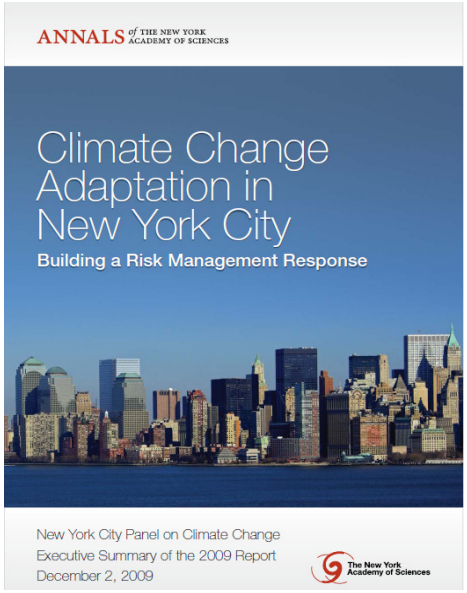
Climate Change Adaptation in New York City: Building a Risk Management Response



David C. Major, Ph. D.

Columbia University Earth Institute

Center for Climate Systems Research

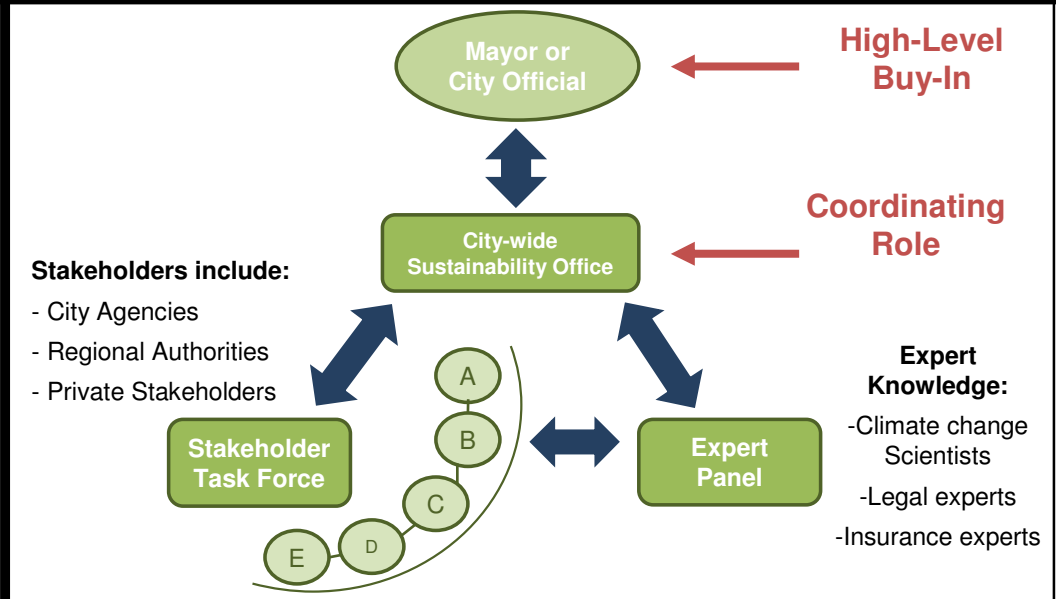
Deltas in Times of Climate Change

29 September 2010

http://www.nyas.org/Publications/Annals/

http://www3.interscience.wiley.com/

Create Integrative Process



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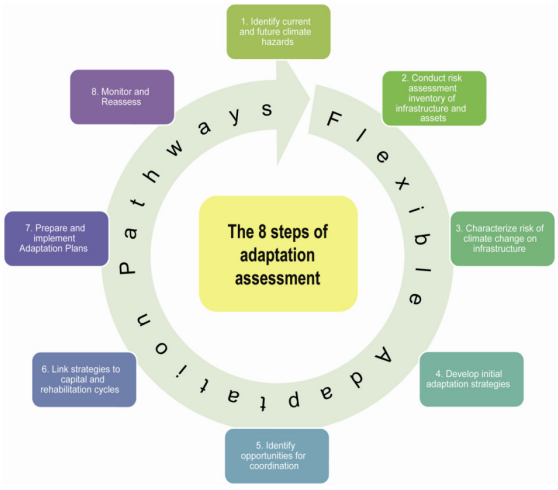
Build on Existing Knowledge: Selected Previous Work

Year	Report Title	Organization/Publisher
1996	The Baked Apple? Metropolitan New York in the Greenhouse	New York Academy of Sciences
2001	Climate Change and a Global City: Potential Consequences of Climate Variability and Change	U.S. National Assessment of Climate Variability and Change & Columbia Earth Institute
2007	Confronting Climate Change in the U.S. Northeast: Science, Impacts and Solutions	Union of Concerned Scientists
2007	August 8, 2007 Storm Report	Metropolitan Transit Authority
2008	Climate Change Program Assessment and Action Plan	New York City Department of Environmental Protection

Engage Stakeholders with Adaptation Assessment Guidelines (AAG)

