



Climate Data Update: Euro-CORDEX

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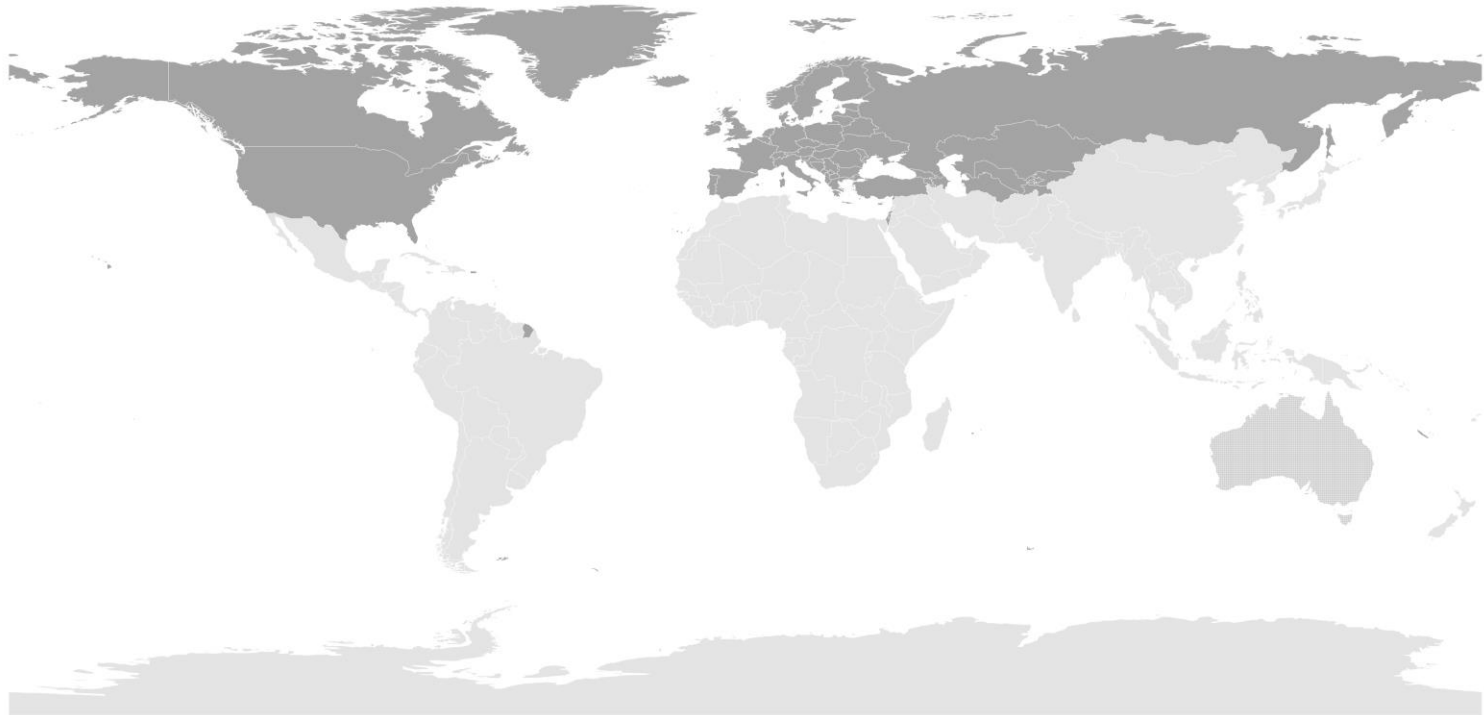
Economic Commission for Europe, Inland Transport Committee Meeting
UN, Geneva, 18-19 December, 2018

■ Background

- **June 2017 meeting:** challenges with providing regional climate model (RCM) data for the whole UNECE region made clear. Therefore GCM data used as a first step, and made available in August 2017
- **June 2018 meeting:** some discussion around the GCM data and ability to identify 'hotspots'. Need identified for very high resolution data, even if only for an 'example' part of the UNECE region
- **Today:** some Euro-CORDEX RCM data examples and update on what may be possible

