

# Paul J. Hurtado

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## POSITIONS

**Assistant Professor – University of Nevada, Reno** Jan 2015 – Present  
Department of Mathematics & Statistics

**Postdoctoral Fellow – The Ohio State University** Sept 2011 – Aug 2014  
Mathematical Biosciences Institute & Aquatic Ecology Laboratory

## EDUCATION

**Ph.D. Applied Mathematics – Cornell University** Jan 2012  
Center for Applied Mathematics

*Committee:* Stephen P. Ellner, Advisor (Applied Mathematics, Ecology & Evolutionary Biology)  
Richard Rand (Mathematics) & André Dhondt (Ecology & Evolutionary Biology)

**M.S. Applied Mathematics – Cornell University** May 2007  
Center for Applied Mathematics

**B.S. Mathematics; B.S. Biology & Chemistry – University of Southern Colorado** Dec 2002

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## RESEARCH INTERESTS

I use techniques from dynamical systems, stochastic processes, probability & statistics to develop & analyze mathematical models of biological systems to address questions in ecology, epidemiology & immunology. I also pursue interesting mathematical questions that emerge from such work.

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## PUBLICATIONS

### In Preparation

Pangle K., **Hurtado P.J.**, Lou Y., Marschall E., Ludsins S. Response by planktivorous fish to environmental hypoxia in Lake Erie's central basin. (*In Preparation*)

### Peer-reviewed Publications

Osnas E, **Hurtado PJ**, Dobson A. 2015. Evolution of Pathogen Virulence Across Space During an Epidemic. *American Naturalist*. *Ahead of Print (online) at [www.jstor.org/stable/10.1086/679734](http://www.jstor.org/stable/10.1086/679734)*

**Hurtado PJ**, Hall S, Ellner SP. 2014. Infectious disease in consumer populations: dynamic consequences of resource-mediated transmission and infectiousness. *Journal of Theoretical Ecology* May 2014, 7(2):163-179. doi:10.1007/s12080-013-0208-2

**Hurtado PJ** 2012. Within-Host Dynamics of Mycoplasma Infections: Conjunctivitis in Wild Passerine Birds. *Journal of Theoretical Biology*, 306:73-92. doi:10.1016/j.jtbi.2012.04.018.

Simpson J, **Hurtado PJ**, Medlock J, Molei G, Andreadis T G, Galvani A, Diuk-Wasser MA. 2011. Vector host-feeding preferences drive transmission of multi-host pathogens: West Nile virus as a model system. *Proc. R. Soc. B.* 279(1730):925-933. doi:10.1098/rspb.2011.1282

**Hurtado PJ** 2008. The Potential Impact of Disease on the Migratory Structure of a Partially Migratory Passerine Population. *Bull Math Biol*, 70(8):2264-82. doi:10.1007/s11538-008-9345-y

**Hurtado PJ** Probable Black Swift (*Cypseloides niger*) Nesting Colony Found in the Wet Mountains, Pueblo County. *Journal of the Colorado Field Ornithologists*, 36(2) April 2002.

Loeffler CW. First Pueblo County Record of Smooth Green Snake (*Liochlorophys vernalis*). *Herpetological Review* 32(1), 2001 pp 60. [Documentation by **Paul Hurtado** and Margaret DiMatteo]

## RESEARCH EXPERIENCE

### Postdoctoral

Postdoctoral Fellow, 50% MBI and 50% EEOB (Evolution, Ecology & Organismal Biology) at OSU  
Project Leader, MBI-NIMBioS-CAMBAM 2013 Summer Graduate Program  
Project Assistant, MBI-NIMBioS-CAMBAM 2012 Summer Graduate Program

### Graduate

#### Mathematical Biosciences Institute (MBI)

The Ohio State University, Columbus, OH - 2010

MBI visitor while completing my PhD. Attended workshops, Topics in Mathematical Ecology course, assisted in the Ecol., Epidemiology and Evol. journal club, & interacted with MBI postdocs, visitors.

#### Ecology & Evolution of Infectious Diseases Workshop

Colorado State University, Ft. Collins, CO - 2008

Week long workshop on modeling, data analysis. Resulted in collaboration & publication.

