Willian Vieira PhD

PhD quantitative ecologist with data engineer experience. I build statistical models, reproducible workflows, and environmental data infrastructure that turn complex biodiversity and geospatial data into analyses people can inspect, trust, and reuse.

DATA SCIENCE & ENGINEER EXPERIENCE

2025 | 2024 (1 yr 9 m)

Data Analyst
Habitat, Montreal, Canada
Delivered statistical and ML models, spatial analysis, and reproducible reports for environmental consulting projects using client and open geospatial data | Became the de facto lead for analytical infrastructure, standardizing R/Python/Julia packages, documentation, code review, Docker/Unix environments, and CI/CD automation | Moved heavy spatial workflows toward cloud-backed access patterns, using object storage and range-request-friendly data access to reduce fragile network-drive dependency | Designed metadata and pipeline conventions to improve lineage, validation, debugging, handoff, and reuse across recurring analyses

2024 | 2017

PhD Research
Integrative Ecology Lab, Sherbrooke, Canada
Developed Bayesian hierarchical and nonlinear statistical models in R and Stan to represent heterogeneous biological populations, forecast dynamics, and propagate uncertainty from noisy, biased, incomplete real-world data | Authored open-source R packages (,) for demographic modelling, with version control, automated tests, documentation, and reusable APIs | Published a technical methods book walking from mathematical concept to R implementation to model evaluation, alongside one peer-reviewed publication and two preprints (,) | Ran thousands of simulations on HPC infrastructure ( ) to test model behavior, compare assumptions, and validate inference at scale | Built reproducible R pipelines harmonizing climate, remote sensing, and field-inventory data across North America

2022 | 2020 (part-time)

Biostatistician
Environment and Climate Change Canada - Quebec, Canada
Developed a cost-aware probability sampling protocol to improve the spatial representativeness of boreal bird surveys in Quebec | Led R&D on spatial bias-correction methods for large-scale ecological monitoring data, designing an approach later adopted by other provinces | Engineered a fully automated and reproducible data pipeline with version-controlled workflows, automated documentation, and stakeholder-ready analytical outputs

EDUCATION

2024 | 2017

PhD, Ecology
Université de Sherbrooke - Sherbrooke, Canada
How climate, competition, and forest management shape the limits of tree species distributions: from individuals to metapopulations

2016 | 2015

Masters 2, Agroecology and Resource Management
Bordeaux Sciences Agro, Bordeaux, France
Modelling the dispersion of weed species in agricultural landscapes

2015 | 2010

BSc in Agronomy
Universidade Federal de Santa Catarina, Florianópolis, Brazil

CONTACT

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w.vieiraw@gmail.com
Linkedin/WillVieira
GitHub/WillVieira
Publications

SKILLS

Statistics, Modelling & Ecology:
Bayesian statistics · Nonlinear hierarchical models · SDMs · Sampling design · Spatial bias · Simulation · Sensitivity analysis · Uncertainty quantification · Model evaluation

Environmental & Geospatial Data:
Biodiversity monitoring · Forest inventory data · Climate and remote-sensing covariates · Habitat and vegetation data · Environmental assessment support · Decision-ready maps and reports

Programming & Scientific Software:
R · Python · Stan · SQL · Bash · DuckDB · Julia · Package development · Shiny · Quarto

Data Engineering & Reproducibility:
ETL pipelines · Metadata and data governance · Cloud object storage · Cloud-optimized geospatial access · Automated validation · Docker · CI/CD · Git · Unix · HPC · Make · Reproducibility

LANGUAGES

Portuguese · Native
French · Full Professional
English · Full Professional

Source · HTML · PDF
Updated 2026-06-01

TEACHING EXPERIENCE

2021 — **Biodiversity Modelling Summer School**
Bios^2 summer school — Sherbrooke, CA
Teaching assistant and lectured for graduate students Evaluating ecological models using Bayesian statistics

