

THE UNIVERSITY OF BRITISH COLUMBIA

Curriculum Vitae for Faculty Members

Date: March, 2019

1. **SURNAME:** Tyson **FIRST NAME :** Rebecca **MIDDLE NAME:** Claire
2. **DEPARTMENT/SCHOOL:** CMPS: Computer Science, Mathematics, Physics and Statistics (Unit 5)
3. **FACULTY:** I.K. Barber School of Arts and Science
4. **PRESENT RANK:** Associate Professor **SINCE:** 2010
5. **POST-SECONDARY EDUCATION**

(a) *Degrees:*

University or Institution	Degree	Subject Area	Dates
McGill University	B.Sc.	Physics and Physiology	1990
University of Washington	M.S.	Applied Mathematics	1992
University of Washington	Ph.D.	Applied Mathematics	1996

(b) *Title of Dissertation and Name of Supervisor*

Title: "Pattern formation by *E. coli* and *S. typhimurium*: Numerical and analytical investigation of a biological phenomenon"

Supervisor: James D. Murray, F.R.S.

6. **EMPLOYMENT RECORD**

(a) *Prior to coming to UBC:*

University, Company or Organization	Rank or Title	Dates
Okanagan University College	Assistant Professor	2003-2005
Okanagan University College	College Professor (2-yr term)	2001-2003
University of Arizona	Visiting Assistant Professor	2001-2001
University of Washington	Math Study Skills Instructor	1997-1999
University of Colorado at Boulder	Postdoctoral Associate	1996-1997

(b) *At UBC:*

Rank or Title	Dates
Assistant Professor	2005-2010
Associate Professor	2010-present

7. **LEAVES OF ABSENCE**

University where leave taken	Type of leave	Dates
University of Arizona	Maternity Leave	1999-2000
UBC	Study Leave	2010-2011

8. TEACHING

(a) *Areas of special interest and accomplishments:*

My teaching reflects my broad interdisciplinary interests in Mathematics, Biology, Physics and Statistics. I emphasise interdisciplinary connections in my lectures at all levels, from 1st year undergraduate to graduate, and encourage my students to take courses and interact with researchers in all scientific disciplines. I also have a special interest in Mathematics Education research, and continually apply knowledge acquired through my work between 1997 and 2001.

I offer my department a unique background in Applied Mathematics, and am committed to bringing new courses to the “Differential Equations and Mathematical Biology” focus area in the undergraduate and graduate Mathematics degrees. I have thus far developed four new courses: MATH 459/559 - Mathematical Biology, MATH 463/605 - Numerical Analysis, MATH 463/605E - Mathematical Ecology, MATH 463/605F - Stochastic Differential Equations and MATH 339 - Dynamical Systems.

(b) *Courses taught at UBC Okanagan:*

Session	Course number	Course Title	Class size	Hours taught Lectures
W05 T1	MATH 319	Partial Differential Equations	15	3 hrs/wk
W05 T2	MATH 225	Ordinary Differential Equations	35	3 hrs/wk
W06 T1	MATH 319	Partial Differential Equations	15	3 hrs/wk
W06 T1	MATH 448	Directed Studies	1	1 hrs/wk
W06 T2	MATH 225	Ordinary Differential Equations	35	3 hrs/wk
W06 T2	MATH 448	Directed Studies	1	1 hrs/wk
W07 T1	MATH 125	Pre-Calculus	60	3 hrs/wk
W07 T2	MATH 225	Ordinary Differential Equations	35	3 hrs/wk
W08 T1	MATH 125	Pre-Calculus	90	3 hrs/wk
W08 T1	MATH 459/559	Mathematical Biology	4	3 hrs/wk
W08 T2	MATH 200	Multivariable Calculus	70	3 hrs/wk
W08 T2	MATH 225	Ordinary Differential Equations	35	3 hrs/wk
W09 T1	MATH 125	Pre-Calculus	130	3 hrs/wk
W09 T1	MATH 463A/605C	Numerical Analysis	3	3 hrs/wk
W09 T2	MATH 200	Multivariable Calculus	80	3 hrs/wk
W09 T2	MATH 225	Ordinary Differential Equations	40	3 hrs/wk
W11 T1	MATH 200	Multivariable Calculus	76	3 hrs/wk
W11 T1	MATH 463/605	Mathematical Ecology	5	3 hrs/wk
W11 T2	MATH 225	Ordinary Differential Equations	52	3 hrs/wk
W11 T2	MATH 339	Dynamical Systems	9	3 hrs/wk
W12 T1	MATH 100	Differential Calculus	350	3 hrs/wk
W12 T1	MATH 463/605F	Stochastic Differential Equations	5	3 hrs/wk
W12 T2	MATH 101	Integral Calculus	230	3 hrs/wk
				+ 1 hr/wk coordination mtgs
W12 T2	MATH 225	Ordinary Differential Equations	60	3 hrs/wk + tutorials
W13 T1	MATH 339	Dynamical Systems	12	3 hrs/wk
W13 T2	MATH 225	Ordinary Differential Equations	100	3 hrs/wk + tutorials

W13 T2	MATH 459/559	Mathematical Biology	6	3 hrs/wk
W14 T1	MATH 319	Partial Differential Equations	60	3 hrs/wk
W14 T2	MATH 225	Ordinary Differential Equations	100	3 hrs/wk + tutorials
W14 T2	MATH 459/559	Mathematical Biology	6 + 3	3 hrs/wk
W15 T1	MATH 339	Dynamical Systems	20	3 hrs/wk
W15 T1	Math 448	Directed Studies	1	3 hrs/wk
W15 T2	MATH 225	Ordinary Differential Equations	100	3 hrs/wk + tutorials
W15 T2	MATH 459/559	Mathematical Biology	18 + 2	3 hrs/wk
W15 T2	MATH 463F/605F	Stochastic Differential Equations	3 + 3	3 hrs/wk
W15 T2	Math 448	Directed Studies	1	3 hrs/wk
W16 T1	MATH 319	Partial Differential Equations	37	3 hrs/wk
W16 T1 & T2	Math 448	Directed Studies	2	4 hrs/wk
W16 T2	MATH 459/559	Mathematical Biology	3 + 2	3 hrs/wk
W16 T2	MATH 225	Ordinary Differential Equations	81	3 hrs/wk
W17 T1	Math 448	Directed Studies	1	3 hrs/wk
W17 T1	Math 339	Dynamical Systems	4	3 hrs/wk
W17 T2	MATH 459/559	Mathematical Biology	9 + 2	3 hrs/wk
W17 T2	MATH 225	Ordinary Differential Equations	81	3 hrs/wk

(c) *Undergraduate research students supervised and/or co-supervised:*

Student name	Program type	Dates	Principal supervisor	Co-supervisor(s)
Jane Krindle	USRA	May 2003 - Jul 2003	Tyson	
Brock Nyquist	RAp	May 2004 - Aug 2005	Tyson	
Carla Robinson	RAv	Jan 2006 - May 2006	Tyson	
Kyle Newton	RAp	May 2004 - Aug 2006	Tyson	
Sheena Haines	RAp	May 2006 - Aug 2006	Tyson	
Justin Hebert	USRA	May - Aug 2004, 2005, 2006	Tyson	
Justin Hebert	RAp	Sep 2006 - Dec 2007	Tyson	
Shaun Strohm	USRA	May - Aug 2007, 2008	Tyson	
Shaun Strohm	DS	Sep 2007 - Apr 2008	Tyson	
Ben Wilson	RAp	May 2008 - Apr 2009	Tyson	
Ben Wilson	URA	May 2009 - Aug 2009	Tyson	
Cassidy Dahl	RAp	May - Aug 2008, 2009	Lalonde	Tyson
Meghan Dutot	RAp	May 2009 - Apr 2010	Tyson	Nelson
Chris Coutts	RAp	May 2009 - Aug 2009	Tyson	
Ben Wilson	DS	Sep 2009 - Apr 2010	Tyson	
Cassidy Dahl	DS	Sep 2009 - Apr 2010	Lalonde	Tyson
Ben Wilson	RAp	May 2010 - Aug 2010	Tyson	
Meghan Dutot	URA	May 2010 - Aug 2010	Tyson	Nelson
Miayan Yeremi	USRA	May 2010 - Aug 2010	Tyson	
Meghan Dutot	DS	Sep 2010 - May 2011	Tyson	
Haley Dirksen	URA & DS	May 2011 - Apr 2012	Saucier	Tyson, Nelson
Andrea Hyde	DS	May 2011 - Dec 2012	Tyson	

