

# Workshop on Fire Weather and Forecasting

13 to 15 February 2024

**Sponsors: Cooperative Institute for Severe and High Impact Weather Research and Operations (CIWRO), University of Oklahoma (OU) School of Meteorology (SoM), the Oklahoma Mesonet, the Storm Prediction Center (SPC), the National Severe Storms Laboratory (NSSL) and Weather Forecast Office (WFO) Norman**

## Agenda

**Tuesday 13 February 2024**

### **Setting the Stage for Workshop with Overview Talks**

The workshop is designed to bring together diverse multi-disciplinary communities working in research on operational forecasting and impacts of fire weather, communicating risks of fire weather, economic impacts of fire, and strategies for land management and prevention of fire. The workshop is organized around four themes: 1) fire forecasting; 2) subseasonal to seasonal variation of and climatology of fires; 3) tools, operational needs, emergency management and communication; and 4) impacts/land management/ecology. Overview talks on the first day of the workshop are designed to emphasize what is state of art in each theme, what are existing problems and uncertainties in each theme, what are impediments to solving those problems or reducing uncertainties, and what resources are needed to overcome those uncertainties. Some topics are covered by multiple speakers in order to hear a diversity of opinions. A poster session combined with a reception on the first evening will ensure that all workshop participants are able to present their views on the relevant topic areas.

**8:00 - 8:30 AM: Arrival and Registration at the National Weather Center**

**Session 1: Room 1313 (Notetaker: Nick Amundsen)**

**Zoom Link:** <https://oklahoma.zoom.us/j/2785936663?pwd=UFNlSnZ0RHRYVmVlbHFzQlExbmtaUT09>

8:30 – 8:40: Introduction to CIWRO and Goals of Workshop, *Greg McFarquhar, CIWRO*

8:40 – 8:55: Challenges and opportunities for short-range fire weather forecasting, *Thomas Jones, CIWRO/NSSL*

8:55 – 9:10: Weather forecasting needs and challenges for prescribed fire, *Brian Potter, USDA Forest Service*

9:10 - 9:30: SPC Activities in Fire Weather, *David Jahn, CIWRO/SPC*

9:30 - 9:45: NOAA's New Fire Weather Testbed, *Zach Tolby, NOAA*

9:45 – 10:00: Enhancing the Unified Forecast System Capabilities through Integration of a Coupled Fire-Atmosphere Model, *Masih Eghdami, U.S. NSF National Center for Atmospheric Research*

**10:00 - 10:30: COFFEE BREAK, National Weather Center Atrium**

**Session 2: Room 1313 (Notetaker: Nick Amundsen)**

**Zoom Link:** <https://oklahoma.zoom.us/j/2785936663?pwd=UFNlSnZORHRyVmVlbHFzQlExbmtaUT09>

10:30 - 10:45: Science to Service: Collaborative Research to Operations in Southern Plains Fire Meteorology, *Todd Lindley, WFO Norman*

10:45 – 11:00: Partnered Power: Connecting Science and Operations in Real Time, *Drew Daily, Oklahoma Department of Agriculture, Food and Forestry Services*

11:00 – 11:15: New NOAA/NESDIS Satellite Products for Wildland Fire Applications, *Michael Pavolonis, NOAA*

11:15 – 11:30: Overview of the NSF I/UCRC Wildfire Interdisciplinary Research Center: Research to Operations, *Craig Clements, SJSU*

11:30 – 11:45: Leveraging radar observations to advance our understanding of wildfire plume dynamics, *Neil Lareau, University of Nevada Reno*

11:45 – 12:00: NOAA's New Fire-Weather Observing Facilities, *Dave Turner, NOAA*

**12:00 – 13:00: CATERED LUNCH, National Weather Center Atrium**

**Session 3: Room 1313 (Notetaker: Yayun Qiao)**

**Zoom Link:** <https://oklahoma.zoom.us/j/2785936663?pwd=UFNlSnZORHRyVmVlbHFzQlExbmtaUT09>

13:00 - 13:15: Moving Towards a More Integrated Fire Environment Decision Support System, *Nicholas Nauslar, Bureau of Land Management*

13:15 – 13:30: Fire Management and Risk Perception Through an Organizational Lens, *Monica Mattox, Oklahoma Climatological Survey*

