

Communicating Cascadia's Earthquake Risk

Earthquake Preparedness & Response: Science to Action

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Additional material from Yumei Wang, Jay Wilson, others



Objectives

- **Describe the role of geoscience in geohazard policy**
- **Demonstrate specific applications at state and local levels**



House Resolution 3 (2011)

76th OREGON LEGISLATIVE ASSEMBLY--2011 Regular Session

Enrolled

House Resolution 3

Sponsored by Representative BOONE; Representatives COWAN, KRIEGER, ROBLAN, WITT, Senators COURTNEY, JOHNSON, KRUSE, VERGER, WHITSETT

Directed (OSSPAC) to “lead and coordinate preparation of an Oregon Resilience Plan that . . . makes recommendations on policy direction to *protect lives and keep commerce flowing during and after a Cascadia (megathrust) earthquake and tsunami.*”



Oregon Resilience Plan (ORP)

The Oregon Resilience Plan

Reducing Risk and Improving Recovery
for the Next Cascadia Earthquake and Tsunami

Report to the
77th Legislative Assembly

from
Oregon Seismic Safety Policy
Advisory Commission (OSSPAC)



Salem, Oregon
February 2013

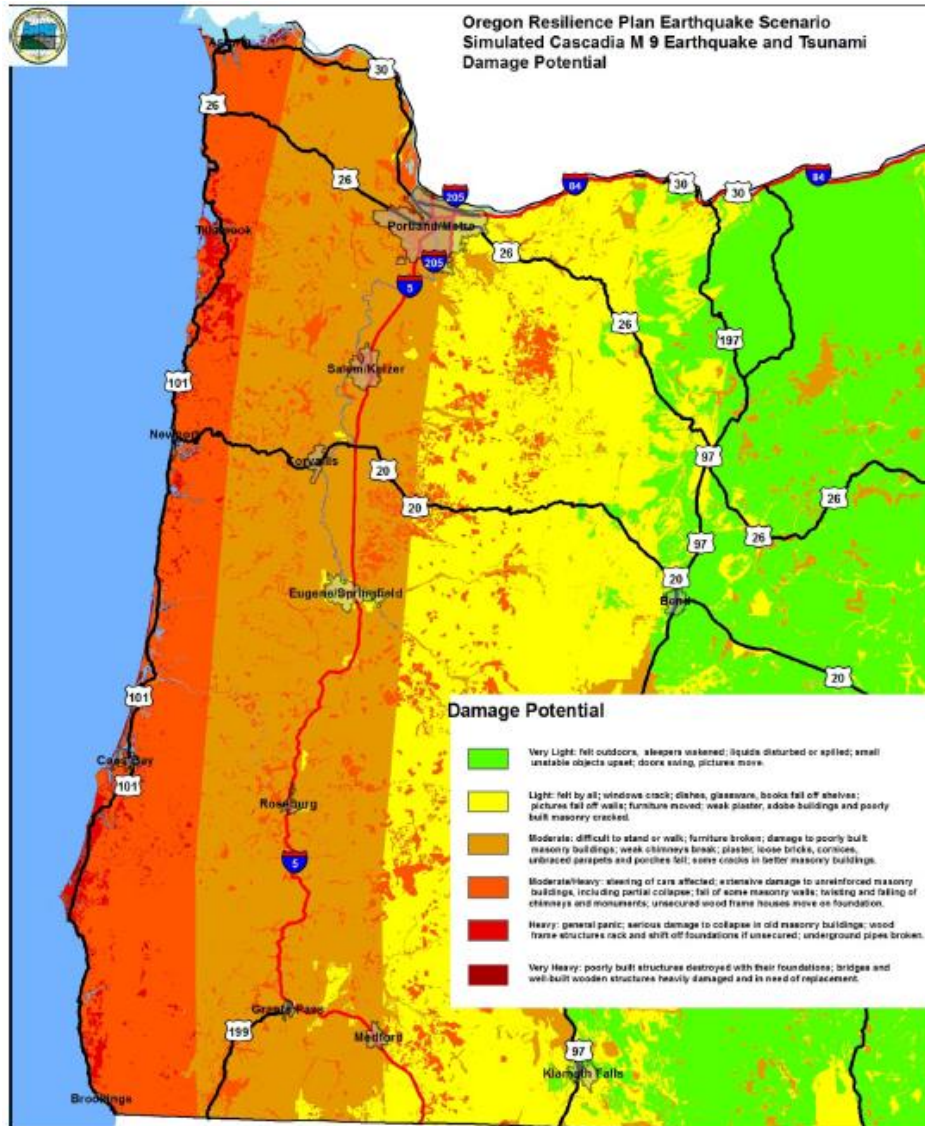
50-year Comprehensive Plan

- Save Lives
- Protect our Economy
- Preserve our Communities

- 169 volunteers
- \$0 Funding
- One-year Schedule



Strong Shaking and Tsunami





Liquefaction



Wikimedia Commons: Martin Luff



Chile, 2/27/10: weak soils (Y. Wang)





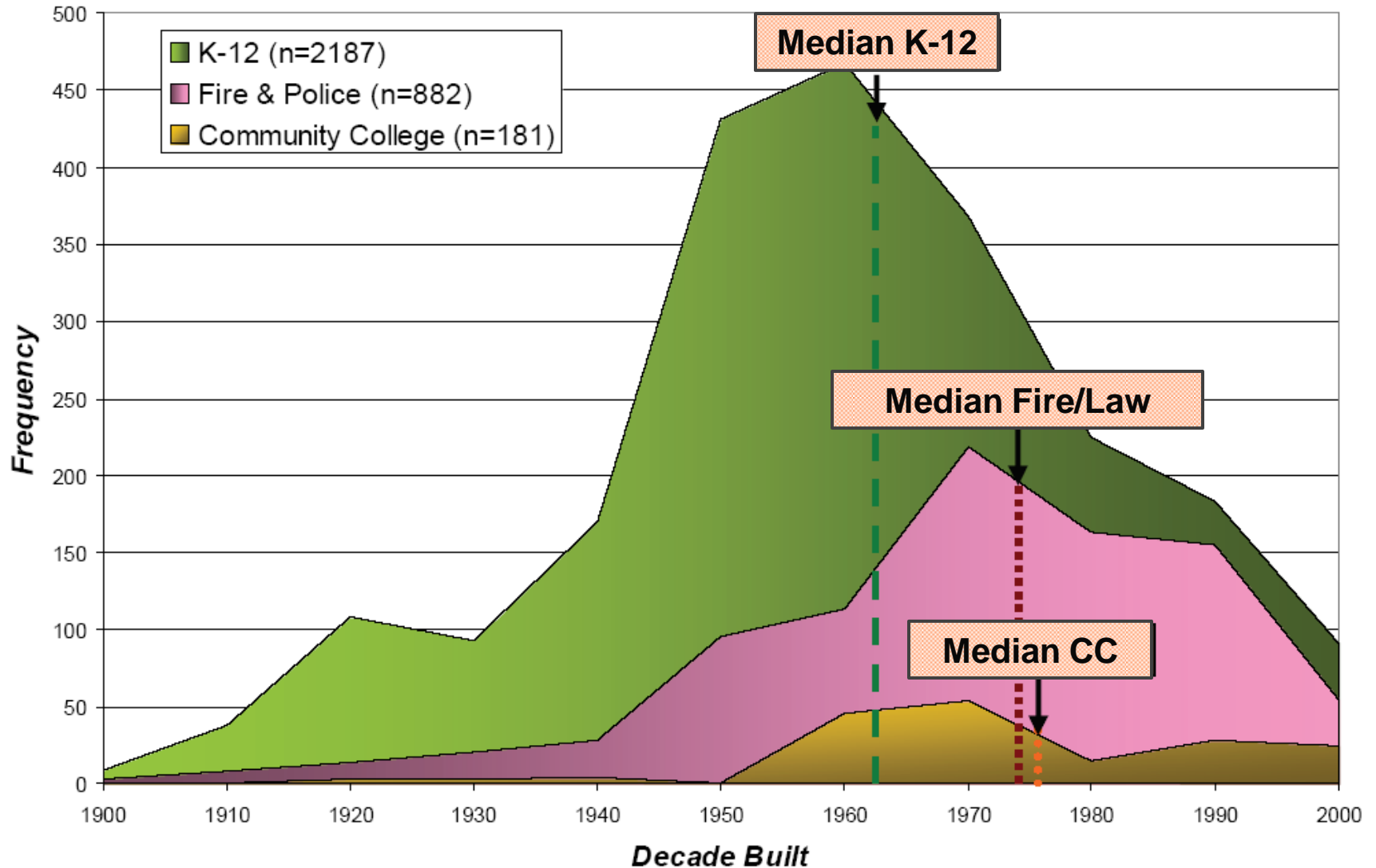
What else?

