

# Geological Map of the Borealis Quadrangle (H01), Mercury

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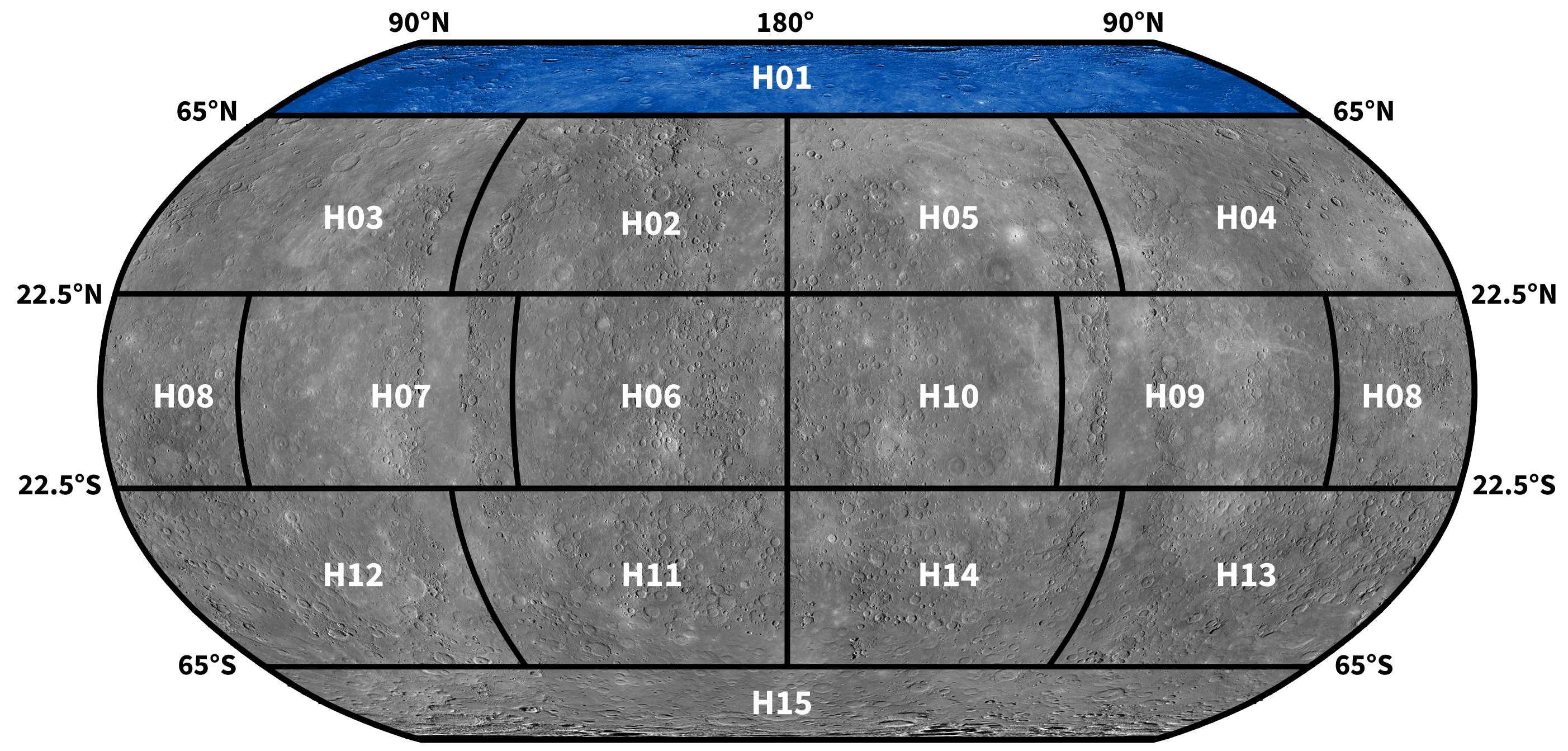
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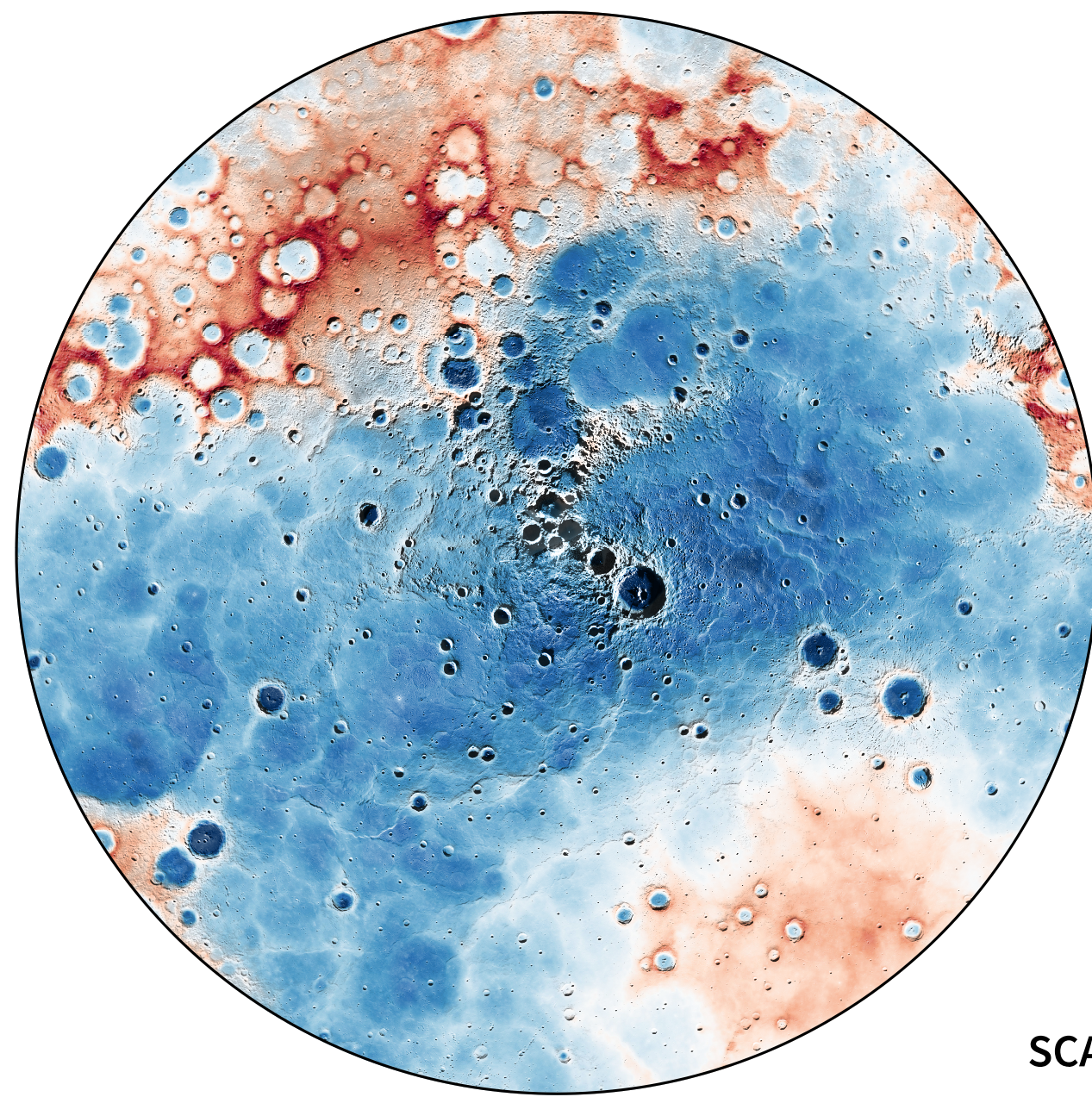


