

GGMAPs

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```
library(tidyverse)

## -- Attaching packages ----- tidyverse 1.3.0 --

## v ggplot2 3.3.5      v purrr  0.3.4
## v tibble  3.1.0      v dplyr  1.0.4
## v tidyr   1.1.2      v stringr 1.4.0
## v readr   1.4.0      v forcats 0.5.1

## Warning: package 'ggplot2' was built under R version 4.0.5

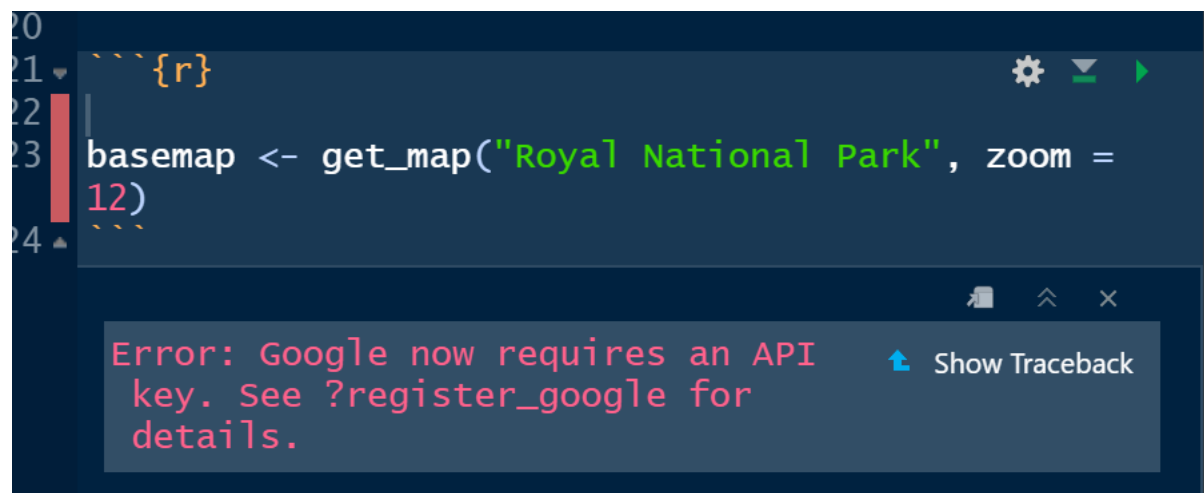
## -- Conflicts ----- tidyverse_conflicts() --
## x dplyr::filter() masks stats::filter()
## x dplyr::lag()    masks stats::lag()

install.packages("ggmap")
library(ggmap)

