

National Centre for Statistical Ecology: Annual report

Overview

The NCSE has now completed its 3rd year of operation. It has continued to operate seminar and visitor programs, and to circulate a Newsletter publicising activities to the wider population. Steering and Management Committees have continued to meet, with minor changes in composition. Both are highly supportive of the work and direction of the NCSE, and emphasise the importance of its continuation in the future. Detailed minutes of all NCSE committees are available on request. A new web-site is under construction. Research students are required to submit regular reports on their work to the Management Committee. A number of research papers directly resulting from NCSE research students and research associates are now in various stages of publication, ranging from *in-print* to Technical Reports. A highlight of the year was the *International Statistical Ecology Conference* held in the University of St. Andrews in July, which attracted over 200 participants from around the world; see: <http://www.creem.st-and.ac.uk/ocs/index.php/isec/isec2008/>. The next such conference will be held in Canterbury in July 2010. The next NCSE annual workshop will take place in Cambridge in July 2009. In addition, NCSE was invited to present a dedicated session at the *International Biometric Conference* in Dublin, also in July.

An attractive feature of the NCSE is the continued investment of the three host institutions in NCSE, through joint financial support of new research students. In addition, a range of university staff is now involved in research student supervision.

A number of new links have been established, viz: US Forest Service, Flagstaff, Arizona, Centre for Ecology and Hydrology, Wallingford, Central Science Laboratory, York, Cefas, Lowestoft, and the Institute of Zoology, London. The Cefas link resulted in a new EPSRC CASE award, noted below. Two separate research links have been established with the Institute of Zoology. The first of these is leading to a successful research collaboration for Lauren Oliver, currently visiting the Institute of Zoology to complete the writing of a research paper, and the second has resulted in a joint new research studentship proposal with Marcus Rowcliffe, entitled, *Developing new methods for estimating ecological parameters from camera trapping data*, which is submitted for a Microsoft studentship see http://research.microsoft.com/aboutmsr/jobs/fellowships/apply_europe.aspx

We plan to seek extension funding in due course, enlarging the NCSE to include relevant research in the universities of Bath, Bristol, Exeter and Sheffield.

Byron Morgan served as Director of NCSE from its inception until the end of September 2008. Steve Buckland now takes over as Director. The University of St Andrews has provided funding for 50% teaching relief and administrative help for Steve Buckland. Louise Burt, a member of staff in the Research Unit for Wildlife Population Assessment (RUWPA) at St Andrews, is providing this support.

It has been agreed that RUWPA will handle approaches to NCSE for external contract work. In addition, Eric Rexstad, head of RUWPA, will seek to develop a programme of NCSE training workshops.

Collaborative projects with the Sea Mammal Research Unit at St Andrews and with the Durrell Institute of Conservation and Ecology at Canterbury have been funded, and we expect to build on these links in the coming years.

Research papers and reports for the period, October 2007- September, 2008, by individuals supported by the NCSE grant (a number of further papers are in final stages of preparation):

Members of the Management Committee are shown in bold, and a * indicates published or accepted.

- Besbeas, P. and Morgan, B.J.T. A threshold model for heron productivity

- Borysiewicz, R.S. and Morgan, B.J.T. Multi-site mark recapture model selection using score tests
- Cave, V., **Freeman S.N.**, Brooks, S.P., **King, R.** and Balmer, D.E. On adjusting for missed visits in the indexing of abundance from “constant effort” ringing. *
- Cave, V., **King, R.** and **Freeman, S.N.** An integrated population model from constant effort bird-ringing data.
- Cole, D.J. and Morgan, B.J.T. Parameter redundancy, identifiability and exhaustive summaries.
- Cole, D.J. and Morgan, B.J.T. Parameter redundancy with covariates
- Lynam, C.P., Thomas, L. and Buckland, S.T. Modelling the spatial distribution of sika deer (*Cervus nippon nippon*) in the Scottish Borders using Bayesian importance sampling.
- Mazzetta, C., Morgan, B.J.T. and **Coulson, T.** Simultaneous estimation of seasonal trends, spatial dispersion and population size for closely monitored species.
- Reynolds, T.J., **King, R.**, Harwood, J., Frederiksen, M., Harris, M.P. and Wanless, S. Integrated data analysis in the presence of emigration and mark loss. *

Developments and changes in NCSE

We give below full details of NCSE-related research students and post-docs, with details for the new projects.

