

# JOHANNA E. ELSENSOHN

U.S. DEPARTMENT OF AGRICULTURE  
AGRICULTURAL RESEARCH SERVICE  
APPALACHIAN FRUIT RESEARCH STATION  
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## EDUCATION

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- 2021      Doctor of Philosophy – North Carolina State University  
Major: Entomology; Minors: Biotechnology; Genetic Pest Management  
Dissertation title: “Factors affecting oviposition behavior in *Drosophila suzukii*”  
Advisors: Drs. Hannah J. Burrack and Coby Schal
- 2012      Master of Science – University of Connecticut  
Conservation Biology and Biodiversity
- 2012      Bachelor of Science – University of Connecticut  
Ecology and Evolutionary Biology, *plant ecology concentration*

## PROFESSIONAL WORK EXPERIENCE

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- 2021-present      **Research Entomologist (GS-11)** to Dr. Tracy Leskey ([tracy.leskey@usda.gov](mailto:tracy.leskey@usda.gov), 304-995-1768), USDA-ARS Appalachian Fruit Research Station, Kearneysville, WV. Full time, 40 hr/wk
- Leading multiple research projects on several invasive insects threatening plant health, including spotted lanternfly, Spotted-wing drosophila, codling moth, and brown marmorated stink bug
  - Evaluating visual cues, grouping and dispersal behavior of *Lycorma delicatula* through a combination of bioassays, tracking and observation
  - Assessing new technologies like UASs (unmanned aerial systems) for tracking pest movement, automated imaging and machine learning to measure insect size, and non-target impacts of UVC light for plant pathogen management
- 2014–2020      **Graduate Research Assistant**, to Drs. Hannah Burrack ([burrackh@msu.edu](mailto:burrackh@msu.edu), 919-208-7494) and Coby Schal ([coby@ncsu.edu](mailto:coby@ncsu.edu), 919-621-9126), NC State University, Department of Entomology and Plant Pathology, Raleigh, NC. Full time, 40 hr/wk
- Designed, conducted, and analyzed lab and field-based experiments to evaluate the basic ecology, oviposition behavior, and host preference of the invasive agro-ecological pest *Drosophila suzukii*.
  - Detailed potential risks of the use of gene drive biotechnology in agricultural systems, highlighting concerns that may not be fully addressed by ecological risk assessment
  - Assessed consumer and stakeholder attitudes toward biotechnology-based approaches for IPM to improve and contextualize current and future recommendations regarding the release of genetically modified organisms for pest management
  - Participated in multiple national and international workshops on the regulatory, environmental, and ethical issues surrounding genetic engineering of plants and insects
  - Provided expert guidance to APHIS-BRS regarding the interstate transportation of *D. suzukii*
- 2018      **Consultant** to Drs. Kent Redford and Nicholas MacFarlane ([nicholas.macfarlane@iucn.org](mailto:nicholas.macfarlane@iucn.org)), International Union for Conservation of Nature, Washington, D.C. Part time, 10-15 hr/wk
- Provided writing assistance, peer editing, illustration guidance, image curation, and reference management for the technical subgroup

- Aided in production of the assessment, “Genetic Frontiers for Conservation: An Assessment of Synthetic Biology and Biodiversity Conservation” to inform discussions at the Congress of Parties at the Convention on Biological Diversity
- 2015      **Partnership Development Intern** to Dr. Deborah Thompson (no longer at NCSU), NC State University, College of Agriculture and Life Sciences (CALs) Partnership Development Office, Raleigh, NC. Part time, 10 hr/wk
- Created and fostered collaborative research and/or development projects between CALs faculty and outside companies
  - Specialized in identifying and understanding the needs and interests of all parties to develop a mutually beneficial partnership
- 2013–2014      **Research Technician** to Dr. Greg Loeb ([gme1@cornell.edu](mailto:gme1@cornell.edu), 315-787-2345), Cornell University, Department of Entomology, New York State Agricultural Experiment Station, Geneva, NY. Full time, 40 hr/wk
- Conducted, analyzed and published research on the population dynamics of *Drosophila suzukii* in non-target host plants near crop plantings
  - Additional research included evaluation of *D. suzukii* overwintering habitats, plant/insect interactions, microbial associations, lure formulation, and repellents
- 2012      **Research Assistant** to Dr. Robert Colwell (retired), University of Connecticut, Department of Ecology and Evolutionary Biology, Storrs, CT. Full time, 40 hr/wk
- Conducted a meta-analysis to analyze the impact of a popular and powerful ecological software
- 2011 – 2013      **Research Assistant** to Dr. Richard Cowles ([Richard.cowles@ct.gov](mailto:Richard.cowles@ct.gov)), Connecticut Agricultural Experiment Station, Department of Entomology, Windsor, CT. Part time, 20 hr/wk
- Conducted research on several pest arthropod species with main focus on *Drosophila suzukii*
  - Evaluated and optimized phagostimulants and volatile attractants, screened candidate *Bt* strains, and developed assays to assess dose response, proboscis extension reflex, ovipositional stimulation, and visual attraction
- 2011 – 2013      **Herbarium Collection Specialist** under Dr. Robert Capers (retired), George Safford Torrey Herbarium at the University of Connecticut, Storrs, CT. Part time, 20 hr/wk
- Databased, photographed, georeferenced and incorporated over 17,000 plant specimens into the herbarium using the software BG-BASE
  - Identified unknown or mislabeled plant specimens from around the world
- 2011      **IPM Scout** under Lorraine Los (retired), University of Connecticut Cooperative Extension, College of Agriculture and Natural Resources, Storrs, CT. Part time, 20-30 hr/wk
- Assessed pheromone mating disruption trials; trained farmers in principles of IPM, vegetable and fruit pest scouting; monitored traps for the new invasive species, *Halyomorpha halys*

