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Carl R Woese Institute for Genomic Biology
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Education

2008. PhD Earth System Science, University of California at Irvine.
2003. MS Ecology, Agriculture conc., University of California at Davis.
1998. BS Biology, Duke University.

Employment

Agrible, Inc.

2015–present. Senior Scientific Advisor.

University of Illinois at Urbana-Champaign

2012–present. Research Scientist, Carl R. Woese Institute for Genomic Biology.
2012–2015. Scientific Research Manager, Ecosystem Modeling Program, Energy Biosciences Institute.
2009–2012. Postdoctoral Researcher, Energy Biosciences Institute.

North Carolina Agricultural and Technical State University

2003–2004. Lab Manager, Mushroom Biology and Fungal Biotechnology Laboratory.

Duke University

1996–2001. Laboratory and Field Technician, Biogeochemistry and Community Ecology Labs.

Publications

Monographs

LeBauer, D. S., Wang, D., Richter, K. T., Davidson, C. C., Dietze, M. C., (2013). Facilitating feedbacks between field measurements and ecosystem models. *Ecological Monographs* **83**(2), 133–154. DOI: 10.1890/12-0137.1.

Journal articles

LeBauer, D. S., Kooper, R., Long, S. P., Mulrooney, P. J., Rohde, S., Wang, D., Dietze, M. C., (2017). BETYdb: A Yield, Trait and Ecosystem Service Database Applied to Second Generation Bioenergy Feedstocks. *Global Change Biology Bioenergy*. DOI: 10.1111/gcbb.12420.

Anderson-Teixeira, K. J., Wang, M., McGarvey, J. C.**, LeBauer, D. S.,** (2016). Carbon dynamics of mature and regrowth tropical forests derived from a pantropical database (TropForC). *Global Change Biology*. DOI: 10.1111/gcb.13226.

Hart, E., Barmby, P.**, LeBauer, D. S.**, Michonneau, F., Mount, S., Mulrooney, P., Poisot, T., Woo, K. H., Zimmerman, N., Hollister, J. W., (2016). Ten simple rules for digital data storage. *PLOS Computational Biology*. DOI: 10.1371/journal.pcbi.1005097.

Davis, S., Ming, R.**, LeBauer, D. S.**, Long, S., (2015). Toward systems-level analysis of agricultural production from Crassulacean Acid Metabolism (CAM): scaling from cell to commercial production. *New Phytologist*. DOI: 10.111/nph.13522.

Wang, D., Jaiswal, D.**, LeBauer, D.**, Wertin, T., Bollero, G., Leakey, A., Long, S., (2015). A physiological and biophysical model of coppice willow (Salix spp.) production for the contiguous USA in current and future climate scenarios. *Plant, Cell & Environment*.

Zhu, X.-G., Lynch, J. P.**, LeBauer, D. S.**, Millar, A. J., Stitt, M., Long, S. P., (2015). Plants in silico: Why, Why Now and Framework - An integrative platform for plant systems biology research. *Plant, Cell & Environment*. DOI: 10.1111/pce.12673.

Davis, S. C.**, LeBauer, D. S.**, Long, S. P., (2014). Light to liquid fuel: theoretical and realized energy conversion efficiency of plants using Crassulacean Acid Metabolism (CAM) in arid conditions. *Journal of experimental botany* **65**(13), 3471–3478. DOI: 10.1093/jxb/eru163.

Dietze, M. C., Serbin, S. P., Davidson, C., Desai, A. R., Feng, X., Kelly, R., Kooper, R.**, LeBauer, D. S.**, Mantooth, J., McHenry, K., Wang, D., (2014). A quantitative assessment of a terrestrial biosphere model's data needs across North American biomes. *Journal of Geophysical Research: Biogeosciences* **119**(3), 286–300. DOI: 10.1002/2013JG002392.

Dietze, M. C.**, LeBauer, D. S.**, Kooper, R., (2013). On improving the communication between models and data. *Plant, Cell & Environment* **36**(9), 1575–1585. DOI: 10.1111/pce.12043.

LeBauer, D. S., Dietze, M. C., Bolker, B. M., (2013). Translating Probability Density Functions : From R to BUGS and Back Again. *R Journal* **5**(1), 207–209.

