The climatic water balance in convection-permitting climate models

The climatic water balance is the difference between precipitation and potential evaporation. In the course of climate change, areas with a negative climatic water balance are increasing in Germany, especially in the east and in the Rhine Graben. The consequences are an increased potential for water stress, increased irrigation requirements and utilisation conflicts. The conflicts are expected to intensify as climate change progresses. It will therefore be crucial for successful climate adaptation in Germany to be able to predict the future development of the water balance.

The new generation of climate models, the high-resolution so-called convection-permitting models, are a promising tool for analysing the effects of climate change on the water balance and projecting future developments. However, little is currently known about the representation of the water balance in the models. This work will contribute to closing this knowledge gap by evaluating the climatic water balance in the model.

The tasks are

- Literature research: Why is the climatic water balance important and how can it be calculated?
- Evaluation of evaporation, potential evaporation and climatic water balance from a convection-permitting climate simulation for Germany
- Comparison with measurement data

If you are interested in the topic and would like to learn more about convection-permitting climate simulation, please contact Marie Hundhausen (marie.hundhausen@kit.edu), PhD student in the working group Regional Climate and Weather Hazards by Joaquim Pinto.

The work would be supervised by Marie Hundhausen and Prof. Joaquim Pinto.