STAT585_Lab2

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2/20/2019

```
library(sf)
```

```
## Linking to GEOS 3.6.1, GDAL 2.1.3, PROJ 4.9.3
```

```
library(ggspatial)
```

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

```
library(tidyverse)
```

```
## -- Attaching packages --------------------------------- tidyverse 1.2.1 --
```

```
## v tibble  1.4.2     v purrr   0.3.0
## v tidyr   0.8.2     v dplyr   0.7.8
## v readr   1.3.1     v stringr 1.3.1
## v tibble  1.4.2     v forcats 0.3.0
```

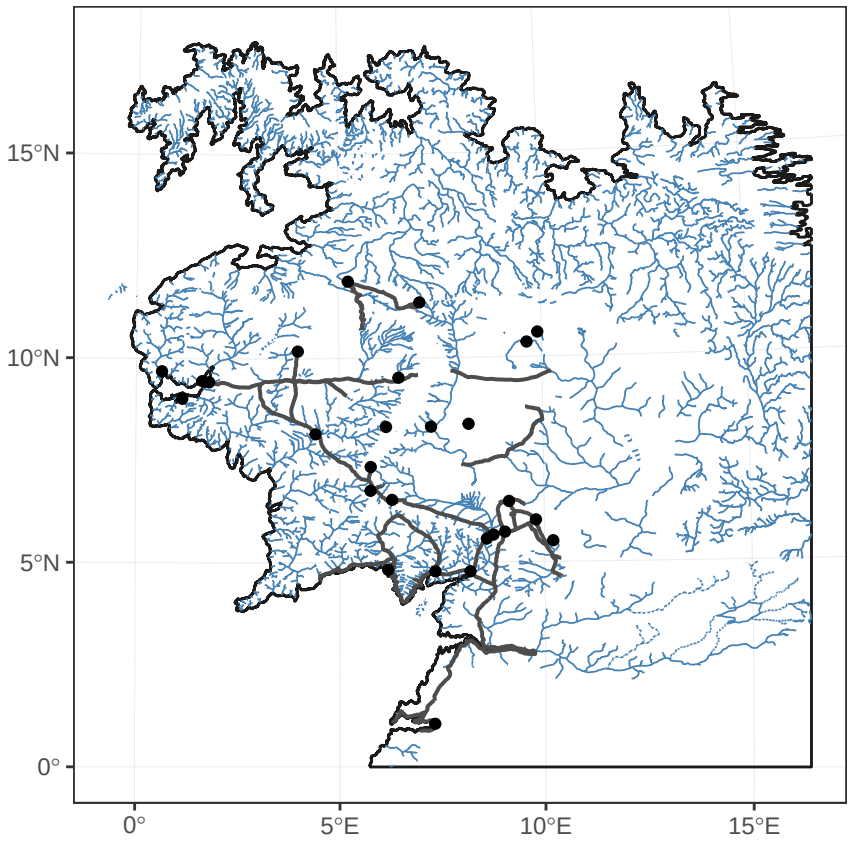
```
## Warning: package 'purrr' was built under R version 3.5.2
```

```
## -- Conflicts ------------------------------------ tidyverse_conflicts() --
## x dplyr::filter() masks stats::filter()
## x dplyr::lag()    masks stats::lag()
```

