THE UNIVERSITY OF BRITISH COLUMBIA
Curriculum Vitae for Faculty Members

Date: September, 2016

1. **SURNAME:** Tyson   **FIRST NAME :** Rebecca
                                 MIDDLE NAME(S): Claire

2. **DEPARTMENT/SCHOOL:** Mathematics, Statistics and Physics (Unit 5)

3. **FACULTY:** I.K. Barber School of Arts and Science

4. **PRESENT RANK:** Associate Professor **SINCE:** 2005 (at UBC, since 2003 at OUC[1])

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 (tenure track)	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

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[1]Okanagan University College (OUC) became The University of British Columbia Okanagan (UBC O) in 2005. My tenure-track appointment continued from OUC to UBC O at the time of the switch. The parameters of the OUC/UBC O context are further explained in item **??**.

7. **LEAVES OF ABSENCE**

1997-2003 Between the end of my postdoctoral work and my first tenure-track appointment at OUC, I concentrated on starting a family and developing my teaching skills. At the University of Washington Instructional Centre (March 1997 - December 1999) I worked with economically disadvantaged and ethnic minority students. I taught Developmental Mathematics courses, tutored students, and developed study materials. In 2000, my twins were born and I took one year of maternity leave. For 6 months in 2001, I was a visiting Assistant Professor at the University of Arizona, where I taught courses, and worked with the faculty and graduate students doing research in Mathematics Education. In 2001 we moved to Kelowna where I held a temporary (2-year) College Professor position at OUC. All of my employment during this period was primarily directed at teaching activities.

2010-2011 I was on academic study leave for the year July 2010 - June 2011. As part of my sabbatical, I visited Dr Stephen Krone at the University of Idaho for a month, to collaborate on a new project and a grant proposal. I also visited Dr Frithjof Lutscher at the University of Ottawa, for 6 weeks, also to collaborate on a new research project. Finally, I visited the University of Washington in Seattle for 6 weeks, to renew ties with the Applied Mathematics Department, to immerse myself in a department with several excellent researchers in mathematical biology, and to explore possible new research topics with Dr Mark Kot, a leading researcher in theoretical ecology.

8. **TEACHING**

Below, I outline the teaching activities I engaged in while at OUC/UBC O. A complete list of post-secondary courses I have taught since 1997 are listed in the appendix.

(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:*

Below are listed the undergraduate students I have supervised along with the dates of my official supervision duties. Several of these students however, continued to attend my weekly research group meetings on a regular basis after the official supervision period ended. I thus continue to mentor these students, and provide a stimulating educational experience for them.

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 -	Tyson	
Sylvain Gretchko	DS	Sep 2017 - Dec 2017		
Kim Wilcott	RAv	Sep 2017 - Apr 2018		
Stephanie Hamilton	USRA	May 2018 - Aug 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	PhDMathematics (CGS, Vanier)	Jan 2010 - Aug 2013	Tyson	
Alex Blässle	MSc Mathematics	Sep 2011 - May 2013	Tyson	
Kelsey Vitense	MS QERM (University of Washington)	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	MSc Mathematics	Sep 2016 - present	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 Kanary	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) *Employees supervised:*

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

(h) *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
Maziyar 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	Aug 2015
Jhn Bepple	MSc	university examiner	Biology	May 2016

(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, May 2005, Course Title: "Discrete Equation Models in Mathematical Biology"

(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 models, and my research is based on local problems with global impact, currently based in the areas of conservation, agriculture and forestry.

- Population Cycles: In collaboration with a number of researchers, including Dr Karen Hodges, Shaun Strohm and Dr Frithjof Lutscher, I am developing a body of work on cyclic populations and their response to fragmented landscapes as well as climate change.
- Agriculture: Working with researchers at the Pacific Agri-Food Research Centre, I have investigated the Sterile Insect Release Technique, and the spread of transgenic pollen. My work provides important information that can be used by regulatory agencies worldwide to design effective strategies and management protocols for the use of insects in agriculture.
- Forestry: Vast areas of mature forest in BC are being denuded of trees by the Mountain Pine Beetle, and there is real concern that the epidemic may spread through the boreal forest. I have collaborative projects with Dr Karl Larsen, (Thompson Rivers University), Dr Mary Reid (University of Calgary), Dr James Powell (Utah State University, Shaun Strohm (OC) and Lael Parrott (UBCO) that will provide new methods for predicting the spatial spread of infestations and forest recolonization dynamics.

