

BUILDING COMMUNITY RESILIENCE  
...MAKING RESILIENCE THE NEW NORMAL

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National Association of Development Organizations

May 20, 2015

Part I: Problem Statement

# COSTS AND LOSSES FROM DISASTERS ARE ON THE RISE

OPEN FOR BUSINESS

"HUGO" KISS MY/GRITS

3 SHOPS





Photo: Cedar Rapids, IA during the 2008 flooding  
Source: AP photo/Jeff Robertson





Photo: Joplin, MO after the May 22, 2011 tornado  
Source: Charlie Ridel/AP Photo











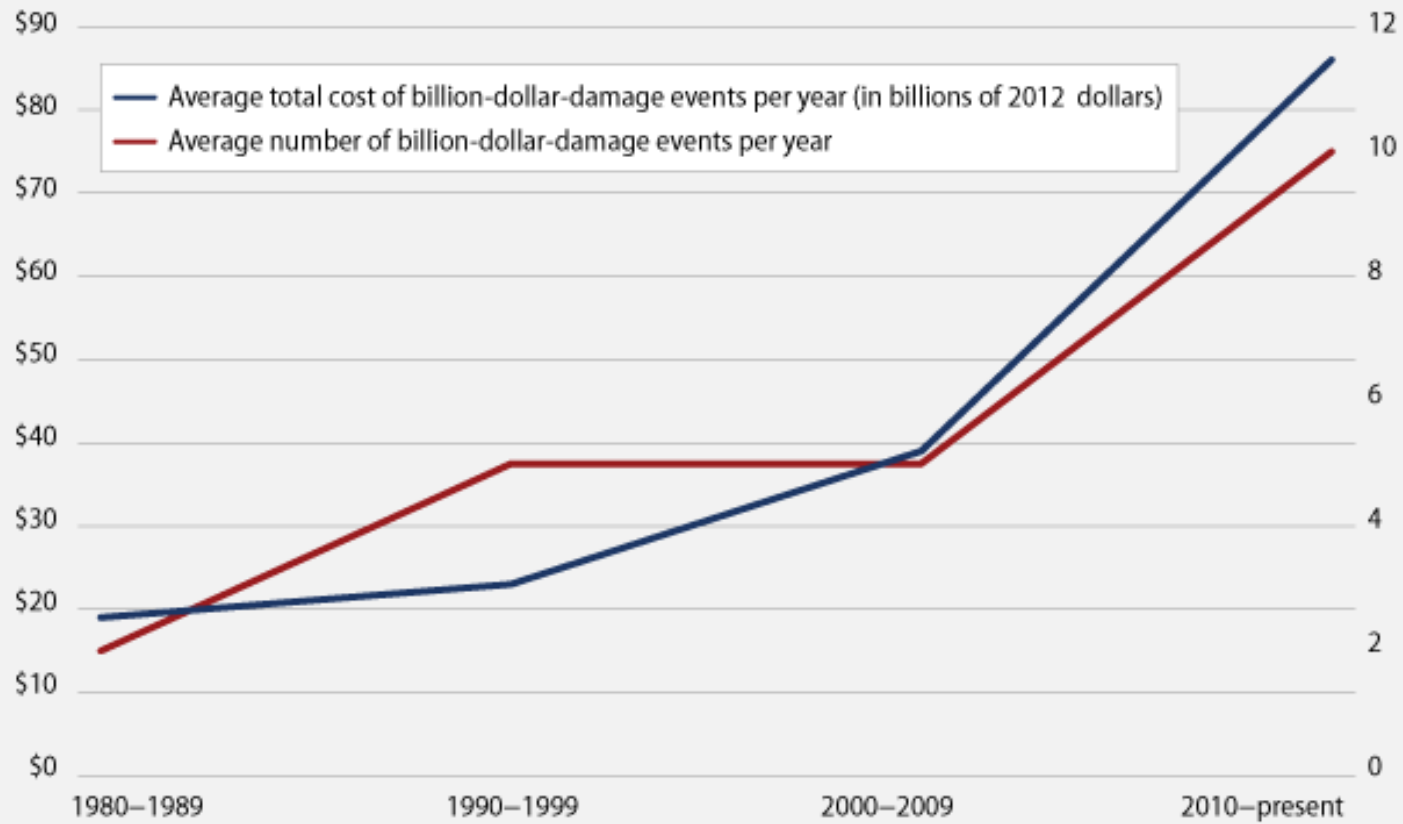
Miami 1992



# EXTREME WEATHER COSTS IN US

FIGURE 1

Billions of dollars in damages from extreme weather events increasing in frequency, cost from 1980–2012



Source: National Oceanic and Atmospheric Administration.

TABLE 1

## Federal spending on disaster relief and recovery, 2011–2013

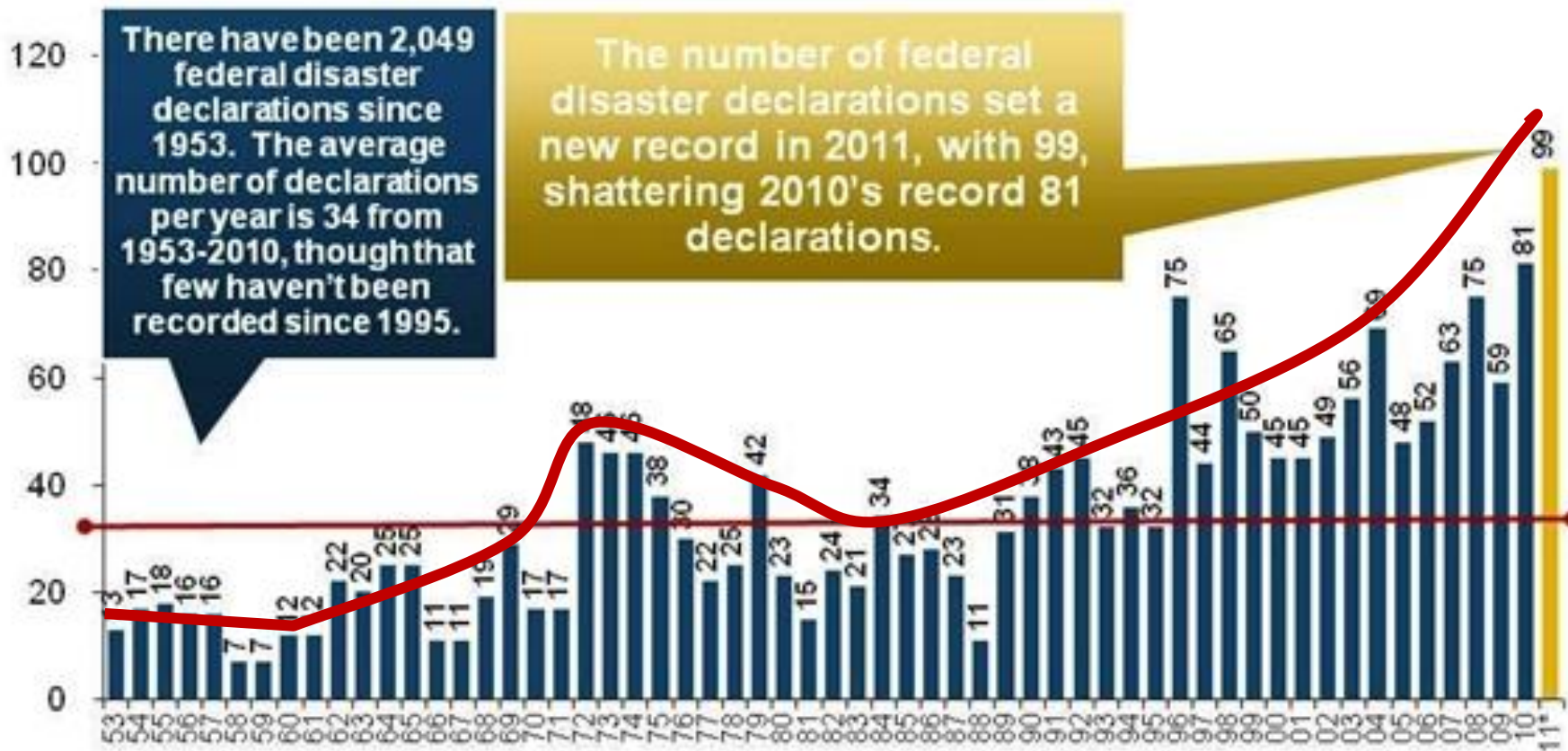
Fiscal year appropriations or supplemental bill spending	Estimated disaster-relief spending (in millions of \$)
FY 2011	\$21,376
FY 2012	\$32,412
FY 2012 supplemental appropriations	\$8,174
FY 2013	\$14,321
FY 2013 Superstorm Sandy supplemental appropriations	\$60,210
<b>Total</b>	<b>\$136,493</b>

Notes: The Treasury Department has two disaster-related programs, but funding levels are unavailable. Figures are rounded.

