Nutzung von GeoDaten in den Sozialwissenschaften - Das R-Paket sp

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Beispiel: US Arbeitslosigkeit

- Mehr über die Nutzung des Paketes `maps`

Die Daten bekommen:

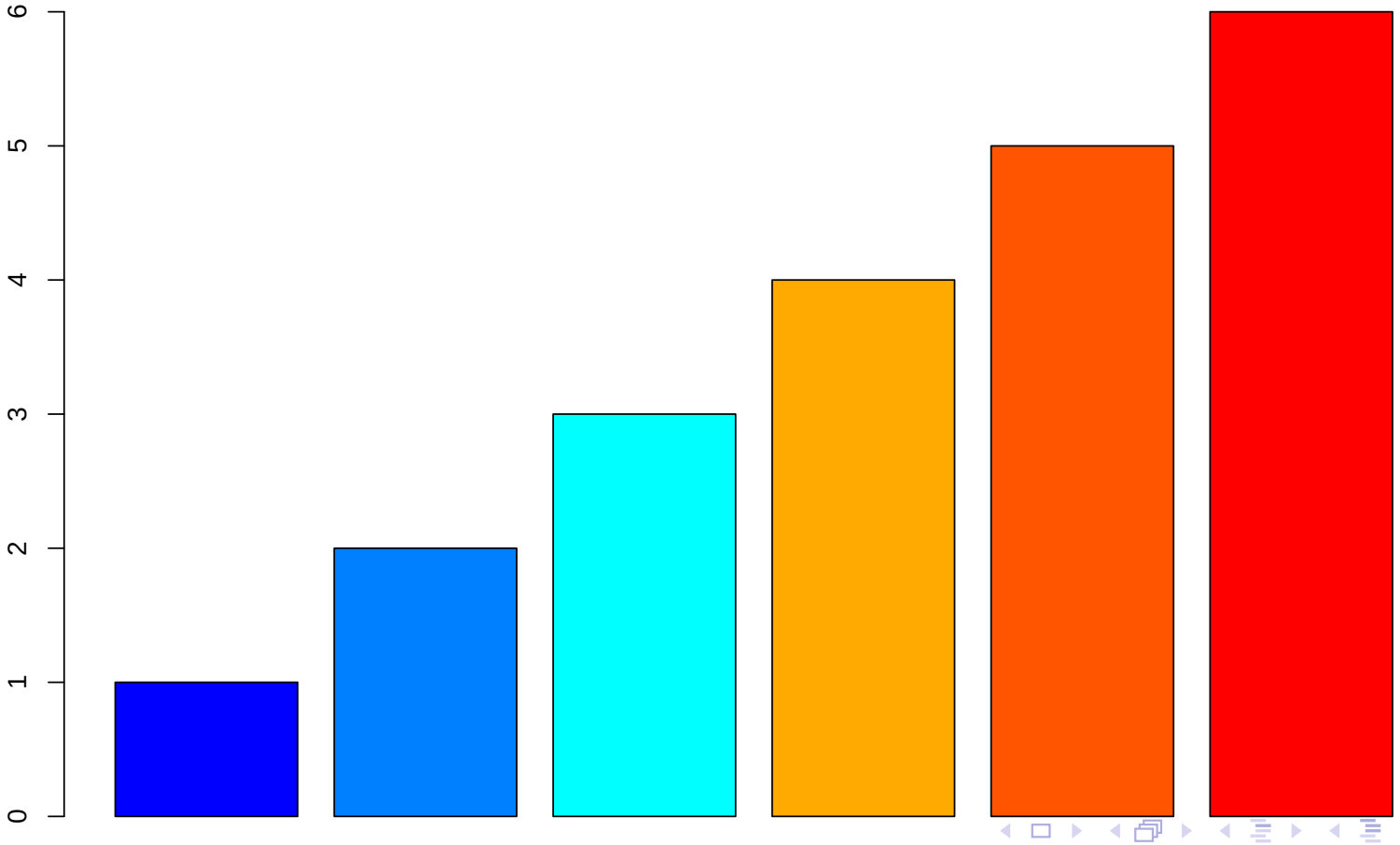
```
library(maps)
```

```
##
##  # maps v3.1: updated 'world': all lakes moved to separa
##  # 'lakes' database. Type '?world' or 'news(package="map
```

```
data(unemp)
data(county.fips)
```

Farbverläufe

```
library(colorRamps)
colors <- blue2red(6)
barplot(1:6,col=colors)
```