#### Summer REU - Project Assistant

University of Akron, Akron, OH (Organizer: Deena R. Schmidt) - Summer 2007

Worked with undergraduate researchers on a population genetics research project.

#### Nonlinear Dynamics of Biological Systems Summer School

Centre for Nonlinear Dynamics in Physiology and Medicine, McGill University - Summer 2004

Two week workshop on Nonlinear Models in Biology.

### Undergraduate

#### Mathematical and Theoretical Biology Summer Institute (MTBI)

Cornell University, Ithaca, NY - Summer 2002

Group project on epidemic models of Chronic Wasting Disease.

Research Mentor: Michael Lanham, Centre for Mathematical Biology, University of Oxford, UK

Other group members: Thela Morales, Marcin Mejran, David Schwager

Cornell University, Ithaca, NY - Summer 2001

Group project on the evolution of trait distributions within heterogeneous populations.

Research Mentor: Dr. Georgy Karev, Georgia Technical Institute

Other Group Members: Heather Watson, Kara Cunningham

#### NIGMS Minority Biomedical Research Support Program

University of Southern Colorado - Summer 1999 through Summer 2000.

Worked under Dr. Sandra J. Bonetti on enzyme biochemistry in *Penicillium fellutanum*.

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## HONORS AND AWARDS

Nominated for the Lee A. Segel Award for Best Student Research Paper (2008-2009)

Cornell University Provost's Diversity Fellowship - Fall 2008

Cornell University SAGE Fellowship, Fall 2005 - Spring 2006

SLOAN Graduate Fellowship, Fall 2003 - Spring 2005

Outstanding Mathematics Graduate, University of Southern Colorado (USC), Fall Class of 2002.

Certificate of Achievement for contributions to USC & the Experiential Learning Center, April 2002.

Colorado Mathematics Award: 3<sup>rd</sup> Place, William Lowell Putnam Mathematical Competition, 2000.

USC Excellence Awards in Organic Chemistry (1999-2000); General Chemistry (1998-1999).

## TEACHING EXPERIENCE

### Workshop Instructor

May 2014 **NIMBioS Tutorial: Parameter Estimation for Dynamic Biological Models**  
*Responsibilities:* Co-organizer and Instructor.

June 2013 **MBI-NIMBioS-CAMBAM Summer Graduate Workshop**  
*Responsibilities:* Taught basic statistical concepts and programming in R and Matlab.  
 Co-organized lectures during the first three days of the two-week workshop.

### Course Instructor

Spring 2015 **Probability Theory (MATH 461/661; UNR)**  
*Responsibilities:* Teach calculus-based probability theory to undergraduate and graduate students.

Fall 2013 **Foundations of Quantitative Ecology (EEOB 8896.1; OSU)**  
*Responsibilities:* Taught basic programming and modeling to Ecology & Evolution graduate students.  
 Curriculum and resource development, lectures, and weekly computer labs in R.

Fall 2009 **Ecological design and analysis I: programming in R (BioEE 7600; Cornell)**  
*Responsibilities:* Taught basic programming, statistical concepts to biology graduate students.  
 Curriculum and resource development; Lecture and computer labs twice a week.  
 Course goals: R programming basics, foundational mathematics, maximum likelihood.

Fall 2007 **Finite Mathematics (Math 105)**  
*Responsibilities:* Lecture 3 sessions per week; create exams, quizzes and worksheets; assign final grades  
 Managed an undergraduate grader; Maintained course website; Weekly office hours  
 Used MapleTA for HW assignments and communication with students

2006, 2007 **Calculus I (Math 111)**  
*Responsibilities:* Lecture 3 sessions per week; create exams, quizzes and worksheets; assign final grades  
 Used MapleTA for online pre-class HW assignments and communication with students  
 Held weekly office hours and managed an undergraduate grader

### Teaching Assistant

Spring 2009 **Theoretical Ecology (BioEE 4600)**  
*Instructor:* S. P. Ellner  
*Responsibilities:* Assist with computer labs, grade homework and labs, and help create exam questions.  
 Provide feedback on student projects extending published models.

