Library maptools

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Das Paket maptools

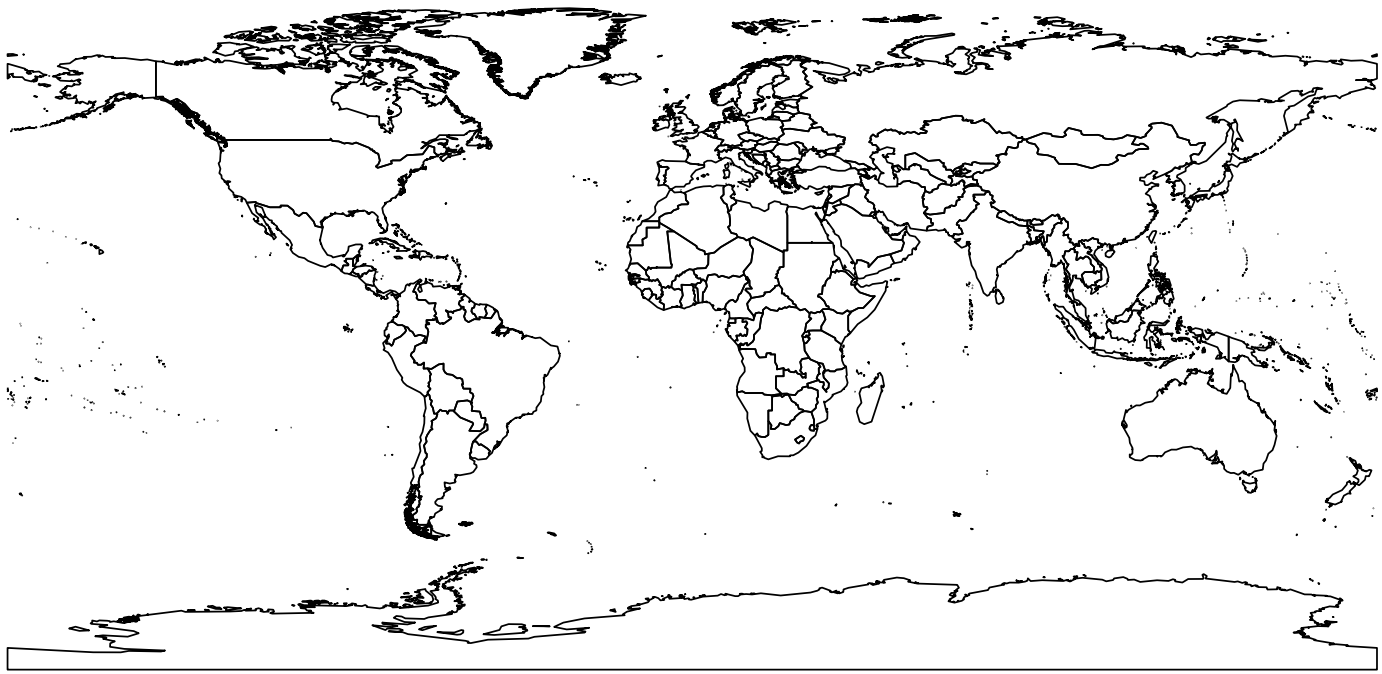
- Datensatz `wrld_simpl` aus dem Paket maptools
- Polygone für fast alle Staaten der Erde

```
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)
```



Der shapefile

- Es handelt sich um einen `shapefile`

```
typeof(wrld_simpl)
```

```
## [1] "S4"
```

- Die Daten sind als `S4` abgespeichert
- Es gibt verschiedene Slots
- In einem davon ist Information als `data.frame` gespeichert.

Der Datensatz

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

	FIPS	ISO2	ISO3	UN	NAME
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Die Struktur der Daten

