CAPE COASTAL CONFERENCE

Linking Science with Local Solutions and Decision-Making

No Regrets Planning Now for What Matters Later

Patrick Field, CBI

Climate change poses risks

The possibility of climate change poses serious risks to the well-being of communities around the world.

Communities depend on critically important services like fresh water, energy, waste disposal, food production and transportation which are threatened by changes in environmental conditions.

Credit: Army Corps of Engineers
(http://www.flickr.com/photos/corpsnewengland/4482667010/)

Credit: The.Rohit
(http://www.flickr.com/photos/rohit_saxena/3591126140/67010/)

Credit: Oxfam International
(http://www.flickr.com/photos/oxfam/4875676622/)

Societal Risk =

Probability of a hazard occurring

(*100 year flood every 100 years, 50, 25, 10?*)

X

Its impact if it does occur

(*Damage property, loss of life, economic disruption*)

Possible risks include

Sea level rise

Source: Northeast Climate Impacts Assessment Synthesis Team (July, 2007) *Confronting Climate Change in the U.S. Northeast: Science, Impacts, and Solutions.* Union of Concerned Scientists.

Possible risks include

More intense storms and/or flooding

Credit: rmd1023 (www.flickr.com/photos/rmd1023/4799506898/)

Credit: sigmaration (www.flickr.com/photos/sigmaration/233499073/)

Possible risks include

Temperatures increases (and heat islands)

Credit: Howard Brier
(www.flickr.com/photos/33764571@N00/2563722120/)

Possible risks include

Habitat and species destruction and migration

Credit: joshbousel
(www.flickr.com/photos/joshbousel/148524545/)

Credit: Jorge Lascar
(www.flickr.com/photos/jlascar/4519894686/)

Possible risks include

Saltwater intrusion

Credit: Kevin Pietrzak
(www.flickr.com/photos/mecocrus/3485393788/)

