Tsunami Hazards, Risks, and Maritime Strategy Results

The Port of Port Angeles

Washington Emergency Management Division

Washington Geological Survey

The United States Coast Guard

PORT of Port Angeles

EMERGENCY MANAGEMENT DIVISION · EM · WASHINGTON

WASHINGTON · DEPARTMENT OF NATURAL RESOURCES

WASHINGTON STATE DEPT OF NATURAL RESOURCES

WASHINGTON GEOLOGICAL SURVEY

Washington is Earthquake Country

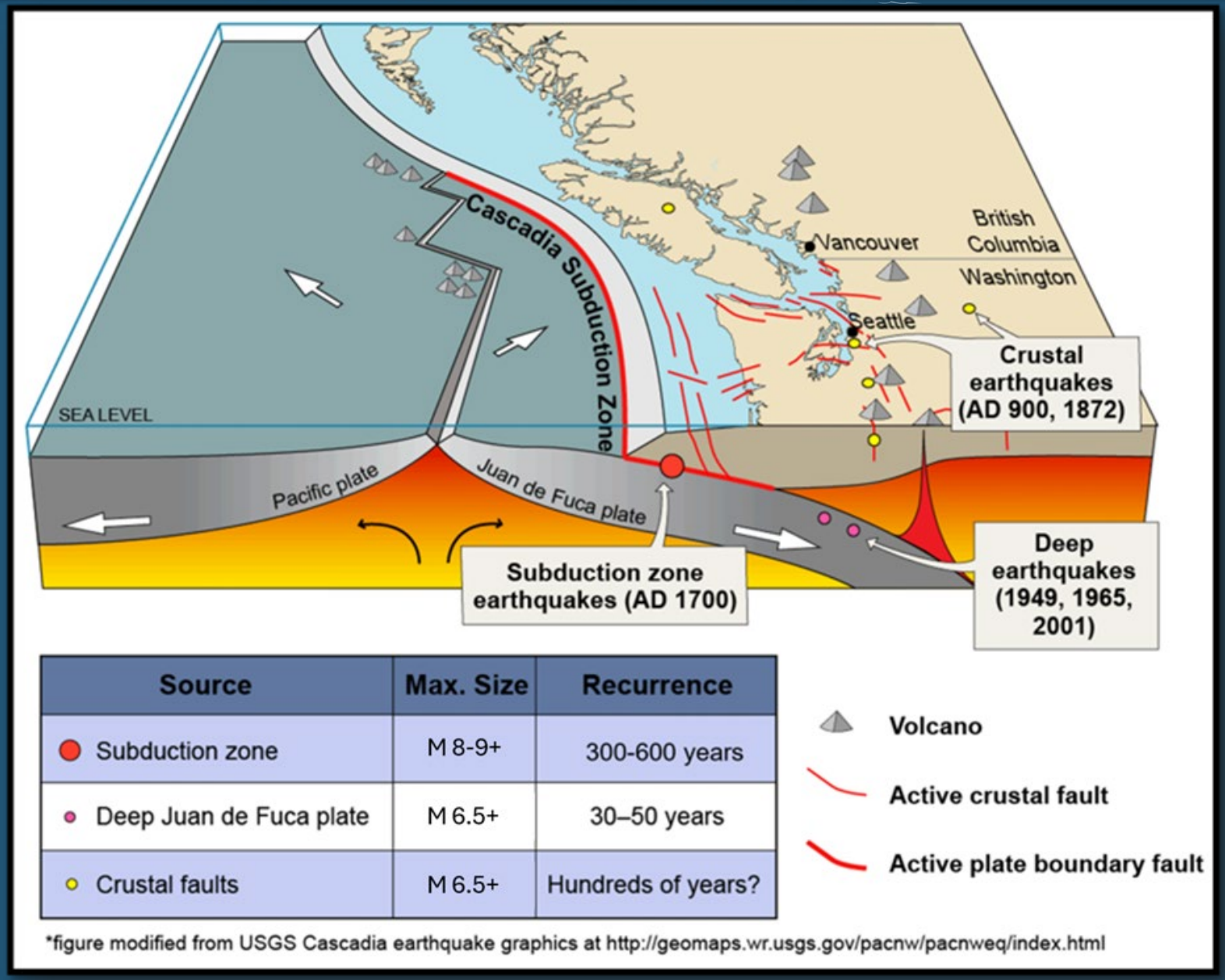
Washington has the
2nd highest earthquake risk
in the United States

It's not a matter of IF…
but WHEN.

"The Big One"

Nisqually, 2001

Seattle Fault, Chelan Fault, etc.



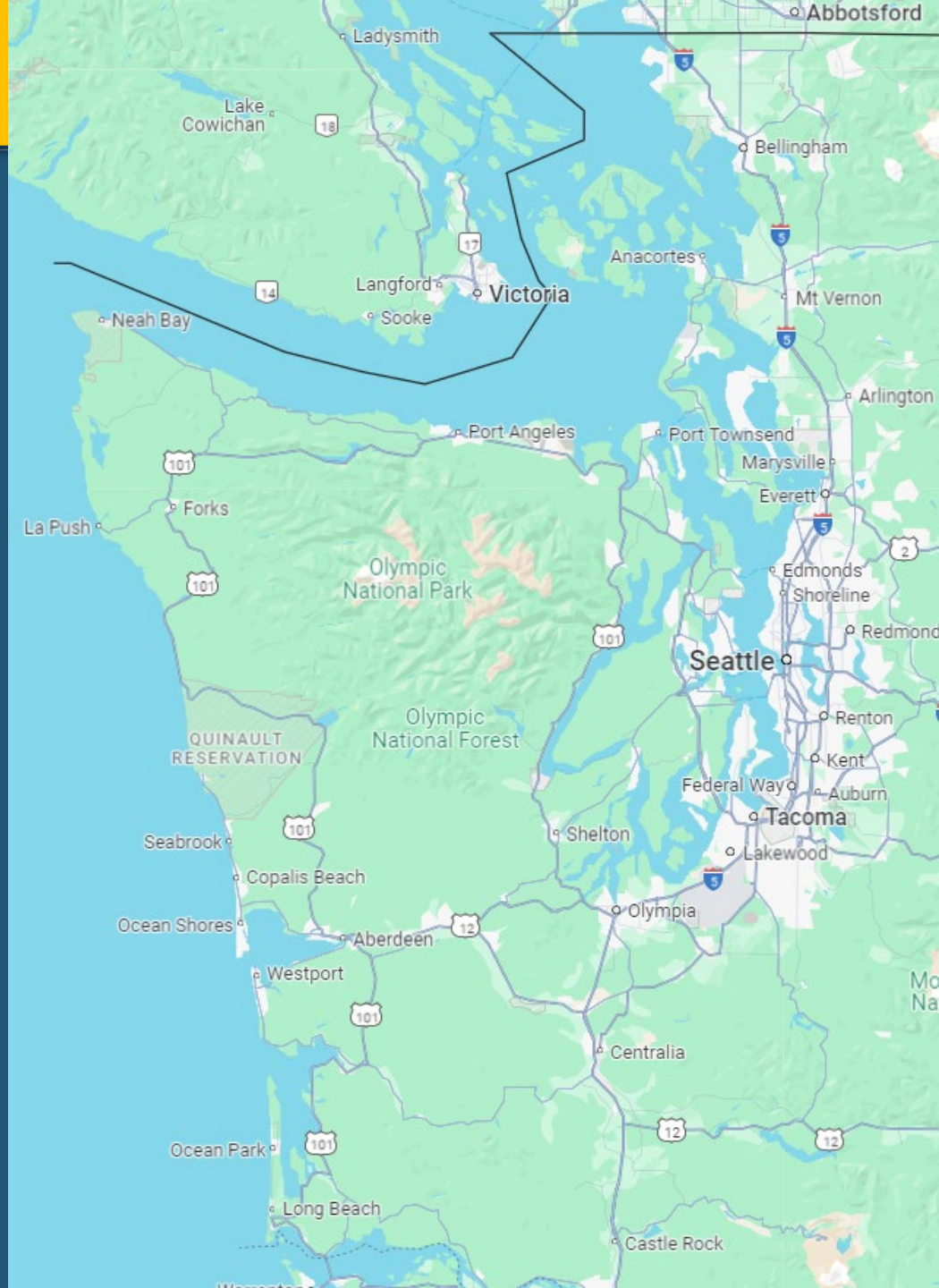
Source	Max. Size	Recurrence
Subduction zone	M 8-9+	300-600 years
Deep Juan de Fuca plate	M 6.5+	30–50 years
Crustal faults	M 6.5+	Hundreds of years?

*figure modified from USGS Cascadia earthquake graphics at http://geomaps.wr.usgs.gov/pacnw/pacnweq/index.html

Washington is Tsunami Country

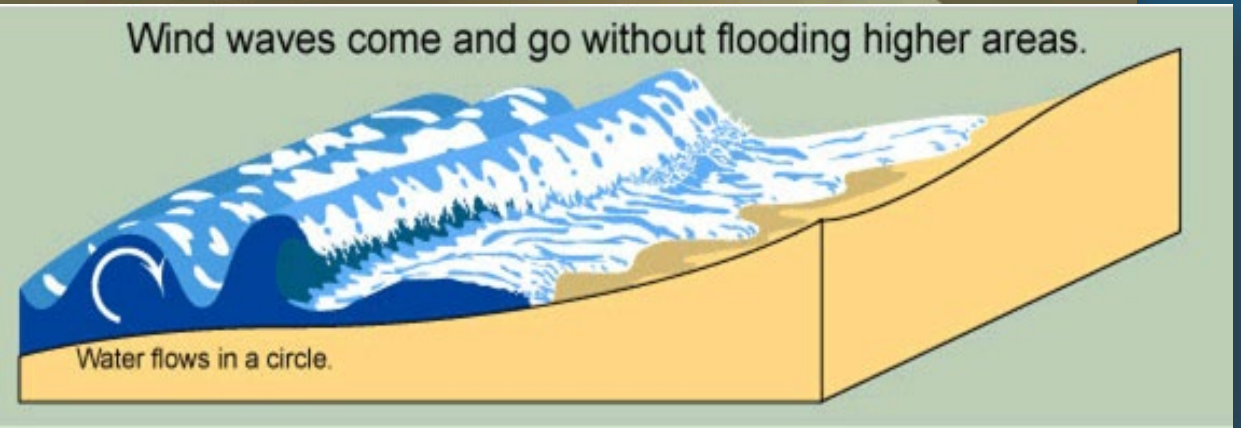
WA has 3,000 miles of shoreline with…

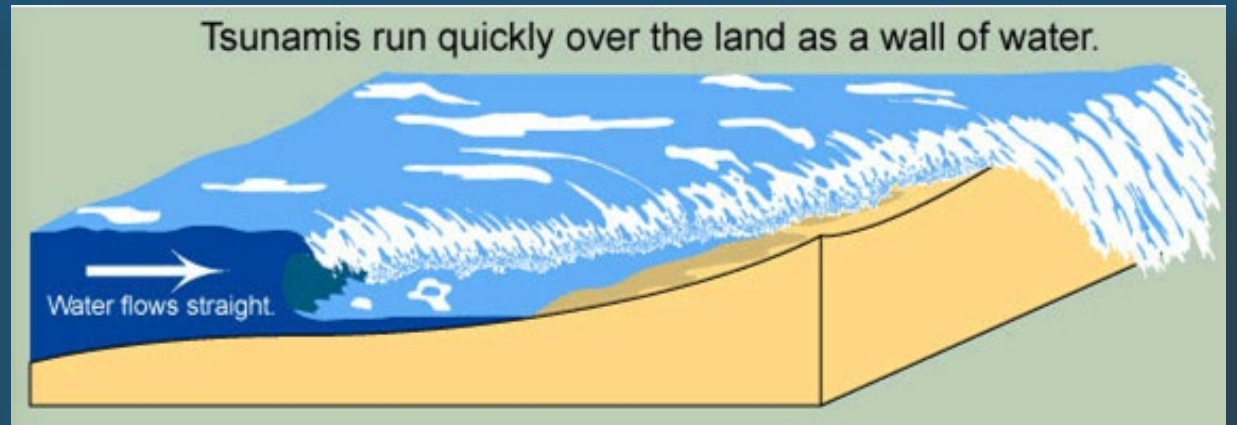
- One of the highest tsunami risks in the U.S.
- 31 ports and over 90 individual port-run shipping terminals, marinas, and harbors
- 7 Coast Guard stations and 4 Navy bases
- 700 fishing & seafood processing operations
- Largest ferry system in the US
- Millions of coastal tourists each year
- Highly vulnerable and aging coastal populations
- **175,000-300,000+ people living, working and recreating in tsunami hazard zones at any given time**

