

# **Corona-Norco Family YMCA**

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## **AirAware Air Quality Monitoring Quarterly Report (02/2025 – 04/2025)**



**Photo of the Corona-Norco Family YMCA**

**Prepared by the  
AirAware Team**

# Corona-Norco Family YMCA

## AirAware Air Quality Monitoring Quarterly Report - #2

February 2025 - April 2025

*Prepared by the AirAware team*

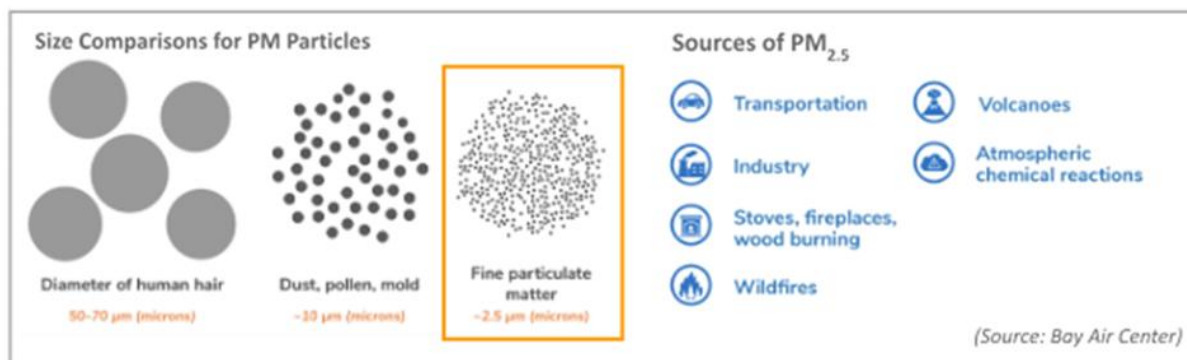
This report summarizes the recent air quality trends observed at your YMCA, focusing on the differences between indoor and outdoor fine particulate matter (PM<sub>2.5</sub>).

### Key Takeaways

- PM<sub>2.5</sub> levels varied across time and largely stayed within the Good and Moderate AQI range for outdoor and predominantly Good AQI for indoor conditions.
- Indoor levels during higher outdoor pollution days showed good HVAC filtration of outdoor particles, showing Good AQI indoors during Moderate AQI outdoors.
- Some trends have emerged over this quarter where indoor PM<sub>2.5</sub> rises above outdoor levels, often involving the Break Room, Hallway, and Sports Room. This may require further investigation by the YMCA.

### Background

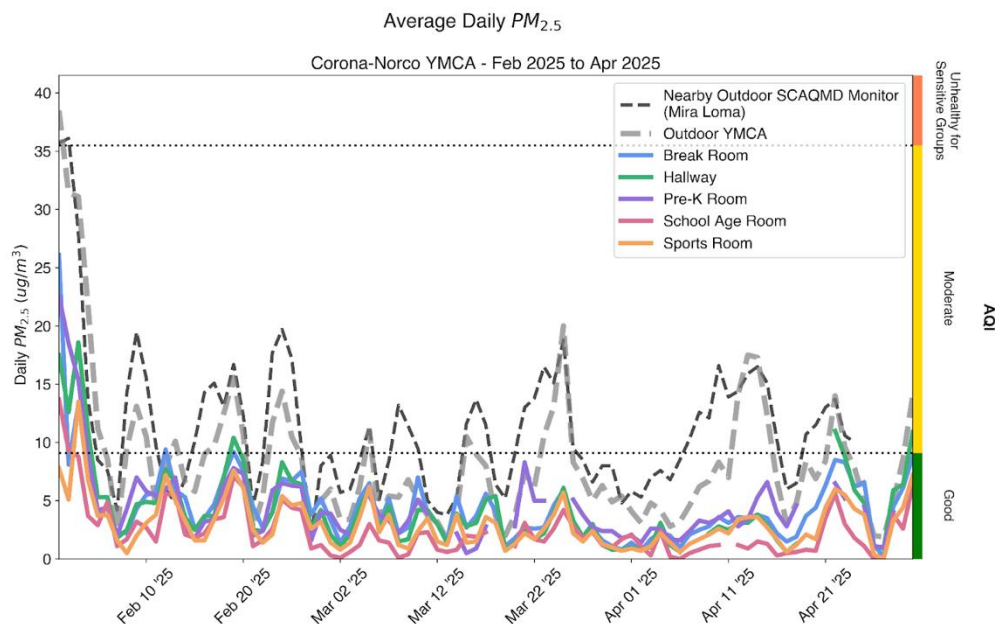
Particulate matter is an air pollutant made of tiny liquid and solid airborne particles that vary in size. Fine particulate matter (PM<sub>2.5</sub>), which is the focus of the AirAware project, describes an important subset of particulate matter that is 2.5 microns and smaller in size (~30x smaller than the diameter of a human hair) and predominantly comes from sources of combustion (burning of fuels), such as wildfires, residential wood burning, transportation, and industry.



