



Photo Credit: Scott McKim, Atmospheric Sciences Research Center, University at Albany



### Air Quality and Public Health

We kicked off two new competitively selected research projects this past quarter:

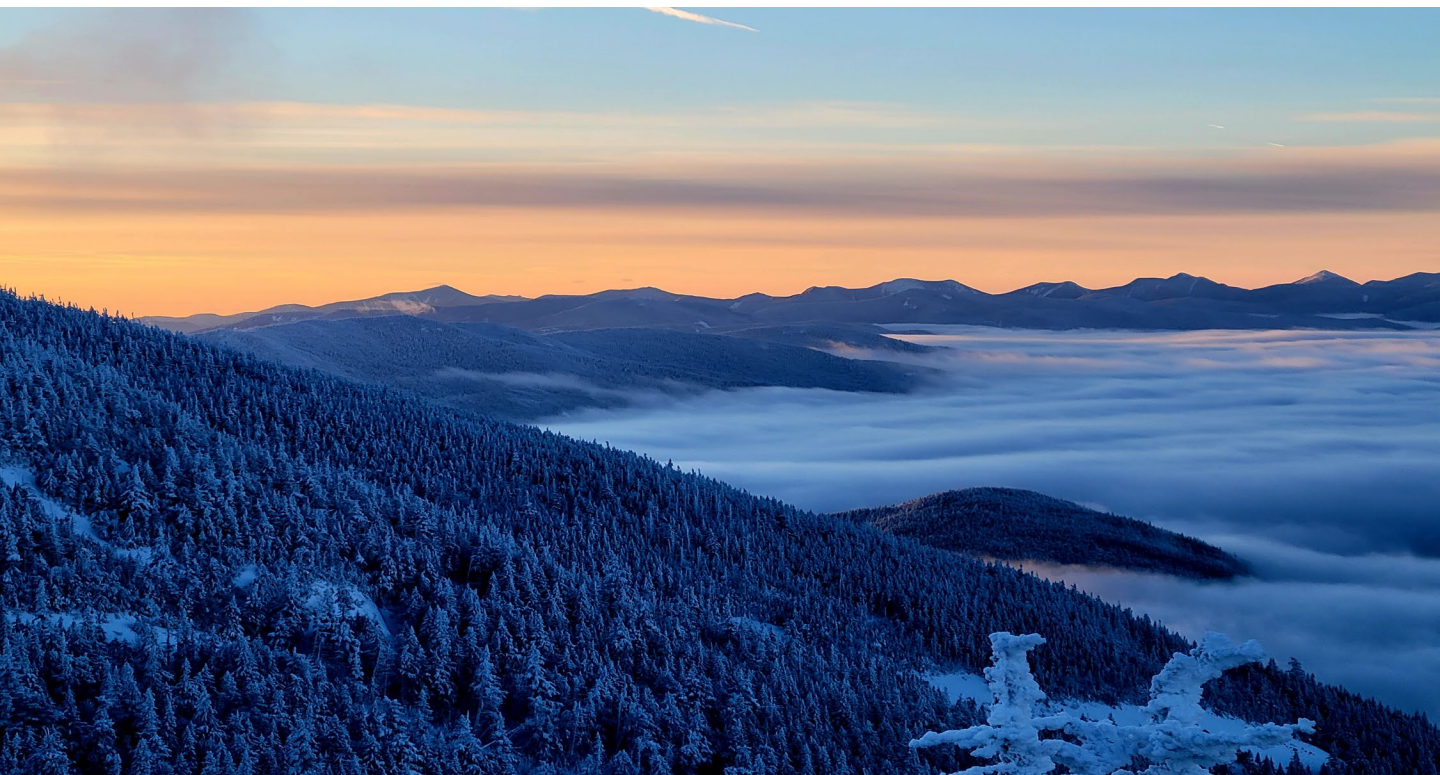
- **Ground-based and satellite remote sensing of atmospheric dynamics and constituents at multiple scales and dimensions for an integrated approach to air pollution characterization and modeling** – Fred Moshary at City University of NY. The primary goal of this study is to develop an integrated observation and modeling framework for a better understanding of urban sources and emissions; pollutant transport and spatial distribution, as well as validation and improvement of satellite products and model forecasts. City College of the City University of New York (CCNY) will carry out a collection of collaborative on-site and field remote-sensing and in-situ observations that will complement others from existing networks. Planned intensive measurements and modeling

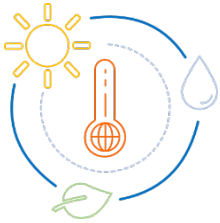
*(Air Quality and Public Health, continued...)*

activities leading to the Summer 2023 multi-agency intensive campaigns will provide a rich platform for CCNY work. CCNY will engage with the planning teams for the campaigns to make synergistic measurements during the planned flights. As such, CCNY field deployments will be driven by forecasts as well as flight plans.

