Geophysical Research Abstracts
Vol. 18, EGU2016-10446, 2016
EGU General Assembly 2016

Scale-emergence of snowmelt runoff recession based on heterogeneous snow accumulation and melt

Charles Luce (1), David Tarboton (2), and Martyn Clark (2)

(1) US Forest Service Research, Boise, United States (cluce@fs.fed.us), (2) College of Engineering, Utah State University, Logan, Utah (dtarb@usu.edu), (3) National Center for Atmospheric Research, Boulder, Colorado (mclark@ucar.edu)

Snow drifts are usually seen as small elements in mountain landscapes; so are inconsistently considered in hydrologic modeling. Their small spatial representation in the landscape belies an outsize influence in the recession characteristics of mountain watersheds. Differential accumulation and melt of mountain snowpacks can shift center of spring runoff timing by months compared to expectations based on a uniform snowpack. Here we develop the quantification of melt and flow recession as an emergent characteristic from heterogeneity in snowpack accumulation and melt. While previous work has demonstrated the ties between differential accumulation and depletion of snowpacks, the importance of differential melt in concert with differential accumulation is less well explored. We develop a framework for showing the combined effects of joint spatial variability in accumulation and melt. Further, we relate the information to alternative methods for estimating snow depletion curves.