

The Future of Drought in the United States

Committee

Jonathan T. Overpeck

Chair

Jonathan T. Overpeck is the Samuel A. Graham Dean of the School for Environment and Sustainability (SEAS) at the University of Michigan. At Michigan, he is the William B. Stapp Collegiate Professor in SEAS, a Professor of Earth and Environmental Science, and a Professor of Climate and Space Science and Engineering. He was a post-doctoral fellow and Research Scientist at Columbia University and NASA Goddard Institute for Space Studies, before being appointed as the Founding Head of the NOAA Paleoclimatology Program. He served as the Founding Director of the World Data Center for Paleoclimatology, before moving to the University of Arizona where he was a Professor of Geosciences the Director of the Institute for the Study of Planet Earth and a Founding Co-Director of the Institute of the Environment. Overpeck is a Fellow of the American Geophysical Union and the American Academy for the Advancement of Science and is a member of the U.S. National Academy of Sciences. Other awards include the US Dept. of Commerce Gold Medal, a Guggenheim Fellowship, the Walter Orr Roberts award of the American Meteorological Society, and the Quivira Coalition's Radical Center Award. Overpeck earned his PhD and MSc from Brown University and BA (honors) from Hamilton College.

Overpeck is a founding member of the Colorado River Research Group which has produced white papers on the Colorado River, including on topics related to drought. Overpeck writes and gives talks on a wide variety of drought-related issues, including water management, monsoon dynamics, and climate.

Amir AghaKouchak

Member

Amir AghaKouchak is a Professor of Civil and Environmental Engineering and Earth System Science at the University of California, Irvine. His research focuses on natural hazards and climate extremes and crosses the boundaries between hydrology, climatology, and remote sensing. One of his main research areas is studying and understanding the interactions between different types of climatic and non-climatic hazards including compound and cascading events. AghaKouchak has published over 260 journal articles in peer-reviewed journals. He has received several honors and awards including the American Geophysical Union's (AGU) James B. Macelwane Medal, Fellow of AGU, and the American Society of Civil Engineers (ASCE) Norman Medal, and Huber Research Prize. AghaKouchak has a PhD in Civil and Environmental Engineering from the University of Stuttgart.

Clara Deser

Member

Clara Deser is a senior scientist and former head of the Climate Analysis Section at the National Science Foundation-National Center for Atmospheric Research (NSF-NCAR). Prior to NCAR, Deser was a postdoc and then a Research Associate at U. Colorado - CIRES. Deser has participated in numerous national and international committees and panels, including the President's Council of Advisors on Science and Technology (PCAST), US and International CLIVAR, Intergovernmental Panel on Climate Change (IPCC) contributing author; and as co-lead of the: IPCC Polar Amplification Model Intercomparison Project, Community Earth System Model (CESM) 1 and CESM2 Large Ensembles, and the US CLIVAR Working Group on Large Ensembles. Deser is a member of the U.S. National Academy of Sciences, American Geophysical Union (AGU), and the American Meteorological Society (AMS), and has received the AMS Meisinger and Charney Medals, and the AGU Bjerknes and Revelle Medals. Deser received a BS from MIT in Earth and Planetary Sciences, and PhD from Univ. of Washington in Atmospheric Sciences.

Trent W. Ford

Member

Trent Ford is the State Climatologist for Illinois and is an Associate Research Scientist with the Illinois State Water Survey and Prairie Research Institute at the University of Illinois. He is an expert in hydroclimate variability, extremes, and climate change impacts. His work spans fundamental to translational understanding of the climate system and its interactions with water, especially related to drought dynamics and impacts. As State Climatologist, Trent leads climate and drought monitoring, research, and data collection for the state of Illinois. He has helped guide state-level climate resilience planning, including co-authoring the Illinois State Water Plan and All-Hazard Mitigation Plan. Trent currently serves on the Illinois Specialty Growers Association advisory board and the State of Illinois' Water Plan Task Force. He works with communities, state agencies, private sector, and special interest groups on issues related to weather, climate, and climate change in Illinois and the broader Midwest region. He regularly engages the public through dozens of online and in-person presentations each year, and works with K-12 educators on climate curriculum and science literacy. Ford earned a bachelors in geography from Illinois State University before completing his masters and PhD in geography at Texas A&M University.

