

2 Methodology and data

2.1 Research area and ice core dating

The ZK glacier is located in the northwest part of the TP, covering an area of 337.98 km^2 with a volume of 41.70 km^3 (2005 data, Shi, 2008). The snow line is about 5700–5940 m a.s.l. In April of 2009, two ice cores to bedrock (127.7 and 126.7 m in length for core 1 and core 2, respectively) were recovered from the glacier ($34^{\circ}18'05.8'' \text{ N}$, $85^{\circ}51'14.2'' \text{ E}$, 6226 m a.s.l., Fig. 1). The glacier temperature ranged from -15.2 to -9.2°C , with a mean temperature of -11.7°C , -12.4°C at 10 m depth and a basal temperature of -9.2°C .