Greig Oldford

Ecosystem Scientist & Modeller

Ecosystem Scientist · Fisheries and Oceans Canada, Pacific Region
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RESEARCH INTERESTS

End-to-end ecosystem modelling (physics to fisheries) · ocean hindcasting · food-web dynamics and early marine survival of Pacific salmon · predator–prey interactions · marine spatial planning and protected-area network design · river connectivity · science advice for ecosystem-based management

APPOINTMENTS

2025–present
Science Manager / Section Head, Nearshore Ecosystems Section
Aquatic Diagnostics and Genomics Technologies, Science Branch, Fisheries and Oceans Canada, Pacific Science Enterprise Centre, West Vancouver
- Manage a group of research scientists and field and laboratory biologists; finances, hiring, field programs and research planning

2023–present
Ecosystem Scientist
Science Branch, Fisheries and Oceans Canada, Pacific Region
- Lead developer of the NEMO-SS1500 Salish Sea ocean model (HOTSSea) on Linux HPC
- Ecosystem modelling and science advice on salmon, marine mammals and fisheries; subject-matter expert in CSAS peer review

2024–2025
Science Program Lead, Integrated Ecosystem Modelling
Regional Ecosystem Effects on Fish & Fisheries Section, Ecosystem Science Division, DFO Pacific
- Designed and led a new research program; won Competitive Science Research Fund support; hired and supervised a scientist
- Led collaborations with DFO, ECCC and university partners

2022–2023
Senior Marine Spatial Planning Officer and Science Advisor
Integrated Oceans Management, Ecosystem Management Branch, DFO Pacific
- Co-chaired an intergovernmental technical working group for the Great Bear Sea MPA network

2018–present
PhD Researcher, Global Ocean Modelling Lab (supervisor V. Christensen)
Institute for the Oceans and Fisheries, University of British Columbia
- Funded by NSERC, MITACS, the Pacific Salmon Foundation and DFO through the Salish Sea Marine Survival Project

2021–2022
Researcher and Science Advisor (contract, education leave)
DFO Pacific and Parks Canada
- Studied cross-sectoral data use in fisheries and oceans management; findings were used to brief DFO management
- Updated FIPEX and ran a connectivity analysis of Ontario rivers for Parks Canada

2017–2018
Marine Spatial Planning Advisor
Integrated Oceans Management, Ecosystem Management Branch, DFO Pacific
- Managed technical aspects of MPA network planning for the Northern Shelf Bioregion; science–management liaison

2014–2017
Oceans Biologist
Integrated Oceans Management, Ecosystem Management Branch, DFO Pacific

2013–2014 **GIS Specialist and Programmer**
Oceans & Coastal Management Division, DFO Maritimes

EDUCATION

expected 2026 **PhD, Oceans and Fisheries (ecosystem modelling)**, University of British Columbia
End-to-end spatial ecosystem modelling of the Strait of Georgia. Supervisor: Villy Christensen

2013 **Master of Environmental Studies**, Dalhousie University
Spatial optimisation of river restoration planning

2007 **Advanced Diploma, Geographic Information Systems**, Nova Scotia Community College (COGS)

2004 **BSc, Environmental Science (Ecology)**, University of Guelph

AWARDS, FELLOWSHIPS & FUNDING

2024 BC Premier's Award (team), Great Bear Sea MPA Network

2023 DFO Prix d'Excellence (team), Great Bear Sea MPA Network

2024–2025 DFO Competitive Science Research Fund (CSRF), integrated ecosystem modelling

2020 UBC President's Academic Excellence Initiative PhD Award

2019–2021 UBC Ocean Leaders Award & Fellowship

2018–2021 MITACS Accelerate PhD Fellowship

2018–2020 UBC Faculty of Science PhD Tuition Award

2018 UBC Faculty of Science Graduate Award

2013–2014 Centre for Art Tapes New Media Arts Scholarship

2010 Neil Munro Parks & Protected Areas Award

2009–2011 NSERC Industrial Postgraduate Scholarship

2007 ESRI Canada Scholarship

PRESENTATIONS

Invited talks, panels & expert testimony

Jun 2026 What can ocean-ecosystem simulations tell us about long-term environmental change in the Strait of Georgia? *Sunshine Coast Ocean Festival (public talk)*, Sechelt, BC.

May 2026 Science, power, and decision-making. *Reimagining the Future of Oceans and Fisheries: UBC Institute for the Oceans and Fisheries 10th Anniversary Symposium (moderator: Nathan Bennett, WWF)*, Vancouver, BC.

Jan 2025 Insights from 'end-to-end' ecosystem modelling of the Strait of Georgia. *Salish Sea Science Roundtable, Puget Sound Institute (University of Washington), co-hosted with Fisheries and Oceans Canada*, Online.

