

ANDREW E. SUYKER, Associate Professor
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EDUCATION

B.S. Meteorology, University of Alberta, Edmonton, Alberta, Canada (1988)
M.S. Micrometeorology (Agricultural Meteorology), University of Nebraska (1992)
Ph.D. Micrometeorology (Agricultural Meteorology), University of Nebraska (2000)
M.Ed. Masters of Education (Teaching, Learning, and Teacher Education), University of Nebraska (2010)

PROFESSIONAL EXPERIENCE

2013-present Associate Prof., School of Natural Resources, University of Nebraska-Lincoln (Tenure: 2017)
2010-2013 Research Associate Prof., School of Natural Resources, University of Nebraska-Lincoln
2004-2010 Research Assistant Prof., School of Natural Resources, University of Nebraska-Lincoln
2001-2004 Post Doc. Research. Assoc., School of Natural Resources, University of Nebraska-Lincoln
1996-2001 Research Technologist, School of Natural Resources, University of Nebraska-Lincoln
1989-1996 Graduate Research Asst., Dept. of Agricultural Meteorology, University of Nebraska-Lincoln

HONORS AND AWARDS

Top Scholar status from ScholarGPS (July 2024; #28 Primary Production; #83 Natural Environment)
Ranked 843rd best scientist globally (238th nationally) in Plant Science and Agronomy as per Research.com
Thomson Reuters World's Most Influential Scientific Minds, June 2014.
University of Nebraska Institute of Agriculture and Natural Resources 2004 Team Award for the Carbon Sequestration Program.

RESEARCH ACTIVITIES

Carbon dioxide, methane, nitrous oxide, and water vapor exchanges in natural and managed ecosystems; carbon sequestration; greenhouse gas emissions; water use efficiency; micrometeorology; eddy covariance instrumentation; atmospheric trace gas dynamics

SCHOLARLY SERVICE

The focus of my scholarly service is as follows: a) provide data to the national archive of AmeriFlux (carbon flux network of the Americas), b) provide data to other scientists and graduate students at UNL and other research institutions, c) conduct inter-calibrations of key micrometeorological sensors, d) continue to collaborate with various scientific groups to measure high resolution CO₂ concentrations needed for inversion modeling of the regional carbon budget.

MAJOR GRANTS

University of Nebraska-Lincoln Grand Challenges – Office of Research and Development, October 1, 2024 to September 30, 2029, \$5,000,000, Advancing Development of Assessments, Practices and Tools (ADAPT) to Produce Climate Smart Beef in Grazing Systems, (Co-recipient with G. Erickson, C. Allen, E. Athanassopoulos, M. Drewnoski, J. Gamon, M. Khorchani, M. Stephenson).

United States Department of Agriculture - Agricultural Research Services, June 1, 2021 to May 31, 2026, \$885,600.00, Nitrogen Research for Agriculture Transformation and Enhancement (Co-recipient with J. Luck, S. Pitla, R. Mahmood, L. Thompson, K.A. Weber, D. Snow, and A. Little).

United States Department of Agriculture - Agricultural Research Services, August, 2021 to July 31, 2024, \$1,024,929.00, Western Corn Belt Agricultural Intensification (Co-recipients with T. Awada, K. Giannakas).

United States Department of Agriculture - Agricultural Research Services, April 26, 2021 to June 30, 2024, \$110,600.00, LTAR Network Strategic Plan and Vision (Co-recipients with T. Awada, K. Giannakas).

KWS Seeds LLC, July 1, 2021 to March 31, 2022, \$97,500.00, ET Modeling Spidercam (Co-recipients with Y. Ge., B. Wardlow, C. Neale).

Foundation for Food & Agriculture Research, July 1, 2017-June 30, 2022, \$1,000,000, Enhancing animal protein through crops and cattle (Co-recipient with J. MacDonald, T. Awada, S. Banerjee, H. Blanco, M. Drewnoski, G. Erickson, J. Okalebo, J. Parsons, D. Redfearn, and G. Burba).

