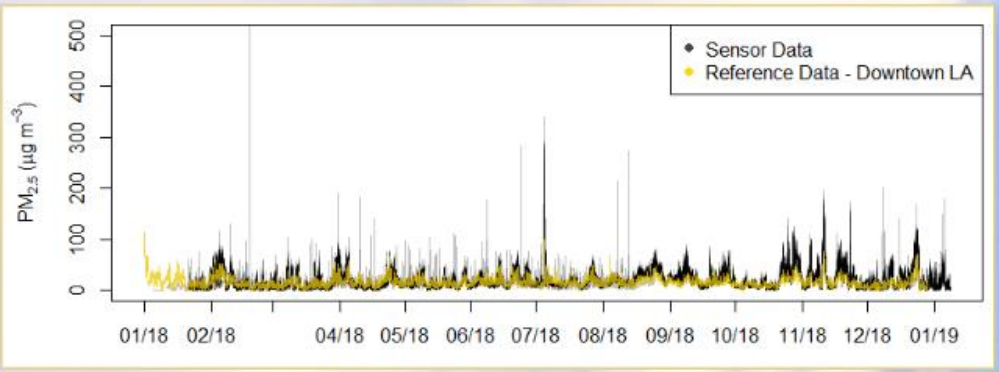
What can we learn from these PurpleAir sensors about outdoor air

A QUICK LOOK AT THE APIFM PURPLEAIR SENSORS

This analysis uses all available data from January 2018 - January 2019.
Note, the results presented here are preliminary.

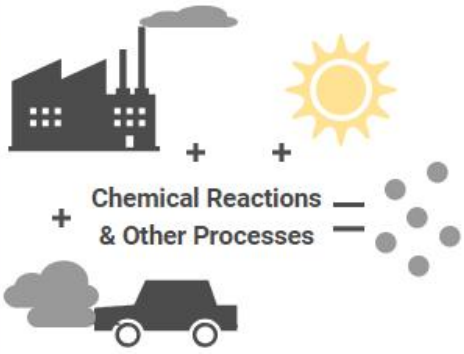
A YEAR OF DATA

- *Similar $PM_{2.5}$ trends across all 31 sensors & reference data*
- *Darker = overlapping*
- *Lighter = single sensor*

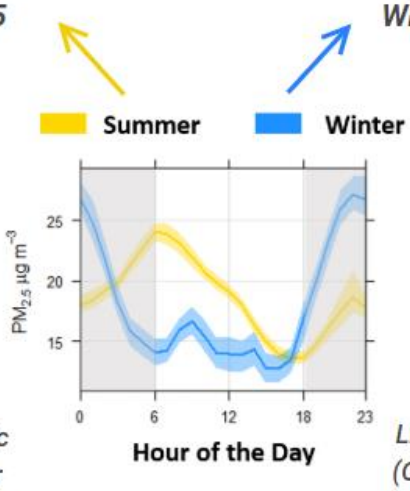


WHEN IS $PM_{2.5}$ HIGHER? ...DEPENDS ON THE SEASON

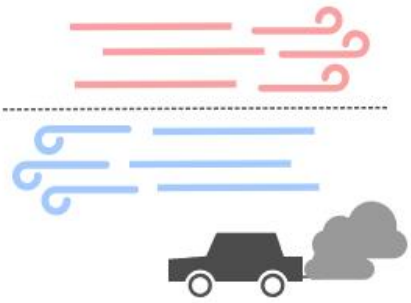
Summer - increased daytime PM2.5



*Likely due to increased "secondary organic aerosol" formation (Or, gases and smaller particles making larger particles in sunlight)**



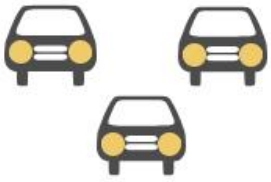
Winter - increased night-time PM2.5



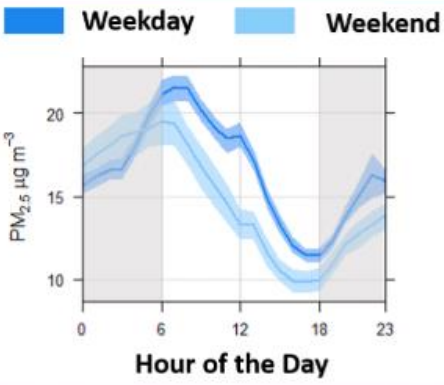
Likely due to stronger nightly "inversions" (Or, stable conditions caused by a layer of warm air over a cold one trapping emissions)

*Applies to late morning and afternoon, but the early morning peak is likely driven by other factors

...ALSO ON THE DAY OF THE WEEK



Elevated levels on weekdays are likely due to morning rush hour and increased traffic
(data used: spring and summer)



The sensor data reflects expected trends, and if sensors can show us when air quality is behaving as we might expect, can they also highlight anomalies and provide new information at sites?

