

Impacts of climate and land-use changes on floods in an urban catchment in southeast Queensland, Australia

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Abstract Over the coming decades, the projected land-use change, when coupled with climate change, could potentially lead to an increased risk of flooding in urban catchments. This research aims to examine impacts of climate and land-use changes on floods in southeast Queensland, Australia. A rainfall–runoff routing model, RORB, was first calibrated and validated using observed flood hydrographs for an urbanised catchment, the Bulimba Creek catchment, for the period 1961–1990. The validated flood model was then used to generate flood hydrographs using projected rainfall based on a global climate model, GFDL, and a regional climate model, CCAM, for 2016–2045. Projected daily precipitation for the two contrasting periods were used to derive adjustment factors for a given frequency of occurrence. Two scenarios of land-use change were considered to evaluate the likely impact of land-use change. Results showed that future flood magnitudes are unlikely to increase for large flood events for the urban catchment. Further, land-use change would not significantly affect flood magnitudes for a given frequency of occurrence in the urbanised catchment.

Key words climate change; land-use change; floods; Queensland, Australia