



Photo Credit: NYSERDA Agreement 44367

ENVIRONMENTAL RESEARCH

Q3 2020



Offshore Wind

- NYSERDA continues to develop a cabling document for regulators and fishermen, pulling together concerns and information about the many variables (environmental, technological, fishing) that are considered during project development. This in-depth document will help improve conversations that both regulators and stakeholders have regarding this topic. The document is scheduled for public feedback in early Q4 of 2020.
- NYSERDA continues to advance the *Opportunity for Experienced Mariners Study* to identify additional job opportunities and training measures for mariners (including fishermen) needed to capitalize on new jobs that result from offshore wind (OSW) development to supplement their income. This study includes an analysis of forecasted job availability and accessibility, a synthesis of available job training and/or certifications needed to be qualified, and recommendations for next steps. The final public product is scheduled for distribution in Q4 of 2020.
- A virtual F-TWG meeting was held on July 17, 2020. Topics for discussion included an update on the status of the 2020 OSW RFP, regional science initiatives from joint Bureau of Ocean Energy Management (BOEM), Rhode Island and Massachusetts funded projects, updates on NYSERDA funded projects - the Fisheries Knowledge Trust and Fishing Access within Turbine Arrays, and an update from US Coast Guard on various Port Access Route Studies taking place in the NY Bight.

(Offshore Wind, continued...)



Note: Image collected onboard Gardline's Ocean Endeavor by a Protected Species Observer in support of NYSERDA's geophysical survey.

- The Environmental Technical Working Group (E-TWG) held virtual meetings in July and August to discuss priorities and to develop work plans for the next two years.
- As part of NYSERDA's efforts to better understand offshore environmental and physical conditions, and to reduce offshore wind development costs, NYSERDA conducted a [geophysical survey](#) within two draft Wind Energy Areas (WEAs), Hudson North and Hudson South, located in the New York Bight. During these surveys, conducted from July to October 2020, NYSERDA prioritized environmental protection using Protected Species Observers (PSO) and committed to additional species protection [measures](#).



- This quarter marks the one-year anniversary of the deployment of two floating LiDAR (FliDAR) [MetOcean Buoys](#) in the New York Bight to support the advancement of responsible and cost-effective offshore wind energy development. In addition to traditional wind speed at hub height and related MetOcean data, the buoys are also equipped with sensors to collect and record wildlife data. This includes passive acoustic microphones to detect vocalizations by birds and bats, nanotag receivers to detect tagged birds and fishes, and hydrophones to detect vocalizations by marine mammals. Better MetOcean characterization of the wind, wave, and ocean currents will also help increase certainty of development conditions which is valuable information for planning project layout, turbine siting and engineering. More efficient design of offshore wind sites will help maximize renewable energy output, delivering more clean energy to the electric grid in a smaller physical and environmental footprint. The [data is available](#) on an ongoing basis and an interim report calculating energy production is in development for release later in 2020.



Note: Images collected by NYSERDA staff while sampling during avian mercury monitoring.



Land Based-Renewables

- Significant progress has been made during this quarter on finalizing contracts for projects competitively selected through Program Opportunity Notice (PON) 4270, Environmental Research – PV Site Design, Information Gaps, and Mitigation Opportunities. Five of the contracts have been executed and one is out for signature. More details on the projects will be included in the Q4 2020 newsletter.