13:30 – 13:45: Importance of Soil Moisture in Understanding and Predicting Fire Danger: A review of Some Recent Research, *J.D. Carlson, Oklahoma State University*

13:45 – 14:00: Multimodal Data, Generative AI, and Ensemble Machine Learning for Fuel Types and Loads Prediction, *Riyaz Shaik, University of California at Los Angeles*

14:00 – 14:15: Supporting Access to Meteorological and Fuel State Conditions for Wildland Fire Managers in the Great Lakes and Alaska Regions, *John Horel, University of Utah*

14:15 – 14:30: Advances in Refining Future Fire Risk, *David Saah, University of San Francisco*

**Break 14:30 to 14:45**

**Session 4: Room 1313 (Notetaker: Yayun Qiao)**

**Zoom Link:** <https://oklahoma.zoom.us/j/2785936663?pwd=UFNlSnZORHRYVmVlbHFzQlExbmtaUT09>

14:45 -15:00 Presenting advancements of sub-seasonal-to-seasonal (S2S) fire weather forecasts, *Pratik Shukla, University of Maryland Baltimore County*

15:00 – 15:15 Examining Oklahoma Emergency Manager’s Use of Fire Weather Forecast Information, *David Hogg, CIWRO/NSSL*

15:15 – 15:30: Introducing OK-FIRE: An Operational Decision-Support System for Wildland Fire Management in Oklahoma, *J.D. Carlson, Oklahoma State University*

15:30 – 15:45: The Impact of Land Management Activities on Post Wildfire Recovery, *Shima Shams, U.S. NSF National Center for Atmospheric Research*

15:45 – 16:00: Microscale Fire Weather and Event Prediction, *Janice Coen, U.S. NSF National Center for Atmospheric Research*

**Session 5: Catered Poster Session NWC Atrium. 16:00 to 18:00**

Exploring the Role of Weather Forecasts in Predicting Wildfire Occurrence for CONUS Using the Unet3+ Deep Learning Model, *Bethany Earnest, CIWRO/SPC*

Spatiotemporal Estimates of Surface PM2.5 Concentrations in the Western U.S. using NASA Retrievals, Deep Learning, and Data Assimilation Techniques, *Marcela Loria Salazar, School of Meteorology, University of Oklahoma*

Linking western U.S. fire to snow and climate conditions by combining machine learning and physics-based models, *Ronnie Abolafia-Rosenzweig, U.S. NSF National Center for Atmospheric Research*

Smoke Plumes Observed with a Polarimetric Weather Radar, *Dusan Zrnic, NSSL*

The Impact of the 2017-2018 Precipitation Whiplash Event Across the Southern Great Plains, *Bryony Puxley, SoM/OU*

NOAA Air Resources Laboratory's Capabilities to Support Fire Weather Research as Demonstrated Through Recent Campaigns, *Temple Lee, NOAA*

Where There's Smoke...There's Fire, *Madelynn Zarembka, NOAA*

Fire weather forecasting in NOAA's global aerosol systems, *Li (Kate) Zhang, CIRES/NOAA GSL*

Toward Understanding Smoke Aerosol Optical Properties due to Local-Generated and Transported Smoke from 2011-2023 Measurements from Western to the Great Plains United States, *Hayden Webb, SoM/OU*

Boundary layer observations in extreme environments, *Tyler Bell, CIWRO/NSSL*

Predicting Probabilistic Lightning Flash Density from the HREF Calibrated Thunder Guidance, *David Harrison, CIWRO/SPC*

Investigating the ERC for evaluation of fuel receptiveness, *Nathan Dahl, CIWRO/SPC*

SPC fire weather outlooks and associated observed fire behavior and deployed mitigation resources, *David Jahn, CIWRO/SPC*

Near-Term Fire Weather Forecasting in the Pacific Northwest using 500-hPa Map Types, *John Saltenberger, BLM*

The Challenges of Forecasting Fire Weather on a National Scale, *Evan Bentley, SPC*

Retrieving high spatiotemporal fuel moisture content over the contiguous U.S. and Alaska using machine learning and VIIRS and ABI instruments, *Pedro Jiminez, U.S. NSF National Center for Atmospheric Research*

An hourly wildfire potential index for predicting wildfire activity based on convection-allowing model forecasts, *Eric James, NOAA*

How emergency managers and broadcast meteorologists receive, use, and communicate wildfire forecasts and alerts, *David Hogg, CIWRO*

