

# National Earthquake Hazards Reduction Program

*... a research and implementation partnership*

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## Program Update

Advisory Committee on Earthquake Hazards Reduction  
19-20 November 2012



FEMA

NIST  
National Institute of  
Standards and Technology



USGS  
science for a changing world

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national **earthquake** hazards reduction program

# ACEHR Update



- ACEHR last met face-to-face on 11/8-9/11, followed by conference calls on 12/20/11, 4/20/12, 4/27/12 & 6/1/12 (largely focused on 2012 report to NIST Director in his capacity as chair of NEHRP Interagency Coordinating Committee - ICC)
- Term expirations since 2011 meeting: Tom O'Rourke, Susan Tubbesing, Ann Von Weller, Yumei Wang
- Currently working on replacement for Susan Tubbesing
- New members: Craig Davis, Bob Herrmann, Laurie Johnson, Ron Lynn, Ken Stokoe, Mary Lou Zoback
- *Discuss face-to-face meeting schedule during this meeting ...*

# 2005-2012 NEHRP Agency Budgets

Enacted Agency NEHRP Budgets (\$M) <sup>1</sup>					
FY	FEMA <sup>2</sup>	NIST <sup>3</sup>	NSF <sup>4</sup>	USGS <sup>5</sup>	NEHRP Total
2005	14.7	0.9	53.1	58.4	127.1
2006	9.5	0.9	53.8	54.5	118.7
2007	7.2	1.7	54.2	55.1	118.2
2008	6.1	1.7	53.6	58.1	119.5
2009	9.1	4.1	56.0	61.2	130.4
2010	9.0	4.1	55.0	62.8	130.9
2011	7.8	4.1	55.3	61.4	128.6
2012	7.8	4.1	53.2	60.4	125.5

## Notes:

1. USGS budget reflects amount appropriated for USGS NEHRP activities. FEMA, NIST, & NSF budgets reflect agency allocations for NEHRP activities from total agency appropriations. Budgets reported as of 11/01/12. 2009 ARRA funds were not included in totals. Amounts reported to nearest \$0.1M.
2. FEMA 2005 enacted NEHRP budget included program activities and employee salaries & expenses (S&E). FEMA 2005 – 2009 NEHRP budgets excluded state grants. FEMA 2006-2012 NEHRP budgets cover all program activities, excluding S&E costs.
3. NIST NEHRP budget supports all expenses for both NEHRP Secretariat (Lead Agency) and NIST Earthquake Risk Reduction in Buildings & Infrastructure R&D Program.
4. NSF NEHRP budget supports program activities, excluding Agency Operations and Award Management (AOAM) costs. Budget includes support for George E. Brown, Jr. Network for Earthquake Engineering Simulation and Global Seismographic Network, but excludes *EarthScope* activities.
5. USGS budget supports program activities, including the Global Seismographic Network (\$5.3M).



# 2013 Administration-Requested NEHRP Agency Budgets

Requested Agency NEHRP Budgets (\$M) <sup>1</sup>					
FY	FEMA <sup>2</sup>	NIST <sup>3</sup>	NSF <sup>4</sup>	USGS <sup>5</sup>	NEHRP Total
2013	6.5	4.1	53.2	64.4	128.2

## Notes:

1. USGS budget reflects amount requested for USGS NEHRP activities. FEMA, NIST, & NSF budgets reflect planned agency allocations for NEHRP activities from total requested agency appropriations. Budgets reported as of 11/01/12. Amounts reported to nearest \$0.1M.
2. FEMA planned NEHRP budget includes program activities, excluding employee salaries & expenses (S&E).
3. NIST planned NEHRP budget supports all expenses for both NEHRP Secretariat (Lead Agency) and NIST Earthquake Risk Reduction in Buildings & Infrastructure R&D Program.
4. NSF planned NEHRP budget supports program activities, excluding Agency Operations and Award Management (AOAM) costs. Budget includes support for George E. Brown, Jr. Network for Earthquake Engineering Simulation and Global Seismographic Network, but excludes *EarthScope* activities.
5. USGS requested budget supports program activities, including the Global Seismographic Network (\$5.5M).
6. Requested budgets not yet enacted. Agencies are currently working under a continuing budget resolution at 2012 funding levels through 3/31/13.



