

**The Great Wave off
Kanagawa
Artist, Katsushika Hokusai**

**Continuity of Operations Planning and
Hazard Vulnerability Analysis**





Workshop Agenda

- ▶ Review Continuity of Operations Planning definition, purpose, and draft process for developing County COOP.
- ▶ Solicit feedback from Board on process, receive endorsement from Board to carry out plan development with assistance from all Elected/Appoint Department heads.
- ▶ Review abbreviated Hazard Vulnerability Analysis.

COOP Planning Definition



- ▶ An effort within individual departments and agencies to ensure the continued performance of minimum essential functions during a wide range of potential emergencies. Essentially, it is the capability of maintaining the business of government under all eventualities. This is accomplished through the development of plans, comprehensive procedures, and provision for alternative facilities, personnel, resources, interoperable communications, and vital records/databases.

COOP Planning Purpose



- ▶ **Goals of a Continuity Plan:**

- ▶ Provide vital or “mission critical” services
- ▶ Exercise civil authority
- ▶ Maintain safety of the general public
- ▶ Sustain economic base during an emergency
- ▶ Provide training and information to staff on emergency procedures and plans

COOP Planning Current Status



- ▶ Many individual departments have done work around continuity:
 - ▶ Chains of succession, food storage, cloud backups, etc.
 - ▶ No single overarching continuity plan exists for County as a whole

COOP Planning Process



- ▶ COOP planning requires participation and awareness from everyone in the organization, including input and assistance in collecting data.
- ▶ We are proposing an 8 steps process, with 4 activities included, to help assemble a county-wide COOP plan.

COOP Planning Process



- ▶ Step 1: Hazard Vulnerability Analysis
 - ▶ Share recently completed Hazard Vulnerability Analysis with Directors and Electeds and next Coordination meeting.
 - ▶ A HVA represents an overview of disaster scenarios within the county and an analysis of risk.
 - ▶ Helps establish what you are planning for and how to prioritize.
 - ▶ This will also serve as an opportunity to solicit input from Appointed and Elected Dept. Heads, and establish a planning timeline based on their capabilities and ability to participate.

COOP Planning Process



- ▶ Step 2/Activity 1: Essential Function Identification
 - ▶ Essential functions are those organizational functions and activities that must be continued under any and all circumstances.
 - ▶ Departments will be asked to list functions under their department that meet the above criteria, and assign them a value based on the below “resumption time objective” (RTOs) based on the standards developed by the California Office of Emergency Services, ranking from A - Emergency Response Functions, that must be resumed with 0 - 2 hours after an event, to E - Low Impact, that can be paused for 3 weeks or longer.
 - ▶ Additionally, departments can be asked to identify which programs are legally mandated (RCW and/or WAC), which programs are necessary to justify or receive funding, and any other justifications for maintaining programs that may be relevant.

COOP Planning Process



- ▶ Step 3/Activity 2: Mission Critical Equipment and Resources
 - ▶ Based on the essential functions identified above, what resources are required to continue those functions adequately?
 - ▶ This can include everything from facilities or work sites, communications systems, personnel, vendors, etc.
 - ▶ Central Services will work with Departments to develop the lists of this information.
 - ▶ After this step, we will have a priority ranking of County essential services, and the resources required to maintain those services.

COOP Planning Process



- ▶ Step 4/Activity 3: Line of Succession/Delegation of Authority and Essential Personnel
 - ▶ Departments will be asked to provide lines of succession for critical authorities within their department. This work has already been done in several departments.
 - ▶ Departments will also be asked to identify all essential personnel within their department, based on the previous surveys, that would be required to perform emergency work or maintain critical operations after an incident (i.e. for tier A, B, or C critical functions).

COOP Planning Process



- ▶ Step 5/Activity 4: Review and Develop Recovery Strategy
 - ▶ With functions, essential resources, and potential hazards identified, we can now develop strategies for recovery, including:
 - ▶ Alternate facilities - locations to resume essential functions should existing facilities (i.e. the courthouse) be impacted.
 - ▶ Systems and equipment - acquiring and deploying backup or new critical resources
 - ▶ Records and databases - implementing backups of critical records should on-site storage be impacted
 - ▶ Essential personnel - identification of essential personnel and communication of their status, and expectation in an emergency

COOP Planning Process



- ▶ Step 6: Plan Compilation and Review
 - ▶ The Planning Team should meet to review data collected after each questionnaire, but one final review should occur as the data is collated into a cohesive COOP plan. The Planning Team should review data collected to discrepancies, opportunities for further discussion, and areas for review/improvement during a future plan update.
 - ▶ The Plan should then be prepared to review and signature before the BOCC.

COOP Planning Process



- ▶ Step 7: Training and Information Sharing
 - ▶ Training for staff on hazards/emergency scenarios, expectations for them as a County employee, and potential continuity operations.
 - ▶ This can occur at the departmental-level, or during broader County-wide trainings.
 - ▶ Solicit feedback on employees on COOP plan and additional emergency prep needs.

COOP Planning Process



- ▶ Step 8: Review feedback and prep for next planning cycle
 - ▶ Planning team should convene after employee training to review feedback, areas for improvement in current plan, solicit direction from BOCC, and prepare for a plan review at least once every two years.

Feedback



- ▶ Exact planning timeline TBD after discussion with Directors/Electeds based on capacity, goals, etc.
- ▶ Any areas of particular concern for BOCC? Any additional goals for COOP planning?

Definition: HVA



- ▶ Hazard and Vulnerability Analysis:
 - ▶ In short, it's an assessment of risk:
 - ▶ Risk = Probability x Impact or (Magnitude - Mitigation/Response Capacity)
 - ▶ Risk is calculated for each identified hazard for comparison/context
- ▶ HVAs represent a snapshot analysis of an organization, agency, or jurisdiction's overall threat profile and the risks it faces.
- ▶ DEM completed one, with community input, for recently FEMA-approved Mitigation Plan.

Definition: HVA



- ▶ Started by listing all potential hazards an organization, agency, or jurisdiction may face, whether they be:
 - ▶ Natural (earthquakes, tornadoes)
 - ▶ Technological (long-term power/internet outage)
 - ▶ Man-made (terrorism)

Definition: HVA



- ▶ Then, identify the probability or likelihood of each on a rough scale:
 1. Unknown but rare
 2. Unknown but anticipated/eventual
 3. One hundred years or less
 4. 25 years or less
 5. Once per year or more

Definition: HVA



- ▶ From there, we evaluate their impacts to our entity with respect to:
 - ▶ Human impact – impact to loss of life or death
 - ▶ Physical losses – losses or damages to homes, property, infrastructure
 - ▶ Continuity impact – interruption of critical services i.e. government, food supply
- ▶ This is the “Magnitude” portion of the equation
- ▶ Rated on a 0 – 3 rating scale, with 0 being no impact, 3 being catastrophic.

Definition: HVA



- ▶ Finally, evaluate your ability to mitigate and/or respond to each threat:
 - ▶ Preparedness: The level of preplanning and mitigation activities you have undertaken to protect yourself
 - ▶ Internal response: The capabilities of local first responders, Emergency Operations, local government, and other disaster responders to respond to impacts.
 - ▶ External response: The capacity of the whole community (NPREP, local non-profits, etc.) to respond to impacts

Definition: HVA



- ▶ Rated on a 0 – 3 rating scale
- ▶ 0 being fully prepared
- ▶ 1 = well prepared
- ▶ 2 = somewhat prepared
- ▶ 3 = not prepared



EVENT	PROBABILITY	SEVERITY = (MAGNITUDE - MITIGATION)						RISK
		HUMAN IMPACT	PROPERTY IMPACT	BUSINESS IMPACT	PREPARED-NESS	INTERNAL RESPONSE	EXTERNAL RESPONSE	
	<i>Likelihood this will occur</i>	<i>Possibility of death or injury</i>	<i>Physical losses and damages</i>	<i>Interruption of services</i>	<i>Preplanning</i>	<i>Time, effectiveness, resources</i>	<i>Community/ Mutual Aid staff and supplies</i>	<i>Relative threat*</i>
SCORE	0 = N/A 1 = Low 2 = Moderate 3 = High	0 = N/A 1 = Low 2 = Moderate 3 = High	0 = N/A 1 = Low 2 = Moderate 3 = High	0 = N/A 1 = Low 2 = Moderate 3 = High	0 = N/A 1 = High 2 = Moderate 3 = Low or none	0 = N/A 1 = High 2 = Moderate 3 = Low or none	0 = N/A 1 = High 2 = Moderate 3 = Low or none	0 - 100%
Hurricane								0%
Tornado								0%
Severe Thunderstorm								0%
Snow Fall								0%
Blizzard								0%
Ice Storm								0%
Earthquake								0%
Tidal Wave								0%
Temperature Extremes								0%
Drought								0%
Flood, External								0%
Wild Fire								0%
Landslide								0%
Dam Inundation								0%
Volcano								0%
Epidemic								0%
AVERAGE SCORE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0%

*Threat increases with percentage.

RISK = PROBABILITY * SEVERITY		
0.00	0.00	0.00



Final Product

- ▶ Risk = Probability x Impact or (Magnitude - Mitigation/Response Capacity)
- ▶ Risk = Prob/5 * (H+P+C+P+I+E)/18

Purpose



- ▶ Easy to read and summarize, snapshot of jurisdictional risk profile.
- ▶ Helps drive conversations about risk and capabilities.
- ▶ Can help drive emergency plan development, mitigation plan development, prioritization or training, planning, projects, etc.
- ▶ HVAs can be shared across jurisdictions to compare common challenges and needs
- ▶ As with many planning projects, the process itself is valuable.

