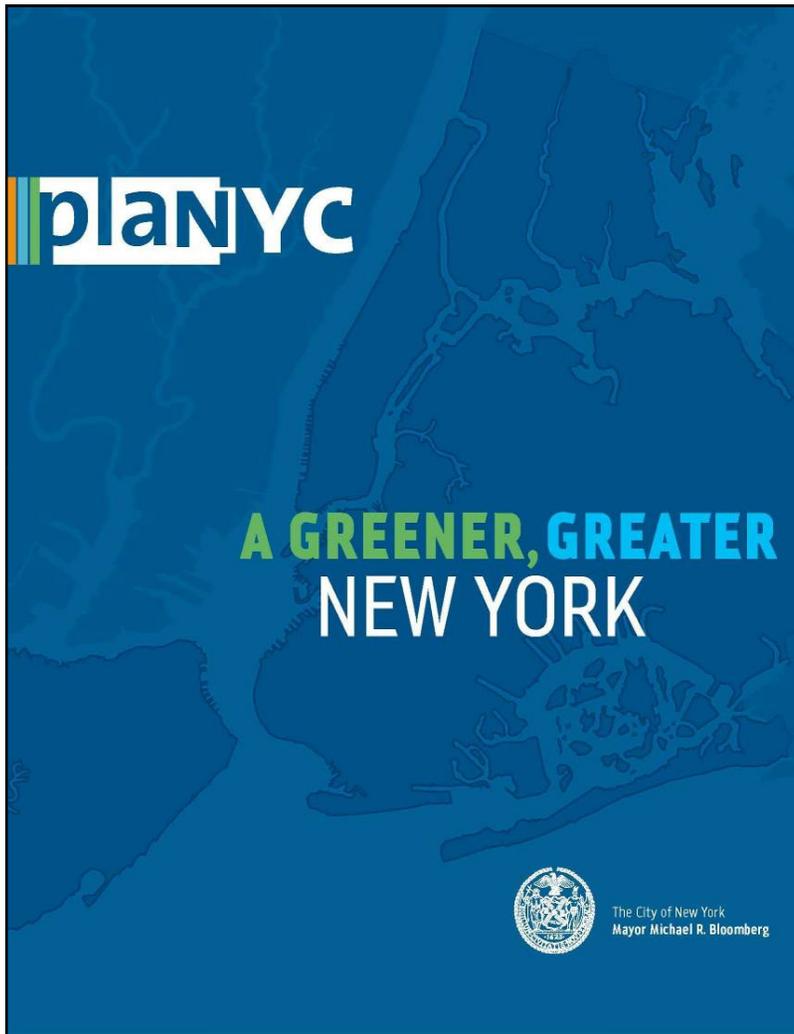


# **CLIMATE CHANGE ADAPTATION: NEW YORK CITY'S APPROACH**

**June 2009**

On Earth Day in 2007, Mayor Bloomberg released a comprehensive sustainability plan to create a greener, more sustainable city



## PlaNYC is a roadmap to achieve 10 goals:

- 1** Create enough housing for our growing population
- 2** Ensure all New Yorkers have parks within a 10-minute walk
- 3** Clean up all contaminated land in New York City
- 4** Develop water network back-up systems
- 5** Open 90% of our waterways and protect natural areas
- 6** Improve travel times by adding transit capacity for millions
- 7** Achieve "State Of Good Repair" on our transportation system
- 8** Upgrade our energy infrastructure to provide clean energy
- 9** Achieve the cleanest air of any big city in America
- 10** Reduce global warming emissions by 30%

