4th Biannual Western Modeling Workshop

July 27th update

September 6-8, 2017
NCAR Center Green Conference Center, Boulder, CO

Advance in-person and remote access registration required, hotel and logistics information here:
(https://westar.ticketleap.com/2017-western-modeling-workshop/)

Remote access to be added
Adobe Connect link and Conference Call line

Workshop Goals:

- Identify data gaps and application/research needs to address unique air quality management issues in the western U.S.;
- Increase collaboration between Local, Tribal and State Air Agencies, EPA, and other Federal Agencies in developing improved data sets and modeling tools to address these needs;
- Discuss and assess the data and modeling needs for the current portfolio of western U.S. programmatic analyses under the Clean Air Act; and
- Identify opportunities within the US EPA ORD/ACE (Air Climate and Energy Program) research portfolio to enhance research that addresses the western air quality management priority needs; identify research that is currently not covered by US EPA ORD or other organizations and look for additional opportunities to meet those needs.

Day One Wednesday, September 6, 2017	
Time (MDT)	**Sessions**
8:00 am	**Registration & Breakfast (on your own)**
9:00	**Welcome and Introductory Remarks** • WESTAR and WRAP • EPA Region 8 / ORD ACE / OAQPS • NCAR
9:30	**Plenary Session I: Global Model Evaluation, Development and New Source Attribution Tools** • Current state of the art for global scale models • EPA Hemispheric CMAQ model Session Leader: Gail Tonnesen, EPA Region 8 Discussion Topics/Session Outcomes: • Additional evaluations needed to assess global models' ability to accurately represent episode-specific transport contributions to Ozone and $PM_{2.5}$ for NAAQS and Regional Haze planning. • Continued development of tools that translate global model output to regional model initial/boundary conditions' inputs;

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Day One Wednesday, September 6, 2017	
Time (MDT)	**Sessions**
	• Additional source attribution tools or model sensitivity simulations to identify source contributions to international transport and; • Research plans and steps to identify resources and collaborations to fill these needs. <u>Speakers and Topics:</u> 1. Daven Henze, UC Boulder (in-person) and Arlene Fiore, Columbia Univ. (remote) 2. Rohit Mathur, EPA ORD – (invited) 3. Barron Henderson, EPA OAQPS – (invited) Future Directions and Coordination panel discussion
11:45 am	**Lunch (on your own)**
1:00 pm	**Plenary Session II: Data & Modeling Studies to Evaluate Regional Haze for 2028 Planning** • Overview of Western Regional Haze planning needs and emission inventories • New tracking metric, natural conditions, and IMPROVE data for model evaluation and Regional Haze planning • EPA First Look 2028 Regional Haze Modeling • Visibility modeling performance, past and present, and source apportionment estimates of natural, international and anthropogenic haze • States' concerns and needs for modeling haze for planning <u>Session Lead</u>: Tom Moore, WESTAR and WRAP <u>Session outcomes:</u> • Better understand relative domestic/international and natural/anthropogenic source contributions to haze to assist with future State regulatory actions • Better understanding of uncertainty in model estimates and poor model performance for regional haze evaluation and planning • Better understanding of uncertainty and model skill for natural & anthropogenic haze estimates • Improved emissions estimates for northern hemisphere anthropogenic emissions, fires, ammonia, and biogenic and geogenic sources • Better understanding of EPA modeling and IMPROVE monitoring for regional haze <u>Speakers and Topics:</u> 1. Brian Timin, EPA OAQPS 2. Gail Tonnesen, EPA Region 8 3. Ralph Morris, Ramboll Environ 4. Tom Moore, WESTAR and WRAP Future Directions and Coordination panel discussion
3:00	**Break**

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Day One Wednesday, September 6, 2017	
Time (MDT)	**Sessions**
3:15	**Plenary Session III: Modeling and other Studies to Evaluate Ozone Source Contributions** • Planning requirements and modeling for NAAQS transport SIPs • Model evaluation for Ozone in the intermountain West during FRAPPE 2014 • Source apportionment studies for Ozone SIPs • WESTAR-WRAP-API Background Ozone Scientific Assessment • Southern New Mexico Ozone Modeling Study and the §179B SIP option • Zero Out Global Model Run of Anthropogenic Global, Mexico, and Canadian Emissions Session Lead: Kevin Briggs, Colorado APCD Discussion/Session outcomes: • Better understanding of uncertainty in model estimates and poor model performance for evaluation and planning related to background / other source contributions to modeled Ozone • Better understanding by EPA OAQPS and ORD of limitations to national approach Speakers and Topics Nonattainment Area Impacts 1. Ralph Morris, Ramboll Environ - Zero-out global emissions modeling analysis for the Denver/NFR Ozone Nonattainment Area 2. Zac Adelman, UNC and Rita Bates, NM AQB – Southern New Mexico Ozone Modeling Study and the §179B SIP Option Ozone Studies 3. Gabi Pfister, NCAR – Update on Model Evaluation for Ozone in the Intermountain West During FRAPPE 2014 4. Norm Possiel, EPA OAQPS (invited, remote) – Planning Requirements & Modeling Evaluation for Ozone NAAQS Transport SIPs 5. Dan Jaffe, UW and Tom Moore, WESTAR and WRAP - WESTAR/WRAP/API Background Ozone Scientific Assessment
5:00	**WRAP-up and adjourn for the day**
6:30	**No-host dinner**