Sources: Annual department budget reports; appropriations and supplemental appropriations law. For more detail, see the attached spreadsheet.



# Number of Federal Disaster Declarations, 1953-2011\*



The Number of Federal Disaster Declarations Is Rising and Set a New Record in 2011

\*Through December 30, 2011.

Source: Federal Emergency Management Administration: [http://www.fema.gov/news/disaster\\_totals\\_annual\\_fema](http://www.fema.gov/news/disaster_totals_annual_fema); Insurance Information Institute.



EARTHQUAKES - MODERATE



EARTHQUAKES - HIGH



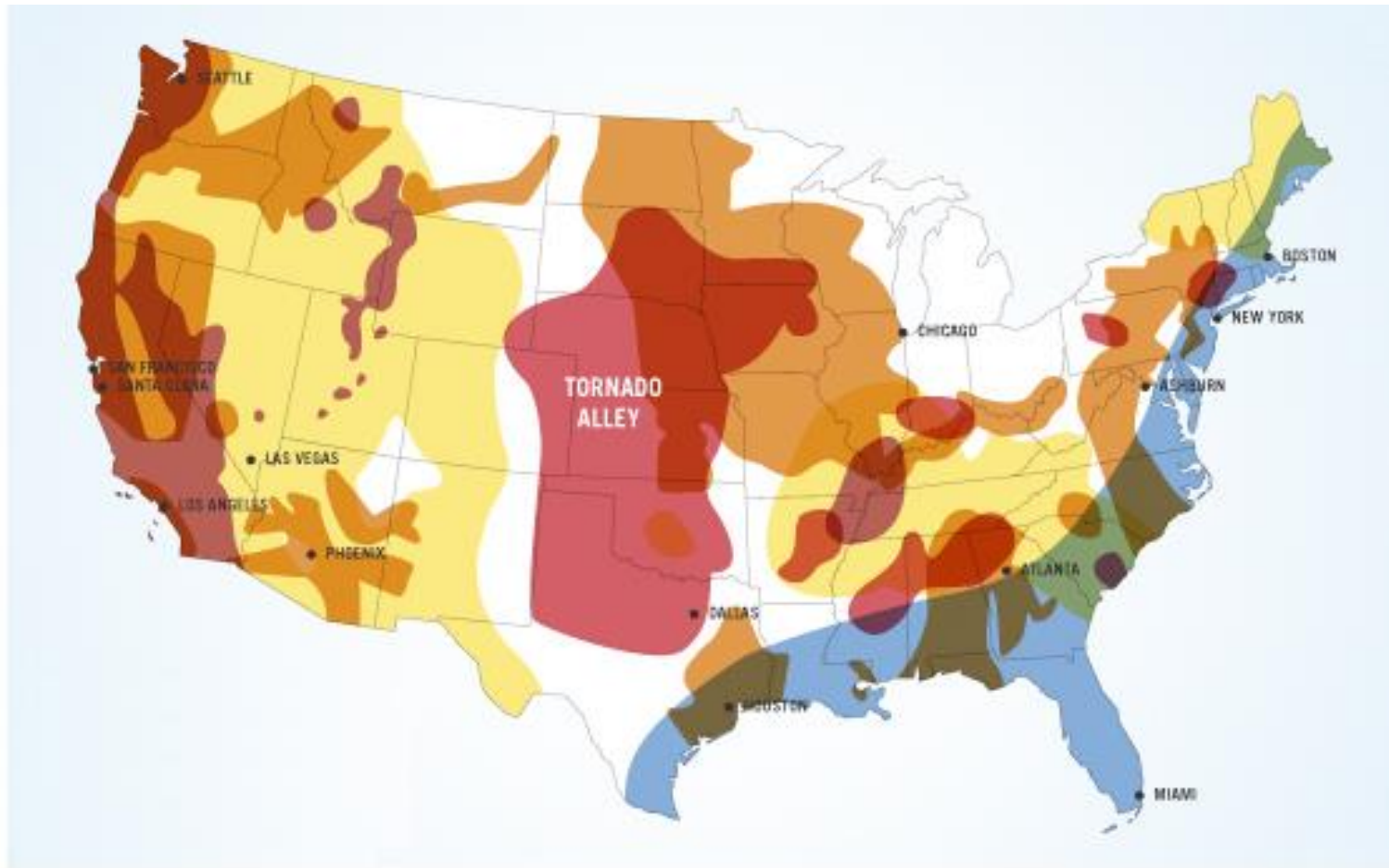
FLOODS



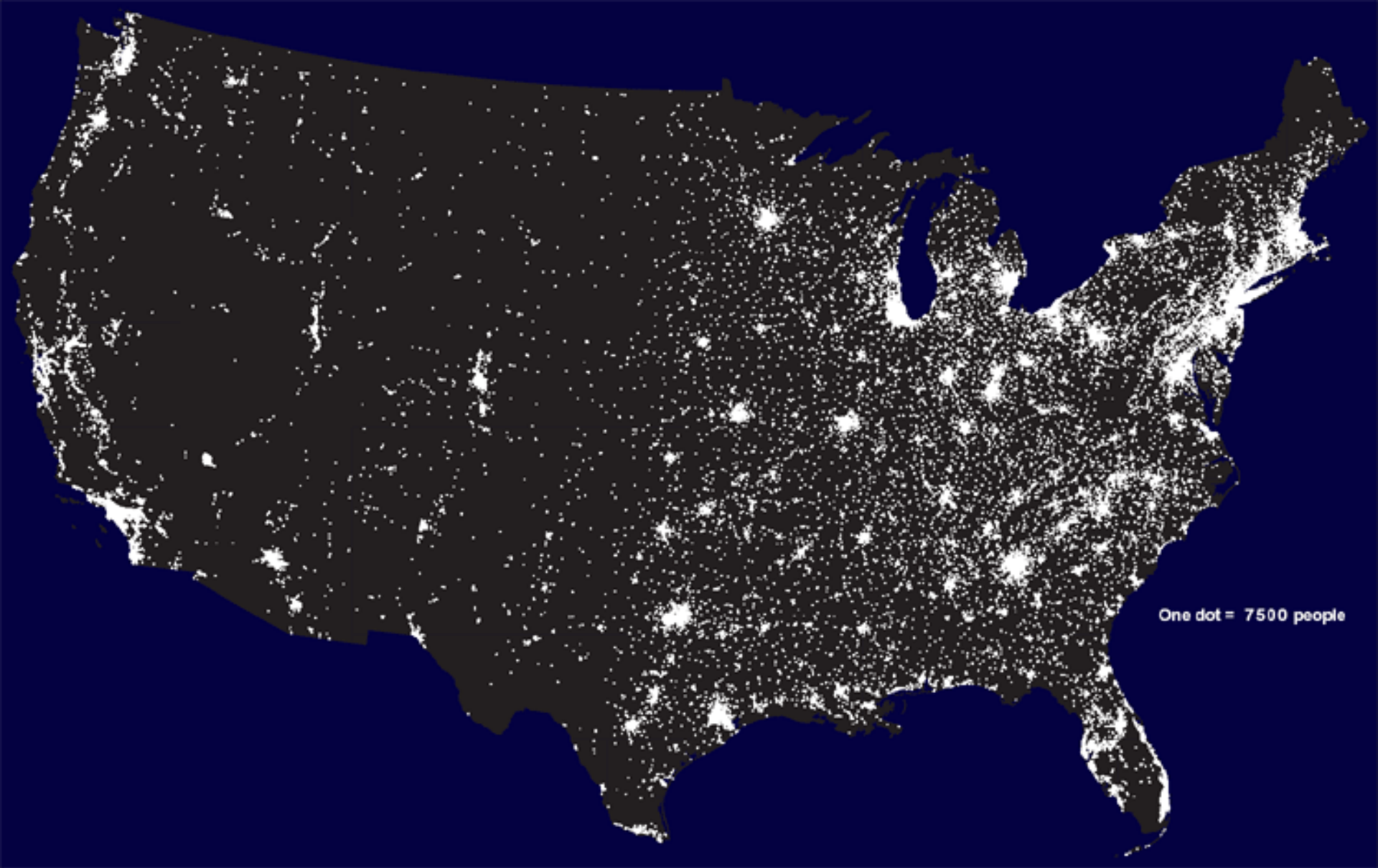
HURRICANES



TORNADOS







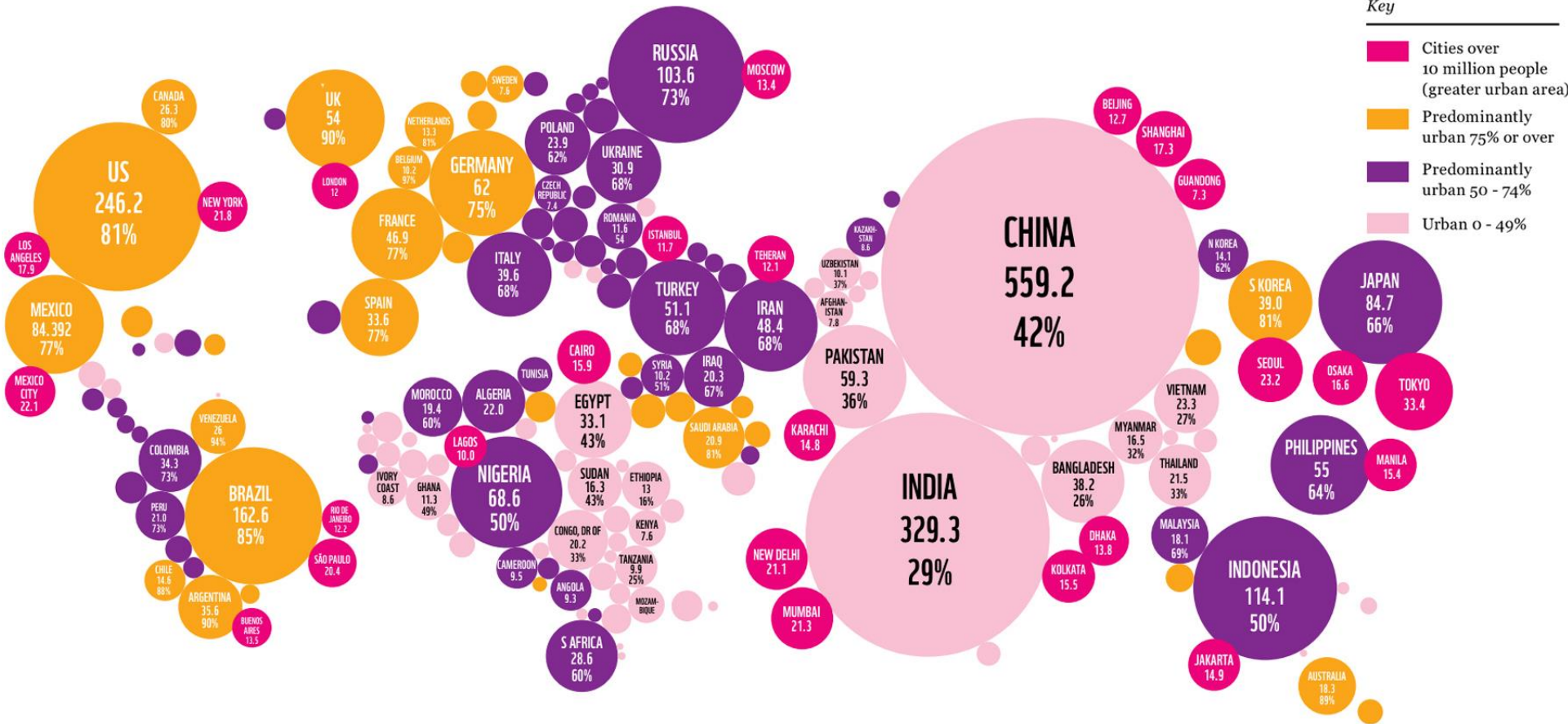
# THE MOST EXPENSIVE US FLOODS ARE...

EVENT	DATE	AMOUNT PAID
HURRICANE KATRINA	August 2005	\$16,280,949,239
SUPERSTORM SANDY	October 2012	\$7,544,907,295
HURRICANE IKE	September 2008	\$2,671,817,473
HURRICANE IVAN	September 2004	\$1,607,508,098
