

DANIEL C. REUMAN

University of Kansas
Department of Ecology and Evolutionary Biology
Kansas Biological Survey
Higuchi Hall
Date of Birth: 5 Sept. 1974

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Lawrence, Kansas, USA
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Citizenship: U.S.A.

Research Positions

Associate Professor, University of Kansas, Lawrence, KS: August 2014 – present
Associate Scientist, Kansas Biological Survey, Lawrence, KS: August 2014 – present
Visiting Assistant Professor, Rockefeller University, New York, NY: June 2008 – present
Senior Lecturer, Imperial College London, UK: June 2012 – August 2014
Lecturer, Imperial College London, UK: September 2007 – May 2012
Equivalent to a tenure-track Assistant Professor in the U.S.A.; tenured September 2010.
Research Associate, Laboratory of Populations, Rockefeller University, New York, NY:
August 2006 – August 2007
Post-doctoral Associate, Laboratory of Populations, Rockefeller University, New York, NY:
September 2002 – July 2006

Education

Ph.D., Mathematics, University of Chicago, Chicago, IL: July 1998 – August 2002
M.S., Mathematics, University of Chicago, Chicago, IL: September 1997 – June 1998
B.A., Mathematics, Harvard University, Cambridge, MA: September 1992 – June 1996
Magna Cum Laude.

Publications

*Corresponding author, when journal practice included corresponding author identification.

- V.-P. Friman, L.M. Guzman, **D.C. Reuman**, T. Bell. In press. Bacterial adaptation to sublethal antibiotic gradients can change the ecological properties of multitrophic microbial communities.
- A.L. Signorile, J. Wang, **D.C. Reuman**, S. Bertolino, P.W.W. Lurz. In press. How population genetics can contribute to the management of grey squirrel invasions. In: C.M. Shuttleworth, P.W.W. Lurz, M. Hayward (Eds). *Red Squirrels: Ecology, Conservation & Management in Europe*. European Squirrel Initiative. England, UK.
- A.L. Signorile*, J. Wang, P.W.W. Lurz, S. Bertolino, C. Carbone, **D.C. Reuman***. 2014. Do founder size, genetic diversity and structure influence rates of expansion of North American grey squirrels in Europe? *Diversity and Distributions* 20, 918-930. doi: 10.1111/ddi.12222. Available open access.
- A.L. Signorile*, D. Paoloni, **D.C. Reuman***. 2014. Grey squirrels in central Italy: a new threat for endemic red squirrel subspecies. *Biological Invasions* 16, 2339-2350. doi: 10.1007/s10530-014-0668-3. Available open access.
- D.C. Reuman***, H. Gislason, C. Barnes, F. Mélin, S. Jennings. 2014. The marine diversity spectrum. *Journal of Animal Ecology* 83, 963-979. doi: 10.1111/1365-2656.12194. Available open access.
The subject of a commentary published concurrently in *J Anim Ecol*.
- D.C. Reuman***, R.D. Holt, G. Yvon-Durocher. A metabolic perspective on competition and body-size reductions with warming. 2014. *Journal of Animal Ecology* 83, 59-69. doi: 10.1111/1365-2656.12064. Available open access.
- G.L. Adams, D.E. Pichler, E.J. Cox, E.J. O’Gorman, A. Seeney, G. Woodward, **D.C. Reuman***. 2013. Diatoms can be an important exception to temperature-size rules at

species and community levels of organization. *Global Change Biology* 19, 3540-3552. doi: 10.1111/gcb.12285. Available open access.

Cover image of the journal issue.

R.M. Ewers*, R.K. Didham, W.D. Pearse, V. Lefebvre, I.M.D. Rosa, J.M.B. Carreiras, R.M. Lucas, **D.C. Reuman***. 2013. Using landscape history to predict biodiversity patterns in fragmented landscapes. *Ecology Letters* 16, 1221-1233. doi: 10.1111/ele.12160. Available open access.

L.N. Hudson*, **D.C. Reuman***. A cure for the plague of parameters: constraining models of complex population dynamics with allometries. 2013. *Proceedings of the Royal Society B* 280, 20131901. doi: 10.1098/rspb.2013.1901. Available open access.

B. García-Carreras*, **D.C. Reuman***. 2013. Are changes in the mean or variability of climate signals more important for long-term stochastic growth rate? *PloS One* 8, e63974, doi: 10.1371/journal.pone.0063974. Available open access.

L.N. Hudson*, N.J.B. Isaac, **D.C. Reuman***. 2013. The relationship between body mass and field metabolic rate among individual birds and mammals. *Journal of Animal Ecology* 82, 1009-1020. doi: 10.1111/1365-2656.12086. Available open access.

O.R. Wearn, **D.C. Reuman**, R.M. Ewers*. 2013. Response to Halley *et al.* comment on 'Extinction debt and windows of conservation opportunity in the Brazilian Amazon.' *Science* 339, 271.

W.J. Sutherland*, R.P. Freckleton, H.C.J. Godfray, S.R. Beissinger, T. Benton, D.D. Cameron, Y. Carmel, D.A. Coomes, T. Coulson, M.C. Emmerson, R.S. Hails, G.C. Hays, D.J. Hodgson, M.J. Hutchings, D. Johnson, J.P.G. Jones, M.J. Keeling, H. Kokko, W.E. Kunin, X. Lambin, O.T. Lewis, Y. Mahli, N. Mieszkowska, E.J. Milner-Gulland, K. Norris, A.B. Phillimore, D.W. Purves, J.M. Reid, **D.C. Reuman**, K. Thompson, J.M.J. Travis, L.A. Turnbull, D.A. Wardle, T. Wiegand. 2013. Identification of 100 fundamental ecological questions. *Journal of Ecology* 101, 58-67. doi: 10.1111/1365-2745.12025. Available open access.

