Geomorphic resilience: An argument for a modified definition

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Discussions on stream management, restoration, and research often use the term 'resilience' to outline ideal conditions, which serve as a frame of reference through which the stream system is contextualized and evaluated. This is problematic as there is no singular definition of resilience in the context of natural systems. One possible definition often used in stream research proposes that a resilient system is one that has the ability to recover post disturbance or stress. This definition is concise but implies a recovery to some pristine previous and does not allow for an ecosystem services approach to management. This definition is also problematic when returning to the pre-disturbance state leaves the system more vulnerable under the new conditions or for the encompassed ecosystem. With the increased need for interdisciplinary collaboration, this definition is not substantive enough to allow for effective communication while collaborating.

Therefore, a new definition of resilience is proposed that will encompasses temporal and anthropogenic elements. Resilience must account for the historical, current, and potential future temporal distribution of the system stressor. It must also include human and ecosystem resilience to changes in the stream system. This facet of the definition is important to managers that are not managing the streams and ecosystems in vacuums and must consider community, social, and political systems. Therefore, the proposed socio-geomorphic definition is proposed that will assess the past, current, and potential human impacts on the system and works to ensure that resilience is adaptive.
Furthermore, the definition will include changes of state under extended periods of stress and allow the co-evolution of 'natural' and 'human' systems.

Biography

Kayla Goguen is an MSc candidate at Western University who is studying the characteristics of large woody debris in urban channels. She is interested in how large wood is retained and transported in ravined urban creeks and it's impacts on sediment retention and release. She completed her BSc at Trent University with an honours thesis that focused on comparing methods of estimating bedload transport using acoustic Doppler current meters in a hydro power dammed river system.