

Joseph Dauer

Professor of Life Science Education

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University of Nebraska-Lincoln
Lincoln, Nebraska 68583

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Professional Preparation (Education)

- 2007 Ph. D. Ecology, The Pennsylvania State University, University Park, PA
 Dissertation Title: From emergence to impact: the role of the environment in
 facilitating dispersal of *Conyza canadensis*
 Advisor: Dr. David Mortensen
- 2004 M.S. Ecology, The Pennsylvania State University, University Park, PA
 Thesis Title: Long-distance dispersal of horseweed, *Conyza canadensis*, seed
 Advisor: Dr. David Mortensen
- 2001 B.S. Biology/Mathematics, Western Washington University, Bellingham, WA
 Advisors: Dr. Merrill Peterson and Dr. Sebastian Schreiber

Appointments

- 2025- **Professor of Life Sciences Education**, School of Natural Resources
 University of Nebraska-Lincoln, Lincoln, NE
- 2019-25 **Associate Professor of Life Sciences Education**, School of Natural Resources
 University of Nebraska-Lincoln, Lincoln, NE
- 2013-19 **Assistant Professor of Life Sciences Education**, School of Natural Resources
 University of Nebraska-Lincoln, Lincoln, NE
- 2010-13 **Research Associate**, Michigan State University, East Lansing, MI
 Advisor: Dr. Tammy Long
- 2008-10 **Postdoctoral Researcher**, Oregon State University, Corvallis, OR
 Advisors: Dr. Carol Mallory-Smith and Dr. Andrew Hulting
- 2007 **Postdoctoral Researcher**, Oregon State University, Corvallis, OR
 Advisor: Dr. Peter McEvoy
- 2001-2 **Research Associate**, Cornell University, Ithaca, NY
 Advisors: Dr. Antonio DiTommaso and Dr. Charles Mohler
- 1999-01 Math and Science Tutor, Western Washington University, Bellingham, WA
- 2001 **Teaching Assistant**, Western Washington University, Bellingham, WA
- 2000 Participant, Research Experience for Undergraduates (REU), Michigan State
 University, Kellogg Biological Station, Hickory Corners, MI, *Advisor:* Fabián
 Menalled

Publications (advised postdocs, #graduate or *undergraduate)

