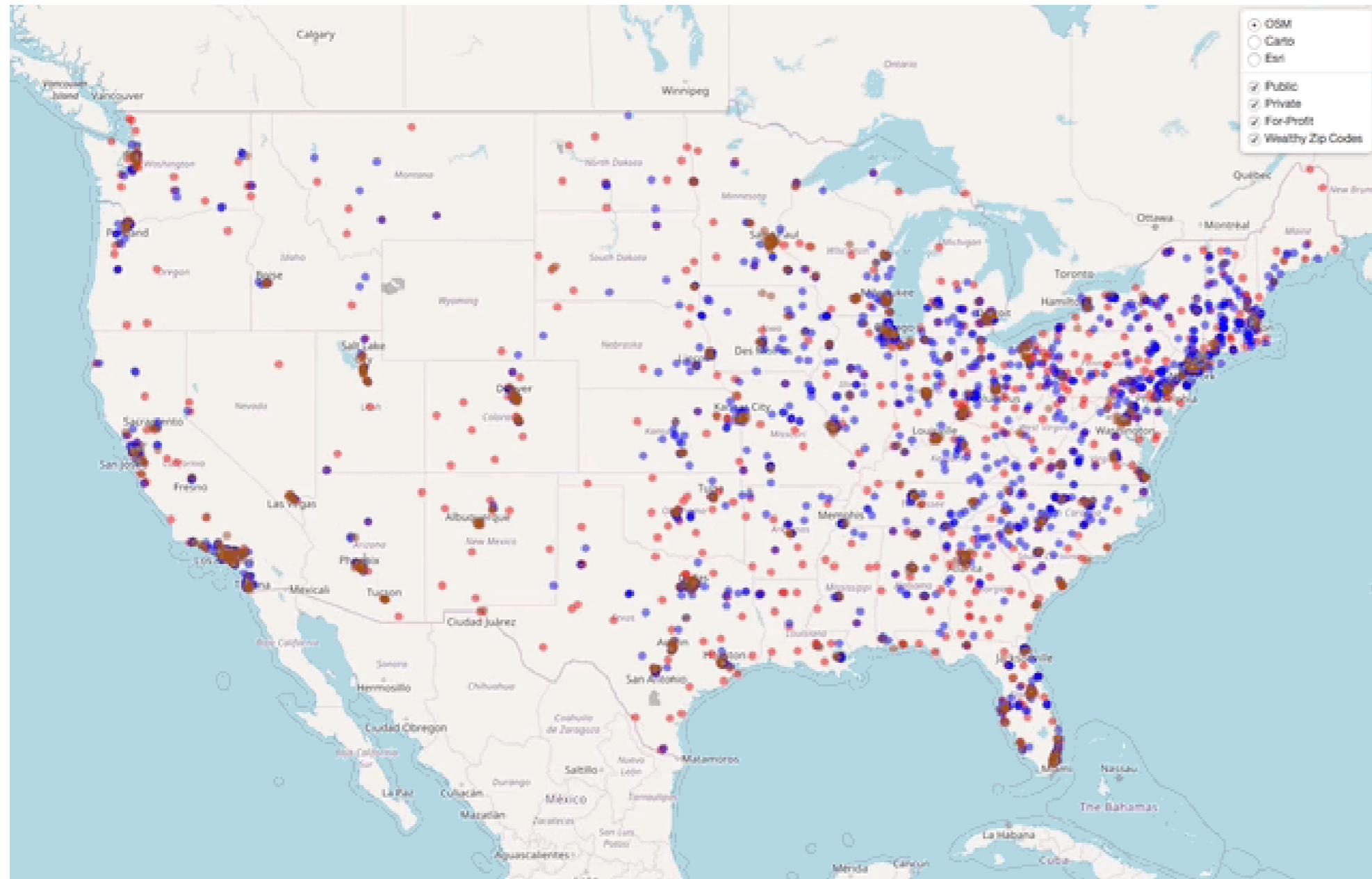


IGN

leaflet Example: National Parks Service

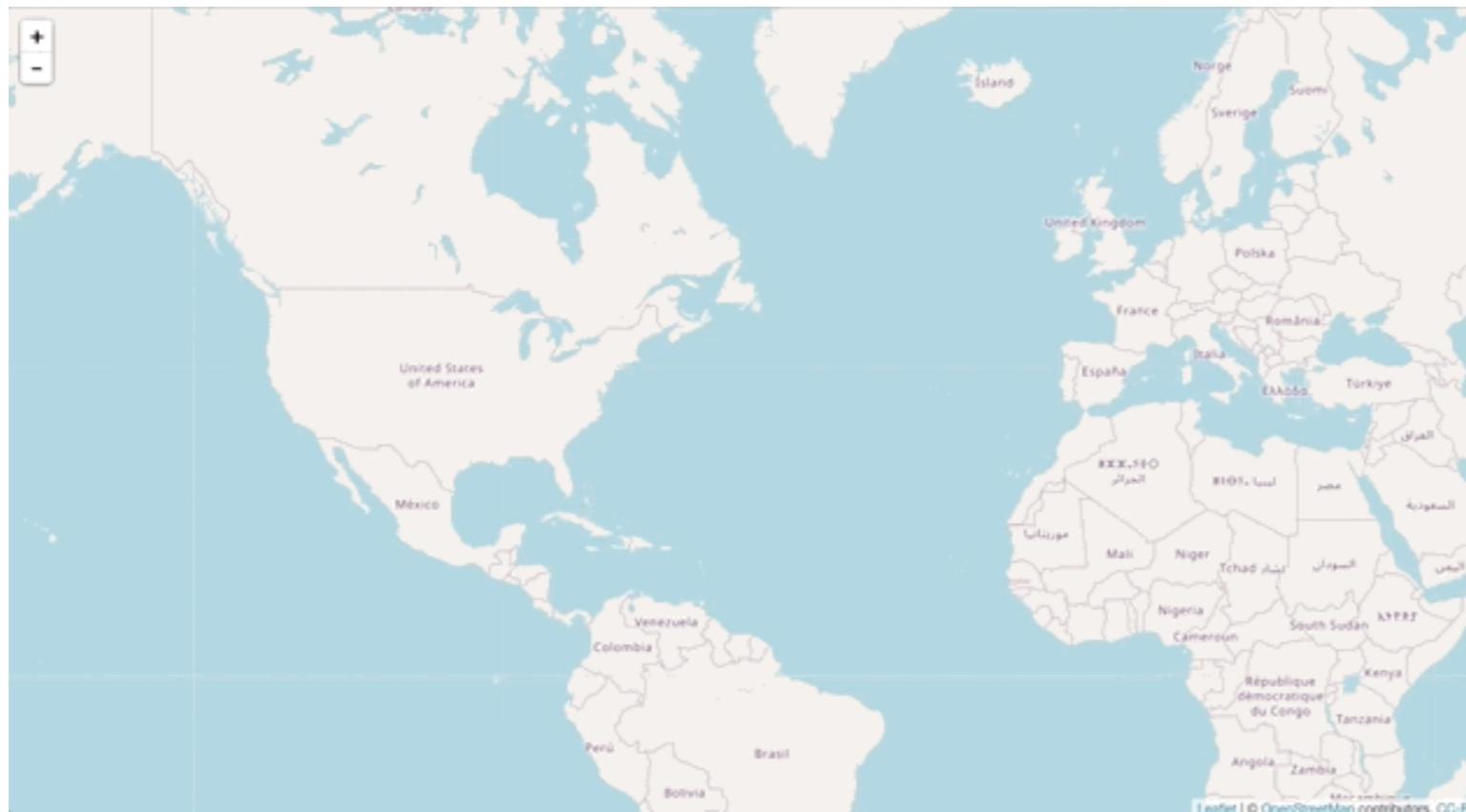


What We are Working Toward



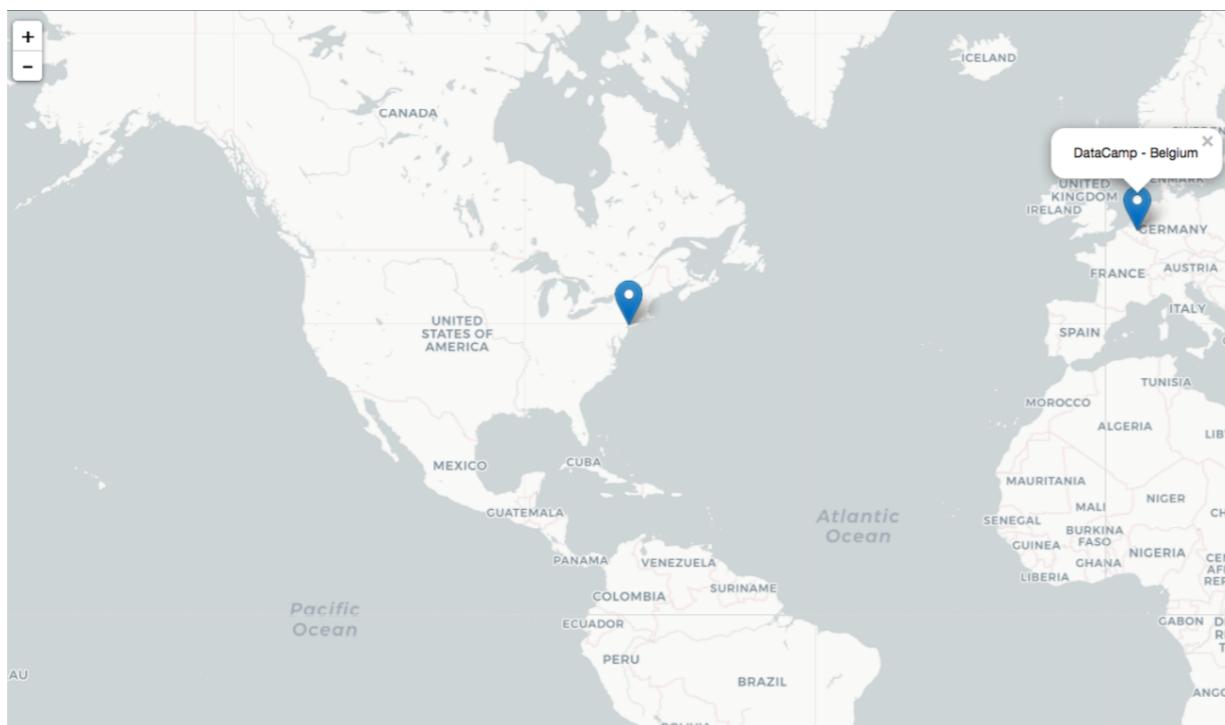
Creating our First leaflet Map

```
