

Course 8

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Mon Nov 09 12:42:50 2015

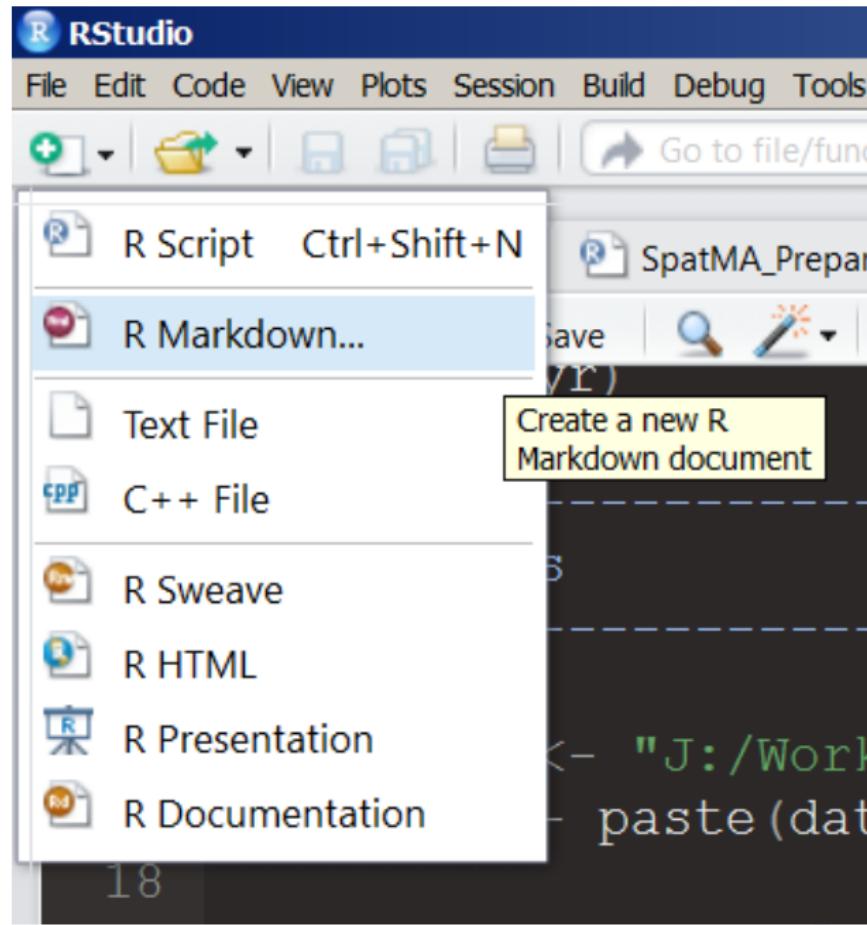
Organisation

- ▶ Send me your presentation until Tuesday November 17, 2015
- ▶ If you have interactive graphs please be shure to have them also in an offline version
- ▶ If you use data please provide the source (OpenStreetMap, Google, Eurostat etc.)
- ▶ Please give some background information about the data source
- ▶ If you use R to produce maps, please send me your code
(Example: myCode.R)