## PUBLICATIONS

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### PEER REVIEWED

19. Elsensohn, J. E. and H. J. Burrack. *In revision*. Plasticity in oviposition and foraging behavior in the invasive pest *Drosophila suzukii* across natural and agricultural landscapes. *Ecol. Evol.*
18. Nixon, L. J., S. Jones, A. C. Dechaine, D. Ludwick, M. Hickin, L. Sullivan, J. E. Elsensohn, J. Gould, M. A. Keena, T. Kuhar, D. G. Pfeiffer, and T. C. Leskey. 2022. Development of a rearing methodology for the invasive spotted lanternfly, *Lycorma delicatula* (Hemiptera:Fulgoridae). *Front. Insect Sci.* 2: p.1025193. DOI: 10.3389/finsc.2022.1025193
17. Tabb, A., J. E. Elsensohn, and T. C. Leskey. 2022. Automated size measurements of *Halyomorpha halys* (Stål) (Heteroptera: Pentatomidae) with an image-based method. *Florida Entomol.* 105: 262-264. DOI: 10.1653/024.105.0314
16. Kokotovich, A. E., S. K. Barnhill-Dilling, J. E. Elsensohn, R. Li, J. A. Delborne, and H. J. Burrack. 2022. Stakeholder engagement to inform the risk assessment and governance of gene drive technology to manage Spotted-wing *Drosophila*. *J. Envir. Manag.* 307: 114480. DOI: 10.1016/j.jenvman.2022.114480

