

Project 2: Bigfoot Workflow

[Code ▾](#)

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Let's check out the dataset.

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```
bigfoots_df<-read.csv("Z:\\486\\Project2\\timothyrenner-bfro-sightings-data\\bfro_reports_geocoded.csv")
colnames(bigfoots_df)
```

[1]	"observed"	"location_details"	"county"	"state"
[5]	"season"	"title"	"latitude"	"longitude"
[9]	"date"	"number"	"classification"	"geohash"
[13]	"temperature_high"	"temperature_mid"	"temperature_low"	"dew_point"
[17]	"humidity"	"cloud_cover"	"moon_phase"	"precip_intensity"
[21]	"precip_probability"	"precip_type"	"pressure"	"summary"
[25]	"uv_index"	"visibility"	"wind_bearing"	"wind_speed"

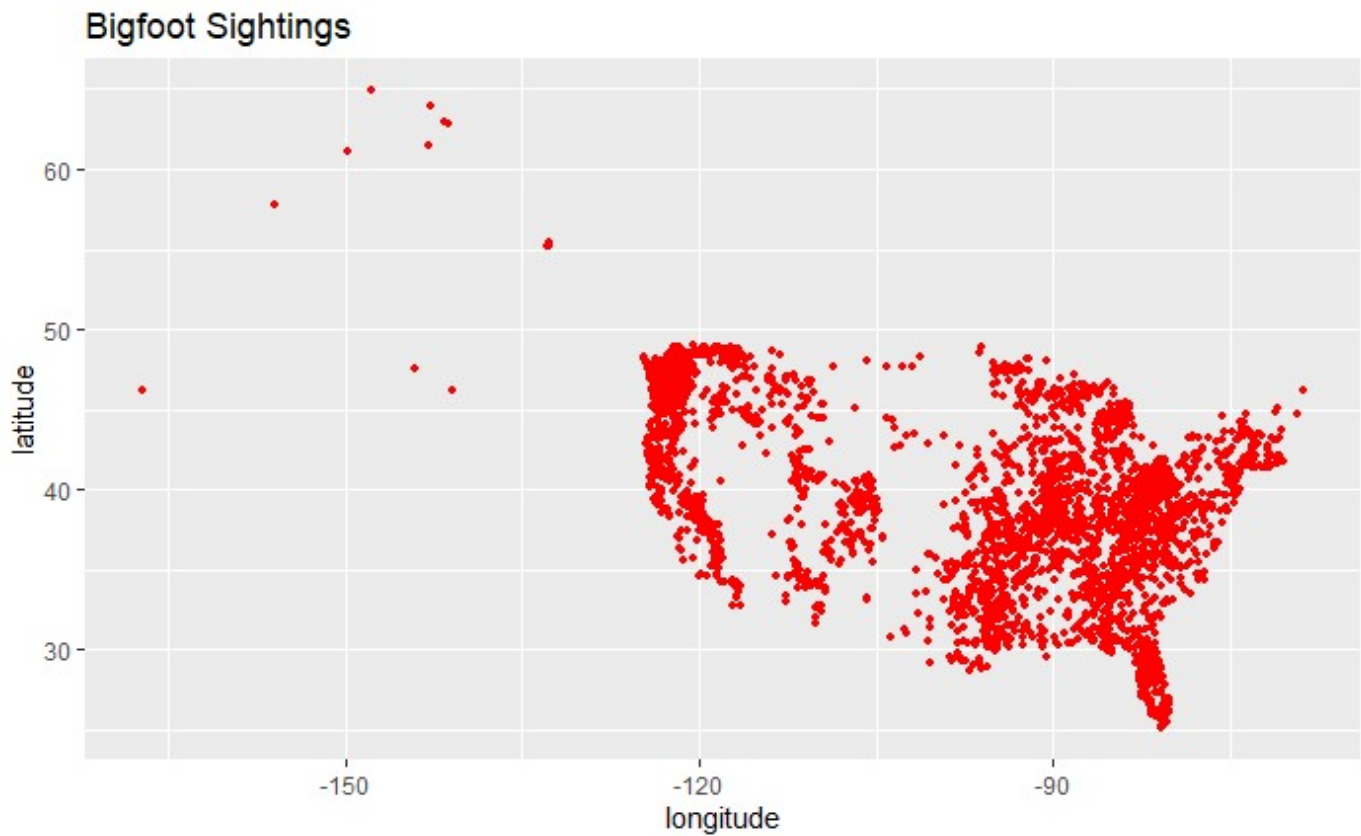
Pretty cool dataset! Looks like it has 4747 sightings in the USA, each sighting has data associated with it like date, temperature, and even a little blurb on the sighting itself!

Looks like there are some NA rows, let's get rid of those.

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```
bigfoots_df2<- bigfoots_df[!is.na(bigfoots_df$latitude),]
```

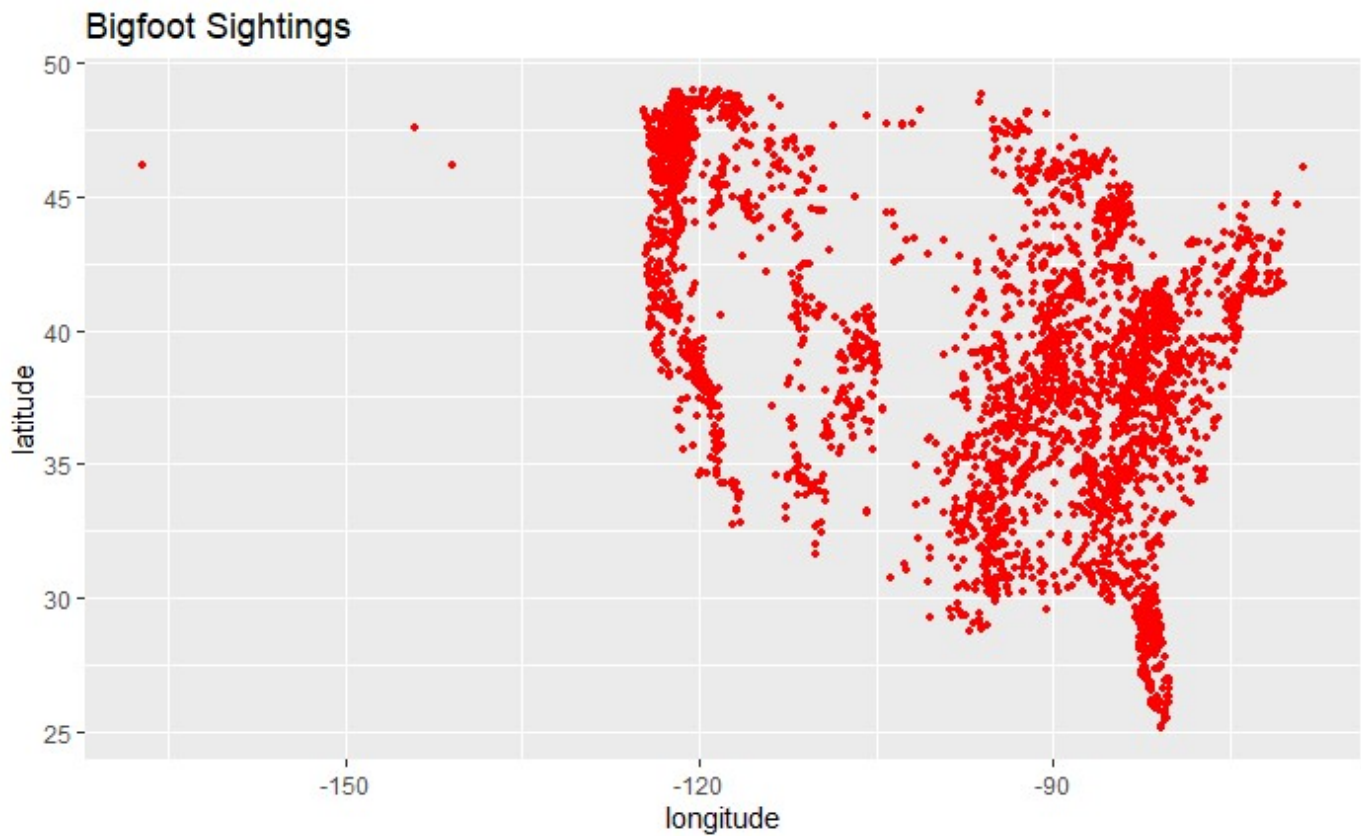
Great! Let's check out what this data looks like spatially.



