



Landscape structure controls on water and carbon distribution and flux in complex terrain

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The topography and topology of catchments can impart fundamental controls on the distribution and redistribution of water, energy, and nutrients across the landscape. Landscape structure therefore can lead to organized heterogeneity of ecosystem development and processes because of the interplay between abiotic and biotic processes. Here, we present the fundamental concepts of organized abiotic and biotic heterogeneity and how hydrologic, soil, and ecosystem science can be advanced through recognition of landscape structure as an organizer of process behavior. Specific examples from catchment scale hydrological and biogeochemical studies, with a focus on carbon cycle science, will be presented as examples of the importance of landscape structure and the utility of including its quantification in landscape scale research.