Suzanne Lora Robertson

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EDUCATION AND EXPERIENCE

Virginia Commonwealth University, Richmond, VA

Aug 2012 - present   Assistant Professor, Department of Mathematics and Applied Mathematics

Mathematical Biosciences Institute, The Ohio State University, Columbus, OH

Sept 2009 - Aug 2012   Postdoctoral Fellow

University of Arizona, Program in Applied Mathematics, Tucson, AZ

May 2009   Ph.D. Applied Mathematics
Advisor: Jim Cushing, Department of Mathematics
Dissertation Title: *Spatial Patterns in Stage-Structured Populations with Density Dependent Dispersal*

Dec 2005   M.S. Applied Mathematics

The College of William and Mary, Williamsburg, VA

May 2003   B.S. Mathematics (Chemistry Minor)
Summa Cum Laude, Phi Beta Kappa

RESEARCH INTERESTS

Mathematical ecology, epidemiology and evolutionary biology. Difference and differential equations.

PUBLICATIONS

1. Henson, S.M., Reilly, J.R., **Robertson, S.L.**, Schu, M.C., Rozier, E.W.D. and Cushing, J.M. 2003. *Predicting irregularities in population cycles.* SIAM Journal on Applied Dynamical Systems 2: 238-253

2. **Robertson, S.L.** and Cushing, J.M. 2011. *Spatial segregation in stage-structured populations with an application to Tribolium.* Journal of Biological Dynamics, 5(5): 398-409

3. **Robertson, S.L.** and Cushing, J.M. 2012. *A bifurcation analysis of stage-structured density dependent integrodifference equations.* J. Math. Anal. Appl., 388(1): 490-499

4. **Robertson, S.L.**, Cushing, J.M. and Costantino, R.F. 2012. *Life stages: interactions and spatial patterns.* Bulletin of Mathematical Biology, 74: 491-508

5. **Robertson, S.L.** and Hamilton, I.M. 2012. *Habitat selection under the risk of infectious disease.* Evolutionary Ecology Research, 14: 51-72

6. Eisenberg, M.C., **Robertson, S.L.** and Tien, J. 2013. *Identifiability and estimation of multiple transmission pathways in cholera and waterborne disease.* Journal of Theoretical Biology, 324(7): 84-102

7. **Robertson, S.L.**, Eisenberg, M.C. and Tien, J. 2013. *Heterogeneity in multiple transmission pathways: modeling the spread of cholera and other waterborne disease in networks with a common water source.* Journal of Biological Dynamics, 7(1): 254-275

8. Chan, D., McCombs, M., Boegner, S., Ban, H.J. and **Robertson, S.L.** 2015. *Extinction in discrete, competitive multi-species patch models.* Discrete and Continuous Dynamical Systems Series B, 20(6): 1583-1590

9. Collins, O.C., **Robertson, S.L.** and Govinder, K.S. 2015. *Analysis of a waterborne disease model with socioeconomic classes.* Mathematical Biosciences, 269: 86-93

10. **Robertson, S.L.** and Caillouet, K.A. 2016. *A host stage-structured model of enzootic West Nile virus transmission to explore the effect of avian stage-dependent exposure to vectors*, Journal of Theoretical Biology, 399: 33-42

11. Caillouet, K.A. and **Robertson, S.** 2016. *Statistical tools for the interpretation of enzootic West Nile virus transmission dynamics.* West Nile Virus: Methods and Protocols, 221-234

12. Beebe, T.A. and **Robertson, S.L.** 2017. *A two species stage-structured model for West Nile virus transmission*, Letters in Biomathematics, 4(1):112-132

13. Fleming-Davies, A.*, Jabbari, S.*, **Robertson, S.L.***, Sri Noor Asih, T.*, Lanzas, C., Lenhart, S. and Theriot, C.M. 2017. *Mathematical modeling of the effects of nutrient competition and bile acid metabolism by the gut microbiota on colonization resistance against Clostridium difficile*. In: Layton A., Miller L. (eds) Women in Mathematical Biology. Association for Women in Mathematics Series, vol 8. Springer, Cham * indicates equal contribution

