

Morpho-stratigraphic map of Jezero crater landing area

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The rover Perseverance of the Mars2020 mission will depart to Mars in July 2020 and land on Mars in February 2021. Its landing site, Jezero crater, has been selected after a series of workshops that involved the whole scientific community (Grant *et al.*, 2018). Jezero crater is a paleolake as deduced from the presence of two fan deltas, inlet and outlet valleys (Fassett and Head, 2005). Jezero crater contains a huge number of aqueous landforms (fluvial and lacustrine sediments) and a series of key mineralogical detections, including hydrated silicates and carbonates (Ehlmann *et al.*, 2008; Goudge *et al.*, 2015).

The geologic map delivered here (Fig. 1) has been produced using public orbital images available on the Planetary Data System (PDS), in particular the High Resolution Imaging Science Experiment (HiRISE) and Context (CTX) imagers, both on Mars Reconnaissance Orbiter spacecraft. Interpretations are based on visual imagery only, taking into account the orbital facies (layers, massive, etc.) and their stratigraphic relationships, the texture and albedo of terrains, without taking into account mineralogical data. The area studied here is centered around the landing area comprising the east of the fan delta and the west of the crater floor. The map has been done at 1:10,000 scale, and is available for further visualization projects (such as integration in VR, e.g. Caravaca *et al.*, 2020). Figure 2 presents the legend for the map (Fig. 1) and a complete list of all units. The main units mapped here consist of:

- The ~40 m thick fan delta (D- in blue colors) separated in sub-units corresponding to distinct textures or layer types, interpreted as fluvial and lacustrine deposition;
- The crater floor unit (DT- and LT- in orange to light-pink colors) separated in sub-units depending on their albedo (dark-toned and light-toned) and their texture (fractured, smooth), interpreted as either volcanic or eolian filling;
- The mottled terrain unit (MT- purple colors) corresponding to sedimentary deposits eroded in hills and buttes and present on the crater margins and locally on its floor, interpreted to be sedimentary or volcano-sedimentary deposition;
- The crater wall (W- in brown colors) corresponding to undifferentiated crustal material from the crater wall excavated by the impact;
- The inlet valley (Neretva Vallis, V- in grey-blue colors) corresponding to the fluvial erosion and local deposition of the inlet valley;
- The residual buttes (B- in green colors) corresponding to sedimentary deposits preserved in buttes, interpreted as either remnants of the main fan delta or residual buttes from former sedimentary bodies;
- Smooth units (D and W-D, in grey colors) with local eolian bedforms, corresponding to eolian mantling and debris-covered hillslopes.