15. **Elsensohn, J. E.**, C. Schal, and H. J. Burrack. 2021. Plasticity in oviposition site selection behavior in *Drosophila suzukii* in relation to adult density and host distribution and quality". *J. Econ. Entomol.* 114(4): 1517-1522. DOI: 10.1093/jee/toab108
  14. **Elsensohn, J. E.**, M.F.K. Aly, C. Schal, and H. J. Burrack. 2021. Social signals mediate oviposition site selection in *Drosophila suzukii*. *Sci Rep.* 11:3796. DOI: 10.1038/s41598-021-83354-2
  13. Stockton, D. S. P. Hesler, A. K. Wallingford, T. C. Leskey, L. McDermott, **J. E. Elsensohn**, D. I. M. Riggs, M. Pritts, and G. M. Loeb. 2020. Factors affecting the implementation of exclusion netting to control *Drosophila suzukii* on primocane raspberry. *Crop Protection.* 105191. DOI: 10.1016/j.cropro.2020.105191
  12. Kokotovich, A., J. A. Delborne, **J. E. Elsensohn**, and H. J. Burrack. 2020. Emerging technologies for invasive insects: the role of engagement. *Ann. Entomol. Soc. Amer.* DOI: 10.1093/aesa/saz064
  11. Jones, M.S., J. A. Delborne, **J. E. Elsensohn**, P. W. Mitchell, and Z. S. Brown. 2019. Does the U.S. public support using gene drives in agriculture? And what do they want to know? *Sci. Adv.* 5(9): eaau8462. DOI: 10.1126/sciadv.aau8462
  10. **Elsensohn, J. E.** 2019. "Modifying epigenomes using synthetic biology" In *Genetic Frontiers for Conservation: An Assessment of Synthetic Biology and Biodiversity Conservation* Eds: Redford et al. DOI: 10.2305/IUCN.CH.2019.05.en
  9. **Elsensohn J. E.**, T. Anderson, J.R. Cryan, T. Durham, K.J.K. Gandhi, J. Gordon, R.K. Krell, M.L. Pimsler, A. Rivers, and H. Spafford. 2019. From Research to Policy: Scientists Speaking for Science. *Ann. Entomol. Soc. Amer.* 112(2): 75-78. DOI: 10.1093/aesa/say057
  8. Baltzegar, J. F.\*, **J. E. Elsensohn**, N. Gutzmann, and S. H. Webster. 2018. ESA Student Debate: What is the single best strategy for decreasing dengue virus (breakbone fever) incidence worldwide? Genetically engineered mosquitoes with lethal genes. *Amer. Entomol.* 64(3): 165-175. DOI: 10.1093/ae/tmy040.
  7. **Elsensohn, J. E.** and G. M. Loeb. 2018. Non-crop host sampling yields insights into small-scale population dynamics of *Drosophila suzukii* (Matsumura). *Insects.* 9(1): 5. DOI: 10.3390/insects9010005
  6. Gutzmann, N., **J. E. Elsensohn**, J. C. Barnes, J. Baltzegar, M. S. Jones, and J. Sudweeks. 2017. "CRISPR-based gene drive in agriculture will face technical and governance challenges". *EMBO Reports.* DOI: 10.15252/embr.201744661
  5. Baltzegar J. F.\*, J. C. Barnes, **J. E. Elsensohn**, N. Gutzmann, M. S. Jones, S. King, and J. Sudweeks. 2017. Anticipating complexity in the deployment of gene drive insects in agriculture. *J. Resp. Innov.* DOI: 10.1080/23299460.2017.1407910
  4. Baltzegar, J. F.\*, **J. E. Elsensohn**, and S. H. Webster. 2017. ESA Student Debate: With the development of tools like RNAi, in the future we may be capable of eradicating species. If we can eradicate a species, should we? Con position. *Amer. Entomol.* 63(2), 114-123. DOI: 10.1093/ae/tmx028
  3. Cowles, R. S., C. R. Rodriguez-Saona, R. Holdcraft, G. M. Loeb, **J. E. Elsensohn**, and S. P. Hesler. 2015. Sucrose improves insecticide activity against *Drosophila suzukii* (Diptera: Drosophilidae). *Econ. Entomol.* 108(2), pp.640-653. DOI: 10.1093/jee/tou100
  2. Burrack, H. J. and **J. E. Elsensohn**. 2015. Efficacy of organically acceptable insecticides against *Drosophila suzukii* in blueberries, 2014. *Arthropod Management Tests.* 40(1), p.C1.
  1. Colwell, R. K., and **J. E. Elsensohn**. 2014. *EstimateS* turns 20: statistical estimation of species richness and shared species from samples, with non-parametric extrapolation. *Ecography.* 37(6), 609-613. DOI: 10.1111/ecog.00814.
- \* Authors contributed equally to this publication

#### IN PREPARATION

2. **Elsensohn, J. E.**, L. J. Nixon, J. Urban, S. Jones, T. C. Leskey. Survival and development of *Lycorma delicatula* (Hemiptera: Fulgoridae) on common secondary host plants differ by life stage under controlled conditions. For submission to *Frontiers in Insect Science* special issue.
1. **Elsensohn, J. E.**, S. W. Flake, and R. R. Dunn. The biogeographic yield gap: why do most crops yield worse in their native range?

#### NON-PEER REVIEWED/POPULAR PRESS ARTICLES

7. **Elsensohn, J. E.**, C. J. Esquivel Palma, L. Iglesias, J. Kansman, and O. Quieroz. 2018. "Putting Research and Policy into Practice: Lessons from P-IE's Field Tours" *Entomology Today* blog.
6. **Elsensohn, J. E.** 2018. "Two model organisms are better than one: toward a better understanding of plant/insect interactions". *The Signal* newsletter for Keck Center for Behavioral Biology, NC State.
5. **Elsensohn, J. E.** 2017. "Capacity funding still has high impact for land grant colleges and local agriculture". *Entomology Today* blog.

