



Washington State EQ Scenario Catalog

**A ‘virtual playbook’ for natural hazard
consequence management**

Why a Scenario Catalog???

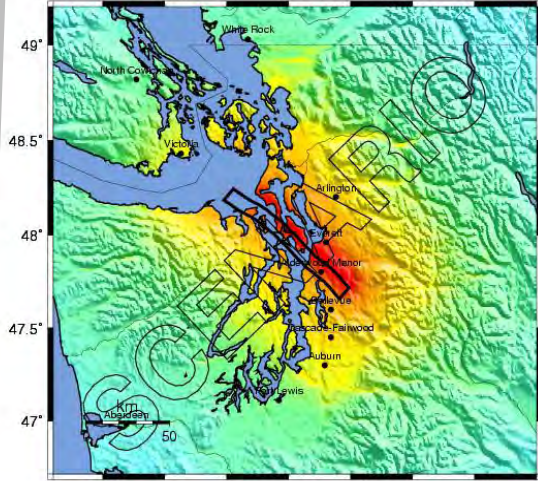
- Mitigation Planning – Consistent, authoritative, and up-to-date information for federal, state, tribal, and local jurisdictions to consider in the planning process
- Response Planning – Credible information to help develop Comprehensive Emergency Management Plans and hazard specific response plans across government
- Exercises & Training - Credible information to test/exercise plans that have been developed and consider modifications based on a variety of scenarios
 - Note: 5 of the 20 scenarios developed for this project are being used in the Evergreen EQ 2012 Exercise and the Cascadia Scenario is being used in the FEMA/State Regional Response Planning Effort
- Earthquake Response – A virtual “playbook” of possible answers to the question “What just happened?”, “How bad is it?”
- Perhaps more importantly: This can serve as a “one stop shop” for hazard/risk assessment information as more data become available and integrated into the application



Earthquake Scenario Catalog Data

-- Earthquake Planning Scenario --
ShakeMap for Swif7.4 Scenario

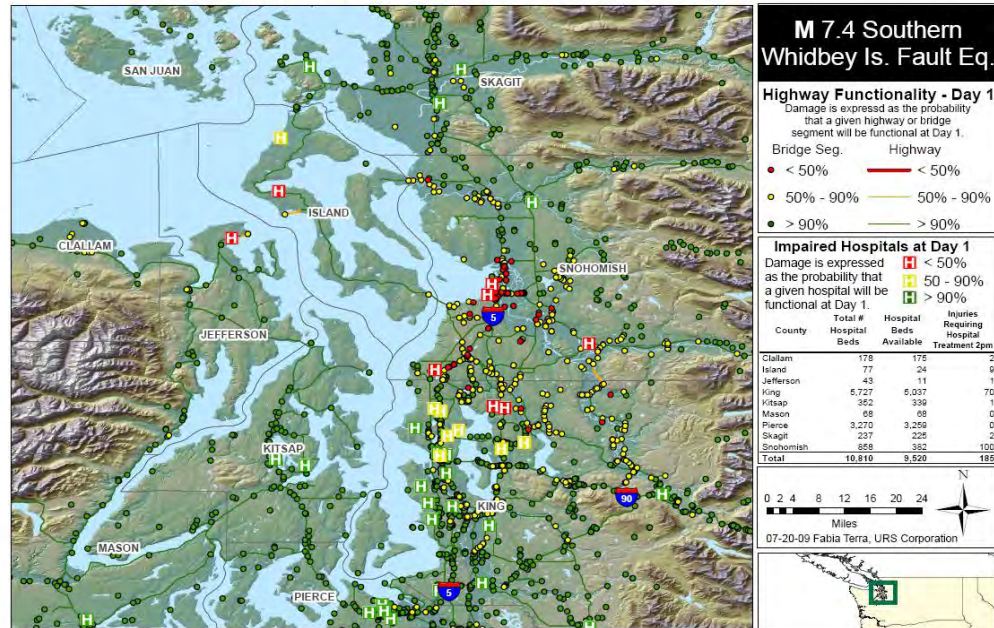
Scenario Date: APR 27 2009 12:00:00 AM UTC UTC M 7.4 N47.99 W122.55 Depth: 5.0km



PLANNING SCENARIO ONLY - Map Version 5 Processed Tue Apr 28, 2009 10:52:00 PM MDT

