



Metro



# 1980 Mt St Helens Ash Cleanup

*Jim Quinn, Metro*

*December 2025*

1-1 About us - Tokyo Metropolitan Area -



Resident Population: 13.9 million      Daytime Population: 15.9 million  
Land Area: 2,194km<sup>2</sup> (cf. State of Washington: 184,690km<sup>2</sup>, Cowiitz county: 3,019km<sup>2</sup>, Multnomah County: 1,100km<sup>2</sup>)  
Distance between Mt. FUJI and our city: about 100km (62 miles)





Mt St Helens, pre-1980



Mt. Fuji

# Today's presentation

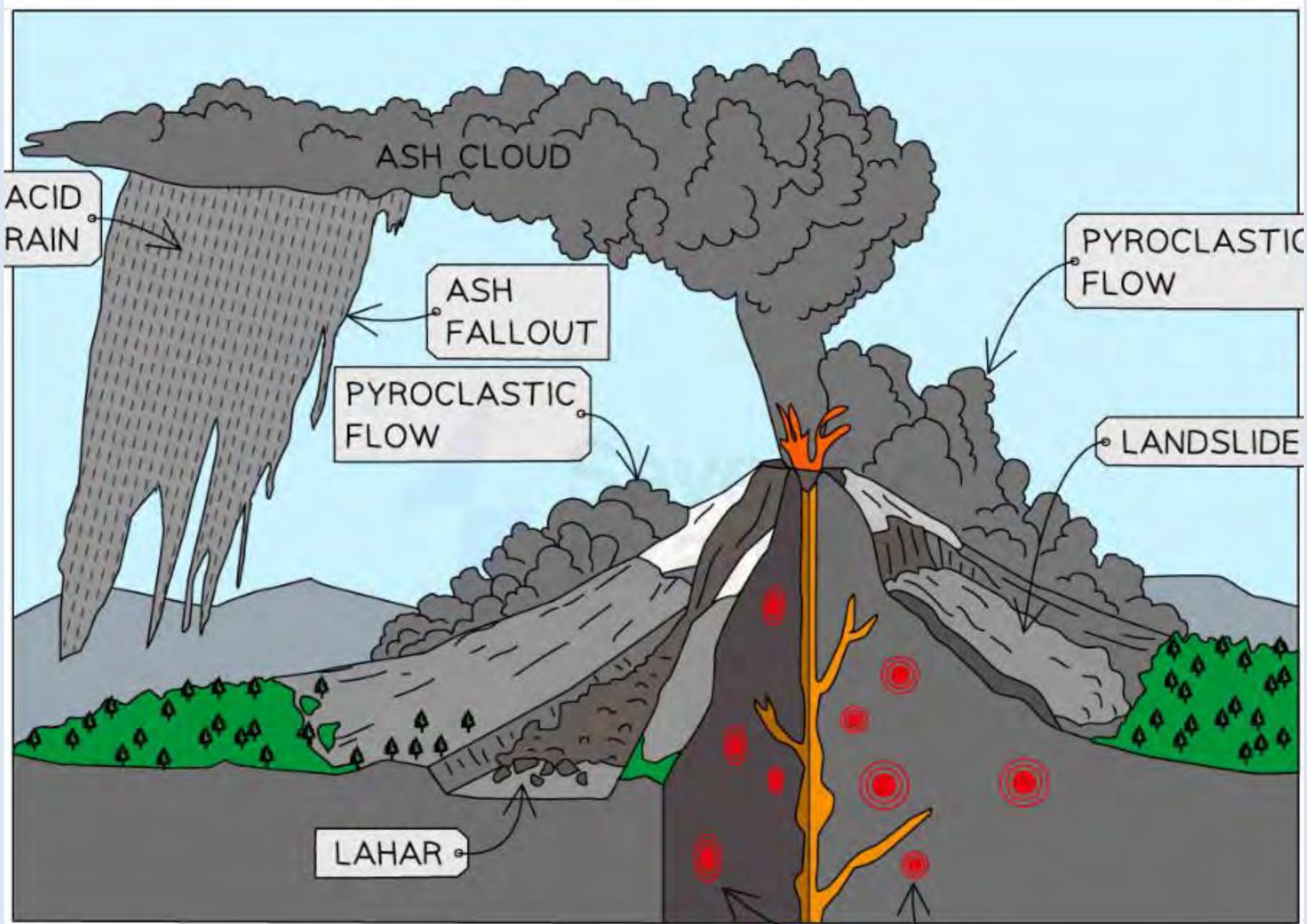
- Mt St Helens eruption overview
- Ash characteristics & dispersal
- Impacts
- Cleanup & disposal
- Planning for ash
- Information resources