L.N. Hudson*, R. Emmerson, G. Jenkins, K. Layer, M.E. Ledger, D. Pichler, M. Thompson, E. O'Gorman, G. Woodward, **D.C. Reuman**. 2013. Cheddar – analysis and visualization of ecological communities in R. *Methods in Ecology and Evolution* 4, 99-104. doi: 10.1111/2041-210X.12005. Available open access.

Cover image of the journal issue.

E.J. O'Gorman, D.E. Pichler, G. Adams, J.P. Benstead, H. Cohen, N. Craig, W.F. Cross, B.O.L. Demars, N. Friberg, G.M. Gíslason, R. Gudmundsdóttir, A. Hawczak, J.M. Hood, L.N. Hudson, L. Johansson, M. Johansson, J.R. Junker, A. Laurila, J.R. Manson, E. Mavromati, D. Nelson, J.S. Ólafsson, D.M. Perkins, O.L. Petchey, M. Plebani, **D.C. Reuman**, B.C. Rall, R. Stewart, M.S.A. Thompson, G. Woodward. 2012. Impacts of warming on the structure and functioning of aquatic communities: individual- to ecosystem-level responses. *Advances in Ecological Research* 47, 81-176. doi: 10.1016/B978-0-12-398315-2.00002-8.

O.R. Wearn, **D.C. Reuman**, R.M. Ewers*. 2012. Extinction debt and windows of conservation opportunity in the Brazilian Amazon. *Science* 327, 228-232. doi: 10.1126/science.1219013.

The subject of a commentary published concurrently in *Science*.

Covered in *Nature News*, 12 July 2012, as well as numerous popular-press venues including *The Guardian* and the *Huffington Post*.

G. Woodward*, L.E. Brown, F. Edwards, L.N. Hudson, A.M. Milner, **D.C. Reuman**, M.E. Ledger*. 2012. Climate change impacts in multispecies systems: Drought alters food web size structure in a field experiment. *Philosophical Transactions of the Royal Society B* 367, 2990-2997. doi: 10.1098/rstb.2012.0245.

- N. Bunnefeld*, **D.C. Reuman**, D. Baines, E.J. Milner-Gulland. 2011. Impact of unintentional selective harvesting on the population dynamics of red grouse. *Journal of Animal Ecology* 80, 1258-1268. doi: 10.1111/j.1365-2656.2011.01862.x.
- B. García-Carreras, **D.C. Reuman***. 2011. An empirical link between the spectral colour of climate and the spectral colour of field populations in the context of climate change. *Journal of Animal Ecology* 80, 1042-1048. doi: 10.1111/j.1365-2656.2011.01833.x.
Covered in Nature Research Highlights, *Nature* 472, 138-139, as well as numerous popular-press venues.
In the top 10 most read papers in *JAE* online, December 2010.
- G. Yvon-Durocher, J. Reiss, J. Blanchard, B. Ebenman, D. Perkins, **D.C. Reuman**, A. Thierry, G. Woodward, O. Petchey. 2011. Across-ecosystem comparisons of size-structure: Methods, approaches, and prospects. *Oikos* 120, 550-563. doi: 10.1111/j.1600-0706.2010.18863.x.
- G. Woodward, J.P. Benstead, O.S. Beveridge, J. Blanchard, T. Brey, L. Brown, W.F. Cross, N. Friberg, T.C. Ings, U. Jacob, S. Jennings, M.E. Ledger, A.M. Milner, J.M. Montoya, E. O’Gorman, J.M. Olesen, O.L. Petchey, D.E. Pichler, **D.C. Reuman**, M.S. Thompson, F.J.F. van Veen, G. Yvon-Durocher. 2010. Ecological networks in a changing climate. *Advances in Ecological Research* 42, 71-138. doi: 10.1016/S0065-2504(10)42002-4.
- U. Görtz, T.J. Haines, R.E. Kottwitz, **D.C. Reuman**. 2010. Affine Deligne-Lusztig varieties in affine flag varieties. *Compositio Mathematica* 146, 1339-1382. doi: 10.1112/S0010437X10004823.
- C. Barnes*, D. Maxwell, **D.C. Reuman**, S. Jennings. 2010. Global patterns in predator-prey size relationships reveal size-dependency of trophic transfer efficiency. *Ecology* 91, 222-232. doi: 10.1890/08-2061.1.
- J.E. Cohen*, D.N. Schittler, D. Raffaelli, **D.C. Reuman***. 2009. Food webs are more than the sum of their tri-trophic parts. *Proceedings of the National Academy of Sciences* 106, 22335-22340. doi: 10.1073/pnas.0910582106.
- E. Nicholson*, G.M. Mace, P.R. Armsworth, G. Atkinson, S. Buckle, T. Clements, R.M. Ewers, J.E. Fa, T.A. Gardner, J. Gibbons, R. Grenyer, R. Metcalfe, S. Mourato, M. Muûls, D. Osborn, L. Peck, **D.C. Reuman**, C. Watson, E.J. Milner-Gulland*. 2009. Priority research areas for ecosystem services in a changing world. *Journal of Applied Ecology* 46, 1139-1144. doi: 10.1111/j.1365-2664.2009.01716.x.
- M. Boots*, D. Childs, **D.C. Reuman**, M. Meador. 2009. Local interactions lead to pathogen driven change to host population dynamics. *Current Biology* 19, 1660-1664. doi: 10.1016/j.cub.2009.07.070.
- D.C. Reuman**, C. Mulder, C. Banašek-Richter, M.-F. Cattin Blandenier, A.M. Breure, H.A. Den Hollander, J.M. Kneitel, D. Raffaelli, G. Woodward, J.E. Cohen. 2009. Allometry of body size and abundance in 166 food webs. *Advances in Ecological Research* 41, 1-44. doi: 10.1016/S0065-2504(09)00401-2.
- D.C. Reuman**, J.E. Cohen, C. Mulder. 2009. Human and environmental factors influence soil food webs’ abundance-mass allometry and structure. *Advances in Ecological Research* 41, 45-85. doi: 10.1016/S0065-2504(09)00402-4.
- J.E. Cohen*, M. Roig, **D.C. Reuman**, C. GoGwilt. 2008. International migration beyond gravity: a statistical model for use in population projections. *Proceedings of the National Academy of Sciences* 105:40, 15269-15274. doi: 10.1073/pnas.0808185105.
- D.C. Reuman***, C. Mulder, D. Raffaelli, J.E. Cohen. 2008. Three allometric relations of population density to body mass: Theoretical integration and empirical tests in 149 food webs. *Ecology Letters* 11, 1216-1228. doi: 10.1111/j.1461-0248.2008.01236.x.
- D.C. Reuman***, R.F. Costantino, R.A. Desharnais, J.E. Cohen. 2008. Colour of environmental noise affects the nonlinear dynamics of cycling, stage-structured populations. *Ecology Letters* 11, 820-830. doi: 10.1111/j.1461-0248.2008.01194.x.