Evidence of International Impact

I am regularly to speak at international research conferences in North America and Europe, and at the prestigious Banff International Research Station, American Institute of Mathematics and Mathematical Biosciences Institute 5-day workshops (attendance by invitation only). My work has appeared in internationally regarded journals in my field, including the Proceedings of the National Academy of Sciences, Theoretical Ecology, the Journal of Theoretical Biology and the Bulletin of Mathematical Biology. I was elected to the board of the

Society for Mathematical Biology, a leading international organization in my field, and I regularly review manuscripts for high impact journals. I have also twice been invited to serve on the Mathematical Biology Grant Review Panel for the National Science Foundation.

(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 patch 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 is 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	≈ $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

Granting agency		Subject	C	$	Dates	Principal inv.	Co-inv.(s)
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 Mathematical Biology Computation 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) *Keynote Addresses - Scientific Conferences*

1. "Predicting transgenic pollen dispersal", Workshop for Women in Differential Equations - ICM 2018, Universidade Federal do ABC (UFABC), Jul 2018, São Paulo, Brazil

2. "Dispersal and recolonisation by a territorial animal", Guelph Biomathematics & Biostatistics Symposium, University of Guelph, Jun 2016, Guelph, ON

3. "The princess and the pea: The unexpected importance of movement algorithms", BIOMAT 2013, Fields Institute, Toronto, ON, Nov 2013

(e) *Invited presentations - Invitation-Only Scientific Workshops*

1. "Human-Bear Interactions: Using Models to Determine Optimal Management Strategies", Mar 2018, Fields Institute, Toronto, ON, Canada

2. "Predicting transgenic pollen dispersal", Workshop on Pollinators and Pollination Modeling, Feb 2018, Fields Institute, Toronto, ON, Canada

3. "The Effect of Habitat Fragmentation on Cyclic Populations," workshop title: Current Challenges for Mathematical Modelling of Cyclic Populations, 5-day workshop, Banff International Research Station (Nov 2013) (video of talk posted at https://www.birs.ca/events/2013/5-day-workshops/13w5151/videos/watch/201311150907-Tyson.mp4)

4. "The Effect of Extreme Temperature Events on Population Dynamics," workshop title: Impact of Climate Change on Biological Invasions and Population Distributions, 5-day workshop, Banff International Research Station (May 2013) (video of talk posted at https://www.birs.ca/events/2013/5-day-workshops/13w5095/videos/watch/201305162005-Tyson.mp4)

5. "Post-Harvest Diseases of Apples: From Spore Dispersal to Epidemiology," workshop title: Spatial Models of Micro and Macro Systems, 5-day workshop, Mathematical Biosciences Institute, Columbus, OH (April 2012)

6. "The effect of habitat fragmentation on cyclic predator-prey population dynamics," workshop title: Stochastic and Deterministic Spatial Modeling in Population Dynamics, 5-day workshop, American Institute of Mathematics, Palo Alto, CA, USA (May 2009).

7. "Accurately modelling the snowshoe hare/Canada lynx population cycle," workshop title: Dynamics of Structured Populations, 5-day workshop, Banff International Research Station, Banff, AB (Apr 2008).

8. "Modelling codling moth dispersal: Role of spatial heterogeneous landscapes," workshop title: Forest Insect Initiatives, Fredericton, NB (Nov 2007).

9. "Recolonization of clearcuts: Population dynamics in managed forests," workshop title: Mathematical Models for Biological Invasions, 5-day workshop, Banff International Research Station, Banff, AB (Nov 2004).

10. "The swimming behaviour of the medicinal leech," workshop title: From Molecules to Ecosystems: The Legacy of Lee Segel, Banff International Research Station, Banff, AB (Jul 2003).

