The abundance and importance of wood in dryland ephemeral streams across the southwestern United States

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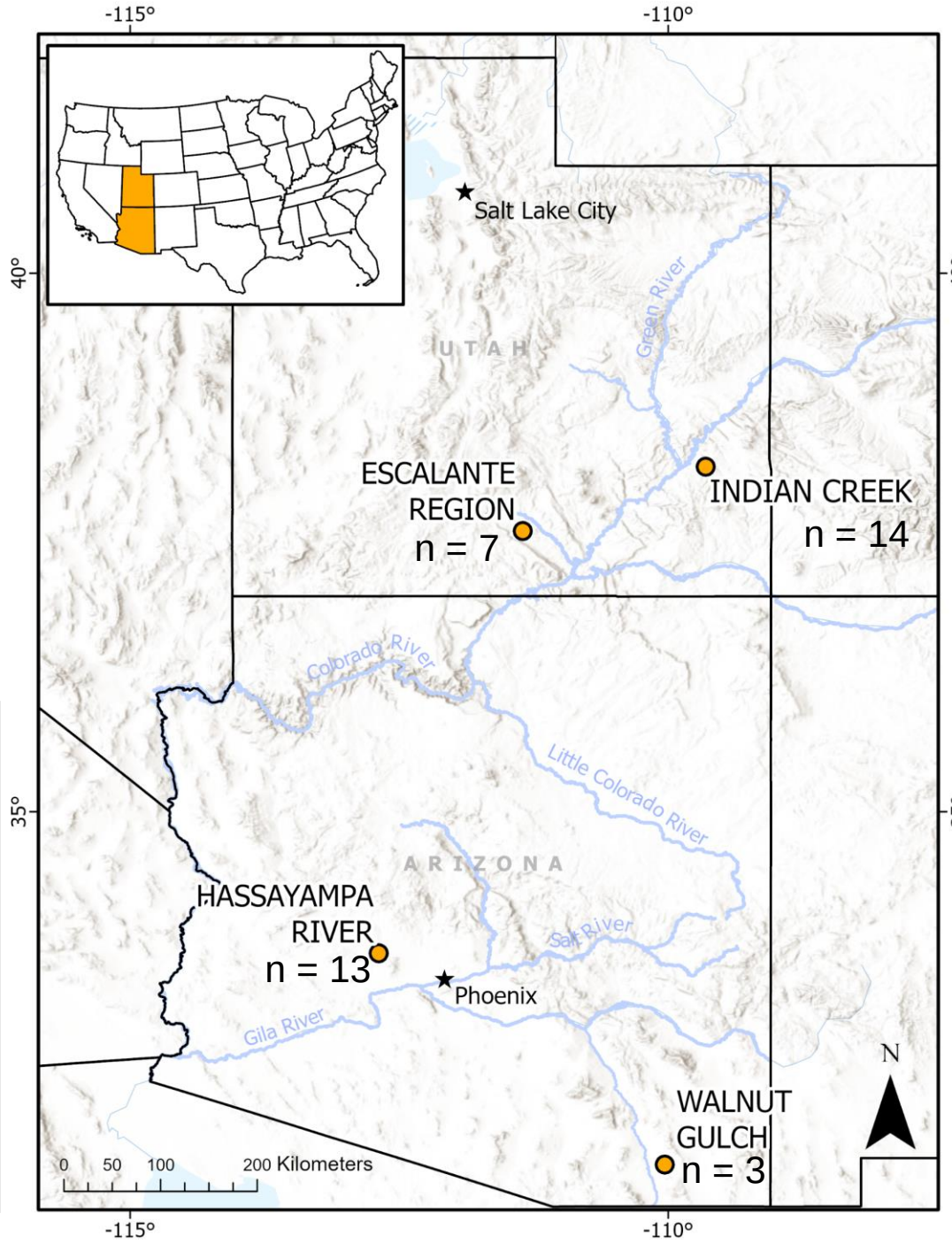
Wood as a Geomorphic Agent

- Wood accumulations (jams) have been shown to increase complexity in river corridors (Sear et al., 2010; Wohl, 2011)
  - Complexity provides additional sites for wood trapping
- Lacking studies of wood accumulation in non-perennial streams (Wohl, 2017)
- Correlation between geomorphic complexity and wood jams in non-perennial drylands of the USA?

