

Site Report For Bradford Woods VFD Station 115

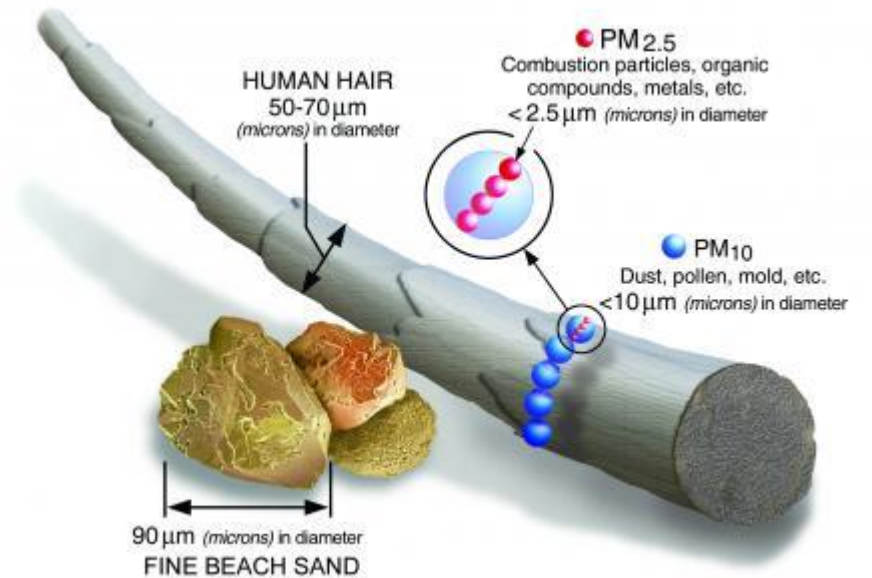
Center for Atmospheric Particles Studies
Carnegie Mellon University
5000 Forbes Avenue
Pittsburgh, PA, 15213

Report Covers: January 1st –January 31st, 2018

Time Logged: 744 hours (31 days)

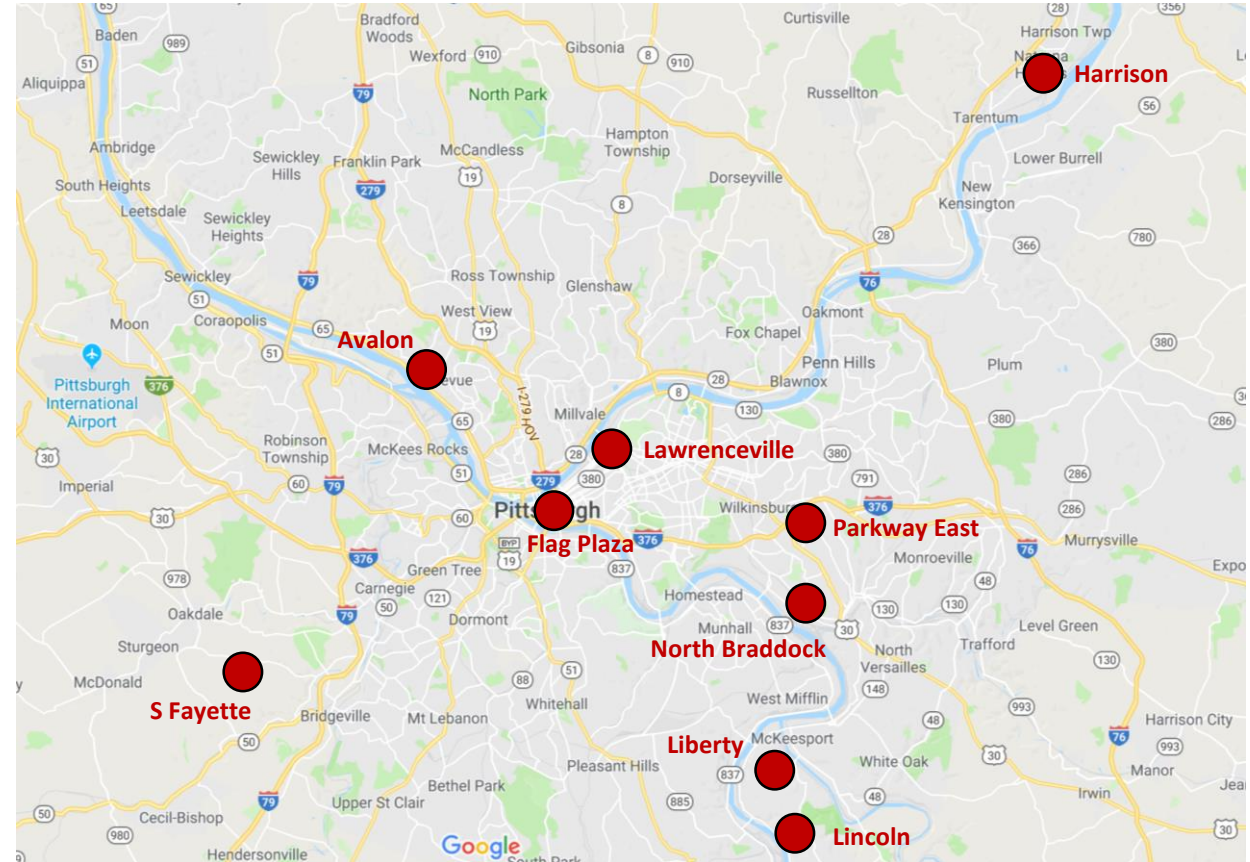
What is PM_{2.5}?