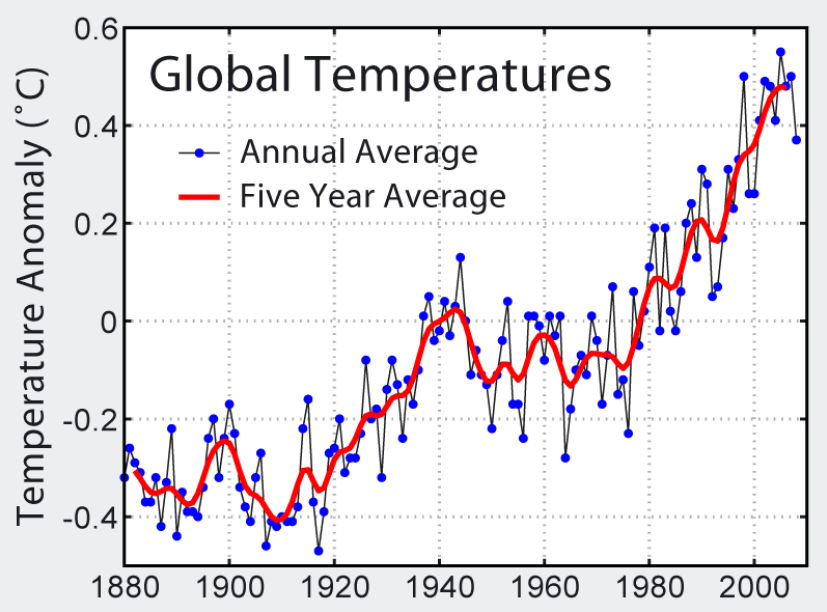
Climate change: Risks

Local Communities Adapting to Climate Change

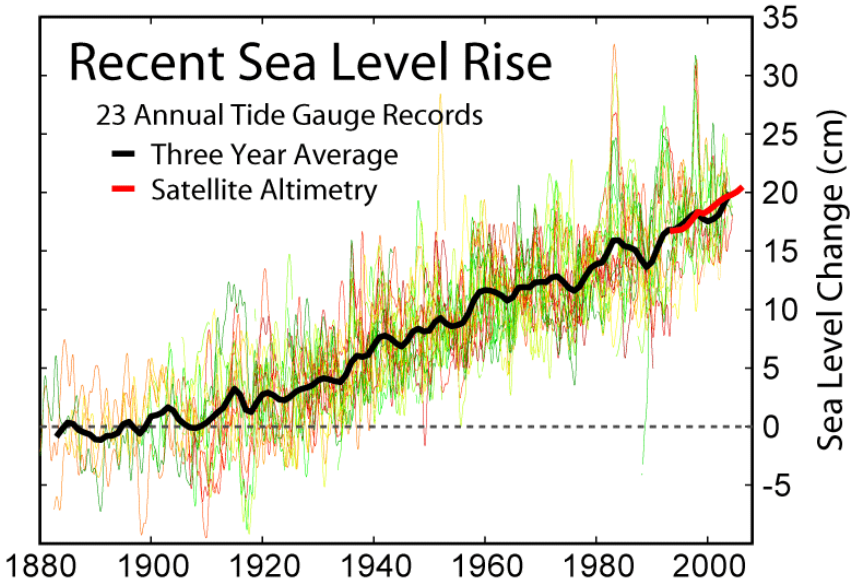
There are some things that make Climate Change unique:

- High degree of uncertainty (contingent on global emissions and highly complex, dynamic, variable systems)
- Intangible: You can't touch, taste, feel, or see "global climate change"
- Global change, local impact
- Current economy premised on continued growth of carbon-based energy
- Risk increasing over time, with the most serious impacts expected in the medium or longer-term
- Little experience dealing with this risk explicitly
- Range of views of the probability of these risks filtered through divergent political views

Convincing the Public



Source: Image created by Robert A. Rohde / Global Warming Art (http://www.globalwarmingart.com/wiki/File:Instrumental_Temperature_Record_png)



Source: Image created by Robert A. Rohde / Global Warming Art (http://www.globalwarmingart.com/wiki/File:Recent_Sea_Level_Rise_png)

"Simply presenting the facts and figures about global warming has failed to convince large portions of the general public, journalists, and policy makers about the scale of the problem and the urgency of required action. From a psychologist's perspective this disconnect is not surprising."

Source: The Psychology of Global Warming, the Bulletin of the American Meteorological Society. Dr. Andy Pitman, co-director of the Climate Change Research Centre at the University of New South Wales, Dr. Ben Newell, senior lecturer in cognitive psychology at the University of New South Wales

Psychology of Global Warming

Local Communities Adapting to Climate Change

Sampling issues: Clarity about the source and representativeness of samples of evidence that your audience and you are using to form inferences and draw conclusions.

Framing issues: Methods for presenting science should engage cognitive and emotional processing, in a balanced manner, and try to make distant future outcomes concrete.

Comprehending the problem and solution: Communicators should take into account the "mental model" held by members of their audience and tailor presentations accordingly.

***Consensus building*: The process and public perception of reaching a consensus about the science needs to be effective, transparent, and objective.**

Source: The Psychology of Global Warming, the Bulletin of the American Meteorological Society. Dr. Andy Pitman, co-director of the Climate Change Research Centre at the University of New South Wales, Dr. Ben Newell, senior lecturer in cognitive psychology at the University of New South Wales

Climate change: Risks

- *'Bad' news:*
  - Communities will need to take these risks seriously in all their decision-making or suffer the consequences.
  - We can't predict the risks easily, not everyone agrees on their probabilities, and we usually act "post facto"

- *'Good' news:* Communities already take a wide range of risks into account when making everyday decisions.
  - For instance, the threat of earthquakes prompts the inclusion of certain provisions in building codes, and motivates contingency planning around such things as water provision should water mains break.

Our suggestion: Consider climate change risks in all community decisions you are already making

Why this is promising…

- Integrated into current actions and activities.
- Does not necessarily require additional staffing.
- Flexible and responsive to change vs. a plan that is fixed in time.
- Technical solutions emerge from the authorities closest to the action (e.g. Water Department experts identify the best way of handling possible risks to water supplies)

Our suggestion:
Consider climate change risks in all decision-making

Why this is promising (cont.)…

- Awareness raised and action taken by all parts of the city leadership, rather than by a single office, committee or official.
- Adaptation involves changing the way we do almost everything, it should not be considered a task or an activity apart from everything else.

