William C. Wetzel

Department of Entomology
Ecology, Evolutionary Biology & Behavior Program
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APPOINTMENTS & EDUCATION

Assistant Professor	**Michigan State University** Department of Entomology Ecology, Evolutionary Biology & Behavior Program Kellogg Biological Station (adjunct)	2017–present
Postdoctoral Fellow	**Cornell University** Department of Entomology Department of Ecology & Evolutionary Biology	2015–2016
PhD	**University of California, Davis** Population Biology Graduate Group Department of Evolution & Ecology Committee: Donald Strong (chair), Richard Karban, Jay Rosenheim	2008–2015
BA (Highest Honors)	**Williams College** Biology Environmental Studies	2002–2006

PUBLICATIONS († = undergraduate mentee, ‡ = graduate and postdoc mentees)

Hauri‡, K.C., A.E. Glassmire‡, and W.C. Wetzel. *In review*. Plant chemical diversity rather than cultivar diversity predicts pest suppression by natural enemies on tomato. Ecological Applications.

Glassmire‡, A.E., L. Zehr, and W.C. Wetzel. *In review*. Disentangling the dimensions of plant chemical diversity: alpha and beta diversity have distinct effects on an insect herbivore. Ecology.

Pearse, I., E. LoPresti, R.N. Schaeffer, W.C. Wetzel, K.A. Mooney, J.G. Ali, P.J. Ode, M.D. Eubanks, J.L. Bronstein, and M.G. Weber. *Accepted*. Generalizing indirect defense and resistance of plants. Ecology Letters.

Holyoak*, M., and W.C. Wetzel*. *In press*. Variance-explicit ecology: a call for holistic study of the consequences of variance at multiple scales. in A.P. Dobson, D. Tilman, and R.D. Holt, editors. Unsolved Problems in Ecology. Princeton University Press, Princeton, NJ. (*equal authorship)

Wetzel, W.C. and S.R. Whitehead. 2020. The many dimensions of phytochemical diversity: linking theory to practice. Ecology Letters 23: 16-32. **(Recommended as "Exceptional" by the Faculty of 1000)**

Leach, H., S. Van Timmeren, W.C. Wetzel, and R. Isaacs. 2019. Predicting within- and between-year variation in activity of the invasive spotted wing Drosophila (Diptera: Drosophilidae) in a temperate region. Environmental Entomology 48: 1223-1233.

Wetzel, W.C., H.M. Kharouba, M. Robinson, M. Holyoak, and R. Karban. 2019. Plant trait covariance and nonlinear averaging: a reply to Koussoroplis et al. Rethinking Ecology 4: 115-118.

Wetzel, W.C., and M.H. Meek. 2019. Physical defenses and herbivory vary more within plants than among plants in the tropical understory shrub *Piper polytrichum*. Botany 97: 113-121. **(Highlighted in Botany's Editor's Choice)**

Wetzel, W.C., N.C. Aflitto, and J.S. Thaler. 2018. Plant genotypic diversity interacts with predation risk to influence an insect herbivore across its ontogeny. Ecology 99: 2338-2347.

Wetzel, W.C. and J.S. Thaler. 2018. Host-choice reduces, but does not eliminate, the negative effects of a diverse diet for an herbivorous beetle. Oecologia 186: 483-493.

Wetzel, W.C., H.M. Kharouba, M. Robinson, M. Holyoak, and R. Karban. 2016. Variability in plant nutrients reduces the performance of insect herbivores. Nature 539: 425-427. **(Recommended by the Faculty of 1000, covered by NPR Capital Public Radio and >10 other media outlets)**

Karban, R., W.C. Wetzel, K. Shiojiri, E. Pezzola, and J. Blande. 2016. Geographic dialects in volatile communication between sagebrush individuals. Ecology 97: 2917-2914.

LoPresti, E.F., R. Karban, M. Robinson, P. Grof-Tisza, and W.C. Wetzel. 2016. The natural history supplement: furthering natural history amongst ecologists and evolutionary biologists. Bulletin of the Ecological Society of America 97: 305-310.

Wetzel, W.C. and J.S. Thaler. 2016. Does plant diversity reduce the ability of insect herbivores to defend against predators? The plant variability-gut acclimation hypothesis. Current Opinion in Insect Science 14: 25-31.

