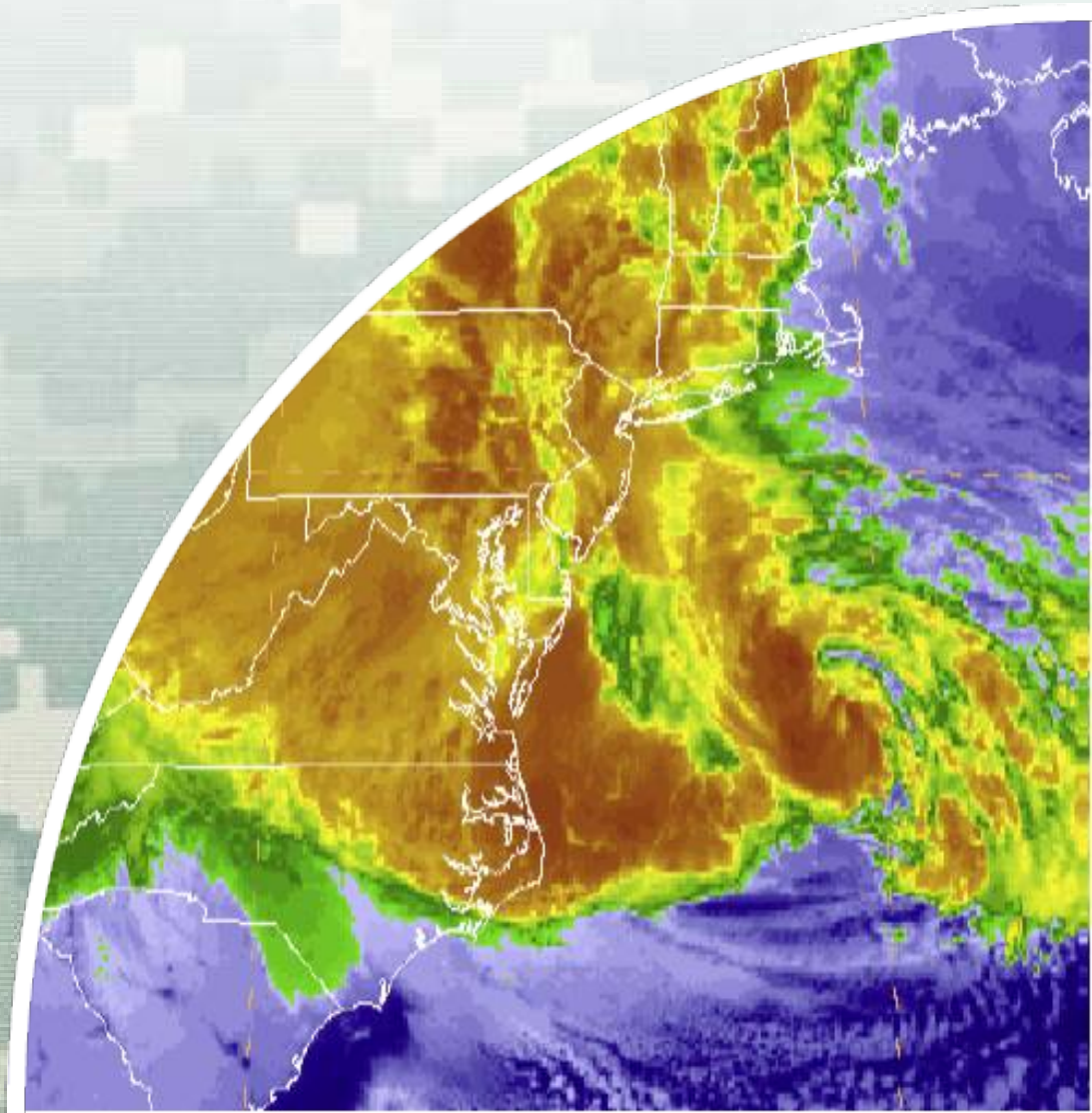
# North Atlantic Coast Comprehensive Study

## Draft Analyses Webinar: Risk, Exposure, and Vulnerability

**U.S. Army Corps of Engineers**
National Planning Center for Coastal Storm Risk Management

4 April 2014



US Army Corps of Engineers
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# Speakers

- Amy Guise

  Chief, Planning Division, Baltimore District

  Chief, North Atlantic Coast Comprehensive Study (NACCS) Command Center

- Dave Robbins

  Project Manager, NACCS

- Julie Rosati

  U.S. Army Engineer Research & Development Center (ERDC)

  Natural and Nature-Based Features (NNBF) Team, NACCS

# NACCS Background

- Hurricane/Post-Tropical Cyclone Sandy moved to the U.S. Atlantic Ocean coastline 22-29 October 2012
- Affected entire U.S. east coast:

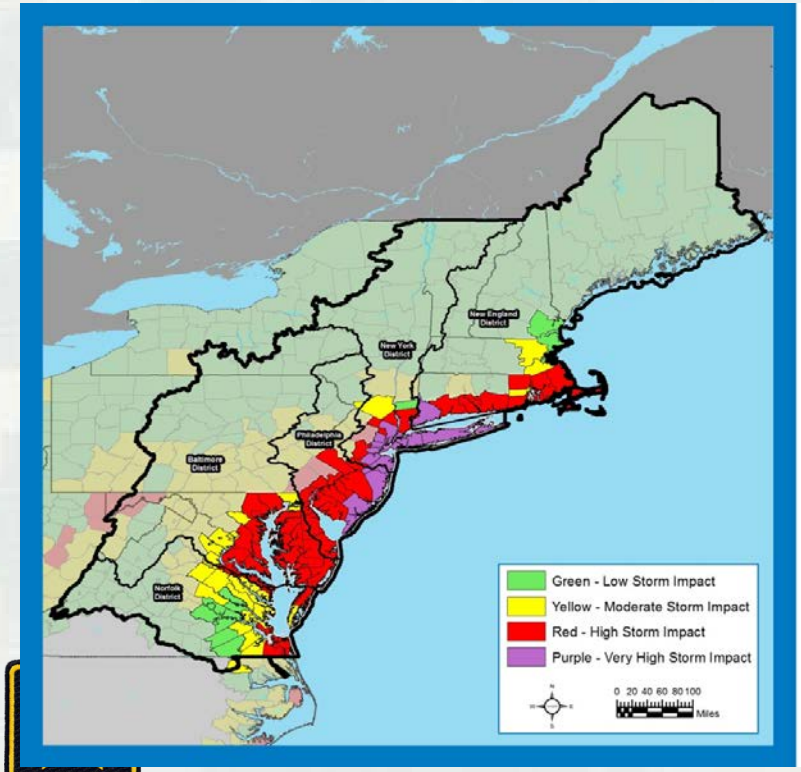
  24 States from Florida to Maine; New Jersey to Michigan and Wisconsin
- Areas of extensive damage from coastal flooding: New Jersey, New York, Connecticut
- Public Law 113-2 enacted

