

## Results on Tuesday 23rd

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## Introduction

This report presents the latest results of our work on the project. We will present the results of our analysis on the data we have been given, mostly through visualizations.

## Density Histograms

These plots shows the temperature densities for each year, each variable and each country. We will first look at the whole country, and then we will look at particular points.

## Country level

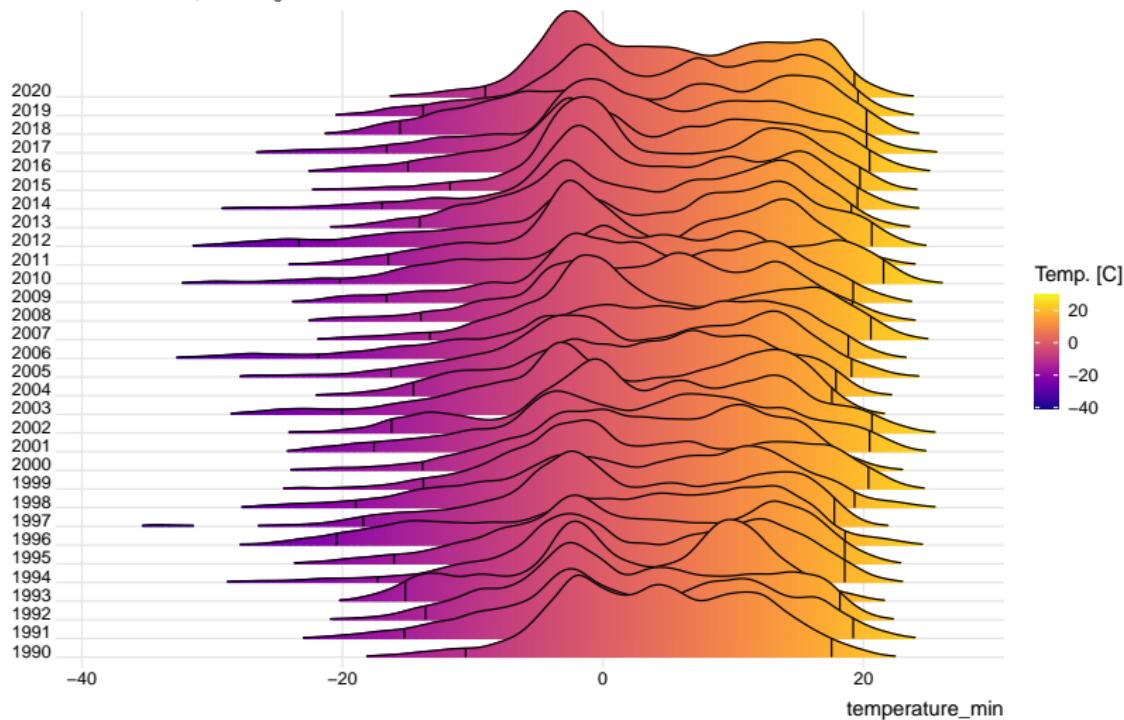
The next slides show 3D density histograms for each variable at the country level.

# Ukraine - Min

## Temperatures in Ukraine

temperature\_min (Celsius) by year between 1990 and 2020

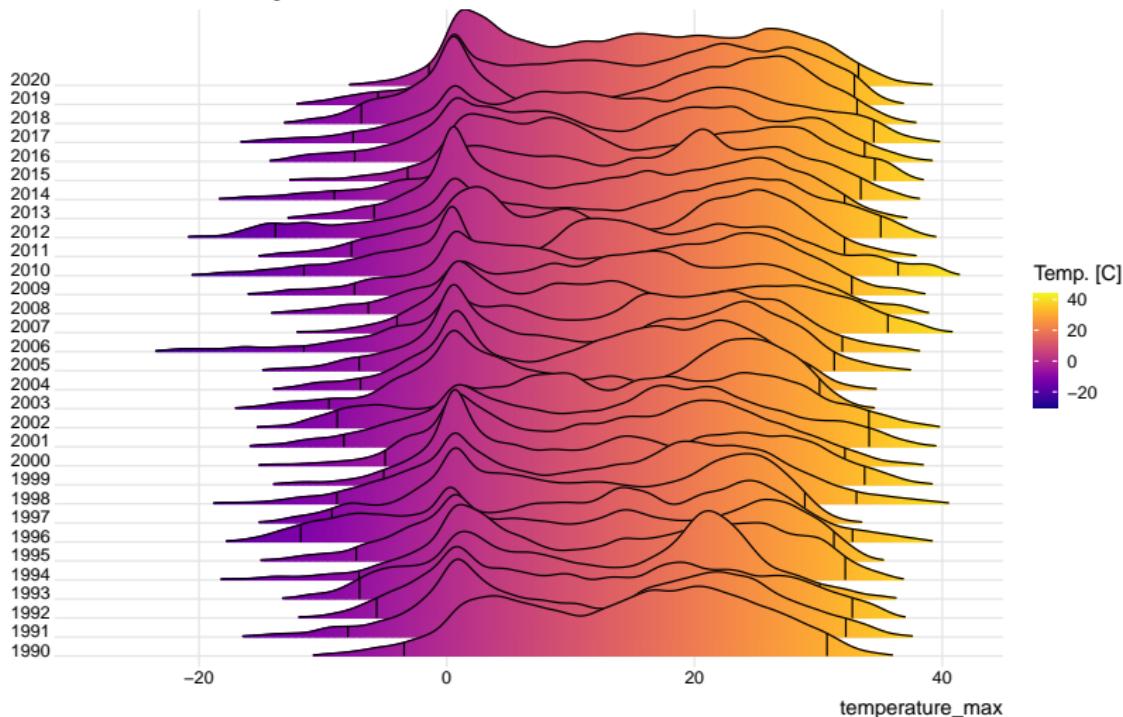
bandwidth = 0.75, kernel = gaussian



# Ukraine - Max

## Temperatures in Ukraine

temperature\_max (Celsius) by year between 1990 and 2020  
bandwidth = 0.75, kernel = gaussian

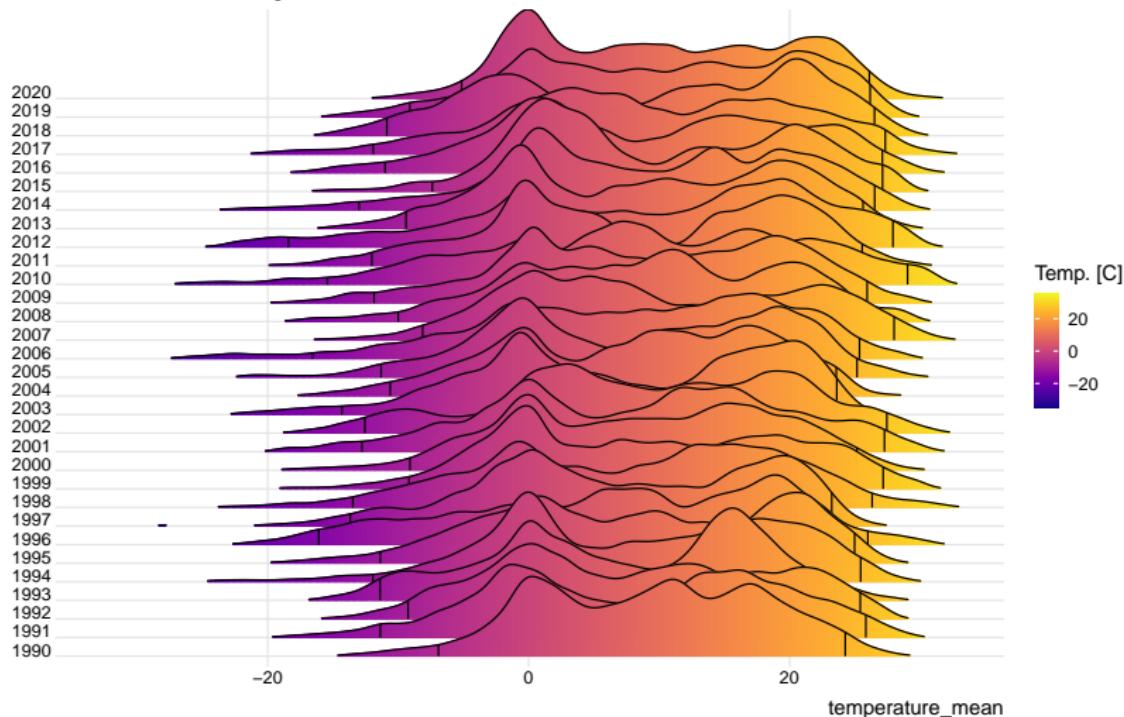


# Ukraine - Mean

## Temperatures in Ukraine

temperature\_mean (Celsius) by year between 1990 and 2020

bandwidth = 0.75, kernel = gaussian

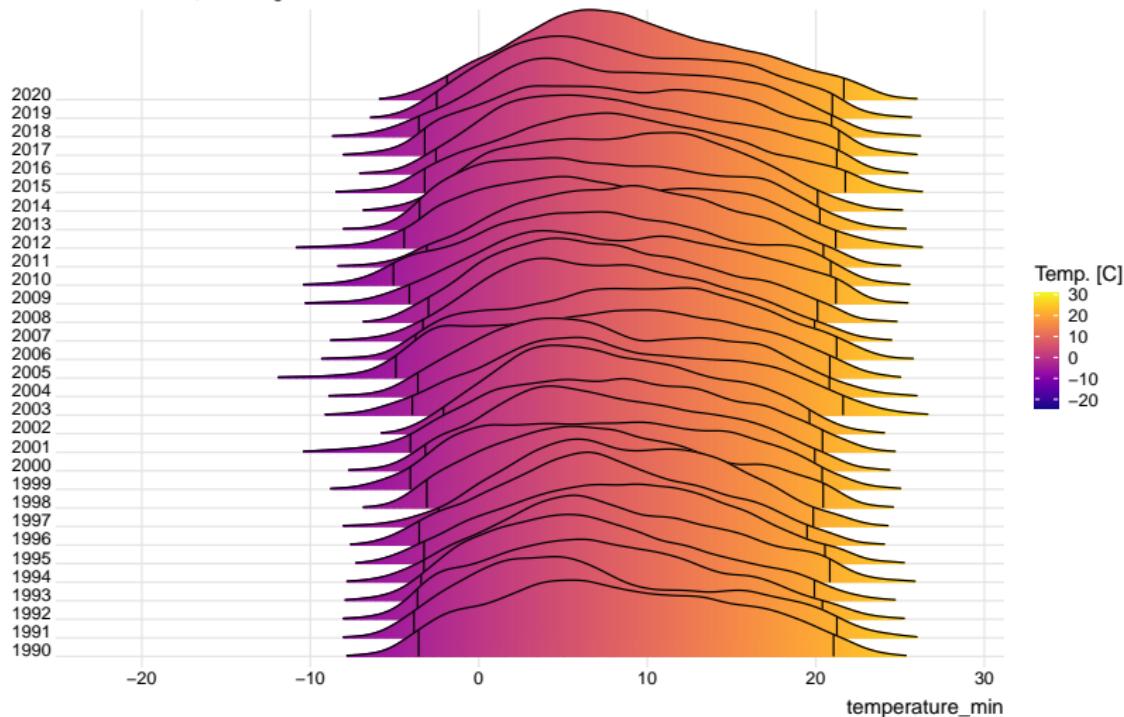


# Spain - Min

## Temperatures in Spain

temperature\_min (Celsius) by year between 1990 and 2020

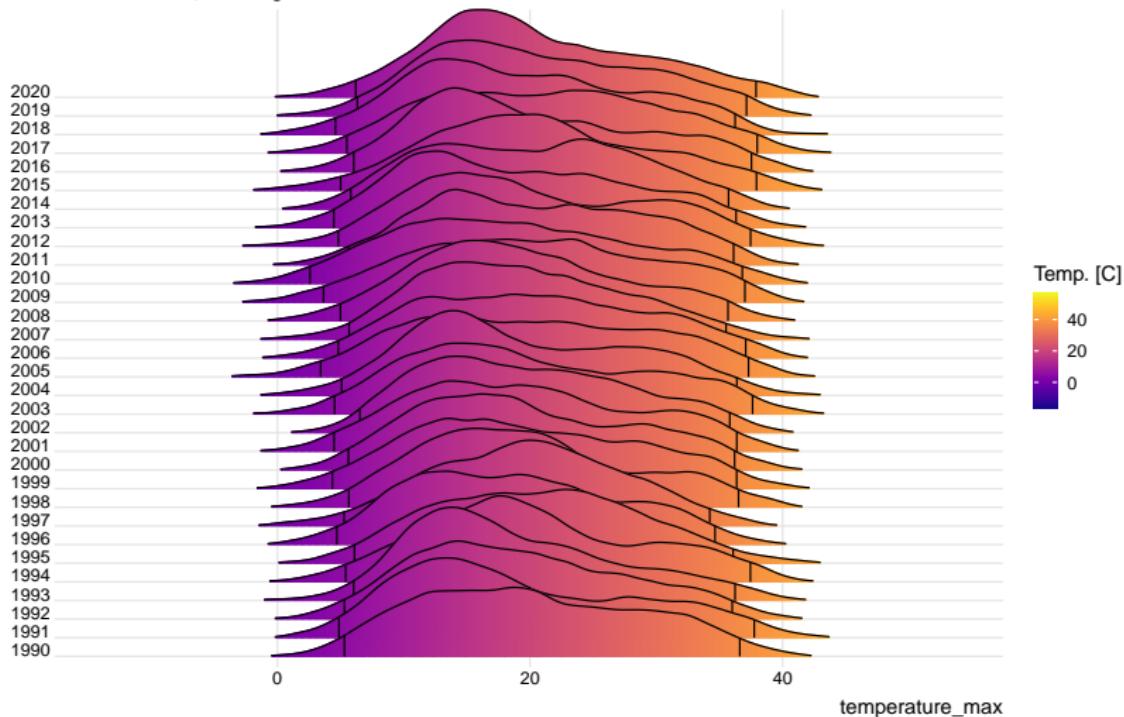
bandwidth = 0.75, kernel = gaussian



# Spain - Max

## Temperatures in Spain

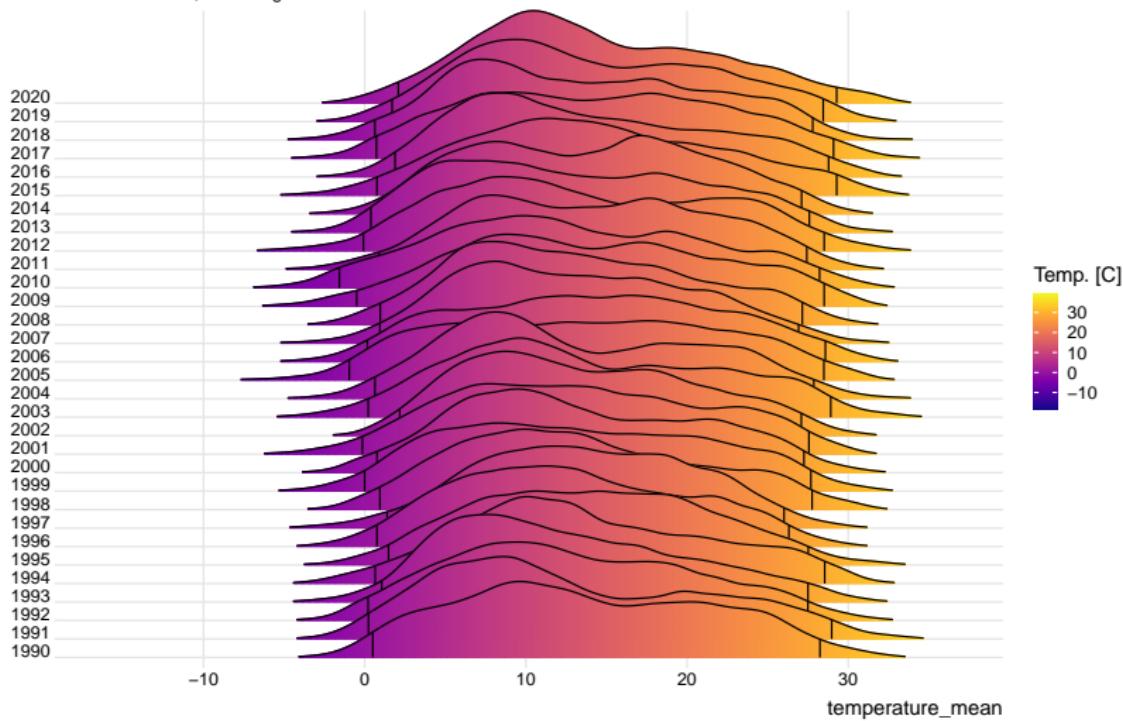
temperature\_max (Celsius) by year between 1990 and 2020  
bandwidth = 0.75, kernel = gaussian



# Spain - Mean

## Temperatures in Spain

temperature\_mean (Celsius) by year between 1990 and 2020  
bandwidth = 0.75, kernel = gaussian

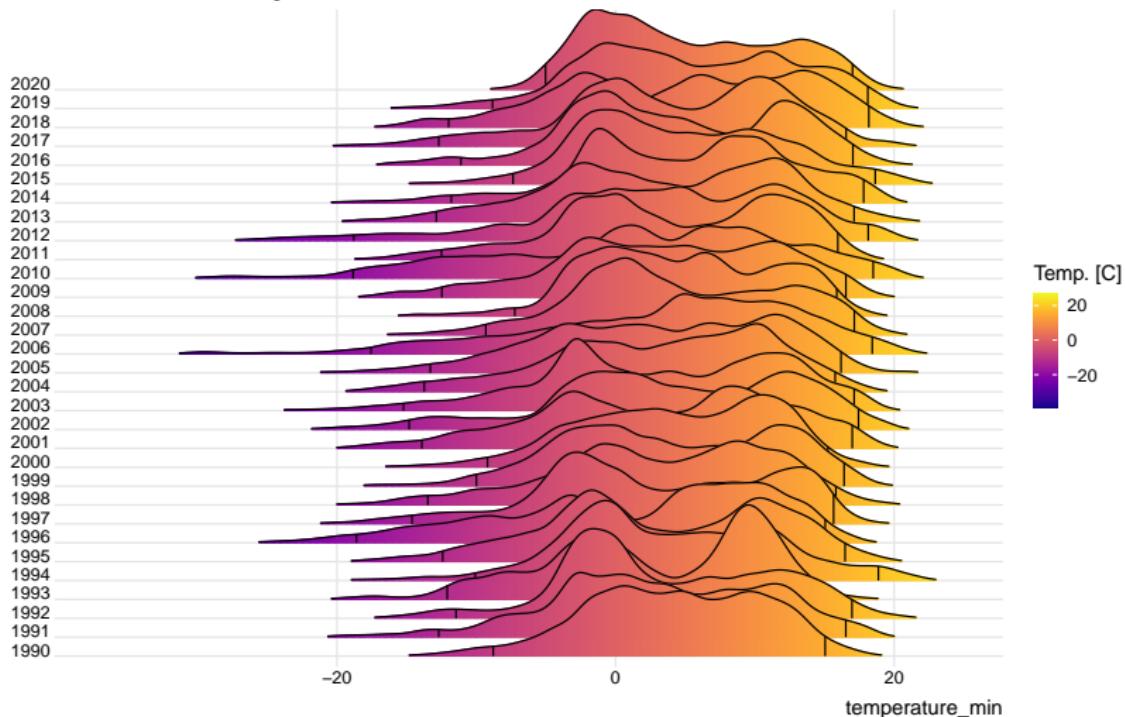


# Poland - Min

## Temperatures in Poland

temperature\_min (Celsius) by year between 1990 and 2020

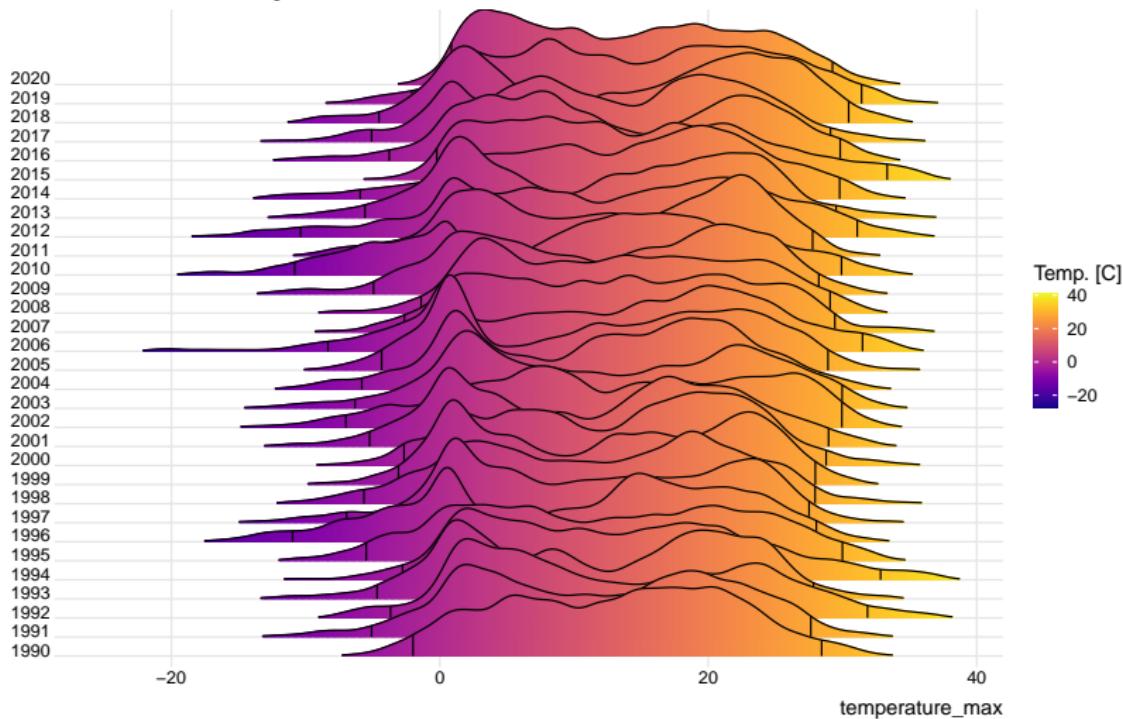
bandwidth = 0.75, kernel = gaussian



# Poland - Max

## Temperatures in Poland

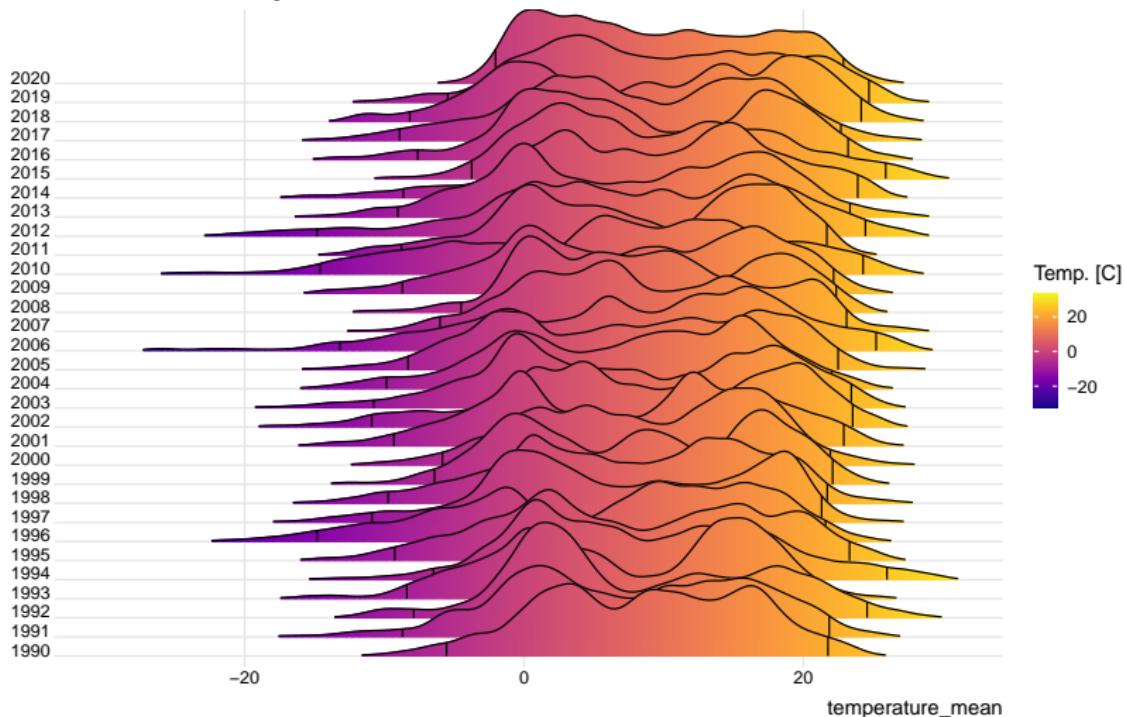
temperature\_max (Celsius) by year between 1990 and 2020  
bandwidth = 0.75, kernel = gaussian



