

Fire Influence on Regional and Global Environments Experiment (FIREX) - Fall 2016

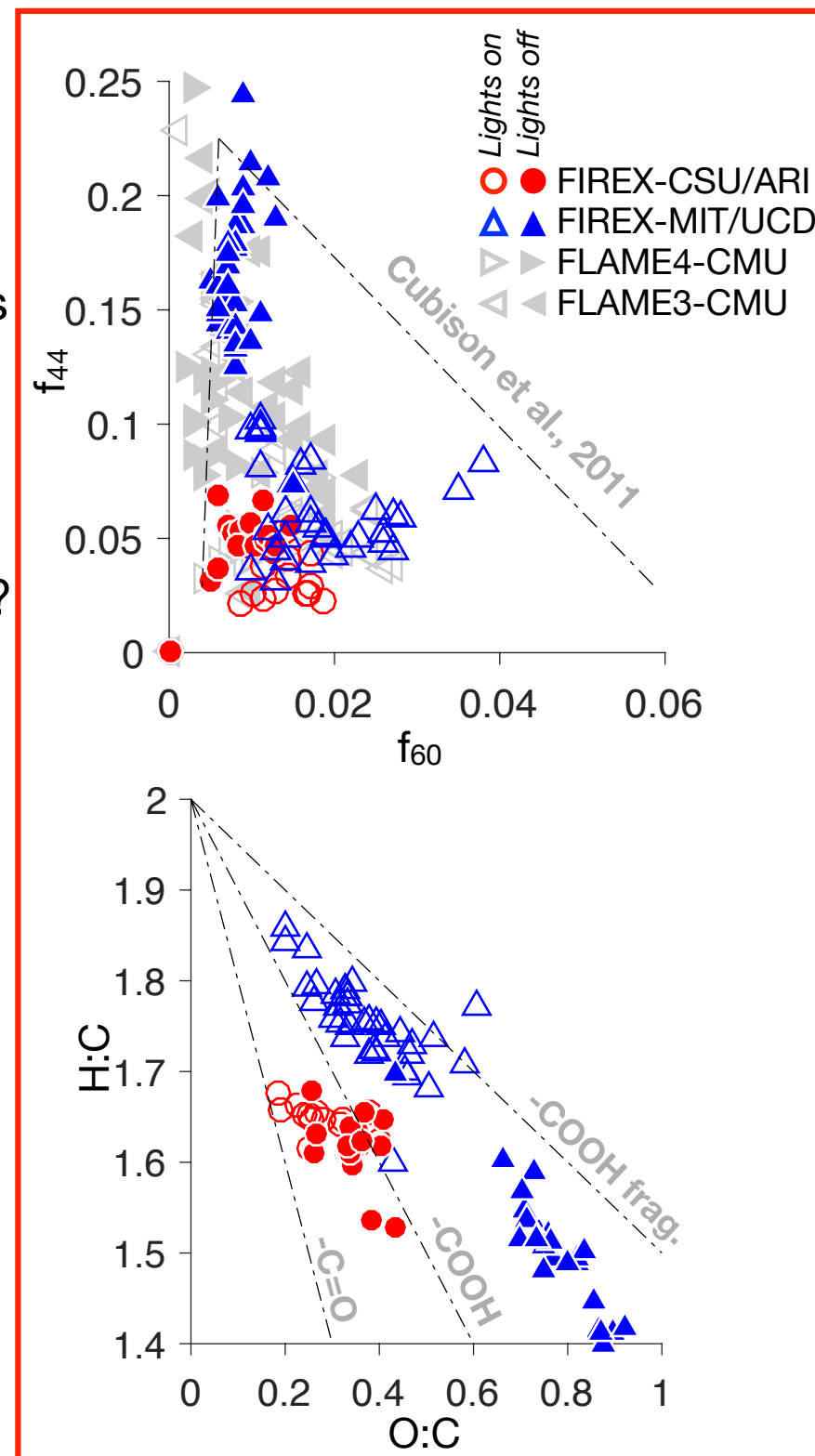
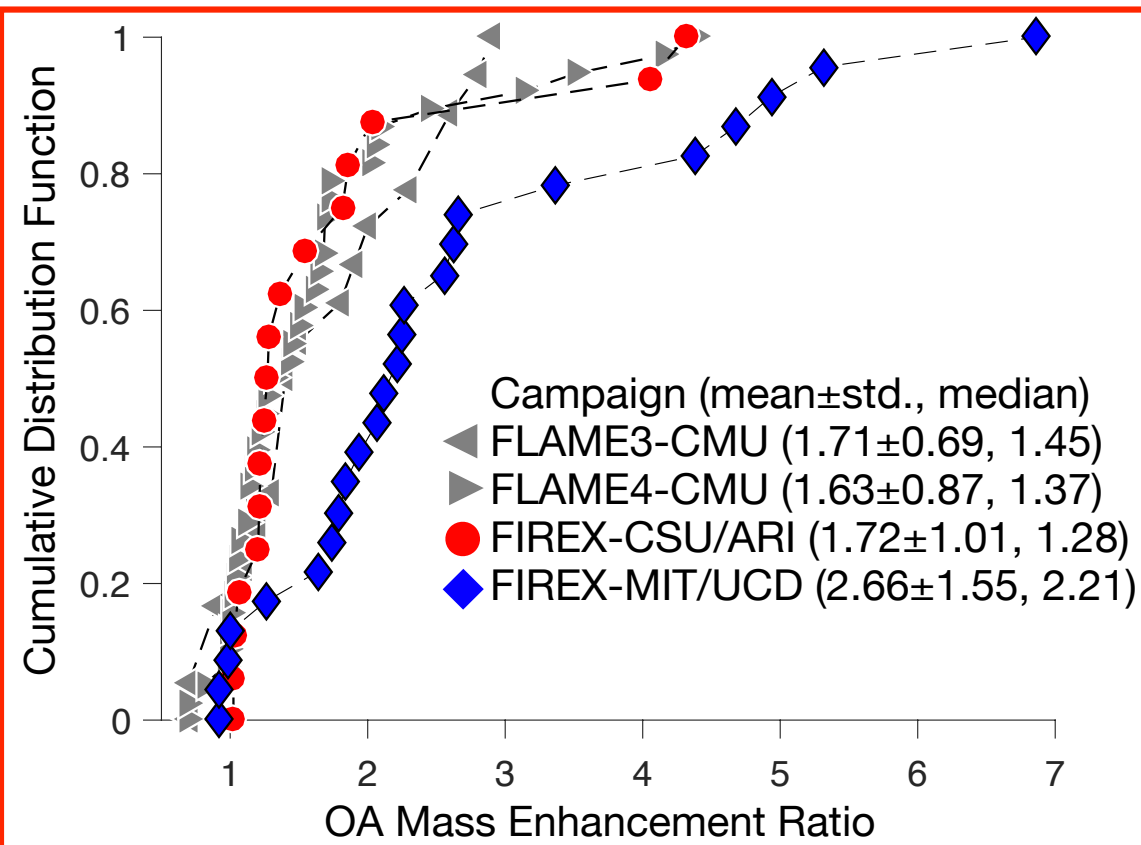




