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In-situ Snow depth measurements (1963-2023) in the Chirchik Basin in the western Tien Shan.

Winter snow accumulation is important for water supply during the summer in Central Asia. Based on daily snow depth measurements, this research quantifies historical changes in snow depth in the Chirchik catchment (Tien Shan region, Uzbekistan) from 1963 to 2023. All snow parameters exhibit a trend towards shorter snow cover and less snow. A more pronounced reduction in the seasonal snow depth was noted during the last 20 years (2003-2023) compared to the long-term periods (60 and 40 years), with a significant reduction of 44.2 cm in the mean seasonal snow depth due to shifts in climatic parameters. Consequently, the discharge volume increased by 11.6% from April to May and reduced by 9.5% from June to September in the Chirchik catchment over the last decades. The changes in the downstream discharge regime are a consequence of the cryospheric changes in the alpine regions with far-reaching impacts.

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