

# LISTOS Measurements at the Yale Coastal Field Station (Guilford, CT) and in New York City

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- Lukas Valin (EPA) et al.
- Pete Babich (CT DEEP) et al.
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- Ethan Weed and Amir Bond (Peabody Evolutions Interns)
- Fred Moshery (CCNY)
- NOAA NYC collaborators: Brian McDonald, Carsten Warneke, Matt Coggon, Georgios Gkatzelis

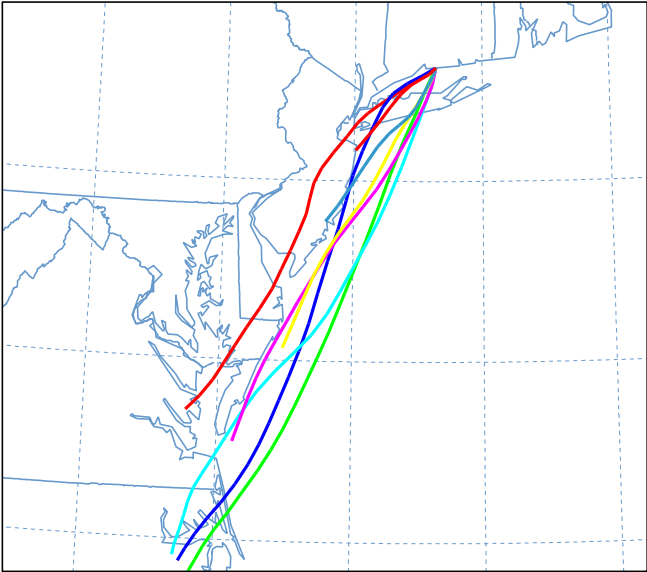


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# Site Locations



Several typical trajectories of air parcels over ~1 day prior to arrival

# Measurements (reference)

## Coastal CT site (year-round)

- $O_3$
- $PM_{2.5}$
- Black carbon
- $NO_x$  ( $NO/NO_2$ )
- CO
- $CO_2$
- $SO_2$
- Offline gas- and aerosol-phase chemical speciation via adsorbent tubes and filters (incl. speciated VOCs and OA)
- Local meteorology
- AERONET (w/ F. Moshery, CCNY)

## Inland CT site (Summer 2018)

- Boundary layer height via ceilometer
- $O_3$

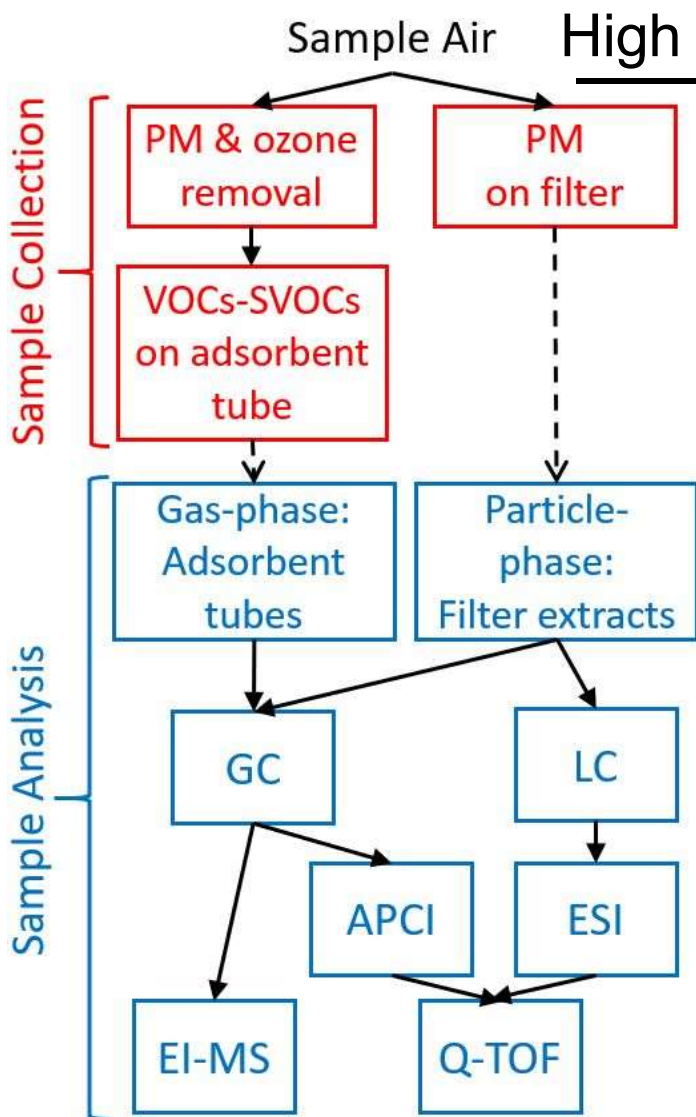
## NYC - Manhattan (with NOAA, Summer 2018)

