Empowering Communities to Find Resilient Solutions to Extreme Events
September 5, 2013

Moderator: Lucy Moore

Guest Panelist: Bruce Babbitt
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  - Rising energy demands threaten energy security, economic growth, and the environment
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  - Evaluates the effectiveness of program and marketing initiatives

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Lucy Moore, President of Lucy Moore Associates, Inc. has years of experience as a mediator, facilitator, trainer and consultant, specializing in natural resource and public policy disputes. Based in Santa Fe, New Mexico, and working throughout the region and country, her clients include federal, state, and local agencies, non-profits, and business interests. She has a particular expertise working in multicultural settings and with tribal communities. She is the author of Common Ground on Hostile Turf.

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CITIES IN THE WILDERNESS
A NEW VISION of land use in America
BRUCE BABBITT
OVERVIEW

- Facing tough realities is hard for all of us
- We share the future....hopefully
- We must make decisions to deal with future crises together
- This means:
  - Empowering stakeholders and communities at the earliest possible point for more resilient, sustainable and supported solutions
  - overcoming “us” and “them” mentalities
    - government and citizens
    - your community and the neighboring community
    - your interest and other interests
- listening to each other and developing trust
- learning and accepting the facts together
- finding common ground and a way forward we all can support
- ..... Is it easy? No, but there are rewards, and we really have no choice...
Session Agenda

• Introduction to the Panel: Lucy Moore
• Panel Presentations
  ➢ Bruce Babbitt: Former Governor of Arizona and Secretary of the Interior
  ➢ Sam Merrill: President of Catalysis and Director New England Environmental Finance Center Muskie School of Public Service, University of Southern Maine
  ➢ Thomas Wieczorek: Director of the ICMA Center for Public Safety Management
  ➢ Alex Washburn: Chief Urban Designer at the New York Department of City Planning
• Panel Discussion Questions
• Audience Questions: Send your questions through the chat box
• Summary Points
• Thank you!

Please fill out the audience exit survey
Bruce Babbitt was elected to statewide office on his first foray into elective politics in Arizona at the age of 36. He became governor in 1978 and was twice reelected to that office, serving nine years in all. As Secretary of the Interior from 1992–2001, Babbitt was perhaps the best-qualified person ever to hold that position. He tackled some of the most complex and controversial issues in public land management, resulting in long overdue reforms to mining, grazing, and endangered species law.

Sam Merrill is President and founder of Catalysis Adaptation Partners. Sam has spent over 20 years at the interface of local community needs, managed landscapes, and sensitive natural resources. Since 2001 Sam has also served as Director of the New England Environmental Finance Center and Associate Research Professor at the Muskie School of Public Service. He is a lead developer of the Coast Adaptation to Seal Level Rise Tool (COAST).

Thomas Wieczorek is the Director of the ICMA Center for Public Safety Management. He has served as a police officer, fire chief, director of public safety, and city manager in Ionia, Michigan. He worked with the National League of Cities and the Department of Homeland Security to create and deliver a program on emergency management for local officials titled, “Crisis Leadership for Local Government Officials.”

As Chief Urban Designer at the New York Department of City Planning, Alexandros Washburn has been at the forefront of Mayor Michael Bloomberg's epic remaking of the city. His book, The Nature of Urban Design, empowers urbanites and lays the foundations for a new approach to design that will help cities to prosper in an uncertain future facing events like Hurricane Sandy.
Community engagement for adaptation to sea level rise and storm surge: How to tolerate the tension.

Samuel B. Merrill, PhD
September 5, 2013
Empowerment:

A multi-dimensional social process that helps people gain control over their own lives. It is a process that fosters power in people for use in their own lives, their communities and in their society, by acting on issues they define as important.

What is “COAST?”

