Moon Shadow

KELLY HERTZ/P&D

Sunday night's "super moon" eclipse (which was also a harvest moon, at least by some definitions) provided a celestial spectacle for people across the region. While there were occasional thin wisps of clouds, the skies were mostly clear to give earthlings a nice view of the grand event. If you didn't catch the event, you face of a bit of a wait: The next "super moon" eclipse won't occur until 2033.

NASA Says Mars Appears To Have Flowing Water

BY MARCIA DUNN
AP Aerospace Writer

CAPE CANAVERAL, Fla. — Mars appears to have flowing rivulets of water, at least in the summer, scientists reported Monday in a finding that boosts the odds of life on the red planet.

"Mars is not the dry, arid planet that we thought of in the past," said Jim Green, director of planetary science for NASA.

Scientists in 2008 confirmed the existence of frozen water on Mars. Now instruments aboard NASA's Mars Reconnaissance Orbiter have yielded what researchers said is the strongest evidence yet that water in liquid form trickles down certain Martian slopes.

And because liquid water is essential to life, the finding could have major implications for the possibility of microscopic life forms on Earth's next-door neighbor.

"It suggests that it would be possible for there to be life today on Mars," NASA's science mission chief, John Grunsfeld, said at a Washington news conference.

The rivulets — if that's what they are, since the evidence for their existence is indirect — are about 12 to 15 feet wide and 300 feet or more long, scientists said. They apparently consist of wet soil, not standing water.

The water is believed to contain certain salts — not ordinary table salt, but magnesium perchlorate, magnesium chlorate and sodium perchlorate. Like road salt used to melt ice and snow on Earth, such compounds can prevent water from freezing at extremely low temperatures.

That would explain how water could exist in liquid form on Mars, which has an average temperature of minus 81 degrees Fahrenheit.

In addition to supporting life, the presence of liquid water could make things easier for astronauts visiting or living on Mars. Water could be used for drinking and for creating oxygen and rocket fuel. NASA's goal is to send humans there in the 2030s.

Michael Meyer, lead scientist for NASA's Mars exploration program, said the only definitive way for now to determine whether there's life on Mars is to collect rocks and soil for analysis on Earth, something a U.S. lander set for liftoff in 2020 will do.

"Water is one of the most precious resources necessary for a human mission to the red planet," Rep. Lamar Smith, R-Texas, chairman of the House science, space and technology committee, said in a statement. "The more evidence we find of it, the more encouraged I am for future Mars missions."

Alfred McEwen of the University of Arizona at Tucson, a scientist on the project, said he, for one, believes the possibility of life on Mars to be "very high."

The source of the briny water is a mystery. Scientists said it could be melting ice, an underground aquifer, water vapor from the thin Martian atmosphere, or some combination.

The evidence of flowing water consists largely of dark, narrow streaks on the surface that tend to appear and grow during the warmest Martian months and fade the rest of the year. The streaks are in places where the temperature is as low as 10 below zero.

They were spotted by the Mars orbiter's high-resolution, telescopic camera, and another on-board instrument detected the chemical signature of salt compounds combined with water.

McEwen said that there appears to be a "significant volume" of water, speculating it could fill many Olympic swimming pools, but that it is spread thin.

Present-day Mars is nothing like ancient Mars. Three billion years ago, our most Earthlike neighbor had a huge ocean, but something radical happened, and exactly what remains a mystery.

Harvest

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Todey said. "On the Nebraska side, there were several 5-inch reports and a (7.71)-inch report near Coleridge," he said.

The Nebraska Rainfall Assessment and Information Network (RAIN) reported numerous areas of significant rainfall, particularly in Knox and Cedar counties of northeast Nebraska.

Coleridge reported not only the 7.71 inches but another site with 4.55 inches. Other areas with heavy rainfall included Fordyce with around 5 inches, Crofton with around 4 inches, Randolph with around 3.4 inches, Bloomfield with around 3 inches, Plainview with 2.8 inches, St. Helena with 2.34 inches and Hartington with 2 inches.

The heavy precipitation raised some concerns about slowing down the harvest, said Cedar County (Neb.) Extension educator Jim Jansen.