Looking good, but to make this map more visually pleasing, let's only analyse the lower 48 states. Make a new data frame that doesn't have Hawaii, Alaska, or Puerto Rico.

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```
bigfoots_lower_48 <- bigfoots_df2[!(bigfoots_df2$state %in% c("Hawaii", "Alaska", "Pue  
rto Rico")),]  
  
sightings_L48<- ggplot()+  
  geom_point(data=bigfoots_lower_48,color="red", size=1, aes(x=longitude, y=latitude))  
+  
  ggtitle("Bigfoot Sightings")  
sightings_L48
```

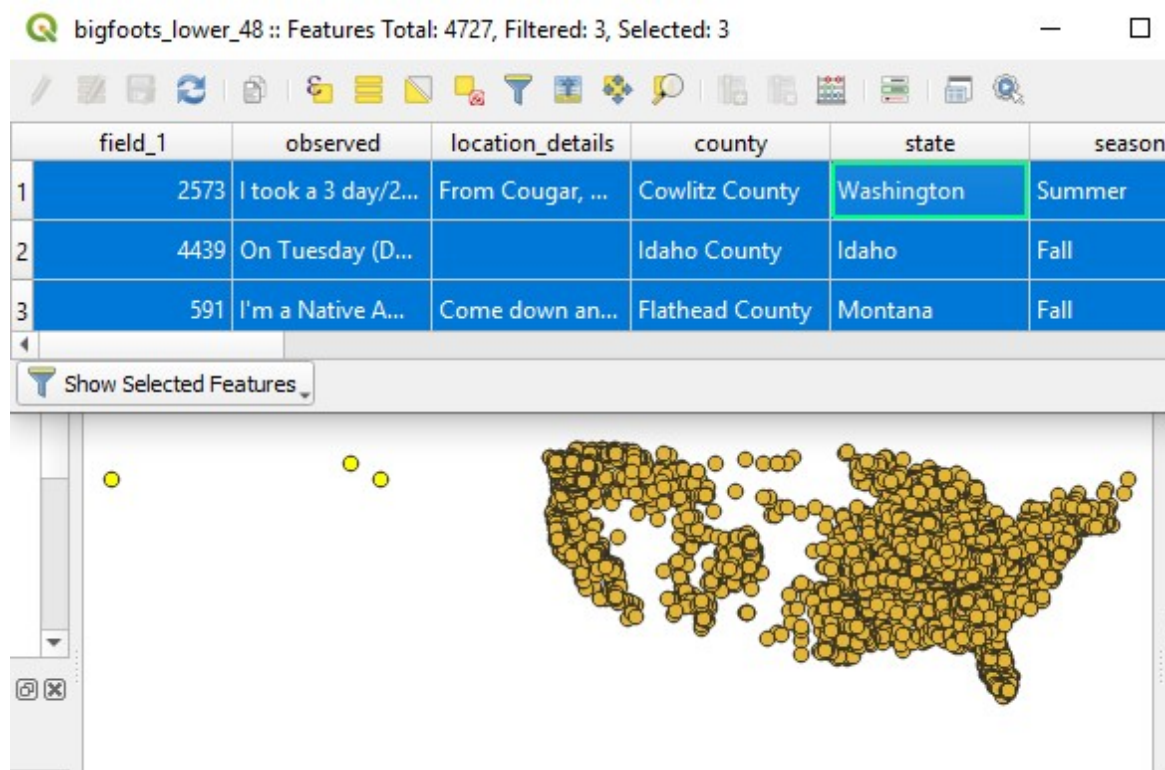


Uh Oh! Looks like that didn't take care of 3 points in Alaska! Let's export this dataframe and bring it into QGIS.

The image below is a snapshot of what was discovered in QGIS. Turns out those three points had incorrect latitude and longitude, so rather than try to fix it they were just removed from the dataset in Q and the shapefile was exported as a csv.

[Hide](#)