Nebraska Research Initiative. January 4, 2017-June 30, 2017, \$205,500. Dual quantum cascade laser trace gas analyzer for innovative micrometeorological measurement techniques necessary for mitigating climate change through continuous monitoring and evaluation of greenhouse gas emissions from managed and natural ecosystems. (Co-recipient with J. Okalebo, T. Awada G. Erickson, and G. Burba).

Lawrence Berkeley National Lab. October 1, 2020-September 30, 2025. \$565, 000. Long-Term Maize-Based Agro-Ecosystem Core Sites as Part of the AmeriFlux Management Project Network (Co-recipient with J. Gamon, A. Liska, H. Blanco, T. Franz, and H. Yang).

Lawrence Berkeley National Lab. October 1, 2016-September 30, 2020. \$432, 000. Long-Term Maize-Based Agro-Ecosystem Core Sites as Part of the AmeriFlux Management Project Network (Co-recipient with T.J. Arkebauer, E.A. Walter-Shea, A.I. Zygielbaum, A. Gitelson, A. Liska, H. Blanco, T. Franz, and H. Yang).

Lawrence Berkeley National Lab. November 1, 2014-September 30, 2016. \$222, 472. Long-Term Maize-Based Agro-Ecosystem Core Sites as Part of the AmeriFlux Management Project Network (Co-recipient with T.J. Arkebauer, E.A. Walter-Shea, A.I. Zygielbaum, A. Liska, H. Blanco, T. Franz, and H. Yang).

United States Department of Agriculture - Agricultural Research Services. September 1, 2015-August 31, 2020. \$630,000. Carbon Flux from Great Plains Agroecosystems Associated with the ARS LTAR Network (Co-recipient with T. Awada and G. Erickson).

Department of Energy: Office of Biological and Environmental Research. September 15, 2006-September 14, 2012. \$1,464,500. Carbon sequestration in dryland and irrigated ecosystems: Quantification at different scales for improved prediction. (Co-recipient with S.B. Verma, K.G. Cassman, T.A. Arkebauer, K.G. Hubbard, J.M. Knops, and D.T. Walters).

National Aeronautics and Space Administration: Earth Sciences Research and Analysis Program. 2008-2011. \$599,485. A Satellite-based Quantification of Carbon Exchange of the Dominant Ecosystems (Maize-Soybean) in the NACP Mid-Continent Intensive (MCI) Region. (Co-recipient with A. Gitelson and S.B. Verma).

Nebraska Department of Environmental Quality. 2013-2018. \$32,000. Mercury Deposition Network.
Nebraska Department of Environmental Quality. 2018-2023. \$32,000. Mercury Deposition Network.
Nebraska Department of Environmental Quality. 2023-2028. \$32,000. Mercury Deposition Network.

Great Lakes Integrated Science and Assessment (GLISA) Center. 2011-2012 \$29,992. Assessing the impacts of climate variability and change on Great Lakes evaporation: Implications for decision making, adaptation, and water resource management. (Co-recipient with J. Lenters).

REFEREED PUBLICATIONS

Freidenreich, A., Schmer, M. R., Khorchani, M., Birru, G., Jin, V. L., Awada, T., Drijber, R. A., Suyker, A., Córdova, S. C., Smith, T., Kettler, T., Christofferson, S., Sun, X., & Li, L. 2024. The LTAR Cropland Common Experiment at Platte River/High Plains Aquifer. *Journal of Environmental Quality*, 53, 939–947, <https://doi.org/10.1002/jeq2.20648>.

Khorchani, M., Schmer, M., Freidenreich, A., Awada, T., Birru, G., Christofferson, S., Drijber, R., Erickson, G., Jin, V., McDermott, R., Suyker, A., Watson, A., Woodbury, B., Xiong, Y., Hiller, J., Sun, X., & Li, L. (2024). The LTAR Grazing Land Common Experiment at Platte River High Plains Aquifer. *Journal of Environmental Quality*, 53, 948–956. <https://doi.org/10.1002/jeq2.20629>.

Khorchani, M., Awada, T., Schmer, M., Jin, V., Birru, G., Dangal, S. R. S., Suyker, A., & Freidenreich, A. 2024. Long-term croplands water productivity in response to management and climate in the Western US Corn Belt. *Agricultural Water Management*, 291, 108640. <https://doi.org/10.1016/j.agwat.2023.108640>.

