

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

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 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

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, 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. 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. \$180,000. 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.

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

- 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*, doi: 10.13031/trans.12311.
- Campos, I., C.M.U. Neale, T.J. Arkebauer, A.E. Suyker, I.Z. Goncalves. 2018. Water productivity and crop yield: A simplified remote sensing driven operational approach. *Agricultural and Forest Meteorology*, 249, 501-511, doi: <https://doi.org/10.1016/j.agrformet.2017.07.018>.
- Campos, I., L. González-Gómez, J. Villodre, J. González-Piqueras, A.E. Suyker, A. Calera. 2018. Remote sensing based crop biomass with water or light-driven crop growth models in wheat commercial fields. *Field Crops Research*, 216C, 175-188, doi:10.1016/j.fcr.2017.11.025.
- Peng, B., K. Guan, M. Chen, D.M. Lawrence, Y. Pokhrel, A. Suyker, T. Arkebauer, Y. Lu. 2018. Improving maize growth processes in the community land model: Implementation and evaluation, *Agricultural and Forest Meteorology* 250–251:64-89, doi:10.1016/j.agrformet.2017.11.012.
- Campos, I., C.M.U. Neale, A.E. Suyker, T.J. Arkebauer, I.Z. Goncalves. 2017. Reflectance-based crop coefficients REDUX: For operational evapotranspiration estimates in the age of high producing hybrid varieties. *Agricultural Water Management*, 187, 140-153, doi: 10.1016/j.agwat.2017.03.022.
- Foolad, F., T.E. Franz, T.J. Wang, J. Gibson, A. Kilic, R.G. Allen, A. Suyker. 2017. Feasibility analysis of using inverse modeling for estimating field-scale evapotranspiration in maize and soybean fields from soil water content monitoring networks. *Hydrology and Earth System Sciences*, 21(2), 1263-1277, doi: 10.5194/hess-21-1263-2017
- Hidy, D., Z. Barcza, H. Marjanović, M.Z. Ostrogović Sever, L. Dobor, G. Gelybó, N. Fodor, K. Pintér, G. Churkina, S. Running, P. Thornton, G. Bellocchi, L. Haszpra, F. Horvath, A. Suyker, Z. Nagy. 2016. Terrestrial Ecosystem Process Model Biome-BGCMuSo: Summary of improvements and new modeling possibilities. *Geoscientific Model Development Discussions*, 9(12), 4405-4437.
- Avery, W. A., C. Finkenbiner, T.E. Franz, T. Wang, A.L. Nguy-Robertson, A.E. Suyker, T.J. Arkebauer, F. Muñoz-Arriola. 2016. Incorporation of globally available datasets into the roving cosmic-ray neutron probe method for estimating field-scale soil water content, *Hydrology and Earth System Sciences*, 20, 3859-3872, doi:10.5194/hess-20-3859-2016.
- Balzarolo, M., S. Vicca, A.L. Nguy-Robertson, D. Bonal, J.A. Elbers, Y.H. Fu, T. Grunwald, J.A. Horemans, D. Papale, J. Penuelas, A. Suyker, F. Veroustraete. 2016. Matching the phenology of Net Ecosystem Exchange and vegetation indices estimated with MODIS and FLUXNET in-situ observations. *Remote Sensing of the Environment*, 174: 290-300.
- Cochran, F. V., N.A. Brunsell, A. Suyker. 2016. A Thermodynamic Approach for Assessing Agroecosystem Sustainability. *Ecological Indicators*, 67, 204-214.
- Hornbuckle, B. K., J.C. Patton, A. VanLoocke, A. Suyker, M.C. Roby, V.A. Walker, E.R. Iyer, D.E. Herzmann, E.A. Endacott. 2016. SMOS optical thickness changes in response to the growth and development of crops, crop management, and weather. *Remote Sensing of Environment*, 180, 320-333.

