

**U.S. HOUSE OF REPRESENTATIVES
COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY
SUBCOMMITTEE ON TECHNOLOGY AND INNOVATION**

HEARING CHARTER

Are We Prepared? Assessing Earthquake Risk Reduction in the United States

**Thursday, April 7, 2011
10:00 a.m. – 12:00 p.m.
2318 Rayburn House Office Building**

1. Purpose

On Thursday, April 7, 2011 the Subcommittee on Technology and Innovation of the Committee on Science, Space, and Technology will hold a hearing to examine earthquake risk in the United States and to review efforts supporting the development of earthquake hazard reduction measures, and the creation of disaster-resilient communities.

2. Witnesses

Dr. Jack Hayes is the Director of the National Earthquake Hazards Reduction Program (NEHRP) at the National Institute of Standards and Technology (NIST).

Mr. Jim Mullen is the Director of the Washington State Emergency Management Division and the President of the National Emergency Management Association (NEMA).

Mr. Chris Poland is the Chairman and Chief Executive Officer of Degenkolb Engineers and the Chairman of the NEHRP Advisory Committee.

Dr. Vicki McConnell is an Oregon State Geologist and the Director of the Oregon Department of Geology and Mineral Industries.

3. Brief Overview

The hearing will examine various elements of the Nation's level of earthquake preparedness and resiliency including the U.S. capability to detect earthquakes and issue notifications and warnings, coordination between federal, state and local stakeholders for earthquake emergency preparation, and research and development measures supported by the federal government designed to improve the scientific understanding of earthquakes.

4. Background

Earthquake Risk and Hazard in the United States

Portions of all 50 states are vulnerable to earthquake hazards, although risks vary across the country and within individual states. Twenty-six urban areas in fourteen U.S. states face significant seismic risk. Earthquake hazards are greatest in the western United States, particularly in California, Oregon, Washington, Alaska, and Hawaii. Though infrequent, earthquakes are unique among natural hazards in that they strike without warning. Earthquakes proceed as cascades, in which the primary effects of faulting and ground shaking induce secondary effects such as landslides, liquefaction, and tsunami, which in turn set off destructive processes within the built environment; structures collapse, people are injured or killed, infrastructure is disrupted, and business interruption begins. The socioeconomic effects of large earthquakes can reverberate for decades.

The recent earthquake that struck off the coast of northern Japan on March 11, 2011, illustrates that the effects of an earthquake can be catastrophic. The earthquake, recorded as a 9.0 on the Richter scale, is the most powerful quake to hit the country, and it triggered a devastating tsunami that swept over cities and farmland in the northern part of the country. As Japan struggles with rescue efforts, it also faces a nuclear emergency due to damage to the nuclear reactors at the Fukushima Daiichi Nuclear Power Station. As of March 31, the official death toll from the earthquake and resulting tsunami includes more than 11,600, and more than 16,000 people were listed as missing. The final toll is expected to reach nearly 20,000. More than 190,000 people remained housed in temporary shelters; tens of thousands of others evacuated their homes due to the nuclear crisis and related fear.

The National Earthquake Hazards Reduction Program (NEHRP)

In 1977 Congress passed the Earthquake Hazards Reduction Act (P.L. 95-124) establishing NEHRP as a long-term earthquake risk reduction program for the United States. The original program focused on research to understand and predict earthquakes. NEHRP's focus was changed in 1990, when Congress decreased the emphasis on earthquake prediction, expanded the program objectives, and required federal agencies to adopt seismic safety standards.

Currently under NEHRP, four federal agencies have responsibility for long-term earthquake risk reduction: NIST, FEMA, the NSF, and the USGS. Current program activities are focused on four broad areas including supporting the development of effective earthquake hazard reduction measures, promoting the adoption of these measures by federal, state, and local governments, improving the basic understanding of earthquakes and their effects on people and infrastructure, and developing and maintaining the Advanced National Seismic System (ANSS), the George E. Brown Jr. Network for Earthquake Engineering and Simulation (NEES), and the Global Seismic Network (GSN).

