

Title of the project: Integral 1D modelling with the new KNMI climate scenarios	
Assignment no.: 01.24	Internal/external: External HydroLogic
Head graduation committee: dr.ir. Martijn Booij/ TBD	Daily advisor: dr. ir. Anouk Bomers
Name(s) of participating companies or institutes: HydroLogic	Start of the project: As soon as possible
Required courses: Hydrology; Hydrological Modelling and Forecasting; Hydraulic Modelling	
<p>Short description and objective of the project: HydroLogic offers the student during this MSc thesis the possibility to delve deeper into integral modelling with D-HYDRO and the new KNMI climate scenarios. In both aspects, major developments have taken place.</p> <p>Starting with D-HYDRO, it is marked by Deltares as the follow-up for their SOBEK software for hydraulic and hydrologic modelling. HydroLogic has been one of the parties which were actively involved in the testing of D-HYDRO and the development of pre- and post-processing tooling. Recently, full connection between urban (sewer) and rural (open water) was added to the newest version of D-HYDRO. This, together with the possibility of 1D2D modelling in D-HYDRO, allows for integral modelling of urban areas.</p> <p>About the other major development: the new KNMI climate scenarios have incited plenty of discussion and are thus known to the general public; researching the consequences quantitatively has just started.</p> <p>Polder De Tol is a major playground for testing D-HYDRO's capabilities, mainly due to the pluvial flooding event in Kockengen (which is located in polder de Tol) in 2014. With the new developments, we would like the student to research together with us as a start:</p> <ul style="list-style-type: none"> • the generation of urban models from existing data schematisations (GWSW); • the coupling with the existing 1D(2D) open water model with the urban model. <p>Having developed this model, we would like to delve into one of the following research topics:</p> <ul style="list-style-type: none"> • evaluation of the results for the pluvial flooding in 2014 with the urban model vs. without the urban model; • modelling and the evaluation of the simulation with (several of) the new KNMI climate scenarios vs. the old KNMI climate scenarios; • the relevance of the reference precipitation events in sewer design and testing vs. use of the KNMI climate scenarios. <p>The aim of this research will thus be twofold, being the evaluation of the implementation of the urban model in D-HYDRO and its added value in existing practices. A major part of this thesis will involve Python programming, since the pre- and post-processing of D-HYDRO models will be done with Python.</p>	