30 Years of Responding to Volcanic Activity: Nature's Lessons for Applied Volcanology

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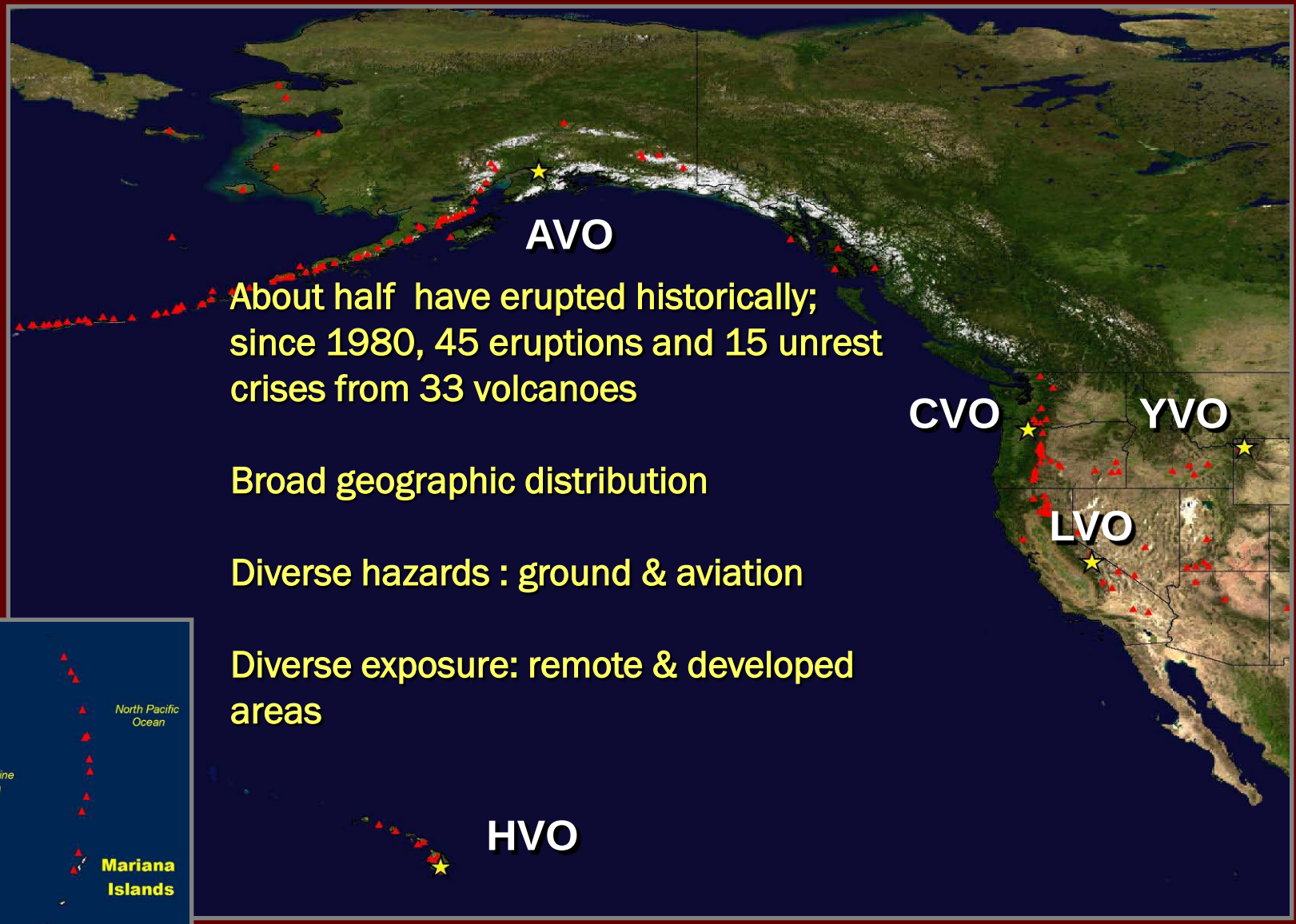
USGS

The US has abundant and diverse volcanism.

169 Holocene (<10,000 yrs) volcanoes (Smithsonian data)



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On MARCH 18, 1980, no one thought that a major eruption in the conterminous U.S. was imminent.....