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

plot the original plot

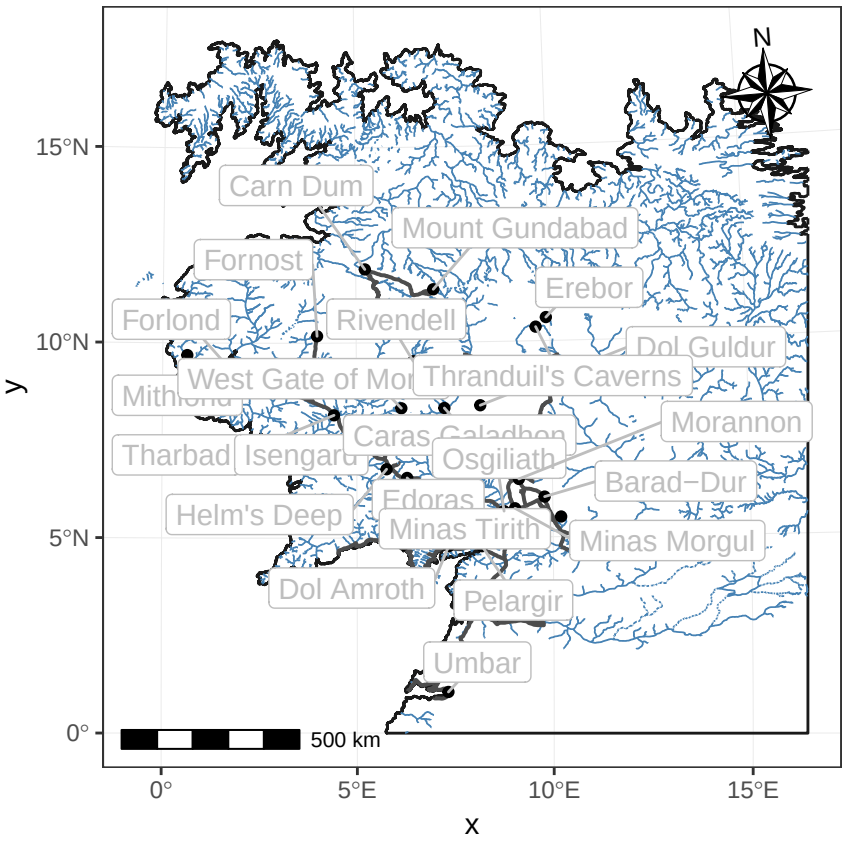
```
p <- ggplot() +
  geom_sf(data = read_sf("Data/ME-GIS-master/Coastline2.shp"),
          colour="grey10", fill="grey90") +
  geom_sf(data = read_sf("Data/ME-GIS-master/Rivers19.shp"),
          colour="steelblue", size=0.3) +
  geom_sf(data = read_sf("Data/ME-GIS-master/PrimaryRoads.shp"),
          size = 0.7, colour="grey30") +
  geom_sf(data = read_sf("Data/ME-GIS-master/Cities.shp")) +
  theme_bw()
p
```



Add the labels

```
library(ggrepel)
p +
  geom_label_repel(data = read_sf("Data/ME-GIS-master/Cities.shp"),
                   aes(label = Name, geometry = geometry),
                   stat = "sf_coordinates",
                   min.segment.length = 0,
                   colour = "gray",
                   segment.colour = "gray")+
  annotation_scale() +
  annotation_north_arrow(which_north = "true", location = "true", style = north_arrow_nautical())
```

```
## Warning: Removed 4 rows containing missing values (geom_label_repel).
```