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

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

Eine logische Abfrage

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

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

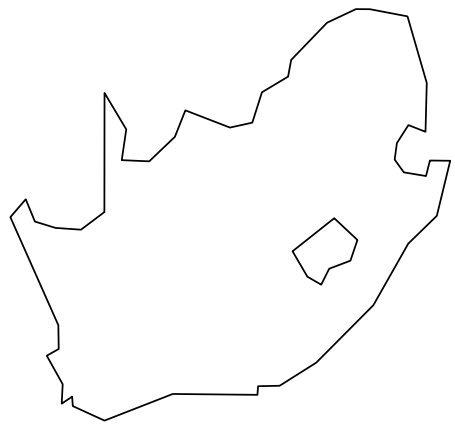
```
table(ind_SA)
```

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

Eine Karte für Süd Afrika

- Ein Land zeichnen

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

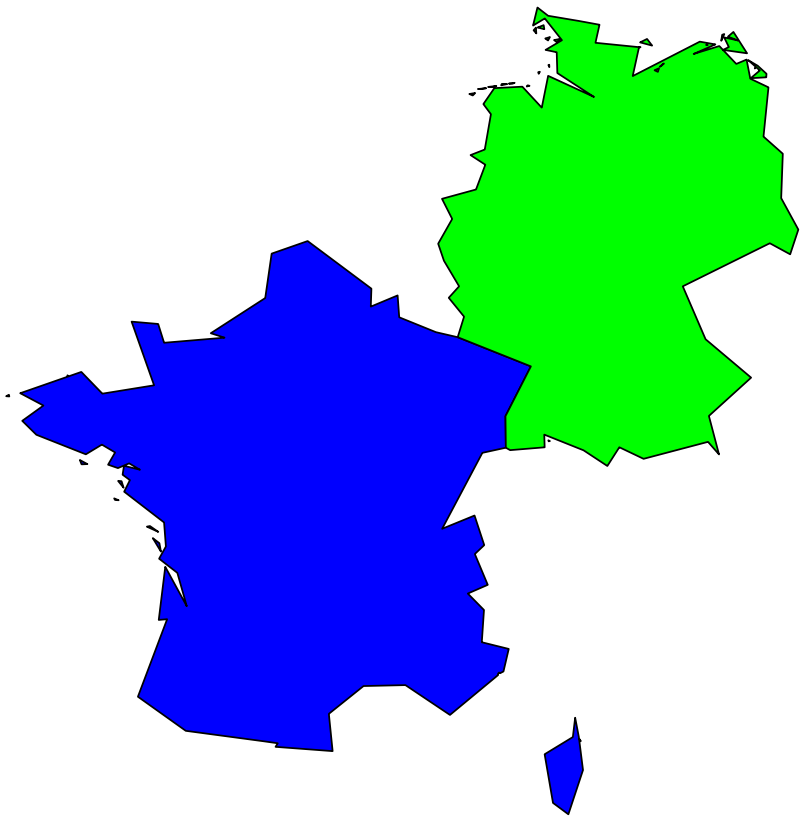


Mehr als ein Land zeichnen

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

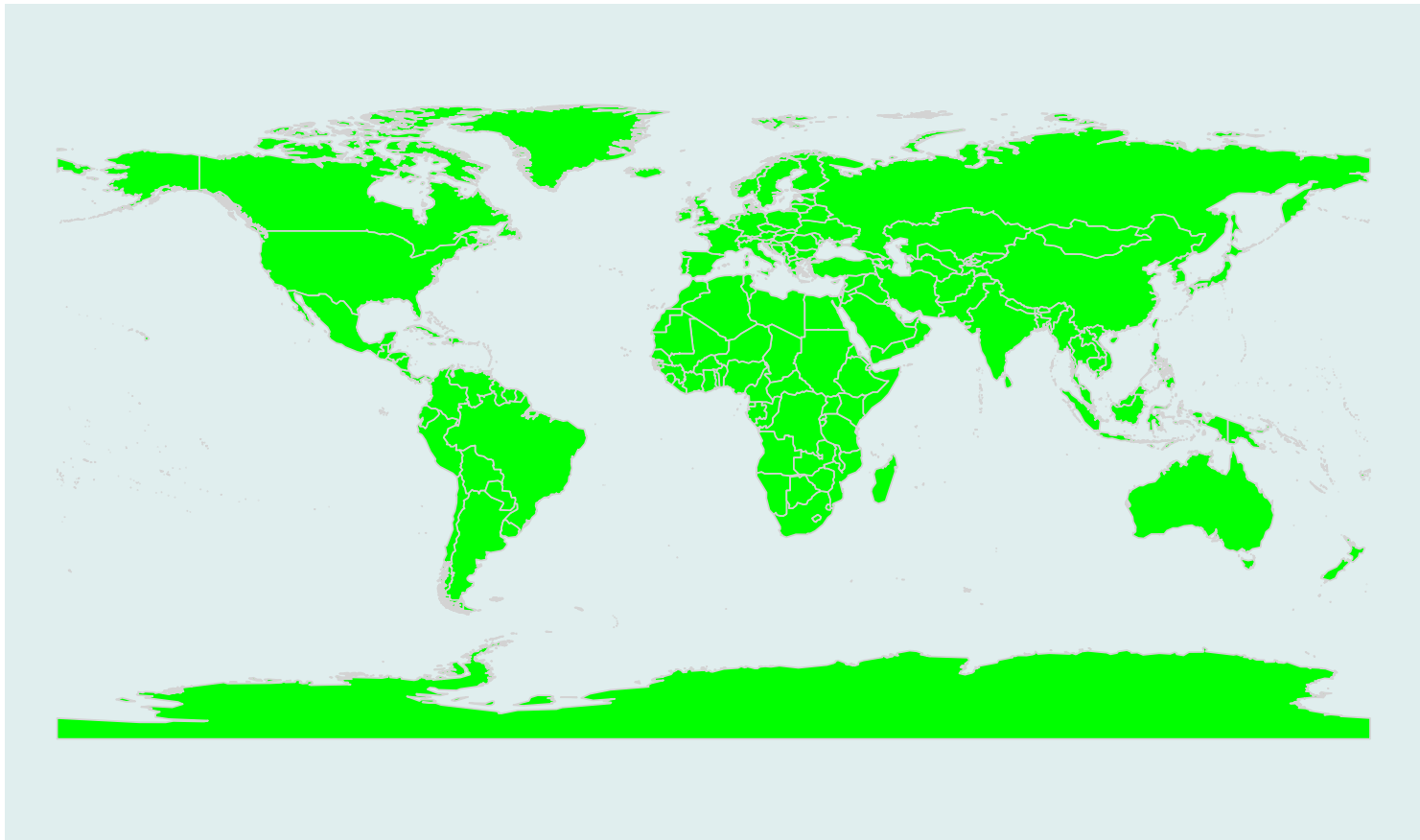
Mehr Farbe

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



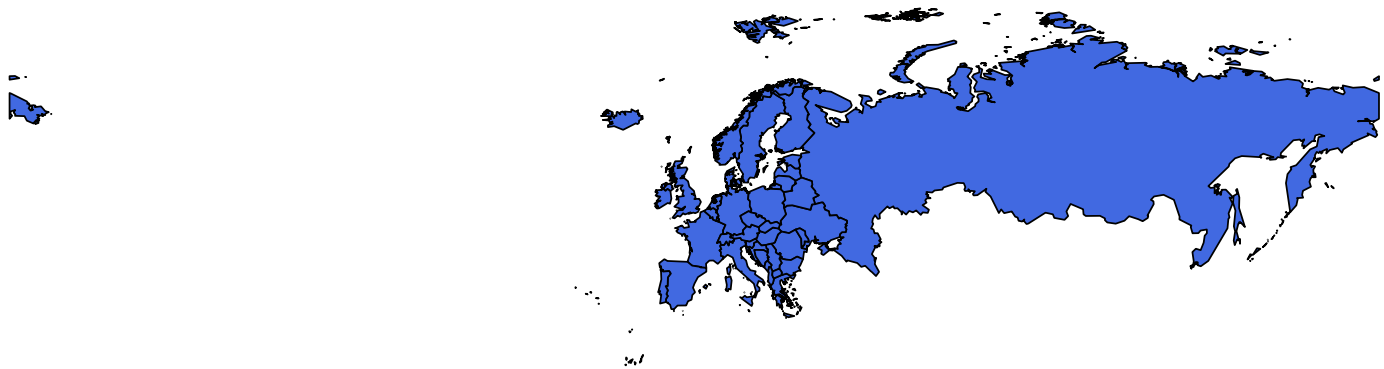
Mehr Farbe für die Welt

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



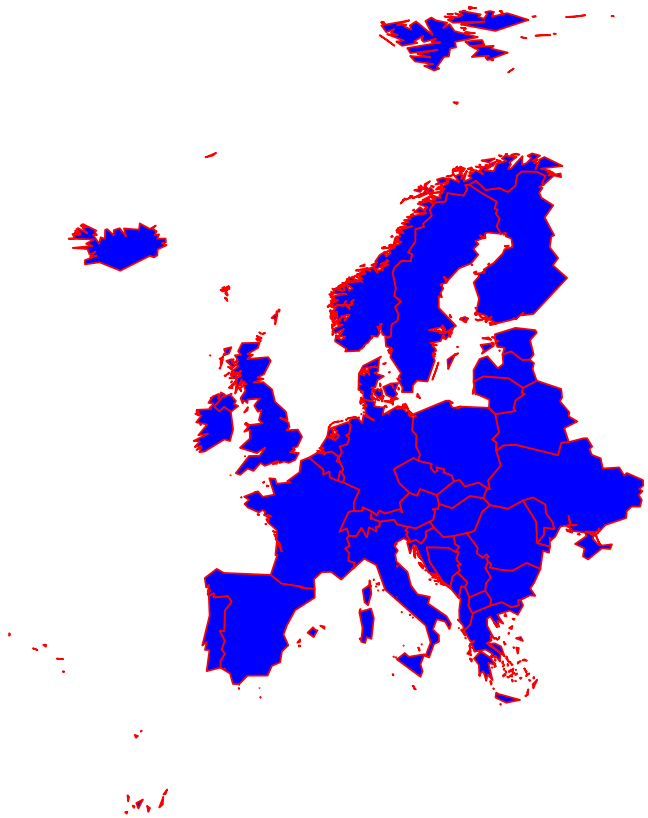
Eine Karte für Europa

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



