EGU23-14880, updated on 30 Sep 2023
https://doi.org/10.5194/egusphere-egu23-14880
EGU General Assembly 2023

Effects of changing atmospheric circulation patterns on waterlogging potential in Southeast Europe

Minučer Mesaroš, Dragoslav Pavić, and **Igor Leščešen**
University of Novi Sad, Faculty of Sciences, Department of Geography, Tourism and Hotel Management, Novi Sad, Serbia (minucher@gmail.com)

Waterlogging or inland flooding occurs when excess water accumulates in the soil, leading to saturated conditions and reduced oxygen levels. Waterlogging affects lowlands, flat terrain and alluvial plains with limited runoff and increased water accumulation, which is typical for large parts of the Pannonian and Peripannonian regions of Hungary, Serbia and Croatia. These inundations cause substantial problems, primarily in agriculture trough crop loss, soil degradation and pollution, as well as damage to infrastructure and various socio-economic challenges.

Precipitation is the primary climatic factor that affects waterlogging, in combination with air temperature, humidity, evaporation, and other local hydrogeological, pedological, geomorphological and anthropogenic factors.

Changes in atmospheric circulation patterns influence the amount, intensity, and seasonality of precipitation which determine the extent and duration and subsequent negative impact of inland flooding.

Based on climate reanalysis data (ERA5) and regional climate models we examined precipitation trends in the period from 1950 to 2022 and from 2023 to 2070. Having the most significant effect on waterlogging the amount and intensity of precipitation in winter and spring season were assessed in detail. While the models indicate generally less rainfall in the future, the seasonal distribution and the increase in frequency of extreme precipitation events will favor the periodic occurrence of waterlogging in the region in the comming decades. The results of this study can be implemented in planning agricultural and water management activities.

Acknowledgements:

This research was supported by ExtremeClimTwin project, which has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 952384.