

Jake Lawlor

Quantitative Ecologist | Scientific Software Developer

CONTACT

McGill University
Department of Biology
Montréal, QC, Canada

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📄 [jakelawlor.github.io](https://github.com/jakelawlor)
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PROGRAMMING SKILLS

Programming Languages

R - expert

Software Development

R Shiny
R Package Development
Git/GitHub
Continuous Integration
(GitHub Actions)

Data Science

Statistical Modeling
Spatial Analysis (sf, terra)
Reproducible Workflows

Web Technologies

HTML
CSS
R Markdown / Quarto

EDUCATION

2020-
exp. Dec. 26 **Ph.D. Biology** McGill University
Effects of species traits, protective status, and environmental forces on species range shifts
ADVISED BY DR. JENNIFER SUNDAY

2017-19 **M.S. Biology** Western Washington University
Modeling climate-dependent larval growth rate and duration of Olympia oysters in the Salish Sea
ADVISED BY DR. SHAWN ARELLANO

2011-15 **B.Sc. Environmental Science** The University of Texas

GRANTS AND FELLOWSHIPS

2025 **Real Décoste-Ouranos Excellence Award** FRQNT / Ouranos Inc.
• \$120,000 fellowship for research on climate change impacts

2024 **Climate Action Scholarship** FRQSC
• One of ten provincially selected to conduct research to guide policy for climate action in Quebec; \$12,000

2021 **Quebec Doctoral Research Scholarship** FRQNT
• \$83,667 fellowship for 3.5 years

Dr. Lawrence Light Graduate Fellowship in Sustainability McGill U
• \$10,000 fellowship + \$4,000 for undergraduate researcher

2020 **Computational Biodiversity Science and Services (BIOS²) Fellowship** NSERC CREATE
• \$10,500 fellowship + \$2,000 mobility funds, renewable 3 years

International Graduate Tuition Award McGill U
• \$13,500 international tuition award, renewable 4 years

2019 **Biology Student Conference Travel Grant** Western Washington U

College of Science & Engineering Student Travel Award Western Washington U

Ross Travel Grant Western Washington U

2018 **Visiting Internship Student Award** Hong Kong U Sci & Tech
• 2-month internship in the Chan Quantitative Plankton Ecology Lab

Enhancement of Graduate Research Fund Project Grant Western Washington U

Steve Sulkin Graduate Research Fellowship Shannon Pt. Marine Center

2015 **Multicultural Initiative in Marine Science: Undergraduate Participation** NSF
• One of eight nationally selected for 6-month NSF marine science research program

HONOURS AND AWARDS

2026 **Best Oral Presentation Award** Species on the Move Conference
Excellence Award (Conference Travel) Quebec Centre for Biodiversity Science

2025 **Biology Writing Year Award** McGill University

2023 **Excellence Award (Conference Travel)** Quebec Centre for Biodiversity Science

2022 **Graduate Mobility Award** BIOS² Program

Graduate Research Enhancement and Travel Award McGill Biology

Student Conference Travel Award Living Data Project

2021 **Learning and Development Award (LeaDA) x3** Quebec Centre for Biodiversity Science

2020 **Learning and Development Award (LeaDA) x2** Quebec Centre for Biodiversity Science

Best Poster Presentation Award Quebec Centre for Biodiv. Sci. Conference

Outstanding Graduate Student Award Western Washington U. Graduate School

Outstanding Graduate Research Award Western Washington U Dept. Biology

2019 **Honorable Mention Graduate Student Presentation** PERS Conference 2019

2018 **"Washingtonian of the Day" Award** Awarded by Gov. Jay Inslee

2013 **Tanzania: Wildlife Conservation Program Scholarship** School for International Training

2011-13 **Undergraduate Merit-Based Scholarship** U. Texas Jackson School of Geosciences

