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## Oregon Cascadia Subduction Zone Planning Effort –

Briefing December 06, 2011- Cannon Beach City Council



Friday, December 9, 2011

# Project Background

## Objective:

To increase the state, local, Regional and National readiness and timely response to a multi State Region Cascadia Subduction Zone (CSZ) catastrophic earthquake/tsunami.

Plan is a multi-year, comprehensive, catastrophic earthquake/tsunami-operational response planning project between Oregon-California-Washington-British Columbia and FEMA.

## Steps in Region wide Planning Process: (More on Oregon's Planning Process Later)

- CSZ Literature Review *already done* ✓
- RISK/Impact Analysis *draft #2 already done* ✓
- CSZ Annex to State Emergency Operations Plans *in process*
- Alaska and Idaho addressing secondary effects/support to OR/WA *in process*
- Joint Federal/State operations plan to lessen “who does what and when” in an event.



# What is the Cascadia Subduction Zone? – The Planning Scenario

Based on a M9.0 Cascadia Subduction Zone earthquake/tsunami scenario with the epicenter immediately off the Pacific Northwest Coast.

- Violent Shaking for up to 5 minutes.
- Millions affected from N. California to Vancouver Island. Tsunami and secondary supply chain issues affecting Alaska.
- Within 30 minutes region inundated by 30'+ tsunami.
- Crippled transportation on coast and I-5 corridor.
- Significant building damages
  - Portland's building codes are designed for M7 "major" quakes
  - A M9 "great" quake has over 1000 times more intensity
  - Western Oregon's seismic codes aren't as strong as California's, which in turn aren't as strong as Japan's or Chile's
- Utilities/food supply/clean water compromised for weeks or months.



Location of  
Cascadia Subduction  
Zone



# Planning Scenario

**Cost To Oregon** (Taken from a DOGAMI study (1999) of an 8.5M CSZ quake) - \*this study does not include tsunami damage

- Between 8,000 and 25,000 casualties\*
- \$12-\$50 Billion in Economic damages\*
- 30,000-80,000 buildings destroyed\*

## Displaced households

- 17,300\*

## Short-term shelter needs

- 12,400 People\*

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## Transportation

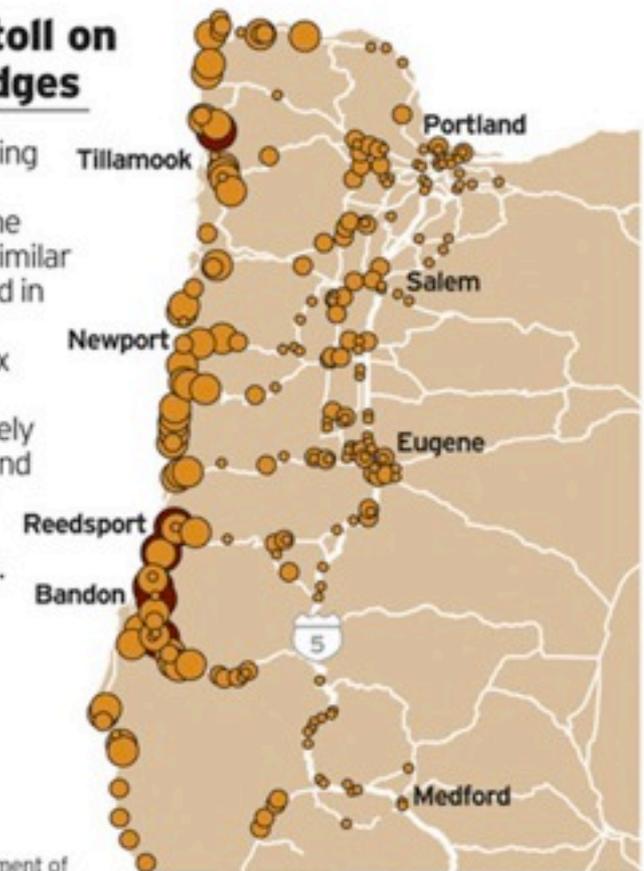
- 399 bridges destroyed
- 621 heavily damaged

Joint study by ODOT and Portland State University, 2009

## A quake's toll on Oregon bridges

Computer modeling shows a 9.0 earthquake off the Oregon coast – similar to what happened in January 1700 – would collapse six major highway bridges, extensively damage others and cost \$1 billion for bridge repair and replacement.