## Cities face a number of challenges in attempting to adapt to climate change



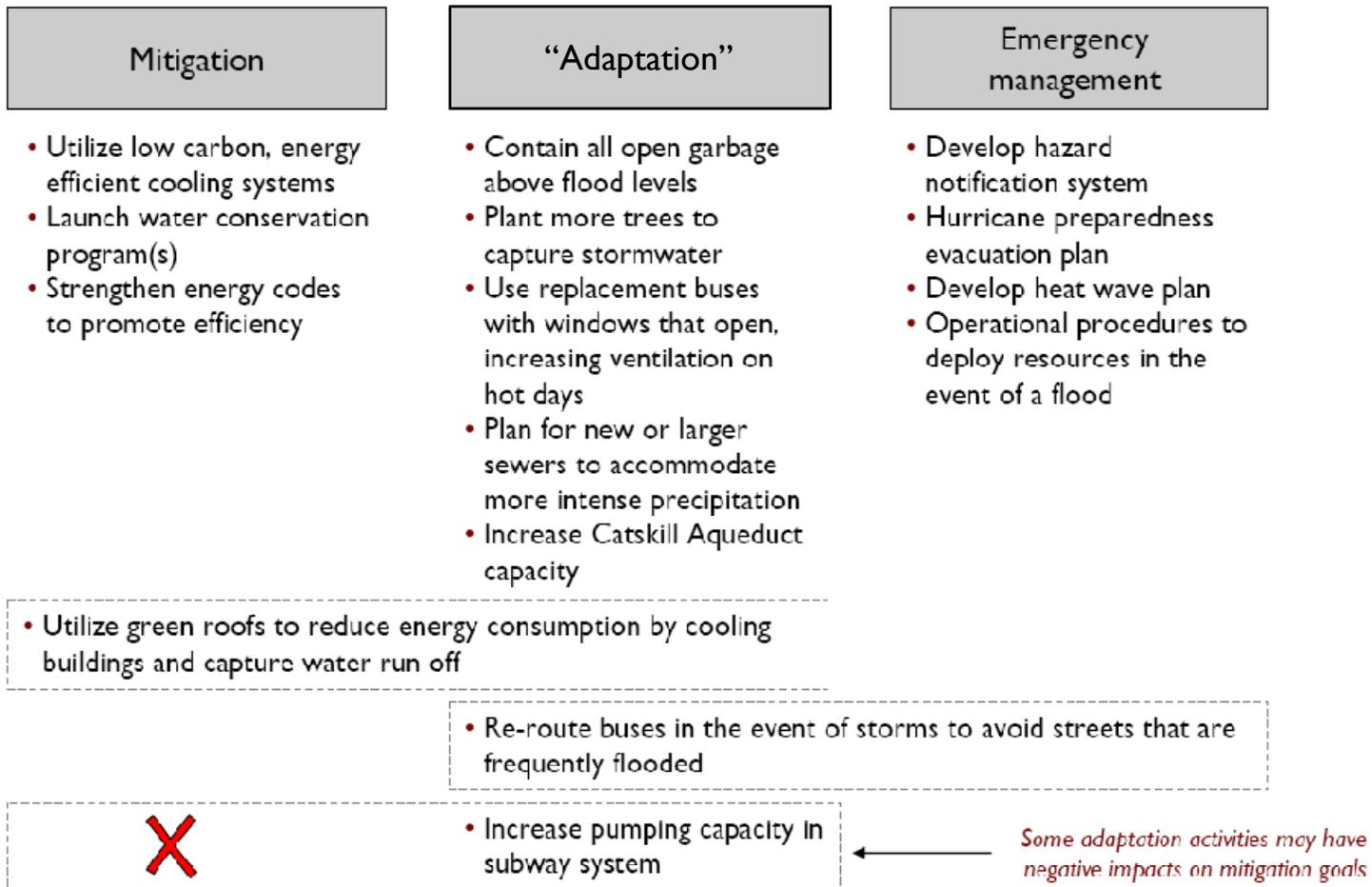
- Availability (or over-availability) of climate change projections
- Frequent disconnect between research and practitioners
- Overlapping jurisdictions
- Need to build beyond current specifications
- Getting stakeholders to focus on incremental individual actions as well as “big fixes”
- “Day After Tomorrow” syndrome
- Confusion over what it means to adapt



# What is adaptation?



Most stakeholders don't know what adaptation is or that they're already adapting to the climate.