4. Wallingford, A., **J. E. Elsensohn**, K. Swoboda-Bhattarai, H. J. Burrack, and G. M. Loeb. 2017. "Local populations of spotted wing drosophila in wild host plants: Do they pose a threat to managed crops?" NY Berry Growers Association Newsletter.
3. **Elsensohn, J. E.** 2017. "New Federal Report on *Aedes* Mosquitoes Could Signal Shift in How Zika Virus and Other Pathogens are Researched". *Entomology Today* blog.
2. **Elsensohn, J. E.** and K. Sears. 2017. Issue Brief: Synthetic plant-associated microorganisms. #2017.1. Genetic Engineering and Society Center, NCSU, Raleigh, NC.
1. **Elsensohn, J. E.** 2016. "A Post-Election Washington D.C.: The ESA Science Policy Fellows' Perspective". *Entomology Today* blog.

## PRESENTATIONS, INVITED

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- Elsensohn, J. E.** 2022. Assessing the risks of an agricultural pest and its management: A case study of the spotted-wing *Drosophila* and gene drive technology. Gene Drives in Agriculture: Risk Assessment and Research Prioritization Workshop. Genetic Engineering and Society Center, NC State
- Elsensohn, J. E.**, S. Jones, B. Evans, and T. C. Leskey. 2022. Prospects of using UV-C light for management of Spotted wing *Drosophila*. North American Raspberry and Blackberry Association conference. Gaithersburg, MD
- Elsensohn, J. E.** and T. C. Leskey. 2022. Incipient invasion by Spotted Lanternfly into Northern Virginia vineyards. UMREC Fruit Grower meeting
- Elsensohn, J. E.**, C. Schal, M. Aly, and H. J. Burrack. 2021. "Behavioral evidence for host marking in *Drosophila suzukii*". Eastern Branch Annual Meeting, Entomological Society of America.
- Elsensohn, J. E.**, C. Schal, M. Aly, and H. J. Burrack. 2020. "Context-dependent oviposition behavior in the agricultural pest *Drosophila suzukii*". USDA-ARS, Appalachian Fruit Research Station, Kearneysville, WV
- Elsensohn, J. E.**, A. Kokotovitch, J. A. Delborne, and H. J. Burrack. 2019. "Lessons from using engagement to elicit potential impacts of emerging technologies in invasive pest management: *Drosophila suzukii* as a case study". Entomological Society of America Annual Meeting. St. Louis, MO
- Elsensohn, J. E.**, H. J. Burrack, Z. S. Brown, and J. A. Delborne. 2018. "Assessing risks of emerging technologies in pest management through expert elicitation". Entomological Societies of America, Canada, and British Columbia joint meeting. Vancouver, British Columbia, Canada
- Jones, M. S., **J. E. Elsensohn**, Z. S. Brown, J. A. Delborne, and P. J. Mitchell. 2018. "Consideration of diverse publics and diverse markets in ethical debates of gene drives in agriculture". Entomological Societies of America, Canada, and British Columbia joint meeting. Vancouver, British Columbia, Canada
- Elsensohn, J. E.**, M. S. Jones, Z. S. Brown, P. Mitchell, and J. A. Delborne. 2018. "Assessing attitudes on gene drives: What consumers want to know". Southeastern Branch of Entomological Society of America. Orlando, FL
- Elsensohn, J. E.** and H. J. Burrack. 2018. New directions in SWD research from the Southeast. Southeast Regional Fruit and Vegetable Conference. Savannah, GA
- Elsensohn, J. E.**, Z. S. Brown, J. A. Delborne and H. J. Burrack. 2016. Comparative risk analysis for agricultural genetic pest management technologies. Society for Risk Analysis. San Diego, CA
- Elsensohn, J. E.** and G. M. Loeb. 2016. Non-crop host infestation by an invasive, polyphagous fly: seasonal dynamics and host preference. Southeastern Branch of Entomological Society of America. Raleigh, NC
- Elsensohn, J. E.**, J. Kuzma, and C. Leitschuh. 2015. Gene Drives and Society. Genetic Engineering and Society Colloquium. Raleigh, NC
- Burrack, H.J. and **J. E. Elsensohn**. 2015. *Drosophila suzukii* biology, ecology, management, and regulatory implications. Webinar for USDA APHIS staff. Raleigh, NC
- Elsensohn, J. E.** 2014. Season Long Evaluation of Wild Hosts for Spotted Wing *Drosophila*. Empire State Producers Expo. Syracuse, NY
- Elsensohn, J. E.**, and R. S. Cowles. 2012. Current and Future Directions of Spotted Wing Control. Connecticut Entomological Society. Storrs, CT

## PRESENTATIONS, SUBMITTED

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- Elsensohn, J. E.**, S. Wolford, A. Tabb, and T. C. Leskey. 2022. A novel approach to assessing human assisted insect dispersal on vehicles. ESA, ESC, and ESBC Joint Annual Meeting. Vancouver, British Columbia, Canada.
- Elsensohn, J. E.**, S. Wolford, A. Tabb, and T. C. Leskey. 2022. Assessing Spotted Lanternfly adhesion to vehicles using a laminar flow wind machine. Entomological Society of America Eastern Branch meeting. Philadelphia, PA.

