Topology_maps

TomanB

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R Markdown

```
### load requisite packages
library(tidyverse)
```

```
## -- Attaching packages ---------------------------------------------------------------------------
## v ggplot2 3.3.0     v purrr   0.3.3
## v tibble  3.0.0     v dplyr   0.8.5
## v tidyr   1.0.2     v stringr 1.4.0
## v readr   1.3.1     v forcats 0.5.0
## -- Conflicts ------------------------------------------------------------------------------------
## x dplyr::filter() masks stats::filter()
## x dplyr::lag()    masks stats::lag()
```

```
library(ggridges)
library(mapproj)
```

```
## Loading required package: maps
##
## Attaching package: 'maps'
## The following object is masked from 'package:purrr':
##
##     map
```

```
library(marmap)
```

```
## Registered S3 methods overwritten by 'adehabitatMA':
##   method                       from
##   print.SpatialPixelsDataFrame sp
##   print.SpatialPixels          sp
##
## Attaching package: 'marmap'
## The following object is masked from 'package:grDevices':
##
##     as.raster
```

```
library(data.table)
```

```
##
## Attaching package: 'data.table'
## The following objects are masked from 'package:dplyr':
```

```
##
##     between, first, last
```

```
## The following object is masked from 'package:purrr':
##
##     transpose
```

```
library(ggrepel)
library(RColorBrewer)

### set wd
setwd("D:/maps")

### get data from NOAA (National Oceanic and Atmospheric Administration)
coord <- getNOAA.bathy(lon1 = 7.8, lon2 = 9.5, lat1 = 46.0, lat2 = 47.25, resolution = 1)
```

```
## Querying NOAA database ...
```

```
## This may take seconds to minutes, depending on grid size
```

```
## Building bathy matrix ...
```

```
summary(coord)
```

```
## Bathymetric data of class 'bathy', with 102 rows and 75 columns
```

```
## Latitudinal range: 46.01 to 47.24 (46.01 N to 47.24 N)
```

```
## Longitudinal range: 7.81 to 9.49 (7.81 E to 9.49 E)
```

```
## Cell size: 1 minute(s)
```

```
##
```

```
## Depth statistics:
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##     191     913    1500    1525    2092    3920
```

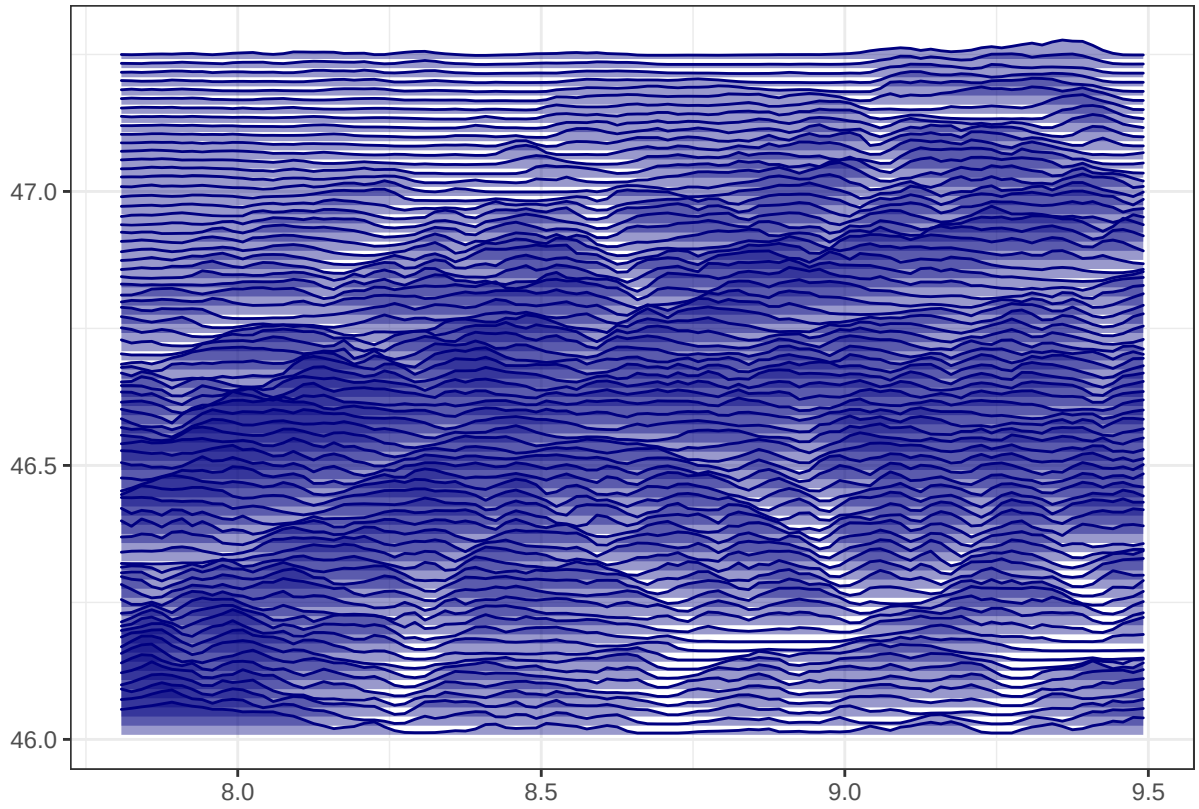
```
##
```

```
## First 5 columns and rows of the bathymetric matrix:
```

