



## Snow Cover Estimation of Western Himalayas using Sentinel-2 High Spatial Resolution Data

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**Abstract:** The seasonal fractional snow cover area mapping for the hydrological year October 2017 to September 2018 in Miyar and Bhaga basin of western Himalayas in Lahaul & Spiti district of Himachal Pradesh has been carried out using Sentinel 2 (A&B) high spatial resolution data of 10m. The snow cover area has been estimated using NDSI, NIR/SWIR ratio and S3 index. In order to overcome the misclassification of water as snow, NIR/SWI Ratio has been used. For the exact classification of parameters and the threshold value selection, statistical analysis using the spectral response of the pixels has been used for NIR/SWIR ratio. The S3 index has been used to detect the snow cover under vegetation (pine trees). The average snow cover area for the accumulation period (October 2017 till May 2018) is estimated to be approximately 1376.505 km<sup>2</sup>, which is 56.06 % of the total basin area and for Bhaga basin (approximately 1094.041 km<sup>2</sup>), which is 65.12 % of total basin area. This indicates that nearly, 54% and 58% of accumulated snow area has been melted in Miyar basin and Bhaga basin during summer (June-September 2018), respectively. To the best of our knowledge, the present proposed study is the first attempt to utilize Sentinel-2 data for Himalayan snow cover monitoring.

**Keywords:** Snow cover area, Sentinel 2, NDSI, Accumulation, Ablation

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