

Positive degree-day factors for snow and ice ablation and their use to estimate discharge from glacierized basins in the Langtang valley, Nepal

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ABSTRACT:

Positive degree-day factors for snow and ice ablation were calculated on Glacier AX010 and Yala Glacier in Nepal during a summer season of 1978 and 1996, respectively and their variations with respect to time and space were analysed. Calculated average degree-day factors for snow and ice ablation on Glacier AX010 were 7.9 and 8.7 mm d⁻¹ °C⁻¹, respectively. The degree-day factors for summer ice ablation on Yala Glacier range from 8.0 to 10.5 mm d⁻¹ °C⁻¹. Basin discharge from Langtang Khola and Lirung Khola Basins in the Langtang valley were estimated using a degree-day method. A relation between degree-day factor and debris properties was used to estimate ice melting under a debris layer. The annual (July 1985-June 1986) total observed and calculated discharges for Langtang Khola Basin were similar, i.e. 1357 mm and 1365 mm, respectively. Similarly, for the Lirung Khola Basin discharge values were also similar from May to September in 1996.

Keywords: glacier, snow and ice ablation, positive degree-day factor, discharge