

Compare cross-cultural stories of January 26, 1700 Mega-thrust Earthquake:

[Background to the stories](#): Indigenous oral accounts of this large earthquake and its tsunami were recorded from Vancouver Island to northern California. The account we read, was told by late Chief Louis Clamhouse, Huu-ay-aht First Nation, recorded in his language in 1964 and translated. It has not been changed much to give a sense of how it was told. The tsunami from the 1700 quake crossed the Pacific in about nine hours and was recorded by officials in Japan. **We'll** read that Japanese account. **We'll** also look at the modern science story, which includes evidence upholding both the Huu-ay-aht and Japanese stories. Each story (traditional, clerical and scientific) has ways of validating itself as a true story. Facts in the traditional story were verified through specific ancestors, genealogy, memorable rituals, marriages, lives lost and territories. The Japanese record was validated by sharing records with magistrates and accounting for emergency supplies given to tsunami survivors. The scientific account came from four different lines of peer-reviewed and published evidence and by many scientists working together across disciplines and international boundaries. [Read the three stories](#).

[The modern science story](#) follows in very simplified form. The dense, oceanic, tectonic Juan de Fuca plate that normally, sub-ducts (dives) slowly under the less dense, North American plate, was stuck in late 1699. When it suddenly became unstuck in January, 1700, it caused a mega-thrust earthquake calculated to be 9.0 on the Richter scale.

Both the Juan de Fuca and Pacific plates arise from molten rock coming up through the Endeavour Ridge, west of what is now southwestern Canada and northwestern USA. The Pacific plate moves to the west towards Asia and the Juan de Fuca plate moves eastward about as fast as your fingernails grow. **As the Juan de Fuca plate 'slides' under the North American plate**, moving batches of small tremors, release energy from the subduction (one going under the other). Today, using GPS technology we can actually measure the land moving east-west in longitude and the up-down movement in elevation. A mega-thrust earthquake results from the tectonic plates getting stuck, the energy of these very large moving masses of rock builds up as does the elevation of the continental plate at its edges where it is literally pushed up. Then something gives and a huge release of energy shakes the land and sea. The shaking starts landslides and underwater slides causing tsunamis: waves with very large heights and speeds. On land, the shaking liquefies wet sandy and silty areas and the quick release drops land elevations causing seawater flooding, which kills low lying coastal forests and along with tsunamis, deposits marine 'evidence' inland.

Until scientists discovered the **"scientific" evidence themselves and** confirmed the date with the written Japanese account, **traditional First Nations' knowledge** was discounted. **The 'triangulation'** of these stories might be an example of reconciliation of different ways of knowing. Even though it took science almost 300 years to catch-up with traditional knowledge, science accepts the truth in

the oral account at last. Only pieces of the stories are presented here, so if you have time, read a fuller account in the book *At Risk*¹ by John Clague and others, and the whole Chief Louis Clamhouse story² as it was recorded and translated in the book *Between Ports Alberni and Renfrew*. Names and place-names are Anglicized here. This story belongs to Huu-ay-aht.

Chief Louis Clamhouse “This is the story about the first Anacla or Pachena Bay people. It is said that they were a big group at the time of, **him whose name was Hayoqwis’is ‘Ten-head-on-beach.’** He was the chief; he was of the Pachena Bay tribe; he owned the Pachena Bay country. Their village site (one of several) was **Lota’a**; they of **Lota’a lived there....**They were members of the Pachena tribe”. ... (Chief Louis describes details of a marriage protocol that tested strength and ability of four sons of the Huu-ay-aht **Kix’iin** and how one son died trying. **The Kix’iin** chief had come to **Lota’a to perform a “ceremonial woman purchase” involving the eldest daughter of Hayoqwis’is. This was “before the big earthquake, before the big flood.**)