(f) *Invited Minisymposium Presentations - Scientific Conferences*

1. "Wild bee movement and survival in agricultural landscapes", European Conference in Mathematical and Theoretical Biology, Jul 2016, Nottingham, UK

2. "Modelling the spread of the mountain pine beetle in an urban environment", Canadian Applied and Industrial Mathematics Society, Jun 2016, Edmonton, AB, Canada

3. "Dispersal and recolonisation by a territorial animal", Canadian Applied and Industrial Mathematics Society, Jun 2015, Waterloo, ON, Canada

4. "Population cycles and seasonal shifts in behaviour," Workshop on Mathematical Biology and Nonlinear Analysis, International Conference in Honour of Steve Cantrell's 60th Birthday, Dec 2014, Miami, FL, USA

5. "Post-Harvest Diseases of Apples: From Spore Dispersal to Epidemiology," Everything Disperses to Miami, International Conference in Honour of Chris Cosner's 60th Birthday, Dec 2012, Miami, FL

6. "Boreal population cycles, seasonal behaviour and climate change", Canadian Mathematics Society Winter Meeting, Dec 2012, Montreal, PQ

7. "A diffusion-based model to predict transgenic seed contamination in bee-pollinated crops," Society for Mathematical Biology Annual Meeting, Knoxville, TN (Jul 2012)

8. "Cyclic Populations: The Role of Specialist Predators," International Congress in Industrial and Applied Mathematics, Vancouver, BC (Jul 2011).

9. "A diffusion-based model to predict transgenic seed contamination in bee-pollinated crops," International Congress in Industrial and Applied Mathematics, Vancouver, BC (Jul 2011).

10. "A diffusion-based model to predict transgenic seed contamination in bee-pollinated crops," CAIMS Annual Meeting, St John's, Nfld (Jul 2010).

11. "The effect of habitat fragmentation on cyclic predator-prey dynamics," SMB Annual Meeting, University of British Columbia, Vancouver, BC (Jul 2009).

12. "Modelling the swimming behaviour of the nematode," CMS Winter Meeting, University of Ottawa, Ottawa, ON (Dec 2008).

13. "Accurately modelling the snowshoe hare/Canada lynx population cycle," CMS Annual Summer Meeting, University of Manitoba, Winnipeg, MB (Jun 2007).

14. "Modelling invertebrate swimming using the Immersed Boundary Method," 11th seminar NUMDIFF on Numerical Solution of Differential and Differential-Algebraic Equations, Halle, Germany (Sep 2006).

15. "Modelling the swimming behaviour of the nematode," World Congress on Computational Mechanics, Los Angeles, CA (Jul 2006).

16. "A simulation study of wild and sterile codling moth behaviour in an apple orchard with pheromone traps," MITACS annual meeting, York University, York, ON (Jun 2006).

17. "Modelling recolonization of second-growth forest stands by the North American red squirrel," CMS Winter Meeting, University of Victoria, Victoria, BC (Dec 2005).

18. "Codling moth dispersal in heterogeneous landscapes," Workshop on Dispersal and Biological Invasions, University of New Brunswick, Fredericton, NB (Nov 2004).

19. "Dispersal of the codling moth: Preliminary results," CMS Winter Meeting, University of British Columbia, Vancouver, BC (Dec 2003).

(g) *Invited Presentations - Public Lectures*

1. "The mathematics of marriage," The Cutting Edge: Royal Society Lecture Series, McGill University, Montréal, PQ (Feb 2005).

(h) *Invited Presentations - Departmental Seminars*

1. "Understanding Opinion Dynamics", Department of Mathematics, University of Ottawa, Ottawa, ON, Canada (Mar 2018)

2. "The Effect of Extreme Temperature Events on Poikilotherm Dynamics", Technical University of Munich, Munich, Germany (Jul 2014)

3. "A diffusion-based model of domestic and wild bee movement, and consequences for pollen dispersal", Max Planck Institute, Túbingen, Germany (Jul 2014)

4. "A diffusion-based model to predict transgenic seed contamination in bee-pollinated crops", Department of Mathematics, University of British Columbia, Vancouver, BC (Apr 2012)

5. "A diffusion-based model to predict transgenic seed contamination in bee-pollinated crops", Department of Mathematics, University of Alberta, Edmonton, AB (Mar 2012)

6. "A diffusion-based model to predict transgenic seed contamination in bee-pollinated crops", Department of Mathematics, University of Victoria, Victoria, BC (Feb 2012)

7. "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)

8. "A diffusion-based model to predict transgenic seed contamination in bee-pollinated crops", Department of Mathematics, University of Ottawa, Ottawa, ON (Feb 2011)

9. "A diffusion-based model to predict transgenic seed contamination in bee-pollinated crops", Department of Mathematics, University of Idaho, Moscow, ID, USA (Aug 2010)

10. "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 (Nov 2008).

