

Oral histories of Puget Lowland tribes: Do some “myths” provide a cultural memory of catastrophic laharc floods from Mount Rainier, Washington?



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ABSTRACT

Myths of Puget Lowland native peoples transcribed by Ballard (1929), Clark (1953), and others present allegories that appear to describe the profound effects of volcanic activity at Mount Rainier on downstream areas. In “How the whales reached the sea”, whales burrow through a valley bottom to change the course of a river. The new stream course that resulted was the Stuck River, which is the historic name of a stream draining south from near Auburn into the Puyallup River. Today the White River, which heads on Mount Rainier’s east and northeast flanks, roughly follows that course, although at times in the past, the White River has drained north to Elliott Bay from near Auburn, where it debouches from Puget Lowland plateau into the Duwamish valley. Buried forests radiocarbon dated to about 1100 yr BP were exhumed in the in the mid-to-late 1990s at Auburn and Fife. The subfossil trees reveal that a great volcanic flood inundated these areas with a layer of andesitic sand and gravel ranging from about 0.5 to as much as 2 m in thickness. In the northern Duwamish River valley, this gravely volcanic sand extends north to the Port of Seattle, where it is about 1. 5-m thick. A volcanic ash layer at Mount Rainier having a correlative age shows that the lahar that coursed down the White River was triggered by a moderate-size explosive eruption at the volcano. The thick lahar-derived sand and gravel in the lowland near Fife and the Port of Seattle likely was deposited within days or weeks of the eruption. The thickness and extent of the deposits indicates catastrophic aggradation in the valley bottoms of the Puget Lowland, and the scale of these landscape changes more than a millennium ago appears to have been captured in oral stories by the power of the burrowing whales changing the course of the river. Alternatively, the burrowing whales may also capture the power of the strong ground motion of the nearby Seattle and Tacoma Faults, both of which produced major earthquakes within a century of the eruption and lahar. Ludwin and others (2005^a, 2005^b) describe indigenous stories related to the Seattle Fault rupture and that of the Cascadia Fault in 1700 CE.

Other indigenous stories, such as “The young man’s ascent of Mount Rainier” (Ballard, 1929) and “The lake on Mount Rainier” (Clark, 1953) describe a flood of water and debris that buried the Puyallup River valley near the present town of Orting. These stories likely are referring the Electron Mudflow, which buried the Orting area about CE 1500. We are using studies of tree-rings of the subfossil trees in an attempt to better constrain the ages of the events and to test the correlation of the Fife and Auburn buried forests.

INTRODUCTION

Accounts of the Indigenous Peoples

The earliest written history of the Pacific Northwest begins in the late 18th century with the first European explorers, but even early 19th century written accounts such as that by Lewis and Clark and by Talmie were limited in geographic scope and by the timing of their visits. Importantly, researchers such as Ballard (1929) and Clark (1953) compiled many stories by interviewing indigenous peoples, and Harris (1980, 2005) compiled a number of these accounts as they pertain to the history of volcanism in the Cascade Range. In this paper we look into specific stories that likely refer to volcanic events from Mount Rainier, specifically highly concentrated floods of sediment that buried lowland river valleys about 500 and 1100 years ago. Examples of these oral histories appear in text boxes about the Deadman Flat lahars (~1100 yr B.P.) and Electron Mudflow (~ 1500 CE) on this poster.

BURIED FORESTS AND THE HISTORY OF LAHARS AND LAHARIC FLOODS

Geologists Dwight “Rocky” Crandell (1963b, 1971) and Donal Mullineaux (1970, 1974) conducted pioneering research on the postglacial deposits and history of Mount Rainier. Crandell found evidence for enormous lahars that flowed along valleys from the volcano for many tens of kilometers, some as far as Puget Sound. Lahars are volcanic debris flows, watery floods that consist mostly of sediment. Once such lahar, dated by Crandell at 530 yr B.P., is the Electron Mudflow, which originated at the upper west flank of Mount Rainier and flowed at least as far as Alderton, and probably as far as Puyallup or farther. The deposits of this clay-rich lahar underlie the town of Orting. Crandell observed that some lahar deposits were high clay content, and he interpreted that these likely began as landslides, whereas other low clay content deposits, were the result of lahar triggered by interactions of hot rock and snow and ice.