- **Remote Sensing and Data-Driven Techniques Supporting Community Protection** – K. Max Zhang at Cornell University. The goal of this project is to develop cost-effective methods and research tools that leverage remote sensing products and data-driven techniques to improve source identification and emissions inventories at the local level. Specifically, the project will use NYC Community Air Survey measurements and observations of local sources of greenhouse gases (GHG) and emissions in NYC to improve existing GHG emission inventories and develop land use regression modeling and strategies to mitigate community exposure to emissions. It will also develop a tool for identifying wood- and oil- burning heating systems to improve residential emissions inventories in Central NYS.
- Four new peer-reviewed air quality and public health publications also were released this quarter. Links and open access to those publications are available below.

Atmospheric Sciences Research Center on Whiteface Mountain





### Climate Change

- The New York State Climate Impacts Assessment continues apace with public release anticipated in 2023. During this quarter, the eight technical workgroups (TWGs) of the Assessment delivered complete chapter drafts for review. We anticipate a few iterations before the chapters will be ready for peer review in Q1 of 2023.
- In 2018, NYSERDA supported a series of research projects at the University at Buffalo on the intersection of climate change and the resiliency of our building stock. We were recently made aware that several of the products developed through NYSERDA’s partnership with U. Buffalo have been cited in the draft Built Environment chapter of the 5th National Climate Assessment, a testament to the good work performed by the Buffalo team. More information about the research products developed by Buffalo can be viewed here: <https://archplan.buffalo.edu/adapting-buildings>

Adapting Buildings for a Changing Climate – University of Buffalo School of Architecture and Planning YouTube Video



Photo Credit: University of Buffalo School of Architecture and Planning



### Ecosystem Response

- In the third quarter of 2022, NYSERDA issued Request for Proposals for Routine Sampling of Adirondack Long Term Monitoring (ALTM) Lakes and Streams and held a scoring committee to review proposals. Paul Smith's College Adirondack Watershed Institute (AWI) and the United States Geological Survey (USGS) were competitively selected to conduct the routine sampling of Adirondack lakes and streams over the next five years as part of the ALTM Program.
- Dr. Charley Driscoll of Syracuse University is assessing the potential enhancement of mercury accumulation in Adirondack Lake fisheries due to climate change. Work is underway with the Syracuse University team analyzing historical and current day fish samples for mercury concentrations. Fish mercury trends were presented at the National Atmospheric Deposition Program meeting in Knoxville in November. A final report for this work is anticipated in Q2 2023.



## Land Based-Renewables

- In 2020, a team of Cornell University scientists was competitively selected to conduct microclimate monitoring research at large solar farm developments to better understand opportunities to optimize the co-utilization for both solar and agriculture. A key aspect of the work has been researchers engaging with the solar industry and NGOs to obtain site access to solar farms and to develop collaborative partnerships. The lead researcher at Cornell was able to leverage this work with NYSERDA to win a competitive a \$1.5 million grant through the United States Department of Energy's (DOE) [Deploying Solar with Wildlife and Ecosystem Services Benefits \(SolWEB\) program](#). The DOE funded project will look at developing the first holistic framework to assess the potential for ecosystem services from solar facilities based on site characteristics and different solar siting configurations. The DOE grant will allow the team to continue the work funded by NYSERDA, which will provide a jumpstart to the project, and bring a better understanding of how to optimize solar siting, configuration, and co-utilization at New York solar farms to the benefit of landowners, wildlife, and ecosystems.
- The Agricultural Technical Working Group (A-TWG) formed a Specialist Committee (SC) in the 4th quarter of 2022 to focus on Agrivoltaics (AGV). The SC is charged with advancing the state of knowledge, barriers and opportunities associated with siting and operating commercially viable agricultural operations within solar developments. The SC intends to develop a stronger understanding of the potential for AGV in NYS, identify information and knowledge needed to better understand the viability of AGV across a range of conditions in NYS, provide guidance on how policies and programs could be developed or amended to advance AGV, among others as more is learned about the exciting agricultural opportunities in this nascent but growing aspect of the solar industry. The [A-TWG website](#) will be continually updated to include copies agenda and presentations from the SC meetings.