*Eruption of Mt. St. Helens from Portland, Oregon*

CardCow.com  
Photo: David Lumen



ACID RAIN

ASH CLOUD

ASH FALLOUT

PYROCLASTIC FLOW

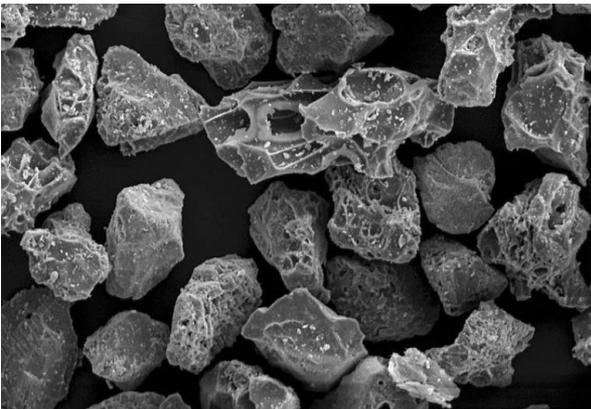
PYROCLASTIC FLOW

LANDSLIDE

LAHAR

# Ash

- Fine fragments (less than 2-4 mm in diameter) of volcanic rock formed by a volcanic explosion or ejection from a volcanic vent.

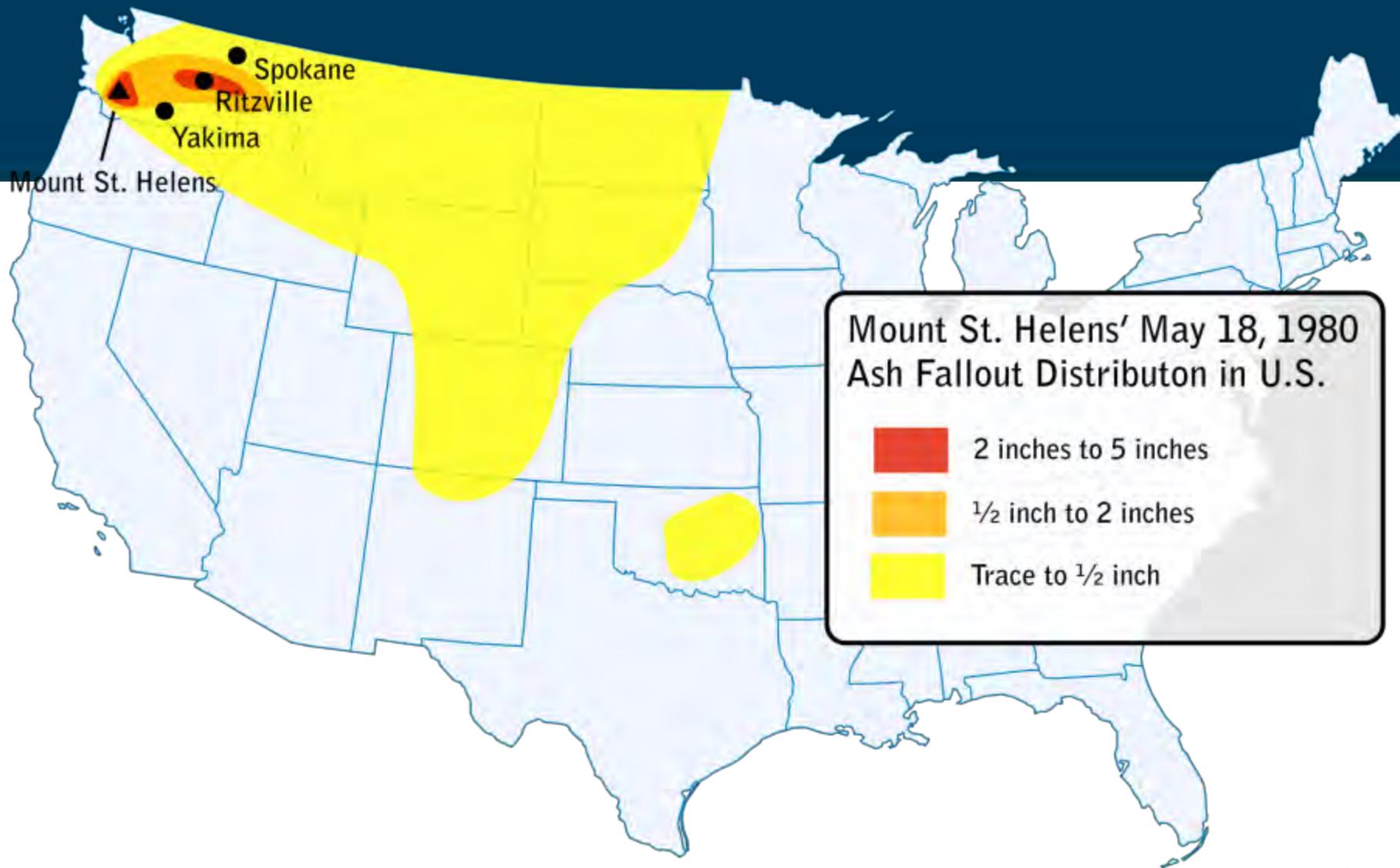


Weiprecht, D. 198  
Ash from Mount St. Helens eruption on May 18, 1980 collected 39 km  
(24 mi) downwind, in Randle, Washington.

# Ash- Mt St Helens

- 15-mile (24 km) high column of ash
- ~540 million tons emitted, during 9 hours of vigorous eruptive activity
- deposited in 11 US states