Following the eruptions of Mount St. Helens, geologists sought more details about Mount Rainier’s past eruptive processes and wanted to apply what they had learned from Mount St. Helens to their interpretations of deposits at other volcanoes. Several studies by US Geological Survey geologists focused mainly on documenting lahars and eruptive events—Investigations by Scott and others, 1992, 1995 and Vallance and Scott, 1997 showed that lahars or lahar-derived floods had moved as far as 100 km (60 mi) downstream of the volcano and detailed the hazards associated with them. The studies resulted in more data on the nature and timing of past lahars and on more detailed mapping of volcanic hazard zones, shown in Fig. 1.

These investigations and mapping efforts continued to uncover the volcanic history of Mount Rainier owing to discoveries of additional buried forests and geotechnical information about subsurface deposits of Mount Rainier origin in the 1990s and after (Dragovich and others, 1994; Palmer, 1997; Zehfuss and others, 2003a,b; Zehfuss, 2005). Still later, Vallance and Pringle (2008) and Sisson and Vallance (2008) reevaluated Holocene volcanism at Mount Rainier and attempted to link volcanism to the triggering of devastating lahars—of particular significance is their recognition that the lahar-derived massive gravely sand deposits such as those that buried trees at Auburn and Fife, and that extend as far as Terminal 107 at the Port of Seattle and were triggered by moderate-size eruptions at Mount Rainier, eruptions whose nature and extent were not recognized until the past two decades. This episodic *aggradation* in the lowlands by laharc floods surely must have impacted the native inhabitants.

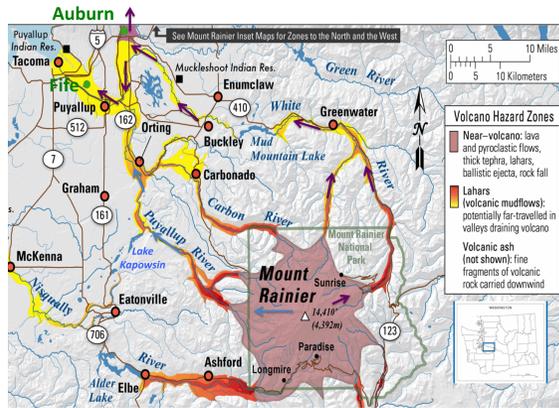


Figure 1. Location map showing Mount Rainier volcanic hazard zones based on mapped areas that have been affected by past volcanic processes such as lahars (volcanic mudflows) by the US Geological Survey. Green dots show locations of buried forests that died about 1100 yr B.P. at Fife and Auburn. Mauve-colored arrows show path of the 1100 yr B.P. Deadman Flat lahar and blue arrows show path of the circa 1500 CE Electron Mudflow that killed buried trees near Orting and dammed Lake Kapowin.



Figure 2. Clip from a portion of the 1895 1:125,000-scale topographic map of Tacoma area showing Stuck River and Wapato Creek, both mentioned in oral histories. Red dots show locations of buried forests that died about 1100 yr B.P. at Fife and Auburn and noted in Fig. 1.

Evidence of inundation by sandy lahars at Fife and Auburn: The Deadman Flat eruption

In 1995 excavations at Auburn had exhumed a subfossil forest buried in a 0.5–2m massive, gravely andesitic sand (aka “lahar runoff”) containing pumice and charred wood (Figs. 3 and 4). Radiocarbon dates indicated the trees likely were buried about 1200–1100 yr ago (Fig. ; Table 1). The trees at Fife included Douglas-fir (*Pseudotsuga menziesii*), western redcedar (*Thuja plicata*), and an unknown deciduous tree. A year later, the excavations at Terminal 107 at the Port of Seattle exposed a correlative 1.5 m lahar-derived gravely sand. And in 1998–99 a buried forest was confirmed at Fife whose radiocarbon age matches that of the one at Auburn (Fig.). The Fife trees had also been buried by a massive gravely, lahar-derived sand about 1.5 m thick (Fig.). The Fife subfossil trees included many subhorizontal logs, mostly western redcedar at about 3-m depth that had been swept up by the flow and also at least one standing western redcedar rooted at a depth of about 5 m. The first radiocarbon age here was derived from a subfossil oak, probably *Quercus garryana*.



