



## Modeling Air Quality from the Global to Local Scale

May 11-15 2015

NCAR Center Green, Boulder, Colorado

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Understanding the different contributions of local, regional, and global sources to air quality problems is becoming increasingly important for air quality modelers, planners, and managers. Recognizing this challenge, the Western Regional Air Partnership (WRAP), the U.S. EPA, the National Center for Atmospheric Research (NCAR), and the LRTAP Convention's Task Force on Hemispheric Transport of Air Pollution (TF HTAP) are organizing two coordinated workshops which will address current challenges in air quality modeling across the global to local spectrum:

- **HTAP2 Global and Regional Model Evaluation Workshop, 11-13 May** (see [www.htap.org](http://www.htap.org))  
May 11-12 will focus on reviewing the global and regional modeling results from the HTAP2 multi-model experiments. These experiments have been organized by TF HTAP to improve our understanding of the influence of global and intercontinental transport of air pollutants across the Northern Hemisphere on local and regional air quality. The 2008-2010 base simulations for these experiments will be compared to various types of observations from around the world, including but not limited to intensive observations in the Western United States. The conclusions of these sessions and insights for the Western United States will be summarized on May 13 as part of joint sessions with the Western Air Quality Modeling Workshop, creating a bridge between global scale and regional scale analyses.
- **2015 Western Air Quality Modeling Workshop, 13-15 May** ([WRAP calendar posting](#))  
Beginning on Wednesday (May 13) and continuing into Thursday and Friday (May 14 and 15), the meeting will focus on air quality modeling to address specific issues in the Western United States, including ozone (O<sub>3</sub>), particulate matter (PM), visibility, and deposition. The goal of this workshop is to identify and address air quality management needs specific to regulating agencies in the Western U.S. to provide a credible air quality modeling platform for multiple uses. Applications include attainment of National Ambient Air Quality Standards, Regional Haze Rule planning, Prevention of Significant Deterioration permitting, and Exceptional Events demonstrations. Topics will include: non-U.S. anthropogenic air quality impacts; wintertime elevated O<sub>3</sub>; wintertime elevated PM<sub>2.5</sub>; emission inventories for critical sectors, such as upstream and midstream oil & gas operations, wild land and agricultural fires, and residential biomass fuel combustion; and spring and summer season O<sub>3</sub>. This meeting builds upon the 2011 and 2013 Western Air Quality Modeling Workshops and the 2012 WESTAR Western Ozone Transport Conference. These meetings were attended by technical air quality planning and modeling staff from Western state and local agencies, tribal representatives, U.S. Environmental Protection Agency, federal land managers, consultants, industry, and researchers from NOAA, NASA, NCAR, and academic institutions.

**Registration is required to participate in the workshops.** Registration and logistical information are available at: [http://www.htap.org/meetings/2015/2015\\_May\\_11-15/meeting.htm](http://www.htap.org/meetings/2015/2015_May_11-15/meeting.htm). For those who will not be able to attend in-person, registered individuals will be able to participate remotely via web conferencing. For more information, please contact Terry Keating (TF HTAP, [keating.terry@epa.gov](mailto:keating.terry@epa.gov)) or Tom Moore (WESTAR/WRAP, [tmoore@westar.org](mailto:tmoore@westar.org)).

## 2015 Western Air Quality Modeling Workshop

**Wednesday, May 13, 2015** (\*morning includes joint sessions with HTAP2 workshop)

Ozone and PM Air Quality in the Western U.S.: Overview (Moderator: Pat Dolwick)

- 08:00 National air quality program management challenges related to CAA planning (Richard Wayland, EPA OAQPS)
- 08:15 Overview of current O<sub>3</sub> AQ and recent AQ/emissions trends in the WUS (Tom Moore, WESTAR/WRAP)
- 08:30 2014 DISCOVER-AQ and FRAPPE field campaigns - Science Team report (Gabriele Pfister/Frank Flocke, NCAR)
- 09:00 Update on trends in background ozone concentrations (Owen Cooper, NOAA)
- 09:15 Messages from the March 31- April 2 Transboundary Ozone Pollution Conference (Lance Avey, Utah DAQ)
- 09:30 Discussion

09:45 Break

Ozone and PM Air Quality in the Western U.S.: Role of international sources (Moderator: Terry Keating)

- 10:00 Overview of HTAP2 and initial findings (Terry Keating, EPA OAR)
- 10:25 Regional Model Intercomparisons: Findings and Plans (Stefano Galmarini, EuCom/JRC)
- 10:50 North American Inflow Analysis (Owen Cooper, NOAA)
- 11:15 Future global scenarios & Next Steps (Terry Keating, EPA OAR)
- 11:40 Discussion

12:00 Lunch (on your own)

Ozone Air Quality in the Western U.S. / Role of natural sources (Moderator: Pat Dolwick)

- 01:00 Thunderstorm-mediated stratospheric intrusion of ozone at surface sites along Colorado's Front Range (Pat Reddy, Colorado APCD)
- 01:20 Results from Las Vegas Ozone Study (Andy Langford, NOAA ESRL)
- 01:40 Tropospheric Ozone Lidar Network (TOLNET) research program update (Chris Senff, NOAA)
- 02:00 Real-time depiction of stratospheric intrusions in RAQMS/WRF-Chem (Brad Pierce, NOAA – *remote*)
- 02:20 Controls on O<sub>3</sub> and SOA production in wildfire plumes and thoughts on parameterization for gridded models (Matt Alvarado, AER)
- 02:40 Discussion

03:00 Break

Ozone Air Quality in the Western U.S. / Modeling background contributions (Moderator: Pat Dolwick)

