

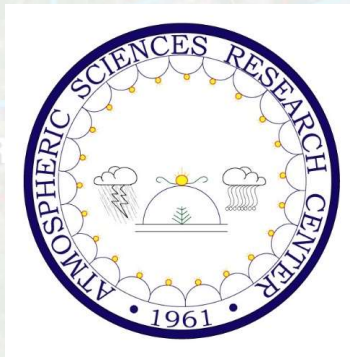
Canister Samples Collected Using the ASRC Mobile Laboratory During LISTOS 2018

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Methods

- Sample Collection: Entech CS1200E passive sampler. Roughly one hour (~50 min) integrated whole air samples in 6 L canisters.
- Analysis: DEC Rensselaer Lab GC-MS Method TO-15
 - Forty plus “toxics” species quantified with a TO-15 standard.
 - Forty plus additional “PAMS” non-polar hydrocarbons quantified using a PAMS standard.
- Note: This sampling and analysis method does not measure anything above C_{12} nor most oxygenated hydrocarbons.

Sample Collection

- **22 total canister samples**, 17 at Flax Pond and 5 collected while parked at near-road locations
- **Often collected in groups of three:** Flax Pond, near road, Flax Pond
 - Three samples including a near road sample collected on the following dates
 - 6/24/2018 – Long Beach (south shore)
 - 6/30/2018 – Robert Moses State Park (south shore)
 - 7/1/2018 – Sands Point (north shore)
 - 7/2/2018 – Sands Point (north shore)
 - 8/6/2018 – Sands Point (north shore)
 - Additional (Flax Pond only) samples collected
 - 7/10/2018 – 2 samples
 - 7/15/2018
 - 7/16/2018 – 2 samples
 - 8/5/2018 – 2 samples

