Curriculum Vitae

Personal Information

Dr Ben Swallow

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Present Appointment

Lecturer (Assistant Professor) in Statistics (Research and Teaching), School of Mathematics and Statistics, University of Glasgow

Employment History

April-June 2015: Research Assistant, School of Mathematics and Statistics, University of St Andrews

2015-2017: Postdoctoral Research Associate, Atmospheric Chemistry Research Group, University of Bristol

2017-2019: Research Fellow, Mathematics Institute and Zeeman Institute for Systems Biology and Epidemiology Research, University of Warwick

Academic Qualifications

2010: BA French and Mathematics, Upper Second-Class Honours, King's College London

2011: MSc Statistics, Distinction, University of St Andrews

2015: PhD Statistics, University of St Andrews

2021: PGcert in Academic Practice, Merit, University of Glasgow

Esteem Indicators (Special Awards, Honours and Distinctions)

Competitively selected member of European Crucible Research Leadership Network 2022.

School-supported research sabbatical, University of Glasgow, August 2021-July 2022

Invited member of the Royal Statistical Society (RSS) President Nominating Committee 2021

Barnett Award Lecture Chair, RSS Conference 2020

Board member, RSS Conference Board and environmental/spatial statistics stream reviewer

RSS Discussions Meeting Committee member and Associate Editor

Associate Editor, Journal of Statistical Theory and Practice

Invited talks at BAMC 2021 and the International Society for Bayesian Analysis world meeting 2021

Invited talk at Edinburgh Futures Institute, March 2021

Invited seminars at Universities of Auckland, Lancaster, St Andrews, Warwick, Bristol, Birmingham, Glasgow, Kent and Loughborough

Contributed talks at many international conferences and other events, including virtual National Centre for Statistical Ecology seminar series, March 2021; International Statistical Ecology Conference (Sydney), June 2020; and American Geophysical Union Fall Meeting (San Francisco), December 2016

Invited science outreach blog post for Ecology and Evolution upon publication of Swallow et al. (2019)

Scottish Ornithologists Club public engagement talk, December 2020 (over 80 attendees)

BTO press release on Swallow et al. (2016b)

Best student talk award, International Statistical Ecology Conference 2014

Research & Related Administration

Publications:

<u>Published</u>

1. Marion, G. et al., 'Modelling: understanding pandemics and how to control them' accepted for special issue of *Epidemics*

2. Zhang, H., Swallow, B. and Gupta, M., 'Bayesian hierarchical mixture models for detecting non-normal clusters applied to noisy genomic and environmental datasets', accepted for in invited special issue, *Aust. N.Z. J. Stat.*

3. Panovska-Griffiths, J. et al., (2022) 'Modelling transmissibility and impact on reopening Roadmap of different SARS-CoV-2 variants in England in the Spring of 2021', invited contribution to themed issue of *PRSA*

4. Dunne, M. et al., (2022) 'Complex model calibration through emulation, a worked example for a stochastic epidemic model' in press in special issue of *Epidemics*

5. Chadwick, F. et al., (2022) 'Combining Rapid Antigen Testing and Syndromic Surveillance Improves Sensitivity and Specificity of COVID-19 Detection: A Community-Based Prospective Diagnostic Study'. Available at http://dx.doi.org/10.2139/ssrn.3927057, accepted in *Nature Comms.*

6. Swallow, B., et al., (2022) 'Challenges in estimation, uncertainty quantification and elicitation for pandemic modelling', in press *Epidemics*

7. Kretzschmar, M. et al., (2022) 'Challenges for modelling interventions for future pandemics' in press *Epidemics*

8. Swallow, B., Xiang, W. and Panovska-Griffiths, J., (2022) 'Tracking the national and regional COVID-19 epidemic status in the UK using directed Principal Component Analysis', accepted contribution to themed issue of *PRSA*, https://arxiv.org/abs/2110.03626

9. Dykes, J. et al., (2022) 'Visualization for Epidemiological Modelling: Challenges, Solutions, Reflections & Recommendations', accepted contribution to themed issue of *PRSA*, https://arxiv.org/abs/2204.06946

10. Hadley, L. et al., (2021) 'Challenges on the interaction of models and policy for pandemic control,' in press *Epidemics*

11. Sacchi, G. and Swallow, B. (2021) 'Parallel tempering as a mechanism for facilitating inference in hierarchical hidden Markov models', in press for invited special issue, *Frontiers in Ecology and Evolution*

12. Swallow, B. (2021) 'A Review of Applied Hierarchical Modelling in Ecology: Volume 2 by Kéry and Royle', *JABES,* 26(2) 325-327

13. ATI Data Study Group team. (2020) 'Data Study Group Final Report: Roche', Zenodo. doi:10.5281/zenodo.3876989

14. Swallow, B., King, R., Buckland, S.T. and Toms, M.P. (2019) 'Assessing factors associated with changes in the numbers of birds visiting gardens in winter: are predators partly to blame?' *Ecology and Evolution* 6 (8515-8525)

15. Jones-Todd, C.M., Swallow, B., Illian, J. and Toms, M. P. (2017) 'A spatio-temporal multi-species model of a semi-continuous response' *JRSS(C)* 67: 705-722

16. Swallow, B., Buckland, S. T., King, R. and Toms, M. P. (2016b) 'Bayesian hierarchical modelling of continuous non-negative longitudinal data with a spike at zero: An application to a study of birds visiting gardens in winter.' *Biometrical Journal*, Special Issue 58:2