Garrett Culos	URA	May 2011 - Aug 2011	Tyson	
Haley Dirksen	RAp	Jun - Jul 2012	Saucier	Tyson, Nelson
Garrett Culos	RAp	May 2012 - Aug 2012	Tyson	
Garrett Culos	DS	Sep 2012 - Apr 2013	Tyson	
Morgan Bennett	USRA	May 2013 - Aug 2013	Parrot	Tyson
Jessa Marley	WS	Sep 2013 - Apr 2015	Tyson	Parrot
Joe Salkeld	WS	Sep 2013 - Apr 2015	Parrot	Tyson
Jessa Marley	URA	May 2015 - Aug 2015	Tyson	
Charles Jolin-Landry	URA	May 2015 - Aug 2015	Tyson	
Kendas Hansen	DS	Sep 2015 - Apr 2016	Tyson	
McCall Milligan	DS	Sep 2015 - Apr 2016	Tyson	
Jessa Marley	RAv	Sep 2015 - Dec 2015	Tyson	Parrot
Jessa Marley	RAp	Jann 2016 - Aug 2016	Tyson	Parrot
McCall Milligan	USRA	May 2016 - Aug 2016	Tyson	
Rayden Shannon	WS	May 2016 - Aug 2016	Tyson	
Tao Gaede	RAv	May 2016 - Jun 2016	Tyson	
Michael Tang	RAv	May 2016 - Aug 2016	Tyson	
Geoff Goetz	WS	Sep 2016 - Apr 2017	Tyson	
Michael Tang	DS	Sep 2016 - Apr 2017	Tyson	
You Rao	DS	Sep 2016 - Apr 2017	Tyson	
Geoff Goetz	WS	Sep 2017 - Apr 2018	Tyson	
Sylvain Gretchko	DS	Sep 2017 - Dec 2017		
Kim Wilcott	RAv	Sep 2017 - Apr 2018		
Stephanie Hamilton	USRA	May 2018 - Aug 2018		
Sylvain Gretchko	URA	May 2018 - Aug 2018		
Matthew Saurette	RAv	June 2018 - Dec 2018		

USRA – Undergraduate Student Research Award (NSERC), URA – Undergraduate Research Award (Barber School, UBC Okanagan), DS – Directed Studies, RAv – Research Assistant (volunteer), RAp – Research Assistant (paid).

(d) *Graduate students supervised and/or co-supervised:*

Student name	Program type	Dates	Principal supervisor	Co-supervisor(s)
Shaun Strohm	MSc Mathematics (IGTC, PGS)	Oct 2008 - Dec 2009	Tyson	
Carly Rozins	PhD Mathematics (incomplete)	Jan 2010 - May 2011	Tyson	
Katrina Williams	MSc IGS	Sep 2010 - Dec 2012	Tyson	Nelson
Shaun Strohm	PhD Mathematics (CGS, Vanier)	Jan 2010 - Aug 2013	Tyson	
Alex Blässle	MSc Mathematics	Sep 2011 - May 2013	Tyson	

Kelsey Vitense	MS QERM (University of Wash- ington)	Sep 2011 - Aug 2014	Anderson	Tyson
May Anne Mata	PhD IGS	Sep 2013 - Jun 2017	Tyson	Greenwood
Matthias Bass	PhD Biology	Jan 2014 - present	Parrot	Tyson
Jimit Majmudar	MSc Mathematics	Sep 2014 - May 2016	Tyson	
Sarah MacQueen	PhD Mathematics	Sep 2015 - present	Tyson	
Maria Martignoni	PhD Mathematics	Sep 2016 - present	Tyson	
Pau Capera Aragones	PhD Mathematics	Sep 2018 - present	Tyson	
Geoff Goetz	MSc Mathematics	Sep 2017 - present	Braun	Tyson

IGTC – International Graduate Training Centre in Mathematical Biology Fellow (Pacific Institute for the Mathematical Sciences), PGS – Postgraduate Scholar (NSERC), CGS – Canada Graduate Scholar (NSERC), Vanier – Vanier Fellow.

(e) *Postdoctoral Research Associates supervised and/or co-supervised:*

Student name	Award type	Dates	Principal supervisor	Co-supervisor(s)
Lisa Canary	Mitacs PDF (BCCA)	May 2011 - Aug 2012	Tyson	Rajapashke
Nourridine Siewe		May 2018 -	Tyson	Hare, Braun

PDF – Postdoctoral fellowship.

(f) *Visiting students supervised and/or co-supervised:*

Student name	Level	Dates	Home University
Lisa Tessier	BSc	Jul 2011 - Dec 2011	AgroParisTech, France
Franciane Azevedo	PhD	Sep 2011 - Feb 2012	Institute of Theoretical Physics, Brazil
Marie-Caroline Prima	MSc	Sep 2012 - Feb 2013	AgroParisTech, France
Thibault Gauduchon	MSc	Sep 2012 - Feb 2013	AgroCampus Ouest, France
Guillaume Grandjean	MSc	Mar 2014 - Aug 2014	AgroCampus Ouest, France
Coralie Romann	MSc	Mar 2015 - Aug 2015	AgroParisTech, France
Aboubakr Lo	MSc	May 2017 - Aug 2017	ENSTA ParisTech, France

IGTC – International Graduate Training Centre in Mathematical Biology Fellow (Pacific Institute for the Mathematical Sciences), PGS – Postgraduate Scholar (NSERC), CGS – Canada Graduate Scholar (NSERC), Vanier – Vanier Fellow.

(g) *Student Awards*

Note: The awards listed here are in addition to the URAs (UBC Okanagan Barber School Undergraduate Research Awards) and USRAs (Natural Science and Engineering Council Undergraduate Summer Research Awards) listed above in the table of undergraduate students supervised.

1. Jessa Marley (research assistant), CGS-M award (2016)
2. Jessa Marley (directed studies student), 3rd prize at the UBC Okanagan Undergraduate Research Conference poster competition (2015)
3. Garrett Culos (directed studies student), 2nd prize in UBC Okanagan Undergraduate Research Conference poster competition (2013)
4. Maziyar Jalaal (volunteer research assistant), Vanier Award (2013)
5. Sylvain Gretchko (directed studies and URA student), figures arising from Sylvain’s research were accepted in the book “The Beauty of Theoretical Biology” (Franziska Matthäus, Thomas Hillen, and Sarah Harris, eds), and were selected for a preview exhibition of some of the best artwork in the book (<https://www.fias.science/en/artoftheoreticalbiology>).

(h) *Employees supervised:*

Employee name	Category	Dates	Project Title
Brock Nyquist	Research Assis- tant 3	Sep 2005 - May 2006	Modelling the recolonization of harvested forest patches
Justin Hebert	Research Assis- tant 3	Jan 2008 - May 2008	Modelling the swimming behaviour of the medicinal leech

(i) *Continuing education activities:*

- *Annual Workshop for Women in Science* (Winter term II, 2006-2009): I co-organised an annual workshop for female science students at UBC Okanagan. We brought in speakers and female scientists from the community, and gave the participants resources and mentoring contacts helpful to their future studies and careers. We also participated in twice-annual meetings of the Jade Bridges group of educators in Vancouver, at which we discussed strategies and pedagogy for encouraging women and girls to embrace careers in science.
- Centre for Teaching and Learning seminars “Two-Stage Tests” Sep 2013: I implemented this new testing format in MATH 339, and it was very well-received.
- Personal Mentoring, Sep 2013 - Apr 2014: I worked closely with Dr Peter Arthur, meeting several times per term to improve my teaching skills. As a result, there was a marked increase in my teaching evaluation scores.

(j) *Visiting lecturer:*

- University of Alberta Summer School in Mathematical Biology, Edmonton, AB, May 2005, Course Title: “Discrete Equation Models in Mathematical Biology”
- CMI (Cursus Master en Ingénierie), Université de Savoie-Mont Blanc, Bourget-du-Lac, France, Talk title: “Prédire la dispersion du pollen transgénique”

(k) *Course development:*

- New course: Math 559/459 - Mathematical Biology
- New course: Math 605C/463A - Numerical Analysis
- New course material: Math 225 - writing assignments (training in scientific writing and research)
- New course: Math 605E/463E - Mathematical Ecology
- New course: Math 339 - Dynamical Systems
- New course: Math 605F/463F - Stochastic Differential Equations

9. SCHOLARLY AND PROFESSIONAL ACTIVITIES

(a) *Areas of special interest and accomplishments*

My research is in Mathematical Ecology, particularly in biological invasions and dispersal. I am interested in understanding the distribution and persistence of organisms in the landscape, from the point of view of conserving species at risk, or managing wanted or unwanted biological invasions. My tools are mathematical and computational models, and my focus is generally based in the areas of conservation, agriculture and forestry.

Populations of real organisms are difficult to count and monitor at the landscape scale. Mathematical modelling allows for cost-effective, non-invasive, and comparatively rapid analyses of dispersal patterns and behaviours, based on local information that can be gathered in the field. Using ordinary and partial differential equations, difference equations and individual-based modelling, I develop and analyse models to describe the population dynamics, spatial movement and complex interactions of organisms with the heterogeneous landscape in which they live.

