

Ellie Weise

Education:

- B.S. in Genomics and Molecular Genetics with a minor in Musical Theatre at Michigan State University (**Graduated May 2019**)
- M.S. in Fisheries and Wildlife at Michigan State University, ongoing (**January 2019-present**)

Research:

Professional Experience:

- **GRADUATE RESEARCHER**, Research in the Molecular Ecology Laboratory, Michigan State University, East Lansing, MI (**January 2019-present**)
 - Thesis work: Estimating effective size and minimum number of parents for sea lamprey in a tributary using larval sequencing and examining potential correlations between effective size and census size, as well as environmental factors.
 - Field work: electroshocking to collect larval sea lamprey
 - DNA isolations and quantification
 - SNP data generated using BestRAD and RAD Capture
 - Analysis in R, Shell, and Python for SNP processing and data analysis
 - Collaboration with Dr. John Robinson, PhD and Dr. Allen Strand, PhD on a section of an R package to model forward and reverse coalescent models on tree populations, and calculate population genetic statistics on the resulting population data
 - Learned about spatial statistics and wrote R code to calculate applicable statistics
 - Ran a set of coalescent simulations to validate the success of the statistic code
 - Simulations were also used to examine what output statistics are representative of different parameter groups
- **UNDERGRADUATE RESEARCHER**, Research in the Molecular Ecology Laboratory, Michigan State University, East Lansing, MI (**2017-2018**)
 - Collaborating with Dr. Nick Sard, PhD and Dr. John Robinson, PhD to quantify species in an aquatic ecosystem using universal barcoding of environmental DNA samples
 - Field work: collection and filtration of water samples
 - DNA extraction of eDNA filters
 - Designing universal primers for Great Lakes arthropods
 - Creation of a bioinformatics pipeline to assemble databases of all potential arthropod, fish, plant species using GBIF occurrence data as well as NCBI sequences for all of those species
 - Amplification and Illumina sequence prep with eDNA samples
 - Post-sequencing data analysis using a bioinformatics pipeline

- Collaborating with Dr. Nick Sard, PhD and Dr. Kim Scribner, PhD to reconstruct the pedigree of a brook trout population following an artificial supplementation event in the system
 - Used Colony program to reconstruct pedigree with an incomplete set of parent genotypes
 - Analyzed the pedigree to quantify the success of the attempted supplementation event
- Contributed to the Sturgeon Project, run by Dr. Kim Scribner, PhD, which has the main objective of rehabilitating the sturgeon population in the Black River system using genetic techniques
 - Field work: collected and quantified larval sturgeon samples
 - Amplified a suite of microsatellite genes used for the sturgeon pedigree
 - Extracted and identified small drift fish in the system that interact with sturgeon
- **UNDERGRADUATE RESEARCHER**, Research on toxicological effects in everyday life that act as triggers in the formation of cancer, Department of Pharmacology and Toxicology, Michigan State University, East Lansing, MI **(2015-2016)**
 - Collaborating with Dr. Jamie Bernard, PhD and Dr. Debrup Chakraborty, PhD to learn the role of NANOG in adipose-tissue induced transformation of mouse epidermal JB6 P⁺ cells
 - Used timed cell RNA collection, RNA isolation, RNA to DNA transformation, qPCR
 - Cell plating and maintenance techniques
 - pipetting and cell counting techniques
 - Western Blot and ELISA
 - Removal of mouse adipose fat pad and transformation to liquid isolate
 - Data collection and analysis in Excel

Publications:

- **Ellen M. Weise**, Nicholas M. Sard, Lauren Stanchek, Andrew Nehfer, Kim T. Scribner. Adaptive genetic management: assessing the efficacy of stocking decisions. **Submitted for review**

Presentations:

- **Ellen M. Weise**, Kim Scribner, Aaron Jubar, Jean Adams, Gale Bravener, John Robinson. Augmenting population assessment of sea lamprey using genetic data and effective size estimates. Oral presentation at: Fisheries and Wildlife Graduate Student Organization Research Symposium, February 22nd, 2019, East Lansing, MI
- **Ellen M. Weise**, Nick Sard, Kim Scribner. Molecular metabarcoding quantification of arthropod biodiversity in Michigan inland lakes. Oral Presentation at: Michigan State University Undergraduate Research and Arts Forum, April 13th, 2018, East Lansing MI
- **Ellen M. Weise**, Debrup Chakraborty, Mercedes A. Reyna, Blair Bullard, Jamie Bernard. Role of NANOG in adipose-tissue induced transformation of mouse epidermal JB6P⁺ cells. Poster presentation at: Michigan State University Undergraduate Research and Arts Forum, April 8th, 2016, East Lansing, MI
- **Ellen M. Weise**, Debrup Chakraborty, Mercedes A. Reyna, Blair Bullard, Jamie Bernard. Role of NANOG in adipose-tissue induced transformation of mouse epidermal JB6P⁺

cells. Poster presentation at: Lyman Briggs Research Symposium, April 25th, 2016, East Lansing, MI

Grants/Scholarships:

- Michigan State University Honors College Professorial Assistantship (2014-2016): \$2,500 research stipend for two years
- Michigan State University Honors College STATE Scholarship (2014-present): \$5,000 per year for 4 years
- Holt Education Association Member Scholarship (2014): \$500

