# CESM Atmosphere / Whole Atmosphere / Chemistry-Climate WINTER WORKING GROUP MEETING

## 30-January-1 February 2023

### Monday, January 30

** All times are MST; **Speakers**: please leave 5 min at the end of your slot for questions.*

| Time | Topic | Speakers |
|---|---|---|
| **Overview: CESM Atmosphere, Whole Atmosphere and Climate Chemistry** *Mesa Lab Main Seminar Room* | | |
| **12:30** | **Welcome and logistics** | |
| 12:35 | AMWG Overview | Julio Bacmeister |
| 12:50 | WAWG Overview | Nick Davis, Nick Pedatella |
| 13:05 | CCWG Overview | Simone Tilmes |
| 13:20 | ***Additional discussion period for all overview talks*** | |
| 13:35 | ***Break*** | |
| **AMWG/CCWG/WAWG Joint Session: New Development Plans** *Mesa Lab Main Seminar Room* | | |
| 13:50 | Model-Independent Chemistry Module | Louisa Emmons |
| 14:05 | The Harmonized Emissions Component (HEMCO) 3.0 as a versatile multi-model emissions component implemented within MUSICA/CAM-chem | Haipeng Lin |
| 14:20 | A New Simplified Parameterization of Secondary Organic Aerosol in the Community Earth System Model Version 2 (CESM2) | Duseong Jo |
| 14:35 | The Incorporation of Volcanic Ash into the CESM | Sarah Deutsch |
| 14:50 | ***Break*** | |
| 15:05 | ADF - Next Generation of AMWG Diagnostics | Justin Richling |
| 15:20 | Development Of SC-WACCM With The Non-Hydrostatic MPAS-A Dynamical Core | Soudeh Kamali |
| 15:35 | A step towards SIMA: Implementation of the CCPP in CAM | Jesse Nusbaumer |
| 15:50 | The Ethical Dimensions of Climate Modeling: Model Adequacy, Epistemic Risk, and Advancing Justice | Monica Morrison |
| 16:05 | ***Discussion*** | |
| 16:30 | ***ADJOURN*** | |

## Tuesday, January 31

** All times are MST;* ***Speakers****: please leave 5 min at the end of your slot for questions.*

| Time | Topic | Speakers |
|---|---|---|
| **AMWG: High-resolution and Variable Resolution**<br>***Damon Room* (see CCWG for agenda of parallel sessions)** | | |
| 9:00 | Welcome and Logistics | |
| 9:05 | EarthWorks Progress Report | Dave Randall |
| 9:20 | Convective-Scale Testing of MPAS with CAM6 Physics | Bill Skamarock |
| 9:35 | Coupling a variable-resolution atmosphere to POP2 in CESM2.2: preindustrial control and an idealized warming experiment | Adam Herrington |
| 9:50 | Evaluating Scale-Dependent Bias in the Community Earth System Model's Representation of the Mean Diurnal Cycle over South America | Patrick Callaghan |
| 10:05 | Key processes associated with the diurnal cycle of rainfall over the east Amazon and its representation in high-resolution CAM6 | Xianan Jiang |
| 10:20 | Using variable resolution to examine orographic effects around the Andes | Julio Bacmeister |
| 10:35 | ***Discussion*** | |
| 10:50 | ***Break*** | |
| **CGD Seminar**<br>***Mesa Lab Main Seminar Room*** | | |
| 11:00 | **CGD Seminar** -<br>Youtube link: https://www.youtube.com/c/NCARCGD<br>Questions on Slido.com | Alyssa Stansfield |
| 12:00 | **Lunch (on your own)** | |
| **AMWG/CCWG/WAWG Joint Session**<br>***Mesa Lab Main Seminar Room*** | | |
| 13:00 | Fast response of East Asian precipitation to local and remote aerosol emission reductions during COVID-19 | Weiyi Wang |
| 13:15 | Quantifying emission and radiative forcing of anthropogenic dust | Xiaohong Liu |
| 13:30 | Performance of the CARMA sectional aerosol microphysical model in CESM2 | Simone Tilmes |
| 13:45 | Sectional Cloud Model for CESM2 (CESM2-CARMA Cloud) | Lu Wang |
| 14:00 | Examining the Impacts of an Interactive Fire Plume-Rise Model in E3SM on Aerosol Radiative Effects | Zheng Lu |
| 14:15 | ***Break*** | |
| **AMWG: Aerosol-Cloud Interactions**<br>***Mesa Lab Main Seminar Room*** | | |
| 14:30 | Increased cloud liquid water in climate models enhances both aerosol indirect forcing and cloud radiative feedback | Xi Zhao |