Non-Perennial Study Sites

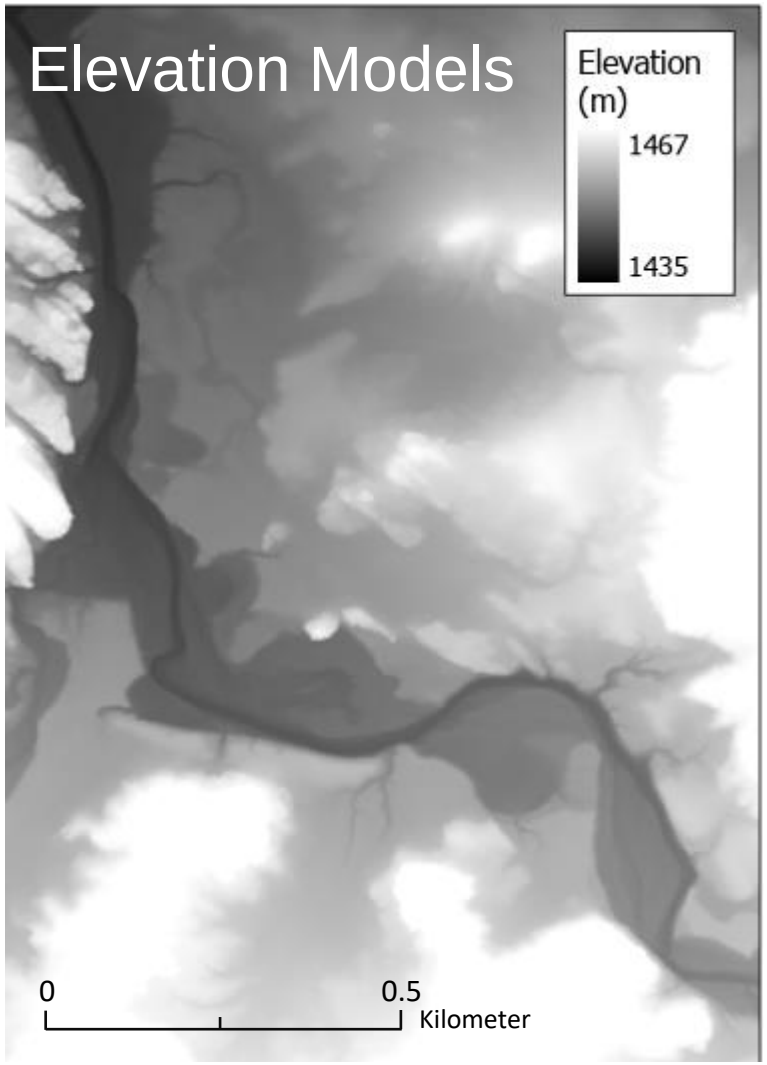
- Surveyed accumulations of wood (large wood and CPOM) – location
- 37 reaches across 6 dryland watersheds in the Southwest USA
- Ephemeral streams


