

The Washington State Earthquake & Tsunami Hazard Mitigation Programs: **Collaborating with our Partners to Build a more Resilient Washington**



John Schelling, EQ Program Manager

NEPM Meeting

April 30, 2013



Washington Military Department
Emergency Management Division



National Tsunami Hazard
Mitigation Program



WASHINGTON STATE DEPARTMENT OF
Natural Resources

The Resilient Washington State Initiative

Resilient Washington State



A Framework for Minimizing Loss
and Improving Statewide Recovery
after an Earthquake

November 2012



Also published as Information Circular 114 by the Division of Geology and Earth Resources, Washington State Department of Natural Resources

An Entirely New
& Improved
Framework for
Post-Earthquake
Recovery*

**(but it's really all about
mitigation)*



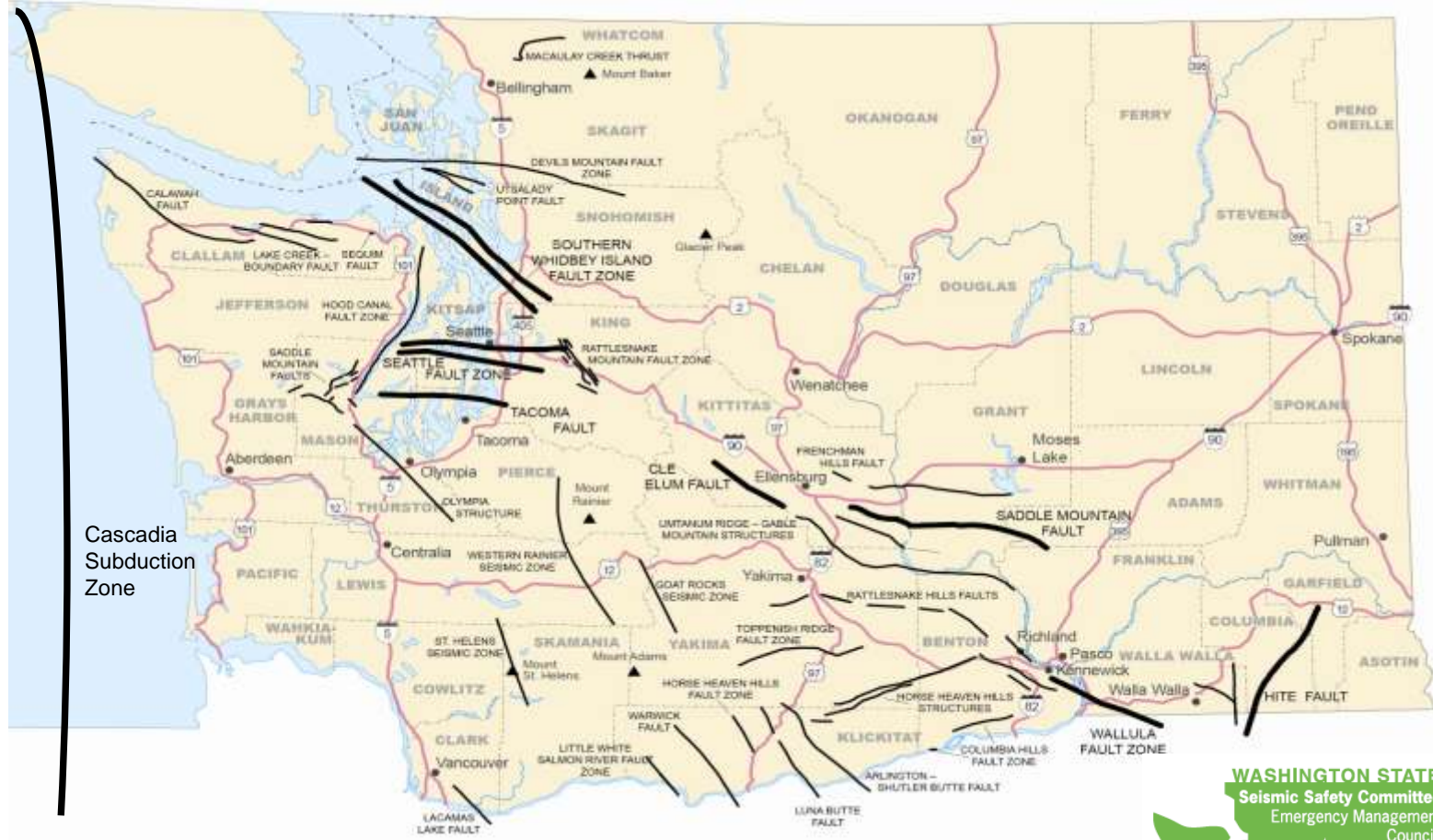
Resilient Washington State

- Modeled after city-level assessment completed by San Francisco Urban Planning & Research (SPUR) Assn.
- Purpose & Timeframe: Provide a 50-year framework for improving Washington's resilience when earthquakes occur.
 - Framework includes more effective seismic mitigation policies & recommendations for legislation/policy changes to improve and enhance statewide seismic safety.
 - A resource document for local communities to consider in their own mitigation and recovery planning.
 - **We can be much more successful in achieving resilience at a state level if we're made up of resilient communities**
- WA SSC state-level model replicated in Oregon as the "Oregon Resilience Plan"



Resilient Washington State

Earthquake Faults in Washington State: *RWS Included darker shaded faults*



Utilities

TARGET STATES OF RECOVERY: WASHINGTON'S UTILITIES SECTOR

	Event occurs	0-24 hours	1-3 days	3-7 days	1 week-1 month	1-3 months	3 months-1 year	1-3 years	3+ years
Domestic water supply									
Supply & transmission pipes				NL			L		
Distribution pipes					NL		L		
Wastewater systems									
Treatment facilities						NL	L		
Sewer pipes						NL		L	
Flood control									
Dams						X			
Levees								X	
Electricity									
Transmission								X	
Distribution, 60% restored					X				
Distribution, 70% restored						X			
Distribution, >70% restored							X		
Natural Gas									
Transmission			NL		L				
Distribution, 40% restored					X				
Distribution, 90% restored						X			
Petroleum									
Refineries & transmission								X	
Distribution						X			
Information and communication technology						X			

KEY TO THE TABLE

TARGET TIMEFRAME FOR RECOVERY:

Operational (time it ought to take to restore component to 80-90% operational):

TIME NEEDED FOR RECOVERY TO 80-90% OPERATIONAL GIVEN CURRENT CONDITIONS:

TIME NEEDED FOR RECOVERY TO 80-90% OPERATIONAL IN LIQUEFACTION ZONES GIVEN CURRENT CONDITIONS:

TIME NEEDED FOR RECOVERY TO 80-90% OPERATIONAL IN NON-LIQUEFACTION ZONES GIVEN CURRENT CONDITIONS:

X
L
NL

WASHINGTON STATE
Seismic Safety Committee
Emergency Management
Council



Ten Resilience Recommendations:

1. Make schools resilient: structurally, socially, and educationally.
2. Require that utility providers identify the vulnerabilities in their systems and mitigate the deficiencies.
3. Improve the resilience of buildings in areas of high seismic hazard to improve life safety and increase the number of people who will be able to shelter in place.
4. Assess the permitting requirements that relate to environmental protection and mitigation to determine how best to make environmental planning mesh with seismic mitigation and recovery planning.
5. Strengthen business continuity planning efforts.