library(leaflet)  
leaflet() %>%  
  addTiles()
```



Where We are Going in Chapter 1

```
leaflet() %>%  
  addProviderTiles("CartoDB") %>%  
  addMarkers(lng = dc_hq$lon,  
            lat = dc_hq$lat,  
            popup = dc_hq$hq)
```



Let's practice!

INTERACTIVE MAPS WITH LEAFLET IN R

Provider Tiles

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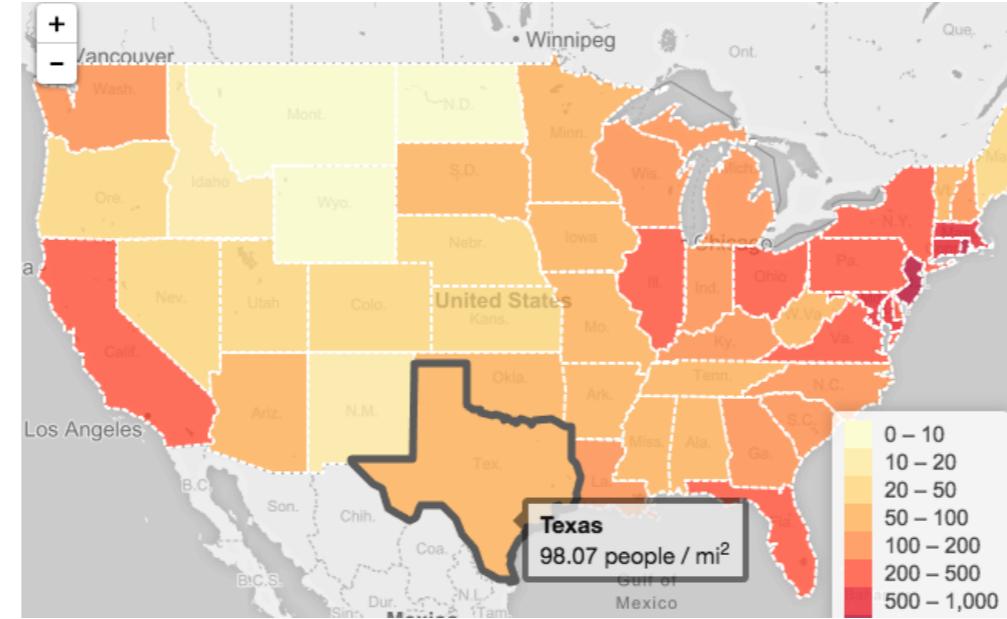
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Selecting a Base Map

