Global Lunar Crater Database (in review with JGR)

Method
This is a fully manual effort because automated detection is not yet good enough for this global work over multiple terrain types.

Craters are manually identified and the rims traced in ArcMap. Digitized rims are exported in units of decimal degrees and imported to Igor Pro where algorithms correct for all projection effects using Great Circles [1] for each rim point.

Both a circle and ellipse are fit. From the circles, location and diameter are saved. From the ellipse, major and minor axes, tilt, ellipticity, and eccentricity are saved.

Comparison with Other Databases: Crater Number versus Diameter
To compare databases, a crater size-frequency distribution (SFD) can be used [2]. This was done with five other recent global databases:

- [3] Named craters and the historic “LPI Catalog”

Each SFD is divided by the SFD for this new database to construct the ratio plots below (2σ uncertainty envelopes).

Stats
| All Craters: | 2,000,319 | # Craters ≥20 km: | 6,966 |
| # Craters ≥5 km: | 82,987 |
| ☐ # Craters ≥1 km*: | 1,296,025 |
| ☐ # Craters <1 km*: | 704,294 |

Data Used
- WAC Morphometric Mosaic
- WAC Dawn/Dusk Mosaics
- WAC Custom Mosaics
- LOLA DTM
- LOLA+Kaguya DTM
- Kaguya TC Mosaics

Global CTX Mosaic Effort
The Context Camera (CTX) [9] on Mars Reconnaissance Orbiter has imaged >97.4% of Mars at ≥5 m/pixel at a consistent time of day. Perfect for mosaicking.

I have constructed uncontrolled global mosaics, rendered at 20 m/pixel (1 TB size). These are being used in the new Mars crater database effort to identify and classify features. These mosaics may be publicly released.

I am also leading a pilot effort to fully control CTX and create a public, 11TB mosaic set for Mars.

References & Acknowledgments
[9] Chang E-1, 2.0

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Want to be notified when the lunar crater database is available? Send e-mail to stuart@boulder.swri.edu