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Searching for Native Stories about Cascadia Subduction Zone Earthquakes

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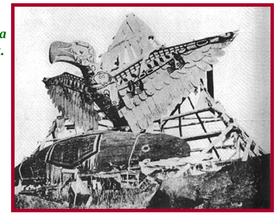
ABSTRACT

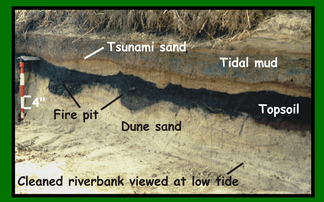
Great earthquakes along the Cascadia Subduction Zone (CSZ) have been taking place for thousands of years. The most recent CSZ earthquake (estimated magnitude 9) occurred on January 26, 1700. The exact date was determined from historic records of a tsunami that struck Japan, and confirmed by tree-ring studies of coastal trees killed when land level changes plunged their roots into tidal water.

A search of Native American myths, stories, and traditions has revealed an abundance of accounts from Washington and Oregon that may be connected to Cascadia Subduction Zone earthquakes.

Thunderbird and Whale in front of a snow-capped peak. (Drucker, 1955)



Tsunami Sand overlying Archeological Site



Tsunami sand associated with the 1700 earthquake covering a Native fire pit on the banks of the Salmon River. Fire cracked rocks, charcoal and ashes delineate the fire pit that was dug into the sandy beach.

Minor, R. and W.C. Grant, 1996, American Antiquity, V. 761, No. 4, p. 772-781. Photo: Brian Atwater.

Kwakiutl house painted with the thunderbird and whale motif. This house belonged to an important village leader, Tlah go glas, and the motif was his family crest. Alert Bay, Vancouver Island. (Malin, 1999); Photo: Goddard, 1934.

Thunderbird and Whale

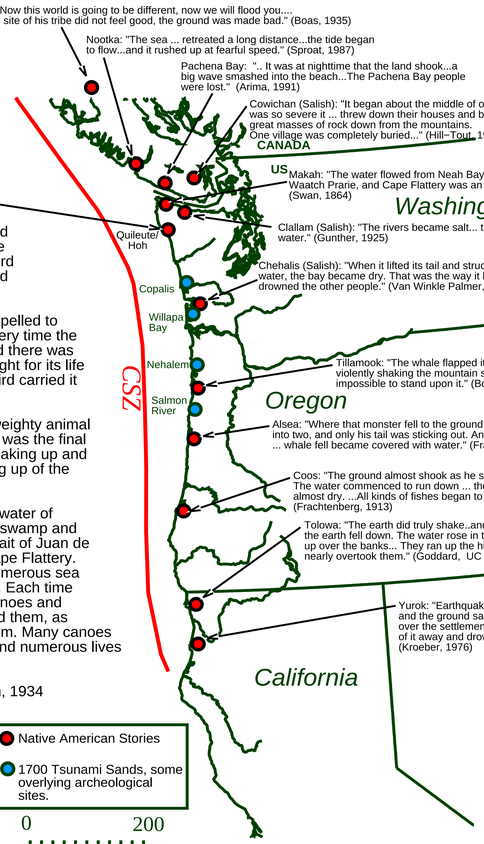
Thunderbird soared far out over the placid waters and waited for Whale to come to the surface. As quick as a flash the powerful bird darted and seized it in her flinty talons, lifted it and soared away toward the land areas.

Passing beyond the oceans she was compelled to alight and rest her wings, and each and every time the bulky beast was allowed to reach solid land there was a terrible battle, for it was powerful and fought for its life with terrible energy. High into the air the bird carried it over the land, dropping it to the surface.

The great thunderbird finally carried the weighty animal to its nest in the lofty mountains, and there was the final and terrible contest fought. There was a shaking up and trembling of the earth beneath, and a rolling up of the great waters.

The waters receded and again rose. The water of the Pacific flowed through what is now the swamp and prairie westward from Neah Bay on the Strait of Juan de Fuca to the Pacific, making an island of Cape Flattery. Again the waters suddenly receded and numerous sea monsters and whales were left on dry land. Each time the waters rose, the people took to their canoes and floated off as the winds and currents wafted them, as there was neither sun nor land to guide them. Many canoes came down in trees and were destroyed, and numerous lives were lost.

