Scientists ready to analyze Yellowstone Park quake data

Written by CJ Baker
Thursday, 08 January 2009

No signs of coming eruption, geologist says

Between Dec. 27 and Jan. 2, more than 500 small earthquakes shook Yellowstone National Park. The swarm of quakes was centered below Yellowstone Lake, beginning southeast of Stevenson Island and migrating north toward Fishing Bridge before quieting.

“It looks as though the swarm has ended, although further activity is possible,” said Yellowstone geologist Hank Heasler on Monday.

Despite rampant online speculation that the rumblings signaled the start of super-volcanic end times, the scientist said he’s more intrigued than worried about the swarm.

“We don’t, at this time, feel there’s any imminent threat,” said Heasler, a member of the Yellowstone Volcano Observatory.

The observatory is a partnership between the U.S. Geological Survey, Yellowstone National Park, and the University of Utah. It monitors the giant volcanic caldera under the Park for the sake of scientific knowledge and public safety.

As of Tuesday, some 300 of the 500 earthquakes recorded by seismological equipment had been reviewed by Volcano Observatory scientists. Eighty-six of the shakes registered above a 2.0 on the Richter Scale, while 16 were recorded above a magnitude 3.0. Heasler said the quakes greater than 3 were generally felt by Park employees and visitors in the immediate area. The highest quake, a 3.9, was felt at Old Faithful and Grant Village, Heasler said.

No damage was reported, though Park employees planned to inspect its structures near the north end of Yellowstone Lake. It generally takes a 5 or greater to cause damage, said a release from the observatory.

The recent swarm may yield some of the most useful data to date. New monitoring equipment was installed this past summer and fall at the Park, and it got “extensive use” over the past week or so.

Heasler said he’s looking forward to the scientific discussion about what exactly drove the event.

“It’s going to be a multiple-month and year project to look at these data,” he said.

A pending as-seen-on-TV super-volcanic eruption does not appear to be the cause.

“Currently, there’s no indication that there’s any volcanic activity causing this swarm,” said Heasler.

A release from the Observatory said earthquakes in Yellowstone are spawned by a combination of geological factors, including stress along normal fault lines, magma movements miles below the surface and hydrothermal activity.

While the recent swarm may not be troubling, it is atypical.

“Yes, Yellowstone’s pulse is a little elevated,” Heasler said. But he added that the swarm is “not unprecedented in the last 40 years of monitoring.”

Since the 1980s, there have been 70 to 80 swarms, Heasler said.

In 1985, more than 3,000 earthquakes shook the Park over a three-month period. The highest was a magnitude 4.9.

Part of the reason the Park is so closely monitored is because of its ancient super-volcanic history. Scientists believe that three times in the past — 2.1 million years ago, 1.3 million years ago, and 640,000 years ago — Yellowstone erupted in cataclysmic fashion. Combined, they blew out enough ash and lava to fill the Grand Canyon.

A massive eruption today would likely bury a large chunk of the United States in ash — killing an untold number of people and wreaking havoc with global climate.

“Fortunately,” says the observatory on its Web site, “The chances of this sort of eruption at Yellowstone are exceedingly small in the next few thousands of years.”

It is frequently said that Yellowstone is “overdue” for a massive eruption, as it blows “every 600,000 years,” but Heasler said that’s inaccurate.

If you take a rough average of the three super-eruptions, you come up with 730,000-year intervals.

“How in the heck do you get 600,000?” Heasler asks. “They get an F for arithmetic.”

With such a small sample size, it’s awfully speculative to use history to predict the next big event, he said.

“Scientifically, we do not know if there will ever be another catastrophic eruption,” said Heasler.

Smaller lava flows — like the one that formed the Pitchstone Plateau in the Park’s southwest corner 70,000 years ago — are far more likely.

“Will there be additional eruptions in Yellowstone? Yes,” Heasler said.

Some 80 lesser flows have occurred since the last mega-eruption. Observatory representatives estimate that, today, one of those more minor events might disrupt the Park’s activities, but likely would threaten few lives.