14. **Robertson, S.L.**, Henson, S.M., Robertson, T. and Cushing, J.M. 2018 *A matter of maturity: to delay or not to delay? Continuous-time compartmental models of structured populations in the literature 2000-2016*, Natural Resource Modeling, 31:e12160

15. Schaefer, E., Caillouet, K.A. and **Robertson, S.L.** *Methods for prophylactic management of West Nile virus using a stage-structured avian host-vector model with vaccination, larvicide, and adulticide*, Natural Resource Modeling, in press

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TEACHING

Dept. of Mathematics and Applied Mathematics, Virginia Commonwealth University

- Math 200: Calculus I, Fall 2014
- Math 301: Differential Equations, Fall 2012 – Spring 2014, Fall 2015, Fall 2016, Spring 2017, Spring 2018
- Math 310: Linear Algebra, Fall 2017
- Math 432: Ordinary Differential Equations, Fall 2017
- Math 480: Methods of Applied Math for the Life Sciences: Discrete (new course), Fall 2016
- Math 532: Ordinary Differential Equations, Fall 2013, Fall 2014, Fall 2015
- Math 582: Computational Modeling in Mathematical Biology, Spring 2013, Spring 2014
- Math 585: Biomathematics Seminar: Epidemiology, Fall 2014, Spring 2018
- Math 591: Topics in Mathematical Biology, Spring 2015
- Math 632: Ordinary Differential Equations II (graduate), Spring 2016, Spring 2017
- Math 690: Research Seminar, Spring 2018

Department of Mathematics, The Ohio State University

- Math 151.03: Calculus and Analytic Geometry 1 (Life Sciences), Fall 2010

Department of Mathematics, University of Arizona

- Math 263: Introduction to Statistics and Biostatistics, Spring 2009
- Math 124: Calculus and its Applications, Spring 2007
- Math 113: Brief Calculus, Fall 2006
- Math 111: Trigonometry, Fall 2004 and Spring 2005

STUDENT ADVISING AND MENTORING

Graduate Students

- Taylor Beebe, M.S. Applied Mathematics - May 2016
  Thesis title: *A two host species stage-structured model of West Nile virus transmission*

- Mark Zimmerman, M.S. Applied Mathematics - August 2015
  Thesis title: *The effects of nicotine sequestration on the dynamics of hyperparasitism in a stage-structured model of Manduca sexta and its related parasitoid wasps*

Undergraduate Students

- Karl Blakeslee, Summer 2015

- Scott Dicken, Fall 2014 - Spring 2015

Committees

- Ellen Goodrich-Stuart, M.S. Biology - May 2014

- Abigail Nelson, M.S. Biology - August 2016

- Rebecca Clark, M.S. Applied Mathematics - August 2016

INVITED AND CONFERENCE PRESENTATIONS

Mathematical Biosciences Institute Workshop on Disease Ecology and Eco-epidemiology (Invited Talk), *Modeling and control of West Nile virus transmission: Incorporating avian stage-dependent vector exposure.* Columbus, OH - March 2018

University of Richmond Mathematics Colloquium (Invited Talk), *Modeling and control of West Nile virus transmission: Incorporating avian stage-dependent vector exposure.* Richmond, VA - November 2017

Symposium on BEER (Biomath and Ecology: Education and Research) (Invited Talk), *Incorporating between-species and within-species heterogeneity in a model for West Nile virus transmission.* Normal, IL - October 2017

Society for Mathematical Biology Annual Meeting (Mini-Symposium Talk), *Modeling and control of West Nile virus transmission: Incorporating avian stage-dependent vector exposure.* Salt Lake City, UT - July 2017