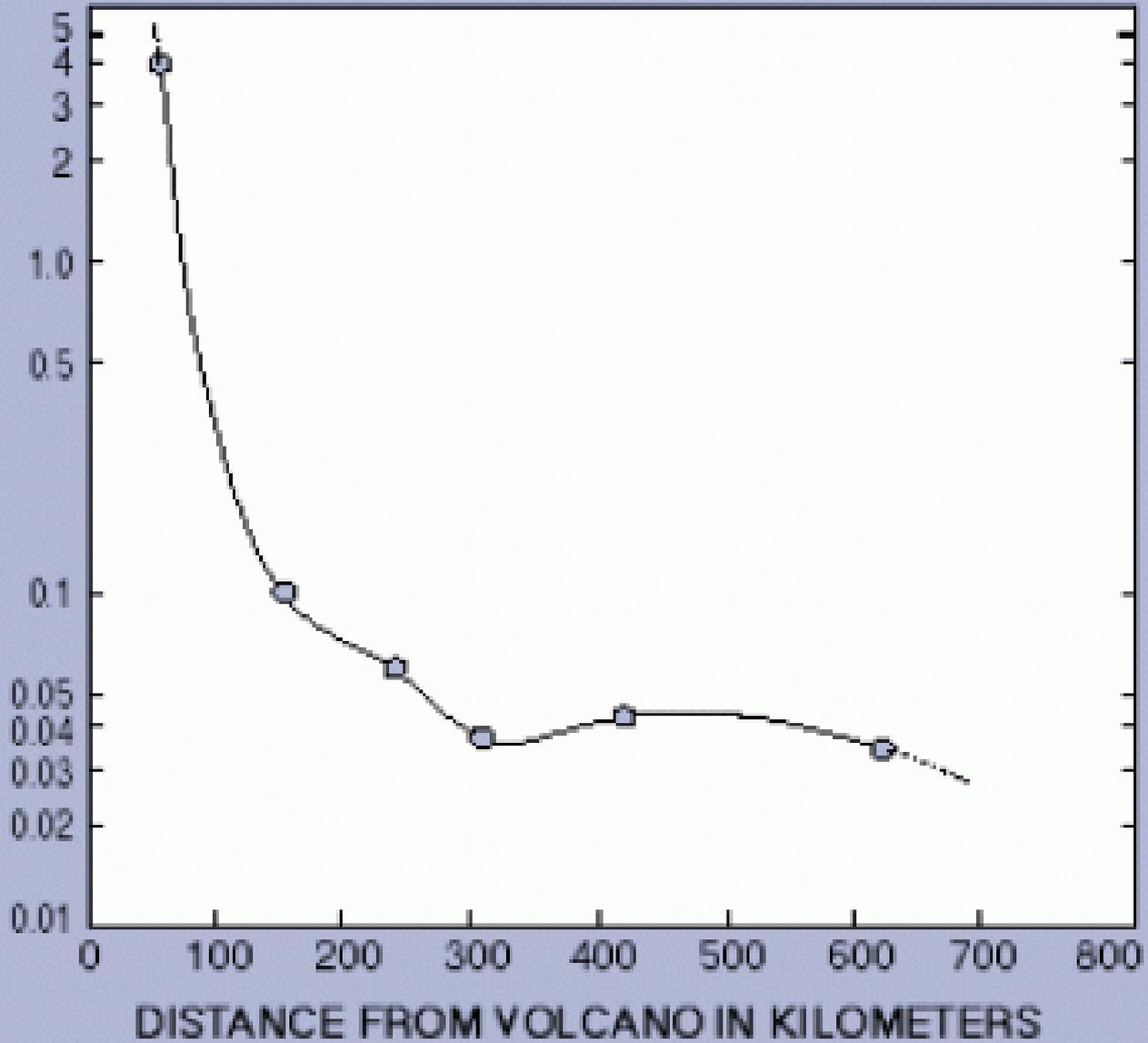


information from the USGS map of the same title.

# Particle size (USGS)

“The **average grainsize** of rock fragments, including volcanic ash, emitted from a single exploding volcanic vent **varies greatly among different eruptions**, even within a single explosive event lasting hours to days. Heavier, larger rock fragments typically fall back to the ground on or close to the volcano, and progressively lighter, **smaller fragments are blown farther** from the volcano by wind. Volcanic ash, the smallest particles, can travel tens to thousands of kilometers downwind from a volcano depending on the wind speed, volume of ash erupted, and height of the eruption column.”

MEAN GRAIN DIAMETER,  $\phi$ , IN MILLIMETERS





# Ash impacts

- Highways, waterways
- Crops
- Vehicles & equipment
- Aviation
- Water treatment, sewage plants
- Health



*Seattle Times*, Sunday, May 14, 2000, “Mount St. Helens Remembered”

<https://special.seattletimes.com/o/special/helens/story1.html>

# Health Impacts

“... transient excesses in adverse respiratory effects occurred in two high-risk groups--hypersusceptibles (with preexisting asthma or chronic bronchitis) and heavily exposed workers”

*-American Journal of Public Health, 1986*



# Yakima, Washington

Yakima is 85 miles  
(137 km) northeast  
of Mt St Helens



# Yakima, Washington

Population in 1980  
