

# Lab 13 Homework

## Instructions

Answer the following questions and complete the exercises in RMarkdown. Please embed all of your code and push your final work to your repository. Your final lab report should be organized, clean, and run free from errors. Remember, you must remove the `#` for the included code chunks to run. Be sure to add your name to the author header above. For any included plots, make sure they are clearly labeled. You are free to use any plot type that you feel best communicates the results of your analysis.

Make sure to use the formatting conventions of RMarkdown to make your report neat and clean!

## Load the libraries

```
library(tidyverse)
library(janitor)
library(ggmap)
```

## Load the Data

We will use two separate data sets for this homework.

The first data set represent sightings of grizzly bears (*Ursos arctos*) in Alaska.

1. Load the `grizzly` data and evaluate its structure.

```
grizzly <- read_csv("data/bear-sightings.csv") %>% clean_names()
```

```
## Rows: 494 Columns: 3
## -- Column specification -----
## Delimiter: ","
## dbl (3): bear.id, longitude, latitude
##
## 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.
```

```
glimpse(grizzly)
```

```
## Rows: 494
## Columns: 3
## $ bear_id    <dbl> 7, 57, 69, 75, 104, 108, 115, 116, 125, 135, 137, 162, 185, ~
## $ longitude  <dbl> -148.9560, -152.6228, -144.9374, -152.8485, -143.2948, -149.~
## $ latitude   <dbl> 62.65822, 58.35064, 62.38227, 59.90122, 61.07311, 62.91605, ~
```

```
summary(grizzly)
```

```
##      bear_id      longitude      latitude
## Min.   : 7      Min.   : -166.2    Min.   : 55.02
## 1st Qu.:2569    1st Qu.: -154.2    1st Qu.: 58.13
## Median :4822    Median : -151.0    Median : 60.97
## Mean   :4935    Mean   : -149.1    Mean   : 61.41
## 3rd Qu.:7387    3rd Qu.: -145.6    3rd Qu.: 64.13
## Max.   :9996    Max.   : -131.3    Max.   : 70.37
```

2. Use the range of the latitude and longitude to build an appropriate bounding box for your map.

```
lat <- c(55.02, 70.37)
long <- c(-166.2, -131.3)
bbox <- make_bbox(long, lat, f = 0.03)
```

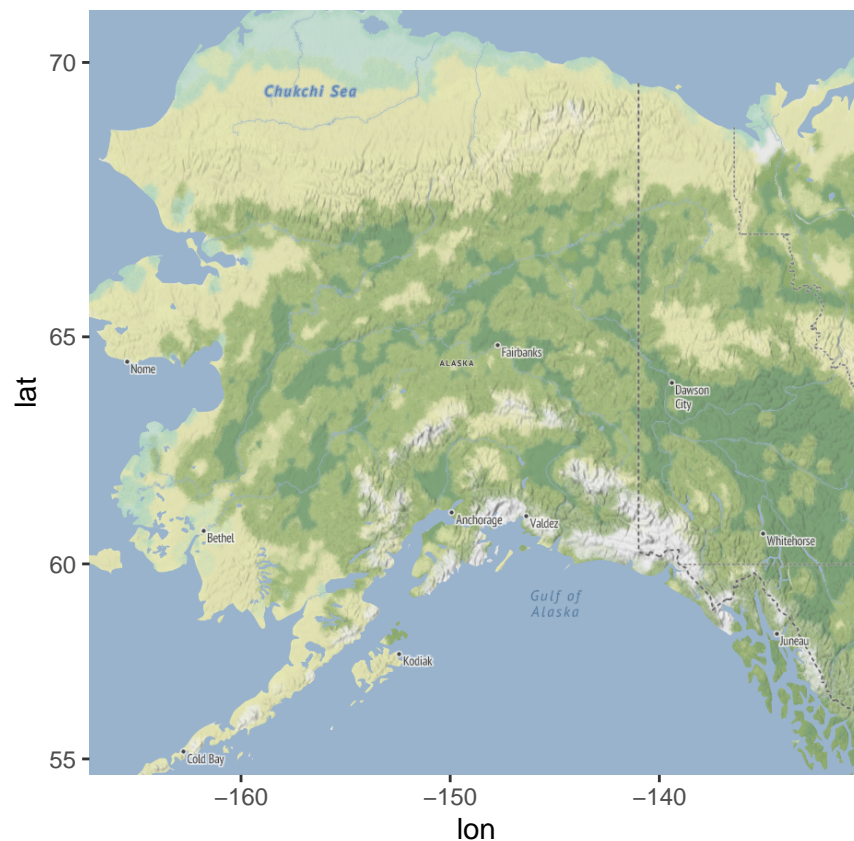
3. Load a map from stadiamaps in a stamen\_terrain projection and display the map. Hint: use zoom=5.

```
register_stadiamaps("292ee626-63ca-408d-b833-5555b8a3253d", write = FALSE)
```

```
map1 <- get_stadiamap(bbox, maptype = "stamen_terrain", zoom=5)
```