### **Wednesday 14 February 2024**

#### **Session 6: Breakout Discussions 8:30 – 12:30 (with coffee break at 10:30-11:00)**

There will be four breakout groups in the AM:

- 1) Collaborative Fire Prediction and Warnings, **Room 1313**,

Facilitator: Todd Lindley and Drew Daily, Note Taker: Michelle Spencer

Zoom: <https://oklahoma.zoom.us/j/2785936663?pwd=UFNlSnZORHRyVmVlbHFzQlExbmtaUT09>

- 2) S2S Variation and Climatology of Fires, **Room 3902**

Facilitator: Jason Furtado, Note Takers: Emily West

Zoom: <https://oklahoma.zoom.us/j/2161679399?pwd=THFGOHhWMFA4NDgweTBaeW5tTHVTdz09>

- 3) Tools, operational needs, emergency management & communication, **Room 3910**

Facilitator: David Hogg, Note Takers: Hazel Xia

Zoom Link: <https://oklahoma.zoom.us/j/91673193312?pwd=bDRVcndDQXcWU43RDI2K2VxSGphdz09>

- 4) Impacts/land management/ecology, **Room 1120**

Facilitator: Monica Mattox Note Taker: Amanda Richter

Zoom: <https://oklahoma.zoom.us/j/4916127450?pwd=aGduSkRPbmRXNmN0NnA4eVlaczBMQT09>

Participants should go to the group of their expertise/interest. Participants may switch between groups at the coffee break if they like.

Questions to be considered by all the breakout groups are as follows:

- a) What is hindering progress on making improvements in the subject area?
- b) What are the key sources inhibiting making progress, and how can they be reduced or minimized?
- c) What additional tools, models, observations and resources are needed to address these challenges?

### **CATERED LUNCH National Weather Center Atrium (12:30 to 13:30)**

#### **Session 7: Breakout Discussions 13:30 – 17:00 (with coffee break at 15:00-15:30)**

There will still be four breakout groups in the PM, but participants will be assigned to different groups in order to have representatives from all four of the morning groups in each breakout group (i.e., the topics will be merged in order to get a true interdisciplinary representation). The questions to be addressed will be similar to those in the morning groups, except that participants should concentrate on how the multitude of tools will be used to address the questions (and those remote participants will be assigned to all four groups with a virtual meeting link available for each group).

1) Group 1

Facilitator: Chris Fiebrich,                      Note Taker: Saurabh Patil

Zoom: <https://oklahoma.zoom.us/j/2785936663?pwd=UFNlSnZORHRyVmVlbHFzQlExbmtaUT09>

2) Group 2

Facilitator: Thomas Jones                      Note Taker: Erika Pruitt

Zoom: <https://oklahoma.zoom.us/j/2161679399?pwd=THFGOHhWMFA4NDgweTBaeW5tTHVTdz09>

3) Group 3

Facilitator: David Jahn                      Note Taker: Mastroreh Ameri

Zoom: <https://oklahoma.zoom.us/j/91673193312?pwd=bDRVcndDQXcWdU43RDl2K2VxSGphdz09>

4) Group 4

Facilitator: Marcela Loria Salazar                      Note Taker: Tyler Bell

Zoom: <https://oklahoma.zoom.us/j/4916127450?pwd=aGduSkRpbmRXNmN0NnA4eVlaczBMQT09>

**Thursday 15 February 2024**

**Session 8 Reports from Breakout Groups 8:30 - 10:30, NWC Auditorium (Note Taker: All notetaker from the Wednesday breakouts)**

**Zoom Link:** <https://oklahoma.zoom.us/j/2785936663?pwd=UFNlSnZ0RHRYVmVlbHFzQlExbmtaUT09>

8:30 – 8:45 AM: NOAA's latest fire weather developments through Disaster and Infrastructure Act investments *Robyn Heffernan, NOAA*

8:45 - 10:45 AM: 15 minute reports from the 8 breakout groups

**10:45 – 11:00 COFFEE BREAK**

**Session 9 Wrap-Up, NWC Auditorium (Note Taker: Peter Brechner)**

**Zoom Link:** <https://oklahoma.zoom.us/j/2785936663?pwd=UFNlSnZ0RHRYVmVlbHFzQlExbmtaUT09>

11:00 -12:00 PM: What are the next steps? Preparation of BAMS article? Funding opportunities?