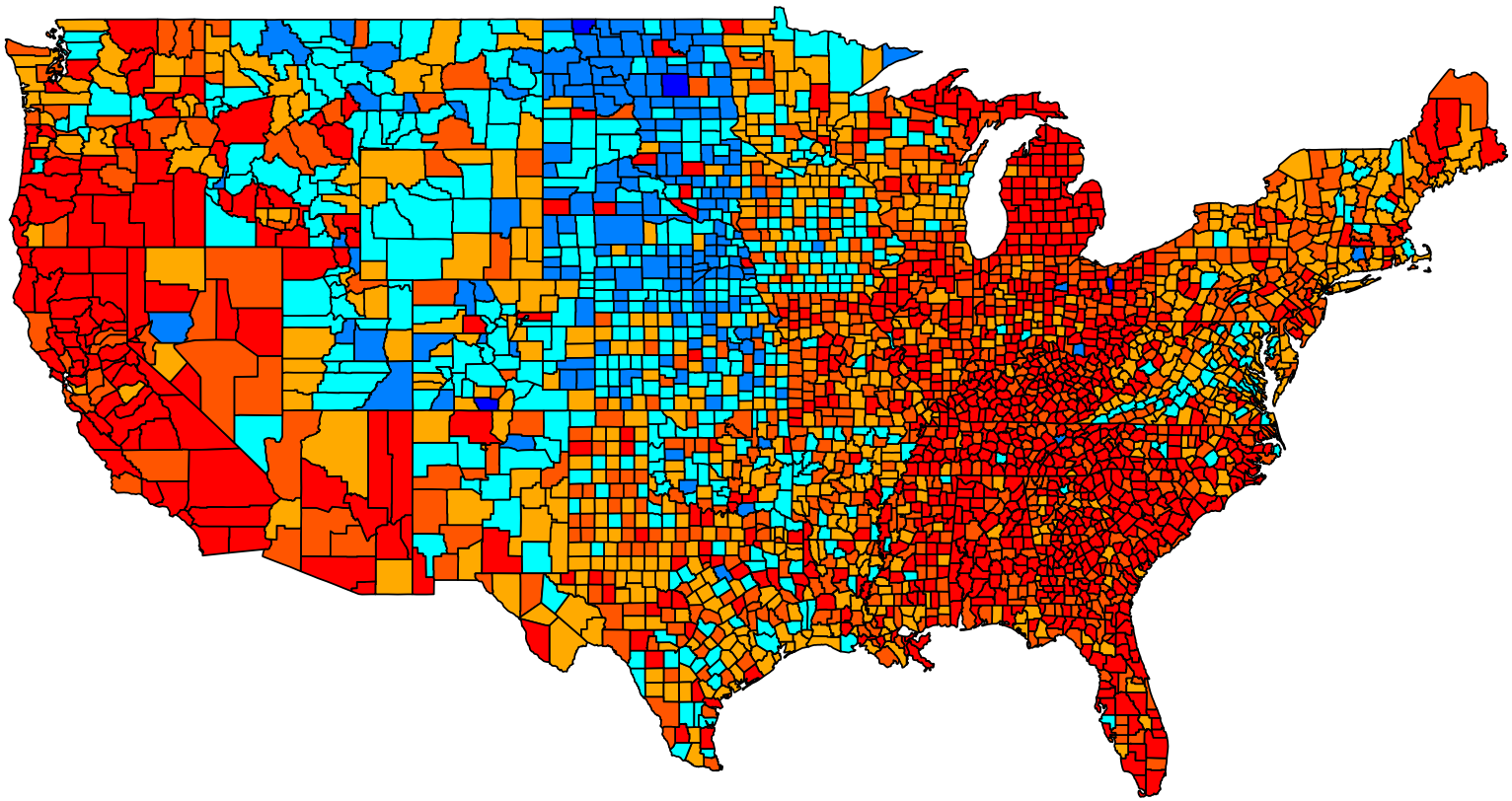


Beispiel: US Arbeitslosigkeit - Farbschattierung

```
unemp$colorSteps <- cut(unemp$unemp,
          c(0, 2, 4, 6, 8,10, 100))
colorsmatch <- unemp$colorSteps[match(county.fips$fips,
          unemp$fips)]
```

Beispiel: US Arbeitslosigkeit

```
map("county", col = colors[colorsmatch],
    fill = TRUE)
```



Das R-Paket sp

- Klassen und Methoden für räumliche Daten
- Authoren: Edzer Pebesma, Roger Bivand, Barry Rowlingson, Virgilio Gomez-Rubio et. al.
- Viele Einführungen sind verfügbar

```
library(sp)
```

Hallo Welt

- Ein erstes Beispiel unter Verwendung von Daten aus `maptools` (ISO2-codes)

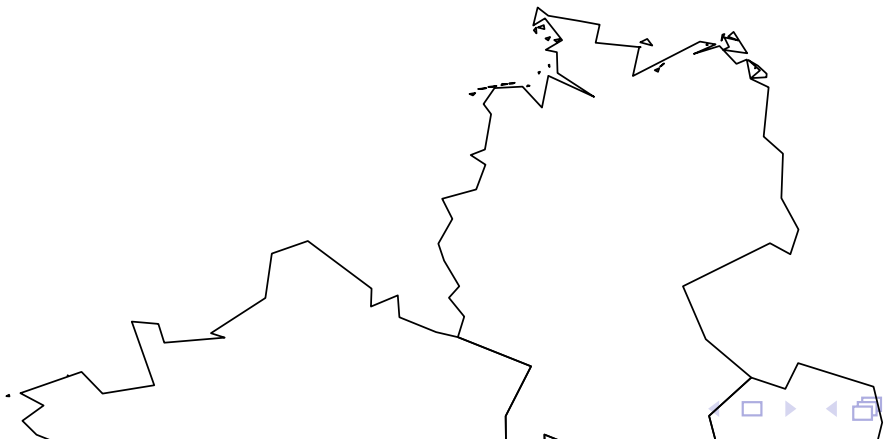
```
library(maptools)
data("wrld_simpl")
ISO2codes <- wrld_simpl@data$ISO2
countries <- c("FR","DE","AT","CH")
ind <- match(countries,ISO2codes)
my_map <- wrld_simpl[ind,]
```

