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Serpent Spirit-power Stories along the Seattle Fault

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INTRODUCTION

The Seattle Fault is a multistranded east-west-striking reverse fault cutting across Puget Sound, through downtown Seattle, and across Lake Washington. Although geophysical evidence has long indicated a substantial offset in basement rocks beneath Puget Sound (Danes *et al.*, 1965), no clear pattern of recent earthquake activity defining the fault has been observed. Geologic evidence of an earthquake around A.D. 900 (estimated magnitude 7.3) came to light in the early 1990's (Bucknam *et al.*, 1992), however, and the Seattle Fault is now recognized as a substantial hazard to the Seattle urban area.

The circa A.D. 900 earthquake caused 7 m of vertical uplift on the southern side, sent massive block landslides tumbling into Lake Washington, and created a tsunami in Puget Sound that left sand deposits on Southern Whidbey Island (Atwater and Moore, 1992).

Two archaeological sites near Seattle attest to the effects of such events on local indigenous communities. Excavations at West Point, a promontory jutting out into Puget Sound north of downtown that was used as a fish- and shellfish-processing site since at least 4,000 years before the present, show that that the area dropped at least a meter during the quake. The point's marshes were flooded with saltwater and a layer of sand covered the entire site. Over time, people returned to West Point and began using it as they had before the quake (Larson and Lewarch, 1995). The earthquake also had the capacity to transform some locales permanently. At the Duwamish No. 1 archaeological site, excavations show that the quake lifted up a low, wet area that had been only a minor camping and food-processing site and turned it into a higher, drier spot that eventually became home to a major permanent settlement with several longhouses (Campbell, 1981; Blukis Onat, 1987).

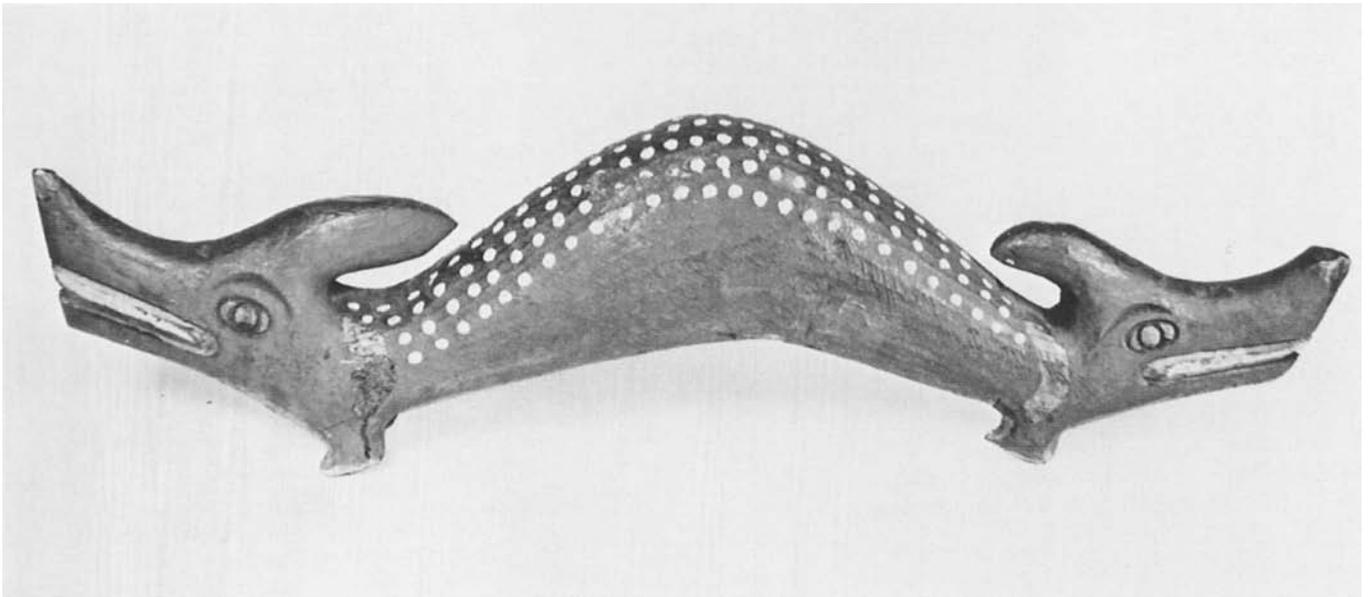
Native peoples described and commemorated geologic events in their oral traditions by using descriptive metaphors based on their cultural concepts, often ascribing earth shaking to actions of supernatural beings. In this paper we discuss stories about *ayahos*, a supernatural spirit power that natives associated with five locales along the trace of the Seattle Fault. Three of these locales are associated with landslides, and another has a description of offset consistent with the movement of the Seattle Fault.

