



Learn Volcanic Warning System!

Volcanic Warnings are issued by Japan Meteorological Agency. There are five Volcanic Alert Levels based on the target area and action to be taken. These are described using action summary keywords.

Forecast

Warning

Emergency Warning

Level 1 Potential for increased activity

- Watch out for volcanic gas. Some volcanoes gas all the time.
- Watch out for unusual activity. If you notice any unusual activity.

Level 2 Restriction on proximity to the crater

Level 3 Restriction on proximity to the volcano

- If you're near the mountain or crater.
- If you hear a warning while you're on the mountain, immediately.
- Don't go near the mountain, even if you're curious.

Level 4 Evacuation of the elderly, etc.

Level 5 Evacuation

- Get away from your home.
- Follow instruction from police station, fire station and village, town, or city office.

Level 3 Shockwave from eruption

When a volcano erupts, the air around it vibrates, causing a shock wave. Stay away from windows, which can break and cause injury if the shock wave is strong enough.

Level 4

Volcanic tremors

Volcanic tremors are the tremors which are caused when magma and volcanic gases dissolved in magma come to the surface. These tremors are also caused when magma heats groundwater and when magma moves underground.

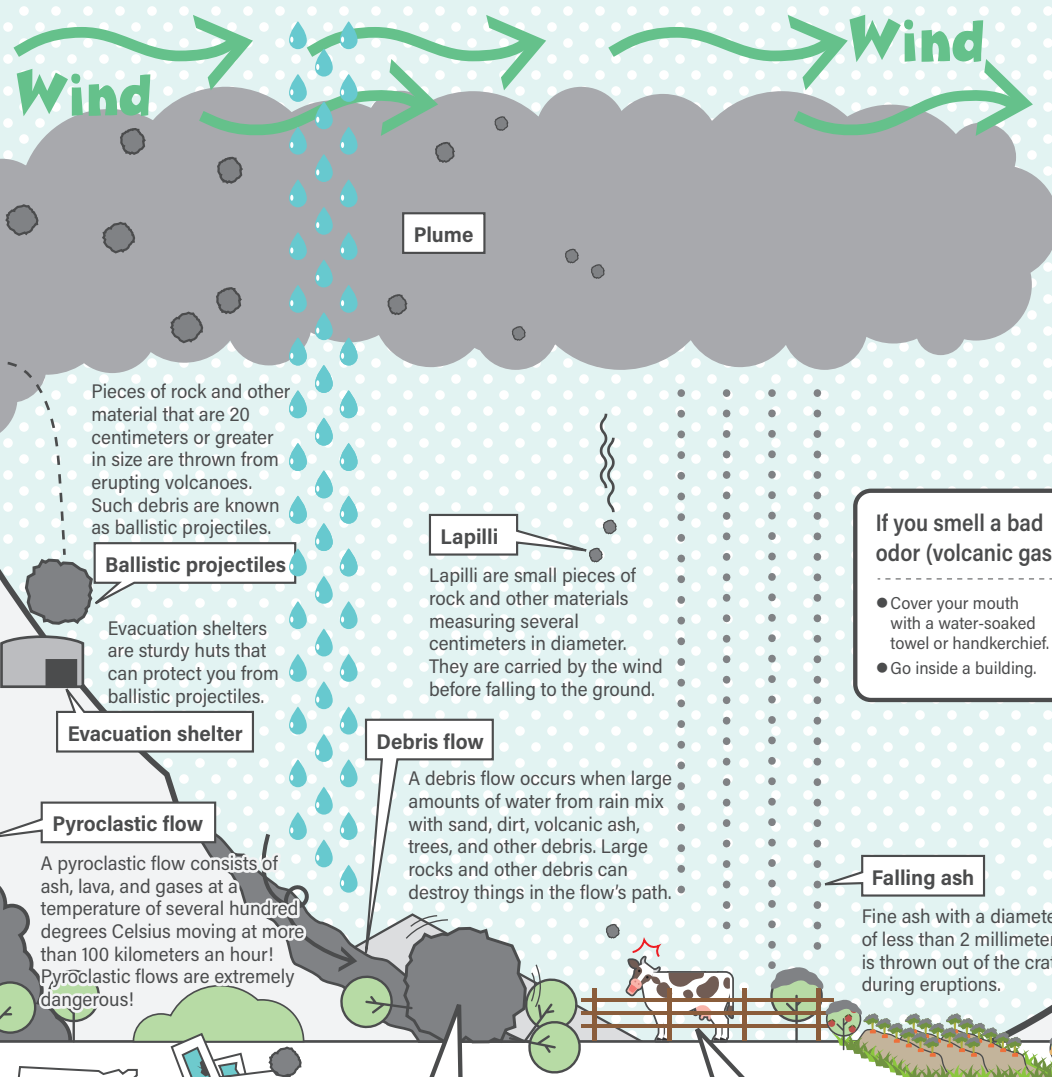
Isolated-type volcanic tremors

Short-period volcanic tremors with a duration of several seconds are observed at Aso volcano and called isolated-type volcanic tremors.



Learn how volcanoes can cause damage!

Various kinds of phenomena cause damages with volcanic eruptions.



Volcanic lightning

Volcanic lightning can occur in the plume during an eruption.

Level 1

Pieces of rock and other material that are 20 centimeters or greater in size are thrown from erupting volcanoes. Such debris are known as ballistic projectiles.

Ballistic projectiles

Evacuation shelters are sturdy huts that can protect you from ballistic projectiles.

Evacuation shelter

Pyroclastic flow

A pyroclastic flow consists of ash, lava, and gases at a temperature of several hundred degrees Celsius moving at more than 100 kilometers an hour! Pyroclastic flows are extremely dangerous!

