



The recent climate change and glaciers retreat in the Tien Shan mountains, Central Asia

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This research presents accurate evaluation of the recession Terskey Alatau glaciers, Tien Shan, central Asia, based on aerial photographs (1944, 1956, 1960, 1977, 1980 and 1988), 1:25 000 scale topographic maps, and the latest satellite images (Landsat ETM+, ASTER from 1999 to 2006). In order to increase the accuracy in the identification of the moraines at the satellite and aerial images, field definition of LIA moraines position and all kind of published information about the front positions of glaciers in the end of XIX century was used. The glaciers under investigation are located on the eastern part of the Teskey Alatau range. We have estimated glaciers changes over the last 130 years. Manual delineation of glaciers was used for all kind of images. For the most part of glaciers we have 10 outline positions since 1870's till 2006. Most glaciers in the study area exhibited shrinkage. On the average the glaciers in this area have retreated by 1000-600 m since the LIA maximum. Thus in the second part of XXth century (since 1950's), glaciers area has changed by about 9-11% comparing with 5-7% between 1880 and 1970s. In the last 10 years glaciers area decrease by 0.3 - 0.5 area %/year and the terminus retreat by 10-20 m/year. The temp of the wastage of glaciers in the Tien Shan has increased from the mid - 1970s till the presents. Climate data from local meteorological stations and mass balance data from the nearest glaciers support these results. The study was supported by the ISTC grant # 2947 and INTAS YSFellowship # 5742.