Andrew Hoell

Curriculum Vitae · September 2026

Senior Research Meteorologist and Team Lead
Physical Sciences Laboratory, Office of Oceanic and Atmospheric Research
National Oceanic and Atmospheric Administration
325 Broadway, Boulder, CO 80305

781-223-2010 · andrew.hoell@noaa.gov · Google Scholar

Research Interests

Predictability, prediction, and process understanding of weather and water extremes on timescales spanning weeks to decades; early warning of drought and its effects on food security, agriculture, water availability, and wildfire; the translation of physical climate science into products, services, and applications that support sector-specific risk assessment and decision making.

Selected Accomplishments

- Recipient of the Presidential Early Career Award for Scientists and Engineers, the highest honor conferred by the United States government on early-career scientists.
- Author of more than 100 peer-reviewed publications cited over 16,000 times, spanning drought, wildfire, food security, and the predictability of weather and water extremes.
- Editor of the Journal of Climate and of the American Meteorological Society's Explaining Extreme Events.
- Principal Investigator at NOAA for the U.S. Department of State's Famine Early Warning Systems Network, guiding a physical science team across federal agencies and several universities whose consensus outlooks support analysts covering more than 40 countries.
- Architect of NOAA's modernization of drought early warning, piloted in the southwestern United States with core partners in public health, agriculture, and water utilities; slated for national expansion.
- Permanent Member for North America on the World Meteorological Organization Expert Team on Drought and lead of the NOAA Drought Task Force from 2020 to 2023, setting national and international direction for drought science and early warning.
- Communicator of weather and water risk to audiences from congressional staff and senior agency leadership to the general public, including roughly 100 media interviews since 2020 for outlets such as the Associated Press, the New York Times, the Los Angeles Times, the Washington Post, and BBC News.

PROFESSIONAL APPOINTMENTS

Physical Sciences Laboratory, NOAA Office of Oceanic and Atmospheric Research, Boulder, CO, June 2015 – Present

Senior Research Meteorologist and Team Lead, ZP-1340-4, November 2024 – Present

- Lead the 10-member Monitoring, Predictability, Prediction, and Processes Team in the Hydrology Applications Division whose efforts provided environmental intelligence to guide proactive sector-specific risk assessments and response related to weather and water extremes.
- Fostered existing and developed new partnerships with local, state, national, and international partners to assess their risks so they may build resilience and respond to weather and water extremes.
- Led research and development activities that improved monitoring, prediction, and process understanding that underpin effective early warning of weather and water extremes.
- Serve as principal investigator at the Physical Sciences Laboratory for the U.S. Department of State's Famine Early Warning Systems Network and as principal subject-matter expert on drought within NOAA Research, managing initiatives on drought and its effects on agriculture, food security, fire, and water availability.

Research Meteorologist, ZP-1340-4, December 2017 – November 2024

- Built coalitions of scientists and decision-makers who collaboratively developed novel information and communication mechanisms that enable risk assessment and response to weather and water extremes.
- Served as a principal subject matter expert on the predictability, prediction, and process understanding of weather and water extremes, especially those that led to the compounding and cascading effects of drought, famine, and fire.
- Performed service activities, including committee assignments, editorships, authorship of assessments, and engagement with the media.

Research Meteorologist, ZP-1340-3, June 2015 – December 2017

- Served as a subject matter expert on predictability, prediction, and process understanding of weather and water extremes on time scales spanning weeks to years.
- Conceived, led, and coordinated several projects supported by governmental and non-governmental partners.
- Served as principal communicator of weather and water information for the Famine Early Warning Systems Network and its partners by broadcasting scenarios of the most likely weather and climate extremes relevant to food security, agriculture, and livelihoods.

Department of Geography, University of California Santa Barbara, Santa Barbara, CA, January 2012 – June 2015

Assistant Researcher, June 2014 – June 2015

Served as principal subject matter expert for a team of scientists representing government agencies and academia regarding the predictability and prediction of weather and water extremes.

Postdoctoral Researcher, January 2012 – June 2014

Conceived and conducted research on the predictability and prediction of weather and water extremes globally.

EDUCATION

University of Massachusetts Lowell

- Ph.D. in Marine Science and Technology, 2012
- M.S. in Marine Science and Technology, 2010
- M.S. in Atmospheric Science, 2007
- B.S. in Meteorology, 2005

SPECIAL ASSIGNMENTS

Special Advisor to the NOAA Deputy Assistant Secretary for International Affairs, 2024

Established a partnership with Department of State Regional Environment Officers to begin co-developing products, services, and experimental applications for the early warning of weather and water extremes relevant to their interests in 13 African countries.

HONORS AND AWARDS

Presidential Early Career Award for Scientists and Engineers, 2019

RESEARCH PROGRAM LEADERSHIP AND FUNDED PROJECTS

Drought Early Warning: A Modern, Sector-Specific Approach

Performance Period: 2024 – Present

Partners: NOAA Physical Sciences Laboratory, NOAA National Integrated Drought Information System, NOAA National Weather Service, California Department of Water Resources, California-Nevada Adaptation Program.

Contributions:

- Conceived a modern approach for drought early warning that is evidence-based, sector-specific, and user-oriented to be incorporated into the National Integrated Drought Information System.
- Built coalitions of partners to develop a pilot program.
- Led the pilot program over Southern California focusing on sectors that include agriculture, water utilities, and human health to determine the feasibility and best practices of the approach we have adopted.
- Led the preparation and communication of monthly outlooks.
- Engaged approximately 50 partners in the first year of the pilot and partnered directly with state climatologists' offices; expansion across the United States is planned for 2026 and 2027.

Famine Early Warning Systems Network (FEWS NET)

Performance Period: 2015 – Present

Partners: NOAA Physical Sciences Laboratory, NOAA National Weather Service, U.S. Geological Survey, NASA, U.S. Department of Agriculture, Several University Partners (e.g., University of Maryland and University of California Santa Barbara), Several International Partners (e.g., Food and Agricultural Organization).

Contributions:

- Served on the senior leadership of the FEWS NET science team, consisting of principal investigators representing federal agencies and universities.
- Developed the Interagency Agreement between NOAA and the Department of State that facilitated the research, development, and application activities.
- Conceived research on products, services, and experimental applications to provide early warning of evolving weather and water extremes related to acute food insecurity in more than 40 countries in Africa, Asia, and Central America.
- Worked closely with FEWS NET scientists who focus on markets, trade, nutrition and livelihoods to identify needs and gaps in monitoring, predictability, and prediction of weather and water extremes relevant to agriculture.
- Conceived and coordinated work plans for federal and cooperative institute staff in the NOAA Physical Sciences Laboratory, so they can conduct meaningful research on monitoring, predictability, and prediction of conditions relevant to agriculture and acute food insecurity.
- Led the Seasonal Forecast Review, an early warning framework in which over 60 scientists reach consensus on the most likely conditions of evolving weather and water extremes, which is then communicated to food security analysts and other government officials who project acute food insecurity outlooks used in the prepositioning of food aid.

- Developed and delivered the FEWS NET Weather and Agriculture Outlook

Fire Weather Research by Developing Wildfire Monitoring and Prediction Capabilities

Performance Period: October 1, 2023 – September 30, 2025

Funder: Disaster Relief Supplemental Appropriations Act, 2022

Partners: NOAA Fire Weather Testbed, Geophysical Fluid Dynamics Laboratory, Global Systems Laboratory, Pacific Marine Environmental Laboratory

Contributions:

- Conceived this multi-institutional project that developed wildfire monitoring and prediction capabilities that provided decision makers and resource managers with novel tools to inform early warning and preparedness.
- Led the reporting of project accomplishments to the Weather Program Office on behalf of participating institutions so they can develop reports to Congress.
- Conceived and guided science activities at the NOAA Physical Sciences Laboratory and related cooperative institutes to ensure that the developed products, services, and experimental applications were meaningful, and milestones were met.