41. Rauschert, E., **J.T. Dauer**, J.M. Dauer, J. Momsen, A Sutton-Grier. Systems Thinking in Ecosystems: Modeling and Predicting Complex Disease Dynamics. In Pathways to Teaching, eds D. Ebert-May and E. Holt. *In Press*.
40. Clark, C.A., #M.G. Behrendt, T.M. Long, and **J.T. Dauer**. 2025. Neural responses to errors in models and their relevance for longer term learning among undergraduate life sciences students. *Trends in Neuroscience and Education*.
39. **Dauer, J.T.**, #M.G. Behrendt, *M. Elliott, #B. Gettings, C.A. Clark, and T.M. Long. 2024. Individual variation in undergraduate student metacognitive monitoring and error detection during biology model evaluation. *Frontiers in Education*. Vol. 9.
<https://www.frontiersin.org/articles/10.3389/feduc.2024.1356626>
38. #Behrendt, M.G., Clark, C.A., and **J.T. Dauer**. 2024. Relation of biology students' metacognitive monitoring to neural activity during model-based scientific reasoning. *npj Science of Learning*. 9(1): 1-12. <https://www.nature.com/articles/s41539-024-00231-z>
37. Lucas, L., B. Couch, #A. Khushal, R. Mayes, and **J.T. Dauer**. 2024. Development of the Quantitative Modeling Observation Protocol (QMOP) for Undergraduate Biology Courses: Validity Evidence for Score Interpretation and Uses. *International Journal of Science Education*, 47(2): 282-306. <https://doi.org/10.1080/09500693.2024.2320060>
36. Mayes, R., **J.T. Dauer**, and D. Owens. 2023. Convergence and Transdisciplinary Teaching in Quantitative Biology. *Quantitative Plant Biology*. 4:e8. doi: 10.1017/qpb.2023.8
35. #Spier, S. and **J.T. Dauer**. 2023. Sexual selection as a tool to improve student reasoning of evolution. *American Biology Teacher*. 85(2): 91-96. <https://doi.org/10.1525/abt.2023.85.2.91>
34. Lucas, L., Helikar, T., and **J.T. Dauer**. 2022. Revision as an essential step in modeling to support predicting, observing, and explaining cellular respiration system dynamics. *International Journal of Science Education*. <https://doi.org/10.1080/09500693.2022.2114815>
33. **Dauer, J.T.**, J.M. Dauer, L. Lucas, T. Helikar, and T. Long. 2022. Supporting university student learning of complex systems: an example of teaching the interactive processes that constitute photosynthesis. In *Understanding Complexity in Biology Education*, eds M.C.P. Knippels and O. Ben-Zvi Assaraf. Springer International Publishing. pp. 63-82. https://doi.org/10.1007/978-3-030-98144-0_4
32. Mayes, R., D. Owens, **J.T. Dauer**, K. Rittschof. 2022. A Quantitative Reasoning Framework and the Importance of Quantitative Modeling in Biology. *Applied and Computational Mathematics*. 11(1):1-17. doi: [10.11648/j.acm.20221101.11](https://doi.org/10.11648/j.acm.20221101.11)
31. **Dauer, J.T.**, R. Mayes, K. Rittschoff and B. Gallant. 2021. Assessing quantitative modelling practices, metamodelling, and capability confidence of biology undergraduate students. *International Journal of Science Education*. <https://doi.org/10.1080/09500693.2021.1928325>
30. Clark, C.A., T. Helikar, and **J.T. Dauer**. 2020. Simulating a computational Biological Model, Rather Than Reading, Elicits Changes in Brain Activity during Biological Reasoning. *CBE—Life Sciences Education* 19, no. 3 (September 1, 2020): ar45. <https://doi.org/10.1187/cbe.19-11-0237>
29. **Dauer, J.T.**, H. Bergan-Roller, G.P. King, *McKenzie KJose, N. Galt, and T. Helikar. 2019. Changes in Students' Mental Models from Computational Modeling of Gene Regulatory

