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## Improving our understanding of Bangladesh tropical cyclone risk: decision making insights using kilometre scale numerical modelling and Bayesian data analysis

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We present results from state-of-the-art kilometre scale numerical models of tropical cyclones over Bangladesh. We demonstrate how the latest generation of numerical models are filling the data gap in regions of the world with sparse observational networks, and compare our results to the latest generation global reanalyses. We show how an ensemble of simulations expands our understanding of plausible events beyond our limited observations record. Utilising this ensemble information in a Bayesian data analysis framework, we can robustly estimate prediction intervals for various parameters, such as peak wind speed or extreme rainfall, which when combined with Decision Theory and a loss function offer a coherent data-to-decision framework supporting disaster risk assessment and management strategies. We show how this decision making could be integrated into current global weather and climate forecast ensembles to provide forecasting of hazards and impacts up to 5 days ahead of an event, and in a future climate context. We end with some thoughts on the ways this could influence the future of risk management and insurance underwriting and the challenges of working with big numerical model datasets.