
MIKE HOBBS, B.Eng., M.S., Ph.D.

Cooperative Institute for Research in Environmental Sciences (CIRES), Boulder, CO 80303

at NOAA-Physical Sciences Laboratory (NOAA-PSL), Boulder, CO 80305

orcid.org/0000-0001-5540-8466 • www.researcherid.com/rid/N-4630-2014

307-228-0815 • mike.hobbins@noaa.gov

PROFESSIONAL SUMMARY

Recent Research Foci

- ~ reformulating and improving modeling and metering of drought;
- ~ developing datastreams and operationalizing tools for drought and famine early warning and monitoring communities;
- ~ examining effects of climate change and variability on the hydrosphere, specifically moisture dynamics at the land surface-atmosphere interface resulting in and from drought;
- ~ developing and operationalizing services of continental- and global-scale, real-time forecasts and reanalyses of hydrologic variables;
- ~ partitioning dynamics of secular hydrologic trends and variability, particularly in evaporative drivers;
- ~ overturning the temperature-proxy paradigm in evapotranspiration in science and operations;
- ~ developing and operationalizing the Evaporative Demand Drought Index (EDDI) – a tool for early warning and monitoring of drought;
- ~ quantifying and describing the spatial distribution of large-scale, natural water supply;
- ~ developing flash drought metrics and establishing principles and definitions to guide the science of flash-drought detection and prediction;
- ~ exploiting the relationships between evaporative fluxes, drought, and wildfire risk to develop decision-support tools for the wildfire community.

Leadership, Service, Outreach, Teaching

- Leadership:
 - ~ CIRES@NOAA Lead: overall supervisor for all CIRES employees (~95) at NOAA-PSL, 2022-2026;
 - ~ vice-chair: American Meteorological Society (AMS) Committee on Hydrology, 2020-2022;
 - ~ conference chair: 34th Conference on Hydrology at 2020 AMS Annual Meeting, the most successful year in conference history;
 - ~ conference co-chair: 32nd and 33rd Conferences on Hydrology at 2018-2019 AMS Annual Meetings;
 - ~ conference co-chair: Famine Early Warning Systems Network (FEWS NET) 2023 Science Meeting;
 - ~ conference session chair: climate-information session and food-security presidential session at 2022 AMS; food-security session at 2023 and 2024 AMS; flash-drought sessions at 2021 and 2023 European Geosciences Union (EGU) General Assembly, 2022-2025 AMS, 2022 Frontiers in Hydrology Meeting (FIHM); hydrology and human health session at 2020 AMS; flood session at 2019 AMS; drought sessions at 2016-2018, 2021-2022, and 2026 AMS; evapotranspiration- and drought-related sessions at 2014-2016 American Geophysical Union (AGU) Fall Meetings; evapotranspiration sessions at 2012-2019, 2021, and 2027 AMS.
 - ~ member: NOAA-PSL Science Board, 2021-2022;
 - ~ steering committee member and facilitator: National Integrated Drought Information System (NIDIS) Flash Drought Virtual Workshop at NOAA-PSL, 2020;
 - ~ member: NIDIS Technical Working Group, 2020-present;
 - ~ search committee member: CIRES Associate Director for Science;
 - ~ hiring manager: 12 CIRES positions in NOAA-PSL;
 - ~ EDDI team-lead: writing successful proposal for grant, science Principal Investigator, recruiting contributing members to the team of 13 people;
 - ~ member: *MDPI Hydrology* journal editorial board, 2020-2021.

- Service and outreach:
 - ~ committee member: AMS Committee on Environmental Security, 2026-present;
 - ~ committee member: AMS Committee on Hydrology, 2017-2022;
 - ~ editorial board member: MDPI *Hydrology*, 2020-2021;
 - ~ guest editor, special collection “Land Use and Water-Carbon: How agricultural land use and management influence water-carbon interactions in dryland ecosystems” in *Agriculture, Ecosystems & Environment*;
 - ~ faculty affiliate: Colorado State University, Fort Collins, CO, 2015-2020;
 - ~ convener: year-long, weekly seminar series for in-house, national, and international speakers at Research School of Biological Sciences, Australian National University;
 - ~ proposal-review panel member: NASA Modeling, Applications, and Predictions program, NOAA Climate Program Office NIDIS-Coping with Drought program;
 - ~ promotion and tenure committee member: School of Natural Resources, Univ. of Nebraska-Lincoln;
 - ~ faculty awards committee member: Desert Research Institute, University of Nevada-Reno;
 - ~ outreach with stakeholders and scientists from other disciplines;
 - ~ interviews with popular news, scientific press and podcasts;
 - ~ communicating with diverse audiences on various topics through peer-reviewed scientific literature, conference papers, and direct instruction;
 - ~ peer reviewer: *Advances in Science and Research*; *Agricultural and Forest Meteorology*; *Bulletin of the American Meteorological Society*; *Climate*; *Climatic Change*; *Earth Interactions*; *Environmental Research Letters*; *Geophysical Research Letters*; *Hydrologic and Earth System Sciences (HESS)*; *Hydrological Processes*; *Hydrological Sciences Journal*; *Hydrology*; *Hydrology Research*; *International Journal of Climatology*; *IPCC Fourth Assessment Report*; *IPCC Sixth Assessment Report*; *Irrigation and Drainage*; *Journal of Applied Meteorology and Climatology*; *Journal of Climate*; *Journal of Geophysical Research-Atmospheres*; *Journal of Great Lakes Research*; *Journal of Hydrologic Engineering*; *Journal of Hydrology*; *Journal of Hydrometeorology*; *Journal of Irrigation and Drainage Engineering*; *Journal of Water Management Modeling*; *Nature Communications*; *Nature Geosciences*; *PLOS ONE*; *Science*; *Science of the Total Environment*; *Theoretical and Applied Climatology*; *Water*; *Water Resources Management*; *Water Resources Research*; *Weather and Climate Extremes*.
- Teaching and mentoring:
 - ~ graduate teaching assistant: Colorado State University, *Engineering Mechanics-Statics*, a 200-level three-credit course in core engineering curriculum;
 - ~ instructor: COMET MetEd, *Evaporative Demand*, in Advanced Hydrologic Sciences Virtual Course;
 - ~ doctoral student’s committee member: Daniel McEvoy, University of Nevada-Reno;
 - ~ graduate students’ committee member: Shuang Xia, University of Nevada-Reno and Connor Seacrest, Colorado State University;
 - ~ mentor for: CIRES post-doctoral fellow (Matilda Newton, University of Colorado), Summer scholar (Timen Jansma, Wageningen University and Research), SOARS scholar (Delián Colón-Burgos, Penn State University), NERTO scholar (Siena Dante, City University of New York).