- Offline gas- and aerosol-phase chemical speciation via adsorbent tubes and filters (incl. speciated VOCs and OA)

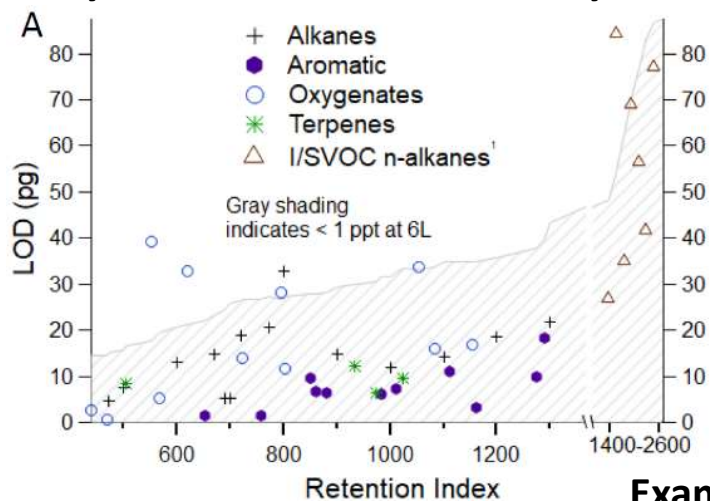




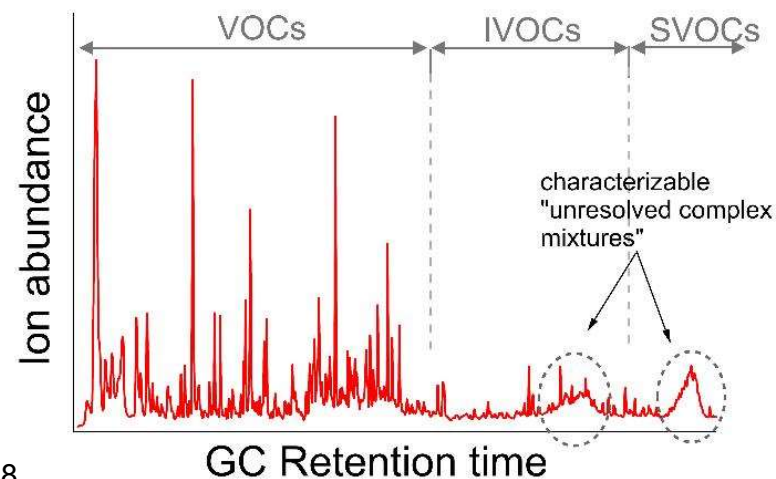
# High chemical resolution offline measurement capabilities



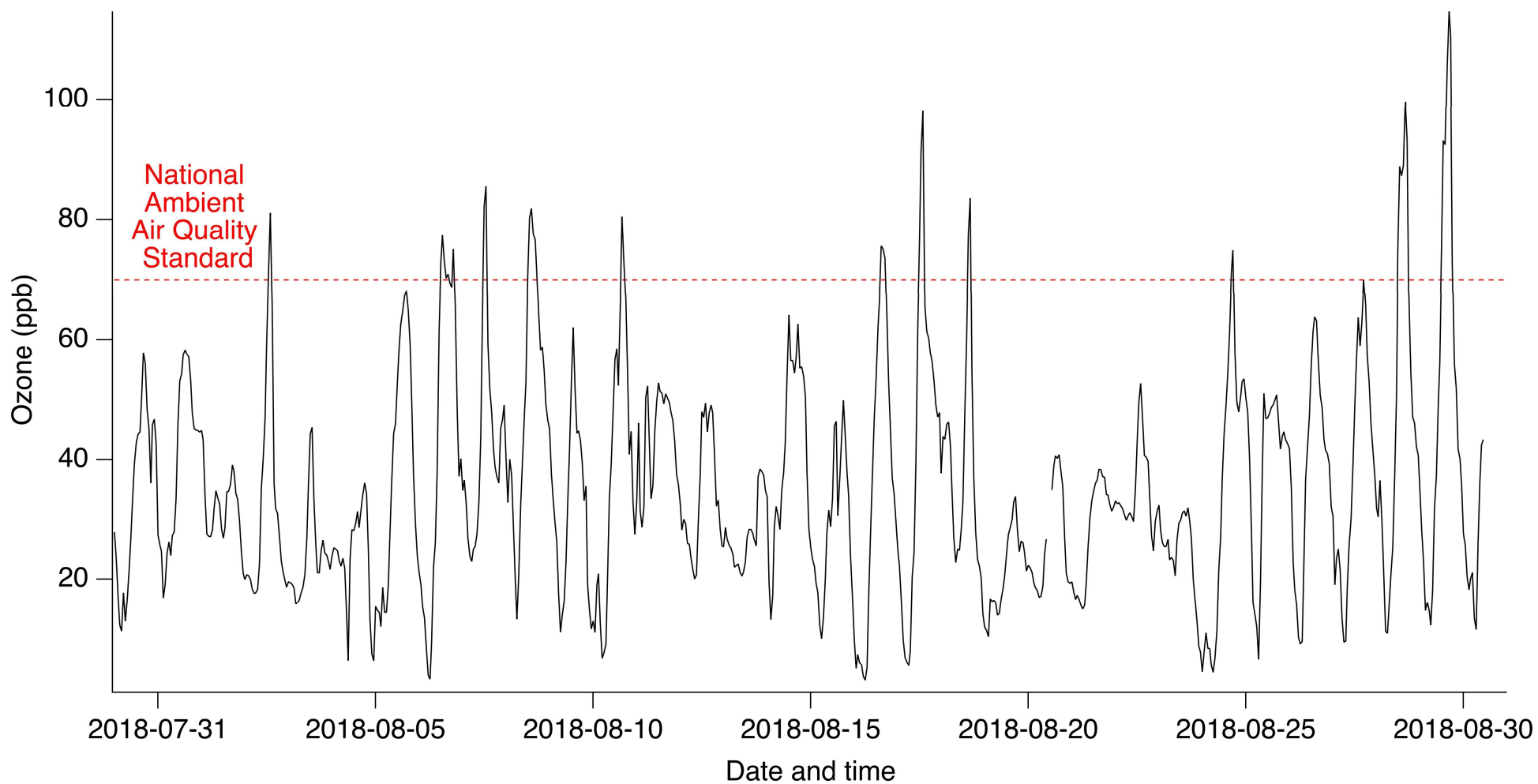
## Very low LODs across a diversity of analytes



