

Addressing Current and Future Risks in Real Estate

Congressional Briefing on
Building Climate Resilience in the Real Estate Sector
March 6, 2018



National Institute of
BUILDING SCIENCES

*An Authoritative Source of Innovative Solutions
for the Built Environment*

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Public Law 93-383, Sect. 809

Congress directed the Institute to “exercise its functions and responsibilities in four general areas.....”

- **Develop and maintain** performance criteria for maintenance of life, safety, health, and public welfare for the built environment
- **Evaluate and prequalify** building technology and products
- **Conduct** related and needed investigations
- **Assemble, store, and disseminate** technical data and related information



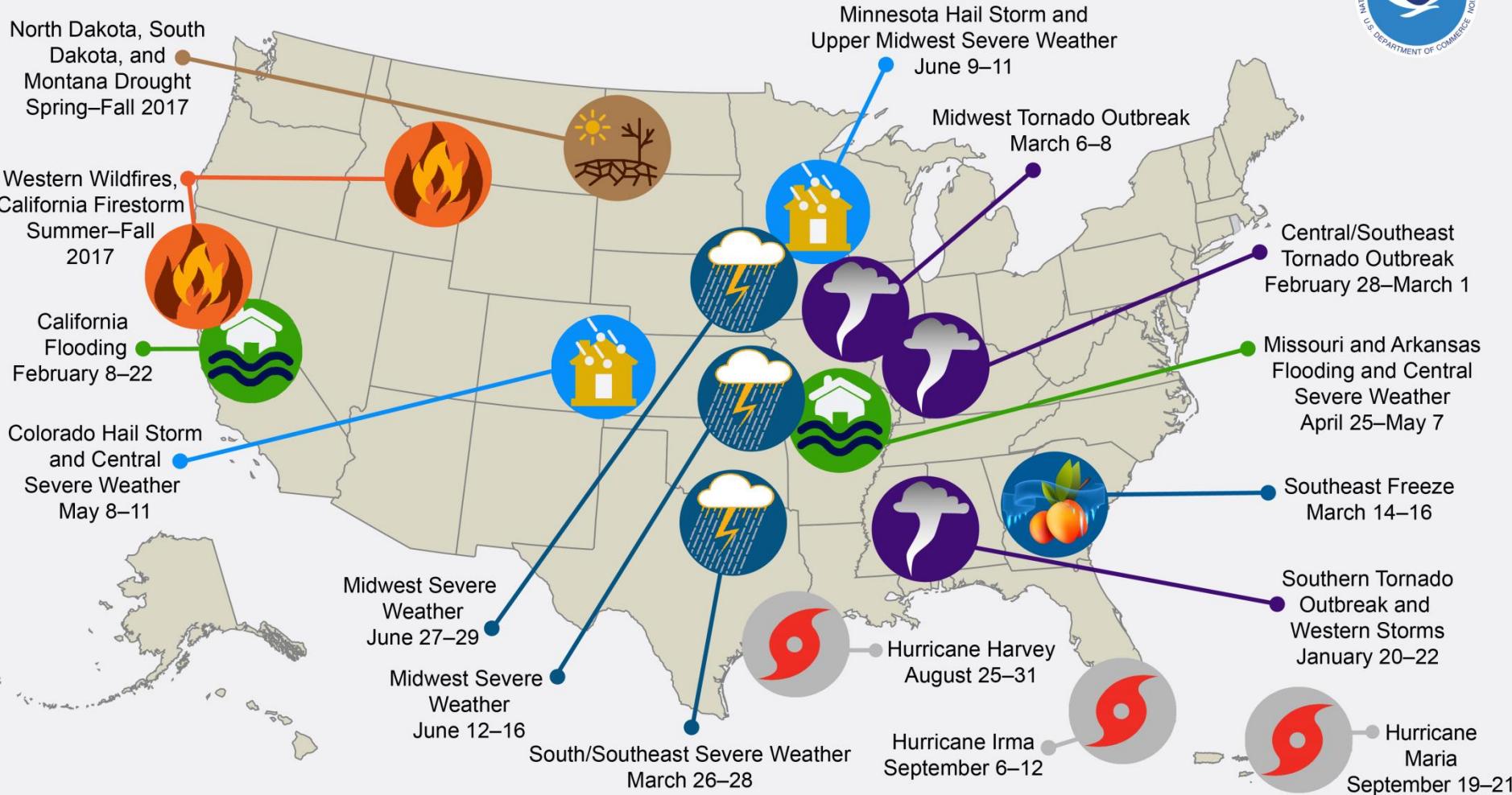
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Institute in Action



