

# Tim CD Lucas

## PERSONAL INFORMATION

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## PRESENT APPOINTMENT

	<i>2016–Present</i>	University of Oxford, Malaria Atlas Project
<i>Post Doc.</i>		My current position is as a postdoctoral research scientist in geospatial epidemiology with the <a href="#">Malaria Atlas Project</a> at the University of Oxford. I use spatial statistics and machine learning methods to map infectious and vector borne diseases.

## PREVIOUS APPOINTMENTS

	<i>Jan–July 2016</i>	CBER, UCL
<i>Research Programmer</i>		I was the staff programmer for the Centre of Biodiversity and Environment Research at UCL. I worked on two main projects. I worked with the <a href="#">Madingley Model</a> —an ecological model of all life, written in C# to enable this model to run on the <i>high performance cluster</i> at UCL. Secondly, I translated code from <i>Mathematica</i> to <i>R</i> for analyses of measurements of 3D objects used in <i>paleontological research</i> . I also provide technical support for the rest of the department.

## EDUCATION

	<i>2012–present</i>	University College London, CoMPLEX
<i>PhD</i>		<i>The role of population structure and size in determining bat pathogen richness</i> Description: I used <i>network models</i> and comparative methods to study the epidemiology of bat-borne diseases. As bats carry a number of important <i>zoonotic diseases</i> , understanding the spread of these diseases within the bat population and how this affects spillover to humans and livestock is increasingly important. The unusually social nature of bat populations will strongly affect how diseases spread. Supervisors: PROF. KATE JONES & DR HILDE WILKINSON-HERBOTS
	<i>2011–2012</i>	University College London, CoMPLEX
<i>MRes</i>		<i>Modelling Biological Complexity · Merit</i> Description: Projects included adapting ‘ <i>ideal gas</i> ’ models to acoustic data, analysing moment closures for a <i>pair-approximation</i> model of plant ecology and applying a novel <i>machine learning</i> method to a library of bat calls.
	<i>2006–2010</i>	University of Sheffield, Animal & Plant Sciences
<i>MBioSci</i>		<i>Zoology · First</i> Description: For my final project I used <i>wavelet</i> analysis to study multi-annual <i>cycles in malaria</i> incidence in Thailand.

## RESEARCH EXPERIENCE

Internship	Autumn 2014	Zoön: An R package for reproducible SDMs
		I wrote the first version of an R package for <i>reproducible</i> species distribution modelling. The package uses an online repository of user submitted 'modules' to allow the software to keep up with this fast moving field and allow analyses to be completely reproducible. [Github]
Volunteer Fieldwork	August 2011	Smithsonian Tropical Research Institute
		Two months fieldwork in Panamá on two projects: studying <i>Anolis dewlap</i> evolution and studying gut length plasticity in Red-eyed tree frogs.
Volunteer Fieldwork	May 2011	Chiloé Silvestre, Chile
		I spent two weeks trapping Darwin's foxes in Chile to collect samples for geophylogenetics.
Summer Internship	August 2010	University of Sheffield
		I studied the evolutionary response of plant communities to climate change with Dr Raj Whitlock. I collected, propagated and analysed plants collected from the field.
TRANSIT Internship	August 2009	University of York, YCCSA
		I studied collective foraging behaviour by programming a <i>complex 3D foraging model</i> in Java and running simulations on a cluster at the York Centre for Complex Systems Analysis.

## OTHER APPOINTMENTS AND AFFILIATIONS

Peer Review	Journals Reviewed for:
	· Methods in Ecology and Evolution, National Academy Science Letters

