Untitled

2023-10-19

```
library(tidyverse)
```

```
## -- Attaching core tidyverse packages ------------------------ tidyverse 2.0.0 --
## v dplyr     1.1.3     v readr     2.1.4
## v forcats   1.0.0     v stringr   1.5.0
## v ggplot2   3.4.3     v tibble    3.2.1
## v lubridate 1.9.3     v tidyr     1.3.0
## v purrr     1.0.2
## -- Conflicts ------------------------------------------ tidyverse_conflicts() --
## x dplyr::filter() masks stats::filter()
## x dplyr::lag()    masks stats::lag()
## i Use the conflicted package (<http://conflicted.r-lib.org/>) to force all conflicts to become errors
```

```
library(cowplot)
```

```
##
## Attaching package: 'cowplot'
##
## The following object is masked from 'package:lubridate':
##
##     stamp
```

```
library(Ecdat)
```

```
## Loading required package: Ecfun
##
## Attaching package: 'Ecfun'
##
## The following object is masked from 'package:base':
##
##     sign
##
##
## Attaching package: 'Ecdat'
##
## The following object is masked from 'package:datasets':
##
##     Orange
```

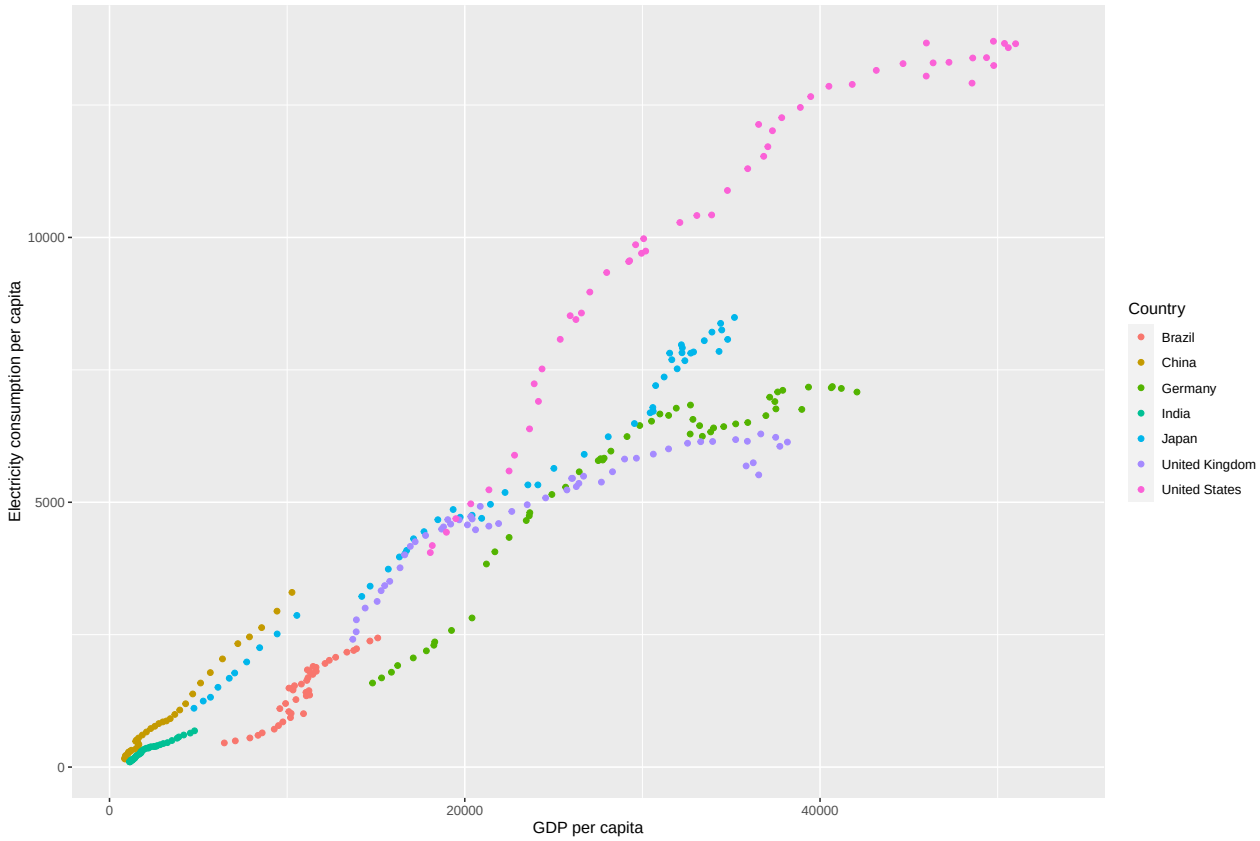
```
df <- read_csv("../data/gapminder-data.csv")
```

```
## New names:
## Rows: 1512 Columns: 10
## -- Column specification
## -------------------------------------------------------- Delimiter: "," chr
## (1): Country dbl (9): ...1, Year, gdp_per_capita,
## Electricity_consumption_per_capita, und...
```

```
## 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.
## * `` -> `...1`
```

```
ggplot(df, aes(gdp_per_capita, Electricity_consumption_per_capita)) +
  geom_point(aes(color=Country)) +
  xlab("GDP per capita") +
  ylab("Electricity consumption per capita")
```

```
## Warning: Removed 1181 rows containing missing values (`geom_point()`).
```

