

Site Report For Bradford Woods VFD Station 115

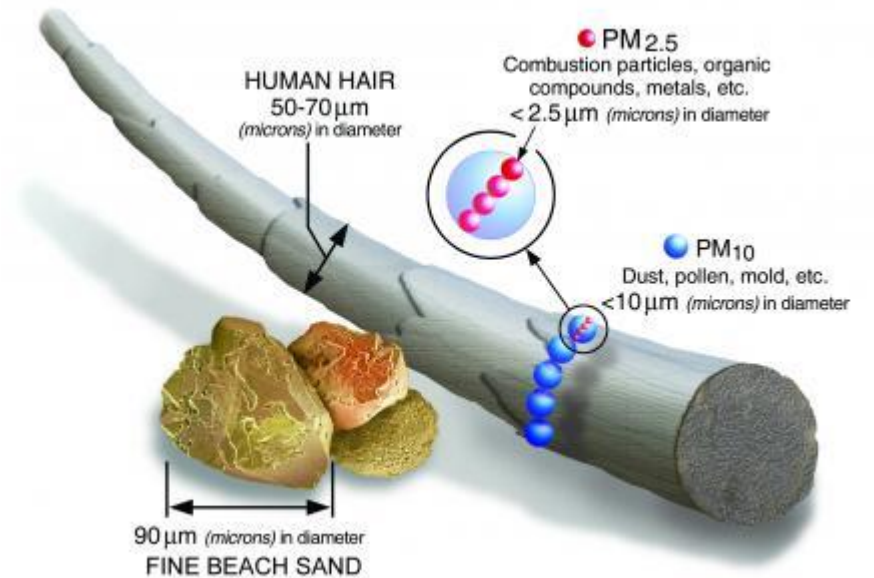
Center for Atmospheric Particles Studies
Carnegie Mellon University
5000 Forbes Avenue
Pittsburgh, PA, 15213

Report Covers: March 1st – 31st, 2019
Time logged: 634 hours (26.5 days)

RAMP data Mar. 2nd-5th is unavailable due to server maintenance. The report will not cover those dates.

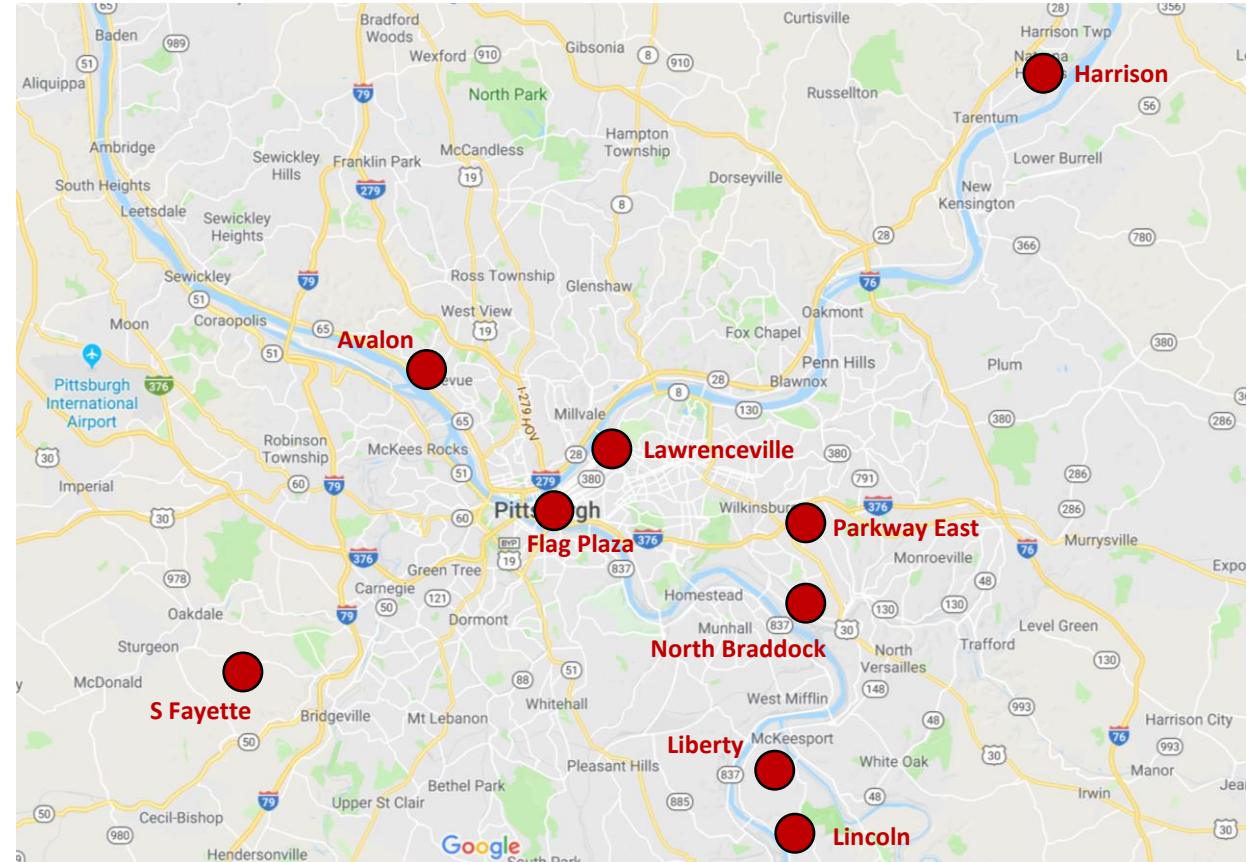
What is PM_{2.5}?