- **Interdependencies: Lifelines**
 - Utilities
 - Transportation
 - Fuel

- **Difficult to grasp low-frequency, high-impact events**
 - Inadequate seismic knowledge + inadequate codes
 - Many “best practices” untested
 - Exercise challenges



Oregon Education & Emergency Facilities

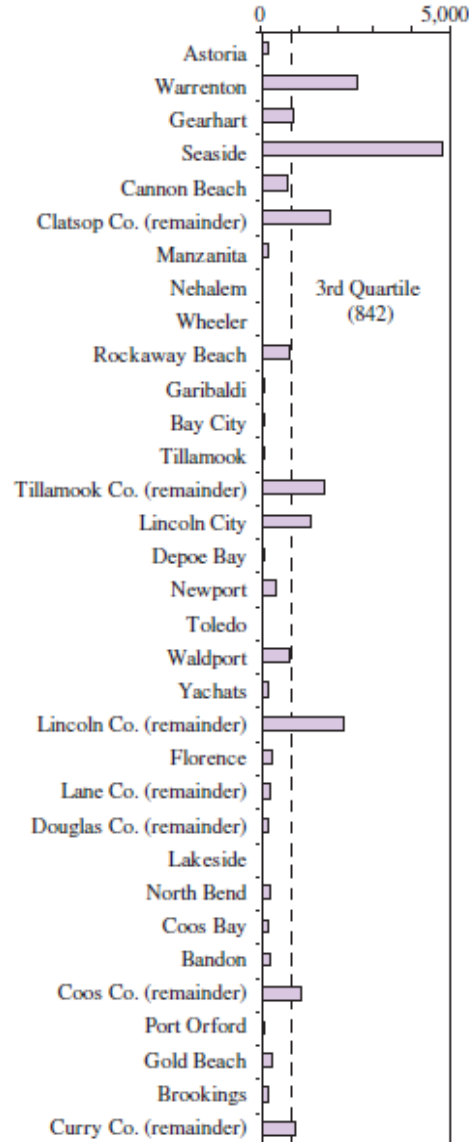




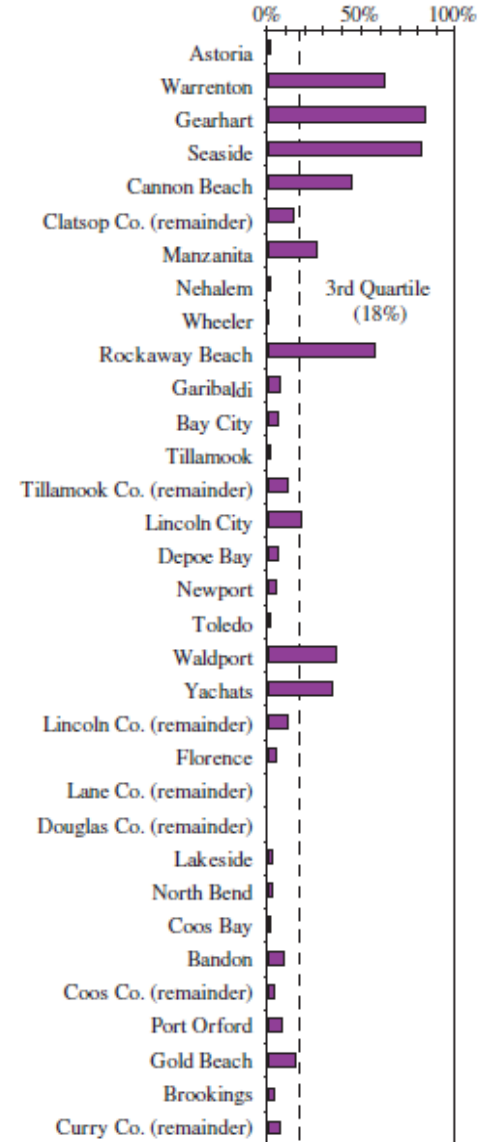
Oregon Tsunami Exposure (N. Wood, USGS)



