WRF/MPAS Workshop 2023
June 20-23, 2023

TUESDAY -JUNE 20, 2023

07:30 – 08:30 **Registration**

Session 1: WRF Modeling System Updates (I) 8:30 – 10:05

Chair - Jordan Powers, NCAR/MMM

08:30 – 08:45 Welcome Remarks

08:45 – 09:05 The Weather Research and Forecasting Model: 2023 Annual Update
Jimy Dudhia, NCAR/MMM

09:05 – 09:25 MPAS Updates
Bill Skamarock, NCAR/MMM

09:25 – 09:45 WRFDA 4.5 and MPAS-JEDI 2.0 Update
Jake Liu, NCAR/MMM

09:45 – 10:05 WRF-Chem v4.5: updates, applications, and future plans
Jordan Schnell, CIRES/NOAA GSL (virtual)

10:05 – 10:35 Coffee Break

Session 1: Model Development Updates (II) 10:35 – 11:55

Chair - Jimy Dudhia, NCAR/MMM

10:35 – 10:55 Recent updates in WRF urban and land surface models
Cenlin He, NCAR/RAL

10:55 – 11:15 Physics Updates
Laura D. Fowler, NCAR/MMM

11:15 – 11:35 Adapting the MPAS Dynamical Core for Applications Extending into the Thermosphere
Joseph Klemp, NCAR/MMM

11:35 – 11:55 Earthworks for Weather
David Randall, Colorado State University

11:55 – 01:30 Lunch Break

Session 2: New Capability Development / Update 01:30 – 03:00

Chair - James Cipriani, The Weather Company

01:30 – 01:45 What's new with the Multiscale Infrastructure for Chemistry and Aerosols (MUSICA) Development
Mary Barth, NCAR/ACOM/MMM

01:45 – 02:00 Development of a whole atmosphere model with the non-hydrostatic MPAS-A dynamical core
Soudeh Kamali, NCAR/HAO

02:00 – 02:15 All-sky ATMS radiance data assimilation with JEDI-MPAS
Junmei Ban, NCAR/MMM

02:15 – 02:30 Raijin project (tools)
Orhan Eroglu, NCAR/CISL

02:30 – 02:45 AceCAST GPU-Accelerated WRF Model Overview
Samuel Elliott, TempoQuest Inc.

02:45 – 03:00 WRF-MOSIT: A modular and Cross-Platform tool for configuring and installing the WRF model
William Hatheway (virtual)

03:00 – 03:30 Coffee Break

Session 3: Global Forecast Applications 03:30 – 04:30

Chair - Cliff Mass, University of Washington

03:30 – 03:45 IBM GRAF - Global High-Resolution Atmospheric Forecast System: An Operational Update and Roadmap
Brett Wilt, The Weather Company

03:45 – 04:00 Progression of Data Assimilation for IBM GRAF: Towards a JEDI-Driven System
James Cipriani, The Weather Company
04:00 – 04:15 MPAS-JEDI-based Variable-Resolution Global Data Assimilation Systems with ~3-km Cell Spacing over North America
Craig Schwartz, NCAR/MMM
04:15 – 04:30 A high resolution (3 km) MPAS ensemble for realtime 5-day convective forecasting
Morris Weisman, NCAR/MMM

Discussion, Reception 04:30 – 07:00

04:30 – 05:15 On-going Model Support, Community Feedback
05:15 – 07:00 Reception

Wednesday – June 21, 2023

Session 4: Physics Developments: Microphysics and Clouds 09:00 – 10:15

Chair - Anders Jensen, NOAA/GSL

09:00 – 09:15 Evaluation of cloud microphysics schemes in WRF for Hokuriku winter clouds using videosonde observation
Yuki Kanno, Central Research Institute of Electric Power Industry, Japan
09:15 – 09:30 A New Warm-Rain Scheme for WRF and MPAS
Cliff Mass, University of Washington
09:30 – 09:45 A Double-Moment Cloud Parameterization with In-Cloud Microphysical Processes for Use in Weather Forecasting
Songyou Hong, CIRES at CU Boulder/NOAA/PSL
09:45 – 10:00 An Explicit Microphysical and Electrical Charging Model to Study the Effects of Changing Aerosol Composition on the Electric Field and Lightning Distribution
Barry H. Lynn, Hebrew University of Jerusalem
10:00 – 10:15 Development and Assessment of Lightning Data Assimilation in a Grid-scale Microphysical Scheme
Daiwen Kang, EPA
10:15 – 10:45 Coffee Break