**CO**astal

**A**daptation to

**S**ea level rise

**T**ool
Muskie School of Public Service

University of Southern Maine
Portland, Maine
v 1.0 Developed by and in conjunction with:
Some Project Sites
Completed or Underway

- East Machias, Maine
- Falmouth, Maine
- Portland, Maine
- Old Orchard Beach, Maine
- Scarborough, Maine
- Bath, Maine
- Hampton, New Hampshire
- Seabrook, New Hampshire
- Hampton Falls, New Hampshire
- Cambridge, Massachusetts
- Duxbury, Massachusetts
- Marshfield, Massachusetts
- Scituate, Massachusetts
- Groton/Mystic, Connecticut
- Kingston, New York
Climatic Change
DOI 10.1007/s10584-011-0379-z

Simplified method for scenario-based risk assessment adaptation planning in the coastal zone

Paul Kirshen • Samuel Merrill • Peter Slovinsky • Norman Richardson

Received: 16 November 2009 / Accepted: 14 November 2011
© Springer Science+Business Media B.V. 2011
It is Difficult to Shift into Action Mode:

1) Consequences appear far off in time.
2) Cost-benefit relationships are ambiguous.
3) Possible actions are complex.
4) Doing nothing is far, far easier.
There are only four options:

1) Do nothing
2) Fortify assets
3) Accommodate higher water levels
4) Relocate assets
There are only four options:

1) Do nothing (usually = remain in denial)
2) Fortify assets
3) Accommodate higher water levels
4) Relocate assets

>> COAST is a tool and approach to help evaluate costs and benefits of these options.
Generalized steps in the COAST Process

1. Engage stakeholders in a process to understand and select different scenarios for sea level rise and storm surge.
For a Range of Scenarios...

Sea Level Rise (cm, by 2100)

- NRC (2007)
- IPCC (2007)
- Rahmstorf (2007)
- Horton et al. (2008)
- Pfeffer et al. (2008)
- Vermeer and Rahmstorf (2009)
- Cazenave et al. (2010)
- Jevrejeva et al. (2010)
- AMAP (2011)

Adapted from Rahmstorf (2010); and Williams (2012)
Projection of Sea Level Rise from 1990 to 2100

Patriot’s Day Storm 2007: York Beach, Maine
Use Best Available Information for Stillwater Flood Elevations and Recurrence Intervals

**TABLE 5 - SUMMARY OF STILLWATER ELEVATIONS**

<table>
<thead>
<tr>
<th>FLOODING SOURCE AND LOCATION</th>
<th>10-YEAR</th>
<th>50-YEAR</th>
<th>100-YEAR</th>
<th>500-YEAR</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ADAMS POND</strong>&lt;br&gt;At Derry</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>326.0</td>
<td>327.1</td>
<td>327.3</td>
<td>328.1</td>
</tr>
<tr>
<td><strong>ATLANTIC OCEAN</strong>&lt;br&gt;Entire shoreline within North Hampton and Rye</td>
<td>8.3</td>
<td>8.9</td>
<td>9.2</td>
<td>9.8</td>
</tr>
<tr>
<td><strong>Entire shoreline within Hampton, Hampton Falls, New Castle, Scabrook, and Seabrook Beach</strong></td>
<td>8.2</td>
<td>8.9</td>
<td>9.2</td>
<td>9.8</td>
</tr>
<tr>
<td><strong>Entire shoreline within Portsmouth</strong></td>
<td>8.0</td>
<td>8.6</td>
<td>8.9</td>
<td>9.5</td>
</tr>
<tr>
<td><strong>BEAVER LAKE</strong>&lt;br&gt;At Derry</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>287.9</td>
<td>289.3</td>
<td>289.6</td>
<td>294.0</td>
</tr>
<tr>
<td><strong>COUNTRY POND</strong>&lt;br&gt;Entire shoreline with Kingston</td>
<td>*</td>
<td>*</td>
<td>120.8</td>
<td>*</td>
</tr>
<tr>
<td><strong>GREAT BAY</strong>&lt;br&gt;Entire shoreline of the Squamscott River within the Exeter corporate limits to a point approximately 370 feet downstream of Chestnut Hill Avenue</td>
<td>7.1</td>
<td>7.6</td>
<td>7.9</td>
<td>8.4</td>
</tr>
<tr>
<td><strong>Entire shoreline within Greenland, and Newington, and the entire shoreline of Great Bay and Lamprey River</strong></td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
</tbody>
</table>
Steps in the COAST Process

