SOPHIE BREITBART, PHD

Research Software Engineer

EDUCATION

2018 | 2024

University of Toronto
PhD in Ecology & Evolutionary Biology — Toronto, Canada

- Thesis: Effects of Urbanization on the Evolutionary Ecology and Population Genetics of Common Milkweed (*Asclepias syriaca*)
- Advisors: Drs. Marc Johnson & Helene Wagner

2012 | 2016

Wesleyan University
BA in Biology — Middletown, Connecticut

- Completed Integrative Genomics Sciences Certificate
- Undergraduate researcher (2013-2016): Minnow biogeography and bacterial phylogeography

EXPERIENCE

2024 | present

Stock Assessment Data and Software Workflow Modeler
ECS, in support of NOAA Fisheries — Remote

- Design, develop, and maintain software (R packages `asar` and `stockplotr`) to streamline workflows, improve reproducibility, and enhance transparency of fisheries stock assessments (NOAA GitHub profile)
- Collaborate with national and regional scientists to assess community needs and prioritize workflow improvements

2024

Business Consultant
Tech Medic — Providence, Rhode Island

- Created and updated internal documents to increase efficiency of computer consulting business
- Identified opportunities to improve workflows and operational procedures

2023 | 2024

Data Scientist & Instructor
University of Toronto & Blood Tribe — Alberta, Canada

- Collaborated with the Blood Tribe of the Kainai First Nation to co-create project assessing reservation's rangeland health
- Co-led creation of interactive app to guide various stakeholders through the data analysis while teaching key data science concepts

2023 | 2024

Data Scientist
University of Toronto & University Health Network — Toronto, Canada

- Cleaned, wrangled, and visualized Twitter data for "#TeamVaccine: Exploring the History of Toronto's COVID-19 Vaccination Initiative through Social Media" project
- Communicated with team, revising deliverables accordingly

2018 | 2024

Research Assistant
University of Toronto — Toronto, Canada

- Studied how urbanization impacts reproductive success, genetic divergence, genetic diversity, and population structure of *A. syriaca*
- Taught tutorials in data science, statistics, evolution, and ecology

2016 | 2018

Staff Scientist I
Princeton Hydro — South Glastonbury, Connecticut

- Designed detailed dam removal engineering plan sets with AutoCAD
- Analyzed geospatial data and generated maps using ArcGIS
- Assisted developing strategies for protecting water resources and co-authored watershed management plans

CONTACT

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SKILLS

Languages: R, including base & tidyverse (advanced); Bash (intermediate); Python, CSS, HTML, SQL (familiar)

Project management & reproducibility: Git/Github, summary reports with R Markdown, version control, reproducible examples

Software development: Software design, unit testing, documentation, code review

Data analysis: Data cleaning & wrangling, high-performance computing, SLURM, parallelization, geospatial analysis

Statistics: Linear and mixed models, predictive modelling, multivariate statistics

Data visualization: `ggplot2`, maps, Shiny apps, dashboards

Communication: Excellent oral and written communication skills including 8 invited and 15 conference presentations, 5 peer-reviewed scientific publications

Full list of publications here.

SOFTWARE

R packages

`asar` (Author, contributor since 2024)

`stockplotr` (Author, contributor since 2024)

`nmfspalette` (Maintainer, contributor since 2025)

FUNDING & AWARDS

Total funding: $63,329

6 research grants; 2 awards; 2 scholarships; 2 travel grants; 1 workshop grant