- 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

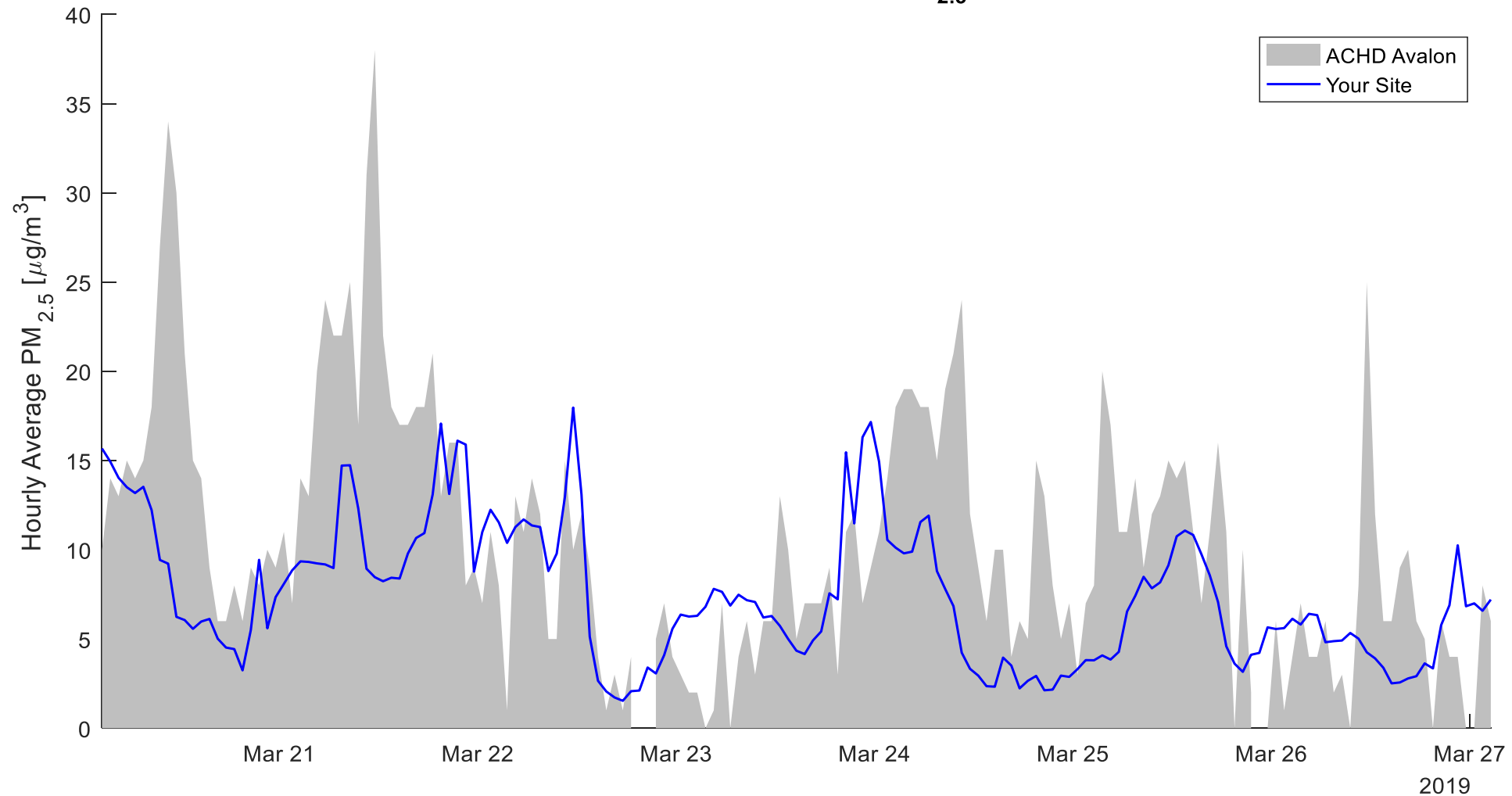
- To monitor Pittsburgh's compliance with the NAAQS, the Allegheny County Health Department (ACHD) maintains a network of air quality monitoring stations, as shown in the figure.
- This network uses highly precise (but very expensive) instruments to measure levels for the air pollutants regulated by 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