Computer Skills:

- Windows Operating System: Microsoft Office, Word, PowerPoint, Excel, OneNote
- Proficient in Endnote-citation and publication processing software
- Proficient in MATLAB-statistical analysis software, Python-based
- Proficient in R and RStudio (certified in 8-week training course)-statistical analysis software
- Proficient in Python programming language
- Proficient in SHELL
- Exposure to C++ programming language

Outreach/Teaching:

Professional Experience:

- **TEACHING ASSISTANT**, Lab instructor for Integrated Science Biology Lab at Michigan State University (**January-May 2019**)
 - Sole instructor for three sections of 27 students for a full semester
 - Designed lecture material to teach a scientific topic to non-science major student
 - Led labs that built on the lecture material
 - Helped students design and execute final projects that produced original research on Michigan State's environmental impact and potential solutions to environmental problems based on research results
- **STUDENT OUTREACH DIRECTOR**, Michigan State University Science Theatre, College of Natural Science, East Lansing, MI (**2017-June 2019**)
 - Organization does science presentations for K-12 students across the State of Michigan, in all areas of science. The focus is to spark student's interest in science using interesting demos combined with scientific explanation
 - Participated or lead over 150 stage or hands-on shows featuring science demonstrations for K12 students. Demonstrations are designed to visualize a specific scientific topic in a fun and engaging way and are paired with a scientific explanation to increase students' knowledge of the topic.
 - Topics could be from any science field, so a wide scope of general science knowledge was needed for each show
 - Ran demonstration training for volunteers so they were effective and safe presenters
 - Mentored younger members as future e-board members

- Organized large-scale hands-on science events to show science demonstrations to the general public
 - MSU Science festival (2017-2019)
 - Girls in STEM (2018)
 - Nano Day! (2017-2018)
 - STEMSEF and SEMSEF events (2017-2018)
 - Halloween Science Night (2017-2018)
- Co-organized the Science Theatre Upper Peninsula Trip, a week-long trip with 8 presenters doing stage demonstrations at 40+ schools (2019)
 - Participated/mentored on previous trips (2016-2018)
 - Pre-trip: trained volunteers for the 30+ demonstrations brought on the trip
 - Selected demonstrations to build a show for each school visited based on restrictions/requests from principles and previous shows at the school
- Designed new demonstrations for hands-on or stage shows
 - Candy DNA (DNA structure)
 - Build a Dinosaur (Punnett squares and modes of inheritance)
 - Cell Membrane Pool (Cell membrane molecular structure)
- Wrote new scripts for themed shows to break down a large, overarching concept into easily understandable topics with a demonstration for each topic
 - Newtonian Mechanics (feat. Gravity and momentum demos, liquid nitrogen to explain energy and states of matter)
 - Don't Try This at Home (feat. Tesla coil and Faraday cage to explain electricity, flame tube to explain sound, methanol cannon to explain combustion, bed of nails to explain pressure)
- **INSTRUCTOR**, Gifted and Talented Education (GATE) program, Michigan State University (2018)
 - Taught a two-day course in Summer 2018 at GATE's middle school summer program. The first day of the course was about the structure of DNA and it's function in the body, the second day was on inheritance and translating genotype to phenotype. Both days were activity-based instruction rather than a lecture.
- **VOLUNTEER INSTRUCTOR**, Dimondale Outdoor Discovery Center in Dimondale, MI 2012-2017.
 - Taught groups of K-4 students about local ecosystems, both aquatic and terrestrial, in collaboration with high school students and instructors, and Dimondale elementary school instructors.
 - Volunteered during the construction of the nature center, removing garbage and invasive species, creating a native plant sanctuary and a butterfly garden, and maintaining the river ecosystem near the discovery center.
- **DIRECTOR**, In Your Face Theatre Troupe, Olin Health Center, Michigan State University, East Lansing, MI (2016-2017)
 - Collaborated with Kevin Patrick at Olin Health center to work on an informative creative production addressing health topics important to undergraduate college students.
 - Updated, cast and directed hour-long performance about health
 - Collaborated with cast to create a higher quality production as well as a productive and fun atmosphere

- Coordinated events with MSU RAs to connect to undergraduate students
 - Coordinated online presence both for the troupe itself and the events at residence halls, with an effort towards raising attendance at events, recruiting to our program, and to increase health awareness through social media
- **TUTOR**, Clara Bell Smith Center, Michigan State University, East Lansing, MI (**Summer 2015, 2016**)
 - Tutored student-athletes in a variety of educational topics, including: algebra, calculus, organic chemistry, writing, health, trigonometry
- **MATH INSTRUCTOR**, Mathnasium, Grand Ledge, MI (**Summer 2014**)
 - Tutored K-12 math in a small group setting
 - Executed customized learning plans for students, adjusting teaching style and material for several students simultaneously
 - Found innovative ways to teach mathematics, using games and puzzles, visual learning devices, different problem-solving methodologies, and others.

Professional Membership:

- MSU Science Theatre (2014-present)
- Actor at a subset of Greater Lansing Ubiquitous Theatre companies: MSU Department of Theatre, Riverwalk Theatre, Peppermint Creek Theatre Company, Over the Ledges Theatre Company, All-of-Us Express Children's Theatre, The Downeaster Theatre, Ixion Players, Roial Players (2008-present)