

IMPROVING EARTHQUAKE RESILIENCY THROUGH THE USE OF POST- EARTHQUAKE CLEARINGHOUSES

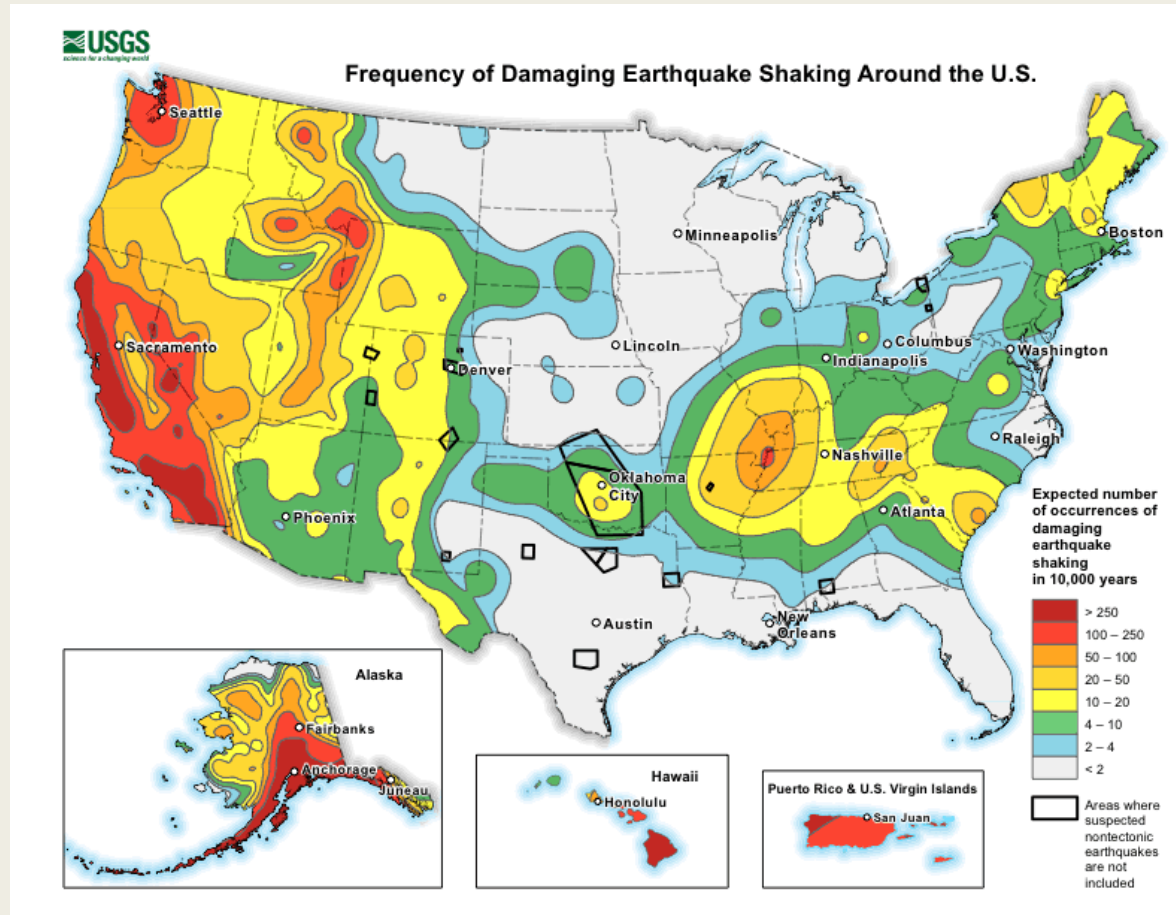


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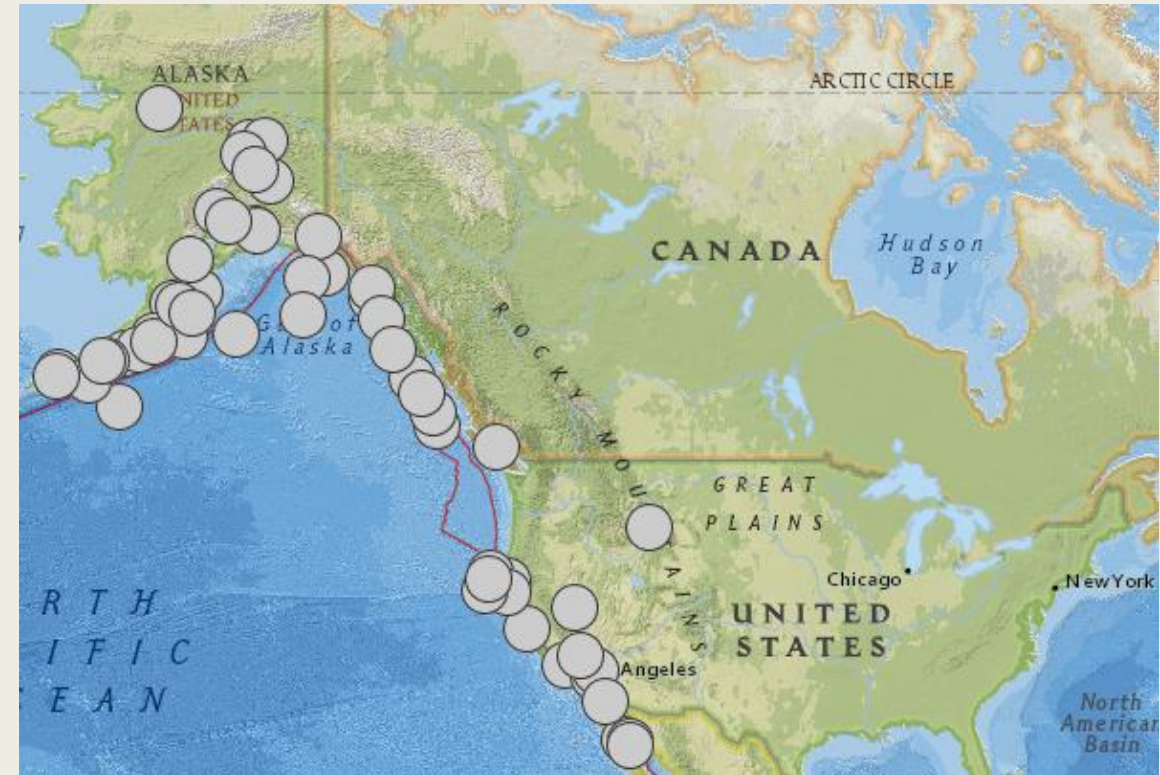
Overview

- **Earthquake Risk and Resilience in the U.S.**
 - Where are earthquakes most prevalent?
 - Population trends/built environment and earthquake risk
 - The importance of post-earthquake investigations in informing science and supporting resilience
- **Physical Earthquake Clearinghouses**
 - Existing plans and/or frameworks for post-earthquake investigation
 - Implementing post-earthquake physical technical clearinghouses
 - Plans and Physical requirements
 - Use of gathered data/information for response, recovery, mitigation, and preparedness
