Kristina McIntire

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Education

Illinois State University, Normal IL
Ph.D. Biological Sciences. Behavior, Ecology, Evolution, & Systematics Dec. 2020
Dissertation: Invaders Dilute, Co-Invaders Inhibit: Community Change Drives Infection Differences in *Aedes triseriatus* & *Ascogregarina barretti*
Advisor: Dr. Steven A. Juliano

Illinois State University, Normal IL
B.S. Biological Sciences May 2014

Heartland Community College, Normal IL
A.S. May 2011

Research Experience

Quantitative Research Analyst Aug 2024-**Present**
Hawai‘i Cooperative Studies Unit, University of Hawaii, Hilo HI
Supervisor: Dr. Kat McClure

- **Designed and led data analysis for a multi-institution collaboration**, building **time-series and zero-inflated mixed model regressions and SEM** linking environmental conditions with mosquito abundance in Hawai‘i
- Developed analyses **to evaluate the efficacy of and optimize** on-going mosquito control efforts.
- Built occupancy models to inform trapping methods **resulting in improved efficiency in sampling**.
- **Created random forest and gradient boosted machine (GBM) models** from mosquito field data to link community conditions to mosquito abundance and occurrence.
- **Communicated results to government and university stakeholders through written manuscripts and audio-visual presentations.**
- **Responsible for data maintenance and management, and the systematic version control of analysis scripts**

Postdoctoral Research Fellow 2021-2024
Ecology & Evolutionary Biology Dept, University of Michigan, Ann Arbor MI
Supervisor: Meghan Duffy

- **Designed and led a multi-institution collaboration** exploring potential mechanistic causes and community outcomes of transgenerational virulence resulting from maternal pathogen exposure.
- **Built and interpreted regression (GLM, GLMM, GAM) and survival models** and interpreted resulting data and **collaborated to create a mathematical model** exploring the impacts of transgenerational virulence on the host population. **Prepared and presented these results for**

publication (McIntire et al. 2023) **and as scientific presentation** at an international and a national conference.

- Analyzed epidemiological field data of Daphnia species and their pathogens to assess the potential for transmission, via **cluster and network analysis in R.** Prepared and presented these results for publication (McIntire et al. 2023) and as scientific presentation at a national conference.
- **Consulted on design of laboratory manipulations and data analysis techniques**, advising collaborators and colleagues to yield publishable outcomes for their experimental works (Dziuba et al. 2024b, McLean et al 2024, Sun et al. 2022)
- **Built a Random Forest model,** assessing disease spread based on community conditions and **created an associated geographic map in Python**
- **Designed and implemented dashboard** for communication of field collection data
- **Prepared analytical results for publication, including graphical representation** (Dziuba et al. 2025, Dziuba et al. 2024a, Dziuba et al. 2024b, McLean et al 2024, Sun et al. 2022).

Graduate Researcher 2014-2020
School of Biology, Illinois State University, Normal IL
Supervisor: Steven Juliano

- **Designed and conducted laboratory and field-based methodologies** exploring the potential for invasion-based changes in community composition to alter parasitic infection rates of *A. barretti* in *A. triseriatus*, causing a dilution effect. **Supervised a team of undergraduate research assistants** for field and laboratory work.
- **Conducted regression, PCA, and piecewise SEM in SAS and R** to identify the mechanism-specific potential for an invader to affect the native parasitism rates.
- **Communicated results of these analyses through scientific publication presentation**, including graph and model-based visualizations for publications (McIntire & Juliano 2021, McIntire et al. 2021) and **oral presentation to the Illinois Mosquito Control Association and at national Ecological and Entomological conferences**.
- **Data-mined relevant public health sources** and evaluated literature reporting Elk overwinter management and *B. abortus* disease rates, **developed a stage-based matrix model** to assess sensitivity and elasticity of Elk population level disease impacts related to overwintering management strategies. **Interpreted and prepared these data for scientific presentation**.
- **Built geographic survey site maps in Python for use in educational presentation.**

Undergraduate Research 2012-2014
School of Biology, Illinois State University, Normal IL
Supervisor: Steven Juliano

- **Collaborated to design laboratory and field experiments** to investigate the likelihood of overcompensation in Aedes mosquitoes.
- **Conducted ANOVA and MANOVA in SAS** on mosquito data. **Prepared and presented these data in publication** (McIntire & Juliano 2018) and at the Ecological Society of America conference.