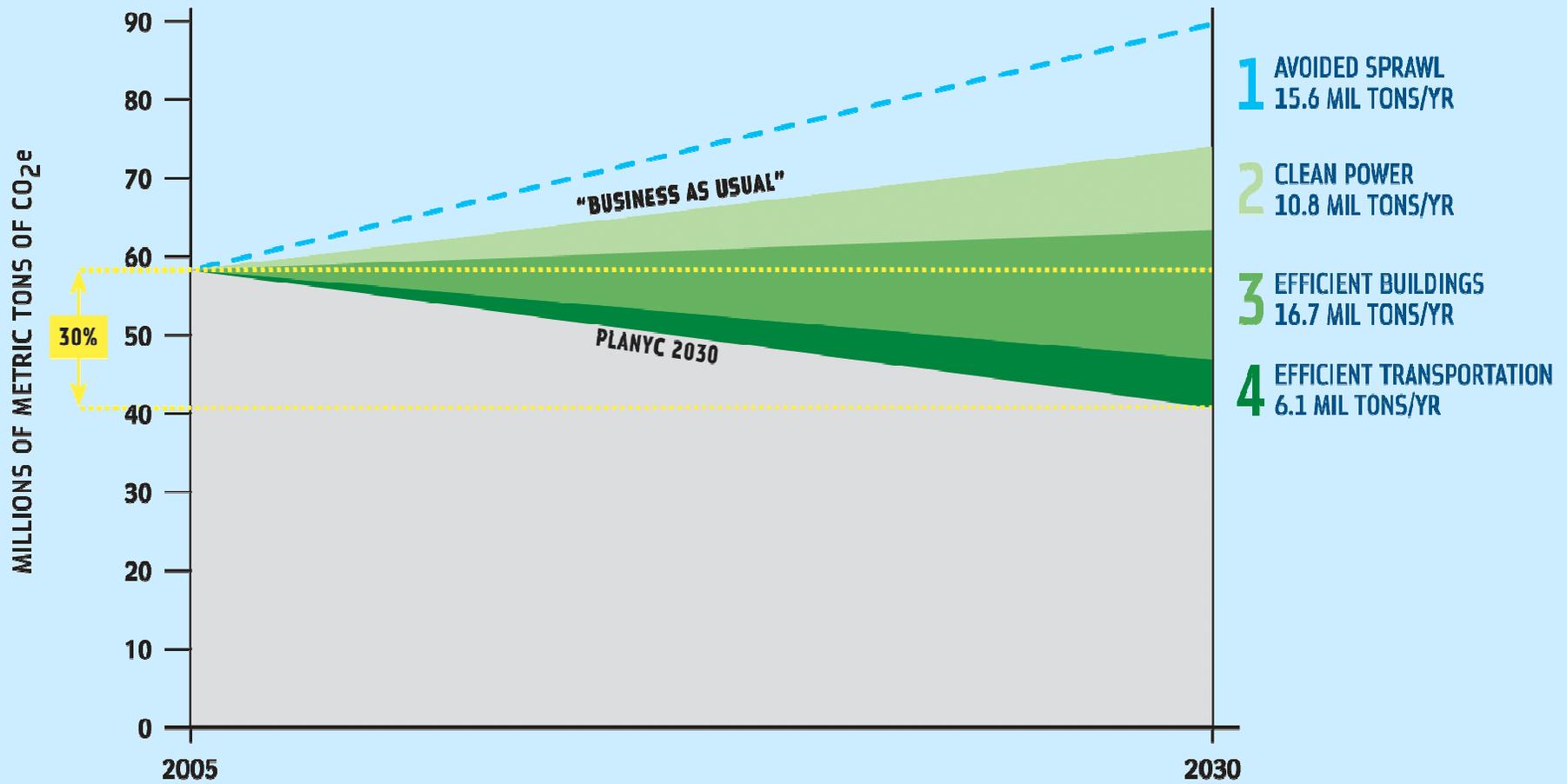




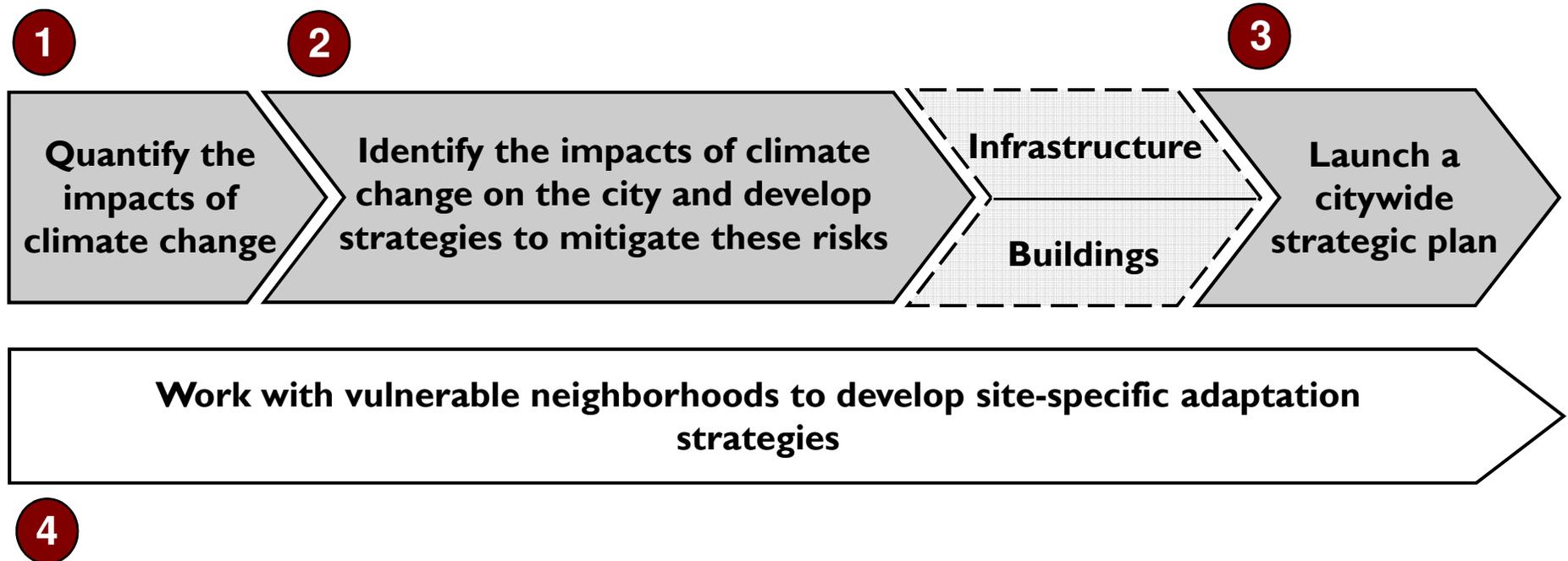
**“We face two urgent challenges... First, we have to shrink our carbon footprint to slow climate change. Second, we have to adapt to the environmental changes that are already beginning to take place.”**

