Program for the 47th Annual Climate Diagnostics and Prediction Workshop  
Logan, Utah, October 25–27, 2022  
(Program Update: September 30, 2022)

Conference Schedule

Tuesday, October 25, 2022

7:30 – 8:30 am  Registration

8:30 – 8:50 am  Welcoming Remarks  
Dr. Dvid Dewitt, Director, Climate Prediction Center/NOAA  
Dr. Kenneth White, Dean, College of Agriculture and Applied Sciences/Utah State University

8:50 – 9:10 am  Keynote Speech  
Recent Sub-Seasonal to Seasonal (S2S) Progress at CPC, David Dewitt, NOAA/CPC  
Dr. Robert Gillies, Director of Utah Climate Center will introduce David Dewitt.

Session 1  ENSO  
Chair: Matt Newman, NOAA/PSL

9:10 – 9:30 am  How Skillful are Collective ENSO Predictions, Michelle L’Heureux, NOAA/CPC, Rohan Schroff, Cornell University, and Michael Tippett, Columbia University

9:30 – 9:50 am  The role of the Western North Pacific (WNP) precursor in El Nino Southern Oscillation (ENSO) development under a warming climate, Krishna Borhara, Utah State University, S. Y. Simon Wang, Utah State University, and Boniface Fosu, Mississippi State University

9:50 – 10:10 am  Multi-year variation of ENSO forecast skill since the late 1800s, Jiale Lou, NOAA/CIRES, Matthew Newman and Andrew Hoell, NOAA/PSL

10:10 – 10:30 am  Break

Session 2  Seasonal Predictions  
Chair: Wanqiu Wang, NOAA/CPC
10:30 – 10:50 am  Consolidation of Monthly and Seasonal Forecast Tools at NOAA’s Climate Prediction Center, **Daniel Barandiaran**, NOAA/CPC

10:50 – 11:10 am  Analyzing a potential upgrade of the CPC consolidated seasonal forecast tool, **Michael Goss**, NOAA/CPC, Daniel Barandiaran, Cory Baggett, and Mike Halpert, NOAA/CPC

11:10 – 11:30 am  Decadal Trend Aware Calibration of the NMME, **Dan Collins**, NOAA/CPC, Emerson LaJoie and Johnna Infanti, NOAA/CPC

11:30 – 11:50 am  An Updated NMME-based Hybrid Prediction Scheme for Atlantic Hurricane Season Activity, **Daniel Harnos**, NOAA/CPC, Matthew Rosencrans and Hui Wang, NOAA/CPC


12:10 – 1:30 pm  Lunch

**Session 3**  
**Subseasonal Predictions**  
Chair: **Arun Kumar**, NOAA/CPC

1:30 – 1:50 pm  Transition of CPC’s Global Tropics Hazard Outlook to Weeks 2 and 3, **Lindsey Long**, NOAA/CPC, Nicholas Novella and Jon Gottschalck, NOAA/CPC

1:50 – 2:10 pm  The hybrid SST/Soil moisture tool for Weeks 3-4 extreme heat forecasting at the CPC, **Evan Oswald**, NOAA/CPC and Jon Gottschalck, NOAA/CPC

2:10 – 2:30 pm  Using CFSv2 Forecasts to Create Extended Lead forecasts of TC Tracks, **David Meyer**, Statistical Solutions LLC and Tom Murphree, Naval Postgraduate School

2:30 – 2:50 pm  Subseasonal Prediction of U.S. Drought in NOAA GEFSv12 Reforecasts, **Hailan Wang**, NOAA/CPC, Li Xu, Andrew Badger, and David DeWitt, NOAA/CPC, and Mike Barlage and Helin Wei, NOAA/EMC

