

A sleeping giant stirs, but what's next?

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Like a just-awakened giant with a rumbling stomach, Mount Iliamna demands attention.

Frequent earthquakes have rattled within the snowy dome of the 10,000-foot volcano in the past few weeks, making scientists at the Alaska Volcano Observatory take a closer look at the mountain, which sits 75 miles across Cook Inlet from the town of Kenai.

Seismologist Steve McNutt from the University of Alaska Fairbanks and graduate student John Benoit recently detailed the habits of volcanoes that erupted from 1979 to 1989. They found the sleeping giants often go through the same rituals before waking with a bang to spew ash, hot gases, and molten rock.

Step 1: High-frequency earthquakes increase within a volcano during the earliest stages of activity. This swarm of

earthquakes is caused as molten rock, known as magma, forces itself upward.

Step 2: As the volcano progresses toward eruption, different kinds of earthquakes shake the volcano. These low-frequency earthquakes, which vibrate slower than the first type, happen when molten rock invades spaces between rocks and form magma-filled cavities. These chambers slowly resonate in response to underground impulses, much like a bell rings when struck by a clapper.

Step 3: The number of earthquakes often decreases after seismometers scratch out the slew of low-frequency earthquakes, but scientists do not relax. Volcanoes typically quiet down right before they erupt.

Step 4: After a volcano seems to snooze, the buildup of gases and the reaction of hot magma with cold ground water often cause volcanic tremor, slight earthquakes that signal eruption can happen at any time.

Step 5: The pattern completes itself when the magma spews forth from a volcano, often quite explosively, and gases and ash are belched from the vent.

In late August, an average of 10 high-frequency earthquakes shook Mount Iliamna each day.

This first step to eruption, a swarm of high-frequency earthquakes, can last an undefined amount of time. When Alaska's Mount Spurr erupted in 1992, high-frequency earthquakes shook the mountain for 10 months before it blew. Other volcanoes have completed the entire sequence from high-frequency swarm to eruption in less than a day.

Although Mount Iliamna has taken the first step to eruption, it may calm down and remain quiet for another 100 years. It is just as likely to explode in clouds of ash and spit up molten rock in a few weeks or months. Such is the mystery that makes the science of predicting volcanic eruptions a constant challenge.