



Downtown Disaster – Can Yours Survive?!

Oregon Heritage Conference Workshop
The Mill Casino, North Bend, Oregon
April 22, 2015

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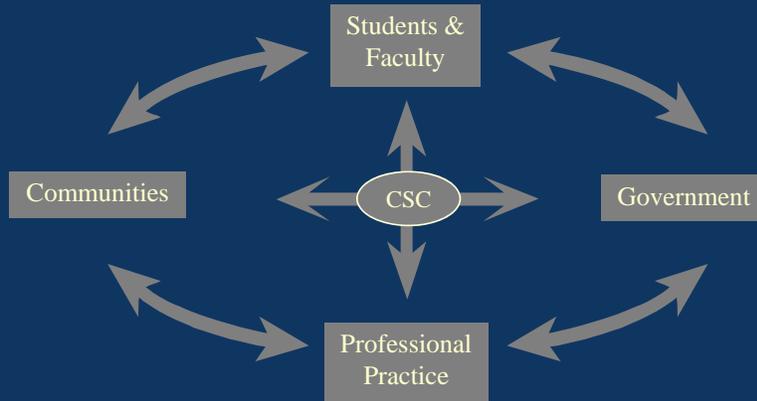


WORKSHOP GOALS

- ◆ Make the case for preparation and planning
 - ◆ Individual Businesses
 - ◆ Main Street / Business Districts
 - ◆ Historic Resource Stewards
- ◆ Introduce Resilience and Recovery Concepts
 - ◆ Economic Recovery Teams
- ◆ Present Risk Reduction Strategies
 - ◆ Hazard Mitigation
 - ◆ Damage and Safety Solutions
 - ◆ Resources and Tools



The **CSC** is an interdisciplinary organization that creates learning opportunities for students by providing planning and technical services to Oregon Communities



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THE CLASSROOM AND THE COMMUNITY

- ◆ The classroom provides a foundation for community-based learning
 - ◆ Analytical skills
 - ◆ Theory, history



The *community* provides the framework and motivation for learning

- Real problems
- Real people



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CSC PROGRAMS:

- ◆ Community Planning Workshop
- ◆ Resource Assistance to Rural Environments
- ◆ University Center for Economic Development
- ◆ Oregon Partnership for Disaster Resilience

<http://csc.uoregon.edu/>

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INTRODUCTIONS

- ◆ Name
- ◆ Community
- ◆ Business Connection
 - ◆ Owner, manager, employee, customer, supplier, chamber, association, NGO?
- ◆ What do you hope to learn today?

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WORKSHOP OUTLINE

- ◆ Context – Business, Disasters, and Resilience
- ◆ Before, During and After
- ◆ Resources and Tools



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SOBERING BUSINESS STATISTICS ...

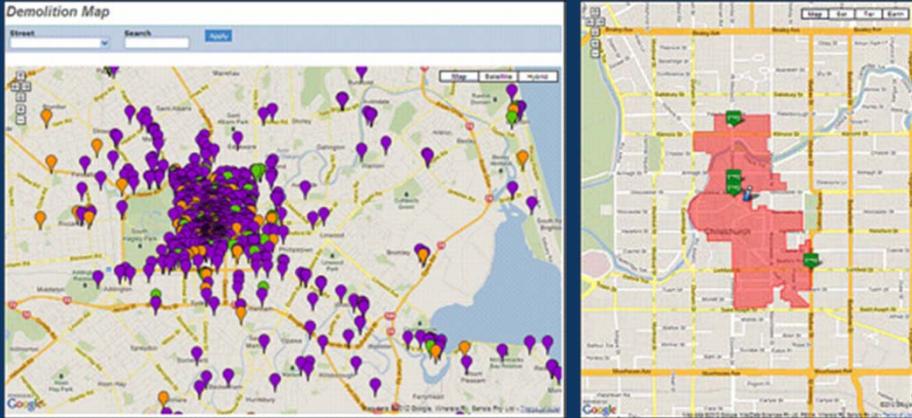
- ◆ 40% never reopen (FEMA)
- ◆ 25% failure rate within one year (FEMA)
- ◆ 90% failure rate after two years (US SBA)



Christchurch NZ,
2011 – The Central
Business District is
still closed today ...

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Demolition Map

Street Search People

Map Satellite Street View

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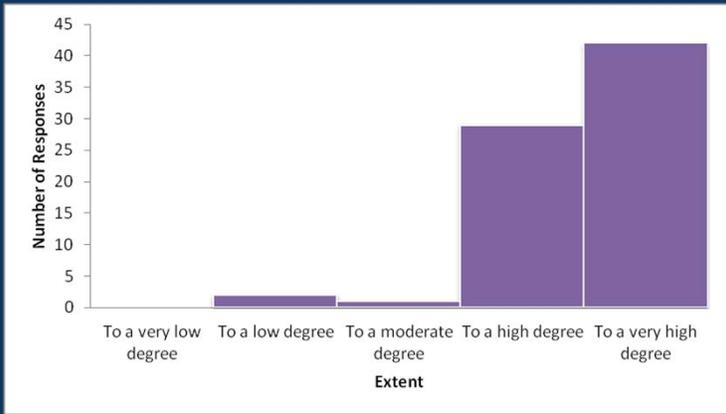


PARTNERSHIP FOR DISASTER RESILIENCE
CSC, COASTAL, ENGINEERING

OREGON SOUTH COAST SURVEY RESULTS

How high will the impact of a catastrophic event be to:

- ◆ Economic Systems



Extent	Number of Responses
To a very low degree	0
To a low degree	2
To a moderate degree	1
To a high degree	29
To a very high degree	42

Number of Responses

Extent

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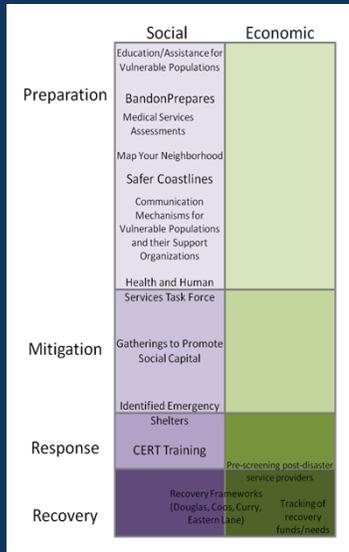


PARTNERSHIP FOR DISASTER RESILIENCE
CSC, COASTAL, ENGINEERING

WHY SOCIO-ECONOMIC RESILIENCE?

How much confidence do you have in the following entities regarding their ability to increase community resilience in your area?

Entity	Average Value
FEMA	5.52
National Non-Profits	5.84
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Local Government	6.27
Local Community Leaders	7.21
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Local Non-Profits	7.5
Your Neighbor	6.53
Your Self	8.12



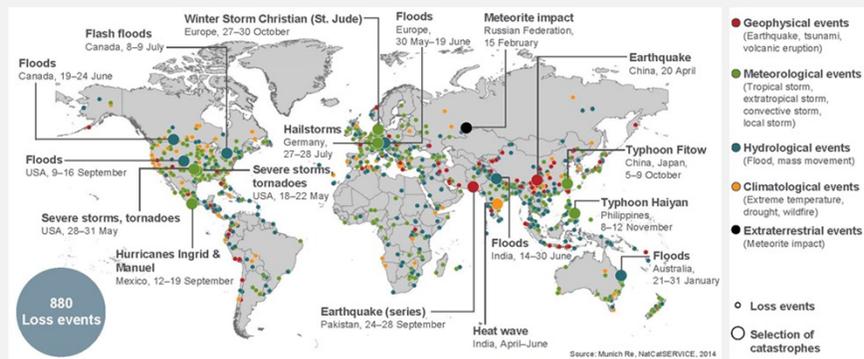
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2013 GLOBAL EVENTS

