

ACCURACY OF AREAL INTERPOLATION METHODS: THE CASE OF COUNT DATA

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The analysis of socio-economic data often implies the combination of data bases originating from different administrative sources so that data have been collected on several different partitions of the zone of interest into administrative units. It is therefore necessary to allocate the data from the source spatial units to the target spatial units. There are three main types of such techniques: proportional weighting schemes, smoothing techniques and regression based interpolation. We study the accuracy of these techniques for regular grid targets in the case of variables related to count data. Examples of such variables are the population of a sub-region or the population density. We introduce a model for this type of variable by assuming that there exists an underlying unobserved Poisson point pattern (in the example the positions of the individuals of the population) and that the observed target variable on a given subzone is the number of points of the point pattern in this subzone. The prediction error depends on the nature of the target variable and its relationship with the auxiliary variable. We focus on proportional weighting schemes and Poisson regression based methods. There is no technique which always dominates.

We present simulations as well as an application to US demographic data from the R package ‘US census 2010’ (Almquist, 2010) to illustrate the findings.