1. Abstract

It is well-known that climate change affects large scale weather patterns and local extremes all over the world as well as in Europe. These changes include the changes of precipitation occurrences, amounts, and spatial patterns, which may require appropriate risk management actions. For this purpose, the first step is a thorough analysis of possible hazards associated to specific precipitation-related weather phenomena.

The primary goals of this study are (i) to examine the changes in precipitation patterns and extremes, and (ii) to explore the possible connections between changes in different localities across Europe. Altogether 14 plain regions are selected in this study to represent different parts within Europe. Daily precipitation time series are analyzed and compared for these plain regions using various statistical tools. The results represent annual and seasonal changes in average and extreme precipitation amount as well as in the frequency of precipitation occurrences. Climate indices and the occurrence of extreme weather conditions including wet and dry spells are also analyzed.

2. Database

Precipitation time series are used from the E-OBS x 0.1° datasets on a 0.1° regular grid. Datasets are based on station measurements from Europe and are available from 1990 onward with daily temporal resolution, and updated regularly.

3. Selected regions

For choosing the plains and their spatial representations we used an objective method. The pre-selected regions have to fulfill two criteria, namely:

- Elevation remains below 200 m throughout the entire defined area
- Difference between the neighboring gridpoints within the plain region does not exceed 40 m

4. Results

The list of the indices used in this study with their definitions.
The median values in the table were calculated with multiple statistical tools. First, yearly time series were determined with spatial averaging for each region. Then medians were calculated, finally we also calculated the median values for the indices.

5. Summary

Altogether 14 regions were selected across Europe for analysis of precipitation patterns and extremes. In most of the regions, significant changes in drought indices can not be detected. In the cases of precipitation indices, several regions show significant increases. We identified four group of regions where similar precipitation trends can be seen, however they also include differences in wet days and dry spells.

6. References and acknowledgement

Research leading to this poster was supported by the Hungarian Academy of Human Capacities under the GfE Excellence Program (770-1/2018/FEKUTSZÉM), and the Hungarian National Research, Development and Innovation Fund under grants 613356 and 6/2016.

We acknowledge the E-OBS dataset from the UEA Climatic Research Unit (http://www.cru.uea.ac.uk) and the Copernicus Climate Change Service, and the data providers in the ECA&D project (http://cera-www.dmi.dk/data).