

The glacial history of the Shaluli Shan area, southeastern Tibetan Plateau

Ping Fu^{1,2}

Jonathan Harbor¹

Arjen P. Stroeven²

Clas Hättestrand²

Jakob Heyman¹

Liping Zhou³

Marc Caffee¹

1. Purdue University, USA

2. Stockholm University, Sweden

3. Peking University, China

We have examined the Quaternary glacial history of the Shaluli Shan area in the southeastern Tibetan Plateau using remote sensing-based geomorphic mapping, field investigations, and ¹⁰Be terrestrial cosmogenic nuclide (TCN) dating. Our geomorphologic studies provide the first detailed glacial landform map of this region, in which extensive former glaciations are either characterized by Alpine glacial landforms centered on high mountain ranges, or by a zonal distribution of glacial landforms on low relief plateaus reflecting the impacts of polythermal ice caps. Combining the TCN ages, 5 periods of glaciation are identified: last deglaciation (17-13 ka BP), last glacial maximum (LGM) (21-17 ka BP), and three older glacial stages with minimum ages of 100-130 ka BP, 150 ka BP, and ~180 ka BP. During the older stages, ice caps covered the Haizi Shan Plateau and Xinlong Plateau with large outlet glaciers extending far down fringing valleys, and extensive valley glaciers and piedmont glaciers in the high mountains. Also during the global LGM, ice caps and/or ice fields were present on the Haizi Shan and Xinlong plateau surfaces, which contrasts strongly to more central regions of the Tibetan Plateau where there was less ice expansion during the global LGM. Given the location of the Shaluli Shan on the southeastern margin of the Tibetan Plateau, this work provides insights into paleoclimate patterns of this monsoon-dominated region of the Tibetan Plateau and shows that its glacial chronology reflects ice expansion more in synchrony with Northern Hemisphere paleo-ice sheets than other areas of the Tibetan Plateau.

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