- Why are you making this map?
 - Exploratory analysis
 - Deliverable product
 - Just for fun!
- What type of data are you plotting?
 - Points
 - Paths
 - Polygons

Selecting a Base Map



leaflet Provider List

- The `leaflet` packages comes with 100+ provider tiles
- The names of these tiles are stored in a list named `providers`

```
names(providers)[1:5]
```

```
[1] "OpenStreetMap"  
[2] "OpenStreetMap.Mapnik"  
[3] "OpenStreetMap.BlackAndWhite"  
[4] "OpenStreetMap.DE"  
[5] "OpenStreetMap.France"
```

Exploring leaflet Provider Tiles

```
names(providers)[str_detect(names(providers), "OpenStreetMap")]
```

```
[1] "OpenStreetMap"           "OpenStreetMap.Mapnik"  
[3] "OpenStreetMap.BlackAndWhite" "OpenStreetMap.DE"  
[5] "OpenStreetMap.France"      "OpenStreetMap.HOT"
```

addProviderTiles()

- Replace `addTiles()` with `addProviderTiles()` to change your basemap
- Pass name of provider tile to `addProviderTiles()`

```
leaflet() %>%  
  # addTiles()  
  addProviderTiles("OpenStreetMap.BlackAndWhite")
```



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Setting the Default Map View

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Geocoding in R

- A common approach is to use the `geocode()` function in the `ggmap` package
- Returns the latitude and longitude of an address or a place name

```
library(ggmap)  
  
geocode("350 5th Ave, New York, NY 10118")
```

```
Information from URL : http://maps.googleapis.com/maps/api/geocode/...
```

```
lon      lat  
-73.98575 40.74856
```

Geocoding in R II

```
geocode(location,  
        output = c("latlon", "latlona", "more", "all"),  
        source = c("google", "dsk"))  
geocode("Colby College", output = "more", source = "googl
```

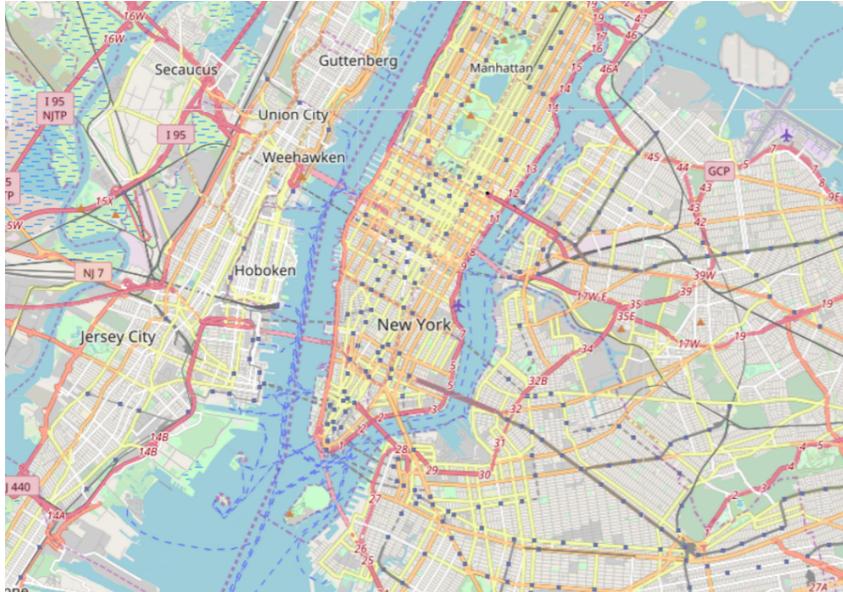
lon	lat	type	loctype
-69.66264	44.56387	establishment	rooftop