In 1985, prior to published evidence of the A.D. 900 earthquake on the Seattle Fault, an article in the *Seattle Weekly* (Buerge, 1985) mentioned a "spirit boulder" associated with earthquakes and landslides located near the Fauntleroy ferry dock in west Seattle. The proximity of this location to the Seattle Fault invited investigation, and we discovered that the Fauntleroy spirit boulder is associated with a supernatural being called *ayahos*, which is often described in a way that could refer to earthquake effects and particularly landslides. The *ayahos* is a shape-shifter, often appearing as an enormous serpent, sometimes double-headed with blazing eyes and horns, or as a composite monster having the forequarters and head of a deer and the tail of a snake (Mohling, 1957).

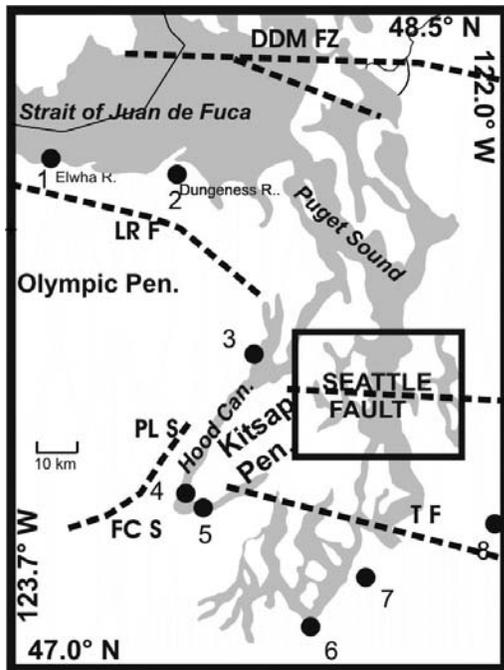
Ayahos is associated with shaking and rushes of turbid water and comes simultaneously from land and sea (Smith, unpublished notes). "At the spot where *ayahos* came to a person the very earth was torn, land slides occurred and the trees became twisted and warped. Such spots were recognizable for years afterward" (Smith, 1940). Figure 1 shows an artifact from a non-Salish tribe on the outer coast of Washington that corresponds to the description of *ayahos* and represents a vicious guardian spirit.

Stories about *ayahos* mention a number of specific locales in the central Puget Sound, along the Hood Canal, and on the Strait of Juan de Fuca as far west as the Elwha River. Thirteen *ayahos* locales are mentioned in various stories (Figures 2 and 3). While some locales are identified precisely, rather general location descriptions (*e.g.*, "Dungeness River") are given for others. *Ayahos* sites appear to coincide generally with shallow faults around the Puget Lowland, including the Little River Fault along the strait of Juan de Fuca, the Seattle and Tacoma Faults, and the Price Lake scarps (Haugerud *et al.*, 2003). Five of the *ayahos* story sites are spatially concentrated and located very close to the trace of the Seattle Fault (Figure 3). Four of the Seattle locales can be associated with land-

