

Thursday, March 4, 2010
POSTER SESSION II: MARS: GULLIES AND SLOPE STREAKS
7:00 p.m. Town Center Exhibit Area

Morgan G. A. Head J. W. III Dickson J. L. Marchant D. R. Levy J. S.

[*Gully Formation on Mars and Earth: The Transition from Glacial Activity to Gully Depositional Phases*](#) [#1044]

We test theories of Mars gully formation by examining gullies found superposed on glacial deposits on Mars and Earth. Many gullies form in environments favoring long-term snow/ice accumulation; stratigraphic relations favor top-down melting during warming climatic periods.

Reiss D. Hauber E. Hiesinger H. Jaumann R. Trauthan F. Preusker F. Zanetti M. Ulrich M. Johnsson A. Johansson L. Olymo M. Carlsson E. Johansson H. A. B. McDaniel S.

[*Terrestrial Gullies on Svalbard as Planetary Analogs for Mars*](#) [#1665]

We compare the morphology of terrestrial gully analogs from Svalbard with martian gullies in order to constrain which formation process might be dominant on Mars, i.e., fluvial and/or debris flow processes.

Johnsson A. Johansson L. Zanetti M. Reiss D. Hauber E. Hiesinger H. Ulrich R. M. Olymo M. Carlsson E. Jaumann R. Trauthan F. Preusker F. Johansson H. A. B. McDaniel S.

[*The Origin of Stripe-like Patterns on Martian Gully Slopes; Using Svalbard Advent Valley as a Mars Analogue*](#) [#2492]

Features on Mars resembling terrestrial stripes have been observed on gully slopes in recent HiRISE images. Stripes on Earth are indicators of freeze and thaw processes. On Mars they could point to niches where soil moisture temporally occurs.

Kincy L. Currit C. Butler D. Fuhrmann S.

[*A Spatial Analysis of Gullies on Mars*](#) [#2743]

The spatial dispersion of gullies is determined to be clustered away from the equator. Evidence is found that indicates gullies are found in areas high in iron and chlorine, low in water, potassium, and silicon. Brine as the likely fluid source for gullies on Mars.

Barbieri L. Dickson J. L. Head J. W. Dyar M. D.

[*Deciphering Late-Amazonian Climate Change on Mars: Evidence for Episodic Gully Activity Preserved in Gully Fan Stratigraphy*](#) [#2745]

HiRISE data have revealed examples of stratigraphy in the fans of martian gullies. We show examples of fan deposits that require multiple episodes of activity. In this way gully fans provide an opportunity to document shifts in the martian climate.

Conway S. J. Balme M. R. Murray J. B. Towner M. C. Okubo C. Grindrod P. M.

[*Geomorphic Analysis of the Formation Processes of Martian Gullies*](#) [#1881]

We present quantitative geomorphic analyses of high resolution digital elevation models of gully systems on Mars. Our methods allowed good discrimination between processes on Earth, and on Mars debris flow is identified as the dominant process.

Conway S. J. Balme M. R. 7:00 p.m. Towner M. C. Murray J. B.

[*Can Water Move Sediment on Present-Day Mars? Insights into Gully Formation from Laboratory Simulations*](#) [#1894]

We describe experiments designed to study sediment transport by liquid water under the current low temperature-pressure on Mars. We find that these flows: are erosive, flow faster and further than on Earth, and produce unique sedimentary features.

Dixon J. C. Howe K. L. Coleman K. A.

[*Periglacial Hillslope Analogs for Martian Gully Formation*](#) [#2392]

This paper examines the appropriateness of periglacial hillslope processes as analogs for the formation of gullies on Mars. Specifically, the suitability of debris flows and slush flows are examined.

Howe K. L. Dixon J. C. Chevrier V. F.

[Effects of Viscosity on the Morphology of Martian Flow Features](#) [#1706]

Although studied for decades, the formation mechanism of slope streaks is still unclear. By altering the viscosity of a fluid, our group has created slope streak features that match many characteristics of Mars slope streaks.

Coleman K. A. Dixon J. Howe K. L. Chevrier V. F.

[Slushflows as Analogs for Martian Gully Formation](#) [#2741]

Simulations performed in our flume with variable water volume supported slushflows as a viable Earth analog for martian gullies based on the water volumes included in the simulations that approximate martian gullies.

Kossacki K. J. Markiewicz W. J.

[Interfacial Liquid Water On Mars: Can It Form Hill Gullies?](#) [#1702]

We model both the diurnal and the seasonal cycle of the interfacial liquid water in the context of a possible mechanism for formation of the so called hill gullies.

Reiss D. Erkeling G. Bauch K. E. Hiesinger H.

[Evidence for Present Day Gully Activity on the Russell Crater Dune Field, Mars](#) [#2152]

Based on the morphology, spectral data and thermal modeling we conclude that the gully changes might be due to transient melting of small amounts of H₂O-ice around LS ~210° triggering small debris flows.

Kereszturi A.

[Gullies, Flow Features and Spider Arms for Climate Reconstruction on Mars — Proposal for Complex Map Generation](#) [#2102]

We review four groups of high latitude features (“classical” gullies, gullies on dunes, small meandering trenches, VLF-flow features) as tools in climate reconstruction for the past million years.

Addison B. C. Chevrier V. F. Dixon J. C. Howe K. L.

[Experimental Simulations of Martian Gullies using MgSO₄ Brine Solution](#) [#1399]

To help us better understand the processes creating martian gullies, we simulated gully morphologies using MgSO₄ brine solutions. We also determined whether sulfates are detectable on the surface and/or subsurface of these gullies.

Grindrod P. M. Warner N. Gupta S.

[Gully Morphology in Hydrated Deposits in Candor Mensa](#) [#1312]

We use a HiRISE DEM to discuss the morphology of gully-like features in Candor Mensa. Our observations fit well with a groundwater model of formation, in which chemical, as well as physical, erosion appears to be significant.

Hart S. D. Gulick V. C. Ishikawa S. T. Barnhart C. J. Parsons R. A.

[Detailed Topographic and Morphometric Analysis of Lyot’s Central Peak Gullies](#) [#2662]

A detailed study of gullies on the central peak of Lyot Crater. Morphometric analysis was done using HiRISE images, MOLA data, and a HiRISE derived DTM. We also estimate gully volume and channel discharge calculations based on channel geometries.

Yakovlev V.

[Slope Streaks on Mars — Gravity-Capillary Displays of Water](#) [#1333]

We proposed the hypothesis about the slope streaks formation on Mars as a result of the mineralized water wave passing along the cavities, formed by the subsurface sublimation of the saline ice, without the lateral energy and substance transferring.