Howard University Workshop on Modeling Infectious Diseases (Invited Talk), *Modeling and control of enzootic West Nile virus transmission: Incorporating avian stage-dependent vector exposure*, Washington, DC - December 2016

Symposium on BEER (Biomath and Ecology: Education and Research) (Invited Talk), *Modeling the effect of avian stage-dependent vector exposure on enzootic West Nile virus transmission and control*, Charleston, SC - October 2016

Indiana University - Purdue University at Indianapolis (IUPUI) Mathematics Colloquium (Invited Talk), *Modeling enzootic West Nile virus transmission: Incorporating avian stage-dependent vector exposure.* Indianapolis, IN - March 2016

Joint Mathematics Annual Meeting (Mini-symposium Talk) *The effect of avian stage-dependent vector exposure on enzootic West Nile virus transmission.* Seattle, WA - January 2016

Symposium on BEER (Biomath and Ecology: Education and Research) (Invited Talk), *The role of avian stage-structure in West Nile virus enzootic transmission.* Normal, IL - October 2015

Society for Mathematical Biology Annual Meeting (Mini-Symposium Talk), *The effect of avian stage-dependent vector exposure on enzootic West Nile virus transmission.* Atlanta, GA - July 2015

Marymount University Seminar (Invited Talk), *The effect of temporal fluctuations in host stage abundance on West Nile virus transmission.* Arlington, VA - November 2014

SIAM Life Sciences (Invited Talk), *The role of avian stage-structure in the transmission and control of West Nile virus.* Charlotte, NC - August 2014

Ecology and Evolution of Infectious Diseases Conference (Poster), *The role of avian stage-structure in the transmission of West Nile virus.* Ft. Collins, CO - June 2014

Joint Mathematics Annual Meeting, *The role of avian stage-structure in the transmission of West Nile virus.* Baltimore, MD - January 2014

College of William & Mary Biomath Seminar (Invited Talk), *The role of stage-structure in the transmission of West Nile virus.* Williamsburg, VA - November 2013

Symposium on BEER (Biomath and Ecology: Education and Research), *The role of stage-structure in the transmission of West Nile virus.* Arlington, VA - October 2013

Eigen*Talk, Andrews University (Invited Talk), *Heterogeneity in multiple transmission pathways: modeling the spread of waterborne disease in networks with a common water source.* Berrien Springs, MI - March 2013

Biology Colloquium, Andrews University (Invited Talk), *Modeling the spread of waterborne disease: the role of multiple transmission pathways.* Berrien Springs, MI - February 2013

Everything Disperses to Miami (Invited Talk), *Habitat selection under the risk of infectious disease.* Miami, FL - December 2012

VCU Biology Seminar, *Heterogeneity in multiple transmission pathways: modeling the spread of waterborne disease in networks with a common water source.* Richmond, VA - November 2012

Mathematical Biosciences Institute 10th Anniversary Meeting (Poster), *Modeling the spread of waterborne disease: the role of multiple transmission pathways.* Columbus, OH - September 2012

Joint Mathematics Annual Meeting (Invited Talk), *Modeling the spread of waterborne disease: Incorporating heterogeneity in multiple transmission pathways .* Boston, MA - January 2012

ICMA III: Third International Conference on Mathematical Modeling and Analysis of Populations in Biological Systems (Invited Talk), *Modeling waterborne disease: incorporating heterogeneity in multiple transmission pathways.* San Antonio, TX - October 2011

Ecological Society of America (ESA) Annual Meeting, *The Effect of the Risk of Infectious Disease on Habitat Selection.* Austin, TX - August 2011

Ecology and Evolution of Infectious Diseases Conference (Poster), *Habitat Selection Under the Risk of Infectious Disease.* Santa Barbara, CA - June 2011

Duke University, Department of Mathematics (Invited Talk), *Modeling Waterborne Disease: Incorporating Heterogeneity in Multiple Transmission Pathways* Durham, NC - June 2011

