

Civil and Environmental Engineering Seminar

The USC Department of Civil and Environmental Engineering presents



Dr. Susan Hubbard
University of California, Berkeley

Date: March 24, 2017

Time: 3-4 pm

Place: SLH 102

Geophysical Approaches for Quantifying Watershed Structure and Function

Quantifying how watersheds and ecosystem respond to climate change and other perturbations is challenging due to the complexity of associated processes that occur from bedrock-to-canopy and over a wide range of spatial and temporal scales. This presentation will describe the development of new geophysical approaches to help bridge these compartments and scales. The new approaches integrate disparate geophysical, hydrological, geochemical and microbial datasets, many collected autonomously. We first demonstrate the new geophysical approaches in an Arctic tundra ecosystem, where increasing temperatures are thawing the permafrost, potentially leading to significantly increased production of greenhouse gasses. We then discuss the use of new methods to quantify the structure and function of a mountainous watershed in the Upper Colorado River Basin, where droughts and early snowmelt may influence downgradient water availability and water quality. The approaches are leading to insights about how these systems function and respond to perturbations - from local scales (where native processes occur) toward watershed scales (that are relevant for managing natural resources).

About the Speaker

As the Associate Lab Director for Earth & Environmental Sciences at Berkeley Laboratory, Dr. Hubbard leads a premier group of ~500 staff that has a significant research portfolio in climate science, terrestrial ecosystem science, environmental and biological system science, fundamental geoscience, and subsurface energy resources. Research within this Area of Berkeley Lab is tackling some of the most pressing environmental and subsurface energy challenges of the 21st Century. Susan Hubbard is also an Adjunct Professor at UC Berkeley in the Department of Environmental Science, Policy and Management. She earned her PhD in Civil and Environmental Engineering at UC Berkeley, an MS in geophysics at Virginia Tech, and a BS in geology from UC Santa Barbara. Prior joining Berkeley Lab, she was a geologist at the US Geological Survey and a geophysicist in the oil and gas industry.

Susan's research focuses on quantifying how terrestrial environments function, with a particular emphasis on how hydrological, geochemical and biological processes interact to govern larger scale system behavior. She has made significant contributions through developing and using geophysical approaches to quantify multi-scale terrestrial system functioning, leading to new insights relevant to contaminant remediation, carbon cycling, water resources,

precision agriculture, and subsurface energy systems. She has published over 100 papers on these topics. She is involved in several large, team-based DOE projects, and leads the DOE Watershed Function Scientific Focus Area (SFA) project and is a co-PI on the Next Generation Ecosystem Experiment Arctic (NGEE-Arctic).

Dr. Hubbard has served on many scientific advisory boards, including the DOE Biological and Environmental Research Program Advisory Committee (BERAC) and the California Council on Science and Technology (CCST). She has been on the editorial boards of JGR-Biosciences, Water Resources Research, Vadose Zone Journal and the Journal of Hydrology. Susan Hubbard has performed extensive service to the scientific community and DOE, including leading many DOE workshops, organizing and chairing several international scientific conferences, and founding the AGU Hydrogeophysical technical committee. She is currently co-leading the DOE Subsurface ('SubTER') crosscut initiative and is involved in developing a 'Water Resiliency' Initiative.

Dr. Hubbard has been honored by the scientific community with several awards. She is a recipient of the Society of Exploration Geophysicists Frank Frischknecht Award and the Hal Mooney Award, both for leadership and innovation in near-surface geophysics. Susan was the distinguished hydrogeology Birdsall Dreiss Distinguished Lecturer in 2010. She is a Distinguished Alumni of UC Berkeley and a Fellow of the Geological Society of America.