Kimball, B. A., Thorp, K. R., Boote, K. J., Stockle, C., Suyker, A. E., Evett, S. R., Brauer, D. K., Coyle, G. G.,

- Copeland, K. S., Marek, G. W., Colaizzi, P. D., Acutis, M., Archontoulis, S., Babacar, F., Barcza, Z., Basso, B., Bertuzzi, P., De Antoni Migliorati, M., Dumont, B., ... Zhou, W. 2024. Simulation of soil temperature under maize: An inter-comparison among 33 maize models. *Agricultural and Forest Meteorology*, 351, 110003. <https://doi.org/10.1016/j.agrformet.2024.110003>.
- Morris, T. C., Franz, T. E., Becker, S. M., & Suyker, A. E. 2024. Effect of Biomass Water Dynamics in Cosmic-Ray Neutron Sensor Observations: A Long-Term Analysis of Maize–Soybean Rotation in Nebraska. *Sensors*, 24(13), 4094. <https://doi.org/10.3390/s24134094>.
- Dias, H. B., Cuadra, S. V., Boote, K. J., Lamparelli, R. A. C., Figueiredo, G. K. D. A., Suyker, A. E., Magalhães, P. S. G., & Hoogenboom, G. 2023. Coupling the CSM-CROPGRO-Soybean crop model with the ECOSMOS Ecosystem Model – An evaluation with data from an AmeriFlux site. *Agricultural and Forest Meteorology*, 342, 109697. <https://doi.org/10.1016/j.agrformet.2023.109697>.
- Gonçalves, I. Z., Neale, C. M. U., Suyker, A., & Marin, F. R. 2023. Evapotranspiration adjustment for irrigated maize–soybean rotation systems in Nebraska, USA. *International Journal of Biometeorology*, 67(11), 1869–1879. <https://doi.org/10.1007/s00484-023-02547-8>.
- Kimball, B.A., Thorp, K.R., Boote, K.J., Stockle, C., Suyker, A.E., Evett, S.R., Brauer, D.K., Coyle, G.G., Copeland, K.S., Marek, G.W., Colaizzi, P.D., Acutis, M., Alimaghani, S., Archontoulis, S., Babacar, F., Barcza, Z., Basso, B., Bertuzzi, P., Constantine, J., De Antoni Migliorati, M., Dumont, B., Durand, J.-L., Fodor, N., Gaiser, T., Garofalo, P., Gayler, S., Giglio, L., Grant, R., Guan, K., Hoogenboom, G., Jiang, Q., Kim, S.-H., Kisekka, I., Lizaso, J., Masia, S., Meng, H., Mereu, T., Mukhtar, A., Perego, A., Peng, B., Priesack, E., Qi, Z., Shelia, V., Snyder, R., Soltani, A., Spano, D., Srivastava, A., Thomson, A., Timlin, D., Trabucco, A., Webber, H., Weber, T., Willaume, M., Williams, K., van der Laan, M., Ventrella, D., Viswanathan, M., Xu, X., Zhou, W. 2023. Simulation of evapotranspiration and yield of maize: An inter-comparison among 41 maize models. *Agricultural and Forest Meteorology*, 333, 109396, <https://doi.org/10.1016/j.agrformet.2023.109396>.
- Mazis, A., Awada, T., Erickson, G. E., Wardlow, B., Wienhold, B. J., Jin, V., Schmer, M., Suyker, A., Zhou, Y., & Hiller, J. 2023. Synergistic use of optical and biophysical traits to assess *Bromus inermis* pasture performance and quality under different management strategies in Eastern Nebraska, U.S. *Agriculture, Ecosystems & Environment*, 348, 108400. <https://doi.org/10.1016/j.agee.2023.108400>.
- Menefee, D., Lee, T. O., Flynn, K. C., Chen, J., Abraha, M., Baker, J., & Suyker, A. 2023. Machine learning algorithms improve MODIS GPP estimates in United States croplands. *Frontiers in Remote Sensing*, 4. <https://doi.org/10.3389/frsen.2023.1240895>.
- Volk, J. M., Huntington, J., Melton, F. S., Allen, R., Anderson, M. C., Fisher, J. B., Kilic, A., Senay, G., Halverson, G., Knipper, K., Minor, B., Pearson, C., Wang, T., Yang, Y., Evett, S., French, A. N., Jasoni, R., & Kustas, W. 2023. Development of a Benchmark Eddy Flux Evapotranspiration Dataset for Evaluation of Satellite-Driven Evapotranspiration Models Over the CONUS. *Agricultural and Forest Meteorology*, 331, 109307, [10.1016/j.agrformet.2023.109307](https://doi.org/10.1016/j.agrformet.2023.109307).
- Wu, G., Guan, K., Jiang, C., Kimm, H., Miao, G., Yang, X., Bernacchi, C. J., Sun, X., Suyker, A. E., & Moore, C. E. 2023. Can upscaling ground nadir SIF to eddy covariance footprint improve the relationship between SIF and GPP in croplands? *Agricultural and Forest Meteorology*, 338, 109532. <https://doi.org/10.1016/j.agrformet.2023.109532>.
- Zhang, J., Guan, K., Zhou, W., Jiang, C., Peng, B., Pan, M., Grant, R. F., Franz, T. E., Suyker, A., Yang, Y., Chen, X., Lin, K., & Ma, Z. 2023. Combining Remotely Sensed Evapotranspiration and an Agroecosystem Model to Estimate Center-Pivot Irrigation Water Use at High Spatio-Temporal Resolution. *Water Resources Research*, 59(3). Portico. <https://doi.org/10.1029/2022wr032967>.
- Bagnall, D. K., Morgan, C. L. S., Bean, G. M., Liptzin, D., Cappellazzi, S. B., Cope, M., Greub, K. L. H., Rieke, E. L., Norris, C. E., Tracy, P. W., Aberle, E., Ashworth, A., Tavarez, O. B., Bary, A. I., Baumhardt, R. L., Gracia, A. B., Brainard, D. C., Brennan, J. R., Reyes, D. B., ... Honeycutt, C. W. 2022. Selecting soil hydraulic properties as indicators of soil health: Measurement response to management and site characteristics. *Soil Science Society of America Journal*, 86(5), 1206–1226. Portico. <https://doi.org/10.1002/saj2.20428>
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- dos Santos, C. L., Abendroth, L. J., Coulter, J. A., Nafziger, E. D., Suyker, A., Yu, J., Schnable, P. S., &