D.C. Reuman*, R.A. Desharnais, R.F. Costantino, O. Ahmad, J.E. Cohen*. 2006. Power spectra reveal the influence of stochasticity on nonlinear population dynamics. *Proceedings of the National Academy of Sciences* 103:49, 18860-18865. doi: 10.1073/pnas.0608571103.

The subject of a commentary published concurrently in *PNAS*.

In the top 20 most read papers in *PNAS* online, December 2006.

- U. Brose*, T. Jonsson, E.L. Berlow, P. Warren, C. Banašek-Richter, L.-F. Bersier, J.L. Blanchard, T. Brey, S.R. Carpenter, M.-F. Cattin Blandenier, L. Cushing, H.A. Dawah, T. Dell, F. Edwards, S. Harper-Smith, U. Jacob, M.E. Ledger, N.D. Martinez, J. Memmott, K. Mintenbeck, J.K. Pinnegar, B. C. Rall, T. Rayner, **D.C. Reuman**, L. Ruess, W. Ulrich, R.J. Williams, G. Woodward, J.E. Cohen. 2006. Consumer-resource body-size relationships in natural food webs. *Ecology* 87:10, 2411-2417. doi: 10.1890/0012-9658(2006)87[2411:CBRINF]2.0.CO;2.
- U. Görtz, T.J. Haines, R.E. Kottwitz, **D.C. Reuman**. 2006. Dimensions of some affine Deligne-Lusztig varieties. *Annales Scientifiques de l'Ecole Normale Supérieure* 39:3, 467-511. doi : 10.1016/j.ansens.2005.12.004.
- D.C. Reuman**, J. E. Cohen. 2005. Estimating relative energy fluxes using the food web, species abundance, and body size. *Advances in Ecological Research* 36, 137-182.
- D.C. Reuman**, J.E. Cohen*. 2004. Trophic links' length and slope in the Tuesday Lake food web with species' body mass and numerical abundance. *Journal of Animal Ecology* 73, 852-866. doi: 10.1111/j.0021-8790.2004.00856.x.
- D.C. Reuman**. 2004. Formulas for the dimensions of some affine Deligne-Lusztig varieties. *Michigan Mathematical Journal* 52:2, 435-451. doi: 10.1307/mmj/1091112084.
- D.C. Reuman**. 2002. Determining whether certain affine Deligne-Lusztig sets are empty. arXiv:math.RT/0211434

Publicly Released Software Packages

Pomp: Statistical inference for partially observed Markov processes

A package for the R programming language, available as “pomp” from the Comprehensive R Archive Network, and see <http://pomp.r-forge.r-project.org/>
Contributors: A.A. King, C. Breto, S. Ellner, M.J. Ferrari, E.L. Ionides, B. Kendall, M. Lavine, D.C. Reuman, H. Wearing
Maintainer: Aaron A. King

Cheddar: Analysis and visualization of ecological communities in R

A package for the R programming language, available as “cheddar” from the Comprehensive R Archive Network, and see <http://quicklizard99.github.com/cheddar/>
Contributors: L.H. Hudson, D.C. Reuman, R. Emmerson
Maintainer: L.H. Hudson

Gruyere: Multi-species population dynamics in the style of Yodzis & Innes 1992 (American Naturalist) in R

A package for the R programming language, available from <http://quicklizard99.github.com/gruyere/>
Contributors: L.H. Hudson, D.C. Reuman
Maintainer: L.H. Hudson

Current and Past Funding

University of Kansas, Tier II Strategic Funding: 2015

\$15,330, plus \$4,000 in complementary funding from the Departments of Ecology and Evolutionary Biology, Geography, and Mathematics and the Kansas Biological Survey, for a workshop.

Project title *Spatio-temporal climate impacts on the ecosystems that support agriculture and fisheries.*