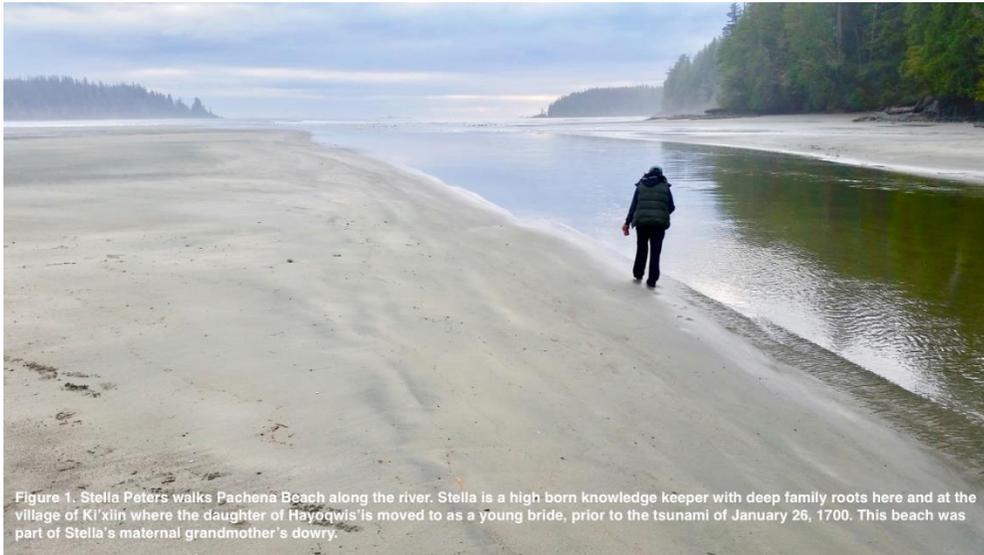
“They (Huu-ay-aht) got in marriage, the elder daughter. The Pachena Bay chief brought (territory) **as dowry for his elder daughter to my grandfather’s** ancestor.... who now has many descendants. It is them now, who are descendants of the first Pachena Bay people. There is no one left alive (at **Lota’a**) due to what this land does at times. They had practically no way or time to save themselves. I think it was at nighttime that the land shook. It was a sandy beach. It was floating, it is said, consisting only of sand, ... They were at **Lota’a** and they simply had no time to get hold of canoes, no time to get awake. They sank all at once, were all drowned; not one survived. Only his (**Hayoqwis’is**) older daughter went to Kix’iin (Huu-ay-aht) as a bride from whom my former grandfather was descended. It is said no one ever knew what happened. I think a big wave smashed into the beach. The Pachena Bay people were lost. Nothing was known of what happened **and what became of them. But they on their part who lived at Ma:Its’a:s “House-Up-Against-Hill’** (across the bay from Klutus Point), the wave did not reach because they were on high ground. Right against a cliff were the **houses on high ground at M’a:lsit “Coldwater-Pool”**. **Because of that** they came out alive. They did not drift out to sea with the others. Everything then drifted away; everything was lost and gone...”

Japanese official’s account translated from a written record of the aftermath in Kuwagaski, Honshu Island where the tsunami that had no shaking associated, swept along about 1,000 kilometers of shoreline with waves up to several meters high in some locations. (from Clague et al (2006)) “The tsunami arrived at night on January 27, 1700; villagers fled to high ground; the water destroyed thirteen houses and set off fires that burned 20 more; in response, magistrates in nearby

¹ J. Clague et al (2006) *At Risk: Earthquakes and Tsunamis on the West Coast*

² E.Y. Arima et al (1991) *Between Ports Alberni and Renfrew: Notes on West Coast Peoples*.

Miyako issued rice to 159 persons and sought wood for shelters; they kept other officials informed of their emergency efforts.”



Worksheet

1. **Create** your own tsunami story using art elements to express the feelings you experienced reading any of the three stories of the 1700 mega-thrust Earthquake and tsunami. Use art to help tell your story, (words, poetry, drawing, painting, etc.). If you are stuck on the art part and happy **with making a simple 4 page kids' book, try this. Fold a sheet of paper in half and then in half again.** Use the top half of the outside page as a title page, the bottom half as the beginning of the story, the two inside pages as the middle of the story and the back outside page as the end of your story. Add colour, movement, emotion and words, as you wish. Take photos of your story.

