

Hannah K. Levenson, PhD

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EDUCATION

Ph.D., North Carolina State University, 2021

Co-majors in Entomology (Behavior, Ecology, Evolution & Systematics) and Biology (Ecology & Evolution)

B.S. & B.A., North Carolina State University, 2015

B.S. in Environmental Technology & Management

B.A. in Design Studies

Minor in Environmental Studies

Magna Cum Laude

PEER-REVIEWED PUBLICATIONS

Levenson, H.K. & Tarpy, D.R. (2023) Planted pollinator habitat in agroecosystems: how does the pollinator community respond? *Frontiers in Ecology and Evolution*.

11.1060834. doi: 10.339/fevo.2023.1060834

Levenson, H.K. & Tarpy, D.R. (2022) Effects of planted pollinator habitat on pathogen prevalence and interspecific detection between bee species. *Scientific Reports*.

12.7806. doi: 10.1038/s41598-022-117343

Levenson, H.K., Sharp, A.E., & Tarpy, D.R. (2022) Evaluating the impact of increased pollinator habitat on bee visitation and yield metrics in soybean crops. *Agriculture, Ecosystems & Environment*. 331:10701. doi: 10.1016/j.agee.2022.10701

EXTENSION PUBLICATIONS

Levenson, H. & Walgenbach, J. (2022) What the 2022 Spotted Lanternfly Detection Means for NC Grape Growers. *NC Cooperative Extension Fact Sheet*.

https://grapes.ces.ncsu.edu/wp-content/uploads/2022/09/NCSU-SLF-Ext-Doc_Final.pdf?fwd=no

PUBLICATIONS IN PREPARATION & UNDER REVIEW (as of October 3, 2023)

Ruzi, S.A., Youngsteadt, E., Cherveney, A., Kettenback, J., **Levenson, H.K.**, Collazo, J., & Irwin, R.E. (IN REVISION) Bee species richness varies through time in an urbanizing landscape of the southeastern USA.

Levenson, H.K., Metz, B.N., & Tarpy, D.R. (IN REVIEW) Effects of sampling effort on estimates of pollinator abundance and diversity: a meta-analysis. *Annals of ESA*.

Levenson, H.K. & Burrack, H.J. (IN REVIEW) Pollinator communities in a blackberry cropping system under intense pest management.

BOOKS AND WEBSITES

Youngsteadt, E., **Levenson, H.**, & Adams, N. Hymenoptera of North Carolina. *North Carolina Biodiversity Project*. <https://auth1.dpr.ncparks.gov/hymenoptera/index.php>

Levenson, H. & Youngsteadt, E. (2019) *The Bees of North Carolina: An Identification Guide*. NCSU Extension. <https://uncpress.org/book/9781469659022/the-bees-of-north-carolina/>

EXPERIENCE

Postdoctoral Research Scholar, North Carolina State University

Specialty Crops Integrated Pest and Pollinator Management Lab (SCIPPM), June 2021 - Present

- Lead of the SCIPPM, Co-PI and Objective co-lead for USDA grant
- Working in collaboration with 10 universities and 4 USDA offices
- Developing sustainable management tactics for spotted wing drosophila through improved sampling and monitoring techniques in order to reduce grower reliance on pesticides in berry crops
- Evaluating stakeholder learning from information dissemination approaches
- Investigating how pollinator and pest populations interact to affect crop yield, and how crop management decisions may impact pollination
- Monitoring establishment of parasitoid predators of SWD through classical biological control and adventive species

Graduate Research Associate, North Carolina State University

NCSU Apiculture Program, July 2017 – May 2021

- Evaluated the effectiveness of planted pollinator habitat in agroecosystems as a conservation tool for pollinator populations by measuring changes in bee abundance and diversity overtime, intra- and interspecific disease occurrence, and how the presence of the habitat affected soybean yield
- Collected samples from 16 NCDA&CS and NCSU research stations across 3 years resulting in the most detailed survey of native bees in NC to date

Field Research Technician, North Carolina State University

NCSU Apiculture Program, February 2016 – July 2017

- Collected, identified, and conducted lab analyses on bee samples from 16 locations across NC to evaluate the effectiveness of planting pollinator habitat as a conservation tool in agricultural areas
- Designed and implemented an independent research project – *Disease interactions between native, wild, and honey bees in northern Perú* – with Peace Corps Volunteers, local beekeepers, and La Universidad Nacional Toribio Rodríguez de Mendoza de Amazonas

