

NIST and US National Priorities: Disaster Resilience

Jason D. Averill

Engineering Laboratory

National Institute of Standards and Technology

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San Francisco - 1906



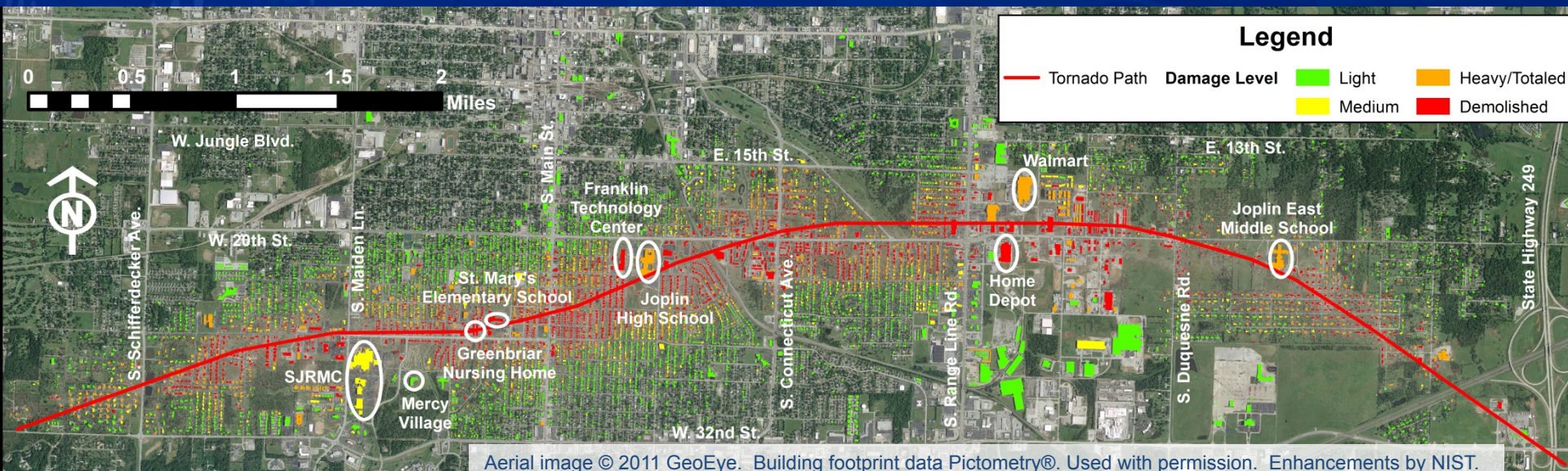
Source: Library of Congress



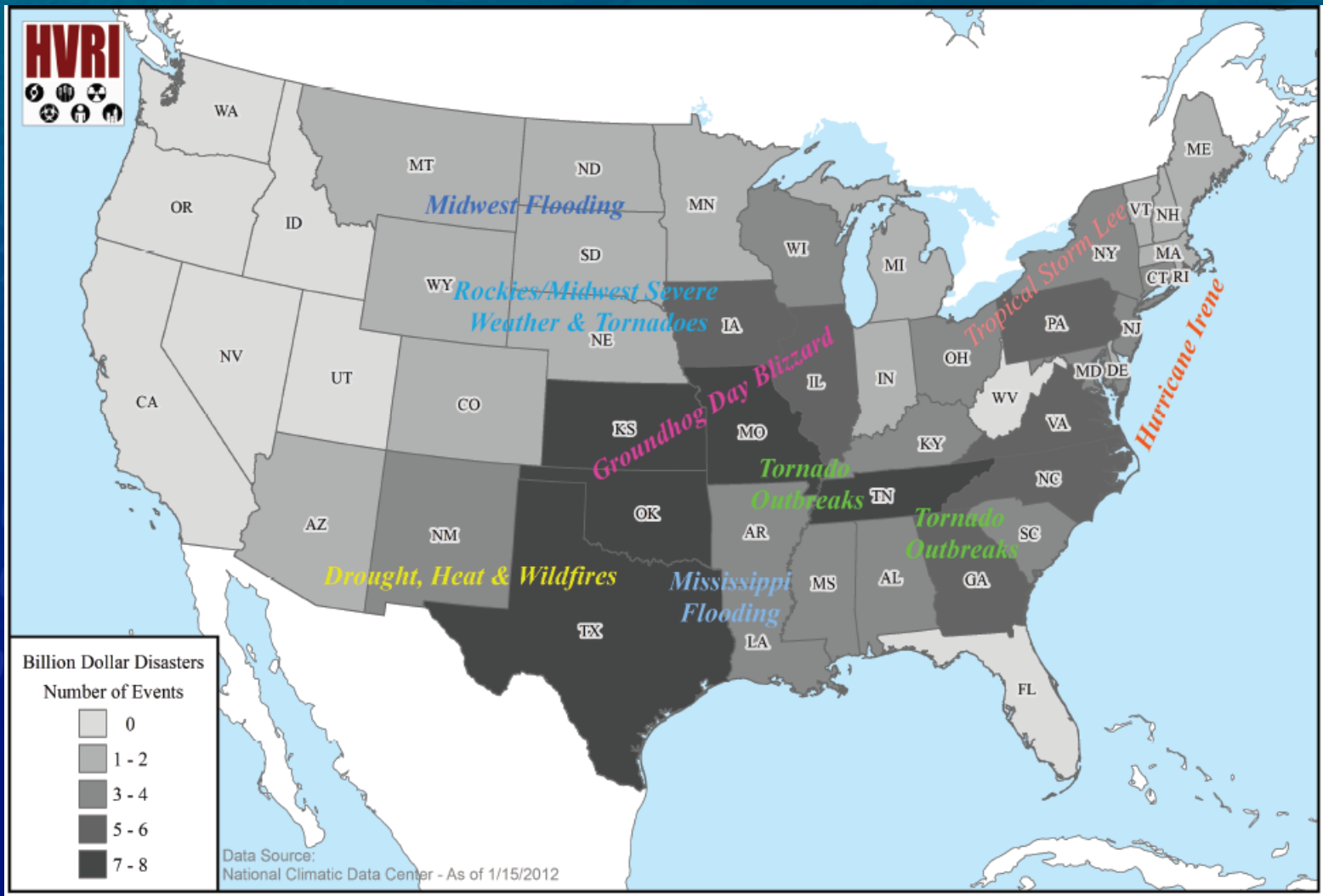
May 2011: Joplin Tornado

Deadliest and Costliest Single Tornado on Record

- Tornado warning issued at 5:17 PM CDT, May 22, 2011. Touched down at 5:34 PM. Track length about 22 miles long (6 miles in City of Joplin)
- Officially rated EF-5 (highest category on the Enhanced Fujita Tornado Intensity Scale), with estimated maximum wind speeds of 200+ mph