Spring 2008 **Dynamic Models in Biology (Math 362 / BioEE 362)**  
*Instructors:* S. P. Ellner and J. Guckenheimer  
*Responsibilities:* Office hours and study sessions, assist computer labs; grade homework, labs, and exams.

Winter 07/08 **Tropical Field Ornithology (BioEE 264)**  
*Instructor:* A. A. Dhondt  
*Responsibilities:* Co-lead field excursions near the Punta Cana field station in the Dominican Republic.  
 Mentored student field projects. Assisted capturing and measuring birds near the field station.  
 Facilitate classroom discussions of daily field observations and assigned reading.  
 Organized project presentations for Cornell's Ornithology Seminar.

### Other Teaching Activities

April 2007,2008 **Expanding Your Horizons**  
 Workshop assistant (2007) and organizer (2008) to promote STEM among middle-school girls.

Aug 2003 **Mathematics Department TA Training**

**INVITED TALKS**

**MathFest 2014: Mathematical Epidemiology Invited Paper Session**  
Portland, OR - 7 August, 2014

**Mathematics & Statistics Research Colloquium**  
Utah State University, Logan, UT - 27 March, 2014

**From Within Host Dynamics to the Epidemiology of Infectious Disease (MBI Workshop)**  
Mathematical Biosciences Institute, Columbus, OH - 8 April, 2014

**Biomathematics Seminar Series**  
Trinity University, San Antonio, TX - 13 November, 2013

**MBI-NIMBioS-CAMBAM Summer Graduate Workshop**  
NIMBioS, University of Tennessee, Knoxville - 18-21 June, 2013

**Science Lecture Series**  
Ohio Wesleyan University, Delaware, OH - 28 March, 2013

**Hancock County Naturalists**  
Oakwoods Nature Preserve, Findlay, OH - 14 March, 2013

**Science Lecture Series**  
Ohio Wesleyan University, Delaware, OH - 1 November, 2012

**Mathematics & Computer Science Department Seminar**  
Ohio Wesleyan University, Delaware, OH - 1 November, 2012

**Ecology (EEOB 3410) Guest Lecture**  
The Ohio State University, Columbus, OH - 18 October, 2012

**SACNAS National Conference: Up-to-the-minute Reports on Mathematical Epidemiology**  
Seattle, WA - 12 October, 2012

**Modern Mathematics Workshop, SACNAS National Conference (MBI Representative)**  
Seattle, WA - 10 October, 2012

**Battelle Lecture Series**  
Capital University, Columbus, OH - 13 September, 2012

**East Central Ohio Audubon Society Annual Meeting**  
College Town House, Granville, OH - 11 June, 2012

**American Society for Information Science & Technology, Central Ohio Chapter**  
Grange Insurance Audubon Center, Columbus, OH - 7 June, 2012

**RUMBA Seminar**  
The Ohio State University, Columbus, OH - 10 January, 2012.

**European Conference on Mathematical and Theoretical Biology**  
Krakow, Poland - 28 June, 2011

**Science Lecture Series**  
Ohio Wesleyan University, Delaware, OH - 30 October, 2008

**Pan American Sciences Institute 2006**  
Universidad De El Salvador, San Salvador, El Salvador - July, 2006

**CONTRIBUTED TALKS & OTHER PRESENTATIONS****MBI Postdoc Seminar** (Talk)

Mathematical Biosciences Institute (MBI), OSU, Columbus, OH - 6 February, 2014

**International Association for Great Lakes Research (IAGLR) 2013 Annual Conference**

Purdue University, West Lafayette, IN - 3 June, 2013

**MBI Postdoc Seminar** (Talk)

Mathematical Biosciences Institute (MBI), OSU, Columbus, OH - 6 December, 2012

**Ecology and Evolution of Infectious Diseases Conference** (Poster)

University of Michigan, Ann Arbor, MI - May, 2012

**MBI Postdoc Seminar** (Talk)

Mathematical Biosciences Institute (MBI), OSU, Columbus, OH - 19 January, 2012

**Workshop for Young Researchers in Mathematical Biology** (Poster)

Mathematical Biosciences Institute (MBI), OSU, Columbus, OH - 31 August, 2011

**Ecological Society of America Annual Meeting** (Talk)

Austin, TX - 12 August, 2011

**MBI Postdoc Seminar** (Talk)

Mathematical Biosciences Institute (MBI), OSU, Columbus, OH - 21 April, 2011

**Institute Partners Meeting** (Poster)

Mathematical Biosciences Institute (MBI), OSU, Columbus, OH - 6 February, 2011

**Ecology and Evolution of Infectious Diseases Conference** (Poster)

Cornell University, Ithaca, NY - June, 2010

**Ecology and Evolution of Infections and Disease, Cornell Retreat** (Short Talk)

Ithaca, NY - 2 October 2009.

