National Air Toxics Assessment (NATA)

Air Toxic Monitoring Workshop
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2011 NATA – EPA TEAM

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What is NATA?

- **Characterization of air toxics across the nation**
  - Nationwide screening assessment with *census tract* resolution for most hazardous air pollutants (HAPs) plus diesel particulate matter (DPM)
  - Emissions, modeled ambient concentrations and estimated *inhalation exposures* from *outdoor sources*
  - *Cancer and noncancer* risk estimates for about 140 HAPs with health data based on *chronic exposures*

- **Tool for EPA and State/Local/Tribal Agencies to prioritize pollutants, emissions sources and locations of interest**

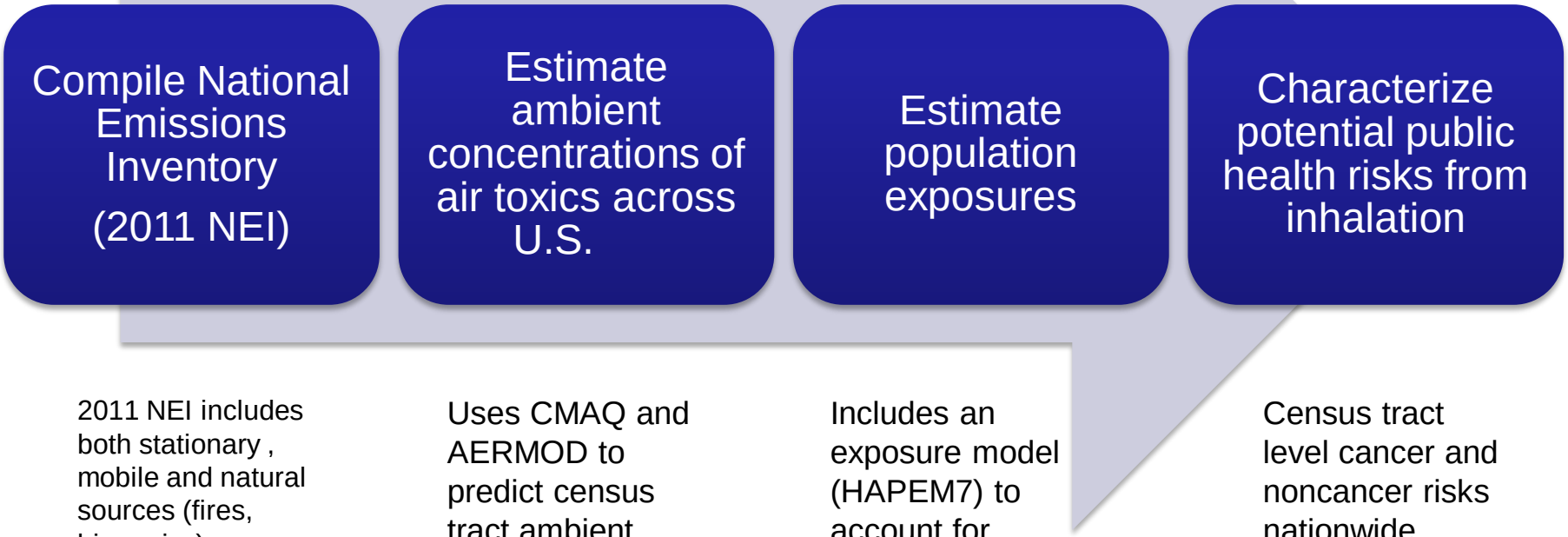
Background

- NATA history generally lines up with tri-annual NEI-- 1996, 1999, 2002, 2005
  - 2005 NATA released in March 2011
- Next version will be 2011 NATA
- Update requested by NACAA Air Toxics Committee in August 2012
- NATA is not a CAA requirement
  - Included in Urban Air Toxics Strategy
  - Prominent part of 2nd Air Toxics Report to Congress

Clients for 2011 NATA

- States/Local Agencies/Tribes: set priorities
- EPA: set priorities, EJSCREEN, CFERST
- Other (academia) – over 100 references to NATA

NATA Analytical Steps



2011 NEI includes both stationary , mobile and natural sources (fires, biogenics).

NATA includes 178 HAPs and diesel particulate from mobile sources

Uses CMAQ and AERMOD to predict census tract ambient concentrations nationwide.