PERCEIVED SHAKING	None	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme
POTENTIAL DAMAGE	none	none	Very light	Light	Moderate	Moderate/Heavy	Heavy	Very Heavy	
PEAK ACC (g)	<.17	.17-1.4	1.4-3.9	3.9-9.2	9.2-18	18-34	34-65	65-124	>124
PEAK VEL (cm/s)	<0.1	0.1-1.1	1.1-3.4	3.4-8.1	8.1-16	16-37	37-60	60-116	>116
INSTRUMENTAL INTENSITY	I	II-III	IV	V	VI	VII	VIII	IX	X

Impaired Hospitals (Day 1), Hospital Bed Availability, & Highway Functionality - Earthquake Scenario: Washington



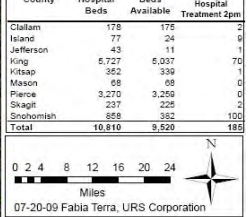
M 7.4 Southern Whidbey Is. Fault Eq.

Highway Functionality - Day 1
Damage is expressed as the probability that a given highway or bridge segment will be functional at Day 1.

Bridge Seg.	Highway
● < 50%	— < 50%
● 50% - 90%	— 50% - 90%
● > 90%	— > 90%

Impaired Hospitals at Day 1
Damage is expressed as the probability that a given hospital will be functional at Day 1.


County	Total # Hospital Beds	Hospital Beds Available	Injuries Requiring Hospital Treatment 2pm
Clallam	178	175	2
Island	77	24	6
Jefferson	43	11	1
King	5,727	5,037	70
Kitsap	952	139	1
Mason	68	68	0
Pierce	3,270	3,259	0
Skagit	237	226	2
Snohomish	858	382	100
Total	10,810	9,529	185



07-20-09 Fabia Terra, URS Corporation

Suite of Materials Including:

- USGS Scenario ShakeMap – Art Frankel, USGS
- HAZUS Summary Report – Ivan Wong, Fabia Terra, (URS)
 - State summary & seven (7) most impacted counties (0.05g threshold)
- Community Vulnerability and Exposure Report – Nate Wood, USGS



The 20 scenario earthquakes and their moment magnitudes selected for this study include:

- Boulder Creek fault **M** 6.8;
- Canyon River-Price Lake fault **M** 7.4;
- Cascadia subduction zone megathrust **M** 9.0;
- Cascadia subduction zone megathrust (North section) **M** 8.3;
- Chelan fault **M** 7.2;
- Cle Elum-Wallula deformed zone **M** 6.8;
- Devils Mountain fault **M** 7.1;
- Devils Mountain fault (western section) **M** 7.4;
- Hite fault **M** 6.8;
- Little River fault (Lake Creek) **M** 6.8;
- Toppenish Ridge fault (Mill Creek) **M** 7.1;
- Mount Saint Helens deformed zone **M** 7.0;
- Nisqually intraslab zone **M** 7.2;
- Saddle Mountain fault **M** 7.35;
- Sea-Tac intraslab zone **M** 7.2;
- Seattle **M** 7.2;
- Spokane blind fault **M** 5.5;
- Southern Whidbey Island fault (SWIF) zone **M** 7.4;
- Olympia fault lineament **M** 5.7; and
- Tacoma fault **M** 7.1.