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All Hazard Mitigation Plan (Rev. 2016)

Jefferson County – City of Port Townsend

MULTI-



Vs. 5

All Hazard Mitigation Plan (Rev. 2016)

Jefferson County – City of Port Townsend

NATURAL HAZARD IDENTIFICATION

September 2016



► Natural Disasters

Damaging Winds

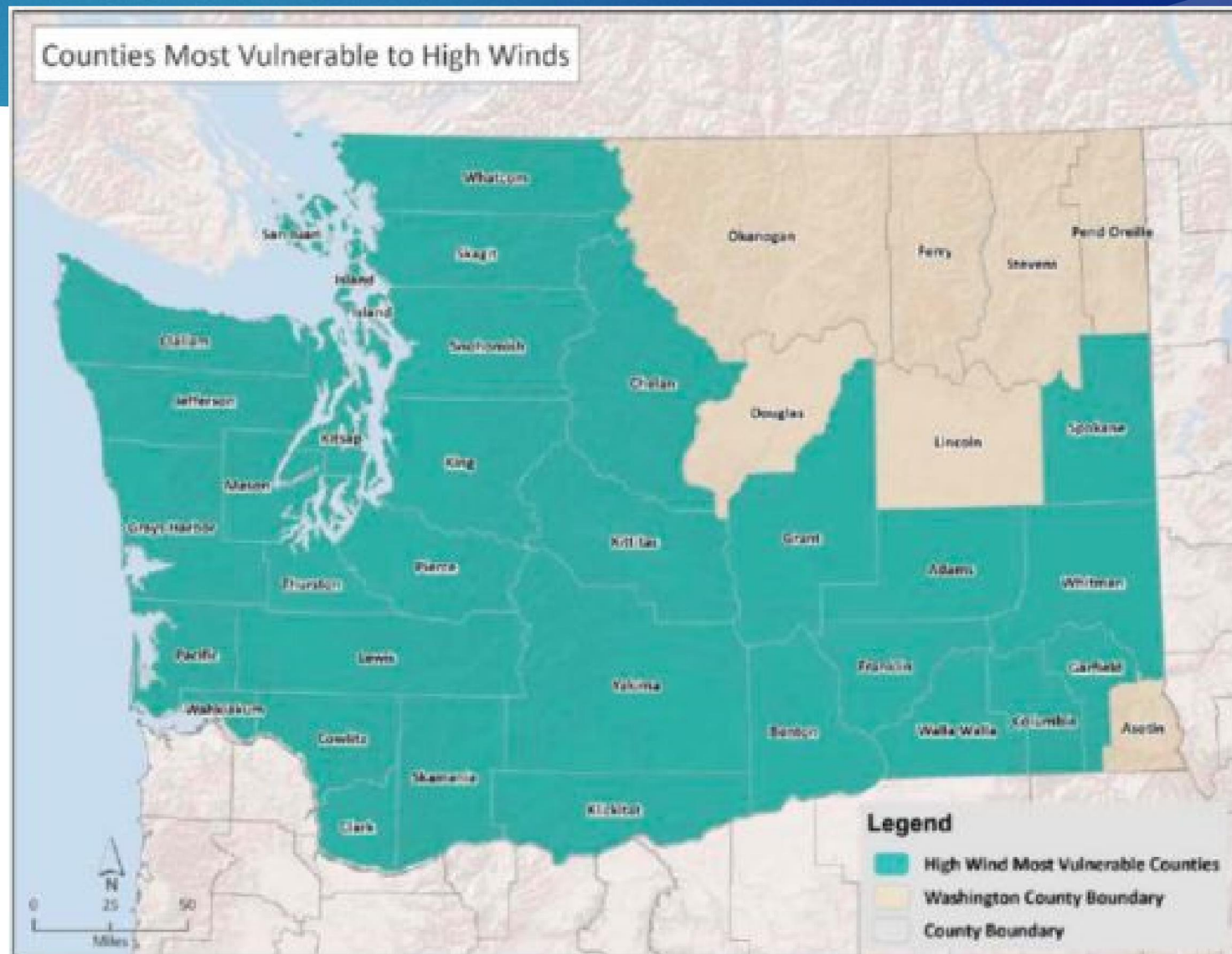


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Damaging Winds

- ▶ National Weather Service defines high winds as sustained winds of 40 mph or gusts of 58 mph or greater, not caused by thunderstorms, expected to last for an hour or more.
- ▶ Yearly occurrence – most recent, Nov '22 windstorms, winter '24 “bomb cyclone”

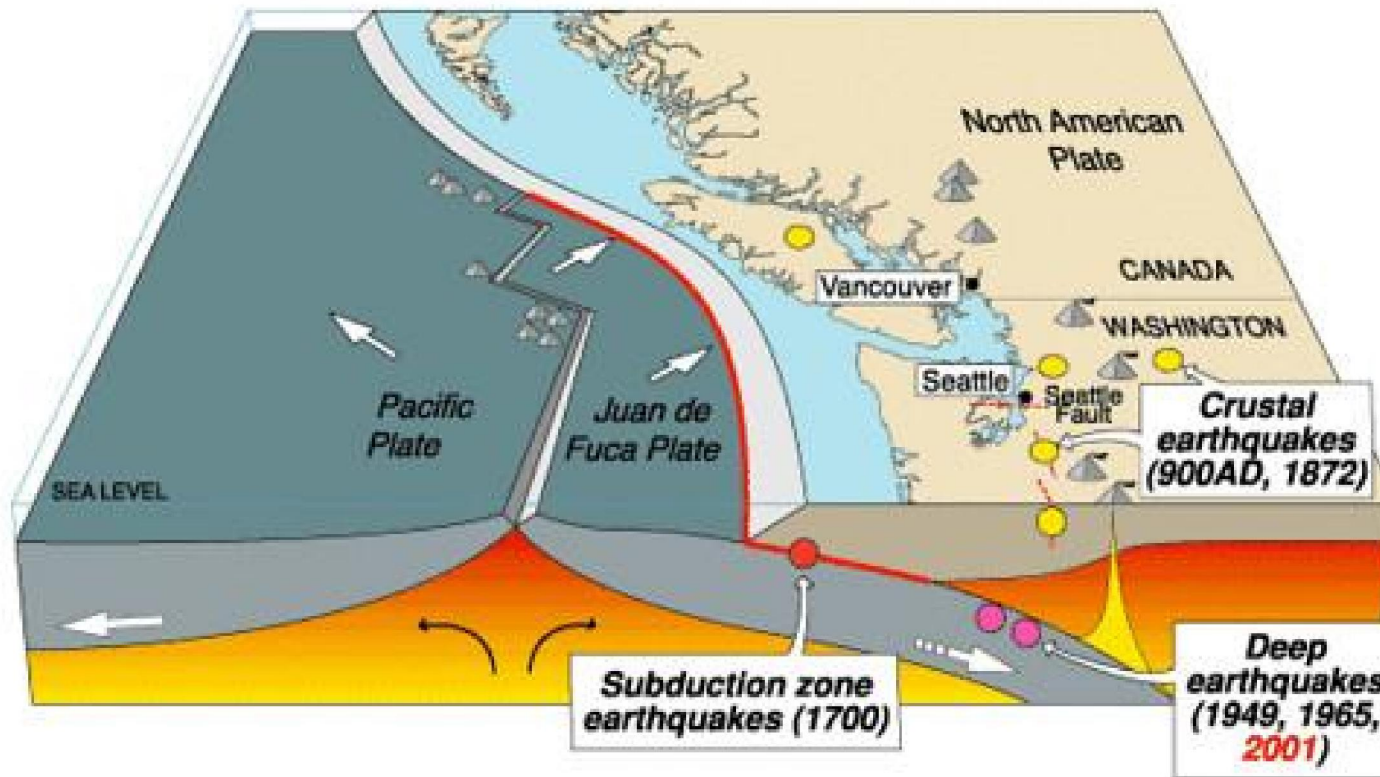


Earthquakes



- ▶ An earthquake is ground shaking caused primarily by an abrupt shift along a fracture in the earth, called a fault.
- ▶ The principal ways that earthquakes cause damage are by:
 - ▶ strong ground shaking
 - ▶ landslides
 - ▶ liquefaction
 - ▶ subsidence
 - ▶ tsunamis (seismic ocean waves)
 - ▶ seiches (rhythmic movements of inland bodies of water)

Cascadia earthquake sources



Source	Affected area	Max. Size	Recurrence
● Subduction Zone	W.WA, OR, CA	M 9	500-600 yr
● Deep Juan de Fuca plate	W.WA, OR,	M 7+	30-50 yr
● Crustal faults	WA, OR, CA	M 7+	Hundreds of yr?

