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Stakeholder driven update and improvement of a national water resources model

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ABSTRACT

It is generally acknowledged that water management must be based on an integrated approach, considering the entire freshwater cycle. This has in particularly been endorsed in Europe by the European Water Framework Directive (WFD) imposing integrated management considering all waters. Although not prescribed by the WFD, integrated hydrological modelling may be necessary to support the management according to the directive as also suggested by several research projects initiated by the EU commission. To ensure a coherent and consistent management across various institutions and authorities, having different responsibilities and operating at various scales, a common tool integrating all relevant knowledge and data is imperative. By the end of 2003, a numerical national water resources model was constructed for Denmark, which has been applied in several national assessments. At the regional level there has, however, been some reluctance to use the model, primarily because the model did not contain the most recent data and understanding obtained from detailed local studies. The model has therefore been subject to a comprehensive update focussing on utilising the system understanding from the local studies. This process was largely stakeholder driven by involvement of predominantly the technical staff at the regional water authorities. Local knowledge is continuously improved urging the model update to be an on-going process. Based on experience from the update of the Danish national water resources model, three levels of model updating have been identified: 1) Basic data update – keeping the model up-to-date with respect to input data, 2) improving the model description by including new or more detailed data, and 3) reconstructing the model concept. The three levels vary with respect to technical tasks, challenges and stakeholder involvement. Two utility programs developed to optimise the updating process and support the uptake of data and knowledge from local users are furthermore presented. Finally, some of the challenges in operating a national model with multiple users belonging to different institutions with varying demands are discussed.