## Warning: package 'ggmap' was built under R version 4.0.5

## Google's Terms of Service: https://cloud.google.com/maps-platform/terms/.

## Please cite ggmap if you use it! See citation("ggmap") for details.
```



<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()
```

```
## 90 tiles needed, this may take a while (try a smaller zoom).
```

```
## Source : http://tile.stamen.com/toner-lite/5/2/3.png
```

```
## Source : http://tile.stamen.com/toner-lite/5/3/3.png
```

```
## Source : http://tile.stamen.com/toner-lite/5/4/3.png
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## Source : http://tile.stamen.com/toner-lite/5/5/3.png
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## Source : http://tile.stamen.com/toner-lite/5/6/3.png
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## Source : http://tile.stamen.com/toner-lite/5/7/3.png
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## Source : http://tile.stamen.com/toner-lite/5/9/3.png
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## Source : http://tile.stamen.com/toner-lite/5/10/3.png
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## Source : http://tile.stamen.com/toner-lite/5/11/3.png
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## Source : http://tile.stamen.com/toner-lite/5/8/4.png
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## Source : http://tile.stamen.com/toner-lite/5/10/4.png
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## Source : http://tile.stamen.com/toner-lite/5/11/4.png
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## Source : http://tile.stamen.com/toner-lite/5/2/5.png
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Source : <http://tile.stamen.com/toner-lite/5/6/11.png>

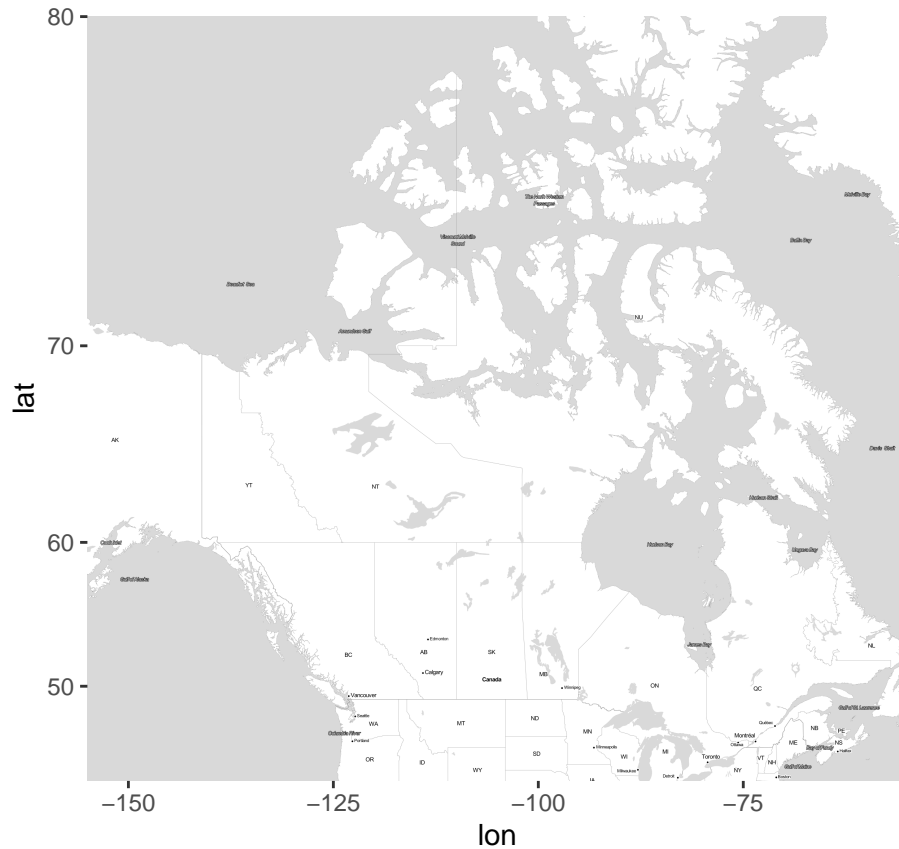
Source : <http://tile.stamen.com/toner-lite/5/7/11.png>

Source : <http://tile.stamen.com/toner-lite/5/8/11.png>

Source : <http://tile.stamen.com/toner-lite/5/9/11.png>

Source : <http://tile.stamen.com/toner-lite/5/10/11.png>

Source : <http://tile.stamen.com/toner-lite/5/11/11.png>



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

