

Andrew Seaton
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Research Interests

I am an applied statistician interested in spatio-temporal modelling applications for ecology and conservation. My main interest is in solving problems collaboratively with statisticians, ecologists and conservationists on the development of statistical models. I am motivated by the challenge of drawing meaningful and robust scientific conclusions from observational data and believe this is a rich area of research that has the potential for many exciting developments in the future.

Education

2017-2021: PhD *Expanding the use of spatial modelling in ecology*, University of St Andrews (thesis submitted, viva pending)

A statistical ecology PhD with a focus on understanding and developing spatial statistics modelling approaches in ecology. The first chapter focuses on drawing links between stochastic parital differential equations (SPDEs) and smoothing splines. The second chapter uses SPDEs in a distance sampling application, for the first time using a novel approximate Bayesian approach to jointly infer the spatial distribution and detectability of animals. The final chapter incorporates, also for the first time, SPDEs and penalised regression splines within spatial capture-recapture models.

2017: MSc *Quantitative Methods in Conservation, Biodiversity and Epidemiology*, University of Glasgow (with distinction)

An ecology degree with a focus on quantitative methods including statistical theory, ecological sampling methods, population and spatial modelling, and statistical programming.

2013: MA *Mathematics*, University of Edinburgh (First class honours)

A mathematics degree with a mix of pure and applied topics including dynamical systems, numerical algorithms, linear algebra, metric spaces, Hilbert spaces and group theory.

Relevant Work Experience

2014-2016: Heat Data Analyst, Scottish Government

A role in the statistics group of the civil service for the Scottish Government. This role was a geographic information systems (GIS) specialist position within the Energy Statistics team of the Office of the Chief Economic Adviser. I managed a GIS database that was shared with all 32 local authorities in Scotland for the purposes of renewable heat planning. I supported the use of the data within local authorities and liaised with the Information Commissioner's Office to ensure compliance with data sharing regulations. I also analysed the data to contribute to policy development within Scottish Government and contributed to published reports.

Publications

Miller, D.L., Glennie, R. & **Seaton, A.E.*** Understanding the Stochastic Partial Differential Equation Approach to Smoothing. *Journal of Agricultural, Biological and Environmental Sciences* **25**, 1–16 (2020)

* joint first author

Conference and seminar presentations

June, 2021: Conference contributed talk, *Distance sampling using iterated integrated nested Laplace approximations*, National Centre for Statistical Ecology meeting (virtual)

Feb, 2021: Departmental seminar, *Flexible spatial modelling using inlabru: a distance sampling case study*, University of St Andrews

June, 2020: Conference contributed talk, *A new point pattern model for spatial capture-recapture*, International Statistical Ecology Conference (virtual)

Nov, 2019: Seminar (joint speaker with David Miller and Richard Glennie), *Understanding the SPDE approach to smoothing*, Scottish Oceans Institute

July, 2019: Conference lightning talk, *Spatial Modelling with Stochastic Partial Differential Equations: applications in Ecology*, British Ecological Society Quantitative & Movement Ecology Special Interest Group Annual Meeting, University of Sheffield

June, 2019: Conference contributed talk, *Demystifying the SPDE approach to spatial modelling*, National Centre for Statistical Ecology meeting, University of Edinburgh

May, 2019: Conference contributed talk, *The thinner takes it all: applications of thinned point processes in ecology*, Point processes in space, time and beyond, Skagen, Denmark.

Teaching Experience

Tutor/Demonstrator:

Introductory Mathematics (2017)

Combinatorics and Probability (2017, 2018)

Statistical Inference (2018)

Statistical Methods (2019)

Introduction to R programming (2017, 2018, 2019)

Stochastic processes (2019)

Teaching assistant:

inlabru, 5-day workshop (advanced spatio-temporal modelling) (2018)

Introduction to R, 2-day workshop (2019)

Introduction to statistics using R, 2-day workshop (2019)

1-1 Tuition:

Centre for Academic, Professional and Organisational Development (CAPOD) Tutor (1-1 statistics tuition for undergraduates and taught postgraduates) (2018, 2019)

CAPOD drop-in statistics clinic (for undergraduates and taught postgraduates) (2019)

Teacher:

Introduction to data wrangling in R (half-day workshop for Statistics MSc students) (2019). I wrote and delivered the material in collaboration with a fellow PhD student.

Supervision:

I assisted in the supervision of a joint statistics and computer science honours project that developed software related to my research. This involved meeting with the student to discuss statistical methods and software development. (2019)

I did not teach in 2020 or 2021 due to childcare responsibilities during the pandemic.

Software and Programming Skills

Proficient in:	Basic Experience:
<ul style="list-style-type: none">• R (5 years experience)• ArcGIS (2 years experience)• SAS (2 years experience)	<ul style="list-style-type: none">• Python• SQL• QGIS