

# Joseph Dauer

Associate Professor of Life Science Education

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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

- 2019- **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)**

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31. 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>
30. **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>
29. 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>.
28. 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>.
27. \*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>.
26. 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. doi.org/10.1080/00219266.2018.1541001
25. Crowther A., H. Bergan-Roller, N. Galt, L. Appleby, **J.T. Dauer**, and T. Helikar. 2018. Discovering Prokaryotic Gene Regulation by Building and Investigating the *lac* Operon. *CourseSource*.
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 Biology Students. *BioScience*. 68:612-621. doi: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.

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**

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- 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. \$299,511.
- 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 Computational Modeling of Biological Systems. National Science Foundation, EHR Improving Undergraduate Stem Education (NSF-DUE 1432001). T. Helikar and **J. Dauer**. Total \$2,321,012
- 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**

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### **Courses instructed:**

- 2014-20 Fundamentals of Biology II, Instructor  
University of Nebraska-Lincoln, Lincoln, NE
- 2018-19 Teaching Undergraduate Science  
University of Nebraska, Lincoln, NE
- 2017-18 Principles of Ecology  
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:**

- 20014 Weed ecology Workshop University of West Indies, Kingston, Jamaica

## **Student and Postdoctoral Mentoring**

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### *Postdoctoral Scholars*

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

### *Graduate Students*

- 2016-19 Sarah Spier, 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, University of Nebraska-Lincoln  
Studying introductory biology students' understanding of quantitative relationships and hidden dimensions of food web dynamics.

### *Undergraduate Student Researchers*

- 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 Uhlir, 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**

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- 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**

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- 2020 Peer Evaluation of Teaching Task Force  
Faculty Equity in Evaluation Task Force
- 2019-20 Secretary, Society for Advancement of Biology Education Research  
LIFE (Introductory Biology) Oversight Committee  
School of Natural Resources Graduate Committee
- 2018-20 CourseSource Journal Managing Editor (Ecology)
- 2019 Co-author faculty tips to integrate Husker Student P.O.W.E.R. into classroom experiences to improve student success
- 2018-19 School of Natural Resources Undergraduate Curriculum Committee

- 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”

## **Presentations**

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*Postdocs* #Graduate Student; \*Undergraduate Researcher

### *Invited Talks*

- 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”
- 2012 **Dauer, J.T**, Kellogg Biological Station K12 Partnership “Going the distance: investigating dispersal across scales”  
**Dauer, J.T**, Western Washington University “Comparing model-data feedback loops in ecological and education systems”
- 2007 **Dauer, J.T**, Northeast Weed Science Society Annual Meeting “How the spatial scale of dispersal modeling has changed with glyphosate-resistant horseweed.”
- 2006 **Dauer, J.T**, North Central Extension Research Assoc - Committee on Migration and Dispersal of Biota “Trying to understand how seeds fly: the story of glyphosate-resistant horseweed.”