# Poland - Mean

## Temperatures in Poland

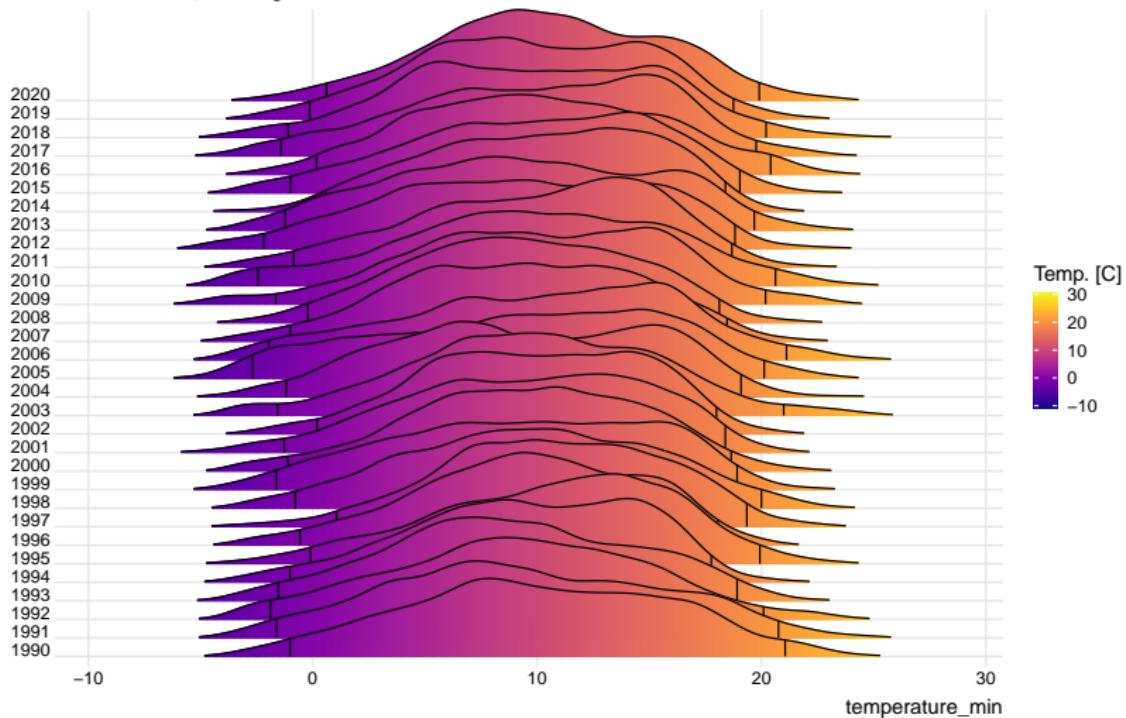
temperature\_mean (Celsius) by year between 1990 and 2020  
bandwidth = 0.75, kernel = gaussian



# Portugal - Min

## Temperatures in Portugal

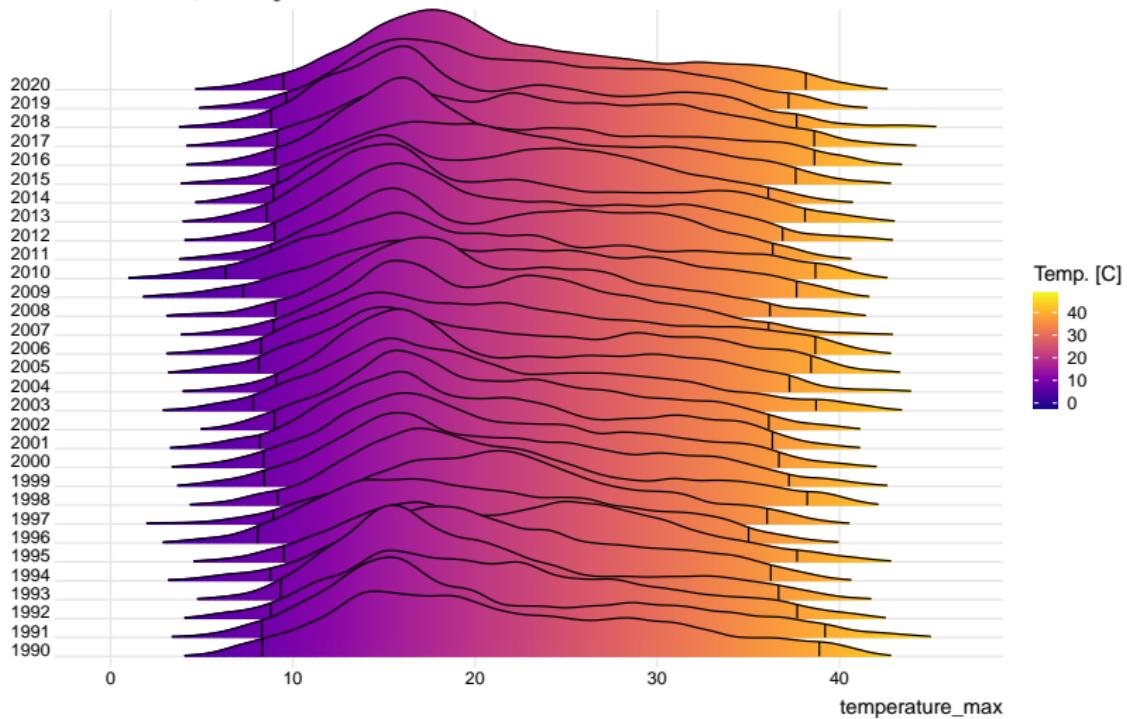
temperature\_min (Celsius) by year between 1990 and 2020  
bandwidth = 0.75, kernel = gaussian



# Portugal - Max

## Temperatures in Portugal

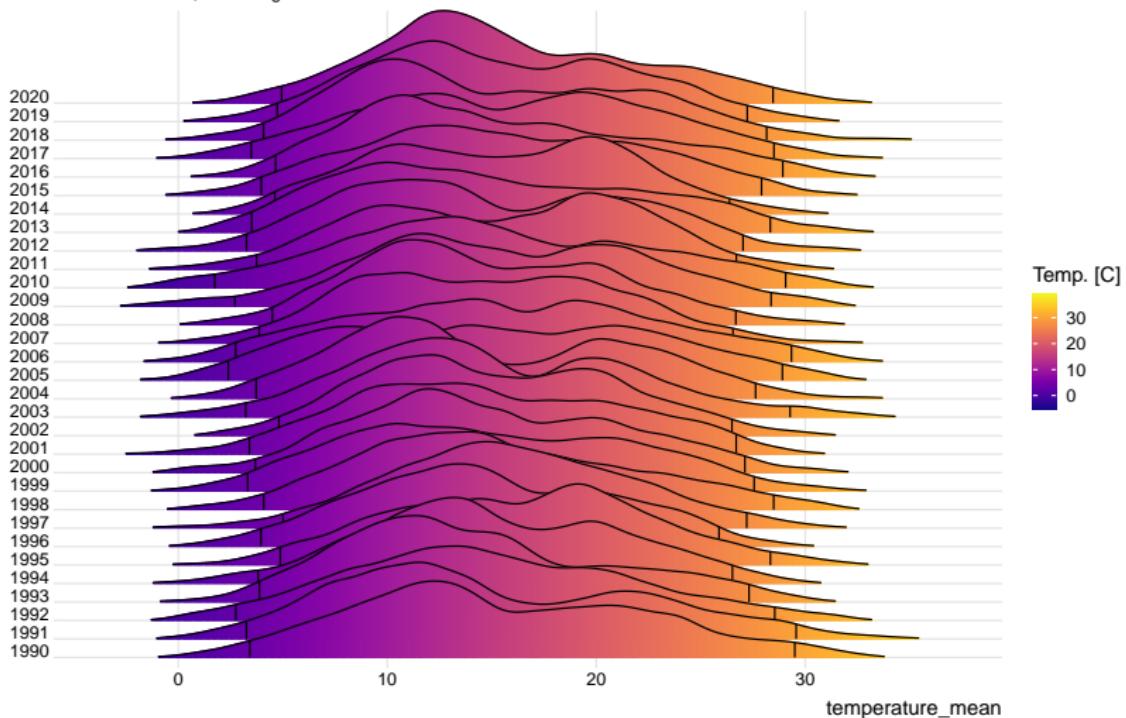
temperature\_max (Celsius) by year between 1990 and 2020  
bandwidth = 0.75, kernel = gaussian



# Portugal - Mean

## Temperatures in Portugal

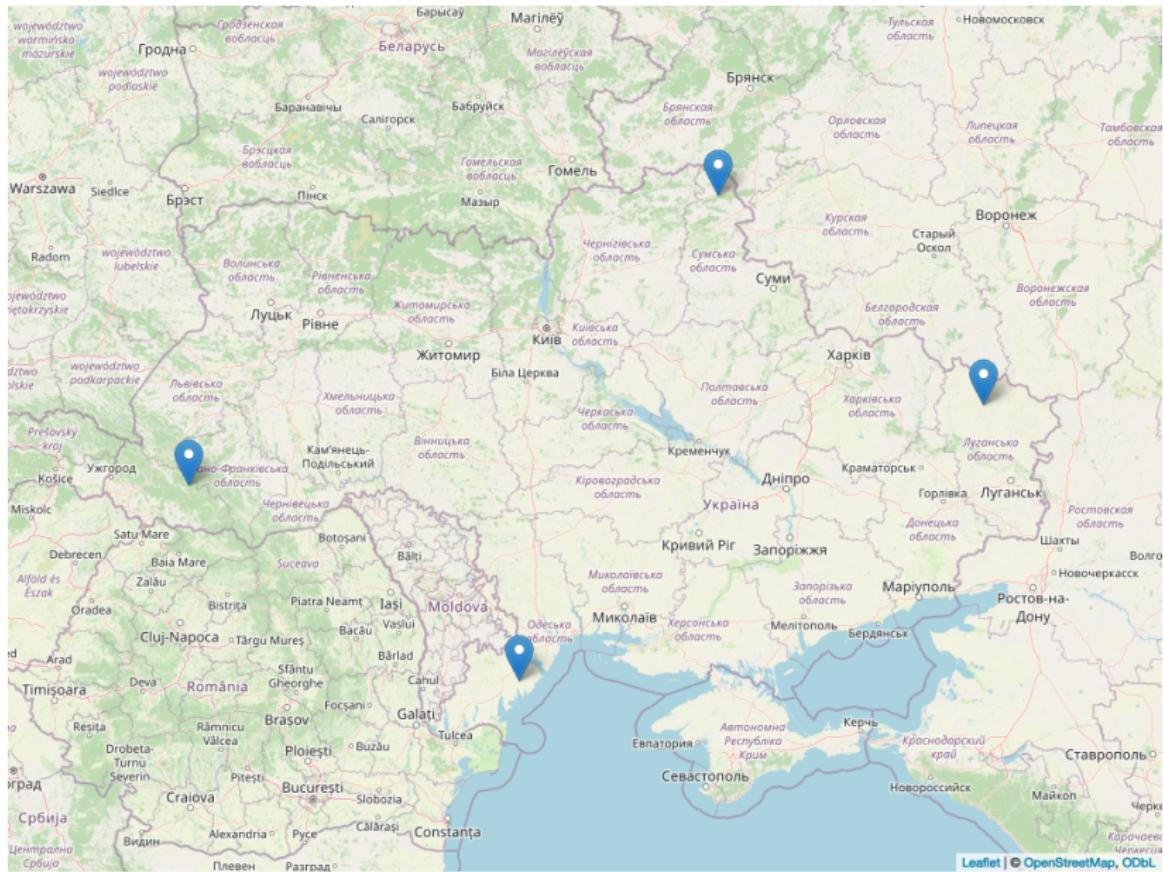
temperature\_mean (Celsius) by year between 1990 and 2020  
bandwidth = 0.75, kernel = gaussian



## Specific geographic points

The next slides show 3D density histograms for each variable at specific geographic points.

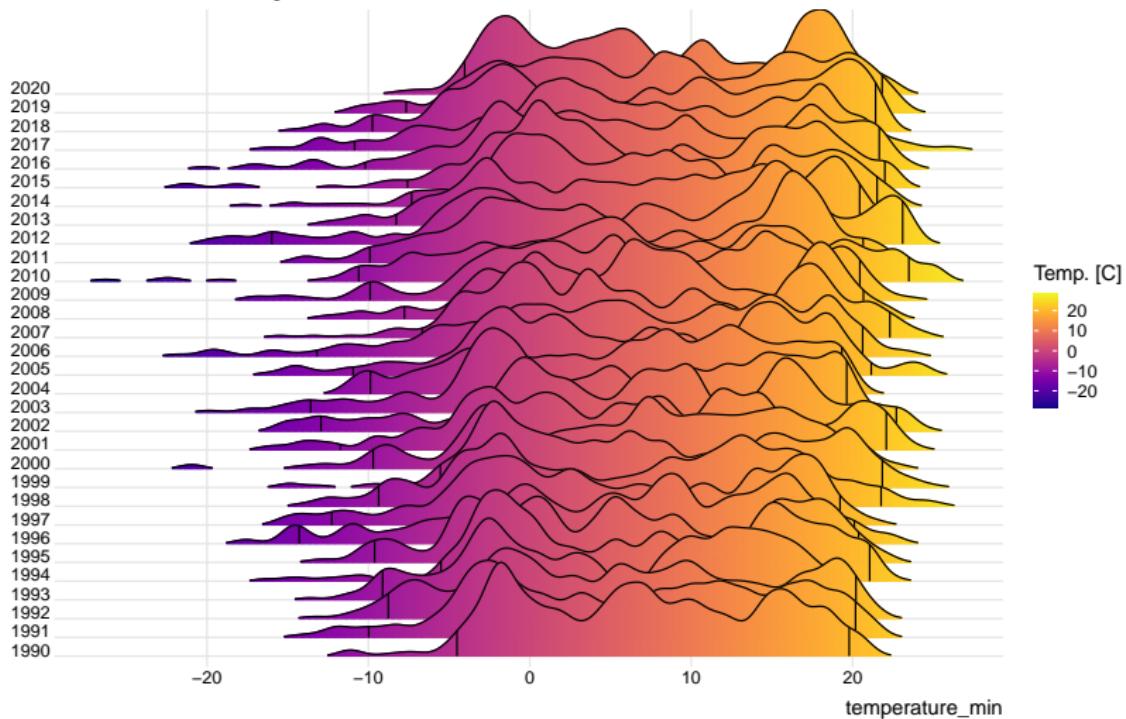
## Ukraine



# South

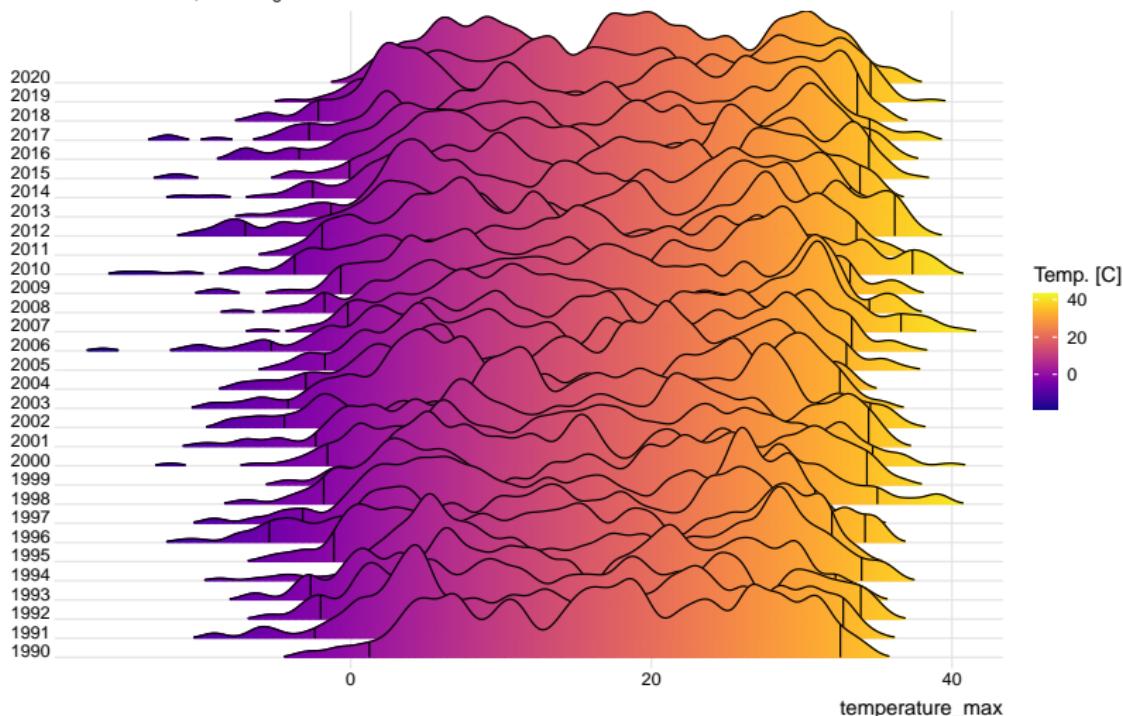
## Temperatures in Ukraine – South

temperature\_min (Celsius) by year between 1990 and 2020  
bandwidth = 0.75, kernel = gaussian



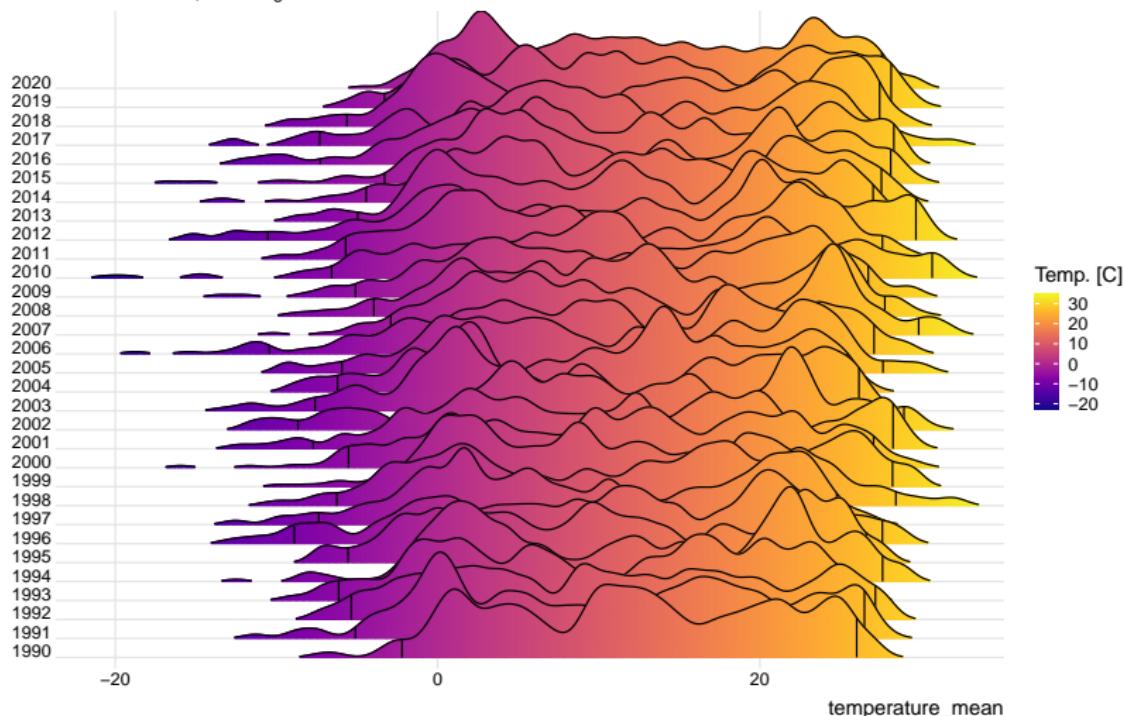
## Temperatures in Ukraine – South

temperature\_max (Celsius) by year between 1990 and 2020  
bandwidth = 0.75, kernel = gaussian



## Temperatures in Ukraine – South

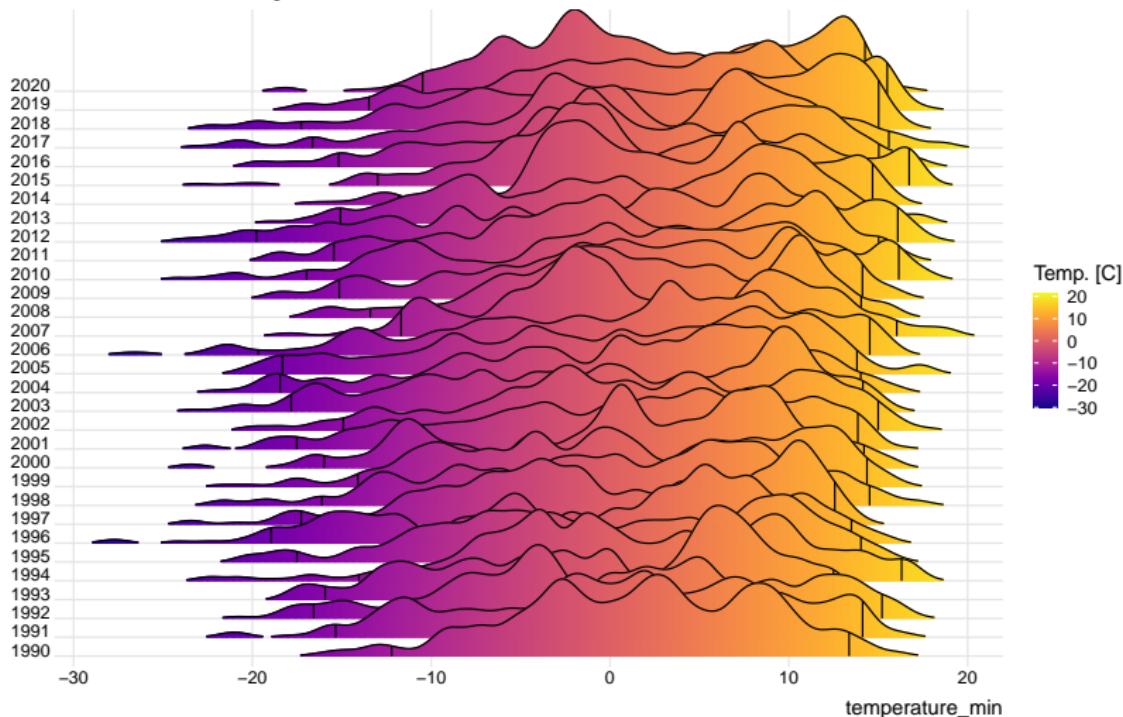
temperature\_mean (Celsius) by year between 1990 and 2020  
bandwidth = 0.75, kernel = gaussian



