

Featured Research: New York State Climate Impacts Assessment Release

The New York State Climate Impacts Assessment (the “Assessment”) is a multi-year research project led by NYSERDA to better characterize how climate change will affect the State and to provide decision-makers with the best-available information on how to prepare for its impacts. Several components of the Assessment were completed and announced by the Governor in early 2024, including NY-specific climate projections and eight technical chapters that focus on sector-specific impacts. An economic impact analysis is still under development.

To develop NY-specific climate projections, NYSERDA worked with Columbia University climate scientists to model projected future changes in several climate variables, including average temperatures, precipitation, extreme events, and sea level rise. The scientists used two greenhouse gas emissions scenarios and socioeconomic pathways from the latest generation of global climate models (CMIP6), downscaled to twelve regions of the State that align closely with NOAA’s climate regions. The modeling revealed that that even under a lower-emissions scenario, climate change impacts across New York State will be substantial and that adapting to current and future climate change impacts is as necessary as reducing greenhouse gas emissions. Among the most significant projected changes will be an increase in average temperatures and extreme heat events.

Historical and projected future number of days per year over 90°F at 6 locations in New York State. Columns show the median (50th percentile) modeled results from a blend of the SSP2-4.5 and SSP5-8.5 greenhouse gas emissions scenarios.

Number of Days with Temperatures Above 90°F in New York State

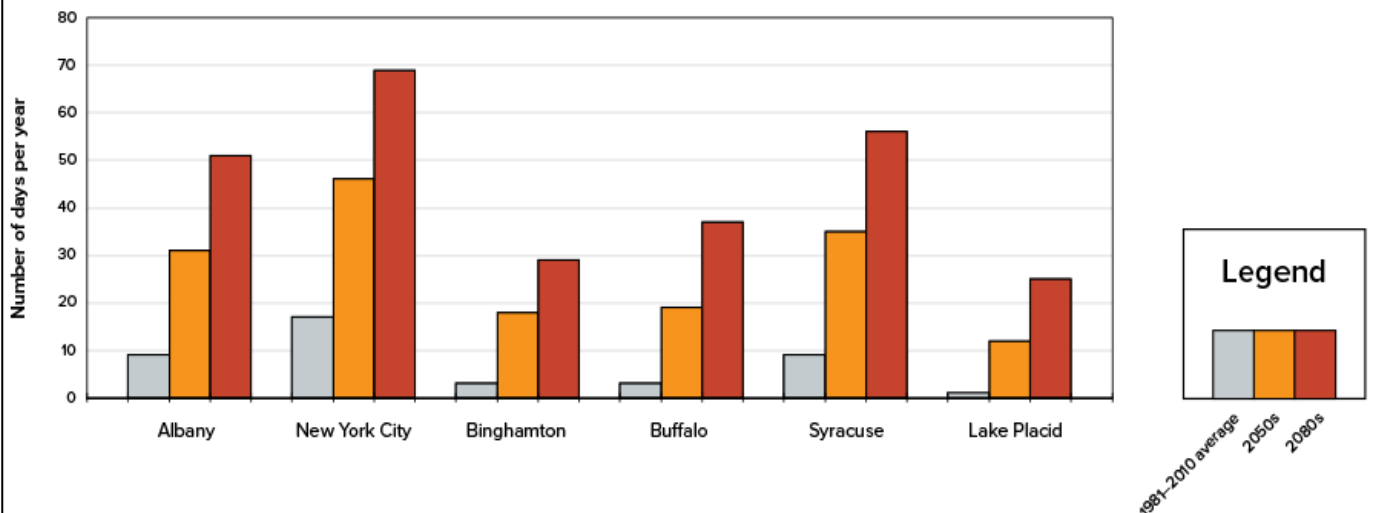


Photo Credits: Climate Impacts Assessment

May 2024

(Article Highlight, continued...)

Extreme heat is a particular concern for human health and will be significant in all parts of the State, even in areas that don't currently experience these temperatures very often. Heavy precipitation and the resultant flooding is also projected to increase in frequency and intensity across the State. Sea level rise will be of particular concern to the coastal regions of the State. The projections team coordinated with the New York City Panel on Climate Change (NPCC) to ensure alignment with the City's work, and the projections have already been used by the State's major utilities in developing their utility climate vulnerability assessments.