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Tohoku, 2011



Chile, 1960



Subduction Source



Alaska, 1964



Indonesia, 2004 (Boxing Day)

1965



Deep San Juan Plate Source

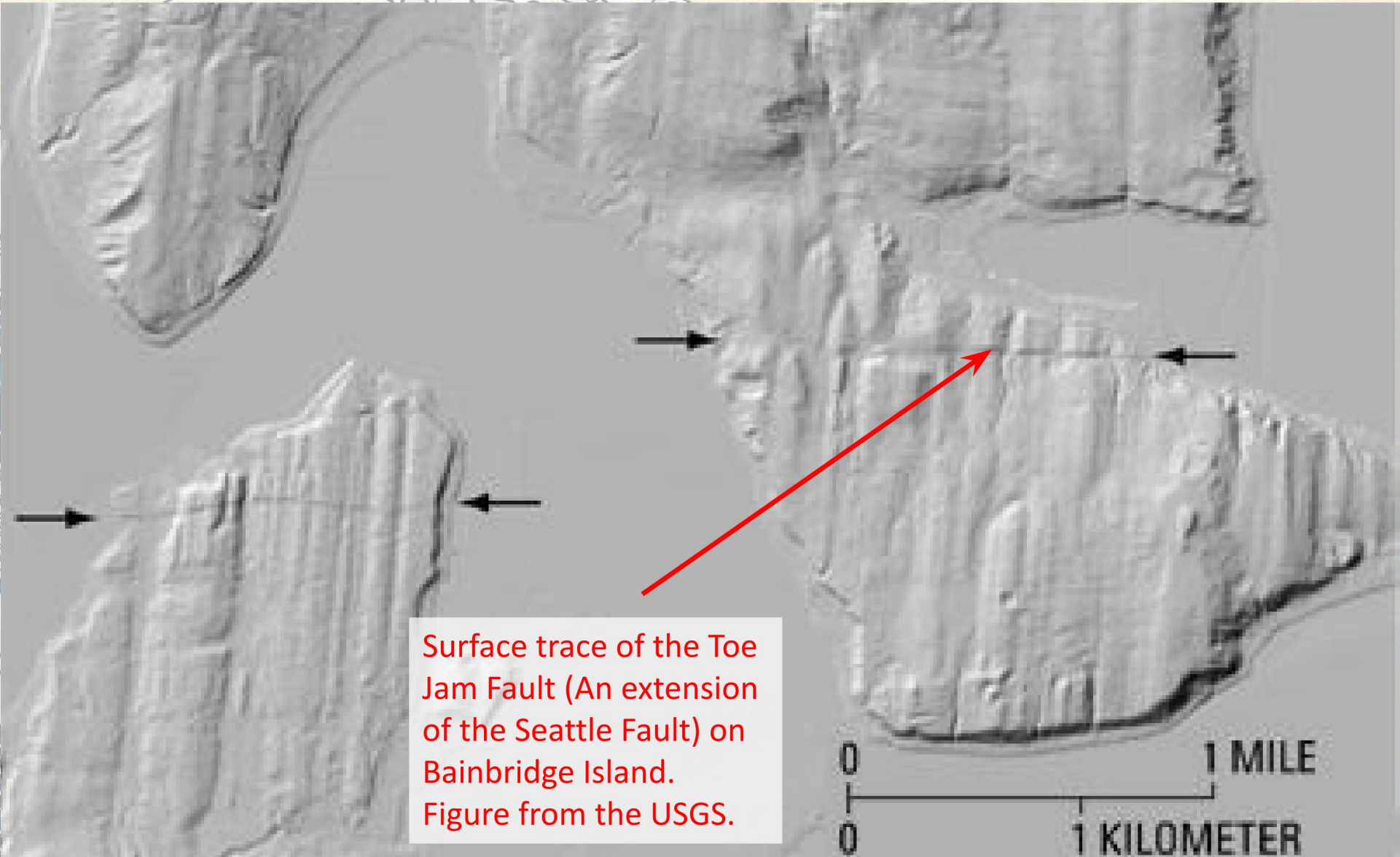
1949



2001



Shallow Crustal Source



Surface trace of the Toe Jam Fault (An extension of the Seattle Fault) on Bainbridge Island.
Figure from the USGS.

Earthquakes



- ▶ Cascadia Subduction: Potential for M8 or greater; occurs every 300 to 500 years, with last being 1700.
- ▶ Juan de Fuca: Approximate “recurrence intervals” for intraplate earthquakes of various magnitude were estimated to be 35 years for magnitude 6.5 and 100 years for magnitude 7. Since 1870, there have been 7 earthquakes in the Puget Sound basin of magnitudes of 6.0 or larger. Generally, these earthquakes last between 20 – 60 seconds.
- ▶ North American: These earthquakes are primarily shallow with depths of 30 kilometers or less and generally have the magnitude of 5 to 5.5, however the largest recorded earthquake in Washington history was a 7.4 in 1872.
- ▶ Current estimates are at a 10% to 17% chance in the next 50 years.

Earthquakes

- ▶ South Whidbey Island:
Research has shown that the SWI faults are active and have generated at least four large earthquakes in the last 16,000 years



Table EQ-4 – Hazus Earthquake Results for Selected Scenarios³³

Community	Total Estimated Building Value	Total Number of Buildings	Number of Buildings in the Moderate – High Liquefaction Zone	Percent of Buildings in the Moderate-High Liquefaction Zone	Building Dollar Loss for a Southern Whidbey M7.4 Event	Loss Ratio (Dollar Losses/ Total Building Value) Southern Whidbey M7.4 Event	Building Dollar Loss for a Cascadia 9.0 Event	Loss Ratio (Dollar Losses/ Total Building Value) Cascadia 9.0 Event
Port Townsend	\$646,052,977	4845	276	5.7%	\$90,401,638	14%	\$23,310,587	3.6%
Hoh Tribe	\$3,119,782	35	6	17.1%	N/A**	N/A**	\$341,835	11% (*)
Unincorporated	1,639,851,022	14356	1151	8.0%	\$75,073,592	4.6%	\$80,928,751	4.9%
Total	\$2,289,023,782	19,236	1,433	7.5%	\$165,475,259	7.4%	\$104,581,170	4.7%

Hilo, 1946



Boxing Day 2004,



Tsunami



Alaska, 1964



Tohoku, 2011

Tsunamis



- ▶ Tsunamis are wave trains, or series of waves, generated in a body of water by an impulsive disturbance including earthquakes, subaqueous or terrestrial landslides impacting water bodies, or volcanoes.
- ▶ Distant source vs. Near Source
- ▶ Typical max wave height from near source (Cascadia) event stands around 23 feet
- ▶ Damaging distant source events in 2011 and 1964

Flood

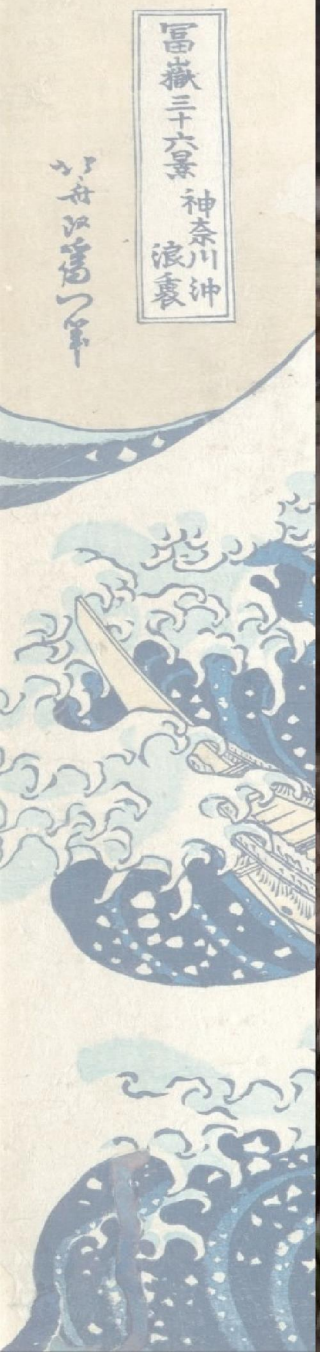


- ▶ Flooding is the uncontrolled release of impounded water resulting that can affect life and property.
- ▶ River – heavy, prolonged rain and/or snowmelt causing rapidly rising river levels
- ▶ Tidal - high tides, strong winds, heavy swell, and low atmospheric pressure combine to produce flooding.
- ▶ Flash - Although possible, flash floods are not as common in Jefferson County as they are in Eastern Washington. Flash floods are characterized by a very rapid quick rise of the water level in a small river, stream or dry wash.