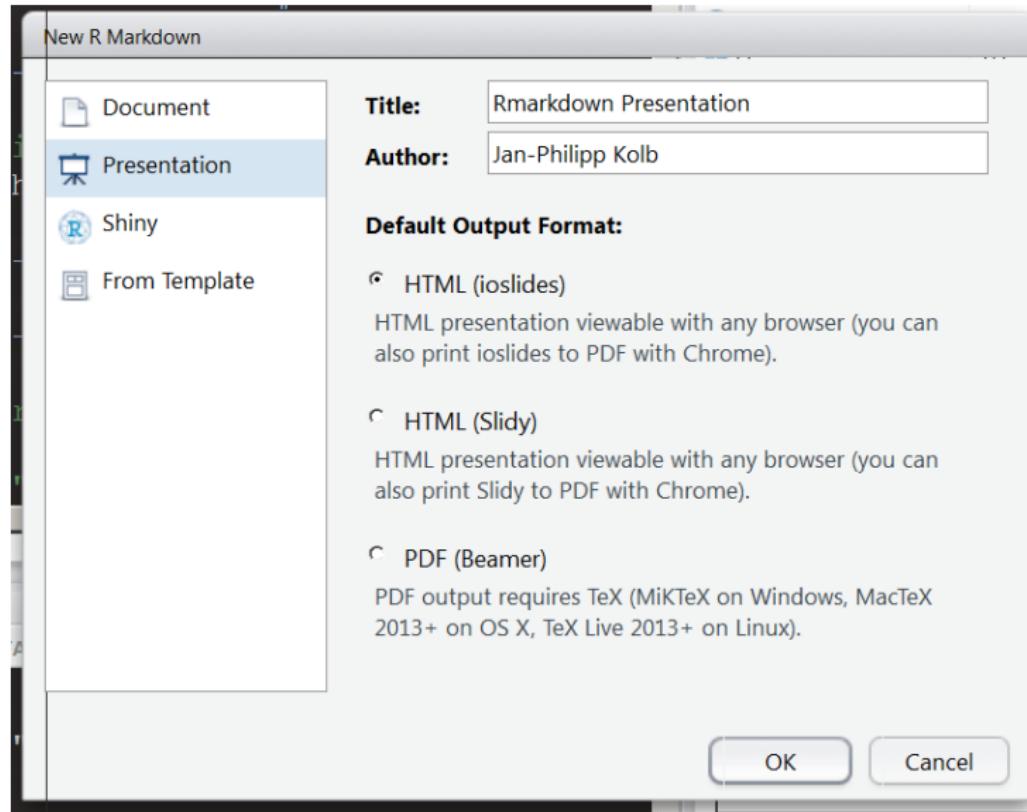
Presentation techniques

- ▶ You can use LaTeX Beamer/Powerpoint/Rstudio or whatever you want
- ▶ If you use Powerpoint please produce also a pdf version
- ▶ You can also use Rstudio to produce presentations (makes sense for interactive maps)

Presentations with Rstudio I



Presentations with Rstudio II



Presentations with Rstudio III

The screenshot shows the RStudio IDE interface. The title bar says "RStudio". The menu bar includes File, Edit, Code, View, Plots, Session, Build, Debug, Tools, and Help. The toolbar has icons for file operations like Open, Save, Print, and Go to file/function. Below the toolbar, three tabs are visible: "ethr.Rmd", "SpatMA_PrepCourse.R", and "CampSiteInteractive.R". The main area is a code editor displaying R Markdown code:

```
1 ---  
2 title: "Rmarkdown Pre  
3 author: "Jan-Philipp Kolb"  
4 date: "11. November 2015"  
5 output: ioslides_presentation  
6 ---  
7  
8 ## R Markdown  
9
```

A tooltip is displayed over the "Knit HTML" button, which reads: "Knit the current document (Ctrl+Shift +K)". The bottom right corner of the screen shows standard presentation navigation icons.

Questions

- ▶ How to get popups in interactive plots?
- ▶ How to plot two maps side by side?
- ▶ How to save plots?

Example on Campsites

- ▶ Data downloaded from:

<http://www.openstreetmap.de/>

- ▶ With usage of:

http://wiki.openstreetmap.org/wiki/Overpass_API

```
url <- "https://raw.githubusercontent.com/Japhilko/  
GeoData/master/2015/data/CampSites_Germany.csv"  
CampSites <- read.csv(url)
```

Overview of Campsite data

```
kable(CampSites[1:8,1:4])
```

X	name	tourism	website
1	Campingplatz Winkelbachtal	camp_site	http://www.g
2	Radler-Zeltplatz	camp_site	NA
3	Campingplatz des Naturfreundehauses	camp_site	NA
4	Campingplatz Am Aichstruter Stausee	camp_site	NA
5	NA	camp_site	NA
6	Kandern	camp_site	NA
7	Campingplatz Baiersbronn-Obertal	camp_site	NA
8	Campingplatz SchwabenmÃ¼hle	camp_site	NA