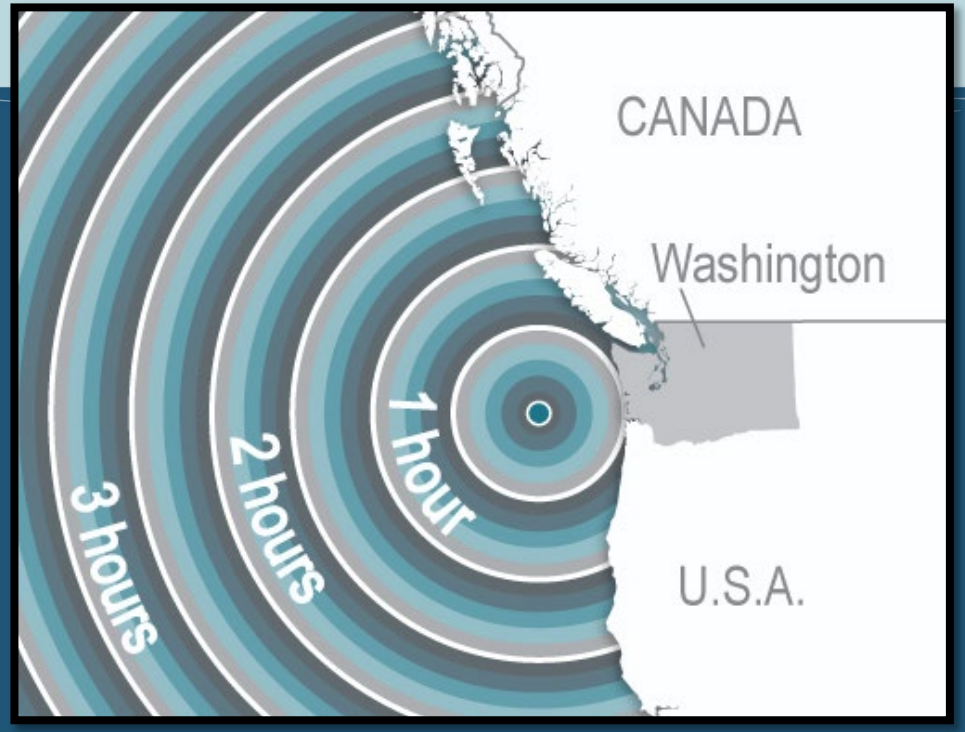


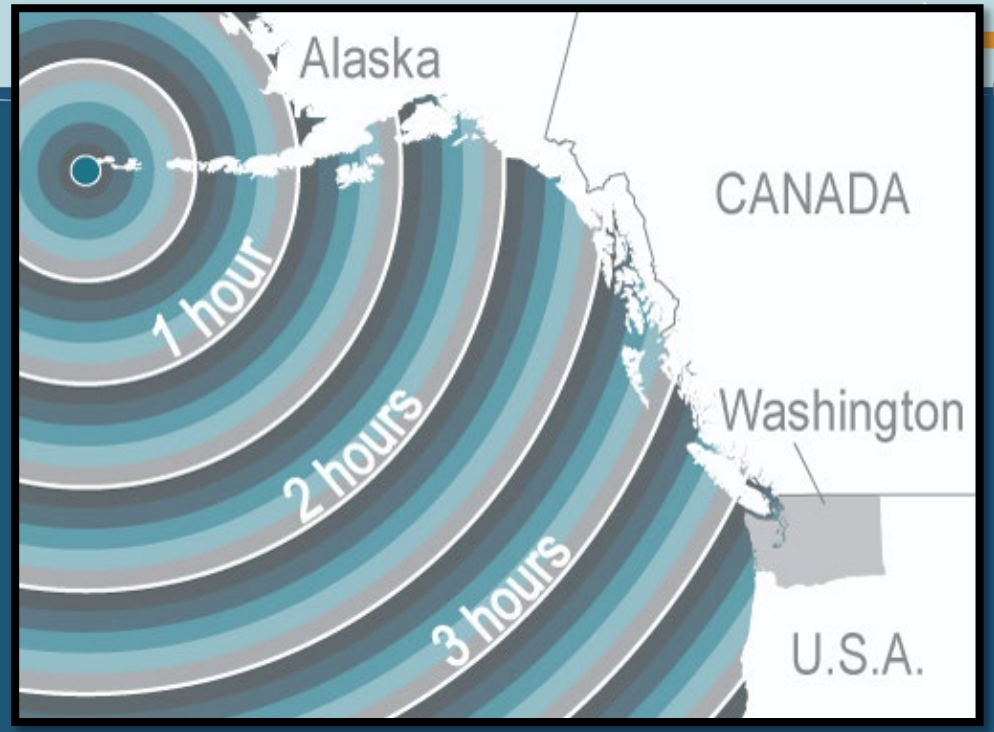
What is a tsunami?

- A series of long waves lasting 12-24+ hours
- Caused by earthquakes, landslides, volcanic eruptions, and some weather phenomena
- Can travel far distances across the water in minutes or hours
- The first wave is often neither the highest nor most destructive wave
- Very fast and powerful; entire column of water moves, not just the top like with wind waves









Local

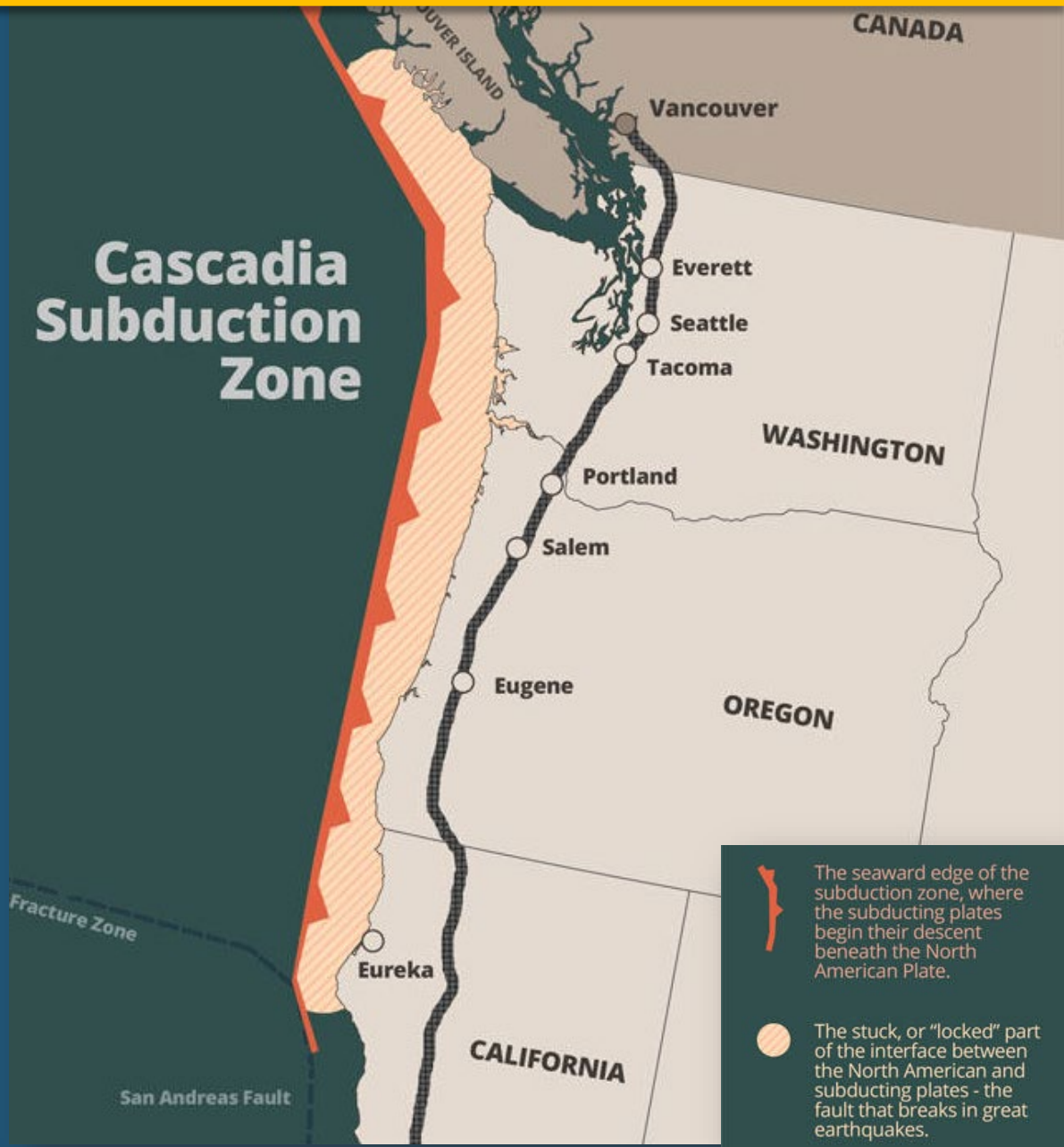
- You **will feel the earthquake**
- **Shaking** is primary warning
- **More inundation/severe currents**
- Greater impact to coast
- Biggest local threat: CSZ
- **Threat to inner and outer coasts**

Distant

- You **will NOT feel the earthquake**
- **Alerts** are primary warning
- **Less inundation/currents**
- Less impact to coast
- Biggest distant threat: Alaska
- Smaller threat to inner coast

Cascadia Subduction Zone (CSZ)

- 700 miles long
- Breaks every 300 – 600 years
- Last great rupture in 1700
- 10-30% chance within next 50 years (this percent will continue to increase)
- Causes magnitude 8.0-9.0+ earthquakes
- Shaking felt for 3–6 minutes throughout state and west coast
- Followed by a major tsunami hitting WA's outer coast in 15-20 mins
- Many large aftershocks will follow main quake and thousands of smaller aftershocks for many years
- **50,000-65,000+ casualties** expected for WA due to the tsunami alone; hundreds of thousands of people displaced



General Earthquake Impacts

- Damage to underground pipes, pumps, and other systems, leading to power loss, water and fuel shortages, and potential hazmat situations
- Damage to unreinforced masonry buildings, soft-story buildings, brick chimneys, and other structures not built to modern (post-1970s) building codes
- Damage to bridges, overpasses, roadways, and other vulnerable transportation infrastructure
- Secondary hazards: liquefaction, landslides, fires, gas leaks


Japan, 2011


Japan, 2011


Japan, 2011


Japan, 2011

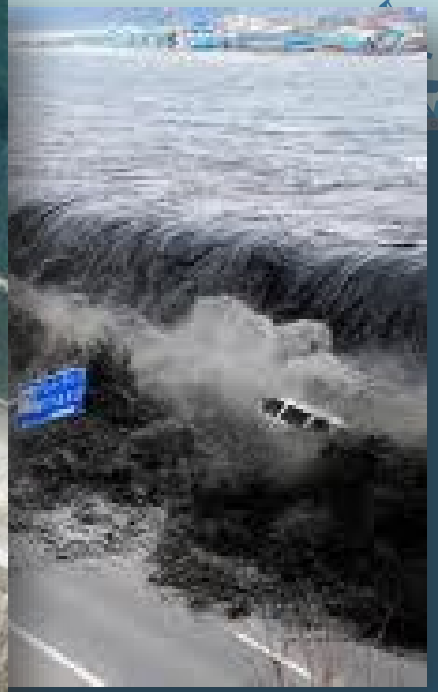
General Tsunami Impacts

- Damage to maritime infrastructure and goods, impacting shipping and supply chains
- Alteration of waterways through scour and deposition
- Generation, movement, and deposition of mixed and hazardous debris
- Injuries and fatalities in coastal communities lacking adequate high ground nearby
- Examples from Japan (2011):
  - 19,700+ deaths (majority from tsunami)
  - 400,000+ people displaced
  - 402,000+ buildings partially or totally collapsed
  - 28,000+ ships destroyed; 319 ports damaged

Japan, 2011

Japan, 2011


March 12, 2011



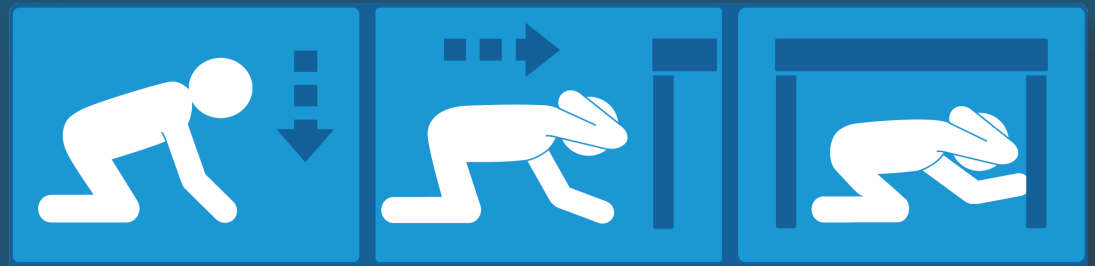
Natural Tsunami Warning Signs

Long or strong ground shaking at the coast

Ocean water bubbling, frothing, or otherwise acting abnormally

Loud roaring sound coming from the ocean

Sudden rise or fall of the ocean



DROP! **COVER!** **HOLD ON!**

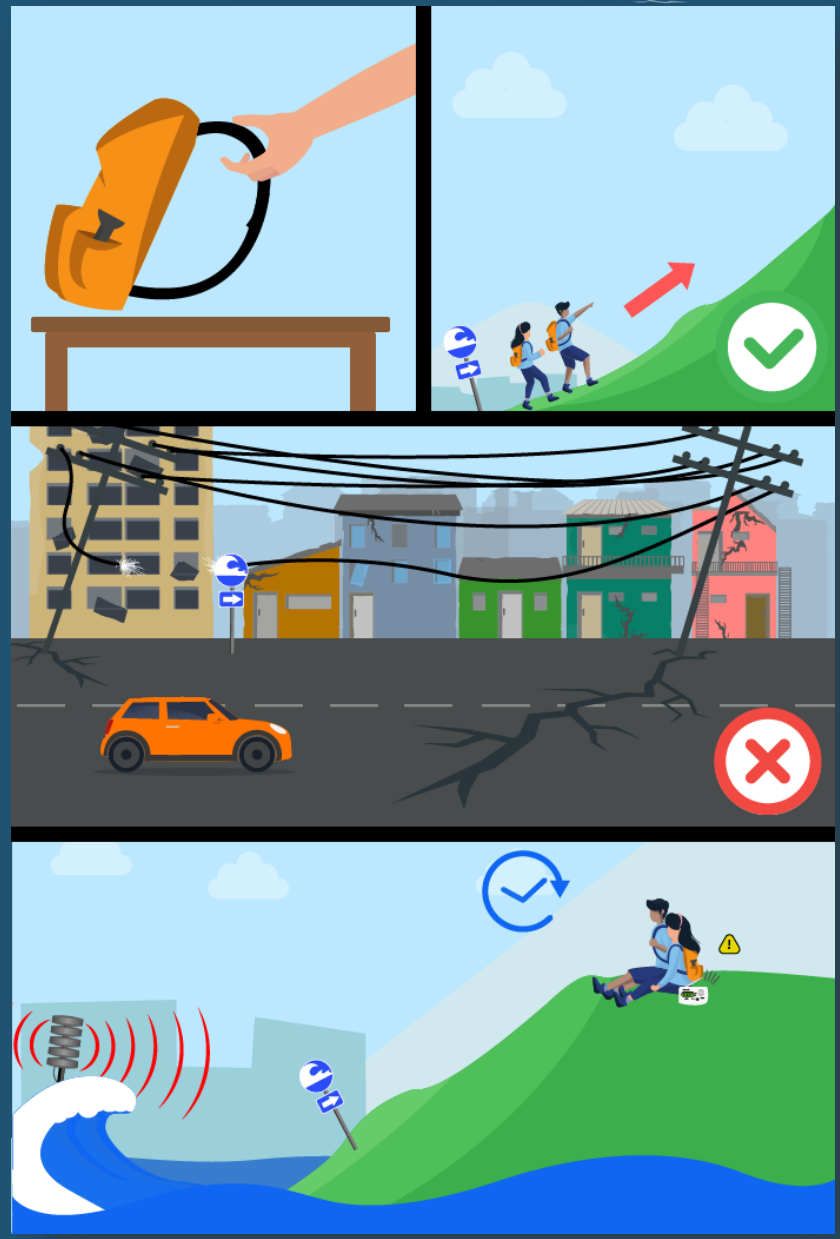
Protect Yourself During Earthquakes

GO TO HIGH GROUND OR INLAND!

The Shaking is Your Tsunami Warning

STAY THERE!