HURRICANE IRENE	August 2011	\$1,325,164,005
TROPICAL STORM ISAAC	August 2012	\$540,095,685
HURRICANE ISABEL	September 2003	\$493,383,587
HURRICANE RITA	September 2005	\$473,604,029
TROPICAL STORM LEE	September 2011	\$449,745,556
HURRICANE WILMA	October 2005	\$384,096,000





# WORLD URBANIZATION 2010-2050



# THE PROBLEM, IN SHORT

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- Number of events is rising
- Number of people at risk is rising
- Costs, losses, and damages from events are rising

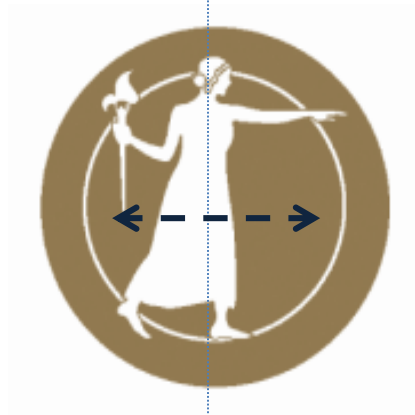
Part II:

# THE NATIONAL ACADEMY OF SCIENCES



# NATIONAL ACADEMY OF SCIENCES

Is a private, non-profit organization. The US National Academy of Sciences is the nation's pre-eminent source of **independent, high-quality, objective advice** on science, engineering, and health matters.



# RESILIENCE DECISION MAKING: MANY ROLES



- Research and data used for projections
- Accuracy of data, analysis, information
- Application of research