Includes an exposure model (HAPEM7) to account for human activity data, commuting patterns, and near roadway exposures.

Census tract level cancer and noncancer risks nationwide.

Updates and Improvements: 2011 NATA

- 2011 NATA based on 2011 National Emissions Inventory (NEI) Version 2
  - Includes more detailed emissions for ports, airports, and oil and gas sectors
  - Estimates mobile emissions based on MOVES 2014 model
  - Major improvements to fire emissions and biogenics
- Hybrid modeling approach for key pollutants
  - Integrates results from regional-scale photochemical model (CMAQ) with near-field dispersion model (AERMOD) in a mass consistent manner to optimize treatment of reactive and transported pollutants with fine scale resolution
  - Similar to Detroit multi-pollutant study application
- Enhanced mapping tools including the EPA's GeoPlatform

Hybrid – combine CMAQ & AERMOD in each grid cell

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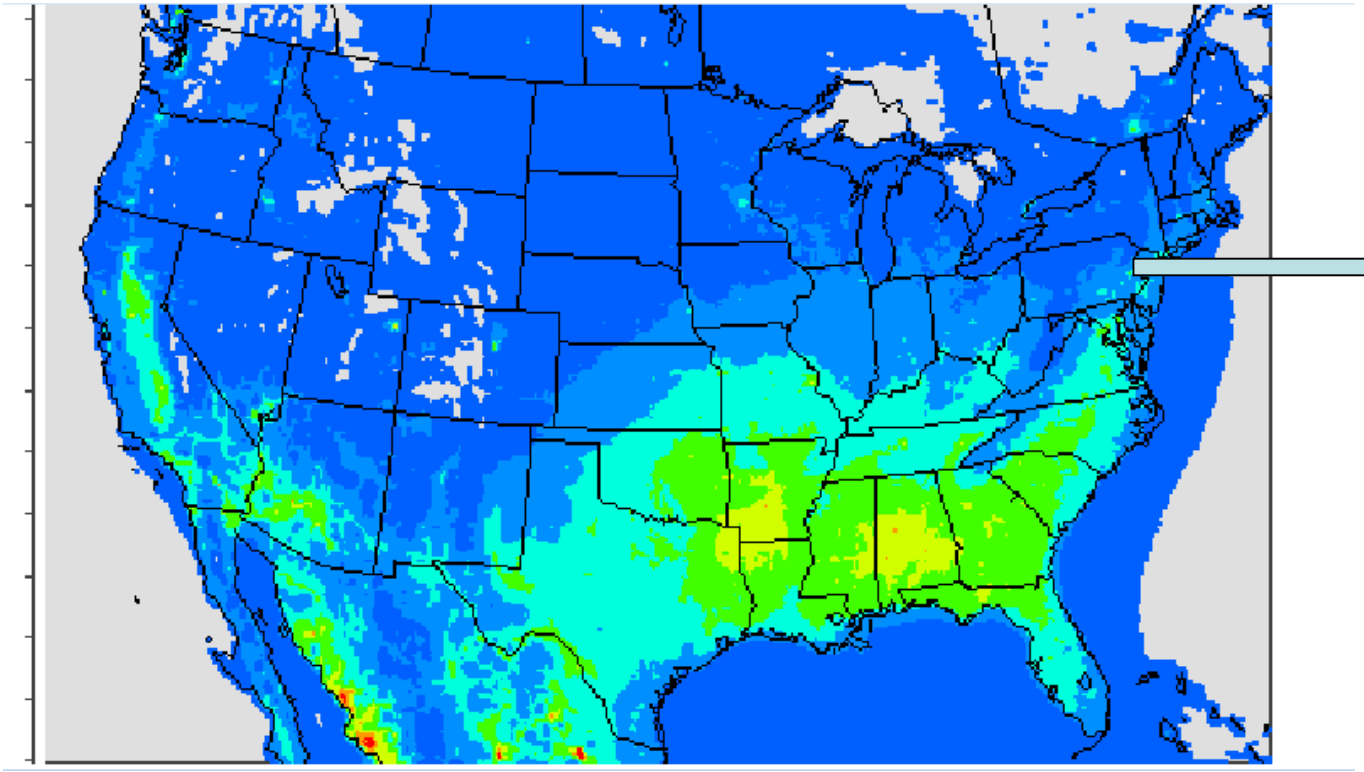
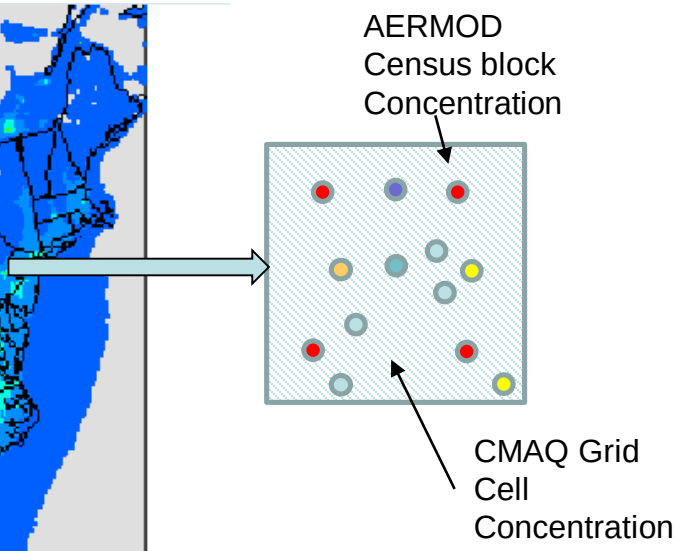