EDUCATION

Doctor of Philosophy

Hydrologic Science and Engineering

2004

Colorado State University

Dissertation: *Regional evapotranspiration and pan evaporation: Complementary interactions and long-term trends across the conterminous United States.*

Master of Science

Hydrologic Science and Engineering

2000

Colorado State University

Thesis: *Evaluating and enhancing two implementations of the complementary relationship in regional evapotranspiration.*

Bachelor of Engineering (Honours)

Civil Engineering

1989

University of Leeds, UK

PRIZES, AWARDS, AND RECOGNITION

- ~ CIRES Outstanding Performance Award in Science for: “Leadership and innovation in drought research, including development and operationalization of the Evaporative Demand Drought Index, its application to famine early warning, and strides in understanding flash drought,” 2022.
- ~ Elected Vice-chair of AMS Committee on Hydrology, 2020.
- ~ American Society of Agricultural and Biological Engineers (ASABE) Superior Paper Award for paper: “The variability of ASCE Standardized Reference Evapotranspiration: a rigorous, CONUS-wide decomposition and attribution,” 2017.
- ~ Elected Member of AMS Committee on Hydrology, 2017.
- ~ Gary Comer Abrupt Climate Change Fellowship, 2005-2008.
- ~ National Science Foundation (NSF) Computer Science, Engineering, and Mathematics Scholarship, 2002.
- ~ H. W. Shen Water Resources Graduate Award, Colorado State University, 2001.
- ~ American Geophysical Union (AGU) Hydrology Days Best M.S. Student Paper Award for presentation: “The complementary relationship in regional evapotranspiration: The CRAE Model and the Advection-aridity approach,” 1999.

AFFILIATIONS AND PROFESSIONAL MEMBERSHIPS

- ~ Vice-chair: AMS Committee on Hydrology, 2020-2022.
- ~ Editorial board member: MDPI *Hydrology*, 2020-2022.
- ~ Committee Member: AMS Committee on Hydrology, 2017-2022.
- ~ Faculty Affiliate: Colorado State University, Fort Collins, CO, 2015-2018.
- ~ Member: American Meteorological Society.
- ~ Member: American Geophysical Union.
- ~ Member: European Geosciences Union.
- ~ Member: International Association of Hydrological Sciences.

GRANTS

- ~ PI on Famine Early Warning Systems Network (FEWS NET) grant (\$350K, pending): “Providing hydroclimatic data and improved process understanding in support of the Famine Early Warning Systems Network's science community,” NOAA-OAR-CIAO-2026-32241, 2026-2027.
- ~ PI on Bipartisan Infrastructure Law (BIL) grant (\$1,210K): “Next-generation hydrologic prediction,” NA23OAR4050186I, 2023-2028.
- ~ PI on BIL grant (\$362K): “Wildland fire potential,” NA23OAR4050186I, 2023-2028.
- ~ Science PI on NOAA Office of Oceanic and Atmospheric Research (NOAA-OAR) Joint Technology Transfer Initiative (JTTI) grant (\$317K): “Operationalizing the computation and dissemination of the Evaporative Demand Drought Index (EDDI) and value-added products for CONUS-wide drought monitoring and early warning at the NOAA-Climate Prediction Center,” 2022-2024.
- ~ NIDIS grant (\$73K): “Further applying the National Water Model for drought monitoring: Model performance assessment and drought-tool development,” 2022.
- ~ Science PI on NOAA Climate Program Office (NOAA-CPO) NIDIS grant (\$448K): “Improving drought monitoring and early warning in the Midwest Drought Early Warning System (DEWS) using the Evaporative Demand Drought Index (EDDI) and a new hydrologically holistic drought measure,” 2020-2022.
- ~ NOAA-CPO Sector Application Research Program (SARP) grant (\$199K): “Identifying and quantifying triggers, time scales, and tools to support management of different drought types in the Northeastern United States,” 2019-2020.
- ~ DOI North Central-Climate Adaptation Science Center (NC-CASC) grant (\$100K) “Evaporation, drought, and the water cycle across timescales: Climate foundational sciences for the NC-CASC,” 2017-2019.