Walnut Gulch, AZ, USA



Measuring Wood and Correlated Variables

Source: NAIP



Source: USGS

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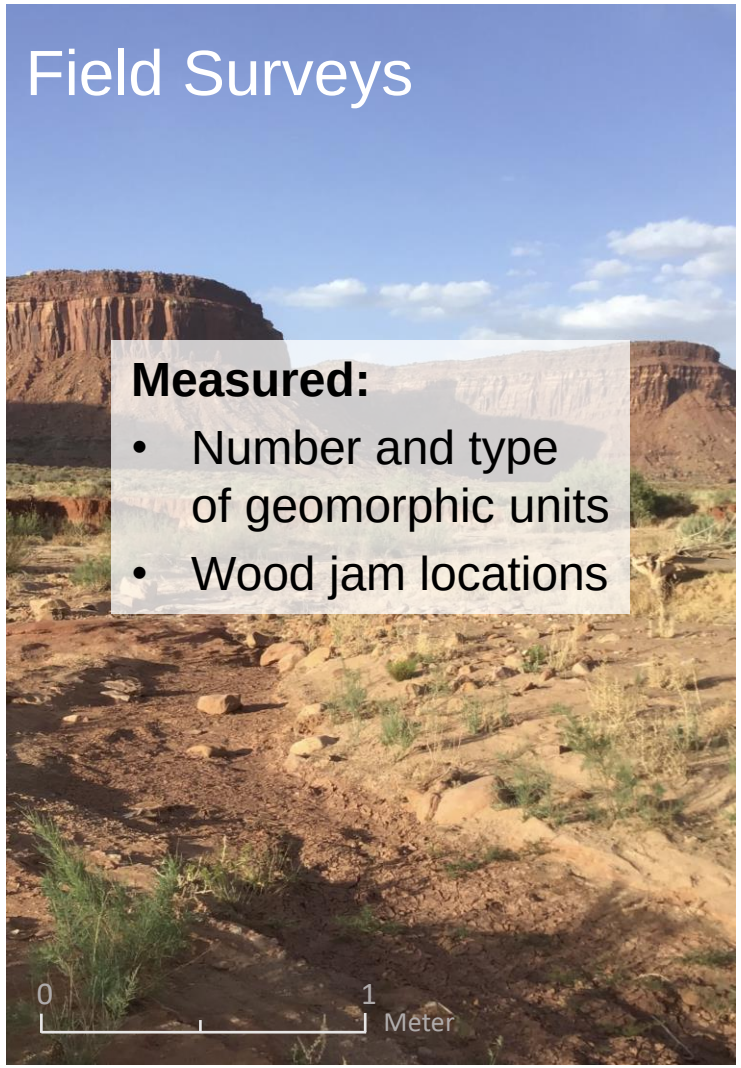