**— Mayor Michael Bloomberg**  
*August 12, 2008*

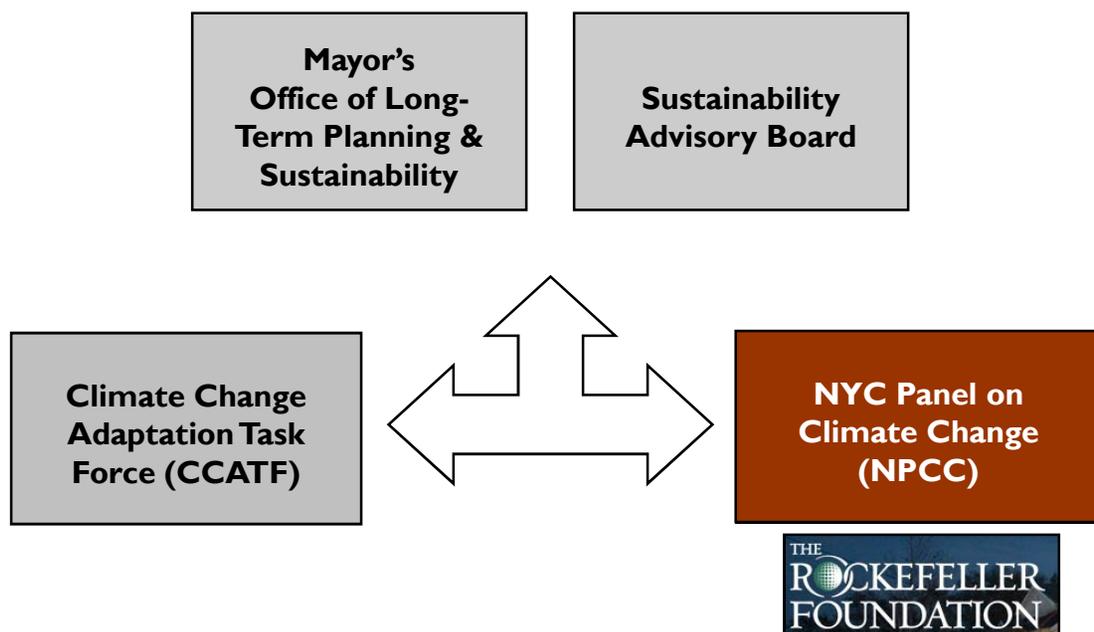
# Projected GHG reduction in PlaNYC



# PlaNYC has a four-step approach to climate change adaptation



**1** The City partnered with the Rockefeller Foundation to convene a panel of experts



**NPCC**

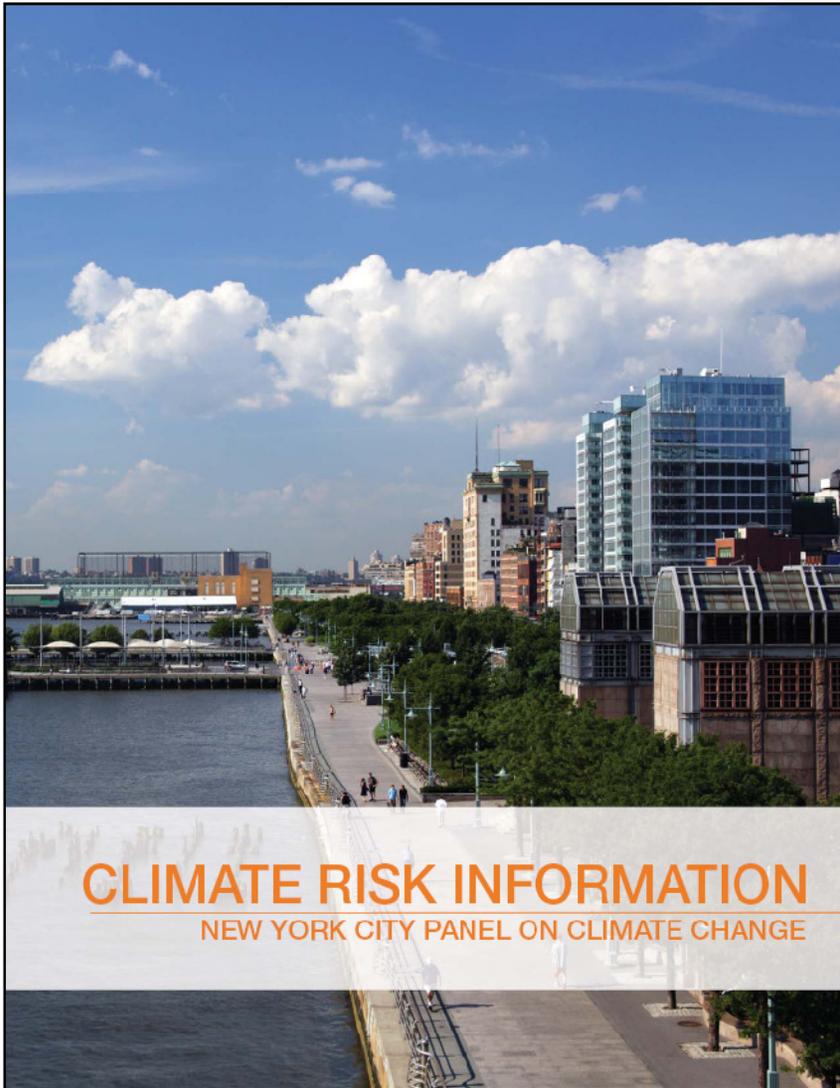
**Academia**

- NASA/Columbia
- CISC/CUNY
- City Tech/CUNY
- Columbia – Lamont
- Columbia University
- NYU
- Rutgers University
- SUNY-Stony Brook
- Wesleyan/UCS