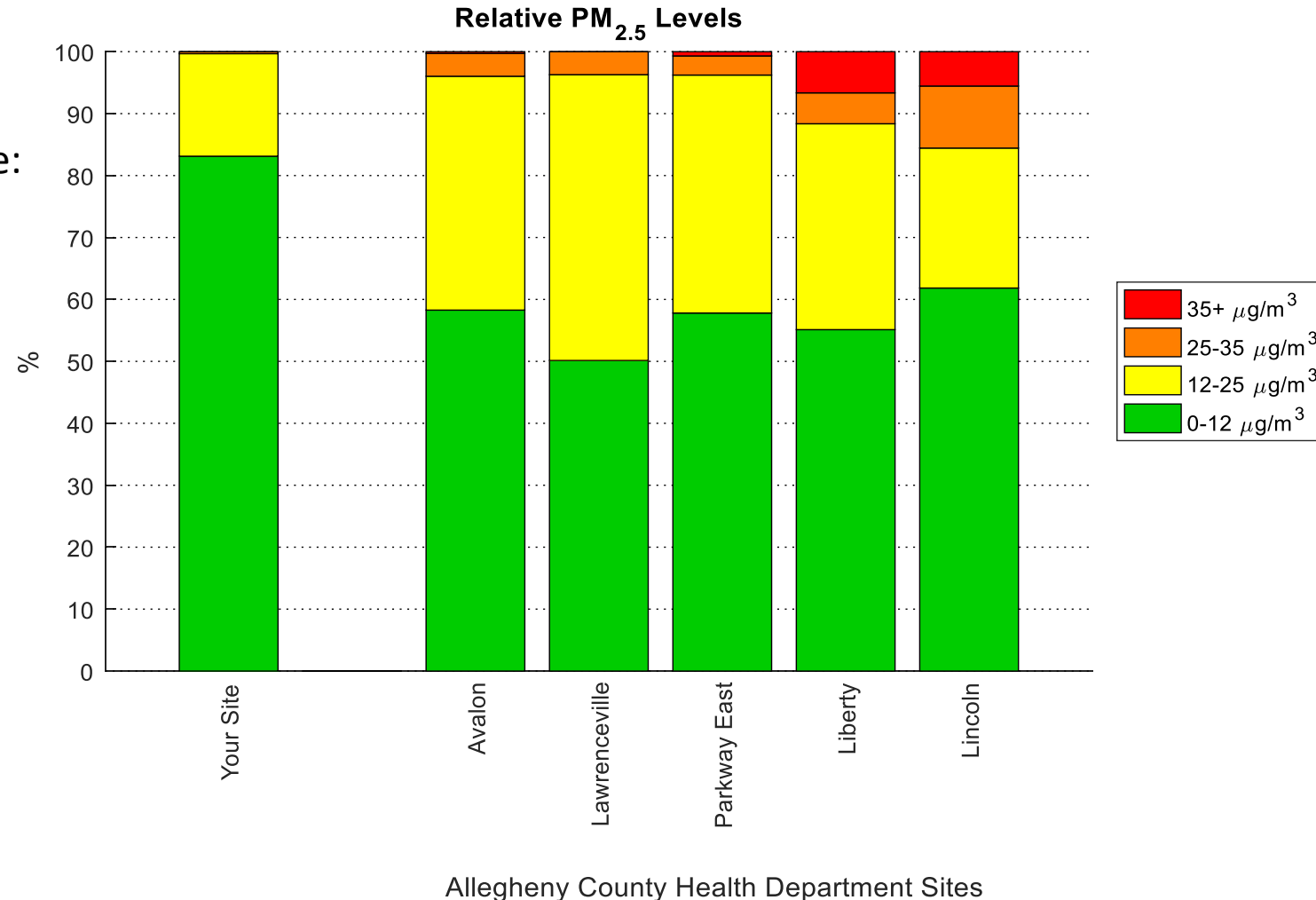
A Representative Week of PM_{2.5} Data



- 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.