```
write.csv(bigfoots_lower_48,"Z:\\486\\Project2\\bigfoots_lower_48.csv")
knitr::include_graphics('Z:/486/Project2/GPS_Issue.png')
```

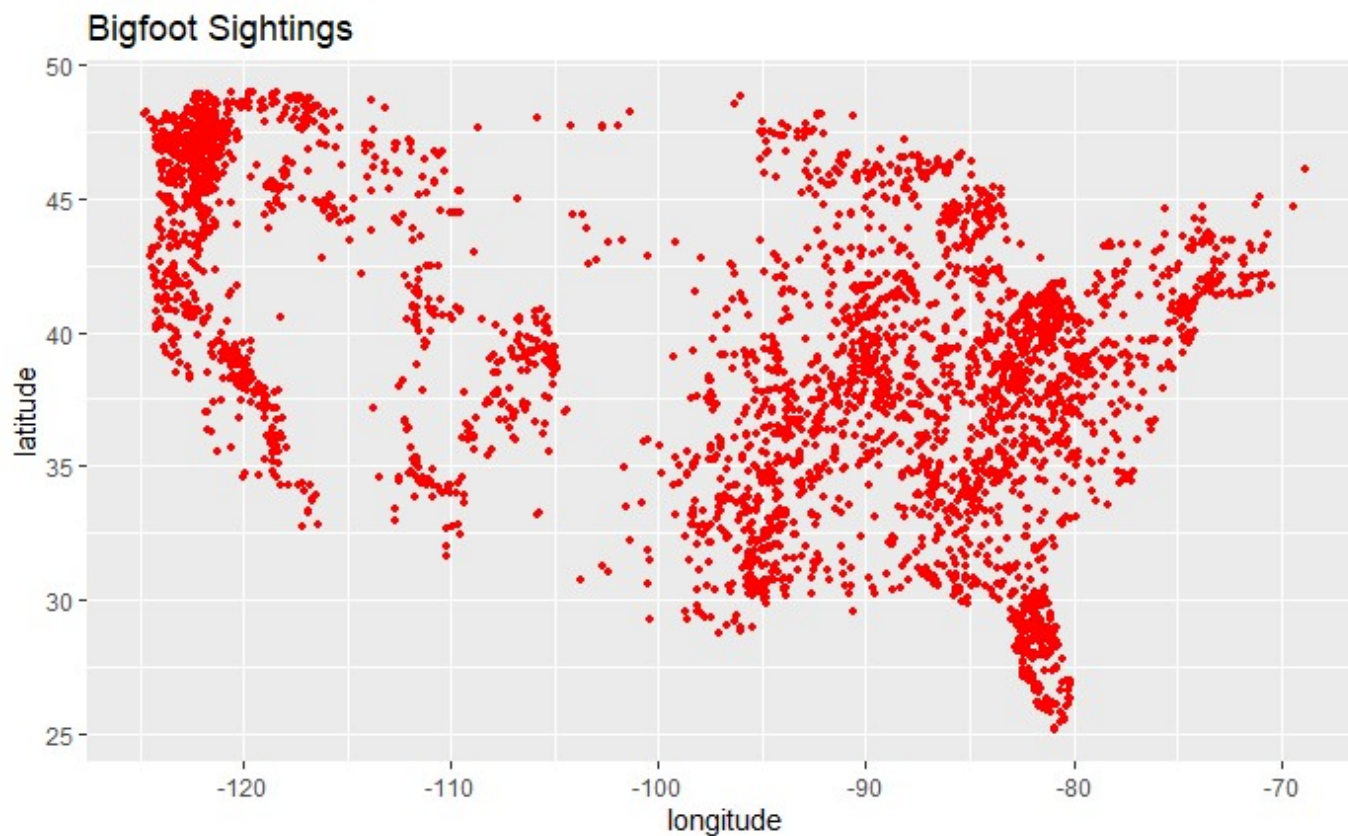


Let's bring in the newly cleaned data.

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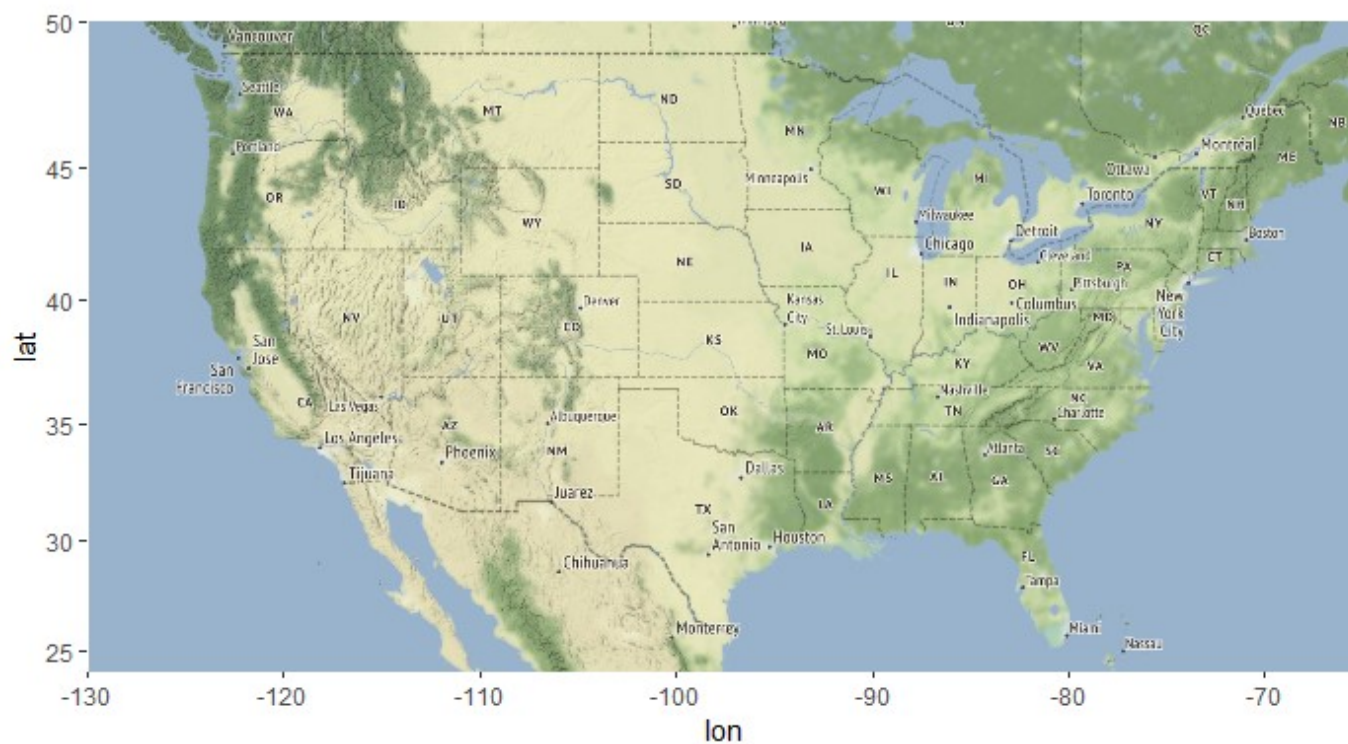
```
bf_L48<-read.csv("Z:\\486\\Project2\\bf_L48.csv")