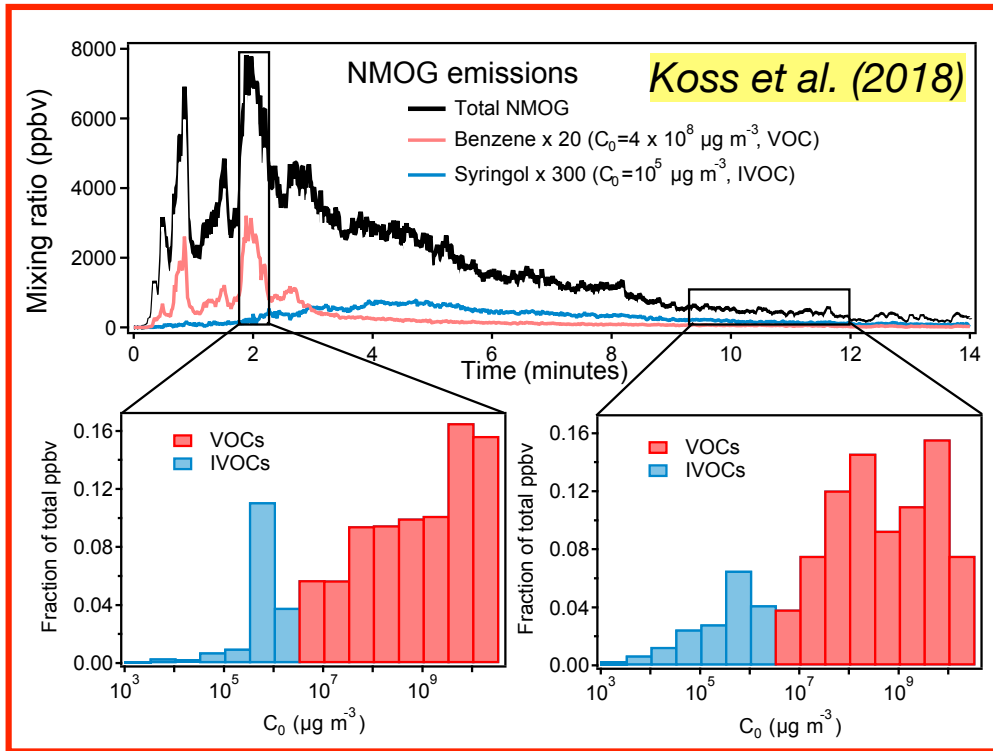
Evolution of BBOA

Jathar (CSU), Onasch+Herndon+... (ARI),
Cappa (UCD), Kroll (MIT)

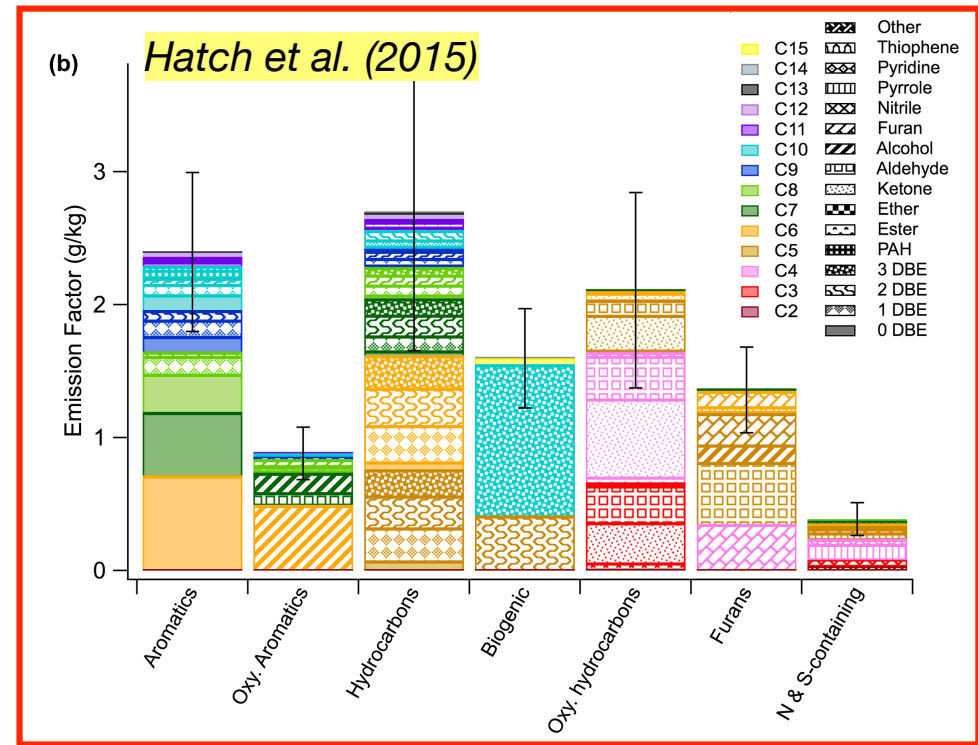
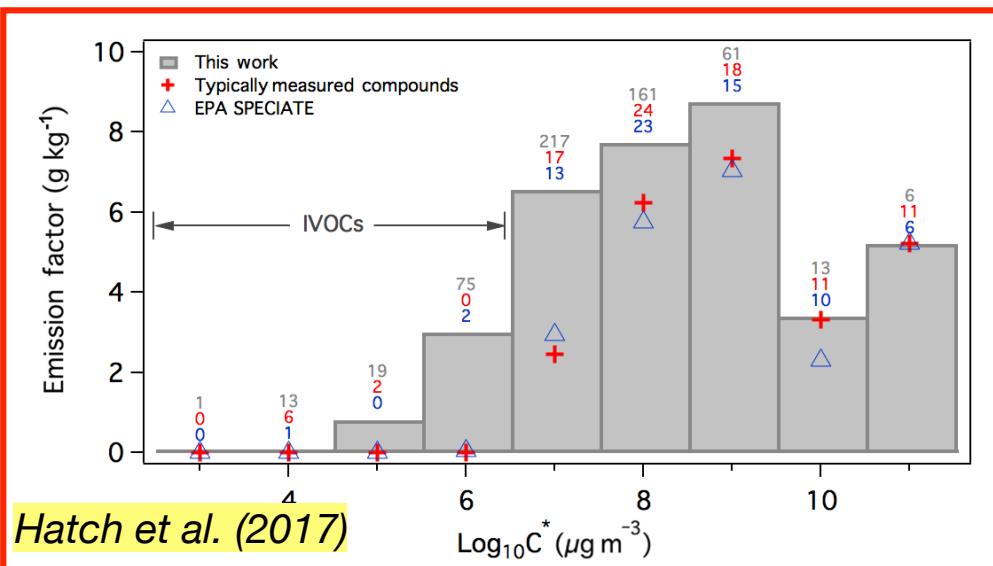
- 16 chamber and 100+ flow reactor experiments to understand **OA = F (fuel, burn conditions, oxidant exposure, experimental artifacts)**
- Can models/parameterizations based on laboratory data in 0D/3D models help explain ground & aircraft field BBOA data (e.g., BBOP)?



