David LeBauer , PhD

University of Arizona
207 Bioscience Research Labs
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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

University of Arizona

2018–present. Director of Data Science for the Division of Agriculture, Life and Veterinary Sciences and Cooperative Extension.

University of Illinois at Urbana-Champaign

2012–2018. Research Scientist, Carl R. Woese Institute for Genomic Biology
Scientific Research Manager, Energy Biosciences Institute Feedstock Productivity and Ecosystem Services Modeling Program (2012–2015)
Fellow, National Center for Supercomputing Applications (2014–present)
Adjunct, Department of Agriculture and Biological Engineering (2017–present).
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

Ely, K. S., Rogers, A., Agarwal, D. A., Ainsworth, E. A., Albert, L., Ali, A., Anderson, J., Aspinwall, M. J., Bellasio, C., Bernacchi, C., Bonnage, S., Buckley, T. N., Bunce, J., Burnett, A. C., Busch, F. A., Cavanagh, A., Cernusak, L. A., Crystal-Ornelas, R., Damerow, J., Davidson, K. J., De Kauwe, M. G., Dietze, M. C., Domingues, T. F., Dusenge, M. E., Ellsworth, D. S., Evans, J. R., Gauthier, P. P., Gimenez, B. O., Gordon, E. P., Gough, C. M., Halbritter, A. H., Hanson, D. T., Heskel, M., Hogan, J. A., Hupp, J. R., Jardine, K., Kattge, J., Keenan, T., Kromdijk, J., Kumarathunge, D. P., Lamour, J., Leakey, A. D., **LeBauer, D. S.**, Li, Q., Lundgren, M. R., McDowell, N., Meacham-Hensold, K., Medlyn, B. E., Moore, D. J., Negrón-Juárez, R., Niinemets, Ü., Osborne, C. P., Pivovaroff, A. L., Poorter, H., Reed, S. C., Ryu, Y., Sanz-Saez, A., Schmiege, S. C., Serbin, S. P., Sharkey, T. D., Slot, M., Smith, N. G., Sonawane, B. V., South, P. F., Souza, D. C., Stinziano, J. R., Stuart-Haëntjens, E., Taylor, S. H., Tejera, M. D., Uddling, J., Vandvik, V., Varadharajan, C., Walker, A. P., Walker, B. J., Warren, J. M., Way, D. A., Wolfe, B. T., Wu, J., Wullschleger, S. D., Xu, C., Yan, Z., Yang, D., (2021). A reporting format for leaf-level gas exchange data and metadata. *Ecological Informatics*, 101232. DOI: 10.1016/j.ecoinf.2021.101232.

Sahneh, F., Balk, M. A., Kisley, M., Chan, C.-k., Fox, M., Nord, B., Lyons, E., Swetnam, T., Huppenkothen, D., Sutherland, W., Walls, R. L., Quinn, D. P., Tarin, T., **LeBauer, D.**, Ribes, D., Birnie, D. P., Lushbough, C., Carr, E., Nearing, G., Fischer, J., Tyle, K., Carrasco, L., Lang, M., Rose, P. W., Rushforth, R. R., Roy, S., Matheson, T., Lee, T., Brown, C. T., Teal, T. K., Papeș, M., Kobourov, S., Merchant, N., (2021). Ten simple rules to cultivate transdisciplinary collaboration in data science. *PLOS Computational Biology* **17**(5), 1–12. DOI: 10.1371/journal.pcbi.1008879.

Fer, I., Gardella, A. K., Shiklomanov, A. N., Campbell, E. E., Cowdery, E. M., De Kauwe, M. G., Desai, A., Duveneck, M. J., Fisher, J. B., Haynes, K. D., Hoffman, F. M., Johnston, M. R., Kooper, R., **LeBauer, D. S.**, Mantooth, J., Parton, W. J., Poulter, B., Quaife, T., Raiho, A., Schaefer, K., Serbin, S. P., Simkins, J., Wilcox, K. R., Viskari, T., Dietze, M. C., (2020). Beyond ecosystem modeling: A roadmap to community cyberinfrastructure for ecological data-model integration. *Global Change Biology* **27**(1), 13–26. DOI: https://doi.org/10.1111/gcb.15409. eprint: https://onlinelibrary.wiley.com/doi/pdf/10.1111/gcb.15409.

Field, J. L., Richard, T. L., Smithwick, E. A. H., Cai, H., Laser, M. S., **LeBauer, D. S.**, Long, S. P., Paustian, K., Qin, Z., Sheehan, J. J., Smith, P., Wang, M. Q., Lynd, L. R., (2020). Robust paths to net greenhouse gas mitigation and negative emissions via advanced biofuels. *Proceedings of the National Academy of Sciences* **117**(36), 21968–21977. DOI: 10.1073/pnas.1920877117. eprint: https://www.pnas.org/content/117/36/21968.full.pdf.