Day Two Thursday, September 7, 2017	
Time (MDT)	**Sessions**
8:00 am	**Welcome and Agenda Review**
8:15	**Plenary Session IV: Applications of studies of monitoring and emissions data to evaluate and develop improved wintertime air quality modeling systems** • Model performance for VOC and Ozone in winter Ozone areas • Understanding emissions, chemical, meteorological, and terrain contribution to winter time elevated $PM_{2.5}$ in Salt Lake City • Model performance for winter $PM_{2.5}$ in CA and UT • Uncertainty in wood heating emissions Session Lead: Chris Pennell, UT DAQ Session outcomes: • Identify needs for future ambient monitoring • Assess benefits and priorities for additional inventory improvements through field studies and expanded routine monitoring; • Discuss improved meteorological model performance for winter cold air pool modeling; • Agree upon next steps for improving emissions inventories for residential wood combustion; • Address uncertainty in oil and gas VOC and NOx emissions and reconciliation of top-down vs. bottom-up emissions estimates; and • Improve model performance for winter oxidants, nitric acid and ammonium nitrate formation, including nighttime and heterogeneous pathways. Speakers and Topics: 1. Nancy Daher, Utah DAQ - Investigating wood burn ban compliance using levoglucosan measurements and heat flux normalization 2. Phil Allen and Chris Swab, Oregon DEQ - Improving residential wood smoke spatial surrogates using extensive survey data 3. Whitney Oswald, Utah DAQ - Filling in the gaps of Utah's oil and gas inventory 4. Chris Foster, Univ. of Utah - Constraining methane emissions in the Uintah Basin with ground-based concentration observations and a time-reversed Lagrangian transport model (STILT) 5. Trang Tran, Utah St. Univ. - FDDA impacts on WRF performance in simulating inversion layer structure in Uintah Basin 6. Dale Wells, CO APCD – title to be added
10:15	**Break**

Day Two Thursday, September 7, 2017	
Time (MDT)	**Sessions**
10:30	**Plenary Session V: Improved Estimates of Ammonia Emissions and Deposition** • Currently data / future research plans • Modeled N deposition in the western U.S. • NPS studies • Diurnal measurements • Ammonia Emissions Inventories • Ammonia Bi-Directional Flux Session Lead: Mike Barna, NPS ARD Discussion/Session outcomes: • Need for measurements and modeling of NH_3 and NH_4 in high population areas and in remote areas; • NPS/CSU monitoring studies that highlighting challenges in interpreting ambient NH_3 measurements in remote areas; • Continuous measurements of NH_3 and NH_4 to evaluate models and for comparison to long term average passive samplers. Speakers and Topics: 1. Jeff Collett, CSU - ammonia measurements at ROMO 2. Daven Henze, CU-Boulder - adjoint modeling for ammonia 3. Kira Shonkwiler, CSU - ammonia flux measurements from feedlots 4. Mike Barna, NPS ARD – O&G deposition modeling 5. Jesse Bash, EPA ORD (invited, remote) - bi-directional ammonia flux in CMAQ 6. John Walker or Donna Schwede, EPA (invited, remote) - "TDEP" estimates of ammonia deposition Future Directions and Coordination discussion
12:30 pm	**Lunch (on your own)**
1:30 to 5:30	**Field trip departing from / returning to NCAR Center Green** *(details in development)* • *Rocky Mountain National Park air quality study sites & Mountain Research Station, INSTAAR*
Dinner and evening activities on your own	

Day Three Friday, September 8, 2017	
Time (MDT)	**Sessions**
8:00 am	**Welcome and Agenda Review**
8:15	**Plenary Session VI: Fire Research and Air Management Needs** • WRAP Fire & Smoke Work Group priorities • EPA's recent and planned projects related to wildland fire • Fire research highlights and plans for the next phase of FIREX Session Lead: Kirk Baker, EPA OAQPS Discussion/Session outcomes: • Exchange of information and improved understanding of national initiatives; • Discussions of applied uncertainties in emissions and model estimates and poor model performance for evaluation and planning related to background O_3, Exceptional Events, and Regional Haze planning; and • Assemble volunteer team to draft research plan to develop more reliable estimates of fire contributions to Ozone / Regional Haze. Speakers and Topics: 1. Kirk Baker and Tesh Rao, EPA OAQPS - 2014 National Fire Emission Inventory overview 2. Sara Strachan, Idaho DEQ - WRAP Fire & Smoke Work Group priorities and projects 3. Ralph Morris, Ramboll Environ - Modeled wildfire contribution in the western U.S. and model performance implications 4. Matt Mavko, Air Sciences – WRAP Tools framework overview and updates 5. Kirk Baker, EPA OAQPS - EPA recent and planned projects related to wildland fire + update on planned field studies in the western U.S. Future Directions and Coordination discussion
10:15	**Break**
10:30	**Plenary Session VII: Model Performance Evaluation (MPE) Tools and Field Studies** • Improving and automating MPE Tools • Examples of MPE systems and efforts • Field Studies to support improved MPE Session Leads: Gail Tonnesen and Tom Moore Session outcomes: • Discussion of modeling and field studies, and effort to systematically apply MPE tests. Speakers and Topics: 1. Zac Adelman, Rodger Ames, and Shawn McClure, (UNC and CSU-CIRA) – Intermountain West Data Warehouse – Western Air Quality Study (IWDW-WAQS) MPE Efforts 2. EPA speaker TBD – ORD MPE Efforts 3. Andrew Langford, NOAA (invited) - FAST-LVOS study in Las Vegas 4. Wayne Angevine, NOAA (invited) – Evaluation of WRF Performance in Complex Terrain
11:45	**Wrap Up and Closing Remarks**
12:00 pm	**Adjourn Workshop**