

William C. Wetzel

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APPOINTMENTS & EDUCATION

Assistant Professor	Michigan State University Department of Entomology Department of Integrative Biology (2020-present) Plant Resilience Institute (2020-present) Ecology, Evolution, & 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)

- Robinson[‡], M., A.L. Schillmiller, and W.C. Wetzel. *In review*. Domestication has altered within-plant trait variability in a crop plant. Preprint on bioRxiv: <https://doi.org/10.1101/2020.11.14.382788>
- Wetzel, W.C. *In press*. Plants as epigenetic mosaics: harnessing variability to thrive in a variable world. *New Phytologist*.
- Wetzel, W.C. *In press*. Evolutionary Ecology of Plant-Herbivore Interaction edited by Juan Núñez-Farfán and Pedro Luis Valverde. *Quarterly Review of Biology*. (Book review)
- Hauri[‡], K.C., A.E. Glassmire[‡], and W.C. Wetzel. 2021. Plant chemical diversity rather than cultivar diversity predicts pest suppression by natural enemies on tomato. *Ecological Applications* 31: e2289.
- Glassmire[‡], A.E., L. Zehr, and W.C. Wetzel. 2020. Disentangling the dimensions of plant chemical diversity: alpha and beta diversity have distinct effects on an insect herbivore. *Ecology* 101: e03158.
- Holyoak*, M., and W.C. Wetzel*. 2020. Variance-explicit ecology: A call for holistic study of the consequences of variability at multiple scales. In A. Dobson, R. D. Holt, and D. Tilman (eds.), *Unsolved Problems in Ecology*. (pp. 25-42). Princeton University Press, Princeton, NJ. (*equal authorship)
- 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. 2020. Generalizing indirect defense and resistance of plants. *Ecology Letters* 23: 1137-1152.

- 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

Active grants

- 2021-2024 MSU Plant Resilience Institute Collaborative Project Initiative (\$396,483)
 "The timing of plant and phytobiome resilience in milkweed species across a climate gradient" PI: W. Wetzel; co-PI: G. Howe
- 2020-2024 USDA NIFA AFRI Foundational Program (\$455,999)
 "Extreme weather events and the sustainable management of pests on potato"
 PI: W. Wetzel; co-PI: Z. Szendrei
- 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

Previous grants

- 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]
- 2018-2019 MSU Project GREEN 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 2021
 Texas A&M University, Department of Entomology (cancelled due to covid-19) 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

Organized session: Plants as Mosaics & the Eco/Evo of Plant-Anim. Interactions, Ecol. Soc. of Am. 2020
 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

Society of American Naturalists: 2021
 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)

Robinson, M., Society of American Naturalists	2021
Glassmire, A., Entomological Society of America	2020
Zehr, L., Entomological Society of America	2020
Dole, H., Entomological Society of America	2020
Robinson, M., Ecological Society of America*	2020
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, 3 credits (ENT/IBIO 831)

Spring 2021, 44 graduate students from 13 departments

Spring 2020, 37 graduate students from 11 departments

Spring 2019, 51 graduate students from 11 departments

Ecology & Evolution of Plant-Arthropod Interactions, 1 credit (ENT 812-001)

Fall 2020, 1 graduate student and 2 undergraduates from 3 depts and majors (low enrollment because of covid-19), plus multiple student and postdoc auditors

Spring 2020, 5 graduate students and 2 undergraduates from 4 depts and majors, plus multiple student and postdoc auditors

Fall 2019, 9 graduate students and 2 undergraduates from 4 depts and majors, plus multiple student and postdoc auditors

Spring 2019, 7 graduate students and 2 undergraduates from 2 depts and majors, plus multiple student and postdoc auditors

Fall 2018, 10 graduate students from 2 depts, plus multiple student and postdoc auditors

Statistical Methods in Temporal Ecology, 1 credit (ENT 812-004)

Spring 2020, 8 graduate students from 3 departments, plus 1 auditor

Hot Topics in Plant-Insect Interactions, 1 credit (ENT 812-003)

Spring 2017, 6 graduate students from 2 depts, plus multiple student and postdoc auditors

Cornell University

The Role of Variability in Ecology, 1 credit

Fall 2015, 10 graduate students

Cornell University 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, lecturing teaching assistant, 4 credits (EVE/ENT 180)

Winter quarter 2013, 10 undergraduate students

Spring quarter 2013, 10 undergraduate students

Introduction to Ecology, teaching assistant, designed lab and discussion curriculum, including labs on ecological modeling in R

Winter 2011, 4 sections of 26-30 undergraduate students

Fall 2011, 4 sections of 26-30 undergraduate students

Winter 2012, 4 sections of 26-30 undergraduate students

Winter 2014, 4 sections of 26-30 undergraduate students

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

Vincent Pan, PhD	2021-present
Kevin Postma, PhD (co-advised w/ Dr. Julianna Wilson)	2021-present
Elizeth Cinto Mejia, PhD	2018-present
Daniel Turner, PhD	2018-present
Kayleigh Hauri, MS	2018-2020
Joshua Snook, MS (co-advised with Dr. Zsofia Szendrei)	2018-2020