Biology Technician – Wildlife Toxicology, Smithers Viscient LLC

February 2015 – August 2015

- Assisted in the management of 300+ honey bee colonies, collected samples from crops and hives, and conducted Digital Colony Condition Assessments in North Carolina, California, and South Dakota
- Successfully handled stressful schedules, multi-tasked in a fast-paced environment, and worked efficiently in hot environments

Field Assistant, North Carolina State University

Marine Biology Laboratory, May 2014 – August 2014

- Constructed 16 artificial patch reefs, conducted fish and seagrass surveys, collected seagrass, ocean water, mangrove, and sediment samples in The Abacos, The Bahamas
- Teaching assistant for a week-long sea creature identification course and authored two blog posts for the extension blog, *The Abaco Scientist*

LEADERSHIP ROLES

CEFS ASPIRE Mentor

Summer 2022, 2023

- Provide scientific training and professional development opportunities to an intern through the NCSU REU program, ASPIRE, including designing and delegating a summer research project

NCSU Horticulture Consumer Youth Working Group Research Co-Coordinator

October 2021 - Present

- Working with NCSU Cooperative Extension agents and Master Gardener Volunteers across NC to evaluate how common garden maintenance techniques impact overwintering beneficial insect and arthropod abundance

Being an Ally in Academia (B.A.A.) Seminar Series Executive Committee Member

April 2022 - Present

B.A.A. is an NCSU organization open to any interested graduate student, postdoc, staff, or faculty with the goal of working to make academia a more welcoming and diverse environment

- Members of the Executive committee are developing a new annual seminar series focused on highlighting diverse researchers from across the US

US National Native Bee Monitoring Research Coordination Network Member

October 2020 – Present

- Participating in quarterly meetings with researchers from across the US to develop a standardized method for conducting research on native bees
- Acted as a breakout group leader during the December 2021 meeting

Workshop Co-Organizer for Ent. Society of America's National Conference

Vancouver, Canada, November 2022

- Co-organized and presented in a workshop focused on developing standardized methods for researching bees in the United States

BeeMORE Mentor

Summer 2018, 2019, 2021, 2022

- Provide scientific training and professional development opportunities to an intern through the NCSU REU program, BeeMORE, including designing and delegating a summer research project

Symposium Co-Organizer for Ent. Society of America's National Conference

Virtual, November 2020

- Co-organized and presented in a symposium with 11 presenters focused on pollinators in soybeans

North Carolina Pollinator Conservation Alliance Committee Member

January 2018 - Present

- Participating in Outreach and Research Subcommittee meetings to coordinate and plan future events and activities for the larger group

NCSU Entomology Graduate Student Association Co-Seminar Chair

April 2019 – May 2020

NCSU Native Bee ID Workshop Co-Creator

September 2018 & May 2019

- Co-developed and delivered a day-long, hands-on ID workshop using pinned specimens, ID workbooks, and field activities

