

Not My Fault: A tsunami alert that faltered

Lori Dengler/For the Times-Standard
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By March 1964, the Hawaiian public and Civil Defense personnel were very tsunami aware. A large area of the Hilo waterfront had been declared a Memorial Park after the damage and loss of life in 1960 and many Hawaiians knew someone who impacted in the 1946 or 1960 tsunamis. When a major earthquake occurred on the 27th, people on the islands were primed to respond.

I've spent a number of years digging into the response to the 1964 tsunami as part of a project on West Coast tsunami vulnerability. Thanks to Mike Blackford, a friend and former director of the Pacific Tsunami Warning Center (PTWC), I was able to get a copy of the original PTWC logbook.

The alarm at PTWC sounded eight minutes after the earthquake, at 4:44 PM HST. At the time, PTWC staff worked an 8-hour workday, five days a week. They lived close to the office and someone was always on call to respond to a seismograph-triggered alarm. When the alarm sounded, seismologists responded and recognized it was a major earthquake. They promptly asked other seismic observatories to in their arrival times. The Philippine observatory was first to phone back, sending the P-wave arrival time 35 minutes after the alarm had sounded.

Seismic data continued to arrive over the next half hour from different seismic labs in the Pacific. Nearly an hour and a half after the earthquake, PTWC issued an Advisory Bulletin stating, "This is a tidal wave (seismic sea-wave) advisory. A severe earthquake has occurred at latitude 61°N., longitude 147.5°W.... It is not known, repeat not known, at this time that a sea wave has been generated. You will be kept informed as further information becomes available. If a wave has been generated, its ETA for the Hawaiian Islands (Honolulu) is 0900Z, 28 March."

There are several things I find interesting about this bulletin. No mention of the term tsunami and it is an Advisory bulletin, not a Warning. Attempts had been made to contact Alaskan authorities but communications were down. They had no confirmation an actual tsunami

had been produced, while in fact, the tsunami was already devastating much of the Alaska coast.

The earthquake was centered near Prince William Sound and the preliminary location is quite good. But note that no magnitude is listed. This earthquake was so large that the traces on seismographs likely clipped, exceeding the mechanical arm swing of the instruments at the time. Magnitude determination was based on the largest recorded surface wave signal and clipped records are useless. It would take days to get a determination of 8.4. Even this estimate would be thrown out a decade or so later when the Moment Magnitude scale would come into existence. The 1964 Alaska earthquake is now generally agreed to have a magnitude of 9.2, second in size only to the 1960 M9.5 Chile earthquake less than four years earlier.

The final note from the initial 1964 bulletin is that only an ETA (Estimated Time of Arrival) for Honolulu is given. The first wave arrival was expected in four hours time. We usually consider three hours the minimum time needed for an orderly, coordinated evacuation. From Hawaiian perspective, the timing is pretty good. But there is no recommended action included in the bulletin and no guidance was included for other areas.

The tsunami warning system in 1964 did not end with a single bulletin. Like today, the scientists at PTWC continued to collect information. Seven minutes after the first bulletin, they learned that the Kodiak tide gauge had been destroyed. They issued a second bulletin stating, "Damage to communications to Alaska makes it impossible to contact tide observers," but if a tsunami had been produced ETAs for first wave arrivals were listed for other locations in the Pacific basin. It also included an ETA for Crescent City – 08:02 GMT, two and half hours after the bulletin.

A tsunami Warning was finally issued in their third bulletin an hour later, almost exactly three hours after the earthquake. By then, first wave arrivals were due in Crescent City only an hour and a half later. But you might think that with the previous bulletin, local emergency personnel would have an idea of what was happening.

It was another last mile failure. Bulletins didn't go directly to counties. The PTWC bulletin was sent to California Civil Defense but, for reasons I don't understand, there it languished. Del Norte County received no official notification from the State until 11:08 pm PST with the first wave arrival due in less than an hour. Del Norte County Sheriff's Department did send deputies to low

waterfront areas. Evacuations weren't ordered, but they suggested people leave and many did. Deputies had not completed the door-to-door notification when the first wave arrived at 11:52 PM.

The tsunami warning system in 1964 worked reasonably well in Hawaii. The alert was issued to the Hawaiian Islands with adequate time for evacuation. Hawaii had experience with tsunami evacuations, a system to disseminate the alert and an aware public. Not so in California and elsewhere on the West Coast. Even though the 1946 tsunami damaged Santa Cruz and 1960 had caused damage in the State, the tsunami system was not a high priority outside of Hawaii.

Of course the greatest 1964 failure was in Alaska where over 100 died. In Valdez, the first surges arrived only minutes after the earthquake and all of the Alaska coastal areas impacted, the damage occurred before the first PTWC bulletin was issued. Thus was born the West Coast Alaska Tsunami Warning Center with a chapter all of its own next week.

Note: On the occasion of the 50th commemoration of the 1964 tsunami, I gave a lecture at UC Berkeley about what happened in California and on the North Coast. You can stream it at

<https://www.youtube.com/watch?v=gt24NQvwYzo> .

Lori Dengler is an emeritus professor of geology at Humboldt State University, an expert in tsunami and earthquake hazards. The opinions expressed are hers and not the Times-Standard's. Not My Faults are archived at <https://www2.humboldt.edu/kamome/resources> and may be reused for educational purposes. Leave a message at (707) 826-6019 or email Kamome@humboldt.edu for questions/comments about this column, or to request a free copy of the North Coast preparedness magazine "Living on Shaky Ground."

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