- ~ NOAA-CPO SARP grant (\$38K): “Developing a wildfire component for the NIDIS California Drought Early Warning System,” 2016-2018.
- ~ PI on NOAA-OAR JTII grant (\$891K): “Operationalizing an Evaporative Demand Drought Index (EDDI) service for drought monitoring and early warning,” 2016-2019.
- ~ NIDIS grant (\$36K): “Development of a Nevada Drought Early Warning System and NIDIS application tools,” 2016-2018.
- ~ CIRES PI on United States Agency for International Development (USAID) Participating Agency Program Agreement (\$550K): “Development of gridded atmospheric forcing datasets,” 2016-2021.

RELEVANT WORK EXPERIENCE

Senior Research Scientist with CIRES

Feb 2015 – Present

Visiting Scientist with University Corporation for Atmospheric Research (UCAR)

Oct 2012 – Jan 2015

at **NOAA-PSL**

Boulder, CO

Developing national evaporative demand (E_0) services for NOAA and NIDIS stakeholders and the National Water Center and a global E_0 service for FEWS NET.

- ~ Developing the first E_0 services (physically based, daily, accurate, long-term reference evapotranspiration) for (i) NOAA (CONUS-wide) and (ii) FEWS NET (global), including automation of production, verification against observations, bias-correction, and data assimilation;
- ~ Developing a new drought E_0 -based index for monitoring and early warning—the Evaporative Demand Drought index (EDDI)—and transitioning it to operations and general acceptance by drought-monitoring and scientific communities;
- ~ Acting as scientific advisor and coordinator to a cross-National Weather Service (NWS) team developing the nation’s first real-time forecasts of reference evapotranspiration (FRET), developing E_0 algorithms and climatologies to add value to forecasts, presenting new FRET product at national scientific and professional meetings;
- ~ Outreach to stakeholders, including within NOAA, other US government agencies, academics (including ecologists and economists), intergovernmental groups such as the Western Governors Association, state climatologists (UT, CO, and CA), students in training courses (COMET);
- ~ Collaborating with various federal and state agencies (e.g., with USGS towards an ET input to the National Water Census, and the production of official state E_0 climatologies), with university researchers (e.g., with UCLA on developing remotely sensed E_0), and with other research institutions (e.g., with the Desert Research Institute on large-scale evapotranspiration [ET] estimation);
- ~ Educating NOAA colleagues on principles pertaining to ET and E_0 .
- ~ Hiring (three) personnel, from early to mid career: including writing position description, reviewing application material, conducting interviews, liaising with human resources, and on-boarding successful hires;
- ~ Presenting background scientific and ongoing project material to colleagues at the NWS OHD, NOAA’s Climate Prediction Center, the CBRFC, Service Hydrologists at other RFCs, and other WFOs, at various inter-agency, regional and national meetings;
- ~ Responsible for developing own funding streams through strategic grant-seeking, from NOAA Office of Hydrologic Development (OHD), NIDIS, and FEWS NET.

Visiting Scientist with UCAR

Feb 2012 – Oct 2012

and **Visiting Scientist with Wyle Information Systems Group**

Oct 2009 – Feb 2012

at **NWS-Colorado Basin River Forecast Center (CBRFC)**

Salt Lake City, UT

Improved the treatment of evapotranspiration (ET) in NWS operations, by (i) improving water-supply forecast skill of CBRFC’s river forecast model by incorporating a physically based, dynamic driver of evaporative demand (E_0), and (ii) instituting a forecast of reference crop evapotranspiration (FRET) throughout the NWS Western Region (WR).

- ~ Increased CBRFC’s streamflow forecast skill by optimizing the evaporation drivers in the Sacramento Soil Moisture Accounting streamflow simulation model;

- ~ Acted as scientific advisor and coordinator to an NWS WR team developing the nation's first real-time forecasts of reference evapotranspiration (FRET), developing E_0 algorithms and climatologies to add value to forecasts, presenting new FRET product at national scientific and professional meetings;
- ~ Developed and hosting real-time and forecast datastreams of E_0 for use by drought-monitoring community, and developing a stand-alone E_0 -based drought metric for use in the input suite for the United States Drought Monitor;
- ~ Liaising with WR headquarters, other RFCs and Weather Forecast Offices (WFOs) to align various disparate efforts on research into ET , and towards distribution and verification of FRET;
- ~ Collaborating with various federal and state agencies (e.g., with USGS towards an ET input to the National Water Census, and the production of official state ET_0 climatologies), with university researchers (e.g., with UCLA on developing remotely sensed E_0), and with other research institutions (e.g., with the Desert Research Institute on large-scale ET estimation);
- ~ Educating colleagues in NWS and NOAA on principles pertaining to ET and E_0 .
- ~ Presenting background scientific and ongoing project material to colleagues at the NWS OHD, NOAA's Climate Prediction Center, the CBRFC, Service Hydrologists at other RFCs, and other WFOs, at various inter-agency, regional and national meetings;
- ~ Leading and collaborating on funding proposals from internal and external (NOAA, NASA, USGS) sources.

Post-Doctoral Fellow

Aug 2005 – Jan 2009

with **Australian National University, Research School of Biological Sciences (RSBS)** *Canberra, Australia*

Examined evaporative dynamics at spatial scales from point to continental, and temporal scales from instantaneous to multi-decadal. Explored E_0 as a driver of drought.