Washington State Seismic Hazards Catalog

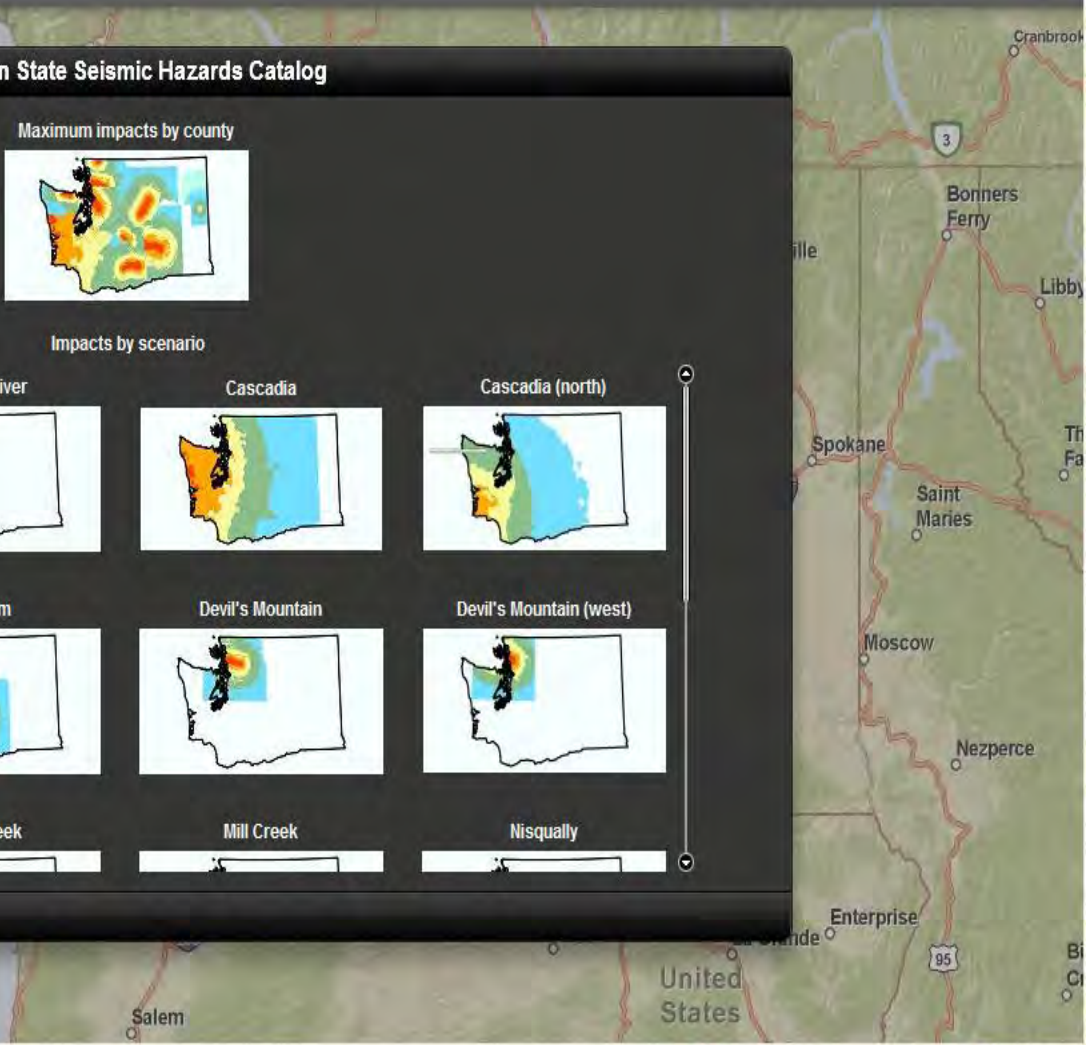
Maximum impacts by county



Impacts by scenario

<p>Boulder Creek</p> 	<p>Canyon River</p> 	<p>Cascadia</p> 	<p>Cascadia (north)</p> 
<p>Chelan</p> 	<p>Cle Elum</p> 	<p>Devil's Mountain</p> 	<p>Devil's Mountain (west)</p> 
<p>Hite</p> 	<p>Lake Creek</p> 	<p>Mill Creek</p> 	<p>Nisqually</p> 

