Cutting Through the Haze

Part 1: The Art & Science of Air Quality Monitoring (October 23, 2023)
Part 2: Tools for Measuring Air Quality and Protecting Public Health (April 11, 2024)

ENVIRONMENTAL HEALTH PROJECT
DEFENDING PUBLIC HEALTH SINCE 2012

GRASSROOTS Environmental Education

An important event for government officials, healthcare professionals, and community groups

Overview and Takeaways

The Environmental Health Project (EHP) defends public health in the face of oil and gas development in New York State and communities across the nation. One of EHP's long-standing partners in this effort is Grassroots Environmental Education (GEE), a New York-based nonprofit organization dedicated to educating the public about the links between common environmental toxins and human health. Together these groups produced a series of interactive virtual events that highlighted air quality monitoring initiatives at the federal, state, and local levels and illustrated how air quality data can be leveraged for health education and policymaking.

The events hosted approximately 130 attendees, who came to hear speakers from the New York State Senate, Environmental Protection Agency (EPA) Region 2, New York State Department of Environmental Conservation (DEC), Environmental Health Project (EHP), and a community impacted by shale gas operations. The first event, held in October 2023, provided an overview of the EPA Region 2's environmental science and assessment programs, the NYDEC's Climate Leadership and Community Protection Act (CLCPA) Statewide Community Air Monitoring Initiative, and EHP's local community air monitoring, analysis, and modeling tools. The second event, held in April 2024, was built upon the information shared in the first event and featured interactive discussions on EHP's data, education, and policy tools to advance local efforts to protect public health.

Major Themes from the Events

- Current air quality regulations, standards, and enforcement measures do not adequately protect public health. To address this situation, there is a need for health-protective actions at both the individual and system levels.
    - Audience questions and breakout room discussions clearly indicated an interest in removing barriers for individuals to protect themselves from pollution (e.g., increasing broadband access to air quality alerts and equipping renters with legal and financial support to replace gas stoves).
    - It was also clear that individual-level interventions will not alone suffice. Stopping the expansion of oil and gas infrastructure and reducing emissions from existing point sources (shale gas related or not) are just as urgent.
- Regional air quality data can overlook local, episodic exposures that impact public health. Local air quality monitoring can inform more accurate health risk communication by capturing these exposures.
- Environmental justice must be a priority in every data collection, education, and policy decision in order to reduce racial and class disparities in exposure and negative health outcomes.
- Policy is catching up with the growing body of literature linking health risks with long-term exposure to air pollution, but effective enforcement and regulation require coordination among all levels of government. For example, NYDEC and the EPA have an opportunity to work closely on source-specific and ambient pollutant regulation compliance.
- Some government agencies operating in New York state are increasingly committed to incorporating citizen science (through low-cost sensors and monitor loan programs) into their air quality management strategies.

Key Resources Referenced for Additional Information

- New York Department of Conservation (NYDEC)
  - AQI Forecast
  - EnviroFlash Alerts
  - Air Quality Map
  - General Air Quality Information
- United States Environmental Protection Agency (U.S. EPA)
  - Interactive Map of Air Monitors
  - EPA grants and startup programs
  - AirNow
  - Fire and Smoke Map
  - EJ Screen Map
  - EPA Participatory Science Bulletin: email Anahita Williamson (williamson.anahita@epa.gov) to sign up
- Environmental Health Project
  - Compressor Stations in the Northeast: A Guide to Protecting Your Health and the Environment
  - HealthWatch Factsheet and Application
  - EHP Health Professional Toolkit
  - EHP Factsheet Library
  - EHP Policy Position Statements
- Other Organizations
  - CDC Places Database
  - PurpleAir Map of Real-Time Monitor Data

Further Exploration

In the second event, attendees participated in three simultaneous breakout room discussions. These discussions illuminated attendees' unique perspectives and valuable insights across a range of topics.

Data Collection & Analysis

Community air monitor networks fill important gaps in existing government approaches to monitor point source emissions and ambient air quality. The applications for local air quality data varies by community, so the equipment, education, and analysis tools utilized in each monitoring initiative must be tailored to their unique context.