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- Nandan, R., Bandaru, V., He, J., Daughtry, C., Gowda, P., & Suyker, A. E. 2022. Evaluating Optical Remote Sensing Methods for Estimating Leaf Area Index for Corn and Soybean. *Remote Sensing*, 14(21), 5301. <https://doi.org/10.3390/rs14215301>
- Rieke, E. L., Bagnall, D. K., Morgan, C. L. S., Flynn, K. D., Howe, J. A., Greub, K. L. H., Mac Bean, G., Cappellazzi, S. B., Cope, M., Liptzin, D., Norris, C. E., Tracy, P. W., Aberle, E., Ashworth, A., Bañuelos Tavarez, O., Bary, A. I., Baumhardt, R. L., Borbón Gracia, A., Brainard, D. C., ... Honeycutt, C. W. 2022. Evaluation of aggregate stability methods for soil health. *Geoderma*, 428, 116156. <https://doi.org/10.1016/j.geoderma.2022.116156>
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- Suyker, A. 2022. AmeriFlux FLUXNET-1F US-Ne1 Mead - irrigated continuous maize site. [Data set]. AmeriFlux; University of Nebraska - Lincoln.
- Wang, R., Gamon, J. A., Hmimina, G., Cogliati, S., Zygielbaum, A. I., Arkebauer, T. J., & Suyker, A. 2022. Harmonizing solar induced fluorescence across spatial scales, instruments, and extraction methods using proximal and airborne remote sensing: A multi-scale study in a soybean field. *Remote Sensing of Environment*, 281, 113268. <https://doi.org/10.1016/j.rse.2022.113268>
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- Zhou, X., Gao, T., Takle, E. S., Zhen, X., Suyker, A. E., Awada, T., Okalebo, J., & Zhu, J. 2022. Air