```
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)
```

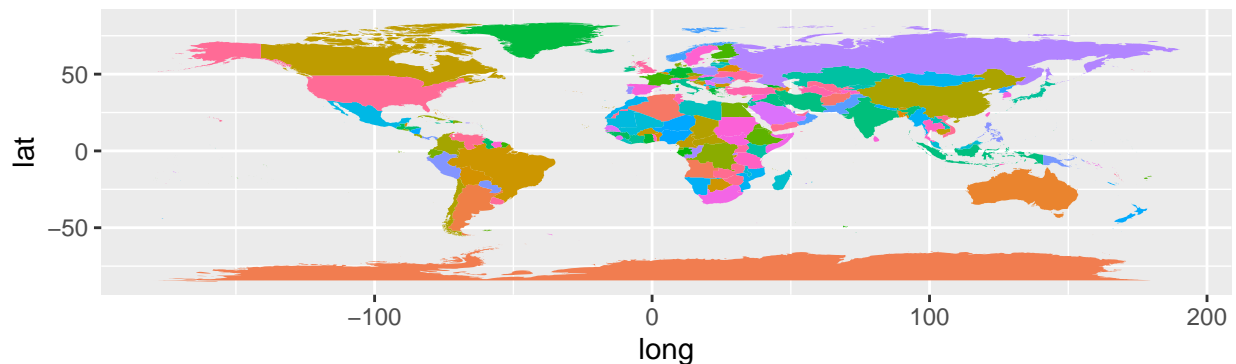
```
## 'data.frame':   99338 obs. of  6 variables:
## $ long      : num  -69.9 -69.9 -69.9 -70 -70.1 ...
## $ lat       : num   12.5 12.4 12.4 12.5 12.5 ...
## $ group     : num    1 1 1 1 1 1 1 1 1 1 ...
## $ order     : int    1 2 3 4 5 6 7 8 9 10 ...
## $ region    : chr   "Aruba" "Aruba" "Aruba"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

```

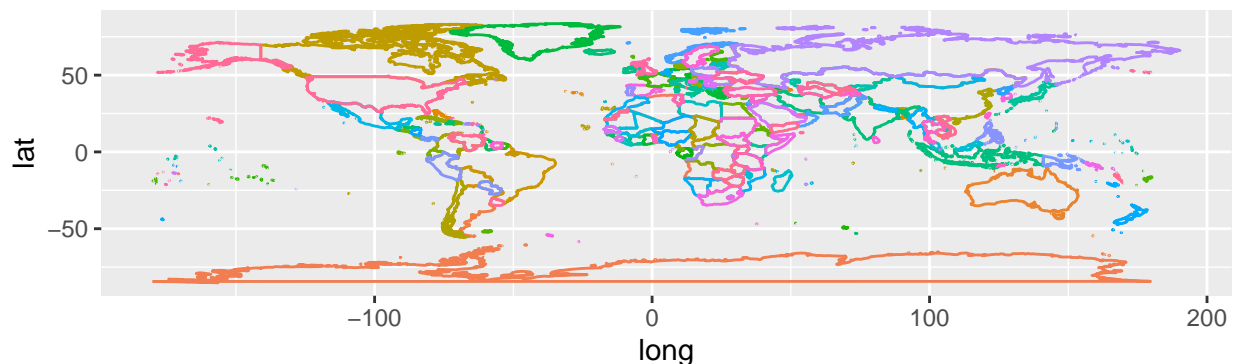
p3 <- ggplot(map.world, aes(x = long, y = lat, group = group, fill = region))
p3 <- p3 + geom_polygon() # fill areas
p3 <- p3 + theme(legend.position="none") # remove legend with fill colours
