GGMAPs

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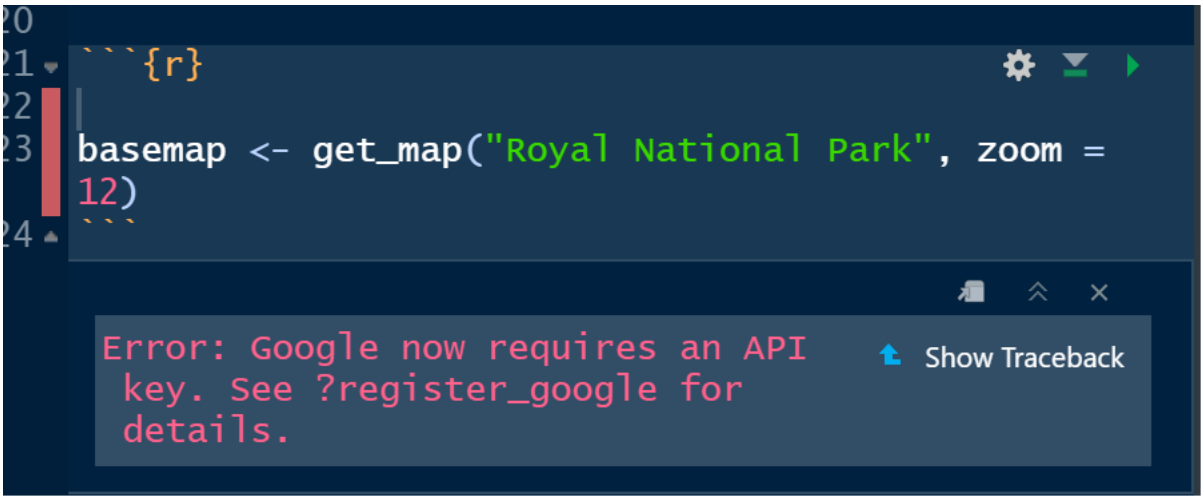
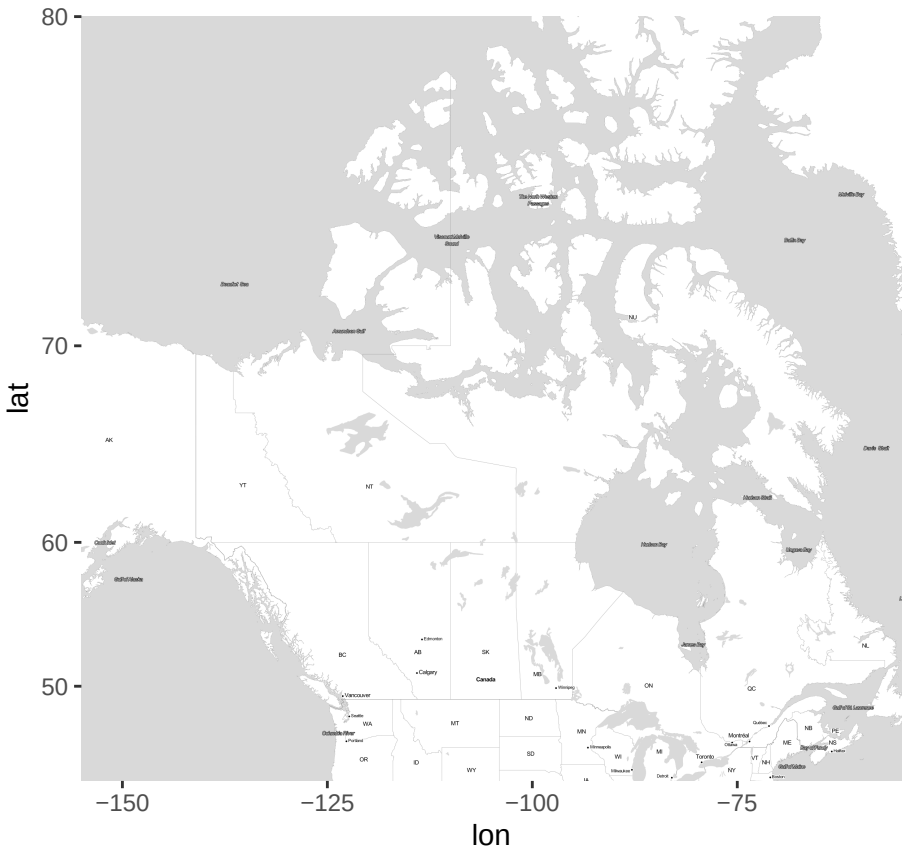
```
library(tidyverse)
#install.packages("ggmap")
library(ggmap)
```