- Lokupitiya, E., A.S. Denning, K. Schaefer, D. Ricciuto, R. Anderson, M.A. Arain, I. Baker, A.G. Barr, G. Chen, J.M. Chen, P. Ciais, D.R. Cook, M. Dietze, M. El Maayar, M. Fischer, R. Grant, D. Hollinger, C. Izaurralde, A. Jain, C. Kucharik, Z. Li, S. Liu, L. Li, R. Matamala, P. Peylin, D. Price, S.W. Running, A. Sahoo, M. Sprintsin, A. Suyker, H. Tian, C. Tonitto, M. Torn, H. Verbeeck, S.B. Verma, Y. Xue. 2016. Carbon and energy fluxes in cropland ecosystems: a model-data comparison. *Biogeochemistry*, 129(1), 53-76.
- Nguy-Robertson, A., E. Brinley-Buckley, A. Suyker, T.N. Awada. 2016. Determining factors that impact the calibration of consumer-grade digital cameras used for vegetation analysis. *International Journal of Remote Sensing*, 37(14), 3365-3383.
- Petrie, M. D., N.A. Brunsell, R. Vargas, S.L. Collins, L.B. Flanagan, N.P. Hanan, M.E. Litvak, A. Suyker. 2016. The sensitivity of carbon exchanges in Great Plains grasslands to precipitation variability. *Journal of Geophysical Research - Biogeosciences*, 121(2), 280-294.
- Shao, J., X. Zhou, Y. Luo, B. Li, M. Aurela, D. Billesbach, P.D. Blanken, R. Bracho, J. Chen, M. Fischer, Y. Fu, L. Gu, S. Han, Y. He, T. Kolb, Y. Li, Z. Nagy, S. Niu, W.C. Oechel, K. Pinter, P. Shi, A. Suyker, M. Torn, A., Varlagin, H. Wang, J. Yan, G. Yu, J. Zhang. 2016. Direct and indirect effects of climatic variations on the interannual variability in net ecosystem exchange across terrestrial ecosystems. *Tellus B*, 68 (online) DOI 10.3402/tellusb.v68.30575.
- Xin, Q., P. Gong, A. Suyker, Y. Si. 2016. Effects of the partitioning of diffuse and direct solar radiation on satellite-based modeling of crop gross primary production. *International Journal of Applied Earth Observation & Geoinformation*, 50, 51-63.
- Zhao, L., X.H. Lee, A.E. Suyker, X.F. Wen. 2016. Influence of Leaf Area Index on the Radiometric Resistance to Heat Transfer. *Boundary Layer Meteorology*, 158(1): 105-123. DOI:10.1007/s10546-015-0070-4.
- Cheng, S. J., G. Bohrer, A.L. Steiner, D.Y. Hollinger, A.E. Suyker, R.P. Phillips, K.J. Nadelhoffer. 2015. Variations in the influence of diffuse light on gross primary productivity in temperate ecosystems. *Agricultural and Forest Meteorology*, 201(0): 98 - 110.
- Dong, J., X. Xiao, P. Wagle, G. Zhang, Y. Zhou, J. Jin, M.S. Torn, T.P. Meyers, A.E. Suyker, J. Wang, H. Yan, C. Biradar, B. Moore III. 2015. Comparison of four EVI-based models for estimating gross primary production of maize and soybean croplands and tallgrass prairie under severe drought. *Remote Sensing of Environment*, 162: 154-168.
- Gitelson, A., Y. Peng, T. Arkebauer, A. Suyker. 2015. Productivity, absorbed photosynthetically active radiation, and light use efficiency in crops: Implications for remote sensing of crop primary production. *Journal of Plant Physiology*, 177: 100-109.
- Nguy-Robertson, A., A.E. Suyker, X. Xiao. 2015. Modeling gross primary production of maize and soybean croplands using light quality, temperature, water stress, and phenology. *Agricultural and Forest Meteorology*, 213: 160-172.
- Shao, J., X. Zhou, Y. Luo, B. Li, M. Aurela, D. Billesbach, P.D. Blanken, R. Bracho, J. Chen, M. Fischer, Y. Fu, L. Gu, S. Han, Y. He, T. Kolb, Y. Li, Z. Nagy, S. Niu, W.C. Oechel, K. Pinter, P. Shi, A.E. Suyker, M. Torn, A. Varlagin, H. Wang, J. Yan, G. Yu, J. Zhang. 2015. Biotic and climatic controls on interannual variability in carbon fluxes across terrestrial ecosystems. *Agricultural and Forest Meteorology*, 205: 11-22.
- Wagle, P., X. Xiao, A. Suyker. 2015. Estimation and analysis of gross primary production of soybean under various management practices and drought conditions. *[ISPRS] Journal of Photogrammetry and Remote Sensing*, 99(0): 70 - 83.
- Xia, J., S. Niu, Y. Luo, P. Ciais, I.A. Janssens, J. Chen, C. Ammann, A. Arain, P.D. Blanken, A. Cescatti, D. Bonal, N. Buchmann, P.S. Curtis, S. Chen, J. Dong, L.B. Flanagan, C. Frankenberg, T. Georgiadis, C.M. Gough, D. Hui, G. Kiely, J. Li, M. Lund, V. Magliulo, B. Marcolla, L. Merbold, L. Montagnani, E.J. Moors, J.E. Olesen, S. Piao, A. Raschi, O. Roupsard, A. Suyker, M. Urbaniak, F. Vaccari, A. Varlagin, T. Vesala, M. Wilkinson, E. Weng, G. Wohlfahrt, L. Yan. 2015. Joint Control of Terrestrial Gross Primary Productivity by Plant Phenology and Physiology. *Proceedings of the National Academy of Sciences of the United States of America*, 112(9): 2788-2793.
- Xin, Q., M. Broich, A. Suyker, Y. Le, P. Gong. 2015. Multi-scale evaluation of light use efficiency in {MODIS} gross primary productivity for croplands in the Midwestern United States. *Agricultural and Forest Meteorology*, 201(0): 111 - 119.
- Yuan, W., W. Cai, A.L. Nguy-Robertson, H. Fang, A.E. Suyker, Y. Chen, W. Dong, S. Liu, H. Zhang. 2015. Uncertainty in simulating gross primary production of cropland ecosystem from satellite-based models. *Agricultural and Forest Meteorology*, 207: 48-57.