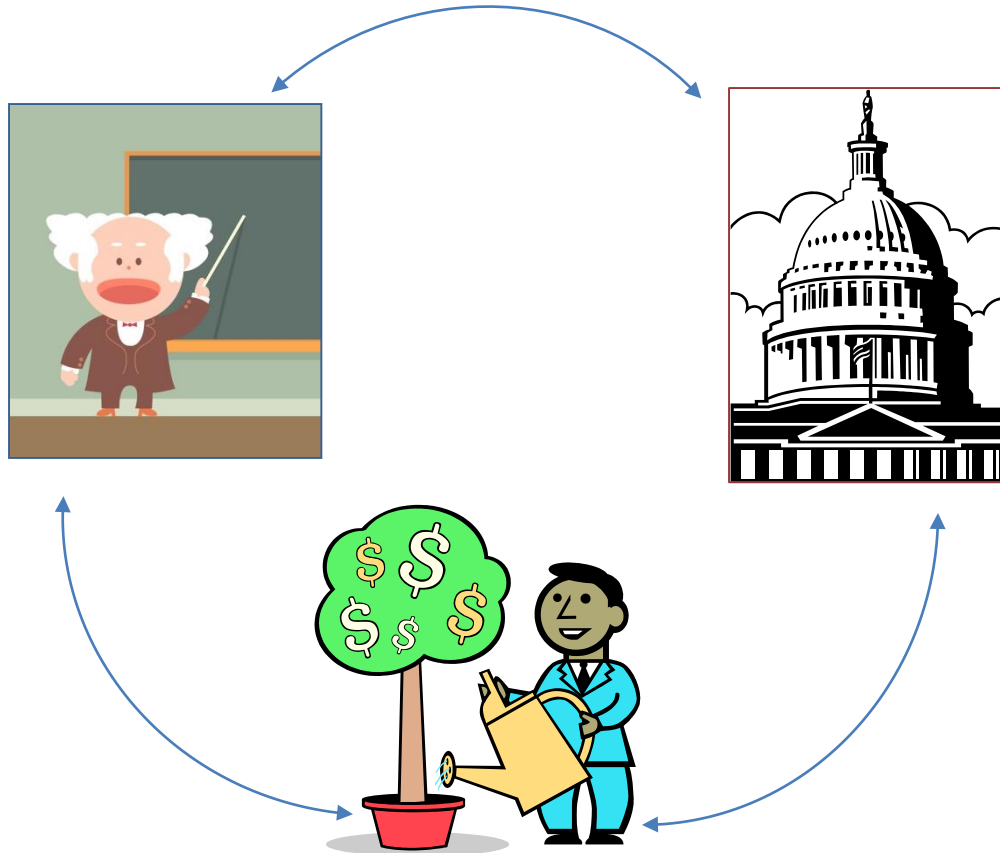
- Policy Decisions
- Timely and Cost-effective
- Effective in saving lives and property, reducing losses



- For Profit and not-for-profit
- Business strategies/business continuity
- Economic Resilience
- Investments and ROI

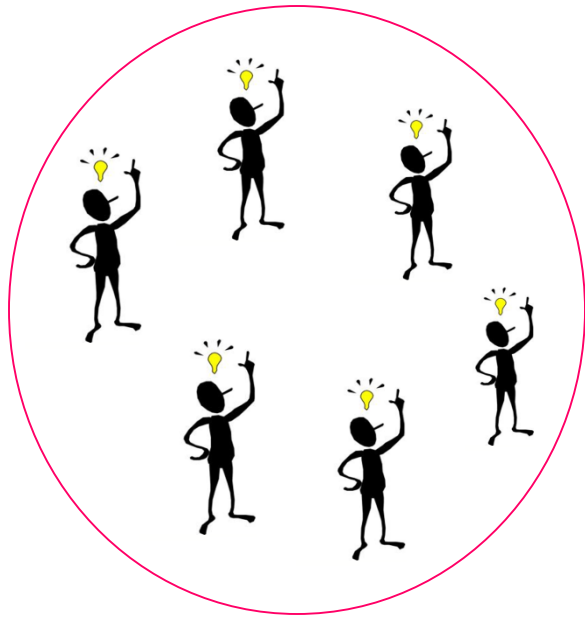


# THE COALITION OF THE WILLING

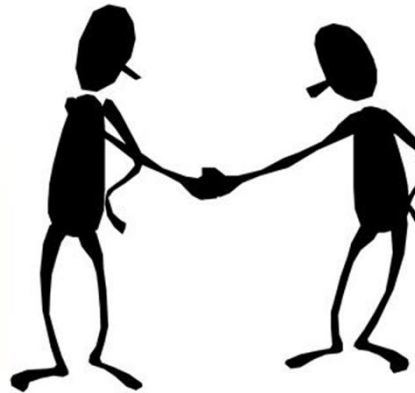


We are being asked to do more with less.  
Can we do more together than we can apart?

# MULTI-STAKEHOLDER ...COLLABORATION



Convene

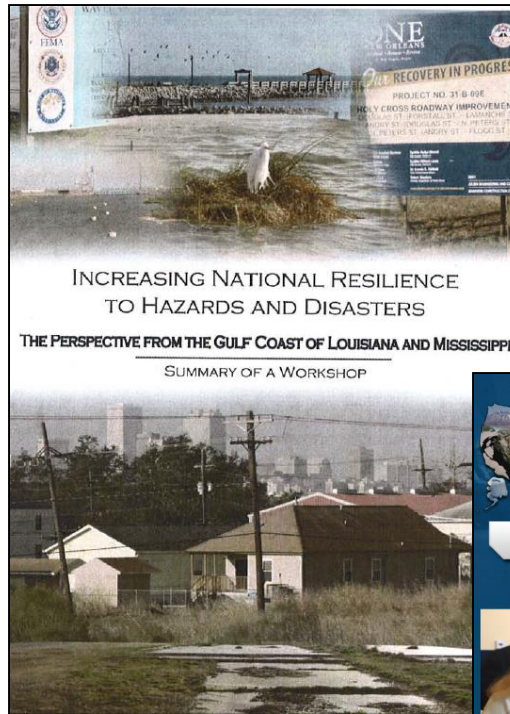
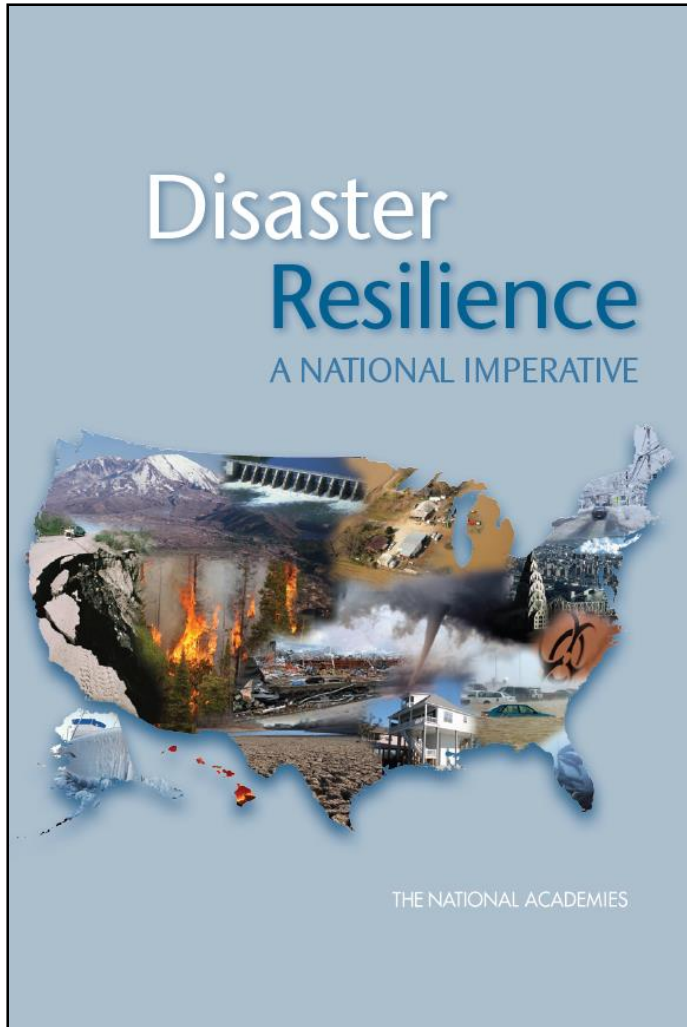