Kristiana M. Hansen

Member

Kristiana Hansen is an Agricultural Economist and Extension Water Resource Economist in the Department of Agricultural & Applied Economics at the University of Wyoming. Dr. Hansen's research is in water resource economics and community resilience to weather and climate variability, especially within the agricultural sector. She conducts applied, interdisciplinary research on how agricultural, municipal, and recreational water users respond to changes in water availability in Wyoming and other water-scarce locations, with an emphasis on the impact of agricultural and water resource management on local rural economies. Current research includes analysis of the risks and impacts of different ways that Wyoming and other upper Colorado River Basin states could meet their obligations to downstream states under the Colorado River Compact. Her Extension program seeks to inform and improve regional decision-making in water management and allocation. Hansen holds a PhD in Agricultural and Resource Economics from the University of California, Davis.

Richard R. Heim, Jr.

Member

Richard Heim recently retired after a 42-year career with NOAA. He joined NOAA through the NWS meteorologist intern program. Mr. Heim served as a meteorologist with the National Centers for Environmental Information (NCEI, formerly NCDC) from 1985-2024, working in user engagement and managing the 1961-1990 U.S. and Global Climate Normals project, Snow Climatology project, and Climate Reference Network, but he is best known for his work in the field of drought monitoring and research. He was an author of the weekly interagency US Drought Monitor (2001-2024), monthly international North American Drought Monitor (2003-2024), and Global Drought Narrative (2022-2024), as well as author of the NCEI monthly online State of the Climate Drought reports (1999-2024) and Synoptic Discussion (2011-2019) and was the Product Area Leader responsible for NCEI's entire drought product portfolio (2019-2024). Heim authored over seven dozen articles published in scientific journals, 26 of which he was sole author or lead author. Awards include five Department of Commerce Bronze Medal Awards and the 2019 Department of Commerce Silver Medal Award for work in the field of drought monitoring. Heim holds a BS in Mathematics with five minors and a Masters in Geography / Meteorology / Climatology from Univ of Nebraska-Lincoln.

Heim retired in December 2024 from the NOAA National Centers for Environmental Information (NCEI). He was an author of the monthly State of the Climate Drought reports (1999-2024), the U.S. Drought Monitor (USDM) (2001-2024), the North American Drought Monitor (NADM) (2003-2024), and the Global Drought Narrative (2022-2024).

Jennifer J. Henderson

Member

Jen Henderson is an assistant professor of Geography in the Department of Geosciences at Texas Tech University where she directs the Risk and Education in Disasters (RED) Lab. Henderson is a social scientist whose research focuses on human-environment relationships in the context of weather and climate extremes. She studies risk communication and decision-making contexts for a variety of hazards, including drought, fire, flooding, tornadoes, and hurricanes. Over the past ten years, Henderson has focused, in particular, on compound and cascading disasters and their impacts on varying populations, as well as the challenges experts face in communicating them. She frequently collaborates with colleagues from atmospheric sciences, engineering, public safety, and operational meteorology on projects that integrate a diverse range of methods and theoretical frameworks to address real-world problems. In addition to her research, Henderson is the incoming Planning Commissioner for the American Meteorological Society and is a member of the NOAA Science Advisory Board's Environmental Information Services Working Group. She holds a Ph.D. in Science and Technology Studies from Virginia Tech.

Zachary H. Hoylman

Member

Zachary H. Hoylman is a Research Assistant Professor at the University of Montana and the Assistant State Climatologist for Montana at the Montana Climate Office. His interdisciplinary work integrates climate, hydrology, and ecosystems, with expertise in drought informatics, remote sensing, and geospatial data analysis. His academic studies focused on hydrologic processes and climate interactions that drive ecosystem vulnerability to climate change across the western United States. More recently, Hoylman's research examines the limitations of traditional assumptions of climate stationarity in drought assessment, advocating for adaptive approaches that account for the realities of a rapidly changing climate. His current work leverages artificial intelligence and machine learning to improve total water assessments and drought prediction, supporting climate adaptation efforts across Montana and the broader United States. Hoylman has a Ph.D. from the University of Montana.

