

# Judge Births

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*10/08/2014*

This map will attempt to plot the birthplaces of Federal Judges using the Federal Judge dataset <http://www.uscourts.gov/JudgesAndJudgeships/BiographicalDirectoryOfJudges.aspx>

```
#Load Libraries
library(rgdal)
```

```
## Loading required package: sp
## rgdal: version: 0.9-1, (SVN revision 518)
## Geospatial Data Abstraction Library extensions to R successfully loaded
## Loaded GDAL runtime: GDAL 1.7.3, released 2010/11/10
## Path to GDAL shared files: /usr/share/gdal/1.7
## GDAL does not use iconv for recoding strings.
## Loaded PROJ.4 runtime: Rel. 4.7.1, 23 September 2009, [PJ_VERSION: 470]
## Path to PROJ.4 shared files: (autodetected)
```

```
library(sp)
library(rgeos)
```

```
## rgeos version: 0.3-8, (SVN revision 460)
## GEOS runtime version: 3.2.2-CAPI-1.6.2
## Polygon checking: TRUE
```

```
library(maptools)
```

```
## Checking rgeos availability: TRUE
```

```
library(ggmap)
```

```
## Loading required package: ggplot2
```

```
library(ggplot2)
library(historydata)
library(dplyr)
```

```
##
## Attaching package: 'dplyr'
##
## The following objects are masked from 'package:rgeos':
##
##   intersect, setdiff, union
##
## The following objects are masked from 'package:stats':
##
```

```
## filter, lag
##
## The following objects are masked from 'package:base':
##
## intersect, setdiff, setequal, union
```

```
library(mullenMisc)
library(dplyr)
library(tidyr)
library(knitr)
library(stringr)

#Pull in Judge Data
jb <- read.csv("~/Documents/Hist698/week6/jb.txt", stringsAsFactors=FALSE)

#Clean Judge Data - pull out id#, birth.location, birth year
judge_birth<-jb
judge_birth<-judge_birth %>%
  tbl_df() %>%
  select(Birth.year, Place.of.Birth..City., Place.of.Birth..State., Judge.Identification.Number) %>%
  mutate(place = paste(Place.of.Birth..City., Place.of.Birth..State., sep=", ")) %>%
  #Run mullenMisc's round_year function
  mutate(decade = round_year(judge_birth$Birth.year))%>%
  #Filter judge dataset for only 1850 births
  filter(decade == 1850)

#Geocode place names
judge_place <- geocode(judge_birth$place)
```

```
## Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Bowdon,+GA&sensor=fa
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Chicago,+IL&sensor=fa
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Clymer,+NY&sensor=fa
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Zionsville,+IN&sensor=fa
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Providence,+RI&sensor=fa
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Jamaica,+VT&sensor=fa
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Yamhill+County,+OR&sensor=fa
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Lee+County,+IL&sensor=fa
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Louisville,+KY&sensor=fa
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Providence,+RI&sensor=fa
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
```

```

## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Kittanning,+PA&sensor=
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=La+Grange,+TX&sensor=
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Fernandina,+FL&sensor=
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Abingdon,+VA&sensor=
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Oswego+County,+NY&sensor=
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Milwaukee,+WI&sensor=
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Cumberland,+MD&sensor=
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=New+Lisbon,+OH&sensor=
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Barbour+County,+AL&sensor=
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Maysville,+KY&sensor=
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Wilmington,+NC&sensor=
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Newton,+MA&sensor=f
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Philippi,+VA+(now+W
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Dayton,+OH&sensor=f
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Cortland,+NY&sensor=
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Mt.+Sterling,+IL&sen
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Yreka,+CA&sensor=fa
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=New+York,+NY&sensor=
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Lower+Horton,+Nova+
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Lexington,+VA&sensor=
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Colchester,+CT&senso
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Ashland,+OH&sensor=
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Millwood,+VA&sensor=
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Gwynedd+Township,+P
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Cincinnati,+OH&senso
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Waynesburg,+PA&senso
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Philadelphia,+PA&sen
## Google Maps API Terms of Service : http://developers.google.com/maps/terms