11. "Modelling the swimming behaviour of the nematode," Département de Mathématique et Statistique, Université de Montréal, Montréal, PQ (Nov 2008).

12. "Modelling the snowshoe hare/Canada lynx population cycle," Department of Mathematics and Statistics, University of Ottawa, Ottawa, ON (Feb 2008).

13. "Mathematical modelling with Rebecca Tyson: Current Projects," School of Advanced Technology and Mathematics, seminar, Thompson Rivers University, Kamloops, BC (Nov 2005).

14. "Pattern formation in a reaction-diffusion-chemotaxis model," PIMS lecture, Department of Mathematics and Statistics, University of Alberta, Edmonton, AB (Nov 2002).

15. "Perspectives on mathematical biology," Department of Applied Mathematics, seminar, University of Washington, Seattle, WA, USA (Sep 1999).

16. "Pattern formation in a reaction-diffusion-chemotaxis model," Centre for Nonlinear Dynamics in Physiology and Medicine, McGill University, Montréal, PQ (Nov 1999).

(i) *Contributed presentations - Scientific Conferences*

1. "Centering and Polarization in Opinion Dynamics", 6th International Conference on Mathematics and its Applications, Tucson, AZ (Oct 2017)

2. "The Effect of Extreme Temperature Events on Poikilotherm Dynamics", European Conference in Mathematical and Theoretical Biology, Göteborg, Sweden (Jun 2014)

3. "The response of stable limit cycle dynamics to spatial dispersal in heterogeneous landscapes," SIAM Conference on Dynamical Systems, Snowbird, UT, USA (May 2009).

4. "Accurately modelling the snowshoe hare/Canada lynx population cycle," Canadian Society for Ecology and Evolution, University of British Columbia, Vancouver, BC (May 2008).

5. "Accurately modelling the snowshoe hare/Canada lynx population cycle," Canadian Association for Industrial and Mathematical Sciences annual meeting, Banff International Research Station, Banff, AB (May 2007).

6. "Modelling codling moth dispersal: The role of orchard boundaries," Department of Mathematics and Statistics, University of Ottawa, Ottawa, ON (Apr 2005).

(j) *Other Presentations*

1. "Mathematical Model of Bumblebee Pollination Services in Blueberry", BC Blueberry Council Field Day, Agassiz, BC (May 2017)

2. "What is Mathematical Biology?", Quantitative Sciences Course Union Workshop, UBC Okanagan, BC (Mar 2017)

3. "Workshp in Mahematical Biology?", Quantitative Sciences Course Union Workshop, UBC Okanagan, BC (Mar 2016)

4. "My Research and Career in Mathematical Biology", Quantitative Sciences Course Union Workshop, UBC Okanagan, BC (Apr 2015)

5. "Modelling the snowshoe hare/Canada lynx population cycle," UBC Okanagan Research Day, UBC Okanagan, BC (Mar 2008).

6. "Modelling codling moth dispersal," UBC Okanagan Research Day, UBC Okanagan, BC (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 thte Applied Mahtematics, 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)

(l) *Media Interviews and Print Stories*

1. Management of pine beetle attack

   A. National Parks Traveler (article), http://www.nationalparkstraveler.com/2016/12/pine-beetle-strategy-banff-national-park-can-do-more-harm-good-research-shows (Dec 2016)

   B. Capital News (article), http://www.kelownacapnews.com/community/403807216.html (Dec 2016)

   C. Castanet (article), http://www.castanet.net/news/BC/182329/Pine-beetle-battle-misguided (Dec 2016)

2. Effect of climate change on the great horned owl and snowshoe hare predator-prey relationship

   A. Pique News (article), http://www.piquenewsmagazine.com/whistler/unexpected-species-extinction-found-in-predator-prey-study/Content?oid=2822829 (Nov 16, 2016)

   B. Science Daily (article), https://www.sciencedaily.com/releases/2016/10/161025114712.htm (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), http://www.castanet.net/news/Kelowna/179230/Predator-prey-balance-at-risk (Oct 26, 2016)

   F. Penticton Info News (article), http://infotel.ca/newsitem/ubc-okanagan-researcher-worries-global-warming-may-harm-predator-and-prey-connections/it35966 (Oct 25, 2016)

10. **SERVICE TO THE UNIVERSITY**

(a) *Memberships on committees*
UNIVERSITY LEVEL

- Chair, UBC Okanagan Internal Research Grant Selection Committee (2007 - present)
- 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) ($\approx$ 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, Interdsiciplinary 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 Commitee (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) *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.

