

Comments on PRB O₃

by

George T. Wolff, Ph.D.
Air Improvement Resource, Inc.
Novi, MI 48734
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REA Health Plan

- “we will likely consider several different background definitions (e.g., U.S. background, a North American background, and natural background)” p 5-9

I strongly support considering different definitions of PRB

EPA Modeling Plan Improvements

- The GEOS-Chem modeling system will be run using emissions and meteorological data for three annual periods (2006, 2007, 2008).
- The GEOS-Chem model will be run using two nested grids –
 - The outer grid will be global in extent and utilize a grid resolution of 2.0 by 2.5 degrees
 - The inner grid will be centered over North America, cover the area from 140-40W/10-70N, and use a horizontal resolution of 0.50 by 0.67 degrees.
- Four scenarios will be modeled.

These are welcomed improvements

Different Background Scenarios Proposed By EPA

- Base Case simulation will be completed using all global anthropogenic and natural emissions sources for 2006-08.
- A model performance evaluation will be completed for this scenario using surface air quality measurements and satellite estimates of ambient air pollutant concentrations.
- U.S. anthropogenic emissions of NO_x, nMVOC, and CO are set to zero, while anthropogenic emissions outside of the U.S. are maintained at their current levels.
- U.S., Canada, and Mexico anthropogenic emissions of NO_x, nMVOC, and CO are set to zero.
- Global anthropogenic emissions of NO_x, nMVOC, and CO are set to zero.

As I will show shortly, these scenarios address the wrong questions.

I Applaud This 4-Tiered Approach Because:

- GEOS-Chem runs used by EPA in the 2007 Health Risk Assessment and Staff Paper significantly underestimated PRB because:
 - Underestimated stratospheric and free tropospheric contribution
 - Underestimated natural NO_x emissions
 - Underestimated Asia/Pacific NO_x emissions
 - Used outdated chemistry and physics
 - Grid resolution too coarse
 - Monthly means of diurnal PRB profiles are inappropriate to used for a NAAQS that is based on the 3-year mean of the 4th highest 8-hour value

However, Definition of PRB Is Inappropriate

- EPA assumes that it has the power to control emissions in Mexico and Canada
- By not including these emissions in PRB, EPA assumes a treaty could eliminate them.
- It penalizes the states that must come up with additional control measures to compensate for Mexican and/or Canadian emissions.
- **EPA needs to redefine PRB to include emissions from all foreign countries including Canada and Mexico.**

EPA Is Asking The Models The Wrong Questions

- EPA is asking: What would the ozone be in the U.S. if the U.S. had no anthropogenic emissions?
 - This is a meaningless question
 - The answer has no relevance to control strategies
 - The answer has no relevance to risk assessments
 - It answers questions about a fictitious atmosphere
- The correct question to ask is: “What are the contributions from sources which EPA has no control over?”

Two Ways to Answer Correct Question

- GEOS-Chem
 1. Base Case (BC)
 2. Zero out natural emissions: $BC - (2) = \text{natural bkg}$
 3. Zero out natural and foreign anthropogenic emissions: $BC - (3) = \text{revised PRB}$
 4. Zero out Mexico and Canadian anthropogenic emissions: $BC - (4) = \text{Canadian/Mexican contributions}$
- CAMx – has source apportionment ability
 - GEOS-Chem to compute US boundary conditions
 - CAMx for source apportionment

Recommendations

- PRB should be redefined to include Canadian and Mexican anthropogenic contributions
- Support EPA new modeling effort with a modification of emission scenarios
- Emission scenarios should be modified so that U.S. anthropogenic emissions are included in all scenarios
- Strongly support rigorous model performance evaluation on base case
- ISA should be revised to include modeling plan