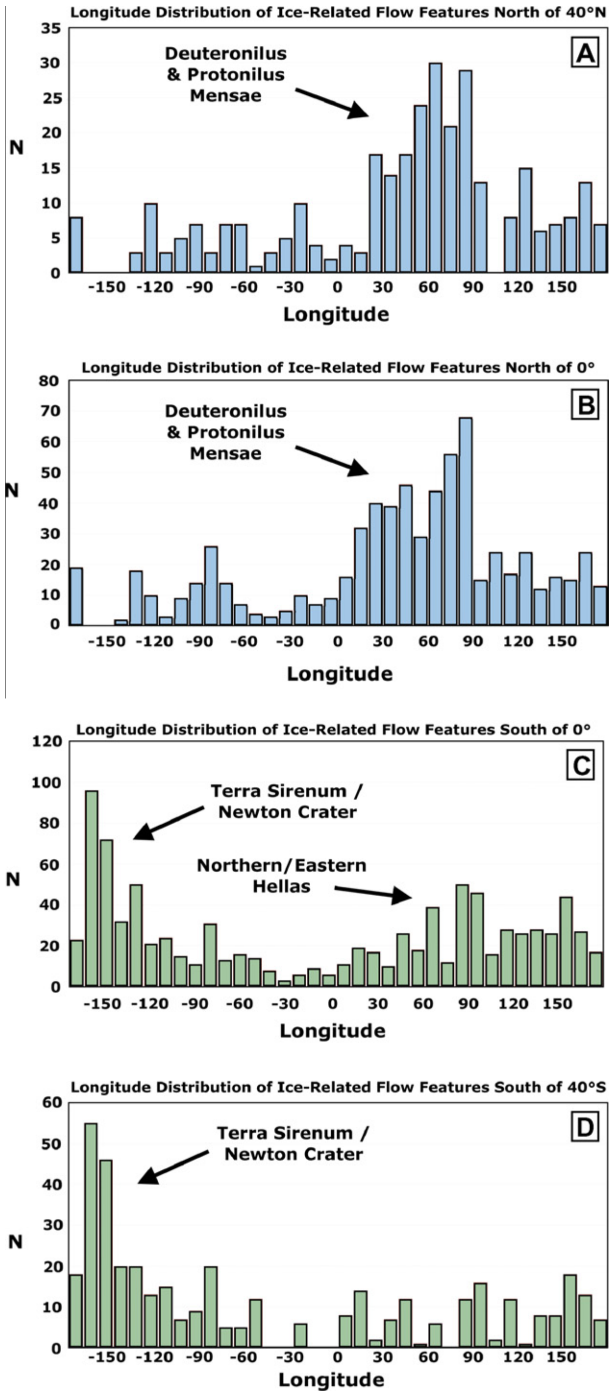


**Fig. 7.** Longitude distribution of ice-related flow features on Mars. Flow features are longitudinally distributed relatively evenly across the planet poleward of ~25°, with the exception of Deuteronilus/Protonilus Mensae in the northern hemisphere and the Newton Crater/Terra Sirenum and Northern/Eastern Hellas regions in the southern hemisphere. (A) Cumulative flow features vs. longitude poleward of 40°N. (B) Cumulative flow features vs. longitude for the northern hemisphere. (C) Cumulative flow features vs. longitude for the southern hemisphere. (D) Cumulative flow features vs. longitude poleward of 40°S.

itude band, 68.5% of flow features are pole-facing, compared to 83.7% between 40° and 45°S. So while the broad latitude-dependent trends are identical in each hemisphere (Fig. 6), there are distinctions that can be drawn that could be due to: (1) absolute elevation differences between the northern lowlands and the southern highlands (ice should be more stable on all slopes at lower elevations) and (2) the availability of steep slopes in each hemisphere (Kreslavsky and Head, 2000).

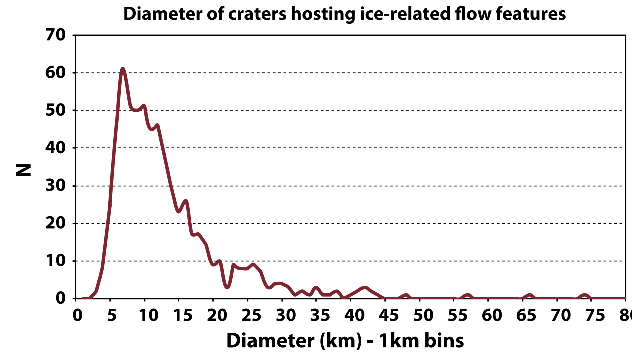


**Fig. 8.** The diameters of craters that host ice-related flow features in the mid-latitudes of Mars. Ice is likely to accumulate on the walls of craters <1 km in diameter, but their small size preclude them from being included in our survey. Craters >75 km in diameter can also host ice-related features, but they are not included in this survey because (1) they may not be fully imaged in CTX data, or (2) they are less likely to have coherent rims that have not been breached (a prerequisite for this survey). Larger craters are also generally older and are less likely to have steep slopes, which would be more conducive to ice accumulation and flow.

We also examined the distribution of ice-related flow features as a function of longitude (Fig. 7). While distribution is broadly uniform in both hemispheres, each hemisphere shows a major peak in one respective area. For the north, the well-studied features along the dichotomy boundary at Deuteronilus and Protonilus Mensae clearly represent the largest concentration of ice-related morphology north of the equator. In the south, a similar concentration is observed in the Newton Crater region, south of Terra Sirenum. A lower-amplitude but measureable concentration is also observed in the terrain along the northern and eastern rims of the Hellas Basin. These are the same regions where these types of features were first mapped in the global mosaics of Viking imagery (Squyres, 1978, 1979).

In our survey, the impact craters that host ice-related flow features range in diameter from ~1 km to ~72 km, with an average of 11.9 km (Fig. 8). It is possible that additional craters with ice-related flow features of both larger and smaller size exist. While we did observe flow features within craters as small as 1.2 km in diameter, features within craters of this size are harder to recognize; our criteria for mapping the existence and orientation of features required recognition of morphological markers of flow. For this reason, our survey does not include many potential features at this scale. For larger craters (>75 km), their size often precludes them from having complete coverage in CTX images, which is a prerequisite for inclusion in our survey. Another possible effect is that large craters are on average older than smaller craters, and thus have more degraded slopes which may be less preferred for ice accumulation. The regions with the highest density of ice-related flow features (Deuteronilus/Protonilus Mensae, Eastern Hellas, Phlegra Montes, etc.) exhibit flow features within more than half of the impact craters in those regions.

We excluded flow features within craters with breached rims from our orientation measurements, as the uneven availability of slope angles would bias our statistics. These features, though, could still be valuable as potential sites for regional glaciation, where breaches could have been exploited for infilling of ice/debris from adjacent terrain. Our survey revealed 34 craters that had breached rims and clear evidence for flow (Fig. 3b). Of these 34, 27 showed evidence only for ice flowing out of the crater. Of more interest are the 7 craters observed that show clear evidence for ice entering the crater through a breach in the rim, suggesting that ice did not accumulate solely along the interior of the crater rim. The small sample set precludes any conclusions with regard to regional ice fields that could have sourced these flows, but