Adaptation as a risk management strategy

Adaptation can reduce vulnerability and increase resilience in the face of substantial uncertainty.

Effective adaptation strategies are:

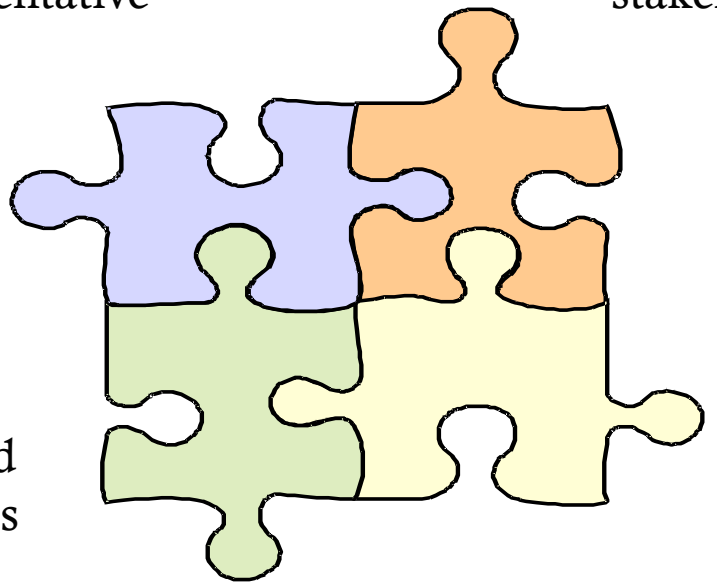
- **Action-oriented** (Assess risks and address vulnerabilities)
- **Adaptive** (Respond to new information)
- **Strategic** (Start with the least-cost, no-regrets measures that are widely supported)
- **Broadly supported** (Involve all stakeholders)
- **No regrets** (based on risks, not certainties)

Collaborative Decision-Making

Local Communities Adapting to Climate Change

Support well-informed, transparent and representative decision-making

Address differences among stakeholders collaboratively



Surface interests and options based on diverse sources of knowledge

Maximize joint gains & manage joint risks (economic, environmental, social, political)

(Re) Build relationships and institutions

The problem at hand?

- What is the system or problem at the center of what we need to consider?
  - Should we build a seawall?
  - How do we protect major infrastructure?
  - How does this geographic area respond to sea level rise?
- For that system or problem, what time horizon should we be thinking about? What is the investment horizon?
  - 20 to 30 years
  - 30 to 50 years
  - 50 or more years?
- What geography should be the focus of our thinking?
  - A neighborhood
  - The city
  - The region

