

# Krisztian Magori



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## PUBLICATIONS

S O'Regan, K Magori, J Pulliam, M Zokan, R Kaul, H Barton and JM Drake. 2015 Multi-scale model of epidemic fadeout: Will local extirpation along geographic corridors inhibit the spread of White-nose Syndrome? *Ecological Applications* 04/2015; 25(3):621-633. doi:10.1890/14-0417.1 <http://www.esajournals.org/doi/abs/10.1890/14-0417.1>

B Berry, K Magori, A Perofsky, DE Stallknecht and AW Park. 2013 Wetland cover dynamics drive hemorrhagic disease patterns in white-tailed deer in the United States. *Journal of Wildlife Diseases*. Jul;49(3):501-9. doi: 10.7589/2012-11-283. <http://www.jwildlifedis.org/doi/abs/10.7589/2012-11-283>

K Magori and JM Drake. 2013 The Population Dynamics of Vector-borne Diseases. *Nature Knowledge Project*. <http://www.nature.com/scitable/knowledge/library/the-population-dynamics-of-vector-borne-diseases-102042523>

AW Park, K Magori, BA White and DE Stallknecht. 2013 When more transmission equals less disease: reconciling the disconnect between disease hotspots and parasite transmission. *PLOS One*. <http://dx.plos.org/10.1371/journal.pone.0061501>

K Magori and A Park. 2013 Dynamics of the frequency of escape mutant: evolutionary and epidemiological interactions. *Journal of Mathematical Biology*. <http://link.springer.com/article/10.1007%2Fs00285-013-0654-x>

SP Maher, AM Kramer, JT Pulliam, MA Zokan, SE Bowden, HD Barton, K Magori and JM Drake. 2012 Non-diffusive spread of White-Nose Syndrome regulated by spatial heterogeneity and climate. *Nature Communications* 3:1306 <http://www.nature.com/ncomms/journal/v3/n12/full/ncomms2301.html>

J Haven, K Magori and AW Park. 2012. The ecological and immunological factors promoting persistence of rapidly cleared Lyme disease strains. *Epidemics* 4(3): 152-157. <http://www.sciencedirect.com/science/article/pii/S1755436512000333>

L Mathieu, K Magori, A Morrison, Ch Xu, T Scott, A Lloyd, F Gould. 2011. Evaluation of Location-Specific Predictions by a Detailed Simulation Model of *Aedes aegypti* Populations. *PLOS One* 6(7): e22701. <http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0022701>

K Magori, WI Bajwa, S Bowden, JM Drake. 2011. Decelerating spread of West Nile virus due to percolation in a heterogeneous, urban landscape. *PLOS Computational Biology*. *PLoS Comput Biol* 7(7): e1002104. <http://www.ploscompbiol.org/article/info:doi/10.1371/journal.pcbi.1002104>

S Bowden, K Magori and JM Drake. 2011. Regional Differences in the Association between Land Cover and West Nile Virus Disease Incidence in Humans in the United States. *Am. J. Trop. Med. Hyg.* 84(2): 234-8.

K Magori, M Legros, ME Puente, DA Focks, TW Scott, AL Lloyd, F Gould. 2009 Skeeter Buster: a stochastic, spatially explicit modeling tool for studying *Aedes aegypti* population replacement and population suppression strategies *PLOS Neglected Tropical Diseases* 3(9): e508

ME Puente, K Magori, GG Kennedy and F. Gould. 2008 Impact of herbivore-induced plant volatiles on parasitoid foraging success: a spatial simulation of the *Cotesia rubecula*, *Pieris rapae* and *Brassica oleraceae* system. *Journal of Chemical Ecology* 34(7):959-970

Y. Huang, K. Magori, AL Lloyd and F. Gould. 2007 Introducing transgenes into insect populations using combined gene-drive strategies: Modeling and analysis *Insect Biochemistry and Molecular Biology* 37(10): 1054-1063

