Washington Tsunami Program

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Agenda

- Introduction/Overview
- Washington Geologic Survey
- Tsunami Maritime Response & Mitigation Strategy
- Tsunami PowerBI Dashport
- AHAB Tsunami Sirens
- Vertical Evacuation Structure Gap Assessment
- Wayfinding Needs Assessment
- Tsunami Event Response Timeline
- FY21 Grant Tasks
- Questions

Washington State By the Numbers

- 3,000 miles of coastline
- Outer and inner coasts
- 17 at-risk coastal counties with 4.9 million residents
- 40+ million tourists per year

And the 2nd highest earthquake risk in the US!

Major Faults in Washington

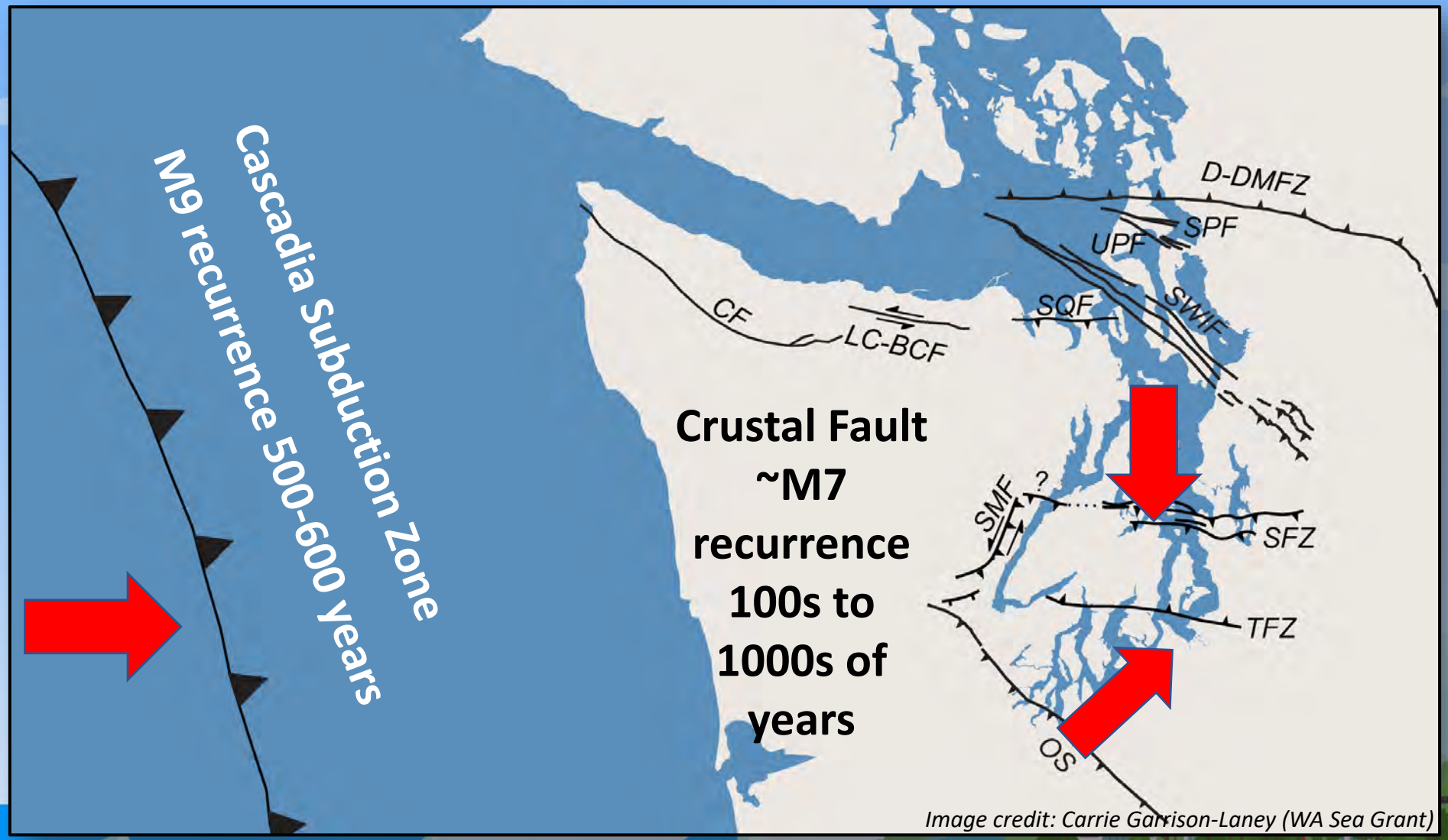


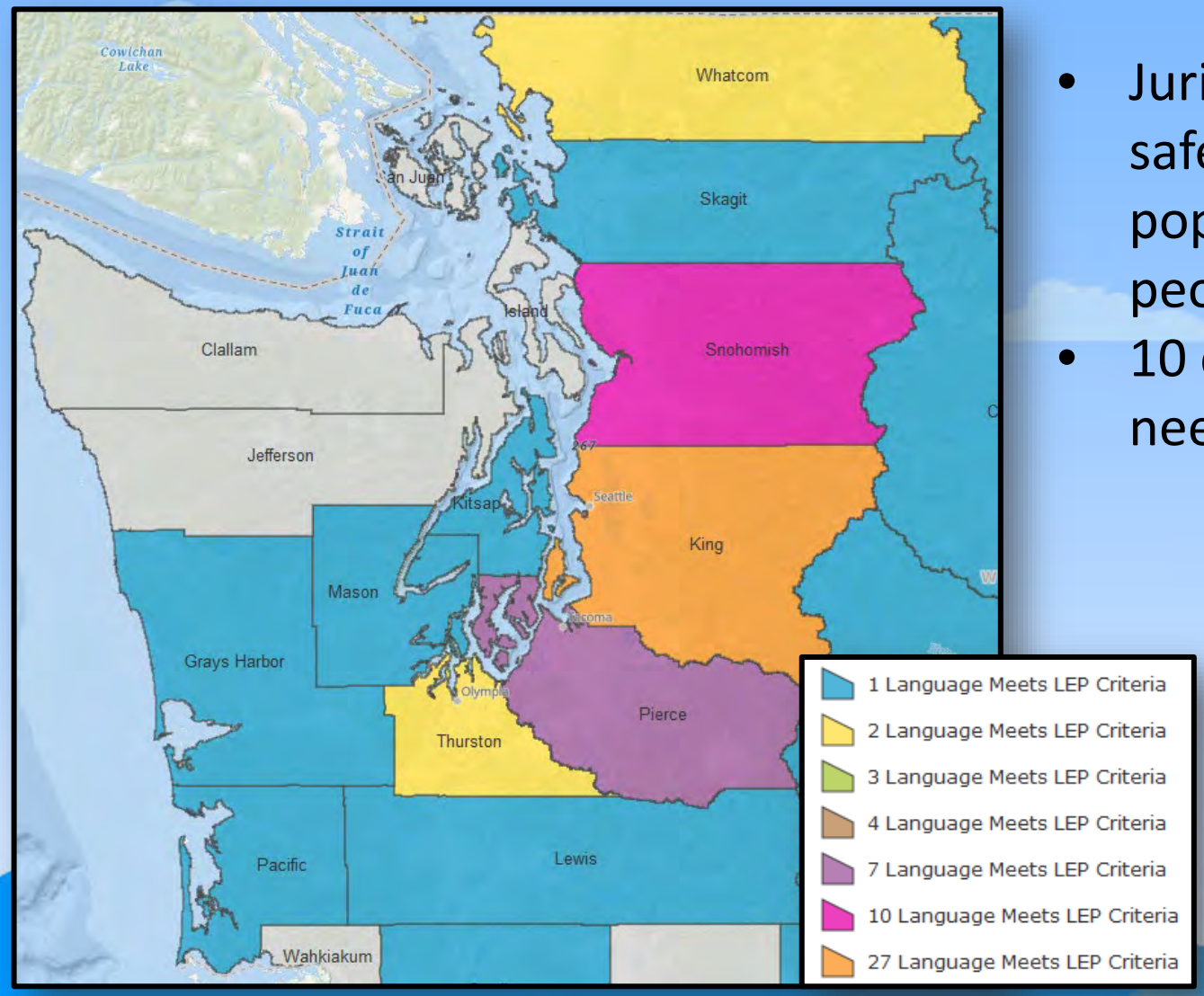
Image credit: Carrie Garrison-Laney (WA Sea Grant)

Cascadia Subduction Zone

- 700 miles long (1,130 km)
- Breaks 300 – 600 years (~500 years on average)
- Last great rupture in 1700 (321 years ago)
- 15-25% chance within next 50 years
- Magnitude 8.0-9.0+
- Shaking felt for 3–6 minutes
- Earthquake followed by a **major tsunami to hit WA outer coast in 15 minutes**

