

# JASON TODD HOVERMAN

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## EDUCATION

Ph.D.	University of Pittsburgh, Pittsburgh, PA	Ecology and Evolution 2007
B.S.	University of Pittsburgh, Pittsburgh, PA	Ecology and Evolution 2000

## APPOINTMENTS

- 2017 – present Associate Professor of Wildlife Ecology, Department of Forestry and Natural Resources, Purdue University
- 2012 – 2017 Assistant Professor of Wildlife Ecology, Department of Forestry and Natural Resources, Purdue University
- 2010 – 2015 Adjunct Assistant Professor of Wildlife Ecology, Department of Forestry, Wildlife, and Fisheries, University of Tennessee

## PROFESSIONAL EXPERIENCE

- 2010 – 2012 Post-doctoral Research Associate, Department of Ecology and Evolutionary Biology, University of Colorado, *Advisor*: Dr. Pieter Johnson
- 2007 – 2010 Post-doctoral Research Associate, Center for Wildlife Health, Department of Forestry, Wildlife, and Fisheries, University of Tennessee, *Advisors*: Drs. Matthew Gray & Debra Miller
- 2007 Post-doctoral Research Associate, Department of Biology/Center for Infectious Disease Dynamics, Pennsylvania State University, *Advisors*: Drs. Peter Hudson & Jason Rohr
- 2001 – 2007 Research/Teaching Assistant, Department of Biological Sciences, University of Pittsburgh, *Advisor*: Dr. Rick Relyea

## AWARDS

- 2019 University Faculty Scholar, Purdue University, Program recognizes outstanding faculty members across the university who are on an accelerated path for academic distinction
- 2017 Seed for Success Award for securing an external sponsored award in excess of \$1 million dollars, Purdue University
- 2014 Bravo Award for Innovation/Creativity, Purdue University
- 2013 George Mercer Award, Ecological Society of America

PEER-REVIEWED PUBLICATIONS (N = 71; ISI metrics: 2,607 citations with an average of 40 citations per article and h-index of 27; Google Scholar metrics: 3,998 citations with an h-index of 32 and an i10-index of 49).

Sauer, EL, N Trejo, **JT Hoverman**, and JR Rohr. *In press*. Behavioral fever reduces ranavirus infection in toads. *Functional Ecology*.

Flynn, RW, MF Chislock, ME Gannon, S. Bauer, BJ Tornabene, **JT Hoverman**, and MS Sepúlveda. *In press*. Lethal and sublethal effects of perfluoroalkyl substance mixtures on larval American

- bullfrogs (*Rana catesbeiana*). *Chemosphere*.
- Höök, TO, CJ Foley, P Collingsworth, L Dorworth, B Fisher, **JT Hoverman**, E LaRue, M Pyron, and J Tank. *In press*. An assessment of the potential impacts of climate change on the freshwater habitats of Indiana, U.S.A. *Climatic Change*.
- DeBlieux, TS, and **JT Hoverman**. 2019. An experimental test of parasite-induced vulnerability to predation in larval anurans. *Diseases of Aquatic Organisms*. 135:241-250.
- Gallagher, SJ, BJ Tornabene, TS DeBlieux, KM Pochini, MF Chislock, ZA Compton, LK Eiler, KM Verble, and **JT Hoverman**. 2019. Healthy but smaller herds: Predators reduce pathogen transmission in an amphibian assemblage. *Journal of Animal Ecology*. 88:1613-1624.
- Hoverman, JT**, MF Chislock, ZA Compton, and ME Gannon. 2019. Ranavirus reservoirs: Assemblage of American Bullfrog and Green Frog tadpoles maintains ranavirus infections across multiple seasons. *Herpetological Review*. 50:275-278.
- Hernández-Gómez, O, SJA Kimble, J Hua, VP Wuerthner, DK Jones, BM Mattes, RD Cothran, RA Relyea, and **JT Hoverman**. 2019. Local adaptation of the MHC class II $\beta$  gene in populations of wood frogs (*Lithobates sylvaticus*) correlates with proximity to agriculture. *Infection, Genetics, and Evolution*. 73:197-204.
- Abercrombie, SA, C de Perre, YJ Choi, BJ Tornabene, MS Sepúlveda, LS Lee, and **JT Hoverman**. 2019. Larval amphibians rapidly bioaccumulate poly- and perfluoroalkyl substances. *Ecotoxicology and Environmental Safety*. 178:137-145.
- Rumschlag, SL, N Halstead, **JT Hoverman**, TR Raffel, HJ Carrick, P Hudson, and JR Rohr. 2019. Effects of pesticides on exposure and susceptibility to parasites can be generalized to pesticide class and type in aquatic communities. *Ecology Letters*. 22:962-972.
- Mihaljevic, JR, **JT Hoverman**, and PTJ Johnson. 2018. Co-exposure to multiple Ranavirus types enhances viral infectivity and replication in a larval amphibian system. *Diseases of Aquatic Organisms*. 132:23-35.
- Blaustein, AR, J Urbina, PW Snyder, E Reynolds, T Dang, **JT Hoverman**, B Han, DH Olson, CL Searle and NM Hambalek. 2018. The effects of emerging infectious diseases on amphibians: A review of experimental studies. *Diversity*. 10:81 DOI:10.3390/d10030081.
- Tornabene, BJ and **JT Hoverman**. The salamander daisy: a novel captive rearing method for cannibalistic salamander larvae. 2018. *Herpetological Conservation and Biology*. 13:167-174.
- Tornabene, BJ, AR Blaustein, CJ Briggs, JR Rohr, PTJ Johnson and **JT Hoverman**. The influence of landscape and environmental factors on ranavirus epidemiology in a California amphibian assemblage. 2018. *Freshwater Biology*. 63:639-651.
- Johnson, PTJ, DM Calhoun, A Stokes, T McDevitt-Gallesa, C Briggs, **JT Hoverman**, V Tkache, and J de Roode. 2018. Of poisons and parasites: The defensive role of tetrodotoxin against infections in adult newts. *Journal of Animal Ecology*. 87:1192-1204.
- Stutz, WE, AR Blaustein, CJ Briggs, **JT Hoverman**, JR Rohr, and PTJ Johnson. 2018. Using multi-response models to investigate pathogen coinfections across scales: insights from emerging diseases of amphibians. *Methods in Ecology and Evolution*. 9:1109-1120.
- Relyea, RA, PR Stephens, LN Barrow, AR Blaustein, PW Bradley, JC Buck, A Chang, JP Collins, B Crother, J Earl, SS Gervasi, **JT Hoverman**, O Hyman, E Moriarty Lemmon, TM Luhring, M Michelson, C Murray, S Price, RD Semlitsch, A Sih, AB Stoler, N VandenBroek, A Warwick, G Wengert, and JI Hammond. 2018. Phylogenetic patterns of trait and trait plasticity evolution: Insights from amphibian embryos. *Evolution*. 72:663-678

