

# AI for Extreme Weather Events Forecasting

## AI for Weather & Climate Forecasting Webinar Series



Historically, weather forecasts have been manually calculated based on barometric pressure, current weather conditions, and cloud cover, using data collected over time to make forecast models, identify trends, and investigate weather phenomena for a specific location. The integration of artificial intelligence (AI) into weather forecasting allows models to digest large amounts of weather data, generating timely and accurate forecasts, which can then be used by emergency services, utility companies, agriculture industries, and the general public to make decisions. This includes improving the speed and reliability of extreme weather forecasts. However, there are challenges associated with integrating AI into extreme weather forecasting models and ensuring the AI outputs are accurate and trustworthy. Through technical presentations, Dr. Gabriele Messori (Uppsala University) and Dr. Amy McGovern (University of Oklahoma) will overview how AI is being used in forecasting extreme events. A discussion, moderated by Dr. Jonathan Overpeck (University of Michigan), will follow to highlight technical challenges associated with using AI for extreme weather events forecasting, advances in AI support decision-making, and opportunities to improve forecasting moving forward.

Join the livestream at [this link](#) and submit your questions and comments using [this link](#). Speaker materials and a recording of the webinar will be made publicly available on [this page](#).

*This is the third of a 4-part educational webinar series, which is an activity of the National Academies Roundtable on Artificial Intelligence & Climate Change. The Roundtable seeks to foster ongoing discussions, shared learning, and nimble coordination around emerging issues related to AI and climate change, including: how AI can combat climate change; the environmental impact of AI itself; and strategies for mitigating the impacts of AI energy consumption and climate effects. See the Roundtable's Statement of Task [here](#).*

**TUESDAY, NOVEMBER 18, 2025**

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**9:00 AM (ET)<sup>1</sup> Welcome**  
April Melvin, National Academies Roundtable on Artificial Intelligence & Climate Change

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<sup>1</sup> All time in Eastern

## **Advanced AI for Earth Systems Forecasting**

AI for Weather & Climate Forecasting Webinar Series

- 9:05 AM**      **Technical Presentation – AI for Extreme Weather Events Forecasting**  
Gabriele Messori, Uppsala University
- 9:20 AM**      **Technical Presentation – Building Trust in AI models for Extreme Weather**  
Amy McGovern, University of Oklahoma
- 9:35 PM**      **Discussion**  
Moderator: Jonathan Overpeck, University of Michigan
- 10:50 AM**      **Audience Q&A**
- 10:00 AM**      **ADJOURN**

## Speaker Biographies

### **Jonathan Overpeck, University of Michigan**

Dr. Jonathan Overpeck (“Peck”) is the Samuel A. Graham Dean of the School for Environment and Sustainability (SEAS) at the University of Michigan. He has served as dean of SEAS since 2017 and is the William B. Stapp Collegiate Professor of Environmental Education, as well as a Professor of Earth and Environmental Science, and a Professor of Climate and Space Science Engineering. An interdisciplinary climate scientist, Overpeck is an expert on climate change, climate-vegetation interactions, earth history, environmental science and sustainability. Overpeck advocates both scholarly and real-world impact, particularly the need for public higher education to emphasize both. He has also worked hard to strengthen the focus on inclusion, community impact, and justice in the study and practice of environmental work and sustainability.

Overpeck’s climate-biosphere work spans his entire career. He was a pioneer in the study of abrupt earth system change, particularly in the study of abrupt changes or “tipping points” that have occurred, or could occur, in warm interglacial and future climates. He was a member of the first National Academy of Sciences study of abrupt change, and also co-led the first comprehensive investigation of the annually-laminated sediments of Cariaco Basin north of Venezuela, an effort that provided key constraints on abrupt glacial and deglacial change in the North Atlantic, the calendar-year calibration of radiocarbon ages, and climate variability over a wide range of time scales. He has also participated in multiple national and regional-scale climate assessments and led/co-led two major long-term research and engagement projects aimed at bridging the natural sciences with the social sciences and providing resource managers and other stakeholders with the information needed for better science-based decision-making, including in the area of climate change adaptation. He has been part of multiple efforts aimed at improving understanding of climate science in society and in legal decision-making. In 2024, he was elected to the U.S. National Academy of Sciences.

### **Amy McGovern, University of Oklahoma**

Dr. Amy McGovern is a Lloyd G. and Joyce Austin Presidential Professor in the School of Meteorology and the School of Computer Science at the University of Oklahoma. Dr McGovern is also the director of the NSF AI Institute for Research on Trustworthy AI in Weather, Climate, and Coastal Oceanography (AI2ES). Her research focuses on developing and applying trustworthy AI and machine learning methods primarily for severe weather phenomena. Dr. McGovern received her PhD in Computer Science from the University of Massachusetts Amherst in 2002 and was a senior postdoctoral research associate at the University of Massachusetts until joining the University of Oklahoma in January 2005. She received her MS from the University of Massachusetts Amherst (1998) and her BS (honors) from Carnegie Mellon University (1996). Dr McGovern is a fellow of the American Meteorological Society.

### **Gabriele Messori, Uppsala University**

Gabriele Messori obtained his M. Sci. in Theoretical Physics from Imperial College London in 2010 and his Ph. D. in Atmospheric Physics, always from Imperial College, in January 2014. He has since worked as post-doctoral researcher and research scientist at the Department of Meteorology of Stockholm University, as research scientist at the UK Met Office, and has been visiting scientist at the Laboratoire des Sciences du Climat et de l'Environnement in Paris. He joined the Department of Earth Sciences in Uppsala University in 2018.