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https://scholar.google.com/citations?hl=en&authuser=1&user=wNR2MkcAAAAJ

Summary

Hydraulic models are useful tools for managing risks associated with floods. Since vegetation is abundant in the fluvial landscape, these models need to be capable of simulating flow through vegetation. Vegetation induces resistance to flow by virtue of the drag force it exerts on the floodwaters. The magnitude of the drag force is dependent on the vegetation morphology and flow velocity. It is common practice to represent this flow resistance as an additional roughness element on the ground surface. However, this is not physically representative, as vegetation extends vertically through the water column. The drag force also influences vegetation morphology through foliage streamlining and rupture. This feedback loop between vegetation morphology and drag further complicates the estimation of flow resistance and attendant fluvial processes.

This project aims to improve on current approaches for modelling of fluvial processes through patches of mature woody vegetation common to SEQ in flood conditions. The research involves developing an understanding of typical mature riparian tree morphology and testing and calibrating a range of drag force models available in the literature. Case studies on the lower North Pine River and upper Brisbane River will be used to test the methods that are developed and to elucidate thresholds for flood induced stripping of riparian trees

Research Expertise

- Floods
- Hydraulic modelling
- Eco-hydraulics