Geological Society of America Birdsall-Dreiss 2010 Distinguished Lecture
Susan S. Hubbard (Lawrence Berkeley National Laboratory)

Toward X-Ray Vision: Geophysical Signatures of Complex Subsurface Processes.

Developing a predictive understanding of water and contaminant fate and transport is complicated by natural heterogeneity, as well as by the disparity of scales across which hydrological, geochemical, and microbiological processes dominate. Because some geophysical attributes are sensitive to hydrological and biogeochemical properties that govern flow and transport, geophysical methods hold potential for minimally invasive subsurface characterization and monitoring.

This presentation will describe the relatively new fields of hydrogeophysics and biogeophysics, which strive to integrate geophysical and other datasets in the quantification of subsurface variables. Several examples will be provided that illustrate how these methods can be used to gain significant insights about complex subsurface system processes, with a particular emphasis on processes relevant to environmental remediation.

Short Biography

Susan S. Hubbard is a staff scientist at Lawrence Berkeley National Laboratory, where she leads the Environmental Remediation and Water Resources Program. She received a BA in geology from UC Santa Barbara, an MS in geophysics at Virginia Tech, and a PhD in Engineering from UC Berkeley. She has previously worked at the U.S. Geological Survey and for the petroleum industry. Her research focuses on advancing the use of geophysical methods for shallow subsurface characterization and monitoring, with a particular emphasis on development of data integration methods and application of those methods to water resource and environmental-remediation problems. She co-edited the first book on hydrogeophysics and has published over 60 papers on this topic. She serves on several scientific advisory boards, as the Associate Director for the Berkeley Water Center, as a Co-Editor for the Vadose Zone Journal, and as an Associate Editor for the Journal of Hydrology. She is the recipient of the 2009 Frank Frischknecht award for leadership and innovation in near-surface geophysics.