

COMMENTS & RESPONSES:
DRAFT 2017 Tillamook County Multi-Jurisdictional Natural Hazards Mitigation Plan

#	COMMENTS	COMMENT	RESPONSE
1	Tom Bender Neahkahnie, OR	What is actual earthquake hazard being considered - what does "M 9.0" mean? Is that the same as R-9? XXL quake is R-9.5, with FIVE TIMES the lateral movement of R9.0. Triple confusion with other two ratings having MM wording!	The earthquake being considered is a Cascadia Subduction Zone (CSZ) event with a "moment magnitude" (M or Mw) of 9.0. The moment magnitude is more accurate for large earthquakes than the Richter scale which is often used for earthquakes that are up to a magnitude 6.5. Magnitude measures the energy released by an earthquake. Most people feel nearby earthquakes of M3.0 or greater. Shaking intensity is measured by the Modified Mercalli (MM) scale. It is based on observation and therefore subjective. Rather than an earthquake measurement, XXL (extra, extra large) is one of five sizes that express the extent of tsunami inundation expected from various CSZ event scenarios. The XXL line is used to depict the tsunami evacuation zone boundary.
2	Tom Bender Neahkahnie, OR	The use of a "Medium" CZE earthquake for Resilience Planning and location of essential facilities feels improper. A careful look at the quake history chart on page 156 of your study clearly shows that the next 3000 yr. XXL quake (last which was a "cluster") is 65 years "overdue", and should be used for planning as well as the smaller "Medium" size quakes.	The Oregon Resilience Plan uses the impact of a "Medium" Cascadia Subduction Zone (CSZ) earthquake and tsunami for planning purposes because this was judged the most likely CSZ event. (For explanation see DOGAMI Special Paper 43, http://www.oregongeology.org/pubs/sp/p-SP-43.htm .) The current regulatory tsunami inundation used by the Oregon Building Code to limit new construction of critical, essential, large occupancy, and hazardous facilities also uses a scenario similar to the "Medium" case.
3	Tom Bender Neahkahnie, OR	Neahkahnie is not included in unincorporated communities, and is shown as "grey" and not rated on most maps.	Of the unincorporated communities in Tillamook County, only Oceanside and Netarts together, Pacific City and Woods together, and Neskowin are addressed directly and separately from the rest of the unincorporated County. They were selected based on their population size and density which allowed responsible characterization of exposure to and potential loss from natural hazards relative to the cities and County.
4	Tom Bender Neahkahnie, OR	Essential facilities not shown on maps: Wheeler - skilled care center, clinic, pharmacy; Nehalem - NCRD evacuation center; Manzanita - Adventist Health, evac. center?; Falcon Cove - Fire Mountain School/evac. center.	Hospitals, schools, fire stations, police stations, emergency operations, and military facilities comprised the initial set of essential facilities included in this analysis. That set has been expanded somewhat based on conversations with the individual jurisdictions.
5	Tom Bender Neahkahnie, OR	The new Nehalem City Hall is located in tsunami inundation zone and flood zone. Although floor level is above current outdated "flood zone", its access is blocked every year by street flooding.	Thank you for this information.
6	Tom Bender Neahkahnie, OR	HAZARDS NOT ADDRESSED: <ul style="list-style-type: none"> Wildfires can also be caused by beach fires being reignited by late afternoon winds. At least 4 have occurred in the last 50-60 years in Neahkahnie, the last setting four homes on fire, the previous one luckily being blown north of residences. Another, after the one affecting 4 homes, was narrowly avoided when improper procedures by ODF intentionally burning beach wood almost caused another fire when the "wind changed". "Blue clay" impervious soils from volcanic ash deposits on existing slopes increases landslide hazards. Ground level drop after quake, ocean-rising, more storm severity impacts not addressed. 	<ul style="list-style-type: none"> The Wildfire section notes that according to the Tillamook County Community Wildfire Protection Plan (CWPP), recreation is the leading cause of wildfires in Tillamook County. This may be augmented in future updates of this Plan and the CWPP. Geology at a statewide scale which may or may not include local units like this was used for this analysis. DOGAMI has recently received funding approval from FEMA to perform a detailed landslide study for Tillamook County. That study will address issues like this at a fine scale. The study timeline is not yet set, but it should be completed over approximately the next two to three years. Coastal subsidence is addressed briefly in the Tsunami section. Sea level rise is addressed briefly in the Coastal Erosion section. Increased impacts from coastal storms after a CSZ event is a secondary hazard and not addressed.
7	Tom Bender Neahkahnie, OR	MITIGATION ACTIONS: <ul style="list-style-type: none"> Install solar PVs on emergency facilities, hospitals, fire stations, cow barns Set up for heat at emergency facilities, potentially needed for months without power. Similarly, what about food at emergency facilities? Nehalem, for example could tie NCRD Evac Center with the new grade school with cafeteria, which could cycle emergency food storage. Seismic upgrades at emergency facilities have not been adequately addressed or implemented. Where have "Tsunami Zone" signs on roads been updated or not updated for XXL quakes and tsunami inundation? Develop access plans for military "bridges" to reestablish road access as soon as possible and long before permanent replacement bridges could occur. Develop debris management plans. Wood-chipping for electric generation, separation of recyclable materials and those with toxic burning potential; tagging of buildings with asbestos and other hazardous materials that need to be avoided until proper treatment. Local stockpiling of water mains, utility poles and transformers, etc. to allow more rapid repairs. 	Thank you for these ideas. The jurisdictions chose not to adopt any for this update; however they may be considered for implementation over the five-year life of the Plan.

