



**VOLCANIC AND SEISMIC ACTIVITY AT MOUNT ST. HELENS – 1987-91**  
**U.S. Geological Survey and University of Washington**  
**Vancouver and Seattle, Washington**

Formal statements released in 1987, 1988, 1989, 1990, and 1991  
Compiled by Bobbie Myers, 2005

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**1987** – *began phasing out regular reports during times of no activity*

**1988** – *very few reports issued owing to ongoing background level activity*

**1989** – *includes Information Statements and reports about seismic events*

**1990** – *includes Information Statements and reports issued about seismic events, explosions, and small lahars*

**1991** – *includes reports issued about explosions*

**1987**

**VOLCANIC AND SEISMIC ACTIVITY AT MOUNT ST. HELENS**  
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Report at 1200 PST, Wednesday, January 7, 1987

Seismicity, deformation, and gas emissions are at background level.

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Report at 1430, Tuesday, January 13, 1987

Seismicity, deformation and gas emissions are at background level.

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Report at 1300, Wednesday, January 14, 1987

Seismicity, deformation and gas emissions are at background level.

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Report at 1430, Friday, January 16, 1987

Seismicity, deformation and gas emissions are at background level.

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Report at 1430, Wednesday, January 27, 1987

Seismicity, deformation and gas emissions are at background level.

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Report at 0940 Wednesday, February 4, 1987

Seismicity, deformation and gas emissions are at background level.

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Report at 1035 PST, Monday, February 9, 1987

Seismicity, deformation and gas emissions are at background level

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Report at 0645 PST, Wednesday, February 11, 1987

Seismicity, deformation and gas emissions are at background level.

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Report at 1055 PST, Tuesday, February 17, 1987

Seismicity, deformation and gas emissions are at background level.

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Report at 0945, Friday, February 20, 1987

Seismicity, deformation and gas emissions are at background level.

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Report at 1100 PST, Monday, February 23, 1987

Seismicity, deformation and gas emissions are at background level.

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Report at 0830 PST, Friday, February 27, 1987

Seismicity, deformation and gas emissions are at background level.

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Report at 1445 PST, Monday, March 02, 1987

Seismicity, deformation and gas emissions are at background level.

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Report at 1000 PST, Monday, March 9, 1987

Seismicity, deformation and gas emissions are at background level.

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Report at 0700 PST, Monday, March 16, 1987

Seismicity, deformation and gas emissions are at background level.

Report at 1554 PST, Friday, March 20, 1987

Seismicity, deformation and gas emissions are at background level.

Report at 900 PST, Thursday, March 26, 1987

Seismicity, deformation and gas emissions are at background level.

Report at 0945 PST, Tuesday, March 31, 1987

Seismicity, deformation and gas emissions are at background level.

Report at 1040 PST, Friday, April 3, 1987

Seismicity, deformation and gas emissions are at background level.

Reported at 0830 PDT, Monday, April 13, 1987

Seismicity, deformation and gas emissions are at background levels.

Report at 0900 PDT, Friday, April 17, 1987

Seismicity, deformation and gas emissions are at background level.

Report at 1230 PDT, Tuesday, April 21, 1987

Seismicity, deformation and gas emissions are at background level.

Report at 700 PDT, Monday, April 27, 1987

Seismicity, deformation and gas emissions are at background level.  
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Report at 1300 PDT, Monday, May 4, 1987

Seismicity, deformation and gas emissions are at background level.  
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Report at 0815 PDT, Monday, May 11, 1987

Seismicity, deformation and gas emissions are at background level.  
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Report at 1130 PDT, Monday, May 18, 1987

Seismicity, deformation and gas emissions are at background level.  
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Report at 1230 PDT, Wednesday, June 3, 1987

Seismicity, deformation and gas emissions are at background level.  
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Report at 0645 PDT, Thursday, June 11, 1987

Seismicity, deformation and gas emissions are at background levels.  
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Report at 0900 PDT, Tuesday, June 16, 1987

Seismicity, deformation and gas emissions are at background level.  
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Report at 1830 PDT, Thursday, June 18, 1987

Seismicity, deformation and gas emissions are at background level.

