



Cascadia Subduction Earthquakes Seismic Hazard and Risk

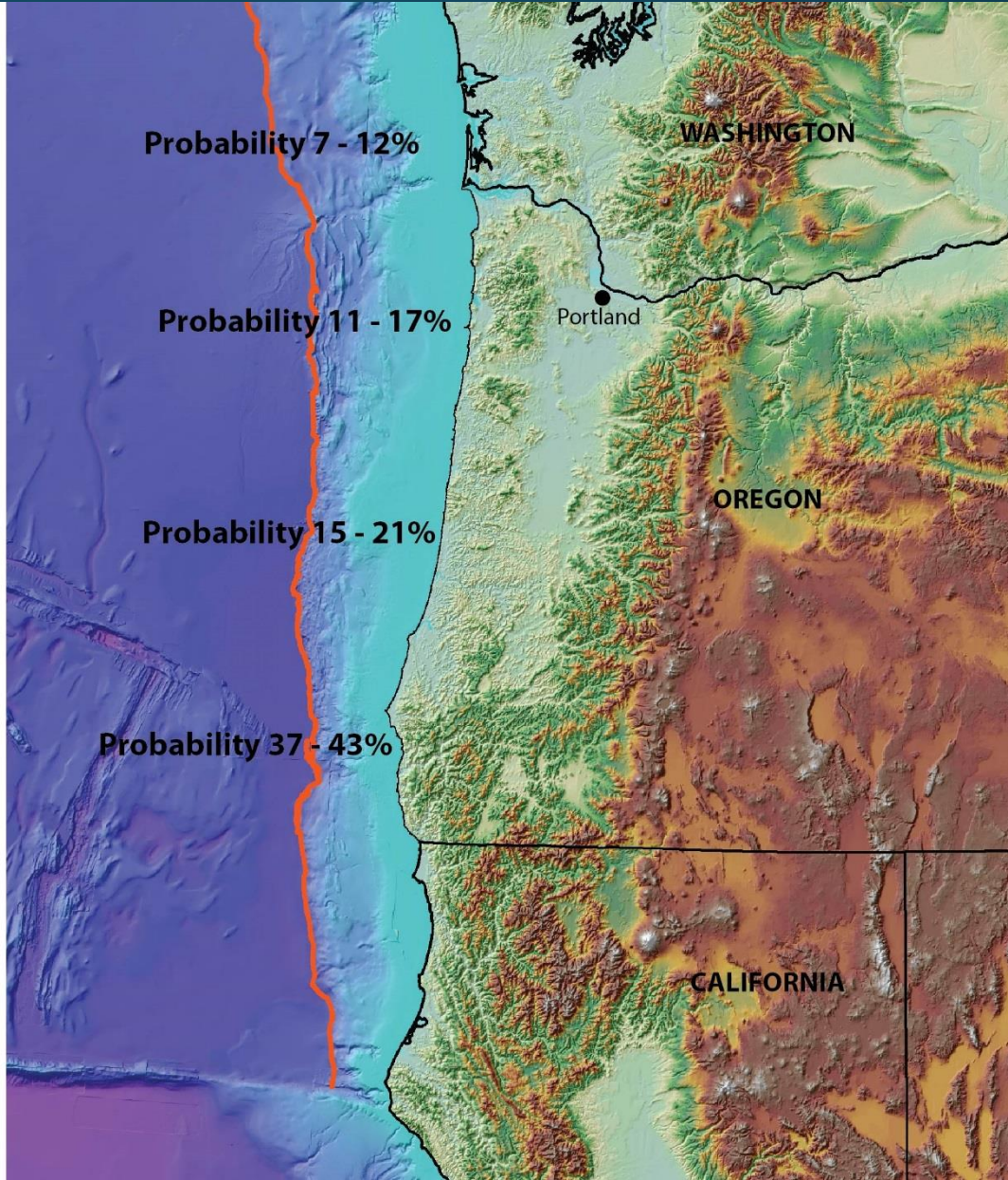