- Natural Environment Research Council of the United Kingdom, Standard Grant:** 2014 – 2017
 >£1M awarded total, PI Samraat Pawar, co-Is include Reuman.
 Project title *Can metabolic traits limit species invasions under climate change?*
- National Science Foundation, standard grant:** 2012 – 2017
 \$600,000 over five-years from the United States National Science Foundation Division of Mathematical Sciences Mathematical Biology Program with PI Robert A. Desharnais.
 Project title *Synchrony in metapopulations at multiple time scales: theory, experiments, and field data.*
- Natural Environment Research Council of the United Kingdom, Quota Studentship:** 2012 – 2015
 £60,000 + tuition funding to support a PhD student.
 Project title *Are complex ecosystems under global change inherently less predictable at population, species, structural, and functional levels?*
- Natural Environment Research Council of the United Kingdom, Standard Grant:** 2011 – 2014
 £505,308 award, PI Daniel Reuman.
 Project title *Synchrony in metapopulations at multiple time scales: theory, experiments, and field data.*
 Tied PhD student also funded for the project *Synchrony in marine plankton metapopulations and the effects of climate.*
- Natural Environment Research Council of the United Kingdom, Standard Grant:** 2011 – 2014
 £726,552 award total, PI Guy Woodward and other researchers at the Queen Mary University of London received £626,478, co-I Reuman received £100,074 for the theoretical component of the work, plus tuition and support for a tied PhD studentship.
 Project title *Using individual metabolism and body size to predict climate warming impacts on aquatic food webs.*
 Tied PhD student project *Biogeography of marine communities: Beyond food webs and the abundance spectrum.*
- Natural Environment Research Council of the United Kingdom, Standard Grant:** 2010 – 2013
 £516,000 award total, PI Mark Trimmer and other researchers at the Queen Mary University of London received £468,000, co-I Reuman received £48,000 for the theoretical component of the work.
 Project title *Predictable feedbacks between warming, community structure and ecosystem functioning: a combined experimental and theoretical approach.*
- Natural Environment Research Council of the United Kingdom, CASE award:** 2009 – 2012
 £67,000 + tuition competitive award to support a PhD student.
 Project title *Ecological and genetic determinants of the expansion of grey squirrel populations in Italy and Britain.*
 CASE partner Institute of Zoology provides additional funding.
- Microsoft Research:** 2009 – 2012
 £69,000 + tuition and computing equipment from a competitive award to support a PhD student.
 Project title *Unifying food web structure and dynamics with metabolic theory: a general and modular computational approach.*
- Natural Environment Research Council of the United Kingdom, Quota Studentship:** 2008 – 2011
 £55,000 + tuition funding to support a PhD student.
 Project title *The global effects of climate change on population dynamics.*

- Natural Environment Research Council of the United Kingdom, Working Group:** 2007
Participant in a NERC-funded working group on predicting the effects of climate change on natural populations and communities, led by David Hodgson and Frank van Veen.
- National Center for Ecological Analysis and Synthesis, Working Group:** 2006 – 2009
Participant in an NCEAS-funded working group on unifying approaches to statistical inference in ecology, led by Aaron A. King and Pejman Rohani.
- National Science Foundation, standard grant:** 2005 – 2010
\$1,400,000 over five-years from the United States National Science Foundation Division of Mathematical Sciences and the Directorate for Biological Sciences with PI Joel E. Cohen, and Robert A. Desharnais and Robert F. Costantino.
- Department of Mathematics, University of Chicago:** September 1997 – August 2002
Full graduate tuition fellowship and stipend.
- American Rewards for College Scientists:** 2000, 2001
Two \$5000 merit-based rewards for excellence in graduate studies.
- National Science Foundation:** 1996
Honorable mention for graduate fellowship.

Selected Press Coverage

- Protecting mainland Europe from an invasion of grey squirrels. 5 June 2014. *ScienceDaily*. Coverage of Signorile *et al.*, Do founder size, genetic diversity and structure influence rates of expansion of North American grey squirrels in Europe?
- Protecting mainland Europe from an invasion of grey squirrels. 5 June 2014. *myScience*. Coverage of Signorile *et al.*, Do founder size, genetic diversity and structure influence rates of expansion of North American grey squirrels in Europe?
- Protecting mainland Europe from an invasion of grey squirrels. 5 June 2014. Imperial College press release by Gail Wilson. Coverage of Signorile *et al.*, Do founder size, genetic diversity and structure influence rates of expansion of North American grey squirrels in Europe?
- Amazon's extinction debt still to be paid. 12 July 2012. *Nature News*. Coverage of Wearn, Reuman & Ewers, Extinction debt and windows of conservation opportunity in the Brazilian Amazon.
- Amazon's doomed species set to pay deforestation's 'extinction debt'. 12 July 2012. *The Guardian*. Coverage of Wearn, Reuman & Ewers, Extinction debt and windows of conservation opportunity in the Brazilian Amazon.
- Amazon's endangered species face 'extinction debt'. 12 July 2012. *Huffington Post*. Coverage of Wearn, Reuman & Ewers, Extinction debt and windows of conservation opportunity in the Brazilian Amazon.
- Amazon due for numerous species extinctions. 12 July 2012. *LiveScience*. Coverage of Wearn, Reuman & Ewers, Extinction debt and windows of conservation opportunity in the Brazilian Amazon.
- Animals go "blue" with temperature. 14 April 2011. Nature Research Highlights, *Nature* 472 138-139. Coverage of García-Carreras & Reuman, An empirical link between the spectra colour of climate and the spectral colour of field populations in the context of climate change.
- Live radio interview of Bernardo García-Carreras by Jose Antonio Ponseti on the "Efectos Secundarios" program, Radio Caracol 1260, Miami, 26 April 2011. Coverage of García-Carreras & Reuman, An empirical link between the spectra colour of climate and the spectral colour of field populations in the context of climate change.
- L. Heredero. El cambio climático vuelve al entorno más "azul". 13 April 2011. *BBC Mundo*. Coverage of García-Carreras & Reuman, An empirical link between the spectra colour of climate and the spectral colour of field populations in the context of climate change.