## CONFERENCES

2016	Using gas models to model camera trap and acoustic sensor surveys. Presentation at <i>Statistical Ecology Research Festival</i> , University of Kent by <b>Lucas TCD</b>
2015	The Zoön Project: Reproducible, Remixable and Shareable Species Distribution Modelling with R. Presentation at <i>BES Annual Meeting</i> by August T, Golding N, <b>Lucas TCD</b> , Gavaghan D, Isaac N, O'Hara B, van Loon E & McInerny G  Simple, Shareable and Reproducible Species Distribution Modelling with the Zoön R package. Poster at <i>BES Annual Meeting</i> by N Golding, <b>Lucas TCD</b> , August T, Gavaghan D, Isaac N, O'Hara B, van Loon E & McInerny G  Comparative and computational studies of pathogen richness in bats. Presentation at Research in Progress, <i>RSTMH</i> by <b>Lucas TCD</b> , Wilkinson-Herbots H & Jones KE.  A comparative and computational study of population structure and pathogen richness in bats. Presentation at <i>Epidemics5</i> conference by <b>Lucas TCD</b> , Wilkinson-Herbots H & Jones KE.  An ideal gas model for estimating absolute abundances from bat detector data. Presentation at the National Bat Conference. [slides]  Pathogen diversity and bat population structure. Poster at British Parasitological Society Autumn Meeting.

*Estimating abundance from camera traps and acoustic sensors.*  
Presentation at CEH, Wallingford seminar series.

2014 Presentation at [id2oxford](#) conference. [[slides](#)]

Poster at the CoMPLEX conference. [[pdf](#)]

2013 Presentation at BritBats 2 [[slides](#)].

Invited attendance at [ecoVIZ](#) Tansley workshop.

Poster at the CoMPLEX conference and id2 conference. [[pdf](#)]

## PUBLICATIONS

2017 Redding D, Lucas TCD, Heath A and Jones KE. *Evaluating Bayesian spatial methods for modelling species distributions models with clumped and restricted data.* Submitted

Lucas TCD, Herbots HM, & Jones KE. *A mechanistic model to compare the importance of interrelated population measures on pathogen richness: host population size, density and colony size.* In prep.

Curnick DJ, Koldewey HJ, Lucas TCD, Jones KE & Collen B. *Detecting changes in pelagic shark populations using remote cameras.* Submitted.

2015 Lucas TCD\*, Moorcroft EA\*, Freeman R, Rowcliffe MJ & Jones KE. (2015) *A generalised random encounter model for estimating animal density with remote sensor data.* *Methods in Ecology and Evolution*. doi: 10.1111/2041-210X.12346 [[pdf](#)]

2013 Walters CL, Collen A, Lucas TCD, Mroz K, Sayer CA and Jones KE. (2013) *Challenges of Using Bioacoustics to Globally Monitor Bats.* in *Bat Evolution, Ecology, and Conservation*. Springer New York. 479-499.

\* Co-first authors.

## SOFTWARE

On CRAN Goswami A, Lucas TCD, Sivasubramaniam P, Finarelli J (2016) *A Maximum Likelihood Approach to the Analysis of Modularity.*  
[www.github.com/timcdlucas/EMMLi](http://www.github.com/timcdlucas/EMMLi)

Lucas TCD, Goswami A (2016) *paleomorph: Geometric Morphometric Tools for Paleobiology.* [www.github.com/timcdlucas/paleomorph](http://www.github.com/timcdlucas/paleomorph)

Lucas TCD, Golding N, August T, McInerny G, van Loon E (2015) *Zoon: Reproducible, Accessible & Shareable Species Distribution Modelling.*  
[www.github.com/zoonproject/zoon](http://www.github.com/zoonproject/zoon)

Lucas TCD (2015) *palettetown: Use Pokemon Inspired Colour Palettes*  
[www.github.com/timcdlucas/palettetown](http://www.github.com/timcdlucas/palettetown)

## TEACHING

2015 · Demonstrator for reproducible species distribution modelling workshop run by Quantitative Ecology special interest group at BES.

2013–2014 · Online tutor for [SysMIC](#), a course for teaching quantitative skills to biologists.

## COMPUTATIONAL SKILLS

Statistical methods

Geospatial statistics, machine learning, Bayesian inference.

<i>Languages</i>	R (eight years), Python, Matlab, Mathematica, Java, SQL.
<i>OS</i>	Comfortable with Windows, Mac or Linux.
<i>Other</i>	Experience in R package development, Git/Github, unit testing, continuous integration, LaTeX, web design, markdown, shell/ssh and high performance computing.

#### REFEREES

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