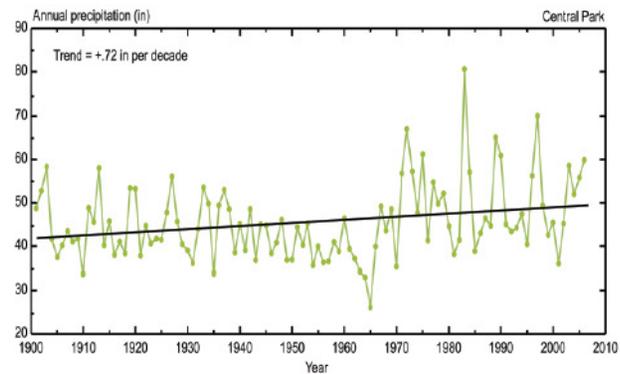
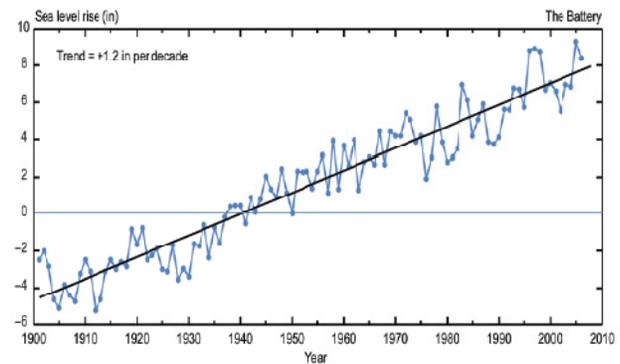
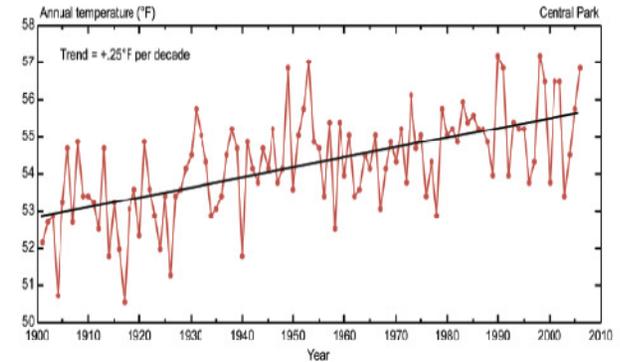
**Private Industry**

- AIG
- Hoguet Newman Regal & Kenney, LLP
- Oliver Wyman
- Swiss Re

# New York City's climate has been changing over the past 100 years



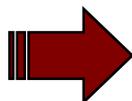
**CLIMATE RISK INFORMATION**  
NEW YORK CITY PANEL ON CLIMATE CHANGE



**TABLE 1.**

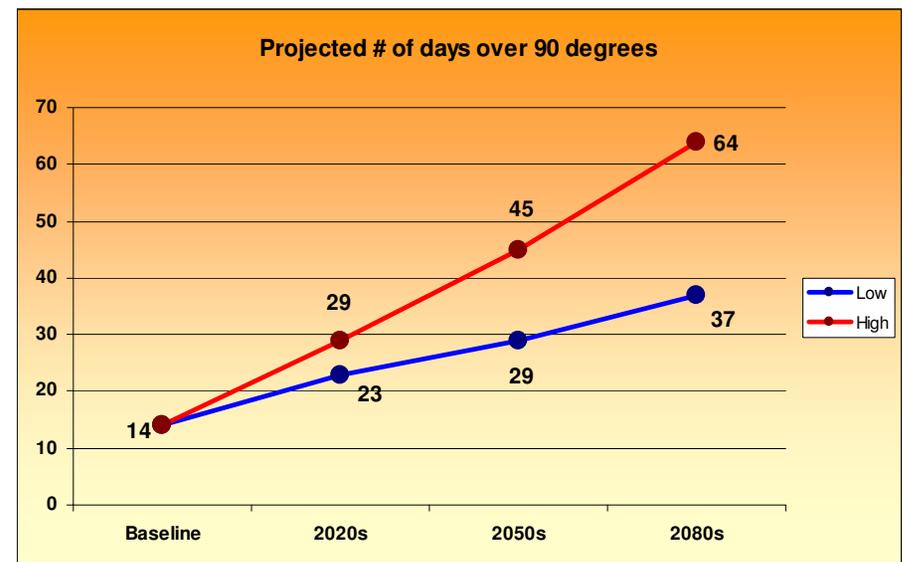
*Baseline Climate and Mean Annual Changes  
(Relative to Baseline Years for New York City)<sup>1</sup>*

	<b>Baseline 1971-2000<sup>2</sup></b>	<b>2020s</b>	<b>2050s</b>	<b>2080s</b>
<b>Air temperature</b> Central range <sup>2</sup>	55° F	+ 1.5 to 3° F	+ 3 to 5° F	+ 4 to 7.5° F
<b>Precipitation</b> Central range <sup>2</sup>	46.5 in	+ 0 to 5 %	+ 0 to 10 %	+ 5 to 10 %
<b>Sea level rise<sup>3</sup></b> Central range <sup>2</sup>	NA	+ 2 to 5 in	+ 7 to 12 in	+ 12 to 23 in
<b>Rapid Ice-Melt Sea Level Rise<sup>4</sup></b>	NA	~ 5 to 10 in	~ 19 to 29 in	~ 41 to 55 in