A Number of Residents in Tsunami-Inundation Zone



B Percentage of Residents in Tsunami-Inundation Zone





Science-based policy

- **ORS 455.446**
 - **Tsunami inundation-zone restrictions**
 - **“Based on scientific evidence that may include geologic field data and tsunami modeling”**
 - **Updated inundation lines to be adopted**



Key ORP Findings

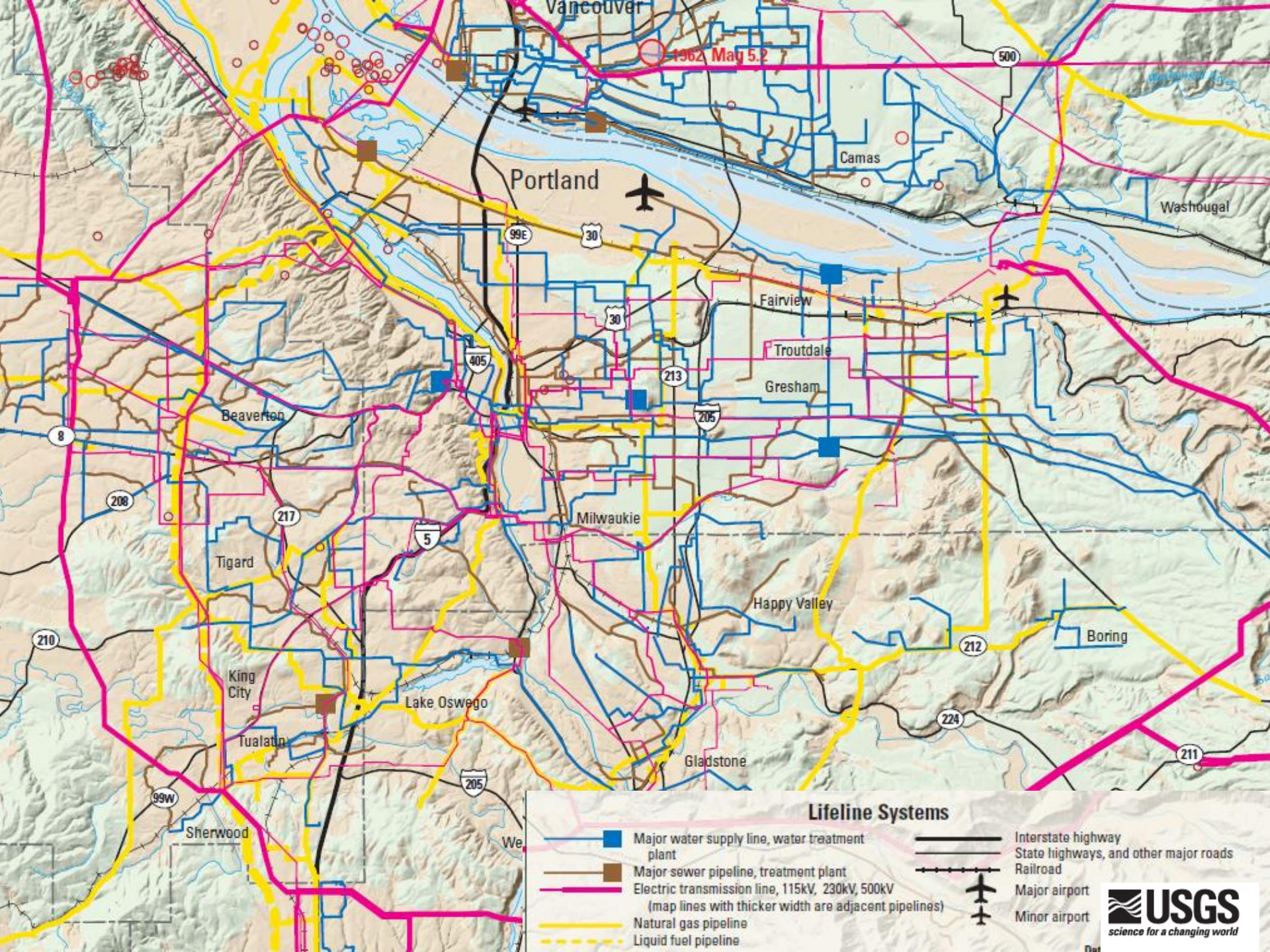
“Very large earthquakes will occur in Oregon’s future, and our state’s infrastructure will remain poorly prepared to meet the threat unless we take action now to start building the necessary resilience.”