## Example: Gas-phase organics in NYC

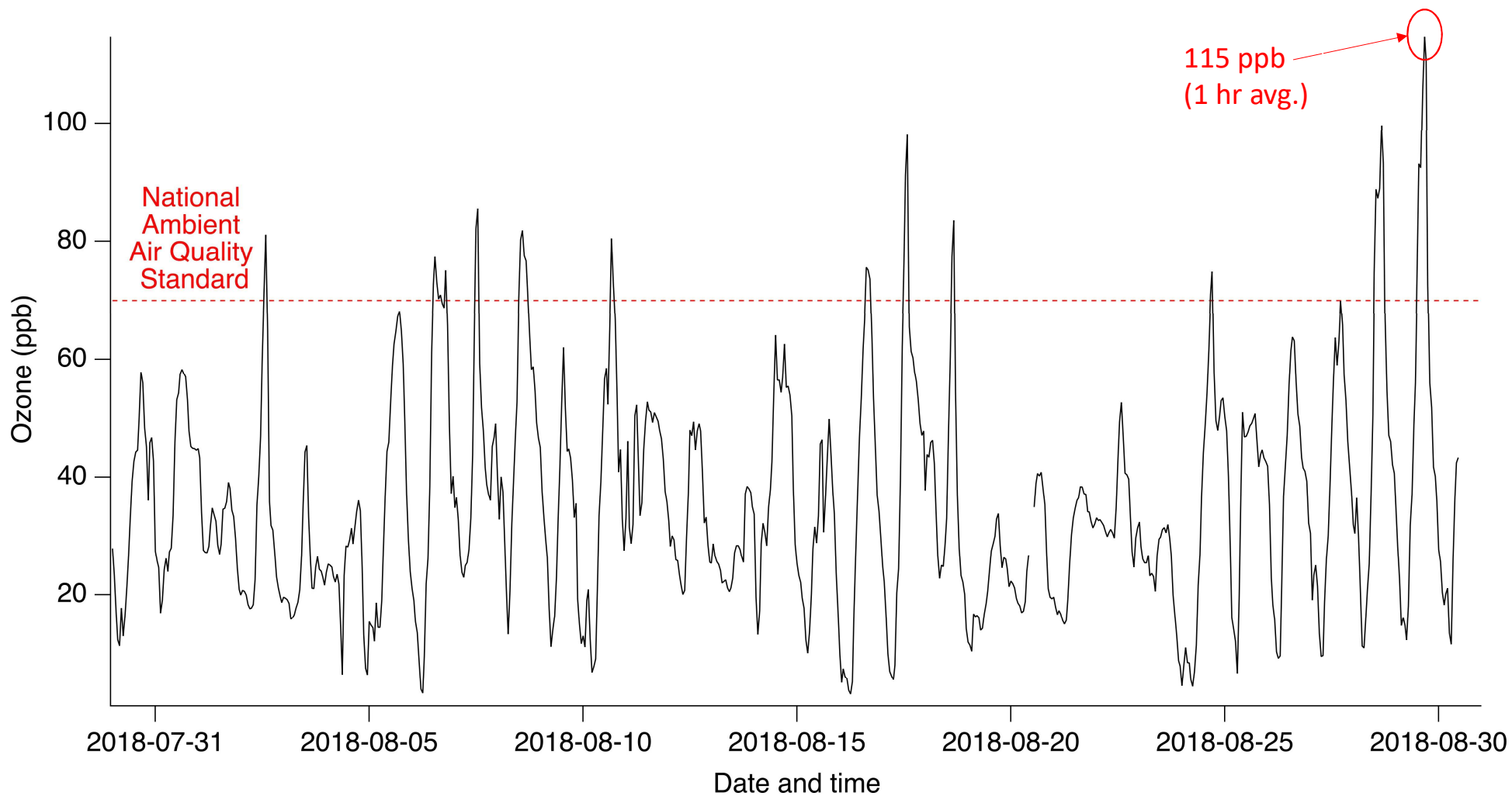


# Ozone – Coastal CT site

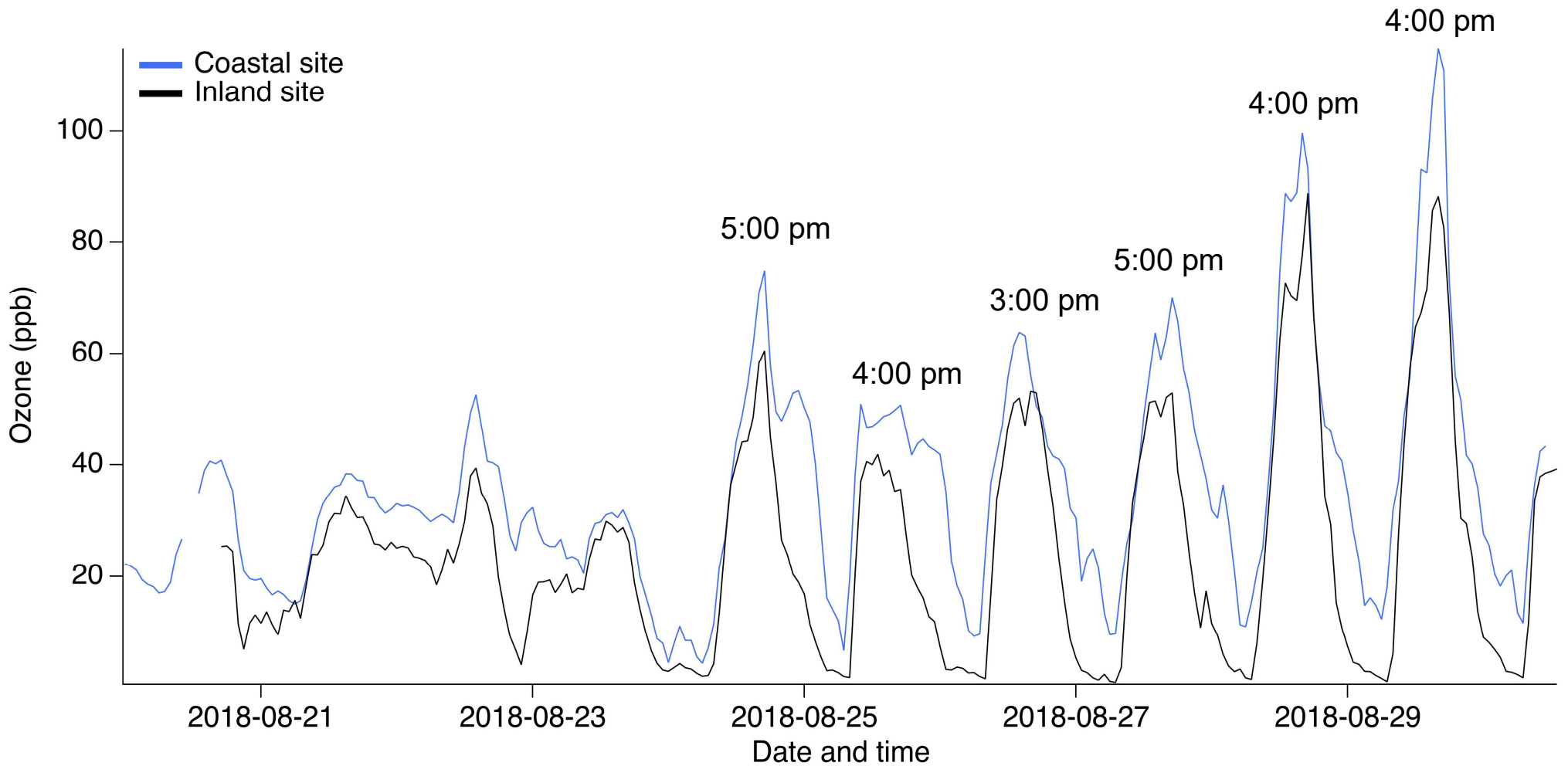




# Ozone – Coastal CT site



# Ozone – Coastal CT and inland CT measurements

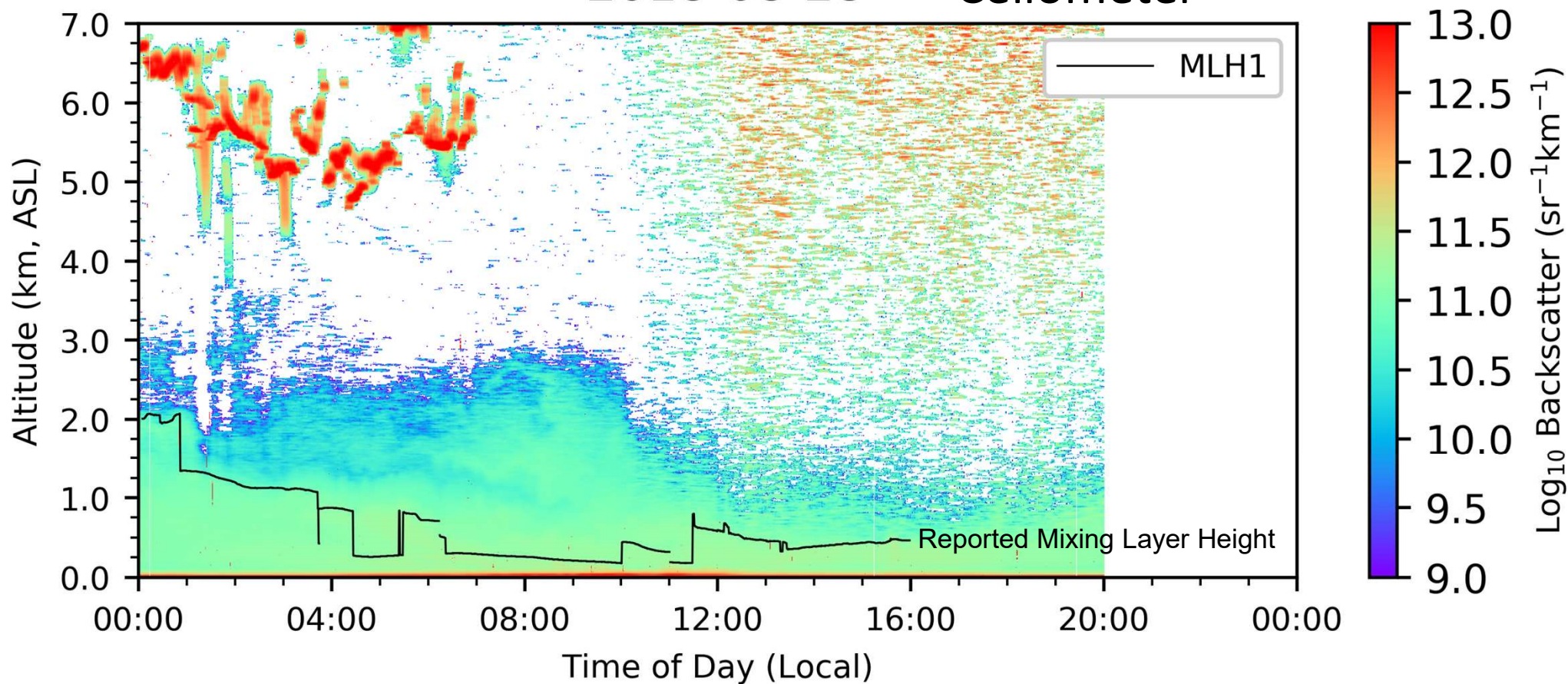




# Boundary layer measurements – Inland site

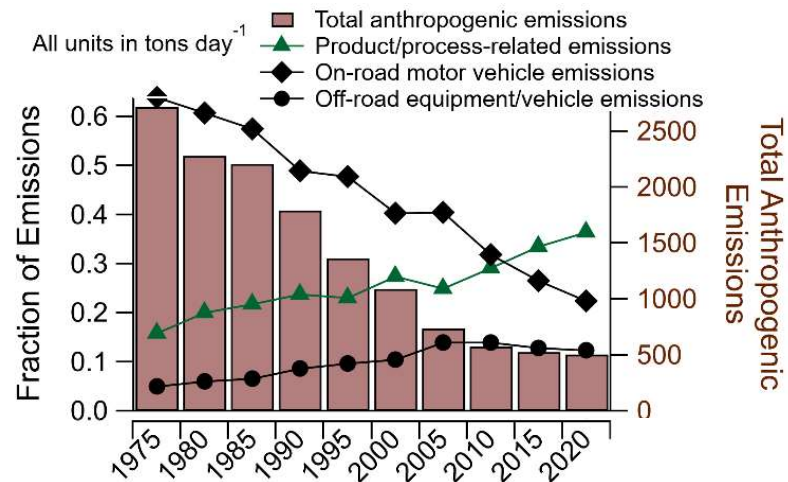
2018-08-28

Ceilometer



# Increasing influence of non-combustion sources on urban air quality

The fraction of total emissions from **known** consumer, commercial, and industrial products and materials is increasing