2. With significant stakeholder input, identify and select vulnerable asset(s)*

*COAST can be used to complete a general Vulnerability Assessment and evaluate at-risk infrastructure
A Range of Vulnerable Assets:

- Real estate values
- Economic output
- Public health impacts
- Displaced persons, vulnerable demographics
- Natural resources values
- Cultural resources values
- Community impacts
- Infrastructure (transportation, energy, facilities, telecommunications)
Steps in the COAST Process

3. **Input Depth-Damage Function**
(can be customized with engineer input).

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Mean of Damage</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>25.5%</td>
</tr>
<tr>
<td>1</td>
<td>32.0%</td>
</tr>
<tr>
<td>2</td>
<td>38.7%</td>
</tr>
<tr>
<td>3</td>
<td>45.5%</td>
</tr>
<tr>
<td>4</td>
<td>52.2%</td>
</tr>
<tr>
<td>5</td>
<td>58.6%</td>
</tr>
<tr>
<td>6</td>
<td>64.5%</td>
</tr>
</tbody>
</table>
Steps in the COAST Process

4. Input Elevation and Asset Layers.
Hit “Go” >> COAST will:

- Estimate dollar damage predicted for a particular-sized storm in a given year, and project results in 3D maps.
- Calculate the cumulative expected damage from all predicted storms out to that year.
Flooding Vulnerability Assessment for the City of Kingston, NY
Benefit Cost Analysis of Three Adaptation Options for the Rondout/East Strand

- For 10-year and 100-year Storm Events
- With High and Low Sea Level Rise Scenarios
- For the Years 2013, 2060 and 2100
- Including Predictions for All Cumulative Expected Monetary Damage to Buildings and Improvements using the COAST tool, and Predictions for Avoided Damages with Adaptations.

This project is funded by NYS DEC's Hudson River Estuary Program, with support from the NYS Environmental Protection Fund, in cooperation with NEIWPCC.
Kingston, NY
100 yr storm, 2013, no SLR

Scenario 2 - Kingston - 100 Year Storm with No SLR in 2013
Lost asset value for scenario: Year 2013, KingstonLoSLR06202013, 100 Storm
Total Storm Damage = $18.9M
- Abandoned or Adapted in Response to Sea Level Rise
- Costs from Storm Surge

Imagery Date: 10/7/2011
Kingston, NY
100 yr storm, 2013, no SLR

COAST ASSET DATA

Flood Depth = 8.2 ft

Estimated Damage = $120,912

bldgvalue = $251,900

Scenario 2 - Kingston - 100 Year Storm with No SLR in 2013
Lost asset value for scenario: Year 2013, KingstonLoSLR06202013, 100 Storm
Total Storm Damage = $18.9M

- Abandoned or Adapted in Response to Sea Level Rise
- Costs from Storm Surge
Kingston, NY
100 yr storm, 2060, high SLR
Kingston, NY
100 yr storm, 2060, high SLR

COAST ASSET DATA

Flood Depth = 11.2 ft

Estimated Damage = $140,813

bldgvalue = $251,900

Scenario 6 - Kingston - 100 Year Storm with High SLR in 2060
Lost asset value for scenario: Year 2060, KingstonHiSLR06202013, 100 Storm
Total Storm Damage = $26.2M
Abandoned or Adapted in Response to Sea Level Rise
Costs from Storm Surge
Kingston, NY
100 yr storm, 2100, high SLR
Kingston, NY
100 yr storm, 2100, high SLR

COAST ASSET DATA

Flood Depth = 13.9 ft

Estimated Damage = $251,900

Year Abandoned Between 2060 and 2070

Scenario 10 - Kingston - 100 Year Storm with High SLR in 2100
Lost asset value for scenario: Year 2100, KingstonHiSLR06202013, 100 Storm
Total Storm Damage = $3.2M

Abandoned or Adapted in Response to Sea Level Rise
Costs from Storm Surge
## COAST Model for City of Kingston