(Composite of several stories from Reagan, 1934 and Reagan and Walters, 1933)



NONE OF THIS PROVES ANYTHING!

Oral history is made up of stories that serve as mnemonic keys to a much larger body of information, and Pacific Northwest Native stories contain highly condensed and deeply layered information. This makes them enigmatic and difficult to interpret.

Knowing that Native Americans living along Cascadia must have experienced earlier subduction zone earthquakes on the CSZ, tsunamis from distant sources, and crustal and Benioff Zone quakes, we re-read Native stories to learn how these events are expressed in the oral literature.

Because earthquakes and tsunamis are repeating events, is nearly impossible to unequivocally link any specific story to the 1700 earthquake, although it is still worth examining the stories to see which pieces fit what we know about the event, and whether the stories contain new information that might be confirmed through paleoseismic studies. The story of Thunderbird and whale clearly predates the 1700 earthquake (McMillan, 1999).

PHASE OF THE MOON:

According to the U.S. Naval Observatory Astronomical Applications Department (URL: oa.usno.navy.mil/AA/)

On the evening of Jan. 26, 1700, sunset along the Washington was at 5:10 PM PST, and the moon rose at 5:21 PM. The Moon was a waxing crescent with 36% of the Moon's disk illuminated. The moon would have had pronounced "horns" pointing upward and to the left (Hal Mofield, NOAA, Personal Communication).

Various representations of the moon and sun are shown with the Thunderbird. Some may refer to family crests. Two representations that correspond to the phase of the moon during the 1700 event have been found:

1. **Inside The Nuu-Chah-Nulth House:** This interior screen was carved in the late 19th century, but little is known of its origins or story. From the Canadian Museum of Civilization: *http://www.civilisation.ca/cmc/cmcmg/ghheSmg.html*

"The screen portrays two prominent Thunderbirds. Down each side of the screen are the tails of Killer Whales breaching the surface of the ocean. The creatures with large heads, protruding tongues and curled tails are likely supernatural Sea Serpents, Thunderbird's spirit helpers. The circle in the middle, with an oval centre, may signify a phase of the moon as well as a portal. The circles containing a cross probably symbolize the earth and the four sacred cardinal points of the compass."

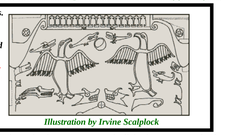


Illustration by Irvine Scalplock

2. ***"A lightning serpent painted on each side of her robe shows that her ancestor saw the lightning serpent at the time of the flood. A quarter moon painted in shiny black on her forehead ..." - Nootka (Roberts and Swadesh, 1955)***

TIME OF YEAR: WINTER - January 26, 1700

Some stories are consistent with winter:

1. ***"It became so cold that the children died." -Clallam (Gunther, 1925)***
2. ***"Chief Wakas held a winter ceremonial. When he gave a winter ceremonial long ago the deluge came." - Kwakiutl (Boas, 1935, p. 92)***

TIME OF DAY: NIGHT - About 9 PM local time (after dark)

1. ***"I think it was at nighttime that the land shook ... I think a big wave smashed into the beach." Nootka (Arima et al, 1989).***
2. ***Stories about earthquake lights (see below) also suggest a nighttime event.***
3. ***"This is not a myth, ... for my tale is seven generations old....it was nearly midnight. Then there was a great earthquake and the houses of the Kwakiutl collapsed" Boas, 1935, p. 122***
4. ***"In the days before the white man, there was a great earthquake. It began about the middle of one night." Cowichan - (Hill-Tout, 1978)***

EARTHQUAKE LIGHTS:

Earthquake lights are a poorly-understood, but well documented earthquake phenomena. The lightning serpents are the companion of the Thunderbird, as is consistent with the more ordinary interpretation as Thunderbird as bringer of thunder and lightning. Several of the Native stories contain elements that relate lightning to effects that could only result from a megathrust earthquake:

1. ***"her ancestor saw the lightning serpent at the time of the flood." - Nootka (Roberts and Swadesh, 1955)***
2. ***"there was a great storm and hail and flashes of lightning in the darkened, blackened sky and a great and crashing "thunder-noise" everywhere. He further stated that there were also a shaking, jumping up and trembling of the earth beneath, and a rolling up of the great waters." - Quileute/Hoh (Reagan, 1934)***
3. ***Earthquake said, "Well, I shall tear up the earth." Thunder said, "That's why I say we will be companions, because I shall go over the whole world and scare them ... for I bought something to be seen at night. ...Always they traveled at night. - Yurok, (Kroeber, 1976 B5).***

SUBSIDENCE : WHERE ARE THE STORIES?

