

## **Erosion, deposition and organic matter: Biogeochemical cycles in dynamic landscapes**

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Soils play a critical role in determining how ecosystems will adapt to Global Change and act as a complex matrix with feedback loops between climate, atmosphere and vegetation. However, the response of soils to disturbance is still one of the largest uncertainties in predicting future earth system dynamics. Clarifying the role of soil erosion in carbon sequestration and release is particularly important. Despite its widely recognized importance for terrestrial C sequestration, no Earth System Model to date implements soil erosion effects on carbon cycling in sufficient detail. Similarly, the vulnerability and role of carbon deposited at foothills, alluvial plains and in aquatic systems requires further examination.

In this talk, I will highlight new empirical and modeling data, which can be used to assess the dynamics of vertical and horizontal of organic matter distribution matter along geomorphic gradients at multiple spatial and temporal scales. I particularly focus on the need for cross-disciplinary research on lateral transport and discuss the implications of soil redistribution for the biogeochemical cycling of carbon and its persistence in dynamic landscapes with respect to the role of different mechanisms to stabilize and sequester C.

Finally, to advance our understanding of the role of soil redistribution in biogeochemical cycles of essential elements, I discuss promising topics for future research that can help to give soil and sediment redistribution the attention it needs to become an integral part of future Earth System Models.