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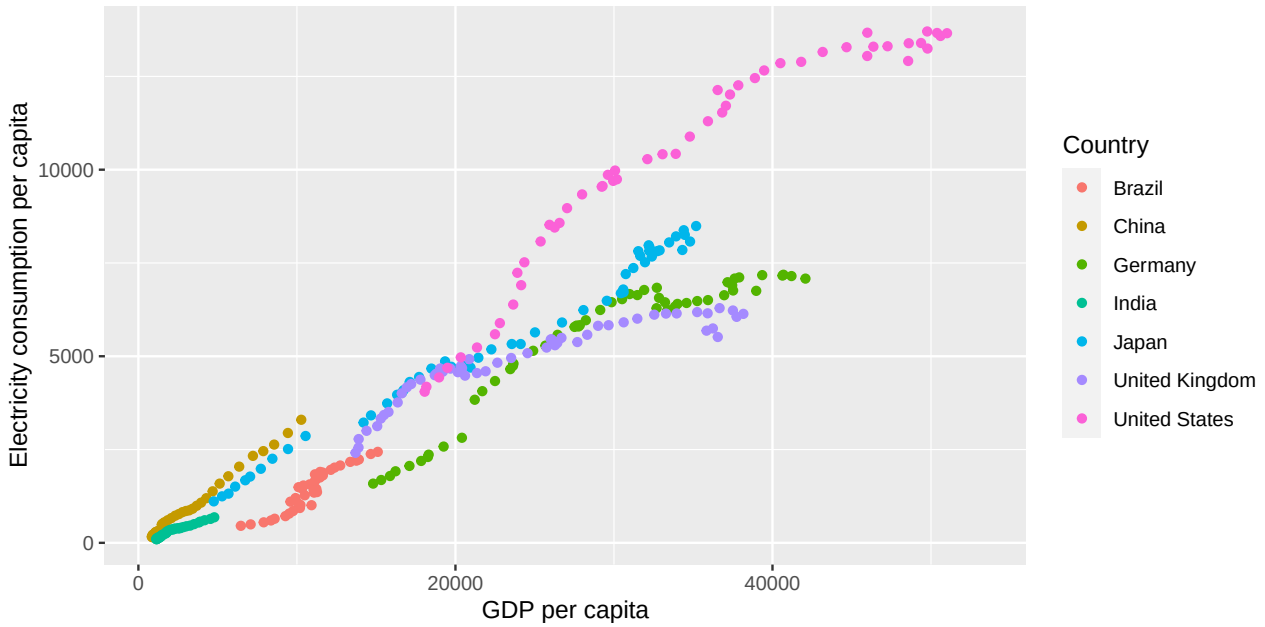


