

Model-based prediction error uncertainty estimation for k-nn method

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Abstract: The k-nearest neighbour estimation method is a widely applied tool in multi-source forest inventories. It is a powerful nonparametric method for which estimates are easy to compute. One downside of this method is that it lacks an uncertainty measure for predicted values and for areas of an arbitrary size. The method to estimate the pixel level prediction uncertainty based on the variogram model by Kim and Tomppo (2006) is discussed. An application is illustrated with multi-source forest inventory data, and the results are compared at pixel level to the conventional RMSE method. We also discuss to possibilities to extend the method to the areas of an arbitrary size.

KEYWORDS: forest inventory, k-NN method, RMSE, variogram