"Harvest for high-moisture corn and some soybeans have started, but (farmers) have been delayed due to the varying degrees of rain," he told the *Press & Dakotan.*

On the other hand, the downpours were followed by heat, Todey said. Last weekend brought temperatures in the 80s and even 90 degrees in one location.

"The heavy precipitation amounts will slow down harvest, though the recent dry period before will have helped," he said. "We are just starting to kick in to harvest season. The delay shouldn't be a large issue because most crops have progressed pretty well to this point. Crops seem to be progressing well and starting to dry down fine. Wet fields would be the only problem in the very wet areas."

RECORD HARVEST?

The U.S. Department of Agriculture (USDA) was already forecasting possible records for corn and soybeans, according to USDA meteorologist Brad Rippey.

Rippey, along with Extension climate field specialist Laura Edwards of South Dakota State University, spoke with reporters earlier this month on a national conference call.

"Seven north-central states, including South Dakota and Nebraska, could expect record corn yields in 2015," Rippey said. "We could also see record high soybean production in Nebraska and South Dakota."

Even if this year doesn't produce records, it should rank among some of the all-time best years for the two states, Rippey said.

The weather will determine a great deal down the home stretch, Rippey said.

"If we continue with the favorable climate for the next month or so, there will be some pretty good yields coming out of those two states," he said.

The record-setting conditions aren't limited to South Dakota and Nebraska, as they are found across the northern tier of states, Rippey said.

"On a very broad scale, it's mostly a good year for corn, especially when you look at the northern part of the Corn Belt," he said. "In 14 states, you see the absolutely optimum conditions. In states like Minnesota, you have 88 percent (of the corn crop) good to excellent. Iowa is looking good, and so are other Upper Midwest states."

Soybeans are also performing well, Rippey said

"The soybeans are maturing quickly. That's making the threat of frost less significant. There is no frost in sight for the next several days," he said. "We should get through the season without too much of a scratch of lower temperatures."

In addition, the Missouri River reservoir storage and stream flow are looking good with no major concerns for water supplies, Rippey said.

WHAT ABOUT EL NINO?

Looking ahead, climatologists are watching the impact of the El Nino weather pattern moving out of the Pacific Ocean, Todey said.

"El Nino is still on track to be very strong this winter. We are likely to be warmer than average for the main part of the winter," he said. "In (the Yankton) area, I'm a little less confident on what will happen with precipitation. There are signals that far southeast South Dakota into Nebraska and Iowa can be wetter during part of the winter. Farther north and west in South Dakota, the more likely to be drier, I would say."

The Climate Prediction Center is looking at a greater than 90 percent chance of El Nino continuing until March and then weakening, Edwards said.

"There is a high certainty that El Nino will hang with us until spring," she said. "El Nino will continue this grip and stay pretty strong."

The 90-day outlook calls for an increased likelihood of warmer temperatures across the region, Edwards said. The precipitation outlook calls for equal chances of below-, above- and normal precipitation.

The long-range forecast, while less confident, predicts warmer-than-average temperatures and below-average precipitation, Edwards said. Livestock producers may be looking at an open winter, she added.

The following are the significant rainfall totals recorded for last week by the Nebraska Rainfall Assessment and Information Network (RAIN):

- Coleridge, 5.4 miles northeast, 7.71 inches;
- Fordyce, 3.6 miles westsouthwest, 5.11 inches;
- Coleridge, 3.5 miles west, 4.55 inches;
- Crofton, 4.4 miles westnorthwest, 4.26 inches;
- Crofton, 0.7 miles northnorthwest, 3.64 inches;
- Randolph, 0.4 miles southsouthwest, 3.41 inches;
- Bloomfield, 0.1 miles eastnortheast, 3.05 inches;
- Plainview, 6.2 miles southsoutheast, 2.82 inches;
- Ainsworth, 18.7 miles southwest, 2.63 inches;
- St. Helena, 4.1 miles southwest, 2.34 inches;
- Pierce, 9.1 miles west, 2.28 inches;
- Pierce, 6.2 miles westsouthwest, 2.07 inches;
- Hartington, 5.9 miles eastnortheast, 2.0 inches;
- Hartington, 7.4 miles north, 1.48 inches;
- Crofton, 6.2 miles northnortheast, 1.47 inches;
- Randolph, 1.4 miles northnorthwest, 1.40 inches.

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