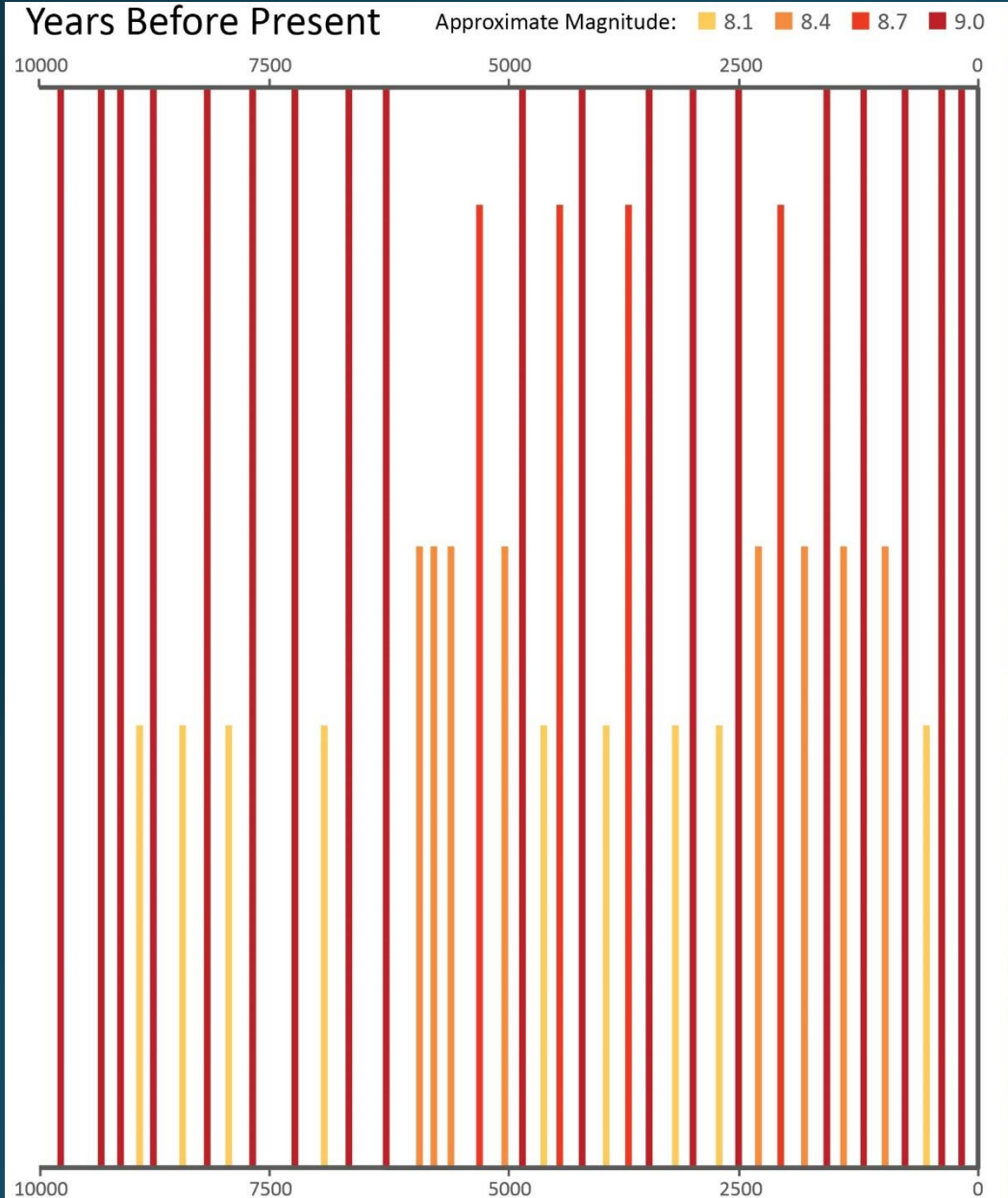
Hazard and Risk Data to Support Action to Improve Resilience

