10TH ANNUAL

WRF Users' Workshop

PROGRAM

WORKSHOP SYNOPSIS

TUESDAY – JUNE 23, 2009

07:30 – 08:30 **Registration** and Coffee
08:30 – 10:00 Session 1: WRF Development (1)
10:00 – 10:30 Coffee Break
10:30 – 12:00 Session 1: WRF Development (2)
12:45 – 13:30 *wrfhelp Desk (CG1 Atrium)*
13:30 – 15:00 Parallel Sessions 2a and 2b
Session 2a: Data Assimilation (1) - South Room
Session 2b: Physics Development and Testing: PBL/LES (1) – Center Room
15:00 – 15:30 Coffee Break
15:30 – 17:00 Parallel Sessions 2a and 2b
Session 2a: Data Assimilation (2) – South Room
Session 2b: Physics Development and Testing: PBL/LES (2) – Center Room
17:45 – 19:30 *Workshop Reception (Tree Plaza, Mesa Lab)*

WEDNESDAY – JUNE 24, 2009

08:30 – 10:00 Parallel Sessions 3a and 3b
Session 3a: Regional Climate Research (1) – South Room
Session 3b: Model Evaluation (1) – Center Room
10:00 – 10:30 Coffee Break
10:30 – 12:00 Parallel Sessions 3a and 3b
Session 3a: Regional Climate Research (2) – South Room
Session 3b: Model Evaluation (2) – Center Room
12:45 – 13:30 *wrfhelp Desk (CG1 Atrium)*
13:30 – 15:00 Session 4: Community and Developers' Forum
15:00 – 17:30 Poster Session *(with refreshments) (Second Floor, CG1)*

THURSDAY – JUNE 25, 2009

08:30 – 10:00 Parallel Sessions 5a and 5b
Session 5a: WRF Chemistry (1) – South Room
Session 5b: Physics Dev. and Testing: LSM/Moist Physics (1) – Center Room
10:00 – 10:30 Coffee Break
10:30 – 12:00 Parallel Sessions 5a and 5b
Session 5a: WRF Chemistry (2) – South Room
Session 5b: Physics Dev. and Testing: LSM/Moist Physics (2) – Center Room
12:45 – 13:30 *wrfhelp Desk (CG1 Atrium)*
13:30 – 15:00 Session 6: Ongoing and Future Model Development
15:00 – 15:30 Coffee Break
15:30 – 17:00 Wrap-up and Discussion

FRIDAY – JUNE 26, 2009 ***(Instruction Sessions)***

08:30 – 10:00 South Room: NCL
Center Room: MET
North Room: GSI
10:30 – 12:00 South Room: IDV
Center Room: WRF-Var: Radiance Data Assimilation
CTTC (CG2 – 3024): VAPOR (10:00 - 12:00)

Administrative Support: Bonnie Slagel, Sudie Kelly
Oral Presentation: Cindy Bruyere, Ming Chen
Poster Presentation: Cindy Bruyere, Wei Wang
Workshop Planning Committee: Wayne Angevine, John Brown, Jimy Dudhia, Georg Grell, Hans Huang, Joe Klemp, Ruby Leung, Cliff Mass, Louisa Nance, Jordan Powers, Wei Wang

	TUESDAY – JUNE 23, 2009		WEDNESDAY – JUNE 24, 2009		THURSDAY – JUNE 25, 2009	
07:30 – 08:00	**Registration** and Coffee					
08:00 – 08:30			Coffee			
08:30 – 10:00	**Plenary** 1-1: WRF Development		**South Room** 3a-1: Regional Climate Research	**Center Room** 3b-1: Model Evaluation	**South Room** 5a-1: WRF Chemistry	**Center Room** 5b-1: Physics Dev. and Testing: LSM/Moist Physics
10:00 – 10:30	Coffee Break					
10:30 – 12:00	**Plenary** 1-2: WRF Development		**South Room** 3a-2: Regional Climate Research	**Center Room** 3b-2: Model Evaluation	**South Room** 5a-2: WRF Chemistry	**Center Room** 5b-2: Physics Dev. and Testing: LSM/Moist Physics
12:00 – 01:30	Lunch Break *wrfhelp desk in CG1 Atrium from 12:45 – 01:30*					
01:30 – 03:00	**South Room** 2a–1: Data Assimilation	**Center Room** 2b–1: Physics Development and Testing: PBL/LES	**Plenary** 4: Community and Developers' Forum		**Plenary** 6: Ongoing and Future Model Development	
03:00 – 03:30	Coffee Break					
03:30 – 05:00	**South Room** 2a–2: Data Assimilation	**Center Room** 2b–2: Physics Development and Testing: PBL/LES	**Poster Session** *Second Floor, CG1* ***03:00 to 05:30*** *(with refreshments)*		**Plenary** Wrap-up and Discussion	
05:45 – 07:30	*Workshop Reception (Tree Plaza, Mesa Lab)*					

	FRIDAY – JUNE 26, 2009 ***(Instruction Sessions)***		
08:30 – 10:00	**South Room** NCL	**Center Room** MET	**North Room** GSI
10:00 – 10:30	Coffee Break		
10:30 – 12:00	**South Room** IDV	**Center Room** Radiance Data Assimilation	**CTTC (CG2 – 3024)** VAPOR ***(10:00 – 12:00)***

Note: All talks during this workshop are 15 minutes total, including questions, unless otherwise noted.

SESSION 1: WRF Model Development (1) **Chair: Nelson Seaman** (PSU)
08:30 – 10:00, Tuesday, June 23 *(Plenary Session)*

Welcoming Remarks

1.1 WRF VERSION 3.1: NEW FEATURES AND UPDATES. *Jimy Dudhia (NCAR)*

1.2 MONOTONIC AND POSITIVE DEFINITE TRANSPORT OPTIONS IN THE ARW V3.1 RELEASE. *Bill Skamarock (NCAR)*

1.3 WRFDA 2009 OVERVIEW. *Xiang-Yu Huang (NCAR)*

1.4 WRF SOFTWARE UPDATE. *John Michalakes, D. Gill, M. Duda, J. Schramm, L. Carson (NCAR)*

SESSION 1: WRF Model Development (2) **Chair: Geoff DiMego** (NCEP)
10:30 – 12:00, Tuesday, June 23 *(Plenary Session)*

1.5 UPDATE ON WRF IN NCEP OPERATIONS. *Geoff DiMego, Zavisa Janjic, Tom Black, Eric Rogers, Brad Ferrier, Matt Pyle, Hui-Ya Chuang, Dusan Jovic, Jun Du (NWS/NCEP/EMC)*

1.6 RECENT ENHANCEMENTS TO THE MODEL EVALUATION TOOLS. *John Halley Gotway, Randy Bullock, Tressa L. Fowler (NCAR)*

1.7 RELEASE OF UPGRADED NOAH LAND SURFACE MODEL IN WRFV3.1. *Mukul Tewari (NCAR)*

1.8 "OBS-NUDGING" RTFDDA AND ITS EXTENSION FOR ENSEMBLE, CLIMATE AND LES MODELING. *Yubao Liu, Al Bourgeois, Gregory Roux, Josh Hacker, Wanli Wu, Francois Vandenberghe, Luca Delle-Monache, William Cheng, Yuewei Liu, Fei Chen, Tom Warner and Scott Swerdlin (NCAR)*

1.9 UPDATE ON WRF-ARW END-TO-END MULTI-SCALE FDDA SYSTEM. *Aijun Deng, David Stauffer, Brain Gaudet, Jimy Dudhia, Cindy Bruyere Wanli Wu, Francois Vandenberghe, Yubao Liu and Al Bourgeoi (Penn State and NCAR)*

1.10 NEW IMPLEMENTATIONS AND EVALUATIONS FOR WRF-CHEM V3.1. *Georg Grell, Jerome Fast, William Gustafson jr., Saulo Freitas, Stuart McKeen, Steven Peckham (NOAA-ESRL/CIRES)*

TUESDAY

SESSION 2A: Data Assimilation (1)

Chairs: Xiang-Yu Huang (NCAR) / **Thomas Auligne** (NCAR)

