

## UNIVERSITY OF VICTORIA - CURRICULUM VITAE

Last Update: January 2023

Name: Mark Lewis

Faculty: Science

Department: Mathematics and Statistics / Biology

### 1. EDUCATION and TRAINING

<u>Degree</u>	<u>Institution</u>	<u>Year obtained</u>
PhD in Mathematics (Mathematical Biology)	University of Oxford	1990
BSc Double Major in Biology and Combined Mathematics/Computer Science	University of Victoria	1987

### Postdoctoral experience

### 2. POSITIONS HELD PRIOR to APPOINTMENT at UVic

07/2001 – 06/2022 - *Professor and Senior Canada Research Chair in Mathematical Biology*  
Department of Mathematical and Statistical Sciences and Department of Biological Sciences, University of Alberta.

01/2002-08/2017 - *Director, Centre for Mathematical Biology*, University of Alberta

07/2012-06/2014- *Killam Research Fellow*, University of Alberta

09/2011-12/2011 - *Research Fellow*, Oxford Centre for Collaborative Applied Mathematics

10/2011-12/2011 – *Visiting Fellow*, Saint Catherine's College, Oxford

07/2000-02/2002 – *Professor*, Department of Mathematics, University of Utah.

07/1995-07-2000 - *Associate Professor*, Department of Mathematics, University of Utah.

05/1995–06/2002 - *Adjunct Faculty*  
Department of Biology, University of Utah.

07/1993–present - *Affiliate Faculty*, Department of Applied Mathematics, University of Washington, Seattle.

04/1999–07/1999 - *Senior Visitor*, Institute for Industrial and Applied Mathematics, University of Minnesota.

09/1998–12/1998 - *Research Fellow*, Centre for Population Biology at Silwood Park, Imperial College, University of London.

1995 winter - *Visiting Fellow*, Department of Ecology and Evolution, Princeton University (Sloan Research Fellow).

08/1992-06/1995 - *Assistant Professor*, Department of Mathematics, University of Utah

01/1991–07/1992 - *Research Associate*, Mathematical Biology, jointly with the departments of Applied Mathematics and Zoology, University of Washington, working with Professors J.D. Murray and P. Kareiva, and supported by an NSERC of Canada Postdoctoral Fellowship Award.

### 3. APPOINTMENTS at the UNIVERSITY of VICTORIA

<u>Period</u>	<u>Rank</u>	<u>Academic unit</u>
07/2022-Present	Gilbert and Betty Kennedy Chair in Mathematical Biology	Mathematics and Statistics / Biology

#### 4. MAJOR FIELD(S) of SCHOLARLY or PROFESSIONAL INTEREST

mathematical biology, dynamical systems, ecology, biological invasions, wildlife disease

#### 5. RESEARCH GRANTS and FELLOWSHIPS

##### a. Research operating grants

<b>Agency</b>	<b>Title</b>	<b>Grant holders (indicate PI)</b>	<b>Time period</b>	<b>Amount awarded per annum to me</b>
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##### Current

*University of Victoria*, Start-up Grant, 2022, Award Amount \$150,000

*Alberta Jobs, Economy and Innovation (JEI)*, The Banff International Research Station for Mathematical Innovation and Discovery (BIRS), 2022-2027 (Malabika Pramanik PI) Award Amount Not yet released (confidential)

*Natural Sciences and Engineering Research Council of Canada*, The Banff International Research Station for Mathematical Innovation and Discovery (BIRS), 2022-2027 (Malabika Pramanik PI) Award Amount Not yet released (confidential)

*MITACS Accelerate* Modelling long term dynamics of Mountain Pine Beetle under climate change. 2023-2025, Award Amount \$155,430

*Alberta Innovates – CWD Research Program* Addressing mule deer harvest strategies for Chronic Wasting Disease management using an Integrative Population Model 2023-2025 (Evelyn Merrill, PI) Award Amount \$248,526

*North Island Marine Mammal Stewardship Assoc. (NIMMSA)* Investigating the population biology of spot prawns (*Pandalus platyceros*) in the Northeast Vancouver Island, Broughton Archipelago, and mainland inlets 2022-2023, Award Amount \$7,500

*fRI Research*, Modelling long-term dynamics of MPB in Alberta under climate change 2022-2024, Award Amount \$109,101.60

*New Frontiers in Research Fund (NFRF) – Rapid Response 2021*, Developing rapid response to emerging fisheries issues with citizen science, mobile apps and machine learning 2022-2024, Award Amount \$237,970

*Department of Fisheries and Oceans*, Improving the biological understanding and management of a trap fishery in British Columbia 2021-2023, Award Amount \$9,200

*Pacific Prawn Fisherman's Association*, Improving the biological understanding and management of a trap fishery in British Columbia 2021-2023, Award Amount \$12,000

*Natural Sciences and Engineering Research Council of Canada, Alliance Grants (ALLRP)*, Improving the biological understanding and management of a trap fishery in British Columbia 2021-2023, Award Amount \$20,000

*Genome Canada, LSARP, TRIA-FoR: Transformative risk assessment and forest resilience using genomic tools for mountain pine beetle outbreak 2021-2025 (Janice Cooke and Catherine Cullingham, PI) Award Amount \$6,433,628*

*Natural Sciences and Engineering Research Council of Canada, EIDM, Canadian network for modelling infectious disease 2021-2023 (Caroline Colijn, PI), Award Amount \$2,500,000*

*Natural Sciences and Engineering Research Council of Canada, EIDM, One health modelling network for emerging infections 2021-2023 (Huaiping Zhu, PI), Award Amount \$2,500,000*

*Natural Science and Engineering Research Council of Canada, Spatial Dynamics in Ecology 2018-2024, Award amount: \$702,000 (\$117,000 per annum, 6 years).*

#### Past

*Canada Research Chairs Program - University of Alberta, Canada Research Chair in Mathematical Biology (Tier I) 2015-2022. Award Amount: \$1,400,000 (\$200,000 per annum).*

*Faculty of Science – University of Alberta, CRC Research Support, 2015-2022. Award Amount \$140,000 (\$20,000 per annum)*

*The Pacific Institute for the Mathematical Sciences (PIMS), Mathematical Biology Seminar Funding 2020-2021 (Jay Newby, PI) Award Amount \$4,000*

*Alberta Innovates (COVID 19 Rapid Response II - Alberta Wave), Predicting and managing COVID-19 pandemic dynamics using machine learning 2020-2021, Award Amount \$220,545.*

*Canadian Foundation for Innovation (Infrastructure Operating Fund), Assessment and analysis of ecological dynamics under environmental change, 2016-2021, Award Amount \$38,765*

*Alberta Innovates Bio Solution/Alberta Prion Research Institute (APRI), Quantifying contact rates for modelling CWD transmission in wild mule deer populations, 2017-2021, (Evelyn Merrill PI) Award Amount \$302,857*

*Wildlife Management Institute (WMI), Modeling Spatial Harvest Strategies for Chronic Wasting Disease Transmission, 2019-2020 (Evelyn Merrill PI) Award Amount \$25,891 USD*

*Alberta Environment and Parks, Belief Network and Decision Network Modeling of Whirling Disease in Alberta, 2017-2021, Award Amount \$178,800.*

*Alberta Environment and Parks, Assessing the movement and behavior of anglers and the risk of spreading whirling disease, 2019-2020, (Mark Poesch and Mark Lewis PIs), Award Amount \$129,690.*

*Natural Sciences and Engineering Research Council of Canada, CTRMS, The Banff International Research Station for Mathematical Innovation and Discovery (BIRS), 2016-2020 (Nassif Ghoussoub PI) Award Amount \$3,405,000.*

*Alberta Innovation and Advanced Education, Banff International Research Station for Mathematical Innovation and Discovery (BIRS), 2016-2020 (Nassif Ghoussoub PI) Award Amount \$4,042,918.*

*Natural Sciences and Engineering Research Council of Canada, CTRMS, The Pacific Institute for the Mathematical Sciences (PIMS), 2014-2020 (Alejandro Adem PI) Award Amount \$6,930,536.*

*Natural Science and Engineering Research Council of Canada Collaborative Research and Training Experience (CREATE)*, Enhancing Canada's Prosperity through Innovative Environmental Assessment, Monitoring and Management, 2014-2020 (Stan Boutin PI) Award amount \$1,650,000.

*Alberta Environment and Parks*, A statistical approach for assessing errors in greenhouse gas flux measurements from mineable and in situ oil sands development, 2018-2019, Award Amount \$20,000.

*Alberta Conservation Association* Cyanobacterial Blooms and their Toxic Effects on Fish Populations, 2018-2019, (Hao Wang, PI) Award Amount \$26,000

*Natural Sciences and Engineering Research Council of Canada Strategic Network Grants Program and Partners*, The NSERC TRIA Network: Turning risk into action for the Mountain Pine Beetle epidemic, 2013-2017 (Janice Cooke PI). Award amount \$2,977,148.

*Natural Science and Engineering Research Council of Canada*, Spatial Dynamics in Ecology 2011–2018. Award amount: \$553,000 (\$79,000 per annum).

*Alberta Innovates Bio Solution, Alberta Prion Research Institute (APRI)*, Experimental harvests for chronic wasting disease (CWD) control in wild Cervids, 2014-2016 (Evelyn Merrill PI) Award Amount \$457,757.

*Alberta Innovates and Advanced Education*, The Pacific Institute for the Mathematical Sciences (PIMS), 2014-2016 (Alejandro Adem PI) Award Amount \$1,350,000.

*University of Alberta Provost's Digital Learning Committee*, Blended Learning Award for Calculus in the Life Sciences I, 2015-2016 (Gerda Devries PI) Award Amount \$20,650.

*Natural Sciences and Engineering Research Council of Canada Strategic Network Grants Program and Partners*, Canadian Aquatic Invasive Species Network II, 2011-2015 (Hugh MacIsaac PI). Award amount \$6,557,500.

*Oil Sands Research and Information Network (OSRIN)*, Modelling and assessing the impact of oil sands contaminants on aquatic food webs, 2014, Award amount \$25,000

*Alberta Innovates Bio Solutions, Value Chain Sustainability program*, Translating Mountain Pine Beetle Outputs into Genomics-Enhanced Environmental and Economic Risk Models. 2012-2015 (Janice Cooke PI). Award amount: \$398,000 (\$199,000 from Genome Alberta and \$199,000 from Alberta Innovates Bio Solutions).

*Canada Council for the Arts*, Killam Research Fellowship 2012-2014, Award amount: \$140,000 (\$70,000 per annum).

*Killam Research Fellowship (Canada Council for the Arts)*, Research Supplement, Faculty of Science, University of Alberta, 2012-2014. Award Amount: \$25,000.

*Killam Research Fellowship (Canada Council for the Arts)*, Research Supplement, Office of the Vice President of Research, University of Alberta, 2012-2014. Award amount: \$50,000 (\$25,000 per annum).

*Canada Research Chairs Program (University of Alberta)*, Canada Research Chair in Mathematical Biology (Tier I) 2008-2015. Award Amount: \$1,400,000 (\$200,000 per annum).

*Natural Science and Engineering Research Council of Canada*, Discovery Accelerator, 2011–2014. Award amount: \$120,000 (\$40,000 per annum).

*Natural Science and Engineering Research Council of Canada, Major Resources Support*, Pacific Institute for Mathematical Sciences 2008–2014 (PI Ivar Ekeland). Award amount: \$6,600,000.

*Alberta Advanced Education and Technology*, Pacific Institute for Mathematical Sciences 2010-2013 (Alejandro Adem PI) Award amount: \$1,200,000.

*Pacific Institute for Math Sciences (PIMS), Scientific Events, Math Biology Summer Workshop 2010* (Gerda de Vries PI). Award Amount \$5,000.

*Natural Sciences and Engineering Research Council of Canada (RTI), University of Alberta PIMS Collaborative Research Environment 2010-2011* (Charles Doran PI), Award Amount \$23,630.

*Alberta Prion Research Institute, Decision support tools for Chronic Wasting Diseases 2009-2011* (Evelyn Merrill PI). Award Amount \$117,878.

*Alberta Heritage Foundation for Science and Engineering, Alberta Water Research Institute 2009-2011* (Ed McCauley PI) Amount: \$1,623,000.

*Canadian Aquatic Invasive Species Network, Travel (SNEI), Mechanistic model for *Bythotrephes* 2009*. Award Amount: \$2,100.

*Alberta Sustainable Resource Development, Instream flow needs: an ecologically dynamic approach 2008-2011*. Award amount \$60,000.

*BC Pacific Salmon Forum, Estimating sea lice transmission from farm to wild juvenile salmon 2007-2008* (coPI Martin Krkošek). Award amount \$20,000.

*BC Pacific Salmon Forum, Survival and predation field experiments 2007-2008* (coPI Martin Krkošek). Award amount \$19,900.

*University of Alberta, McCalla Funding, 2007-2009*. Award Amount \$24,000.

*University of Alberta, Centre for Mathematical Biology 2006-2011*. Award Amount: \$352,100.

*Natural Science and Engineering Research Council of Canada, Spatial Dynamics in Ecology 2006–2011*. Award amount: \$259,000 (\$51,800 per annum).

*Natural Science and Engineering Research Council of Canada, Canadian Aquatic Invasive Species Network 2006–2011* (Hugh MacIsaac PI). Award amount: \$3,781,944.

*Mathematics of Information Technology and Complex Systems, MITACS Industry, 2004-2009*. Award amount: \$120,837.

*Natural Resources Canada Mountain Pine Beetle Initiative, Modeling Spatiotemporal patterns of MPB infestation 2004–2007* (CoPI Fangliang He). Award amount: \$394,090.

*MITACS - Networks of Centres of Excellence, Network for Biological Invasions and Dispersal Research 2003–2010* (J. Watmough PI). Award amount from NCE (not including matching from nonacademic participants). Award amount: \$690,000.

