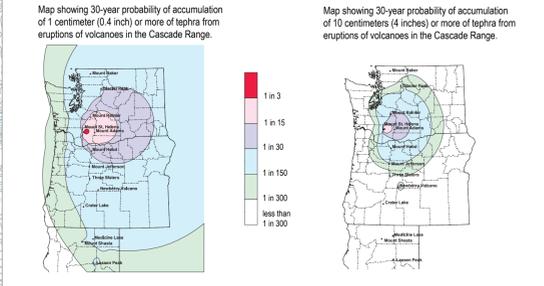


Map showing hazard zones for very large magnitude, but very infrequent events at Mount Hood. Solid black line, hazard zone for directed blast similar in behavior to the 1980 event at Mount St. Helens [10]; triangles, vents for lava flows during the past two million years; dashed black line, regional lava flow hazard zone based on future eruptions occurring within zone defined by these vents [8]. A directed blast probably would only affect a 90 to 180 degree sector of the hazard zone. The white line encompasses proximal hazard zones A and B.



EXPLANATION

This volcano-hazards-zonation map delineates the relative degree of hazard near Mount Hood from future eruptions and other hazardous geologic events. Eruptive events are characterized by extension of lava domes and, less likely, of lava flows. Collapse of growing lava domes generates pyroclastic flows that can melt snow and ice to produce lahars and floods. Landslides of altered rock from high on Mount Hood can be triggered by eruptions, but can also occur without eruptive activity. Such landslides, called debris avalanches, also produce lahars. Eruptions of Mount Hood, as well as other volcanoes in the Cascade Range, generate tephra clouds that are transported by wind and can affect areas hundreds of kilometers (hundreds of miles) away.

Boundaries between hazard zones do not represent sharp changes in hazards. Rather, the degree of hazard decreases gradually in a down-valley direction and more rapidly as height above valley floors increases.

Numerals in brackets refer to end notes in booklet.

Proximal Hazard Zones

Areas subject to rapidly moving, devastating pyroclastic flows and surges, lahars, and debris avalanches that can sweep out to the hazard boundary in less than 30 minutes. Also subject to ballistic projectiles and lava flows. Subdivided into two zones depending on vent location.

- Hazard zone PA — vent at or near Crater Rock, which is considered the most likely case during future eruptions. The 30-year probability of an eruption affecting a substantial portion of zone is estimated to be 1 in 15 to 1 in 30 [4].
- Hazard zone PB — vent on east, north, or west flank, or the summit (a summit vent also would endanger zone PA). The 30-year probability of an eruption affecting a substantial portion of zone is estimated to be about 1 in 300 [4].

Major valleys that pyroclastic flows and lahars would follow from lava-dome collapses on the upper flanks or summit. As an eruptive episode progresses, one or more of these valleys might become filled with debris, so that pyroclastic flows and lahars could then spill into adjacent valleys and affect a broader sector of a hazard zone. Also includes areas that are affected frequently (several times or more per century) by small lahars and debris avalanches generated by storms and rapid snowmelt.

Distal Hazard Zones

Valleys heading on Mount Hood that show the estimated travel time for lahars of the size used to define zones DA and DB. Subdivided into three zones on the basis of vent location, event magnitude, and probability of inundation.

- Hazard zone DA — Areas along Sandy River and its tributaries and White River that are subject to lahars generated by eruptions at vent located at or near Crater Rock and to debris avalanches and related lahars generated from steep upper flanks on west and south sides of Mount Hood. The 30-year probability of inundation of a substantial portion of zone is about 1 in 15 to 1 in 30 [4, 5].
- Hazard zone DB — Areas along Hood River that are subject to lahars generated by eruptions at vents located on upper east or north flanks and to debris avalanches and related lahars of about 50 million cubic meters. The 30-year probability of inundation of a substantial portion of this zone is about 1 in 300 [4, 6].

Areas along Sandy and Hood Rivers subject to inundation by a debris avalanche and lahar of about 500 million cubic meters, which is considered to be among the largest magnitude events possible at Mount Hood [9]. Estimated 30-year probability of such an event is very low—less than 1 in 300.

- Columbia River islands and areas along the Washington shore that could be affected by bank erosion and flooding induced by lahars and sediment-rich floods from Sandy and Hood Rivers during and immediately following eruptions.

Legend:

- 1:30 Estimated travel time for lahars in hours:minutes [3]
- Diversion structure for irrigation or power canal
- Conduit crossing for irrigation, power, or municipal water
- Railroad bridge across White River
- Major electric-power transmission line
- Boundaries of municipal watersheds of Portland (Bull Run) and The Dalles (Sandy) generated by storms and rapid snowmelt

Base from U.S. Geological Survey, 30 by 60 minute quadrangles: Condon, 1981; Goldsboro, 1980; Hood River, 1982; Mount Hood, 1983; Oregon City, 1982; and Vancouver, 1979. Digital base maps from USGS NED and Paer Index, Inc. Universal Transverse Mercator projection, Zone 10.

VOLCANO HAZARDS IN THE MOUNT HOOD REGION, OREGON

by
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