## Khare & Gentner, ACP 2018

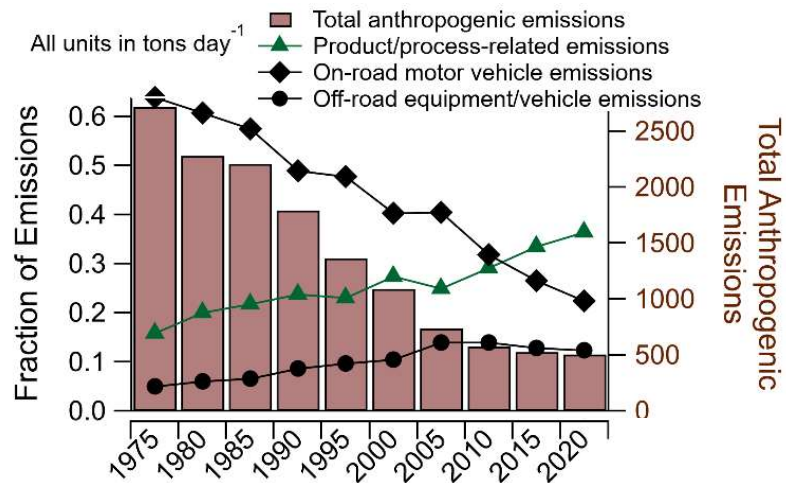
- Defines a comprehensive emissions framework
- Emissions over lifecycles
- Multiple emission pathways of solvents, solutes, and degradation by-products
- VOCs, IVOCs, and SVOCs
- Most are fossil fuel-derived and the SOA produced is often misattributed

Emissions Data: SoCAB, CARB inventory



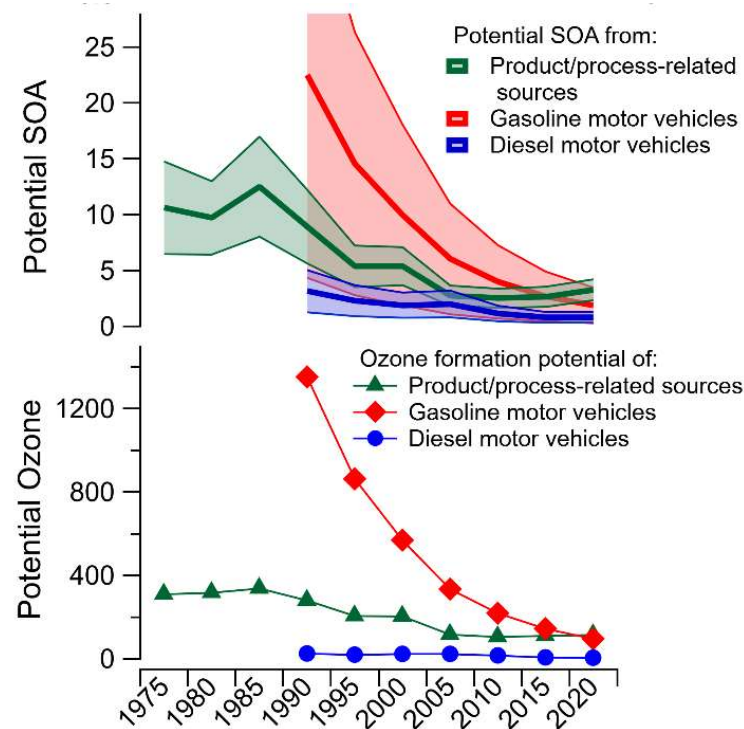
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Khare & Gentner, ACP 2018