**SIAM Life Sciences 2009 Annual Conference** (Minisymposium Speaker)

Denver, CO - July 2009.

**Mathematical Biology Workshop** (Poster)

University of Utah - May 2009

**2008 Workshop for Young Researchers in Mathematical Biology** (Poster)

Mathematical Biosciences Institute (MBI), OSU, Columbus, OH. Sept 2-4, 2008

**SIAM Life Sciences 2008 Annual Conference** (Minisymposium Speaker)

Montreal, QC - July 2008

**Ecology and Evolution of Infectious Diseases Conference** (Poster)

Cornell University, Ithaca, NY - June, 2007

**Math Sciences Colloquium** (Talk)

Center for Applied Mathematics, Cornell University - March 1, 2007

**Python Tutorial** (Organizer)

Center for Applied Mathematics, Cornell University - Spring 2005

## PROFESSIONAL SERVICE

### Workshop, Symposium & Seminar Organization

NIMBioS Tutorial: Parameter Estimation for Dynamic Biological Models, May 2014 (Co-organized with Marisa Eisenberg and Ariel Cintron-Arias)  
MBI Scientific & Professional Development Seminar, 2013-2014 (Co-organized with Lucy Spardy)  
2013 SIAM Workshop Celebrating Diversity, Minisymposium Organizer  
MBI Scientific & Professional Development Seminar, 2012-2013 (Co-organized with Arjun Beri)  
MBI Postdoc Seminar, 2011-2012 (Co-organized with Harsh Jain)

### Mentoring Activity

2013 MBI-NIMBioS-CAMBAM Summer Graduate Program, Project Leader.  
2012 MBI-NIMBioS-CAMBAM Summer Graduate Program, Project Assistant with Linda Allen.  
2007 Summer REU at University of Akron (OH), Project Assistant with Deena Schmidt.

### Professional Memberships

American Mathematical Society (AMS)  
Society for Industrial and Applied Mathematics (SIAM)  
Society for Mathematical Biology (SMB)  
Ecological Society of America (ESA)

### Professional Development

Regular interaction with staff and students at OSU's Aquatic Ecology Lab  
Regular attendance at MBI workshops, postdoc seminars and colloquia  
Fall 2013: Ecosystem Dynamics and Management workshops at the MBI.  
Math Biology: Looking at the Future (MBI's 10th Anniversary Meeting), September, 2012  
MBI Fall Semester Course: Topics in Mathematical Neuroscience, Fall, 2012  
Workshop for Young Researchers in Mathematical Biology, August 2012  
Workshop 5: Spatial Models of Micro and Macro Systems, April, 2012  
Workshop 4: Evolution and Spread of Disease, March, 2012  
CTW: Recent Advances in Statistical Inference for Mathematical Biology, Feb, 2012  
MBI Winter Course: An Invitation to Probability (Winter 2012)  
Workshop 2: Stochastic Processes in Cell and Population Biology, Oct, 2011  
CTW: Spatio-Temporal Dynamics in Disease Ecology And Epidemiology, Oct, 2011  
Workshop 1: New Questions in Probability Theory Arising from Biology, Sept, 2011  
MBI Autumn Course: Bifurcation Theory, Fall, 2011

### Referee/Reviewer

The American Naturalist; Bulletin of Mathematical Biology; PLoS ONE; Theory in Biosciences;  
Journal of Biological Dynamics; Chaos, Solitons, & Fractals

### Grant Proposal Reviewer

Army Research Office; The Mississippi-Alabama Sea Grant Consortium; Colorado Field Ornithologists.

### Other Service

MBI Representative at SACNAS 2012, Seattle, WA.