- Networks. *International Journal of STEM Education* 6 (1): 38. <https://doi.org/10.1186/s40594-019-0193-0>
28. King, G.P., H. Bergan-Roller, N. Galt, T. Helikar, and **J.T. Dauer**. 2019. Modelling Activities Integrating Construction and Simulation Supported Explanatory and Evaluative Reasoning. *International Journal of Science Education* 41 (13): 1764–86. <https://doi.org/10.1080/09500693.2019.1640914>.
 27. Mayes, R., K. Rittschof, **J.T. Dauer**, and B. Gallant. 2019. Quantitative Modelling Biology Undergraduate Assessment. *Letters in Biomathematics*, September 24, 2019, 1–27. <https://doi.org/10.1080/23737867.2019.1653234>.
 26. *Crowther, Audrey, H.E. Bergan-Roller, N. Galt, L. Appleby, **J.T. Dauer**, and T. Helikar. 2019. Discovering Prokaryotic Gene Regulation by Building and Investigating a Computational Model of the *Lac* Operon. *CourseSource* 6. <https://doi.org/10.24918/cs.2019.4>.
 25. Bergan-Roller, H., N. Galt, T. Helikar, and **J.T. Dauer**. 2020. Content and organization of student knowledge of cellular respiration in undergraduates. *Journal of Biological Education*. 54: 33-46. <https://doi.org/10.1080/00219266.2018.1541001>
 24. *Crowther A., H. Bergan-Roller, N. Galt, **J.T. Dauer**, and T. Helikar. 2018. Discovering Prokaryotic Gene Regulation with Simulations of the *trp* Operon. *CourseSource*. doi:10.24918/cs.2018.9
 23. Bergan-Roller, H., N. J. Galt, C. Chizinski, T. Helikar, and **J.T. Dauer**. 2018. Simulated Computational Model Lesson Improves Systems Thinking in Biology Students. *BioScience*. 68:612-621. <https://doi.org/10.1093/biosci/biy054>
 22. **Dauer, J.T.**, A. Hulting, D. Carlson, J. Harden, L. Mankin, and C. Mallory-Smith. 2018. Gene flow from single and stacked herbicide-resistant rice: modeling occurrence of multiple herbicide-resistant red rice. *Pest Management Science*. 74:348-355.
 21. #Sabel, J. L., **J.T. Dauer**, C. Forbes. 2017. Introductory Biology Students' Use of Rubrics and Reflection Questions to Engage in Metacognition and Enhance Understanding. *CBE- Life Sciences Education*. 16(3):ar40.
 20. Bergan-Roller, H., N. Galt, **J.T. Dauer**, and T. Helikar. 2017. Discovering Cellular Respiration with Computational Modeling and Simulation. *CourseSource*. <https://doi.org/10.24918/cs.2017.10>
 19. **Dauer, J.T.** and J.M. Dauer. 2016. A framework for understanding the characteristics of complexity in biology. *International Journal of STEM Education*. 3:13. <https://doi.org/10.1186/s40594-016-0047-y>
 18. Kowal, B., T.R. Schreier, **J.T. Dauer**, and T. Helikar. 2016. Programmatic Access to Cell Collective models via a REST API. *BioSystems*. 139: 12-16.
 17. **Dauer, J.T.** and T.M. Long. 2015. Long-term conceptual retrieval by college biology majors following model-based instruction. *Journal of Research in Science Teaching*. 52(8):1188-1206.
 16. Jongejans, E., O. Skarpaas, M. Ferrari, E. Long, **J.T. Dauer**, C. Schwarz, E. Rauschert, R. Jabbour, D.A. Mortensen, S. Isard, D. Lieb, Z. Sezen, A. Hulting, K. Shea. 2014. A Unifying gravity framework for dispersal. *Theoretical Ecology*. 8(2):207-223.

15. Long, T.M., **J.T. Dauer**, K.M. Kostelnik, J.L. Momsen, S.A. Wyse, and D. Ebert-May. 2014. Designing Instruction to Foster Ecoliteracy Skills in Undergraduate Biology Education. *Frontiers in Ecology and the Environment*. 12(2): 138-139.
 14. **Dauer, J.T.**, J.L. Momsen, E. Bray-Speth, *S. Makohon-Moore, and T.M. Long. 2013. Analysis of Student-Constructed Models of Complex Biological Systems. *Journal of Research in Science Teaching*. 50(6):639-659.
 13. **Dauer, J.T.** and E. Jongejans. 2013. Elucidating the population dynamics of Japanese knotweed using integral projection models. *PLoS ONE* 8 (9):e75181.
 12. Hulting, A., **J.T. Dauer**, B. Hinds-Cook, D. Curtis, R. Koepke-Hill, and C. Mallory-Smith. 2012. Management of Italian Ryegrass (*Lolium perenne* ssp. *multiflorum*) in Western Oregon with preemergence applications of pyroxasulfone in winter wheat. *Weed Technology* 26(2): 230-235.
 11. **Dauer, J.T.**, P.B. McEvoy, and J. Van Sickle. 2012 Controlling an invasive plant species by targeted disruption of its life cycle. *Journal of Applied Ecology* 49:322-330.
 10. Felix, J., **J.T. Dauer**, A. Hulting, and C. Mallory-Smith. 2012. Yellow nutsedge growth and tuber production in response to increasing glyphosate rates and selected adjuvants. *Weed Technology* 26: 95-101.
 9. Rauschert, E. S. J., **J.T. Dauer**, J. L. Momsen, and A. Sutton-Grier. 2011. Primary literature across the undergraduate curriculum: teaching science process skills and content. *Bulletin of the Ecological Society of America* 92:396–405.
 8. **Dauer, J.T.**, E.C. Luschei, and D.A. Mortensen. 2009. Effects of glyphosate-resistant crop adoption on the connectivity of a landscape: an herbicide-resistant weed perspective. *Landscape Ecology* 24(6): 735-747.
 7. **Dauer, J.T.**, D.A. Mortensen, E.C. Luschei, S. Isard, E. Shields, and M.J. VanGessel. 2009. *Conyza canadensis* seed ascent in the lower atmosphere. *Agricultural and Forest Meteorology*. 149: 526-534.
 6. DiTommaso, A., Clements, D.R., Darbyshire, S.J., and **J.T. Dauer**. 2009. The Biology of Canadian Weeds 143. *Apocynum cannabinum* L.. *Canadian Journal of Plant Science*. 89:977-992.
 5. **Dauer, J.T.**, D.A. Mortensen, and M.J. VanGessel. 2007. Temporal and spatial dynamics of long-distance *Conyza canadensis* seed dispersal. *Journal of Applied Ecology* 44(1): 105-114.
 4. Menalled, F.D., R.G. Smith, **J.T. Dauer**, and T. Fox. 2007. Impact of agricultural management systems on carabid beetle communities and invertebrate weed seed predation. *Agriculture, Ecosystems and Environment* 118: 49-54.
 3. Shields, E.J., **J.T. Dauer**, M.J. VanGessel, and G. Neumann. 2006. Horseweed (*Conyza canadensis*) seed collected in the planetary boundary layer. *Weed Science* 54: 1063-1067.
 2. **Dauer, J.T.**, D.A. Mortensen, and R. Humston. 2006. Controlled environment experiments to predict dispersal distances of horseweed (*Conyza canadensis*) seed. *Weed Science* 54: 484-489.
- Outstanding Paper in Weed Science (Weed Science Society of America)**
1. Menalled, F., **J.T. Dauer**, T. Fox, and Renner, K. 2001. Managing your farm to increase weed-seed predation. Extension Bulletin E-2740, Michigan State University. February 2001.

