

CONFERENCE

Meteorology
And
Climate

-
Modeling *for*
Air
Quality

University of California, Davis
September 11-13, 2020

CONFERENCE PROGRAM

WEDNESDAY, SEPTEMBER 11, 2019

- 7:00 AM **REGISTRATION AND BREAKFAST** *in Conference Center Lobby*
- 8:00 AM **OPENING REMARKS**
- 8:05 AM **PLENARY TALK**
Forecasting atmospheric composition at the European Centre for Medium-Range Weather Forecasts: Achievements and challenges of the global CAMS system.
Johannes Flemming, European Center for Medium-Range Weather Forecasts
- 8:55 AM **MODELING OF PROCESSES ACROSS GLOBAL TO REGIONAL AND LOCAL SCALES**
Hosted by Katie Lundquist, Lawrence Livermore National Lab & Sue Haupt, National Center for Atmospheric Research
A review of recent advances in climate modeling across scales
Paul Ullrich, UC Davis
Toward the integration of atmosphere and wind plant physics and simulation techniques: An overview of the DOE's Mesoscale-Microscale Coupling project
Jeff Mirocha, Lawrence Livermore National Laboratory
Atmospheric Acidity and the Role of Clouds on Air Quality
Mary Barth, NCAR
- 10:00 AM **BREAK**
Coffee and Refreshments in Lobby
- 10:20 AM **MODELING OF PROCESSES ACROSS GLOBAL TO REGIONAL AND LOCAL SCALES continued...**
Forecasting Dust Emissions from Regional to Global Scale using Satellite Data In NOAA FV3
Barry Baker, CICS-MD & George Mason University & NOAA
Defining environmental parameter domains for secondary organic aerosol formation
William Porter, UC Riverside
- 11:05 AM **COMPOSITION AND OPERATIONAL FORECASTING FROM DAILY TO SEASONAL SCALES**
Hosted by Christoph Keller, NASA Global Modeling and Assimilation Office, Georg Grell, National Oceanic and Atmospheric Administration, Maria Teresa Pay, Barcelona Super Computing Center
Routine Multi-model Performance Analysis over North America for Three Operational Air Quality Forecast Systems
Mike Moran, Environment and Climate Change Canada
Development of Air Quality Modeling and Forecast over China
Jian-Bin Wu, 3Clear Technology Co., Ltd
Near Real-Time Sub/Seasonal Prediction of Aerosol at NASA Global Modeling and Assimilation Office
Andrea Molod, NASA
- 12:05 PM **LUNCH**
Provided by Magpie Caterers
- 1:00 PM **COMPOSITION AND OPERATIONAL FORECASTING FROM DAILY TO SEASONAL SCALES continued...**
High Resolution Air Quality Forecasting systems for India and the United States
Rajesh Kumar, NCAR
A Machine Learning Approach for Ozone Forecasting and its Application for Kennewick, WA
Kai Fan, Laboratory for Atmospheric Research, Department of Civil and Environmental Engineering

CONFERENCE PROGRAM

WEDNESDAY, SEPTEMBER 11, 2019

1:45 PM **BL PARAMETERIZATIONS**

Hosted by Jimy Dudhia, National Center for Atmospheric Research & Jon Pleim, U.S. Environmental Protection Agency

Modeling Subgrid Transport

Jimy Dudhia, *National Center for Atmospheric Research*

Evaluation of PBL Parameterizations in WRF at Subkilometer Grid Spacings: Turbulence Statistics in the Dry Convective Boundary Layer

Hailey Shin, NCAR

Accounting for vertical and horizontal turbulent mixing in a three-dimensional planetary boundary layer parameterization

Pedro Jimenez, NCAR

Scale-aware tests of the MYNN-EDMF PBL, shallow cumulus, and chemical mixing scheme with a novel framework

Wayne Angevine, CIRES & NOAA CSL

3:15 PM **BREAK**

Coffee and Refreshments in Lobby

3:35 PM **COMPLEX TERRAIN AND COASTAL ZONE METEOROLOGY**

Hosted by Eric Pardyjak, University of Utah

Implications of Soil Moisture on Modeled Land-Atmosphere Interactions over Heterogenous Terrain

Aaron Alexander, UC Davis

Daytime, anabatic winds over a steep Alpine slope: Turbulence structure and modeling implications

Holly J. Oldroyd, UC Davis

Diagnosing and Mitigating Errors in Boundary Layer Structure

Robert Fovell, University at Albany SUNY

4:40 PM **MINUTE MADNESS**

Poster Presenters will have 1-minute 1-slide to share with audience about their poster.