bfsightings_L48<- ggplot()+
  geom_point(data=bf_L48,color="red", size=1, aes(x=longitude, y=latitude)) +
  ggtitle("Bigfoot Sightings")
bfsightings_L48
```



Sick! This data frame now has 3783 sightings, and is just the Lower 48 US States.

Let's add a basemap under this data!



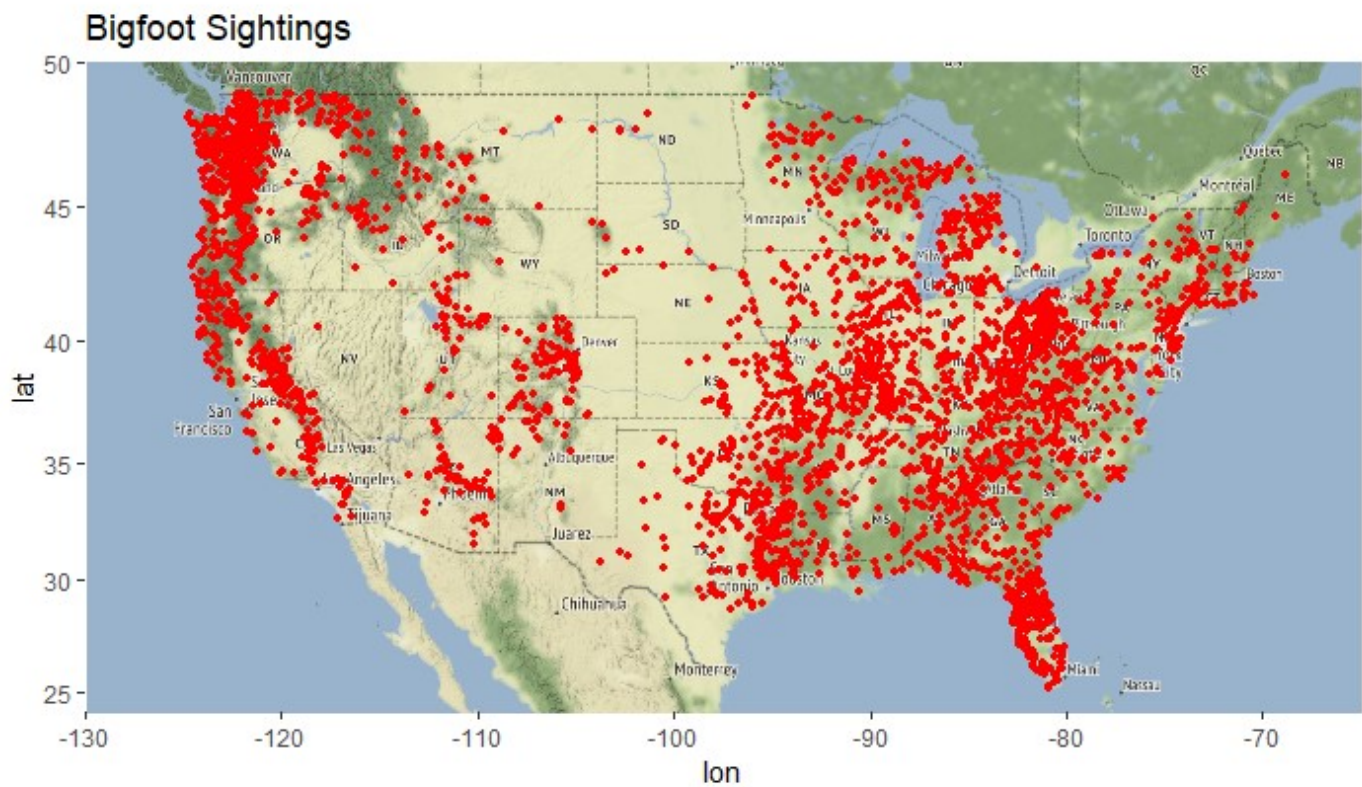
After some tinkering with the bounding box, this looks like a pretty good basemap. Let's overlay our data on top

and then we can explore other stamen maps.

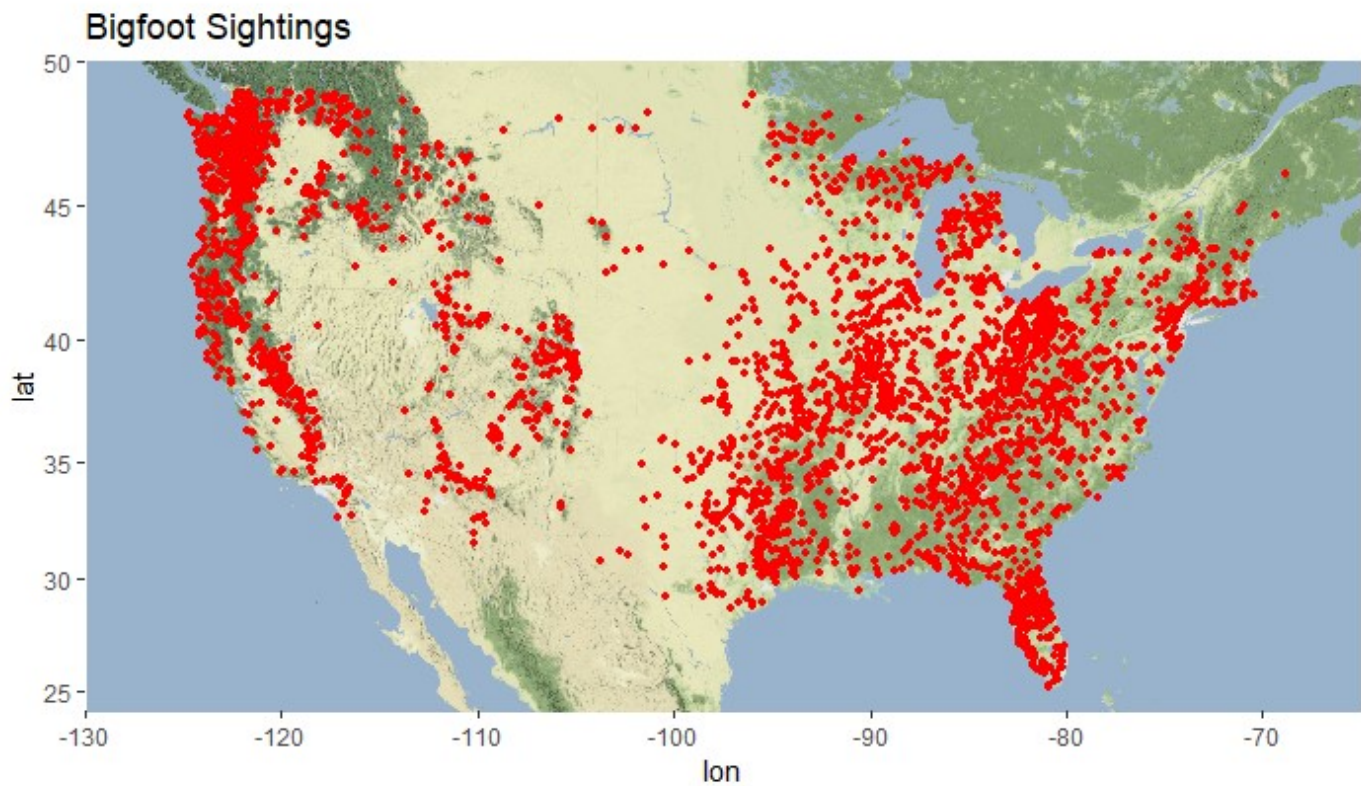
[Hide](#)

```
wheresbf<- ggmap(bf_bm)+  
  geom_point(data=bf_L48,color="red", size=1, aes(x=longitude, y=latitude)) +  
  ggtitle("Bigfoot Sightings")
```

