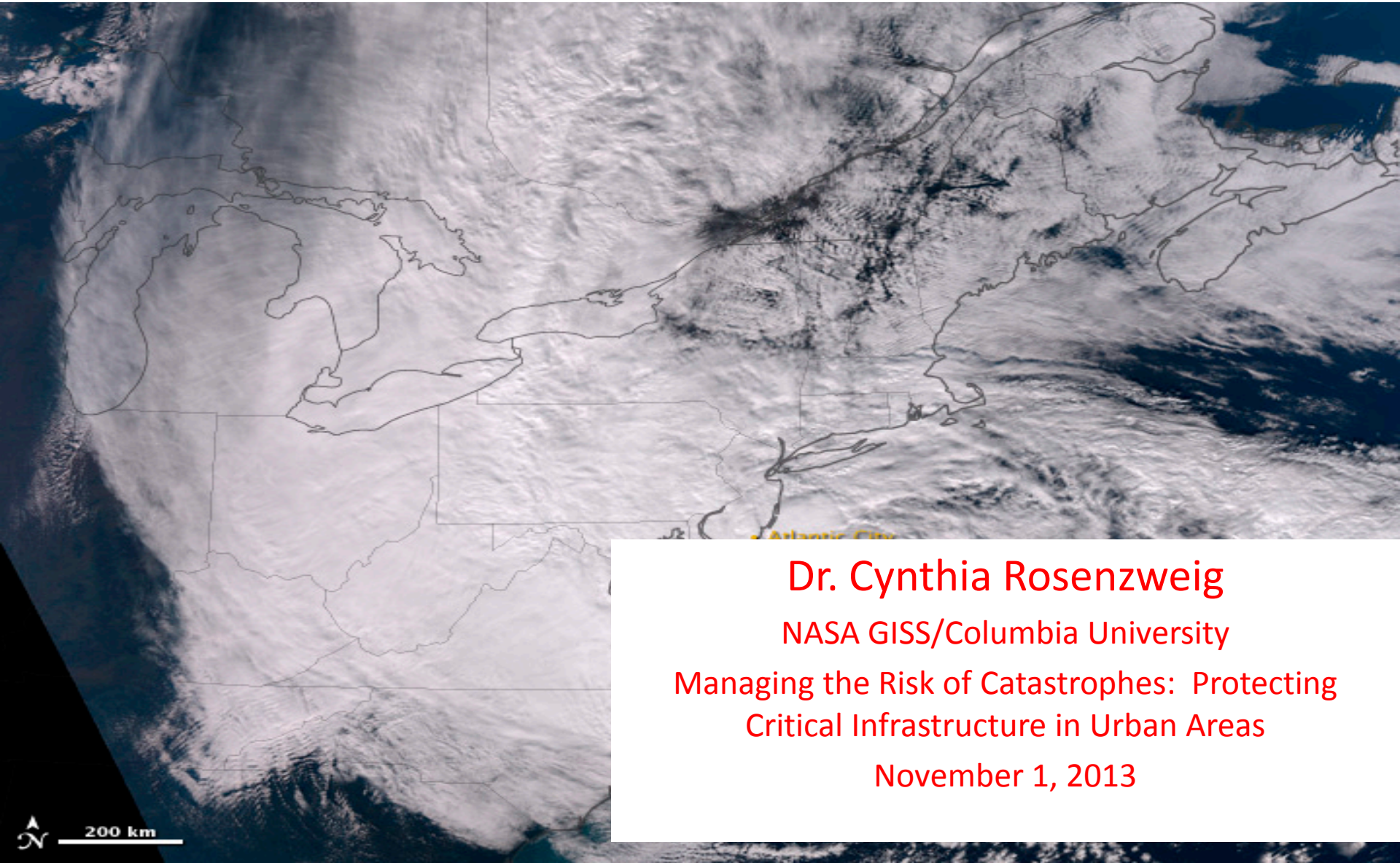




The New York City Panel on Climate Change

Climate Risk Information



Dr. Cynthia Rosenzweig

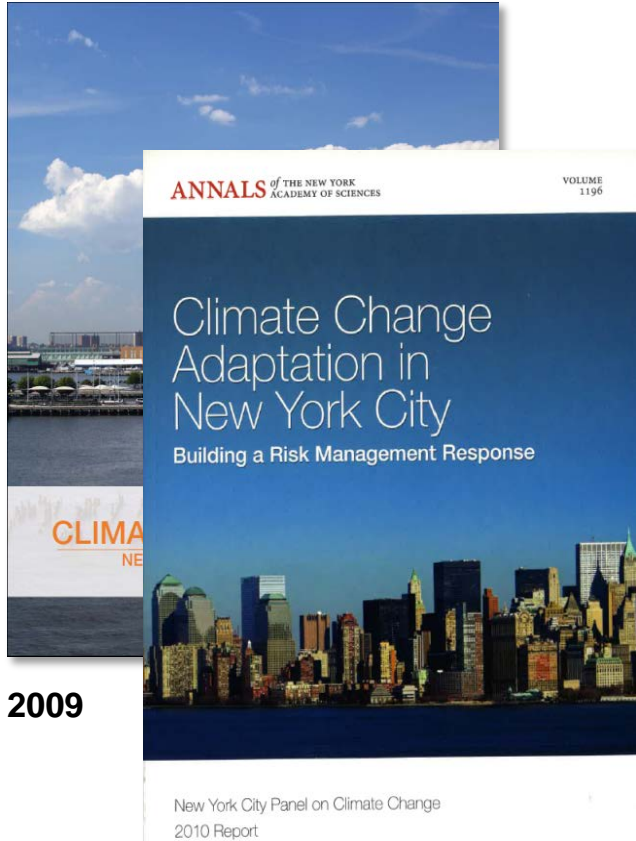
NASA GISS/Columbia University

Managing the Risk of Catastrophes: Protecting
Critical Infrastructure in Urban Areas

November 1, 2013

First New York City Panel on Climate Change