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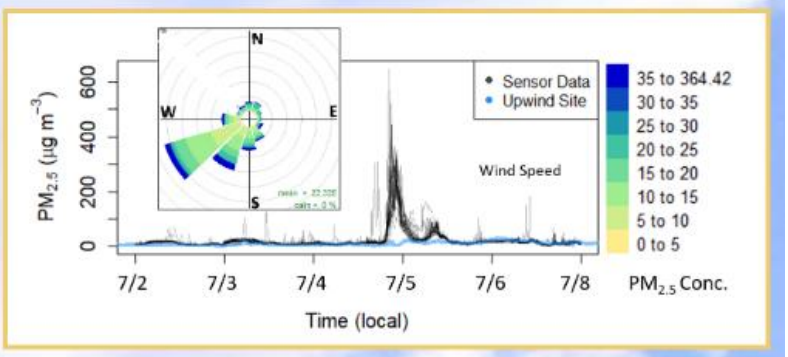
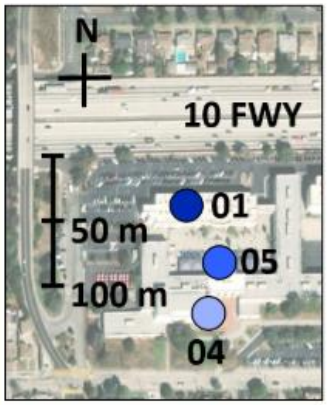
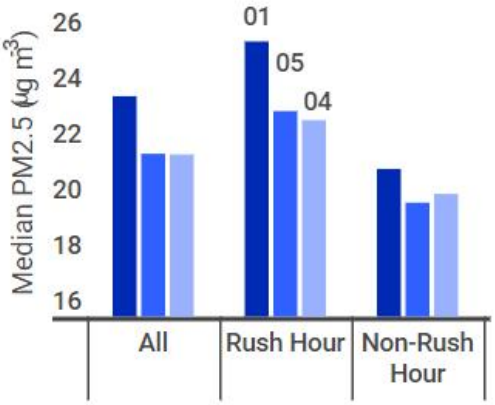
UNIQUE EMISSION EVENTS

- *High $PM_{2.5}$ on July 4th*
- *Southwest winds seem to be transporting emissions from fireworks shows in and around DTLA*
- *Sites upwind -> lower $PM_{2.5}$*



WHAT ABOUT THE 10 FWY?



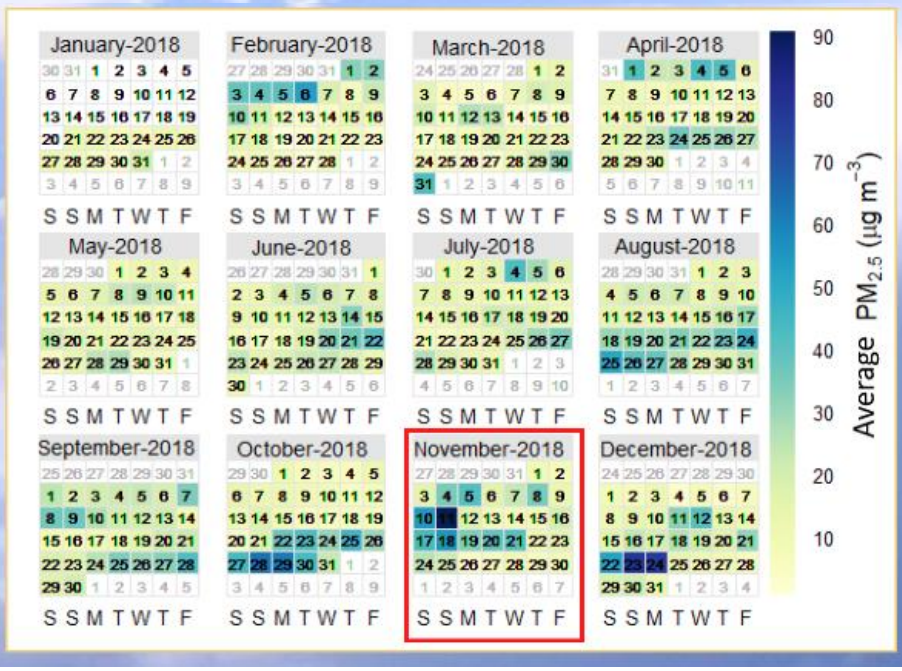


- *Data selected: summer, weekday, with northerly winds*
- *High $PM_{2.5}$ next to FWY is elevated during rush hour*
- *Lower levels during non-rush hour time*
- *Patterns such as this can help highlight when and where exposure may be the highest*

Other Events...

- *Average $PM_{2.5}$ for each day*
- *In winter months inversions may result in increased $PM_{2.5}$ for several days at a time*
- *In November, an additional contributing factor was the Woolsey Fire (11/8-11/21)*

These sensors seem to be able to provide indicative information about local air quality and air quality trends.



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