20th Annual
Climate Prediction Applications
Science Workshop
Asheville, NC
May 9-11, 2023

NOAA

Understanding Socio-economic Value of Climate Data, Prediction, Information and Services

NOTES:

20th Annual
Climate Prediction Applications Science Workshop

8:00am	**ROOM OPEN**
8:30am	**OPENING REMARKS**

Marina Timofeyeva
NWS Climate Services Branch Chief

Jeff Privette
NCEI Acting Chief of Climatic Science and Services Division

Douglas Rao
North Carolina Institute for Climate Studies

KEYNOTE SPEAKERS

8:45am — **Building a Climate Ready Nation: What Does it Mean for Our Service Evolution and Partners Including Service Producers and Users**
Ko Barrett, NOAA's Senior Advisor for Climate

9:05am — **NESDIS NCEI's Role in Building a Climate Ready Nation, Past Successes In Climate Services, and Future Directions**
Deke Arndt, NCEI Director

9:25am — **NWS CPC's Role In Building a Climate Ready Nation, Past Successes In Climate Services, and Future Directions**
David DeWitt, NWS CPC Director

9:45am — **SESSION 1: PANEL ON HISTORY AND LEGACY OF NOAA CLIMATE SERVICES PARTNERSHIP**
Moderator: Marina Timofeyeva, NWS CSB

Celebrating 50 Years of AASC and Partnership with NOAA
Hope Mizzell, South Carolina State Climatologist

Celebrating 40 Years of the Regional Climate Center Program and Partnership with NOAA
Alison Tarter, Southern Regional Climate Center/Texas A&M for the RCC 40th Anniversary Committee

Celebrating 20th CPASW: Original Vision for NWS Climate Services and CPASW
Bob Livezey, NWS Climate Services Division Chief 2000-2008 (Retired)

Celebrating 20th CPASW: NWS Climate Services Evolution and Partnership Development
Fiona Horsfall, NOAA OAR/RTA, Climate Services Branch Chief 2010-2021

10:45am	**BREAK**
11:15am	**SESSION 2: HEAT & HEALTH SERVICES** *Moderator: Steve Baxter, NWS CSB*

Using a Web-Based Tool to Forecast Local Variations in Wet Bulb Globe Temperature
Chip Konrad, SERCC / UNC Chapel Hill

NOAA/NWS Western Region HeatRisk v2.0: Updates and Impact-Based Verification
Michael Staudenmaier, NWS WRH

Extreme Heat: the CPC Forecasting of it and its Sensitivity to Definition
Evan Oswald, NWS CPC

The National Integrated Heat Health Information System and Heat.gov: A Federal Approach to Addressing Extreme Heat and Health
Morgan Zabow, NOAA CPO

12:15pm	**LUNCH (ON YOUR OWN)**
1:45pm	**SESSION 3: CLIMATE SERVICES DATA & TOOLS** *Moderator: Tami Houston, NCEI*

The Global Historical Climatology Network hourly (GHCNh) Dataset
Matt Menne, NCEI

An Overview of State Climate Office of North Carolina Initiatives for Data-Driven Extreme Event Monitoring and Response
Sheila Saia, State Climate Office of North Carolina

AgroClimate Indicators for Decision Making in Southeast USA
Clyde Fraisse, University of Florida

Conversion of Week 3-4 Temperature and Precipitation Outlooks from 2-category to 3-category Systems
Cory Baggett, NOAA CPC

MRCC Resources to Assess Climate Patterns and Risk
Melissa Widhalm, MRCC / Purdue University

Climate Decision Support as a Service - Not Just Up and Coming, Up and Running
Bruce Ford, Clear Science, Inc

NOTES:

3:15pm	**SPECIAL GUEST SPEAKER**

14th Weather Squadron Mission Brief
Lt Col Bill Danyluk, Commander, 14th Weather Squadron

3:30pm	**BREAK**

4:30pm	**TRAVEL TO NEW BELGIUM BREWERY** *Directions / Instructions for Travel*

91 Craven Street, Asheville

Transportation will be provided between The Collider and New Belgium before and after the event. Additional details will be available the day of the event.

If you wish to use your own transportation, the New Belgium Brewhouse is separate and to the left (and across the walking bridge) of the New Belgium Liquid Center. Park in the left side parking lot titled "Brewery and Liquid Center Parking" versus the right side parking lot titled "Liquid Center Parking - Tours and Tastings".