*Natural Sciences and Engineering Research Council of Canada, Collaborative Research Opportunities Grant: Ecological Forecasting and Risk Analysis of Nonindigenous Species. April 2003–April 2007* (CoPI Hugh MacIsaac). Award amount: \$685,292.

*National Science Foundation, University of Notre Dame subcontract, Ecological Forecasting and Risk Analysis of Nonindigenous Species. September 2002–September 2007. Award amount: \$75,000.*

*Natural Sciences and Engineering Research Council of Canada, Models for dispersal in spatial ecology. April 2002–April 2006. Award amount: \$180,000 (\$45,000 per annum).*

*Endowment Fund for the Future, University of Alberta, Distinguished visitor fund. February 2002–April 2002 (CoPI Thomas Hillen). Total Award amount: \$8,836.*

*University of Alberta, Faculty of Science, New appointment supplement, 2001-2005. Award amount: \$310,000.*

*Canada Research Chair in Mathematical Biology, Chair’s Fund for Research. University of Alberta, July 2001–July 2008. Award amount: \$483,000.*

*National Science Foundation, Mathematical Sciences: International Conference on Mathematics in Biology at the University of Utah, August 2000. Total Award amount: US\$13,000.*

*National Science Foundation, Mathematical Sciences: Discrete-time models for biological invasions, August 1999 — July 2002. Award is joint with M. Neubert, M. Kot and B. Fagan. Total Award amount: \$380,000.00. Utah portion: US\$127,500.*

*National Science Foundation, Mathematical Sciences: Gordon Research Conference on Theoretical Biology and Biomathematics, June 1998. Award is joint with J. Milton. Award amount: US\$19,296.*

*Funding Incentive Seed Grant Program, University of Utah, Fluid flow model for optimizing high-frequency ventilation of the lung, April 1997 – September 1998. CoPIs D. Eyre, A. Fogelson, and S. Kern. Award amount: US\$35,000.*

*National Science Foundation, Mathematical Sciences: Special Year in Mathematical Biology 1995-1996. Award is joint with H. Othmer and F. Adler. Award amount: US\$309,124.*

*Alfred P. Sloan Research Fellowship, Mathematics: June 1994–September 1996. Award amount: US\$30,000.*

*National Science Foundation National Young Investigator Award: October 1994 – July 2000. Award amount: US\$187,802.*

*National Science Foundation, Mathematical Sciences: Modelling Territorial Patterns and Stability of Wolf-Deer Interactions, September 1992 – August 1995. Award amount: US\$124,380.*

*Environmental Protection Agency: Developing Guidelines for the Assessment of “Spread Risk” Using Microbe Field Trial Data: A Model Based Approach, September 1992 – August 1994. Award joint with P. Kareiva (project manager) and J.D. Murray. Award amount: US\$163,858.*

#### **b. Equipment grants**

<b><u>Agency</u></b>	<b><u>Equipment</u></b>	<b><u>Grant holders</u></b>	<b><u>Year</u></b>	<b><u>Amount awarded</u></b>
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*Canadian Foundation for Innovation (John Evans Leadership Fund)*, Assessment and analysis of ecological dynamics under environmental change, 2014-2018, Award Amount \$155,059.

*Alberta Innovation and Advanced Education*, Assessment and analysis of ecological dynamics under environmental change, 2014-2018, Award Amount \$155,059.

*Natural Sciences and Engineering Research Council of Canada, Research Tools and Instruments (RTI) Category 1*, Biotelemetry System: Infrastructure for assessing disease transmission in wildlife, 2014 (Evelyn Merrill PI) Award amount \$150,000.

*Innovation and Science Research Investments Program*, Research Program in Mathematical Biology and Centre for Mathematical Biology at the University of Alberta, July 2001. Total Award amount: \$95,000.

*Canadian Foundation for Innovation*, Research Program in Mathematical Biology and Centre for Mathematical Biology at the University of Alberta, July 2001. Total Award amount: \$95,000.

### **c. Honours, fellowships, and scholarships**

- Alfred P. Sloan Research Fellowship, June 1994–September 1996;
- National Young Investigator Award (NSF), October 1994–September 1999;
- University of Utah Faculty Fellowship, April 1998–June 1998;
- Tier 1 Canada Research Chair in Mathematical Biology (renewed twice), July 2001–2022;
- Killam Annual Professorship (Alberta), 2006–7;
- American Society of Naturalists Presidential Award, 2006;
- McCalla Professorship (Alberta), 2007–8;
- Lee Segel Prize for Best Original Research Paper, 2008;
- Canadian Applied and Industrial Mathematics Society Research Prize, 2009;
- CRM-Fields-PIMS Prize for Exceptional Research in Mathematics, 2011;
- Fields Institute Fellow, 2011-present;
- NSERC Discovery Accelerator, 2011-14;
- University of Victoria Distinguished Alumni Award, 2012;
- Killam Research Fellowship, July 2012–June 2014;
- Alberta Science and Technology (ASTech) Honouree, 2012;
- Fellow of the Royal Society of Canada, 2015;
- Fellow of the Society for Industrial and Applied Mathematics, 2017;
- Fellow of the Society for Mathematical Biology, 2017;
- Fellow of the Canadian Mathematical Society, 2018;
- J. Gordin Kaplan Award for Excellence in Research, 2020
- Gilbert and Betty Kennedy Chair in Mathematical Biology, 2022

## **6. PUBLICATIONS and PRESENTATIONS**

**a. Articles published in refereed journals** (list all articles published, accepted for publication, in press, or submitted; include reviews)

1. **Harrington, P.D.**, Cantrell, D.L, Foreman M.G.G., Guo, M., Lewis M.A. (2022) Calculating the timing and probability of arrival for sea lice dispersing between salmon farms, In Press at *Royal Society Interface* <https://arxiv.org/abs/2206.07187>

2. **Fischer, S., Ramazi, P.,** Simmons, S., Poesch, M., Lewis, M.A (2022) Boosting propagule transport models with individual-specific data from mobile apps. In Press at *Journal of Applied Ecology*, <https://arxiv.org/abs/2105.14284>.
3. **Giunta, V.,** Hillen, T., Lewis, M.A., Potts, J.R. (2022) Detecting minimum energy states and multi-stability in nonlocal advection-diffusion models for interacting species. *Journal of Mathematical Biology*. 85: 56 <https://doi.org/10.1007/s00285-022-01824-1>
4. **Wang, X.,** Wang, H., **Ramazi, P., Nah, K.,** Lewis, M.A. (2022) From policy to prediction: Forecasting COVID-19 dynamics under imperfect vaccination. In press at *Bulletin of Mathematical Biology*.
5. **Thompson, P.R.,** Lewis, M.A., Edwards, M.A., Derocher, A.E. (2022) Time-dependent memory and individual variation in Arctic brown bears (*Ursus arctos*). *Movement Ecology* 10:18 <https://doi.org/10.1186/s40462-022-00319-4>.
6. Hamelin, F., Mammeri, Y., Aigu, Y., Strelkov, S.E., Lewis, M.A. (2022) Host diversification may split epidemic spread into two successive fronts advancing at different speeds. *Bulletin of Mathematical Biology* 84:68 <https://doi.org/10.1007/s11538-022-01023-5>.
7. **Xu, J.,** Merrill, E., Lewis, M.A. (2022) Spreading speed of chronic wasting disease across deer groups with overlapping home ranges. *Journal of Theoretical Biology* 547: 111135 <https://doi.org/10.1016/j.jtbi.2022.111135>.
8. **Klappstein, N.J.,** Potts, J., Michelot, T., Borger, L., Pilfold, N., Lewis, M.A., Derocher, A. (2022) Energy-based step selection analysis: modelling the energetic drivers of animal movement and habitat use *Journal of Animal Ecology* 91(5): 946-957 <https://doi.org/10.1111/1365-2656.13687>
9. **Wang, X.,** Wang, H., **Ramazi, P., Nah, K.,** Lewis, M.A. (2022) A hypothesis-free bridging of disease dynamics and non-pharmaceutical policies. *Bulletin of Mathematical Biology* 8:57 <https://doi.org/10.1007/s11538-022-01012-8>
10. Potts, J.R., **Giunta, V.,** Lewis, M.A. (2022) Beyond resource selection: emergent spatio-temporal distributions from animal movements and stigmertgent interactions *Oikos* e09188 <https://doi.org/10.1101/2022.02.28.482253>
11. **Giunta, V.,** Hillen, T., Lewis, M.A., Potts, J.R. (2022) Local and Global Existence for Non-local Multi-Species Advection-Diffusion Models. *SIAM Journal on Dynamical Systems* 21(3): [10.1137/21M1425992](https://arxiv.org/abs/2106.06383) <https://arxiv.org/abs/2106.06383>
12. Feng, C., Lewis, M.A., Wang, C., Wang, H. (2022) A Fisher-KPP model with nonlocal free boundary. *Bulletin of Mathematical Biology* 84:34
13. **Feng, S.,** Luo, X., Pei, X., Lewis, M.A., Wang, H. (2022) Modeling the early transmission of COVID-19 in New York and San Francisco using a pairwise network model. *Infectious Disease Modeling* 7(1): 212-230 <https://doi.org/10.1016/j.idm.2021.12.009>
14. **Heggerud, C.M.,** Wang, H., Lewis, M.A. (2021) Coupling the socio-economic and ecological dynamics of cyanobacteria: single lake and network dynamics. *Ecological Economics*. 194:107324 <https://doi.org/10.1016/j.ecolecon.2021.107324>
15. **Harrington, P.D.,** Lewis, M.A., van den Driessche, P. (2021) Reactivity, Attenuation, and Transients in Metapopulations. *SIAM J. Applied Dynamical Systems*. 21(2): 1287-1321 <https://doi.org/10.1137/21M140451X>
16. **Thompson, P.R.,** Derocher, A.E., Edwards, M.A., Lewis, M.A. (2021) Detecting seasonal episodic-like spatio-temporal memory patterns using animal movement modelling. *Methods of Ecology and Evolution* 13(1): 105-120 <https://doi.org/10.1111/2041-210X.13743>
17. **Ramazi, P.,** Haratian, A., Meghdadi, M., Mari Oriyad, A., Lewis, M.A., Maleki, Z., Vega, R., Wang, H., Wishart, D., Greiner, R. (2021) Accurate long-range forecasting of COVID-19 mortality in the USA *Scientific Reports* 11:13822 <https://doi.org/10.1038/s41598-021-91365-2>
18. Hassanzadeh Keshteli, A., Allen, D., Anjum, A., Patel, Y., Sivakumaran, A., Tian, S., Wang, F., Wang, H., Lewis, M.A., Greiner, R., Wishart, D. (2021) The longitudinal dataset of incidence and intervention policy impacts regarding the COVID-19 pandemic in Canadian provinces. *Data in Brief* 38:107381 <https://doi.org/10.1016/j.dib.2021.107381>
19. **Ramazi, P., Fisher, S.M.,** Alexander, J., James, C.T., Paul, A., Greiner, R., and Lewis, M.A. (2022) *Myxobolus cerebralis* establishment and spread: a graphical synthesis. *Canadian Journal of Fisheries and Aquatic Sciences* 79(4):677-691 <https://doi.org/10.1139/cjfas-2020-0352>