  29 January 2013

# NACCS Background

"That using up to $20,000,000* of the funds provided herein, the Secretary shall conduct a **comprehensive study** to address the flood risks of **vulnerable coastal populations** in areas that were affected by Hurricane Sandy within the boundaries of the North Atlantic Division of the Corps…" (*$19M after sequestration)

- **Complete by January 2015**




**Goals**

- Provide a **Risk Reduction Framework** , consistent with USACE-NOAA Rebuilding Principles

- Support **Resilient Coastal Communities** and robust, sustainable coastal landscape systems, considering future sea level rise and climate change scenarios, to reduce risk to vulnerable population, property, ecosystems, and infrastructure

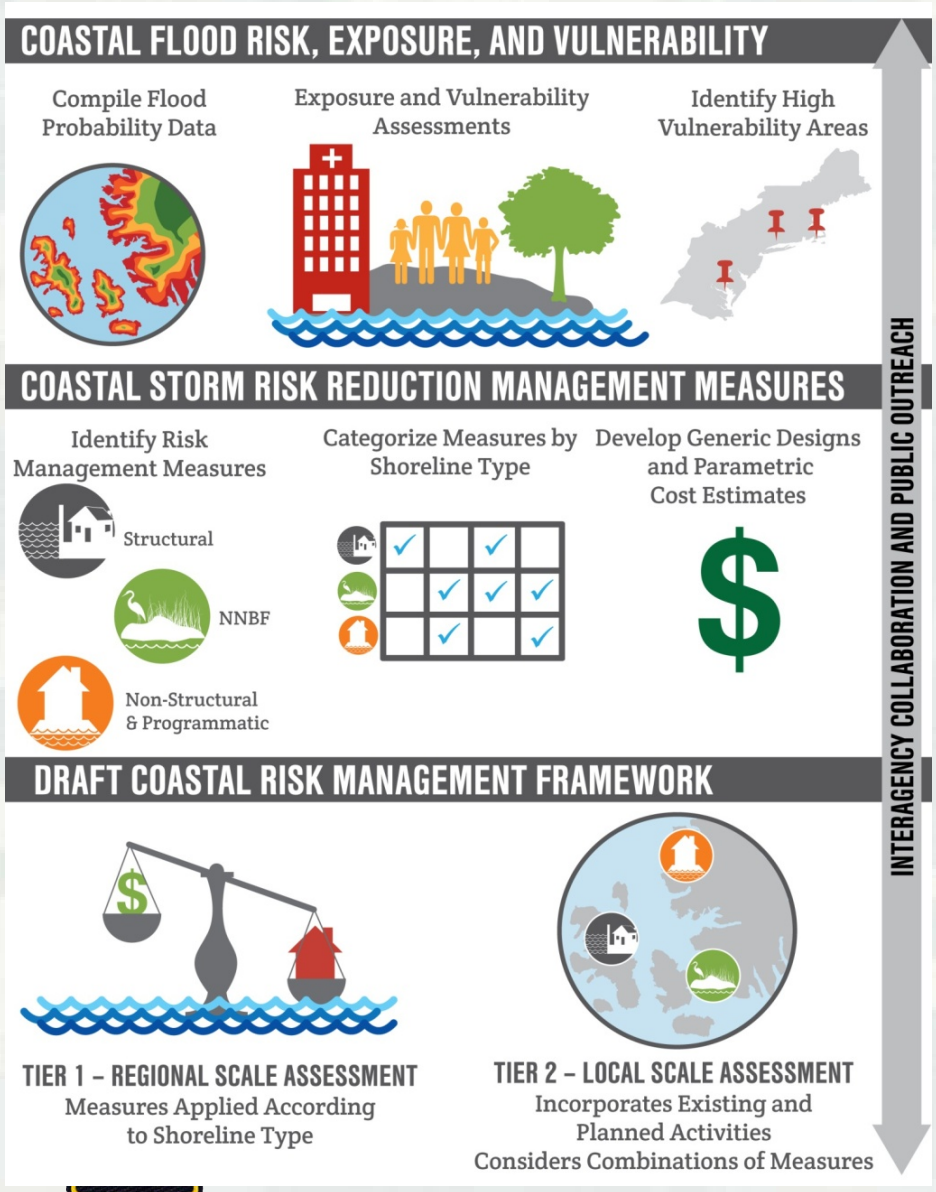
## Technical Teams

- **USACE Enterprise**
- **Agency Subject Matter Experts**
  - Engineering
  - Economics
  - Environmental, Cultural, and Social
  - Sea Level and Climate Change
  - Plan Formulation
  - Coastal GIS Analysis

## Products

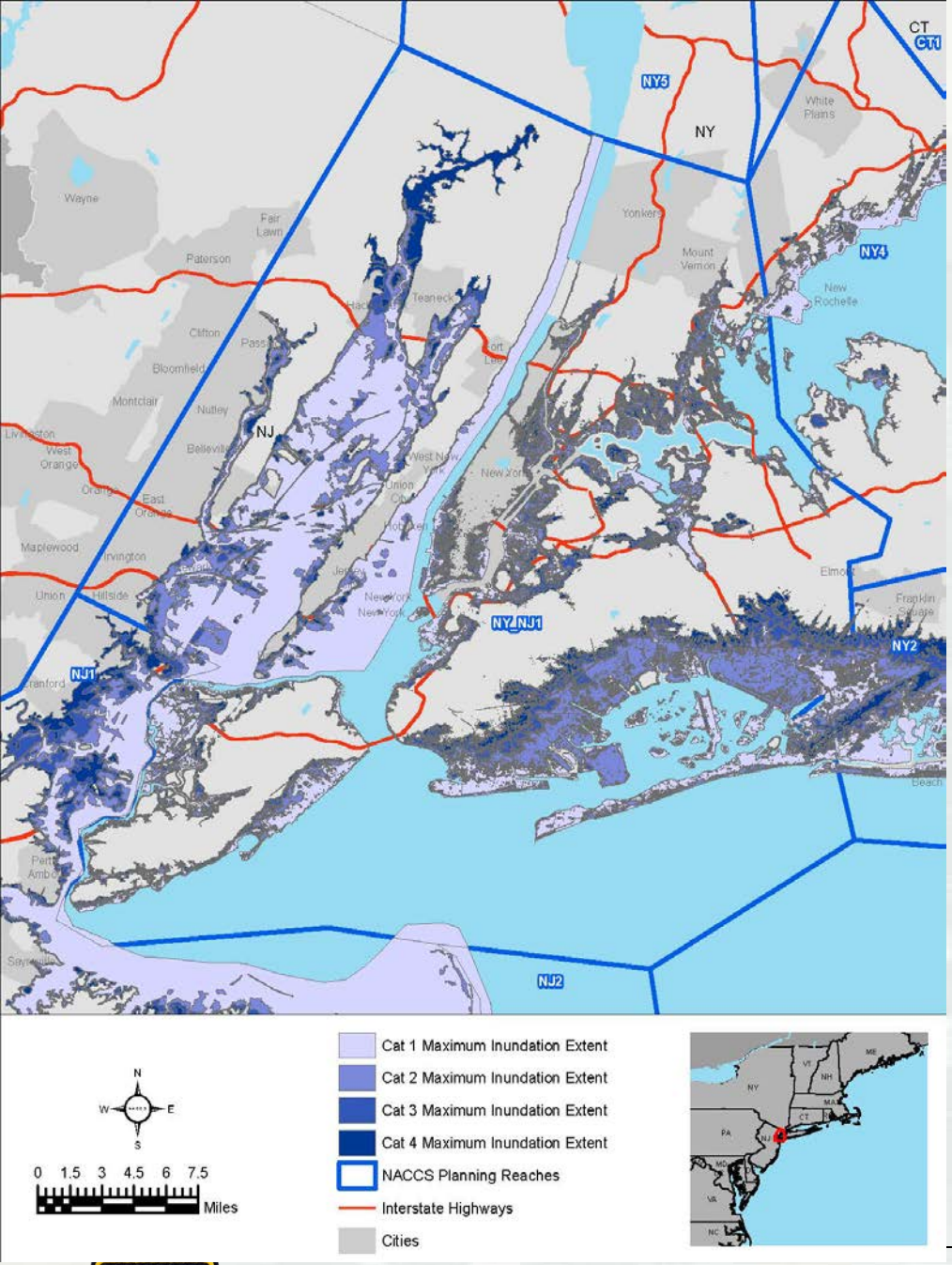
- **Coastal Framework**
  - Regional scale
  - Collaborative
  - Opportunities by region/state
  - Identify **range of potential solutions** and parametric costs by region/state
  - Identify activities warranting additional analysis and social/institutional barriers
- **Not a Decision Document**
  - No NEPA
  - No Recommendations