Research students:

Cambridge:

- Vanessa Cave transferred to St. Andrews from Cambridge, and is now in her 3rd year.
- James Lawrence will start in October 2008, jointly funded by NCSE and Cambridge University. Project title: *Trans-dimensional sequential importance sampling for model averaging, with application to Bayesian state-space models of wildlife population dynamics*. Supervision: Bobby Gramacy and Steve Buckland.
- Alison Johnston is now in her 4th year.

Kent:

- Lauren Oliver started work in October 2007, with a remit to analyse long-term data sets. So far she is working on Big Horn Sheep (in collaboration with Marco Festa Bianceti and Giacomo Tavecchia) and cheetahs (in collaboration with the Institute of Zoology). Additional data sets are being provided, for instance by Christophe Barbraud (Chizé). Supervision by Tim Coulson and Byron Morgan.
- Dan Brown is now in his 4th year.
- Eleni Matechou transferred from the Max Planck Institute for Demographic Research in Rostock, where she spent her first 18 months, to Kent. Supervision by Byron Morgan and David Thomson.
- A new studentship, jointly financed by NCSE and the University of Kent: *Modelling the spatio-temporal distribution of Sumatran tigers and their prey* will start in October 2008. The student is Gurutzeta Guillera-Arroita. Supervision: Rachel Borysiewicz, Matt Linkey (Sumatra), Byron Morgan and Martin Ridout.

St. Andrews:

- Transfer of Vanessa Cave. Supervision by Ruth King and Stephen Freeman.
- Colin Millar started his PhD on October 2007. He has since transferred to part-time study, with joint funding from Fisheries Research Services. His research topic is estimating fishery statistics with observer data. Supervision by David Borchers and Rob Fryer.
- Angelika Studeny accepted an NCSE studentship funded by the University of St Andrews, starting in January 2008. She is developing methods for quantifying regional trends in biodiversity. Supervision by Steve Buckland, Janine Illian and Anne Magurran.
- Ella Marley-Zagar had to withdraw due to illness.
- Toby Reynolds is in his 4th year. *Supervision* by Ruth King and John Harwood
- A new studentship, jointly funded by NCSE and the University of St Andrews, has been accepted by Cornelia Oedekoven. She will be developing mixed models for distance sampling

surveys. Supervision by Monique Mackenzie and Steve Buckland

Post-docs:

Cambridge:

- Leah Johnson
- Ben Wright left following the departure of Steve Brooks.

Kent:

- Chiara Mazzetta (until October 2008): *Bayesian modelling of deer and sheep data*. Collaboration with Tim Coulson, Imperial College.
- Rachel Borysiewicz: *Multi-site integrated population analysis*
- Diana Cole left to become a lecturer in statistics at Kent.

St. Andrews:

- Chris Lynam left to take up a position at the Irish Marine Institute in Galway.
- Andrew Thomas: WinSIS: developing a version of WinBUGS for sequential importance sampling.

New EPSRC grants:

- *Statistical analysis and modelling of benthic data*: CASE with Cefas; joint supervision by Jon Barry, Byron Morgan and Martin Ridout. Student: Beth Norris starts work in October, 2008.
 - *The way they move: towards a general framework for understanding animal movement in changing environments*: Joint supervision by Ruth King, Len Thomas and Jason Matthiopoulos. Start date January 2009.
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Steve Buckland and Byron Morgan,

22 September, 2008.