5:00-7:00pm	**FIELD TRIP / BANQUET**

New Belgium Brewery
Sustainability at New Belgium, taking action on climate change
Banquet Speaker: Sarah Fraser, New Belgium Brewery Sustainability Specialist

Sarah Fraser is the sustainability specialist at New Belgium's east coast brewery located in Asheville, NC. Sarah supports the company's social and environmental programs with a focus on supply chain and material sustainability. She engages brewery coworkers and supply chain partners in making progress toward the company's ambitious GHG, energy, water, emissions and waste reduction goals.

END OF DAY 1

Tuesday Morning Keynote Speaker:
Ko Barrett, NOAA's Senior Advisor for Climate

Ko Barrett is NOAA's Senior Advisor for Climate. In this role, Barrett is responsible for providing strategic advice and direction within NOAA to enable the agency to align, integrate, and extend its capabilities to best provide the climate services needed to address the climate challenge. She represents NOAA's equities in whole-of-government efforts to transform the economy and achieve U.S. climate goals to reduce emissions and stabilize global temperature by mid-century.

Tuesday Morning Keynote Speaker:
Deke Arndt, Director, NOAA's National Centers for Environmental Information (NCEI)

Deke Arndt became NCEI's Director on January 30, 2023. He served as Chief of NCEI's Climatic Science and Services Division (CSSD) for three years after previously leading the CSSD Monitoring Section. Deke's career began in 1996 at the Oklahoma Climatological Survey. He worked closely with public safety, agriculture, climate monitoring, and the energy generation and transmission sectors. In recent years, he served on the Council of the American Meteorological Society, was a co-lead editor of the AMS's annual State of the Climate report, and co-chaired the US Global Change Research Program's Interagency Indicators Working Group.

Tuesday Morning Keynote Speaker:
David DeWitt, Director, NWS Climate Prediction Center (CPC)

David DeWitt is the Director of the NWS Climate Prediction Center. DeWitt joined NOAA's National Weather Service (NWS) in 2012 as the lead modeler within the Science Plans Branch of the Office of Science and Technology. During his tenure at NWS, he served a detail as the acting deputy director for NCEP's Environmental Modeling Center, and as a project manager for the Sandy Supplemental projects, which accelerated development of NOAA's foundational numerical guidance for weather prediction. David has provided leadership on several NWS and NOAA cross-line office activities targeted toward improving NOAA's products and services. Prior to coming to NOAA, DeWitt worked as a research scientist at the International Research Institute for Climate and Society (IRI) at Columbia University from 1999-2012. From 1994-1999, DeWitt worked at the Center for Ocean-Land-Atmosphere Studies developing coupled atmosphere-ocean models for seasonal forecasts and conducting research to better understand short-term climate variability.

Wednesday, May 10th   *** All Times Eastern Time Zone ***

8:00am	ROOM OPEN
8:30am	INVITED TALK

CLIMATE CHANGE AND ASHEVILLE'S URBAN FOREST: BUILDING RESILIENCE IN VULNERABLE COMMUNITIES
Dawn Chávez, Executive Director of Asheville GreenWorks

9:00am — SESSION 4: SUBSEASONAL TO SEASONAL IMPACT-BASED DECISION SUPPORT SERVICES
Moderator: Andrea Bair, NWS Western Region

The Start of the NWS "Key Messages" Concept at the Climate Prediction Center: Objectives, Procedures, Coordination and Examples to Date
Jon Gottschalck, NWS CPC

S2S IDSS - Developing Climate Partner Relationships with NWS
Steve Baxter, NWS CSB for Chelsea Peters, NWS Sacramento

Tailoring NOAA Seasonal Outlooks for Local Audiences
Tim Armstrong, NWS Wilmington NC

Providing S2S Support to Transportation Officials Ahead of the 17-20 November 2022 Record Snow Event
Brandon Hoving, NWS Grand Rapids

10:00am	POSTER LIGHTNING TALKS (HUANG, RAO, AND KUMAR)
10:15am	BREAK & POSTER SESSION 1 (SEE LIST ON PAGE 13)

10:45am — SESSION 5: PANEL - DISCUSSION ON CLIMATE INFORMATION FOR THE RETAIL INDUSTRY
Moderator: Jenny Dissen, NCICS

NCEI Listens and Collaborates: Case Study with the Retail Sector
Jenny Dissen, NCICS

From Listening Sessions to Roundtables: Building User Engagement with the Retail Industry
Erin Hiatt, Retail Industry Leaders Association (RILA)

Ron Jarvis, Chief Sustainability Office, Home Depot

11:15am — PANEL DISCUSSION
Moderator: Jenny Dissen, NCICS

11:45pm	LUNCH (ON YOUR OWN)

