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Lasting Lessons from Mount St. Helens

by J. Kelvin Grady, Jennifer Blair Pierce, and Ann Bridges on April 1, 2011
Reviewed by Anne Minard on April 1, 2011

A quick criticism

The eruption of Mount St. Helens 35 years ago provided an amazing opportunity for scientists to study the effects of catastrophe. The incredible lessons we are valuable as well.

May 18, 2010, marks the 35th anniversary of one of the most violent natural disasters in the United States. The eruption of Washington's Mount St. Helens blasted 1 cubic mile of debris into the surrounding landscape. The eruption's effects spread far and wide. Ash from the eruption reached as far as Montana and Canada, and more than 1 billion cubic feet of property was destroyed, and over 57 people—including a photographer and a volcanologist—died. Ash from the eruption also caused a temporary decline in global temperatures, affected the weather for several years, and even affected the Earth's rotation. Scientists have learned a great deal about how the eruption occurred and what it means for future eruptions, but there are still many questions to be answered. The eruption's effects on the environment and on human beings are still being studied. The eruption's effects on the environment and on human beings are still being studied.

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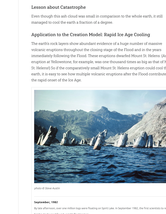


May 18, 1980, 8:32 am

Eruption of Washington's Mount Mount St. Helens, triggering a massive eruption. Pyroclastical blasted up to 12 miles into the atmosphere, and within a few minutes about 230 square miles was devastated.

Ash Cloud

by Andrew A. Snelling

On May 18, 1980, at 8:32 am the initial blast of steam—equivalent to 20 megatons of TNT—decimated the northern side of the once pristine cone-shaped volcano. Within a few minutes an area of about 230 square miles (600 km²) was devastated. The total energy output during the subsequent nine-hour eruption was equivalent to 500 million tons of TNT, approximately 32,000 Hiroshima-atomic bombs. That's about one such atomic bomb exploding every second for nine hour!

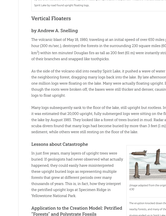


photo Carmen P. Andriani

More than two-thirds of a cubic mile (2.5 km³) of rock was ejected and pulverized to fine ash and pumice. The ash was blown to the east at 60 miles per hour (100 km/hr), was 10 miles (16 km) wide, and the maximum rise was 45 miles (66 km) wide and 25 miles (24 km) high. Winds in the atmosphere dispersed the ash eastward at 60 mph (100 km/hr) covering 11 states and several Canadian provinces with dust. Some towns were engulfed in complete darkness at midday.

photo Carmen P. Andriani

Lesson about Catastrophe

Even though this ash cloud was small in comparison to the whole earth, it still managed to cover the earth a fraction of a degree.

Application to the Creation Model: Rapid Ice Age Cooling

The earth's rock layers show abundant evidence of a huge number of massive volcanic eruptions throughout the closing stage of the Flood and in the years immediately following the Flood. These eruptions devoted Mount St. Helens into eruption at Yellowstone, for example, was one thousand times as big as that of Mount St. Helens. Although the comparatively small Mount St. Helens eruption could not by itself, it is easy to see how multiple volcanic eruptions after the Flood contributed to the rapid cream of the Ice Age.

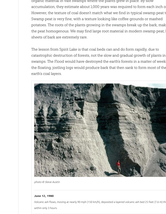


photo © Dave Rubin

September, 1980

Ash and pumice from the eruption lying upon floating on Spirit Lake, in September 1980, the first scientists to reach Spirit Lake found large pumice floating logs.

Vertical Floaters

by Andrew A. Snelling

The volcanic blast of May 18, 1980, traveling at an initial speed of one 600 miles per hour (300 m/s), devastated the forests in the surrounding 230 square miles (600 km²) within ten minutes! Douglas fir as tall as 200 feet (61 m) were instantly stripped of their branches and snapped like toothpicks.

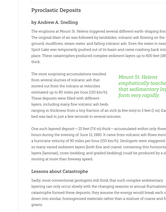


photo © Dave Rubin

As the side of the volcano slid into nearby Spirit Lake, it pushed a wave of water into the neighboring forest, dragging many logs back into the lake. By ten afternoon over one million logs were floating on the lake. These were actually floating upright. Even though the roots were broken off, the bases were still thicker and denser, causing the logs to float upright.

