

# Bathymetry mapping with ggplot in R

Marko Lipka

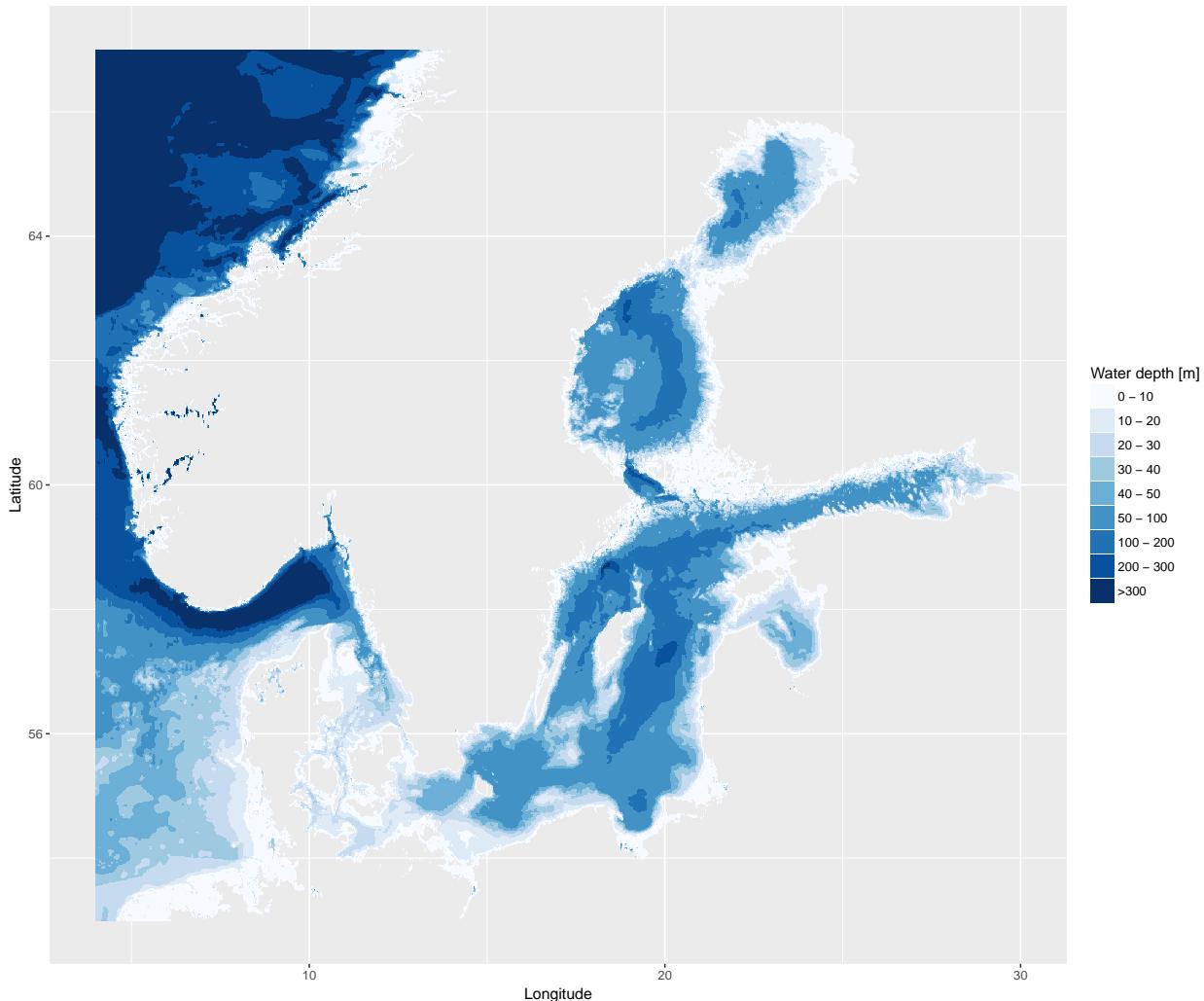
## Get bathymetry data

The *marmap* package provides world wide high resolution bathymetry data.

```
source("ggPlotBathymetry.R")

baltic.bathy    <- get.bathymetry(lon1 = 4, lon2 = 30,
                                lat1 = 53, lat2 = 67,
                                bathy.breaks = c(seq(0, 50, length.out = 6),
                                                seq(100, 300, length.out = 3),
                                                +Inf))

## File already exists ; loading 'marmap_coord_4;53;30;67_res_1.csv'
ggplot(baltic.bathy) +
  geom_tile(aes(x=Longitude, y=Latitude, fill=Depthsteps_m)) +
  scale_fill_brewer(palette = "Blues", name = "Water depth [m]")
```