5:00 PM **WELCOME RECEPTION & POSTER DISCUSSIONS**

Join us in the Lobby of the Conference Center for some light appetizers, drinks and great discussions on the poster displays and session topics.

Thank you to our generous sponsor



CONFERENCE PROGRAM

THURSDAY, SEPTEMBER 12, 2019

- 7:00 AM **REGISTRATION AND BREAKFAST** *in Conference Center Lobby*
- 8:00 AM **COMPLEX TERRAIN AND COASTAL ZONE METEOROLOGY continued...**
Hosted by Eric Pardyjak, University of Utah
The Impacts of Wildland Fires and Lower Troposphere Ozone in relation to Air Quality during CABOTS 2016
Jodie Clark, San Jose State University
Diablo Winds in the Bay Area California: Their climatology, extremes, and behavior
Yi-Chin Liu, California Air Resources Board
- 8:45 AM **LES, CFD, AND URBAN CANOPY MODELING**
Hosted by Katie Lundquist, Lawrence Livermore National Lab & Jon Pleim, U.S. Environmental Protection Agency
Modeling variations in ozone dry deposition - what is important for ozone pollution?
Olivia Clifton, NCAR
Large-Eddy Simulation and Lagrangian Two-Particle Modeling of Mean and Fluctuating Concentrations in the Atmospheric Boundary Layer
Jeff Weil, NCAR
Analyzing and improving turbulence characterization in a multiscale atmospheric model of transport and dispersion through an urban area
David Wiersema, UC Berkeley
- 9:50 AM **BREAK**
Coffee and Refreshments in Lobby
- 10:20 AM **CONVECTION**
Hosted by Saulo Freitas, NASA Goddard Space Flight Center & Baode Chen, Shanghai Meteorological Service
The Shallow-to-Deep Convective Transition: A Modeling Challenge
David Adams, Universidad Nacional Autanoma de Mexico
Current Developmental Activity on the Grell-Freitas Cumulus Parameterization Including the Addition of Number Concentrations and Storm Motion
Hannah Barnes, NOAA ESRL
Improvement of parameterized convective transport and wet scavenging of trace gases in the WRF-Chem model
Kenneth Pickering, University of Maryland
- 11:30 AM **LUNCH**
Provided by Magpie Caterers
- 12:30 PM **PLENARY: Connecting Ozone Exceedances in Houston TX to Variability in Emissions and Meteorology: Implications for Federal Attainment**
By, William Vizuete, University of North Carolina - Chapel Hill

CONFERENCE PROGRAM

THURSDAY, SEPTEMBER 12, 2019

- 1:25 PM **AEROSOL DIRECT & INDIRECT FEEDBACKS AND AEROSOL AWARE MICROPHYSICS**
Hosted by Shu-Hua Chen, UC Davis & Kiran Alapaty, US EPA
Effects of GHG mitigation strategies on future California climate
Mike Kleeman, UC Davis
Substantial Convection and Precipitation Enhancements by Ultrafine Aerosol Particles
Jiwen Fan, Pacific Northwest National Laboratory
An Investigation of Proposed Aerosol Indirect Effect Mechanisms in Deep Convection
Adele Igel, UC Davis
- 2:30 PM **BREAK**
Coffee and Refreshments in Lobby
- 2:50 PM **AEROSOL DIRECT & INDIRECT FEEDBACKS AND AEROSOL AWARE MICROPHYSICS continued...**
Medium Complexity Aerosol Treatment Coupled with Clouds/Precipitation/Radiation in a USA Operational NWP Model
Gregory Thompson, NCAR-RAL
The Comparison of Dust-Radiation versus Dust-Cloud Interactions on the Development of a Modeled Mesoscale Convective System over North Africa
Chu-Chun Huang, UC Davis
- 3:35 PM **MODEL EVALUATION USING METEOROLOGICAL AND CHEMICAL OBSERVATIONS**
Hosted by Maria Teresa Pay, Barcelona Super Computing Center, Gabriele Pfister, National Center for Atmospheric Research & Stu McKeen, NOAA
CAMS Forecast and Reanalysis Evaluation using Chemical Observations
Henk Eskes, KNMI
Regional and hemispheric evaluation of the new Community Multiscale Air Quality Model (CMAQ) version 5.3
K. Wyatt Appel, US EPA
Seasonality and Trends of Modeled PM_{2.5} using WRF-CMAQ using Empirical Mode Decomposition
Marina Astitha, University of Connecticut
WRF-Chem Modeling of Summertime Ozone during the Long Island Sound Tropospheric Ozone Study
Brian McDonald, NOAA Earth System Research Laboratory
Challenges in simulating high air pollution concentrations during persistent cold air pool events
Xia Sun, University of Nevada, Reno

