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

Cooperative Institute for Research in Environmental Sciences
University of Colorado, Boulder, CO 80309-0216
303-497-3092 • mike.hobbins@noaa.gov

PROFESSIONAL SUMMARY

Scientific Research Experience

- Recent research foci:
 - ~ developing operational, real-time forecasts and reanalyses of hydrologic variables at continental and global scales;
 - ~ examining the effects of climate change and variability on the hydrosphere, specifically moisture dynamics at the land surface-atmosphere interface;
 - ~ partitioning dynamics of secular hydrologic trends and variability, particularly in evaporative drivers;
 - ~ quantifying and describing the spatial distribution of large-scale, natural water supply;
 - ~ reformulating and improving modeling and metering of drought.
- Core research skills:
 - ~ spatial and time-series analyses;
 - ~ hydrologic model creation, calibration, and assessment;
 - ~ GIS and programming (UNIX/Linux scripting, FORTRAN, IDL, Python);
 - ~ management of large datasets;
 - ~ fieldwork, including flow gauging and tracing, water quality and soil sampling, surveying, and hydrometeorologic experimentation from design and field-data capture to troubleshooting;
 - ~ outreach with stakeholders and scientists from other fields (climatologists, ecologists, economists);
 - ~ communicating with diverse audiences on various topics through peer-reviewed scientific literature, conference papers, and direct instruction.

Service and Teaching Experience

- Science community service:
 - ~ chair: evapotranspiration sessions at 2012-2015 American Meteorological Society meetings;
 - ~ chair and session proposer: evapotranspiration and drought session at 2014 American Geophysical Union Fall Meeting;
 - ~ lead author: chapter on evapotranspiration in American Society of Civil Engineers Environmental Water Resources Institute manual, *Statistical Distributions in Hydrology*;
 - ~ lead author: chapter on evapotranspiration and evaporative demand in *Handbook of Applied Hydrology*, McGraw-Hill;
 - ~ convenor: year-long, weekly seminar series for in-house, national, and international speakers at Research School of Biological Sciences, Australian National University;
 - ~ peer reviewer: Climatic Change, Earth Interactions; Environmental Research Letters; Geophysical Research Letters; Hydrological Processes; Hydrology Research; International Journal of Climatology; IPCC Fourth Assessment Report; Journal of Applied Meteorology; Journal of Geophysical Research-Atmospheres; Journal of Great Lakes Research; Journal of Hydrologic Engineering; Journal of Hydrology; Journal of Hydrometeorology; Journal of Water Resources Management; PLOS ONE; Theoretical and Applied Climatology; Water Resources Research.
- Teaching experience:
 - ~ 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 committee member for Daniel McEvoy, University of Nevada-Reno.

EDUCATION

- Doctor of Philosophy** 2004
Hydrologic Science and Engineering Colorado State University
Dissertation: *Regional evapotranspiration and pan evaporation: Complementary interactions and long-term trends across the conterminous United States.*
- Master of Science** 2000
Hydrologic Science and Engineering Colorado State University
Thesis: *Evaluating and enhancing two implementations of the complementary relationship in regional evapotranspiration.*
- Bachelor of Engineering (Honors)** 1989
Civil Engineering University of Leeds, UK

PRIZES AND AWARDS

- ~ Best M.S. Student Paper Award at 19th Annual AGU Hydrology Days conference, 1999.
- ~ H. W. Shen Water Resources Graduate Award, Colorado State University, 2001.
- ~ National Science Foundation (NSF) Computer Science, Engineering, and Mathematics Scholarship, 2002.
- ~ Gary Comer Abrupt Climate Change Fellowship, 2005 – 2008.