Funded Research Projects

- 2022 Neural substrates of metacognition in education (NSF Research Collaboration Opportunity in Europe) **J. Dauer**, C. Clark, N. Faivre (Universite Alpes Grenoble). Total \$6,980
- 2020 ECR DBER DCL: Describing the neurobehavioral effects of modeling-based instruction in undergraduate life sciences education (NSF-DUE 2000549). **J. Dauer**, C. Clark, T. Long. Total \$313,907.
- Quantitative Modeling in Biology Undergraduate (QM BUG) Courses: Teaching Approaches and Student Outcomes (NSF-DUE 2021103). **J. Dauer** and B. Couch. \$402,926.
- 2019 Innovating life sciences education through computational modeling and simulations. National Science Foundation, EHR Improving Undergraduate Stem Education (NSF-DUE 1915131). T. Helikar, W. Smith, and **J. Dauer**. Total \$1,896,570.
- 2018 Describing the Neural Effects of Modeling-Based Instruction. University of Nebraska-Lincoln. C. Clark, **J. Dauer**, and T. Helikar. Total \$5,000.
- 2014 An Innovative Computational Modeling Intervention to Facilitate Learning of Biology in University Courses using Simulation and Dynamical Systems Approaches. National Science Foundation, EHR Improving Undergraduate Stem Education (NSF-DUE 1432001). T. Helikar and **J. Dauer**. Total \$2,321,016
- From atoms to ecosystems: Investigating undergraduate student reasoning across biological scales. UNL Office of Research and Economic Development. **J. Dauer** and B. Couch. Total \$28,855
- 2009 Quantifying Management Success of Japanese Knotweed. U.S. Department of Agriculture – Food and Agricultural Science Enhancement Post-Doctoral Fellowship. **J. Dauer**. Total \$125,000
- Modeling gene flow between herbicide resistant crops and weeds. BASF Corporation. **J. Dauer**, C. Mallory-Smith, and A. Hulting. Total \$32,000
- 2005 *Polygonum cuspidatum* seed and fragment retention time in water and effects on seedling establishment rate. Weed Science Society of America – Undergraduate Research Grants. Sponsor for Undergraduate PI D. Heggenstaller. Total \$1,000
- Weed Seed Dispersal into the Planetary Boundary Layer. Penn State College of Agricultural Sciences – Competitive Grants Program. **J. Dauer**. Total \$2,000