# NACCS Framework




- **Who and what** is exposed to flood risk?
- **Where** is the flood risk?
- What are the **appropriate strategies** and measures to reduce flood risk and how do they align with **each other and other regional plans**?
- What is the **relative cost** of a particular measure compared to the anticipated risk reduction?
- What **data are available** to make a **RISK INFORMED decision**?
- What **data gaps exist/can be closed** through the NACCS?

# Extent of Inundation



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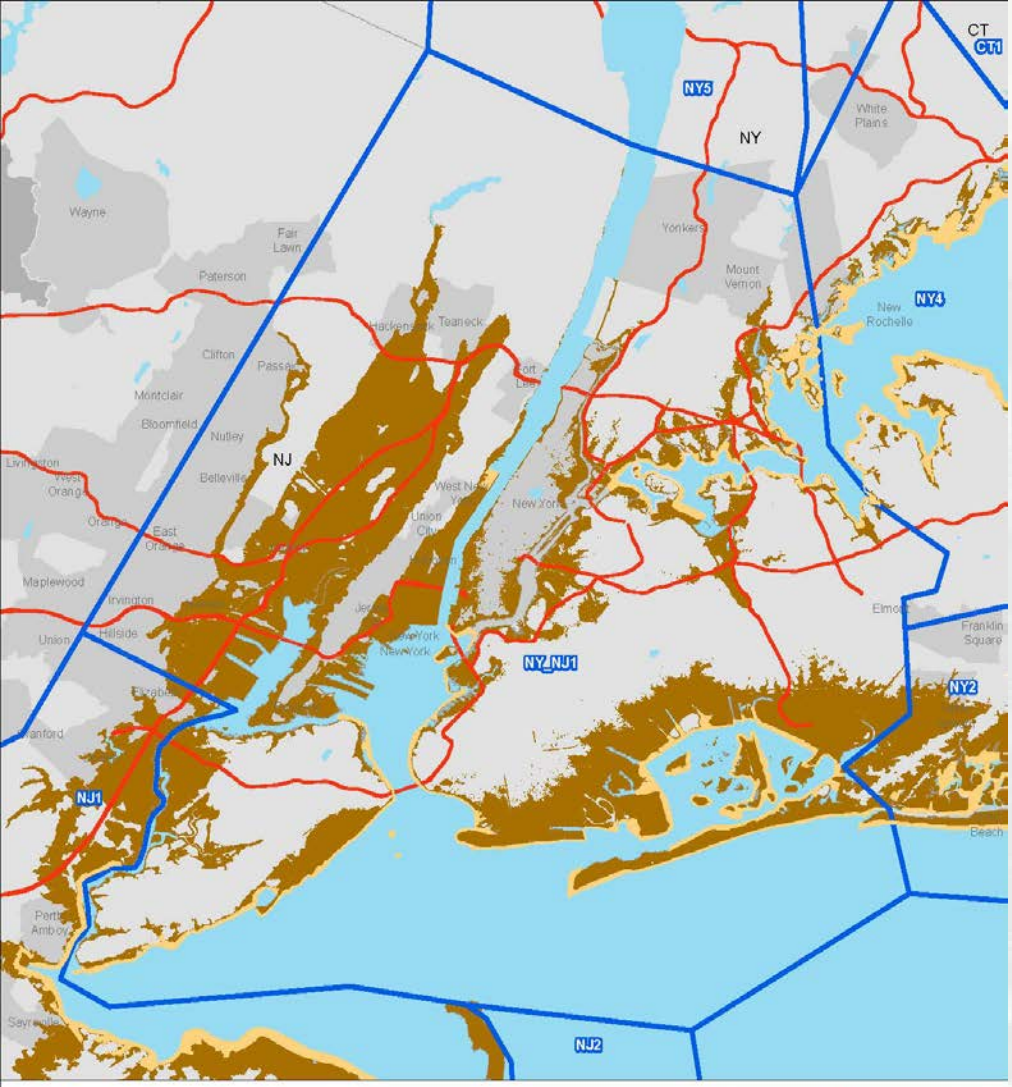