Wang, D.**, LeBauer, D. S.**, Dietze, M., (2013). Predicting yields of short-rotation hybrid poplar (Populus spp.) for the United States through model–data synthesis. *Ecological Applications* **23**(4), 944–958. DOI: 10.1890/12-0854.1.

Wang, D.**, LeBauer, D. S.**, Kling, G., Voigt, T., Dietze, M. C., (2013). Ecophysiological screening of tree species for biomass production: trade-off between production and water use. *Ecosphere* **4**(11), art138. DOI: 10.1890/ES13-00156.1.

LeBauer, D. S., (2010). Litter degradation rate and β-glucosidase activity increase with fungal diversity. *Canadian Journal of Forest Research* **40**(6), 1076–1085. DOI: 10.1139/X10-054.

Wang, D.**, LeBauer, D. S.**, Dietze, M. C., (2010). A quantitative review comparing the yield of switchgrass in monocultures and mixtures in relation to climate and management factors. *GCB Bioenergy* **2**(1), 16–25. DOI: 10.1111/j.1757-1707.2010.01035.x.

Allison, S. D.**, LeBauer, D. S.**, Ofrecio, M. R., Reyes, R., Ta, A. M., Tran, T. M., (2009). Low levels of nitrogen addition stimulate decomposition by boreal forest fungi. *Soil Biology and Biochemistry* **41**(2), 293–302. DOI: 10.1016/j.soilbio.2008.10.032.

LeBauer, D. S., Treseder, K. K., (2008). Nitrogen limitation of net primary productivity in terrestrial ecosystems is globally distributed. *Ecology* **89**(2), 371–9. DOI: 10.1890/06-2057.1.

Okano, Y., Hristova, K. R., Christian, M., Jackson, L. E., Denison, R. F.**, LeBauer, D. S.**, Scow, K. M., Leutenegger, C. M., Gebreyesus, B., (2004). Application of Real-Time PCR To Study Effects of Ammonium on Population Size of Ammonia-Oxidizing Bacteria in Soil. *Applied and Environmental Microbiology* **70**(2), 1008–1016. DOI: 10.1128/AEM.70.2.1008.

Conference proceedings

Lin, T.**, LeBauer, D. S.**, Rodriguez, L., Wang, S., (2015). A holistic workflow development for agricultural supply chain analysis: Integration of meteorological forecasting, crop simulation, and supply chain optimization models. In: *1st Climate Change Symposium - Adaptation and Mitigation*. 152143848. ASABE.

Kooper, R., McHenry, K., Dietze, M. C.**, LeBauer, D. S.**, Serbin, S., Desai, A., (2013). Ecological Cyberinfrastructure and HPC Towards More Accurately Predicting Future Levels of Greenhouse Gases. In: *XSEDE13*.

Submitted papers

Black, C. K., Masters, M. D.**, LeBauer, D. S.**, Anderson-Teixeira, K. J., DeLucia, E. H., (*submitted*). Root volume distribution of maturing perennial grasses revealed by correcting for minirhizotron surface effects.

Jaiswal, D., Larsen, S., De Souza, A.**, LeBauer, D. S.**, Miguez, F. E., Sparovek, G., Buckeridge, M. S., Bollero, G., Long, S. P., (*submitted*). Brazilian Sugarcane Ethanol Could Offset 14% of Global Oil Use and 6% of Net Emissions by 2045.

Other

Software

LeBauer, D. S., Kooper, R., Dietze, M., Cowdery, B., Serbin, S. P., (2015). *Predictive Ecosystem Analyzer (PEcAn)*. DOI: 10.5281/zenodo.14632.

Miguez, F. E., Jaiswal, D.**, LeBauer, D. S.**, Wang, D., (2015). *BioCro Crop Productivity and Ecosystem Service Simulation Model*. DOI: 10.5281/zenodo.15859.

Rohde, S., Mulroony, P., Kooper, R., Crott, C., Shirk, A.**, LeBauer, D. S.,** (2015). *Biofuel Ecophysiological Traits and Yields database (BETYdb)*. DOI: 10.5281/zenodo.14099.

