Guest Editorial of the SEEM-2019 conference EEST special issue

Nokuthaba Sibanda¹ · Stephen Marsland¹

Accepted: 5 February 2022 / Published online: 15 February 2022

© The Author(s), under exclusive licence to Springer Science+Business Media, LLC, part of Springer Nature 2022

On 2–4 December 2019, the biennial Statistics in Ecology and Environmental Monitoring (SEEM) Conference was hosted by the School of Mathematics and Statistics at Te Heranga Waka—Victoria University of Wellington, New Zealand. This series of international events brings together researchers at the interface of statistics, ecology and environmental monitoring. The SEEM series was established at the University of Otago, New Zealand. Each conference is comprised of a variety of presentations ranging from statistical methods to more applied ecological and environmental topics. The programme for the SEEM 2019 conference can be found at <https://sms.wgtn.ac.nz/Events/SEEM2019/>.

This EEST special issue includes four articles (one published earlier).

Caley, Reid, Colloff, and Barry developed a state-space model-based Bayesian approach to infer population trends of mobile waterbirds using data collected from aerial transect surveys. The authors addressed the challenges of monitoring waterbird populations that arise due to counting logistics, and possible rapid shift in aggregation and dispersion in response to large spatio-temporal variations in resource availability. Their approach explicitly incorporates process noise and observation uncertainty. They further use random effects and rainfall-derived covariates to model year-to-year variation in the proportion of the total population that is present, and available to be counted on surveyed wetlands. Rainfall is found to have a strong effect on whether species are present on surveyed wetlands, while species respond differently to rainfall in terms of habitat use.

Morris and Sibanda use pivotal discrepancy measures to assess goodness-of-fit for spatio-temporal models. They modify and generalise a technique introduced by Jun,

Handling Editor: Pierre R. L. Dutilleul.

✉ Nokuthaba Sibanda
nokuthaba.sibanda@vuw.ac.nz

Stephen Marsland
stephen.marsland@vuw.ac.nz

¹ School of Mathematics and Statistics, Te Heranga Waka – Victoria University of Wellington, Wellington, New Zealand

Katzfuss, Hu, and Johnson (“Assessing fit in Bayesian models for spatial processes”, *Environmetrics*, 25:584–595, 2014) that calculated a pivotal discrepancy measure based on spatial partitions of the domain. In the modified and generalised version, the authors use K-means clustering to create spatial partitions that are allowed to be of unequal size. Use of the method is illustrated with simulated data and an application to hoki (*Macruronus novaezelandiae*) catch data from a survey of the sub-Antarctic region.

Robertson, van Dam-Bates and Gansell made advancements on previous work that proposed a spatial sampling design to draw spatially balanced samples using a nested partition. Here, the authors modify the partitioning strategy by introducing a spatial ordering for point resources, called the Halton Iterative Partition (HIP) master frame. Samples of consecutive points from the HIP master frame are spatially balanced and these individual samples can be easily incorporated into a broader spatially balanced design for integrated monitoring.

A fourth article, derived from a presentation at the SEEM 2019 conference, was published in an earlier issue of the journal (Juodakis, J., Castro, I., and Marsland, S. “Precision as a metric for acoustic survey design using occupancy or spatial capture-recapture”, *Environmental and Ecological Statistics*, 28:587–608, 2021). Juodakis et al. propose the use of precision, i.e., the variance of the population density estimator, as a metric to evaluate survey performance for animal populations. The authors show that in the Spatial Capture-Recapture framework, precision of the density estimate can be usefully optimised, and they demonstrate it on data from an acoustic survey of Little Spotted Kiwi (*Apteryx owenii*).

We acknowledge with thanks the instigators of the SEEM conference series at the University of Otago for the opportunity to host the event at Victoria University of Wellington. We deeply appreciate the invitation, support and encouragement of Dr. Bryan Manly, Prof. Pierre Dutilleul and Prof. Luiz Duczmal for a special issue to be published in the EEST journal. Finally, we wish to express our gratitude to all the speakers at the SEEM 2019 conference, the reviewers of the submitted manuscripts, and the authors of the published articles.