- Kimble, SJA, AJ Johnson, RN Williams, and **JT Hoverman**. 2017. A severe Ranavirus outbreak in captive, wild-caught box turtles. *EcoHealth* 14:810-815.
- Hua, J, VP Wuerthner, DK Jones, B Mattes, RD Cothran, RA Relyea, and **JT Hoverman**. 2017. Evolved pesticide tolerance influences susceptibility to parasites in amphibians. *Evolutionary Applications* 10:802-812.
- Hoover, GM, MF Chislock, BJ Tornabene, SC Guffey, YJ Choi, C De Perre, **JT Hoverman**, LS Lee, and MS Sepúlveda. 2017. Uptake and depuration of four per/polyfluoroalkyl substances (PFAAs) in northern leopard frog *Rana pipiens* tadpoles. *Environmental Science & Technology Letters* 4:399-403.
- Hernández-Gómez, O, **JT Hoverman**, and RN Williams. 2017. Cutaneous microbial community variation across populations of Eastern Hellbenders (*Cryptobranchus alleganiensis alleganiensis*). *Frontiers in Microbiology* 8(1379) DOI:10.3389/fmicb.2017.01379.
- Wuerthner, VP, J Hua, and **JT Hoverman**. 2017. The benefits of coinfection: Trematodes alter disease outcomes associated with virus infection. *Journal of Animal Ecology* 86:921-931.
- Pochini, KM and **JT Hoverman**. 2017. Immediate and lag effects of pesticide exposure on parasite resistance in larval amphibians. *Parasitology* 144:817-822.
- Miles, JC, J Hua, MS Sepulveda, CH Krupke and **JT Hoverman**. 2017. Neonicotinoids and aquatic communities: Evaluating the lethal and sublethal effects of exposure. *PLoS ONE* 12(3): e0174171. doi:10.1371/journal.pone.0174171.
- Pochini, KM and **JT Hoverman**. 2017. Reciprocal effects of pesticides and pathogens on amphibian hosts: The importance of exposure order and timing. *Environmental Pollution* 221:359-366.
- Hoverman, JT** and CL Searle. 2016. Behavioural influences on disease risk: Implications for conservation and management. *Animal Behaviour*. 120:263-271
- Hua, J, N Buss, J Kim, SA Orlofsky, and **JT Hoverman**. 2016. Population-specific toxicity of six insecticides to the trematode *Echinoparyphium*. *Parasitology* 143:542-550.
- Hoverman, JT**, and RA Relyea. 2016. Prey responses to fine-scale variation in predation risk from combined predators. *Oikos* 125:254-261.
- Kimble, SJA, RN Williams, and **JT Hoverman**. 2015. Ranavirus detected in *Lithobates clamitans* and *L. catesbeianus* in Indiana. *Herpetological Review* 46:532-534.
- Hua, J, DK Jones, BM Mattes, RD Cothran, RA Relyea, and **JT Hoverman**. 2015. The contribution of phenotypic plasticity to the evolution of insecticide tolerance in amphibian populations. *Evolutionary Applications* 8:586-596.
- Hua, J, DK Jones, BM Mattes, RD Cothran, RA Relyea, and **JT Hoverman**. 2015. Evolved pesticide tolerance in amphibians: Predicting mechanisms based on mode of action and pesticide novelty. *Environmental Pollution* 206:56-63.
- Bourdeau, P, RK Butlin, C Brönmark, T Edgell, **JT Hoverman**, and J Hollander. 2015. Phenotypic plasticity in aquatic gastropods: A systematic review and meta-analysis. *Heredity* 115:312-321.
- Sutton, WB, MJ Gray, **JT Hoverman**, RG Secrist, P Super, RH Hardman, JL Tucker, and DL Miller. 2015. Trends in ranavirus prevalence among plethodontid salamanders in the Great Smoky Mountains National Park. *EcoHealth* 12:320-329.
- Kimble, SJA, AK Karna, AJ Johnson, **JT Hoverman**, and RN Williams. 2015. Mosquitoes as a potential vector of ranavirus transmission in terrestrial turtles. *EcoHealth* 12:334-338.
- Hoverman, JT**, RD Cothran, and RA Relyea. 2014. Generalist versus specialist strategies of plasticity: Snail responses to predators with different foraging modes. *Freshwater Biology* 59:1101-1112.