Teaching Experience

Courses instructed:

- 2014-25 Fundamentals of Biology II, Instructor
University of Nebraska-Lincoln, Lincoln, NE
- 2018-25 College Science Teaching

- University of Nebraska, Lincoln, NE
- 2017-25 Principles of Ecology (Fall, odd years)
University of Nebraska, Lincoln, NE
- 2012 Biological Science – Organisms and Populations, Co-Instructor
Michigan State University, East Lansing, MI
- 2008-9 Introduction to Weed Management, Lecture and Laboratory Instructor
Oregon State University, Corvallis, OR
- 2009 Toxic Plants in Pacific Northwest Pastures, Co-developer and Co-instructor
Oregon State University, Corvallis, OR
- 20015 Population Dynamics, Laboratory Instructor
The Pennsylvania State University, University Park, PA
- 2003-4 Principles in Weed Management, Laboratory Instructor
The Pennsylvania State University, University Park, PA

Curriculum Development and Training:

- 2018-19 Rwanda Institute for Conservation Agriculture (<https://www.rica.rw/>)
- 2015-17 Quantitative Undergraduate Biology Education and Synthesis (<https://qubeshub.org>)
- 2014 National Academies Summer Institute (<http://www.academiessummerinstitute.org>)
- 2013 Introductory Biology Project (<http://ibp.ou.edu>)
- 2009-10 Faculty Institutes for Reforming Scientific Teaching (<http://www.firstiv.org>)
- 2007 Teaching certificate program, The Pennsylvania State University Graduate School

Non-credit courses and workshops:

- 2014 Weed ecology Workshop University of West Indies, Kingston, Jamaica

Student and Postdoctoral Mentoring

Postdoctoral Scholars

- 2019-23 Dr. Lyrica Lucas
- 2017-19 Dr. Gretchen King
- 2015-17 Dr. Heather Bergan-Roller

Graduate Students with Direct Supervision

- 2021-25 Anum Khushal, M.S., University of Nebraska-Lincoln
Quantitative modeling teaching and learning
- 2016-19 Sarah Spier, M.S., University of Nebraska-Lincoln
Traffic noise and sexual selection: studies of anthropogenic impact on bird songs and undergraduate student reasoning of evolutionary mechanisms.
- 2014-15 Nathan Niosco, M.S., University of Nebraska-Lincoln

Studying introductory biology students' understanding of quantitative relationships and hidden dimensions of food web dynamics.

Graduate Students with Shared Supervision

- 2021-25 Mei Grace Behrendt, Ph.D., University of Nebraska-Lincoln
Linking behavioral and neural correlates of metacognitive monitoring among stem undergraduates

Undergraduate Student Researchers

- 2021 McKenna Elliott, University of Nebraska-Lincoln
Undergraduate Students' Confidence & Accuracy in Detecting Errors in Biological Models Related to GPA
- 2019 Marius Dongmo, University of Nebraska-Lincoln
Student explanations and predictions during modeling activities impacts learning gains. Findings presented at UNL Undergraduate Research.
- 2018 Taylor Uhler, University of Nebraska-Lincoln
Student understanding of creating and transferring recombinant DNA to create genetically modified organisms. Findings presented at UNL Undergraduate Research.
- 2016 McKenzie KJose, University of Nebraska-Lincoln
Studying student knowledge of the *lac* operon system of gene regulation in prokaryotes. Findings presented at UNL Undergraduate Research Fair and incorporated into upcoming publication.
- 2015 Sinan Akkoseoglu, University of Nebraska-Lincoln
Studying alignment between introductory biology instructors' verbal description of biological processes and inclusion of the processes in student-constructed conceptual models. Findings presented at UNL Undergraduate Research Fair.
- Jai Mediratta, University of Nebraska-Lincoln
Developed a computational model of positive and negative feedback loops using the Cell Collective platform. Findings presented at UNL Undergraduate Research Fair.
- 2013 Etiowo Usoro, Michigan State University
How do students change their usage of relationships between two biological concepts over time in an Introductory Biology Course? Findings presented at Michigan State University Undergraduate Research & Arts Forum
- 2012 Patrycja Zdziarska, Michigan State University
Model-based learning: investigating students' understanding of biological systems. Findings presented at Michigan State University Undergraduate Research & Arts Forum
- Neelima Wagley, Michigan State University
Model-based learning: investigating students' understanding of biological systems. Findings presented at Michigan State University Undergraduate Research & Arts Forum
- Sasha Makohon-Moore, Michigan State University
Student trends in critical understanding of a multimedia model. Does major influence structural complexity in students' conceptual models? Findings presented at Michigan State University Undergraduate Research & Arts Forum