Lapilli

Lapilli are small pieces of rock and other materials measuring several centimeters in diameter. They are carried by the wind before falling to the ground.

Debris flow

A debris flow occurs when large amounts of water from rain mix with sand, dirt, volcanic ash, trees, and other debris. Large rocks and other debris can destroy things in the flow's path.

Falling ash

Fine ash with a diameter of less than 2 millimeters is thrown out of the crater during eruptions.

If you see a debris flow

- Immediately move to the second or higher floor of a strong building.
- Run away from the flow, moving at a right angle from it!

If you see small pieces of rock (lapilli) falling from the sky

- Take shelter in a sturdy building.
- Protect your head using whatever you can find around you.

Understand volcanoes!

I get volcanoes!

Learn the volcanic alert levels and volcanic activity.

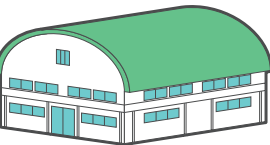
By knowing the current state of the volcano correctly, you can have fun and safe sightseeing and travel.

Kumamoto Local Meteorological Office

2-10-1 Kasuga, Nishi-ku, Kumamoto 860-0047
Phone: 096-352-7740 (receptionist)



Level 5





Learn about volcanic observations!

Various kinds of observation equipment are installed around a volcano. These devices continuously send data to meteorological observatories so we evaluate volcanic activity from a distance.

Near volcanic crater

Crater rim

The height of the plume is measured from here.

This area is hotter than the surrounding area due to the effects of heat coming from underground.



In the case of Mt. Aso, water including groundwater flows into the crater, creating a green-colored pool of water at about 50° to 60°C.

Visible cameras

Visible and infrared cameras provide 24-hour monitoring of plume color, height, and direction while watching for ballistic projectiles and debris flows. Sometimes satellites are used to measure plume height.

Thermal cameras

Infrared imaging devices observe the volcano's surface temperature.

Seismometers

Scientists use seismometers to investigate the location, size, and depth of earthquakes. These devices tell us when magma's moving, too.