Connecting Precursors to OA Formation

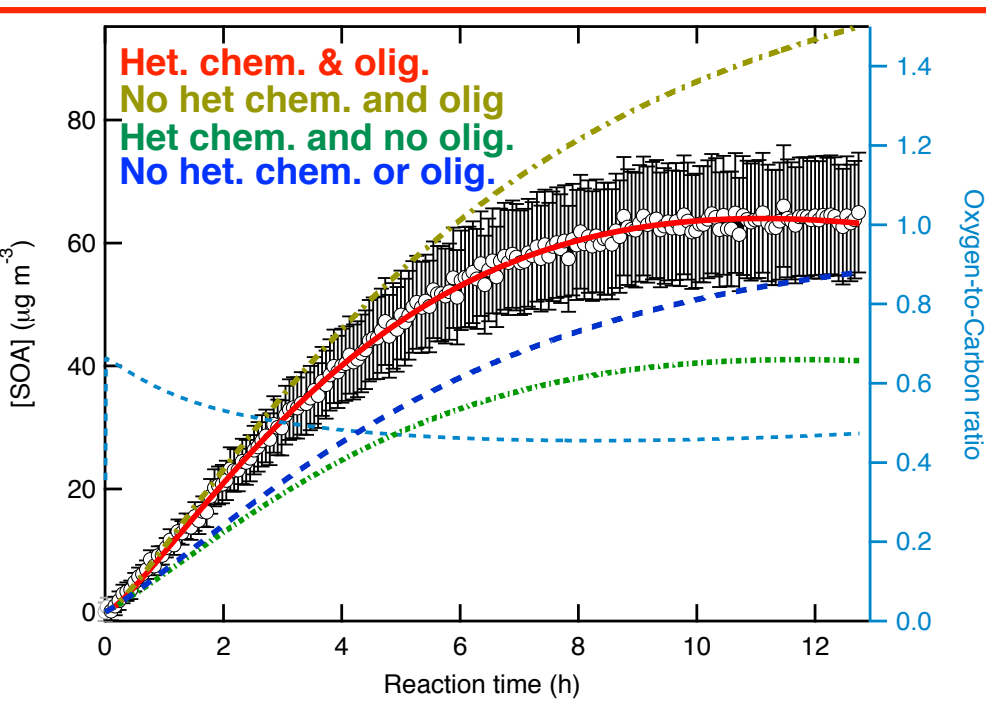
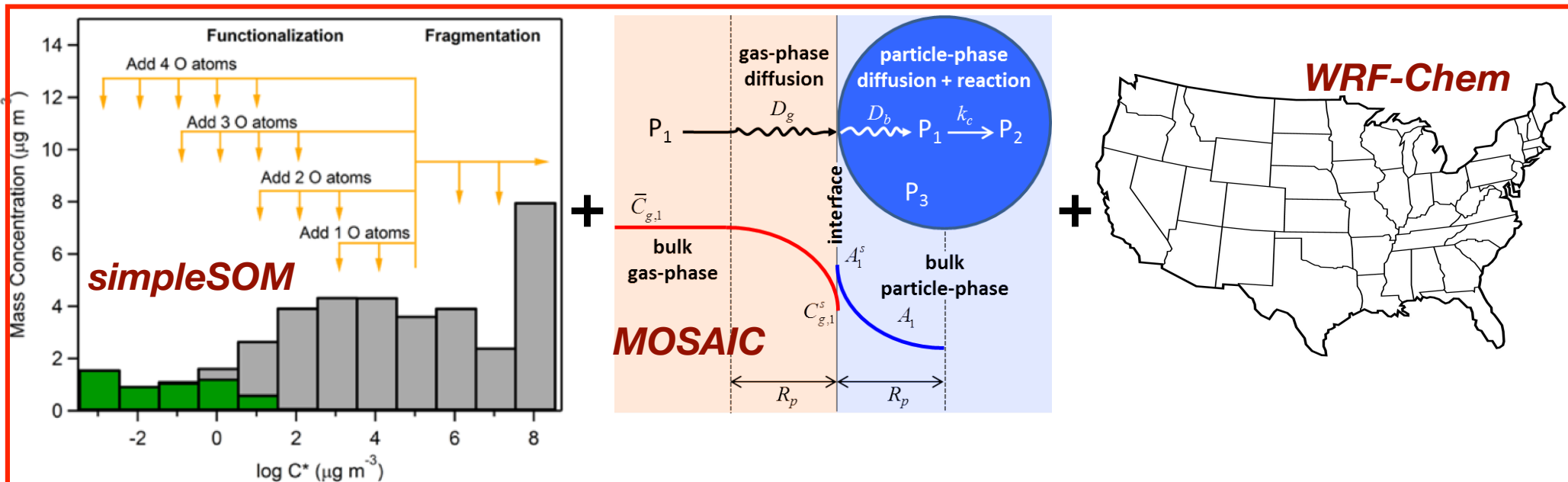


- Emissions of aromatics and biogenic VOCs do not explain OA enhancements
- What are the emissions, volatility, composition, reactivity, and SOA potential of S/IVOCs from BB?



simpleSOM+MOSAIC+WRF-Chem

Jathar+Pierce (CSU), Cappa (UCD), Zaveri+Shrivastava (PNNL)



- Volatility-based organic aerosol model that includes: SOA from S/I/VOCs, multigenerational aging, oligomerization, particle phase state, chamber wall losses
 - OA processes constrained based on following data:
 - ◆ anthropogenic VOCs (Seinfeld/Caltech)
 - ◆ biogenic VOCs (Shilling-Thornton/UW)
 - ◆ OFR laboratory data (Lambe/ARI)
 - ◆ OFR field data (Jimenez/CU)
 - ◆ combustion sources (Allen Robinson/CMU)
 - However, can we constrain:
 1. Both growth and evaporation of SOA?
 2. Gas vs. particle chemistry to form low-volatility SOA?
 3. Processes that explain growth of nucleation mode?
 4. Oligomer formation and dissociation rates?
- Or, do we need more data?