Wetzel, W.C., R. Screen†, I. Li†, J. McKenzie†, K. Phillips†, M. Cruz†, W. Zhang†, A. Greene†, E. Lee†, N. Singh†, C. Tran†, and L. Yang. 2016. Ecosystem engineering by a gall-forming wasp indirectly suppresses density and diversity of herbivores on oak trees. Ecology 97: 427-438.

Spawton†, K.A., and W.C. Wetzel. 2015. Gall-insect community on big sagebrush varies with plant size but not plant age. Environmental Entomology 44: 1095-1100.

Wetzel, W.C. and D.R. Strong. 2015. Host selection by an insect herbivore with spatially variable density-dependence. Oecologia 179: 777-784.

Karban, R., W.C. Wetzel, K, Shiojiri, S. Ishizaki, S. Ramirez, and J. Blande. 2014. Deciphering the language of plant communication: volatile chemotypes of sagebrush. New Phytologist 204: 380-385.

Wetzel, W.C. 2014. Density-dependent recruitment structures a heterogeneous distribution of herbivores among host-plants. Ecology 95: 2894-2903. **(Winner of the 2014 Ecological Society of America Student Section Outstanding Student Research Award)**

Hammock, B. and W.C. Wetzel. 2013. The relative importance of drift causes for stream insect herbivores across a canopy gradient. Oikos 122: 1586-1593.

Karban, R., K. Shiojiri, S. Ishizaki, W.C. Wetzel, and R. Evans. 2013. Kin recognition affects plant communication and defense. Proceedings of the Royal Society B-Biological Sciences 280: 20123062.

Wetzel, W.C., I. Lacher, D. Swezey, S. Moffitt, and D. Manning. 2012. Survey and landscape analysis reveal potential consequences of Williamson Act for rangeland conservation. California Agriculture 66:131-136. **(Journal cover story)**

Meek, M., A. Wintzer, W.C. Wetzel, and B. May. 2012. Climate change likely to facilitate the invasion of the non-native hydroid, Cordylophora caspia, in the San Francisco Estuary, CA. PLOS ONE 7:e46373.

Chong, G., W.C. Wetzel, and M. Holloran. 2011. Greater sage-grouse of Grand Teton National Park: Where do they roam? Park Science 27: 42-49.

FUNDING (total = $1,355,555)

Active grants

2020-2024 USDA NIFA AFRI Foundational Program ($455,000)
"Extreme weather events and the sustainable management of pests on potato"
PI: W. Wetzel; co-PI: Z. Szendrei (*Funding to start in 2020*)

2019-2021 USDA NIFA Postdoctoral Fellowship ($157,000)
"Enhancing biological control in tomato plants using odor mixtures:
a tomato hornworm case study." PIs: Andrea Glassmire [postdoc], W. Wetzel [mentor]

2018-2022 USDA NIFA AFRI Foundational Program ($499,855)
"Evaluation of defense diversity in tomato and its deployment for managing insect pests"
PI: W. Wetzel

2018-2020 USDA NIFA Postdoctoral Fellowship ($155,000)
"Effects of domestication selection on plant trait variability: consequences to insect pests and natural enemies in crop systems." PIs: Moria Robinson [postdoc], W. Wetzel [mentor]

Pending grants

NSF Rules of Life Postdoctoral Research Fellowship in Biology ($138,000)
"Towards a temporally-explicit community genetics: using common milkweed to scale from the molecular basis of plant ontogeny to the dynamics of arthropod communities"
PI: Olivia Cope; Mentor: W. Wetzel

NSF Biology Integration Institutes ($12,499,868)
"Phytobiome resilience in the dynamic global environment"
PI: Gregg Howe; co-PIs: Robin Buell, Ashley Shade, Thomas Sharkey, Robert VanBuren; Senior Personnel: W. Wetzel (Challenge Area Lead), S.-H. Shiu (Challenge Area Lead), T. Long, H. Rouached

Previous grants

2018-2019 MSU Project GREEEN Research Grant ($40,000)
"Determining insect and disease impacts on potatoes and developing strategies for sustainable management in the face of extreme weather events" PI: W. Wetzel; co-PIs: Z. Szendrei, J. Willbur, M. Szucs