was ~ 172,000

Cleaned up  
~ 600,000 tons of  
ash, > 31,000 dump  
truck loads

Roads were cleared  
in 10 days, the  
entire cleanup took  
10 weeks



# Yakima, Washington

- Had 3 street sweepers, acquired 12 more, plus water trucks, dump trucks, front end loaders, graders, vacuum trucks from Seattle & Portland
- Had to close the sewage treatment plant to prevent damage, discharged raw sewage to the river
- Much of the ash was deposited on open park land
- Cleanup cost was around \$2 million (1980 dollars)





**Chesterley Park – Yakima, WA in 2021- (volcanic ash site)**

# Elsewhere

- In Spokane, Washington (245 miles/397 km from MSH) the particles were too small to clean up with street sweepers, they just made it airborne. Damp sawdust was placed on top of ash to facilitate cleanup.
- An estimated 900,000 tons of ash was removed from highways and airports in Washington



Residents of Ritzville, Washington, clean up ash in the city park after Mount St. Helens erupted on May 18, 1980.

# Portland

Portland was spared in the initial eruption, but there were 2 subsequent explosive eruptions.

MT. ST. HELENS ASH CLEANUP

by Jerry Markesino,  
Street Cleaning Supervisor  
Department of Public Works, Portland, Oregon

June 12: "Within two hours the city and surrounding areas were engulfed in snowstorm-like fallout of fine volcanic ash."



