

J. BURDETTE BARKER, PH.D., P.E.

Assistant Professor and Extension Irrigation Specialist
Department of Civil and Environmental Engineering and
Utah Water Research Laboratory
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EDUCATION

- Ph.D. Biological Engineering**, *University of Nebraska-Lincoln* 2017
Dissertation Title: *Spatial Irrigation Management Using Remote Sensing Water Balance Modeling and Soil Water Content Monitoring*
- M.S. Irrigation Engineering**, *Utah State University* 2011
Thesis Title: *Estimation of Field Alfalfa Evapotranspiration in a Windy, Arid Environment*
- B.S. Biological Engineering**, *Utah State University*, Magna Cum Laude 2009

PROFESSIONAL EXPERIENCE

- Assistant Professor and Extension Irrigation Specialist**, *Civil and Environmental Engineering and Utah Water Research Laboratory, Utah State University, Logan, UT* 2022-Present
- Senior Engineer**, *Natural Resources Consulting Engineers, Inc., Fort Collins, CO* 2018-2022
- Post-Doctoral Research Associate**, *University of Nebraska-Lincoln, Lincoln, NE* 2017-2018
- Graduate Research Assistant**, *University of Nebraska-Lincoln, Lincoln, NE* 2014-2017
- Project Engineer**, *IRZ Consulting, LLC, Hermiston, OR* 2011-2014
- Research Assistant**, *Utah State University, Logan, UT* 2007-2011

Areas of Expertise

- Development of Extension educational materials.
- Measurement and modeling of crop and irrigation water use including consumptive water use.
- Design and evaluation of agricultural irrigation application, conveyance, and pumping systems.
- Water flow measurement and water accounting.
- Farm irrigation water management and irrigation water conveyance system management.
- Groundwater monitoring.
- Weather and soil monitoring and environmental instrumentation and remote sensing.

TEACHING AND INSTRUCTION EXPERIENCE

1. CEE 5001/6001 Field Irrigation Systems Design and Evaluation Fall 2022
2. Invited Course Lectures – 12 Lecture/Labs 2007-2018
3. Teaching Assistant – 2 Semesters 2015-2016

FUNDED PROPOSALS

1. **Barker, J.B.** 2022. “Beaver County Irrigation System Performance Evaluations.” Beaver Conservation District. \$1,000
2. **Barker, J.B.** 2022. “Beaver County Irrigation System Performance Evaluations.” Twin M Conservation District. \$1,000
3. **Barker, J.B.** 2022. “Irrigation System Performance.” Enterprise and Iron Conservation District. \$2,600
4. **Barker, J.B.** 2022. “Improved Estimates of Irrigation and Crop Water Use.” Utah Agricultural Experiment Station. 15% of my salary.
5. Heeren, D.M., **J.B. Barker** (collaborator), C.M.U. Neale, D.L. Martin, D.R. Rudnick, and X. Qiao. 2018-2021. “Sensor-based irrigation management for maize and soybean in the Great Plains.” Daugherty Water for Food Global Institute Graduate Student Research Support. \$51,000.
6. Heeren, D.M., D.R. Rudnick, F. Muñoz-Arriola, and **J.B. Barker** (collaborator). 2017-2018. “Impact of variable rate irrigation on consumptive use of water resources.” U.S. Geological Survey (USGS) 104(b) program. \$20,000.
7. Heeren, D.M., and **J.B. Barker** (collaborator). 2016-2018. “Field testing variable rate irrigation (VRI) for managing spatial variability in soils and evapotranspiration.” Daugherty Water for Food Global Institute Grad Student Research Support. \$33,500.