**Modeled Water Levels and Vulnerability Assessment Results**

<table>
<thead>
<tr>
<th>Year</th>
<th>Sea Level Rise Scenario</th>
<th>Storm Intensity (return period in years)</th>
<th>Predicted Elevation of Flood Height from FEMA Flood Insurance Study, 2007 NAVD88 (ft.)&lt;sup&gt;1&lt;/sup&gt;</th>
<th>COAST Model of Sea Level Rise Above MHHW in 2013 Selected by Kingston (in./ft)&lt;sup&gt;2&lt;/sup&gt;</th>
<th>COAST Model Total Flood Elevation for Each Scenario NAVD 88 (ft.)</th>
<th>COAST Model Expected Damage to the Value of All Buildings &amp; Improvements From This Single Storm Incident in the Scenario Year ($ Million)</th>
<th>COAST Model Cumulative Expected Value of All Buildings and Improvements Located on Properties Permanently Inundated by Sea Level Rise if No Action is Taken, by this Year ($ Million)&lt;sup&gt;1&lt;/sup&gt;</th>
<th>COAST Model Cumulative Expected Damage to the Value of All Buildings &amp; Improvements From Sea Level Rise and All Storms, 2013 to Scenario Year ($ Million, with Discounting)&lt;sup&gt;3&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>1-No SLR</td>
<td>10 yr</td>
<td>6.0</td>
<td>0</td>
<td>0</td>
<td>6.0</td>
<td>1.0</td>
<td>n/a</td>
</tr>
<tr>
<td>2013</td>
<td>2-No SLR</td>
<td>100 yr</td>
<td>8.2</td>
<td>0</td>
<td>0</td>
<td>8.2</td>
<td>18.9</td>
<td>n/a</td>
</tr>
<tr>
<td>2060</td>
<td>3-Lo SLR</td>
<td>10 yr</td>
<td>6.0</td>
<td>20</td>
<td>1.67</td>
<td>7.7</td>
<td>17.3</td>
<td>2.0</td>
</tr>
<tr>
<td>2060</td>
<td>4-Lo SLR</td>
<td>100 yr</td>
<td>8.2</td>
<td>20</td>
<td>1.67</td>
<td>9.9</td>
<td>23.7</td>
<td>2.0</td>
</tr>
<tr>
<td>2060</td>
<td>5-Hi SLR</td>
<td>10 yr</td>
<td>6.0</td>
<td>36</td>
<td>3</td>
<td>9.0</td>
<td>20.0</td>
<td>2.0</td>
</tr>
<tr>
<td>2060</td>
<td>6-Hi SLR</td>
<td>100 yr</td>
<td>8.2</td>
<td>36</td>
<td>3</td>
<td>11.2</td>
<td>26.2</td>
<td>2.0</td>
</tr>
<tr>
<td>2100</td>
<td>7-Lo SLR</td>
<td>10 yr</td>
<td>6.0</td>
<td>33</td>
<td>2.75</td>
<td>8.8</td>
<td>19.9</td>
<td>2.0</td>
</tr>
<tr>
<td>2100</td>
<td>8-Lo SLR</td>
<td>100 yr</td>
<td>8.2</td>
<td>33</td>
<td>2.75</td>
<td>11.0</td>
<td>26.0</td>
<td>2.0</td>
</tr>
<tr>
<td>2100</td>
<td>9-Hi SLR</td>
<td>10 yr</td>
<td>6.0</td>
<td>68</td>
<td>5.67</td>
<td>11.7</td>
<td>1.9</td>
<td>55.3</td>
</tr>
<tr>
<td>2100</td>
<td>10-Hi SLR</td>
<td>100 yr</td>
<td>8.2</td>
<td>68</td>
<td>5.67</td>
<td>13.9</td>
<td>3.2</td>
<td>55.3</td>
</tr>
</tbody>
</table>

<sup>1</sup>Tidal state is included in FEMA FIS predicted flood elevations for the 10-yr and 100-yr storms.

