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Earth surface dynamics - dispatches from the flats (Ralph Alger Bagnold Medal Lecture)

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Earth's surface is shaped by the physical, chemical and biological processes operating on it and the interactions amongst them. No single discipline can lay claim to this surface, nor offer a full explanation of its dynamics. Only interdisciplinary approaches can unlock answers to key questions such as how do erosion and tectonics interact to build mountains, how do landscapes respond to climate change, how can we read processes from the sedimentary record, what is the role of erosion in Earth's carbon cycle, and how can we give reliable early warning of damaging earth surface process events? The wastelands between established academic fields are rich and bountiful and replete with steep learning curves and pitfalls for the naïve. In this lecture, I shall scour the interfaces of geophysics, geochemistry and geomorphology for understanding of the mechanisms, controls and impacts of mass wasting in steep mountain settings, ending up in remarkably flat places to find new insight into the dynamics of Earth's surface.