20. Haratian, A., Fazelinia, H., Maleki, Z, **Ramazi, P.**, Wang, H., Lewis, M.A., Greiner, R., Wishart, D. (2021) Dataset of COVID-19 outbreak and potential predictive features in the USA. *Data in Brief* 38: 107360 <https://doi.org/10.1016/j.dib.2021.107360>
21. Lewis, M.A., Fagan, W., Auger-Méthé, M., Frair, J., Fryxell, J., Gros, C., Gurarie, E., Healy, S., Merkle, J. (2021) Learning and animal movement. *Frontiers in Ecology and Evolution* 9:681704 doi: 10.3389/fevo.2021.681704
22. **Ramazi, P., Kunegel-Lion, M.**, Greiner, R., Lewis, M.A. (2021) Predicting insect outbreaks using machine learning, *Ecology and Evolution* 11(19):13014-13028 <http://doi.org/10.1002/ece3.7921>
23. **Koch, D.**, Lele, S., Lewis, M.A. (2021) The signature of endemic populations in the spread of mountain pine beetle outbreaks. *Bulletin of Mathematical Biology* 83: 65. <https://doi.org/10.1007/s11538-021-00899-z>
24. **Nagy-Reis, M.B., Reimer, J.**, Lewis, M.A., Jensen, W.F., Boyce, M.S. (2021) Aligning Population Models with Data: Adaptive Management for big game harvests. *Global Ecology and Conservation* 26: e01501. <https://doi.org/10.1016/j.gecco.2021.e01501>
25. **Fischer, S.M.**, Lewis, M.A (2021) A Robust and Efficient Algorithm to Find Profile Likelihood Confidence Intervals. *Statistics and Computing* 31: 38. <https://doi.org/10.1007/s11222-021-10012-y>
26. **Fischer, S.M.**, Beck, M., Herborg, L.-M., and Lewis, M.A. (2021) Managing Aquatic Invasions: Optimal Locations and Operating Times for Watercraft Inspection Stations. *Journal of Environmental Management* 283: 111923. <https://doi.org/10.1016/j.jenvman.2020.111923>
27. **Ramazi, P., Kunegel-Lion, M.**, Greiner, R., Lewis, M.A. (2021) Exploiting the Full Potential of Bayesian Networks in Predictive Ecology. *Methods in Ecology and Evolution*, 12(1): 135-149. <https://doi.org/10.1111/2041-210X.13509>
28. **Koch, D.**, Lele, S., Lewis, M.A. (2020) A unifying theory for 2D spatial redistribution kernels with applications to model-fitting in ecology. *Journal of the Royal Society Interface*, 17(170): 20200434m. <https://doi.org/10.1098/rsif.2020.0434>
29. **Koch, D.**, Lele, S., Lewis, M.A. (2020) Computationally Simple Anisotropic Lattice Covariograms. *Environmental and Ecological Statistics*, 27: 665-688. <https://doi.org/10.1007/s10651-020-00456-2>
30. Miller, T.E.X., Angert, A.L., Brown, C.D., Lee-Yaw, J.A., Lewis, M.A., Lutscher, F., **Marculis, N.**, Melbourne, B., Shaw, A.K., Szűcs, O.T., Usui, T., Weiss-Lehman, C., Williams, J.L. (2020) The eco-evolutionary dynamics of range expansion. *Ecology*, 101(10): e03139. <https://doi.org/10.1002/ecy.3139>
31. **Fischer, S.M.**, Beck, M., Herborg, L.-M., and Lewis, M.A. (2020) A hybrid gravity and route choice model to assess vector traffic in large-scale road networks. *Royal Society Open Science*, 7(5): 191858. <https://doi.org/10.1098/rsos.191858>
32. Peacock, S.J., Krkošek, M., Lewis, M.A., Molnár, P.K. (2020) A unifying framework for the transient parasite dynamics of migratory hosts. *Proceedings of the National Academy of Sciences*, 117(20): 10897-10903. <https://doi.org/10.1073/pnas.1908777117>
33. **Marculis, N.G.**, Evenden, M.L., Lewis, M.A. (2020) Modeling the dispersal-reproduction trade-off in an expanding population. *Theoretical Population Biology*, 134:147-159. <https://doi.org/10.1016/j.tpb.2020.03.003>
34. **Heggerud, C.M.**, Wang, H., Lewis, M.A. (2020) Transient dynamics of a stoichiometric cyanobacteria model via multiple-scale analysis. *SIAM Journal on Applied Math*, 80(3): 1223-1246. <https://doi.org/10.1137/19M1251217>
35. **Kunegel-Lion, M.**, Lewis, M.A, 2020. Factors governing outbreak dynamics in a forest intensively managed for mountain pine beetle. *Scientific Reports*, 10, 7601. <https://doi.org/10.1038/s41598-020-63388-8>
36. **Kunegel-Lion, M.**, McIntosh, R.L., Lewis, M.A. (2020) Dataset of mountain pine beetle outbreak dynamics and direct control in Cypress Hills, SK. *Data in Brief*, 29: 105293. <https://doi.org/10.1016/j.dib.2020.105293>
37. **Bateman, A., Peacock, S.J.**, Krkošek, M., Lewis, M.A. (2020) Migratory hosts can maintain the high-dose refuge effect in a structured host-parasite system: the case of sea lice and salmon. *Evolutionary Applications*, 13(10): 2521-2523. <https://doi.org/10.1111/eva.12984>
38. **Kunegel-Lion, M.**, Lewis, M.A. (2020) Mountain pine beetle outbreak duration and pine mortality depend on direct control effort. *Journal of Environmental Management*, 260: 110167. <https://doi.org/10.1016/j.jenvman.2020.110167>

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257. Grindrod, P., Lewis, M.A., Murray, J.D. (1991) A geometrical approach to wave-type solutions of excitable reaction-diffusion systems. *Proceedings of the Royal Society of London, A*, **433(1887)**: 151-164. <https://doi.org/10.1098/rspa.1991.0040>
258. Hethcote, H.W., Lewis, M.A., van den Driessche, P. (1989) An epidemiological model with a delay and nonlinear incidence rate. *Journal of Mathematical Biology*, **27(1)**: 49-64. <https://doi.org/10.1007/BF00276080>

**b. Refereed conference proceedings** (note item 6e)

**c. Books and chapters in books** (indicate whether published, accepted for publication, or submitted)

**Books:**

259. Bianchi, A., Hillen, T., Lewis, M.A., Yi, Y. (2019) *The Dynamics of Biological Systems*, Springer-Verlag.
260. Lewis, M.A., Petrovskii, S., Potts, J. (2016) *Mathematics Behind Biological Invasions*, Springer-Verlag.
261. Lewis, M.A., Maini, P.K., Petrovskii, S. (2012) *Dispersal, Individual Movement and Spatial Ecology: A Mathematical Perspective*, Springer-Verlag.
262. Lewis, M.A., Chaplain, M.A.J., Keener, J.P., Maini, P.K. (2009). *Mathematical Biology*. Institute for Advanced Study/Park City Mathematics Institute.
263. Keller, R.P., Lodge, D.M, Lewis, M.A., Shogren, J.F. (2009). *Bioeconomics of Invasive Species: Integrating Ecology, Economics and Management*. Oxford University.
264. de Vries, G., Hillen, T., Lewis, M.A., Müller, J. Schonfisch, B. (2006). *A Course in Mathematical Biology: Quantitative Modeling with Mathematical and Computational Methods*, SIAM Press 309 pages.
265. Moorcroft, P., Lewis, M.A. (2006). *Mechanistic Home Range Analysis*. Princeton Monograph in Population Biology 172 pages.
266. Othmer, H.G., Adler, F.R., Lewis, M.A., Dallon, J.C. (1997). *Mathematical Modeling in Biology: Case Studies in Ecology, Physiology and Cell Biology*. Prentice Hall. ISBN 0-13-574039-8.

**Chapters in Books:**

267. Hillen, T., Lewis, M.A. (2019) *Dynamical Systems in Biology – A Short Introduction*, In Bianchi, A., Hillen, T., Lewis, M.A., Yi, Y. (eds) *The Dynamics of Biological Systems*, Springer-Verlag
268. Peacock, S.J., Bateman, A.W., Connors, B., Goodwin, S., Lewis, M.A., Krkošek, M. (2019) Ecology of a marine ectoparasite in farmed and wild salmon, Chapter 19 In K. Wilson, A. Fenton and D.M. Tompkins (eds) *Wildlife Disease Ecology: Linking Theory to Data and Application*, *Ecological Reviews*.
269. Lewis, M.A. (2014) *Invasive Species*. In H.G. Kaper and C. Rousseau (eds) *The Mathematics of Planet Earth: An International Year of Scientific and Outreach Activities*, SIAM.
270. Lewis, M.A. (2014) *Scientific Research on Sustainability and its Impact on Policy and Management*. In H.G. Kaper and C. Rousseau (eds) *The Mathematics of Planet Earth: An International Year of Scientific and Outreach Activities*, SIAM.
271. Hillen, T, Lewis M.A. (2013) *Mathematical Ecology of Cancer*, Chapter 2. In G. A. Marsan and M. Delitala et al. (eds) *Managing complexity, reducing perplexity. Modeling biological systems*, Springer.
272. Kot, M., Lewis, M.A., Neubert, M.G. (2012). *Integrodifference Equations*. In A. Hastings and L. Gross (Eds.) *Sourcebook in Theoretical Ecology*, University of California Press.
273. Lewis, M.A., Jerde, C. (2012). *Invasion Biology*. In A. Hastings and L. Gross (Eds.) *Sourcebook in Theoretical Ecology*, University of California Press.
274. Finnoff, D., Potapov, A., Lewis M.A. (2010). Second best policies on invasive species management: When are they “good enough”? In Charles Perrings, Hal Mooney, and Mark Williamson (eds) *Bioinvasions and Globalization*, Oxford University Press.



275. Lewis, M.A., **Krkošek, M., Wonham, M.J.** (2010). Dynamics of emerging wildlife disease, In S. Sivaloganathan (ed) *Mathematical Biology*, Fields Institute Communications, American Mathematical Society.
276. Haderler, K.P., Hillen, T., Lewis, M.A. (2010). Biological modeling with quiescent phases, Chapter 6. In S. Cantrell, C. Cosner and S. Ruan (eds.) *Spatial Ecology*, CRC Press.
277. Lewis, M.A., **Potapov, A.**, Finnoff, D. (2009). Modeling integrated decision-making responses to invasive species. In R.P. Keller, D.M. Lodge, M.A. Lewis and J.F. Shogren, (eds.) *Bioeconomics of Invasive Species: Integrating Ecology, Economics and Management*, (Ch 9, pp 180-204). Oxford University Press.
278. Lodge, D.M., Lewis, M.A., Shogren, J.F., Keller, R.P. (2009). Introduction to biological invasions: Biological, economic, and social perspectives. In R.P. Keller, D.M. Lodge, M.A. Lewis and J.F. Shogren, (eds.) *Bioeconomics of Invasive Species: Integrating Ecology, Economics and Management*, (Ch 1, pp 1-24). Oxford University Press.
279. Keller, R.P., Lewis, M.A., Lodge, D.M., Shogren, J.F., **Krkošek, M.** (2009). Putting bioeconomic research into practice. In R.P. Keller, D.M. Lodge, M.A. Lewis and J.F. Shogren, (eds.) *Bioeconomics of Invasive Species: Integrating Ecology, Economics and Management*, (Ch 13, pp 266-284). Oxford University Press.
280. Lewis, M.A., Hillen T., **Lutscher, F.** (2009). Spatial dynamics in ecology. In M.A. Lewis, M.A.J. Chaplain, J.P. Keener and P.K. Maini (Eds.), *Park City Mathematics Institute Volume in Mathematical Biology*, (pp 25-45). Institute for Advanced Study, Princeton.
281. **Wonham, M.J.**, Lewis, M.A. (2008). [A comparative analysis of West Nile virus models](#). In F. Brauer, P. van den Driessche and J. Wu. (Eds.), *Lecture Notes in Mathematical Epidemiology*, (pp. 365-390). Springer-Verlag.
282. **Wonham, M.J.**, Lewis, M.A. (2008). [Modeling Marine Invasions: Current and Future Approaches](#). In M.G. Rilov and J. Crooks, (Eds.), *Biological Invasions in Marine Ecosystems* (Ch 4). Springer-Verlag Berlin Heidelberg.
283. Lewis, M.A., Neubert, M.G., Caswell, H., Clark, J, Shea, K. (2006). [A guide to calculating discrete-time invasion rates from data](#). In Marc W. Cadotte, Sean M. McMahon, and Tadashi Fukami (Eds.), *Conceptual Ecology and Invasions Biology: Reciprocal Approaches To Nature* (pp. 169–192). Springer, The Netherlands.
284. **de Camino-Beck, T.**, McClay, A.S., Lewis M.A. (2003). Spatially explicit models for weed-biocontrol agent interactions: scentless chamomile as a case study. In J.M. Cullen (Ed.), *Proceedings of the XI International Symposium on Biological Control of Weeds*, April 27 - May 2, 2003, Canberra, Australia. CSIRO (2004).
285. White, K.J., Lewis, M.A., Murray, J.D. (1998). On wolf territoriality and deer survival. In J. Bascompte & R.V. Sole (Eds.), *Modeling Spatiotemporal Dynamics*, (Ch.6 pp. 105–126). Verlag and Landes Bioscience.
286. Lewis, M.A. (1997). Variability, patchiness and jump dispersal in the spread of an invading population, In D. Tilman and P. Kareiva (Eds.), *Spatial Ecology: The Role of Space in Population Dynamics and Interspecific Interactions*, (Chapter 3, pp. 46–69). Princeton University Press.
287. Kareiva, P., Settle, W., Lewis, M.A. (1992). The significance of vegetation structure as a constraint on insect mobility: Implications for pest management. In Shiyomi, M., Yano, E., Koizumi, H., Andow, D.A. and Nobuhiko, H. (Eds.), *Ecological Processes in Agro-Ecosystems* (pp. 67–78). National Institute of Agro-Environmental Sciences, Japan.

**d. Other publications** (reports to agencies, patents applied for and granted; do not include articles published in the popular press - these belong in section 8)

288. Koch, D., Lewis, M.A. (2020) Raster datasets relevant to mountain pine beetle outbreak ecology in the province of British Columbia. Federated Research Data Repository. <https://doi.org/10.20383/101.0283>

#### **Book Reviews:**

289. Lewis, M.A. (2003). Featured Review: 'Diffusion and Ecological Problems: Modern Perspectives. Second Edition. By Akira Okubo and Simon Levin' SIAM Review 45: 127–128.
290. Lewis, M.A. (1996). Review of 'Growth and Diffusion Phenomena: Mathematical Frameworks and Applications, by Robert B. Banks' Bull. Math. Biol. 58: 205–206

**e. Presentations at conferences or institutions** (include conference contributions that are not already described in 6b, above; indicate type of presentation, whether poster, plenary talk, seminar, etc.; list co-authors, title, and indicate whether presentation was by invitation)

**Selected Invited Lectures (since 1995):**

- 1995 Dept. Mathematics and Statistics, University of Victoria; Dept. Applied Mathematics, University of Washington, Seattle; Dept. Mathematics, University of British Columbia, Vancouver; Woods Hole Oceanographic Institute, Woods Hole; SWRIMS Conference on Mathematical Modeling in Population Biology, Logan, Utah.
- 1996 Spatial Ecology Working Group, NCEAS, Santa Barbara; International Conference on Dynamical Systems and Differential Equations, Missouri; Kyoto Conference on Mathematical Biology, Kyoto, Japan; NCEAS workshop on the role of dispersal in the Holocene expansion of trees, Santa Barbara; Society for Mathematical Biology Annual Meeting, Seattle; 3rd European Conference on Mathematics Applied to Biology and Medicine, Heidelberg, Germany.
- 1997 International Conference on Differential Equations with Applications to Biology, Halifax; Society for Mathematical Biology Annual Meeting, Raleigh; Species Range Working Group, NCEAS, Santa Barbara.
- 1998 Dept. Math, University of Minnesota; Dept. Applied Math, University of Washington; Institute for Theoretical Dynamics, University of Davis; Dept. Math, Duke University; Biostatistics, North Carolina State University; AMS Western Division Meeting, Davis; Dept. Biology, Arizona State University; Science at Breakfast Lecture, U Utah; Dept. Math, Bath University; Dept. Biology, Imperial College, University of London; Dept. Math, Heriot Watt University; Dept. Math, Dundee University; Kings College, Cambridge University; Dept. Math, University of Heidelberg; Institute for Theoretical Biology, Leiden University; Dept. Math Utrecht University; AMS Western Division Meeting, Tucson.
- 1999 Institute for Mathematics and its Applications Minneapolis; Theory and Mathematics in Biology and Medicine, Amsterdam; Ecological Society of America, Spokane; Oberwolfach, Germany.
- 2000 Dept. Math, University of Alberta; Dept. Biology, University of Alberta; Dept. Math, University of British Columbia; Dept. Biology, University of Santa Barbara, California; UC San Diego Supercomputer Institute; Alberta Entomological Society; Max Planck Institute, Leipzig.
- 2001 NCEAS workshop on a New Synthesis of Demography and Dispersal (group participant), Santa Barbara, California; Dept. Math, UC Irvine; Dept. Math, University of Utah; Canadian Applied Mathematics Society, University of Victoria, Canada; Society for Mathematical Biology Meeting, Hawaii; 2001 Canada-China Mathematics Congress, Vancouver, Canada; Newton Institute, Cambridge.
- 2002 Department of Biological Sciences, University of Miami; Department of Mathematical Sciences, University of Miami; SIAM Life-Sciences Conference, Boston; Bio-X EFF Distinguished Lecture Series, Edmonton, Alberta; Gordon Research Conference on Theoretical Biology and Biomathematics, Tilton, New Hampshire; 5th Americas Conference of Differential Equations and Dynamical Systems, Edmonton, Alberta; International Conference on Modeling Pattern in Biology, Chubu, Japan; Woods Hole Annual Retreat in Mathematical Biology, Nantucket.

