



Contribution of snow / glacier melt and warm season precipitation to warm season flow in a glacierized catchment in Central Asia

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The glacierized upper Ala-Archa catchment is located in Northern Kyrgyzstan and has a size of about 230 km². Catchment runoff shows a distinct peak during the warm season with snowmelt and glacier melt contributing to river runoff in the spring and summer months, respectively.

Based on an extensive field data set collected over three years (2014-2016) within the GlaSCA and GlaSCA-V projects, this study aims to quantify the contributions from snow / glacier melt and rain to warm season river runoff at the catchment outlet. For this, stable isotope signatures of river water, melt water and rain, as well as electric conductivity measurements are used for endmember definition in simple mixing models. Despite the high uncertainty related to the endmember definitions, the mixing models yield a first approximation of the shares of the different runoff components. They may explain the substantial inter-annual variation in warm season runoff with 2014 being a water-poor year with total warm season (May-September) flow volume not exceeding 115 million m³, while 2015 was a water-rich year with warm season runoff volume amounting to 170 million m³.