

Experiences of using different calculation methods concerning the RBMB work in Finland

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Agricultural production is a major source of diffuse nutrient loading to lakes and rivers in Finland. Total nutrient load from catchments depends strongly on the proportion of agricultural land. Studies in Finnish agricultural catchments and river basins have indicated only minor reduction of nutrient loads in spite of massive efforts towards environmentally sound management practices including a massive and widely adopted (more than 90% of the farms participating) policy measure for controlling nutrient losses from agriculture. In Finland, researchers and end-users apply various models in order to assess nutrient losses from agricultural and other rural areas. However, few of the models are suitable for catchment scale calculations. In the implementation of the Water Framework Directive a goal is to be familiar with large river basins and to assess the nutrient losses of different loading sectors. Therefore, the most practical way was to integrate some models together and to apply them individually.

After the loading calculations, a very important step is also to use suitable water quality models of lakes in order to get reliable estimations of the effects of different water protection measures. Pirkanmaa Regional Environment Centre (PREC) is one of the end-user agencies, which in practice makes the final calculations of nutrient losses and selects the tools (models) for applications. Relatively simple modelling tools, such as VEPS, have been utilized to identify the river basins susceptible to risk of eutrophication. VEPS calculates potential annual nutrient load (agriculture, forestry, point load, deposition, peat production and natural background load) for all third-level sub catchments in Finland. In order to get more detailed information of agricultural loading, the VIHMA model was used at PREC. VIHMA model is a decision support system developed to be a planning tool for allocation of mitigation measures against erosion and nutrient loading. The selected cultivation methods affect characteristics of the field surface in different ways, key factors being the timing and intensity of tillage, vegetation cover during the winter and the stability of the vegetation cover. In water quality modelling, a linked CSTR mass balance system was used.

Key words: agriculture, nutrient loading, model, VEPS, VIHMA