Many logs subsequently sank to the floor of the lake, still upright but vertikes. Indeed, it was estimated that 20,000 upright, fully submerged logs were sitting in the floor of the lake by August 1981. They looked like a forest of trees buried in mud. Radar and sonar divers found that these logs had become buoyant by means of a fixed pod of sediment, while others were still standing on the floor of the lake.

photo © Dave Rubin

Lessons about Catastrophe

In just five years, many layers of upright trees were buried. If geologists had been observed what actually happened, they could easily have misinterpreted these upright fossil logs as representing multiple forests that grew at different periods over many thousands of years. This is, in fact, how they interpret the petrified upright logs at Specimen Ridge in Yellowstone National Park.

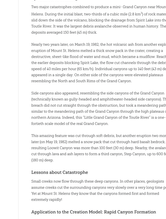


photo © Dave Rubin

This eruption involved about 5 cubic miles (20 km³) of material. Some of it was ejected as a liquid gas. Very big fragment upright pillars thick with. Forming deposits called ignimbrites. Ignimbrites are now known to be "pyroclastic flows." Ignimbrites are also known as "welded tuffs."

Application to the Creation Model: Petrified "Forests" and Vertipetrified Fossils

Many of the petrified logs in Yellowstone are upright and missing their roots like those at Mount St. Helens. This shows that the fossilized upright logs in so-called 'petrified forest' could have come from logs that were floating along and after the Flood and sank to be buried upright in sediments. This phenomenon would explain another type of fossilized upright logs called petrified tombs, which preserve multiple sedimentary layers. These, too, must have been floating on the Flood waters and buried rapidly in Flood sediments.

Back Peat

by Andrew A. Snelling

The enormous log mat floating on Spirit Lake lost its bark and branches, rubbed off by the abrasive action of wind and waves. Scuba investigations of the lake bottom uncovered a layer of peat that shares of bark intermingled with volcanic sediments had formed a layer of peat more than 3 feet (1 m) thick. Together with broken branches and root materials the sheets of bark gave the peat a coarse texture and a banded appearance. This "Spirit Lake peat" resembles, both compositionally and texturally, certain coal beds of the eastern United States.

Lessons about Catastrophe

The "Spirit Lake peat" accumulated in just five years. The Spirit Lake peat is texturally and compositionally similar to the coarse cement of coal beds, which secular geologists believe require many thousands of years to accumulate.

Application to the Creation Model: Rapid Coal Beds

Many geologists claim that coal beds formed by the very slow accumulation of organic material in vast swamps where the plants grew in place. By slow accumulation, they estimate about 1,000 years were required to form each inch of coal. However, the mixture of coal doesn't match what we find in typical swamp peat today. Swamp peat is very fibrous, with a texture looking like coffee grounds or matted potatoes. The coal of the plants growing in the swamp forms a layer of bark, making the peat homogeneous. We find large non-banded coal material in modern swamp peat, but shards of bark are entirely lacking.

The lesson from Spirit Lake is that coal beds can and do form rapidly, due to catastrophic transportation of forests, not the slow and gradual growth of plants in swamps. The Flood would have deposited the earth's forests in a matter of weeks, and the floating anything logs would produce bark that then sank to form most of the earth's coal layers.

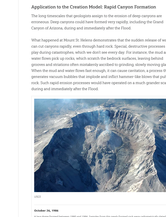


photo © Dave Rubin

June 13, 1980

Volcanic ash flows, mixing as nearly 50 half-270 km/h, deposited a layered volcanic ash bed 0.7 feet (1.0 m) thick within a day. Crews.

Pyroclastic Deposits

by Andrew A. Snelling

The eruption at Mount St. Helens triggered several different earth-shaping forces. The blast of steam and ash was followed by landslides, volcanic ash flowing on the ground, mudflows, minor waters and falling volcanic ash. Even the water in nearby Spirit Lake was temporarily pushed out of its basin and came crashing back into place. These catastrophics produced complex sediment layers up to 600 feet (180 m) thick.

photo © Dave Rubin

Another explosion eruption created destructive mudflows that cut canyons up to 100 feet (30 m) deep in a single day. Tree-lined canyon of the Toutle River, near Kelso, is a Southwest side model of Grand Canyon.

Mount St. Helens emphatically teaches us that sedimentary layers form very rapidly.

