Background Ozone Scientific Assessment project overview

March 28-29, 2017 workshop interactive agenda

Tom Moore

4 Corners Air Quality Group Meeting

Sept. 13, 2017

WESTAR
Western States Air Resources Council

WRAP
Western Regional Air Partnership

energy API

Background Ozone Scientific Assessment – motivations:

- last review - McDonald-Buller et al. (EST 2012)
- results from western and national U.S. modeling studies
- 2015 Ozone air quality standard
- EPA's Feb. 2016 white paper, public meeting, review docket
- letters to EPA from WESTAR, API, others
- recent 2015 Ozone standard implementation guidance and national source apportionment modeling results from EPA

This assessment effort will address the current science and emerging issues related to regulatory needs for assessing background ozone across the U. S. as documented by WESTAR and many others.

The assessment is focused on technical and scientific aspects of background ozone that are relevant to policy, but will not directly address policy.

The project will result in one or more peer-reviewed publications.

assessment design

The assessment will consider current research to examine:

1. Sources of background ozone;
2. Background ozone as seen by observations;
3. Background ozone as seen by models;
4. Reconciling observations and models;
5. Temporal and spatial variations in background ozone; and
6. Research needs to improve our understanding of background ozone.

- The scientific assessment effort developed a draft review document reviewed and discussed at the March workshop, prepared by Dr. Dan Jaffe of the University of Washington and co-authors.

- The end result will be one or more peer-reviewed journal articles incorporating the results and discussions from the workshop.

assessment effort core team

- Prof. Dan Jaffe (University of Washington) - lead
- Dr. Owen Cooper (University of Colorado / NOAA ESRL)
- Prof. Arlene Fiore (Columbia University)
- Dr. Barron Henderson (EPA OAQPS)
- Dr. Gail Tonnesen (EPA Region 8)
- Prof. Ted Russell (Georgia Institute of Technology)
- Prof. Daven Henze (University of Colorado)
- Dr. Andrew Langford (NOAA-ESRL)
- Dr. Meiyun Lin (Princeton University / NOAA GFDL)
- Mr. Tom Moore (WESTAR-WRAP) – project support

“Non-controllable ozone sources” (NCOS) are global

- Biogenics
- Soil NOx
- Wildfires
- Lightning*
- Stratosphere*
- Anthropogenic International Transport*

- U.S Boundary Conditions are the sum of global sources

- What sources might change?

*Almost exclusively from global/hemispheric model

Slide courtesy of B. Henderson, U.S. EPA

Quantifying NCOS contributions

- Background Ozone Science Assessment – example for one of several recommendations
  - Quantify, quantify, quantify with air quality modeling studies
  - International (Anthropogenic) Contribution
  - Routine natural contributions (lightning, stratosphere, biogenic, etc.)
  - Exceptional Events

- Contribution Analysis Methods
  - Integrated Source Apportionment Model(s)
  - Ozone Source Apportionment Technology
  - Theoretical test methods to verify

- Sensitivity Tests
  - Sensitivity tests for U.S. sites
    - Tests contribution of a component to the sum
    - Examples:
      - Zero out: 100%
      - Hemispheric Transport of Air Pollutants study: ±20%

Adapted from a slide by B. Henderson, U.S. EPA

Thanks.

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