

## **Watershed monitoring across the snow transition zone: An east slope-west slope comparison**

***Gigi Richard, Craig Moore and Ross Fischer, Colorado Mesa University;  
Stephanie Kampf, John Hammond and Abby Eurich, Colorado State University***

### Abstract

Through a new collaborative research effort between Colorado Mesa University and Colorado State University, we established hydrologic monitoring sites that span the gradient of snow conditions in Colorado from high elevations where snow lasts through the winter to lower elevation snowpack that is more sensitive to drought and warming temperatures. The initial phase of study established hydrologic monitoring watersheds in intermittent, transitional, and persistent snow zones on the east slope and west slope of the Rocky Mountains in Colorado, and uses this monitoring network to improve understanding of how snow accumulation and melt affect soil moisture and streamflow generation under different snow conditions. We monitored six small watersheds (three west slope, three east slope) (0.8 to 3.9 km<sup>2</sup>) that drain intermittent, transitional, and persistent snow zones. At each site, we measured: streamflow, snow depth, soil moisture, precipitation, air temperature, and snow water equivalent (SWE). In 2017 monitoring was expanded into the San Juan Mountains. In our first season of monitoring, the west slope persistent and transitional sites had more mid-winter melt and infiltration, shorter snowpack duration, and lower peak SWE than the east slope sites. With our ongoing watershed monitoring across a broad range of snow conditions in Colorado, we continue to learn about the factors that increase or decrease streamflow in the headwater streams that supply the state's major rivers.

### Biography

Gigi Richard, PhD, received her Bachelor of Science in civil engineering from the Massachusetts Institute of Technology with a concentration in water resources and environmental engineering. Richard went on to earn her Master of Science and PhD in civil engineering from Colorado State University in the Hydraulic Engineering Program. An associate professor of geology and Faculty Director of the Water Center at Colorado Mesa University, Richard created the Watershed Science Program at CMU and teaches Water Science, Environmental Geology and GIS courses. The Water Center at CMU facilitates education, outreach, research and dialogue on water issues in the Upper Colorado River Basin.

Richard's research on human impacts on rivers systems includes the study of downstream impacts of dams, levees and other human activities on rivers in Colorado, New Mexico and New Zealand. Her recent work has focused on better understanding the hydrology and morphology of intermittent streams in western Colorado, on the impacts of vegetation removal on channel morphology of the Colorado River and on the need for peak flows to maintain the channel form of the Yampa and Dolores Rivers in western Colorado.

A resident of Colorado for 25 years, Richard has experience in private engineering consulting and served on water quality and land use planning commissions in Summit County, Colo. in the early 1990s. Richard's passions include growing, cooking and eating delicious locally-grown produce as well as hiking, biking and exploring the world.