Projected sea level rise for New York City. Shown are the 50th percentile projections for low (SSP2-4.5) and high (SSP5-8.5) scenarios. A person (5 feet, 6 inches) and two-story house (20 feet) are provided for comparison. This graphic shows a visual representation of the average projected sea level rise; it does not represent the depth of water in the city due to sea level rise.

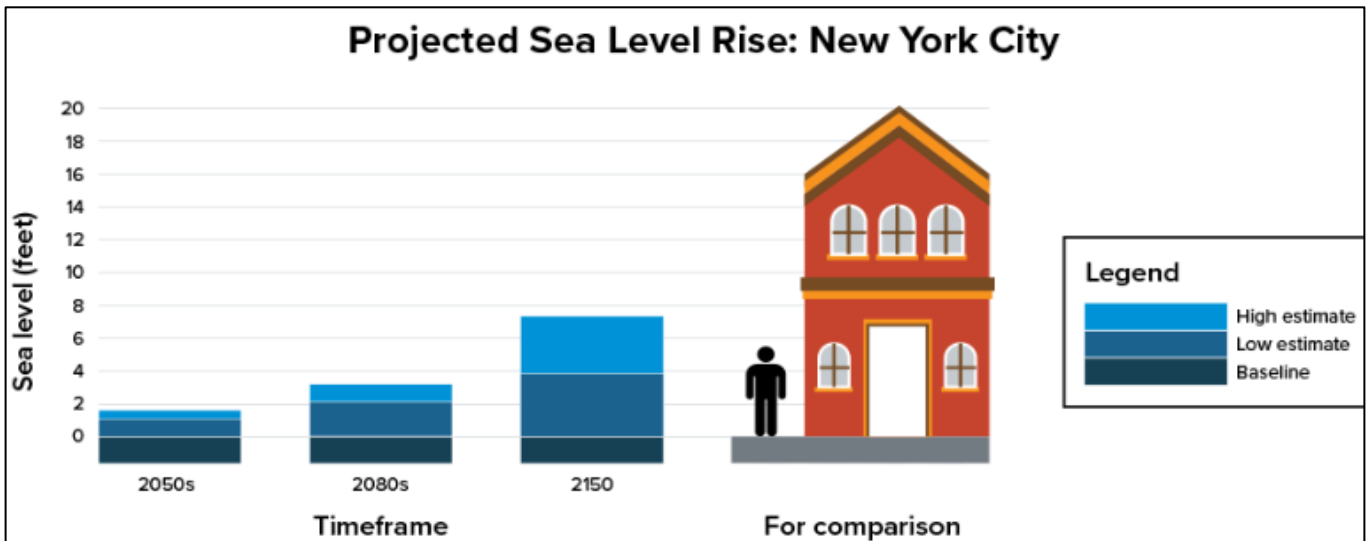
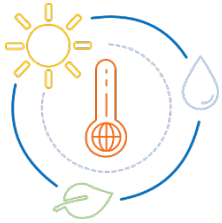


Photo Credit: Climate Impacts Assessment

The assessment's technical chapters focused on identifying current and projected impacts to eight sectors: agriculture, buildings, ecosystems, energy, health, society & economy, transportation, and water resources. These chapters were shaped by a rigorous scientific and stakeholder engagement process. Nearly 80 individuals from more than 60 organizations participated in working groups to develop the chapters, and 160 additional experts provided a breadth of experience and expertise to advise the work. Diverse perspectives were enlisted throughout the assessment process to incorporate voices that are often overlooked in traditional assessment processes. For example, the working groups included not just academics but individuals with varied and first-hand experience and expertise, including members of Tribal Nations.

One overarching finding from multiple working groups is that communities of color, Indigenous communities, and low-income communities often have a greater exposure to climate hazards, and these climate vulnerabilities can be exacerbated by existing inequities.

In addition to the detailed, technical chapters, the assessment team developed various summary materials written in simpler language for non-technical readers. All of the information and products can be found on the assessment website: <https://nysclimateimpacts.org/>



Climate Change

- **Extreme Heat Adaptation Plan:** Program staff have continued working with others at NYSERDA, NYS Department of Environmental Conservation, and other agencies on the Extreme Heat Adaptation Plan. Agency review began in March and is scheduled to finish in Q2. The final plan, anticipated to be released this summer, will include specific actions the State will take to build resilience and adapt to extreme heat, build local capacities, and support local communities in taking action.



