



Investigating floodplain deposition in a large semi-arid Australian river using Caesium-137.

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Few data exist to quantify sediment dynamics within large dryland regions, due to episodicity of transport events, and often because of a lack of historical data. The Fitzroy River is a 140 000 km² predominantly semi-arid catchment draining the north-east coast of Australia, and has been identified as having high rates of erosion, and as a significant source of sediment and nutrients to the Great Barrier Reef lagoon. We analysed the total ¹³⁷Cs inventory of floodplain soils at 4 geographically dispersed sites within the basin, in order to investigate whether these floodplains are acting as sediment sources or sinks. Reference cores were collected near these sites, in order to compare the floodplain inventories with those of undisturbed locations. The < 63 micron fraction was analysed, as the ¹³⁷Cs concentrations of test samples were very low. Of the 20 floodplain samples analysed, 9 had ¹³⁷Cs concentrations of < 1 Bq kg⁻¹, approaching the detection ability of our equipment, and had total inventories of < 20 - 31 mBq kg⁻¹. The other 11 floodplain samples had total ¹³⁷Cs inventories of 22 - 44 (± 10) mBq cm⁻², with no differences between field locations. Reference samples had ¹³⁷Cs inventories of 20 - 40 (± 10) mBq cm⁻², similar to published ¹³⁷Cs reference values for the region. The similarity between floodplain and reference ¹³⁷Cs inventories indicates that there has been very little, if any, floodplain deposition at these locations since the 1960's (maximum fallout *c.* 1965). Core stratigraphy indicates no distinct episodes of erosion or deposition; most cores are comprised of homogenous silts and clays. It is thus most likely that overbank events during this period have neither deposited nor eroded much material at our sample locations. Relatively little information about ¹³⁷Cs concentrations in this region exists, and our results substantiate the few previous observations that very little ¹³⁷Cs was deposited both in northern Australia, and in the southern Hemisphere generally.