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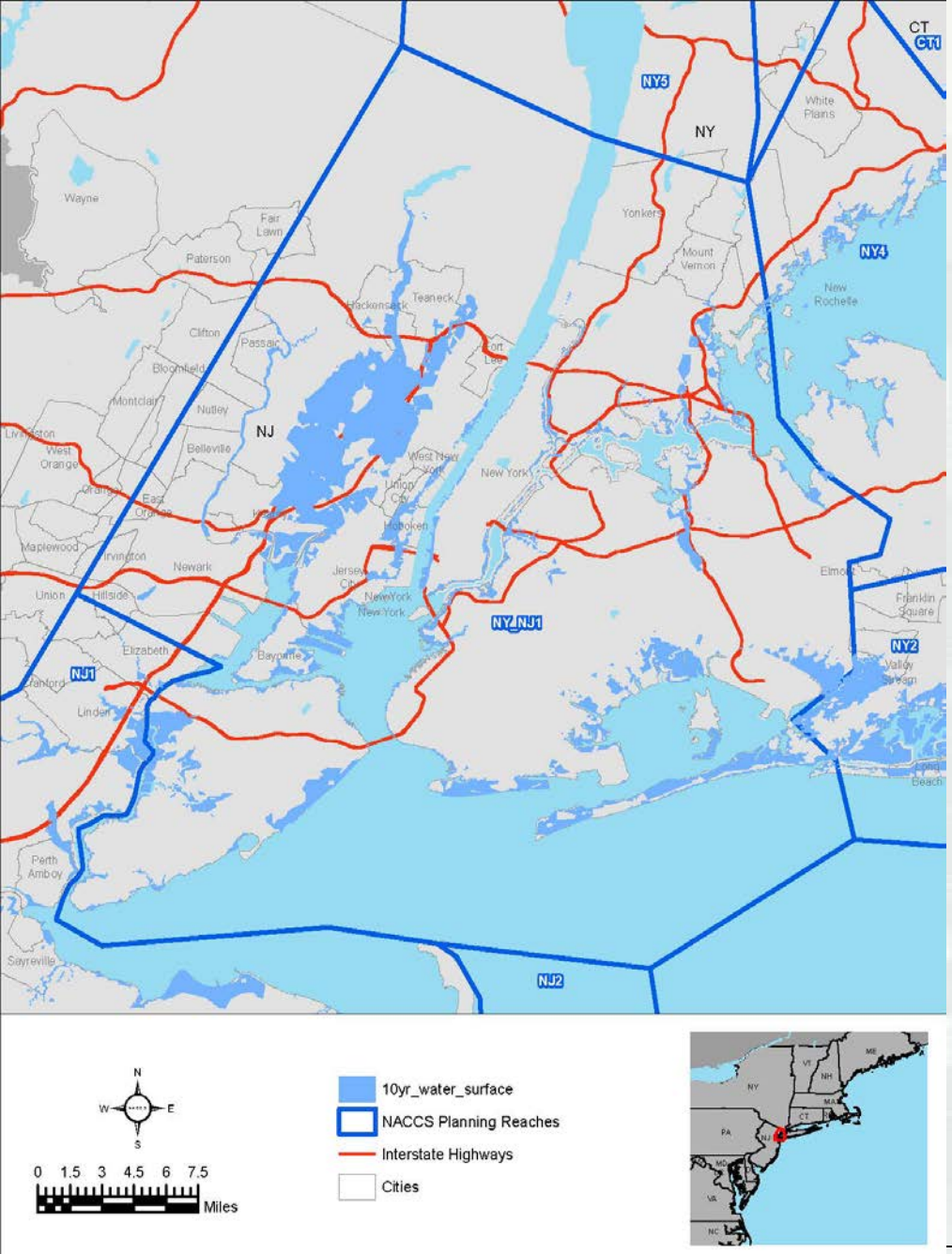
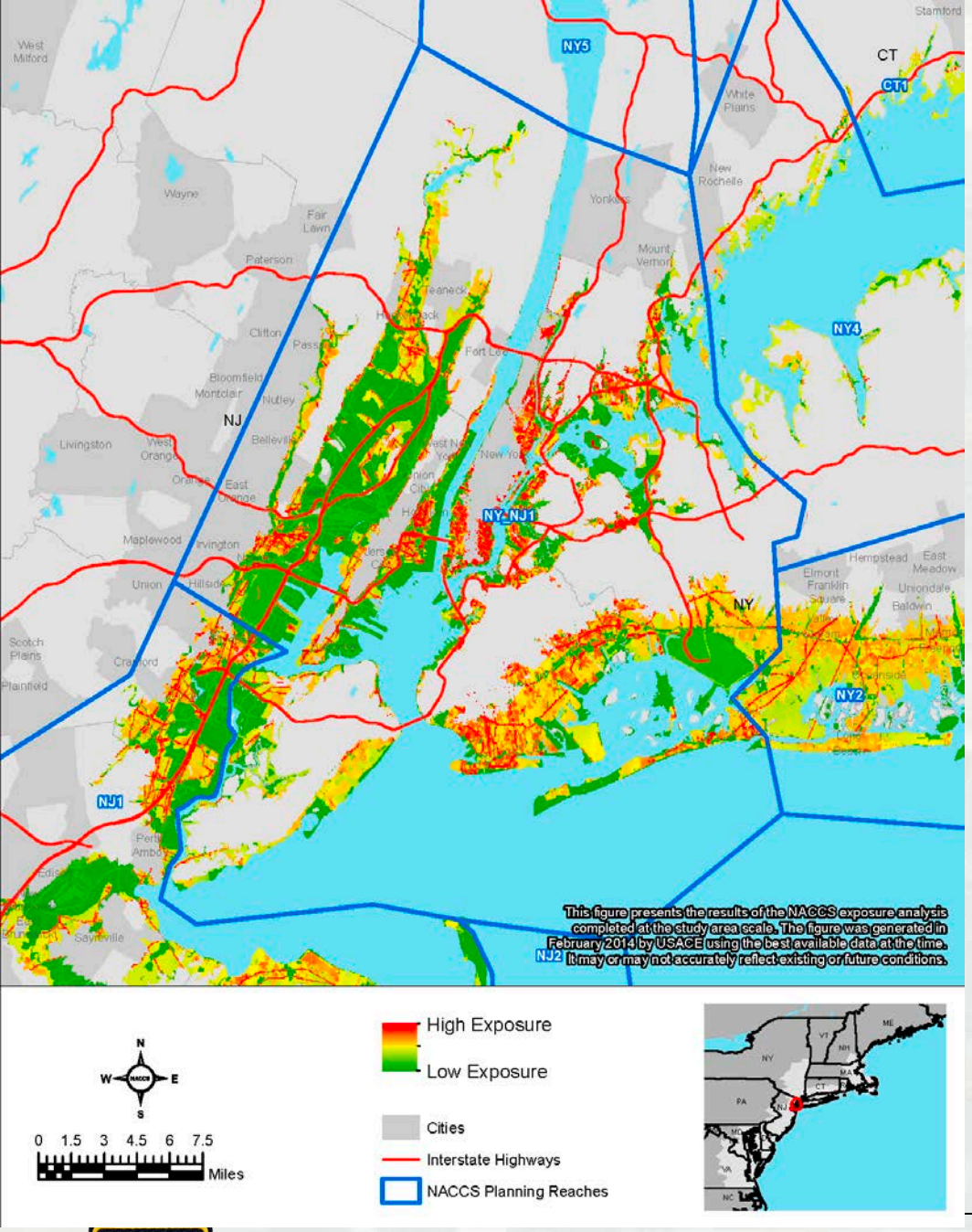