May 2022 Expert witness, study of "Science at the Department of Fisheries and Oceans". *House of Commons Standing Committee on Fisheries and Oceans (FOPO), 44th Parliament, Meeting 21*, Ottawa, ON.

Mar 2021 Evaluating Chinook and coho marine survival hypotheses using a spatially resolved end-to-end model for the central and northern Salish Sea. *NOAA WRAP Workshop*, Online.

Jan 2021 Approaches to salmon life history modelling: an overview of Ecopath-Ecosim-Ecospace. *North Pacific Anadromous Fish Commission, International Year of the Salmon, Salmonscape Workshop Series*, Online.

Conference, workshop & seminar presentations

Mar 2025	A look at spring bloom timing in the Strait of Georgia (1980–2018) in 2D: evaluation of a NEMO-Ecospace model framework. *DFO–UBC Modelling Group*, Vancouver, BC.
Mar 2025	Supporting the Salish Sea Marine Survival Project and future research: the NEMO-Ecospace end-to-end model. *American Fisheries Society, WA-BC Chapter Meeting*, Vancouver, BC.
Jun 2024	No biogeochemical model? No problem! Using Ecospace in lieu of a biogeochemical model in the Salish Sea. *Ecopath 40 Years Conference*, Ostend, Belgium.
Mar 2024	HOTSSea v1: a NEMO-based 3D physical hindcast of the Salish Sea supporting ecosystem model development and Pacific salmon research. *State of the Pacific Ocean (SOPO) meeting, Fisheries and Oceans Canada*, Sidney, BC.
Feb 2024	Physics to fisheries: multipurpose 'end-to-end' ecosystem model development for the Salish Sea. *Pacific Salmon Foundation, Science Team*, Vancouver, BC.
Dec 2023	Ecosystem modelling in support of marine spatial planning, conservation planning and ecosystem-based fisheries and oceans management. *Salish Sea Science Updates (Canadian federal)*, Vancouver, BC.
May 2023	Investigating decadal-scale changes affecting juvenile coho and Chinook survival in the Strait of Georgia using the SS1500 end-to-end model. *Salish Sea Marine Survival Project Transboundary Workshop*, Bellingham, WA.
Sep 2022	An overview of recent work with hatchery data to support research on early marine salmon survival. *DFO Salmonid Enhancement Program, PSSI Hatchery Renewal managers*, Vancouver, BC.
Jun 2022	NEMO-Ecospace-1500: an end-to-end ecosystem model for the Strait of Georgia. *Pacific Salmon Foundation staff retreat*, Cowichan, BC.
Feb 2022	Are predators to blame? Using integrative ecosystem modelling to investigate early marine survival of coho and Chinook salmon in the Salish Sea. *Canadian Conference for Fisheries Research (CCFFR)*, Vancouver, BC.
Feb 2022	River connectivity from a fish's perspective: modifying the Dendritic Connectivity Index with distance limitations. *Canadian Conference for Fisheries Research (CCFFR)*, Vancouver, BC.
Jan 2022	Three lines of research into long-term marine ecosystem change in the Salish Sea. *DFO Pacific Aquatic Ecosystem and Marine Mammal Science Section*, Vancouver, BC.
Dec 2021	Pacific salmon from freshwater to the ocean: integrating knowledge on the early marine life history. *UBC Institute for the Oceans and Fisheries Seminar*, Vancouver, BC.
Nov 2020	Modelling long-term ecosystem and productivity change in the Strait of Georgia pelagic zone. *UBC IOF Quantitative Modelling Group Seminar Series*, Vancouver, BC.
Feb 2020	Evaluating marine survival hypotheses using a spatially resolved end-to-end model for the Strait of Georgia. *Salish Sea Marine Survival Project, Bottom-up Working Group*, Victoria, BC.
Dec 2019	Whodunnit? The case of the dying salmon in the Salish Sea (an investigation using an end-to-end ecosystem model). *Ecopath 35 Years International Conference*, St. Petersburg, FL.
Oct 2019	Seals may not increase exploitable biomass in the Salish Sea: steps towards a new E2E ecosystem model. *Salish Sea Marine Survival Juvenile Salmon Workshop*, Victoria, BC.
Jun 2019	Ecosystem models: supporting marine planning and ecosystem-based management. *Fisheries and Oceans Canada*, Vancouver, BC.
Jun 2019	Spatial-temporal fitting for ecosystem models: experiences and observations from Canada. *EwE International Meeting*, Barcelona, Spain.
May 2019	Seals may not increase exploitable biomass in the Salish Sea: steps towards a new E2E ecosystem model. *Salish Sea Marine Survival Pinniped Impact Seminar*, Vancouver, BC.