NatCatSERVICE

Loss events worldwide 2013 Geographical overview

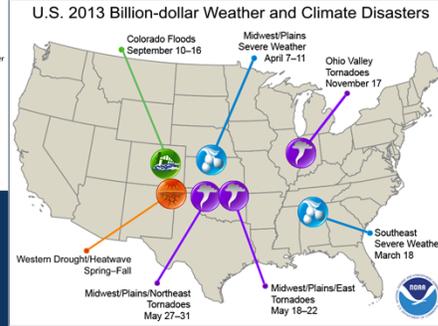
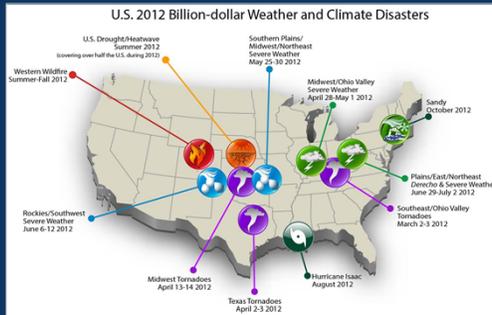


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2012 US BILLION + DISASTERS



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2013 US MAJOR DISASTER DECLARATIONS

- ◆ 62 Presidentially declared disasters
 - ◆ 17 Floods***
 - ◆ 14 Winter Storms
 - ◆ 16 Tornadoes/Strait-Line Windstorms
 - ◆ 7 Severe Storms (flooding, landslides, mudslides)
 - ◆ 4 Wildfires*** (+ 28 Assistance Declarations)
 - ◆ 1 Explosion
 - ◆ 1 Severe Freeze
 - ◆ 2 Hurricane Sandy



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OREGON NATURAL HAZARDS

- ◆ Coastal Erosion
- ◆ Drought
- ◆ Dust Storm
- ◆ Earthquake
- ◆ Wildfire
- ◆ Flood
- ◆ Landslide
- ◆ Tsunami
- ◆ Volcano
- ◆ Windstorm
- ◆ Winter storm

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29 OREGON DISASTER DECLARATIONS

Number	Date	Incident Description	Declaration Type
1036	8/2/1994	El Nino Effects (The Salmon Industry)	Major Disaster Declaration
1061	8/3/1995	Flash Flooding	Major Disaster Declaration
69	3/17/1957	FLOOD	Major Disaster Declaration
49	12/29/1955	FLOOD	Major Disaster Declaration
853	1/24/1990	Flooding, Severe Storm	Major Disaster Declaration
144	2/25/1963	FLOODS	Major Disaster Declaration
184	12/24/1964	Heavy Rains & Flooding	Major Disaster Declaration
1221	6/12/1998	Oregon Flooding	Major Disaster Declaration
136	10/16/1962	SEVERE STORMS	Major Disaster Declaration
319	1/21/1972	SEVERE STORMS, FLOODING	Major Disaster Declaration
1733	12/8/2007	Severe Storms, Flooding, Landslides, and Mudslides	Major Disaster Declaration
1672	12/29/2006	Severe Storms, Flooding, Landslides, and Mudslides	Major Disaster Declaration
1632	3/20/2006	Severe Storms, Flooding, Landslides, and Mudslides	Major Disaster Declaration
413	1/25/1974	SEVERE STORMS, SNOWMELT, FLOODING	Major Disaster Declaration
1099	2/9/1996	Severe Storms/Flooding	Major Disaster Declaration
1107	3/19/1996	Severe Storms/High Winds	Major Disaster Declaration
4169	4/4/2014	Severe Winter Storm	Major Disaster Declaration
1683	2/22/2007	Severe Winter Storm and Flooding	Major Disaster Declaration
4055	3/2/2012	Severe Winter Storm, Flooding, Landslides, and Mudslides	Major Disaster Declaration
1956	2/17/2011	Severe Winter Storm, Flooding, Landslides, Landslides, And Debris Flows	Major Disaster Declaration
1824	3/2/2009	Severe Winter Storm, Record and Near Record Snow, Landslides, and Mudslides	Major Disaster Declaration
1510	2/19/2004	Severe Winter Storms	Major Disaster Declaration
1160	1/23/1997	Severe Winter Storms/Flooding	Major Disaster Declaration
1405	3/12/2002	Severe Winter Windstorm with High Winds	Major Disaster Declaration
60	7/20/1956	STORM, FLOOD	Major Disaster Declaration
301	2/13/1971	STORMS, FLOODING	Major Disaster Declaration
985	4/26/1993	Earthquake	Major Disaster Declaration
1004	10/15/1993	Earthquakes	Major Disaster Declaration
1964	3/25/2011	Tsunami Wave Surge	Major Disaster Declaration

Floods and Severe Storms

Earthquake
Distant Tsunami

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OR FIRE MANAGEMENT ASSISTANCE

Number	Date	Incident Description	Declaration Type
5050	6/2/2014	Twin Oaks Fire	Fire Management Assistance Declaration
5048	8/18/2013	Governments Flats Fire Complex	Fire Management Assistance Declaration
5039	8/2/2013	Brimstone Fire	Fire Management Assistance Declaration
5037	7/18/2013	Onagala Fire Complex	Fire Management Assistance Declaration
5036	7/16/2013	Four Mile Fire	Fire Management Assistance Declaration
4818	9/22/2009	South County Fire Complex	Fire Management Assistance Declaration
4820	8/16/2009	Millcreek Fire	Fire Management Assistance Declaration
4787	9/17/2008	Noyce Butte Fire	Fire Management Assistance Declaration
4771	9/2/2007	OW Fire	Fire Management Assistance Declaration
4712	11/2/2007	Sage Fire Complex	Fire Management Assistance Declaration
4659	7/27/2006	Mask Crater Fire	Fire Management Assistance Declaration
4657	7/25/2006	Palmer Gulch Fire Complex	Fire Management Assistance Declaration
4575	8/2/2005	Clear Creek	Fire Management Assistance Declaration
3549	8/21/2004	Ward Mountain #2 Fire	Fire Management Assistance Declaration
3239	8/4/2004	Subsided Highway Fire	Fire Management Assistance Declaration
2490	8/6/2003	Cove Road Fire	Fire Management Assistance Declaration
2485	9/2/2003	Herman Creek Fire	Fire Management Assistance Declaration
2493	8/20/2003	South Fire	Fire Management Assistance Declaration
3451	7/19/2002	Cache Mountain Fire	Fire Management Assistance Declaration
2454	7/18/2002	Indian Hill Fire	Fire Management Assistance Declaration
2453	7/18/2002	Flavence Fire	Fire Management Assistance Declaration
2452	7/16/2002	Sheldon Ridge Fire	Fire Management Assistance Declaration
2448	11/10/2002	Magnum Fire	Fire Management Assistance Declaration
2445	7/17/2002	Sage Peak Fire	Fire Management Assistance Declaration
2444	7/16/2002	Winter Fire	Fire Management Assistance Declaration
2443	7/16/2002	Barley Fire	Fire Management Assistance Declaration
2382	8/17/2001	Monument Fire Complex	Fire Management Assistance Declaration
2275	8/15/2001	Bridge Creek Fire	Fire Management Assistance Declaration
2145	8/24/1996	Northwest Creek Fire	Fire Management Assistance Declaration
2137	8/23/1996	Whiskey Fire	Fire Management Assistance Declaration
2122	8/24/1984	Hill Mountain Fire	Fire Management Assistance Declaration
2083	8/4/1982	East Davis Creek Fire	Fire Management Assistance Declaration
2084	8/4/1982	Love Fire Fire	Fire Management Assistance Declaration
2082	8/1/1982	Round Lake Fire	Fire Management Assistance Declaration
2081	8/9/1982	Sage Flats Fire	Fire Management Assistance Declaration
2075	8/2/1980	Adrian Hill Fire	Fire Management Assistance Declaration
2050	8/26/1968	Walker Mountain Fire	Fire Management Assistance Declaration
2056	10/10/1987	Shady Lane Fire	Fire Management Assistance Declaration
2062	8/2/1987	Truman Creek Fire	Fire Management Assistance Declaration
2063	8/2/1987	Savage Creek Fire	Fire Management Assistance Declaration
2064	9/23/1987	Salem Creek Fire	Fire Management Assistance Declaration
2060	7/16/1987	Wood Mountain Fire	Fire Management Assistance Declaration
2048	8/27/1984	La Pine/Wagon Butte Fire	Fire Management Assistance Declaration
2043	8/15/1981	Neacum Peak	Fire Management Assistance Declaration
2041	7/29/1981	Round Lake Fire	Fire Management Assistance Declaration
2038	8/30/1979	Pine Grove Fire	Fire Management Assistance Declaration
2035	7/26/1979	Silver Fire	Fire Management Assistance Declaration
2034	7/25/1979	St. Ridge Creek Fire	Fire Management Assistance Declaration
2036	8/13/1978	Grave Creek Fire	Fire Management Assistance Declaration
2014	9/7/1973	Millcreek Fire	Fire Management Assistance Declaration
2011	8/4/1973	Clear Creek Fire	Fire Management Assistance Declaration
2012	8/20/1973	Onagala Fire Fire	Fire Management Assistance Declaration
2010	8/18/1973	Rocky Creek Fire	Fire Management Assistance Declaration
2008	8/27/1973	Perry Canyon Fire	Fire Management Assistance Declaration

