

Inundation of anabranching river flood plain wetlands: the Ovens River, Victoria, Australia

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Abstract This study investigates flood plain inundation on the anabranching Ovens River, Australia, a regionally significant River Red Gum flood plain forest. Morphology and sedimentology was measured at sites with varying connectivity to the main river channel. Surface and groundwater levels, rainfall, evaporation and river height were monitored during 2009–2010. Rainfall was below average until August 2010, and then above average for the rest of 2010, with major flooding. During the initial period, rainfall supplied all flood plain water. Flood plain sedimentology determined whether water infiltrated, or formed lakes. Groundwater levels rose, eventually sustaining some oxbow lakes where conditions permitted groundwater exfiltration. Before groundwater sustained oxbow lakes at sites disconnected from the main channel, flow commenced in the anabranching channel network, and surface water inundated the oxbows. Overbank flow from the main channel only reached the flood plain during the major flood event. Our observations show that groundwater–surface water interactions are limited on these flood plains, and only play a role at low to intermediate river stages, and quite modest flow stages can inundate significant portions of the flood plain provided anabranch connectivity is maintained.

Key words flood plain; anabranch; groundwater; flooding; geomorphology; sedimentology; Australia