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| 14:45 | Ice, Ice, Maybe? CAM6 Ice Formation in Southern Ocean Mixed Phase Clouds | Christina McCluskey |
| 15:00 | Characterizing two types of cirrus clouds that differ in nucleation mechanism and radiative effect | David Mitchell |
| 15:15 | ***Break*** | |
| **AMWG: Atmosphere-Land-Ocean Coupling**<br>***Mesa Lab Main Seminar Room*** | | |
| 15:30 | The Simple Land Interface Model (SLIM): an idealized land surface model in CESM | Marysa Lague |
| 15:45 | Enhancing the ability of the atmosphere to respond to subgrid land surface heterogeneity | Megan Fowler |
| 16:00 | Using a variety of Slab-Ocean Models (SOMs) to evaluate climate sensitivity | Cecile Hannay |
| 16:15 | ***Discussion*** | |
| 16:45 | ***ADJOURN*** | |

## Tuesday, January 31

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| Time | Topic | Speakers |
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| **CCWG Session**<br>***Chapman Room* (see AMWG for agenda of parallel sessions)** | | |
| 8:45 | Welcome and Logistics | Simone Tilmes<br>Rafael Fernandez |
| 8:50 | Overview of CAM-chem development and adding chemistry into the atmospheric diagnostic framework | Rebecca Buchholz |
| 9:05 | **Discussion** | |
| 9:15 | Role of iodine recycling on sea-salt aerosols in the global marine boundary layer | Qinyi Li |
| 9:30 | Understanding the distribution of Cl-VSLS and their interhemispheric transport based on global model simulation and measurement data | Behrooz Roozitalab |
| 9:45 | Comparing the effect of Natural Halogens on Tropospheric Ozone Chemistry between Pre-Industrial and Present-Day | Javier A. Berraea |
| 10:00 | Modeling Isoprene Emission Response to Drought and Heatwaves Within MEGAN Using Evapotranspiration Data and by Coupling With the Community Land Model | Hui Wang |
| 10:15 | Coffee Break | |
| 10:30 | A two-dimensional global model to quantify halocarbon emissions | Luke Western |
| 10:45 | Understanding recent tropospheric ozone trends in the context of internal variability | Arlene Fiore |
| 11:00 | Characterizing impacts of external forcings and internal climate variability on interannual upper tropospheric ozone variations | Xinyuan Yu |

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| 11:15 | Evaluation of Model Simulated Ozone and its Precursors Using High-Resolution Model Simulations during the Michigan-Ontario Ozone Source Experiment (MOOSE) | Noribeth Mariscal |
| 11:30 | Assessing the impact on the atmospheric oxidative capacity from deforestation-driven changes in the emissions of soil nitric oxide and biogenic terpenes | Ben Lee |
| 11:45 | Characterizing continental-scale OH trends in CESM2-WACCM6 climate model | Qindan Zhu |
| 12:00 | **Lunch (on your own)** | |