- ~ Designed and conducted a field experiment on fine-scale physics of evaporation pans. Collected, quality-controlled, stored, and analyzed micro-meteorological and thermodynamic data.
- ~ Analyzed trends in evaporative demand and drought exposure and under past and predicted climate change. Examined the effects of non-traditional different evaporative drivers in drought modeling.
- ~ Collated NetCDF output from multiple GCM scenarios and generated intermediate NetCDF output from offline modeling toward the first analysis of evaporative demand under modeled climate change.
- ~ Wrote or co-authored six peer-reviewed journal articles, reported research results in nine presentations at national and international conferences.
- ~ Organized and conducted week-long familiarization programs to attract top undergraduates from Australia and New Zealand to graduate research at RSBS.

Water Resources Engineer and Data Analyst

Jun 2003 – Jul 2005

with **Riverside Technology, inc.** and **Paluster Environmental Services**

Fort Collins, CO

While in graduate school, consulted to National Weather Service (NWS) for flood-forecasting and the Rio Grande Water Conservancy District on an assessment of ET from groundwater in the San Luis Valley, CO.

- ~ Evaluated, analyzed, and managed raw micro-meteorological data. Gathered new literature online.
- ~ Calibrated NWS's river forecasting suite of models (SNOW-17 and Sacramento Soil Moisture Accounting models) for basins in the New England and Southeast River Forecasting Centers.
- ~ Prepared and reviewed academic papers and project reports on procedures and results.

Post-Doctoral Research Fellow and Graduate Research Assistant
with **Colorado State University (CSU), Civil Engineering Department**

May 1996 – May 2005

Fort Collins, CO

Conducted research into a new paradigm in estimating actual ET while first a Graduate Research Assistant, then a Post-Doctoral Research Fellow. Funded by the US Forest Service Rocky Mountain Research Station.

- ~ Evaluated two models of the complementary relationship in regional ET across CONUS and refined one model for use on a regional and seasonal basis.

- ~ Implemented ARC/INFO and ArcView GIS packages to create a suite of user-friendly FORTRAN-nested Arc Macro Language (AML) programs to run *ET* model over CONUS.
- ~ Using station-based and remotely sensed datasets, created the first long-term, monthly, continental-scale, high resolution, accurate time-series of *ET* and intermediate variables.
- ~ Conducted secular trend analyses on 42-year monthly time-series of *ET* and its components.
- ~ Reported research results in peer-reviewed journal articles and at national and regional conferences.

PUBLICATIONS

Peer-reviewed: Papers, chapters, extended abstracts

Worsnop RP, Hoell A, Hatchett BJ, Chapman TB, Breeden ML, Tolby Z, Short KC, and **Hobbins MT** (2026), Characterizing windows of opportunity for prescribed pile and broadcast burning in Northern California. *Fire Ecology*, 22(51), doi:10.1186/s42408-026-00492-6. <https://doi.org/10.1186/s42408-026-00492-6>

Jackson D, **Hobbins MT**, and Abel M (2026), Complementary relationship-derived actual evapotranspiration for operational drought monitoring. *Journal of Hydrometeorology*, 27:887-906, doi:10.1175/JHM-D-25-0169.1. <https://doi.org/10.1175/JHM-D-25-0169.1>

Hoell A, Robinson R, Breeden ML, Guerrero E, **Hobbins MT**, and Worsnop RP (2026), The relationship between the El Niño-Southern Oscillation and wildfire area burned in contiguous United States Geographic Area Coordination Centers. *Journal of Geophysical Research-Atmospheres*, 131:e2025JD045436, doi:10.1029/2025JD045436. <https://doi.org/10.1029/2025JD045436>

Breeden ML, Hoell A, Worsnop RP, Albers JR, **Hobbins MT**, Robinson RM, and Vimont DJ (2025), Seasonal predictability of vapor pressure deficit in the western United States. *Weather and Climate Dynamics*, 6(4):1443-1459, doi:10.5194/wcd-6-1443-2025. <https://doi.org/10.5194/wcd-6-1443-2025>

Kukul M, and **Hobbins MT** (2025), Thirstwaves: Prolonged periods of agricultural exposure to extreme atmospheric evaporative demand for water. *Earth's Future*, 13:e2024EF004870, doi:10.1029/2024EF005276. <https://doi.org/10.1029/2024EF004870>

Lisonbee J, Parker B, Fleishman E, Ford TW, Bocensky RK, Follingstad G, Frazier AG, Hoylman ZH, Hudson AR, Nielsen-Gammon JW, Umphlett NA, Wickham E, Bamzai-Dodson A, Fontenot R, Fuchs B, Hammond JC, Herrick JE, **Hobbins MT**, Hoell A, Jones J, Lane E, Leasor Z, Li Y, Otkin JA, Sheffield A, Todey D, and Pulwarty R (2025), Prioritization of research on drought assessment in a changing climate. *Earth's Future*, 13:e2024EF005276, doi:10.1029/2024EF005276. <https://doi.org/10.1029/2024EF005276>

Hughes MA, Jackson DJ, Unruh D, Wang H, **Hobbins MT**, Ogden FL, Cifelli R, Cosgrove B, DeWitt D, Dugger A, Ford TW, Fuchs B, Glaudemans M, Gochis D, Quiring SM, RafieeiNasab A, Webb RS, Xia Y, and Xu L (2024), Evaluation of retrospective National Water Model soil moisture and streamflow for drought-monitoring applications. *Journal of Geophysical Research-Atmospheres*, 129(6):e2023JD038522, doi:10.1029/2023JD038522. <https://doi.org/10.1029/2023JD038522>

