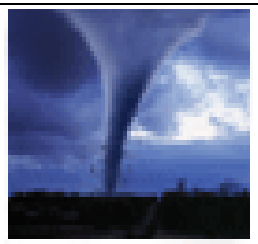
Role of Disaster Insurance in Improving Resilience: An Expert Meeting

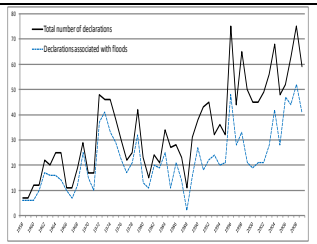
The Resilient America Roundtable

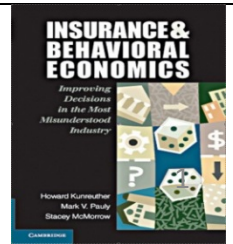
Introduction to the Workshop

Howard Kunreuther
kunreuth@wharton.upenn.edu

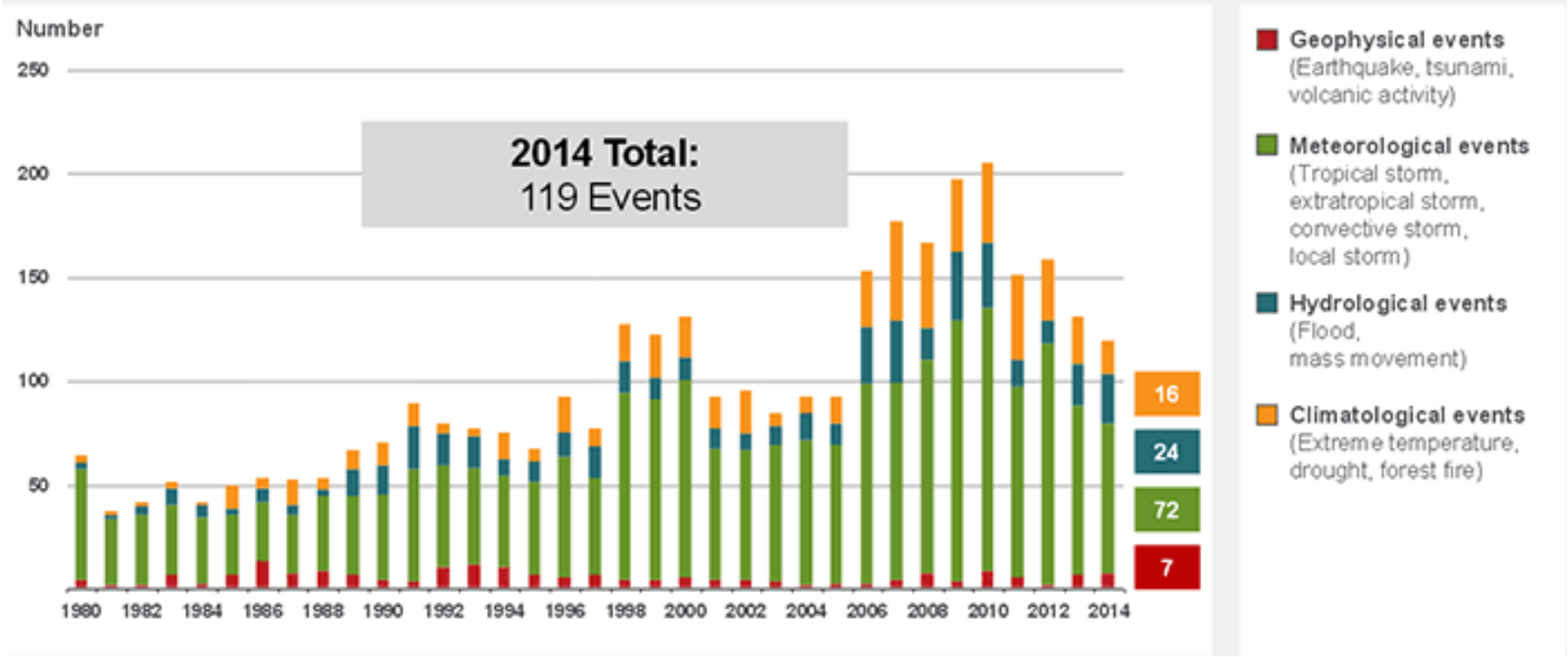
National Academy of Sciences
Washington, DC
July 9-10 2015