(f) *Other Awards*

   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)

Surname: Tyson   **First Name:** Rebecca   **Middle Name(s):** Claire

(a) **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. In those works published after 2003, when I resumed active research, I am either the first author or the author responsible for developing the concepts and supervising the project. My co-authors in the published works listed below include the following students (all were undergraduates working directly under my supervision at the time of manuscript submission): S. Haines, J. Hebert, K. Newton, B. Nyquist, and S. Strohm.

Summary of my Research Program

Habitats are continually subject to fragmentation due to natural and anthropogenic causes. Fragmentation creates opportunities for invasive organisms to become established, and is simultaneously detrimental to native species. Both situations induce significant economic and environmental costs. Mathematical modelling is an important tool for cost-effective, accurate and timely analyses of dispersal patterns and behaviours. Using ordinary and partial differential equations, difference equations and individual-based modelling, I develop and analyse models to accurately describe the population dynamics, spatial movement and complex interactions of organisms with the heterogeneous landscape in which they live.

1. Journals - Invited Publications

    A. Barraquand, F., Louca, S., Abbott, K.C., Cobbold, C.A., Cordoleani, F., DeAngelis, D.L., Elderd, B.D., Fox, J.W., Greenwood, P., Hilker, F.M., Murray, D.L., Stieha, C.R., Taylor, R.A., Vitense, K., Wolkowicz, G.S.K., and Tyson, R.C. (Jun 2017) **Moving forward in circles: Challenges and opportunities in modelling population cycles** *Ecology Letters* doi:10.111/ele.12789

    B. Culos, G.J. and Tyson, R.C. (Dec 2014) **Response of poikilotherms to thermal aspects of climate change** *Ecological Complexity* 20(Special Issue):293-306

    C. Long, A. and Tyson, R.C. (Dec 2014) **Integrating *Homo sapiens* into ecological models: Imperatives of climate change** *Ecological Complexity* 20(Special Issue):325-334

    D. Tyson, R.C. (Sep 2014) **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

    E. Gauduchon, T., Strohm, S. & Tyson, R.C. (2013) **The Effect of Habitat Fragmentation on Cyclic Populations with Edge Behaviour**, *Mathematical Modelling of Natural Phenomena* 8(6):45-63

    F. Tyson, R., C.E. Jordan & J. Hebert (2007) **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. (Impact Factor: 2.129)

G. Murray, J.D., J. Cook, R. Tyson & S.R. Lubkin (1998) **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. (Impact Factor: 0.616)

2. Journals - Contributed Publications

A. Mata, M., Greenwood, P., and Tyson, R.C. (in press) **The relative contribution of direct and environmental transmission routes in stochastic avian flu epidemic recurrence** *Bulletin of Mathematical Biology*

B. Vallaeys, V., Tyson, R.C., Lane, W.D., Deleersnijder, E., and Hanert, E. (2017) **A Lévy-flight diffusion model to predict transgenic pollen dispersal** *Journal of the Royal Society Interface* 14:20160889

C. Tyson, R.C. and Lutscher, F.L. (Nov 2016) **Seasonally varying predation behavior and climate shifts are predicted to affect predator-prey cycles** *The American Naturalist* 188(5):539-553

D. Marley, J., Hyde, A., Salkeld, J.H., Prima, M.-C., Parrott, L., Senger, S.E., and Tyson, R.C. (Oct 2017) **Does human education reduce conflicts between humans and bears? An agent-based modelling approach** *Ecological Modelling* 343:15-24

E. Baumgaertner, B.O., Tyson, R.C., and Krone, S.M. (Sep 2016) **Opinion strength influences the spatial dynamics of opinion formation** *The Journal of Mathematical Sociology* doi: 10.1080/0022250X.2016.1205049

F. Blaessle, A., and Tyson, R.C. (Sep 2016) **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

G. Strohm, S., Reid, M.L., and Tyson, R.C. (Oct 2016) **Impacts of management on Mountain Pine Beetle spread and damage: A process-rich model** *Ecological Modelling* 337:241-252

H. Vitense, K., Wirsing, A.J., Tyson, R.C., and Anderson, J.J. (May 2016) **Theoretical impacts of habitat loss and generalist predation on predator-prey cycles** *Ecological Modelling* 327:85-94

I. Culos, G. and Tyson, R.C. (Dec 2014) **Response of poikilotherms to thermal aspects of climate change** *Ecological Complexity* 20(SI):293-306.