2011: Billion Dollar Disasters



Source: "Disaster Resilience: A National Imperative" National Academies



October 29, 2012: Hurricane Sandy



Source: NASA

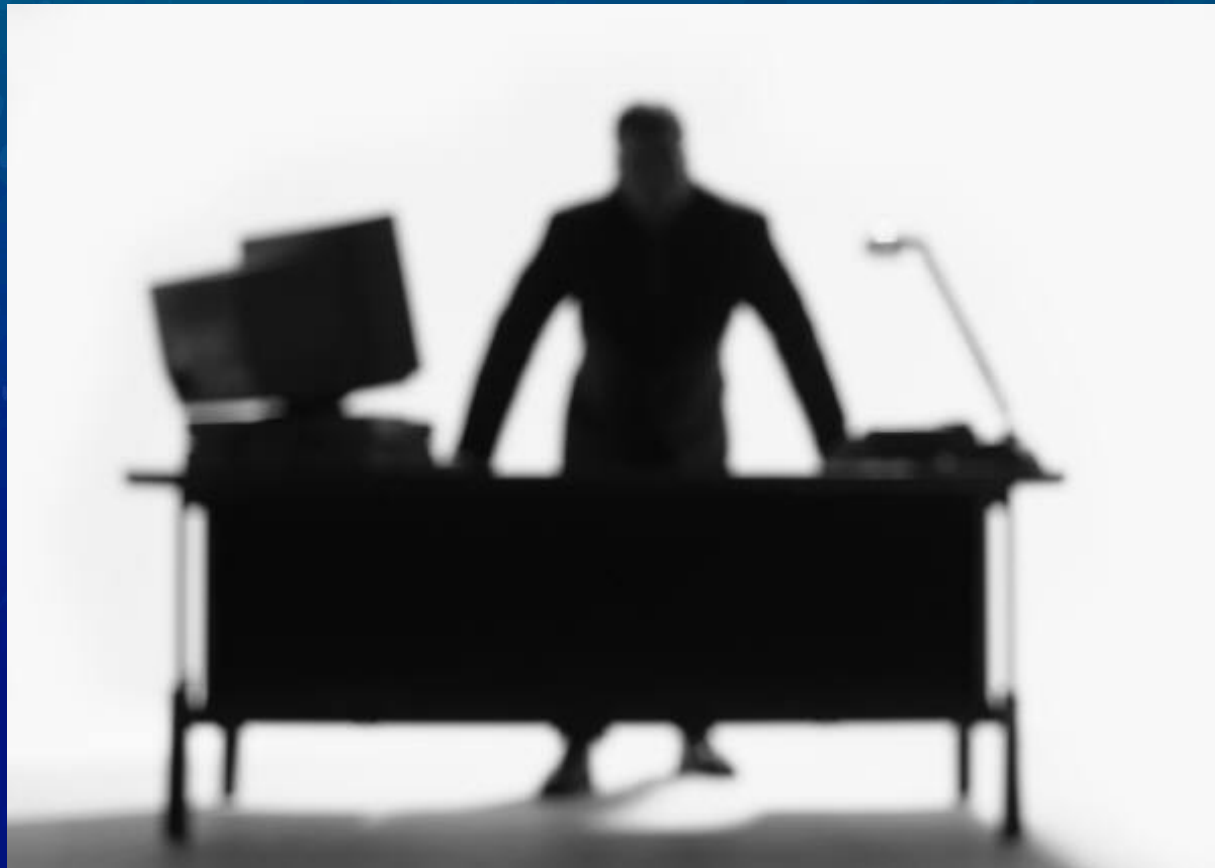


August 2005: Hurricane Katrina

- US Census Department
 - 2000: New Orleans Population was 484,000
 - 2010: New Orleans Population was 343,000
- Bureau of Labor Statistics
 - Job loss 10 months after 105,300
 - \$62.3B supplementary appropriations from US Congress
 - Total economic loss approaching \$200B



What if you became a community's Resilience Officer?



What is “Resilience”

- Presidential Policy Directive (PPD) 21
 - Resilience is “the ability to prepare for and adapt to changing conditions and withstand and recover rapidly from disruptions.”