Primary responsibilities for the NEHRP agencies break down as follows:

- **NIST** is the lead NEHRP agency and has responsibility for the planning and coordination of the program. NIST also promotes earthquake resistant design and construction practices through building codes, standards, and construction practices.
- **FEMA** assists other agencies and private-sector groups to prepare and develop earthquake risk modeling tools, and aids the development of performance-based codes for buildings and other structures.
- **NSF** supports basic research to improve the safety and performance of buildings and structures using the research facilities of NEES and other institutions engaged in earth sciences, engineering, and social sciences relevant to understanding the causes and impacts of earthquakes.
- **USGS** conducts research to assess earthquake causes and effects, produces national and regional seismic hazards maps, monitors and rapidly reports on earthquakes and their shaking intensities in the U.S. and abroad. The USGS maintains the ANSS and the GSN.

The table below shows the authorized and enacted levels of funding for NEHRP over the last reauthorization period.

National Earthquake Hazards Reduction Program (NEHRP) Funding
(dollars in millions)

Agency	FY09 Authorized*	FY09 Enacted	FY10 Enacted	FY12 Request	FY12 Request versus FY10 Enacted	
					\$	%
NIST	14.6	4.1	4.1	4.1	0	0
NSF	64.7	55.0	55.3	53.8	(1.5)	(2.7)
USGS	88.9	61.2	62.8	57.6	(5.2)	(8.3)
FEMA	23.6	9.1	9.0	6.4	(2.6)	(28.9)
Total:	191.8	129.4	131.2	121.9	(9.3)	(7.1)

*the last year NEHRP was authorized was FY09

5. 110th and 111th Congressional Hearings

The House Committee on Science, Space, and Technology held one hearing in the 111th Congress entitled “Reauthorization of the National Earthquake Hazards Reduction Program” to review NEHRP in preparation for reauthorization. The Subcommittee also held two hearings related to this legislation during the 110th Congress.

6. Reauthorization

The last year to provide an authorization for NEHRP was fiscal year 2009. The House passed reauthorization legislation (H.R. 3820) in the last Congress, but it was not considered by the Senate.

7. Issues for Examination

Coordination of Federal Preparedness Efforts

The Subcommittee has requested that witnesses address the coordination between federal, state, and local stakeholders, and their roles in earthquake preparedness efforts.

Witnesses will also discuss how well NEHRP is functioning, opportunities to improve coordination among the NEHRP agencies, and the priorities for NEHRP moving forward.

Hazard Mitigation Costs and Benefits

Much of the expense resulting from damage caused by earthquakes is borne by the federal government. Witnesses are asked to discuss the costs and benefits of hazard mitigation spending, specifically, whether the cost of government investments in natural hazard mitigation with the objective of reducing or eliminating losses from future natural disasters results in a measurable benefit.

The State of Hazards Reduction Science

In the Strategic Plan for the National Earthquake Hazards Reduction Program Fiscal Years 2009-2013¹, the NEHRP agencies list nine strategic priorities to accomplish the goals of understanding earthquakes and their impacts, developing cost-effective measures to reduce these impacts, and improve earthquake resiliency nationwide. The Subcommittee has asked witnesses to address how these goals are being accomplished, challenges faced by the NEHRP agencies, and how research priorities align with the strategic plan goals. Also, in a recent National Research Council report², eighteen preparedness tasks were identified, ranging from basic research to community-oriented applications. Witnesses have been asked to discuss how this “roadmap” helps to further NEHRP goals and implement the NEHRP Strategic Plan to provide the basis for a more earthquake resilient nation.

Response and Recovery Planning

The Subcommittee has requested that witnesses address research and development for hazard mitigation tools and products. These activities must meet the needs of state and local officials who must prepare their communities for disasters and help them respond. How well do NEHRP activities meet state and local needs, how could efforts be better aligned, and what are the lessons that can be drawn from the resilience demonstrated in responding to a moderate earthquake in preparing for a great one?

¹ National Earthquake Hazards Reduction Program, *Strategic Plan for the National Earthquake Hazards Reduction Program Fiscal Years 2009-2013*, October 2008, http://www.nehrp.gov/pdf/strategic_plan_2008.pdf.

² National Research Council of the National Academies, *National Earthquake Resilience: Research, Implementation, and Outreach*, March 2011, http://www.nap.edu/catalog.php?record_id=13092.