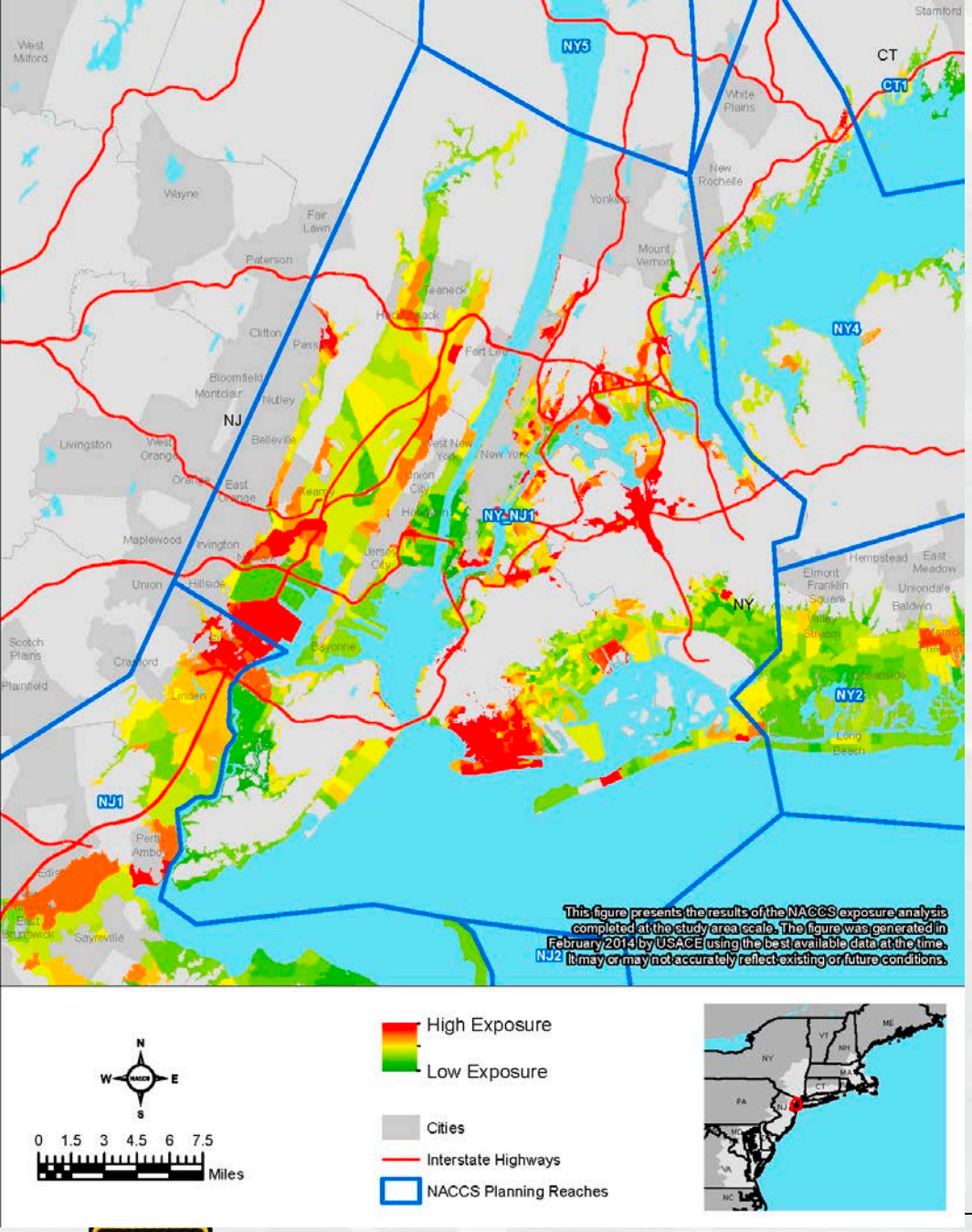
# Exposure Assessment

- **Exposure Indices**
  - **Population density and infrastructure** (number of people and infrastructure in communities subject to flooding)
  - **Socio-economic groups** (populations that may have more difficulty preparing and responding to flooding)
  - **Environmental/Cultural** (critical habitat, wetlands and other environmental and cultural resources)
- **Mapping**
  - Relative higher exposure = highly populated areas and urban centers
  - Boston, NY/northern NJ metropolitan area including Nassau County, Connecticut shoreline, Monmouth and Cape May Counties, the upper Delaware Bay portion of NJ

