

Giulia Ruggeri



@giurugg



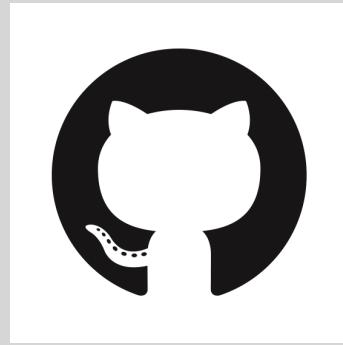
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# Working With Spatial Data With R: an Introduction

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## CODE AND PRESENTATION AVAILABLE



[https://github.com/gruggeri/r\\_lunch\\_feb2021](https://github.com/gruggeri/r_lunch_feb2021)

Few concepts before getting started  
with vector data...

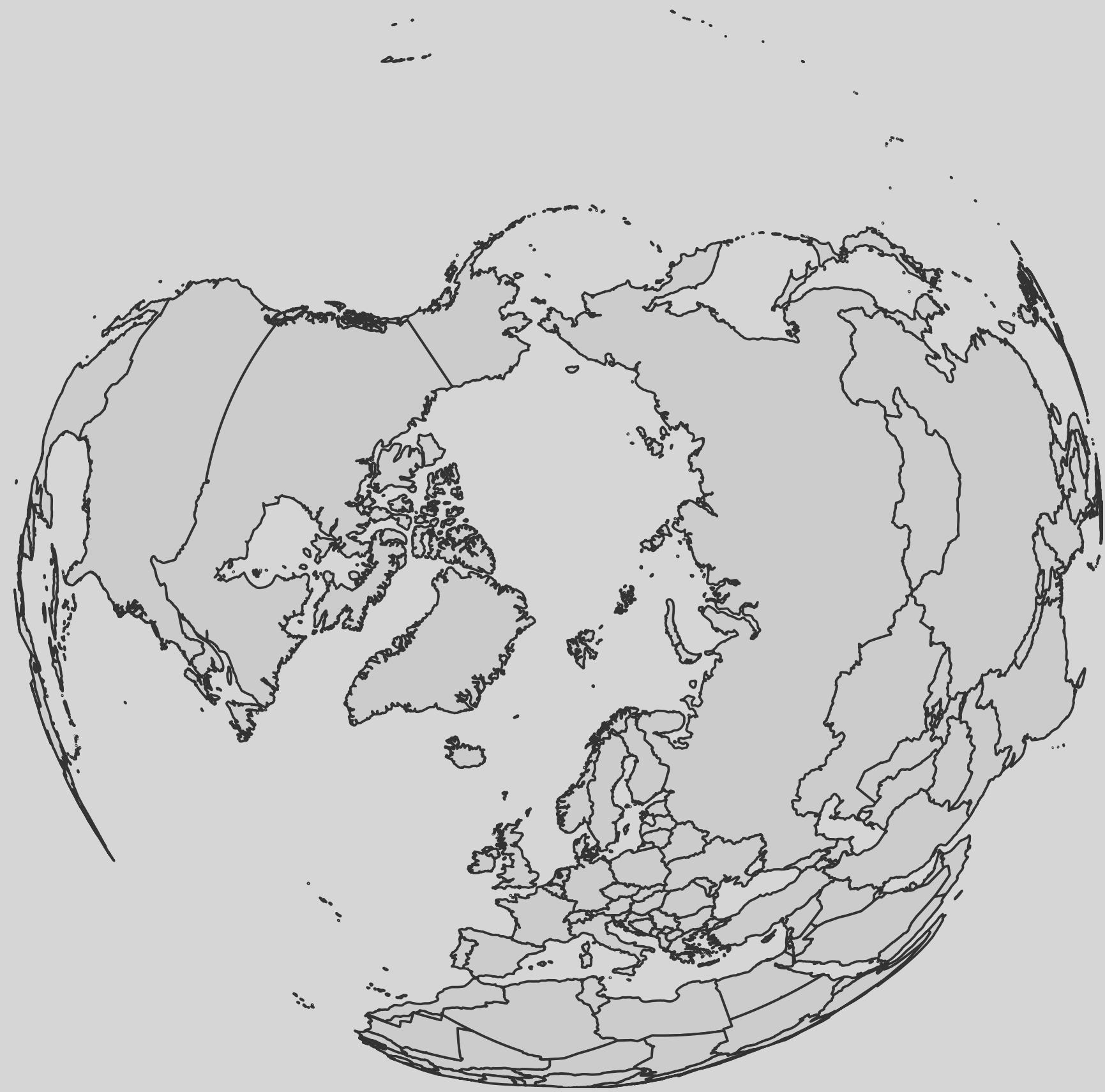
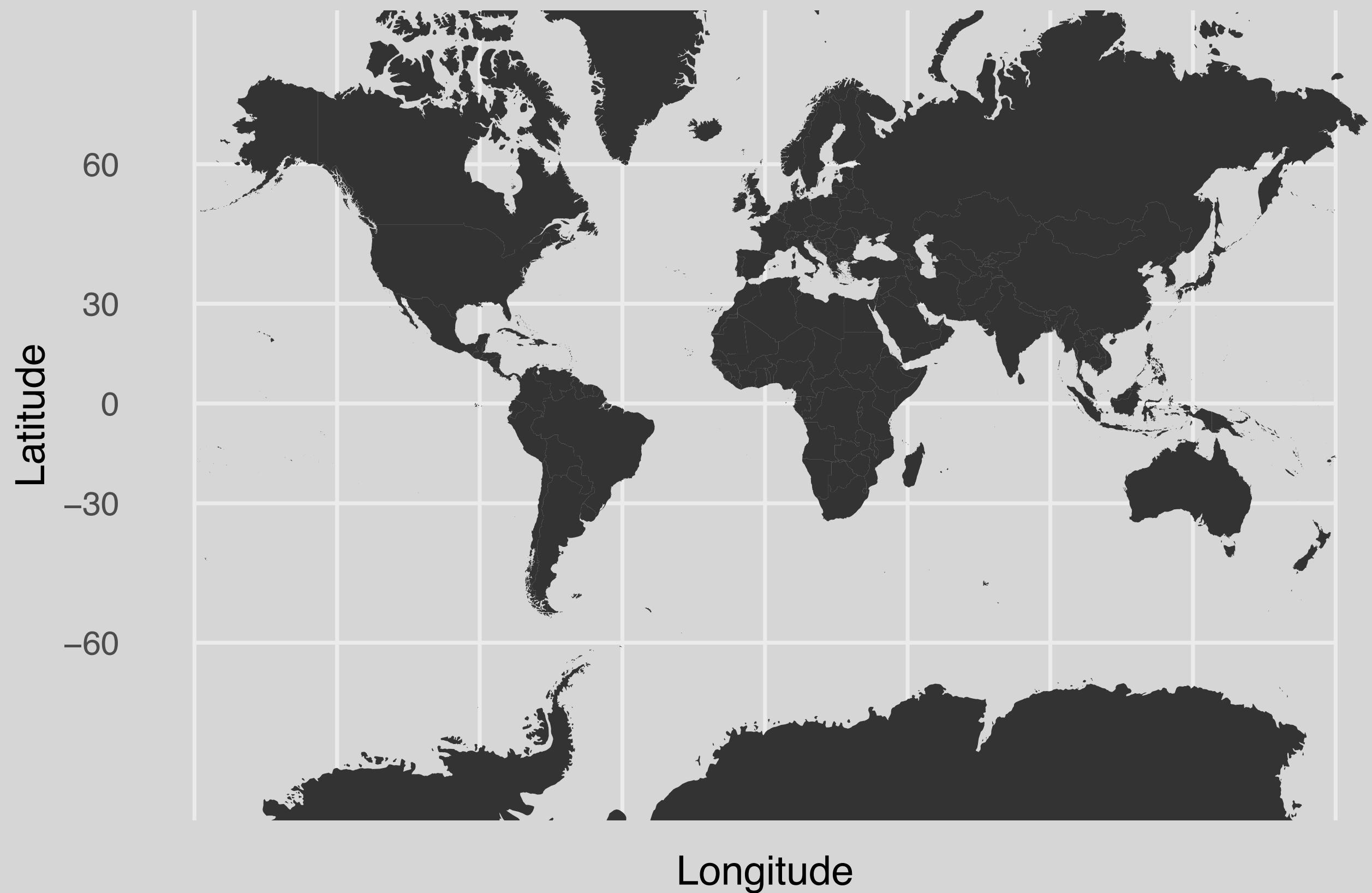
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## COORDINATE REFERENCE SYSTEM (CRS)