PUBLICATIONS

Submitted Manuscripts

- 2026 **BioShifts v2 and BioShiftR: tools for navigating and analysing species range shift data**
Lawlor, J.A., Oliveira, B.F., Moore, N.A., Lenoir, J., Bandara, R.M.W.J., Bertrand, R., Chen, I-C., Diamond, S., Grenouillet, G., Lancaster, L., Pinsky, M., Rolland, J., Scheffers, B., Villalobos, F., Wolfe, B., Sunday, J., Weiskopf, S.R., Comte, L.
IN REVIEW AT METHODS IN ECOLOGY & EVOLUTION
- Global patterns predict local biodiversity shifts in a climate change hotspot**
Lawlor, J.A., Hesketh, A.V., Beaulieu, J., Knight, N.S., Peller, T., Super, L., Pereira, A., Bledsoe, E.K., Burant, J.B., Dijkstra, J.A., Benes, K., Byrnes, J.E.K.
IN REVIEW AT GLOBAL CHANGE BIOLOGY; ECOEVOXIV PREPRINT: [HTTPS://DOI.ORG/10.32942/X20H2J](https://doi.org/10.32942/X20H2J)
- Dispersal rate limits range expansion rate only when it is slower than climate velocity**
Moore, N.A., Lenoir, J., Comte, L., Lawlor, J.A., Sunday, J.M.
IN REVIEW AT ECOLOGY LETTERS; BIOXIV PREPRINT: [HTTPS://DOI.ORG/10.64898/2026.03.16.712231](https://doi.org/10.64898/2026.03.16.712231)
- Historical subtidal regime shifts echoed in adjacent intertidal community**
Beaulieu, J., Knight, N.S., Hesketh, A.V., Lawlor, J., Gheřa, M., Peller, T., Burant, J.B., Super, L., Bledsoe, E.K., Benes, K., Dijkstra, J.A., Byrnes, J.E.K.
IN REVIEW AT ECOLOGY; ECOEVOXIV PREPRINT: [HTTPS://DOI.ORG/10.32942/X20W90](https://doi.org/10.32942/X20W90)
- Within-Community-Sampling Power Analysis to Detect Richness Change**
Tekwa, E., Lawlor, J., Lemay, M., Stanley, R., Jeffery, N., Rubidge, E., Sunday, J.
SUBMITTED TO METHODS IN ECOLOGY & EVOLUTION; ECOEVOXIV PREPRINT: [HTTPS://DOI.ORG/10.32942/](https://doi.org/10.32942/)