2013 + 2014

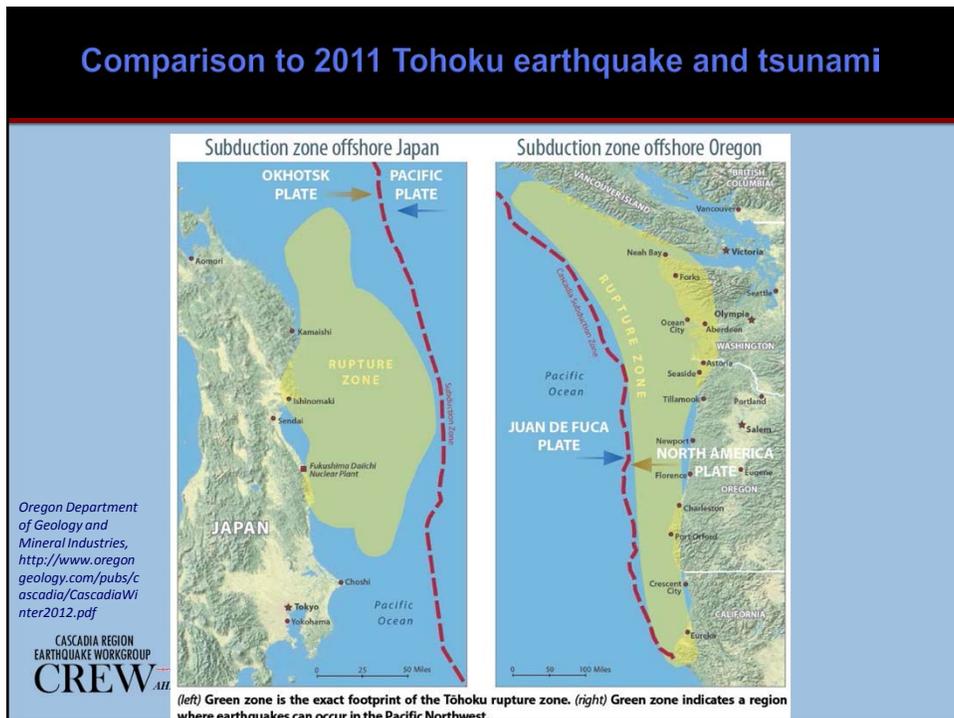
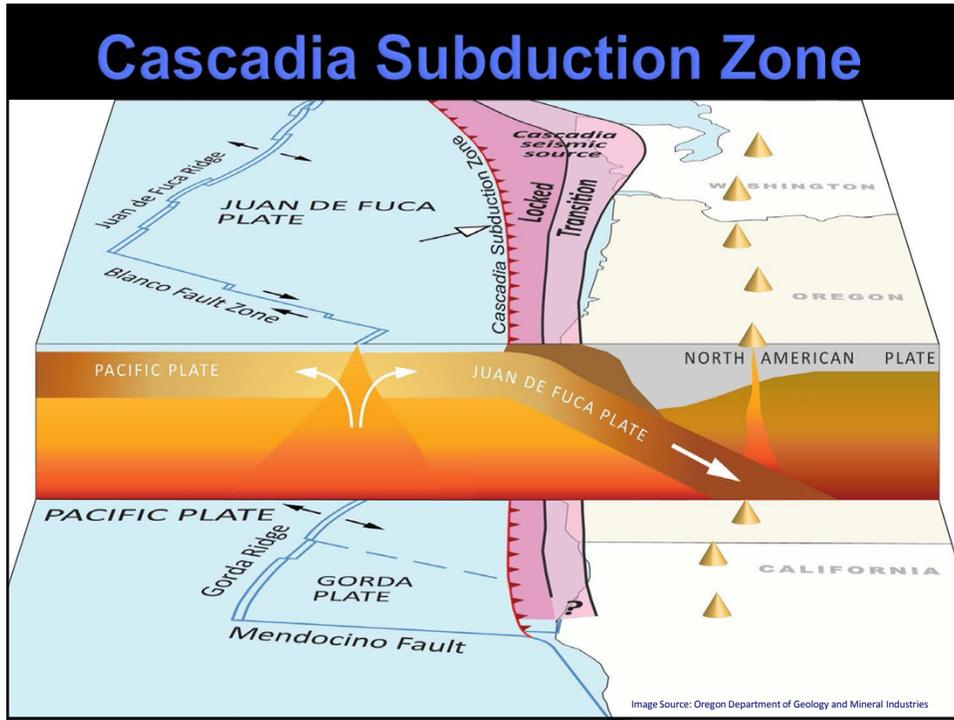
2000s (23)

'70s, 80's & '90s (26)

... 54 additional fire management assistance declarations, so far ...

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Physical Changes during CSZ Earthquake



Tsunami

- 15-30 minutes after ground shaking
- Multiple waves
- Variable wave heights



2011 Tohoku earthquake and tsunami
M9.0 earthquake
~18,000 deaths

Image: Associated Press via New York Times

Building Impacts



PhotoSource: CBSA, Ross Blocker



Source: University of Washington, National Earthquake Clearinghouse



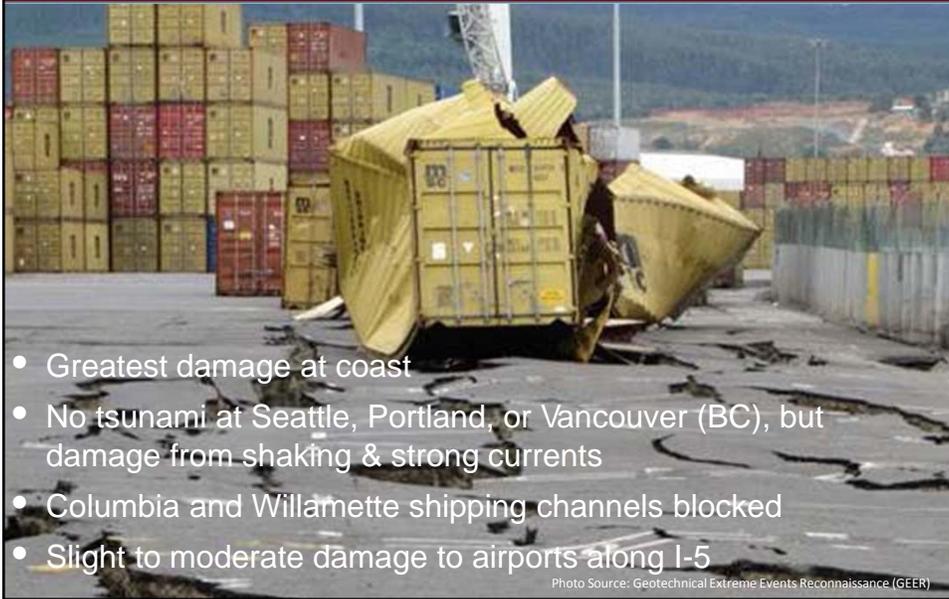
Impacts to Transportation Networks

- 19 bridges on Oregon's Interstate 5 heavily damaged
- 56 of 135 bridges on U.S. Hwy 101 in Oregon collapse
- Disrupted rail service due to bridge damage (Portland, Olympia, Seattle)



Photo by GW Thorsen, Washington Division of Geology and Earth Resources.