- temperature equation derived from sonic temperature and water vapor mixing ratio for turbulent airflow sampled through closed-path eddy-covariance flux systems. *Atmospheric Measurement Techniques*, 15(1), 95–115. <https://doi.org/10.5194/amt-15-95-2022>
- Batsukh, K., V.A. Zlotnik, A. Suyker, P. Nasta. 2021. Prediction of biome-specific potential evapotranspiration in Mongolia under a scarcity of weather data, *Water*, 13 (18), doi: 10.3390/w13182470.
- Browning, D. M., E.S. Russell, G.E. Ponce-Campos, N. Kaplan, A.D. Richardson, B. Seyednasrollah, S. Spiegel, N. Saliendra, J.G. Alfieri, J. Baker, C. Bernacchi, B.T. Bestelmeyer, D. Bosch, E.H. Boughton, R.K. Boughton, P. Clark, G. Flerchinger, N. Gomez-Casanovas, S. Goslee, N.M. Haddad, D. Hoover, A. Jaradat, M. Mauritz, G.W. McCarty, G.R. Miller, J. Sadler, A. Saha, R.L. Scott, A. Suyker, C. Tweedie, J.D. Wood, X.K. Zhang, S.D. Taylor. 2021. Monitoring agroecosystem productivity and phenology at a national scale: A metric assessment framework. *Ecological Indicators*, 131, 108147, doi: 10.1016/j.ecolind.2021.108147.
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- Cuadra, S.V., B.A. Kimball, K.J. Boote, A.E. Suyker, N. Pickering. 2021. Energy balance in the DSSAT-CSM-CROPGRO model, *Agricultural and Forest Meteorology*, 297, 108241, doi: 10.1016/j.agrformet.2020.108241.
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- Zhang, J.W., K.Y. Guan, B. Peng, M. Pan, W. Zhou, C.Y. Jiang, H. Kimm, T.E. Franz, R.F. Grant, Y. Yang, D.R. Rudnick, D.M. Heeren, A.E. Suyker, W.L. Bauerle, G.L. Miner. 2021. Sustainable irrigation based on co-regulation of soil water supply and atmospheric evaporative demand. *Nature Communications*, 12(1), doi: 10.1038/s41467-021-25254-7.
- Zhou, X.H., T. Gao, Y.C. Pang, H. Mahan, X.F. Li, N. Zheng, A.E. Suyker, T. Awada, J.J. Zhu. 2021. Based on atmospheric physics and ecological principle to assess the accuracies of field CO₂/H₂O measurements from infrared gas analyzers in closed-path eddy-covariance systems. *Earth and Space Science*, 8(10), doi: 10.1029/2021ea001763.
- Zhou, X.H., T. Gao, E.S. Takle, X. Zhen, A.E. Suyker, T. Awada, J. Okalebo, J. Zhu. 2021. Air temperature equation derived from sonic temperature and water vapor mixing ratio for air flow sampled through closed-path eddy-covariance flux systems. *Atmospheric Measurement Techniques*, 15 (1), 95-115, doi: 10.5194/amt-2021-160.
- Bandaru, V., R. Yamasu, P. Koutilya, J. He, S. Fernando, R. Sahajpal B.D. Wardlow, A. Suyker, C. Justice. 2020. PhenoCrop: An integrated satellite-based framework to estimate physiological growth stages of corn and soybeans, *International Journal of Applied Earth Observation and Geoinformation*, 92, 102188, doi: 10.1016/j.jag.2020.102188.
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OTHER PROFESSIONAL ACTIVITIES

Board of Editors, Agricultural and Forest Meteorology, An International Journal (since June, 2012).

Member, Carbon Sequestration Advisory Committee (mandated by Legislative Bill 957 and appointed by the Governor) (Feb. 2013 – May 2017).

Peer Review of manuscripts submitted to Journal of Geophysical Research - Biogeosciences, Journal of Geophysical Research - Atmospheres, Agricultural and Forest Meteorology, Agricultural Ecosystems and Environment, Wetlands, Great Plains Research, Rangeland Ecology and Management, Agronomy Journal, Global Change Biology, Global Change Biology- Bioenergy, Plant and Soil, Journal of Hydrometeorology, Water Resources Research, Science of the Total Environment.