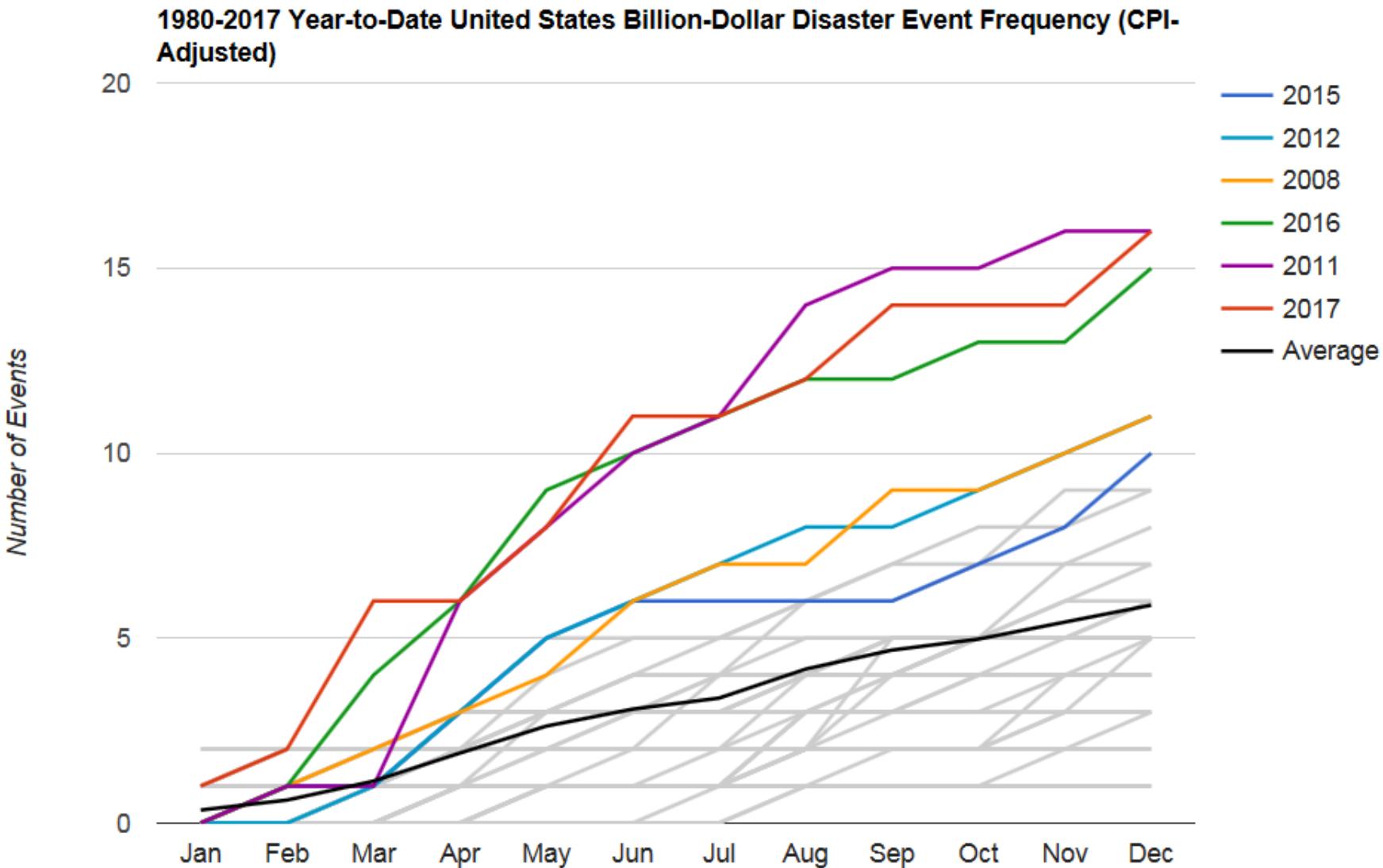
The Growing Impacts of Natural Disasters