- Slight
- Moderate
- Extensive
- Collapse



Source: Oregon Department of Transportation/Portland State University

STEVE COWDEN/THE OREGONIAN



# Product One: Risk/Impact Analysis

A FEMA computer analysis model based on scientific data showing the effects of a Catastrophic Cascadia Subduction Zone earthquake and tsunami

Model includes for each State:

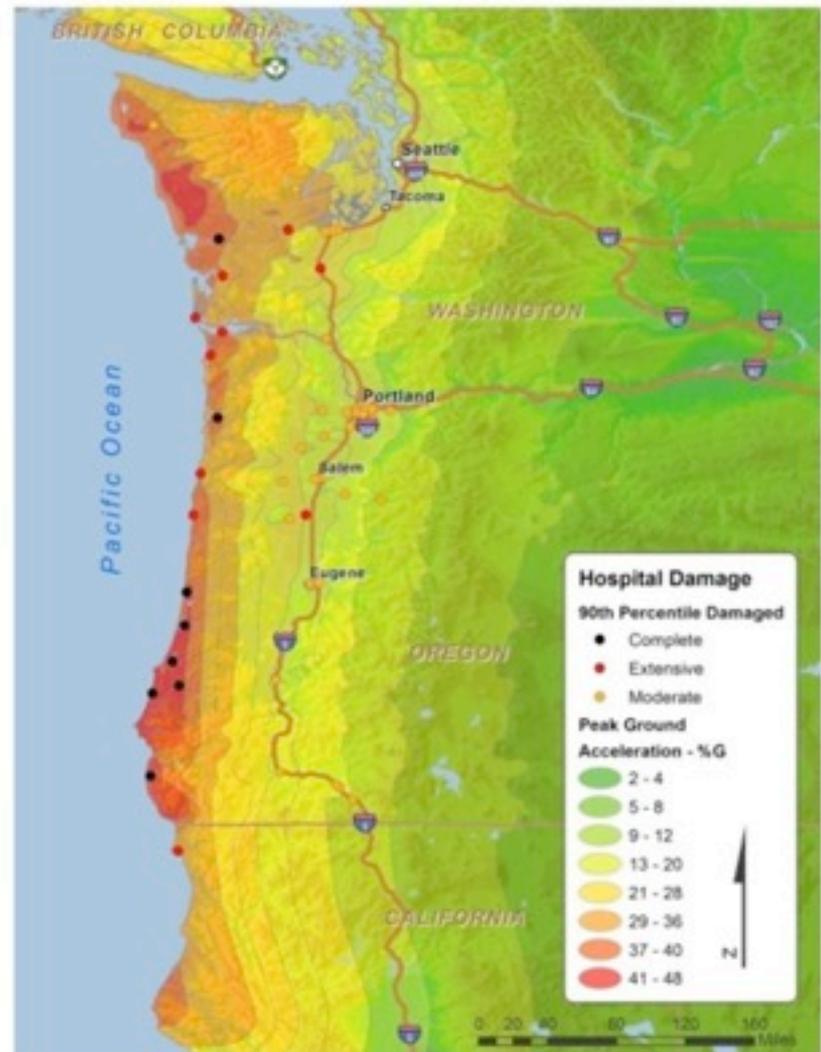
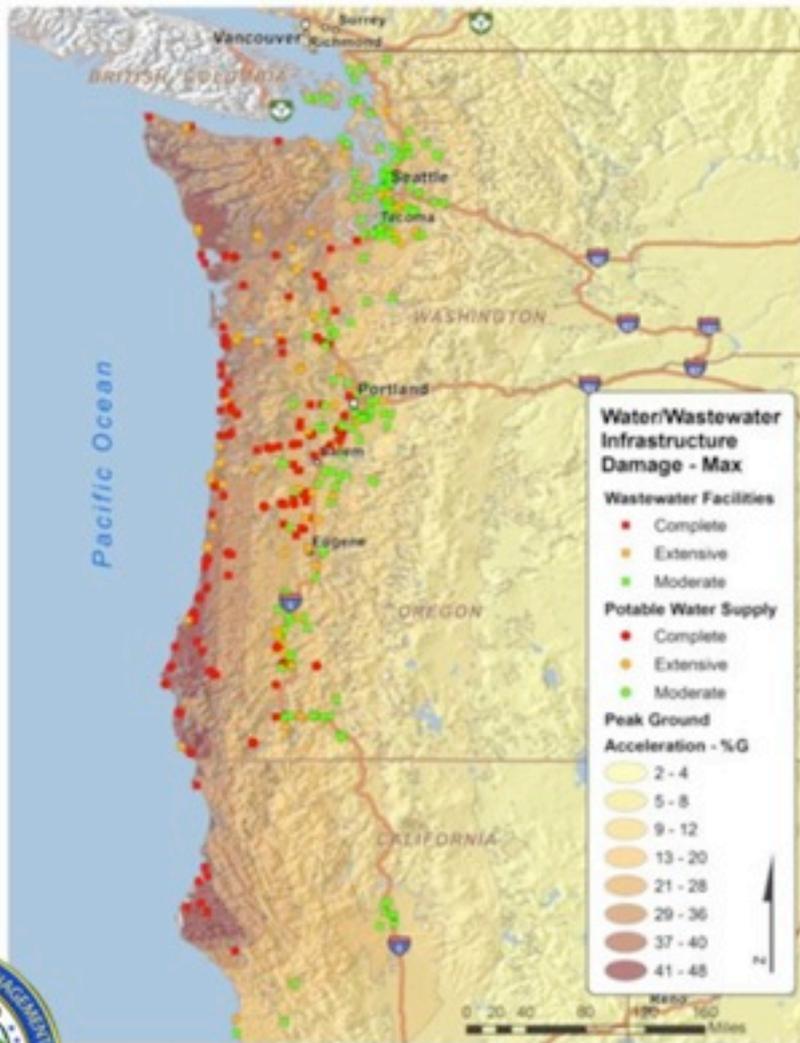
- Physical impacts to the built environment;
- Estimate the numbers of damaged and destroyed residential and commercial buildings to include hospitals and key public safety buildings;
- Determine impacts to transportation systems to include major highways/roads, bridges, rail corridors, air and seaports;
- Estimates on loss of critical utilities and estimates on their reconstruction;
- Formulate gross direct and indirect economic losses;
- Estimate of injuries and deaths;
- Analysis of secondary effects:
  - Impacts to supply chain; Identify breaking points and cascading effects in the region and nationwide; ability and speed of supply chain recovery