Tsunami Waves May Arrive for Hours



Port Angeles Tsunami Evacuation Walk Times

WASHINGTON GEOLOGICAL SURVEY MARCH 2019

Port Angeles, WASHINGTON

Washington State Department of Natural Resources, Washington Geological Survey | University of Washington | National Tsunami Hazard Mitigation Program | Washington Military Department Emergency Management Division

N

IN CASE OF EARTHQUAKE, GO TO HIGH GROUND OR INLAND

Strait of Juan de Fuca

Beyond safe slow-walk time—must walk fast (~18 minute/mile) to exit inundation zone before tsunami arrival

Beyond safe slow-walk time—must run (~15 minute/mile) to exit inundation zone before tsunami arrival

must walk fast

must run

Edz Hook

US Coast Guard Air Station

ESTIMATED WAVE ARRIVAL TIME TO STUDY AREA: 60 MIN

~2,000 feet to evacuation point

Nippon Paper Industries USA

bridge

lagoon

West 4th Street

West 8th Street

Marine Drive

Port Angeles Boat Haven

Port of Port Angeles

Port Angeles Harbor

Port Angeles Ferry Terminal

Port Angeles City Pier

Port Angeles

SR117

Cedar St

Tumwater Truck Rd

West 8th St

Peabody St

Safeway parking lot

Playground at 5th & Oak

Port Angeles Fire Department

Bo Baggins Daycare Center

Vern Burton Community Center

Port Angeles Police Department

Olympic Medical Center

Port Angeles Senior Center

East 5th St

N Race St

S Race St

East 6th St

N Ennis St

S Ennis St

US101

West Lauridsen Blvd

Jefferson Elementary School

No-Bridge Scenario

Beyond safe slow-walk time

bridge out lagoon

The bridge crossing the lagoon at the west end of Ediz Hook may be destroyed during the Cascadia earthquake. This walk map scenario shows that evacuation times would be significantly increased on Ediz Hook by the loss of the bridge, creating a less direct evacuation route around the lagoon.

Morse Creek area map, two miles east of main map area. Scale 1:9,000

Sea View Dr.

Strait View Dr.

N. Ridgeview Dr.

Map Symbols

OUTSIDE OF MODELED TSUNAMI INUNDATION ZONE

Approximate tsunami evacuation slow-walk times (~24 minute/mile)

TSUNAMI INUNDATION ZONE

15 — 0–15 minutes

30 — 16–30 minutes

45 — 31–45 minutes

60 — 46–60 minutes

75 — 61–75 minutes

Area beyond safe slow-walk times

must walk fast

90 — 76–90 minutes

120 — must run — 91–120 minutes

ocean | trail, staircase, or bike path | road | tsunami evacuation route | edge of inundation zone

lake or pond

impassable slope

tsunami siren

stairs

hospital

fire station

police station

post-tsunami assembly area

This item was funded by Award #NA16NWS4670041 by a National Tsunami Hazard Mitigation Program grant to the Washington Geological Survey from the Department of Commerce/National Oceanic and Atmospheric Administration. This does not constitute an endorsement by NOAA.

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 City of Port Angeles 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 extent 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 2.46 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.
- Assembly areas are places of high ground for displaced people. These rally points are typically in open outdoor spaces or in large structures just beyond the tsunami inundation zones.
- Do not re-enter or cross back into the inundation zone until instructed to do so by local officials. Tsunamis are multi-wave events. The first wave may not be the highest, and danger of tsunami inundation may persist for many hours after the initial wave has subsided.

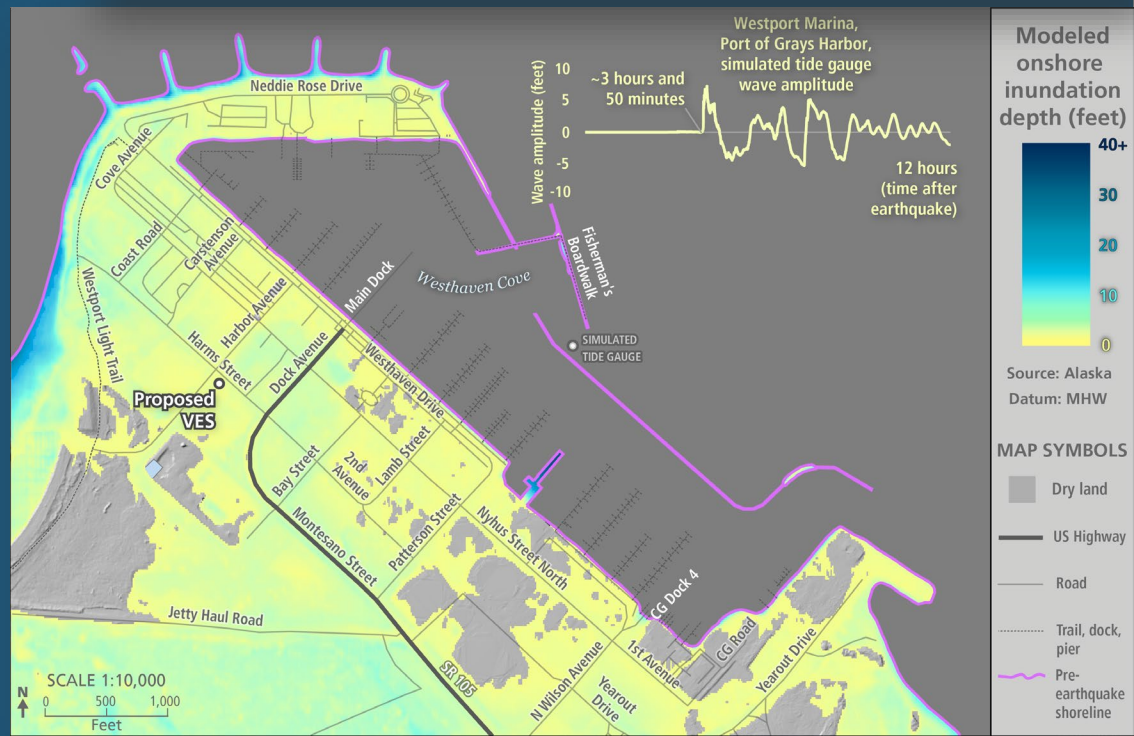
Tsunami inundation data from:
Dungard, D. W., Forson, Corine, Walsh, T. J., Gonzalez, F. I., LeVeque, R. J. Adams, L. M., 2016, Tsunami hazard maps of Port Angeles and Port Townsend, Washington—Model results from a ~2,500-year Cascadia subduction zone earthquake scenario: Washington Geological Survey Map Series 2016-03, 8 sheets, scale 1:11,000 and 1:16,000, 11 p. text. [http://www.dnr.wa.gov/publications/ger_ms2016-03_tsunami_hazard_pt_angeles_pt_townsend.zip]

0 0.25 0.5 0.75 1 miles

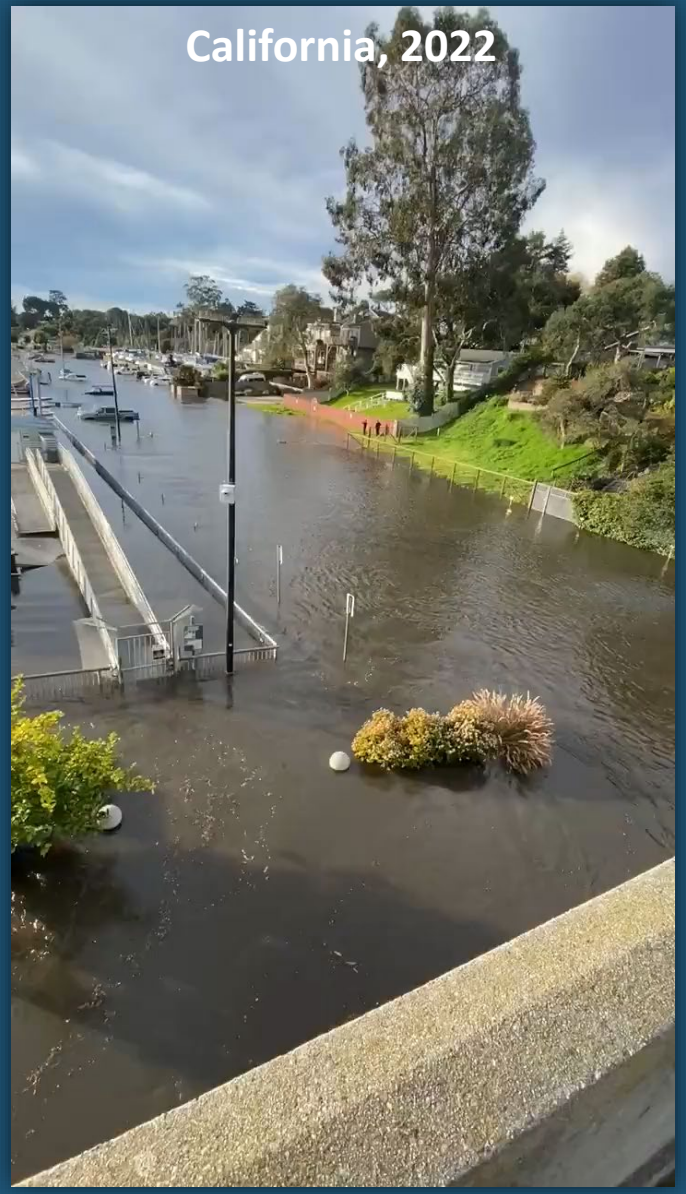
SCALE 1:9,000

Alaska Aleutian Subduction Zone

- Washington's greatest tsunami threat from outside the state
- Since 1900, Alaska has averaged an M8.0+ earthquake every ~13 years
- No shaking felt in Washington
- Official alerts are primary warning
- Mainly threat to outer coast
- M9.2 Alaskan Aleutian Subduction Zone Scenario
  - Similar to 1964 Alaska Good Friday earthquake and tsunami
  - Wave crest is leading (meaning no water drawdown to warn beachgoers)
  - Tsunami reaches WA outer coast in 3.5-4 hrs