Session 5: Physics Updates and Evaluation: PBL and Surface Layer

Chair - Songyou Hong, NOAA/PSL and CU/CIRES

10:45 – 11:00 Updates to the MYNN-EDMF PBL Scheme to Improve Operational Forecasting Applications
Joseph B. Olson, NOAA/GSL
11:00 – 11:15 Comparisons of Marine Boundary Layer Clouds simulated by the MYNN-EDMF PBL Scheme in both WRF-ARW and FV3: Exploring Dynamical Core Dependence
Xia Sun, CIRES at CU Boulder/ NOAA GSL
11:15 – 11:30 Subgrid cloud performance in MYNN-EDMF
Wayne M. Angevine, CIRES at CU Boulder/ NOAA CSL
11:30 – 11:45 Application of a satellite-retrieved sheltering parameterization for dust event simulation with WRF-Chem
Sandra L. LeGrand, US Army Engineer Research and Development Center (ERDC), UCLA
11:45 – 01:15 Lunch Break

Session 6: Posters 01:15 – 02:45

Chair – May Wong, NCAR/MMM

01:15 – 01:30 1-Slide Presentation (optional)
01:30 – 02:45 Poster Session

1. Convective Transport and Wet Scavenging of Aerosols in a Modeled and Observed SEAC4RS Case study
   Ajay Parottil, NCAR/ACOM
2. Nocturnal boundary layer height uncertainty in particulate matter simulations during the KORUS-AQ campaign
   Cheol-Hee Kim, Pusan National University, S. Korea
3. Using WRF to Simulate Environmental Forcing Conditions for a Southwest Asia Dust Storm
   Kent Sparrow, US Army Corps of Engineers - Engineer Research and Development Center
4. Incorporating advanced snow microphysics and lateral transport into the Noah-MP land surface model
   Theodore Letcher, USACE-Cold Regions Research and Engineering Lab
5. A New Boundary Layer Parameterization for WRF: A Heat Flux Budget Approach
   Rafael Maroneze, Universidade Federal do Pampa, Brazil
6. Impact of stochastic boundary layer and microphysics perturbation under distinct weather regimes in convective-permitting resolution
   I-Han Chen, Meteorologisches Institut München, Ludwig-Maximilians-Universität München, Munich, Germany and UCAR
7. Facilitating Physics Interoperability in SIMA: Updates of CCPP SCM and Effort to Connect MMM Shared Physics with CCPP
   Weiwei Li, UCAR/NCAR/RAL/JNT/DTC
8. Sensitivity of the February 2021 U.S. Cold-Air Outbreak to Tropopause Polar Vortex Intensity
   Tomer Burg, U of Oklahoma
9. Efforts to balance the potential vorticity budget in MPAS
   Manda Chasteen, NCAR/MMM
10. A conditional object-based verification of MPAS medium-range forecasts
    May Wong, NCAR/MMM
11. Daily MPAS Convection-Allowing Forecasts at NSSL
    Kent Knopfmeier, Cooperative Institute for Severe and High-Impact Weather Research and Operations, The University of Oklahoma, and NOAA/OAR/NSSL
12. A method for producing limited-area MPAS meshes with one-to-one cell matching to global quasi-uniform meshes at the boundary
    Russ Bullock, U.S. Environmental Protection Agency
13. The Weather Research and Forecasting Model Special Interest Group (WRF-SIG) at the National Energy Research Scientific Computing Center (NERSC)
    Koichi Sakaguchi, Pacific NorthWest National Laboratory

02:45 – 03:00 *Coffee Break*

Session 7: Tropical and Precipitation Studies (I) 03:00 – 04:30

Chair - Robert Fovell, University of New York at Albany

03:00 – 03:15 Simulating the Water Cycle over the Third Pole Region - A Multi-Model, Multi-Physics Framework
Andreas F. Prein, NCAR/MMM

03:15 – 03:30 Track Evolution of Typhoon Chanthu (2021) past Taiwan as Investigated Using a High-Resolution Global Model
Ya-Shin Chi, Department of Atmospheric Sciences, National Central University, Taiwan

03:30 – 03:45 Equatorial Waves and Tropical Rainfall Variability in MPAS Simulations with Resolutions of 3.75 km, 15 km, and 120 km
Falko Judt, NCAR/MMM

03:45 – 04:00 Moisture Sensitivity in the Formation of an Atlantic Tropical Cyclone: A Case Study
Kelly M. Núñez Ocasio, NCAR/MMM