Mayor Bloomberg convened the NPCC in 2008 to identify future climate risks facing NYC



2009

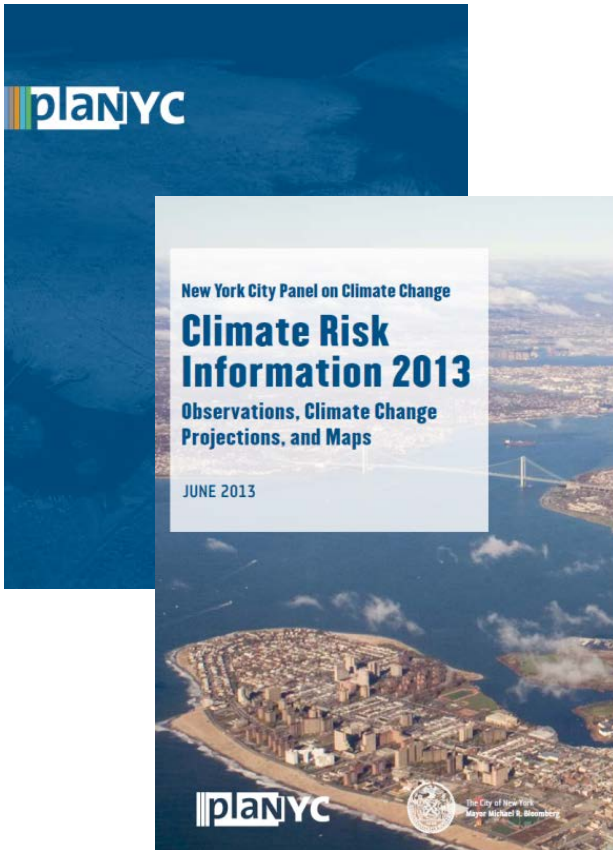
2010

Institutions Represented

- NASA Goddard Institute for Space Studies
- CUNY Institute for Sustainable Cities, Hunter College
- CUNY, NYC College of Technology
- SUNY, Stony Brook
- Swiss Re
- Accenture
- Columbia University, Earth Institute
- Rutgers University
- Wesleyan University
- New York University