NCSU Department of Entomology & Plant Pathology Social Committee Member

August 2018 – April 2019

NCSU Entomology Graduate Student Association Co-Social Chair

March 2018 – April 2019

MEMBERSHIPS

North Carolina Pollinator Conservation Alliance

Founding Member

Being an Ally in Academia

Founding Member

Entomological Society of America

North Carolina Entomological Society

AWARDS

NCSU DEPP Excellence in Entomology Award, *June 2021*

NCES 3-Minute Thesis Competition – 1st Place, *October 2020*

N.C. State Beekeepers Association's J.T. Ambrose Student Award, *July 2020*

NCSU CALS Research Foundation Competition – 2nd Place, *March 2020*

NCES Outstanding Ph.D. Student, *October 2019*

NSF GRFP – Honorable Mention, *October 2019*

NCSU Ent. Graduate Student Symposium – 10-Minute Pres. 1st Place, *March 2019*

NCES Outstanding Masters Student, *October 2018*

RESEARCH GRANTS, TRAVEL GRANTS, AND FELLOWSHIPS

USDA CPPM Grant (\$48,277)*, *September 2023*

NC Blueberry Council (\$11,278)*, *February 2023*

USDA SCRI Grant: Co-PI for the NCSU subaward (\$420,000), *January 2022*

NCSU Impact Scholar (\$1,000), *January 2022*

NCSU STEM Externship Fellow (\$1,500), *May 2021*

NCSU GSA Travel Award (\$1,500), *April 2020*

Southern SARE Graduate Student Grant (\$16,000), *August 2019*

NCSU CEFS Graduate Fellow (\$10,000), *July 2019*

International Pollinator Conference Travel Award (\$500), *March 2019*

Garden Club of America's Centennial Pollinator Fellowship (\$4,000), *March 2019*

Syngenta Bee Research Grant (\$25,000)*, *December 2018*

NCES Travel Award (\$250), *October 2018*

NCSU Graduate Student Association Travel Award (\$500), *April 2018*

NCSU Biology Research Award (\$1,500), *March 2018*

*could not be listed as a PI on the paperwork, but significantly contributed to writing and conducting of research to the level of co-PI

SCIENTIFIC AND PROFESSIONAL PRESENTATIONS

Levenson, H.K. & Burrack, H.J. (2023) Pollinator communities in a blackberry cropping system under intense management of an invasive pest. ISHS Rubus and Ribes, Portland, OR.

Levenson, H.K., Burrack, H.J., Isaacs, R., Walton, V.M., Van Timmeren, S. (2023) Improvements in spotted-wing drosophila monitoring and management in berry crops. (INVITED). Entomological Society of America Southeastern Branch Meeting, Little Rock, AK.

Levenson, H.K. (2023) Applied pollination ecology in a diverse agroecosystem: from row crops to specialty crops. (INVITED). MSU Entomology Seminar, East Lansing, MI.

Levenson, H.K. and Burrack, H.J. (2022) Enabling IPPM Strategies in Caneberries. Entomological Society of America Annual Meeting, Vancouver, CA.

Levenson, H.K. (2022) Pollinator communities across North Carolina: from the individual to the agroecosystem. (INVITED). Entomological Society of America Southeastern Branch Meeting, San Juan, PR.

Levenson, H.K., Sharp, A.E. & Tarpy, D.R. (2020) Evaluating the impacts of augmented pollinator habitat on surrounding cropping systems. Entomological Society of American Annual Meeting, Virtual.

Levenson, H.K. & Tarpy, D.R. (2020) Native bee communities across North Carolina: from the individual to the agroecosystem. (INVITED). Entomological Society of American Annual Meeting, Virtual.

Levenson, H.K. (2020) Temporal and spatial dynamics of pollinator communities across NC agroecosystems. NCPA Annual Meeting, Virtual.

Levenson, H.K. (2020) The Who, What, and How of Native Bees. (INVITED) NC Vegetation Management Association's Annual Meeting, Virtual.

Levenson, H.K. (2020) Pollinator communities across North Carolina: what their populations look like and how we can support them. (INVITED – KEYNOTE SPEAKER). Montgomery Community College Pollinator Conference, Troy, NC.

Levenson, H.K. & Tarpy, D.R. (2020) Evaluating the impact of augmented pollinator habitat on surrounding cropping systems. Southern Appalachian Honey Bee Research Consortium Annual Meeting, Boone, NC.