- 2003 22nd Annual Ostrum Lecturer, Washington State University; Topical Lecturer SIAM/CAIMS annual meeting, Montreal; Mini-symposium Speaker at Canadian Mathematical Society Annual General Meeting, Edmonton; Society for Mathematical Biology meeting, Dundee, Banff International Research Station, Fields Mathematics Institute workshop on Pattern Formation in Physics, Toronto.
- 2004 Plenary Speaker, Mathematics in Technology and Complex Systems 5th Annual Conference, Halifax; Plenary Speaker, joint annual meeting of the Canadian Applied Math Society and Canadian Mathematical Society, Halifax; Plenary Speaker, American Institute for Mathematical Sciences meeting, Pomona; Plenary Speaker, Annual Meeting of Japan Society for Mathematical Biology; Invited Speaker, DIVERSITAS workshop on Integrated modelling of economies and ecosystems, Paris; Invited Speaker, Banff International Research Station.
- 2005 Dept. Zoology, University of British Columbia; Dept. Organismal and Evolutionary Biology, Harvard University; Principal speaker, Sixth Mississippi State–UAB Conference on Differential Equations and Computational Simulations; Graduate summer school lecturer, Park City Math Institute (Institute for Advanced Study); Canadian Mathematical Society Winter Meeting, Victoria.
- 2006 Lansdowne Lecturer, University of Victoria; Invited speaker, American Association for the Advancement of Science; Keynote speaker, Western Conference on Linear Algebra; Dept. Biology, University of Toledo; Plenary speaker, Mexican Biomathematics Autumn School (Xalapa); PIMS Distinguished Lecturer, University of British Columbia.
- 2007 Invited Participant, Summit of Scientists on Aquaculture and the Protection of Wild Salmon; Colloquium Speaker, Dept. Biology, University of Calgary; Interdisciplinary Mathematical Biology Speaker, Iowa State University; Plenary Speaker, New Zealand Institute of Mathematics and its Applications programme on Modelling Invasive Species and Weed Impact; Plenary Speaker, 2007 Alberta North-South Dialogue on Mathematics; Invited Speaker, Canadian Applied and Industrial Mathematics Society Annual Meeting; Invited Speaker, Jim Keener 60th Birthday Conference; Invited Speaker, Ecological Society of America Meeting; Plenary Speaker, Mathematical Biosciences Institute Workshop for Young Researchers in Mathematical Biology; Plenary Speaker, PIMS International Graduate Training Centre in Mathematical Biology (First Graduate Research Summit); Invited Speaker, Mathematical Biology Conference on the Occasion of Jim Cushing's 65th Birthday.
- 2008 Distinguished Lecturer in the Program for Interdisciplinary Mathematics, Ecology, and Statistics, Colorado State University; Invited Speaker, Banff International Research Station; Plenary Speaker, Society for Mathematical Biology Meeting, Toronto; Plenary Speaker, Western Section of the American Mathematical Society Meeting, Vancouver; Invited Speaker, PIMS Pacific Northwest meeting on Partial Differential Equations; Principal Speaker, Hans Weinbergers 80<sup>th</sup> Birthday Conference; Invited Speaker, University of Washington Boeing Distinguished Colloquium; Invited Speaker, Institute for Theoretical and Mathematical Ecology, University of Miami.
- 2009 Invited Speaker, Center for Infectious Disease Dynamics, Penn State University; CRM Distinguished Visitor, University of Ottawa; Speaker, Distinguished Lecture Series, Centre for Scientific Computation, Simon Fraser University; Invited Speaker, Workshop on Statistical Methods for Dynamic System Models, Simon Fraser University; Canadian Applied and Industrial Mathematics Society Research Prize Lecture; Invited Public Lecture at York U50 Colloquium Series on Mathematics and Interdisciplinary Science; Canadian Aquatic Invasive Species Network Annual General Meeting, Halifax; Invited Speaker, Workshop on Analysis of Self-Organization in Biology, Banff International Research Station; Invited Speaker, Workshop on Adaptive Movement of Interacting Species, Fields Institute; Public Speaker at the University of Maryland's Bioscience Day.
- 2010 Speaker, Canadian Aquatic Invasive Species Annual General Meeting; Invited Storer Lecturer, University of California Davis, Plenary Speaker, Sea Lice 2010 Modelling Workshop, Victoria; Guest Lecturer, Mathematics for Biological Networks Summer School Course, University of



- Victoria; Plenary Speaker, Third Conference on Computational and Mathematical Population Dynamics, Bordeaux; Departmental Seminar Speaker, Rennes Agrocampus, France; American Geophysical Union AGM, San Francisco.
- 2011 CRM-Fields-PIMS Prize lecture, delivered at Centre de Recherches Mathematiques, Fields Institute, and Pacific Institute for Mathematical Sciences; Invited Speaker, Banff International Research Station; Invited Speaker, Mathematical Biology Workshop and IGTC Summit, Victoria; Plenary Speaker, 7th International Congress on Industrial and Applied Mathematics; Keynote Speaker, Mathematical and Theoretical Ecology 2011: linking models with ecological processes, Essex; Invited Seminar Speaker, Oxford Centre for Collaborative and Applied Mathematics; Invited Seminar Speaker, Oxford Centre for Mathematical Biology; Invited Speaker, Applied Mathematics Seminar Series, Department of Mathematics at the University of Leicester; Invited Speaker, Mathematics in Medicine and Biology Seminar Series, Department of Mathematics at the University of Nottingham; Seminar Speaker, NERC Centre for Ecology and Hydrology; Keynote Speaker, CANPDE Workshop on Mathematical Ecology, Heriot Watt University; Invited Colloquium Speaker (Landscapes in Mathematical Sciences), Bath University, Invited Speaker, Bristol Centre for Complexity Sciences.
- 2012 Invited Ireland Lectureship, University of New Brunswick; Invited Howard Rowlee Lecturer, University of Nebraska; Invited Speaker, Conference on Mathematical Ecology, University of Nebraska; Invited Speaker, PIMS Lunchbox Series, Calgary; Distinguished Guest Speaker, Center for Complex Biological Systems, University of California Irvine; Applied Mathematics Colloquium Speaker, University of California Los Angeles; Invited Workshop Speaker, Mathematical Biosciences Institute, Columbus; Plenary Speaker, Harbin Institute of Technology Workshop on Mathematical Modeling of Biological Processes, Harbin, China; Plenary Speaker, Models in Population Dynamics and Ecology (MPDE-12), Santa Maria, Brazil; Invited Speaker, Integrative Biology Seminar, University of Austin, Texas; Invited Speaker, Everything Disperses to Miami: The Role of Movement and Dispersal in Ecology, Epidemiology and Environmental Science, Miami.
- 2013 Invited Lecture, University of McGill Organismal Seminar Series; Invited Speaker, Centre for Applied Mathematics in Bioscience and Medicine, McGill University; PIMS Distinguished Speaker for Mathematics of Planet Earth, University of Victoria; Invited Speaker, Banff International Research Station; Plenary Speaker, PIMS Young Researcher's Conference, University of Alberta; Invited Speaker, Oxford Conference on Challenges in Applied Mathematics; Invited Speaker, Mathematical Congress of the Americas; Invited Speaker, Mathematical Biosciences Institute, Columbus, Ohio; Invited Speaker, Bristol Conference in Animal Movement in Confined Space.
- 2014 Invited Speaker, University of Victoria Colloquia; Invited Speaker, Mathematical Biosciences Institute, Columbus, Ohio; Colloquium Speaker, Departmental Colloquium, University of Louisville; Plenary Speaker, Alberta Mathematics Dialogue, Camrose Alberta; Plenary Speaker, 2014 Canadian Mathematical Society Summer Meeting; Colloquium Speaker, University of Urbana, Illinois; Colloquium Speaker, Global Change and Sustainability Centre, University of Utah; Invited Speaker, ICTS-PIMS-IISER Pune Program on Advances in Mathematical Biology, Pune, India.
- 2015 Plenary Speaker, Models in Population Dynamics and Ecology, Universidade Federal do ABC - UFABC, Centro de Matemática, Computação, Rio de Janeiro; Invited Speaker, Universidade de São Paulo, Departamento de Ecologia, Invited Speaker, International Workshop on Mathematics in the Life and Physical Sciences, Renmin University, Beijing, China; Invited Speaker, Micro and Macro Systems in the Life Sciences, Bedlewo, Poland; Invited Speaker, Uncertainty, Sensitivity and Predictability in Ecology: Mathematical Challenges and Ecological Applications, Mathematical Biosciences Institute.
- 2016 Keynote Speaker, CAIMS 2016, University of Alberta; Invited Speaker, University of Rennes; Invited Speaker, Global change impact on diseases and alien species expansion workshop, African Institute for Mathematical Sciences (AIMS), Capetown, South Africa; Plenary

- Speaker, 46<sup>th</sup> Annual John H. Barrett Memorial Lectures, Analysis and Modelling of PDEs in Spatial Ecology, University of Tennessee; Invited Speaker, Europe Society for Mathematical and Theoretical Biology (ESMTB), University of Nottingham; Plenary Speaker, CMPDE16, Marseilles, France; Invited Speaker, Integrodifference Equations in Ecology: 30 years and counting workshop, Banff; Invited Speaker, Population Models in the 21<sup>st</sup> Century, Mathematical Biosciences Institute.
- 2017 Colloquium speaker, Mathematics, Statistics & Actuarial Science (SoMSS) Colloquium , Arizona State University; Invited Speaker, CSEE 2017 symposium, Exploring the roles of mechanistic and phenomenological models in ecology, Victoria; Invited Speaker, U of A Science Alumni speaker, Victoria & Vancouver; Plenary Speaker, Society for Industrial and Applied Mathematics Annual General Meeting; Invited Speaker for Minisymposium on Dynamics of Infection at the Society for Mathematical Biology Annual General Meeting; Invited Speaker, Utah Alumni Conference, University of Utah; Invited Speaker, Conference on ecology and evolutionary biology, deterministic and stochastic models at Institut de Mathématiques de Toulouse; Invited Speaker for Conference on reaction-diffusion, propagation, modelling, Institut Henri Poincaré, Paris.
- 2018 Colloquium Speaker, McMaster University; Invited Speaker, Colloque des sciences mathématiques du Québec, Laval University, Invited Speaker, Centre de recherches mathématiques, Université de Montréal; Distinguished Lecture at the CRM-ISM Colloquium, Université Laval, Invited Speaker, AARMS CRG Annual Meeting, Fredericton, NB; Plenary Speaker, Canadian Mathematical Society, Fredericton NB; Plenary Speaker, 6th G. J. Butler Memorial Conference on Differential Equations and Population Biology, UA; Plenary Lecture, ICM Satellite Conference: A Pan-Hemispheric Celebration, University of Miami; Colloquium Speaker, MBI Online Mathematical Biology Colloquium.
- 2019 PIMS Distinguished Visitor, University of Victoria; Invited Speaker, Applied Mathematics Seminar UVic,; Invited speaker, PIMS UVic Distinguished Lecture, University of Victoria; Invited Speaker, Public Lecture, Centre de recherches mathématiques “Great Lectures” series, Université de Montréal; Invited Speaker, Ecology & Evolutionary Biology Seminar, University of Toronto; Invited Speaker, Musgamagw Dzawada’enuxw First Nations Fisheries Camp; Invited Speaker, P. Maini’s 60<sup>th</sup> birthday workshop on growth & pattern formation, Oxford; Invited Speaker, 2019 CMS Winter Meeting; Plenary Lecture SIAM Pacific Northwest sectional meeting; Invited Minicourse, SIAM Meeting on Partial Differential Equations, Palm Springs.
- 2020 Virtual Presentation, Applied Math Seminar at the University of Cardiff (Wales); Nonlinear Differential Equations and Applications Online Summer School, Harbin Institute of Technology (HIT); Invited Speaker (Virtual Presentation), Life on Planet Earth: Above and Beyond, Mathematical Biosciences Institute (MBI); Virtual Presentation, Centre for Applied Mathematics in Bioscience and Medicine (CAMBAM), McGill; Clarkson Virtual Mathematics Colloquium; Virtual Presentation, Mathematical Biology Seminar, University of Pennsylvania.
- 2021 Virtual presentation, Mathematics of Human Environmental Systems Workshop (BIRS); Keynote Speaker (virtual), Joint Mathematics Meeting, The American Mathematical Society (AMS); Virtual presentation Mathematics and Statistics Colloquium, UNCG; Virtual presentation, Graduate Seminar UFABC Math program; Virtual presentation Mathematical and Computational Biology Seminar Series, UMass; Invited Speaker (virtual) Canadian Mathematical Society Summer Meeting, Invited Speaker (virtual) Canadian Mathematical Society Winter Meeting Session on Spatial Dynamics of Evolution Systems in Ecology and Evolution.
- 2022 Invited Speaker, UA Math Department Colloquium; Invited Lecture: Swansea Biomathematics Colloquium; Invited Speaker SIAM PD22 Minisymposium on Recent Advances in Cross-Diffusion and Population Models (online); Invited Lecture, Principal Lecturer, NSF-CBMS Conference Interface of Mathematical Biology and Linear Algebra,

University of Central Florida; Plenary Speaker Eighth International Conference on Mathematical Modeling and Analysis of Populations in Biological Systems (ICMA VIII); Brandeis University Mathematical Biology Seminar; Guest Speaker, 2022 Donghua-UVic Differential Equations and Mathematical Biology Workshop, Invited speaker, Special Session on Mathematical modeling and analysis in spatial ecology and epidemiology, Canadian Mathematical Society AGM.