Collaborate



Impact

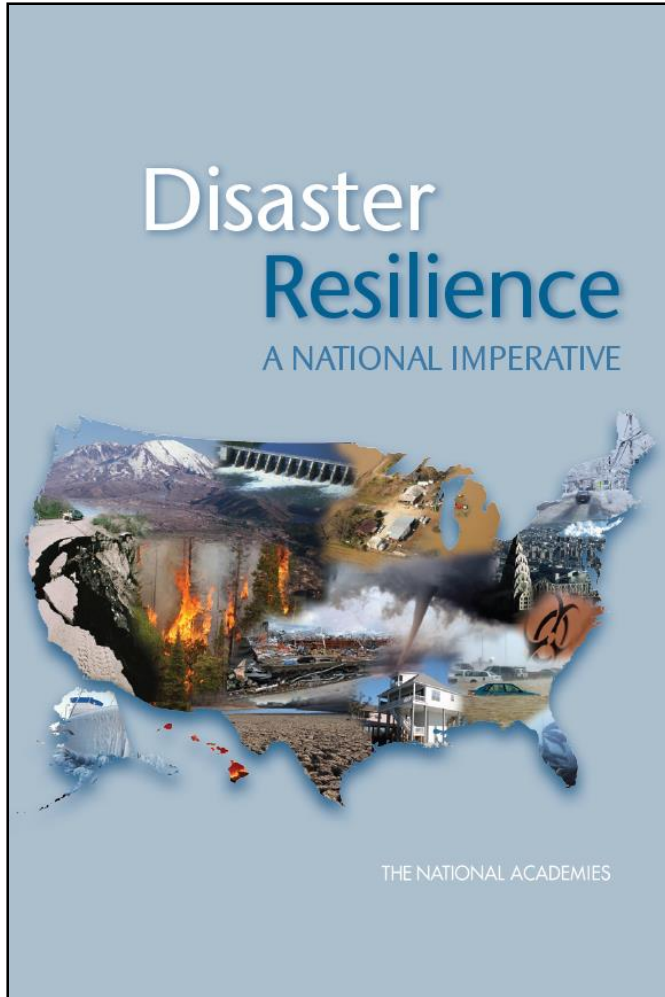
# DISASTER RESILIENCE: A NATIONAL IMPERATIVE





# Four major recommendations

- Manage and communicate risk
- Measure resilience in communities
- Build community partnerships and coalitions
- Share information and data to build resilient communities



# FREE REPORT

[http://www.nap.edu/catalog.php?record\\_id=13457](http://www.nap.edu/catalog.php?record_id=13457)

Part III: Implementing the Report

# BUILD COMMUNITY RESILIENCE



WHAT  
DOES  
THAT  
MEAN



The ability to **prepare** and **plan for**,  
**absorb, recover** from, or more  
successfully **adapt** to actual or potential  
adverse events.



A man with short dark hair and glasses, wearing a dark pinstriped suit, white shirt, and striped tie, is speaking at a press conference. He is gesturing with both hands raised. In the foreground, several microphones are visible, including one with a 'WABC' logo. A blue speech bubble is overlaid on the left side of the image, containing the text: 'What does Resilience mean to me? Here in my community?'.

What does  
Resilience  
mean to me?  
Here in my  
community?

Building **Whole of Society Resilience** is hard to  
enact

So....



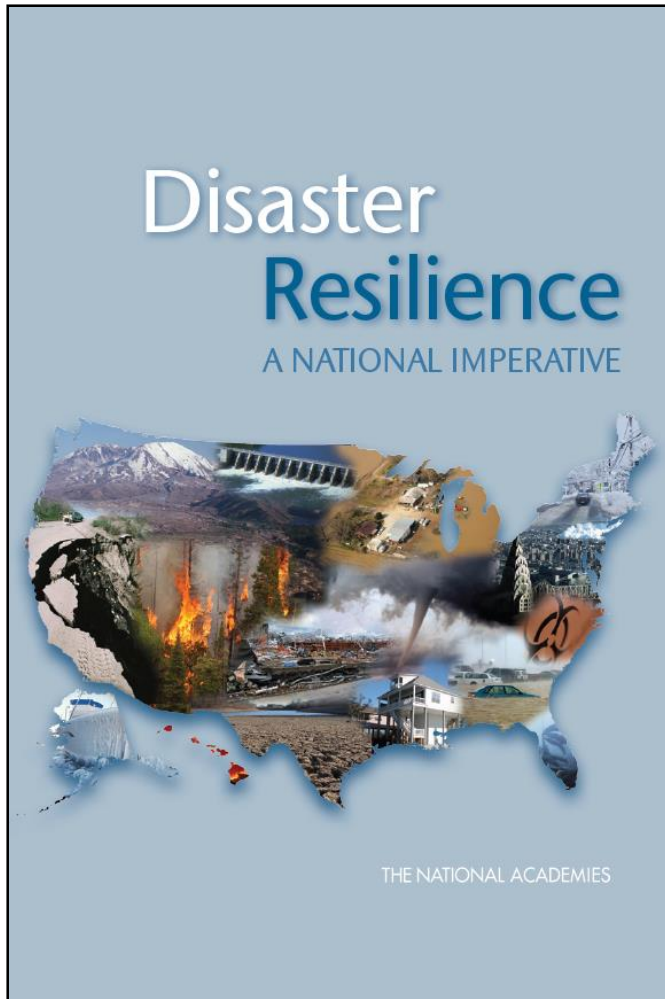
A short primer would be helpful

# RESILIENT AMERICA 101

- A new program at the **National Academy of Sciences**
- Launched in **2014**
- Based on **Disaster Resilience: A National Imperative Report**
- A way to engage **diverse** sets of **stakeholders** in community action to build resilience

# Four major recommendations

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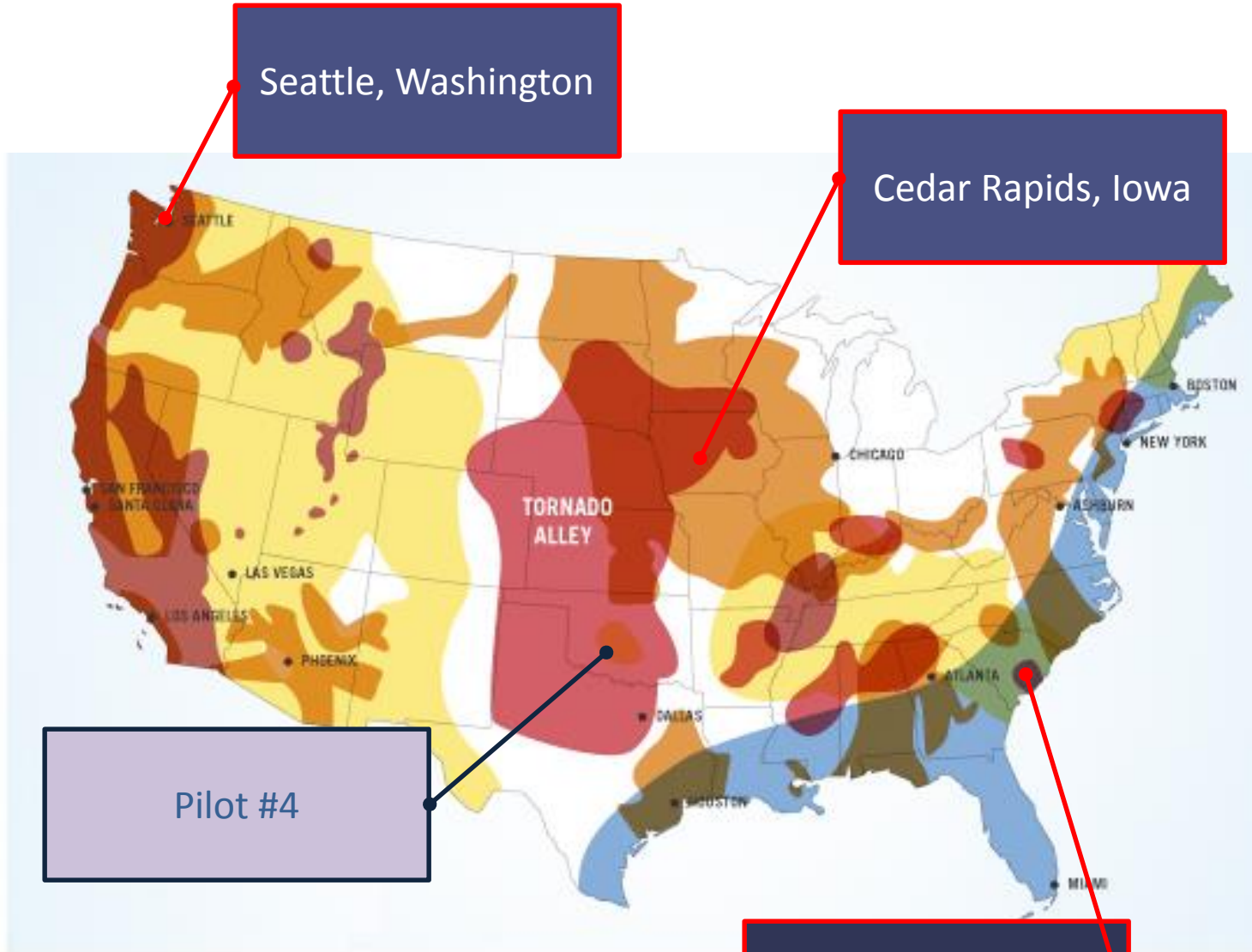
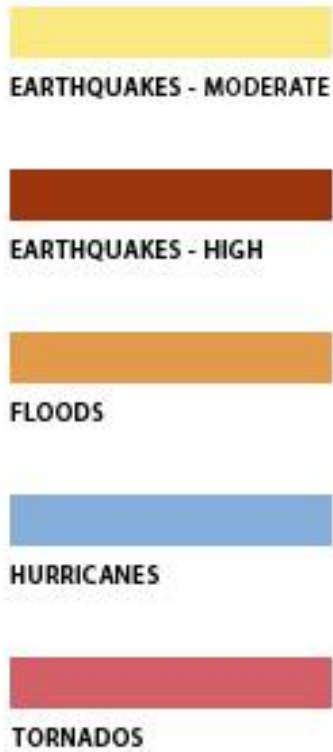