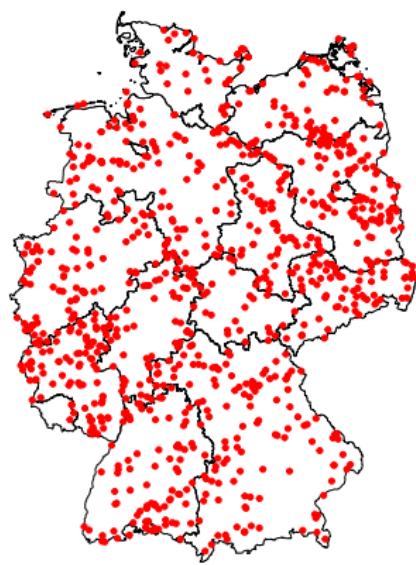
Get a map for Germany

```
library(raster)
DEU1 <- getData('GADM', country='DEU', level=1)
plot(DEU1)
```



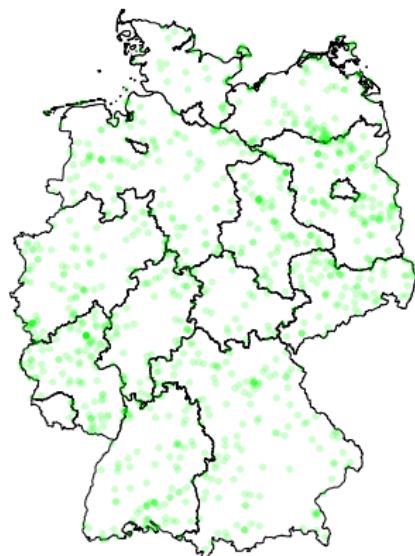
Add Campsites

```
plot(DEU1)
points(y=CampSites$lat, x=CampSites$lon, col="red", pch=20)
```



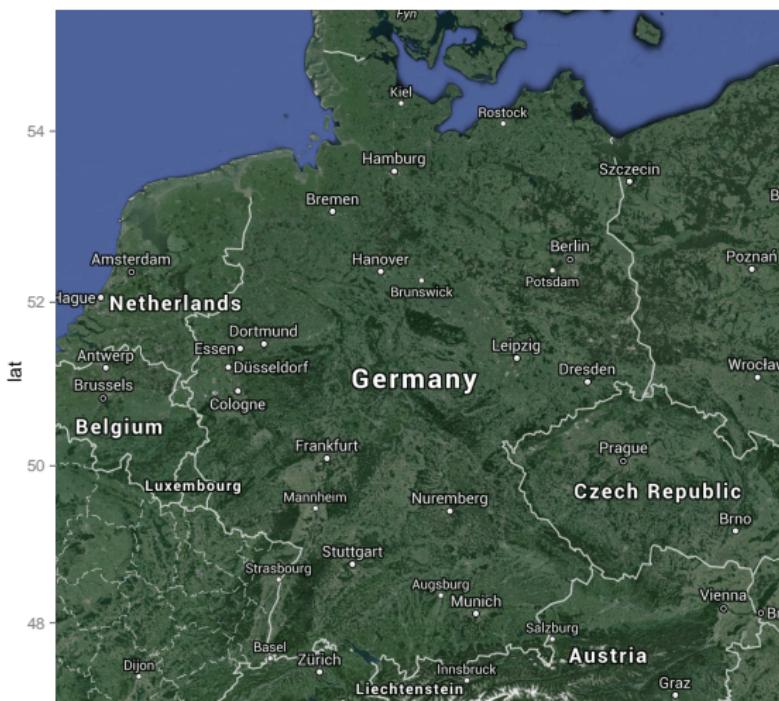
Change the alpha level

```
plot(DEU1)
points(y=CampSites$lat, x=CampSites$lon, col=rgb(0,1,0,.2),
       pch=20)
```