- Zhang, Q., Y.-B. Cheng, A.I. Lyapustin, Y. Wang, X. Zhang, A. Suyker, S. Verma, Y. Shuai, E.M. Middleton. 2015. Estimation of crop gross primary production (GPP): II. Do scaled {MODIS} vegetation indices improve performance? *Agricultural and Forest Meteorology*, 200(0): 1 - 8.
- Liska, A. J., H. Yang, M.P. Pelton, A. Suyker. 2014. Reply to 'CO₂ emissions from crop residue-derived biofuels'. *Nature Climate Change*, 4(11): 934-935.
- Zhang, Q., Y.-B. Cheng, A.I. Lyapustin, Y. Wang, F. Gao, A. Suyker, S. Verma, E.M. Middleton. 2014. Estimation of crop gross primary production (GPP): fAPARchl versus {MOD15A2} {FPAR}. *Remote Sensing of Environment*, 153(0): 1 - 6.
- Xiao, J., S.V. Ollinger, S. Frolking, G.C. Hurtt, D.Y. Hollinger, K.J. Davis, Y. Pan, X. Zhang, F. Deng, J. Chen, D.D. Baldocchi, B.E. Law, M.A. Arain, A.R. Desai, A. D. Richardson, G. Sun, G., B. Amiro, H. Margolis, L. Gu, R.L. Scott, P.D. Blanken, A. Suyker. 2014. Data-driven diagnostics of terrestrial carbon dynamics over North America. *Agricultural and Forest Meteorology*, 197(0): 142 – 157.
- Zhang, Q., Y.-B. Cheng, A.I. Lyapustin, Y. Wang, X. Xiao, A. Suyker, S. Verma, B. Tan, E.M. Middleton. 2014. Estimation of crop gross primary production (GPP): I. impact of {MODIS} observation footprint and impact of vegetation {BRDF} characteristics. *Agricultural and Forest Meteorology*, 191(0): 51 - 63.
- Gilmanov, T.G., J.M. Baker, C.J. Bernacchi, D.P. Billesbach, G.G. Burba, S. Castro, J. Chen, W. Eugster, M.L. Fischer, J.A. Gamon, M.T. Gebremedhin, A.J. Glenn, T.J. Griffis, J.L. Hatfield, M.W. Heuer, D.M. Howard, M.Y. Leclerc, H.W. Loescher, O. Marloie, T.P. Meyers, A. Olioso, R.L. Phillips, J.H. Prueger, R. H. Skinner, A.E. Suyker, M. Tenuta, B.K. Wylie. 2014. Productivity and Carbon Dioxide Exchange of the Leguminous Crops: Estimates from Flux Tower Measurements. *Agronomy Journal*, 106(2): 545-559. DOI:10.2134/agronj2013.0270.
- Liska, A.J., H. Yang, M. Milner, S. Goddard, H. Blanco-Canqui, M.P. Pelton, X.X. Fang, H. Zhu, and A.E. Suyker. 2014. Biofuels from crop residue can reduce soil carbon and increase CO₂ emissions. *Nature Climate Change*, 4(5): 398-401. DOI:10.1038/nclimate2187.
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- Lagos, L.O., D.L. Martin, S.B. Verma, S. Irmak, A. Irmak, D.E. Eisenhauer, and A.E. Suyker. 2013. Surface energy balance model of transpiration and evaporation from residue-covered or bare-soil systems: Model evaluation. *Irrigation Science*, 31(2): 135-150. DOI:10.1007/s00271-011-0298-9.