p3 <- p3 + labs(title = "World, filled regions")
#print(p3)
p4 <- ggplot(map.world, aes(x = long, y = lat, group = 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")

```

World, filled regions



World, path outlines only



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

```

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

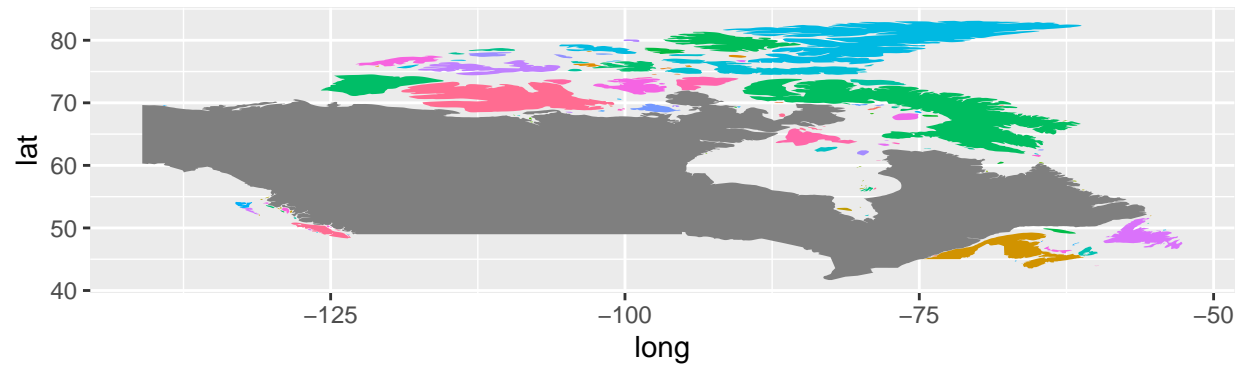
p1<- ggplot(canada, aes(x = long, y = lat, group = group, fill = subregion))
p1 <- p1 + geom_polygon() # fill areas
p1 <- p1 + theme(legend.position="none") # remove legend with fill colours
p1 <- p1 + labs(title = "Canada, filled subregions")

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")

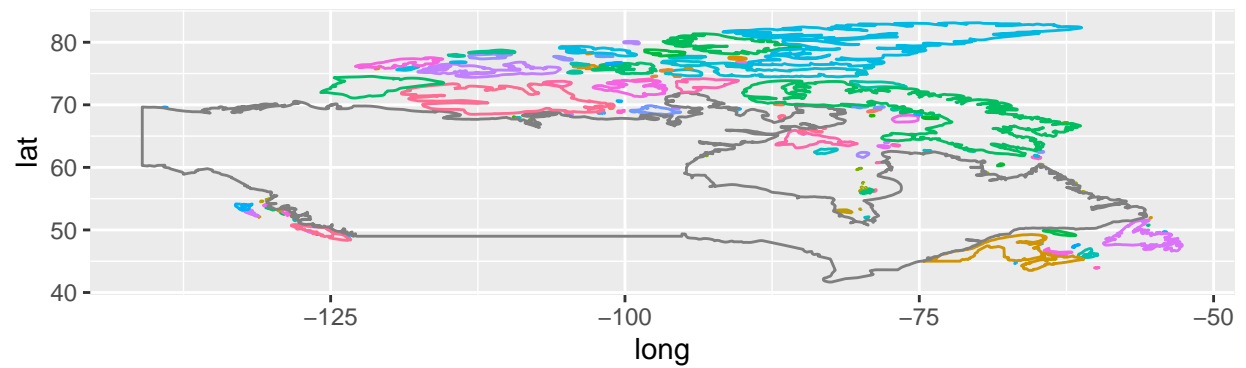
```