Oregon Department of Geology and Mineral Industries
Testimony to the House Veterans and Emergency Preparedness Committee

2/28/2017

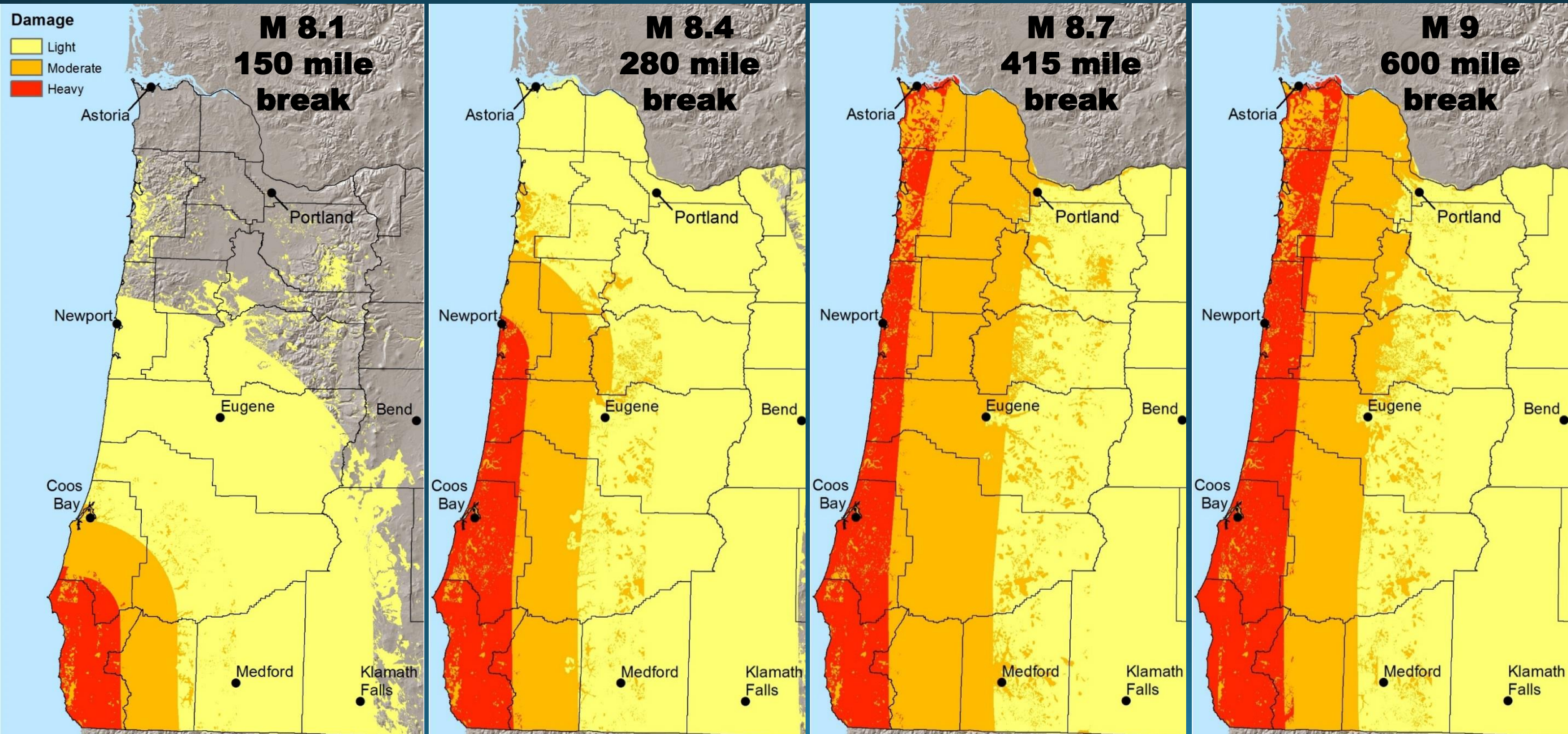
Ian Madin, Chief Scientist and Deputy Director