Andy George, Michigan State University

Does point value affects student's effort and achievement. What's really important?

Identification of important concepts by major and non-major life science students. Findings presented at Michigan State University Undergraduate Research & Arts Forum.

2011 Megan Gustafson, Michigan State University

Context-based responses regarding origin of variation. Findings presented at Michigan State University Undergraduate Research & Arts Forum.

2007 Dan Heggenstaller, The Pennsylvania State University

Current status: Received M.S. in Forestry (The Pennsylvania State University)

Professional Development

2022-23 Utrecht University Freudenthal Institute Faculty Professional Development

2021-22 University of Nebraska-Lincoln, Deep Dive into Course Equity Data

2019 University of Nebraska-Lincoln, Course (Re)Design

National Society for Experiential Education, Experiential Education Academy

AAC&U, Institute on High-Impact Practices and Student Success

2018 University of Nebraska-Lincoln, Student Success Fellows Program

2015-17 Quantitative Undergraduate Biology Education and Synthesis (QUBES), Teaching quantitative biology working group

2016 University of Nebraska-Lincoln, Alan Alda Center for Communicating Science Workshop

2015 University of Nebraska-Lincoln, Adopting Research Based Instructional Strategies for Enhancing (ARISE) – Faculty Learning Community

2014 University of Nebraska-Lincoln, Research Development Fellows Program

Academic Service

2023- Committee to Foster Belongingness (chair)

2022- UNL Faculty Senate

2018 - CourseSource Journal Managing Editor (Ecology)

2016 - LIFE (Introductory Biology) Oversight Committee

2018-24 School of Natural Resources Graduate Committee

2018-22 School of Natural Resources Undergraduate Curriculum Committee

2020-21 Peer Evaluation of Teaching Task Force

Faculty Equity in Evaluation Task Force

2019-21 Secretary, Society for Advancement of Biology Education Research

2019 Co-author faculty tips to integrate Husker Student P.O.W.E.R. into classroom experiences to improve student success

2015-18 Consultation and Advisory Boards

“Developing a Student-Centered Introduction to Organic Agriculture Curriculum”
PI: Dr. Randa Jabbour (Univ. of Wyoming)

- 2015 University of Nebraska-Lincoln
Invited contributor to re-design of genetics courses

Graduate school campus-wide workshops for graduate TA's. Workshop co-organizer: “Student Learning and Engagement in Large Lecture Classes”

Teaching and Learning Symposium. Workshop co-organizer: “Student Learning and Engagement in Large Lecture Classes”
- 2013 Weed Science Society of America
Workshop co-organizer: “Re-aligning your course to improve student learning”

Ecological Society of America
Workshop co-organizer: “Got Data? Visualizing and manipulating ecological data sets to support undergraduate learning ”
- 2012 Ecological Society of America
Workshop co-organizer: “Formative Assessment: Just do it! Rapid Response to Undergraduate Feedback”
- 2011 Ecological Society of America
Workshop co-organizer: “101 ways to effectively use journal articles as teaching tools”