In addition to several minutes of strong shaking and rapidly arriving Tsunami waves, permanent land level changes accompany great Subduction Zone earthquakes. In 1700, estuaries near the coast sank and were flooded with salt water. Red Cedar "Ghost Forests" still stand at the Copalis river (photo from Brian Atwater), on the Bone River near Willapa Bay, and along Highway 4 between Long Beach and Longview. Other ghost forests were logged circa 1900, and remain only as stumps. Tree ring dates from Red Cedars at four sites show that these trees died in the winter of 1699-1700. (Yamaguchi, D.K., B.F. Atwater, D.E. Bunker, B.E. Benson, and M.S. Reid, 1997, Nature, V. 39, p. 922).

No stories about the ghost forests are known to me.

Are there other stories about subsidence? - Headlands that were once easy to walk around, but suddenly became impassable, or the submergence of near-shore village sites? We're still looking.

HEIGHT OF TIDE:

Low tide.

A RECURRING EVENT:

Kwakiutl Stories include a description of the Thunderbird sending his feather costume back to the sky, admonishing it:

"You will not keep on thundering. Only sometimes you will sound when my later generations will die. You will speak once at a time when those who will change places with me will die." (Boas, 1935, p. 65)

AFTERSHOCKS:

Native stories often refer to several Thunderbird brothers or to the Whale and his son.

Nootka (Sproat, 1987, p. 121)
Quileute/Hoh (Reagan, 1934, various)
Salish (Curtis, 1913, p. 162)
Tillamook (Boas, 1898, p. 33)
Yurok (Spott and Kroeber, 1942, p. 227)

Japanese print of the Kashima Deity holding down the Earthquake Catfish (namazu-e), surrounded by smaller catfish

References

Kwakwaka'waka (Kwakiutl)

*Boas, Franz, 1935, Kwakiutl Tales New Series Part 1 - Translations, New York, Columbia University Press. Gagonesalas (sorry about the left-out accents -RSL), p. 68. **Also of interest:** The tale of the Dogs, p. 122-124 (Night-time shaking), The deluge, told by Giquilas, p. 92 (Winter deluge); Origin Story of the Gigilgam, Nimkish, Native Informant: Written by Dan Crammer (p.33) (Relationship of Thunderbird to Flood); Hemasis (p. 65-66) Native Informant: Giquilas, a Gwawaenx (sorry about the left-out accents -RSL) (Relationship of Thunderbird to Flood). Origin of the Xwe'xwe Dance, told by Ya'qoLas (p.27) (Story of fish-like figures and shaking - discussed extensively by Claude Levi-Strauss in "The Way of the Masks", UW Press, 1982).*

Nuu-chah-nulth (Nootka)

Sproat, G.M., 1987, The Nootka: scenes and studies of savage life [edited and annotated by C. Lillard]; Sono Nis Press, Victoria, B.C., 215 p. (originally published: Scenes and studies of savage life: London, Smith, Elder, 1868). This ebb-and-flow of the sea story was noted by Clague, John J., 1995, Early historical and ethnological accounts of large earthquakes and tsunamis on western Vancouver Island, British Columbia, in Current Research, 1995-A; Geological Survey of Canada, p. 47-50.

PACHENA BAY:

Arima,E.Y., Louis Clamhouse, Joshua Edgar, Charles Jones, and John Thomas, 1989, Between Ports Alberni and Renfrew: Notes on West Coast Peoples, Canadian Museum of Civilization, pp. 207, 230, 231, 264, & 265 Specific story cited here: The Tsunami At ?Ousqi?i or "Pachena Bay", Native Informant: Louis Clamhouse. This story was noted by Hutchinson, I and A.D. McMillan, 1997, Archaeological evidence for village abandonment associated with late Holocene earthquakes at the northern Cascadia subduction zone, Quaternary Research, V.48, pp. 79-87.