```

```

## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Morgan+County,+IL&sensor=
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Limestone+County,+AL&sensor=
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=New+Orleans,+LA&sensor=
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Winslow,+ME&sensor=
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Brewerton,+SC&sensor=
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Rutherford+County,+NC&sensor=
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Boalsburg,+PA&sensor=
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Lithopolis,+OH&sensor=
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Charleston,+SC&sensor=
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Hastings,+MI&sensor=
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Cedar+Grove,+GA&sensor=
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Cass+County,+MO&sensor=
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Boston,+MA&sensor=fal
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=near+Warrenton,+VA&sensor=
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Lancaster,+OH&sensor=
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Clarksburg,+TN&sensor=
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Glenluce,+Scotland&sensor=
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Troy,+NY&sensor=fal
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Galena,+IL&sensor=f
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Newbury,+MA&sensor=
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Lynchburg,+VA&sensor=
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Kosciusko,+MS&sensor=
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
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## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Spring+Bay,+IL&sensor=
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=New+Orleans,+LA&sensor=
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Morristown,+NJ&sensor=
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Towanda,+PA&sensor=f
## Google Maps API Terms of Service : http://developers.google.com/maps/terms

```

```

## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Belmont+County,+OH&sensor=
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Ralls+County,+MO&sensor=
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Jonesboro,+TN&sensor=
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Allegheny,+PA&sensor=
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Trenton,+NJ&sensor=
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Ironton,+OH&sensor=f
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Preble+County,+OH&sensor=
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Holland+Patent,+NY&sensor=
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Huntsville,+AL&sensor=
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Brasner+Falls,+NY&sensor=
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=New+Haven,+OH&sensor=
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Campbell+County,+VA&sensor=
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Dudley,+MA&sensor=f
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Ionia+County,+MI&sensor=
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Preble+Co.,+OR&sensor=
## Google Maps API Terms of Service : http://developers.google.com/maps/terms

## Warning: geocode failed with status ZERO_RESULTS, location =
## "Preble+Co.,+OR"

## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Charleston,+SC&sensor=
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=San+Francisco,+CA&sensor=
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=County+Cavan,+Ireland
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Mount+Pleasant,+IA&sensor=
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Cincinnati,+OH&sensor=
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Youngstown,+OH&sensor=
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Beaver+County,+PA&sensor=
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Raschkow,+Germany&sensor=
## Google Maps API Terms of Service : http://developers.google.com/maps/terms

## Warning: geocode failed with status ZERO_RESULTS, location =
## "Raschkow,+Germany"

```

```
## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Princeton,+IN&sensor=
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Marion,+IN&sensor=f
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Maumee+City,+OH&sensor=
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Charles+City+County
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Penfield,+NY&sensor=
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Florence,+AL&sensor=
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Ann+Arbor,+MI&sensor=
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=New+York,+NY&sensor=
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=St.+Paul,+MN&sensor=
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Linn+County,+OR&sensor=
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=St.+Johnsbury,+VT&sensor=
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=North+Bloomfield,+OH
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Des+Moines+County,+IA
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
## .Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Darlington,+SC&sensor=
## Google Maps API Terms of Service : http://developers.google.com/maps/terms
```

```
judge_birth <- cbind(judge_birth, judge_place)
```

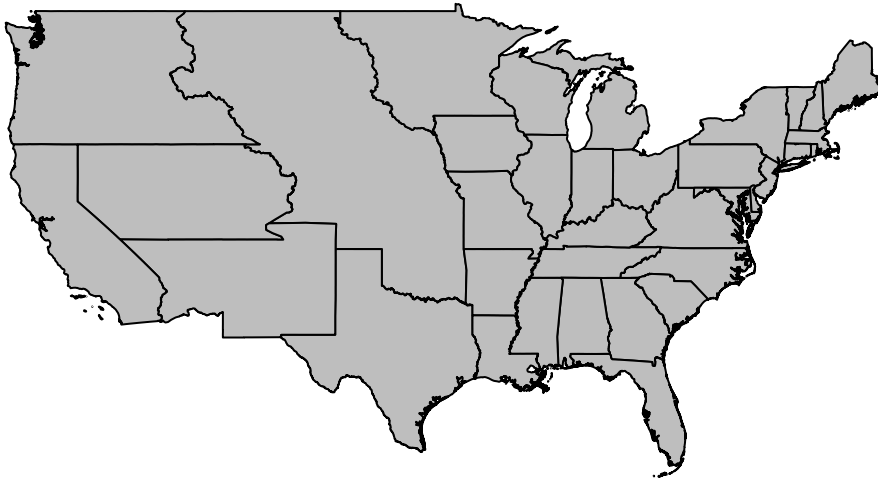
```
str(judge_birth)
```

```
## 'data.frame': 101 obs. of 8 variables:
## $ Birth.year : int 1854 1859 1856 1857 1857 1857 1854 1852 1856 1854 ...
## $ Place.of.Birth..City. : chr "Bowdon" "Chicago" "Clymer" "Zionsville" ...
## $ Place.of.Birth..State. : chr "GA" "IL" "NY" "IN" ...
## $ Judge.Identification.Number: int 3295 33 38 41 52 3329 128 163 241 281 ...
## $ place : chr "Bowdon, GA" "Chicago, IL" "Clymer, NY" "Zionsville, IN" ...
## $ decade : int 1850 1850 1850 1850 1850 1850 1850 1850 1850 1850 ...
## $ lon : num -85.3 -87.6 -79.6 -86.3 -71.4 ...
## $ lat : num 33.5 41.9 42 40 41.8 ...
```

```
#judge_map <- ggplot(judge_birth, aes(x=lon, y = lat)) +
# geom_point() +
# geom_text(aes(label=place), vjust = -1) +
# coord_map() +
# xlim(-135, -65)
map_sp <- readOGR("nhgis-shp/", "state_1850")
```