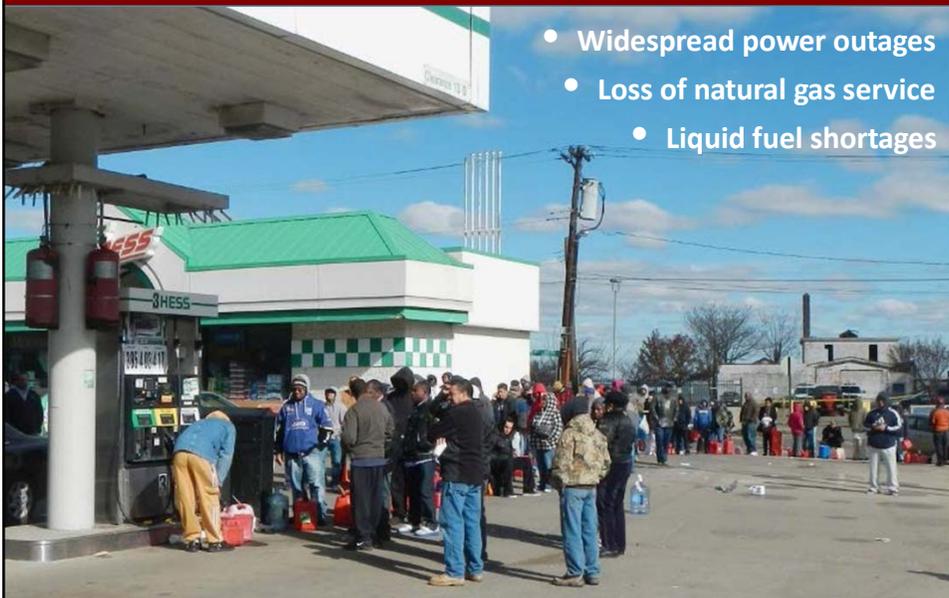
Ports, Shipping Channels, and Airports



- Greatest damage at coast
- No tsunami at Seattle, Portland, or Vancouver (BC), but damage from shaking & strong currents
- Columbia and Willamette shipping channels blocked
- Slight to moderate damage to airports along I-5

Photo Source: Geotechnical Extreme Events Reconnaissance (GEER)

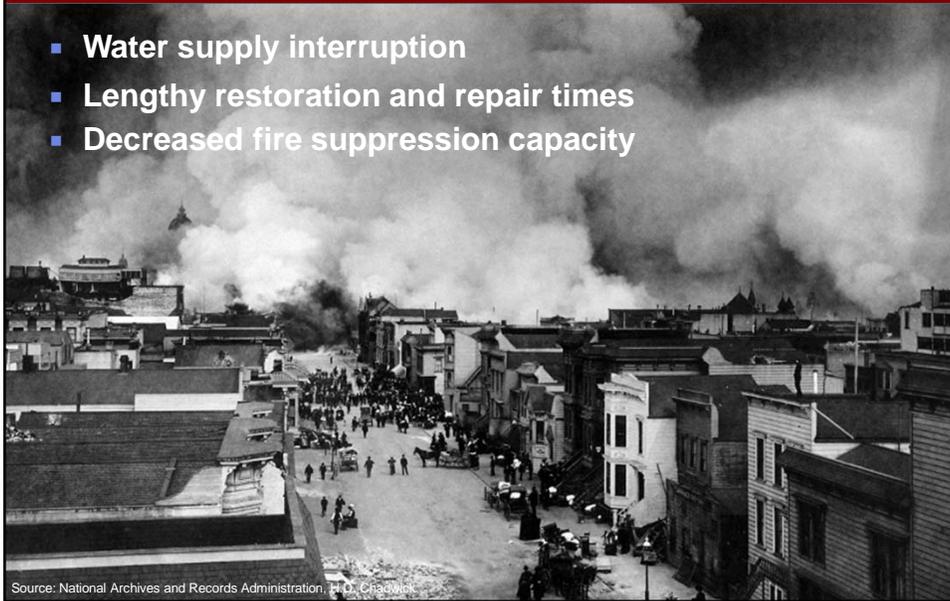
Electricity, Natural Gas, Liquid Fuel



- Widespread power outages
- Loss of natural gas service
- Liquid fuel shortages

Water Systems

- Water supply interruption
- Lengthy restoration and repair times
- Decreased fire suppression capacity



Source: National Archives and Records Administration, F.D. Croshaw

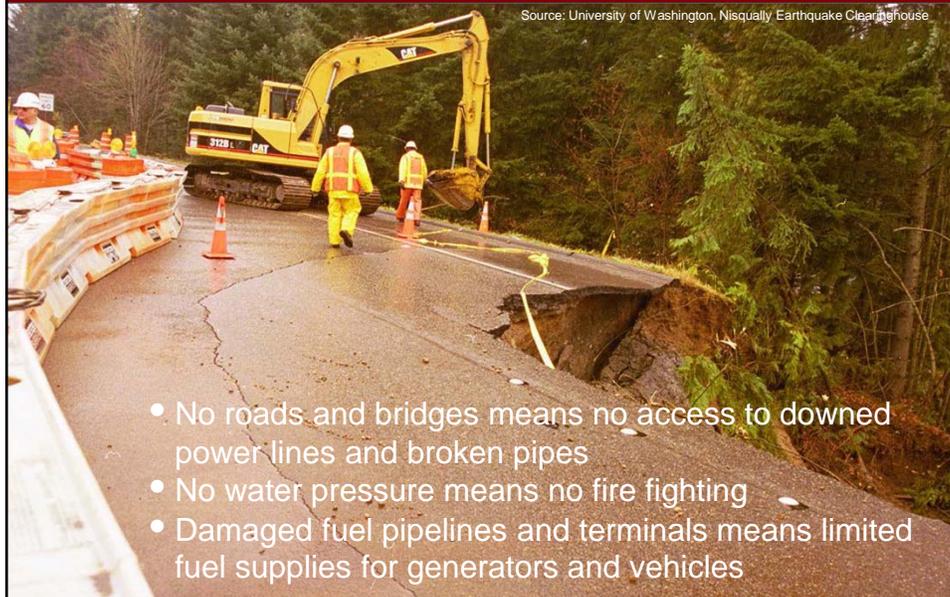
Communication Networks

- Landline & wireless
 - Broken cables
 - Equipment failures and structural damage
 - Power outages
 - Jamming
- Undersea transpacific cables severed



Source: FM News 101KXL

Interdependence of Infrastructure



Displaced Populations



Impacts in Eastern Oregon



- Staging for emergency response
- Wells may go dry
- Influx of hospital patients
- Transfer of administrative functions
- Disruption of business supply chains

