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# Basin-wide sediment interactions between channels, floodplains and dunes in a large, dryland river system, central Australia

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Low, flat terrain (slope $<$200 m km$^{-1}$) covers $\sim$90% of Earth's land surface and is thought to account for roughly half of the global sediment flux[1], yet knowledge of sediment production, transport, and storage in such areas is minimal. Here we investigate the sediment dynamics of Cooper Creek, an exceptionally low-slope catchment in eastern central Australia, using *in situ*–produced cosmogenic nuclides, $^{10}$Be and $^{26}$Al, in river sediments. Cooper Creek drains 300,000 km$^2$ of intracratonic drylands and flows 1600 km to the continental depocentre at Lake Eyre. Conflicting hypotheses have been proposed to explain the lack of post-Miocene sediments at the Lake Eyre depocentre: post-depositional deflation to surrounding dune fields[2] versus storage of fluvial sediments en route[3]. We utilise the concentration ratio of the cosmogenic nuclide pair, $^{26}$Al/$^{10}$Be, in river sediments to test for significant sediment burial ($>$400 kyr) implied in the 'storage' hypothesis. The $^{26}$Al/$^{10}$Be ratio has been used to identify a complex exposure history, such as one including burial, where a lower offset in $^{26}$Al/$^{10}$Be ratio from the expected production-rate ratio of 6.8 can be converted to a burial age. Eleven detrital samples were collected along the full length of the Cooper, plus three surface samples from source-bordering dunes in the lowermost reach. We discuss our preliminary findings with regard to sediment burial and long-term interactions in the river-dune systems of central Australia.

References:

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