Robinson projection of Mercury's globe divided into 15 mapping quadrangles. H01 (Blue) is the mapping area.

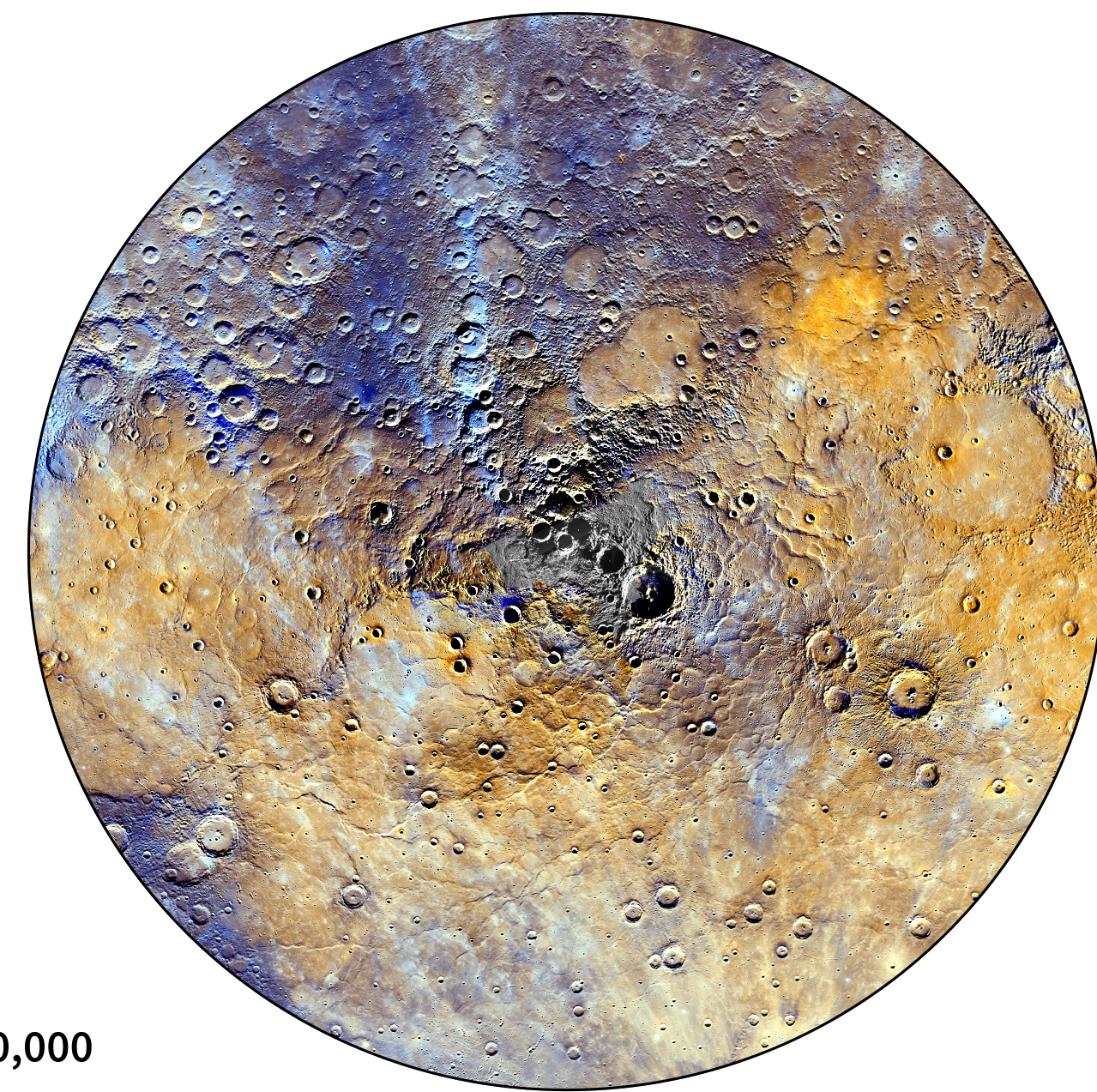
SCALE: 1:40,000,000

MESSENGER USGS DEM overlain on BDR basemap

MESSENGER MDIS Enhanced Color mosaic overlain on BDR basemap



SCALE: 1:13,000,000



## Mapping units

### Plains materials

- Smooth plains**  
Sparsely cratered flat/gently rolling material. Isolated patches are probably ponded/perched impact melt whilst expanses of smooth plains likely to be volcanic in origin.
- Intermediate plains**  
Intermediate in surface roughness between smooth and intercrater plains. Originally smooth plains that has been partially altered by cratering.
- Intercrater plains**  
Heavily cratered material with a rough texture. Originally volcanic plains that has been heavily reworked.