Michigan Community College Biologists
Workshop organizer: “101 ways to effectively use journal articles as teaching tools”
- 2010 Ecological Society of America
Workshop co-organizer: “In full Bloom: Using Bloom's taxonomy to align class learning objectives and assessments in introductory biology”
- 2008 Ecological Society of America
Organized Oral Session co-organizer: “Theoretical Perspectives in Agroecology”
- 2005 Northeast Ecology and Evolution Conference, Co-organizer

Presentations

Postdocs #Graduate Student; *Undergraduate Researcher

Invited Talks since 2013

- 2023 **Dauer, J.T.**, Utrecht University Biology Department. “Teaching and learning quantitative biology”
Dauer, J.T., Radboud University Nijmegen Biosciences Education Institute “Teaching and learning quantitative biology”
- 2022 **Dauer, J.T.**, The Pennsylvania State University Biology Dept. “How do undergraduate students organize and use biology models? Neural and cognitive research to support our teaching approaches”
Dauer, J.T., Biennial Conference on University Teaching in Natural Resources. “How do undergraduate students organize and use biology models? Neural and cognitive research to support our teaching approaches”

- 2020 **Dauer, J.T.**, University of Minnesota Biology Teaching and Learning Dept. “Exploration of Cognitive and Neural Processes Used by Undergraduate Biology Students during Modeling”
- 2019 **Dauer, J.T.**, Michigan State University CREATE for STEM “Exploration of Cognitive and Neural Processes Used by Undergraduate Biology Students during Modeling”
- 2017 **Dauer, J.T.**, University of Memphis “Modeling to Learn Biology: Research on how students construct and interpret biological system models”
Dauer, J.T., South Dakota State University “Comparison of student learning while investigating versus building models of biological systems”
- 2016 **Dauer, J.T.**, UNL STEM Education Seminar Series “Building versus Investigating Models of Regulation of Gene Expression”
- 2014 **Dauer, J.T.**, North Dakota State University “Fix it or Forget it: Biology models to aide undergraduate student sense-making and knowledge retention.”
Dauer, J.T., UNL STEM Education Seminar Series “Systems Thinking with Biology Models”
- 2013 **Dauer, J.T.**, Xi’an Jiaotong University Visiting (to UNL) Scholars seminar “Modeling as a way of knowing science”
Dauer, J.T., Ecological Society of America Annual Meeting Symposium “Using Education Theory: Learning From the Past to Shape the Future of Ecology Teaching”

Conference Talks (since 2021)

- 2025 #Behrendt, M.G., J. Wheeler, **J.T. Dauer**, and C.A.C Clark. Measuring undergraduates’ metacognitive monitoring during biological model evaluation. Presented at Society for Advancement of Biology Education Research.
Dauer, J.T., K. Rittschof, B. Couch, R. Mayes, and #A. Khushal. Assessing University Students’ Quantitative Modeling Abilities, Metacognition of Modeling, and Confidence in Modeling. Presented at Society for Advancement of Biology Education Research and European Science Education Research Association.
- 2024 #Behrendt, M.G., **Dauer, J.T.** & Clark, C.A.C. Exploring neural correlates of metacognitive monitoring in life science through a longitudinal mixed methods study. Poster presented at Flux Society, Baltimore, Maryland.
#Behrendt, M.G., **Dauer, J.T.** & Clark, C.A.C. Neural correlates of metacognitive monitoring predict knowledge retention in undergraduate biology students. Poster presented at the International Mind Brain and Education Society, Leuven, Belgium.
Clark, C.A.C., #Behrendt, M.G., & **Dauer, J.T.** The relevance of error detection and associated brain activity for biology concept retention among undergraduate life sciences students. Poster presented at the International Mind Brain and Education Society, Leuven, Belgium.
Dauer, J.T., #Behrendt, M.G., Elliott, M., #Gettings, B., Long, T.M. & Clark, C.A.C. Individual variation in university student metacognitive monitoring and error detection during biology model evaluation. Poster presented at the International Mind Brain and Education Society, Leuven, Belgium.
- 2023 *Lucas, L., Dauer, J.*, Helikar, T., Socially mediated metacognition during undergraduate lab group discussions about modeling of complex biological systems. Cross-Discipline-based Education Research, Lincoln, NE
Lucas, L., #A. Khushal, R. Mayes, B. Couch, and **J. Dauer**, Development of the Quantitative Modeling Observation Protocol (QMOP) for Undergraduate Biology Courses. National Association for Research in Science Teaching, Chicago, IL.

