Earthquake hazard is climate hazard

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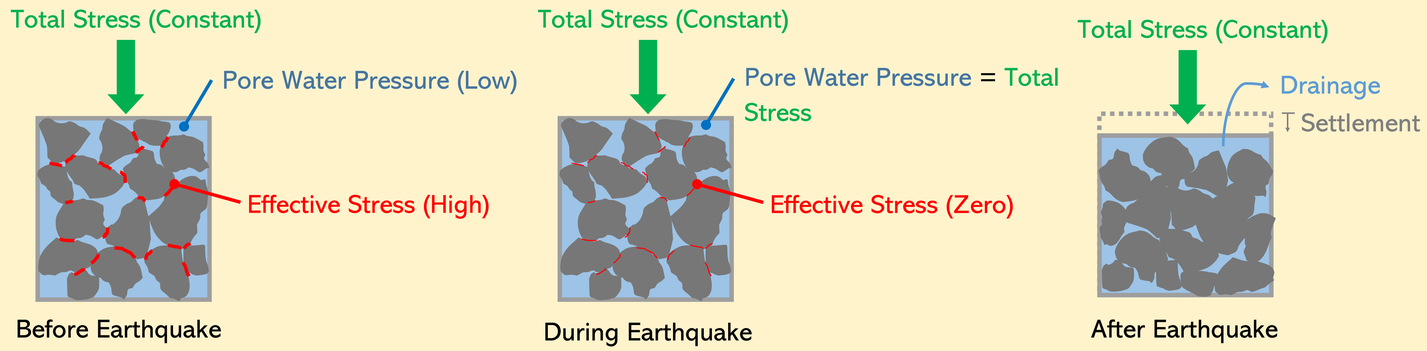
Many communities that will be disproportionately affected by climate change also have very high seismic hazard. While climate change does not impact the frequency or magnitude of earthquakes, some of the effects of climate change will impact secondary seismic hazards, like **soil liquefaction**.

Lincoln, Mark. *Faceplant—Car in Silt 2*. Retrieved from www.nzraw.co.nz.

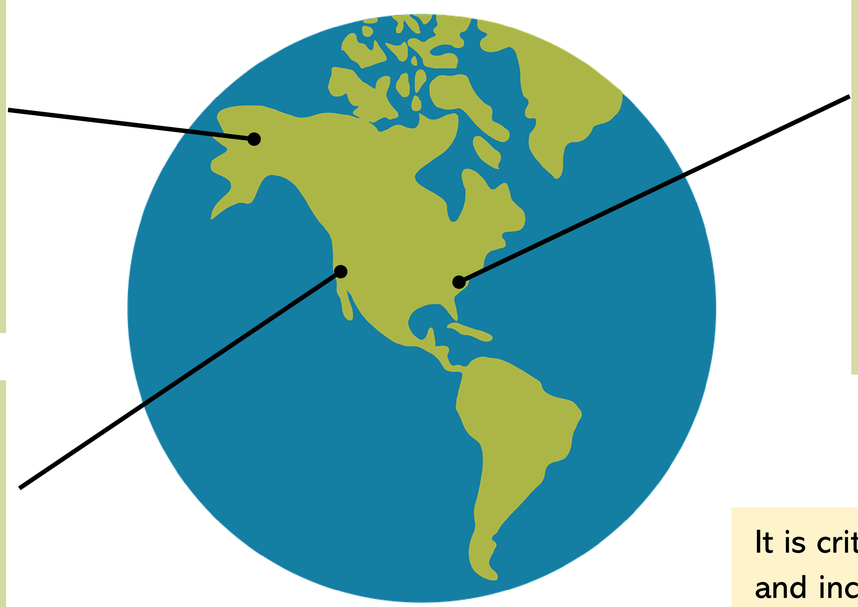
Soil liquefaction is the loss of strength in saturated, sandy soils subjected to earthquake shaking. It can result in extremely detrimental infrastructure damage, like cracking of water lines, differential settlements or failures of foundations, and even alter the shape of our coastlines. The phenomenon can be explained through the concept of effective stress, which can be thought of as a proxy for **soil strength**.

Effective Stress = Total Stress - Pore Water Pressure



Thawing permafrost in Alaska not only results in soil settlement and loss of strength, but also means that a greater proportion of Alaskan soils will be saturated and susceptible to soil liquefaction. Alaska has some of the highest seismic hazard in the US and large earthquakes in the southern portion of the state have caused significant liquefaction damage historically. Communities who have never faced liquefaction threats before will have to adapt.

Unusual weather patterns in California will result in uneven distribution of liquefaction hazard throughout the year. Periods of unprecedented rain will saturate soils that are usually dry. If an earthquake occurs during this timeframe, liquefaction hazard will be higher than usual.



Sea level rise is projected to impact large portions of downtown Charleston, South Carolina, inundating previously livable areas. Sea level rise will result in rising groundwater tables. The city is also experiencing widespread subsidence, meaning the ground is sinking, exacerbating flooding and shallow groundwater levels. All of these add up to larger portions of the city being potentially liquefiable. The 1886 ~M7 Charleston earthquake serves as a reminder that this region may also experience damaging earthquakes.

It is critical we take a **holistic view of disaster resilience** and incorporate seismic considerations in our discussions about climate change.