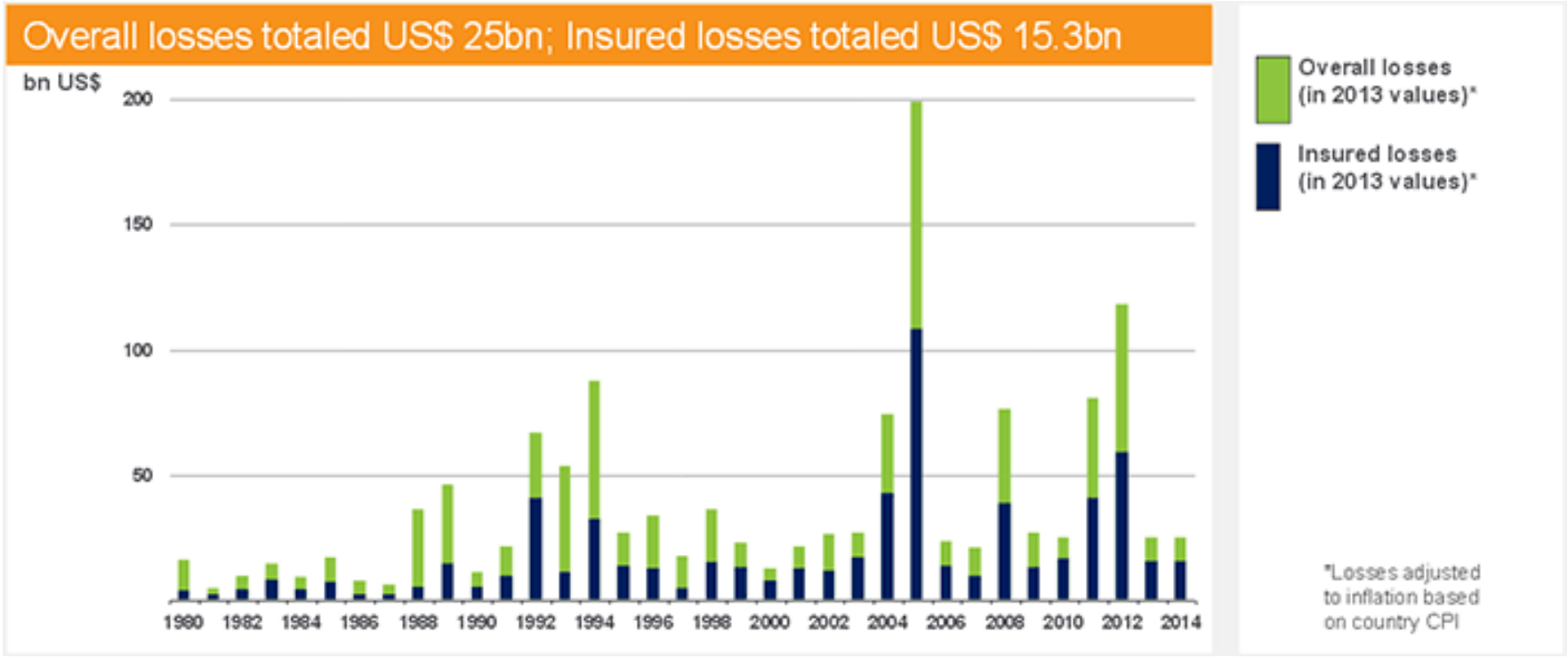


Number of Natural Disasters in the United States, 1980–2014



Source: © 2015 Munich Re, NatCatSERVICE. As of January 2015

Natural Catastrophe Losses In The United States, 1980-2014

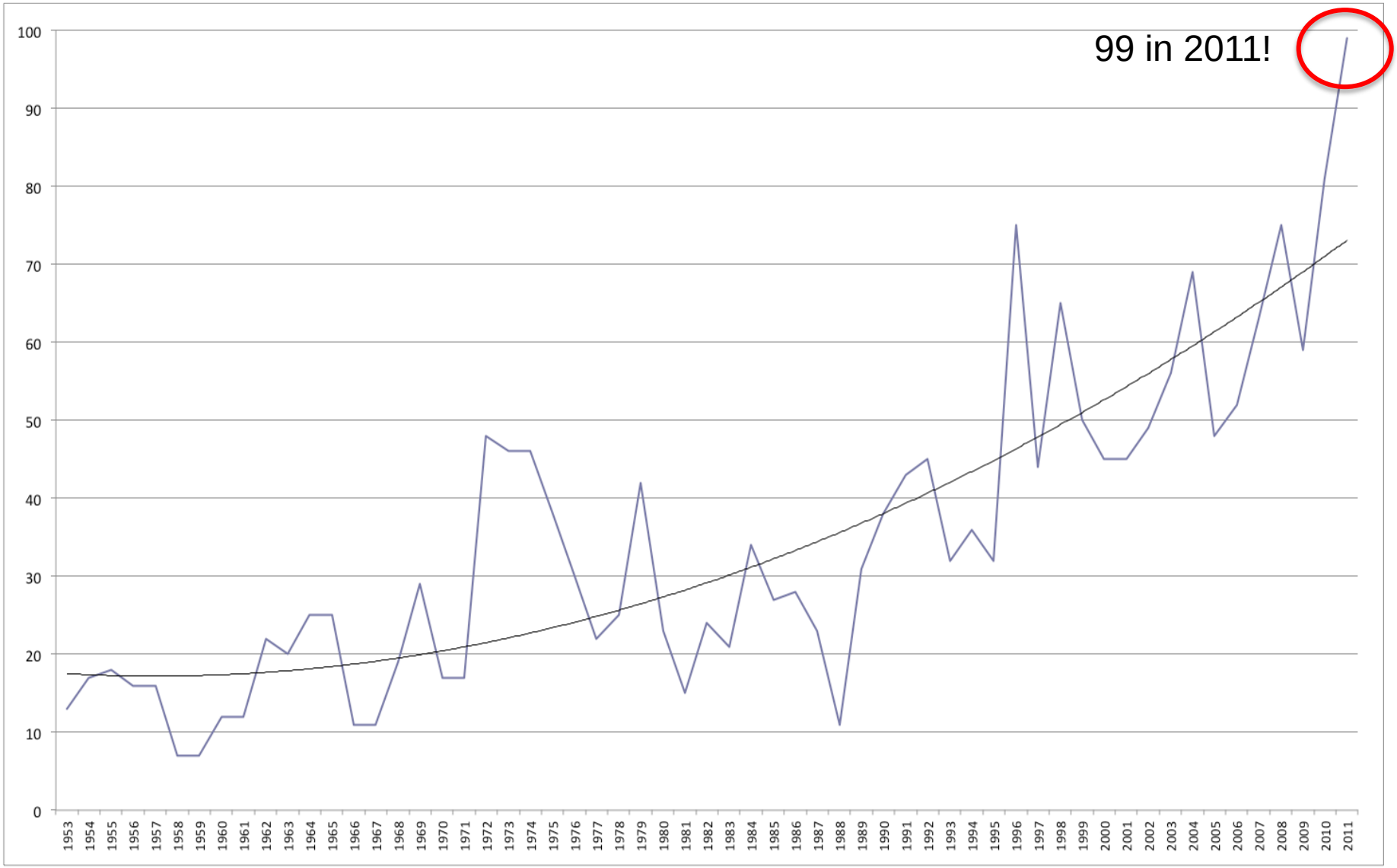


Source: © 2015 Munich Re, NatCatSERVICE; Property Claim Services (PCS), a division of Verisk Analytics. As of January 2015

12 of the 15 Most Costly Insured Catastrophes Worldwide between 1970–2014 (2014 prices), occurred since 2000. 11 in the United States.