- Elsensohn, J. E.** and T. C. Leskey. 2021. Incipient invasion by Spotted Lanternfly into Northern Virginia vineyards. Cumberland Shenandoah Fruit Workers Conference. Gaithersburg, MD.
- Elsensohn, J. E.** and H. J. Burrack. 2021. Flying under the radar: *Drosophila suzukii* in the National Forests of North Carolina has implications for ecology and management. Entomological Society of America annual meeting. Denver, CO.
- Elsensohn, J. E.**, M. S. Jones, Z. S. Brown, P. Mitchell, and J. A. Delborne. 2018. "Consumer attitudes on the use of gene drives in agriculture." Entomology Graduate Student Symposium. Raleigh, NC
- Elsensohn, J. E.**, M. S. Jones, Z. S. Brown, P. Mitchell, and J. A. Delborne. 2018. "Public survey on attitudes toward gene drives in agriculture". Specialty Crops Research Initiative on *Drosophila suzukii* annual meeting. Portland, OR
- Loeb, G. M., R. S. Cowles, C. Rodriguez-Saona, and **J. E. Elsensohn**. 2016. *Drosophila suzukii* alternate host and spatial distribution and improvement of pesticide efficacy. International Congress of Entomology. Orlando, FL
- Elsensohn, J. E.**, H.J. Burrack, and C. Schal. 2016. Context-dependent oviposition site selection in the polyphagous pest species, *Drosophila suzukii*. Keck Center for Behavioral Biology Student Symposium. Raleigh, NC
- Elsensohn, J. E.** and H. J. Burrack. 2016. A mother's memory: how previous exposure affects oviposition site preference in *Drosophila suzukii*. Southeastern Branch of Entomological Society of America Annual Meeting. Raleigh, NC
- Elsensohn, J. E.**, F. Li, and M. J. Scott. 2016. "Development of genetic control tactics for spotted wing *Drosophila*". Sustainable SWD Management SCRI Working Group Meeting. Hershey, PA
- Elsensohn, J. E.** and H. J. Burrack. 2015. "Behavioral ecology and resource use by an invasive fly, *Drosophila suzukii*." Entomological Society of America Annual Meeting. Minneapolis, MN
- Loeb, G.M, A.K. Wallingford, **J. E. Elsensohn**, and S.P. Hesler. 2014. "SWD overwintering biology and use of wild host plants in the Northeast US". Entomological Society of America. Portland, OR
- Baltzegar, J. F., **J. E. Elsensohn**, E. I. Nwakupda, B. W. Peddycord III, E A. Pitts, and R. X. Valdez. 2014. "Mapping Responsible Innovation: A First Principles Approach". International Genetically Engineered Machines (iGEM) Competition. Boston, MA
- Elsensohn, J. E.** and G. M. Loeb. 2013. "Spotted wing *drosophila* update and discussion". Twilight meeting for NY berry growers. Trumansburg, NY
- Elsensohn, J. E.** 2012. Spotted Wing *Drosophila*: The Small Fly Causing Big Problems for CT Farmers. Graduate EEB Symposium. Storrs, CT