Image – Bloomberg Business Week

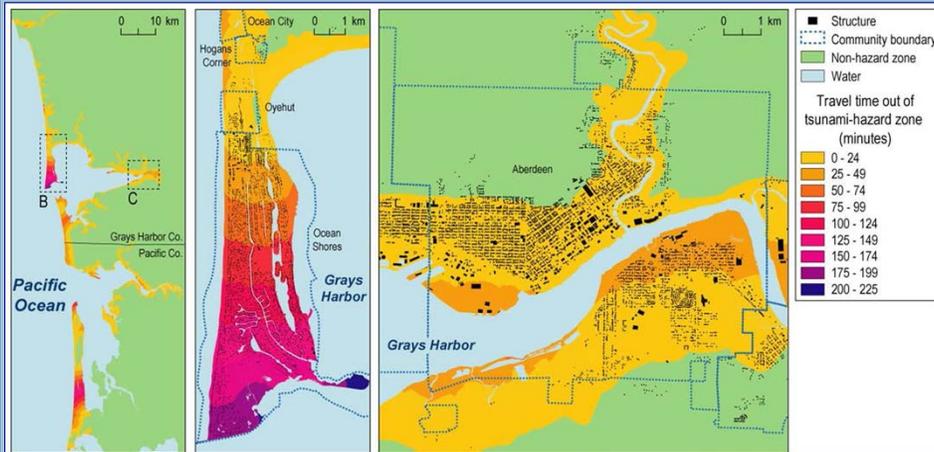
Potential Earthquake Losses

- >30,000 injuries
- >10,000 fatalities
- >\$80 billion in losses



Photo Source: NOAA/NGDC, Shunichi Koshimura

Loss of Life and Injuries in Tsunami Impact Zones



Wood and Schmidlein, 2013



Surviving Disaster – Building a Resilient Downtown!

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What is Resilience?



The ability to anticipate, absorb, adapt to, and recover from disruptions

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Anticipate



Absorb



Adapt



Recover

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Current Resilience Gap

Business can only tolerate two to four weeks of disruption of essential services

Critical Service	Zone	Estimated Time to Restore Service
Electricity	Valley	1 to 3 months
Electricity	Coast	3 to 6 months
Police and fire stations	Valley	2 to 4 months
Drinking water and sewer	Valley	1 month to 1 year
Drinking water and sewer	Coast	1 to 3 years
Top-priority highways (partial restoration)	Valley	6 to 12 months
Healthcare facilities	Valley	18 months
Healthcare facilities	Coast	3 years

ORP Definition of Resilience



(Yumei Wang)

- ◆ **Resilience:** Save lives, Reduce Losses, Speed Recovery, & Rebuild Better
- ◆ Sustainability without **Resilience** is NOT sustainable!
- ◆ Vital communities are **Resilient** communities.

How do you achieve Resilience?

Stockholm Resilience Center - Seven Principles:

- ◆ Maintain diversity and redundancy
- ◆ Manage connectivity
- ◆ Manage slow variables and feedback loops
- ◆ Foster complex, adaptive systems thinking
- ◆ Broaden participation
- ◆ Encourage learning
- ◆ Promote polycentric governance systems

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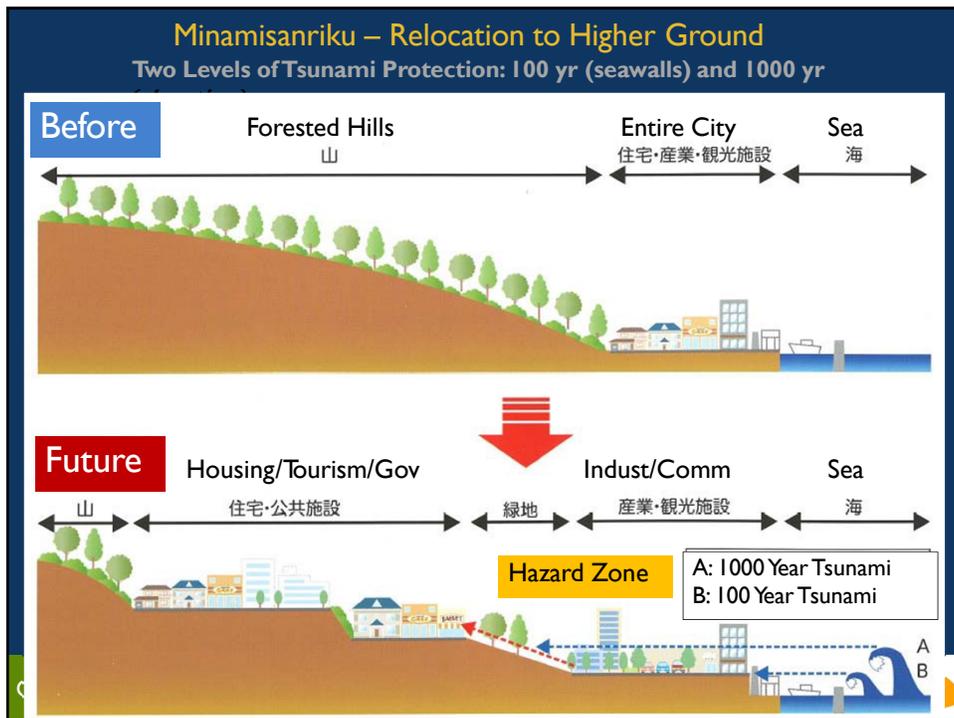
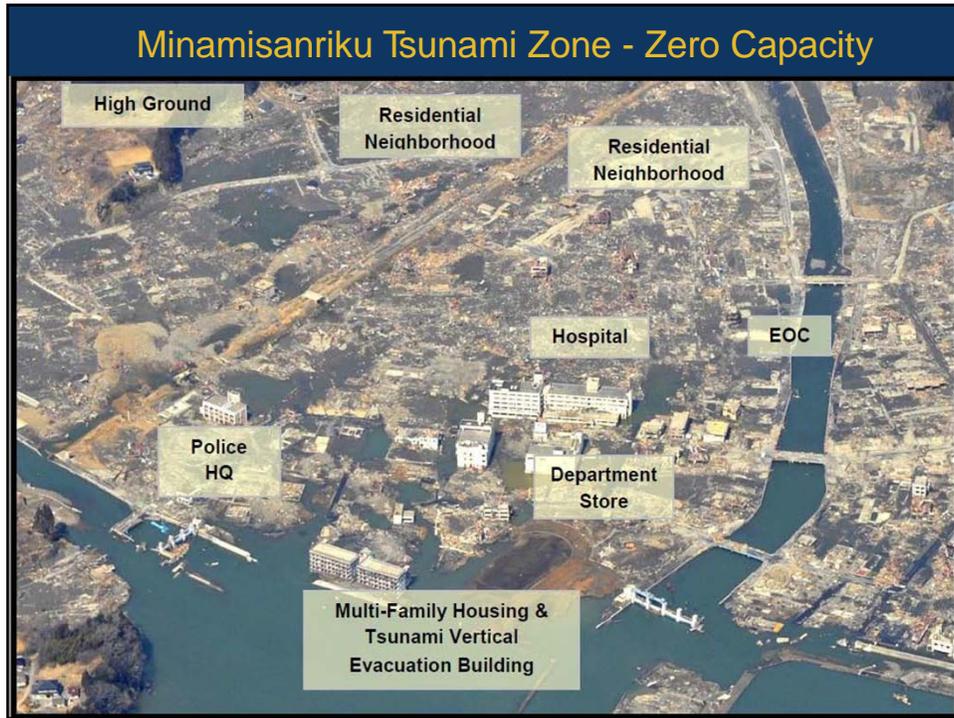
Diversity and Redundancy

Keep your options open ...



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Connectivity

Make friends with different kinds of folks...