REFEREED JOURNAL ARTICLES

1. Sullivan, T., M. Yost, D. Boren, E. Creech, B. Kitchen, R. Violett, and B. Barker. 2022. “Irrigation technology, irrigation rate, and drought-tolerant genetics impacts on silage corn production.” *Agronomy Journal*. Under Review
2. Bhatti, S., D.M. Heeren, **J.B. Barker**, C.M.U. Neale, W.E. Woldt, M.S. Maguire, and D.R. Rudnick. 2020. “Site-specific irrigation management in a sub-humid climate using a spatial evapotranspiration model with satellite and airborne imagery.” *Agricultural Water Management*. 230:105950 <https://doi.org/10.1016/j.agwat.2019.105950>
3. **Barker, J.B.**, W.E. Woldt, B.D. Wardlow, C.M.U. Neale, M.S. Maguire, B.C. Leavitt, and D.M. Heeren. 2019. “Calibration of a common shortwave multispectral camera system for quantitative applications.” *Precision Agriculture*. 21: 922-935. <https://doi.org/10.1007/s11119-019-09701-6>
4. **Barker, J.B.**, S. Bhatti, D.M. Heeren, C.M.U. Neale, and D.R. Rudnick. 2019. “Variable rate irrigation of maize and soybean in west-central Nebraska under full and deficit irrigation.” *Frontiers in Big Data*. 2:34. <https://doi.org/10.3389/fdata.2019.00034>.
5. **Barker, J.B.**, D.M. Heeren, K. Koehler-Cole, C.A. Shapiro, H. Blanco-Canqui, R.W. Elmore, C.A. Proctor, S. Irmak, C.A. Francis, T.M. Shaver, and A.T. Mohammed. 2018. “Cover crops have negligible impact on soil water in Nebraska maize-soybean rotation.” *Agronomy Journal*. 110(5): 1718-1730. <https://doi.org/10.2134/agronj2017.12.0739>
6. **Barker, J.B.**, D.M. Heeren, C.M.U. Neale, and D.R. Rudnick. 2018. “Evaluation of variable rate irrigation using a remote-sensing-based model.” *Agricultural Water Management*. 203:63-74. <https://doi.org/10.1016/j.agwat.2018.02.022>
7. **Barker, J.B.**, C.M.U. Neale, D.M. Heeren, A.E. Suyker. 2018. “Evaluation of a hybrid reflectance-based crop coefficient and energy balance evapotranspiration model for irrigation management.” *Transactions of the ASABE*. 61(2): 533-548. <https://doi.org/10.13031/trans.12311>

8. Miller, K.A., J.D. Luck, D.M. Heeren, T. Lo, D.L. Martin, and **J.B. Barker**. 2018. "A geospatial variable rate irrigation control scenario evaluation methodology based on mining root zone available water capacity." *Precision Agriculture*. 19: 666-683. <https://doi.org/10.1007/s11119-017-9548-z>
9. **Barker, J.B.**, T.E. Franz, D.M. Heeren, C.M.U. Neale, and J.D. Luck. 2017. "Soil Water Content Monitoring for Irrigation Management: A Geostatistical Analysis." *Agricultural Water Management*. 188: 36-49. <https://doi.org/10.1016/j.agwat.2017.03.024>
10. Lo, T., D.M. Heeren, L. Mateos, J.D. Luck, D.L. Martin, K.A. Miller, **J.B. Barker**, and T.M. Shaver. 2017. "Field characterization of field capacity and root zone available water capacity for variable rate Irrigation." *Applied Engineering in Agriculture*. 33(4): 559-572. <https://doi.org/10.13031/aea.11963>
11. Lecina, S., Hill, R.W., and **Barker, J.B.** 2016. "Irrigation uniformity under different socio-economic conditions: evaluation of center pivots in Aragon (Spain) and Utah (USA)." *Irrigation and Drainage*. 65(4): 549-558. <https://doi.org/10.1002/ird.2031>

