**Effects of gophers on volcanic plains revealed**

By Patience Munro Davies

**Image:** MSH82\_st\_helens\_plume\_from\_harrys\_ridge\_05-19-82.jpg

**Caption:** The Mount St Helen’s volcano. Credit: Wikimedia Commons / Lyn Topinka.

The 1980 Mount St Helens eruption in the USA led to a surprising discovery. The eruption killed 57 people and destroyed 350 km2 of forest. In an effort to restore the ecosystem of the plains, in 1983, scientists captured 2 wild gophers, placing each into a small, fenced off area on the volcanic plain. The gophers dug for twenty-four hours before the scientists removed them. A new study published in 2024 shows the long-lasting effects the gophers had on the ecosystem.

The study, which was [published](https://www.frontiersin.org/journals/microbiomes/articles/10.3389/frmbi.2024.1399416/full) in *Frontiers in Microbiomes,* found that there are key differences in the fungi and other microbes in the old gopher enclosure.

**Hero Image: gopher.webp**

**Caption: A pocket gopher lives underground most of the time. Credit: Alan Schmierer**

Study co-author, Professor Michael Allen, a microbiologist at the University of California-Riverside, USA, says, “Who could have predicted you could toss a gopher in for a day and see a residual effect 40 years later? In the 1980s, we were just testing the short-term reaction.” Michael worked on both the 1983 and the 2024 studies.

In the 1980s, the team had theorised that gophers might help the soil recover after it was choked by ash and lava. The gophers would do this by digging through the top layer of ash, bringing helpful microbes to the surface.

The 1980s study was successful, and after six years, the team found that the sites that had gophers were covered in plants, while neighbouring land was still thoroughly volcano-scorched.

According to Michael, “A big reason for this was the gophers’ ability to return mycorrhizal fungi to the surface.” This helped the soil and microbes, because, “with the exception of a few weeds, there is no way most plant roots are efficient enough to get all the nutrients and water they need by themselves,” says Michael. The fungi transport these things to the plant and get carbon they need for their own growth in exchange.”

The team returned in 2014 and sampled soil communities from the gopher sites, and neighbouring land. There were clear differences in the microbial diversity from the sites with gophers and the sites without.

**Image:** Gopher\_by\_fence.jpeg

**Caption:** A gopher and plant near the gopher enclosure fence in 1982. Credit: Michael Allen/UCR.

The team also found a noticeable difference in recovery between areas that were old-growth forests and areas that had been clearcut prior to the volcanic eruption. The scientists found that the old-growth forests recovered faster and more strongly than the clearcut areas.

“These trees have their own mycorrhizal fungi that picked up nutrients from the dropped needles and helped fuel rapid tree regrowth,” says co-author, Associate Professor Emma Aronson, a microbiologist at the University of California, Riverside. She adds, “The trees came back almost immediately in some places. It didn’t all die like everyone thought.”

**Image:** Mount St Helens 2012 copy.jpeg

**Caption:** Plants thriving in the once barren area scarred by the volcanic eruption, photo taken in 2012, which is 32 years after the eruption. Credit: Michael Allen/UCR.

The soil fungi and the trees that need it did not do well in the clearcut areas. “There still isn’t much of anything growing in the clearcut area,” says Erin. “It was shocking looking at the old growth forest soil and comparing it to the dead area.”

*Patience Munro Davies is an outstanding participant in Double Helix’s Young STEM Journalism Bootcamp. This year, Double Helix partnered with Letterly to launch the inaugural 4-week program, inviting students aged 8 to 18 to write science news articles on the topics that matter to them! This article went through multiple rounds of editing with 1-to-1 feedback from Letterly's highly qualified and passionate writing coaches. Double Helix editors provided a final edit for accuracy and style.*