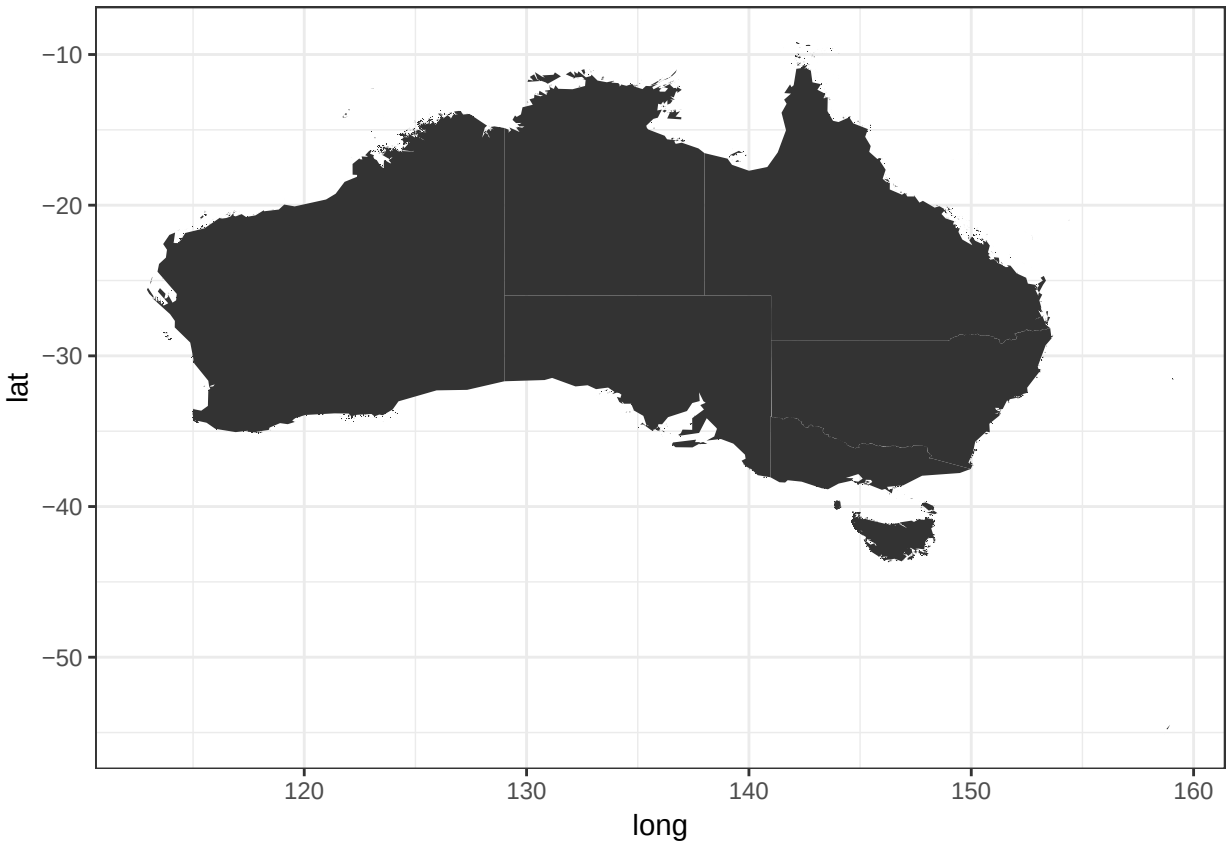


Australia shapefile

```
ozbig <- read_sf("Data/gadm36_AUS_shp/gadm36_AUS_1.shp")
oz_st <- maptools::thinnedSpatialPoly(
  as(ozbig, "Spatial"), tolerance = 0.1,
  minarea = 0.001, topologyPreserve = TRUE)
oz <- st_as_sf(oz_st)
```

