## **PNNL Science Plan on Mixing State**



## **Primary Science Question**

How does the mixing state of BC particles evolve as a result of condensation and coagulation, and how does this influence optical and CCN properties?

## **Overall Approach**

- Field Measurement Analyses: Use data from the CARES and TCAP campaigns to identify major areas of uncertainty in our understanding of the evolution of BC mixing state and the associated optical and CCN activation, e.g. perform closure studies using the extensive surface and aircraft measurements (SPLAT, SP2, microscopy, in situ and remote sensing scattering and absorption, etc.)
- Laboratory Studies: Use continuous flow chamber to perform 24 48 h experiments that measure properties of soot particles as they age (condensation and coagulation), based on insights from field measurements
- Process Modeling: Evaluate PartMC-MOSAIC box model with lab data and use the results to provide a benchmark for simplified treatments (e.g. MOSAIC-mix) suitable for 3-D models
  - <u>Regional Modeling</u>: Simulate aerosol evolution during CARES and TCAP and compare with data and closure studies, test new treatments (e.g. MOSAIC-mix)