Funding

Grants
Phi Sigma Biological Honor Society, Weigel Research Grant 2019

Lead researcher for local adaptation research. Award amount $1000

Illinois State University, Omar Rillett Travel Grant 2019
Funds for presentation of research. Award amount $700

Phi Sigma Biological Honor Society, Weigel Research Grant 2018
Lead researcher for local adaptation research. Award amount $1000

Illinois State University, Omar Rillett Travel Grant 2015
Funds for presentation of research. Award amount $500

Awards

Dr. Robert H. Gray Ecology/Biology Scholarship 2018
Illinois State University RSP Research Fellowship 2014
Illinois State University RSP Research Fellowship 2013
Dr. David W. Borst, Jr. Memorial Endowed Scholarship 2013

Publications

McIntire, K.M. et al. 2025. Transgenerational virulence: Maternal pathogen exposure reduces offspring fitness. *Ecology.*

Dziuba, M.K., **McIntire, K.M.** et al. 2024. Microsporidian coinfection reduces fitness of a fungal pathogen due to rapid host mortality. *mBio*.

Dziuba, M.K., **McIntire, K.M.** et al. 2024. Phenology, morphology, virulence, ecology, and host range of Ordospora pajunii (Ordosporidae), a microsporidian symbiont of Daphnia spp. *mBio*.

Juliano, S. A., **McIntire, K.M.** et al. 2023. Different demographic responses of three species of container *Aedes* (Diptera: Culicidae) larvae to timing of extrinsic mortality. *J Med Ent.*

Sun S-J., Dziuba M.K., **Mclntire K.M**., Jaye R.N., Duffy M.A. 2022. Transgenerational plasticity alters parasite fitness in changing environments. *Parasitology*

McIntire, K.M., Chappell, K.M, & Juliano, S.A. 2021. How do noncompetent hosts cause dilution of parasitism? Testing hypotheses for native and invasive mosquitoes. *Ecology*

McIntire, K.M. & Juliano, S.A. 2021. Detrimental effects of a failed infection by a co-invasive parasite on a native congeneric parasite and its native host. *Biological Invasions*

McIntire, K.M. & Juliano, S.A. 2018. How can mortality increase population size? A test of two mechanistic hypotheses. *Ecology* 99(7):1660-1670.

Non-peer reviewed publications

McIntire, K.M. & Juliano, S.A. Sometimes mosquito control efforts give larvae more room to grow. Entomology Today. Nov. 20, 2023.

McIntire, K.M. et al. Patterns of potential cross-species transmission in planktonic multihost-multiparasite communities. Preprint Authorea 2023.

McIntire, K.M. & Juliano, S.A. 2018. How can mortality increase population size? A test of two mechanistic hypotheses. *Bulletin of the Ecological Society of America* 99(3):340-342. Photo-essay publicizing the peer reviewed paper in *Ecology* with the same title

Recent Presentations

Invited:

2021: Departmental Seminar. Purdue University, Dept of Biological Sciences
2021: Society for Advancement of Chicanos/Hispanics & Native Americans in Science, Normal IL
2019: Entomological Society of America Annual Meeting. St Louis, MO.

Contributed:

2024: Ecology and Evolution of Infectious Disease Conference, Palo Alto, CA
2023: Ecological Society of America Annual Meeting, Portland, OR
2022: Ecological Society of America Annual Meeting, Montreal, Canada
2020: Entomological Society of America Annual Meeting, Virtual
2020: Ecological Society of America Annual Meeting, Virtual
2019: Ecological Society of America Annual Meeting. Louisville, KY
2017: Ecological Society of America Annual Meeting. Portland OR
2016: International Congress on Entomology. Orlando FL
2015: Ecological Society of America Annual Meeting. Baltimore MD
2013: Illinois Mosquito & Vector Control Annual Meeting, Springfield, IL
2013: Entomological Society of America Annual Meeting. Austin TX

Internal:

2020: Departmental Seminar. ISU
2019: Integrative Biology Seminar. ISU
2018: University Symposium, ISU
2017: Phi Sigma Symposium, ISU
2015: Integrative Biology Seminar, ISU