1. Identify current and future climate hazards
2. Conduct inventory of infrastructure and assets and begin to identify vulnerabilities
3. Characterize risk
4. Develop initial list of strategies
5. Identify opportunities for coordination
6. Link to capital and rehabilitation cycles
7. Prepare and implement Adaptation Plans
8. Monitor and reassess



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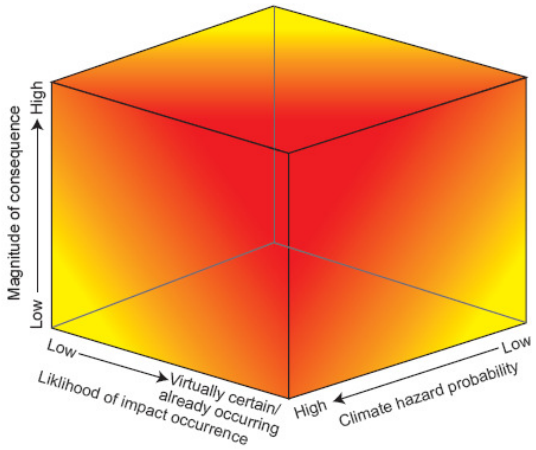
AAG Spreadsheets

Guide stakeholders through completing:

- Inventory of At-Risk Infrastructure
- Risk Assessment Matrix
- Strategy Prioritization Framework



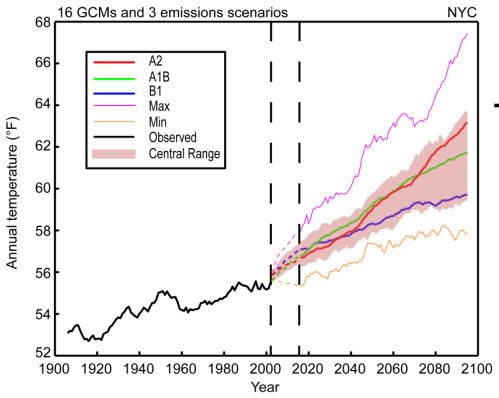
Red	risks for which adaptation strategies should be developed
Orange	risks for which adaptation strategies may need to be developed or for which further information is needed is intermediate
Yellow	risks for which impacts should be monitored but which may not need actions at this time

Leading to Climate Resilient City Report
NYC Climate Change Task Force
Expected Late 2010

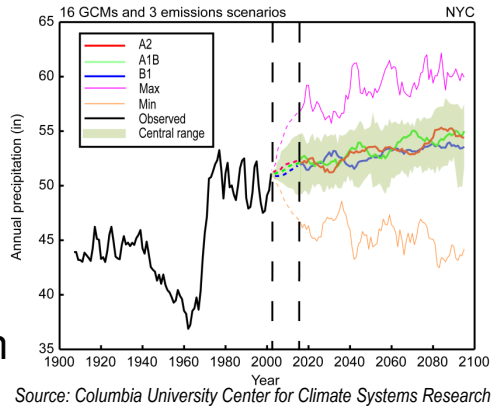
NPCC Report, 2010

Observed Climate and Future Projections

Identify current and future climate hazards



Temperature



Precipitation

Source: Columbia University Center for Climate Systems Research

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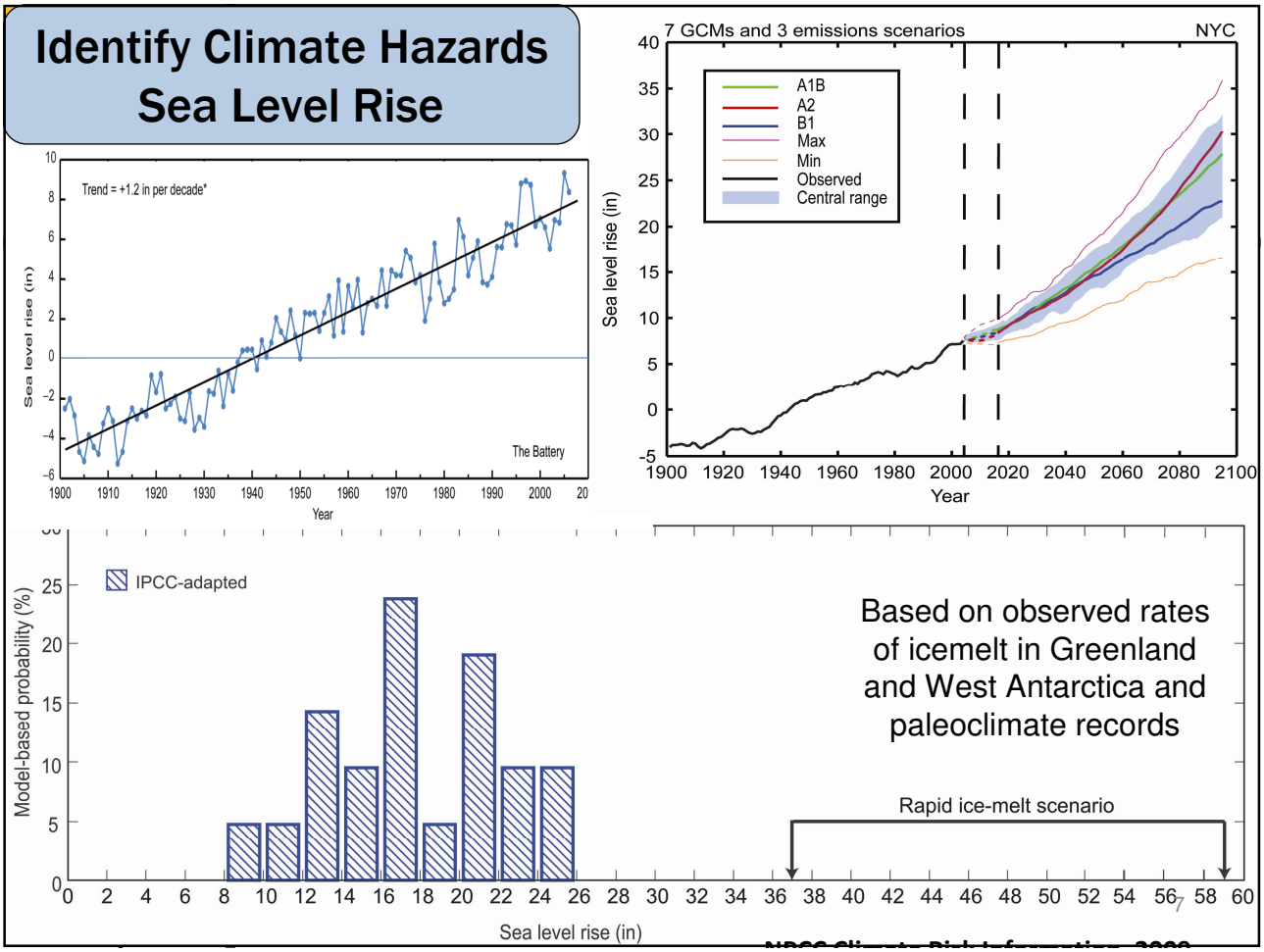
Identify Climate Hazards
Sea Level Rise