Community Resilience for the Built Environment

Community Resilience Performance Goals are based on societal needs



- Natural hazards
- Manmade hazards
- Degradation
- Climate change

- Performance Goals
- Mitigation
- Response
- Recovery



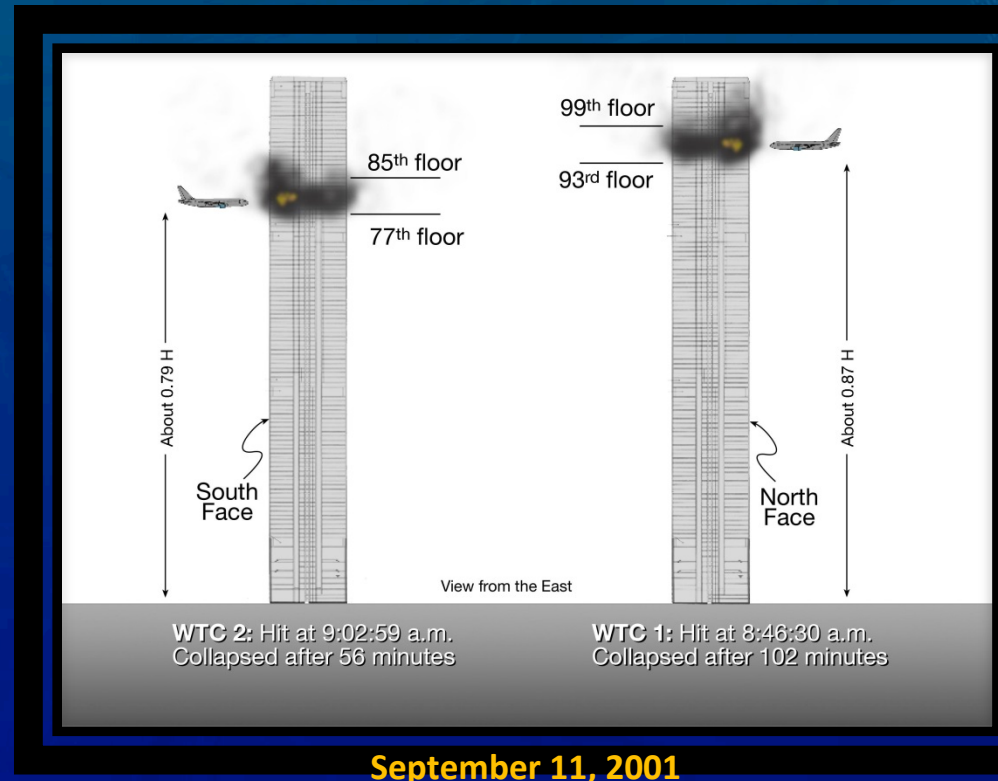
Disaster Resilience Activities at NIST

- Statutory Authorities
- Convening Power
- Research



National Construction Safety Team (NCST)

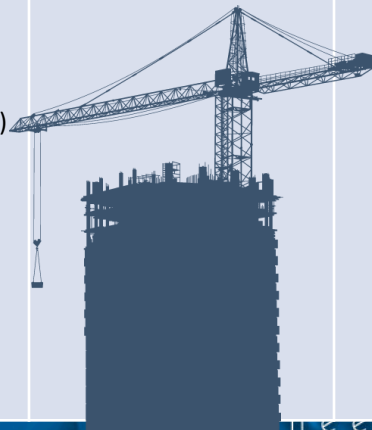
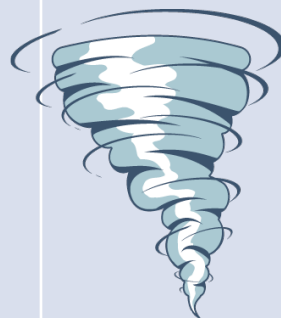
- Public Law 107-231,
Oct. 01, 2002
 - “...provides for the establishment of Teams to assess building performance and emergency response and evacuation procedures in the wake of any building failure that has resulted in substantial loss of life or that posed significant potential of substantial loss of life.”



Disaster and Failure Studies at NIST



Earthquakes	Hurricanes	Construction & Building	Tornadoes	Fires
<p>San Fernando, CA (1971)</p> <p>Mexico City, Mexico (1985)</p> <p>Loma Prieta, CA (1989)</p> <p>Northridge, CA (1994)</p> <p>Kobe, Japan (1995)</p> <p>Kocaeli, Turkey (1999)</p> <p>Maule, Chile (2010)</p> <p>Christchurch, NZ (2011)</p>	<p>Camille, MS/LA (1969)</p> <p>Alicia, Galveston, TX (1983)</p> <p>Hugo, SC (1989)</p> <p>Andrew, FL (1992)</p> <p>Hurricanes Mitch and Georges, LAC (1998)</p> <p>Hurricanes Katrina and Rita (2005)</p>	<p>Skyline Plaza Apartments, Bailey's Crossroads, VA (1973)</p> <p>Willow Island Cooling Tower, WV (1978)</p> <p>Kansas City Hyatt Regency, Kansas City, MO (1981)</p> <p>Riley Road Interchange, East Chicago, IN (1982)</p> <p>Harbor Cay Condominium, Cocoa Beach, FL (1981)</p> <p>L'Ambiance Plaza, Hartford, CT (1987)</p> <p>Ashland Oil Tank Collapse, Floreffe, PA (1988)</p> <p>U.S. Embassy, Moscow, USSR (1987)</p> <p>Murrah Federal Building, Oklahoma City, OK (1995)</p> <p>World Trade Center Disaster, New York, NY (2001)</p> <p>Dallas Cowboys Indoor Practice Facility, May 2009</p>	<p>Jarrell, TX (1997)</p> <p>Spencer, SD (1998)</p> <p>Oklahoma City, OK (1999)</p> <p>Joplin, MO (2011)</p> <p>Moore OK (2013)</p>	<p>DuPont Plaza Hotel, San Juan, PR (1986)</p> <p>First Interstate Bank Building, Los Angeles, CA (1988)</p> <p>Loma Prieta Earthquake, CA (1989)</p> <p>Hillhaven Nursing Home (1989)</p> <p>Pulaski Building, Washington, DC (1990)</p> <p>Happyland Social Club, Bronx, NY (1990)</p> <p>Oakland Hills, CA (1991)</p> <p>Watts St, New York City (1994)</p> <p>Northridge Earthquake, CA (1994)</p> <p>Kobe, Japan (1995)</p> <p>Vandalia St, New York City (1998)</p> <p>Cherry Road, Washington, DC (1999)</p> <p>Keokuk, IA (1999)</p> <p>Houston, TX (2000)</p> <p>Phoenix, AZ (2001)</p> <p>Cook County Administration Building Fire (2003)</p> <p>The Station Nightclub, RI (2003)</p> <p>Charleston, SC, Sofa Super Store Fire (2007)</p> <p>Witch Creek & Guejito, CA, WUI Fire (2007)</p> <p>Amarillo, TX, WUI Fire (2011)</p> <p>San Francisco, CA (2012) *</p>