https://community.rstudio.com/t/how-i-can-get-google-map-api-key-giving-error-of-api-key/43273/2

```
library(ggmap)
can <- c(left = -155, bottom = 42, right = -55, top = 80)
get_stamenmap(can, zoom = 5, maptype = "toner-lite") %>% ggmap()
```




```
# crop to the area desired (outside can)
# (can use maps.google.com, right-click, drop lat/lon markers at corners)
```

```
attr_can <- attr(can, "bb")    # save attributes from original
can[can == "#000000"] <- "#C0C0C0"

# correct class, attributes
class(can) <- c("ggmap", "raster")
attr(can, "bb") <- attr_can
ggmap(can)
```

Lets now make a map using ggplot2

```
library(ggplot2)
library(gridExtra)
```

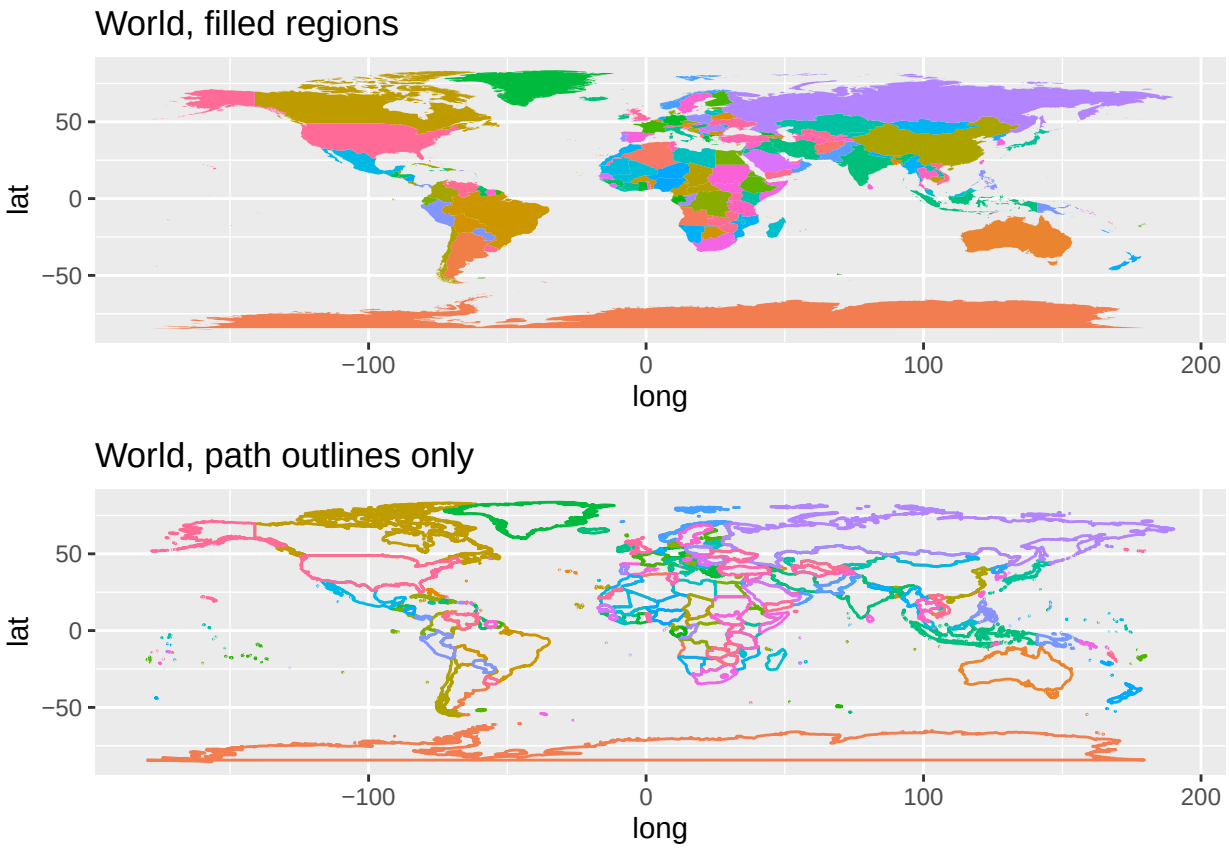
```
##
## Attaching package: 'gridExtra'
```

```
## The following object is masked from 'package:dplyr':
##
##     combine
```

```
map.world <- map_data(map = "world")
str(map.world)
```