EXTENSION PUBLICATIONS

1. **Barker, B.**, K. Taylor, and M. Yost. 2022. "Delta Water Workshop." *Outcomes and Impacts Quarterly*. Utah State University Extension. In Review.
2. **Barker, B.**, M. Yost, and C. Zesiger. 2022. *Agricultural Irrigated Land and Irrigation Water Use in Utah*. Fact Sheet. Utah State University Extension, Logan, UT. https://digitalcommons.usu.edu/extension_curall/2311/
3. Mufute, N., M. Yost, **B. Barker**, K. Taylor, M. Nelson, R. Violett, and J. Gale. 2022. *Ten Considerations for Solar-Powered Irrigation in Utah*. Fact Sheet. Utah State University Extension, Logan, UT. https://digitalcommons.usu.edu/extension_curall/2303/
4. **Barker, B.** 2022. *Pipe Flow Measurement for Irrigation*. White Paper. Available at: https://extension.usu.edu/irrigation/files/pipe_flow_measurement_for_irrigation.pdf
5. Hansen, S., T. Beddes, **B. Barker**, and A. Butler. 2022. *Water Recommendations for Vegetables*. Fact Sheet. Utah State University Extension, Logan, UT. (Submitted for Review)
6. Crookston, B. R.T. Peters, M. Yost, and **B. Barker**. 2022. *Water Loss and Recover of Irrigation Systems in Utah*. Fact Sheet. Utah State University Extension, Logan, UT. Available at: <https://extension.usu.edu/crops/research/irrigation-water-loss-and-recovery>
7. Lo, T., D.R. Rudnick, Y. Ge, D.M. Heeren, S. Irmak, **J.B. Barker**, X. Qiao, and T.M. Shaver. 2018. *Ground-based thermal sensing of field crops and its relevance to irrigation management*. NebGuide G2301, University of Nebraska-Lincoln Extension, Lincoln, NE. Available at: <https://extensionpubs.unl.edu/publication/9000020029545/ground-based-thermal-sensing-of-field-crops-and-its-relevance-to-irrigation-management-g2301/>
8. Heeren, D.M., **J.B. Barker**, T.H. Lo, S.R. Melvin, D.L. Martin, and J.D. Luck. 2017. "Considerations in Adopting Variable Rate Irrigation." *UNL Water*. University of Nebraska-Lincoln Institute of Agriculture and Natural Resources, Lincoln, NE. Available at: <https://water.unl.edu/article/agricultural-irrigation/considerations-adopting-variable-rate-irrigation> (Not peer reviewed)
9. **Barker, J.B.**, D.M. Heeren, and S.R. Melvin. 2017. *Considerations in Adopting Variable Rate Irrigation for Center Pivots and Lateral Systems*. Handout prepared for Husker Harvest Days 2017, September 12-14, 2017, Grand Island, NE. (Not peer reviewed).

CONFERENCE PROCEEDINGS

1. **Barker, J.B.***, D.M. Heeren, and C.M.U. Neale. February 23-24, 2016. "Perspectives on VRI prescription map development with satellite imagery." Central Plains Irrigation Conference, Kearney, NE. <https://www.ksre.k-state.edu/irrigate/oow/p16/Barker16.pdf>
2. **Barker, J.B.***, C.M.U. Neale, and D.M., Heeren. November 10-12, 2015 "Evaluation of a hybrid remote sensing evapotranspiration model for variable rate irrigation management." 2015 ASABE/ IA Irrigation Symposium: Emerging Technologies for Sustainable Irrigation – A Tribute to the Career of Terry Howell, Sr., Long Beach, CA. <https://doi.org/10.13031/irrig.20152142641>
3. Lecina Brau*, S., R.W. Hill, and **J.B. Barker**. June 10-12, 2014. "Uniformidades de riego bajo diferentes condiciones socio-económicas: evaluación de pivots en Aragón (España) y en Utah (EEUU)." *XXXII Congreso Nacional de Riegos*. Madrid, Spain. <https://digital.csic.es/handle/10261/98436>

*Presenting author

OTHER TECHNICAL PUBLICATIONS

1. Hill, R.W., **J.B. Barker**, and C.S. Lewis. 2011. *Crop and Wetland Consumptive Use and Open Water Surface Evaporation for Utah*. Research Report No. 213, Utah Agricultural Experiment Station, Utah State University, Logan, UT. <https://extension.usu.edu/irrigation/crop-water-use>
2. Hill, R.W., and **J.B. Barker**. 2010. *Verification of Turfgrass Evapotranspiration in Utah*. Research Report No. 211, Utah Agricultural Experiment Station, Utah State University, Logan, UT. <https://extension.usu.edu/irrigation/crop-water-use>

EXTENSION PRESENTATIONS

1. **Barker, B.** August 10, 2022. "Irrigation Water Conservation." 2022 Delta Water Workshop, Delta, UT.
2. **Barker, B.** August 9, 2022. "New Extension Irrigation Specialist Introduction." Utah Onion Growers Summer Tour, Box Elder, County, UT.
3. **Barker, B.** June 7-9, 2022. "Irrigation of Pasture Grasses." (Presentation, Handouts, and Demonstration). Sustainable Grazing Institute, Kaysville, UT.
4. **Barker, B.** March 21-23, 2022. "Smart Technologies for Future Water Use." 2022 Utah Water Users Workshop, St. George, UT.
5. **Barker, B.** 2017. Prepared materials and presented at a University of Nebraska-Lincoln Extension booth at Husker Harvest Days 2017 near Grand Island, NE
6. **Barker, B.** 2010. "Crop Water Requirements." Ditch Riders Workshop, Logan, UT.