Riverine Flooding



Brinnon Flooding – February 2015 Photo
by Keppie Keplinger



Coastal Flooding



Coastal Flooding – near Anacortes

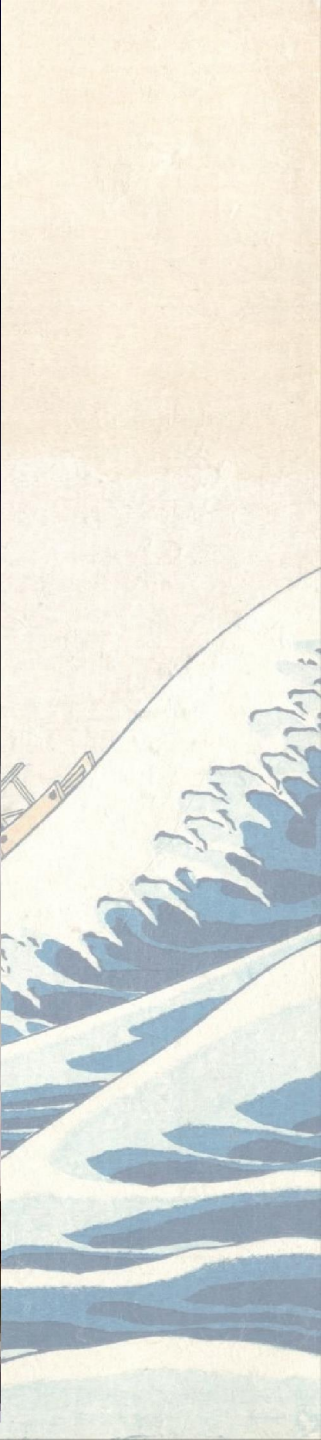
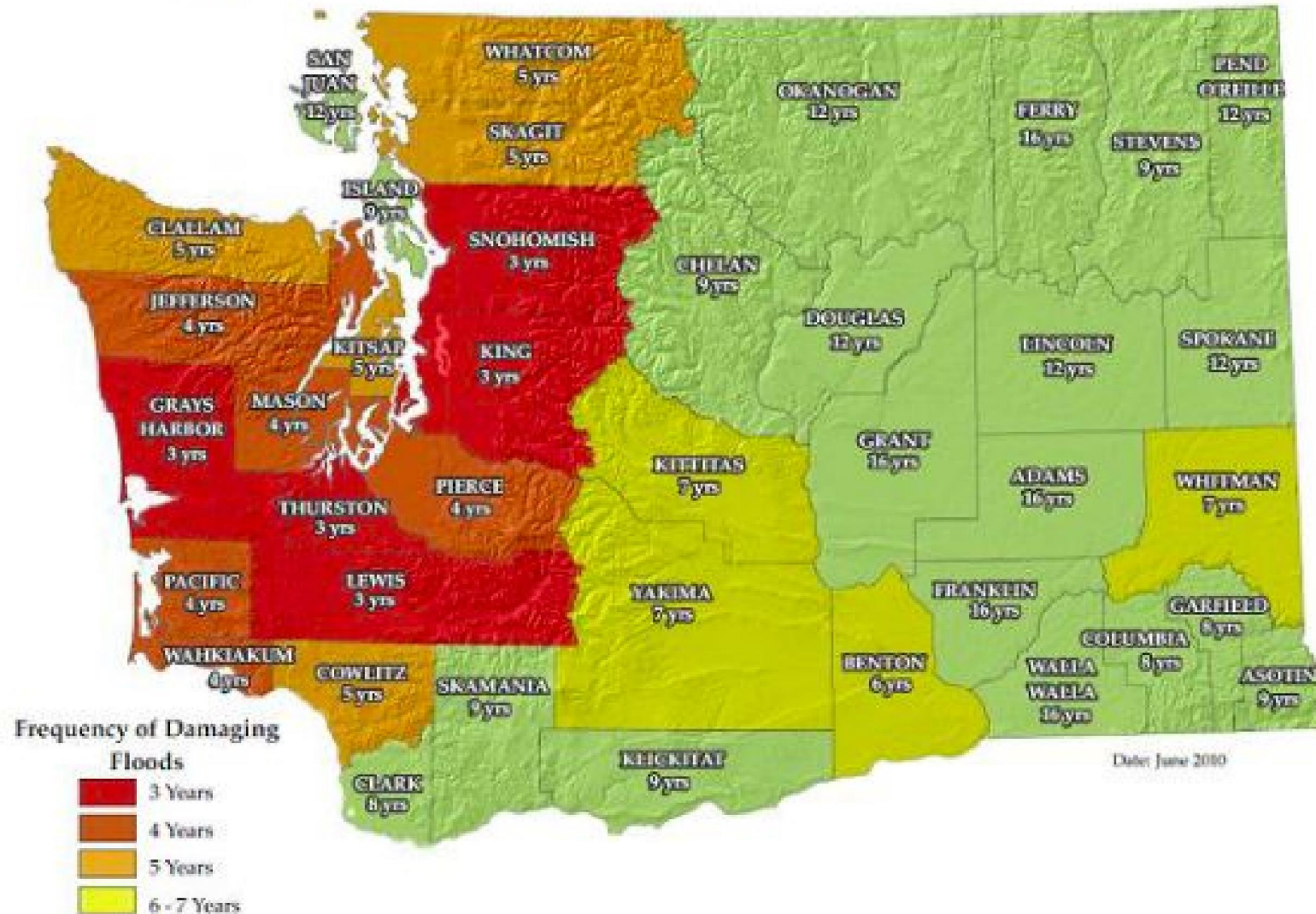


Figure FL-4 – Frequency of Major Flooding¹⁵

Frequency of Flooding Causing Major Damage, 1956 - Present



Source: Washington State Emergency Management Division Hazard Mitigation Plan



Public Health Emergency



- ▶ Public Health Emergencies can be food or water contamination or medical emergencies such as diseases, epidemics, or a pandemic that have the potential to affect people and animals over a significant area.
- ▶ Includes blue green algae outbreaks at Anderson Lake, and in 2007, Jefferson County health authorities put out warnings to customers of a Port Townsend farm who purchased produce handled by an employee who had contracted Hepatitis-A.
- ▶ Nationally, Ebola, Zika, and of course, COVID-19



Tornadoes

- ▶ Tornadoes are characterized by funnel clouds of varying sizes that generate winds as fast as 500 miles per hour. They can affect an area of $\frac{1}{4}$ to $\frac{3}{4}$ of a mile and seldom more than 16 miles long.

Table TN-1. Recorded Tornado Events in Jefferson County Washington since 1950					
<i>Date</i>	<i>Location</i>	<i>Force</i>	<i>Death(s)</i>	<i>Injuries</i>	<i>Distance</i>
12/12/1969	Brinnon	F3	0	1	27
11/24/1970	Port Townsend	F2	0	0	27
04/09/1991	Brinnon	F0	0	0	13
06/11/2001	Brinnon	F0	0	0	19
06/05/2004	Port Townsend	F0	0	0	26
05/18/2005	Port Townsend	F1	0	0	25
01/18/2015	Brinnon	EF1	0	0	28

Tornado



Port Orchard, 2018

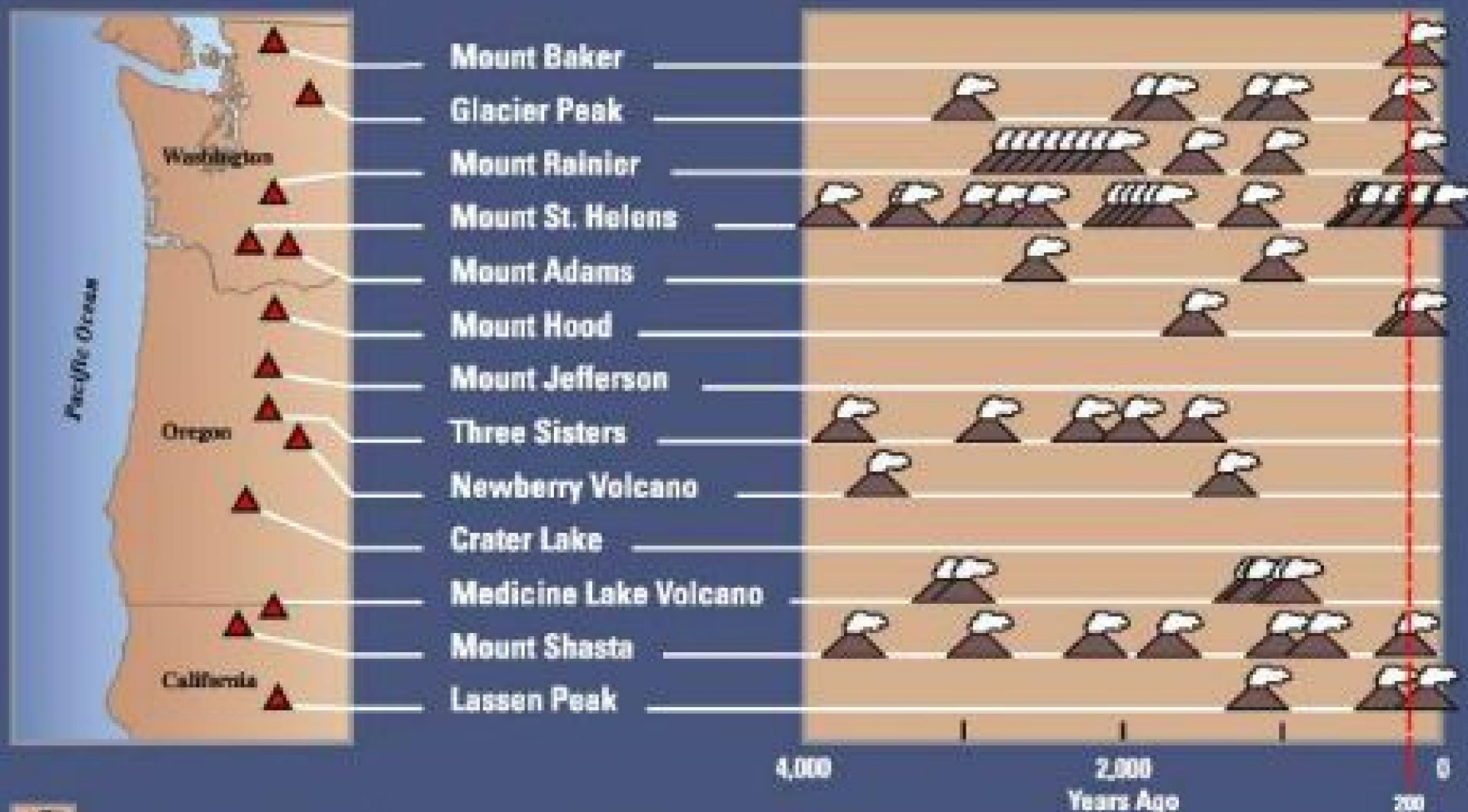
Image Courtesy KING 5



Volcanic Eruption/Ash

- ▶ A volcano is an opening in Earth's surface through which lava (molten rock), hot gases, and rock fragments erupt from the earth's interior. Such an opening forms when melted rock from deep within Earth (magma) blasts through the surface.
- ▶ There are no volcanoes in Jefferson County; however, the proximity to potentially active volcanoes in the Cascade Mountains to the east could impact the county. When Mt. St. Helens erupted on May 18, 1980, heavy ash from a west wind blanketed much of Eastern Washington. Subsequent eruptions on May 25 and June 12 similarly affected Western Washington, although to a lesser degree.

