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Quantification of the accuracy of groundwater characteristics predicted by a linked 'soil - groundwater - surface water' model

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Accurate information on groundwater dynamics is indispensable for district water boards for making thoughtful decisions on groundwater and surface water management. This information is essential for optimizing hydrological conditions for agricultural purposes and nature conservation, for diminishing soil subsidence, and for reducing eutrophication of surface waters.

Information on groundwater dynamics is obtained by means of extensive monitoring networks and sophisticated groundwater models. Physically based distributed groundwater models offer the advantage of a priori assessment of the impact of proposed management strategies by means of scenario analysis. Notwithstanding the usefulness of groundwater models, the reliability of the predictions is often unknown. Having insight in the reliability of groundwater models may help district water boards to make more informative decisions. It may seem quite trivial to quantify the reliability of groundwater models at locations where measurements are available. However, at locations where measurements are missing, a more elaborate approach has to be pursued.

In this paper, a method will be presented for quantifying the accuracy of groundwater characteristics predicted by a linked 'soil - groundwater - surface water' model. Data layers of different quality will be assimilated by means of a geostatistical procedure in order to quantify the prediction accuracy at all model nodes. The method will be illustrated by a case study performed in the management district of water board 'De

Stichtse Rijnlanden’.