- Orlofske, SA, RC Jadin, **JT Hoverman**, and PTJ Johnson. 2014. Predation and disease: understanding the effects of predators at multiple trophic levels on pathogen transmission. *Freshwater Biology* 59:1064-1075.
- Johnson, PTJ and **JT Hoverman**. 2014. Infection heterogeneity: how variation in host size, behaviour, and immunity affect parasite aggregation in an experimental system. *Journal of Animal Ecology* 83:1103-1112.
- Preston, DL, CE Boland, **JT Hoverman**, and PTJ Johnson. 2014. Parasitism and host behavior: comparing the effects of predation risk, infection risk and disease. *Journal of Animal Ecology* 28:1472-1481.
- Boone, MD, CA Bishop, LA Boswell, RD Brodman, J Burger, C Davidson, M Gochfeld, **JT Hoverman**, L Neuman-Lee, CR Propper, RA Relyea, JR Rohr, CL Rowe, C Salice, RD Semlitsch, D Sparling, S Weir. 2014. Pesticide regulation amid the influence of industry. *BioScience* 64:917-922.
- Hoverman, JT**, BJ Hoyer, and PTJ Johnson. 2013. Does timing matter? How priority effects influence the outcome of parasite interactions within hosts. *Oecologia* 173:1471-1480.
- Johnson, PTJ, DL Preston, **JT Hoverman** and BE LaFonte. 2013. Host and parasite diversity jointly control disease risk in complex communities. *Proceedings of the National Academy of Sciences of the United States of America* 110:16916–16921.
- Johnson, PTJ, DL Preston, **JT Hoverman**, and KLD Richgels. 2013. Biodiversity decreases disease through predictable changes in host community competency. *Nature* 494:230-233.
- Richgels, KLD, **JT Hoverman** and PTJ Johnson. 2013. Evaluating community structure and the role of regional and local processes in larval trematode metacommunities of *Helisoma trivolvis*. *Ecography* 36:854-863.
- Johnson PTJ, **JT Hoverman**, VJ McKenzie, AR Blaustein, and KLD Richgels. 2013. Urbanization and wetland communities: applying metacommunity theory to understand the local and landscape effects. *Journal of Applied Ecology* 50:34-42.
- Hoverman, JT** and RA Relyea. 2012. The long-term impacts of predators on prey: Inducible defenses, population dynamics, and indirect effects. *Oikos* 121:1219-1230.
- Hoverman, JT**, JR Mihaljevic, KLD Richgels, JL Kerby, and PTJ Johnson. 2012. Widespread co-occurrence of virulent pathogens within California amphibian communities. *EcoHealth* 9:36-48.
- Johnson, PTJ and **JT Hoverman**. 2012. Parasite diversity and coinfection determine pathogen infection success and host fitness. *Proceedings of the National Academy of Sciences of the United States of America* 109:9006-9011.
- Haislip, NA, **JT Hoverman**‡, MJ Gray, and DL Miller. 2012. Natural stressors and disease risk: Does the threat of predation increase amphibian susceptibility to ranavirus? *Canadian Journal of Zoology* 90:893-902. (‡Hoverman listed as corresponding author)
- Hoverman, JT**, MJ Gray, DL Miller, and NA Haislip. 2012. Widespread occurrence of ranavirus in pond-breeding amphibian populations. *EcoHealth* 9:36-48.
- Blaustein, AR, SS Gervasi, PTJ Johnson, **JT Hoverman**, LK Belden, PW Bradley, and GY Xie. 2012. Ecophysiology meets conservation: understanding the role of disease in amphibian population declines. *Philosophical Transactions of the Royal Society B: Biological Sciences* 367:1688-1707.
- Gray, MJ, DL Miller, and **JT Hoverman**. 2012. Effectiveness of non-lethal surveillance methods at detecting systemic ranavirus infections. *Diseases of Aquatic Organisms* 99:1-6.
- Johnson PTJ, JR Rohr, **JT Hoverman**, E Kellermanns, J Bowerman, and KB Lunde. 2012. Living fast and dying of infection: host life history explains interspecific variation in disease risk. *Ecology Letters*

15:235-242.

Johnson, PTJ, DL Preston, **JT Hoverman**, JS Henderson, SH Paull, M Redmond, and KL Dosch. 2012. Species diversity reduces parasite transmission through cross-generational effects on host abundance. *Ecology* 93:56-64.

**Hoverman, JT**, MJ Gray, NA Haislip, and DL Miller. 2011. Phylogeny, life history, and ecology contribute to differences in amphibian susceptibility to ranaviruses. *EcoHealth* 8:301-319.

Redmond, M, RB Hartson, **JT Hoverman**, CN De Jesús-Villanueva and PTJ Johnson. 2011. Experimental exposure of *Helisoma trivolvis* and *Biomphalaria glabrata* (Gastropoda) to *Ribeiroia ondatrae* (Trematoda). *Journal of Parasitology* 97:1055-1061.

**Hoverman, JT**, CJ Davis, EE Werner, DK Skelly, RA Relyea, and KL Yurewicz. 2011. Environmental gradients and the structure of freshwater snail communities. *Ecography* 34:1049-1058.

Haislip, NA, MJ Gray, **JT Hoverman**‡, and DL Miller. 2011. Development and disease: how susceptibility to an emerging pathogen changes through anuran development. *PLoS ONE* 6(7): e22307. doi:10.1371/journal.pone.0022307. (‡Hoverman listed as corresponding author)

**Hoverman, JT**, MJ Gray, and DL Miller. 2010. Anuran susceptibilities to ranaviruses: the role of species identity, exposure route, and a novel virus isolate. *Diseases of Aquatic Organisms* 89:97-107.

Raffel, TR, **JT Hoverman**, NT Halstead, PJ Michel, JR Rohr. 2010. Parasitism in a community context: Trait-mediated interactions with competition and predation. *Ecology* 91:1900-1907.

**Hoverman, JT** and RA Relyea. 2009. Survival trade-offs associated with inducible defences in snails: the roles of multiple predators and developmental plasticity. *Functional Ecology* 23:1179-1188.

Gray, MJ, DL Miller, and **JT Hoverman**. 2009. Ecology and pathology of amphibian ranaviruses. *Diseases of Aquatic Organisms* 87:243-266.

Gray, MJ, DL Miller, and **JT Hoverman**. 2009. First report of *Ranavirus* infecting lungless salamanders. *Herpetological Review* 40:316-319.

**Hoverman, JT** and RA Relyea. 2008. Temporal variation in predation risk: a mechanism underlying priority effects. *Oikos* 117:23-32.

Rohr, JR, AM Schoetthofer, TR Raffel, HJ Carrick, N Halstead, **JT Hoverman**, CM Johnson, LB Johnson, C Lieske, MD Piwoni, PK Schoff, and VR Beasley. 2008. Agrochemicals increase trematode infections in a declining amphibian species. *Nature* 455:1235-1239.

Relyea, RA and **JT Hoverman**. 2008. Interactive effects of predators and a pesticide on aquatic communities. *Oikos* 117:1647-1658.

Wiens, JJ and **JT Hoverman**. 2008. Digit reduction, body size, and paedomorphosis in salamanders. *Evolution and Development* 10:449-463.

**Hoverman, JT** and RA Relyea. 2007. The rules of engagement: how to defend against combinations of predators. *Oecologia* 154:551-560.

**Hoverman, JT** and RA Relyea. 2007. How flexible is phenotypic plasticity? Developmental windows for trait induction and reversal. *Ecology* 88:693-705.

Relyea, RA and **JT Hoverman**. 2006. Assessing the ecology in ecotoxicology: a review and synthesis in freshwater systems. *Ecology Letters* 9:1157-1171.