## 7. SERVICE and PROFESSIONAL ACTIVITIES

### **a. University and Faculty committees** (include any offices held and dates)

2002-2017 Director - Centre for Mathematical Biology, University of Alberta  
 2008-2010 Canada Research Chair Evaluation Committee Member  
 2009-2010 Faculty Evaluation Committee Member  
 2010-2011 Faculty of Science Planning Committee Member  
 2010-2011 CRC Renewal Advisory Committee Member  
 2011-2012 Faculty of Science Advisory Selection Committee Member  
 2014-2015 Killam Memorial Chair Advisory/Selection Committee Member  
 2014-2015 Killam Research Fellowship Review Committee Member  
 2014-2015 NSERC Discovery Grant Round Table Presentation/Discussion on evaluation process (UA/NSE Grant Assist Program)  
 2015-2016 Faculty of Science Chair Review Committee Member  
 2015-2016 Faculty of Science First Year Course Committee Member  
 2015-2016 General Appeals Committee, President's Appointee  
 2015-2016 Ad hoc review of nominations from the VP Research Office  
 2016-2017 Faculty of Science Research Award Committee Member  
 2018 NSERC Discovery Grant Application Mentor (UA/NSE Grant Assist Program)  
 2018 NSERC Discovery Round Table (UA/NSE Grant Assist Program) - Panelist  
 2020-2021 Martha Cook Piper Research Prize (UAlberta) - Adjudication Committee member

### **b. Departmental committees and responsibilities**

2001-2011 CRC Hiring Committee Member (Math/Stat Sciences)  
 2001-2002 Jr. CRC Chair in Filtering Theory Hiring Committee Member  
 2002-2011 UFA Hiring Subcommittee Member (Mathematical and Statistical Sciences),  
 2002-2004 Library Committee Member (Biological Sciences)  
 2007-2008 Appointments Committee Member (Math/Stat Sciences)  
 2007-2009 Promotion and Tenure Committee Member (Math/Stat Sciences)  
 2007-2008 Mathematical Biology Hiring Subcommittee Chair (Math/Stat Sciences)  
 2007-2008 Quantitative Biologist Hiring Subcommittee Chair (Math/Stat Sciences and Biological Sciences)  
 2007-2008 Max Wyman Mathematical Biology Hiring Committee Member (Math/Stat Sciences)  
 2008-2009 Math Biology Hiring Subcommittee Chair  
 2008-2009 Quantitative Biologist Hiring Subcommittee Chair  
 2010-2011 Max Wyman Mathematical Biology Hiring Committee Member (Math/Stat Sciences)  
 2014-2015 Appointment/Promotion and Tenure Committee Member (Math/Stat Sciences)  
 2015-2016 Dynamical Systems Hiring Committee Member  
 2015-2016 2016 Seminaire de Mathematique Superieures Dynamics of Biological Systems Organizer  
 2016-2017 Max Wyman Hiring Committee Chair  
 2017-2018 Promotion and Tenure Committee Member  
 2017-2018 Mathematical Biology Hiring Committee Chair

2017-2018	Appointments Committee Member
2017-2018	CRC Appointments Committee Member
2019-2020	Scientific Advisory Committee Member
2019-2020	Chair Selection Committee Member (Math/Stat Sciences)
2019-2021	Associate Research Chair (Math/Stat Sciences)

**c. Membership and service on international, national and provincial professional bodies and societies**

(include any offices held and dates; do not include grant selection committees - these belong in 7e, below)

1996-1999	Society for Mathematical Biology, Board of Directors,
2000	Society for Mathematical Biology, President Elect
2001	Okubo Prize, Society for Mathematical Biology, Committee Member
May 2001-May 2003	Journal of Theoretical Biology Advisory Board
March 2001-June 2002	Banff International Research Station for Mathematical Innovation and Discovery Steering Committee
March 2001-June 2004	Banff International Research Station for Mathematical Innovation and Discovery Scientific Advisory Board
2002	Canada Research Chairs College of Reviewers
2002	Bellman Prize, Elsevier, Committee Member
April 2002	Alberta Ingenuity Fund Associateship Panel
2001-2003	Society for Mathematical Biology, President
Oct 2006-Sept 2007	Mathematical Biosciences Institute Board of Scientific Governors
Jan 2004-June 2005	Pacific Institute for Mathematical Sciences Board of Directors
2006-2007	Canadian Aquatic Invasive Species Network Scientific Committee
July 2006-June 2009	Pacific Institute for Mathematical Sciences Board of Directors
Sept 2007-2011	Mathematical Biosciences Institute Board of Trustees
2007-2011	PIMS International Graduate Training Centre in Mathematical Biology, Program Director
Oct 2007-2011	Mathematical Biosciences Institute Scientific Advisory Committee member
2008-2011	Society for Industrial and Applied Math Program Committee
2008-2012	Society for Industrial and Applied Math, Program Committee
July 2009-June 2010	Mathematics of Information Technology and Complex Systems (MITACS) Board of Directors
May 2009-2011	Mathematical Biosciences Institute Scientific Advisory Committee Chair
2009-present	F1000 Faculty Member (Theoretical Ecology)
2009-present	Canadian Aquatic Invasive Species Network Scientific Committee
Nov 2009-present	Canadian Institute of Ecology and Evolution, Scientific Advisory Committee
2010	Lord Robert May Prize Committee Member
2010-2012	CAIMS/PIMS Early Career Award Prize, Committee Member
2011	Lee Segel Prize, Committee Member

Nov 2012-present	Pacific Institute for Mathematical Sciences Scientific Review Panel
2013	CAIMS Research Prize, Committee Chair
2013	Lee Segel Prize, Committee Chair
2013-2015	Canadian Mathematical Society, Vice President-Western
2013-2017	Pacific Institute for Mathematical Sciences, Scientific Review Panel
July 2013-2016	PIMS Scientific Panel
2014	David Borwein Award, Canadian Mathematical Society, Committee Member
June 2014-present	Institute for Mathematical Sciences, Renmin University of China, Scientific Board
2015	International Symposium on Application of Nonlinear Partial Differential Equations in Life Science, Nankai University, Tianjin, China, Scientific Committee
2016	Global change impact on diseases and alien species expansion, African Institute for Mathematical Sciences, Scientific Organizing Committee
2016	NSERC Mathematics and Statistics Liaison Committee
July 2016-June 2018	Mathematical Biosciences Institute National Colloquium, Committee Member
2017	Bellman Prize, Elsevier, Committee Member
2017	ICMA-VI: 6Th International Conference on Mathematical Modelling and Analysis of Populations in Biological Systems, Scientific Advisory Committee
2017	NSERC Mathematics and Statistics Liaison Committee
2017-2018	Canadian Mathematical Society, President-Elect
Sept 2017 to Aug 2021	Fields Institute, Scientific Panel
March 2018 – June 2019	5th Computational and Mathematical Population Dynamics (CMPD5) conference, Scientific Committee
July 2018-June 2019	Centre for Quantitative Analysis and Modelling, Fields Institute, Research Committee Member
Nov 2018- Oct 2019	International Conferences on Mathematical Modelling and Analysis of Populations in Biological Systems (ICMS VII), Scientific Advisory Committee
Feb 2018-Jan 2020	American Mathematical Society, Western Section Program Committee
2018-2020	Canadian Mathematical Society, President
2018-present	American Mathematical Society, Section Program Committee
Jan 2019 – March 2020	The Fourth International Conference on the Dynamics of Differential Equations (4th Hale conference), Scientific Committee
August 2019- July 2020	Joint Mathematics Meetings (JMM), SIAM Ad hoc Committee
2019	Society for Mathematical Biology, President's Advisory committee
2019-2022	Field's Institute, Research and Innovation Committee
2020-2021	Canadian Mathematical Society, Past President
May 2021-July 2022	SIAM Activity Group on Life Sciences Early Career Prize, Selection Committee
2021-present	UBC/PIMS Mathematical Sciences Young Faculty Award, Selection Committee Chair
2021-present	BIRS Scientific Advisory Board
2021-present	Fellows of the CMS, Selection Committee Chair
2021-present	OMNI/RÉUNIS Disease Modelling Network, Co-Director

**d. Conference organisational committees** (indicate position in organisation)

**Organized (since 1995):**

- 1995 Special Year in Mathematical Biology (1995/96) at University of Utah.
- 1998 Co-chair of Gordon Conference on Theoretical Biology and Biomathematics.
- 1999 Co-organizer of a workshop: 'From Individuals to Aggregations' at the Institute for Mathematics and its Applications.
- 2000 Main Organizer of the International Conference on Mathematics in Biology and Society for Mathematical Biology Annual Meeting.
- 2001 Scientific Organizing Committee member, SIAM Life Sciences Conference, Boston; Mini-symposium organizer, SIAM Life Sciences Conference, Boston; Scientific Organizing Committee member, International Conference on Mathematics in Biology and Society for Mathematical Biology Annual Meeting in Hawaii.
- 2002 Organizer of PIMS Mathematical Biology Undergraduate Workshop; Scientific Organizing Committee member, International Conference on Mathematics in Biology and Society for Mathematical Biology Annual Meeting in Knoxville; Session organizer on Global Change at the Gordon Conference on Theoretical Biology and Biomathematics.
- 2003 Scientific Organizing Committee member, Fourth Geoffrey J. Butler International Conference in Differential Equations and Mathematical Biology (Alberta), Scientific Committee for Applications of Mathematics in Medicine workshop at the Fields Institute; Co-organizer of BIRS workshop: From molecules to ecosystems; The legacy of Lee Segel; Co-organizer of a BIRS Focused Research Group on Mathematical Models for Plant Dispersal; Scientific Organizing Committee member and Mini-symposium organizer, International Conference on Mathematics in Biology and Society for Mathematical Biology Annual Meeting in Dundee, Scotland; Co-organizer of Pacific Institute for the Mathematical Sciences, Period of Concentration in Mathematical Ecology and Evolution (2003–5).
- 2004 Scientific committee for Differential Equations and Applications in Mathematical Biology, Malaspina University College, Nanaimo; Co-organizer of MITACS/PIMS Summer School and Workshop: Infectious Diseases, Banff.
- 2005 Co-organizer of BIRS workshop, Mathematical Models for Biological Invasions, Banff; Scientific Committee member of European Society for Mathematical and Theoretical Biology Meeting; Co-organizer of IPAM Cells and Materials program in Los Angeles; Graduate Program Organizer for Park City Math Institute Summer Program in Mathematical Biology (Institute for Advanced Study); Scientific Organizing Committee member for Mathematics Institutes and NRC Workshop in Computational Biology.
- 2007 Organizer of PIMS Mathematical Biology Undergraduate Workshop; Scientific Program Committee Member and Mini-symposium Organizer for Canadian Applied and Industrial Mathematics Society Annual Meeting; Symposium Organizer for Ecological Society of America Meeting.
- 2008 Scientific Committee member for European Society for Mathematical Biology Meeting in Edinburgh; Scientific Advisory Committee member, Society for Mathematical Biology Meeting in Toronto.
- 2009 Scientific Committee for joint Society for Mathematical Biology/Chinese Society for Mathematical Biology Meeting in Hangzhou, China; Minisymposium Organizer at the Society for Mathematical Biology Meeting in Vancouver; Scientific Committee for Conference on Computational and Mathematical Population Dynamics, Bordeaux
- 2010 Scientific Committee for Models in Population Dynamics & Ecology 2010: Animal Movement, Dispersal and Spatial Ecology, Leicester; Working Group Organizer, National Institute for Mathematical and Biological Synthesis, Conference Organizer, Modeling Understanding and Managing River Ecosystems, University of Ottawa, Scientific Committee Member for Canada-China International Conference on Dynamics of Climate Impact and Infectious Diseases.