Distant Tsunami Impacts on the West Coast

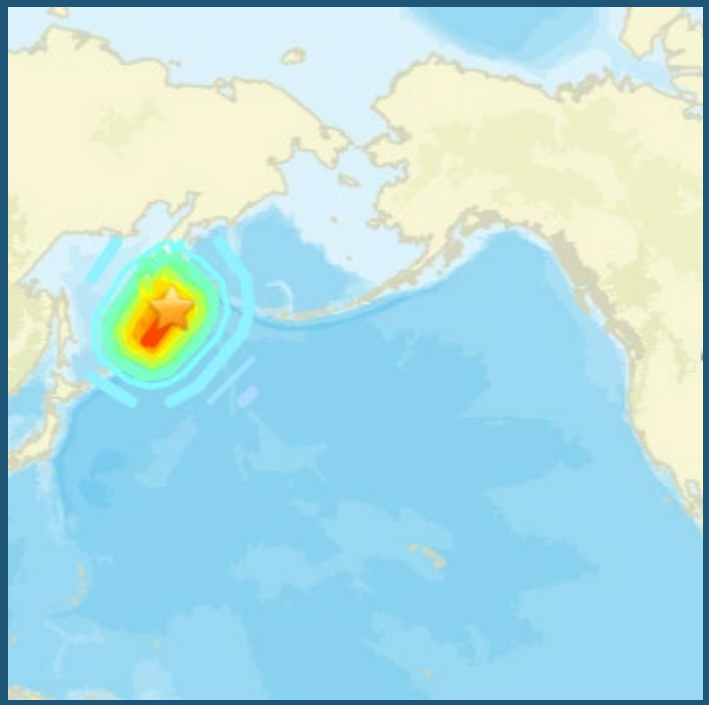


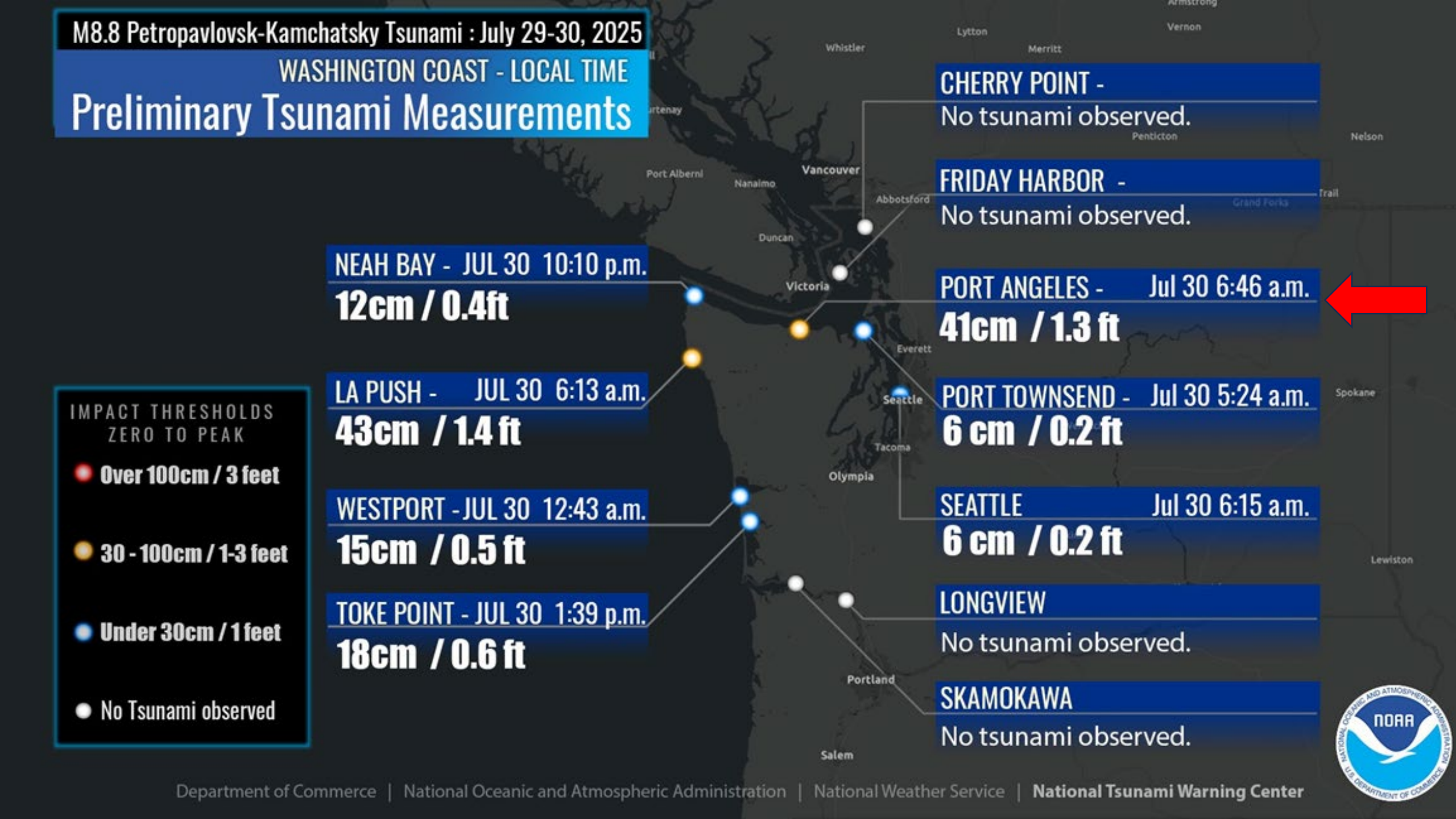
Tsunami Alerts

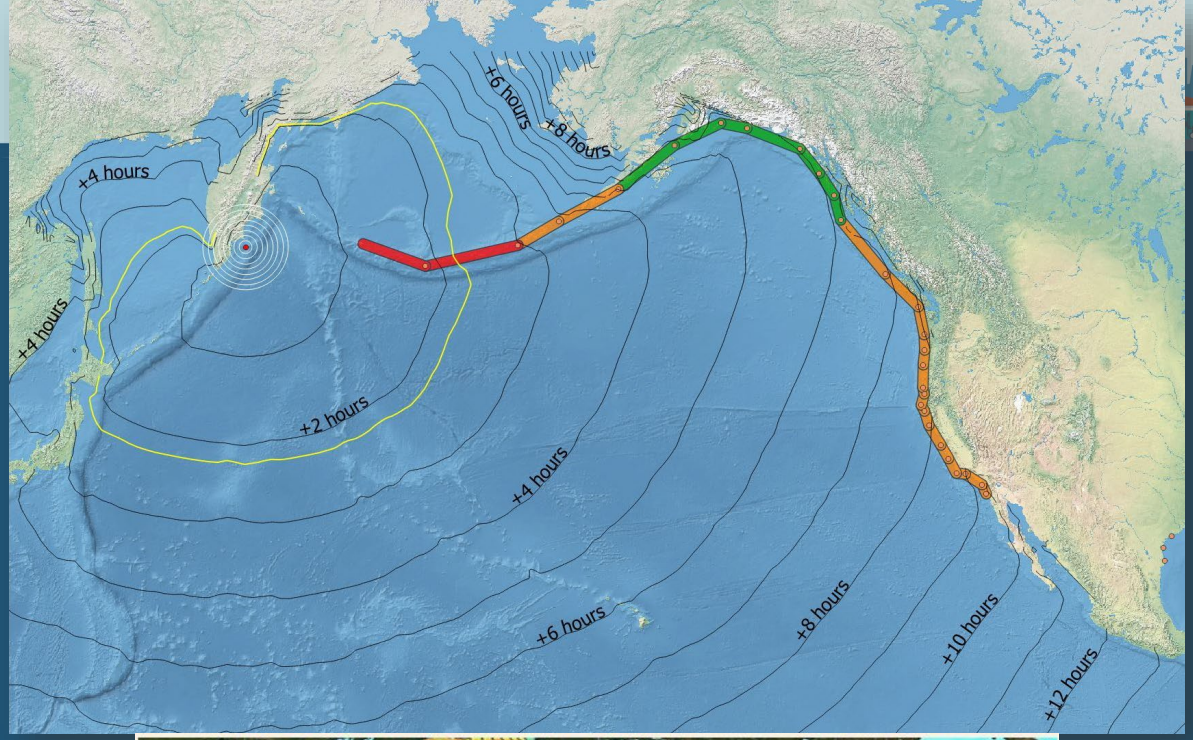
Alert Name	Actions	Potential Hazards
WARNING	Get to high ground or inland IMMEDIATELY Follow tsunami evacuation signage	DANGER! TSUNAMI IMMINENT! Flooding/powerful currents Wave heights > 3 ft. or unknown
ADVISORY	Stay out of the water and away from the shore	STRONG CURRENTS AND DANGEROUS WAVES in or very near coastal water Wave heights of 1 - 3 ft.
WATCH	Be prepared to take action Stay tuned to local radio/TV/ NOAA “alert” weather radios	TSUNAMI IS POSSIBLE Alert level *will* change once more information is known
INFORMATION STATEMENT	No action needed	NO TSUNAMI IMPACT EXPECTED Alert level may change once more information is known

M8.8 Kamchatka Tsunami Advisory Overview

- 07/29/2025 at 4:25 PM PT: M8.0 earthquake off the coast of Kamchatka, Russia.
- 07/29/2025 at 5:19 PM: Magnitude revised to M8.7 (eventually M8.8 – 7th largest EQ in recorded history) and Washington upgraded to a Tsunami Watch.
- 07/29/2025 at 6:27 PM: Washington further upgraded to a Tsunami Advisory.
- 07/30/2025 at 10:20 AM: Tsunami Advisory cancelled (18 hours after earthquake). Strong and unusual currents persist in WA for many more hours.
- Highest recorded wave height in WA was ~1.3 ft (La Push and Port Angeles). There were no casualties or damage reported for Washington state.

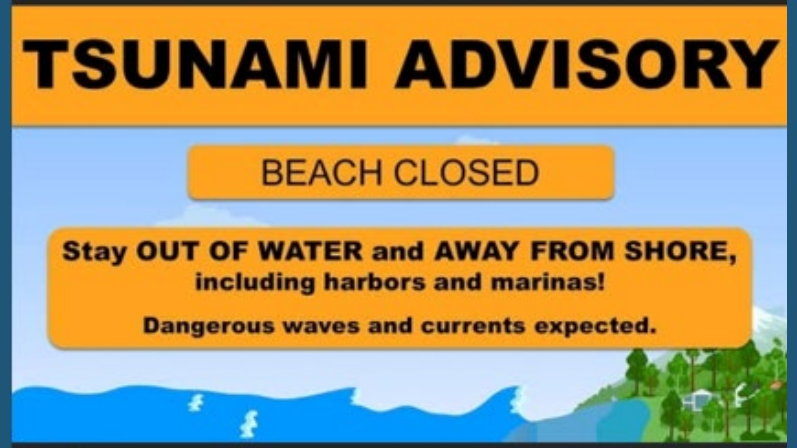



M8.8 Petropavlovsk-Kamchatsky Tsunami : July 29-30, 2025
WASHINGTON COAST - LOCAL TIME
Preliminary Tsunami Measurements
CHERRY POINT -
No tsunami observed.
FRIDAY HARBOR -
No tsunami observed.
NEAH BAY - JUL 30 10:10 p.m.
12cm / 0.4ft
PORT ANGELES - Jul 30 6:46 a.m.
41cm / 1.3 ft
LA PUSH - JUL 30 6:13 a.m.
43cm / 1.4 ft
PORT TOWNSEND - Jul 30 5:24 a.m.
6 cm / 0.2 ft
WESTPORT - JUL 30 12:43 a.m.
15cm / 0.5 ft
SEATTLE Jul 30 6:15 a.m.
6 cm / 0.2 ft
TOKE POINT - JUL 30 1:39 p.m.
18cm / 0.6 ft
LONGVIEW
No tsunami observed.
SKAMOKAWA
No tsunami observed.
IMPACT THRESHOLDS
ZERO TO PEAK
Over 100cm / 3 feet
30 - 100cm / 1-3 feet
Under 30cm / 1 feet
No Tsunami observed
Whistler
Lytton
Merritt
Vernon
Penticton
Nelson
Port Alberni
Nanaimo
Vancouver
Abbotsford
Duncan
Victoria
Everett
Seattle
Tacoma
Olympia
Spokane
Lewiston
Portland
Salem
Department of Commerce | National Oceanic and Atmospheric Administration | National Weather Service | National Tsunami Warning Center

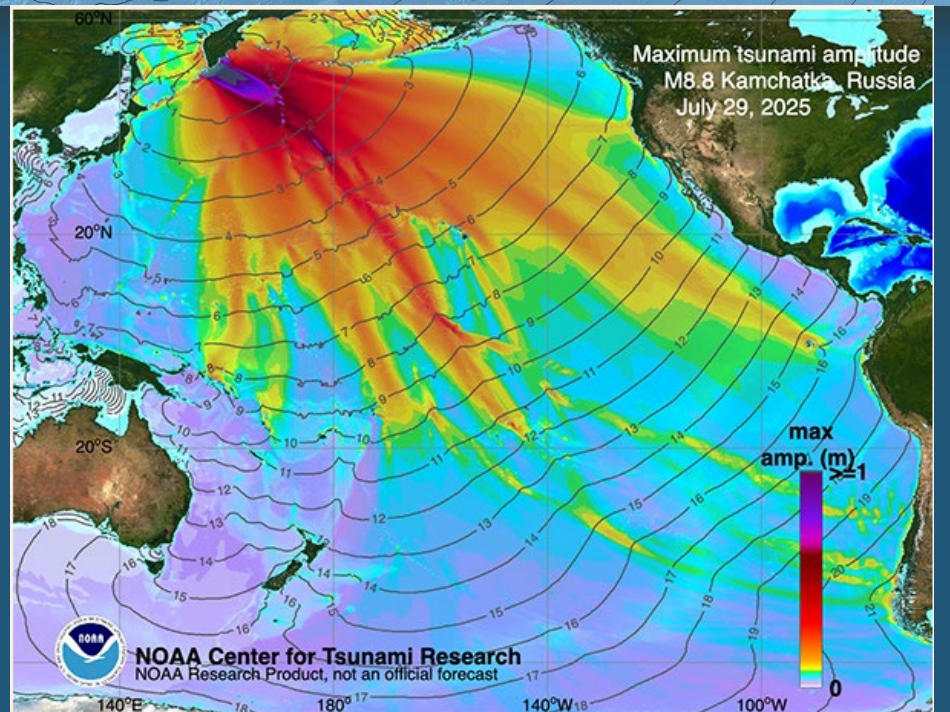


Washington State Parks & Recreation Commission
4h ·

A tsunami advisory has been issued for Washington's outer coast. Ocean beaches are closed and people are advised to stay … See more



15 comments 495 shares



Official Tsunami Alerting Methods

Sign up for tsunami alerts at mil.wa.gov/alerts

- **3rd party apps**
  - iNWS (National Weather Service)
  - NVS Tsunami Evacuation App
  - Local alert options (CodeRed, Everbridge, etc)
- **Other**
  - NOAA Weather Radio
  - tsunami.gov

Alert Methods – Local Alerts

Third Party Systems

- Systems that have permission to retrieve alerts and deliver alerts to their customer base.
- Customizable and often specific to a geographic area or organization, so provide more detail than state or federal level alerts.
- Often require users to opt-in.

Clallam County uses Everbridge – sign up today!

Sign up here!

Tsunami Maritime Response and Mitigation Strategies

- **Site-specific** – strategies focus on the tsunami threat to the maritime community in a specific port/harbor/marina along WA's coast
- **Study includes**
  - An overview of tsunami hazards and risk including maps and models
  - Evaluation of feasibility for 31 total response and mitigation actions for port consideration
  - Available mitigation funding options
  - Recommended next steps to improve tsunami resilience
- **Comprehensive** – 20 agencies or organizations participated in the strategy
- **Completed strategies** – Port of Bellingham, Westport Marina (Port of Grays Harbor), Port of Anacortes, Port of Neah Bay, Eagle Harbor (Bainbridge Island); find them all at mil.wa.gov/tsunami

Tsunami Maritime Modeling

Study areas:

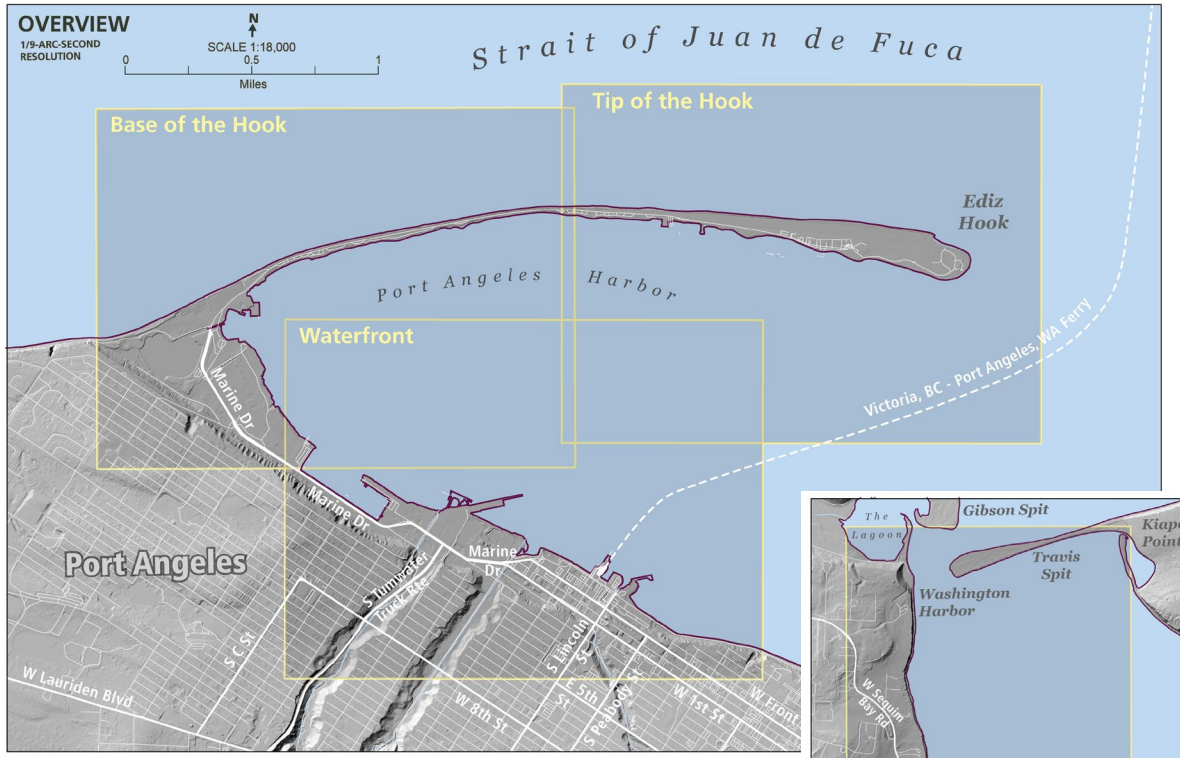
- Port Angeles Harbor
  - Base of the hook
  - Tip of the hook
  - Waterfront
- Sequim Bay
  - John Wayne Marina