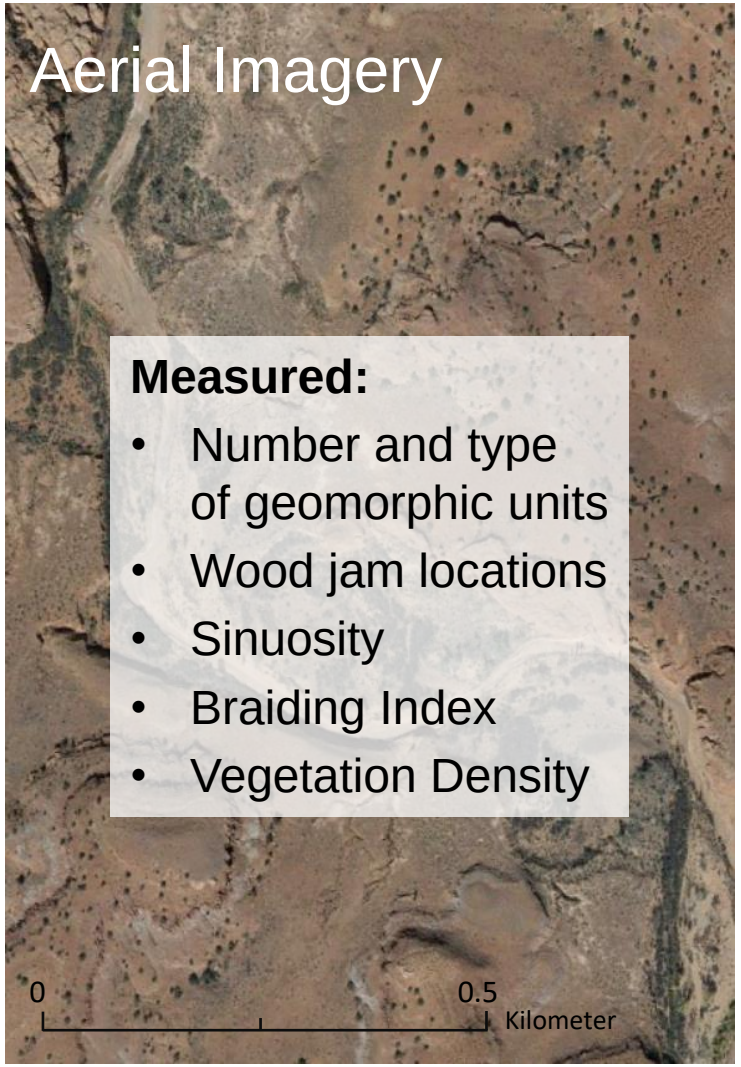

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