## RA101 WHAT DOES IT DO?

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- Seeks to **identify** and **share** key elements in building resilience at the community level
- Works with 4 communities as **they** develop a **community-based** and –owned **resilience strategy**
- Organizes workshops, meetings, table top exercises, and other **multi-stakeholder** interactive **events** with resilience themes
- Provides **resources\***, **experts**, and **information** to help communities and decision makers better understand, communicate, and manage **risk**.





## RA101 WHO IS INVOLVED?

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- **Experts**, including social scientists, engineers, risk managers, private sector business operators, academics, public sector decision makers, federal agencies, and more
- **Community members**, businesses, decision makers
- Those who **have resources** and can help
- Those who **need resources** and assistance
- **Diverse stakeholders**: Private sector, public sector, NGOs, academia, individuals

- Costs of natural disasters and other disruptions are **rising**
- Greater **networks** and connections → more opportunities for **widespread impacts**
- Federal or **top-down** programs to build resilience get **mixed results**
- Bottom-up approaches are **needed, but hard** to implement alone
- Communities want to **protect** their quality life, their property, and their people.

# RA101 GENERAL TIMELINE?

- Launched in January 2014
- First two pilot communities selected in September 2014
- Third pilot community selected in February 2015
- Fourth pilot community to be confirmed in spring 2015
- Extreme Events Ice Breaker goes on line May 2015
- Community Resilience Strategy **Step 1**, Spring 2015
- Critical Infrastructure/Economic Supply Chain, Meeting 1, May 2015
- Measures/metrics Workshop in July 2015 in Cedar Rapids, IA
- Community Resilience Strategy **Step 2**, Summer/Fall 2015
- Community Resilience Strategy **Step 3**, Winter 2015
- Community Strategy **Step 4**, Spring 2016
- Community Resilience Strategy completed Fall 2016

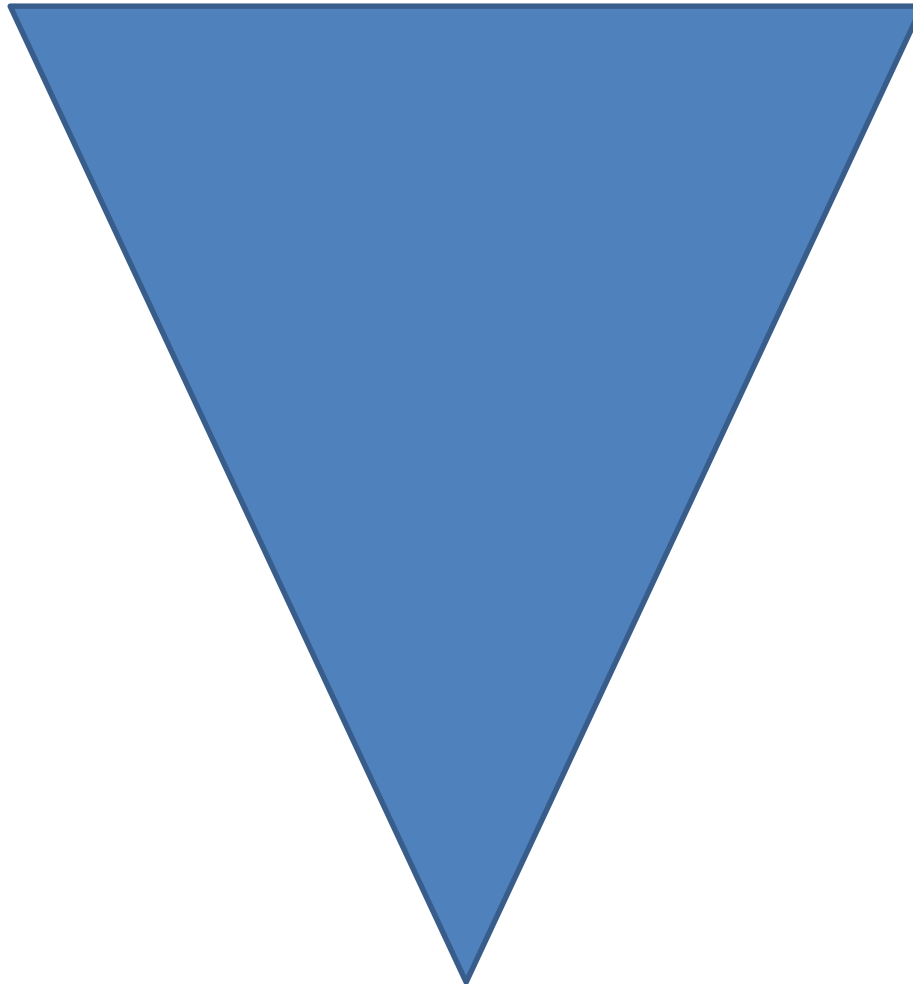


Part IV:

# AN APPROACH TO COMMUNITY RESILIENCE

# THE RESILIENT AMERICA APPROACH

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Broad Ideas



Specific Actions

# THE RESILIENT AMERICA APPROACH

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- Helps community members **understand different aspects** of community resilience
- Brings diverse community stakeholders together
- **Brainstorms** ideas about community resilience
- Defines **elements** that are **strong influences** on building resilience
- Gathers **information** from the community
- Identifies **elements** that may be included in the **community resilience strategy**

What are the community **priorities**?

How do **priorities** frame **resilience**?

How can we **identify** the priorities?