## POSTERS

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- Jones, M. S., **J. E. Elsensohn**, Z. S. Brown, P. W. Mitchell, and J. A. Delborne. 2018. U.S. public attitudes and uncertainties on using gene drive on invasive insects in agriculture. Addressing the North American and Pacific Rim Invasive Insect and Arthropod Species Challenge Summit. Vancouver, BC
- Elsensohn, J. E.** 2018. Using basic biology to inform genetic pest management of an invasive fruit fly. Forging Integrated Expertise in Graduate Education Symposium. Raleigh, NC
- Elsensohn, J. E.** and F. Gould. 2017. NSF-IGERT: Intersections of genetic engineering and society. Consortium on National Science Funding. Washington, D.C.
- Elsensohn, J. E.**, Z. S. Brown, J. A. Delborne, and H. J. Burrack. 2016. New kids on the block: regulatory issues around emerging pests and emerging technologies. International Congress of Entomology. Orlando, FL
- Baltzegar, J. F., J. C. Barnes, **J. E. Elsensohn**, N. Gutzmann, M. S. Jones, S. King, and J. Sudweeks. 2016. Gene drives in agriculture. International Congress of Entomology. Orlando, FL
- Elsensohn, J. E.** 2015. "Beyond the lab: communicating with the public about emerging technologies." Genetic Engineering Symposium. Raleigh, NC
- Baltzegar, J. F., **J. E. Elsensohn**, E. I. Nwakupda, B. W. Peddycord III, E A. Pitts, and R. X. Valdez. 2014. "Mapping Responsible Innovation: A First Principles Approach". International Genetically Engineered Machines (iGEM) Competition. Boston, MA
- Elsensohn, J. E.** and G. M. Loeb. 2014. "Seasonal dynamics of non-cultivated hosts of the invasive *Drosophila suzukii* (Diptera: Drosophilidae) in central New York". North Carolina Entomological Society Annual Meeting. Raleigh, NC
- Elsensohn, J. E.**, and G. M. Loeb. 2013. Spotted Wing *Drosophila*: A Small Invasive Fly Causing Big Problems for NY Farmers. Insectapalooza. Cornell University, Ithaca, NY

## GRANTS

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2018                      **Keck Center for Behavioral Biology Grant \$1,750**

- “Investigating wild hosts of a global crop pest to identify novel attractants”
- PI: J. E. Elsensohn
- 2018 **Southern Region IPM Center Enhancement Program Grant \$30,000**
  - “Does the invasive pest *Drosophila suzukii* manipulate the microbiome of its fruit hosts? Implications for management and ecology”
  - PI: H.J. Burrack, Co-PI: M. Cubeta, J. E. Elsensohn.
- 2016 **North American Bramble Growers Research Foundation Grant \$2,500**
  - “Using bacteria and fungi to develop sustainable control methods for *Drosophila suzukii*. “
  - PI: J. E. Elsensohn

## FELLOWSHIPS AND AWARDS

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- 2022 **Performance Award**. USDA-ARS
- Performance Award**. USDA-ARS
- 2017-2018 **Preparing the Professoriate Fellowship**, North Carolina State University
  - Competitive, university-wide program to prepare graduate students and postdocs for their first year as an academic professor
  - Included teaching a standalone course as instructor of record
- 2017 **CCE-STEM Fellowship**, Cultivating Cultures of Ethics in Science, Technology, Engineering, and Math (NSF)
  - Trained and led focus groups with different stakeholder groups about meanings of responsible innovation and ethics.
- 2016-2018 **CEFS Graduate Fellowship**, Center for Environmental Farming Systems
  - Leadership training in agriculture policy and public outreach
  - Included experiences in extension, outreach, and meeting with food organizations
- 2016 **1<sup>st</sup> Place and Best Overall Debate Team awards**, Student Debates at the International Congress of Entomology
- 2015-2017 **Science Policy Fellow**, Entomological Society of America
  - Highly competitive national program. One of five members selected as Fellow.
  - Included semi-annual visits to Washington, D.C. to meet with congressional offices, non-governmental organizations, scientific societies
  - Training in science policy advocacy in person and through written communication
- 2015 **1<sup>st</sup> Place and Best Overall Debate Team awards**, Student Debates at Entomological Society of America
- 2014-2017 **NSF IGERT Fellowship**, Genetic Pest Management, North Carolina State University
- 2014 **Graduate School Recruitment Fellowship**, (*Declined*) Cornell University
- 2014 **iGEM Silver Award** and **Best Policy and Practices Project**, International Genetically Engineered Machines (iGEM) Competition
  - Project: Mapping Responsible Innovation: A First Principles Approach

## PROFESSIONAL DEVELOPMENT

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- 2020 Accelerate to industry (A2i) program. NC State Graduate School. Raleigh, NC
- Python programming workshop series. NC State Libraries. Raleigh, NC
- 2018 ESA Invasive Species Tour. Philadelphia, PA
- Forging Integrated Expertise in Graduate Education Symposium. Raleigh, NC
- ComSciCom (regional workshop on science communication) Research Triangle, NC
- 2017 Introduction to Teaching Workshop. Raleigh, NC
- Creating a Scholarly Website Workshop. Raleigh, NC
- 2016 Graduate Student Professional Development Workshop. Chapel Hill, NC
- Disclosing/Enclosing Knowledge in the Life Sciences: Science, Technology and Society Summer School. Holtz Center, University of Wisconsin. Madison, WI
- Strategic Persuasion Workshop. Raleigh, NC
- Science Communication Workshop. NCSU Graduate School. Raleigh, NC
- 2014 Intersections of Genetics and Society: Workshop and Symposium. Raleigh, NC