2018-2019 Michigan Potato Industry Commission Research Grant ($10,000)
"Determining insect and disease impacts on potatoes and developing strategies for sustainable management in the face of extreme weather events" PI: W. Wetzel; co-PIs: Z. Szendrei, J. Willbur

2017-2018 Michigan Potato Industry Commission Research Grant ($20,000)
"Building climate variability into models that forecast pest pressure on potato and developing strategies for managing potato pests in the face of extreme weather" PI: W. Wetzel; co-PI: Z. Szendrei

2010-2012 Research Awards (3), Center for Population Biology, UC Davis ($4,400)

2010-2011 Mildred Mathias Research Grants (2), Univ. of California Natural Reserve System ($3,500)

2010-2011 Valentine Research Awards (2), Univ. of California Natural Reserve System ($4,000)
2003-2005 Research Grants (2), Williams College ($6,800)

AWARDS, HONORS, AND FELLOWSHIPS

Outstanding Supervisor Award, Michigan State University	2019
USDA NIFA Postdoctoral Fellowship ($152,000) (declined fellowship to start at MSU)	2016
Outstanding Student Research Award, Ecological Society of America Student Section	2014
Mary DeDecker Botanical Award, California Native Plant Society ($1,000)	2012
Travel Award, Center for Population Biology, UC Davis ($500)	2012
Travel Award, Center for Population Biology, UC Davis ($800)	2010
IGERT Graduate Fellowship, National Science Foundation ($90,000)	2008
Highest Honors in Biology, Williams College	2006

SEMINARS AND PRESENTATIONS

Invited seminars

Texas A&M University, Department of Entomology (scheduled)	2020
Utah State University, Department of Biology	2020
Pennsylvania State University, Department of Entomology	2019
Kellogg Biological Station, Michigan State University	2019
University of Arizona, Department of Ecology & Evolutionary Biology	2018
University of Illinois, Urbana-Champaign, Department of Entomology	2018
University of Michigan, Department of Ecology & Evolutionary Biology	2018
Michigan State University, Department of Plant Biology	2018
Western Michigan University, Department of Biology	2018
Michigan State University, Ecology, Evolutionary Biology & Behavior Program	2018
University of Guelph, College of Biological Science	2017
Michigan State University, Department of Entomology	2016
Cornell University, Department of Entomology	2015
University of Nevada, Reno, Chemical Ecology Group	2014

Invited oral presentations at scientific meetings

Milkweed Biology Summit, Oak Spring Garden Foundation, Upperville, VA	2019
Symposium: Stressors across Space and Time, Entomological Society of America	2018
Organized session: The Consequences of Plant Trait Diversity, Ecological Society of America	2018
Symposium: New Perspectives on Indirect Plant Defense, Entomological Society of America	2017

Contributed oral presentations at scientific meetings

Ecological Society of America Annual Meeting: 2010, 2012, 2013, 2014, 2015, 2017
International Congress of Entomology: 2016
Plant-Herbivore Interactions Gordon Research Conference: 2017

Wetzel Lab member oral presentations at scientific meetings (*invited) (†undergraduate)

Glassmire, A., Entomological Society of America	2019
Snook, J., Entomological Society of America	2019
Hauri, K., Entomological Society of America	2019

Hauri, K., North Central Branch Meeting, Entomological Society of America 2019
Snook, J., North Central Branch Meeting, Entomological Society of America 2019
†Frick, M., MSU Undergraduate Research & Arts Forum 2019
*Glassmire, A., Organized Session: Plant Trait Diversity, Ecological Society of America 2018
*Zehr, L., Symposium: Trophic Interactions in a Changing Climate, Entom. Society of America 2018
Glassmire, A., Entomological Society of America 2018
Hauri, K., Entomological Society of America 2018
Snook, J., Entomological Society of America 2018
Elzinga, D., International Symposium on Biomathematics and Ecology Education and Research 2018