CONFERENCE PROGRAM

FRIDAY, SEPTEMBER 13, 2019

7:00 AM **REGISTRATION AND BREAKFAST** *in Conference Center Lobby*

8:00 AM **DATA ASSIMILATION AND INVERSE MODELING**

Hosted by Daven Henze, University of Colorado Boulder, Christoph Keller, NASA Global Modeling and Assimilation Office, Shu-Hua Chen, UC Davis, Ave Arellano, University of Arizona

Navy Ensemble Aerosol Forecasting and Data Assimilation

Juli Rubin, US Naval Research Laboratory, Remote Sensing Division

Leveraging deep learning hyperparameter tuning frameworks for intelligent WRF ensembles

Derek Jensen, Lawrence Livermore National Laboratory

A biomass burning smoke prediction system including near-real time constraints on emissions over the Western U.S.

Pablo Saide, UCLA

Errors in top-down estimates of emissions using a known source

Wayne Angevine, CIRES and NOAA CSL

Top-down N₂O emission estimation in California using tower measurements and an inverse modeling technique

Yu YanCui, California Air Resources Board

9:45 AM **BREAK**

Coffee and Refreshments in Lobby

10:05 AM **NEW AND INNOVATIVE MODELING TECHNIQUES: MACHINE LEARNING, NEW COMPUTATION METHODS/GPU'S, EXPOSURE ESTIMATE IMPROVEMENT, DATA SIMULATION**

Hosted by Daven Henze, University of Colorado Boulder, Christoph Keller, NASA Global Modeling and Assimilation Office, Eric Pardyjak, University of Utah, Ave Arellano, University of Arizona

Using Machine Learning to Assess Parameters Associated with Harmful Algal Blooms and Hypoxia for Lake Erie

Christina Feng Chang, University of Connecticut

Machine Learning for Air Quality Applications

David Lary, University of Texas, Dallas

AI for Science: Deep Learning for improved Satellite Observations and Numerical Modeling

Craig Tierney, NVIDIA

A Deep Learning Parameterization for Ozone Dry Deposition Velocities

Sam Silva, Massachusetts Institute of Technology

A Mass-Conserving Machine Learning Algorithm for Atmospheric Chemistry

Anthony Wexler, UC Davis, Air Quality Research Center

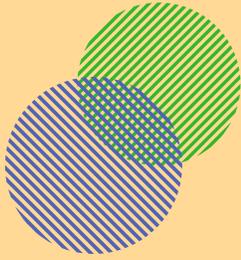
11:40 AM **CLOSING REMARKS** *by Gabriele Pfister, NCAR*

Poster Session Key

- | | |
|--|--|
| 1 Modeling of Processes Across Global and Regional Scales | 6 BL Parameterizations |
| 2 Model Evaluation Using Meteorological and Chemical Observations | 7 Data Assimilation & Inverse Modeling |
| 3 Aerosol Direct & Indirect Feedbacks and Aerosol Aware Microphysics | 8 LES, CFD, and Urban Canopy Modeling |
| 4 Composition and Operational Forecasting from Daily to Seasonal Scales | 9 Complex Terrain and Coastal Zone Meteorology |
| 5 New and Innovative Modeling Techniques: Machine Learning, New Computation Methods/GPUs, Exposure Estimate Improvement, Data Simulation | |