Exposure to PM<sub>2.5</sub> has various detrimental health effects, such as aggravated asthma, decrease in lung function, increase in respiratory symptoms, and nonfatal heart attacks and premature deaths in people with heart and lung disease. It also impacts the environment through reduced visibility, damaged vegetation, and reduced soil nutrients, among many other impacts.

## Trends in Fine Particulate Matter (PM<sub>2.5</sub>)

Indoor and outdoor air quality monitoring at the Corona-Norco Family YMCA has been underway since late Fall 2024. This section explores the trends across time and space in Spring 2025.



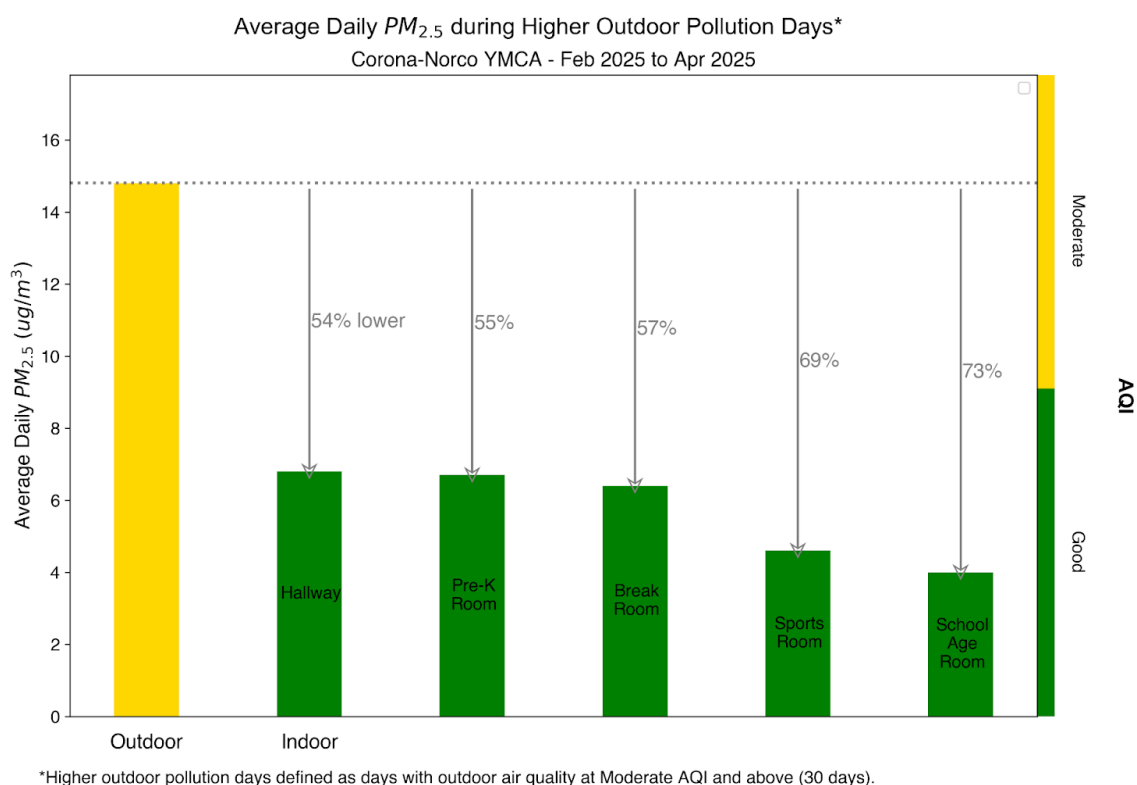
This plot shows average daily PM<sub>2.5</sub> levels across time for both the indoor (solid color lines) and outdoor (dashed grey line) AirAware monitors from the beginning of February 2025 to the end of April 2025. Data from a nearby regulatory monitor from the South Coast Air Quality Management District (SCAQMD) is also included (dashed black line). The Air Quality Index (AQI) categories coinciding with PM<sub>2.5</sub> concentrations are shown on the right with bounds shown across the plot in dashed black lines, helping to provide health context. Any gaps in the data are due to issues in power or WiFi/cellular connectivity.

### What does this plot tell us?

- From February 2025 to April 2025, PM<sub>2.5</sub> levels varied across time, and largely stayed within the Good and Moderate AQI range for outdoor levels, but stayed in the Good AQI for indoor levels. The highest outdoor PM<sub>2.5</sub> levels occurred in early February, with levels rising into the Unhealthy for Sensitive Groups AQI. Indoor levels remained in the Moderate AQI during this time. These outdoor February measurements are consistent with winter trends in Southern California, where PM<sub>2.5</sub> levels are higher due to atmospheric conditions and lower winds compared with other seasons.
- The outdoor YMCA monitor often showed lower PM<sub>2.5</sub> levels than the nearest regulatory monitor from the South Coast Air Quality Management District (SCAQMD). The regulatory monitor is about 8 miles Northeast from the YMCA. This may be due to real differences in PM<sub>2.5</sub> across space, but also could be due to the performance of the AirAware monitors. These monitors have not been directly evaluated against the SCAQMD monitor, so we cannot draw conclusions about any differences between the two.