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Report at 1530 PDT, Thursday, June 25, 1987

Seismicity, deformation and gas emissions are at background level.

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Report at 1045 PDT, Monday, June 29, 1987

Seismicity, deformation and gas emissions are at background level.

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Report at 13:00 PDT, Tuesday, June 30, 1987

Deformation, seismicity and gas emissions are at background level.

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Report at 14:50 PDT, Wednesday, July 8, 1987

Seismicity, deformation and gas emissions are at background level.

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Report at 14:50 PDT, Monday, July 13, 1987

Seismicity, deformation and gas emissions are at background level.

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Report at 1700 PDT, Monday, July 27, 1987

Seismicity, deformation and gas emissions are at background level.

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Report at 0800 PDT, Wednesday, August 5, 1987

Seismicity, deformation and gas emissions are at background level.

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Report at 9:30 PDT, Thursday, August 13, 1987

Seismicity, deformation and gas emissions are at background level.

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Report at 0645 PDT, Monday, August 24, 1987

Seismicity, deformation and gas emissions are at background level.

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Report at 0800 PDT, Thursday, September 10, 1987

Seismicity, deformation and gas emissions are at background level.

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Report at 1700 PDT, Tuesday, October 20, 1987

Seismicity, deformation and gas emissions are at background level.

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Report at 0730 PST, Friday, November 13, 1987

Seismicity, deformation and gas emissions are at background level.

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Report at 0845 PST, Friday, December 4, 1987

Seismicity, deformation and gas emissions are at background levels.

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**1988**

**VOLCANIC AND SEISMIC ACTIVITY AT MOUNT ST. HELENS**

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Report at 1615 PST, Friday, January 8, 1988

Seismicity, deformation and gas emissions are at background levels.

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Report at 1500 PST, Tuesday, January 19, 1988

Seismicity, deformation and gas emissions are at background levels.

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Report at 1000 PST, Tuesday, February 23, 1988

Seismicity, deformation and gas emissions remain at background levels.

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Report at 0930 PST, Monday, March 21, 1988

Seismicity, deformation and gas emissions are at background levels.

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Report at 0730 PDT, Tuesday, April 19, 1988

Seismicity, deformation and gas emissions are at background levels.

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**1989**

**VOLCANIC AND SEISMIC ACTIVITY AT MOUNT ST. HELENS**

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Report at 1700 PDT, August 25, 1989

INFORMATION UPDATE

AUGUST 25, 1989  
1700PDT

Two episodes of sustained seismicity beneath Mount St. Helens occurred within the past 24 hours. Frequent small shallow earthquakes followed these events and are continuing. No other changes to the lava dome or crater floor were observed today. This seismicity represents an increase in the level of activity since October 1986; its significance in terms of future activity is uncertain.

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Report at 1130 PDT, Wednesday, September 06, 1989

Since August 31, 1989 there have not been any additional sequences of seismic events similar to that which occurred on August 24. Small magnitude earthquake activity remains above average. Prior to August 14, Mount St. Helens had fewer than 1 earthquake per day. We are currently locating several events per day. If there are significant changes in the current level of activity another update will be put on the system.

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Report at 1100 PST, Friday, December 08, 1989

A seismic event much like those that occurred in late August took place for about 5 hours late yesterday. The event began at approx 1610 local time and continued until approximately 2121. Several closely spaced, small earthquakes occurred at the onset, and the event continued as tremor-like seismicity with numerous small embedded earthquakes. Preliminary locations indicate that the initial earthquakes occurred at about 2 km beneath the dome, and at least some of the later earthquakes were shallower. Amplitude of the background seismicity decreased through the course of the event and diminished abruptly to background at the end.

Minor deformation of the dome accompanied the event. A displacement meter on the dome showed about 16 mm of extension, and tiltmeters on the north and west flanks recorded abrupt outward tilts on the order of 10 to 100 microradians. A gas sensor on the dome did not respond to the event.