- 2011 Co-organizer for MBI Workshop on Biological Invasions; Co-organizer for Workshop at Banff International Research Station; Co-organizer for Mathematical Biology and IGTC Summit, Victoria.
- 2012 Primary organizer, Focused Research Group on Animal Movement and Memory, Banff International Research Station
- 2013 Co-organizer, 2013 Year of Mathematics of Planet Earth, Scientific Advisory Committee, 4th International Conference on Computational and Mathematical Population Dynamics, Primary organizer, Workshop on Impact of climate change on invasions and population distributions at Banff International Research Station; Scientific Committee 2013 Society for Mathematical Biology Annual Meeting, Co-organizer, Workshop on Animal movement in confined space: from space use patterns to epidemic spread at the University of Bristol.
- 2015 Scientific Committee member, International Symposium on Application of Nonlinear Partial Differential Equations in Life Science, Tianjin, China
- 2016 Co-organizer, 2016 Séminaire de Mathématiques Supérieures: Dynamics of Biological Systems; Organizer, minisymposium Europe Society for Mathematical and Theoretical Biology (ESMTB), University of Nottingham; Organizer, Integrodifference Equations in Ecology: 30 years and counting workshop, Banff International Research Station; Co-Organizer, Population Models in the 21<sup>st</sup> Century, MBI
- 2017 Co-Organizer, PIMS Graduate Summit in Mathematical Biology and Applied PDE, Jasper, Alberta; Co-Organizer, 2018 SIAM Conference on the Life Sciences, Minneapolis; Scientific Advisory Committee, Sixth International Conference on Mathematical Modeling and Analysis of Populations in Biological Systems, UArizona.
- 2018 Co-organizer, 5th Computational and Mathematical Population Dynamics (CMPD5) conference, Ft. Lauderdale; Scientific Organizing Committee, Canadian Mathematical Society (CMS) 2018 Winter Meeting; Co-organizer, Thematic Semester in Mathematical Biology (Jan-June 2018), Fields Institute; Co-organizer, Emphasis Workshop on Disease Ecology and Eco-epidemiology (Mathematical Biosciences Institute); Organizing Committee, National Mathematical Biology Colloquium (Mathematical Biosciences Institute).
- 2019 Organizing Committee, Quantum and Kinetic Problems: Modeling, Analysis, Numerics and Applications, Institute for Mathematical Sciences (IMS), National University of Singapore (NUS); Co-organizer; New Mathematical Methods for Complex Systems in Ecology, Banff International Research Station (BIRS); Co-Organizer, Learning and Animal Movement Focussed Research Group Workshop, Banff International Research Station (BIRS); Mini tutorial Organizer, SIAM Meeting on Partial Differential Equations
- 2021 Organizing Committee, Mathematics of Human Environmental Systems, Banff International Research Station (BIRS);
- 2022 Organizing Committee, PIMS Mathematical Biology Spring Workshop 2022, Organizer, NSF-CBMS Conference Interface of Mathematical Biology and Linear Algebra, University of Central Florida, Scientific Committee, Computational and Mathematical Population Dynamics 6 (CMPD6)

**e. Grant committees** (agency, committee, period served)

- Feb 2002 NSF/NIH joint NIGMS grant committee in mathematical biology, Panel member
- 2004 Mathematical Biosciences Institute, National Science Foundation (NSF) Review Committee
- 2004-2005 NSERC Grant Selection Committee in Ecology and Evolution
- 2006-2008 NSERC Grant Selection Committee in Ecology and Evolution
- July 2014- June 2017 NSERC Evaluation Group in Mathematics and Statistics (EG 1508),
- July 2016- June 2017 Chair, Applied Mathematics Committee, NSERC Evaluation Group in Mathematics and Statistics (EG 1508),

July 2017- Chair of Applied Mathematics, NSERC Mathematics and Statistics Evaluation Group,  
 June 2018  
 2018 (NSE) Grant Assist Program

**f. Grant proposals reviewed** I have undertaken many of these but do not keep a record.

**g. Visiting scientists hosted** (include lab visitors who have spent more than two weeks in your group)

Xiaoqi Xie	Jan 2023	MSc Student	University of Alberta
Thomas Hillen	Oct 2023	Professor	University of Alberta
Valeria Giunta	Oct 2023	Research Associate	University of Sheffield
Peter Thompson	Sept 2022	PhD Student	University of Alberta
Emma Atkinson	Sept 2022	PhD Student	University of Alberta
Micah Brush	Sept 2022	PDF	University of Alberta
Frederic Hamelin	April 2022	Professor	Rennes University
Frederic Hamelin	Nov 2019	Professor	Rennes University
Bill Fagan	Oct 2019	Professor	University of Maryland
Paulo Amorim	March 2019	PIMS MathBio Initiative Visitor	Universiade Federal do Rio de Janeiro
Tim Coulson	March 2019	Guest of Mark Boyce	University of Oxford
Nadia Loy	Jan-Feb 2019	Visiting Researcher	Torino, Italy
Frederic Hamelin	Nov 2018	Professor	Agrocampus OUEST, France
Yong Jung Kim	Sept-Oct 2018	Professor	Korea Advanced Institute of Science and Technology (KAST)
Frederic Hamelin	Oct-Nov 2017	Professor	Agrocampus OUEST, France
Vincent Calvez	Oct 2017	PIMS-CNRS Visitor	Lyon, France
Yuki Kubo	Oct-Dec 2017	Visiting Student	Kyushu University, Japan
Valentin Doli	Dec 2016-Jan 2017	Visiting Student	IRMAR, France
Ross Cressman	Oct-Nov 2016	Professor	Wilfred Laurier University
Sean Lawley	Oct-Nov 2016	Professor	University of Utah
Nancy Rodriguez	Oct 2016	Professor	University of North Carolina at Chapel hill
James Bullock	Sept 2016	Individual Merit Scientist	Centre of Ecology and Hydrology Wallingford, UK



Valentin Doli	Sept-Dec 2015	Visiting Student	IRMAR
Vanessa Schakau	Sept-Oct 2015	Visiting Student	Osnabrück University
Mohsen Mesgaran	Jan-June 2015	Researcher	University of Melbourne
Leah Edelstein-Keshet	February 2014	Professor	University of British Columbia
Guillaume Bastille-Rousseau	Nov 2012	Visiting Student	Trent University
Frederic Hamelin	July 2012	Professor	Agrocampus Ouest, France
Vlastimil Krivan	April 2012	Professor	Czech Republic
Frank Hilker	May 2009	Professor	University of Bath
Jon Jacobsen	June 2008-June 2009	Professor	Harvey Mudd College, California
Meike Wittmann	2008-2009	Visiting Student	LMU, Germany
Michael Sieber	Sept-Dec 2007	Visiting Student	Osnabrück University
Nils Kehrein	Feb-April 2007	Visiting Student	Osnabrück University
Nuno Oliveira	May-June 2007	Visiting Student	Lisbon, Portugal
Weide Li	Jan 2005-Jan 2006	Visiting Scholar	Lanzhou, China

#### **h. Editorships**

2008-2022	Journal of Mathematical – Chief Editor
1996-2006	IMA Journal of Mathematics Applied to Biology and Medicine
1997-2001	Journal of Theoretical Biology
2000-2008	Journal of Mathematical Biology
2001-2004	Ecology and Ecological Monographs (2001-04);
2002-present	Academic Press Theoretical Ecology Series Editorial Advisory Board
2005-2008	SIAM Journal on Applied Math
2005-2008	Applied Math Research eXpress
2006-present	Bulletin of Mathematical Biology
2006-2019	Journal of Biological Dynamics
2007-present	Theoretical Ecology
2008-2015	SIAM Review (Survey and Review Section)
2011-present	Springer Series: Lecture Notes on Mathematical Modeling in the Life Sciences
2012-present	Movement Ecology
2014-present	Ecological Complexity
2014-present	Springer Series: Mathematics of Planet Earth
2016-2019	Mathematical Biosciences
2018-present	Mathematics in Science and Industry (MSI)- Associate Editor
2020-present	Mathematical Reports of the Academy of Science of the Royal Society of Canada

**i. Reviews for journals, book reviews, published commentaries**

I have undertaken many of these but do not keep a record.

**j. Other professional activities**

2007-2009	Board of Directors, Clifford E. Lee Nature Sanctuary
2007-2009	Education and Interpretation Committee Chair, Clifford E. Lee Nature Sanctuary
2007-2008	Team Mentor, St. Mary's School first Lego League Robotics
March 2018	Mathematics Department External Review, UBC

**8. OTHER ACTIVITIES**

**Distinguished Lectures:**

- 22nd Annual Ostrum Lecture, Washington State University (2003);
- Lansdowne Lecture, University of Victoria (2006);
- Plenary Speaker, 7<sup>th</sup> International Congress on Industrial and Applied Mathematics (2011);
- Ireland Lecture, University of New Brunswick (2012);
- Howard Rowlee Lecture, University of Nebraska (2012);
- Invited Speaker, 1<sup>st</sup> Mathematical Congress of the Americas (2013);
- Bullitt Lecture, University of Louisville (2014);
- 46<sup>th</sup> Annual John H. Barrett Lecture, University of Tennessee (2016);
- Distinguished Lecture at the CRM-ISM Colloquium, Université Laval (2018);
- Plenary Speaker, 6th G. J. Butler Memorial Conference on Differential Equations and Population Biology, University of Alberta (2018);
- Centre de recherches mathématiques “Great Lectures” series, Université de Montréal, Public lecture (2019);
- PIMS UVic Distinguished Lecture (2019)

**UNIVERSITY OF VICTORIA - TEACHING DOSSIER**

**Last Update: January 2023**

**Name:** Mark Lewis

**Faculty:** Science

**Department:** Math/Stats and Biology

**TEACHING EXPERIENCE**

You may include teaching performed at another university before you joined UVic. How far back you go in listing your teaching experience is up to you.

**Undergraduate courses taught**

<b>Academic Year</b>	<b>Course and term</b>	<b>Hours</b>	<b>Number of students</b>
2022	MATH 475/Fall	40	6

**Undergraduates supervised**

<b>Student</b>	<b>Type of supervision (e.g. Honours thesis, summer project, Coop)</b>	<b>Period of supervision</b>
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**Undergrad Supervision:**

<b>Name</b>	<b>Type of Supervision</b>	<b>Period of Supervision</b>
Andrew Beltaos	Summer student	2002 & 2003
Aaron Glenn	Summer student	2002
Nicholas Piazza	Undergraduate Student Programmer, Supervisor	May-June 2009
Chris Finlay	Math 499 Project Supervisor	Jan-April 2010
Isabella Lin	URI summer student Supervisor	May-Aug 2014
Allison Roth	NSERC USRA Supervisor	May-Aug 2017
Emma Atkinson	NSERC USRA Supervisor	March-June 2018
Yiheng Fu	Undergraduate Student Supervisor	April 2019-April 2020

**Graduate courses taught**

<b>Academic Year</b>	<b>Course and term</b>	<b>Hours</b>	<b>Number of students</b>
2022	MATH 575/Fall	40	6

**Graduate students I have directly supervised or co-supervised****Masters Supervision:**

<b>Name</b>	<b>Period of Supervision</b>	<b>Degree Awarded</b>	<b>Thesis/Project Name</b>
Greg Schmitz		1993	A model for the spread of genetically engineered microbes
Steve Parrish		1998	Analysis of a Home Range Model: Pattern Formation from Scent-Marking
Lora Ballinger		1999	Yellowstone Elk Migration: a dynamic programming model

Brenlyn Thiroit		2000	MStat project - Analysis and simulation of pair-wise distances between lupine plants on Mt St Helene
Amy Hurford	2002-2005	2005	Wolf movement within and beyond the territory boundary
Hannah McKenzie	2004-2010	2006, 2010	Linear features impact predator-prey encounters: analysis with first passage time (2006), Effect of flow on population dynamics in streams (2010)
Justin Marleau	2007	2009	Modelling early plant primary succession
Jaime Ashander	2008-2010	2010	Effects of parasite exchange between wild and farmed salmon
Jeanette Wheeler	2008-2010	2010	Temp-dependant population dynamics of <i>Parnassium smintheus</i> ...
Michael Bryniarski	2012-2015	withdrew	Mathematical Ecology
Jessa Marley	2016	2020	Mathematical Analysis of Shark Movement
Broghan Erland	2018-2019	transferred	Assessing Errors in Greenhouse Gas Flux Measurements from Mineable and in Situ Oil Sands
Kelsey Gritter	2019-2022	2022	Spatial modeling of CWD
Xiaotian Hua	2019-current	2022	Mathematical models for coral algae interactions
Nick Paroshy	2021-current		Polar bear movement modelling
Xiaoqi Xie	2021-current		Mountain Pine Beetle
Johnson Yue	2022-current		

Doctoral Supervision:

<b>Name</b>	<b>Period of Supervision</b>	<b>Degree Date</b>	<b>Thesis/Project Name</b>	<b>Present Position</b>
Robert van Kirk		1995	Integrodifference Models of Biological Growth and Dispersal	Senior Scientist, Henry's Fork Foundation, Ashton, ID
Tom Robbins	1999-2004	2004	Seed Dispersal and Biological Invasions: A Mathematical Analysis	Vice President of Software Development, BioFire, Salt Lake City UT
Jungmin Lee	2002-2006	2006	Prey-taxis and its Applications	Researcher, National Institute for Mathematical Sciences, Korea
Tomas de Camino-Beck	2002-2006	2006	Theoretical Considerations for Biocontrol	Professor, Lead University, Costa Rica
Chris Jerde	2002-2006	2007	NIS Arrival and Establishment	Research Assistant Professor, University of Nevada

