**Flood Hydrology and River Recovery in Eastern Australia**

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* **This abstract is for an Oral**
* **Applied Geomorphology**

# ABSTRACT

# The geomorphic and vegetative structure of rivers in coastal catchments of New South Wales (NSW) have been highly disturbed since European colonisation. However, since the late 1980s, nearly 55% of rivers in these catchments have undergone a significant ‘re-greening’ and geomorphic recovery with significant changes to the roughness of these rivers. In this study, approximately 7,000 available one-hour interval hydrographs are used at 117 gauges on 45 study rivers (17 of 20 catchments) to assess the changes in flood hydrology over time. A range of indicators of hydrograph shape and flood attenuation are used to quantify changes in flood hydrology for all in-channel fresh, high flow (bankfull), and overbank floods from the early-20th Century to present. The results indicate that significant changes in flood hydrology, especially in some large rivers, are occurring. These changes in flood hydrology at individual stations produce hydrographs that are less peaked, more negatively skewed with a slower rate of rise, and are more platykurtic. Changes from upstream-to-downstream include an increase in peak-to-peak travel time, a lower flow wave celerity and attenuation of flood peaks. These findings help identify whether a signal of hydrological flood mitigation is emerging, with implications for the development of nature-based river and flood management strategies.

# REFERENCES

Arash, A.M., Fryirs, K., Ralph, T.J. 2023. Detection of decadal time-series changes in flow hydrology in Eastern Australia: Considerations for river recovery and flood management. ***Earth Surface Processes and Landforms***. <https://doi.org/10.1002/esp.5694>