

# How are volcanic eruptions monitored? – I

A famous military quote suggests that the best way to defeat an enemy is to know the enemy. By understanding how natural disasters occur, we can attempt to manage the dangers they bring. Volcanologists study volcanic eruptions so they can predict when they might occur again. This knowledge could be vital for saving the lives of the people who live close to their fertile slopes, giving officials time to put communities on alert and engage action plans for everyone's safe evacuation.

After an eruption, the areas affected by volcanic deposits such as ash and rock are mapped and recorded. This tells scientists how extensive the volcano's damaging coverage is, and so how far from the volcano protective measures need to be taken in case of a future eruption.

In the event of another eruption, an alert system can be used to inform communities of its progress and the expected dangers. If necessary, the people living within areas affected by volcanic deposits can be evacuated.

Scientists are also attempting to recognise the warning signs of an upcoming volcanic eruption. If an active volcano is in a highly-populated area, they will monitor and record the volcano's activity. Any changes to the norm may indicate that an eruption could soon occur.

One warning sign is an increase in the area of the gas sulfur dioxide. A strong-smelling gas, increases in its release can be detected by a machine called a spectrometer.

Another sign is an increase in seismic activity in the area. As magma collects in chambers before an eruption, it creates changes within the volcano. This can cause

small but measurable volcanic tremors, which can be detected and measured on a seismometer. People living within range of a volcano will be familiar with volcanic tremors as they often cause buildings to shake. The signal of a volcanic tremor has been used to predict the eruption of some volcanoes where monitoring is in place; for example: Mt Redoubt in 1989 and Popocatepetl in 2000.

The magma can also cause the slopes of a volcano to bulge. This swelling can be detected with a tiltmeter and a geodimeter.

Even though scientists might be able to predict an eruption, they can not say exactly when it will occur. Volcanoes are unpredictable. Sometimes the magma in a chamber may not erupt; it may just cool below the surface. At other times just before an eruption, the volume of sulfur dioxide gas released may decrease. In such cases, scientists believe the magma seals the passage ways through which the gas usually escapes. This causes a build up of gas pressure and increases the chance of an explosive eruption.

By monitoring volcanoes, scientists are learning more about 'the enemy', but it is not possible to monitor every single active volcano. It would be very expensive as there are far too many volcanoes. Many people choose to live close to volcanoes because the land around them is rich in mineral deposits and good for farming. For some people, the risk of danger is the price they pay.