- S. Pappas. Climate change linked to rapid species fluctuations. 6 April 2011. *LiveScience.com*. Coverage of García-Carreras & Reuman, An empirical link between the spectra colour of climate and the spectral colour of field populations in the context of climate change.
- B. Allen. Climate change is making our environment “bluer”. 6 April 2011. British Ecological Society press release, appeared on *Science Newsline*. Coverage of García-Carreras & Reuman, An empirical link between the spectra colour of climate and the spectral colour of field populations in the context of climate change.
- J. Palmer. Slimming odds for emperor penguins. 26 January 2009. *BBC News online*. Asked for comments on Jenouvrier *et al.*, Demographic models and IPCC climate projections predict the decline of an emperor penguin population. *Proceedings of the National Academy of Sciences*.
- J. Berman. Scientists develop model for predicting international population migrations. 30 September 2008. *Voice of America Online*. Coverage of Cohen *et al.*, International migration beyond gravity: a statistical model for use in population projections.
- J. Marshall. Human Migration Patterns Get Global Forecast. 29 September 2008. *Discovery News*. Coverage of Cohen *et al.*, International migration beyond gravity: a statistical model for use in population projections.
- R. Twombly. New formula predicts how people will migrate in coming decades. 29 September 2008. *Rockefeller University Newswire*. Coverage of Cohen *et al.*, International migration beyond gravity: a statistical model for use in population projections.
- W. Dunham. New formula helps predict immigration patterns. 29 September 2008. *Reuters.com*. Coverage of Cohen *et al.*, International migration beyond gravity: a statistical model for use in population projections.
- R. Twombly. New means of predicting populations more accurately accounts for random influences. 11 December 2006. *Rockefeller University Newswire*. Coverage of Reuman *et al.*, Power spectra reveal the influence of stochasticity on nonlinear population dynamics.
- T.G. Benton. Revealing the ghost in the machine: Using spectral analysis to understand the influence of noise on population dynamics. 2006. *Proceedings of the National Academy of Sciences* 103:49, 18387-18388. Commentary on Reuman *et al.*, Power spectra reveal the influence of stochasticity on nonlinear population dynamics.

Research Supervision

Postdoctoral Researcher Supervision

Lawrence Sheppard, Imperial College London, UK: September 2011 - present
 Funded by NERC grant *Synchrony in metapopulations at multiple time scales: theory, experiments, and field data*.

Brandon Mechtley, University of Kansas, USA: August 2014 - present

PhD Supervision

Drew Wilson, Imperial College London, UK: October 2013 – present

A laboratory model of habitat fragmentation and terrageny.

Second supervisor Tom Bell of Imperial College London.

Emma Defriez, Imperial College London, UK: September 2011 - present

Synchrony in marine plankton metapopulations and the effects of climate.

Second supervisor Chris Reid of the Sir Alister Hardy Foundation for Ocean Science.

Georgina Adams, Imperial College London, UK: October 2011 - present

Biogeography of marine communities: Beyond food webs and the abundance spectrum.

Second supervisor Simon Jennings of the Centre for Environment, Fisheries and Aquaculture Science.

Julieta Decarre, Imperial College London, UK: January 2011 - present

Effects of agricultural intensification on bird and mammal biodiversity in Chaco, Argentina.

Primary supervisor Chris Carbone of the Institute of Zoology.

Lisa Signorile, Imperial College London, UK: October 2009 – January 2014

Ecological and genetic determinants of the expansion of grey squirrel populations in Italy and Britain.

Second supervisors Chris Carbone, Jinliang Wang, and Tony Sainsbury of the Institute of Zoology.

Lisa completed January 2014.

Lawrence Hudson, Imperial College London, UK: October 2009 – August 2012

Unifying food web structure and dynamics with metabolic theory: a general and modular computational approach.

Lawrence completed August 2012 and went immediately on to a postdoc in the Purvis lab, Imperial College London.

Bernardo Garcia Carreras, Imperial College London, UK: October 2008 – Sept 2012

The global effects of climate change on population dynamics.

Bernardo completed September 2012 and went immediately to a research job at the Centre for Environment, Fisheries, and Aquaculture Science.

Masters Supervision

James Chris Terry, Imperial College London, UK, April 2014 – September 2014

Detecting signatures of physiology in dynamics: direct tests of allometrically parameterized food web models.

Became a PhD student at Oxford University.

Simon Mills, Imperial College London, UK, April 2014 – September 2014

Measuring histories of habitat fragmentation using terrageny metrics offers fresh insight into fragmented landscapes

Became a PhD student at the University of Sheffield.

Yaodong Yang, Imperial College London, UK, April 2014 - September 2014

Became a PhD student at the University of Southampton.

Primary supervisor James Rosindell.

Laura Nunes, Imperial College London, UK, November 2012 – April 2013

Potential trends in the sensitivity of long term growth rate to changes in the mean and standard deviation of environmental conditions.

Became a PhD student at University College London.

Melissa Guzman, Imperial College London, UK, November 2012 – April 2013

The inflationary effects of temporal autocorrelation provide persistence in multi-trophic sink metacommunities.

Became a PhD student at McGill University.

Paul Russell, Imperial College London, UK, April 2012 – September 2012

Replicability of ecological community dynamics and the measures which characterize them: a study of innate variability in real and simulated communities.

Became a PhD student at Imperial College London.

Shiyu Li, Imperial College London, UK, April 2012 – September 2012

On the relative importance of changes in the mean and variability of climatic signals for the long-term stochastic growth rate of an age-structured population.

Rosemary Moorhouse-Gann, Imperial College London, UK, November 2011 – April 2011

An American invasion: the origins, genetic diversity, and population structure of the American grey squirrel in Cumbria.

Became a PhD student at the University of Cardiff.

Harkiran Bhogal, Imperial College London, UK, November 2011 – April 2012

Temperature and optimal swimming speed in fish.