- 03:20 Interannual variability in boundary conditions and importance to surface air quality in the western U.S. (Dan Jaffe, Univ. of Washington)
- 03:40 Key drivers of Western U.S. surface ozone variability over recent decades: stratospheric intrusions, Asian pollution, and climate (Meiyun Lin, Princeton/NOAA)

- 04:10 Initial results from 3-State AQ modeling study related to O3 background (Zac Adelman, UNC)
- 04:30 Modeling estimates of emissions-influenced background ozone and its relationship to trends in the western United States (Allen Lefohn – ASL & Associates)
- 04:50 Model estimates of U.S. background (U.S. boundary condition inflow) ozone (Pat Dolwick & Jim Kelly, EPA OAQPS)
- 05:10 Identification of outstanding technical issues associated with background O3 (Gail Tonnesen, EPA Region 8)
- 05:30 Adjourn for the day

**Thursday, May 14, 2015**

Western States air quality impacts from fires (Moderator: Kirk Baker)

- 08:00 Ozone, PM, and fire – analysis tools for exceptional events and planning (Matt Mavko, Air Sciences– *remote*)
- 08:20 Impact of wildfires on air quality along the Wasatch Front (John Lin, Univ. of Utah)
- 08:40 FIREX 2018 field campaign (Carsten Warneke, NOAA)
- 09:00 Discussion

Western States air quality regulatory drivers: National Ambient Air Quality Standards (NAAQS), exceptional events, regional haze, NEPA, and other programs (Moderator: Kirk Baker)

- 09:20 Interactive Overview of western States air quality issues, modeling guidance, and looking forward on the NEI (Kirk Baker, EPA OAQPS)
- 10:00 Break
- 10:20 State perspective on monitoring networks and modeling tools for air quality planning (Gordon Pierce, Colorado APCD)
- 10:40 NEPA photochemical modeling needs & NO2 drill rig study (Mary Uhl, BLM)
- 11:00 Status of western regional (3-State, NW-Airquest, and others) air quality studies; modeling and monitoring components (Tom Moore, WESTAR/WRAP)
- 11:20 NASA AQA program support for western US air quality management (Tracey Holloway, Univ. of Wisconsin)
- 11:40 Discussion
- 12:00 Lunch (on your own)

Oil & Gas emissions inventory and modeling: Inventory comparisons; Top down vs. bottom up inventory assessments, Activity data, emissions factors, control efficiency; Oil & gas emissions “tool” overview and update; VOC speciation; Projections (Moderator: Tom Moore)

- 01:00 Reducing uncertainty and increasing representativeness of upstream O&G emissions in the western US (Tom Moore, WESTAR/WRAP)
- 01:20 2011 CAP/HAP National Emission Inventory development & 2014 NEI plans for the oil & gas exploration sector (Jennifer Snyder, EPA OAQPS)
- 01:40 Emissions inventory and modeling issues for O&G sector: VOC speciation, spatial allocation, stack parameters, temporal allocation (Zac Adelman, UNC & Alexis Zubrow, EPA OAQPS)

- 02:00 Using Growth and Decline Factors to Project VOC Emissions from Oil and Gas Production (Whitney Oswald, Utah DAQ)
- 02:20 Characterizing oil and natural gas field emissions using top-down approaches in the Uinta and Denver-Julesburg basins (Ravan Ahmadov and Stu McKeen, NOAA)

02:40 Break

Winter oxidant photochemical observation and model based studies (moderator: Gail Tonnesen)

- 03:00 Historical trends in ambient data and model application for the Upper Green River Basin (Darla Potter, Wyoming AQD)
- 03:20 Review of key findings from 2012, 2013, and 2014 Uinta basin field studies (Jim Roberts, NOAA)
- 03:40 SONGNEX 2015 field campaign goals and outcomes (Joost de Gouw, NOAA)
- 04:00 Bakken field study (Jeff Collett, CSU)
- 04:20 Colorado Oil & Gas Emissions Studies (Jeff Collett, CSU)
- 04:40 CMAQ sensitivity to Uinta Basin oil and gas emissions inventory updates (Lance Avey, Utah DAQ)

05:00 POSTER SESSION

06:30 Adjourn for the day

### **Friday, May 15, 2015**

Photochemical model, meteorological model, and observation based assessments and investigations of winter time elevated O<sub>3</sub> and PM<sub>2.5</sub> air pollution events. These events are typically associated with “cold pool” meteorological events that combine multi-day patterns of cold temperatures, stagnant winds, and terrain blocking (Moderator: Kirk Baker)

- 08:00 EPA/CARB model performance comparison using CALNEX (Jim. Kelly, EPA OAQPS)
- 08:20 Wintertime ozone chemistry and snow albedo updates for CAMx (Chris Emery, ENVIRON)
- 08:40 Residential wood emission inventory development and contribution modeling (Rich Mason & Kirk Baker, EPA OAQPS)
- 09:00 Numerical Modeling of Wintertime Cold Air Pools in the Uinta and Salt Lake Basin (Eric Crosman, Univ. of Utah)
- 09:20 Western / 3-State AQ Study winter ozone modeling (Kevin Talgo, UNC)
- 09:40 Denver ozone modeling for NAAQS attainment (Ralph Morris, ENVIRON)

10:00 Break

- 10:15 Rapid roundtable updates on technical work from States, Federal agencies, and other stakeholders
- 11:15 Concluding remarks and follow-up items from this workshop: Needs assessment for western States air quality (Tom Moore, WESTAR/WRAP)

Adjourn (Noon)