Western Pilot Sub-Seasonal to Seasonal Weather Forecast Improvement Collaborations

Performance Period: October 2024 – September 2025

Partners: California Department of Water Resources, NOAA National Weather Service

Contributions:

- Conceived this multi-institutional project that diagnosed the predictability and prediction of weather and water extremes in the western United States by: 1) developing of seasonal reforecasts based on the Unified Forecast System, 2) diagnosing and quantifying the sources of lead-dependent extreme Western U.S. precipitation predictability, and 3) diagnosing and quantifying the physical sources of lead-dependent Upper Colorado River Basin runoff predictability in spring and summer.
- Led the coordination of sub-project teams by integrating the research of over a dozen scientists, ensuring situational awareness of several work streams and sparking collaboration.
- Led the coordination of reporting project milestones and deliverables.

Wildfire Potential Research to Inform Extended Range Resource Planning

Performance Period: October 1, 2023 – September 30, 2027

Funder: Bipartisan Infrastructure Law, 2022

Partners: Fire Weather Testbed, Geophysical Fluid Dynamics Laboratory

Contributions:

- Conceived this multi-institutional project that diagnosed the physical sources of prediction skill concerning the sequential and simultaneous compound weather extremes that led to land surface states that increase wildfire potential, and evaluated whether models of the earth system can simulate these causal chains of events.
- Led the reporting of project accomplishments to the Weather Program Office on behalf of participating institutions so they can develop reports to Congress.
- Conceived and guided science activities at the NOAA Physical Sciences Laboratory and related cooperative institutes to ensure that products, services, and experimental applications were meaningful, and milestones were met.

Principal investigator of several external grants to conduct research on the predictability and prediction of weather and water extremes, which include:

- Causes for Multiyear Droughts in the Missouri River Basin (October 2020 – September 2023)
- Causes and Impacts of the 2017–2019 Southeast Alaska Drought (October 2020 – September 2022)
- Characteristics, Predictability and Risk of Mississippi and Ohio River Valley Drought (October 2019 – September 2021)
- The Causes, Predictability, and Historical Context of the 2017 Upper Missouri River Basin Drought (October 2017 – September 2019)

Program Leadership Roles

- Principal Investigator and Senior Agroclimatology Staff, Famine Early Warning Systems Network: lead program direction and scope with representatives of several government agencies and manage the supporting interagency agreement at NOAA
- Lead Subject Matter Expert, NOAA Research Drought Priority Project, bridging multiple NOAA laboratories and programs, 2026 – Present

PUBLICATIONS

Bibliometrics

More than 100 peer-reviewed publications. Google Scholar as of 7 September 2026: 16,438 citations; h-index 46; i10-index 93.

Peer-Reviewed Journal Articles

111. Anderson, W., Becker-Reshef, I., Bodanac, N., Carneiro, B., English, D., **Hoell, A.**, Hoffine, T., Liu, Y. Y., Machefer, M., Meroni, M., Raleigh, C., Tatem, A., Trigwell, R., Vesco, P., & Vos, R. (2026). Responsible use of artificial intelligence and machine learning for food security early warning systems. *Nature Food*. https://doi.org/10.1038/s43016-026-01400-6

110. Worsnop, R. P., **Hoell, A.**, Hatchett, B. J., Chapman, T. B., Breeden, M. L., Tolby, Z., Short, K. C., & Hobbins, M. T. (2026). Characterizing windows of opportunity for prescribed pile and broadcast burning in Northern California. *Fire Ecology, 22*, 51. https://doi.org/10.1186/s42408-026-00492-6

109. Moore, B. J., Dias, J., **Hoell, A.**, Tulich, S., Gehne, M., Albers, J. R., Baggett, C., & LaJoie, E. (2026). Impacts of tropical forecast errors on weeks 3–4 extreme precipitation predictions over California during winter 2022–23. *Monthly Weather Review, 154*, 1193–1215. https://doi.org/10.1175/MWR-D-25-0133.1

108. **Hoell, A.**, Robinson, R., Hobbins, M. T., Breeden, M. L., Worsnop, R. P., & Guerrero, E. (2026). The relationship between the El Niño–Southern Oscillation and extensive wildfire area burned in contiguous United States Geographic Area Coordination Centers. *Journal of Geophysical Research: Atmospheres, 131*, e2025JD045436. https://doi.org/10.1029/2025JD045436

107. Toride, K., Hakim, G. J., & **Hoell, A.** (2026). Roles of MJO and tropical–extratropical interactions in subseasonal conditions related to landfalling atmospheric rivers. *Journal of Climate, 39*, 885–901. https://doi.org/10.1175/JCLI-D-25-0211.1

106. Breeden, M. L., **Hoell, A.**, Worsnop, R. P., Albers, J. R., Hobbins, M., Robinson, R. M., & Vimont, D. J. (2025). Seasonal predictability of vapor pressure deficit in the western United States. *Weather and Climate Dynamics, 6*, 1443–1459. https://doi.org/10.5194/wcd-6-1443-2025

105. **Hoell, A.**, Breeden, M. L., Worsnop, R. P., Robinson, R., Agel, L., Anderson, W., Barlow, M., Jayanthi, H., McNally, A., Shukla, S., … (2025). An unexpected outcome followed an apparent seasonal forecast of opportunity and prolonged drought in Southwest Asia. *International Journal of Climatology, 45*(8), e8851. https://doi.org/10.1002/joc.8851

104. Slinski, K., Senay, G. B., Adoum, A., Shukla, S., McNally, A., Rowland, J., Fillol, E., Yatheendradas, S., Funk, C., & **Hoell, A.** (2025). In situ, modeled, and Earth observation monitoring of surface water availability in West African rangelands. *Frontiers in Water, 7*, 1320010. https://doi.org/10.3389/frwa.2025.1320010

103. Toride, K., Newman, M., **Hoell, A.**, Capotondi, A., Schlör, J., & Amaya, D. J. (2025). Using deep learning to identify initial error sensitivity of ENSO forecasts. *Artificial Intelligence for the Earth Systems, 4*, e240045. https://doi.org/10.1175/AIES-D-24-0045.1

102. Lisonbee, J., Parker, B., Fleishman, E., Ford, T. W., Bocinsky, R. K., Follingstad, G., Frazier, A. G., Hoylman, Z. H., Hudson, A. R., Nielsen-Gammon, J. W., … **Hoell, A.** (2025). Prioritization of research on drought assessment in a changing climate. *Earth's Future, 13*(3), e2024EF005276. https://doi.org/10.1029/2024EF005276

101. Dias, J., Gehne, M., Kiladis, G. N., Wolding, B., & **Hoell, A.** (2025). Robust multi-decadal variability of Madden–Julian Oscillation amplitude in the 20th century. *Geophysical Research Letters, 52*, e2024GL113303. https://doi.org/10.1029/2024GL113303

100. Beverley, J. D., Newman, M., & **Hoell, A.** (2024). Climate model trend errors are evident in seasonal forecasts at short leads. *npj Climate and Atmospheric Science, 7*(1), 285. https://doi.org/10.1038/s41612-024-00832-w

