

Critical Zone Observatory

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On Friday, August 9, researchers from UC Merced and the USFS Pacific Southwest Experiment Station held a Summer Public Field Tour. The tour topic was "Science and Forest Management in the Mixed-Conifer Forest." SCE Forestry staff, retired and current Forest Service foresters, graduate students, organizations, news media and a member of US Congressman Jim Costa's staff attended.

The UC Merced Lead Investigator, Roger Bales, gave an introduction in front of the Shaver Lake Community Center, in Shaver Lake. Bales explained that the Southern Sierra Critical Zone Observatory (CZO) is one of six CZOs in North America. This zone is important because it borders the winter snow to rain level in the Sierra Nevada. At this point winter storms transition between rain and snow. During the winter, precipitation above this zone is normally only snow and only rain below it. There has never been a detailed long-term study of the zone's hydrology, bio-geo-chemistry and weathering before.

Using advanced scientific measuring equipment they are recording baseline data that can be used in the future to predict the effects of climate warming on water runoff, evapotranspiration rates, soil moisture and oth-

er factors essential for water and forest management.

The study areas are in the Providence Creek drainage below Dinkey Creek. One of the flux towers was visited at Stop 1A. These tall towers go up through the forest canopy over 100 feet and precisely measure at different levels the exchange of water between the canopy and the atmosphere, evapotranspiration, temperature, atmospheric carbon exchange, and bio-chemical factors. Some trees even have imbedded probes and sensors. Stop 1B had equipment measuring snow depth, soil moisture and other climatological factors. All equipment is solar powered and has wireless sensors.

At Stops 2A+B, the group observed flux towers and probes scattered around the meadows that measure factors similar to those measured in the forest canopy. Snow melt patterns are a very important factor when predicting spring runoff.

The third stop, which included a brown bag lunch, was in the Kings River Experimental Watershed, located on US Forest Service and SCE lands. High Sierra District silviculturist Ramiro Rojas explained the different silvicultural and fuels treatments and wildlife habitat values on the USFS lands. SCE forester Patrick Emmert explained the uneven-aged



On Friday, August 9, researchers from UC Merced and the USFS Pacific Southwest Experiment Station held a Summer Public Field Tour of the Southern Sierra Critical Zone Observatory (CZO) and the Kings River Experimental Watershed. Shown is Roger Bales explaining to the group the function of the Flux Tower at Stop 1A. **CATCHPOLE PHOTO**

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management system practiced on SCE land. Prescribed fire will reduce the slash on portions of the treated USFS and SCE lands.

The watershed was divided into eight sub-drainages; Stop 4 was a flume and catchment basin site. Monitoring sensors in each flume constantly measure high and low streams flows, temperature, turbidity, chemical content and other factors. The

sediment from the catchment basins is removed by hand, measured and analyzed in the laboratory.

"Water is our most important resource. So far we have learned more from our data than we previously knew about water usages and balances in the Sierra. Warming temperatures will raise the rain level with less snow storage, causing more runoff and shortages of water for its users," noted Bales. For detailed CZO information go to: www.criticalzone.org/sierra.