RELEVANT WORK EXPERIENCE

Visiting Scientist Oct 2012 – Present
National Integrated Drought Information System (NIDIS), NOAA-Earth System Research Laboratory (NOAA-ESRL) Boulder, CO

Developing a national reference evapotranspiration (ET_0) service for NOAA and NIDIS stakeholders and the National Water Center and a global ET_0 service for the Famine Early Warning Systems Network (FEWS NET). Contracted to NOAA through first, the University Corporation for Atmospheric Research (UCAR) Visiting Scientist Program and, second, the Cooperative Institute for Research in Environmental Sciences (CIRES).

- ~ Developing NOAA's first ET_0 product – physically based, daily, CONUS-wide, accurate, long-term – automation of production, verification against observations, bias-correction and data assimilation;
- ~ Developing FEWS NET's first ET_0 product – physically based, daily, global, accurate, long-term – automation of production, verification against observations, bias-correction and data assimilation;
- ~ Acting as scientific advisor and coordinator to an NWS-wide team developing the nation's first real-time forecasts of ET_0 (FRET), developing ET_0 algorithms and climatologies to add value to forecasts, presenting new FRET product at national scientific and professional meetings;
- ~ Developing and testing a new ET_0 -based drought index (EDDI);
- ~ Outreach to stakeholders, including within NOAA, other US government agencies, academics (including ecologists and economists), intergovernmental groups such as Western Governor's Association, state climatologists (UT, CO, and CA), students in training courses (COMET);
- ~ Hiring a post-doc: reviewing application material and conducting interviews; Responsible for developing own funding streams through strategic grant-seeking, from NOAA Office of Hydrologic Development (OHD), NIDIS, and the Famine Early Warning Systems Network (FEWS NET).

Visiting Scientist

Oct 2009 – Oct 2012

National Weather Service (NWS), Colorado Basin River Forecast Center (CBRFC) *Salt Lake City, UT*

Improving 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). Contracted to NWS-CBRFC through Wyle Information Systems Group and UCAR Visiting Scientist Program.

- ~ 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 ET_0 (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

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 seven oral papers and two posters 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

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
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

Moorhead J, Gowda P, **Hobbins MT**, Senay G, Paul G, Marek T, and Porter D (2015), Accuracy Assessment of NOAA Gridded Daily Reference Evapotranspiration for the Texas High Plains. *Journal of the American Water Resources Association* (in press).

King DA, Bachelet DM, Symstad AJ, Ferschweiler K, and **Hobbins MT** (2015), Estimation of potential evapotranspiration from extraterrestrial radiation, air temperature and humidity to assess future climate change effects on the vegetation of the Northern Great Plains, USA. *Ecological Modelling* (2015): 86–97, doi:10.1016/j.ecolmodel.2014.10.037.

Xia Y, **Hobbins MT**, Mu Q, and Ek MB (2014), Evaluation of NLDAS-2 evapotranspiration against tower flux site observations. *Hydrologic Processes*, doi:10.1002/hyp.10299

Bardsley T, Wood A, **Hobbins MT**, Kirkham T, Briefer L, Niermeyer J, and Burian S (2013), Planning for an uncertain future: Climate change sensitivity assessment towards adaptation planning for public water supply. *Earth Interactions*, 17(23), doi:10.1175/2012EI000501.1

Lim WH, Roderick ML, **Hobbins MT**, Wong SC, Farquhar GD (2013), The energy balance of a US Class A evaporation pan. *Agricultural and Forest Meteorology*, 182–183: 314–331, doi:10.1016/j.agrformet.2013.07.001

Hobbins MT, Wood A, Streubel D, and Werner K (2012), What drives the variability of evaporative demand across the conterminous United States? *Journal of Hydrometeorology*, 13:1195–1214, doi:10.1175/JHM-D-11-0101.1

Lim WH, Roderick ML, **Hobbins MT**, Wong SC, Groeneveld PJ, Sun F, and Farquhar GD (2012), The aerodynamics of pan evaporation. *Agricultural and Forest Meteorology*, 152: 31–43, doi:10.1016/j.agrformet.2011.08.006

Szilagyi J, **Hobbins MT**, and Jozsa J (2009), Modified advection-aridity model of evapotranspiration. *Journal of Hydrologic Engineering*, 14(6): 569–574, doi:10.1061/(ASCE)HE.1943-5584.0000026.

