Precipitation, Erosion and Uplift: From the Olympic Mountains to the Western Ghats

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Growing realization of the potential importance of interactions between the deep earth, surface processes, and climate has driven interdisciplinary research into connections between climate, erosion and tectonics. I focus on spatial variability in precipitation at high spatial resolution and use two contrasting field areas, the Olympic Mountains in the Pacific Northwest, and India’s Western Ghats, to illustrate the impact of precipitation variability on long term landscape evolution. Ground based and remotely sensed precipitation measurements are used to test simple precipitation models as well as full physics numerical weather models. Precipitation models are used to drive numerical landscape evolution models of erosion by rivers and glaciers. Together, these data and models provide insight into the coupling of tectonic uplift, erosion and climate, in particular highlighting the need for a more complete and subtle understanding of climate and weather in advancing the field.

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