Ten Resilience Recommendations:

6. Strengthen regional transportation networks.
7. Make hospitals resilient—structurally and functionally.
8. Identify and map in greater detail sources of seismicity and geologically hazardous areas and develop plans for mitigation of identified hazards.
9. Improve life safety in coastal communities at risk of local tsunamis.
10. Implement resilience principles through formalized accountability.

Read the full report at: www.emd.wa.gov on the SSC page



Results of 1st Great Washington ShakeOut:

Drop, Cover, Hold Drill & Coastal Tsunami Warning Siren Test

October 18, 2012






OCT 18
AT
10:18 AM

Tsunami
Siren
Test



Year 1 ShakeOut Goals & Objectives:

- Get Washington's kids (and their families) prepared!
-  public awareness to earthquake & tsunami hazards.
-  public preparedness for seismic events.
-  school and community participation in tsunami evacuation drills.
- **100%** successful test of tsunami warning sirens.
- **1 million** registered for ShakeOut drills.



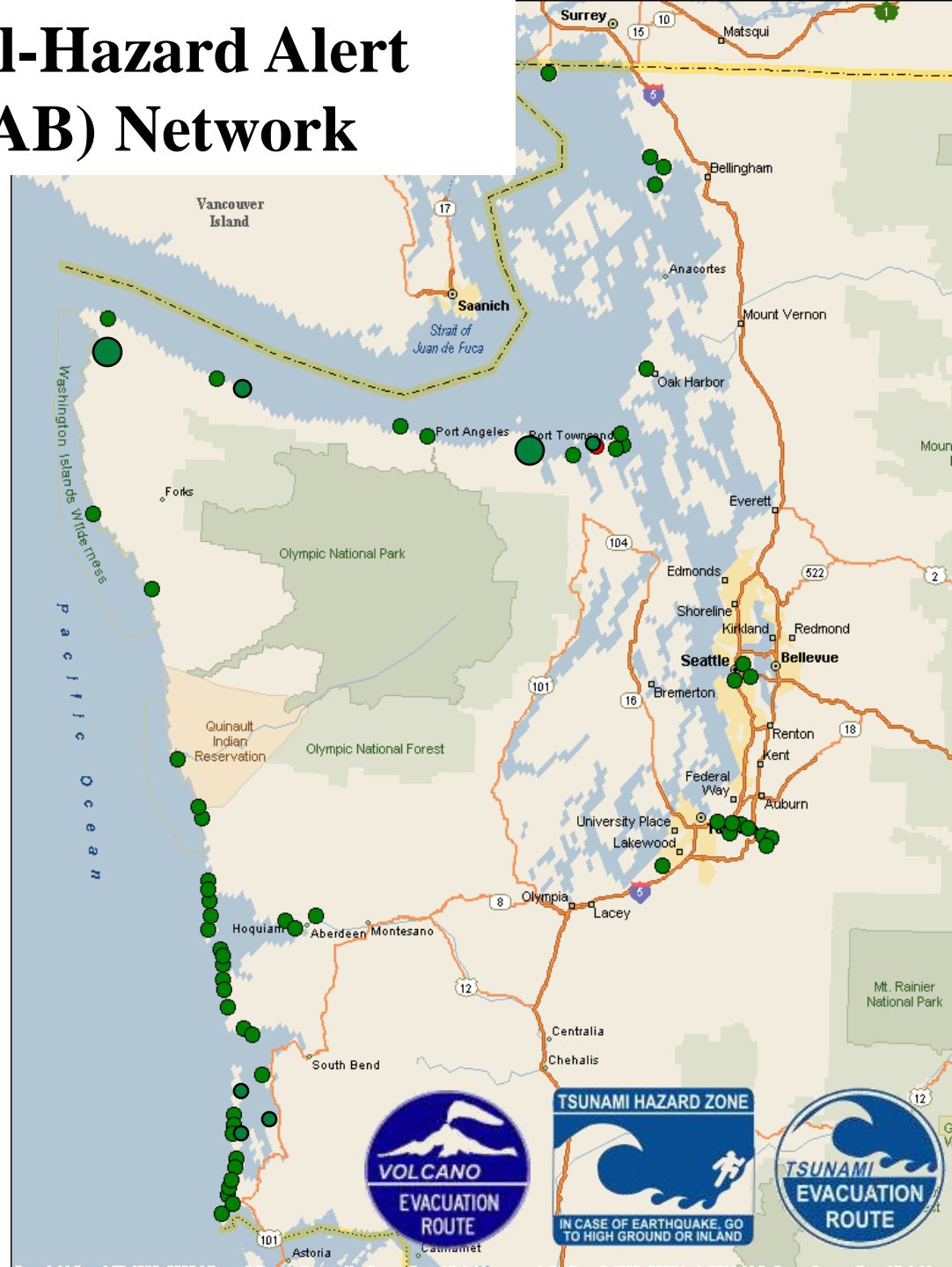
Washington State All-Hazard Alert Broadcasting (AHAB) Network

OPERATIONAL (58)

- Aberdeen (2)
- Bay Center
- Cape Disappointment
- Copalis Beach
- Diamond Point
- Fort Worden
- Grayland (3)
- Hoh Tribe
- Hoquiam
- Ilwaco
- Island County
- La Push (Quileute Tribe)
- Long Beach
- Lower Elwha
- Lummi Nation (2)
- McAlder
- McMillin
- Moclips
- Neah Bay
- North Cove
- Ocean City
- Ocean Park (4)
- Ocean Shores (4)
- Orting (3)
- Puyallup (2)
- Pacific Beach
- Pacific Park
- Point Roberts
- Port Angeles
- Port Townsend (2)
- Sandy Point
- Seattle (3)
- Seaview
- Sumner
- Surfside
- Taholah (Quinault Nation)
- Shoalwater Bay Tribe (2)
- Westport (3)
- Camp Murray (Controller)

**96 AHABs are needed along the
outer coast for tsunami warning**

Current: 50 tsunami, 8 lahar



Pre-Drill Awareness Campaign

Target Market/Audiences:

- Schools
- Residents
- Lodging Establishments
- Media Outlets
 - PSAs developed by WAEMD & NOAA
 - Press Releases issued by WA EMD & Local Jurisdictions
 - Bought media on KOMO television to promote EQ safety



How Did We Do???