- On March 20, 1980, after a quiet period of 123 years, earthquake activity once again began under Mount St. Helens.
- 7 days later, on March 27, small phreatic (steam) explosions began.
- Barely 2 months later came the catastrophic eruption on 18 May 1980.

A quiet volcano today may not be quiet tomorrow.

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Huge eruption column, >15 miles high

Pyroclastic flows, 5 mile extent

Lateral blast, 17 mile extent

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Volcanoes present diverse, far-reaching hazards.

Huge debris avalanche and mudflows, reaching the Columbia River

Ash fall affecting 10 states

57 people dead – many more if eruption had not occurred on a Sunday

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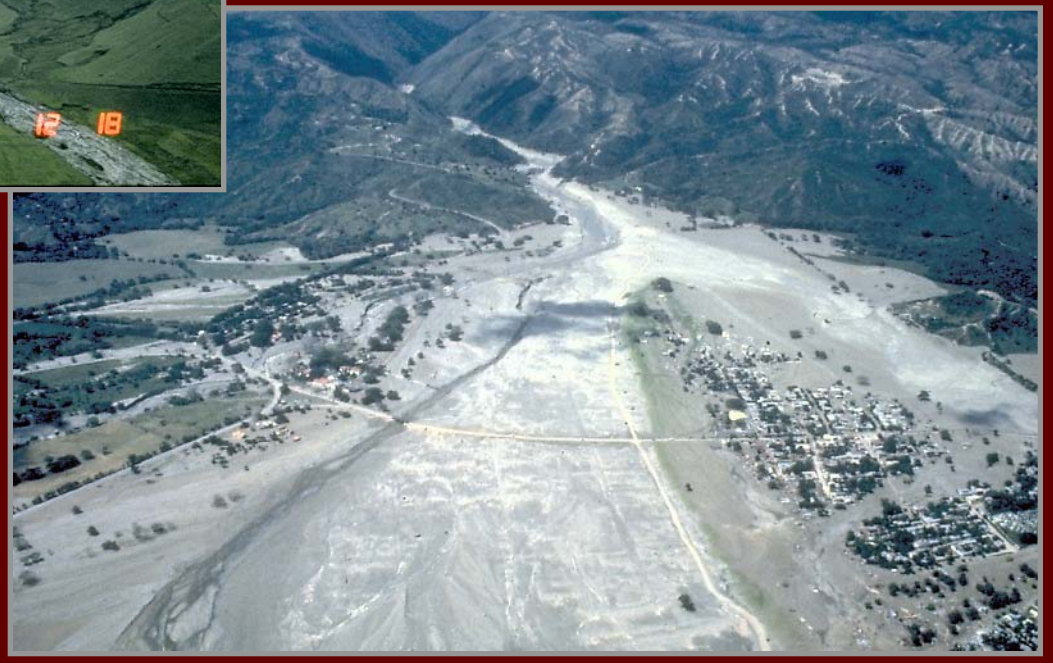
COLOMBIA, 1985: 23,000 souls buried alive by mudflows from a small eruption of Nevado del Ruiz volcano.



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Volcanologists must work with emergency managers and the public to prevent similar disasters.

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FLYING INTO ASH: All engines failed, 4 minutes powerless descent, near crash of passenger jet.

Volcanic ash poses very real hazards – both costly & life threatening – to aviation. *There are no remote volcanoes with respect to aviation hazards.*

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PINATUBO, PHILIPPINES, 1991

Successful hazard assessment, monitoring response, and forecast.
60,000 evacuated.

We can do it right.

USGS

Akutan, AK, 1996

USGS scientist explaining to seafood processing employees rattled by earthquake swarms that the nearby volcano did *not* pose a major threat to them.

Strive to ensure that people neither under react nor overreact.

USGS

The stakes are too great to be playing catch-up with a volcano about to erupt

Instruments need to be in the ground and community linkages in place before the onset of unrest.

The reactive strategy – wait for unrest, then deploy – is flawed. Experience has shown that playing catch-up with volcanoes is ineffective and dangerous.

The eruption fuse can be very short.

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Summary

A quiet volcano today may not be quiet tomorrow.

Hazards can be diverse and far-reaching.

Scientists must embrace their role in crisis response.

For aviation, there are no “remote” volcanoes.

Neither over-reaction nor under-reaction is good.

The eruption fuse can be very short.

Instruments and plans have to be in place before the crisis starts.

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End

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