A coordinate reference system defines the mathematical approach used to **flatten (project)** a spherical object into 2D space...

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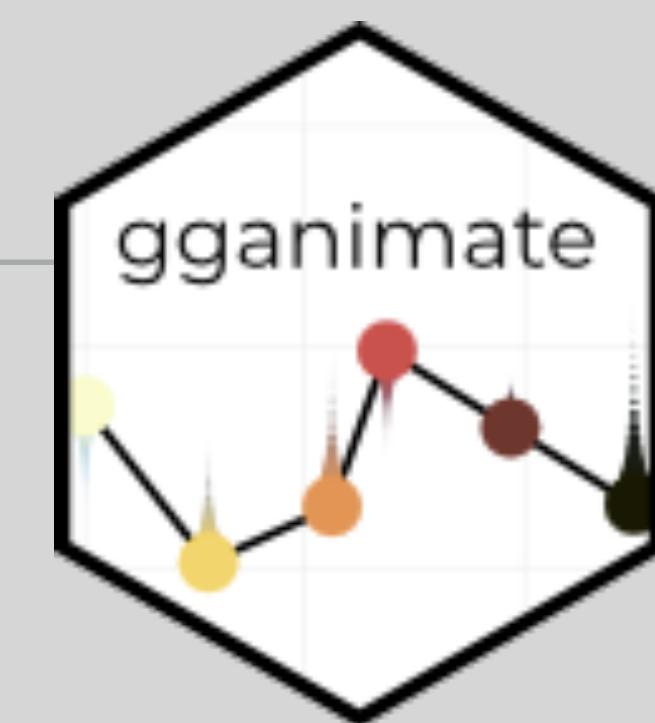
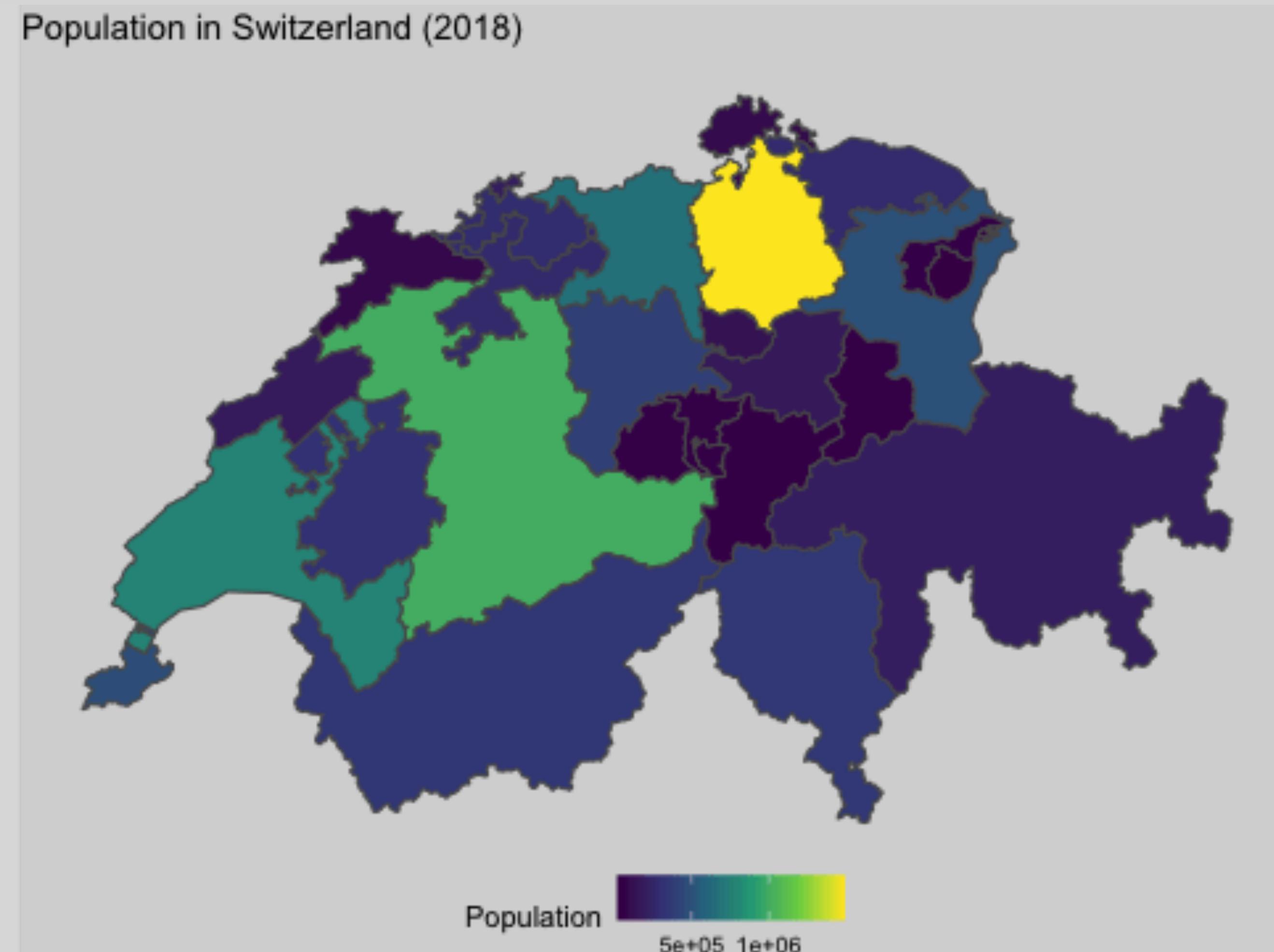
“Every plot is a projection”



