

New York City Panel on Climate Change 2015 Report Conclusions and Recommendations

Conclusions

Climate risks in the New York metropolitan region are increasing and are projected to continue to increase throughout the 21st century. Higher temperatures, heavy downpours, sea level rise, and intensified coastal flooding are the major climate hazards projected for the region. Future hazards and risks include:

- Warmer temperatures are extremely likely,^a and the frequency of heat waves is very likely to increase.
- Total annual precipitation will likely increase, and brief, intense rainstorms are very likely to increase.
- Sea level rise is very likely to accelerate as the century progresses.
- New York City's sea level rise is projected to exceed the global average, increasing the risks posed to New York City's coastal populations, infrastructure, and other built and natural assets.

Coordination in the development and communication of climate risk information at city, state, and national levels is essential so that decision-making at local scales can utilize the best science. The future climate will very likely pose new threats and stress to existing and future assets, which should be assessed as part of the City's ongoing planning and investment processes.

Reducing greenhouse gas emissions now reduces the likelihood of more extreme climate risks in the future.

^aProbability of occurrence and likelihood defined as (IPCC, 2007; 2013): Virtually certain: >99% probability of occurrence. Extremely likely: >95% probability of occurrence. Very likely: >90% probability of occurrence. Likely: >66% probability of occurrence. More likely than not: >50% probability of occurrence. About as likely as not: 33% to 66% probability of occurrence.

Recommendations for research

To promote research that has the greatest potential value for adaptation planning, we recommend the implementation of programs to support ongoing partnerships involving local researchers and city practitioners to work on addressing key knowledge gaps. These include:

- Study global climate science and signals as well as local climate processes and manifestations and their interactions in order to better understand how climate is changing in the New York metropolitan region.
- Investigate extreme events, their impacts, and resiliency strategies with a focus on how frequency and intensity are changing in order to respond effectively to current as well as future events.
- Develop methods to do finer-scale integrated analyses of urban climate, risks, vulnerability, and resiliency.
- Conduct studies of infrastructure and ecosystem interdependencies.
- Enhance capacity to examine societal vulnerabilities and resiliency strategies at neighborhood scales.
- Deepen understanding of transformative adaptation. Transformative adaptation integrates climate adaptation and mitigation and relates to change that happens at the level of technological, political, and economic systems.
- Study how adaptation and mitigation actions can interact to provide co-benefits to the region.

Recommendations for climate resiliency

Although there remain significant uncertainties regarding long-term climate change, the NPCC 2015 report (NPCC, 2015) supports the large body of evidence indicating that decision makers are better served by consideration of the future climate risks,

rather than by reliance on the climate of the past, in development of resiliency and rebuilding programs. Specific recommendations for climate resiliency include:

- Continue to follow the risk-based Flexible Adaptation Pathways approach to climate resiliency, set forth by the NPCC in 2010. This approach enhances the ability of the region to periodically assess, adjust, and tailor future development plans under changing climate conditions, updated by the NPCC as mandated by New York City's Local Law 42.
- Make progress on achieving the initiatives in *A Stronger, More Resilient New York* (City of New York, 2013). Because of the short- and long-term challenges posed by increasing risks of temperature extremes, heavy downpours, and coastal flooding, these initiatives need to be strengthened and expanded to the entire New York metropolitan region.
- An integrated approach that includes engineering, ecosystems, and social strategies is vital to ensuring climate resiliency in the coming decades. Land-use planning for sustainable infrastructure systems, particularly in coastal zones and low-lying areas, are especially important.
- At the same time, develop and support programs and policies (such as *One City: Built to Last*; City of New York, 2014) that work to reduce greenhouse gas emissions in order to limit the rate and magnitude of future climate change. Consider co-benefits of adaptation and mitigation.
- Establish the New York City Climate Resiliency Indicators and Monitoring System. Associated working groups should be convened to develop and analyze key information for decision-making on critical infrastructure, ecosystems, and health issues. Build wider networks to monitor indicators and actively support their operation and long-term maintenance in the metropolitan region.
- Coordinate with state and federal partners on climate change projections and resiliency pro-

grams such as Rebuild by Design and U.S. Army Corps of Engineers North Atlantic Comprehensive Study. FEMA should incorporate local sea level rise projections into its coastal flood methodology and mapping. This enables residents as well as planners to utilize the best available information as they develop and implement climate resilience strategies.

- While the 100-year coastal flood is widely used to inform decision-making, other risk thresholds should be examined to improve risk-reduction decisions in the future. The goal is dynamic performance-based risk management across a range of probabilistic hazards established for current and future climates.

It is essential to facilitate an ongoing and continuous process of stakeholder–scientist interactions, with cross-linkages between the NPCC, other experts, the City, the New York metropolitan region, New York State, relevant agencies of the federal government, and the U.S. National Climate Assessment.

Collaboration across multiple scales will ensure that the climate science developed for the New York metropolitan region informs and draws from the best available information, thereby positioning residents and planners to confront expected future changes in the most effective way possible.

References

- City of New York. 2013. *A Stronger, More Resilient New York*. New York.
- City of New York. 2014. *One City: Built to Last*. New York, NY: Mayor's Office of Long Term Planning and Sustainability. 114 pp.
- IPCC. 2007. *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge: Cambridge University Press.
- IPCC. 2013. *Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge: Cambridge University Press.
- NPCC. 2015. Building the Knowledge Base for Climate Resiliency: New York City Panel on Climate Change 2015 Report. C. Rosenzweig and W. Solecki, Eds. *Ann. N.Y. Acad. Sci.* **1336**: 1–149.