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		<ul style="list-style-type: none"> • Emergency power supply for water pumping to storage facilities drained by broken water mains. • Mapping shutoffs for water service, etc. to allow most rapid phasing of repair and resupply. Similarly, distributed location of water shut-off wrenches to shut off lines to damaged homes so mains can supply remaining ones. • Nehalem Bay State Park continues, after 9 years, to post fraudulent "Evacuation Route" signs, though there is almost no possibility that any of 1500 visitors at a time could escape by those routes even if drivable. They continue to ignore signing of walkable escape routes to the high eastern parts of the park. Mitigation action: implement on-foot escape routes. • Another mitigation action is that "danger trees" growing at 30 - 45 degree angles out over Hwy 101 and other important roads can be removed BEFORE storms causing them to fall. • Logging impacts on streams, flooding, landslides are not addressed, nor banning logging in areas with potential landslide impact on communities. • An important mitigation action not addressed for earthquakes and landslides is to prohibit additional construction in those impact areas, and to bring additional land outside impact zones into "buildable lands" category. The "value added" from such upzoning can be captured as is done in other jurisdictions, to pay for infrastructure serving those new areas, payments to development-banned properties, etc. • Another major issue not discussed is whether to ban rebuilding in Inundation Zone after the Big One. Seaview WA - Sou'wester Lodge is an example where building is not allowed out to the beach. Sendai, Japan, had rocks in place 300 years ago saying "do not build beyond this point because of tsunamis". Obviously ignored, causing major losses from Fukushima quake. 	
8	Guy Sievert Neskowin, OR	I worry that the county's plan stops at Neskowin's south beach....US101 is a major landslide risk.	The Draft Risk Assessment covers all of Tillamook County, including the area south of Neskowin to Lincoln County. The Landslide susceptibility map shows high and very high landslide susceptibility in the vast majority of the area south of Neskowin and along US 101.
9	Tilda Jones Tillamook Bay Flood Improvement District	Southern Flow Corridor Project (a public flood and environmental safety project) described on pages 105-106 rewritten (Rachael?) to be more factual, accurately described, and updated.	This section was reviewed and revised as requested.
10	John Coopersmith Pete Anderson Realty Manzanita, OR	<p>Residential Seismic Upgrading could be a cost effective method to preserve or minimize housing loss after a catastrophic earthquake.</p> <p>On the Oregon Construction Contractors Board website there is a page discussing Residential Seismic Upgrades. The information indicates a cost of between \$4000 and \$10,000 for an average upgrade.</p> <p>At the \$7,000 mid-point, for a \$10 million investment over 1400 could be seismically retrofitted. To preserve the state's capital investment these could be a part-grant part-loan to home owners. Loans could be in the form of perhaps 1% interest with no payments but due on sale of the property. The loan would be recorded as a lien on the property. In this way, over time, the capital investment would return to the state replenishing the fund thus allowing for more retro-fits.</p> <p>If the state would fund this at \$10 million per year over 10 years with loans being paid back a substantial fund would be created. Over time tens of thousands of homes could be saved.</p>	Thank you for this suggestion. We will follow-up with you.