

<http://www.trust.org/alertnet/blogs/alertnet-news-blog/the-difference-between-climate-hazards-and-climate-disasters>

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Climate Conversations - Is climate change increasing earthquakes?

By Ilan Kelman | Tue., March 15, 3:17 PM | Comments (10)

Connections between earthquakes and climate change exist, but they are few. The earthquake destruction seen recently in Japan and New Zealand cannot and should not be linked to climate change.

But some scientific evidence suggests it is worth thinking about interactions between climate change and earthquakes.

Two principal components must be considered in looking at threats from earthquakes: the hazard itself - the earth shaking - and vulnerability to that hazard, revealed through deaths and damage.

There are also two directions of action to ponder: Whether earthquakes influence climate change, and whether climate change influences earthquakes.

On the first point, there is little scientific support, and no connection should currently be made.

But as for climate change affecting earthquakes, there are tentative hints of links. Changing ice caps and sea-level redistribute weight over fault lines, which could potentially have an influence on earthquake occurrences. No studies quantify the relationship to a high level of detail, so recent earthquakes should not be linked with climate change.

Additionally, shifting seas mean that climate change could lead to changes in the weight of water on undersea volcanoes. Such changes correlate with eruptions, many of which are linked with earthquakes – though the recent quakes were not.

Volcano eruptions, and to some degree earthquakes associated with volcanoes, are well-known to affect weather and climate conditions in the short-term. After the Tambora volcano erupted in Indonesia in 1815, many regions of the world experienced "the year without a summer". After Mount Pinatubo erupted in the Philippines in 1991, a small cooling effect was seen in the global climate for a few years.

Longer-term links between volcano eruptions and climate are more disputed.

Now let's turn to vulnerability. Earthquake vulnerability and climate change vulnerability have some links.

Climate change affects livelihoods and can cause local environmental knowledge to become outdated. That can contribute to decisions to move elsewhere. Yet migration decisions are infrequently only due to climate change. They usually involve many other factors, including

economic conditions and livelihood possibilities, even if a specific climate-related disaster triggers a specific decision to migrate.

But if climate-influenced migrants, with limited resources and options, settle in a zone of higher earthquake activity or one with worse preparation for earthquakes, then their earthquake vulnerability could potentially increase. Many factors are involved, so the connection is tenuous. Settling in a new area with better plans for earthquake damage mitigation could actually reduce earthquake vulnerability, for instance.

In terms of earthquake vulnerability affecting climate change vulnerability, people who have been affected by an earthquake are often highly vulnerable to climate-related problems, including more extreme storms. Soon after the 2010 Haiti earthquake, devastating storms took a toll on earthquake survivors, many of whom continued to huddle in tents and other inadequate shelter.

It is difficult to link any specific weather event to climate change. And even without climate change, immense climate-related and earthquake-related vulnerability would still exist in Haiti and around the world.

Overall, climate change tends to be a minor component of the disaster-related vulnerabilities that have existed for centuries. These vulnerabilities lead to the tragedies that make headlines. Our challenge is to reduce overall vulnerability, which will also contribute to dealing with climate change.

Japan is a good example. The city of Kobe was devastated by an earthquake in 1995. The deaths and damage were terrible in part because of building codes written mainly with an eye toward protecting structure from typhoons. Earthquakes were considered to be a secondary threat.

Rather than trying to blame climate change for destruction from disasters around the world, it is time to look more closely at human decisions that create and perpetuate vulnerability over the long-term. Irrespective of climate change, we know how to reduce the number of people dying in earthquakes.