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## Attributing Chinese Hydrological Extreme Events

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In 2018 & 2019 China was impacted by three extreme hydrological events. Heavy rainfall in Central China during summer 2018, heavy summer rainfall in south eastern China during 2019 and a severe drought in Yunnan in May/June of 2019. Using the Hadley Centre's state-of-the-art attribution system the role of anthropogenic forcing in the changing risk of these events was studied. The modelling system uses two large ensembles of a 60 km resolution atmospheric model driven with sea-surface temperatures (SST), sea-ice and a package of different forcings. One ensemble uses observed SSTs and natural and human forcings while the other uses pre-industrialised SSTs and natural forcings. The studies were done in two week-long workshops held in China which aimed to train early career researchers to carry out event attribution studies. The methodologies used in all studies were similar. In all three cases, anthropogenic forcing reduced the risk of heavy rainfall and increased the risk of drought. Changes in risk for the three events are surprisingly large with the probability of the Yunnan drought increasing by a factor of 14, the probability of the summer 2019 heavy rainfall declining by a factor of four, and the probability of the summer 2018 rainfall event declining by a half. Aerosol induced circulation changes in the model are the likely reason for these changes.

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