Second New York City Panel on Climate Change

- NPCC codified into local law in September 2012
- After Hurricane Sandy, Mayor Bloomberg re-convened the NPCC in January to provide updated climate risk information for the Special Initiative for Rebuilding and Resiliency (SIRR)



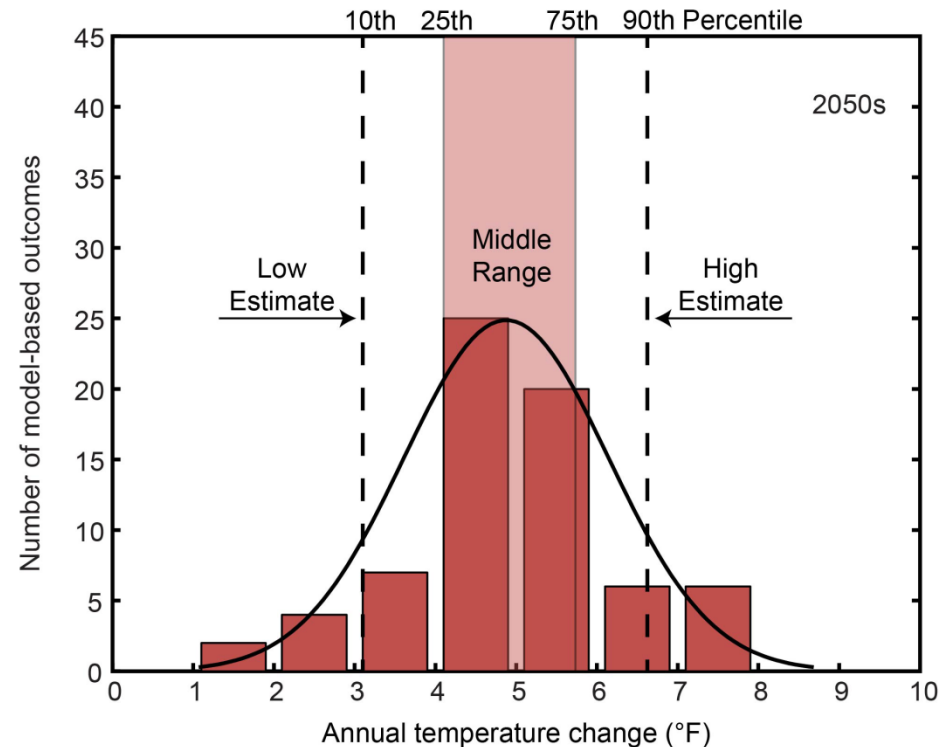
- The 2013 NPCC Climate Risk Information Report (CRI) provides new climate change projections and future coastal flood risk maps for New York City
- Both “A Stronger, More Resilient New York” and CRI reports released on June 11, 2013

Uncertainty and Risk Management

Projections are presented in a way that facilitates risk-based decision-making

- Accomplished by:
 - Using ranges of model-based outcomes and likelihoods based on scientific literature
 - Presenting outcomes based on climate model results and different future greenhouse gas emissions
- Note that model-based outcomes do not encompass the full range of possible futures

