Mount St. Helens Eruption: Destruction and Growth

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1 Introduction

Mount St. Helens stands as a powerful testament to the dynamic forces that shape our planet. Before 1980, this active stratovolcano was always a **popular attraction**. It was a moderately sized mountain with an iconic conical shape upholding a large logging scene and an active hiking scene. Its popularity however skyrocketed when it showcased its spot as the most active volcano in the cascades. The date was May 18th, 1980 when its most notorious moment, a violent eruption emitting a force equivalent to about 25 megatons of TNT, unleashed unimaginable natural forces and left a profound impact on the environment, economy, and human life in its wake.

Despite the popularity alluded to in the text, before 1980 Mt. St. Helens was far from the most iconic mountain in Washington State. Now it has solidified itself as one of the most recognizable mountains in the United States.

As we navigate through the different phases of this natural disaster, from the tranquility that preceded the eruption to the resilience displayed in its aftermath, it becomes apparent that Mount St. Helens serves as a living monument to the powers that govern our planet, offering invaluable insights into the complex dynamics of natural disasters and the subsequent processes of recovery and adaptation.

2 Background and Environment Prior to the Eruption

Mount St. Helens, which sits in the Cascade Range in Washington, was not merely a geological wonder; it held a bustling and diverse ecosystem, hosting many plants, animals, and humans. The landscape boasted dense coniferous forests, primarily Douglas fir and western hemlock, which provided a dense habitat for its wildlife. Helens' ecosystem was not simply restricted to a land-dwelling ecosystem but had a rich underwater system with its many lakes and rivers.

Human settlements marked the landscape, with small communities relying on the mountain's abundant natural resources. These **communities**

Cougar, one of the towns closest Mt. St. Helens is very pleasant to drive through. Towns like this are a great view into the smaller subcultures and communities that environments like this foster.

included loggers, farmers, and small businesses, all intertwining into a functioning society. Logging companies played a significant role in the local economy, harvesting from the largely abundant forestscape. Helens' valleys provided great plots for a thriving agricultural scene, and tourism ever prevailed, with visitors far and wide lured in by its scenic landscape.

Mount St. Helens' history involved periodic eruptions, but the region had adapted to this natural rhythm. Residents remained aware of the volcanic activity, but nobody could predict the magnitude of the impending disaster in 1980. Had it not been for the region's sparse population the damage to human lives could have been much greater.

The pre-eruption period was marked by elegantly with residents and industries relying on the resources of the environment. However, this era of balance would quickly be upset disrupting human lives, industries, and the mountain's fragile ecosystem.

3 The Eruption

Before 1980, Mount St. Helens had remained dormant for over one hundred years. That changed on March 15th when a series of small earthquakes signaled that magma had begun to move under the volcano. After March 15th seismic activity soared in magnitude and frequency over the few weeks. During March 25-27th 174 shocks of magnitude 2.6 or greater were recorded According to the USGS, with one quake even reaching a magnitude of 5.1 on the Richter scale. The result? On March 27th at 12:36 pm, the volcano erupted for the first time in over 100 years, signaling an awaking of the mountain's long-dormant slumber. **Phreatic** eruptions blasted a 60-75 meter wide crater through the volcano's summit ice cap and a column of ash shot up over 2000 meters covering the once snow-covered southeast side of the mountain.

Phreatic eruptions refer to the ejection of super heated underground water, one example being geysers.

Over the coming weeks, many alarming features occurred, including but not limited to harsh lightning caused by electrostatic energy, twelve eruptions on the 28th of March, 93 separate explosions on March 30th, and plumes of ash reaching 6000 meters tall on April 1st. By this time the crater had grown to over 400 meters in diameter and giant cracks formed crossing the area of the summit. Eruptions slowed to about one a day by mid-April, when the first period of activity ceased.

Eruptions resumed slowly starting May 7 growing in magnitude up till May 17th. Earthquakes, over 10,000 by this point, deformed the volcano around the north flank growing outward about 140 meters, forming an iconic bulge. From the initial eruption, the bulge grew outward at rates of about 2 meters per day. Which suggested magma had risen high in the volcano. We now know the bulge was formed by a crypto dome that had built up inside the volcano, waiting to erupt.

May 18th, Day of the Eruption

May 18th, like any other day, started with bated breath. The mountain had shown signs of a larger eruption for months, which initially had been a tourist appeal, but after months of smaller eruptions, it became a waiting game for the locals who wanted to get back to their homes. State officials had let residents in their homes to tend to their needs the day before on the 17th and promised them they would get another opportunity in the morning. That promise would not come to fruition, however. At 8:42 am a magnitude 5.1 magnitude hit the base of the mountain, and with that, the most powerful eruption in the history of the United States had begun.

