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Simultaneous isotope-hydrochemical investigations and modeling to study the runoff valuations of highland catchments (case study for Djankaut river basin, North Caucasus)

Glacial-nival zone plays an important role in the formation of mountain river flow. The rivers with a high rate of glacial nourishment identify hazards taking place in the mountains. Djankaut river basin was selected as the representative for the North Caucasus during the International Hydrological Decade. Complex observations of glacier mass balance, runoff, meteorological characteristics and isotope-hydrochemical investigations are conducted. Also snow and ice melting for ablation season was simulated.

It is shown, that only the part of melt water is discharged from the catchment area during the ablation season. This is due, primarily, with a secondary transfer of the melt water into the ice. This determines the inertia of the glacial runoff and high values of the autocorrelation coefficient. Runoff fluctuation during the day, so-called "fast" flow, formed by meltwater having the lag time of about 3-4 hours in June and July, 2-3 hours in August and September.

Oxygen isotopes ($d^{18}O$) is widely used as an indicator for different water origins. According to the results we can conclude that $d^{18}O$ is a clear marker of melting winter snow. The heaviest at $d^{18}O$ isotopic composition associated with summer precipitation. The isotopic composition of glacial ice can vary considerably accordingly to the weather conditions during the freezing period.

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