2:50 – 3:10 pm  Prediction and Impacts of 14-day Extreme Precipitation Periods within the CONUS, **Melanie Schroers**, University of Oklahoma and Elinor Martin, South Central Climate Adaptation Science Center
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<th>Time</th>
<th>Session 4 Part 1</th>
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<td>3:10 – 3:30 pm</td>
<td>Break</td>
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| 3:30 – 3:50 pm| Attributions Detection and Diagnostics | Chair: **Michelle L’Heureux**, NOAA/CPC  
Rapid development of ENSO-related seasonal forecast errors, **Matt Newman**, NOAA/PSL, Jon Beverley, CIRES/University of Colorado and NOAA/PSL and Andrew Hoell, NOAA/PSL |
| 3:50 – 4:10 pm| Attributions of North American Subseasonal Precipitation Prediction Skill, **Arun Kumar**, NOAA/CPC, Lantao Sun and James W. Hurrell, Colorado State University, Martin P. Hoerling and Andrew Hoell, NOAA/PSL, Jadwiga H. Richter, NCAR, Arun Kumar, NOAA/CPC |  
The Impact of Tropical SST Variability on the Northern Hemisphere Circumglobal Teleconnection Pattern, **Yen-Heng Lin**, Northern Gulf Institute and Boniface Fosu, Mississippi State University & Northern Gulf Institute |
| 4:10 – 4:30 pm| The Impact of Tropical SST Variability on the Northern Hemisphere Circumglobal Teleconnection Pattern, **Yen-Heng Lin**, Northern Gulf Institute and Boniface Fosu, Mississippi State University & Northern Gulf Institute |  
Importance of Tropospheric Wave Breaking for Subseasonal Forecasts of the February 2021 North American Cold Air Outbreak, **Jason Furtado**, University of Oklahoma and Oliver T. Millin, University of Oklahoma |
| 4:50 – 5:10 pm| 2021 Texas Cold Snap: Manifestation of Natural Variability and a Recent Warming Trend, **Pei-Chun Hsu**, Research Center for Environmental Changes, Academia Sinica, Taipei, Taiwan, Huang-Hsiung Hsu, Hao-Jhe Hong, Ying-Ting Chen, Yu-Luen Chen, and Wan-Ling Tseng, Research Center for Environmental Changes, Academia Sinica, Taipei, Taiwan |  
Poster Session - Ice Breaker (Light refreshments served) |

**Wednesday, October 26, 2022**

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<tr>
<th>Time</th>
<th>Session 4 Part 2</th>
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<td>7:30 – 8:30 am</td>
<td>Registration</td>
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| 8:30 – 8:50 am| Attributions Detection and Diagnostics | Chair: **Hailan Wang**, NOAA/CPC  
Investigating the role of convectively coupled equatorial waves in subseasonal tropical predictions, **Juliana Dias**, NOAA/PSL, Maria Gehne, CIRES & University of Colorado, and George Kiladis, NOAA/PSL |
8:50 – 9:10 am  Global and regional discrepancies between early 20th century coastal air and sea-surface temperature detected by a coupled energy-balance analysis, **Duo Chan**, *Woods Hole Oceanographic Institution*, Geoffrey Gebbie, *Woods Hole Oceanographic Institution*, and Peter Huybers, *Harvard University*


9:30 – 9:50 am  Implications of AMOC base-state to the mode of variability of the US summer precipitation, **Christopher Sala**, *Pennsylvania State University*, Yifei Fan and Dr. Laifang Li, *Pennsylvania State University*

9:50 – 10:10 am  Upper ocean diurnal cycle in CFS, **Jack Reeves** Eyre, *NOAA/CPC*, Jieshun Zhu, Arun Kumar, and Wanqiu Wang, *NOAA/CPC*

10:10 – 10:30 am  Break

**Session 5 Part 1**  Observations Model Analysis and Prediction  Chair: **Yan Xue**, *NOAA/OSTI*


11:10 – 11:30 am  Circulation Study: On the Relationship of Temperature and Precipitation with 500-hPa Heights at the Week 3-4 timescale, **Cory Baggett**, *NOAA/CPC*, Emerson LaJoie, Johnna Infanti, and Michael Goss, *NOAA/CPC*

11:30 – 11:50 am  A New Processing System for the SHEF Daily Precipitation Reports, **Ping-Ping Xie**, *NOAA/CPC*, Shaorong Wu, Thomas Collow, Ryan Bolt, Brt Katz and Wei Shi, *NOAA/CPC*
11:50 – 12:10 am  Land use analysis of Kumira-Hathazari region of Chittagong, Bangladesh from MODIS land cover from 2005 to 2020, Md. Sajidul Hossain, Bangladesh University of Engineering and Technology, Nusrat Nasrin Khan, Bangladesh University of Engineering and Technology

12:10 – 1:30 pm  Lunch

Session 5 Part 2  Observations Model Analysis and Prediction
Chair: Emerson LaJoie, NOAA/CPC

1:30 – 1:50 pm  Trends from Reanalyses: Progress over the last 10 years, Wesley Ebisuzaki, NOAA/CPC, Leigh Zhang and Arun Kumar, NOAA/CPC, Jeffrey Whitaker, NOAA/PSD, and Jack Woollen, NOAA/EMC