- Sean Webber, Imperial College London, UK, April 2011 – September 2011
Reconstructing the rise and demise of two squirrel species in Great Britain: Testing the role of forest cover.
- Dimitrios Nerantzis, Imperial College London, UK, April 2011 – September 2011
Predicting imposed chaos in the population dynamics of an insect species.
Became a PhD student at Imperial College London.
- Guo Heng Chin, Imperial College London, UK, April 2011 – September 2011
Abundance-occupancy relationships in deep-sea fish species.
Primary supervisor Julia Blanchard.
- Lavrentis Sidiropoulos, Imperial College London, UK, November 2011 – September 2011
Primary supervisor Alex Lord.
- Georgina Adams, Imperial College London, UK, May 2011 – September 2011
Body size and species composition of diatoms in Icelandic streams.
Became a PhD student at Imperial College London.
Secondary supervisors Guy Woodwad and Eileen Cox.
- Yangchen Lin, Imperial College London, UK, April 2010 – September 2010
The link between maximum likelihood and the forecast accuracy of mechanistic population models.
Became a PhD student at Cambridge University.
Yangchen won the Gerald Durrell award for best thesis in his MSc in his year.
- Yesim Dodlani, Imperial College London, UK, April 2010 – September 2010
Spatial and temporal scaling of the abundance spectrum.
- Carmen Suriel-Melchor, Imperial College London, UK, April 2010 – June 2010
The effects of climate change on bird population dynamics in North America.
- Marco Lusquiños, Imperial College London volunteer, UK, January 2010 – January 2011
Volunteer student, MSc level.
- Silvia Antonelli, Imperial College London, UK, April 2010 – September 2010
Modeling the eco-evolutionary dynamics of a temperature-dependent consumer-resource system.
Primary supervisor Tim Barraclough.
- Oliver Wearn, Imperial College London, UK, April 2009 – September 2009
Extinction debt in the Brazilian Amazon.
Became a PhD student at Imperial College London.
Primary supervisor Robert Ewers.
- Lawrence Hudson, Imperial College London, UK: April 2009 – September 2009
Dynamics of complex food webs: Empirical verification of models.
Became a PhD student at Imperial College London.
- Yajun Sun, Imperial College London, UK: April 2008 – September 2008
Distributions of average species body masses in local community food webs.
Became a PhD student at the University of Toronto.
- Research Mentoring for Undergraduates**
- Emilie Tarouilly, Imperial College London, UK, March 2014 – June 2014
Environmental drivers of global synchrony in phytoplankton.
- Sharmila Rana, Imperial College London, UK, March 2014 – June 2014
Is change in the mean or the variability of a climate variable more important for extinction risk in a density dependent population model?
- Richard Clifton, Imperial college London, UK, March 2014 – June 2014
Can extinctions be predicted after anthropogenic perturbations to ecosystems?
- Jonathan Chan, Imperial College London, UK: June 2013 – August 2013
Competition and the effects of temperature.
- Sean Jordan, Imperial College London, UK: March 2013 – May 2013

Competition and the effects of temperature.
 Alexander Kazhdan, Imperial College London, UK: March 2013 – May 2013
Predicting extinctions in food webs.
 Lucy Li, Imperial College London, UK: March 2012 – May 2012
The predictive power of R^ in a two-predator one-prey Lotka-Volterra model.*
 Timothy Saunders, Imperial College London, UK: March 2012 – May 2012
What are the most important questions in ecology for the 21st century?
 Ryota Nakamura, Imperial College London, UK: April 2011 – June 2011
Murder rates are higher when the weather is warmer.
 Andrew Brockman, Imperial College London, UK: April 2010 – June 2010
Are top predators really on top?
 Feng Wang, Imperial College London, UK: April 2010 – June 2010
Confidence intervals for population viability analysis.
 Thomas Britton, Imperial College London, UK: April 2010 – June 2010
Latitudinal biodiversity gradients.
 Edward Stephens, Imperial College London, UK: April 2009 – June 2009
An unwritten future: defining the global water shortage and the multidimensional crisis facing China's national security.
 Cai GoGwilt, Rockefeller University, New York, NY: June 2007 – July 2007
Population models with mechanistic stochasticity.
 Daniella Schittler, Rockefeller University, New York, NY: September 2006 – February 2007
Emergent properties of tri-trophic interactions and food chains in food webs with abundances and body masses.

PhD Examining and Panel Membership

Internal Examiner, Matthew Robb, Imperial College Department of Mathematics, UK: November 2013
 External Examiner, Tak Ching Fung, Queen's University Belfast, UK: August 2013
 Internal Examiner, Thomas Ezard, Imperial College London, UK: 13 December 2007
 Internal Examiner, Edwin van Leeuwen, Royal Holloway University of London, UK: 17 July 2008
 Progress Review Panel: Tin-Yu Hui, Imperial College London, UK, 2013-2016
 Progress Review Panel: Aliénor Chauvenet, Imperial College London, UK, 2009-2012
 Progress Review Panel: Matthew Robb, Imperial College Department of Mathematics, UK, 2009-2012
 Progress Review Panel: Ana Bento, Imperial College London, UK, 2007 - 2011
 Progress Review Panel: Sophie Bell, Imperial College London, UK, 2010 - 2014
 Progress Review Panel: Jacques Deere, Imperial College London, UK, 2010 - 2013
 Progress Review Panel: Diane Lawrence, Imperial College London, UK, 2009 - 2012
 Progress Review Panel: Martina DiFonzo, Imperial College London, UK, 2008 – 2011
 Progress Review Panel: Maren Rebke, Imperial College London, UK, 2007 – 2010

Teaching Experience

University of Kansas, Lawrence, KS: August 2014 – present
 Co-taught Biology 499, Honors Research, Spring 2015
Imperial College London, UK: September 2007 – August 2014
 Course Director for an MRes in Biodiversity Informatics and Genomics: October 2013 – September 2014
 Responsible for running this one-year full time MRes course.
 Teach modules on Computing in Biology and other materials as needed.
 Supervise research students.
 Course Director for an MSc in Quantitative Biology: October 2010 – September 2014

Designed and founded the course, with co-directors.
 Responsible for running this one-year full time MSc course.
 Teach modules on Maximum Likelihood; Inference for Mechanistic Models;
 Complex Communities; Computing in Biology; and other materials as needed.
 Supervise research students.

