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Ecohydrology on the Threshold?

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This presentation suggests that there are three major limitations to the development of ecohydrology as a coherent disciplinary area. One of the principal controls and feedbacks on patterns of plants and water in the environment is the form of the landscape and landscape-forming processes. Yet (eco)geomorphology is typically overlooked as a topic for ecohydrological investigation. Thus, the process domains used to explain patterns is typically overly restricted. As surface change controls the connectivity of other process, this restriction is significant.

However, even when surface change is incorporated, there is often an emphasis on subdisciplinary areas, so that the investigation of patterns across process domains is not carried out in a holistic way. For example, studies of the feedbacks of vegetation on flow resistance are carried out significantly differently when considering wind and water flows (and indeed differently for water flows on hillslopes compared to in channels).

Human action is the most important global control on ecohydrology, either from a top-down perspective through climate change, or from a bottom-up perspective through land use and land-use change. The actions of people on ecohydrological and ecogeomorphic processes, though, are typically considered in a static way. Techniques of agent-based modelling are being developed to overcome this limitation, but there need to be parallel developments in field techniques to address the data requirements and empirical underpinnings of such approaches.
I argue that to cross the threshold into becoming a more mature discipline ecohydrology/ecogeomorphology needs to take on board the limitations of representations of process, pattern and people. Using examples from studies of land degradation in drylands, as well as from more temperate settings, I will suggest how progress may start to be made.