Wetzel Lab member poster presentations at scientific meetings (†undergraduate)
Turner, D., The American Society of Naturalists 2020
†Randall, B., Entomological Society of America, **2nd Place in Plant-Insect Poster Competition** 2019
†Doud, K., KBS Undergraduate Summer Symposium 2019
†Randall, B., KBS Undergraduate Summer Symposium 2019
†Avalos, G., KBS Undergraduate Summer Symposium 2019
†Jullie, A., MSU Undergraduate Research & Arts Forum 2019
†Britwum, N., Ecological Society of America 2018
†Hansen, B.A., KBS Undergraduate Summer Symposium 2018
†Jullie, A., KBS Undergraduate Summer Symposium 2018
†Britwum, N., KBS Undergraduate Summer Symposium 2017

TEACHING

Michigan State University
Statistical Methods for Ecology & Evolution (ENT/IBIO 831). 48-54 graduate students from >8 departments. Spring 2019, Spring 2020
Ecology & Evolution of Plant–Arthropod Interactions (ENT 812-001). 10–15 students (undergraduate and graduate), plus attendance from postdocs, faculty, and other community members. Spring 2017, Fall 2018, Spring 2019, Fall 2019, Spring 2020
Temporal Ecology. 9 students. Spring 2020

Cornell University
The Role of Variability in Ecology. 10 graduate students. Fall 2015

Cornell Center for Teaching Excellence – Teaching Professional Development
Certificate in Course Design 2016
Certificate in Teaching Research Skills 2016
Workshop in Creating a Teaching Identity 2015

University of California, Davis
Experimental Ecology & Evolution in the Field. Capstone course with 10 undergraduates. Winter–Spring quarters 2013
Introduction to Ecology. Teaching Assistant, designed lab and discussion curriculum, including labs on ecological modeling in R. 4 sections of 26-30 undergraduate students. Winter 2011, Fall 2011, Winter 2012, Winter 2014

Ecological Investigators. A weeklong field ecology course for grades 5-8, Outdoor Science Education Program at Valentine Eastern Sierra Reserve, University of California Natural Reserve System. 8-12 middle school students. July 2010, July 2011, July 2012, July 2013

MENTORING

Graduate students

Elizeth Cinto Mejia, PhD	2018–present
Daniel Turner, PhD	2018–present
Kayleigh Hauri, MS	2018–present
Joshua Snook, MS (co-advised with Dr. Zsofia Szendrei)	2018–present

Postdocs

Dr. Andrea Glassmire (USDA NIFA Postdoctoral Fellow)	2017–present
Dr. Moria Robinson (USDA NIFA Postdoctoral Fellow)	2018–present

Student committees

Alice Puchalsky, PhD, Department of Integrative Biology, MSU	2020–present
Lindsey Kemmerling, PhD, Department of Integrative Biology, MSU	2019–present
Bruce Martin, PhD, Department of Plant Biology, MSU	2019–present
Jenna Walters, MS, Department of Entomology, MSU	2019–present
Rob Curtiss, PhD, Department of Entomology, MSU	2018–present
Jason Olsen, PhD, Department of Plant Biology, MSU	2018–present
Ali Zahorec, PhD, Department of Entomology, MSU	2018–present
Nicole Wonderlin, PhD, Department of Entomology, MSU	2017–present
Damian Popovic, Department of Plant Biology, MSU	2017–2018
Aaron Langille, PhD, Dept. of Integrative Biology, University of Guelph (external examiner)	2017

Undergraduate students mentored on independent research

Brendan Randall. 2019–present. **Second place in Plant-Insect Ecosystems Poster Competition at 2019 Entomological Society of America annual meeting**.

Grave Avalos. 2019. NSF REU at MSU Kellogg Biological Station. Poster presentation at Kellogg Research Symposium.

Megan Frick. 2018–2019. **Winner of Best Poster Presentation** at MSU Undergraduate Research & Arts Forum, Apr 2019.

Anna Jullie. 2018–2019. URA Program at MSU Kellogg Biological Station. Poster presentation at Kellogg Research Symposium. Poster presentation at MSU Undergraduate Research & Arts Forum, Apr 2019.

Beth Ann Hansen. 2018. NSF REU at MSU Kellogg Biological Station. Poster presentation at Kellogg Research Symposium.

Nana Britwum. 2017–2018. NSF REU & ESA SEEDS Fellow at MSU Kellogg Biological Station. Undergraduate thesis. Poster presentation at Kellogg Research Symposium. **Poster presentation at 2018 Ecological Society of America annual meeting** (New Orleans, LA).

Dan Pearlstein. 2015–2016. Cornell University. Undergraduate research experience and honors thesis.