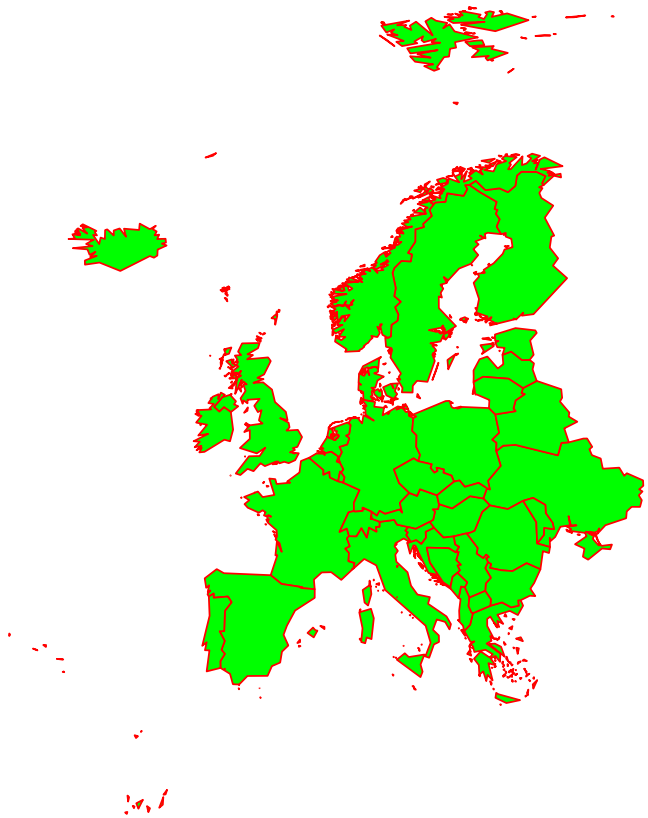
Europa ohne Russland

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



Spielen Sie mit Farben

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



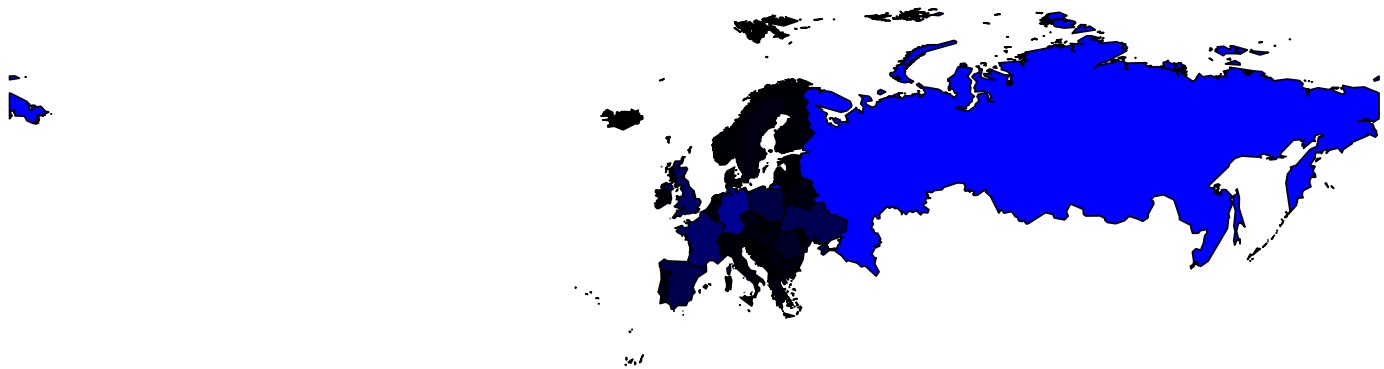
Mehr über Farben

Colors in R

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

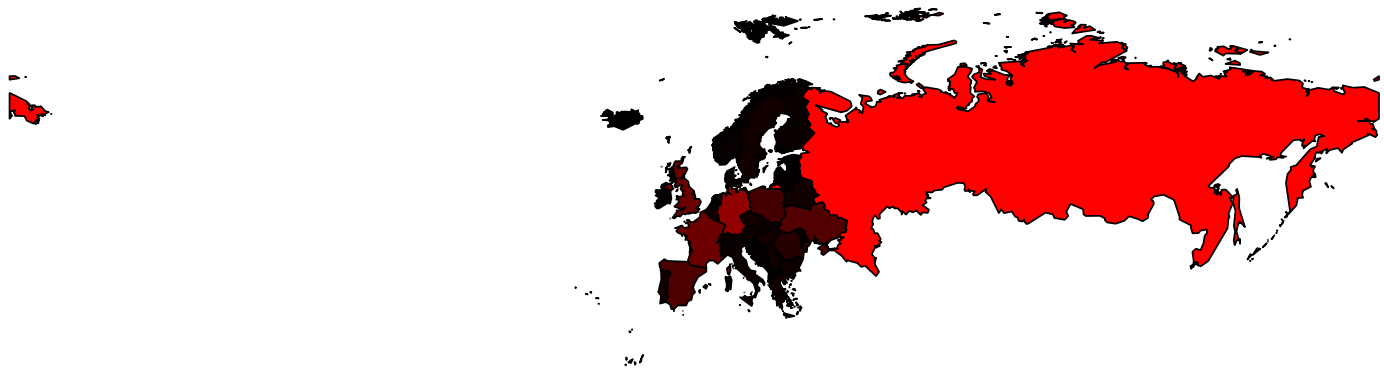
Europa - Farbschattierung blau

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