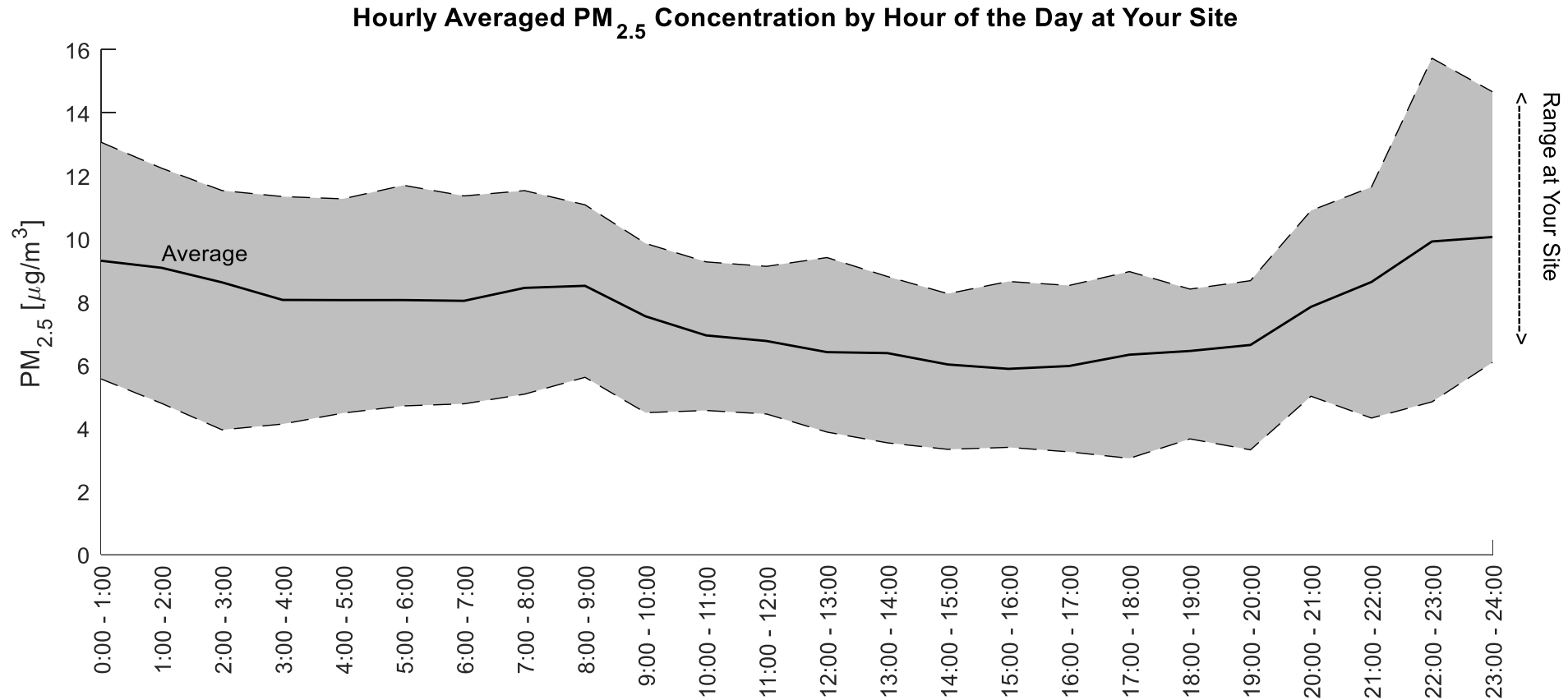
How your site compares to others

- 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)
- A higher percent of “low” concentrations were measured at your site than at all ACHD PM_{2.5} monitoring stations.
- Additionally, your site has seen the lowest proportion of “moderate” and “elevated” concentrations, with no “high” hourly levels recorded in the past month.
- This indicates that your site has typically been cleaner than the areas to its southeast.