## SERVICE

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### International

- 2018 **Co-organizer and moderator.** Student P-IE Symposium. Entomological Societies of America, Canada, and British Columbia joint meeting. Vancouver, BC, Canada
- 2016 **Content leader.** “Environmental Release of Engineered Pests: Building an International Governance Framework”. OECD-sponsored conference. Raleigh, NC
- Content leader and facilitator.** “Grand Challenges Entomology Leadership Summit”. International Congress of Entomology. Orlando, FL
- Session moderator.** “Roadmap to Gene Drives: A Deliberative Workshop to Develop Frameworks for Research and Governance”. NSF-sponsored workshop. Raleigh, NC

### National

- 2020-2023 **Committee member.** Invasive species ‘Wildly Important Goal’ committee, development of webinar series, policy tour and infographics.
- 2020 **Technical expert.** Submission letter to the US Dept of State regarding updating the Nagoya Protocol on Digital Sequence Information. Entomological Society of America
- 2020-2022 **Chair.** P-IE Tour Oversight Committee. Entomological Society of America
- 2019 **Co-Chair.** P-IE Tour Oversight Committee. Entomological Society of America
- Writing committee member.** Position statement on gene drive systems. Entomological Society of America
- 2018 **Session moderator.** Forging Integrated Expertise in Graduate Education Symposium. Raleigh, NC
- 2017 **Organizer and moderator: Live podcast** broadcast at a national conference. “*This Week In Science* Podcast Live Taping!” Lunch and Learn event at Entomological Society of America’s annual meeting. Denver, CO
- P-IE section volunteer,** Entomological Society of America annual meeting. Denver, CO
- 2015 **Session moderator.** USDA Stakeholder’s Workshop on Coexistence. Raleigh, NC

### University

- 2018-2019 **Graduate representative.** Student Wellness Advisory Group, NC State
- 2018-2019 **Graduate representative.** Wellness Advisory Committee, NC State
- 2014-2018 Entomology Graduate Student Association, North Carolina State University
- Outreach Coordinator** 2017 – 2018
- Seminar Committee Chair** 2015 – 2016
- Committee Member** (Outreach, Fundraising) 2014 – present
- 2016-2018 **Graduate representative.** University Standing Committee on Student Health
- 2015 **Discussion leader.** “Gene Drives and Society”. Genetic Engineering and Society Colloquium. NC State. Raleigh, NC
- Planning committee member.** Genetic Engineering at NC State Symposium
- Judge.** NC State Postdoc Symposium. Raleigh, NC

### Reviewer, *ad hoc*

Environmental Entomology  
Genes  
Insects  
Journal of Applied Entomology  
Journal of Economic Entomology  
Journal of Thermal Biology  
PeerJ  
PLOS One

## OUTREACH

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### Entomology

- 2022 American Conservation Film Festival. Frederick, MD
- 2019 Freehold Rotary Club. Freehold, NJ

- 2018 Carolina Friends School. Chapel Hill, NC  
Hunter Elementary School. Raleigh, NC  
Franklinton Middle School, Franklinton, NC  
Math and Science Night, Washington GT Elementary. Raleigh, NC
- 2017 STEM opportunities for middle schoolers. TRIO Talent Search. Raleigh, NC  
BugFest. NC Museum of Science. Raleigh, NC  
Packapalooza. North Carolina State University. Raleigh, NC  
Bright Horizons Daycare. Raleigh, NC  
Twilight Boy Scout Summer Camp. New Bern, NC  
Grady A. Brown Elementary Science Night. Hillsborough, NC  
Nature Designs Art Festival/Earth Day. Raven Rock State Park, Lillington, NC
- 2016 Trick-or-Treat at the Trails. White Deer Park. Garner, NC  
Yam Festival. Tabor City, NC  
Judge for STEM and STEAM Expo. East Wake Middle School. Raleigh, NC  
STEM Expo. Weatherstone Elementary School. Cary, NC
- 2015 Science Explorers Club. Dillard Drive Middle School. Raleigh, NC  
NC State CALS AgDay Tailgate Event. PNC Arena. Raleigh, NC  
Bugfest. NC Museum of Science. Raleigh, NC  
Fall Festival. Whole Foods Market. Raleigh, NC  
Packapalooza. North Carolina State University. Raleigh, NC
- 2014 Bugfest. North Carolina Museum of Natural Sciences, Raleigh, NC  
Insectapalooza. Cornell University. Ithaca, NY