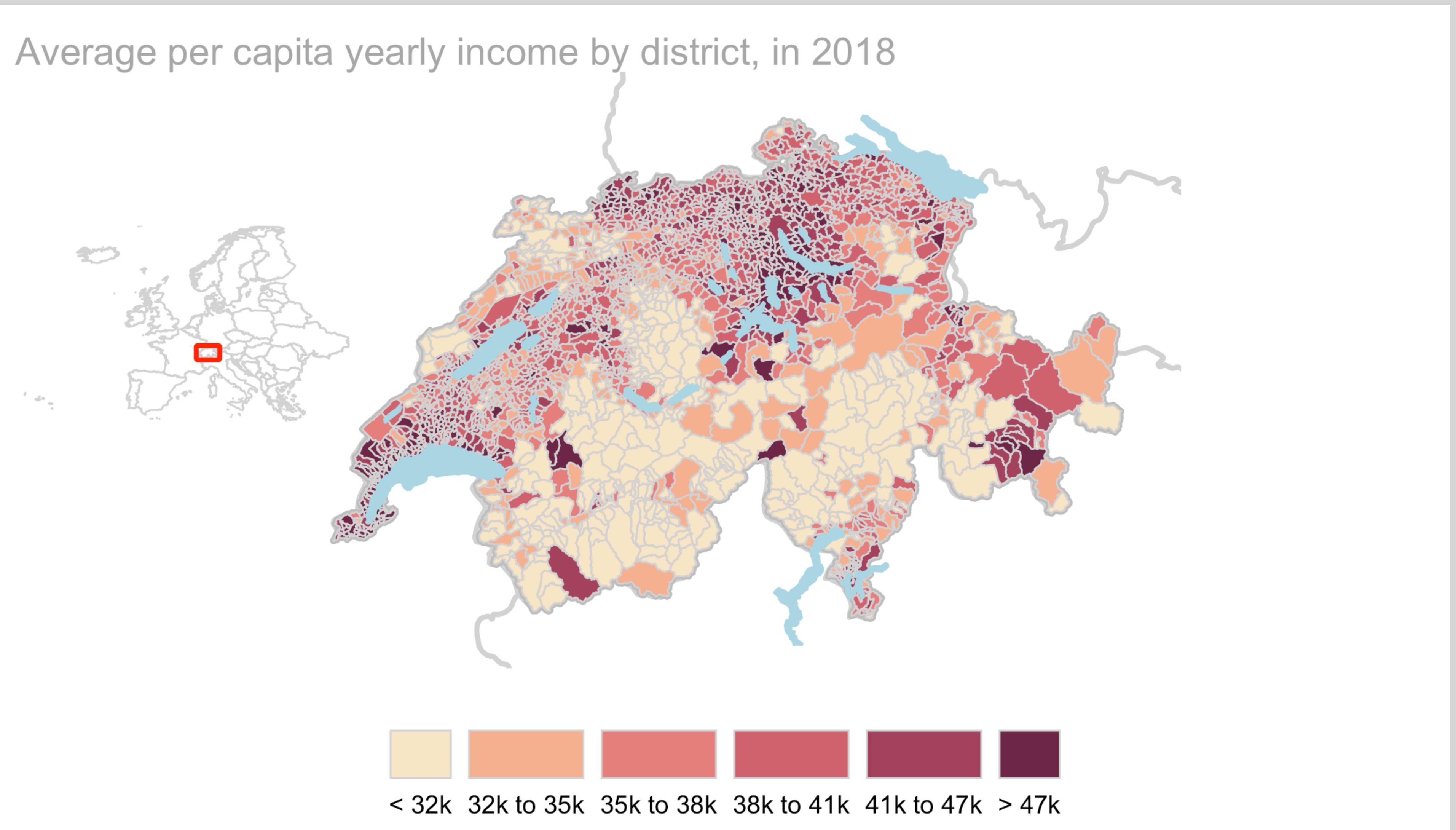
Let's get our hands dirty...

Why we use {ggplot2}...

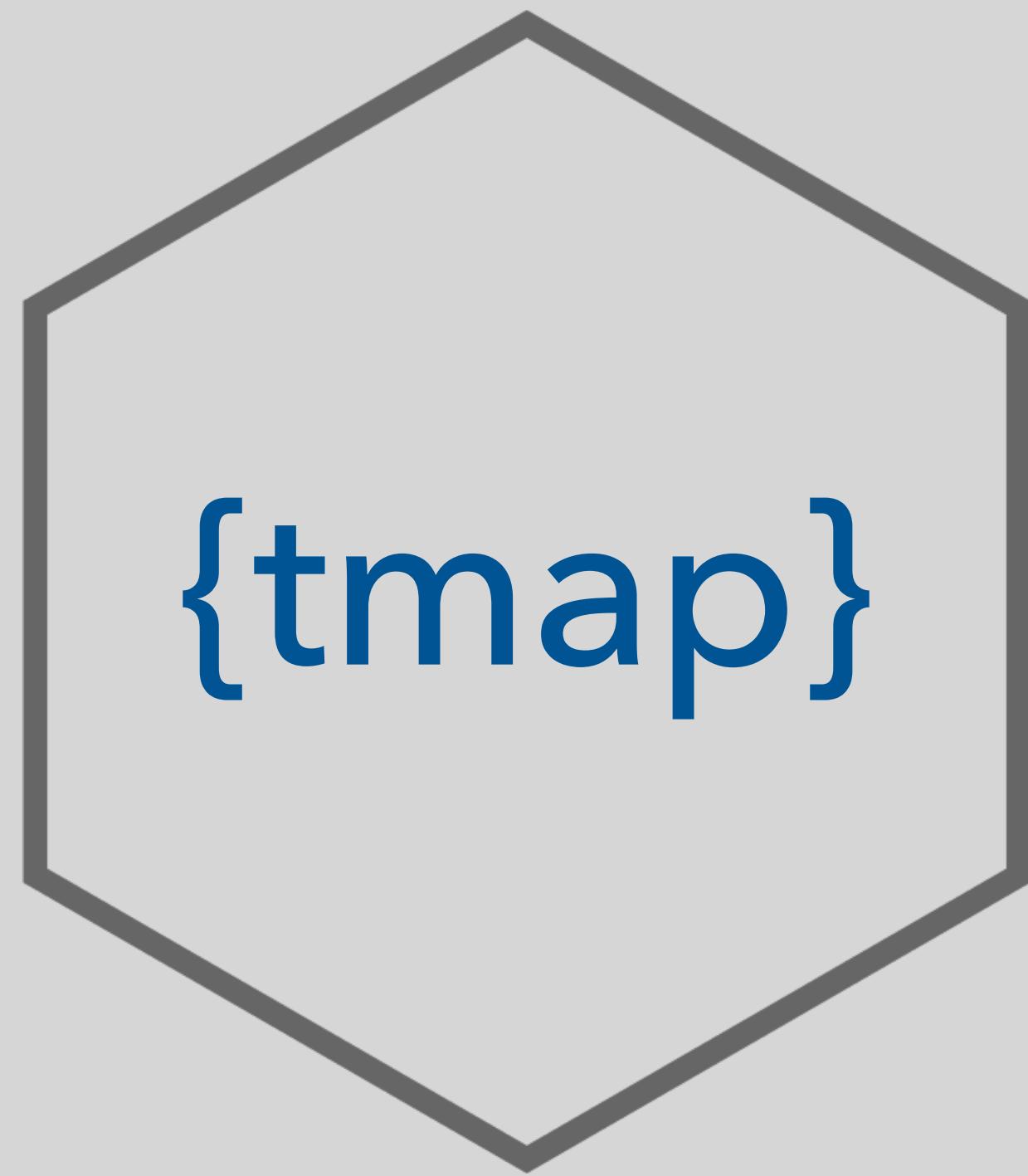
# Advantages of using {ggplot2}: being able to create animations