Y. Huang, K. Magori, AL Lloyd and F. Gould. 2007 Introducing desirable transgenes into insect populations using Y-linked meiotic drive - a theoretical assessment *Evolution Int J Org Evolution* 61(4): 717-726

F. Gould, K. Magori and Y. Huang. 2006 Genetic strategies for controlling mosquito-borne diseases. *American Scientist* 94(3): 238-246 (won the inaugural George Bugliarello prize in 2007 from the Sigma Xi Foundation)

K. Magori and F. Gould. 2006 Genetically Engineered Underdominance for Manipulation of Pest Populations: A Deterministic Model. *Genetics* 172: 2613-2620

F. Gould, K. Magori and Y. Huang. 2006 "Enfermedades transmitidas por mosquitos". *Investigación y ciencia* 359: 62-71

K. Magori, F. Mizera, P. Szabo and G. Meszena. 2005. Adaptive dynamics on lattice: Role of spatiality in competition, coexistence and evolutionary branching. *Evolutionary Ecology Research* 7: 1-21

K. Magori, B. Oborny, U. Dieckmann and G. Meszena. 2003. Cooperation and competition in heterogeneous environments: the evolution of resource sharing in clonal plants. *Evolutionary Ecology Research* 5 (6): 787-817

## EDUCATION

2004      **Ph.D in Biological Physics**, Eotvos University, Budapest, Hungary  
Advisor: Geza Meszena  
Competition and evolution in lattice models  
Adaptive Dynamics in spatial cellular automaton models

1999      **M.Sc. in Ecology, Ethology and Systematics**, Eotvos University, Budapest, HU  
Advisors: Geza Meszena, Beata Oborny  
'Cooperation and competition in heterogeneous environments: the evolution of resource sharing in clonal plants'

1995-1999      **MSc studies in Teaching Biology**, Eotvos University, Budapest, Hungary

## RESEARCH EXPERIENCE

- 2012-2014     **Postdoctoral Fellow**, Center for Forest Sustainability, School of Forestry and Wildlife Sciences, Auburn University
- Coordinating project on the effects of forest cover loss and urbanization on the population dynamics of *Culex quinquefasciatus*, and the transmission of West Nile virus transmission in the Southeastern US, mediated through the altered hydrology and water quality of urban streams.
- 2010-2012     **Postdoctoral associate**, Park Lab, Odum School of Ecology, UGA
- Integrating epidemiological and evolutionary models of disease dynamics in order to test competing hypotheses about cross-species transmission; Demonstrating the effects of epidemiological processes on the evolution of equine influenza; Disentangling the effects of land-cover type, climate and host density on the spread of epizootic hemorrhagic disease virus in white-tailed deer.
- 2008- 2010    **Postdoctoral associate**, Drake Lab, Odum School of Ecology, UGA
- Developing a statistical understanding of the patterns and processes involved in the dynamics of West Nile Virus in New York City based on a dataset collected by the NY-DOHMH between 1999-2007. Creating dynamical models to investigate whether high spatial heterogeneity in the built environment leads to percolation-like spread rather than wave-like spread.
- 2006-2007     **Senior mathematical modeler**, Oxitec Limited, Oxford, UK
- Cost-effectiveness analysis, coupled entomological model of *Aedes aegypti* and epidemiological model of dengue, population dynamical models of genetics methods for population suppression
- part of the Consortium 'Genetic Strategies for Control of Dengue Virus Transmission' funded in the Grand Challenges in Global Health Initiative by the Bill&Melinda Gates Foundation through FNIH
- 2004-2006     **Postdoctoral researcher**, Department of Entomology, NCSU  
supervisors: Fred Gould and Alun Lloyd
- Models of genetic pest control strategies and *Aedes aegypti* mosquito populations. Rewrote and extended CIMSIM (Focks et al. 1995) with stochasticity, spatial structure and population genetics to enable testing genetics strategies in the model
- part of the Consortium 'Genetic Strategies for Control of Dengue Virus Transmission' funded in the Grand Challenges in Global Health Initiative by the Bill&Melinda Gates Foundation through FNIH