Within twenty seconds of the initial shock, the northern bulge and summit of the volcano dislodged starting the largest debris avalanche ever recorded. Seconds later the mountain underwent its **main volcanic blast**, accelerating the flow and destruction of the north face of the mountain. The landslide was now traveling at upwards of 250 kilometers an hour. Within 15 minutes ash had risen to over 24 kilometers high, where winds carried over 500 million tons of ash over 56,000 square kilometers in area. The lateral blast itself is said to have devastated an area of up to 600 square kilometers. The inner circle of 10 kilometers within the mountain's range was completely wiped of trees and beyond this area knocked over or scorched. The debris devastated local rivers and obliterated landscapes. In all the eruption is said to have released an upward of 24 megatons of TNT during the initial blast, just shy of half the power of the largest nuclear weapon ever tested. Left behind was a husk of a mountain with a crater approximately 1600 meters wide and 3200 meters long. It is estimated about 4.2 cubic kilometers of rock was lost during the eruption, a shocking 12% of the mountain, on top of that the **height of the mountain decreased** by approximately 400 meters.

The crater this left behind is truly phenomenal to behold in person, even if you do not intend on summiting the mountain I would highly recommend checking out the many viewpoints into the dome.

The height lost that day knocked Mt. St. Helens down from the 5th tallest mountain Washington all the way to the 35th tallest.

4 Impacts of the Eruption

In all, 57 human lives were lost, thousands of animals died, over 200 homes were destroyed, and around 200 miles of road were damaged. Damages caused by this eruption were around 3.3 billion US Dollars assuming values presented in 2023. Over thirty **logging** trucks and twenty transport vehicles were damaged or destroyed. Uncountable amounts of timber were lost in the landslides. Mount Saint Helens' landscape and culture were forever changed that day.

Hiking near Cold Water Peak you'll find what I can only presume to be logging equipment essentially fossilized by the eruption

The flooding caused by the landslide was not limited to short-term impacts either. Debris filled the Toutle River to an average depth of 150 feet, creating unstable upstream lakes, which made flooding an active possibility. Portland had a specific interest in clearing up the Toutle River with prices in the range of 330 million US dollars to provide a proper response. The US Army Corps of Engineers was also enlisted by FEMA to come up with

solutions for an especially nastily flooded area, Spirit Lake. Their solutions included pumping water out of the lake, boring rock, and creating a tunnel as an outlet for the lake.

5 The Landscape and its Healing

The 1980 eruption made Mount Saint Helens an even more bustling environment. While the land was barren, it provided a truly unique scene for **tourists** and a living laboratory for the scientists intrigued by it. Over the past forty-four years, the landscape and communities have made an amazing comeback.

Being one of those tourists seeing the mountain further along in its continual healing I can only imagine being there while the scent of scorch was still fresh.

Since 1980, about 1 billion board feet of damaged timber have been recovered, about 25% of the affected timber, according to the United States Geological Survey. The area near the mountain, about 450 square kilometers, has been designated the Mount Saint Helens National Volcanic Monument. This designation leaves the land protected as a sanctuary for growth and a testament of time. **Observatories** have been built giving beautiful views of the resulting crater, and climbing the mountain has become so popular reserving a ticket can take months.

My favorite of these, the Johnston Ridge Observatory unfortunately is inaccessible for the time being(as of 2024) due to a landslide damaging the road in May 2023.

The landscape is young and readily changing, with recovery being made on every front. Just as the soil is made ready with nutrients after a fire, the soil of Mount Saint Helens has been primed for a beautiful landscape to emerge. The **trees** of Mount Saint Helens, though young, grow readily, plant life is vibrant, and animals have settled in. Despite this growth, however, the destruction will remain on display for thousands of years.

I always find hiking through young forests refreshing, and off the lakes near St. Helens, there is no shortage of lichen and moss to give off a wonderful green atmosphere.

There is no shortage of hiking near Mount Saint Helens. If you are willing to hike 10 miles round-trip the trail up Monitor Ridge from Climbers Bivouac provides a hefty, but **non-technical** route to the summit. However, to hike beyond the treeline, you must purchase and carry a Mount Saint Helens climbing permit. After the first five miles up you will get a wonderful view with many features, but most unique of all is the top-down view directly into the mountains Crater.

Always be vigilant of the time of year you go hiking, for instance depending on snow levels it could be a terrible idea to forget some cleats. If snow is present, however, there are some pretty solid glissading spots following the ridge if that is your cup of tea.

6 Conclusion

Mount Saint Helens is the most defining eruption in the history of the United States. It has completely redefined the word eruption and created one of the most unique landscapes in the US. Despite that the mountain-scape is recovering swiftly, providing a new refuge for animals, plants, and humans alike. The future of Mount Saint Helens remains unknown as it is still one of the most active volcanoes in the US and another eruption in our lifetime is far from ruled out.