



Impact of climate change on European weather extremes

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An emerging science consensus is that global climate change will result in more extreme weather events with concomitant increasing financial losses. Key questions that arise are: Can an upward trend in natural extreme events be recognised and predicted at the European scale? What are the key drivers within the climate system that are changing and making extreme weather events more frequent, more intense, or both?

Using state-of-the-art coupled climate simulations from the UK Met Office (HadGEM3-GC2, historical and future scenario runs) as well as reanalysis data, we highlight the potential of the currently most advanced forecasting systems to progress understanding of the causative drivers of European weather extremes, and assess future frequency and intensity of extreme weather under various climate change scenarios.

We characterize European extremes in these simulations using a subset of the 27 core indices for temperature and precipitation from The Expert Team on Climate Change Detection and Indices (Tank et al., 2009). We focus on temperature and precipitation extremes (e.g. extremes in daily and monthly precipitation and temperatures) and relate them to the atmospheric modes of variability over Europe in order to establish the large-scale atmospheric circulation patterns that are conducive to the occurrence of extreme precipitation and temperature events.

Klein Tank, Albert M.G., and Francis W. Zwiers. Guidelines on Analysis of Extremes in a Changing Climate in Support of Informed Decisions for Adaptation. WMO-TD No. 1500. Climate Data and Monitoring. World Meteorological Organization, 2009.