### Crater materials (three degradation classes)

- C<sub>3</sub> crater — well preserved**  
Fresh craters with crisp rims and internal crater structures. Textured ejecta blankets, sometimes albedo rays present.
- C<sub>2</sub> crater — degraded**  
Degraded craters with somewhat subdued rims. Internal crater structures present but slumped. No albedo rays.
- C<sub>1</sub> crater — heavily degraded**  
Incomplete and significantly subdued crater rims. No obvious internal crater structures. No ejecta.
- Smooth crater floor**  
Sparsely cratered smooth floor material confined to craters. Possibly impact melt (C<sub>3</sub>), and a combination of volcanic material/impact melt for other crater classes.
- Hummocky crater floor**  
Texturally rough or cratered material confined to within craters. Likely degraded internal structures and floor material.

### Geological contacts

- Certain** — Solid line
- Approximate** — Dashed line
- Uncertain** — Dotted line
- Crater rims**
  - Rim crest of crater (diameter ≥ 20 km) — Thick solid line
  - Rim crest of crater (≥ 5 km diameter < 20 km) — Thin solid line
  - Rim crest of buried or subdued crater. — Dashed line
  - Irregular pit — possible volcanic vent. — Dotted line

### Tectonic structures

- Thrust fault, certain — confident identification.** — Solid line with triangles
- Thrust fault, approximate — approximate location identification.** — Dashed line with triangles
- Graben — a down dropped fault block.** — Solid line with circles
- Wrinkle ridge — compressional structures common in smooth crater floors and smooth plains.** — Solid line with wavy pattern

### Superficial units

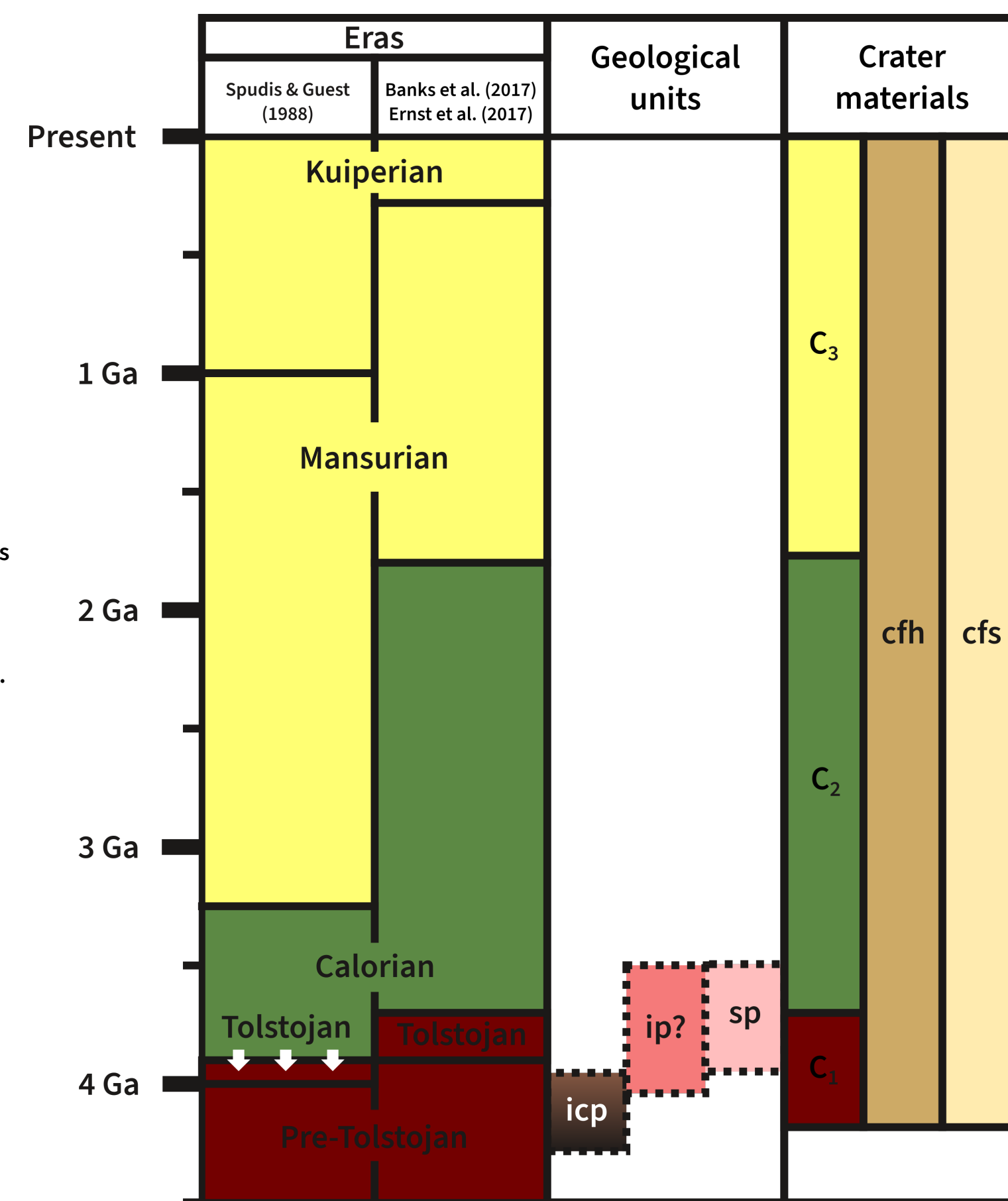
- Bright crater rays — high albedo ejecta material.** — Dotted pattern
- Hollows — high albedo irregular flat floored shallow depressions.** — Stippled pattern
- Faculae — bright diffuse red spots, putative pyroclastics.** — Red stippled pattern
- Catenaes — Secondary crater chains/clusters.** — Dotted pattern