Local Tsunami Sources: Crustal Faults
Seattle Fault

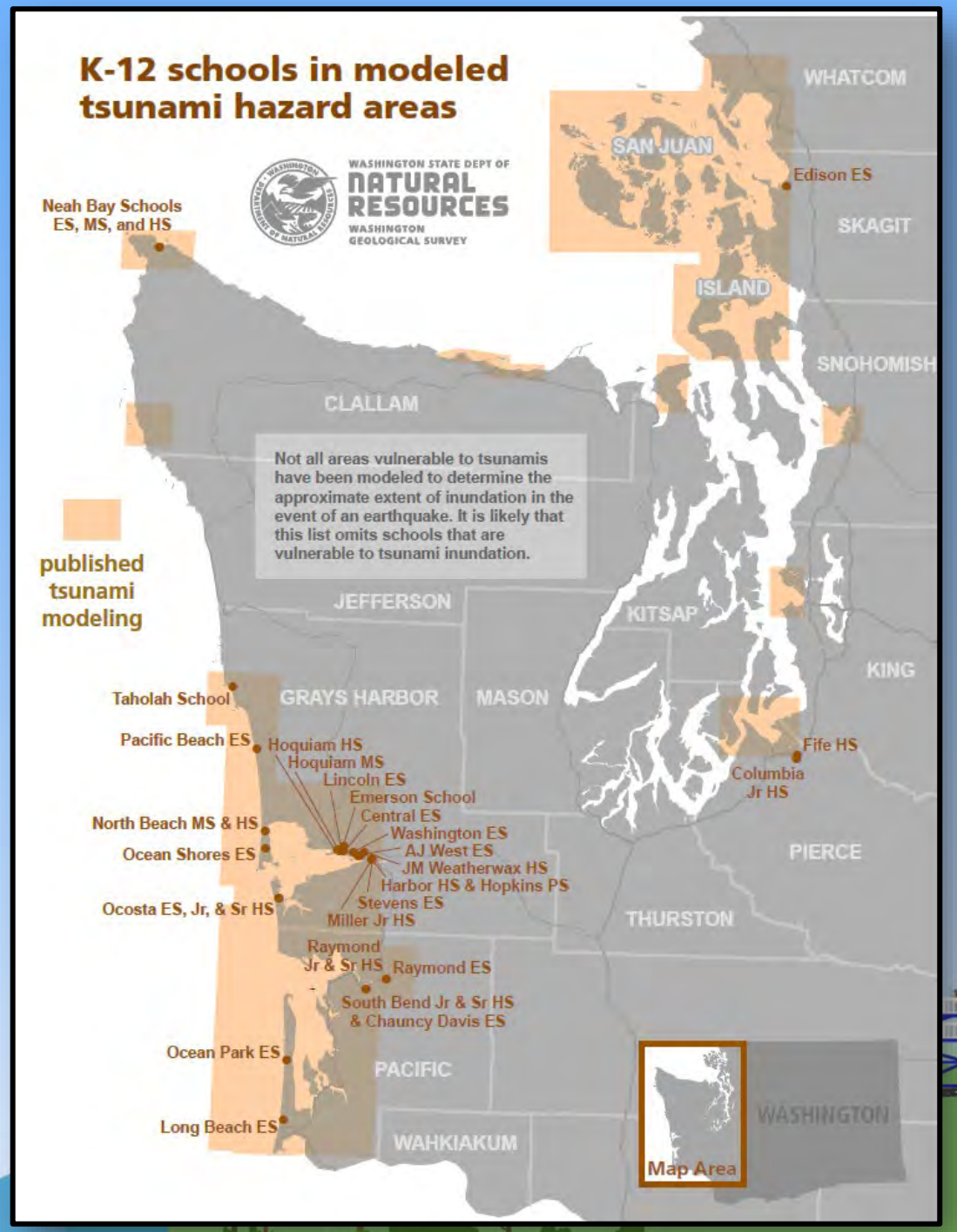
Vulnerable Populations
Limited English Proficiency



- Jurisdictions required to provide translated life safety information if limited English proficient population is 5% of total population or 1,000 people (whichever is smaller)
- 10 coastal counties have at least 1 language needing translated communications
    - Emergency alerts, tsunami siren audio
    - Educational materials, outreach

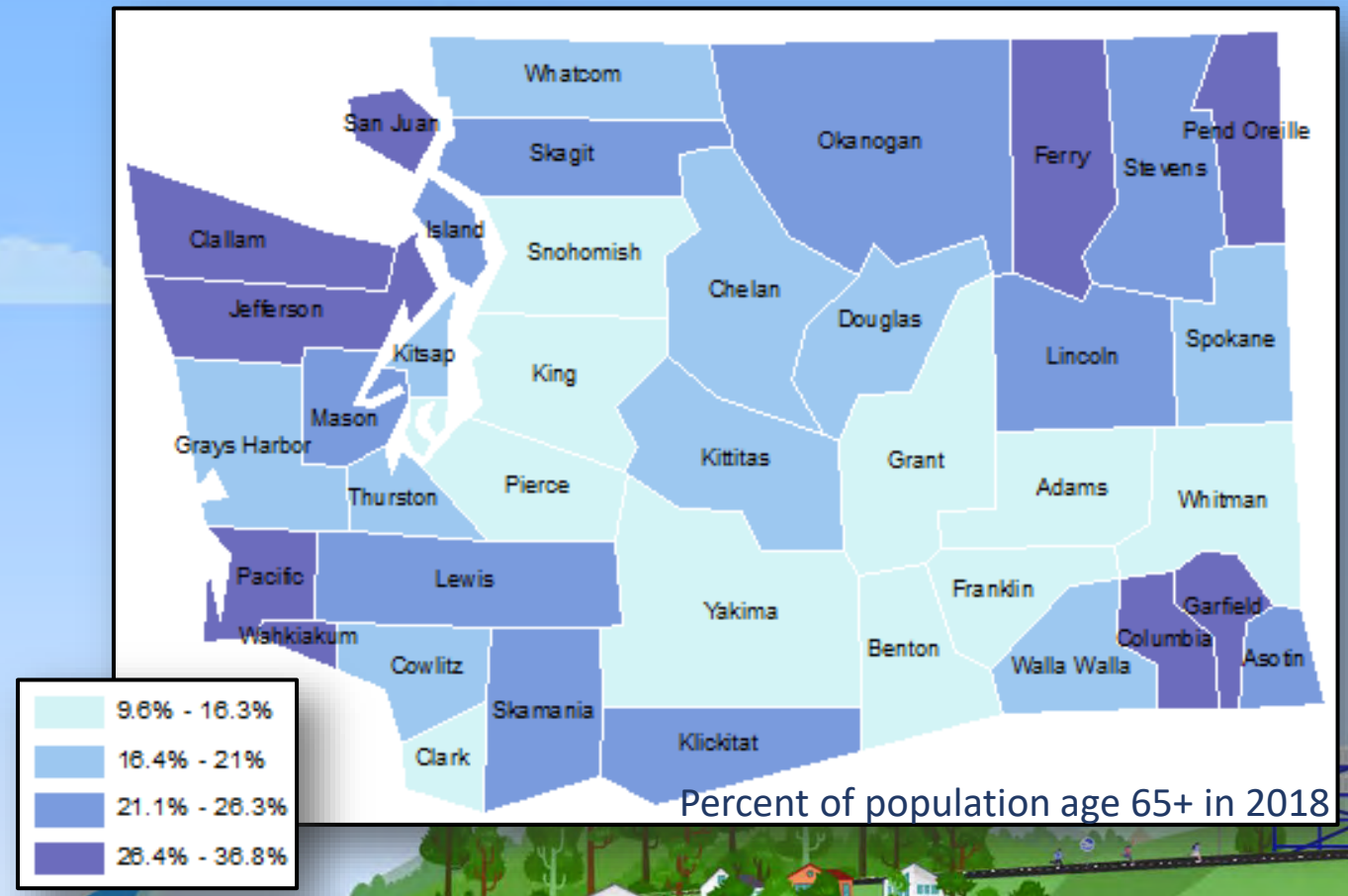
Vulnerable Populations Children

- 38 public schools located in *mapped* inundation zones
  - Does not include private schools, daycares, or institutions of higher learning
  - Does not include schools in unmapped inundation zones



Vulnerable Populations
Elderly and Disabled

- 16% of WA residents are age 65+
- Outer coast counties have high populations of elderly residents
- 24% of adults in WA have some type of disability
  - 10% have serious mobility issues
  - 10% have vision or hearing issues



Percent of population age 65+ in 2018

Vulnerable Populations
Tourists

- $1.4 billion state park tourism industry
- Major facilitator of outdoor recreation economy for Pacific, Grays Harbor, Island, and San Juan counties
- 1.2 million tourists take part in Seattle's cruise industry

Washington State Geohazards & Outreach

- **Mission:** *A state-level hazards risk reduction and preparedness outreach program that promotes and supports:*
  - Public education and outreach
  - Exercises (Cascadia Rising 2022)
  - Alerting and warning for geological hazards
  - Mitigation/risk reduction
  - Response and recovery planning
  - Stakeholders: international, national, state, tribal, local governments, businesses, non-profits, scientists, media, and the public

WA State Tsunami Program - EMD

- Maximilian Dixon, *Hazards and Outreach Program Supervisor*
- Elyssa Tappero, *Tsunami Program Coordinator*
- Jacob Witcraft, *Tsunami Program Coordinator*
- Highlights
  - Tsunami Roadshows
  - Support preparedness activities of state agencies and schools
  - Exercises and workshops
  - Inner and Outer Coast Tsunami Workgroups
  - Great Washington ShakeOut
  - Tsunami alerting and response

