CLIMATE ENVELOPES FOR SPECIES DISTRIBUTION MODELS

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Spatial models of species distribution often include attempts to describe relationships of presence with climate variables; these are commonly termed "climate envelopes". It is has been claimed that such curves should typically be either unimodal or monotonic, and univariate low-degree spline curves have seemingly become popular.

We argue that current practice can be improved, and propose a simple parametric alternative to spline curves which appeals to biological plausibility as well as capturing common expected features of species' presence/climate relationships. Importantly, the methodology is multivariate, as univariate splines will fail to capture simple interactions between climate covariates. Furthermore, this parametric form can incorporate knowledge from biophysical climate envelope research.

We discuss implementation of the envelopes in both WinBUGS and INLA.