Roderick ML, **Hobbins MT**, and Farquhar GD (2009), Pan evaporation trends and the terrestrial water balance. I. Principles and observations. *Geography Compass*, 3(2): 746–760, doi:10.1111/j.1749-8198.2008.00213.x.

Roderick ML, **Hobbins MT**, and Farquhar GD (2009), Pan evaporation trends and the terrestrial water balance. II. Energy balance and interpretation. *Geography Compass*, 3(2): 761–780, doi: 10.1111/j.1749-8198.2008.00214.x.

Brown TC, **Hobbins MT**, and Ramírez JA (2008), Spatial distribution of water supply in the coterminous United States. *Journal of the American Water Resources Association*, 44(6): 1474-1487, doi:10.1111/j.1752-1688.2008.00252.x.

Hobbins MT, Dai A, Roderick ML, and Farquhar GD (2008), Revisiting the parameterization of potential evaporation as a driver of long-term water balance trends. *Geophysical Research Letters*, 35, L12403, doi:10.1029/2008GL033840.

Roderick ML, Rotstajn LD, Farquhar GD, and **Hobbins MT** (2007), On the attribution of changing pan evaporation. *Geophysical Research Letters*, 34, L17403, doi:10.1029/2007GL031166.

Ramírez JA, **Hobbins MT**, and Brown TC (2005), Observational evidence of the complementary relationship in regional evaporation lends strong support for Bouchet's hypothesis. *Geophysical Research Letters*, 32, L15401, doi:10.1029/2005GL023549.

Hobbins MT, Ramírez JA, and Brown TC (2004), Trends in pan evaporation and actual evaporation across the conterminous U.S.: Paradoxical or complementary? *Geophysical Research Letters*, 31(13): L13503, doi:10.1029/2004GL0198426.

Hobbins MT, Ramírez JA, and Brown TC (2004), Developing a long-term, high-resolution, continental-scale, spatially distributed time-series of topographically corrected solar radiation, In: *Proceedings of the Twenty-fourth Annual AGU Hydrology Days*, Colorado State University, Fort Collins, CO, March 10-12.

Hobbins MT, Ramírez JA, Brown TC, and Claessens LHJM (2001), The complementary relationship in estimation of regional evapotranspiration: The CRAE and Advection-aridity models. *Water Resources Research*, 37(5): 1367-1387.

Hobbins MT, Ramírez JA, and Brown TC (2001), The complementary relationship in estimation of regional evapotranspiration: An enhanced Advection-aridity model. *Water Resources Research*, 37(5): 1389-1403.

Hobbins MT, Ramírez JA, and Brown TC (2001), Trends in regional evapotranspiration across the United States under the complementary relationship hypothesis, In: *Proceedings of the Twenty-first Annual AGU Hydrology Days*, Colorado State University, Fort Collins, CO, April 2-5, pp. 106-121.

Hobbins MT, Ramírez JA, and Brown TC (1999), The complementary relationship in regional evapotranspiration: The CRAE model and the Advection-aridity approach, In: *Proceedings of the Nineteenth Annual AGU Hydrology Days*, Colorado State University, Fort Collins, CO, August 16-20, pp. 199-212.

Chapters and Papers Submitted

Hobbins MT (2015), The variability of ASCE Standardized Reference Evapotranspiration: a rigorous, CONUS-wide decomposition and attribution. Submitted to *Transactions of the ASABE*.

Hobbins MT and Huntington J (2015), Chapter 44: Evapotranspiration and evaporative demand. Submitted to *Handbook of Applied Hydrology*, McGraw-Hill.

Hobbins MT, Senay G, Gowda P, and Artan GA (2013), Chapter 4: Evapotranspiration and evaporative demand. Submitted to *Statistics in Hydrology*, American Society of Civil Engineers-Environmental Water Resources Institute.