99. Wilczak, J. M., Akish, E., Capotondi, A., Compo, G. P., & **Hoell, A.** (2024). A multi-decadal analysis of US and Canadian wind and solar energy droughts. *Journal of Renewable and Sustainable Energy, 16*(5), 053303. https://doi.org/10.1063/5.0223890

98. Schreck, C. J., III, Easterling, D. R., Barsugli, J. J., Coates, D. A., **Hoell, A.**, Johnson, N. C., Kunkel, K. E., Labe, Z. M., Uehling, J., & Vose, R. S. (2024). A rapid response process for evaluating causes of extreme temperature events. *Environmental Research: Climate, 3*(4), 045017. https://doi.org/10.1088/2752-5295/ad7a4d

97. Otkin, J. A., Zhong, Y., Ford, T. W., Anderson, M. C., Hain, C., **Hoell, A.**, Svoboda, M., & Wang, H. (2024). Multivariate evaluation of flash drought across the United States. *Water Resources Research, 60*(11), e2024WR037333. https://doi.org/10.1029/2024WR037333

96. Otkin, J. A., Woloszyn, M., Wang, H., Svoboda, M., Skumanich, M., Pulwarty, R., Lisonbee, J., **Hoell, A.**, Hobbins, M., & Haigh, T. (2024). Anticipating flash drought: Formulating a system for early warning and event assessment. *Bulletin of the American Meteorological Society, 105*(2), 103–106. https://doi.org/10.1175/BAMS-D-23-0301.1

95. Stuart, L., Hobbins, M., Niebuhr, E., Ruane, A. C., Pulwarty, R., **Hoell, A.**, Thiaw, W., Rosenzweig, C., Muñoz-Arriola, F., Jahn, M., & Farrar, M. (2024). Enhancing global food security: Opportunities for the American Meteorological Society. *Bulletin of the American Meteorological Society, 105*(4), E760–E777. https://doi.org/10.1175/BAMS-D-22-0106.1

94. Shukla, S., Zaheer, F., **Hoell, A.**, Anderson, W., Jayanthi, H., Husak, G., Lee, D., Barker, B., Pervez, S., Slinski, K., Justice, C., Rowland, J., McNally, A. L., Budde, M., & Verdin, J. (2024). ENSO-based outlook of droughts and agricultural outcomes in Afghanistan. *Weather and Climate Extremes, 45*, 100697. https://doi.org/10.1016/j.wace.2024.100697

93. **Hoell, A.**, Robinson, R., Agel, L., Barlow, M., Breeden, M., Eischeid, J., McNally, A., Slinski, K., & Quan, X.-W. (2024). Changes to Middle East and Southwest Asia compound drought and heat since 1999. *Journal of Climate, 37*(1), 269–287. https://doi.org/10.1175/JCLI-D-23-0194.1

92. **Hoell, A.**, Quan, X.-W., Robinson, R., & Hoerling, M. (2024). Potential predictability of two-year droughts in the Missouri River Basin. *Journal of Climate, 37*(12), 3413–3432. https://doi.org/10.1175/JCLI-D-23-0588.1

91. Christian, J. I., Hobbins, M., **Hoell, A.**, Otkin, J. A., Ford, T. W., Cravens, A. E., Powlen, K. A., Wang, H., & Mishra, V. (2024). Flash drought: A state of the science review. *WIREs Water, 11*(3), e1714. https://doi.org/10.1002/wat2.1714

90. Anderson, W., Shukla, S., Verdin, J., **Hoell, A.**, Justice, C., Barker, B., Slinski, K., Lenssen, N., Lou, J., Cook, B. I., & McNally, A. (2024). Preseason maize and wheat yield forecasts for early warning of crop failure. *Nature Communications, 15*(1), 7262. https://doi.org/10.1038/s41467-024-51555-8

89. Shirvani, A., Landman, W. A., Barlow, M., & **Hoell, A.** (2023). Evaluation of the forecast skill of North American Multi-Model Ensemble for monthly and seasonal precipitation forecasts over Iran. *International Journal of Climatology, 43*(2), 1141–1166. https://doi.org/10.1002/joc.7900

88. Lou, J., Newman, M., & **Hoell, A.** (2023). Multi-decadal variation of ENSO forecast skill since the late 1800s. *npj Climate and Atmospheric Science, 6*(1), 89. https://doi.org/10.1038/s41612-023-00417-z

87. **Hoell, A.**, Magadzire, T., McNally, A., & Eischeid, J. (2023). Multiyear dry periods in southern Africa. *International Journal of Climatology, 43*(7), 3225–3246. https://doi.org/10.1002/joc.8026

86. **Hoell, A.**, Hoerling, M., Quan, X.-W., & Robinson, R. (2023). Recent high Missouri River Basin runoff was unlikely caused by climate change. *Journal of Applied Meteorology and Climatology, 62*(6), 657–675. https://doi.org/10.1175/JAMC-D-22-0158.1

85. Hobbins, M., Jansma, T., Sarmiento, D. P., McNally, A., Magadzire, T., Jayanthi, H., Turner, W., **Hoell, A.**, Husak, G., Senay, G., Boiko, O., Budde, M., Mogane, P., & Dewes, C. F. (2023). A global long-term daily reanalysis of reference evapotranspiration for drought and food-security monitoring. *Scientific Data, 10*(1), 746. https://doi.org/10.1038/s41597-023-02648-4

84. Funk, C., Harrison, L., Segele, Z., Rosenstock, T., Steward, P., Coughlan de Perez, E., Maxwell, D., Endris, H. S., Koch, E., Artan, G., Teshome, F., Aura, S. M., Galu, G., Korecha, D., Anderson, W., **Hoell, A.**, Damerau, K., Williams, E., … Hughes, D. (2023). Tailored forecasts can predict extreme climate informing proactive interventions in East Africa. *Earth's Future, 11*(7), e2023EF003524. https://doi.org/10.1029/2023EF003524

83. Breeden, M. L., **Hoell, A.**, Albers, J. R., & Slinski, K. (2023). The monthly evolution of precipitation and warm conveyor belts during the central southwest Asia wet season. *Weather and Climate Dynamics, 4*(4), 963–980. https://doi.org/10.5194/wcd-4-963-2023

82. Beverley, J. D., Newman, M., & **Hoell, A.** (2023). Rapid development of systematic ENSO-related seasonal forecast errors. *Geophysical Research Letters, 50*(10), e2022GL102249. https://doi.org/10.1029/2022GL102249

81. Magadzire, T., **Hoell, A.**, Nakalembe, C., & Tongwane, M. (2022). Recent advances in agrometeorological analysis techniques for crop monitoring and yield estimation. *Frontiers in Climate, 4*, 950447. https://doi.org/10.3389/fclim.2022.950447

80. Herring, S. C., Christidis, N., **Hoell, A.**, & Stott, P. A. (2022). Explaining extreme events of 2020 from a climate perspective. *Bulletin of the American Meteorological Society, 103*(3), S1–S129. https://doi.org/10.1175/BAMS-ExplainingExtremeEvents2020.1

79. Wahl, E. R., Zorita, E., Diaz, H. F., & **Hoell, A.** (2022). Southwestern United States drought of the 21st century presages drier conditions into the future. *Communications Earth & Environment, 3*(1), 202. https://doi.org/10.1038/s43247-022-00532-4