# COMMUNITY COMPRISED OF 5 ENVIRONMENTS

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1. Physical—the **built** environment
2. Natural—natural resources, non-engineered structures, **ecosystem services**
3. Economic—level, variability, and diversity of **income sources**; access to financial resources
4. Social/wellness—the capacity for **people** to **connect** with each other
5. Human—the sum of people’s **skills**, knowledge, **labor**, and good health

# 6 STEPS

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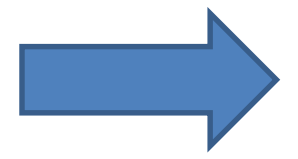
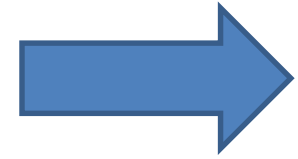
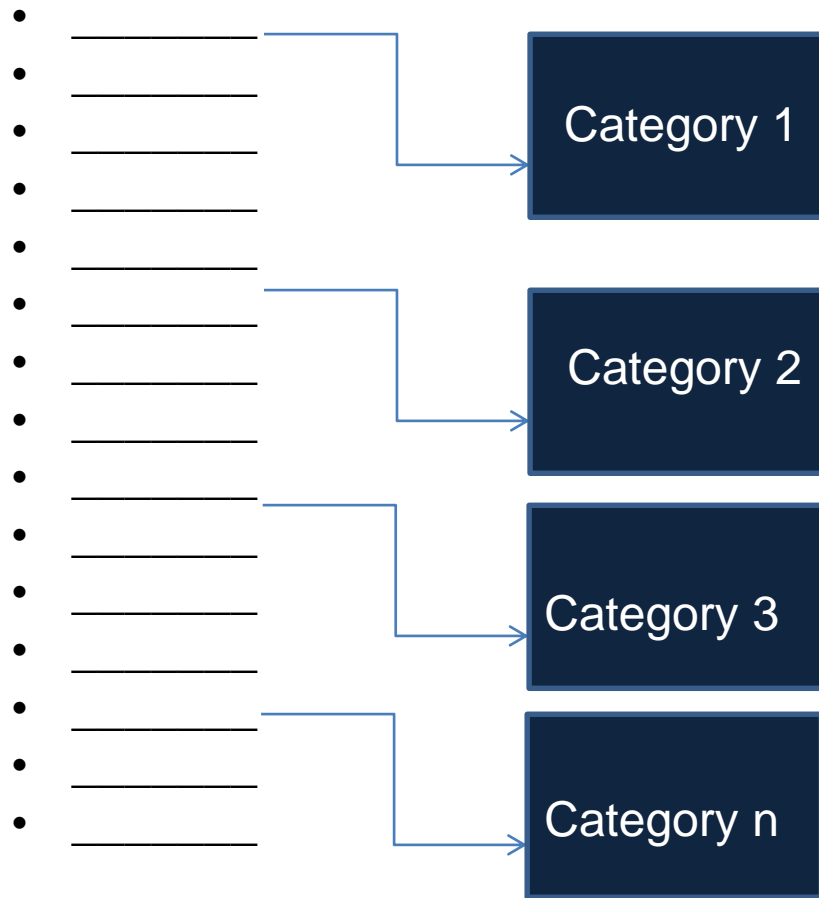
1. **Define** what each environment means to that community
2. **Brainstorm** ideas of the types of things that are a part of that community
3. **Categorize** the brainstormed list
4. Identify key needs for each category to function
5. **Rank** the categories (relative importance)
6. Use the highest ranked items in the community resilience strategy

Brainstormed  
List of Elements  
in each Environment

Categorize  
Ideas

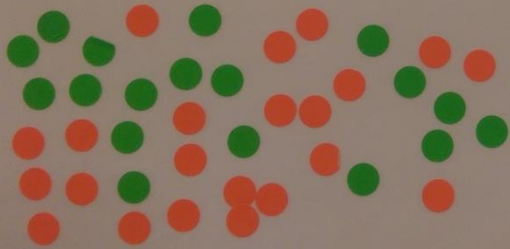
Rank  
Categories

Use Highest  
Rankings in  
Community  
Resilience  
Strategy



# Natural Environment

natural resources, non-engineered structures, and associated eco-system services (e.g., erosion, surge, flood protection)



## What are Charleston's resilience challenges?

### NATURAL

Builds awareness and opportunities to employ natural & nature-based solutions to enhance resilience

I second this!

Charleston is surrounded by about 10 acres of nature that provide a natural opportunity to adapt to climate change & sea level rise - But it is being rapidly "lost" by development. Natural systems protect from storms, urban heat island effects, absorb stormwater, remove pollutants.

Development pressures could lead to a loss of natural resources & the ecosystem services they provide.

Accommodating growth while preserving ecosystem services

MORE BUSINESS SHOULD BE PLACED ON BUFFERS TO OUR MARSHES/WETLANDS

Resisting further degradation of natural environment from development

Loss of or changing known/durable natural beauty

Openness to density to preserve natural resources

Political pressures

Protecting existing natural landscapes for storm surge protection, adaptability to future storms, etc.

# What are Charleston's resilience challenges?

PHYSICAL

Too much insularious surface/STORMWATER runoff

~~Plastic~~  
Plastic  
Junk bags  
Extrajunk

Lack of understanding regarding transportation systems

We are not used to dealing with...  
the built environment

Most of our physical environment (at least built since NER started) are built to be above the 100 yr flood level - but w/ sea level rise our vulnerabilities will increase

Physical Environment

Current infrastructure is barely meeting current needs AND

Current codes don't address future anticipated hazards

Too much development.

Too much reliance on I-26

Need transportation alternatives - light rail, public transportation, etc.

population growth in relationship to the built environment = critical

Transformers in low lying areas could be flooded

Ability to cool indoors in weather wars

No transportation available for working/poor/unemployed population

- Flooding
- Land for urban agriculture
- Earthquakes
- \$

Already overbooked roads

low flat coastal geography

Transportation facilities are marginal

Roads w/ bridges are in disrepair

Mass transit is extremely limited

Street flooding

Bridges too old

Roads too crowded

Dealing w/ water from pinbursts

cop with new development

Port area vulnerable to heavy water

## SOCIAL ENVIRONMENT CHARLESTON

### In what ways is Charleston resilient?

There is a high level of community resilience in Charleston (e.g. keep events)

This helps in community & providing calm in wake of disaster

We are great at social networking

Charleston is highly social region - high individualism amongst citizens - love of local history and culture - love of the outdoors - love of the water - love of the food - love of the music - love of the arts - love of the sports - love of the events - love of the people

### What else do we need to know?

We need for someone focus on A Need

In the Community we can assist those with (I.E. Juvenile delinquency, Mental Health Association)

Why doing this the Community Stakeholders would be more apt to take to buy in to this groups agenda to Resiliency

Needs Assessment of community preparedness





Armonny the shore  
 Natural Infrastructure  
 Historical sites

Charleston  
 Natural

Definition co-benefits

"resources" → natural

Ecology based

Impacts of degradation to ec  
 Structure of the area

Relationship w/ people -

Nature based structure

7/12

Economic growth  
 Urban growth

land use - local

Regulatory FW - state

Property owners - Priv

Political Will Build

Education - informed citizenry

Environmental Education - (college)

Fishing / Hunting Housing

Birders

Parks

Charleston  
 Natural

Beaches - all public  
 Waterways

Land Use ✓<sup>H</sup>  
 - economic growth  
 - Pop ↑ recent  
 - urban ↑

Education ✓<sup>H</sup>  
 informed citizenry trad knowledge  
 Environ. ed.  
 Conservation groups  
 Aquarium - understanding risk