Pacific Ocean



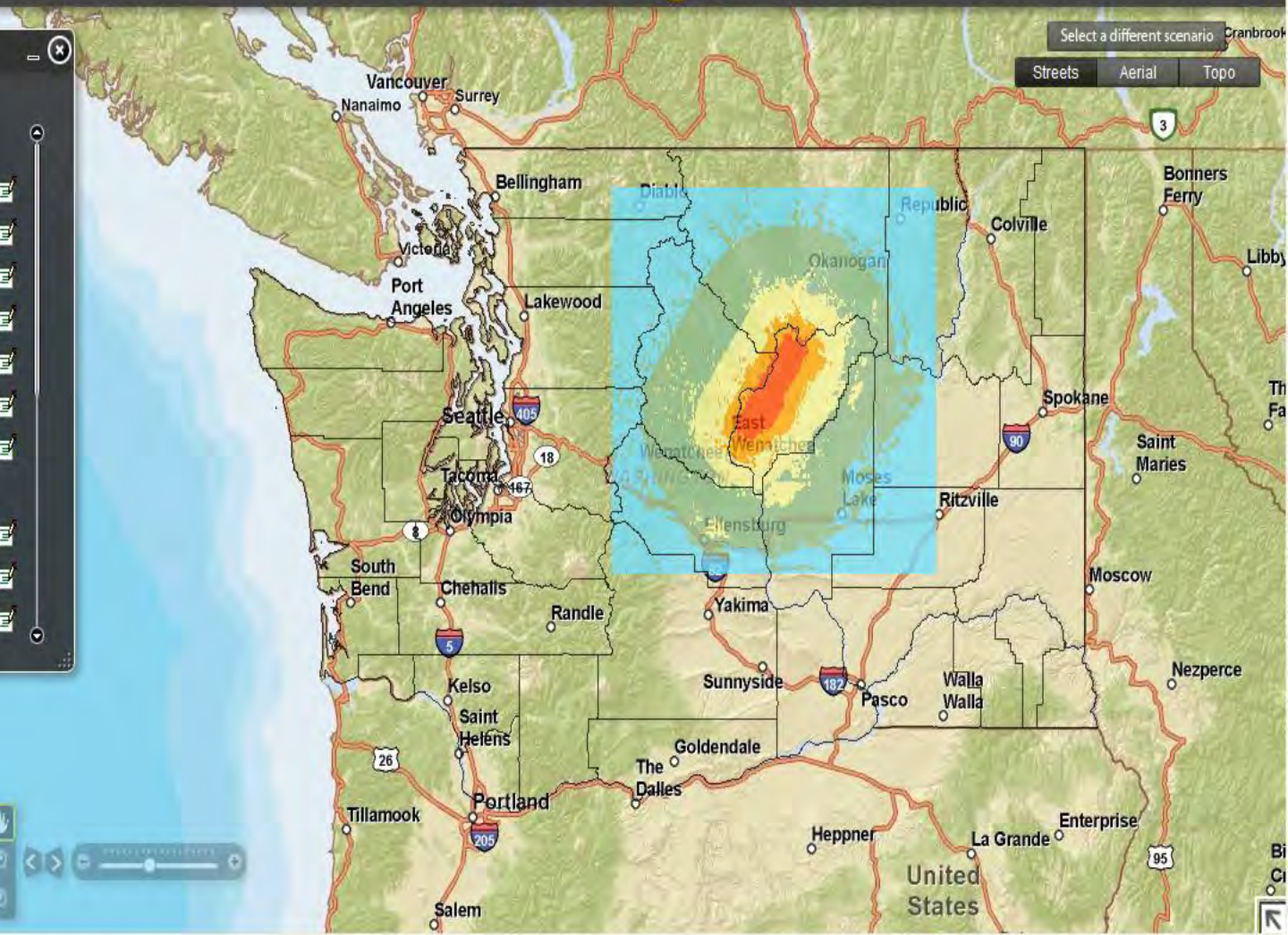
Chelan M7.2 Scenario

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Impacts

Layer Visibility

- Chelan M7.2
 - Hospital Damage
 - School Damage
 - Fire Station Damage
 - Oil Facility Damage
 - Natural Gas Facility Damage
 - Port Facility Damage
 - Highway Bridge Damage
 - Railway
 - Railway Bridge Damage
 - Waste Water Facility Damage
 - Electric Power Facility