## Comparison of Indoor and Outdoor PM<sub>2.5</sub>

The relationship between indoor and outdoor PM<sub>2.5</sub> is important to explore as it can tell us how effective your YMCA is at filtering out particulate matter from outdoor sources and can help highlight indoor air quality concerns and any needs for HVAC improvement.



The bar chart above compares average daily outdoor (left) and indoor (right) PM<sub>2.5</sub> levels during higher outdoor pollution days. The color of each bar chart coincides with an AQI category, and the arrows from the grey dashed line and coinciding percentages indicate how much lower average indoor levels are per room compared to outdoor. The indoor spaces are ordered from most to least similar to outdoor levels.

For this quarter, we are considering "higher" pollution days to be anything above Good AQI. However, air pollution was acceptable during this time, and only one day saw outdoor levels above Unhealthy for Sensitive Groups. This let us draw conclusions about indoor and outdoor PM<sub>2.5</sub> comparisons from more data.

### What does this chart tell us?

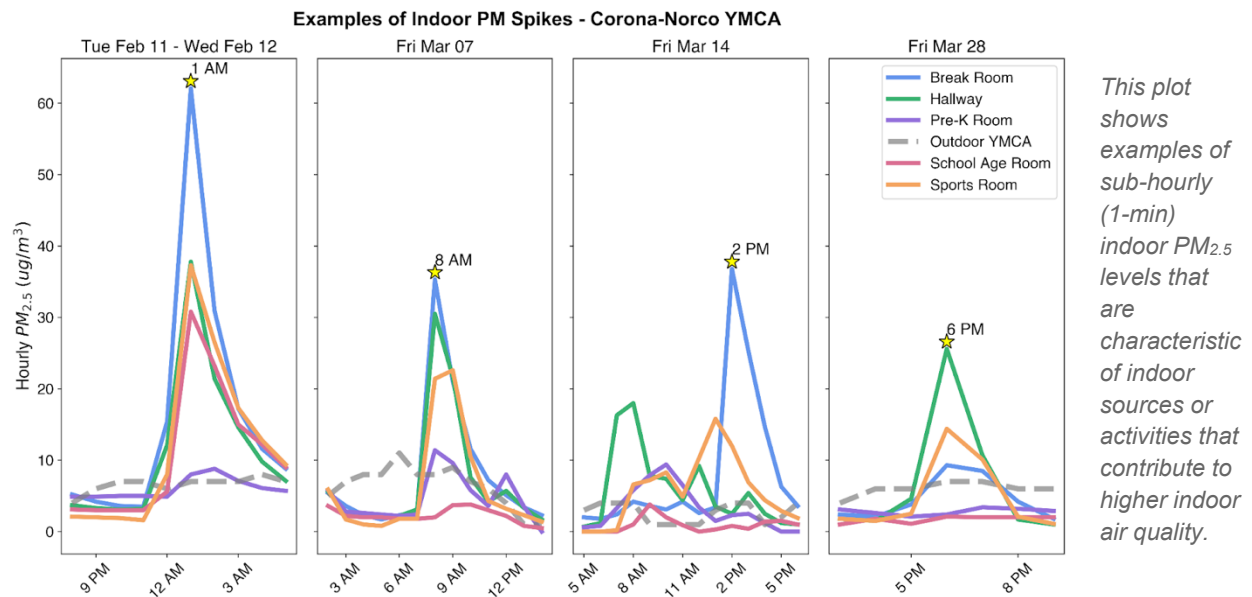
- On average, we expect indoor PM<sub>2.5</sub> levels to be between 30% and 80% lower than outdoor levels on average, depending on currently installed HVAC filtration. For this second quarter, all average indoor levels during higher pollution days were within the expected range. This means the HVAC filtration system is working as expected.
- When outdoor air quality was in the Moderate AQI, all indoor spaces were on average in the Good AQI, highlighting that the current HVAC system is effectively filtering outdoor



particles from indoor air. Statistical analysis also showed that the averages across the rooms were similar.

## Questions about Indoor PM<sub>2.5</sub>

Indoor sources and activities can also contribute to higher indoor air quality levels, and exploring these trends can help identify contributing indoor activities or behaviors and provide insight on possible changes to improve indoor air quality.



- Some trends have emerged over this quarter where indoor PM<sub>2.5</sub> rises above outdoor levels. The timing is not consistent across the peaks, but three out of four peaks occurred during the day on Fridays in March (inconsistent with the overnight cleaning activities discussed in the last quarterly report). These higher levels often involved the Break Room, Hallway, and Sports Room. While daily averages were in the Good AQI, these periodically higher hourly PM<sub>2.5</sub> levels can still have an impact on health. **What could be causing these periodic indoor spikes in PM<sub>2.5</sub> in the Break Room, Hallway and Sports Room?**
- During one period in mid February, all the indoor spaces, apart from the Pre-K Room, rose substantially higher than hourly outdoor levels overnight, with the Break Room being the highest.