Past Cascadia earthquakes typically break one of four segments of the fault. All earthquakes break the southern end, while only half break the whole fault. The probability of a nearby earthquake increases from south to north.





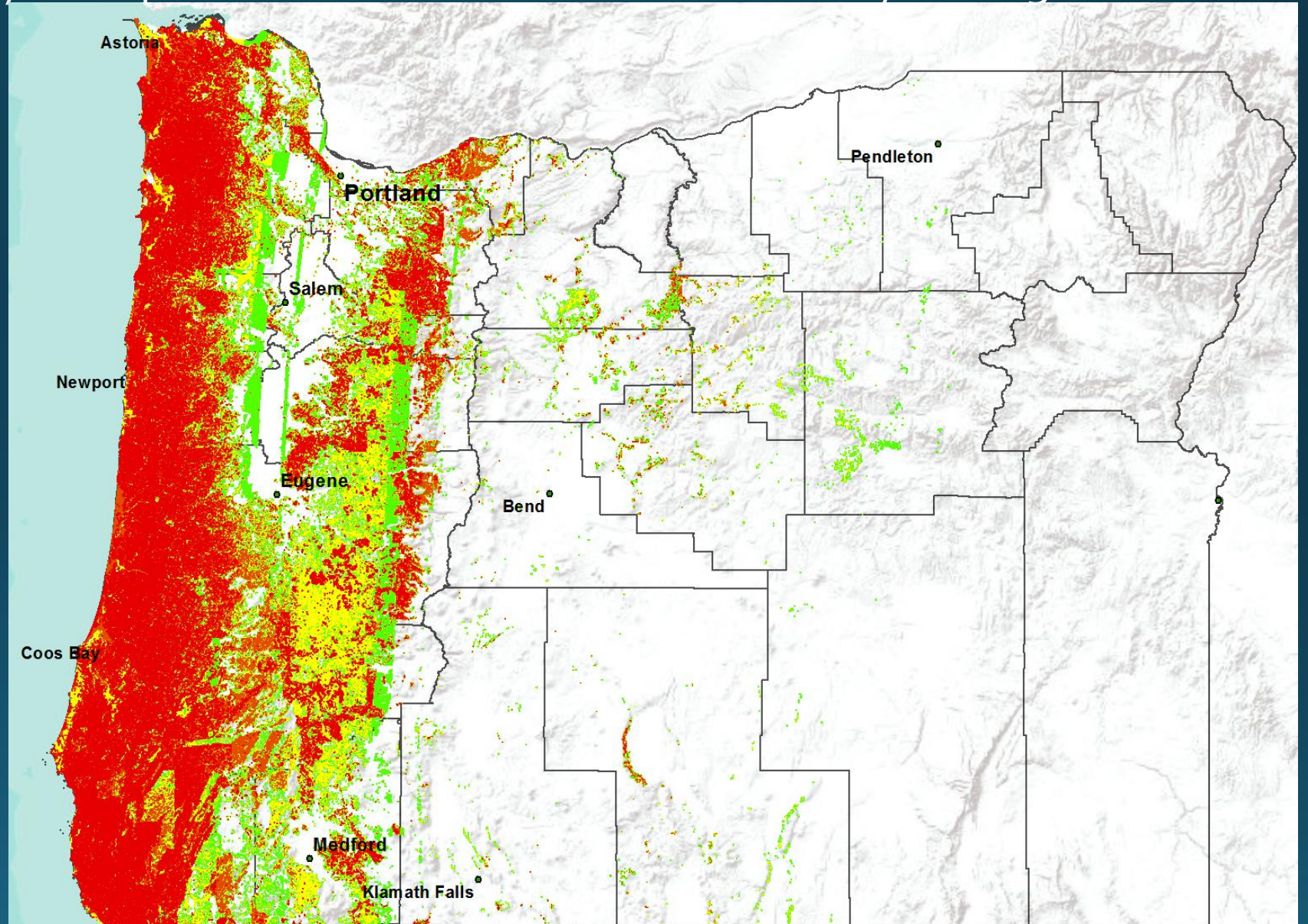
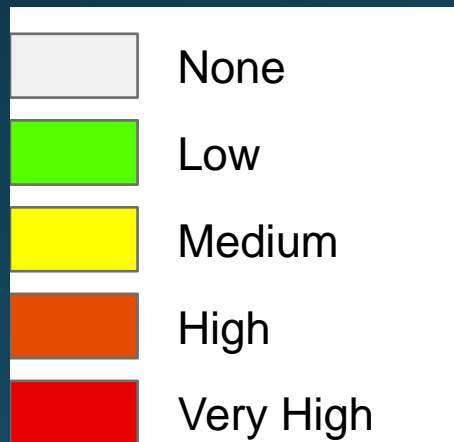
The amount of damage from a Cascadia earthquake will depend on which segment of the subduction zone breaks. Longer breaks expose more area to high levels of damage, but even the smallest cause heavy damage near the fault.