01:30 – 03:00, Tuesday, June 23 *(Parallel Session – South Room)*

2A.1 VARIATIONAL ANALYSIS OF HYDROMETEORS WITH SATELLITE RADIANCE OBSERVATIONS: A SIMULATED STUDY. *Zhiquan Liu, Xiaoyan Zhang, Thomas Auligne (NCAR)*

2A.2 INTRODUCING CLIMATOLOGICAL FLOW-DEPENDENCE IN THE WRFVAR BACKGROUND ERROR MODEL FOR VARIATIONAL DATA ASSIMILATION. *Y. Michel (NCAR)*

2A.3 THE IMPACT OF ASSIMILATING RETRIEVED TOTAL PRECIPITABLE WATER AND SOUNDING DATA FROM AIRS AND MODIS ON SEVERE WEATHER SIMULATIONS. *Yi-Chin Liu and Shu-Hua Chen (UC Davis)*

2A.4 IMPLEMENTATION OF ASSIMILATING MODIS BRIGHTNESS TEMPERATURE INTO WRFDA AND THE EVALUATION OF ITS IMPACT ON SEVERE WEATHER SIMULATIONS. *Shu-Hua Chen (UCD), Tom Auligne (NCAR), Hui-Chuan Lin (NCAR), and Zhiquan Liu (NCAR)*

2A.5 OBSERVATION SENSITIVITY WITH WRF. *Tom Auligne (NCAR)*

2A.6 STORM-SCALE RADAR-DATA ASSIMILATION AND NUMERICAL PREDICTION WITH WRF AND DART. *David Dowell (NCAR), Wiebke Deierling (NCAR, UAH), Altug Aksoy (CIMAS), and Chris Snyder (NCAR)*

SESSION 2B: Physics Development and Testing: PBL/LES (1)

Chair: Wayne Angevine (CIRES/CU/NOAA-ESRL)

01:30 – 03:00, Tuesday, June 23 *(Parallel Session – Center Room)*

2B.1 HOW DOES THE WRF MODEL CAPTURE THE INTRINSIC FEATURES OF EVENING TRANSITIONAL BOUNDARY LAYERS? *Arquimedes Ruiz-Columbie (Texas Tech University), Sukanta Basu (Texas Tech University), Suraj Harshan (Texas Tech University)*

2B.2 SENSITIVITY OF NEAR-SURFACE METEOROLOGICAL FIELDS IN WRF TO BOUNDARY/SURFACE-LAYER PARAMETERIZATIONS IN CONJUNCTION WITH HORIZONTAL GRID SPACING. *Jeremy A. Gibbs and Evgeni Fedorovich (University of Oklahoma School of Meteorology)*

2B.3 PERFORMANCE OF WRF FOR WIND ENERGY APPLICATIONS OVER COMPLEX SITES IN NEW ZEALAND AND AUSTRALIA. *Mike Green (Aurecon)*

2B.4 SENSITIVITY OF VERTICAL STRUCTURE IN THE STABLE BOUNDARY LAYER TO VARIATIONS OF THE WRF MODEL'S MELLOR-YAMADA-JANJIC TURBULENCE SCHEME. *Nelson Seaman, Brian Gaudet, Jeff Zielonka and David Stauffer (PSU)*

2B.5 EVALUATING THE PERFORMANCE OF THE WEATHER RESEARCH AND FORECASTING MODEL IN REPRESENTING THE ANTARCTIC SURFACE LAYER. *Suraj Harshan (Texas Tech University), Sukanta Basu (Texas Tech University), Arquimedes Ruiz Columbie (Texas Tech University)*

2B.6 THE TEMF BOUNDARY LAYER SCHEME - IMPLEMENTATION AND TESTS OF SHALLOW CUMULUS CASES. *Wayne M. Angevine (CIRES, University of Colorado), Hongli Jiang, Thorsten Mauritsen*

SESSION 2A: Data Assimilation (2)

Chairs: Xiang-Yu Huang (NCAR) / **Thomas Auligne** (NCAR)

03:30 – 05:00, Tuesday, June 23 *(Parallel Session – South Room)*

2A.7 MESOSCALE, ENSEMBLE DATA ASSIMILATION FOR WRF WITH THE DATA ASSIMILATION RESEARCH TESTBED. *Chris Snyder (NCAR)*

2A.8 PRELIMINARY TESTS OF NCEP DATA ASSIMILATION SYSTEM: FROM OPERATIONS TO THE COMMUNITY. *Hui Shao, Ming Hu, Louisa Nance, Hans Huang, and John Derber (NCAR)*

2A.9 DATA ASSIMILATION CHALLENGES FOR HIGH-RESOLUTION REANALYSIS IN THE POLAR REGIONS: THE ARCTIC SYSTEM REANALYSIS. *David H. Bromwich (Byrd Polar Research Center, Ohio State University); and Y.-H. Kuo, M. Serreze, J. Walsh, F. Chen, K. Hines, L. Bai, S.-H. Wang, Z. Liu, M. Barlage, T. K. Wee, H. Lin, W. Wang, A. Slater, W. Chapman, P. Berger, and L. Li*

2A.10 A HYBRID DATA ASSIMILATION (WRF-VAR AND ENSEMBLE TRANSFORM KALMAN FILTER) SYSTEM BASED RETROSPECTIVE TESTS. *Meral Demirtas (NCAR), Dale Barker, Yongsheng Chen, Josh Hacker, Xiang-Yu Huang, Chris Snyder, Xuguang Wang*

SESSION 2B: Physics Development and Testing: PBL/LES (2)

Chair: Wayne Angevine (CIRES/CU/NOAA-ESRL)

03:30 – 05:00, Tuesday, June 23 *(Parallel Session – Center Room)*

2B.7 SIMULATING INTRA-FARM WIND VARIATIONS WITH THE WRF-RTFDDA-LES MODELING SYSTEM. *Yubao Liu, Yuewei Liu, Will Cheng, Wanli Wu, Thomas T. Warner and Keith Parks (NCAR)*

2B.8 NESTED HIGH-RESOLUTION LARGE-EDDY SIMULATIONS IN WRF. *J.D. Mirocha, G. Kirkil, B. Kosovic and J. K. Lundquist (Lawrence Livermore National Laboratory)*

2B.9 NESTING LARGE-EDDY SIMULATIONS WITHIN MESOSCALE SIMULATIONS IN WRF FOR WIND ENERGY APPLICATIONS. *J.K. Lundquist, J. D. Mirocha, B. Kosovic (Lawrence Livermore National Laboratory)*

Discussion

WORKSHOP RECEPTION (5:45 – 7:30, Tuesday, June 23) *(Tree Plaza, Mesa Lab)*

WEDNESDAY

SESSION 3A: Regional Climate Research (1) **Chair: Ruby Leung** (PNNL)
08:30 – 10:00, Wednesday, June 24 *(Parallel Session – South Room)*

3A.1 HIGH RESOLUTION SIMULATIONS OF THE IMPACT OF CLIMATE CHANGE ON THE SNOWPACK IN THE COLORADO HEADWATERS. *Roy Rasmussen, David Gochis, Changhai Liu, Kyoko Ikeda, Fei Chen, Jimy Dudhia (NCAR)*

3A.2 COUPLING WRF 3 AND CLM 3.5 FOR REGIONAL CLIMATE SIMULATION AND UNDERSTANDING INTERACTIONS BETWEEN LAND COVER AND THE ATMOSPHERE. *Zachary M. Subin (UC Berkeley), Jiming Jin (Utah State U.), Lara M. Kueppers (UC Merced), William J. Riley (Lawrence Berkeley Lab), Danielle M. Svehla (UC Berkeley), Margaret S. Torn (Lawrence Berkeley Lab)*

3A.3 PERFORMANCE OF POLAR WRF OVER ARCTIC LAND. *Keith M. Hines (The Ohio State University) David H. Bromwich (The Ohio State University) Michael Barlage (NCAR) and Andrew G. Slater (University of Colorado)*