```
wheresbf
```



The stamen base map "terrain-background" takes away the state labels.

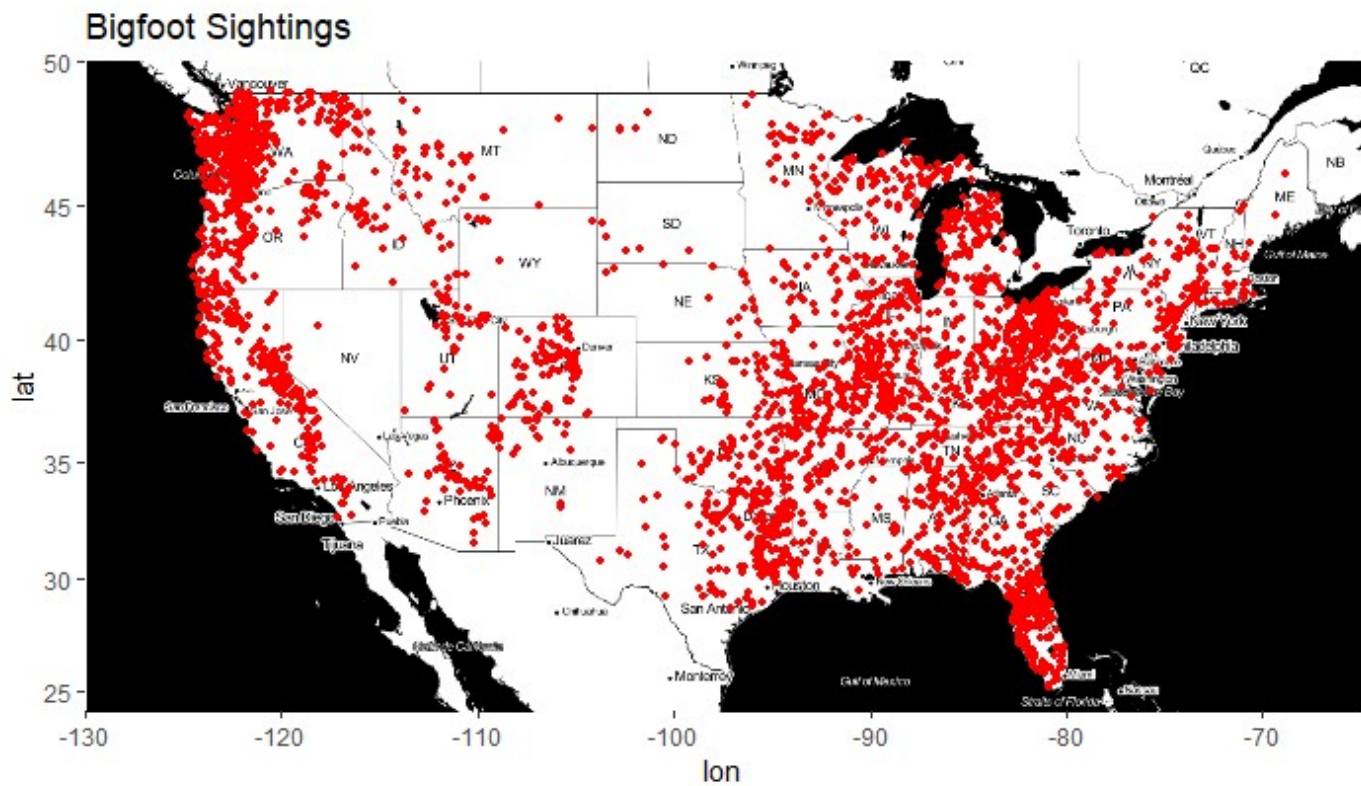


The stamen map “Toner” gives a simple and clean look.

[Hide](#)

```
bf_bm3 <- get_stamenmap( bbox, zoom=5, maptype = "toner")
wheresbf<- ggmap(bf_bm3)+
  geom_point(data=bf_L48,color="red", size=1, aes(x=longitude, y=latitude)) +
  ggtitle("Bigfoot Sightings")

wheresbf
```

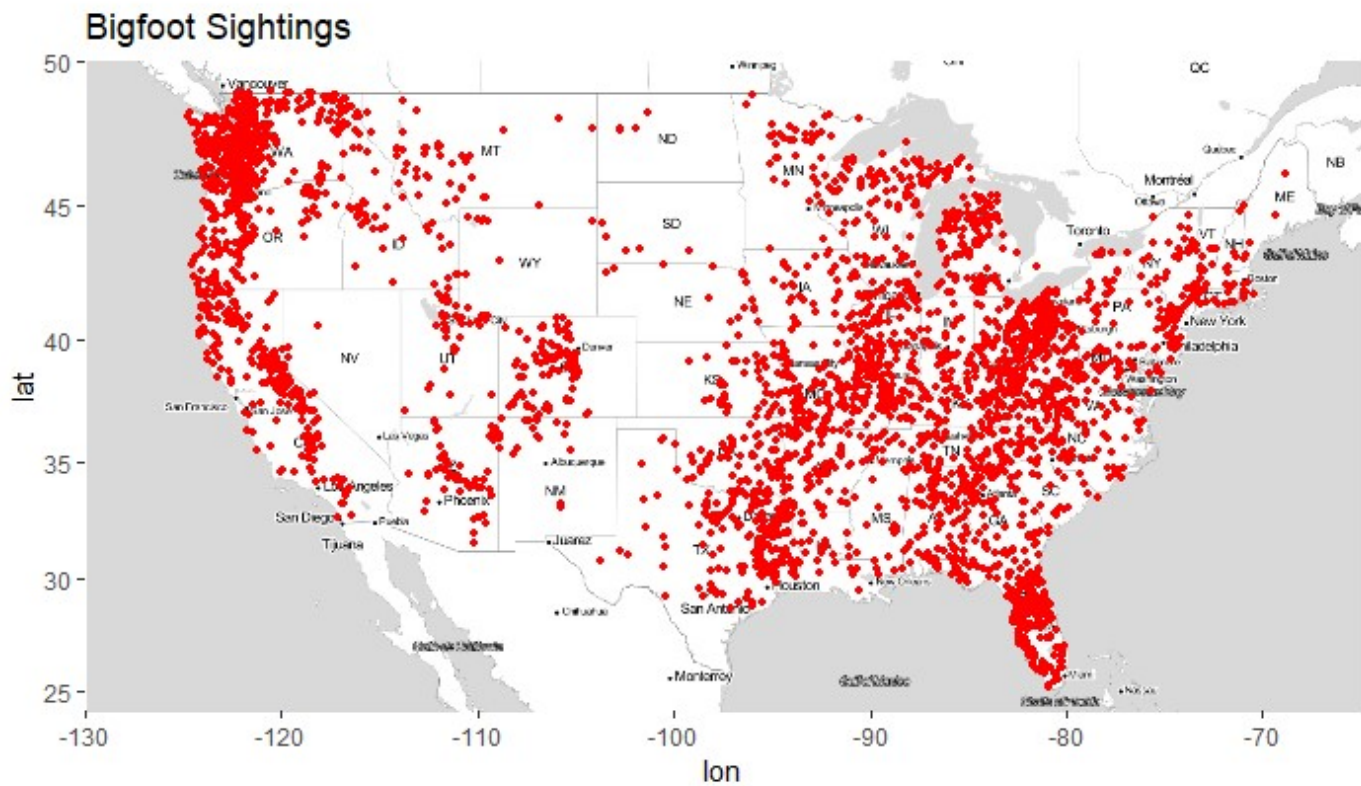


Another version of the stamen map “toner” but not as intense.

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```
bf_bm4 <- get_stamenmap( bbox, zoom=5, maptype = "toner-lite")
wheresbf<- ggmap(bf_bm4)+
  geom_point(data=bf_L48,color="red", size=1, aes(x=longitude, y=latitude)) +
  ggtitle("Bigfoot Sightings")
```

```
wheresbf
```

