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Attributing regional effects of the 2014 Jordanian extreme drought to external climate drivers

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Throughout 2014, the regions of Jordan, Israel, Lebanon and Syria have experienced a persistent draught with clear impacts on the local populations. In this study we perform an extreme event attribution analysis of how such a draught has changed under climate change, with a specific focus on the flow rate of the Upper Jordan river and the water level of Lake Tiberious (AKA the Sea of Galilee). Both of which hold major societal, political and religious importance. To perform the analysis we make use of distributed computing power to run thousands of modelled years of 2014 with slightly different initial conditions. We use an atmosphere only model (HadAM3p) with a nested 50 km regional model covering Africa and the Middle East. The 50 km model atmospheric variables will be used directly to force offline our 1 km LIS surface model. Two separate experiments and simulations are performed, 1. for all known climate forcings that are present in 2014, and 2. for a naturalised 2014 scenario where we assume humans never impacted the climate. We perform sensitivity analyses on the observed precipitation over the regions of interest, and determine that the TRMM data is in good agreement with station data obtained from the Jordanian Ministry of Water. Using a combination of the TRMM and model data we are able to make clear statements on the attribution of a 2014-like extreme draught event to human causal factors.