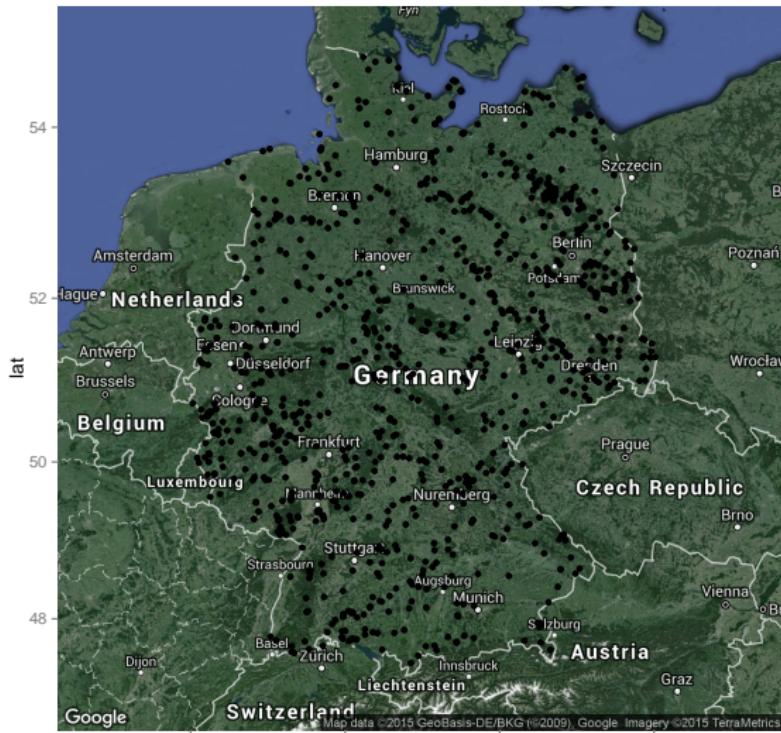
Get a google map for Germany

```
library(ggmap)  
DE_Map <- qmap("Germany", zoom=6, maptype="hybrid")  
DE_Map
```



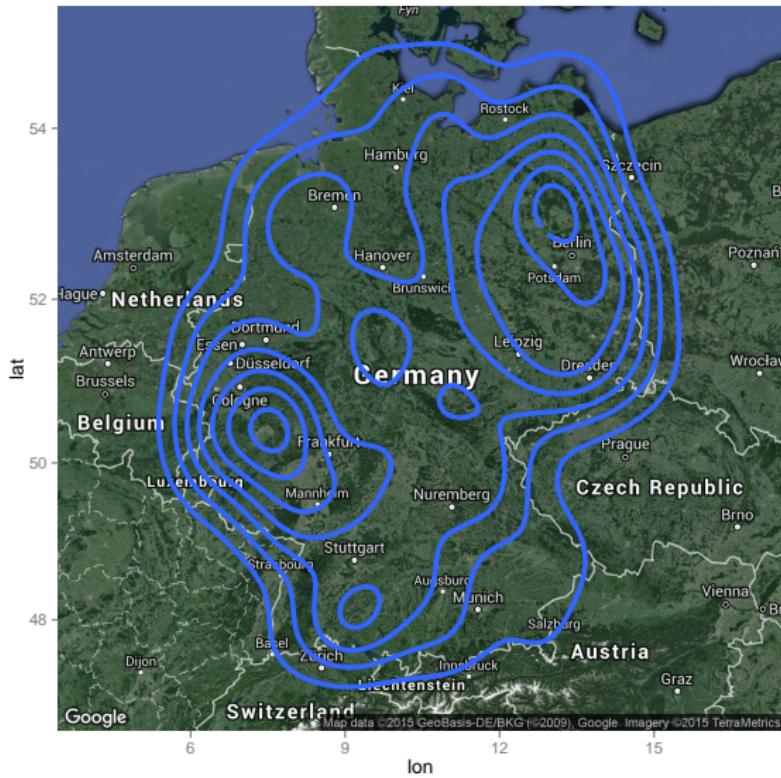
Plot points on google map

```
DE_Map + geom_point(aes(x = lon, y = lat),  
                     data = CampSites)
```