$ BILLION	EVENT	VICTIMS	YEAR	AREA OF PRIMARY DAMAGE
78	Hurricane Katrina; floods	1,836	**2005**	USA, Gulf of Mexico
41	9/11 Attacks	3,025	**2001**	USA
37	Earthquake (M 9.0) and tsunami	19,135	**2011**	Japan
35	Hurricane Sandy; floods	237	**2012**	USA
26	Hurricane Andrew	43	1992	USA, Bahamas
22	Northridge Earthquake (M 6.6)	61	1994	USA
22	Hurricane Ike; floods	136	**2008**	USA, Caribbean
16	Hurricane Ivan	124	**2004**	USA, Caribbean
15	Floods; heavy monsoon rains	815	**2011**	Thailand
15	Earthquake (M 6.3); aftershocks	181	**2011**	New Zealand
15	Hurricane Wilma; floods	35	**2005**	USA, Gulf of Mexico
12	Hurricane Rita	34	**2005**	USA, Gulf of Mexico, et al.
11	Drought in the Corn Belt	123	**2012**	USA
10	Hurricane Charley	24	**2004**	USA, Caribbean, et al.
10	Typhoon Mireille	51	1991	Japan

Federal Disaster Relief Has Been Increasing Over Time



Number of U.S. Presidential Disaster Declarations – 1953-2011

Source**:** Michel-Kerjan and Kunreuther, "Reforming flood insurance." *Science* (2011) (data from FEMA)

Key Roles of Insurance

Insurance today is not effectively meeting two of its most important objectives:

- Providing information to those residing in hazard prone areas
- Incentivizing those at risk to invest in loss reduction measures

Factory mutual companies in the 19th century played these roles very effectively:

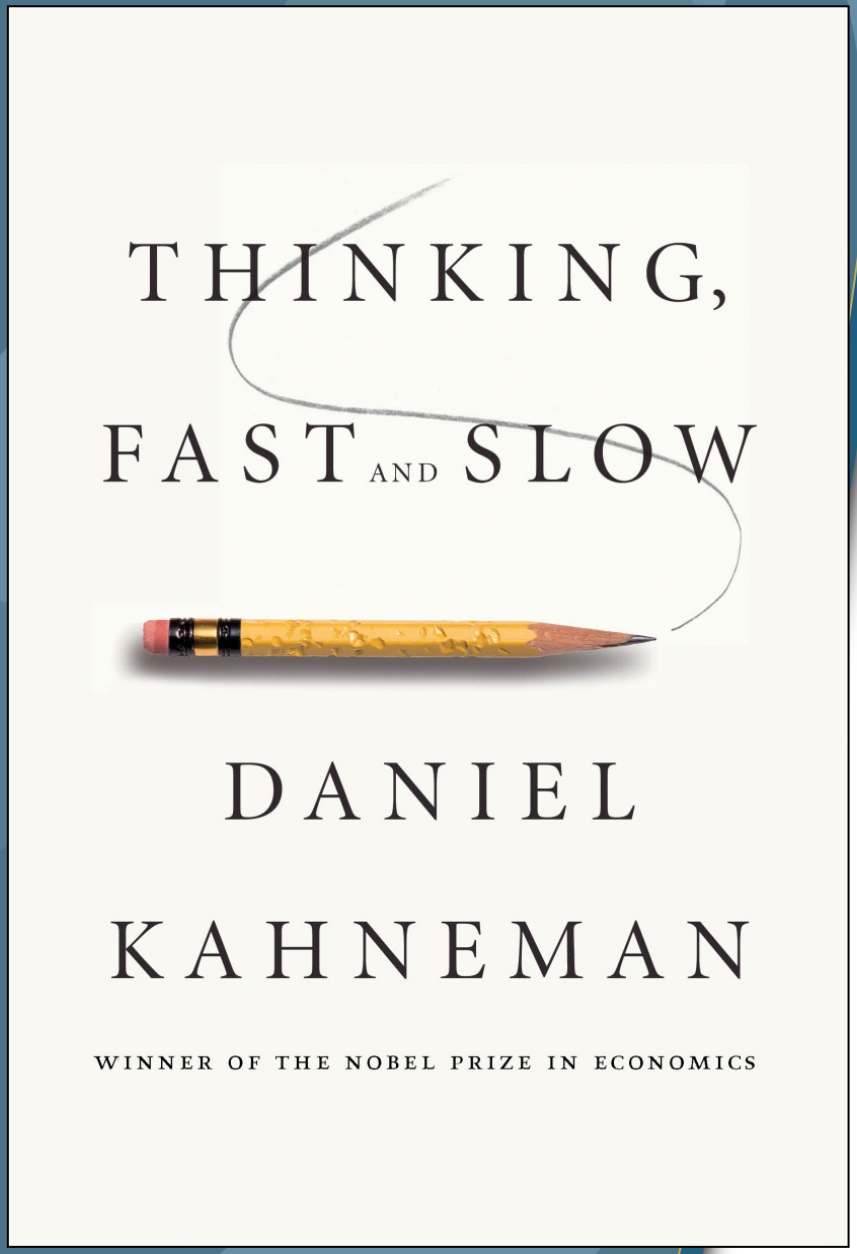
- Required inspections of factories prior to issuing a policy
- Poorly-monitored factories had their policies canceled
- Premiums reflected risk and were reduced for factories that instituted loss prevention measures

How Can Insurance Encourage Loss Prevention?