Designed and delivered lectures and practicals and wrote examination questions in:
 Ecology, Behavior and Evolution: For first-year undergraduates. 2008-2013.
 Population and Community Ecology: For third-year undergraduates. 2008-present.
 An MSc course in Conservation Science. 2008-2011.
 An MSc course in Ecology, Evolution, and Conservation. 2008-present.
 Advances in Population and Community Ecology: For PhD students. 2008-2010.

Personal Tutor for several undergraduate students.
 Meet periodically with each student.
 First point of contact for academic and personal issues.

Volunteer Tutor, DOME project, New York, NY: December 2004 – June 2006
 Served as a one-on-one, long term mentor and mathematics tutor.

Lecturer in Mathematics, University of Chicago, Chicago, IL: October 1999 – June 2002
 Fully responsible for teaching seven undergraduate mathematics courses:
 Elementary Calculus I, II: Basic calculus.
 Calculus II, III: Introduction to calculus. Taught II twice.
 Multivariable Calculus and Linear Algebra: For economics students.
 Designed and delivered about 30 lectures over 10 weeks for each course, wrote exams,
 and supervised teaching assistants.

Math Reasoning Instructor, Johns Hopkins University Center for Talented Youth,
 Clinton, NY: June 2000 – July 2000
 Created and taught an intensive three week course in logic and mathematical reasoning
 for students of ages 13-15 years. Instructional time was 7 hours daily.

Teaching Fellow in Mathematics, University of Chicago, Chicago, IL: October 1998 –
 June 1999
 Assessed students using homework, taught weekly review, lectured on special topics, and
 assisted students individually in an Honors Analysis course.

High School Teaching Intern, Casablanca American School, Casablanca, Morocco:
 August 1996 – June 1997
 Fully responsible for teaching high school mathematics and computer science courses:
 International Baccalaureate Math Methods (calculus and other topics).
 Several computer programming courses for 7-8th grade students.
 Created and taught interactive units on Newtonian mechanics, philosophy of math, and
 electric motor construction, and assisted with instruction of 10-12th grade students.

Teaching Fellow in Mathematics, Harvard University, Cambridge, MA: January 1996 –
 June 1996, September 1993 – January 1993
 Multivariable calculus; Elementary number theory.

Professional service

Member of the University of Kansas Graduate Admissions Committee, 2014-2015
**Member of the Imperial College Department of Life Sciences Research Strategy
 Committee**, 2012 – 2014
Subject Editor, Oikos: 2010 – 2013
**Member of the Imperial College Department of Life Sciences Academic Opportunities
 Committee**, 2010 – 2012

Additional Professional Training

Certificate of Advanced Study in Learning and Teaching, Imperial College London, UK: September 2008 – January 2011.

Conferences and Lectures

- Lecture, Red Hot Research lecture series, University of Kansas, 6 March 2015
Hierarchical systems and synchrony in biology and other fields.
- Lecture, Department of Mathematics, University of Kansas, 4 February 2015
Synchrony in populations and other dynamical systems.
- Lecture, Kansas Biological Survey, University of Kansas, 17 October 2014
The global biogeography of size-diversity relationships in coastal seas.
- Lecture, Ecology and Evolutionary Biology, University of Kansas, 29 January 2014
A cure for the plague of parameters: Toward a mechanistic understanding of warming effects on whole communities.
- Lecture, Department of Integrative Biology, Oklahoma State University, 5 November 2013
A cure for the plague of parameters: Toward a mechanistic understanding of warming effects on whole communities.
- Lecture, Intecol meeting, London, 21 August 2013
Competition and body size reductions with warming.
- Lecture, Section of Ecology and Evolution, Imperial College London, 19 November 2012
A more or less extemporaneous talk on effects of climate warming on competition.
- Invited lecture, Department of Mathematics, University of Surrey, 11 May 2012
How many species are in the sea and how big are they?
- Lecture, Department of Ecology and Evolution, University of Chicago, 29 April 2012
How many species are in the sea and how big are they?
- Invited lecture, Department of Ecology and Evolution, University of Chicago, 7 February 2012
A cure for the plague of parameters: constraining models of multi-species population dynamics with physiological and community allometries.
- Invited lecture, Department of Ecology and Evolution, University of Chicago, 6 February 2012
The marine diversity spectrum: How many species are in the sea and how big are they?
- Invited lecture, European Science Foundation workshop on Body-size and ecosystem dynamics, Institute for Hydrobiology and Fisheries Science, University of Hamburg, Hamburg, Germany: 13-15 April 2011.
The diversity spectrum.
- Lecture, Section of Ecology and Evolution, Imperial College London, 13 December 2010
How many species are in the sea and how big are they?
- Lecture, Mathematical biology seminar, Department of Mathematics, Imperial College London, 22 November 2010
How many species are in the sea and how big are they?
- Lecture, British Ecological Society annual meeting, University of Leeds, 7-9 September 2010
The marine diversity spectrum: Theory and empirical validation.
- Invited participant, workshop on Ecosystem-level effects of climate-change-induced phenological shifts, Durham University, 31 August – 2 September 2010
- Invited Lecture, Royal Entomological Society technology special interest group, Rothamsted Research, UK, 13 May 2010
The blind men and the elephant: deciphering complex population dynamics using new tools for combining statistical perspectives.

Invited Lecture, Population Under Pressure Workshop, Imperial College London, UK: 26-28 May 2009
Prediction is very difficult, especially about the future.

Invited Lecture, Institute for Mathematical Sciences, Complexity and Networks meeting, Imperial College London, UK: 20 May 2009
Predicting abundance-body mass scaling in local community food webs: Big fierce animals are (usually) rare, but how rare?

Lecture, School of Biological Sciences, Royal Holloway University of London, UK: 18 February 2009
The blind men and the elephant: Deciphering population dynamics by combining statistical perspectives.

Lecture, Institute of Zoology, Zoological Society of London, UK: 9 February, 2009
Predicting abundance-body mass scaling in local community food webs: Big fierce animals are (usually) rare, but how rare?