Peer-Reviewed Publications

- 2026 **Species range shifts often speed ahead of their modeled climatic niches**
Oliveira, B.F., Bertrand, R., Pinsky, M.L., Casajus, N., Wolfe, B.W., Scheffers, B.R., Villalobos, F., Grenouillet, G., Pecl, G., Chen, I-C., Baecher, J.A., Lawlor, J.A., Sunday, J., Murienne, J., Rolland, J., Thompson, L.M., Lancaster, L.T., Rubenstein, M., Moore, N.A., Bandara, R.M.W.J., Diamond, S., Weiskopf, S.R., Lenoir, J., Comte, L.
PNAS 123 (14) E2515903123 [HTTPS://DOI.ORG/10.1073/PNAS.2515903123](https://doi.org/10.1073/pnas.2515903123)
- Genetic diversity impacts climate-induced species range shifts**
Oliveira, B.F., Bertrand, R., Comte, L., Lenoir, J., Grenouillet, G., Lancaster, L.T., Murienne, J., Diamond, S., Scheffers, B.R., Bandara, R.M.W.J., Lawlor, J.A., Moore, N.A., Wolfe, B.W., Villalobos, F., Weiskopf, S.R., Thompson, L.M., Pinsky, M.L., Rolland, J.
ECOLOGY LETTERS 29(4) [HTTPS://DOI.ORG/10.1111/ELE.70345](https://doi.org/10.1111/ELE.70345)
- 2025 **Don't miss the forest for the trees: how abstracting nature can get us closer to our goals**
Lawlor, J.
GLOBAL CHANGE BIOLOGY 31.4: E70146 [HTTPS://DOI.ORG/10.1111/GCB.70146](https://doi.org/10.1111/GCB.70146)
• INVITED COMMENTARY
- 2024 **Interactive effects of predation and climate on the distributions of marine shellfish in the Northwest Atlantic.**
Zabihi-Seissan, S., Baker, K.D., Stanley, R.R.E., Tunney, T.D., Beauchamp B., Benoit, H., Brickman, D., Chabot D., Cook, A., Deslauriers, D., Koen-Alonso, M., Lawlor, J., LeBris, A., Mullaney, D.R.J., Roux, M.J., Skanes, K.R., Wang, Z., Pedersen, E.J.
OIKOS E10524 [HTTPS://DOI.ORG/10.1111/OIK.10524](https://doi.org/10.1111/oik.10524)
- Mechanisms, detections, and impacts of species redistributions under climate change**
Lawlor, J., Comte, L., Lenoir, J., Grenouillet, G., Baecher, J.A., Bandara, R.M.W.J., Bertrand, R., Chen, I-C., Diamond, S., Lancaster, L., Moore, N., Murienne, J., Oliveira, B., Pinsky, M., Rolland, J., Rubenstein, M., Scheffers, B., Thompson, L., van Amerom, B., Villalobos, F., Weiskopf, S., Sunday, J.
NATURE REVIEWS EARTH AND ENVIRONMENT 5(5) [HTTPS://DOI.ORG/10.1038/S43017-024-00527-Z](https://doi.org/10.1038/s43017-024-00527-z)
• 5-YEAR JOURNAL IMPACT FACTOR: 73.7
• TOP 5% ALTMETRIC SCORE
- Notes from the past show how local variability can stymie urchins and the rise of the reds in the Gulf of Maine**
Byrnes, J.E.K., Brown, A., Sheridan, K., Peller, T., Lawlor, J., Beaulieu, J., Muñoz, J., Hesketh, A., Pereira, A., Knight, N., Bledsoe, E., Burant, J.B., Super, L., Dijkstra, J.A., Benes, K.
ECOSPHERE 15:E4800. [HTTPS://DOI.ORG/10.1002/ECS2.4800](https://doi.org/10.1002/ECS2.4800)
- Bringing traits back into the equation: A roadmap to understand species redistribution**
Comte, L.; Bertrand, R., Diamond, S., Lancaster, L.T., Pinsky, M.L., Scheffers, B.R., Baecher, J.A., Bandara, R.M.W.J., Chen, I-C., ; Lawlor, J.A., Moore, N.A., Oliveira, B.F., Murienne, J., Rolland, J., Rubenstein, M.A., Sunday, J., Thompson, L.M., Villalobos, F., Weiskopf, S.R., Lenoir, J.
GLOBAL CHANGE BIOLOGY 30:E17271 [HTTPS://DOI.ORG/10.1111/GCB.17271](https://doi.org/10.1111/GCB.17271)

- 2023 **Priorities for synthesis research in ecology and environmental science**
Halpern, B., Boettiger, C., Dietze, M., Gephart, J., Gonzalez, P., Grimm, N., Großmann, P., ... [Lawlor, J.](#)
(127 authors total)
ECOSPHERE 14:1 E4342 [HTTPS://DOI.ORG/10.1002/ECS2.4342](https://doi.org/10.1002/ECS2.4342)
- 2022 **Ten simple rules for teaching yourself R**
[Lawlor, J.](#), Banville, F., Forero-Muñoz, N.R., Hébert, K., Martínez-Lanfranco, J.A., Rogy, P., and McDonald, A
PLOS COMPUTATIONAL BIOLOGY 18(9): E1010372. [HTTPS://DOI.ORG/10.1371/JOURNAL.PCBI.1010372](https://doi.org/10.1371/JOURNAL.PCBI.1010372)
- 2020 **Temperature and salinity, not acidification, predict near-future larval growth and larval habitat suitability of Olympia oysters in the Salish Sea.**
[Lawlor, J.](#), and Arellano, S.
SCIENTIFIC REPORTS 10:13787; [HTTPS://DOI.ORG/10.1038/s41598-020-69568-w](https://doi.org/10.1038/s41598-020-69568-w)