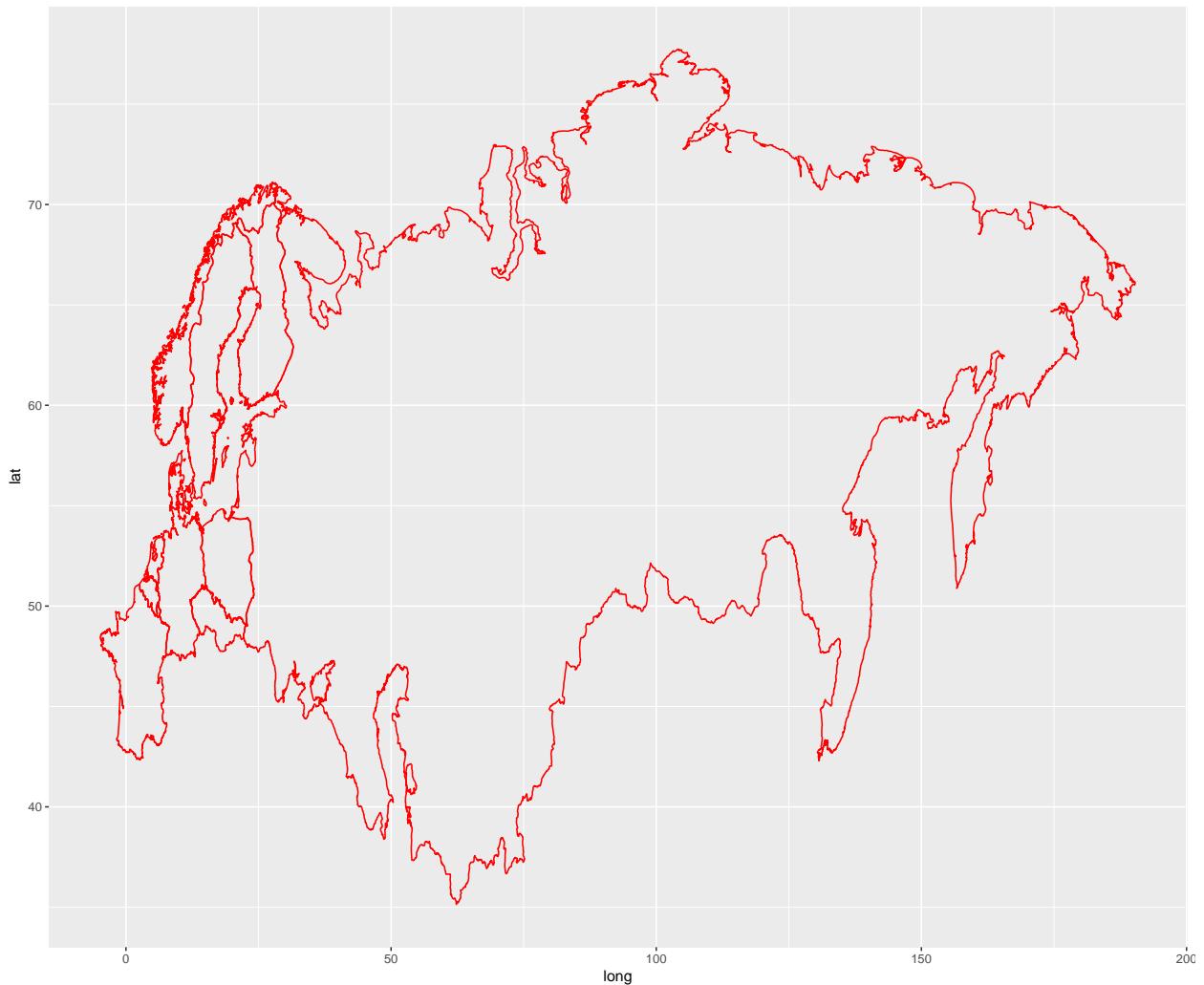


## Load world coastlines

The *mapdata* package allows to download world coastline polygon data. Unfortunately these are missing some ‘small’ islands (like Hiddensee). Haven’t found a workaround for that yet...

```
baltic.coastlines <- map_data('worldHires', xlim = c(4, 29), ylim = c(50, 66))

ggplot(baltic.coastlines) +
  geom_polygon(aes(x=long, y=lat, group=group), colour = "red", fill = NA)
```