## Offshore Wind

### New Solicitations

- On December 8, 2022, NYSERDA released a solicitation for \$2.5 million seeking proposals on environmental and fisheries research to support the responsible development of offshore wind. Proposals will be accepted to support two main topic areas: 1) Enhancement of sustainable fisheries – including efforts to promote a path towards co-existence with offshore wind, and 2) Benthic ecosystems – better understanding how offshore wind development might result in changes in biological characteristics and identifying opportunities for ecological enhancement. Proposals are due March 13, 2023. More details about the PON can be found here: [Program Opportunity Notice \(PON\) 5226](#)

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- NYSERDA was excited to see the release of the multi-state Request for Information (RFI) to inform the establishment of a regional fisheries compensatory mitigation fund administrator on December 12, 2022, with comments due back on January 31, 2023. For more details see <https://offshorewindpower.org/fisheries-mitigation-project> This effort supports the implementation of the Bureau of Ocean Energy Management's (BOEM) [Draft Fisheries Mitigation Framework](#) in a fair, equitable, and transparent manner for impacted Atlantic Coast fishing industry members and offshore wind developers. NYSERDA is unified with our multi-state partners in creating an inclusive and transparent process that directly involves the fishing industry, offshore wind developers, and collectively works alongside BOEM and National Oceanic and Atmospheric Administration (NOAA) towards coexistence between these two essential industries. NYSERDA looks forward to continuing to help lead these efforts with our regional partners, including members of the fishing and offshore wind industries, to establish a fisheries compensation fund that is equitable, effective, and meets the desired outcome for all.

### Newly Completed Project Reports and Publications

- The NYSERDA funded project Addressing Commercial Fishing Access within Wind Energy Areas Study led by National Renewable Energy Laboratory (NREL) was completed this past fall. The goal of the project was to collaboratively develop technical strategies and tools to minimize disruption of commercial fishing within offshore wind arrays while also ensuring economical energy generation. The project completed an information gathering activity to identify regional needs and risks in the New York Bight. It also developed and analyzed a realistic set of offshore wind project scenarios to better understand how to reduce potential access restrictions to fishermen and minimize risk to vessels and gear. Additionally, the project identified and assessed a pilot project that provided a small-scale preliminary study to evaluate the applicability and feasibility of select mitigation measures. The final report can be found here: <https://www.nyserdera.ny.gov/-/media/Project/Nyserda/Files/Programs/Offshore-Wind/22-24-Collaborative-Development-of-Strategies-and-Tools-to-Address-Commercial-Fishing-Access.pdf>
- The Fisheries Knowledge Trust Project led by Responsible Offshore Development Alliance (RODA) was completed this December. The main goal of the project focused on developing an industry-owned knowledge trust that allows fishermen to own, use, and share their data while retaining granular control over its ownership, use and sharing. The Trust was developed to also enhance the regulatory process for offshore wind and other ecosystem services by dramatically improving the overall understanding of the current state of fisheries and the ecosystems in which they operate. The project also provides a proof of concept for other fisheries and creates the data infrastructure to create effective and protected data products in a cost-effective manner. Additionally, the Trust may improve the understanding on “data poor” fisheries by aggregating proprietary

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data in a new way which could improve current fisheries regulatory processes. The final report can be found here: <https://www.nyserdera.ny.gov/-/media/Project/Nyserda/Files/Programs/Offshore-Wind/22-35-Data-Trust-Fisheries-Knowledge-of-OSW-Decision-Making.pdf>

- The Environmental Technical Working Group (E-TWG) Regional Synthesis Workgroup has published the Atlantic Offshore Wind Environmental Research Recommendations, a database compilation and synthesis of data gaps and research needs that have been identified from existing sources. Potential users of this database include state and other government entities funding offshore wind research, offshore wind developers who are funding research and monitoring, and regional research entities, such as the Regional Wildlife Science Collaborative, that are developing science plans. The database was developed with support from the Biodiversity Research Institute and the Synthesis of Environmental Effects Research (SEER) group (National Renewable Energy Laboratory and the Pacific Northwest National Laboratory). The database is available on Tethys Environmental Effects of Wind and Marine Renewable Energy: <https://tethys.pnnl.gov/atlantic-offshore-wind-environmental-research-recommendations>

Snapshot of Regional Synthesis Workgroup Database

Stressor:	Receptor:	Development Phase:	Search:	Apply
Baseline	- Any -	- Any -		Apply
Research Recommendation	Stressor/Topic	Receptor	Development Phase	Citations
<p><b>Adapt study design for OSW farm presence</b></p> <p>Develop integrated methods and survey design to adapt long-term data collection to the presence of OSW structures. Survey methods include fisheries trawl, aerial and other baseline distribution and oceanographic surveys that could utilize autonomous monitoring methods.</p>	Technology/ Methods Development	Bats, Benthos, Birds, Ecosystem/Oceanographic processes, Fishes, Invertebrates, Marine mammals	Pre-construction, Operations & Maintenance	Bureau of Ocean Energy Management (BOEM) 2022, Brodie et al. 2021, Degraer et al. 2021, Joint Nature Conservation Committee (JNCC) 2021, Responsible Offshore Development Alliance (RODA) 2021
<p><b>Assess acoustic exposure from OSW activities</b></p> <p>Identify acoustic exposure and contextual conditions associated with potential acute response to OSW stressors, including a review of sound sources, assessment of potential exposure and susceptibility during different phases of development (including geophysical surveys for site assessment).</p>	Noise	Benthos, Fishes, Invertebrates, Marine mammals, Sea turtles	Construction, Operations & Maintenance	Di Franco et al. 2020, Edmonds et al. 2016, Gulka and Williams 2020, Joint Nature Conservation Committee (JNCC) 2021, Kraus et al. 2019, Southall et al. 2021