Postdocs

Dr. Olivia Cope (NSF Postdoctoral Fellow)	2020-present
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Dr. Moria Robinson (USDA NIFA Postdoctoral Fellow)	2018-present
Dr. Andrea Glassmire (USDA NIFA Postdoctoral Fellow)	2017-2021

Student committees

Carolyn Graham, PhD, Department of Plant Biology, MSU	2021-present
Kara Dobson, PhD, Department of Integrative Biology, MSU	2021-present
Keri Greig, PhD, Department of Integrative Biology, University of Texas, Austin	2020-present
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, PhD, Department of Entomology, MSU	2019-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
Rob Curtiss, PhD, Department of Entomology, MSU	2018-2021
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.** (Starting as a PhD student at the University of Maryland)

Grave Avalos. 2019. NSF REU at MSU Kellogg Biological Station. Poster presentation at Kellogg Research Symposium. (Starting as a PhD student at the University of Maryland)

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. (Currently a graduate student at the University of California, Irvine)

Beth Ann Hansen. 2018. NSF REU at MSU Kellogg Biological Station. Poster presentation at Kellogg Research Symposium. (Currently a PhD student at the University of Arizona)

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). (Currently a graduate student at the University of Michigan)

Dan Pearlstein. 2015-2016. Cornell University. Undergraduate research experience and honors thesis. (Currently a PhD student at the University of Illinois)

Kayla Spawton. 2011-2013. UC Davis. Undergraduate honors thesis. Oral presentation at UC Davis Undergraduate Research Conference. **Published thesis in Environmental Entomology.** (Currently a PhD student at Washington State University)

Sam Krasnobrod. 2010-2013. High school student, Bishop, California. (Currently an Environmental Scientist at the California Department of Food and Agriculture)

Cassandre Kaplinsky. 2012-2013. UC Davis. Undergraduate research experience. (Currently Director of Research at Carroll-Loye Research)

Ivana Li. 2012. UC Davis. Undergraduate research experience. (Currently Instructor at the University of California, Davis)

Robyn Screen. 2012-2013. UC Davis. Undergraduate research experience. (Currently a PhD student at the University of Hawaii)

Melissa Cruz. 2010-2011. UC Davis. Undergraduate research experience. Poster at UC Davis Undergraduate Research Conference. (Currently the Outreach and Leadership Program Manager at UC Davis Arboretum and Public Garden)

ACADEMIC SERVICE AND OUTREACH

Founder and lead PI of The Herbivory Variability Network, a global project with >200 researchers from 100+ institutions and 30+ countries. www.HerbVar.org

Organized Oral session for ESA 2020 digital meeting: "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

Associate Editor, *Oecologia* (2021-present)

Faculty member of Faculty Opinions, Population Ecology Section (2020-present)

Ad hoc subject-matter editor for *Ecology* (6 manuscripts handled)

Grant Review Panelist, NSF (2021)

Grant Review Panelist, USDA NIFI AFRI Foundational Program (2018)

Grant review for NSF-USDA Plant Biotic Interactions Program (2019)

Grant review for EU European Research Council (2019)

Manuscript review: *Nature* (2017), *PNAS* (2021), *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, 2020), *New Phytologist* (2020, 2021), *Journal of Ecology* (2020), *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, 2020), *Ecology and Evolution* (2020), *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, 2020), *Ecosphere* (2017), *Biotropica* (2018), *BMC Ecology* (2018), *Journal of Plant Ecology* (2018), *Global Ecology and Biogeography* (2020), *Agriculture, Ecosystems & Environment* (2020)

Academic committees

Director Search Committee, MSU Plant Resilience Institute 2021-present

MSU Plant Resilience Institute Postdoctoral Fellowship Committee, MSU 2021-present

Interim chair and member of inaugural committee for the MSU Presidential Postdoctoral Fellowship in Ecology, Evolution, and Behavior 2020-present

Founding member, Diversity, Equity, and Inclusion Committee, Dept. of Entom., MSU 2018-present

Seminar Committee, Ecology, Evolutionary, & Behavior, MSU 2018-2021

Seminar Committee, Department of Entomology, MSU 2017-2020

Committee Chair 2019-2020

Society Memberships

Ecological Society of America 2010-present

Outreach

Plenary Speaker, Kellogg Biological Station K-12 Education Partnership Summer Institute, 2019
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)

<https://content.govdelivery.com/accounts/USDANIFA/bulletins/29f6a64>

<https://www.canr.msu.edu/news/plant-chemicals-are-a-trick-or-treat-for-insects>

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>