2020 | 2019 — **Methods in computational ecology**
BIO500 - Département de biologie, Université de Sherbrooke — Sherbrooke, CA
Teaching assistant and lectured for undergraduate students Tools for reproducible science | SQL | Git | R | LaTeX | Markdown | Makefile

2020 — **Software and Data Carpentry workshop**
Bios^2 training for graduate students — Online
The Unix Shell Data Management with SQL for Ecologists

2019 | 2018 — **QCBS R Workshops**
Université de Sherbrooke & Université du Québec à Rimouski — Sherbrooke & Rimouski, CA
Instructor to graduate students Workshops: Introduction to R | Data management | Data Visualization | Control flow | Linear models

2019 — **Probability and statistics**
GCI145 - Faculté de génie, Université de Sherbrooke — Sherbrooke, CA
Teaching assistant and lectured for undergraduate students Probability theory | Distribution | Descriptive statistics | Hypothesis testing | Linear models

2018 — **Modelisation de la dynamique forestier du Quebec face au changement climatique**
Département de biologie, Université de Sherbrooke — Sherbrooke, CA
Guest lecturer in Plant Ecology (Presentation) to undergraduate students Covered modelling approaches in ecology | model construction and applications

2018 — **Introduction to scientific programming**
BIO109 - Département de biologie, Université de Sherbrooke — Sherbrooke, CA
Teaching assistant for undergraduate students Pogramming concepts | Data management | Control flow | R language

TRAINING

2022 — **Data visualization and biodiversity modelling**
Summer school - Bios^2 — Magog, CA
Business intelligence | data user profiles | Conceptualize interactive dashboard | Figma

2020 — **Mathematical Modelling in Ecology and Evolution**
Workshop - Bios^2 — Remote
Developing equations | Finding equilibria | analyzing stability | Maxima

2019 — **Stage-based demographic models in ecology, evolution and conservation biology**
NERC Advanced Training - University of Oxford

Oxford, UK

Theory and practice | Matrix population models | Integral Projection Models

2019 **Biodiversity Modelling**
Summer school - Université de Sherbrooke — Magog, CA
Theory and practice on different biodiversity modelling techniques Statistics | Differential equations | Stochastic simulations | Climate change models | uncertainty tracking

2017 **Data-driven ecological synthesis**
DDES summer school - Université de Montréal — Montréal, CA
Good practices in scientific computing Data management | Mathematical tools | Data analysis tools | Parallel computing | Rreproducible science

2017 **Bayesian Statistics for Ecologists**
Summer school - Université de Sherbrooke — Magog, CA
Theory and practice using Stan | Probability theory | Likelihood | MCMC | Hierarchical modelling | Model comparison

PUBLICATIONS

2026 **Unifying individual and metapopulation scales with stochastic population models: the effect of climate and competition on tree range limits**
In production. Preprint hosted on
Vieira, W., Gravel, D.

2026 **Sensitivity of tree species demography to climate and competition across their range**
Under review. Preprint hosted on
Vieira, W., MacDonald, A., Gravel, D.

2024 **Paying colonization credit with forest management could accelerate the range shift of temperate trees under climate change**
Ecological Modelling
• Vieira, W., Boulangeat, I., Brice, M., Bradley, R.L., Gravel, D.

2020 **Moderate disturbances accelerate forest transition dynamics under climate change in the temperate–boreal ecotone of eastern North America**
Global Change Biology
• Brice, M.H., Vissault, S., Vieira, W., Gravel, D., Legendre, P., Fortin, M.J.

2020 **Genetic and demographic aspects of Varronia curassavica Jacq. in a heterogeneous coastal ecosystem**
Anais da Academia Brasileira de Ciências
• Hoeltgebaum, M.P., Lauterjung, M.B., Montagna, T., Candido-ribeiro, R., Vieira, W., Bernardi, A.P., Cristofolini, C., Reis, M.S.D.