Photo Credit: Tethys

**TWG Meetings and Expert Panels**

- NYSERDA organized a panel titled, The Intersection of Technology and Environmental Data Supporting Offshore Wind Development, at the New York State Innovation Summit in October. Panelists included representatives from

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NYSERDA's Environmental Research and Offshore Wind programs, Offshore Wind Regional Wildlife Science Collaborative (RWSC), National Offshore Wind Research and Development Consortium (NOWRDC), and NUAIR, an unmanned aircraft systems nonprofit. The panelists discussed opportunities for new and existing technology to be used in novel ways across all phases of offshore wind development, specifically for environmental characterization and monitoring.

- The Environmental and Fisheries Technical Working Groups held follow up discussion sessions in late November and early December led by Equinor on the mitigation plans for the Empire Wind I and II projects and the Beacon Wind I project. The purpose of these meeting was to engage with the working groups to discuss specific approaches to survey plans and more details on Equinor's approach to implementing a regional monitoring fund which is associated with the \$10,000 per MW that the winning contracts are required to set aside for regional wildlife and fisheries monitoring as part of the 2020 offshore wind solicitation.
- The Environmental Technical Working Group convened in November to discuss updates on the [State of the Science Workshop](#), Regional Synthesis Workgroup, and the [Avian Displacement Guidance Committee](#). They also made recommendations on coordination among New York Bight leaseholders, NYSERDA's Environmental Research Program Opportunity Notice, and the Offshore Wind Blueprint for Master Plan 2.0: Deep Water.

Panel Discussion at New York State Innovation Summit



Photo Credit: NYSERDA

# Program Reports and Papers

Program Reports & Papers posted recently include:

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

Li D, Wu Y, Gross B, Moshary F., Dynamics of Mixing Layer Height and Homogeneity from Ceilometer-Measured Aerosol Profiles and Correlation to Ground Level PM<sub>2.5</sub> in New York City. Remote Sensing. 2022; 14(24):6370. <https://doi.org/10.3390/rs14246370>

Nair, A. A., Yu, F., Luo, G. The importance of ammonia for springtime atmospheric new particle formation and aerosol number abundance over the United States. Science of the Total Environment, 863, 160756, 2023. <https://doi.org/10.1016/j.scitotenv.2022.160756>

Tao, M., Fiore, A.M., Jin, X, Schiferl, L.D., Commane, R., Judd, L.M., Janz, S., Sullivan, J.T., Miller, P.J., Karambelas, A., Davis, S., Tzortziou, M, Valin, L., Whitehill, A., Civerolo, K., and Tian, Y. Investigating Changes in Ozone Formation Chemistry during Summertime Pollution Events over the Northeastern United States, Environ. Sci. Technol., <https://doi.org/10.1021/acs.est.2c02972> (2022)

Yount CS, Utell MJ, Hopke PK, Thurston SW, Lin S, Ling FS, Chen Y, Chalupa D, Deng X, & Rich DQ. (2023). Triggering of ST-elevation myocardial infarction by ultrafine particles in New York: Changes following Tier 3 vehicle introduction. Environ Res. 216,114445. <https://doi.org/10.1016/j.envres.2022.114445>

Zhang, J., Catena, A., Shrestha, B., Freedman, J., McCabe, E., Schwab, M.J, Felton, D., Kent, J., Gaza, B., and Schwab, J.J., Unraveling the interaction of urban emission plumes and marine breezes involved in the formation of summertime coastal high ozone on Long Island, Environmental Science: Atmospheres, DOI: 10.1039/d2ea00061j (2022) (<https://pubs.rsc.org/en/content/articlelanding/2022/EA/D2EA00061J>)

## ***Offshore Wind***

New York State Energy Research and Development Authority (NYSERDA). 2022. "New York Bight Offshore Wind Farms: Collaborative Development of Strategies and Tools to Address Commercial Fishing Access," NYSERDA Report Number 22-24. Prepared by National Renewable Energy Laboratory, Responsible Offshore Development Alliance, and Global Marine Group, LLC. [nysERDA.ny.gov/publications](https://nysERDA.ny.gov/publications)

New York State Energy Research and Development Authority (NYSERDA). 2022. "Creation of a 'Data Trust' to Include Fishermen's Knowledge in Offshore Wind Energy Decision Making," NYSERDA Report Number 22-35. Prepared by Responsible Offshore Development Alliance. [nysERDA.ny.gov/publications](https://nysERDA.ny.gov/publications)