

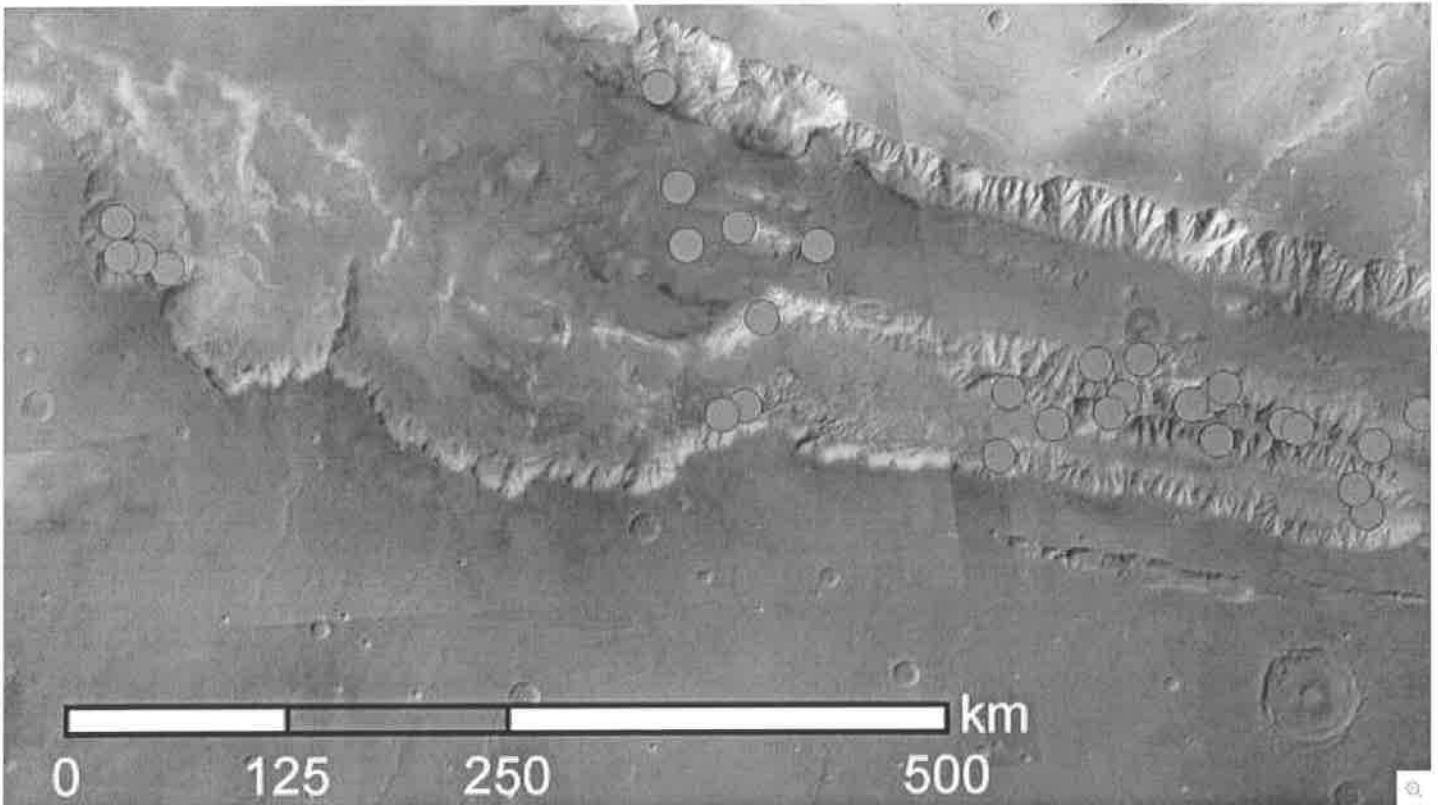
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Dark Streaks on Mars Hold Water - But Not Much

By Jesse Emspak, Space.com Contributor | August 25, 2016 05:26pm ET

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The Valles Marineris canyon network on Mars is home to Recurring Slope Lineae (RSL), or dark streaks that may contain liquid water. RSL are indicated with blue dots.

Credit: NASA/JPL-Caltech/Univ. of Arizona

Dark streaks identified in dozens of locations on the surface of Mars appear to hold water, but not very much, according to an analysis of data from NASA's Mars Odyssey mission.

The dark streaks are called recurring slope lineae (RSL), and last year, scientists presented new evidence suggesting that these streaks contain liquid water — albeit very, very salty water called brine. The new work shows that these RSL cannot contain more water than the driest deserts on Earth, which makes it unlikely that water is streaming down these hillsides.

In an attempt to determine the water content of the RSL, researchers turned to Mars Odyssey's Thermal Emission Imaging System (THEMIS), and looked at the temperature of the planet's surface from orbit. [Flowing Water on Mars: The Discovery in Pictures]]

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"When water is present in the spaces between particles of soil or grains of sand, it affects how quickly a patch of ground heats up during the day and cools off at night," NASA officials said in a statement. The depth to which the water saturates the soil also influences how quickly the surface changes temperature, according to NASA.

The researchers studied the RSL on the walls of craters within the Valles Marineris canyon on Mars. They looked at several years' worth of surface-temperature measurements by THEMIS, to figure out the water concentration in the soil.

The researchers found that the upper limit of the water content was about 3 percent by weight — about the same concentration of water as in the surface material of the Atacama Desert in Chile and the Antarctic Dry Valleys, which are two of the driest places in the world.

The findings presented in 2015 showed evidence of "hydrated salts" (or brines) at the surface where the dark streaks are located.

"Our findings are consistent with the presence of hydrated salts, because you can have hydrated salt without having enough for the water to start filling pore spaces between particles," said Christopher Edwards, a faculty member in the Department of Physics and Astronomy at Northern Arizona University and one of the study's authors. "Salts can become hydrated by pulling water vapor from the atmosphere, with no need for an underground source of the water."

The dark streaks have been identified at dozens of sites on the Martian surface. The dark regions typically appear in the Martian spring and summer, and fade away in the fall and winter.

"Some type of water-related activity at the uphill end still might be a factor in triggering RSL, but the darkness of the ground is not associated with large amounts of water, either liquid or frozen," Edwards said. "Totally dry mechanisms for explaining RSL should not be ruled out."

The findings appear online in the journal *Geophysical Research Letters*.

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