(b) *Research or equivalent grants (C - grants obtained competitively, NC - grants obtained non-competitively) (listed in order of date awarded - table continued on next page - abbreviations listed on next page)*

Granting agency	Program	Subject	C	\$/year	Dates	PI	Co-PI.(s)
NSERC	Strategic Project Grant	Determining optimal wildflower arrangements to maximize pollination services by wild bees in cultivated blueberry	C	\$120,665	2017-2020	RT	WH, JB, RL, RC, PG

NSERC	Engage	Modelling the effect of wildflower enhancements on bumblebee pollination services in Fraser Valley blueberry	C	\$25,000	2017-2017	RT	
NSERC	Discovery Grant	Mathematical and computational study of dispersal in mixed landscapes	C	\$33,000	2016-2021	RT	
NSERC	Engage	Modelling the effectiveness of bear-proof garbage bins at the community scale	C	\$22,100	2016-2016	RT	
UBC O	Faculty Travel Grant	Travel to the European Conference on Mathematical and Theoretical Biology (international conference in Sweden)	C	\$2,000	Jun-Jul 2014	RT	
BIRS	5-day workshop	Current challenges for mathematical modelling of cyclic populations	C	\approx \$50,000	2013	RT	JS, HW
NSERC	Discovery Grant	Understanding the dynamics of predator-prey populations dispersing in heterogeneous habitat	C	\$11,000	2011-2016	RT	
UBC O	Internal Grant	Predators of cyclic prey: Changes in bobcat numbers in response to snowshoe hares	C	\$10,000	2009-2010	KH	RT
MITACS		Network for Biological Invasions and Dispersal Research	C	\$120,000	2009-2010	JW	RT, FL, ML, MB, PM, XZ
MITACS		Network for Biological Invasions and Dispersal Research	C	\$120,000	2007-2009	JW	RT, FL, ML, MB, PM, XZ
NSERC	Discovery Grant	Dispersal in heterogeneous landscapes	C	\$12,000	2006-2010	RT	
MITACS		Network for Biological Invasions and Dispersal Research	C	\$80,000	2006-2007	JW	RT, FL, ML, MB, PM, XZ

UBC O	Internal Grant	Mountain Pine Beetle Dispersal in Urban Landscapes	NC	\$10,000	2008-2009	RT	BL
CFI	NO	Spatial Biology Laboratory	C	\$105,267	2005	RT	
OUC	Grant-In-Aid	Insect dispersal in the presence of pheromone traps	C	\$3,500	2005	RT	
CFI		Centre for Species at Risk and Habitat Studies	C	\$2,200,000	2004	DD	RT, NK, KH, MJ
OUC	Grant-In-Aid	Dispersal of wild and sterile insects in the presence of pheromone traps	C	\$4,000	2004	RT	
NSERC	Discovery Grant	Dispersal of the codling moth	C	\$11,455	2003-2006	RT	
MITACS		Network for Biological Invasions and Dispersal Research	C	\$50,000	2003-2004	JW	RT, FL, ML, MB, PM, XZ

RT – Rebecca Tyson, NK – Nusha Keyghobadi, KH – Karen Hodges, MJ – Melanie Jones, FL – Frithjof Lutscher, ML – Mark Lewis, MB – Miriam Barbeau, PM – Patrick Montgomery, XZ – Xingfu Zhou, DD – Dan Durall, JW – James Watmough, BL – Bob Lalonde, HW – Hao Wang, JS – Jonathan Sherratt, WH – Warren Hare, JB – John Braun, RL – Ramon Lawrence, RC – Ralph Cartar, PG – Paul Galpern; PI – Principal Investigator, Co-PI – Co-investigator; NO – New Opportunities

(c) *Research or equivalent contracts (C - grants obtained competitively (C), NC - grants obtained non-competitively (NC))*

Granting agency	Subject	C	\$ per year	Dates	Principal inv.	Co-inv.(s)
NOAA	Modeling the swimming behaviour of the nematode	NC	\$11,000	2006-2007	Tyson	

NOAA - National Oceanic and Atmospheric Administration (US)

(d) *Plenary or Keynote Addresses - Scientific Conferences*

1. Rethinking the predator-prey relationship, Fifth International Conference on Com-

- putational and Mathematical Population Dynamics, Ft Lauderdale, FL, USA, May 2019. (plenary talk)
2. Predicting transgenic pollen dispersal, Workshop for Women in Differential Equations - International Congress of Mathematicians 2018, Universidade Federal do ABC (UFABC), São Paulo, Brazil, Jul 2018. (plenary talk)
 3. Dispersal and recolonisation by a territorial animal, Guelph Biomathematics & Biostatistics Symposium, University of Guelph, Guelph, ON, Canada, Jun 2016. (plenary talk)
 4. The princess and the pea: The unexpected importance of movement algorithms, BIOMAT 2013 (International Symposium on Mathematical and Computational Biology), Nov 2013. (plenary talk)
- (e) *Invited presentations - Invitation-Only Scientific Workshops*
1. Tba, Workshop on New Mathematical Methods for Complex Systems in Ecology, Banff International Research Station, Banff, AB, Canada, Jul 2019. (invited - invitation-only scientific workshop)
 2. Human-bear interactions: Using models to determine optimal management strategies, Workshop on Mathematical Models of Human-Environment Systems, Fields Institute, Toronto, ON, Canada, Mar 2018. (invited - Invitation-only scientific workshop)
 3. Predicting transgenic pollen dispersal, workshop on pollinators and pollination modeling, Fields Institute, Toronto, ON, Canada, Feb 2018. (invited - Invitation-only scientific workshop)
 4. The effect of habitat fragmentation on cyclic populations, Workshop on Current Challenges for Mathematical Modelling of Cyclic Populations, Banff International Research Station, Banff, AB, Canada, Nov 2013. (invited - Invitation-only scientific workshop)
 5. The effect of extreme temperature events on population dynamics, Workshop on the Impact of Climate Change on Biological Invasions and Population Distributions, Banff International Research Station, Banff, AB, Canada, May 2013. (invited - Invitation-only scientific workshop)
 6. Post-harvest diseases of apples: From spore dispersal to epidemiology, Workshop on Spatial Models of Micro and Macro Systems, Mathematical Biosciences Institute, Columbus, OH, USA, Apr 2012. (invited - Invitation-only scientific workshop)
 7. The effect of habitat fragmentation on cyclic predator-prey population dynamics, Workshop on Stochastic and Deterministic Spatial Modeling in Population Dynamics, American Institute of Mathematics, Palo Alto, CA, USA, May 2009. (invited - Invitation-only scientific workshop)
 8. Accurately modelling the snowshoe hare/Canada lynx population cycle, Workshop on Dynamics of Structured Populations, Banff International Research Station, Banff, AB, Canada, Apr 2008. (invited - Invitation-only scientific workshop)
 9. Modelling codling moth dispersal: Role of spatially heterogeneous landscapes, Workshop on Forest Insect Initiatives, Fredericton, NB, Canada, Nov 2007. (invited - Invitation-only scientific workshop)

10. Recolonization of clearcuts: Population dynamics in managed forests, Workshop on Mathematical Models for Biological Invasions, Banff International Research Station, Banff, AB, Canada, Nov 2004. (invited - Invitation-only scientific workshop)
 11. The swimming behaviour of the medicinal leech, Workshop on From Molecules to Ecosystems: The Legacy of Lee Segel, Banff International Research Station, Banff, AB, Canada, Jul 2003. (invited - Invitation-only scientific workshop)
- (f) *Invited Minisymposium Presentations - Scientific Conferences*
1. Les cycles prédateur-proie : Rôles des prédateurs et des saisons, Journées Équations-différentielles Auvergne-Rhône-Alpes, Grenoble, France, Nov 2018. (invited talk)
 2. Wild bee movement and survival in agricultural landscapes, European Conference in Mathematical and Theoretical Biology, Nottingham, UK, Jul 2016. (invited - minisymposium)
 3. Modelling the spread of the mountain pine beetle in an urban environment, Canadian Applied and Industrial Mathematics Society Annual Meeting, Edmonton, AB, Canada, Jun 2016. (invited - minisymposium)
 4. Dispersal and recolonisation by a territorial animal, Canadian Applied and Industrial Mathematics Society Annual Meeting, Waterloo, ON, Canada, Jun 2015. (invited - minisymposium)
 5. Population cycles and seasonal shifts in behaviour, Workshop on Mathematical Biology and Nonlinear Analysis, International Conference in Honour of Steve Cantrell's 60th Birthday, Miami, FL, USA, Dec 2014. (invited - minisymposium)
 6. Post-harvest diseases of apples: From spore dispersal to epidemiology, Everything Disperses to Miami, International Conference in Honour of Chris Cosner's 60th Birthday, Miami, FL, USA, Dec 2012. (invited - minisymposium)
 7. Boreal population cycles, seasonal behaviour and climate change, Canadian Mathematics Society Winter Meeting, Montreal, PQ, Canada, Dec 2012. (invited - minisymposium)
 8. A diffusion-based model to predict transgenic seed contamination in bee-pollinated crops, Society for Mathematical Biology Annual Meeting, Knoxville, TN, USA, Jul 2012. (invited - minisymposium)
 9. Cyclic populations: The role of specialist predators, International Congress in Industrial and Applied Mathematics, Vancouver, BC, Canada, Jul 2011. (invited - minisymposium)
 10. A diffusion-based model to predict transgenic seed contamination in bee-pollinated crops, International Congress in Industrial and Applied Mathematics, Vancouver, BC, Canada, Jul 2011. (invited - minisymposium)
 11. A diffusion-based model to predict transgenic seed contamination in bee-pollinated crops, Canadian Applied and Industrial Mathematics Society Annual Meeting, St John's, NL, Canada, Jul 2010. (invited - minisymposium)
 12. The effect of habitat fragmentation on cyclic predator-prey dynamics, Society for Mathematical Biology Annual Meeting, Vancouver, BC, Canada, Jul 2009. (invited - minisymposium)
 13. Modelling the swimming behaviour of the nematode, Canadian Mathematics Society Winter Meeting, Ottawa, ON, Canada, Dec 2008. (invited - minisymposium)

