

- Tsunami Evacuation Wayfinding
 - Up and out wayfinding research
 - Large format evacuation map signs
 - Cannon Beach pilot project
 - Blue line project



- 2016 Oregon Tsunami Conference
- DarkHorse tsunami comic book
- Tsunami evacuation drill guidance
- Hospitality outreach



Maritime Guidance for Distant Source Tsunami Events

Ports of Newport and Toledo Lincoln County, Oregon

Oregon Maritime Tsunami Response Guidance (MTRG) No. 2015-OR-01

Maritime response guidance in this document is based on anticipated effects of a **maximum-considered distant tsunami event**, scenario **AKmax** of the Oregon Department of Geology and Mineral Industries (see www.oregontsunami.org for more information on this scenario). Smaller distant source tsunamis will occur more commonly and are likely to cause significantly less damage than this maximum considered scenario. Check with local authorities for more specific guidance that may be appropriate for smaller distant tsunami events.

In and near the PORT OF NEWPORT...



Tsunami Advisories

- **During the event** (before the tsunami arrives):
 - Evacuate from all structures and vessels in the water.
 - Access of public along waterfront areas will be limited by local authorities.
 - All personnel working on or near the water should wear personal flotation devices.
 - Port authorities will shut off fuel to fuel docks, and all electrical and water services to all docks.
 - Secure and strengthen all mooring lines throughout harbor, specifically areas near the entrance or narrow constrictions.
- **After the event:** Port authorities will not allow public to re-enter structures and vessels in the water until Advisory is cancelled.



Tsunami Warnings

- **During the event:**
 - Access of public along waterfront areas will be limited by local authorities.
 - Port authorities will shut off fuel to fuel docks, and all electrical and water services to all docks.
 - If you are on the water,
 - Prepare for heavy seas and currents. Maintain extra vigilance and monitor VHF Channel 16 for possible Urgent Marine Information Broadcast from the US Coast Guard.
 - Monitor VHF FM Channel 16 and the marine WX channels for periodic updates of tsunami and general weather conditions; additional information will be available from NOAA Weather Radio.
 - If advised that offshore evacuation is an option and this option looks practical for your vessel, proceed to a staging area **greater than 30 fathoms (180 ft)**; at Yaquina Bay go to greater than 5 nautical miles offshore.
 - If conditions do not permit, dock your boat and get out of the **DISTANT Tsunami Evacuation Zone** (ORANGE zone on map at <http://www.oregongeology.org/tsuclearinghouse/pubs-evacbro.htm> (PDF) or <http://nvs.nanoos.org/TsunamiEvac> (interactive map).

NOTABLE HISTORICAL TSUNAMIS IN NEWPORT AREA

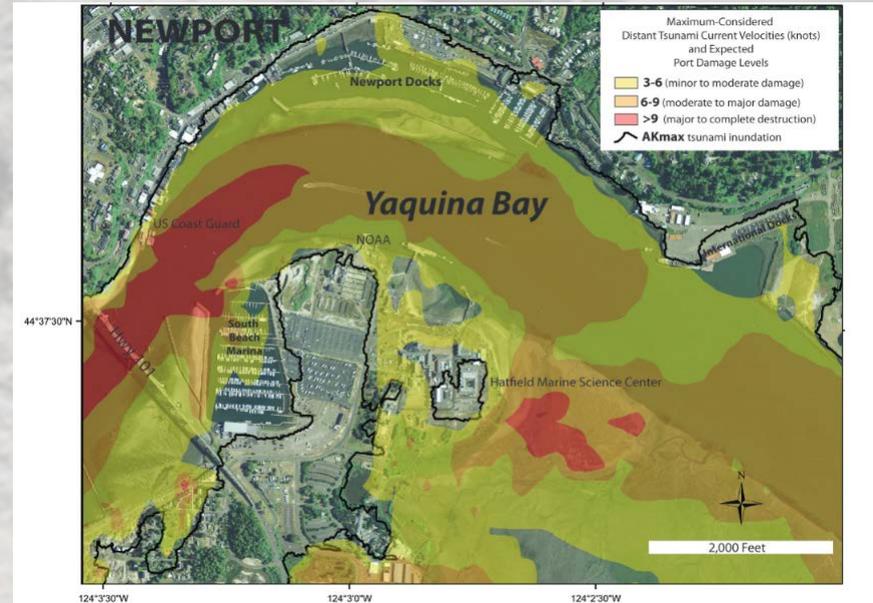
The table provides basic information about historical tsunami events; very minor tsunamis are not shown. The largest, most damaging distant-source tsunamis in Newport area have come from large earthquakes in the Alaska-Aleutian Islands region. The peak amplitude and damage information may help provide port authorities background for comparing future Advisory and Warning level tsunamis in the area. For example, the 2011 Japan tsunami may provide a threshold for no damage occurring below a forecast amplitude (wave height) of 0.43 m (1.4 ft).

