



The Increasing of Glacial Runoff in Response to Climate Warming in Glacier No.1 at the Headwaters of the Urumqi River, Tianshan Mountains

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Based on hydrological observations and calculations of water balance [U+FF0C] the annual meltwater runoff of Glacier No.1 which locates at the Headwaters of the Urumqi River, Tianshan Mountains has been computed. It shows an elevated trend during the last several decades. The mean meltwater runoff depth is 936.6mm during the period of 1986 to 2001, comparing to 508.4mm during the period of 1958 to 1985. Data analysis shows that the proportion of liquid precipitation which can form runoff over the glacier surface has also been raised, with the annual mean air temperature at the glacier terminus in the period of 1986 to 2001 increased by 0.5 [U+2103] to the period of 1958 to 1985. We also found that the ablation occurred in the position corresponding approximately to the equilibrium altitude in the glacier kept pace well with the glacier meltwater runoff. We conclude that the ablation on that altitude can represent the glacial meltwater runoff to a certain extent. Considering the climate shift in northwest of China, it is necessary to realize the glacial meltwater runoff sensitivity to climate change. We applied the degree-day model which has performed well for reconstructing mass balance of this glacier to simulate glacial meltwater runoff.