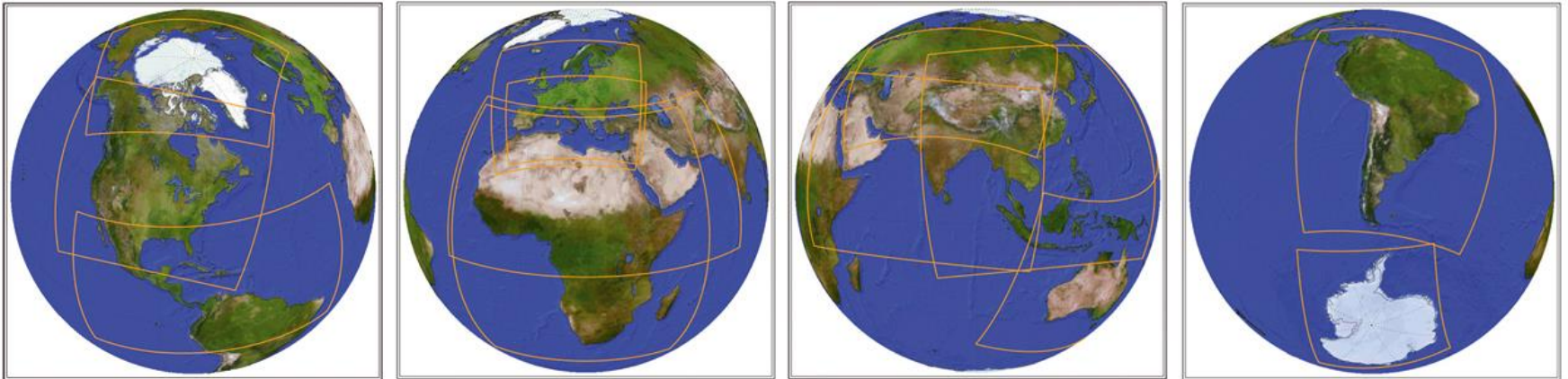
■ The size of the challenge...

UNECE Region



■ The Coordinated Regional Climate Downscaling Experiment (CORDEX) www.cordex.org

- 14 domains or areas where simulations are available
- Number of simulations varies regionally, and by RCP
- Data are available on the Earth System Grid Federation



- Using CORDEX data to meet the initial requirements (from the March meeting in 2017) for the UNECE region would mean a data volume in the region of 6 terabytes