<https://efiles.portlandoregon.gov/record/13642498/>

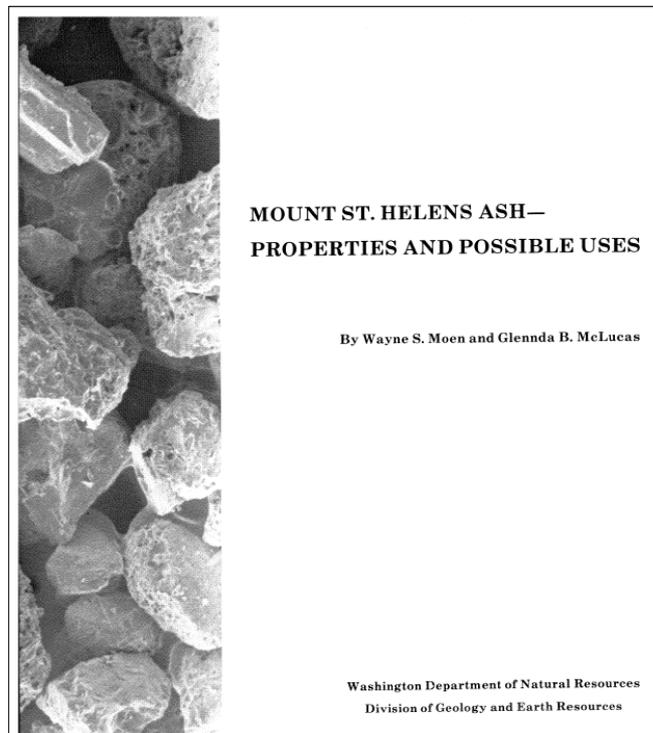
# Uses for ash?

- Helenite, figurines



# Uses for ash?

- 1981 WA Dept of Natural Resources study



# Planning for ash

“We know we have recharge of the magma chamber now. We could have an eruption with a few days warning; it could be 100 years from now”

- *Carolyn Driedger, USGS*



# Pre- 1980

- Most recent pre-1980 eruption ended in 1857.
- 1960s & 1970s: geological studies of MSH historical eruptions. 1975 article in Science: “eruption is ... likely to occur within the next one hundred years, and perhaps even by the end of this century”
- Local official: “If you wrote an [eruption] contingency plan before [1980], you would have been laughed out of town”



# FEMA, USGS

- FEMA was 1 year old when MSH erupted- their first major natural disaster response
- FEMA did not directly conduct ash removal- played a crucial role in providing resources & technical assistance
- USGS expanded staffing, deployed new instruments, developed new tools for eruption forecasting, created new communication pathways, etc.



# Active volcanos in the Cascades

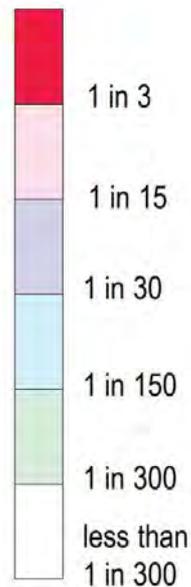
OR: Mount Hood,  
Mount Jefferson,  
Newberry Volcano,  
and Crater Lake

WA: Mount Baker,  
Glacier Peak,  
Mount Rainier,  
Mount St. Helens,  
and Mount Adams

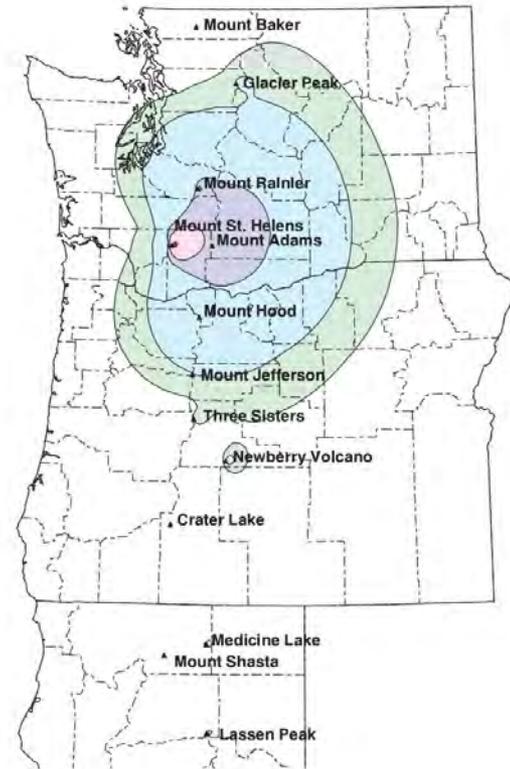
& Mt Lassen in  
California



Map showing 30-year probability of accumulation of 1 centimeter (0.4 inch) or more of tephra from eruptions of volcanoes in the Cascade Range.



Map showing 30-year probability of accumulation of 10 centimeters (4 inches) or more of tephra from eruptions of volcanoes in the Cascade Range.