# Annual Report

- Annual report on 2011 activities recently released (copies distributed at meeting)
- New report on 2012 activities is planned (following 2013 & 2014 budget decisions)



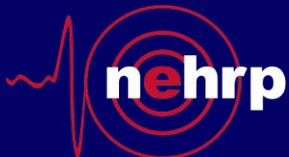
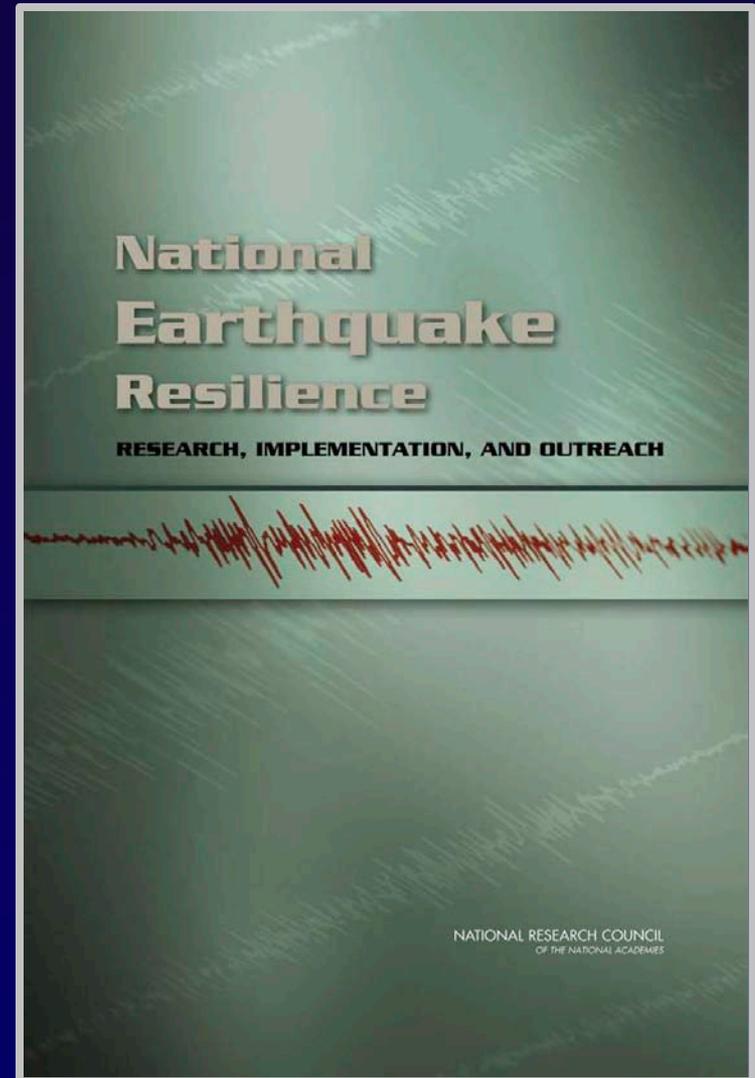
Annual Report  
of the  
National Earthquake Hazards Reduction Program  
for Fiscal Year 2011

September 2012



# Program Activities

- National Research Council (NRC) 20-yr U.S. Earthquake Implementation Roadmap completed on 3/31/11
- Interagency Coordinating Committee (ICC) meeting conducted 1/12/12 (next meeting slated for early 2013)
- Post-Earthquake Investigations Strategy Development, Ph I, 2013 (task order with NCJV)
- Lifelines Research & Implementation Roadmap Study, with Workshop, in 2013 (task order with NCJV)