SCIENTIFIC SOFTWARE & DATA PRODUCT DEVELOPMENT

- 2026 **BioShiftR R Package** BIOSHIFTS Working Group
R package to access, manipulate, and organize the BioShifts database
- 2025 **Maritimes Ecosystem Indicator [Data Catalogue](#)** Fisheries and Oceans Canada
Technical document for 'marec' R package
- Canada Marine Policy Recommendations [Web Report](#)** Fonds de Recherche du Quebec
Recommendations for climate change adaptation strategies for Canada's oceans
- 2024 **BioDivPower R Package** McGill x Fisheries and Oceans Canada
Power analysis tool for biodiversity monitoring sampling schemes
- 2023 **Project Optimize [Shiny App](#)** McGill x Fisheries and Oceans Canada
Interactive dashboard for biodiversity sampling with eDNA in Canada's Pacific
- 2022 **Marine Conservation Network Design [Shiny App](#)** Fisheries and Oceans Canada
Decision support tool for implementing marine protected areas
- 2021 **Vaccine-Preventable Diseases Interactive [Data Article](#)** Precision Analytics
Interactive article exploring demographic predictors of vaccine hesitancy in New York State
- Species Distribution Model Outputs [Shiny App](#)** Fisheries and Oceans Canada
Interactive dashboard for exploring effects of predation integration on SDM outputs
- 2020 **PNWColors R Package** Shannon Point Marine Center
R color palettes inspired by nature in the US Pacific Northwest
• >31K DOWNLOADS FROM CRAN



RESEARCH APPOINTMENTS

- 2020-26 **Sunday Global Change Ecology Lab, PhD Researcher** McGill University
- 2019 **Larval Biology Research Associate** Shannon Point Marine Center
Research Cruise Consultant; R/V Tiglax Northern Gulf of Alaska LTER
- 2017-19 **Arellano Larval Ecology Lab, MS Researcher** Western Washington University
- 2018 **Chan Quantitative Plankton Ecology Lab Visiting Researcher** Hong Kong U Sci & Tech
- 2017 **Shellfish Research Hatchery Lab Technician** UNC Wilmington
- 2016 **Arellano Larval Lab Research Technologist** Shannon Point Marine Center
- 2015 **National Science Foundation Undergraduate Research Fellow** Shannon Point Marine Center

CONFERENCE PRESENTATIONS

- 2026 **Species on the Move Conference, Oral Presentation | Sun Moon Lake, Taiwan**
Small windows, big conclusions – how partial-range study areas probably misrepresent range-wide distribution changes, and what to do instead
• BEST ORAL PRESENTATION AWARD
- 2025 **Living Data Conference, Oral Presentation | Bogota, Colombia**
A user-friendly power analysis tool for confidently detecting biodiversity change
- Canadian Society for Ecology and Evolution Conference, Oral Presentation | Sherbrooke, QC**
Species Range Shifts and Marine Conservation in Canada
- McGill Biology Department Day, Oral Presentation | Montreal, QC**
Climate Action in Canada's Oceans
• INVITED KEYNOTE PRESENTATION