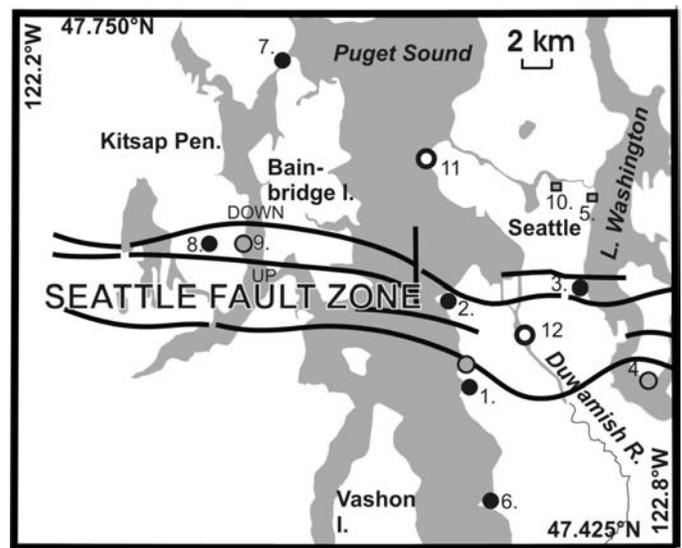
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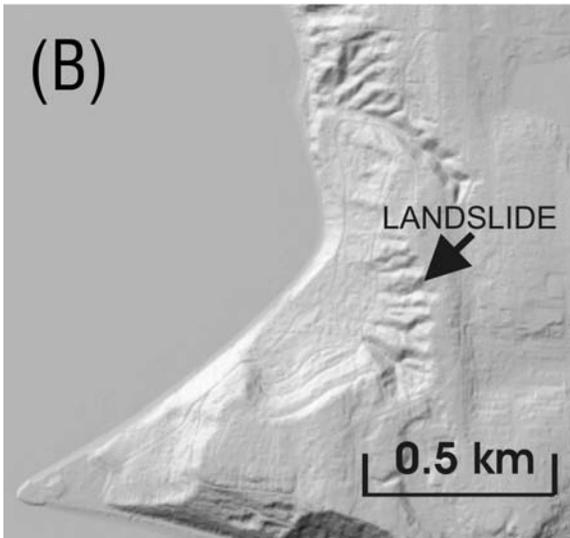
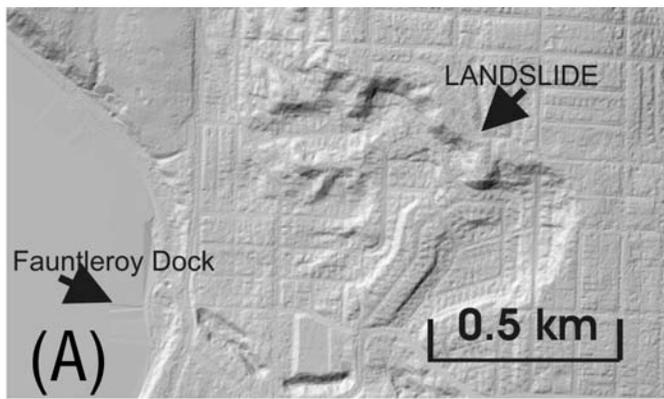
▲ **Figure 1.** A Quileute ceremonial representation of a two-headed horned serpent with legs; known as a vicious guardian spirit-power. From Powell and Jensen (1976). Courtesy American Museum of the American Indian, Smithsonian Institution, 05/8861.



▲ **Figure 2.** Puget Sound and eastern Olympic Peninsula. Boxed area indicates location of larger-scale map shown in Figure 3. Dashed lines show locations of some shallow faults (after Haugerud *et al.*, 2003): LR F: Little River Fault; T F: Tacoma Fault; DDM FZ: Darrington Devil's Mountain fault zone; PL S: Price Lake scarp; FC S: Frigid Creek scarp. Numbers indicate locales outside the Seattle Fault area associated with *a'yahos* stories: 1. Elwha River; 2. Dungeness River; 3. Dabob Bay; 4. Bald Point, also known as Ayers Point; 5. Tahuya River; 6. Medicine Creek (Nisqually Delta); 7. American Lake; 8. Black Diamond Lake (1–5 from Elmendorf, 1993; 6 and 8 from Waterman, 2001; 7 from Smith, 1940).



▲ **Figure 3.** Map showing the Seattle Fault zone, *a'yahos* story locales (black circles), other stories that have apparent connection to earth shaking or landsliding (gray circles), and archaeological sites (white circles). Locales: 1. Fauntleroy; 2. Alki Point; 3. Lake Washington *a'yahos* site; 4. South Point, Mercer Island; 5. Madison Park; 6. Three-Tree Point; 7. Agate Passage; 8. Bremerton; 9. Moore Point; 10. Portage Bay; 11. West Point; 12. Duwamish Site No. 1. LIDAR images of Fauntleroy (1) and Three-Tree Point (6) are shown in Figure 4.