Anderson-Teixeira, K., DeLucia, E., Crott, C.**, LeBauer, D. S.**, Rohde, S., (2014). *Ecosystem Climate Regulation Services Calculator*. DOI: 10.5281/zenodo.12319.

Book chapter

Isikhuemhen, O.**, LeBauer, D.,** (2004). "Growing *Pleurotus tuberregium*". In: *Oyster Mushroom Cultivation*. Seoul, Korea: MushWorld, pp. 270–281.

Grants

2016–2019. Global Sustainable Bioenergy Initiative: Geospatial and environmental analysis of pastureland intensification for bioenergy, FAPESP (Fundacao de Amparo a Pesquisa do Estado de Sao Paulo). Co-PI ($200k).

2015–2019. A Reference Phenotyping System for Energy Sorghum, U.S. Department of Energy: Advanced Research Projects Agency - Energy (ARPA-E). Co-PI ($1.7m of $8.4m).

2015–2017. TERRA-MEPP (Mobile Energy-crop Phenotyping Platform), U.S. Department of Energy: Advanced Research Projects Agency - Energy (ARPA-E). Co-PI ($132k of $3.4m).

2015–2019. The PEcAn Project: A Community Platform for Ecological Forecasting, NSF Division of Biological Infrastructure Award 1458021. Co-Investigator ().

2012–2015. Feedstock and Ecosystem Service Modeling Program, Energy Biosciences Institute. Lead author ($2.5m).

2011–2014. Model-data synthesis and forecasting across the upper Midwest; Partitioning uncertainty and environmental heterogeneity in ecosystem carbon., NSF Advances in Bioinformatics Infrastructure. Co-author ().

Awards

2014–present. Faculty Fellow, National Center for Supercomputing Applications ($25k).

2006. Mildred E. Mathias Graduate Research Grant, UC Natural Reserve System, Decomposition responses to nitrogen in a California grassland ($1k).

2005–2007. Graduate Fellowship, Kearney Soil Science Foundation ($34k).

2004–2005. Graduate Fellowship, UC Irvine Department of Earth System Science ($32k).

1998. Honors in Ecology and Graduation with Distinction, Duke University Department of Biology.

1998. Benenson Award in the Arts, Duke University ($1.5k).

1997. Undergraduate Research Support, Duke University ($400).

Invited talks

2017 *Integrating Diverse Environmental Data Streams for Phenomic Analysis and Crop Modeling*. Phenome 2017, Tucson, AZ.

2016 *Building Open Access Data, Computing, and Software Infrastructure for High Throughput Phenomics*. Plant Imaginge Consortium Annual Meeting, University of Arkansas, Fayetteville, AK.
2016 *An open access crop observatory and computing platform for plant breeding*. ROGER Users Meeting, National Center for Supercomputing Applications, Urbana, IL.
2016 *Uncertainty Analysis in the Predictive Ecosystem Analyzer (PEcAn)*. PEcAn 2 Terrestrial Model Informatics Workshop, Boston University, Boston, MA.
2016 *Opportunities to Improve Cropping Systems with Data*. International Food Security at Illinois Symposium: Using Big Data to Improve International Food Security, University of Illinois, Urbana, IL.
2016 *Demonstration of The TERRA Phenotyping Reference Platform*. 5th National Data Service Consortium Workshop, Chapel Hill, NC.
2015 *An open-access platform for quantification of plant traits from big sensor data*. Informatics for Reproducibility in Earth and Environmental Science Research, American Geophysical Union, San Francisco, CA.
2015 *Software for Ecological Inference and Prediction: What We Have and What We Need*. Developing, Maintaining, and Employing Large Computational Frameworks in the Ecological Sciences. Statistical and Applied Mathematical Sciences Institute, Durham, NC.
2014 *Modeling the Productivity and Ecosystem Services of Sugarcane*. Global Sustainable Bioenergy / FAPESP annual meeting, Piracicaba, Brazil.
2014 *PEcAn: A probabilistic modeling workflow for deterministic models*. FACE-IT Workshop, Computation Institute, University of Chicago, Chicago, IL.
2013 *Modeling Bioenergy Feedstock Productivity and Ecosystem Services*. Global Bioenergy Crop Modeling Workshop, Oak Ridge National Laborator, Oak Ridge, TN.
2013 *Reducing uncertainty through data-driven model development*. Uncertainty Analysis: A Critical Step in Ecological Synthesis, Organized Oral Session, Ecological Society of America Meetings, Minneapolis, MN.
2010 *PEcAn, a workflow management tool for real-time data assimilation and forecasting*. Combining Experiments, Process Studies, and Models to Forecast the Future of Ecosystems, Communities, and Populations. Organized Oral Session, Ecological Society of America Meetings, Pittsburgh, PA.