### **Genetic Engineering**

- 2017 Kenan Fellows (middle and high school teachers) discussion and Q&A. Raleigh, NC  
Lacy Elementary School Genetics Night. Raleigh, NC
- 2016 Building with Biology. The Museum of Life and Science. Durham, NC  
Triangle SciTech Expo. North Carolina Museum of Natural Sciences, Raleigh, NC
- 2015 Building with Biology. The Museum of Life and Science. Durham, NC

### **Sustainable Agriculture**

- 2018 Farm to Fork Festival. Center for Environmental Farming Systems. Pittsboro, NC
- 2017 Judge for 4-H Statewide Competition. Raleigh, NC  
CEFS Summer Internship for Undergraduates. NC State. Raleigh, NC  
Farm to Fork Festival. Center for Environmental Farming Systems. Pittsboro, NC
- 2014 Pints of Science. North Carolina State University. Raleigh, NC

## **TEACHING**

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- 2020 **Teaching assistant**, ENT 425 "General Entomology". Fall semester, asynchronous online. NC State, Raleigh, NC
- 2017 - 2020 **Guest lecturer**. "Transgenic Insects and Sustainable Agriculture" for NUTR 175: Intro to Food Studies: From Science to Society. University of North Carolina, Chapel Hill, NC
- 2018 **Instructor of Record**, ENT 201 "Insects and People". Spring semester. NC State, Raleigh, NC  
*Sole taught 23 undergraduate students*
- 2017 **Guest lecturer**. "Understanding the potential impacts from using genetically modified insects to control agricultural pests". Sustainable Agriculture Summer Institute. NC State, Raleigh, NC
- 2014 **Workshop Organizer**, co-led with Anna Wallingford. "*Drosophila suzukii* Identification for Cornell Cooperative Extension personnel". Cornell University, Geneva, NY

## **MENTORSHIP**

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- 2022 **Michelle Hunt, Caitlin Barnes** (research technicians) – experiments involving UAVs, human aided dispersal of insects, spatial analysis of spotted lanternfly in vineyard habitats, visual bioassays, insect rearing. USDA-ARS



- 2021 **Jessica Patterson** (research technician) – scientific method, SLF field assays, behavioral observations, graduate school preparation. USDA-ARS  
**Logan Rothstein** (research technician) – scientific method, experiment development, behavioral observations, graduate school preparation. USDA-ARS
- 2018 **Coadi Disney** (undergraduate) – teaching assistant for ENT 201. NC State
- 2016 **Sarah Bloomer** (undergraduate) – molecular biology, DNA extraction. NC State
- 2013-2014 **Gabrielle Brind-Amour** (undergraduate) – behavioral assays, wild host sampling, colony rearing. Cornell University
- 2013-2014 **Allison Wentworth** (undergraduate) – bioassay and field collection techniques. Cornell University
- 2013 **McKenzie Schessl** (undergraduate) – bioassay and field collection techniques. Cornell University

## MEDIA

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- 2021 *Eastern Panhandle Talk* radio interview. Topic: Spotted Lanternfly and other insects. WRNR. *VERIFY* fact checking website. Provided background information on genetically modified mosquitoes “Invasive Flies Prefer Untouched Territory When Laying Eggs” NC State News. Picked up by over 13 news outlets, including Fruit Grower News, phys.org
- 2020 “A New IDEA: Pairing Trainees with Computational Experts During the Pandemic”. 31 August, NC State CALS News  
*The Pulse* (podcast) Provided background information on genetically modified mosquitoes
- 2017 “Playing God: are we prepared to use gene drive technology?” The Western Producer. 14 December.  
“Scientist to the Senators”. NC State CALS Student Profile  
“Facing our Future” in the “What’s Next” Issue, NC State CALS Alumni Magazine  
*VICE News Daily* television show. Provided background information on genetically modified diamondback moth

## PROFESSIONAL AFFILIATIONS (current membership unless noted)

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Ecological Society of America  
Entomological Society of America  
Entomology Graduate Student Association, NC State (2014-2021)  
North Carolina Entomological Society (2014-2017)  
National Honor Society  
Society for Risk Analysis (2016-2018)