

Library maptools

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The library maptools

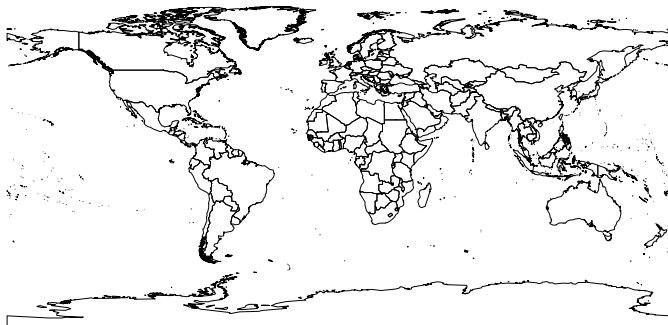
- ▶ The data set `wrld_simpl` from package `maptools` has polygons for the most countries in the world

```
library(maptools)
data(wrld_simpl)
```

	FIPS	ISO2	ISO3	UN	NAME
ATG	AC	AG	ATG	28	Antigua and Barbuda
DZA	AG	DZ	DZA	12	Algeria
AZE	AJ	AZ	AZE	31	Azerbaijan
ALB	AL	AL	ALB	8	Albania

Hello world

```
data(wrld_simpl)  
plot(wrld_simpl)
```



The data set behind

- ▶ Information is saved in a data.frame
- ▶ With head you get only the first entries

```
head(wrld_simpl@data)
```

	FIPS	ISO2	ISO3	UN	NAME
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The structure of the data set

```
head(wrld_simpl@data$NAME)
```

```
## [1] Antigua and Barbuda Algeria Azerbaijan  
## [4] Albania Armenia Angola  
## 246 Levels: Aaland Islands Afghanistan Albania Algeria
```

A logical request

```
ind_SA <- wrld_simpl@data$NAME == "South Africa"  
head(ind_SA)
```

```
## [1] FALSE FALSE FALSE FALSE FALSE FALSE
```

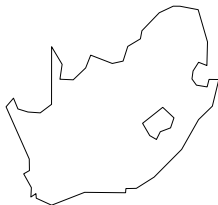
```
table(ind_SA)
```

```
## ind_SA  
## FALSE  TRUE  
##    245    1
```

A map for South Africa

- ▶ plot only one country

```
SouthAfrica <- wrld_simpl[ind_SA,]  
plot(SouthAfrica)
```



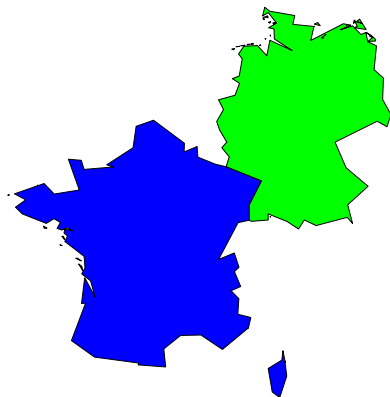
Select more than one country

```
EuropeList <- c('Germany', 'France')  
my_map <- wrld_simpl[wrld_simpl$NAME %in% EuropeList, ]  
par(mai=c(0,0,0,0))  
plot(my_map)
```



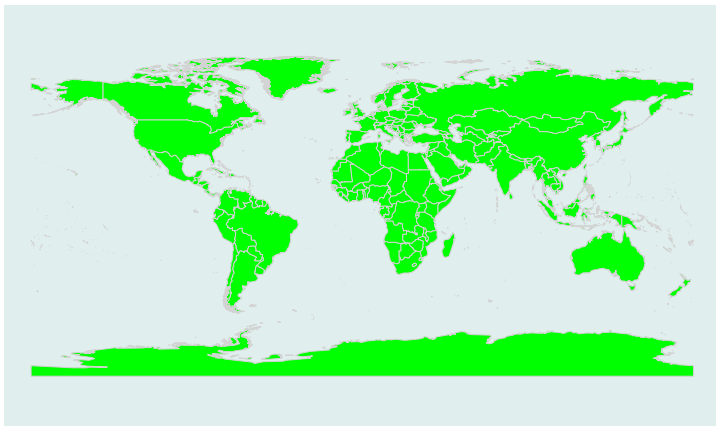
More color

```
my_map@data$color <- c("blue","green")  
plot(my_map,col=my_map@data$color)
```



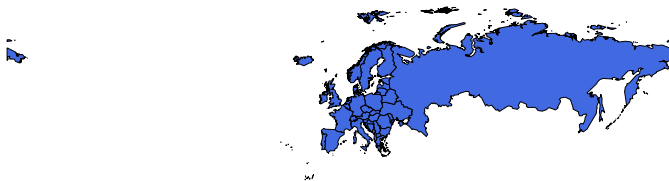
More color for the world

```
plot(wrld_simpl, bg='azure2', col='green', border='lightgray')
```



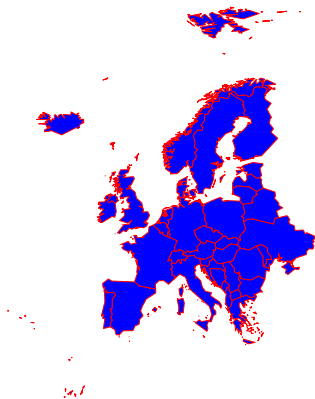
A map for Europe

```
Europe <- wrld_simpl[wrld_simpl$REGION=="150",]  
plot(Europe,col="royalblue")
```



