



## **Role of soil moisture vs. recent climate change for heat waves in western Russia**

Mathias Hauser, Rene Orth, and Sonia Seneviratne

Institute for Atmospheric and Climate Science IAC, ETH Zürich, Switzerland

Using the framework of event attribution, anthropogenic climate change was found to have a discernible influence on the occurrence-probability of heat waves, such as the one in Russia in 2010. Soil moisture, on the other hand, is an important physical driver for heat waves as its availability has a large influence on the partitioning of the available surface net radiation into latent and sensible heat flux. The presented study investigates the relative importance of both controls, soil moisture and increasing greenhouse gas concentrations, on heat waves in the region of the 2010 Russian heat wave. This is done with a large number of ensemble members from climate simulations with and without interactive soil moisture for both, the 2000s and the 1960s. The simulations allow to determine the occurrence-probability of heat waves with and without the soil moisture-temperature feedback and to compare it to the change caused by climate change. Thereby, we expect to see the largest effect on daytime maximum temperatures (TXx) and a smaller influence of soil moisture on the mean temperatures and cold extremes.