Die Karte zeichnen

```
library(maptools)
```

```
## Warning: package 'maptools' was built under R version 3.
## Loading required package: sp
## Warning: package 'sp' was built under R version 3.2.4
## Checking rgeos availability: TRUE
```

```
plot(my_map)
```



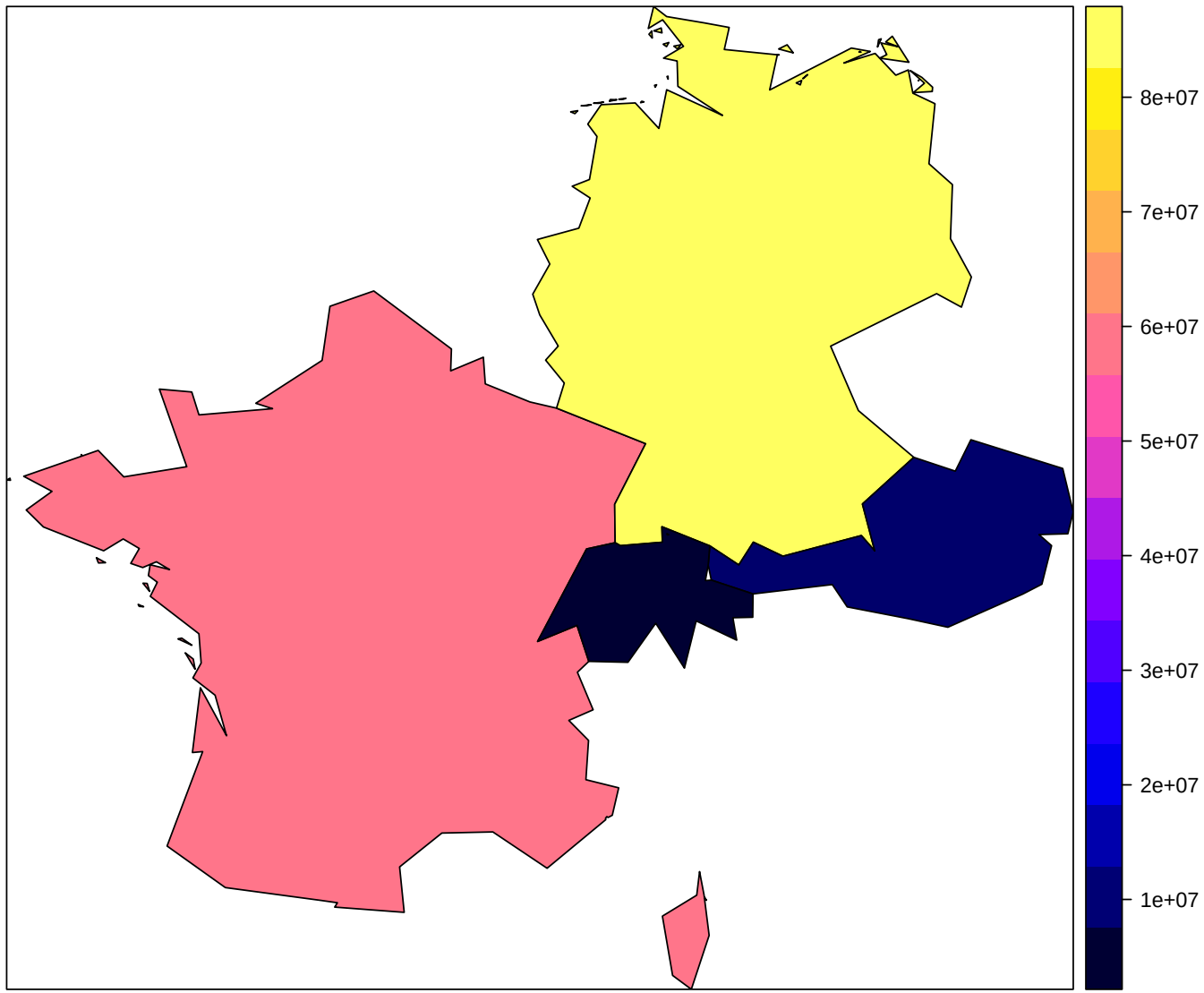
Der Datensatz

```
head(my_map@data)
```

	ISO2	NAME	AREA	POP2005	REGION
FRA	FR	France	55010	60990544	150
DEU	DE	Germany	34895	82652369	150
AUT	AT	Austria	8245	8291979	150
CHE	CH	Switzerland	4000	7424389	150