3A.4 CWRF CLOUD-AEROSOL-RADIATION ENSEMBLE MODELING SYSTEM: VALIDATION. *Xin-Zhong Liang and Feng Zhang (University of Illinois), Everette Joseph and Vernon R. Morris (Howard University), Julian X.L. Wang (NOAA Air Resources Laboratory)*

3A.5 HIGH RESOLUTION WRF-FDDA SEASONAL PRECIPITATION OVER COMPLEX TERRAIN. *Dorita Rostkier-Edelstein (IIBR), Yubao Liu, Gregory Roux, Amir Givati, Adam Pietrkowski, Ming Ge, Andrea Hahmann, James Pinto, Tom Warner and Scott Swerdlin*

3A.6 CLIMATE-SOIL-VEGETATION CONTROL ON GROUNDWATER TABLE DYNAMICS AND ITS FEEDBACKS IN A CLIMATE MODEL. *L. Ruby Leung (PNNL), Maoyi Huang, Yun Qian, and Xu Liang*

SESSION 3B: Model Evaluation (1) **Chair: Cliff Mass** (UW)
08:30 – 10:00, Wednesday, June 24 *(Parallel Session – Center Room)*

3B.1 THE USE OF THE RUC DFI INITIALIZATION FOR THE 2009 WRF-ARW 3 KM EXPLICIT CONVECTIVE FORECASTS. *Morris L. Weisman, Wei Wang, and Kevin Manning (NCAR)*

3B.2 THE HFIP HIGH RESOLUTION HURRICANE TEST. *Ligia Bernardet (NOAA ESRL), Louisa Nance (NCAR), Shaowu Bao (NOAA ESRL), Barbara Brown (NCAR), Jamie Wolff (NCAR), Tara Jensen (NCAR), Christopher Harrop (NOAA ESRL), Laurie Carson (NCAR), and Jian-Wen Bao (NOAA ESRL)*

3B.3 RESULTS FROM THE HIGH-RESOLUTION HURRICANE TEST USING THE ADVANCED HURRICANE-RESEARCH WRF. *Chris Davis, Wei Wang, Sherrie Fredrick, Jimy Dudhia, Rich Rotunno, Jim Bresch and Greg Holland (NCAR), Ryan Torn (SUNY Albary)*

3B.4 MULTI-SCALE SIMULATIONS USING WRF WITH VERTICAL NESTING AND IMPLICIT RELAXATION: CASE STUDIES FROM T-REX. *A. Mahalov (ASU), M. Moustaoui (ASU), V. Grubisic (Vienna and DRI)*

3B.5 IMPACT OF DIGITAL FILTER INITIALIZATION AND OBSERVATIONAL NUDGING IN WRF FOR NOWCAST OF CONVECTIVE SYSTEMS. *Amit Kesarkar, M Rajeevan, and Rajasekhar M., Andhra Pradesh (India)*

Discussion

1. *Is there a rational approach to determining optimal physics/model structure combinations for WRF?*
2. *What are the largest outstanding problems?*
3. *Are we making real progress?*

SESSION 3A: Regional Climate Research (2) **Chair: Ruby Leung** (PNNL)
10:30 – 12:00, Wednesday, June 24 *(Parallel Session – South Room)*
Presentations 5 minutes each

3A.7 THE DEVELOPMENT OF DYNAMICAL DOWNSCALING AT THE ENVIRONMENTAL PROTECTION AGENCY: DEVELOPING A MODEL FRAMEWORK FOR WRF. *Jared H. Bowden (EPA), Tanya L. Otte (EPA), Jerold A. Herwehe (EPA), Christopher G. Nolte (EPA)*

3A.8 PARAMETERIZATION INDUCED ERROR-CHARACTERISTICS IN REGIONAL CLIMATE MODELS: AN ENSEMBLE BASED ANALYSIS. *N.K. Awan (Wegener Center for Climate and Global Change), H. Truhetz, A. Gobiet*

3A.9 AN EFFORT TO DEVELOP THE COUPLED WRF BY THE USE OF CPL7. *Juanxiong He (IARC and ARSC), Greg Newby (ARSC), Tony Craig (NCAR), Mark Seefeldt (CU)*

3A.10 CALIFORNIA WINTERTIME PRECIPITATION IN REGIONAL AND GLOBAL CLIMATE MODELS. *Peter M. Caldwell (Lawrence Livermore Nat. Lab)*

3A.11 STATISTICAL CHARACTERIZATIONS OF OCEAN SURFACE WINDS GENERATED BY NUMERICAL MODELS IN COMPARISON WITH SATELLITE OBSERVATIONS AND REANALYSIS. *Hsiao-ming Hsu, William Large and Joseph Tribbia (NCAR)*

3A.12 PRECIPITATION DOWNSCALING ON THE WEST COAST OF NORWAY: COMPARISON WITH OBSERVATIONAL NETWORK DATASET. *U. Heikkilä, M.d.S. Mesquita and I. Barstad (Bjerknes Centre for Climate Research)*

Discussion

1. *Model development for regional climate applications*
   a. *High resolution physics*
   b. *Earth system components*
   c. *Other gaps or missing components*
   d. *Software issues*
   e. *Coordination with other working groups*
2. *Model evaluation*
   a. *What we have learned collectively (e.g., systematic biases, impacts of physics, dynamical cores, model resolution, nudging, domain configuration)*
   b. *Evaluation methods and datasets*
   c. *Ideas for collaboration*
3. *Open discussion of modeling issues*

WEDNESDAY

SESSION 3B: Model Evaluation (2) **Chair: Cliff Mass** (UW)
10:30 – 12:00, Wednesday, June 24 *(Parallel Session – Center Room)*

3B.6 IMPLEMENTATION AND VALIDATION OF WRF MODEL AS ENSEMBLE MEMBER OF A PROBABILISTIC PREDICTION SYSTEM OVER EUROPE. *D. Santos-Muñoz (AEMET), J. Wolff (DTC), C. Santos (AEMET), J.García-Moya (AEMET) and L. Nance (DTC)*

3B.7 REAL-TIME STORM-SCALE WRF ENSEMBLE FORECAST FOR NOAA HWT 2009 SPRING EXPERIMENT. *Fanyou, Kong, Ming Xue, and co-authors (Center for Analysis and Prediction of Storms, University of Oklahoma)*

3B.8 REPRESENTING MODEL ERROR IN THE AWFA JOINT MESOSCALE ENSEMBLE BY A STOCHASTIC KINETIC BACKSCATTER SCHEME. *J. Berner, S.-Y. Ha, A. Fournier, J. Hacker, C. Snyder (NCAR)*

Discussion

1. *How do we get sufficient diversity in mesoscale ensembles?*
2. *What is the best way to design a mesoscale ensemble system?*
3. *Can one system serve the entire nation?*

SESSION 4: Community and Developers' Forum **Chair: Joe Klemp** (NCAR)
01:30 – 03:00, Wednesday, June 24 *(Plenary Session)*

4.1 IS WRF REALLY IMPROVING? A COMPREHENSIVE VERIFICATION OVER THE PACIFIC NORTHWEST. *Cliff Mass (UW) and David Ovens*

4.2 THE WRF DEVELOPMENT TESTBED CENTER AS A COMMUNITY FACILITY. *Bill Kuo, Louisa Nance (NCAR), Steven Koch and Ligia Bernardet (GSD/NOAA)*

4.3 Developers' Forum Panel
Panel members: Geoff DiMego, Jimy Dudhia, Georg Grell, Xiang-Yu Huang, Bill Kuo, John Michalakes, Bill Skamarock, Wei Wang
Questions and Discussion with the Developers

POSTER SESSION
03:00 – 05:30, Wednesday, June 24 *(Second Floor, CG1)*

SESSION 5A: WRF Chemistry (1) **Chair: Georg Grell** (NOAA-ESRL/CIRES)
08:30 – 10:00, Thursday, June 25 *(Parallel Session – South Room)*

5A.1 AN APPLICATION OF THE AEROSOL MODELING TESTBED TOOLKIT: INVESTIGATING SENSITIVITY OF AEROSOLS TO GRID CELL SIZE. *William I. Gustafson Jr., Yun Qian, & Jerome D. Fast (Atmospheric Sciences and Global Change Division, Pacific Northwest National Laboratory)*

