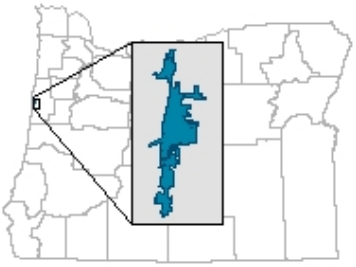
TSUNAMI EXPOSURE SNAPSHOT

Newport, OR



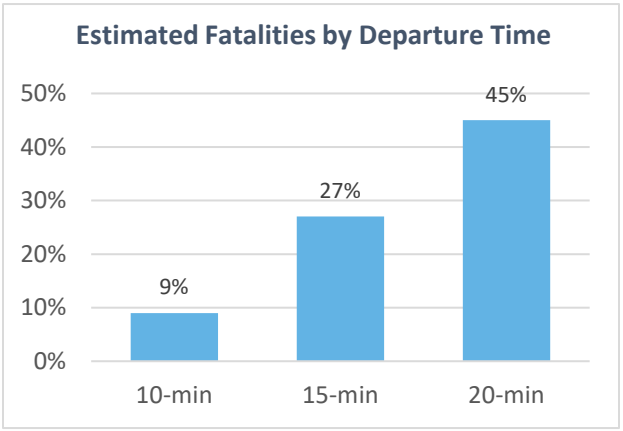
The Department of Geology and Mineral Industries (DOGAMI) has completed a tsunami damage assessment for a local Cascadia Subduction Zone earthquake and tsunami event in Newport, OR. The major results are presented below along with suggested action items to increase resilience in the community. This study was designed so that public decisions might be made with the best, most detailed science available.

Casualty Estimates (Injuries + Fatalities)

The first tsunami wave arrives in Newport **30 minutes** from the start of earthquake shaking. The wave arrival time is important for assessing a community's ability to quickly evacuate, which directly affects the potential for fatalities.

Results presented are for a summer weekend at 2 AM, which represents a peak number (all possible beds occupied).

Assuming a 10-minute departure time and average walking speed of 3 miles per hour, 91% of the Newport summer population (temporary + permanent) is expected to survive an XXL tsunami. Departure time includes the length of earthquake shaking (3-5 min.) plus milling time before someone starts evacuating. Evacuation delays could increase the number of fatalities significantly, as shown in the graph.



Longer evacuation delays can significantly increase the percent of the population that could be killed by a tsunami.

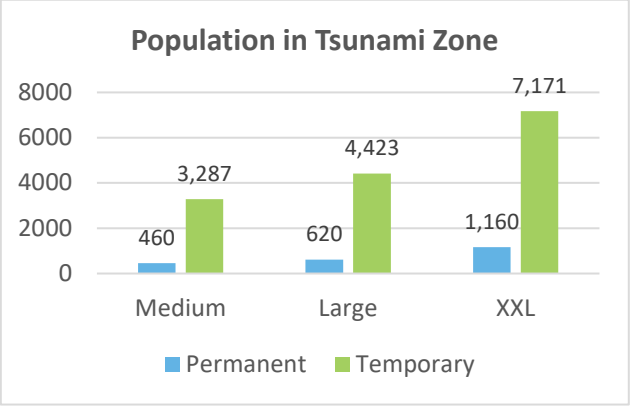
Most of the fatalities are estimated to occur in South Beach State Park (SBSP) and the Southshore neighborhood due to long distances to safety. Evacuation scenarios analyzed in the South Beach community included the Oregon State University vertical evacuation structure as a safety destination, which may save an estimated 170-290 lives.

Population in the Tsunami Zone

Most of the city is located outside of the XXL tsunami zone. However, specific areas are highly impacted by the tsunami: SBSP, Bayfront, Nye Beach, and Agate Beach.

People located within the tsunami zone will have to quickly evacuate to safety following an earthquake. Effective evacuation, and hence survivability, can become more difficult when additional risk factors are involved such as visitors, older or younger individuals, or those with mobility challenges.

- 11% of Newport's permanent residents live in the XXL tsunami zone; 42% are aged 65 years or older.
- Temporary residents could increase the local population within the XXL tsunami zone by ~7 times in the summer.



Temporary population = those occupying vacation rentals & second homes. Temporary population estimates are based on a summer weekend scenario (i.e., all beds full).

- There is a big increase in affected populations from the Large to XXL tsunami scenario (see graph).
- 27% of the jobs in Newport are within the XXL tsunami zone, which accounts for ~$98 million in annual wages.
- Most of the permanent population in the XXL tsunami zone occupies single-family or multi-family dwellings (68%). About one third (29%) of the temporary population stays in mobile housing (i.e., tents, recreational vehicles, boats), while another 27% stays in hotels or motels.
- Temporarily occupied households make up 36% of the residential households in the XXL tsunami zone.

