Hydrological modelling of the Gunt (Western Pamir) using remote sensing data

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Unlike other Central Asian mountainous regions such as the Himalaya or Hindu-Kush, which are influenced by the summer monsoon, the Pamir Mountains and Tien Shan receive their precipitation as snow in winter and spring due to westerly winds originating in the Atlantic. The main research objectives are to understand the current and future key hydrological processes, such as streamflow generation and groundwater recharge in an exemplary drainage system in the Tajik Pamir and to use remote sensing data to enable a regionalisation of the results over the whole of western Tibet. A combination of remote sensing techniques, isotope geochemical methods and enhanced hydrological simulation models are used to understand the hydrological system of the area of replenishment on catchment scale. This includes detailed groundwater studies, investigation of seasonal dynamics of runoff components and how this is connected to climate variability. Remote sensing data is essential for monitoring the ice-cover and changes in glacial extent of the last decades and allows mapping the geometry of stream beds to outline areas of potential water infiltration, accumulation of sediments and regions of high hydraulic energy. Investigations focus on the Gunt and Bartang catchments (14,000 km2 and 21,400 km2, respectively) in the Tajik Pamir, which are representative for the entire region.