1:15pm	**SESSION 6A: LINKING SOCIAL, BEHAVORIAL, AND ECONOMIC SCIENCES TO CLIMATE SERVICES** *Moderator: Marina Timofeyeva, NWS CSB*

Improving the Understandability and Usability of NOAA CPC Drought Outlooks
Melissa Kenney, University of Minnesota

Salmon, Census, and the "Nth" Warmest Summer on Record: Finding Ways to Converge Socioeconomic and Climate Data
Jared Rennie, NOAA NCEI

Informing the Design of Climate Applications and Websites through User Research and Usability Studies
Dave Michelson, NEMAC

NASA Earth Science Climate-Related Applications Programs
Allison Leidner, NASA

2:15pm	**POSTER LIGHTNING TALKS (JOYNER, PARSONS, BOYNE)**
2:30pm	**BREAK & POSTER SESSION 2 (SEE LIST ON PAGE 13)**
3:00-4:00pm	**SESSION 6B: LINKING SOCIAL, BEHAVORIAL, AND ECONOMIC SCIENCES TO CLIMATE SERVICES** *Moderator: Monica Rao, NWS*

What Might a Million Dollar Disaster Product Look Like for Alaska
Jessica Cherry, NOAA NCEI

The Socioeconomic Value of Weather Information: The Case Study of the Households in Taiwan
Hen-I Lin, Chung-Hua Institution for Economic Research

Economic Effects of Coastal Hazards on Employment
Kate Quigley, NOAA Office for Coastal Management

Applying Climatology for Strategic Planning: The 14th Weather Squadron Capabilities in Eastern Europe
Stephanie Smith, U.S. Air Force 14th Weather Squadron

END OF DAY TWO

NOTES:

Wednesday Invited Speaker:
Dawn Chávez, Executive Director of Asheville GreenWorks

Dawn has more than 25 years of leadership experience in nonprofit management in the environmental field. A native of the Bronx in New York City, Dawn has lived and worked across the country in many different communities, from wilderness outposts to small towns to large urban centers. Throughout her career, Dawn has been passionate about equity issues, environmental protection and the intersection of the two. Before moving to Asheville in January 2015, Dawn worked in Boston for twelve years as director of the Boston Youth Environmental Network and education director of the Urban Ecology Institute. Dawn serves on the board of the NC Center for Nonprofits and the North American Association for Environmental Education. In her free time, Dawn enjoys hiking and camping in the mountains around Asheville with her husband, Andrew, two children, Noah and Phoebe and the family dogs, Finn and Paco.

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8:00am	**ROOM OPEN**
8:30am	**INVITED TALK**
	THE FUTURE OF SUSTAINABLE AVIATION *Michelle Ragland, EH&S Manager, Pratt & Whitney*
9:00am	**SESSION 7: DATA TO DECISIONS** *Moderator: Jeff Boyne, NWS La Crosse*
	Recent Strides in Enhancing NOAA's Climate Information Services and Risk Mitigation Capabilities *David Benson, NOAA CPO*
	Climate Impact Tracability with NOAA Pathfinders *Vanessa Escobar, NESDIS OSAAP*
	Disaster Normals *Esther Boyle, Arizona State University*
	Calculating and Communicating Daily Climate Change Attribution *Andrew Pershing, Climate Central*
	A Multidecade Reanalysis of Coastal Water Levels and Waves *Taylor Asher, UNC Chapel Hill*
	Barriers to Recognizing, Communicating, and Mitigating Compound Flood Risk: A Case Study in Rural Eastern North Carolina *Scott Curtis, The Citadel*
10:30am	**BREAK**
11:00am	**SESSION 8: ADVANCING CLIMATE RESILIENCE** *Moderator: Justyn Jackson, U.S. Air Force 14th Weather Squadron*
	Building a Trained Workforce of Climate Service Providers for Societal Decision-making *Jim Fox, Fernleaf*
	An Un-BIL-ievable Opportunity to Advance Resilience *Chris Ellis, NOAA OCM* *Valerie Were, CIRA* *Gina Eosco, NOAA OAR*
12:00pm	**GROUP DISCUSSION** *Moderator: Chris Ellis*
12:30pm	**LUNCH (ON YOUR OWN)**