U.S. 2017 Billion-Dollar Weather and Climate Disasters



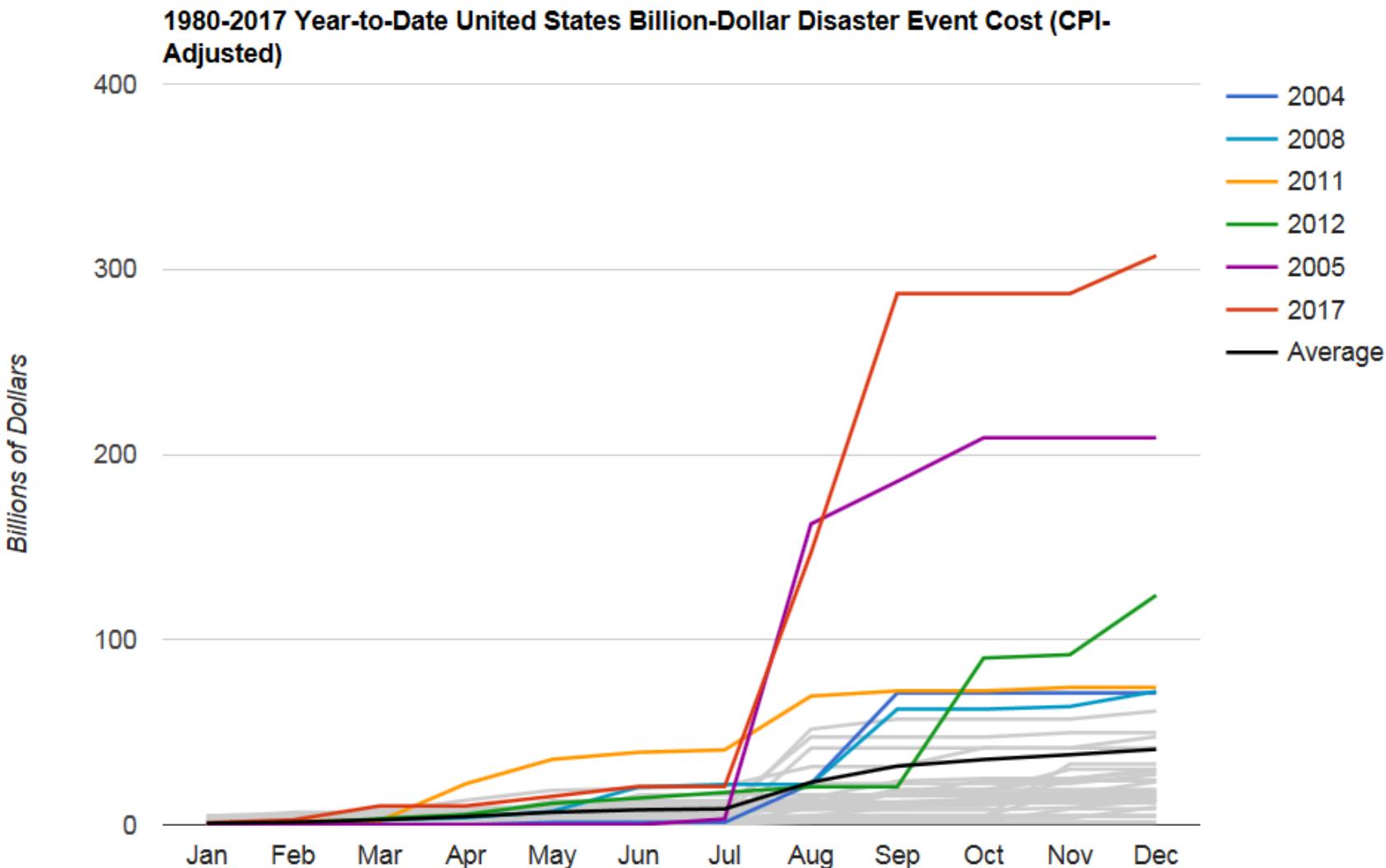
This map denotes the approximate location for each of the 16 billion-dollar weather and climate disasters that impacted the United States during 2017.