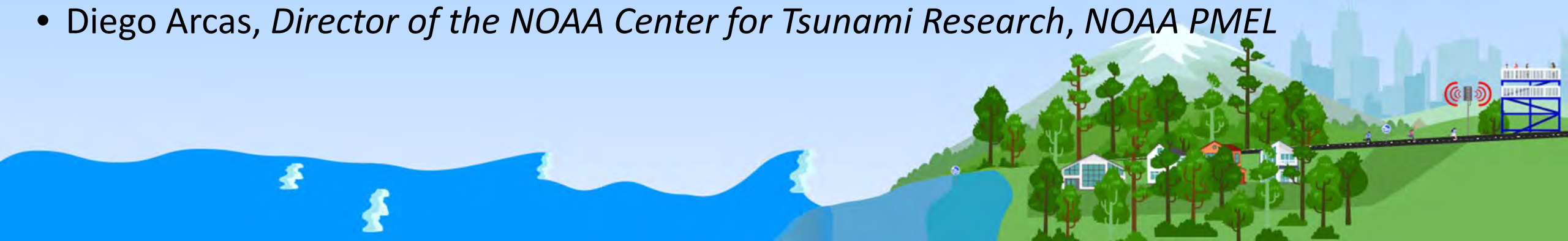
WA Geological Survey Tsunami Program

- MISSION: To collect, develop, use, distribute, and preserve geologic information to promote the safety, health, and welfare of the residents of Washington, protect the environment, and support its economy.
  - Corina Allen, *Chief Hazards Geologist*
  - Daniel Eungard, *Geologist-Subsurface Lead/Tsunami Hazards*
  - Alex Dolcimascolo, *Tsunami Geoscientist*
  - Highlights
    - Tsunami modeling and mapping
    - Inundation and current velocity simulations
    - School seismic safety project
    - Tsunami hazard identification
    - VES project support
    - Respond to real-life events


Chief Hazards Geologist
Corina Allen

University of Washington and NOAA's PMEL

- Robert Freitag, *Director of the Institute for Hazards Mitigation Planning and Research, University of Washington*
- Dr. Frank I. González, *Affiliate Professor, University of Washington*
- Loyce M. Adams, *Professor of Applied Mathematics, University of Washington*
- Randy J. Leveque, *Professor Emeritus, University of Washington*
- Carrie Garrison-Laney, *Coastal Hazards Specialist, UW SeaGrant*
- Vasily Titov, *Senior Tsunami Modeler, NOAA PMEL*
- Diego Arcas, *Director of the NOAA Center for Tsunami Research, NOAA PMEL*



Other Key Partners

- **Federal:** NWS Seattle & Portland, NTWC
- **States:** OR, CA, AL, HI
- **Local:** counties, tribes, cities, school districts, community groups, media
- **Other:** NTHMP, ShakeOut, CREW, state agencies

FY20 So Far

~1 million Great WA ShakeOut participants

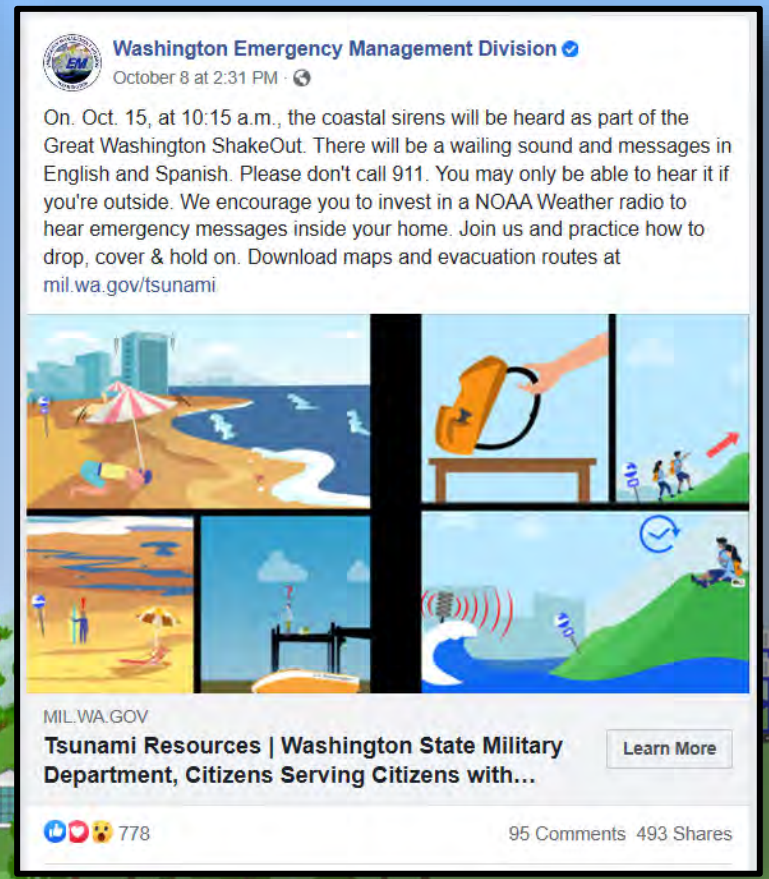
512,500+ people reached through tsunami print, radio, and social media ads

1,100+ people reached through webinars and virtual presentations

130+ signs distributed

115+ NOAA weather radios distributed

3 virtual TsunamiReady Community renewals



Washington Geological Survey

Washington Maritime By the Numbers

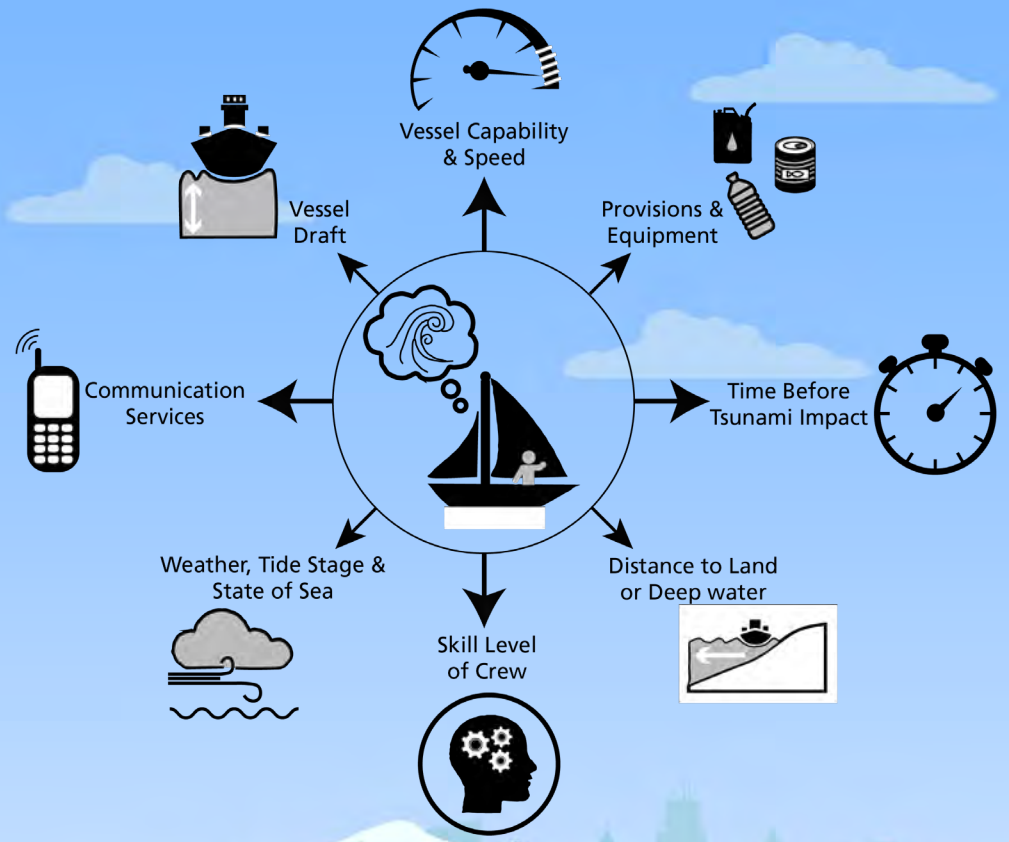
- 31 ports at risk of tsunami damage
  - Over 90 individual port-run shipping terminals, marinas, harbors and boat launches
- 7 Coast Guard stations and 4 Navy bases
- 700 fishing and seafood processing operations
- Over 400 private marinas
- $21.4 billion maritime industry
- NW Seaport Alliance (ports of Seattle and Tacoma) is the fifth largest container gateway in the US

Washington Maritime By the Numbers

- Largest ferry system in the US
  - 24 ferry terminals
  - 22 WSDOT ferries
  - 10.7 M vehicles, 13.9 M passengers in 2018
  - 400-500 sailings a day
  - 161,000 trips per year (1 M miles)
- 14 other county and private ferries
- Southern terminal for Alaska Marine Highway (Bellingham)
- AK and HI are dependent upon WA Ports

