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Geomorphic changes to rivers in south-eastern Australia since European settlement

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European settlement has fundamentally altered channel morphology and sediment transfer dynamics within a variety of rivers in south-eastern Australia. In many instances, longer-term ($i.e.$ mid-late Holocene) channel and floodplain processes have been fundamentally changed in a period of less than 200 years. In some cases channel capacity has increased by an order of magnitude and sediment transport capacity by three orders of magnitude. River response to anthropogenic disturbances in SE Australia appears to be more extreme than that experienced in many northern hemisphere rivers, and we would argue that this is a function of factors controlling channel morphodynamics prior to disturbance. River channels in this region were adjusted to low background sediment supply rates (which are primarily a function of the Australian continent's tectonic stability and absence of glaciation) and a highly variable hydrologic regime. The relatively recent European colonisation of Australia (i.e. $\sim$200years), and the rapid rate of deforestation that accompanied this colonisation, coupled with extensive desnagging, are also key factors in the catastrophic nature of channel response to the changes in the channel and catchment boundary conditions.

Holocene river dynamics in SE Australia are characterised by long term stability, with unconfined systems showing aggradation since pre-LGM, and the more confined rivers showing lateral stability since around 4 ka. Within one or two decades of first settlement, riparian vegetation had been cleared along many rivers, and river channel response was almost immediate. Increases in channel capacity of 200% - 300% are typ-

ical. There was, however, considerable spatial and temporal variability in the response, depending on a range of local scale controls. These include, lithologic variation (particularly associated with the dominance of granitic vs metasedimentary rocks), valley confinement (accommodation space for sediment storage), and climatic variability. This paper presents a synopsis of post-European channel changes in south-eastern Australia and importantly identifies inter and intra-catchment variability of landscape response to European land use.