

Late Glacial to late Holocene exposure ages from glacial moraines in Ak-Shyrak, central Kyrgyz Tian Shan

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The Tian Shan is a 2500 km-long WSW-ENE trending arc of mountains dissecting the borders of the Xinjiang province in northwestern China, Kyrgyzstan and Tajikistan. Understanding the spatial and temporal patterns of glaciation in this region is important because there is a general lack of paleoclimatic data from this extremely continental location. The aim of this project is to quantify past glacier variations in the Ak-Shyrak area of the Tian Shan in Central Asia. We do this in order to test hypotheses related to the influence of large-scale climate systems on glacier dynamics. We use geomorphological mapping and ^{10}Be exposure dating of erratic boulders on glacial moraine deposits. We observe large site-specific scatter in our exposure ages. Apparent minimum exposure ages range from ~ 0.2 ka to ~ 180 ka. Most of our apparent exposure ages come from boulders with an age range between 30 ka to 0.2 ka. We observe a spatial variation in timing of glaciation across the Tian Shan that might be due to differences in either paleoclimate or local physiographic conditions (e.g. altitude, slope, aspect). Because of the considerable scatter in our age data we refrain from assigning oxygen isotope stages to our mapped glacial advances. Finally, we assess and discuss possible reasons for the observed age scatter in terms of prior and/or incomplete exposure histories of individual samples and compare our data to other regional datasets.