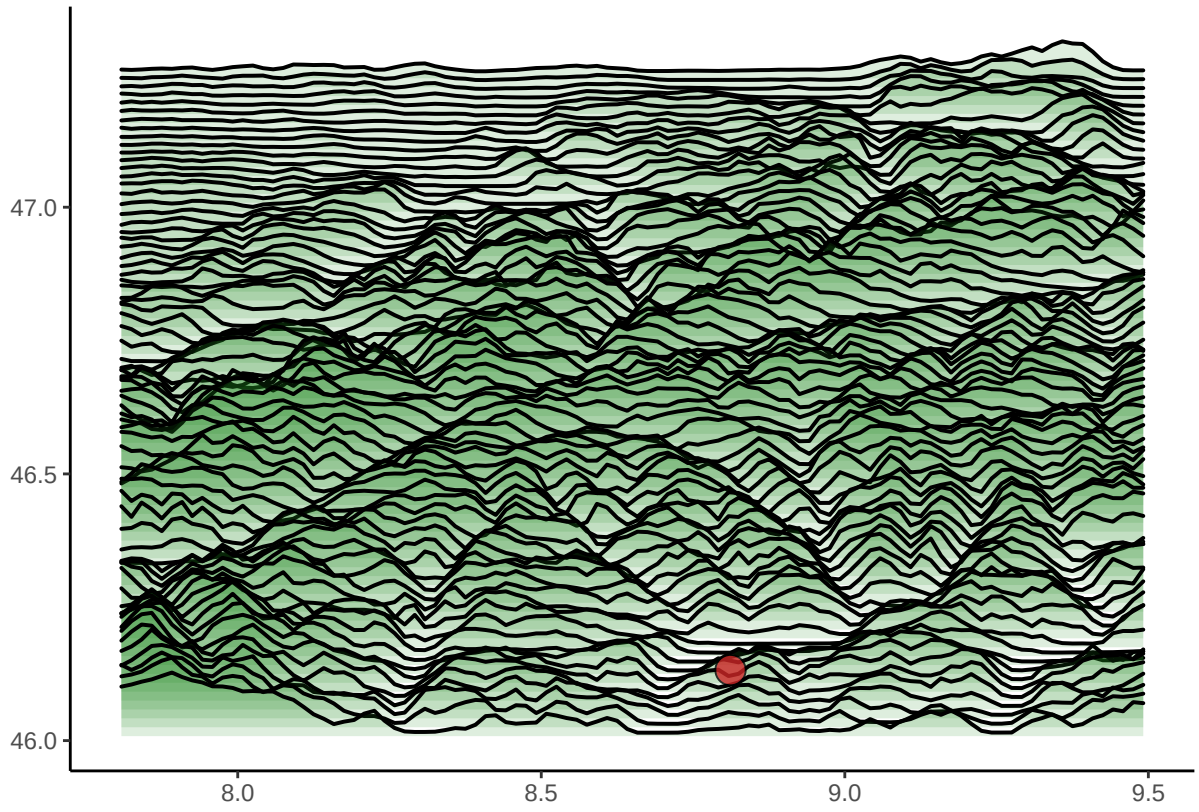
```
##                  46.0083333333333 46.025 46.0416666666667 46.0583333333333
## 7.80833333333333             2730   2806             2952             2424
## 7.825                        2848   2907             2668             2713
## 7.84166666666667             3003   3067             2919             3108
## 7.85833333333333             3130   3397             3343             3503
## 7.875                        3320   3672             3633             3555
##                  46.075
## 7.80833333333333   2738
## 7.825              2984
## 7.84166666666667   3367
## 7.85833333333333   3920
## 7.875              3435
```

```
coord.df <- fortify.bathy(coord)
colnames(coord.df) <- c("longitude","latitude","depth")

coord.df$ndepth <- coord.df[,c("depth")] - min(coord.df$depth)

# insert special location(s)
```