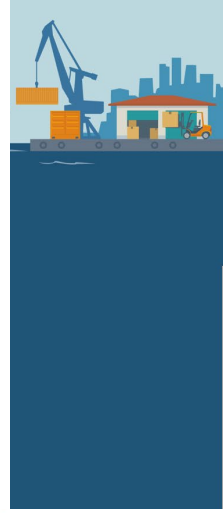
Sea level scenarios:

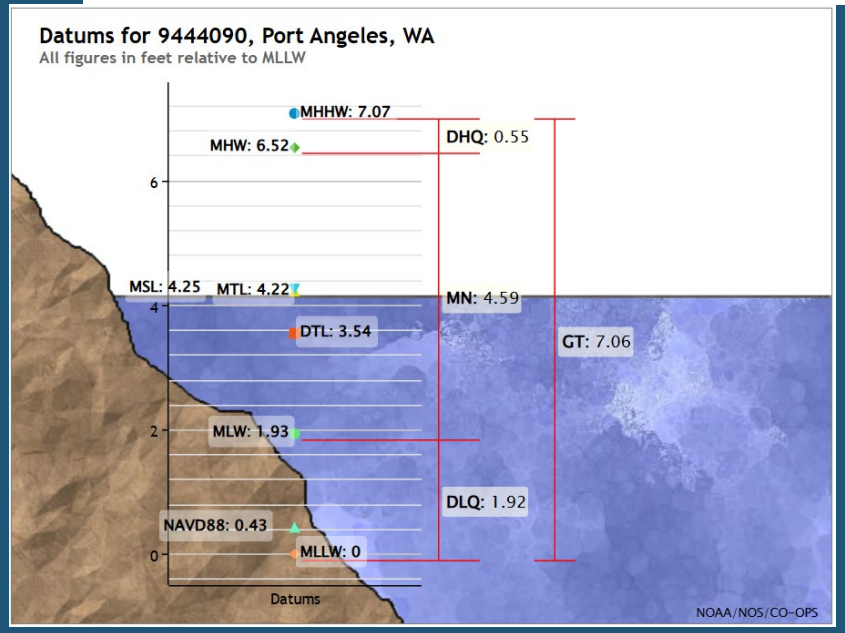
- Mean high water (MHW)
- Mean low water (MLW)

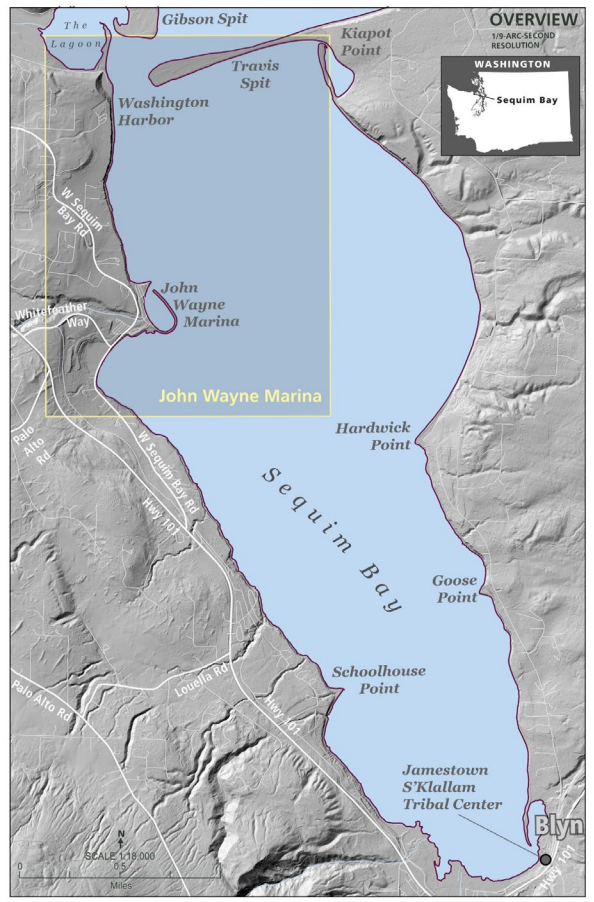
Model resolution:

- 3-meters (1/9th arc-second)
  - 9x improvement over published regional modeling (2022)

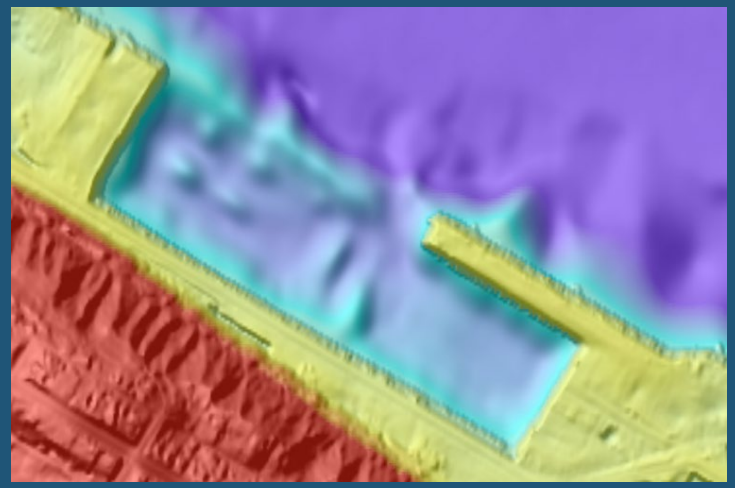


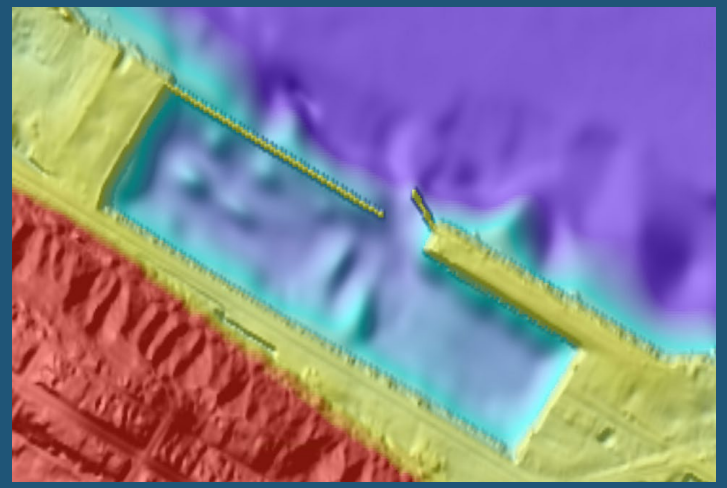


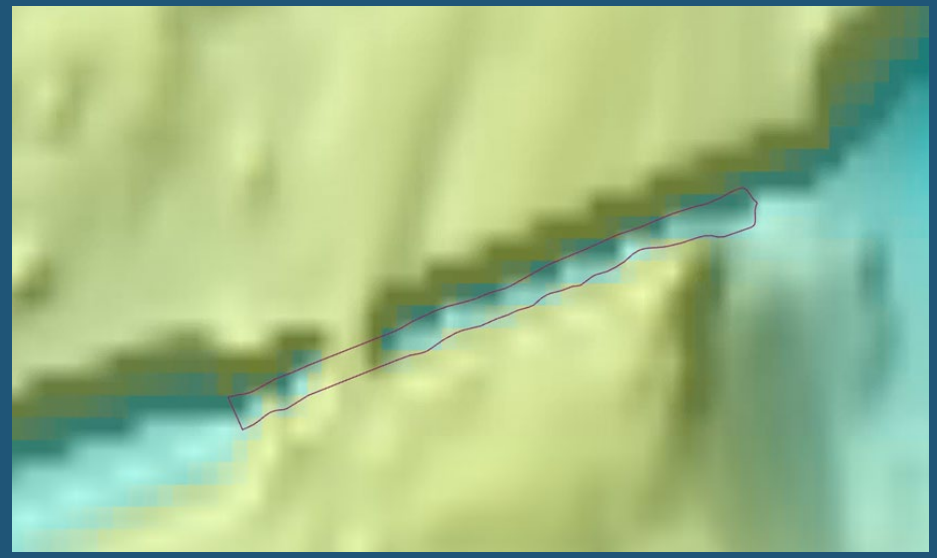




Benefits of 1/9” modeling resolution: DEM enhancements

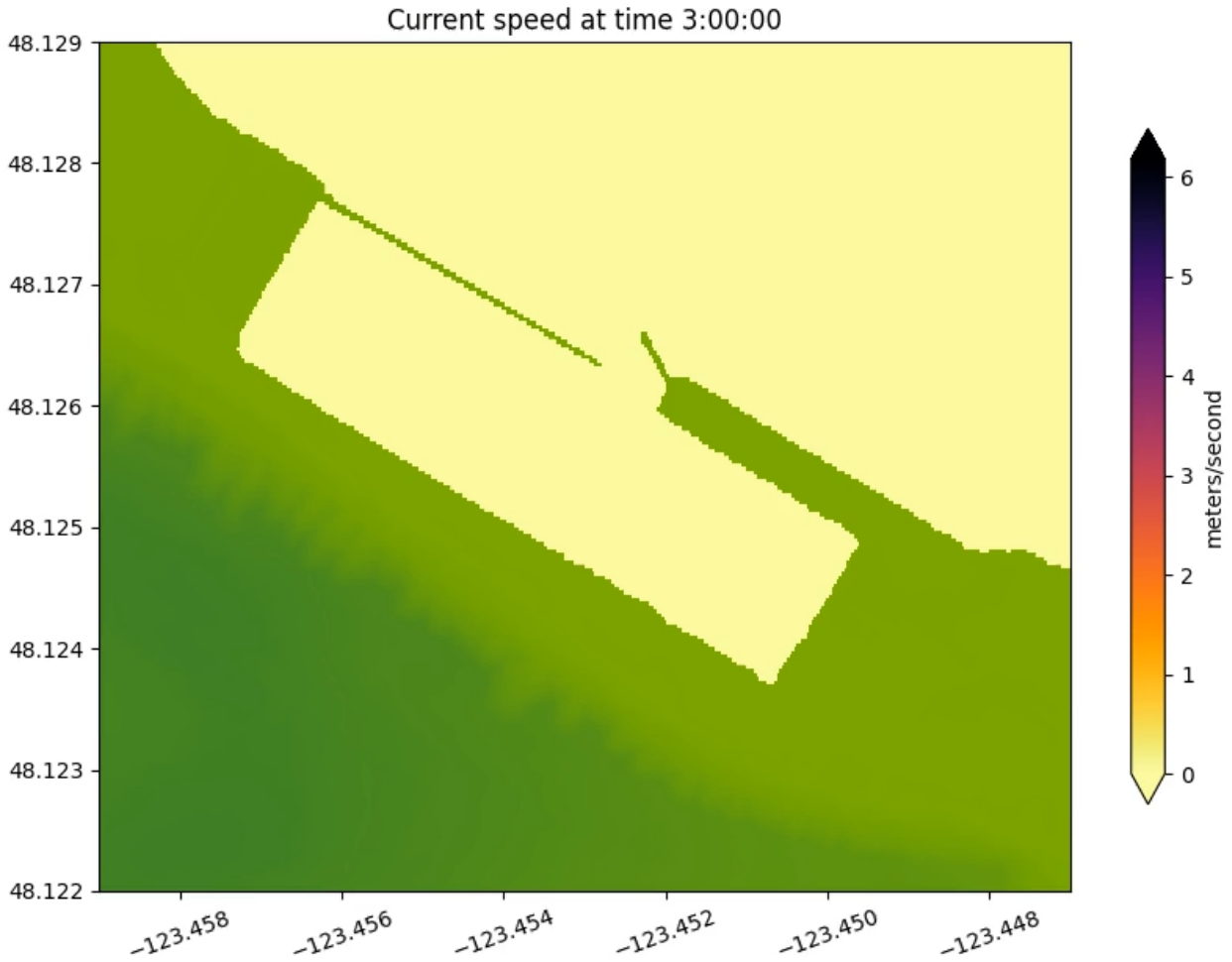






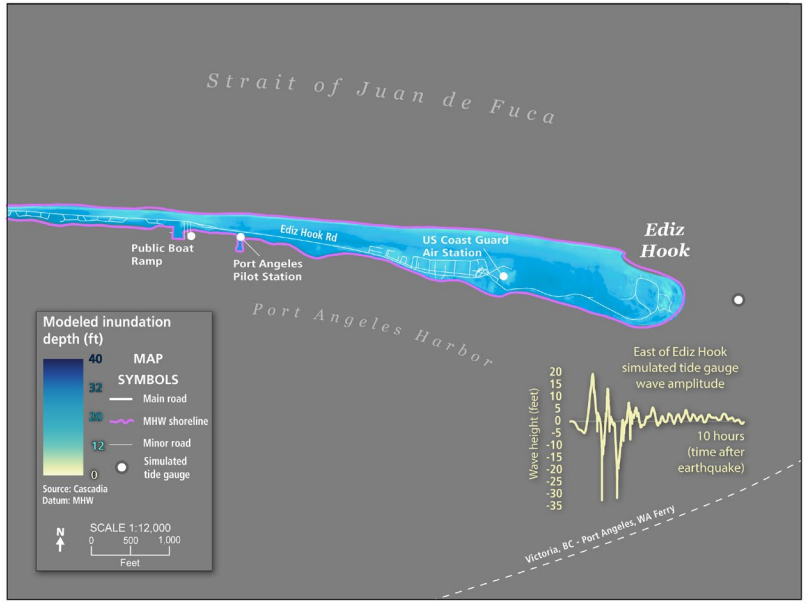
Benefits: higher accuracy models around narrow port features