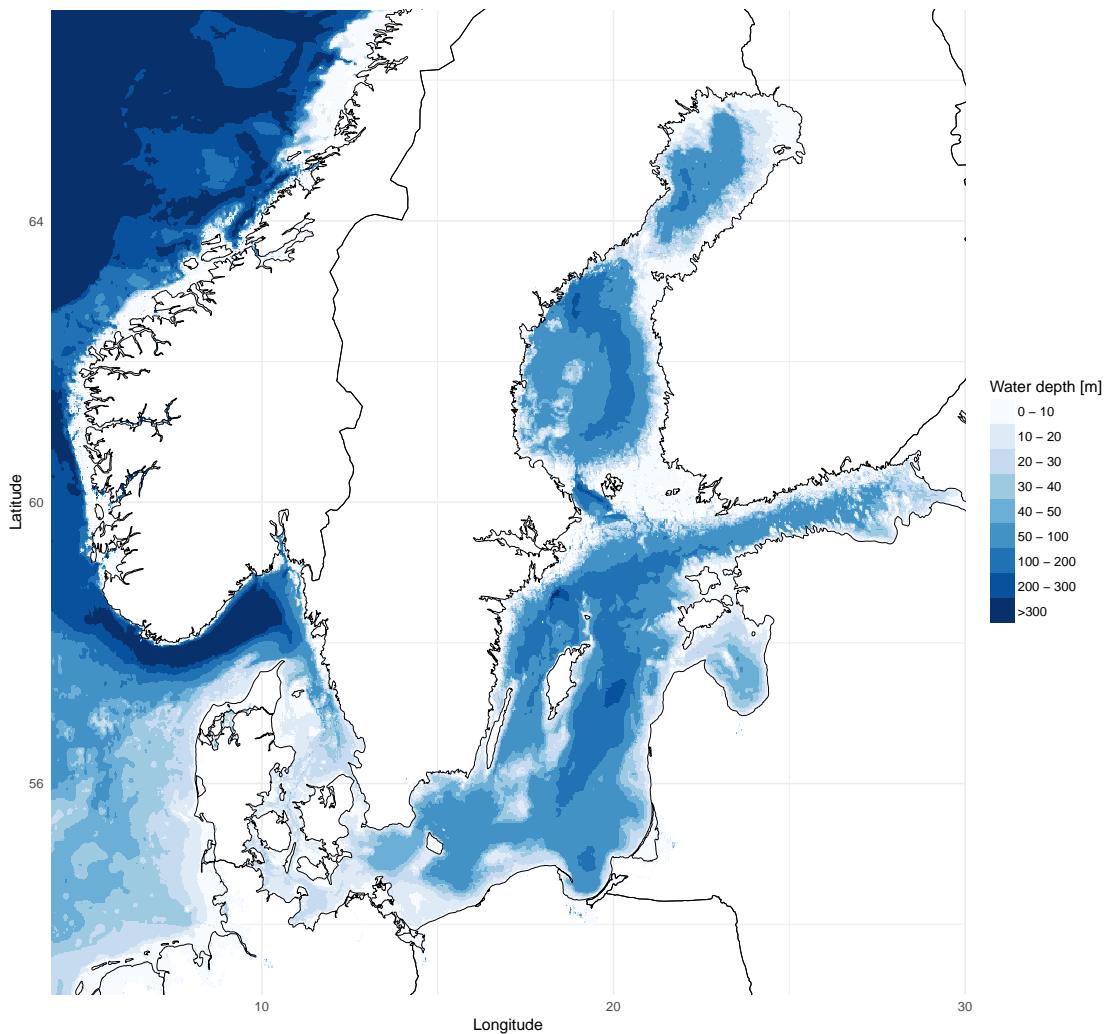
## Plot some maps

... combine plot of bathymetry and coastlines in one function *plot.bathymetry()*

The whole Baltic Sea:

```
plot.bathymetry()
```

```
## File already exists ; loading 'marmap_coord_4;53;30;67_res_1.csv'
```