# West

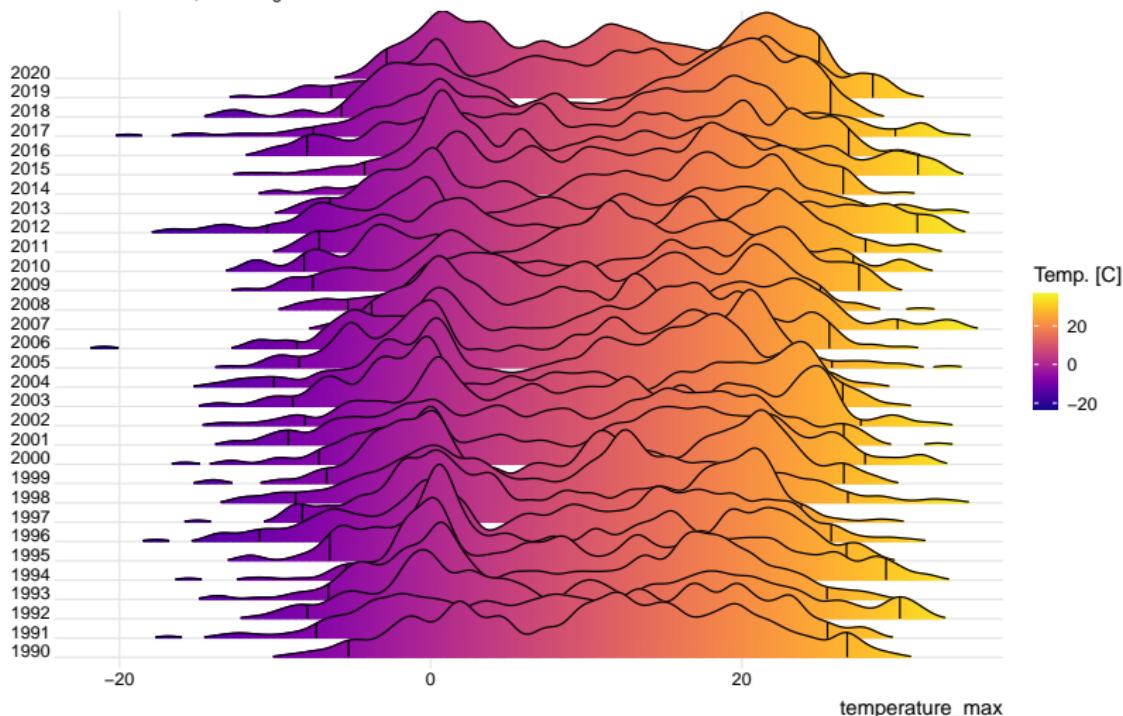
## Temperatures in Ukraine – West

temperature\_min (Celsius) by year between 1990 and 2020  
bandwidth = 0.75, kernel = gaussian



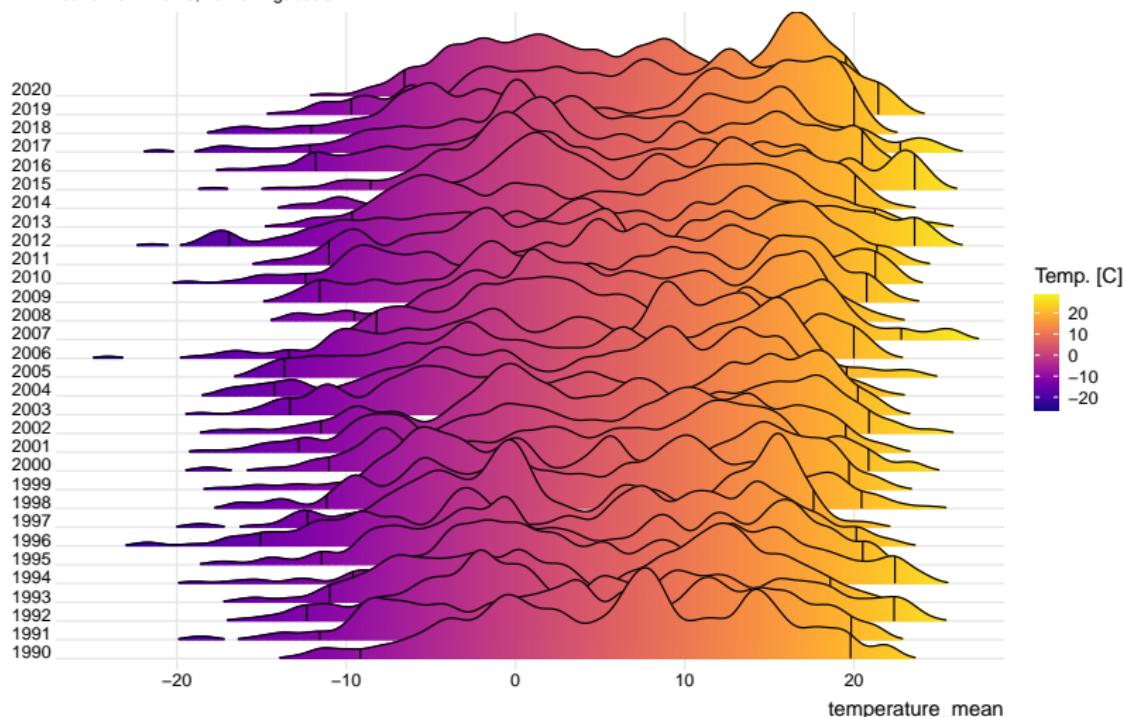
## Temperatures in Ukraine – West

temperature\_max (Celsius) by year between 1990 and 2020  
bandwidth = 0.75, kernel = gaussian



## Temperatures in Ukraine – West

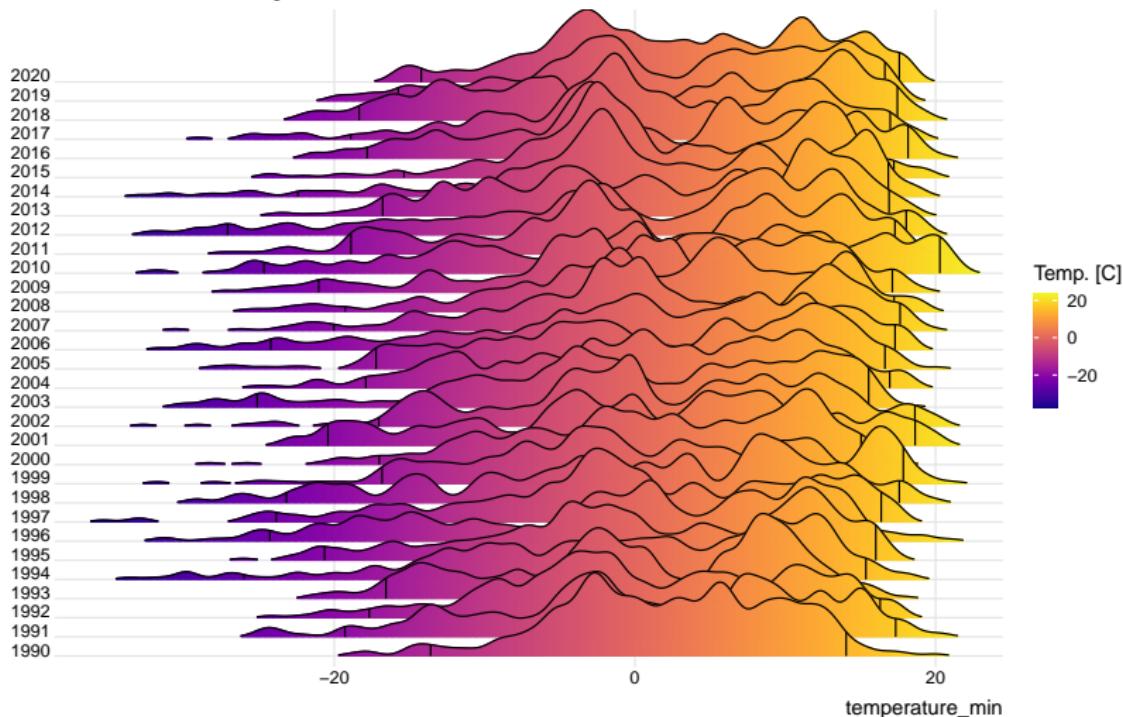
temperature\_mean (Celsius) by year between 1990 and 2020  
bandwidth = 0.75, kernel = gaussian



# North

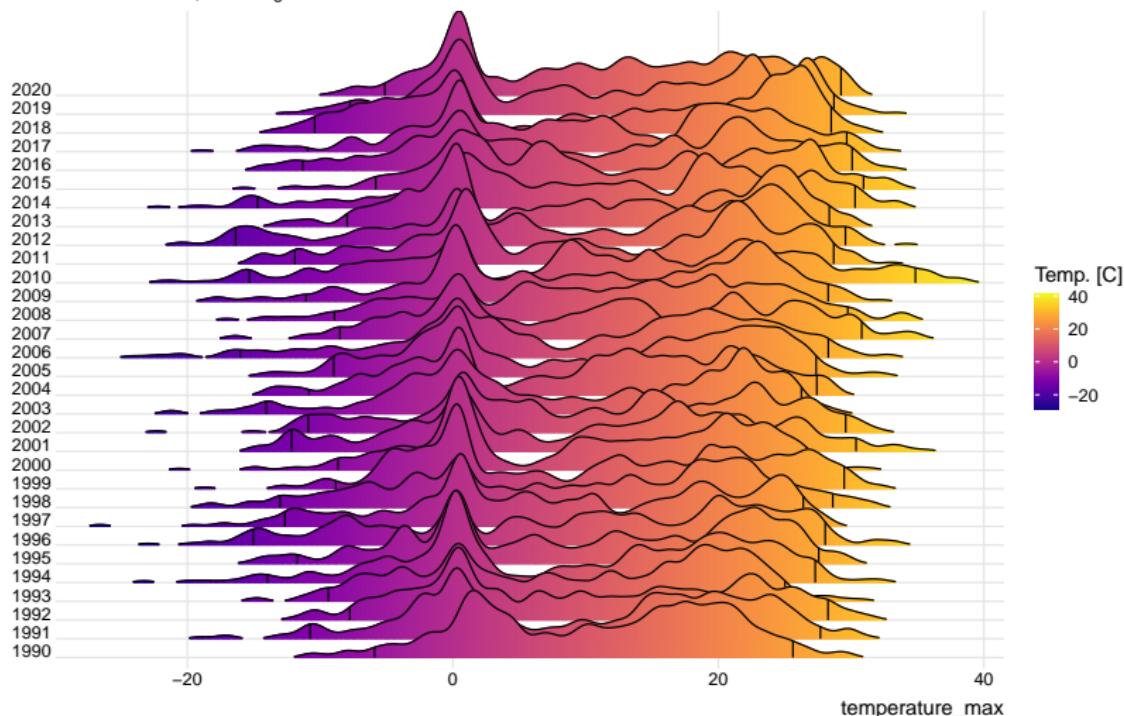
## Temperatures in Ukraine – North

temperature\_min (Celsius) by year between 1990 and 2020  
bandwidth = 0.75, kernel = gaussian



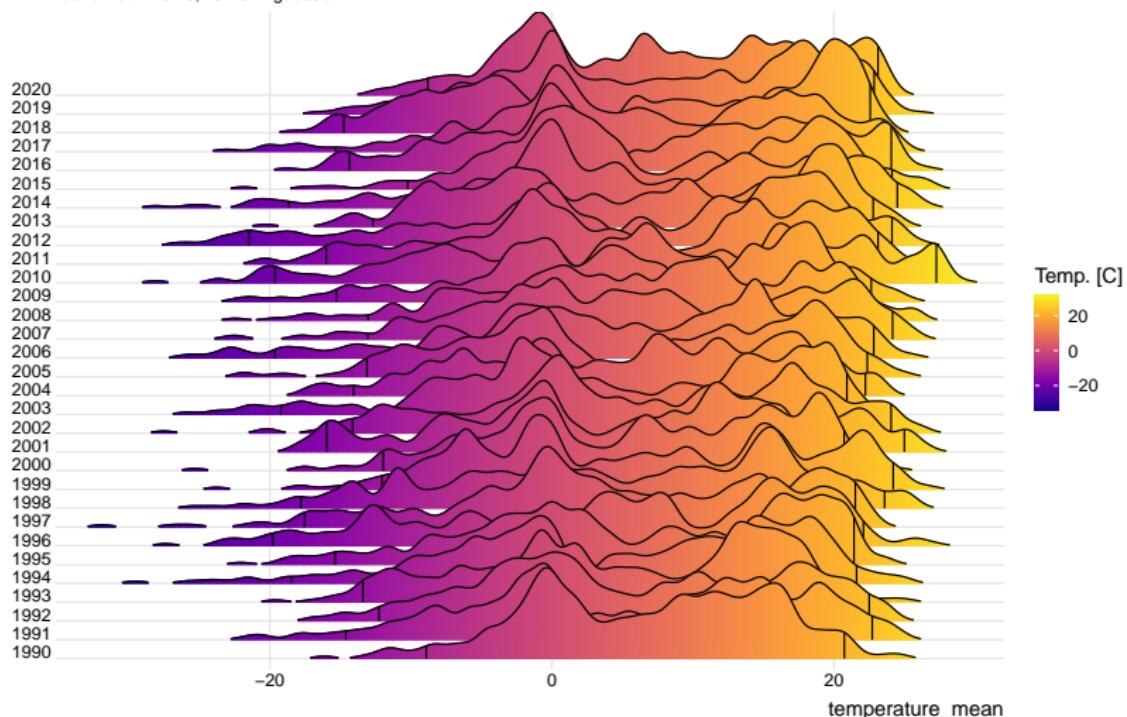
## Temperatures in Ukraine – North

temperature\_max (Celsius) by year between 1990 and 2020  
bandwidth = 0.75, kernel = gaussian



## Temperatures in Ukraine – North

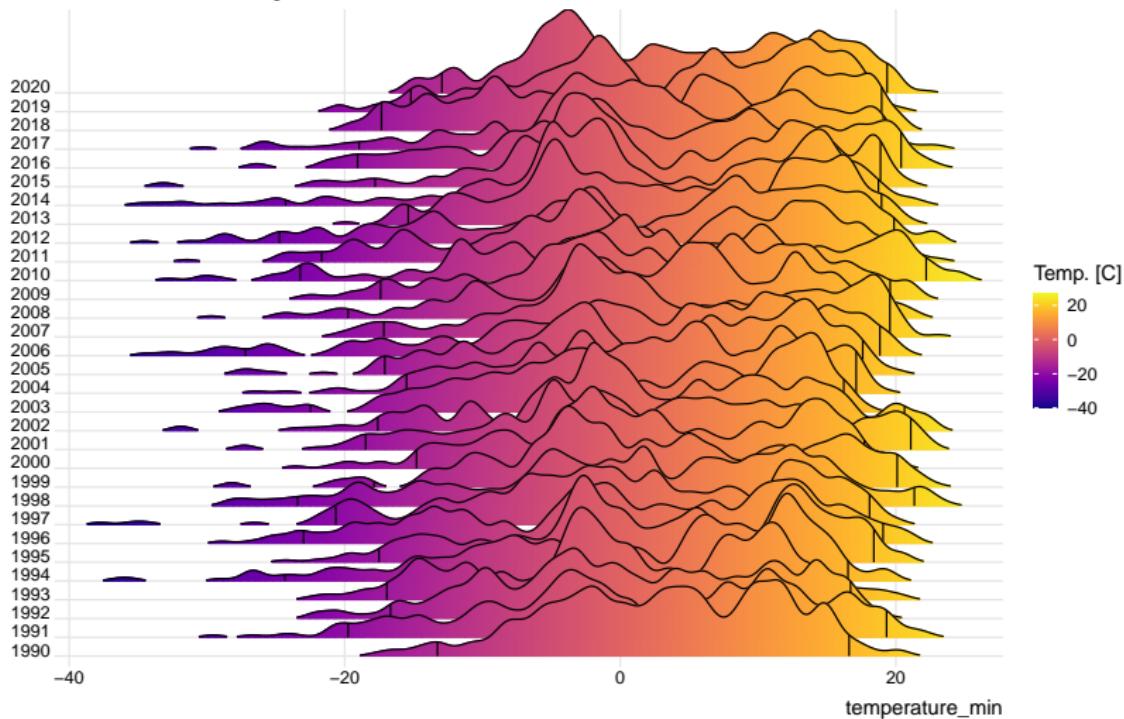
temperature\_mean (Celsius) by year between 1990 and 2020  
bandwidth = 0.75, kernel = gaussian



# East

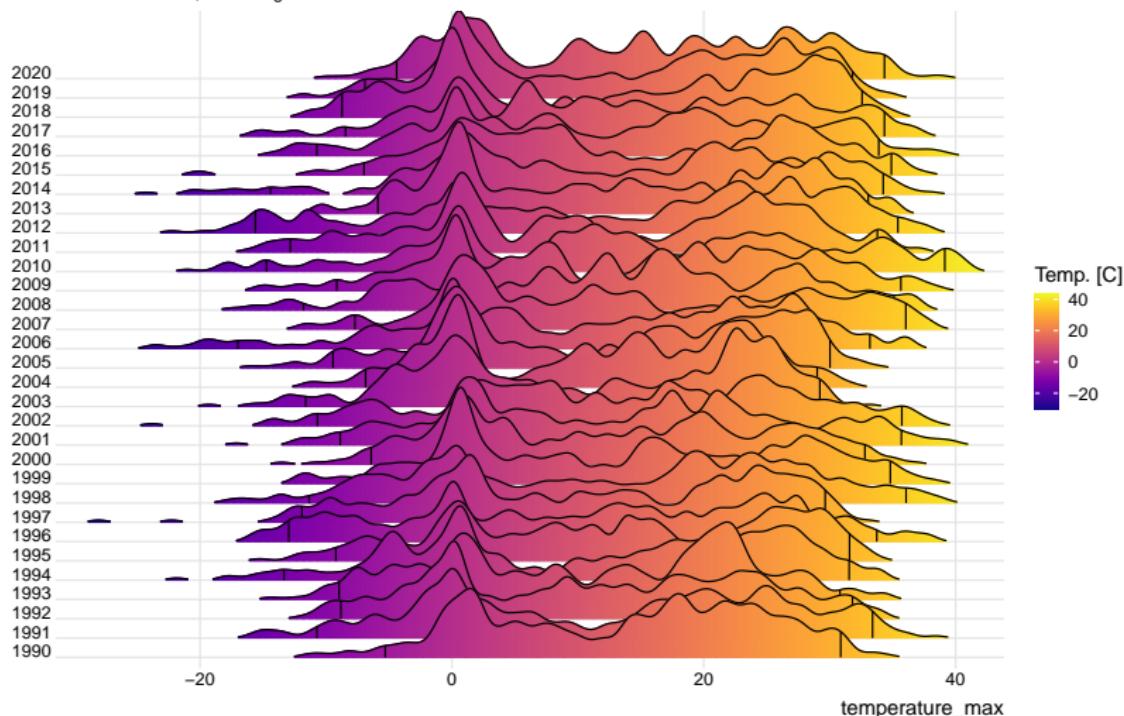
## Temperatures in Ukraine – East

temperature\_min (Celsius) by year between 1990 and 2020  
bandwidth = 0.75, kernel = gaussian



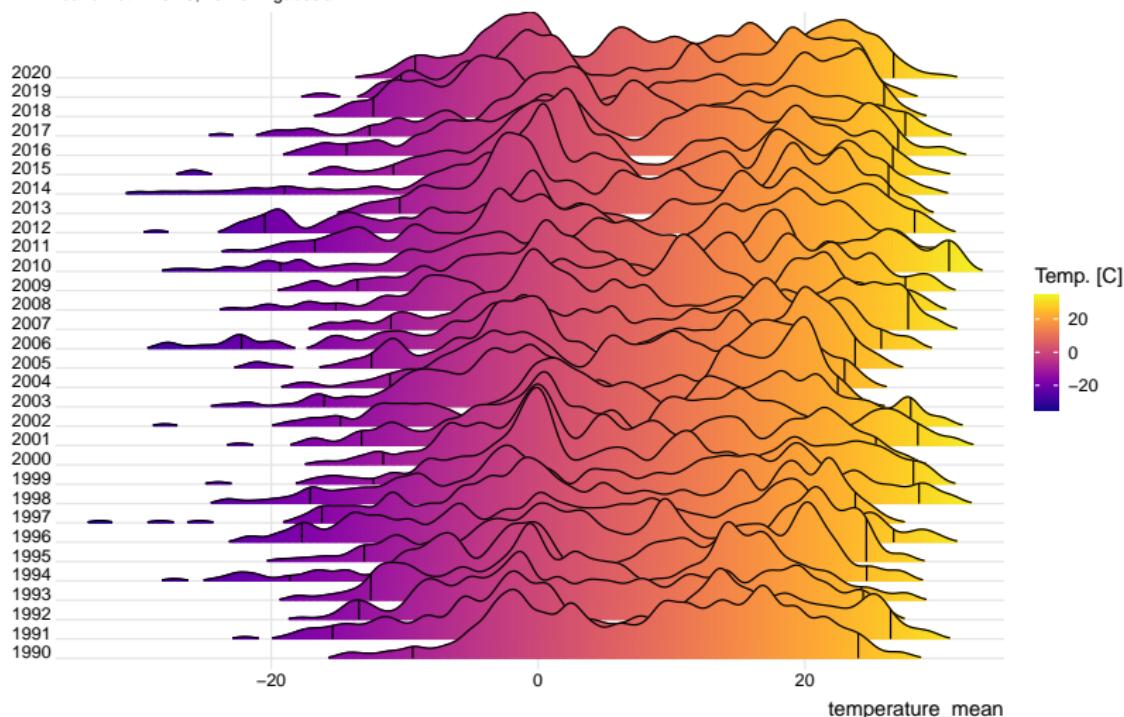
## Temperatures in Ukraine – East

temperature\_max (Celsius) by year between 1990 and 2020  
bandwidth = 0.75, kernel = gaussian

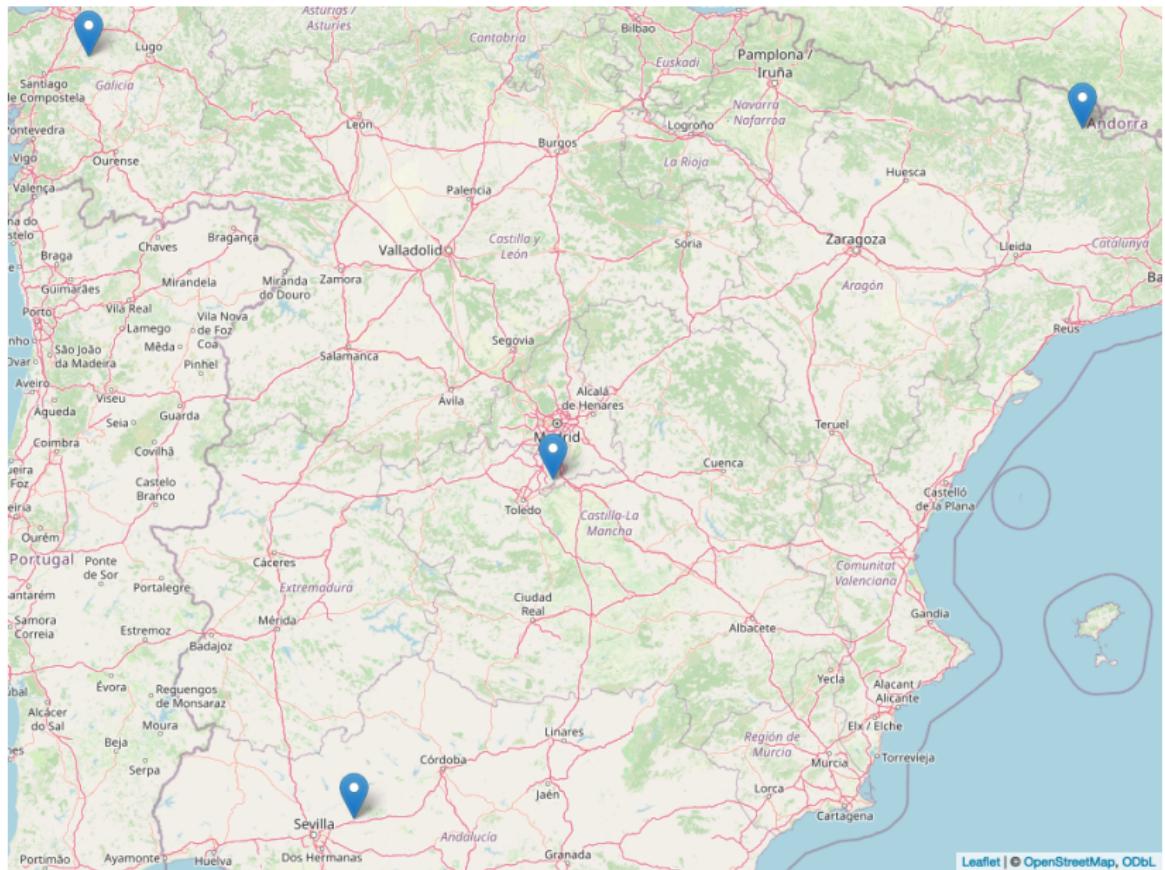


## Temperatures in Ukraine – East

temperature\_mean (Celsius) by year between 1990 and 2020  
bandwidth = 0.75, kernel = gaussian