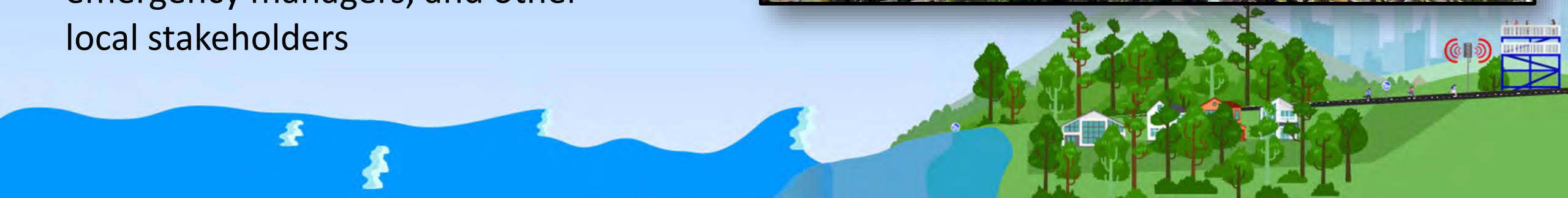
Tsunami Maritime Response and Mitigation Strategy (TMRMS)

- Project goal
  - Development of TMRMS for all major WA ports and marinas
  - TMRMS template for use by any maritime facility
  - Uses standardized components developed by AK, CA, and OR with NTHMP support
- WA Additions
    - Expanded mitigation section with visuals specific to Port
    - Roles and Responsibilities section
    - Maritime focused maps of waterways near port showing inundation, dangerous currents, and modeled minimum water depths



Port of Bellingham TMRMS

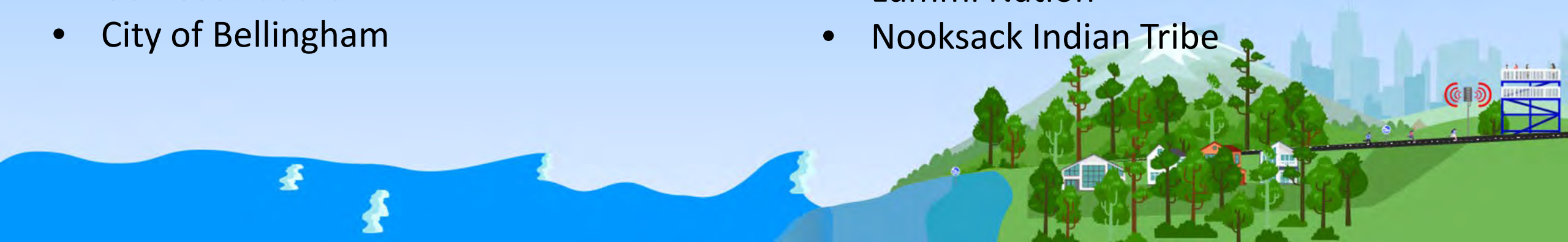
- First WA TMRMS complete for the Port of Bellingham
- Focused on the Port's main harbor, shipping terminal, and cruise terminal that is the southern terminus for the Alaska Marine Highway System
- Developed with local assistance from port authorities, local emergency managers, and other local stakeholders



Port of Bellingham TMRMS

Stakeholders

- Commercial boat operators
- Private and recreational boat owners
- Port area business owners
- Alaska Marine Highway
- San Juan Island cruises/charters
- Puget Sound Energy (Encogen Generating Station)
- US Coast Guard
- City of Bellingham
- Whatcom County
- Port of Bellingham
- Bellingham Tourism Commission
- Bellingham and Whatcom County Tourism
- American Association of Port Authorities
- BNSF Railway
- NOAA
- Lummi Nation
- Nooksack Indian Tribe