- PM_{2.5} is particulate matter (such as smoke, soot, and dust) in the atmosphere that has a diameter of 2.5 micrometers (about 1/30th the width of a human hair) or smaller, allowing them to enter your lungs and bloodstream^[1]
- PM_{2.5} has been linked to cardiovascular disease and lung disease^[2]
- The National Ambient Air Quality Standards (NAAQS) are set by the Environmental Protection Agency (EPA) and regulate what concentrations of PM_{2.5} are acceptable.^[3] PM_{2.5} is measured in micrograms per meter cubed (µg/m³). The standards are as follows:
 - Annual average (over 3 years) of PM_{2.5} should not exceed 12µg/m³
 - 24 hour average (98th percentile over 3 years) should not exceed 35µg/m³
- For more information, visit <https://www.epa.gov/pm-pollution/particulate-matter-pm-basics>



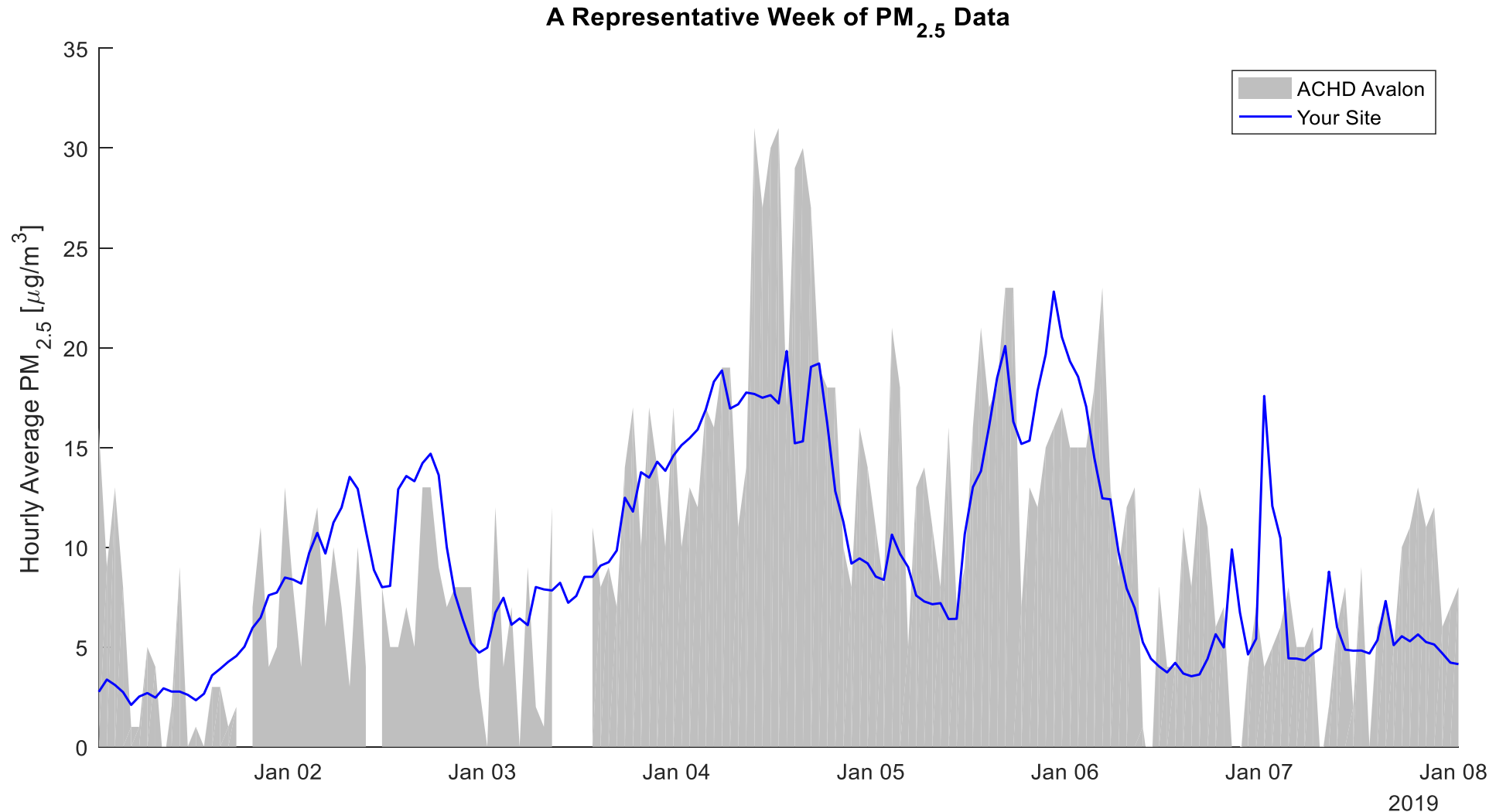
The ACHD Monitoring Network

- To monitor Pittsburgh's compliance with the NAAQS, the Allegheny County Health Department (ACHD) maintains a network of air quality monitoring stations, as shown in the figure.
- This network uses highly precise (but very expensive) instruments to measure levels for the air pollutants regulated by the EPA, including PM_{2.5} (however, not all of the pollutants are measured at all of the sites).
- While not as precise, our RAMP monitors allow us to measure many pollutants at a much larger number of locations, including your site!
- Further information on the ACHD network can be found at: <http://www.achd.net/air/index.php>



Map of ACHD Monitoring Stations^[4]