- Resources**
- News and Events
 - Share the ShakeOut
 - Partners and Sponsors
 - Participant Login
 - Contact Us
 - Other ShakeOuts

PARTICIPANTS

To view participants that have agreed to be listed:

Select a category

Participant totals for each area and county:

Select an area

Category	Registrants*	Participants
Total:		719,952
Individuals/Families	1,487	4,077
Childcare and Pre-Schools	58	4,999
K-12 Schools and Districts	457	416,304
Youth Organizations	17	1,435
Colleges and Universities	45	158,902
Tribes	15	2,950
Federal Government	41	5,192
State Government	92	43,925
Local Government	86	16,162
Neighborhood Groups	3	150
Businesses	169	43,504
Healthcare	51	15,138
Senior Facilities/Communities	23	1,814
Disability/AFN Organizations	6	305
Non-Profit Organizations	47	2,556
Preparedness Organizations	10	355
Faith-based Organizations	4	187
Museums, Libraries, Parks, etc.	12	881
Volunteer/Service Clubs	1	40
Animal Shelter/Service Providers	1	2
Agriculture/Livestock	0	0
Volunteer Radio Groups	7	164
Science/Engineering Organizations	5	473
Media Organizations	9	64
Other	15	373

* People who register one or more participants

Participation totals for each area[Coastal](#)**Total****37,919**




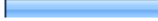

Year 1 ShakeOut Drill Results...

- Test declared an overwhelming success by media, local jurisdictions, tribes, me!
- EAS message announcing drill went to broadcasters, but not NOAA weather radios.
- 3 tsunami sirens did not activate. 2 were satellite alignment issues, 1 may have been satellite interference.






Internal Survey Results

7. Please indicate where you learned about what to do to prepare for earthquakes

		Response Percent	Response Count
At school		97.1%	199
Summer camp		2.9%	6
Boy Scouts / Girl Scouts		5.4%	11
At home		31.2%	64
Other (please specify)		7.8%	16

8. If you hear the words "Drop, Cover and Hold On", what would you do?

		Response Percent	Response Count
Drop what you are doing, cover your ears, hold on to your belongings		0.8%	2
Drop to the ground, take cover under a desk or table if near by, hold on to the desk or table until the shaking stops		97.1%	232
Drop what you are doing, run for cover, hold on to your belongings		1.3%	3
None of the above		0.4%	1
I don't know		0.4%	1
answered question			239
skipped question			44

54. What I knew **before** ShakeOut about what to do during an earthquake:

	Nothing	Very little	Some	A lot	Rating Average	Response Count
	2.5% (6)	4.7% (11)	38.1% (90)	54.7% (129)	3.45	236
	answered question					236
	skipped question					47

55. What I know **after** ShakeOut about what to do during an earthquake:

	Nothing	Very little	Some	A lot	Rating Average	Response Count
	5.5% (13)	5.5% (13)	28.5% (67)	60.4% (142)	3.44	235
	answered question					235
	skipped question					48



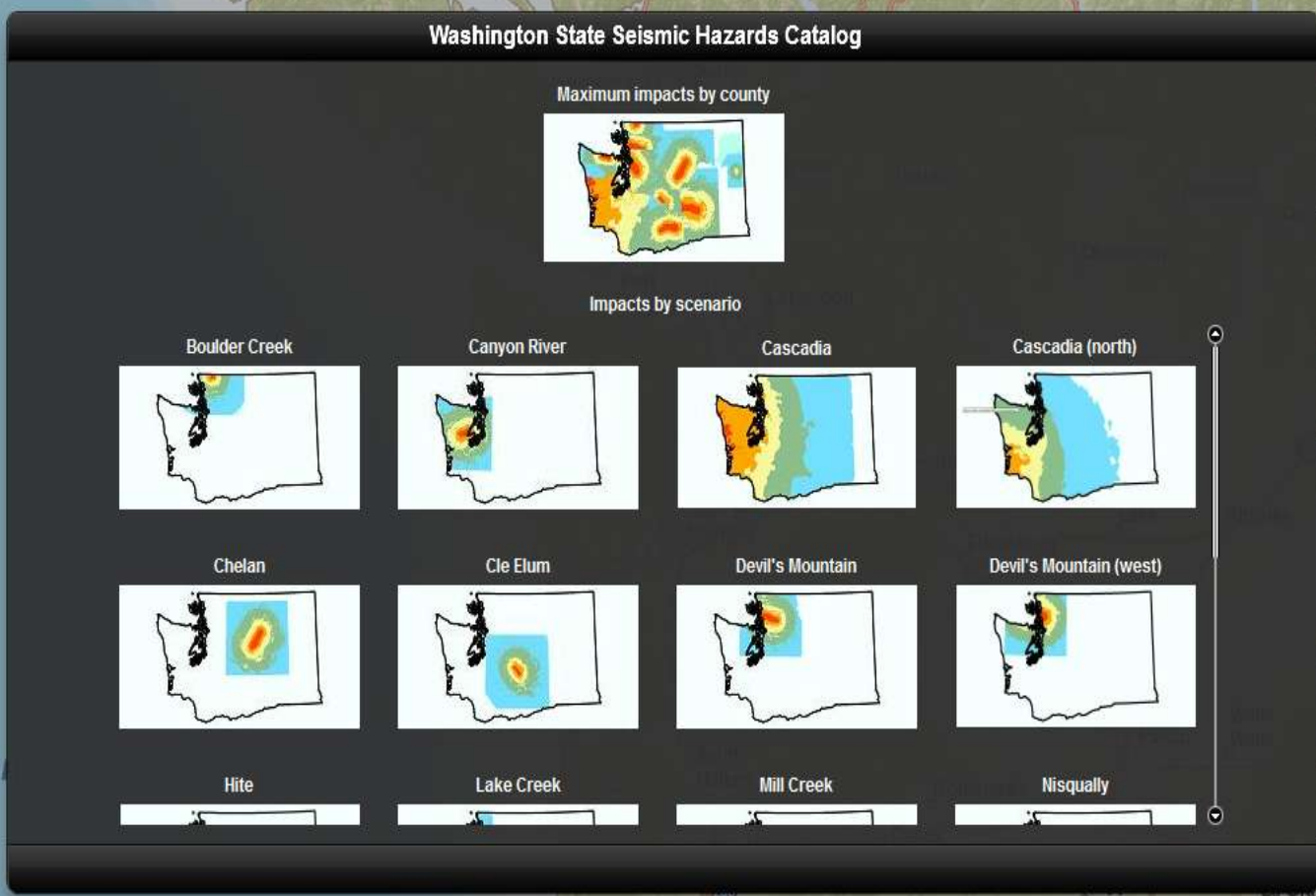
56. What I knew **before** ShakeOut about what to do during a tsunami:

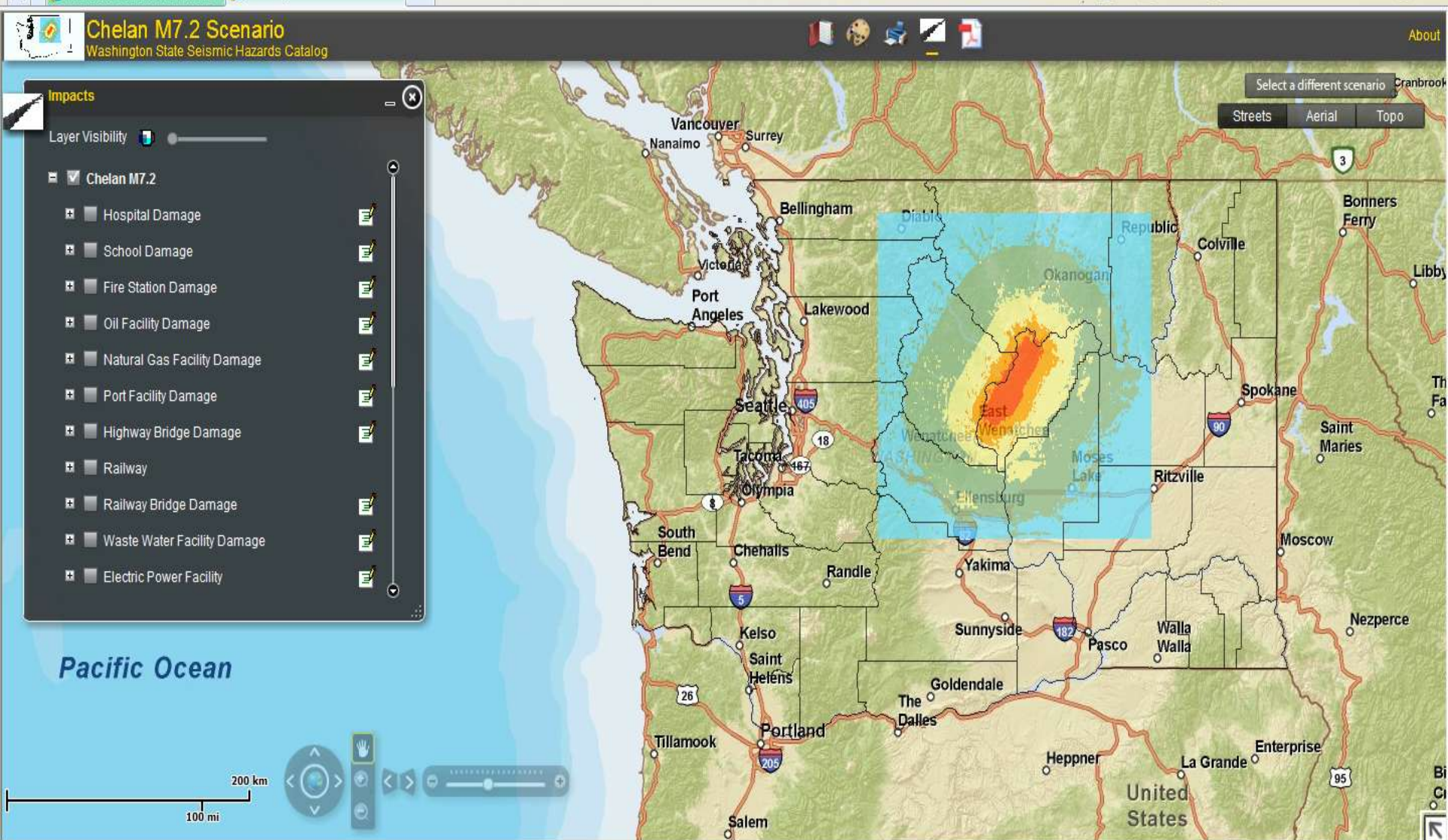
	Nothing	Very little	Some	A lot	Rating Average	Response Count
	5.1% (12)	5.5% (13)	34.7% (82)	54.7% (129)	3.39	236
	answered question					236
	skipped question					47

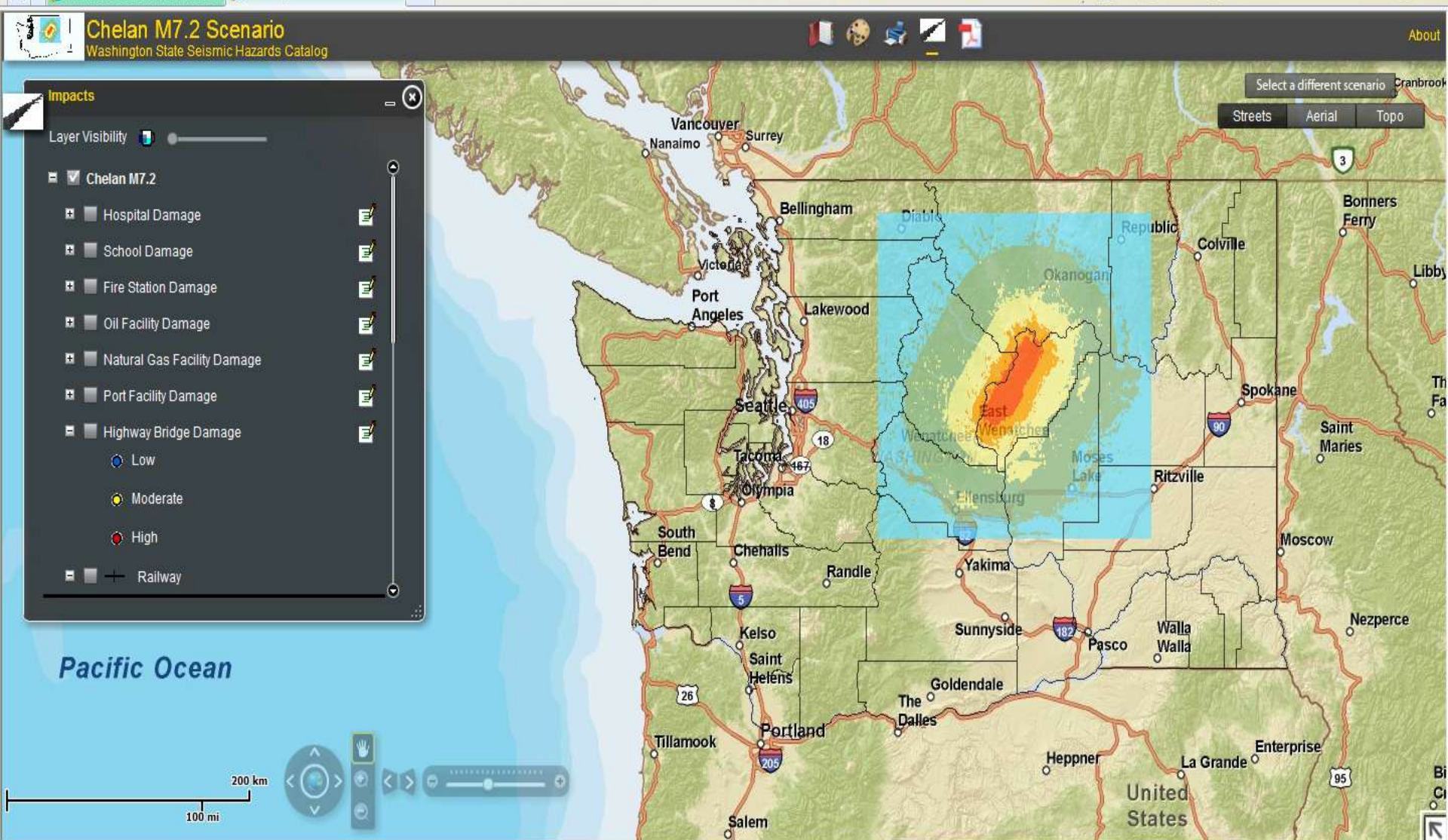
57. What I know **after** ShakeOut about what to do during a tsunami:

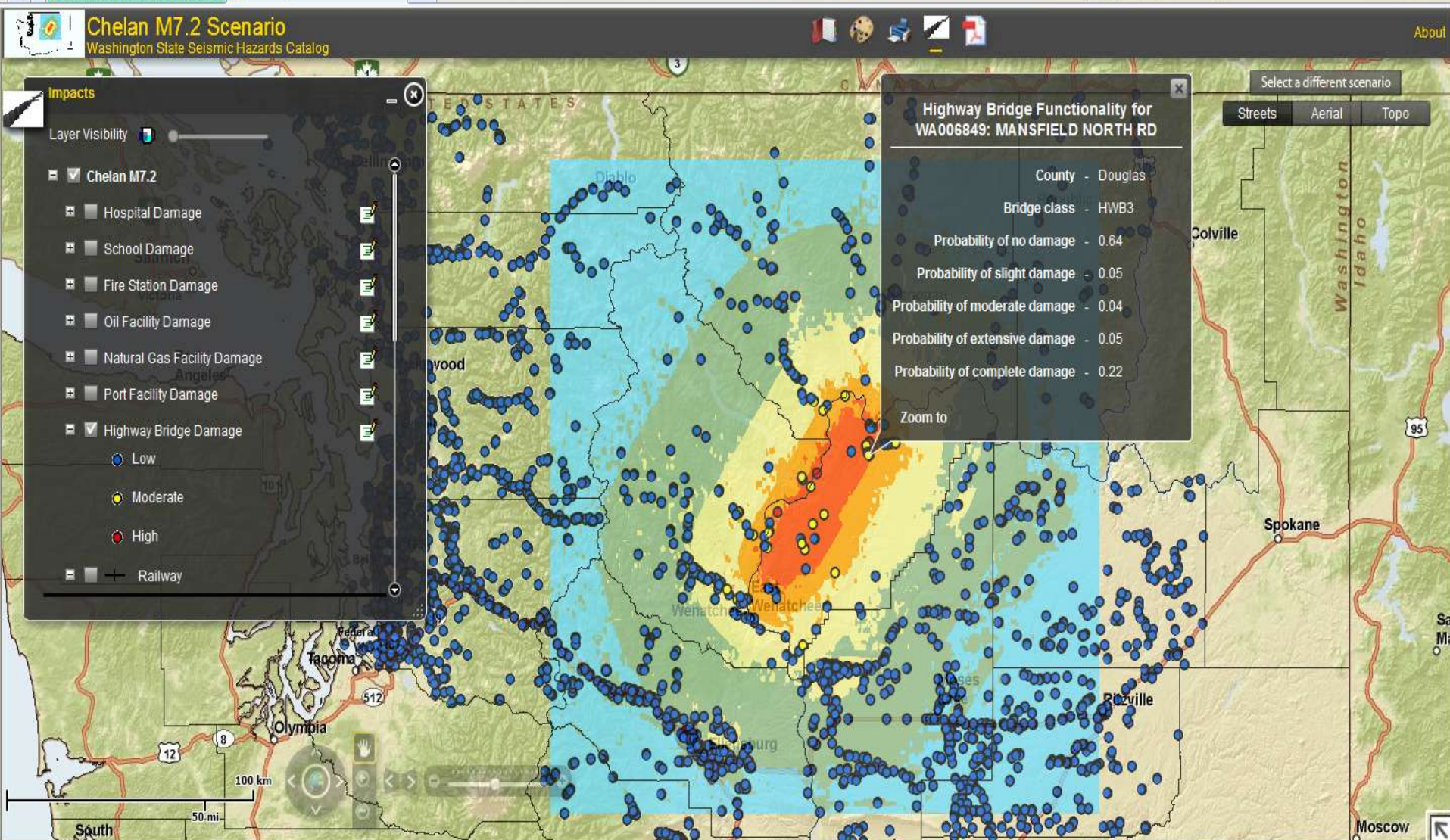
	Nothing	Very little	Some	A lot	Rating Average	Response Count
	5.1% (12)	6.8% (16)	26.7% (63)	61.4% (145)	3.44	236
	answered question					236
	skipped question					47