# Related Activities

- Interagency Committee on Seismic Safety in Construction (ICSSC) RP-8, *Standards of Seismic Safety for Existing Federally Owned or Leased Buildings* (contract via BSSC) completed and released, early 2012
- Re-engaged U.S. Japan Cooperative Program in Natural Resources (UJNR) Panel on Wind and Seismic Effects - August 2011 meeting in Japan, meeting planned for NIST, February 2013)
- Hosted delegation from China Earthquake Administration (CEA) Institute of Engineering Mechanics (IEM) – December 2011
- Disaster and Failure Studies Program in NIST Engineering Laboratory gathering momentum

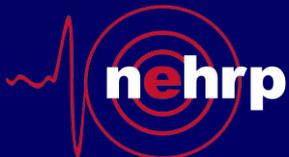
NIST GCR 11-917-12

## Standards of Seismic Safety for Existing Federally Owned and Leased Buildings

ICSSC Recommended Practice 8  
(RP 8)



**NIST**  
National Institute of  
Standards and Technology  
U.S. Department of Commerce



# Legislation Status

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- PL 108-360, *National Earthquake Hazards Reduction Program Reauthorization Act of 2004*, remains in effect (budget authorizations expired 30 September 2009)
- New bills, HR 3479 and S 646, have been considered by 112<sup>th</sup> Congress
  - Known as *Natural Hazards Risk Reduction Act of 2011*
  - Both bills combine earthquake (NEHRP), wind (NWIRP), & fire research legislation
  - S 646 also includes *National Construction Safety Team Act* amendments
  - NEHRP provisions of HR 3479 and S 646 differ (see following slides)
  - No current indication of movement in 112<sup>th</sup> Congress
- *Information on following slides is from review of legislation by Hayes & Filson and does not represent a formal legislative review by legal staff – actual language is included in committee notebooks.*



## Major Changes from PL 108-360 in HR 3479 & S 646 (1/10)

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- *Program Activities* language:
  - Changed in both bills from “develop effective measures for earthquake hazards reduction” to “research and develop effective methods, tools, and technologies to reduce the risk posed by earthquakes to the built environment, especially to lessen the risk to existing structures and lifelines.” [Section 5, (a)(2)(A)]
  - Changed in S 646 from “promote the adoption of earthquake hazards reduction measures ...” to “facilitate the adoption of earthquake risk reduction measures ...” [Section 5, (a)(2)(B) becomes (a)(2)(C)]
  - Added in S 646 compared to PL 108-360: “outreach and information dissemination to communities on location-specific earthquake hazards and methods to reduce the risks from those hazards” [Section 5, (a)(2)(B) becomes (a)(2)(C), with new subsection (iii)]



## Major Changes from PL 108-360 in HR 3479 & S 646 (2/10)

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- *Program Activities* language, continued:
  - Added in HR 3479: “support public education and outreach to assist different populations, including individuals and households with special needs, in preparing for and responding to earthquake-related disasters” [Section 5, (a)(2)(E) added]
- *Lead Agency* language:
  - Added in both bills: “when warranted by research or investigative findings, issue recommendations to assist in informing the development of model codes and provide information to Congress on the use of such recommendations” [Section 5, (b)(1)(E) added]



# Major Changes from PL 108-360 in HR 3479 & S 646 (3/10)

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- *NIST* language:
  - Added in S 646: “develop tools, technologies, methods, and practitioner guidance to feasibly and cost-effectively retrofit existing buildings and structures to increase their earthquake resiliency” [Section 5, (b)(5)(E) becomes (b)(2)ff]
  - Changed by S 646: Deleted requirements for performance-based design and for working with other agencies to work with upgrade and maintenance of testing facilities [Section 5, (b)(5)(E) becomes (b)(2)ff]
- *FEMA* language changed by S 646 [Section 5, (b)(2)ff becomes (b)(3)ff]:
  - “Resilience” terminology added
  - State Assistance Grant Program language shortened



