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Temporal variabilities of runoff and suspended sediment load in the Babao River basin

Fan Zhang and Guanxing Wang

Chinese Academy of Sciences, Institute of Tibetan Plateau Research, Beijing, China (zhangfan@itpcas.ac.cn)

The runoff and suspended sediment load of the Babao River basin in the northeast of the Tibetan plateau has been responded to the climate changes during the last 50 years. According to the Qi Lian meteorological and hydrological stations' records, from 1968 to 2012, the annual average air temperature showed a significant raising trend with raising speed about 3 times of the world average value reported by the fifth assessment report of IPCC. There was no significant increasing trend of annual precipitation and suspended sediment concentration, but a significant increasing trend in runoff. During the time period, the summer months' precipitation decreased slightly while the air temperature increased significantly which might introduce the increasing glacier and frozen soil melt water, replenishing the might-be lessened precipitation runoff and resulting in slightly raising total runoff. In winter months, precipitation was stored in the basin in solid form. While the significantly raising air temperature caused the fading of the deep frozen soil layer and increasing of the soil moisture, resulting in a significant increase in winter runoff. The diverse trends of runoff and suspended sediment load after 1997 showed that there might be significant changes of the underlying surface.