J. Long, A. and Tyson, R.C. (Dec 2014) **Integrating Homo sapiens into ecological models: Imperatives of climate change** *Ecological Complexity* 20(SI):325-334.

K. Kanary, L., Musgrave, J., Tyson, R.C., Locke, A. and Lutscher, F. (Nov 2014) **Modelling the dynamics of invasion and control of competing green crab genotypes** *Theoretical Ecology* 7(4):391-406

L. Strohm, S., Tyson, R.C., Powell, J.A. (2013) **Pattern formation in a model for mountain pine beetle dispersal: Linking model predictions to data** *Bulletin of Mathematical Biology* doi:10.1007/s11538-013-9868-8

M. Dutot, M., Nelson, L.M., Tyson, R.C. (2013) **Predicting the spread of postharvest disease in stored fruit, with application to apples** *Postharvest Biology and Technology* 85:45-56 doi:10.1016/j.posthavbio.2013.04.003

N. Strohm, S., Tyson, R.C. (2011) **The Effect of Habitat Fragmentation on Cyclic Population Dynamics: A Reduction to Ordinary Differential Equations** *Theoretical Ecology* doi:10.1007/s12080-011-0141-1

O. Tyson, R.C., Wilson, J.B., Lane, W.D. (2011) **A mechanistic model to predict transgenic seed contamination in bee-pollinated crops validated in an apple**

orchard, *Ecological Modelling* 222(13):2084-2092

P. Tyson, R.C., Wilson, J.B., Lane, W.D. (2011) **Beyond diffusion: Modelling local and long-distance dispersal for organisms exhibiting intensive and extensive search modes** *Theoretical Population Biology* 79(3):70-81

Q. Tyson, R., S. Haines & K.E. Hodges (2010) **Modelling the Canada Lynx and Snowshoe Hare Population Cycle: The Role of Specialist Predators**, *Theoretical Ecology*, 3:97-111.

R. Senger, S.E., R. Tyson, B.D. Roitberg, H.M.A. Thistlewood, A.S. Harestad & M.T. Chandler (2009) **Influence of habitat structure and resource availability on the movements of rhagoletis indifferens (Diptera: Tephritidae)**, *Environmental Entomology*, 38(3):823-835.

S. Strohm, S. & R. Tyson (2009) **The effect of habitat fragmentation on cyclic population dynamics: A numerical study**, *Bulletin of Mathematical Biology*, **71**(6):1323-1348.

T. Tyson, R., K.D. Newton, H. Thistlewood & G. Judd (2008) **Mating rates between sterile and wild codling moths (*Cydia Pomonella*) in springtime: A simulation study**, *Journal of Theoretical Biology*, **254**(2):319-330.

U. Tyson, R., H. Thistlewood & G.J.R. Judd (2007) **Modelling dispersal of sterile male codling moths, Cydia pomonella, across orchard boundaries**, *Ecological Modelling*, **205**(1-2):1-12.

V. Nyquist, B, R. Tyson & K. Larsen (2007) **Modelling recolonization of second-growth forest stands by the North American red squirrel Tamiasciurus hudsonicus**, *Bulletin of Mathematical Biology*, **69**(4):1311-1339.

W. Gottman, J.M., R.W. Levenson, C. Swanson, K. Swanson, R. Tyson & D. Yoshimoto (2003) **Observing gay, lesbian and heterosexual couples' relationships: mathematical modelling of conflict interaction**, *Journal of Homosexuality*, **45**(1):65-91.

X. Tyson, R., L.G. Stern & R.J. LeVeque (2000) **Fractional step methods applied to a chemotaxis model**, *Journal of Mathematical Biology*, **41**(5):455-475.

