Times Standard

Not My Fault: A sixty-year perspective on the Great 1964 Alaska earthquake

Lori Dengler for the Times-Standard

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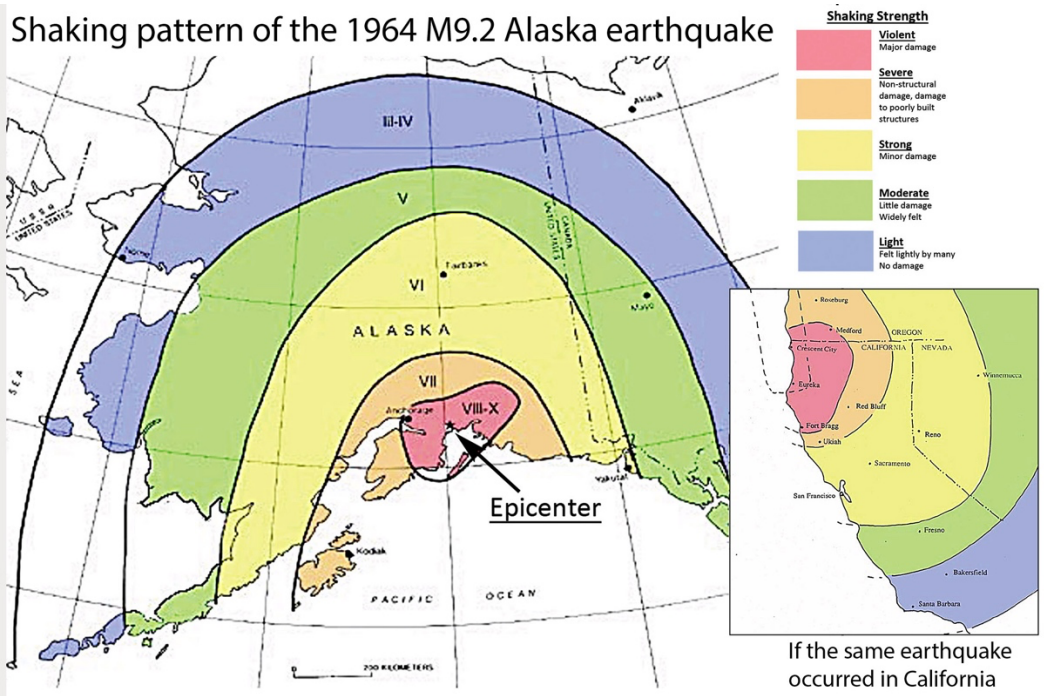

On the left, USGS isoseismal map (contours of equal shaking strength) of the 1964 Alaska earthquake; on the right, those same contours superimposed on California at the same scale with the epicenter near Humboldt Bay to give a feel for how large an area felt the earthquake.

At 5:36 PM AST on Good Friday sixty years ago, a small crack formed about 16 miles beneath the ground near Prince William Sound on the south coast of Alaska. Over the next four minutes, the rupture would grow both towards the surface and laterally, displacing rock along a 500 mile long by 125-mile-wide fault surface, uplifting some areas by more than 30 feet and dropping others down nearly eight feet.

For the whole time and area that the fault ruptured, it generated seismic waves. Almost everyone in Alaska felt it, from Ketchikan in the Southeast to the eastern Aleutian Islands, and as far north as the Brooks Range, an area of over 800,000 square miles. If I center that same felt map near Humboldt Bay, It would have been felt from Los Angeles to Seattle and inland to Utah and Idaho.

Remembering what happened on March 27, 1964 is not only of historic interest. Very large earthquakes are rare and one of the few places on the planet where they occur is right beneath your feet, if you live in coastal Northern California, Oregon, or Washington. Examining what happened in Alaska provides clues to what could happen here.

I've read and heard many accounts of people who were in Alaska that day. There is one that is unique. Bob Pate was a salesman for radio station KHAR in Anchorage and aspired to be an on-air reporter. He carried a portable tape recorder with him and, whenever anything of interest happened around him, would turn it on and describe what was happening. That's what he did from his home that evening.

