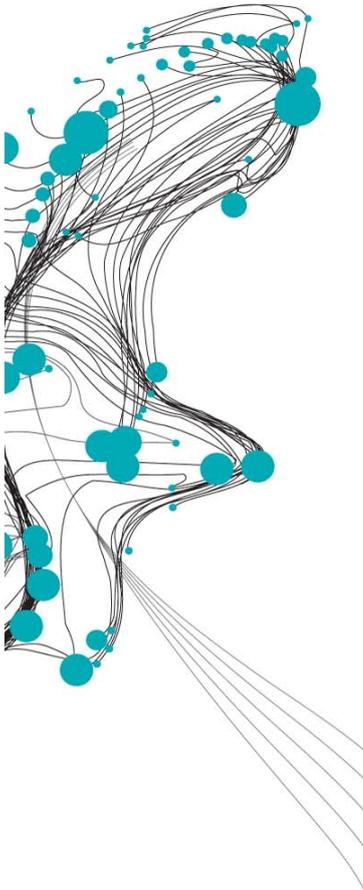# COMPARITIVE ASSESSMENT OF SOBEK2 AND D-HYDRO SUITE 1D2D FOR REGIONAL INUNDATION MODELLING

Hydrological and hydraulic modelling tools are critical for effective water management by water authorities in the Netherlands. Among others, models are used to perform a Water System Analysis (WSA), which entails assessing whether regional water hindrance norms are met. Historically, SOBEK2 has been applied for these purposes, generally employing a 1D schematization to represent hydraulic processes. However, recently D-HYDRO Suite 1D2D has been developed as the intended successor for SOBEK2, most notably improving 1D2D modelling functionality.

This study describes the comparative assessment of a (1D) SOBEK2 and a D-HYDRO Suite 1D2D model in the context of the WSA, with the intent of obtaining insights in how the new tool compares to the current standard. In addition, potential consequences of this new tool for current best practises are investigated. The Soestwetering catchment in the west of Overijssel, the Netherlands, was used as a realistic and representative case study.

An Assessment Framework was developed to assess model suitability for the WSA, consisting of model performance, usability and applicability criteria. The SOBEK2 and D-HYDRO models are found to be similar in model performance for the chosen case. Simulated 2D flow dynamics in D-HYDRO Suite 1D2D appear realistic, but have little effect on model performance. However, due to several technical issues related to the beta version of D-HYDRO Suite 1D2D used (0.9.7.51931), the tool is unsuitable at the moment due to a lack of usability. Expert opinions indicate that the current 1D approach to the WSA is generally sufficiently accurate and more practical than the 1D2D modelling approach used in this study. Two exceptions to this are when overland flow processes are relevant for overall model performance, or when detailed inundation insights are desired. When 1D2D modelling would be applied in a WSA context, it may be preferable to opt for a simple 2D schematization at the locations of interest, sacrificing model accuracy and mesh optimization for a faster schematization process.

It was concluded that the used beta version of D-HYDRO Suite 1D2D (0.9.7.51931) is not suitable for the WSA, most notably due to several (yet) unsupported features and long computation times. That being said, experts agree on the expectation that most of the technical issues will be resolved before the official release of D-HYDRO, which would likely make it similarly or more suitable than SOBEK2 for the WSA in the future.

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Graduation Date:
14 July 2021

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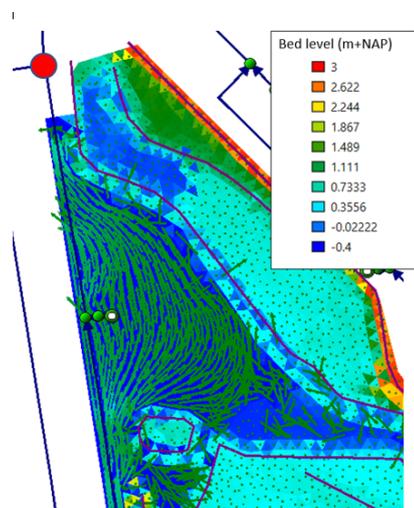*Arcadis*
ir. A. Buijert
ir. S. de Vries
ir. B. Agerbeek

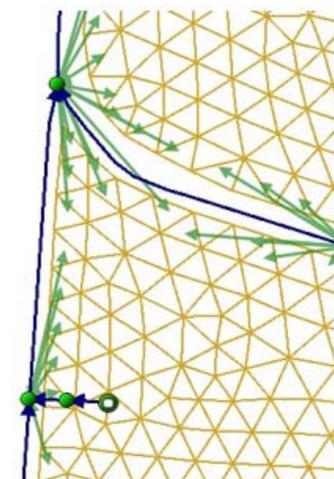Figure 1: Example of 2D flow through a retention area.

Figure 2: Example of lateral 1D2D connections in D-HYDRO Suite 1D2D..

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