Marty Krkošek	2003-2008 200820019	2008	Effects of Salmon Aquaculture on Sea Lice Transmission and Wild Salmon Population Dynamics	Associate Professor and Canada Research Chair, University of Toronto
Raluca Eftimie	2003-2008	2008	Modeling Animal Group Formation	Professor, Laboratoire de Mathématiques de Basançon, Université de Franche-Comté
Peter Molnár	2003-2009	2009	Modelling Future Impacts of Climate Change and Harvest on the Reproductive Success of Female Polar Bears ( <i>Ursus maritimus</i> )	Assistant Professor, University of Toronto
Andria Dawson	2007-2013	2013	Models for Forest Growth and Mortality: Linking Demography to Competition and Climate	Assistant Professor, Mount Royal University
Harshana Rajakaruna	2007-2013	2013	Temperature and Propagule Flow on Invasibility	Postdoctoral Research Associate, University of Tennessee
Marie Auger- Méthé	2009-2014	2014	Walking in Their Footsteps: New Approaches to Identify Behavioural Processes and Define Home Ranges Using Animal Movement Data	Assistant Professor and Canada Research Chair, University of British Columbia
Ulrike Schlägel	2009-2015	2015	Modeling Wolf Movement and Researching State-side Models	Postdoctoral Fellow, University of Potsdam
Stephanie Peacock	2010-2015	2015	Modeling Disease Transmission from Aquaculture to Wild Salmon	Postdoctoral Fellow, University of Calgary
Jody Reimer	2013-2019	2019	Predator and Prey, Past, Present, and Projected: Modelling Polar Bears and Ringed Seals in a Dynamic Arctic	Wylie Assistant Professor Lecturer, University of Utah
Mérodie Kunegel-Lion	2014-2019	2019	Mountain Pine Beetle Population Dynamics and Management	Researcher, Northern Forestry Centre (NRCan)
Nathan Marculis	2014-2019	2019	Integrodifference Models for Neutral Genetic Patterns and Trade-offs in Ecology	Business Owner Brewmaster Irrational Brewing Company, Edmonton
Samuel Fischer	2014-2020	2020	Quantitative Methods for Controlling the	Postdoc, Helmholtz Centre for

			Spread of Invasive Species	Environmental Research Leipzig, Germany
Dean Koch	2013-2020	2020	Mountain Pine Beetle Dynamics	Postdoctoral Fellow, University of Alberta
Christopher Heggerud	2015-2021	2021	Modelling, Analysis and Control of Blue-green Algae	Postdoctoral Fellow, University of California, Davis
Peter Harrington	2015-2022	2022	Using Mathematics to Control Disease Outbreaks on Salmon Farms	Postdoctoral Fellow, University of British Columbia
Emma Atkinson	2019-current	current	Analysis of Spot Prawn Population Dynamics and Management	
Peter Thompson	2019-current	current	Memory and Polar Bear Movement Patterns	
Shan Gao	2021 - current	current		
Shibai Zhang	2022-current	current		

#### **Other contributions to graduate student supervision**

\*Types of contributions:

- (1) Member of supervisory committee (but not direct supervisor or co-supervisor)

<b>Name</b>	<b>Period of Supervision</b>	<b>Degree Program</b>	<b>*Type of Supervision</b>
Cam Gillies	2001	PhD in Biological Sciences	Committee member
Cheryl Chetkiewicz	2002-2006	PhD in Biological Sciences	Committee member
Mark Hebblewhite	2002	PhD in Biological Sciences	Committee member
Nicole McCutchen	2002-2006	PhD in Biological Sciences	Committee member
Steve Kembell	2002-2006	PhD in Biological Sciences	Committee member
Jalene LaMontagne	2002-2007	PhD in Biological Sciences	Committee member
Judith Toms		PhD in Biological Sciences	Committee member
Gustavo Carerras		PhD in Mathematical and Statistical Sciences	Committee member
Nathan Varley	2004-2007	PhD in Biological Sciences	Committee member
Dave Roth		MSc in Biological Sciences	Committee member
Melody Gharmani		MSc in Mathematical and Statistical Sciences	Committee member
Ibrahim Agyemang		PhD in Mathematical and Statistical Sciences	Committee member
Judy Muir		MSc in Biological Sciences	Committee member
Shawn F. Morrison	2004-2007	PhD in Biological Sciences	Committee member
Darcy Visscher	2004-2010	PhD in Biological Sciences	Committee member
Stephen Spencer	2006-2009	PhD in Renewable Resources	Committee member
Carrie Roever	2006-2006	MSc in Biological Sciences	Committee member
Petro Babak	2005-2006	MSc in Renewable Resources	Committee member

Brian Tucker	2005-2011	PhD in Biological Sciences	Committee member
Sandra Luz Montero-Correa	2005-2006	MSc in Earth & Atmospheric Sciences	Committee member
Jennifer Els Carpenter	2004-2007	MSc in Biological Sciences	Final Examiner
Conrad Douglas Thiessen	2003-2006	MSc in Biological Sciences	Final Examiner
Zhian Wang	2005	PhD in Mathematical and Statistical Sciences	Committee member/Oral Examiner
Hongbin Guo	2006	PhD in Mathematical and Statistical Sciences	Committee member/Oral Examiner
Bogdan Cristescu	2007-2013	PhD in Biological Sciences	Supervisory Committee member/examiner
Liv Vors	2007-2013	PhD in Biological Sciences	Supervisory Committee member/examiner
Malcolm Roberts	2007	PhD in Applied Mathematics	Supervisory Committee member
Helen Wheeler	2008-2012	PhD in Biological Sciences	Supervisory Committee member
Vijay Patil	2008	PhD in Biological Sciences	Supervisory Committee member
Thomas Habib	2008	PhD	Supervisory Committee member
Christopher Neufeld	2005-2011	PhD in Biological Sciences	Supervisory Committee member
Cam Gillies	2007	PhD in Biological Sciences	Oral Examiner
Rafael Avila-Florez	2009	PhD in Biological Sciences	Supervisory Committee member
Robert Serrouya	2008	PhD in Biological Sciences	Supervisory Committee member
Amy Nixon	2008-2011	MSc in Biological Sciences	Supervisory Committee member/examiner
Monica Moreno	2009	PhD in Mathematical and Statistical Sciences	Candidacy examiner
Barry Norbert	2009	MSc in Biological Sciences	Supervisory Committee member
Rita Wong	2009-2010	MSc in Mathematical and Statistical Sciences	Supervisory Committee member
Jeremy Banfield	2010	MSc in Biological Sciences	Supervisory Committee member
Guillaume Blanchet	2009-2012	PhD in Biological Sciences	Examining Committee
Samson Nuanumba	2007-2010	PhD in Biological Sciences	Supervisory Committee member /Examiner
Khurram Nadeem	2009-2013	PhD in Mathematical and Statistical Sciences	Supervisory Committee member/Examiner
Shahin Jabbari	2010	MSc in Computing Science	Examining
Samira Sadeghi	2010-2015	PhD in Mathematical and Statistical Sciences	Supervisory Committee member/examiner
Jessica Stolar	2010	PhD in Biological Sciences	Supervisory Committee member/examining

Stephen Hamilton	2010	PhD in Biological Sciences	Supervisory Committee member
Brendan Hall	2011	PhD	Supervisory Committee member
Aditya Gangadharan	2009-2014	PhD in Mathematical and Statistical Sciences	Supervisory Committee member/Examiner
Dana Seidel	2011-2014	MSc in Biological Sciences	Supervisory Committee member
Danielle Ludeman	2012-2014	MSc in Biological Sciences	Supervisory Committee member
Jonathan Martin	2013-2013	PhD in Mathematical and Statistical Sciences	Examiner
Camille Warbington	2014-2020	PhD in Biological Sciences	Supervisory Committee member
Valentin Doli	2015-2017	PhD in Mathematical and Statistical Sciences	Supervisory Committee member
Amael Le Squin	2016-2019	PhD in Biological Sciences	Supervisory Committee member/Examiner
Brendan Alexander	2011	MSc in Biological Sciences	Supervisory Committee member
Andreas Buttenscoen	2013-2017	MSc in Mathematical and Statistical Sciences	Supervisory Committee member
Amanda Droghini	2014-2016	MSc in Biological Sciences	Supervisory Committee member
Youhua Chen	2013-2017	PhD in Biological Sciences	Supervisory Committee member
Margarete Dettlaff	2016	PhD in Biological Sciences	Examiner
Zaheen Farraz Ahmad	2016	MSc in Computing Science	Examiner
Benjamin Liu	2018	PhD	Supervisory Committee member
Arwa Baabdulla	2018	PhD in Mathematical and Statistical Sciences	Supervisory Committee member
Nora Gilbertson	2018	PhD Applied Math	Supervisory Committee member
Emily Upham-Mills	2018	MSc in Biological Sciences	examine
Carrie-Ann Adams	2020	PhD in Biological Sciences	Supervisory Committee member
Cole Brookson	2020	MSc in Biological Sciences	Supervisory Committee member
Cesar Estevo	2019	PhD in Biological Sciences	Supervisory Committee member
Roman Frolov	2020	PhD in Mathematical and Statistical Sciences	Examining Committee
Chris Souliere	2019	PhD in Biological Sciences	Examining Committee

(2) External examiner (indicate if at another university)

<b>Name</b>	<b>Period of Supervision</b>	<b>Degree Program</b>	<b>*Type of Supervision</b>
Abbey J. Trewenack	2009	PhD - Department of Mathematics and Statistics	Thesis examiner external University of Melbourne



Brian Ma	2010	PhD - Ecology and Evolution	External Simon Fraser University
Kyrre Kausrud	2010	PhD - Department of Biology	External University of Oslo

**External examiner:**

Arizona State University, 2001

Dalhousie University, 2009

University of British Columbia 2009

University of British Columbia, 2013

Universidade Estadual Paulista, Sao Paulo, 2015

(3) Chairman of examination committee

Name	Period of Supervision	Degree Program	*Type of Supervision
Aaron Shafer	2007	PhD in Biological Sciences	Committee chair
Jackson Chu	2010	MSc in Biological Sciences	Committee Chair
Samira Sadeghi	2010-2015	PhD in Mathematical and Statistical Sciences	Committee Chair
Jonathan Martin	2013-2013	PhD in Mathematical and Statistical Sciences	Committee Chair
Jude Kong	2017	PhD in Mathematical and Statistical Sciences	Committee Chair
Courtney MacInnis	2017	MSc in Biological Sciences	Committee Chair
Alyssa Friesen	2016	MSc in Biological Sciences	Committee Chair

**Postdoctoral Supervision**

Name	Period of Supervision	Present position (if known)
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Postdoctoral Supervision:

Name	Period of Supervision	Project	Present Position
Markus Owen	1997-1999	Predator-prey dynamics in spatial ecology	Professor, University of Nottingham
Bingtuan Li	1999-2001	Spreading speeds for cooperative dynamical systems	Professor, University of Louisville
Christina Cobbold	2001-2003	Spatial dynamics of forest tent caterpillar systems	Senior Lecturer, University of Glasgow
AnneMarie Pielaat	2001-2003	Models for plant dispersal	Research Associate. RIVM, The Netherlands
Frithjof Lutscher	2001-2005	Interodifference models in Ecology	Professor, University of Ottawa

Leeza Pachepsky	visiting postdoc 2002-2004	Population dynamics of stream systems	Associate Psychotherapist at the Center for Psychotherapy, Spirituality and Creativity, Oakland, CA
Marjorie Wonham	2002-2006	Modelling of biological invasions in aquatic systems	Special Advisor to the President & Life Sciences Tutor, Quest University
Joanna Renclawowicz	2003-2004	West Nile virus dynamics	Polish Academy of Sciences
Erik Noonburg	2003-2005	Elk migration models and analysis	Associate Professor, Florida Atlantic University
Alex Potapov	Research Associate 2003-2013	Risk analysis of biological invaders	Research Associate University of Alberta
Tom Robbins	2004-2005	Population spread in heterogeneous systems	Vice President of Software Development, BioFire, Salt Lake City, UT
Caroline Bampfylde	2004-2008	Risk analysis of biological invaders	Risk Assessment Modeller, Environment and Sustainable Resource Development, Government of Alberta
Bill Nelson	2005-2007	Modelling mountain pine beetle	Professor, Queen's University
Jungmin Lee	2006-2007	Prey-taxis and its applications	National Institute for Mathematical Sciences, Korea
Frank Hilker	2006-2008	Analysis of mathematical models for biological invasions	Professor, Osnabrück University
Tomas de Camino Beck	2006-2008	Mountain pine beetle models: Computational and mathematical analysis	Teacher, Lead University, Costa Rica
Frederic Hamelin	2007-2008	Mathematical analysis of ecological systems	Faculty, Agrocampus Rennes, France
Jim Muirhead	2007-2010	Forecasting dispersal and establishment of non-indigenous species	Research Staff, Smithsonian Environmental Research Center

Martin Krkošek	2008	Mathematical & statistical synthesis of sea lice models in the Broughton Archipelago	Assistant Professor Professor and Canada Research Chair, University of Toronto
Mario Pineda-Krch	2008-2012	Genomics of mountain pine beetle populations	Education Student, University of Alberta
Carly Strasser	2009-2010	Models for aquatic invasive species	Director of Alliances and Data Strategy at the Fred Hutchinson Cancer Research Center
Peter Molnár	2009-2010	Mathematical & statistical models for polar bear dynamics	Assistant Professor, University of Toronto
Yu Jin	2009-2012	Instream flow needs for healthy ecosystems	Associate Professor, University of Nebraska-Lincoln
Qihua Huang	2011-2016	Modelling river dynamics & analysis of oilsands pollution risks	Professor, Southwest University, China
Olga Vasilyeva	2012-2013	Analysis of river dynamics	Assistant Professor, Memorial University
Jimmy Garnier	2012-2013	The effect of climate change on genetic diversity	Associate Scientist, Centre National de la Recherche Scientifique, France
Greg Breed	2012-2014	Models for animal movement	Associate Professor, Fairbanks University
Jonathan Potts	2012-2014	Develop animal movement models & models for territoriality	Lecturer, Sheffield University
Devin Goodsman	2012-2016	Mountain pine beetle dispersal models	Entomologist Northern Forestry Centre, Natural Resources Canada, (Gov't Canada)
Andrew Bateman	2013-2016	Quantitative research on pesticide resistance in sea lice on salmon farms	Research Associate with the Pacific Salmon Foundation's Strategic Salmon Health Initiative, British Columbia
Tal Avgar	2014-2017	Spatial aspects of trophic interactions and cognitive ecology	Assistant Professor, Utah State University
Yanyu Xiao	2014-2015	Risk assessment for invasive species	Assistant Professor, University of Cincinnati