14. Accurately modelling the snowshoe hare/Canada lynx population cycle, Canadian Mathematics Society Annual Summer Meeting, Winnipeg, MB, Canada, Jun 2007. (invited - minisymposium)
 15. Modelling invertebrate swimming using the immersed boundary method, 11th seminar NUMDIFF on Numerical Solution of Differential and Differential-Algebraic Equations, Halle, Germany, Sep 2006. (invited - minisymposium)
 16. Modelling the swimming behaviour of the nematode, World Congress on Computational Mechanics, Los Angeles, CA, USA, Jul 2006. (invited - minisymposium)
 17. A simulation study of wild and sterile codling moth behaviour in an apple orchard with pheromone traps, Mathematics of Information Technology and Complex Systems Annual Meeting, York, ON, Canada, Jun 2006. (invited - minisymposium)
 18. Modelling recolonization of second-growth forest stands by the North American red squirrel, Canadian Mathematics Society Winter Meeting, Victoria, BC, Canada, Dec 2005. (invited - minisymposium)
 19. Codling moth dispersal in heterogeneous landscapes, Workshop on Dispersal and Biological Invasions, Fredericton, NB, Canada, Nov 2004. (invited - minisymposium)
 20. Dispersal of the codling moth: Preliminary results, Canadian Mathematics Society Winter Meeting, Vancouver, BC, Canada, Dec 2003. (invited - minisymposium)
- (g) *Invited Presentations - Public Lectures*
1. The mathematics of marriage, The Cutting Edge: Royal Society Lecture Series, McGill University, Montréal, PQ, Canada, Feb 2005. (invited - public lecture)
- (h) *Invited Presentations - Departmental Seminars*
1. From transgene spread to wild bee survival, Environmental Sustainability Institute, University of Exeter, Penryn Campus, Penryn, UK, Mar 2019. (invited - departmental seminar)
 2. Rethinking the predator-prey relationship, Department of Mathematics, University of Leicester, Leicester, UK, Mar 2019. (invited - departmental seminar)
 3. Rethinking the predator-prey relationship, Department of Mathematics, Heriot-Watt University, Edinburgh, Scotland, Mar 2019. (invited - departmental seminar)
 4. Rethinking the predator-prey relationship, Department of Mathematics, University of Glasgow, Glasgow, UK, Mar 2019. (invited - departmental seminar)
 5. Rethinking the predator-prey relationship, Department of Mathematics, University of Swansea, Swansea, UK, Mar 2019. (invited - departmental seminar)
 6. Prédire la dispersion du pollen transgénique, Laboratoire de Mathématiques Appliquées, Université de Savoie-Mont Blanc, Bourget-du-Lac, France, Feb 2019. (invited - departmental seminar)
 7. Understanding opinion dynamics, Department of Mathematics, University of Ottawa, Ottawa, ON, Canada, Mar 2018. (invited - departmental seminar)
 8. The effect of extreme temperature events on poikilotherm dynamics, Technical University of Munich, Munich, Germany, Jul 2014. (invited - departmental seminar)
 9. A diffusion-based model of domestic and wild bee movement, and consequences for pollen dispersal, Max Planck Institute, Tübingen, Germany, Jul 2014. (invited - departmental seminar)

10. A diffusion-based model to predict transgenic seed contamination in bee-pollinated crops, Department of Mathematics, University of British Columbia, Vancouver, BC, Canada, Apr 2012. (invited - departmental seminar)
 11. A diffusion-based model to predict transgenic seed contamination in bee-pollinated crops, Department of Mathematics, University of Alberta, Edmonton, AB, Canada, Mar 2012. (invited - departmental seminar)
 12. A diffusion-based model to predict transgenic seed contamination in bee-pollinated crops, Department of Applied Mathematics, University of Washington, Seattle, WA, USA, May 2011. (invited - departmental seminar)
 13. A diffusion-based model to predict transgenic seed contamination in bee-pollinated crops, Department of Mathematics, University of Ottawa, Ottawa, ON, Canada, Feb 2011. (invited - departmental seminar)
 14. A diffusion-based model to predict transgenic seed contamination in bee-pollinated crops, Department of Mathematics, University of Idaho, Moscow, ID, USA, Aug 2010. (invited - departmental seminar)
 15. Modelling the snowshoe hare/canada lynx population cycle: The role of specialist predators, Centre for Nonlinear Dynamics in Physiology and Medicine, McGill University, Montréal, PQ, Canada, Nov 2008. (invited - departmental seminar)
 16. Modelling the swimming behaviour of the nematode, Département de Mathématique et Statistique, Université de Montréal, Montréal, PQ, Canada, Nov 2008. (invited - departmental seminar),
 17. Modelling the snowshoe hare/canada lynx population cycle, Department of Mathematics and Statistics, University of Ottawa, Ottawa, ON, Canada, Feb 2008. (invited - departmental seminar)
 18. Mathematical modelling with Rebecca Tyson: Current projects, School of Advanced Technology and Mathematics, Thompson Rivers University, Kamloops, BC, Canada, Nov 2005. (invited - departmental seminar)
 19. Modelling codling moth dispersal: The role of orchard boundaries, Department of Mathematics and Statistics, University of Ottawa, Ottawa, ON, Canada, April 2005. (invited - departmental seminar)
 20. Pattern formation in a reaction-diffusion-chemotaxis model, PIMS lecture, Department of Mathematics and Statistics, University of Alberta, Edmonton, AB, Canada, Nov 2002. (invited - departmental seminar)
 21. Perspectives on mathematical biology, Department of Applied Mathematics, University of Washington, Seattle, WA, USA, Sep 1999. (invited - departmental seminar)
 22. Pattern formation in a reaction-diffusion-chemotaxis model, Centre for Nonlinear Dynamics in Physiology and Medicine, McGill University, Montréal, PQ, Canada, Nov 1999. (invited - departmental seminar)
- (i) *Contributed presentations - Scientific Conferences*
1. Centering and polarization in opinion dynamics, 6th International Conference on Mathematics and its Applications, Tucson, AZ, USA, Oct 2017. (contributed - scientific conference)
 2. The effect of extreme temperature events on poikilotherm dynamics, European Conference in Mathematical and Theoretical Biology, Göteborg, Sweden, Jun 2014. (con-

tributed - scientific conference)

3. The response of stable limit cycle dynamics to spatial dispersal in heterogeneous landscapes, Society for Industrial and Applied Mathematics Conference on Dynamical Systems, Snowbird, UT, USA, May 2009. (contributed - scientific conference)
4. Accurately modelling the snowshoe hare/canada lynx population cycle, Canadian Society for Ecology and Evolution, Vancouver, BC, Canada, May 2008. (contributed - scientific conference)
5. Accurately modelling the snowshoe hare/Canada lynx population cycle, Canadian Applied and Industrial and Mathematics Society Annual Meeting, Banff, AB, Canada, May 2007. (contributed - scientific conference)

(j) *Other Presentations*

1. Mathematical model of bumblebee pollination services in blueberry, BC Blueberry Council Spring Field Day, Agassiz, BC, Canada, May 2017
2. What is mathematical biology?, Quantitative Sciences Course Union Workshop, UBC Okanagan, BC, Canada, Mar 2017
3. Workshop in mathematical biology, Quantitative Sciences Course Union Workshop, UBC Okanagan, BC, Canada, Mar 2016
4. My research and career in mathematical biology, Quantitative Sciences Course Union Workshop, UBC Okanagan, BC, Canada, Apr 2015
5. Modelling the snowshoe hare/Canada lynx population cycle, UBC Okanagan Research Day, UBC Okanagan, BC, Canada, Mar 2008
6. Modelling codling moth dispersal, UBC Okanagan Research Day, UBC Okanagan, BC, Canada, Mar 2007
7. Dealing with mathematics anxiety, Department of Speech and Hearing Sciences, University of Washington, USA, Sep 1999