Low-frequency microphones

These microphones can tell whether an eruption is occurring based on vibrations in the air, even when the weather's bad.

Microphone

Tiltmeters

Scientists use precise equipment to check the slope of mountains.

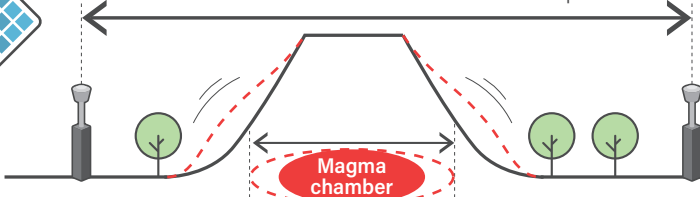
Observing volcanic gases

- Sulfur dioxide is a component of volcanic gas.
- To measure the sulfur dioxide emissions, highly precise equipment fitted to cars and ships are then driven or sailed underneath the plume.
- Caution is necessary if there is a sudden change in volcanic gas levels.

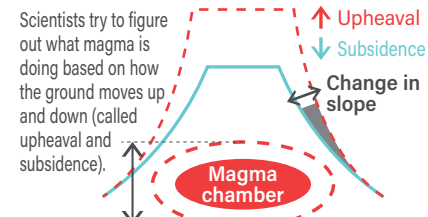
Measuring distance using GNSS(Global Navigation Satellite System)

When magma rises toward the surface, ground deformation can be observed.

We measure the distance between two points (called a "base line") that includes the volcano we're observing and monitoring. For example the base line will increase in distance when magma moves from deep underground toward the surface. A volcano's base line shrinks when it erupts.



Slight deformation of the ground can be detected with tiltmeter.



The Japan Meteorological Agency issues the volcanic alert levels immediately if there is an abnormality in the volcano.

There are 111 active volcanoes in Japan. The volcanic alert levels are applied at 48 volcanoes as of July 2019.

You can check the volcanic alert levels and the monthly volcanic activity report issued by the Japan Meteorological Agency.

Volcanic Warnings Search



Aso Volcano Disaster Prevention Council

Even if Mt. Aso is at volcanic alert level 1, it may not be possible to enter near the crater due to gas concentration or weather on the mountain. Please check in advance from the QR code.

Japan Meteorological Agency

Analysis

Announcements
(About the state of the volcano)

Collecting information



Understand volcanic eruptions!

Even when a volcano isn't erupting, it still gives off volcanic gases including water vapor, sulfur dioxide and so on.

Do you know? Where does magma come from?

Magma is created deep underground (at a depth of around 100 to 150 kilometers). Since it's lighter than around, magma gradually rises toward the surface over long periods of time. Once magma reaches the surface, it's called lava. Volcanoes are made from magma.

3 Volcanic gases and other substances are generated, pushing magma close to the crater and causing the volcano to erupt.

Seismic waves

Seismic waves grow stronger as the magma approaches the crater.

2 The number of earthquakes and the amount of gas increases.

1 The mountain swells as the magma rises.

Magma

Rocks and other materials melt due to the heat!

Magma chamber

Eruption

The volcano emits a gray plume including volcanic ash, ballistic projectiles and lapilli. Also, a pyroclastic and debris flow may be caused.



Volcanic earthquakes

Magma moves upward and groundwater boils, causing rocks to split and become dislodged. This causes earthquakes and tremors (volcanic earthquakes, low-frequency earthquakes, volcanic tremors, isolated volcanic tremors, etc.). You may even feel the ground shake due to an earthquake.

Even when the volcano is not erupting...

- White plumes actually consist mostly of water! These plumes contain almost no volcanic materials such as ash.
- Groundwater may be released as heated water.

Benefits of volcanoes

Volcanoes aren't all bad! They also provide many blessings that enrich our daily lives.

Environmentally friendly geothermal energy



Hot springs



Good-tasting water