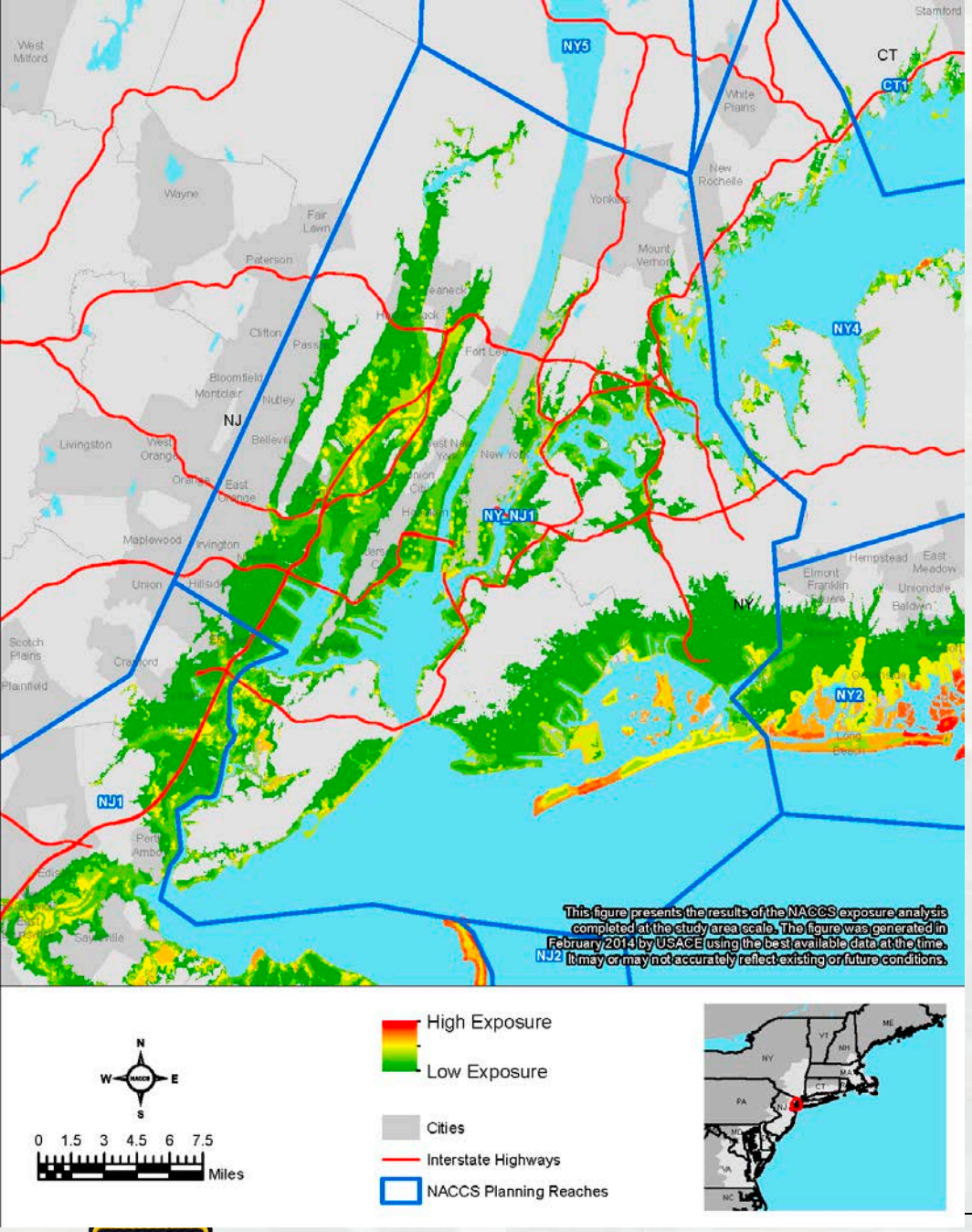
# Population & Infrastructure Exposure



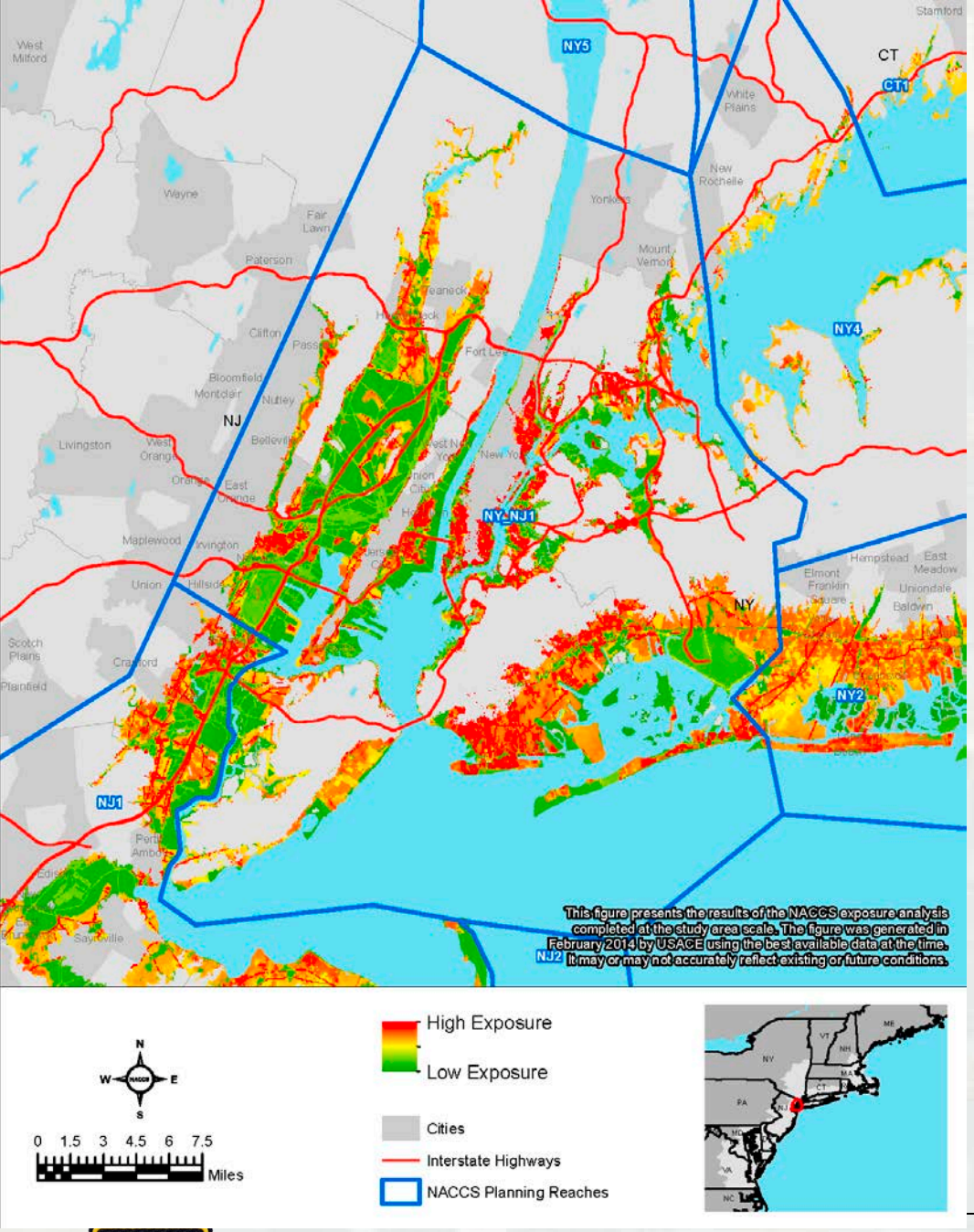
# Social Exposure



# Environmental/ Cultural Exposure



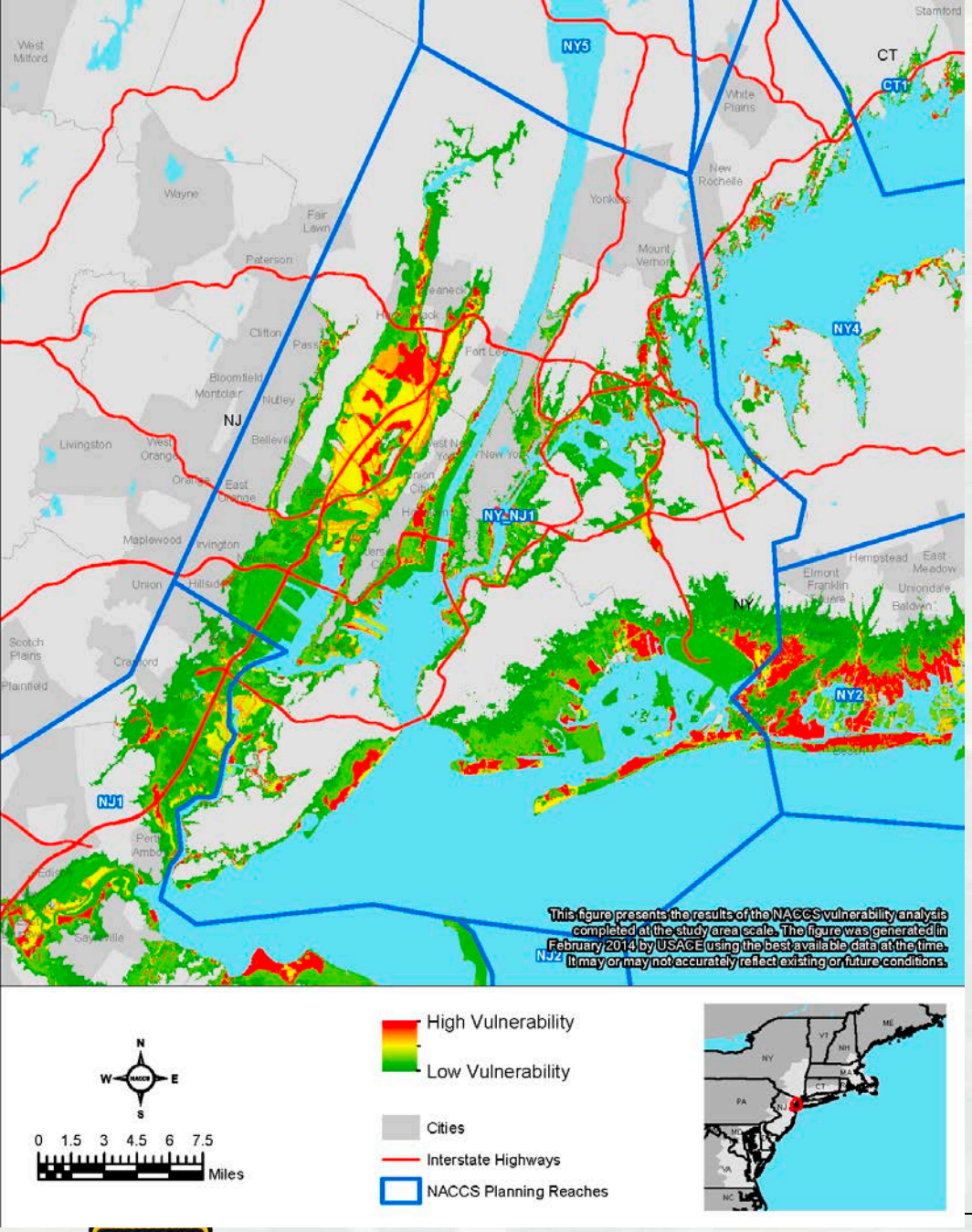
# Composite Exposure



# Vulnerability Assessment

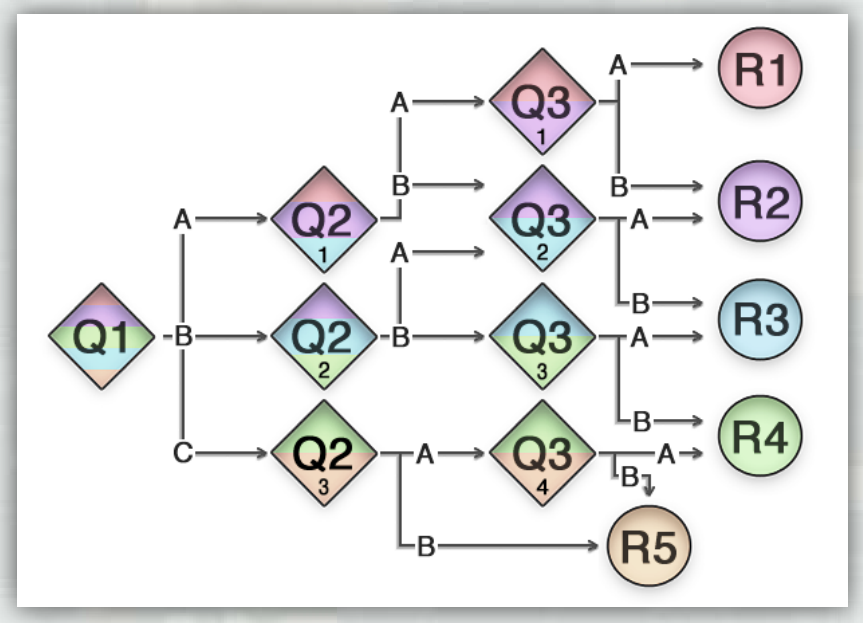
- Greater vulnerability based on proximity to flooding source
