

# Martian Dune Gullies Active in Winter

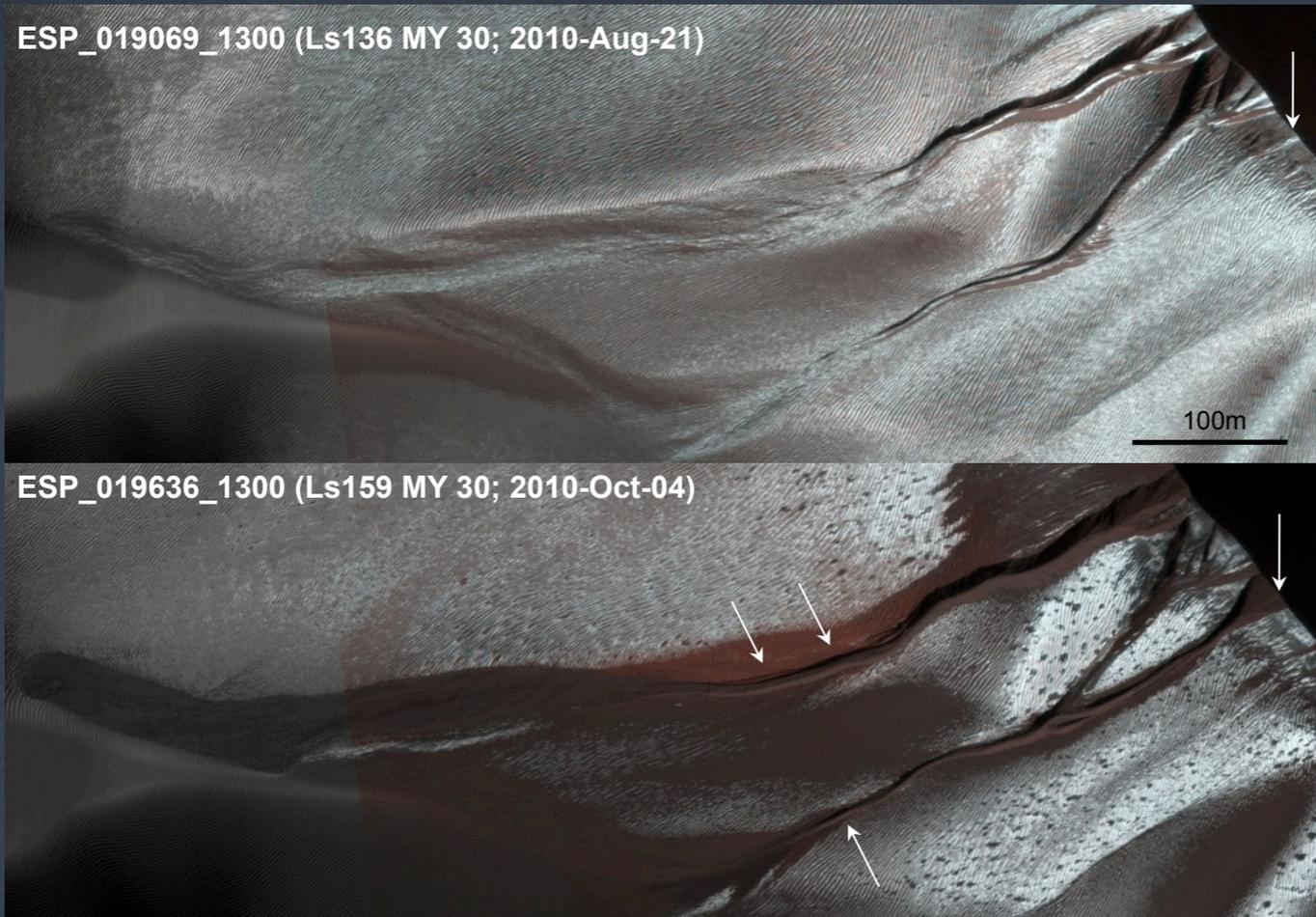


Figure caption: This dune gully is found in Matara Crater (50°S). During the latest Mars southern winter, a new alcove and channel (white arrow) eroded during late winter, sending material downslope through the existing channel and out onto the fan (new deposits are the darker material on the dune surface). In both larger gullies, the existing channel was incised further into the apron (black arrows). Frost coats the dune surface in both images, but defrosting has begun in the bottom one.

Gullies on Mars are of great interest as they appear to be active and resemble landforms that on the Earth are formed by water. Understanding how these features form and evolve, especially during the present-day, will yield important information about the Martian climate and active surface processes.

Observations of gullies on Martian dunes during the last decade show that repetitive activity occurs only during the winter seasons. Alcoves and channels (up to ~5m wide) are created and enlarged, and aprons are extended. Since the activity occurs when it is too cold for liquid water to be found, it is most likely that these dune gullies are formed and reactivated by avalanching CO<sub>2</sub> frost. Observations of changes within Martian gullies on rocky slopes show that these may also be active primarily during winter, and thus may also be evolving due to CO<sub>2</sub> frost and not liquid water.

For more information, see Diniega et al., *Geology*, Nov. 2010; Dundas, et al., *GRL*, Apr. 2010; Hansen et al., *Science*, submitted 2010. For full images, see <http://uahirise.org>.



Figure caption: This dune gully is in the northern hemisphere (70°N). During the latest Mars northern winter, a new alcove (white arrow) eroded during winter, sending material downslope onto the frost (middle image). Once the frost had disappeared, the full apron and channel are visible.