5A.2 OVERVIEW OF NCAR/ACD WRF-CHEM ACTIVITIES AND DEVELOPMENT EFFORTS. *Mary Barth, Jeff Lee, Ave Arellano, Trude Eidhammer, Louisa Emmons, Alma Hodzic, Gabriele Pfister, Xue Xi Tie, Stacy Walters, Christine Wiedinmyer (NCAR)*

5A.3 WRF/CHEM SMOKE FORECASTING SYSTEM FOR ALASKA. *M. Stuefer (Geophysical Institute, UAF), G. Grell (NOAA/ESRL), S. Freitas (CPTEC/INPE), A. Kulchitsky (Arctic Region Supercomputing Center, University of Alaska Fairbanks), G. Newby (Arctic Region Supercomputing Center, University of Alaska Fairbanks)*

5A.4 HIGH RESOLUTION COUPLED RAQMS/WRF-CHEM OZONE AND AEROSOL SIMULATIONS FOR GOES-R RESEARCH. *Todd Schaack (Space Science and Engineering Center, University of Wisconsin), Brad Pierce (NOAA/NESDIS/STAR), Allen Lenzen (Space Science and Engineering Center, University of Wisconsin), Georg Grell and Steve Peckham (CIRES, University of Colorado and Environmental Science Research Laboratory/Global Systems Division, NOAA), Jason Otkin (CIMSS, University of Wisconsin)*

5A.5 SENSITIVITY OF SIMULATED MARINE STRATOCUMULUS TO BOUNDARY LAYER AND MICROPHYSICS SCHEMES: IMPLICATIONS FOR ASSESSING CLOUD-AEROSOL INTERACTIONS. *Jerome Fast and William Gustafson Jr. (PNNL)*

5A.6 CHEMICAL DATA ASSIMILATION OF OZONE AND FINE AEROSOLS.SOME RESULTS USING ARW-WRF-CHEM AND THE GSI. *M. Pagowski, GA. Grell, S. McKenn, S. Peckham (NOAA/ESRL, Boulder)*

SESSION 5B: Physics Development and Testing: LSM/Moist Physics (1)
Chairs: John Brown (NOAA) / **Robert Fovell** (UCLA)
08:30 – 10:00, Thursday, June 25 *(Parallel Session – Center Room)*

5B.1 NEW HIGH RESOLUTION LAND-USE DATA IN WRF. *Jonathan Pleim (USEPA), Limei Ran (UNC), and Robert Gilliam (USEPA)*

5B.2 IMPROVING SNOW-RELATED PROCESSES IN THE NOAH LAND SURFACE MODEL. *Michael Barlage, Fei Chen, Mukul Tewari, Kyoko Ikeda (NCAR)*

5B.3 A DESCRIPTION OF THE WRFV3.1 SINGLE-COLUMN MODEL. *J. Hacker (NCAR), K. Arsenault (IGES/GMU), W. Angevine (NOAA/CIRES)*

5B.4 MODELING AND FORECASTING THE ONSET AND DURATION OF A SEVERE DUTCH FOG EVENT. *Ivar R. van der Velde, G. J. Steeneveld, and Albert A. M. Holtslag, Ben G. J. Wichers Schreur (Wageningen University)*

THURSDAY

5B.5 VERIFICATION OF HIGH-RESOLUTION WRF-RTFDDA SURFACE FORECASTS OVER MOUNTAINS AND PLAINS. *Gregory Roux, Yubao Liu, Luca Delle Monache, Rong-Shyang Sheu and Thomas T. Warner (NCAR)*

Discussion

1. *Issues raised by preceding 5 talks*
2. *Relevant matters raised in PBL session 2B*

SESSION 5A: WRF Chemistry (2) **Chair: Georg Grell** (NOAA-ESRL/CIRES)
10:30 – 12:00, Thursday, June 25 *(Parallel Session – South Room)*

5A.7 CONTRIBUTION OF POINT EMISSIONS ON THE PM2.5 CONCENTRATIONS AT BREATHING LEVEL. *Nicole Mölders, Huy Tran (University of Alaska Fairbanks)*

5A.8 THE TRANSPORT OF AIR POLLUTANTS IN CALIFORNIA USING WRF-CHEM. *Pallavi Marrapu (University of Iowa)*

5A.9 WRF-CHEM SIMULATION OF EAST ASIAN AIR QUALITY: SENSITIVITY TO EMISSIONS DISTRIBUTIONS. *Xueyuan Wang and Xin-Zhong Liang (Illinois State Water Survey, University of Illinois at Urbana-Champaign), Georg A. Grell and Steven E. Peckham (NOAA Earth System Research Laboratory/Global Systems Division), Julian X.L. Wang (NOAA Air Resources Laboratory)*

5A.10 IMPLEMENTATION OF THE M3DRY GASEOUS DRY DEPOSITION VELOCITY SCHEME INTO WRF-CHEM. *Christopher P. Loughner, Dale J. Allen, Russell R. Dickerson, and Elena Yegorova (University of Maryland), Kenneth E. Pickering (University of Maryland and NASA Goddard Space Flight Center)*

Discussion

SESSION 5B: Physics Development and Testing: LSM/Moist Physics (2)
Chairs: John Brown (NOAA) / **Robert Fovell** (UCLA)
10:30 – 12:00, Thursday, June 25 *(Parallel Session – Center Room)*

5B.6 THE WRF DOUBLE-MOMENT CLOUD MICROPHYSICS SCHEME (WDM). *Song-You Hong, Kyo-Sun Sunny Lim (Yonsei University)*

5B.7 EXPLORATION OF CALIFORNIA WINTERTIME MODEL WET BIAS: SENSITIVITY OF WRF PHYSICS AND MEASUREMENT UNCERTAINTY. *Hung-Neng S Chin (Lawrence Livermore National Lab), Peter M. Caldwell, and David C. Bader*

5B.8 EFFECT OF CLOUD PROCESSES ON HURRICANE TRACKS: IDEALIZED SIMULATIONS AND OPERATIONAL FORECASTS. *Robert Fovell (UCLA) and Donald Boucher*

5B.9 FORECASTING HURRICANE INTENSITY: THE IMPORTANT ROLE OF AEROSOLS IN WEAKENING LANDFALLING HURRICANES. *Barry Lynn (Weather It Is, LTD), Alexander Khain (The Hebrew University of Jerusalem), and Ruby Leung (Pacific Northwest National Laboratory)*

Discussion

1. *Issues raised by preceding 4 talks*
2. *What inadequacies and weaknesses in available physics, coupling between physics schemes, and feedback to dynamics can we identify, and what to do about them?*
3. *Where should the emphasis be in physics development?*

SESSION 6: Ongoing and Future Model Development **Chair: Bill Kuo** (DTC/NCAR)
01:30 – 03:00 *(Plenary Session)*

6.1 DEVELOPMENT OF A REGIONAL ARCTIC CLIMATE SYSTEM MODEL. *John J. Cassano (University of Colorado), Wieslaw Maslowski, William Gutowski, Dennis Lettenmaier, Mark Seefeldt, Juanxiong He*

6.2 FROM GLOBAL PROJECTIONS TO REGIONAL PREDICTIONS. *Jim Hurrell (NCAR)*

6.3 NESTING IN WRF WITH VERTICAL GRID REFINEMENT AND IMPLICIT RELAXATION. *M. Moustaoui (ASU), A. Mahalov (ASU) , J. Dudhia (NCAR), D. Gill (NCAR)*

6.4 BUILDING RESOLVING SIMULATIONS IN THE WEATHER RESEARCH AND FORECASTING MODEL INCORPORATING SURFACE PHYSICS AND DISPERSION. *K. A. Lundquist (UC Berkeley), F.K. Chow (UC Berkeley), J.K. Lundquist (LLNL)*

6.5 PLANETARY AND GLOBAL WRF. *Claire Newman (Caltech, Ashima Research), Mark Richardson (Ashima Research) and Anthony Toigo (Cornell)*

