Midwest RPO Chemical Transport Emissions Modeling

Mark Janssen

Emissions Model Versus Photochemical Emissions Model

- Emissions models generally create typical Day estimates for generic spatial scale and for broad chemical groups(PM25,VOC)
- Photochemical Emissions Models generate model ready emissions estimates for specific days using that days meteorology. Estimates are made for specific cells(36km, 12km, 4km). Estimates are made for specific chemical mechanism(ALD2, PAR)

SMOKE, EMS and CONCEPT

- Emissions Processors: Point, Area
  - Key Input is emissions
  - Spatial, Temporal, Speciation
  - DON'T Calculate Emissions
- Emissions Models
  - Primary Input is Activity, Local Meteorology is input
  - Calculate Emissions
  - More data intensive
  - SMOKE/EMS – Mobile, Biogenics
  - CONCEPT – also Agriculture NH3, Nonroad, EGU's?

EMS2002 and CONCEPT for Fire

- Formats – NIF 3.0 as Point
  - Fire = Facility
  - Emissions Unit (Boiler) = plant community
  - Process = Fuel Type
  - Pseudo Stacks in multiple layers hardcoded
  - TRANSPARENT!
- Outputs and QA
  - Output to CAMX/CMAQ and SAPRC/CB-IV
  - Geograpic- In county

Is there a common Photochemical emissions model that the RPO's can agree to?

- Different Photochemical models
- Different QA, Operational, and Processing Goals
- Languages: Write it in Fortran and C but is the data transparent and accessible?
- We’re building CONCEPT because current models have significant limitations.