A magnitude 9 earthquake will cause thousands of landslides on sloping terrain over much of the western half of the state; many will be severe, particularly in the Coast Range . Highways and power transmission lines will be badly damaged.



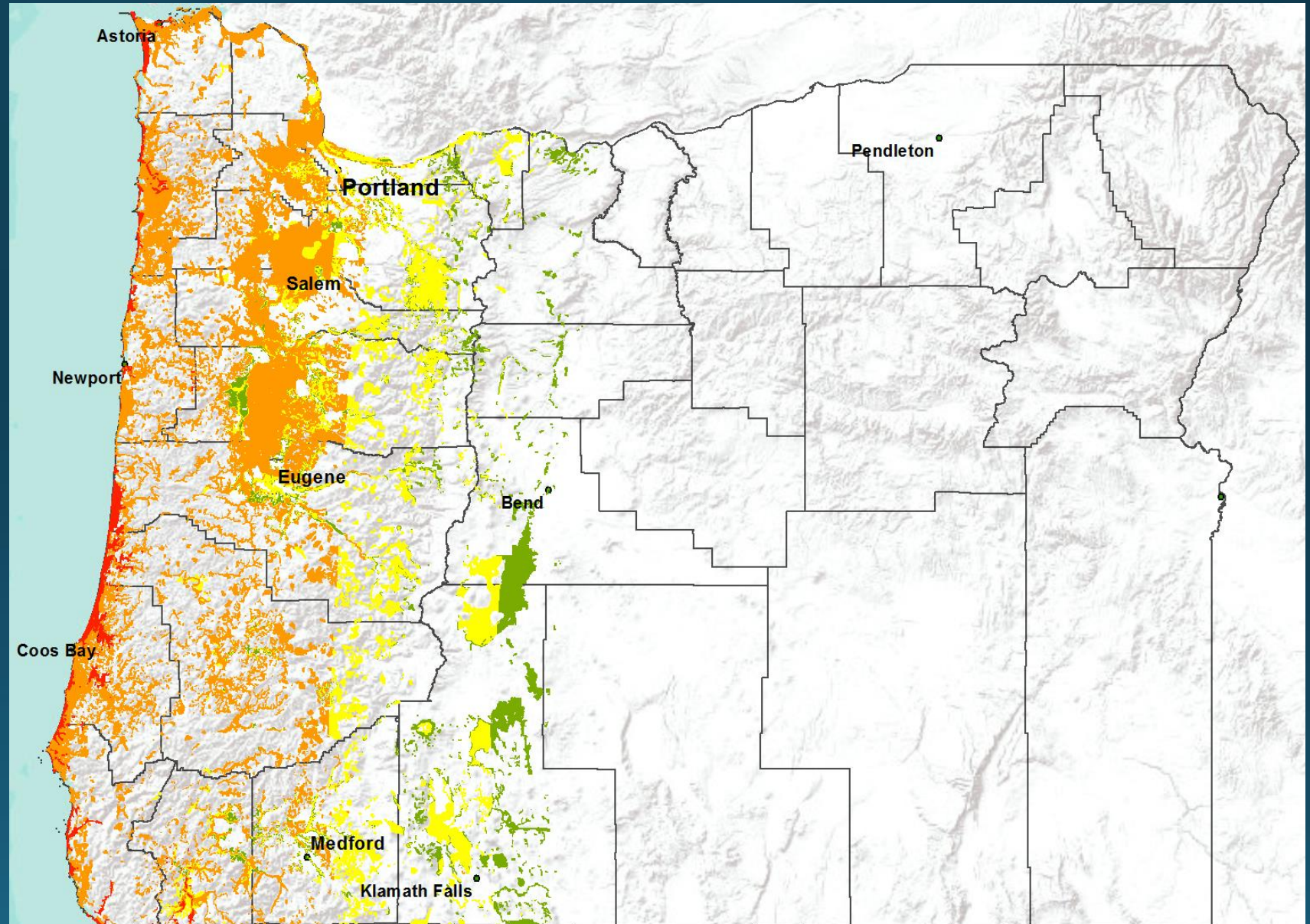
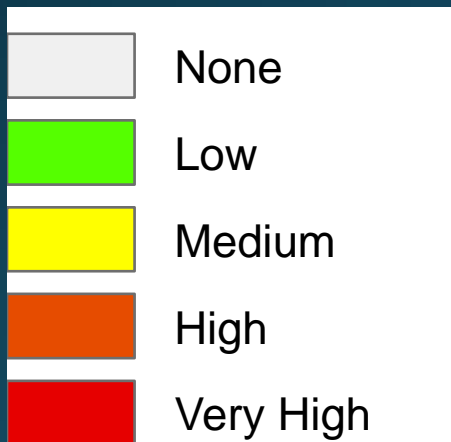
Expected amount of landslide movement