**Hoverman, JT**, JR Auld, and RA Relyea. 2005. Putting prey back together again: integrating predator-induced behavior, morphology, and life history. *Oecologia* 144:481-491.

Relyea, RA, NM Schoeppner, and **JT Hoverman**. 2005. Pesticides and amphibians: the importance of community context. *Ecological Applications* 15:1125-1134.

Relyea, RA and **JT Hoverman**. 2003. The impact of larval predators and competitors on the morphology and fitness of juvenile treefrogs. *Oecologia* 134:596-604.

### BOOK CHAPTERS (N = 2)

Brunner, J, A Storfer, MJ Gray, and JT Hoverman. 2015. Ranavirus ecology and evolution: From epidemiology to extinction. Pages 71-104 in M. Gray and G. Chinchir, editors. *Ranaviruses: Lethal pathogens of ectothermic vertebrates*. Springer, New York, USA.

**Hoverman, JT**, SH Paull, and PTJ Johnson. 2013. Does climate change increase the risk of disease? Analyzing published literature to detect climate-disease interactions. Pages 61-70 in T. Seastedt and K. Suding, editors. *Climate Vulnerability: Understanding and addressing threats to essential resources*. Elsevier, Oxford, UK.

### REPORTS (N = 1)

Höök, T, P Collingsworth, L Dorworth, B Fisher, C Foley, **JT Hoverman**, E LaRue, M Pryon, M Widhalm, JS Dukes. 2018. Aquatic Ecosystems in a Shifting Indiana Climate: A Report from the Indiana Climate Change Impacts Assessment. Purdue Climate Change Research Center, Purdue University. West Lafayette, Indiana. (<http://dx.doi.org/10.5703/1288284316782>)

### OUTREACH PUBLICATIONS (N = 9)

Williams, RN, BJ MacGowan, Z Walker, **JT Hoverman**, and N Burgmeier. 2017. *Frogs and Toads of Indiana*. Purdue University Cooperative Extension Service, West Lafayette, IN. FNR-545.

**Hoverman, JT**, Z Olson, S LaGrange, J Grant, and RN Williams. 2015. *A guide to larval amphibian identification in the field and laboratory*. Purdue University Cooperative Extension Service, West Lafayette, IN. FNR-496-W.

Winzeler, M, S LaGrange, and **JT Hoverman**. 2014. *Ranaviruses: Emerging threat to amphibians*. Purdue University Cooperative Extension Service, West Lafayette, IN. FNR-485-W.

Wuerthner, V, and **JT Hoverman**. 2014. Salamanders in a world of pathogens. *Partners in Amphibian and Reptile Conservation*. Year of the Salamander June Newsletter. (<http://parcplace.org/images/stories/YOSal/SalamanderNewsJune.pdf>).

**Hoverman, JT** and PTJ Johnson. 2012. Lakes and ponds: A journey through the life aquatic. *Nature Education Knowledge*. 3(6):17.

**Hoverman, JT**. October 2010. Predator-induced plasticity. In: *Encyclopedia of Life Sciences (ELS)*. John Wiley & Sons, Ltd: Chichester. (DOI: 10.1002/9780470015902.a0003305.pub2).

**Hoverman, JT**. 2009. The bacterium *Aeromonas hydrophila* in amphibian populations. *Southeastern Partners in Amphibian and Reptile Conservation, Disease, Pathogens and Parasites Task Team, Information Sheet #3*. (<http://www.separc.org/>).

Gray, MJ, DL Miller, and **JT Hoverman**. 2009. Ranaviruses of amphibians in the southeastern United States. *Southeastern Partners in Amphibian and Reptile Conservation, Disease, Pathogens and Parasites Task Team, Information Sheet #1*. (<http://www.separc.org/>).

Gray, MJ and **JT Hoverman**. 2008. *Ranavirus: An amphibian pathogen of global concern*. *Tennessee Herpetological Society Newsletter*. Fall 2008, Volume 4.

### GRANTS (\$5.2 million in total funding received, \$1.9 million directly administered by Hoverman)

#### External

- 2019 – 2021. Michigan Department of Natural Resources. *Quantifying the Distribution, Movement, and Ecological Risk of Per-/Polyfluoroalkyl Substances (PFAS) in an Impacted Wetland Ecosystem*. PI: **Jason Hoverman**, Co-PIs: Wes Flynn, Maria Sepulveda, Linda Lee. Amount: \$115,000.
- 2017 – 2020. National Science Foundation, Division of Environmental Biology Program. *Collaborative research: Disease ecology in the midst of anthropogenic stressors: Exploring the influence of pesticides on host- parasite interactions*. PI: **Jason Hoverman**, Co-PIs: Jessica Hua, Rick Relyea. Amount: \$774,800.
- 2016 – 2021. Department of Defense, Strategic Environmental Research and Development Program. *Development of amphibian poly- and perfluoroalkyl substances toxicity reference values for use in ecological risk assessment at aqueous film forming foam sites*. PI: Maria Sepulveda, Co-PIs: **Jason Hoverman**, Linda Lee. Amount: \$2,465,781.
- 2013 – 2017. National Science Foundation, Ecology and Evolution of Infectious Diseases Program. *Disease in complex communities: how multi-host, multi- pathogen interactions drive infection dynamics*. PI: Cherie Briggs, Co-PIs: Andrew Blaustein, **Jason Hoverman**, Pieter Johnson, Jason Rohr. Amount: \$1,240,992.
- 2013 – 2015. Indiana Department of Natural Resources. Ranavirus surveillance in box turtles and aquatic amphibians. PI: Rod Williams, Co-PIs: **Jason Hoverman**, April Johnson. Amount: \$122,215.
- 2005 – 2006. National Science Foundation, Doctoral Dissertation Improvement Grant. *The relative, long-term importance of trait- and density-mediated indirect interactions in a freshwater snail community*. PI: **Jason Hoverman**. Amount: \$12,000.