Math Institutes Modern Math Workshop (Invited Talk, MBI representative), *Modeling Spatial Patterns in Structured Populations with an Application to Tribolium.* Anaheim, CA - September 2010

SIAM Life Sciences Annual Meeting (Invited Talk), *Spatial Patterns in Stage-Structured Populations with Density Dependent Dispersal: An Application to Tribolium.* Pittsburgh, PA - July 2010

ICMA II: Second International Conference on Mathematical Modeling and Analysis of Populations in Biological Systems (Invited Talk), *Formation of Spatial Patterns in Structured Populations with Density Dependent Dispersal.* Huntsville, AL - October 2009

Society for Mathematical Biology Annual Meeting (Poster), *Spatial Patterns in Stage-Structured Populations with Density Dependent Dispersal.* Toronto, CA - August 2008

ICMA I: Mathematical Modeling and Analysis of Populations in Biological Systems (Invited Talk), *Spatial Patterns in Stage-Structured Populations with Density Dependent Dispersal.* Tucson, AZ - October 2007

Utah-Arizona IGERT Summit (voted best talk), *Modeling the Dynamics of Tribolium: The Role of Inhibition.* Salt Lake City, UT - May 2005

Math Conversations Colloquium, Andrews University (Invited Talk), *Predicting Irregularities in Population Cycles.* Berrien Springs, MI - October 2001

OTHER TALKS

VCU Biomath Seminar, Richmond, VA
A stage-structured model for West Nile virus enzootic transmission, October 2015
Heterogeneity in multiple transmission pathways: Modeling the spread of waterborne disease in networks with a common water source, October 2012

Mathematical Biosciences Institute Postdoctoral Seminar, Columbus, OH
Modeling Waterborne Disease: Incorporating Heterogeneity in Multiple Transmission Pathways, May 2011
Spatial Patterns in Stage-Structured Populations with Density Dependent Dispersal, Oct 2009

RUMBA (Research for Undergraduates: Adventures in Mathematical Biology and its Applications) Seminar, Columbus, OH
Careers in Mathematical Biology, April 2011
Modeling the Dynamics of Tribolium, February 2010

Biomathematics Seminar, University of Arizona, Tucson, AZ
Formation of Spatial Patterns in Structured Populations with Density Dependent Dispersal, April 2009
Mammalian Spontaneous Otoacoustic Emissions: A Global Standing-Wave Model, Sept 2008
Formation of Animal Coat Patterns, March 2006
Random Determination of a Developmental Process, Feb 2006
HSP90: A Mechanism for Rapid Evolution, Aug 2005
Independent Component Analysis, May 2005
Partitioning Carbon Dioxide Exchange, April 2005
R_0 and Backwards Bifurcations, Sept 2004
Competition Theory and Non-Lotka/Volterra Dynamics, April 2004
Circadian Rhythms and Sleep Patterns, Oct 2003

Applied Math Graduate Colloquium, Tucson, AZ
Spatial Patterns in Stage-Structured Populations with Density Dependent Dispersal, April 2008
Population Dynamics in Fluctuating Habitats, Oct 2006

Arizona Summer Program on Mathematical Modeling, Tucson, AZ
Spatial Patterns in Flour Beetles, July 2007

2nd Year Applied Math Graduate Research Conference, Tucson, AZ
Population Dynamics of Tribolium brevicornis, December 2004

OTHER CONFERENCES/WORKSHOPS ATTENDED

Integrodifference Equations in Ecology: 30 years and counting, BIRS, Banff, CA, September 2016

Research Collaboration Workshop for Women in Mathematical Biology, NIMBioS, June 2015

Evolutionary Game Theory, Mathematical Biosciences Institute, April 2015

Workshop on Sustainability and Complex Systems, MBI, September 2013

Ecology and Evolution of Infectious Disease Conference, Ann Arbor, MI, May 2012

GRANTS AWARDED

SIMONS Collaboration Grant (PI), *Controlling Infectious Disease Through Collaboration.* September 1, 2016 - August 31, 2021 $35,000

