

David LeBauer, Ph.D.

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EDUCATION

- 2008 **Ph.D.** Earth System Science, University of California at Irvine
- 2001 **M.S.** Ecology, Agriculture, University of California at Davis
- 1998 **B.S.** Biology with honors, Ecology concentration, Duke University

SELECTED WORK EXPERIENCE

Mar 2024–present **Owner and Principal Scientist**, The LeBauer Approach, LLC

- Modeling Lead and Project Manager, California Cropland Measurement and Modeling Framework (Sept 2024–present).
- Scientific Advisor, Varaha Climate AG (Jun 2024–present).
- Scientific consultant.

Feb 2023–Feb 2024. **Staff Scientist and Technical Lead**, Indigo Ag

- Technical lead for team that calibrated, validated, and wrote report following Climate Action Reserve Soil Enrichment Protocol to support generation of verified carbon credits. Wrote science requirements for automated model calibration and validation.
- Harmonized an extensive calibration and validation dataset of observed soil carbon, greenhouse gas fluxes, and yields; migrated dataset to a relational geospatial database.

Jul 2019–Jan 2023. **Director of Data Science**, University of Arizona Division of Agriculture, Life and Veterinary Sciences, and Cooperative Extension

- Founded and built a data science support team comprising 4-6 data scientists and software engineers to provide research support for the Division of Agriculture, Life Science, and Cooperative Extension at the University of Arizona. datascience.cct.arizona.edu
- Facilitated cross-disciplinary, collaborative research projects through data curation, statistical guidance, grant writing, workshops, and translation of research priorities across domains.
- Developed and launched a data science incubator program, leveraging institutional funds to provide researchers with technical support for data intensive projects with outcomes that include: producing preliminary results; upgrading scientific software; publishing papers, data, and code; creating data visualization dashboards and analysis pipelines: datascience.cct.arizona.edu/incubator
- Developed long term vision and five year plan to support team with core USDA Hatch funding alongside over \$2m in extramural funding to support modeling, computing, and informatics projects from ARPA-E, DARPA, USDA, and NSF.
- Associate Data Scientist (2023–present)

Jun 2015– Jul 2018 (part time). **Senior Scientific Advisor**, Agrible, Inc

- Designed and implemented analyses of yield data used to inform seed choice.
- Consulted with software engineers and scientists develop, analyze, and apply a crop model to inform and optimize farms and supply chains. Taught quantification and propagation of uncertainty in crop models, including soil physical properties and advised on implementation of these methods.

Jul 2012– Jul 2018. **Research Scientist**, University of Illinois

2015–2019 **Data and Computing Pipeline Lead**, *TERRA-REF*

- Awarded \$1.7m from the DOE plus over \$1m in computing and storage from NSF-funded computing resources to lead a team of three full time and ten part time programmers in the design and implementation of a pipeline of a cutting edge sensor based plant observation data stream.
- Coordinated development of software and data products across six collaborating research groups representing diverse domains across genomics, physiology, breeding, remote sensing, computer vision, and robotics. Obtained and integrated feedback from end users, an advisory committee, and industry partners into data products and metadata standards.

- Published the world's largest public domain agricultural data set including over 1PB of sensor, trait, and genomics data.

2012-2015 **Scientific Manager**, EBI Ecosystem Modeling Program

- Managed scientific research program that predicted yield potential, yield stability, and environmental impacts of bioenergy feedstock production.
- Responsible for writing proposals and administering a \$600k annual budget that supported research across four faculty, three postdocs, one research programmer, a project manager, multiple contractors, and dozens of part-time student employees.
- Led development and application of simulation, statistical, and informatics software.

Aug 2009-Jul 2012. **Postdoctoral Researcher**, University of Illinois

- Created, implemented (as PEcAn), and distributed a new software platform and database to support synthesis of ecophysiological and yield data and model-data synthesis.
- Developed protocol and database, and designed a UI to support efficient extraction of data from literature by teams of scientists and technicians.

SELECTED DATA & SOFTWARE PROJECTS

- PEcAn:** The Predictive Ecosystem Analyzer
Creator, developer, & co-PI 2009-present: Ecoinformatics toolbox for model-data synthesis, analysis, and prediction. Integrates observations with scientific understanding of crop and ecosystem functioning as an iterative, directed learning process. Skills: R package development, Bayesian statistics, ecosystem modeling, high performance computing, mentoring. web: pecanproject.org; code: github.com/PecanProject/pecan
- BETYdb:** Biofuel Ecophysiological Traits and Yields database
Creator & development lead 2009-present: Database network and web interface to harmonize heterogeneous plant, ecosystem, and agronomic data. Supports meta-analysis, simulation modeling, and synchronization among six research teams. Skills: SQL, PostGIS, UI design, APIs, networking, data management web: betydb.org; code: github.com/PecanProject/bety
- TERRA REF:** TERRA Reference Phenotyping Platform
Lead, data and computing pipeline, 2015-2019: Computing pipeline, reference data products, and cloud environments advancing the use of technology to improve crops and agriculture through high-throughput phenotyping. Skills: project management, cloud computing, API development, data standards, Python, MongoDB, netCDF, high performance computing. web: terraref.org; code: github.com/terraref
- BioCro:** Bioenergy Crop simulator
Development lead 2013-2015: Dynamical simulation model combining physics, chemistry and physiological processes to predict crop growth and water use. Skills: R, GitHub, ecophysiology, project management, software architecture, netCDF, high performance computing. code: github.com/ebimodeling/biocro
- GHGVC:** Ecosystem Climate Regulation Services Calculator.
Development lead 2013-2017: Web interface and R package to compute biophysical and biogeochemical impacts of land use change. code: github.com/ebimodeling/ghgvc

NOTABLE PUBLICATIONS

- 2020 What does TERRA-REF's high resolution, multi sensor plant sensing public domain data offer the Computer Vision Community? Proc. IEEE/CVF International Conference on Computer Vision doi: [10.1109/iccvw54120.2021.00162](https://doi.org/10.1109/iccvw54120.2021.00162)
- 2017 BETYdb: a yield, trait, and ecosystem service database applied to second-generation bioenergy feedstock production. Global Change Biology-Bioenergy doi: [10.1111/gcbb.12420](https://doi.org/10.1111/gcbb.12420)
- 2013 Facilitating feedbacks between field measurements and ecosystem models. Ecological Monographs doi: [10.1890/12-0137.1](https://doi.org/10.1890/12-0137.1)
- 2008 Nitrogen limitation of net primary productivity is globally distributed. Ecology doi: [10.1890/06-2057.1](https://doi.org/10.1890/06-2057.1)

HONORS AND AWARDS

- 2023 Equity, Inclusion, and Diversity Award. North American Plant Phenotyping Network
- 2021 Best Paper, 7th workshop on Computer Vision in Plant Phenotyping and Agriculture, ICCV 2021
- 2017 Outstanding Mentor, Students Pushing Innovation program at NCSA
- 2014 Faculty Fellow, National Center for Supercomputing Applications
- 2007 Graduate Student Representative, Department of Earth System Science
- 2005 Graduate Fellow, Kearney Soil Science Foundation
- 1998 Benenson Award in the Arts