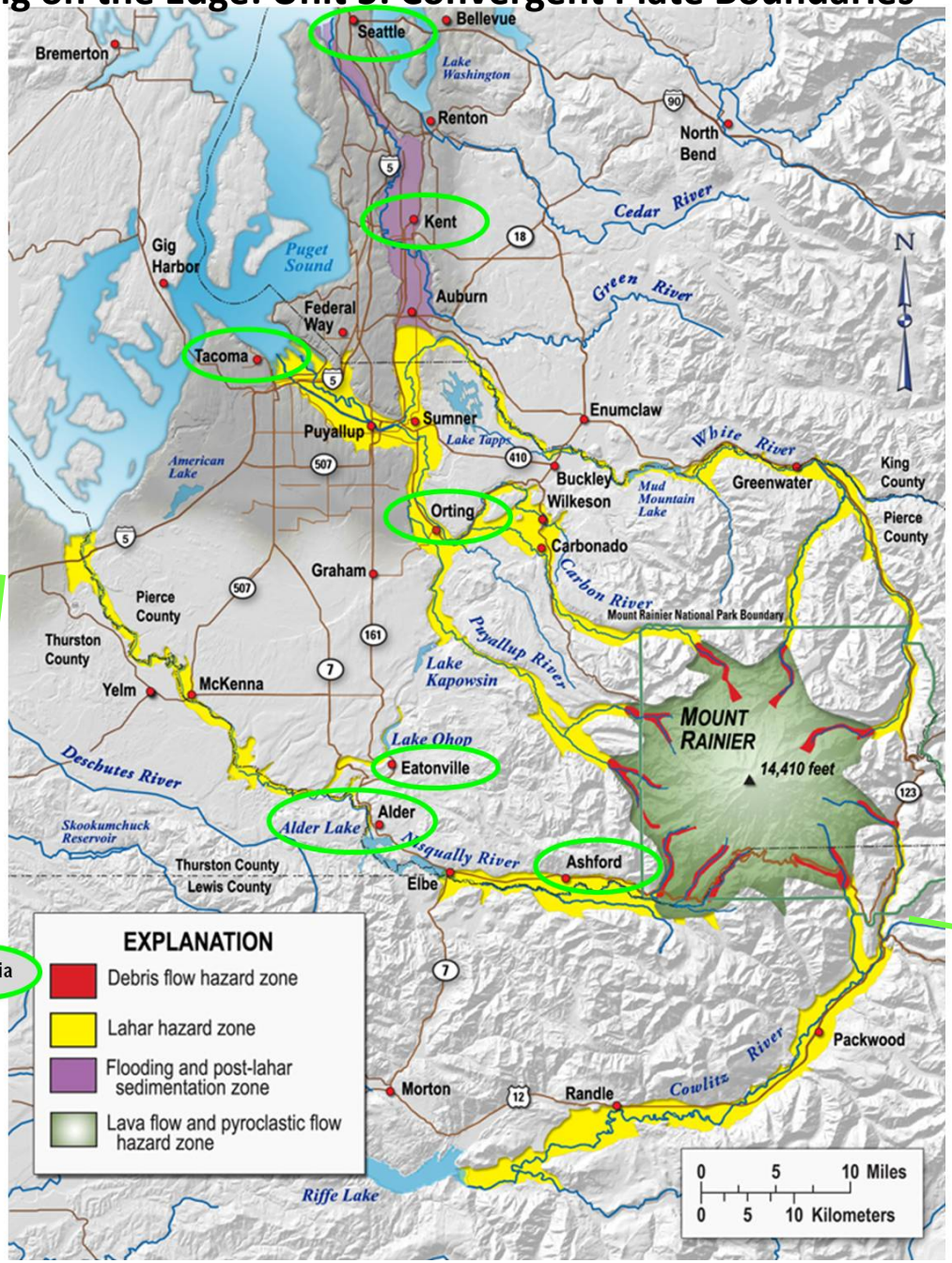
Living on the Edge: Unit 5: Convergent Plate Boundaries

