1988) and observations from Viking (Schultz and Lutz, 1988) that pedestal craters preserve evidence of epochs when ice accumulated on high-latitude plains to thicknesses of up to ~260 m (Kadish et al., 2010). If this interpretation is correct, then it correlates well with our findings. Both results suggest that at certain times poleward of ~40–45° in each hemisphere, ice accumulated regionally, regardless of slope orientation and specific microenvironments. Provided that slopes were steep enough, this accumulation could induce flow and yield the concentric crater fill that is preserved today. Equatorward of 45°, ice accumulation has been limited to pole-facing slopes that lie outside of the present-day tropics. In these locales, the importance of microclimates are amplified; the disparate insolation conditions provided by opposite walls of the same crater rim yield net ice accumulation on the pole-facing slope, with negligible accumulation on the equator-facing slope (e.g. Fig. 5) (Costard et al., 2002; Kreslavsky and Head, 2006; Kreslavsky et al., 2008; Morgan et al., 2010).

In summary, these findings show that the most recent phase of significant ice-related flow on Mars is likely to have been focused (1) in cold-traps on steep slopes in the mid-latitudes and (2) over all steep slopes at high-latitudes (>45°). The areal correlation of concentric flow in CCF at these latitudes and the distribution of pedestal craters suggests that if their formation was synchronous, then there could have been regional ice sheets in place for potentially extended periods of time at these latitudes, analogous in scale to terrestrial continental glaciation. These observations, along with ongoing measurements of the age of ice-rich deposits, will provide important new constraints on the Amazonian climate history of Mars.

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