* ongoing



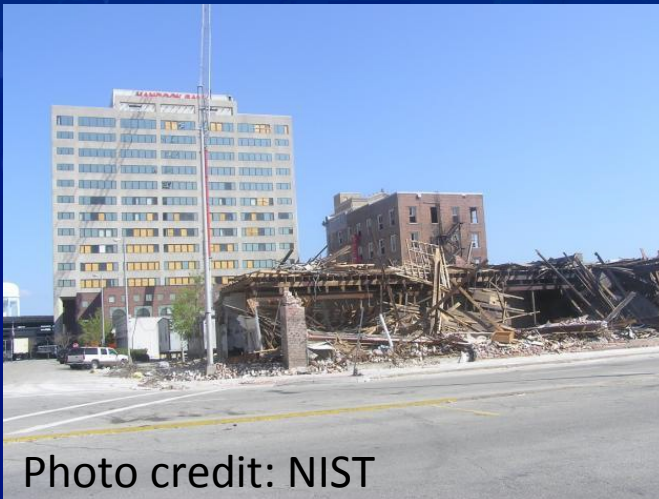
National Earthquake Hazards Reduction Program

A Statutory Multi-Agency Partnership



National Windstorm Impact Reduction Program (NWIRP)

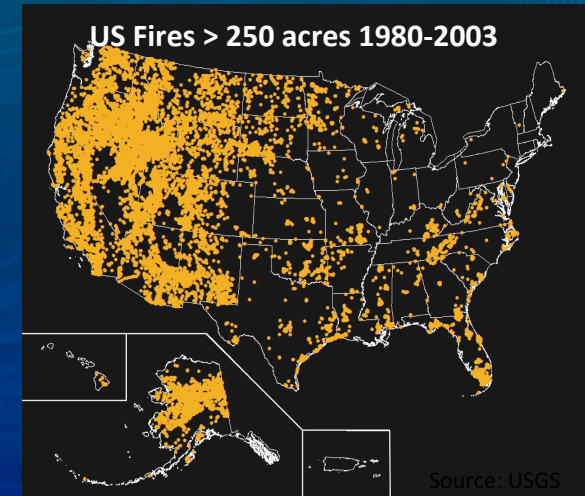
- Created by the National Windstorm Impact Reduction Act of 2004 (PL 108-360)
- Objective
 - *“achievement of major measurable reductions in losses of life and property from windstorms”*



Wildland-Urban Interface Fires

Massive Exposure

- 39% of US homes in WUI (60% new homes)
- > 44,000 high risk communities



Significant Drivers

- Fuel accumulation
- Climate change



Convening Power

- Disaster Resilience Framework

- Conceptual structure
- Educational tool
- Identifies mature standards
- Recommends best practices

* Not a standard



Stakeholder Engagement is Critical

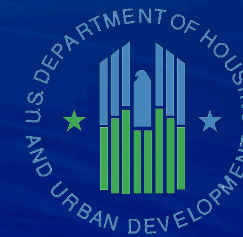
Stakeholders include, but are not limited to:

- Codes and standards organizations
- State, local, and regional officials
- Insurance/re-insurance industry
- Architects
- Engineers
- Utility operators
- Urban planners
- Industry
- Emergency managers
- Relief organizations
- Regulators
- Academia



Federal Stakeholders

- Federal stakeholders include, but are not limited to:
 - Executive Office of the President (NSS, OSTP, NSTC)
 - Department of Homeland Security
 - Department of Commerce
 - Department of Defense
 - Environmental Protection Agency
 - U.S. Army Corps of Engineers
 - Department of Energy
 - Department of Health and Human Services
 - Department of Housing and Urban Development
 - Department of Transportation
 - U.S. Geological Survey
 - National Science Foundation



