

Near-infrared photography to quantify temporal changes in melt-freeze crusts

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Objective quantification of snowpack stratigraphy is a difficult task, especially when multiple observers may be tracking changes over time. Properties such as grain type and size, though well defined by various snow observation guidelines, are often interpreted differently. One potential solution is the use of near infrared (NIR) photography to track the specific surface area (SSA) of a given layer. Processed images provide a quantitative measure of in-situ grain morphology free of any requirements for interpretation in the field. For the past two winters the Applied Snow and Avalanche Research Group at the University of Calgary has used NIR photography to track changes in and around buried melt-freeze crusts in the Columbia Mountains of western Canada. Eight crusts were tracked using both NIR and manual observations for periods ranging from 5 to 12 weeks. This paper describes the methods used and presents results from this study. Advantages of the method over traditional observations are also discussed, as are challenges encountered over the past two seasons.