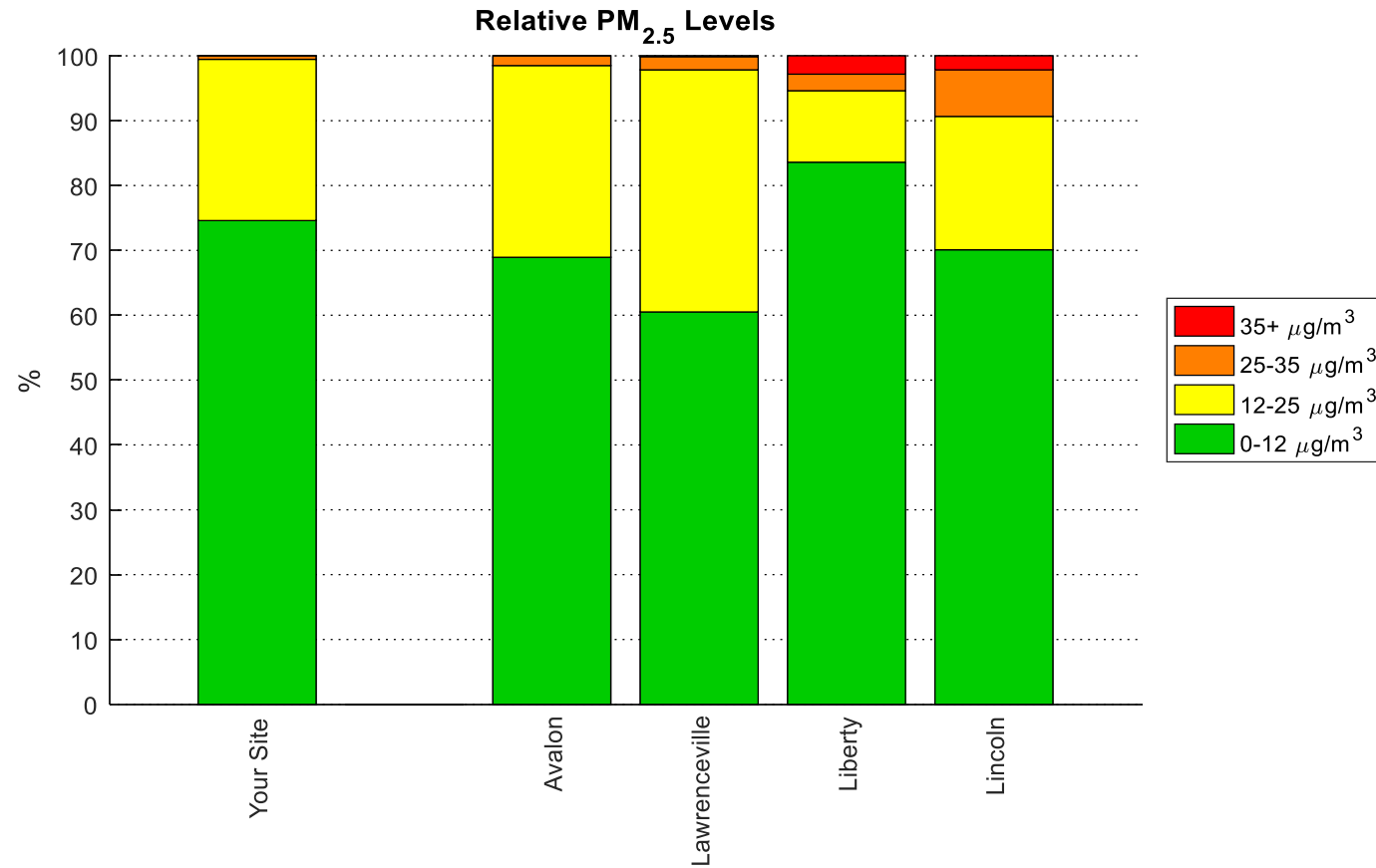
PM_{2.5} concentration over time



- This chart shows the hourly average concentration of PM_{2.5} at your site (blue) compared to the hourly average at the nearest ACHD monitoring station for a representative week of the year.

How your site compares to others

- The bar graph represents the fraction of hours when the PM_{2.5} concentration is in a certain range:
 - **low** (0-12 μg/m³)
 - **moderate** (12-25μg/m³)
 - **elevated** (25-35 μg/m³)
 - **high** (more than 35μg/m³)
- The same results are shown for the ACHD monitoring stations
- The percentage of “low” concentrations measured at your site in the past month fell between ACHD Liberty and all other ACHD sites.
- However, the proportion of PM_{2.5} concentrations above 25μg/m³ has been the lowest at your site in the past month. Furthermore, your site has not experienced “high” concentrations last month on an hourly basis.
- This indicates that your site has seen a background about as clean as a typical rural-industrial site and periods of particulate pollution either milder or lasting shorter than at all ACHD sites.

