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Attributing the influence of climate change on the 2022 Pakistan floods

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In 2022 large parts of Pakistan suffered devastating flooding, with the southern provinces of Balochistan and Sindh particularly badly impacted. These regions received record-breaking rainfall totals during August, following a very wet July over the summer monsoon season. In this attribution study we combine the forecasting attribution technique developed by Leach et al. 2021 with flood inundation modelling to estimate the influence of anthropogenic climate change on the 2022 floods. This combined storyline and probabilistic approach uses the European Centre for Medium-Range Weather Forecasts (ECMWF) forecasts, and perturbed counterfactual forecasts with the same synoptic setup. These are fed into the 2D hydrodynamic flood inundation model LISFLOOD-FP over the worst affected regions to produce flood maps at 90m resolution.