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Karakoram glaciers slightly gained mass in the early 21st century

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There is a severe lack of observations to assess the state of health of Hindu Kush-Karakoram-Himalaya glaciers and constrain their contribution to regional hydrology and global sea-level rise. In particular, no recent mass balance measurement is available to confirm a presumably anomalous behavior of Karakoram glaciers. In this study, we observe for the first time the regional mass balance of Karakoram glaciers, by differencing two digital elevation models acquired in 2000 (SRTM) and 2008 (SPOT-5). The spatial pattern of glacier elevation changes is highly heterogeneous, confirms that glacier surges are widespread in this region and shows that high ice thinning and ablation rates can occur on debris-covered glacier tongues. The regional mass balance is slightly positive ($+0.10 \pm 0.21$ m a-1 w.e.), in strong contrast with a negative global average for glaciers and ice caps and in agreement with a decreasing runoff from rivers originating in this mountain range. We thereby confirm the so-called "Karakoram anomaly" and show that the sea-level rise contribution of glaciers in Central Asia should be revised downward by 0.05 mm a-1 sea-level equivalent.