

**Predicting changes in the probability of extreme heatwave events in Europe**Helen Hanlon<sup>†</sup>; Gabriele Hegerl; Simon Tett<sup>†</sup> University of Edinburgh, United KingdomLeading author: [h.hanlon@ed.ac.uk](mailto:h.hanlon@ed.ac.uk)

Daily maximum and daily minimum Summer temperatures have increased throughout the majority of Europe over the past few decades. As a result, the frequency and intensity of heatwaves in Europe have also increased. Future climate modelling results suggest this rise is expected to continue in the future. Previous studies into the mechanisms causing Europe heatwaves have shown that precipitation can also have a significant role in such events. Hence research is currently being undertaken to predict changes in both heatwave and drought indices, which are relevant to heatwave impacts research, along with an investigation of the mechanisms behind these changes. This research is being performed as a contribution to the EQUIP (End-to-end Quantification of Uncertainty for Impacts Prediction) project, a three-year consortium project that brings together the UK climate modelling, statistical modelling, and impacts communities to work closely together for the first time on developing risk-based prediction for decision making in the face of climate variability and change. The main aim of this project is to assess the level of precision associated with climate predictions. Precise predictions of future heatwaves remain unattainable, owing to the fundamental chaotic nature of the climate system and to imperfections in our understanding, our climate simulation models and our observations of the climate system. This situation limits our ability to make effective adaptation decisions. However, effective adaptation is still possible, if we can effectively quantify uncertainty surrounding these predictions as this would allow an improved understanding of the risks posed by climate change and will aid more effective planning for the future. So as the climate changes the financial losses and loss of human lives seen previously can be minimised in subsequent events.