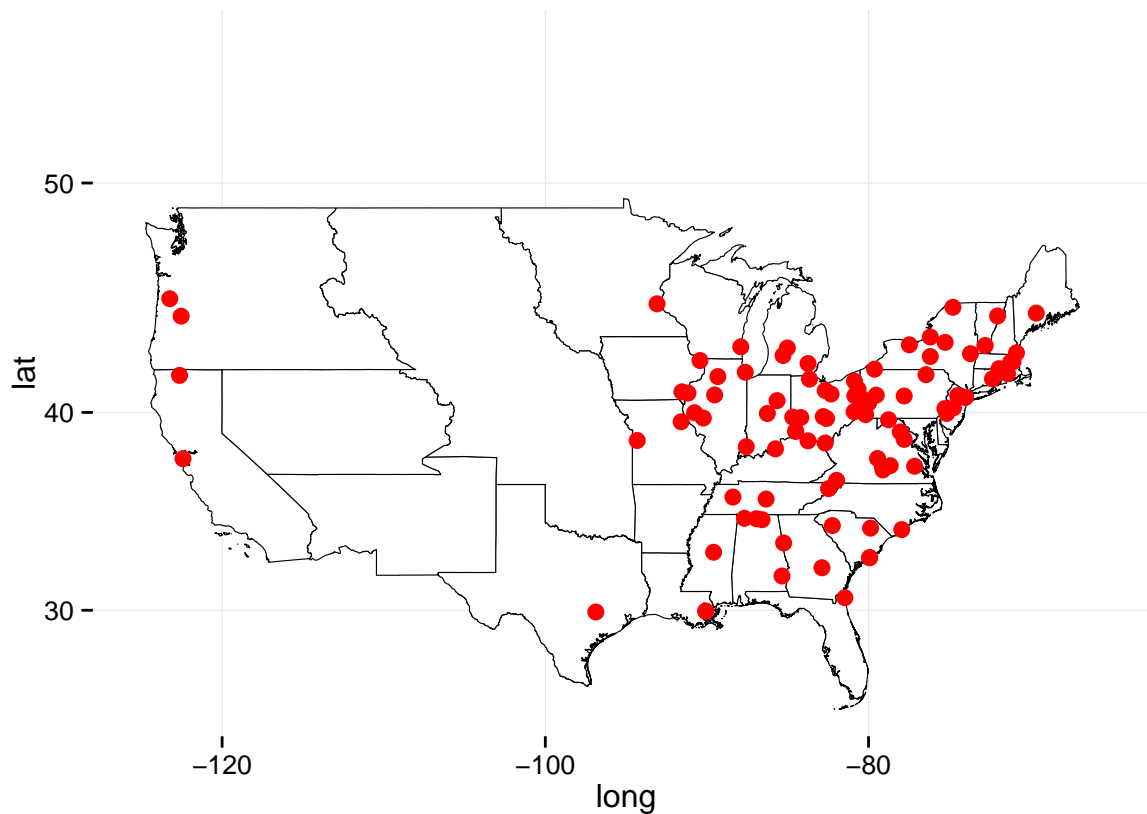
```
## OGR data source with driver: ESRI Shapefile
## Source: "nhgis-shp/", layer: "state_1850"
## with 37 features and 7 fields
## Feature type: wkbPolygon with 2 dimensions
```

```
plot(map_sp, col = "grey")
```



```
map_df <- fortify(map_sp, region = "GISJOIN")
#And make a map with ggplot
map_1850 <- ggplot() +
  geom_map(data = map_df,
           map = map_df,
           aes(x=long, y=lat, group = group, map_id = id),
           fill = "white",
           color = "black",
           size = 0.2) +
  coord_map() +
  theme_minimal()
#Add the "Cities" Data to our 1850 map. Voila!
map_1850 +
  geom_point(data = judge_birth, aes(x = lon, y = lat), color = "red", size = 3) +
  xlim(-125, -65)
```

```
## Warning: Removed 5 rows containing missing values (geom_point).
```



```
#geom_text(data = judge_birth, aes(x = lon, y = lat, label=place), vjust = -1)
```

```
#add us county data and farm data
counties_1850_sp <- readOGR("nhgis-shp/", "US_county_1850")
```

```
## OGR data source with driver: ESRI Shapefile
## Source: "nhgis-shp/", layer: "US_county_1850"
## with 1632 features and 20 fields
## Feature type: wkbPolygon with 2 dimensions
```

```
counties_1850_df <- fortify(counties_1850_sp, region = "GISJOIN")
farms_1850 <- read.csv("nhgis0003_csv/nhgis0003_ds11_1850_county.csv", stringsAsFactors = FALSE)
#merge the tables at GISJOIN/ID fields. I had to change the GISJOIN column to id in "farms_1850" to get
colnames(farms_1850)[1] <- "id"
farms_merged <- counties_1850_df %>%
  left_join(farms_1850, by = "id")
```

```
#Plot this map on top of the "Farm Value by County" in Mullen's Mapping in R
library(classInt)
library(RColorBrewer)
classIntervals(farms_1850$AE7001, 9, "pretty")
```

```
## style: pretty
## one of 6.503e+10 possible partitions of this variable into 10 classes
## [0,200) [200,400) [400,600) [600,800) [800,1000) [1000,1200)
```



```
##          1515          1          0          0          0          0
## [1200,1400) [1400,1600) [1600,1800) [1800,2000]
##          0          0          0          1
```

```
intervals <- classIntervals(farms_1850$AE7001, 9, "jenks")
head(cut(farms_1850$AE7001, breaks = intervals$brks))
```

