



## **Water balance modeling using remote sensing data**

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Remote sensing data are very useful for many reasons. Among others, it provides information for data limited and heavily accessible regions. Moderate-resolution Imaging Spectroradiometer (MODIS) is one of the scientific instruments launched on Terra and Aqua satellites that capture data on entire earth daily with 500 and 1000 meter spatial resolution.

In this research, MODIS data was used to study water balances in Kokcha basin in north-eastern part of Afghanistan where data availability is very limited because of very rare gauging stations and very high mountainous area. There are no meteorological stations above 2000 meter elevation which represents 75 percent area of the total basin. Mainly snow plays an important role in the hydrological cycle of the basin. This is why MODIS snow cover information as a source for water and temperature information as an energy for melt dynamics are used to study hydrological behavior of the catchment. Different preprocessing methods were used to validate MODIS data which can be well evaluated for the application in hydrological models. Results such as potential snowfall event, snow water equivalent or evapotranspiration give good information on hydrological properties of the region. Such information can be used in further planning issues in water sector of the region. Few examples are irrigation planning, reservoir placement or hydro power plant operation.