

## **The Spatial Distribution of Fine Resolution Snow Surface Roughness**

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**Abstract.** Variability in snow surface roughness is rarely incorporated into climate or hydrological models, yet it can potentially have a large impact on both latent and sensible heat for a snow dominated system. We looked at the spatial variability of snow surface roughness using the data collected by the NASA Cold Land Processes Experiment (CLPX) during the winters of 2002 and 2003 for nine 1 km<sup>2</sup> study sites across northern Colorado. These Intensive Study Areas (ISAs) included the Fraser Alpine, Fool Creek, and St. Louis Creek sites, and the Rabbit Ears Spring Creek, Buffalo Pass, and Walton Creek sites. Black boards were placed perpendicularly into the snow to create a contrast so that pictures could be taken of the surface. The surfaces were digitally extracted and the surfaces were detrended to remove random data acquisition biases. The datasets for each board within a study site were then assigned a value based on variability in the surface, standard deviation and categorized based on location. These roughness metrics were then analyzed geospatially to understand their spatial variability and the driving processes.