- Mitigating emissions and halting fossil fuel operations are both viable strategies for reducing negative health impacts people currently face. Still, the greatest health benefits will result from transitioning away from fracked gas.
- State and regional trends in PM2.5, sulfur dioxide, nitrogen dioxide, and ozone show improvement, but communities living near shale gas infrastructure, such as compressor stations or gas-fired power plants, have not necessarily experienced these improvements. In areas where pipeline and compressor station expansions are proposed, emissions and their associated health impacts will increase.
- Discussions indicate an increasing interest in monitoring under- or unregulated pollutants, such as PFAS.
- Sources of concern vary by community and facilities of concern. Compressor stations, incinerators, and pipelines were a few of the point sources mentioned. Understanding exposure in community spaces (e.g., swimming pools) is a top concern.
- Monitoring is not only useful for measuring "how bad" pollution levels are, but also "how good" green infrastructure can be for local air quality.
- Distinguishing pollution from a source of interest and other regional sources is a challenge in community air monitoring projects.
- Social factors are not captured by air monitors and must be accounted for in other ways in community air quality programs.
- Funding is a key limitation to the development of more community air monitor networks.

Health & Wellness Education

Based on attendee feedback, community education on air quality appears to be more successful when tailored to unique audiences and framed from a climate justice perspective. Noted barriers to sustaining community engagement over long-term efforts include a lack of awareness of oil- and gas-related health risks and lack of resources for health professionals. Attendees generally felt that government entities have a responsibility to communicate local exposure risks accurately.

- While health impacts are a top concern among residents and health professionals, discussions indicated that they are not the most effective starting point for education on industrial air pollution. Many felt that climate change is a better conversation starter, as this

topic is top of mind for New York State residents, policymakers, scientists, and the medical community.

- Public perception of "natural gas" has not yet caught up with public policy. While fracking was banned in New York State in 2014, fracked gas is still framed as an essential resource. Attendees recognized that a transition to renewable, cleaner energy sources must be accompanied by education about the necessity of transitioning away from a methane-based energy sector.
- Government entities have an important role in communicating local air quality information. The following opportunities were identified:
    - Regional averages overlook local exposures of great concern, pointing to a need for more granular data on local, episodic emissions.
    - Information about severe (and, in some cases, fatal) health impacts of exposure to oil and gas air pollution should be provided to health care providers so they are better equipped to care for their patients.

Policy & Advocacy Initiatives

New York State legislation has progressed in public health's favor over the last decade. Recent wins, such as the Climate Leadership and Community Protection Act (CLCPA) and Green Amendment, present new opportunities for communities to defend themselves from oil and gas development.

- The strength of recent policy wins has been put to the test, as applications for new and expanded oil and gas infrastructure are considered by the NY DEC. Advocates are considering lawsuits that could affirm the power of the Climate Act to protect residents from pollution.
- Advocacy efforts have shifted from reacting to the negative impacts of shale gas infrastructure to building a cleaner energy sector that does not rely on fracked gas.
- Despite the public health gains in the absence of fracking, New Yorkers continue to be exposed to dangerous (and, in some places, increasing) levels of oil and gas air emissions near fracked gas pipelines and compressor stations. Project Maple and Iroquois Enhancement by Compression Project (ExC Project) are recent examples of proposed infrastructure expansions.
- Attendees indicated interest in strengthening collaboration between communities with existing or proposed infrastructure. EHP will explore networking opportunities through our flagship community engagement program, HealthWatch.

Additional Audience/Follow-up Questions

Robust feedback during these events resulted in insightful discussions, but unfortunately there was not enough time to answer all questions posed by attendees. Key questions and answers are shared below. Responses provided by sources other than EHP are noted below.

How are air quality permits decided in New York? What is the difference between a Title V and an Article 10 permit? *(response provided by the NY DOH)*

For each major stationary source facility, as defined in 6 NYCRR Part 201, DEC issues a Title V Facility Permit, a comprehensive permit containing all regulatory requirements applicable to all air emitting sources at the facility. In general, the requirements contained in air quality permits issued by DEC are dependent on the types of sources in operation at the facility, the applicable federal and state regulations that pertain to those sources, and an evaluation (or consideration) of impacts that the sources may have on the surrounding area.

Article 10 provides for the siting review of new and repowered or modified major electric generating facilities in New York State by the Board on Electric Generation Siting and the Environment (Siting Board) in a unified proceeding instead of requiring a developer or owner of such a facility to apply for numerous state and local permits.