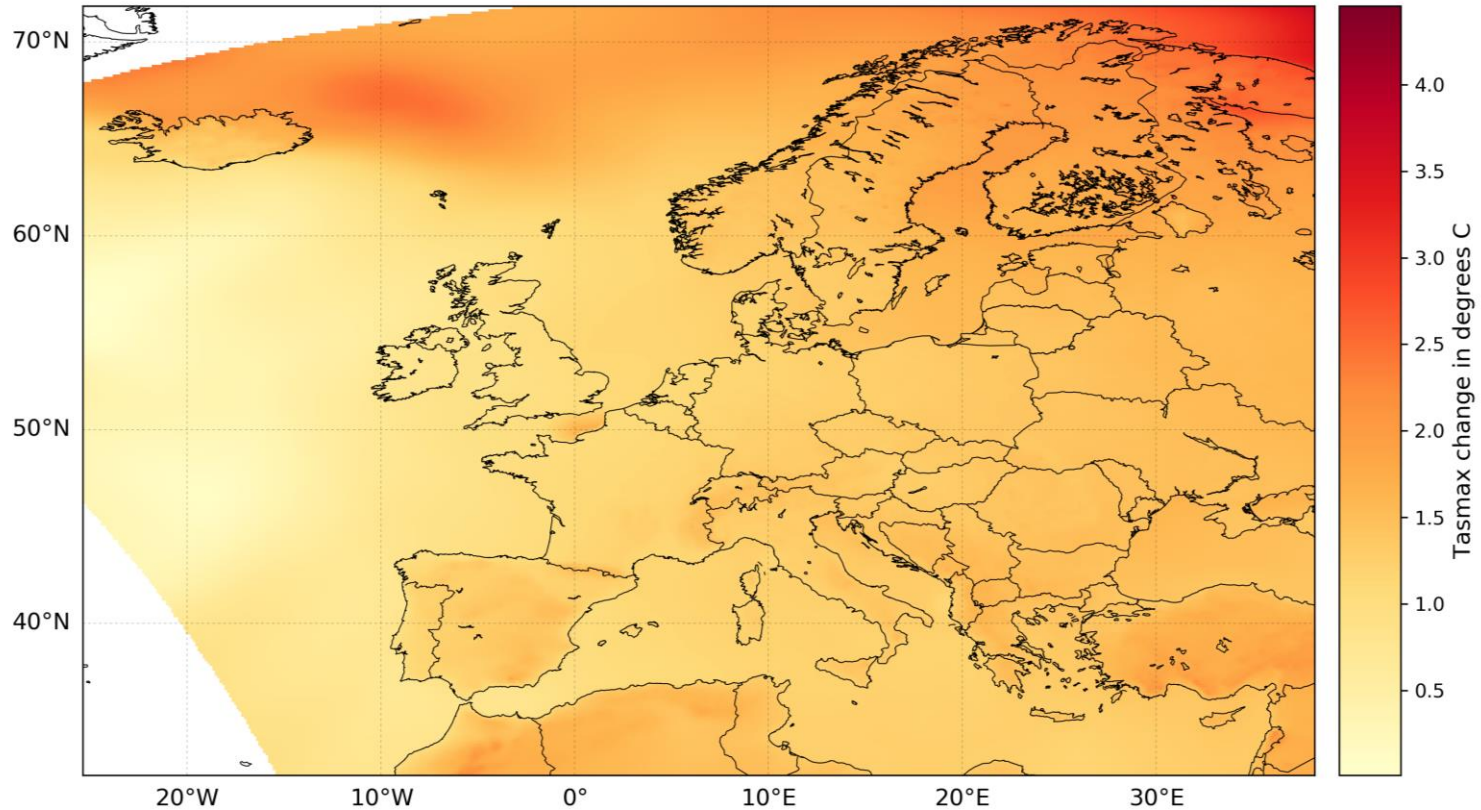
■ The requirement

- A desire to look at changes in a **number of climate extremes** related to precipitation, temperature and wind, e.g. tasmax, Rx5day, CWD, CDD, Tx90p
- Reference period: 1971-2000
- Future time period: 2051-2080
- For two RCP emissions scenarios: **RCP2.6** (“Paris”), and **RCP8.5** (“business as usual”)