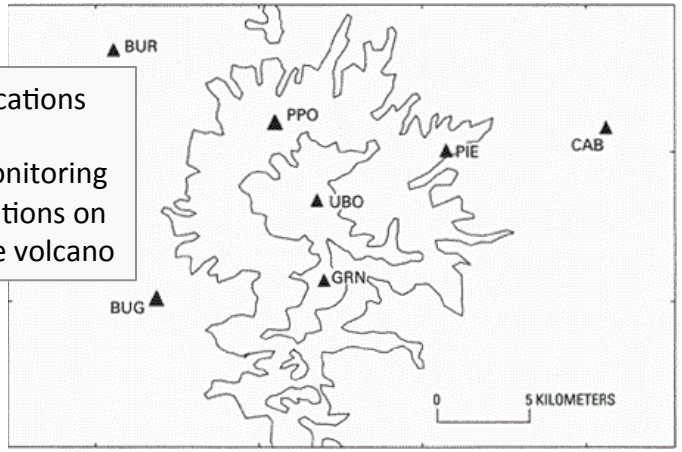


Centralia

Yakima

Because of its elevation (4,392 m), relief, hydrothermal alteration, ice cap, glacier-fed radial valleys, and proximity to suburbs of the Seattle-Tacoma area, ***Mount Rainier is the most threatening volcano in the Cascades***. Its next eruption could produce volcanic ash, lava flows, and *avalanches of intensely hot rock and volcanic gases, called pyroclastic flow*s. Some of these events swiftly melt snow and ice and could produce torrents of meltwater that erode loose rock and become *rapidly flowing slurries of mud and boulders known as lahars,* which is the greatest risk at the volcano, rather than from an eruption itself.

http://volcanoes.usgs.gov/volcanoes/mount_rainier/mount_rainier_hazard_49.html



Locations of monitoring stations on the volcano

"We call it low probability, high consequence," says Steven Bailey, Pierce County, Washington's director of emergency management. "It's a low probability it's going to occur in our lifetime. But if and when it does, the consequences are going to be huge."

www.geographyalltheway.com/igcse_geography/natural_environments/plate_tectonics/igcse_volcanoes_manage.htm

Above left, modified from: USGS Fact Sheet 2008-3062; http://volcanoes.usgs.gov/vsc/images/image_mngr/300-399/img350.jpg; Map above right from Lockhart et al., 1996

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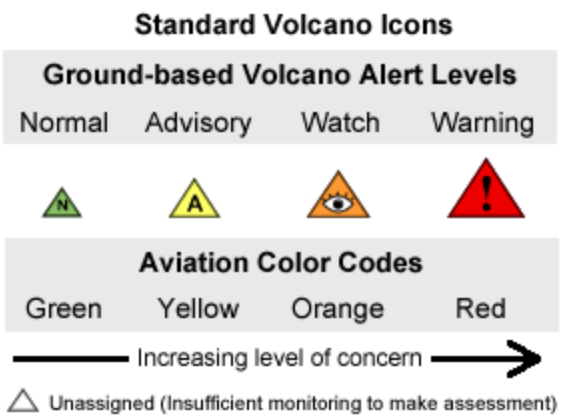
The USGS has established an alert level system to communicate the likelihood of increasing or decreasing volcanic activity. Keep these alert levels in mind as you look through the geologic activity data attached.



Alert Level	Description
NORMAL	Volcano is in typical background, non-eruptive state *or, if changing from a higher level*: The activity has ceased and volcano has returned to non-eruptive background state.
Advisory	Volcano is exhibiting signs of elevated unrest above known background level; *or, if changing from a higher level:* Volcanic activity has decreased significantly but continues to be closely monitored for possible renewed increase.
Watch	Volcano is exhibiting heightened or escalating unrest with increased potential of eruption, timeframe uncertain, OR eruption is underway but poses limited hazards.
Warning	Hazardous eruption is imminent, underway, or suspected.