Y. Tyson, R., S.R. Lubkin & J.D. Murray (1999) **A minimal mechanism for bacterial pattern formation**, *Proceedings of the Royal Society of London Series B: Biological Sciences*, **266**(1416):299-304.

Z. Tyson, R., S.R. Lubkin & J.D. Murray (1999) **Model and analysis of chemotactic bacterial patterns in a liquid medium**, *Journal of Mathematical Biology*, **38**(4):359-375.

. Cook, J., R. Tyson, J. White, R. Rushe, J. Gottman & J. Murray (1995) **Mathematics of marital conflict: Qualitative dynamic mathematical modeling of marital interaction**, *Journal of Family Psychology*, **9**(2):110-130.

. Woodward, D.E., R. Tyson, M.R. Myerscough, J.D. Murray, E.O. Budrene & H.C. Berg (1995) **Spatio-temporal patterns generated by Salmonella typhimurium**, *Biophysical Journal*, **68**(5):2181-2189.

. Tyson, R., W.T. Welch, J. Berreen, C. Wells & C.E. Pearson (1993) **Pressure changes in the eye due to an injection of inert gases: A theoretical model**, *Journal of Theoretical Biology*, **164**(1):15-36.

8. Conference Proceedings

A. Tyson, R.C. (Nov 2013) **The princess and the pea: The unexpected importance of movement algorithms** in *BIOMAT 2013, Proceedings of the International*

Symposium on Mathematical and Computational Biology Mondaini, R.P. (ed.), World Scientific Publication Company, ISBN:9814602211 *Note: The date I have given is the date of the talk, not the date when the proceedings were eventually published, which was some months later.*

9. Other

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

(b) **NON-REFEREED PUBLICATIONS**

1. Book Reviews

A. SIAM book review: Small, M. (2013) "Dynamics of Biological Systems", CRC Press

B. SIAM book review: Bacaer, N. (2011) "A Short History of Mathematical Population Dynamics" Springer

(c) **BOOKS**

1. Authored

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

- *"... neatly presents marriage as a process both mathematical and unpredictable, both stable and prone to catastrophe."* Jordan Ellenberg, Slate Magazine

- *"The Mathematics of Marriage is a splendid, important, and extremely useful book. Gottman and colleagues set a new standard for psychological explanation with their exquisite conversation among theory, models, data, and clinical intervention. They also provide the most clear and accessible introduction to the mathematics I have seen. This work is compelling evidence of the power of nonlinear dynamic models for understanding complex psychological phenomena. It will also change forever the way you look at marriage."* Esther Thelen, Department of Psychology, Indiana University, Co-editor of *A Dynamic Systems Approach to the Development of Cognition and Action*

- *"Dynamic systems theory is infiltrating psychology in a variety of ways, increasing the sensitivity, realism, and scope of psychological models and methods. But I know of no other application that covers so much ground, from theory-building and modeling to methodology and measurement, and finally to clinical interventions that actually work."* Marc D. Lewis, Professor, University of Toronto, Co-editor of *Emotion, Development, and Self-Organization: Dynamic Systems Approaches to Emotional Development*

(d) **WORK IN PROGRESS**

- **Manuscripts in Preparation**
  - Dutot, M., Grandjean, G., Tyson, R.C., and Nelson, L. **Modelling biocontrol of post-harvest fungal disease in apples**, manuscript 60% complete
  - Tyson, R.C., Larsen, K. and Krone, S.M. **Emergent patterns of colonization of virgin territory by a highly territorial animal**, manuscript 10% complete
  - Baumgartner, B., Tyson, R.C., and Krone, S.M. **Opinion Dynamics II**, manuscript 90% complete

- Majmudar, J., Krone, S.M., Baumgartner, B., and Tyson, R.C. **Opinion dynamics in the presence of an external forcing feedback loop**, manuscript 90% complete
- Wilson, J.B., Tyson, R.C. **Wild bee dispersal and consequences for pollination: An energetics model**, manuscript 40% complete
- Williams, K., Tyson, R.C. **Predicting dispersal of fungal spores in orchards**, manuscript 30% complete

- **Active Research Projects Not Yet At Manuscript Stage**
  - **Modelling the effect of wildflower patches on bumblebee pollination services in blueberry**, with S. MacQueen (PhD student)
  - **A stochastic differential equations model for avian flu**, 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) and R. Declerck-Floate (Agriculture and Agri-Foods Canada)