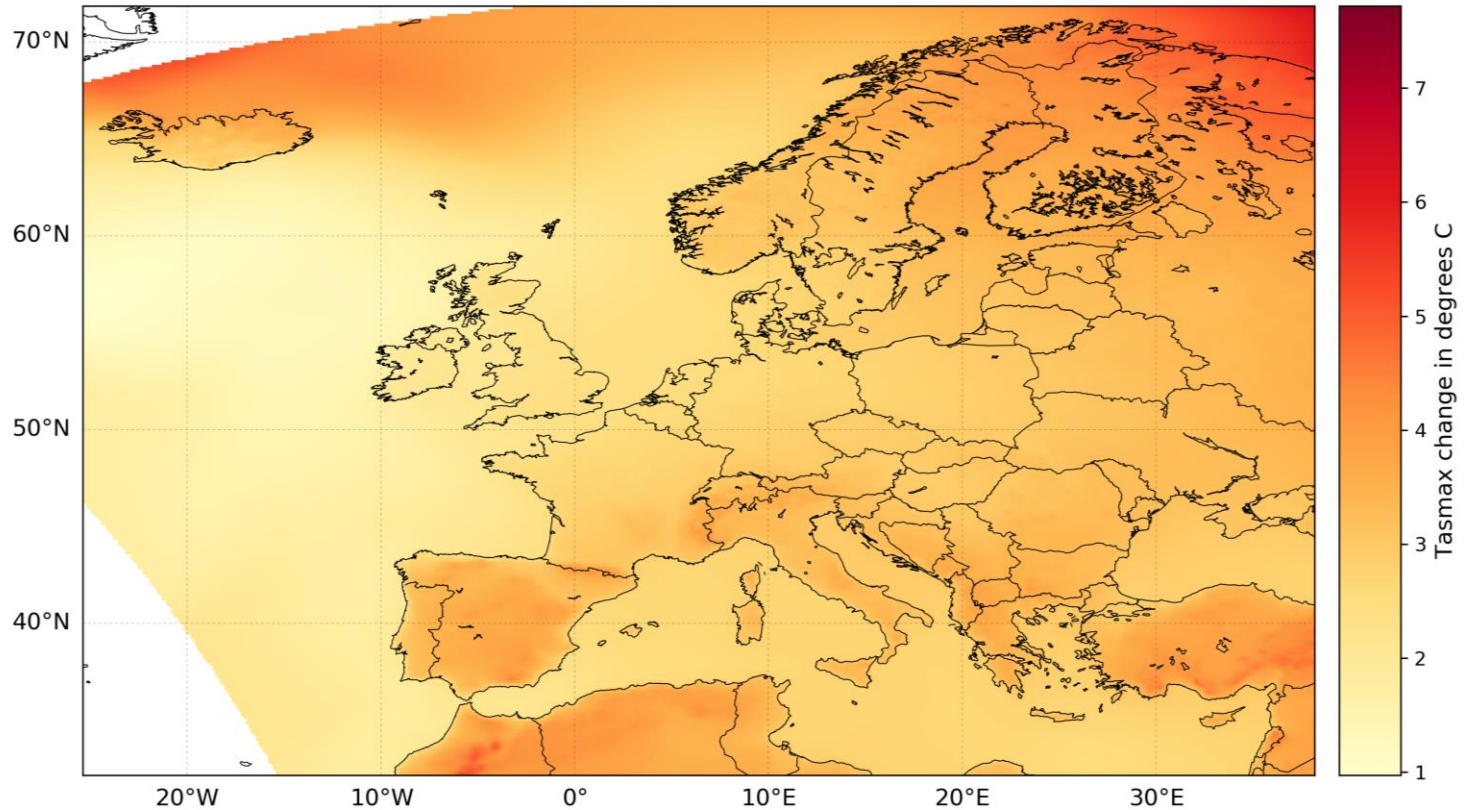
>> GCM approach, limited for identification of ‘hotspots’

>> Analysis of very high resolution for an example region: Euro-CORDEX (EUR11 - 12.5km horizontal resolution) data to highlight the ‘added value’ of RCM data.

