



## The hard science of 'soft' geomorphology: ecogeomorphology and carbon dynamics in river corridors

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### Abstract:

In rivers and floodplains (river corridors), there are complex feedbacks between hydrogeomorphic and ecological processes. River corridors are important components of the organic carbon (OC) cycle, acting as sites of carbon transport, transformation, and storage. However, human modifications to river systems, such as reduction in beaver populations and the removal of instream wood, have likely modified OC storage and reduced the physical complexity of river corridors. In this talk, I provide examples of how geomorphic dynamics influence the flux and storage of OC in river corridors. First, I present results on sedimentation and carbon accretion rates in beaver ponds at sites in the Colorado Front Range, contributing to understanding of sediment-associated OC accretion due to beaver. Second, I highlight how valley geometry and instream variations in geomorphic characteristics influence coarse particulate organic matter (CPOM) transport in headwater streams, which has implications for downstream fluxes of organic matter and watershed OC export. Finally, I draw on a 20-year dataset of instream wood volume and wood mobility to demonstrate how human activities, such as logging and instream wood removal, can have long-term (>100 years) impacts on wood loads in river corridors. To constrain watershed OC budgets, we must better understand how the geomorphic template modifies OC fluxes and storage.



**Speaker Bio:** Katherine's research is focused on river and floodplain dynamics and the interactions between geomorphic processes and ecological processes. Katherine completed her PhD in Earth Science-Fluvial Geomorphology at Colorado State University in the Geoscience Department. Her dissertation investigated the geomorphic controls on the spatial distribution of floodplain soil organic carbon and large wood in interior Alaska. She completed her masters in Geography at the University of Texas at Austin, and her undergraduate degree at the University of Wisconsin-Madison in Geography and Political Science. In addition to her academic career, she has experience working for the Union of Concerned Scientists, a science-based advocacy group.