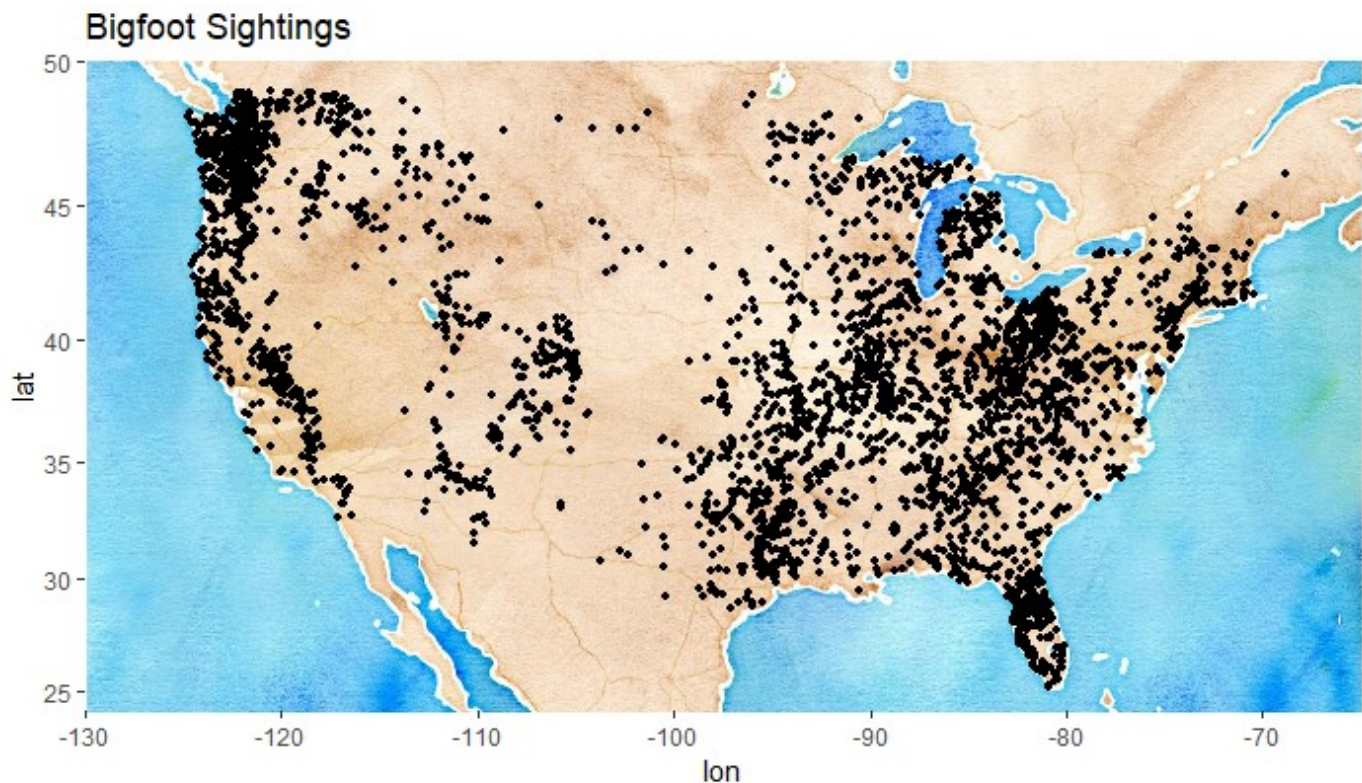



The stamen map “watercolor” adds a touch of fun to any map background.

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```
bf_bm5 <- get_stamenmap( bbox, zoom=5, maptype = "watercolor")
wheresbf<- ggmap(bf_bm5)+
  geom_point(data=bf_L48,color="black", size=1, aes(x=longitude, y=latitude)) +
  ggtitle("Bigfoot Sightings")
```

```
wheresbf
```



Now let's have some fun, honestly these maps are very beautiful but their color's do not scream "Bigfoot Themed". Let's try inverting some of them.

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```
bf_bm5 <- get_stamenmap( bbox, zoom=5, maptype = "watercolor")

invert <- function(x) rgb(t(255-col2rgb(x))/255)
bf_bm5_inv <- as.raster(apply(bf_bm5, 2, invert))

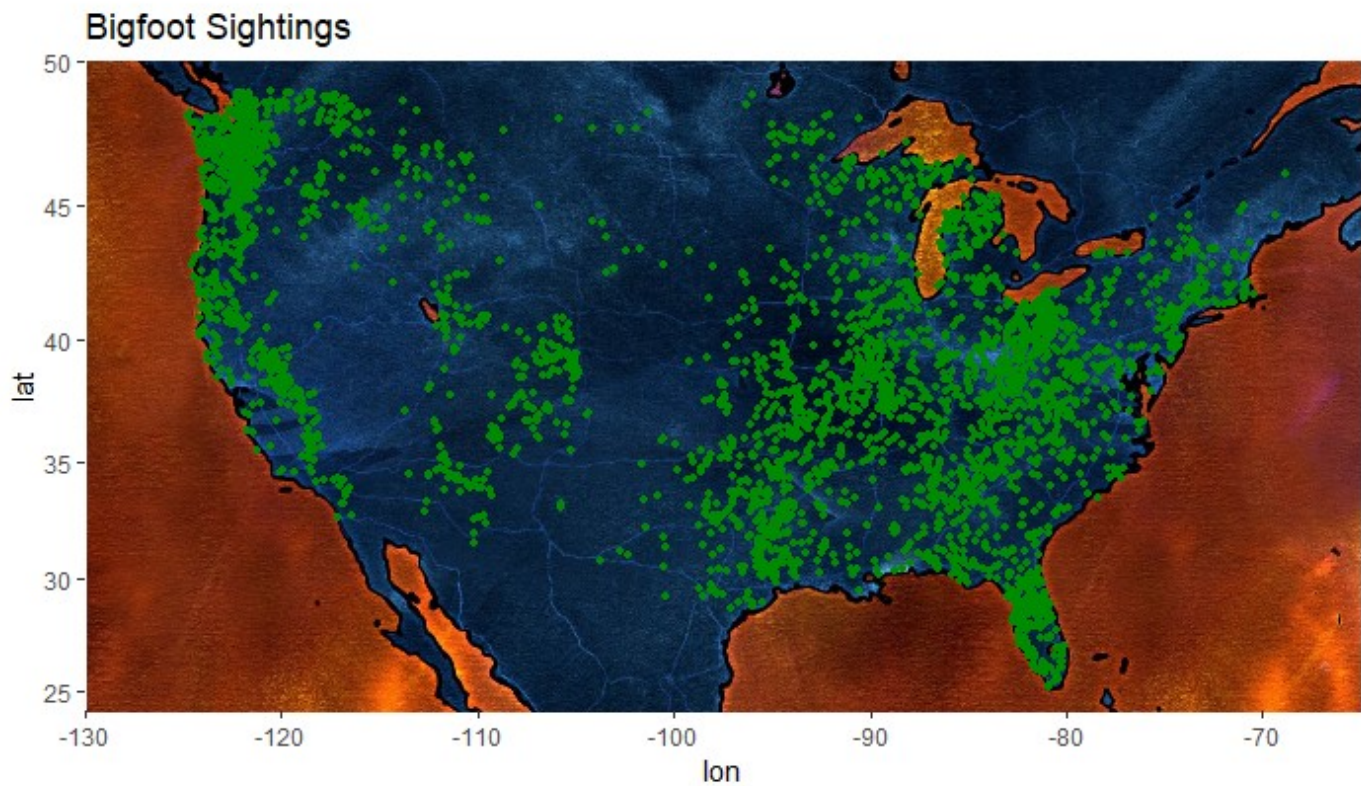
class(bf_bm5_inv) <- class(bf_bm5)
attr(bf_bm5_inv, "bb") <- attr(bf_bm5, "bb")
```

