

Landforms: Portland

Portland's turbulent geologic past and potentially troubled future can be read in its landforms. The city sits at the confluence not only of two great rivers, but of distinct geologic provinces. The Willamette River drains the southernmost portion of the great Puget Willamette Trough, a structural valley formed by the uplift of the Coast Range and simultaneous depression of the lowland to its east. The northern end of the lowland is submerged under Puget Sound. The structural grain of the Coast Range in the Portland area runs northwest by southeast. Ridges west of the Willamette generally follow that trend, as do many stream channels following old faults and fractures. The parallel alignment of the lower Tualatin and Willamette Rivers between Oregon City and Lake Oswego, as well as the former channels of the Clackamas River between the towns of Clackamas and Milwaukie, reflects this regional trend.

The most impressive northwest-southeast feature on the map is also the most ominous. Portland's West Hills follow the very straight line marking the Portland Hills Fault. The steep slopes with their fine views of the Cascades are also evidence of the young age of the uplift which raised the hills above the water-deposited lowland fill on the bank of the Willamette. The East Valley Fault runs parallel to the Portland Hills Fault just east of the river. Both line up with faults in the Cascades and across southeastern Oregon, making them part of one of the most extensive geological structures in the state. The destructive effects of a major earthquake along this system or nearby would be increased by the looseness of the Columbia River-deposited Troutdale Formation sands, gravels and clays underlying the city. (Earthquakes are discussed on pages 138-139).

The numerous buttes and small cone- or dome-shaped hills in the center of the map are the Boring volcanoes, a swarm of vents which were active between 1.2 and 3.9 million years ago. Similar small volcanoes occur in great numbers over much of Oregon. In the western parts of the state heavy tree cover contributes to their relative anonymity.

A long series of devastating Missoula Floods inundated the Portland area repeatedly between 18,000 and 12,000 years ago (see pages 134-135). These floods surged through the Columbia Gorge, roaring across east Portland and covering what is today the downtown area with 400 feet of muddy water. The floodwaters left behind a pattern of scoured channels and depositional bars where they flowed around the resistant rocks of Mount Tabor, Rocky Butte, Kelly Butte and the northwest edge of the Boring volcanoes. These features, easily overlooked on the ground, are startlingly obvious on this landforms map. Much of Portland resembles a beach at low tide, but on a gigantic scale.