A magnitude 9 earthquake will cause liquefaction of susceptible soil over much of the western half of the state; it will be particularly severe along the Coast. Liquefaction can cause severe damage to buildings and infrastructure.



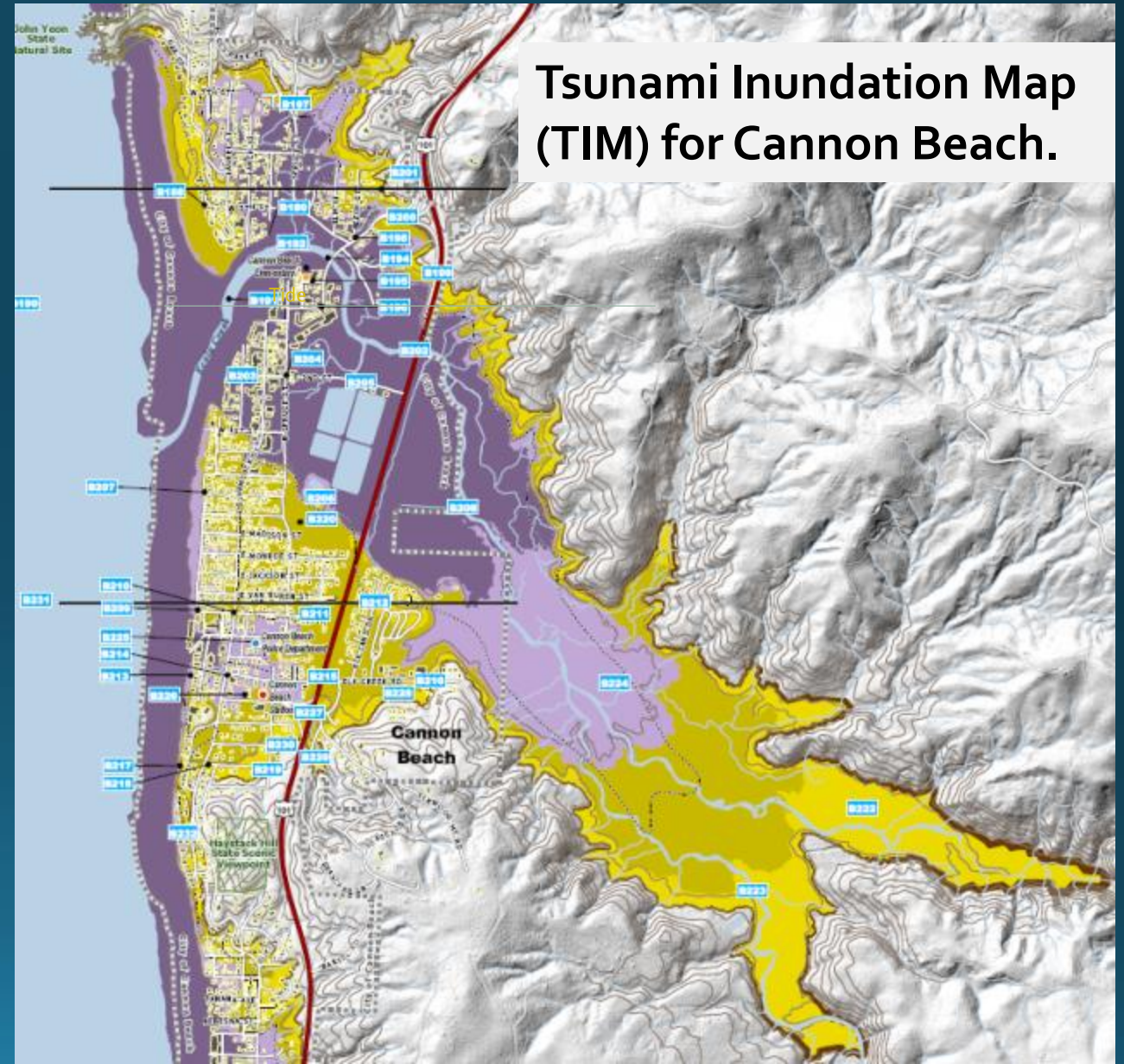
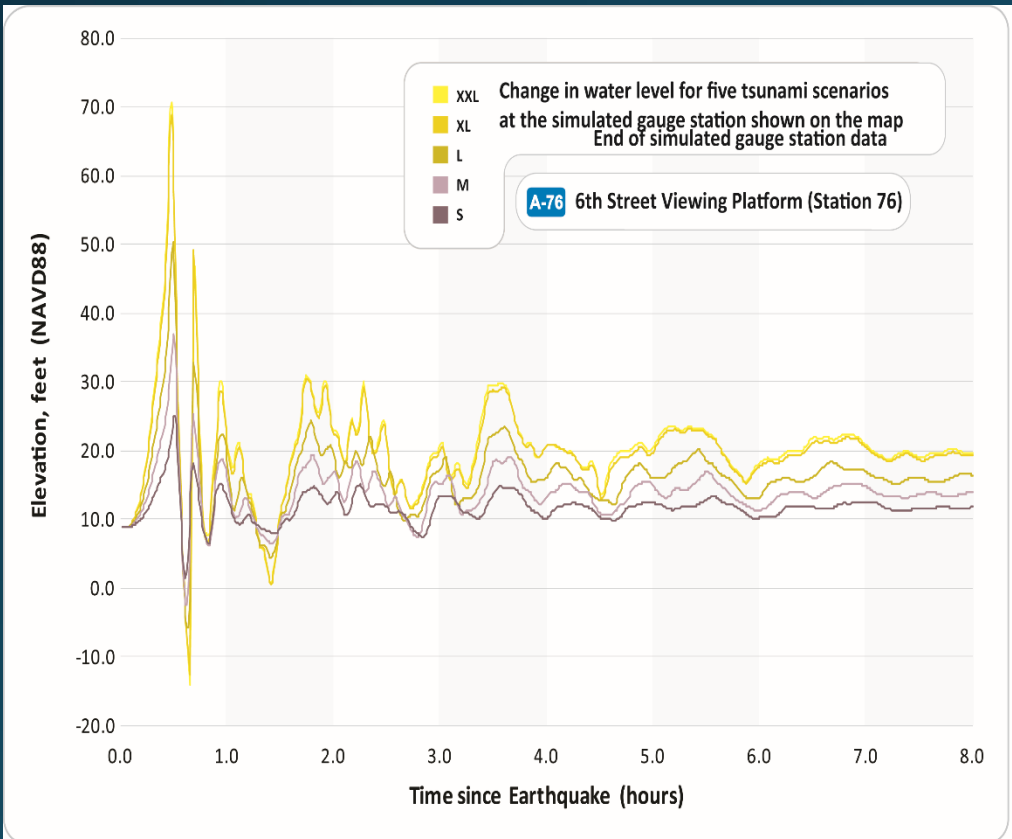
Expected ground movement due to liquefaction