The Value Proposition

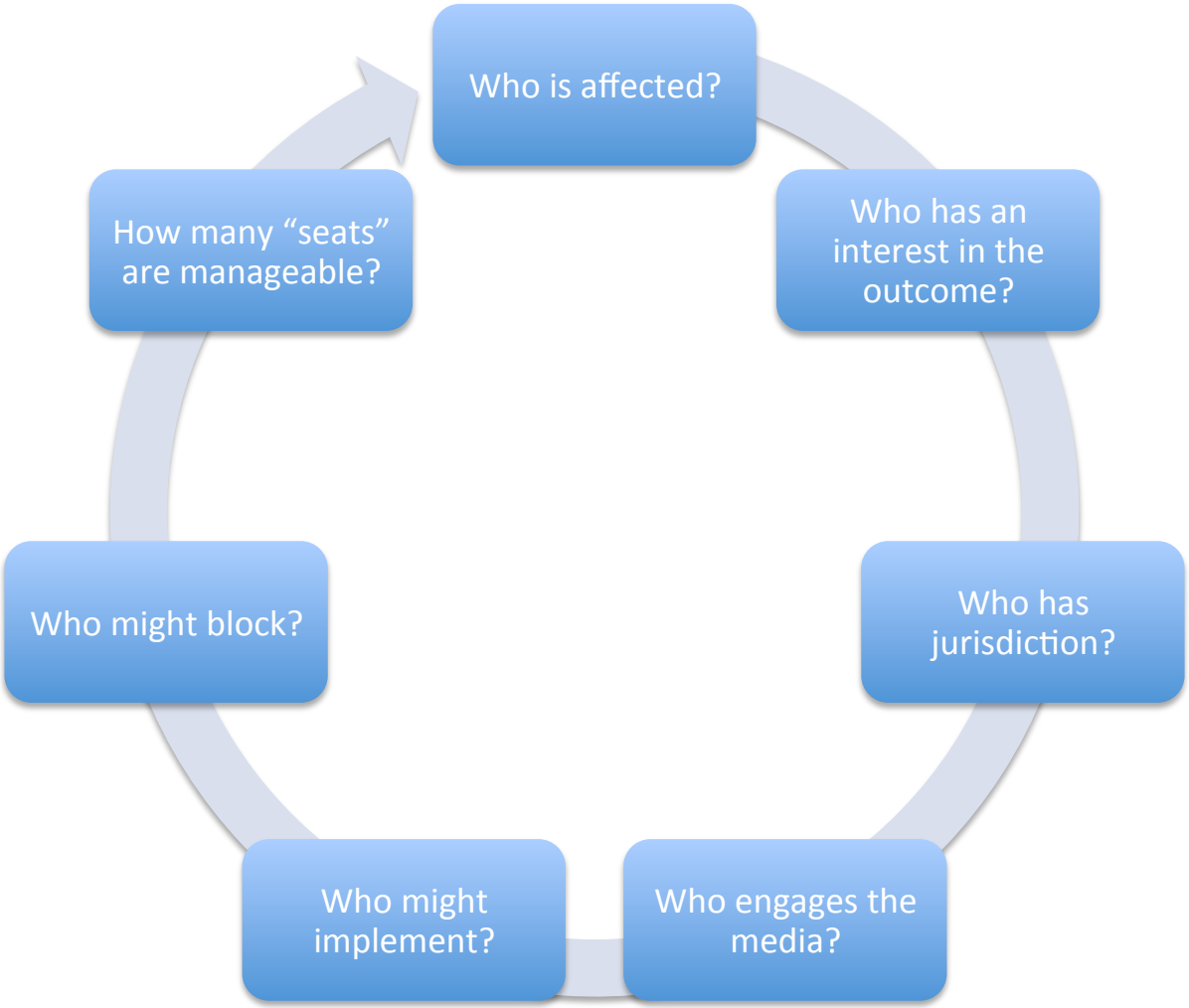
- What is the value-proposition?
  - Resources needed in time, money, people, expertise?
  - What together than be accomplished that really can't be done alone?
  - Benefits likely to exceed costs, including transaction & start-up costs?
- How can I test the proposition early and before the collaboration takes on a life of its own?
- What will motivate people: fear, financial loss, gain, opportunity?

Stakeholders for Adaptation

- The standard cast of characters around an issue (wastewater, transportation, etc.)
- The potentially adversely affected, but unaware and unengaged (general citizens, lower half of economic strata, small business,)
- The potentially adversely affected and aware (larger business of certain kinds)
- Agencies (within their jurisdiction, like environmental agencies non-direct “span” agencies like police, fire, and public health)
- The experts

Identifying Stakeholders

Local Communities Adapting to Climate Change



Stakeholders & Complexity

Local Communities Adapting to Climate Change

- Identifying stakeholders in complex systems often requires multiple rounds
- As the issues are grounded and focused, other stakeholders may emerge
- As the issues are tied systemically to other systems (up and down stream, for instance) more stakeholders may need to be added
- Some may only “Play” once the issues are focused and the impacts to them are clear and specific
- Unlike the multi-faceted mitigation stakeholders, site or resource specific planning can bring players into focus

Who is the Convenor

Local Communities Adapting to Climate Change

- Key Considerations
  - Power to encourage/compel participation
  - Legitimacy regarding the issue
  - Authority to adopt
  - Authority/ability to implement
  - "Staying power"
- Examples
  - Rising Waters: The Nature Conservancy
  - Climate Change Boston: City of Boston, Mayor & environmental division
  - Regional Plan Assocation: RPA