▲ **Figure 4.** LIDAR images showing apparent landslides at locales said to be *a'yahos* dwelling places: (A) Fauntleroy Cove in West Seattle; (B) Three-Tree Point in Burien.

slides or reports of land-level changes that might have been caused by the A.D. 900 Seattle earthquake. Additional native stories related to shaking, landsliding, or land-level change are associated with three of these sites.

A'YAHOS STORIES ALONG THE SEATTLE FAULT

The west Seattle *a'yahos* spirit boulder mentioned by Buerge (1985) is located on the beach immediately south of Fauntleroy ferry dock, below what appears to be a very large landslide of undetermined age clearly visible in LIDAR images (Figure 4A) but not shown on existing geologic maps (the boulder location was pointed out by long-time local residents Morey Skaret and Judy Pickens; Waterman [2001] indicated a location further south, near Brace Point). Stories of *a'yahos* spirit power are told about both the Fauntleroy boulder (Waterman, 2001) and Alki Point (Smith, notes), immediately to the north and uplifted during the A.D. 900 quake. Stories about Alki Point speak of shaking, rocks exploding, and the power coming from sea and land simultaneously (Smith, notes). Williams Point, between Alki and Fauntleroy, is just

south of a creek called “Capsize” (Waterman, 2001). Places that have undergone massive transformations are often referred to as having “capsized” in Lushootseed, the indigenous language of the region (Miller, 1999).

The second place in Seattle associated with *a'yahos* is by the shore of Lake Washington. According to elders who worked with T. T. Waterman, “On the lake shore opposite the north end of Mercer Island ... an enormous supernatural monster ... lived” (Waterman, 2001). Large block landslides dated to A.D. 900 slid into Lake Washington from the southern end of Mercer Island and at Madison Park (Karlin and Abella, 1992), about 2 km south and north, respectively, of the *a'yahos* site. In addition to the massive slides of A.D. 900 that bracket this site, a close-by landslide during the 1890's is said to have damaged buildings (McDonald, 1956). It is possible that the 1890's landslide influenced the identification of this site with *a'yahos*. Landslides occur in many locations along the bluffs and steep slopes that line portions of the shores of Lake Washington and Puget Sound.

The large blocks of land that slid into Lake Washington from Mercer Island's South Point submerged intact and upright trees. As the lake rose and fell several feet during the course of the year owing to seasonal run-off in the lake basin, the trunks of these drowned trees were exposed. Native people avoided this place, which they called “stripping someone's clothes off” (Waterman, 2001), because they believed supernatural “earth beings” lived in the stumps of the drowned trees. A man who came to strip the bark off the drowned trees protruding above the lake surface reportedly became crazy, because stripping the bark from the submerged trees was thought to be like stripping the clothes off the earth beings (Waterman, 2001).

A third locale in greater Seattle is on the shore of Puget Sound, near Three-Tree Point in Burien, at a bluff where “a great snake lived inside, shoving the sand down when people disturbed him” (Waterman, 2001). James Rasmussen, of the Duwamish Tribe, identifies this snake as *a'yahos*. As at Fauntleroy, a large undated and previously unmapped apparent landslide visible in LIDAR (Figure 4B) is located there.

The fourth story comes from the Suquamish Tribe on the western side of Puget Sound. Oral traditions handed down by elders tell of the creation of Agate Passage (the waterway between the northern end of Bainbridge Island and the Kitsap Peninsula; located on the downthrown side of the Seattle Fault) following an underwater battle between a water serpent (not specifically identified as *a'yahos*) and a mythic bird, resulting in ground shaking, churning of the waters, and widening of the channel.

Long ago, when this land was new, the area we know as Agate Pass was much smaller than today. ... There lived in this ... body of water a ... Giant Serpent.

The Double Headed Eagle flew over the pass and the Giant Serpent came up very angry. The two began to fight, and the earth shook and the water

boiled ... the people began to scream and cry until it was as loud as thunder.