AASZ, MHW, maximum current speed

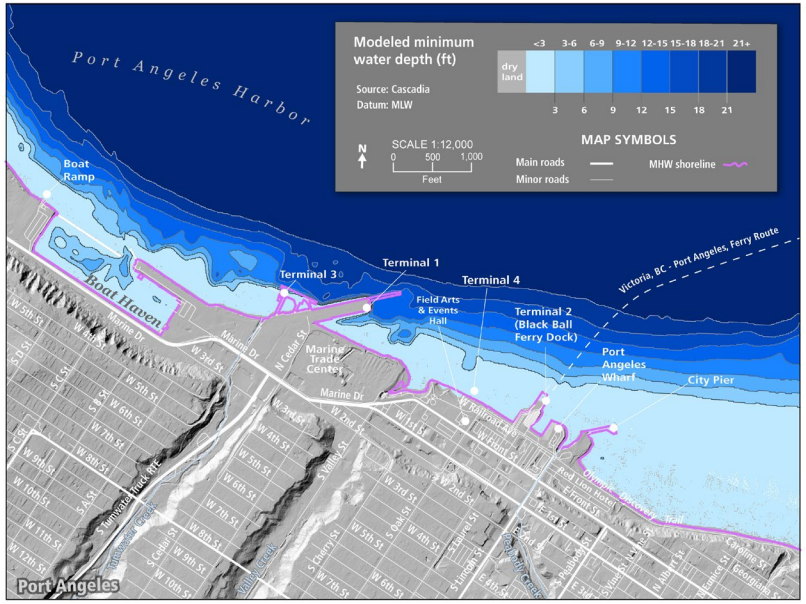


Main product development

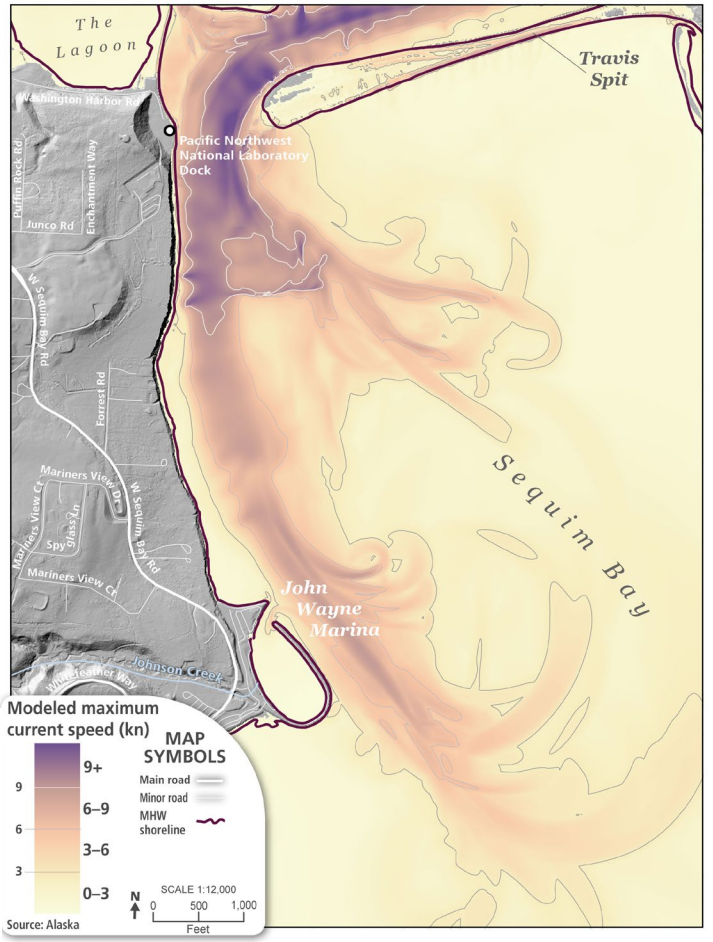
Maximum flow



Minimum water depth

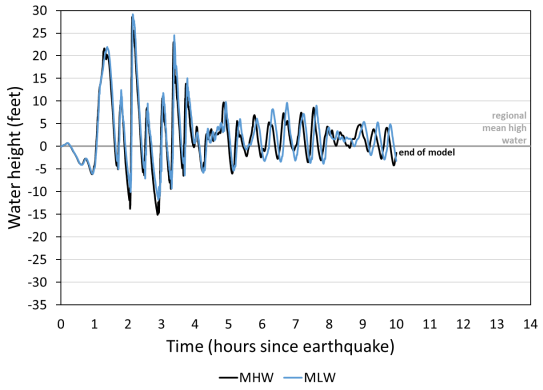


Maximum current speed

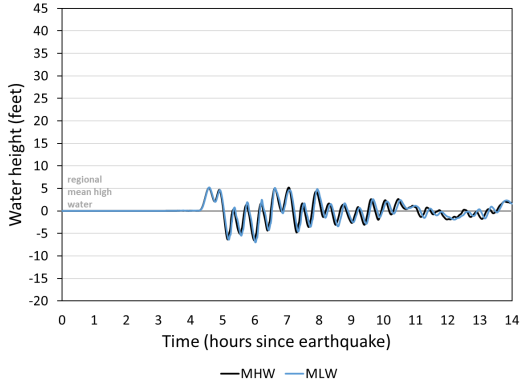


Simulated tide gauges

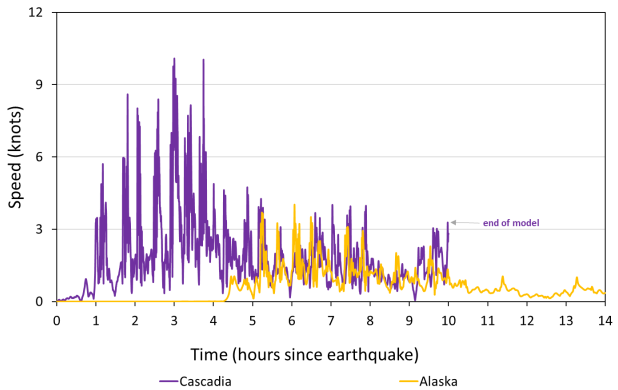
Boat Haven, center (Cascadia)



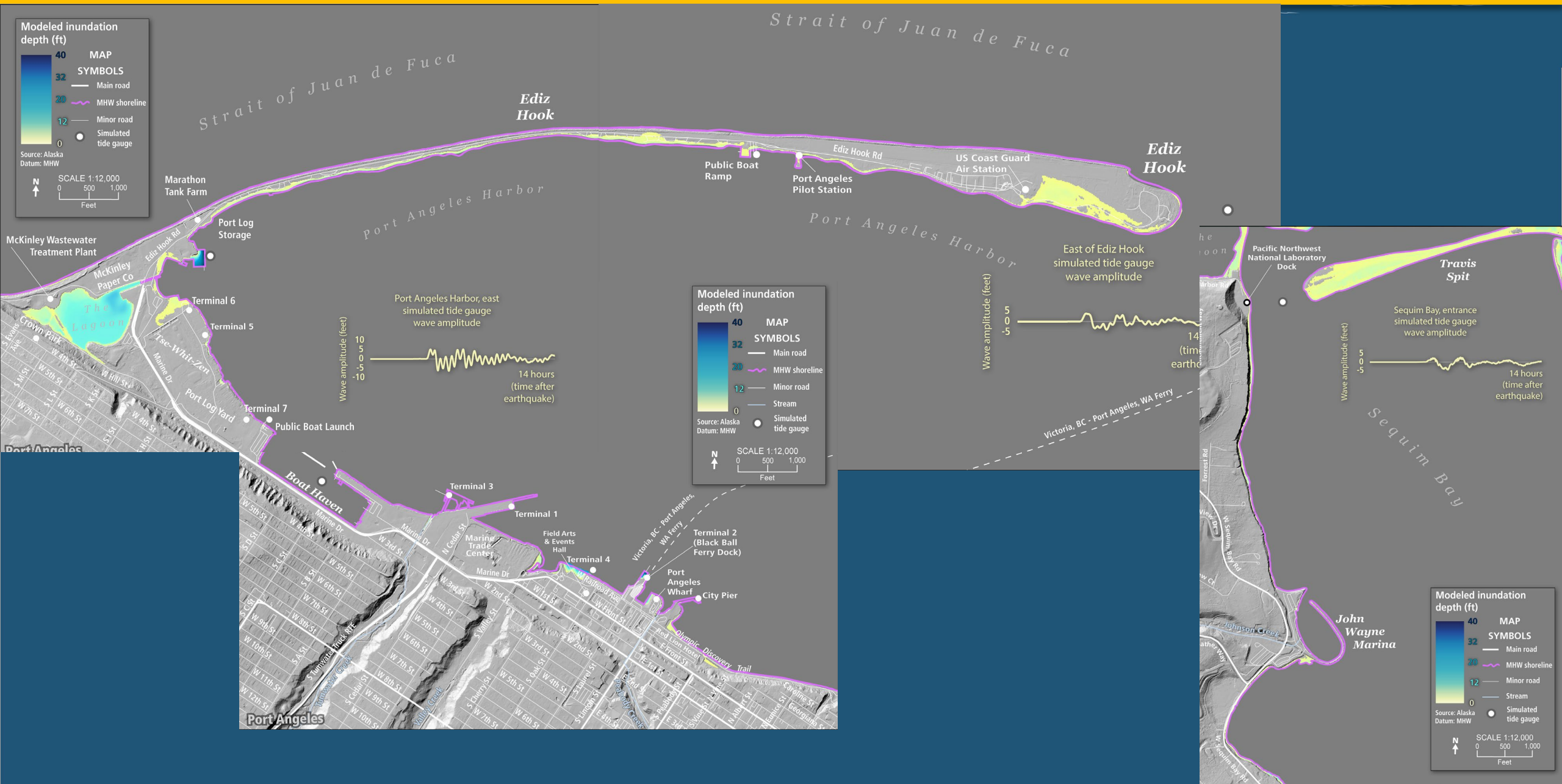
Boat Haven, center (Alaska)



Boat Haven, center maximum tsunami current speed



AASZ Modeling Results – Inundation



AASZ Modeling Results – Minimum Water Depths

Tsunami Currents and Maritime Infrastructure Damage

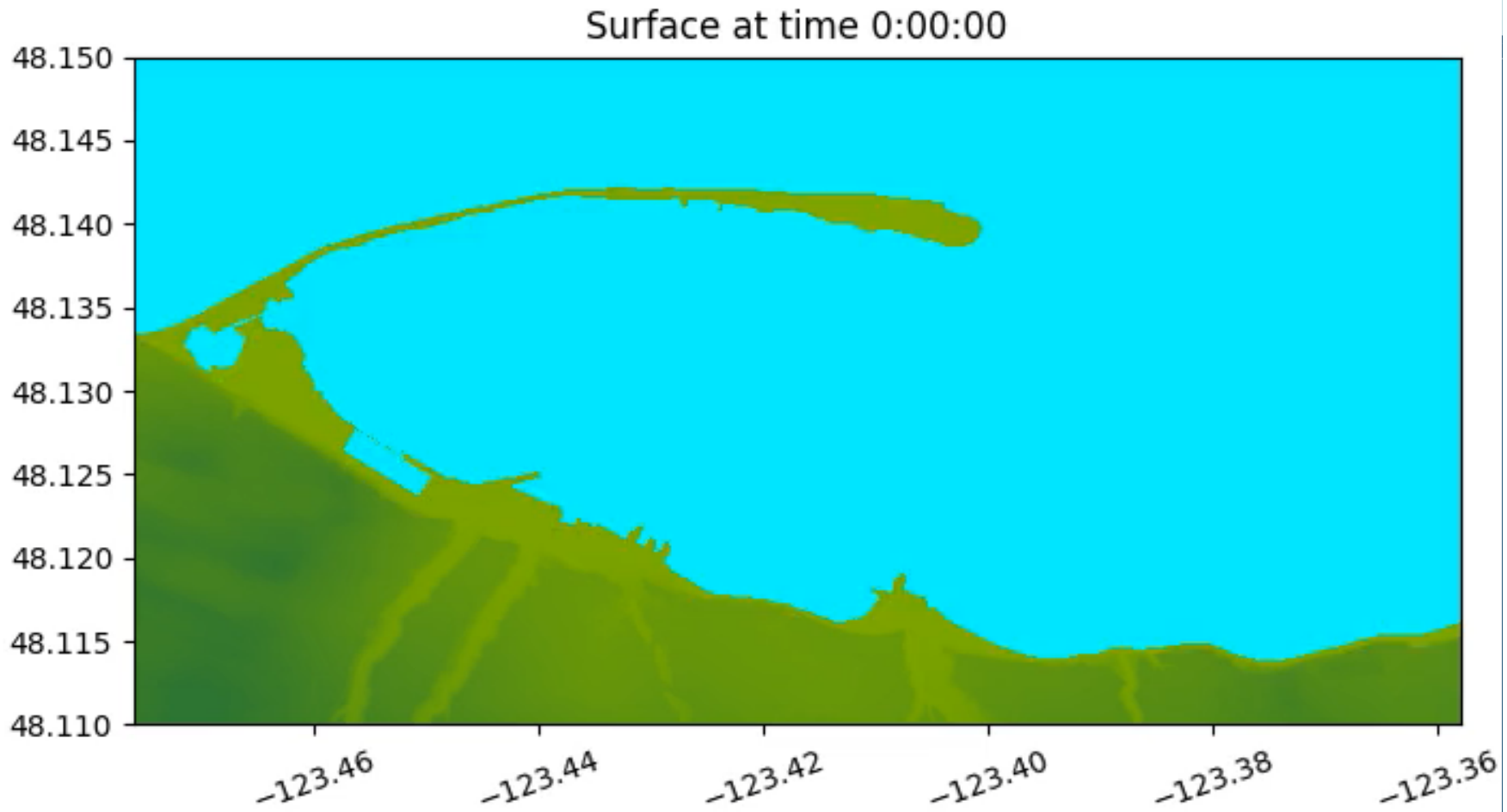
Current Speed	Damage Type
0 Knots	**No Damage**
>0-3 Knots	**No Damage:** • Small buoys moved
3-6 Knots	**Minor/Moderate damage:** • Docks/small boats damaged • Large buoys moved
6-9 Knots	**Moderate/Major Damage:** • Damage to docks and boats • Mid-sized vessels off moorings
>9 knots	**Major Damage:** • Significant damage to docks and boats • Large vessels off moorings
>>9 Knots	**Complete Destruction:** • Widespread damage to all maritime infrastructure and vessels of all types

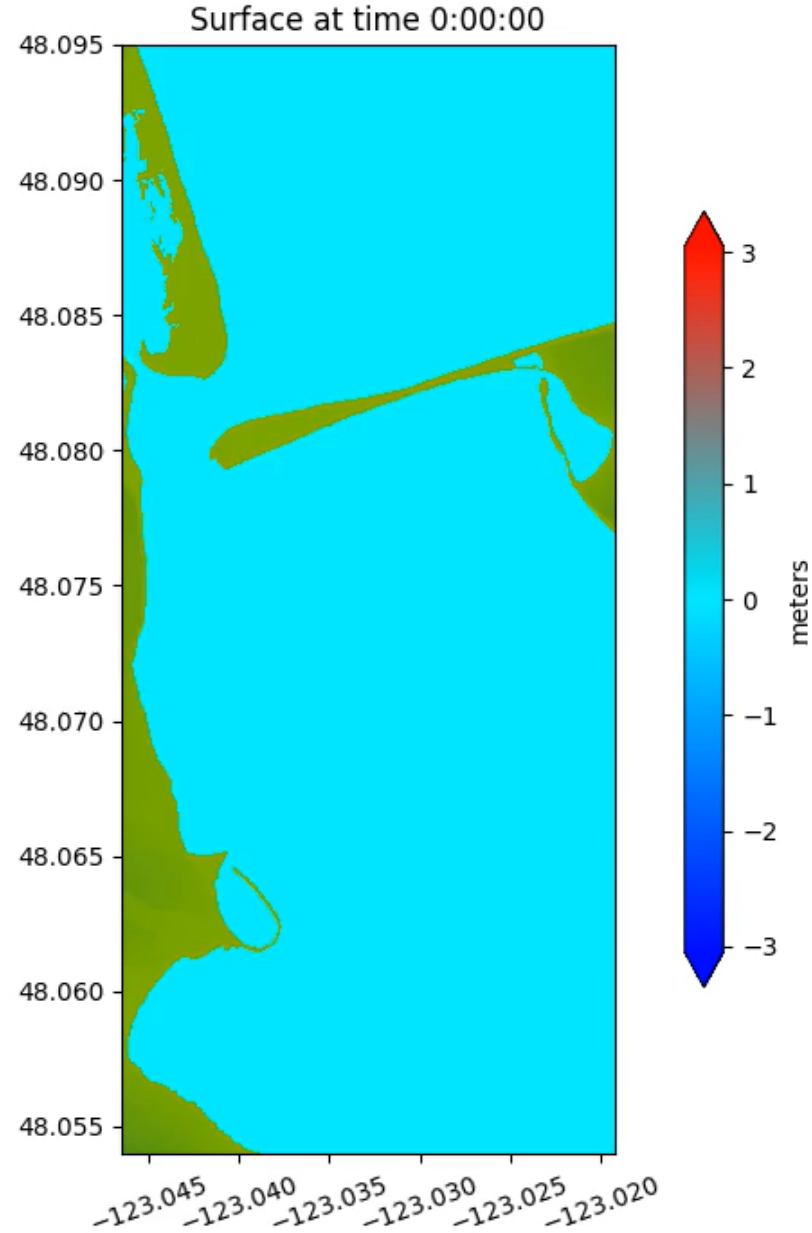
The older the infrastructure, the greater the impacts at lower currents!