When should residents close their windows due to poor air quality?

Outdoor air can enter homes through windows or other openings in a home (US EPA, 2024a). When your local Air Quality Index (AQI) is more than 50, at which point "unusually sensitive groups" may be impacted, you may consider closing windows, which may help reduce exposure to outdoor pollution (US EPA, 2015). Keeping windows closed when winds are low and temperatures drop will also help prevent outdoor air pollution from entering the home.

Are NYS schools required to have any physical activity plans that consider current NYS AQI levels? *(response provided by the NY DOH)*

The NYS DEC provides a daily AQI forecast and general guidance regarding outdoor activity for the various AQI levels. Some municipalities may have developed additional guidance for their school districts. NYC has developed recommendations based on AQI for childcare, schools, and day camps. This information is similar to what DEC and EPA include when describing the AQI levels.

What pollutants and levels of pollution do low-cost air monitors detect?

Most low-cost air pollution monitors sold in the U.S. are designed to detect gases or particles in the air such as particulate matter (PM), radon, carbon monoxide (CO), carbon dioxide (CO2), formaldehyde, volatile organic compounds (VOCs), or environmental factors such as temperature and humidity (US EPA, 2024b). Generally speaking, low-cost air quality monitors can detect air pollutants across the range of human health effects. For instance, low-cost PM monitors can detect particulate matter

across the entire EPA AQI scale. However, the low cost comes with other tradeoffs, including reduced precision and accuracy or greater interference from weather conditions such as humidity. Additionally, some monitoring technologies lack specificity. For example, low-cost VOC sensors can report when VOC levels are elevated but not what individual compounds the sensor is responding to. This lack of complete data makes determinations of health risk difficult.

How can you find out what pollutants are being emitted from a particular site?

Pollutants regulated by New York State can be found for permitted facilities on this interactive map, called DEC Info Locator, and this online database, called Open Data NY. Facilities that do not require a permit are not included in these resources.

What are the limitations of National Ambient Air Quality Standards and the impacts of spikes in emissions from facilities?

The National Ambient Air Quality Standards (NAAQS) have done a good job of reducing harmful air pollution across the country. However, the NAAQS struggle to deal with the impact of local emitters on the surrounding community. These impacts often take the form of sub-daily spikes in pollutants that reach people nearby. These short-term spikes in pollution can impact various health outcomes, ranging from headaches and asthma attacks to hospitalization for cardiovascular and respiratory issues.

The NAAQS additionally do not look at all pollutants; instead, they look at the six most consequential pollutants for the entire country. This means that communities with specific facilities emitting non-criteria pollutants must rely on other mechanisms to protect their communities.

Lastly, the NAAQS are largely enforced through monitoring, and not all communities host a regulatory monitor. This leads to concerns in communities without these monitors around even criteria pollutants.

What data are not in the public data sets?

Not all emitters must report their emissions to regulators. Largely speaking, minor sources of air emissions—those that do not meet the criteria for a Title V permit—are not required to report actual emissions to state regulators. Many states do require "synthetic minor" sources to report these emissions. Synthetic minor sources are sources of air emissions that fall below the Title V threshold due to their use of pollution control devices. These requirements vary by state.

In addition to these requirements, certain chemical releases must be reported to the Toxic Release Inventory (TRI). This requirement only applies to some industrial sectors and only to emitters who employ at least 10 full-time employees. The full requirements, including the covered chemicals and industrial sectors, can be found on the EPA's website.

What recourse do communities have when the state is not renewing expired Title V permits? Will the EPA intervene?

Generally, a Title V facility cannot continue operating without a valid air emissions permit. However, if a renewal application was submitted on time, and state agencies are unable to evaluate the application before the end of the pervious permit's term, the old permit remains in effect until the state agency makes their determination. This "permit application shield" varies state by state. The EPA may provide technical assistance to speed up a process that is particularly behind schedule.

These events were made possible in part by the generous support of the Park Foundation. Many thanks to Grassroots Environmental Education for their tremendous collaboration in planning, marketing, and delivering this series.

The feedback received during these events will shape and inform EHP's future programming and collaborations in New York State and beyond. We are deeply grateful for every individual who shared their time, energy, and wisdom with us. We hope the information shared in this series will benefit attendees' work to advance public health in communities impacted by oil and gas development. Please reach out with any questions or feedback.