Sands Point

Flax Pond



Long Beach

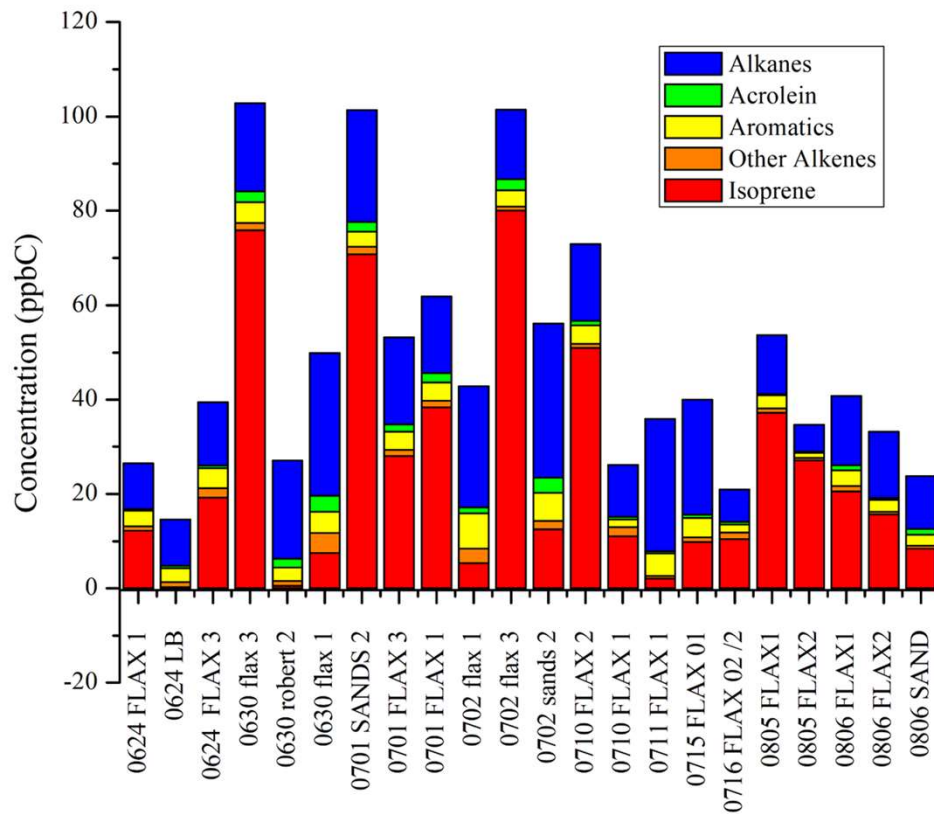
Robert Moses SP

State Park

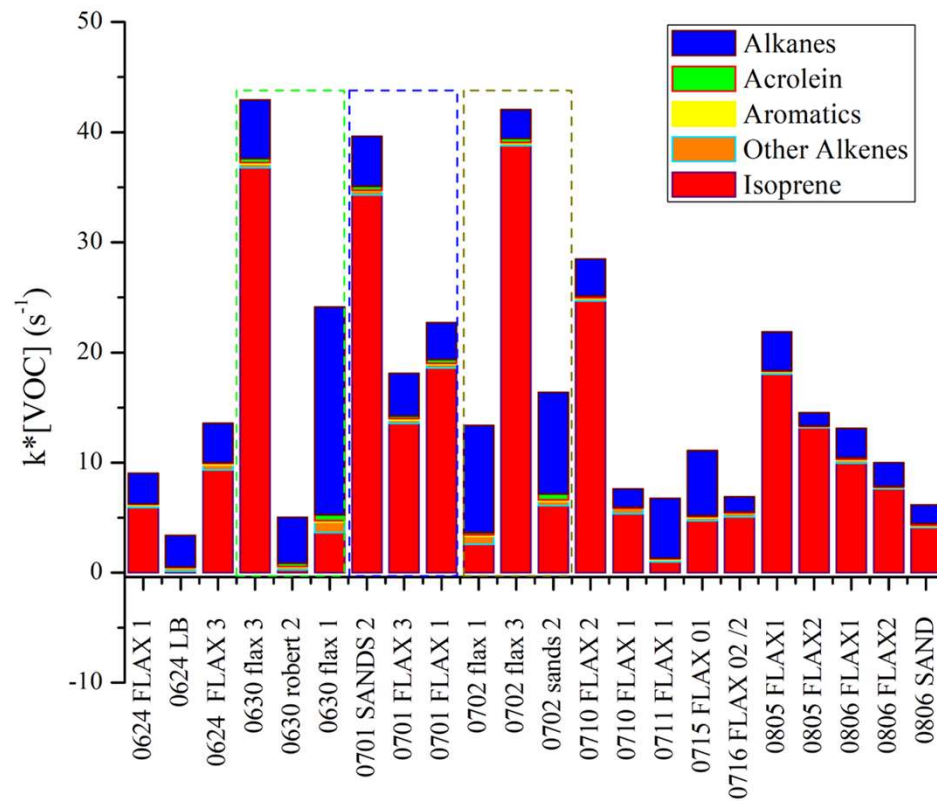
Results – VOC Reactivity (VOCR)

- Express results in terms of the OH reactivity of the VOC mixture. This is a measure of the ozone producing capacity (or ozone production rate potential) of the VOCs in the sample.
- We considered a group of 30 of the most abundant and/or reactive PAMS compounds – 18 alkanes, 5 alkenes including isoprene, 6 aromatics, and acrolein.
- VOCR (VOC Reactivity) = $\sum k_{\text{VOC}_i} [\text{VOC}_i]$, where i denoted one of the 30 VOCs
- VOCR of roughly 20 s^{-1} represents a moderately reactive system (value representative of SOAS)