- 2024 **McGill Biology Department Day, Oral Presentation | Montreal, QC**
Assessing Canada's Marine Protected Areas in the Context of Climate-Driven Species Range Shifts
- 2023 **Species on the Move Conference, Oral Presentation | Bonita Springs, FL**
Assessing Global Marine Protected Areas In The Context Of Anticipated Species Range Shifts
- 2022 **Ecological Society of America/Canadian Society for Ecology & Evolution, Talk | Montreal, QC**
Shifts in the thermal affinity of a Gulf of Maine intertidal community over 35 years
- Ecological Forecasting Initiative, Poster | Virtual**
A Framework for Forecasting Sea Urchin Recruitment on the North American West Coast
• CO-PRESENTATION WITH UNDERGRADUATE MENTEE, VICTOR CRUZ
- 2021 **Québec Centre for Biodiversity Science, Poster | Virtual**
What do we need to accurately detect range shifts?
- 2020 **Québec Centre for Biodiversity Science, Poster + Speed Talk | Virtual**
How have we detected range shifts? A review and synthesis
• CO-PRESENTATION WITH UNDERGRADUATE MENTEE, BRIT VAN AMEROM
• BEST POSTER PRESENTATION AWARD
- Western Society of Naturalists Conference, Oral Presentation | Virtual**
Using interacting environmental gradients to predict larval success in future oceans
- 2019 **Species on the Move Conference, Poster Presentation | Kruger NP, South Africa**
Scaling up climate-dependent larval growth rates and behaviors to population distributions of oysters in a changing ocean
- Pacific Estuarine Research Society (PERS) Conference, Fast Talk | Anacortes, WA**
Effects of interacting climate stressors on Olympia oyster larval growth rate and duration
• GRADUATE STUDENT PRESENTATION HONORABLE MENTION
- 2017 **International Larval Biology Symposium, Poster Presentation | Honolulu, HI**
Effects of multiple stressors on Olympia oyster larval swimming
- 2015 **WWU All University Scholars Week, Poster Presentation | Bellingham, WA**
Effects of acidification and warming on Olympia oyster larval swimming and growth
- Pacific Estuarine Research Society (PERS), Poster Presentation | Seattle, WA**
Effects of acidification and warming on Olympia oyster larval swimming and growth
- NOAA Alaska Fisheries Science Center, Oral Presentation | Seattle, WA**
Oysters in a changing ocean: effects of acidification and warming on larval swimming
- 2014 **UT Environmental Science Institute Symposium, Poster Presentation | Austin, TX**
*Intertidal donation in stands of *Sonneratia alba* on the shorelines of Northern Tanzania*
- School for International Training Symposium, Oral Presentation | Arusha, Tanzania**
Intertidal donation in Northern Tanzanian mangrove stands

TEACHING

Course Instructor

- 2026 **Ecological Data Synthesis, Course Co-Instructor** Bamfield Marine Science Centre
- 2023-25 **Data Science in R Series, Sole Instructor (33 classes)** McGill Computational and Data Systems Initiative
- *RECOGNIZED IN MCGILL CO-CURRICULAR RECORD
- Introduction to R Programming (x4)*
- Data Wrangling in R (x5)*
- Exploratory Data Analysis in R (x4)*
- Data Visualization in R: Introductory (x5)*
- Data Visualization in R: Intermediate (x5)*
- Quarto / R Markdown (x1)*
- Creating Shiny Dashboards in R (x5)*
- Working with Text in R (x2)*
- Building Interactive Plots in R (x3)*

Programming Workshop Instructor

- 2026 **BioShifts & the BioShiftR R Package for range shift data access and hypothesis testing** Species on the Move Conference
- 2022 **Shiny Apps for Communicating Science [slides](#) | [repo](#)** QCBS R Symposium

2021	Shiny Apps for Communicating Science	Living Data Project Working Group
	Software Carpentry (3-hour section - tidyR)	BIOS2 Program
2020	Programming in R: 4-hour workshop	Quebec Centre for Biodiv. Sci.
	Data Visualization in R: 4-hour workshop	Quebec Centre for Biodiv. Sci.
	Creating Shiny Apps in R: 6-hour workshop & development	BIOS2 Program
	Generalized Additive Models in R: 4-hour workshop	Quebec Centre for Biodiv. Sci.
	Software Carpentry: 16-hour workshop	BIOS2 Program
	Data Carpentry: 16-hour workshop	BIOS2 Program
2020	Introduction to R: 4-hour workshop	Quebec Centre for Biodiv. Sci.
	Data Visualization in R: 4-hour workshop & development	Quebec Centre for Biodiv. Sci.

Guest Lecturer

2025	Organismal Biology Research and Professional Skills <i>"Upgrading your practices to make your science useful"</i>	McGill Biology Grad Studies
2023	Ocean Climate Change Biology <i>"Climate-driven shifts in marine ecosystems"</i>	WWU Marine & Coastal Sci.
2022	Introduction to Graduate Studies in Biology <i>"Data Visualization as a Professional Skill:"</i>	McGill Biology Grad Studies
2021	Introduction to Graduate Studies in Biology <i>"Data Visualization as a Professional Skill:"</i>	McGill Biology Grad Studies
	Summer NSF REU R Workshop Series <i>"101 Things You Can Do in RStats"</i>	Shannon Point Marine Center
2020	BIOL 407: Marine Ecology <i>Guest lecture in marine biogeography and proposal writing</i>	WWU Marine & Coastal Sci.
	BIOL 399: Intro Experimental Design and Statistics <i>Guest lecture in statistical programming</i>	Oregon Inst. of Marine Biol

