# Scientists publish case study on growing food in space

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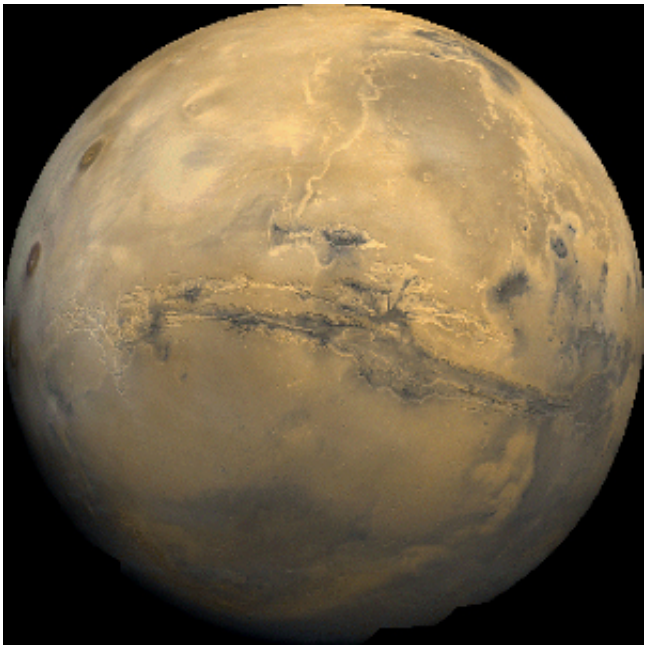

Valles Marineris, Mars. Credit: NASA

Scientists at Washington State University and the University of Idaho are helping students figure out how to farm on Mars, much like astronaut Mark Watney, played by Matt Damon, attempts in the critically acclaimed movie "The Martian."

Washington State University physicist Michael Allen and University of Idaho food scientist Helen Joyner teamed up to explore the challenge. Their five-page study guide was published online at the National Center

for Case Study Teaching in Science the day the movie premiered earlier this month, said Allen.

"Congratulations! You are leaving Earth forever," the case study begins. "You are selected to be part of a mining colony of 100 people located on the planet Mars. Before you head to Mars, however, you need to figure out how to feed yourself and your colleagues once you are there."

The task is similar to that of Watney, who has to grow food in an artificial habitat after he is separated from his mission crew in a Martian windstorm. "Mars will come to fear my botany powers," he boasts.

The film has been praised for its scientific accuracy, with the exception of the storm's unlikely intensity. It led the box office for the first two weekends of the month and has so far grossed more than $143 million, according to Box Office Mojo.

Allen and Joyner have students identify potential challenges producing crops indefinitely and develop criteria for selecting crops. Students then use a scoring system to select three optimal foods.

In some 30 trial runs with students and teachers, "no people have ever gotten the same answer," said Allen, a senior instructor of physics and astronomy and director of the WSU Planetarium.

One particular challenge is scientists have little idea of what Martian soil is actually like, he said. Probes have detected little carbon, the central element to life as we know it, and nitrogen, which is needed to make protein. Water is also likely to react with peroxides in the soil, bubbling off as gas.

Like real astronauts, the tabletop astronauts are limited in what they can bring, so they won't have a lot of tools to farm with.

"You are starting with nothing," said Joyner, an assistant professor in the School of Food Science, which is jointly administered by WSU and UI.

Would-be Martians must also wrestle with the mental challenge of some very limited fare.

"If I had to eat a single food for the rest of my life, could I do it?" Joyner asked.

But in a sense, farming and dining on the Red Planet is beside the point, Allen said.

"I'm not teaching about growing food on Mars," Allen said. "I'm teaching about living with choices. I'm teaching about problem solving."

Allen and Joyner's case study is one of more than 500 at the National Science Foundation-funded center, which is operated by the University at Buffalo. All cases undergo a rigorous process of peer review by outside reviewers and author revision.

**More information:** "Farming In Space? Developing a Sustainable Food Supply on Mars" can be found at sciencecases.lib.buffalo.edu/c … p?case_id=800&id=800 . Teaching notes and the answer key are password protected and require a paid subscription to access.

Provided by Washington State University