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Sapir, Edward, and Morris Swadesh, 1939, Nootka Texts; Tales and Ethnological Narratives with Grammatical Notes and Lexical Materials, Linguistic Society of America, University of Pennsylvania, Philadelphia. Red-Headed Woodpecker and the Thunderbirds (In this story, all but one of the Thunderbird brothers is killed by the Transformer god in the guise of a whale.)

Drucker, Philip, c1955, Indians of the Northwest Coast, Published for the American Museum of Natural History [by McGraw-Hill [c1955], New York. (source of photo shown with abstract)

Malin, Edward, 1999, Northwest Coast Indian Painting, House Fronts and Interior Screens, Timber Press, Portland, Oregon. (Photographs and copies of Nuu-chah-nulth Thunderbird and Whale Art).

McMillan, Alan D., 1999. Since the Time of the Transformers, The Ancient Heritage of the Nuu-chah-nulth, Ditidaht, and Makah, UBC Press, Vancouver (Photographs of Thunderbird and Whale motifs from Ozette archeological site - buried by mudslide c. 1700. p. 90 and 162.)

Cowichan (Salish)

Hill-Tout, 1978, The Salish People: The Local Contribution of Charles Hill-Tout: the Sechelt and the South-Eastern Tribes of Vancouver Island" (R. Maud, Ed.); Talonbooks, Vancouver.

Makah

Swan, James, Diary of James Swan JANUARY 1864 Tuesday 12th, Native Informant: Billy Balch, Manuscripts, Special Collections and University Archives, University of Washington, Seattle, Washington. This story was noted by Heaton, T.H. and Snavely, P.D., 1985, Possible tsunami along the northwestern coast of the United States inferred from Indian traditions, Bulletin of the Seismological Society of America, V. 75, No. 5, pp. 1455-1460.

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Other Clallam References of interest:

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Myron Eells, 1985, The Indians of Puget Sound: The Notebooks of Myron Eells, edited by George Pierre Castile, University of Washington Press, Seattle, 478 pp. p. 266 (Flood only a few generations ago) Noted by Jacilee Wray, anthropologist, Olympic National Park

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Reagan, Albert B., 1934, Some Additional Myths of the Hoh and Quileute Indians, Native Informants: Hal George, Luke Hobucket, Harold Johnson, Klakishker, Bucker Mason, Elon Mason, M.B. Penn, Mrs. Jimmie Howe, Frank Bennett, Klekabuck, Klikabuhlap, Dixon Payne, Wetherburt Jones, Arthur Howsattie, Eli Ward, Jack Ward, Bear rice Pullen, Mark Williams, and Carl Black and his wife, Sally Black, Utah Academy of Sciences, Arts, and Letters, Vol. XI, 1934, pp. 17-37. Specific stories cited here: A Hoh version of the Thunderbird Myth, A Story of the Flood

***Also of interest:** Various stories insert or modify the Thunderbird-kills whale motif - Sometimes the Transformer (who changes the landscape to be suitable for humans) kills or wounds the monster whale. Sometimes the Transformer uses a whale disguise and kills the Thunderbird. There may be several Thunderbird brothers, or father and son whales.*

*Reagan, Albert B., and L.V.W. Walters, 1933, Tales from the the Hoh and Quileute Indians, Journal of American Folklore, V. XLVI, pp. 297-346. Specific story cited here: Thunderbird Fights Mimlos-Whale, Native Informant: Luke Hobucket. **Also of interest:** Stories giving background on Thunderbird.*

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*Frachtenberg, Leo J., 1920, Alsea Texts and Myths, Smithsonian Institution, Bureau of American Ethnology, Bulletin 67, 304p., Specific story cited here: 3. SU'KU THE TRANSFORMER; collected by Farrand in 1900 pp. 66-91. **Also of interest:** 1. Wind-Woman and her Children pp. 23-35. (shaking and landslides)*

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Thunderbird and Whale.

(All the red and black illustrations shown are representations of 19th century Nuu-chah-nulth artworks from Malin, 1999)

4/24/2001 RSL