OTHER EXTENSION ACTIVITIES

1. Performed irrigation system evaluations for cooperators in three Utah counties. 2022
2. Provided irrigation design recommendations for a modern demonstration irrigation system for the Bastian Agricultural Center, South Jordan, UT, which will get thousands of visitors annually. 2022
3. Organized the first annual Delta Water Workshop, Delta, UT. 2022
4. Provided advice for the rehabilitation of a well on a USU research farm 2022
5. Conducted applied research in five Utah counties 2022

6. Consulted with irrigation water users, performed research, or provided other services in 14 of Utah's 29 counties 2022
7. Interviewed with KUER public radio about Great Salt Lake 2022
8. Interviewed for USU student television about Great Salt Lake 2022
9. Performed irrigation system evaluations for cooperators in four Utah counties. 2007-2010
10. Performed flow measurements for cooperators in Utah. ca. 2007-2010, 2022

CONFERENCE ORAL PRESENTATIONS

1. Stewart, S.**, **J.B. Barker**, and L. Hipps. May 21-24, 2023. "Multi-approach evapotranspiration estimates for irrigation plot research." 2023 World Environmental & Water Resources Congress. Henderson, NV. (Abstract Accepted)
2. **Barker, J.B.***. March 21-23, 2022. "Smart technologies for future water use." Utah Water Users Workshop, St. George, UT.
3. Bhatti, S., D.M. Heeren, **J.B. Barker**, C.M.U. Neale, W.E. Woldt, M.S. Maguire, and D.R. Rudnick. December 9-13, 2019. "Site-specific irrigation management in a sub-humid climate using a spatial evapotranspiration model with satellite and airborne imagery." American Geophysical Union Fall Meeting, San Francisco, CA.
4. Akasheh, S.Z, I. Goncalves, C.M.U. Neale, **B. Barker**, B. Safa, and D.L. Martin. December 9-13, 2019. "Mapping riparian vegetation evapotranspiration using multispectral and thermal remote sensing over the Republican River, Nebraska." American Geophysical Union Fall Meeting, San Francisco, CA.
5. Singh, J., D.M. Heeren, Y. Ge, **J.B. Barker**, W.E. Woldt, C.M.U. Neale, G. Bai, D.R. Rudnick, J.D. Luck, and G.E. Meyer. July 7-10, 2019. "Soil structure and soil texture effects on soil water content measurements by a capacitance based electromagnetic sensor" ASABE Annual International Meeting, Boston, MA.
6. Heeren, D.M., **J.B. Barker**, S. Bhatti, D.R. Rudnick, and F. Munoz-Arriola. February 26-27, 2019. "Impact of variable rate irrigation (VRI) on consumptive use of water resources." Central Plains Irrigation Association Central Plains Irrigation Conference, Kearny, NE. (invited).
7. Bhatti, S., D.M. Heeren, **J.B. Barker**, C.M.U. Neale, D.R. Rudnick, W.E. Woldt, Y. Ge, J.D. Luck, G.E Meyer, F. Munoz-Arriola, A.L. Boldt, and M.S. Maguire. July 29-August 1, 2019. "Variable rate irrigation management using a spatial evapotranspiration model." ASABE Annual International Meeting, Detroit, MI.
8. **Barker, J.B.***, M.S. Maguire, C.M.U. Neale, W.E. Woldt, B.D. Wardlow, B.C. Leavitt, and D.M. Heeren. July 29-August 1, 2018. "Calibration of an unmanned-aircraft-mounted shortwave multispectral camera system for use in evapotranspiration modeling." ASABE Annual International Meeting, Detroit, MI.
9. Kovalskyy, V.*, D. Devecigil, C.M.U. Neale, and **B. Barker**. December 10-14, 2018. "Scientific challenges in building and testing image based irrigation recommendation services." American Geophysical Union Fall Meeting, Washington, D.C.
10. **Barker, J.B.***, S. Bhatti, D.M. Heeren, and C.M.U. Neale. June 6, 2018. "VRI irrigation scheduling." Marena Oklahoma In Situ Sensor Testbed (MOISST) Workshop, Lincoln, NE. (invited).
11. **Barker, J.B.**, S. Bhatti, D. M. Heeren, and C.M.U. Neale*. May 9, 2018. "Irrigation management using remote-sensing-based spatial evapotranspiration modeling in maize and soybean in Nebraska, USA." ICRS-IAHS Remote Sensing and Hydrology Symposium. Cordoba, Spain.