Then, as if the earth was going to be swallowed by the waters, they began to boil and churn. Then, the Double Headed Eagle exploded out of the water and up into the sky with the body of the Giant Serpent in its claws. The Double Headed Eagle flew back into the mountain and behind him was left the wide pass (Jefferson, 2001)

The description of the widened channel could reflect permanent ground-level change, and the sense of ground motion suggested by the story is accurate: Agate Passage is on the down-dropped northern side of the Seattle Fault. Geologic evidence suggests that the A.D. 900 earthquake produced mainly uplift on the southern side, however, with the north side down-dropped only slightly; the correspondence between the story and reality is thus approximate rather than exact. We note that some “drift” seems probable in a story that may be a thousand years old and has been preserved through extreme cultural destruction. This story, though set in an undated “long ago”, is strikingly similar to stories from the outer coast of Cascadia that use the struggle of a supernatural bird and water-beast to refer to earthquakes on the Cascadia subduction zone (Ludwin *et al.*, 2005). The “long ago” time frame suggests an origin more ancient than 1700. Another account refers to a more recent event, which might be the 1700 CSZ earthquake:

When Seattle was first settled by the white people the Indians told of a great earthquake that had occurred some fifty years before. They related that the shocks were so severe that the earth opened up in great cracks and that their little mat and slab huts were shaken to the ground and there were great landslides. The largest slide near Seattle was immediately south of West Point lighthouse. It is about a mile in extent and can be clearly seen at the present day. The lower bench of Kinnear Park slid at that time from the cliff shore, carrying giant fir trees that still stand on the slide. The Indians said that the mountains “momoked poh” (shot at each other), and roaring of the tidal waves was frightful. (*Seattle Post-Intelligencer*, Sunday, March 20, 1904, p. 1, c. 1, byline “Chelana”, probably a daughter of the Denny family)

A fifth locale, on the Kitsap Peninsula near Bremerton, is said to be another spot where shamanistic spirit-power could be acquired (Smith, notes; Waterman, 2001). Sam Wilson, born in 1861 and grandson of Chief Seattle, told Marian Smith “it comes from land and sea at same time” (Smith, notes). No obvious geologic features were noted at this site, though it is situated between several strands of the Seattle Fault. On the Puget Sound shore of Kitsap Peninsula, just east of this locale, at Moore Point near Illahee State Park, is a spot named “to have a chill” or “to feel a tremor” (Waterman, 2001). A com-

parison of earth tremors to feverish chills was made by Aristotle (Leet, 1948; Oeser, 2002), and it is possible that the natives of Puget Sound drew a similar connection.

A'YAHOS, INDIAN DOCTORING, AND CEREMONY IN SALISH CULTURE

Shaking was a central element in Puget Sound native medical practices and ceremonies, and *a'yahos*, associated with both landslides and earth shaking, was a central source of “doctor” power.

The Puget Sound lowland was home to dozens of Salish-speaking bands with two distinct, but related, languages: Lushootseed and Twana. Cultural beliefs, like language, were distinct but closely related. Throughout the region, individuals sought personal spirit powers to guide their lives and bring them luck and skill. *A'yahos* was one of the most powerful of these personal spirit powers, though it was also malevolent, dangerous, and possibly fatal to encounter (Smith, 1940). *A'yahos* “doctor” spirit power was one of only two powers (*a'yahos* and *staduk^{wa}*) reserved exclusively for shamans, and descriptions of both these shamanistic powers include shaking or landsliding imagery (Elmendorf, 1993; Smith, notes; Smith, 1940; Waterman, 2001). Descriptions of these powers are quite limited and vary somewhat, likely reflecting both cultural differences between groups in the area and perhaps also the shape-shifting nature of *a'yahos*.

Shamans obtained power from some of the same spirit sources as laymen, but two very powerful spirits gave power to shamans only. These were the *ʔayahus*, described by the Twana as a two-headed serpentlike being and by some Lushootseed speakers as a giant elklike creature, and the *staduk^{wa}* (Twana), an alligatorlike being that appeared sliding down talus slopes in the mountains. (Suttles and Lane, 1990)

Shaking was an important element in Puget Sound Salish ceremony, occurring when ritual objects filled with spirit-power became self-animated (Haeblerlin and Gunther, 1932; Miller, 1999; Elmendorf, 2001). The name of James Zackuse, a Duwamish Indian doctor who lived on Portage Bay in Seattle in the late 19th and early 20th centuries, translates to “trembling face.” Its root is *dzaku*, the Lushootseed word for earthquake (Miller and Blukas-Onat, 2004). A specific connection between ceremony and earthquake shaking was noted by Samuel Coombs, an early settler, in 1893:

