

# Satellite images detect underwater volcanic eruptions

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Degassing lava erupts onto the seafloor at NW Rota-1 volcano, creating a billowing cloudy plume that is extremely acidic, and is full of carbon dioxide and sulfur. Credit: Woods Hole Oceanographic Institution

(Phys.org) —Oregon State University scientists have discovered how to pinpoint the time and place of underwater volcanic eruptions using satellite images.

Volcanic eruptions on the [ocean floor](#) can spew large amounts of pumice and [fine particles](#), as well as [hot water](#) that brings nutrients to the surface, resulting in plumes of algae. The plumes are picked up as shades of green in [satellite images](#).

"Some volcanic eruptions take place hundreds of feet below water and show no changes to the sea surface to the naked eye," said Robert O'Malley, an OSU research assistant in botany and plant pathology in OSU's College of Agricultural Sciences. "It's amazing an orbiting satellite can detect color changes that indicate an eruption has taken place. Many times you can't spot an eruption if you were floating over it in a boat."

Underwater volcanic eruptions are rarely detected, so little is known about them, according to Mike Behrenfeld, an OSU expert in [marine algae](#) and one of the researchers on the project.

"Satellite measurements of the planet are made every day," Behrenfeld said, "so this new method provides another tool for spotting these dramatic events that affect life in the oceans."

O'Malley and Behrenfeld developed a process for analyzing low-resolution images to show evidence of eruptions, which can extend over thousands of square miles, by matching five known eruptions with data from NASA satellites.

"We measured sunlight going into the ocean interacting with particles consistent with underwater [volcanic eruptions](#)," said O'Malley. "From there, we found we could connect color data with documented eruptions. Now we have a better idea of what to look for in the data when we don't know about the eruption first."

Next, the researchers plan to test how well their method works as

eruptions are happening. Further study will also focus on the depth at which eruptions can be detected.

The study was published in the journal *Remote Sensing of the Environment*.

**More information:** Read the study here:  
[ir.library.oregonstate.edu/xmlui/handle/1957/45229](http://ir.library.oregonstate.edu/xmlui/handle/1957/45229)

Provided by Oregon State University

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