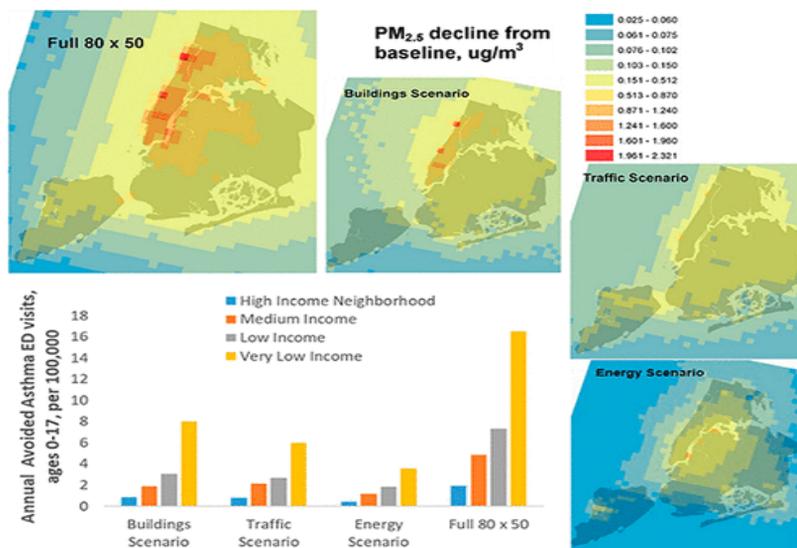
Ecosystem Response

- A NYSERDA-sponsored project with Biodiversity Research Institute (BRI) is nearing completion. This project aimed to synthesize mercury (Hg) data collected over the last 50 years in New York State (NYS) and discuss the impacts of Hg on wildlife and the environments in which they live. As discussed in previous newsletters, through this project, a communications piece ([NYS Mercury Connections](#)) has been developed and researchers for the project have briefed staff from both State and Federal organizations on how monitoring efforts in NYS have helped inform and validate legislation, such as the Mercury and Air Toxics (MATS) rule.
- It is anticipated in 4Q 2020/1Q 2021 that the special issue of *Ecotoxicology* that contains over 20 manuscripts developed by researchers from SUNY College of Environmental Science and Forestry (ESF), Syracuse University, Hobart and William Smith Colleges, Adirondack Center for Loon Conservation (ACLC), BRI, NYS Department of Environmental Conservation, Rensselaer Polytechnic Institute (RPI), and the United States Geological Survey (USGS), many of whom have been supported by NYSERDA within the last five years, will be published. The manuscripts include results from studies that looked at the spatial and temporal patterns of Hg in atmospheric deposition, water, fish, loons, eagles, songbirds, and invertebrates. Also, a complete dataset that synthesizes Hg data collected in NYS from over 20 different sources will be made public and posted on the Open Data NY site. We will let everyone know once both the special issue and database are complete.



Air Quality & Public Health

- Proposals submitted to PON 4230, Energy-related Air Quality and Health Effects were reviewed by an independent Scoring Committee and five proposals were recommended for funding. Contract negotiations are underway.
- Matthew Ninneman defended his Ph.D. dissertation at SUNY Albany this Spring. The dissertation is entitled “Ozone and reactive oxidized nitrogen chemistry in the northeast U.S.” Matthew did a great job and passed easily!
- Dr. James Schwab’s research was featured in Research Outreach earlier this year. The article, “[Air Pollution Monitoring and its Role in Public Health](#),” describes the importance of Jim’s long-term monitoring and short-term intensive studies in NYS to better inform air quality management and policies.
- NYC Health and ICF finished a major research project, [Assessing Air Quality and Public Health Benefits of New York City’s Climate Action Plans](#). This study performed highly spatially resolved air quality modeling of some of NYC’s key 80 x 50 climate mitigation plans. This included policy initiative for buildings (energy efficiency, fuel oil phase out, electrification), traffic (phase in of EVs, LEVs, more mass transit and active transport) and power (renewable) and was able to predict impacts at the neighborhood level and across socioeconomic status. The air-quality related public health benefits were then estimated to avoid between 160 and 390 premature deaths and 460 hospitalizations and emergency department visits for respiratory and cardiovascular disease each year, valued at \$3.4 billion annually.





Biomass

NYS Office of the Attorney General cites NYSERDA-funded research in amicus brief

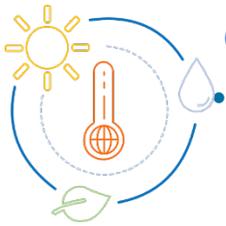
- Wood stoves are used in approximately two percent of homes in NYS, but residential wood smoke is a major source of primary particulate pollution in NYS. According to the National Emissions Inventory, residential wood smoke is a greater source than either the power or transportations sectors.
- In September, the New York State Attorney General was joined by AK, CT, IL, MD, MN, NJ, OR, RI, VA, WA, and the Puget Sound Clean Air Agency in support of US EPA in response to a petition by the Hearth, Patio, and Barbeque Association. The petitioner brought a suit challenging the 2015 New Source Performance Standard for Residential Wood Heaters (NSPS) and their objection to audit-testing provisions in the Rule due to testing variability.
- NYSERDA is supporting the Northeast States for Coordinated Air Use Management (NESCAUM) in the development of new test methods for residential wood heating appliances. As part of that research, several certified appliances were purchased and tested to determine how testing procedures affect emission performance measurements. This included baseline testing using current certification procedures with replicate analysis that allowed an evaluation of emission rate variability. NESCAUM was able to reproduce certification test results in both pellet and cordwood stoves according to the audit criteria specified in the NSPS when those certification tests. Their analysis demonstrated that an audit would likely identify substantial issues associated with unrepresentative operating and fueling procedures and with appliances that have highly variable performance.
- The amicus brief concludes the analyses demonstrate that that audit-testing provisions are necessary to ensure compliance with the Rule's emissions standards. As a result, the States urged the Court to uphold the Rule in full and reject the Petitioner's challenge.



