

What's Going on at Mount Spurr?

Mount Spurr Volcano, about 80 miles west of Anchorage across the Cook Inlet, has grown restless in recent months. Scientists at the Alaska Volcano Observatory (AVO) first noticed the unrest in early July when hundreds of small earthquakes occurred 3 to 4 miles beneath Spurr's summit. Aerial reconnaissance in mid-July and early August documented recent small flows of mud and rock and a recently formed "ice cauldron" in the summit ice cap. The ice cauldron is a collapse feature possibly caused by an increase in heat coming from deep beneath the summit. Using sensitive instruments, scientists flying around the volcano on August 7 detected small amounts of the volcanic gases in a plume from the summit.

Taken together, the observations indicate that new molten rock (magma) has intruded deep beneath Mount Spurr. In response, AVO raised the level-of-concern color code to YELLOW. Eruptions, however, do not always follow such activity. Most times the magma never reaches the surface but instead harmlessly cools miles beneath the ground. At this time, it is impossible to forecast whether the current activity will culminate in an eruption or slowly diminish.

Though current activity is centered beneath the summit, Crater Peak, a flank vent on Mount Spurr two miles south of the summit, was the site of a 1953 eruption and the three 1992 eruptions that deposited several millimeters of ash on Anchorage and other communities in Alaska. Crater Peak has been the source of all known eruptions from Mount Spurr for the last few thousand years.

AVO monitors unrest at Mount Spurr using a network of seismic instruments, satellite observations, periodic overflights, and ground observations. In response to recent events, AVO installed five new radio-telemetered seismic stations at the volcano that will permit more precise location of earthquakes and better recording of volcanic tremor, and three radio-telemetered GPS stations to detect swelling of the volcano as magma moves towards the surface in the days and weeks preceding any eruption. In addition to new monitoring instruments, periodic overflights will enable scientists to look for surface changes at the summit and Crater Peak and changes in gases escaping from the volcano. Several teams of AVO geologists have already visited Mount Spurr to assess current conditions and to examine past deposits for clues about what might happen in the future.

An eruption of Mount Spurr, if it occurs, will likely be preceded by further changes in activity. Earthquakes will likely increase both in number of events and size. As magma moves from beneath the volcano toward the surface, it will break surrounding rock and thereby trigger earthquakes along its path. Emissions of volcanic gases are likely to both increase in volume and change in content before an eruption begins. When magma rises into a volcano, it causes the earth's crust to swell in response. This swelling is usually, but not always, very small, and is only detected with very sensitive GPS instruments. New instrumentation will monitor these changes.

By combining observations of earthquakes, volcanic gas emissions, ground swelling, and on-the-ground geologic investigations, AVO scientists can better understand what is going on at this restless volcano. From these observations, scientists can formulate an accurate forecast of the possibility of an eruption that could spread ash on Southcentral Alaskan communities and disrupt aviation and airport operation.

AVO's mission is to inform the public when the volcanoes are about to erupt, but it cannot prevent them from erupting. On average, a Cook Inlet volcano erupts every 8 years spreading ash on the surrounding communities. Even if current activity does not lead to an eruption, residents need to be prepared to deal with the eventuality of volcanic ash falling on their community. Instructions on how to prepare for ashfall can be found on USGS (<http://volcanoes.usgs.gov/ash/>) and the Alaska Division of Homeland Security and Emergency Management (<http://www.ak-prepared.com/plans/mitigation/volcano.htm>) web sites.

The Alaska Volcano Observatory is a cooperative program of the U.S. Geological Survey, the University of Alaska Fairbanks Geophysical Institute, and the Alaska Division of Geological and Geophysical Surveys.