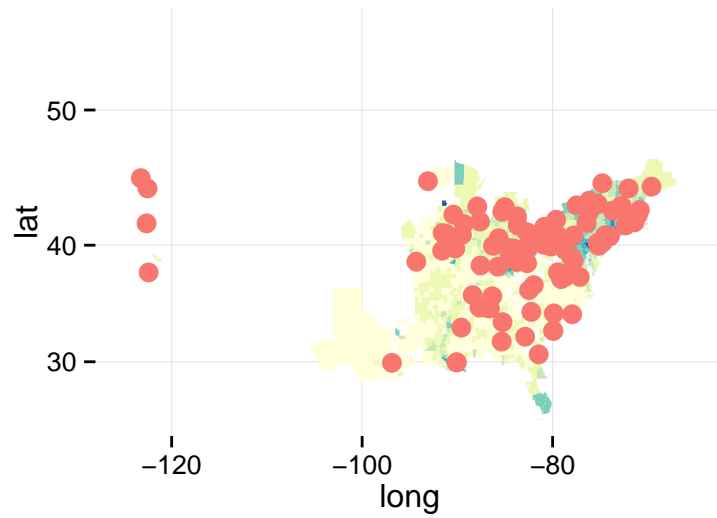
```
## [1] (1,5] (1,5] (1,5] (1,5] (1,5] (1,5] (1,5]
## 9 Levels: (1,5] (5,10] (10,18] (18,29] (29,43] (43,60] ... (208,1.85e+03]
```

```
#merge it back into our farms dataframe
farms_1850 <- farms_1850 %>%
  mutate(value_classified = cut(AE7001, intervals$brks))
farms_merged <- counties_1850_df %>%
  left_join(farms_1850, by = "id")

farm_map<-ggplot() +
  geom_map(data = farms_merged,
    map = farms_merged,
    aes(x = long, y = lat, group = group, fill = value_classified, map_id = id))+
  coord_map() +
  theme_minimal()+
  theme(legend.position = "bottom") +
  scale_fill_brewer(palette = "YlGnBu")

farm_map +
  geom_point(data = judge_birth, aes(x = lon, y = lat, color = "red", size = 3)) +
  xlim(-125, -65)
```

```
## Warning: Removed 5 rows containing missing values (geom_point).
```



"red" • red

3 • 3

ssified (1,5] (5,10] (10,18] (18,29] (29,43] (43,60] (60,120] (120,208]

*#Plot 1850 births on that map*

*#Plot all birth.locations on US Map. Maybe use hex or density plot.*