An XXL tsunami is survivable for most residents north of Yaquina Bay, but is significantly more challenging south of the bay. Distances to safety for South Beach State Park visitors are typically a mile away, with the campground evacuating to Safe Haven Hill and the day use area evacuating across Highway 101 to SE 50th St (Mike Miller Park).

Almost all campground residents and the Southshore Beach Homes neighborhood can evacuate safely in a Large tsunami scenario. Results improve again if evacuees increase their speed to 4 miles per hour (or 15-minute miles). However, this assumes that every visitor knows and takes the most optimal route to safety, which may be different for a Large tsunami vs. an XXL tsunami. A Large tsunami event represents 95% of the probability of the next event.

Building Damage & Debris Estimates

Within the XXL tsunami zone, combined earthquake and tsunami building repair costs are estimated to be ~$558 million (which includes over 1,000 households), with the bulk of the cost attributed to the destruction caused by the tsunami. The costs to repair buildings and infrastructure located outside the tsunami zone that are also damaged by the earthquake are **not** included in this estimate.

$558 MILLION

IN BUILDING DAMAGES

195,000+ TONS

OF DEBRIS

The weight of debris generated by the destruction of the buildings in the tsunami zone is estimated to be ~195,000 tons, which is a minimum estimate (excludes content in the buildings, vehicles, and other forms of debris).

Sheltering Needs

Permanent and temporary residents who successfully evacuate out of the tsunami zone will require short- to medium-term shelter (which may mean several weeks to months after a tsunami).

- For an XXL tsunami event, the displaced population in Newport may range from 1,100 (mid-winter) to 7,600 people (peak summer).
- For a Large tsunami event, the displaced population may range from 600 (mid-winter) to 4,500 people (peak summer).

These numbers reflect only those displaced from the tsunami zone; there may be additional sheltering needs for those whose homes have been damaged or destroyed by the earthquake event.

600 – 7,600 PEOPLE

IN NEED OF SHELTER

Data Source:

Open File Report O-20-03, *Analysis of earthquake and tsunami impacts for people and structures inside the tsunami zone for five Oregon coastal communities: Gearhart, Rockaway Beach, Lincoln City, Newport, and Port Orford*, DOGAMI: www.oregongeology.org/pubs/ofr/p-O-20-03.htm. More resources at: www.oregontsunami.org.

Instill a Culture of Preparedness.

Through adaptation planning, communities can be better prepared to face natural disasters.

Action Items:

- **CONDUCT COMMUNITY EVACUATION DRILLS** – All neighborhoods in Newport that need to evacuate in a tsunami should review evacuation maps, walk evacuation routes, and conduct tsunami evacuation drills.
- **EDUCATE** – Loss of life can be minimized if individuals evacuate as soon as possible after the earthquake and travel on foot as fast as possible to safety. Tsunami evacuation map distribution, signage, and roadway paint are education tools that are highly effective if used widely.
  - Focus education to visitors, particularly in the South Beach area of Newport, where evacuation is the most challenging. Specific evacuation maps can now be generated for any location via the online tsunami evacuation portal: http://nvs.nanoos.org/TsunamiEvac. Or the smartphone application: NVS Tsunami Evacuation.
- **PREPARE COMMUNITY RESOURCES,** such as disaster supply caches and mass sheltering plans. OEM and DOGAMI have a community disaster cache planning guide with resources to get groups started.
- **ENCOURAGE THE PURCHASE OF FLOOD INSURANCE TO COVER TSUNAMI LOSSES** – There is a small percentage of permanent residents in Newport located in the tsunami zone, but not in a designated FEMA flood zone. The voluntary purchase of flood insurance is available to all building owners through the National Flood Insurance Program, which covers building loss due to a tsunami. Standard homeowner's insurance does not cover flood, tsunami, or earthquake damage. Find out more: www.fema.gov/flood-insurance.
- **IMPLEMENT EVACUATION IMPROVEMENTS**, focused to the challenges of the community, such as:
  - Increase the density of tsunami evacuation signage so that signs can be easily viewed and read.
  - Encourage residents of manufactured homes to store crowbars and sledgehammers near doors or windows to address compromised egress. Such homes may slip off their foundations during an earthquake, hindering timely evacuation out of the tsunami zone.
  - Evaluate major engineering projects to improve resilience, such as beach access improvements or new trails at the South Beach State Park campground.
- **ADVANCE LOCAL PLANNING**
  - Relocate critical and essential buildings if they are within the tsunami zone.
  - Develop a plan for how to manage earthquake and tsunami debris after a disaster event. Look to OEM and FEMA for resources to get started.
- **DEVELOP MUTUAL AID AGREEMENTS** with other jurisdictions or organizations to provide additional resources for the community during disaster events. Coastal hospitals will need to prepare for a surge in injuries that could exceed existing capacity.
- **KNOW WHAT RESOURCES ARE AVAILABLE** – Federal and state agencies have grant funds available for risk reduction activities (e.g., FEMA's Hazard Mitigation Grant Program, NOAA's Coastal Management Program).