12. **Maguire, M.S.**, J.B. Barker, C.M.U. Neale*, and W.E. Woldt. May 9, 2018. "Modeling evapotranspiration over low vegetation crop cover using multispectral and thermal infrared imagery acquired with a low altitude unmanned aerial system." ICRS-IAHS Remote Sensing and Hydrology Symposium. Cordoba, Spain.
13. **Barker, J.B.***, C.M.U. Neale, and D.M. Heeren. February 20-21, 2018. "Using remote sensing to improve irrigation uniformity." Central Plains Irrigation Association Central Plains Irrigation Conference, Colby, KS. (invited)
14. Koehler-Cole*, K., R.W. Elmore, H Blanco-Canqui, C.A. Shapiro, C. Proctor, D.M. Heeren, **J.B. Barker**, C.A. Francis, T.M. Shaver, and M. Stockton. October 22-25, 2017. "Management and implications of cover crops in Nebraska." American Society of Agronomy International Meeting, Tampa, FL.
15. **Barker, J.B.***, D.M. Heeren, C.M.U. Neale, D.L. Martin, T.E. Franz, and W.R. Kranz. July 16-19, 2017. "Variable rate irrigation management of corn and soybean using a remote-sensing-based water balance." ASABE Annual International Meeting, Spokane, WA.
16. **Barker, J.B.***, D.M. Heeren, C.A. Shapiro, K. Koehler-Cole, S. Irmak, A.T. Mohammed, R.W. Elmore, H. Blanco-Canqui, T.M. Shaver, C.A. Francis, R.B. Ferguson. July 16-19, 2017. "Impact of a multiple species cover crop on soil water content in corn and soybean rotations in Nebraska." ASABE Annual International Meeting, Spokane, WA.
17. **Barker, J.B.**, T.E. Franz, D.M. Heeren*, C.M.U. Neale, and J.D. Luck. July 16-19, 2017. "Number of soil water monitoring locations required for irrigation management: A geostatistical analysis." ASABE Annual International Meeting, Spokane, WA.
18. **Barker, J.B.***, D.M. Heeren, K. Koehler-Cole, R.W. Elmore, C.A. Shapiro, S. Irmak, H. Blanco-Canqui, A.T. Mohammed, T.M. Shaver, C.A. Francis, R.B. Ferguson. April 10-12, 2017. "Impact of cover crops on soil water content in irrigated and rainfed corn-soybean systems." Robert B. Daugherty Water for Food Global Institute, Water for Food Global Conference, Lincoln, NE. (invited)
19. Heeren, D.M.*, **J.B. Barker**, and C.M.U. Neale. February 2, 2017. "Managing variable rate irrigation for spatial variability in evapotranspiration using remote sensing." Nebraska Agriculture Technologies Association (NeATA) Conference, Lincoln, NE. (invited)
20. Heeren*, D.M., T. Lo, J.D. Luck, **J.B. Barker**, D.L. Martin, and L. Mateos. November 8, 2016. "Variable rate irrigation for mining undepleted soil water." International Committee on Irrigation and Drainage (ICID) World Irrigation Forum, Chiang Mai, Thailand. (invited)
21. **Barker, J.B.***, D.M. Heeren, and C.M.U. Neale. October 11-14, 2016. "Variable rate irrigation management using a remote sensing water balance model." USCID Ninth International Conference on Irrigation and Drainage: Improving Water Management - Latest Methods in Evapotranspiration and Supporting Technologies. Fort Collins, CO.
22. Neale*, C.M.U., **J.B. Barker**, D.M. Heeren, W. Woldt, and M. Maguire. September 26-29, 2016. "Remote sensing assisted modeling of soil water content for center pivot variable rate irrigation prescriptions." SPIE Remote Sensing Conference, Edinburgh, Scotland.
23. **Barker, B.***, D.M. Heeren, and C.M.U. Neale. July 17-20, 2016. "Irrigation management using a remote sensing water balance model and spatial soil moisture mapping with application in variable rate irrigation." ASABE 2016 Annual International Meeting, Orlando, FL.
24. Heeren, D.M.*, J.D. Luck, T. Lo, and **J.B. Barker**. March 16, 2016. "Variable rate irrigation: Spatial variability in water holding capacity and quantifying the benefits of VRI." Eureka! 2016 Conference, UNL Extension, Lincoln, NE.
25. Campos, I.*, **J.B. Barker**, C.M.U. Neale, A.E. Suyker, and T.J. Arkebauer. January 10-14, 2016. "Combining energy and soil water balances based on remote sensing inputs for

