Physiographic Influences on Snowpack Variability in the Upper Colorado Basin using Snowpack Telemetry (SNOTEL) data

J. Derry and S.R. Fassnacht
Watershed Science Program, College of Natural Resources, Colorado State University, Fort Collins, Colorado, USA

Abstract. The Western United States is heavily dependant upon seasonal snowpack with 70-80% of annual discharge originating as snowmelt [Doesken and Judson, 1996]. In the Rocky Mountains, hierarchal precipitation regimes operate at different spatial scales and local geography is an important factor in determining temporal and spatial variability of snow accumulation as well as the timing and magnitude of runoff. Knowledge is limited regarding the understanding of snowpack processes in relation to local physical forcing variables. Much of the previous research over large basin scales has not considered the influence of physical variables on snowpack characteristics or has been limited due to temporal resolution of snow course data. Daily data from 240 snowpack telemetry (SNOTEL) stations located in the Upper Colorado River Basin are utilized in unison with their respective geographic parameters in performing a principle component analysis to determine the degree of influence that is explained by these parameters. Snow climate zones will then be established based on similar characteristics of these point data. Results are expected to show an unbiased clustering of stations not defined by geographic location, but local physical setting and snowpack characteristics.