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**ON THE NEED FOR A QUANTITATIVE UNDERSTANDING OF HIGH ELEVATION CLIMATE IN THE
WESTERN HEADWATER STATES**

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ABSTRACT: Over the past decade our interest in climate change has focused on the gradual changes that could take place over a period of 50-100 years. These GCM-based studies repeatedly suggest that high elevation climate changes will contribute to changes in the way that we manage our limited water supplies. The states of New Mexico, Colorado, Wyoming and Montana are key sources of high elevation snowpack that provide a significant, if not majority, contribution to downstream state's water supply. Yet our quantitative understanding of the natural climate of these high elevation snowpacks is just beginning and will form a basis for how we assess potential man-made influences on their climate over the remainder of this century. This paper explores several "natural scenarios" of high elevation climate variation that are associated with drought and flood climate regimes and develops useful insights based on quantitative relationships between above and below normal snow packs and water supply years. It appears that a tangible and, to a degree, repeatable set of climate regime cycles can work in and out of sync to create periods of extra-ordinary high and low snow packs. Understanding these natural cycles will enhance our ability to apply far-ranging GCM- model scenarios in understanding and planning for future water supply abundance and shortages with their related socio-economic consequences both east and west of the Continental Divide.

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