 - Communication & coordination with emergency management officials

Earthquake Risk and Resilience in the US



7.0 Magnitude or higher earthquakes in North America since 1900 C.E.



<https://earthquake.usgs.gov/earthquakes/map/>

Earthquake Risk and Resilience in the US

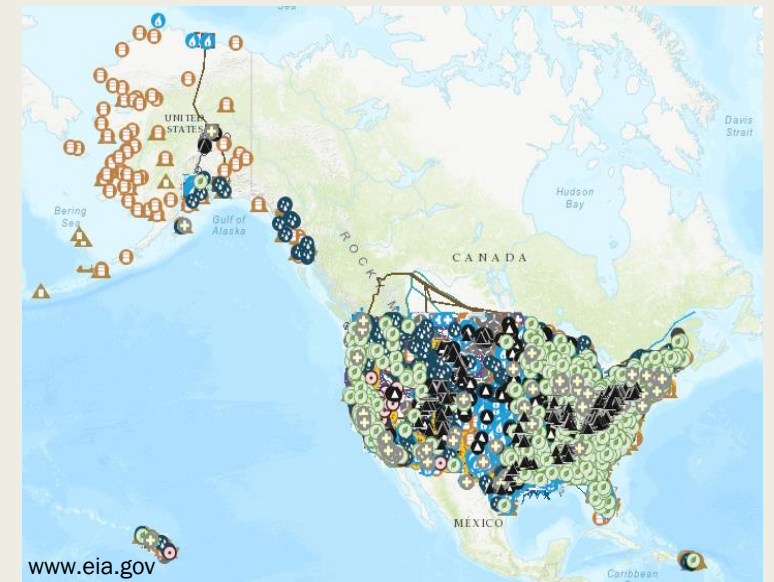
- US population estimated at 327,167,434¹
- Over 51,000,000 live on the West Coast
- Among the fastest growing cities are Seattle, Provo, Boise, Bend-Redmond, Los Angeles
- 12.8% have special needs
- As of 2014, approx. half of all people in the U.S. live in earthquake zones²
- ICC Building Codes are updated every three years www.iccsafe.org
 - Adoption
 - Grandfathering
 - “Functional Recovery”