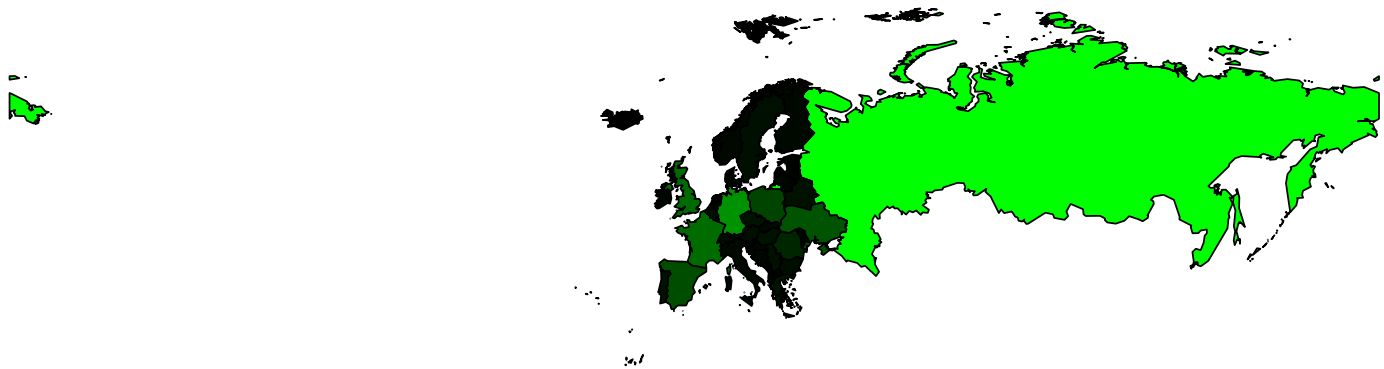
Europa - Farbschattierung rot

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



Europa - Farbschattierung grün

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



Europa - Farbschattierung grau

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

Europa - zwei Graphiken nebeneinander

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

Europa - Punkte hinzufügen

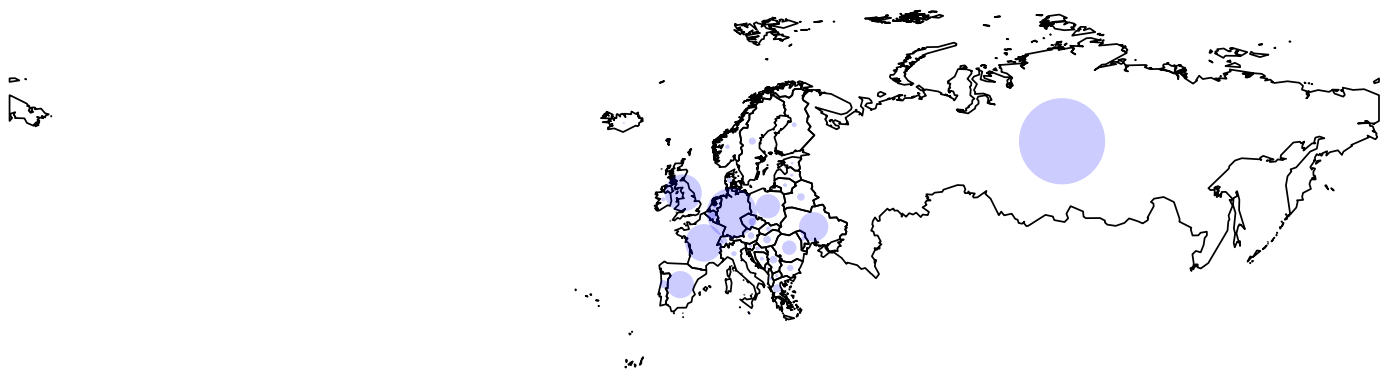