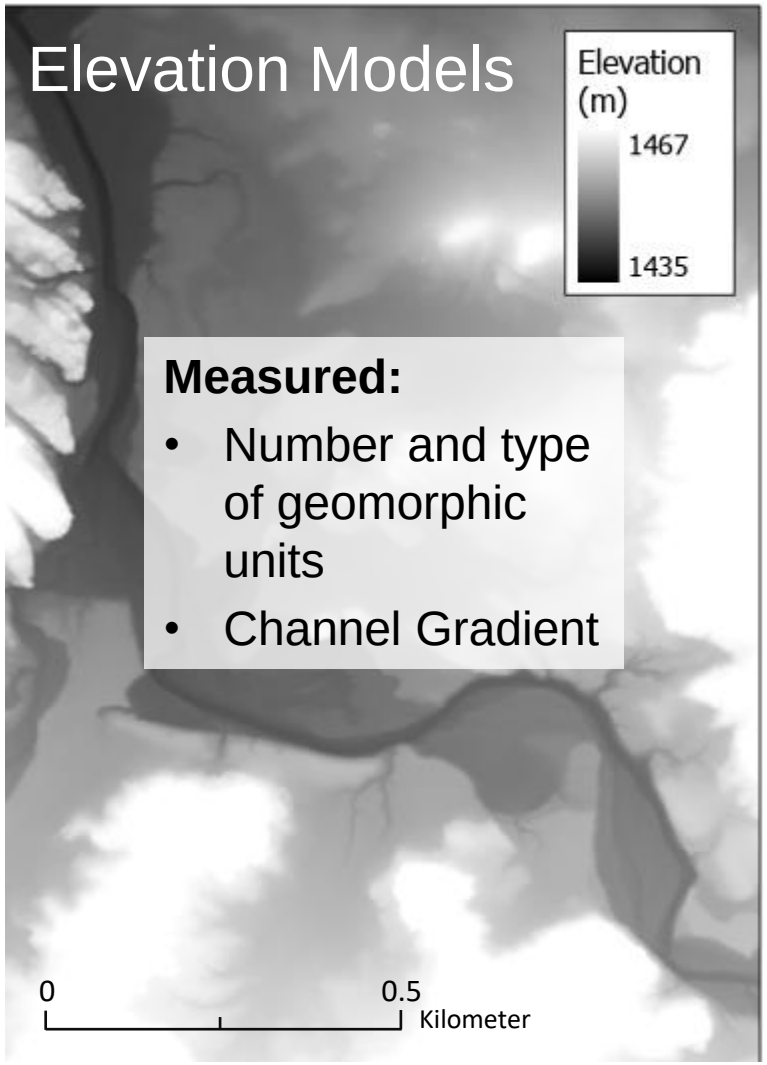
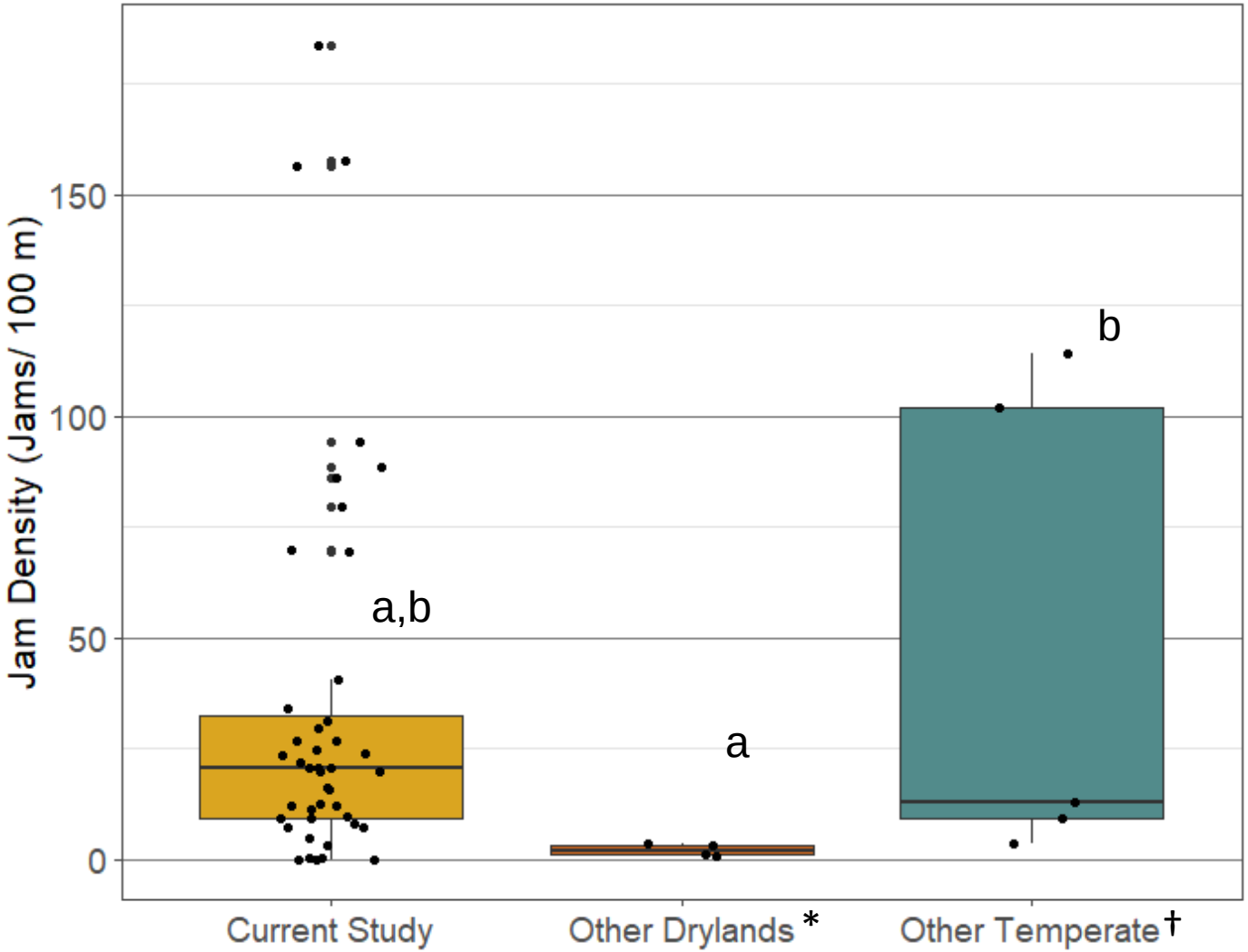