Eruptions in the Cascade Range During the Past 4,000 Years



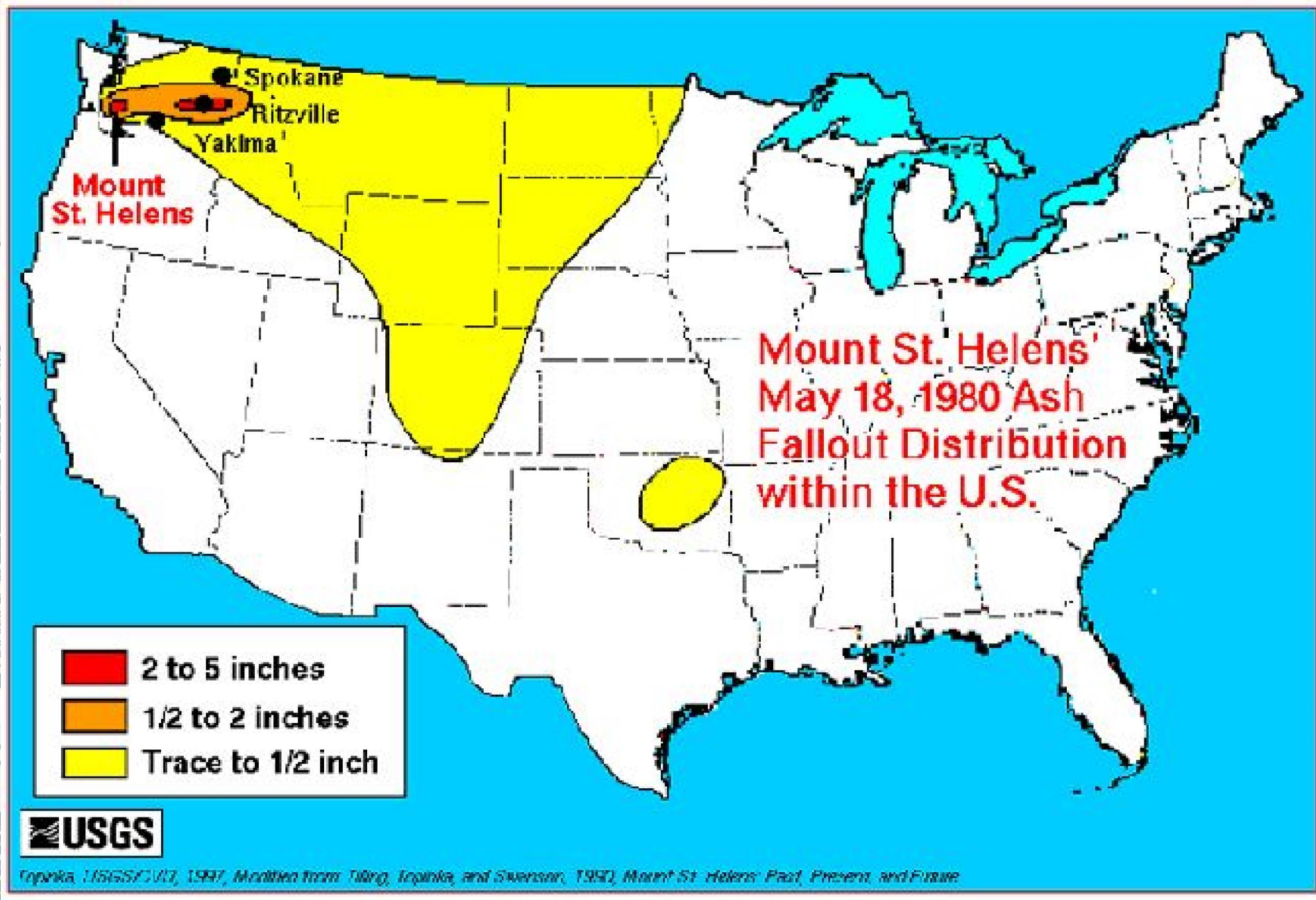
Eruption or period of multiple eruptions at or near named volcano

Ash Fall



2010 eruption of Eyjafjallajökull, Iceland. Photo by Henrik Thorburn

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Wildfire/Forest Fire/Urban Interface



- ▶ Forest and wildland fires are the uncontrolled destruction of forested and wild lands by fire caused by natural or human-made events. Forest and wildland fires occur primarily in undeveloped areas, although there are significant pockets of residences within Jefferson County woodlands.
- ▶ According to the National Fire Information Reporting System (NFIRS), Jefferson County averages 5 – 10 acres of wildland fires every year. The last major wildfire, the Chimney Peak fire, occurred in 1981.

Wildfire



Hayes Fire, ONP, August 26, 2016

Photo from Peninsula Dailey News



Winter Storm

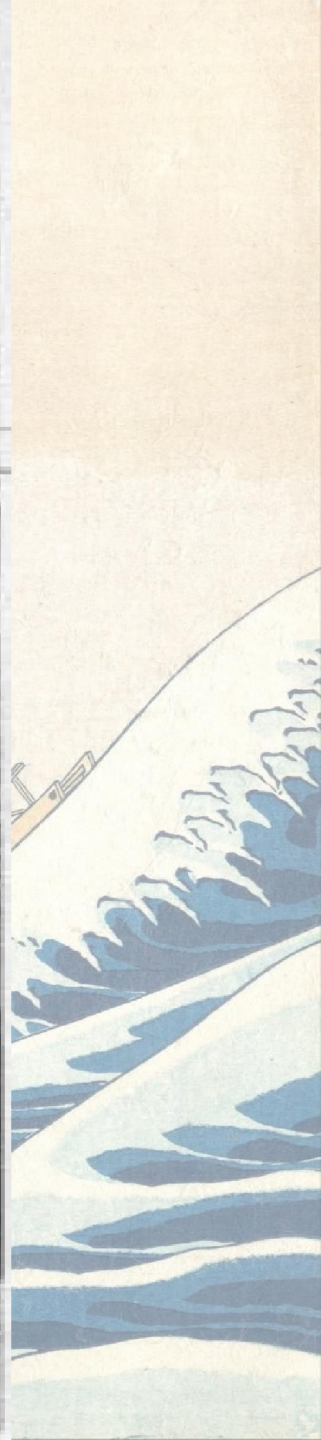
- ▶ The National Weather Service defines a winter storm as having significant snowfall, ice, and/or freezing rain; the quantity of precipitation varies by elevation.
- ▶ Heavy snowfall is 4 inches or more in a 12-hour period, or 6 inches or more in a 24-hour period in non-mountainous areas;
- ▶ 12 inches or more in a 12-hour period or 18 inches or more in a 24-hour period in mountainous areas.
- ▶ Different than high winds, flooding, landslides – each hazard can impact Jefferson separately or together.
- ▶ Last snow storm requiring declaration was in 1955, although a declaration was requested in 2019 for February's "Snowmageddon" – it was denied.

Winter Storms



Water Street, 1955

Source: Port Townsend An Illustrated History...





► Man-made Disasters



Military Ordinance Incident

- ▶ The largest munitions depot on the west coast, Naval Magazine Indian Island (NAVMAG), is located within the boundary of Jefferson County. Tens of thousands of tons of high explosives in the form of missiles, torpedoes, warheads, etc. are shipped in and out of the depot every year by ship and by truck. There is a possibility of an accident or incident detonating high explosives near a populated area.
- ▶ In 2008, a fully loaded semi-truck carrying 155mm munitions out of the base lost its brakes on a hill leading to the main gate of the navy base. A quick-thinking sentry raised the security bollards, which stopped the truck from entering onto the state highway fronting the base. There were no detonators with the munitions, so the threat of explosion was relatively low in this case.