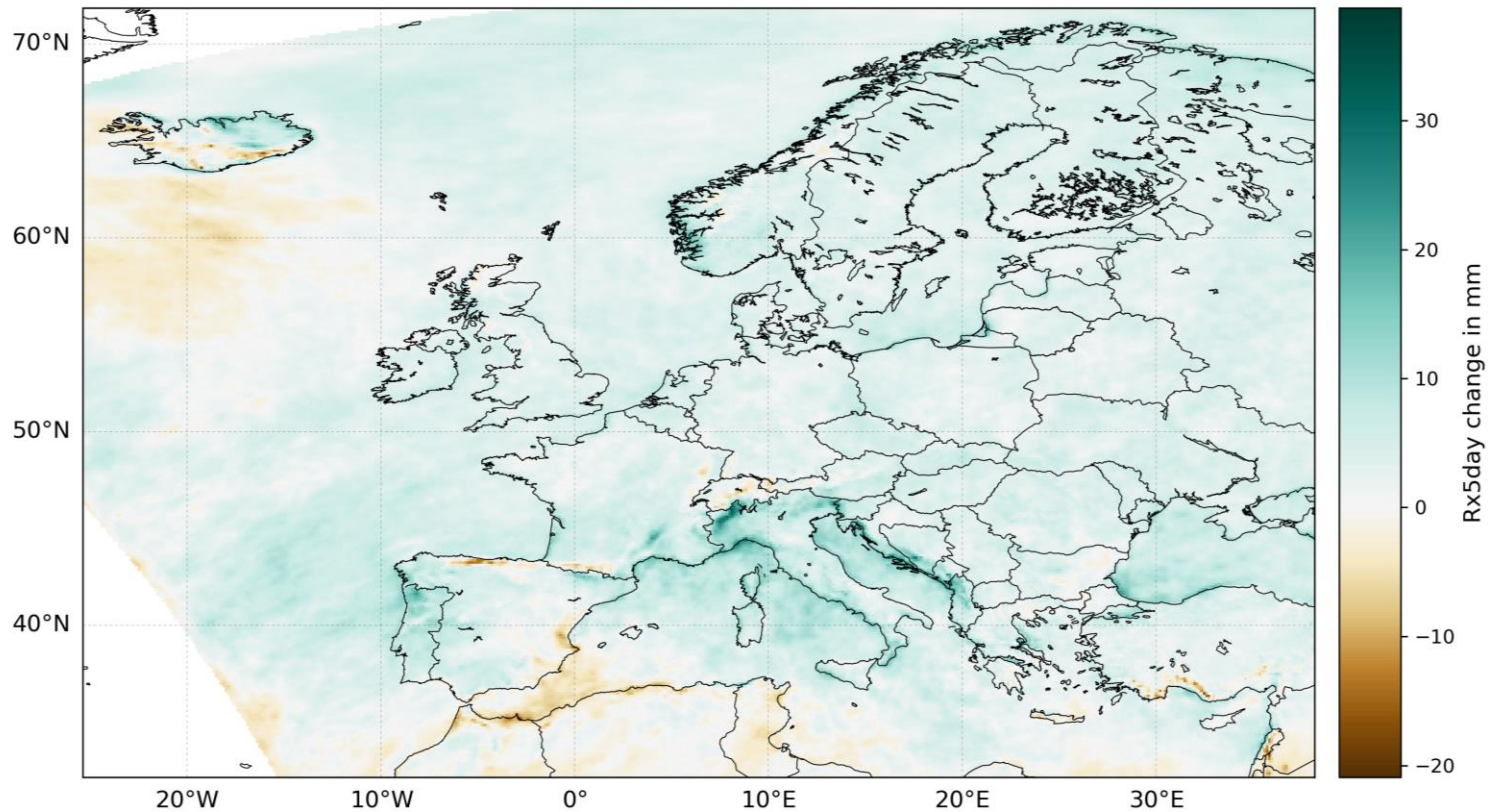
Absolute change in daily maximum temperature RCP2.6 (ensemble mean, 15 members)



