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Is Upper Lake Merzbacher (Central Tien Shan, Kyrgyzstan) the result of a fluctuating glacier?

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Based on time series analysis of topographic maps, aerial photos and satellite images, and on fieldwork at the Global Change Observatory "Gottfried Merzbacher", we reconstruct the retreat and advance of the Northern Inylchek Glacier and the development of supraglacial and proglacial lakes respectively. The aerial photo of 1943 reveals a Northern Inylchek Glacier with abundant supraglacial lakes. Change detection since 1943 documents the formation of a proglacial lake, which until 1981 increased in size and was termed Upper Lake Merzbacher. In contrast to the increase of the Upper Lake, an undulated terrain with a dozen of small lakes did not change at all during the last 70 years. We term this area of about one square kilometre in size the "stable-moraine-lake-ensemble". It is situated northeast of the terminal moraine of the Northern Inylchek Glacier. Regarding its geomorphologic features, this stable-moraine-lake-ensemble represents an old stage of glacier karst. Since this area is covered by several meters of fine-grained and thin-layered lake sediments we postulate a former proglacial lake, which was dammed by both the Northern and Southern Inylchek Glacier. In view of the fact that a meter thick massive till, rich in striated pebbles, overlies these lake sediments, we conclude that the Northern Inylchek Glacier overthrusted these lake sediments; a process which must have happened before 1943, and hence long before the (present) Upper Lake Merzbacher came to exist.

From our findings we postulate the following fluctuations of the Northern Inylchek Glacier:

1) An ice stream net consisting of both the Northern and Southern Inylchek Glaciers jointly flowing down the Inylchek Valley existed during Würm glaciation.
2) At the end of the Little Ice Age, the moraines of which are poorly dated in the Central Tien Shan, the glaciers rapidly retreated. As soon as the Southern Inylchek Glacier stagnated and the Northern Inylchek Glacier separated and retreated, part of the Southern Inylchek Glacier bended and flew up the Northern Inylchek Valley.
3) Next, the Northern Inylchek Glacier advanced again, piling up a terminal moraine (which at present borders the Peremitschka to the southwest). Then a lake flooded the stable-moraine-lake-ensemble and lake sediments were deposited on it. We hypothesize that Gottfried Merzbacher in 1902 saw exactly this icy lake "... in whose blue waters floated thousands of tiny icebergs and frozen blocks in every shape and form. . . ".
4) Gottfried Merzbacher could not have seen the (present) Upper Lake, which only came to exist after the 1940s. However, he could also not have seen the Lower Lake (in its present size, as soon as it comes to exist), because in his photo taken in 1902, the Southern Inylchek Glacier covers most of the Peremitschka.
5) We have no documents of the Northern Inylchek Valley between 1902 and 1943, but due to the fact that a ground moraine clearly overlies the lake deposits of the stable-moraine-lake-ensemble, we postulate that another advance of the Northern Inylchek Glacier occurred during this 40 year period.
6) From 1943 to 1981 the Northern Inylchek Glacier retreated again and gave way to an increasing Upper Lake Merzbacher.
7) During a rapid advance, which we do not term a glacier surge however, the size of Upper Lake Merzbacher was significantly reduced in late 1997 and early 1998 respectively.