- Xin, Q., P. Gong, C. Yu, L. Yu, M. Broich, A.E. Suyker, R.B. Myneni. 2013. A Production Efficiency Model-Based Method for Satellite Estimates of Corn and Soybean Yields in the Midwestern US, *Remote Sensing*, 5(11): 5926-5943. DOI:10.3390/rs5115926
- Sakamoto, T., A.A. Gitelson, A.L. Nguy-Robertson, T.J. Arkebauer, B.D. Wardlow, A.E. Suyker, S.B. Verma, and M. Shibayama. 2012. An alternative method using digital cameras for continuous monitoring of crop status. *Agricultural and Forest Meteorology*, 154-155: 113-126.
- Sakamoto, T., A.A. Gitelson, B.D. Wardlow, T.J. Arkebauer, S.B. Verma, A.E. Suyker, and M. Shibayama. 2012. Application of day and night digital photographs for estimating maize biophysical characteristics. *Precision Agriculture*, 13: 285-301.
- Singh, R.K., S. Liu, L.L. Tieszen, A.E. Suyker, and S.B. Verma. 2012. Novel approach for computing photosynthetically active radiation for productivity modeling using remotely sensed images in the Great Plains, United States. *Journal of Applied Remote Sensing Letters*, 6(1): 063522:1-12. DOI: 10.1117/1.JRS.6.063522.
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- Sakamoto, T., A.A. Gitelson, B.D. Wardlow, S.B. Verma, and A.E. Suyker. 2011. Estimating daily gross primary production of maize based only on MODIS WDRVI and shortwave radiation data. *Remote Sensing of Environment*, 115: 3091-3101.
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- Xiao, J., Q. Zhuang, B.E. Law, J. Chen, D.D. Baldocchi, D.R. Cook, R. Oren, A.D. Richardson, S. Wharton, S. Ma, T.A. Martin, S.B. Verma, A.E. Suyker, R.L. Scott, R.K. Monson, M. Litvak, D.Y. Hollinger, G. Sun, K.J. Davis, P.V. Bolstad, S.P. Burns, P.S. Curtis, B.G. Drake, M. Falk, M.L. Fischer, D.R. Foster, L. Gu, J.L. Hadley, G.G. Katul, R. Matamala, S. McNulty, T.P. Meyers, J.W. Munger, A. Noormets, W.C. Oechel, K.T. Paw U, H.P. Schmid, G. Starr, M.S. Torn, S.C. Wofsy.

2010. A Continuous Measure of Gross Primary Production for the Conterminous U.S. Derived from MODIS and AmeriFlux Data. *Remote Sensing of Environment*, 114: 576-591.
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- Issues and Uncertainties Related to Long-term Eddy Covariance Measurements of Carbon and Energy Exchanges, Boulder, CO, May 2000.
- Suyker AE, Verma SB (2000) "Nighttime CO₂ Exchange in a Tallgrass Prairie and a Winter Wheat Field", 24th Conference on Agricultural and Forest Meteorology (AMS Conference), Davis, CA, August 2000, pp. 192.
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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) (since Feb. 2013).

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.

Member of American Meteorological Society (February, 2005 - present)