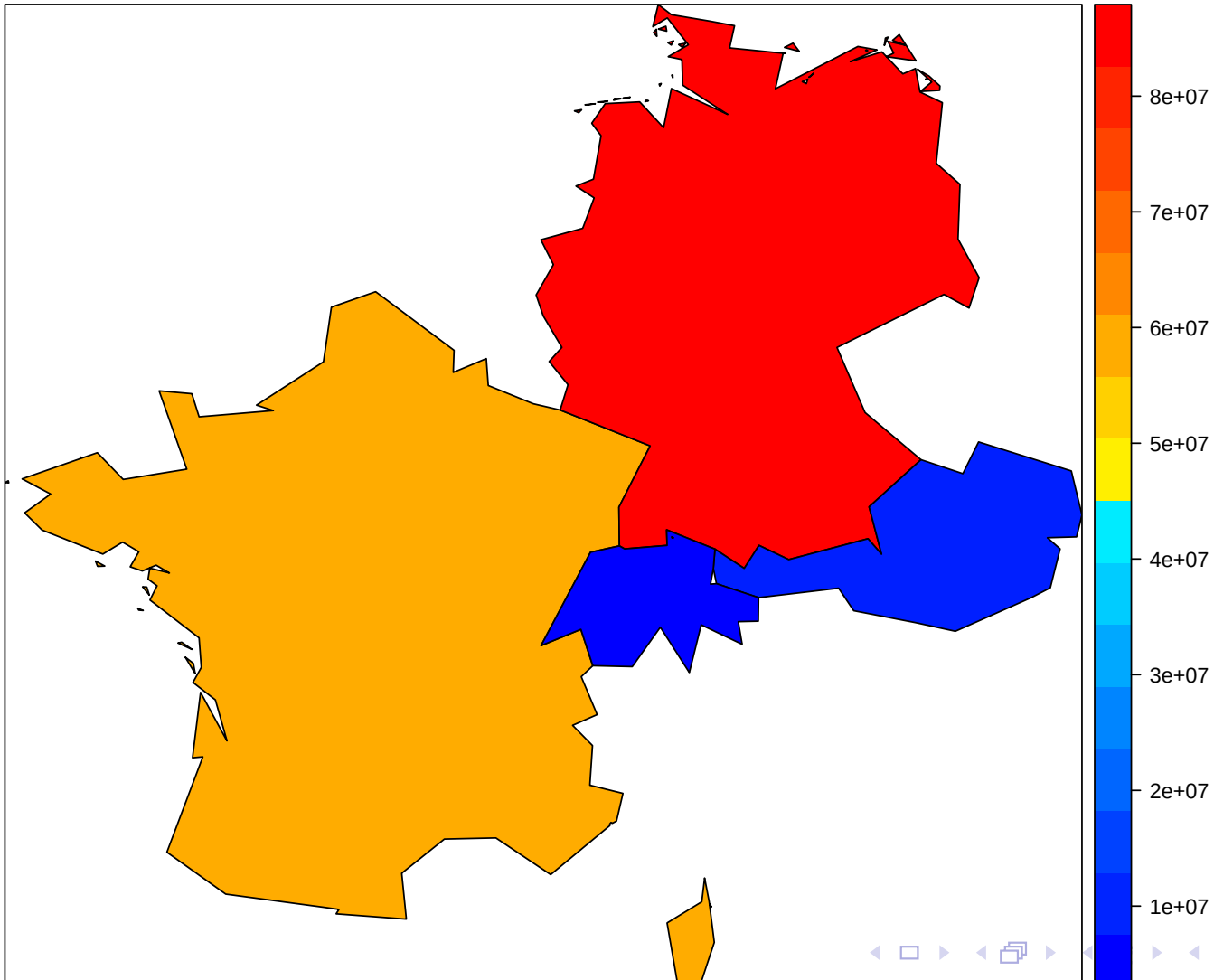
Ein weiteres Beispiel

```
spplot(my_map,"POP2005")
```