Maimaitijiang, M., Sagan, V., Erkbol, H., Adrian, J., Newcomb, M., **LeBauer, D.**, Pauli, D., Shakoor, N., Mockler, T. C., (2020). UAV-Based Sorghum Growth Monitoring: A Comparative Analysis of LIDAR and Photogrammetry. *ISPRS Annals of the Photogrammetry, Remote Sensing and Spatial Information Sciences* **V-3-2020**, 489–496. DOI: 10.5194/isprs-annals-V-3-2020-489-2020.

Babaeian, E., Sidike, P., Newcomb, M. S., Maimaitijiang, M., White, S. A., Demieville, J., Ward, R. W., Sadeghi, M., **LeBauer, D. S.**, Jones, S. B., Sagan, V., Tuller, M., (2019). A New Optical Remote Sensing Technique for High-Resolution Mapping of Soil Moisture. *Frontiers in Big Data* **2**, 37. DOI: 10.3389/fdata.2019.00037.

Selby, P., Abbeloos, R., Backlund, J. E., Basterrechea Salido, M., Bauchet, G., Benites-Alfaro, O., Birkett, C., Calaminos, V. C., Carceller, P., Cornut, G., Vasques Costa, B., Edwards, J. D., Finkers, R., Gao, S. Y., Ghaffar, M., Glaser, P., Guignon, V., Hok, P., Kilian, A., König, P., Lagare, J. E. B., Lange, M., Laporte, M.-A., Larmande, P., **LeBauer, D. S.**, Lyon, D., Marshall, D., Matthews, D., Milne, I., Mistry, N., Morales, N., Mueller, L., Neveu, P., Papoutsoglou, E., Pearce, B., Perez-Masias, I., Pommier, C., Ramirez-Gonzalez, R. H., Rathore, A., Raque, A. M., Raubach, S., Rife, T., Robbins, K., Rouard, M., Sarma, C., Scholz, U., Sempéré, G., Shaw, P., Simon, R., Soldevilla, N., Stephen, G., Sun, Q., Tovar, C., Uszynski, G., Verouden, M., (2019). BrAPI - an Application Programming Interface for Plant Breeding Applications. *Bioinformatics*. DOI: 10.1093/bioinformatics/btz190.

LeBauer, D. S., Kooper, R., Long, S. P., Mulrooney, P. J., Rohde, S., Wang, D., Dietze, M. C., (2018). BETYdb: A Yield, Trait and Ecosystem Service Database Applied to Second Generation Bioenergy Feedstocks. *Global Change Biology Bioenergy*. DOI: 10.1111/gcbb.12420.

Black, C. K., Masters, M. D., **LeBauer, D. S.**, Anderson-Teixeira, K. J., DeLucia, E. H., (2017). Root volume distribution of maturing perennial grasses revealed by correcting for minirhizotron surface effects. *Plant and Soil*. DOI: 10.1007/s11104-017-3333-7.

Jaiswal, D., Larsen, S., De Souza, A., **LeBauer, D. S.**, Miguez, F. E., Sparovek, G., Buckeridge, M. S., Bollero, G., Long, S. P., (2017). Brazilian Sugarcane Ethanol As an Expandable Green Alternative to Crude Oil Use. *Nature Climate Change*. DOI: 10.1038/NCLIMATE3410.

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

Pistorius, J., Martin, C., Sudarshan, S., **LeBauer, D. S.,** (2020). Exosphere - Bringing The Cloud Closer. In: *2020 IEEE/ACM International Workshop on Interoperability of Supercomputing and Cloud Technologies (SuperCompCloud)*. IEEE, pp.1–6. DOI: 10.1109/SuperCompCloud51944.2020.00006.

Schnaufer, C., Pistorius, J. L., **LeBauer, D. S.,** (2020). An open, scalable, and flexible framework for automated aerial measurement of field experiments. In: Proceedings of SPIE. DOI: 10.1117/12.2560008.

Burnette, M., Kooper, R., Maloney, J., Rohde, G. S., Terstriep, J. A., Willis, C., Fahlgren, N., Mockler, T., Newcomb, M., Sagan, V., (2018). TERRA-REF Data Processing Infrastructure. In: *Proceedings of the Practice and Experience on Advanced Research Computing*. ACM, pp.27.

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*.