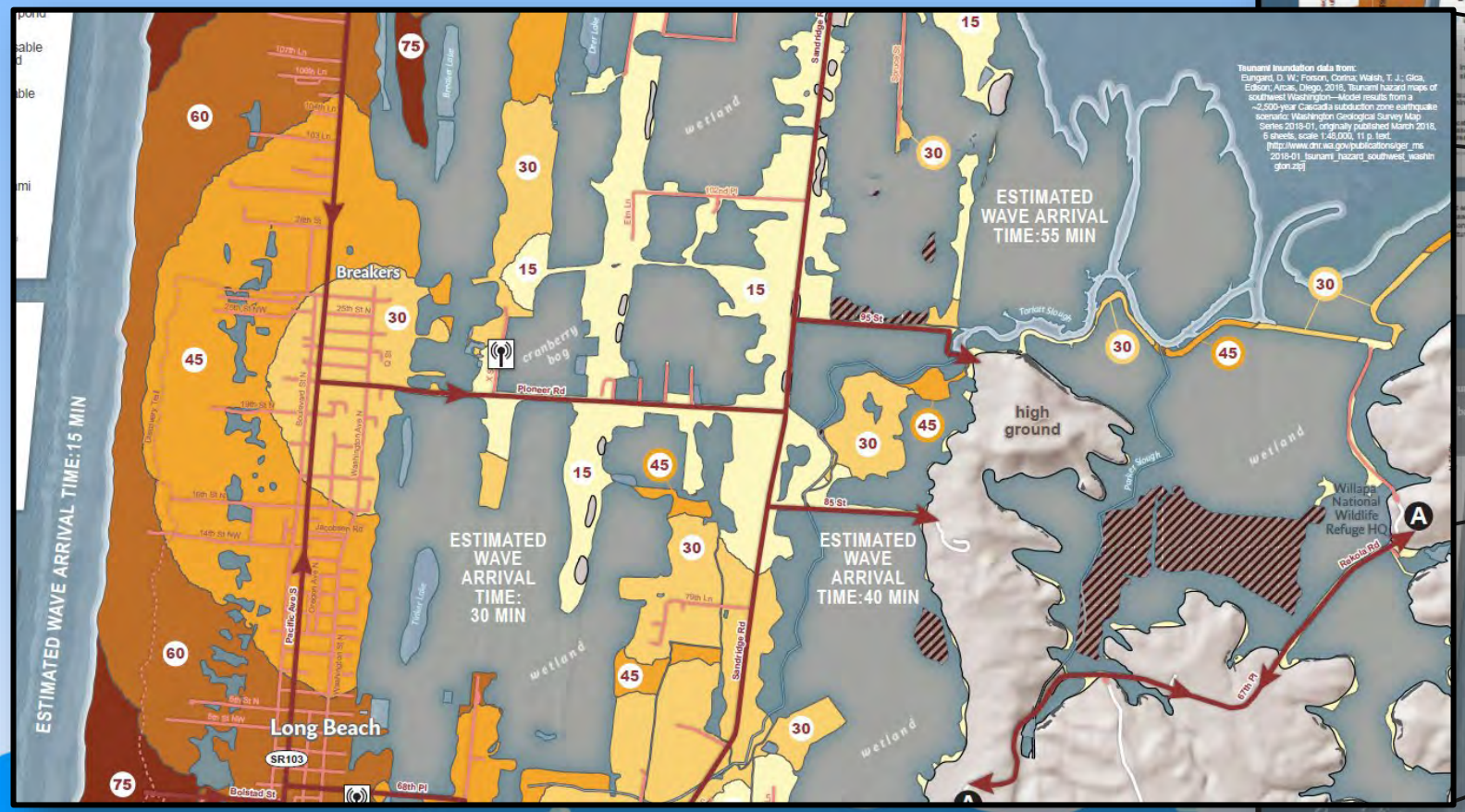


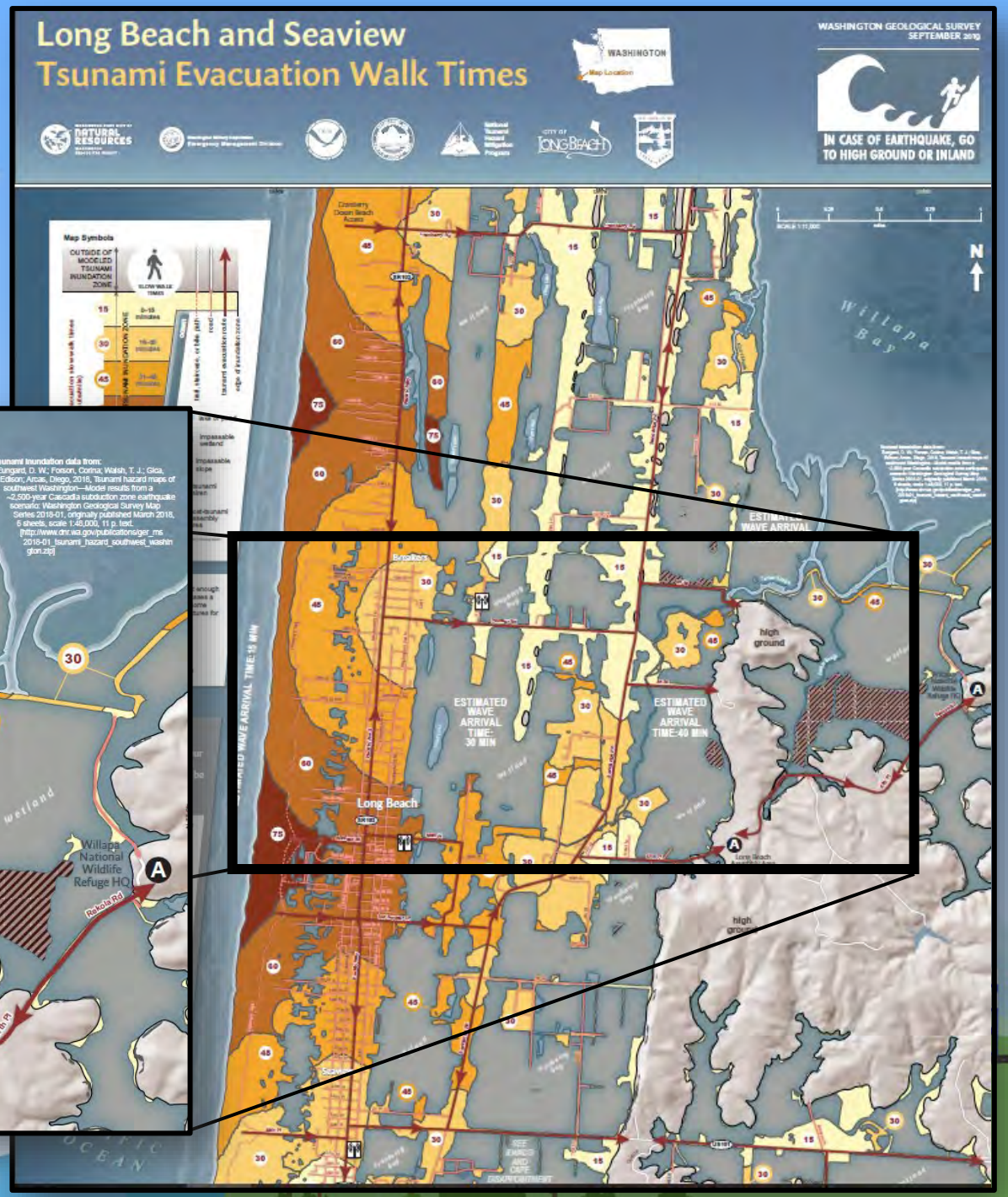
Tsunami Program Dashport

AHAB Tsunami Siren Network Completion!

- In 2020, WA EMD received enough state funding to complete the AHAB tsunami siren network (a process that otherwise would have taken another 20+ years!)
- 47 new sirens will have been installed between June 2020 and June 2021 for a total of **123 sirens**
- This will complete the network and ensure coverage of all identified at-risk areas for both the outer and inner coasts
- Next steps:
  - Outreach to communities with new sirens
  - AHAB Siren Guide for each jurisdiction
  - Network-wide test with actual wail sound on Great WA ShakeOut

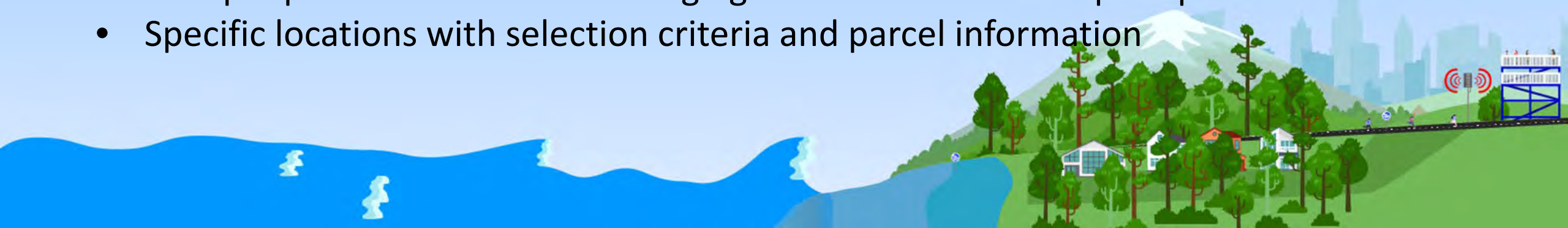
Vertical evacuation is a must in many coastal communities





Vertical Evacuation Needs Assessment

- Building off work begun in 2009 which identified 61 Vertical Evacuation Structures (VES) needed on outer coast
- Based on 2010 census data; does NOT include visitors
- Project determined how many VES needed in each county and potential locations of VES
- Jurisdictions are provided multiple options, including a “No VES” option for comparison
  - Number of VES per option
  - Minimum VES capacity needed per option
  - % of people who can make it to high ground within 15 mins per option
  - Specific locations with selection criteria and parcel information



From the VES Manual

This guide was written to help Washington coastal communities save lives from tsunamis through the construction of accessible vertical evacuation structures. This effort is the product of an evolution of work began over 15 years ago. This guide builds upon prior efforts with the specific purpose being of verifying potential sites for vertical evacuation structures within coastal communities vulnerable to local source tsunamis. It is the intent of this guide to provide community leaders with a tool to save lives.

Vertical evacuation, as a strategy to reduce tsunami risk, has been explored and its applicability researched for over a decade. In the beginning, a series of community vertical evacuation planning meetings were held in Pacific County, Grays Harbor County, and Clallam County. The meetings and research efforts took place over the span of two years, which resulted in the development of a series of "SafeHaven" reports for each County.

The first tsunami vertical evacuation structure built in north America is the Ocosta Elementary School. It was completed in 2016 and is near Westport, Washington. The Ocosta school district's superintendent had participated in the initial vertical evacuation planning for Westport and Grays Harbor County in 2011 and was a key advocate for not only getting the new Ocosta school funded through a local school bond, but also making it a vertical evacuation structure.

Building upon the successes and outcomes of the first completed vertical evacuation structure and initial rounds of community meetings and subsequent increasing public awareness, a "Manual for Tsunami Vertical Evacuation Structures" was completed in 2018. The Manual guides communities through the process of constructing tsunami vertical evacuation structures using a 7-phase approach.

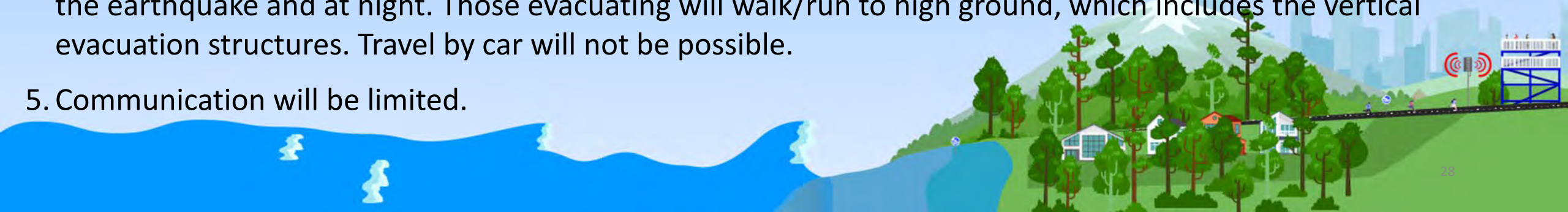
10 Years in the Making:

Community-Based Planning Process

- **2010 - 2012**: Pacific County, Grays Harbor County, Clallam County Community Planning + Visioning Process
- **2016**: Cost Estimate Report
- **2018**: Vertical Evacuation Manual for Communities
- **2020**: Site Verification and Assessment of Vertical Evacuation Options

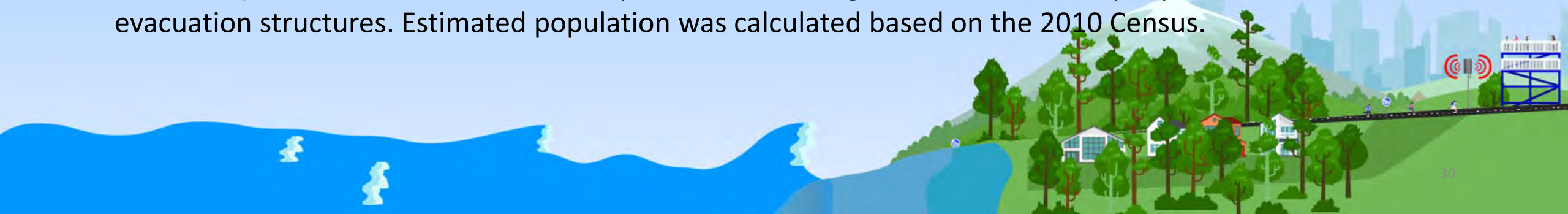
Tsunami Hazard Assumptions

1. The scenario event is a 9.0 magnitude subduction zone earthquake approximately 80 miles off the coast of the Long Beach peninsula. The earthquake shaking could last five to six minutes and will create a tsunami. Six feet of subsidence is expected. The warning before the tsunami will be the earthquake. People will have 15 minutes or less to get to high ground.
2. Although tsunami models estimate that people will have approximately 20 minutes to get to high ground once the shaking begins, the preferred strategies contained within this study are based on people having only 15 minutes due to approximately 5 minutes of expected intense shaking.
3. **This reduced response time does not take into account the following challenges that people will face in getting to high ground: people not evacuating right away due to not understanding what is happening or what to do, looking for more information, contacting loved ones, finding pets, being injured, and grabbing supplies; poor road/evacuation route conditions resulting from landslides, liquefaction, downed power lines/trees, and traffic; and possible panic.**
4. Routes to high ground, including vertical evacuation structures will be available, accessible, and discernible after the earthquake and at night. Those evacuating will walk/run to high ground, which includes the vertical evacuation structures. Travel by car will not be possible.
5. Communication will be limited.



- Several high-risk communities or “study areas” in each County were assessed:
  - Pacific County: Ilwaco, Seaview, Long Beach South, Long Beach North, Ocean Park, Oysterville, Leadbetter, Tokeland, and North Cove
  - Grays Harbor County: Grayland, Westport, Ocean Shores West, Ocean Shores East, Taholah
  - Clallam County: La Push and Neah Bay
- **Option #1: No Vertical Evacuation**
  - This option assumes no new or future vertical evacuation structures will be built. It models resident walk times as if the scenario tsunami were to happen tomorrow.
- **Option #2: Community-Derived Vertical Evacuation Structures**
  - This option includes VES locations that were proposed and confirmed through a rigorous community planning process, called “Project Safe Haven.” At the time, various types of vertical evacuation structures were considered by the community (i.e. berm, tower, etc.), however for the purposes of current research effort we are assuming a generic vertical evacuation type and did not drill down to the scale of measuring or considering the merits of each potential type of structure. Rather, the placement or location of each structure is what matters most for this effort.

