Uranium-isotopic method using to determine sources of moraine-glacial lakes feeding and assess of its outburst danger.

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Mountain moraine-glacial lakes are formed from atmospheric precipitates in melted snow water form, "young" ice of glacier beetling over lake (meteoric waters) and water from melted "aged" buried ice, lying in adjoining rocks of lake edges and bottom (waters, leached from rocks) [1]. Waters from first source are characterized by extremely low U content and balanced ratio of its even isotopes (C = (0,39± 0,02) ppm; γ =1,02±0,02) [2]. Waters from melted buried ice are noted for higher U content and non-equilibrium γ ratio (C range = 2,48 ± 0,08 - 28 ± 0, 2 ppm; γ range = 0,862 ± 0,007 - 1,16 ± 0,02). More role of buried ice in lake feeding is, more water in moraine-glacial lakes deflects from glacial melted water by corresponding C and γ values, which allows to determine main feeding sources. The latter testifies about lake instability state and increasing of its outburst probability. The presented method is confirmed by our inspection of five Kyrgyz lakes [2]: maximum C and γ deflections from the same values in meteoric waters were in Teztor-1 lake (C=23± 2 ppm; γ=0,93 ±0,01) and Atjailoo lake (C=1,69 ±0,05 ppm; γ=0,89 ±0,01). After that Teztor-1 had several outbursts; the last was in 2004. Atjailoo outburst was in 1997 and today it is in constantly growing outburst stage. Another three lakes are stable and their uranium-isotopic parameters are close to meteoric waters: for Teztor-2 lake C=1,14±0,03 ppm; γ=1,00 ±0,02; for Kashkasu and Tuuktor lakes C=1,39 ±0,05 ppm; γ=1,06 ±0,01.

1. T.V.Tuzova, S.A.Erokhin, et.al."Uranium and tritium in glacial lakes of Northern Tien-Shan. Water sources", v.1, № 2, 1994, p. 236-239.
2. T.V.Tuzova. "Investigations of waters of the Issykkyl basin with the use of uranium isotopic method. Study of the Issyk-Kyl lake hydrodynamics with the use of isotopic methods". PartII. Institute of water problems and hydropower, NAS KR: ISTC.- Bishkek:Ilim,2006, p. 132-140. ISBN 5-8355-1440-9