Location	Event	Peak Amplitude Observed		NTWC Tsunami Alert Level Assigned	Tides During First 5 Hours	Damage Summary
		(m)	(ft)			
Newport area	1964 M9.2 Alaska	3.5	11.5	Warning	High*	light damage to ships and docks**
South Beach	2009 M8.0 Samoa	0.08	0.3	Advisory***	High	no damage reported
South Beach	2010 M8.8 Chile	0.16	0.5	Advisory***	Low	no damage reported
South Beach	2006 M8.3 Kuril	0.17	0.6	—	Low	no damage reported
South Beach	2011 M9.0 Japan	0.43	1.4	Warning***	Low	no damage reported

*Alaska 1964 arrival on PNW coast was at mean high water flood tide.

**1964 observation by ship captain Terry Thompson communicated February 19, 2015 to George Priest.

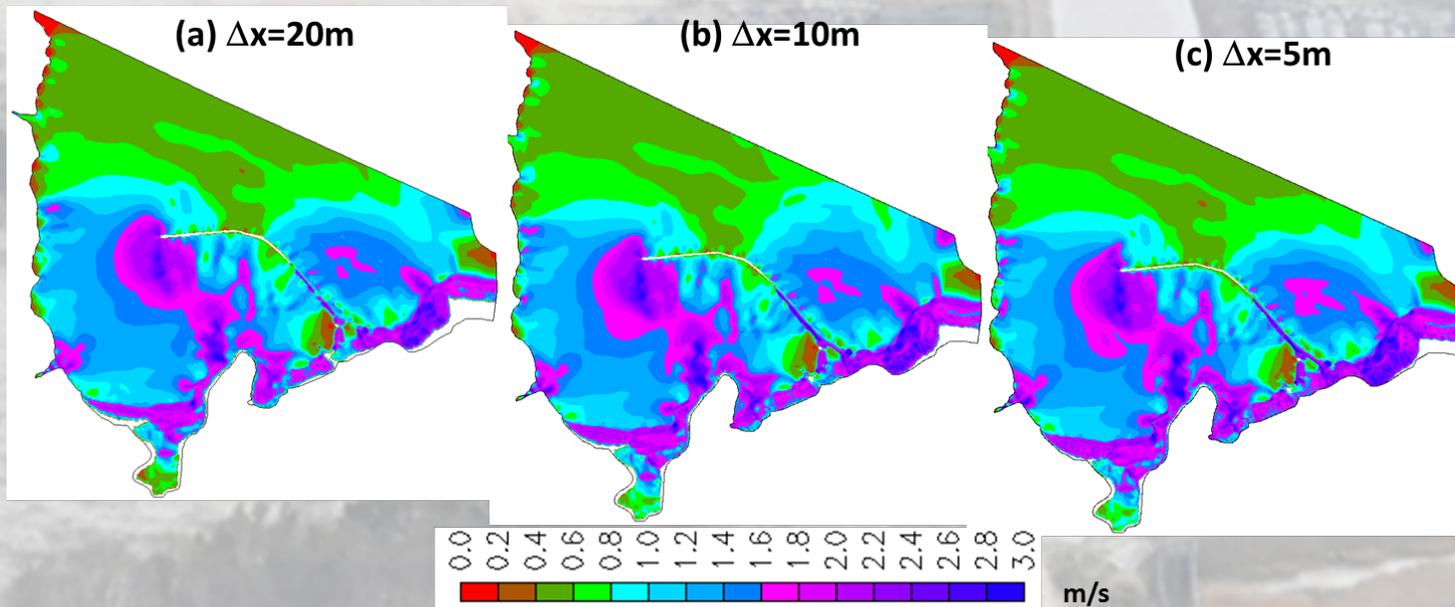
***Alert assigned by forecast OUTSIDE of bay.