Apr 2019 Preying on the weak? Possible non-additive effects of seal predation and stress-related mortality in juvenile coho and Chinook in the Salish Sea. *American Fisheries Society, WA-BC Chapter Meeting*, Bremerton, WA.

PUBLICATIONS & RESEARCH OUTPUTS

Peer-reviewed articles & book chapters

Beaty, F., Martone, R. G., Cristiani, J., **Oldford, G.**, Bodtker, K., Robb, C., Rubidge, E., Gale, K., Yang, K., Brown, K. H. T., Schubert, A., & McDougall, C. (2026, in press). Accounting for the effects of levels of protection on ecological representation improves protected area network design. *Ecological Applications*.

Oldford, G., Jarníková, T., Christensen, V., & Dunphy, M. (2025). HOTSSea v1: a NEMO-based physical Hindcast of the Salish Sea (1980–2018) supporting ecosystem model development. *Geoscientific Model Development*, 18(2), 211–237. https://doi.org/10.5194/gmd-18-211-2025

Wiersma, Y. F., Mahlum, S., **Oldford, G.**, Arkilanian, A., Kehler, D., & Cote, D. (2025). Will a fish's perspective improve the ecological relevance of river connectivity metrics? *River Research and Applications*, 41(10), 2248–2259. https://doi.org/10.1002/rra.70028

de Mutsert, K., Coll, M., Steenbeek, J., Ainsworth, C., Buszowski, J., Chagaris, D., Christensen, V., Heymans, S. J. J., Lewis, K. A., Libralato, S., **Oldford, G.**, Piroddi, C., Romagnoni, G., Serpetti, N., Spence, M. A., & Walters, C. (2024). Advances in spatial-temporal coastal and marine ecosystem modeling using Ecospace. *Treatise on Estuarine and Coastal Science (2nd ed.), Elsevier*, 122–169. https://doi.org/10.1016/B978-0-323-90798-9.00035-4

Oldford, G., Cote, D., Kehler, D. G., Riefesel, G. R., & Wiersma, Y. F. (2023). FIPEX v10.4: An ArcGIS Desktop Add-in for assessing impacts of fish passage barriers and longitudinal connectivity of rivers. *SoftwareX*, 23, 101469. https://doi.org/10.1016/j.softx.2023.101469

Couture, F., **Oldford, G.**, Christensen, V., Barrett-Lennard, L., & Walters, C. (2022). Requirements and availability of prey for northeastern Pacific southern resident killer whales. *PLOS ONE*, 17(6), e0270523. https://doi.org/10.1371/journal.pone.0270523

Steenbeek, J., Buszowski, J., Chagaris, D., Christensen, V., Coll, M., Fulton, E. A., Katsanevakis, S., Lewis, K. A., Mazaris, A. D., Macias, D., de Mutsert, K., **Oldford, G.**, Pennino, M. G., Piroddi, C., Romagnoni, G., Serpetti, N., Shin, Y.-J., Spence, M. A., & Stelzenmüller, V. (2021). Making spatial-temporal marine ecosystem modelling better – a perspective. *Environmental Modelling & Software*, 145, 105209. https://doi.org/10.1016/j.envsoft.2021.105209

McKay, S. K., Cooper, A. R., Diebel, M. W., Elkins, D., **Oldford, G.**, Roghair, C., & Wieferich, D. (2017). Informing watershed connectivity barrier prioritization decisions: a synthesis. *River Research and Applications*, 33(6), 847–862. https://doi.org/10.1002/rra.3021

In revision & preprints

Oldford, G., Hunt, B., Walters, C., & Christensen, V. (2026, in revision). Evaluation of a spatial physics-forced EwE model with simple nutrient dynamics.

Finke, J. F., Tai, T. C., Freshwater, C., Connors, B., Holdsworth, A. M., **Oldford, G. L.**, Selbie, D. T., Stiff, H. W., & Thompson, P. L. (2026, preprint). Climate impacts on sockeye salmon productivity vary across life stages and regions. *Preprint*. https://doi.org/10.64898/2026.08.26.746844

Oldford, G., Cote, D., Kehler, D. G., Riefesel, G. R., & Wiersma, Y. F. (2022). FIPEX+DCI v10.4: Bridging network analysis and GIS for river connectivity assessment. *SSRN preprint*. https://doi.org/10.2139/ssrn.4159582

Software, models & data

Edwards, A. M., Tai, T. C., Watson, J., Peña, M. A., Hilborn, A., Hannah, C. G., Rooper, C. N., Flynn, K. L., & **Oldford, G.** (2024). pacea: An R package of Pacific ecosystem information to help facilitate an ecosystem approach to fisheries management. *Zenodo (v1.0.0)*. https://doi.org/10.5281/zenodo.13840804

