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Tweedie Mixed Models for Spatiotemporal Data.

Massive data sets with complex spatiotemporal structures are common in forestry, health and environmental studies. In order to account for such spatiotemporal structures, we incorporate spatially and temporally correlated random effects into Tweedie generalized linear models, accommodating a wide range of discrete, continuous and semi-continuous data. The estimation of these models often poses theoretical and computational challenges. We propose a unified estimation method for these models based on orthodox best linear unbiased predictors of random effects. Our approach is illustrated with application to analysis of environmental data.