>> SYNTHESIZE MOUNTAINS OF KNOWLEDGE <<

Submitted Abstract

ID IMC22-FSAbstr- 521

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Title	Comparison Of Methods For Downscaling Snow Cover From Modis To Sentinel-2 Resolution In Mountainous Regions.
Keywords	Downscaling, Snow Cover, Modis, Sentinel-2
Type	List Of Focus Session
Focus Session ID	36

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1 of 2

Abstract

Obtaining retrospective information on snow covered area (SC) by means of remote sensing is challenged by a mismatch of desired temporal and spatial resolution and the characteristics of available image collections. Oftentimes, coarse resolution (CR) SC products (e.g. derived from the Moderate Resolution Imaging Spectroradiometer (MODIS) or Advanced Very-High-Resolution Radiometer) do not meet the requirements of mountain researchers who focus on processes taking place at a significantly smaller scale. Especially in high-mountain regions, such CR products fail to adequately represent the heterogeneity of the complex terrain. Still, there are large archives of CR (e.g. MODIS) products that provide a temporal coverage that is superior to other archives (e.g., Landsat). Since there is some temporal overlap of CR satellite image archives with medium to high resolution (MHR) satellite image archives (Landsat, Sentinel-2), MHR products are increasingly exploited to downscale CR products. We present first results of downscaling MODIS snow products to Sentinel-2 resolution (i.e. 20 m) by an implementation of methodologically different, existing approaches (probabilistic, Machine Learning) and compare their performance at a high alpine study site in the Stubai Alps (Tyrol, Austria). Emphasis is put on challenges that arise when working in high-mountain areas, namely the performance and errors of the different methods with respect to the complex terrain (i.e. topography, surface roughness and vegetation cover). Methods developed will be validated for robustness and transferability ensuring applicability in high-alpine study sites with similar characteristics.

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2 of 2