

# What is the difference between active and dormant volcanoes?

September 19 2016, by Matt Williams

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Volcano Vesuvius. Credit: Pastorius

Volcanoes are an impressive force of nature. Physically, they dominate the landscape, and have an active role in shaping our planet's geography. When they are actively erupting, they are an extremely dangerous and

destructive force. But when they are passive, the soil they enrich can become very fertile, leading to settlements and cities being built nearby.

Such is the nature of volcanoes, and is the reason why we distinguish between those that are "active" and those that are "dormant". But what exactly is the differences between the two, and how do geologists tell? This is actually a complicated question, because there's no way to know for sure if a volcano is all done erupting, or if it's going to become active again.

Put simply, the most popular way for classifying volcanoes comes down to the frequency of their eruption. Those that erupt regularly are called active, while those that have erupted in historical times but are now quiet are called dormant (or inactive). But in the end, knowing the difference all comes down to timing!

## **Active Volcano:**

Currently, there is no consensus among volcanologists about what constitutes "active". Volcanoes – like all geological features – can have very long lifespans, varying between months to even millions of years. In the past few thousand years, many of Earth's volcanoes have erupted many times over, but currently show no signs of impending eruption.

As such, the term "active" can mean only active in terms of human lifespans, which are entirely different from the lifespans of volcanoes. Hence why scientists often consider a volcano to be active only if it is showing signs of unrest (i.e. unusual earthquake activity or significant new gas emissions) that mean it is about to erupt.

The Smithsonian Global Volcanism Program defines a volcano as active only if it has erupted in the last 10,000 years. Another means for determining if a volcano is active comes from the International

Association of Volcanology, who use historical time as a reference (i.e. recorded history).



Sarychev volcano, (located in Russia's Kuril Islands, northeast of Japan) in an early stage of eruption on June 12, 2009. Credit: NASA

By this definition, those volcanoes that have erupted in the course of human history (which includes more than 500 volcanoes) are defined as active. However, this too is problematic, since this varies from region to region – with some areas cataloging volcanoes for thousands of years, while others only have records for the past few centuries.

As such, an "active volcano" can be best described as one that's currently

in a state of regular eruptions. Maybe it's going off right now, or had an event in the last few decades, or geologists expect it to erupt again very soon. In short, if its spewing fire or likely to again in the near future, then it's active!

## **Dormant Volcano:**

Meanwhile, a [dormant volcano](#) is used to refer to those that are capable of erupting, and will probably erupt again in the future, but hasn't had an eruption for a very long time. Here too, definitions become complicated since it is difficult to distinguish between a volcano that is simply not active at present, and one that will remain inactive.

Volcanoes are often considered to be extinct if there are no written records of its activity. Nevertheless, volcanoes may remain dormant for a long period of time. For instance, the volcanoes of Yellowstone, Toba, and Vesuvius were all thought to be extinct before their historic and devastating eruptions.

The same is true of the Fourpeaked Mountain eruption in Alaska in 2006. Prior to this, the volcano was thought to be extinct since it had not erupted for over 10,000 years. Compare that to Mount Grímsvötn in south-east Iceland, which erupted three times in the past 12 years (in 2011, 2008 and 2004, respectively).

And so a dormant volcano is actually part of the [active volcano](#) classification, it's just that it's not currently erupting.



Aleutian island #volcano letting off a little steam after the new year on Jan 2, 2016. #YearInSpace. Credit: NASA/Scott Kelly/@StationCDRKelly

### **Extinct Volcano:**

Geologists also employ the category of [extinct volcano](#) to refer to volcanoes that have become cut off from their magma supply. There are many examples of extinct volcanoes around the world, many of which are found in the Hawaiian-Emperor Seamount Chain in the Pacific Ocean, or stand individually in some areas.

For example, the Shiprock volcano, which stands in Navajo Nation territory in New Mexico, is an example of a solitary extinct volcano. Edinburgh Castle, located just outside the capitol of Edinburgh,

Scotland, is famously located atop an extinct volcano.

But of course, determining if a volcano is truly extinct is often difficult, since some volcanoes can have eruptive lifespans that measure into the millions of years. As such, some volcanologists refer to extinct volcanoes as inactive, and some volcanoes once thought to be extinct are now referred to as dormant.

In short, knowing if a [volcano](#) is active, dormant, or extinct is complicated and all comes down to timing. And when it comes to [geological features](#), timing is quite difficult for us mere mortals. Individuals and generations have limited life spans, nations rise and fall, and even entire civilization sometimes bite the dust.

But volcanic formations? They can endure for millions of years! Knowing if there still life in them requires hard work, good record-keeping, and (above all) immense patience.

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