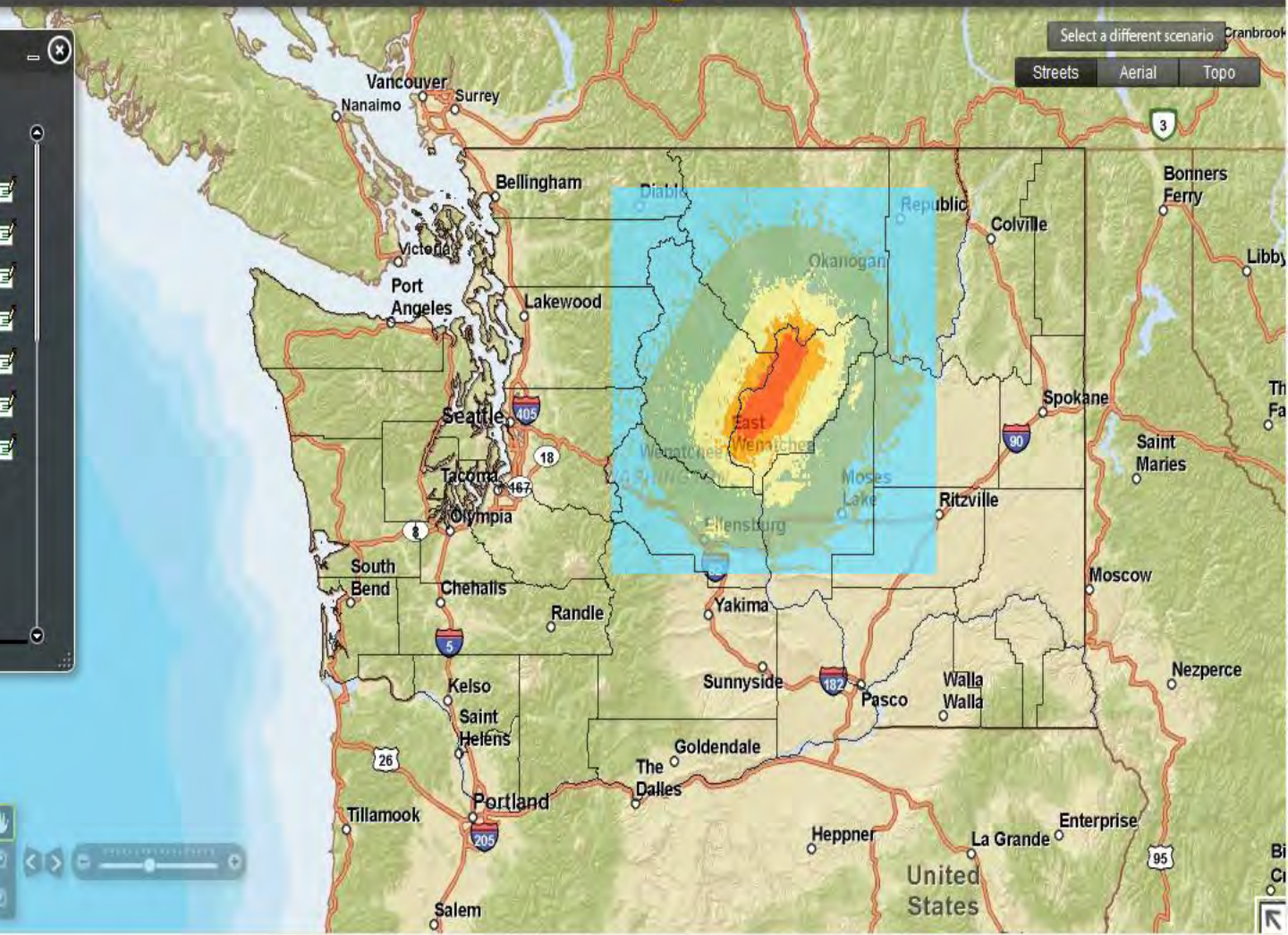
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Impacts

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- Low
- Moderate
- High
- Railway