78. Wahl, E., Zorita, E., & **Hoell, A.** (2022). The Kalman filter as post-processor for analog data–model assimilation in paleoclimate reconstruction. *Journal of Climate, 35*(17), 5501–5518. https://doi.org/10.1175/JCLI-D-21-0454.1

77. Sun, L., Hoerling, M. P., Richter, J. H., **Hoell, A.**, Kumar, A., & Hurrell, J. W. (2022). Attribution of North American subseasonal precipitation prediction skill. *Weather and Forecasting, 37*(11), 2069–2085. https://doi.org/10.1175/WAF-D-22-0076.1

76. Otkin, J. A., Woloszyn, M., Wang, H., Svoboda, M., Skumanich, M., Pulwarty, R., Lisonbee, J., **Hoell, A.**, Hobbins, M., Haigh, T., & Cravens, A. E. (2022). Getting ahead of flash drought: From early warning to early action. *Bulletin of the American Meteorological Society, 103*(10), E2188–E2202. https://doi.org/10.1175/BAMS-D-21-0288.1

75. McNally, A., Jacob, J., Arsenault, K., Slinski, K., Sarmiento, D. P., **Hoell, A.**, Pervez, S., Rowland, J., Budde, M., Kumar, S., Peters-Lidard, C., & Verdin, J. P. (2022). A Central Asia hydrologic monitoring dataset for food and water security applications in Afghanistan. *Earth System Science Data, 14*(7), 3115–3135. https://doi.org/10.5194/essd-14-3115-2022

74. Jong, B.-T., Newman, M., & **Hoell, A.** (2022). Subseasonal meteorological drought development over the central United States during spring. *Journal of Climate, 35*(8), 2525–2547. https://doi.org/10.1175/JCLI-D-21-0435.1

73. **Hoell, A.**, Quan, X.-W., Hoerling, M., Fu, R., Mankin, J., Simpson, I., Seager, R., He, C., Lehner, F., Lisonbee, J., Livneh, B., & Sheffield, A. (2022). Record low North American monsoon rainfall in 2020 reignites drought over the American Southwest. *Bulletin of the American Meteorological Society, 103*(3), S26–S32. https://doi.org/10.1175/BAMS-D-21-0129.1

72. **Hoell, A.**, Quan, X.-W., Hoerling, M., Diaz, H. F., Fu, R., He, C., Lisonbee, J. R., Mankin, J. S., Seager, R., Sheffield, A., Simpson, I. R., & Wahl, E. R. (2022). Water Year 2021 compound precipitation and temperature extremes in California and Nevada. *Bulletin of the American Meteorological Society, 103*(12), E2905–E2911. https://doi.org/10.1175/BAMS-D-22-0112.1

71. Breeden, M. L., Albers, J. R., & **Hoell, A.** (2022). Subseasonal precipitation forecasts of opportunity over central southwest Asia. *Weather and Climate Dynamics, 3*(4), 1183–1197. https://doi.org/10.5194/wcd-3-1183-2022

70. Albers, J. R., Newman, M., **Hoell, A.**, Breeden, M. L., Wang, Y., & Lou, J. (2022). The February 2021 cold air outbreak in the United States: A subseasonal forecast of opportunity. *Bulletin of the American Meteorological Society, 103*(12), E2887–E2904. https://doi.org/10.1175/BAMS-D-21-0266.1

69. Murray, D., **Hoell, A.**, Hoerling, M., Perlwitz, J., Quan, X.-W., Allured, D., Zhang, T., Eischeid, J., Smith, C. A., & Barsugli, J. (2021). Unique FACTS. *Bulletin of the American Meteorological Society, 102*(3), 245–250. https://doi.org/10.1175/BAMS-D-20-0304.1

68. **Hoell, A.**, Parker, B.-A., Downey, M., Umphlett, N., Jencso, K., Akyuz, F. A., Peck, D., Hadwen, T., Fuchs, B., & Kluck, D. (2021). A flash of insight: Learning lessons from the 2017 northern Great Plains drought. *Bulletin of the American Meteorological Society, 102*(8), 721–729.

67. Funk, C., **Hoell, A.**, & Mitchell, D. (2021). Climate science advances to address 21st century weather and climate extremes. *Frontiers in Climate, 3*, 680291. https://doi.org/10.3389/fclim.2021.680291

66. Zinke, J., Browning, S. A., **Hoell, A.**, & Goodwin, I. D. (2021). The West Pacific Gradient tracks ENSO and zonal Pacific sea surface temperature gradient during the last Millennium. *Scientific Reports, 11*(1), 20395. https://doi.org/10.1038/s41598-021-99738-3

65. Otkin, J. A., Zhong, Y., Hunt, E. D., Christian, J. I., Basara, J. B., Nguyen, H., Wheeler, M. C., Ford, T. W., **Hoell, A.**, Svoboda, M., & Anderson, M. C. (2021). Development of a flash drought intensity index. *Atmosphere, 12*(6), 741. https://doi.org/10.3390/atmos12060741

64. **Hoell, A.**, Hoerling, M., Eischeid, J., & Barsugli, J. (2021). Preconditions for extreme wet winters over the contiguous United States. *Weather and Climate Extremes, 33*, 100333. https://doi.org/10.1016/j.wace.2021.100333

63. **Hoell, A.**, Gaughan, A. E., Magadzire, T., & Harrison, L. (2021). The modulation of daily southern Africa precipitation by El Niño–Southern Oscillation across the summertime wet season. *Journal of Climate, 34*(3), 1115–1134. https://doi.org/10.1175/JCLI-D-20-0379.1

62. **Hoell, A.**, Ford, T. W., Woloszyn, M., Otkin, J. A., & Eischeid, J. (2021). Characteristics and predictability of Midwestern United States drought. *Journal of Hydrometeorology, 22*(11), 3087–3105. https://doi.org/10.1175/JHM-D-21-0052.1

61. Funk, C., Turner, W., McNally, A., **Hoell, A.**, Harrison, L., Galu, G., Slinski, K., Way-Henthorne, J., & Husak, G. (2021). An agro-pastoral phenological water balance framework for monitoring and predicting growing season water deficits and drought stress. *Frontiers in Climate, 3*, 716568. https://doi.org/10.3389/fclim.2021.716568

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Technical Guidance and Outreach Writing

- NOAA State of the Science Fact Sheets on long-term changes in extreme weather events
- The Western Drought Issue, NOAA National Integrated Drought Information System, September 2025 (author)
- From Dust to Deluge: Weather Whiplash Devastates Texas, NOAA Physical Sciences Laboratory, 23 July 2025
- Technical reviewer, New NOAA El Niño–Southern Oscillation Index Supports Drought Early Warning and El Niño on the Horizon: Can the Warm Phase End Six Years of Drought in the Southern Plains of the U.S.?, March 2026
- Famine Early Warning Systems Network white papers on El Niño, La Niña, Indian Ocean Dipole, and Building Assumptions for Scenario Development
- Foundational training materials on weather and climate for food security analysts, Famine Early Warning Systems Network

DATA AND SOFTWARE

Datasets developed as a contributing author and documented in the peer-reviewed literature.

