



VALIDATION OF NATIONAL MODEL FOR NITROGEN RETENTION IN RESTORED WETLANDS

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ABSTRACT

In recent years a large focus has been dedicated to exploring different mitigation options that can assist in reducing nitrogen (N) emission from fields to streams, lakes and coastal areas. One of the mitigation measures that have been implemented in Denmark is restoration of wetlands, with a total of 7,121 ha restored in 2010. Furthermore, in an effort to estimate the spatial differences in the potential for N retention across the country a national N transport and retention model has been developed. As part of this national model, a sub-model was developed to describe the N retention potential in restored wetlands. Therefore, the focus of this study has been to (1) develop; and (2) test this new empirical model for N retention in restored wetlands in Denmark.

The wetland N retention model was developed based on data from the 0.8 ha wetland along Storåen in Denmark, restored in 1990. Between 1990 and 2005 daily wetland inflow and outflow of water and total N were measured, allowing estimates of daily total N retention. The dataset was investigated for relationships between N-retention and water runoff and season as surrogate for temperature and the analysis resulted in the development of two sub-models (summer: May-Sep and winter: Oct-Apr). Furthermore, based on previous monitoring of restored wetlands in Denmark, the wetland retention models were adjusted to give a yearly retention of 120 kg N/ha on sandy soils, and 190 kg N/ha on loamy soils. The overall empirical models are being validated against data from five different restored wetlands across Denmark, having between one and three years of monitoring data. The first results suggest a satisfactory model performance ($R^2=0.6$) with the largest deviations between modelled and measured data in May-Jun and in Jan-Feb.