"Hey, were going through an earth (voice trails), hey boy that's an earthquake for sure…woo-ee, that's a good one, boy oh boy oh boy," the recording begins. From the breathlessness of the narrator, he is very frightened. You can hear everything in the house rattling and crashing. Pate stumbles over words as he tries to describe what is going on and frequently repeats himself. The recording starts about five seconds after the shaking began. By that time, the vibrations are already violent. This strong shaking phase lasts well over a minute and some swaying continues until the end of the recording, more than three minutes later.

While Pate is frightened, he is not panicking. The action of turning on the recorder is a rational one and his attempts to describe what is going on probably helps to focus his thoughts. He describes moving the television off the table, so it won't fall. After the strongest shaking passes, he does a tour of his house to check the damage. And just like I would probably do, he keeps flicking on the light switch only to be reminded that the power is out.

About 100,000 people lived in Anchorage in 1964 and all of them, like Bill Pate, were in the zone of strongest shaking. The Modified Mercalli (MMI) scale is a qualitative measure of shaking strength that varies from zero to XII. We often use roman numerals to distinguish intensities from magnitude. Intensity V is the level when some items topple over and everyone indoors will feel it. The Anchorage area varied between VIII and X, strong enough to toss items into the air and damage even some well-built structures.

In spite of the extreme level of shaking, only nine deaths were directly caused by the earthquake. Four were in Turnagain Heights, a middle-class suburb of newer homes built on the gentle hillslope above the Cook Inlet. When the shaking began, friction melted some of the frozen ground triggering liquefaction and causing a 130 acres to slide a third of a mile towards the sea. The ground didn't move uniformly. It broke into chunks forming great chasms in between. Some of the 75 homes atop the sliding ground likewise broke apart.

Liquefaction also played a role in other parts of Anchorage. The control tower at the airport collapsed killing an air traffic controller. Several areas in the downtown subsided damaging Penny's Department Store where two people died and Government Hill elementary school broke in half. Fortunately, it was a holiday, and no one was in the school at the time.

The Good Friday holiday and the early evening hour contributed to the low death toll. Schools and businesses were closed, and most people were at home. But the built environment also contributed; homes were built of wood, and outside of the liquefaction zones, had little structural damage despite their proximity to the fault rupture zone.

Fewer than one hundredth of a percent of the population died from shaking. But like Bill Pate, they were without power and other services. Areas of Anchorage were isolated from one another due to landslides and damage to roads and bridges. Severe weather prevented outside relief efforts for days; more remote areas were on their own for weeks.

For those first hours and days, it was neighbors helping neighbors. Alaskans are resilient by nature and set up informal neighborhood centers to help one another, sharing food and emergency first aid. One radio station was back on air within 24 hours, providing a calming voice and what little information was available. Lyndon Johnson, only four months into his presidency, declared a state of emergency, but it took days for assistance to reach Anchorage.

The details of what happened that Good Friday wouldn't be known for years. It took painstaking field investigation and re-examination of data, some of which is still ongoing, to draw a more complete picture. 1964 was the dawn of the modern tectonic era and 'subduction zone' wouldn't enter the literature for another six years. A very large earthquake had occurred nearly four years earlier along the coast of southern Chile and the magnitude scale in use at the time gave a value of 8.6. Using that outdated magnitude estimate, the 1964 Alaska had a value of 8.4, barely larger than the 1906 San Francisco quake then ranked at an 8.3.

It would take 15 years before the moment magnitude scale was developed and the true size of these great quakes could be accurately compared. The 1960 Chile earthquake still sits at the top of the earthquake Leader Board at a magnitude of 9.5, Alaska is in second at 9.2 and 1906 San Francisco earthquake, revised to magnitude 7.9, doesn't even make the top 100. But these changes weren't made until much later. For people in Alaska, they knew something extraordinary had happened.

We still use a variation of MMI today, although now it is augmented by instruments that measure ground accelerations and responses of people who experienced the earthquake on the USGS "Did You Feel It?" web site.

In case you hadn't noticed, there is not one mention of tsunami in what I have written above. Tune in to next week's column for what happened then and how it might play out differently were a repeat to happen today.

Note: You can find a link to the Bill Pate recording at https://kamome.humboldt.edu/activities/6-8/sounds-quake-grades-6-8. It is part of the online Sounds of a Quake curriculum activity that all teachers are welcome to use

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