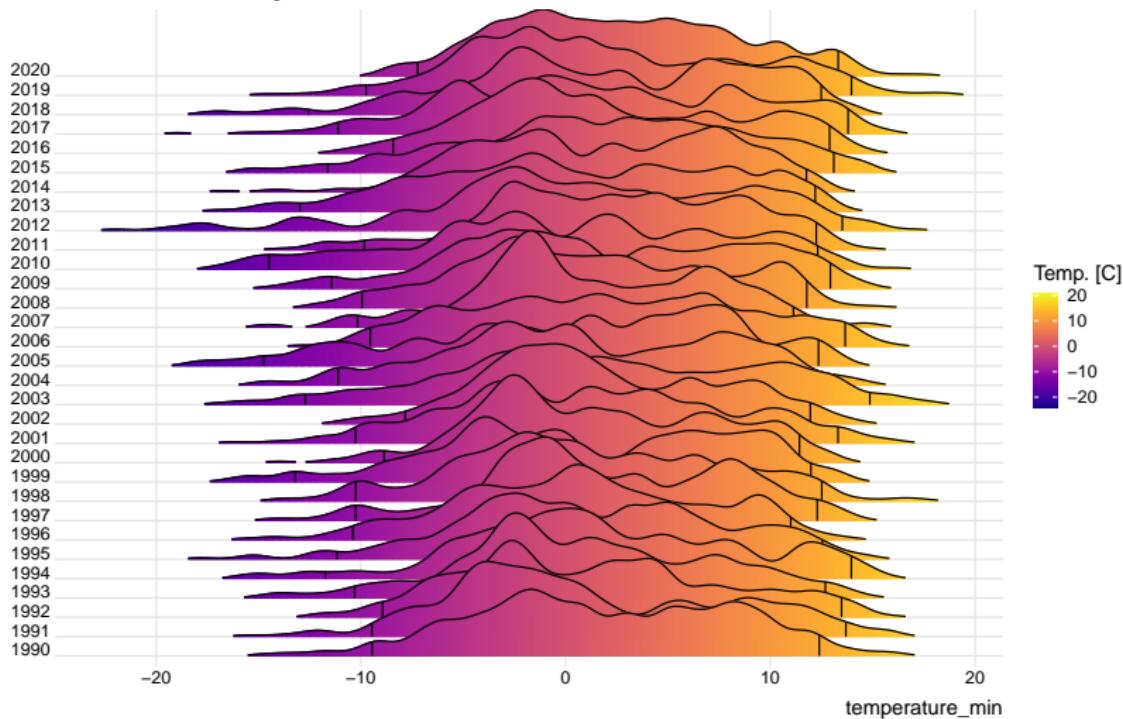
# Spain



# North

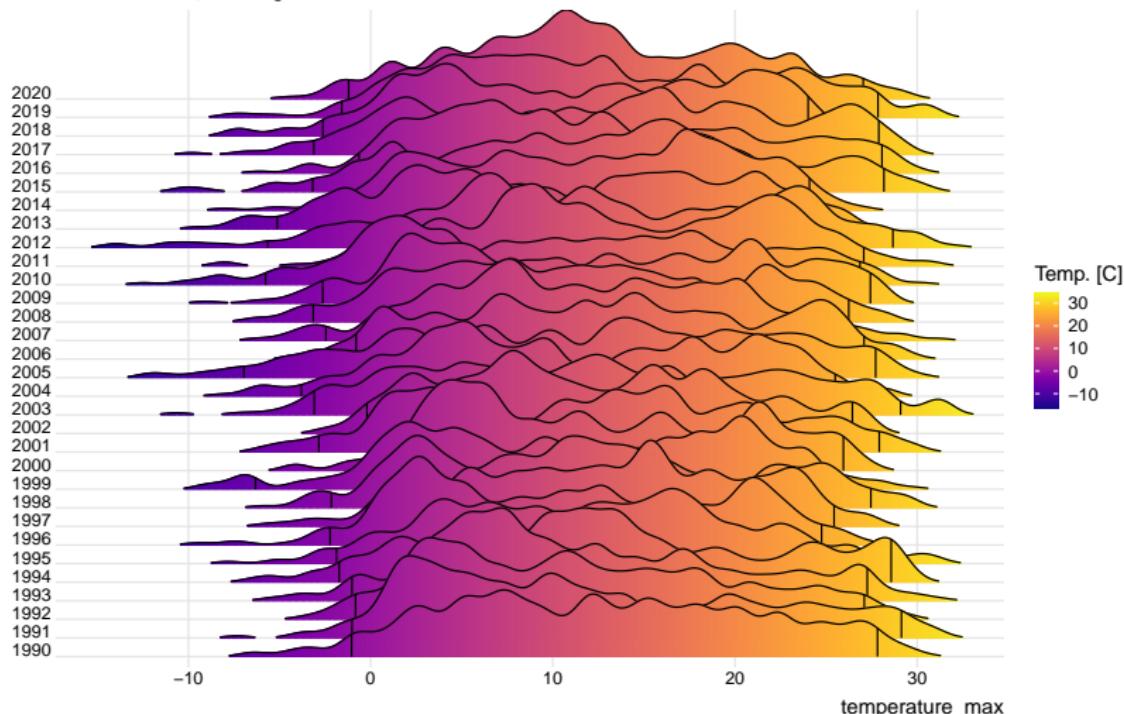
## Temperatures in Spain – North

temperature\_min (Celsius) by year between 1990 and 2020  
bandwidth = 0.75, kernel = gaussian



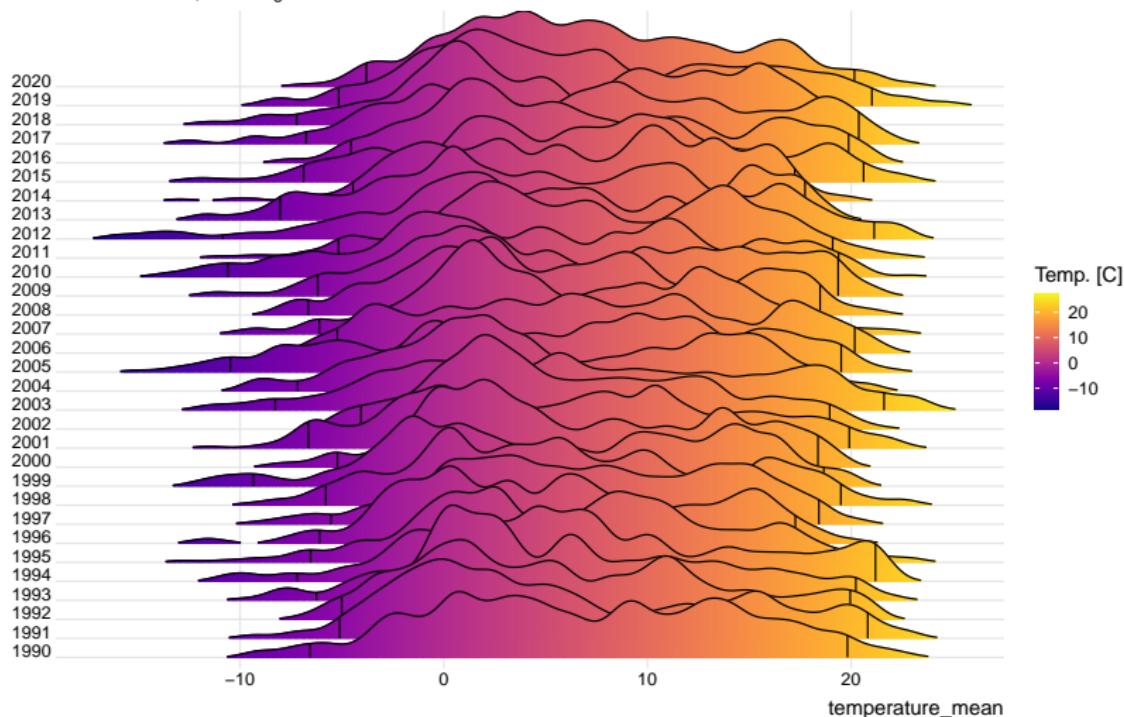
## Temperatures in Spain – North

temperature\_max (Celsius) by year between 1990 and 2020  
bandwidth = 0.75, kernel = gaussian



## Temperatures in Spain – North

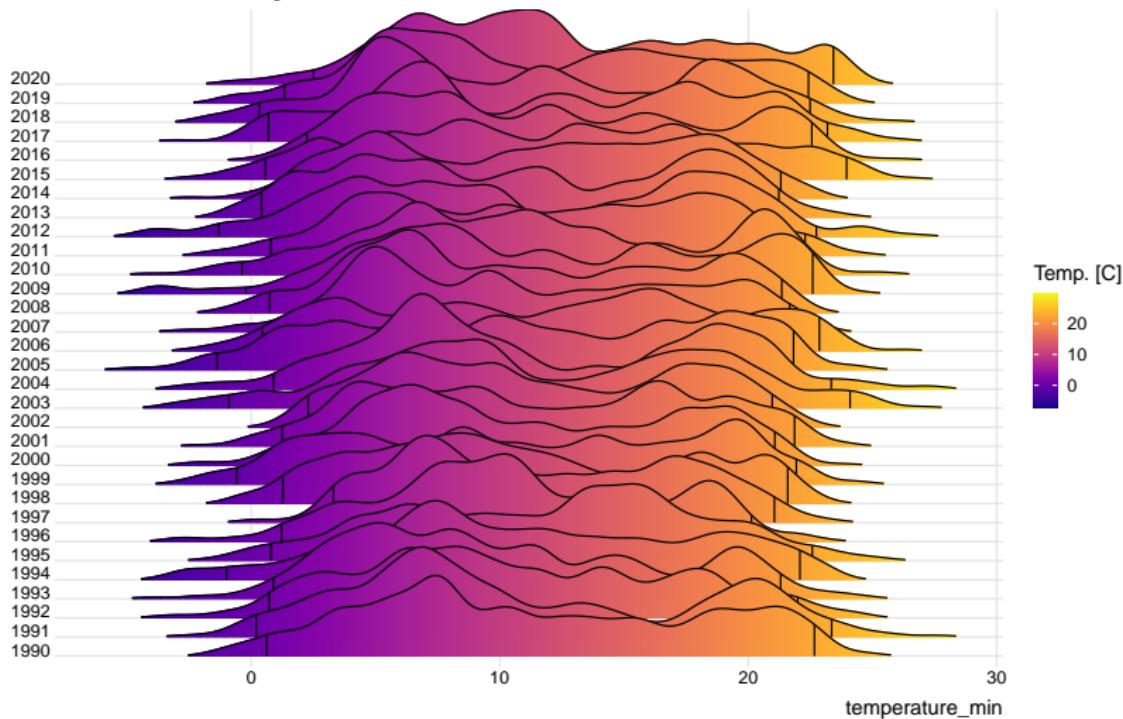
temperature\_mean (Celsius) by year between 1990 and 2020  
bandwidth = 0.75, kernel = gaussian



# South

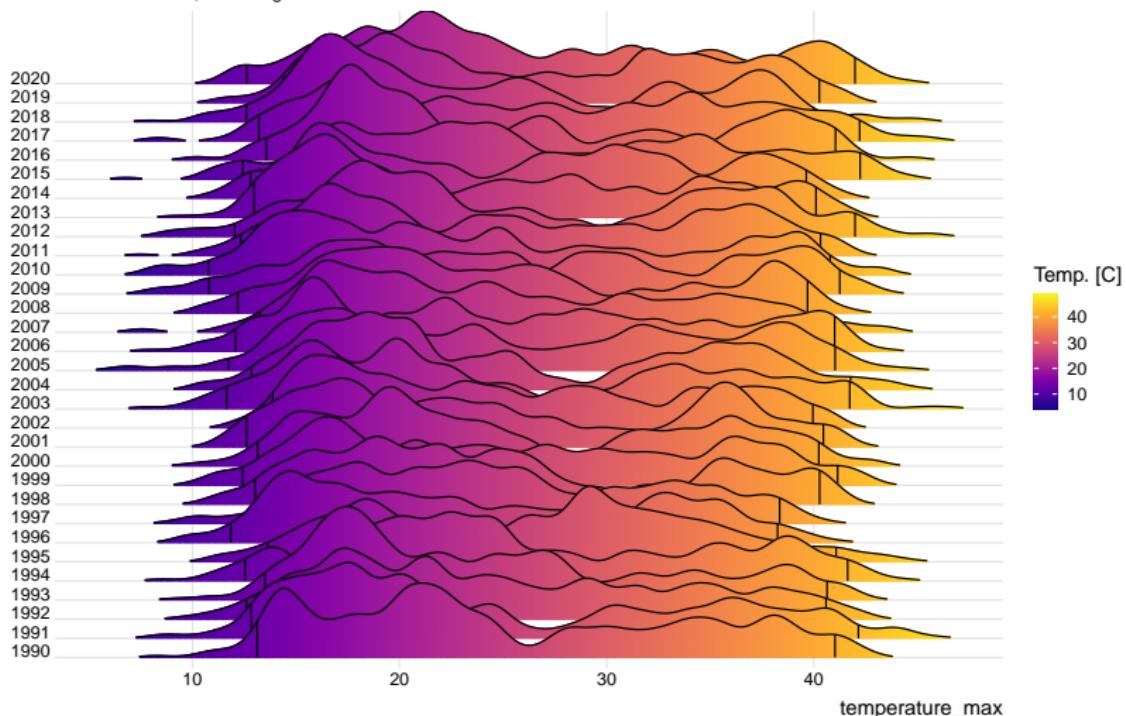
## Temperatures in Spain – South

temperature\_min (Celsius) by year between 1990 and 2020  
bandwidth = 0.75, kernel = gaussian



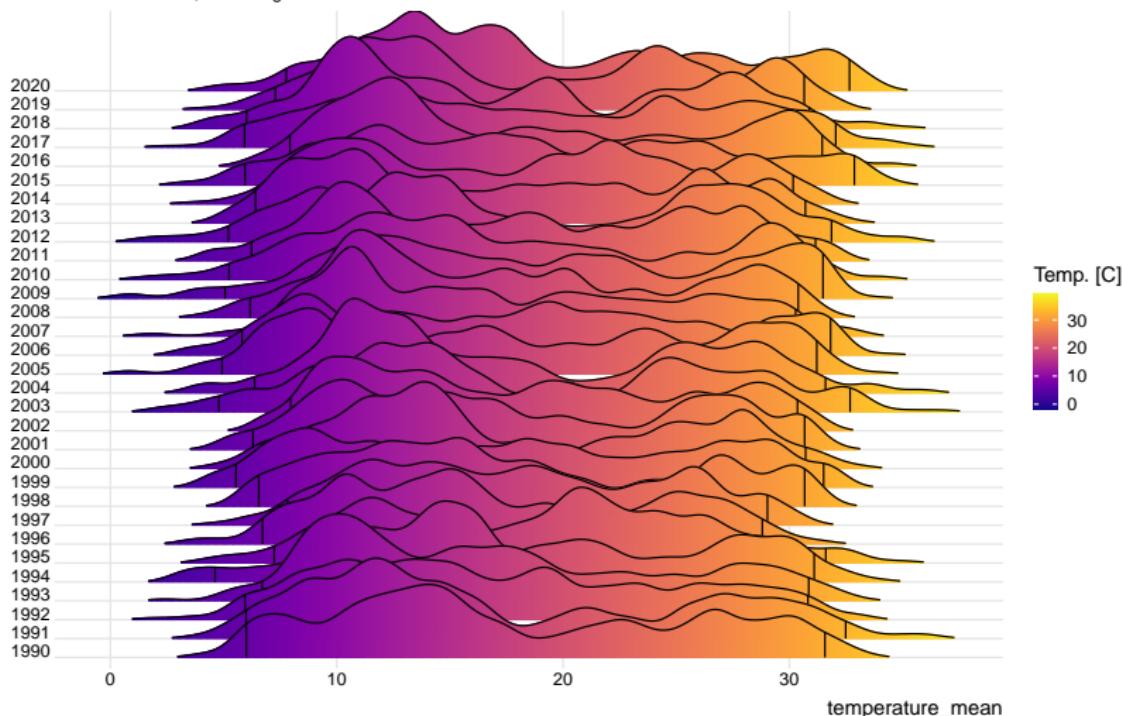
## Temperatures in Spain – South

temperature\_max (Celsius) by year between 1990 and 2020  
bandwidth = 0.75, kernel = gaussian



## Temperatures in Spain – South

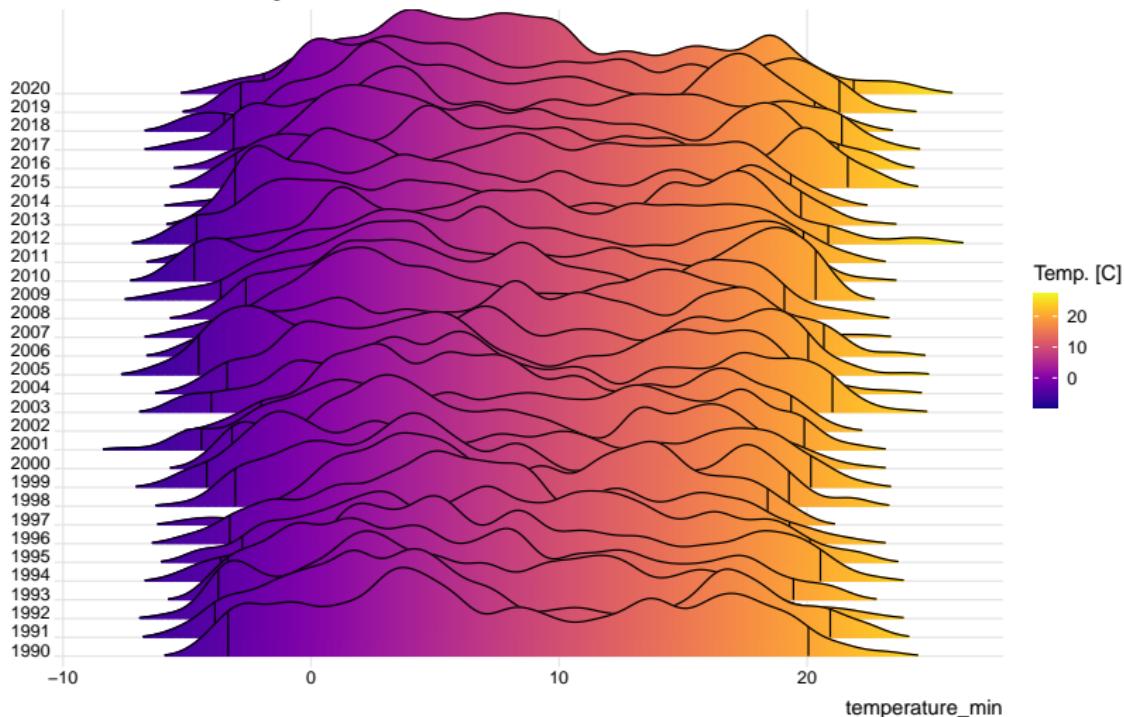
temperature\_mean (Celsius) by year between 1990 and 2020  
bandwidth = 0.75, kernel = gaussian



# Center

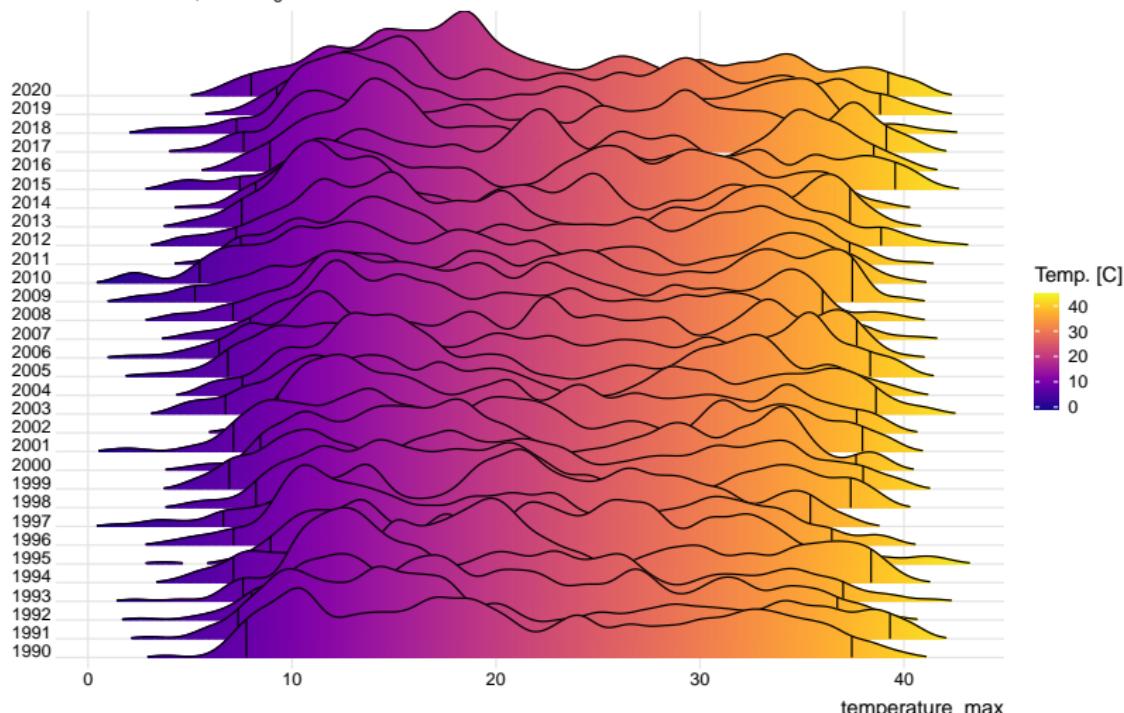
## Temperatures in Spain – Center

temperature\_min (Celsius) by year between 1990 and 2020  
bandwidth = 0.75, kernel = gaussian



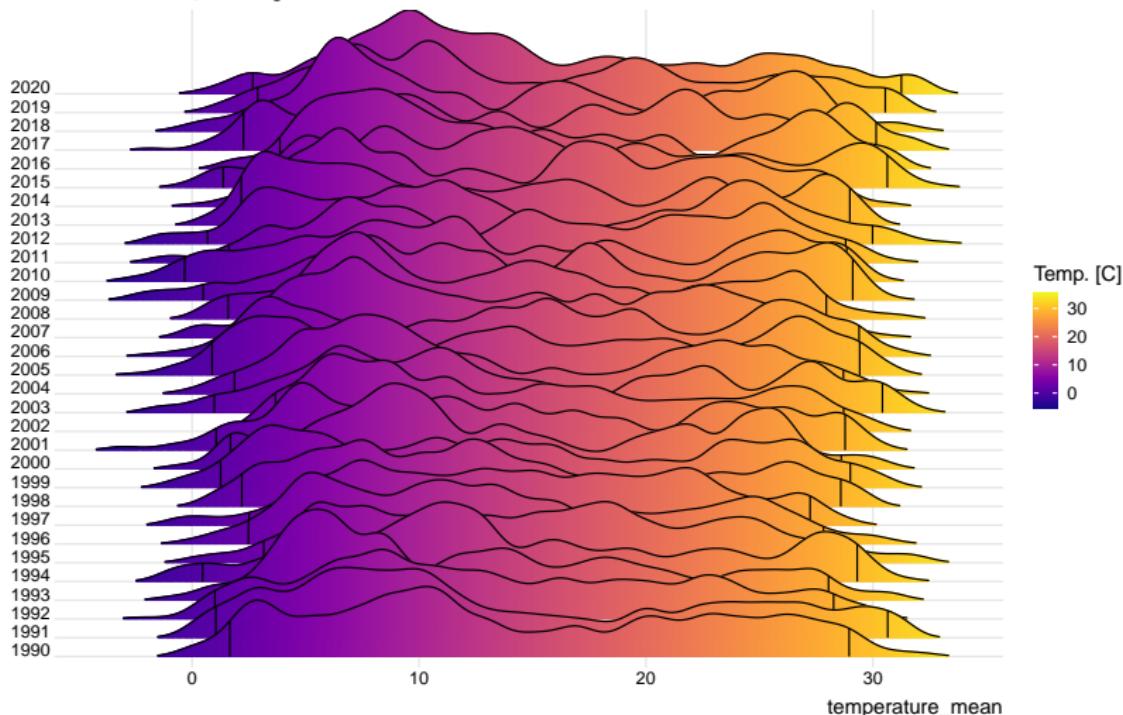
## Temperatures in Spain – Center

temperature\_max (Celsius) by year between 1990 and 2020  
bandwidth = 0.75, kernel = gaussian