Other eruptions also occurred, resulting in the wide canyons of the Grand Canyon. Dramatically erosion, as gully-headed and amphitheater-headed side canyons. The breach did not cut straight through the obstruction, but took a meandering path, similar to the meandering path of the Grand Canyon through the high plateaus of northern Arizona. Indeed, this "Little Grand Canyon of the Toutle River" is a one-fortieth scale model of the real Grand Canyon.

This amazing features was cut through soft debris, but another eruption two months later on May 18, 1982 created a stone pack that cut through hard basalt bedrock. The resulting Lavaret Canyon was more than 820 feet (250 m) deep. Nearby, the avalanche cut through lava and ash layers to form a third canyon, Step Canyon, up to 600 feet (180 m) deep.

Lessons about Catastrophe

Small creeks can flow through these deep canyons. In other places, geologists estimate creeks cut the surrounding canyons very slowly over a very long time period. Yet at Mount St. Helens they know that the canyons formed from rapid flows of extremely rapidly!

Application to the Creation Model: Rapid Canyon Formation

The long timescales that geologists assign to the erosion of deep canyons are erroneous. Deep canyons could have formed very rapidly, including the Grand Canyon of Arizona, during and immediately after the Flood.

What happened at Mount St. Helens demonstrates that the sudden release of water can cut canyons rapidly, even through hard rock. Special, destructive processes are in play during catastrophes, which we don't see every day. For instance, the mud and water flows gain up speed, which scours the bedrock surfaces, leaving behind grooves and striations often mistakenly ascribed to grinding slowly moving glaciers. Also, the mud and water flows can pick up large rocks and boulders and carry them downstream because buoyancy forces that stabilize and soften hammer like forces that pulverize rock. Such rapid erosion processes would have spread on a large scale during and immediately after the Flood.

photo

October 26, 1986

Lava dome in Novarupta crater, 1986 and 1986. Eruptions from this newly formed vent were relatively mild, lasted at, supposedly 150,000 years old and were mainly rhyolitic at 2.5 million years old.

New Lava Dome with Old Radiometric Dates

by Andrew A. Snelling

When the volcano initially erupted, the big, 1,300 feet (395 m) of its summit was blasted away and slid down the slopes, leaving an enormous horseshoe-shaped crater. Within days the release of pressure underneath allowed lava to flow out of the vent so that a dome begin to build and harden.

Five times in subsequent months, eruptions destroyed each growing lava dome. The tenth dome was formed in the eruption between October 30, 1980 and October 18, 1986. Seventeen lava flows, consisting of more than 2.5 billion cubic feet (70 million m³) of lava, built this new dome, which covered 1.25 square miles (3 km²).

In June 1981 a large sample was collected from the surface of one of the last lava flows to erupt from the dome in 1986. Samples were sent in laboratories in 1986 to be

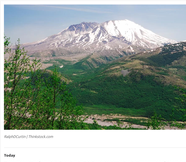
radiometrically dated using the potassium-argon method. This method measures the amount of argon atoms that presumably formed from the radioactive decay of potassium atoms in the lava after it cooled. The rock was a mere ten years old, but the potassium-argon "clock" dated the rock at 300,000 years old, and minerals within it dated at up to 2.4 million years old.

Lessons about Catastrophe

These results are consistent with many reports in the literature of numerous other lava samples from around the world that have similarly yielded highly erroneous potassium-argon ages. This unquestionably demonstrates that the radioactive dating methods are fraught with difficulties that render them unreliable.

Application to the Creation Model: Radiometric Dating Is Based on Unprovable Assumptions about Unseen Conditions inside the Earth

If the assumptions are faulty, they can produce incorrect dates. So when we see old dates that contradict the biblical timeframe, we can be certain they are based on mistaken assumptions and must be radically adjusted.



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Today
The eruption and its aftermath challenged, and still challenge, the slow-and-gradual interpretation of the accumulation of sediments, the erosion of landscapes, and the recovery of environments.

Soil Recovery at the Death Zone

by Joe Francis

The eruption of Mount St. Helens showed just how many ways a volcano can destroy once-thriving environments—from the slow death of choking ash to instant burial under rock avalanches, mudflows, or scorching 600°F (315°C) winds traveling at hundreds of miles per hour.