<sup>2</sup>Elevation of Mean Higher High Water (MHHW) in year 2013 is 3.0 feet (NAVD 88).

<sup>3</sup>Discount Rate of 3.3 percent applied.

<sup>4</sup>See spreadsheet for complete list of properties.

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This project is funded by NYS DEC’s Hudson River Estuary Program, with support from the NYS Environmental Protection Fund, in cooperation with NEIWPCC.

Dates Run: 06/25-30/2013
Next Steps in the COAST Process

5. Select candidate adaptation actions to protect from sea level rise and storm surge, staged over time, and estimate costs of each action.
Possible Adaptation Actions: Hard or Soft

- Revetments
- Sea walls
- Jetties
- Levees
- Subway tunnel plugs
- Automatic floodgates
- Geotextile tubes
- Beach nourishment

- Dry flood-proofing
- Wet flood-proofing
- Increasing freeboard (now or later)
- Zoning changes
- Rolling easements
- Buyouts
Pea Patch Island, DE (Delaware River)
Next Steps in the COAST Process

6. For each action, modify the DDF or the spatial distribution of the vulnerable asset to represent the effect of the action.
Next Steps in the COAST Process

7. Perform cumulative expected damage analysis on each action.
### BENEFIT COST ANALYSIS OF ADAPTATION STRATEGIES – KINGSTON

<table>
<thead>
<tr>
<th>Scenario B: WITH ELEVATION OF EAST STRAND STREET TO 11 FEET (NAVD 88)</th>
<th>Scenario C: WITH ELEVATION OF BULKHEAD/WITH PATH TO 11 FEET (NAVD 88)</th>
<th>Scenario D: PURCHASES OF ROLLING EASEMENTS, WITH TRANSFER OF TITLE TO CITY AT 2060 OR WHEN MHHW REACHES 6.0 FEET (NAVD 88)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Low SLR</strong></td>
<td><strong>High SLR</strong></td>
<td><strong>Low SLR</strong></td>
</tr>
<tr>
<td>Cumulative Damage to East Strand Study Area With No Action&lt;sup&gt;1&lt;/sup&gt;</td>
<td>46,400,000</td>
<td>44,100,000</td>
</tr>
<tr>
<td>Cumulative Damage with Adaptation Strategy in Place&lt;sup&gt;1&lt;/sup&gt;</td>
<td>4,900,000</td>
<td>4,700,000</td>
</tr>
<tr>
<td>Avoided Damage (Row 1 – Row 2) or BENEFIT&lt;sup&gt;1&lt;/sup&gt;</td>
<td>41,500,000</td>
<td>39,400,000</td>
</tr>
<tr>
<td>Estimated COST of Adaptation Strategy</td>
<td>9,800,000</td>
<td>6,200,000</td>
</tr>
<tr>
<td>BENEFIT/COST Ratio (The higher the number above 1, the more favorable the ratio.)</td>
<td>4.2</td>
<td>4.0</td>
</tr>
</tbody>
</table>

<sup>1</sup>Discount Rate of 3.3% applied.

<sup>2</sup>Does not include purchase of easements at five city-owned properties, and sewage treatment plant remains unprotected.
Scenario D:
PURCHASES OF ROLLING EASEMENTS, WITH TRANSFER OF TITLE TO CITY AT 2060 OR WHEN MHHW REACHES 6.0 FEET (NAVD 88)

- Purchase Easements from all property owners whose land is at less than 11 feet elevation.
- **City does not elevate road or bulkhead** or make any capital expenditures to mitigate damages over time.
- Owners receive a cash payment now, and can stay on their property until 2060 or when MHHW reaches 6 feet (3 feet higher than today). Title transfers to easement holder at that time.
- Cash payment can be used for flood mitigation for buildings or for any purpose, such as relocation, but owner can not armor the shoreline.
- Sewage Treatment Plant remains unprotected.
- **Total Estimate:** $2.54 million
- **B/C Ratio =** 3.7 or 1.8 (Hi vs. Low SLR)
Next Steps in the COAST Process

8. Use maps and tables in public process, implement strategies.
Some social lessons learned using the COAST approach:

- Debates over climate change can be avoided. *Sea level rise and storm surge are being felt at local levels now and require local responses.*

- Analogy: If you were robbed, would you get better locks and a burglar alarm right away or wait until someone could prove the cause of the high crime rate in your area?
Some social lessons learned using the COAST approach:

• Citizens want cities, towns and states to get beyond vulnerability studies and to start putting adaptation strategies in place!

