

Recent variability of glacial lakes and geomorphological conditions in the northern Tien Shan

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To assess the current state of glacial lakes, we examine the seasonal variability of 339 glacial lakes in the Teskey and Kungoy Ranges of the Issyk-Kul Basin, Kyrgyzstan, during 2013–2016 based on optical satellite images (Landsat7 ETM+ and 8 OLI). The glacial lakes are classified into six types based on their annual variations in area: stable, increasing, decreasing, appearing, vanishing, and short-lived. We find that many appearing, vanishing, and short-lived types occurred in both mountain ranges, having a large variability that is not directly related to glacier recessions. The large lake variability over such short periods arises from regional geomorphological conditions and not directly from the local short-term climate variations.

Keywords: lake variability, debris landform, Tien Shan