(k) *Conference and minisymposium organization*

1. Career Workshop, Society for Mathematical Biology Annual Meeting, co-organiser, presenter and panelist (Jul 2016)
2. PIMS Graduate Student Summit in Mathematical Biology, member of the organising committee (May 2017)
3. Mathematical Biology Sessions at the Canadian Association for Industrial and Applied Mathematics Annual Meeting and the Applied Mathematics, Modeling and Computational Science International Congress (AMMCS-CAIMS Congress), 44 speakers (Jun 2015)
4. European Conference in Mathematical and Theoretical Biology, Minisymposium on “Current Mathematical Modelling of Cyclic Populations”, 6 invited speakers (Jun 2014)
5. Banff International Research Station 5-day workshop: “Current Mathematical Challenges in Cyclic Population Dynamics”, BIRS, Banff, 20 speakers (Nov 2013)
6. International Graduate Training Centre in Mathematical Biology Annual Summit, Naramata, BC (Oct 2012)
7. “The Mathematical Biome: Okanagan Symposium in Mathematical Biology”, UBC Okanagan, Kelowna, BC (Oct 2012)

8. “Showcasing Research Collaborations between the BC Cancer Agency and UBC Okanagan”, BCCA-UBCO minisymposium (Apr 2012)
9. Graduate Student Workshop Organizer, Pacific Institute for the Mathematical Sciences International Graduate Training Centre in Mathematical Biology, Naramata, BC (Oct 2010)
10. Conference Organization Committee, Society for Mathematical Biology Annual Meeting, Vancouver, BC (Jul 2009)
11. Graduate Student Workshop Organizer, “MITACS Conference Preparation Workshop for Graduate Students,” Vancouver, BC (Jul 2009)
12. Minisymposium Organizer, Society for Mathematical Biology Annual Meeting, Toronto, ON (Jul 2008)
13. Minisymposium Organizer, Society for Mathematical Biology Annual Meeting, San Jose, CA, USA (Jul 2007)
14. Minisymposium Organizer, Society for Mathematical Biology Annual Meeting, Ann Arbor, MI, USA (Jul 2004)

10. SERVICE TO THE UNIVERSITY

(a) *Memberships on committees*

UNIVERSITY LEVEL

- Chair, UBC Okanagan Internal Research Grant Selection Committee (2007 - 2009)
- Member, UBC Okanagan Graduate Studies Committee (2007)
- Member, UBC Okanagan Teaching Effectiveness Committee (2006)
- Member, OUC Dean of Science Hiring Committee (2003)

(b) *Memberships on committees*

FACULTY LEVEL

- Unit Representative, Awards Review Committee (2016 - present) (≈ 1 hr/mth)
- Board Member, Institute for Biodiversity, Resilience, and Ecosystem Services (2014 - present)
- Board Member, Centre for Species at Risk and Habitat Studies (2004 - 2010))
- Co-Chair, I.K. Barber School Undergraduate Research Award Committee (2008)
- Member, I.K. Barber School Undergraduate Research Award Committee (2008)
- Member, NSERC Undergraduate Student Research Awards Selection Committee (2004-2007)
- Member, Hiring Committee, Assistant Professors for Science, general competition (2004-2005)

(c) *Memberships on committees*

DEPARTMENT LEVEL

- Coordinator, Interdisciplinary Studies Graduate Program (Jan 2016 - present)
- Chair, UBC Okanagan Unit 5 Colloquium (2011 - present)
- Member, CRC Data Science application committee (2015)
- Member, Medical Physics hiring committee (2015)

- Member, Peer Review, Paul Lee (2013)
- Member, Unit 5 Strategic Planning Design Team (2012)
- Member, UBC Okanagan Mathematics Graduate Program Committee (2011 - present)
- Program Coordinator, UBC Okanagan Mathematics Graduate Program (2009 - 2010)
- Member, UBC Okanagan Mathematics, Statistics & Physics Head Selection Committee (2009)
- Member, UBC Okanagan Mathematics, Statistics & Physics Head Review Committee (2008)
- Member, UBC Okanagan Hiring Committee - Assistant Professor (2008)
- Member, UBC Okanagan Peer Review Committee (2007-2008)
- Member, UBC Okanagan Hiring Committee - Assistant Professor (2006)
- Member, OUC Hiring Committee - Assistant Professor (2004)
- Member, OUC Hiring Committee - Assistant Professor, External (for Biology) (2003)

(d) *Conferences Organised at UBCO*

- “The Mathematical Biome: Okanagan Symposium in Mathematical Biology”, UBC Okanagan, Oct 12, 2012, 7 speakers from BC, AB, WA, and Mexico, 60 attendees
- “Showcasing Research Collaborations between the BC Cancer Agency and UBC Okanagan”, BCCA-UBCO minisymposium, Apr 11, 2012, 25 attendees

(e) *Student committees and thesis reading:*

Student name	Degree	Role	Department	Date
Josh Gould	MSc	external examiner	Math (Acadia U.)	Sep 2007
Roberta Newbury	PhD	committee member	Biology	Oct 2006- Apr 2013
Haley Catton	PhD	committee member	Biology	Oct 2008- present
Mazyar Jalaal	MEng	external examiner	Engineering	Aug 2012
Cody Epema	MSc	committee member and examiner	Math	Sep 2012 - Jun 2015
Vardayani Ratti	PhD	external examiner	Math (U. Guelph)	Aug 2015
Jhn Bepple	MSc	university examiner	Biology	May 2016
Luke Crevier	PhD	committee member	Earth & Environmental Sciences	Sep 2018 – present

(f) *Media Interviews and Print Stories*

1. Management of pine beetle attack
 - A. National Parks Traveler (article), (Dec 2016)
 - B. Capital News (article), (Dec 2016)
 - C. Castanet (article), (Dec 2016)
2. Effect of climate change on the great horned owl and snowshoe hare predator-prey relationship

- A. Pique News (article), (Nov 16, 2016)
- B. Science Daily (article), (Oct 25, 2016)
- C. Kootenay Morning (live interview), Radiant Audio, Nelson, BC (Nov 2, 2016)
- D. Radio West (live interview), CBC Radio 1, Kelowna, BC (Oct 25, 2016)
- E. Castanet (article), (Oct 26, 2016)
- F. Penticton Info News (article),

(g) *Other service*

- Associate Editor, Ecological Complexity, Jan 2018 -
- Board Member, Canadian Applied and Industrial Mathematics Society, May 2017 -
- Computational Ecology Research Group (CERG): I led the formation of the CERG with Drs Parrott, Pither, and Lalonde. I organise the weekly meetings of the research group, which provides students with a venue to gain experience presenting their research in poster, talk, or grant proposal format, and exposes them to research ideas and questions outside their particular research project and outside their supervisor's discipline.

THE UNIVERSITY OF BRITISH COLUMBIA

Publications Record

Date: May 7, 2019

Surname: Tyson

First Name: Rebecca

Middle Name(s): Claire

1. **REFEREED PUBLICATIONS**

Notes on Authorship

Since most of my papers are written in collaboration with biologists or ecologists, the general format is to list the mathematical authors first and the life sciences authors second. The first author is usually the one who made the greatest contribution to the work. Students and postdoctoral fellows are indicated with a † symbol below.

(a) Journals - Invited Publications

1. F. Barraquand, S. Louca†, K.C. Abbott, C.A Cobbold, F. Cordoleani†, D.L. DeAngelis, B.D. Elderd, J.A. Fox, P. Greenwood, F.M. Hilder, D.L. Murray, C.R. Stieha†, R.A. Taylor†, K. Vitense†, G.S.K. Wolcovicz, and R.C. Tyson. Moving forward in circles: Challenges and opportunities in modelling population cycles. *Ecology Letters*, 2017. doi: 10.1111/ele.12789. (invited paper)
2. G.J. Culos† and R.C. Tyson. Response of poikilotherms to thermal aspects of climate change. *Ecological Complexity*, 20 (Special Issue):293–306, 2014. (invited paper)
3. A. Long and R.C. Tyson. Integrating homo sapiens into ecological models: Imperatives of climate change. *Ecological Complexity*, 20 (Special Issue):325–334, 2014. (invited paper)
4. R.C. Tyson. Pest control: A modelling approach comment on “multiscale approach to pest insect monitoring: Random walks, pattern formation, synchronization, and networks” by S. Petrovskii, N. Petrovskaya and D. Bearup. *Physics of Life Reviews*, 11(3):526–528, 2014. (invited paper)
5. T. Gauduchon†, S. Strohm†, and R.C. Tyson. The effect of habitat fragmentation on cyclic populations with edge behaviour. *Mathematical Modelling of Natural Phenomena*, 8(6):45–63, 2013. (invited paper)
6. R.C. Tyson, C.E. Jordan, and J. Hebert†. Modelling anguilliform swimming at intermediate reynolds number: A review and novel extension of immersed boundary method applications. *Computer Methods in Applied Mechanics and Engineering, Special issue on the immersed boundary method*, 197(25-28):2105–2118, 2007. (invited paper)
7. J.D. Murray, J. Cook†, R. Tyson†, and S.R. Lubkin†. Spatial pattern formation in biology. i. dermal wound healing ii. bacterial patterns. *Journal of the Franklin Institute: Engineering and Applied Mathematics*, 335B(2):303–332, 1998. (invited paper)