Data

David, E., Serouart, M., Smith, D., Madec, S., Velumani, K., Liu, S., Wang, X., Espinosa, F. P., Shafiee, S., Tahir, I. S. A., Tsujimoto, H., Nasuda, S., Zheng, B., Kichgessner, N., Aasen, H., Hund, A., Sadeghi-Tehran, P., Nagasawa, K., Ishikawa, G., Dandrifosse, S., Carlier, A., Mercatoris, B., Kuroki, K., Wang, H., Ishii, M., Badhon, M. A., Pozniak, C., **LeBauer, D. S.**, Lilimo, M., Poland, J., Chapman, S. C., Solan, B., Baret, F., Stavness, I., Guo, W., (2021). Global Wheat Head Dataset 2021: an update to improve the benchmarking wheat head localization with more diversity. *CoRR* **abs/2105.07660**. arXiv: 2105.07660.

LeBauer, D., Burnette, M. A., Demieville, J., Fahlgren, N., French, A. N., Garnett, R., Hu, Z., Huynh, K., Kooper, R., Li, Z., Maimaitijiang, M., Mao, J., Mockler, T. C., Morris, G., Newcomb, M., Ottman, M. J., Ozersky, P., Paheding, S., Pauli, D., Pless, R., Qin, W., Riemer, K., Rohde, G. S., Rooney, W. L., Sagan, V., Shakoor, N., Stylianou, A., Thorp, K., Ward, R., White, J. W., Willis, C., Zender, C. S., (2020). *TERRA-REF, An Open Reference Data Set From High Resolution Genomics, Phenomics, and Imaging Sensors. Dryad Digital Repository.* DOI: 10.5061/dryad.4b8gtht99.

Anderson-Teixeira, K., Wang, M., McGarvey, J., Herrmann, V., Tepley, A., Bond-Lamberty, B., **LeBauer, D.,** (2018). ForC: A global database of forest carbon stocks and fluxes. *Ecology*.

Letters

Jaiswal, D., De Souza, A. P., Larsen, S., **LeBauer, D. S.**, Miguez, F. E., Sparovek, G., Bollero, G., Buckeridge, M. S., Long, S. P., (2019). Reply to: Brazilian ethanol expansion subject to limitations. *Nature Climate Change* **9**(3), 211.

Other

Software

LeBauer, D., Burnette, M., Willis, C., Li, Z., Pless, R., Hajmohammadi, S., Rohde, S., contributors, T. R., (2017). *TERRA Reference Phenotyping Platform database and computing pipeline (*`terraref.org`*)*. code: `github.com/terraref`. Version 1.0 beta.

LeBauer, D., Dietze, M., Kooper, R., Shiklomanov, A., Cowdery, B., Fer, I., Gardella, A., Bond-Lamberty, B., Serbin, S. P., Raiho, A., Thomas, A., Black, C., Simkins, J., Desai, A., Mantooth, J., Kumar, A., Burke, L., Pourmokhtarian, A., Rollinson, C., Agarwal, S., Hardiman, B., Kauwe, M. D., McCabe, T., Cohen, T., Viskari, T., Zhao, Y., Xia, J., (2017). *Predictive Ecosystem Analyzer (PEcAn,* `pecanproject.org`*)*. code: `github.com/pecanproject/pecan`. Version 1.5.1. DOI: `10.5281/zenodo.1003756`.

Rohde, S., Mulroony, P., Kooper, R., Crott, C., Shirk, A., **LeBauer, D. S.,** (2017). *Biofuel Ecophysiological Traits and Yields database (BETYdb, betydb.org)*. code: `github.com/pecanproject/bety`. Version 4.18. DOI: `10.5281/zenodo.832983`.

Anderson-Teixeira, K., DeLucia, E., Crott, C., **LeBauer, D. S.**, Rohde, S., Potter, N., Dorsey, J., (2015). *Ecosystem Climate Regulation Services Calculator (*`www.ecosystemservicescalc.org`*)*. code: `github.com/ebimodeling/ghgvc`. Version 1.0. DOI: `10.5281/zenodo.12319`.

Miguez, F. E., Jaiswal, D., **LeBauer, D. S.**, Wang, D., McGrath, J., (2015). *BioCro Crop Productivity and Ecosystem Service Simulation Model*. code: `github.com/ebimodeling/biocro`. Version 0.93. DOI: `10.5281/zenodo.15859`.

Book chapter

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

Grants

2021–2022. Evaluating High Bandwidth Satellite Communications for Data Intensive Agriculture, Yuma Center for Desert Agriculture Small Grants Program. PI ($20k).

2019–2022. The Agricultural Research Data Network (ARDN), USDA-NIFA. Co-PI ($75k of $500k).

2018–2021. SENTINEL: SENsing Threats In Natural Environments using Ligand-receptor modules, DARPA. Co-PI ($731k of $10m).

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).

2016–2019. TERRA REF Computing and Storage Allocation, National Center for Supercomputing Applications: Blue Waters project and CyberGIS Center. PI ($1m+ in computing resources).

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-I ($0).