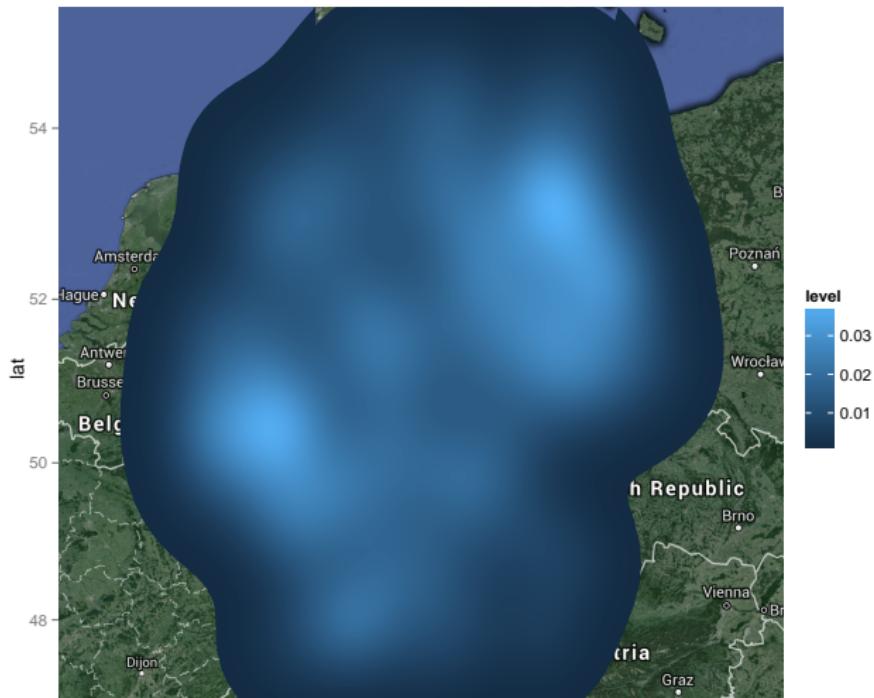
Density plot

```
DE_Map + geom_density2d(data = CampSites,
```



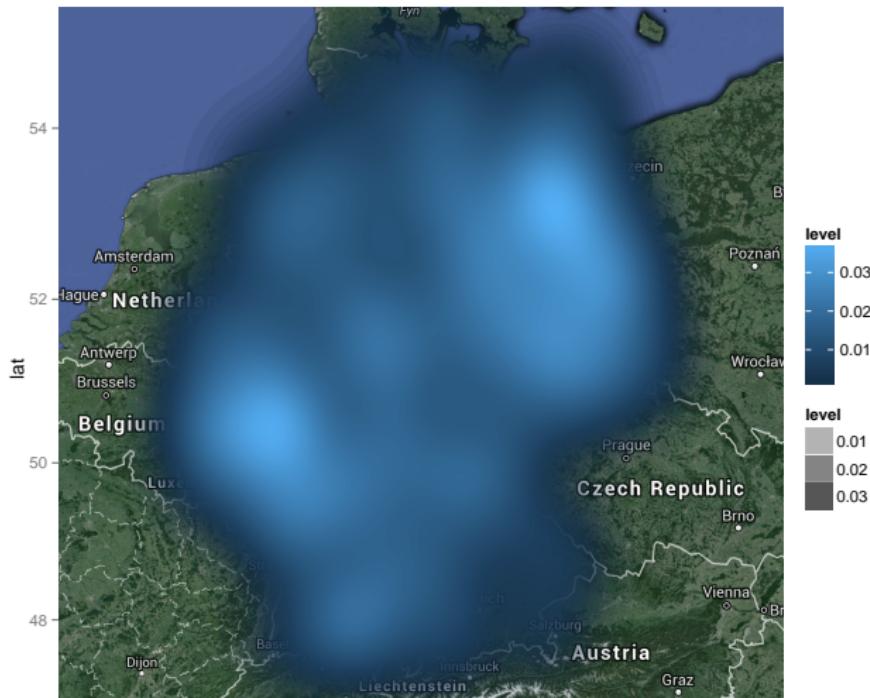
Another density plot

```
DE_Map + stat_density2d(data = CampSites,  
aes(x = lon, y = lat, fill = ..level..), bins = 100,  
geom = 'polygon')
```



Another density plot

```
DE_Map + stat_density2d(data=CampSites,  
                         aes(x=lon,y=lat,fill=..level..,  
                             alpha = ..level..),bins=80,geom='polygon')
```



Make the interactive map

Prepare an interactive map

```
library(magrittr)
library(leaflet)
```

```
m <- leaflet() %>%
  addTiles() %>%
  addMarkers(lng=CampSites$lon,
             lat=CampSites$lat,
             popup=CampSites$name)
```

```
m
```

Push more information

```
popupInfo <- paste(CampSites$name, "\n", CampSites$website)

m <- leaflet() %>%
  addTiles() %>% # Add default OpenStreetMap map tiles
  addMarkers(lng=CampSites$lon,
             lat=CampSites$lat,
             popup=popupInfo)

m
```