Otkin JA, Woloszyn M, Wang H, Svoboda MD, Skumanich M, Pulwarty R, Lisonbee J, Hoell A, **Hobbins MT**, Haigh T, and Cravens AE (2024), Anticipating flash drought: Formulating a system for early warning and even earlier action. *Bulletin of the American Meteorological Society*, 105(2):103-105. <https://doi.org/10.1175/BAMS-D-21-0288.A>

Stuart L, **Hobbins MT**, Niebuhr E, Ruane AC, Pulwarty R, Hoell A, Thiaw WM, Muñoz-Arriola F, Jahn M, and Farrar M (2024), Enhancing global food security: Opportunities for the American Meteorological Society. Published online at *Bulletin of the American Meteorological Society*, doi:10.1175/BAMS-D-22-0106.1. <https://doi.org/10.1175/BAMS-D-22-0106.1>

Christian JI, **Hobbins MT**, Hoell A, Otkin JA, Ford TW, Cravens AE, Powlen KA, Wang H and Mishra V (2024), Flash drought: A state of the science review. *WIREs Water*, 11(3):e1714, doi:10.1002/wat2.1714. <https://doi.org/10.1002/wat2.1714>

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

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

Baghban S, Bozorg-Haddad O, Berndtsson R, **Hobbins MT**, and Al-Ansari N (2022), Mitigation and adaptation measures. Chapter 9 in: *Climate Change in Sustainable Water Resources Management*, edited by Bozorg-Haddad O, Springer Water, Singapore. ISBN:978-981-19-1898-8, doi:10.1007/978-981-19-1898-8_9. https://doi.org/10.1007/978-981-19-1898-8_9

Abadi A, Gwon Y, Gribble M, Berman J, Bilotta R, **Hobbins MT**, and Bell J (2022), Drought and all-cause mortality risk in Nebraska from 1980 to 2014: Time-series analyses by age, sex, race, urbanicity and temporality of drought. *Science of the Total Environment*, 840:156660, doi:10.1016/j.scitotenv.2022.156660. <https://doi.org/10.1016/j.scitotenv.2022.156660>

McEvoy DJ, Roj S, Dunkerly C, McGraw D, Huntington JL, **Hobbins MT**, and Ott T (2022), Validation and bias correction of forecast reference evapotranspiration for agricultural applications in Nevada, USA. *Journal of Water Resources Planning and Management*, 148(11):04022057, doi:10.1061/(ASCE)WR.1943-5452.0001595. <https://ascelibrary.org/doi/full/10.1061/%28ASCE%29WR.1943-5452.0001595>

Hoffmann D, Gallant A, and **Hobbins MT** (2021), Flash drought in CMIP5 models. *Journal of Hydrometeorology*, 22:1439-1454, doi:10.1175/JHM-D-20-0262.1. <https://doi.org/10.1175/JHM-D-20-0262.1>

Parker T, Gallant A, **Hobbins MT**, and Hoffmann D (2021), Flash drought in Australia and its relationship to evaporative demand. *Environmental Research Letters*, 16(6):064033, doi:10.1088/1748-9326/abfe2c. <https://doi.org/10.1088/1748-9326/abfe2c>

Kew SF, Philip SY, Hauser M, **Hobbins MT**, Wanders N, van Oldenborgh GJ, van der Wiel K, Veldkamp TIE, Kimutai J, Funk CC, and Otto FEL (2021), Impact of precipitation and increasing temperatures on drought in eastern Africa. *Earth System Dynamics*, 12:17-35, doi:10.5194/esd-12-17-2021. <https://doi.org/10.5194/esd-12-17-2021>

Hobbins MT, and Barsugli JJ (2020), Threatening the vigor of the Colorado River: Loss of sunlight-reflecting snow spurs evaporation and ebbs river flow. *Science*, 367(6483):1192-1193, doi:10.1126/science.abb3624. <https://doi.org/10.1126/science.abb3624>

Pendergrass AG, Meehl GA, Pulwarty RS, **Hobbins MT**, Hoell A, AghaKouchak A, Bonfils CJW, Gallant AJE, Hoerling M, Hoffmann D, Kaatz L, Lehner F, Llewellyn D, Mote P, Neale RB, Overpeck JT, Sheffield A, Stahl K, Svoboda MD, Wheeler MC, Wood AW, and Woodhouse CA (2020), Flash droughts present a new challenge for subseasonal-to-seasonal prediction. *Nature Climate Change*, 10:191-199, doi:10.1038/s41558-020-0709-0. <https://doi.org/10.1038/s41558-020-0709-0>

Zhang B, Xia Y, Long B, **Hobbins MT**, Zhao X, Hain CR, Li Y, and Anderson MC (2020), Evaluation and comparison of multiple evapotranspiration data models over the contiguous United States: Implications for the next phase of NLDAS (NLDAS-Testbed) development. *Agricultural and Forest Meteorology*, 280(107810), doi:10.1016/j.agrformet.2019.107810. <https://doi.org/10.1016/j.agrformet.2019.107810>

Hobbins MT, Dewes CF, Huntington JL, McEvoy DJ, Rangwala I, Shukla S, and Yocum HM (2019), Evaporative demand: Dynamics and opportunities in drought early warning, monitoring, and vulnerability assessment. *Proceedings of the 6th Interagency Conference on Research in the Watersheds*, Shepherdstown, WV, 23-26 July, doi:10.2737/SRS-GTR-243. <https://tinyurl.com/zwaaf7sy>