- Levenson, H.K.** & Tarpy, D.R. (2019) Native bee communities across North Carolina: from the individual to the agroecosystem. NCDA Superintendent Annual Meeting, Raleigh, NC.
- Levenson, H.K.** & Tarpy, D.R. (2019) Temporal and spatial dynamics of pollinator communities across NC agroecosystems. (NOMINATED PRESENTER). NCSU Graduate Research Symposium, Raleigh, NC.
- Levenson, H.K.** & Tarpy, D.R. (2019) Temporal and spatial dynamics of pollinator communities across NC agroecosystems. NCSU Entomology Student Research Symposium, Raleigh, NC.
- Levenson, H.K.** & Tarpy, D.R. (2019) Evaluating the connectedness of pollinator networks between augmented pollinator habitat and adjacent cropping systems. Entomological Society of American Annual Meeting, St. Louis, MO.
- Levenson, H.K.** & Tarpy, D.R. (2019) Native bee communities across North Carolina: from the individual to the agroecosystem. (AWARD PRESENTATION). North Carolina Entomological Society, Raleigh, NC.
- Levenson, H.K.** & Tarpy, D.R. (2019) Temporal and spatial dynamics of pollinator communities across NC agroecosystems. CEFS Board Meeting, Raleigh, NC.
- Levenson, H.K.** & Tarpy, D.R. (2019) Temporal and spatial dynamics of pollinator communities across NC agroecosystems. (SELECTED PRESENTER). International Pollinator Conference, Davis, CA.
- Levenson, H.K.** & Tarpy, D.R. (2019) Temporal and spatial dynamics of pollinator communities across NC agroecosystems. (INVITED). Entomological Society of American Eastern Branch Meeting, Blacksburg, VA.
- Levenson, H.K.** & Tarpy, D.R. (2019) Temporal and spatial dynamics of pollinator communities across NC agroecosystems. Southern Appalachian Honey Bee Research Consortium Annual Meeting, Charlotte, NC.
- Levenson, H.K.** & Tarpy, D.R. (2019) Temporal and spatial dynamics of pollinator communities across NC agroecosystems. NCSU Entomology Student Research Symposium, Raleigh, NC.
- Levenson, H.K.** & Tarpy, D.R. (2018) Temporal and spatial dynamics of pollinator communities across NC agroecosystems. Entomological Society of American Annual Meeting, Vancouver, CA.
- Levenson, H.K.** & Tarpy, D.R. (2018) Temporal and spatial dynamics of pollinator communities across NC agroecosystems. Ecological Society of America Annual Meeting, New Orleans, LA.
- Levenson, H.K.** & Tarpy, D.R. (2018) Temporal and spatial dynamics of pollinator communities across NC agroecosystems. (INVITED). Entomological Society of American Southeastern Branch Meeting, Orlando, FL.
- Levenson, H.K.**, Goethe, J.K. & Tarpy, D.R. (2018) Disease interactions between native bees, wild bees, and honey bees in northern Peru. Southern Appalachian Honey Bee Research Consortium Annual Meeting, Wake Forest, NC.

Levenson, H.K. & Tarpy, D.R. (2017) Temporal and spatial dynamics of pollinator communities across NC agroecosystems. NCDA Superintendent Annual Meeting, Raleigh, NC.

Levenson, H.K. & Tarpy, D.R. (2017) Temporal and spatial dynamics of pollinator communities across NC agroecosystems. Southern Appalachian Honey Bee Research Consortium Annual Meeting, Greensboro, NC.

Levenson, H.K. & Tarpy, D.R. (2016) Pollinator habitat study. NCDA Superintendent Annual Meeting, Raleigh, NC.

EXTENSION ACTIVITIES

Levenson, H.K. (2023) Supporting pollinator communities in NC agroecosystems. (INVITED). NC Botanical Garden, Chapel Hill, NC.

Levenson, H.K., Burrack, H.J., Isaacs, R., Walton, V.M., Fanning, P., Van Timmeren, S. (2023) Improvements in spotted-wing drosophila monitoring and management in berry crops. SCRI Annual Stakeholder Meeting, Virtual.

Levenson, H.K. (2023) Release of a novel parasitoid for SWD control. (INVITED). NC Blackberry and Raspberry Grower Association Meeting, Rose Hill, NC.

Levenson, H.K. and Burrack, H.J. (2023) Improvements in SWD Monitoring and Management. (INVITED). NARBA, Tampa, FL.

Levenson, H.K. & Burrack, H.J. (2022) North Carolina Update 2021. WERA1021: Spotted Wing Drosophila Biology, Ecology, and Management Annual Meeting, Virtual.

Levenson, H.K. (2022) Enabling IPPM Strategies in Caneberries. (INVITED). Moore County Beekeepers Association Meeting, Vass, NC

Levenson, H.K. (2022) How Researchers are Supporting Native Bees at the Local, State, and National Levels. (INVITED). Oakwood Garden Club, Raleigh, NC.

Levenson, H.K. (2022) Bee Field Collection and Identification. NCPCA Pollinator Field Day, Kinston, NC.