Examples of Tools & Cases

Local Communities Adapting to Climate Change

LOCAL

- Vulnerability analysis with "nested" community involvement (*City of Cambridge*)
- Town-Based Risk Planning (*Kingston, NY*)
- "Games" and community involvement (*New England Climate Adaptation Project*)
- Just Do It! (*MWRA Boston*)

REGIONAL

- Scenario Planning and engagement (*Regional Plan Association*)
- Interdisciplinary technical teams with stakeholder involvement (*Lower Hudson Sustainable Shorelines*)
- Post-Disaster Engagement and Analysis for the Future (*Resilient Vermont)*

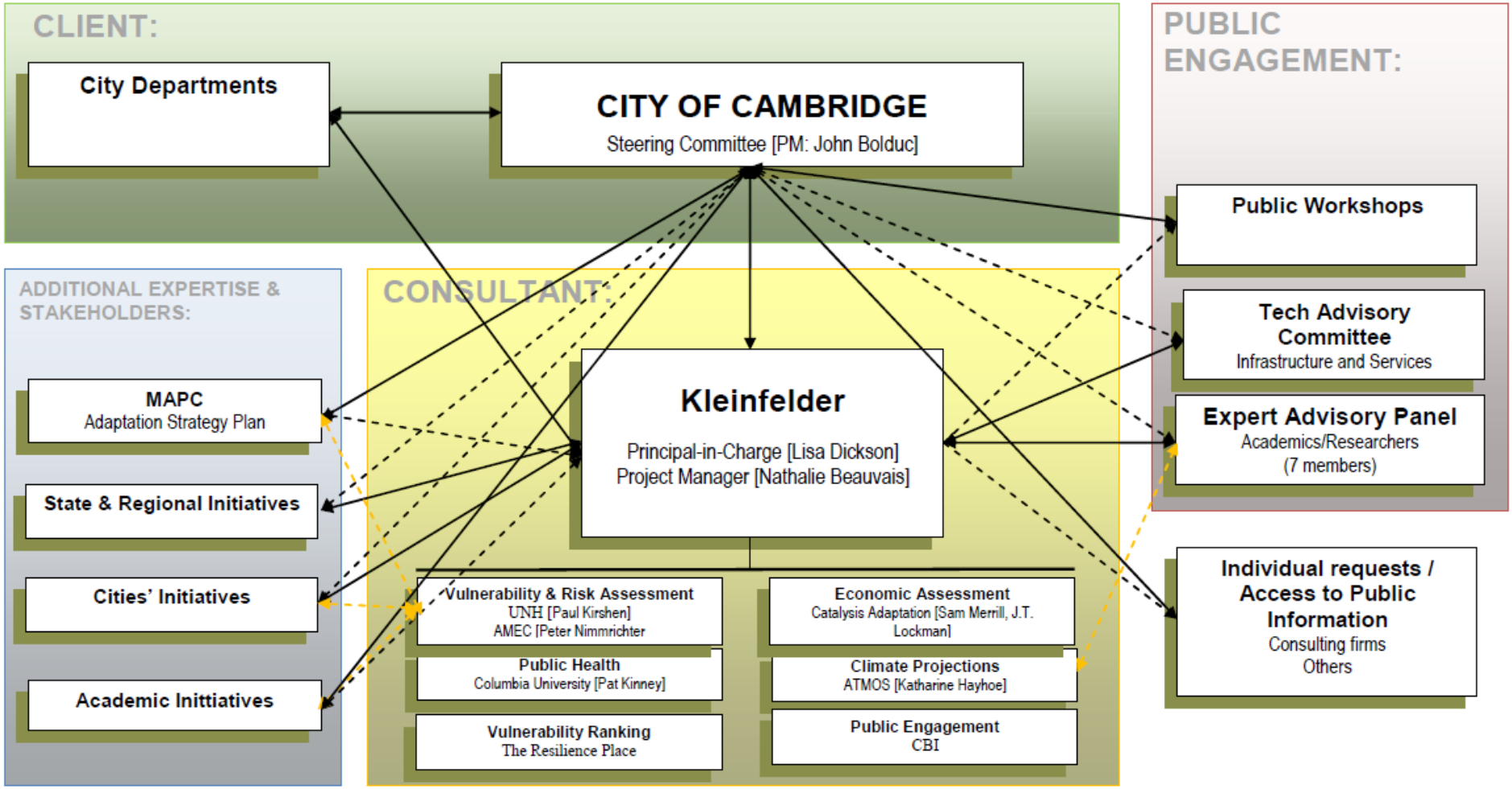
Cambridge

Local Communities Adapting to Climate Change

- *Scope*: City-wide vulnerability assessment to be followed by planning
- *Initiator*: City of Cambridge
- *Process and Engagement*:
  - Part of larger city-wide conversation on climate change (i.e., Climate committee, climate congress, engaged city staff)
  - Technical consulting firm identifies, scores, and ranks vulnerable infrastructure with input from:
    - Climate Expert Review Panel
    - Climate Stakeholder Panel (utilities, major institutions, transportation, a few citizen appointees)
    - Public workshops