Technical Reports

Hobbins MT (2010), What are Evapotranspiration and Forecast Reference Crop Evapotranspiration (FRET)? <http://www.wrh.noaa.gov/forecast/evap/FRET/ExplainingFRETscientific.pdf>, accessed December 13, 2010.

Brown TC, **Hobbins MT**, and Ramírez JA (2005), The source of water supply in the United States, RMRS-RWU 4851 Discussion Paper, *Rocky Mountain Research Station, US Forest Service*, Fort Collins, CO.

Hobbins MT, Ramírez JA and Brown TC (2000), The Complementary Relationship in the Estimation of Regional Evapotranspiration: An Enhanced Advection-Aridity Model, Open File Report No.13, Colorado Water Resources Research Institute, Colorado State University, Fort Collins, CO.

Hobbins MT and Bowen B (1995), Water Quality Discipline Report: I-5 High Occupancy Vehicle Lane Project, Mounts Road to Fife Interchange, Washington State Department of Transportation, Olympia, WA.

Hobbins MT (1995), National Pollution Discharge Elimination System Permit Application: Pierce County, Washington State Department of Transportation, Olympia, WA.

Hobbins MT (1995), Global Positioning System Protocol, Washington State Department of Transportation, Olympia, WA.

Hobbins MT (1995), Outfall Inventory and Field Screening Project Report: WSDOT Olympic Region, Washington State Department of Transportation, Olympia, WA.

PRESENTATIONS

Invited Presentations

Hobbins MT (2014), A global reference ET service for FEWS NET: goals, tasks, and uses. *FEWS NET Science Update Meeting: Putting Drought in Historical Context*, Boulder, CO, 19-20 November.

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, McEvoy DJ, Huntington JL, Wood AW, and Verdin JP (2015), The Physical Basis of the Evaporative Demand Drought Index, *American Meteorological Society Annual Meeting*, Phoenix, AZ, 4-8 January. (Poster)

Hobbins MT, McEvoy DJ, Huntington JL, Wood AW, and Verdin JP (2014), The Evaporative Demand Drought Index: The Physical Basis, *Eos Trans. AGU*, Fall Meet. Suppl., Abstract H41B-0799, San Francisco, CA, 15-19 December. (Poster)

Hobbins MT, Senay GB, and Verdin J (2014), NOAA introduces its multi-generational reference evapotranspiration product, *ASABE International Symposium on Evapotranspiration: Challenges in Measurement and Modeling from Leaf to the Landscape Scale and Beyond*, Raleigh, NC, 7-10 April. (Oral)

Hobbins MT, Wood AW, McEvoy D, and Huntington J (2014), An Evaporative Demand Drought Indicator (EDDI), *ASABE International Symposium on Evapotranspiration: Challenges in Measurement and Modeling from Leaf to the Landscape Scale and Beyond*, Raleigh, NC, 7-10 April. (Oral)

Hobbins MT (2014), What drives the spatial and temporal variability of evaporative demand across CONUS? *ASABE International Symposium on Evapotranspiration: Challenges in Measurement and Modeling from Leaf to the Landscape Scale and Beyond*, Raleigh, NC, 7-10 April. (Poster)

Hobbins MT, Geli HME, Lewis C, Senay GB, and Verdin JP (2013), NOAA introduces its first-generation reference evapotranspiration product, *Eos Trans. AGU*, Fall Meet. Suppl., Abstract H53E-1453, San Francisco, CA, 9-13 December. (Poster)

Hobbins MT (2013), What drives spatial and temporal variability of evaporative demand across CONUS? A 1st-order, 2nd-moment variability analysis of potential evaporation, *Thirty-third Annual AGU Hydrology Days*, Fort Collins, CO, 25-27 March. (Oral)