Develop and Prioritize Adaptation Strategies

Potential Strategy Prioritization Categories

- Cost
- Feasibility
- Timing of Implementation
- Efficacy
- Resiliency Rating
- Co-benefits

Adaptation Strategy	Strategy Cost (1 = low to 3 = high)	Strategy Feasibility (1 = high to 3 = low)	Timing of implementation (1 = high to 3 = low)	Efficacy (1 = high to 3 = low)	Resiliency rating (1 = high to 3 = low)	Co-benefits (1 = high to 3 = low)	Average*	Notes & institutional considerations
Clean drains	1	1	1	2	2	2	1.8	
Build flood walls	3	2	2	1	3	2	2.2	

**1 = high priority strategy, 2 = medium priority strategy, 3 = low priority strategy*

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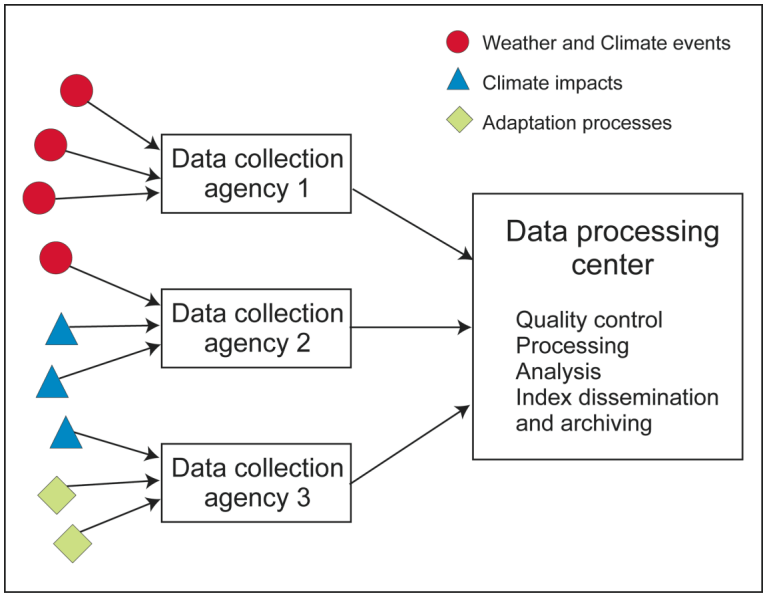
Prepare and Implement Adaptation Plans

- Agency-specific or city-wide
- Adaptation types
  - Operations/management
  - Hard/soft infrastructure
  - Policy
- Specific steps and timeline for implementation, including identifying responsible parties
- Key strategies, such as those that address high-risks, are win-win with mitigation, or low-cost

Monitor and Reassess



Proposed structure and process of monitoring climate change, impact, and adaptation parameters, and for translating them into indicators for New York City

Related CCSR Activities

1. Climate Change and Cities: First Assessment Report of the Urban Climate Change Research Network (forthcoming, Cambridge Univ. Press)
2. ClimAID: New York State Adaptation Assessment (forthcoming)
3. Mapping sea level rise and storm surge on Long Island (The Nature Conservancy, underway)
4. Consortium for Climate Risk in the Urban Northeast: a NOAA-funded Regional Integrated Science and Assessment Center