Discussion:

While a number of studies have investigated ecohydrological classification as a tool to explain community attributes such as species richness, stand structure and composition (following ELOHA), functional approaches in ecohydrology are still novel. Despite the small sample size, different hydrological classes showed significant differences in mean wood density. Differences in wood density also tracked differences in hydrology between classes. **HOW GENERALISABLE TO OTHER CLASSES??**

While resolution between hydrologically similar classes was weak, these results lend credibility to broad-scale ecohydrological classification as a coarse but useful tool in riparian functional ecology. Where river systems belong to different hydrological classes but are spatially or climatically close, it makes sense to dig deeper than lumped categorical comparisons and look compare continuous hydrological parameters.

We found that wood density increased with intensity of flooding disturbance. Wood density was not correlated with the frequency of high flow periods, which may or may not be significant disturbance events, depending on the hydrological characteristics of the given river. Rather, it was the actual magnitude of flow during high flow periods that was important. The observation that variability but not average values of flood rise and fall rates predicted wood density, indicates the influence of low frequency, intensely flashy outlier flow events not captured by the mean. A pattern is apparent then, in which wood density in riparian communities is driven by powerful but rare flow events. That high wood density strategies are more abundant in these environments indicates that infrequent but high-stakes events are a greater force of selection in riparian plant communities than average conditions. We therefore suggest that a ‘brick house’ ecological strategy is selected for in riparian environments that experience intense flooding.

Consistency of water availability emerged also emerged as strongly predictive of mean wood density. Plants living in environments where flow occurs largely in specific events, rather than being evenly distributed throughout time, will experience episodic bouts of water stress. In this case, conservative resource-use strategies are likely to be increasingly successful. Numerous studies have discussed the role of various anatomical components of woody tissue in stabilising xylem against cavitation when plants are under severe water stress (REFS – Zanne et al.?). High wood density may be symptomatic of wood anatomy strategies that allow plants to tolerate water stress (see Hacke et al 2001, Jacobsen 2005, 2007a – in Martiez Cabrera paper), although the exact role that woody fibres play in stabilising xylem vessels remains unclear (Martinez-Cabrera).

*So what if you have low constancy (i.e. high seasonality) but high contingency (same every year). That would give you a pattern of seasonal dominance. Sure.*

*I NEED SOMETHING IN MY INTRO THAT RELATES ECOLOGICAL CONSERVATISM TO ENVIRONMENTAL UNPREDICTABILITY*

* Ecological limits to plant phenotypic plasticity – Valladares 2007 new phytologist

This is to say, when flow patterns are highly modal, but modes can occur at any time.

Teasing out specific environmental drivers of variability in wood density is difficult, however.