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

Canada, filled subregions

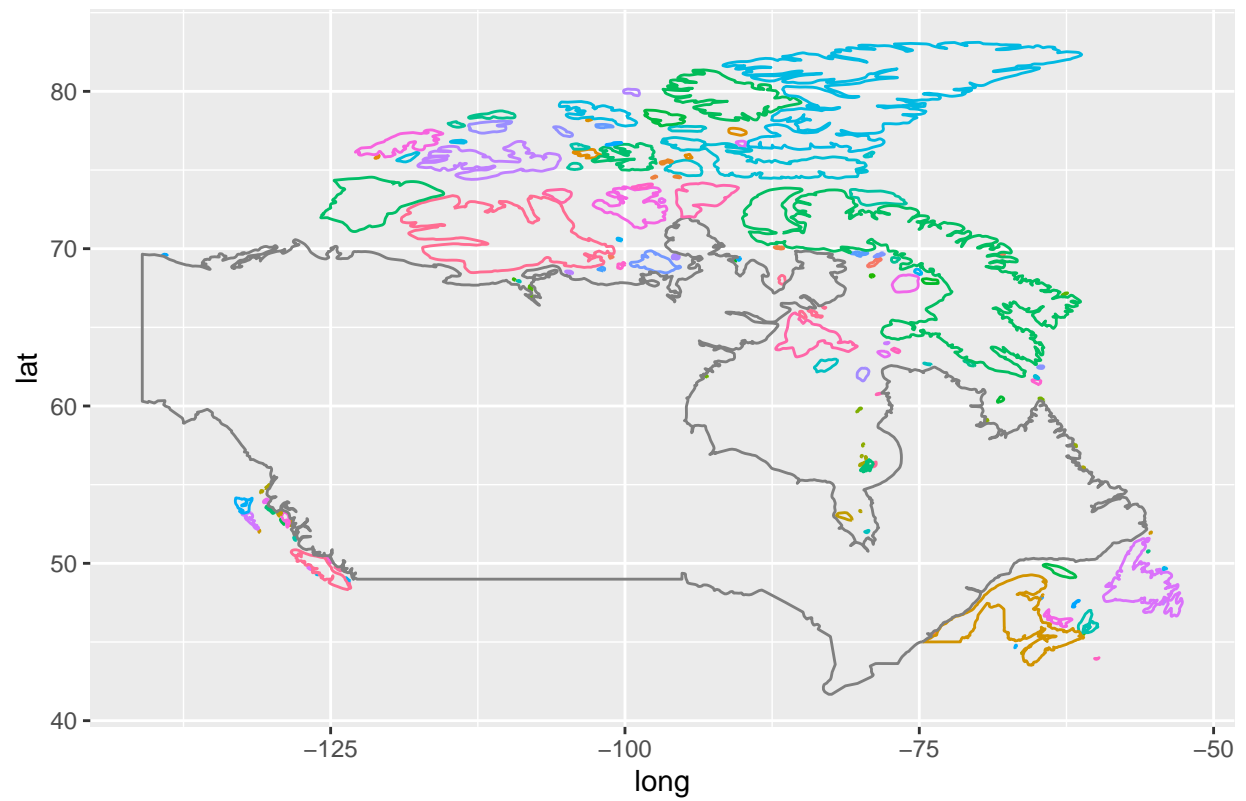


Canada, path outlines only



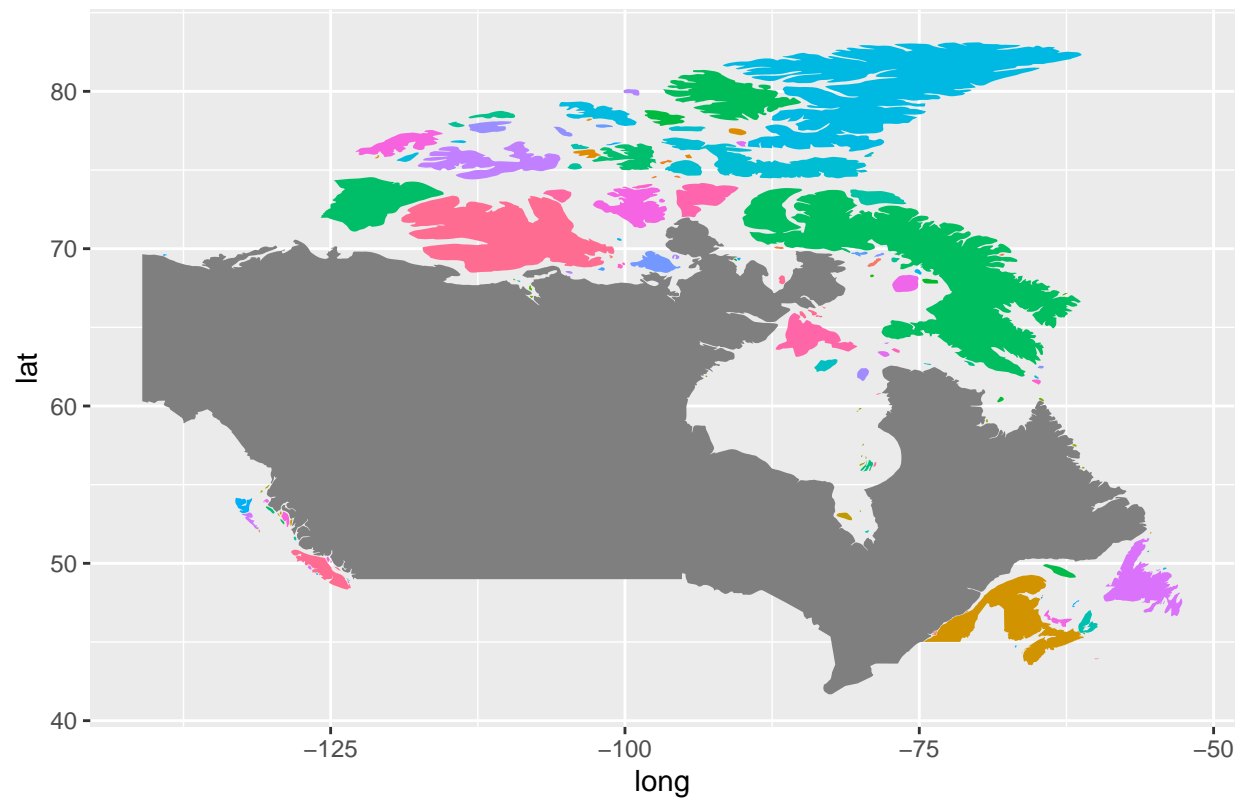
```
#examine just the paths
p2
```


Canada, path outlines only



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

Canada, filled subregions



For more information:

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