Discussion Topic: What information is currently being communicated between health and atmospheric chemistry communities?

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What can the atmospheric chemistry community provide

SOURCES

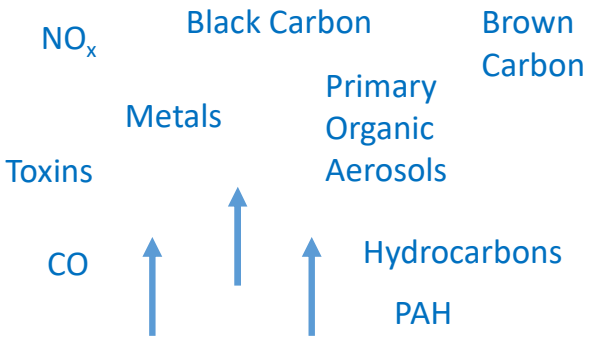
Gases and particles

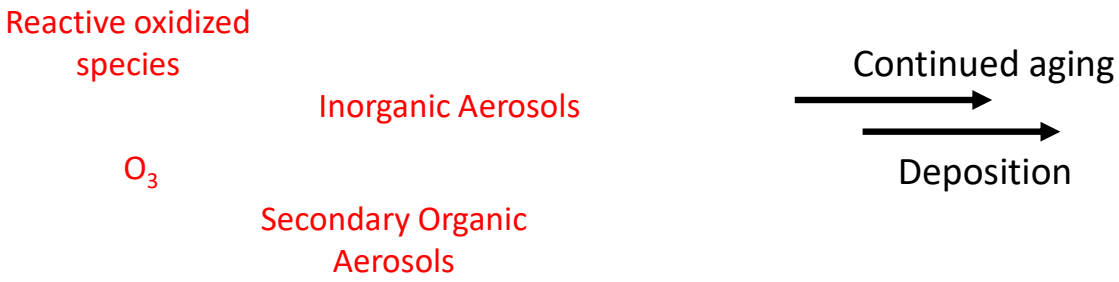
CHEMICAL TRANSFORMATIONS

Reactions, formation, transformations, interactions, etc

FATES

Removal





Sources	Composition	Loading	Properties
• Gases, particles • Directly emitted (primary) vs. atmospheric formation (secondary)	• Chemical reactions, mechanisms *(day/night)* • Chemical species • Degree of oxidation • Continued aging	• Spatial variation • Temporal variation • Dilution • Dynamics	• Volatility • Solubility • Optical properties • Hygroscopicity • Toxicity

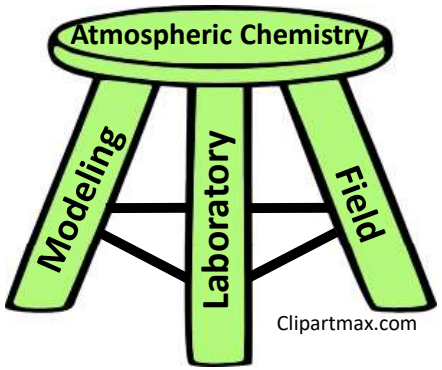
Atmospheric chemistry and Health community

What is being used now:

Model Outputs
Monitoring Networks
Satellite Data
(PM Samples)

Particulate Matter ⟷

Exposure Assessment
Epidemiological Studies
(Toxicological Studies)



Modeling: chemical transport models; regional models, global models

Constrained by lab and field studies; predictive capability; level of complexity

Field measurements: life cycles (emissions, formation, processing, fates)

Provide fundamental inputs for model development and validation

Laboratory experiments: fundamental data, rates, chemical mechanisms, "model systems" under well-controlled environments

Instrument development: new analytical instruments

Link highly reactive hazardous species to toxicological studies

→ Causes and effects; mechanistic understanding
→ Attribute constituents to sources
→ Link toxicity of individual and mixture of components to their chemical composition

What improvements could be made; opportunities

- Improve quantification of wildfire emissions and understanding of their chemical transformations, especially VOCs, SIVOCs, amount and properties of wildfire organic aerosols (OA), ozone formation
- Long-term measurements of atmospheric constituents, chemical speciation; development of low-cost real-time analytical techniques for air quality monitoring, exposure assessment
- (Continued/More) Engagement of atmospheric chemists in health-related research
  - Knowledge of sources, transformation, and fates of wildfire emissions critical for linking to and understanding their health impacts
  - Gases and particles
  - Mechanistic links between chemical and physical properties of wildfire smoke with biological and toxicological endpoints
- Platforms for atmospheric chemists and health communities to interact: workshops, conferences, funding opportunities, etc