2:00pm	**SESSION 9: APPLICATIONS OF MODERN TECHNOLOGIES** *Moderator: Valerie Were, CIRA*
	A Data Fusion Approach for Daily Humidity at Public Health Relevant Scales Using AI methods *Revathi Muralidharan, NCICS*
	Hyperspectral & Polarimetric Ocean Observations from space! How the NASA PACE Mission will Advance Environmental & Societal Applications in Disaster Management *Natasha Sadoff, NASA*
	Risk Communication of Urban Flood through Augmented Reality *ZhiQiang Chen, University of Missouri Kansas City*
	Use of Machine Learned Mutual Information Between Drought Factors Influencing the USDM *Michael Shaw, NOAA, iSciences LLC, Riverside*
3:00pm	**BREAK**
3:30pm	**SESSION 10: ENHANCING CLIMATE DATA AND SERVICES DISSEMINATION PRACTICES** *Moderator: Sheila Saia, State Climate Office of North Carolina / NCSU*
	Reaching Cloud Users via NOAA Open Data Dissemination *Patrick Keown, NOAA OCIO*
	Microsoft Weather - Empowering the World for Better Decisions *Matt Corey, Microsoft Weather*
	From Data to Decision - Using Open Data in the Cloud *Chris Stoner, Amazon Web Services*
	Using Climate Engine for Cloud-Based Drought Monitoring *Steve Ansari, NOAA NCEI*
	Cloud-native Geospatial with Pangeo and the Planetary Computer *Tom Augspurger, Microsoft*
4:45-5:00pm	**WORKSHOP WRAP-UP** *Marina Timofeyeva, NWS CSB*
	END OF MEETING

NOTES:

Michelle Ragland is the site Environment, Health, and Safety Manager for Pratt and Whitney's new state-of-the-art aerospace manufacturing facility in Asheville, North Carolina. Her responsibilities span from supporting the design of the LEED-accredited facility to overall compliance with internal and external regulatory bodies. Michelle spent the first half of her career as an Environmental Officer in the maritime industry and transitioned to the aerospace industry in 2015. After supporting a greenfield expansion with sister company, Collins Aerospace, she expanded her interest in startups to pursue Pratt and Whitney's new 1.2 million square foot facility. Michelle takes this opportunity with great responsibility because she believes today's investments in design and forward-thinking technologies will have environmental and operational impacts for many years to come.

NOTES:

POSTER LIST

Poster Session 1 (Wednesday 10:15am - 10:45am)

Improvements of Land Surface Air Temperature Reconstruction in NOAAGlobalTemp: An Artificial Neural Network Approach
Boyin Huang, NOAA NCEI

Long-Range Forecasting of Atmospheric Variables using Transformers Trained on MERRA2
Ankur Kumar, University of Alabama in Huntsville

ClimateBench v1.0: A Benchmark for Data-Driven Climate Projections
Yuhan "Douglas" Rao, Cooperative Institute for Satellite and Earth System Studies

CONUS404: The NCAR-USGS 4-km Long-term Regional Hydroclimate Reanalysis over the CONUS
Roy Rasmussen, NCAR

Comparison of CLM 4.5 and BATS Land-Surface Scheme in Regional Climate Model for Climate Prediction in Indonesia: A Sensitivity Study
Jose Rizal, Indonesia for Agency Meteorology Climatology and Geophysics (BMKG)

Analyzing Future Changes of Frost Damage Risk for Apples in Nagano prefecture, Japan - Assessment of Delay in Breaking Bud Dormancy Due to Climate Change
Fumi Sezaki, Japan Meteorological Agency

Poster Session 2 (Wednesday 2:30pm - 3:00pm)

Impacts of Increased Precipitation on the Upper Mississippi River
Jeffrey Boyne, NWS La Crosse

Making NASA Earth Data Accessible and Actionable
Elizabeth Joyner, NASA

Economic Assessment of Weather Information Services: A Case Study of the Outlying Island Tourism in Penghu, Taiwan
Hen-I Lin, Chung-Hua Institution for Economic Research

Disproportionate Heat Exposure Makes Fan Use Unsafe for Many Vulnerable Populations in the US
Luke Parsons, Duke University

An Integrated Approach to Develop a National Early Warning System for Forest Fire
Alberth Nahas, Agency for Meteorology Climatology and Geophysics (BMKG) Indonesia

Hyperspectral & Polarimetric Ocean Observations from space! How the NASA PACE Mission will Advance Environmental & Societal Applications in Disaster Management
Natasha Sadoff, NASA

Examining the North American Monsoon: A Look at the Onset of, and Climatology of the Monsoon and its Impacts on New Mexico
Tim Brice, NWS El Paso

Assessing Tropical Pacific-induced Predictability of Southern California Precipitation Using a Novel Multi-input Multi-output Autoencoder
Salil Mahajan, Oak Ridge National Laboratory

Observed Changes in Extreme Precipitation Associated with United States Tropical Cyclones
John Uehling, North Carolina State University, NCICS

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