### Auxiliary information

- Areas of permanent shadow with radar-bright material (craters ≥ 5 km in diameter between 80–90°N) after Deutsch et al., 2016 (<https://doi.org/10.1016/j.icar.2016.06.015>)** — Dark grey pattern

## Correlation of map units

(Showing relative and absolute ages of the mapped units)

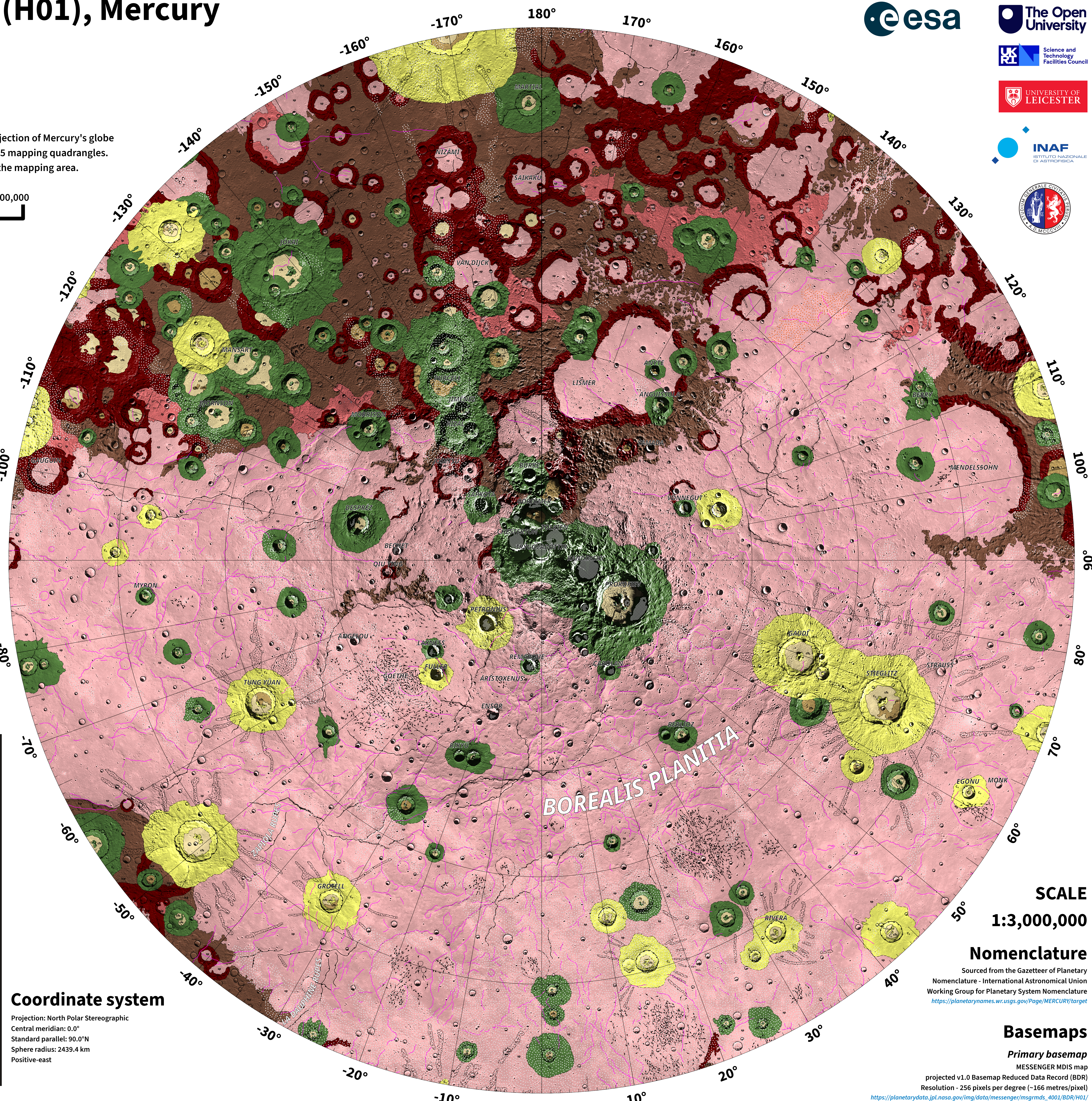
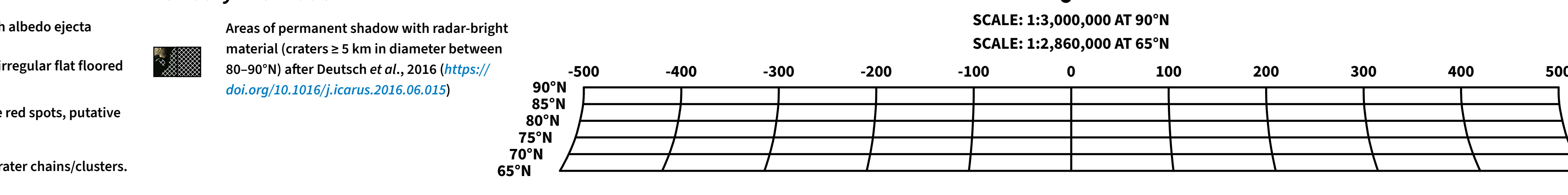