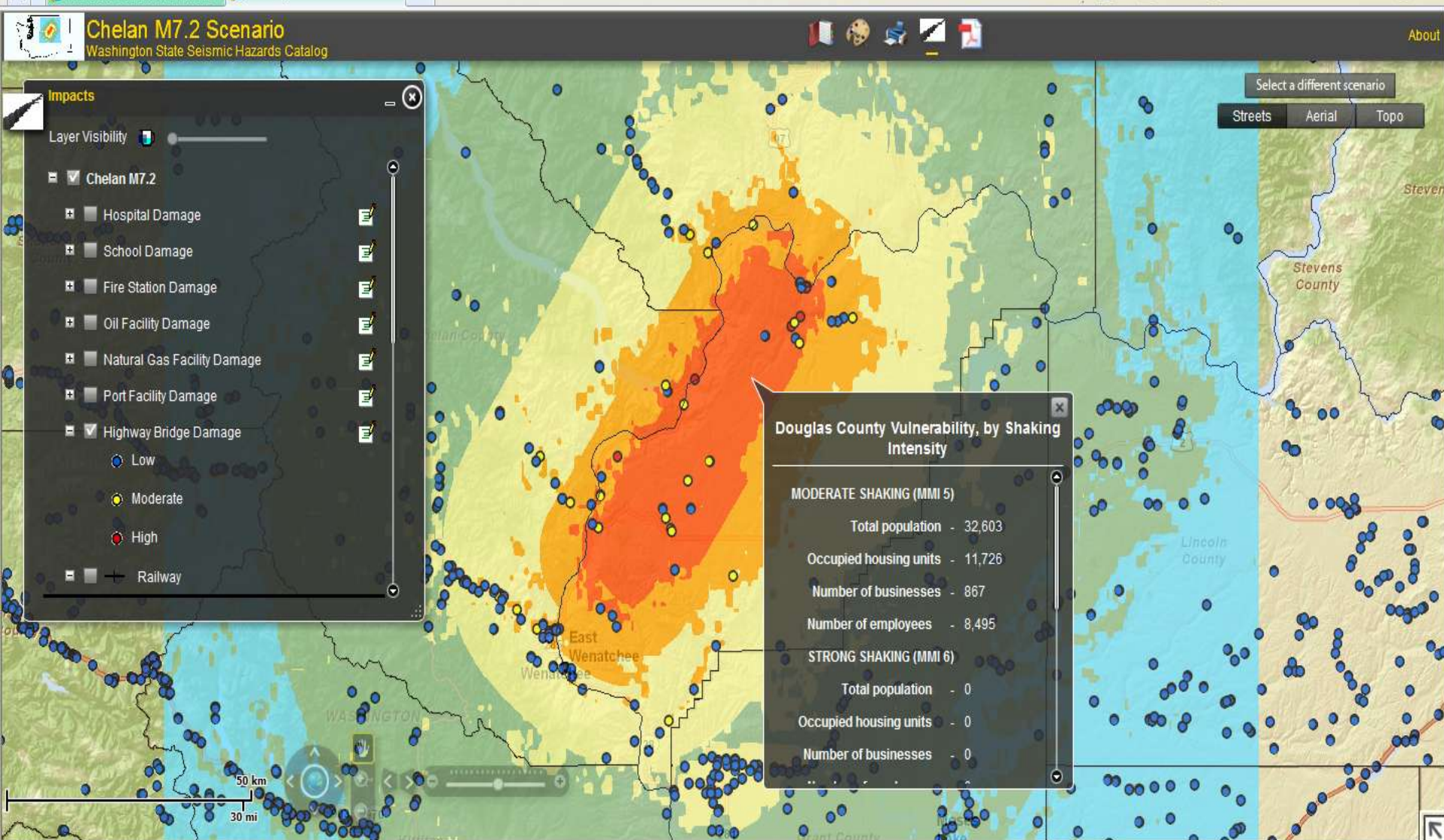


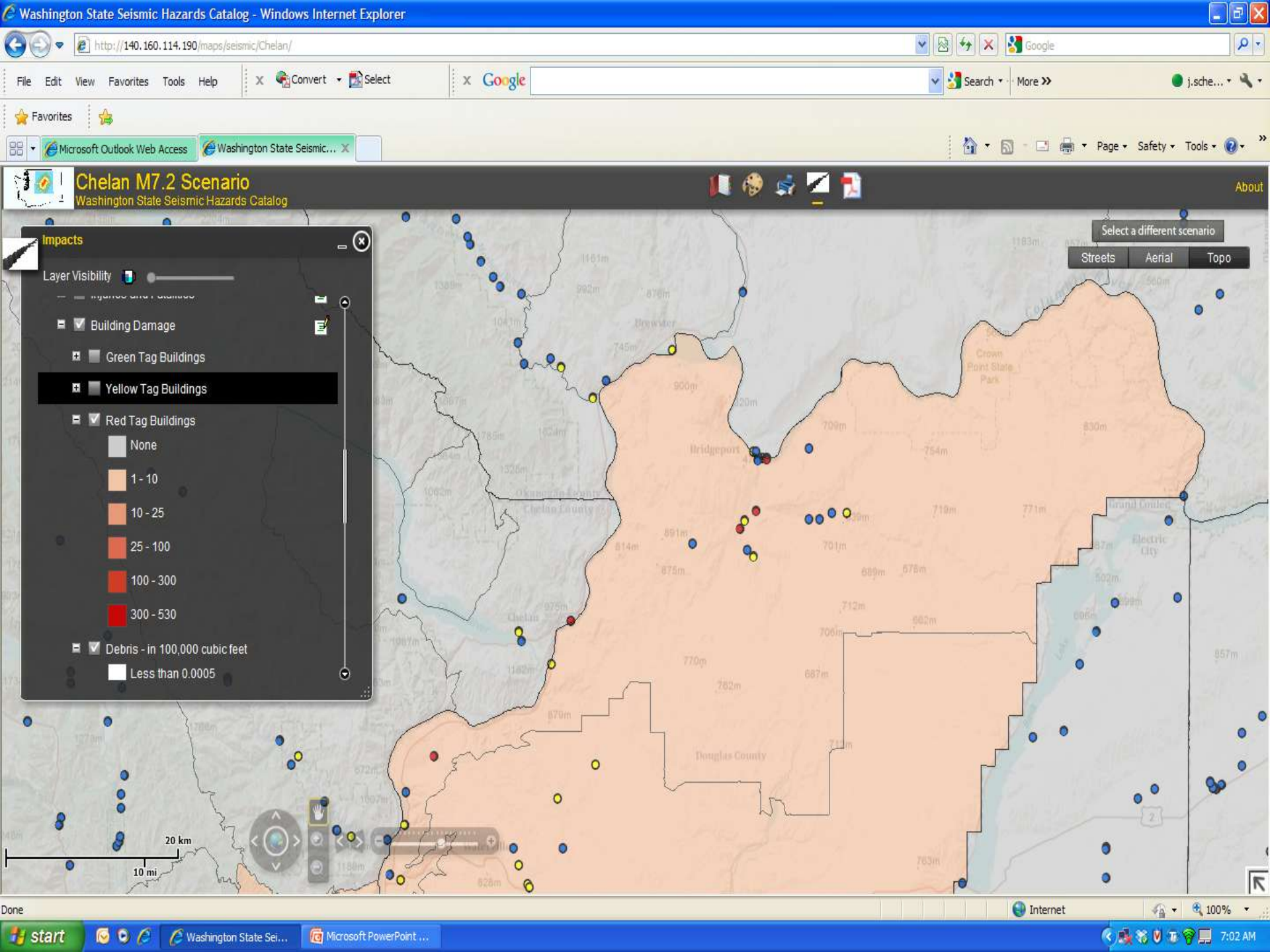




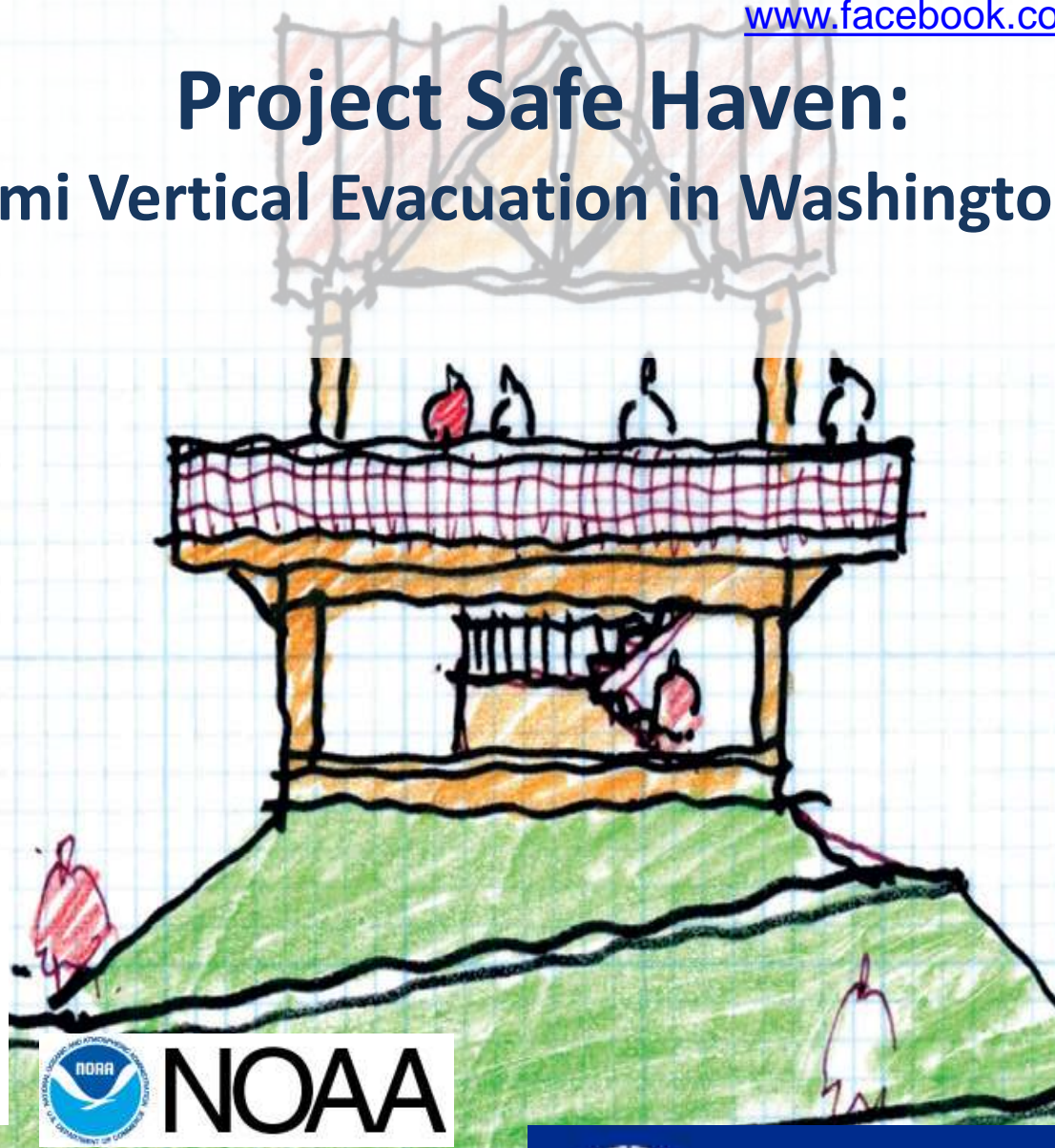








Project Safe Haven: Tsunami Vertical Evacuation in Washington State



National Tsunami Hazard
