

Mapping Snow Surfaces Using Photogrammetry Versus Lidar

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Abstract. Snow dominated watersheds rely on operational measurements to model and predict annual water yields for agricultural and municipal use. However, such measurements are usually at a very coarse resolution. Currently, finer resolution data are difficult to obtain on snow's extent, depth, and density. Recent efforts using photogrammetry have shown promise in providing results similar to those produced using lidar (light distance and ranging/laser scanning) techniques. Current aerial and terrestrial lidar products require equipment and implementation that are expensive, and may not be used with enough frequency to justify purchase. Photogrammetry can substantially reduce the cost of equipment and data acquisition, and is capable of being implemented with greater frequency. This study endeavors to quantify the vertical error associated with photogrammetric methods compared to terrestrial lidar scanned surfaces generated with commercial off-the-shelf photographic equipment and processing software. This study describes techniques that can be used in an operational setting with management implications. The methods can refine products used to estimate snow coverage and other earth science variables across large spatial domains.