

Sagehen Creek Watershed, Sierra Nevada, USA: A long-term dataset for investigating groundwater-mediated streamflow response to variable maritime snowmelt and rainfall

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Abstract:

Sagehen Creek watershed is a forested research watershed in the Sierra Nevada Mountains about 30 km north of the town of Truckee, California. It was established by University of California (UC) Berkeley to focus on fish spawning and mortality and remains a UC Reserve with long-term monitoring over a large elevation gradient (1962-2541m). Annual precipitation is ~800 mm, with most falling as snow in the winter and upper parts of the basin receiving 2-3 times more precipitation than lower elevations. The watershed is underlain by volcanic bedrock with high groundwater storage, resulting in numerous wet meadows and high summer baseflow. Sagehen contains streamflow records beginning in 1953 collected by the U.S. Geological Survey (USGS), three Snow Telemetry (SNOTEL) stations beginning in 1980 but with snow courses back to 1932, COOP meteorological station with temperature and precipitation data since 1953 (1934m); and three towers (1934, 2114, and 2350 m) have measured temperature, humidity, wind, and radiation since 2009. Sagehen also has substantial remote sensing records, including numerous snow-on and snow-off lidar overflights. A recent resurgence of activity by Drs. Adrian Harpold (University of Nevada, Reno) and Jim Kirchner (ETH-Zurich) has resulted in more distributed snow and soil moisture measurements, as well as sap flow and eddy covariance systems. Current research foci are towards runoff generation processes, spatiotemporal variability in evapotranspiration and energy, tree water use, snow-forest interactions, snow energetics and rain on snow processes, and development of models and remote sensing validation.

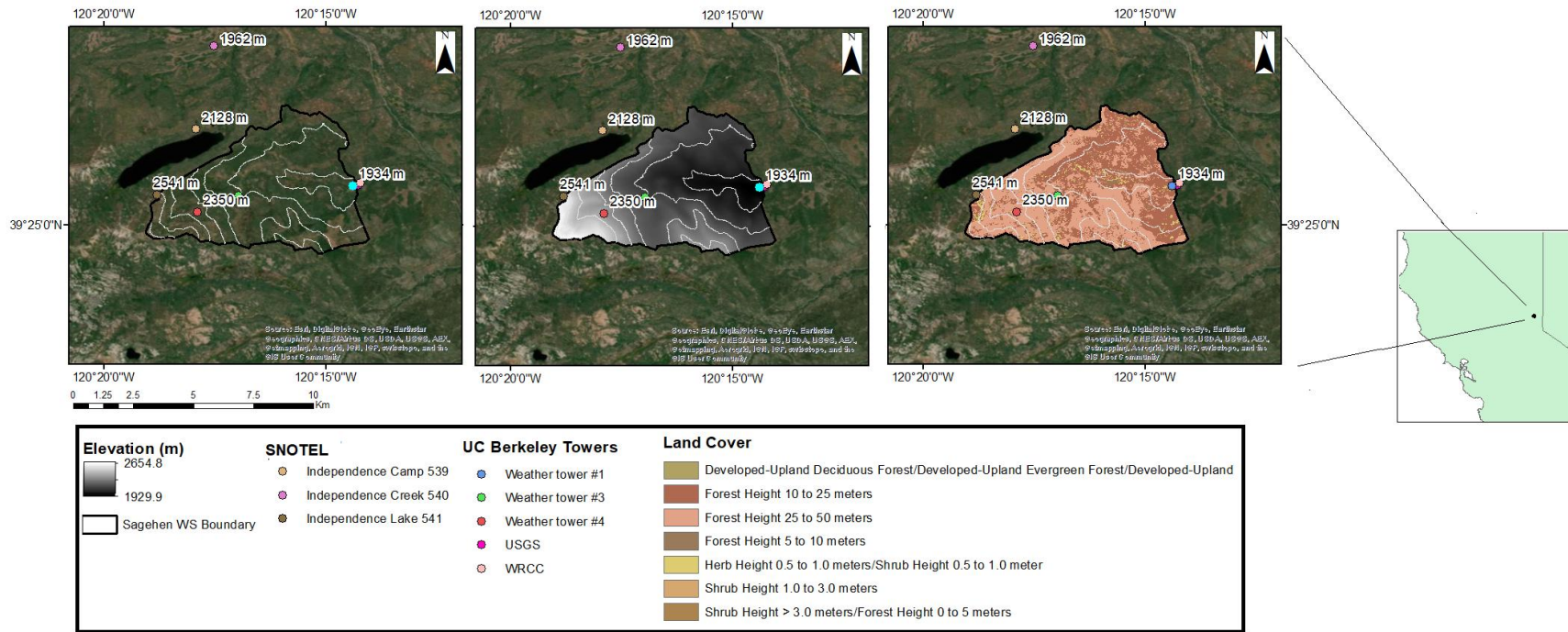


Figure 1: Infrastructure of Sagehen Watershed California USA, with orthophoto (left) elevations (center), and land cover (right). Countour lines (light gray) at 100 m.