

Department of Earth and Environmental Sciences Presents:

Masters Thesis Defense by

Douglas DeFlicht

Friday, April 30, 2010

3:00-5:00pm, room Ag109

**Measurement and Monitoring of Bedload Sediment Transport
Along the Upper San Joaquin River from Gravelly Ford to the
Chowchilla Bypass Bifurcation Structure**

ABSTRACT

The San Joaquin River is a highly utilized and manipulated hydrologic system. Its transformation from the mid-1800s to present is perhaps the most dramatic alteration of any of the Central Valley Rivers. These alterations impose tremendous challenges to restoration of the system. The objective of this thesis was to measure the dynamics of sediment transport along a section of the main stem of the San Joaquin River from Gravelly Ford to the Chowchilla Bypass Bifurcation Structure (Reach 2A) and compare the results with predictions made by a working model for the river. On-site quantitative measurements of the sub-aqueous topography were gathered using acoustic doppler radar and GPS (Global Positioning System) techniques. The volumes of sediment scour and deposition were calculated using spatial analyses in GIS (Geographic Information System). Results show that the sediment bed of the study reach is mobile and the simulation models using the fixed-bed assumption under-predicts the capacity in the study reach. The one-dimensional sediment transport model underestimates the amount of deposition for the lowest part of the sub-reach, and over-estimated the amount of scour for the entire sub-reach. These results can be used to explore opportunities to modify the physical system to benefit riparian habitat and/or gain conveyance capacity in Reach 2A.