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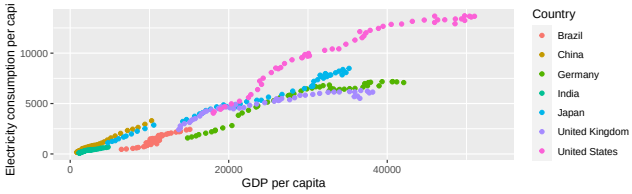
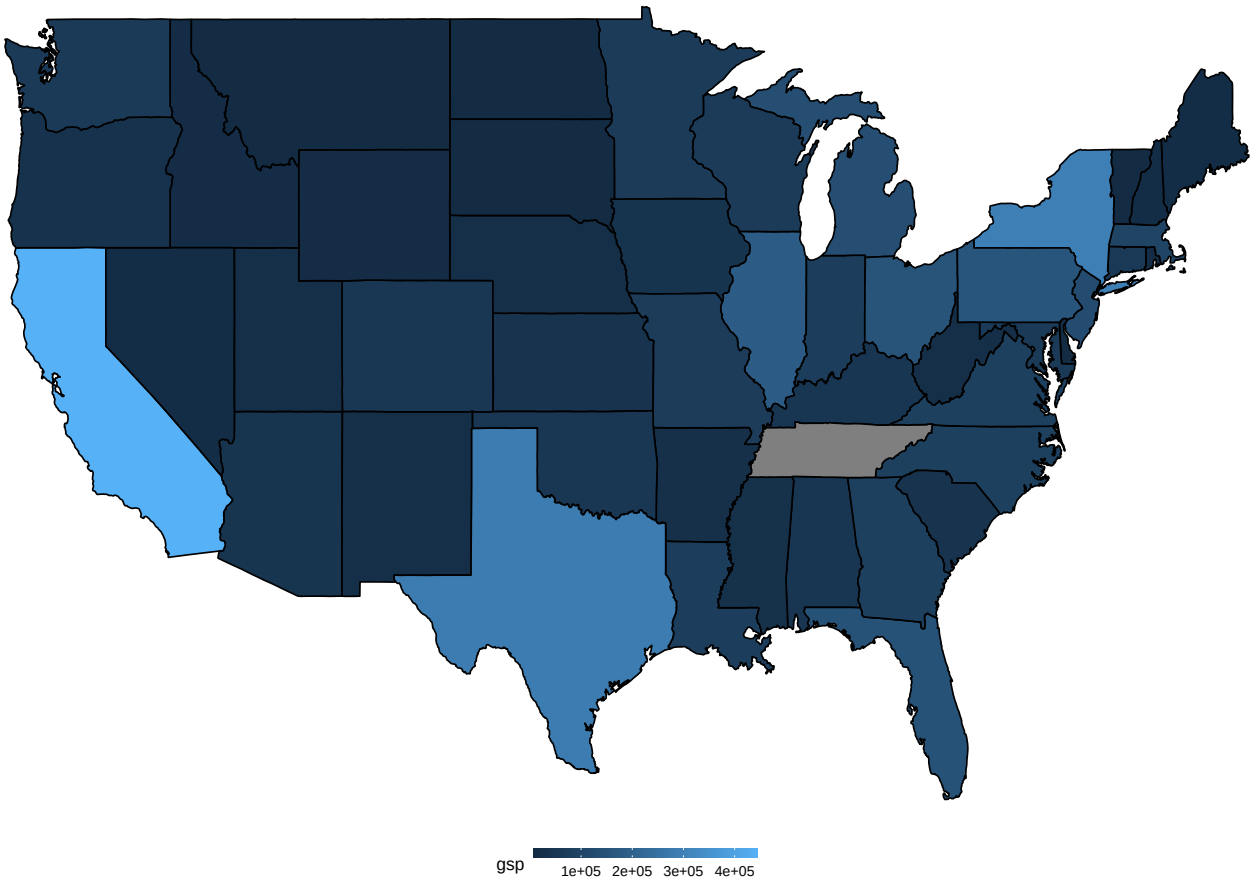