Mitigation Program



NOAA



FEMA



Washington Military Department
Emergency Management Division



UNIVERSITY of
WASHINGTON



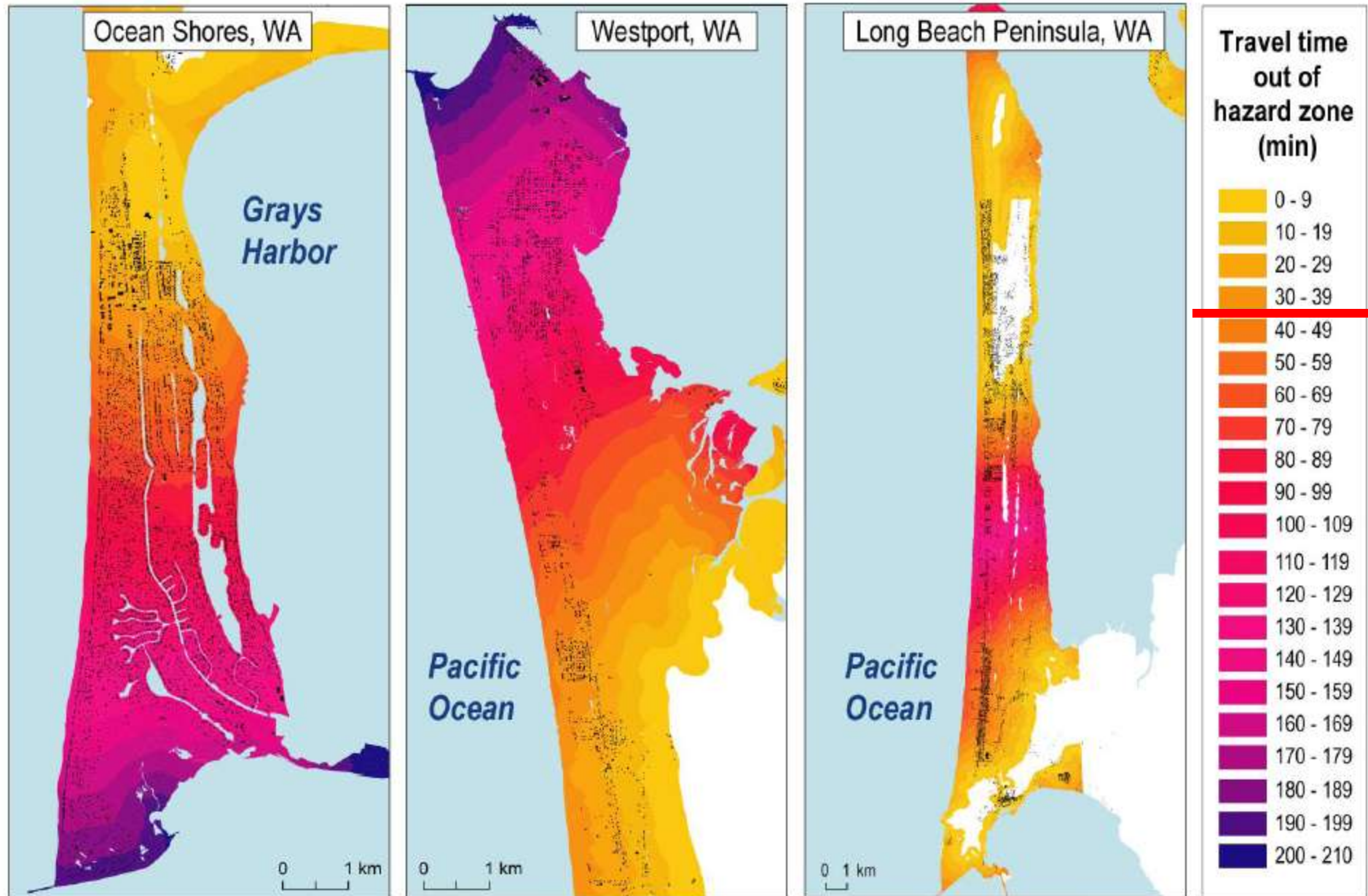
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Natural Resources



