**Description**

The water-related features on Mars suggest that liquid water was once stable on the surface of Mars for fairly long periods of time, and that there was once much more water on the surface than we see today. In order for liquid water to have been stable on the Martian surface, it must have once had a thicker atmosphere. Data also suggests that Mars once had a global magnetic field, similar to Earth’s, before its core cooled. With its weaker gravity and without a global magnetic field like the Earth’s, Mars’ atmosphere is susceptible to erosion from the solar wind.

The *Mars Atmosphere and Volatile EvolutioN*, or MAVEN, mission is orbiting Mars to explore how the Sun has stripped Mars of most of its atmosphere, turning a once possibly habitable planet into a cold and barren desert world.

MAVEN has measured the effects of the Sun’s radiation and particles on Mars’ atmosphere, and the rates at which particles are escaping into space. The findings include:

* The solar wind strips away gas at a rate of about 100 grams (equivalent to roughly 1/4 pound) every second.
* About 80% of Mars’ atmosphere has been lost over its history as particles in the atmosphere are knocked out due to collisions with other particles (a process called “sputtering”).
* The erosion of Mars’ atmosphere increases by a factor of 10 or more during solar storms.

Overall, the mission has determined that the erosion of Mars’ atmosphere was great enough to account for a significant change in Mars’ climate.

**Notable Features**

* Early in the history of the solar system, Mars had liquid water on the surface and likely had a global magnetic field, a thicker atmosphere, and auroras similar to those on Earth.
* Without a global magnetic field, Mars has now lost most of its atmosphere and cooled.
* The MAVEN mission is examining how Mars is losing its atmosphere to space.

**Credits**

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