6.6 A NEW GLOBAL DYNAMIC CORE FOR WEATHER AND CLIMATE APPLICATIONS. *Joe Klemp (NCAR)*

Wrap-up and Discussion **Chair: Joe Klemp** (NCAR)
03:30 – 05:00 *(Plenary Session)*

Panel members: Wayne Angevine, John Brown, Georg Grell, Xiang-Yu Huang, Ruby Leung, and Cliff Mass

Discussion

1. *Session chair reports*
2. *Development priorities*
3. *General discussion*

POSTERS

POSTER SESSION 3:00 – 5:30 Wednesday, June 26

Coordinators: Wei Wang and Cindy Bruyere (NCAR)

WRF Model Development and Visualization

P1.1 COMBINING 2D AND 3D IMAGERY IN VAPOR FOR IMPROVED WRF VISUALIZATION. *Alan Norton and Rick Brownrigg (NCAR)*

P1.2 ANALYSIS AND VISUALIZATION OF HIGH-RESOLUTION WRF HURRICANE SIMULATION USING VAPOR. *Alan Norton, Yongsheng Chen, John Clyne (NCAR)*

P1.3 WRF ON THE GRID IN FLORIDA. *Pat Welsh (UNF) and Masoud Sadjadi (FIU)*

P1.4 TYPHOON RELOCATION IN CWB WRF. *L.-F. Hsiao (Central Weather Bureau), C.-S. Liou, Y.-R. Guo, D.-S. Chen, K.-N. Huang, and T.-C. Yeh*

P1.5 BOGUSSING OF TROPICAL CYCLONES IN WRF VERSION 3.1. *Sherrie Fredrick (NCAR)*

P1.6 A SIMPLE TECHNIQUE TO ALLEVIATE DISCONTINUITY BETWEEN GLOBAL AND REGIONAL MODELS. *Jae-Ik Song, Eun-Chul Chang, Kyo-Sun Lim and Song-You Hong (Department of Atmospheric Sciences and Global Environment Laboratory, Yonsei University, Seoul, Korea)*

P1.7 AUTO-GENERATION OF WRF CODE FOR GPUSs. *Thomas Nipen (University of British Columbia, Canada) and John Michalakes (NCAR)*

P1.8 IMPROVING WRF PERFORMANCE ON THE LATEST INTEL® BASED PLATFORMS. *Roman Dubtsov (Intel), Alexander Kosenkov, Alexander Semenov, Dmitry Shkurko*

P1.9 WRF FOR WINDOWS. *Tony Heller and Dan Connors (CSU), John Michalakes (NCAR) and Wen-Ming Ye (Microsoft)*

Data Assimilation

P2A.1 *withdrawn*

P2A.2 MAKING A SINGLE EXECUTABLE WRF 4DVAR WITH ESMF. *Don Stark, Xiang-Yu Huang, Xin Zhang (NCAR)*

P2A.3 A NEW FORMULATION OF WRFDA ANALYSIS CONTROL VARIABLES. *Monika Krysta, Syed RH Rizvi and Xiang-Yu Huang (NCAR)*

P2A.4 A QPE PRODUCT WITH BLENDED GAGE OBSERVATIONS AND HIGH-RESOLUTION WRF ENSEMBLE MODEL OUTPUT: COMPARISON WITH ANALYSES AND VERIFICATION DURING THE HMT-ARB. *Edward I. Tollerud and John A. McGinley (ESRL, Global Systems Division Boulder), Steven L. Mullen (University of Arizona), Tomislava Vukicevic and Huiling Yuan (ESRL, Global Systems Division Boulder), Chungu Lu and and Isidora Jankov (Colorado State University and ESRL, Global Systems Division Boulder)*

P2A.5 IMPACT OF FORMOSAT-3/COSMIC GPS RADIO OCCULTATION AND DROPWINDSONDE DATA ON REGIONAL PREDICTIONS DURING MEI-YU SEASON. *Chien, Fang-Ching (National Taiwan Normal University, Taiwan), and Ying-Hwa Kuo (NCAR)*

P2A.6 THE IMPACT OF TAMDAR DATA ON TYPHOON IKE FORECAST USING WRFDA SYSTEM. *Hongli Wang (NCAR)*

P2A.7 *withdrawn*

P2A.8 IMPACT OF DOPPLER WEATHER RADAR DATA ON SIMULATION OF INDIAN MONSOON DEPRESSIONS. *Ashish Routray (Indian Institute of Technology, India)*

P2A.9 IMPACT OF SAINT LOUIS UNIVERSITY-AMERENUE QUANTUMWEATHER PROJECT MESONET DATA ON WRF-ARW FORECASTS. *M. J. Mueller (Saint Louis University), R.W. Pasken, W. Dannevik, and T. P. Eichler*

P2A.10 IMPROVING WIND AND RAIN SIMULATIONS FOR TROPICAL CYCLONES WITH THE ASSIMILATION OF DOPPLER RADAR DATA. *T.C. Cheung (Chinese University of Hong Kong) and P.W. Chan (Hong Kong Observatory)*

P2A.11 IMPROVING REGIONAL FORECAST BY ASSIMILATING ATMOSPHERIC INFRARED SOUNDER (AIRS) PROFILES INTO WRF MODEL. *Shih-Hung Chou (NASA/MSFC)*

P2A.12 ASSIMILATION OF DUAL-POLORIMETRIC RADAR OBSERVATIONS AND ITS IMPACT. *Xuanli Li, John Mecikalski, and Lawrence Carry (University of Alabama in Huntsville)*

Physics Development and Testing

P2B.1 RESOLUTION DEPENDENCY OF THE OROGRAPHY-INDUCED GRAVITY WAVE DRAG (GWDO) PARAMETERIZATION: AN EVALUATION USING THE GLOBAL WRF MODEL. *Hyeyum Hailey Shin and Song-You Hong (Yonsei Univ.) and Jimy Dudhia (NCAR)*

P2B.2 IMPLEMENTATION OF DYNAMIC EDDY VISCOSITY SUBFILTER TURBULENCE MODELS IN WRF 3.0. *Gokhan Kirkil, J. Mirocha and B. Kosovic (Lawrence Livermore National Laboratory)*

P2B.3 USING A NETWORK OF SCINTILLOMETERS AND CEILOMETERS FOR VALIDATION OF THE WRF-MESOSCALE MODEL. *G.J. Steeneveld (Wageningen University), O.K. Hartogensis, A.F. Moene, H. Klein Baltink, and A.A.M. Holtslag*

POSTERS

P2B.4 A COMPARISON OF TWO MELLOR-YAMADA BASED PBL SCHEMES IN SIMULATING A HYBRID BARRIER JET. *Joseph B. Olson and John M. Brown (NOAA-ESRL)*

P2B.5 TESTING OF THE UPDATED NOAA/ESRL SEA-SPRAY SCHEME IN THE ARW MODEL. *Sara A. Michelson (NOAA/ESRL and CIRES/University of Colorado) and Jian-Wen Bao (NOAA/ESRL)*

P2B.6 DEVELOPMENT OF A COUPLED GROUNDWATER-ATMOSPHERIC MODEL. *R. M. Maxwell (Colorado School of Mines), J. K. Lundquist, J. D. Mirocha, S. G. Smith and C.S. Woodward (LLNL)*

P2B.7 INITIALIZING THE LAND SURFACE WITH THE NASA LAND INFORMATION SYSTEM TO IMPROVE WRF PREDICTIONS OF SUMMERTIME CONVECTION. *Jonathan L. Case (ENSCO, Inc./SPoRT Center), Sujay V. Kumar (SAIC/NASA GSFC), Gary J. Jedlovec (NASA MSFC/SPoRT Center)*

P2B.8 DEVELOPMENT OF KOREA LAND DATA ASSIMILATION SYSTEM WITH MODIS-DERIVED LAND DATA AND ITS APPLICATION USING WRF. *Lim Yoon-Jin (Yonsei University), Byun Kun-Young, Lee Tae-Young*

P2B.9 WIND SPEED REDUCTION INDUCED BY URBAN MORPHOLOGY. *Allen Chan (Hong Kong University of Science and Technology)*