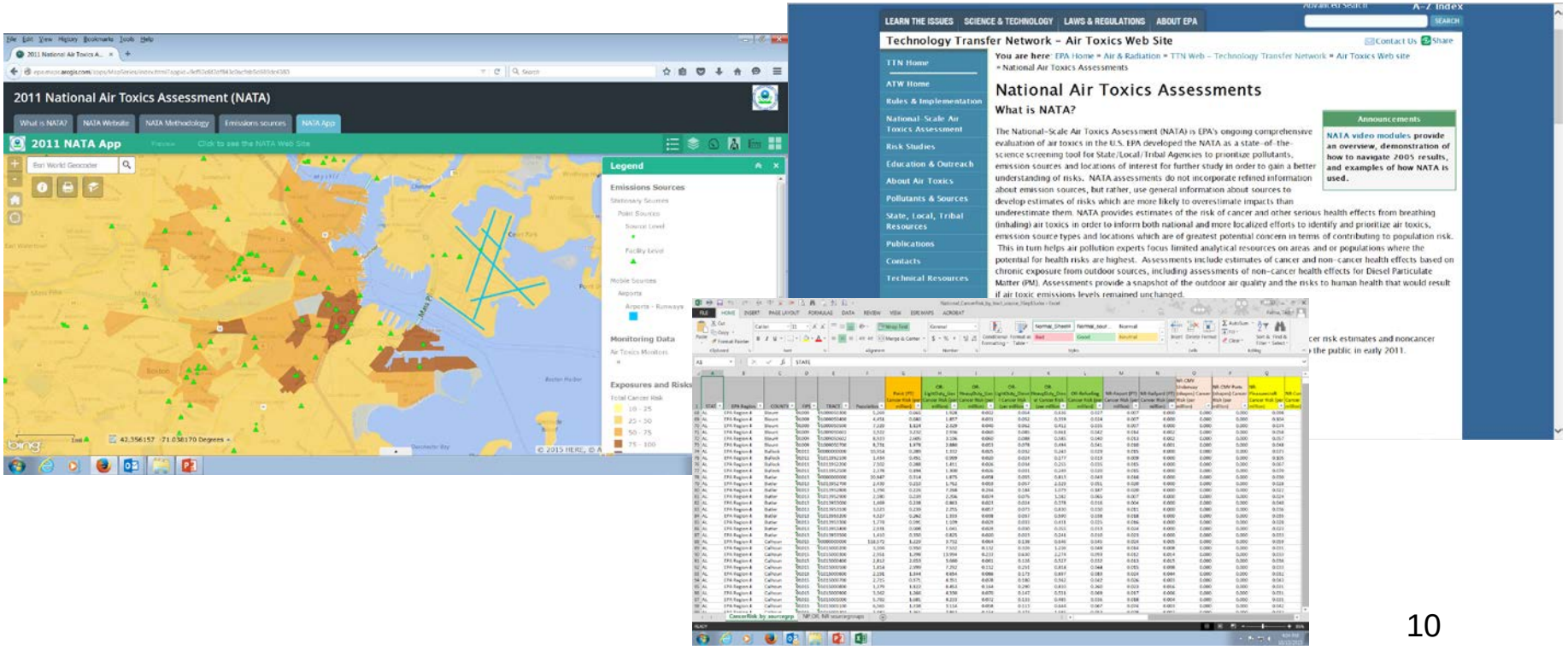
Gridded MET, consistent emissions across CMAQ and AERMOD