- Global long-term daily reanalysis of reference evapotranspiration for drought and food-security monitoring. https://doi.org/10.1038/s41597-023-02648-4
- Central Asia hydrologic monitoring dataset for food and water security applications in Afghanistan. https://doi.org/10.5194/essd-14-3115-2022
- Climate Hazards Infrared Precipitation with Stations (CHIRPS), an environmental record for monitoring extremes. https://doi.org/10.1038/sdata.2015.66

OPERATIONAL PRODUCTS AND DECISION-SUPPORT TOOLS

- Monthly-to-Seasonal Forecasts, a web interface disseminating extreme precipitation, temperature, and sea surface temperature forecasts for subsequent months

- Experimental Seasonal Vapor Pressure Deficit Guidance, giving likelihoods of high or low vapor pressure deficit up to 18 months ahead; in use by the Climate Prediction Center and several National Weather Service forecast offices
- El Niño–Southern Oscillation conditions and forecast portal
- Fire weather prediction and predictability resources, Physical Sciences Laboratory
- Preseason ENSO-based maize and wheat yield forecasts, skillful up to a year ahead of harvest and to 18 months for wheat in some regions, supporting early warning of global crop failure and its effects on food security and markets

Recurring Operational Briefings

Briefings on Early Warning of Weather and Water Effects

- Drought Early Warning: A Modern Sector-Specific Approach, National Integrated Drought Information System, Monthly Cadence
- Seasonal Forecast Review for Food Security Scenario Development, Famine Early Warning Systems Network Food Security Analysts, Monthly Cadence
- Famine Early Warning Systems Network Weather and Agriculture Outlook, Monthly Cadence
- Special El Niño and La Niña briefings, U.S. Department of State and partners, As Needed

Research Presentations

As lead author or resulting from role as project principal investigator

Invited

- Weather Whiplash: Abrupt Transitions from Prolonged Dryness to Extreme Wetness , American Geophysical Union Fall Meeting 2025, New Orleans, LA
- The Relationship between the El Niño-Southern Oscillation and Wildfire Area Burned in Contiguous United States Geographic Area Coordination Centers , NOAA Fire Research from Conditions to Impacts Seminar Series, 2025
- Rapid and Widespread Soil Moisture Declines in the Contiguous United States , 2025 U.S. CLIVAR Summit
- Flash Drought in the Great Plains and Its Prediction , Western States Water Council Improving Subseasonal to Seasonal Precipitation Forecasting Workshop, May 2025, San Diego, CA
- Town Hall Meeting - Drought, Megadrought, or a Permanent Change? A Shifting Paradigm for Drought in the Western United States , American Meteorological Society Annual Meeting 2023, Denver, CO

- Hydroclimate Change Detection and Attribution , Johns Hopkins University Bromery Lecture 2022, Baltimore, MD
- Where Have all the Hydrological Droughts Gone in the Missouri River Basin? , University of Utah Department of Atmospheric Sciences, Salt Lake City, UT
- Could America's Wettest Winter of 2018-19 Have Been Anticipated? , American Geophysical Union Fall Meeting 2019, San Francisco, CA

Contributed

- 20 Years of the National Integrated Drought Information System, American Meteorological Society Annual Meeting 2026, Houston, TX
- Southern California Drought Early Warning and Causal Mapping through the 2024–2025 Wildfire and Drought Season, American Meteorological Society Annual Meeting 2026, Houston, TX
- Precipitation Predictability in the Mississippi River Basin, Precipitation Prediction Grand Challenge Workshop, College Park, MD
- An Unexpected Outcome Followed an Apparent Forecast of Opportunity and Prolonged Drought in Southwest Asia American Meteorological Society Annual Meeting 2025, New Orleans, LA
- A Modern, Sector-Specific Approach to Drought Early Warning, American Meteorological Society Annual Meeting 2025, New Orleans, LA
- Preconditions for Area Burned in the Contiguous United States by Drought-Related Wildland Fires American Geophysical Union Fall Meeting 2024, Washington, DC
- Rapid development of systematic trend errors in seasonal forecasts, NOAA's Subseasonal and Seasonal Applications Workshop, College Park, MD
- Using Deep Learning to Identify Initial Error Sensitivity of ENSO Forecasts, 24th Conference on Atmospheric and Oceanic Fluid Dynamics, Burlington, VT
- Tropical origins of subseasonal forecast errors for high-impact precipitation events over California during winter 2022–2023, S2S Community Workshop: Toward Minimizing Early Model Biases and Errors in S2S Predictions, Boulder, CO
- Rapid development of systematic trend errors in seasonal forecasts and their connection to CMIP6 trend errors, S2S Community Workshop: Toward Minimizing Early Model Biases and Errors in S2S Predictions, Boulder, CO
- Hybrid deep learning and model-analog forecasting of ENSO, S2S Community Workshop: Toward Minimizing Early Model Biases and Errors in S2S Predictions, Boulder, CO

- Dynamics and subseasonal predictability of a blocking event associated with extreme weather over California during February 2023: U.S. CLIVAR Blocking Workshop 2024, Boulder, CO
- Rapid development of systematic trend errors in seasonal forecasts and their connection to climate model errors: U.S. CLIVAR Workshop on Confronting Earth System Model Trends with Observations 2024: The Good, the Bad, and the Ugly, Boulder, CO
- The Physical Sciences Update in the Fifth National Climate Assessment, American Meteorological Society Annual Meeting 2024, Baltimore, MD
- ENSO Forecast Skill in a Changing Climate, American Meteorological Society Annual Meeting 2024, Baltimore, MD
- Potential Predictability of Two-Year Droughts in the Missouri River Basin, American Meteorological Society Annual Meeting 2024, Baltimore, MD
- Multiyear ENSO-Based Crop Yield Forecasts for Early Warning, American Meteorological Society Annual Meeting 2024, Baltimore, MD
- Differences in the Timing of Peak Precipitation and Peak Storm Track Activity over Central Southwest Asia, American Meteorological Society Annual Meeting 2024, Baltimore, MD
- Changes to Middle East and Southwest Asia Compound Drought and Heat Since 1999, American Meteorological Society Annual Meeting 2024, Baltimore, MD
- Identifying State-Dependent Precursors to Improve ENSO Forecasting Using a Hybrid Model-Analog and Deep Learning Approach, American Meteorological Society Annual Meeting 2024, Baltimore, MD
- Multiyear ENSO-based crop yield forecasts for early warning, American Geophysical Union Fall Meeting 2023, San Francisco, CA
- Understanding ENSO driven risks of drought and adverse agricultural outcomes in Afghanistan to support early warning of food insecurity, American Geophysical Union Fall Meeting 2023, San Francisco, CA
- ENSO forecast skill in a changing climate, American Geophysical Union Fall Meeting 2023, San Francisco, CA
- Rapid Development of Systematic ENSO-Related Seasonal Forecast Errors, American Geophysical Union Fall Meeting 2023, San Francisco, CA
- A flow-regime perspective on future changes in wintertime atmospheric rivers over the North Pacific and western North America, American Geophysical Union Fall Meeting 2023, San Francisco, CA
- Trend Errors in Seasonal Forecast Models and Their Links to Climate Model Errors, American Geophysical Union Fall Meeting 2023, San Francisco, CA