Model-based range of outcomes for 2050s temp. change¹

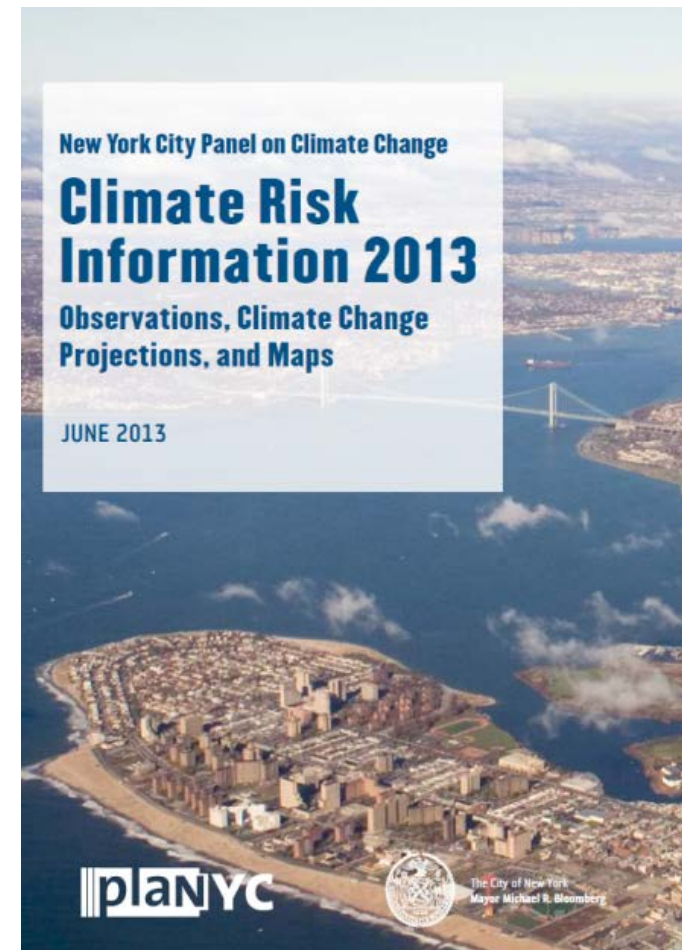


¹ Presented relative to the 1971 - 2000 base period. Based on 35 global climate models and 2 representative concentrations pathways. The 10th, 25th, 75th, and 90th percentiles of the distribution are presented.

Key Findings for Future Projected Changes

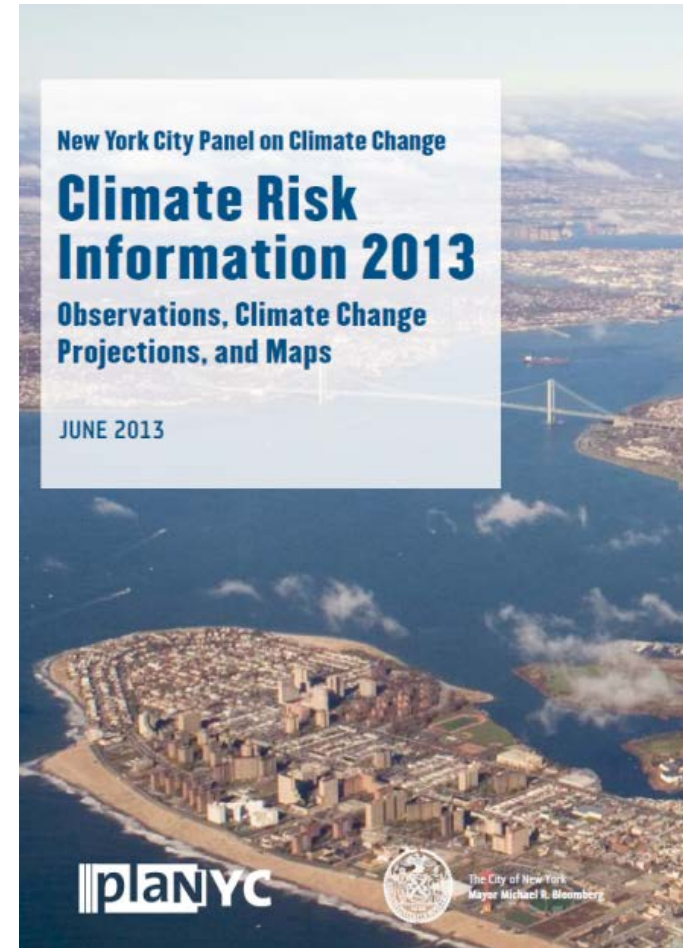
Recently released (June 2013) climate change projections...