Teaching Assistant

2023	Scientific Data Management (postdoc level appointment)	Living Data Project
2023	Scientific Collaboration (postdoc level appointment)	Living Data Project
2023	Synthesis Statistics (postdoc level appointment)	Living Data Project
2021	ATOC 184: The Science of Storms	McGill Atmospheric & Ocean Sci.
2020	ATOC 185: Natural Disasters	McGill Atmospheric & Ocean Sci.
	ATOC 184: The Science of Storms	McGill Atmospheric & Ocean Sci.
2018	BIOL 465: Algae	WWU Biology
2017	BIOL 405: Marine Ecology	WWU Biology
	BIOL 101: Introductory Biology six sections	WWU Biology
2015	UGS 302: Austin Area Environmental Issues (undergrad TA)	U. Texas Env. Sci.

SERVICE

2021-	Peer Reviewer — see verified reviews on ORCID <i>Ecology Letters (4) Global Change Biology (2) Ecography (2) Facets (1) Journal of Experimental Marine Biology and Ecology (1) Northeast Naturalist (1) Oikos (1) USGS Internal Review (1)</i>
2019-22	Selection Committee Member <i>BIPOC Undergraduate Research Award Committee - Grad Representative McGill Biology (2)</i> <i>New Faculty Selection Committee - Student Member McGill Biology (1)</i> <i>New Faculty Selection Committee - Student Member Western Washington U. Marine & Coastal Science (2)</i>
2018-23	Graduate Student Association Officer <i>Data Analyst McGill Biology Graduate Student Association (2021-2023)</i> <i>Marine Center Representative Western Washington University Graduate Student Advisory Council (2018)</i>

WORKING GROUP PARTICIPATION

2021-24	BIOSHIFTS Working Group (4 meetings)	Cent. for the Synth. and Analysis of Biodiv.
2022-25	Climate and Biodiversity in Marine Ecosystems (CBIOME) working group (4 meetings)	Conservation International
2021	Coastal Oceans Working Group (1 meeting)	NSERC-CREATE Living Data Project

CERTIFICATIONS

- 2024 **Data and Software Carpentry Instructor** The Carpentries
2021 **Certificate in Synthetic and Collaborative Science** NSERC-CREATE Living Data Project

WORKSHOPS & SPECIAL COURSES

- 2023 **Forecasting for Decision-Making: An Epidemiological & Ecological Perspective** Canadian Ecological Forecasting Initiative
2022 **Near-term Ecological Forecasting Short Course** Near-term Ecological Forecasting Initiative
2021 **Data Driven Ecological Synthesis Short Course** Comp. Biodiv. Science & Services (BIOS?)
2021 **Future of Synthesis in Science Workshop** NCEAS (Virtual)

SELECTED OUTDOOR EDUCATION & OUTREACH

- 2015-19 **Sea Kayak Guide / Naturalist**
Anacortes Kayak Tours | Anacortes, WA
- 2014-19 **Outdoor Education Instructor (Multiple Programs)**
Program Leader, Fiddlehead Montessori School | Anacortes, WA
Substitute Teacher, Fidalgo Nature School | Anacortes, WA
Outdoor School Instructor, Academic Adventures | Anacortes, WA
Marine Ecology Outreach Leader, Anacortes School District | Anacortes, WA
International Trip Guide, Adventures Cross Country | Mill Valley, CA & Bangkok, Thailand
After School Outdoor Education Program Leader, Camp Fire USA | Austin, TX
- 2012-14 **Environmental Stewardship Director**
John Knox Ranch | Fischer, TX

SCIENCE COMMUNICATION

- 2018-19 **Instagram Manager, Shannon Point Marine Center — @wwushannonpoint**
- 2018 **Science Journalist, University of Washington Puget Sound Institute**
The Puget Sound Coastal Storm Modeling System
Published Aug. 2018 in Encyclopedia of Puget Sound