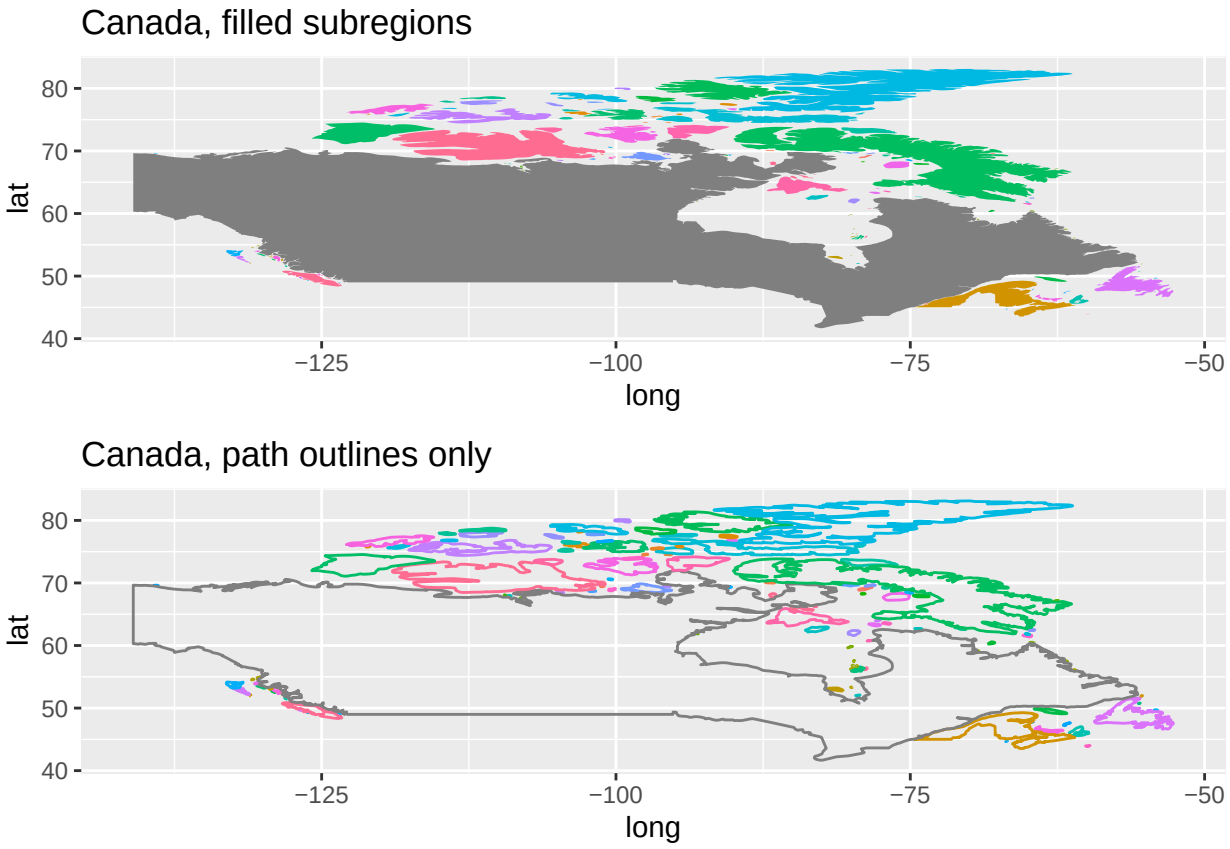
```
## 'data.frame':    99338 obs. of  6 variables:
##  $ long     : num  -69.9 -69.9 -69.9 -70 -70.1 ...
##  $ lat      : num  12.5 12.4 12.4 12.5 12.5 ...
##  $ group    : num  1 1 1 1 1 1 1 1 1 1 ...
##  $ order    : int  1 2 3 4 5 6 7 8 9 10 ...
##  $ region   : chr  "Aruba" "Aruba" "Aruba" "Aruba" ...
##  $ subregion: chr  NA NA NA NA ...
```

```
p3 <- ggplot(map.world, aes(x = long, y = lat, group = group, fill = region))
p3 <- p3 + geom_polygon() # fill areas
p3 <- p3 + theme(legend.position="none") # remove legend with fill colours
p3 <- p3 + labs(title = "World, filled regions")
#print(p3)
p4 <- ggplot(map.world, aes(x = long, y = lat, group = group, colour = region))
p4 <- p4 + geom_path() # country outline, instead
p4 <- p4 + theme(legend.position="none") # remove legend with fill colours
p4 <- p4 + labs(title = "World, path outlines only")
#print(p4)
library(gridExtra)
grid.arrange(grobs=list(p3, p4), ncol=1, main="ggmap examples")
```