Lectures, Department of Zoology, University of Florida, Gainesville, FL: 20, 22 January 2009
 Lecture 1: *Predicting abundance-body mass scaling in local community food webs: Big fierce animals are (usually) rare, but how rare?*
 Lecture 2: *The blind men and the elephant: Deciphering population dynamics by combining statistical perspectives.*

Lecture, Center for Population Biology, Imperial College London, UK: 1 December 2008
Predicting abundance-body mass scaling in local community food webs: Big fierce animals are (usually) rare, but how rare?

Lecture, Department of Biological Sciences, University of East Anglia, Norwich, UK: 10 September 2008
Predicting abundance-body mass scaling in local community food webs: Big fierce animals are (usually) rare, but how rare?

Working group leader, European Science Foundation workshop on Body-size and ecosystem dynamics, Cambridge University, Cambridge, UK: 5-7 April 2008.

Lecture, Center for Population Biology, Imperial College London, UK: 4 February 2008
The blind men and the elephant: Deciphering population dynamics by combining statistical perspectives.

Invited lecture, Department of Animal and Plant Sciences, University of Sheffield, Sheffield, UK: 22 November 2007
The blind men and the elephant: Deciphering population dynamics by combining statistical perspectives.

Invited participant, Natural Environment Research Council working group entitled Predicting the Effects of Climate Change on Natural Populations and Communities, Exeter, UK, April 2007, London, UK, November 2007

Invited participant, National Center for Ecological Analysis and Synthesis working group entitled Unifying Approaches to Statistical Inference in Ecology, Santa Barbara, CA, March 2007, December 2007, June 2008, January 2009

Invited lecture, 91st annual meeting of the Ecological Society of America, Memphis, TN: 6-11 August 2006
Power spectra reveal the interactions among nonlinear population dynamics, stochasticity, and lattice effects.

Invited participant, Gordon Research Conference on the Metabolic Basis of Ecology, Lewiston, ME: 9-14 July 2006
 Poster: *Disturbance and fertilization shape diversity, abundance-body-mass relations, and biomass flux in 146 soil food webs.*

Invited lecture, Department of Ecology and Evolutionary Biology, Princeton University, Princeton, NJ: 8 May 2006

Power spectra reveal the interactions among nonlinear population dynamics, stochasticity, and lattice effects.

Invited participant and lecturer, workshop on the analysis of entire networks of ecological interactions, Institute for Scientific Interchange Foundation, Turin, Italy: 11-13 January 2006

Food webs augmented with additional data: Structure and dynamics.

Invited lecture, Department of Biology at Bard College, Annandale-on-Hudson, NY: 17 October 2005

Food webs of the past, present and future: from static community description to predictive tool.

Lecture, International Association for Ecology Ninth International Congress of Ecology, Montreal, Canada: 9 August 2005

Estimating relative fluxes of energy in trophic links using the food web, species abundance, and body size.

Invited lecture, Center for Environmental Research and Conservation, Columbia University, New York, NY: 22 February 2005

Estimating relative fluxes of energy along trophic links using the food web, species abundance, and body size.

Lecture, Rockefeller Research Exchange, Rockefeller University, New York, NY: 17 February 2005

Frequency domain analysis of difference equation models of chaotic beetle population dynamics.

Invited participant and lecturer, International Advancement of Community Ecology Theory workshop in Cork, Ireland: 2-4 September 2004

Co-leader of the working group on trivariate patterns in food webs, and the estimation of energy fluxes.

Lecture: *Estimating relative flux along trophic links using trivariate data.*

Invited participant, Gordon Research Conference on the Metabolic Basis of Ecology, Lewiston, ME: 4-9 July 2004

Poster: *Length, slope and flux for trophic links in the Tuesday Lake food web with body mass and numerical abundance.*

Lecture, Biomathematics Lunchtime Seminar, Courant Institute of Mathematical Sciences, New York, NY: 2 March 2004

Frequency domain analysis of difference equation models of chaotic beetle population dynamics.

Invited participant and lecturer, Northeast Ecology and Evolution Conference, Rutgers University, New Brunswick, NJ: 11-13 April 2003

Lecture: *Testing stochastic models of population dynamics against data using the Fourier Transform.*

Poster: *Links in gourmet food webs: length and slope of links in food webs plotted on body mass versus numerical abundance coordinates.*

Invited participant, NSF/NIH Symposium on Accelerating Mathematical-Biological Linkages, Bethesda, MD: 12-13 February 2003

Invited participant, Santa Fe Institute workshop on Modeling and Simulating Biocomplexity for Mathematicians and Physicists, Santa Fe, NM: 4-9 August 2002

Attended American Mathematical Society Central Sectional Meeting, Ann Arbor, MI: 1-3 March 2002

Awards and Honors

American Rewards for College Scientists, Chicago, IL: 2000, 2001

Two annual merit based \$5000 rewards for excellence in graduate studies.

CUE Award for excellent teaching, Harvard University, Boston, MA: June 1996

John Harvard Scholarship for Academic Excellence, Harvard University, Boston, MA:

June 1996

Prize for an excellent lecture, Undergraduate Math Table, Harvard University, Boston, MA: 1995

Dividing a Square into Triangles.

Professional Memberships

Ecological Society of America.

British Ecological Society.

Sigma Xi.

Fellow of the Higher Education Academy.

Member, Round Table Group network of expert witnesses and consultants.

Other Work Experience

Educational Development Consulting Intern, Khulisa Management Services,

Johannesburg, South Africa: June 2001 - December 2001

Undergraduate Researcher, Research Experience for Undergraduates, Mt. Holyoke

College, South Hadley, MA: June 1995 – August 1995

Cryptographic Researcher, Director's Summer Program, National Security Agency, Ft.

Meade, MD: June 1994 – August 1994