Biomass

Integrated-Duty Cycle test protocol used in EPA certification and Renewable Heat NY

- A contributing factor the high emissions for residential wood heating devices is that manufacturers develop new appliances for tests that typically have steady-state conditions and are not representative of how the appliance will be operated in the home. NYSERDA has been supporting the development of test protocols that provide a technology-forcing mechanism toward cleaner and more efficient technologies that are improvements over steady-state testing. These Integrated-Duty Cycle (IDC) test protocols challenge the appliance during start-up and cyclic operations as well as high and low loads. They also provide real-time measurement of particulate matter rather than averaging over long periods of time using a composite filter, so manufacturers know where to focus improvements. Foundational research for these method advancements was conducted by Brookhaven National Laboratory and NESCAUM. Further improvements were made by NESCAUM, Hearth Lab Solutions and ClearStak for a variety of appliances including wood stoves, pellet stoves, cordwood boilers, pellet boilers and cordwood furnaces.
- In early 2020, a manufacturer requested that EPA approve the use of the IDC for four pellet boilers to obtain U.S. EPA certification. EPA approved this request and testing was performed, results were submitted to EPA and the units were certified for Step-2 of the NSPS.
- The manufacturer then applied for the pellet boiler to become Qualified Technology in NYSERDA's Renewable Heat NY (RHNY) program. A Technical Review Committee (TRC) reviewed the test reports, and these units were approved for the program. The TCR further recommended that NYSERDA only accept test reports for units tested using the IDC to be technology forcing and allow consumers a more realistic efficiency rating. The RHNY program requirements for Qualified Technology have been updated and it is anticipated that EPA will continue to move toward IDC methods



Climate Change

An Assessment Coordinator and Assessment Facilitator were contracted, and work began on detailed planning for the statewide climate impacts assessment. The assessment will be a complex effort involving numerous work groups and stakeholder involvement. While not directly related to the Climate Leadership and Community Protection Act (CLCPA), the resulting information will provide the scientific foundation for future climate policy.

- An assessment of stakeholder needs regarding climate change projections and information was completed. The information gathered from stakeholders will be instrumental in shaping the climate assessment.
- A small project to explore potential ways people may migrate into and within New York State as a result of climate change began. The project will convene multiple research teams who will work both independently and collaboratively on different methods for modeling this migration.
- As discussed in the Q2 2020 newsletter, the second of the two recently completed projects that assessed how emissions and greenhouse gases (GHGs) could be reduced and climate impacts could be mitigated in order to meet the goals outlined in the CLCPA has been posted on NYSERDA's website. The [final report](#) for this project, led by Guidehouse, assessed the potential of technologies that are currently available, and those expected to be available by mid-century to capture, utilize, and store carbon in NYS.



Photo credit: NYSERDA staff, Indian Lake NY.

Program Reports & Papers posted recently include:

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

[Assessing Air Quality and Public Health Benefits of New York City's Climate Action Plans](#)

[LISTOS 2018: Evidence for Sea Breeze Influence](#)

[Further improvement of wet process treatments in GEOS-Chem v12.6.0: impact on global distributions of aerosols and aerosol precursors](#)

Biomass

[Characterization of Residential Woodsmoke PM_{2.5} in the Adirondacks of New York State](#)

Ecosystem Response to Atmospheric Deposition of Sulfur, Nitrogen and Mercury

[20-05 Land-Atmosphere Dynamics of Mercury and Ecological Implications for Adirondack Forest Ecosystems](#)

[Long-term Monitoring of Mercury in Adult Saltmarsh Sparrows Breeding in Maine, Massachusetts and New York, USA 2000-2017](#)

Climate Change

[20-13 Potential for Carbon Capture, Utilization and Storage Technologies in New York State](#)

Other Environmental

[Life Cycle Assessment of Forest Biomass Energy Feedstock in the Northeast United States](#)

[Willow Lignin Recovered from Hot-Water Extraction for the Production of Hydrogels and Thermoplastic Blends](#)