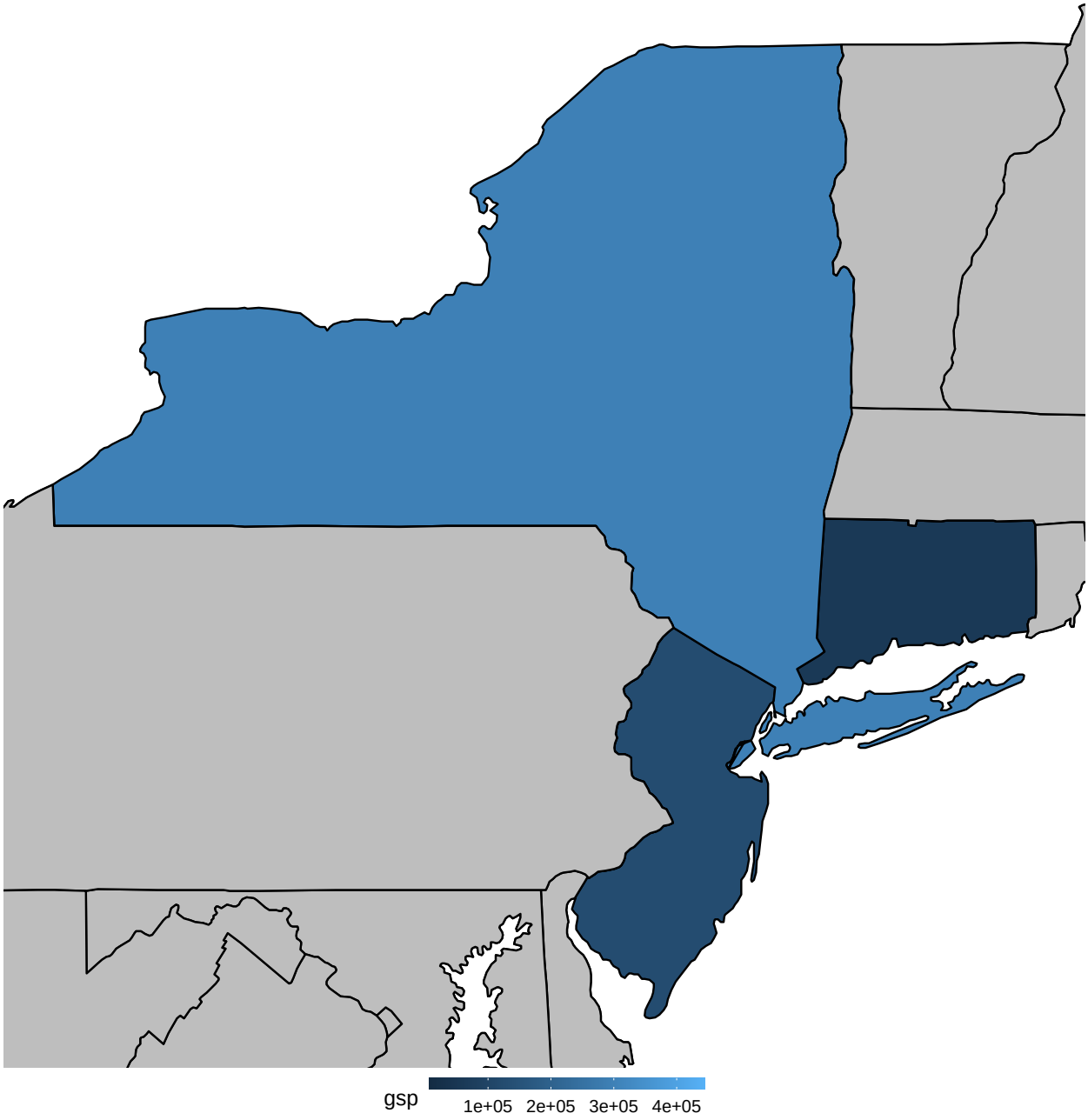

```
ggsave(filename = "figures/small_memory_size.png", ggplot(mtcars, aes(x=wt, y=mpg)) +
  geom_point(size=2, shape=23) + theme_bw(base_size = 10),
  width = 5, height = 4, dpi = 150, units = "in", device='png')
ggsave(filename = "figures/big_memory_size.png", ggplot(mtcars, aes(x=wt, y=mpg)) +
  geom_point(size=2, shape=23) + theme_bw(base_size = 10),
  width = 5, height = 4, dpi = 300, units = "in", device='png')
ggsave(filename = "figures/big_figure.png", ggplot(mtcars, aes(x=wt, y=mpg)) +
  geom_point(size=2, shape=23) + theme_bw(base_size = 10),
  width = 10, height = 8, dpi = 300, units = "in", device='png')
```

```
us_map <- map_data("state")
us_prod <- Produc[Produc$year==1985,]
us_prod$region <- gsub("_", " ", tolower(us_prod$state))
merged_data <- left_join(us_map, us_prod[, c("region", "gsp")], by="region")
choropleth <- ggplot(merged_data) +
  geom_polygon(aes(x=long, y=lat, group=group, fill=gsp), color="black") +
  theme_void() +
  theme(legend.position="bottom") +
  scale_fill_continuous(guide=guide_colorbar(barheight=unit(2, units="mm"),
                                             barwidth=unit(5, units="cm")))
choropleth
```