During the past thirty-three years I have on many occasions endeavored to gather from the oldest and most intelligent Indians something for their earlier recollections; for instance, as to when the heaviest earthquake occurred. They said that one was said to have occurred a great many years before any white man had ever been seen here, when mam-ook tamah-na-wis was carried on by hundreds. This is the

same performance they go through when they are making medicine men, and consists of shouting, singing, beating on drums and sticks and apparently trying to make as much noise as they can. (*Seattle Post-Intelligencer*, Sunday, March 26, 1893, p. 10, c. 4, "Recollections of Samuel Coombs")

Salish earthquake stories from outside Puget Sound also draw a connection between ceremony and shaking (Boas, 1898; Hill-Tout, 1978). Other cultures regionally (Yurok, Nuu-chah-nulth, Kwakiutl) also have ceremonies related to earthquake shaking.

The strong link between shaking and spiritual power and ceremonial observances with earth shaking in Puget Sound suggests that the earthquakes memorialized in these culturally central ways were likely much more severe than the rather modest events known from the 19th and 20th centuries.

DISCUSSION

Stories of *áyahos*, a supernatural creature linked to shaking and landslides, correspond to large landslides at Fauntleroy and Three-Tree Point that are not easily observable, *i.e.*, not active in historic time and not included in previous geologic maps. The difficulty of observing these landslides in modern times lends support to the idea that the stories are based on actual eyewitness experience. The proximity of a similar *áyahos* locale on the shore of Lake Washington close to the site of A.D. 900 block landslides suggests the possibility of seismic triggering of the Fauntleroy and Three-Tree Point slides in the A.D. 900 Seattle Fault earthquake. Dating the landslides at Fauntleroy and Three-Tree Point could confirm or negate this hypothesis, though present landslide dating methods may not be adequate to provide dates.

In fact, current geologic maps do not categorize these features as landslides. USGS scientists are currently identifying landslide features in Seattle using LIDAR imagery (Schulz, 2004). Although the appearance of the feature seen in the Fauntleroy LIDAR suggests a landslide, it has not been mapped as such due to the lack of evidence of recent activity. Schulz (personal communication, 2004) suggests that the lobed appearance of this feature could result from multiple episodes of activity and notes that the shape of the feature north of Three-Tree Point is more suggestive of a single landslide episode. The rather deep erosional channels across the Three-Tree Point feature suggest that its occurrence was not recent. Definitive identification of either feature as a landslide would require trenching or excavating, which would be difficult due to extensive development in both areas.

Active landslides are extremely common in Puget Sound, including features along shorelines that are several kilometers in length, though these features were probably not active simultaneously over their whole length (Schulz, personal communication, 2004). Many hillsides and bluffs along Seattle-area waterfronts have landslide-prone geology, and LIDAR imagery has been used to identify 173 active land-

slide sites within the city (Schulz, 2004). Landslides in Puget Sound are most frequently a result of weather-related groundwater conditions, though several 20th-century earthquakes also caused landsliding (Noson *et al.*, 1988; Highland, 2003). Shaking in the Puget Basin from the A.D. 900 earthquake would have been very much stronger than any shaking experienced in modern times.

Additional stories from along Hood Canal and the Strait of Juan de Fuca, either about *áyahos* or describing changes in topography (Costello, 1896; Elmendorf and Kroeber, 1992, #28, #29, #57), can be used to develop additional testable hypotheses that offer the possibility of clarifying landscape features and unifying the geologic record with local human recall of landscape-damaging events.

CONCLUSIONS

Stories about a dangerous serpent power (*áyahos*) that lives in the ground often speak of shaking and earth disturbances, and are concentrated in Puget Sound in the vicinity of the Seattle Fault. One *áyahos* site is close to a landslide dated to the A.D. 900 Seattle Fault earthquake, and two others are linked to large-scale but currently inactive landslides near the Seattle Fault. These ancient, place-specific stories have a powerful effect on the human imagination. The profound respect in which *áyahos* was held by the natives of Puget Sound for perhaps a thousand years may help contemporary Puget Sound residents grasp the severity of the earthquake effects experienced by c. A.D. 900 Puget Sound residents, and grapple with the hazard issues that the Seattle Fault continues to present. Geologic knowledge of the earthquake history of Puget Sound and Cascadia helps us interpret the meaning of these native stories, and the traditional knowledge from the region may hold additional clues to past events as yet unidentified. ☒

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