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Not My Fault: Haiti hit again by big quake

Lori Dengler/For the Times-Standard
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I decided to take a Not My Fault break this week. I wasn't quite sure what to write about and could use a quiet Saturday morning. Mother Nature had different plans for me.

One can't ignore a major quake in Haiti. Yesterday morning at 8:29 AM EDT, a magnitude 7.2 earthquake occurred on Haiti's Tiburon Peninsula about 70 miles west of Port-au-Prince, Haiti's capital. As I write, impact information is preliminary – 227 deaths reported and much damage in the city of Les Cayes twenty miles from the epicenter. It is already the deadliest quake of 2021. The death toll will likely rise. The USGS loss estimate based on location, size, population, and building construction projects a death toll of more than 1000 and economic losses of 30 - 50% of the country's GDP.

I clearly remember a similar morning back in January 2010, when my computer flashed with a magnitude 7 earthquake in Haiti. It was only three days after the North Coast M6.5 and that morning I was prepping to brief then Governor Schwarzenegger about the earthquake that caused $40 million in damages to Eureka and Ferndale. It took no more than an instant to realize that, if the preliminary magnitude and location were correct, what happened in Haiti would be far far worse.

It was the same gut punch yesterday when I learned about the 2021 Haiti earthquake. The location put it in the Enriquillo-Plantain Garden fault system, the same fault that produced the 2010 earthquake, but sixty miles to the west and further away from the Haiti capital. The Tiburon Peninsula is one of the most populated areas of the country and the city of Les Cayes (126,000) and numerous smaller towns were within the area of strong shaking. The USGS estimates over one million people live in the area of intensity VII and stronger shaking, a level that can easily topple poorly build structures. In contrast, the 2010 earthquake exposed three times as many people to this level of shaking, so at first glance, yesterday's quake is likely to be bad but not as bad as 2010.

Why so many disastrous quakes in Haiti? People have short memories and two damaging earthquakes in a little over a decade seems like a lot. Haiti has a history of deadly quakes – an earthquake in 1770 likely killed 200 and one in 1842, estimated at M8.1, killed at least 5000. But those were a long time ago and until 2010, the country had been mostly spared.

Hispaniola, home to Haiti and the Dominical Republic, is caught in a crunch between the North American and Caribbean plates. The plate boundary zone is complex, and several slivers of continental crust have been caught up in deformation zone. Hispaniola is sandwiched between two major thrust fault systems – the Hispaniola trench just north of the Island and the Muertos trench to the south. The Enriquillo-Plantain Garden fault is a strike-slip fault running through the most populated part of Haiti that accommodates some of the intraplate motion between the North American and Caribbean plates and the motion of the nearby two thrust faults. The fault produced three major quakes in the 1700s and had been quiet until 2010.

Human perception of time and geologic recurrence don't match. We think in years and decades where geologic events recur centuries to millennia or longer. The population growth and development has occurred during a time of seismic quiet. Haiti has building codes but no enforcement. Structures that were built to code performed very well in 2010 but many buildings in the region did not meet code requirements and collapsed. I expect the same will be true in the recent quake.

Yesterday's quake couldn't have happened in a more fragile place. Haiti has endured nearly a century of governments that have put the gain of a few over the needs of the many. It was the poorest in the Western Hemisphere when the 2010 earthquake struck. 2010 losses exceeded $2 billion US$ and recovery has been slow (see Not My Fault 1/19/2020). On July 7th, Haiti's President was assassinated, and the country is in political and social turmoil. The lack of civic institutions will make response even more difficult this time.

A magnitude 7 earthquake in a populated area will cause problems in most places in the world. I know and work with many emergency mangers and the specter of a 7 in the LA basin the SF Bay Area gives them nightmares. But it won't be a Haiti – most of our buildings are constructed to resist the shaking levels seen in yesterday's Haiti earthquake and plans are in place on how to respond.

Haiti's quake wasn't the only excitement in the Atlantic this week. The Pacific "Ring of Fire" hosts over 70% of the

world's earthquakes, but they do occur elsewhere. Last Thursday, a M8.1 struck the South Sandwich Islands far offshore of the southern tip of South America. First reported as a 7.5, it took a day of work by seismologists to determine that it was a doublet - the 7.5 followed three minutes later by an 8.1. Doublets aren't unusual – many large quakes will begin to rupture, then pause for a few seconds or minutes before continuing. The good news about was the remote location - too far from populated areas to pose a shaking damage threat. It did produce a small tsunami, but too far from populated coastlines to be a problem.

2021 is an unusual year for earthquakes. This week's 8.1 makes it only the second time since 1970 that three or more quakes in the M8 range have occurred. And all three 8s – the 8.1 March 4th in the Kermadec Islands, the 8.2 south of the Alaska Peninsula on July 28th, and Thursday's 8.1 in the southern Atlantic caused no damage. The Haiti quake was more than 30 times weaker in terms of energy release than the largest quake of the year, but when it comes to earthquakes, it's all about location and yesterday's M7.2 could not have found a more vulnerable place.

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