Concentration Results for all samples



VOCR Results for all samples

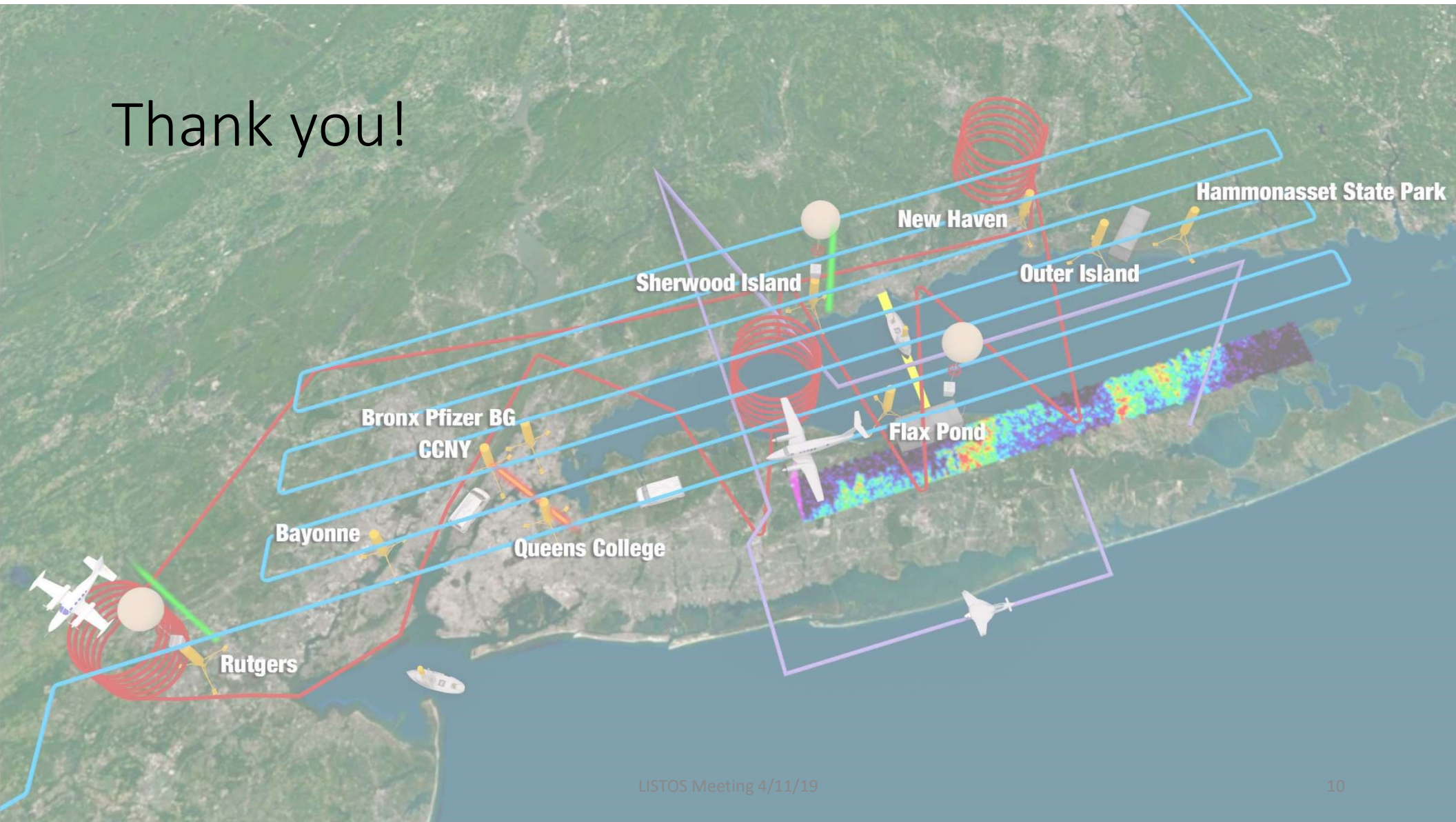


- Isoprene dominates overall, but is highly variable
- Highest measured reactivity observed during 6/30 – 7/2 major ozone episode
- Alkanes important contributors, and sometimes dominate a given sample (Mostly pentanes and hexanes)

