Applications of a hydro-geomorphic (dis)connectivity framework to study vegetation transitions in semiarid ecosystems

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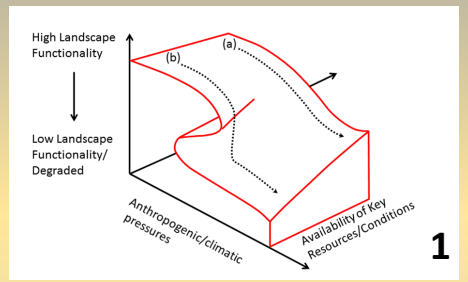
Application of Hydrologic Connectivity to Rangelands: Thresholds for Transitions to Degraded states



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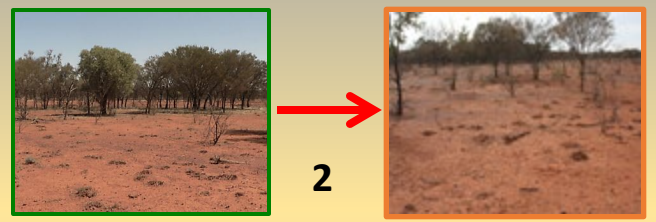
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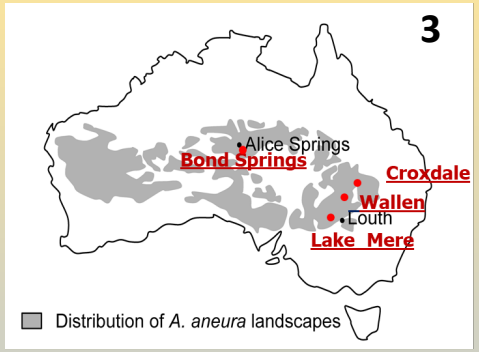

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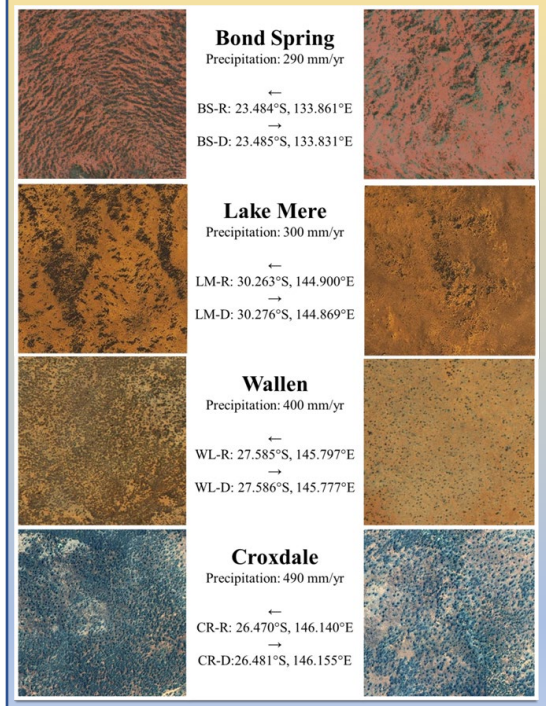

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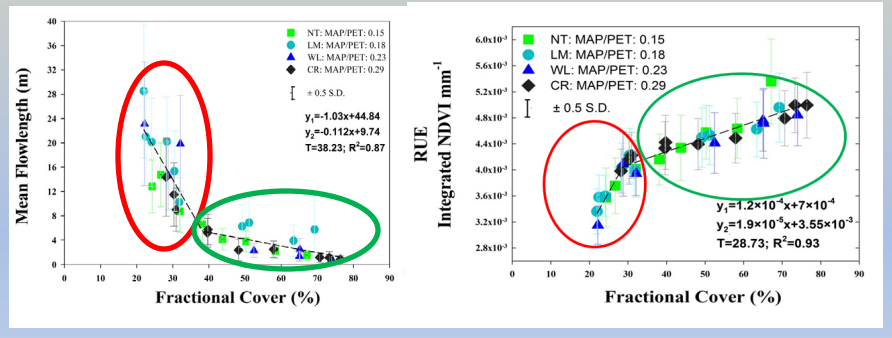
Four study sites (Acacia Aneura). Three in the Mulga Lands Bioregion, along a precipitation gradient, spanning a variety of patchy vegetation patterns (regular banded and irregular spotted patterns)



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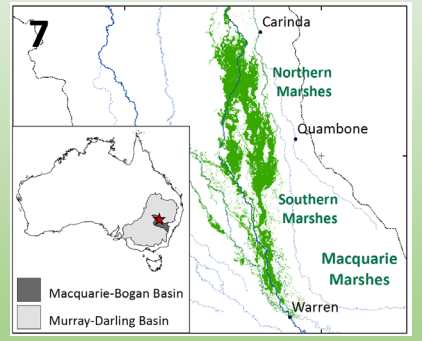
Several Sites x 2 Plots (1 km²/plot)
- ✓1 Nearly pristine plot
- ✓1 Disturbed plot

Analysis of over 35 plots in four sites (MAP from 250-500mm)
- ➢ Evidence for threshold behavior

Hydrologic Dis-Connectivity: Early warning Indicator of loss of ecosystem function in semiarid floodplain wetlands



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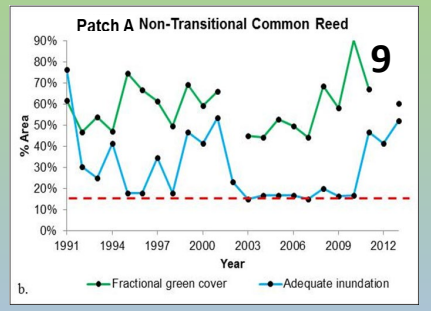

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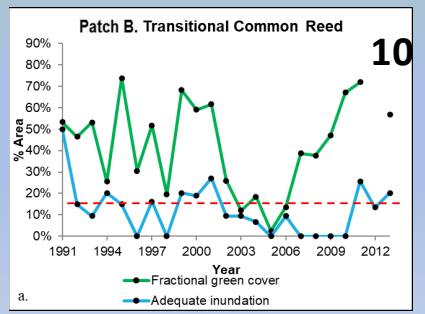

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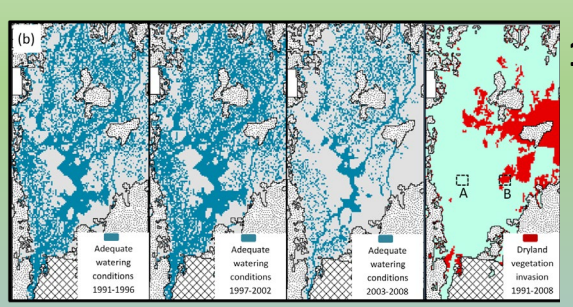
Transitional Patch: After 2005 patch transitions to terrestrial vegetation



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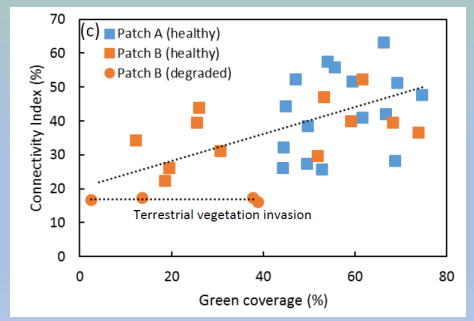
Functional Connectivity Threshold



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Connectivity: defined as percentage of patch area that satisfies the minimum inundation conditions (including duration, depth and frequency) to maintain healthy vegetation