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Stationary monitoring of glacier response to climate change in China

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At present, there are about 48571 glaciers with a total area of about 51.8×103 km2 and a volume of about 5.6×103 km3 in China. They are distributed widely in the high mountains in and surrounding the Tibetan Plateau and other high mountains such as Tianshan, Altay and Pamir. In view of differences in climatic conditions and glacier types, stationary monitoring of the glacier variations has been ongoing in different regions in order to investigate the glacier response to climate change.
The monitoring results show that all the monitoring glaciers have been in retreat during the past decades and especially since 1990's the retreat rate has an accelerating trend. The accumulative mass balance is much negative and has a large annual variability for the monsoonal maritime glaciers in comparison with the continental and sub-continental glaciers.
Under climate warming background, the acceleration of glacier melting is mainly attributed to rise in air temperature, ice temperature augment and albedo reduction of glacier surface. Particularly, the albedo reduction has a positive feedback effect on the glacier melting.
Based on long term observation of glacier variations and physical properties, a simple dynamics model is coupled with mass balance modeling to make a projection of a typical glacier change in future. The primary modeling results suggest that the glacier will continue in shrinkage until vanishing within 50-90 years.