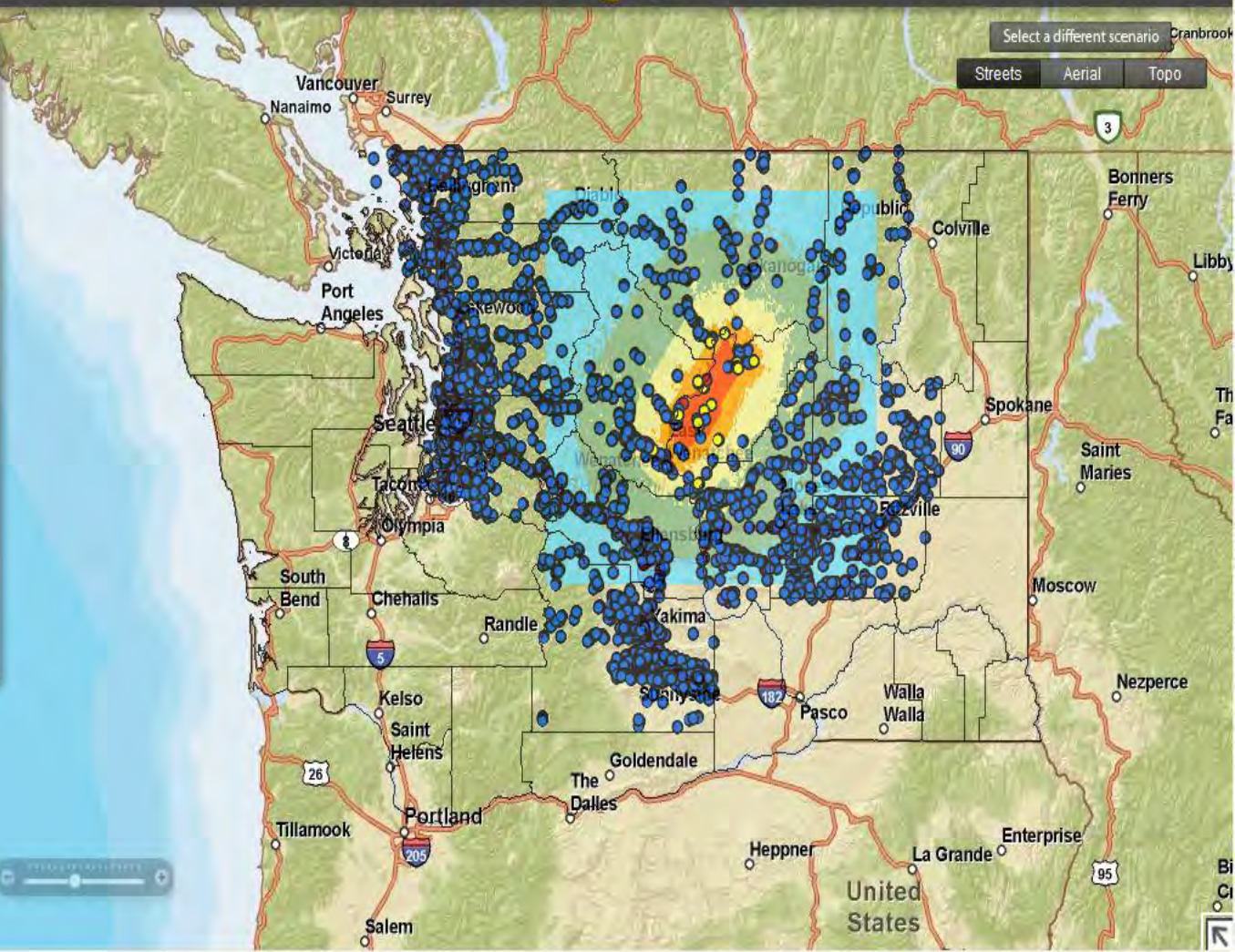
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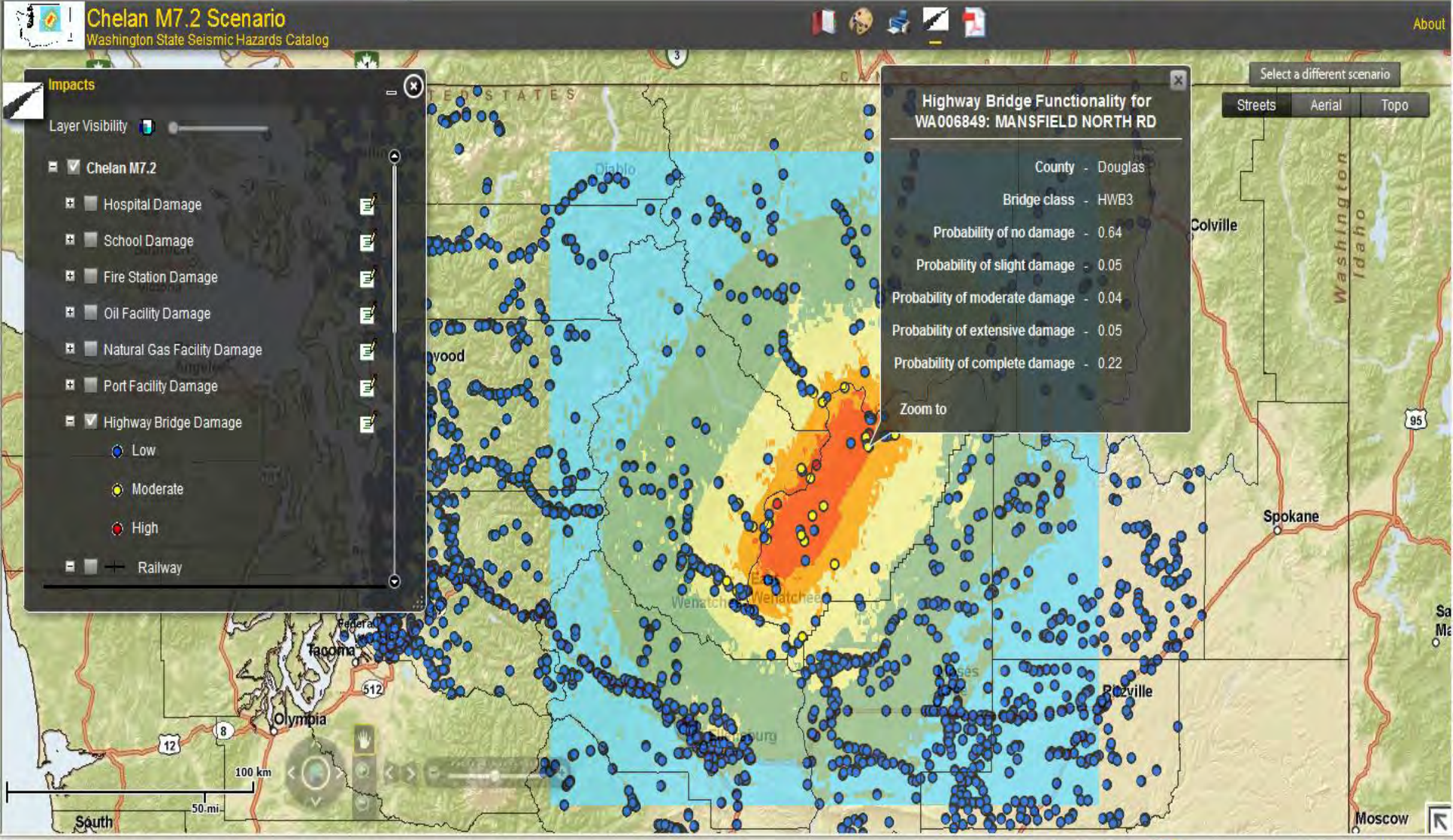
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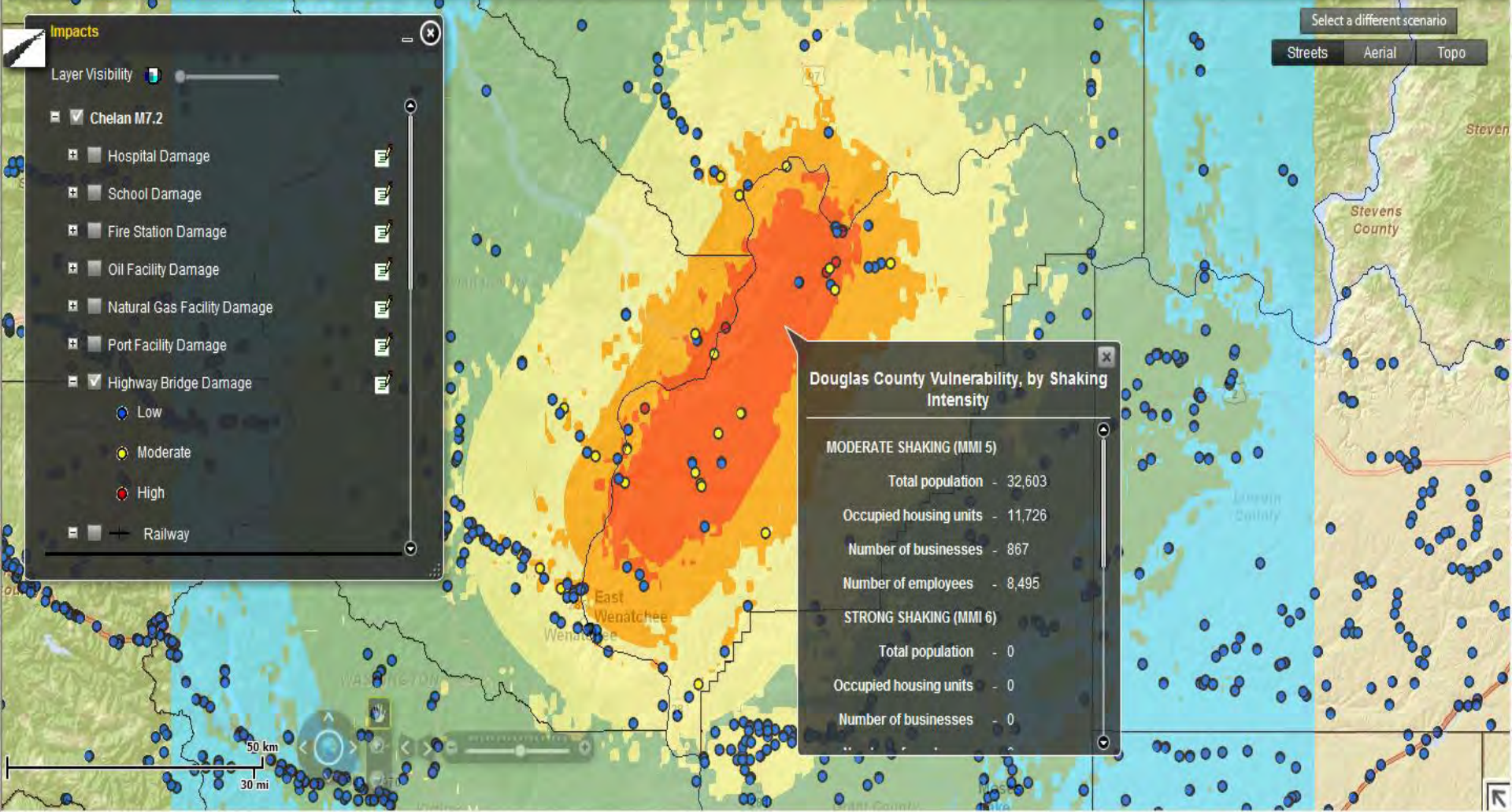