Frequency of Natural Disasters



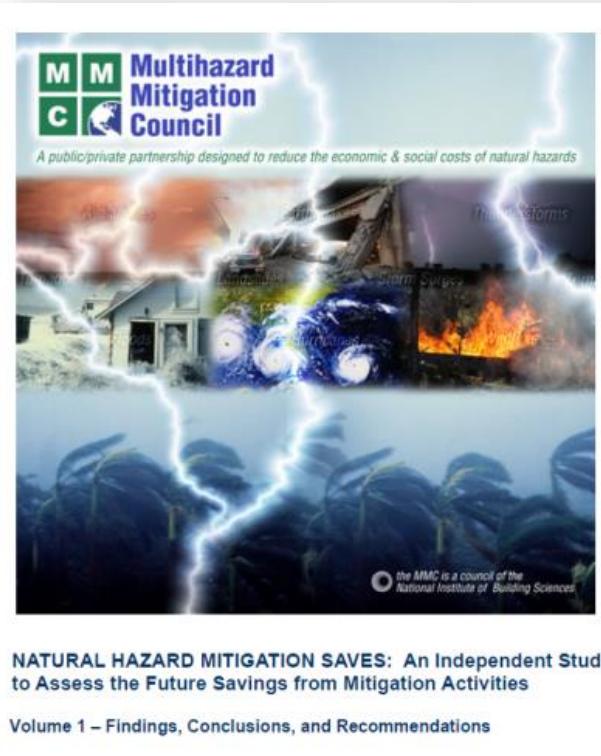
Event statistics are added according to the date on which they ended.

Cost of Natural Disasters



Event statistics are added according to the date on which they ended.

Natural Hazard Mitigation Saves: An Independent Study to Assess the Future Savings from Mitigation Activities (2005)



“Money spent on reducing the risk of natural hazards is a sound investment. On average, a dollar spent by FEMA on hazard mitigation provides the nation about \$4 in future benefits.”

A Valuable Contribution . . . But Questions Remained



Private Sector Initiatives

1999
STANDARD
BUILDING
CODE



Building Codes



Lifelines



FEMA

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Summary of Findings

**Natural Hazard Mitigation Saves:
2017 Interim Report**

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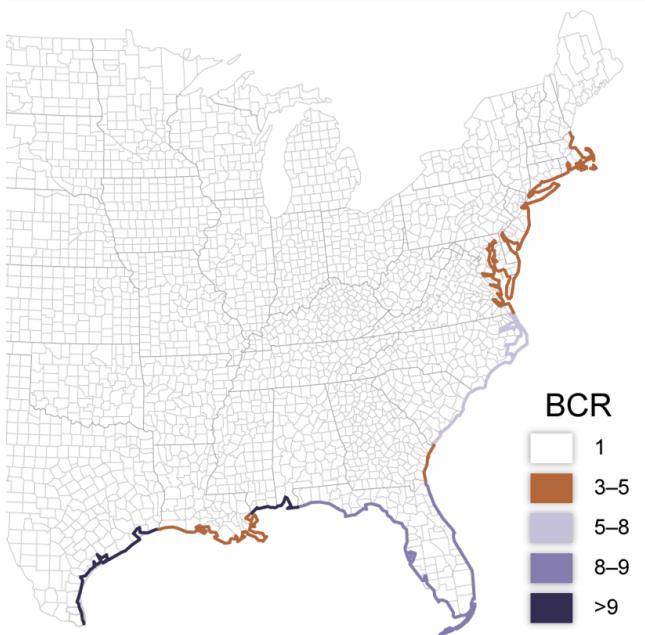