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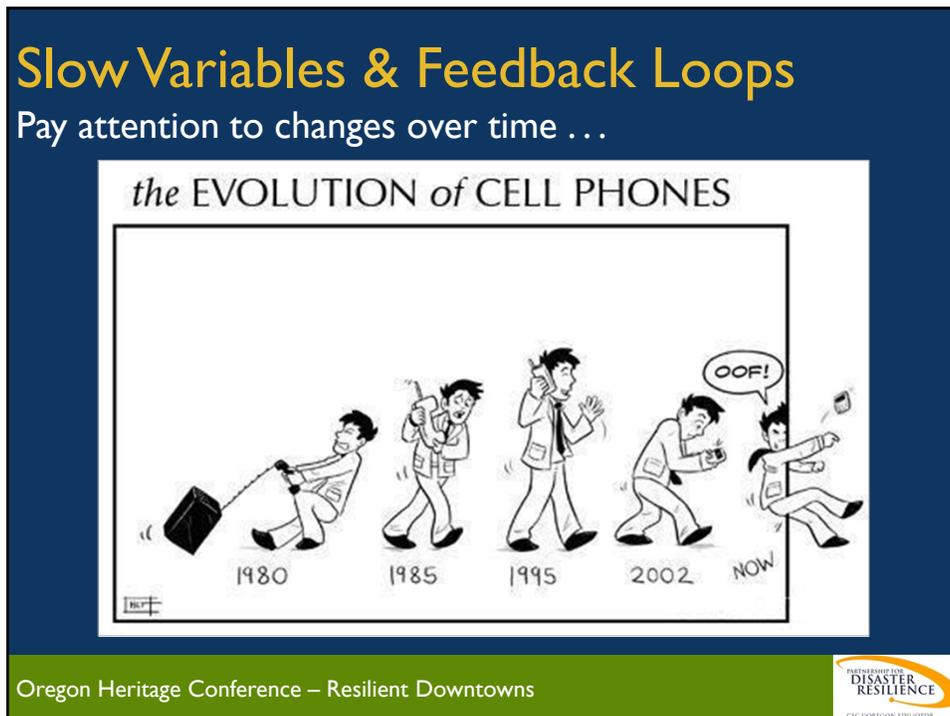
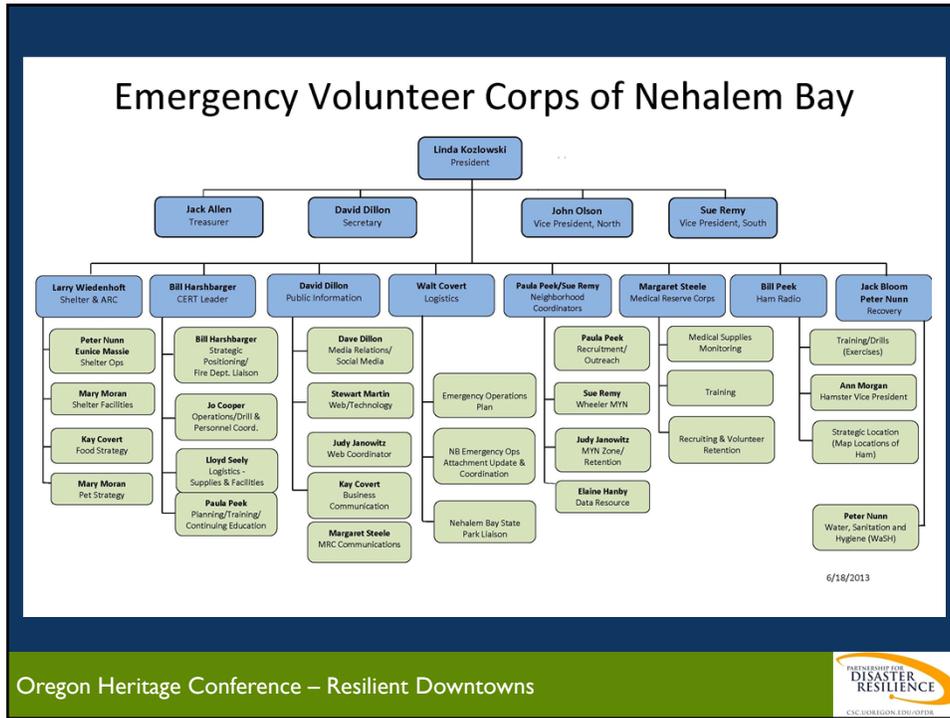
TFFF Socio-Economic Resilience Survey

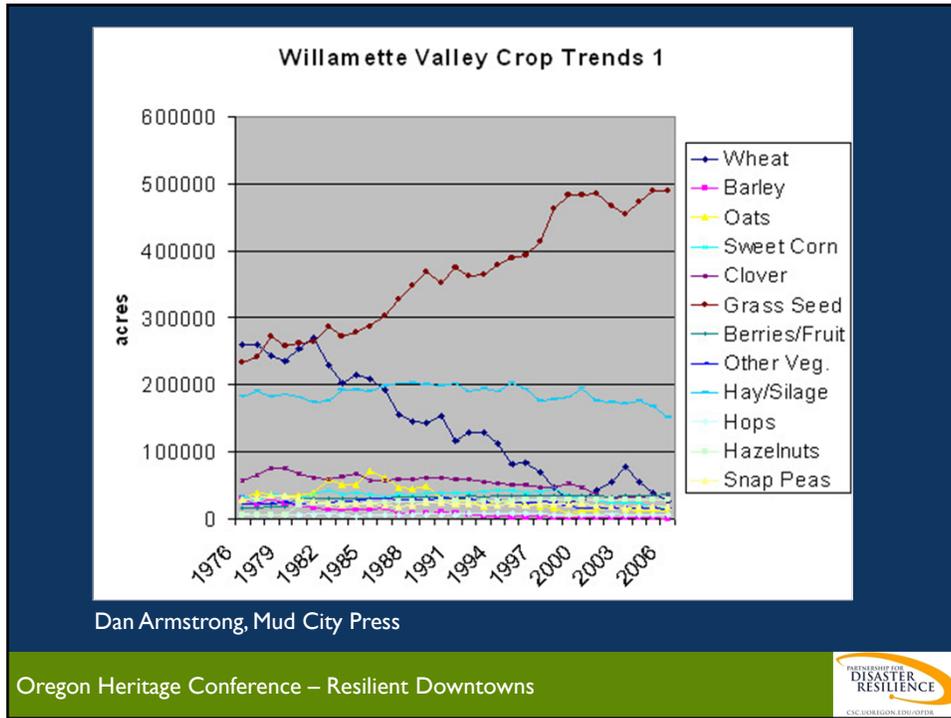
How much confidence do you have in the following entities regarding their ability to increase community resilience in your area?

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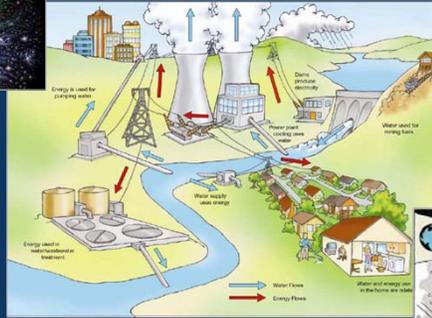






Complex systems thinking

Systems, interdependencies and uncertainties matter . . .



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Lifeline Interdependencies

Interdependencies will make disaster recovery much more difficult. The earthquake will damage all systems at the same time.