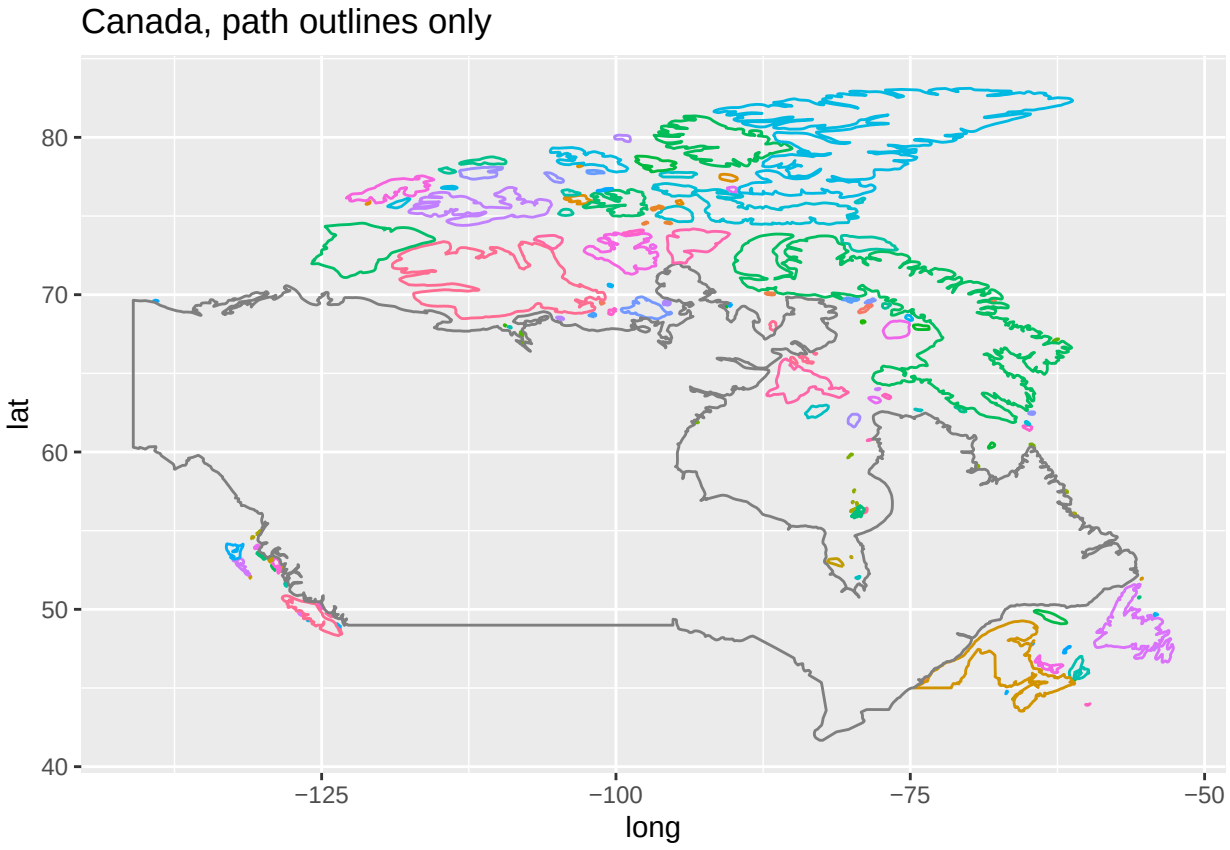


Now let's see what happens if we use ggmap to create a map of Canada.