Weather prohibits our visiting the crater today. If there are significant changes in the current level of activity another update will be put on the system.

**1990**

**VOLCANIC AND SEISMIC ACTIVITY AT MOUNT ST. HELENS**

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Report at 1800 PST, Saturday, January 6, 1990

A small explosion, possibly accompanied by an avalanche from the lava dome, occurred at 5:37 a.m. PST on Saturday, January 6. Radio signals from three stations in the crater, one on the north flank of the dome and two on the crater floor north of the dome, were lost as a result of the event. There have been several reports of a light dusting of fine, gritty ash in the Yakima area, 130 km northeast of the volcano.

Seismic activity has returned to near background levels. Current weather conditions prevent visual observations of the volcano. Tomorrow a field party will investigate the extent of the ashfall. When weather permits, further observations will be made in the crater.

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Report at 1500 PST, Monday, January 8, 1990

Crews were unable to fly to the crater today owing to poor weather conditions. Seismic activity continues at near background levels. Preliminary analysis of ash samples collected 12 miles east of the volcano indicate most of the material is old dome rock.

Tomorrow, if the weather permits, field crews will make observations in the crater, repair damaged instruments, and collect more ash.

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Report at 0930, Thursday, January 11, 1990

USGS crews reached the crater yesterday afternoon for the first time since the ash emission event on January 6. During a brief visit, they surveyed damage to three instrument stations in the crater, examined the January 6 deposit, and made ground deformation measurements on the lava dome.

The only noticeable change on the dome is a new steaming area high on its north flank; the vent for the ash emission must be buried by snow. A tiltmeter and a surveying target in the new steaming area were destroyed, apparently by a rockfall. A seismometer, tiltmeter, and magnetometer on the crater floor north of the dome also were damaged.

The January 6 deposit is 10-30 cm thick on the crater floor immediately north of the dome, and contains clasts at least as large as 25 cm in diameter. At Yellow Rock (about 700 m north of the dome), the deposit is 1 cm thick and includes clasts up to 1 cm in diameter. At both locations, the deposit consists mostly of rock fragments from the dome.

EDM measurements to stations on the dome indicate that movement since the last

measurements on December 22 was concentrated on the north flank. As soon as weather conditions permit, EDM measurements will be repeated to determine whether the movement is continuing.

Seismic activity beneath the volcano remains at a normal background level. If there are significant changes in the current level of activity or significant new observations from the field, another update will be put on the system.

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Report at 1100 PDT, Wednesday, April 25, 1990

At 0126 PDT this morning, a small explosion occurred on the lava dome at Mount St. Helens. The explosion was followed by several hours of increased seismic activity. The seismic signal from this event was smaller than the 12/07/89 and 01/06/90 explosion signals.

Current weather conditions prevent visual observations at the volcano.

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Report at noon, Friday, June 8, 1990

There was a two hour period of increased seismic activity last night at Mount St. Helens. The increase began at 2251 PDT on the 7<sup>th</sup>. Tilt and strain meters in the crater did not respond to the activity.

Seismicity returned to background after the two-hour increase.

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Report at 0545 PST, Monday, November 5, 1990

MOUNT ST. HELENS  
INFORMATION STATEMENT

NOVEMBER 5, 1990  
0545 PST

Seismic signals at Mount St. Helens increased abruptly at 0207 PST. The strong seismic signals continued for about 6 minutes and then gradually returned to background over the next 2-3 hours. Pilots reported a plume to an altitude of 25,000-30,000 feet, and the Skamania County Sheriff reports light ashfall south of Mount St. Helens. The seismic signal resembles that of January 6, 1990, and probably records a small explosion on the dome. A small mudflow detected by seismometers along the North Fork of the Toutle River was not sufficiently large to trip flood gages.

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Reported at 1500 PST, Tuesday, November 6, 1990

MOUNT ST. HELENS  
INFORMATION STATEMENT

NOVEMBER 6, 1990  
1500 PST

Seismicity at Mount St. Helens returned to background level several hours after yesterday's small explosion (at 0207 PST on November 5) and has remained at background level since then.