To restore electric service, you need to reopen roads



To restore water service, you need electricity

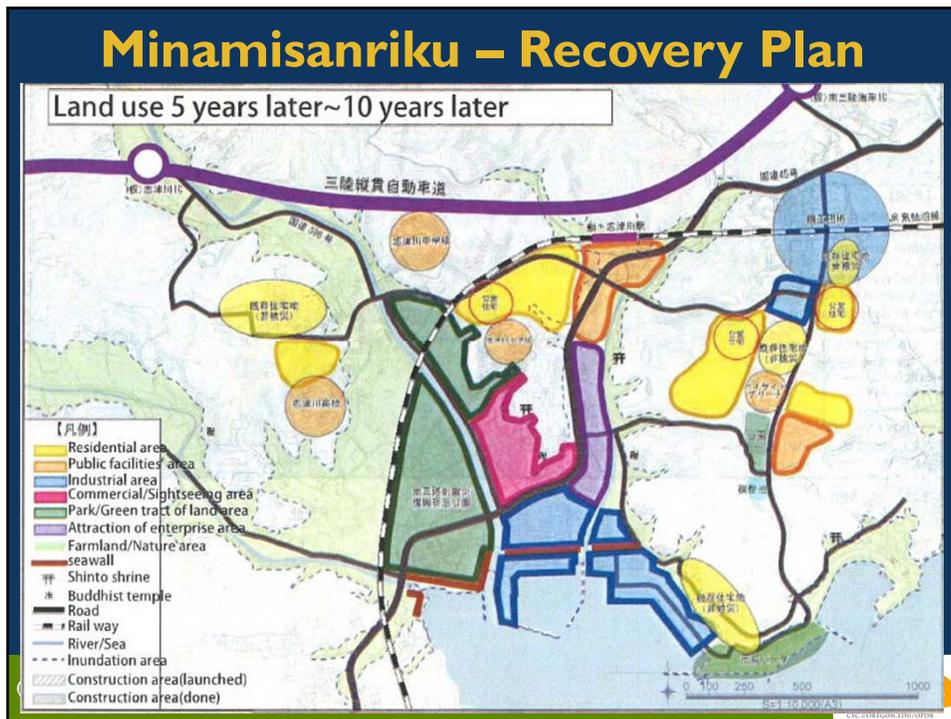


To restore fuel supplies you need electricity



To reopen roads, you need to restore fuel supplies





Broaden Participation

Expand the depth and diversity of engagement . . .



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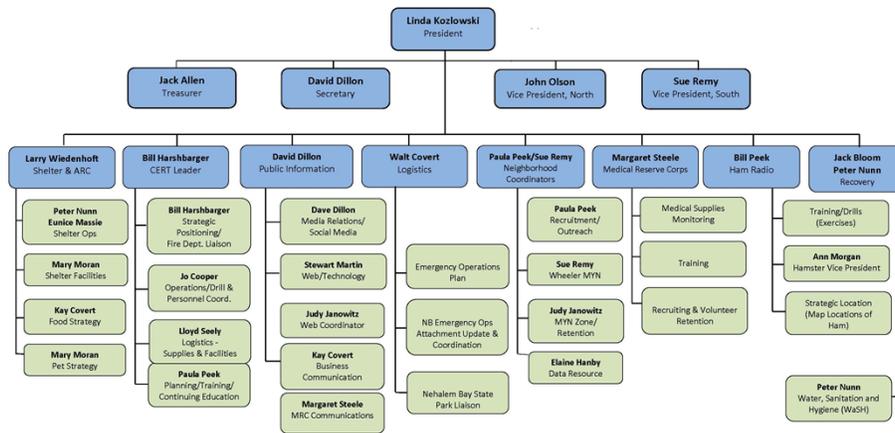
“If a variety of people participate, from a diversity of backgrounds and perspectives, it can uncover perspectives that may not be acquired through more traditional scientific processes.”



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Emergency Volunteer Corps of Nehalem Bay



6/18/2013

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SUCCESS STORIES

- ◆ **Soldiers Grove, Wisconsin**
 - ◆ Repeated flooding
 - ◆ Rebuilt town center on higher grounds
 - ◆ Sustainable development ordinances passed
 - ◆ [Link to flood history/relocation](#)

- ◆ **Darlington, Wisconsin**
 - ◆ Repeated flooding
 - ◆ Historic rehabilitation with innovative floodproofing techniques
 - ◆ [Link to success story summary](#)



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SUCCESS STORIES

- ◆ **Greensburg, Kansas**
 - ◆ Tornado leveled 95% of town
 - ◆ Resolution passed stating that all city buildings would be built to LEED - platinum standards
 - ◆ Rebuilding as a “green town”



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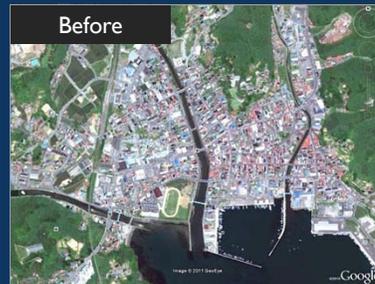
BREAK

- ◆ Please stand up, stretch, and take some deep breaths!
- ◆ We will reconvene in five minutes ...



OUTLINE

- ◆ Context – Business, Disasters, and Resilience
- ◆ Before, During and After
- ◆ Resources and Tools



MINAMISANRIKU RECOVERY VISION



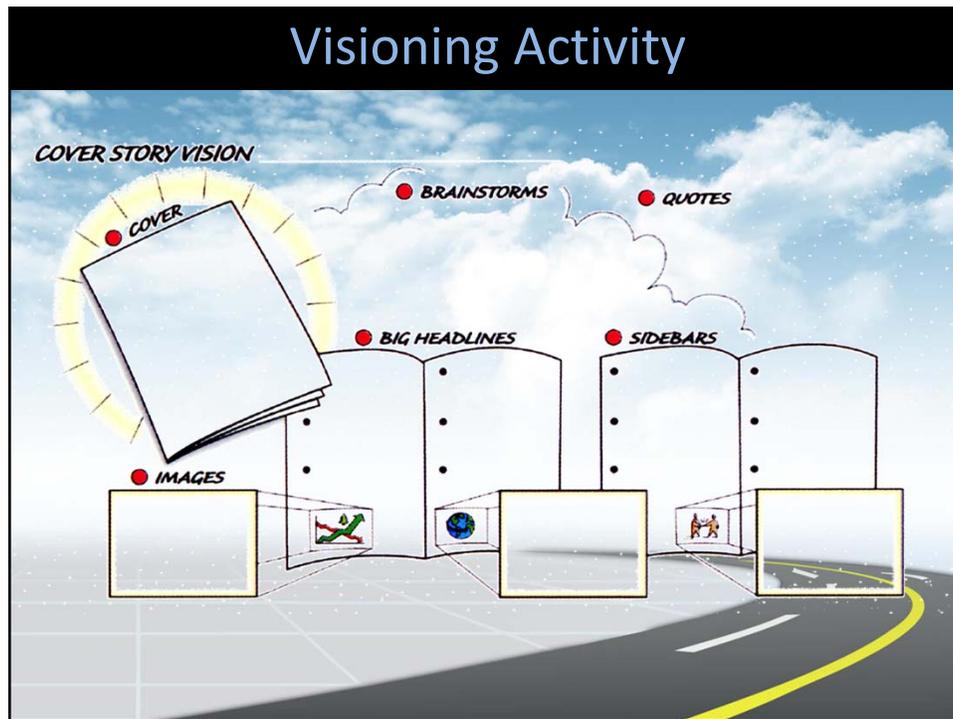
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Re:Start Mall

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EXERCISE: RECOVERY HEADLINE

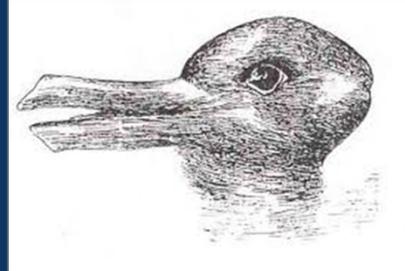
- ◆ Working with a partner, please consider ...
- ◆ Your main street or central business district is impacted by a disaster.
- ◆ What is the headline on your local paper ...

One year after the event?

Five years after the event?