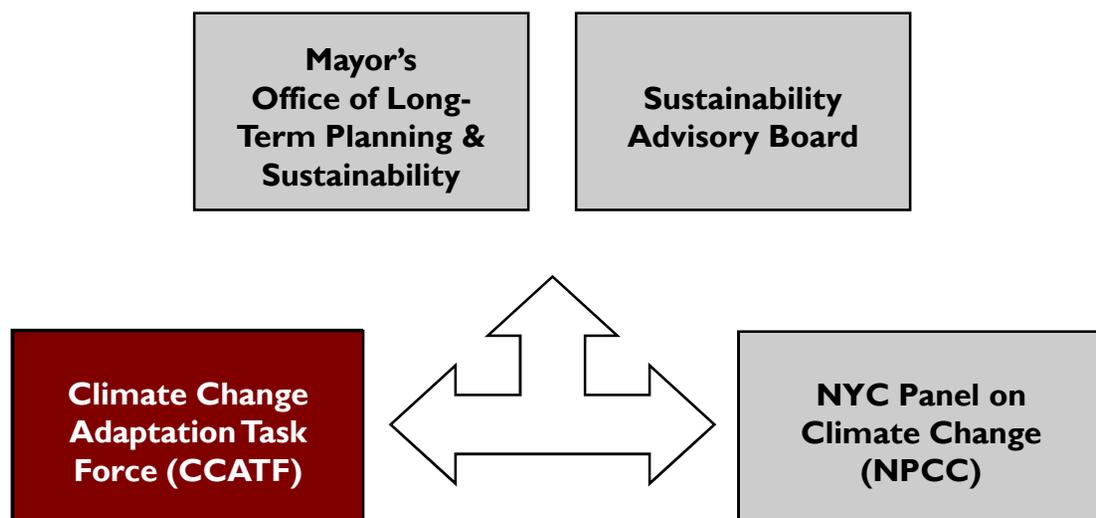


### By the end of the century, New York City could experience:

- Approximately 3 to 4 times more days per year over 90 degrees.
- Approximately 3 to 4 times more heat waves (as defined as three consecutive days over 90 degrees) a year
- Longer heat waves lasting up to 7 days
- More frequent, intense rainstorms
- A current 1-in-10 year coastal flood about once every 1 to 3 years
- A current 1-in-100 year coastal flood about once every 15 to 35 years



**2** In August 2008, Mayor Bloomberg launched the New York City Climate Change Adaptation Task Force



**CCATF**

- 12 City agencies
- 5 Regional public authorities
- 6 State agencies
- 2 Federal agencies
- 15 Private companies

The Task Force is the first effort of its kind to include representatives from the local, state, and federal government and the private sector



### **City Agencies**

- Dept. of Buildings
- Dept. of City Planning
- Dept. of Design & Construction
- Dept. of Environmental Protection
- Dept. of Health
- Dept. of Law
- Dept. of Parks & Recreation
- Dept. of Sanitation
- Dept. of Transportation
- Economic Development Corp.
- Office of Emergency Management
- Office of Management & Budget

### **State Agencies/Authorities**

- Dept. of Environmental Conservation
- Dept. of State
- Dept. of Transportation
- Governors Island Preservation and Education Corporation
- Hudson River Park Trust
- Metropolitan Transportation Authority
- NY Power Authority
- NYS Public Service Commission
- NJ Transit
- Port Authority of NY/NJ
- State Emergency Management Office

### **Federal Agencies**

- Amtrak
- National Park Service

### **Private Companies**

- Astoria Energy LLC
- AT&T
- Cablevision
- Con Edison
- CSX
- National Grid
- NRG Energy
- NY Independent System Operators
- Sprint Nextel
- Suez Energy, NA
- Time Warner Cable
- T-Mobile
- TransCanada
- USPowerGen
- Verizon

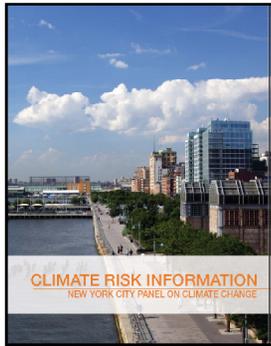
**To identify critical infrastructure in New York City that could be at-risk from the effects of climate change and to develop coordinated adaptation strategies to secure these assets**

- Adopt uniform climate change projections for NYC
- Create inventory of at-risk infrastructure
- Develop adaptation strategies to protect at-risk Infrastructure
- Develop design guidelines to protect critical Infrastructure
- Coordinate adaptation strategies across stakeholders
- Identify issues for further study

# The CCATF engaged in a multi-stepped process over 18 months



NYC-specific climate change projections



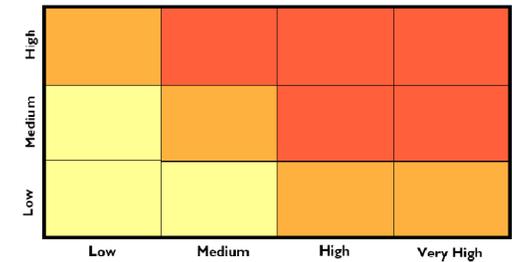
Stakeholder's use projections to identify vulnerabilities



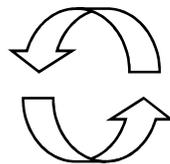
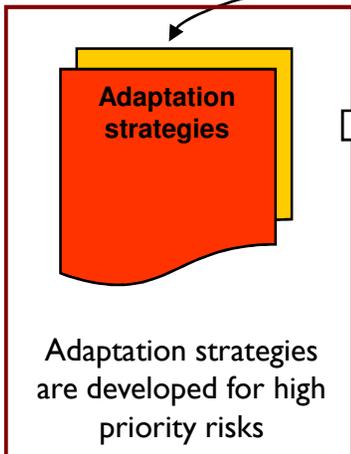
Inventories normalized by sector through the working groups and policies and regulations identified for Policy Working Group review