## Temperatures in Spain – Center

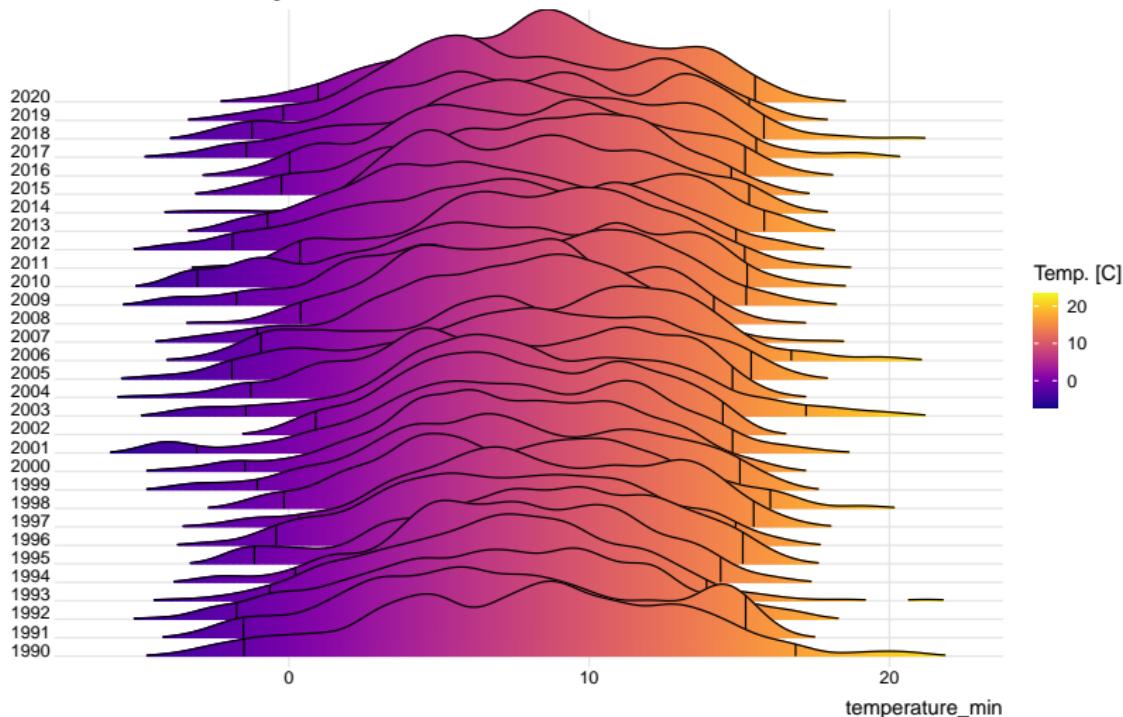
temperature\_mean (Celsius) by year between 1990 and 2020  
bandwidth = 0.75, kernel = gaussian



# West

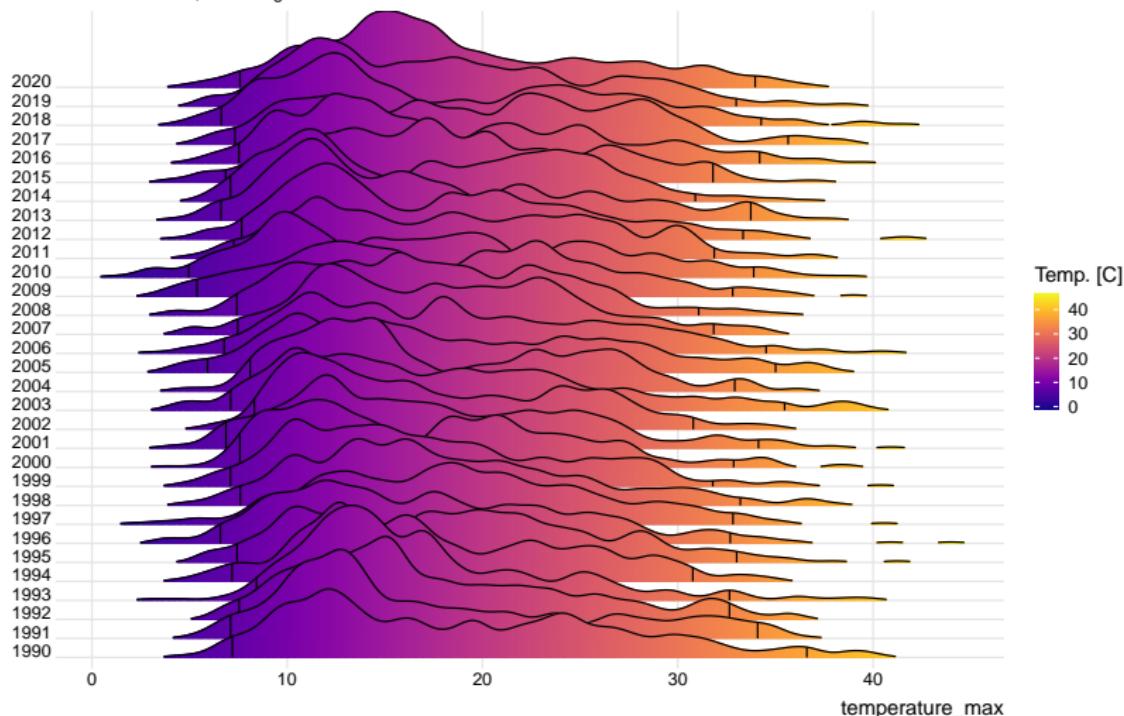
## Temperatures in Spain – West

temperature\_min (Celsius) by year between 1990 and 2020  
bandwidth = 0.75, kernel = gaussian



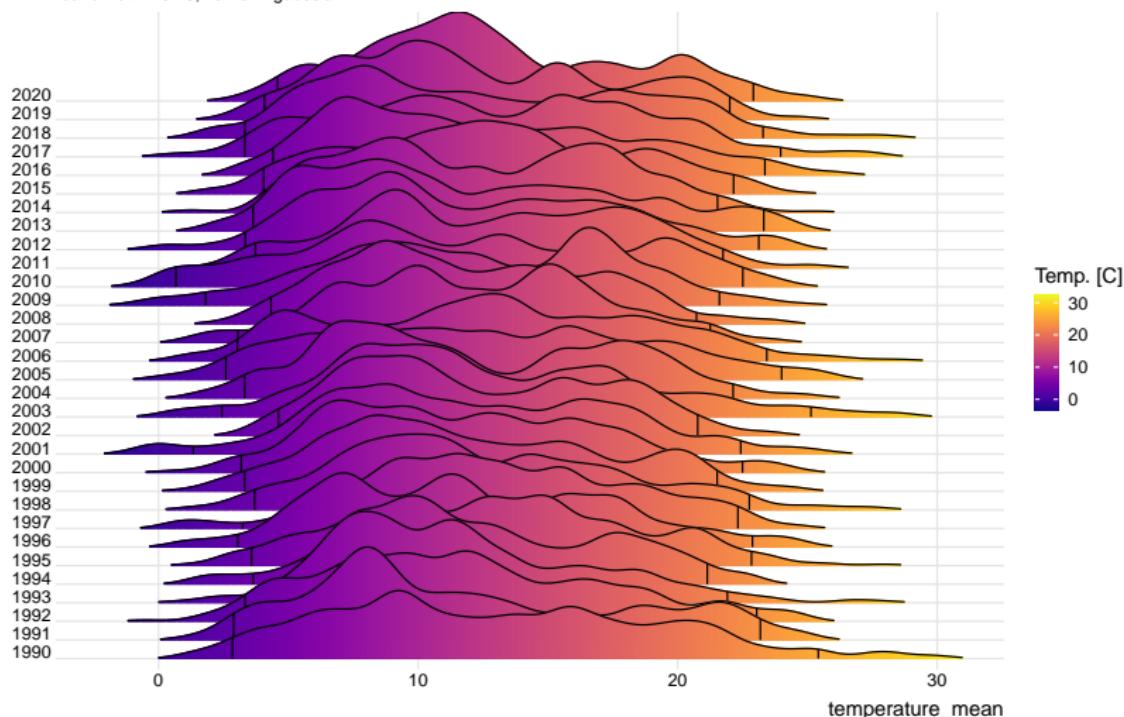
## Temperatures in Spain – West

temperature\_max (Celsius) by year between 1990 and 2020  
bandwidth = 0.75, kernel = gaussian

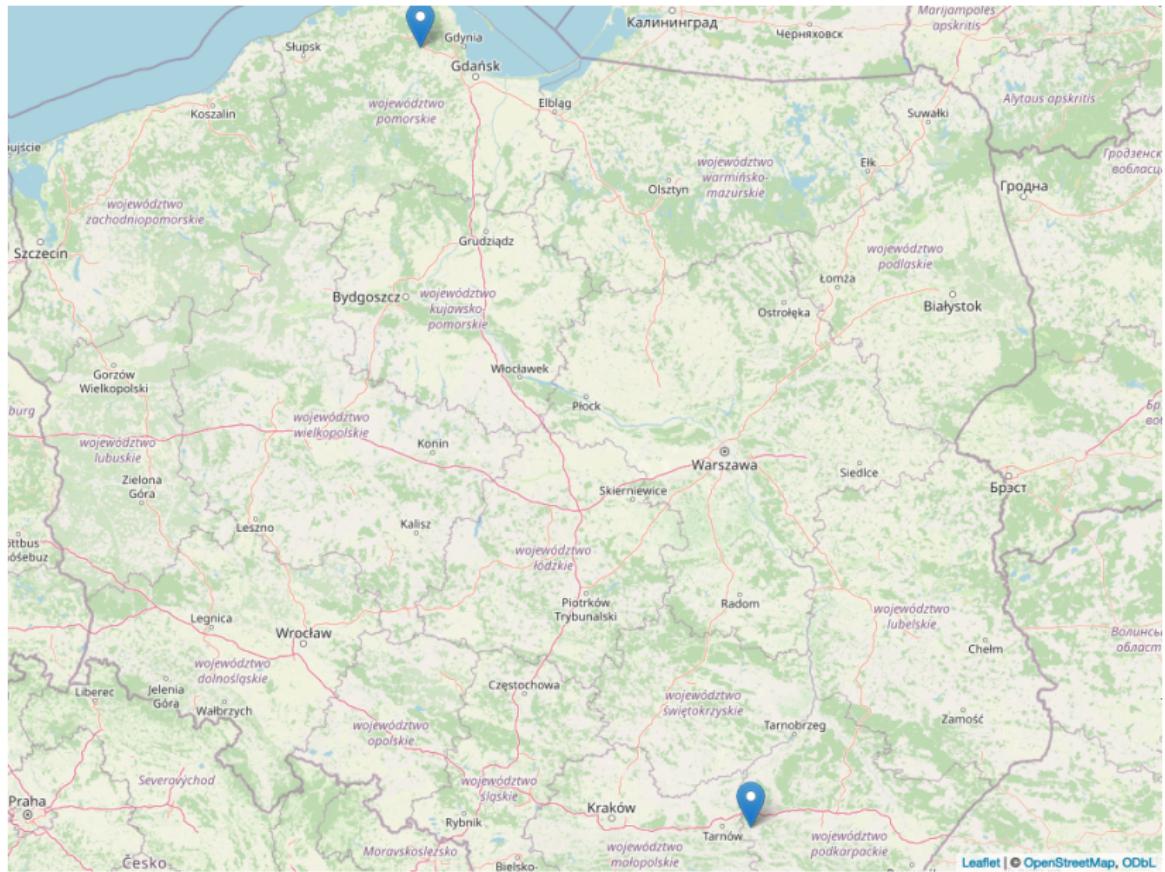


## Temperatures in Spain – West

temperature\_mean (Celsius) by year between 1990 and 2020  
bandwidth = 0.75, kernel = gaussian



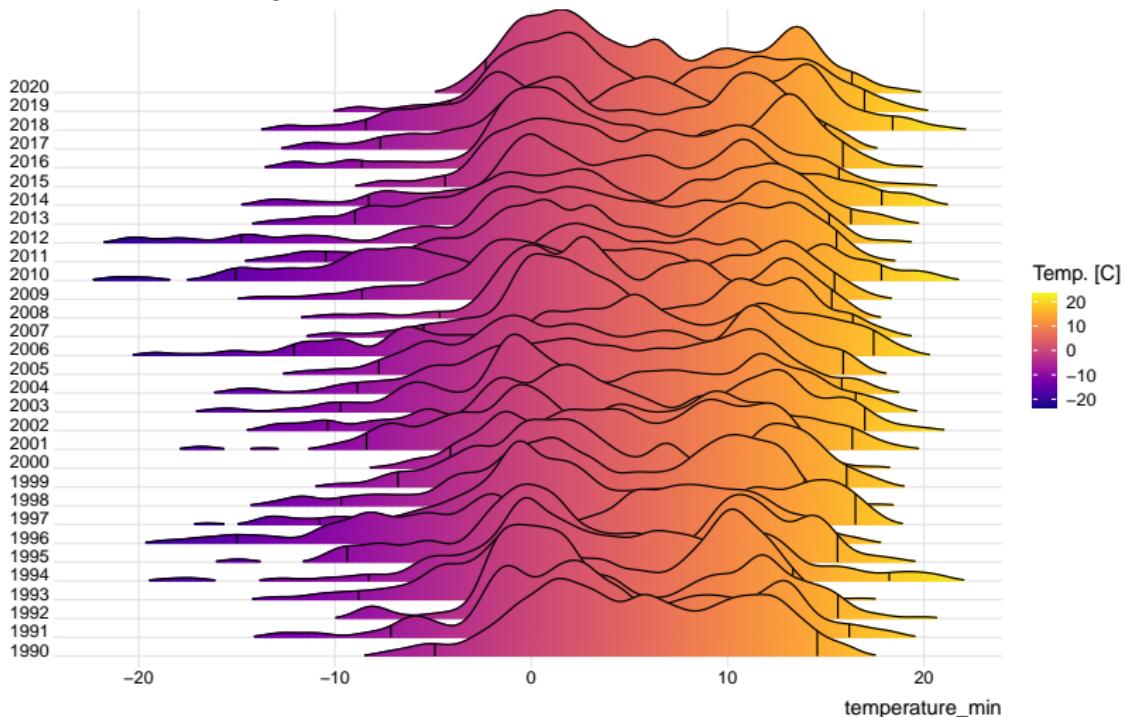
# Poland



# North

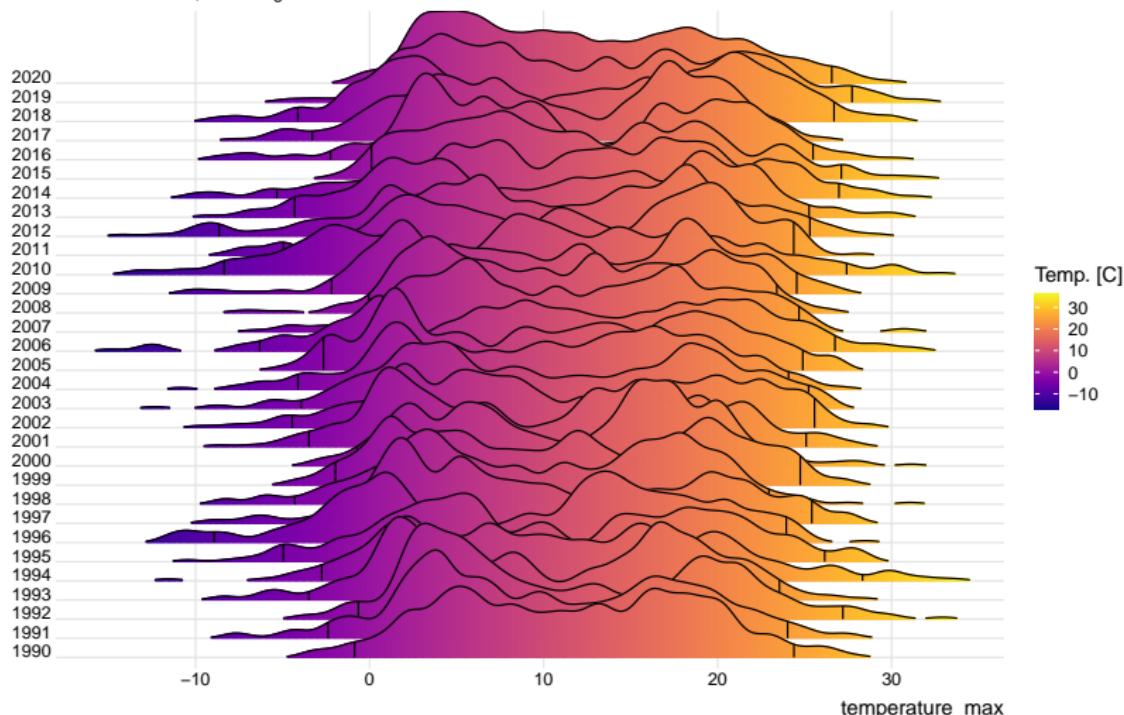
## Temperatures in Poland – North

temperature\_min (Celsius) by year between 1990 and 2020  
bandwidth = 0.75, kernel = gaussian



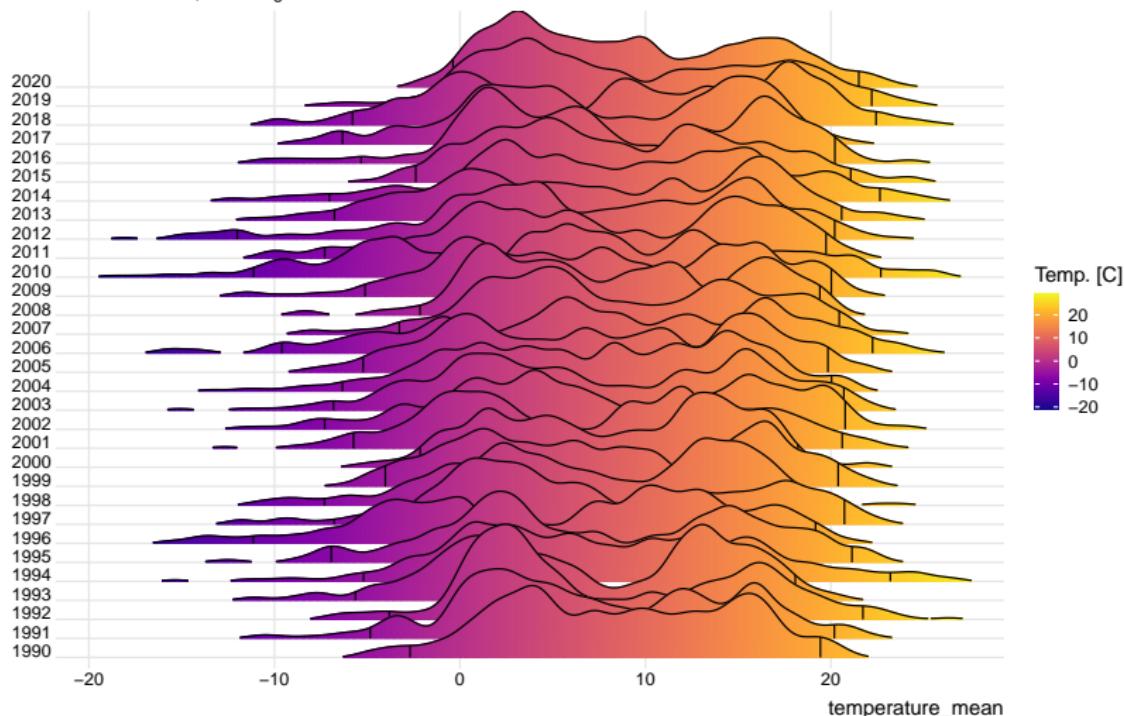
## Temperatures in Poland – North

temperature\_max (Celsius) by year between 1990 and 2020  
bandwidth = 0.75, kernel = gaussian



## Temperatures in Poland – North

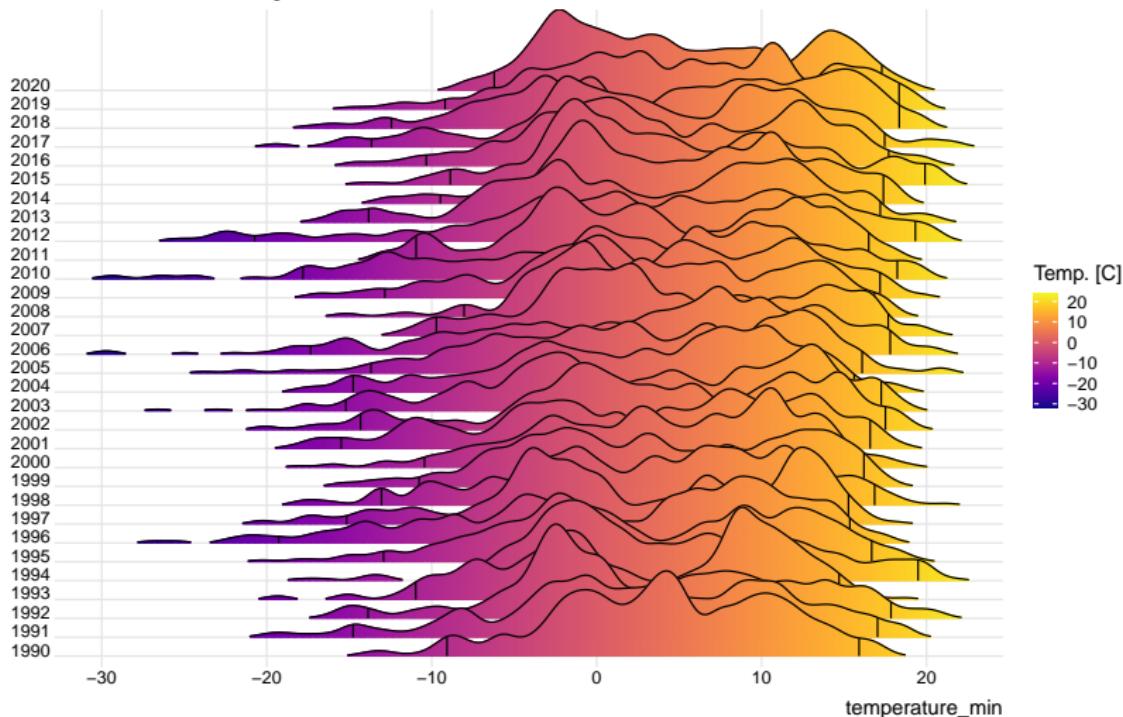
temperature\_mean (Celsius) by year between 1990 and 2020  
bandwidth = 0.75, kernel = gaussian