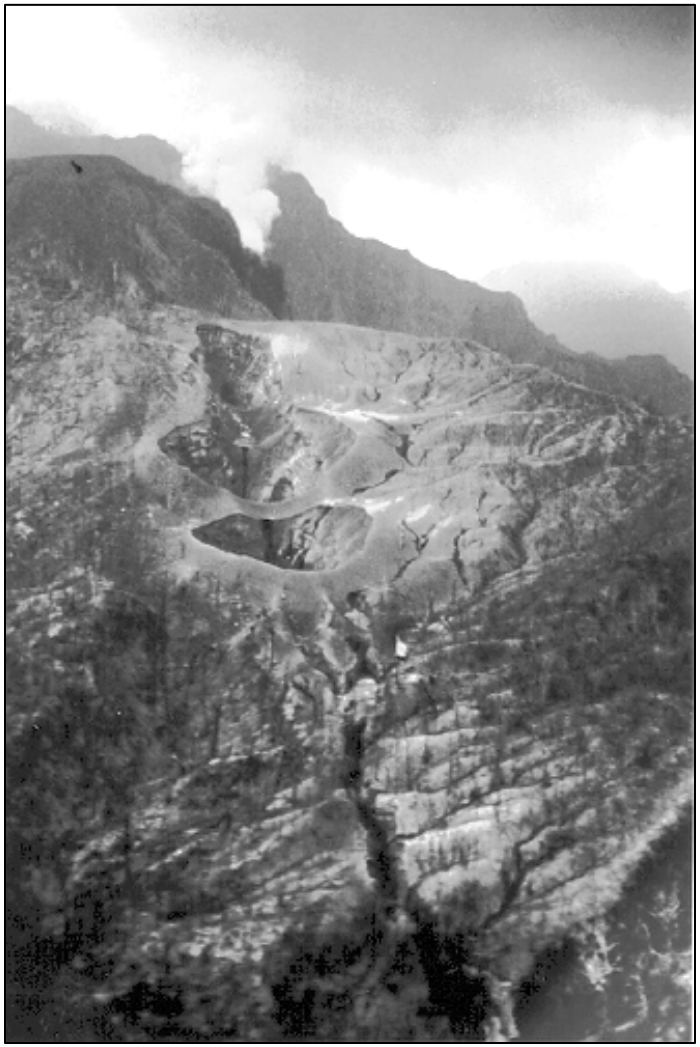
http://volcanoes.usgs.gov/activity/alertsystem/index.php#alertlevel

Note: Data included in the following handouts are from the USGS. References for specific figures and information can be obtained from your instructor.

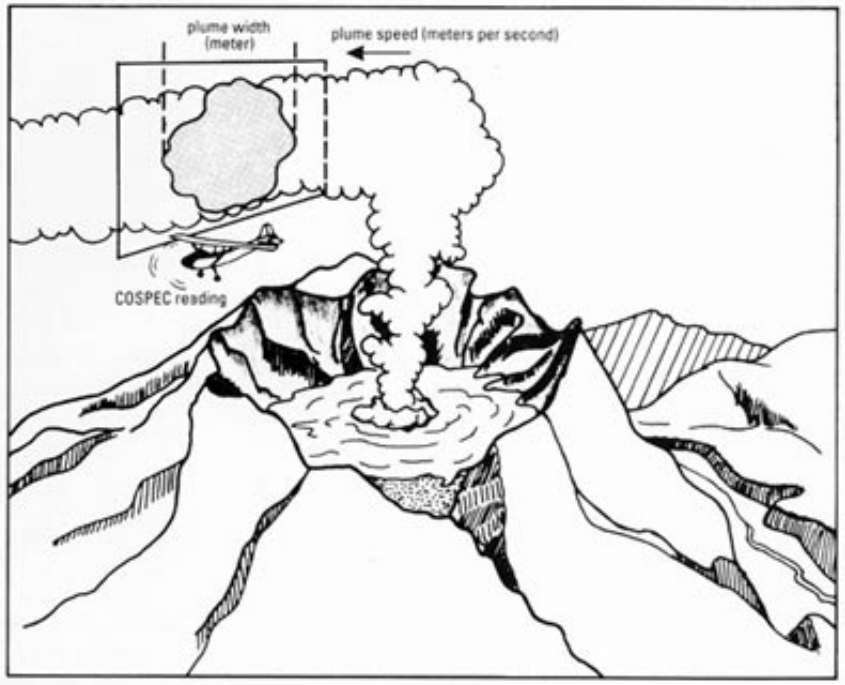
GAS, FUMAROLES & ASH
DATA SET 1:
THROUGH JUNE 8