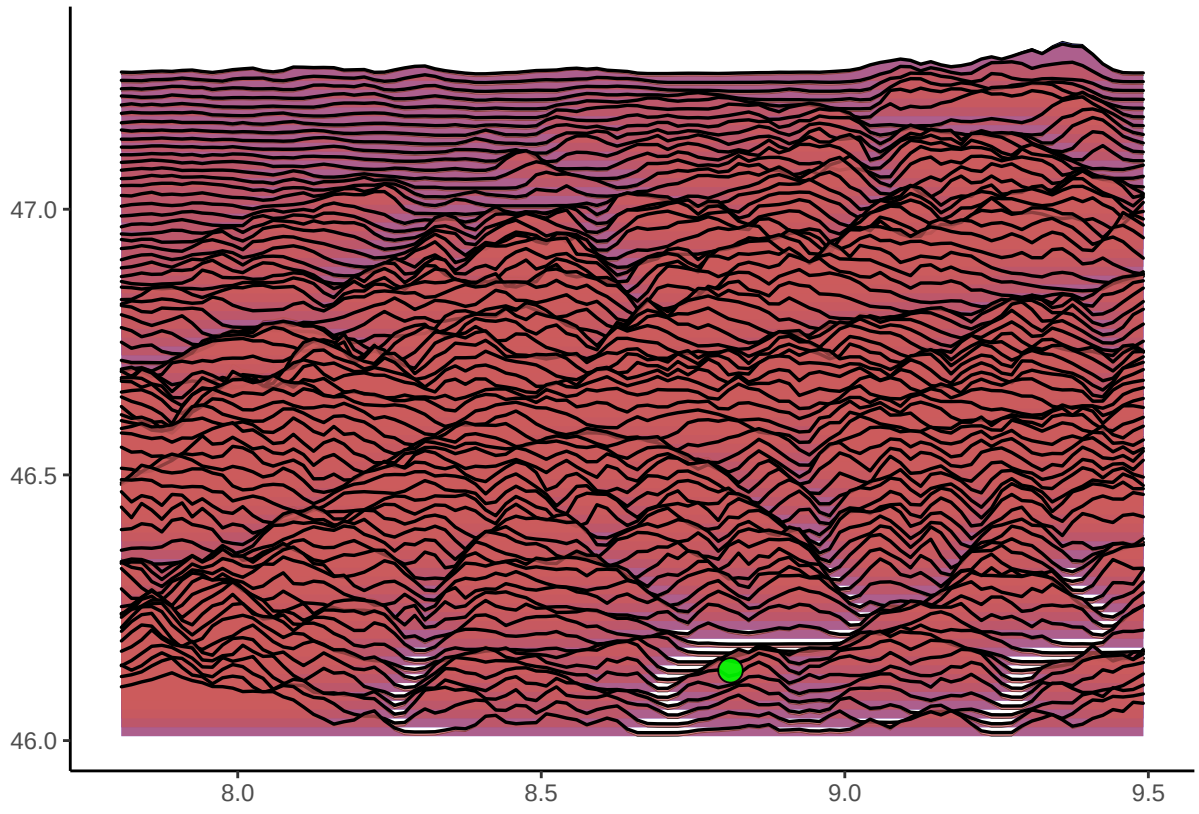
```r
sites <- data.frame(longitude = c(8.811742), latitude = c(46.132199),
                    POI = c(""))

# sites <- data.frame(longitude = c(8.801), latitude = c(46.125), POI = c("Casenzano"))

# plot the transects with ggplot2 & ggridges
ggplot(coord.df, aes(x = longitude, y = latitude, group = latitude, height = depth, scale = 4)) +
      geom_density_ridges(stat = "identity", fill = "navy", alpha = 0.4, color = "navy") + xlab("") + yl
```




```r
# land
ggplot() +
  geom_density_ridges(coord.df, mapping=aes(x = longitude, y = latitude, group = latitude, height = dep
                      stat = "identity", fill = "forestgreen", alpha = 0.15, size = 0.7) + xlab("") + yl
  geom_label_repel(color = "black", data = sites, mapping = aes(x = longitude, y = latitude , label = PO
                   size = 5, segment.size  = 0.3, nudge_x = c(0.1), nudge_y = c(-0.2)) +
  geom_point(data = sites, aes(x = longitude, y = latitude), size = 5, shape = 21, fill = "firebrick3",
  theme_classic()
```




```
# ridge overlay
ggplot() +
  geom_density_ridges(coord.df, mapping=aes(x = longitude, y = latitude, group = latitude, height = nde
                      stat = "identity", fill = "blue", color = "black", alpha = 0.6, size = 0.1) +
  geom_density_ridges(coord.df, mapping=aes(x = longitude, y = latitude, group = latitude, height = dep
                      stat = "identity", fill = "indianred", alpha = 0.7, size = 0.6) + xlab("") + ylab
  geom_label_repel(color = "black", data = sites, mapping = aes(x = longitude, y = latitude , label = P
                   size = 4, segment.size  = 0.3, nudge_x = c(0.0), nudge_y = c(-1)) +
  geom_point(data = sites, aes(x = longitude, y = latitude), size = 4, shape = 21, fill = "green", alpha
  theme_classic()
```


47.0
46.5
46.0
8.0
8.5
9.0
9.5