Rangwala I, and **Hobbins MT** (2019), Flash droughts in the Mountain West: Emerging risks under a warmer climate. *Mountain Views*, 13(1): 34-37. <https://tinyurl.com/s54w8488>

Hobbins MT, Senay GB, Gowda PH, and Artan GA (2019), Evapotranspiration and evaporative demand. Chapter 3 in: *Statistical Analysis of Hydrological Variables: Methods and Applications*, edited by Teegavarapu R, Salas JD, and Stedinger JR, American Society of Civil Engineers-Environmental Water Resources Institute, Reston, VA, ISBN:9780784415177, doi:10.1061/9780784415177.ch03. <https://doi.org/10.1061/9780784415177.ch03>

Hobbins MT, Rangwala I, Barsugli JJ, and Dewes CF (2019), Extremes in evaporative demand and their implications for drought and drought monitoring in the 21st Century. Chapter 25 in: *Extreme Hydrology and Climate Variability: Monitoring, Modeling, Adaptation and Mitigation*, edited by Melesse AM, Abtew W, and Senay GB, Elsevier, New York, NY, ISBN:9780128159989. <https://tinyurl.com/z7v6tn4>

McEvoy DJ, **Hobbins MT**, Brown TJ, VanderMolen KA, Wall TU, Huntington JL, and Svoboda MD (2019), Establishing relationships between drought and wildfire danger indices: A test case for the California-Nevada Drought Early Warning System. *Climate*, 7(52), doi:10.3390/cli7040052. <https://www.mdpi.com/2225-1154/7/4/52>

McNeeley SM, Dewes CF, Stiles CJ, Beeton TA, Rangwala I, **Hobbins MT**, and Knutson CL (2018), Anatomy of an interrupted irrigation season: Micro-drought at the Wind River Indian Reservation. *Climate Risk Management*, 19: 61-82, doi:10.1016/j.crm.2017.09.004. <https://doi.org/10.1016/j.crm.2017.09.004>

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PRESENTATIONS

Invited presentations

Hobbins MT (2026), Decomposition of the demand side of the drought-wildfire nexus. *NOAA Fire Research from Conditions to Impacts webinar*, virtual, 3 June.

Hobbins MT (2026), The Famine Early Warning Systems Network. *CIESRDS 5-year Review*, Boulder, CO, 17 March.

Hobbins MT, Ullrich P, Hatchett B, Rhoades A, and Levine C (2025), Emerging climate science panel. *Delta Independent Science Board Climate Symposium*, Davis, CA, 16 September.

Hobbins MT (2025), Re-thinking drought's demand side: A love song to evaporative demand. *Delta Independent Science Board Climate Symposium*, Davis, CA, 16 September.

Hobbins MT (2025), Using NLDAS drivers in drought monitoring: the Evaporative Demand Drought Index (EDDI). *NASA NLDAS-3 Drought Monitoring Workshop*, virtual, 10 April.

Hobbins MT (2024), Opportunities for collaboration on drought research. *University of Catania Civil Engineering Department seminar*, Catania, Italy, 16 July.

Hobbins MT and the EDDI Team (2023), The Evaporative Demand Drought Index “EDDI” and flash drought. *NIDIS Flash Drought Workshop*, Boulder, CO, 2-4 May.

Hobbins MT (2023), Beyond the rain: non-stationarity in the demand side of drought. *NIDIS Assessing Drought in a Changing Climate webinar*, virtual, 10 February. <https://tinyurl.com/mr3zfdry>

Hobbins MT (2021), The Evaporative Demand Drought Index (EDDI) and the current drought in the western United States. *AWWA Western U.S. Drought: What you need to know Webinar Series*, virtual, 24 August. <https://tinyurl.com/kxjc852r>

Cravens A, **Hobbins MT**, Lisonbee J, and Woloszyn M (2021), Flash drought: Current understanding and future priorities. *NIDIS Flash Drought Webinar Series*, virtual, 3 August. <https://tinyurl.com/47tkvrp2>

Hobbins MT (2021), The Evaporative Demand Drought Index (EDDI) in the Southeast DEWS region. *Apalachicola-Chattahoochee-Flint Drought Early Warning System webinar*, virtual, 22 June. <https://tinyurl.com/4zta3cu2>

Ray A, Bianco L, **Hobbins MT**, Scott J, Slivinski L, and Switanek M (2020), Transitions: Research to Applications (R2X). *NOAA Physical Sciences Laboratory Review*, virtual, 19 November.

Hobbins MT, Jackson DL, McEvoy DJ, Rangwala I, and Yocum HM (2020), The Evaporative Demand Drought Index (EDDI): Early warning, monitoring, and attribution of drought. *NOAA Eastern Region Climate Services webinar*, virtual, 30 July. <https://tinyurl.com/ddvcpft6>

Hobbins MT, and Ramírez JA (2019), Evapotranspiration, evaporative demand, and Jorge Ramírez: 25 years from fundamental research to applied tools. *39th Annual AGU Hydrology Days*, Fort Collins, CO, 27-29 March.

Ek MB, Franz KJ, Gochis DJ, **Hobbins MT**, and Lettenmaier DP (2019), The AMS Hydrology Committee: The past, present and future. *Town Hall Meeting, 99th American Meteorological Society Annual Meeting*, Phoenix, AZ, 6-10 January.

Hobbins MT (2018), The Evaporative Demand Drought Index: Early warning, monitoring, and attribution of drought, flash drought, and fire-risk. *Denver Water*, Denver, CO, 26 November.