# Advantages of using {ggplot2}: {patchwork} and all other extensions



- **{patchwork}**: a library to combine multiple plots

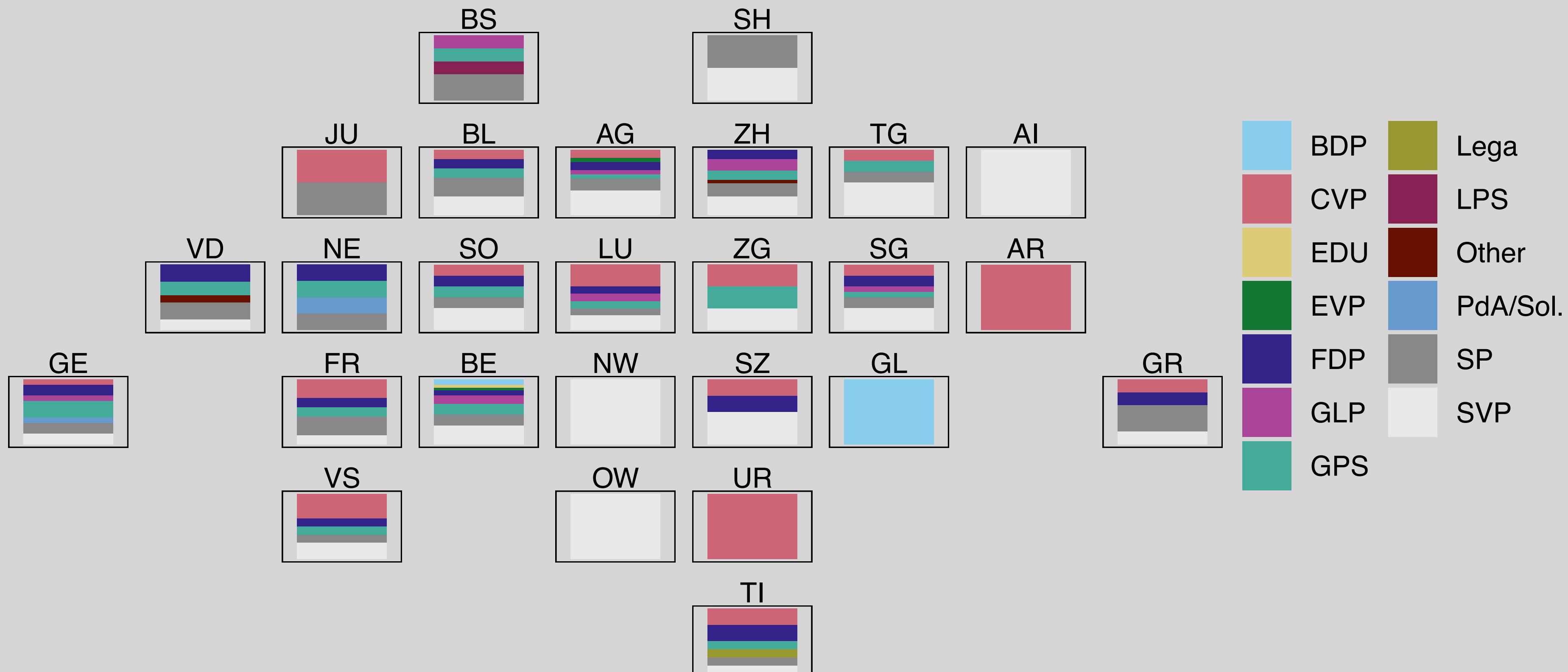


*Sorry, no logo!*

*A cartography-specific visualization package*

More packages for spatial data  
visualization...