Figure 3 (left above). Photo excavation in Auburn on August 9, 1995 exposing a subfossil forest that had been buried in a massive, gravely, andesitic sand (at right). Yellow arrow points to stump of deciduous tree whose radiocarbon age was 1080 ±60 on wood about 30 rings from bark.

Figure 4 (right above). View of an exposure of the andesitic gravely sand that buried a forest at Fife about 1100 years ago. Red arrow shows organic horizon and lower diatomaceous layer (white) below lahar-derived sediment.

Figure 6 (right). Massive andesitic gravely lahar-derived sand deposit exposed about 100 m south of the intersection of 20th St. E. and 70th Ave. E. in Fife WA.



Artists note: “The mural tells the story of great Salish legends, mixing Northwest Native art painted on cedar with abalone inlay surrounded by flowing tide landscapes. The artists balance traditional warm wood and contemporary cool tile, embracing the dualities of life that form the oneness of nature. The mural creates a positive and uplifting atmosphere that supports the Hospital’s mission to heal as well as illustrating a connection to Tacoma’s beautiful cultural and environmental past.

The mural is based on a Salish legend about how the Puyallup River was formed: After a great flood, two whales were trapped in a lake on Mount Takopid (Mount Rainier). The whales were lonely and missed their families, so they swam right through the mountain, plowing their way into the Puget Sound. The channel they dug became the Puyallup River.

The figures in the mural represent the symbology of the Northwest Native culture. Orca are regarded as symbols of the importance of the family unit and its function of providing for and protecting our local communities. They mate for life; live in close families and usually travel in groups. The thunderbird represents a protector and provider for the community.”

Stories that describe the ~1100 yr B.P. Deadman Flat lahar

How the Whales Reached the Sea

First version (Puyallup)

A long time ago the valley between what is now Summer and Renton junction was a vast lake; the course of the Puyallup River followed what is now known as Wapato Creek. In the lake there used to be two whales; there they made their home. One day the children from the village noticed the whales acting strangely and reported the strange actions to their elders. The whales had become tired of their restricted range in the inland lake and were thrashing and churning the waters mightily in their effort to make their way out. Finally on the fourth day they plowed into the land and forced their way through, opening a way through the plain out to the Sound. The water followed them down the channel and thus a new river came into being. We call that river Stax, which means “plowed through.” The whites call it Stuck River.

Second version (Green River)

One young man was travelling by jumping on the logs and brush in Stuck River. They were really whales. The whales said, (not recorded). The youth ran away and the whales went to the salt water.

Third version (Puyallup)

A lake was there. Big whales went up into the lake from the bay. They made a hole through the ground to the lake not seen by anyone. It rose until four whales got there. After one of the whales stayed there a certain length of time a big spruce tree grew on his head. When he was very old he went out to the bay and turned north. He came out in British Columbia and there the Indians shot him. After he was dead they drew him out and cut him to pieces. The fat was about a foot thick. The Indians cut a piece about four inches by six inches and traded it for one blanket. The Indians from all other tribes came and bought the whale fat until the chief of that place was rich.

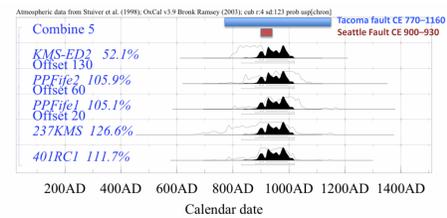


Figure 5. Plot of “wiggle matched” radiocarbon ages for selected subfossil trees from Auburn (ED2), Fife, and farther upstream locales (KMS and RC1) for the Deadman Flat lahars. Blue and red bars show approximate calendric ages for Tacoma fault (Sherrrod and others, 2003, 2004) and for the Seattle Fault (Atwater, 1999), which likely occurred within a century or so of the Deadman Flat lahar. “Wigglematch” calibration via program Oxcal courtesy of Jim Vallance, USGS (Bronk Ramsey, 2001).

