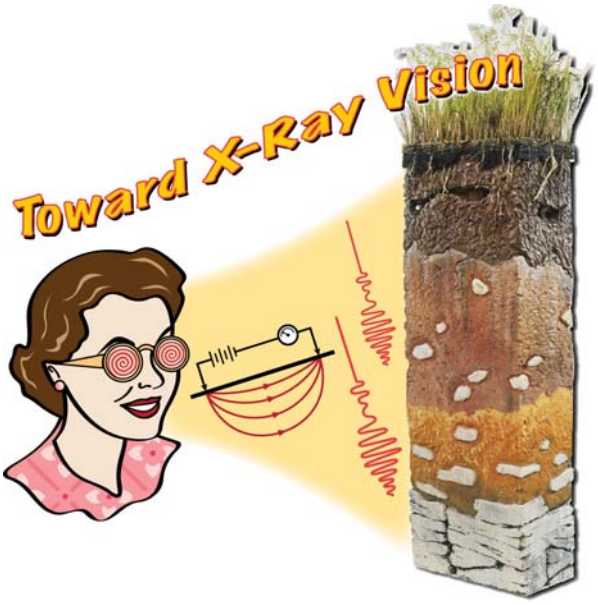
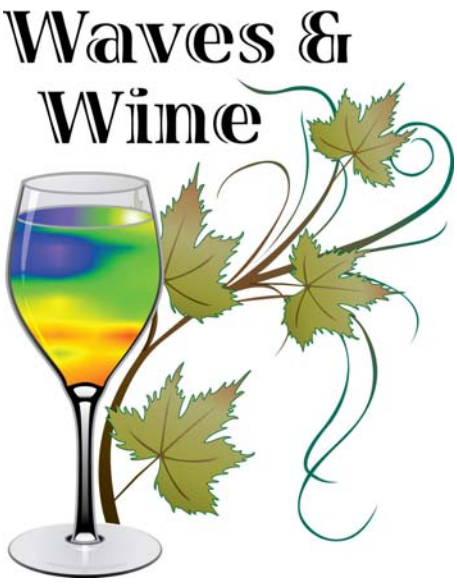
Susan S. Hubbard has been selected as the 2010 Birdsall Dreiss Distinguished Lecturer. The lectureship is made to one person annually by the GSA Hydrogeology Division; Hubbard is the 32nd GSA Birdsall-Dreiss Lecturer and the first from a National Laboratory. Susan S. Hubbard is a staff scientist at Lawrence 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 at Lawrence Berkeley Laboratory 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. At the request of interested institutions, Susan will present one of the two lectures summarized below. More information and a lecture request form are available at http://susanhubbard.lbl.gov/birdsall.html

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 recent hydrogeophysical and biogeophysical advances, obtained using laboratory



experiments; radar, seismic, and complex electrical field datasets; and stochastic integration methods. This research suggests that geophysical methods can provide significant insights about our complex subsurface system. This seminar is intended for engineering, hydrogeology, and earth science audiences who are interested in advanced approaches to explore complex subsurface systems as is needed to guide environmental remediation and water resources management.

Waves and Wine: Geophysical Characterization to Guide Precision Viticulture.



Precision viticulture strategies that focus on promoting uniformly high winegrape quality throughout vineyard blocks require information about the nature and interaction of factors that can impact grape quality-such as soil moisture, canopy density, and micrometeorological properties. Although advanced ground-based and airborne geophysical datasets are now available to provide information about soil variability and vegetation, the wine industry is still at an early stage in using these approaches to guide viticulture. This presentation discusses advances in precision viticulture that have been realized through experimentation at several California vineyards through interpretation of geophysical attributes (electrical, ground penetrating radar, and remote sensing) in terms of soil and canopy properties and the use of such data within statistical and water-balance numerical models to explore vineyard variability. The overall objective of this research is to use advanced approaches to delineate and guide the management of vineyard based on natural site variability. Such approaches are expected to lead to more uniform vegetation and winegrape characteristics within vineyard blocks, while potentially reducing water, fertilizer, and energy use. This lecture is intended for those interested in the practical use of advanced datasets to guide precision agriculture.