What data will be available?

- Emissions Data
  - County and facility level
- Ambient and Exposure Concentration Data
  - 178 pollutants at census tract level
  - Pollutant and source group summaries
- Cancer and Noncancer Risk
  - About 140 pollutants at census tract level
  - Pollutants and source group summaries
  - Cancer risks in a million
  - Noncancer risks expressed as Hazard Index
- Tabular (Excel, Access) and Graphical Outputs (NATA web App)
- NATA does NOT present facility level risks

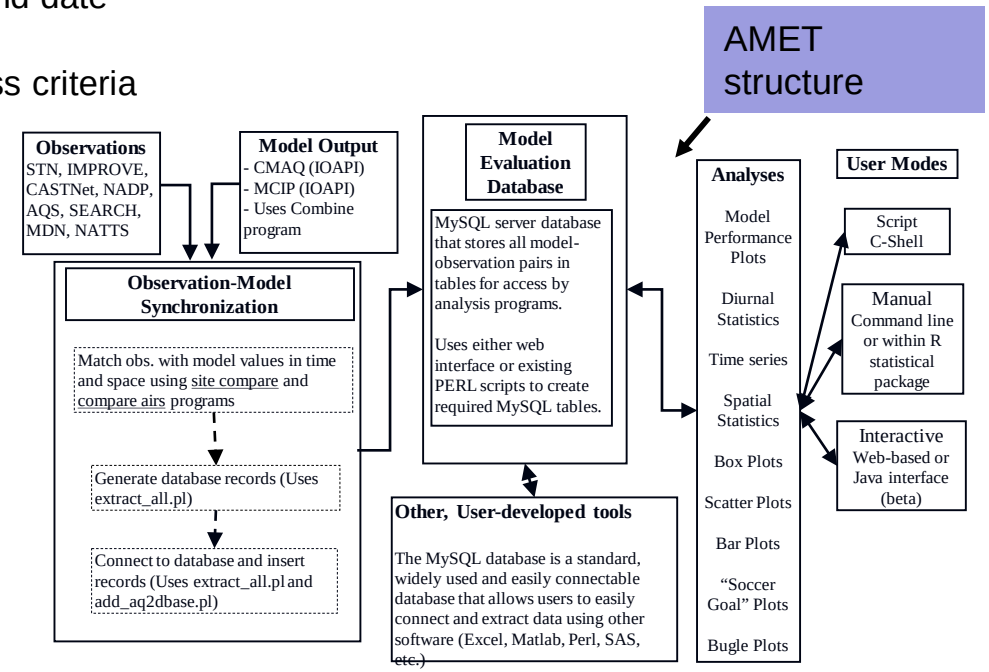
NATA Schedule

- Expect public release in late 2015
  - S/L/Ts will have about a week to preview data before the public release