Stories that describe the ~ 1500 CE Electron Mudflow

The Young Mans Ascent of Mount Rainier (Upper Puyallup)

This story is not a myth. The man in this story was a real person. He was out looking for (magic power.) He made five wedges of elk horn. He went up to the mountain T’qo’bed, and began to climb up over the snow. He used the elk horn wedges to chisel steps in the snow and ice. One wedge wore out and the man threw it away. He used another and another. The wedges lasted until he reached the top of the mountain.

At the top of the mountain the man looked about and found a lake. He stayed one night. He swam and washed himself in the lake. He gained his magic power.

T’qo’bed said, “You have come to stay one night, so I can talk. You shall grow to be an old, old man. Moss will grow on the joints of both your arms and on both your knees. Your hair will fall out and your scalp will be as moss, and then in time you will die of old age. At the time of your death, when you are very old, my head will burst open and the water, which you now see, shall flow down the hillsides. The man picked up five pearl shells... he starts back. “Oh! It’s snowing! The mountain does not wish me to take these shells,” he said. He threw down one, then another and another until he had thrown down all five. Then it ceased to snow.

The young man grew old; his hair fell out. He grew very old. Moss grew upon his head his knees and his elbows. He said to the people, “When I die, look to T’qo’bed her head will be broken and the little lake will burst forth.” The man died and it was so. The head of T’qo’bed burst open and water rushed down the hillsides and swept the trees from the valley. The prairie above the town of Orting was called by us swe’k’w, which means “open,” because the flood cleaned it and left it covered with porous stones. The white people do not now see the lake on the mountaintop; it has been spilled out.

The Lake on Mount Rainier (Puyallup)

(This is essentially the same story as “The young man’s Ascent of Mount Rainier. The difference is in the beginning and ending.) *When the grandfather of my grandmother was a young man, he climbed Takobed. My grandmother, who told me the story, remembered when the lake burst and spilled out.*

Summary

Oral histories of Puget Lowland tribes appear to reflect volcanic disturbances that profoundly affected the riparian areas of the White, Duwamish, and Puyallup River valleys where they lived and found their livelihood. The stories have survived for more than a millennium.

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Discussion

The Deadman Flat lahar was generated by a moderately explosive eruption at Mount Rainier that sent a flow along the White River to the Puget Lowland. The deposits show that the flood of sediment flowed north in the Duwamish Valley to Elliott Bay and south into the Puyallup River via the Stuck River channel and then out to Commencement Bay burying the lowland in sediment as thick as 1–2m locally. The stories “How the whales reached the sea” recorded by Ballard (1929) appear to describe this great volcanic disturbance, although the rupture of the Seattle and Tacoma Faults also occurred about this time (Atwater, 1999; Logan and others, 2007; Sherrrod and others, 2003, 2004).

Oratory teachings were considered sacred in traditional tribal communities. The word expressed spirit and the “breath of life” of the speaker (Cajete, 1994). Often, the mythologies shared over generations changed very little in retelling. As in, “The young man’s ascent of Mount Rainier” the story teller states, “This story is not a myth.” And in “The Lake on Mount Rainier,” the speaker is a descendent, four generations from the time the event took place. These sacred teachings were the facts of day-to-day life. While some stories have become romanticized, others have been often disregarded as fairytales. In recent instances, oral histories and narratives have been found to coincide with scientific discoveries—Story tellers relay crucial information about geologic and environmental events to present and future members of their community. Indigenous peoples were observers of nature, giving great respect to the animals and spirit of the land, not taking any observation for granted. In everything was a lesson, and in every instance, a message from the mountain, if only one has the ears to hear it.

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