Cascadia Earthquakes: Preparing Oregon’s Coastal Hospitals

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Photo: Carey Palm
Cascadia Fault

5 Minutes Shaking & Tsunami Arrives (~15 min)

COASTAL COMMUNITIES
- Strongest shaking
- Tsunami casualties
- Geographic isolated (*inoperable highways*)
- Longest response times
11 Coastal Hospitals

- Columbia Memorial, Astoria (Tsunami hazard)
- Providence Seaside, Seaside (Tsunami hazard)
- Tillamook Regional, Tillamook (Tsunami hazard)
- Samaritan North Lincoln, Lincoln City (no tsunami hazard)
- Samaritan Pacific Communities, Newport (no tsunami hazard)
- PeaceHealth Peace Harbor, Florence (no tsunami hazard)
- Lower Umpqua Hospital, Reedsport (no tsunami hazard)
- Bay Area Hospital, Coos Bay (no tsunami hazard)
- Coquille Valley, Coquille (no tsunami hazard)
- Southern Coos Hospital and Health Center, Bandon (no tsunami hazard)
- Curry General, Gold Beach (Tsunami hazard)

Source: DOGAMI

Y. Wang, DOGAMI, 2018
2017 Coastal Hospitals Project
*Provided Technical Assistance*

Seismic Stability of Hospitals & Lifeline System Dependencies
### Hospital Self-Assessments of Expected Performance

<table>
<thead>
<tr>
<th></th>
<th>Very Low</th>
<th>Low</th>
<th>Moderate</th>
<th>High</th>
<th>Very High</th>
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<tr>
<td>Building Structure</td>
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<td>5</td>
<td>0</td>
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<td>Non-Structural Components</td>
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<td>Generator(s)</td>
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<td>2</td>
<td>4</td>
<td>0</td>
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<tr>
<td>Emergency Fuel</td>
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<td>3</td>
<td>3</td>
<td>0</td>
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<tr>
<td>Water for Sheltering</td>
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<td>3</td>
<td>1</td>
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<td>0</td>
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<tr>
<td>Water for Hospital Functions</td>
<td>4</td>
<td>5</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

Source: DOAGMI O-18-3
2017 Coastal Hospitals Project

Conclusions and 4 Recommendations

- Ready for Winter Storms
- Not Ready for Cascadia Earthquakes

1. Clarify and Improve Existing Hospital Requirements on Earthquake Preparedness
2. Conduct On-Site Consultative Visits
3. Encourage Fuel and Water Disaster Planning
4. Create Coastal Hospital Resilience Network to Accelerate Cascadia Preparedness

2018 Coastal Hospitals Resilience Project

On-Site Consultative Visits

Tillamook Regional Hospital Example

Photo taken 12/9/2015

Permission from: Jordan Phillips
Tillamook Regional Medical Center

XXL Tsunami Arrival Time
44 minutes starting from onset of shaking

Source: DOGAMI
Site Resilience Plan Map

Tillamook Regional Medical Center
Tillamook, Oregon

Explanation of Symbols

- **Red Border**: Tsunami evacuation route
- **Orange Border**: Tsunami hazard zone
- **Yellow**: Proposed new hospital site
- **Green**: Current hospital site
- **Pink**: Health care services
- **Blue**: Critical infrastructure
- **Brown**: Buildings

Tillamook Area Map

Source: DOGAMI

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Hospital Resilience Action Plans
Strategic – Prioritize – Incremental

[Diagram showing a matrix with the axes labeled as 'Resilience Benefits' and 'Implementation'. The quadrants are labeled as 'Critically Important', 'Just Do It', 'Not Worth It', and 'Easy'.]
Hospital Fuel Disaster Planning

Stage 1: On-Site emergency power system
Stage 2: Local fuel supply (with County emergency managers)
Stage 3: Post-disaster delivery by State in 3 weeks

- **Resilient Stage: local power source & microgrid**
  - Operating generators for long periods is challenging
  - State is co-developing local energy resilience guidance
Need Uninterrupted Fuel Supply

Stage 1: On-Site Fuel

Stage 2: Local Fuel Options (e.g., Card Lock Fuel Facility)

Stage 3: State Delivers to County

Source: DOGAMI

3 weeks

Plan, Prepare, Respond, & Recover From Severe Fuel Shortages

Source: DOGAMI

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Create Coastal Hospitals Resilience Network

- Separated across 3 Regions
- Connect to focus on coastal challenges
- Coastwide “learning community”
- Collaboration: good ROI
- Discussions can inspire an alternative future
- Accelerate Cascadia preparedness
- Collectively, A Stronger Voice
State Resilience Officer Encourages Network

“Many hospitals can be better evaluated for seismic vulnerabilities and mitigated, which will go a long ways toward improving resilience in Oregon communities”

M. Harryman, State Resilience Officer
Questions?

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Oregon Health Authority webpage and DOGAMI reports:

www.oregon.gov/oha/PH/Preparedness/Prepare/Pages/PrepareForEarthquake.aspx
www.oregongeology.org/pubs/ofr/O-17-01.pdf