Tourism ✓<sup>H</sup>  
 - eco tourism  
 - fishing / hunting  
 Economic growth

Sea Level Rise ✓<sup>H</sup>  
 Wetlands  
 Protection  
 Ecosystem Services

Nat Coastal Protec System

Wetlands

Protection

Ecosystem Services

Political Will ✓<sup>H</sup>  
 local & state govt

Property Owners - housing planners

Regulations  
 impact of incremental change over time, slow  
 - building codes

Built Environ ✓<sup>H</sup>  
 Part

Transportation ✓<sup>H</sup>  
 Industry

Federal Agency ✓<sup>L</sup>

Recreation ✓<sup>H</sup>  
 parks  
 beaches  
 waterways

Pollution ✓<sup>H</sup>

Science ✓<sup>H</sup>  
 local dec making

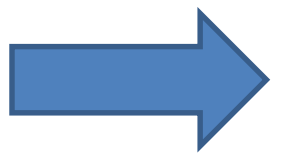
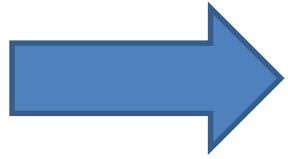
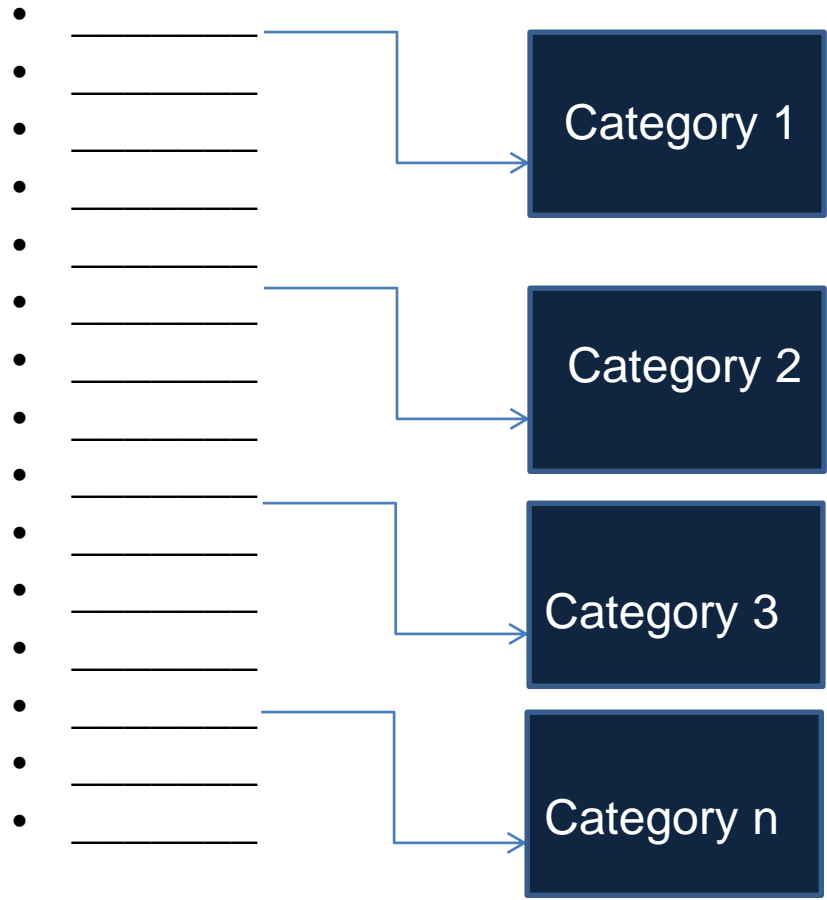
Culture ✓<sup>H</sup>  
 and Environ

Brainstormed  
List of Elements  
in each Environment

Categorize  
Ideas

Rank  
Categories

Use Highest  
Rankings in  
Community  
Resilience  
Strategy



# END RESULTS

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- 2-3 highly ranked categories of important elements per type of environment
- The categories can be cross-cutting
- The most important categories for resilience begin to create the whole of society resilience picture
- These categories create the structure for the community's resilience strategy

These priorities create the basic structure for the community's resilience strategy.

- Aspirational state for each priority
- Baseline assessment for each priority
- Relative scale of progress
- Each community works on its own scale
- No scorecard
- Bottom up approach



# ELEMENTS OF MEASURES

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Strength/Robustness

Speed

Ability to mobilize/ access to resources

Redundancy

# THE MAKINGS OF A STRATEGY

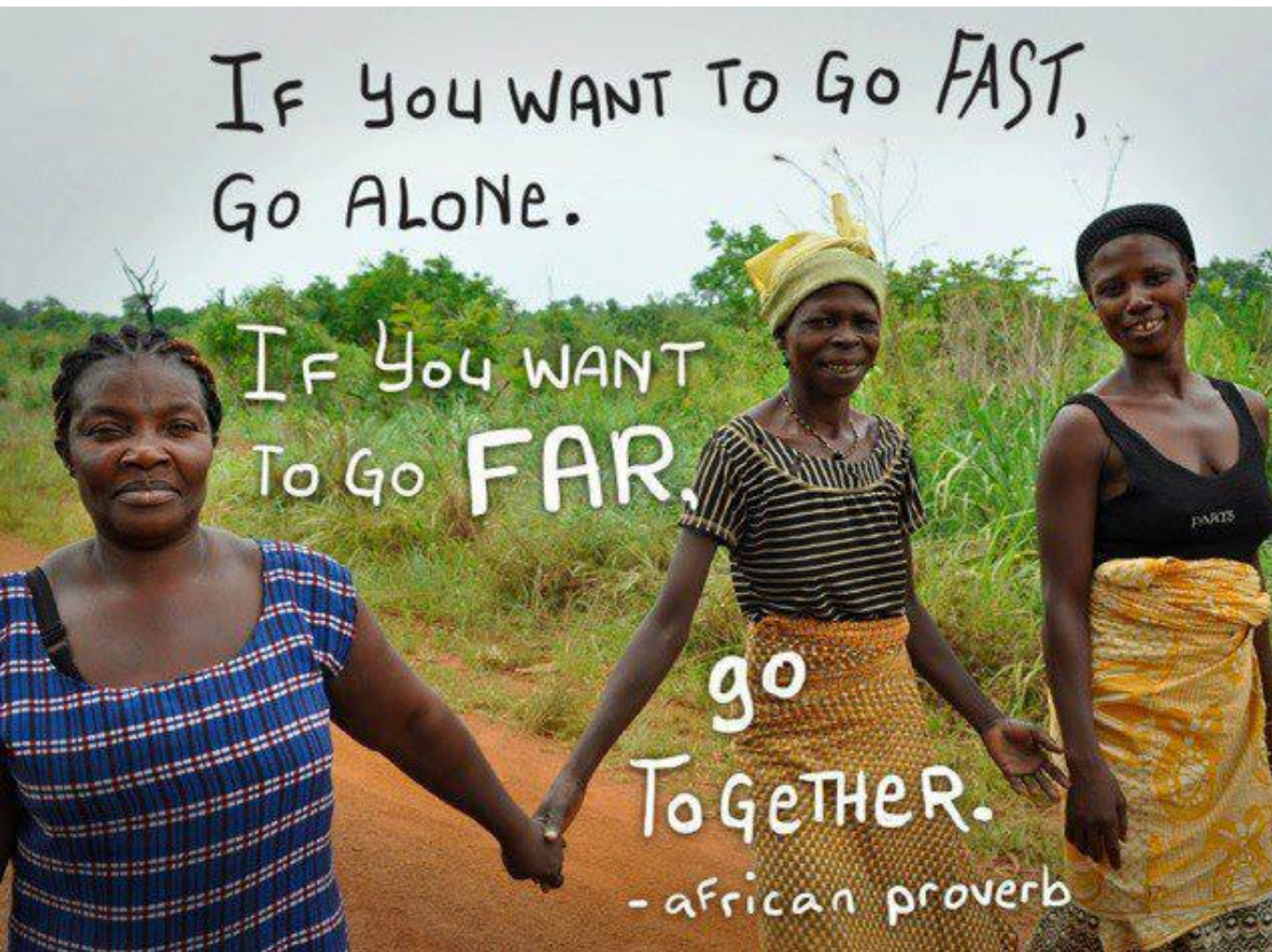
Priority	Baseline	Aspiration	Steps to Take
Natural Priority 1			
Natural Priority 2			
Social Priority 1			
Social Priority 2			
Social Priority 3			
Physical Priority 1			
Physical Priority 2			
Human Priority 1			
Economic Priority 1			
Economic Priority 2			

Almost Done

# BOTTOM LINE—TAKE HOME MESSAGE

- 
1. Building community resilience combines both **bottom-up** and **top-down** approaches
  2. Operationalizing resilience requires a **multi-stakeholder** approach (federal agencies, state agencies, private sector, academia, etc.) and **alignment of interests** across stakeholders groups
  3. Implementing resilience involves identifying community **priorities**
  4. Measures are **relative** within each community; the **approaches** are **transferrable** across communities

IN CLOSING...



Community resilience is a long journey.

We can do it together.



Thank you! [laugustine@nas.edu](mailto:laugustine@nas.edu)

[HTTP://RESILIENTAMERICA.NAS.EDU](http://RESILIENTAMERICA.NAS.EDU)