(b) Journals - Contributed Publications

8. B.O. Baumgaertner, P.A Fetros†, S.M. Krone, and R.C. Tyson. Spatial opinion dynamics and the effects of two types of mixing. *Physical Reivew E*, 98(2), 2018. doi: 10.1103/PhysRevE.98.022310

9. M. Mata†, P. Greenwood, and R.C. Tyson. The relative contribution of direct and environmental transmission routes in stochastic avian flu epidemic recurrence. *Bulletin of Mathematical Biology*, 2018. doi: 10.1007/s11538-018-0414-6
10. V. Vallaeyts†, R.C. Tyson, W.D. Lane, E. Deleersnijder, and E. Hanert. A lévy-flight diffusion model to predict transgenic pollen dispersal. *Journal of the Royal Society Interface*, 2017. doi: 10.1098/rsif.2016.0889
11. R.C. Tyson and F.L. Lutscher. Seasonally varying predation behavior and climate shifts are predicted to affect predator-prey cycles. *The American Naturalist*, 188(5): 539–553, 2016
12. J. Marley†, A. Hyde†, J.H. Salkeld†, M.-C. Prima†, L. Parrott, S.E. Senger, and R.C. Tyson. Does human education reduce conflicts between humans and bears? An agent-based modelling approach. *Ecological Modelling*, 343:15–24, 2017
13. B.O. Baumgaertner, R.C. Tyson, and S.M. Krone. Opinion strength influences the spatial dynamics of opinion formation. *The Journal of Mathematical Sociology*, 2016. doi: 10.1080/0022250X.2016.1205049
14. A. Blaessle† and R.C. Tyson. First capture success in two dimensions: The search for prey by a random walk predator in a comprehensive space of random walks. *Ecological Complexity*, 28:24–35, 2016
15. S. Strohm†, M.L. Reid, and R.C. Tyson. Impacts of management on mountain pine beetle spread and damage: A process-rich model. *Ecological Modelling*, 337:241–252, 2016
16. K. Vitense†, A.J. Wirsing, R.C. Tyson, and J.J. Anderson. Theoretical impacts of habitat loss and generalist predation on predator-prey cycles. *Ecological Modelling*, 327:85–94, 2016
17. L. Canary†, J. Musgrave†, R.C. Tyson, A. Locke, and F. Lutscher. Modelling the dynamics of invasion and control of competing green crab genotypes. *Theoretical Ecology*, 7(4):391–406, 2014
18. S. Strohm†, R.C. Tyson, and J.A. Powell. Pattern formation in a model for mountain pine beetle dispersal: Linking model predictions to data. *Bulletin of Mathematical Biology*, 2013. doi: 10.1007/s11538-013-9868-8
19. M. Dutot†, L.M. Nelson, and R.C. Tyson. Predicting the spread of postharvest disease in stored fruit, with application to apples. *Postharvest Biology and Technology*, 85:45–56, 2013. doi: 10.1016/j.posthvbio.2013.04.003
20. S. Strohm† and R.C. Tyson. The effect of habitat fragmentation on cyclic population dynamics: A reduction to ordinary differential equations. *Theoretical Ecology*, 2011. doi: 10.1007/s12080-011-0141-1
21. R.C. Tyson, J.B. Wilson†, and W.D. Lane. Beyond diffusion: Modelling local and long-distance dispersal for organisms exhibiting intensive and extensive search modes. *Theoretical Population Biology*, 79(3):70–81, 2011
22. R.C. Tyson, J.B. Wilson†, and W.D. Lane. A mechanistic model to predict transgenic seed contamination in bee-pollinated crops validated in an apple orchard. *Ecological Modelling*, 222(13):2084–2092, 2011
23. R. Tyson, S. Haines†, and K.E. Hodges. Modelling the canada lynx and snowshoe hare population cycle: The role of specialist predators. *Theoretical Ecology*, 3:97–111, 2010

24. S.E. Senger†, R. Tyson, B.D. Roitberg, H.M.A. Thistlewood, A.S. Harestad, and M.T. Chandler. Influence of habitat structure and resource availability on the movements of *rhagoletis indifferens* (diptera: Tephritidae). *Environmental Entomology*, 38(3):823–835, 2009
25. S. Strohm† and R. Tyson. The effect of habitat fragmentation on cyclic population dynamics: A numerical study. *Bulletin of Mathematical Biology*, 71(6):1323–1348, 2009
26. R. Tyson, K.D. Newton†, H. Thistlewood, and G. Judd. Mating rates between sterile and wild codling moths (*cydia pomonella*) in springtime: A simulation study. *Journal of Theoretical Biology*, 254(2):319–330, 2008
27. R. Tyson, H. Thistlewood, and G.J.R. Judd. Modelling dispersal of sterile male codling moths, *cydia pomonella*, across orchard boundaries. *Ecological Modelling*, 205(1-2):1–12, 2007
28. B. Nyquist†, R. Tyson, and K. Larsen. Modelling recolonization of second-growth forest stands by the north american red squirrel *tamiasciurus hudsonicus*. *Bulletin of Mathematical Biology*, 69(4):1311–1339, 2007
29. J.M. Gottman, R.W. Levenson, C. Swanson†, K. Swanson†, R. Tyson†, and D. Yoshimoto. Observing gay, lesbian and heterosexual couples’ relationships: mathematical modelling of conflict interaction. *Journal of Homosexuality*, 45(1):65–91, 2003
30. R. Tyson†, L.G. Stern†, and R.J. Leveque. Fractional step methods applied to a chemotaxis model. *Journal of Mathematical Biology*, 41(5):455–475, 2000
31. R. Tyson†, S.R. Lubkin†, and J.D. Murray. Model and analysis of chemotactic bacterial patterns in a liquid medium. *Journal of Mathematical Biology*, 38(4):359–375, 1999
32. R. Tyson†, S.R. Lubkin†, and J.D. Murray. A minimal mechanism for bacterial pattern formation. *Proceedings of the Royal Society of London Series B: Biological Sciences*, 266(1416):299–304, 1999
33. J. Cook†, R. Tyson†, J. White†, R. Rushe†, J. Gottman, and J. Murray. Mathematics of marital conflict: Qualitative dynamic mathematical modeling of marital interaction. *Journal of Family Psychology*, 9(2):110–130, 1995
34. D.E. Woodward, R. Tyson†, M.R. Myerscough, J.D. Murray, E.O Budrene, and H.C. Berg. Spatio-temporal patterns generated by *salmonella typhimurium*. *Biophysical Journal*, 68(5):2181–2189, 1995
35. R. Tyson†, W.T. Welch†, J. Berreen, C. Wells, and C.E. Pearson. Pressure changes in the eye due to an injection of inert gases: A theoretical model. *Journal of Theoretical Biology*, 164(1):15–36, 1993

(c) Conference Proceedings

36. R.C. Tyson. The princess and the pea: The unexpected importance of movement algorithms. In R.P. Mondaini, editor, *BIOMAT 2013, Proceedings of the International Symposium on Mathematical and Computational Biology*. World Scientific Publication Company, 2013

2. NON-REFEREED PUBLICATIONS

(a) Journals

1. S. Gretchko†, J. Marley†, and R.C. Tyson. The effects of climate change on predator-prey dynamics. *arXiv*, (1805.11816v1), May 2018

(b) Book Reviews

1. R. Tyson. SIAM book review: A short history of mathematical population dynamics (2011) by n. Bacaer. *SIAM Review*, 53(4):820, 2011

(c) Other

1. R.C. Tyson. Movement in heterogeneous landscapes. *Canadian Mathematical Society Research Notes*, 46(1):20–21, 2014

3. BOOKS

(a) Authored

1. J.M. Gottman, J.D. Murray, C.C. Swanson, R. Tyson†, and K.R. Swanson†. *The Mathematics of Marriage: Dynamic Nonlinear Models*. MIT Press, Cambridge, MA, 2002 *My contribution: I wrote chapter 13 and most of chapter 4.*

4. WORK SUBMITTED

- (a) M. Martignoni†, M.M. Hart, and R.C. Tyson. Parasitism within mutualist guilds explains the maintenance of diversity in multi-species mutualism. *American Naturalist*, Apr 2019. (2nd submission, invited)
- (b) J. Marley†, J. Salkeld†, T. Hamilton, S.E. Senger, R.C. Tyson, and L. Parrott. Individual-based modelling of black bear (*Ursus americanus*) foraging in Whistler, BC: Reducing human-bear interactions. *Ecological Modelling*, Nov 2018. (accepted subject to minor revision)
- (c) S. MacQueen†, W.J. Braun, and R.C. Tyson. Wildflower patches can draw bumble bee pollinators into or away from a crop. *Ecological Modelling*, Mar 2019. (1st submission)
- (d) R.C. Tyson, S.D. Hamilton†, A.S. Lo†, S.M. Krone, and B. Baumgaertner. The timing and nature of behavioural responses affect the course of an epidemic. *Bulletin of Mathematical Biology*, Feb 2019. (1st submission)
- (e) M.A.E. Mata†, R.C. Tyson, and P.E. Greenwood. Random fluctuations around a stable limit cycle in a stochastic system with parametric forcing. *Journal of Mathematical Biology*, Jan 2019. (revised version)
- (f) J. Majmudar†, B. Baumgaertner, S.M. Krone, and R.C. Tyson. Voter models and external influence. *Journal of Mathematical Sociology*, Feb 2019. (accepted subject to minor revision)