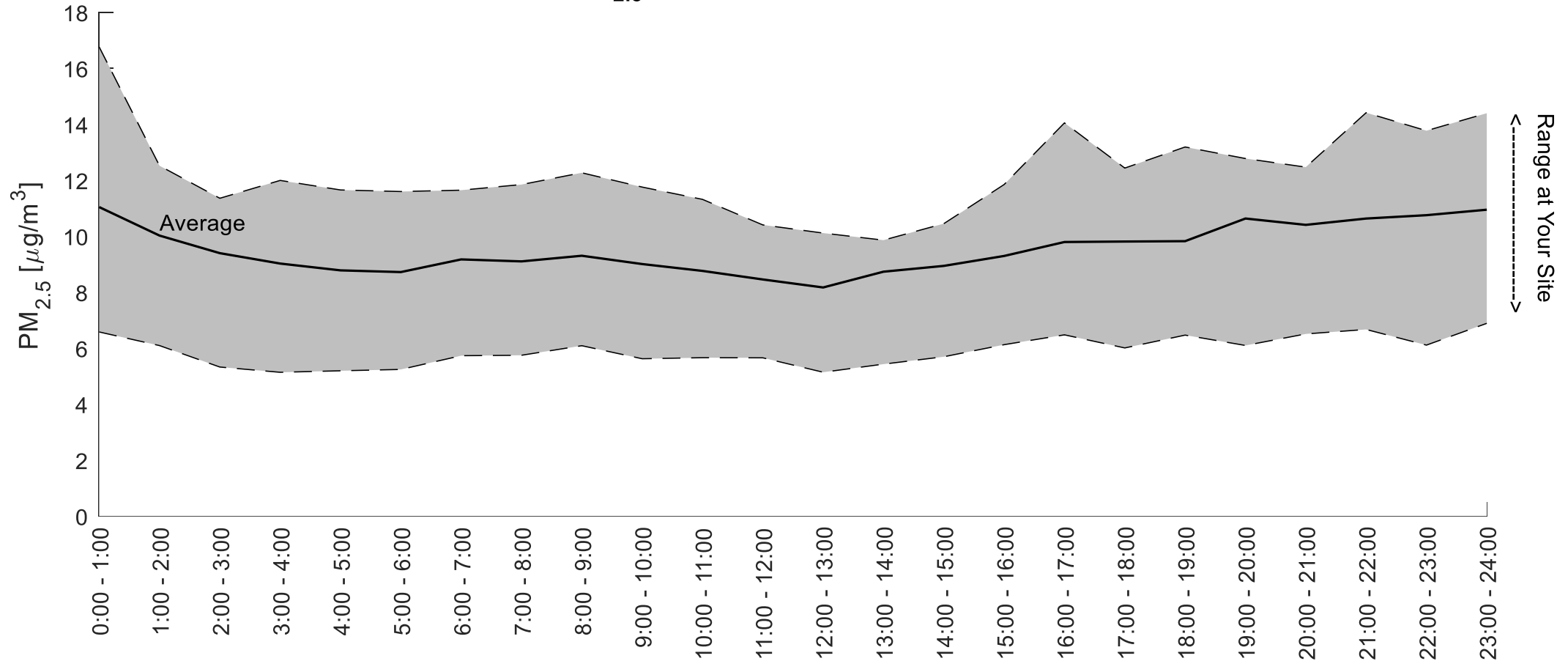


Allegheny County Health Department Sites

- Note: in this chart, collected RAMP data are averaged hourly, as it is at the ACHD stations