Key ORP Findings



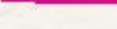
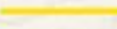

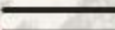
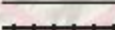



- **OR far from resilient to impact of great Cascadia earthquake today**
 - **Casualties (1,000-10,000)**
 - **Economic loss (close to 20% of state GDP)**
 - **More than one million truckloads of debris**
- **Liquid fuel vulnerability**





1962 Mag 5.2

Lifeline Systems

-  Major water supply line, water treatment plant
-  Major sewer pipeline, treatment plant
-  Electric transmission line, 115kV, 230kV, 500kV (map lines with thicker width are adjacent pipelines)
-  Natural gas pipeline
-  Liquid fuel pipeline
-  Interstate highway
-  State highways, and other major roads
-  Railroad
-  Major airport
-  Minor airport



OR Resilience Task Force

77th OREGON LEGISLATIVE ASSEMBLY--2013 Regular Session

Enrolled

Senate Bill 33

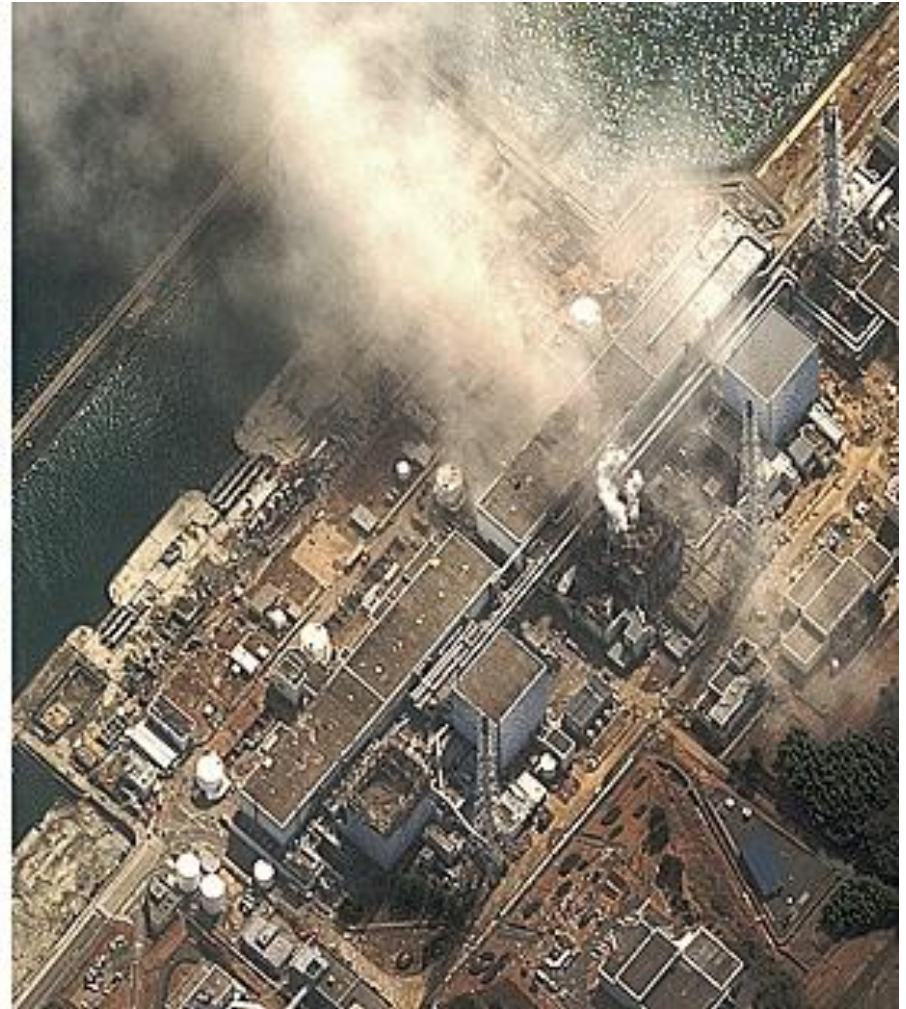
Printed pursuant to Senate Interim Rule 213.28 by order of the President of the Senate in conformance with pre-session filing rules, indicating neither advocacy nor opposition on the part of the President (at the request of Governor John A. Kitzhaber, M.D., for Oregon Military Department)

“The task force shall facilitate a *comprehensive and robust plan to implement the strategic vision and roadmap of the ORP* for responding to the consequences of naturally occurring seismic events associated with geologic shift along the CSZ by making recommendations about...”