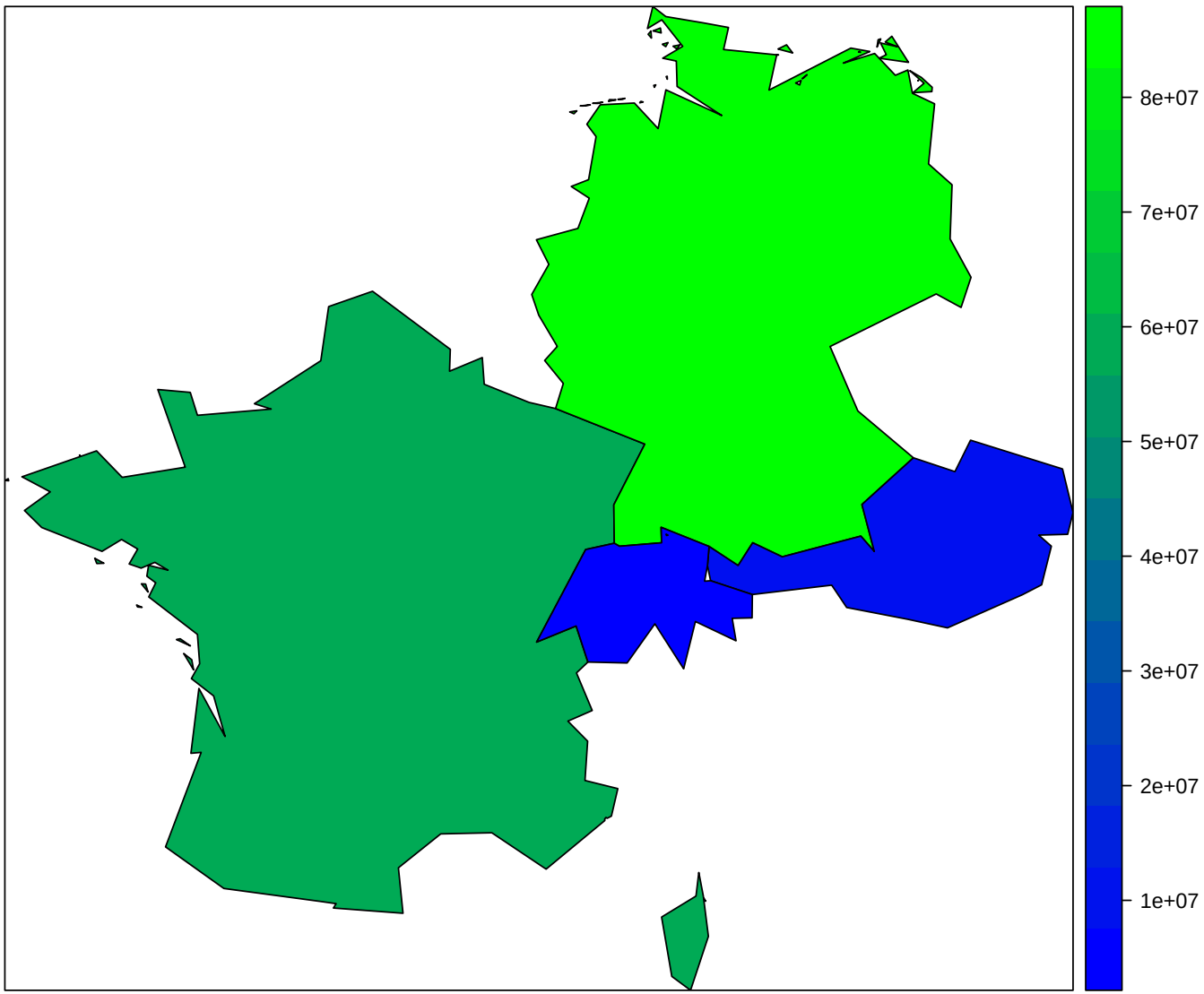
Nutzung von colorRamps

```
library(colorRamps)
spplot(my_map,"POP2005",col.regions=blue2red(100))
```



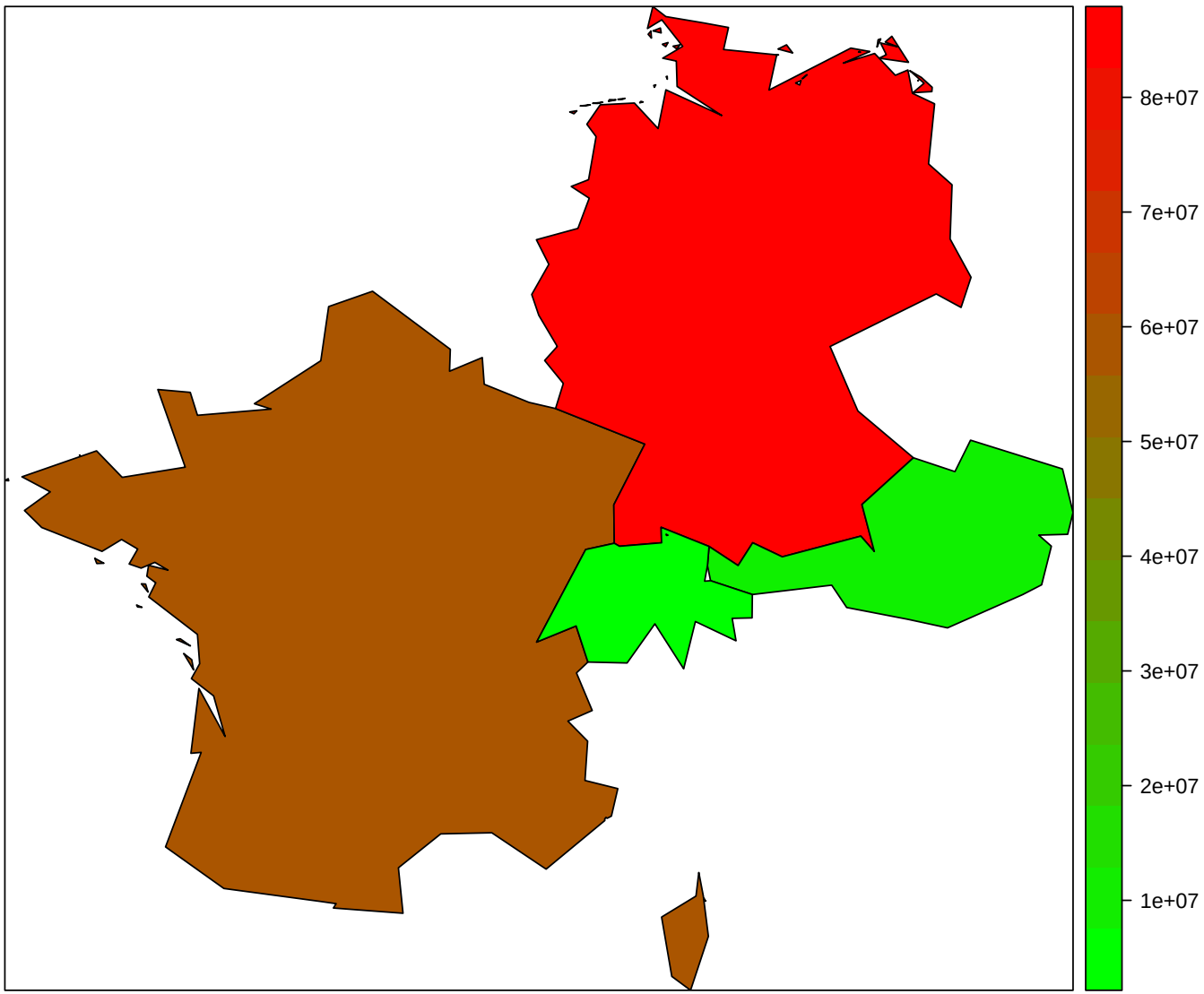
Nutzung von colorRamps

```
spplot(my_map,"POP2005",col.regions=blue2green(100))
```



