4th Biannual Western Modeling Workshop

final agenda

September 6-8, 2017

NCAR Center Green Conference Center, Boulder, CO

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.

Day One Wednesday, September 6, 2017	
Time (MDT)	**Sessions**
8:00 am	**Registration and Breakfast (on your own)**

9:00	**Welcome, Agenda Review, Acknowledgements** – Tom Moore
	
	Introductory Remarks
	 • EPA
	  ○ Region 8 – Gail Tonnesen
	  ○ ORD ACE – Dan Costa (remote)
	  ○ OAQPS – Kirk Baker
	 • WESTAR and WRAP – Mary Uhl

9:30	**Plenary Session I: Global Model Evaluation, Development and New Source Attribution Tools** Session Leader: Gail Tonnesen, EPA Region 8 **Issue paper** 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; • 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. Speakers and Topics: • Introductory Remarks – Gail Tonnesen 1. Daven Henze, UC Boulder (in-person) and Arlene Fiore, Columbia Univ. (remote) - Overview of current evaluations, applications and advances in global air quality models (PDF) 2. Rohit Mathur, EPA ORD – A Hemispheric Version of the Community Multiscale Air Quality (CMAQ) Modeling System: Motivation and Status (PDF) 3. Barron Henderson, EPA OAQPS (remote) - Global Modeling to Support Domestic Simulations: Plans and Progress (PDF) Future Directions and Coordination panel discussion
11:45	**Lunch (on your own)**
1:00 pm	**Plenary Session II: Data & Modeling Studies to Evaluate Regional Haze for 2028 Planning** Session Lead: Tom Moore, WESTAR and WRAP **Issue paper** Session outcomes: • 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 understand 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 Speakers and Topics: • Introductory Remarks – Tom Moore 1. Bret Schichtel, NPS ARD – Tracking Progress to Natural Visibility on Anthropogenically Impaired Days: What is anthropogenic impairment and how good is EPA's proposed method of estimation? (PDF) 2. Brian Timin, EPA OAQPS - Model Outputs and Caveats from EPA's Initial 2028 Visibility Air Quality Modeling (PDF) 3. Gail Tonnesen, EPA Region 8 - Comparing estimates of visibility improvement at Class I areas based on IMPROVE data analysis and photochemical model simulations (PDF) 4. Ralph Morris, Ramboll Environ - Evaluation of Visibility Metrics for Demonstrating Reasonable Progress Goals under the Regional Haze Rule (PDF) 5. Tom Moore, WESTAR and WRAP - Regional Analysis steps to support western Regional Haze planning (PDF) Future Directions and Coordination panel discussion

2:45	**Break**
3:00	**Plenary Session III: Modeling and other Studies to Evaluate Ozone Source Contributions** Session Lead: Kevin Briggs, Colorado APCD **Issue paper** Discussion/Session outcomes: - Better understanding of uncertainty in model estimates and 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 - Introductory Remarks – Kevin Briggs Nonattainment Area Impacts 1. Ralph Morris, Ramboll Environ - Zero-out global emissions modeling analysis for the Denver/NFR Ozone Nonattainment Area (PDF) 2. Ralph Morris, Ramboll Environ – Southern New Mexico Ozone Modeling Study and the §179B SIP Option (PDF) Ozone Studies 3. Gabi Pfister and Frank Flocke, NCAR – Source Contributions to Surface Ozone in the Colorado Front Range during FRAPPÉ (PDF) 4. Brian Timin, EPA OAQPS – Overview of EPA Ozone Transport Modeling (PDF) 5. Tom Moore, WESTAR and WRAP - Background Ozone Scientific Assessment (PDF)
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