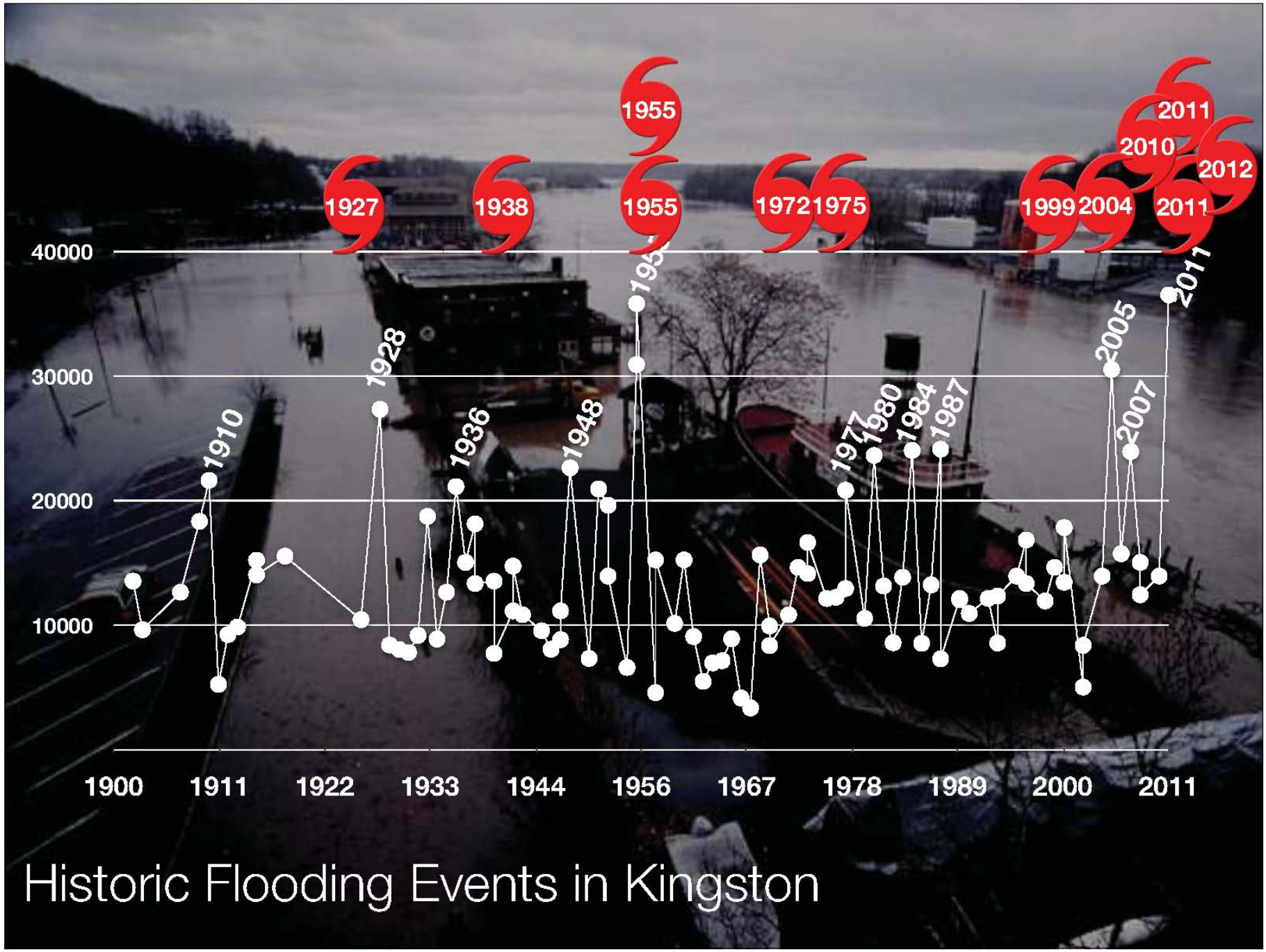
Exercise – Vulnerability Ranking

		Sensitivity: Low → High				
		S0	**S1**	**S2**	**S3**	**S4**
Adaptive Capacity Low ↓ High	**AC0**	V2	V3	V4	V5	V5
	AC1	V1	V2	V3	V4	V5
	AC2	V1	V1	V2	V3	V4
	AC3	PO	V1	V1	V2	V3
	AC4	PO	PO	PO	V1	V2


CLIENT:
City Departments
CITY OF CAMBRIDGE
Steering Committee [PM: John Bolduc]
PUBLIC ENGAGEMENT:
Public Workshops
Tech Advisory Committee
Infrastructure and Services
Expert Advisory Panel
Academics/Researchers
(7 members)
ADDITIONAL EXPERTISE & STAKEHOLDERS:
MAPC
Adaptation Strategy Plan
State & Regional Initiatives
Cities' Initiatives
Academic Inittiatives
CONSULTANT:
Kleinfelder
Principal-in-Charge [Lisa Dickson]
Project Manager [Nathalie Beauvais]
Vulnerability & Risk Assessment
UNH [Paul Kirshen]
AMEC [Peter Nimmrichter
Public Health
Columbia University [Pat Kinney]
Vulnerability Ranking
The Resilience Place
Economic Assessment
Catalysis Adaptation [Sam Merrill, J.T. Lockman]
Climate Projections
ATMOS [Katharine Hayhoe]
Public Engagement
CBI
Individual requests / Access to Public Information
Consulting firms
Others

Kingston, NY

- *Scope*: Flooding in downtown Kingston, New York
- *Initiator*: City of Kingston, Mayor
- *Process and Engagement*:
  - Seeking recommendations for managing increased flooding over time
  - Thirty-five member appointed, diverse group (business, neighborhoods, faith-based organizations)
  - Seven, three hour meetings over 10 months