Hazard Mitigation Saves: 2017 Interim Report Findings

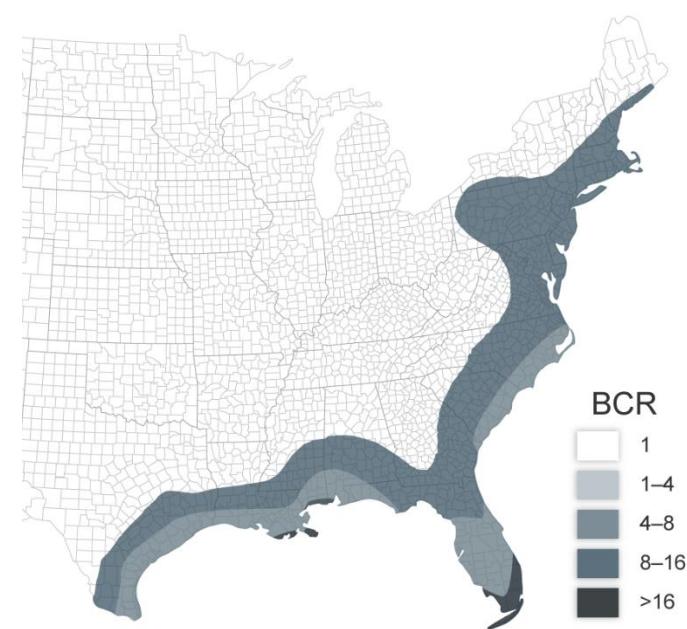
- **Federal grants:** The impacts of 23 years of federal mitigation grants provided by the Federal Emergency Management Agency (FEMA), Economic Development Administration (EDA) and Department of Housing and Urban Development (HUD), resulting in a national benefit of \$6 for every \$1 invested.
- **Exceed code requirements:** The costs and benefits of designing all new construction to exceed select provisions in the *2015 International Building Code* (IBC) and the *2015 International Residential Code* (IRC) and the implementation of the *2015 International Wildland-Urban Interface Code* (IWUIC). This resulted in a national benefit of \$4 for every \$1 invested.

Benefit Cost Ratios by Hazard and Mitigation Measure

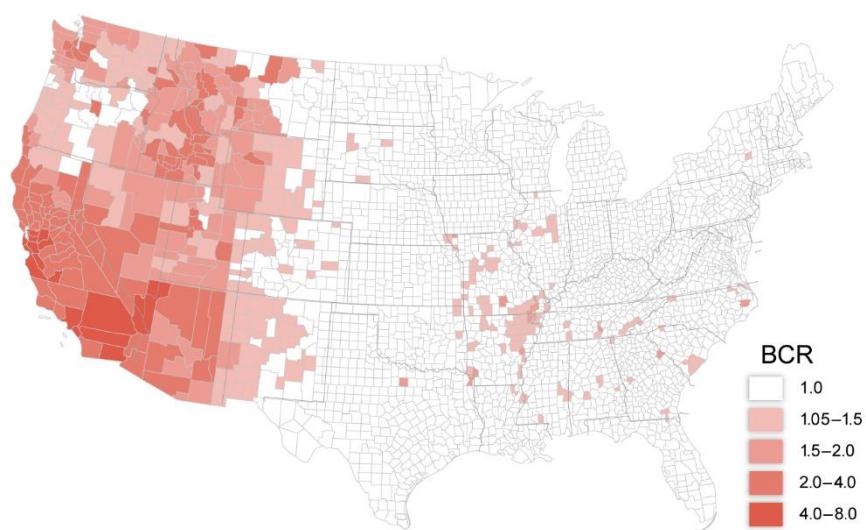
National Benefit-Cost Ratio Per Peril <small>*BCR numbers in this study have been rounded</small>		Federally Funded	Beyond Code Requirements
Overall Hazard Benefit-Cost Ratio		6:1	4:1
	Riverine Flood	7:1	5:1
	Hurricane Surge	Too few grants	7:1
	Wind	5:1	5:1
	Earthquake	3:1	4:1
	Wildland-Urban Interface Fire	3:1	4:1