USGS
science for a changing world

ron kasprisk

Hotspots of Evacuation Challenges



Source: Wood & Schmidlein, 2011

Based on 1.1 m/s travel speed

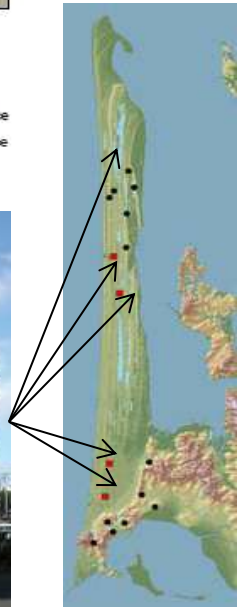
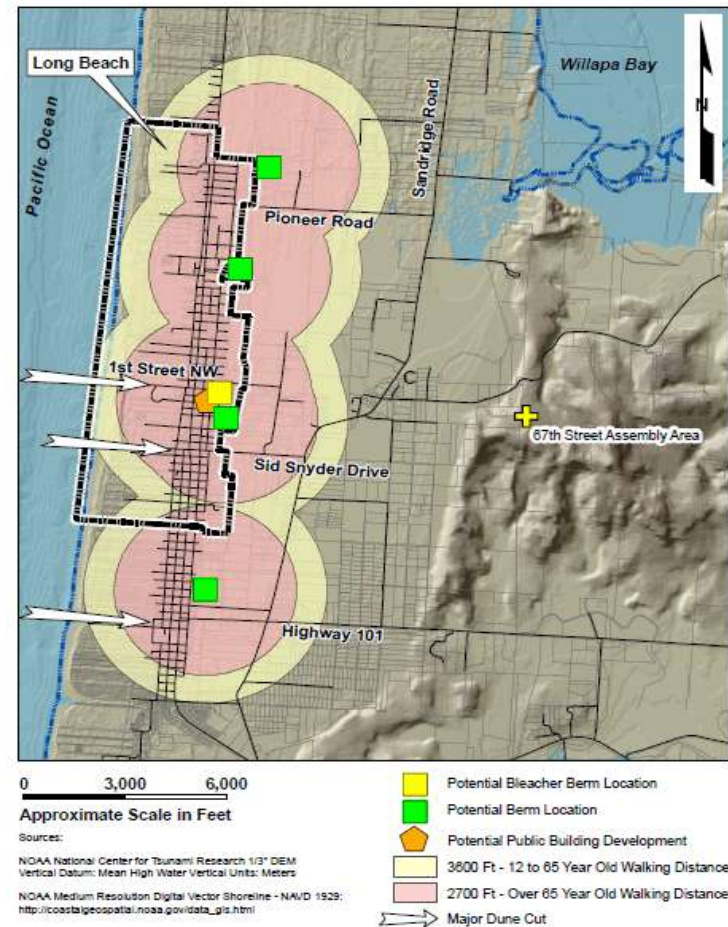
Figure 2 - Preferred Strategy

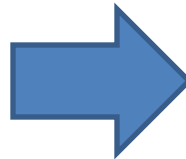
Vertical Evacuation Safe Haven Project

- Community-based, 'bottom-up' approach
- All options (buildings, towers, berms, etc.) are on the table for consideration

Common Themes:

- School Safety
- Seniors and special needs populations
- More conservative travel times





PROJECT SAFE HAVEN:

TSUNAMI VERTICAL EVACUATION ON THE WASHINGTON COAST

Grays
Harbor
County

Ocosta School District Facilities Planning Committee

- Reconvened in March, 2012 at request of School Board to look at facilities priorities
- Members from:
 - Community at large
 - Parents
 - Business leaders
 - School district staff members
 - Tsunami specialists
 - ESD 112



Ocosta School Facility Planning Committee Conclusions & Recommendations

1. Replace the existing round elementary school building
2. Upgrade the existing elementary school addition
3. Eliminate existing elementary portables
4. Enhance existing parking and circulation on the elementary school campus
- 5. Provide tsunami resistance enhancements and refuge improvements to the new, replacement elementary school structure**

Preferred Option “C”

- Following committee review and comment, the consultant developed a preferred conceptual design option that represented the majority of the committee’s thinking. The preferred option became the basis of the conceptual cost estimate.
- ***Of particular interest in the conceptual design process was the concept of a vertical evacuation (safe haven) structure for students and community members to occupy during a potential emergency related to tsunami driven water inundation. This issue received significant discussion and the committee was informed about the status of funding and design for such structures by experts from public agencies.***

Summary of Estimated Costs

- A cost estimate for each of the options was developed and presented to the Committee.
- Total project cost: \$ 14,600,000
- Local share: \$ 11,800,000
- State share: \$ 2,800,000
- **Tsunami safe refuge (a local cost): \$ 2,000,000**



10:30 am - April 24, 2013 — Updated: 10:30 am - April 24, 2013

Voters OK ambulance service in McCleary, school measures in Ocosta and Satsop.

The Vidette & The Daily World

MONTESANO — People living in the McCleary area will still get an ambulance when they call one, Ocosta School District will get a renovated grade school and Satsop School District voters approved a property tax levy during a special election Tuesday.

In initial vote counting, McCleary area voters in Fire District 12 were approving a property tax increase for ambulance service, with an approval rate of 85.47 percent.

Fire District 12 voters turned down several earlier attempts and without this approval there is a question as to what would happen if someone called 911 in a medical emergency.