

# THE LIFE AND TIMES OF MOUNT MAZAMA

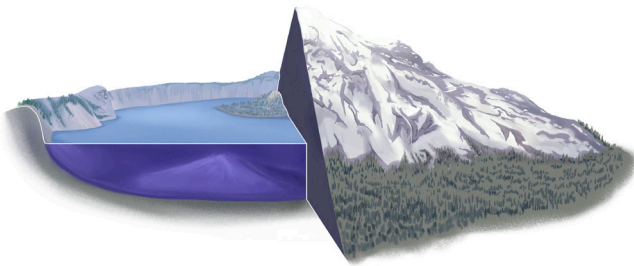
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Picture the scene: a massive volcano, three kilometers high, looms over the landscape of what is now Southern Oregon. It's a day like any other, but that's all about to change: the volcano—known as Giiwas by the local Klamath people—is about to blow.

Suddenly, a vent at the top of the volcano opens, releasing a gigantic cloud of ash and volcanic rock 50 kilometers into the air. The cloud is thick enough to block out the sun. Red-hot lava flows down the mountainside, burning through forests and valleys as it nears the Klamath settlements. Faced with a fiery wall of destruction, the Klamath flee. After the eruption, all that's left of Giiwas, or Mount Mazama, is a huge crater.

For those who witnessed the eruption, the sight of the venting volcano might have looked like the end of the world. And indeed, according to Klamath oral history, the eruption was the result of an epic showdown between two gods—Llao, the vengeful god of the underworld, and Skell, the god of the sky.

Now, we know that the eruption wasn't the result of a primordial battle between the gods. But what did cause Mount Mazama to blow? To find out, we'll need to learn about magma pools, shield volcanoes, and the deepest lake in the United States.



What caused the three-kilometer-high mountain (pictured right) to turn into a lake (pictured left)?

## PHASE 1: SHIELD VOLCANO

Millions of years ago, two tectonic plates collided, pushing one of the plates down into the Earth's mantle. This plate got so hot that it melted into magma, which is semi-liquid or liquid rock.

A few million years after the collision, the magma moved up into the Earth's crust, pooling in a hot reservoir called a magma chamber.

Over thousands of years, the volcano continued to erupt—the magma spilled out onto the Earth's surface, flowing over the land before cooling and forming a vast network of glossy volcanic rock.

At this point in its history, geologists would call Mount Mazama a shield volcano, or a volcano with a broad, gently sloping surface. With its magma reservoirs empty, parts of the volcano fell into the Earth, shortening Mount Mazama's height to just a few hundred meters tall. For thousands of years, Mount Mazama lay dormant.

## PHASE 2: STRATOVOLCANO

But a dormant volcano isn't a totally inactive volcano. Underground, a new magma chamber full of thicker and more explosive magma was forming. Occasionally erupting onto the surface of the mountain, the

magma quickly cooled into solid rock. Over thousands of years, these layers of cooled magma built up on top of each other, forming a steeper, higher mountain.

At over 2,500 meters high, Mount Mazama was now a stratovolcano—the conical kind most of us think of when we think of volcanoes. But the volcano's life cycle was far from complete.

Hundreds of years passed. Mount Mazama gained more underground magma and lost more of its height—winds and giant glaciers peeled off its top layers of rock, shortening it to around 2,000 meters. Then, around 250,000 years ago, Mount Mazama exploded, showering the landscape in magma and ash in a violent volcanic eruption.

As we know, this wasn't its last eruption—the volcanic cycle had simply started anew. With its magma chambers empty, the volcano entered a new state of dormancy. Once again, the volcano built up its magma reserves over thousands of years—until the year that would mark its final eruption.



The caldera at Crater Lake is all that remains of Mount Mazama

### PHASE 3: THE FINAL ERUPTION

Mount Mazama's eruption almost 7,000 years ago was so violent and so explosive that it hollowed out the volcano. With no molten rock to support it, Mount Mazama's heavy top collapsed under its own weight and fell into the mountain. Just two days after the eruption, the volcano lost a full kilometer of height.

The collapse soon formed an enormous bowl-like crater where the volcano's top had once been, which geologists call a caldera. Over time, mudslides, lahars caused by the

eruption, and annual rainfall filled the caldera. Now measuring eight kilometers across and 594 meters deep, this caldera is one of the world's biggest.

In the 750 years following the eruption, rainwater and melting snow filled the caldera, forming a lake—the deepest in the United States—while a few more minor volcanic eruptions caused the formation of small islands.

Today, you can see the site of the once-formidable Mount Mazama by visiting Crater Lake National Park, in Southern Oregon.