Yusuke Kuwayama

Member

Yusuke Kuwayama is an Associate Professor in the School of Public Policy at the University of Maryland, Baltimore County, and a Fellow at Resources for the Future (RFF) in Washington, DC. He studies the economics of water resource and ecosystem management, with a focus on federal and state regulation of ambient water pollution, water management to protect aquatic species habitats, and sustainable water use in agriculture. He is an at-large appointee to the Chesapeake Bay Program's Scientific and Technical Advisory Committee (STAC), serves on the Water Science and Technology Board at the National Academies, and serves on the steering committee of AquaWatch, a water quality initiative within the Group on Earth Observations (GEO). He previously served as Director of the Consortium for the Valuation of Applications Benefits Linked with Earth Science (VALUABLES), a cooperative agreement between RFF and the National Aeronautics and Space Administration (NASA). He received his Ph.D. in agricultural and applied economics and an M.S. in economics from the University of Illinois Urbana-Champaign and an A.B. in economics from Amherst College.

Venkataraman Lakshmi

Member

Venkataraman Lakshmi is the John L. Newcomb Professor of Engineering in the Department of Civil and Environmental Engineering at the University of Virginia. He has served as Cox Visiting Professor at Stanford University and Program Director for Hydrologic Sciences at the National Science Foundation. Lakshmi is a fellow of the American Society of Civil Engineers (ASCE), Geological Society of America (GSA), American Society of Agronomy (ASA), American Association for the Advancement of Science (AAAS). He is currently serving as editor for Vadose Zone Journal and the founding editor-in-chief of Remote Sensing in Earth System Science (Springer Journals). He has served on the National Academies Panel for the Decadal Survey of Earth Observations from Space and as chair of the planning committee for Groundwater Recharge and Flow: Approaches and Challenges for Monitoring and Modeling Using Remotely Sensed Data. He is currently serving as a member of the Water Science and Technology Board, National Academy of Sciences, and Vice-Chair of the Earth Science Advisory Committee for NASA. He is the President of the Hydrology Section of the American Geophysical Union. Lakshmi has a PhD in Civil and Environmental Engineering from Princeton.

Justin S. Mankin

Member

Justin S. Mankin is an associate professor of geography at Dartmouth. He holds courtesy appointments in Earth & Planetary Sciences and the EEES graduate program and is an Adjunct Associate Research Scientist at Lamont-Doherty Earth Observatory (LDEO). Mankin is Principal Investigator of Dartmouth's Climate Modeling & Impacts Group, studying the origins and impacts of climate variability and change, including on drought. Previously, he was co-lead of the NOAA Drought Task Force (2021-2024) and led the synthesis report on the 2020–2023 Western U.S. drought. He serves on the American Meteorological Society's Climate Variability & Change Committee, is a UCAR Member Representative, and a Graphics Lead Author for NCA6. He is an editor at Earth's Future and an associate editor at Journal of Climate. He was named a 2025 MIT & WHOI H. Burr Steinbach Scholar, received the American Geophysical Union's 2024 Global Environmental Change Early Career Award, and delivered a keynote for the National Academies workshop on Climate Change & Migration. His previous career was as an intelligence officer working in South Asia and the Middle East. He holds degrees from Columbia (BA, MPA), London School of Economics (MSc), and Stanford (PhD), and completed his training at LDEO and NASA GISS as an Earth Institute Postdoctoral Fellow.

Karen A. McKinnon

Member

Karen McKinnon is an Associate Professor with tenure at UCLA where she is jointly appointed in the Department of Atmospheric and Oceanic Sciences, Department of Statistics and Data Science, and Institute of the Environment and Sustainability. Her research sits at the nexus of climate change and statistics and is aimed at improving our understanding and prediction of climate extremes, variability, and change, particularly over land. McKinnon currently serves as a co-lead of the NOAA Drought Task Force. McKinnon is a 2024 NSF CAREER awardee, a 2023 Kavli Fellow, and a 2021 Packard Fellow in Science and Engineering. She received her PhD at Harvard University and was an Advanced Study Postdoctoral Fellow at the National Center for Atmospheric Research.