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

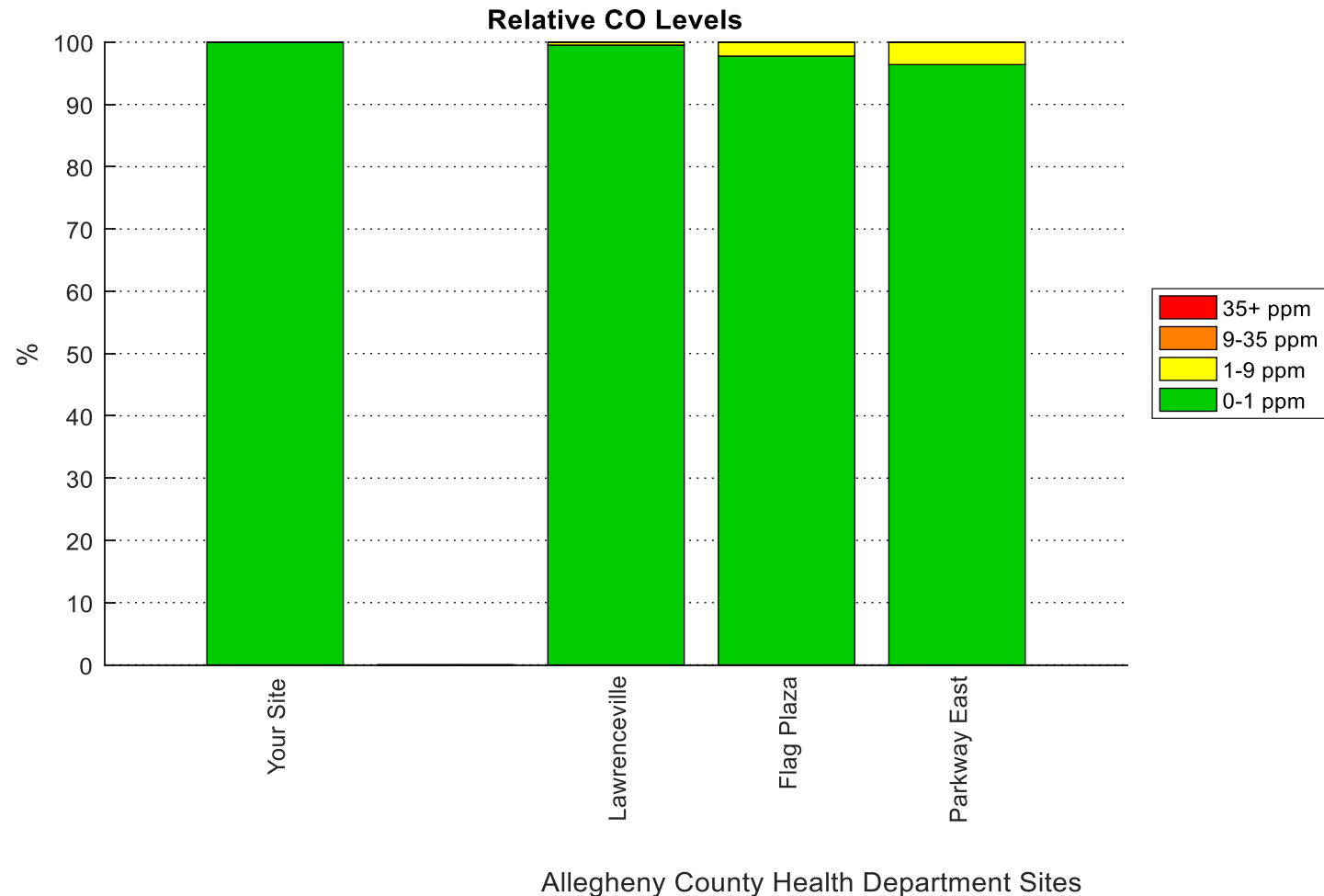
What is your site's daily pollution pattern?



- The mean concentration of PM_{2.5} throughout the day at your site is around 7.5 $\mu\text{g}/\text{m}^3$
- Higher concentrations typically occurring in around midnight (10pm to 2 am)
- The times of the day with the lowest concentrations tend to be in the afternoon (2pm to 5pm)
- Note: range shown represents the 25th to 75th percentiles of the data at your site, averaged hourly.