## TEACHING EXPERIENCE

- 2016 Spring BIOL490 Capstone Course on Disease Ecology
- 2015 Winter BIOL511 (Biological Research Methods II – Biostatistics) for graduate Biology students; First Year Experience class on “spread”
- 2015 Fall, Spring BIOL270 (Biological Investigations) for undergraduate Biology students
- 2015 Fall, Winter, Spring BIOL380 (Analysis of Biological Data) for undergraduate Biology students
- 2014 Spring BIOL511 (Biological Research Methods II – Biostatistics) for graduate Biology students
- BIOL540 (Biostatistics) for students in the Master of Public Health program
- 2015- **Advising** graduate student Robert Shadix on project investigating the ecology of ticks and tick-borne diseases at the 30 Acre Lake Trail site at Turnbull National Wildlife Refuge
- 2012 **Advising** graduate student Navideh Noori on the connections between water quality and *Culex quinquefasciatus* survival and development, as it affects West Nile virus transmission in urban areas of the southeastern US
- 2011 **Advising** undergraduate student Brett Berry on testing the relationship between changes in EHDV incidence and land-cover land-use change in the US; and Bradley White on studying the disease ecology of EHDV
- 2010 **Presented guest lecture** to undergraduate and graduate students in **ECOL 4000/6000** (Population and Community Ecology) on **Community Epidemiology**, led by John Drake and Andrew Park
- 2009-2010 **Advised** undergraduate student Kevin Knoblich and RET teacher Chris Michael on their summer research projects (1) Statistical analysis of the population dynamics of mosquito vectors in NYC (2) Developing a multi-host multi-vector temperature-driven seasonal model of WNV in order to explain multiple peaks of WNV prevalence in dead birds in NYC.
- 2008,2009 **Presented guest lecture** to graduate students in ECOL 8310 (Population Ecology) on dynamics of host-pathogen systems at UGA, led by John Drake

- 2008 **Advised** an REU student (Sarah Bowden) and a RET teacher (Chris Michael) on their summer research projects (1) GIS analysis of West Nile data in New York City (2) development of a spatially-explicit West Nile model to study percolation in MATLAB
- 2006-2007 **Co-advised** two CASE PhD students (Nina Alphey, Laith Yakob) at the Department of Zoology at Oxford University in modeling
- 2004-2006 Supported modeling PhD student (Molly Puente) at NC State University
- 2002-2003 **Biology teacher** at Bethlen Gabor Elementary and High School in Budapest, HU
- 2001 **Teaching assistant** at Radnoti Miklos Elementary and High School in Budapest, Hungary as part of biology teacher education
- 1999-2000 **Teaching assistant** Eotvos University, Budapest, Hungary  
Modern physics laboratory for Physics majors, Liquid crystal laboratory Biophysics course for biology majors, Computer modeling of evolutionary biology

## PROFESSIONAL MEETINGS

- 7-8 March 2013 Alabama Vector Management Society Annual Meeting, Orange Beach, AL
- 27 November 2012 "Science: Becoming the Messenger" NSF EpScore workshop on effective science communication at Tuskegee University, AL
- 11-15 November 2012 American Society of Tropical Medicine and Hygiene (ASTMH) 2012 Annual Conference, Atlanta, GA
- 18 September 2012 "Challenges in Modeling the Spatial and Temporal Dimensions of the Ecology of Infectious Diseases" workshop at the Disease Ecology and Computer Modeling Laboratory, Ohio State University
- 11-14 March 2012 International Conference on Emerging Infectious Diseases (ICEID), Atlanta, GA
- 8-10 Nov 2010 Investigative Workshop on Modeling Wildlife and Virus Zoonoses, National Institute for Mathematical and Biological Synthesis