• Appropriations for expensive strategies (e.g., elevating waterfronts or relocating WWTPs) will not occur until there is enough social/political/economic consensus on what direction to take.
  • COAST helps create this consensus.
Some social lessons learned using the COAST approach:

• It’s not all about the numbers. Communities may pick a less cost-effective option. But they need the opportunity to have the conversation.

• The conversations will be difficult. Deeply held values are at stake, and span large gaps in the room. Expect it to be messy, and trust that “empowerment” – as a process that puts citizens in the driver’s seat – will result in the occasional multi-car pileup, but it serves a higher purpose.
Sea Isle City, NJ

Geotextile Tubes
Learn the alchemy
True human beings know.
The moment you accept
what troubles you’ve been given,
The door will open.

- Jalallabad Rumi, 13th Century Persia
Facing the bluntness of reality is the highest form of sanity and enlightened vision.

- Chogyam Trungpa Rinpoche
Summary points about COAST:

- COAST helps communities navigate among “fortify, accommodate, or relocate” decisions for SLR and SS.
- 3D visualization, combined with benefit-cost analysis where stakeholders make the decisions, appears to be a powerful form of local empowerment.
- It’s very possible to move forward on SLR and SS adaptation without becoming bogged down in climate change politics.
To download the software, user’s manual, and tutorial data sets: http://efc.muskie.usm.maine.edu

On an ongoing basis: when new versions are available, you will receive email notification.

www.catalysisadaptation.com
Sam Merrill: 207-615-7523
smerrill@catalysisadaptation.com
Empowering Communities to Find Resilient Solutions

Thomas J. Wieczorek
Director
ICMA Center for Public Safety Management
ICMA

• 9,000 members throughout the world
• Our mission: “To create excellence in local governance by developing and fostering professional local government management”
• Center for Public Safety Management is one of four centers in the Programs area of ICMA
Program Centers

ICMA Program Centers help strengthen communities by:

– Fostering peer collaboration
– Collecting and analyzing data
– Disseminating information, and
– Providing direct technical assistance

Specific areas of expertise include brownfields redevelopment, energy and the environment, livable communities, military communities and base reuse, performance measurement and management, and public safety and homeland security.
Center for Public Safety Management

• **Technical Assistance**
  – Police, Fire, EMS, Homeland Security
  – Forensic data analysis
  – Comprehensive Operational Review

• **Education and Training**

• **Chief Selection Advantage**
  – Police and Fire
Resiliency

Resilience is the ability to anticipate risk, limit impact, and bounce back rapidly through survival, adaptability, evolution, and growth in the face of turbulent change.

Resilient communities minimize any disaster’s disruption to everyday life and their local economies. Resilient communities are not only prepared to help prevent or minimize the loss or damage to life, property, and the environment, but they also have the ability to quickly return citizens to work, reopen businesses, and restore other essential services needed for a full and timely economic recovery.
The next step in FEMA’s ongoing efforts to work together to improve for a wide range of threats and hazards, such as acts of terrorism, cyber attacks, pandemics and catastrophic natural disasters, by releasing a description of the National Preparedness System.

What makes this preparedness system unique is that it involves the whole community – individuals, businesses, community- and faith-based organizations, schools and all levels of government.

“We recognize that the nation will be most prepared for threats and hazards when we work together and the National Preparedness System outlines the approach, resources and tools for achieving that goal.” –Craig Fugate, FEMA Administrator
The National Preparedness Goal, released in September 2011, defines what it means for the whole community to be prepared for all types of disasters and emergencies. The goal itself is succinct:

“A secure and resilient nation with the capabilities required across the whole community to prevent, protect against, mitigate, respond to, and recover from the threats and hazards that pose the greatest risk.”
National Goals

The National Preparedness Goal organizes the core capabilities into the five **mission areas**:

- **Prevention.** Prevent, avoid or stop an imminent, threatened or actual act of terrorism.