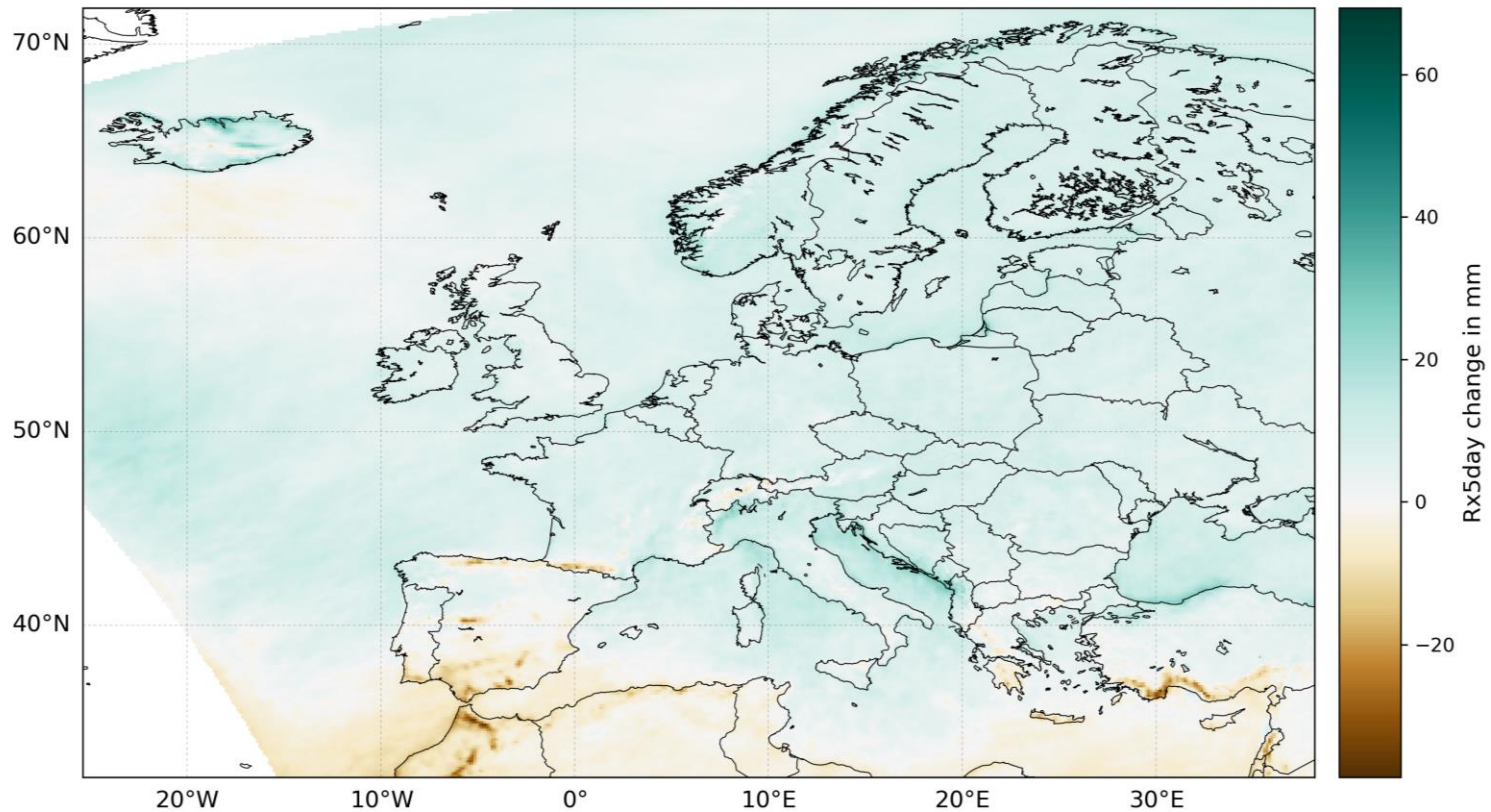
Absolute change in daily maximum temperature RCP8.5 (ensemble mean, 20 members)