P2B.10 COMPARISON AND VALIDATION OF WRF-ARW CLOUD MICROPHYSICS SCHEMES DURING C3VP/CLEX-10 FIELD EXPERIMENT. *Yoo-Jeong Noh and Thomas H. Vonder Haar (CIRA/Colorado State University)*

P2B.11 EXAMINATION OF AEROSOL EFFECTS ON THE DEVELOPMENT OF SUPERCELL STORM USING THE WRF DOUBLE-MOMENT (WDM) MICROPHYSICS SCHEMES. *Kyo-Sun Sunny Lim, Song-You Hong and Seong-Soo Yum (SNU, Korea) and Jimy Dudhia (NCAR)*

P2B.12 FORWARD SEMI-LAGRANGIAN MASS CONSERVATION POSITIVE DEFINITE. *Hann-Ming Henry Juang (NCEP/EMC), Song-You Hong (Yonsei Univ., Korea)*

P2B.13 THE IDENTIFICATION OF PREFERRED PHYSICS PARAMETERIZATIONS IN THE WEATHER RESEARCH AND FORECASTING (WRF) MODEL FOR USE IN THE POLAR REGIONS. *Mark W. Seefeldt and John J. Cassano (CU)*

Regional Climate Research

P3A.1 VERTICAL WIND SHEAR BIAS IN THE WRF NESTED REGIONAL CLIMATE MODEL FORCED BY THE CCSM OUTPUT. *Asuka Suzuki-Parker (Georgia Institute of Technology), Greg Holland (NCAR)*

P3A.2 ICE ACCRETION FORECASTS USING THE WEATHER RESEARCH AND FORECASTING MODEL AND A MODIFIED PRECIPITATION-TYPE ALGORITHM. *Arthur T. DeGaetano, Brian N. Belcher, Pamela L. Spier (Cornell University)*

P3A.3 EFFECTS OF AIR-SEA INTERACTION ON THE EAST-ASIAN MONSOON SIMULATION: A REGIONAL CLIMATE STUDY. *Eun-Jung Kim and Song-You Hong (Yonsei University, Korea)*

P3A.4 WAVE ACCUMULATION AND TROPICAL CYCLONE GENESIS. *James Done (NCAR), Greg Holland (NCAR) and Asuka Suzuki-Parker (Georgia Institute of Technology)*

P3A.5 INFLUENCE OF CLIMATE CHANGE ON CALIFORNIA REGION. *Lin-Lin Pan, Shu-Hua Chen, (LAWR, University of California), Mary Tyree, Dan Cayan, (Scripps Institution of Oceanography), and Mei-Ying Lin (Taiwan Typhoon and Flood Research Institute, Taiwan)*

P3A.6 A COMPARISON BETWEEN TWO MICROPHYSICAL SCHEMES OF DIFFERENT SOPHISTICATION LEVELS: PRECIPITATION DOWNSCALING IN COMPLEX TERRAIN ON THE WEST COAST OF NORWAY. *Mesquita, Michel dos Santos; Heikkilä, Ulla and Barstad, Idar (Bjerknes Centre for Climate Research)*

P3A.7 IMPACT OF VEGETATION COVER ESTIMATES ON REGIONAL CLIMATE FORECASTS. *Phillip Stauffer (South Dakota School of Mines and Technology), William Capehart, Christopher Wright, Geoffery Henebry*

P3A.8 PREDICTABILITY OF THE MOISTURE REGIME ASSOCIATED WITH THE PREONSET OF SAHELIAN RAINFALL. *Roberto Mera (NCSU CML) and Fredrick Semazzi*

P3A.9 DYNAMICAL DOWNSCALING OF NASA/GISS MODEL USING WRF: INITIAL PROOF-OF-CONCEPT. *Tanya L. Otte, Jared H. Bowden, Jerold A. Herwehe and Christopher G. Nolte (USEPA/ORD), and Greg Faluvegi (NASA/GISS)*

P3A.10 APPLICATION OF WRF INTO THE HYDROLOGICAL PREDICTION STUDY IN A RIVER BASIN, JAPAN. *Xieyao Ma, Takao Yoshikane, Masayuki Hara and Fujio Kimura (JAMSTEC)*

P3A.11 EVALUATION OF THE NEWLY COUPLED WRF3-CLM3.5 WITH CCSM3 FORCING. *Yan Bao (UC-Berkeley), Zack Subin (UC-Berkeley), Jiming Jin (USU-Logan), Norman L. Miller (UC-Berkeley)*

P3A.12 MODELING THE CLIMATE SENSITIVITY TO FOREST COVER IN NORTH AMERICA. *Yaqiong Lu (UC Merced), Lara M. Kueppers (UC Merced), Zachary M. Subin (UC Berkeley)*

P3A.13 DYNAMICALLY DOWNSCALING PCM DATA USING WRF FOR FUTURE CLIMATE IN CALIFORNIA. *Zhan Zhao, Shu-hua Chen and Michael J. Kleeman (UC Davis), Mary Tyree, and Dan Cayan (Scripps Institution of Oceanography)*

P3A.14 THE DEVELOPMENT OF DYNAMICAL DOWNSCALING AT THE ENVIRONMENTAL PROTECTION AGENCY: DEVELOPING A MODEL FRAMEWORK FOR WRF. *Jared H. Bowden (EPA), Tanya L. Otte (EPA), Jerold A. Herwehe (EPA), Christopher G. Nolte (EPA)*

P3A.15 PARAMETERIZATION INDUCED ERROR-CHARACTERISTICS IN REGIONAL CLIMATE MODELS: AN ENSEMBLE BASED ANALYSIS. *N.K. Awan (Wegener Center for Climate and Global Change), H. Truhetz, A. Gobiet*

POSTERS

P3A.16 AN EFFORT TO DEVELOP THE COUPLED WRF BY THE USE OF CPL7. *Juanxiong He (IARC and ARSC), Greg Newby (ARSC), Tony Craig (NCAR), Mark Seefeldt (CU)*

P3A.17 CALIFORNIA WINTERTIME PRECIPITATION IN REGIONAL AND GLOBAL CLIMATE MODELS. *Peter M. Caldwell (Lawrence Livermore Nat. Lab)*

P3A.18 STATISTICAL CHARACTERIZATIONS OF OCEAN SURFACE WINDS GENERATED BY NUMERICAL MODELS IN COMPARISON WITH SATELLITE OBSERVATIONS AND REANALYSIS. *Hsiao-ming Hsu, William Large and Joseph Tribbia (NCAR)*

P3A.19 CLIMATOLOGICAL FEATURES AND NUMERICAL MODELLING OF PRECIPIPATION DURING WINTERTIME STORMS IN THE SNOW MOUNTAINS. *Thomas Chubb, Anthony Morrison, Simon Caine, Steve Siems and Michael Manton (Monash University)*

Model Evaluation

P3B.1 WRF REFERENCE CONFIGURATIONS – UPDATE. *Jamie Wolff (NCAR)*

P3B.2 EVALUATION OF EXPERIMENTAL FORECASTS FROM THE 2008 AND 2009 NOAA HAZARDOUS WEATHER TESTBED SPRING EXPERIMENT. *Tara Jensen, Barbara Brown and Louisa Nance (NCAR), Steve Weiss (NOAA/NWS/Storm Prediction Center), Jack Kain, and Mike Coniglio (NOAA/OAR/National Severe Storms Laboratory)*

P3B.3 FOSTERING STUDENT INTEREST IN THE WEATHER RESEARCH AND FORECASTING MODEL THROUGH A UNIVERSITY FORECAST COMPETITION. *Brian N. Belcher (Cornell University)*

P3B.4 A REAL-TIME FORECAST SYSTEM FOR DENMARK: VERIFICATION OF PBL PROCESSES FOR WIND POWER FORECASTING AND RESOURCE ASSESSMENT. *Andrea N. Hahmann, Claire L. Vincent, and Caroline Draxl (Risoe-DTU)*

P3B.5 A RATHER SIGNIFICANT IMPROVEMENT IN THE MODELING OF PRECIPITATION. *Barry Lynn (Weather It Is), Amir Givati (Israel Hydrological Service)*