## Coordinate system

Projection: North Polar Stereographic  
Central meridian: 0.0°  
Standard parallel: 90.0°N  
Sphere radius: 2439.4 km  
Positive-east

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SCALE  
1:3,000,000

## Nomenclature

Sourced from the Gazetteer of Planetary Nomenclature - International Astronomical Union Working Group for Planetary System Nomenclature  
<https://planetarynames.wr.usgs.gov/Page/MERCURY/target>

## Basemaps

### Primary basemap

MESSENGER MDIS map  
projected v1.0 Basemap Reduced Data Record (BDR)  
Resolution - 256 pixels per degree (~166 metres/pixel)  
[https://planetarydata.jpl.nasa.gov/img/data/messenger/msgrmds\\_4001/BDR/H01/](https://planetarydata.jpl.nasa.gov/img/data/messenger/msgrmds_4001/BDR/H01/)

### Ancillary data

Mercury MESSENGER North Pole DEM 665m v2 (see Ancillary Data section at link below)  
[https://astrogeology.usgs.gov/search/map/Mercury/Topography/MESSENGER/Mercury\\_Messenger\\_USGS\\_DEM\\_Global\\_665m\\_v2](https://astrogeology.usgs.gov/search/map/Mercury/Topography/MESSENGER/Mercury_Messenger_USGS_DEM_Global_665m_v2)  
Mercury MESSENGER MDIS Basemap Enhanced Color Global Mosaic 665m (64ppd)  
[https://astrogeology.usgs.gov/search/map/Mercury/Messenger/Global/Mercury\\_MESSENGER\\_MDIS\\_Basemap\\_EnhancedColor\\_Mosaic\\_Global\\_665m](https://astrogeology.usgs.gov/search/map/Mercury/Messenger/Global/Mercury_MESSENGER_MDIS_Basemap_EnhancedColor_Mosaic_Global_665m)