## Parties selected by canton, in the Swiss National Council Results of 2019 elections



- **geo\_facet()**: an alternative to **facet\_wrap()**

# DOWNLOADING OPEN STREET MAP FEATURES



- {OSM}: a package to download Open Street Map features

Recap: we have only worked with **vector**  
data

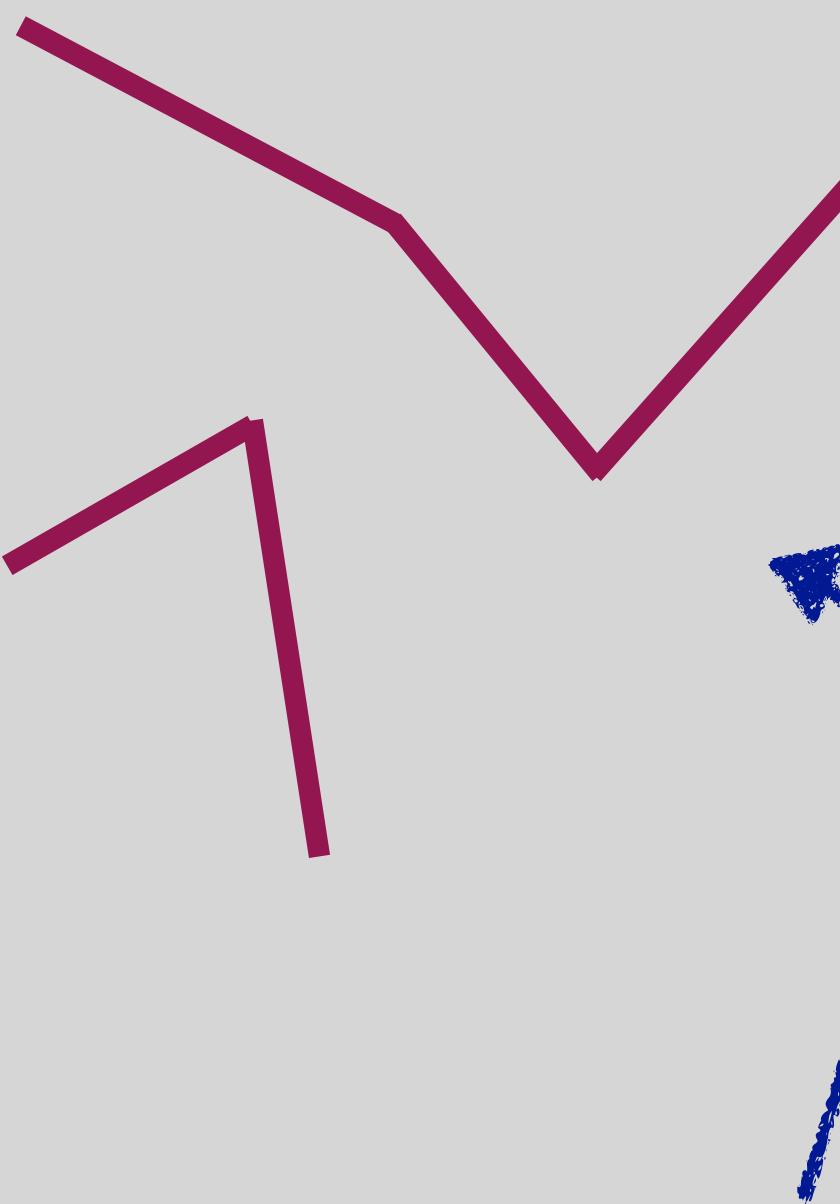
# VECTOR DATA

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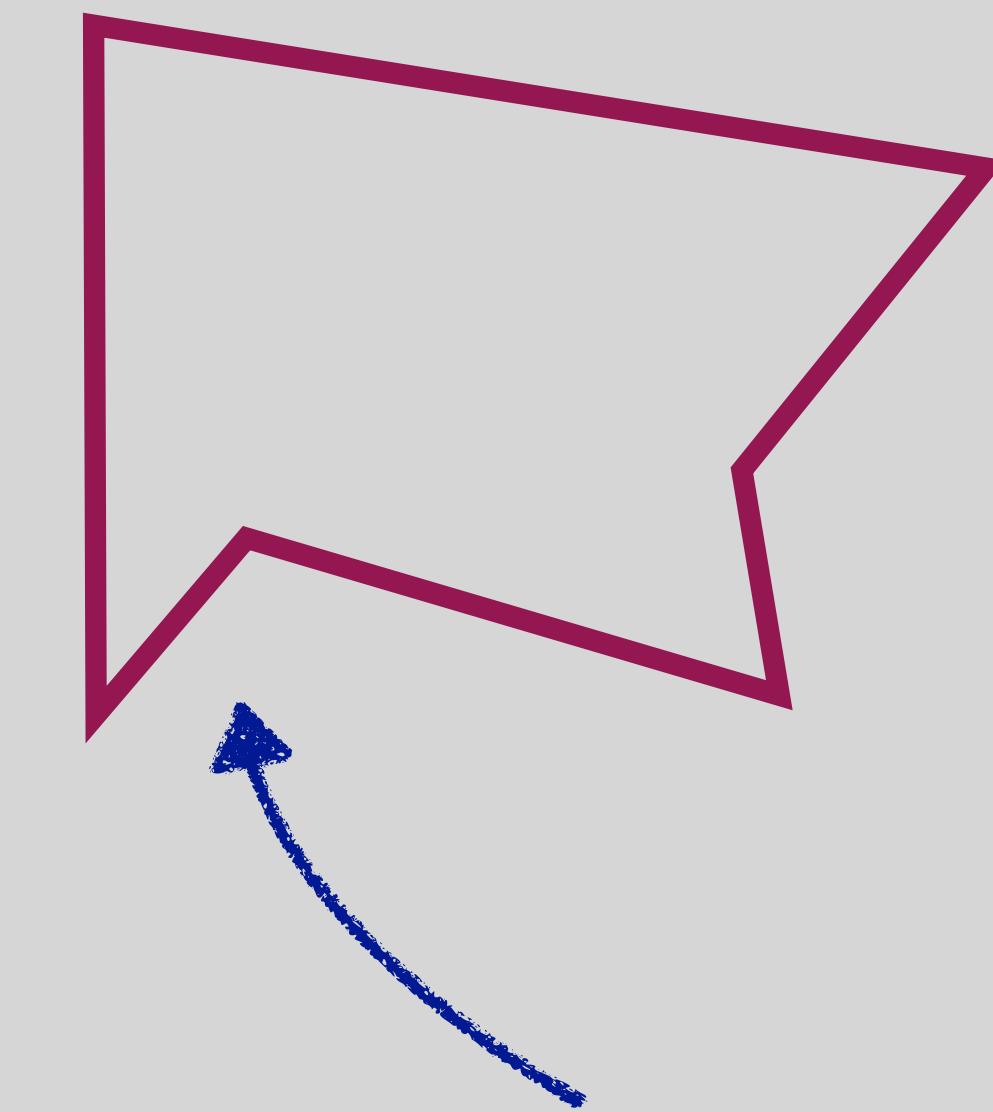
**Points**

eg. shop location, a  
house location etc...



**Lines**

eg. roads, train tracks,  
river, ski routes...



**Polygon**

eg. buildings, country  
borders, geological  
areas etc...