P3B.6 EVALUATION OF WRF-NMM PERFORMANCE ON TUSCANY, ITALY DURING THE YEAR 2007. *Gozzini B., Bartolini G., Grifoni D., Messeri G., Pasi F., Piani F., Rossi M., Tei C. (CNR – IBIMET, Italy)*

P3B.7 EXTENDING THE OPERATIONAL APPLICABILITY OF THE ADVANCED RESEARCH WRF MODEL. *Brent L. Shaw, Richard L. Carpenter, Jr., Zach DuFran, and Phillip L. Spencer (WDT)*

P3B.8 THE USE OF A HIGH RESOLUTION MODEL IN A PRIVATE ENVIRONMENT. *Daniël van Dijke (MeteoGroup), Dirk Malda*

P3B.9 VERTICAL VELOCITY AND MICROPHYSICAL DISTRIBUTIONS RELATED TO RAPID INTENSIFICATION OF HURRICANE DENNIS (2005). *E. C. Meyers, G. M. McFarquhar, B. F. Jewett, S. W. Nesbitt (University of Illinois at Urbana-Champaign), and G. M. Heymsfield (NASA Goddard Space Flight Center)*

P3B.10 VALIDATION OF WRF FORECASTS OF THE DEVELOPMENT OF HURRICANE HELENE. *Folmer, M.J. (Saint Louis University), R.W. Pasken (Saint Louis University) and B.E. Anderson (NASA Langley Research Center)*

P3B.11 SIMULATION OF SPIRAL RAIN BANDS AND VERTICAL RESOLUTION. *Zhihua Zeng, S. A. Michelson, J.-W. Bao (NOAA/ESRL)*

P3B.12 VARIABILITY OF OCEAN-ATMOSPHERIC INTERACTIONS ASSOCIATED WITH TROPICAL CYCLONE/HURRICANE KATRINA. *R. Seseela Reddy and Quinton L. Williams (Jackson State University)*

P3B.13 CUSTOMIZATION OF PHYSICAL PARAMETERIZATION SCHEMES OF WRF MODEL FOR INDIAN SEAS TROPICAL CYCLONES. *Krishna K. Osuri, U.C. Mohanty, A. Routray and Makarand A. Kulkarni (Indian Institute of Technology, Delhi)*

P3B.14 DOWNSCALING OF LIFE CYCLE OF TROPICAL CYCLONES OVER BAY OF BENGAL. *Amit Kesarkar, M Rajeevan, and Rajasekhar M., Andhra Pradesh, India*

P3B.15 ASSESSING THE FUTURE COASTAL FLOOD RISK FROM SEVERE STORMS IN THE UK. *Qingping Zou and Dominic E. Reeve (University of Plymouth), Ian Cluckie (Swansea University), Shunqi Pan (University of Plymouth), Dawei Han (University of Bristol), Xin Lv (University of Plymouth), Richard Hewston (Swansea University), Yongping Chen and Zhong Peng (University of Plymouth)*

P3B.16 LARGE-EDDY SIMULATION OF SEA AND LAKE BREEZES AND SENSITIVITY TO FORCING MECHANISMS. *Erik T. Crosman and John D. Horel (University of Utah)*

P3B.17 IDEALIZED WRF EXPERIMENTS ON MESOSCALE MOTIONS INDUCED BY SURFACE HEAT FLUX VARIATION. *Song-Lak Kang, Fei Chen, Jimy Dudhia (NCAR)*

P3B.18 EFFECTS OF SOIL MOISTURE ON A SQUALL LINE IN THE SAHEL REGION STUDIED BY WRF-ARW RESULTS AND FIELD OBSERVATIONS. *Jordi Vila (WUR), Dirk Wolters (WUR), Chiel van Heerwaarden (WUR), Bernard Cappelaere (WUR) and David Ramier (WUR)*

P3B.19 THE IMPACT OF WRF PBL PARAMETERIZATIONS ON THE SIMULATION OF FIRE WEATHER PARAMETERS OVER THE NORTHEAST U.S. *Joseph J. Charney (U.S. Forest Service), Brian A. Colle (Stony Brook University), and Joseph Pollina (Stony Brook University)*

P3B.20 FORECASTING OF WIND FOR ENERGY IN SOUTHERN IDAHO. *Kevin Nuss, Paul Dawson, and Todd Haynes (Boise State University)*

P3B.21 WRF MODELING FOR RETROSPECTIVE AIR QUALITY APPLICATIONS. *Robert Gilliam and Jonathan Pleim (US EPA)*

P3B.22 HIGH-RESOLUTION SIMULATED ABI DATASETS USED FOR GOES-R RESEARCH AND DEMONSTRATION ACTIVITIES. *Jason Otkin (UW-Madison/CIMSS), Tom Greenwald, Justin Sieglaff, Mat Gunshor, Kaba Bah, Tim Schmit, Allen Huang, and Steve Wanzong*

POSTERS

P3B.23 THE LIFE CYCLE OF AN UNDULAR BORE AND ITS INTERACTION WITH A SHALLOW, INTENSE COLD FRONT. *Daniel Hartung (UW-Madison), Jason Otkin, Jon Martin, and David Turner*

P3B.24 PERFORMANCE ANALYSIS OF WRF FORECASTS OF CONVECTIVE ACTIVITY DURING NE MONSOON 2008. *Rajasekhar M. (Meteorology, SDSC SHAR, Sriharikota, India), Amit Kesarkar, M. Rajeevan, S. Ram Babu, D. Gayatri Vani and G. V. Rama*

P3B.25 SENSITIVITY OF MESOSCALE CIRCULATION NEAR ICE-EDGE TO THE SURFACE CONDITIONS: INVESTIGATION IN WRF. *Muralidhar Adakudlu, Idar Barstad (Bjerknes Centre for Climate Research)*

P3B.26 PERFORMANCE OF POLAR WRF IN AN ANTARCTIC SEVERE WIND EVENT. *Jordan G. Powers (NCAR)*

P3B.27 STUDY OF CLOUD PROPERTIES WITH DIFFERENT SHEAR AND CAPE ENVIRONMENT USING 2D WRF IDEALIZED SIMULATIONS. *Danielle Groenen and Shu-Hua Chen; University of California, Davis*

P3B.28 NUMERICAL MODELLING OF SOUTHERN OCEAN MIXED PHASE BOUNDARY LAYER CLOUDS. *Anthony Morrison (Monash University, Australia)*

P3B.29 WRF SIMULATION OF PRECIPITATION REGIMES. *Simon Caine (Monash University), Steven T Siems, Christian Jackob*

P3B.30 SIMULATION OF A SNOWFALL EVENT OVER JAPAN SEA USING WRF AND GCE MODEL. *Xiaowen Li (GEST/UMBC), Wei-Kuo Tao (NASA/GSFC), Jainn Jong/Roger Shi (GEST/UMBC)*

P3B.31 SIMULATING APPALACHIAN COLD AIR DAMMING WITH WRF NUDGING DATA ASSIMILATION SYSTEM. *W. Wu, J. Grim, F. Vandenberghe, Y. Liu, J. Hacker, A. Bourgeois, C. Bruyere and Jimy Dudhia (NCAR) A. Deng, B. Gaudet, and D. Stauffer (PSU)*

P3B.32 HIGH RESOLUTION MODELING IN WRF TO DETERMINE THE IMPACT OF TERRAIN RESOLUTION ON LOW-LEVEL WINDS IN COMPLEX TERRAIN. *Kathleen Carroll (IAS-SDSMT), William Capehart (IAS-SDSMT), Mark Hjelmfelt (IAS-SDSMT)*

P3B.33 WRF SIMULATIONS AROUND MT. EVEREST. *Arnico Panday (Princeton/GFDL)*

P3B.34 SENSITIVITY OF A SIMULATED WINTER STORM TO WRF MODEL PHYSICS OVER COMPLEX TERRAIN. *William Y.Y. Cheng (RAL/NCAR), Yubao Liu (RAL/NCAR) and Thomas T. Warner (RAL/NCAR)*