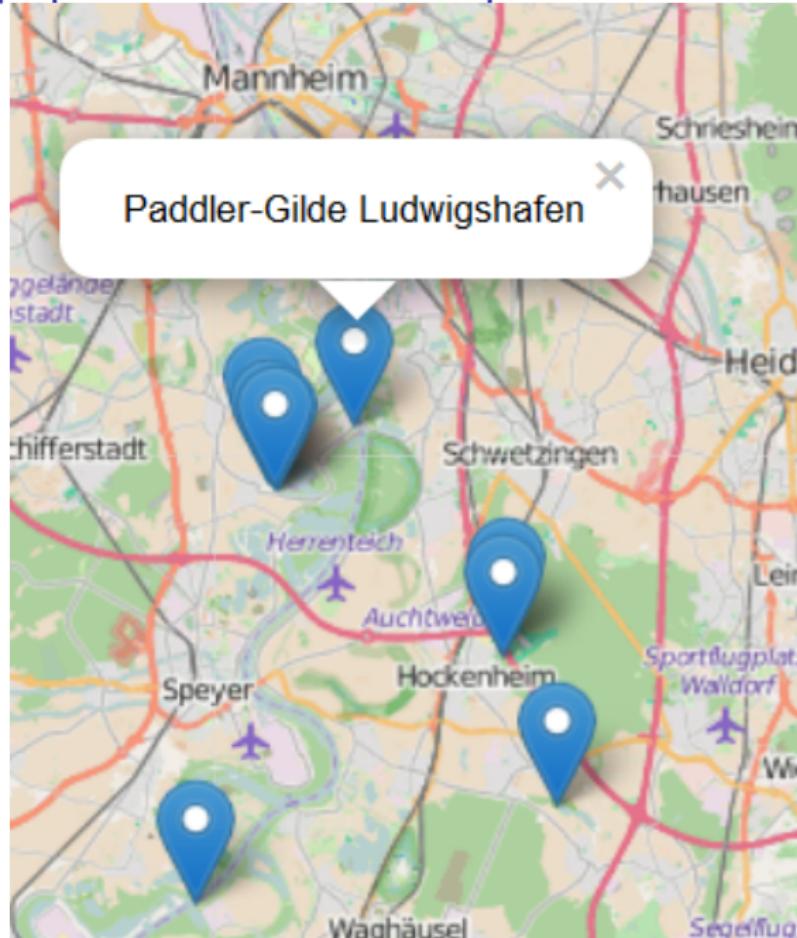
Result is here:

<http://rpubs.com/Japhilko82/CampSitesHL>

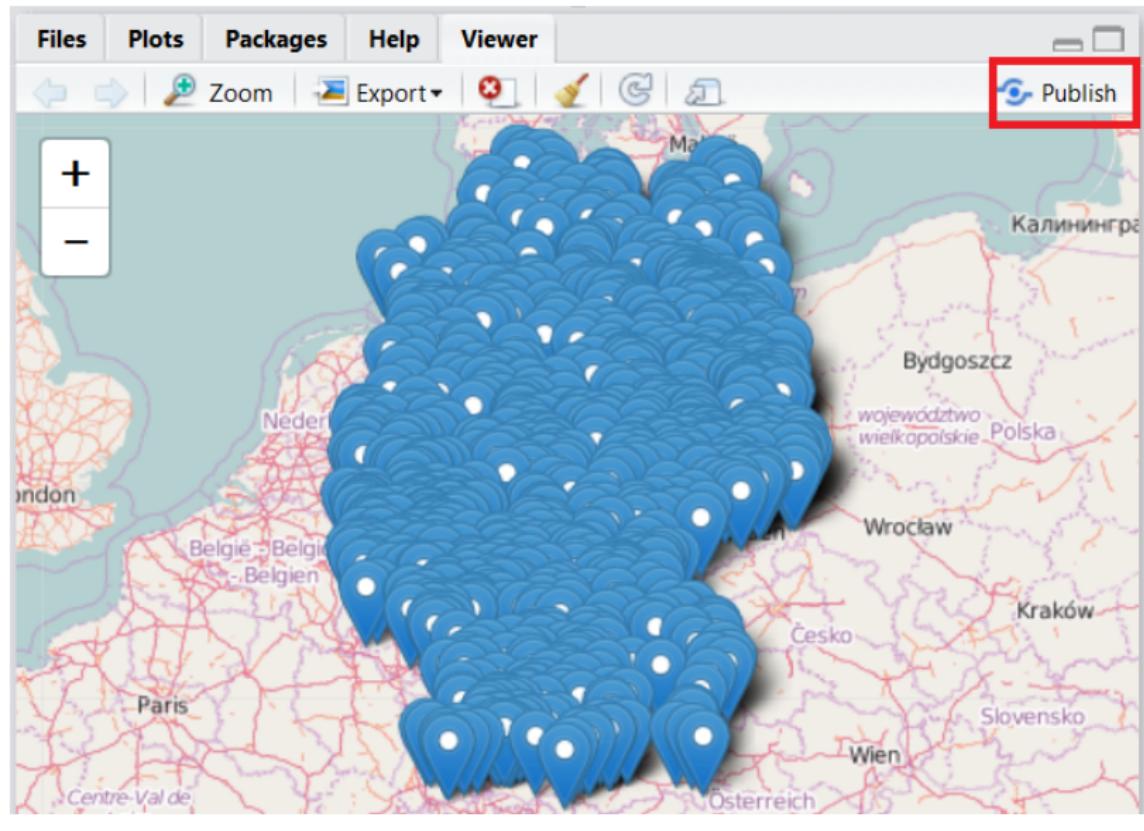
The resulting map



Popups in interactive map



How to publish on Rpubs



ggmap: two plots side by side

```
url <- "https://raw.githubusercontent.com/Japhilko/  
GeoData/master/2015/data/whcSites.csv"  
UNESCO <- read.csv(url)
```

name_en

Cultural Landscape and Archaeological Remains of the Bamiyan Valley
Minaret and Archaeological Remains of Jam
Historic Centres of Berat and Gjirokastra
Butrint

Get sites for Germany

```
library(ggmap)
ind <- UNESCO$states_name_en=="Germany"
UNESCO_DE <- UNESCO[ind,]
```

Plot first map

```
library(ggplot2)  
DE_Map + geom_point(aes(x = longitude, y = latitude),  
                     data = UNESCO_DE)
```



Produce two maps

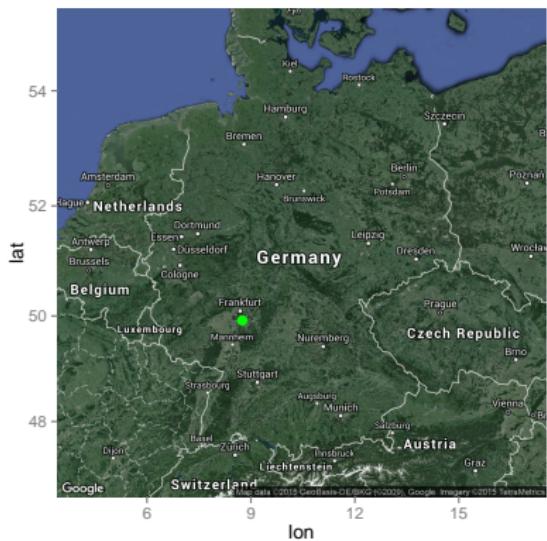
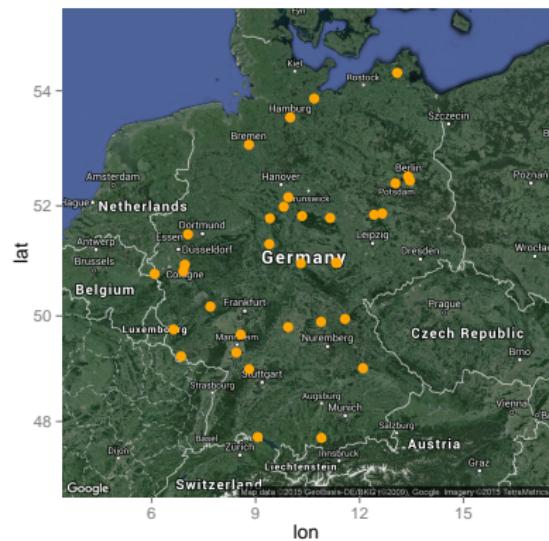
```
library(ggplot2)
DNunesco <- UNESCO_DE[UNESCO_DE$category=="Natural",]
DCunesco <- UNESCO_DE[UNESCO_DE$category=="Cultural",]

Csites <- DE_Map + geom_point(aes(x = longitude,
                                    y = latitude),
                               data = DCunesco,
                               col="orange", size= 3)

Nsites <- DE_Map + geom_point(aes(x = longitude,
                                    y = latitude),
                               data = DNunesco,
                               col="green", size= 3)
```