Framework Development Process

Community
Resilience
Framework
Version 1.0

July 2014
Workshop
• 25% Draft

October 2014
Workshop
• 50% Draft

January 2015
Workshop
• 75% Draft

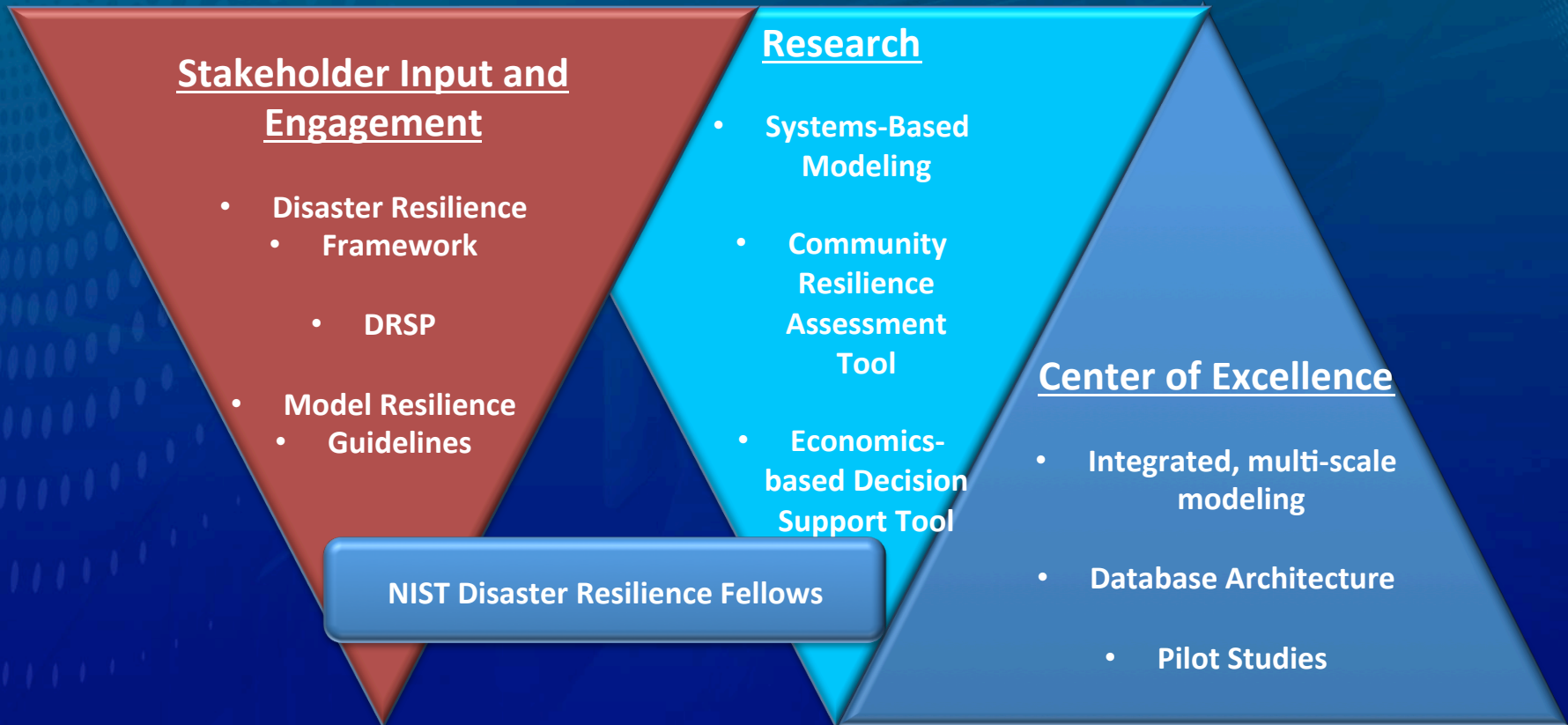
April 2015
Workshop
• Draft for
Public Comment

April 2014
Kick-Off Meeting

http://www.nist.gov/el/building_materials/resilience/disresworkshp.cfm



NIST Community Resilience Program



Contact Info:

Jason D. Averill, Acting Chief
Materials and Structural Systems Division
averill@nist.gov

Disaster Resilient Buildings Goal:

<http://www.nist.gov/el/disresgoal.cfm>

Disaster and Failure Studies Program: <http://www.nist.gov/el/disasterstudies/index.cfm>

Community Resilience Program at NIST: http://www.nist.gov/el/building_materials/resilience/index.cfm