04:00 – 04:15 Understanding the Drivers of Connected Extreme Precipitation Events
James M. Done, NCAR/MMM
04:15 – 04:30 Multi-Scale Interactions of Tropical Weather Systems in MPAS-A Aquaplanet Simulations
Rosimar Rios-Berrios, NCAR/MMM
04:30 End of Day 2

Thursday – June 22, 2023

Session 8: Tropical and Precipitation Studies (II) and More 09:00 – 10:15

Chair - Ólafur Rögnvaldsson, Belgingur

09:00 – 09:15 MPAS-A with Hierarchical Timestepping and Customized Mesh Generation: 2023 Updates
Chi-Chiu Cheung, ClusterTech Limited, Hong Kong (Virtual)
09:15 – 09:30 Effect of single and double moment microphysics schemes and change in CCN, latent heating rate structure associated with severe convective system over Korean Peninsula
Akkisetti MadhuLatha, IMD, MoES/KIAPS, India (Virtual)
09:30 – 09:45 Atmospheric River: The Cause of extreme precipitation over Eastern India in 2019
Abhishek Kumar Mishra, Department of Planning and Development, Government of Bihar, India (Virtual)
09:45 – 10:00 Evaluation of MPAS-A microphysics and convection schemes for Hurricane Catarina (Brazil, 2004) simulations
Danilo Couto de Souza, University of Sao Paulo, Brazil (Virtual)
10:00 – 10:15 Exploring MPAS Physics Suites to Simulate Tropical Convective Systems Consistently Across Scales
Koichi Sakaguchi, PNNL (Virtual)
10:15 – 10:45 Coffee Break

Session 9: Surface and Urban Studies 10:45 – 12:00

Chair - Russell Bullock, EPA

10:45 – 11:00 Wind and humidity forecasts during downslope windstorm events
Robert Fovell, University at Albany
11:00 – 11:15 Simulating New York City's Urban Environment using WRF Urban Physics
Roger Turnau, North Carolina State University / EPA
11:15 – 11:30 Incoming land surface data quality in high-resolution urban climate simulations and the improvement ideas in physics equations
Pater Li, Arup, Hong Kong SAR China
11:30 – 11:45 Applications of the New York State Mesonet with High-Resolution Numerical Weather Predictions Using WRF
Lloyd Treinish, IBM Thomas J. Watson Research Center
11:45 – 12:00 The configuration and evaluation of the WRF-Chem air quality model in Thailand
Worapop Thongsame, University of Colorado Boulder
12:00 – 01:30 Lunch Break

Session 10: High-Res Regional Forecast Applications 01:30 – 03:00

Chair - Bill Skamarock, NCAR/MMM

01:30 – 01:45 Regional Arctic Cyclone Prediction with MRI-4DVAR and Polar WRF
David H. Bromwich, Byrd Polar and Climate Reserch Center, The Ohio State University
01:45 – 02:00 EURO1k – a rapid refresh model for Europe
Johannes Rausch, Meteomatics AG, Switzerland
02:00 – 02:15 Adding MPAS to the Convective-Scale Model Test Suite
Louis Wicker, NOAA/National Severe Storms Laboratory

02:15 – 02:30 Development of the CONUS NSSL Regional MPAS Forecast System/NOAA National Severe Storms Laboratory
Larissa Reames, Cooperative Institute for Severe and High-Impact Weather Research and Operations

02:30 – 02:45 Verifying and Comparing Forecasts of the HRRR, RRFS, and NSSL MPAS Models
Corey Potvin, NOAA/National Severe Storms Laboratory

02:45 – 03:00 Evaluations of three regional MPAS configurations for severe weather forecasting applications during the 2023 NOAA/Hazardous Weather Testbed Spring Forecasting Experiment
Adam Clark, NOAA/National Severe Storms Laboratory

03:00 – 03:30 *Coffee Break*

Discussion 03:30 – 04:30

03:30 – 04:30 MPAS – Future Directions: Where we are and where we are going from here?

04:30 *End of Day 3*

FRIDAY JUNE 23, 2023: 8:30 - 12:00

Mini Tutorials

08:30 – 10:00 **MPAS-A:** Demonstration of steps to run regional MPAS-Atmosphere Simulations

10:00 – 10:30 *Coffee Break*

10:30 – 12:00 **MPAS-JEDI:** NCAR/MMM's new-generation community data assimilation system