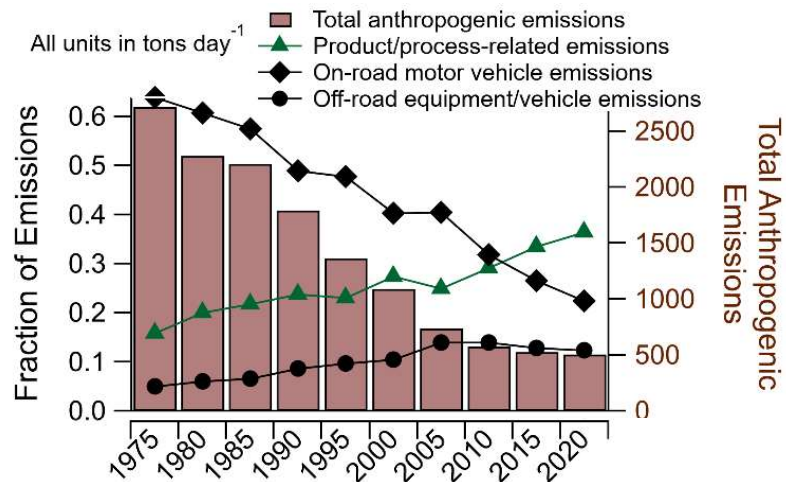
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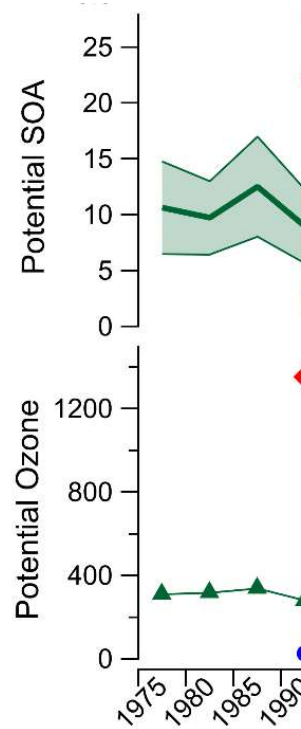
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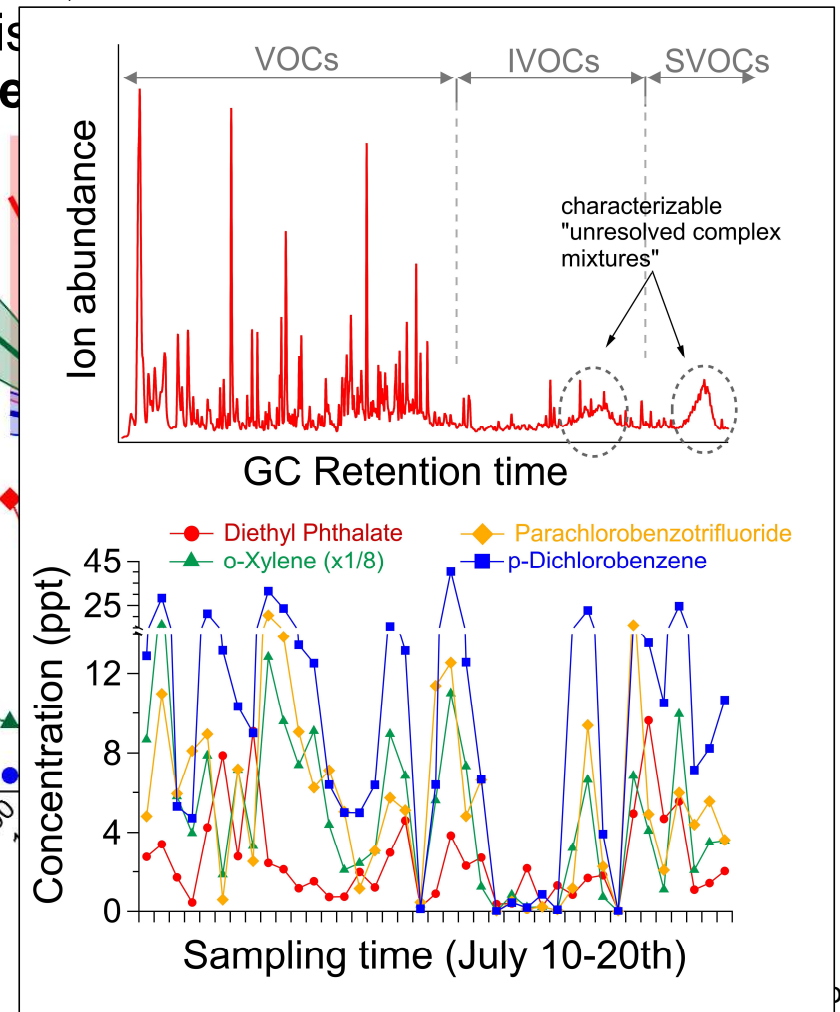