¹ U.S. Census Bureau:

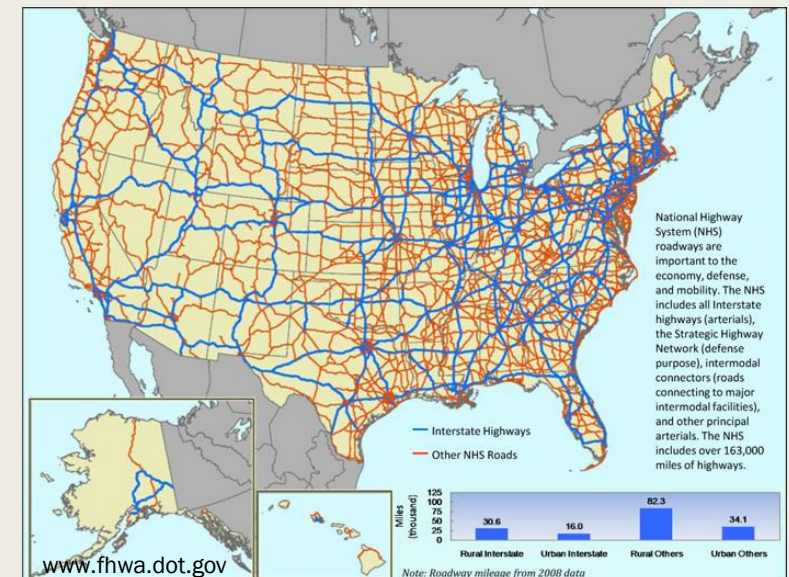
<https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml>

² Earthquake Spectra: <https://doi.org/10.1193/111814EQS195M>

Energy Infrastructure



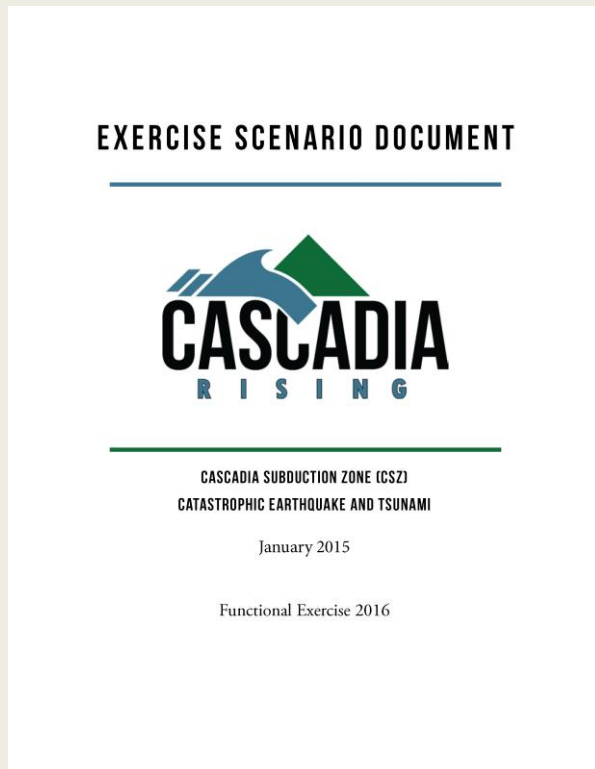
Transportation Infrastructure



Scenarios

Discussions/Exercising Potential Impacts

National Level Exercise



HayWired Scenario (USGS)

The image shows a map titled 'HayWired' depicting the Hayward Fault area in California. The map uses a color gradient from blue to red to show seismic hazard levels. Key locations labeled include Napa, Concord, Livermore, Santa Rosa, Richmond, Oakland, Fremont, San Jose, San Francisco, Palo Alto, and San Mateo. A red line indicates the Hayward Fault, with an 'Epicenter' marked. A white arrow points North.

