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Flood hazard estimation and climate change: impacts and uncertainties for Irish catchments using CMIP6

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In the coming decades, climate change will likely become a complex issue affecting hydrological regimes and flood hazard conditions. According to the IPCC reports, significant changes in atmospheric temperature, precipitation, humidity, and circulation are expected which may lead to extreme events including flood, droughts, heatwaves, heavy precipitation, and more intense cyclones. Although the effects of climate change on flood hazard indices is subject to large uncertainty, the evaluation of high-flows plays a crucial role in flood risk planning and extreme event management. With the advent of the Coupled Model Intercomparison Project Phase 6 (CMIP6), flood managers are interested to know how changes in catchment flood risk are expected to alter relative to previous assessments. Here we examine catchment based projected changes in flood quantiles and extreme high flow events for Irish catchments, selected to be representative of the range of hydrological conditions on the island. Conceptual hydrological models, together with different downscaling techniques are used to examine changes in flood risk projected from the CMIP6 archive for mid and end of century. Results will inform the range of plausible changes expected for policy relevant flood indices, the sensitivity of findings to use of different climate model ensembles and inform the tailoring of adaptation plans to account for the new generation of climate model outputs.