  - Group id's vulnerabilities, periods, or analysis
  - Linked to the comprehensive plan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Historic Flooding Events in Kingston

Kingston

Community Plan Checklist					
Plans, Ordinances, and Codes	**Yes**	**No**	**Adoption Year**	**Update Frequency**	**Notes**
Municipal Master Plan	X		1961		Kingston is currently working on a new comprehensive plan targeted to 2025. Timeline is not yet set.
Multi-Hazard Mitigation Plan	X		2009	5 years	This plan is for Ulster County and is currently being updated and will be complete in 2014. The existing one implies that Kingston is not tidal.
Floodplain Management Plan		X			There is flood hazard overlay district (2009) within city zoning ordinance, sec 405-26.
Evacuation Plan		X			Ulster County has a detour evacuation route plan that mostly covers major highways. It is an annex to the county CEMP.
Comprehensive Emergency Management Plan	X			3 Years	Kingston is currently updating this plan.
Continuity of Operations Plan		X			

Kingston Short-Term Objectives

Local Communities Adapting to Climate Change

- Set goal for flood resilience in the Kingston 2025 Plan
- Incorporate climate resilience into dept. capital improvements
- Incorporate findings into plans in process
- Add sea-level rise and emergency debris removal to new CEMP
- Finalize the Stormwater Management Plan
- Revise zoning in Kingston 2025

