

## **Water balance in the headwaters of the Rio Grande River using remote sensing technology**

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**Abstract.** Snow is a precious resource that plays a key component to agriculture and industry in the Western United States, sustaining life for countless species and making daily life a possibility. The volume of water that flows in and out of a system can be estimated using the water balance equation; a critical tool in assessing water supply. Advanced remote sensing technology provides access to temporal and spatial data that can be used to determine evapotranspiration of an area and be applied to the water budget. The West Fork Complex Region, located at the headwaters of the Rio Grande River in Southern Colorado, experienced a major fire in 2013 and in order to better understand the effects of this fire on the area, historical characteristics must be analyzed. The purpose of this study is to examine the water balance in the West Fork Complex Region using remote sensing data. A historical and contemporary water budget will be conducted for the watershed. The contemporary analysis will include a comprehensive evapotranspiration comparison using various models. Data will be gathered from various sources including the Simplified Surface Energy Balance (SSEBop) method, Moderate Resolution Imaging Spectroradiometer (MODIS), the Land Data Assimilation Systems (LDAS), the Parameter-elevation Regression on Independent Slopes Model (PRISM), ground based precipitation stations, and USGS gaging stations.