P3B.35 MICROSCALE SIMULATION OF TERRAIN-DISRUPTED AIRFLOW AROUND THE HONG KONG INTERNATIONAL AIRPORT (HKIA) – COMPARISON OF RESULTS BETWEEN NUMERICAL MODELS. *P.W. Chan (Hong Kong Observatory) and T.C. Cheung (Chinese University of Hong Kong)*

P3B.36 A NUMERICAL INVESTIGATION OF A DOWN-VALLEY FLOW REGIME DURING EOP 4 OF T-REX 2006. *Robert E. Dumais, Jr (US Army Research Laboratory) and Dr. Sen Chiao (Florida Institute of Technology)*

WRF Chemistry

P5A.1 UNCERTAINTY QUANTIFICATION FOR FOSSIL FUEL CO2 EMISSIONS VERIFICATION. *Branko Kosovic, Luca Delle Monache, Philip Cameron-Smith, Dan Bergmann, Tom Guilderson (Lawrence Livermore National Laboratory)*

P5A.2 UNIFYING THE CHEMISTRY ACROSS SCALES: WRF-CHEM/MOZCART. *Gabriele Pfister and Stacy Walters (NCAR)*

P5A.3 EARLY EXPERIMENTS IN EVALUATING THE POTENTIAL CLIMATIC IMPACT OF AGRICULTURALLY PRODUCED AEROSOLS IN THE NORTHERN GREAT PLAINS USING WRF/CHEM. *Daniel J. Koller (University of North Dakota), Jeffrey S. Tilley and David Delene*

P5A.4 INVESTIGATION OF THE IMPACT OF MINERAL DUST ON SUMMERTIME CONVECTION WITH WRF-CHEM. *Karina Apodaca (Howard University), Mary C. Barth (NCAR), Vernon R. Morris (Howard University)*

P5A.5 IMPLEMENTING SCALARS AND LIGHTNING-NOX FOR STUDIES OF THUNDERSTORMS AND CHEMISTRY. *Mary Barth (NCAR), Jeff Lee (NCAR), Lesley Ott (NASA/Goddard), Kenneth Pickering (NASA/Goddard), Christelle Barthe (CNRS)*

P5A.6 ESTIMATION OF OZONE-INDUCED CROP YIELD LOSS IN 2020 OVER EAST ASIA. *Masayuki Takigawa, Masaaki Takahashi, Hajime Akimoto (JAMSTEC), Kazuyuki Kobayashi (Univ. of Tokyo)*

P5A.7 IMPACT OF UNREGULATED SHIP EMISSIONS ON AIR AND WATER QUALITY IN SOUTHERN ALASKA. *Nicole Mölders, Trang Thu Tran, Stacy E. Porter, Catherine F. Cahill (University of Alaska Fairbanks)*

P5A.8 THE TRANSPORT OF AIR POLLUTANTS IN CALIFORNIA USING WRF-CHEM. *Pallavi Marrapu (University of Iowa)*

P5A.9 IMPACT OF URBAN CANOPY PARAMETERIZATIONS ON THE TRANSPORT AND DISPERSION OF GASEOUS AIR POLLUTANTS. *Sang-Hyun Lee (CIRES/CU and ESRL/NOAA), Stuart A. McKeen, Wayne M. Angevine, Gregory J. Frost, Si-Wan Kim, Michael Trainer*

P5A.10 COMPARISONS OF OFF-LINE AND ON-LINE AIR QUALITY SIMULATIONS IN CALIFORNIA'S CENTRAL VALLEY. *E. D. Grell, I. V. Djalalova and S. A. Michelson (NOAA/ESRL and CIRES/University of Colorado), J.-W. Bao (NOAA/ESRL)*

P5A.11 SCIAMACHY MEASUREMENTS OF TROPOSPHERIC COLUMN NITROGEN DIOXIDE OVER NORTHWEST CONTINENTAL EUROPE: COMPARISON WITH WRF/CHEM RESULTS AND SURFACE OBSERVATIONS. *Saskia Buchholz, Klaus Goergen, Franz Kai Ronellenfitsch, Laurent Pfister (Centre de Recherche Public - Gabriel Lippmann, Luxembourg), and Günther Heinemann (University Trier, Germany)*

P5A.12 *withdrawn*

POSTERS

P5A.13 PROGRESS MADE TOWARDS INCLUDING WILDFIRES IN REAL-TIME CLOUD RESOLVING FORECASTS AT NOAA/ESRL AND EXAMINING ITS IMPACT UPON WEATHER AND AIR QUALITY. *Steven Peckham (ESRL/NOAA), Georg Grell, Tanya Smirnova, Stan Benjamin, Stu McKeen*

P5A.14 AEROSOL - CLOUD INTERACTION WITHIN THE BEACHON FRAMEWORK. *Trude Eidhammer, Mary C. Barth, Christine Wiedinmyer (NCAR)*

P5A.15 EVALUATION OF THE WRF/CHEM MODEL DURING THE MILAGRO FIELD EXPERIMENT: COMPARING DIFFERENT CHEMICAL MECHANISMS FOR GAS AND AEROSOL SPECIES. *Hodzic A. (NCAR), Barth M., Fast J., Madronich S.*

P5A.16 CAST STUDY USING WRF-CHEM. *John Wong (Univ of Colorado at Boulder), David Noone, Mary Barth, Bill Skamarock, Georg Grell*

P5A.17 AN EVALUATION OF PHOTOCHEMICAL MODEL ESTIMATED PM2.5 AND OZONE USING MM5 AND WRF INPUTS FOR THE WESTERN UNITED STATES. *Kirk Baker (U.S. Environmental Protection Agency)*

FRIDAY – JUNE 26, 2009 **8:30 – 12:00**
Instructional Sessions

NCL *8:30 – 10:00* ***(South Room)***
The NCAR Command Language (NCL) was designed to manipulate and display a wide variety of datasets. This instructional session will give participants an overview of the capabilities of NCL, as well as how to display WRF model data specifically.

MET *8:30 – 10:00* ***(Center Room)***
An overview of the Model Evaluation Tools with an emphasis on the updates in the latest version 2.0 will be covered in this tutorial.

GSI *8:30 – 10:00* ***(North Room)***
The Gridpoint Statistical Interpolation (GSI) software package is designed to be an operational, state-of-the-art meteorological data analysis tool. This instructional session will provide the participants with an overview of GSI's current capabilities, plans for maintaining and supporting a Community GSI package, and basic instructions on how to install and run GSI.

IDV *10:30 – 12:00* ***(South Room)***
This tutorial provides an overview of Unidata's Integrated Data Viewer (IDV) and how it can be used with WRF model output. IDV is a freely available 3D visualization and analysis tool that allows integration of model and observed datasets. This session will include an overview of IDV functionality and investigation of a case study that includes WRF output, satellite, radar and observational data. A new version of the IDV (2.7) will be available in time for the workshop and attendees are encouraged to bring a laptop with that version installed. IDV can be downloaded from http://www.unidata.ucar.edu/downloads/idv.

WRF-Var: Radiance Data Assimilation *10:30 – 12:00* ***(Center Room)***
This radiance tutorial will be presented in two parts. The first part will cover basic principal of satellite radiance measurements, radiative transfer model, and direct radiance assimilation. The second part will emphasis on practical aspects of assimilating radiance data using WRF-Var system, such as channels selection and bias correction as well as some diagnostics tools.

VAPOR: Understanding WRF Datasets with Interactive 3D Visualization
10:00 – 12:00 ***(CTTC: CG2 – 3024)***
This tutorial is a hands-on course, presenting a variety of techniques for understanding WRF output through the use of 3D visualization. The goal is to enable attendees to easily use 3D graphics and animation in the analysis of WRF output. Attendees are not expected to be familiar with 3D graphics. The visualization will be performed using VAPOR (http://www.vapor.edu), an interactive visualization tool that has been developed at NCAR for the understanding of turbulence data.

This course will be held at the NCAR CTTC computer classroom in building CG2, a short walk from the WRF workshop sessions in building CG1. Attendance is limited to 32, with one or two attendees per computer.