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# Mount St. Helens – Mount Adams Volcanic Region Coordination Plan



Coordinating efforts among public and private  
agencies in the event of volcanic unrest in the  
Mount St. Helens and  
Mount Adams volcanic region

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October 2014

Washington Military Department, Emergency Management Division

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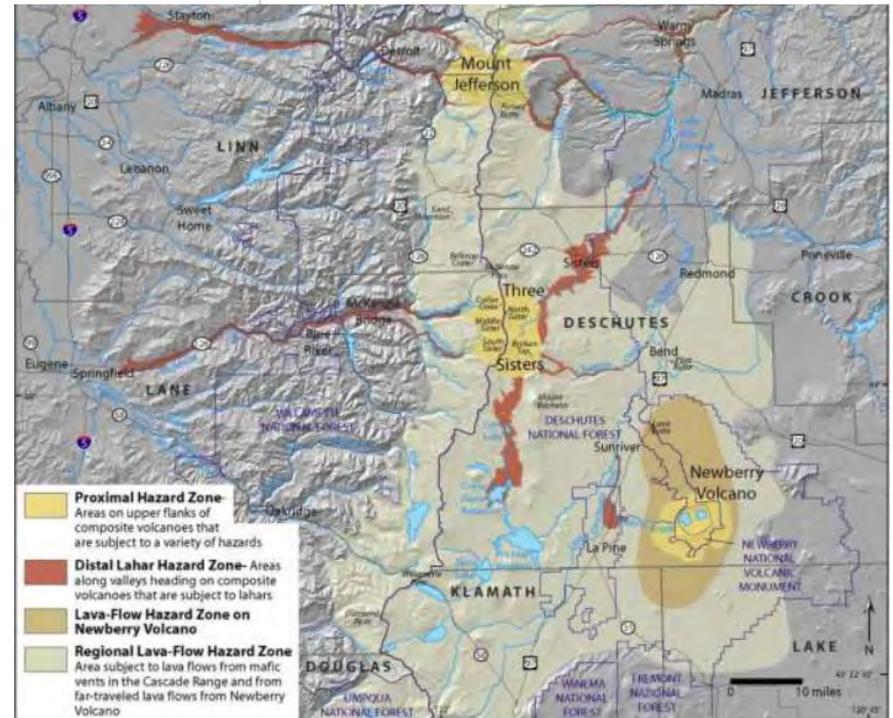
[https://volcanoes.usgs.gov/vsc/file\\_mgr/file-132/mount-st.-helens---mount-adams-volcanic-region-coordination-plan-october-2014.pdf](https://volcanoes.usgs.gov/vsc/file_mgr/file-132/mount-st.-helens---mount-adams-volcanic-region-coordination-plan-october-2014.pdf)

# Central Cascades Volcano COORDINATION PLAN

July 2019

Prepared by:

The Central Cascades Volcano Facilitating Committee



[https://www.oregon.gov/oem/documents/  
central\\_cascades\\_coordination\\_plan.pdf](https://www.oregon.gov/oem/documents/central_cascades_coordination_plan.pdf)

# USGS Resources

## Volcanic Ashfall Impacts Working Group

### Cleanup, Disposal & Reuse

Why clean up  
ash?

Prepare for  
Cleanup

Clean-up  
strategies

Ash Disposal

Personal  
Protection PPE

Cleaning up:  
outside

Cleaning up:  
inside

Airport Clean-up

Roadways

Servicing  
Machinery

Equipment &  
Appliances

Power System  
Operators

Safety  
Considerations

When to Remove

Reuse of Ash

**Remobilisation—  
Long-Term Ash**

**Preparedness**

**Citizen Science**

**Case Studies**

Eruptions of Mount St. Helens: Past, Present,  
and Future, 1990 [[link](#)]