2014. Advancing Software for Ecological Forecasting (Workshop), Microsoft Research Connections, Carl R Woese Institute for Genomic Biology, DOE RCN Forecast. Chair and Co-PI ($30k).

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 ($770k).

Awards

2017. Outstanding Students Pushing Innovation (SPIN) Mentor, National Center for Supercomputing Applications.
2014–2015. NCSA Fellowship, 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).
1998. Honors in Ecology and Graduation with Distinction, Duke University Department of Biology.
1998. Benenson Award in the Arts, Duke University ($1.5k).

Invited talks

2018 *Open Software, Data, and Computing Frameworks to Advance High Throughput Phenomics and Agricultural Forecasting*. Center for Sustainable Resource Science, RIKEN Yokohama Campus, Yokohama, Japan.
2018 *Open Software, Data, and Computing Frameworks to Advance High Throughput Phenomics and Agricultural Forecasting*. Data driven crop design technology. Institute of Mathematics for Industry, Kyushu University, Fukuoka, Japan.
2018 *Software and Data as Scaffolds for Integrative Science*. Department of Agricultural and Biological Engineering, University of Arizona, Tucson, AZ.
2017 *Panelist*. Agricultural Data Integration: From Genomics to Unmanned Systems. Institute of Mathematics and its Applications, University of Minnesota, Minneapolis, MN.
2017 *TERRA REF Data and Computing Infrastructure*. DARPA Data Driven Discovery of Models (D3M) Fall Hackathon and Evaluation Dry-Run, Arlington, VA.
2017 *TERRA REF Data and Computing Infrastructure.*. ARPA-E Joint TERRA and ROOTS Annual Meeting, Saint Louis, MO.
2017 *Software and Data as Scaffolds for Integrative Science.*. College of Agriculture, Purdue University, West Lafayette, IN.
2017 *A Meteoroligcal Data Format That Makes Research Easier and Will Work for Imaging Sensors.*. 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 and 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 Laboratory, 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.

Teaching

2017. Data Science in Modern Agriculture (Seminar), University of Illinois Department of Agricultural and Biological Engineering, Urbana, IL.

2017. Instructor, Computational Mathematics Bootcamp, Program for Interdisciplinary and Industrial Internships at Illinois, Urbana, IL. `pi4-uiuc.github.io/2017-bootcamp`.

2017. Instructor, Advanced Phenomics Workshop, Purdue University Departments of Agronomy and Agricultural and Biological Engineering, West Lafayette, IN..

2017–present. Instructor, Urbana Math Circle, Urbana, IL. `urbanamathcircle.blogspot.com`.

2015–present. Software Carpentry Instructor.

2015. Instructor, Cultivating Shiitake on Logs, Land Connection Workshop, Urbana, IL.

2013–2014. Instructor, PEcAn Software Training, Ecological Society of America Meetings.

2009. Instructor, Global Change Biology, California Summer School for Science and Math.

2008. TA, Experimental Biology Lab, UC at Irvine. `sites.google.com/site/bio100lwlab14`.

2008. TA, 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. Instructor, 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.

Service

Academic

2021–2020. Member. Data Science Resources and Training Steering Committee.

2017–present. Google Summer of Code Mentor. PEcAn Project.

2015–present. Undergraduate Student Mentor. Students Pushing Innovation Program, National Center For Supercomputing Applications.

2015–2016. Reviewer. EarthCube Architecture Conceptual Design.

2014–2016. Graduate Student Summer Intern Mentor. Program for Interdisciplinary and Industrial Internships at Illinois.

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 2019. Organizer. PEcAn Project Hackathon. Santa Rita Experimental Range, Green Valley, Arizona.
February 2018. Co-organizer. Big Data Driven Agriculture: Advances, Challenges, and Opportunities. USDA NIFA-FACT, Alexandria, VA.
November 2017. Invited participant. The Subterranean Macroscope: Sensor Networks for Understanding, Modeling, and Managing Soil Processes. NSF, Chicago, IL.
February 2017. Co-organizer, lead instructor. Using TERRA REF phenotyping data. Phenome 2017, Tucson, AZ.
January 2017. 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, Foundation for Food and Agricultural Research

Journal Reviewer

Applied Soil Ecology, Ecology, Ecology Letters, Ecological Applications, Frontiers in Plant Science (Review Editor), Global Change Biology, Global Change Biology - Bioenergy, Geophysical Research Letters, Global Ecology and Biogeography, Journal of Geophysical Research, Journal of Geophysical Research - Biogeosciences, Nature Climate Change, Nature Scientific Reports, Open Data Journal for Agricultural Research, Plants, People, Planet, Proceedings of the National Academy of Sciences of the United States of America, New Phytologist, Plant Soil

Consultancy

2015–2018. Senior Scientific Advisor, Agrible, Inc., Champaign, Il
2015–2016. 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