# Center

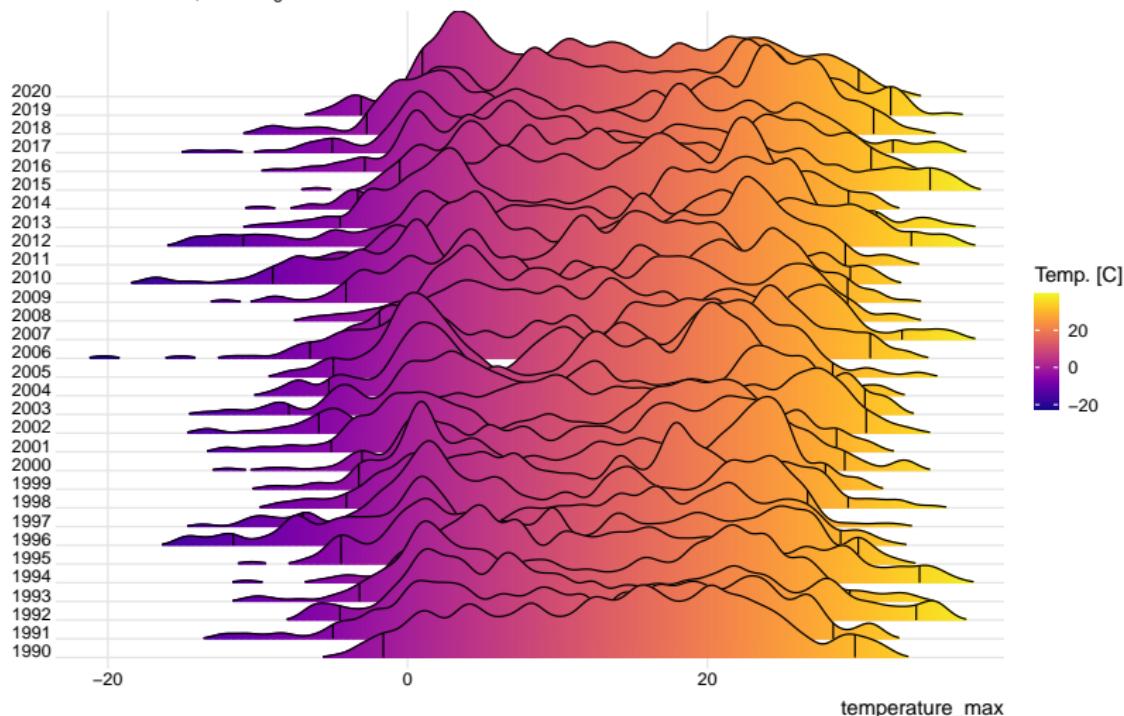
## Temperatures in Poland – Center

temperature\_min (Celsius) by year between 1990 and 2020  
bandwidth = 0.75, kernel = gaussian



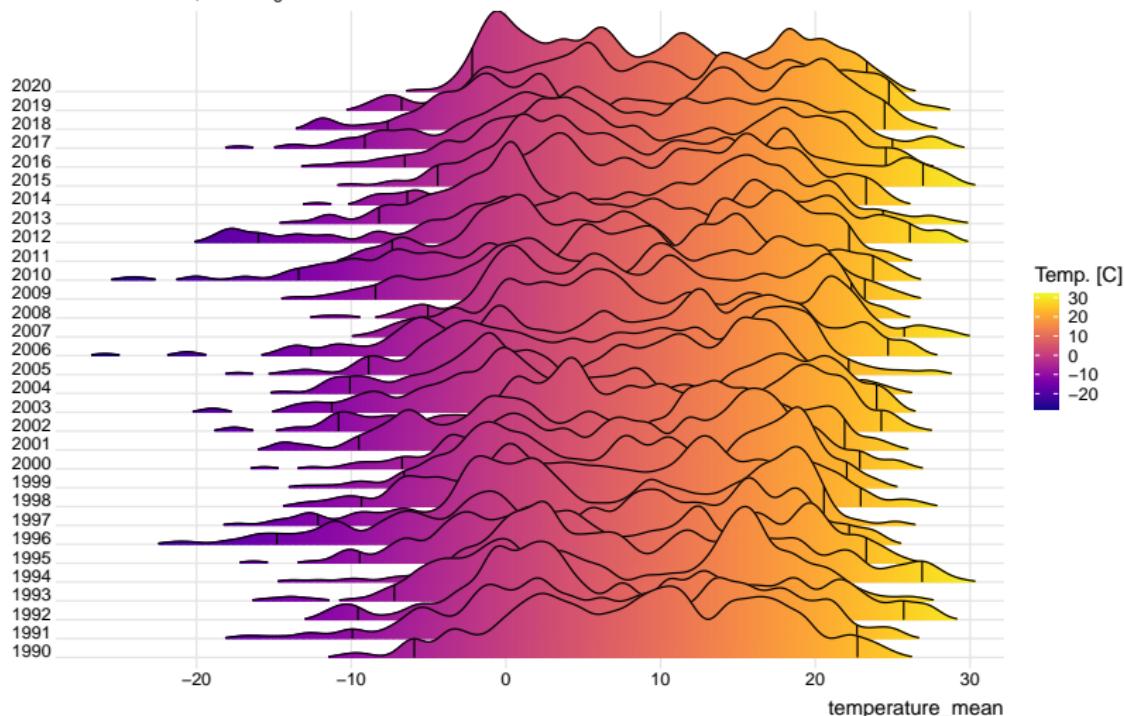
## Temperatures in Poland – Center

temperature\_max (Celsius) by year between 1990 and 2020  
bandwidth = 0.75, kernel = gaussian

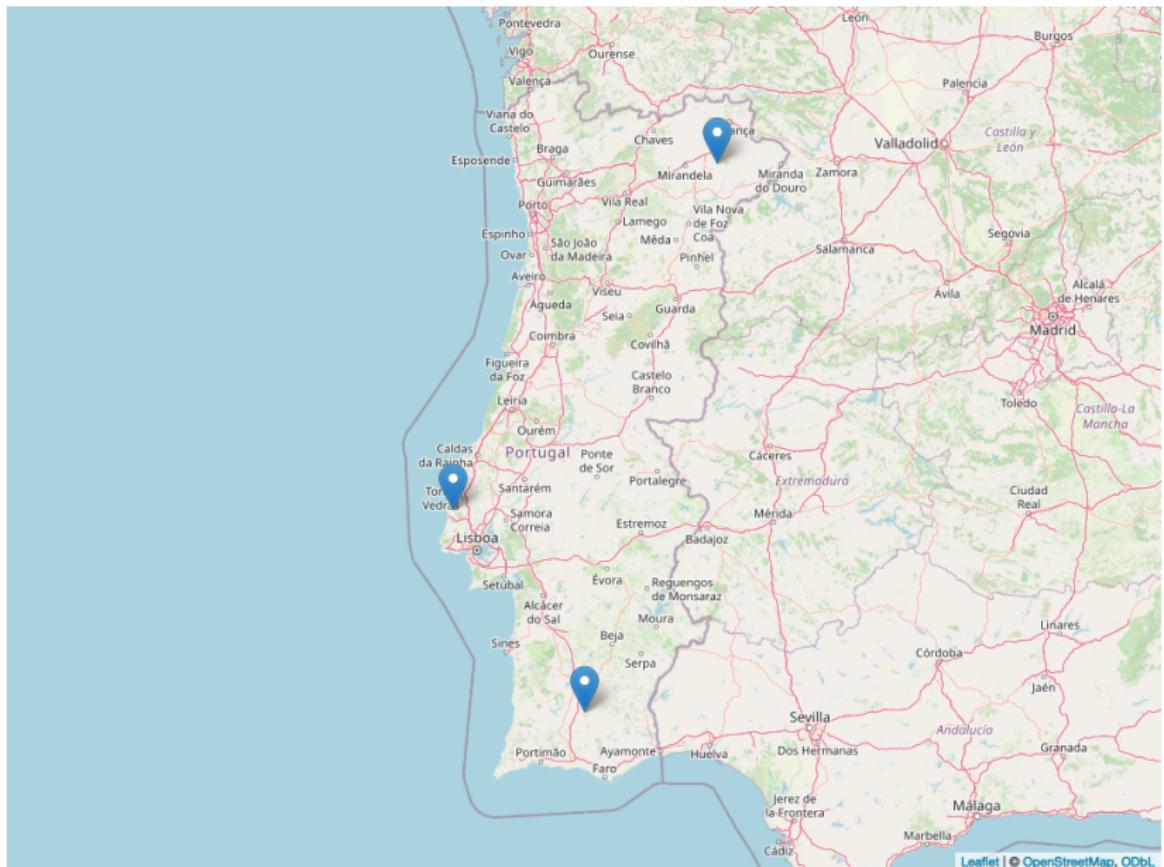


## Temperatures in Poland – Center

temperature\_mean (Celsius) by year between 1990 and 2020  
bandwidth = 0.75, kernel = gaussian



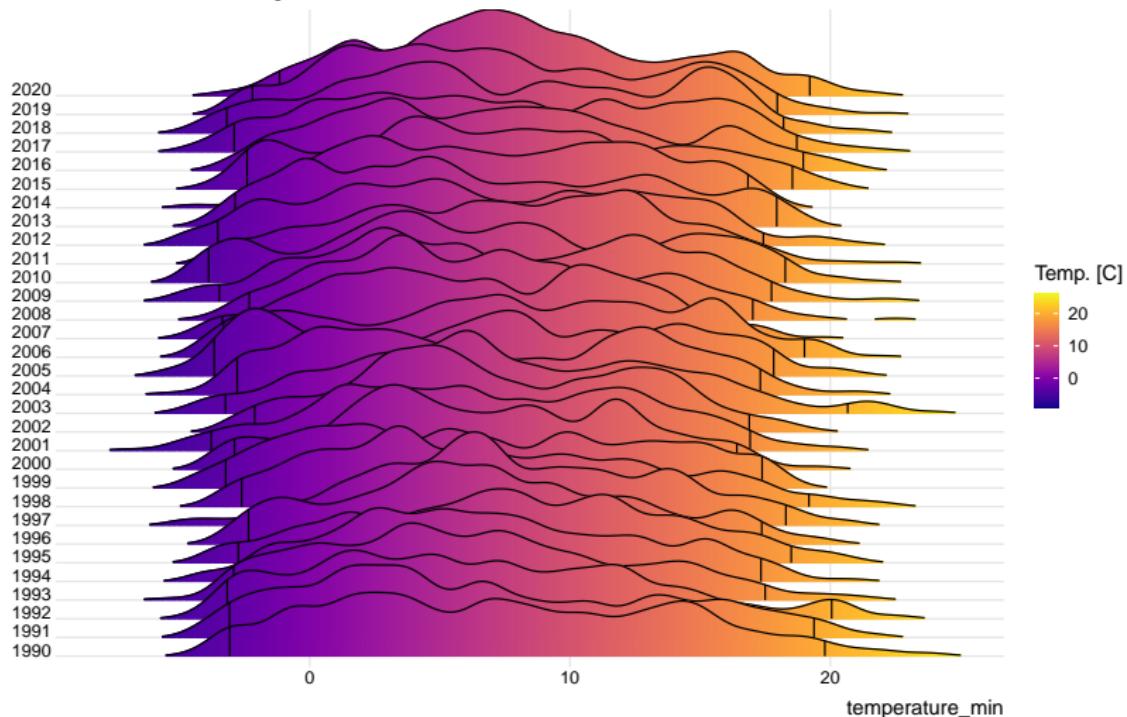
# Portugal



# North

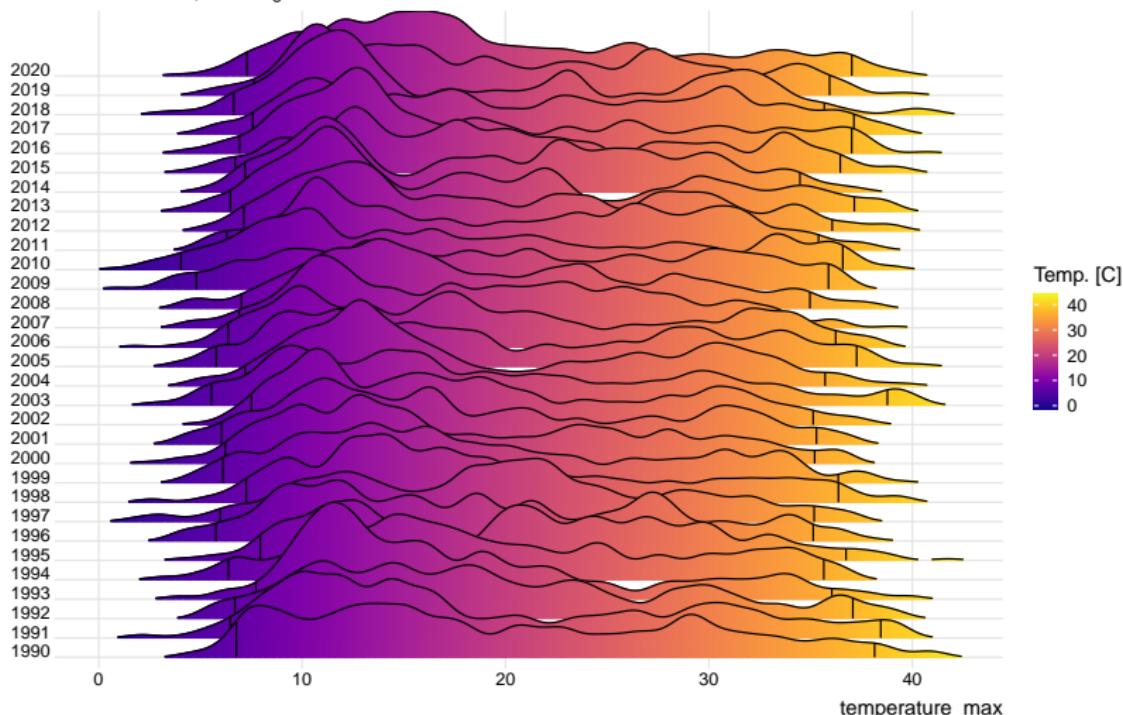
## Temperatures in Portugal – North

temperature\_min (Celsius) by year between 1990 and 2020  
bandwidth = 0.75, kernel = gaussian



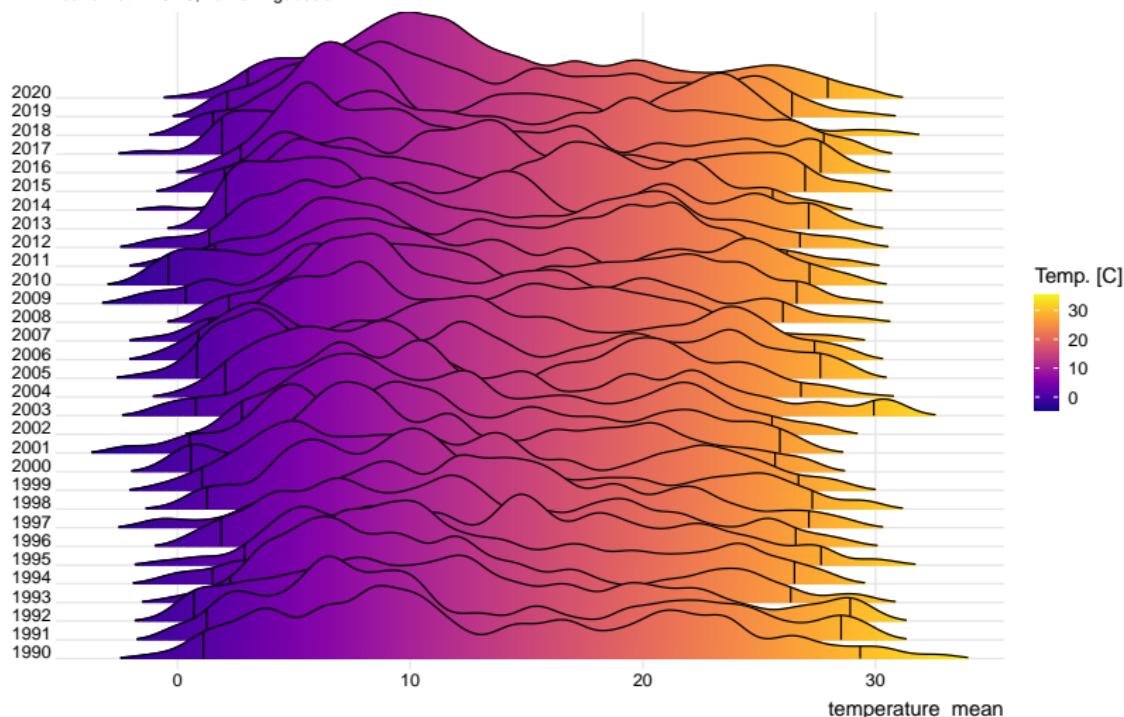
## Temperatures in Portugal – North

temperature\_max (Celsius) by year between 1990 and 2020  
bandwidth = 0.75, kernel = gaussian



## Temperatures in Portugal – North

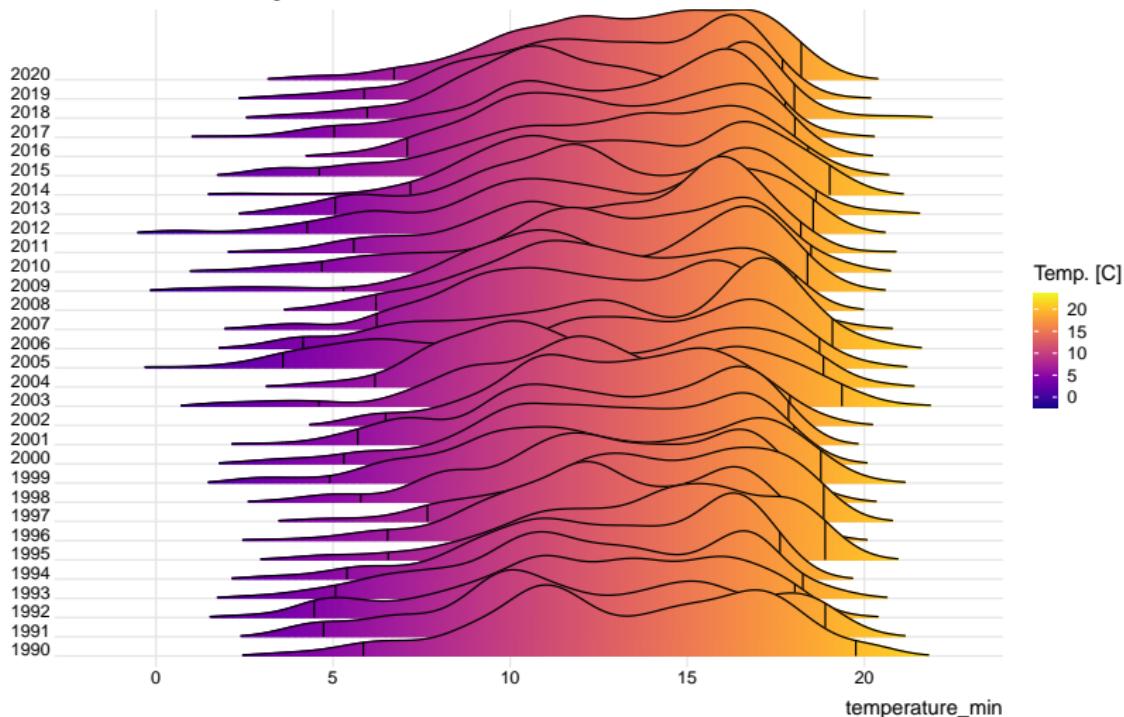
temperature\_mean (Celsius) by year between 1990 and 2020  
bandwidth = 0.75, kernel = gaussian



# West

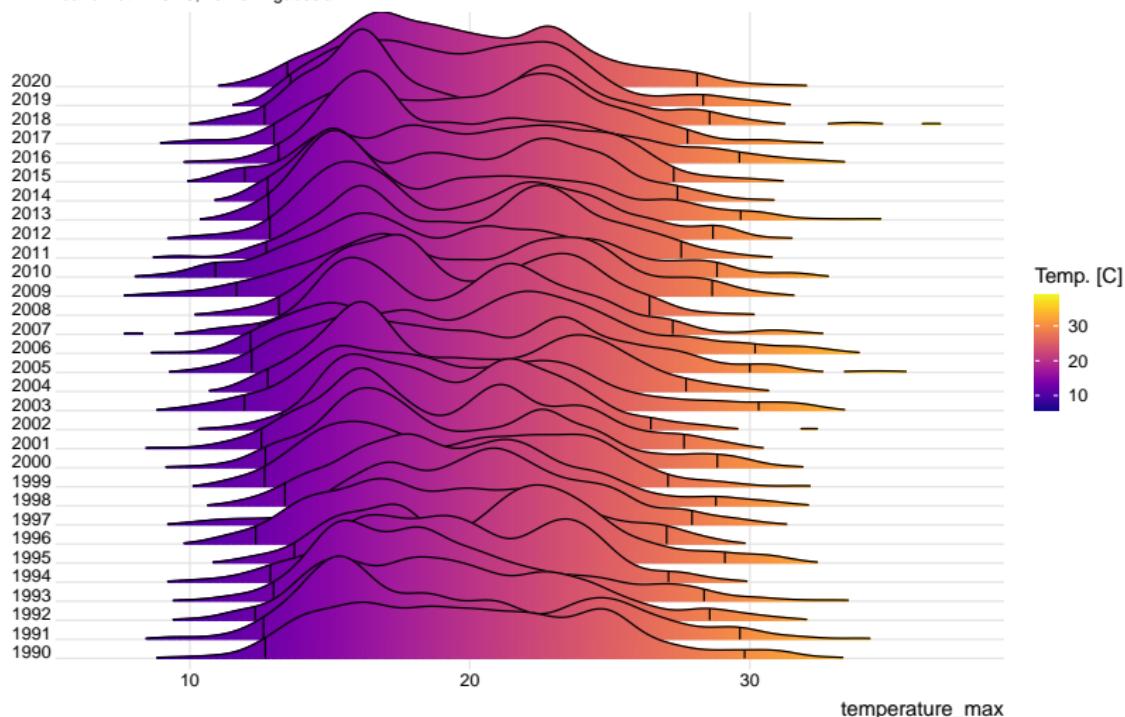
## Temperatures in Portugal – West

temperature\_min (Celsius) by year between 1990 and 2020  
bandwidth = 0.75, kernel = gaussian



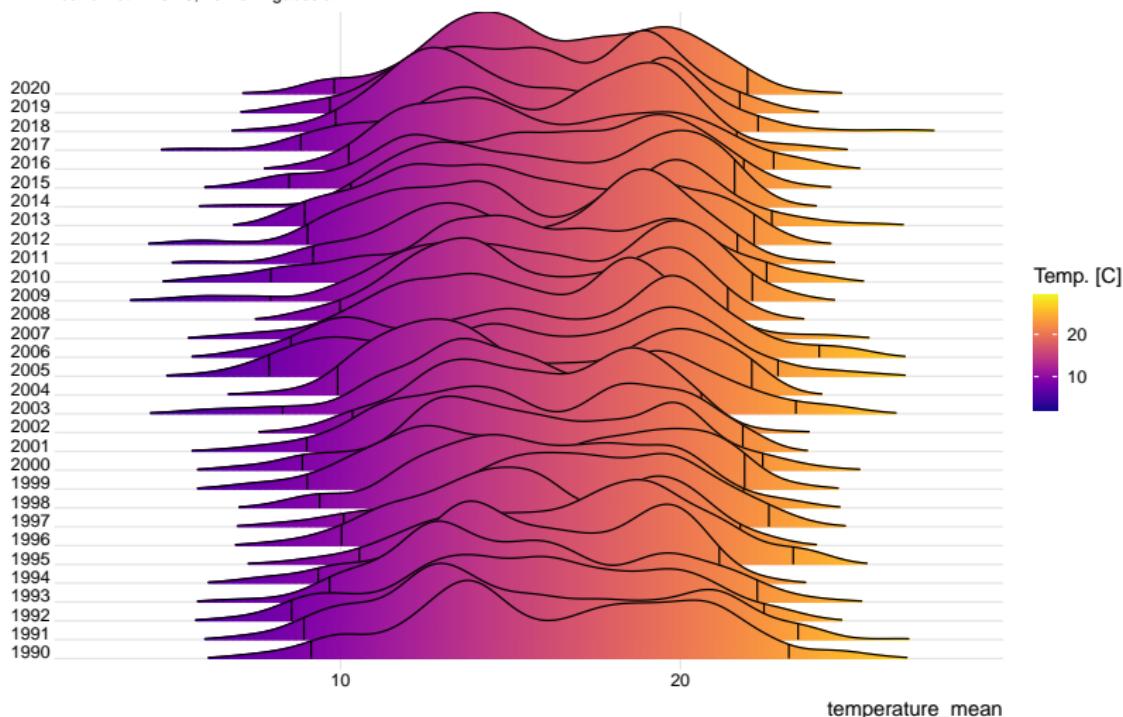
## Temperatures in Portugal – West

temperature\_max (Celsius) by year between 1990 and 2020  
bandwidth = 0.75, kernel = gaussian