Questions to be addressed:

- What are the decision processes that explain the actions taken by the key interested parties?
- What are two guiding principles for insurance to encourage loss prevention prior to a disaster?
- What long-term roles can the public and private sectors play if these principles are implemented?
- How can insurance be modified to serve as a model for being linked more closely to mitigation?

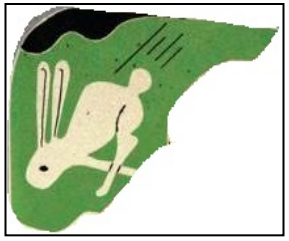
Linking Intuitive and Deliberative Thinking for Dealing with Extreme Events



Intuitive Thinking (System 1) & Deliberative Thinking (System 2)

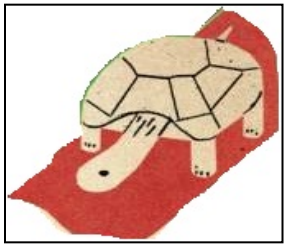
System 1 operates automatically and quickly with little or no effort

- Individuals use simple associations including emotional reactions
- Highlight importance of recent past experience
- Basis for systematic judgmental biases and simplified decision rules



System 2 allocates attention to effortful and intentional mental activities

- Individuals undertake trade-offs implicit in benefit-cost analysis
- Recognizes relevant interconnectedness and need for coordination
- Focuses on long-term strategies for coping with extreme events



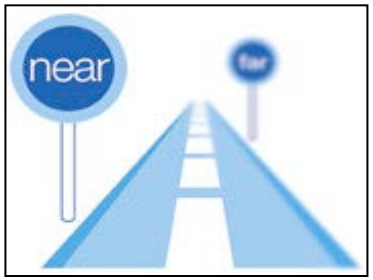
Behavior Triggered by Intuitive (System 1) Thinking

***Availability Bias* –** Estimating likelihood of a disaster by its salience

***Threshold Models* –** Failure to take protective measures if perceived likelihood of disaster is below threshold level of concern

***Imperfect Information* –** Misperceives the likelihood of event occurring and its consequences.

***Myopia* –** Focus on short-time horizons in comparing upfront costs of protection with expected benefits from loss reduction



Guiding Principles for Insurance

Principle 1: Premiums reflecting risk

Insurance premiums should be based on risk to provide individuals with accurate signals as to the nature of the hazards they face and to encourage them to engage in cost-effective mitigation measures to reduce their vulnerability.

Principle 2: Dealing with equity and affordability issues

Any special treatment given to those deserving special treatment (e.g., low-income individuals) currently residing in hazard-prone areas should come from general public funding and not through insurance premium subsidies. Funding could be obtained from several different sources (e.g., general taxpayer revenue, state government or taxing insurance policyholders) depending on the response to the question, "Who should pay?"

Long-term Strategies for Dealing with Extreme Events

Choice architecture

- Frame the problem so that the risks are salient
- Develop scenarios so people recognize the importance of insurance and investing in loss reduction measures prior to a disaster

Public-private partnerships

- Assist those who cannot afford to invest in protective measures
- Public sector provides financial protection against extreme tail risks that are viewed as uninsurable by the private sector

Multi-year insurance

- Provide premium stability
- Lower marketing costs
- Reduction in the cancellation of coverage by those at risk

Choice Architecture

Provide better information to consumers on the role of insurance

- The best return on an insurance policy is *no return at all*

Use availability bias to focus on consequences to consumers

- Highlight financial problems if disaster occurred and the property were destroyed because it was unprotected and uninsured

Stretch time horizon

Example: Likelihood of 100-year flood

- Next year: 1 in 100
- 25 years: greater than 1 in 5 chance of experiencing at least 1 flood during this period