5. WORK IN PROGRESS

• **Manuscripts in Preparation**

- J. Marley† and R.C. Tyson, **Climate-induced critical transitions in cyclic predator-prey populations**, manuscript 90% complete
- N. Siewe†, and R.C. Tyson, **Effect of alternative wildflower resources on crop pollination services**, (manuscript 90% complete)

- G. Goetz†, C. Romann†, R.J.C. Shannon†, R. DeClerke-Floate, B. Sinclair, R.C. Tyson, **bfInsect overwintering capacity in the presence of chinooks**, (manuscript 70% complete) (PC)
 - S. MacQueen†, W. Hare, W.J. Braun, and R.C. Tyson, **Modelling the effect of memory-guided foraging on pollination service distribution** (manuscript 50% complete)
 - M. Dutotdag, G. Grandjean†, R.C. Tyson, and L. Nelson **Modelling biocontrol of post-harvest fungal disease in apples**, (manuscript 50% complete)
 - R.C. Tyson, K. Larsen, and S.M. Krone, **Emergent patterns of colonization of virgin territory by a highly territorial animal**, (manuscript 30% complete)
 - P.C. Aragonés†, J.B. Wilson†, N. Siewe†, and R.C. Tyson, **Wild bee dispersal and consequences for pollination: An energetics model**, (manuscript 40% complete)
 - K. Williams† and R.C. Tyson, **Predicting dispersal of fungal spores in orchards**, (manuscript 30% complete)
- **Active Research Projects Not Yet At Manuscript Stage**
 - **Modelling the effect of memory-guided foraging on pollination service distribution**, with S. MacQueen (PhD student)
 - **Stochastic fluctuations around a forced limit cycle**, with M. Mata (PhD student) and P. Greenwood (Co-supervisor, UBCV)
 - **Predator-prey population cycles in the presence of Allee effects and varying climatic switching rates**, with J. Marley (URA student)
 - **Mathematical investigation of the Chinook hypothesis for *Mecinus* mortality**, with G. Goetz (undergraduate), R. Declerck-Floate (Agriculture and Agri-Foods Canada), and B. Sinclair (Western University)

References

- [1] Rethinking the predator-prey relationship, Fifth International Conference on Computational and Mathematical Population Dynamics, Ft Lauderdale, FL, USA, May 2019. (plenary talk).
- [2] Predicting transgenic pollen dispersal, Workshop for Women in Differential Equations - International Congress of Mathematicians 2018, Universidade Federal do ABC (UFABC), São Paulo, Brazil, Jul 2018. (plenary talk).
- [3] Dispersal and recolonisation by a territorial animal, Guelph Biomathematics & Biostatistics Symposium, University of Guelph, Guelph, ON, Canada, Jun 2016. (plenary talk).
- [4] The princess and the pea: The unexpected importance of movement algorithms, BIOMAT 2013 (International Symposium on Mathematical and Computational Biology), Nov 2013. (plenary talk).
- [5] Tba, Workshop on New Mathematical Methods for Complex Systems in Ecology, Banff International Research Station, Banff, AB, Canada, Jul 2019. (invited - invitation-only scientific workshop).
- [6] Human-bear interactions: Using models to determine optimal management strategies, Workshop on Mathematical Models of Human-Environment Systems, Fields Institute, Toronto, ON, Canada, Mar 2018. (invited - Invitation-only scientific workshop).
- [7] Predicting transgenic pollen dispersal, workshop on pollinators and pollination modeling, Fields Institute, Toronto, ON, Canada, Feb 2018. (invited - Invitation-only scientific workshop).
- [8] The effect of habitat fragmentation on cyclic populations, Workshop on Current Challenges for Mathematical Modelling of Cyclic Populations, Banff International Research Station, Banff, AB, Canada, Nov 2013. (invited - Invitation-only scientific workshop).
- [9] The effect of extreme temperature events on population dynamics, Workshop on the Impact of Climate Change on Biological Invasions and Population Distributions, Banff International Research Station, Banff, AB, Canada, May 2013. (invited - Invitation-only scientific workshop).
- [10] Post-harvest diseases of apples: From spore dispersal to epidemiology, Workshop on Spatial Models of Micro and Macro Systems, Mathematical Biosciences Institute, Columbus, OH, USA, Apr 2012. (invited - Invitation-only scientific workshop).
- [11] The effect of habitat fragmentation on cyclic predator-prey population dynamics, Workshop on Stochastic and Deterministic Spatial Modeling in Population Dynamics, American Institute of Mathematics, Palo Alto, CA, USA, May 2009. (invited - Invitation-only scientific workshop).
- [12] Accurately modelling the snowshoe hare/Canada lynx population cycle, Workshop on Dynamics of Structured Populations, Banff International Research Station, Banff, AB, Canada, Apr 2008. (invited - Invitation-only scientific workshop).

- [13] Modelling codling moth dispersal: Role of spatially heterogeneous landscapes, Workshop on Forest Insect Initiatives, Fredericton, NB, Canada, Nov 2007. (invited - Invitation-only scientific workshop).
- [14] Recolonization of clearcuts: Population dynamics in managed forests, Workshop on Mathematical Models for Biological Invasions, Banff International Research Station, Banff, AB, Canada, Nov 2004. (invited - Invitation-only scientific workshop).
- [15] The swimming behaviour of the medicinal leech, Workshop on From Molecules to Ecosystems: The Legacy of Lee Segel, Banff International Research Station, Banff, AB, Canada, Jul 2003. (invited - Invitation-only scientific workshop).
- [16] Les cycles prédateur-proie : Rôles des prédateurs et des saisons, Journées Équations-différentielles Auvergne-Rhône-Alpes, Grenoble, France, Nov 2018. (invited talk).
- [17] Wild bee movement and survival in agricultural landscapes, European Conference in Mathematical and Theoretical Biology, Nottingham, UK, Jul 2016. (invited - minisymposium).
- [18] Modelling the spread of the mountain pine beetle in an urban environment, Canadian Applied and Industrial Mathematics Society Annual Meeting, Edmonton, AB, Canada, Jun 2016. (invited - minisymposium).
- [19] Dispersal and recolonisation by a territorial animal, Canadian Applied and Industrial Mathematics Society Annual Meeting, Waterloo, ON, Canada, Jun 2015. (invited - minisymposium).
- [20] Population cycles and seasonal shifts in behaviour, Workshop on Mathematical Biology and Nonlinear Analysis, International Conference in Honour of Steve Cantrell's 60th Birthday, Miami, FL, USA, Dec 2014. (invited - minisymposium).
- [21] Post-harvest diseases of apples: From spore dispersal to epidemiology, Everything Disperses to Miami, International Conference in Honour of Chris Cosner's 60th Birthday, Miami, FL, USA, Dec 2012. (invited - minisymposium).
- [22] Boreal population cycles, seasonal behaviour and climate change, Canadian Mathematics Society Winter Meeting, Montreal, PQ, Canada, Dec 2012. (invited - minisymposium).
- [23] A diffusion-based model to predict transgenic seed contamination in bee-pollinated crops, Society for Mathematical Biology Annual Meeting, Knoxville, TN, USA, Jul 2012. (invited - minisymposium).
- [24] Cyclic populations: The role of specialist predators, International Congress in Industrial and Applied Mathematics, Vancouver, BC, Canada, Jul 2011. (invited - minisymposium).
- [25] A diffusion-based model to predict transgenic seed contamination in bee-pollinated crops, International Congress in Industrial and Applied Mathematics, Vancouver, BC, Canada, Jul 2011. (invited - minisymposium).
- [26] A diffusion-based model to predict transgenic seed contamination in bee-pollinated crops, Canadian Applied and Industrial Mathematics Society Annual Meeting, St John's, NL, Canada, Jul 2010. (invited - minisymposium).