## Major Changes from PL 108-360 in HR 3479 & S 646 (4/10)

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- NSF language altered in S 646 [Section 5, (b)(4)ff becomes (b)(5)ff]:
  - Adds “resilience” terminology
  - Adds language regarding multi-disciplinary and inter-disciplinary research
  - Describes research in social sciences (“research to support more effective earthquake mitigation and response measures, such as developing better knowledge of the specific types of vulnerabilities faced by segments of the community vulnerable to earthquakes, addressing the barriers they face in adopting mitigation and preparation measures, and developing methods to better communicate the risks of earthquakes and to promote mitigation,” and “research on the response of communities, households, businesses, and emergency responders to earthquakes”)



## Major Changes from PL 108-360 in HR 3479 & S 646 (5/10)

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- *NSF* language altered in S 646 [Section 5, (b)(4)ff becomes (b)(5)ff], continued:
  - Reduces specific requirements in engineering disciplines
  - Removes requirements for supporting consortia, centers



## Major Changes from PL 108-360 in HR 3479 & S 646 (6/10)

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- USGS language altered in S 646 [Section 5, (b)(3)ff becomes (b)(4)ff]:
  - “Predictions” terminology replaced by “real-time earthquake information...”
  - “Microzonation” terminology replaced by “urban and other developed areas where earthquake risk is determined to be significant ...”
  - Added requirements for developing and supporting seismic instrumentation of buildings and other structures, monitoring and assessing earth surface deformations.
  - Deleted requirements for working with other agencies to work with upgrade and maintenance of testing facilities



## Major Changes from PL 108-360 in HR 3479 & S 646 (7/10)

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- *Post-Earthquake Investigations* language:
  - S 646 designates NIST as post-earthquake investigations lead (as program Lead Agency) [new Section 105] – but no added funds authorized specifically for this
  - HR 3479 designates USGS as post-earthquake investigations lead , “... utilizing the coordination expertise of the Lead Program agency ...” [new Section 104]



# Major Changes from PL 108-360 in HR 3479 & S 646 (8/10)

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- ACEHR language:
  - HR 3479:
    - ✓ Requires biennial reports to Interagency Coordinating Committee
    - ✓ Sunsets committee 5 yrs following bill enactment
    - ✓ Adds assessment of Strategic Plan priorities to reporting
  - S 646:
    - ✓ Covered under requirements for Interagency Coordinating Committee, with requirements largely unchanged from PL 108-360 (includes biennial reporting)



# Major Changes from PL 108-360 in HR 3479 & S 646 (9/10)

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- *Interagency Coordinating Committee (ICC) language:*
  - Both bills:
    - ✓ Create ICC on Natural Hazards Risk Reduction
    - ✓ Add NOAA and wind/storm issues to ICC jurisdiction
    - ✓ Require coordinated annual budgets
    - ✓ Require new Strategic Plan with greater delineation of metrics
  - HR 3479: Requires “Progress Report” 18 months following enactment
  - S 646: Requires “Progress Report” 12 months following enactment and biennially thereafter.



## Major Changes from PL 108-360 in HR 3479 & S 646 (10/10)

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- HR 3479 requires *Report on Coordination of Federal Disaster Research, Development, and Technology Transfer* from NSTC Committee on Environment and Natural Resources Subcommittee on Disaster Reduction (SDR):
  - Report to detail all current federal R&D and technology transfer activities that address hazard mitigation for natural disasters, as well as budgets for those activities
  - Report to list areas of research that are common to two or more hazards
  - Report to list opportunities to create synergies among research activities
  - Report to list status of coordination of the above activities
  - Report to be provided within two years of enactment of bill
  - No additional funds authorized for report development