What is your site's daily pollution pattern?

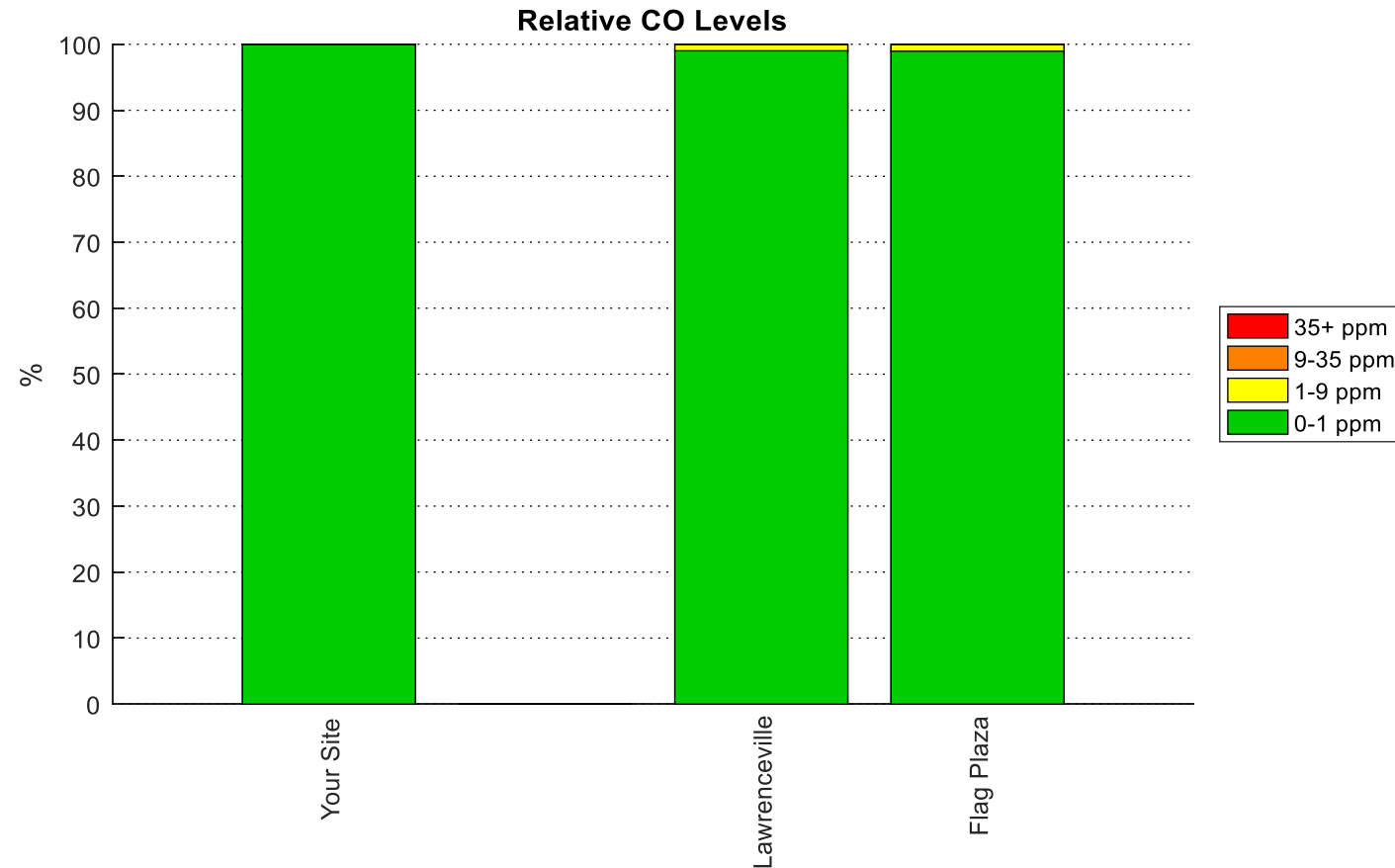
Hourly Averaged PM_{2.5} Concentration by Hour of the Day at Your Site