- Earth Systems Processes - The Fifth National Climate Assessment, American Geophysical Union Fall Meeting 2023, San Francisco, CA
- Rapid development of systematic ENSO-related seasonal forecast errors, American Meteorological Society Annual Meeting 2023, Denver, CO
- Water Year 2021 Compound Precipitation and Temperature Extremes in California and Nevada, American Meteorological Society Annual Meeting 2023, Denver, CO
- Subseasonal Precipitation Forecasts of Opportunity over Southwest Asia Related to the Madden Julian Oscillation, American Meteorological Society Annual Meeting 2023, Denver, CO
- How Much is the Recent High Missouri River Flow Due to Climate Change?, American Geophysical Union Fall Meeting 2022, Washington, DC
- Multi-decadal variation of ENSO forecast skill since the late 1800s, American Geophysical Union Fall Meeting 2022, Washington, DC
- Multi-decadal variation of ENSO forecast skill since the late 1800s, 47th Climate Diagnostics and Predictability Workshop 2022, Logan, UT
- Rapid development of systematic ENSO-related seasonal forecast errors 47th Climate Diagnostics and Predictability Workshop 2022, Logan, UT
- The Development of a Machine Learning-based Probabilistic Seasonal Outlook for the Famine Early Warning Systems Network (FEWS NET) 47th Climate Diagnostics and Predictability Workshop 2022, Logan, UT
- Rapid development of systematic ENSO-related seasonal forecast errors, 6th WGNE workshop on systematic errors in weather and climate models 2022, Reading U.K.
- Earth System Predictability Research and Assessments to Support Climate Services, George Mason University Department of Atmospheric, Oceanic, and Earth Sciences 2022, Fairfax, VA
- Multiyear Wet and Dry Epochs in Southern Africa, American Meteorological Society Annual Meeting 2022, Houston, TX
- Rapid Meteorological Drought Development over the Central United States During Spring, American Meteorological Society Annual Meeting 2022, Houston, TX
- Seasonal-to-Interannual Reforecasts of the Tropical Climate System in the Twentieth Century, American Meteorological Society Annual Meeting 2022, Houston, TX
- Identifying Skillful Subseasonal Precipitation Forecasts over Southwest Asia, American Meteorological Society Annual Meeting 2022, Houston, TX
- Evaluating dynamical and statistical model seasonal precipitation forecasts for East Africa, American Geophysical Union Fall Meeting 2021, San Francisco, CA

- Record Low North American Monsoon Rainfall in 2020 Reignites Drought over the American Southwest, American Geophysical Union Fall Meeting 2021, San Francisco, CA
- Characterization of the recent drought in the US Southwest: historical context and what can we expect in the future? American Geophysical Union Fall Meeting 2021, San Francisco, CA
- Preconditions for Extreme Wet Winters over the Contiguous United States, 46th Climate Diagnostics and Prediction Workshop, College Park, MD
- Identifying skillful subseasonal precipitation forecasts over southwest Asia, 46th Climate Diagnostics and Prediction Workshop, College Park, MD
- Who Is Ready to Define Flash Drought? From Definitions to Principles, Assessing the Performance of Differing Approaches, American Meteorological Society Annual Meeting 2021, Virtual
- Development of a Flash Drought Intensity Index, American Meteorological Society Annual Meeting 2021, Virtual
- Subseasonal Evolution of Springtime Flash Droughts over the Central United States, American Meteorological Society Annual Meeting 2021, Virtual
- Anthropogenic Influences Increase the Risk of Extreme Precipitation that Leads to Bonnet Carré Spillway Operations and Gulf of Mexico Ecosystem Impacts, American Geophysical Union Fall Meeting 2020, Virtual
- On the interpretation of seasonal Southern Africa precipitation prediction skill estimates during Austral Summer, American Meteorological Society Annual Meeting 2020, Boston, MA
- Characteristics, Precursors and Predictability of Amu Darya Drought, American Meteorological Society Annual Meeting 2020, Boston, MA
- Flash Droughts, American Meteorological Society Annual Meeting 2020, Boston, MA
- The Role of Stationary Rossby Waves in Springtime Hydroclimate over the Central United States, American Geophysical Union Fall Meeting 2019, San Francisco, CA
- Hydrologic Monitoring in Afghanistan to Support Food and Water Security Decision Making, American Geophysical Union Fall Meeting 2019, San Francisco, CA

INVITED TALKS, SERVICE, AND PARTNERSHIP PRESENTATIONS

All invited; sources indicated where possible

- The Very Strong El Niño of 2026–2027: How a Warm Tropical Pacific Reshapes Weather Worldwide (forthcoming), NEDTalks seminar series, October 2026

- From Diagnostics to Decisions: Leveraging 50 Years of Predictability Science for Actionable Intelligence (keynote), 50th NOAA Climate Diagnostics, Prediction, and Application Workshop, 2026
- Drought impacts and early warning, California Department of Public Health, 2026
- Drought impacts and early warning, California Department of Water Resources Drought Resilience Interagency and Partners (DRIP) Collaborative, 2026
- El Niño and global agricultural outlooks, CGIAR, 2026
- Seasonal predictability of vapor pressure deficit, and optimal conditions for prescribed fire, National Weather Service Forecast Office, Boulder, CO, 2026
- Hydrology Report – The Drought Outlook (invited), California DRIP Collaborative Meeting, July 2025
- Modernizing drought early warning, Drought and Health National Workshop, 2025
- Drought and its compounding and cascading effects, including wildfire, briefing to community officials, June 2025
- The Famine Early Warning Systems Network's Integrated Approach to Early Warning of Acute Food Insecurity (invited), Integrated Drought Management Programme High Level Meeting on National Drought Policy, October 2024
- NOAA Monthly Climate Briefing, 15 August 2024
- Drought in Colorado, Colorado Farm Bureau Elite Leadership Academy, 29 July 2024
- Drought and Famine Early Warning at the NOAA Physical Sciences Laboratory, NOAA Lapenta Scholars Program July 2024
- Modernizing Drought Early Warning, National Integrated Drought Information System Executive Spring Council Meeting in April 2024, Washington, DC
- Arability Consultation and Climate Projections Interpretation, U.S. Department of State, September 2023
- Recent High Missouri River Basin Flow Was Unlikely Due to Climate Change, Missouri River Basin Climate Extremes, Trends and Climate Change Webinar, 27 June 2023
- 2022 – 2023 Western U.S. Wet Season: Wet Interlude or Path to Multidecadal Drought Recovery?, 2023 Western Drought Webinar, May 2023
- Drought Early Warning and Information Systems, NOAA-European Union Joint Research Center Steering Committee Meeting, March 2023
- Southwest Drought in a Non-Stationary Climate, Land and Water Summit 2023, New Mexico

- Drought Assessment in a Non-Stationary Climate: Perspectives Based on the Southwest and Central U.S, Drought Assessment in a Changing Climate Webinar Series, February 2023
- Southeast Alaska Drought, Alaska Center for Climate Assessment and Policy, 10 January 2023
- How Much is the Recent High Missouri River Flow Due to Climate Change?, Mid-West Electric Consumers Association Annual Meeting, December 2022
- Drought and Climate Change in Colorado, Colorado Farm Bureau Elite Leadership Academy, October 2022
- Precipitation and Temperature Extremes within the Southwest Megadrought, Three-Minute Thesis Webinar on Drought, Virtual
- Why Has Missouri River Basin Runoff Increased in the 21st Century?, Missouri River Natural Resources Conference 2022, Nebraska City, NE
- Characteristics and Predictability of Midwestern United States Drought, NIDIS Midwest Drought Early Warning System Webinar, Virtual
- Southeast Alaska Precipitation, Past and Future, Alaska Forum for the Environment, Virtual
- NOAA MAPP Task Force 2020–2021 Southwestern Drought Report, National Integrated Drought Information System Executive Council Meeting, Washington, DC
- The 2016–2019 Southeast Alaska Drought, Drought and Extreme Events: Building collaborations to enhance data, decision making, and adaptation planning in Southeast Alaska, Alaska Sea Grant
- Setting the Stage: How Did We Get Here? Southwest Drought Forum, Virtual
- An Eye to the Future: Examining Long-term Drought and Climate Change Trends, American Water Works Association, Virtual
- Flash Drought Prediction – Challenges, Opportunities, Gaps, and Needs, Flash Drought Virtual Workshop, Virtual
- Food Security Scenarios Based on NMME Forecasts, North American Multimodel Ensemble (NMME) Monthly Meeting
- Characteristics, Predictability and Risk of Mississippi and Ohio River Valley Drought, National Integrated Drought Information System Midwest Partners Meeting 2019, St. Paul, MN
- Guiding International Food Security Assessments Using Subseasonal to Seasonal Predictions and Predictability, NOAA Central Library 2019