Hobbins MT, Wood A, Werner K, and Streubel D (2012), The drivers of spatial and temporal variability of potential evaporation across CONUS: Laying poor parameterizations to rest with a first-order, second-moment variability analysis, *Eos Trans. AGU*, Fall Meet. Suppl., Abstract H44A-06, San Francisco, CA, 3-7 December. (Oral)

Hobbins MT, Wood A, Werner K, and Streubel D (2012), What drives the spatial and temporal variability of potential evaporation across CONUS and the Colorado River basin? *Utah State University Spring Runoff Conference*, Logan, UT, 3-4 April. (Oral)

Hobbins MT, Wood A, and Werner K (2011), Improving drought monitoring and predictions using physically based evaporative demand estimates, *Eos Trans. AGU*, Fall Meet. Suppl., Abstract H43H-1322, San Francisco, CA, 5-9 December. (Poster)

Hobbins MT, Wood A, Werner K, and Hogue T (2011), Evapotranspiration estimation at the NOAA-NWS-Colorado Basin River Forecast Center: Operational challenges and research opportunities, *Western States Remote Sensing of ET Workshop*, Boise, ID, 12-13 October. (Poster)

Hobbins MT, Wood A, and Werner K (2011), Examining the role of evaporative demand in drought monitoring, *NASA Workshop on Global Drought Monitoring*, Silver Spring, MD, 11-12 April. (Oral)

Hobbins MT, Streubel D, Wood A, and Werner K (2011), Examining the spatio-temporal variability of potential evaporation across the conterminous US, *NASA/USDA Workshop on Evapotranspiration: An Essential Observation for Climate Understanding and Efficient Water Management*, Silver Spring, MD, 5-7 April. (Poster)

Hobbins MT, Streubel D, Werner K, and Brandon D (2011), Developing two long-term, daily datasets of evaporative demand across the conterminous US, *NASA/USDA Workshop on Evapotranspiration: An Essential Observation for Climate Understanding and Efficient Water Management*, Silver Spring, MD, 5-7 April. (Poster)

Hobbins MT, Streubel D, and Werner K (2011), Forecasting evaporative demand across the conterminous US, *NASA/USDA Workshop on Evapotranspiration: An Essential Observation for Climate Understanding and Efficient Water Management*, Silver Spring, MD, 5-7 April. (Oral)

Hobbins MT, Streubel D, and Werner K (2011), Forecasting evaporative demand across the conterminous US, *Utah State University Spring Runoff Conference*, Logan, UT, 29-30 March. (Oral)

Hobbins MT, Streubel D, and Werner K (2011), Forecasting evaporative demand across the conterminous US, *Climate Prediction Application Science Workshop*, Des Moines, IA, 1-4 March. (Oral)

Hobbins MT, Streubel D, Werner K, and Brandon D (2011), Developing two long-term, daily datasets of evaporative demand across the conterminous US, *American Meteorological Society Annual Meeting*, Seattle, WA, 22-27 January. (Poster)

Hobbins MT, Streubel D, Werner K, and Brandon D (2010), Two long-term, daily datasets of evaporative demand for the conterminous US, *Eos Trans. AGU*, Fall Meet. Suppl., Abstract H31B-0981, San Francisco, CA, 13-17 December. (Poster)

Hobbins MT, Dai A, Roderick ML, and Farquhar GD (2008), Parameterizing evaporative demand in the Palmer Drought Severity Index: Implications for Australia, *Eos Trans. AGU*, 89(23), West. Pac. Geophys. Meet. Suppl., Abstract H24A-08, Cairns, Qld., Australia, 29 July-1 August. (Oral)

Hobbins MT, Farquhar GD, and Roderick ML (2007), The evaporation paradox, and the roles of dimming and stilling, *Third Conference of the Gary Comer Abrupt Climate Change Fellowship*, Palisades, NY, 2-5 May. (Oral)

Hobbins MT, Farquhar GD, and Roderick ML (2007), Moving beyond 'the simpler, the better': The dangers of parameterizing evaporative demand by temperature alone, *Third Conference of the Gary Comer Abrupt Climate Change Fellowship*, Palisades, NY, 2-5 May. (Oral)

