

Department of

Chemical and Environmental Engineering

2013—2014 Seminar Series

Friday January 17, 2014

9:30—10:30 AM

WCH 205/206



**Thomas Harmon**

**Professor of Environmental Engineering  
University of California Merced &  
Sierra Nevada Research Institute**

**Climate Variability in the Snow-Rain Transition Zone of California's Southern Sierra Nevada Mountains:  
Understanding Impacts and Adapting in the San Joaquin Valley**

In many arid and semi-arid regions of the world, including much of Western U.S., water resources management plans are built on the assumption that the snow pack holds the majority of the water, gradually melting to replenish the reservoirs as supplies are metered out to satisfy human water and power demands, and environmental flow mandates. Nowhere is this more evident than in Central California. Streams flowing from the southern Sierra Nevada mountain range provide hydropower, flood control and irrigation water to the Central California at the same time the Lower San Joaquin River is undergoing an ambitious restoration program. It is essential to understand how the timing and quantity of mountain runoff to this region will respond to changes in the timing and phase of precipitation (snowfall versus rainfall) that accompany climate change. This understanding will better inform efforts to predict and adapt to future water supply scenarios in a region where water will become increasingly scarce. Our ongoing research is aimed at quantifying the effect of projected climate change scenarios on snow melt, runoff, and multi-purpose reservoir operation (hydropower, water supply, flood control, recreation, and environmental flows). The San Joaquin River Basin serves as a model system for this study, the outcomes of which will be transferrable to other snowpack-controlled river basins. This presentation will focus primarily on recent project results pertaining to changing precipitation-runoff conditions in headwater catchments. Potential ramifications of these changes and adaptive management strategies will also be discussed in the context of sustaining San Joaquin Valley water resources and aquatic ecosystems over the coming decades.

Thomas C. Harmon is a Professor of Environmental Engineering and Founding Faculty member at the University of California, Merced. Prior to joining this, he served on the faculty of the Department of Civil & Environmental Engineering at UCLA from 1992-2003. He currently serves as the lead investigator on Water Sustainability and Climate project funded by the National Science Foundation. He also leads the U.S. portion of an international effort focused on understanding risks to aquatic ecosystems in the Western Hemisphere. He received a B.S. in Civil Engineering from the Johns Hopkins University, and M.S. and Ph.D. degrees from the Environmental Engineering program at Stanford University. During the course of his career, his research and teaching has addressed a wide range on water quality and quantity issues in natural and engineered systems throughout the world.