#### Internal

- 2018. Purdue University, Center for the Environment. *Distribution of perfluoroalkyl and polyfluoroalkyl substances (PFASs) in Indiana aquatic ecosystems and implications for wildlife health*. PI: **Jason Hoverman**, Co-PIs: Wes Flynn, Maria Sepulveda, Linda Lee. Amount: \$13,456.
- 2014 – 2015. Purdue University, Department of Forestry and Natural Resources. *Landscape genetics of wood frogs (*Lithobates sylvaticus*) in a complex world: pesticides, viruses and parasites*. PI: **Jason Hoverman**, Co-PIs: Jessica Hua, Obed Hernandez-Gomez, Steve Kimble, Rod Williams. Amount: \$14,885.
- 2015 – 2016. Purdue University, College of Agriculture, AgSEED. *Evaluating neonicotinoid exposure risk in wetland communities*. PI: **Jason Hoverman**, Co-PIs: Christian Krupke, Maria Sepulveda. Amount: \$49,832.
- 2015. Purdue University, College of Agriculture, Mary S. Rice Farm Estate. *Wetland and wildlife project expansion*. PI: Jon Leuck, Co-PIs: Don Carlson, Robert Chapman, **Jason Hoverman**, Rick Ward, Rod Williams, Harvey Nix. Amount: \$5,000.
- 2013. Purdue University, College of Agriculture, Provost's Teir 1 Instructional Instrumentation Grant. *Experiential learning in habitat management of Purdue forestlands*. PI: Michael Saunders, Co-PI. Rod Williams, Elizabeth Flaherty, **Jason Hoverman**, Michael Jenkins, Patrick Zollner, Songlin Fei Amount: \$20,077.
- 2013. Purdue University, Office of the Vice President of Research. *Induced pesticide resistance: The role of phenotypic plasticity in adaptation to novel environments*. PI: **Jason Hoverman**. Amount: \$8,000.

#### Minor grants and fellowships

- 2005 Andrew Mellon Predoctoral Fellowship
- 2005 Malacological Society of London, Centenary Research Grant. The evolution of phenotypic plasticity in snails.

- 2004 Sigma Xi, Grants-in-Aid of Research. The evolution of phenotypic plasticity in snails: The role of phenotypic trade-offs.
- 2004 Conchologists of America, Grants to Malacology Award. The evolution of phenotypic plasticity in freshwater snails.
- 2004 Pymatuning Laboratory of Ecology, University of Pittsburgh, McKinley Award
- 2003 Pymatuning Laboratory of Ecology, University of Pittsburgh, McKinley Award
- 2003 Pennsylvania Academy of Science, Graduate Research Award. Malathion and the conservation of aquatic biodiversity.
- 2002 Pennsylvania Academy of Science, Graduate Research Award. The impacts of calcium and parasites on predator-induced phenotypic plasticity.
- 2002 Sigma Xi, Grants-in-Aid of Research. The impacts of calcium on predator-induced plasticity.
- 2002 Pymatuning Laboratory of Ecology, University of Pittsburgh, McKinley Award
- 1999 Pymatuning Laboratory of Ecology, University of Pittsburgh, Richard T. Hartman Scholarship
- 1999 Howard Hughes Medical Institute Fellowship
- 1998 University of Pittsburgh, College of the Arts and Sciences Academic Scholarship

#### INVITED INTERNATIONAL SEMINARS (N =2)

- 2019 Zoological Society of London, United Kingdom. Symposium and workshop: Mitigating single pathogen and co-infections that threaten amphibian biodiversity. *“Healthy but smaller herds: Predators mediate disease risk in amphibian communities”*
- 2012 Lund University, Sweden. Symposium: Phenotypic Plasticity – Variation, Alteration and Speciation. *“Generalist versus specialist anti-predator strategies among closely related gastropod prey”*

#### NATIONAL SEMINARS (N =24)

- 2019 University of Georgia, Savannah River Ecology Laboratory. *“Advancing natural enemy ecology using wetland communities”*
- 2019 University of Georgia, Odum School of Ecology. *“The life aquatic: Dangers lurking in the shallows”*
- 2019 University of Georgia, Center for Ecology of Infection Diseases. *“Advancing natural enemy ecology using wetland communities”*
- 2018 University of South Carolina at Aiken, Department of Biology and Geology. *“Exploring the complexities of disease risk in amphibian populations”*
- 2017 Indiana State University, Department of Biology. *“Integrating ecology, evolution, and toxicology to understand disease risk in amphibians”*
- 2016 Washington State University, School of Biological Sciences. *“Coinfection: Exploring the influence of parasite diversity on disease dynamics”*
- 2016 University of Georgia, Savannah River Ecology Laboratory. *“Integrating ecology, evolution, and toxicology to understand amphibian responses to pesticides”*
- 2015 Ball State University, Department of Biology. *“Ecological and evolutionary insights into phenotypic plasticity using freshwater snails”*
- 2015 Southern Illinois University, Department of Zoology. *“Integrating ecology, evolution, and toxicology to understand amphibian responses to pesticides”*



- 2014 Purdue University, Center for the Environment and Purdue Water Community Interactive Seminar. *"The importance of connectivity and diversity in complex wetland landscapes"*
- 2014 Purdue University-Calumet. *"Ranaviruses: Exploring drivers of disease risk within amphibian communities"*
- 2014 Hoosier Herpetological Society. *"Ranaviruses: Exploring drivers of disease risk within amphibian communities"*
- 2014 Purdue University, Department of Biology, EcoLunch Seminar Series. *"Ranaviruses: Exploring drivers of disease risk within amphibian communities"*
- 2014 University of Pittsburgh, Pymatuning Laboratory of Ecology Lecture Series. *"Ranaviruses: Exploring drivers of disease risk within amphibian communities"*
- 2012 Purdue University. Department of Forestry and Natural Resources. *"Living in a stressful world: The threat of disease to amphibians"*
- 2012 Purdue University. Department of Forestry and Natural Resources. *"Wildlife as a tool for engaging students across multiple scales"*
- 2010 University of Connecticut. Center for Environmental Sciences and Engineering. *"Predators, pathogens, and pesticides: The perils of life in a pond"*
- 2010 University of Tennessee. Department of Forestry, Wildlife, and Fisheries. *"Ecological insights into the emerging amphibian pathogen Ranavirus"*
- 2010 Georgia Southern University. Department of Biology seminar series. *"Predators, pathogens, and pesticides: The perils of life in a pond"*
- 2009 East Carolina University. Ecology seminar series. *"A life and death shell game: Inducible defenses in freshwater snails"*
- 2007 University of Pittsburgh, Ecology and Evolution Seminar Series. *"An elaborate shell game: Insights into phenotypic plasticity using inducible defenses"*
- 2005 University of Pittsburgh, Ecology and Evolution Seminar Series. *"The rules of engagement: Inducible defenses in freshwater snails"*
- 2004 University of Pittsburgh, Ecology and Evolution Seminar Series. *"Exploring phenotypic plasticity: Gastropods as a model system"*
- 2002 University of Pittsburgh, Pymatuning Laboratory of Ecology Lecture Series. *"Gastropod plasticity: A model system"*