- Exposure * Probability of Flooding
  - Multiply value in each pixel of the composite exposure grid by the probability of flooding
- Additional metrics would need to be considered at smaller scales

# Vulnerability Assessment



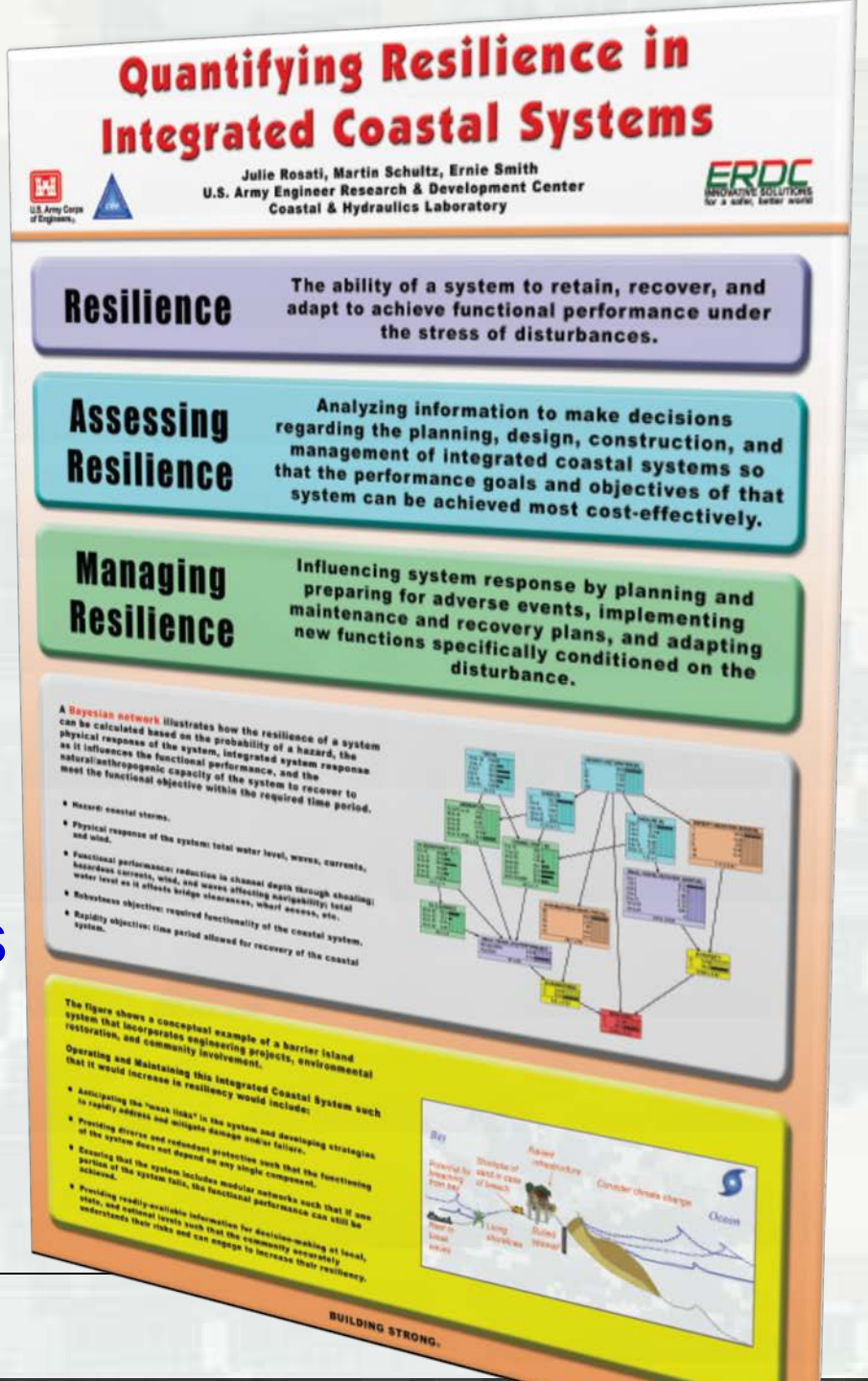
# Capturing the Community's Perspective of System Vulnerability

