Deliverable D14: **Mixing State Analysis and Modeling during BBOP**

- Objective: An integrated effort to understand the evolution of the chemical, hygroscopic, microphysical, morphological, and optical properties of aerosol particles generated by biomass burning using data analysis, modeling, and single-particle characterization

Lead personnel: Adachi, Buseck, Onasch, Sedlacek

Collaborators: Arnott, Gilles, Kleinman, Lewis, Moffet, others

Funding status: proposed

Challenges or needed resources/collaborators:

- Support for single-particle characterization (e.g., microscopy is information-rich but labor intensive)
- Participation of modelers in data analysis and in transferring findings to models
- Execution of targeted laboratory experiments to augment field observations and address questions raised from field measurements (e.g., Boston College)

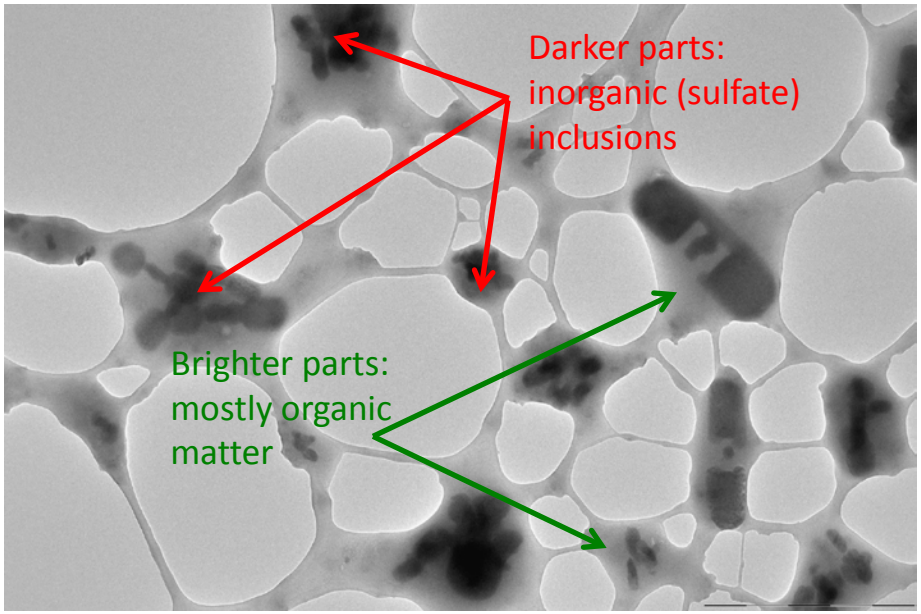
Summary of progress:

- BBOP field campaign successfully completed with observations and particle sampling of 17 wildfires and 3 dozen agricultural burns
- Data reduction/ingest is just beginning (measurement phase concluded Oct 22nd)

BBOP: Smoke-particle Morphology & Composition

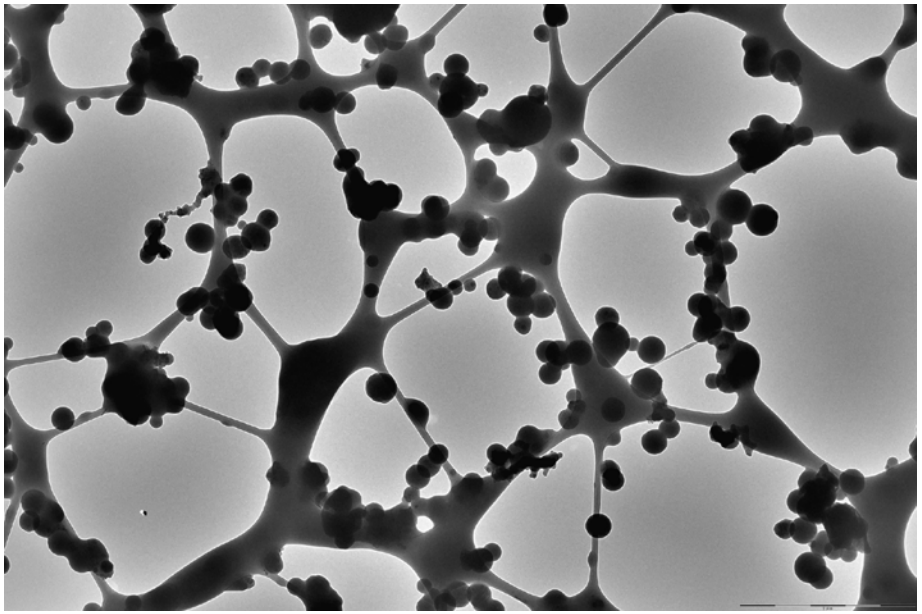
Biomass Burn Particle Comparison: Wildfire vs. Ag-burn

20131010 19:49-19:58 (Ag-burn)



2μm

20130730 19:57-20:10 (Wildfire)



2μm

Ag-burns:

- Sulfate is coated/embedded within organics
- Particles are deformed over the substrate, suggesting they were liquid when collected
- Internal mixing is prominent

Wildfires:

- Tarballs or more solid (high viscosity) organic particles dominant
- Wildfire particles have smaller & scattered sulfate
- Internal mixing is evident

Adachi and Buseck