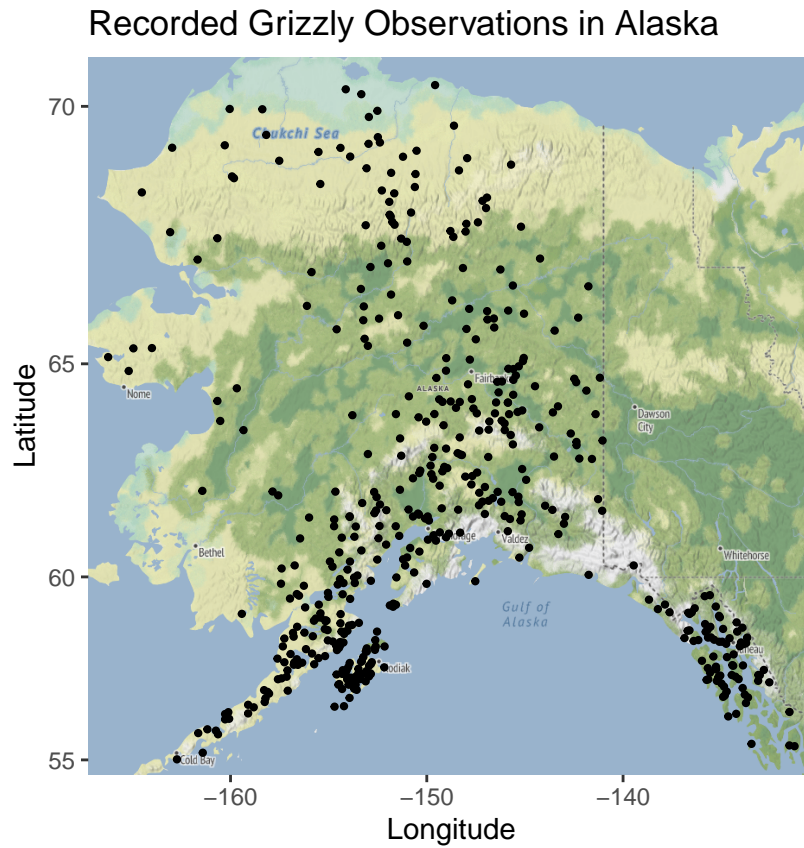
```
## i © Stadia Maps © Stamen Design © OpenMapTiles © OpenStreetMap contributors.
```

```
ggmap(map1)
```



4. Build a final map that overlays the recorded observations of grizzly bears in Alaska.

```
ggmap(map1)+  
  geom_point(data=grizzly, aes(x=longitude, y=latitude), size=0.8)+  
  labs(x="Longitude", y="Latitude", title="Recorded Grizzly Observations in Alaska")
```



**Push your final code to GitHub!**

Please be sure that you check the `keep md` file in the knit preferences.