Other Pollutants: Carbon Monoxide

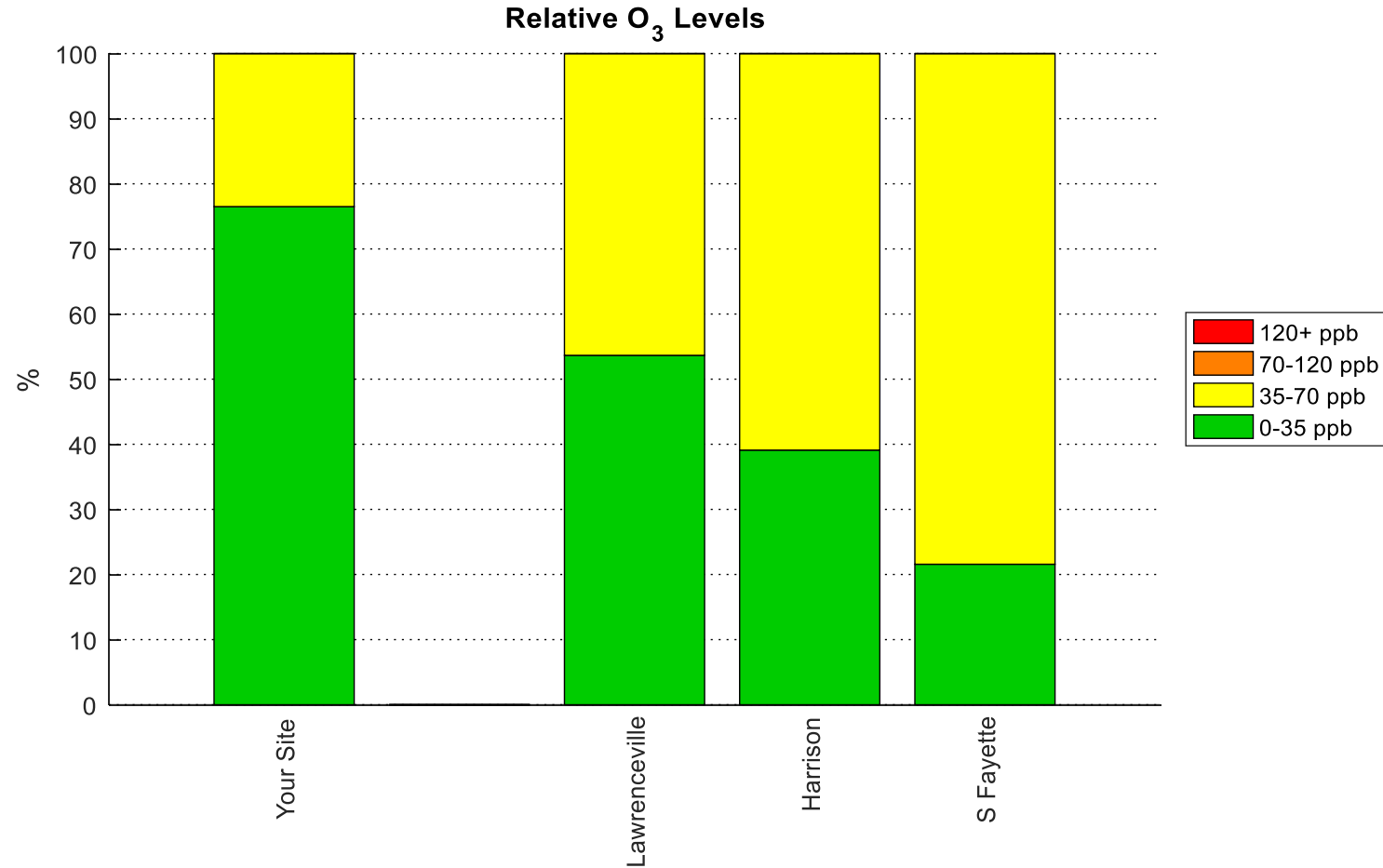
- Carbon Monoxide (CO), measured in parts per million (ppm), is mainly produced by cars, trucks, and other gas-powered vehicles outdoors. Indoor CO levels can also be high if you use gas heaters or stoves in a poorly ventilated area^[1]
- Exposure to extreme levels of CO (600+ ppm) can cause loss of 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 ACHD CO monitors, your site has seen slightly lower carbon monoxide levels in the past month.



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

Other Pollutants: Ozone

- Ozone (O_3), 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 O_3 are^[3]
 - O_3 should not exceed 120 ppb in one hour
 - O_3 should not exceed 70 ppb over eight hours
- The O_3 levels at your site were well within EPA limits, with a maximum hourly concentration of 47 ppb.
- The O_3 levels at your site were considerably lower than those recorded at ACHD monitoring stations in the past month.



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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