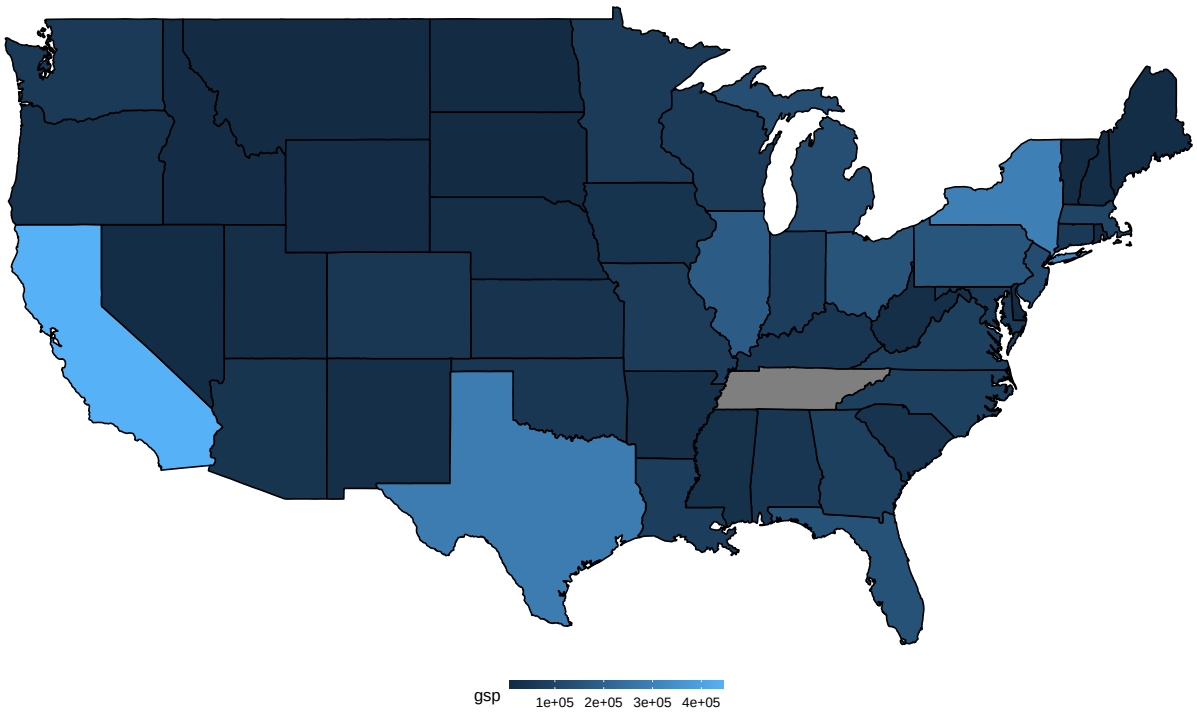

```
tristate <- c("new york", "new jersey", "connecticut")
long_lim <- merged_data$long[merged_data$region %in% tristate]
lat_lim <- merged_data$lat[merged_data$region %in% tristate]
outer <- merged_data[!merged_data$region %in% tristate,]

choropleth +
  geom_polygon(data=outer, aes(x=long, y=lat, group=group),
               fill="gray", color="black") +
  coord_fixed(xlim=c(min(long_lim), max(long_lim)),
              ylim=c(min(lat_lim),max(lat_lim)),
              ratio=1.3)
```



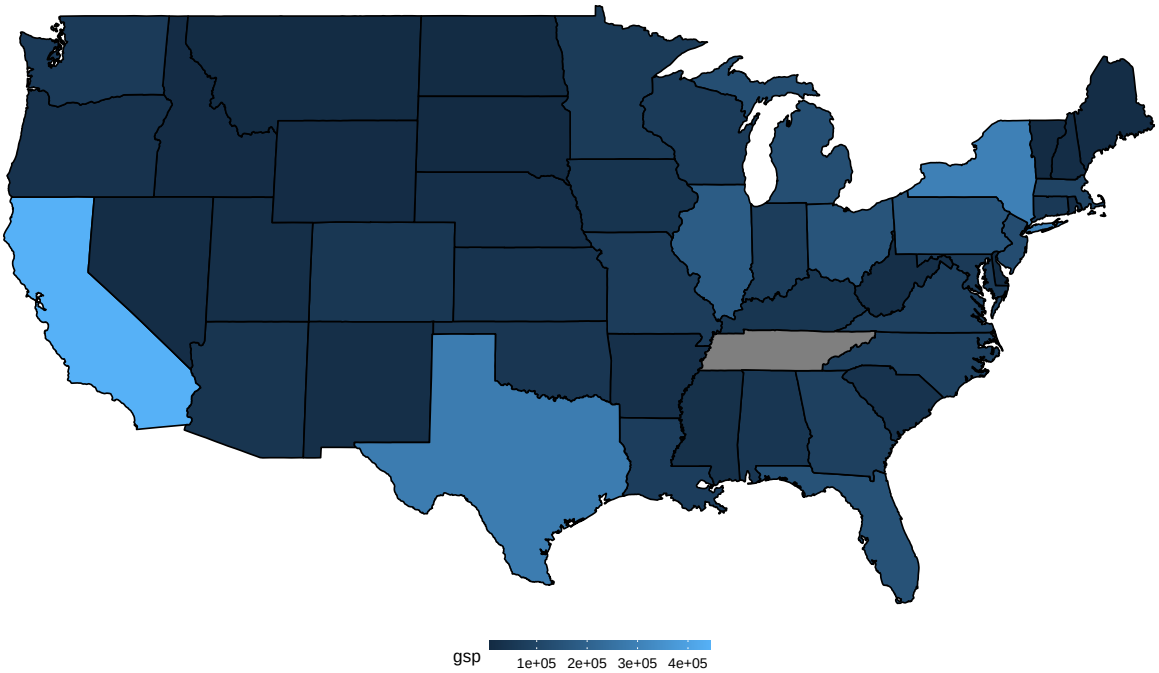

```
choropleth + coord_map() +
  ggtitle("Mercator")
```