## Temperatures in Portugal – West

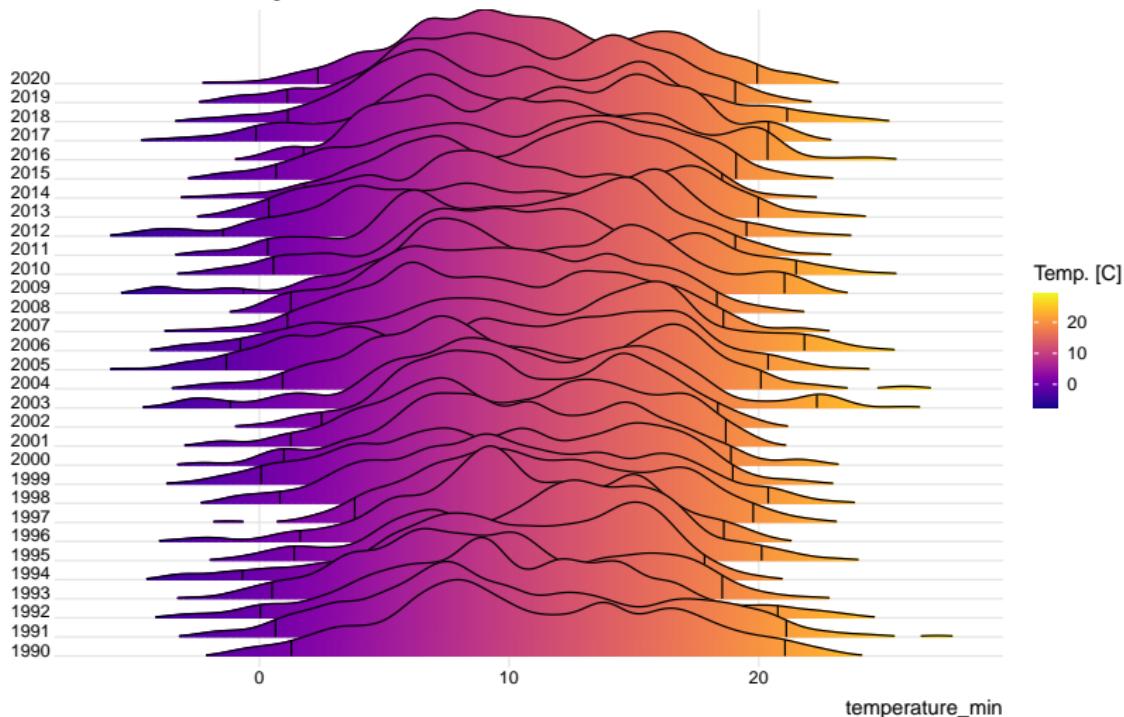
temperature\_mean (Celsius) by year between 1990 and 2020  
bandwidth = 0.75, kernel = gaussian



# South

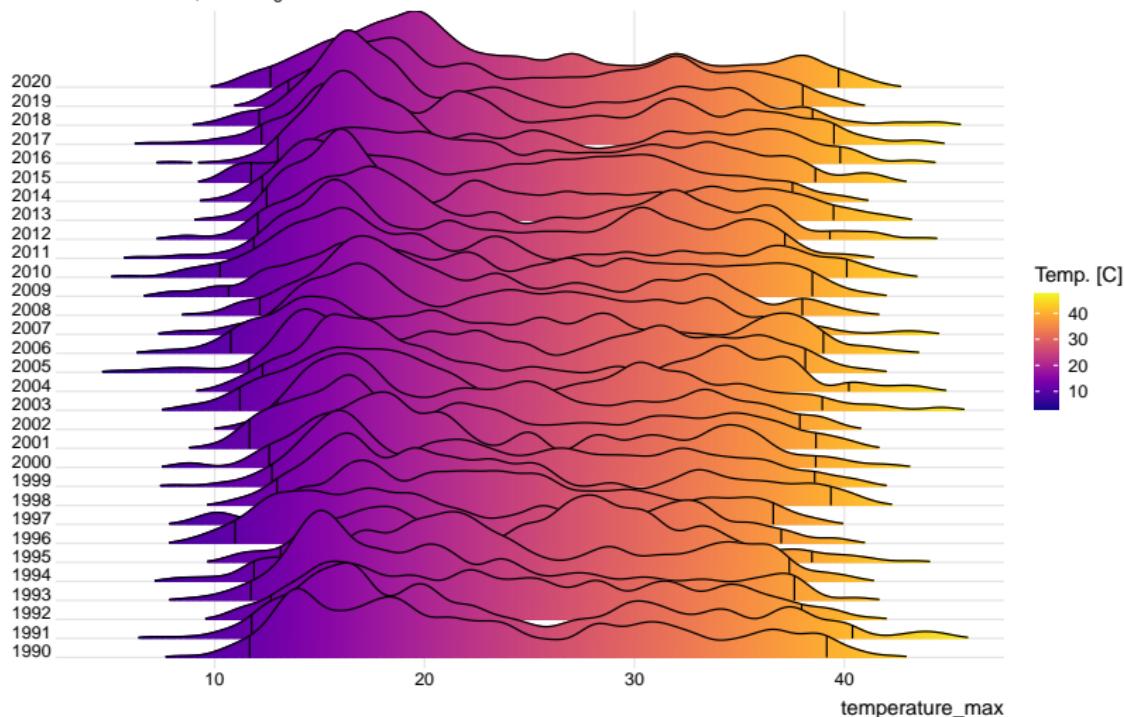
## Temperatures in Portugal – South

temperature\_min (Celsius) by year between 1990 and 2020  
bandwidth = 0.75, kernel = gaussian



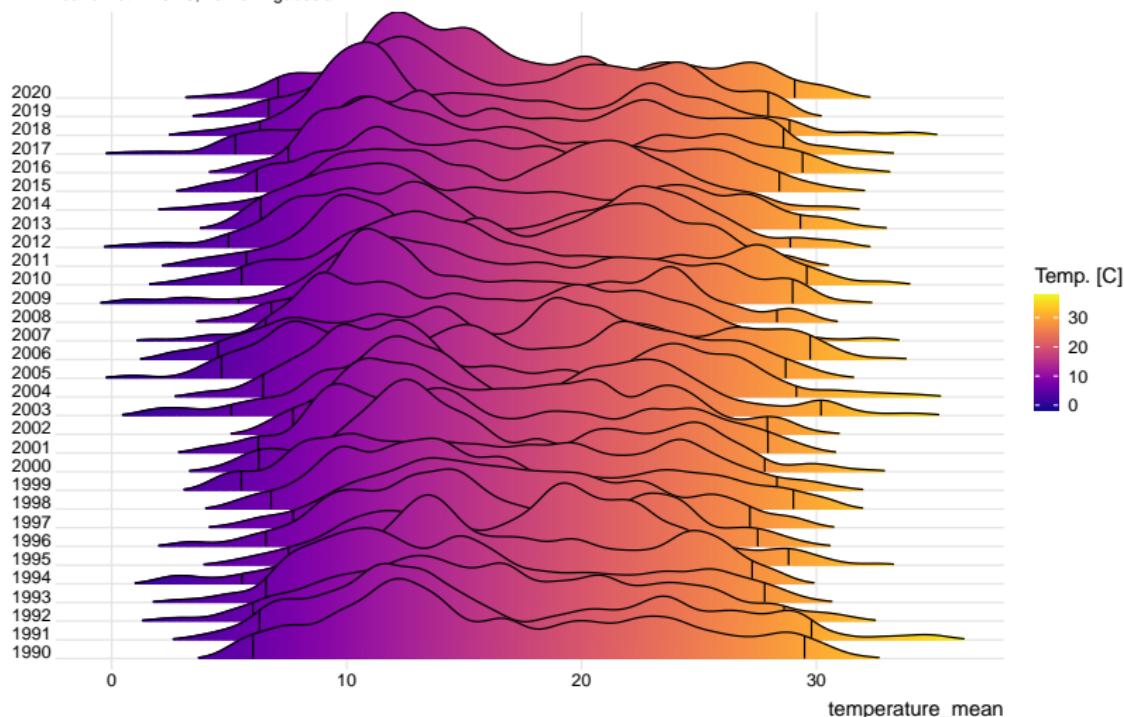
## Temperatures in Portugal – South

temperature\_max (Celsius) by year between 1990 and 2020  
bandwidth = 0.75, kernel = gaussian



## Temperatures in Portugal – South

temperature\_mean (Celsius) by year between 1990 and 2020  
bandwidth = 0.75, kernel = gaussian

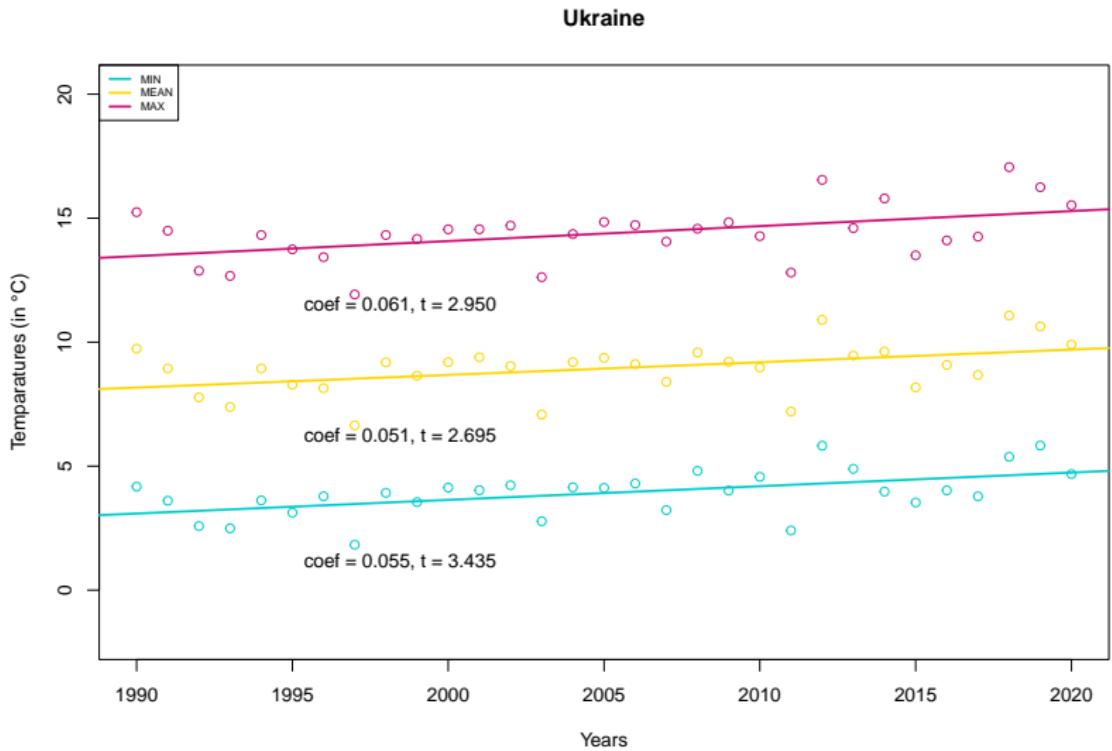


## Linear regression

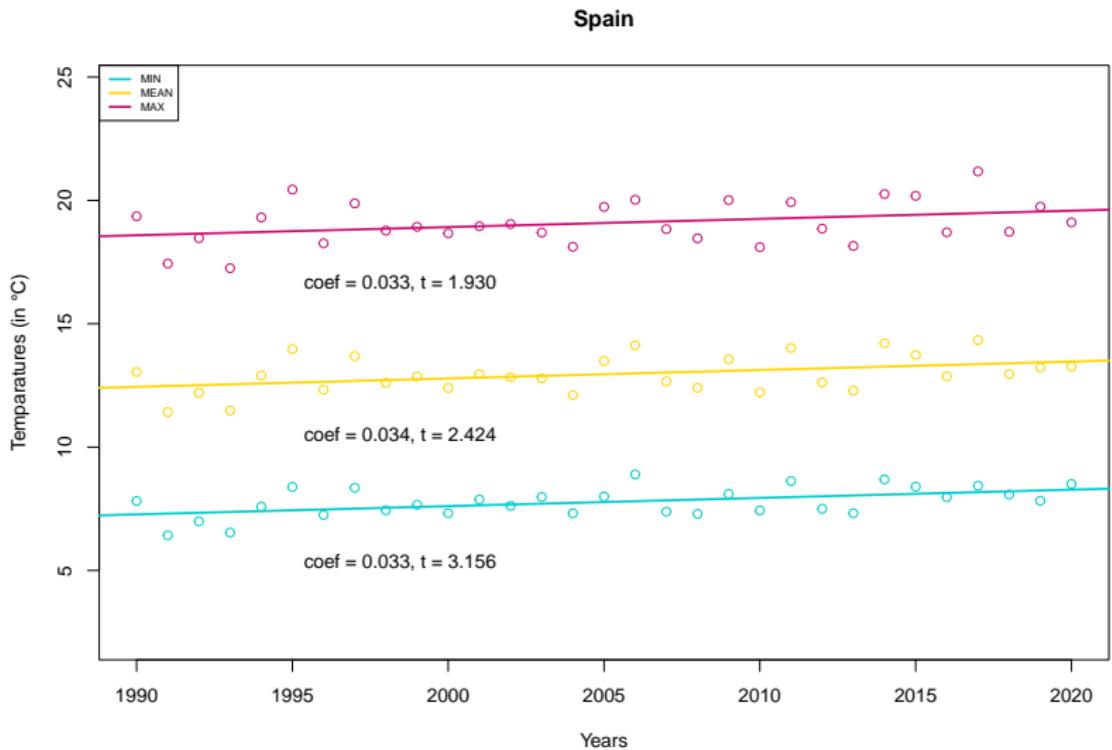
### Min, max, mean temperature

These plots shows the linear regression of the temperature variables (min, max, mean) for each country over the years.

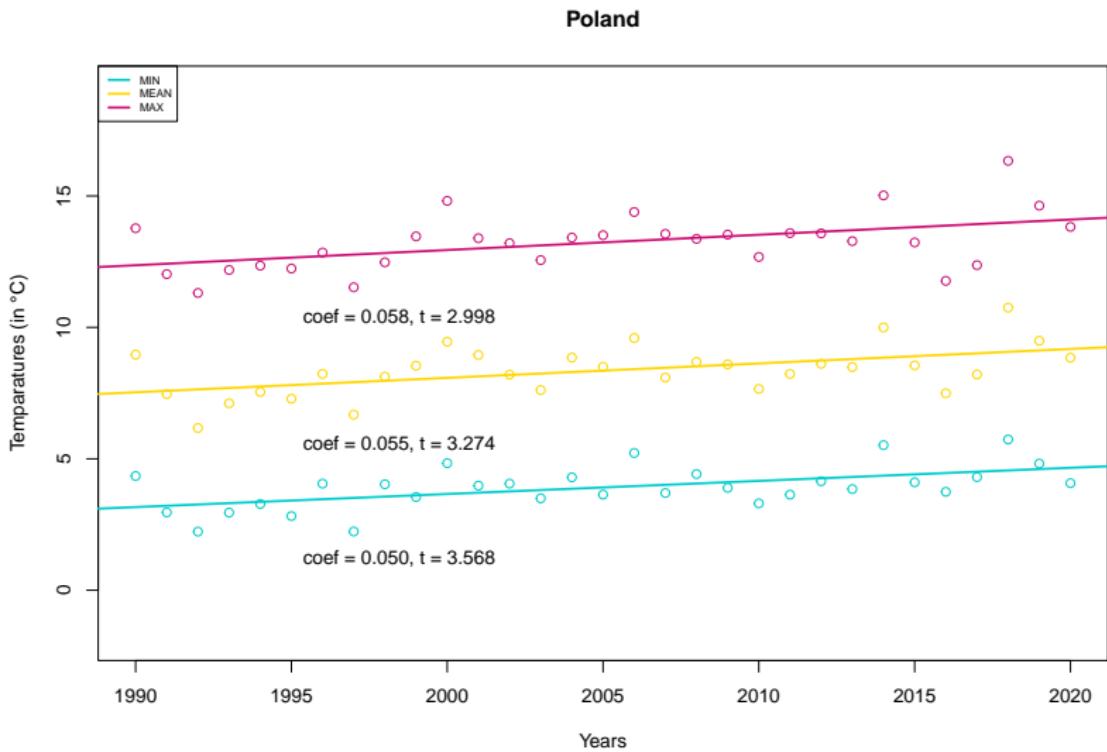
# Ukraine



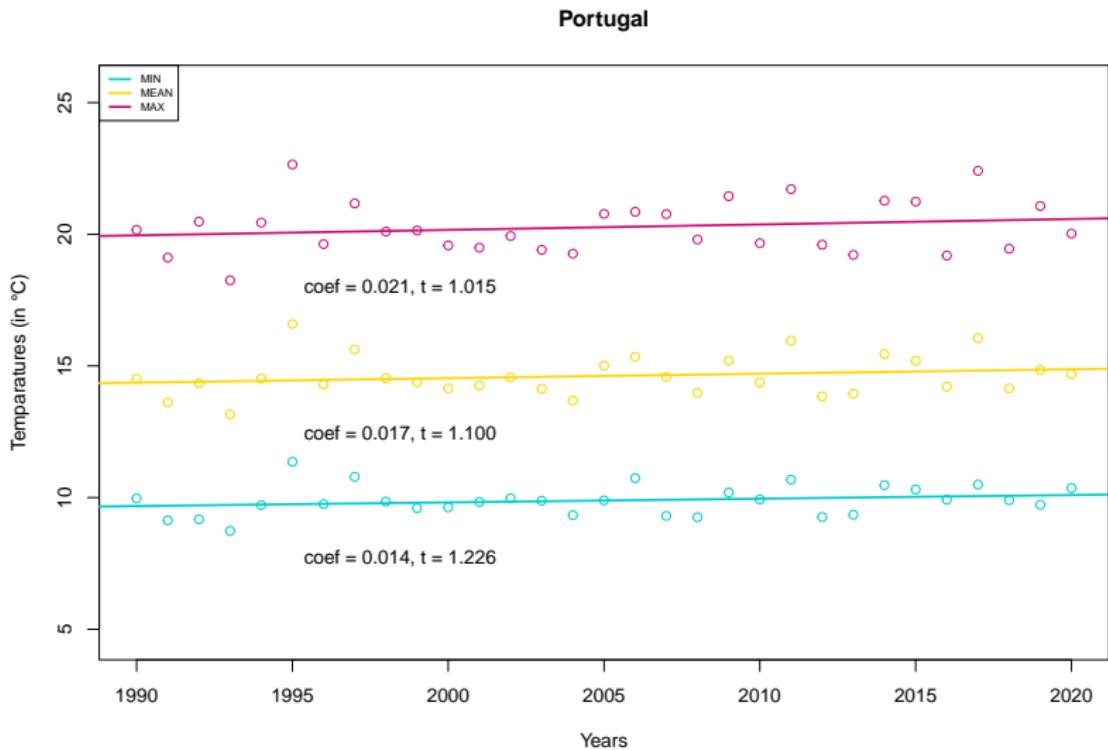
# Spain



# Poland



# Portugal

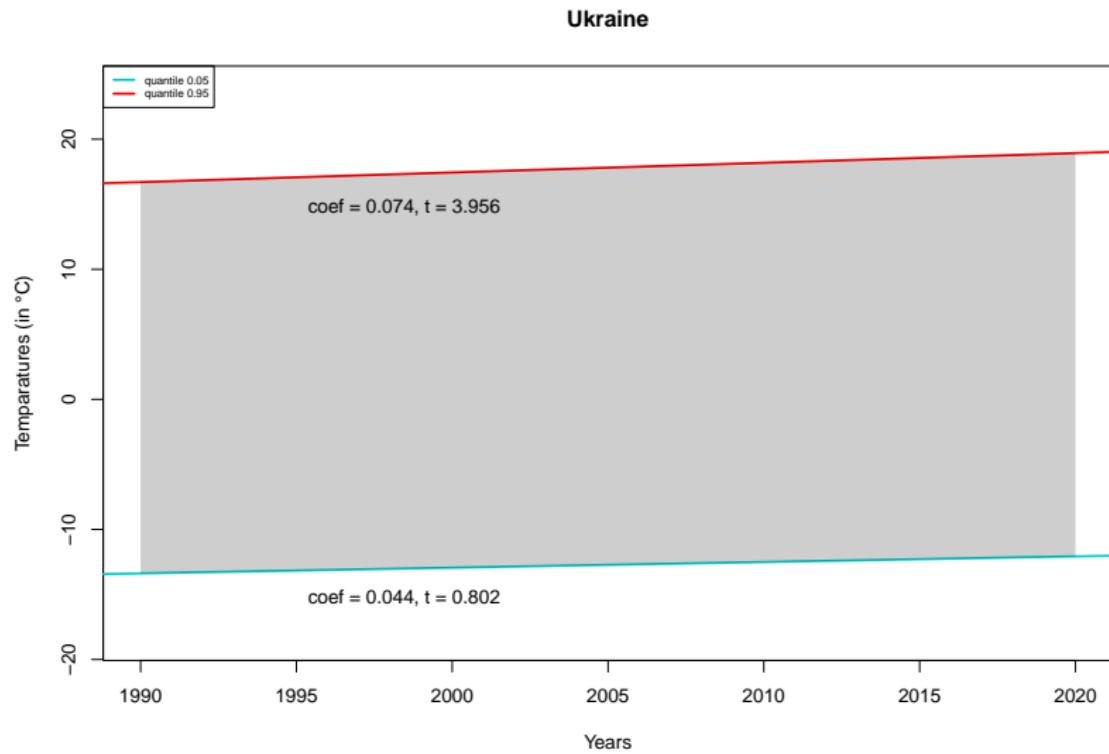


## Extreme quantiles

The following plots show the linear regression of the temperature quantiles 0.05 and 0.95.