Hobbins MT, Farquhar GD, and Roderick ML (2007), Do temperature-based parameterizations of evaporative demand force overestimates of mid-latitude continental drying?, *Third Conference of the Gary Comer Abrupt Climate Change Fellowship*, Palisades, NY, 2-5 May. (Poster)

Hobbins MT, Roderick ML, and Farquhar GD (2006), Is the temperature-based parameterization of potential evapotranspiration in the Palmer Drought Severity Index forcing overestimates of mid-continental drying and drought?, *Eos Trans. AGU*, 87(52), Fall Meet. Suppl., Abstract H24B-04, San Francisco, CA, 11-15 December. (Oral)

Hobbins MT, Roderick ML, and Farquhar GD (2006), What are we talking about when we talk about drying?, *Seventeenth Annual Australia New Zealand Climate Forum*, Canberra, ACT, Australia, 5-7 September. (Oral)

Hobbins MT, Farquhar GD, and Roderick ML (2006), Towards a more robust characterisation of Australian drought, *Bureau of Meteorology workshop on Climate Change Detection and Attribution*, Melbourne, Vic., Australia, 5 June. (Oral)

Hobbins MT, Roderick ML, and Farquhar GD (2006), Evaporation demand: Trends and dynamics, *Final Science Meeting, Cooperative Research Centre for Greenhouse Accounting*, Melbourne, Vic., Australia, 29-30 May. (Oral)

Hobbins MT, Roderick ML, and Farquhar GD (2005), Using a half-century of misdiagnosis to make bad predictions about future drought trends, *Gary Comer Abrupt Climate Change Fellowship Roundtable*, Palisades, NY, 20-22 October. (Poster)

Hobbins MT, Ramírez JA, and Brown TC (2004), Developing a long-term, high-resolution, continental-scale, spatially distributed time-series of topographically corrected solar radiation, *Twenty-fourth Annual AGU Hydrology Days*, Fort Collins, CO, 10-12 March. (Oral)

Hobbins MT, Ramírez JA, and Brown TC (2004), Developing a homogeneous data series of pan evaporation across the conterminous United States for analysis of long-term trends, *Twenty-fourth Annual AGU Hydrology Days*, Fort Collins, CO, 10-12 March. (Oral)

Hobbins MT, Ramírez JA, and Brown TC (2003), Is pan evaporation decreasing across the conterminous United States? If it is, so what?, *Twenty-third Annual AGU Hydrology Days*, Fort Collins, CO, 31 March-2 April. (Oral)

Hobbins MT, Ramírez JA, and Brown TC (2001), Trends in regional evapotranspiration across the United States under the complementary relationship hypothesis, *Twenty-first Annual AGU Hydrology Days*, Fort Collins, CO, 2-5 April. (Oral)

Hobbins MT, Ramírez JA, and Brown TC (1999), The complementary relationship in regional evapotranspiration: The CRAE Model and the Advection-aridity approach, *Nineteenth Annual AGU Hydrology Days*, Fort Collins, CO, 16-20 August. (Oral)

Hobbins MT, Ramírez JA, and Brown TC (1999), Regional evapotranspiration and the complementary relationship: A comparison and evaluation of the CRAE model and the Advection-aridity approach, *Eos Trans. AGU*, 80(17), Spring Meet. Suppl., Abstract H51A-14, Boston, MA, 1-4 June. (Poster)

Co-author Presentations

McEvoy DJ, **Hobbins MT**, Huntington JL, Mejia JF (2015), Exploring the use of physically based evaporative demand anomalies to improve seasonal drought prediction. Nevada Water Resources Association Annual Conference. Reno, NV, 26-29, January. (Poster: 2nd place prize student posters)