Oldford, G. (lead developer, 2009–present). FIPEX with the Dendritic Connectivity Index: ArcGIS add-in for river connectivity analysis. https://goldford.github.io/FIPEX_with_DCI_Website/

Reports, theses & other writing

Taft, S., **Oldford, G.**, Lilley, P. L., Oetterich, S. B., Morin, J., George, M., George, M., & Christensen, V. (2022). Reconstructing the pre-European contact shoreline of Burrard Inlet (Vancouver, BC, Canada) using participatory mapping and a two-eyed seeing approach. *Institute for the Oceans and Fisheries Research Reports, University of British Columbia*. link

Brownlee, G., Lang, C., **Oldford, G.**, & Virgen-Urcelay, A. (2020). Technical aspects of marine spatial planning in Burrard Inlet. *Report and story map prepared for Tsleil-Waututh Nation*. link

Oldford, G. (2020). It's time to call out denialism, on racism and on climate change. *Canada's National Observer (opinion), 4 June 2020*. link

Martone, R. G., **Oldford, G.**, McDougall, C., Cristiani, J., Chow, A., Robb, C., Rubidge, E., Gale, K. S. P., Chaves, L., Damjkar, E., Mahaux, P., & Ban, S. (2018). Assessing the contribution of established protected areas towards meeting MPA network objectives in the Northern Shelf Bioregion. *In Chandler, P. C., King, S. A., & Boldt, J. (Eds.), State of the physical, biological and selected fishery resources of Pacific Canadian marine ecosystems in 2017. Canadian Technical Report of Fisheries and Aquatic Sciences*, 3266. link

Oldford, G. (2013). Spatial optimisation of river restoration planning in Nova Scotia, Canada. *Master's thesis, School for Resource and Environmental Studies, Dalhousie University*. link

TEACHING

Guest lectures

Nov 2025	Fisheries data and stock assessment. *EOSC 478: Introduction to Fisheries Science, University of British Columbia*, Vancouver, BC.
Apr 2023	Modelling early marine survival of salmon with Ecosim and foraging arena theory. *FISH 501: Ecosystem Modelling, UBC Institute for the Oceans and Fisheries (instructor V. Christensen)*, Vancouver, BC.
Mar 2022	Towards an end-to-end spatial-temporal EwE model for investigating Pacific salmon early marine survival. *FISH 501: Ecosystem Modelling, UBC Institute for the Oceans and Fisheries*, Vancouver, BC.
Nov 2019	Systematic marine conservation planning: my experience with MPA network planning in Canada's Northern Shelf Bioregion. *FISH 507: Ocean Leaders, UBC Institute for the Oceans and Fisheries*, Vancouver, BC.

Teaching assistant & instructor

2019–2020	Teaching Assistant, Supervised Machine Learning II (DSCI 572) and Data Visualization (DSCI 531). *Master of Data Science, UBC*.
2011	GIS course design and instruction (three tutorials). *Strum Environmental (consulting)*.
2009–2011	Teaching Assistant and GIS lab instructor, Environment & Human Health (ENVS 3400); Intro to Environmental and Resource Management (ENVS 1100); Global Approaches to Environmental Decision Making (SUST 3000). *Dalhousie University*.

SUPERVISION & MENTORING

2024–2025	Hired and supervised a scientist in the Integrated Ecosystem Modelling Program, DFO Pacific
2017–2018	Supervised casual staff on technical analyses for the Northern Shelf Bioregion MPA network, DFO

SERVICE, LEADERSHIP & OUTREACH

2018, 2022	Co-chair, intergovernmental technical working group, Great Bear Sea MPA network (Northern Shelf Bioregion)

2014–present	Steering committee member and subject-matter expert, Canadian Science Advisory Secretariat (CSAS) peer reviews
2026	Participant, DFO Ocean Science Division machine-learning hackathon
2020	UBC Ocean Leaders Fellow
2009–2013	Executive Director, TEDxHalifax
	Assistant Coach, Guelph Special Olympics basketball team

Journal peer review

2026	*Ocean & Coastal Management*
2025	*Canadian Journal of Fisheries and Aquatic Sciences*
2025	Invited to review for *Nature Communications*

TECHNICAL SKILLS

Ecosystem & ocean modelling	Ecopath with Ecosim / Ecospace, NEMO, HPC (Linux), NetCDF, CDO/NCO
Programming & data science	Python, R, Bash, VB.NET, JavaScript; supervised ML, clustering, data wrangling
Geospatial	ArcGIS, QGIS, GeoPandas, geostatistics, cartography, ISO 19115 metadata
Visualization	Matplotlib, ggplot2, Plotly/Dash, D3.js, WebGL
Science advice	Briefings to senior management, CSAS processes, collaboration with First Nations, provinces and stakeholders

References available on request · Updated Nov 2026