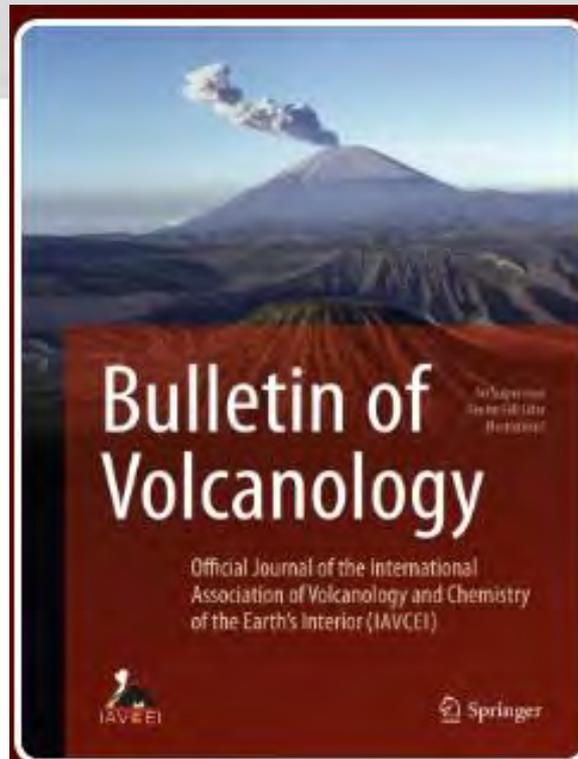


[https://volcanoes.usgs.gov/volcanic\\_ash/](https://volcanoes.usgs.gov/volcanic_ash/)

GUIDELINES ON  
PREPAREDNESS  
BEFORE, DURING AND  
AFTER AN ASHFALL



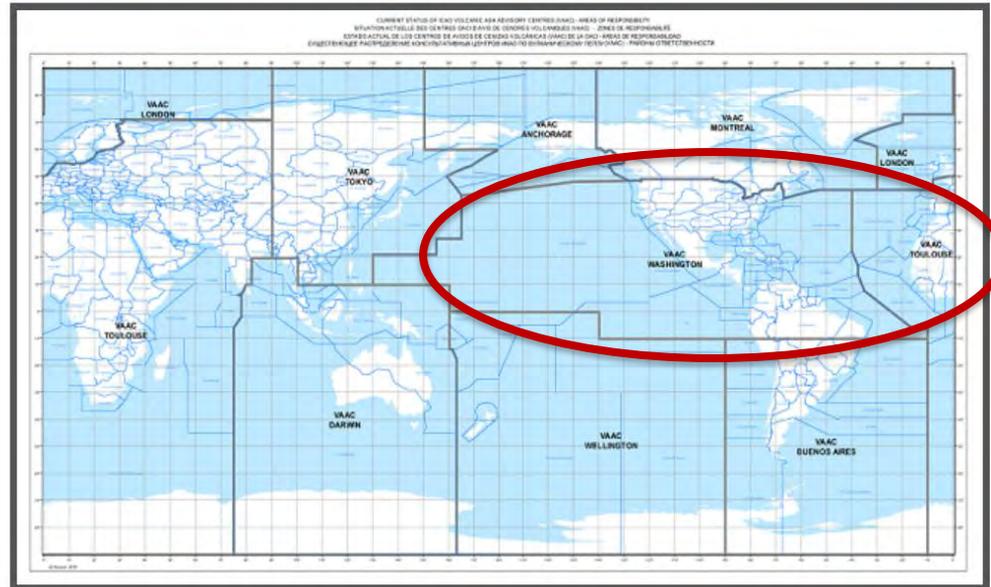
[https://www.ivhhn.org/images/pamphlets/  
Preparedness Guidelines English WEB.pdf](https://www.ivhhn.org/images/pamphlets/Preparedness_Guidelines_English_WEB.pdf)



Bulletin of Volcanology 2023, “Development of a volcanic risk management system at Mount St. Helens—1980 to present”

<https://link.springer.com/article/10.1007/s00445-023-01663-y>

# NOAA- Washington Volcanic Ash Advisory Center



<https://www.ospo.noaa.gov/products/atmosphere/vaac/>

“We look forward to future activity of Mount St, Helens with great apprehension, but we are prepared to deal with her if necessary.”

*- Jerry Markesino,  
Portland street  
cleaning supervisor,  
1980*



“One really important thing as we move on in time from that memorable eruption is that memory really needs to be transmitted down through time so future generations don’t forget that these are active volcanoes, and you need to be prepared for them to act up from time to time.” *Carolyn Driedger, USGS*



# Tokyo revises volcano response plan, outlines steps for Mount Fuji ashfall

By HANA KUSUMOTO

STARS AND STRIPES • September 30, 2025



Mount Fuji, Japan's tallest mountain and an active volcano, sits less than 62 miles from central Tokyo. (Aaron Kidd/Stars and Stripes)



**TOKYO** — The Tokyo Metropolitan Government has laid out detailed procedures to follow in the event of a volcanic eruption near the capital, including specific steps to deal with ash from Mount Fuji.

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