17. Swallow, B., Buckland, S.T., King, R. and Toms, M.P. (2016a) 'Identifying multispecies synchrony in response to environmental covariates.' *Ecology and Evolution* 6:23

Preprints

18. Swallow, B., Rand, D.A. and Minas, G., 'Bayesian inference for stochastic oscillatory systems using the phase-corrected Linear Noise Approximation' https://arxiv.org/abs/2205.05955

19. Xiang, W. and Swallow, B. 'Multivariate spatio-temporal analysis of the global COVID-19 pandemic', medrxiv.org/content/10.1101/2021.02.08.21251339v1

20. Swallow, B., Rigby, M., Rougier, J.C., Manning, A.J., Webster, H.N., Thompson, D.J., Lunt, M. and O'Doherty, S.J. 'Parametric uncertainty in complex environmental models: a cheap emulation approach for models with high-dimensional output' arxiv.org/abs/1702.03696, under revision in *Environmetrics*

21. Shadbolt, N. et al., 'The Challenges of Data in Future Pandemics' https://www.newton.ac.uk/documents/preprints/

Under submission

22. Firat, E., Swallow, B. and Laramee, R.S., 'Techniques for Dense Parallel Coordinate Plots'

23. Rydow, E. *et al.*, 'Development and Evaluation of Two Approaches of Visual Sensitivity Analysis to Support Epidemiological Modelling'

Research Leadership:

Scottish COVID-19 Response Consortium Uncertainty Quantification Lead

National Centre for Statistical Ecology Summer Meeting 2021, Local Organising Committee

School of Mathematics and Statistics Research Committee ECR member

2019/20: Statistics seminar organiser and creator of ICMS virtual 'Research and Teaching in Statistical and Data Sciences' seminar series

Spatio-temporal epidemiology of COVID-19 in Bangladesh, project lead

Hierarchical modelling of global COVID-19 interventions, project co-lead

Organiser of accepted invited session at RSS Conference 2021 on 'Showcase of visualisation methods for spatial and environmental statistics'

Co-organiser and co-chair of invited session at AISC 2021 on 'Advances in Statistical Ecology'

Organiser of RSS one day meeting with Environmental Statistics Section and Glasgow local group on 'Causal inference in epidemiology and environmental health', January 2021 (115 attendees)

Supervisor of undergraduate research internships; Summer 2020 and February/March 2021 and three Summer 2021. These have led to one submitted paper and three in preparation.

Member of the EPSRC Associate College and UKRI Future Leader Peer Review College.

Research Grants

Grants:

1. University of Glasgow 'Reinvigorating Research' scheme (Total £25,000), January 2022

Funded two research assistants on a project on Bayesian model-based approaches to zero-inflated data in biological and environmental sciences.

2. EPSRC Impact Acceleration Fund (Total £5,620), March 2022

Funded a student on a project developing a prototype for visualization of complex spatiotemporal statistical models for informing policy.

3. Edinburgh Mathematical Society Covid Recovery Grant (Total £1,000), November 2021

To provide computational resources for a project on Approximate Bayesian inference in stochastic systems.

4. EPSRC Vacation internship programme (Total £3,300), June 2021

10-week internship funded for a project on 'Visualisation of spatio-temporal model outputs for supporting areal public health policy in LMICs.'

5. Corn seed funding grant, Jean Goulding Institute for data-intensive research, (Total £4,974), March 2017

Stipend awarded for a project entitled 'Supervised learning to support the optimisation of chemical reactions' based at the Universities of Bristol and York, in collaboration with industry partners.

6. Research workshop grants, funded by EPSRC via the SECURE network, Cabot Institute and NERC (Total £2,250)

Competitive grant of £1250 awarded by SECURE for a research workshop/conference entitled 'Modelling uncertainty from multi-scale data streams in ecological and environmental sciences', with additional competitive funding of £1,000 secured from the University of Bristol's Cabot Institute.

Teaching & Related Administration

September 2022: Guest lecturer on International MSc One Health: Managing Health of Populations, University of Lyon, France

2021-2022: Statistics PGT co-director, DataLab industrial placement co-ordinoart and MRes Advanced Statistics project co-ordinator

2020-present: Alarm Bell Steering Group, College of Science and Engineering

2019/20: PGT Statistics project supervision team

2019-present: PGT Statistics curriculum review committee

2019-present: Course head for Honours/Masters Level courses in Multivariate Methods (to 2021) and Stochastic Processes

2019-present: Induction week Honours revision lecture on Probability

Professional Activities beyond the University

I have been a reviewer for many journals, including *Biometrics*, *Annals of Applied Statistics, Journal of Theoretical Biology, Chemometrics and Intelligent Laboratory Systems* (awarded Outstanding Reviewer status November 2016), *JABES, Environmental and Ecological*

Statistics, Proceedings of the Royal Society A, Royal Society Open Science, Biology Letters, Studies in Automation and Information Technology and *Frontiers in Ecology and Evolution.*

I am Associate Fellow of the Higher Education Academy, GradStat Fellow of the Royal Statistical Society and member of the International Biometric Society, the International Environmetrics Society and the International Society for Bayesian Analysis. I am also senior group member of the Scottish Ornithologists Club Youth Connect.