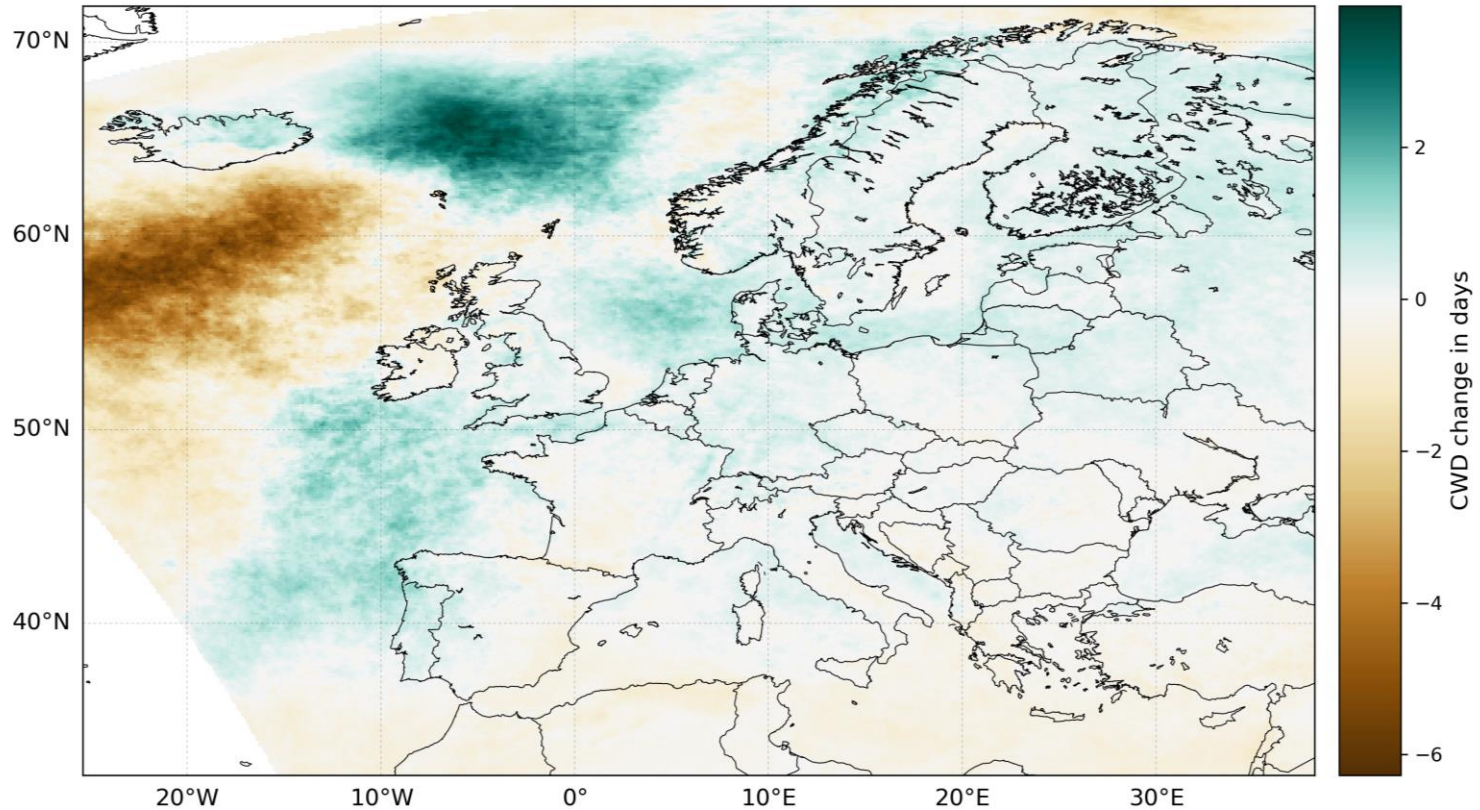
Absolute change in Rx5day “maximum precipitation amount in a consecutive 5 day period” RCP2.6 (ensemble mean, 15 members)