# VECTOR DATA

```
> class(lakes)
```

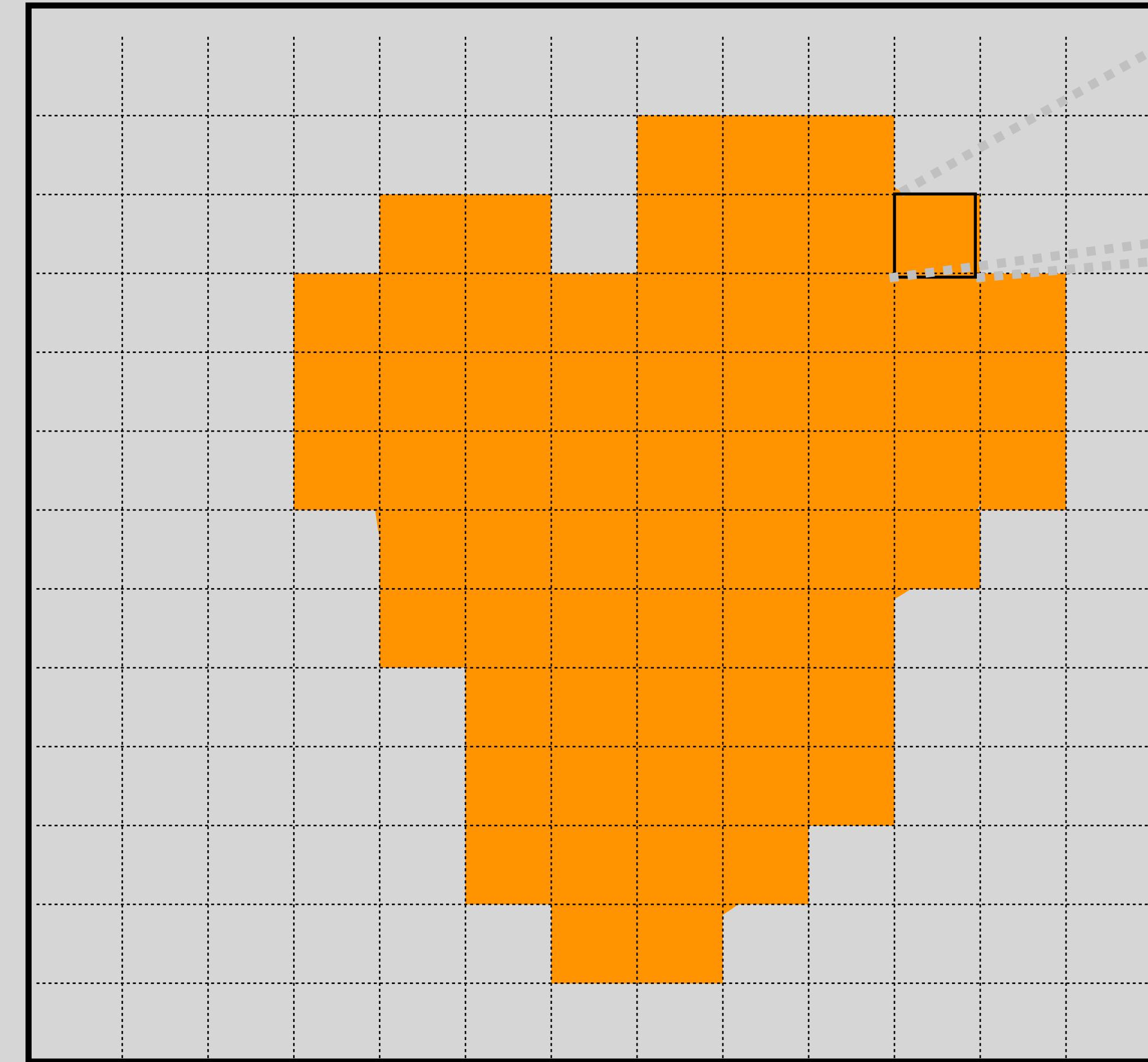
```
[1] "sf"
```

# "data.frame"

Data types we did not cover: raster data

# RASTERS

Latitude



Longitude



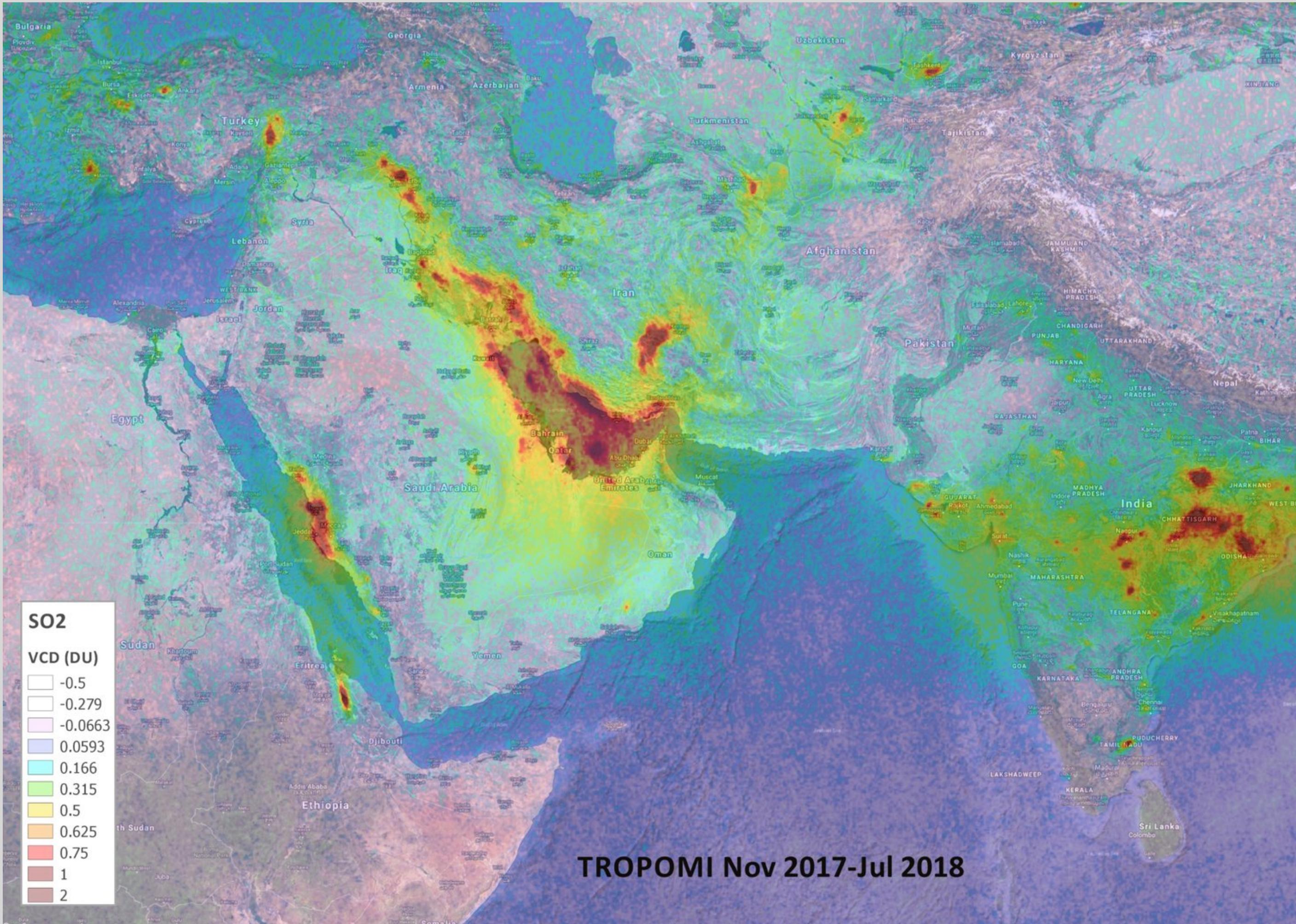
Cell

Width



# RASTERS: Example

- Used for continuous variables : eg. population density, air pollution, surface temperature



# R Packages

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## Import and manipulation

- {sf}
- {raster}
- {stars}
- {terra}

## Visualization

- {ggplot2}
- {tmap}
- {cartography}
- {leaflet}
- {rayshader}
- {mapdeck}

# Thank you for your attention!

## Contacts:



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