

Thursday, March 22, 2012
WATER ON MARS: FLOWING, FLOODING, AND FREEZING
8:30 a.m. Waterway Ballroom 6

Chairs: Edwin Kite
Gordon Osinski

- 8:30 a.m. Scanlon K. E. * Head J. W. III Madeleine J.-B. Wordsworth R. D. Forget F.
[*Orographic Precipitation in Terra Cimmeria: Towards New Constraints on the Climate of Noachian Mars*](#) [#1287]
 To test the idea that Mars' valley networks were precipitation-sourced, we compared Terra Cimmeria's valleys with the predictions of an orographic precipitation model. We hope to develop new constraints on the Noachian climate using this framework.
- 8:45 a.m. Mangold N. * Adeli S. Conway S. Ansan V. Langlais B.
[*A Chronology of Mars Hydrological Evolution from Impact Degradation*](#) [#1210]
 Degradation of impact craters >20 km is studied in two Noachian regions. Results show a shift in degradation at 3.7 Gy. Craters with alluvial fans are distinct from the most degraded by being better preserved, and being formed during the Hesperian.
- 9:00 a.m. Grant J. A. * Wilson S. A.
[*A Synoptic Source of Water for Late Alluvial Fan Activity in Southern Margaritifer Terr. Mars?*](#) [#2064]
 Deposition of sediments exposed on widely distributed alluvial deposits in southern Margaritifer Terra was likely related to a relatively late period of synoptic precipitation rather than local impact induced degradation.
- 9:15 a.m. Hurwitz D. M. * Head J. W. III
[*Testing the Late-Stage Outflow Channel Origin Hypothesis: Investigating Both Water Erosion and Lava Erosion Origins for Athabasca Valles, Mars*](#) [#1056]
 Analytical models estimate the fluid volumes, effusion rates, and erosion rates required to erode Athabasca Valles by water and by lava. Results are put in context with geomorphologic observations to assess the potential for each origin hypothesis.
- 9:30 a.m. Warner N. H. * Sowe M. Gupta S. Dumke A. Goddard K.
[*Connecting Valles Marineris to the Northern Plains: Linkage by Lake Overspill and Catastrophic Flooding*](#) [#1237]
 We demonstrate that linkage of basins east of Valles Marineris occurred by lake spillover and was controlled by the base level of each basin. The data indicate a mechanism for the formation of an extensive regional flow routing system on Mars.
- 9:45 a.m. Kite E. S. *
[*Evidence for Melt-Fed Meandering Rivers in the Gale-Aeolis-Zephyria Region, Mars*](#) [#2778]
 Here I describe watershed-scale topographic relations that suggest the presence of large near-surface ice bodies at the time the Gale-Aeolis-Zephyria rivers were flowing, and evidence that Gale-Aeolis-Zephyria rivers were fed by seasonal melt.
- 10:00 a.m. Lefort A. * Burr D. M. Beyer R. A. Howard A. D.
[*Sinuuous Ridges as Tools to Investigate Post-Flow Modification in the Aeolis-Zephyria Plana, Western Medusae Fossae Formation, Mars*](#) [#1953]
 The longitudinal profiles of inverted fluvial features located in the Medusa Fossae Formation exhibit undulations that we interpret as evidence of post-fluvial deformation of the region. We propose and evaluate possible deformation processes.

- 10:15 a.m. Hopley D. E. J. * Howard A. D. Moore J. M.
[*Geomorphology of Fluvioglacial Features in the Martian Southern Midlatitudes, Northeastern Noachis Terra*](#) [#1344]
We map and analyze a suite of 761 small-scale, post-Noachian channel segments in the martian southern midlatitudes, over an area 320×560 km. Scaling and distribution of the channels is most consistent with formation under a thick ice cover.
- 10:30 a.m. Goudge T. A. * Mustard J. F. Head J. W. III Fassett C. I.
[*Constraints on the History of Open-Basin Lakes on Mars from the Timing of Volcanic Resurfacing*](#) [#1328]
The morphology, physical attributes, and mineral composition of 30 martian open-basin lakes indicates the basins are volcanically resurfaced. Dating of these units suggests the resurfacing likely began shortly after the end of valley network activity.
- 10:45 a.m. Haltigin T. W. * Pollard W. H. Dutilleul P. Osinski G. R.
[*Morphometric Evidence of Co-Evolving Polygonal and Scalloped Terrains in Southwestern Utopia Planitia, Mars*](#) [#2689]
This project provides various quantitative analyses of polygonal and scalloped terrain morphologies in Utopia Planitia, demonstrating that these two landforms interact as they evolve.
- 11:00 a.m. Orloff T. C. * Kreslavsky M. A. Asphaug E. I.
[*Possible Mechanism for Boulder Clustering on Thermal Contraction Polygons*](#) [#1652]
We propose that the CO₂ frost formed in martian winters locks boulders in place during the contraction phase of the seasonal cycle, and then in summer, boulders shift outward with expanding surface material leading to clustering in polygon margins.
- 11:15 a.m. Costard F. * Sejourne A. Kargel J. Soare R.
[*Shallow Melting and Underground Drainage in Utopia Planitia, Mars*](#) [#1822]
Based on the identification of sinuous and elongated pits in Utopia Planitia, we suggest that shallow melting and underground drainage are possible. We test that hypothesis using a thermal model that comprises a thick insulating dusty layer.
- 11:30 a.m. Osinski G. R. * Capitan R. D. Kerrigan M. Barry N. Blain S.
[*Late Amazonian Glaciations in Utopia Planitia, Mars*](#) [#1957]
We present evidence from western Utopia Planitia, including lineated valley fill and lobate debris aprons, for widespread glaciations over a large expanse of the northern plains and dichotomy boundary during Late Amazonian times.