monitoring irrigated and rainfed agriculture.” 96th American Meteorological Society Annual Meeting, New Orleans, LA.

**Presenting author*

***Advised student*

CONFERENCE POSTER PRESENTATIONS

1. Bai, G.*, **B. Barker**, Y. Ge, M. Maguire, C.M.U. Neale, A. Suyker, and D. Scoby. December 12-16, 2022. “Estimating evapotranspiration for crop breeding at the plot scale using energy balance and crop coefficients.” American Geophysical Union Fall Meeting, Chicago, IL.
2. Zesiger, C.*, A. Sandoval, S. Hansen, and **B. Barker**. October 12, 2022. Chad Reid NACAA Western Region Professional Improvement Conference, Tucson, AZ.
3. Crookston, B.*, M. Yost, R.T. Peters, and **B. Barker**. March 29, 2022. “Trade-offs in irrigation technology efficiency, water loss, and recovery.” Spring Runoff Conference, Utah State University, Logan, UT.
4. Singh, J.*, Y. Ge, G. Bai, **J.B. Barker**, D.M. Heeren, and C.M.U. Neale. April 29-30, 2019. “In-field soil and plant sensor network to improve variable rate irrigation decision-making.” Daugherty Water for Food Global Institute Water for Food Global Conference, Lincoln, NE.
5. Bhatti, S.*, **J.B. Barker**, D.M. Heeren, C.M.U. Neale, D.R. Rudnick, W.E. Woldt, and A.L. Boldt. October 24-26, 2018. “Variable rate irrigation with spatial evapotranspiration model using imagery from satellite and unmanned aerial systems.” Nebraska Water Center Great Plains Regional Water Symposium, Lincoln, NE.
6. Li, J.*, **J.B. Barker**, S. Bhatti, I. Possignolo, D.M. Heeren, A.L. Boldt, and H. Yan. October 24-26, 2018. “Comparison of methods for calculating deep percolation.” Nebraska Water Center Great Plains Regional Water Symposium, Lincoln, NE.
7. Singh, J.*, Y. Ge, G. Bai, **J.B. Barker**, D.M. Heeren, and C.M.U. Neale. October 24-26, 2018. “In-field soil and plant sensor network to improve variable rate irrigation decision-making.” Nebraska Water Center Great Plains Regional Water Symposium, Lincoln, NE.
8. Li, J.*, **J.B. Barker**, I.P. Possignolo, D.M. Heeren, A.L. Boldt, S. Bhatti, and H. Yan. June 6, 2018. “Comparison of methods for calculating deep percolation.” Merena Oklahoma In Situ Sensor Testbed (MOISST) Workshop, Lincoln, NE.
9. Bhatti, S.*, **J.B. Barker**, D.M. Heeren, C.M.U. Neale, D.R. Rudnick, W.E. Woldt, Y. Ge, J.D. Luck, M. Maguire. October 26-27, 2017. “Crop and water response to variable rate irrigation using remote sensing model and soil moisture content monitoring.” Nebraska Water Center Water Symposium, Lincoln, NE. – Second place in graduate student poster competition.
10. Bhatti, S.*, **J.B. Barker**, D.M. Heeren, C.M.U. Neale, M. Maguire, W.E. Woldt, and D.R. Rudnick. April 10-12, 2017. “Water and crop response to variable rate irrigation using remote sensing models.” Robert B. Daugherty Water for Food Global Institute, Water for Food Global Conference, Lincoln, NE.
11. Zution, I.*, N. Souza, C. Neale, E. Mantovani, H. Medeiros, and **B. Barker**. April 10-12, 2017. “Relationships between spectral vegetation indices and biomass accumulation using hybrid model for corn under tropical conditions in Brazil.” Robert B. Daugherty Water for Food Global Institute, Water for Food Global Conference, Lincoln, NE.
12. **Barker, J.B.***, D.M. Heeren, and C.M.U. Neale. April 24 – 26, 2016. “Remote sensing-based irrigation management with application in site-specific irrigation.” 2016 Water for Food Global Conference, Lincoln, NE.
13. **Barker, J.B.***, A.T. Mohammed, D.M. Heeren, R.W. Elmore, C.A. Shapiro, S. Irmak, S., K. Koehler-Cole, T.M. Shaver, H. Blanco-Canqui, and C.A. Francis. April 12, 2016. “Impact of