# Authorized NEHRP Budgets Shown in HR 3479 & S 646

HR 3479 (\$M)					
	2011	2012	2013	2014	2015
FEMA		6.4	6.4	6.4	
NIST		4.1	4.1	4.1	
NSF		53.8	53.8	53.8	
USGS		57.7	57.7	57.7	

S 646 (\$M)					
	2011	2012	2013	2014	2015
FEMA	10.2	10.5	10.9	11.2	11.5
NIST	7.0	7.7	7.9	8.2	8.4
NSF	64.1	66.0	68.0	70.1	72.2
USGS*	90.0	92.1	94.3	96.5	98.8

FY 2009 Authorizations in  
PL 108-360:

FEMA: \$23.6M

NIST: \$14.6M

NSF: \$42.8M + \$21.9M for  
NEES

USGS: \$88.9M

\* S 646 requires specific amounts of USGS authorized budgets to be available for ANSS



# NIST Engineering Laboratory (EL) Updates

- PI Jeff Dragovich resigned in June 2012 – now searching for possible replacements (see NEHRP web site, November EERI Newsletter)
- Awaiting delivery from BSSC of suggested R&D roadmap for future NIST activities – draft submitted on 11/9/12, with final expected NLT 11/30/12, to be followed by public comment period via NEHRP web site
- No new task orders being awarded against FY 2007 – FY 2012 IDIQ contract with NEHRP Consultants Joint Venture (ATC + CUREE) after FY 2012 – now initiating solicitation process for new IDIQ
- Disposition of 2013 resilience initiative proposed in President's 2013 request awaits formal 2013 budget appropriations (currently under continuing resolution at 2012 levels)



# Comments on NIST-Related Recommendations in 2012 ACEHR Report to NEHRP ICC

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- The NEHRP agencies continue to support NEHRP within the limits of the current resource-constrained environment, proceeding as aggressively as possible.
- NIST has funded via ATC-CUREE a study to develop a lifelines research and implementation roadmap for all of NEHRP.
- It is not expected that NIST will be able to expand its NEHRP research efforts in the short term. The previously mentioned proposed 2013 resilience initiative, if supported, will relate to NEHRP but not be solely tied to it. NIST continues to explore support for future NEHRP-related budget initiatives for existing buildings and lifelines.
- As a new IDIQ contract is competed and awarded, NIST continues to rely on that avenue for disciplinary expertise outside the structural engineering field – key task orders related to foundations, ground motion issues, and lifeline issues in the ATC-CUREE work exemplify this.



# FY 2012 NIST EL Extramural Earthquake Research Projects \*

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- Reinforced Concrete Wall Testing and Analysis (at ERDC CERL)
- Advisory Committee for Reinforced Concrete Wall Testing Project
- Assistance with Preparation of NEHRP Annual Report (covering 2012)
- Seismic Behavior and Design of Deep, Slender Wide-Flange Structural Steel Beam-Columns – Experimental Evaluation
- Peer Assessment of Ongoing In-House PBSE Evaluation of ASCE 41 Procedures / Memphis Cost Study Report
- Lifelines Roadmap Study
- NEHRP Post-Earthquake Studies Strategy (Phase I)
- Techbrief – Special Steel Concentric Braced Frames

\* Includes final task orders to NEHRP Consultants Joint Venture under auspices of FY 2007 – FY 2012 IDIQ contract.



# Planned FY 2013 NIST EL Earthquake Research Program \*

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- NEHRP Office
- Seismic Analysis and Design Procedures in Existing Standards (in-house)
- Lateral Force-Resisting Structural Elements and Systems (in-house/extramural)
- Assessment of Design Methods in Existing PBSD Standards (in-house)
- Performance-Based Seismic Engineering for New Buildings (in-house/extramural)
- Techbriefs – Reinforced Masonry Shear Walls, Special Steel Eccentric Braced Frames (extramural)

\* Includes both ongoing in-house (performed by NIST employees) and proposed extramural projects. Final program planning pending FY 2013 appropriation.