## Wednesday, February 1

** All times are MST;* ***Speakers****: please leave 5 min at the end of your slot for questions.*

| Time | Topic | Speakers |
|---|---|---|
| **AMWG: Automated Tuning approaches**<br>***Mesa Lab Main Seminar Room* (see CCWG/WAWG for agenda of parallel sessions)** | | |
| 9:00 | Welcome and logistics | |
| 9:05 | RegTune: A regional tuner for global atmospheric models | Vince Larson |
| 9:20 | Experimenting with machine learning hindcast emulators to help tune CAM | Colin Zarzycki |
| 9:35 | Using the Perturbed Parameter Ensemble | Trude Eidhammer |
| 9:50 | ***Break*** | |
| **AMWG: Clouds: Parameterization and Evaluation**<br>***Mesa Lab Main Seminar Room*** | | |
| 10:05 | Update on PUMAS development | Andrew Gettelman |
| 10:20 | Analyzing Cloud Regimes in ISCCP, MODIS, MISR, and CAM | Isaac Davis |
| 10:35 | Climate impacts of convective cloud microphysics in NCAR CAM5 | Lin Lin |
| 10:50 | Parametric sensitivity of cloud feedbacks in CAM6 | Margaret Duffy |
| 11:05 | CESM dominates CMIP6 ensemble in Pareto optimal evaluation of tropical low cloud simulation | Mengxi Wu |
| **AMWG: Radiation**<br>***Mesa Lab Main Seminar Room*** | | |
| 11:20 | Status of RRTMGP implementation in CAM | Brian Medeiros |
| 11:35 | ***Break - LUNCH (on your own)*** | |
| **AMWG: Planetary Boundary Layer**<br>***Mesa Lab Main Seminar Room*** | | |
| 12:45 | Using dimensionality reduction techniques to parameterize and decompose the vertical turbulent flux of scalars | Sara Shamekh |
| 13:00 | Unified boundary layer and convection parameterization CPT project: Recent developments | Joao Teixiera |
| 13:15 | Employing PBL Mixing and Simple Parcel Dynamics in CAM Convection | Rich Neale |
| 13:30 | Logarithmic profile of temperature in sheared and unstably stratified atmospheric boundary layers | Yu Cheng |

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| 13:45 | The Role of Parameterized Momentum Flux on Mean State Biases in CAM6-CLUBB | Kyle Nardi |
| 14:00 | Evaluating low-level jets and boundary layer processes in CAM6 runs nudged using the ERA5 reanalysis | Joakim Pyykkö |
| 14:15 | ***Break*** | |
| 14:30 | ***Wrap-up Discussion*** | |
| 15:00 | **ADJOURN** | |

## Wednesday, February 1

** All times are MST;* ***Speakers****: please leave 5 min at the end of your slot for questions.*

| Time | Topic | Speakers |
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| **Joint CCWG/WAWG Session**<br>***Damon Room*** **(see AMWG for agenda of parallel sessions)** | | |
| 9:00 | Welcome and logistics | |
| 9:05 | Inclusion of Inline photolysis module (TUV-x) in CESM2 MUSICAv0 | Doug Kinnison |
| 9:20 | Relative Contributions of Anthropogenic and Lightning Nitrogen Sources in the Upper Troposphere during the Asian Summer Monsoon | Jun Zhang |
| 9:35 | Evaluating the representation of the Asian summer monsoon UTLS composition in CESM using airborne in situ observations | Ren Smith |
| 9:50 | Stratospheric climate anomalies and ozone loss caused by Hunga-Tonga volcanic eruption | Xinyue Wang |
| 10:05 | Quantifying the uncertainty in climate response to stratospheric aerosol injection from gravity wave parametrizations in CESM2(WACCM) | Ewa Bednarz |
| 10:20 | ***Break*** | |
| 10:35 | Variability of Tidal Dynamics in Whole Atmosphere Models Constrained by GEOS Meteorology | Valery Yudin |
| 10:50 | Simulations of the Quasi-Biennial Oscillation for 1980-2014 using the 2° version of the Whole Atmosphere Community Climate Model | Mijeong Park |
| 11:05 | Effects of coupled chemistry on the QBO simulated with WACCM | Rolando Garcia |
| 11:20 | The circulation response to greenhouse gas forcings as a negative climate feedback | Nick Davis |
| 11:35 | ***Wrap-up Discussion*** | |
| 12:00 | **ADJOURN** | |