Ecosystem Response

- **Cloud Water Chemistry:** University at Albany’s Atmospheric Sciences Research Center’s (ASRC) *Long-term monitoring of cloud water chemistry at Whiteface Mountain: the emergence of a new chemical regime* has been selected as the winner of the 2023 Atmospheric Chemistry & Physics Paul Crutzen Publication Award. The paper highlighted long term trends in cloud water composition at Whiteface Mountain from 1994 through 2021, which was supported by the United States Environmental Protection Agency from 1994 to 2000 and by NYSERDA from 2001 through 2021. It was one of two papers to receive this award in 2023 out of over 1,000 submitted papers to the Atmospheric Chemistry & Physics journal. To read the article, visit: <https://doi.org/10.5194/acp-23-1619-2023>

United States Geological Survey’s Presentation on the New York State Climate Impacts Assessment Ecosystem Chapter

- **Adirondack Research Forum:** The 21st annual Adirondack Research Forum was held on February 26-27, 2024 at the Adirondack League Club (ALC) in Old Forge NY. Adirondack research was presented in a mix of presentations and posters and highlighted work in fisheries, ecology, climate change, cyanobacteria, and monitoring. Several presentations highlighted NYSERDA funded projects

The New York State Climate Impacts Assessment: Current and Future Effects on Adirondack Forests and Lakes

Doug Burns
USGS New York Water Science Center
Troy, NY



Photo Credit: USGS

including an update on the New York State Climate Impacts Assessment and several updates on the Survey of Climate Change in Adirondack Lake Ecosystems (SCALE) initiative and PILOT projects. The planning workshop for SCALE was held in the summer of 2021 through support from NYSERDA.

(Ecosystem Response, continued...)

- **Loon Monitoring:** The Adirondack Center for Loon Conservation (ACLC) continued their long-term monitoring of the Common Loon in the Adirondack State Park and completed their 2023 data collection and annual report. In 2023, the ACLC monitored 101 nesting loon pairs for reproductive success and analyzed feather and blood samples from 23 loons to provide an indication of long-term mercury accumulation. The ACLC’s scientific research provides a broader understanding on the impact of climate change and airborne mercury pollution on ecosystems in the Adirondack State Park. Research and reports can be found on the ACLC website: <https://www.adkloon.org/>

Land Based-Renewables

- **Agricultural Technical Working Group (A-TWG):** The A-TWG’s Smart Siting Scorecard specialist committee reviewed the aggregated scorecard results from the solar proposals submitted to the 2023 Renewable Energy Standard Request for Proposals ([RESRFP23-1](#)). This included their strategies to co-use the sites for pollinator habitat, grazing, and crop production as well as their avoidance of agricultural land and forested land. The committee also deliberated on how to further improve the scorecard and suggestions are actively being considered in the development of the 2024 Scorecard.
- **RAISE Specialist Committee:** A new A-TWG specialist committee was launched in January to better characterize the Regional Agronomic Impacts from Solar Energy (“RAISE”). The RAISE Committee is comprised of a balanced group of stakeholders representing farmland protection boards and agricultural producers, solar industry representatives, non-profit entities and local

Bird Flying Above Solar Project



governments, State agencies and independent advisors. Three RAISE committee meetings were held this past quarter, during which the committee provided feedback on preliminary analyses of historical solar development and historical agricultural land use change. This work will continue as the committee further examines drivers and impacts of agricultural land conversion. More information about the RAISE committee and meeting materials can be found at: <https://www.nyatwg.com/raise-specialist-committee>