- Climate Perspective of Wet Decades in the Missouri River Basin, 2019–2020 Annual Quad Agency Meeting (FEMA/NWS/USGS/USACE)

Conferences and Workshops Organized

- NOAA Drought Seminar Series, conceived and co-organized with Hailan Wang (NOAA National Weather Service) and Veva Deheza (NOAA National Integrated Drought Information System); monthly, 2026 – Present
- Advancements in Drought Prediction and Analysis, American Meteorological Society Annual Meeting 2026, Houston, TX
- Famine Early Warning Systems Network Principal Investigators Meeting, organized and hosted, 2026
- Explaining Extreme Events, American Meteorological Society Annual Meeting 2025, New Orleans, LA
- Flash Drought Monitoring, Predictability, and Impacts in a Changing Climate, American Meteorological Society Annual Meeting 2025, New Orleans, LA
- Drought Early Warning workshop session, convened with National Weather Service and NOAA Research colleagues, 2025
- Explaining Extreme Events from a Climate Perspective, American Meteorological Society Annual Meeting 2024, Baltimore, MD
- Flash Drought Monitoring, Predictability, and Impacts in a Changing Climate, American Meteorological Society Annual Meeting 2024, Baltimore, MD
- Drought: Mechanisms and Impacts in the Past, Present, and Future, American Geophysical Union Fall Meeting 2023, San Francisco, CA
- Famine Early Warning Systems Network Science Meeting 2023, Boulder, CO
- National Flash Drought Workshop 2023, Boulder, CO
- Explaining Extreme Events from a Climate Perspective, American Meteorological Society Annual Meeting 2023, Denver, CO
- Compounding and Cascading Causes and Effects of Flash Drought, American Meteorological Society Annual Meeting 2023, Denver, CO
- Drought: Mechanisms and Impacts in the Past, Present, and Future, American Geophysical Union Fall Meeting 2022, Chicago, IL
- Advancements in Analysis and Prediction of Drought, American Meteorological Society Annual Meeting 2022, Houston, TX
- Southwest Drought Virtual Forum 2021

- Advances in Monitoring, Analysis, and Prediction of Flash Drought and Related Heat Waves, American Meteorological Society Annual Meeting 2021, Virtual
- Drought: Mechanisms and Impacts in the Past, Present, and Future, American Geophysical Union Fall Meeting 2021, New Orleans, LA
- Climate Extremes: Mechanisms, Attribution, and Early Warning, American Geophysical Union Fall Meeting 2021, New Orleans, LA
- Flash Drought Virtual Workshop 2020
- Climate Extremes: Patterns, Mechanisms, and Attribution, American Geophysical Union Fall Meeting 2020, Virtual
- Drought Timescales and Impacts: Prediction, Risk Assessment, and Resilience, American Geophysical Union Fall Meeting 2020, Virtual
- Improvements to the Analysis and Prediction of Flash Drought and Long-Term Drought, American Meteorological Society Annual Meeting 2020, Boston, MA

POLICY AND LEGISLATIVE ENGAGEMENT

- El Niño briefing to congressional staff, with the Assistant Administrator of NOAA Research, the National Weather Service, and National Marine Fisheries Service, September 2026
- Remarks to the National Academies of Sciences, Engineering, and Medicine panel on The Future of Drought in the United States, May 2025; originator of the study
- Agency Coordinating Lead Author, Southwest Chapter, Sixth National Climate Assessment, 2024 – Present
- Author, Earth System Processes Chapter, Fifth National Climate Assessment, 2021 – 2023
- Climate Extremes Under Climate Change to Inform Planned Nuclear Power Plants, Government Accountability Office, June 2023
- El Niño Briefing, U.S. Agency for International Development and U.S. Department of State, July 2023
- Recurring El Niño and La Niña briefings, U.S. Department of State Bureau of Humanitarian Assistance, 2015 – Present

PROFESSIONAL SERVICE AND AFFILIATIONS

Editorial and Technical Reviews

- Editor, Journal of Climate, 2021 – Present

- Editor, Bulletin of the American Meteorological Society Explaining Extreme Events, 2016 – Present
- Editor, Recent Advances in Agrometeorological Analysis Techniques for Crop Monitoring in Support of Food Security Early Warning, 2021
- Editor, Climate Science Advances to Address 21st Century Weather and Climate Extremes, 2020 – 2021
- Associate Editor, Journal of Climate, 2016 – 2020

Expert Teams and Task Forces

- Permanent Member for North America, World Meteorological Organization Expert Team on Drought, Standing Committee on Agriculture, 2022 – Present
- Lead, NOAA Drought Task Force, 2020 – 2023

Advisory Services

- Member, American Meteorological Society Committee on Climate Services, 2026 – Present
- Member, American Meteorological Society Board of Certified Climate Science Professionals, 2025 – Present
- Agroclimatology Senior Staff, Famine Early Warning Systems Network, 2018 – Present
- Originator, National Academies of Sciences, Engineering, and Medicine study on The Future of Drought in the United States, 2023

Professional Memberships

Member of the American Meteorological Society and the American Geophysical Union.

Proposal Review Panels

Panelist for the National Science Foundation, the U.S. Department of Energy, the NOAA Climate Program Office, and the NOAA Weather Program Office.

Journal Peer Review

Referee for Nature, Science, Nature Communications, Bulletin of the American Meteorological Society, Journal of Climate, Journal of the Atmospheric Sciences, Journal of Hydrometeorology, Journal of Applied Meteorology and Climatology, Climate Dynamics, International Journal of Climatology, and Theoretical and Applied Climatology, among others.

TEACHING AND MENTORING

University Instruction

- **Instructor of Record**: *Weather and Climate* (undergraduate), University of Massachusetts Lowell, 2010

- **Teaching Assistant**: *Atmospheric Dynamics*, *The Climate System*, *Physical Climatology*, and *Weather and Climate Laboratory* (undergraduate), University of Massachusetts Lowell, 2006–2011

Professional and Continuing Education

- Author, foundational training curriculum on weather and climate for food security analysts, Famine Early Warning Systems Network; used to train analysts supporting more than 40 countries
- Instructor, recurring analyst training on El Niño, La Niña, and the Indian Ocean Dipole and their implications for food security, U.S. Department of State and partners
- Founder and co-organizer, NOAA Drought Seminar Series, a monthly cross-agency instructional forum, 2026 – Present

Research Supervision

- **Early Career Researchers**: Kinya Toride (2022), Rachel Robinson (2022), Melissa Breeden (2021)
- **Postdoctoral Researchers**: Jonathan Beverley (2022–2025), Jiale Lou (2021–2023), Bor-Ting Jong (2019–2021)
- **NOAA Experiential Research and Training Opportunities**: Aysha Akter (2026), E'lysha Guerrero (2024), Siena Dante (2022)
- **Federal Pathways Program**: Anna Pohl (2018)
- **High School Researchers**: Nora Simmons (2025)

SELECTED MEDIA

Nearly 100 media interviews since 2020. Selected appearances follow.