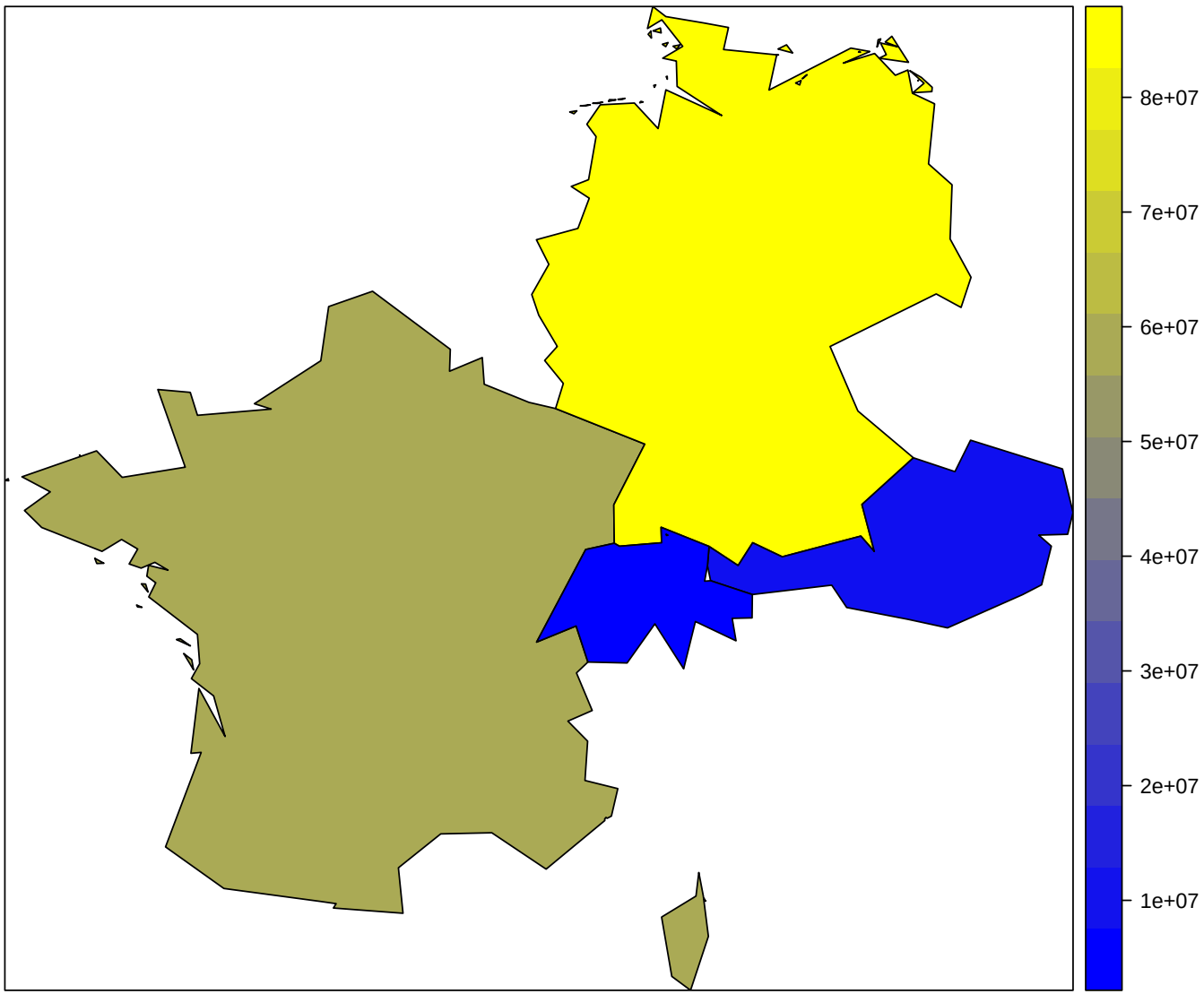
Nutzung von colorRamps

```
spplot(my_map,"POP2005",col.regions=green2red(100))
```