Service

Academic

2015–2016. Reviewer. EarthCube Architecture Conceptual Design.
2012–2016. Campus Representative. National Ecological Observatory Network (NEON).
2009–2011. Expert for Climate Science Experts Referal Service. American Geophysical Union.
2006–2008. Judge. California State Science Fair.
2006–2007. Graduate Student Representative. UCI Department of Earth System Science.
2005–2006. Graduate Student Seminar Organizer. UCI Department of Earth System Science.
2003. Project Mentor. FARMS Leadership, Inc. and Sacramento Public Schools.
1998–1999. Guest Teacher, K-12. Sigma Xi, Scientists in the Classroom.

Workshops

February 2016. Workshop Co-organizer. Using TERRA REF phenotyping data. Phenome 2017, Tucson, AZ.
January 2016. Invited Participant. Moving Field Phenomics From Theory to Practice. US-UK Phenomics Workshop, Maricopa, AZ.

October 2016. Invited Participant. Plant Science Cyberinfrastructure Initiative. Plant Science Research Network, Washington, DC.
August 2016. Session Co-Organizer. Hacking Ecology 2.0, a showcase of open tools for data-driven ecology. Ecological Society of America Annual Meetings, Fort Lauderdale, FL.
November 2014. Workshop Co-Organizer. Soil Carbon Cycle Super-Modeling. Biosphere 2, Oracle, AZ.
August 2014. Symposium Co-Organizer. Challenges and Advances in Statistical Software For Ecology.. Ecological Society of America Annual Meetings, Sacramento, CA.
March 2014. Workshop Chair and Co-Organizer. Advancing Software for Ecological Forecasting. Urbana, IL.

Grant Reviews

US National Science Foundation

Journal Reviewer

Applied Soil Ecology, Ecology, Ecology Letters, Ecological Applications, Global Change Biology, Global Change Biology - Bioenergy, Geophysical Research Letters, Journal of Geophysical Research, Journal of Geophysical Research - Biogeosciences, Nature Climate Change, Nature Scientific Reports, New Phytologist, Plant Soil

Consultancy

2015–present. Smithsonian Institution, CTFS – ForestGEO Ecosystems and Climate Initiative, Falls Curch, Va
2011–2014. Global Change Solutions, LLC, Urbana, IL
1999–2000. Wildflower Organics, Dawsonville, GA
2000. Crabtree Valley Farms, Chatanooga, TN
1999. Sustenance Farm, Bear Creek, NC

Teaching

2017. Instructor, Computational Mathematics Bootcamp, Program for Interdisciplinary and Industrial Internships at Illinois, Urbana, IL.
2017. Introduction to the TERRA Reference Phenotyping Dataset, Phenome 2017, Tucson, AZ.
2015–present. Software Carpentry Instructor.
2015. Cultivating Shiitake on Logs, Land Connection Workshop, Urbana, IL.
2013–2014. PEcAn Software Training, Ecological Society of America Meetings.
2009. Global Change Biology, California Summer School for Science and Mah.
2008. TA, Experimental Biology Laboratory, UC at Irvine.
2008. Atmospheric and Environmental Sciences, California Summer School for Science and Math.
2008. TA, GIS for Environmental Science, UC Irvine.
2007. TA, Global Change Biology, UC Irvine.
2006. TA, GIS for Environmental Science, UC Irvine.
2003. Shiitake Cultivation Workshops, Hosted by NC Extension at multiple locations.
2003. TA, Mushroom Cultivation, UC Davis.
1997. TA, Archaeology and Geology Southwest field trip, Duke Talent Identification Program.