www.oregon.gov/OMD/OEM/Pages/Resilience-Taskforce.aspx

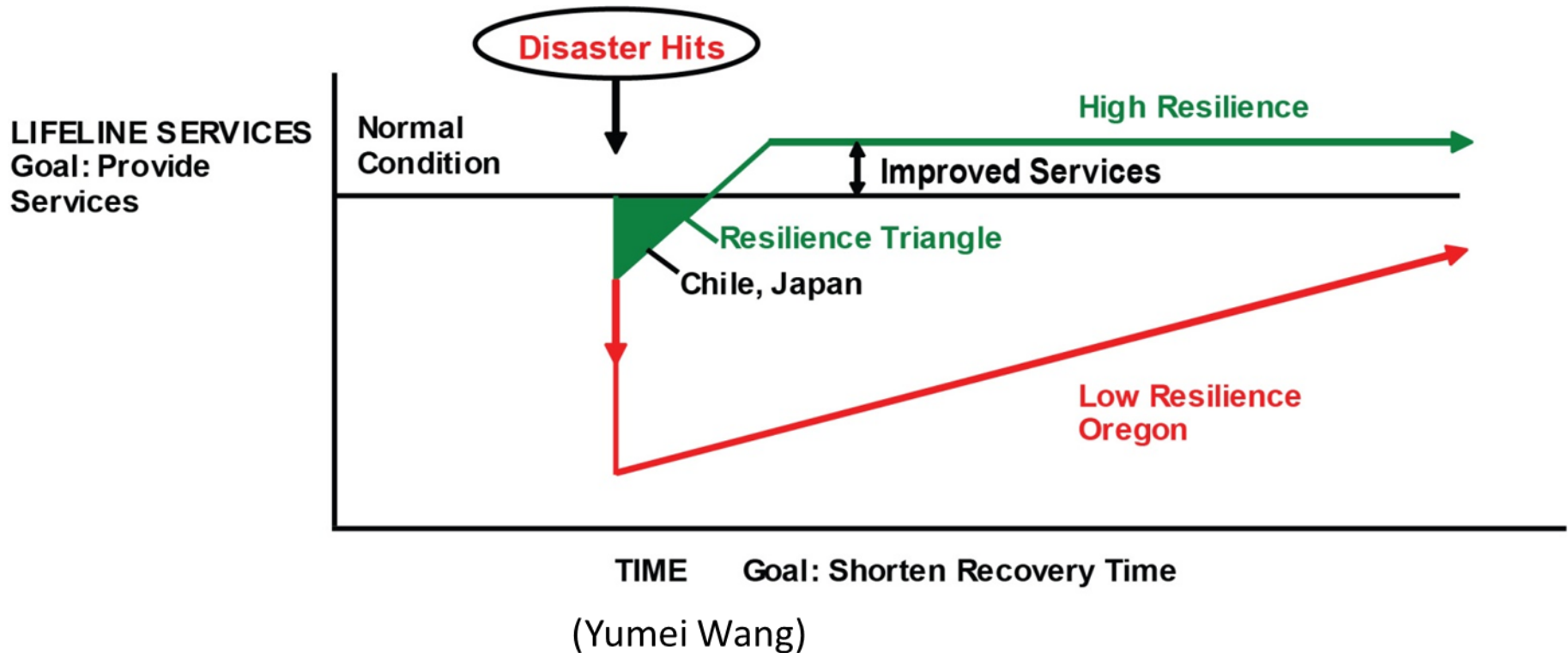


What Does Resilience Mean?





Our Definition of Resilience



- **Resilience: Save lives, Reduce Losses, Speed Recovery, Rebuild Better**



2015 Legislative Session

- ✓ **State Resilience Officer**
- ✓ **Funding facilitation for seismic rehab of multi-occupant buildings**
- ✓ **Liability protection for privately-owned utilities**
- ✓ **Require insurance to cover 90-day Rx at walk-in pharmacy**
 - **Still need to address additional prescription for reserve**



What's Next?

- DOGAMI to adopt updated inundation maps
- State-local hazards coordination on land-use options (esp. tsunami)
- Mass care, shelter, medical care
- Fuel vulnerabilities
- ORTF report intended to address first biennium only
 - Establish foundation of ***sustainable process***



If all else fails...





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