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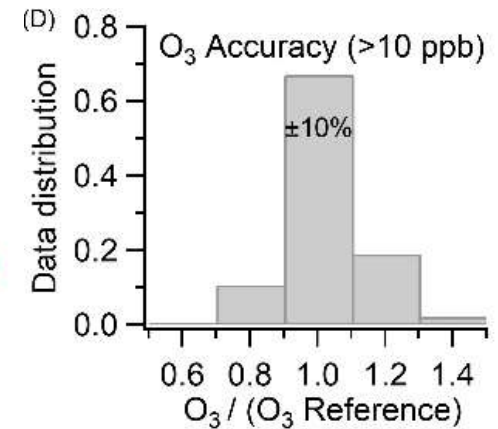
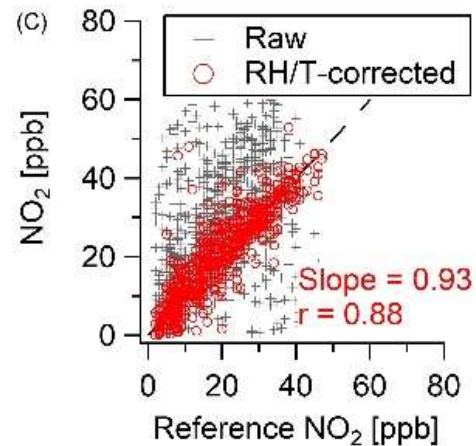
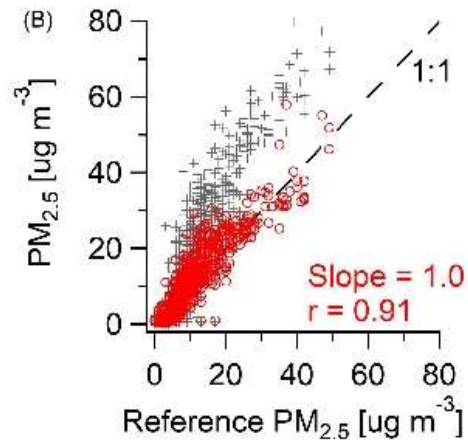
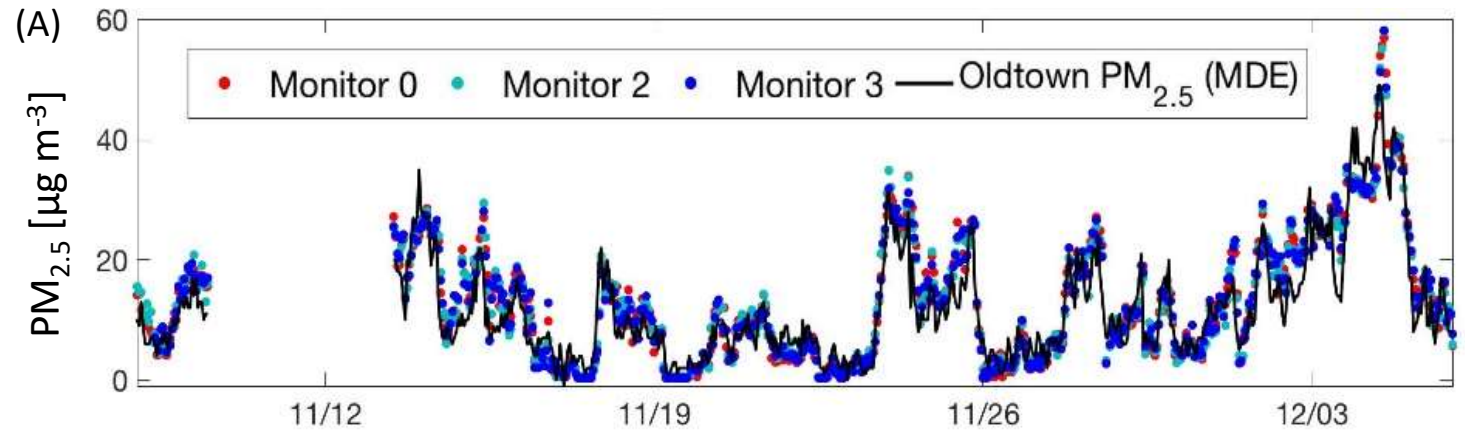
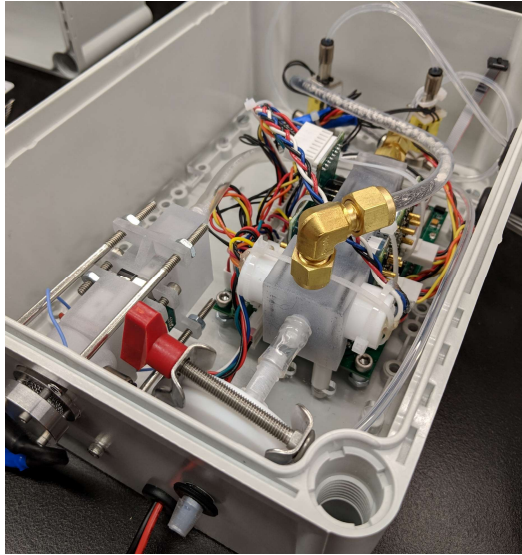


NYC – Manhattan Measurements



# Yale-Johns Hopkins SEARCH Center Dense Urban Network in Baltimore

50+ stationary sites, 200+ participants with portable monitors



Zamora et al., ES&T 2019; Xiong et al., in prep



# Measurements Summary

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