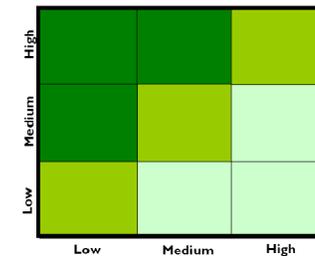
Stakeholder vulnerabilities are prioritized using Risk Matrix



**WE ARE HERE**



Strategies are coordinated among Task Force members



Strategies are prioritized using Prioritization Matrix



Adaptation plans are developed, including recommendations for policy and regulatory changes

- **Update mapping tools to account for climate change**
  - FEMA FIRMs
  - NOAA SLOSH
- **Provide localities with localized/regional climate change projections**
  - (or standardized guidelines on how this should be done)
- **Provide risk-based funding to cities for local adaptation planning and actions**
- **Review federal regulatory processes to determine the impact of climate change**



## Early Adaptation Actions: NYC Flood Mitigation Task Force (April 2008)



### Near-Term Mitigation Strategies

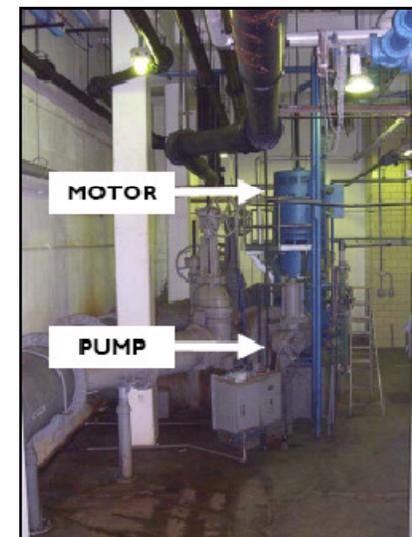
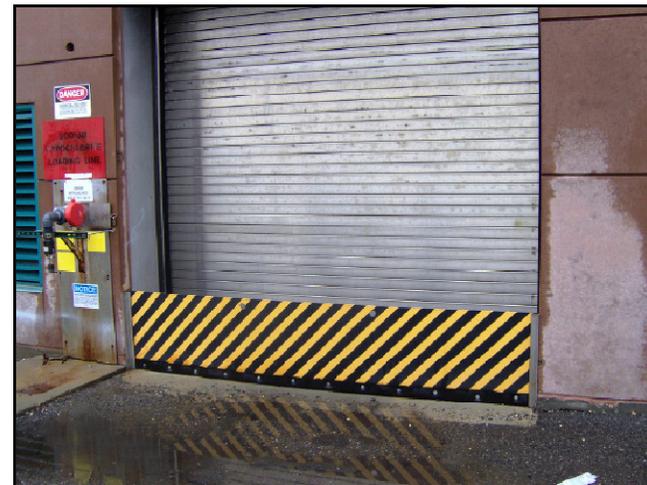
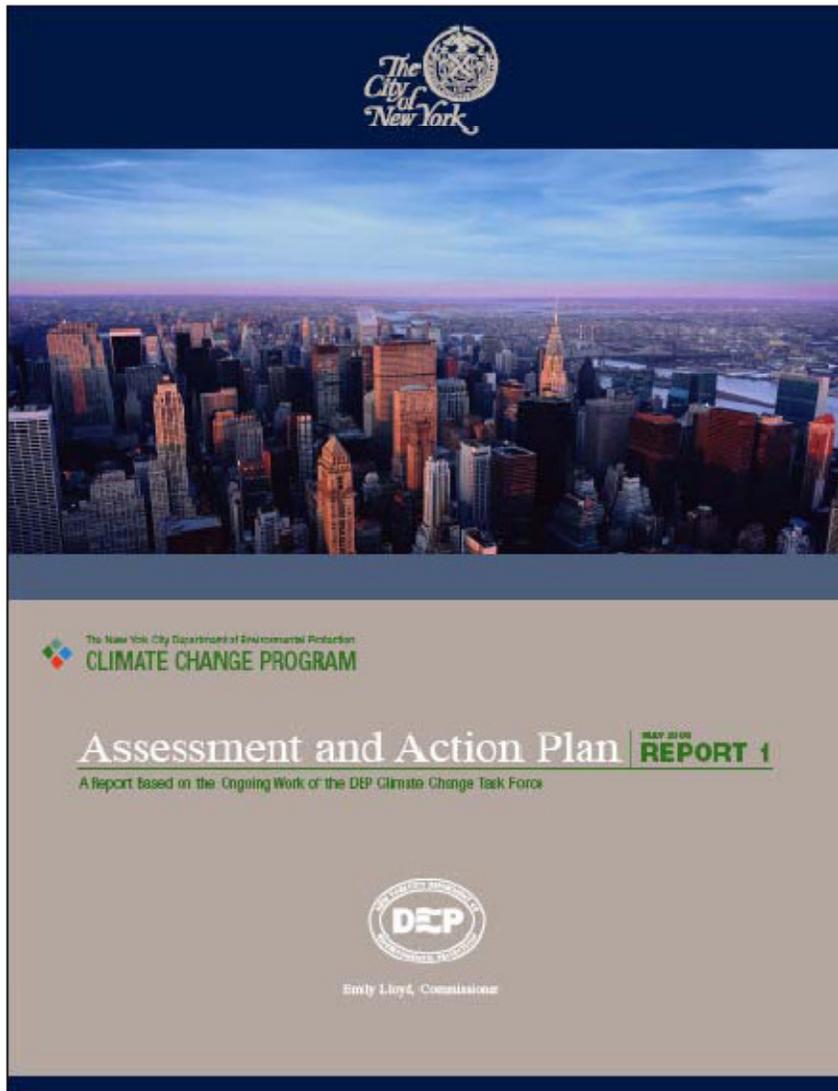
- Inspect and clean catch basins and sewers.
- Installing catch basins.
- Plant more trees to capture stormwater. Trees will be planted in pits designed to maximize stormwater retention capacity.
- Implement flow monitoring at critical locations to determine whether short-term sewer projects might enhance sewer capacity for accepting large amounts of stormwater.