Kayla Spawton. 2011–2013. UC Davis. Undergraduate honors thesis. Oral presentation at UC Davis Undergraduate Research Conference. **Published thesis in Environmental Entomology**.

Sam Krasnobrod. 2010–2013. High school student, Bishop, California

Cassandre Kaplinsky. 2012–2013. UC Davis. Undergraduate research experience.
Ivana Li. 2012. UC Davis. Undergraduate research experience.
Robyn Screen. 2012–2013. UC Davis. Undergraduate research experience.
Melissa Cruz. 2010–2011. UC Davis. Undergraduate research experience. Poster at UC Davis Undergraduate Research Conference.

ACADEMIC SERVICE AND OUTREACH

Founder and lead PI of The Herbivory Variability Network, a global project with more than 120 researchers from 60+ institutions and 23+ countries. www.HerbVar.org

Organizing Oral session for ESA 2020, Salt Lake City, UT: "Plants as Mosaics: How Trait Variability Within Plants Shapes the Ecology and Evolution of Plant-Animal Interactions"

Organized Oral Session at ESA 2018, New Orleans, LA: "The Consequences of Plant Trait Diversity for Higher Trophic Levels: A Mechanistic Perspective"

Editing and review

Ad hoc subject-matter editor for Ecology (6 manuscripts handled)
USDA NIFI AFRI Foundational Grant Review Panelist (2018)
Grant review for NSF-USDA Plant Biotic Interactions Program (2019)
Grant review for EU European Research Council (2019)
Manuscript review: Nature (2017), Current Biology (2018), Ecology Letters (2015, 2017, 2019), Trends in Ecology & Evolution (2019), Frontiers in Ecology & the Environment (2018), Ecology (2014, 2015 x2, 2016, 2017, 2019), Ecological Applications (2019), Ecological Monographs (2016), Journal of Animal Ecology (2016), The American Naturalist (2019), Oecologia (2015 x2), Oikos (2012, 2019), Functional Ecology (2018, 2019 x2), Annals of Botany (2016, 2019, 2020), American Journal of Botany (2018), Basic and Applied Ecology (2017), PLOS ONE (2014, 2017), Entomologia Experimentalis et Applicata (2016), Scientific Reports (2017), Ecosphere (2017), Biotropica (2018), BMC Ecology (2018), Journal of Plant Ecology (2018)

Academic committees

Chair, Seminar Committee, Department of Entomology, MSU	2019–present
Founding member, Diversity, Equity, and Inclusion Committee, Dept. of Entom., MSU	2018–present
Seminar Committee, Ecology, Evolutionary Biology, & Behavior, MSU	2018–present
Seminar Committee, Department of Entomology, MSU	2017–present
Research and Site Use Committee, Kellogg Biological Station, MSU	2017–present

Society Memberships

Ecological Society of America	2010–present
Entomological Society of America	2016–present

Outreach

Plenary Speaker, Kellogg Biological Station K–12 Education Partnership Summer Institute, 2019
Currently starting an MSU Chapter of ESA SEEDS, a national outreach program run through the Ecological Society of America aimed at promoting diversity, equity, and inclusion in ecology
Mentor for ESA SEEDS (Ecol. Soc. of America, Strategies for Ecology Education, Diversity, and Sustainability), UC Davis Chapter. 2009-2014. Awarded Chapter of the Year Award 2013-2014

PRESS COVERAGE (selected from more than 15 pieces)

Profile in MSU Futures Magazine: https://www.canr.msu.edu/news/studying-the-impact-of-diversity-in-all-forms

https://msutoday.msu.edu/news/2018/researchers-explore-diversity-as-new-weapon-against-crop-pests/

http://www.kbs.msu.edu/2018/08/wetzel/

https://www.canr.msu.edu/news/new_entomologist_wetzels_research_on_plant_diversity_published_in_nature

Radio interview on NPR Capital Public Radio, 9/2016, http://www.capradio.org/articles/2016/10/17/mono-culture-leads-to-ideal-conditions-for-crop-eating-pests-uc-davis-study-finds/

http://www.takepart.com/article/2016/10/16/crop-diversity-pesticide/

https://www.sciencedaily.com/releases/2016/10/161012134054.htm