

## 59th Northeast Fish and Wildlife Conference Paper Abstract

1. Wildlife
2. Paper
3. Title: Model Selection for Species Distribution Models Incorporating Spatial Autocorrelation
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5. Presenter: Volker Bahn, student
6. Abstract:

When modeling species distributions, a common problem is a lack of independence in sampling values obtained at neighboring locations. Spatial autocorrelation in species incidences usually occurs because a) the resources used by the species are clustered in space; and/or b) the species' spatial behavior, such as migration, passive and active dispersal or simply ranging, lead to spatial dependencies. Such autocorrelation poses problems for traditional distribution models based on associating a species with environmental characteristics, because these models typically assume independent error values, an assumption that is violated if autocorrelation is present. Expressed in ecological terms, traditional models associate species with environmental conditions only, independent of the abundance of the organism at a nearby location. In reality, however, a close-by population might be a critical factor for predicting the likelihood of occurrence of a species at a certain location. Several authors have investigated autocorrelation in spatial distributions and some methods for incorporating spatial dependence in distribution analyses exist. I investigated a new, information-theoretic method for selecting the most appropriate model, judged by Akaike's Information Criterion (AIC). Depending on the data available and the situation, the most appropriate model may or may not incorporate spatial autocorrelation. I investigated this method using Breeding Bird Survey (BBS) data from the Rose-breasted Grosbeak. I compared a "traditional" distribution model based only on vegetation and climate information with a model adding a spatial trend surface and finally a spatial regression incorporating autocorrelation structures. The last approach outperformed the second, with the first approach being a distant third, as judged by AIC.

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