



**Sixth Bayesian, Fiducial, and Frequentist (BFF6)  
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**SPEAKER TITLES/ABSTRACT**

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“Bayesian Analysis for Misaligned Regions and Applications in Cancer Mortality”

For many datasets, multiple variables measured on (possibly differing) areal units are available. We wish to simultaneously model both the spatial relations within each variable and the relations between variables. Unlike other approaches to constructing multivariate generalizations of the CAR model, we require that each marginal distribution is an ordinary CAR model. The method is based on transforming each variable to a variable that is marginally standard normal, but with a cross-covariance matrix between each pair proportional to a fixed region “overlap matrix” analogous to an adjacency matrix. This method allows the possibility that the geographies of each variable differ from each other, but at the disadvantage of a set of conditions to ensure positive definiteness that quickly become cumbersome as the number of variables increases. The methods are illustrated to fit Missouri cancer mortality datasets.