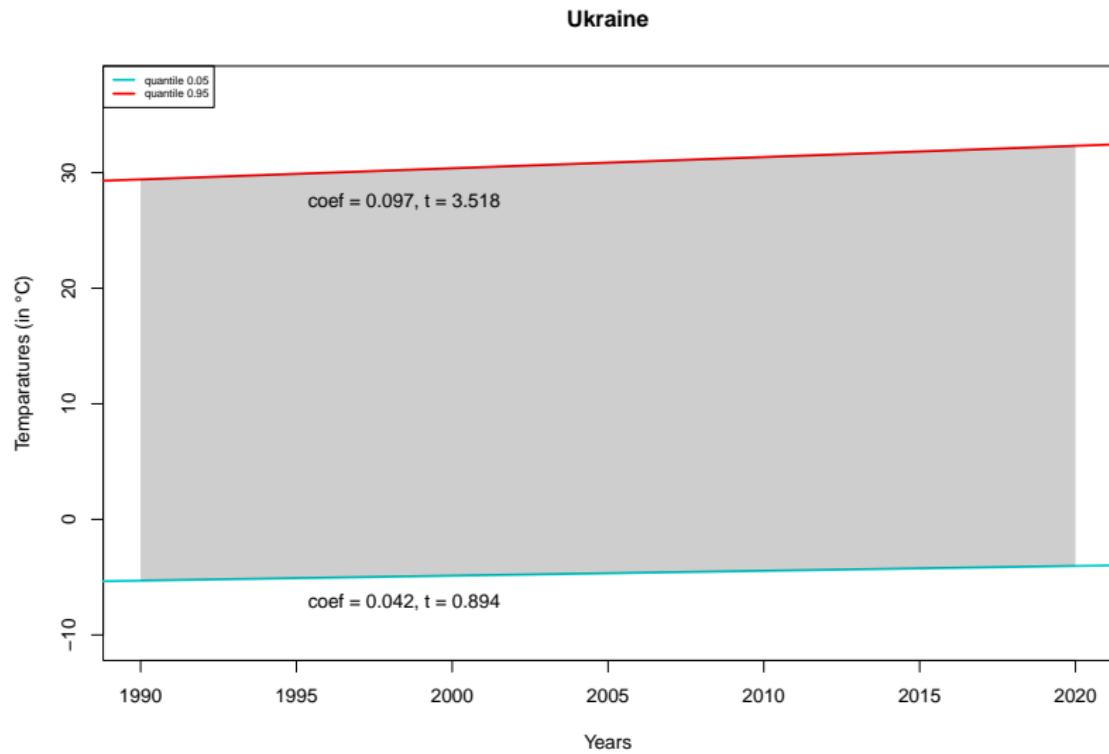
# Ukraine

## Minimum



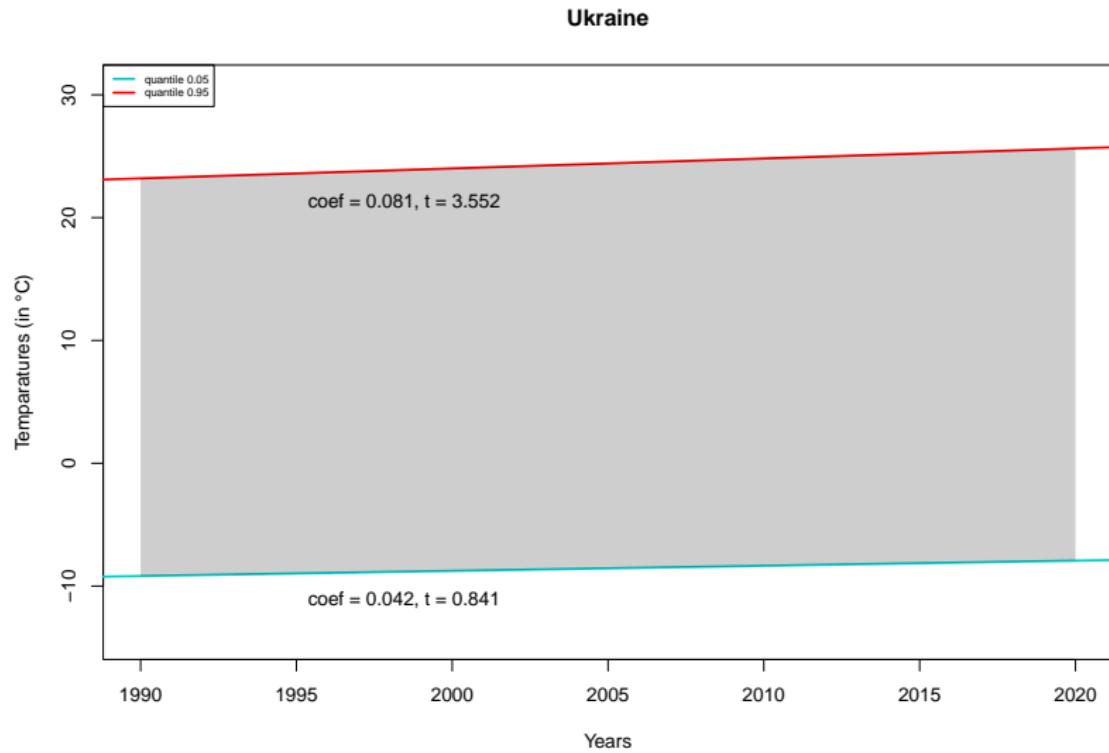
# Ukraine

## Maximum



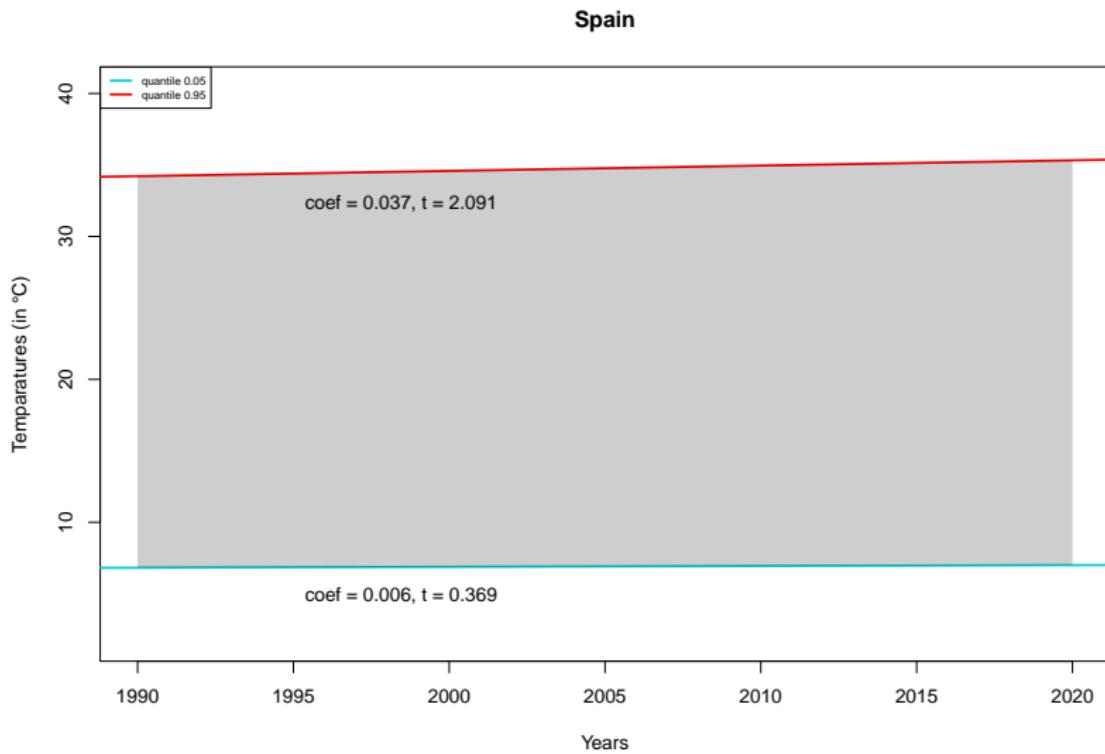
# Ukraine

## Mean



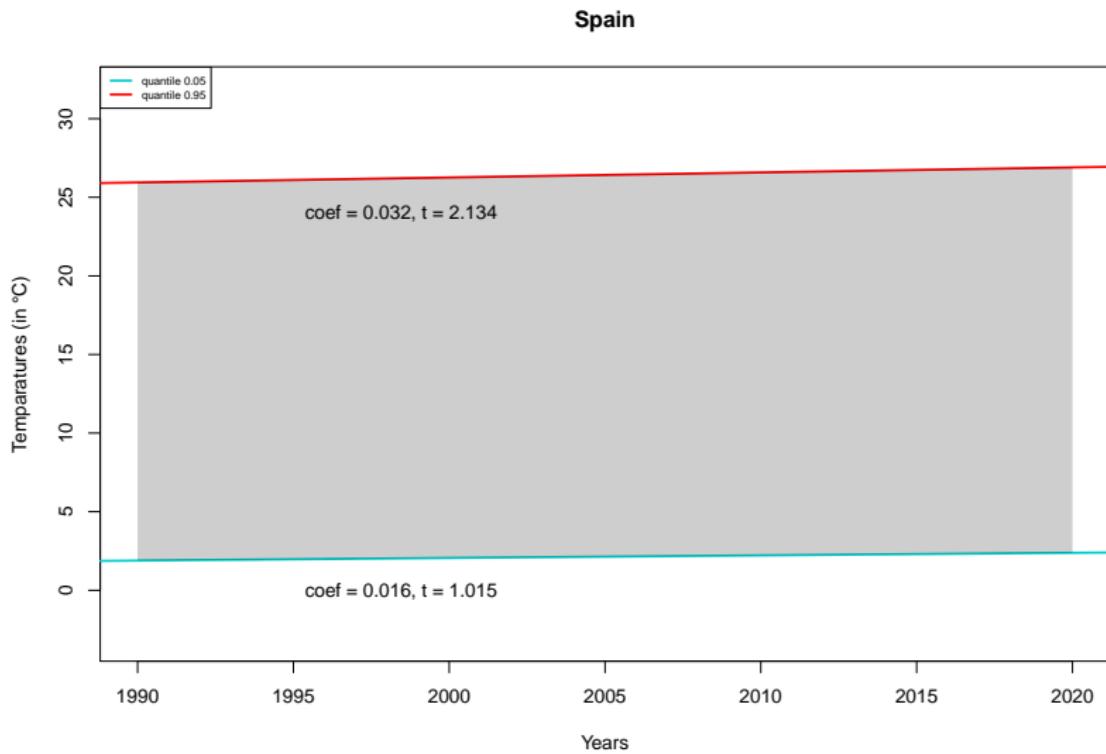
# Spain

## Maximum



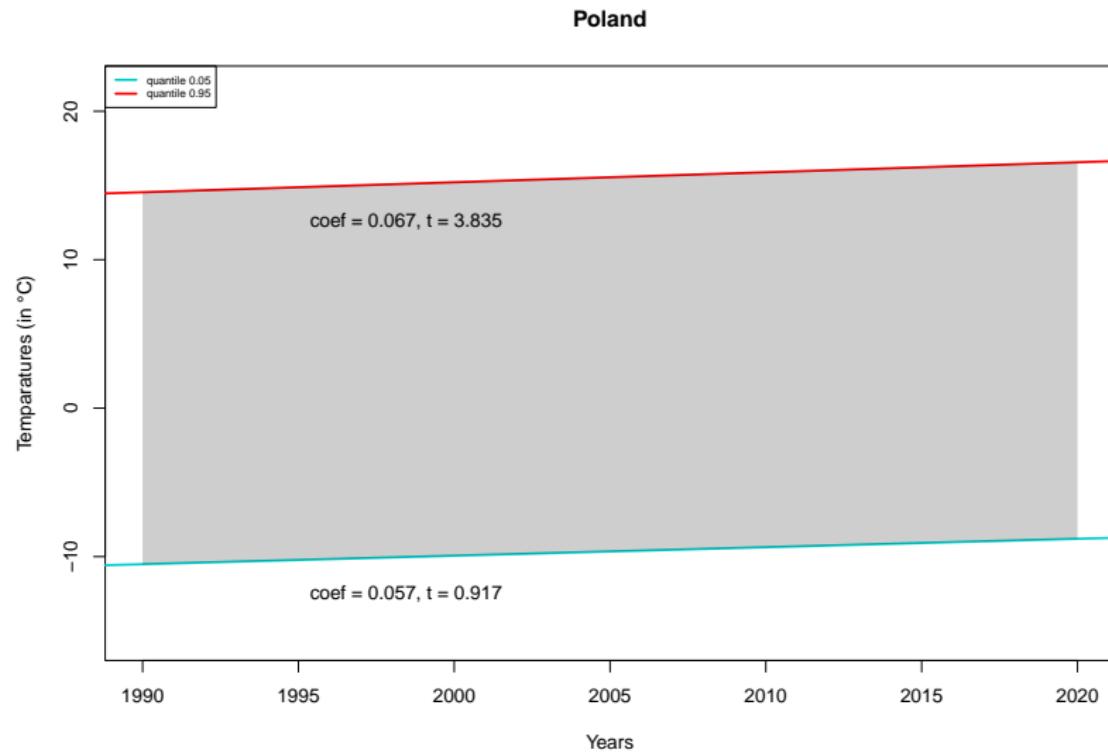
Spain

Mean



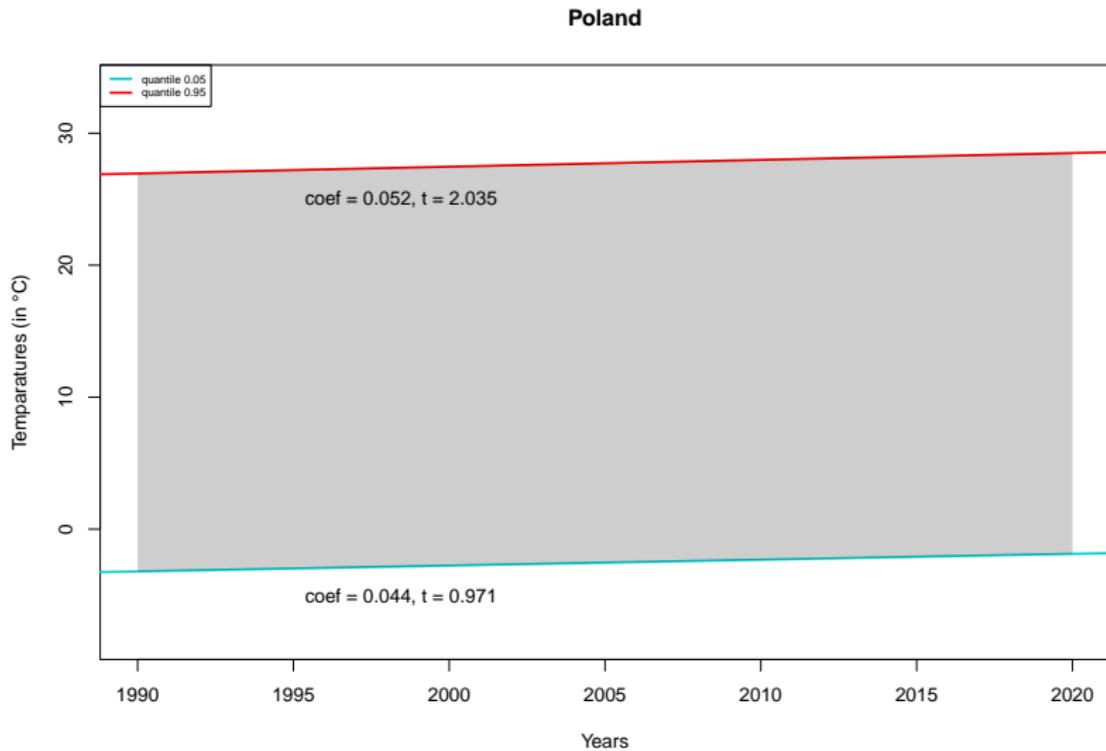
# Poland

## Minimum



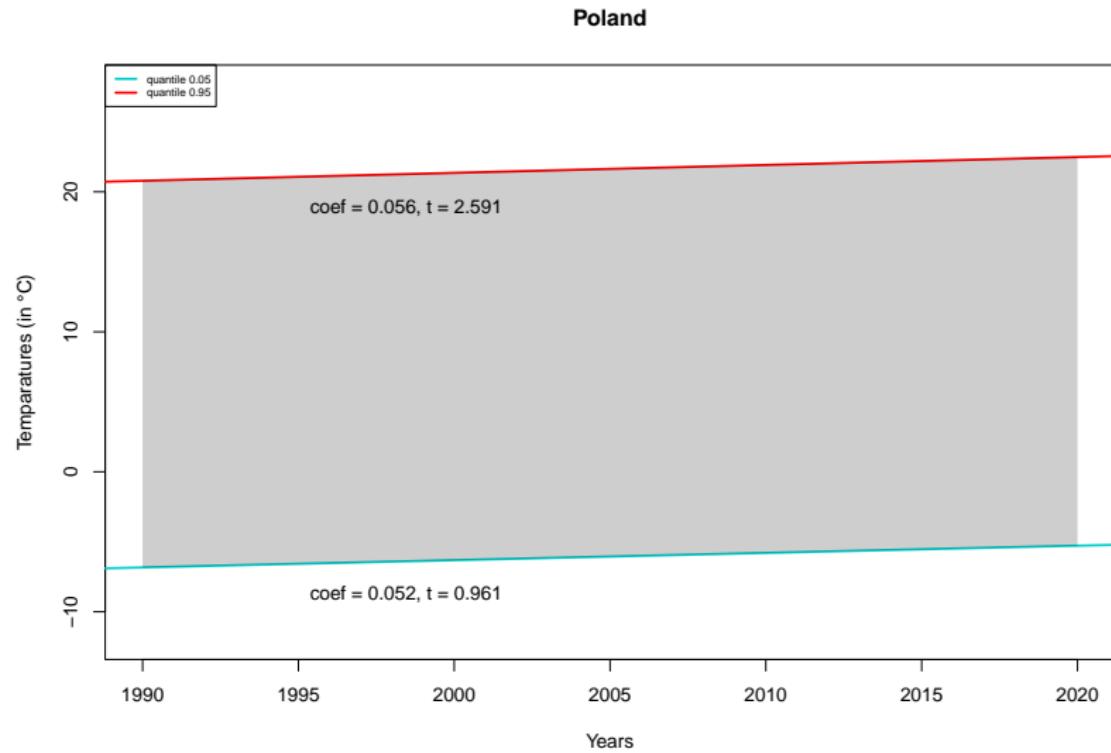
# Poland

## Maximum



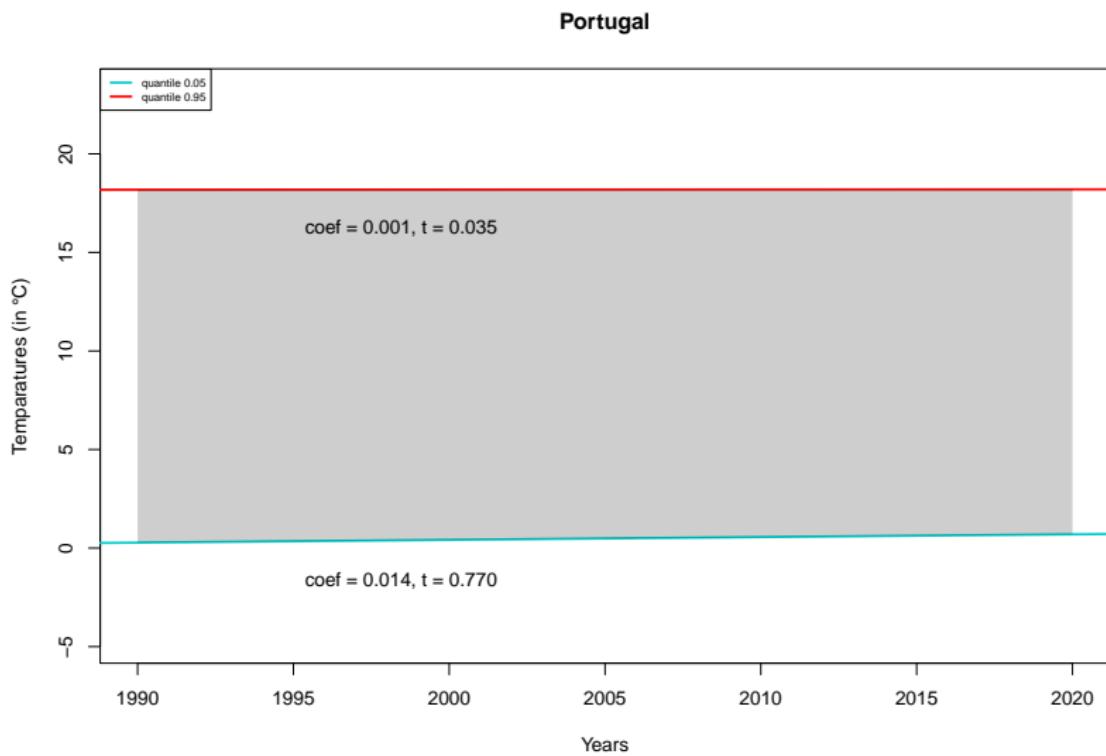
# Poland

## Mean



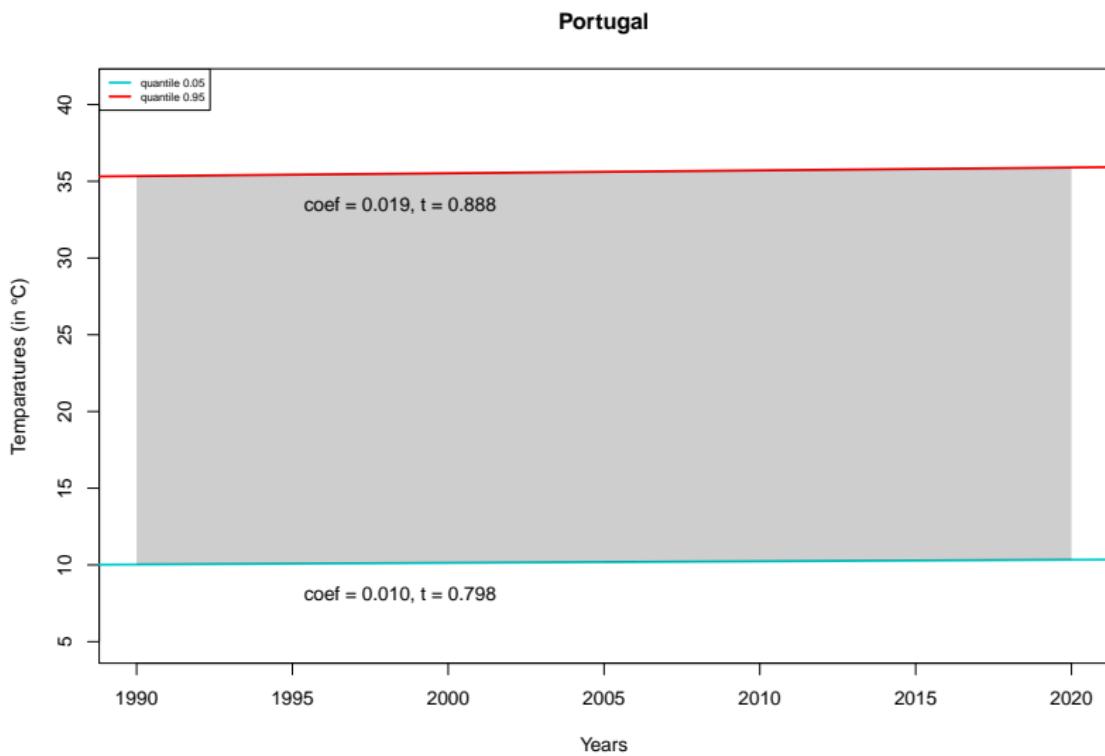
# Portugal

## Minimum



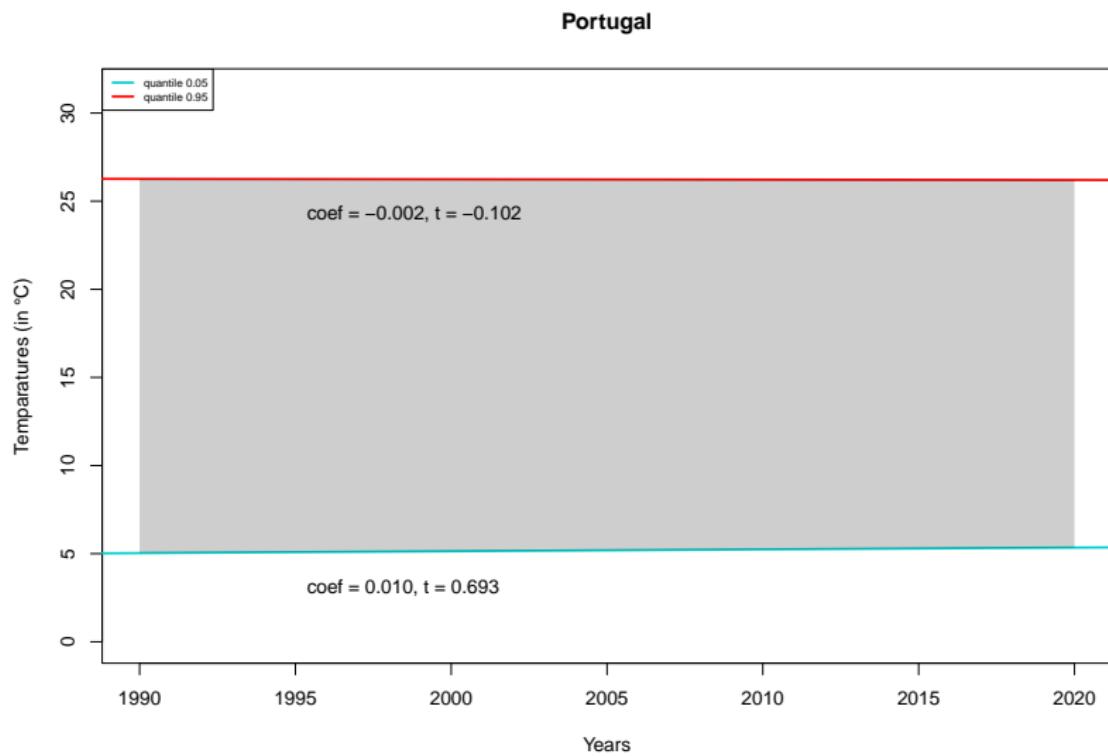
# Portugal

## Maximum



# Portugal

## Mean



# Migration Analysis

ToDo

Variable selection

ToDo

Model Development

ToDo

# Literature Review

ToDo

# Conclusion