AASZ Modeling Results – Current Speeds

Distant AASZ Tsunami Key Actions

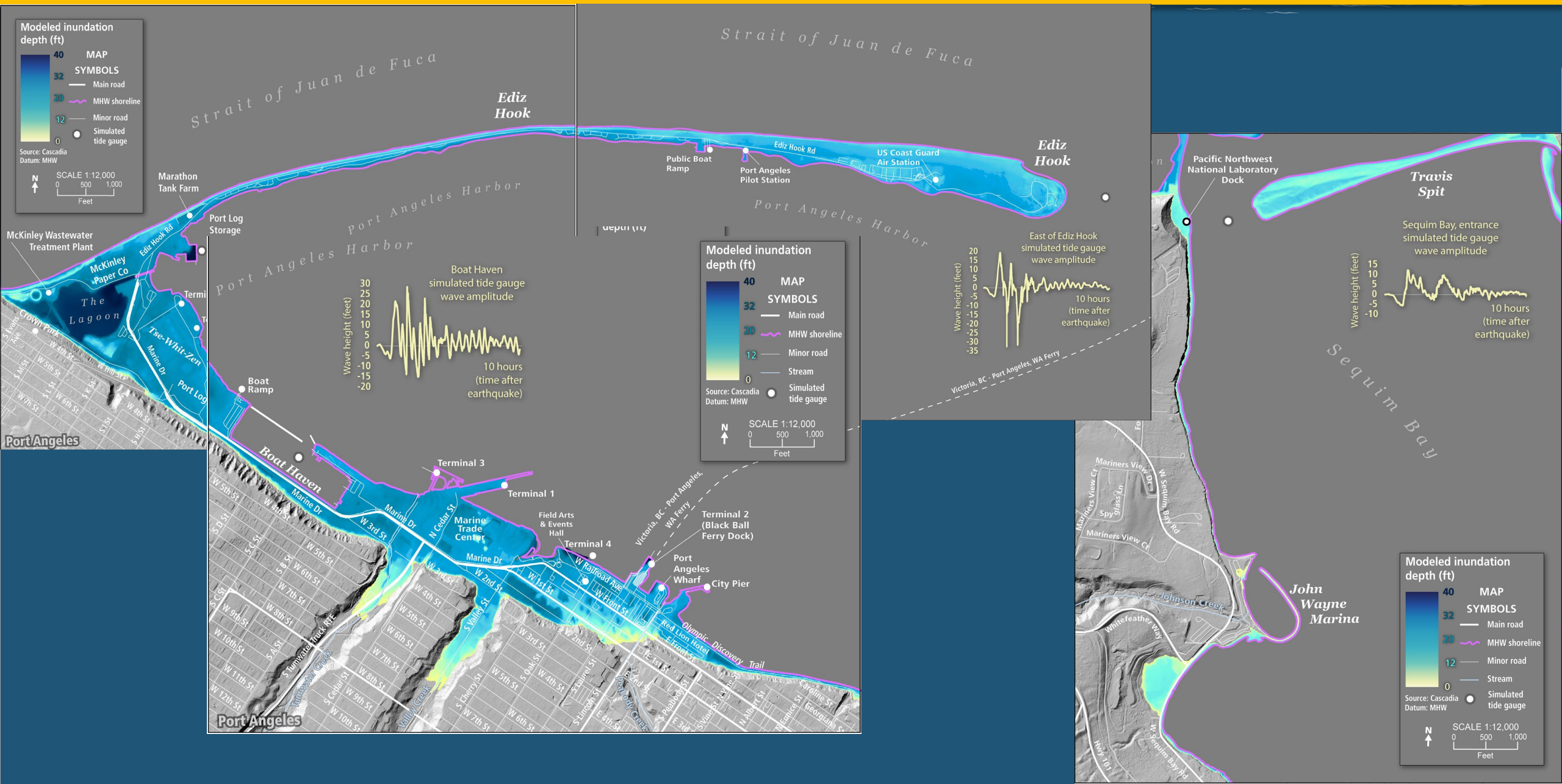
- About 4 hours and 20 minutes for waves to arrive (Port Angeles);
- Tsunami Impacts
  - Limited inundation
  - Primarily a maritime threat
    - Rapid water level changes at Port Angeles Boat Haven
    - Potentially damaging currents
- Response actions for distant tsunami response
  - Notification and coordination to internal staff and customers
  - Shut down infrastructure before tsunami arrives
  - Restrict traffic or access to areas that may be impacted
- Mitigation actions for distant tsunami impacts
  - Dock infrastructure upgrades
  - Fortifying and building protective infrastructure (breakwaters, floodgates, etc.)



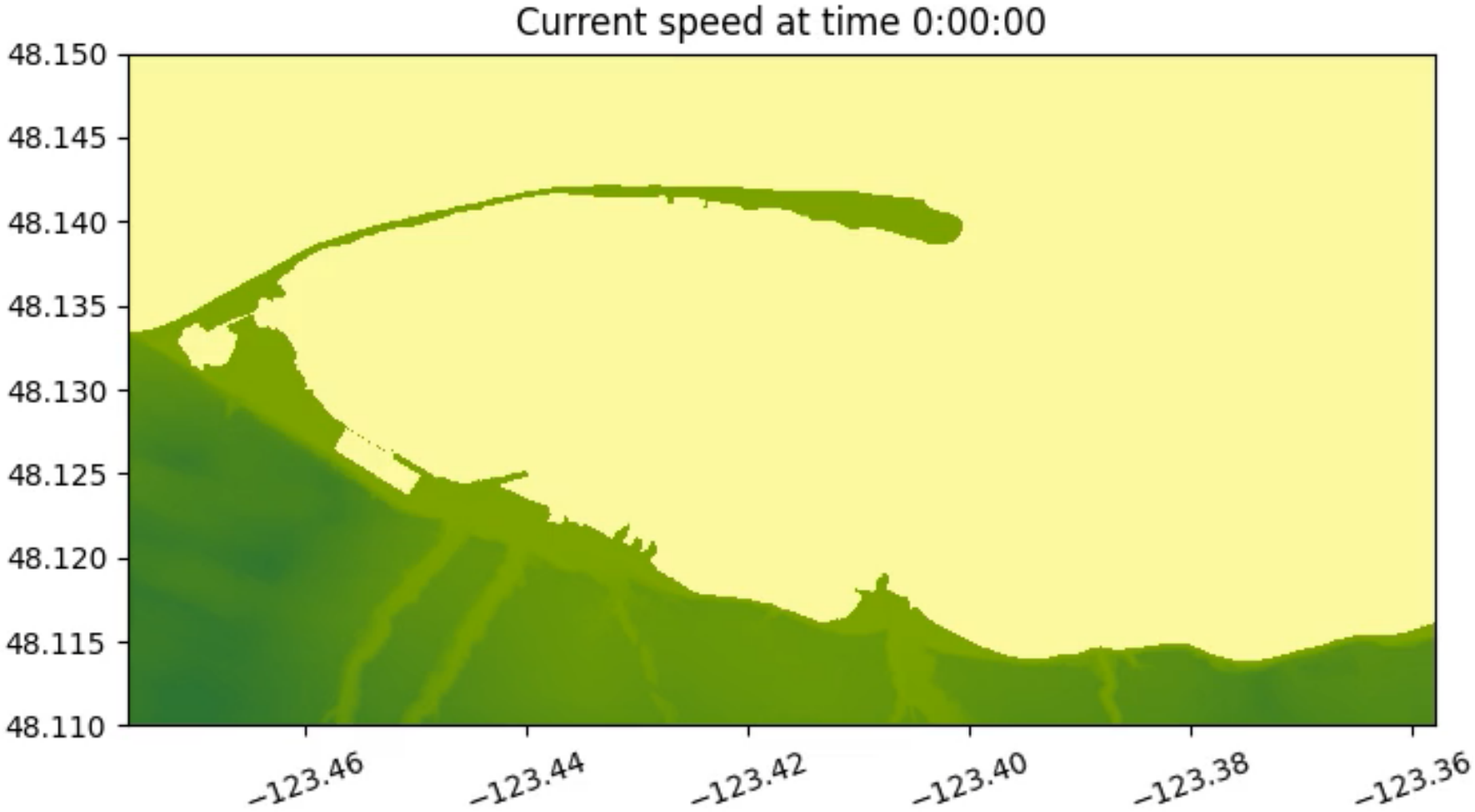


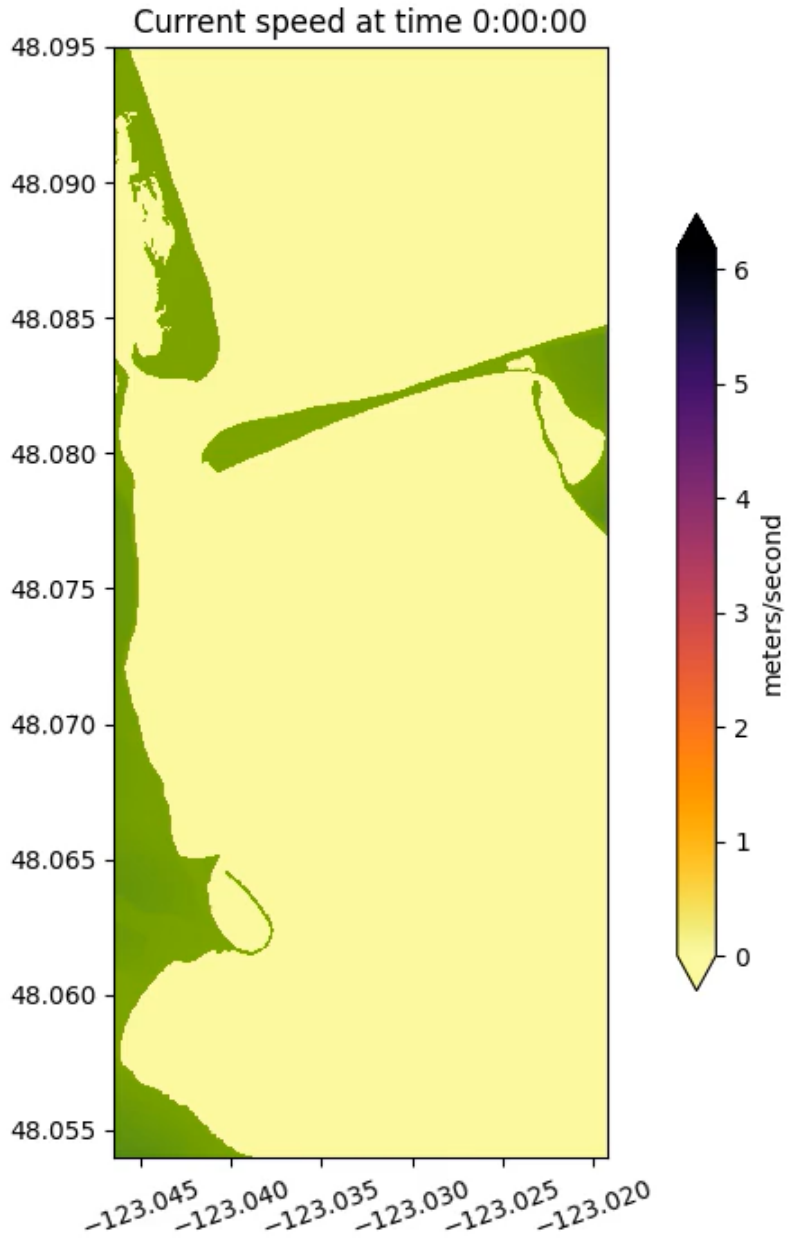
Cascadia Subduction Zone Modeling Results - Inundation