OUTLINE

- ◆ Context – Business and Disasters
- ◆ **Before, During and After**
- ◆ Resources and Tools



Community Ambassador Summit, Gleneden Beach, OR June 22, 2014



BEFORE – PREPARATION AND PRACTICE

- ◆ Business Capacity Assessment
 - ◆ How long can businesses last?
 - ◆ What would you do without your people?
 - ◆ What would you do without your place?
 - ◆ What would you do without your things?



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BEFORE – PREPARATION AND PRACTICE

- ◆ Catalogue Business Services and Assets
 - ◆ Pre-disaster business registry
 - ◆ Pre-approval for service
 - ◆ Establish local contracts pre-event
 - ◆ Adopt policy that gives preference to local businesses
 - ◆ Identify equipment, tools, resources



The "Farmy Army" post earthquake
Christchurch, NZ

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BEFORE – PREPARATION AND PRACTICE

- ◆ ID At Risk Businesses
 - ◆ Where are businesses located?
 - ◆ Floodplain, inundation zone, wildfire, earthquake
 - ◆ How old are the buildings?
 - ◆ Building codes change over time
 - ◆ What are the buildings made of?



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BEFORE – PREPARATION AND PRACTICE

- ◆ Mitigate Business Risks
 - ◆ Structural
 - ◆ Relocation, retrofit, elevation, energy efficiency
 - ◆ Non-Structural
 - ◆ Equipment elevation / anchoring
 - ◆ Furniture, fixtures, inventory
 - ◆ Continuity of Business / Continuity of Operations
 - ◆ Data, material supply, distribution, etc.



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BEFORE – PREPARATION AND PRACTICE

- ◆ Workforce Retention Strategy
 - ◆ Employee preparedness programs
 - ◆ Home preparedness
 - ◆ Train, Practice, Exercise



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BEFORE – PREPARATION AND PRACTICE

- ◆ Understand Post-Disaster Recovery Funds
 - ◆ How long? Paperwork? Match? Volunteer Tracking?
- ◆ Post-Disaster Economy Forecasting
 - ◆ Community Economic Development Strategy
- ◆ Business Involvement in Community Emergency Response Teams (CERT)
 - ◆ Train and encourage participation in CERT model
- ◆ Locally administered Small Business Disaster Recovery Loan Funds?

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EXERCISE: ESTABLISH A TEAM

- ◆ Work in groups of three to five:

You have been appointed to a subcommittee tasked with convening an Economy and Recovery Finance Working Group. The group will be responsible for organizing the business community pre-event and assisting with business recovery post-event.

- ◆ How big is the group?
- ◆ Who needs to be represented?
- ◆ How do you maintain it over time?

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DURING – GAME DAY ...

- ◆ #1 - Protect Lives and Key Assets
 - ◆ Evacuate, Fight, Defend
 - ◆ Approach will depend on disaster type ...

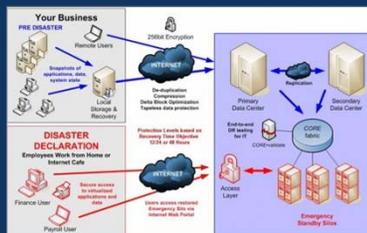


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DURING – GAME DAY ...

- ◆ Implement Disaster Response Protocol
 - ◆ People, Place, Things
- ◆ Mobilize Available Resources
 - ◆ Access Off-Site Back Ups, Notify Insurer(s), Equipment
- ◆ Assist Business Network



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EXERCISE: MESSAGING

- ◆ Working individually:

If your Main Street or Central Business District needed to communicate one thing during a disaster (1) what would it be? and (2) who would it be directed to?

- ◆ Consider:

- ◆ Employees
- ◆ Customers
- ◆ Tourists
- ◆ Shareholders
- ◆ Business Owners
- ◆ Suppliers
- ◆ Others?

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BREAK

- ◆ Please stand up, stretch, and take some deep breaths!
- ◆ We will reconvene in five minutes ...

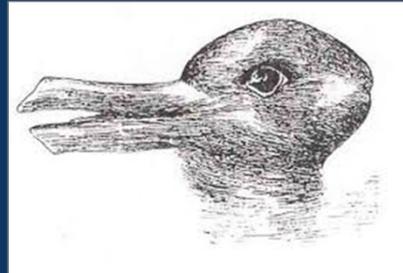


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OUTLINE

- ◆ Context – Business and Disasters
- ◆ **Before, During and After**
- ◆ Resources and Tools



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AFTER – RESTORATION & RECOVERY

- ◆ Implement (or develop) revitalization strategy
 - ◆ Vision, goals, objectives, timeline
 - ◆ Develop temporary and long-term strategies
- ◆ Identify, evaluate and prioritize projects
 - ◆ Historic rehab? Business district? Infrastructure? Business relocation?
- ◆ [Re]develop historic, recreational & tourist attractions



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AFTER – RESTORATION & RECOVERY

- ◆ Establish a Business Recovery Center
 - ◆ Technical assistance, information and support
 - ◆ Identify flexible transition spaces for businesses
- ◆ Convene Economy and Recovery Finance Group
- ◆ Implement grant management and in-kind tracking
 - ◆ NGO? Business? Government office?
- ◆ Inventory and Promote Local Funding
 - ◆ Loans, Grants, Donations

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KEY BUSINESS STRATEGIES SUMMARY

- ◆ Inventory local businesses capable of providing services, material, and equipment needed in the event of a catastrophe.
- ◆ Coordinate with local chambers of commerce and community development agencies:
 - ◆ Form a business recovery subcommittee
 - ◆ Establish a business recovery center that can stand up within the Recovery Operations Center framework following a disaster
- ◆ Develop and implement a business communication and outreach plan, prior to a disaster, to inform local businesses about the need for recovery planning.

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KEY BUSINESS STRATEGIES SUMMARY

- ◆ Develop, test and implement continuity of operation and continuity of government plans.
- ◆ Establish a process to solicit, pre-approve and contract with local businesses, contractors and vendors for services, materials and equipment following a disaster.
- ◆ Encourage businesses to develop, test and implement business continuity plans.
- ◆ In cooperation with large employers, business clusters, or dense commercial areas located within hazard zones, develop strategy to harden, elevate, re-locate or otherwise mitigate / prevent damage from natural hazards.

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Community Ambassador Summit, Gleneden Beach, OR June 22, 2014



RESOURCES – GENERAL BUSINESS

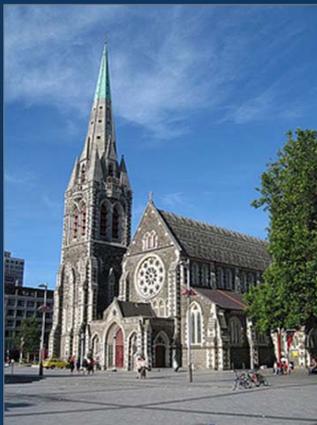
- ◆ Institute for Business and Home Safety (IBHS)
 - ◆ Open For Business - Small Business Tool Kit
 - ◆ Fortified for Safer Business – Voluntary Building Code

- ◆ Federal Emergency Management Agency (FEMA)
 - ◆ General Information – www.fema.gov/private-sector
 - ◆ Tools for Business e.g. COOP - www.ready.gov/business
 - ◆ Small Business Resource – www.fema.gov/small-business-toolkit

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Christchurch NZ Cathedral



Before



After

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RESOURCES – HISTORIC

- ◆ Federal Emergency Management Agency (FEMA)
 - ◆ [General Information](#) (policy, guidance, etc.)
- ◆ Preservation Leadership Forum
 - ◆ [Preparing for Climate Change Reading List](#)
- ◆ National Trust for Historic Preservation
 - ◆ [General Main Street Preparation Articles](#)
 - ◆ [Flood Response for Historic Buildings](#)
- ◆ Heritage Preservation – National Institute for Conservation
 - ◆ [Resources for Response and Recovery](#)

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Thank You!