- **Option #3: Broad Spatial Coverage**
  - This option attempts to achieve broad spatial coverage in each study area or community. In some cases, depending upon the study area, vertical evacuation structures were added to Option #2 to fill gaps. In other cases, Option #2 already met the goal of broad spatial coverage for the populations of primary concern (resident/worker/overnight visitor/school) so no changes were necessary.
- **Option #4: Efficient/Lean**
  - This option attempts to strike a balance between cost and coverage. Meaning, this option presents the "biggest bang for the buck" or, "the best of both worlds." Each proposed location in Options #2 and #3 were analyzed to determine most efficient placement to maximize coverage. Some locations were moved or even removed entirely to develop an option that is both strong (in terms of coverage, # of people in walking distance) and realistic (in terms of cost).
- **Population**
  - Estimated resident, school, fire department, and overnight visitor population was added to each study area in each expected spatial location. The population layer informed each vertical evacuation option (1-4) to calculate evacuation times and routes to "safe zones" (both naturally-occurring and proposed vertical evacuation structures), and to determine which option serves the greatest number of people with the fewest vertical evacuation structures. Estimated population was calculated based on the 2010 Census.



Ocean Shores - West

Community study area population in the tsunami hazard area = ~6,712 people

Resident/Worker/Overnight Visitor population = ~6,212 people

Fire Department occupancy = ~30 people

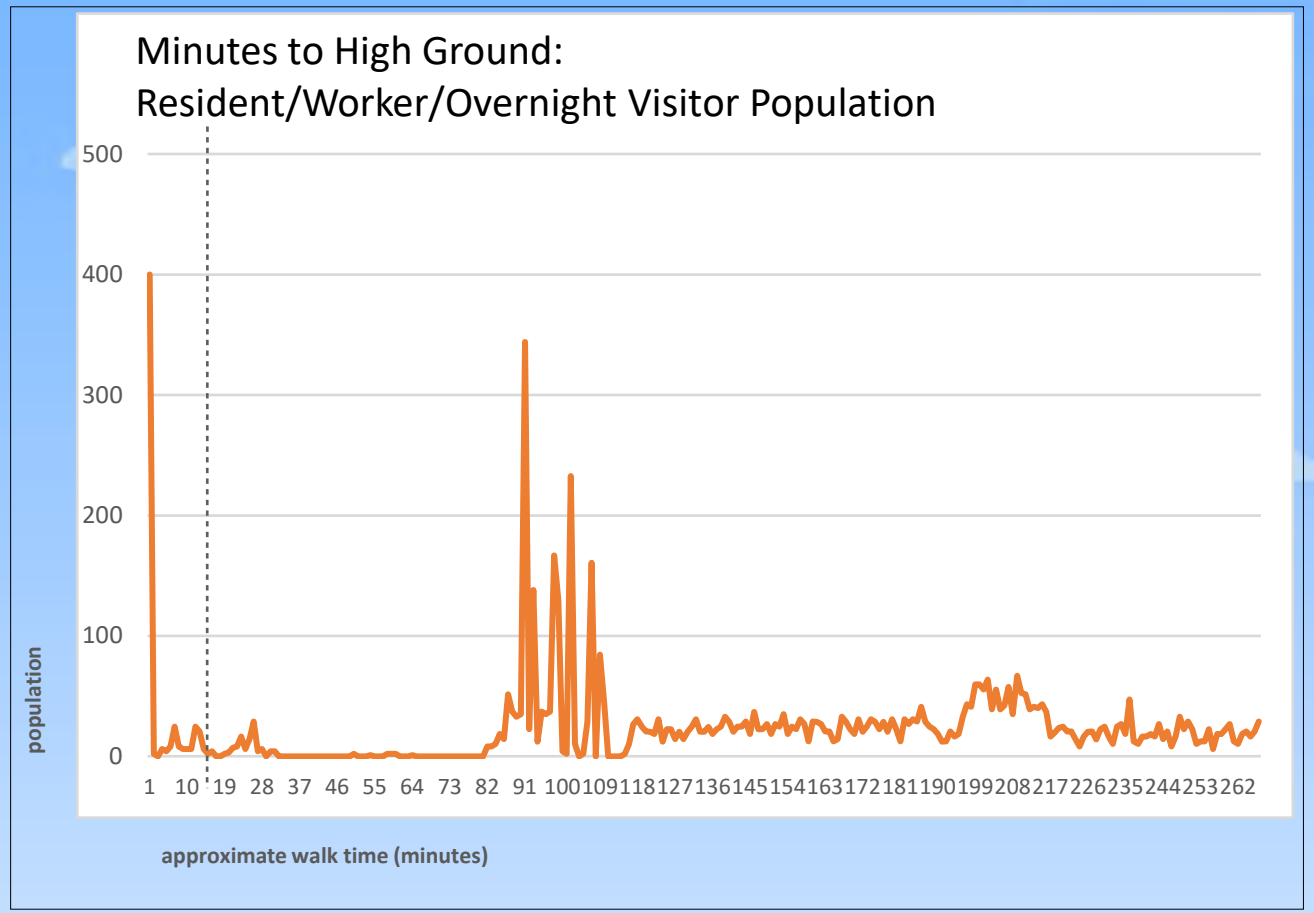
Schools occupancy = ~469 people

Source: 2010 Census (average household size); Grays Harbor County Residential Land Use


Ocean Shores - West:
Context Map
Community Study Area
Fire Station
School
Tsunami Siren
Natural High Ground
Water/Wetland (Impassable)
Evacuation Zone
0.75 0.375 0 0.75 1.5 Miles


Ocean Shores - West:
Option #1 (no VES)
Community Study Area
Fire Station
School
Tsunami Siren
Natural High Ground
Water/Wetland (Impassable)
(Slow Walk) Walk Speed to
High Ground
<15 Minutes
15-25 Minutes
25+ Minutes
0.75 0.375 0 0.75 1.5 Miles

Ocean Shores - West: VES Option #1 (No VES)



*Approximate *maximum* walk time accounts for the resident/worker/overnight visitor population locations only. This does not factor in daytime visitors or beach visitors, for example.

Approximate # of People, by Walking Time Bands, to High Ground

<15 minutes	15-25 minutes	25+ minutes
524 people	64 people	6,124 people

- *Fire Station: Approximate 114 minute walk time to high ground*
- *Schools: Approximate 70 and 113 minute walk time to high ground*

Under **Option #1:**

- approximately **7.8%** of the total estimated Ocean Shores - West population are within 15 minutes to natural high ground
- approximate **maximum* walk time to natural high ground for identified population = **267** minutes

Ocean Shores - West: Comparison of All Options (1-4)

Option #1

# of proposed VES = 0

N/A

*Minimum VES Capacity (# of People)

7.8%

% of people within **15 minutes** of high ground

8.8%

% of people within **25 minutes** of high ground

Option #2

# of proposed VES = 11

4,633

*Minimum VES Capacity (# of People)

76.9%

% of people within **15 minutes** of high ground or vertical evacuation

99.4%

% of people within **25 minutes** of high ground or vertical evacuation

Option #3

# of proposed VES = 14

5,027

*Minimum VES Capacity (# of People)

82.7%

% of people within **15 minutes** of high ground or vertical evacuation

99.6%

% of people within **25 minutes** of high ground or vertical evacuation

Option #4

# of proposed VES = 11

4,860

*Minimum VES Capacity (# of People)

80.2%

% of people within **15 minutes** of high ground or vertical evacuation

99.5%

% of people within **25 minutes** of high ground or vertical evacuation

Study Area Summary Tables: Options 1-4

OPTION 1							
# of VES	Minimum VES Capacity Need	% of People Within 15 Min to High Ground or VES	# of People Within 15 Min to High Ground or VES	% of People Not Within 15 Min to High Ground or VES	# of People Not Within 15 Min of High Ground or VES	% of People Within 25 Min to High Ground or VES	# of People Within 25 Min to High Ground or VES
N/A	**N/A**	42.2%	19,392	57.8%	26,589	51.6%	23,725

OPTION 2							
# of VES	Minimum VES Capacity Need	% of People Within 15 Min to High Ground or VES	# of People Within 15 Min to High Ground or VES	% of People Not Within 15 Min to High Ground or VES	# of People Not Within 15 Min of High Ground or VES	% of People Within 25 Min to High Ground or VES	# of People Within 25 Min to High Ground or VES
58	**16,302**	77.6%	35,697	22.4%	10,284	96.5%	44,350

OPTION 3							
# of VES	Minimum VES Capacity Need	% of People Within 15 Min to High Ground or VES	# of People Within 15 Min to High Ground or VES	% of People Not Within 15 Min to High Ground or VES	# of People Not Within 15 Min of High Ground or VES	% of People Within 25 Min to High Ground or VES	# of People Within 25 Min to High Ground or VES
78	**20,851**	87.5%	40,221	12.5%	5,760	98.8%	45,429

OPTION 4							
# of VES	Minimum VES Capacity Need	% of People Within 15 Min to High Ground or VES	# of People Within 15 Min to High Ground or VES	% of People Not Within 15 Min to High Ground or VES	# of People Not Within 15 Min of High Ground or VES	% of People Within 25 Min to High Ground or VES	# of People Within 25 Min to High Ground or VES
55	**19,315**	84.4%	38,808	15.6%	7,173	98.2%	45,137

Study Area Summary Table: ~Average VES Size

Average Size of Each Proposed VES, per Option (#2, #3, #4)				
Option	**# of Proposed VES**	**Minimum VES Capacity Need**	**Approximate # of People per VES**	**Approximate Average SF per VES** (*based on FEMA's requirement of 10 SF per person*)
#2	**58**	**16,302**	**281**	**2,810 square feet**
#3	**78**	**20,851**	**267**	**2,673 square feet**
#4	**55**	**19,315**	**351**	**3,512 square feet**

For Reference:
The approved Tokeland/Shoalwater Bay Tribal tower is anticipated to have a capacity of 384 people.

