COLORADO SCHOOL OF MINES
EARTH • ENERGY • ENVIRONMENT

DEPARTMENT OF GEOPHYSICS

HEILAND LECTURE SERIES

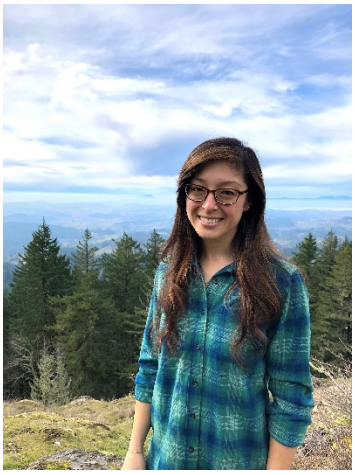
Danica Roth

"Rivers an hillslopes; deciphering the signal of sediment transport"

Abstract: In view of modern anthropogenic impacts, forecasted changes in climate, and resulting shifts in the frequencies and magnitudes of surface processes such as wildfires, landslides and large floods, reliable models are needed to monitor and predict the short-term evolution of the Earth's surface. Models generally consider climate and tectonics to be the primary controls on landscape evolution over large areas and long timescales, but applying these models to real landscapes over timescales relevant to humans remains a major challenge in geomorphology. This is largely because sediment transport at the process or field scale is nonlinear, stochastic, often heavily influenced by heterogeneous secondary parameters such as biota and soil characteristics, and hence difficult to measure in situ or model through laboratory experiments. I will discuss two novel approaches to studying sediment transport in rivers and on hills: (1) using seismometers to monitor the elastic waves generated by mobile river sediment impacting its bed, and (2) a non-local convolution model that statistically accounts for long-distance particle motion over real surfaces of varying roughness (e.g., due to vegetation or wildfire).

4-5 pm Wed January 30th
Coolbaugh Hall, Room 209

Reception following GRLA Annex 107



Danica Roth is a new Assistant Professor in the Department of Geology and Geological Engineering at the Colorado School of Mines. Previously, she was an NSF Postdoctoral Fellow at the University of Oregon. She holds BA degrees in Physics and Astrophysics from the University of California, Berkeley, and a PhD in Earth Science from the University of California, Santa Cruz (2016). Danica's primary research interests lie at the intersections of process geomorphology, hazards and environmental seismology. Her work combines analytical and geophysical techniques with theory development to better understand the coupling of Earth surface processes with climate, biology and anthropogenic influences.

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