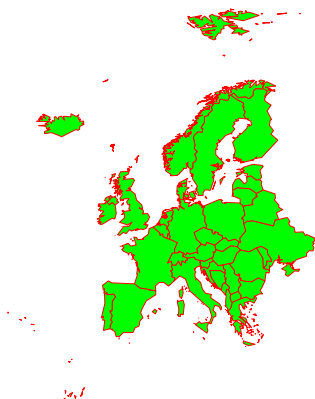
Europe without Russia

```
ind <- which(Europe@data$NAME=="Russia")  
EU <- Europe[-ind,]  
plot(EU,col="blue",border="red")
```



Play with colors

```
EU$colors <- "green"  
plot(EU,col=EU$colors,border="red")
```



Play with colors

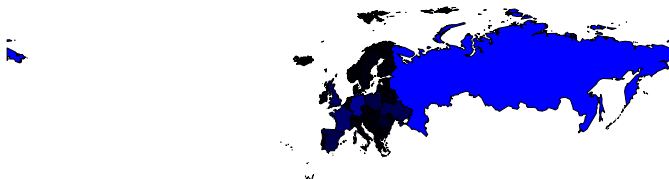
Colors in R

```
Europe$colors[pop05>median(pop05)] <- "chocolate4"  
plot(Europe,col=Europe$colors)
```



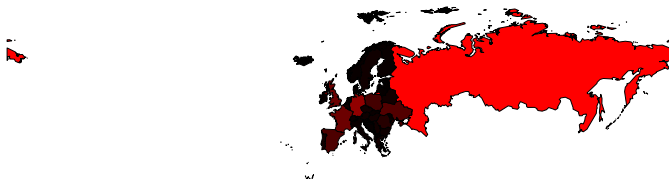
Plotting Europe - shading blue

```
val <- Europe$POP2005/max(Europe$POP2005)  
plot(Europe,col=rgb(0,0,val))
```



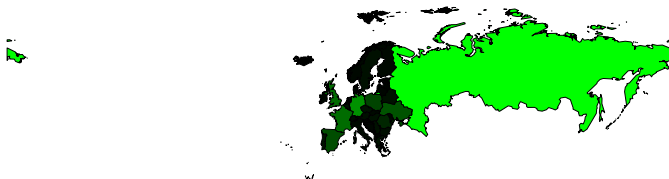
Plotting Europe - shading red

```
val <- Europe$POP2005/max(Europe$POP2005)  
plot(Europe,col=rgb(val,0,0))
```



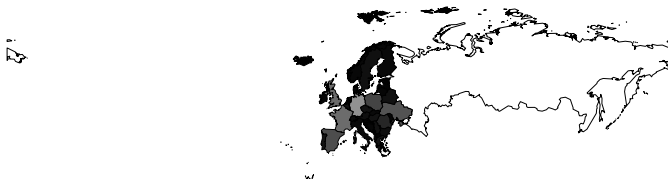
Plotting Europe - shading green

```
val <- Europe$POP2005/max(Europe$POP2005)  
plot(Europe,col=rgb(0,val,0))
```



Plotting Europe - shading gray

```
val <- Europe$POP2005/max(Europe$POP2005)  
plot(Europe,col=rgb(val,val,val))
```



Plotting Europe - two plots beside

```
par(mfrow=c(1,2))  
plot(Europe,col=rgb(val,0,val))  
plot(Europe,col=rgb(val,val,0))
```



Plotting Europe - add points

```
which(Europe$ISO2=="FR") # 14
```

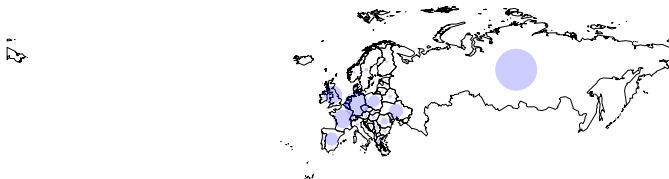
```
## [1] 10
```

```
plot(Europe)  
points(Europe$LON[14],Europe$LAT[14],col="red",pch=20)
```



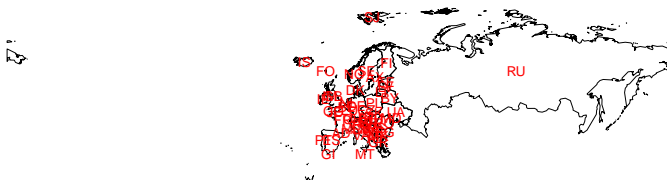
Plotting Europe - add bubbles

```
pop <- Europe$POP2005  
pop <- pop/max(pop)*10  
plot(Europe)  
points(Europe$LON,Europe$LAT,cex=pop,col=rgb(0,0,1,.2),  
pch=20)
```



Plotting Europe - add text

```
plot(Europe)  
text(Europe$LON,Europe$LAT,Europe$ISO2,col="red")
```



Plotting Europe - add lines

```
which(Europe$ISO2=="FR") # 15
```

```
which(Europe$ISO2=="DE") # 16
```

```
Dat <- cbind(Europe$LON[15:16],Europe$LAT[15:16])
```

```
plot(Europe)
```

```
lines(Dat,col="red",lwd=2)
```



Plotting Europe - add symbols

```
library(png)
fDEU <- readPNG("DEUflag.png")
fDEU <- as.raster(fDEU[, , 1:3])
plot(Europe)
rasterImage(fDEU, Europe$LON[16], Europe$LAT[16], 13, 54)
```