That code was found here: <https://stackoverflow.com/questions/32464638/how-to-invert-the-colors-of-a-ggmap-raster-image-in-r> (<https://stackoverflow.com/questions/32464638/how-to-invert-the-colors-of-a-ggmap-raster-image-in-r>)

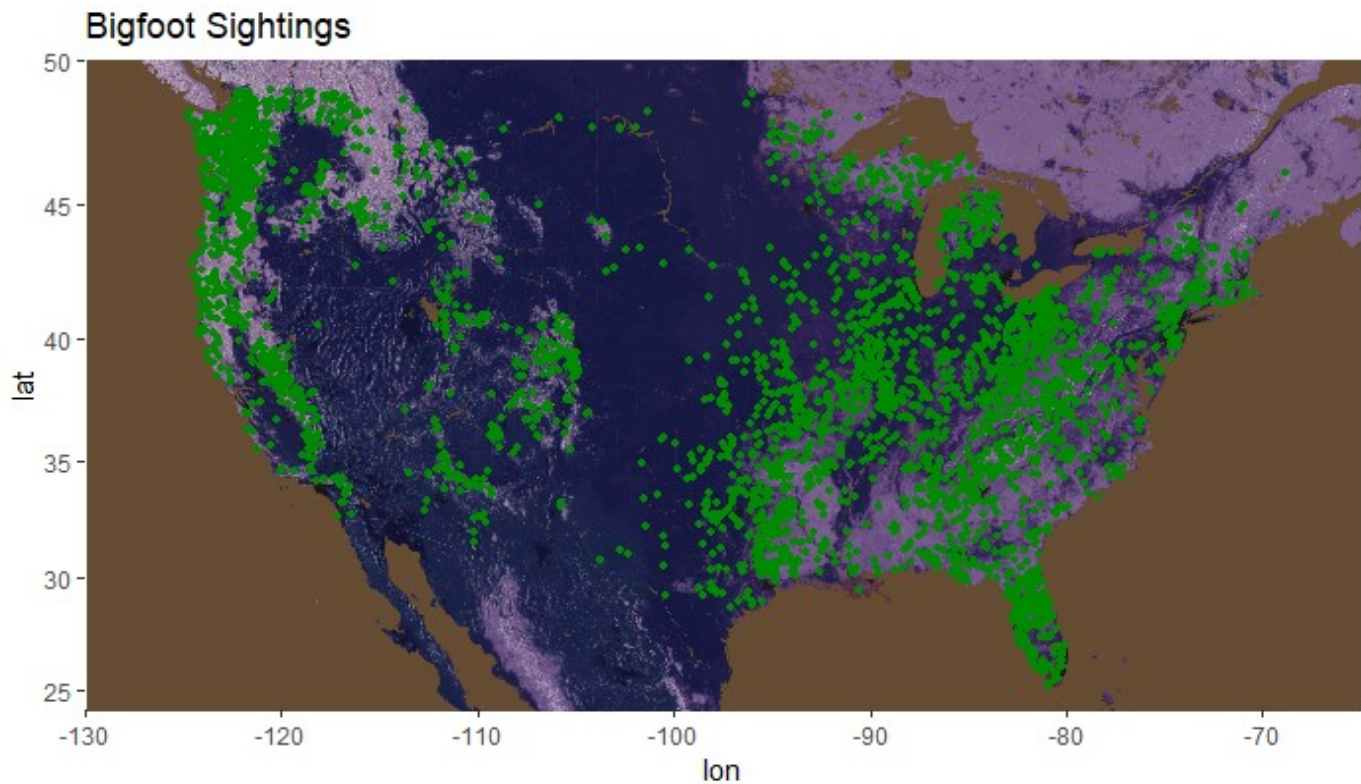
[Hide](#)

```
wheresbf<- ggmap(bf_bm5_inv)+
  geom_point(data=bf_L48,color="green4", size=1, aes(x=longitude, y=latitude)) +
  ggtitle("Bigfoot Sightings")

wheresbf
```

Now THAT'S looking creepier! Very on Bigfoot theme, but let's look at some others.



Modifying these basemaps was a lot of fun for me, so I went on to see what else I could do. Using stamen's website([http://mapstack.stamen.com/edit.html#watercolor\[tint=\\$e6f0db@70\]/11/37.7544/-122.3503](http://mapstack.stamen.com/edit.html#watercolor[tint=$e6f0db@70]/11/37.7544/-122.3503))

([http://mapstack.stamen.com/edit.html#watercolor%5Btint=\\$e6f0db@70%5D/11/37.7544/-122.3503](http://mapstack.stamen.com/edit.html#watercolor%5Btint=$e6f0db@70%5D/11/37.7544/-122.3503))) I was able to modify the colors of all of the basemap options. I created this color scheme of the watercolor basemap that I really liked, and tried to find a way to do this is R.

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```
knitr::include_graphics('Z:/486/Project2/coolstamen.png')
```



The image above was created using Map Stack on the Stamen site and manipulating the settings to what is shown below:

[Hide](#)