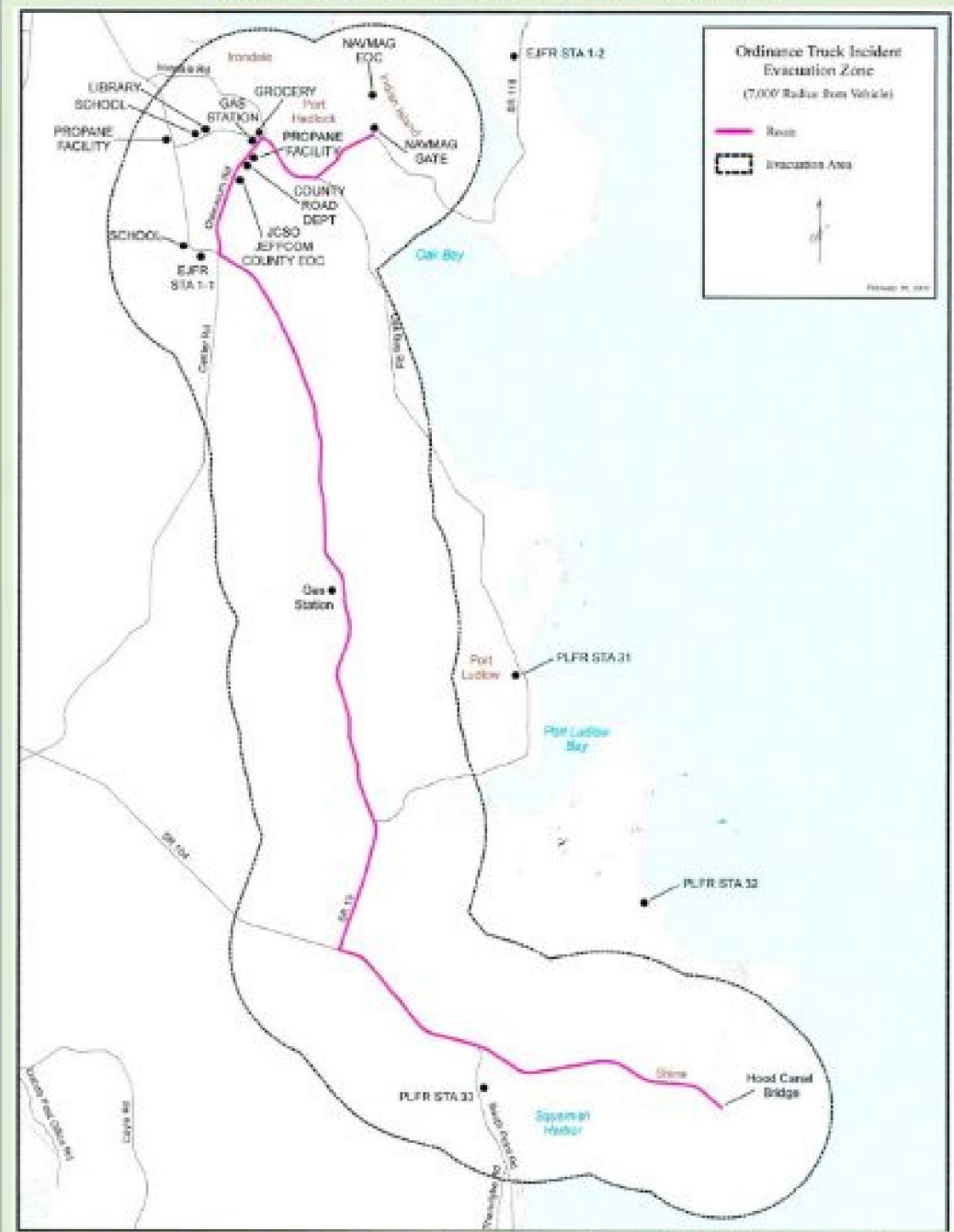
Military Ordnance Incident



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Figure OR-1. Ordnance Truck Incident Evacuation Zone⁵



Source: Jefferson County Department of Emergency Management





Long-term Power Outage

- ▶ Can occur as a result of winter storms, issues at Bonneville Feeder, or by acts of terrorism (physical attack to infrastructure, cyber attack)
- ▶ Outages occur multiple times a year due to storms. Whole county lost power for several hours after Bonneville line was compromised in 2019.
- ▶ Extended (>24 hours) outages can cause loss of life due to medical device failure and lack of heating/cooling; economic damage due to lost wages and food.



Water Shortage/Sewer Failure

- ▶ Water can be in short supply or become contaminated due to either intentional actions or to unintentional consequences of improper handling, system breakdowns, or through the introduction of bacteria from various means. It can also be chronically in short supply due to the effects of climate warming on municipal water supplies.
- ▶ On September 19, 2016, routine testing identified the possibility of a toxic substance in the City water supply. Subsequent testing showed the water to be safe. In the meantime, the EOC prepared a plan to distribute water to 10,000 residents daily. Water trucks and bladders were deemed not adequate. Estimated costs to deliver bottled water were \$30,000 per day in both direct and indirect costs.



Misc. Human-Caused Events

- ▶ Civil Disturbance – mass protests; previously seen sit-ins at NavMag; possibility during COVID, police reform protests
- ▶ Hazardous Materials Spill – 25 – 30 spills per year, mostly petroleum near ports. Paper Mill and transport in/out of NavMag represent biggest threats.
- ▶ Major Fire Activity – Large urban fires, may spread building to building. Modern fire codes, improved response limits probability, although older homes may contribute.
- ▶ Major Law Activity and/or Terrorism – Any incident that consume limited law resources i.e. pipe bomb scare in 2013 at Mountain View. Hard to predict.

HazMat



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Homeland Security

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Cyber Terrorism

Cyber Threats

Cyber Defense

Terrorism

Destruction
Sabotage

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Misc. Human-Caused Events

- ▶ Marine oil spill – See HazMat. Occurs semi-frequently at small scale. Larger event could disrupt local economy.
- ▶ Maritime emergency - Puget Sound and the Admiralty Inlet are some of the highest trafficked sea lanes in the United States. The Port Townsend Bay has traffic from the ferry system, submarines, navy and coast guard warships, commercial fishing vessels, occasional cruise ships, and many pleasure craft. At times, the rough seas can threaten the ferries or small vessels.

Maritime Emergency



Ferry, Collision, Philippines, December 24, 2009,
Photo: Radio Free Europe



HVA Survey Results

- ▶ Final tally of participants: 84
- ▶ Some qualitative feedback:
 - ▶ PERCEPTION
 - ▶ Difficult to gauge preparedness levels most of all
 - ▶ Tedious
 - ▶ More often