#### KEYNOTE CONFERENCE PRESENTATIONS (N =1)

- 2018 70<sup>th</sup> Annual Midwestern Conference of Parasitologists. Charleston, Illinois. *"Exploring the complexities of disease risk in amphibian populations"*

#### INVITED CONFERENCE PRESENTATIONS (N =5)

- 2017 Society of Environmental Toxicology and Chemistry. *"Exploring the ecological and evolutionary implications of pesticide exposure on disease risk in amphibians"*
- 2012 World Congress of Herpetology. *"Beyond single pathogens: significance of co-infections and pathogen communities for amphibian conservation"*
- 2011 Joint Meeting of Ichthyology and Herpetology. First international symposium on ranaviruses. *"Amphibian susceptibilities to the emerging amphibian pathogen ranavirus"*
- 2011 Northwest Partners in Amphibian and Reptile Conservation. Amphibian Disease Workshop. *"Ranaviruses: An emerging risk to amphibians"*

- 2011 Northwest Partners in Amphibian and Reptile Conservation. Amphibian Disease Workshop. *"Amphibian malformations and trematode parasite infection"*

### LEAD AUTHOR CONFERENCE PRESENTATIONS (N =16)

- 2017 Ecological Society of America. *"Lethal and sublethal effects of predators on pathogen transmission and trophic cascades"*
- 2015 Ecological Society of America. *"Prey responses to fine-scale variation in predation risk from combined predators"*
- 2014 Joint Meeting of Ichthyology and Herpetology. *"Disease risk within complex communities: The influence of coinfection by virulent pathogens on an amphibian assemblage"*
- 2013 Joint Meeting of Ichthyology and Herpetology. *"On the making of a superspreader: Experimental assessment of the factors driving parasite aggregation and infection heterogeneity"*
- 2011 Joint Meeting of Ichthyology and Herpetology. *"On the making of a superspreader: Experimental assessment of the factors driving parasite aggregation and infection heterogeneity"*
- 2011 Ecological Society of America. *"Co-infecting parasites: How parasite assemblages and timing of exposure affect host pathology and parasite loads"*
- 2010 Ecological Society of America. *"Anuran susceptibilities to the emerging amphibian pathogen Ranavirus"*
- 2009 University of Tennessee. Comparative and Experimental Medicine Research Symposium. *"Anuran susceptibilities to the emerging amphibian pathogen Ranavirus"*. Received Award of Excellence for the presentation.
- 2009 Joint Meeting of Ichthyology and Herpetology. *"Anuran susceptibilities to the emerging amphibian pathogen Ranavirus"*
- 2009 Tennessee Herpetological Society, 15<sup>th</sup> Annual conference. *"Anuran susceptibilities for two Ranavirus isolates"*
- 2008 Tennessee Herpetological Society, 14<sup>th</sup> Annual conference. *"An investigation of anuran sensitivities to the emerging amphibian pathogen Ranavirus"*
- 2005 Ecological Society of America. *"Inducible defenses in snails lead to indirect interactions within a freshwater community"*
- 2004 Ecological Society of America. *"Exploring phenotypic plasticity: Gastropods as a model system"*
- 2004 Joint Meeting of Ichthyology and Herpetology. *"Pesticides and amphibians: The importance of community context"*
- 2003 Ecological Society of America. *"Integrating predator-induced behavior, morphology, and life history: Why choose a single trait?"*
- 2001 Ecological Society of America. *"The impacts of larval predators and competitors on the morphology and fitness of juvenile tree frogs"*

### TEACHING EXPERIENCE

#### Purdue University

- 2017 – present Amphibian Ecology and Conservation (FNR 598)

2017 – present	Wild Things Learning Community (FNR 198)
2016 – present	Disease Ecology (FNR 529)
2013 – present	Summer Practicum (FNR 373)
2012 – present	Wildlife in America (FNR 240)
2014	Advanced Herpetology (FNR 598)
2013-2015	Ecosystem Management Practice (FNR 408)

#### University of Colorado

2012	Biology of Amphibians and Reptiles (EBIO 4740, Guest lecturer)
2011	Food and Sustainability (Guest lecturer)
2010	Disease Ecology (EBIO 4800)

#### University of Tennessee

2008 – 2010	Amphibian Ecology and Conservation (WFS 433/533)
2007 – 2010	Current topics in Wildlife Health (WFS 101, Guest lecturer)

#### University of Pittsburgh – Graduate Teaching Assistant

2006	Animal Behavior (BIOSC 1440)
2005	Conservation Biology (BIOSC 1610)
2004	Vertebrate Morphology Laboratory (BIOSC 1210)
2004 – 2005	Animal Physiology Laboratories (BIOSC 1880)
2003	Microbiology Laboratory (BIOSC 1850)
2002	Introduction to Biology Laboratory (BIOSC 0050)

### MENTORING AND OUTREACH

2015 – 2018	Faculty advisor for The Wildlife Society Student Chapter at Purdue.
2018	<i>Conservation Field Day, Tippecanoe County Partnership for Water Quality.</i> Extension event for 4 <sup>th</sup> and 5 <sup>th</sup> grade students (n = 275) organized by the Tippecanoe Water Quality Educator. The event was hosted at the Wright Center and Martell Forest. Students learned about the diversity of vertebrate and invertebrate species that exist in local ponds and wetlands. Students were provided with hands-on activities involving the species.
2017	<i>Indiana Chapter of The Wildlife Society. Continuing Education Series, Managing Disease in the 21<sup>st</sup> Century. "Amphibian Diseases."</i> Presentation to 37 members of the Indiana Chapter of The Wildlife Society seeking continuing education credit. Members learned about the major disease risks of amphibians and methods for collecting samples for different pathogens.
2017	<i>Wildlife techniques and awareness day.</i> Extension event for 8 <sup>th</sup> grade students (n = 22) in the accelerated science class at Tecumseh Middle School. The event was hosted at the Wright Center and Martell Forest. The students gained knowledge in: GPS use, radio telemetry use, wetland sampling, animal ID, and general conservation concerns.
2017	The Wildlife Society, North Central Section Student Conclave. <i>"Agrochemicals and amphibians: Should we be concerned?"</i> Presentation to 50 student members of The