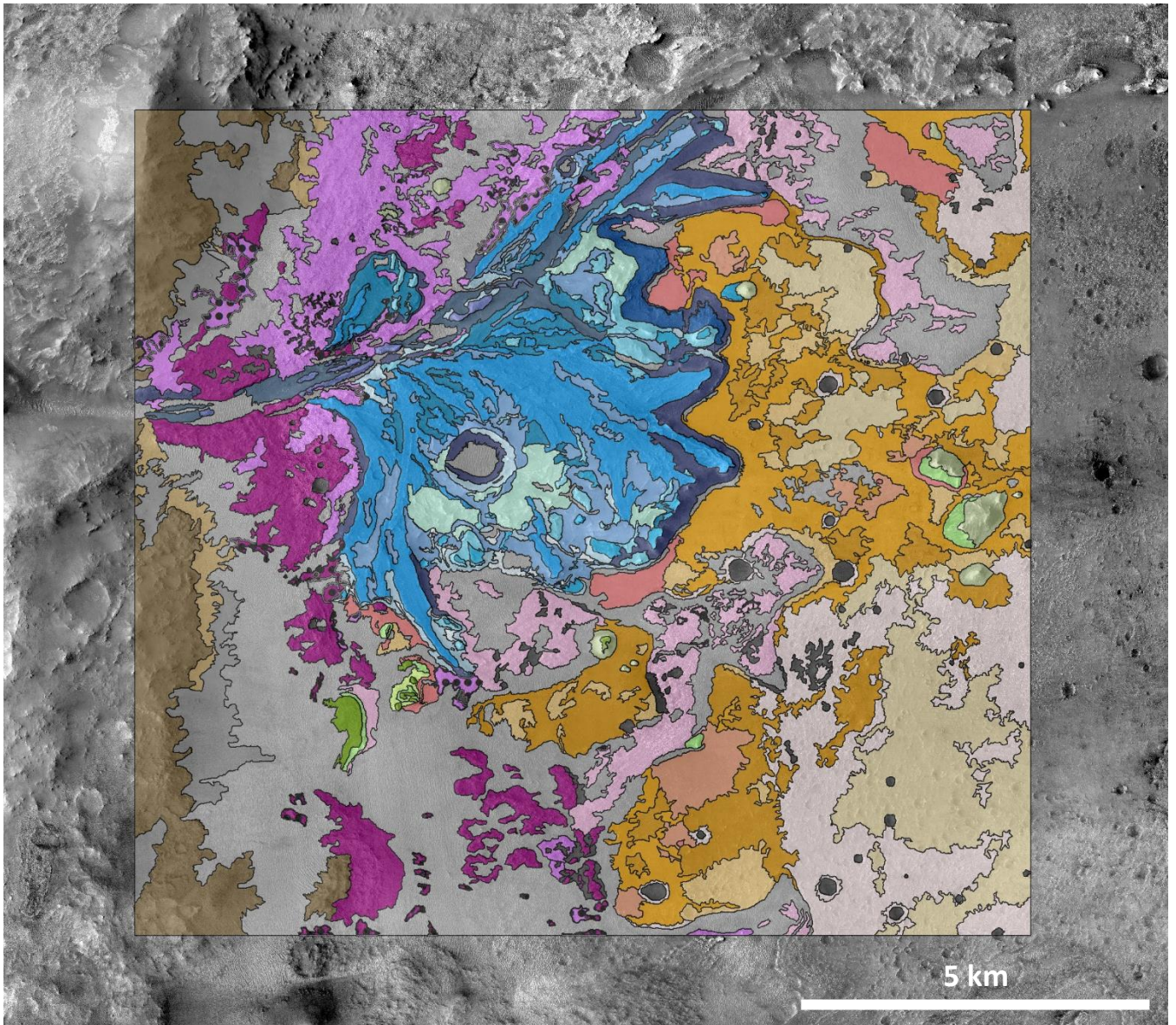


Figure 1: Geologic map (1:10,000) of the western fan delta and western part of the crater floor of Jezero crater.

Map units

■ D-LTcu - Light Toned capping unit	■ DTf - Dark Toned fractured	■ W - Wall
■ D-LTk - Light Toned knobs	■ DTlt - Dark Toned with patchy light toned	■ W-LTf - Wall Light Toned fractured cover
■ D-LTI - Light Toned layering	■ DT1 - Dark Toned Intermediate	■ V-DsVF - Dark smooth Valley Floor
■ D-W - White layer	■ LTdt - Light Toned with patchy dark toned	■ V-R - Valley Ridges
■ D-SLT - Smooth Light Toned	■ LTc - Cratered Light Toned	■ B-Cm - Buttes Capping material
■ D-R - Delta Ridges	■ LT - Light Toned	■ B-LTI - Buttes Light Toned layering
■ D-CLs - Curvilinear Strata	■ LTe - Eroded Light Toned	■ B-LTs - Buttes Light Toned slopes
■ DMLTI - Massive Light Toned layering	■ LTe-m - Eroded Light Toned - mantled	■ B-U - Unstructured Buttes
■ D-ds - dusty surface	■ LTF - Fractured Light Toned	■ W-Dfc - Dusty featureless Wall cover
■ D-rs - rubbly surface	■ LTF-m - Fractured Light Toned - mantled	■ Dunes
■ D-fs - Featureless slope	■ MT - Mottled Terrain	■ Dm - Dark mantling material
■ DTs - Dark Toned smooth	■ MT-m - Mottled Terrain - mantled	

Figure 2: Complete list of units and legend for the map presented in Figure 1.

Acknowledgments

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References:

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Appendices

Appendix 1: List of files provided with this archive (associated database and projection subfiles are not listed).

- Geologic_map_of_Jezero_crater.pdf: this document
- Geologic_map_of_Jezero_crater.png: Image file preview of the map
- Geologic_map_of_Jezero_crater_legend.png: Image file preview of the legend of the map
- Jezero_delta_map.mxd: ArcMap 10.4 GIS project file

Included in the ArcMap (10.4) project:

Group	Layer	Associated layer file (.lyr)	Data type (raster/vector)	File (relative to "Home" folder in ArcMap)
<hr/>				
Geological Maps				
	Landing_ellipse	Geological maps.lyr	Vector (shapefile)	/Geological_maps/Delta_Map/Delta_map.shp
	Delta-map	Geological maps.lyr	Vector (shapefile)	/Landing_ellipse_19/Landing_ellipse.shp
Orthoimages				
	CTX_Ortho_Jezero_delta.tif	Orthoimages.lyr	Raster (GeoTIFF)	/CTX/CTX_Ortho_Jezero_delta.tif