OIKOS Satellite Symposium Sharing Biodiversity data for re-use: Informatics tools and processes in Ecology. *Lund University, 6 February 2017*

Extracting time series from occurrence records

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Monitoring and understanding biodiversity loss in the Anthropocene is critical in order to enact effective mitigation strategies, but there is a dearth of high quality data for this purpose. Occurrence records, such as those collected by Citizen Science projects, are a rich source of information: the Global Biodiversity Information Facility (GBIF) database now contains over 600 million records. However, occurrence records were not gathered in a systematic manner, leading to numerous biases. Hierarchical Bayesian occupancy-detection models provide a way to derive robust inferences from unstructured occurrence records: computer simulation show that the resultant trends are robust to known biases in the data. I will demonstrate the power of these models for hypothesis-testing, using an example of pesticide impacts on beneficial insects. I will then show how these models have been used to generate biodiversity indicators. Finally, I will discuss, using examples, how the concept of Essential Biodiversity Variables provides a unifying framework for storing, using and interrogating outputs from occupancy-detection models.