Offshore Wind

- **Regional Fisheries Compensation Fund:** The Multi-State effort to advance a regional fisheries compensation fund has continued to make significant progress. On February 7, 2024 a Request for Proposals (RFP) was released to select an entity for the design and development of a claims-based compensation fund and associated policies and procedures. The RFP closed on March 26, 2024 and proposals are currently being reviewed by a scoring committee made up of members from the fishing industry, State representatives, and offshore wind developers. The selected entity is expected to commence work during the early part of Q3 2024. Further details on the program can be found here: <https://offshorewindpower.org/fisheries-mitigation-project>
- **State of the Science:** The [2024 State of the Science Workshop](#) on Offshore Wind, Wildlife, and Fisheries, hosted by NYSERDA on behalf of the New York State Environmental Technical Working Group, will be held on Long Island, New York from July 16-19. Registration is open until June 13.
- **Environmental Technical Working Group (E-TWG):** The E-TWG has developed a series of [Frequently Asked Questions and Answers](#) related to whales and offshore wind. A specialist committee made up of science-based subject matter experts will continue to add questions and answers to provide information at both a high level and extended answers with appropriate scientific citations.
- **Fisheries Technical Working Group (F-TWG):** The F-TWG met on March 29, 2024. Topics discussed at the meeting included progress of the regional fisheries compensation fund, updates on Master Plan 2.0 and the NY OSW Project Portfolio, 2024 F-TWG topical priorities, including the drafting of an overview of substation cooling water, and updates from the fisheries research projects funded from PON 5226. These research topics included stock enhancement, stock assessment impacts and mitigation strategies, and gear advancement techniques to promote co-existence. A meeting summary and presentation materials can be found on the F-TWG website: <https://nyftwg.com/>
- **World Council of Fisheries Societies:** Morgan Brunbauer presented at the World Fisheries Congress which was held in Seattle, Washington from March 3 to March 7, 2024. The World Fisheries Congress is organized through the [World Council of Fisheries Societies](#), where every four years delegates from around the world meet to exchange ideas and perspectives about new research, emerging issues, scientific breakthroughs, and governance related to fisheries science, industry, conservation, and management. The two presentations were “Technical Working Groups as Tools for Stakeholder Engagement in Offshore Wind Energy Development” and “Establishing a Regional Compensatory Mitigation Claims Process for Offshore Wind Impacts on Fishing.” There were over 1,600 in attendance at this event.
- **Trade Shows:** Captain Tony DiLernia, NYSERDA’s Recreational Fisheries Liaison, attended and staffed a booth at multiple trade shows this quarter in New York, New Jersey, and Rhode Island. These events included the New York Boat Show

(Offshore Wind, continued...)

from January 24 to January 28, the Freeport Fishing and Boating Show from February 17 to February 18, the Atlantic City Boat Show from February 28 to March 3, and the New England Saltwater Fishing Show from March 8 to March 10. These shows had over 70,000 attendees combined and hundreds of individuals stopped by the booth each show to have their questions and concerns about the development of offshore wind in NY and across the region addressed.

Captain Tony DiLernia, NYSERDA's Recreational Fisheries Liaison at tradeshow



Photo Credit: NYSERDA

- Empire Wind and Sunrise Wind:** On February 29, Governor Hochul announced the State awarded two offshore wind projects for contract negotiation as a result of its [fourth offshore wind solicitation](#) – Empire Wind 1, a planned 810-megawatt project (developed by Equinor), and Sunrise Wind, a planned 924-megawatt project (developed by Ørsted and Eversource).
- Webinar Series:** NYSERDA continues to host a monthly offshore wind webinar series, [Learning from the Experts](#). Recent webinars have discussed offshore wind financing and installation.
- Open Houses:** In January, the Offshore Wind Team hosted Open Houses in Albany, New York City, and Long Island focused on New York's Offshore Wind Program, regulatory processes, and general offshore wind education.



Air Quality and Public Health

- **American Meteorological Society Annual Meeting:** During January 12-16, 2024, the Northeast States for Coordinated Air Use Management (NESCAUM), City College of New York (CCNY), State University of New York (SUNY) Albany, Columbia University, University of Rochester, Ithaca College, and New York State Department of Environmental Conservation (NYSDEC) researchers presented results from NYSERDA funded projects at the American Meteorological Society Annual Meeting in Baltimore, Maryland. Research was supported through NYSERDA Public Opportunity Notice 4895, Energy-related Air Quality research and Request for Qualifications 4810: Technical Assistance in Support of the NYS Clean Energy Transition, and included oral presentations and posters on the following topics:
 - *Methane Emission Estimates From Several Waste Sector Facilities in New York State*
 - *Regional chemical transport modeling to assess emissions reduction strategies in the northeastern U.S. Oral presentation*
 - *Investigation of sea breeze circulation and O₃ distribution over New York metropolitan area using WRF-Chem during 2018 Long Island Sound Tropospheric Ozone Study (LISTOS)*
 - *Synergistic Ozone Lidar Observations at New York during 2023 Summer Campaigns*
 - *Design of a Mobile Tropospheric Ozone Lidar and Ozone Profiling in New York during Summer 2023*
- **International Seminar Presentation:** During February 6-7, 2024, Phil Hopke of the University of Rochester presented NYSERDA-funded research on: *Updated effects of source specific particular matter (PM_{2.5}) on acute health outcomes in New York State*, at the International Seminar: Understanding the Global Research and Impact of PM_{2.5}, in Seoul, Korea.
- **NYSDEC/NYSERDA Seminar Series:** On February 29, 2024, Jay Turner gave a webinar presentation on NYSERDA-funded research on: *Trends Analysis and Source Apportionment of Volatile Organic Compounds (VOCs) Measured at Goethals Field, Staten Island* as part of the NYSDEC Bureau of Air Quality Analysis and Research (BAQAR)/NYSERDA seminar series.
- **Dissertation Defense:** Congratulations to Chin-An Lin, who also defended his dissertation this quarter. Chin-An Lin was a student in SUNY Albany's atmospheric Sciences research Center and worked with Dr. Sarah Lu on the project, *Infusing satellite Data into Environmental Applications (IDEA-NYS) air quality forecast and analysis system: Real-time aerosol detection, monitoring, and trajectories in NYS* selected through PON 3208, Energy-related Air Quality and Health effects Research. He has now joined the National Renewable Energy Laboratory (NREL) as a postdoctoral fellow.