Xia Y, **Hobbins MT**, Mu Q, and Ek MB (2015), Evaluation of Multimodel and Multiscale NLDAS-2 Evapotranspiration Using Different Observations. American Meteorological Society Annual Meeting, Phoenix, AZ, 4-8 January. (Poster)

McEvoy DJ, **Hobbins MT**, Huntington JL, Mejia J, Wood AW, Hain C, Anderson M, and Verdin JP (2014), Exploring the use of Physically Based Evaporative Demand Anomalies to Improve Seasonal Drought Prediction, *Eos Trans. AGU*, Fall Meet. Suppl., Abstract H41B-0799, San Francisco, CA, 15-19 December. (Oral, Invited)

Ham C, **Hobbins MT**, Abt KL, and Prestemon JP (2014), Using the Evaporative Demand Drought Index and the Palmer Drought Severity Index to forecast the number of large wildland fires on federal lands, *Large Wildland Fires Conference*, Missoula, MT, 19-23 May. (Oral)

Bardsley, T, Wood AW, **Hobbins MT**, Kirkham T, Briefer L, Niermeyer J, Burian S, and Goharian E (2014), Planning for an Uncertain Future: Climate Change and the Salt Lake City Water Supply, *CIRES Science Rendezvous*, Boulder, CO, 2 May. (Poster)

McEvoy D, Huntington J, **Hobbins MT**, and Wood A (2014), Tracking flash drought with atmospheric feedbacks, *Great Basin Climate Forum 2014*, Reno, NV, 10 April. (Poster)

Moorhead J, Gowda P, Paul G, **Hobbins MT**, Senay G, Marek T, and Porter D (2014), Accuracy assessment of NOAA's reference evapotranspiration maps in the Texas High Plains, *ASABE International Symposium on Evapotranspiration: Challenges in Measurement and Modeling from Leaf to the Landscape Scale and Beyond*, Raleigh, NC, 7-10 April. (Poster)

McEvoy DJ, **Hobbins MT**, Huntington JL, and Wood AW (2014), Tracking flash drought with land-atmospheric feedbacks, *American Meteorological Society Annual Meeting*, Atlanta, GA, 3-6 February. (Oral: 2nd place prize student presentations)

Snell HD, Palmer CK, Krone-Davis P, Melton FS, and **Hobbins MT** (2013), National Weather Service forecast reference evapotranspiration, *Eos Trans. AGU*, Fall Meet. Suppl., Abstract H21A-1012, San Francisco, CA, 9-13 December. (Poster)

Geli HME, Neale CMU, **Hobbins MT**, Verdin JP, and Senay GB (2013), Actual Evapotranspiration using a two-source energy balance model and gridded reference ETo, *Eos Trans. AGU*, Fall Meet. Suppl., Abstract H21P-03, San Francisco, CA, 9-13 December. (Oral)

Lim WH, Roderick ML, **Hobbins MT**, Wong SC, and Farquhar GD (2012), The energy balance of a US Class A pan? *Centre of Excellence for Climate System Science (CoECSS Workshop)*, Hobart, Tas., Australia, 25-27 September. (Poster)

Verdin J, **Hobbins M**, and Senay G (2012), A new reference evapotranspiration surface for the National Water Census community, *Eos Trans. AGU*, Fall Meet. Suppl., Abstract H33P-08, San Francisco, CA, 3-7 December. (Oral)

Wood A, Werner K, **Hobbins MT**, Clark M, and Verdin J (2011), Science applications in the Colorado River basin to improve drought management, *Eos Trans. AGU*, Fall Meet. Suppl., Abstract GC33C-04, San Francisco, CA, 5-9 December. (Oral)

Lim WH, Roderick ML, **Hobbins MT**, Wong SC, Groeneveld PJ, Sun FB, and Farquhar GD (2011), A new equation for the aerodynamics of pan evaporation, *Eos Trans. AGU*, Fall Meet. Suppl., Abstract H33A-1265, San Francisco, CA, 5-9 December. (Poster)

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