:15	**Plenary Session IV: Applications of studies of monitoring and emissions data to evaluate and develop improved wintertime air quality modeling systems** Session Lead: Chris Pennell, UT DAQ **Issue paper** Session outcomes: • 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. Speakers and Topics: • Introductory Remarks – Chris Pennell 1. Trang Tran, Utah St. Univ. – Four Dimensional Data Assimilation impacts on WRF performance in simulating inversion layer structure in Uintah Basin (PDF) 2. Chris Foster, UoUtah - Constraining methane emissions in the Uintah Basin with ground-based concentration observations and a time-reversed Lagrangian transport model (STILT) (PDF) 3. Whitney Oswald, Utah DAQ - Filling in the gaps of Utah's oil and gas inventory (PDF) 4. Dale Wells, CO APCD – A Comparison of Denver Metropolitan/North Front Range Ozone Nonattainment Area Oil and Gas Inventories with Monitored Ambient VOC Precursors (PDF) 5. Chris Pennell, Utah DAQ – Wasatch Front PM2.5 modeling progress/Investigating wood burn ban compliance in Northern Utah (PDF) 6. Phil Allen (in-person) and Chris Swab (remote), Oregon DEQ - Statewide Spatial Allocation of Residential Wood Heating Emissions based on a Portland Survey (PDF)
10:15	**Break**
10:30	**Plenary Session V: Improved Estimates of Ammonia Emissions and Deposition** Session Lead: Mike Barna, NPS ARD **Issue paper** 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: • Introductory Remarks – Mike Barna 1. Jeff Collett, CSU - The Dynamic World of Ammonia (PDF) 2. Daven Henze, CU-Boulder - NH3 satellite remote sensing and top-down emissions estimates (PDF) 3. Kira Shonkwiler, CSU - Estimating Ammonia Emissions from a Beef Feedlot in Colorado (PDF) 4. Mike Barna, NPS ARD – Simulating the Contribution of Emissions from Oil and Gas Development to Regional Nitrogen Deposition at National Parks in the Intermountain West (PDF) 5. Jesse Bash, EPA ORD (remote) – Modeling and Measurements to Improve Bidirectional Exchange in CMAQ (PDF) 6. Donna Schwede, EPA (remote) – Measurements and Modeling to Enhance Estimates of NH3 Total Deposition (PDF)

12:30	**Lunch (on your own)**
1:30 to 5:30	**Field trip departing from / returning to NCAR Center Green** • *Rocky Mountain National Park air quality study sites*

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**
	
	Session Lead: Kirk Baker, EPA OAQPS **Issue paper**
	
	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:
	    • Introductory Remarks – Kirk Baker
	    1. Kirk Baker (in-person) and Tesh Rao (remote), EPA OAQPS - 2014 National Fire Emission Inventory and 2016 EPA modeling platform overview (PDF)
	    2. Sara Strachan, ID DEQ (remote) - WRAP Fire & Smoke Work Group priorities / projects (PDF)
	    3. Matt Mavko, Air Sciences and Ralph Morris, Ramboll Environ – Lessons Learned from Modeling Regional Air Quality Impacts from Wildland Fires - Implications and Next Steps (PDF)
	    4. Ravan Ahmadov, NOAA - HRRR-Smoke case study model evaluation for $PM_{2.5}$ (PDF)
	    5. Kirk Baker, EPA OAQPS - EPA recent and planned projects related to wildland fire + update on planned field studies in the western U.S. (PDF)
	
	Future Directions and Coordination discussion

10:15	**Break**

10:30	**Plenary Session VII: Model Performance Evaluation (MPE) Tools and Field Studies** Session Leads: Gail Tonnesen and Tom Moore **Issue paper** Session outcomes: • Discussion of modeling and field studies, and effort to systematically apply MPE tests. Speakers and topics: • Introductory Remarks – Gail and Tom 1. Rebecca Matichuk (EPA R8) and Zac Adelman, Rodger Ames, and Shawn McClure, (UNC and CSU-CIRA) – Intermountain West Data Warehouse – Western Air Quality Study (IWDW-WAQS) MPE Efforts ([PDF](#)) 2. Kristen Foley and Wyat Appel (remote) - EPA ORD - The Use of AMET and Automated Scripts for Model Evaluation ([PDF](#)) 3. Andrew Langford, NOAA - FAST-LVOS study in Las Vegas ([PDF](#)) 4. Wayne Angevine, NOAA – Evaluation of WRF Performance in Complex Terrain ([PDF](#))
11:45	**WRAP-up** and Closing Remarks
12:00 pm	**Adjourn Workshop**