Based on FEMA's guidelines, the actual refuge area will be ~3,800 square feet.

Equation: (Minimum VES Capacity Need / # of Proposed VES) * 10 = Approximate average size per VES

Wayfinding Needs Assessment

- Current status:
  - For the highest risk coastal areas, high ground is far away and it's not obvious how to get there.
  - The majority of tsunami signage was installed 10-15 years ago and only along major roads. It was not widely understood at that time that people will need to evacuate on foot, so signs were placed based on driving distance.
  - As we publish Pedestrian Evacuation Maps, the evacuation routes are updated due to changes in roadways, development, updated tsunami modeling, and moving to pedestrian evacuation. This means many signs need to be moved or added to the routes.

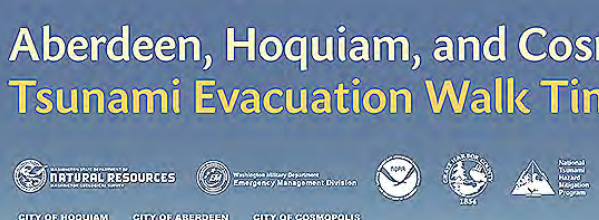
Wayfinding Needs Assessment

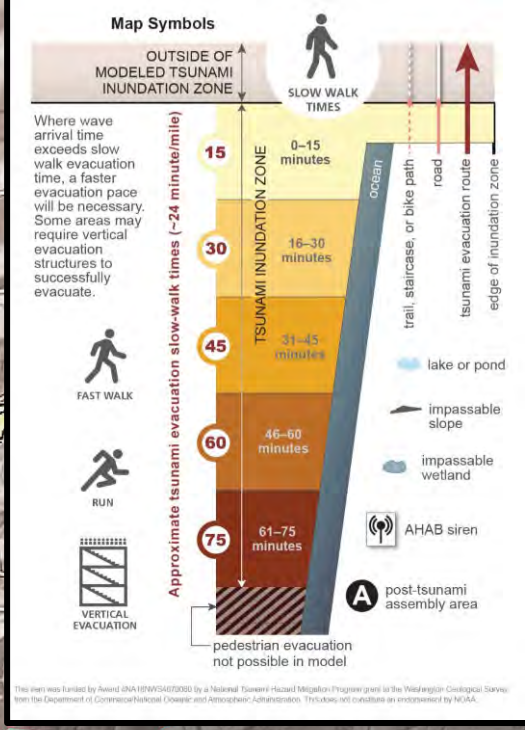
- Current status:
  - Signage was never put into parks or high recreation areas that are outside of a jurisdiction. Evacuation routes are not obvious for these locations; there is a critical need to assess where signage needs to be placed.
  - Locations and status of current wayfinding markers are largely unknown.
  - Local jurisdictions do not have the time, manpower, or funding necessary to complete assessments on their own. A few communities are doing this slowly by utilizing volunteers but are very limited in capacity and don't have GIS capability to put the sign locations into a database.

Wayfinding Needs Assessment

- Proposed project would contract with UW team to work with work with local emergency managers, WA DOT, WA Parks and Recreation Commission, WGS, and other partners/stakeholders.
- Targeting outer coast communities which have Tsunami Evacuation Pedestrian Walk Time maps available, as well as popular outer coast state park locations which experience high visitor populations.
- Assessment will:
  - Provide a record of all current wayfinding markers/signs (type, location, condition)
  - Determine if any current markers need to be replaced
  - Recommend locations for new markers, especially for pedestrian evacuation
  - Provide other wayfinding recommendations as appropriate (ex: route maintenance)

Aberdeen, Hoquiam, and Cosmopolis
Tsunami Evacuation Walk Times





This map was funded by Award #NA18NWS4670000 by a National Tsunami Hazard Mitigation Program grant to the Washington Geological Survey from the Department of Commerce/National Oceanic and Atmospheric Administration. The views do not constitute an endorsement by NOAA.

tsunami inundation may extend farther upstream

Old Landfill
Sunset Memorial Cemetery
Hoquiam High School
Hoquiam
Beacon Hill
Basich Blvd
Sam Benn Park
Aberdeen
Bowerman Basin
Moon Island
Bowerman Airport
Beyond safe slow-walk time—must walk fast (~16 minute/mile) to exit inundation zone before tsunami arrival
ESTIMATED WAVE ARRIVAL TIME: 50 MIN
ESTIMATED WAVE ARRIVAL TIME: 60 MIN
ESTIMATED WAVE ARRIVAL TIME: 70 MIN
Ramie Island
Grays Harbor
Chehalis River
Grays Harbor County Juvenile Facility
Grays Harbor College
Makarenko Park
Cosmopolis
US101
US12
SR109
SR105

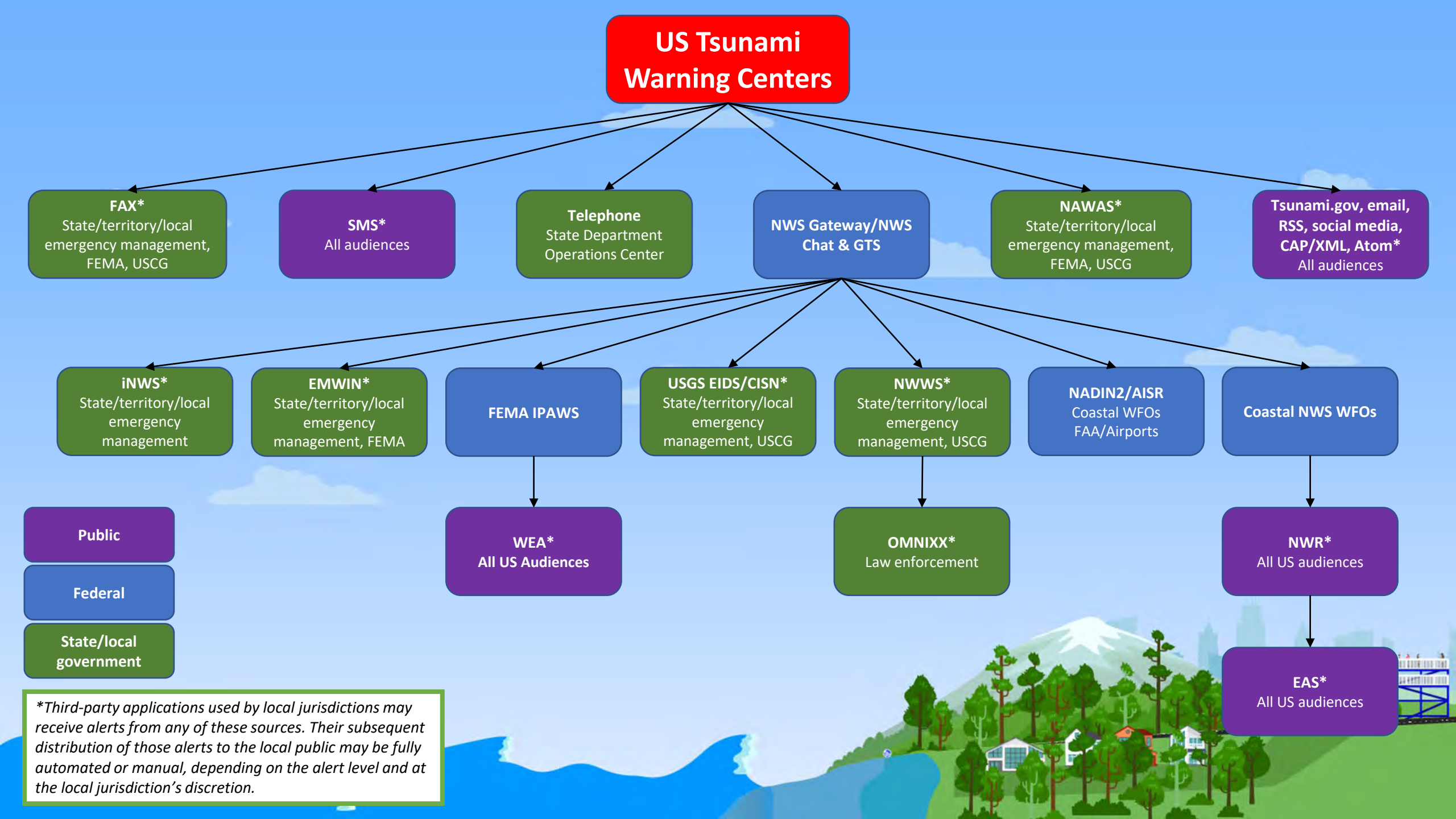
This map is a planning and preparation tool. Learn the evacuation routes for you and your family where you live, work, and play—evacuation maps may not be on hand during an actual emergency.