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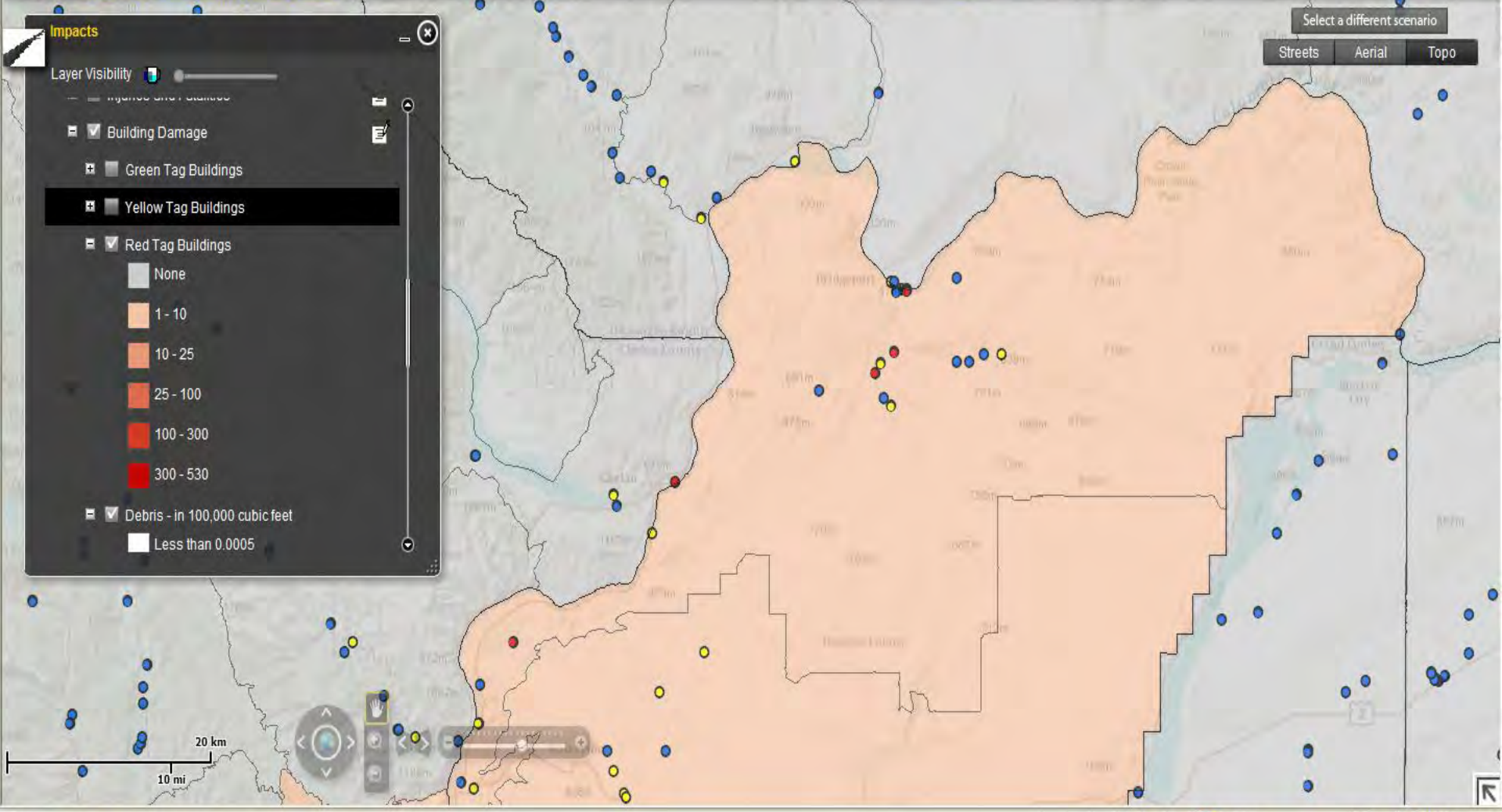






Chelan M7.2 Scenario

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This is cool, but what's next?

“If you build it they will come...”

- Resolve hosting/security/access issues
- Resolve liability/disclaimer issues
- Virtual briefings for federal, state, tribal, and local emergency management officials
- Addition of volcano and tsunami community exposure and vulnerability data (Wood, et. al)