```
which(Europe$ISO2=="FR") # 14
```

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

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

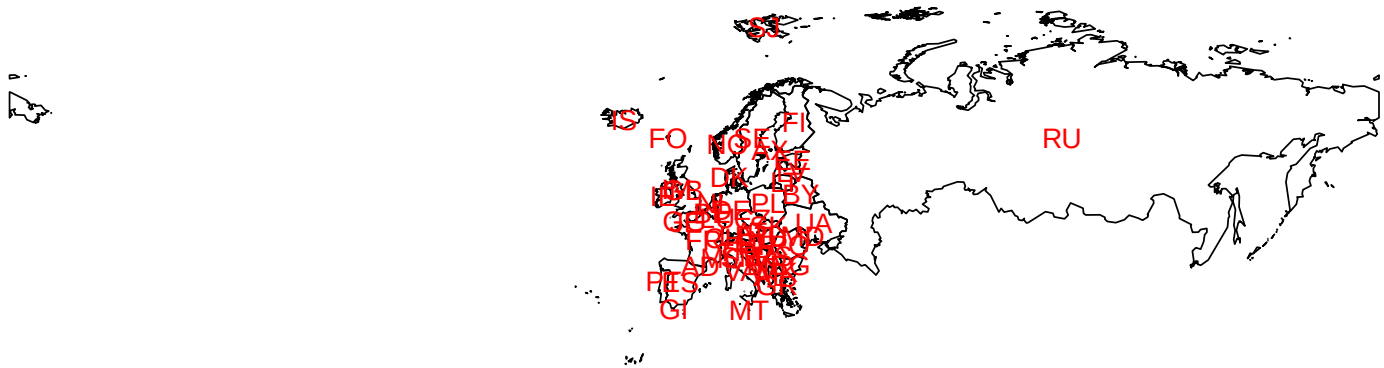
Europa - Blasen hinzufügen

```
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)
```



Europa - Text hinzufügen

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



Europa - Linien hinzufügen

```
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)
```