Levenson, H.K. (2022) The Who, What, and How of Native Bees. (INVITED). Raleigh Parks and Rec: Environmental Lecture Series, Virtual.

Levenson, H.K. & Youngsteadt, E. (2022) Native Bees: Documenting Occurrences and Planning Conservation. (INVITED). Future of Conservation Forum, Chapel Hill, NC.

Levenson, H.K. (2022) The Who, What, and How of Native Bees. (INVITED). Forsyth County Master Gardner Club Meeting, Virtual.

Levenson, H.K. (2022) The Who, What, and How of Native Bees. (INVITED). NCDA Earth Day Presentation Series, Raleigh, NC.

Levenson, H.K. (2022) Improvement in SWD monitoring and management. (INVITED). Southeast Regional Fruit and Vegetable Conference, Savannah, GA.

Levenson, H.K. (2021) Identification of Native Bees. NCSU Apiculture Program's BEES Academy, Monroe, NC.

Youngsteadt, E. & **Levenson, H.K.** (2021) Native Bee Diversity and Identification. NCPCA Pollinator Field Day, Virtual.

- Levenson, H.K.** (2021) The Who, What, and How of Native Bees. (INVITED). NCSU Staff Senate Pollinator Week, Virtual.
- Levenson, H.K.** (2021) The Who, What, and How of Native Bees. (INVITED). North Raleigh Rotary Club Meeting, Virtual.
- Levenson, H.K.** (2020) Identification of Native Bees. NCSU Apiculture Program's BEES Academy, New Bern, NC.
- Levenson, H.K.** (2020) Bee Field Collection and Identification. NCPCA Pollinator Field Day, Virtual.
- Levenson, H.K.** (2020) The non-honey bees: native bees active this time of year. NCSU Apiculture Program: Hive Chat, Virtual.
- Levenson, H.K.** (2020) Pollinator communities across North Carolina: from the individual to the agroecosystem. (INVITED). Haywood County Beekeepers Association Meeting, Virtual.
- Levenson, H.K.** (2020) The bees in your backyard. (INVITED). Springdale Garden Club Meeting, Raleigh, NC.
- Levenson, H.K.** (2019) Identification of Native Bees. NCSU Apiculture Program's BEES Academy, Bolivia, NC.
- Levenson, H.K.** (2019) Identification of Native Bees. NCSU Apiculture Program's BEES Academy, Pittsboro, NC.
- Levenson, H.K.,** Favre, M. & Youngsteadt, E. (2019) BEE ID Mini Workshop. NCPCA Pollinator Field Day, Raleigh, NC.
- Levenson, H.K.** (2019) Bee Field Collection and Identification. NCPCA Pollinator Field Day, Raleigh, NC.
- Levenson, H.K.** (2019) Bees as Social Insects. (INVITED). Midnight Bee Supply – Bee School, Vass, NC.
- Youngsteadt, E & **Levenson, H.K.** (2019) Native Bee ID. (INVITED). Master Gardner College, Raleigh, NC.
- Levenson, H.K.** (2018) Native pollinators and pollinator interactions. (INVITED – FEATURED SPEAKER) National Honey Bee Veterinary Consortium, Raleigh, NC.
- Levenson, H.K.** (2018) Bee Field Collection and Identification. NCPCA Pollinator Field Day, Salisbury, NC.
- Levenson, H.K.** (2018) Temporal and spatial dynamics of pollinator communities across NC agroecosystems. (INVITED). Wake County Beekeepers Association Meeting, Raleigh, NC.
- Levenson, H.K.** (2017) Pollinator Habitat Study. (INVITED). Orange County Beekeepers Association Meeting, Hillsborough, NC.
- Levenson, H.K.** & Blanchard, V. (2016) Pollinator Habitat Study. (INVITED). Person County Beekeepers Association Meeting, Roxboro, NC.