A field crew in the crater yesterday found a blanket of hot dome blocks and finer-grained material overlying snow on the crater floor northwest and north of the dome; in addition, hot dome blocks up to about 2 meters in diameter were scattered on the lower part of the west crater wall northwest of the dome. These deposits represent rock debris from the explosion and from a rock avalanche on the north side of the dome. Water originating from snow melted by the hot debris blanket generated a debris flow that drained into both Loowit and Step Gulches and thence into the North Fork of the Toutle River in the early morning hours. Later in the morning, observers near Elk Rock (about 12 miles northwest of the crater) saw no definitive evidence of a flood event. The explosion and avalanche destroyed two seismic stations and a 20 foot steel tower on the crater floor north of the dome. A seismic station on the dome and one in an underground vault on the north crater floor survived the event.

The plume from yesterday's explosion was blown to the southeast. Light ashfall was reported as far away as Fossil, Oregon (125 miles southeast)

This event is one of a family of small explosions that have occurred on the dome since August 1989. These explosions occur without recognizable warning, have significant effect only within the crater, and are likely to recur.

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Report at noon, Thursday, November 15, 1990

Last night at 2341 PST the Mount St. Helens seismic net recorded a small explosion-type signal. The event lasted less than 5 minutes. There were no visual observations or plume reports associated with this event. Seismicity remains at background levels today.

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Report at noon, Wednesday, November 21, 1990

Yesterday at 1058 PST the Mount St. Helens seismic net recorded another small explosion-type signal. The event lasted less than 2 minutes and was followed by a few small earthquakes. There were no visual observations or plume reports associated with this event. Seismicity remains at background level today.

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Report at 1700, Wednesday, December 20, 1990

At 1259 PST today, a small explosion occurred on the lava dome at Mount St. Helens. The explosion was marked by a strong seismic signal which decreased after several minutes to low

levels and continued for several hours. Pilots reported a light gray plume to 23,000 feet. Strong winds aloft carried the plume to the south-southwest, and minor ashfall was reported as far as ten miles southwest of the volcano. The explosion did not cause a mud or water flow event.

This event is one of a family of small explosions that have occurred on the dome since August 1989. These explosions occur without recognizable warning, have significant effect only within the crater, and are likely to recur.

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Report at noon, Friday, December 21, 1990

The continuous low-level seismicity which followed yesterday's explosion ended by early evening. Seismic activity since yesterday evening has consisted of small individual earthquakes occurring at a rate of several per hour.

Field observations yesterday afternoon showed a new fragmental deposit on the east flank of the dome and the adjacent crater wall. A deposit of fine ash from the vertical eruption plume extends southwestward from the volcano.

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Report at noon, Monday, December 24, 1990

The number of small earthquakes which followed the December 20 explosion decreased to background on Saturday. A one hour episode of increased seismicity occurred between 1100 and 1200 on Sunday, December 23. There was no plume associated with the seismic increase.

Seismicity remains at background today.

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**1991**

**VOLCANIC AND SEISMIC ACTIVITY AT MOUNT ST. HELENS**

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Reported at 0850, Tuesday, February 5, 1991

A small explosion occurred at Mount St. Helens at 0747 this morning. A resulting plume initially rose straight up above the volcano to a level of approximately 14,000 feet. Winds then blew the plume towards the southeast. The color of the plume initially was white, probably composed predominantly of steam, and after about three minutes turned a darker color, likely due to minor amounts of associated ash. The strong seismic signal lasted less than 10 minutes. Seismicity is at near background levels at the time of this statement.

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Reported at 0915, Thursday, February 14, 1991

A seismic event similar to those that accompanied recent small explosions on the Mount St. Helens dome occurred at 0524 PST. A pilot report shortly after 0600 PST indicated that it was too dark to detect an ash plume; however, there have been ashfall reports from Yakima County during the last few minutes. Instrumentation at Loowit indicated that a small flow passed through the Loowit channel; however, the flow was too small to register on downstream stations.

Seismicity is slightly above background at this time.

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