Program Reports and Papers

Program Reports & Papers posted recently include:

Air Quality and Related Health Research: Particulate Matter (PM), Ozone and Co-Pollutants

Chen, Y., Rich, D. Q., & Hopke, P. K. (2024). Changes in source specific PM_{2.5} from 2010 to 2019 in New York and New Jersey identified by dispersion normalized PMF. *Atmospheric Research*, 304, 107353. <https://doi.org/10.1016/j.atmosres.2024.107353>

Cheng, B., Alapaty, K., & Arunachalam, S. (2024). Spatiotemporal trends in PM_{2.5} chemical composition in the conterminous U.S. during 2006–2020. *Atmospheric Environment*, 316, 120188. <https://doi.org/10.1016/j.atmosenv.2023.120188>

Croft, D. P., Utell, M. J., Liu, H., Lin, S., Hopke, P. K., Thurston, S. W., Chen, Y., & Rich, D. Q. (2024). Change in rate of healthcare encounters for respiratory infection from air pollution exposure after improved vehicle emissions standards in New York State. *Air Quality, Atmosphere & Health*. <https://doi.org/10.1007/s11869-024-01505-6>

Gao, D., Friedman, S., Hosler, A. S., Sheridan, S., Zhang, W., Yu, F., & Lin, S. (2024). Ambient heat and diabetes hospitalizations: Does the timing of heat exposure matter? *Science of The Total Environment*, 912, 169011. <https://doi.org/10.1016/j.scitotenv.2023.169011>

Hass-Mitchell, T., Joo, T., Rogers, M., Nault, B. A., Soong, C., Tran, M., Seo, M., Machesky, J. E., Canagaratna, M., Roscioli, J., Claflin, M. S., Lerner, B. M., Blomdahl, D. C., Misztal, P. K., Ng, N. L., Dillner, A. M., Bahreini, R., Russell, A., Krechmer, J. E., ... Gentner, D. R. (2024). Increasing contributions of temperature-dependent oxygenated organic aerosol to summertime particulate matter in New York City. *ACS ES&T Air*, 1(2), 113–128. <https://doi.org/10.1021/acsestair.3c00037>

Hopke, P. K., Chen, Y., Chalupa, D. C., & Rich, D. Q. (2024). Long term trends in source apportioned particle number concentrations in Rochester NY. *Environmental Pollution*, 347, 123708. <https://doi.org/10.1016/j.envpol.2024.123708>

Nair, A. A., Lin, S., Luo, G., Ryan, I., Qi, Q., Deng, X., & Yu, F. (2023). Environmental exposure disparities in ultrafine particles and PM_{2.5} by Urbanicity and socio-demographics in New York State, 2013–2020. *Environmental Research*, 239, 117246. <https://doi.org/10.1016/j.envres.2023.117246>

Yu, F., Nair, A. A., Lauper, U., Luo, G., Herb, J., Morse, M., Savage, B., Zartarian, M., Wang, M., Lin, S., Mysteriously rapid rise in Legionnaires' disease incidence correlates with declining atmospheric sulfur dioxide. *PNAS Nexus*, Volume 3, Issue 3, March 2024, <https://doi.org/10.1093/pnasnexus/pgae085>