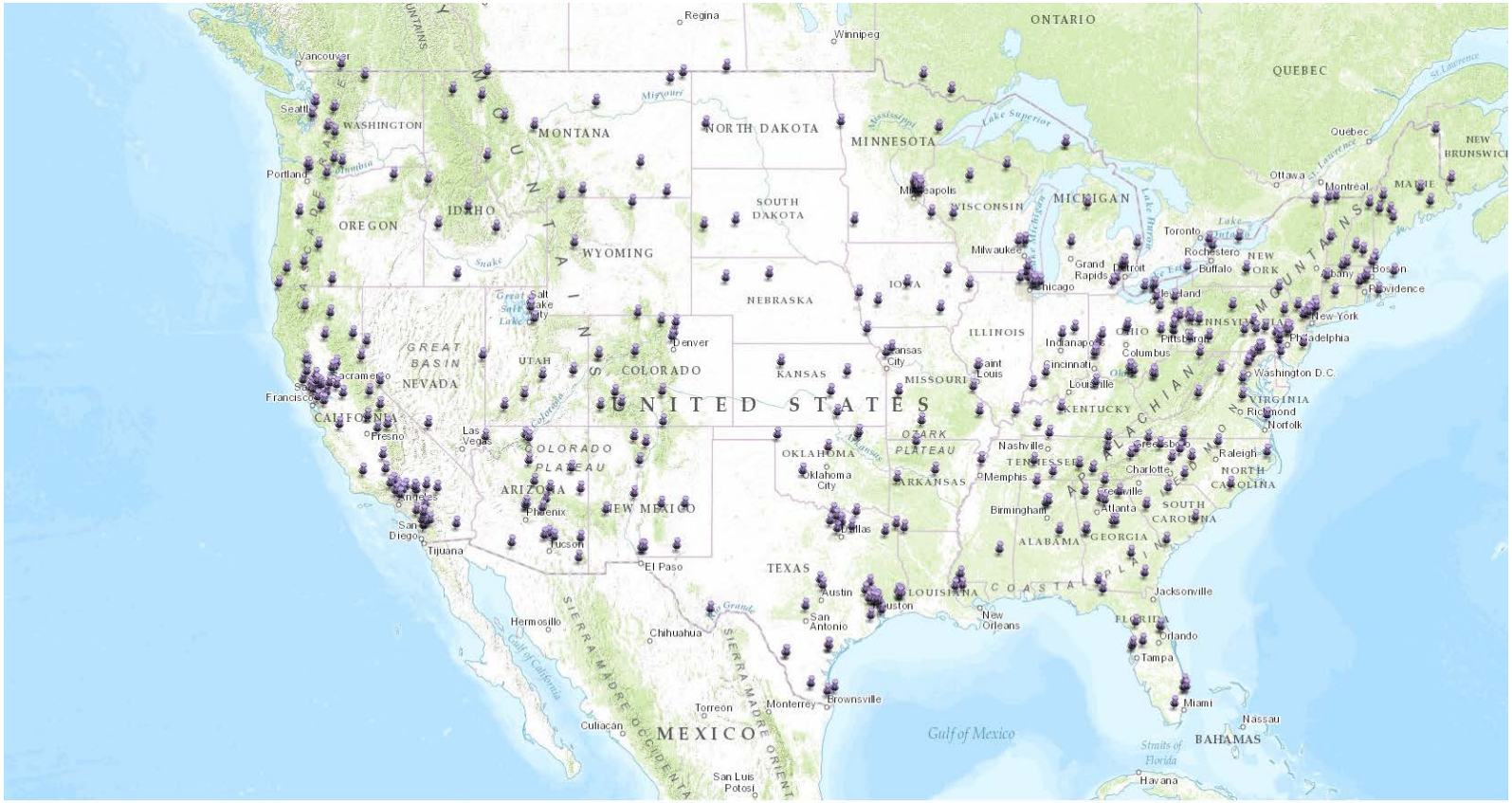


2011 NATA: Model Evaluation Approach

- Model-to-monitor comparisons:
  - CMAQ vs Hybrid (CMAQ+AERMOD)
    - 2011 HAP data -- Air Monitoring Archive (ERG)
      - Recognize limited pollutant & geographic coverage although high risk HAPs are observed
    - Paired spatial and temporal obs/model data
      - Site Compare & Atmospheric Model Evaluation Tool (www.cmascenter.org)
        - Pairing data based on lat/lon and date
      - Annual/seasonal comparison
        - Applying obs data completeness criteria
      - Analysis Products
        - Scatterplots
        - Spatial bias/error plots
        - Timeseries plots
        - Bar charts/plots
        - Box plots
        - Statistics
        - Region-specific

