

The climate envelope may not be empty

A recent paper (1) purported to document negligible climatic determination among European bird species, with implications for forecasting range shifts in changing climates. However, only 12 of 100 species analyzed were endemic—thus, for the remaining 88% of test species, key limits with likely climatic determination were excluded, particularly eastward and southward (2). Second, the authors developed null distributions conserving the same prevalence and semivariogram as real species' distributions and showed that real distributions were not modeled better than “null” distributions. However, most variation in null and real distributions at broad geographic scales is explained by spatially structured climate variation that is difficult to disentangle. The authors' manipulation fails to eliminate climate as a correlate of null ranges exactly because their occurrences were spatially clumped: as climate is autocorrelated, null distributions have climate signatures just like real distributions. Producing null models removing effects of climate but keeping the spatial cohesion of the distribution is unlikely, as in recent debates regarding mid-domain effects as appropriate null models for diversity (3). Null distributions will show climate signatures similar to those of real species that are not eliminated in their randomization algorithm, so the authors cannot reject the hypothesis of a climate association in European birds. Nonetheless, we

agree that, because distributions can be modeled by using current spatially structured climatic predictors without necessity of direct causal linkages (4), more studies oriented at testing the robustness of correlative methods in predicting species' distributions under future climate scenarios are needed (5).

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