The Thomas F. and Kate Miller Jeffress Memorial Trust (PI) *The impact of temporal variation in host life-stage abundance on the regional transmission and control of West Nile virus.* June 30, 2014 - June 29, 2015, $100,000

Sonia Kovalevsky High School Mathematics Day Grant (co-PI), 2008, Association for Women in Mathematics, $1000

GRANTS SUBMITTED (NOT FUNDED)

VCU Presidential Research Quest Fund (PI), April 2017 *Modeling West Nile virus: the importance of the avian nesting curve* ($33,071)

The Thomas F. and Kate Miller Jeffress Memorial Trust (co-PI), Jan 2015 *The impact of antibiotic exposure on Clostridium difficile infection: A predictive model*, PI: Joanna Wares, University of Richmond (subaward $10,875)

NSF/NIH Ecology and Evolution of Infectious Disease (co-PI), Nov 2014 *Improved forecasts for West Nile virus risk by integrating ecological data with multiscale mathematical models*, PI: Dawn Wesson, Tulane University (subaward $108,656)

VCU Faculty Council Research Award, April 2014 ($1,000)

NSF/NIH Ecology and Evolution of Infectious Disease (co-PI), Nov 2013 *Complex adaptive systems and emerging infectious diseases: Social-ecological transition and West Nile virus in New Orleans*, PI: Melissa Finucane, Rand Institute (subaward $63,214)

ORAU Ralph E. Powe Award (PI), Jan 2013 *The impact of temporal variation in host abundance of the transmission of vector-borne disease* ($10,000, selected as one of two submissions from VCU)

HONORS AND AWARDS

Nominated for VCU College of Humanities and Sciences Excellence in Scholarship Award, 2015 and 2016

Travel Awards/Funding:
- Colloquium speaker, IUPUI, March 2016
- NIMBioS Workshop for Women in Mathematical Biology, June 2015
- Workshop on Sustainability and Complex Systems, Mathematical Biosciences Institute, September 2013
- Symposium on BEER (Biomath and Ecology: Education and Research), Marymount University, October 2013
- Biology Colloquium and Math EigenTalk speaker, Andrews University, March 2013
- Everything Disperses to Miami Conference, December 2012
- 10th Anniversary Meeting, Mathematical Biosciences Institute, September 2012

National Science Foundation VIGRE Fellow, Fall, Summer and Spring 2008, Summer 2007

National Science Foundation IGERT Fellow, 2004-2005 (Full Award), 2005-2006 (Half Award)

University of Arizona BIO5 Scholarship, Fall 2008

Undergraduate Awards:

- William and Mary Prize in Mathematics
- Phi Beta Kappa Honor Society
- Waldemar J. Trjitzinsky Scholarship from the American Mathematical Society
- Verizon Research Scholarship for Women in Mathematics
- Monroe Scholar

SERVICE

Editorial Board, *Natural Resource Modeling*, June 2014-present

- Co-editor of special edition of review papers to be published January 2018

Reviewer for:

- Mathematical Biosciences, PLOS One, Theoretical Ecology, Integrative and Comparative Biology, International Journal of Environmental Research and Public Health, Journal of Mathematical Biology, Journal of Biological Dynamics, Journal of Theoretical Biology, Journal of Nonlinear Science, Applied Mathematical Modeling, Applicable Analysis, Letters in Biomathematics, Calculus for the Life Sciences Textbook (Stewart and Day)