Mercator



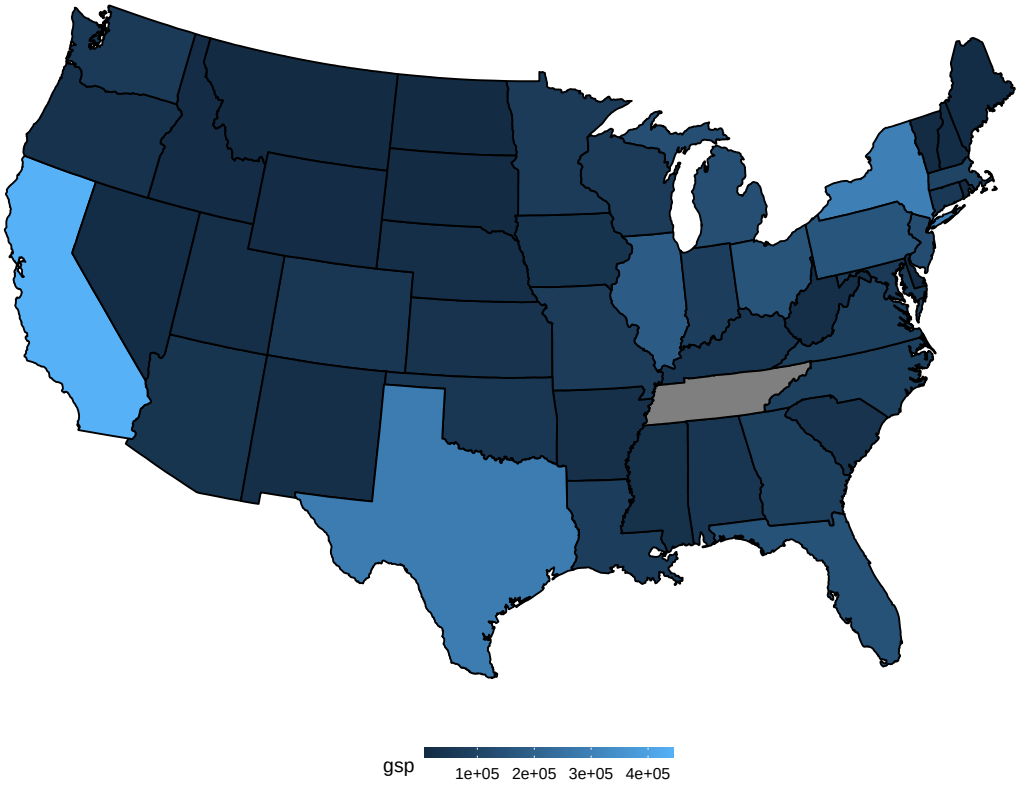

```
choropleth + coord_map(projection="gilbert") +
  ggtitle("Gilbert")
```