Two plots side by side

```
library(gridExtra)  
grid.arrange(Csites, Nsites, ncol=2)
```



Load the data

```
url <- "https://raw.githubusercontent.com/Japhilko/  
GeoData/master/2015/data/Unemployment07a13.csv"  
  
Unemp <- read.csv(url)
```

Overview data

GEO	Val2007M12	Val2013M01
EU28	6.9	10.9
EU27	6.9	10.9
EU25	6.9	11.0
EU15	6.9	11.1
EA	7.3	12.0
EA19	7.3	12.0
EA18	7.4	12.0
EA17	7.4	12.0

Usage of package tmap

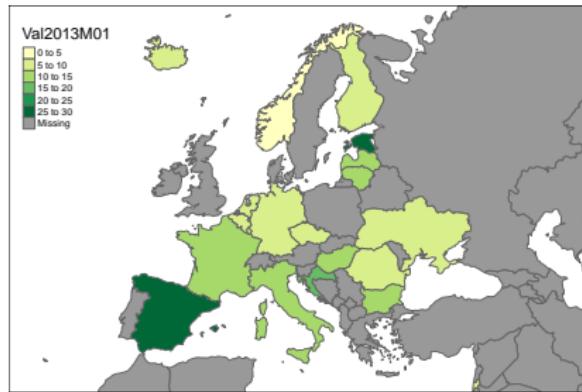
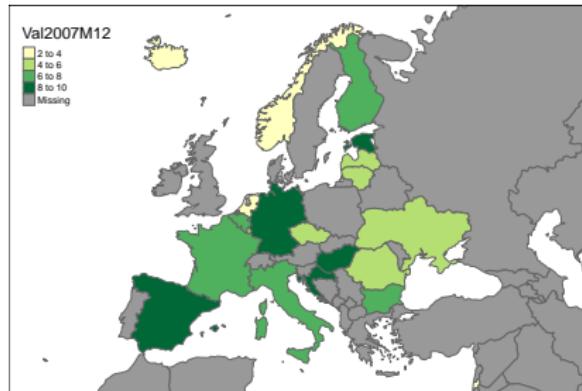
```
library(tmap)
data(Europe)
```

Match the data

```
iso_a2<- substr(Europe@data$iso_a3,1,2)
ind <- match(iso_a2,Unemp$GEO)
Europe@data$Val2007M12 <- Unemp$Val2007M12[ind]
Europe@data$Val2013M01 <- Unemp$Val2013M01[ind]
```

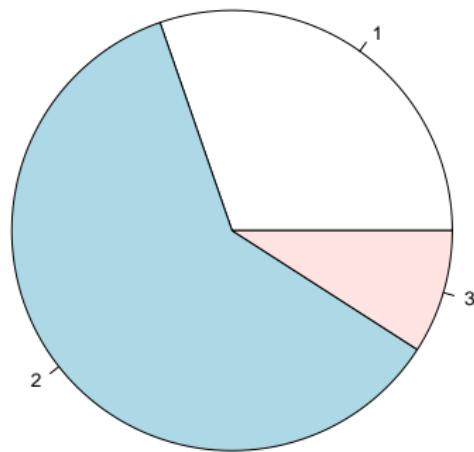
Make the map

```
qtm(Europe, c("Val2007M12", "Val2013M01"))
```



A pie chart

```
Students <- c(100, 200,30)  
pie(Students)
```



Save graphics

```
pdf("pie_Students.pdf")
pie(Students)
dev.off()
```

```
## pdf
## 2
```