address
4000 mayflower hill dr, waterville, me 04901, usa

Setting the Default Map View

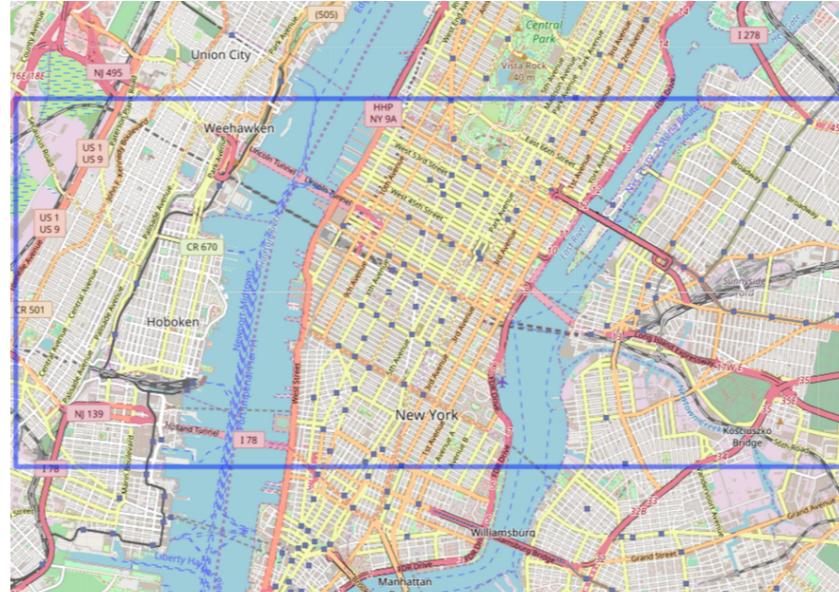
setView()

```
leaflet() %>%  
  addTiles() %>%  
  setView(lng = -73.98575,  
          lat = 40.74856,  
          zoom = 13)
```



fitBounds()

```
leaflet() %>%  
  addTiles() %>%  
  fitBounds(  
    lng1 = -73.910, lat1 = 40.773,  
    lng2 = -74.060, lat2 = 40.723)
```



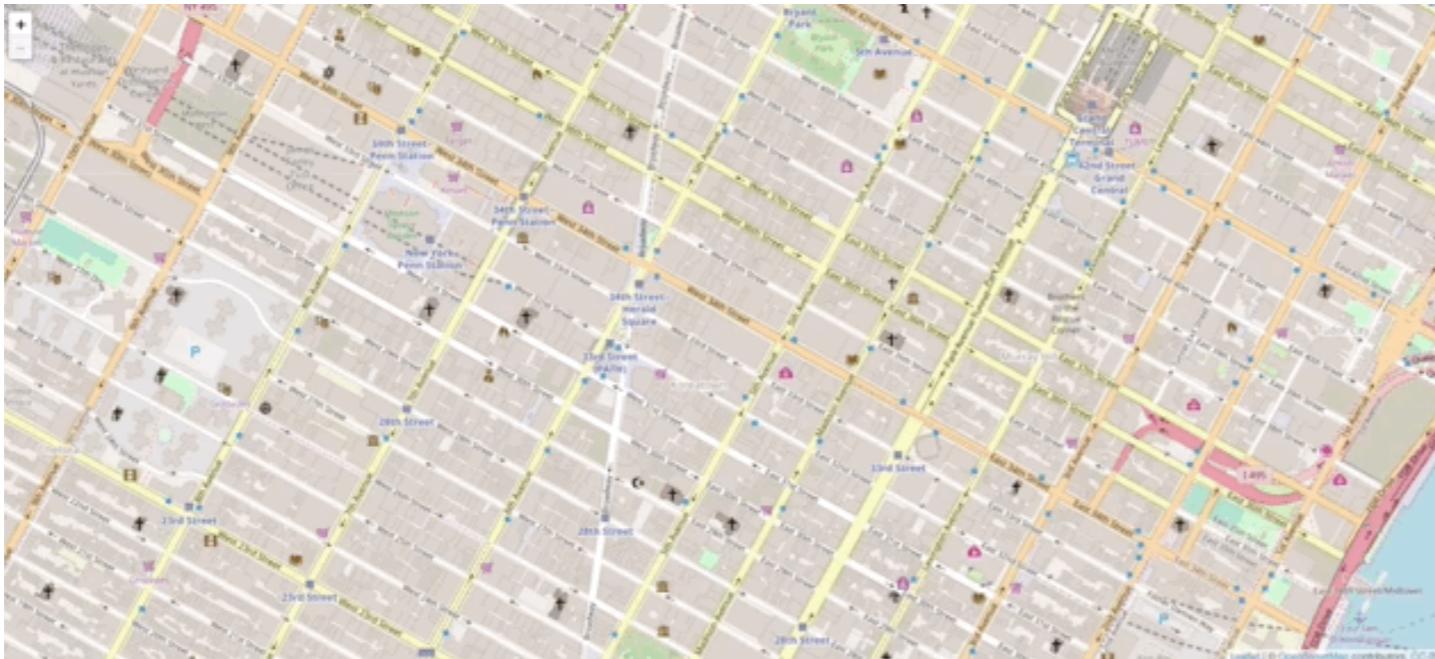
Staying Focused

```
leaflet(options = leafletOptions(dragging = FALSE,  
                                  minZoom = 14,  
                                  maxZoom = 18)) %>%  
  addProviderTiles("CartoDB") %>%  
  setView(lng = -73.98575, lat = 40.74856, zoom = 18)
```

