



Dealing with spatiotemporal heterogeneity: The GBME model

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We discuss a synthesis of the generalized spatiotemporal random field theory with the Bayesian maximum entropy (BME) model of Epistematics. The resulting Generalized BME (GBME) formalism makes no restrictive assumptions concerning estimator linearity and probabilistic normality (i.e., nonlinear estimators and non-Gaussian distributions are automatically incorporated); it can study natural systems with space-time heterogeneous features (including fractal and wavelet representations); it can account for various kinds of physical knowledge concerning the system of concern; and it can generate informative maps of the relevant system attributes. Mapping does not merely refer to the space-time distribution of natural attributes; instead, it takes into consideration the background, expertise and objectives of the map users: learning how to look is much simpler than learning how to see beyond appearances into the actual phenomenon represented by a map. Insight into the computational implementation and performance of GBME is gained by means of numerical experiments.