

William N. Weaver

www.WilliamWeaver.xyz

EDUCATION

PhD Student: Ecology and Evolutionary Biology

University of Michigan, Ann Arbor

September 2019 - Present

BA Double Major: Ecology and Evolutionary Biology; Environmental Studies

University of Colorado, Boulder

May 2017

EMPLOYMENT

University of Colorado, Boulder

Department of Ecology and Evolutionary Biology

Professional Research Assistant

March 2018 – August 2019

- Developed computer vision and machine learning algorithms to fully automate basic morphological trait extraction from herbarium specimen vouchers.
- Designed, trained, and optimized convolutional neural networks and support vector machine algorithms.

Cooperative Institute for Research in Environmental Science

Center for Limnology

Associate Scientist

March 2018 – April 2019

- Researched and implemented Gauss-peak spectral deconvolution methods as an alternative to high performance liquid chromatography for algal pigment analyses.
- Assisted with the development of mathematical models describing carbon assimilation and turnover in riparian consumers based on isotopic discrimination.

Colorado State Senate – Denver, CO

Policy Research Intern

January 2017 – May 2017

- Researched energy and environmental legislation for the 2017 Colorado legislative session, drafted bill packets, managed town halls and community outreach events, took minutes of Senate committee hearings, regularly interacted with constituents and legislators via phone, email, and in person.

Cooperative Institute for Research in Environmental Science

Center for Limnology

Laboratory Technician

October 2015 – February 2018

- Operated and maintained analytical equipment including segmented flow analyzer, ion chromatograph, and specialized gas chromatograph.
- Conducted water quality analyses testing amounts of chlorophyll, phosphorus, nitrogen, hardness, dissolved organic carbon, total suspended solids, dissolved metals, and ash-free dry mass. Safely handled hazardous acids, bases, and organic solvents.

Field Technician

- Collected field data including water samples using a Van Dorn sampler, depth profile measurements using a YSI multiparameter sonde, Secchi disk depths, streamflow measurements, macroinvertebrates, periphyton, and zooplankton.
- Operated a truck with trailer and motorboat.

University of Colorado, Boulder

Faculty Laboratory – Dr. Stacey Smith

Research Assistant

September 2015 – February 2018

- Used molecular phylogenies and comparative phylogenetic methods to infer patterns of trait evolution and species distributions for North American plant species. NSF funded project included in-house genetic sequencing and large-scale analysis of NEON population database and NCBI published sequences.

Preservationist

- Assisted with preservation efforts required to maintain UCB's extensive collection of rare and irreplaceable media.
- Performed minor repairs on books and novel media.
- Constructed custom enclosures for vellum books, first edition texts, and newsprint.

TEACHING**University of Michigan, Ann Arbor**

September 2019 – December 2019

Department of Ecology and Evolutionary Biology

Graduate Student Instructor

- Two sections of BIO 173 – Introduction to Biology Lab (Fall 2019)
- Three sections of BIO 171 – Introduction to Biology (Fall 2020)

PUBLICATIONS

Weaver, W. N., J. Ng, and R. G. Laport. 2020. LeafMachine: Using machine learning to automate leaf trait extraction from digitized herbarium specimens. *Applications in Plant Sciences* 8(6): e11367. doi:10.1002/aps.3.11367

Ng, J., **Weaver, W.N.** and Laport, R.G. 2019. Testing Darwin's Naturalization Conundrum using phylogenetic relationships: generalizable patterns across disparate communities? *Diversity and Distributions*. 25(3):361-373

ORAL PRESENTATIONS**LeafMachine: Using machine learning to automate phenotypic trait extraction from herbarium vouchers**

- Botanical Society of America – Tucson, AZ Summer 2019
- Ecological Society of America – New Orleans, LA Summer 2018

POSTER PRESENTATIONS**Rise of the machines: does plant blindness affect machine learning applications, too?**

- Botanical Society of America – Tucson, AZ Summer 2019

Testing Darwin's naturalization hypothesis: phylogenetic community structure among native and non-native species

- Ecological Society of America – Portland, OR Summer 2017
- Biological Sciences Initiative Symposium – University of Colorado, Boulder Spring 2017
- Botanical Society of America – Savannah, GA Summer 2016

GRANTS AND SCHOLARSHIPS

Rackham Graduate School - EEB Block Grant (\$1,450)	Spring 2020
Michigan Institute for Computational Discovery & Engineering Fellow (\$4,000)	2019-2020
Microsoft AI for Earth Azure Compute Grant (\$10,000)	January 2019
Biological Sciences Initiative Travel Grant (\$700)	Summer 2017
Biological Sciences Initiative Scholar (\$2,500)	2016 – 2017
Professional and Academic Conference Endowment Travel Grant for Botany Conference (\$1,000)	Summer 2016
Biological Sciences Initiative Travel Grant for Botany Conference (\$600)	Summer 2016
Undergraduate Research Opportunities Program Research Grant (\$2,400)	Summer 2016
Biological Sciences Initiative BURST Research Grant (\$2,500)	2015 – 2016
President Horace M. Hale Award (\$14,000)	2013 – 2017
Loach Engineering Scholarship	2013 – 2014
Dean's List	Spring 2015 - Spring 2017

SKILLS AND EXPERIENCE

Mathematics Courses

- Calculus 1, 2, 3
- Linear Algebra
- Differential Equations

Programming and Computer Skills

- Programming fluency in R, Matlab, and Python
- Programming proficiency in C++, VBA, and HTML
- Project-based experience with computer vision and machine learning architectures
- Skilled in Mathematica, Microsoft Office Suite, In-Design, and numerous IDEs

Relevant Coursework

- Course work covering Colorado water rights, water management, natural resource management, political theory, climate change, grant writing, environmental economics, environmental public policy, limnology, environmental ethics, and environmental sociology.

Certification

- Mine Safety and Health Administration (MSHA) Part 46 Surface Miner Contractor Certification
Henderson Mine - Empire, CO. January 29, 2019

PROFESSIONAL AFFILIATIONS

Ecological Society of America (ESA)	2016 - Present
Botanical Society of America (BSA)	2016 - Present
Colorado Native Plant Society (CONPS)	2016 - 2017