One landscape in particular led former President Carter to compare the devastation to a moonscape. Now called the Pumice Plain, this 6-square-mile (15.5 km²) region was scoured clean of plants and animals by the intense heat and then buried under more than six feet of sterile rocks and volcanic ash and dust (called pumice). No garden could grow in this sterile, nutrient-poor soil without the addition of new soil and lots of nutrient-rich fertilizer. Or so scientists assumed.

So biologists were quite surprised to find life returning to this pale ashen desert within a couple of years. Part of the secret was a small "soil engineer" living underground, the pocket gopher. These small rodents, often condemned for destroying suburban lawns and golf courses, were digging tunnels and mixing good soil with the nutrient-poor soil. But where did the gophers get their food?

The lone biologist employing this barren landscape noted a flowering plant, called a lupine, growing early in the recovery. But how could flowering plants grow in the sterile dust and ash without nutrients like nitrogen?

That's where bacteria came into play. Lupines are legumes, which live closely with special bacteria that between nitrogen from the air. Somehow enough of these bacteria survived the high temperatures below the soil, or they traveled with the lupine seeds that blew in, or they were dropped by birds. The bacteria then took up residence with the lupines and began passing nitrogen to them.

The lupine uses this nitrogen to make rich proteins, which it packs into seeds. The plants' nitrogen also passes into the soil, making it more fertile. The gophers could easily survive on the lupine's leaves and nutritious seeds.

It didn't require much, after all, to kick-start a web of life on the Pumice Plain!

Lessons about Catastrophe

It's fun to realize how God designed lowly creatures like rodents and bacteria—which we often associate with pests and disease—to help restore His earth after catastrophes. And they don't need much extra help to reestablish a thriving environment!

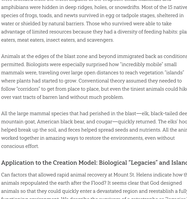
Regions outside the Pumice Plain recovered even more quickly, with the circumstances varying dramatically from spot to spot. While some kinds of environments disappeared, such as the old-growth fir trees, the number of healthy lakes and ponds increased. Freshwater biologists came away with a new appreciation for the versatility of living things, and the difficulty of predicting how many ways they can reestablish thriving environments after a single catastrophe.

Application to the Creation Model: Rapid Soil Recovery after the Flood

Creation biologists were intrigued by how fast the most sterile areas around Mount St. Helens returned to life after the 1980 eruption. Biologists had to "rewrite the books," as it were, about the speed with which bacteria and rodents could help restore health to devastated soils.

While we often consider these creatures pests, their high reproductive rates make sense as a designed phenomenon to help restore destroyed ecosystems. Many different kinds of rodents could have reproduced rapidly on Noah's Ark during the voyage. Without predators, these ready-made soil engineers could have spread over the earth, preparing the soil for other animals to come.

If we can be surprised by biological recovery on a small scale, we can't even imagine all the possibilities after the Flood, which left a variety of nutrient-rich sediments and plenty of water.



Lorraine Swanson / Dreamstime.com

Fall 1981
Within days of the eruption, elk were already back in the blast zone searching for food. Herds flourished on the nutritious leafy plants that recolonized the region. Within five years several hundred had settled back in the region.

Rapid Animal Recovery

by Tom Hennigan

The volcanic blast toppled 230 square miles (600 km²) of their forest home, burying all the local animals in stream, rock, and mud. How long would it take for a full complement of their forest brethren to return in sustainable numbers? Prevailing theories about ecological succession assumed it might take a century or more. Yet, amazingly, within a decade many animal species already repopulated the Mount St. Helens area and have been gaining in numbers ever since.

The first colonists spread quickly because there were so few post-blast predators, parasites, and disease-causing organisms. Reproductive rates went through the roof. For instance, the safe conditions triggered a biological change in female elk, which began bearing twins and triplets each year, rather than their typical rate of one calf every two or three years.

This process was not always smooth, however. As predators and disease increased, some animal populations were eliminated only to later arrive again, re-establish, and remain.

Lessons about Catastrophe

Ecologists are in awe at the rapid animal recovery at Mount St. Helens. One of the greatest lessons is the impact of "biological legacies." This refers to organisms that were shielded from the worst impacts of the eruption. Small mammals and amphibians were hidden in deep ridges, holes, or snowdrifts. Most of the 15 native species of frogs, toads, and newts survived in egg or tadpole stages, sheltered in water or shielded by natural barriers. Those who survived were able to take advantage of limited resources because they had a diversity of feeding habits: plant eaters, meat eaters, insect eaters, and scavengers.