Overview Related Science Publications Data and Tools News Partners FAQ

The HayWired scenario examines a hypothetical earthquake (mainshock) with a moment magnitude of 7.0 occurring on April 18, 2018, at 4:18 p.m. on the Hayward Fault in the east bay part of California's San Francisco Bay area. Most economic, cultural, and personal elements of society have grown entwined with the Internet since the last time California experienced a large urban earthquake. What will happen to an Internet-dependent society when a large earthquake occurs? How do tangible lifelines—roads, power, water, communication, etc.—interact in damage and restoration, and how do they interact with the online world of commerce, social media, and news? How will aftershocks affect recovery? To answer these questions, the HayWired earthquake scenario builds on past studies of a Hayward Fault earthquake and previous scenario development procedures to advance risk analysis and inform disaster planning (preparedness, response, and recovery).

Status - Active

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Cascadia Rising: https://www.oregon.gov/oem/Documents/Cascadia_Rising_Exercise_Scenario.pdf

HayWired Scenario: <https://www.usgs.gov/centers/wgsc/science/haywired>

Importance of Post-Earthquake Investigations

Science ⇒ Risk Assessment ⇒ Policy ⇒ Action/Implementation

- Quantification of the hazard
 - *Increase base knowledge*
 - *“Ground truthing”*
- Probable/possible impacts in relation to probability of occurrence
- Development of policies to address event impacts
- Development of policies, prioritization of options, and actions to take

Existing Frameworks/Resources

- The first post-earthquake clearinghouse was mandated in the California after the 1971 San Fernando Earthquake
<http://californiaeqclearinghouse.org/>
- WSSPC Model Plan (2001)
- Utah Geological Survey Earthquake-Response Plan and Investigation Field Guide (2001) – OFR-384
- “A Plan to Coordinate NEHRP Post-Earthquake Investigations” (2002)
 - *CUSEC initiates efforts using this plan as its base in 2002*

California Earthquake Clearinghouse: <http://californiaeqclearinghouse.org/>

WSSPC Model Plan (2001): <https://www.wsspc.org/wp-content/uploads/2013/10/wsspcclearinghouseplan-1.pdf>

Utah Geological Survey OFR-384: https://ugspub.nr.utah.gov/publications/open_file_reports/OFR-384.pdf

NEHRP Post-Earthquake Investigations (2002): <https://www.atcouncil.org/pdfs/atc-35postearthquake.pdf>



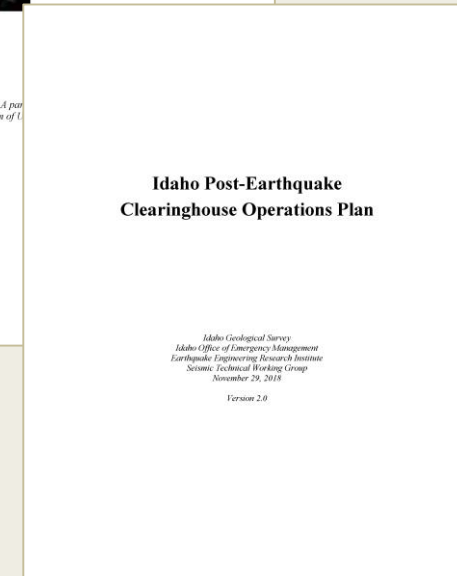
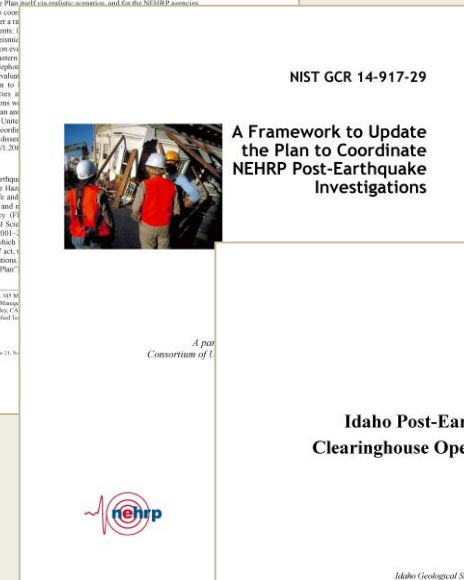
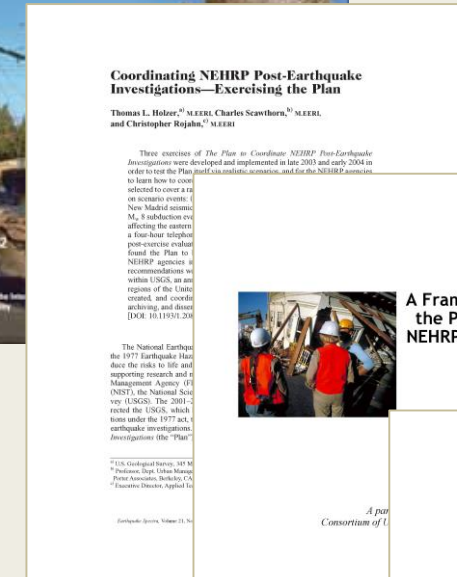
ANNOUNCEMENT:

The California Earthquake Clearinghouse has activated for the M6.4 July 4, 2019 Searles Valley Earthquake. For more information, visit the virtual clearinghouse website for the learningfromearthquakes.org/2019-07-04-searles-valley/.



Existing Frameworks/Resources

- USGS Circular 1242 (2003) - <https://pubs.usgs.gov/circ/1242>
- “Coordinating NEHRP Post-Earthquake Investigations – Exercising the Plan” (2005) - http://www.nehrpscenario.org/wp-content/uploads/2009/01/coordinating_investigations_exercise2.pdf
- A Framework to Update the Plan to Coordinate NEHRP Post-Earthquake Investigations (2013) - https://tsapps.nist.gov/publication/get_pdf.cfm?pub_id=915148
- Idaho Post-Earthquake Clearinghouse Operations Plan (2018) - http://learningfromearthquakes.org/images/LFE_site/Clearinghouses/Idaho_Clearinghouse_Plan_v2.pdf



Implementing Post-Earthquake Physical Technical Clearinghouses - Requirements

■ Physical (Structural)

- *Safe structure*
- *Power*
- *Water*
- *Communication*

■ Personnel

- *Clearinghouse Lead*
- *Technical Experts (Field)*
- *Communication*
 - *Interagency and External Affairs*
- *Administrative & Logistics Staff*

■ Logistics

- *Food*
- *Lodging*
- *Transportation*
- *Mutual Aid*

■ Administrative

- *Documentation*
- *Accountability Process*
- *Budget and Finance*

Implementing Post-Earthquake Physical Technical Clearinghouses

Have a Plan!!

- Under what conditions do you implement the plan?
 - *What level of event is required?*
 - *How soon after the event?*
- Who is on the call down list?
- Who opens the door to the clearinghouse?
- Do you have a “Go Kit”?
 - *Example - <http://californiaeqclearinghouse.org/go-kit/>*

Clearinghouse Connections to Emergency Management

Information/data gathered and provided by the Clearinghouse are used in all phases of Emergency Management.

Response

- *Better understanding of current conditions (plus aftershock impacts) helps guide resource allocation and increases the effectiveness, efficiency, and safety of response personnel.*

Recovery

- *Accurate documentation of impacts supports resource allocation, assists in prioritizing needs/repairs, and is a element which can be used to support a Major Disaster request.*

Clearinghouse Connections to Emergency Management

Information/data gathered and provided by the Clearinghouse are used in all phases of Emergency Management.

Mitigation

- *Hazard Identification and Risk Analysis*
- *Supports the development of strategies to reduce impacts from future events*

Preparedness

- *Understanding who was impacted and how leads to the development of targeted outreach*
- *Improved planning*

Clearinghouse Connections to Emergency Management

Emergency Management Agencies can support the Clearinghouse with:

- Coordination of Mutual Aid
- Logistical support
- Administrative support
- External Affairs support

*Direct communication between the Clearinghouse and the state EOC should be **at least** once a day.*

This leads to a shared understanding of:

- Objectives, Information gathered and/or requested, and **Needs**

Thank You

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