- Wildlife Society interested in learning about the effects of pesticides on amphibians.
- 2017 Indiana Division of Fish and Wildlife Annual Conference. *“Beyond the host: What do we know about disease at the ecosystem level?”* Presentation to 150 state agency workers interested in learning about the broader implication of disease and introduced pathogens for ecosystems.
- 2015 Mentor for Purdue TWS dove hunt sponsored by the Indiana Division of Fish and Wildlife.
- 2015 Ohio River Valley Woodland & Wildlife Workshop. *“Macroinvertebrates: A journey below the water’s surface”*. Public presentation to 20 people interested in learning about the diversity of aquatic macroinvertebrates on their properties.
- 2015 *Wildlife techniques and awareness day*. Extension event for 8<sup>th</sup> grade student (n = 24) in the accelerated science class at Tecumseh Middle School. The event was hosted at the Wright Center and Martell Forest. The students gained knowledge in: GPS use, radio telemetry use, wetland sampling, animal ID, and general conservation concerns.
- 2013 Provided a workshop on macroinvertebrates to the student chapter of the American Fisheries Society at Purdue University.
- 2012 Presentation on amphibian diseases to the student chapter of The Wildlife Society at Purdue University.
- 2010 – 2012 Mentor for underrepresented students involved in the Summer Multicultural Access to Research Training (SMART) program through the Colorado Diversity Initiative at the University of Colorado.
- 2008 – 2009 Volunteer educating 4-H students participating in the Junior High Academic Conference at the University of Tennessee on different types of amphibians and reptiles (native and exotic).
- 2008 – 2009 Academic Enrichment Upward Bound (AEUB) Volunteer, University of Tennessee - Educate high school students about the field of ecology, helping the students decipher their career interests and goals.
- 2001 – 2006 Pymatuning Laboratory of Ecology Volunteer - Showcased and educated the public on freshwater systems and native reptiles and amphibians for the Pennsylvania Boat and Fish Commission Exhibit Days, Linesville, PA.
- 2001 – present Trained and supervised over 30 undergraduate and 10 graduate students from six universities and colleges across the United States.

### POST-DOCTORAL RESEACHERS ADVISED (N = 3)

- Wes Flynn, Purdue Postdoctoral Scholar in Natural Resources, Purdue University, FNR (2018 – present)
- Michael Chislock, Purdue Postdoctoral Scholar in Natural Resources, Purdue University, FNR (2016–2017) (currently Assistant Professor, The College at Brockport – The State University of New York)
- Jessica Hua, Purdue Postdoctoral Scholar in Natural Resources, Purdue University, FNR (2014 – 2015) (currently Assistant Professor, Binghamton University)

### GRADUATE STUDENTS ADVISED (N = 10)

- Melissa Lech, Purdue University, FNR, MS (2019 – present). Thesis: *Exploring the effects of*

*perfluorinated compounds and their mixtures on disease risk in amphibians.*

Logan Billet, Purdue University, FNR, MS (2018 – present). Thesis: *Disease ecology in the midst of anthropogenic stressors: Exploring the influence of pesticides on host- parasite interactions.*

Riley Rackliffe, Purdue University, FNR, PhD (2017 – present). Thesis: *The influence of evolved pesticide tolerance on assessments of ecosystem health and function.*

Turner DeBlieux, Purdue University, FNR, MS (2017 – 2018). Thesis: *Natural enemy ecology: Community-level consequences of predators and pathogens within ecological communities.* (currently PhD student at Indiana University)

Sarah Abercrombie, Purdue University, FNR, MS (2017 – 2018). Thesis: *Toxicity of perfluorinated compounds to metamorphic amphibians.* Awards: 2<sup>nd</sup> place in FNR Research Symposium 2017, M.S. research category; travel grant from the Society of Environmental Toxicology and Chemistry in 2018. (currently research technician at National Resources Conservation Service in Indiana)

Samantha Gallagher, Purdue University, FNR, MS (2016 – 2017). Thesis: *Investigating the metabolic consequences of exposure to pathogens and pesticides in amphibians.* (currently research technician in Texas)

Katherine Pochini, Purdue University, FNR, MS (2014 – 2016). Thesis: *Understanding the role of pesticides in host-pathogen interactions.* Awards: 1<sup>st</sup> place in FNR Research Symposium 2016, M.S. research category. (currently research technician in New York)

Jesse Miles, Purdue University, FNR, MS (2014 – 2015). Thesis: *The effects of the neonicotinoid clothianidin on wetland communities.* (currently environmental law student in Oregon)

Vanessa Wuerthner, Purdue University, FNR, MS (2014 – 2015). Thesis: *Exploring the consequences of coinfection on disease dynamics.* Awards: 2<sup>nd</sup> place in FNR Research Symposium 2015, M.S. research category (currently PhD student at Binghamton University)

Nathan Haislip, University of Tennessee, Department of Forestry, Wildlife, and Fisheries, MS (co-advised, 2008 – 2010) (currently Facilities Manager and Lead Keeper, Turtle Survival Center)

## GRADUATE STUDENT COMMITTEES (N =13)

Henry Legett, Purdue University, Biological Sciences, Ph.D. (2015 – present)

Trevor Vannatta, Purdue University, Biological Sciences, Ph.D. (2018 – present)

Leonardo Bertassello, Purdue University, Lyles School of Civil Engineering, Ph.D. (2017 – 2019)

Tim Malinich, Purdue University, FNR, Ph.D. (2015 – 2019)

Janna Willoughby, Purdue University, FNR, Ph.D. (2013 – 2015)

Obed Hernandez-Gomez, Purdue University, FNR, Ph.D. (2014 – 2017)

Mike Garvey, Purdue University, Entomology, Ph.D. (2013 – 2018)

Adam Alford, Purdue University, Entomology, Ph.D. (2014 – 2018)

Erin Kenison, Purdue University, FNR, Ph.D. (2014 – 2018)

Gary Hoover, Purdue University, FNR, Ph.D. (2016 – 2018)

Abigail Merrick, Purdue University, Biological Sciences, M.S. (2017 – 2018)

Devin Jones, Rensselaer Polytechnic Institute, Department of Biological Sciences, Ph.D. (2014 – 2017)

Megan Winzler, University of Georgia, Warnell School of Forestry and Natural Resources, M.S. (2014 – 2016)

### UNDERGRADUATE STUDENTS ADVISED (N = 22)

Ruby Blake, Purdue University, Wildlife major (2019 – present)

Kristopher Mengi, Purdue University, Wildlife major (2019 – present)

Sophia Brown, Purdue University, Biology major (2018 – present)

- Project title: Exploring the effects of poly- and perfluoroalkyl substances on the susceptibility of tadpoles to trematode infections.