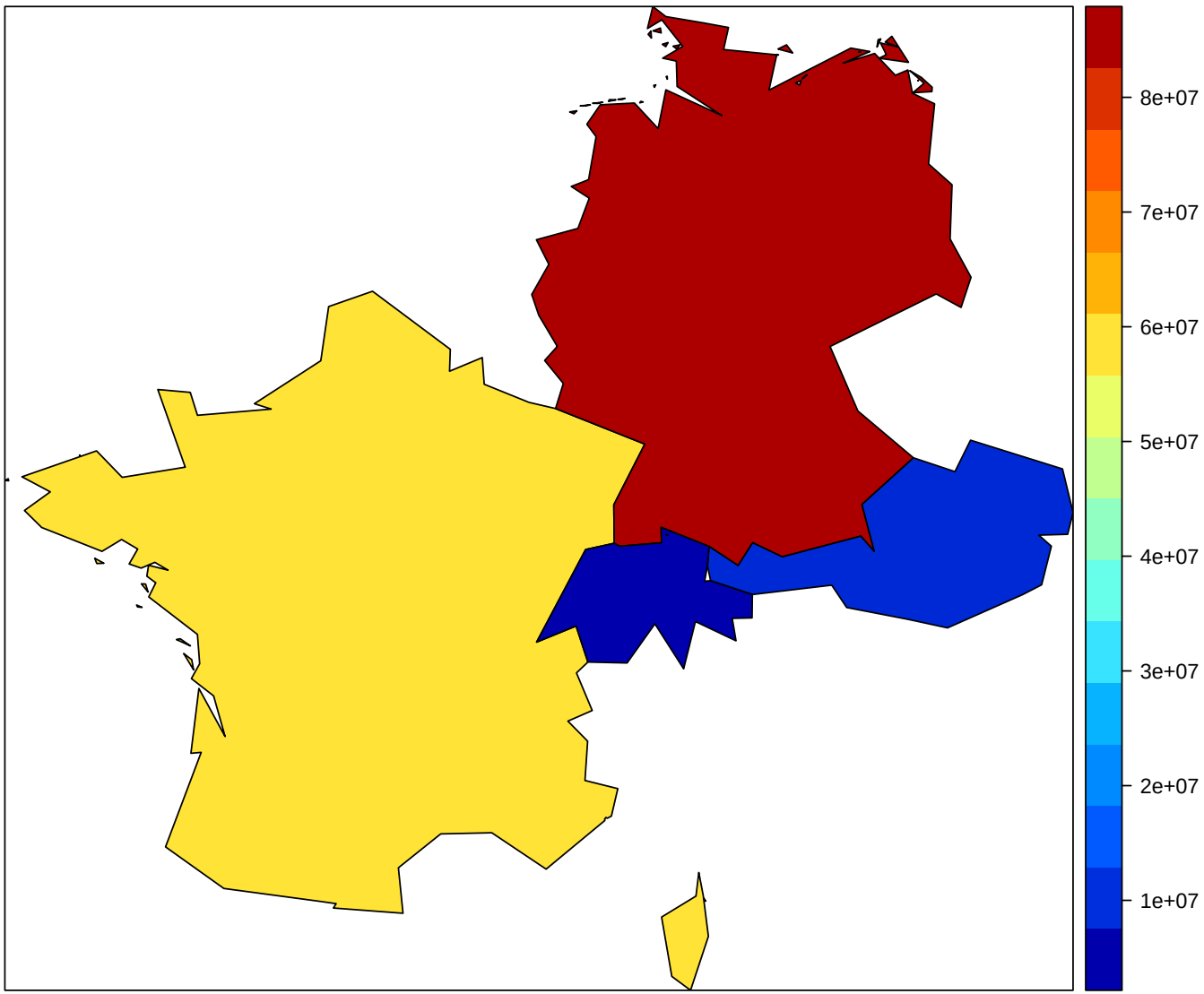
Nutzung von colorRamps

```
spplot(my_map,"POP2005",col.regions=blue2yellow(100))
```



Nutzung von colorRamps

```
spplot(my_map,"POP2005",col.regions=matlab.like(100))
```