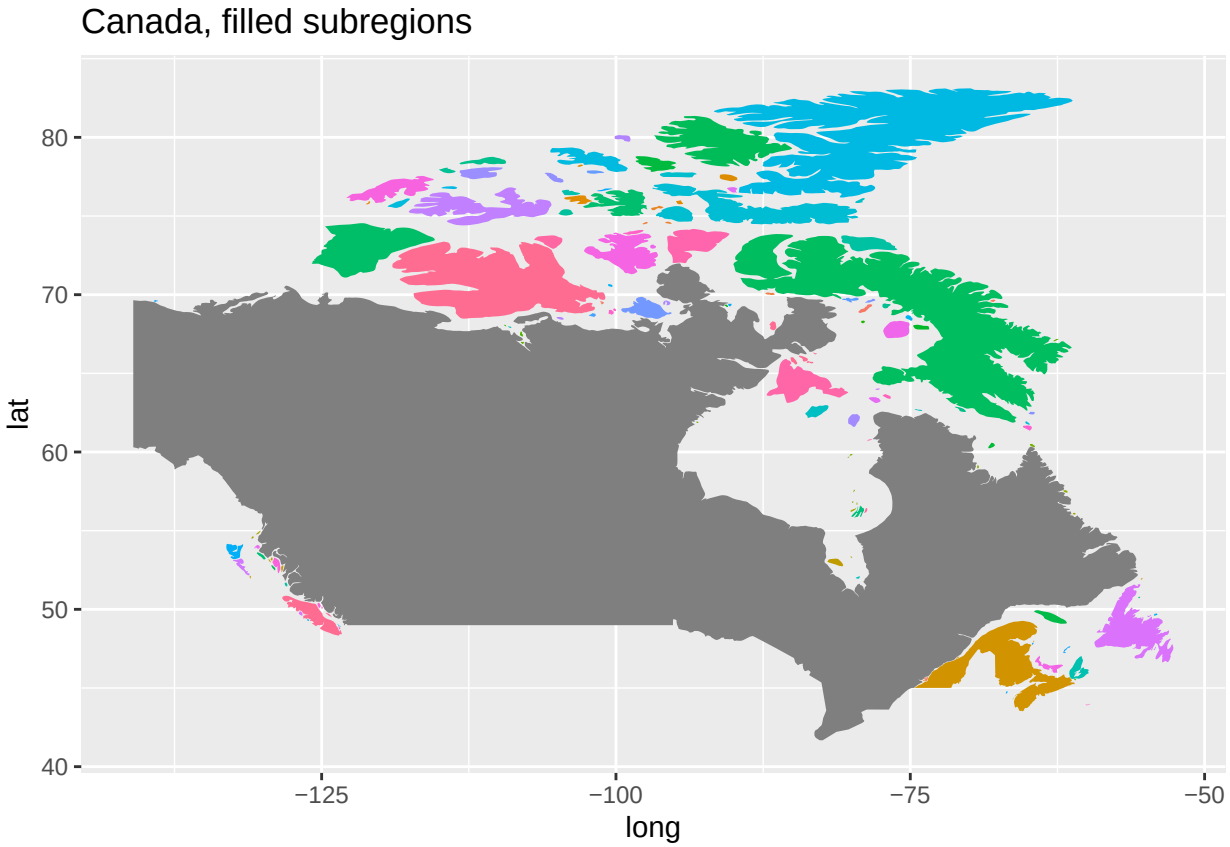
```
canada<-map.world %>% filter(region=="Canada")

p1<- ggplot(canada, aes(x = long, y = lat, group = group, fill = subregion))
p1 <- p1 + geom_polygon() # fill areas
p1 <- p1 + theme(legend.position="none") # remove legend with fill colours
p1 <- p1 + labs(title = "Canada, filled subregions")

p2 <- ggplot(canada, aes(x = long, y = lat, group = group, colour = subregion))
p2 <- p2 + geom_path() # country outline, instead
p2 <- p2 + theme(legend.position="none") # remove legend with fill colours
p2 <- p2 + labs(title = "Canada, path outlines only")

library(gridExtra)
grid.arrange(grobs=list(p1, p2), ncol=1, main="ggmap examples")
```




```
#examine just the paths
p2
```




```
#now examine the regions filled
p1
```



For more information:

https://cran.r-project.org/web/packages/ggmap/readme/README.html