MODELLING VEGETATION-SUCCESSION ON PEAT LANDS FOR LAND USE PLANING

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Various factors are known to change as a result of peat soil drainage. Weighing economic values against all environmental aspects requires an amount of knowledge that is exceeding most people's abilities. Within the EUROPEAT project a Decision Support System has been developed for European peat lands to enable stakeholders to balance the consequences of water table change and changes in land use intensity against different parameters. A part of the system is a succession model presented on this poster. The model shows the vegetation change on an annual time step over a 50 year period. The relevant output parameters gained from the model are nature conservation value and productivity.

Model development

The model is based on functional vegetation groups, using the abundance and intensification parameters defined by Schrautzer & Jensen (1999) and three Ellenberg ecological indicator values (moisture, soil reaction, nitrogen). Nine average vegetation types summarized from 30 vegetation plots of typical vegetation types on peat soils in northern Germany were used as input parameters of the model. They can be replaced by vegetation relevees if present. Based on a Markov model the changes in abundance of different groups are calculated by using transition probabilities that depend on land use intensity and water table change. Nature conservation value is defined by the number and status of Red List species in different European countries per functional group. The second output parameter is a value for productivity which is a combination of harvest quality and quantity.

Model calibration

For verifying model results vegetation samples gathered on different peat sites with constant land use intensities were used. The time span covered by the data was 4 to 40 years of vegetation development and the transition probabilities were adjusted according to the results.

Results

Different results are presented showing the response of conservation value and productivity to changes in water table, water type and land use intensity. The model results are compared to measurements taken in northern Germany.With this vegetation module it is possible to predict the effect of land use change and water table change caused by subsidence on the coverage of functional vegetation groups. This information is required to develop land use strategies with low environmental impact and maintaining the plant species diversity at the same time.