Mohsen Mesgaran	2015 Visiting Postdoc	Invasion dynamics via hybridization	Faculty member, University of California, Davis
Juliette Bouhours	2015-2016	The effect of climate change on population persistence	High School Math teacher, Paris, France
Arianna Bianchi	2016-2017	Mathematical analysis of animal movement patterns	Instructor at the Liceo Scientifico Statale "Galileo Galilei" in Siena, Italy.
Stephanie Peacock	2016-2017	Modelling Disease Transmission from Aquaculture to Wild Salmon	Postdoctoral Fellow – University of Calgary
Pouria Ramazi	2018- 2020	Bayesian belief and decision network modelling of whirling disease in Alberta	Assistant Professor, Brock University
Mariana B. Nagy-Reis	2018- 2019	A retrospective analysis of white-tailed deer and mule deer harvest and demographic data in North Dakota	Caribou Recovery Ecologist University of Alberta, ABMI, Caribou Monitoring Unit
Jingjing Xu	2018- 2021	Cyanobacterial blooms and their toxic effects on fish populations and quantifying contact rates for modelling transmission of chronic wasting disease (CWD)	Postdoctoral Fellow, York University
Samuel Fischer	2020	Model angler movement patterns to determine the impact on the risk associated with the spread of whirling disease	Postdoctoral Fellow, Helmholz Centre for Environmental Research Leipzig, Germany
Dean Koch	2020	Mountain pine beetle growth spread	Postdoctoral Fellow, University of Alberta
Kyeongah Nah	2020	Models for COVID-19 outbreaks	Researcher, National Institute for Mathematical Science, Korea
Xiunan Wang	2021	Models for COVID-19 outbreaks	Assistant Professor, University of Tennessee
Micah Brush	2021 - current	TRIA-Net Mountain pine beetle modelling	
Azadeh Aghaeeyan	2022 - current	Integrating human decision making and epidemiological models to reveal the human impact on epidemics	
Pijush Panday	2022 - current	One-health modelling network for emerging infections 2021	

Julia Schmid	2022 - current	Citizen-science based models for angler pressure	
Evan Johnson	2022-current	TRIA-Net Mountain pine beetle modelling	

### **Training and Supervision of highly qualified personnel**

<b>Name</b>	<b>Period of Supervision</b>	<b>Present position (if known)</b>
Mark Duller	2005- current	Computer Analyst
Christine Zinchuk	2005-2006	Administrative and Research Coordinator
Cecilia Hutchinson	2006-2012	Administrative and Research Coordinator
Kimberley Wilke-Budinski	Feb 2012-current	Admin/Lab Assistant
Martina Beck	2015-2016	Research/Technical Assistant
Jamie Svendsen	2022-current	Data Analyst
Kelsey Gritter	2022	Data Analyst

### **TEACHING PHILOSOPHY and NARRATIVE of TEACHING EXPERIENCE**

#### Teaching Philosophy

My teaching focuses on mathematical biology, applied math, and ecology. The teaching occurs at many levels, ranging from undergraduate summer school training on the “Mathematics of Biological Systems” to graduate student and postdoc training and mentorship.

My teaching philosophy is to recognize and embrace the diversity of student backgrounds, and to find ways to use that diversity as a strength in the classroom and laboratory. In each course, I tailor the curriculum to include a broad range of levels of inquiry, ranging from technical mathematical approaches to biological insights. Depending on background, each student will feel most at their ease with a certain level of inquiry. The goal is to use connections in the course content that are found between the different levels to move the student to excellence in new areas. Empirically-based students will learn the power and beauty of mathematical methods; theoretical students will see how to make applications to real biological questions. This building of connections is also achieved by having students work together in groups for team projects, where group members have complementary skills.

Both inside and outside of the classroom, my goal is “vertical integration” of the research and training, from one level to the next. For example, for the undergraduate summer workshop that I have organized and run, Mathematics of Biological Systems, involves a mixture of teachers including senior instructors, postdocs and graduate students. Senior instructors (primarily faculty) lecture and help guide student projects; graduate students help with problem solving and computer code; and postdocs guide the computing and assist with the student projects.

Students and postdocs that I mentor come from diverse backgrounds with differing strengths and weaknesses. Some are good mathematicians; others have excellent biological “intuition” but little formal quantitative training. However, almost all would like to develop a deep understanding of how humans interact with and modify their natural environment. Their research projects reflect this motivation, with

subjects ranging from the effects of marine aquaculture on wild salmon to the impacts of global warming on polar bear reproductive success.

My mentoring philosophy is to recognize and embrace the diversity of student backgrounds, and to find ways to use that diversity as strength. I try to guide each project to include a broad range of levels of inquiry, ranging from technical mathematical approaches to “common sense” scientific insights.

I try to immerse students in a culture of research and inquiry so that they catch the “research bug.” This immersion goes far beyond supervisory meetings. It involves weekly lab meetings, student-led discussion groups, lab retreats, broader Collaborative Math Biology Group retreats, as well as shared lab recreational and social events. Here an essential ingredient is a cadre of mature researchers (such as successful postdocs) who also lead by example. Vertical integration of research training from one level to the next helps to facilitate the transfer of ideas and approaches. Postdoctoral fellows interact with advanced researchers and help mentor junior graduate students and undergraduates. Interactions are facilitated by membership in multidisciplinary teams addressing ecological problems using mathematical tools, by collaboration with external research visitors, by attendance to the weekly interdisciplinary mathematical biology seminar, and by assistance with the education of others.

I believe that my role as supervisor is to observe carefully and see what students need to be successful in their development as researchers, and then to act to remove the impediments to progress. Rarely do students need to be told what to do. By making their own decisions, students take responsibility for their research projects right from the start. More often, my role is to try to highlight useful directions or ideas and to demonstrate how to undertake certain key activities (eg., create a model, write a proof, make an asymptotic approximation, design a field study, write a paper). This is learned via shared research experiences, discussion, and critiquing, either with me or within a larger collaborative research group. When interacting one-on-one with students, I let them know that it is fine to not know how to solve problems. Indeed, I emphasize that the process of getting lost and then finding one’s self is key to the creative process of research.

### Teaching Experience

I have been teaching at a university level since 1992 (over 40 years), first at the University of Utah (1992-2001), then at the University of Alberta (2001-2022) and now at the University of Victoria (2022 onwards). I have taught in both Mathematics/Statistics and Biology and, in my 21 years at Alberta, developed eight new courses (see below) as well as six new summer courses (see below). In the fall of 2022 I taught Topics in Mathematical Biology (Elements of Mathematical Ecology) at the University of Victoria as both an undergraduate (MATH 475) and a graduate (MATH 575) course.

Generally teaching evaluations have been positive.

### Average Numerical Student Responses (University of Alberta) 2010-20:

Overall, the quality of the course was excellent: 4.3/5  
The instructor treated the students with respect: 4.8/5  
Overall, this instructor was excellent: 4.4/5

## **EXPERIENCE in CURRICULUM and COURSE DEVELOPMENT, and in INNOVATIVE TEACHING**

### **New Courses Developed and Taught at the University of Alberta (2001-2022)**

I have been active in developing new opportunities for graduate seminars, as described below.

- Math 656: Seminar in Mathematical Biology. This seminar has ran every year since I started it in 2001 until I left the University of Alberta in 2022. It features local, national and international speakers in mathematical biology. Many of these are visitors to the Centre for Mathematical Biology/Collaborative Mathematical Biology Group at Alberta. Attendance at the seminar primarily includes faculty, postdocs, and graduate students, and varies from 20 to 40 people. It is the longest continuously running seminar in the Mathematics and Statistics Department at Alberta. I organized it in the early years but now it typically organized by colleagues.
- Biol 633: Advanced Techniques in Biology These discussion-based graduate seminar courses on Animal Movement Models and Habitat Selection, were co-taught with colleague Evelyn Merrill.

I created new graduate courses in mathematical biology in both Mathematical and Statistical Sciences and Biological Sciences. These courses are popular and run regularly.

- Math 570: Mathematical Biology This course is designed for mathematics graduate students interested in research in mathematical biology. It focuses on the interface of scientific problems, mathematical models, and mathematical analysis. This course runs regularly as a Math/Stat Sciences graduate course.
- Biol 570: Models in Ecology This course is designed for ecology graduate students interested in learning how models can be used in research. It focuses on the development, implementation, and analysis of models that interface with data and field studies. It is a very popular course amongst Biological Sciences graduate students, but also has students from Mathematical and Statistical Sciences, Renewable Resources and Physics. I also co-taught this as a summer course at Bamfield Marine station.
- Math 663: Topics in Applied Math-Mathematical Ecology In 2011 I developed a live interactive online graduate course with students connecting from Alberta, Calgary, UVic, and UBC. Although more common now, this was the first such course in the Math/Stat Dept at Alberta, and the first in any in western Canada. This course was developed in conjunction with the PIMS International Graduate Training Centre in Mathematical Biology, which I directed at the time. Subsequently I have run a version of this as a discussion-based reading course with groups of interested graduate students (twice in person and once online).
- Biol 560: Topics in Ecology (Quantitative Ecology, Winter 2003; Biological Invasions, Winter 2004). These two courses were created as topics courses for graduate in Biological Sciences. Each course had a highly motivated core group of graduate students. The Quantitative Ecology course was developed into a permanent course (Biol 570, above).

I have also been active in the creation of undergraduate courses in mathematical biology. The biocalculus course, described below, has been a major undertaking over the last five years.

- Math 134: Biocalculus In 2014 I developed a new first-year course, Biocalculus, jointly with Thomas Hillen, and with help from Gerda de Vries and the University of Alberta Centre for Teaching and Learning. This is a blended, flipped version of calculus designed for biology students. Development was based on a grant from the Provost's Digital Learning Committee. Feedback was positive from the students and from the independent survey of students run by the Centre for Teaching and Learning. The course is now currently being offered as a mainstream calculus course to approximately 1200 undergraduates. In the Fall of 2020, I created video lectures for this course using a lightboard (currently also posted on YouTube).
- Math 371: Mathematics in the Life Sciences I developed this course with colleagues Gerda de Vries and Thomas Hillen. It was a natural outgrowth of our undergraduate summer workshop for which we wrote a textbook. It is a semester-long introduction to mathematics in the life sciences suitable for mathematics students and students from related fields. It has continued to be offered regularly and is now a staple course for undergraduates at Alberta.

### **New Summer Schools Developed and Taught at the University of Alberta**

I have been active in designing and organizing summer schools at the University of Alberta. One very successful program has been the Undergraduate Summer Workshop, which has run 7 times now, and has had a major impact on graduate recruitment.

- PIMS/MITACS Undergraduate Summer Workshop (since 2002) Mathematics of Biological Systems. This 10-day intensive workshop first started in 2002 and has now run 7 times at Alberta. It involves teaching, computer labs, and projects for undergraduate math students from across Canada and the US. It is held at the University of Alberta, typically at the start of May. It also gave rise to a textbook (publication [260]), coauthored with colleagues Gerda de Vries, Thomas Hillen and others.
- PIMS Graduate Course: Mathematics Behind Biological Invasions (2013) I helped design, run and teach this 2.5-week summer course, which involved international guest lecturers and student projects. The primary course organizer was Thomas Hillen.
- Séminaire de Mathématiques Supérieures (2016) This well-known mathematics summer school has been held continuously since 1962, with support from math institutions across North America. In the summer of 2016, it was held at the University of Alberta, co-organized by me and colleagues Thomas Hillen and Yingfei Yi. This was the first time that the SMS was held outside of Montreal. The subject of the course was Dynamics of Biological Systems, and the course content was based on lecture sequences from international guest lecturers. The lecture notes were published as a text (publication [255]).

### Summer School Courses Developed and Taught Elsewhere

In addition, I have accepted invitation to organize and teach summer school courses elsewhere. The most high-profile of these is the Park City Math Institute Program, run by the Institute for Advanced Study.

- Minicourse: The Mathematics Behind Biological Invasions (2003). This two-week minicourse on mathematical models for invasive species spread was designed for graduate students from across North America and was offered as part of the University of Utah VIGRE (NSF) program. I developed and co-taught the course with Dr. Mike Neubert (Woods Hole Oceanographic Institute).
- Park City Math Institute Summer Program in Mathematical Biology (2005). This international summer math institute, supported by the Institute for Advanced Study (Princeton), includes a 3-week summer school. I organized the 2005 PCMI summer school and taught one of the summer school modules.
- African Institute for Mathematical Sciences (2016) I designed and taught a module on Structured Dynamics of Invasive Species at this summer school in South Africa.

### HONOURS

Awards and other recognition for teaching

- Josephine Mitchell Graduate Mentoring Award (Alberta), 2016;
- Faculty of Science Graduate Mentoring Award (Alberta), 2016;
- Killam Award for Excellence in Mentoring (Alberta), 2016;
- Faculty of Science Instructor of Distinction Honor Roll (Alberta), 2016

### PROFESSIONAL DEVELOPMENT in TEACHING and LEARNING

Examples might include teaching upgrading through courses taken at the Learning and Teaching Centre

### SCHOLARSHIP OF TEACHING



"Scholarship of Teaching", including published papers, invited presentations, other examples of scholarly activity in teaching, should appear in the curriculum vitae under the appropriate headings.

## ATTACHMENTS

(primarily for tenure and promotion; not part of the core Teaching Dossier; not to be submitted to the Dean's office annually)

**- comments of students**

If the comments of students from teaching evaluations are included for a given course, ALL comments for that course must be provided.

**- peer review of teaching (required for awarding of tenure and promotion )**

**- course outlines (optional)**

**- comments from former students who have left the university**

Such comments may not be solicited by you, but may be obtained by your Chair or Dean