Source: USGS

Jam Density Compared to Other Studies



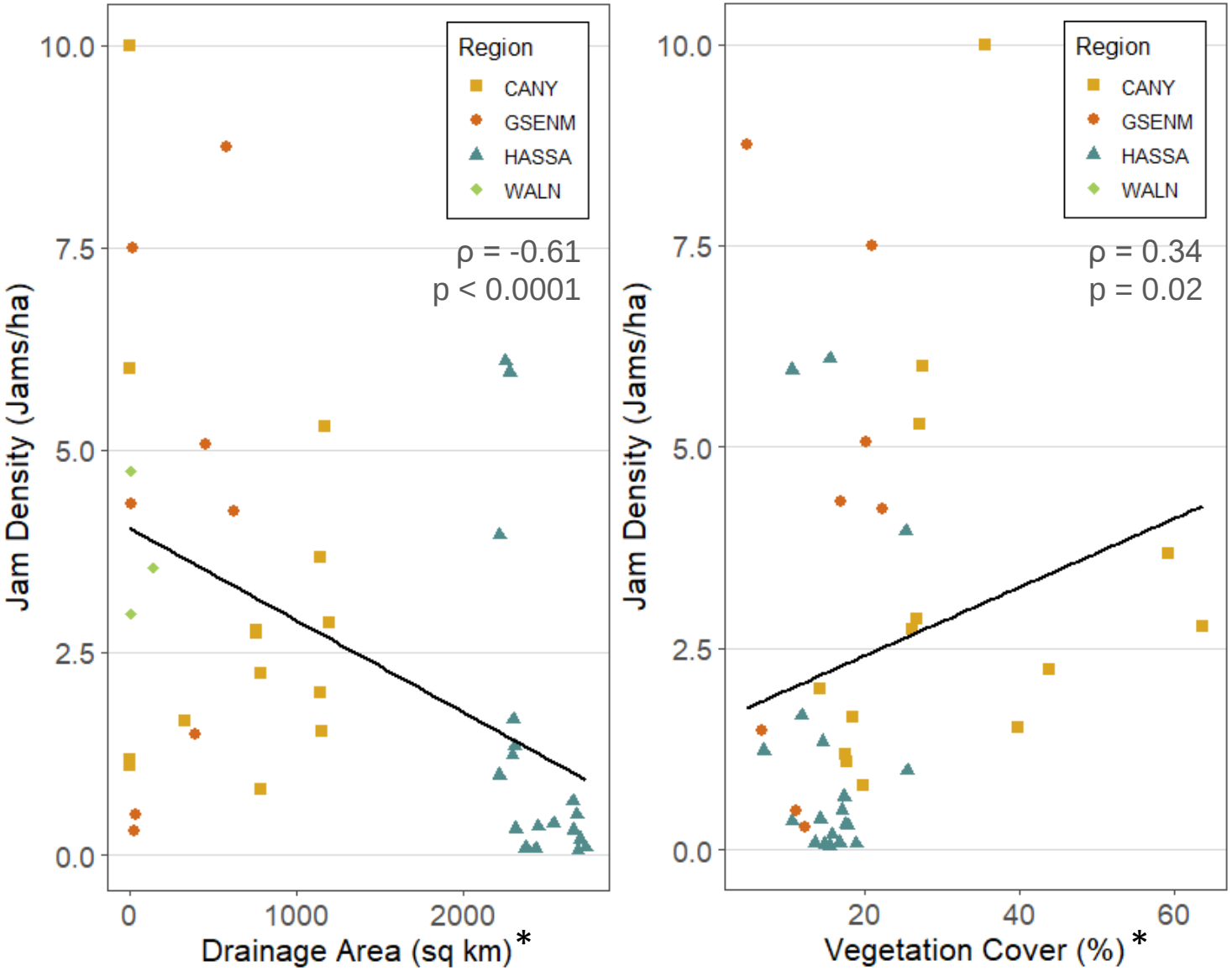
- Wood jam densities ranging from 0.01 – 184 jams/100 m (0.05 – 30 jams/ha)
- Statistically similar to jam densities in non-perennial drylands (Africa, Australia) and temperate watersheds (global)