New England Climate Adaptation Project

Local Communities Adapting to Climate Change

- *Scope*: Four coastal communities in New England (Wells, Dover, Barnstable, Cranston)
- *Initiator*: NERRs and MIT
- *Process and Engagement*:
  - Conduct concise technical risk assessment and stakeholder analysis
  - Prepare "simulation" based on local conditions
  - Conduct multiple plays of the simulation throughout the Town
  - Conduct pre and post survey on understanding of issues and potential to address them locally
  - Consider next steps and action post- effort

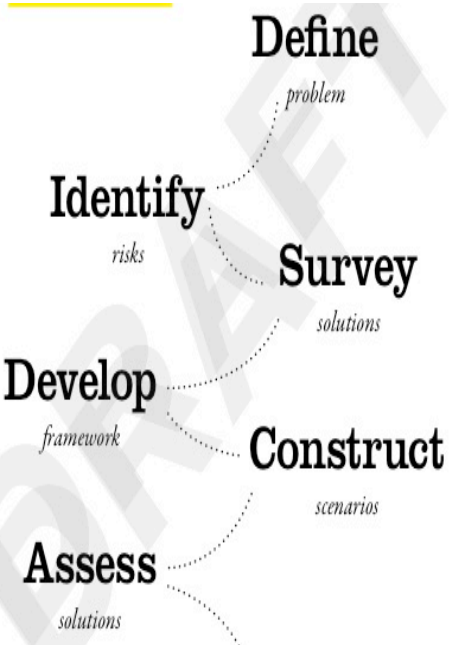
MWRA (long ago and yet!)

- *Scope*: Design of new Deer Island shoreline-sited treatment plant
- *Process and Engagement*:
  - Identified climate risk early (sea level rise and storm surges)
  - Engineered several feet of foundation fill above what was originally designed based on current risks
  - No engagement

Regional Plan Association

Local Communities Adapting to Climate Change

- *Scope*: Coastal flooding and storm surges in greater metropolitan NYC
- *Initiator*: Regional Plan Association
- *Process and Engagement*:
  - Part of post-Sandy early response
  - Development of explication of various adaptive responses: building, neighborhood, and regional scale
  - Development of limited number of "futures" scenarios
  - Engaged existing HUD Sustainable Grant inter-municipal stakeholder group
  - Output a diagnostic tool that models the use of scenario planning to support adaptation to coastal storm hazards.

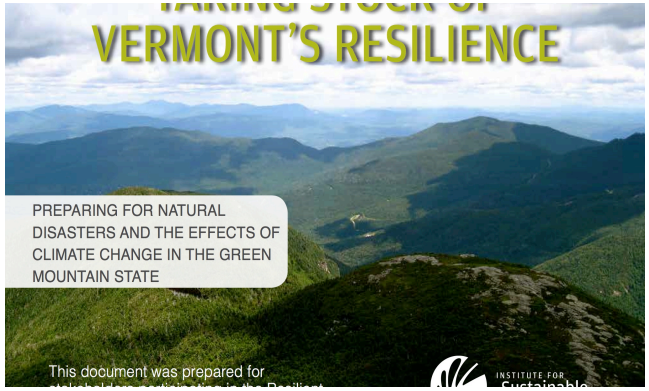


Sustainable Shorelines

Local Communities Adapting to Climate Change

- *Scope*: Shoreline of the Lower Hudson from the Troy Dam to New York Harbor
- *Initiator*: Lower Hudson Estuarine Research Reserve Program
- *Process and Engagement*:
  - Convene a multi-disciplinary technical team (ecologists, engineers for infrastructure, economics for ecosystem services valuation, climate scientists)
  - Create a multi-stakeholder advisory body that meets periodically to review research, offer advice, and help translate for relevant distribution
  - Prepare materials and information readily accessible to local communities and regulators

Resilient Vermont

Local Communities Adapting to Climate Change

- *Scope*: Recovering from Irene, how do we make Vermont more resilient for the future
- *Initiator*: Governor and Institute for Sustainable Communities
- *Process and Engagement*:
  - Looking beyond the immediate recovery
  - Extensive interviews with numerous stakeholders on issues, challenges, and options for the future
  - Three major convenings of state leaders across agencies, businesses, municipalities
  - Work groups on land use, infrastructure, emergency preparedness, and social capital
  - Various interim reports and analysis
  - Output a set of achievable, actionable recommendations