Public-Private Partnerships: Catastrophic Protection

Private sector (insurers/reinsurers) cover losses against all events which they feel are insurable

Public sector (state/federal) provides against protection against extreme tail risks that the private sector cannot cover

Well enforced building codes and land-use regulations to reduce catastrophic losses

Multi-Year Insurance: Challenges

Regulators allowing insurers to set risk-based prices

Inability to change premiums or non-renew policies

Sufficient protection against catastrophic losses through risk transfer instruments and public sector protection

Dealing with systematic changes in risk (e.g., climate change)

Purposes of Expert Insurance Meeting

Ways to reduce future losses from floods and earthquakes

Scientific bases for insurance to encourage loss prevention

Coupling insurance with other policy tools to make communities more resilient

Current Status of the National Flood Insurance Program

Community-based program

- Requires building codes/land use regulations by communities
- Subsidized premiums on existing structures to maintain property values
- New construction charged premiums reflecting risk

Policies, Coverage and Debt

- 5.2 million policies in 22,000 communities
- Almost $1.3 trillion in coverage concentrated in coastal states
- Program has borrowed nearly $23 billion from the U.S. Treasury

Recent Legislation and National Academy of Science Reports

Biggert-Waters Flood Insurance Reform Act of 2012 (July 2012)

- Update floodplain maps
- Strengthen local building code enforcement
- Remove insurance subsidies for certain properties
- Move towards charging premiums that reflect flood risk

Homeowner Flood Insurance Affordability Act (March 2014)

- Delayed implementation of risk-based rates
- National Academy of Sciences study on affordability
- Federal Emergency Management Agency (FEMA) to draft an affordability framework based on the recommendations of NAS study

National Academy of Sciences Reports on Flood Insurance

- Affordability of National Flood Insurance Premiums—Report 1 (March 2015)
- Affordability of National Flood Insurance Premiums—Report 2 (Fall 2015)
- Tying Flood Insurance to Flood Risk for Low Lying Structures (June 2015)
- Community-based Flood Insurance Options (Fall 2015)

Structure of the Day

Panel Discussion 1: The National Flood Insurance Program

Moderator: Roy Wright, Roundtable Member

Panel Discussion 2: Privatizing Flood Insurance in the United States

Moderator: Granger Morgan, Co-Chair, Resilient America Roundtable

Lunchtime Talk – Thinking ahead: Understanding future flood risks

Holly Bamford, Roundtable Member

Panel Discussion 3: Insurance, investments, and new ways forward on flood resilience

Moderator: Gerry Galloway, Roundtable Member

Group exercise:

Build a list of options and strategies that mitigate or reduce flood losses and help communities to become more resilient to floods

Structure of July 10th Earthquake Insurance Meeting

Panel Discussion 1: Earthquake Insurance Market in the U.S.

- How can one characterize the supply and demand for earthquake insurance in the United States?
- How does affordability of earthquake insurance affect the demand for earthquake coverage?
- Has earthquake insurance encouraged adoption of other types of loss reduction measures?
- What can be done to improve California's public-private partnership for earthquake insurance and what are some alternative models for earthquake insurance?

Moderator: Arrietta Chakos, Resilient America Roundtable Member

Panel Discussion 2: New Ways Forward for Earthquake Insurance and Resilience

- What motivates people to buy or not buy earthquake insurance?
- How can insurance coupled with other policy tools increase community resilience with respect to the earthquake risk?
- How do actions of retrofitting work with earthquake insurance to increase resilience?
- What are the lessons from California and other countries that can be applied to those who reside in other seismically active areas in the United States?

Moderator: Reginald DesRoches, Resilient America Roundtable Member

Working LUNCH with a Group exercise:

Build a list of options and strategies that mitigate or reduce earthquake losses and help communities to become more resilient to earthquakes

Expected Outcomes from the Expert Meeting

Specify roles of insurance coupled with other policy tools for making communities more resilient against disasters

Proposed long-term strategy for roles of public and private sectors in encouraging mitigation and providing insurance protection against floods and earthquakes

Short-term measures supporting proposed long-term strategy

- Roles of financial institutions and developers/real-estate agents
- Modifying the National Flood Insurance Program to be renewed in 2017
- Modifying the California Earthquake Authority to encourage mitigation