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Snow modeling using remote sensing data

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Remote sensing data has become a valuable source for scientific research. Land surface and atmospheric parameters offered by remote sensing instruments bring alternative sources for models in data sparse regions. Moreover, remote sensing information can also represent not monitored regions where continuous observations are not possible because of the unsuitable geographic locations, such as snow and glacier cover over mountain peaks that can play a considerable role in the hydrological response of the catchment and even in climate change issues.

This study focuses on modeling snow cover in the parts of Pamir Mountains in central Asia. MODIS remote sensing data is utilized as an input data for the model which is globally available. 500 meter resolution MODIS snow cover data is analyzed cell by cell to understand the snow cover cycles of the region. As an output, snow cover dynamics at different temporal resolutions give information about snow accumulation and melt characteristics for the catchment and also possible contribution of snow and glacier melt for hydrological response of the catchment. In addition, modeling methods and data assimilation from MODIS is presented. Results show usefulness of snow model in hydrological modeling of such regions where snow melt dominates the catchment discharges in hot summer seasons.