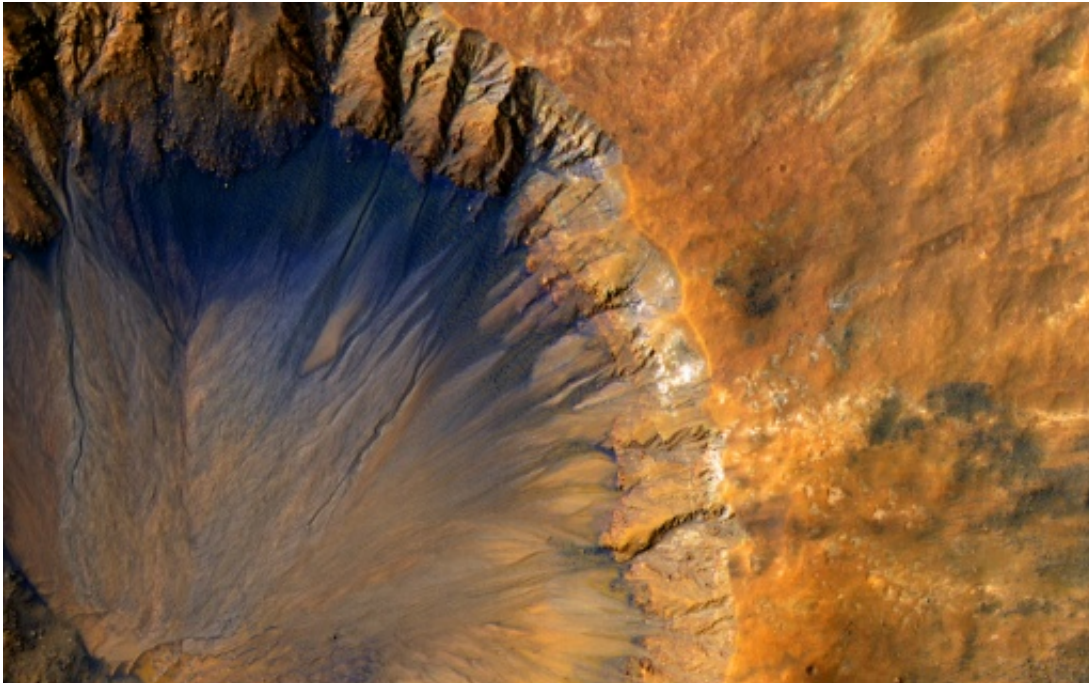


# Mars gullies likely contain 'no water', study says

December 21 2015, by Pascale Mollard-Chenebenoit

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This NASA/JPL/University of Arizona image obtained June 7, 2015 shows a close-up of a "fresh" impact crater in the Sirenum Fossae region of Mars captured by the High Resolution Imaging Science Experiment camera on March 30, 2015

Months after scientists announced "the strongest evidence yet" of liquid water on Mars, a study Monday said there was none at least in the valleys carved into numerous Red Planet slopes.

Rather than water flows like those on Earth, these Martian gullies were likely created by [dry ice](#) defrosting, a duo of French scientists wrote in the journal *Nature Geoscience*.

"The role of [liquid water](#) in gully formation should... be reconsidered, raising the question of the importance of its occurrence in Mars' recent past," wrote Francois Forget and Cedric Pilorget of the French national research institute CNRS.

They said their findings held no implications for the headline-making announcement in September that dark lines running down slopes in the tropics of Mars in summer, may be streaks of super-salty brine—hinting at the presence of life-sustaining water.

Monday's paper dealt with unrelated geological features in a different part of the planet, mainly in the mid-latitude range between 30 and 60 degrees, on pole-facing cold slopes, said the French team.

They had set out to explain the origins of small channels carved into crater walls, hills and other martian protrusions.

When first discovered, these gullies were interpreted as runoff from melting water ice or groundwater leaks that occurred hundreds of thousands of years ago.

Then, in recent years, it was discovered that gully formation was ongoing, in spite of Mars being too cold for liquid water to exist.



Image captured by NASA's Hubble Space Telescope shows a close-up of the Red Planet Mars when it was just 34,648,840 miles away

Pilorget and Forget looked for answers in a thin layer of frozen carbon dioxide (CO<sub>2</sub>) observed to be present in periods that gullies were being formed.

They used computer simulations to show that thawed and trapped CO<sub>2</sub> gas building up beneath the surface ice layer would eventually break

through the soil and trigger flows of gas and debris.

No similar processes are known to occur on Earth.

Pilorget, an astrophysicist, said dry ice melt may not be responsible for all gully formation on Mars, but in cold areas with very young gullies, the gassy theory "must be favoured."

Nothing could be excluded, though, and "other complimentary processes may be at work," he said.

"For example, gullies have been detected in regions closer to the equator which are probably created by different mechanisms," he told AFP.



This NASA image obtained October 9, 2015 shows a view from the "Kimberley" formation on Mars taken by NASA's Curiosity rover

In September, scientists said seasonal streaks on Mars dubbed "recurring slope lineae" may be briny flows.

They found evidence of hydrated salt minerals in the lines, which they said implied liquid water was present, even as others cautioned against reading too much into the results.

"Our study has no link to the announcements made in September," said Forget, a planetologist.

"Our findings show that at least some [gullies](#), maybe all, do not have liquid water and that the areas where they are found are not conducive to hosting liquid water, or life."

It is widely accepted that the Red Planet once had plentiful water in liquid form, and still has some today—albeit frozen in ice underground.

Earlier this year, NASA said almost half of Mars' northern hemisphere had once been an ocean, reaching depths greater than 1.6 kilometres (one mile).

**More information:** *Nature Geoscience*, [DOI: 10.1038/ngeo2619](https://doi.org/10.1038/ngeo2619)

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