Amanda Komaskinski, Purdue University, Biology major (2018 – present)

- Project title: Examining the effects of pesticide mixtures on ranavirus infection.

Hailea Howard, Purdue University, Biology major (2016 – present)

Alice Belskis, Stockton University, Biology major (2019)

- National Science Foundation Research Experience for Undergraduates student
- Project title: Examining the effects of temperature on pesticide toxicity in trematodes.

Megan Gannon, Purdue University, Wildlife major (2016 – 2019)

Lucas Foertsch, Purdue University, Biology major (2017 – 2018)

Caroline Harms, Purdue University, Wildlife major (2017 – 2018)

Tori Floyd, Purdue University, Biology major (2017 – 2018)

Logan Billet, Allegheny College, Biology major (2017 – 2018)

Zachary Compton, Purdue University, Wildlife major (2015 – 2018)

Lexington Eiler, Purdue University, Wildlife major (2015 – 2018)

- Lexi presented her work at the 2017 FNR research symposium and was awarded 1<sup>st</sup> place (Undergraduate research category)

Sarah Gray, Purdue University, Wildlife major (2016 – 2018)

Allison O'Brien, Purdue University, Biology major (2016 – 2018)

- Honors thesis: Bioaccumulation dynamics of perfluorooctane sulfonate in larval amphibians.

Sarah Abercrombie, Purdue University, Wildlife major (2016)

Kelton Verble, Purdue University, Wildlife major (2015 – 2016)

Nicholas Buss, Purdue University, Wildlife major (2014 – 2015)

- Nick published one article based on his research at Purdue. He is currently a graduate student at Binghamton University.

Justin Kim, Purdue University, Wildlife major (2014 – 2016)

- Justin published one article based on his research at Purdue.

Brandon Zinman, Purdue University, Wildlife major (2013 – 2014)

Vanessa Wuerthner, Purdue University, Wildlife major (2013 – 2014)

Michael Hiatt, Purdue University, Biology major (2012 – 2015)

- Summer Undergraduate Research Fellowship (SURF) 2014

### HIGH SCHOOL STUDENTS ADVISED (N = 1)

Shelly Tan, Jefferson High School (2014 – 2015)

- Awards: Gold medal in the category of Environmental Science, American Meteorological Society Sponsor Award, Exceptional GENIUS Award from SUNY Oswego

### RESEARCH TECHNICIANS ADVISED (N = 4)

Grace Coogan, Purdue University, FNR (2019 – present)

Michael Iacchetta, Purdue University, FNR (2017 – 2019)

Brian Tornabene, Purdue University, FNR (2016 – 2017)

Kelly DeRolf, Purdue University, FNR (2013 – 2014)

### SERVICE

2019 – present Handling editor for *Oecologia*.

2018 – present Member of the Indiana Herpetological Technical Advisory Committee.

2018 Reviewed and provided feedback on CVs for the Annual Conference for Pretenure Women hosted by the Susan Bulkeley Butler Center for Leadership Excellence, Purdue University.

2018 Provided tour of research facilities at the Purdue Wildlife Area for the North American College Teachers in Agriculture Annual Conference .

2015 – 2016 Chair Ecology Section of Indiana Academy of Sciences.

2014 – 2015 Vice-chair Ecology Section of Indiana Academy of Sciences.

2011 Co-organizer of the first international symposium of ranaviruses, Joint Meeting of Ichthyology and Herpetology, Minneapolis 2011.

2010 – present External grant reviewer for the National Science Foundation, National Geographic Society, Center for Global Change, Graduate Women in Science, and Department of Defense, Strategic Environmental Research and Development.

2009 – 2011 Steering Committee member, Southeastern Partners in Amphibian and Reptile Conservation. The Steering Committee provides a broader perspective in guiding the present and future workings of SEPARC, works with and supports the SEPARC Co-chairs and officers, and provides improved communication throughout the region to advance amphibian and reptile conservation.

2008 – 2011 Disease task team member, Southeastern Partners in Amphibian and Reptile Conservation. The team develops informational brochures on common herpetofaunal pathogens, protocols for collecting and shipping diseased animals, and instructions on disinfecting field equipment. We also are developing an

- interactive website where herpetofaunal die-offs from diseases can be reported.
- 2005 – 2006 President of Graduate Student Organization, Biology Chapter, University of Pittsburgh.
- 2001 – present Peer Reviewer for the following journals: *American Naturalist*, *Animal Conservation*, *Aquatic Laboratory Research*, *Behavioral Ecology*, *Biological Conservation*, *Biological Journal of the Linnean Society*, *Canadian Journal of Zoology*, *Conservation Physiology*, *Diseases of Aquatic Organisms*, *Ecography*, *EcoHealth*, *Ecology*, *Ecology and Evolution*, *Ecology Letters*, *Ecological Applications*, *Environmental Science & Technology*, *Environmental Toxicology & Chemistry*, *Freshwater Biology*, *Functional Ecology*, *Heredity*, *Herpetological Conservation and Biology*, *Herpetological Review*, *Hydrobiologia*, *Journal of Animal Ecology*, *Journal of Applied Ecology*, *Journal of Herpetology*, *Journal of Molluscan Studies*, *Journal of the North American Benthological Society*, *Journal of Wildlife Diseases*, *Journal of Wildlife Management*, *Molecular Ecology Resources*, *Northeastern Naturalist*, *Oecologia*, *Oikos*, *PLoS ONE*, *Southeastern Naturalist*, *Wetlands*