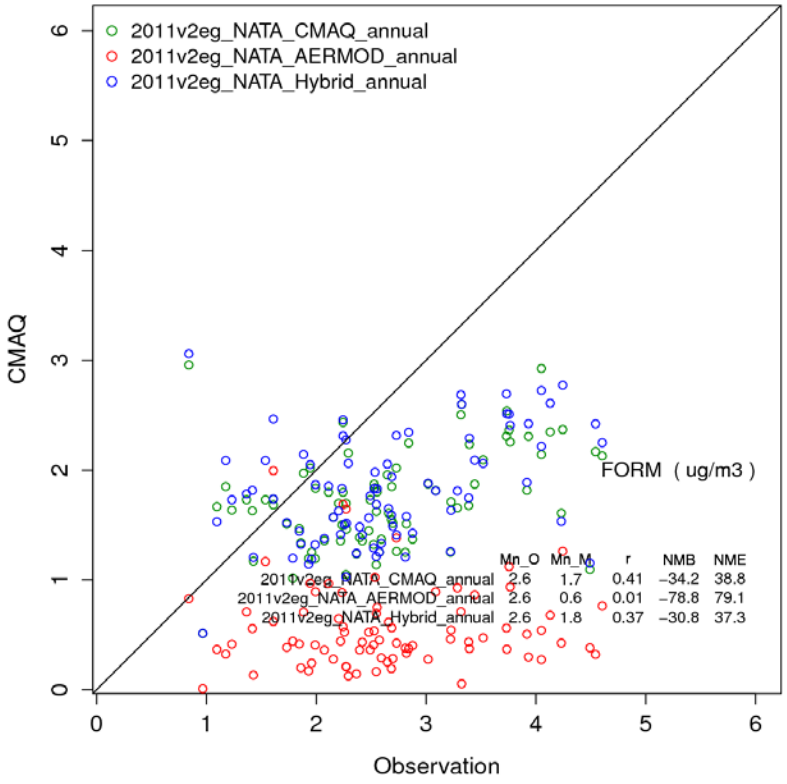


2011 Air Toxic Monitors

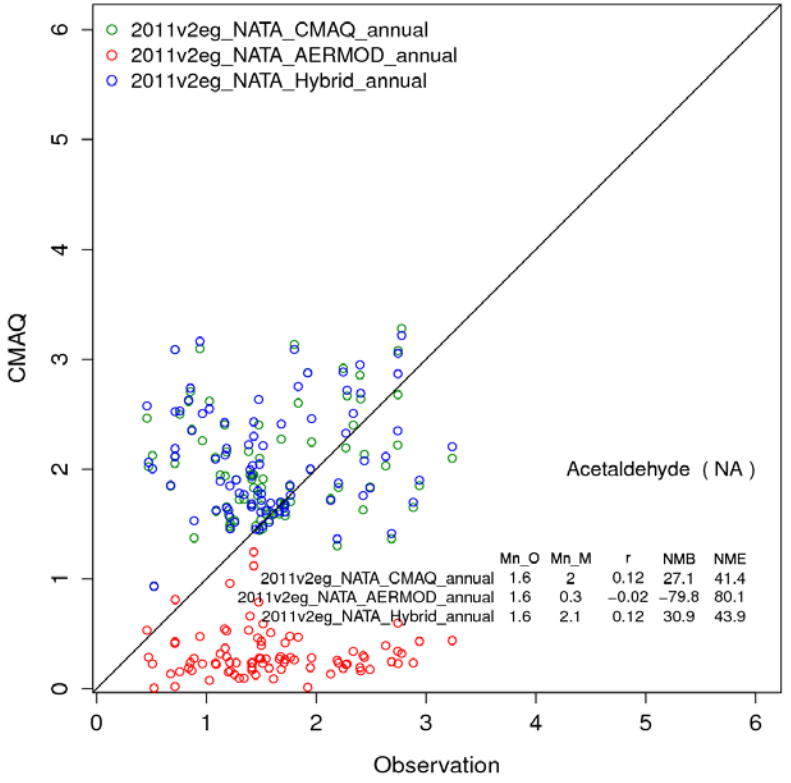


2011 NATA: Model Evaluation Examples
CMAQ vs AERMOD vs Hybrid

Annual Formaldehyde



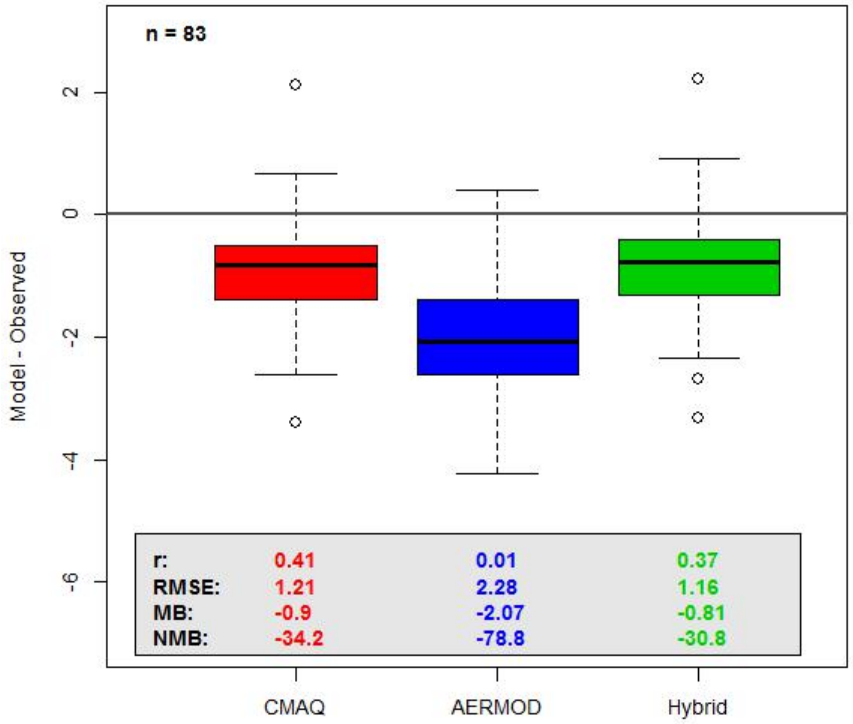