GAS & FUMAROLES

Below and at right: Photos of fissure and line of new craters formed by explosions of April 2 on upper north flank of the volcano. View in photo below left: looking to the south, with prominent fumaroles in distance at the head of river drainage. View at right shows north arrow.



Right: To collect SO_2 flux data, an aircraft carrying the COSPEC instrument flies the plume to measure the concentration of SO_2, which is integrated over the width of the plume and multiplied by the wind speed to get the rate of SO_2 emission.

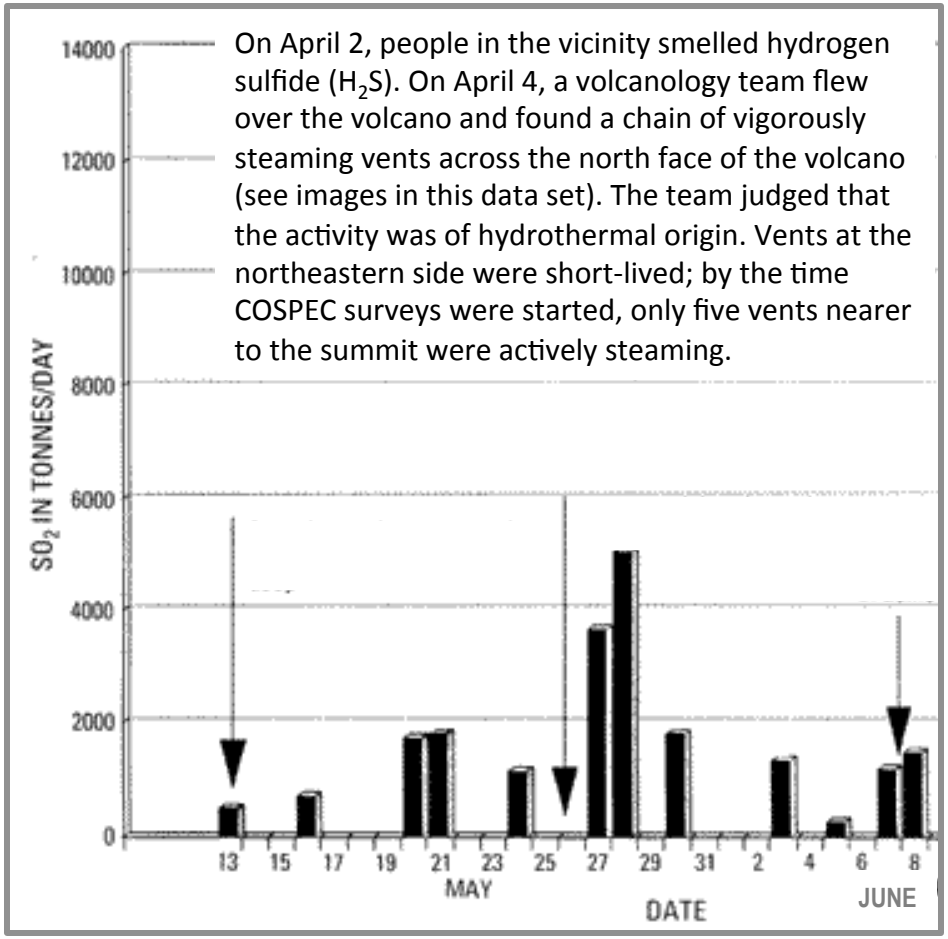


Upper left from Wolfe & Hoblitt, 1996; Upper right from Ewart et al., 1996; Graphic above right from Daag et al., 1996