- Wildfire plans a must in today's climate, air monitoring expert says, Facilities Dive, 10 August 2026
- El Niño's Arrival May Provide Wildfire Relief in Southern U.S. Next Year, SSBCrack News, 23 July 2026
- As U.S. grapples with destructive wildfires, El Niño hope, Los Angeles Times, 22 July 2026
- Washington drought set to worsen as heat wave, El Niño loom over Pacific Northwest, Associated Press, syndicated via MyNorthwest and KIRO 7, 9 July 2026
- "It's rapidly intensifying:" Over 85% chance of "Super El Niño" developing, KING 5 Seattle, 8 July 2026; also carried by KGW Portland and Yahoo News
- El Niño brings record heat and wildfire risks, Las Cruces Sun-News, 25 June 2026

- Hola, El Niño, Golf Course Industry, June 2026
- Record-low water shortages expected ahead of very active US wildfire season, Wildfire Today, 17 May 2026
- El Niño and La Niña predict US wildfire severity up to a year early, NOAA research finds, Wildfire Today, 7 May 2026
- Officials predict "active" fire season in California. Here's where conditions could be worst, San Francisco Chronicle, 17 May 2025
- Live interview on heat forecasting in the United States and Europe, BBC News World, July 2025
- Drought conditions in California will lead to poor air quality, Palm Springs Desert Sun, 18 April 2025
- Why California air quality and allergies could be bad this year, San Francisco Chronicle, 18 April 2025
- Three years after Colorado's most destructive wildfire, experts consider whether it can happen again, Rocky Mountain Community Radio, 6 January 2025
- NOAA using AI to scan satellite imagery, identify wildfires right when they start, KMGH-Denver, 27 August 2024
- NOAA using new drone to gather crucial weather information during active wildfires, KMGH-Denver, 23 August 2024
- July was hottest on record, NOAA says, with 2024 likely to be warmest year to date, CBS News, 15 August 2024
- How Kern County's heat wave compares to other cities, KGET-Bakersfield, 10 July 2024
- Drylands could give way to desert, climatologist warns, Plainview Herald, 13 June 2024
- Wild Weather Ahead: Summer 2024 Could Be a Scorcher With Incoming Heat Wave, CNET, 17 June 2024
- Here's why California is drought free for a second straight year, Washington Post, 12 April 2024
- Unseasonal wildfires beset midwest: 'The strangest winter I've ever seen', The Guardian, 12 April 2024
- Extreme weather in 2023 caused bad air quality and deadly floods. Don't expect it to get better, Albany Times-Union, 20 December 2023
- Rising El Niño Intensity Sparks Global Food Security Concerns, Gizmodo, 30 October 2023

- As El Niño looms, California braces for storms and floods, The Washington Post, 13 October 2023
- Eight catastrophic floods in 11 days: What's behind intense rainfall around the world? NBC, 12 September 2023
- Is this summer's extreme heat the new normal? The Hill, 27 July 2023
- Deadline: White House, MSNBC, July 25, 2023
- Expert explains climate change impact on infectious diseases, KMGH-Denver, 20 July 2023
- Is climate change making Colorado's weather crazier? Colorado Sun, 20 July 2023
- Climate change caused catastrophic East Africa drought, scientists say, The Washington Post, 27 April 2023
- As the world warms, droughts come on faster, study finds, The New York Times, 13 April 2023
- Southeast Alaska drought risk declining, but warming temps may amplify future impacts, The Juneau Empire, 24 January 2023
- Bomb Cyclone? Or Just Windy with a Chance of Hyperbole?, The New York Times, 18 January 2023
- Climate change makes heat waves, storms and droughts worse, climate report confirms, National Public Radio, 9 January 2023
- Weather whiplash: US west set to cook as east coast braces for bomb cyclone, The Guardian, 23 December 2022
- Why California's 2022 Wildfire Season Was Unexpectedly Quiet, The New York Times, 20 December 2022
- Severe Weather and Flash Floods Wreak Havoc in the Southwestern United States Causing Massive Flight Delays, 24 August 2022, Nature World News
- Flash floods wreak havoc in US south-west – but are no salve for drought, The Guardian, 23 August 2022
- Ongoing Multi-Season Drought in Afghanistan "Perhaps a Harbinger of Things to Come", Agrilinks, 25 July 2022
- 'Megadrought' threatens water and power supplies to millions in US, Financial Times, 22 May 2022
- Extreme heat, drought will permanently scar California and its social fabric, The Los Angeles Times, 30 June 2022

- ‘Historic’ weather: why a cocktail of natural disasters is battering the US, The Guardian, 18 June 2022
- Dangerous Heat Drives Wildfires Across the Southwest , The National Interest, 14 June 2022
- More than 65 million Americans are experiencing ’severe to exceptional drought, Yahoo Finance, 13 June 2022
- Climate Change Is Making Afghanistan’s Hunger Crisis Worse, Bloomberg, 5 April 2022
- Researchers meet to review impacts of drought, extreme weather in SE, KFSK, 30 March 2022
- Project looks into causes, effects of 2016–2019 drought, Juneau Empire, 18 March 2022
- Climate change: Low water levels at key U.S. reservoir 'putting us in uncharted territory,' expert says, Yahoo Finance, 14 March 2022
- Scientists are studying what extreme drought looks like in Alaska’s temperate rainforest, KTOO, 4 March 2022
- ‘Urban fire storm’: suburban sprawl raising risk of destructive wildfires, The Guardian, 6 January 2022
- ‘How can I help?’ After fire, Coloradans’ generosity lifts neighbors, The Christian Science Monitor, 3 January 2022
- Statistic Reveals How Big of a Damage Wildfires Caused in 2021, Nature World News, 1 January 2022
- What the numbers tells us about a catastrophic year of wildfires, The Guardian, 25 December 2021
- Weather whiplash: California’s historic downpour interrupts historic drought, The Guardian, 26 October 2021
- Drought-stricken Southwest could experience another dry La Nina winter, Las Vegas Review Journal, 20 October 2021
- Southwest conditions historically dry since 2020, report finds, Las Vegas Review Journal, 8 October 2021
- Human-Caused Climate Change Is Worsening The Megadrought Gripping Colorado, NOAA Scientists Say, Colorado Public Radio, 23 September 2021
- Southwest Drought is Worst on Record, NOAA Finds, Axios, 23 September 2021
- There’s a 1-in-3 chance Lake Powell won’t be able to generate hydropower in 2023 due to drought conditions, new study says, CNN, 22 September 2021

- Fueled by Climate Change, Costly Southwest U.S. Drought Isn't Going Away, The Washington Post, 21 September 2021
- Southwest U.S. drought, worst in a century, linked by NOAA to climate change, Reuters, 21 September 2021
- Mudslide on scenic Colorado highway tests limits of aging infrastructure in era of climate change, NBC News, 12 September 2021
- Heat, drought and fire: how climate dangers combine for a catastrophic 'perfect storm', The Guardian, 10 August 2021
- Colorado mudslides wreak havoc on major transportation route, The Associated Press, 7 August 2021
- Baked barnacles, scorched cherries: the disastrous impact of heatwaves on plants and animals, The Guardian, 1 August 2021
- Portland's roads melted during last month's heatwave. So what does this extreme weather event tell us about climate change?, ABC News Australia, 31 July 2021