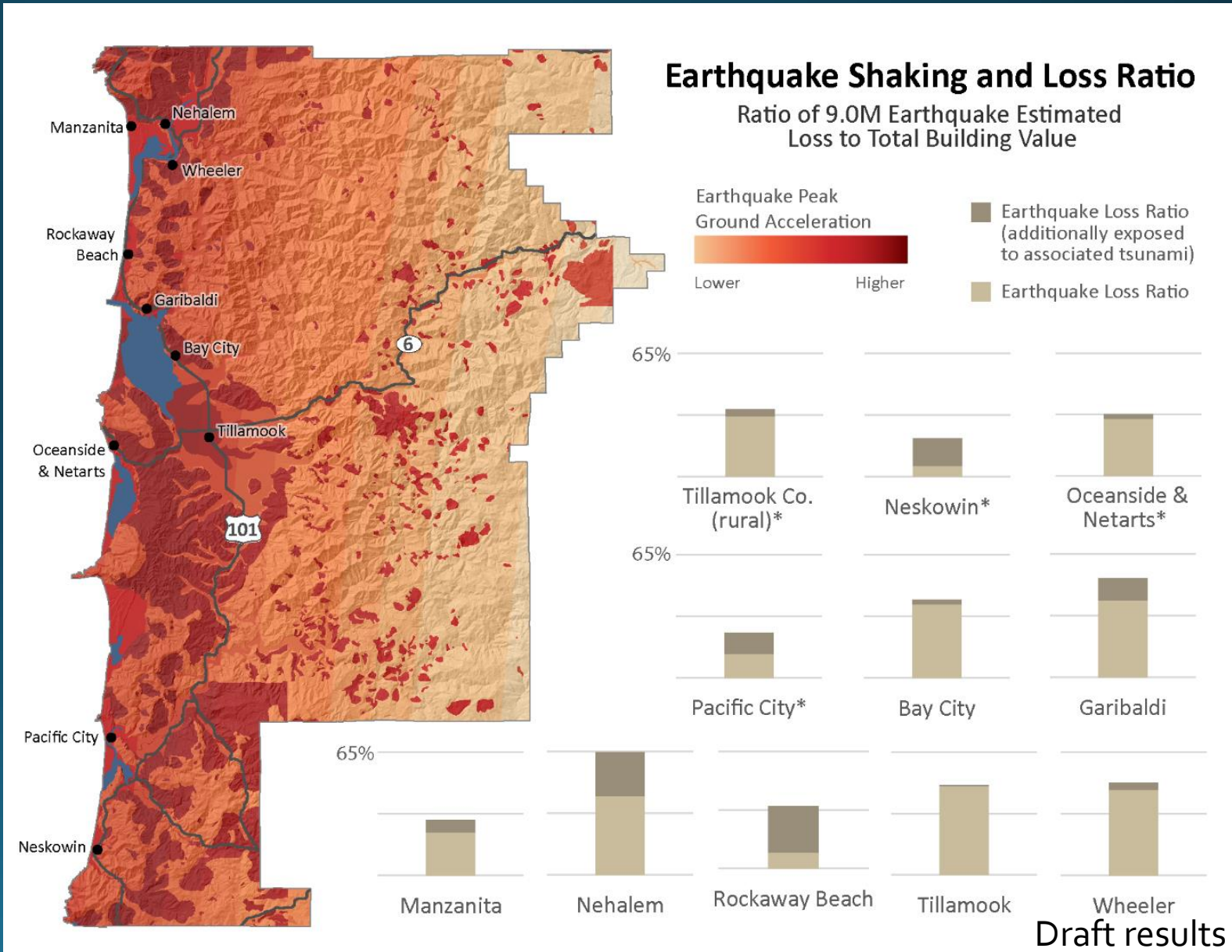
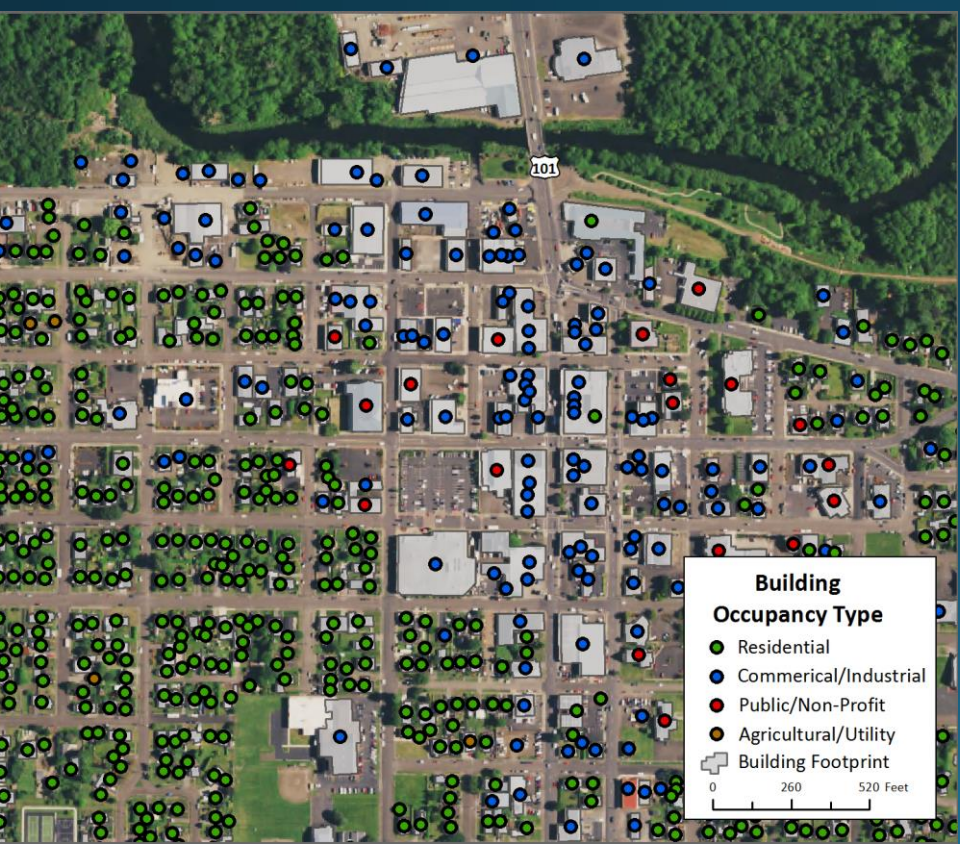


Coastal communities will be inundated by a tsunami within 20-30 minutes of the start of the earthquake. The extent of inundation will depend on the size of the earthquake. DOGAMI maps show tsunami inundation for a range of possible earthquake sizes.