cover crops on soil moisture available for the primary crop.” University of Nebraska-Lincoln Spring Research Fair, Lincoln, NE.

14. **Barker, J.B.***, C.M.U. Neale, and D.M. Heeren. March 19, 2015. “Managing variable rate irrigation with a hybrid remote sensing evapotranspiration model.” Nebraska Water Symposium, Lincoln, NE.-Second place in the graduate student poster contest.
15. **Barker, J.B.***, and R.W. Hill. March 31, 2010. “A comparison of evapotranspiration estimation methods with application in the verification of field crop evapotranspiration.” Intermountain Graduate Research Symposium, Utah State University, Logan, UT.
16. Millett, J.* and **B. Barker.*** with C.L. Hansen as Faculty Mentor. March 31, 2009. “Determining the possibility of utilizing anaerobically digested algal material as a fertilizer source.” Undergraduate Student Showcase, Utah State University, Logan, UT.
17. **Barker, J.B.*** with R.W. Hill as Faculty Mentor. April 1, 2008. “Measurement of evapotranspiration for alfalfa, in Snowville, UT.” Undergraduate Student Showcase, Utah State University, Logan, UT.

**Presenting Author*

OTHER TECHNICAL PRESENTATIONS

1. Heeren, D.M.*, **J.B. Barker**, S. Bhatti, M.S. Maguire, W.E. Woldt, and C.M.U. Neale. September 14, 2018. “Variable rate irrigation (VRI): Benefits, limitations, and management practices.” Delegation from Irrigation New Zealand, Lincoln, NE. (invited).
2. Heeren, D.M.*, **J.B. Barker**, S. Bhatti, M. Maguire, W.E. Woldt, and C.M.U. Neale. April 4, 2018. “Variable rate irrigation (VRI): Benefits, limitations, and management practices.” Nebraska Water Center Water Seminar, Lincoln, NE. (invited)
3. Heeren, D.M.*, **J.B. Barker**, M. Maguire, W.E. Woldt, and C.M.U. Neale. January 15, 2018. “Drones are buzzing toward increased crop production.” IHE Delft Lunch Seminar, Delft, Netherlands. (invited)
4. Heeren, D.M.*, D.R. Rudnick, F. Munoz-Arriola, and **J.B. Barker**. August 29, 2017. “Impact of variable rate irrigation on consumptive use of water resources.” Nebraska Water Center Advisory Board, Lincoln, NE. (invited)
5. Heeren, D.M.* and **J.B. Barker***. June 8, 2017. “Variable rate irrigation (VRI): Principles, example problems and current research.” Irrigation Association Agriculture Faculty Academy, Grand Island, NE. (invited)
6. Bhatti, S.*, **J.B. Barker**, and D.M. Heeren. May 11, 2017. “Water and crop response to variable rate irrigation using remote sensing based models.” Robert B. Daugherty Water for Food Global Institute Research Forum, Lincoln, NE.
7. Heeren, D.M.*, T. Lo, J.D. Luck, and **J.B. Barker**. September 15, 2016. “Dynamic prescription maps for variable rate irrigation.” Presentation to Lindsay Corporation delegation from South America, Lincoln, NE. (invited)
8. Heeren, D.M.*, J.D. Luck, T. Lo, and **J.B. Barker**. September 7, 2016. “Variable rate irrigation: Spatial variability in water holding capacity and quantifying the benefits of VRI.” Presentation to delegation from the Ghana Commercial Agriculture Project, Lincoln, NE. (invited)

**Presenting Author*

REVIEWER FOR REFEREED JOURNAL AND CONFERENCE PROCEEDINGS

1. Journal of Irrigation and Drainage Engineering

2. Journal of Hydrology
3. Transactions of the ASABE
4. Journal of the ASABE
5. Irrigation and Drainage
6. ASABE/IA Irrigation Symposium Nov. 10-12, 2015, Long Beach, CA