**This product is 90% Complete. We are waiting for FEMA to release the final draft. This analysis along with Oregon specific studies is being used for our planning scenario. It will be made available to local emergency managers to base local planning efforts in the future.**



# Risk/Impact Analysis

Infrastructure and Economic Damage examples:



# Product Two: Oregon Catastrophic Response Annex

## What OEM Needs to Deliver by 31 April :

- Cascadia Catastrophic Earthquake Annex to the State of Oregon Emergency Operations Response Plan
- Inclusion of local response issues and needs
- Cooperation with our neighbor states and ability of our annex to sync with the federal response plan



# OEMs Planning Process a three phase approach:

## Phase One:

Completion of State Agency Response Analysis

Estimated Completion Date-Jan 2012

one

- FEMA contractor assisting OEM to complete this phase by January 2012
- Currently Interviewing and getting response capability information for 34 State Agencies & Adjunct Agencies (Red Cross, Civil Air Patrol, etc.)

- Gathering responses to the following questions:

*What are your capabilities and resources now?*

*What are your likely capabilities and resources post quake?*

*What missions are you likely to be tasked with?*

*Based on the scenario what will be your priorities? What key missions will you unlikely be able to perform?*

*What are your likely needs post quake?*

*Can they be met with in state agency resources or personnel?*

*What out of state (federal resources) will you likely be need?*

*How long will you be able to operate without these resources?*



# OEMs Planning Process:

## Phase Two:



Completion of State Agency Response Analysis

Estimated Completion Date-Jan 2012

Inclusion of Local Response Issues and Needs

Estimated Completion Date-April 2012

As a part of our outreach to the locals, and our desire to make a complete plan, we are committed to incorporating local ESF response capabilities and shortfalls into the state annex.

This will allow us to have a decent grasp of what counties may need in the event of communication loss and will allow the locals to understand the States response priorities, limitations and challenges following the scenario.

We have already received a wealth of local information at a workshop we held in August, this step will build upon that local knowledge



# OEMs Planning Process:

## Phase Two:



Completion of State Agency Response Analysis

Estimated Completion Date-Jan 2012

Inclusion of Local Response Issues and Needs

Estimated Completion Date-April 2012

We will be starting in January to meet with the coastal counties as a priority.

They will conduct interviews using the same capability and shortfall questions configured for the local level.

The key to success in these meetings is not discussing detailed local response, rather it is in discussing what they will likely be needing from the state and the federal government.

These County-specific response capabilities and shortfalls will be included as a support annex in the State plan.

As these are developed in the spring, should time permit we will be extending the reach of these interviews to the Metro counties and other impacted western Oregon counties.



# OEMs Planning Process:

## Phase Three:



Completion of State Agency Response Analysis

Estimated Completion Date-Jan 2012

Inclusion of Local Response Issues and Needs

Estimated Completion Date-April 2012

Sync With Regional and Federal Response Plan:

Estimated Completion Date-July 2012

To be accomplished June-July 2012.

Developing an Oregon Annex that addresses strengths and shortfalls from the local level up.

Continuing communication and coordination with FEMA Region X.

Communication and coordination with other states planners & contractors.

*To their credit - FEMA has learned from Katrina and the New Madrid Seismic Zone planning effort. Their approach on this project is to base their response off State and local needs.*



# Our Calendar:



# Cascadia Catastrophic Response Planning's Future

- **Continued Local Planning** – After completing the coastal county local response annexes we will be moving on to our second priority-Portland Metro Area, Salem and Eugene. And third priority – The rest of Western Oregon.
- **Ongoing updates/additions to the plan.**
- **Adding information on the public sector role in response and recovery.**
- **National Level Exercise-** There is talk of a major exercise in the future that will test and lead to refinements of the Federal and State plan.



# Cannon Beach Oregon - Tsunami wave >15 m (45 feet)