* Jacobson et al. (1999), Dunkerley (2014)

† Wohl et al. (2017)

Wohl & Scamardo (2022), STOTEN

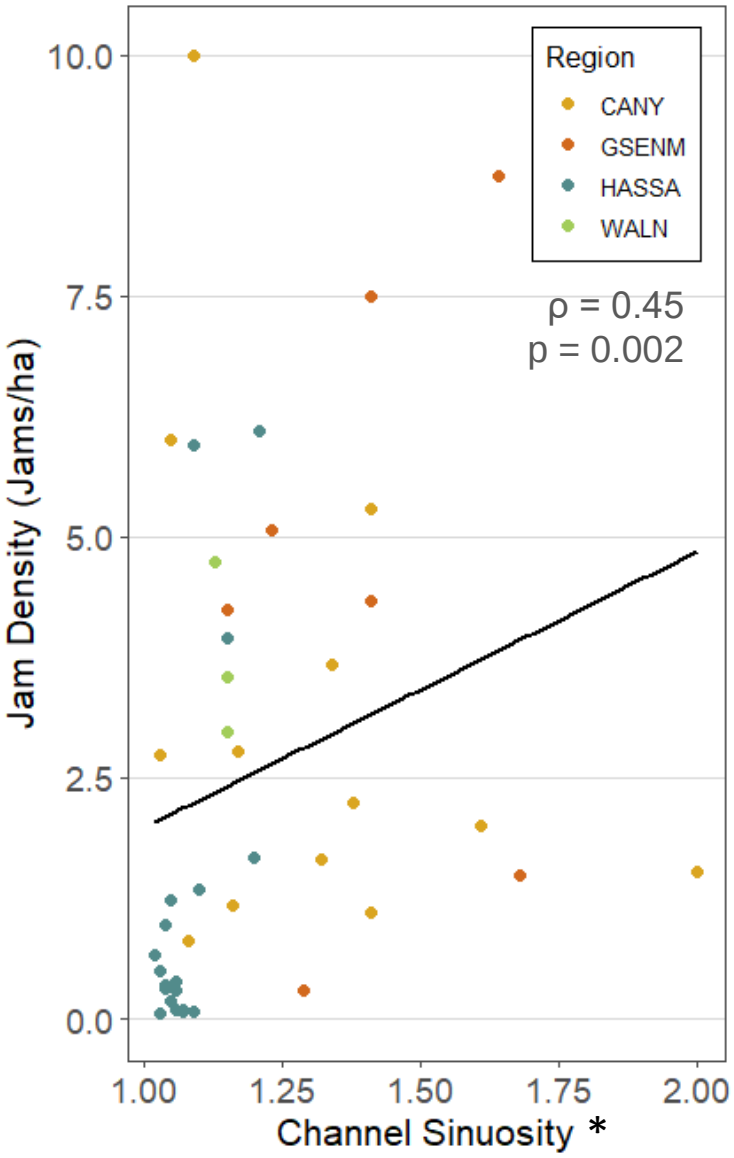
Correlations with Reach Characteristics

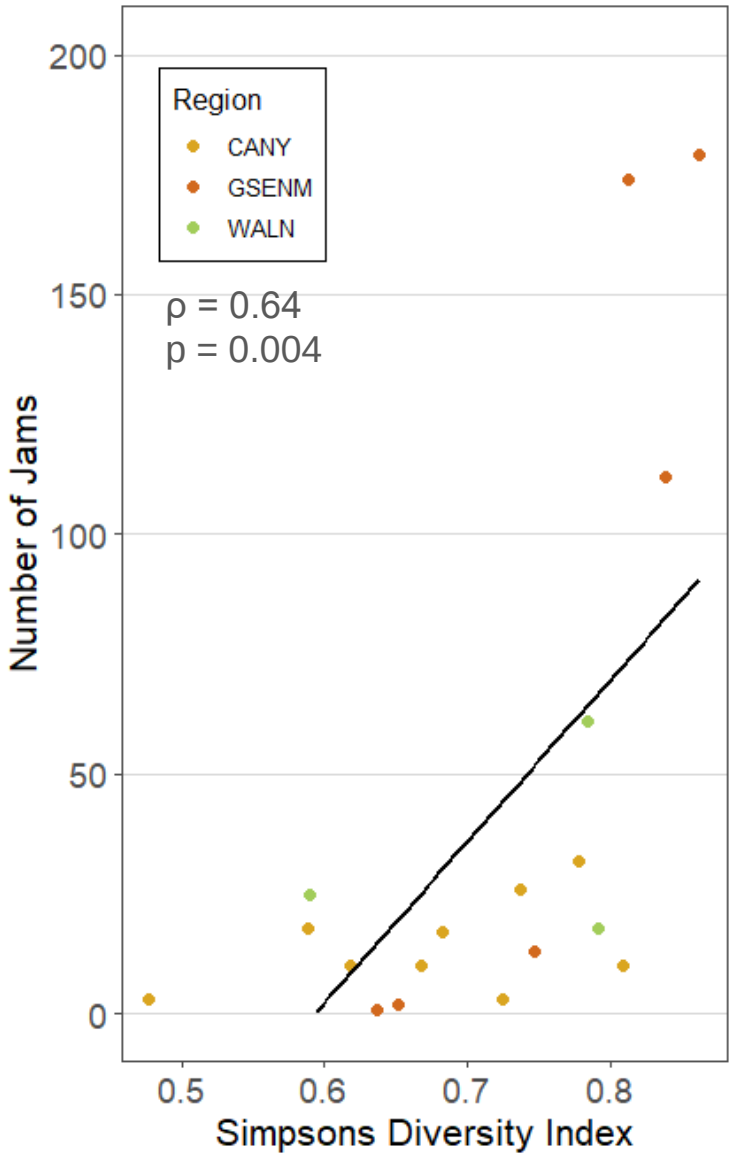


- Decreased jam density with increased distance from headwater forests (supply)
- Increased density with increased vegetation cover (trapping mechanism)

* Wohl & Scamardo (2022), STOTEN

Correlations with River Corridor Complexity





- Simpson's Diversity Index: metric for quantifying diversity of geomorphic units
- Positive correlations between complexity and jams
- Potential feedbacks between complexity and wood even in non-perennial streams

* Wohl & Scamardo (2022), STOTEN

Conclusions

- High density of wood jams in non-perennial streams
- Wood supply (headwater forests) and trapping locations (vegetation) strongly influence jam density
- Potential feedbacks between complexity and trapped wood

Questions?

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