### *Conference Talks (since 2015)*



- 2019 **Dauer, J, G. King.** Surface reasoning dominates postsecondary group discussions during computational modeling. European Science Education Research Association, Biannual Meeting (ESERA).  
*G. King and J. Dauer.* Examining Undergraduates' Metamodeling Skills after Computational Modeling Activities in Introductory Biology Labs. National Association for Research in Science Teaching, Annual Meeting (NARST)
- 2018 **Dauer, J, G. King, H. Bergan-Roller, N. Galt, T. Helikar.** Creating a space for students to theorize about model evaluation. NARST.  
**Dauer, J,** and R. Mayes. Quantitative Modeling by Biology Undergraduate Students. Society for the Advancement of Biology Education Research, Annual Meeting (SABER).  
 Mayes, R., **J. Dauer,** K. Rittschof. QUBES Project: QM BUGS II Assessment Results. National Association of Biology Teachers, Annual Meeting.  
 Mayes, R., **J. Dauer,** K. Rittschof. Getting to Quantitative Literacy for Biology Students, invited session for Biomathematics and Ecology: Education and Research Conference.  
 Mayes, R. and **J. Dauer.** QUBES Project: QM BUGS II. Society for Mathematical Biology International Conference, Annual Meeting.  
 #Spier, S. and **J. Dauer.** More Than Survival: Student Descriptions of Fitness are Impacted by the Relationship Between Natural and Sexual Selection. SABER  
 #Spier, S. and **J. Dauer.** Selection Pressure and Student Reasoning of Evolution. National Association of Biology Teachers Annual Meeting.  
*King, G, T. Helikar, H. Bergan-Roller, N. Galt, and J. Dauer.* Understanding student reasoning between modeling tasks during a computer-based lesson. SABER
- 2017 **Dauer, J.T,** W. Schacht, and D. Wedin. Blowout! A Board Game about Plant Community Dynamics. Ecological Society of America, Annual Meeting (ESA).  
**Dauer, J.T.,** A. Alred, J.M. Dauer, and #N. Niosco. Exploration of undergraduate students' knowledge of community dynamics. ESA.  
 Appleby, L., *H. Bergan-Roller, N. Galt, J. Dauer,* and T. Helikar. Improving student tracing through metabolic systems through a computational model-based learning module. SABER.  
 Helikar, T., L. Appleby, *H. Bergan-Roller, N. Galt, and J. Dauer.* Assessing Students' Modeling Abilities using Computational Models of Biological Systems. SABER.  
*Bergan-Roller, H., N. Galt, L. Appleby, T. Helikar, and J. Dauer.* Student Understanding of System Dynamics and Cycles. SABER.  
 Mayes, R. and **J. Dauer.** QUBES Quantitative Reasoning in Undergraduate Biology Assessment. HHMI Constellation Studio.  
*Bergan-Roller, H.E., Galt, N., Helikar, T., Dauer, J.T.* Simulated Computational Model Activity Improves Conceptual Understanding about Biological System. National Association for Research in Science Teaching, Annual Meeting (NARST).
- 2016 *Bergan-Roller, H.E., Galt, N., Tichy, D., Kowal, B., Dauer, J.T., Helikar, T.* Teaching about cellular processes using computational modeling and interactive simulations. Biennial Conference on Chemical Education.  
*Bergan-Roller, H.E., Galt, N., Helikar, T., Dauer, J.* Guided Investigation using Simulated Computational Models Improves Student Thinking about Cellular Respiration System. SABER.  
**Dauer, J., Bergan-Roller, H.E., Galt, N., Helikar, T.** Effect of Model Building and Model Investigation on Student Learning of Gene Regulatory Networks. SABER.

- Dauer, J.**, C. Mallory-Smith, A. Hulting, L. Mankin, J. Harden, and D. Carlson. Effects of Crop and Herbicide Rotation on Likelihood of Red Rice to Develop Herbicide Resistance. Weed Science Society of America, Annual Meeting.
- 2015 Galt, N., *H. Bergan-Roller*, C. Cutucache, **J. Dauer**, and T. Helikar. The use of interactive computational network modeling in life science courses to increase students' mechanistic reasoning about biological systems. International Conference on Systems Biology.
- Dauer, J.** and T. Long. Model construction to reveal students' conceptual knowledge retrieval in college-level biology. NARST.
- Dauer, J.**, B. Couch, and M. Durham. Analysis of students' conceptual knowledge of stochasticity and homeostasis. SABER.
- Bergan-Roller, H.*, N. Galt, \*J. Mediratta, \*S. Akkoseoglu, T. Helikar, and **J. Dauer**. Using modeling to assess concept connectedness in cellular respiration. SABER.
- #Niosco, N., and **J. Dauer**. To bound or not to bound? Testing the effects of framing on ecosystem reasoning. SABER.
- Galt, N., *H. Bergan-Roller*, C. Cutucache, **J. Dauer**, and T. Helikar. Learning about complex system biology with cell collective: an interactive, collaborative simulation platform. SABER.
- Galt, N., *H. Bergan-Roller*, **J. Dauer**, and T. Helikar. Evaluation of students' mechanistic reasoning through dynamic simulations of cellular respiration. SABER.

#### *Older Conference Presentations*

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

#### **Extension Activities**

- 2010-3 4<sup>th</sup>/5<sup>th</sup> 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**

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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

### **Professional Membership**

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- 2011- Society for Advancement of Biology Education Research
- 2012- National Association for Research in Science Teaching
- 2005- Ecological Society of America
- 2014-15 North American Colleges and Teachers of Agriculture