

Current state of glacier changes and glacier lakes in Tien Shan Mountains, Central Asia

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Inhabitants of arid to semi-arid lowland area (oasis areas and irrigational agriculture field) of Central Asia depend on fluvial water sourced from distant mountains. Mountain glaciers contribute part of this important water resource and supply stable discharge during drought years and through the annual dry season of summer. Because glacier meltwater makes up for shortage of discharge during drought years, glacier shrinkage may lead to decrease flow discharge in the future. Glacier area in Pamir and Himalayas areas, predicted based on the temperature rise reported by IPCC (2001), decrease up to 43-81%. Global warming will lead to water shortages and natural disasters in Central Asia.

To clarify the recent spatial variability of recent changes in five mountain regions in the Tien Shan Mountains, photographs from the Corona satellite program and images acquired by Landsat 7 ETM+ and ALOS data were analyzed. On the comparisons of glacier area change in five mountain area, glacier behavior has differed markedly by mountain regions within the Tien Shan Mountains. Glacier shrinkage has been great in the outer Tien Shan and small in the interior of the mountain range. This study reports on the current state of glaciers and glacier lakes in the Tien Shan of Central Asia for recent climate change.