



November 2024 Lehigh Valley Breathes Update!

As we eagerly await the holiday season, our Lehigh Valley Breathes monitors continue to do the work of data collection with little news to report. So we'd like to take this month's update to share with you two other projects focused on PM 2.5.

One question we're asked is **why do we have to collect data over such a long period of time**. To answer it, let's look at a similar project that was conducted by a community science team in the area of Waterbury, CT. The project was sponsored by the Sierra Club CT and Sacred Heart University. If you're interested in reading about the project in detail, you can find the published results [here](#) in the peer-reviewed, open-access journal, Heliyon/Elsevier.

Similar to the LV Breathes project, the Waterbury project was created to identify causal factors for PM 2.5 pollution. The plan was to study temperature, relative humidity, time of day, day of week, precipitation, visibility, wind speed, wind direction, energy production, energy distribution, road and air traffic activity. Also similar to the LV Breathes project, this project sought more micro-locations for data gathering since there was only one CT-DEEP monitor in the area. To do that, the project used 3 PurpleAir monitors spread over the project area which appears to be considerably smaller than the Lehigh Valley.

Over the course of the project, it was determined that some of the causal factors they expected to test for couldn't, in fact, be reliably identified. One of those was road traffic activity. Despite the fact that the air quality study period ran from January 1, 2021 to July 1, 2022, the traffic study data covered only a 3-day monitoring period from March 16 to March 19, 2021 comprised of only weekdays. That data was then extrapolated to the study's timeframe of 18 months in order to match up with the air quality data. The shortness of the traffic data monitoring period basically made the results unreliable and the authors suggest that this is an area that should receive further study.

For the LV Breathes project, we expect there to be quite a bit more road traffic data available to match up with PM 2.5 readings. Also the larger area of the Lehigh Valley has been divided into 11 separate study categories based on proximity to highways, rural vs. urban, high and low traffic counts and proximity to warehouses. This categorization will provide more precise comparisons between PM 2.5 levels and each surrounding environment with the goal of establishing likely causality. For more information on the study categories, you can read the October 2023 LVBreathes update.

The second project we'd like to share with you covers a MUCH bigger area. In fact, it covers the whole of North America. Titled "**Air Quality Improvement for Environmental Justice**," it

is being conducted by Canada's Environment and Climate Change Canada (ECCC), Mexico's National Institute of Ecology and Climate Change (INECC), and the United States' Environmental Protection Agency (USEPA) Office of Air Quality Planning and Standards. What's interesting about this collaborative project is how the issues it is attempting to tackle and the aim of the project match up in many ways with what LVBreathes is attempting to do on a much smaller scale.

From their project description, here are the issues they are attempting to tackle. The commonalities between their project and ours have been highlighted.

- "Sources of BC (black carbon) and PM_{2.5} include agricultural burning, domestic wood combustion, and fossil fuel combustion from transportation and industrial activities.
- National systems for monitoring air pollution in the three North American countries have limited spatial coverage.
- Regulated air quality monitoring stations are costly and technically demanding."

This collaborative project has chosen one community in each of the three countries that has limited air quality monitoring coverage and limited funds for the purchase of air quality monitoring stations. The project has deployed low-cost air quality sensors to increase public access and awareness of air pollution.

Again, from the published "Aim" of the project:

"This initiative aims to foster collaborative partnerships with interested communities in Canada, Mexico, and the United States disproportionately affected by PM_{2.5}/BC air pollution and that need ambient air quality monitoring and mitigation. The project will work with local stakeholders to identify emission sources and monitor air quality, as well as formulate potential emission mitigation strategies, assess their benefits, and implement them."

Likewise, the LV Breathes project not only plans to collect data on emission sources and air quality, but also includes the aim of formulating emission mitigation strategies and making the recommendations available to our local counties to share with municipalities.

This collaborative project began on 24 October 2022 and is expected to last 3 years at a cost of \$1 million. You can read a summary of the project [here](#) or the complete project proposal [here](#).

These are only two of many such air quality projects happening right now as people become more aware of the dangers of air pollution, particularly PM 2.5. Much of this work may fall to local, county and state governments in the coming days, especially if the federal government steps away. We're lucky here in the Lehigh Valley that our county governments have already seen the value of this work and gotten a head start on it. It's important for all of us to be advocates for clean air and to support both governmental and non-governmental organizations that are working hard to help us all breathe more easily.