HAZARD AND VULNERABILITY ASSESSMENT TOOL

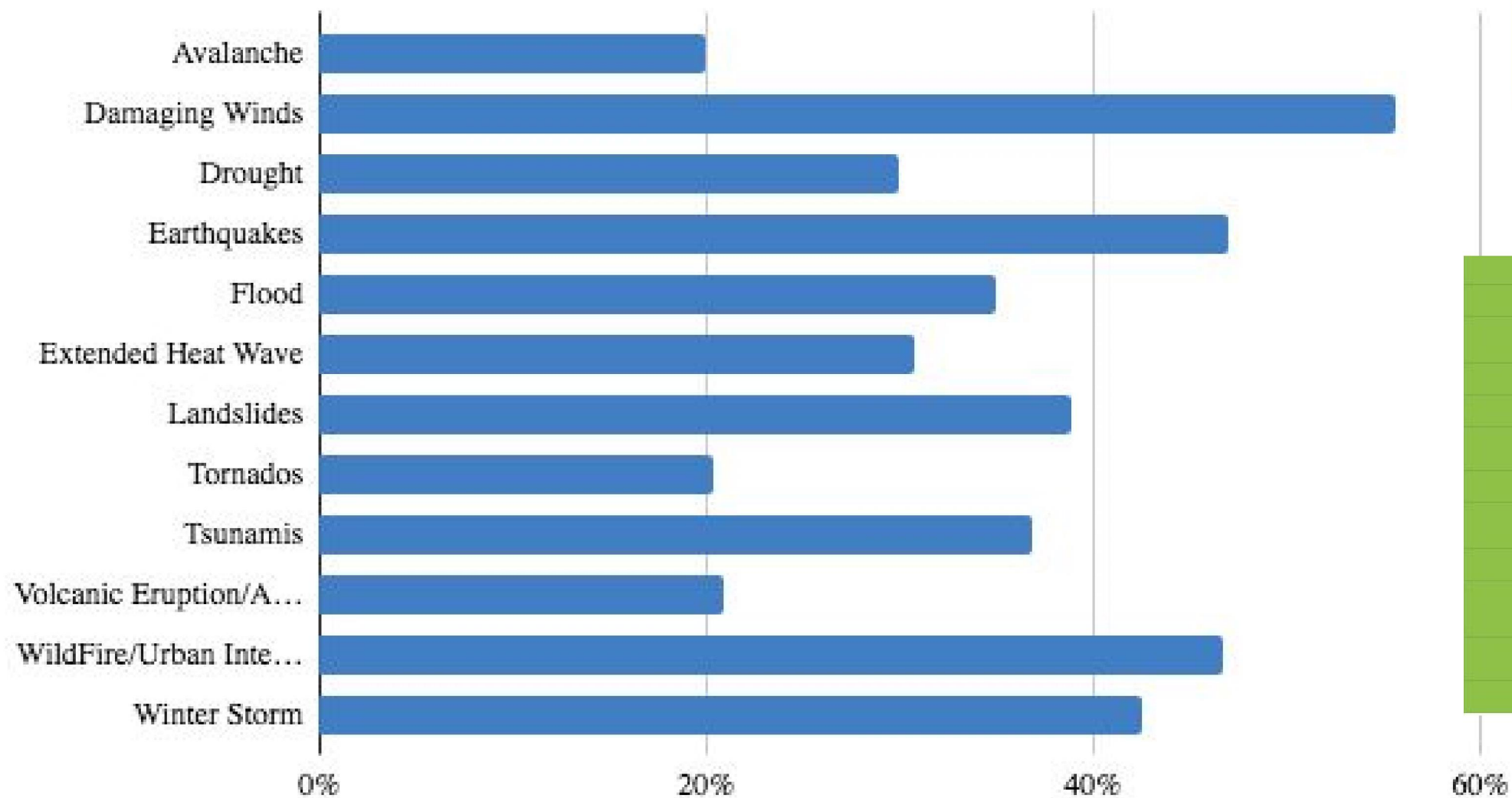
NATURALLY OCCURRING EVENTS



EVENT	PROBABILITY	SEVERITY = (MAGNITUDE - MITIGATION)						RISK
		HUMAN IMPACT	PROPERTY IMPACT	BUSINESS IMPACT	PREPARED-N ESS	INTERNAL RESPONSE	EXTERNAL RESPONSE	
	<i>Likelihood this will occur</i>	<i>Possibility of death or injury</i>	<i>Physical losses and damages</i>	<i>Interruption of critical services</i>	<i>Level of Preplanning you have undertaken</i>	<i>Capabilities of local resources to respond to impacts</i>	<i>Capacity of whole community to respond to impacts</i>	<i>Relative threat*</i>
SCORE	1= Unknown but rare 2 = Unknown but anticipated 3 = One hundred years or less 4 = 25 years or less 5 = once per year or more	0 = No Impact 1 = Some Impact 2 = Moderate Impact 3 = Catastrophic Impact	0 = No Impact 1 = Some Impact 2 = Moderate Impact 3 = Catastrophic Impact	0 = No Impact 1 = Some Impact 2 = Moderate Impact 3 = Catastrophic Impact	0 = Fully Prepared 1 = Well Prepared 2 = Somewhat Prepared 3 = Not Prepared	0 = Fully Prepared 1 = Well Prepared 2 = Somewhat Prepared 3 = Not Prepared	0 = Fully Prepared 1 = Well Prepared 2 = Somewhat Prepared 3 = Not Prepared	0 - 100%
Avalanche	2	1	1	1	2	1.75	2.25	20%
Damaging Winds	5	1.5	1.75	1.5	1.75	1.5	2	56%
Drought	3	1	1	1	2	2	2	30%
Earthquakes	3.25	2.5	2.5	2.5	1.75	1.75	2	47%
Flood	3	1.25	1.75	1.5	2	2	2	35%
Extended Heat Wave	3	1.5	1	1	1.75	2	2	31%
Landslides	3.25	1.5	1.75	1.5	2	2	2	39%
Tornados	1.5	1.75	2	1.75	2.5	2	2.25	20%
Tsunamis	2.5	2.25	2.5	2.5	2	2	2	37%
Volcanic Eruption/Ashfall	1.75	1.5	1.5	1.5	2	2	2.25	21%
WildFire/Urban Interface	3.5	2	2.25	2	2	1.75	2	47%
Winter Storm	4.25	1.25	1.25	1.5	1.5	1.5	2	43%
AVERAGE SCORE	3.00	1.58	1.69	1.60	1.94	1.85	2.06	36%



Natural Hazards



56%	Damaging Winds
47%	Earthquakes
47%	Wildfire/Urban Interface
43%	Winter Storm
39%	Landslides
37%	Tsunami
35%	Flood
31%	Extended Heat Wave
30%	Drought
21%	Volcanic Eruption/Ashfall
20%	Tornado
20%	Avalanche

HUMAN RELATED EVENTS

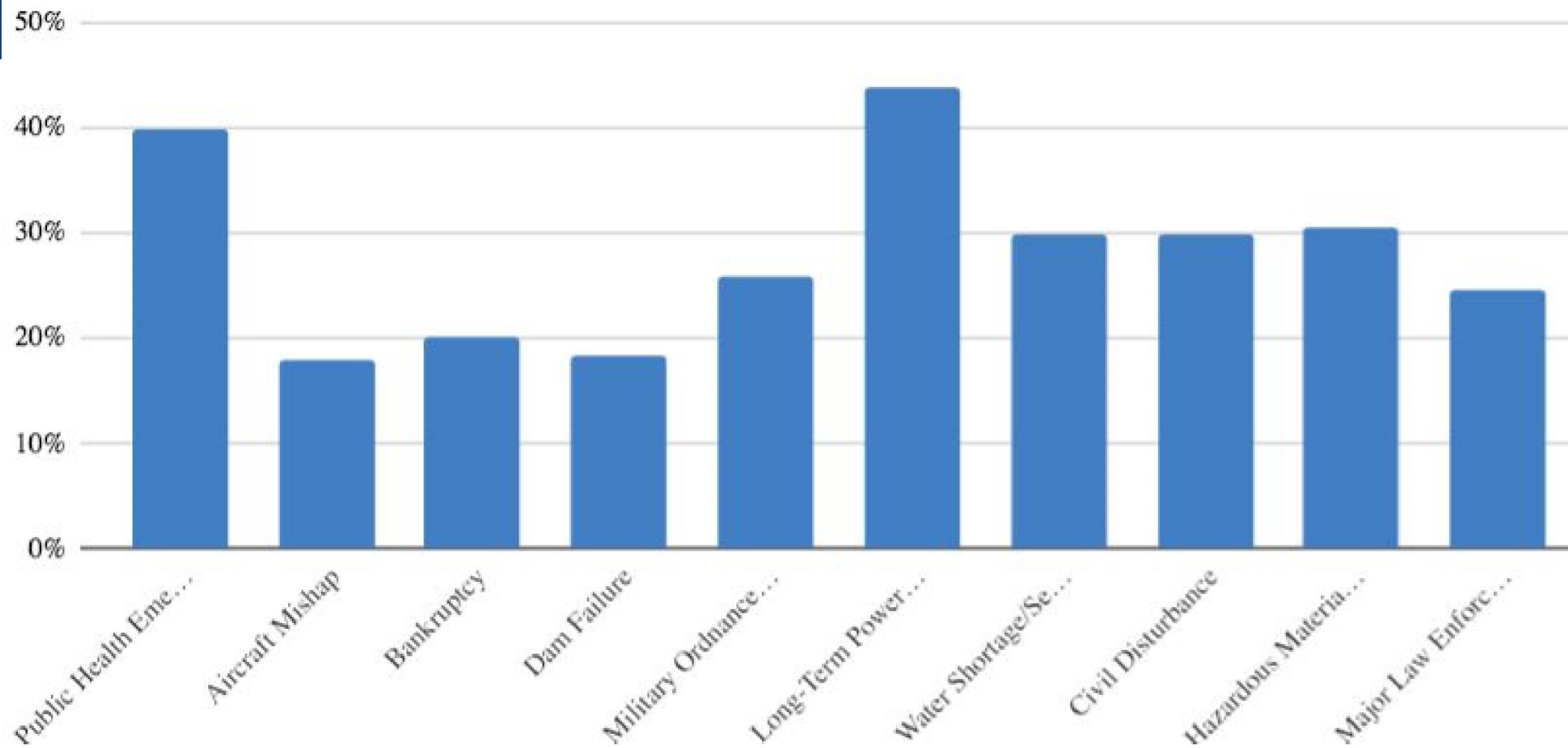


EVENT	PROBABILITY	SEVERITY = (MAGNITUDE - MITIGATION)						RISK
		HUMAN IMPACT	PROPERTY IMPACT	BUSINESS IMPACT	PREPAREDNESS	INTERNAL RESPONSE	EXTERNAL RESPONSE	
	<i>Likelihood this will occur</i>	<i>Possibility of death or injury</i>	<i>Physical losses and damages</i>	<i>Interruption of critical services</i>	<i>Level of Preplanning you have undertaken</i>	<i>Capabilities of local resources to respond to impacts</i>	<i>Capacity of whole community to respond to impacts</i>	<i>Relative threat*</i>
SCORE	1= Unknown but rare 2 = Unknown but anticipated 3 = One hundred years or less 4 = 25 years or less 5 = once per year or more	0 = No Impact 1 = Some Impact 2 = Moderate Impact 3 = Catastrophic Impact	0 = No Impact 1 = Some Impact 2 = Moderate Impact 3 = Catastrophic Impact	0 = No Impact 1 = Some Impact 2 = Moderate Impact 3 = Catastrophic Impact	0 = Fully Prepared 1 = Well Prepared 2 = Somewhat Prepared 3 = Not Prepared	0 = Fully Prepared 1 = Well Prepared 2 = Somewhat Prepared 3 = Not Prepared	0 = Fully Prepared 1 = Well Prepared 2 = Somewhat Prepared 3 = Not Prepared	0 - 100%
Public Health Emergency	3.5	2	1	2	1.75	1.5	2	40%
Aircraft Mishap	1.75	1.25	1.25	0.75	2.25	1.5	2.25	18%
Bankruptcy	1.5	1.25	1.25	2.25	2.25	2.5	2.5	20%
Dam Failure	1.5	1.25	1.5	1.25	2.5	2	2.5	18%
Military Ordnance Incident	1.75	2.25	2.25	1.75	2.5	2	2.5	26%
Long-Term Power Outage	3.5	1.75	1.75	2	1.75	1.75	2.25	44%
Water Shortage/Sewage Failure	2.5	1.75	1.25	1.75	2	2	2	30%
Civil Disturbance	2.5	1.25	1.5	1.5	2	2	2.5	30%
Hazardous Materials Spill	2.5	1.5	1.5	1.5	2.25	1.75	2.5	31%
Major Law Enforcement Activity or Terrorism	2	1.5	1.5	1.75	2.25	1.75	2.25	24%
AVERAGE	2.30	1.58	1.48	1.65	2.15	1.88	2.33	28%

*Threat increases with percentage.