- Develop a "questioning tree" that facilitates the development of user-valued weightings of valued system functions.
- Engage the NACCS team and Agency Subject Matter Experts and guide them through the weightings development.
- Engage the community and capture the range of values associated with the various vulnerability metrics so that we can inform the development of a vulnerability framework at the community scale.

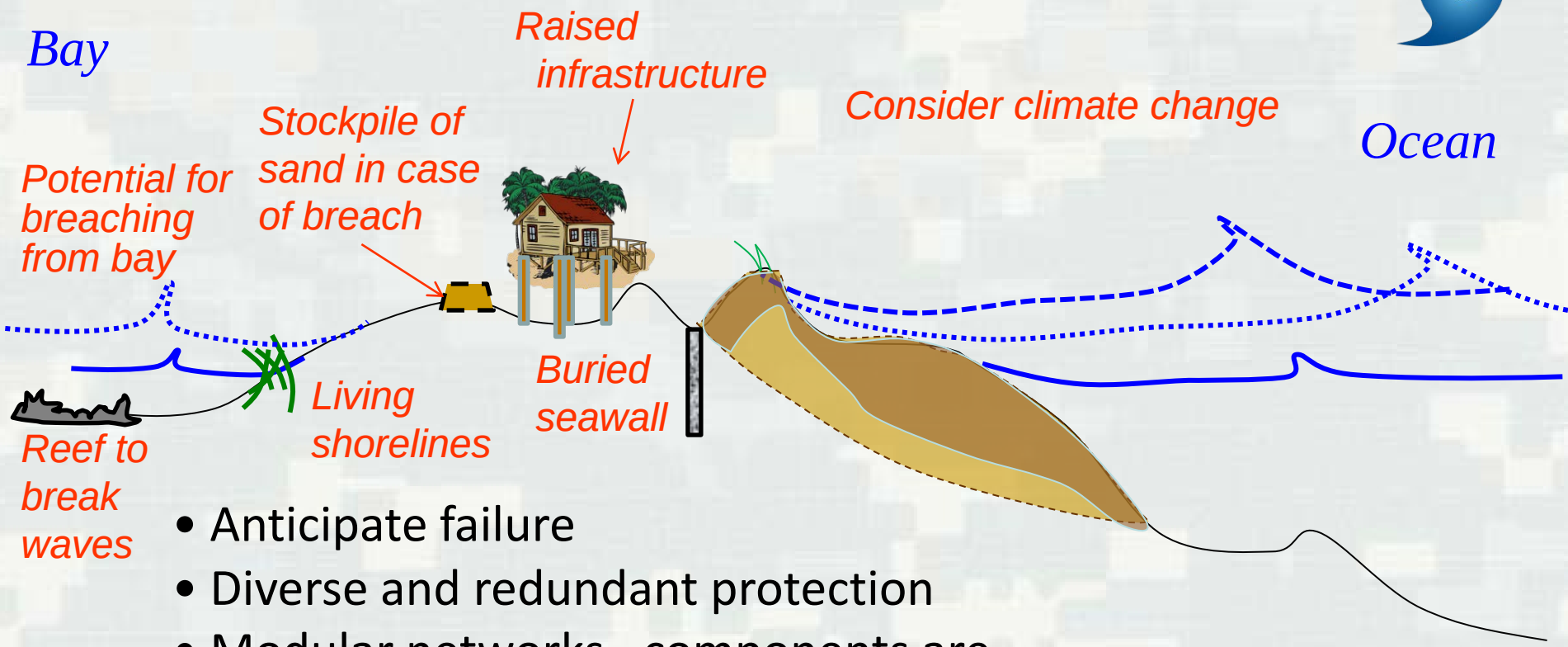


# Resilience

- How can we quantify resilience of an integrated coastal system (ICS)? Incorporate:
  - ► Natural and Nature-Based Features (NNBF)
  - ► Engineering Projects
  - ► Community Values
- What are the best practices for assessing, operating and maintaining a resilient coastal system?



# Example of Resilient Practices for Reducing Coastal Risks




- Anticipate failure
- Diverse and redundant protection
- Modular networks –components are independent of, and complement each other.
- Information is accessible for decision-making

# Resilience Pilot Study at Jamaica Bay

- Schultz et al.'s (2012) Methodology for quantifying ICS resilience applied to Jamaica Bay as pilot study
- Utilizing NACCS storm forcing calculations

# What Happens Next?

- The NACCS team will receive comments for integration into the NACCS report
  - ► Mid-April 2014
- Integration
  - ► Mid-April/May 2014
- Draft Final Report production
  - ► June 2014
- Final USACE vertical team review
  - ► July – December 2014
- Submit to Congress
  - ► **January 2015**

# Review Information

- Review documents are DRAFT and NOT FOR DISTRIBUTION
- Download the documents via AMRDEC
  - See email from No-Reply@amrdec.army.mil
- Review the draft analyses documentation
- Follow the link to the feedback form
  - Keep the feedback questions in mind during your review
  - Complete the online feedback form
- Tune into subject-specific webinars
- All feedback forms due by **April 14, 2014**

# What Happens Next?

- Technical Challenges with accessing document and comment forms?
- General issues or for further coordination?
- Contact via email:

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Baltimore District, USACE

Email: David.W.Robbins@usace.army.mil

# Questions