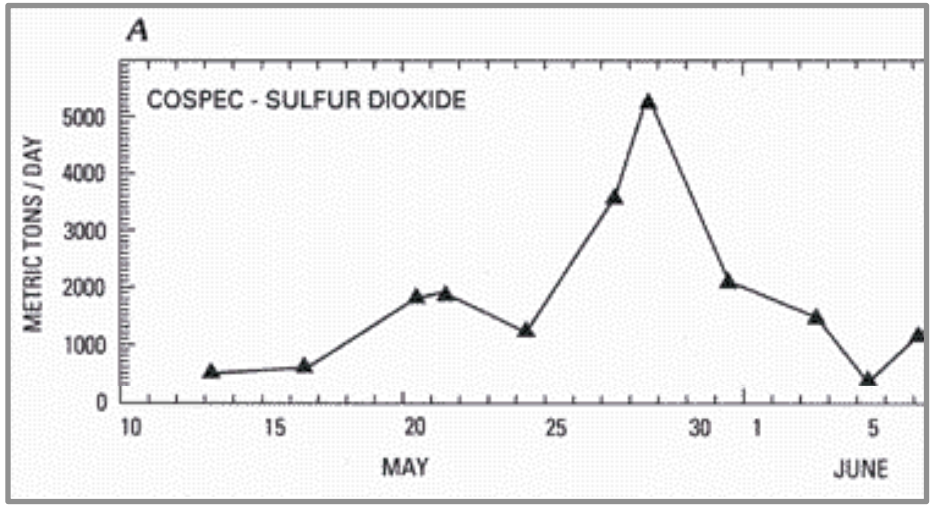
GAS, FUMAROLES AND ASH

DATA SET 1: THROUGH JUNE 8

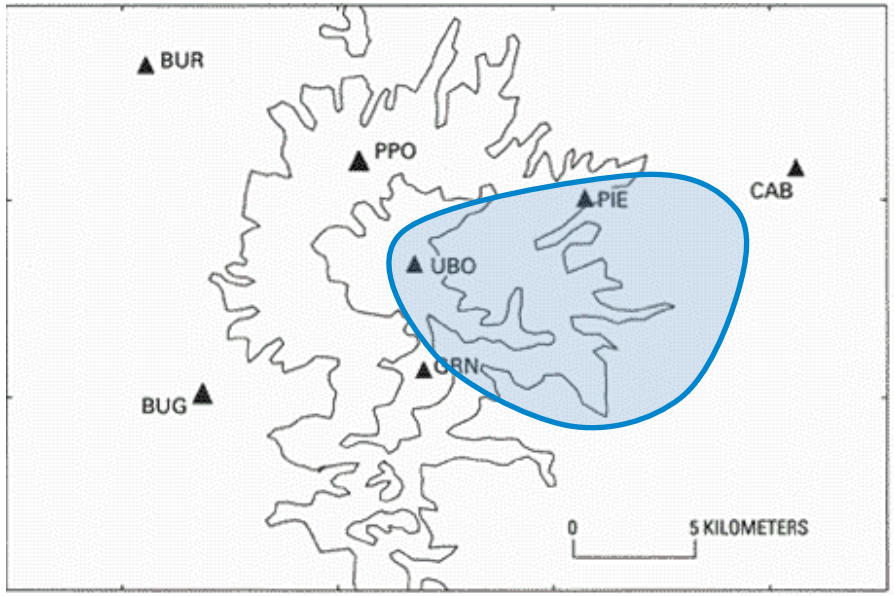
On April 2, people in the vicinity smelled hydrogen sulfide (H_2S). On April 4, a volcanology team flew over the volcano and found a chain of vigorously steaming vents across the north face of the volcano (see images in this data set). The team judged that the activity was of hydrothermal origin. Vents at the northeastern side were short-lived; by the time COSPEC surveys were started, only five vents nearer to the summit were actively steaming.



SO_2 emission from May 13 to June 10



Plot of SO_2 volumes from **May 10 to June 8**, estimated from COSPEC measurements



Outline of areas affected by tephra fall on April 2.

Left: Daag et al., 1996; Upper right: Wolfe & Hoblitt, 1996; Lower right: Modified from Lockhart et al., 1996