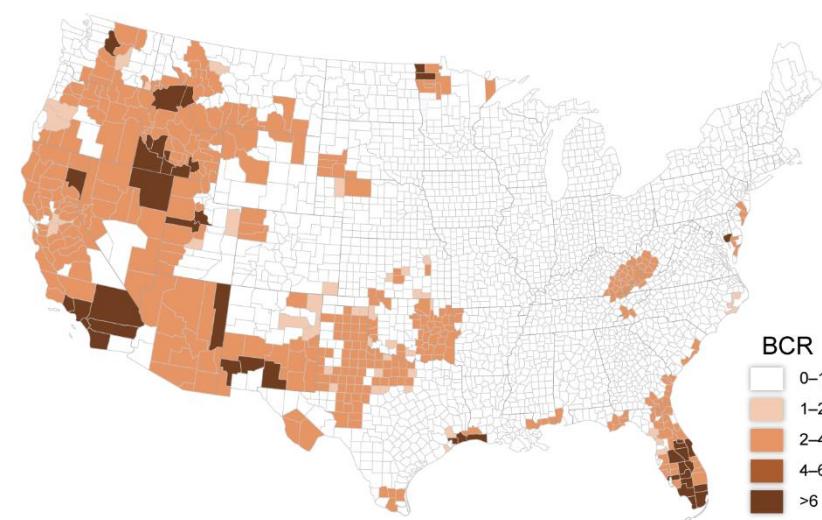
BCR for Coastal Flooding Mitigation



BCR for Hurricane Wind Mitigation



BCR for Earthquake Mitigation



BCR for Wildfire Mitigation

Some Benefits Cannot Be Estimated, so BCRs May Be Low



Elisa.rolle

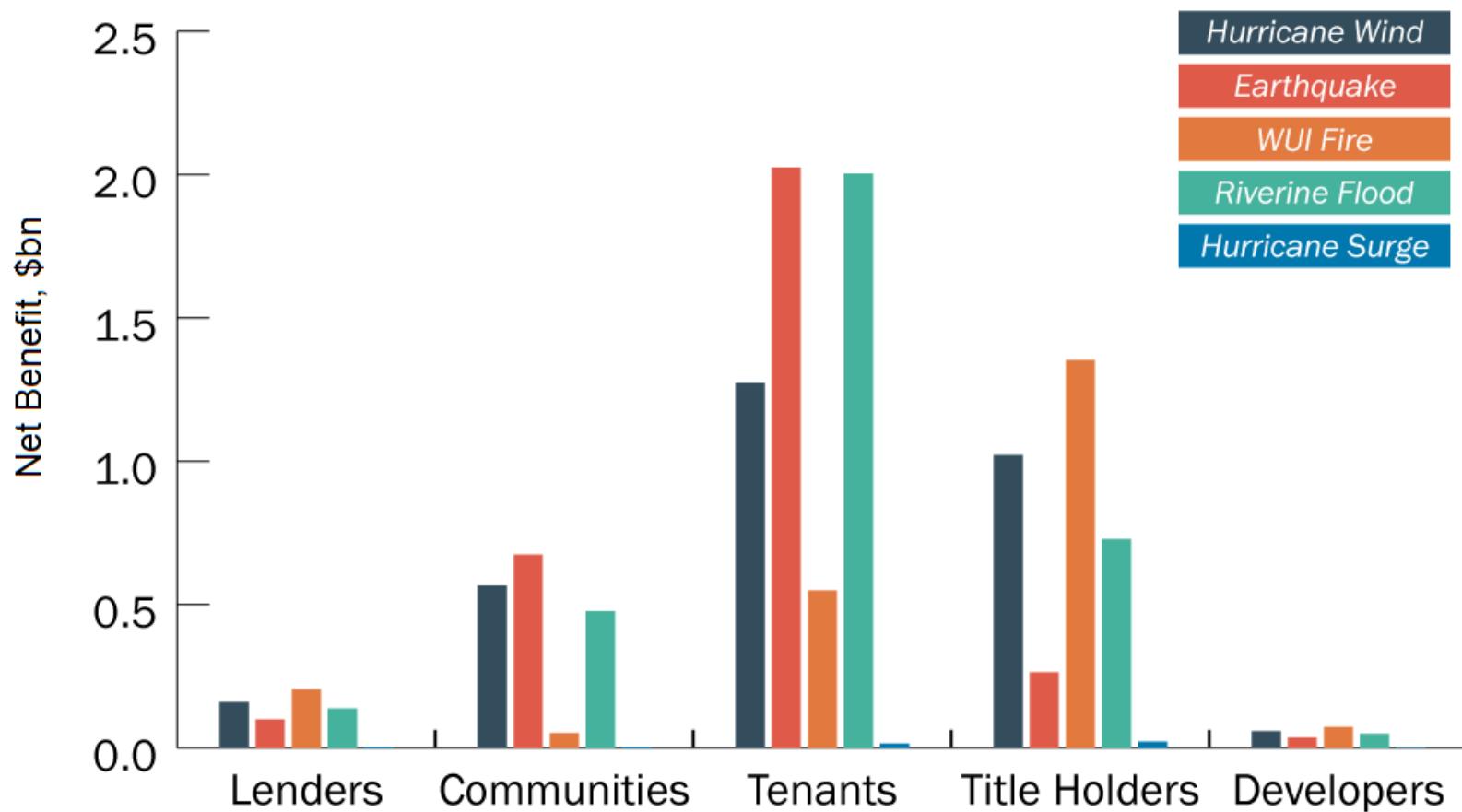


Matty1378



Changes in future risks also not generally included. . .

All Stakeholders Benefit from Exceeding Select 2015 I-Code Provisions

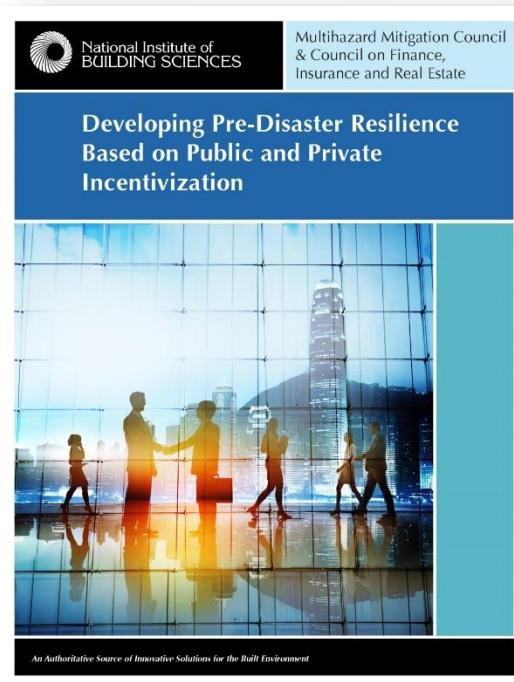




Additional Mitigation Measures to Study

- Adoption of Current Building Codes (In Progress)
- Retrofit of Existing Facilities (In Progress)
- Business Continuity Planning (Proposed)
