



Enhanced flood risk with 1.5°C global warming in the Ganges-Brahmaputra-Meghna basin

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Flood hazard is a global problem, which in some regions may be exacerbated by climate change. In south Asia, where livelihoods are highly dependent on water resources, people can be affected disproportionately. The 2017 monsoon flooding in the Ganges-Brahmaputra-Meghna (GBM) basin, with record river levels observed, resulted in ~1200 deaths, and dramatic loss of crops and infrastructure. Climate model scenarios representing the Paris Agreement targets were investigated and the changes in extreme precipitation were quantified over the GBM region. Large ensembles of climate simulations using different models and experimental designs were used to evaluate the range of possible changes. These estimates were linked to a high-resolution flood hazard model to determine the corresponding changes in flood hazard. The simulations of 1.5°C and 2°C warming indicate an increase in extreme precipitation and hence flood hazard over the GBM basin compared to the current climate. So even with global warming limited to 1.5°C, there is a detectable increase in the likelihood in flooding for extreme precipitation events such as the south Asian crisis in 2017. The additional ~0.6°C warming needed to take us from current climate to 1.5°C highlights the changed flood risk even with low levels of warming.