Organizer, VCU Biomathematics Seminar, Fall 2013 - Spring 2016

Reviewed applications for Mary Lou Gibson scholarship, Spring 2015

Department Committees:
- Biomath/Applied Math Committee (2012-present)
- Undergraduate Affairs Committee (2017 - present)
- Undergraduate Credentials Committee (2017 - present, chair)
- Undergraduate Curriculum Committee (2017 - present)
- Awards Committee (2017 - present)
- Search Committee (2016-2017)
- Graduate Affairs Committee (2015-2017)
- Honors Math 230 Committee (2014-2015)
- Calculus Committee (2013-2014)
- Undergraduate Credentials Committee (2012-2015)
- Visitation Committee (2015-2016)
- Student Activities Committee (2012-2015)
- Diversity Committee (2012-2015)

PROFESSIONAL DEVELOPMENT AND OUTREACH

Organizing committee, Biology and Medicine through Mathematics! (BAMM!) Conference, May 2016, 2017, 2018

Co-organized minisymposium at Society for Mathematical Biology Annual Meeting *(Linking ecological dynamics with disease risk and control)*, July 2015

Co-organized session at University of Arizona's Program in Applied Mathematics 35th Anniversary Meeting *(Trends in Population Dynamics)*, April 2014

Center for Teaching Excellence Mentorship Program, Fall 2013 - Spring 2014
- Met with mentor in Biology, Dr. Cara Cario twice a semester
- Attended the following 1.5 hour workshops: Preparing for Promotion and Tenure, Developing a Teaching Portfolio, Obtaining External Funding, Teaching, Learning and Technology: Staying afloat in a sea of change.

Teaching Workshops Attended:
- CTE Preparing to Teach @ VCU series, August 2013
- Math Department Calculus Workshop, August 2013
- Teaching at VCU: Tips for Rewarding Teaching Experiences in a Learning Centered Research University, August 2012

Grant Workshops Attended:
- Grant Proposal Budgeting, VCU Sponsored Programs, Oct 2013
- Strategies for Success in Sponsored Research, VCU OSP, Oct 2013

Planning committee, Sonia Kovalevsky Day, VCU, 2013
- Helped organize day long mathematics workshop for high school girls sponsored by Women in Math at VCU.
- Volunteer coordinator.

Joint MBI-NIMBios-CAMBAM Summer Graduate Workshops, 2011 & 2012
- Ran computer lab and mentored group project in evolutionary game theory (2011) and stochastic models in epidemiology (2012).

Organizer, MBI Workshop for Young Researchers in Mathematical Biology
- One of two main organizers of August 2010 workshop
- Assisted in organizing and running August 2011 workshop

RUMBA Seminar: Careers in Mathematical Biology, 2011
- Spoke to RUMBA (Research for Undergraduates: adventures in Mathematical Biology and its Applications) students at Ohio State about careers in mathematical biology.

MBI Summer Program in Mathematical Biology for Undergraduates, 2010
- Ran computer lab and mentored group project in mathematical epidemiology.

Project Leader, Calculus and Analytic Geometry 1 (Life Sciences), OSU, 2009
- Led team project on population genetics for undergraduate calculus course with applications to biology.

Organizer, Sonia Kovalevsky Day, University of Arizona 2008
- Organized day long mathematics workshop for high school girls. Wrote grant proposal to obtain funding from AWM, recruited students from local high schools, planned schedule, and recruited speakers and workshop leaders from female graduate students in mathematics and applied mathematics.

Workshop Leader, Sonia Kovalevsky High School Mathematics Day, University of Arizona, 2007
- Developed and led mathematical biology activity for high school workshop intended to promote female interest in mathematics.

Vice President of SIAM Student Chapter, University of Arizona, 2005-2007
- Planned, advertised, and invited speakers for student SIAM chapter meetings. Meetings included talks by local researchers and scientists in industry, as well as trips to Kitt Peak National Observatory and the University of Arizona mirror lab.

University of Arizona High School Calculus Visitation Project, 2008
- Spoke to a local high school calculus class about my research and experiences as a graduate student.

Course Project Mentor, Math 485: Mathematical Modeling, University of Arizona, 2005
- Mentored semester-long undergraduate group project in mathematical epidemiology and served as judge for final poster session.