Questions

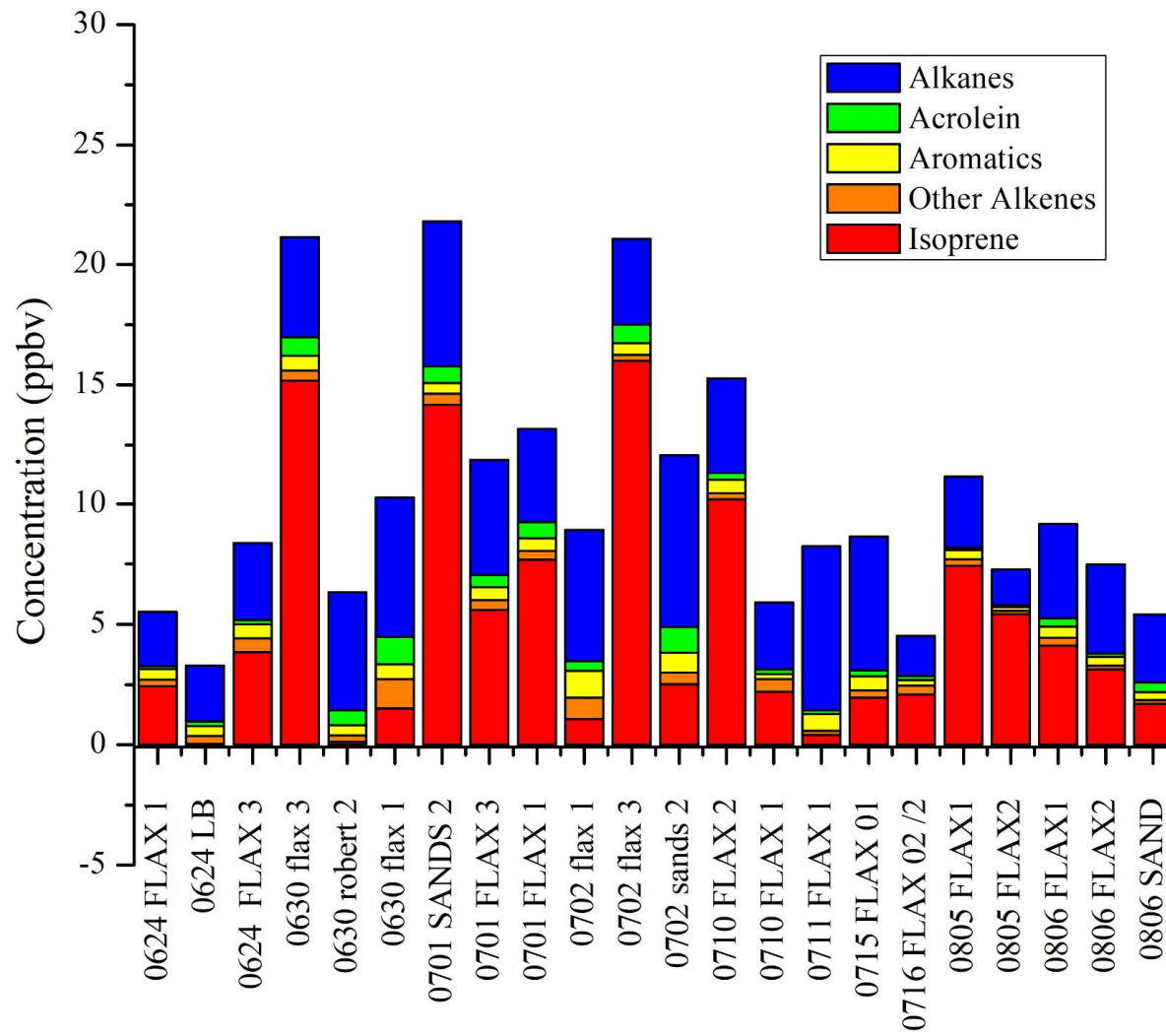
- How much reactivity are we missing measuring only PAMS compounds?
- What do others see for VOCCR?
 - DEC at Bronx;
 - Mak group at Flax Pond (PTR-MS);
 - NOAA group in mobile lab (PTR-MS);
 - Russ and Xinrong – aircraft canister samples;
 - Gentner Group?
- How do these compare with GCAS HCHO columns?
- How do these compare with model predictions?

Thank you!



PAMS ANALYTES	Cyclohexane
Propene	2-methylhexane
Propane	2,3-dimethylpentane
Isobutane	3-methylhexane
1-butene+isobutene	2,2,4-trimethylpentane
n-butane	n-heptane
t-2Butene	methylcyclohexane
Cis2-butene	2,3,4-trimethylpentane
iso-Pentane	2-methylheptane
1Pentene	3-methylheptane
n-pentane	n-octane
isoprene	nonane
trans-2-pentene	isopropylbenzene
cis-2pentene	n-propylbenzene
2,2-dimethylbutane	m-ethyltoluene
cyclopentane	p-ethyltoluene
2,3-dimethylbutane	o-ethyltoluene
2-methylpentane	decane
3-methylpentane	1,2,3-trimethylbenzene
n-hexane	1,3-diethylbenzene
methylcyclopentane	1,4-diethylbenzene
2,4-dimethylpentane	undecane

TOXICS ANALYTES	CHBrCl2
Dichlorodifluoromethane	TCE
Chloromethane	cis-1,3-DCPE
Ethane, 1,2-dichloro-1,1,2,2-tetrafluoro	trans-1,3-DCPE
Vinyl Chloride	1,1,2-TCEA
1,3-butadiene	Toluene
Bromomethane	1,2-Dibromoethane
Chloroethane	PERC
Acrolein	Chlorobenzene
Trichlorofluoromethane	Ethylbenzene
1,1-dichloroethene	M+P Xylene
Dichloromethane	Styrene
1,1,2-1,2,2-Trichlorotrifluoroethane	1,1,2,2-Tetrachloroethane
t-1,2-DCEE	o-Xylene
1,1-DCEA	1,3,5-trimethylbenzene
MTBE	1,2,4-trimethylbenzene
Chloroform	Benzyl Chloride
1,2-DCEA	m-DCB
111 TCEA	p-DCB
Benzene	o-DCB
Carbon Tetrachloride	1,2,4-TCB
1,2-DCPA	HCBD



Monasset State Park