

VASHON ROCKS FAQA (Frequently Asked Questions Answered)

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Q. Why is Vashon an Island?

A. Vashon is sandwiched between two active East-West fault systems (named the Seattle & Tacoma faults) and is being horizontally pressed from the south, lifting it higher than its surroundings. Intense erosion by streams of water under the most recent ice sheet, prior to 10,000-15,000 years ago, carved deep channels to Vashon's east and west. After the ice sheet melted away, the sea entered Puget Sound and filled the lowlands to the north and south of Vashon Island and the channels to the east and west, thereby creating an island. Prior to the last glacial advance, rivers draining the Cascades deposited sands on Vashon, prior to it becoming an island.

Q. Should residents and visitors be concerned about geological hazards on Vashon?

A. Yes, depending on where you live or stay. You could be impacted by landslides, which commonly occur during very wet winters. Slopes that have been over-steepened by wave erosion or human activity are most liable to fail, as are slopes underlain by deep slip surfaces. You could be impacted by ash from volcanic eruptions, although the last nearest eruption was on Mt. Rainier almost 600 years ago. Mudflows related to catastrophic slope failures on Mt. Rainier happen more often than major eruptions, but mudflows are exceedingly unlikely to cross Puget Sound and reach Vashon Island. This is not so for Orting, WA (population of over 3,300), situated between Carbon and Puyallup Rivers less than 30 miles from Mt. Rainier and built entirely on several layers of lahar deposits.

For Vashon islanders, major earthquakes in the Puget Sound region pose a real risk, being capable of producing much more damage than the 2001 Nisqually earthquake, which had a magnitude of 6.8, or two equally large earthquakes in 1965 and 1949. The largest earthquakes, fortunately, occur less frequently. The most recent very large earthquake inside Puget Sound happened about 1100 years ago with a magnitude of about 7.5. Parts of Bainbridge Island and Alki Point shot up 20 feet from beach level and a 16-foot-high tsunami bore down on the north end of Vashon Island. The most recent major "subduction earthquake" happened 300 years ago off the coast of Washington and had a magnitude of about 9.0. Such an event would be devastating for the Washington coast but somewhat less inside Puget Sound. However, the intensity of shaking and height of tsunami waves inside Puget Sound resulting from a subduction earthquake are not yet well understood. Over 25 earthquakes have been felt on Vashon in the last century. Based on the sizes of the Seattle and Tacoma Fault Systems, earthquakes of maximum magnitude 7 are expected (less than a minute of shaking) in contrast to the magnitude 9 possible on the mega-thrust fault to the west (several to ten minutes of shaking).

Q. Why is Vashon in the Puget Lowlands surrounded by mountain ranges to the west & east?

A. The Puget Lowlands are located in a forearc basin with the Olympic Mountains to the west thrust up by collision and subduction of the Juan de Fuca Plate and the Cascade Range to the east resulting from subduction-related magmatism and the growth of volcanoes.

Q. Where do the rocks on Vashon beaches come from?

A. Rocks on Vashon beaches come from the erosion of the glacial and fluvial deposits that cover all of Vashon and Maury islands. Waves remove all the finer sand, silt and clay from the beach, leaving behind pebbles, cobbles, and boulders that ice sheets had and rivers carried down from elsewhere in Washington State, Vancouver Island, and British Columbia.

Q. Are there fossils on Vashon?

A. Yes, although they are rare. You can find rounded bits of petrified wood and a variety of fossils in sedimentary rock boulders, cobbles and pebbles on the beaches that were transported here by glaciers, as well as much younger Pleistocene mammoth and other bones in the glacial outwash deposits.

Q. Is there an underground lake beneath Vashon?

A. No, there are no underground lakes nor any open river channels below the surface of Vashon and Maury Island. Such bodies of water only exist where underground caves exist, like in Florida. The water that does exist beneath the surface of the island, termed groundwater, lies within tiny spaces between grains of sand in rock or sedimentary layers called aquifers.

Q. Where does Vashon groundwater come from?

A. Vashon groundwater comes from the atmosphere. Rain and meltwater from snow percolate into underground aquifers that feed natural springs and water wells drilled by humans; Vashon is considered a single source aquifer.

Q. Why is till so hard to dig?

A. Glacial till consists of sand and gravel but also silt and clay, which fill the spaces between larger grains, making for a dense and hard material. The glacial till deposited on Vashon about 15,000 years ago was further compacted by an ice sheet over 1000 feet thick, which helped to produce our modern cement-like hardpan.

Q. Why is there a sandspit at KVI beach?

A. The KVI sandpit is caused by the intersection of two opposite-flowing drift cells that erode sand from the bluffs to the north and south and transport it along the coast by wind, waves, and currents.

Some Resources:

Books:

Geology Underfoot in Western WA by Dave Tucker (2015)

Roadside Geology of Washington by Marti Miller & Darrel Cowan (2017)

world wide web links:

[King County Vashon Geology Underfoot](#)

[King County Vashon Water Resources Review \(2013\)](#)

[WA DNR Geology of King County Bulletin 63 \(1971\)](#)

[USGS Geological Map Vashon Quadrangle \(2015\)](#)

youtubes of: [Nick Zentner](#)