- Illustrate a broad-based acceleration of climate change in coming decades
- Show significant climate risks for New York City, especially heat waves, extreme precipitation events, and coastal flooding
- Valid for New York City **and** the metropolitan region



Future Projected Changes

- By 2050s, projected changes include
 - Annual temperature increase up to 6.5°F
 - Mean precipitation change between +5 and +10 percent
 - Sea level rise up to 31 inches
 - Days at or above 90°F may occur approximately 2 times more often
 - 1-in-100 year flood may occur approximately 5 times more often with the high-estimate for sea level rise
 - More likely than not increase in the number of the most intense hurricanes in the North Atlantic Basin
 - Unknown how the total number of tropical cyclones will change in the North Atlantic Basin



2080s and 2100 projections in progress

Temperature, Precipitation, and Sea Level Rise Projections

Temperature and precipitation projections show accelerating change and broad consistency with previous NPPC projections

Air temperature ¹ Baseline (1971-2000): 54° F	Low-estimate (10 th percentile)	Middle range (25 th to 75 th percentile)	High-estimate (90 th percentile)
2020s	+ 1.5°F	+ 2.0°F to 2.8°F	+ 3.2°F
2050s	+ 3.1°F	+ 4.1°F to 5.7°F	+ 6.6°F

Precipitation ¹ Baseline (1971-2000): 50.1 inches	Low-estimate (10 th percentile)	Middle range (25 th to 75 th percentile)	High-estimate (90 th percentile)
2020s	-1 percent	+ 1 to + 8 percent	+ 11 percent
2050s	+ 1 percent	+ 4 to + 11 percent	+ 13 percent

Newly-released sea level rise projections account for processes not well reflected in global climate models, including the possibility of rapid ice loss