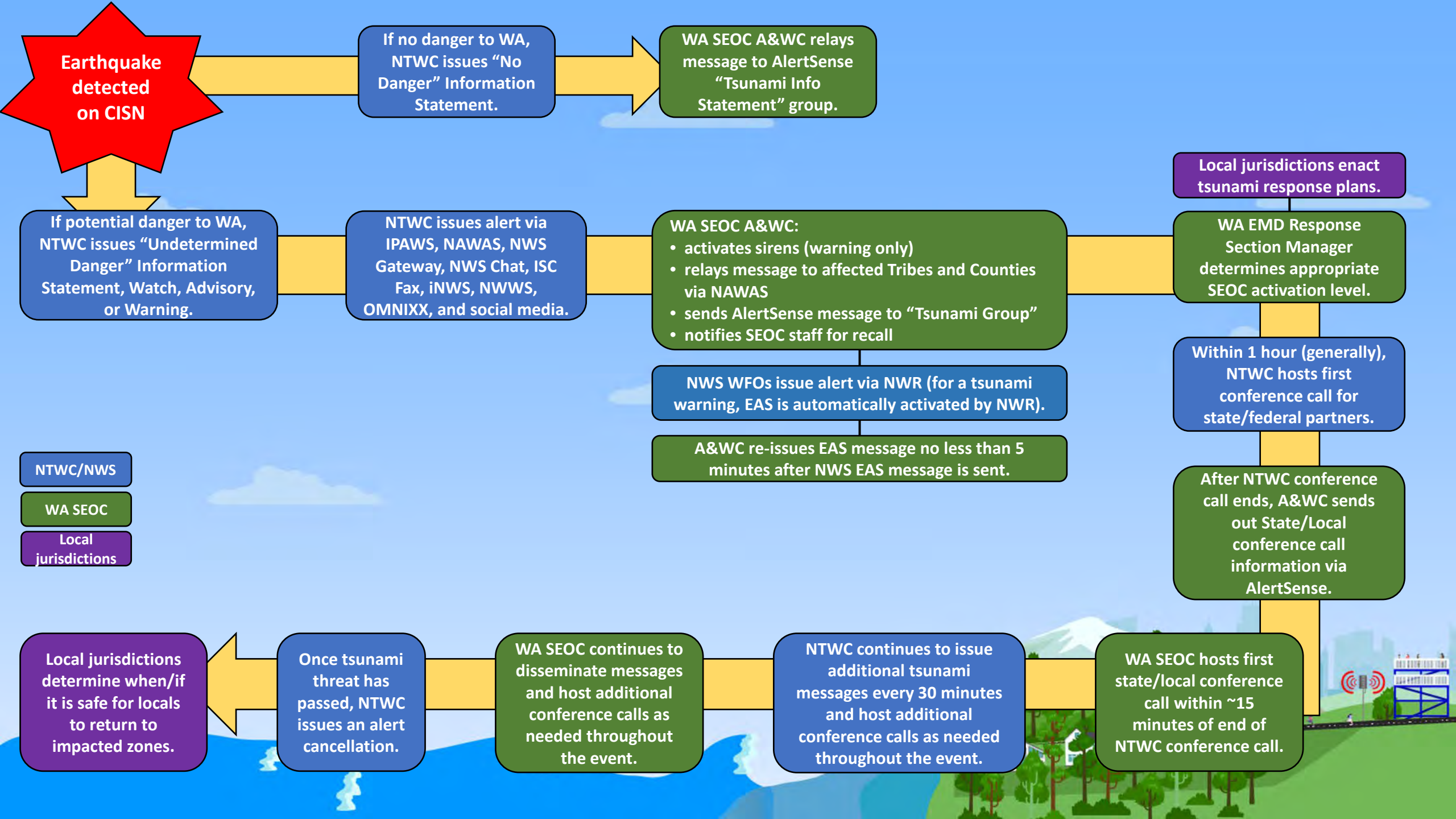
This evacuation walk time map for the cities of Aberdeen, Hoquiam, and Cosmopolis, provides an estimate of the amount of time it would take to evacuate from within the modeled inundation zone of a Cascadia-sourced subduction zone earthquake. This map provides inundation zones for the L1 scenario, defined as the 2,500-year event from which seismic and tsunami codes are locally derived. Time estimates on this map are modeled assuming a slow walking pace of 2.45 mph (~24 minute/mile), equivalent to the pace used for the timing of cross walks. Estimated wave arrival times shown on the map indicate the time between the beginning of the earthquake and modeled wave arrival at that location.

- Evacuation should begin as soon as earthquake shaking stops and it is safe to move from your drop, cover, and hold position or as directed by a tsunami warning siren, NOAA weather radio, or other official announcements.
- You should make your way uphill and follow the designated evacuation routes shown on this map. These routes were selected for pedestrian evacuation, but may be affected by post-earthquake hazards, such as collapsed bridges, landslides, and downed power lines. Use situational awareness when evacuating and be prepared to take alternate paths if necessary.

Tsunami Event Response Timeline

- Comprehensive doc that includes all key SOPs and alerting/communication steps and procedures at all levels with all key stakeholders
- Roles and responsibilities
  - Federal, state, local
- Tsunami alerting
  - Alert levels and determinations
  - Alert dissemination responsibilities, methods, and systems
  - Alerting limitations for the inner coast
- Tsunami event timeline
- Contacts and resource links
- Appendices
  - WA EMD docs
  - NTWC docs
  - NWS docs


US Tsunami Warning Centers
FAX*
State/territory/local emergency management, FEMA, USCG
SMS*
All audiences
Telephone
State Department Operations Center
NWS Gateway/NWS Chat & GTS
NAWAS*
State/territory/local emergency management, FEMA, USCG
Tsunami.gov, email, RSS, social media, CAP/XML, Atom*
All audiences
iNWS*
State/territory/local emergency management
EMWIN*
State/territory/local emergency management, FEMA
FEMA IPAWS
USGS EIDS/CISN*
State/territory/local emergency management, USCG
NWWS*
State/territory/local emergency management, USCG
NADIN2/AISR
Coastal WFOs
FAA/Airports
Coastal NWS WFOs
WEA*
All US Audiences
OMNIXX*
Law enforcement
NWR*
All US audiences
EAS*
All US audiences
Public
Federal
State/local government
*Third-party applications used by local jurisdictions may receive alerts from any of these sources. Their subsequent distribution of those alerts to the local public may be fully automated or manual, depending on the alert level and at the local jurisdiction's discretion.


Earthquake detected on CISN
If no danger to WA, NTWC issues "No Danger" Information Statement.
WA SEOC A&WC relays message to AlertSense "Tsunami Info Statement" group.
If potential danger to WA, NTWC issues "Undetermined Danger" Information Statement, Watch, Advisory, or Warning.
NTWC issues alert via IPAWS, NAWAS, NWS Gateway, NWS Chat, ISC Fax, iNWS, NWWS, OMNIXX, and social media.
WA SEOC A&WC:
• activates sirens (warning only)
• relays message to affected Tribes and Counties via NAWAS
• sends AlertSense message to "Tsunami Group"
• notifies SEOC staff for recall
NWS WFOs issue alert via NWR (for a tsunami warning, EAS is automatically activated by NWR).
A&WC re-issues EAS message no less than 5 minutes after NWS EAS message is sent.
Local jurisdictions enact tsunami response plans.
WA EMD Response Section Manager determines appropriate SEOC activation level.
Within 1 hour (generally), NTWC hosts first conference call for state/federal partners.
After NTWC conference call ends, A&WC sends out State/Local conference call information via AlertSense.
WA SEOC hosts first state/local conference call within ~15 minutes of end of NTWC conference call.
NTWC continues to issue additional tsunami messages every 30 minutes and host additional conference calls as needed throughout the event.
WA SEOC continues to disseminate messages and host additional conference calls as needed throughout the event.
Once tsunami threat has passed, NTWC issues an alert cancellation.
Local jurisdictions determine when/if it is safe for locals to return to impacted zones.
NTWC/NWS
WA SEOC
Local jurisdictions

Tsunami Tabletop Exercise

- Wednesday, July 28, 9:00 AM PDT – 4:00 PM
- Purpose:
  - Test the thoroughness, accuracy, and usability of the timeline document
  - Build out the timeline for response on the local level
  - Educate and refresh stakeholders about state/federal level response process
  - Generate discussion and brainstorming about stakeholder response, areas for collaboration, lessons learned, action items, etc
- Format:
  - Morning: seminar presentations from WA EMD, WGS, and NTWC
  - Afternoon: Breakout sessions with discussion prompts
- Want an invite? Email Elyssa.Tappero@mil.wa.gov!

FY21 Tasks

- Outreach and education for both coasts
- Siren network sustainment (looking for state funding avenues to support this in the future)
- TMRMS for a third port/marina
- Pedestrian Evacuation Walk Maps for Ocean Shores and Grayland, WA
- Tsunami simulations
- Tsunami HAZUS risk assessments

Questions?