- Leaflet references
 - <http://leafletjs.com/reference-1.3.0.html>
 - <https://rstudio.github.io/leaflet/>

Restoring Focus

```
leaflet() %>%  
  addTiles() %>%  
  setView(lng = -73.98575, lat = 40.74856, zoom = 18) %>%  
  setMaxBounds(lng1 = -73.98575, lat1 = 40.74856,  
               lng2 = -73.98575, lat2 = 40.74856)
```



Let's practice!

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Plotting DataCamp HQ

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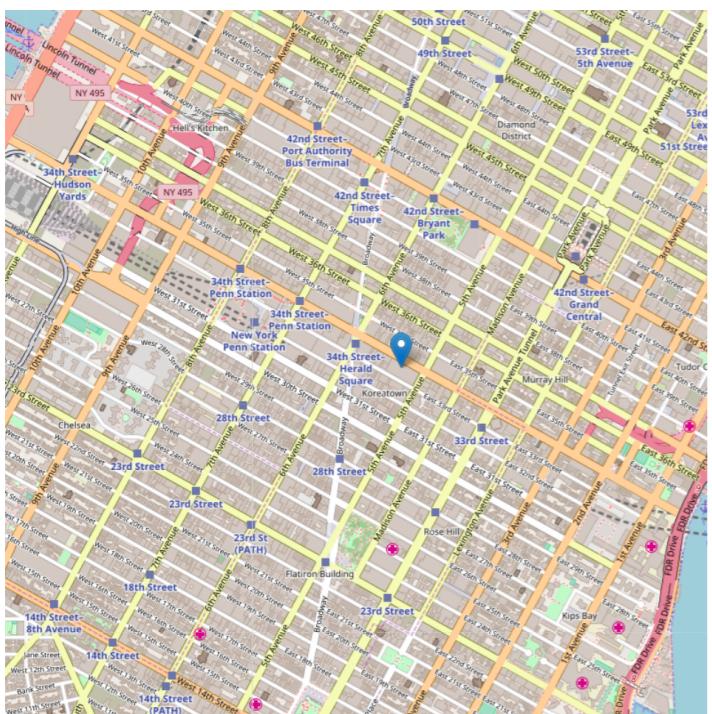


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Plotting a Point

```
# add marker layer to map  
leaflet() %>%  
  addTiles() %>%  
  addMarkers(lng = -73.98575,  
            lat = 40.74856)
```



- Supplying Marker Data
 - Numeric data frame columns
 - Numeric vectors
- `addMarkers()` Defaults
 - Centered on a single point
 - Zoomed to fit all points

Plotting Multiple Points

```
dc_hq <-  
  tibble(  
    hq = c("DataCamp - NYC", "DataCamp - Belgium"),  
    lon = c(-73.98575, 4.717863),  
    lat = c(40.74856, 50.881363))  
  leaflet() %>%  
    addTiles() %>%  
    addMarkers(lng = dc_hq$lon, lat = dc_hq$lat)
```



Plotting Multiple Points II

```
# When piping a data frame into the leaflet function, R will search  
# for columns named lat/latitude and lon/lng/long/longitude  
  
dc_hq %>%  
  leaflet() %>%  
  addTiles() %>%  
  addMarkers()  
  
Assuming 'lon' and 'lat' are longitude and latitude, respectively
```