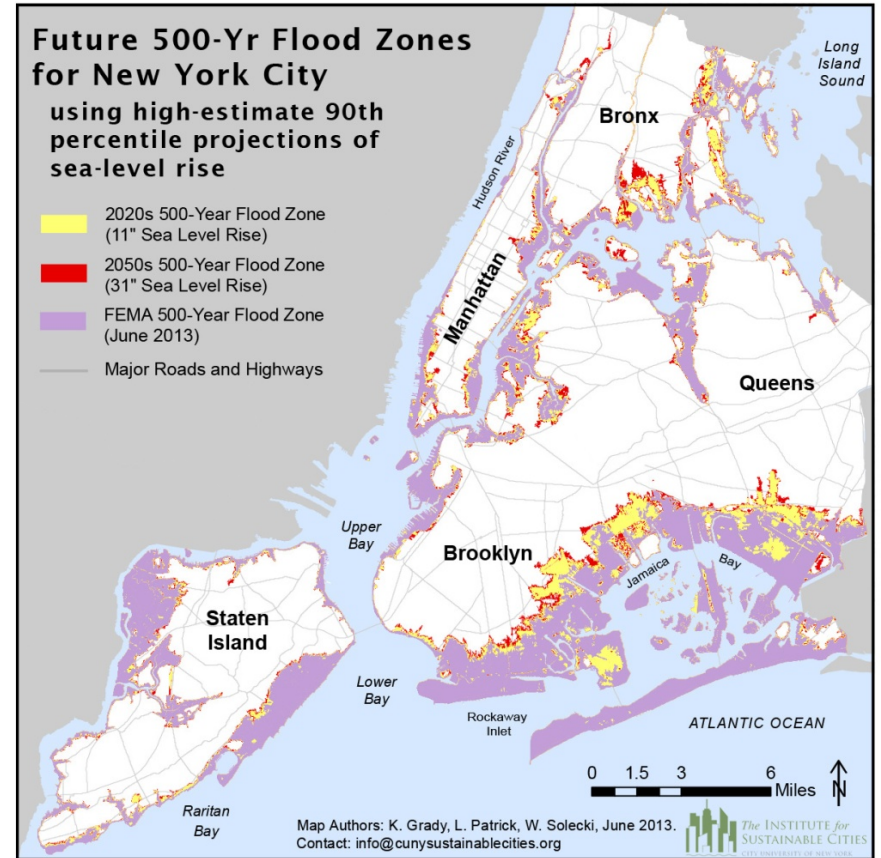
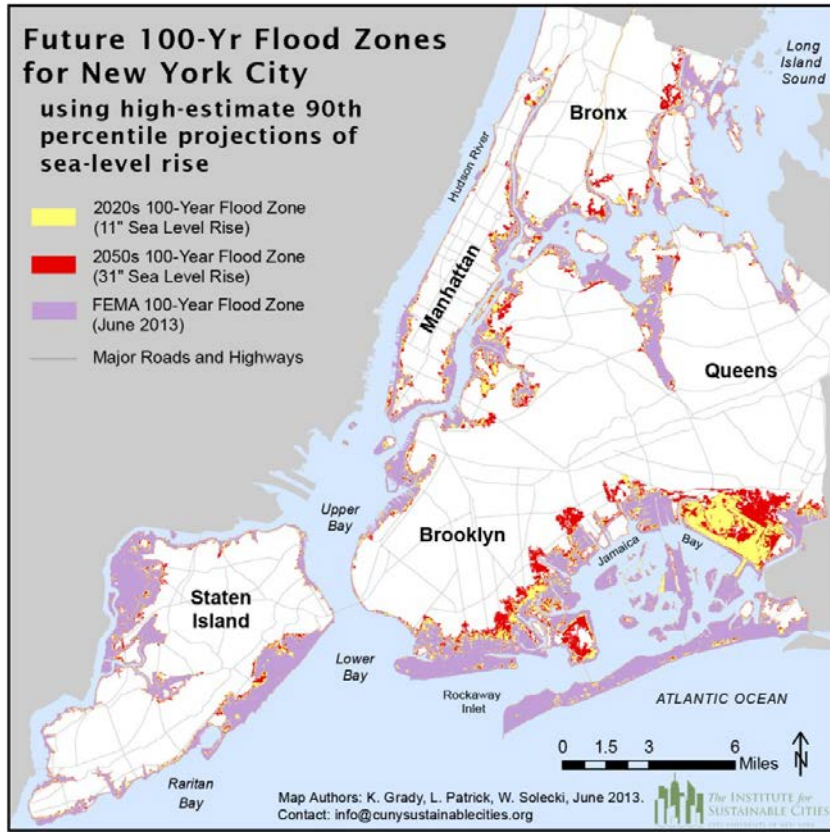
Sea level rise ² Baseline (2000-2004): 0 inches	Low-estimate (10 th percentile)	Middle range (25 th to 75 th percentile)	High-estimate (90 th percentile)
2020s	2 inches	4 to 8 inches	11 inches
2050s	7 inches	11 to 24 inches	31 inches

- High estimate projections are higher than the Panel’s 2009 “Rapid-ice melt” Scenario
- Sea level rise for New York City is projected to exceed the global average

¹ Based on 35 GCMs and 2 Representative Concentration Pathways. Baseline data from NOAA National Climatic Data Center (NCDC) United States Historical Climatology Network (USHCN), Version 2 (Menne et al., 2009). 30-year mean values from model-based outcomes.

² Based on 24 GCMs and 2 Representative Concentration Pathways.

Future Coastal Flood Risk Maps



The potential areas that could be impacted by the 100-year and 500-year floods in the 2020s and 2050s based on projections of the high-estimate 90th percentile sea level rise scenario