2. List four things that happen when tectonic plates suddenly move after being stuck for a while.

3. Complete this table comparing and contrasting the three story-telling methods.

Story Authority	Oral Knowledge (Spoken Word by Traditional Knowledge Holder)	Government Record (Brush and ink on rice paper.)	Scientific Record (Published scientific papers.)
Storyteller (year)	_____ (1964)	Japanese government officials (1700)	Dr. John Clague, and other geologists and geophysicists (1990s)
Validation	Genealogy, dowry passed down, places to live that were safe and not safe in a earthquake/tsunami	_____ _____	Peer reviewed papers, four lines of evidence (drowned trees;
Details (Similar or not similar, for example shaking versus no shaking)	Shaking, liquid sand, they sank all at once, all were drowned, wave destroyed homes, taken out to sea, high land was safe.	_____ _____ _____	Liquefaction, shaking, land sinks, massive underwater landslides, wave, ghost forests, marine sand layers in marshes and lakes, carbon dating etc.

Reflection

Be prepared, not scared. Help prepare for an earthquake/tsunami at home and school. Do you know about taking cover and holding on? Ask your teacher to help your class practice the drill. Do you already have emergency kits or 'go-bags' ready? **What are five items in your 'go bag' for emergencies?** If you **don't have a go bag, what** are your top five items for the grab-bag that you are going to put together? If you live in a coastal community, take look at a map with one of your adults and talk through high land escape routes in different locations and where you would meet up with family if you get separated. Get involved with your local community emergency response group and start a youth volunteer section.

The data presented in the ONC graph below (See Figure 1.), was compiled from NEPTUNE data collected after the devastating 2011 mega-thrust earthquake, near Japan. Now, there are even more sensors. West coast Vancouver Island now has a better forecasting system for tsunamis as part of Ocean **Networks Canada's near field detectors** which gives valuable time and wave height and speed information.

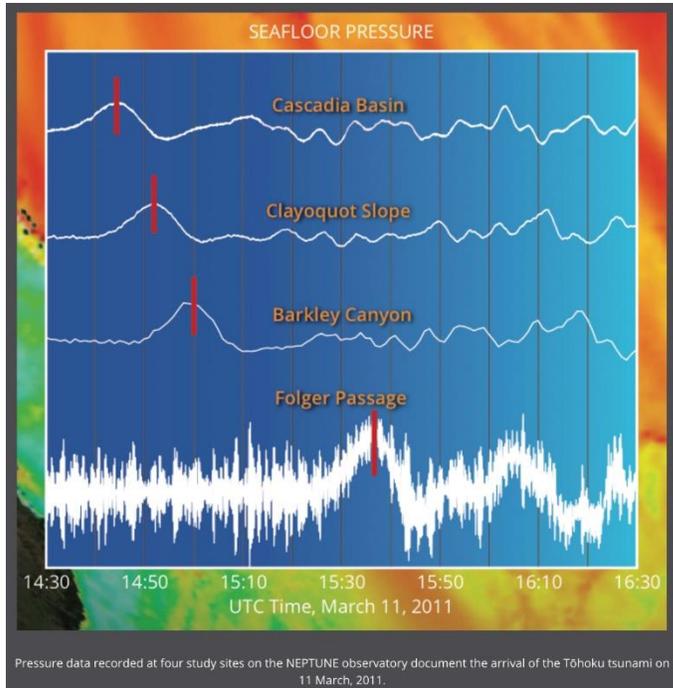


Figure 1. Tsunami (red bar) passes from west to east, deep to shallow, above Ocean Networks Canada NEPTUNE seafloor pressure sensors. As waves pass overhead, pressure sensor reflects depth of water. There is almost an hour between the wave passing over deep water Cascadia basin sensor and shallow water Folger Passage at entrance to Barkley Sound. The ancient Huu-ay-aht village site, where Chief Louis **Clamhouse's ancestors survived the 1700 tsunami**, is only a short paddle away from Folger Passage and the photo at the top of these pages is of a regular wave, breaking on a beach that was hit by the 1700 tsunami.

http://www.oceannetworks.ca/sites/default/files/images/pages/data/japan_tsunami.png

References

E.Y. Arima, St. Claire D., Clamhouse L., Jones C., Thomas, J. (1991) Between Ports Alberni & Renfrew: Notes on West Coast Peoples, Canadian Ethnology Service, Mercury Series, Paper 121, 323 pp.

J. Clague, Yorath, R., Franklin B., and Turner C. (2006) At Risk: Earthquakes & Tsunamis on the West Coast. Tricouni Press, Vancouver, BC, Canada, 200 pp.

Ocean Networks Canada (ONC) <http://www.oceannetworks.ca>