Animals at the edges of the blast zone and beyond immigrated back as conditions permitted. Biologists were especially surprised how "incredibly mobile" small mammals were, traveling over large open distances to reach vegetation "islands" where plants had started to grow. Conventional theory assumed they needed to follow "corridors" to get from place to place, but even the tiniest animals could hike over vast tracts of barren land without much problem.

All the large mammal species that had perished in the blast—elk, black-tailed deer, mountain goat, American black bear, and cougar—quickly returned. The elks' hooves helped break up the soil, and feces helped spread seeds and nutrients. All the animals worked together in amazing ways to restore the environments, even without conscious effort.

Application to the Creation Model: Biological "Legacies" and Islands

Can factors that allowed rapid animal recovery at Mount St. Helens indicate how the animals repopulated the earth after the Flood? It seems clear that God designed animals so that they could quickly enter a devastated region and reestablish a fully functioning environment. We describe the survivors of a catastrophe as "legacies." Many types of plants and small creatures could have survived the Flood on floating vegetation, establishing vegetation "islands" around the globe (like the slime that the dove found). Birds and fast-moving, fast-reproducing small land animals could scatter across the planet in record time, stirring up the soil and spreading seeds, while larger animals came close behind. The succeeding decades produced wild fluctuations, as some creatures went extinct and others moved in, until the environments stabilized. That's what we find in miniature form at Mount St. Helens today.

Just as God showed favor toward Noah, He knew the importance of biological legacies as He sheltered a diversity of air-breathing land animals on the Ark. He designed them to respond to the changing landscape, move large distances, and repopulate the planet afresh. More important, these environments would sustain Noah's family until God could provide His greatest demonstration of grace through their descendant, Jesus Christ.

Conclusion

The 1980 eruption of Mount St. Helens provided a rare opportunity to study catastrophic processes at work. Within a few months it produced changes that scientists assumed required many thousands of years. And the environments returned to full health in just a few years, not decades or centuries. The eruption and its aftermath challenged, and still challenge, the slow-and-gradual interpretation of the accumulation of sediments, the erosion of landscapes, and the recovery of environments.

On one hand, this catastrophe challenged the uniformitarian ideas that underpin Darwinian evolution. On the other hand, it provided invaluable clues to help us understand the catastrophic power of the Genesis Flood, and the biological designs that helped plants and animals repopulate the earth after the Flood.

Dr. Andrew Snelling holds a PhD in geology from the University of Sydney and has worked as a consultant research geologist in North Australia and America. Author of numerous scientific articles, Dr. Snelling is now director of research at Answers in Genesis-USA.

Tom Hennigan is associate professor of biology at Truett-McConnell College, where he teaches undergraduate biology and ecology. He is co-author of the newest edition of the Wonders of Creation series, *The Ecology Book*.

Dr. Joe Francis, chairperson of the Department of Biological and Physical Sciences and Department of Mathematics at The Master's College, earned his PhD from Wayne State University and completed a post-doctoral fellowship at the University of Michigan Medical School.

For Further Information . . .

- *The 1980 Eruptions of Mount St. Helens*. Washington edited by P. W. Lipman and D. R. Mullineaux.
- "Mount St. Helens and Catastrophism" by Steven A. Austin in *Proceedings of the First International Conference on Creationism*, vol. 1 (Pittsburgh, Pennsylvania: Creation Science Fellowship, 1986), 3–9.
- "Excess Argon within Mineral Concentrates from the New Dacite Lava Dome at Mount St. Helens Volcano," by Steven A. Austin in *Creation Ex Nihilo Technical Journal* 8:3 (1994): 335–343
- *Footprints in the Ash: The Explosive Story of Mount St. Helens* by John Morris and Steven A. Austin (Green Forest, Arkansas: Master Books, 2003).
- "Why Is Mount St. Helens Important to the Origins Controversy?" by Steven A. Austin in *The New Answers Book* 1, ed. Ken Ham (Green Forest, Arkansas: Master Books, 2010), chapter 26, 215–282
- *Mount St. Helens: Modern Day Evidence for the World Wide Flood* by Steven A. Austin and Kyle Justice (Compel Media, 2012).

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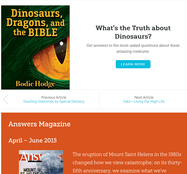
Mount St. Helens: Modern Evidence for the World Wide Flood Excerpt



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