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US fluvial, pluvial and coastal flood hazard under current and future climates

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This talk reports a new and significantly enhanced analysis of US flood hazard at 30m spatial resolution. For the first time we consider pluvial, fluvial and coastal flood hazards within the same framework and provide projections for both current (rather than historic average) conditions and for future time periods centred on 2035 and 2050 under the RCP4.5 emissions pathway. Validation against high quality local models and the entire catalogue of FEMA 1% annual probability flood maps yielded Critical Success Index values in the range 0.69-0.82. Significant improvements over a previous pluvial/fluvial model version are shown for high frequency events and coastal zones, along with minor improvements in areas where model performance was already good. The result is the first comprehensive and consistent national scale analysis of flood hazard for the conterminous US for both current and future conditions. Even though we consider a stabilization emissions scenario and a near future time horizon we project clear patterns of changing flood hazard (3σ changes in 100yr inundated area of -3.8 to +16% at 1° scale), that are significant when considered as a proportion of the land area where human use is possible or in terms of the currently protected land area where the standard of flood defence protection may become compromised by this time.