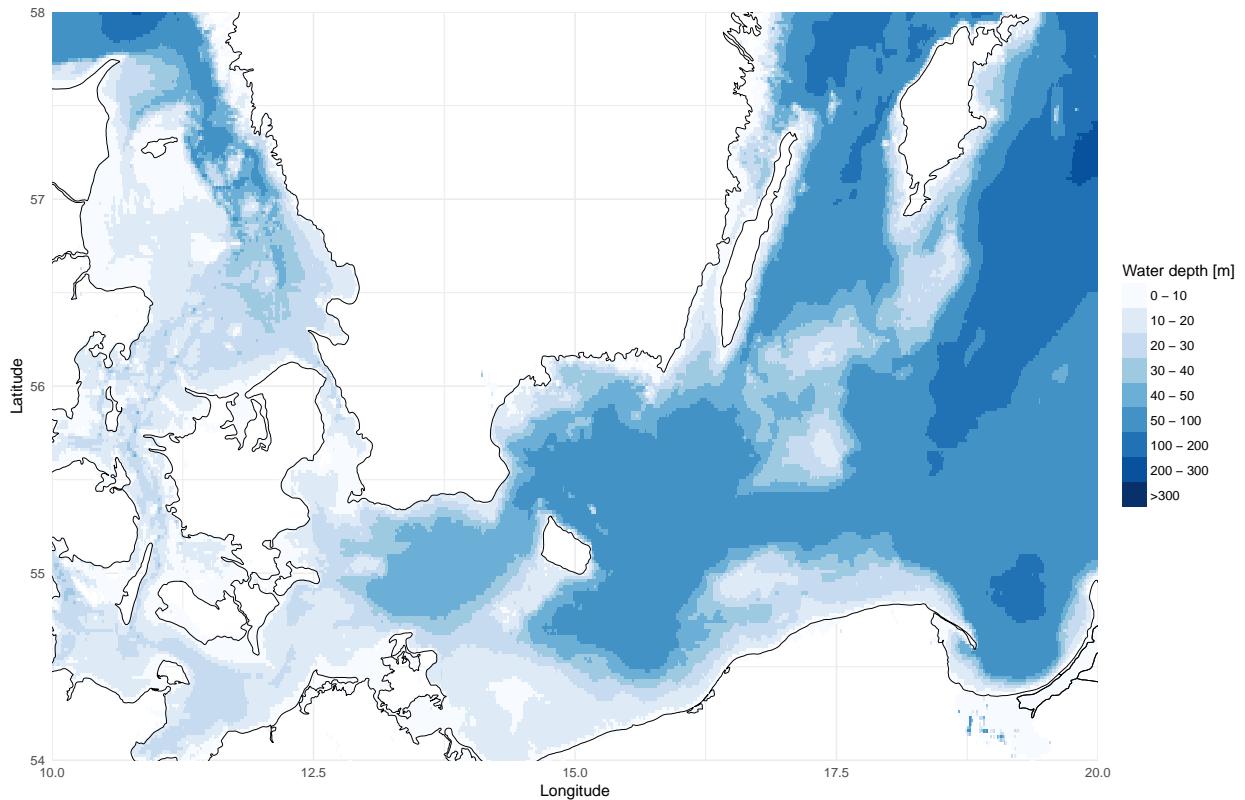


### The southern part only:

... with the bathymetry depth range of the whole Baltic Sea ...

```
plot.bathymetry(lon.min = 4, lon.max = 30,
                 lat.min = 53, lat.max = 67) +
  coord_quickmap(xlim = c(10, 20), ylim = c(54, 58))

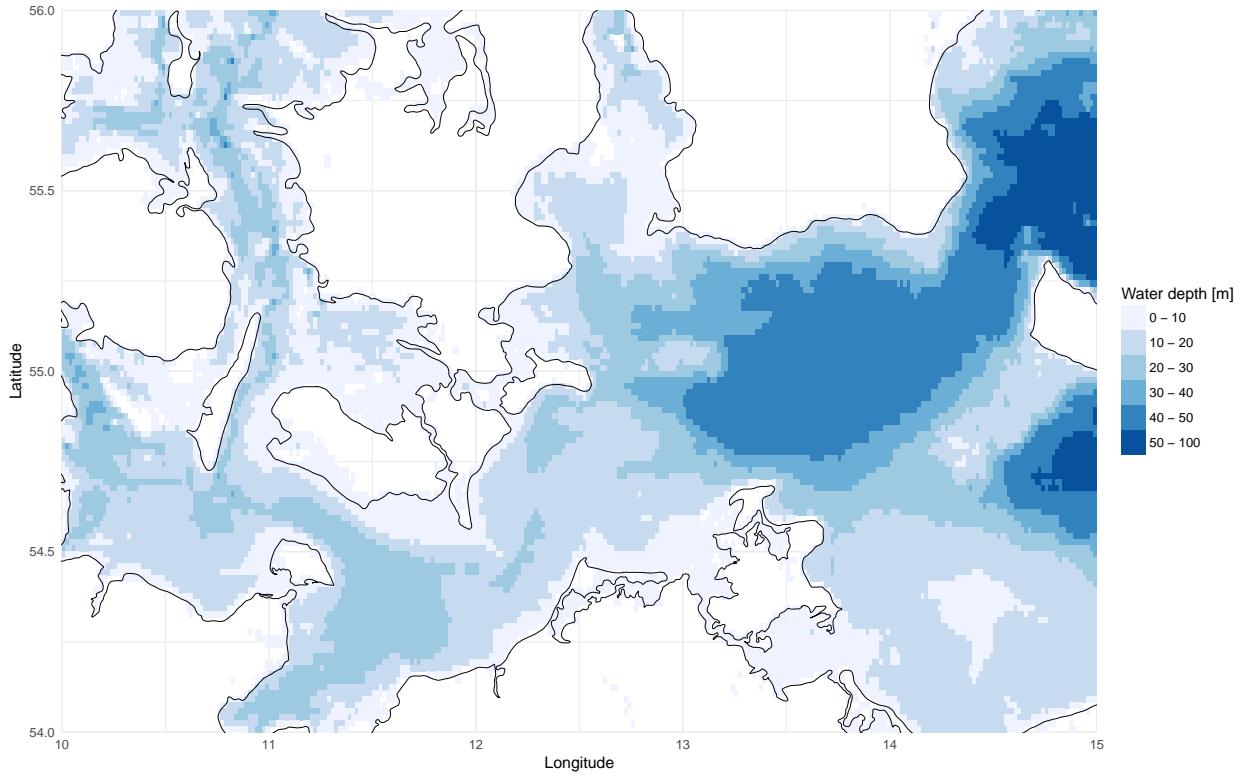
## File already exists ; loading 'marmap_coord_4;53;30;67_res_1.csv'
```