- The mean concentration of PM_{2.5} throughout the day at your site is around 10 $\mu\text{g}/\text{m}^3$
- Higher concentrations typically occurring in the around midnight (midnight to 7am)
- The times of the day with the lowest concentrations tended to be around noon (10am to 3pm)
- Note: range shown represents the 25th to 75th percentiles of the data at your site, averaged hourly.

Other Pollutants: Carbon Monoxide

- Carbon Monoxide (CO), measured in parts per million (ppm), is mainly produced by cars, trucks, and other gas-powered vehicles outdoors. Indoor CO levels can also be high if you use gas heaters or stoves in a poorly ventilated area^[1]
- Exposure to extreme levels of CO (600+ ppm) can cause loss of consciousness or death. At lower levels, people with heart diseases can be put under increased stress^[1]
- The NAAQS for CO are^[3]
 - CO should not exceed 35 ppm in one hour
 - CO should not exceed 9 ppm over eight hours
- The CO levels at your site were well within EPA limits, never exceeding 1 ppm on an hourly basis.
- Relative to other sites, your site has had lower CO levels than all other ACHD sites.

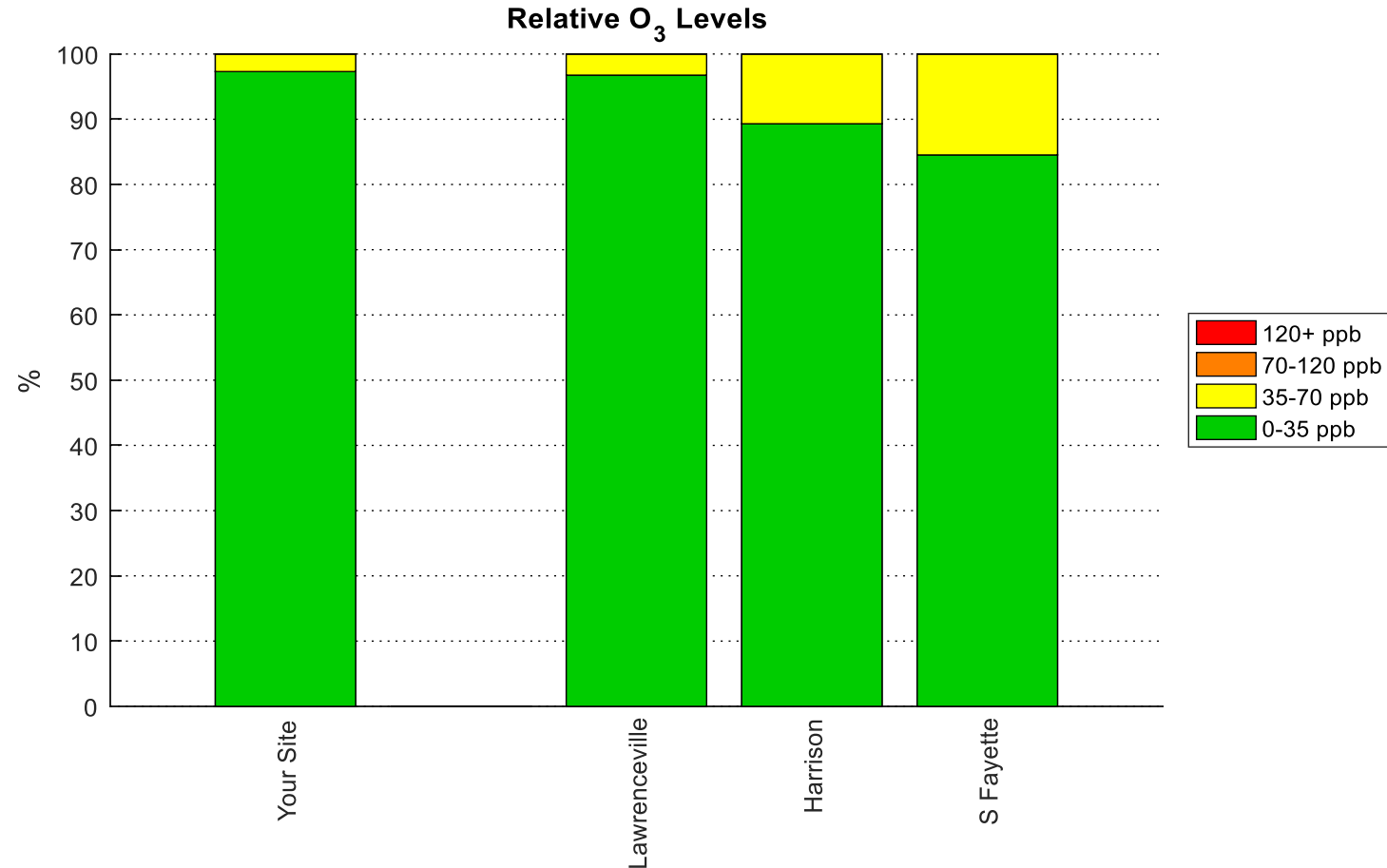


Allegheny County Health Department Sites

- Note: in this chart, collected RAMP data are averaged hourly, as it is at the ACHD stations

Other Pollutants: Ozone

- Ozone (O₃), measured in parts per billion (ppb), can be beneficial when it is high in the atmosphere, but breathing in Ozone at ground level can have many harmful effects, such as causing coughing and chest pain, damaging throat and lung tissues, and exacerbating other health problems like asthma and bronchitis^[1]
