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# Synchronous linked changes in rainfall, floods and river channel changes in southeastern Australia since European settlement

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**Abstract** Synchronous, alternating, rainfall-driven, flood- and drought-dominated regimes have been previously identified in the flood record of many rivers in southeastern Australia over the last 200 years. During the wet phases, annual and summer rainfall, rainfall intensities and flood magnitudes are much greater than during the dry phases. Synchronous river channel changes have also been documented on many but by no means all rivers. The theory of alternating flood- and drought-dominated regimes was proposed as an explanation of these rainfall- and flood-driven channel changes where two different channel states were recognised. The purpose of the present paper is to show that these alternating wet and dry phases are not simply related to easily measured changes in general circulation, such as ENSO or IPO, and that many river channels are so resilient due to protection by flood-tolerant vegetation that the threshold of channel stability is not exceeded by these regime changes. Sand-bed streams and rivers cleared of riparian vegetation after European settlement are the most sensitive to alternating regime changes. Synchronous, linked rainfall, flood and channel changes can only be recognised where active river management has not been practised in south- eastern Australia. Current channel states on some rivers have no historical or pre-historical analogue.

**Key words** flood-dominated regimes; drought-dominated regimes; river sensitivity; river resilience; river recovery