Annual Acetaldehyde



2011 NATA: Model Evaluation Examples

Boxplots of Model Bias

Annual Formaldehyde



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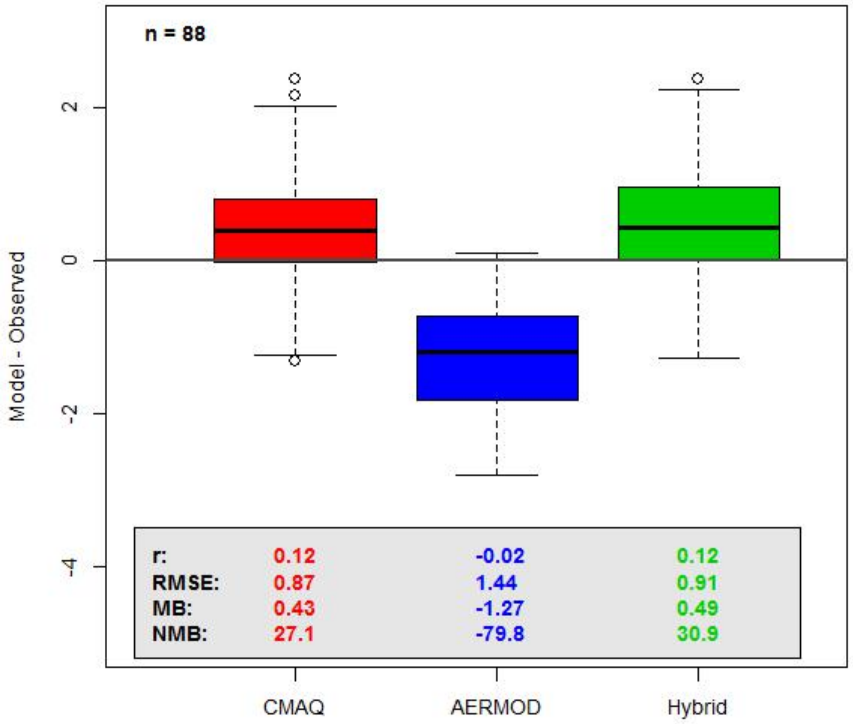

QUESTIONS ?