GRADUATE MENTORING

- | | |
|---|--------------|
| 1. Sheridan Stewart, M.S. Advisor | 2022-Present |
| 2. Matthew Harames, M.S. Committee Member | 2011-Present |
| 3. Anderson Safre, Ph.D. Committee Member | 2022-Present |
| 4. Elisa Flint, Ph.D. Committee Member | 2022-Present |
| 5. Hadia Akbar, Ph.D. Committee Member | 2022-Present |
| 6. Hemanth Dakshinamurthy, Ph.D. Committee Member | 2022-Present |
| 7. Jonathan Holt, Ph.D. Committee Member | 2022-Present |
| 8. Karem Meza Capcha, Ph.D. | 2022-Present |
| 9. Rui Gai, Ph.D. | 2022-Present |
| 10. Tina Sullivan, Ph.D. | 2022-Present |
| 11. Sandeep Bhatti, M.S. Non-Voting Advisory Committee Member | 2017-2018 |
| 12. Unofficial Mentoring (3) | 2017-2018 |

UNDERGRADUATE MENTORING

- | | |
|-------------------------------|------|
| 1. Erika Munk | 2022 |
| 2. Rodrigo Dal Sasso Lourenço | 2015 |
| 3. Aaron B. Steckly | 2016 |
| 4. Christian Uwineza | 2016 |

ADDITIONAL PROFESSIONAL TRAININGS

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| 1. Empowering Teaching Excellence Conference. Utah State University | August 17, 2022 |
| 2. The Invisible Influence of Storytelling. The Sandusky Group | April, 19, 2022 |
| 3. Understanding Control Valves. The Eastern Oregon Regional Subsection of
AWWA/PNCWA | September 18, 2012 |
| 4. Adjustable Speed Drive Application and Energy Efficiency. Northwest Energy Efficiency
Alliance, Northwest Regional Industrial Training | November 10, 2011 |
| 5. Cornell Pump School. Cornell Pumps | 2011 |

SCHOLARSHIPS AND FELLOWSHIPS

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|--|----------------------|
| 1. University of Nebraska Presidential Fellowship, <i>University of Nebraska-Lincoln</i> (Awarded to only 3 students at UNL) | 2016-2017 |
| 2. Milton E. Mohr Biotechnology Fellowship, <i>University of Nebraska-Lincoln</i> | 2015-2016 |
| 3. Nebraska Engineering Recruitment Fellowship, <i>University of Nebraska-Lincoln</i> | 2014-2015 |
| 4. Keller-Bliesner Scholarship, <i>Utah State University</i> | 2008-2010 |
| 5. Dean's Scholarship, <i>Utah State University</i> | 2003-2004, 2006-2009 |

AWARDS

- | | |
|---|------|
| 1. Elenore Gakeneier Swarts Outstanding Doctoral Student, Biological Systems Engineering,
University of Nebraska-Lincoln | 2016 |
| 2. Second place entry, graduate student poster contest | 2015 |

Barker, J.B., C.M.U. Neale, and D.M. Heeren. (2015). “Managing variable rate irrigation with a hybrid remote sensing evapotranspiration model.” Nebraska Water Symposium, Lincoln, NE.

LICENSURE AND MEMBERSHIP

1. Licensed Professional Agricultural and Biological Engineer, Nebraska License No. E-17287
2. Member, American Society of Agricultural and Biological Engineers 2008-Present
 - Vice Chair: NRES 241 – Sprinkler Irrigation Sub-Committee 2021-Present
 - Sub-Committee Membership: NRES 241 - Sprinkler Irrigation 2016-Present
 - Sub-Committee Membership: NRES 244 - Irrigation Management 2016-Present
3. Member, U.S. Committee on Irrigation and Drainage 2014-~2017, 2019-Present
4. Member, American Society of Civil Engineers 2021-Present
 - Committee Membership: Evapotranspiration in Irrigation and Hydrology 2022-Present
 - Committee Membership: On Farm Irrigation 2022-Present
 - Committee Membership: Evapotranspiration in Irrigation and Hydrology 2022-Present
5. Alternate Member: Utah Agricultural Water Optimization Task Force 2022-Present
6. Member: Utah Water Users Association Workshop Planning Committee 2022-Present