Presented at the Annual Pacific Northwest Waterways Association Meeting (PNWA)

Current Benchmarking Workshop

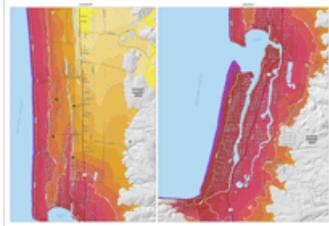
Assess a model's ability to accurately simulate commonly observed velocity patterns in field cases, including the vortex/eddy structure generated by shear instability and high velocity flows in the nearshore.



Benchmarking a 3D unstructured-grid model for tsunami current modeling

Yinglong J. Zhang^{a1}, George Priest^b, Jonathan Allan^b and Laura Stimely^b

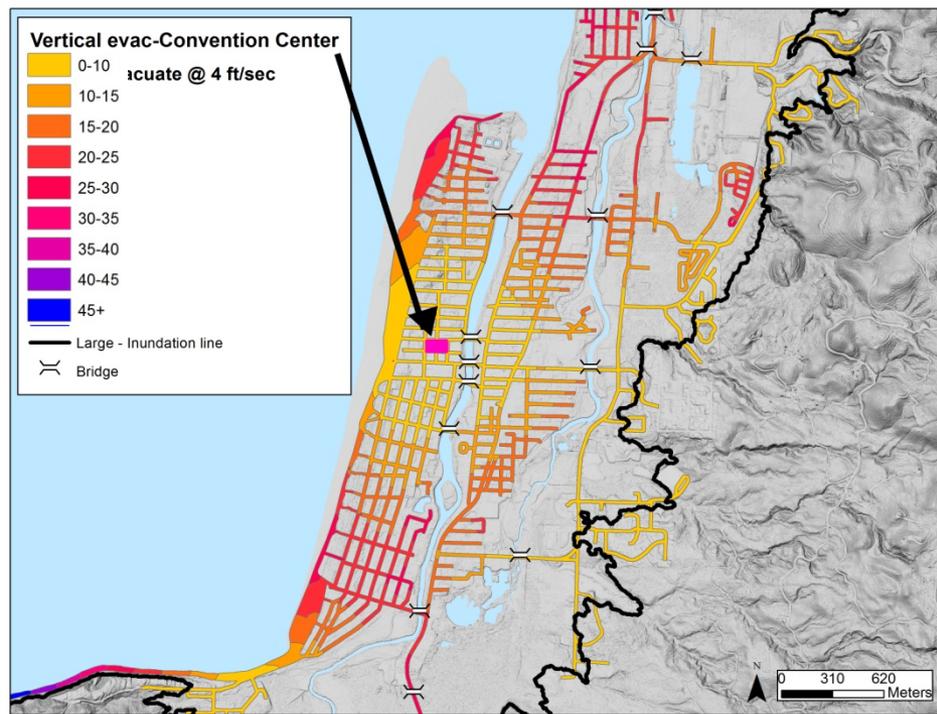
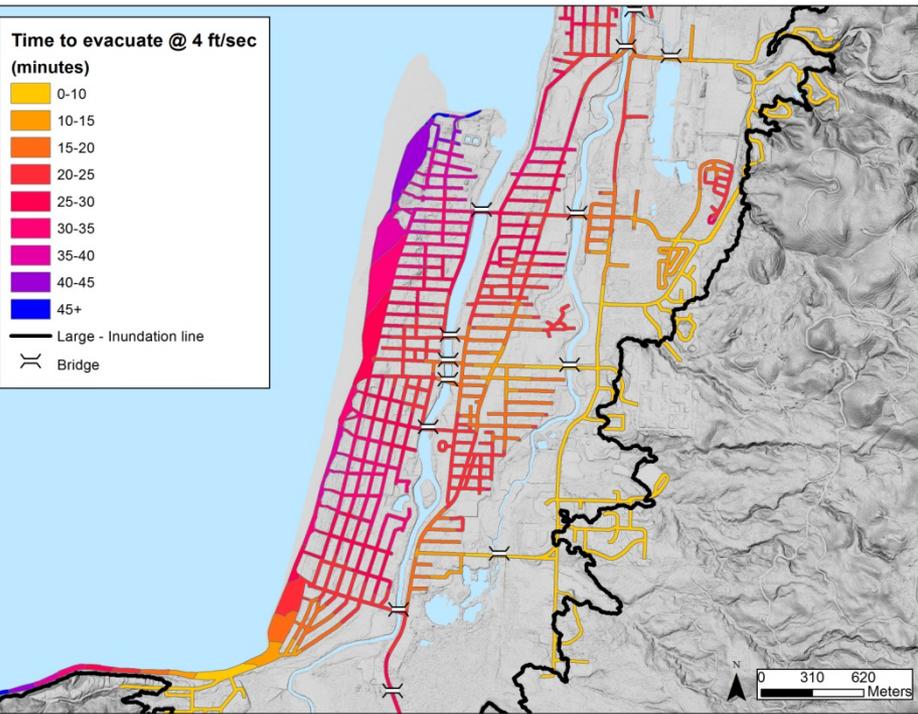
Tsunami Evacuation Modeling: Seaside-Gearhart-Warrenton-Hammond