```
knitr::include_graphics('Z:/486/Project2/watercoloredit.png')
```


Edit Map Layer ✕

Watercolor ▾

Opacity

100 %

Brightness

0 %

Saturation

100 %

Invert?

☒ OFF ☐ **ON**

+ Color Tint

☐ OFF ☒ ON

R 230 G 240 B 219 # #e6f0db

HUE

90 °

SATURATION

41 %

LUMINANCE

90 %

AMOUNT

70 %

Layer Mask

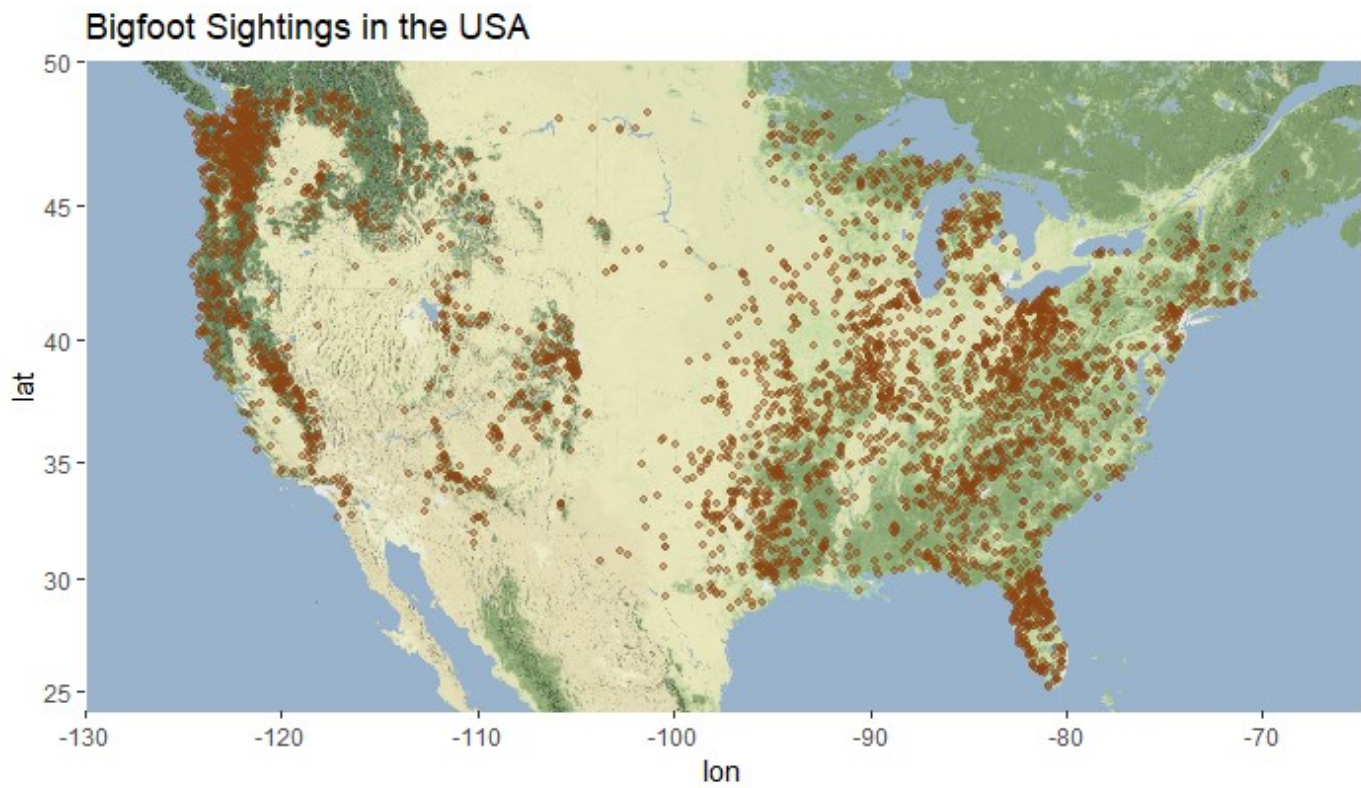
(no mask) ▾

Blend Mode

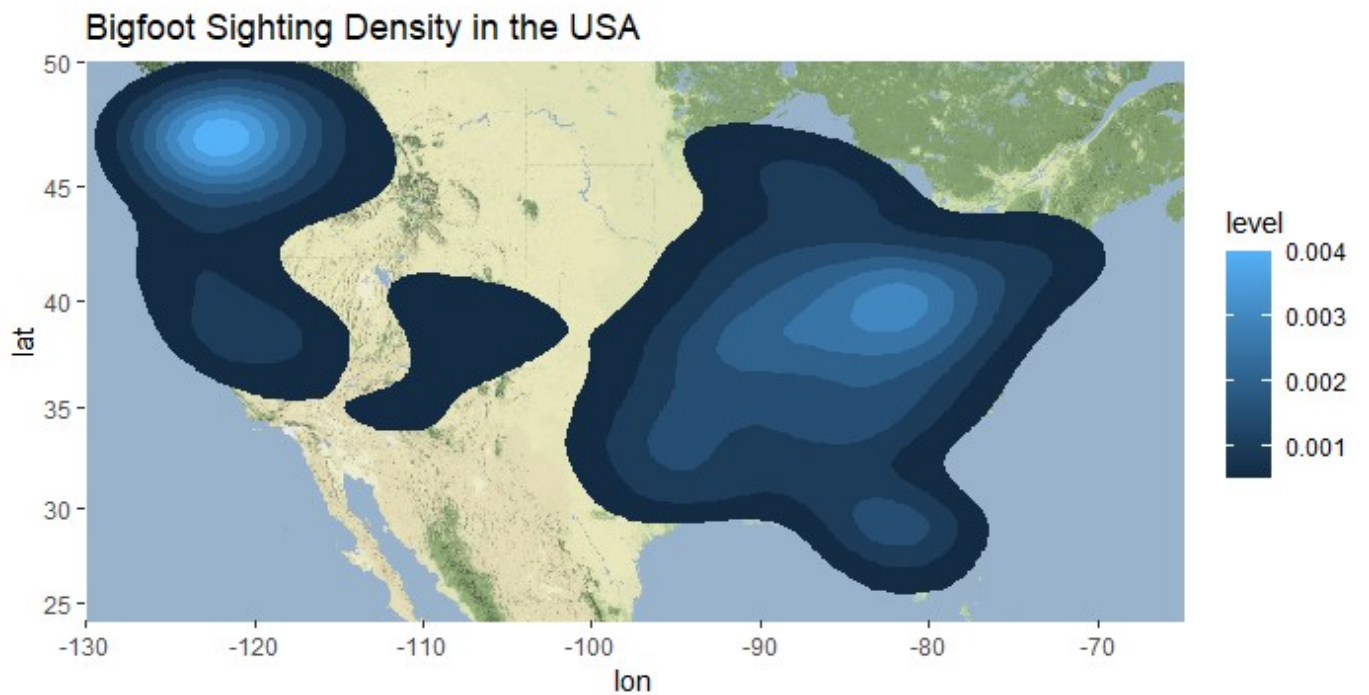
over (default) ▾

Could not figure out how to apply these edits in R, maybe I will be able to make a web map and edit the html code in github!

Let's pick a basemap and start displaying our data in different ways.

[Hide](#)

```
bfdensity<- ggmap(bf_bm2)+  
stat_density_2d(data = bf_L48,  
                aes(x = longitude,  
                    y = latitude,  
                    fill = stat(level)),  
                geom = "polygon")+  
  ggtitle("Bigfoot Sighting Density in the USA")  
bfdensity
```

[Hide](#)

```
library(RColorBrewer)
bfdensity<- ggmap(bf_bm2)+
stat_density_2d(data = bf_L48,
  aes(x = longitude,
      y = latitude,
      fill = stat(level)),
  alpha = .2,
  bins = 25,
  geom = "polygon") +
scale_fill_gradientn(colors = brewer.pal(7, "YlOrRd"))+
ggtitle("Bigfoot Sighting Density in the USA")
bfdensity
```