1:50 – 2:10 pm  Trends in Global Tropical Cyclone Activity: 1990 - 2021, Philip Klotzbach, Colorado State University, Kimberly M. Wood, Mississippi State University, Carl J. Schreck III, North Carolina State University, Steven G. Bowen, Aon, Christina M. Patricola, Iowa State University, and Michael M. Bell, Colorado State University

2:10 – 2:30 pm  Next Generation Global Ocean Data Assimilation System (NG-GODAS): reanalysis and applications, Jieshun Zhu, NOAA/CPC, Shastri Paturi and Guillaume Vernieres, NOAA/EMC, Travis Sluka, UCAR, Arun Kumar and Wanqiu Wang, NOAA/CPC

2:30 – 2:50 pm  Development of a Multi-physics Forecast System for the Sub-seasonal Scale Prediction, Manpreet Kaur, Goethe University Frankfurt Am Main, Susmitha Joseph, R. Phani, R Mandal, A Dey, and A. K. Sahai, Indian Institute of Tropical Meteorology Pune

2:50 – 3:10 pm  Development of UFS Coupled GEFS for Subseasonal Forecasts, Yuejian Zhu, NOAA/CPC, Bing Fu, Hong Guan, Bo Yang, Wei Li, Jiayi Peng, Xianwu Xue, Sanghoon Shin, and Dingchen Hou, NOAA/EMC, Eric Sinsky, NOAA/CPC, Phillip Pегion, NOAA/PSL, Xin-Zhong Liang, University of Maryland

3:10 – 3:30 pm  Improving NWS Subseasonal-to-Seasonal Forecast with Unified Forecast System: Highlights of Modeling and Analysis Results, Yan Xue, NOAA/OSTI, Avichal Mehra, Fanglin Yang, Michael Barlage, Yuejian Zhu, and Vijay Tallapragada, NOAA/EMC, Cristiana Stan, Jim Kinter, George Mason University, Jeff Whitaker, NOAA/PSL, Wanqiu Wang, NOAA/CPC, and Deepthi Achuthavarier, NWS/OSTI
3:30 – 3:50 pm  Break

Session 6 Part 1  Applications of Modern Technologies to S2S Forecasting
Chair: Md Abul Ehsan Bhuiyan, NOAA/CPC

3:50 – 4:10 pm  The Development of a Machine Learning-based Probabilistic Seasonal Outlook for the Famine Early Warning Systems Network (FEWS NET), Nachiketa Acharya, CIRES, University of Colorado & NOAA Physical Sciences Laboratory, Kyle Joseph Chen Hall, NOAA/CIRES and Andrew Hoell, NOAA/PSL

4:10 – 4:30 pm  Development of neural networks to statistically post-process sub-seasonal precipitation accumulation forecasts over the contiguous United States, Rochelle Worsnop, Cooperative Institute for Research in Environmental Sciences (CIRES) and NOAA/ESRL/Physical Sciences Laboratory, Michael Scheuerer, Norwegian Computer Center, Thomas M. Hamill, IBM/Weather Company

4:30 – 4:50 pm  Post-Processing of Week 2 GEFSv12 Heat Forecasts via Neural Nets, Greg Jennrich, NOAA/CPC & ERT, Li Xu, Evan Oswald, NOAA CPC & ERT, and Matt Rosencrans, NOAA/CPC

4:50 – 5:50 pm  Networking - Dinner Follows

Thursday, October 27, 2022

7:30 – 8:30 am  Registration

Session 6 Part 2  Applications of Modern Technologies to S2S Forecasting
Chair: Nachiketa Acharya, NOAA/CIRES

8:30 – 8:50 am  Assessing Decadal Variability of Subseasonal Predictability using Artificial Neural Networks, Marybeth Arcodia, Colorado State University and Elizabeth Barnes, Colorado State University

8:50 – 9:10 am  Improving Sub-seasonal Precipitation and Temperature Outlooks with Deep Learning, Yun Fan, NOAA/CPC, Li Xu and Jon Gottschalck, NOAA/CPC

9:10 – 9:30 am  Evaluation and Bias Correction of S2S Reforecast Ensemble for Forecasting US Extreme Precipitation Events, Devin McAfee, University
9:30 – 9:50 am
Advancing Machine Learning-Based Bias Correction Technique for Rainfall Estimation Over the Complex Terrain Region, Md Abul Ehsan Bhuiyan, NOAA/CPC, Raihan Sayeed Khan, Intel, and Wassila Thiaw, NOAA/CPC

