## NON NESTED GEOGRAPHICAL SCALES IN ECOLOGICAL POISSON REGRESSION MODELS

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Ecological studies use data (health outcomes and exposures) measured on geographical areas. These data may be aggregated over different non-nested scales. Let refer to the partition on which exposure data are available as "source" zoning and the partition for which exposure data are to be imputed as "target" zoning. Suppose that health outcomes are available on "target" zones. We propose to compare two Bayesian hierarchical models: the first one is based on the relationship between latent exposure measurements on the "target" zones and the observed ones on the "source" zones while the second model takes into account the risk structure on the "target" zones conditional on the observed exposure measurements and the individual dose-response relationship. These models are expanded for Poisson responses. Their performances are studied on the basis of simulations.