- 2022 #Behrendt, M.G., M. Elliott, C.A.C. Clark, and **J. Dauer**. Metacognitive Self-Monitoring Is Linked to Biology Students' Recruitment of Lateral Prefrontal Cortex during Model-Based Reasoning. American Education Research Association, San Diego.
 #Behrendt, M.G., M. Elliott, M. Madigan, **J. Dauer**, and C.A.C. Clark. Linking Undergraduate Biology Students' Model-Based Reasoning and Associated Neural Activity to Error Detection and Inhibitory Control. International Mind Brain and Education Society, Montreal.
J. Dauer, M.G. Behrendt, M. Elliott, and C.A. C. Clark. Combining behavioral and neuroimaging research on university student error detection in biological models." Presented at Society for the Advancement of Biology Education Research, Minneapolis; European Research in Didactics of Biology, Cyprus; European Association for Research on Learning and Instruction SIG 20/26, Utrecht, the Netherlands.
Lucas, L., Dauer, J., Helikar, T., and G. King. Socially mediated metacognition in computational modeling-based laboratory activities in undergraduate biology. Society for the Advancement of Biology Education Research, Annual Meeting (SABER)
- 2021 **J. Dauer**, C. Clark, and T. Helikar. Simulating biological models elicits changes in brain activity consistent with complex reasoning. European Science Education Research Association, Biannual Meeting (ESERA).
Lucas, L. and J. Dauer. Revision as an Essential Step in Modeling Cellular Respiration System Dynamics. National Association for Research in Science Teaching, Annual Meeting (NARST)

Conference Presentations before 2020

Society for the Advancement of Biology Education Research, Annual Meeting (2014-2018, 2011-2012)
 National Association of Biology Teachers Annual Meeting (2018)
 National Association for Research on Science Teaching, Annual Meeting (2017-2019, 2015, 2012)
 European Science Education Research Association, Biannual Meeting (2019)
 Ecological Society of America, Annual Meeting (2017, 2012, 2011, 2008, 2007, 2005)
 Weed Science Society of America, Annual Meeting (2016, 2013, 2012, 2006, 2003)
 European Weed Science Society, Annual Meeting (2005)

Extension Activities

- 2010-3 4th/5th Grade Class, Kazoo School, Kalamazoo, MI
 Students developed and implemented a research project on an invasive weed and presented the results at a public weed information day in May 2011.

Co-instructed workshops on identifying, understanding, and managing noxious and invasive weeds including:

- 2012 Michigan Department of Natural Resources Master Naturalist Program
 2009-10 Oregon Master Gardeners
 2009 Oregon Watershed Enhancement Board

Honors and Awards

- 2020 Holling Family Award for Teaching Excellence – Senior Faculty
 2018 University of Nebraska-Lincoln
 Student Success Fellows Program

- 2014 University of Nebraska-Lincoln
Research Development Fellows Program
- 2005 J. Brian Horton Award (Penn State Ecology Program)
- 2004 Global Travel Award (Penn State College of Agricultural Science - International Programs)
- 2004 Carl Shaffer Travel Fund for Students (Penn State Dept. of Crop and Soil Science)
- 2003 Graduate Research and Service Assistantship (Penn State Ecology Program)
- 2000 Research Experience for Undergraduates (REU) program (National Science Foundation)

Reviewer

Review Panel, National Science Foundation (Core Research, TUES)

Reviewed journal manuscripts – Journal of Research on Science Teaching, Cell Biology Education – Life Science Education, BioScience, Oikos, Frontiers in Ecology and the Environment, Journal of Applied Ecology, Weed Research, Invasive Plant Science and Management, Journal of Vegetation Science, International Plant Science and Management, Weed Technology, Diversity and Distributions, Biological Control