



## **A case for multi-model and multi-approach based event attribution: The 2015 European drought**

Mathias Hauser (1), Lukas Gudmundsson (1), René Orth (1), Aglaé Jézéquel (2), Karsten Haustein (3), and Sonia Isabelle Seneviratne (1)

(1) ETH Zürich, Zürich, Switzerland, (2) Laboratoire des Sciences du Climat et de l'Environnement, LSCE/IPSL, CEA-CNRS-UVSQ, Université Paris-Saclay, F-91191 Gif-sur-Yvette, France, (3) University of Oxford

Science on the role of anthropogenic influence on extreme weather events such as heat waves or droughts has evolved rapidly over the past years. The approach of “event attribution” compares the occurrence probability of an event in the present, factual world with the probability of the same event in a hypothetical, counterfactual world without human-induced climate change. Every such analysis necessarily faces multiple methodological choices including, but not limited to: the event definition, climate model configuration, and the design of the counterfactual world. Here, we explore the role of such choices for an attribution analysis of the 2015 European summer drought (Hauser et al., in preparation). While some GCMs suggest that anthropogenic forcing made the 2015 drought more likely, others suggest no impact, or even a decrease in the event probability. These results additionally differ for single GCMs, depending on the reference used for the counterfactual world. Observational results do not suggest a historical tendency towards more drying, but the record may be too short to provide robust assessments because of the large interannual variability of drought occurrence. These results highlight the need for a multi-model and multi-approach framework in event attribution research. This is especially important for events with low signal to noise ratio and high model dependency such as regional droughts.

Hauser, M., L. Gudmundsson, R. Orth, A. Jézéquel, K. Haustein, S.I. Seneviratne, in preparation. A case for multi-model and multi-approach based event attribution: The 2015 European drought.