- Utility and Transportation Lifeline Mitigation (In Progress)
- Public-Sector Direct Mitigation Efforts (Proposed)

Pre-Disaster Resilience Based on Public and Private Incentivization



The most cost-effective manner to achieve resilience is through a holistic and integrated set of public, private and hybrid incentivization programs including mortgages, insurance, finance, tax incentives and credits, and grants

The Importance of Community-Level Resilience Illustrated



Galveston Texas, Post-Ike

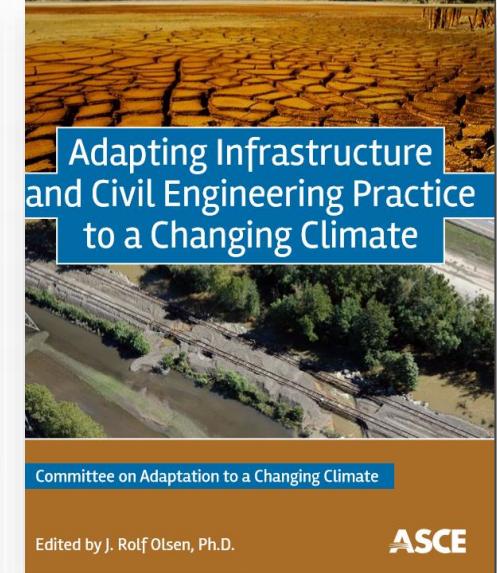
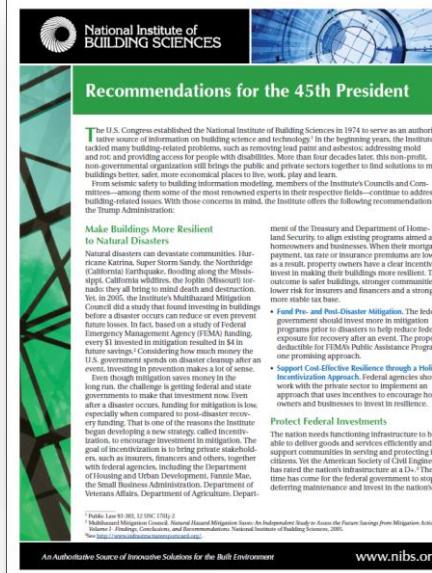
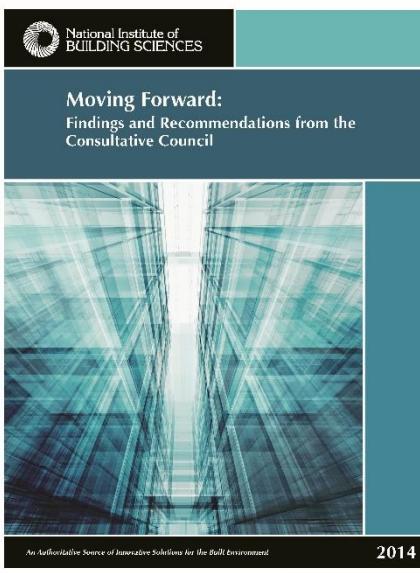