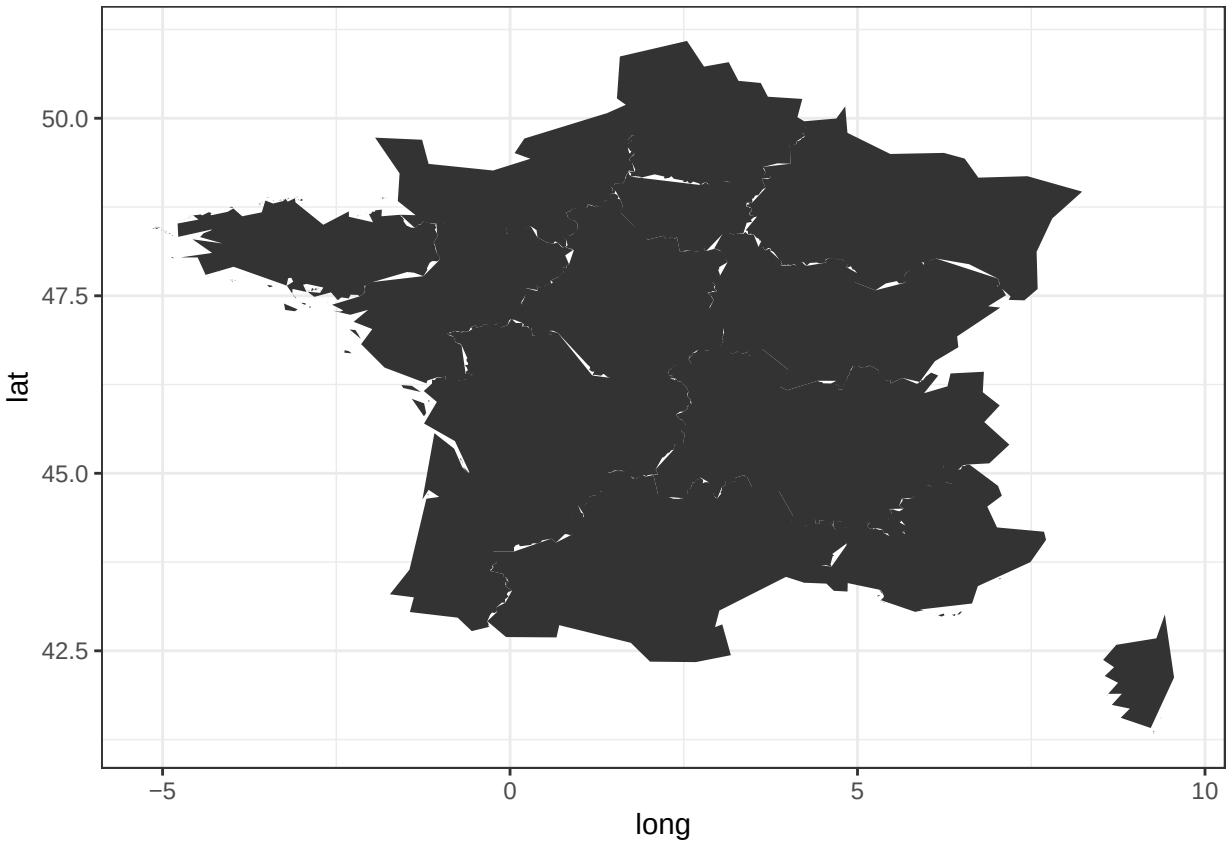
```
## Help calculate the group.
## Input: oz$geometry
helper.group <- function(geo){
  geo %>%
    unlist(., recursive = FALSE) %>%
    unlist(., recursive = FALSE) -> dd
  countgrouprep <- unlist(map(dd, nrow))
  num_group <- length(countgrouprep)
  rep(1:num_group, time = countgrouprep)
}

## Help calculate the order.
## Input: oz$geometry[[i]]
helper.order <- function(geol){
  geol %>%
    unlist(., recursive = FALSE) -> d
  longlat <- do.call(rbind, d)
  order_num <- sum(unlist(map(d, nrow)))
  order <- seq(1:order_num)
  cbind(longlat, order)
```

```
}
res <- map(oz$geometry, .f=helper.order)
ress <- do.call(rbind, res)
group <- helper.group(oz$geometry)
ress <- cbind(ress, group)
colnames(ress) <- c("long", "lat", "order", "group")
ress <- as.data.frame(ress)
ress %>% ggplot(aes(x=long,y=lat,group=group)) + geom_polygon() + theme_bw()
```



We pcik France

```
frabig <- read_sf("Data/gadm36_FRA_shp/gadm36_FRA_1.shp")
fra_st <- maptools::thinnedSpatialPoly(
  as(frabig, "Spatial"), tolerance = 0.1,
  minarea = 0.001, topologyPreserve = TRUE)
fr <- st_as_sf(fra_st)
frres <- map(fr$geometry, .f=helper.order)
frress <- do.call(rbind, frres)
frgroup <- helper.group(fr$geometry)
frress <- cbind(frress, frgroup)
colnames(frress) <- c("long", "lat", "order", "group")
frress <- as.data.frame(frress)
frress %>% ggplot(aes(x=long,y=lat,group=group)) + geom_polygon() + theme_bw()
```


50.0
47.5
45.0
42.5
lat
−5
0
5
10
long