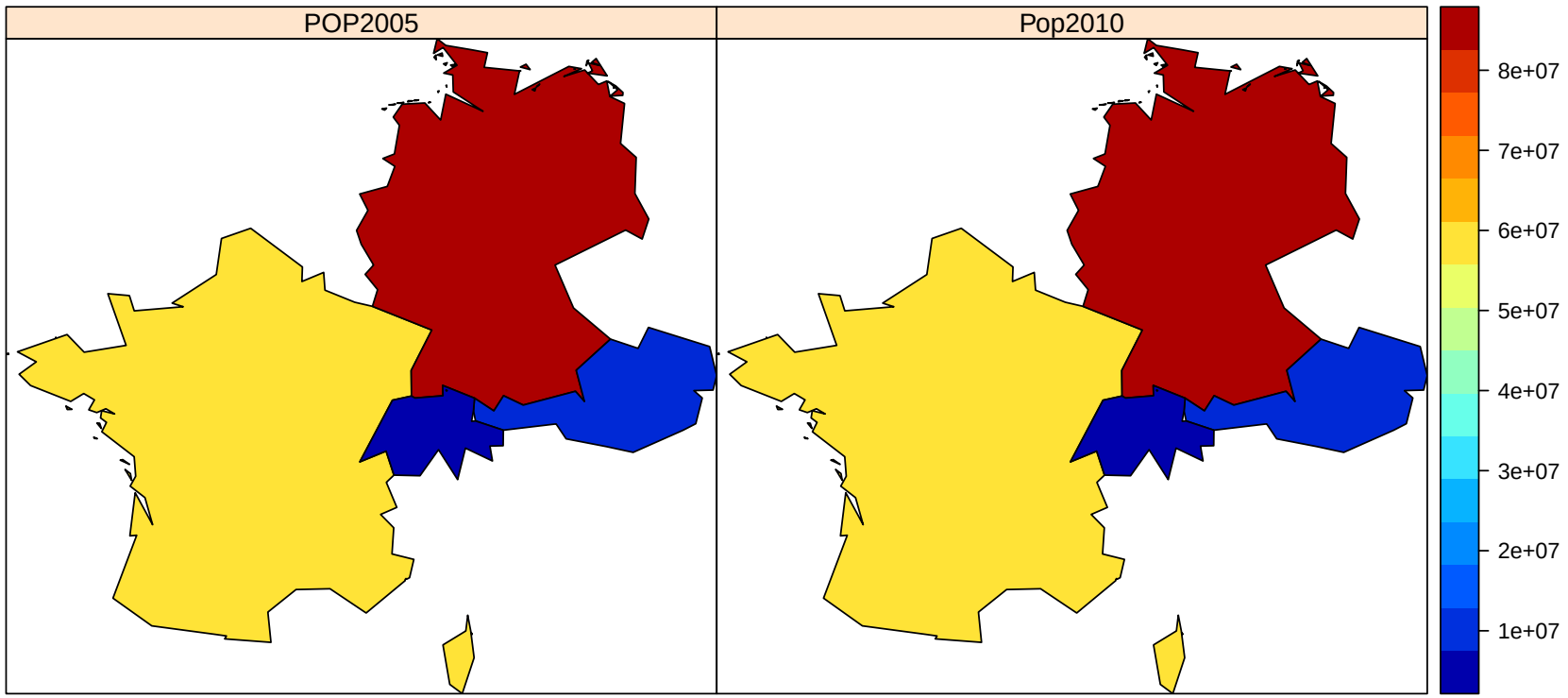
Nutzung von synthetischen Daten

Synthetische Daten erzeugen (Bevölkerung 2010)

```
my_map$Pop2010 <- my_map$POP2005 +
                    runif(length(my_map),-10000,10000)
```

Farben wie bei matlab

```
spplot(my_map,c("POP2005","Pop2010"),
       col.regions=matlab.like(100))
```



Mehr Beispiele

- Stamen Karten mit spplot

https://procomun.wordpress.com/2013/04/24/stamen-maps-with-spplot/

- Indien durch Visualisierung kennenlernen

http://justanotherdatablog.blogspot.de/2014/02/know-india-through-visualisations-1.html

- Great circles

https://procomun.wordpress.com/2011/05/20/great-circles/

- Kanadischer Wählerkompass

http://blog.revolutionanalytics.com/2011/12/vote-compass-visualizing-canadian-poll-results-with-r.html

- Mehr Farben in R

http://www.r-bloggers.com/using-the-new-viridis-colormap-in-r-thanks-to-simon-garnie

Vignetten für das Paket sp

- Edzer Pebesma - Customising spatial data classes and methods

`https://cran.r-project.org/web/packages/sp/vignettes/csdacm.pdf`

- Edzer Pebesma und Roger S. Bivand - S Classes and Methods for Spatial Data: the sp Package

`https://cran.r-project.org/web/packages/sp/vignettes/intro_sp.pdf`

- Edzer Pebesma - Map overlay and spatial aggregation in sp

`https://cran.r-project.org/web/packages/sp/vignettes/over.pdf`