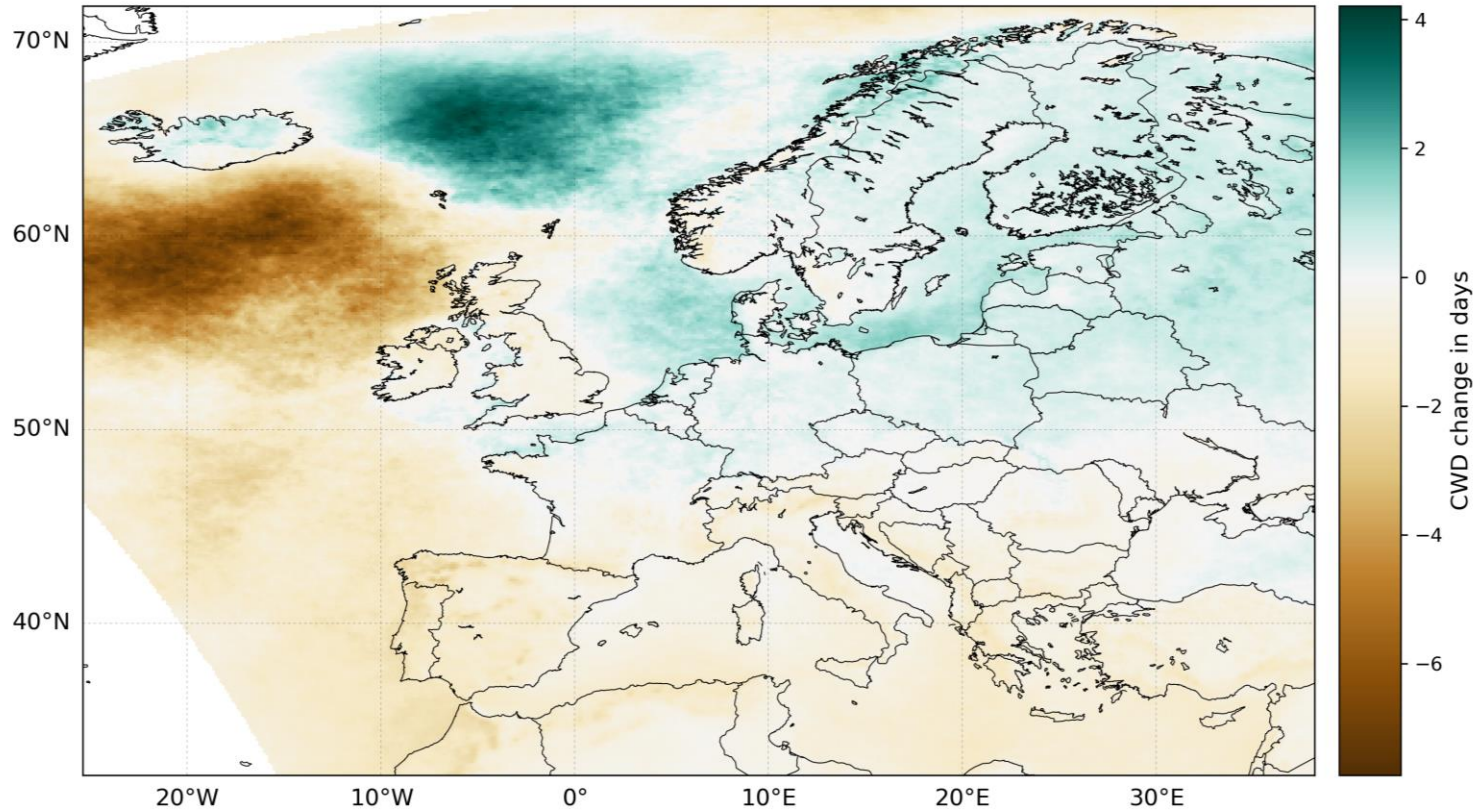
Absolute change in Rx5day “maximum precipitation amount in a consecutive 5 day period” RCP8.5 (ensemble mean, 20 members)



Absolute change in consecutive wet days (CWD) a consecutive RCP2.6 (ensemble mean, 15 members)



Absolute change in consecutive wet days (CWD) a consecutive RCP8.5 (ensemble mean, 20 members)



■ Where do we stand?

- Data set prepared using Euro-CORDEX data for the two RCPs, future reference period, for the following variables:
 - Annual daily maximum temperature (tasmax)
 - Annual precipitation
 - Rx5day (maximum 5 day consecutive precipitation (pr) amount)
 - R10mm (annual count of days pr > 10mm)
 - R20mm (annual count of days pr > 20mm)
 - Tx90p (% days when daily max temp. > 90th percentile)
 - Tx10p (% days when daily max temp. < 10th percentile)
 - Tn90p (% days when daily min temp. > 90th percentile)
 - Tn10p (% days when daily min temp. < 10th percentile)
 - Consecutive wet days
 - Consecutive dry days
- Ensemble means and percentiles calculated

■ Summary and concluding comments

- Working with **very high resolution RCM data** provides the **basis for a richer analysis** which together with analysis of associated socio-economic data may lead to identification of inland transport ‘hotspots’ in relation to relevant climate risks
- Using very high resolution RCM data does however provide **a not insignificant data processing challenge**, and resource requirement, when dealing with a region as large as the UNECE
- Data set over Europe has been prepared and can be made available to the UNECE inland transport committee
- What about the **other areas of the UNECE region?** Very high resolution RCM data desired/required?
- Does the data set contain the climate variables of interest, **is there anything missing?**

■ Interested to learn more?

- Climate extremes that were analysed are part of the Expert Team on Climate Change Detection and Indices (ETCCDI)
 - <http://etccdi.pacificclimate.org/index.shtml>
- Coordinated Regional Downscaling Experiment (CORDEX)
 - <http://www.cordex.org>
- Euro-CORDEX
 - <https://www.euro-cordex.net>



Thank you

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