Human Hazard





	Natural	Human
Probability	0.60	0.46
Severity	0.60	0.61
Hazard Specific Relative Risk:	0.36	0.28

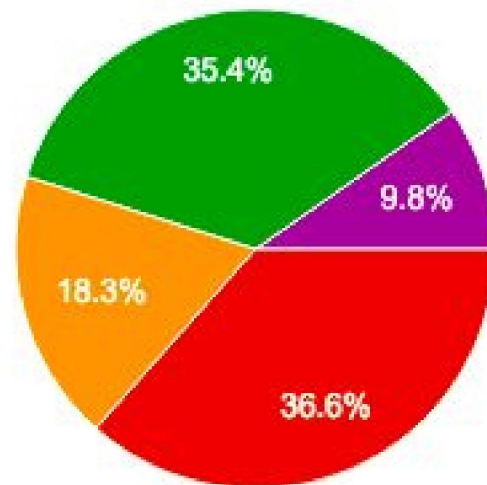
Earthquake



EARTHQUAKES

The likelihood this will occur on a scale of 1-5

82 responses



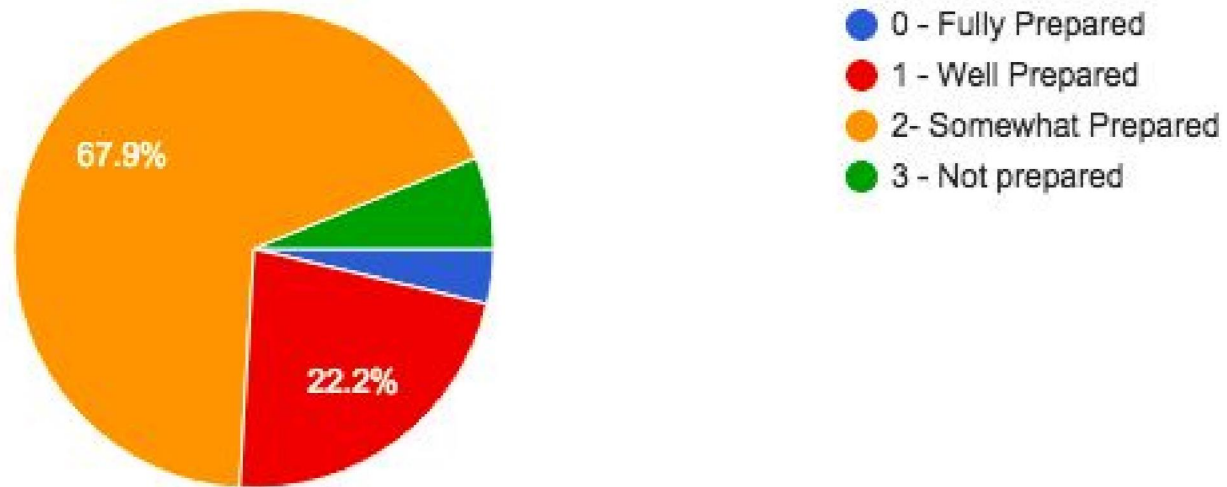
- 1 - Unknown but rare
- 2 - Unknown but anticipated/eventual
- 3 - One hundred years or less
- 4 - 25 years or less
- 5 - once per year or more

Earthquake



Preparedness: level of preplanning activities you have undertaken

81 responses

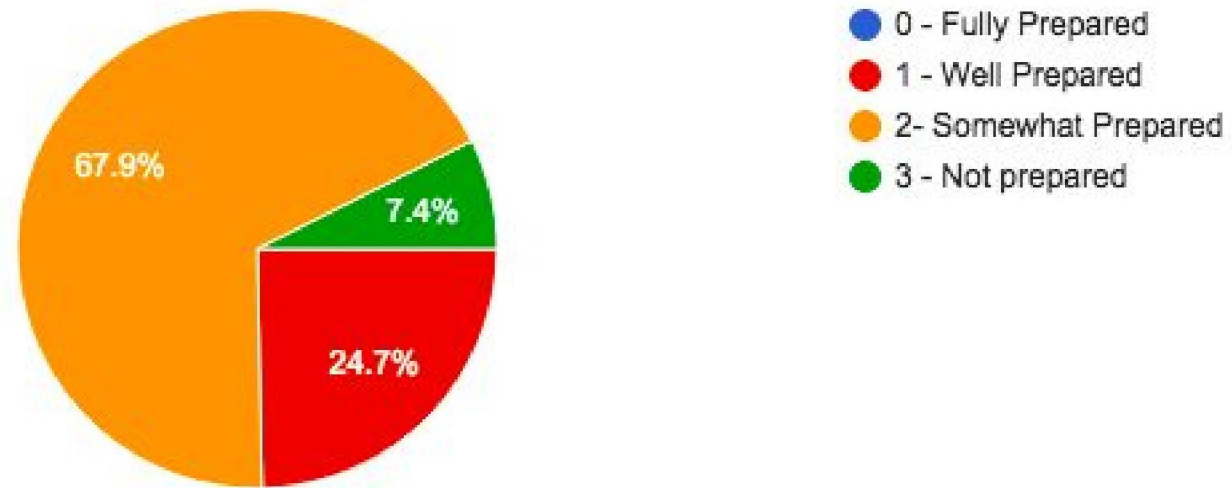


Earthquake



Internal Response: Capabilities of local first responders, local government, and others to respond to impacts

81 responses

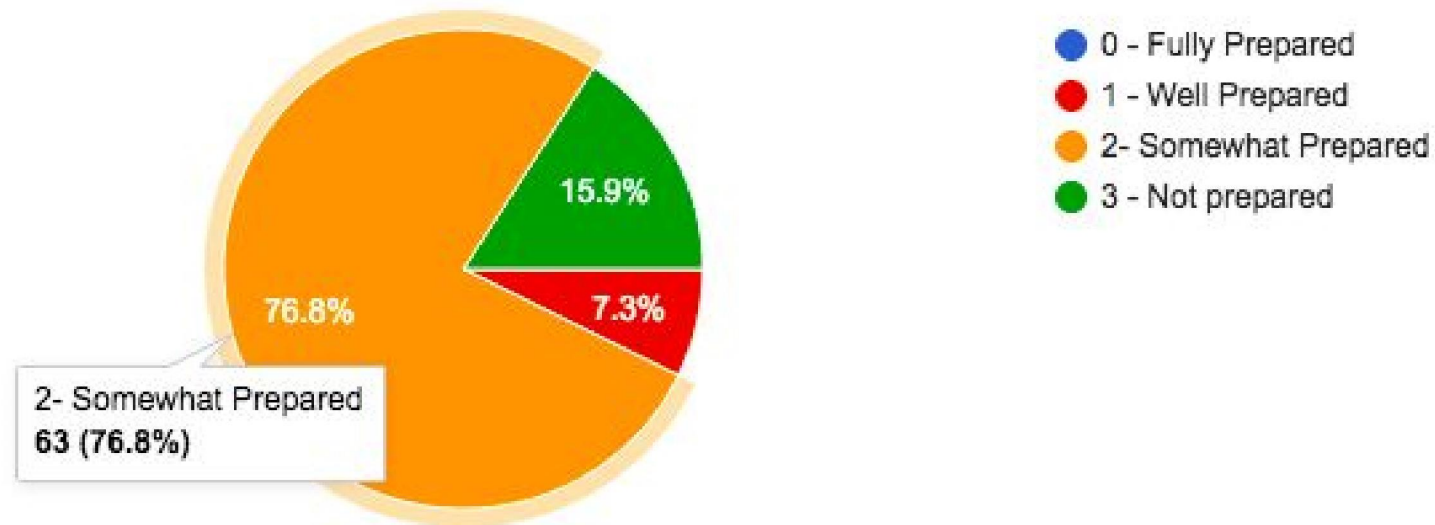


Earthquake



External Response: Capacity of the whole community to respond to impacts

82 responses



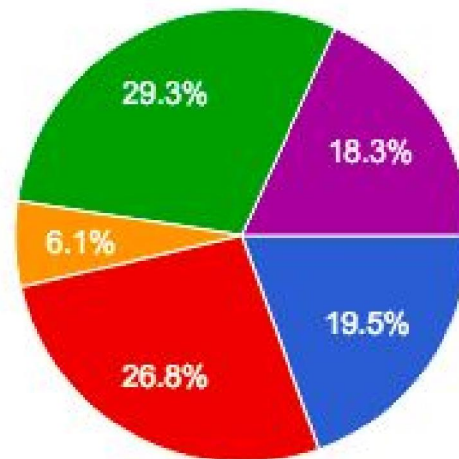
Heat Wave



EXTENDED HEAT WAVE

The likelihood this will occur on a scale of 1-5

82 responses



- 1 - Unknown but rare
- 2 - Unknown but anticipated/eventual
- 3 - One hundred years or less
- 4 - 25 years or less
- 5 - once per year or more

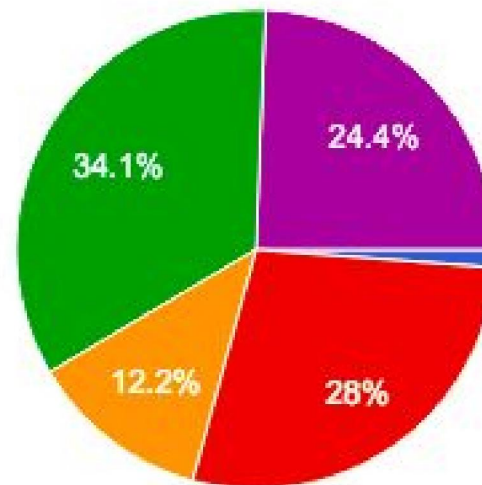
Fire



WILDFIRE/FOREST FIRE/URBAN INTERFACE

The likelihood this will occur on a scale of 1-5

82 responses



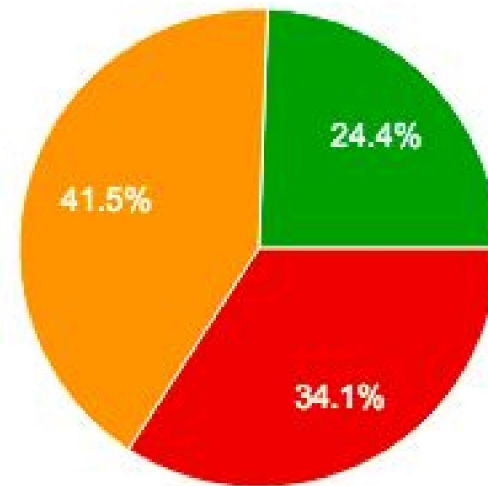
- 1 - Unknown but rare
- 2 - Unknown but anticipated/eventual
- 3 - One hundred years or less
- 4 - 25 years or less
- 5 - once per year or more

Fire



Human Impact: Possibility of Death or Injury?

82 responses



- 0 - No Impact
- 1 - Some Impact
- 2- Moderate Impact
- 3 - Catastrophic Impact