- **Protection.** Protect our citizens, residents, visitors, and assets against the greatest threats and hazards in a manner that allows our interests, aspirations, and way of life to thrive.

- **Mitigation.** Reduce the loss of life and property by lessening the impact of future disasters.

- **Response.** Respond quickly to save lives, protect property and the environment, and meet basic human needs in the aftermath of a catastrophic incident.

- **Recovery.** Recover through a focus on the timely restoration, strengthening and revitalization of infrastructure, housing and a sustainable economy, as well as the health, social, cultural, historic and environmental fabric of communities affected by a catastrophic incident.

*All disasters start/end locally!*
THIRA


• THIRA: Threat, Hazard Identification and Risk Assessment

• Required for grants – both pre and post disaster
Resilient Communities

- Holistic approach
- Government (local-state-federal)
- Non-profits
- Business

Emergencies and disasters have the potential to cripple or even destroy businesses – of all sizes and scope – that are unprepared for such events; *studies show that 40% of businesses that do not have emergency plans in place do not re-open after a major incident.*
Failing to plan or planning to fail?

Some examples of climate change impacts on emergencies

• New York – “A Stronger, More Resilient New York”

• CARRI (Community and Regional Resilience Institute)
  http://www.resilientus.org/research-needed-for-the-newresilience

• U.S. Chamber of Commerce
Failing to plan or planning to fail?

- Ionia, Michigan
- Community Resilience System (CRS)  
- Tri-County Area of South Carolina
- Anaheim, CA; Anne Arundel County and Annapolis, MD; Charleston, SC; Gadsden, AL; Greenwich, CT
Questions? Contact Info

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• What are some ways of dealing with turf battles with local and federal (sometime tribal) authorities?
• After events like Hurricane Sandy, how has the need for emergency response preparedness influenced the resiliency agenda?
Audience Questions
Bruce Babbitt was elected to statewide office on his first foray into elective politics in Arizona at the age of 36. He became governor in 1978 and was twice reelected to that office, serving nine years in all. As Secretary of the Interior from 1992–2001, Babbitt was perhaps the best-qualified person ever to hold that position. He tackled some of the most complex and controversial issues in public land management, resulting in long overdue reforms to mining, grazing, and endangered species law.

Sam Merrill is President and founder of Catalysis Adaptation Partners. Sam has spent over 20 years at the interface of local community needs, managed landscapes, and sensitive natural resources. Since 2001 Sam has also served as Director of the New England Environmental Finance Center and Associate Research Professor at the Muskie School of Public Service. He is a lead developer of the Coast Adaptation to Seal Level Rise Tool (COAST).

Thomas Wieczorek is the Director of the ICMA Center for Public Safety Management. He has served as a police officer, fire chief, director of public safety, and city manager in Ionia, Michigan. He worked with the National League of Cities and the Department of Homeland Security to create and deliver a program on emergency management for local officials titled, “Crisis Leadership for Local Government Officials.”

As Chief Urban Designer at the New York Department of City Planning, Alexandros Washburn has been at the forefront of Mayor Michael Bloomberg's epic remaking of the city. His book, The Nature of Urban Design, empowers urbanites and lays the foundations for a new approach to design that will help cities to prosper in an uncertain future facing events like Hurricane Sandy.
Closing Thoughts

- We have learned important lessons from painful experience and have tools to better face the next crisis.
- We are now able to predict the future – within a range of possibilities.
- It may be difficult to accept that future because of:
  - overwhelming nature of some of the scenarios
  - impacts that may be in the distant future and not affect us
  - the mass of information available
- Disaster begins and ends locally – they have the most to lose and they have the most to gain from preparedness and a resilient response.
- We ALL must face this reality and take ownership of the future if we are to survive – and we must do it together.
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