## SELECTED PRESENTATIONS

- 28 September 2015 "Why Can't We Still Predict West Nile virus Outbreaks?" 46<sup>th</sup> Annual Conference of the Society of Vector Ecology, Albuquerque, NM
- 16 September 2015 "The most dangerous animals on Earth" invited seminar at the Department of Entomology at Washington State University, Pullman, WA
- 16-17 October 2013 "Combined landscape and social conditions create high WNV infection risk in Atlanta, GA" 36<sup>th</sup> Annual Meeting of the Georgia Mosquito Control Association, Athens, GA
- 4-9 August 2013 "Combined landscape and social conditions create high WNV infection risk in a major US metropolis" Oral Presentation at the 98<sup>th</sup> Annual Meeting of the Ecological Society of America, Minneapolis, MI

27 March 2013 "Applied disease ecology for forest, wildlife and people" Oral presentation as part of the Departmental Seminar series for the School of Forestry and Wildlife Sciences at Auburn University

31 October 2012 "Urbanization Increasing the Risk of West Nile-virus Infection Through Impaired Water Quality and Hydrology in the Southern US" Oral presentation at Water and Health 2012 Conference, Chapel Hill, NC

27 January 2012 "Potential for State-of-the-Art Methods in Mathematical and Statistical Modeling for Insect Resistance Management" Invited presentation at Monsanto Corp.

18 January 2011 "Understanding the Ecology of Vector-borne Diseases to Save Lives" Invited presentation at the Department of Biology at Ball State University

1-6 August 2010 "Multimodal epidemics in multihost pathogens" Oral presentation at the 2010 Ecological Society of America meeting, Pittsburgh, PA

5-9 April 2010 "Spatial variation in WNV vector distribution in NYC" at the US-IALE Landscape Ecology conference, Athens, GA

20-22 May 2009 "Decelerating spread of West Nile virus due to percolation in a heterogeneous, urban landscape" Poster presentation, 7<sup>th</sup> EEID conference, Athens, GA

1-3 December 2008 "Bites in the Big Apple: Ecology of West Nile Virus in New York City". Poster presentation at the first EPIDEMICS conference, Asilomar, CA

5-11 Oct 2007 "Status report on cost-effectiveness analysis of genetic strategies for control of dengue virus transmission". Modelling workshop for Grand Challenge #7 and #8 at the 3rd Annual Grand Challenges in Global Health Conference, Cape Town, South Africa

9-13 September 2007 "Genetic solution for dengue". Poster presented at the Oxford Conference on Innovation and Technology Transfer for Global Health, Saïd Business School, Oxford, UK

6-9 October 2006 Co-organized and presented at the workshop at NC State for the PIs of the Gates Consortium "Genetic Strategies for Control of Dengue Virus Transmission" the following talks:

- Simple population genetics models of engineered underdominance
- Introduction to Skeeter Buster: a biologically detailed model of *Aedes aegypti*
- Skeeter Buster: A biologically detailed model of *Aedes aegypti*

24 September 2006 "Genetic control of disease-vector mosquitoes: lessons from simulation models" Departmental seminar at the Department of Entomology, NC State University

8 November 2004 "Adaptive dynamics on lattice" PhD defense talk, Department of Biological Physics, Eotvos University, Budapest, Hungary

**PUBLIC SERVICE:** reviewed for *Ecosphere*, *Ecological Applications*, *Genetics*, *Am. J. Trop. Med. Hyg.*, *Proc. Roy. Soc. B*, *JTB*, *International Journal of Environmental Research and Public Health*, *NSF*, *Agence Nationale de la Recherche*; co-chair of the Postdoctoral Association at UGA; member of the Society for Zoonotic Ecology and Epidemiology; editor of Bugbitten, the official blog of the journal "Parasites & Vectors"

**SKILLS:** R, ArcGIS, C++, MATLAB, Mathematica/Maxima, BEAST/Beauti