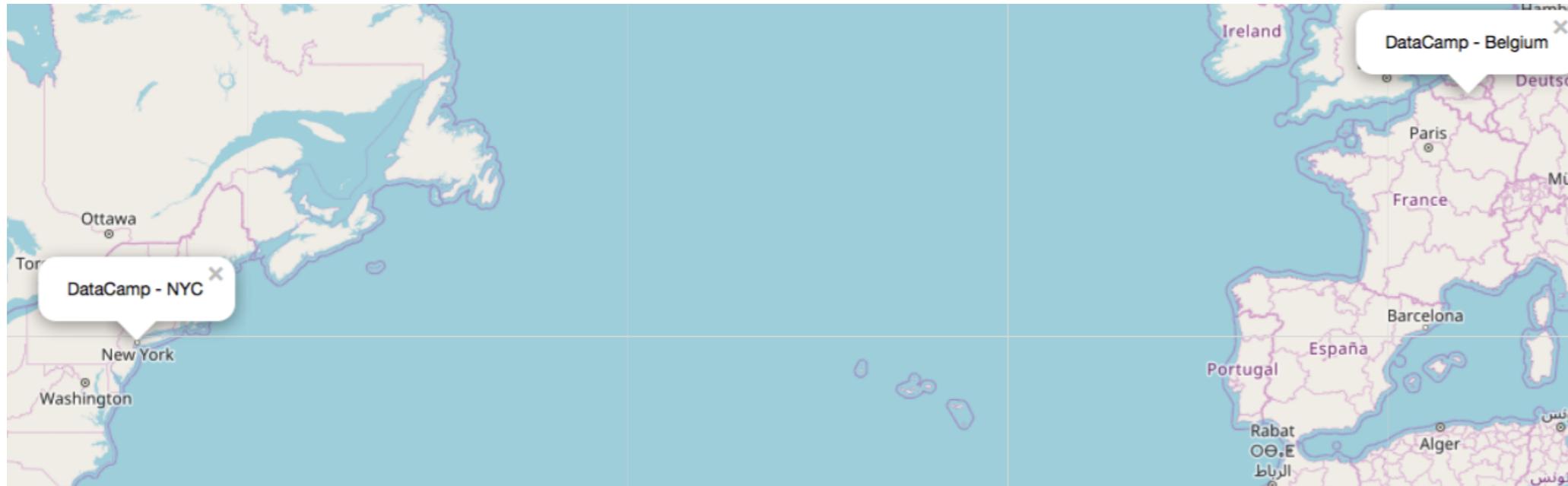
Pop-ups

```
leaflet() %>%  
  addTiles() %>%  
  addMarkers(lng = dc_hq$lon, lat = dc_hq$lat,  
            popup = dc_hq$hq)
```



Pop-ups II

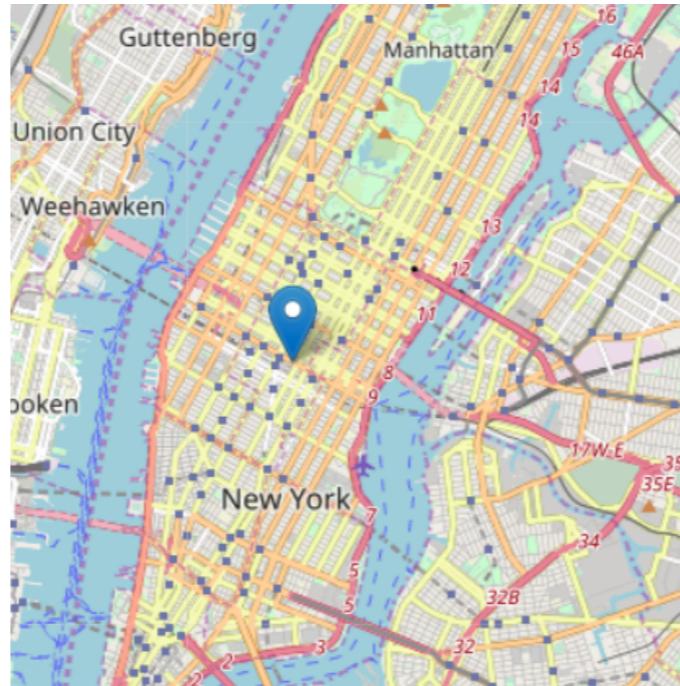
```
leaflet() %>%  
  addTiles() %>%  
  addPopups(lng = dc_hq$lon, lat = dc_hq$lat,  
            popup = dc_hq$hq)
```



Storing leaflet Maps as Objects

```
m <- leaflet() %>%  
  addTiles() %>%  
  setView(lng = dc_hq$lon[1],  
          lat = dc_hq$lat[1],  
          zoom = 12)
```

```
# %>% leaflet objects to functions  
# to add or edit layers  
m %>% addMarkers(lng = dc_hq$lon,  
                    lat = dc_hq$lat,  
                    popup = dc_hq$hq)
```



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