NYC, Post-Sandy



MTA

Designing for Life-Cycle Risks



United States Government Accountability Office
GAO
Report to the Honorable Matthew Cartwright, House of Representatives

November 2016

CLIMATE CHANGE

Improved Federal Coordination Could Facilitate Use of Forward-Looking Climate Information in Design Standards, Building Codes, and Certifications

GAO-17-3

WORKSHOP REPORT
Nonstationary Weather Patterns and Extreme Events
Informing Design and Planning for Long-Lived Infrastructure
ESTCP Project RC-201591

NOVEMBER 2017

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Distribution Statement A
This document has been cleared for public release

ESTCP



Industry Statement on Resilience

- We **research** materials, design techniques, construction procedures, and other methods to improve the standard of practice.
- We **educate** our profession through continuous learning. Through coordinated and continuous learning, design, construction and operations professionals can provide their clients with proven best practices and utilize the latest systems and materials to create more resilient communities.
- We **advocate** at all levels of government for effective land use policies, modern building codes, and smarter investment in the construction and maintenance of our nation's buildings and infrastructure.
- We **respond** alongside professional emergency managers when disasters do occur. Industry experts routinely work in partnership with government officials to survey damage, coordinate recovery efforts, and help communities rebuild better and stronger than before.
- We **plan** for the future, proactively envisioning and pursuing a more sustainable built environment.

Industry Statement on Resilience

Representing nearly 1.7 million professionals, America's design and construction industry is one of the largest sectors of this nation's economy, generating over \$1 trillion in GDP. We are responsible for the design, construction, and operation of the buildings, homes, transportation systems, landscapes, and public spaces that enrich our lives and sustain America's global leadership.

We recognize that natural and manmade hazards pose an increasing threat to the safety of the public and the vitality of our nation. Aging infrastructure and disasters result in unacceptable losses of life and property, straining our nation's ability to respond in a timely and efficient manner. We further recognize that contemporary planning, building materials, and design, construction and operational techniques can make our communities more resilient to these threats.

Drawing upon the work of the National Research Council, we define resilience as the ability to prepare and plan for, absorb, recover from, and more successfully adapt to adverse events.

As the leaders of this industry, we are committed to significantly improving the resilience of our nation's buildings, infrastructure, public spaces, and communities.

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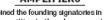
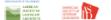
The promotion of resilience will improve the economic competitiveness of the United States. Disasters are expensive to respond to, but much of the destruction can be prevented with cost-effective mitigation features and advanced planning. Our practices must continue to change, and we commit ourselves to the creation of new practices in order to break the cycle of destruction and rebuilding. Together, our organizations are committed to build a more resilient future.

CULTIVATORS
led the effort to establish and implement the Statement with their industry peers



FOUNDERS

united to define the goals and objectives of a resilient built environment:



joined the founding signatories in committing to the advancement of the Statement





Recommendations

- Invest in mitigation to reduce future federal obligations
- Encourage state and local governments to adopt and enforce the latest building codes
 - Coordinated interagency code program
 - Prerequisite for certain federal funding
- Support research into incorporating climate risk into design and construction guidance
- Encourage innovative federal programs (and remove barriers) to enhance private-sector investment in mitigation
- All federal investments should recognize current and future risks to assure assets are protected