Melas Chasma

Coordinates: 10.4°S 72.7°W

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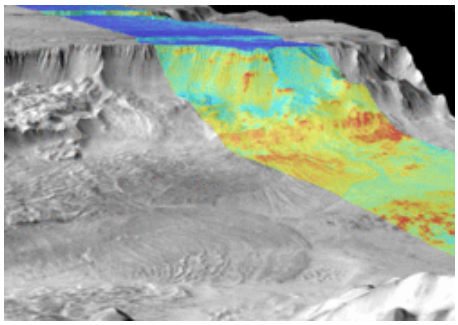
Melas Chasma is a canyon on Mars, the widest segment of the Valles Marineris canyon system,[1] located east of Ius Chasma at 9.8°S, 283.6°E. It cuts through layered deposits that are thought to be sediments from an old lake that resulted from runoff of the valley networks to the west.[2] Other theories include windblown sediment deposits and volcanic ash.[1] Support for abundant, past water in Melas Chasma is the discovery by MRO of hydrated sulfates. In addition, sulfate and iron oxides were found by the same satellite.[3]

Melas Chasma



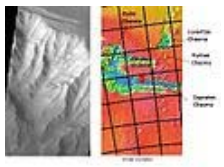
Combined infrared and daytime observation of Melas Chasma. The shadowed regions (blue) indicate successive landslides.

Coordinates	10.4°S 72.7°W
Length	547.0 km

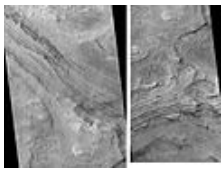
V · T · E (//en.wikipedia.org/w/index.php?title=Template:MarsGeo-Valley&action=edit)

The floor of Melas Chasma is about 70% younger massive material that is thought to be volcanic ash whipped up by the wind into eolian features. It also contains rough floor material from the erosion of the canyon walls. Around the edges of Melas is also a lot of slide material.[4] This is also the deepest part of the Valles Marineris system at eleven kilometers deep from the surrounding surface, from here to the outflow channels are about a 0.03 degree slope upward to the northern plains, which means that if you filled the canyon with fluid, would have a lake with a depth of one kilometer before the fluid would flow out onto the northern plains.[5]

The canyon's depth suggests that this location may be the best site for a manned outpost as it would have the highest natural air pressure on Mars. Equatorial solar irradiation and access to water would enhance this option still further.



Cliff in Melas Chasma, as seen by THEMIS. Click on image to see relationship of Melas to other features.



Two views of Melas Chasma Layered Deposits, as seen by HiRISE. Left picture lies north of other picture on the right. Pictures are not the same scale. Click on image to see details of layers.

Layers in Monument Valley. These are accepted as being formed, at least in part, by water deposition. Since Mars contains similar layers, water remains as a major cause of layering on Mars.

References

1. ^ a b HiRISE | Eroding Layers in Melas Chasma (PSP_004054_1675) (http://hirise.lpl.arizona.edu/PSP_004054_1675)

2. ^ HiRISE | MSL Landing Site in Melas Chasma (PSP_002828_1700) (http://hirise.lpl.arizona.edu/PSP_002828_1700)
3. ^ Murchie, S. et al. 2009. A synthesis of Martian aqueous mineralogy after 1 Mars year of observations from the Mars Reconnaissance Orbiter. Journal of Geophysical Research: 114.
4. ^ Witbeck, Tanaka and Scott, Geologic Map of the Valles Marineris Region, Mars; USGS I-2010; 1991.
5. ^ Cattermole, Peter John (2001). *Mars: the mystery unfolds*. Oxford University Press. p. 105. ISBN 0-19-521726-8.

External links

- Metz, Joannah M.; John P. Grotzinger, David Mohrig, Ralph Milliken, Bradford Prather, Carlos Pirmez, Alfred S. McEwen, and Catherine M. Weitz (2009). "Sublacustrine depositional fans in southwest Melas Chasma" (http://www.gps.caltech.edu/~grotz/Publications/Publications_files/2009_Metz_Melas.pdf) . *Journal of Geophysical Research* **114** (E10002). Bibcode 2009JGRE..11410002M (http://adsabs.harvard.edu/abs/2009JGRE..11410002M) . doi:10.1029/2009JE003365 (http://dx.doi.org/10.1029%2F2009JE003365) . http://www.gps.caltech.edu/~grotz/Publications/Publications_files/2009_Metz_Melas.pdf.