CSZ Modeling Results – Inundation



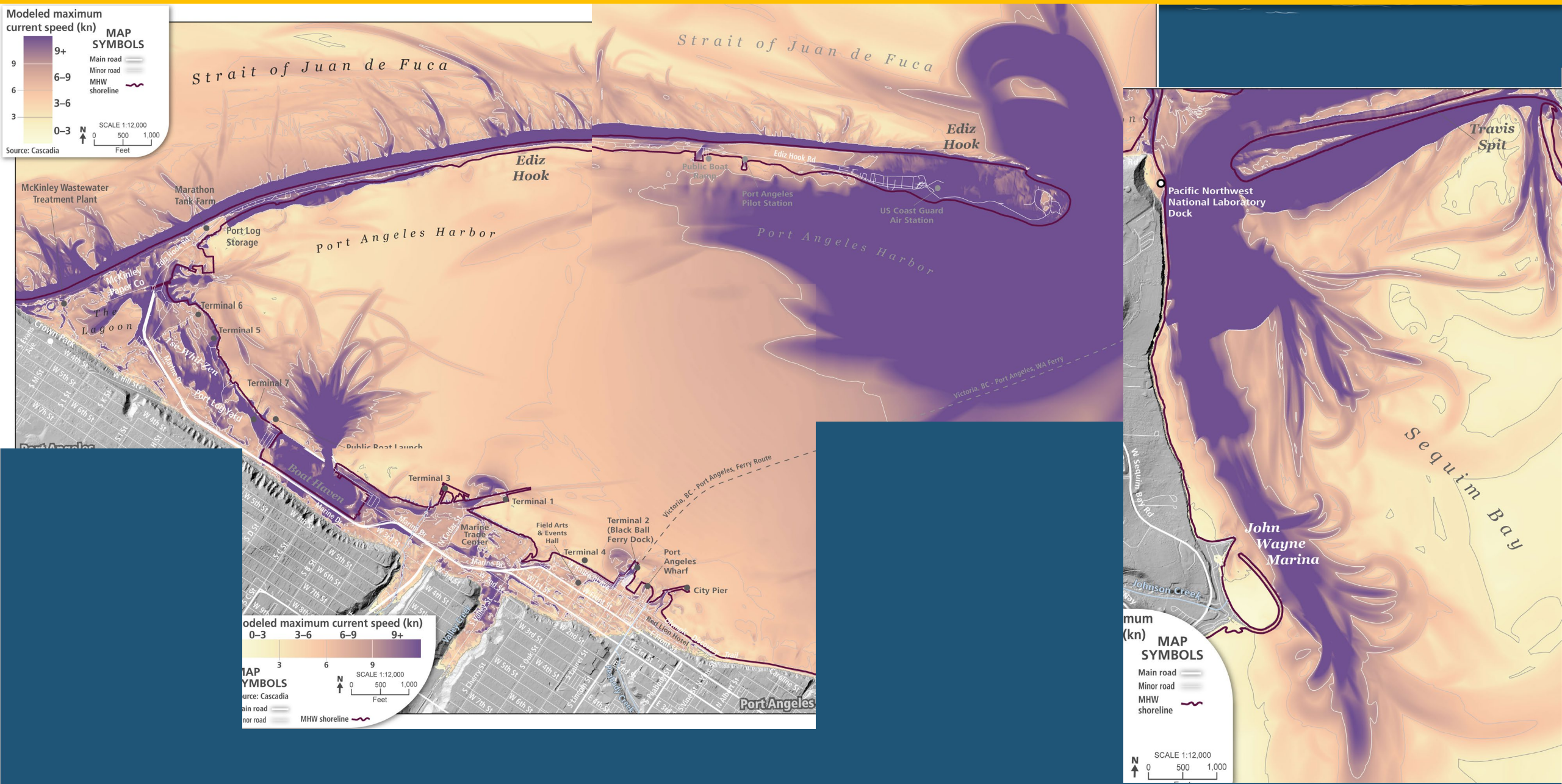
CSZ Modeling Results – Minimum Water Depths





Cascadia Subduction Zone Modeling Results – Current Speeds

CSZ Modeling Results – Current Speeds



Local CSZ Tsunami Key Actions

- Earthquake shaking impacts
- 50 minutes for waves to arrive in PA; 1 hour 15 minutes for JWM
  - Water starts receding 15 minutes after the earthquake start in PA Harbor
- Tsunami Impacts
  - Widespread impacts to Ediz Hook and the PA waterfront, JWM
- Response actions for distant tsunami response
  - Drop, cover, and hold for the duration of shaking
  - Immediately head inland to high ground once the shaking stops
- Mitigation actions for distant tsunami impacts
  - Physical infrastructure is not realistic to mitigate CSZ impacts
  - Focus is on “soft” mitigation measures – evacuation signage, education and outreach

Port Angeles Tsunami Evacuation Walk Times

WASHINGTON GEOLOGICAL SURVEY MARCH 2019

Port Angeles, WASHINGTON

Washington State Department of Natural Resources, Washington Geological Survey | University of Washington | National Tsunami Hazard Mitigation Program | Washington Military Department Emergency Management Division

N

IN CASE OF EARTHQUAKE, GO TO HIGH GROUND OR INLAND

Strait of Juan de Fuca

Beyond safe slow-walk time—must walk fast (~18 minute/mile) to exit inundation zone before tsunami arrival

Beyond safe slow-walk time—must run (~15 minute/mile) to exit inundation zone before tsunami arrival

must walk fast

must run

Edz Hook

US Coast Guard Air Station

ESTIMATED WAVE ARRIVAL TIME TO STUDY AREA: 60 MIN

~2,000 feet to evacuation point

Nippon Paper Industries USA

bridge

lagoon

West 4th Street

West 8th Street

Marine Drive

Port Angeles Boat Haven

Port of Port Angeles

Port Angeles Harbor

Port Angeles Ferry Terminal

Port Angeles City Pier

Port Angeles

SR117

Cedar St

Tumwater Truck Rd

West 8th St

Peabody St

Safeway parking lot

Playground at 5th & Oak

Port Angeles Fire Department

Bo Baggins Daycare Center

Vern Burton Community Center

Port Angeles Police Department

Olympic Medical Center

Port Angeles Senior Center

East 5th St

N Race St

S Race St

East 6th St

N Ennis St

S Ennis St

US101

West Lauridsen Blvd

Jefferson Elementary School

No-Bridge Scenario

Beyond safe slow-walk time

bridge out lagoon

The bridge crossing the lagoon at the west end of Ediz Hook may be destroyed during the Cascadia earthquake. This walk map scenario shows that evacuation times would be significantly increased on Ediz Hook by the loss of the bridge, creating a less direct evacuation route around the lagoon.

Morse Creek area map, two miles east of main map area. Scale 1:9,000

Sea View Dr.

Strait View Dr.

N. Ridgeview Dr.

Map Symbols

OUTSIDE OF MODELED TSUNAMI INUNDATION ZONE

Approximate tsunami evacuation slow-walk times (~24 minute/mile)

TSUNAMI INUNDATION ZONE

15 — 0–15 minutes

30 — 16–30 minutes

45 — 31–45 minutes

60 — 46–60 minutes

75 — 61–75 minutes

Area beyond safe slow-walk times

must walk fast

90 — 76–90 minutes

120 — must run — 91–120 minutes

ocean | trail, staircase, or bike path | road | tsunami evacuation route | edge of inundation zone

lake or pond

impassable slope

tsunami siren

stairs

hospital

fire station

police station

post-tsunami assembly area

This item was funded by Award #NA16NWS4670041 by a National Tsunami Hazard Mitigation Program grant to the Washington Geological Survey from the Department of Commerce/National Oceanic and Atmospheric Administration. This does not constitute an endorsement by NOAA.

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 City of Port Angeles 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 extent 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 2.46 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.
- Assembly areas are places of high ground for displaced people. These rally points are typically in open outdoor spaces or in large structures just beyond the tsunami inundation zones.
- Do not re-enter or cross back into the inundation zone until instructed to do so by local officials. Tsunamis are multi-wave events. The first wave may not be the highest, and danger of tsunami inundation may persist for many hours after the initial wave has subsided.

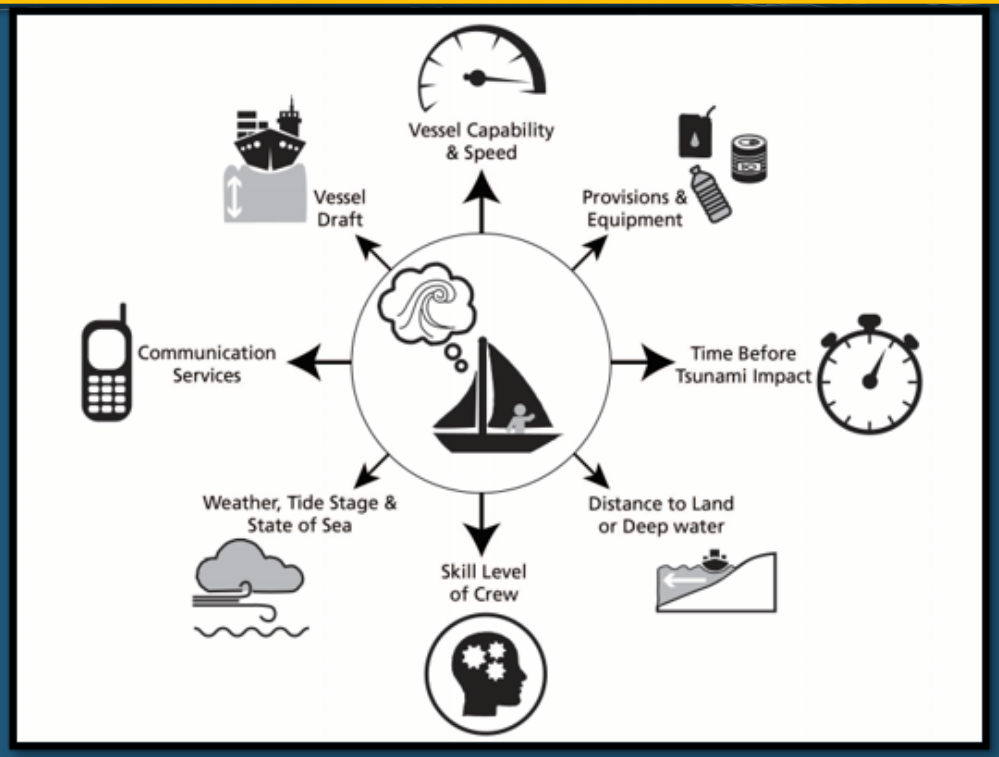
Tsunami inundation data from:
Dungard, D. W., Forson, Corine, Walsh, T. J., Gonzalez, F. I., LeVeque, R. J. Adams, L. M., 2016, Tsunami hazard maps of Port Angeles and Port Townsend, Washington—Model results from a ~2,500-year Cascadia subduction zone earthquake scenario: Washington Geological Survey Map Series 2016-03, 8 sheets, scale 1:11,000 and 1:16,000, 11 p. text. [http://www.dnr.wa.gov/publications/ger_ms2016-03_tsunami_hazard_pt_angeles_pt_townsend.zip]

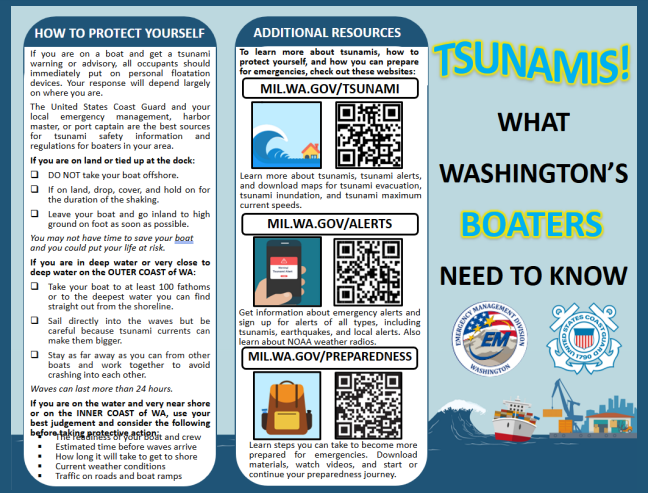
0 0.25 0.5 0.75 1 miles

SCALE 1:9,000

WA State Tsunami Boater's Guide

- Provides tsunami hazard guidance for boat owners and vessel operators in Washington State
- Includes maritime tsunami hazard information, natural warning signs, official alert methods, and checklists for receiving alerts, making plans, and building kits
- Lays out decision points both for vessels on the water and vessels docked onshore when a tsunami is approaching
- Provides links to additional sources of information to enhance preparedness efforts





Response and Mitigation Action Feasibility Results

- Evaluation of 16 response actions
  - 9 actions are feasible
  - 3 actions need review
- Evaluation of 15 mitigation actions
  - 3 actions are complete
  - 5 actions are feasible
  - 3 actions need review

Where are you on your preparedness journey?

- How will I get alerted to a hazard?
- Do I have a family emergency plan?
- Do I have a go-bag with me (home, vehicle, vessel)?
- Do I know my evacuation routes?
- How will I communicate/reunite with my family?
- Am I involved in community preparedness?

US Coast Guard
Port Angeles, WA

CDR Trish Jantzen
Sector Puget Sound
Chief, Emergency Management

Jim Buck on Emergency Preparedness

Panel Q&A

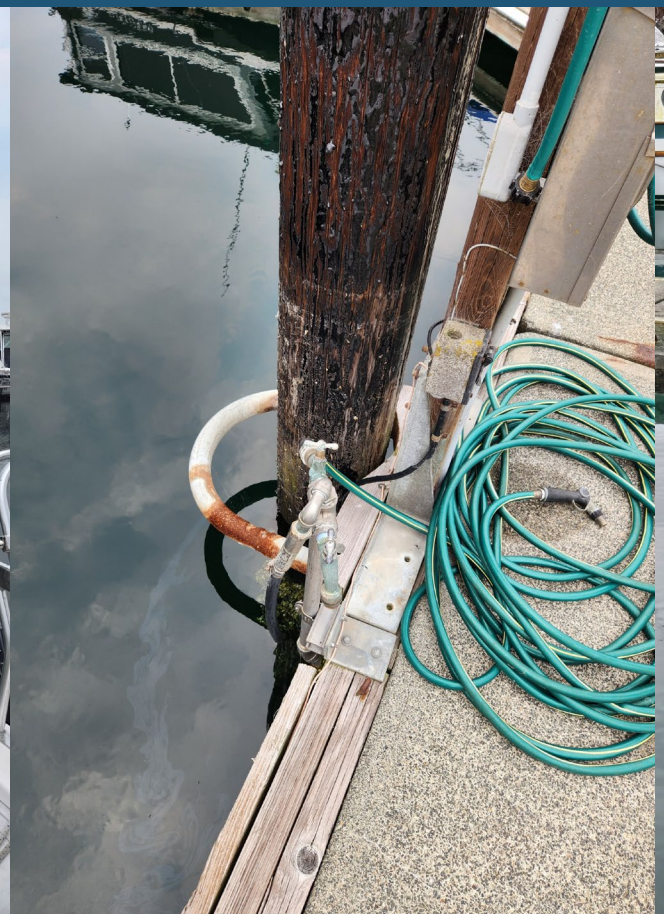
Chris Hartman – Chief Operating Officer, Port of Port Angeles

Response Opportunities

- Opportunities
  - Evacuate Public/Vehicles from Waterfront Areas
  - Pre-stage emergency equipment outside of the inundation zone

Mitigation Opportunities

- Opportunities
  - Installing taller and thicker pilings as part of the upcoming refloat projects
  - Improve movement of pilings along docks with the installation of rollers



You CAN survive IF you get prepared!

mil.wa.gov/alerts

mil.wa.gov/tsunami

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