Honors

2021	Phi Sigma Outstanding PhD student, School of Biological Sciences, ISU
2019	Outstanding Biology Teaching Assistant Award, School of Biological Sciences, ISU
2017	Outstanding Biology Teaching Assistant Award, School of Biological Sciences, ISU
2013	Honorable Mention Talk, Illinois Mosquito and Vector Control Annual Meeting

Service & Outreach

2023	University of Michigan EEB Prison Science Panel. Parnell Correctional Facility
2021, 2022	Skype a Scientist
2021	Panelist. Society for Advancement of Chicanos/Hispanics & Native Americans in Science
2018, 2019	Presenter. Fox Creek Elem. School, Bloomington IL
2018, 2019	Session organizer & Presenter. Bloom Community School, Normal IL
2018, 2019	Habitat Restoration Volunteer, Phi Sigma Honor Society, ISU
2017, 2018	Biological Science Student Association Symposium Judge, ISU
2017-2023	Reviewer – PLOS One, Ecology & Evolution, Proceedings of the Royal Society of London B, Parasites & Vectors, Journal of Medical Entomology
2013	Illinois State University High School Research Symposium Judge

Teaching Experience

Lincoln Land Community College, *Instructor of Record*
General Biology (BIO 101) 1 semester 2021

Illinois State University, *Head Teaching Assistant*
Ecology (BSC 201) 5 semesters 2017- 2020

Illinois State University, *Teaching Assistant*

Ecology (BSC 201) 3 semesters	2016, 2020
Rainforest Ecology (BSC 311) 1 semester	2018
Biostatistics (BSC 420.27) 1 semester	2015
Biological Diversity (BSC 196), 1 semester	2015
Intro Biology (BSC101), 1 semester	2014

Undergraduate Student Mentorship

Name	University, Year, Project
Cristian Huerta	U. Michigan, 2023-2024, Transgenerational Virulence
Lindsey Selter	Eastern Michigan U., 2023-2024, Transgenerational Virulence
Emma Baird	U. Michigan, 2022-2024, Senior Thesis: Parasite Variation and Specificity
Riley Jaye	U. Michigan, 2022-2024, Plasticity & Senior Thesis: Antibiotic Resistance
Fiona Corcoran	U. Michigan, 2023, Transgenerational Virulence
Tahleah Nelson	U. Michigan, 2022-2023, Maternal Investment
Megan Vaandrager	U. Michigan, 2021-2022, Transgenerational Immune Priming
Kasie Chappell	Illinois State U., 2018-2020, Dilution & Nutrition
Kat Coburn	Illinois State U., 2018-2020, Local Adaptation
Miranda Gonzalez	Illinois State U., 2018, Local Adaptation

Workshops, Trainings, and Certifications

Data Science

- IBM Data Science Professional Certification. 2023. Cert#PJC925HZ4YES

Pedagogy

- Bringing Computational Data Science to your Undergraduate Ecology Classroom, ESA
- Evidence-Based Teaching Practices to Shape Your Response to GenAI Writing Tools, University of Michigan
- Rubrics: Transparent, Consistent, and Efficient Assessment in Support of Students' Learning, University of Michigan

DEI

- Safeguarding Principles: Interrogating Free Speech in Diversity, Equity & Inclusion (DEI) Discourse**,** University of Michigan

Skills

Classroom: cooperative course development**,** lecture and laboratory module development, independent student research mentorship, course implementation through Sakai, Canvas, and Blackboard

Data Analysis: Python, SQL, SAS, R, NetLogo. Jupyter Notebook, Dash, Machine Learning, Structural Equation Modeling, Piecewise Structural Equation Modeling, Network Analysis, Survival Analysis, Sensitivity and Elasticity analysis, agent-based modeling, life tables, PCA, MANOVA

Laboratory: Digital PCR, spectrophotometric assays, dissection (avian, mammal, & insect), light microscopy, hemocytometer use, mosquito colony husbandry, daphnia husbandry, protozoan parasite culture, fine needle aspiration, cell staining, hemocyte identification, mosquito and daphnia species

identification, daphnia infection diagnosis, microscopic imaging and measurement, mammalian and amphibian phlebotomy.

Field: design of appropriate field experiment size and technique, coordinating team data collection, larval and egg mosquito collection, aquatic invertebrate sampling, quadrat sampling, mark-recapture sampling.
Languages: English: Native. Italian: Proficient. Spanish: Basic