- The NAAQS for O₃ are^[3]
 - O₃ should not exceed 120 ppb in one hour
 - O₃ should not exceed 70 ppb over eight hours
- The O₃ levels at your site were well within EPA limits, with maximum hourly level of 38 ppb.
- The O₃ levels at your site were comparable to or lower than those observed at all other sites during the monitoring period.



Allegheny County Health Department Sites

- Note: in this chart, collected RAMP data are averaged hourly, as it is at the ACHD stations

References

- [1] EPA website: <https://www.epa.gov/criteria-air-pollutants>
- [2] Dockery, D. W., Pope III, C. A., Xu, X., Spengler, J. D., Ware, J. H., Fay, M. E., ... Speizer, F. E. (1993). The New England Journal of Medicine as published by New England Journal of Medicine. Downloaded from www.nejm.org on August 16, 2010. For personal use only. No other uses without permission. Copyright © 1993 Massachusetts Medical Society. All rights reser. *N Engl J Med*, 329(24), 1753–1759. <https://doi.org/10.1056/NEJM199410063311401>
- [3] EPA website: <https://www.epa.gov/criteria-air-pollutants/naaqs-table>
- [4] Allegheny County Health Department Air Quality Program; Draft Monitoring Plan for 2019. <http://www.achd.net/air/publiccomment2018/ANP2019draft.pdf>.

If you would like any additional information about anything presented in this report, please contact us:

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