Gilbert



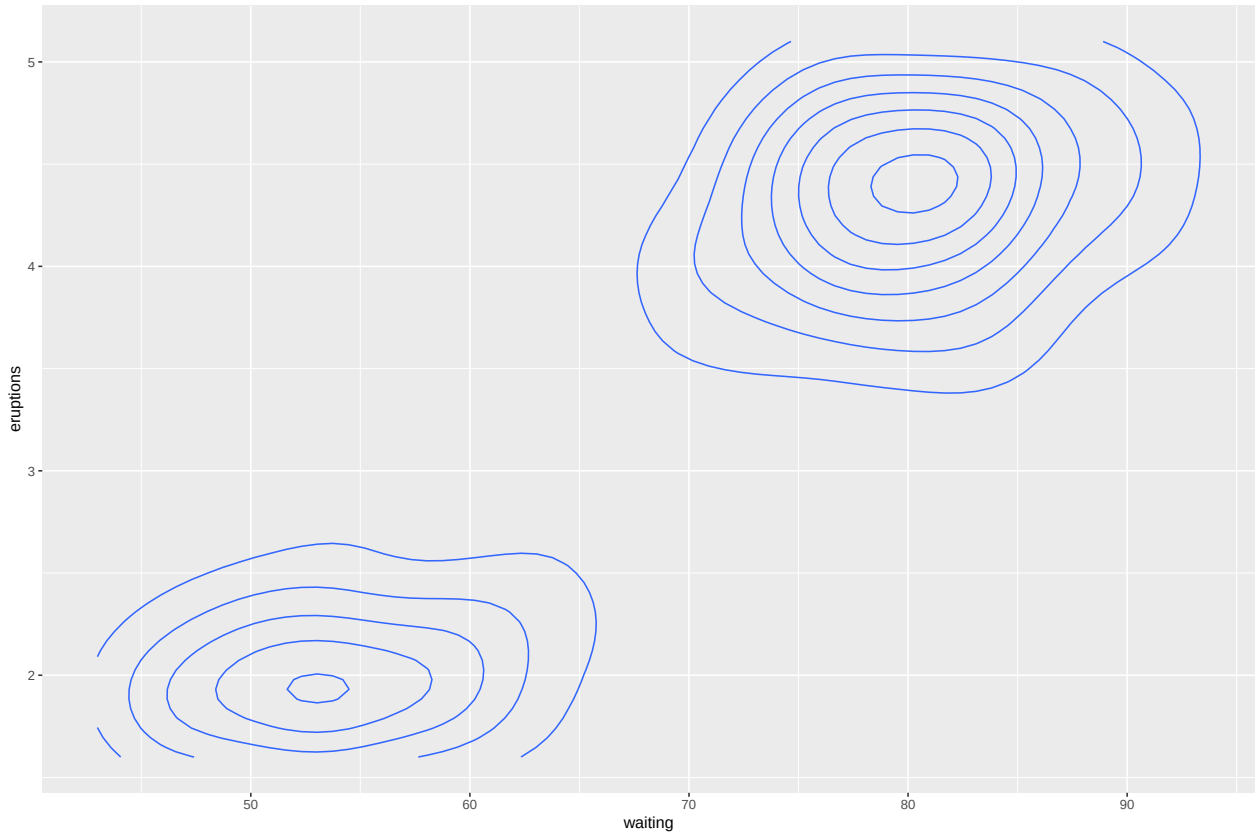

```
choropleth + coord_map(projection="conic", lat0=50) +
  ggtitle("conic - 50")
```

conic − 50

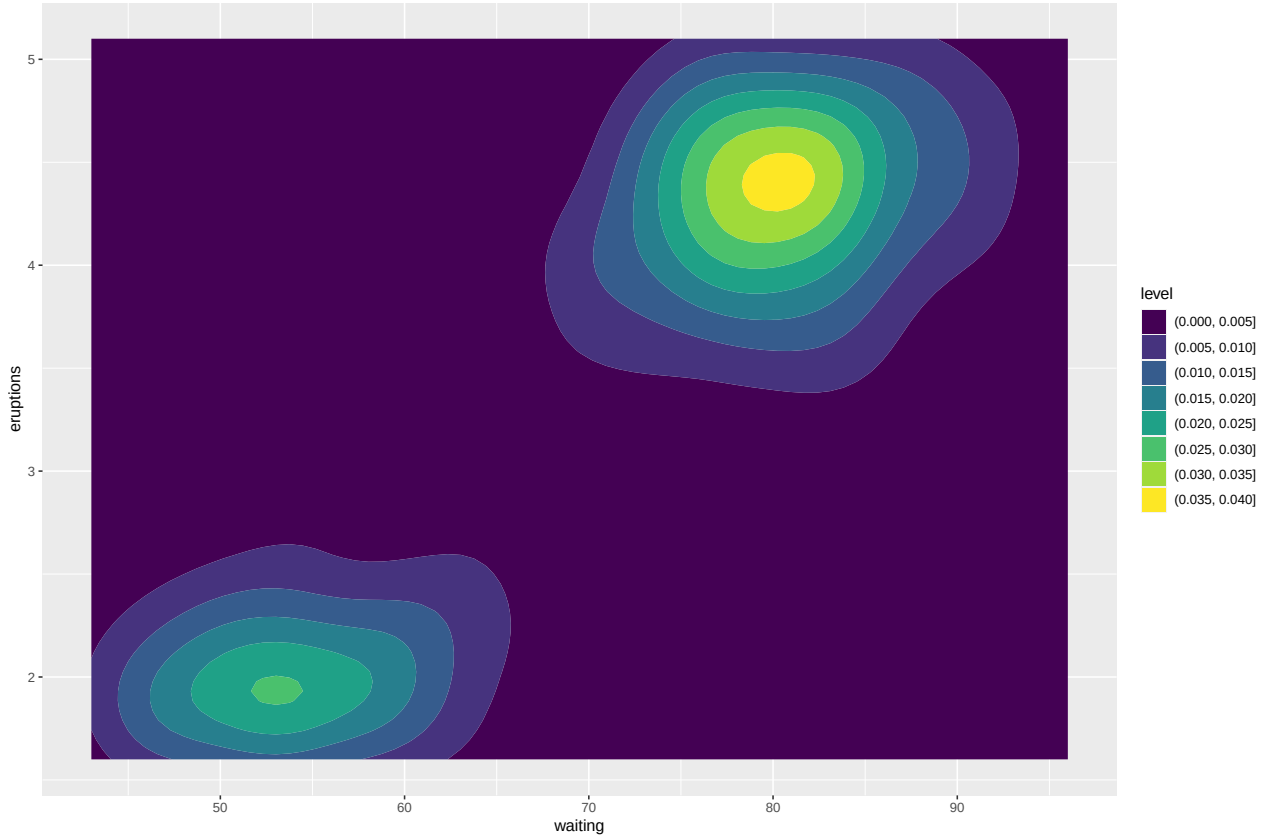



```
p <- ggplot(faithfuld, aes(waiting, eruptions, z=density))
```