### Long-Term Mitigation Strategies

- Continue building new or larger sewers according to drainage plans.
- Determine feasibility of installing high-level storm sewers, which enhance stormwater management capacity by capturing excess flow through sewer lines during heavy rain events.

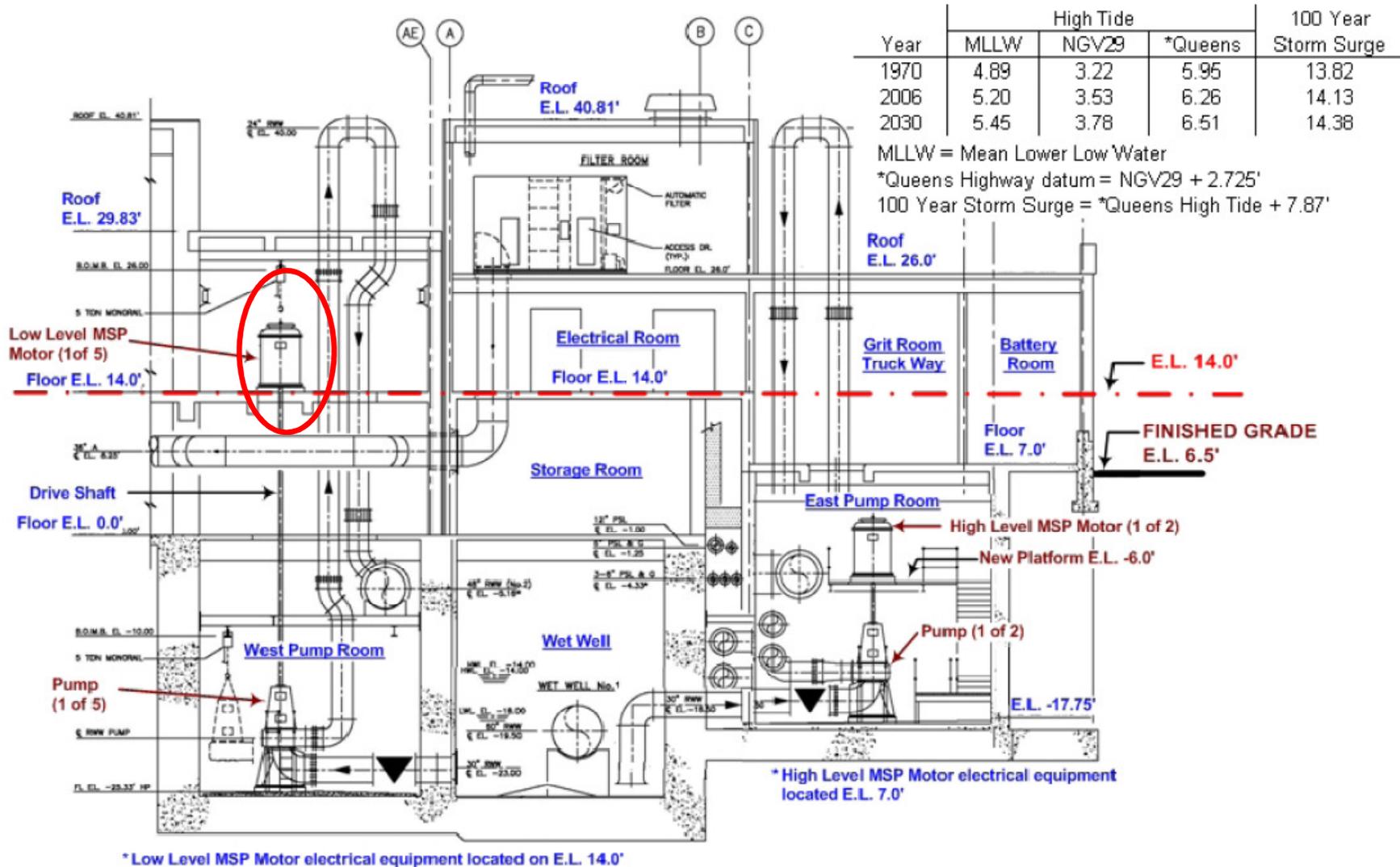


# Early Adaptation Actions: DEP Adaptation Assessment & Action Plan (May 2008)



Source: NYC Department of Environmental Protection

# Early Adaptation Actions: DEP Adaptation Assessment & Action Plan (May 2008)



**Early Adaptation Actions:  
Sustainable Stormwater Management Plan (Dec 2008)**



- The Final Plan was released on December 12, 2008
- The BMP Task Force was comprised of representatives from 12 City agencies.
- The Final Plan is available on the PlaNYC website at:  
[www.nyc.gov/planyc2030](http://www.nyc.gov/planyc2030)

