Contribution ID: **9**   Type: **Talk**

Developing a Non-Stationary Weather Generator for Central Europe: Using Large-Scale Circulation Patterns and Downscaling Future Climate Model Projections

Friday 23 June 2023 10:50 (15 minutes)

This study presents the development of a non-stationary gridded weather generator for Central Europe region conditioned on large-scale weather circulation patterns and the regional average temperature. The generator is then employed to downscale the future meteorological fields such as precipitation and temperature for the region accounting their variability. An ensemble of the nine most skillful models from the Climate Model Inter-comparison Project Phase 6 (CMIP6), two shared socio-economic pathways, and two future periods until 2100 are considered. Based on that, future changes in these fields for the five major catchments in Germany including Donau, Elbe, Ems, Rhine and Weser are assessed. This analysis is expected to provide valuable inputs for future flood risk assessments in the region.

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Session Classification: Climate engineering and nature-based solutions & Linking meteorology and hydrology

Track Classification: Linking meteorology and hydrology