... or adapted to plot region.

```
plot.bathymetry(lon.min = 10, lon.max = 15, lat.min = 54, lat.max = 56)
```

```
## File already exists ; loading 'marmap_coord_10;54;15;56_res_1.csv'
```

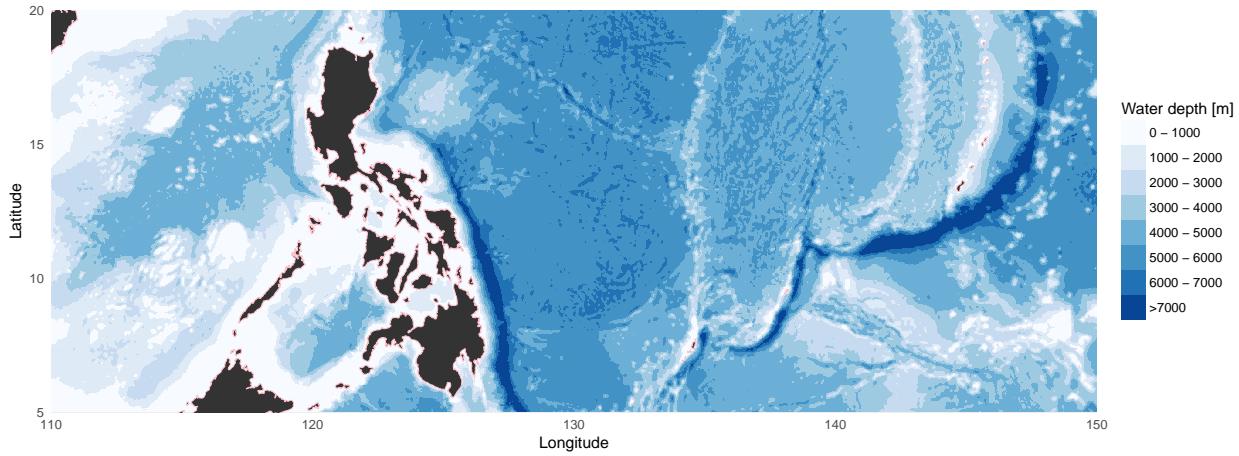


Should also work for any other region in the world

```
long <- 110
lat <- 5

plot.bathymetry(lon.min = long, lon.max = long +40, lat.min = lat, lat.max = lat + 15,
                 bathy.breaks = c(0, 1000, 2000, 3000, 4000, 5000, 6000, 7000, +Inf),
                 land.colour = "grey20", border.colour = "pink")

## File already exists ; loading 'marmap_coord_110;5;150;20_res_1.csv'
```



Viola! Have fun ...

## Known issues / #TODO:

- map\_data even with `map = 'worldHires'` does not include all islands:
  - is there another source for high resolution coastlines of the world?
  - is the coastline necessary ?
- would be nice to have some options for the colour scale of bathymetry
  - continuous vs. discrete
  - colour gradient selection
  - more convenient labeling / interval selection