Hobbins MT, McEvoy DJ, and Shukla S (2018), Evaporative demand: Dynamics and opportunities in drought early warning, monitoring, and S2S predictability. *Aspen Global Change Institute Workshop: When the Rain Stops: Drought on Sub-seasonal and Longer Timescales*, Aspen, CO, 10-14 September.

Hobbins MT, Dewes CF, Huntington JL, McEvoy DJ, Rangwala I, and Shukla S (2018), Evaporative demand: Dynamics and opportunities in drought early warning, monitoring, and vulnerability assessment. *Interagency Conference on Research in the Watersheds: Working Watersheds and Coastal Systems: Research and Management for a Changing Future*, Shepherdstown, WV, 23-26 July.

Hobbins MT (2018), The Evaporative Demand Drought Index (EDDI): An emerging drought-monitoring and early warning tool. *43rd Annual Natural Hazards Research and Applications Workshop*, Broomfield, CO, 8-11 July.

Hobbins MT, Dewes CF, Huntington JL, McEvoy DJ, Morton CG, and Yocum HM (2018), Introducing the Evaporative Demand Drought Index (EDDI): A new drought-monitoring and early warning tool. *North American Drought Monitor Forum*, Calgary, AB, Canada, 1-3 May.

Hobbins MT, Barsugli JJ, Dewes CF, Huntington JL, Lukas JJ, McEvoy DJ, Morton CG, Rangwala I, Ray AJ, Smith C, Wood AW, and Yocum HM (2018), The Evaporative Demand Drought Index (EDDI): Early warning and monitoring of drought from the demand side. *American Water Works Association Sustainable Water Management Conference*, Seattle, WA, 25 March.

Hobbins MT, McEvoy DJ, Wood AW, and Huntington JL (2017), The Evaporative Demand Drought Index (EDDI): A new drought monitoring and early warning tool. *Universities Council on Water Resources / National Institutes for Water Resources Conference*, Fort Collins, CO, 13-15 June.

Hobbins MT, Barsugli JJ, Dewes CF, Huntington JL, Lukas JJ, McEvoy DJ, Morton CG, Rangwala I, Ray AJ, and Yocum HM (2017), The Evaporative Demand Drought Index (EDDI): An emerging drought-monitoring and early warning tool. *U.S. Drought Monitor Forum*, Keystone, SD, 3-5 April.

Hobbins MT (2017), The Evaporative Demand Drought Index (EDDI): A new drought monitoring and early warning tool. *Colorado Water Conservation Board Water Availability Task Force meeting*, Denver, CO, 21 March.

Hobbins MT (2017), The Evaporative Demand Drought Index (EDDI): An emerging drought-monitoring and early warning tool. *Missouri River Basin Drought Early Warning System Meeting and New Tools Workshop*, Nebraska City, NE, 7-9 March.

Hobbins MT (2016), The Evaporative Demand Drought Index (EDDI): An emerging drought-monitoring and early warning tool. *DWD-NOAA Workshop*, Dresden, Germany, 16-18 November.

Hobbins MT (2016), The Evaporative Demand Drought Index (EDDI): An emerging drought-monitoring and early warning tool. *Pacific Northwest Drought Early Warning System Meeting*, Boise, ID, 10 November. <https://tinyurl.com/w8n3tcut>

Hobbins MT (2016), The Evaporative Demand Drought Index (EDDI): An emerging drought-monitoring and early warning tool. *Intermountain West Drought Early Warning System Meeting*, Denver, CO, 25 October.

Hobbins MT (2016), Large-scale evaporative demand: Opportunities in reanalyses, forecasting, and projections. *US Committee on Irrigation and Drainage Evapotranspiration Workshop*, Fort Collins, CO, 13 October.

Hobbins MT (2016), The Evaporative Demand Drought Index (EDDI): An emerging drought-monitoring and early warning tool. *Intermountain West Drought Early Warning System Drought and Climate Outlook Meeting*, Oracle, AZ, 20 September.

Hobbins MT (2016), Evapotranspiration and drought: Early warning, monitoring, and climate-scale projections. *Cooperative Institute for Research in Environmental Sciences Review*, Boulder, CO, 29-31 August.

Hobbins MT (2015), Evaporative demand (and evapotranspiration): Modeling and projections. *Workshop on High-Resolution Climate Modeling in the Northern Great Plains*, Boulder, CO, 24-25 September.

Hobbins MT (2015), Gridded weather and reference ET data for US and global ET mapping. *International Workshop on Evapotranspiration Mapping for Water Security*, Washington, D.C., 15-17 September.

Hobbins MT (2014), NOAA's reference ET forecast and reanalysis products. *WEA-1022 Meteorological and Climate Data to Support ET-Based Irrigation Scheduling, Water Conservation, and Water Resources Management*, Orlando, FL, 17-18 September.

Hobbins MT (2014), Evapotranspiration and evaporative demand: How important are physically based estimates? *North Central Climate Science Center: Mini Workshop on Evapotranspiration*, Fort Collins, CO, 5 May.

Hobbins MT (2013), Evaporative demand: Drought impacts and assessment. *Western States Water Council-California Department of Water Resources Workshop on Measuring, Quantifying, and Reporting Drought Impacts*, San Diego, CA, 5-7 August.

First-author presentations

Hobbins MT (2026), EDDI tool for week-2 hazards in CPC's Monthly Drought Outlook. *CPC Webinar*, Boulder, CO, 1 April.