TEACHING ACTIVITIES

- Levenson, H.K.** (2023) SWD Management in Small Fruits. (INVITED GUEST LECTURE). ENT 641, NCSU.
- Levenson, H.K.** (2023) Balancing Pollinator Health and IPM. (INVITED GUEST LECTURE). ENT 762, NCSU.
- Levenson, H.K.** (2023) Management of Arthropods in Small-fruit Production Systems. (INVITED GUEST LECTURE). ENT 762, NCSU.
- Levenson, H.** & Youngsteadt, E. (2022) Native Bees. BeeMORE Bee Biology 'Crash Course', Raleigh, NC.
- Levenson, H.K.** (2022) The Who, What, and How of Native Bees. (INVITED). North Carolina Botanical Garden's Garden Guide Training, Chapel Hill, NC.
- Levenson, H.** & Youngsteadt, E. (2021) Native Bees. BeeMORE Bee Biology 'Crash Course', Raleigh, NC.
- Levenson, H.K.** (2020) Native bees: diversity, biology, and identification tricks. (INVITED). NCSU Extension Agent Training Video.
- Pinilla, S., Giacomini, J., **Levenson, H.** & Youngsteadt, E. (2019) Native Bees. BeeMORE Bee Biology 'Crash Course', Raleigh, NC.
- Levenson, H.K.** (Spring 2019) Teaching Assistant. ENT 201: Insects and People, NCSU.
- Levenson, H.K.** (2018) Native bees and pollinator interactions. (INVITED GUEST LECTURE). ENT 203: Field Section, NCSU. Pinilla-Gallego, S., Giacomini, S. &
- Levenson, H.** (2018) Native Bees. BeeMORE Bee Biology 'Crash Course', Raleigh, NC.
- Levenson, H.K.** (Fall 2017) Teaching Assistant. ENT 203: An Introduction to the Honey bee and Beekeeping, NCSU.
- Levenson, H.**, Giacomini, J., Connon, S. & Fowler, A. (2017) Native Bees. BeeMORE Bee Biology 'Crash Course', Raleigh, NC.

UNDERGRADUATES AND ASSISTANTS SUPERVISED

- 2023 – 4 undergraduates and 3 co-advised undergraduates
- 2022 – 3 undergraduates and 1 summer research assistant
- 2021 – 2 undergraduates
- 2020 – 2 undergraduates
- 2019 – 6 undergraduates
- 2018 – 5 undergraduates
- 2017 – 3 undergraduates
- 2016 – 1 undergraduate

PROFESSIONAL SERVICE

- Peer Review – **Microbial Ecology** (INVITED), 2023
- Peer Review – **Apidology** (INVITED), 2023
- Peer Review – **Annals of ESA** (INVITED), 2023
- Peer Review – **Frontiers** (INVITED), 2023

Peer Review – **Frontiers** (INVITED), 2022
Peer Review – **Journal of Economic Entomology** (INVITED), 2022
Peer Review – **Frontiers** (INVITED), 2021
Peer Review – **Journal of Economic Entomology** (INVITED), 2021
Peer Review – **Scientific Reports** (INVITED), 2021
Peer Review – **Insects** (INVITED), 2020
Co-Peer Review – **Insects**, 2020
Co-Peer Review – **Sustainability**, 2020
Peer Review – **Ecology Letters** (INVITED), 2020
Peer Review – **Apidology** (INVITED), 2019

POPULAR PRESS

WUNC: North Carolina Public Radio. (2023) “North Carolina researchers are learning what it takes to bring back the bees”
The News & Observer. (2022) “Carpenter bees can be a spring buzzkill. Here’s how to get rid of them (or coexist)”
NCSU Extension: Homegrown. (2020) “Bee, Wasp, or Fly? Identifying N.C. Bees”
NC State University News. (2020) “The Buzz About Native Bees”
NCSU Extension: Homegrown. (2019) “Growing a Pollinator Garden”
Oregon State University: PolliNation Podcast. (2019). “Regional bee communities (and the plants they like)”

TRAINING

Adult Mental Health First Aid Certification, *December 2022*
Agricultural Leadership Institution (SELECTED ATTENDEE), 2022
NCSU STEM EXTERNSHIP (SELECTED PARTICIPANT), 2021
Inclusive STEM Teaching Project, 2021

OUTREACH EVENTS

JC Raulston Arboretum Summer Camp 2021
Bugfest, North Carolina Museum of Natural Sciences 2015, 2016, 2017, 2018, 2019
Brain Awareness Night, North Carolina Museum of Natural Sciences 2016, 2017
Pollinator Garden, Gregg Museum 2017
Native Bees, Festival for the Eno 2017