- [27] The effect of habitat fragmentation on cyclic predator-prey dynamics, Society for Mathematical Biology Annual Meeting, Vancouver, BC, Canada, Jul 2009. (invited - minisymposium).
- [28] Modelling the swimming behaviour of the nematode, Canadian Mathematics Society Winter Meeting, Ottawa, ON, Canada, Dec 2008. (invited - minisymposium).
- [29] Accurately modelling the snowshoe hare/Canada lynx population cycle, Canadian Mathematics Society Annual Summer Meeting, Winnipeg, MB, Canada, Jun 2007. (invited - minisymposium).
- [30] Modelling invertebrate swimming using the immersed boundary method, 11th seminar NUMDIFF on Numerical Solution of Differential and Differential-Algebraic Equations, Halle, Germany, Sep 2006. (invited - minisymposium).
- [31] Modelling the swimming behaviour of the nematode, World Congress on Computational Mechanics, Los Angeles, CA, USA, Jul 2006. (invited - minisymposium).
- [32] A simulation study of wild and sterile codling moth behaviour in an apple orchard with pheromone traps, Mathematics of Information Technology and Complex Systems Annual Meeting, York, ON, Canada, Jun 2006. (invited - minisymposium).
- [33] Modelling recolonization of second-growth forest stands by the North American red squirrel, Canadian Mathematics Society Winter Meeting, Victoria, BC, Canada, Dec 2005. (invited - minisymposium).
- [34] Codling moth dispersal in heterogeneous landscapes, Workshop on Dispersal and Biological Invasions, Fredericton, NB, Canada, Nov 2004. (invited - minisymposium).
- [35] Dispersal of the codling moth: Preliminary results, Canadian Mathematics Society Winter Meeting, Vancouver, BC, Canada, Dec 2003. (invited - minisymposium).
- [36] The mathematics of marriage, The Cutting Edge: Royal Society Lecture Series, McGill University, Montréal, PQ, Canada, Feb 2005. (invited - public lecture).
- [37] From transgene spread to wild bee survival, Environmental Sustainability Institute, University of Exeter, Penryn Campus, Penryn, UK, Mar 2019. (invited - departmental seminar).
- [38] Rethinking the predator-prey relationship, Department of Mathematics, University of Leicester, Leicester, UK, Mar 2019. (invited - departmental seminar).
- [39] Rethinking the predator-prey relationship, Department of Mathematics, Heriot-Watt University, Edinburgh, Scotland, Mar 2019. (invited - departmental seminar).
- [40] Rethinking the predator-prey relationship, Department of Mathematics, University of Glasgow, Glasgow, UK, Mar 2019. (invited - departmental seminar).
- [41] Rethinking the predator-prey relationship, Department of Mathematics, University of Swansea, Swansea, UK, Mar 2019. (invited - departmental seminar).
- [42] Prédire la dispersion du pollen transgénique, Laboratoire de Mathématiques Appliquées, Université de Savoie-Mont Blanc, Bourget-du-Lac, France, Feb 2019. (invited - departmental seminar).

- [43] Understanding opinion dynamics, Department of Mathematics, University of Ottawa, Ottawa, ON, Canada, Mar 2018. (invited - departmental seminar).
- [44] The effect of extreme temperature events on poikilotherm dynamics, Technical University of Munich, Munich, Germany, Jul 2014. (invited - departmental seminar).
- [45] A diffusion-based model of domestic and wild bee movement, and consequences for pollen dispersal, Max Planck Institute, Tübingen, Germany, Jul 2014. (invited - departmental seminar).
- [46] A diffusion-based model to predict transgenic seed contamination in bee-pollinated crops, Department of Mathematics, University of British Columbia, Vancouver, BC, Canada, Apr 2012. (invited - departmental seminar).
- [47] A diffusion-based model to predict transgenic seed contamination in bee-pollinated crops, Department of Mathematics, University of Alberta, Edmonton, AB, Canada, Mar 2012. (invited - departmental seminar).
- [48] A diffusion-based model to predict transgenic seed contamination in bee-pollinated crops, Department of Applied Mathematics, University of Washington, Seattle, WA, USA, May 2011. (invited - departmental seminar).
- [49] A diffusion-based model to predict transgenic seed contamination in bee-pollinated crops, Department of Mathematics, University of Ottawa, Ottawa, ON, Canada, Feb 2011. (invited - departmental seminar).
- [50] A diffusion-based model to predict transgenic seed contamination in bee-pollinated crops, Department of Mathematics, University of Idaho, Moscow, ID, USA, Aug 2010. (invited - departmental seminar).
- [51] Modelling the snowshoe hare/canada lynx population cycle: The role of specialist predators, Centre for Nonlinear Dynamics in Physiology and Medicine, McGill University, Montréal, PQ, Canada, Nov 2008. (invited - departmental seminar).
- [52] Modelling the swimming behaviour of the nematode, Département de Mathématique et Statistique, Université de Montréal, Montréal, PQ, Canada, Nov 2008. (invited - departmental seminar).
- [53] Modelling the snowshoe hare/canada lynx population cycle, Department of Mathematics and Statistics, University of Ottawa, Ottawa, ON, Canada, Feb 2008. (invited - departmental seminar).
- [54] Mathematical modelling with Rebecca Tyson: Current projects, School of Advanced Technology and Mathematics, Thompson Rivers University, Kamloops, BC, Canada, Nov 2005. (invited - departmental seminar).
- [55] Modelling codling moth dispersal: The role of orchard boundaries, Department of Mathematics and Statistics, University of Ottawa, Ottawa, ON, Canada, April 2005. (invited - departmental seminar).

- [56] Pattern formation in a reaction-diffusion-chemotaxis model, PIMS lecture, Department of Mathematics and Statistics, University of Alberta, Edmonton, AB, Canada, Nov 2002. (invited - departmental seminar).
- [57] Perspectives on mathematical biology, Department of Applied Mathematics, University of Washington, Seattle, WA, USA, Sep 1999. (invited - departmental seminar).
- [58] Pattern formation in a reaction-diffusion-chemotaxis model, Centre for Nonlinear Dynamics in Physiology and Medicine, McGill University, Montréal, PQ, Canada, Nov 1999. (invited - departmental seminar).
- [59] Centering and polarization in opinion dynamics, 6th International Conference on Mathematics and its Applications, Tucson, AZ, USA, Oct 2017. (contributed - scientific conference).
- [60] The effect of extreme temperature events on poikilotherm dynamics, European Conference in Mathematical and Theoretical Biology, Göteborg, Sweden, Jun 2014. (contributed - scientific conference).
- [61] The response of stable limit cycle dynamics to spatial dispersal in heterogeneous landscapes, Society for Industrial and Applied Mathematics Conference on Dynamical Systems, Snowbird, UT, USA, May 2009. (contributed - scientific conference).
- [62] Accurately modelling the snowshoe hare/canada lynx population cycle, Canadian Society for Ecology and Evolution, Vancouver, BC, Canada, May 2008. (contributed - scientific conference).
- [63] Accurately modelling the snowshoe hare/Canada lynx population cycle, Canadian Applied and Industrial and Mathematics Society Annual Meeting, Banff, AB, Canada, May 2007. (contributed - scientific conference).
- [64] Mathematical model of bumblebee pollination services in blueberry, BC Blueberry Council Spring Field Day, Agassiz, BC, Canada, May 2017.
- [65] What is mathematical biology?, Quantitative Sciences Course Union Workshop, UBC Okanagan, BC, Canada, Mar 2017.
- [66] Workshop in mathematical biology, Quantitative Sciences Course Union Workshop, UBC Okanagan, BC, Canada, Mar 2016.
- [67] My research and career in mathematical biology, Quantitative Sciences Course Union Workshop, UBC Okanagan, BC, Canada, Apr 2015.
- [68] Modelling the snowshoe hare/Canada lynx population cycle, UBC Okanagan Research Day, UBC Okanagan, BC, Canada, Mar 2008.
- [69] Modelling codling moth dispersal, UBC Okanagan Research Day, UBC Okanagan, BC, Canada, Mar 2007.
- [70] Dealing with mathematics anxiety, Department of Speech and Hearing Sciences, University of Washington, USA, Sep 1999.

- [71] F. Barraquand, S. Louca†, K.C. Abbott, C.A Cobbold, F. Cordoleani†, D.L. DeAngelis, B.D. Elderd, J.A. Fox, P. Greenwood, F.M. Hilder, D.L. Murray, C.R. Stieha†, R.A. Taylor†, K. Vitense†, G.S.K. Wolcovicz, and R.C. Tyson. Moving forward in circles: Challenges and opportunities in modelling population cycles. *Ecology Letters*, 2017. doi: 10.1111/ele.12789. (invited paper).
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- [75] T. Gauduchon†, S. Strohm†, and R.C. Tyson. The effect of habitat fragmentation on cyclic populations with edge behaviour. *Mathematical Modelling of Natural Phenomena*, 8(6):45–63, 2013. (invited paper).
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- [112] J. Marley†, J. Salkeld†, T. Hamilton, S.E. Senger, R.C. Tyson, and L. Parrott. Individual-based modelling of black bear (*Ursus americanus*) foraging in Whistler, BC: Reducing human-bear interactions. *Ecological Modelling*, Nov 2018. (accepted subject to minor revision).
- [113] S. MacQueen†, W.J. Braun, and R.C. Tyson. Wildflower patches can draw bumble bee pollinators into or away from a crop. *Ecological Modelling*, Mar 2019. (1st submission).
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- [115] M.A.E. Mata†, R.C. Tyson, and P.E. Greenwood. Random fluctuations around a stable limit cycle in a stochastic system with parametric forcing. *Journal of Mathematical Biology*, Jan 2019. (revised version).
- [116] J. Majmudar†, B. Baumgaertner, S.M. Krone, and R.C. Tyson. Voter models and external influence. *Journal of Mathematical Sociology*, Feb 2019. (accepted subject to minor revision).