POSTER PRESENTATION DISPLAYS

- 3 Precipitation Partitioning Across Grey Zone Scales Using Scale-Aware Cloud Formulations: Impacts of Aerosols**
Kiran Alapaty, US EPA
- 2 A novel ensemble design for fine particulate matter probabilistic predictions and quantification of their uncertainty**
Rajesh Kumar, NCAR
- 8 Ongoing improvements to surface-layer turbulence modeling in the Weather Research and Forecasting model**
Robert Arthur, Lawrence Livermore National Laboratory
- 4 Emissions, Transport, and Chemistry of Smoke from Western U.S. Wildfires**
Megan Bela, Cooperative Institute for Research in Environmental Sciences (CIRES) University of Colorado / NOAA ESRL Chemical Sciences Division
- 2 Effect of biomass burning on Light-Absorbing Particles vs. snow albedo reduction on Central Andes: the analysis of WRF-Chem modeling**
Tomas Rafael Bolano-Ortiz, National Technological University, Mendoza Regional Faculty - National Scientific and Technical Research Council
- Evaluating the impact of assimilating aerosol optical depth observations on dust forecasts over North Africa and the East Atlantic using different data assimilation methods**
Shu-Hua Chen, University of California, Davis
- 6 Evaluation of PBLH simulated by WRF using a new LiDAR network in California**
Yuyan Cui, California Air Resources Board
- 2 Exploring future climate effects on northwestern US air quality**
Kai Fan, Laboratory for Atmospheric Research, Department of Civil and Environmental Engineering, Washington State University
- 8 Effects of urban land use on meteorology and atmospheric chemistry in Pacific Northwest urban areas**
Ana Carla Fernandez Valdes, Washington State University
- 1 Assessing the Goddard Earth Observing System model in non-resolved to convection-permitting regimes**
Saulo Freitas, USRA/GESTAR - NASA/GSFC
- 1 A Comparison of MPAS and WRF Meteorological Models in California: 2013 Winter and 2016 Summer Case Studies**
Kemal Gurer, California Air Resources Board
- 1 Using WRF-STILT to Determine the Relative Contributions of US and Mexican Emissions to High Ozone Events in El Paso, Texas**
Jennifer Hegarty, AER
- 5 Atmospheric chemistry modeling using machine learning**
Christoph Keller, NASA GMAO / USRA
- 1 What causes the observed surface ozone-temperature relationship? Effect of the eddy-driven jet on surface-level transport**
Gaiige Hunter Kerr, Department of Earth & Planetary Sciences, Johns Hopkins University
- 5 Source apportionment modelling to unravel the origin of tropospheric ozone peaks over southwestern Europe**
Maria Teresa Pay, Barcelona Supercomputing Center
- 1 Evaluation of the online multiscale MONARCH model to forecast air quality over Europe**
Maria Teresa Pay, Barcelona Supercomputing Center
- 2 Evaluation of AQ models: what we miss with limited information**
Gabriele Pfister, National Center for Atmospheric Research
- 1 Interactions between meteorology and chemistry during wildfire season over Western US**
Amit Sharma, Laboratory for Atmospheric Research, Washington State University
- 9 Simulation of the land-atmosphere exchange during persistent cold air pool events in Salt Lake Valley, Utah**
Xia Sun, University of Nevada, Reno
- 6 Micro-Pulse LiDAR Measurements of the Mixed Layer Height in the San Joaquin Valley**
William Vance, California Air Resources Board
- 1 How would a regional nuclear war affect the global climate?**
Benjamin Wagman, Lawrence Livermore National Laboratory
- 7 Empirical estimation of posterior emission flux errors**
Yuzhong Zhang, Harvard University
- 1 Assessment of Climate change impact over California for wintertime using dynamic downscaling with a bias correction technique**
Zhan Zhao, California Air Resources Board



Meteorology And Climate

Modeling for Air Quality

Technical Planning Committee

- | | |
|--|---|
| Kiran Alapaty, U.S. Environmental Protection Agency | Daven Henze, University of Colorado Boulder |
| Ave Arellano, University of Arizona | Ajith Kaduwela, California Air Resources Board |
| Jeremy Avise, California Air Resources Board | Christoph Keller, NASA Global Modeling and
Assimilation Office |
| Baode Chen, Shanghai Meteorological Service | Katie Lundquist, Lawrence Livermore National Lab |
| Shu-Hua Chen, UC Davis | Stu McKeen, National Oceanic and Atmospheric
Administration |
| Jimmy Dudhia, National Center for Atmospheric
Research | Eric Pardyjak, University of Utah |
| Saulo Freitas, Universities Space Research
Association / NASA Goddard Space Flight Center | Maria Teresa Pay, Barcelona Super Computing Center |
| Georg Grell, National Oceanic and Atmospheric
Administration | Gabriele Pfister, National Center for Atmospheric
Research |
| Sue Haupt, National Center for Atmospheric Research | Jon Pleim, U.S. Environmental Protection Agency |

Upcoming Events

- | | |
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| Refinery And Chemical Industry Emissions Symposium
November 6-8, 2019 ~ Davis, California
https://racie.aqrc.ucdavis.edu | International Smoke Symposium 3
April 21-23, 2019 ~ Davis, California
https://aqrc.ucdavis.edu/events/3rd-international-smoke-symposium |
| International Aerosol Modeling Algorithms Conference
December 4-6, 2019 ~ Davis, California
https://iama.aqrc.ucdavis.edu | Air Sensors International Conference
May 12-15, 2019 ~ Pasadena, California
https://asic.aqrc.ucdavis.edu |

For questions about the UC Davis Air Quality Research Center Conference Programs, email Conference Staff at airqualityevents@ucdavis.edu