9:50 – 10:10 am
Break

Session 7 Part 1 Improving Climate Services
Chair: Stephen Baxter, NOAA/OSTI

10:10 - 10:30 am
An Improved Analysis of Daily Maximum and Minimum Surface Air Temperature over the Global Land, Wanqiu Wang, NOAA/CPC, Pingping Xie, Yanjuan Guo, Shaorong Wu, and Wei Shi, NOAA/CPC

10:30 - 10:50 am
The Recent Development of Global Drought Monitor and Outlook, Li Xu, NOAA/CPC, Miliaritiana Robjhon, Yun Fan, and Wassila Thiaw, NOAA/CPC

10:50 - 11:10 am
Verification of a Drought Prediction System over the Horn of Africa, Miliaritiana Robjhon, NOAA/CPC, Li Xu, Wassila Thiaw, and Yun Fan, NOAA/CPC

11:10 - 11:30 am
Understanding the Connection between Soil Moisture and Safe Water Access Using Earth Observations, Farah Nusrat, University of Rhode Island, Joseph Goodwill, Jason Parent, Kristin Johnson and Ali Shafqat Akanda, University of Rhode Island, Ashraful Islam Khan, Md. Taufiqul Islam, and Firdausi Qadri, International Centre for Diarrhoeal Disease Research, Bangladesh

11:30 - 11:50 am
Applying Climatology for Strategic Planning: The 14 WS Capabilities in Eastern Europe, Christina Maurin, USAF 14th Weather Squadron, Justyn Jackson, Kevin Havener, Patrick Johnston, Bret Kerstetter, Stephanie Smith, Robert Falvey, and William Henning, USAF 14th Weather Squadron

11:50 - 12:10 pm
Machine learning based Prediction of Land Use/Land Cover and Land Surface Temperature using Landsat imagery for Rajshahi, Bangladesh using Google Earth Engine, Md Shihab Uddin, Bangladesh University of Engineering and Technology, and Indronil Sarkar, Bangladesh University of Engineering and Technology
12:10-1:30 pm  Lunch

Session 7 Part 2  Improving Climate Services
Chair: Christina Maurin, USAF 14th Weather Squadron

1:30 - 1:50 pm  Ohio River Forecast Center Support for the Lake Erie Harmful Algal Bloom Forecasts, Abram DaSilva, NWS/OHRFC

1:50 - 2:10 pm  A Prototype Forecast-Informed Reservoir Operation (FIRO) for Lake Conroe, TX – Application of NOAA/WPC’s QPF and CPC’s Outlooks in Reservoir Operational Modeling, John Zhu, Texas Water Development Board and Nelun Fernando, Texas Water Development Board

2:10 - 2:30 pm  A Real Time Fire Weather 8-14 Day Outlook Tool Based on NCEP GEFS, Mingyun Chen, NOAA/CPC, Wanqiu Wang and David DeWitt, NOAA/CPC

2:30 - 2:50 pm  Evaluation of a supply-chain climate model for its long-range temperature forecasting ability, Wayne Bancroft, Retired

2:50 - 3:10 pm  NWS Climate Services Capabilities for Building a Climate Ready Nation, Marina Timofeyeva, NWS Climate Services Branch, Stephen Baxter, Margaret Hurwitz, Jenna Meyers, Viviane Silva, and James Zdrojewski, NWS Climate Services Branch

3:10 - 3:30 pm  Break

Session 8  Hydroclimate in the Western United States
Chair: Wei Zhang, Utah State University

3:30 - 3:50 pm  CPC’s Experimental Water Year Outlook Tool, Emerson LaJoie, NOAA/CPC,

3:50 - 4:10 pm  Improving NWS Drought Messaging and Regional Collaboration, Margaret Hurwitz, NWS Climate Services Branch, Stephen Baxter and Marina Timofeyeva, NWS Climate Services Branch

4:10 - 4:30 pm  Utilizing causal inference on single-model initial condition large ensembles for future Great Salt Lake predictability, Siiri Bigalke, Utah State University, Simon Wang, Wei Zhang, and Yoshi Chikamoto, Utah State University

4:30 - 4:50 pm  Can dynamically downscaling the CFSv2 model improve operational sub-seasonal climate services?, Jon Meyer, Utah Climate Center,
4:50 - 5:10 pm  North Pacific High anomalies and the extreme pan-Western drought, Matthew LaPlante, Utah State University and Shih-Yu Simon Wang, Utah State University

5:10 - 5:30 pm  Human Influence Increased the Risk of the 2021 Extreme Western U.S. Drought, Grace Affram, Utah State University (She has agreed to do a oral presentation), Wei Zhang, Lawrence Hipps, and Cody Ratterman, Utah State University

End of Workshop