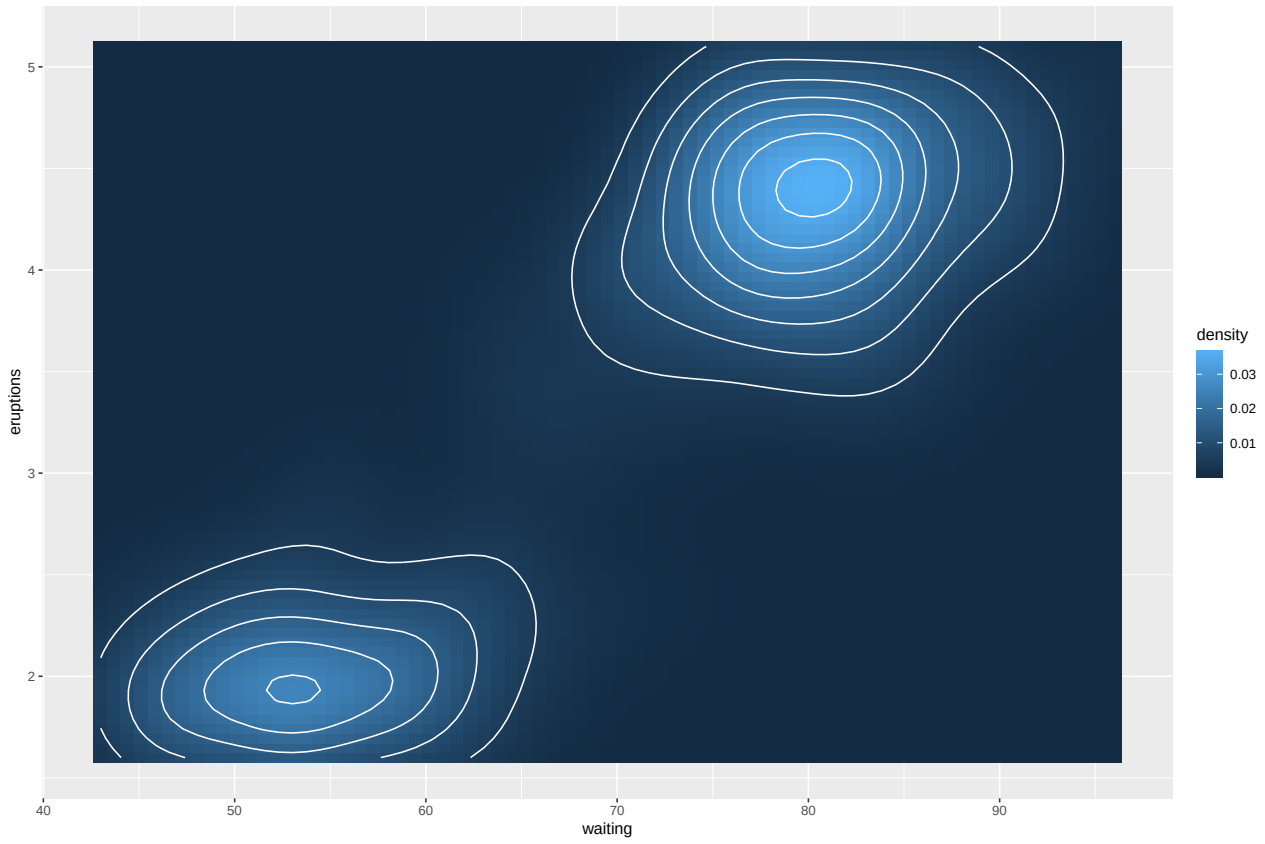
```
p1 <- p + geom_contour()
p1
```




```
p2 <- p + geom_contour_filled()
p2
```




```
p3 <- p + geom_raster(aes(fill=density)) +
  geom_contour(color="white")
p3
```


eruptions
5
4
3
2
40
50
60
70
80
90
waiting
density
0.03
0.02
0.01