[DOGAMI Open-File Report O-15-02, Local tsunami evacuation analysis of Seaside and Gearhart, Clatsop County, Oregon](#)

This report evaluates the difficulty of pedestrian evacuation of Seaside and Gearhart, Oregon, in the event of a local tsunami generated by an earthquake on the Cascadia subduction zone (CSZ). The map plates depict minimum evacuation speed needed to stay ahead of the wave for

three levels of increasing evacuation difficulty: 1) all bridges intact, 5-minute delay from start of earthquake before starting evacuation, 2) only retrofitted bridges intact, 5-minute delay, and 3) only retrofitted bridges intact, 10-minute delay.





BEAT THE WAVE

LOCAL TSUNAMI EVACUATION MAP

CANNON BEACH, OREGON (NORTH)

Map symbols

- Evacuation flow zones & routes to safety
- Outside tsunami hazard area
- Outside hazard area, but excluded from consideration
- Bridge fails { Assumed for all non-earthquake retrofitted bridges
- Bridge
- School
- Fire Department
- Law Enforcement
- Hospital
- Assembly Area
- Building

N SCALE
 1,000 ft
 500 m

START HERE:

1. Find the nearest road and color to your location



This map assumes a 10 minute evacuation delay due to the earthquake

- Maintain this speed until you reach the GREEN "OUTSIDE HAZARD AREA" zone
- Use evacuation flow zones and arrows to determine the fastest evacuation route
- If you can manage a clear and faster alternative route to safety, take it!
- DO NOT DELAY, DO NOT SLOW DOWN!