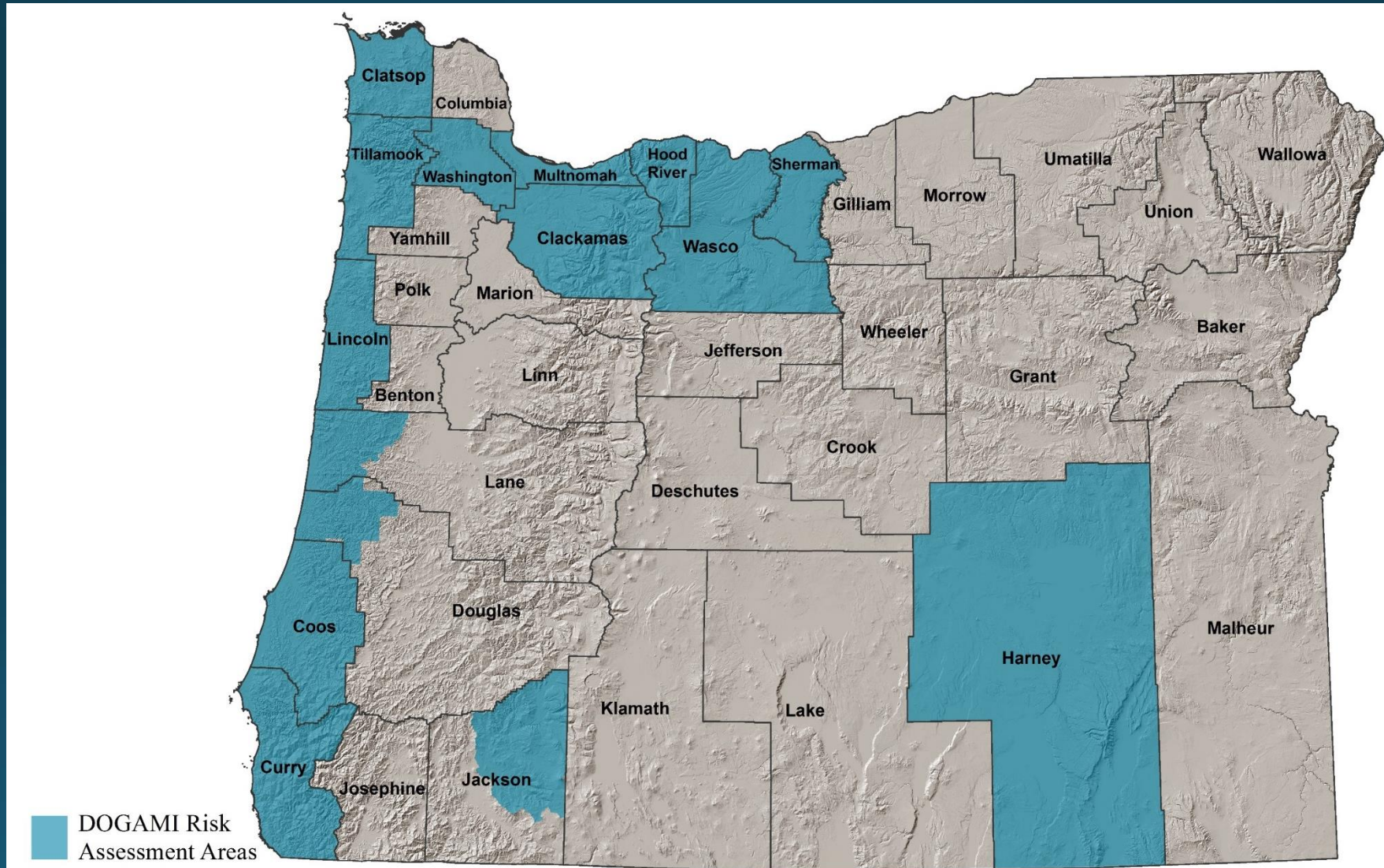
Even small Cascadia earthquakes will produce large waves. Most structures that are inundated by more than a few feet of water will be severely damaged or completely destroyed.



DOGAMI is making hazard and risk studies for earthquake, landslide, flood, tsunami and coastal erosion for Oregon communities. The earthquake risk studies provide detailed loss estimates for magnitude 9 Cascadia earthquakes.



DOGAMI currently has grant funding to complete earthquake hazard and risk studies in these areas. DOGAMI's 17-19 budget bill includes a new KPM focused on completing these hazard and risk studies for all Oregon communities.





2013 Oregon Resilience Plan

Prepared by OSSPAC at request of Legislature

- 18 month effort by ~200 volunteers
- Evaluated likely performance of systems needed to sustain commerce
- Identified desired post-earthquake performance goals
- Gap analysis and **recommendations** to close the gap
- Most recommendations have not been acted on

