

Styx Glacier (73°51.10'S, 163°41.22'E, 1,623 m above sea level) is located near the western coast of the Ross Sea, northern Victoria Land (Figure 1). A shallow (depth of 210.5 m) ice core was drilled during the 2014–2015 austral summer (Han et al., 2015). The drilling site is close to the ice divide, and the horizontal ice flow was estimated as  $\sim 0.9$  m/year by interferometric synthetic aperture radar observations (supporting information Figure S2). Ground penetrating radar survey showed that the ice thickness at drilling location is 550 m (Hur, 2013). The temperature of the 210.5-m borehole was measured in November 2016, 2 years after drilling. The borehole temperature was logged twice in both downward and upward directions. The logging interval was every 1 m for the upper 15 m and every 3 m down to 90 m; 5 m intervals were used for depths below 90 m. The thermistor was held in place for at least 10 min to allow it to stabilize, and the resistance was averaged for 5 min. The measured resistance data were converted to temperature by an extended Steinhart-Hart calibration function (Clow et al., 1996). The expanded absolute accuracy of our logging device is 0.1 K in the range of 0 to  $-35$  °C (Institute of Calibration & Technology Co., Ltd.). The relative accuracy of the borehole logging data is 9 mK, which is estimated as a pooled standard deviation of the four repeated temperature measurements. We note that the relative temperature difference between the depth intervals is more important for the borehole temperature inversion than the absolute temperature (Orsi et al., 2012).