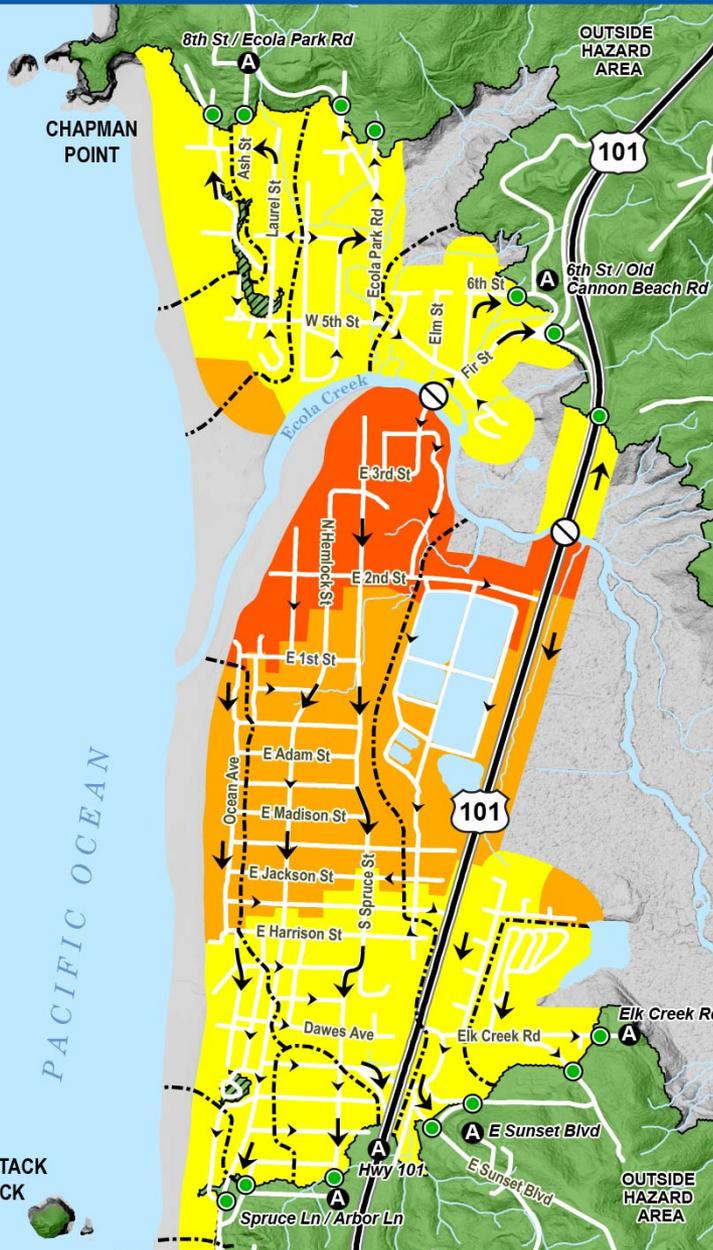


NOTICE

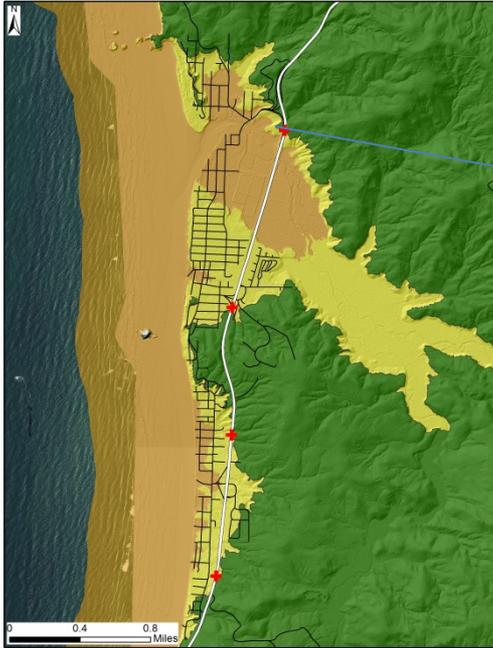
This "Beat the Wave" local tsunami evacuation map was developed by DOGAMI for the purpose of evaluating the fastest evacuation routes within each community as well as how quickly the public must travel in the event of a tsunami evacuation. The map is based on the best available science at the time of production and may be used to help guide the public out of harm's way. This map has been reviewed by the Oregon Tsunami Advisory Council, local government officials including emergency managers and the Oregon Department of Emergency Management. Funding for this work was provided by the National Tsunami Hazard Mitigation Program (NTHMP) of NOAA.



HAYSTACK ROCK



Entering and Leaving Tsunami Hazard Signs



- 36 installed in early 2000 (now in wrong location) along HWY101;
- Finalized new sign locations;
- Held meeting with ODOT (northern OR coast region); Disseminated locations;
- ~100 new signs going in this year;
- \$15k (NTHMP funds), ODOT labor/supplies ~\$80k.