Hobbins MT, Wang H, Pan Y, and Uzoma A (2026), [The Evaporative Demand Drought Index \(EDDI\): Updates and improvements](#). *Joint PSL-CPO webinar*, Boulder, CO, 24 March.

Hobbins MT, Ray AJ, Pan Y, Wang H, Abel MR, Counts K, Rosencrans M, Uzoma A, and Yocum H (2026), The second time's the charm: Operationalizing the Evaporative Demand Drought Index at the NOAA-Climate Prediction Center. *106th AMS Annual Meeting*, Houston, TX, 25-29 January. (Oral)

Hobbins MT (2026), Examining drought from the demand side for improved food security analyses. *106th AMS Annual Meeting*, Houston, TX, 25-29 January. (Oral)

Hobbins MT, Hughes ML, Ray A, Pan Y, Pugh B, Rosencrans M, Wang H, and Glaudemans M (2024), The Evaporative Demand Drought Index (EDDI): Operationalizing the computation and dissemination of EDDI and value-added products for CONUS-wide drought monitoring and early warning at NOAA-CPC. *NOAA-Climate Prediction Center webinar*, College Park, MD, 13 March. (Oral)

Hobbins MT and Harrison L (2024), Drought in Africa: diagnosing demand side drivers. *104th American Meteorological Society Annual Meeting*, Baltimore, MD, January 29-February 1. (Oral)

Hobbins MT (2024), A new global reference evapotranspiration dataset for FEWS NET: Opportunities in monitoring food security and famine early warning. *104th American Meteorological Society Annual Meeting*, Baltimore, MD, January 29-February 1. (Oral)

Hobbins MT, Boiko O, Budde M, Dewes CF, Hoell A, Husak G, Jansma T, Jayanthi H, McNally A, Magadzire T, Mogane P, Sarmiento DP, Senay GB, and Turner W (2023), Global reference evapotranspiration: Opportunities in operational drought monitoring and famine early warning. *FEWS NET Science Meeting*, Boulder, CO, June 13-15 (Oral).

Hobbins, MT, Boiko O, Dewes CF, Hoell A, Husak G, Jayanthi H, Magadzire T, McNally A, Sarmiento DP, Senay GB, and Turner W (2023), A new global reference evapotranspiration reanalysis: global opportunities in operational drought monitoring and famine early warning. Abstract EGU23-16989, *European Geosciences Union General Assembly*, Vienna, Austria, 23-28 April. (PICO)

Hobbins MT, Jackson DL, Hughes M, and Woloszyn M (2022), A rigorous attribution of the demand side of drought: a case study in the Midwest US. Abstract EGU22-13137, *European Geosciences Union General Assembly*, Vienna, Austria, 23-27 May. (Oral)

Hobbins MT, Jackson DL, Hughes M, and Woloszyn M (2022), A rigorous attribution of the demand side of agricultural drought: a case study in the Midwest US. *102nd American Meteorological Society Annual Meeting*, Houston, TX, 24-27 January. (Oral) <https://tinyurl.com/44r5ppb8>

Cifelli R, **Hobbins MT**, Morales A, Currier WR, Mahoney K, Bytheway J, Biswas S, Radhakrishnan C, Hughes MA, and Stovern D (2021), Hydrometeorology Modeling and Applications team: Perspectives on water research. *NOAA Physical Sciences Laboratory Science Days*, virtual, 18 November. (Oral)

Hobbins MT, McEvoy DJ, Rangwala I, Xia S, and Yocum HM (2021), Drought indices and indicators for the Northeast: NOAA's Evaporative Demand Drought Index (EDDI). *Northeast DEWS Drought Indicators and Tools Webinar series*, virtual, 14 September. (Webinar)

Hobbins MT, McEvoy DJ, Rangwala I, Xia S, and Yocum HM (2021), Drought indices and indicators for the Northeast: Flash drought. *Northeast DEWS Drought Indicators and Tools Webinar series*, virtual, 7 September. (Webinar) <https://tinyurl.com/4t2xhhmh>

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Bhardwaj J, Parker T, **Hobbins MT**, and Hoffmann D (2026), Variability of reference evapotranspiration and its sensitivity to four major drivers: Applications for extremes. *Australian Meteorological and Oceanographic Society*, Hobart, Tas., Australia, 18-20 February. (Oral)

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Hughes MA, Jackson DL, Unruh D, **Hobbins MT**, Cifelli R, Webb RS, Salas F, Glaudemans MJ, Ogden F, Meng J, Wang H, and DeWitt D (2020), Evaluating the National Water Model for stakeholders' needs. *NOAA PSL flash seminar series*. Boulder, CO, 21 April. (Oral)

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Jackson DL, Hughes MA, Zamora RJ, Cifelli R, **Hobbins MT**, and Webb RS (2019), Characteristics of National Water Model and North American Land Data Assimilation System soil moisture climatological distributions in the Mediterranean climate of the California Russian River basin. *99th American Meteorological Society Annual Meeting*, Phoenix, AZ, 6-10 January. (Poster)

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Hughes MA, Jackson DL, Zamora RJ, Cifelli R, **Hobbins MT**, Salas F, Sparrow K, Webb RS, DeWitt DG, and Colohan P (2018), Development of prototype National Water Model soil moisture products for drought monitoring. Abstract H41P-2341, *2018 Fall Meeting, AGU*, Washington D.C., 10-14 December. (Poster)

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