

Ecohydrological and Flood Management of the River Basin Demer



Financed by: Ministry of the Flemish Community (Brussels)
AMINAL-Water Division & Nature Division

Client: Ministry of the Flemish Community (Brussels)
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Location: Basin Demer

Partners: SumResearch, Taken Landscapsplanning

Assignment:

The project aimed at setting up an integrated water management plan for the river basin Demer between the Belgian cities Diest and Werchter. The integrated approach focused on remediating the artificially lowered groundwater table in the valley and increasing the protection of residential areas against flooding. Forestry, agriculture and recreation were dealt with too in this integrated assessment.

Scope of Services:

- Hydrological modelling
- Modelling of groundwater and surface water quantity
- Interaction between groundwater and surface water
- Integrated water management

Technical Description:

Firstly, a surface water quantity model was set up and validated with field measurements. Input data from precipitation and water level data were statistically generated.

Several river basin management scenarios were developed and investigated with the model with respect to flooding. For this hydrological task, seven representative flood storms with different return period were scrutinized. Scenarios included the design of weirs, sluices, orifices and bypasses. Actual river banks were lowered to include natural flood plains in the "active" water system and others were made higher to locally protect towns and specific agricultural areas. River meandering was investigated too because of its increased water buffer capacity and ecological value.

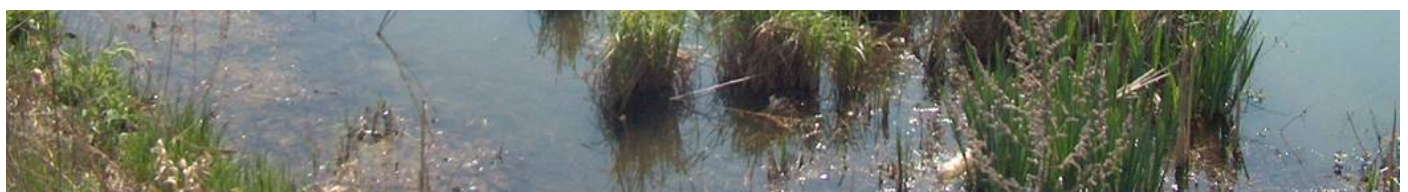


Nature reserve Demerbroeken



Flooding of the Demer in September 1998

Besides flood protection, the groundwater table needed to be raised again in dry season. To identify the impact of the different scenarios on the groundwater resources, computed river water levels were used as a direct input in a validated regional/local groundwater model. With respect to ecological potentials, groundwater seepage fluxes were looked at.



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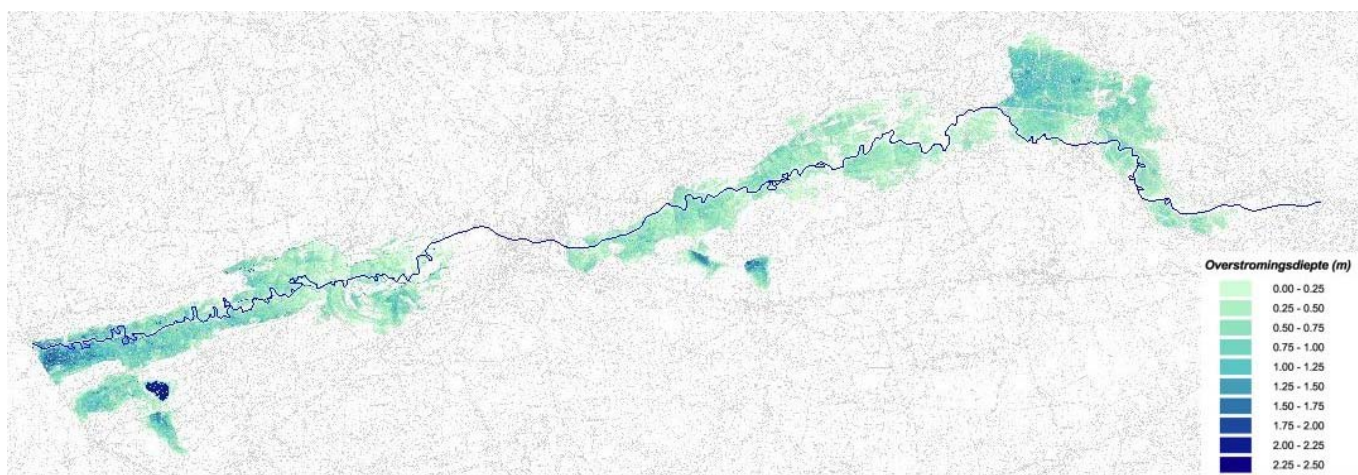
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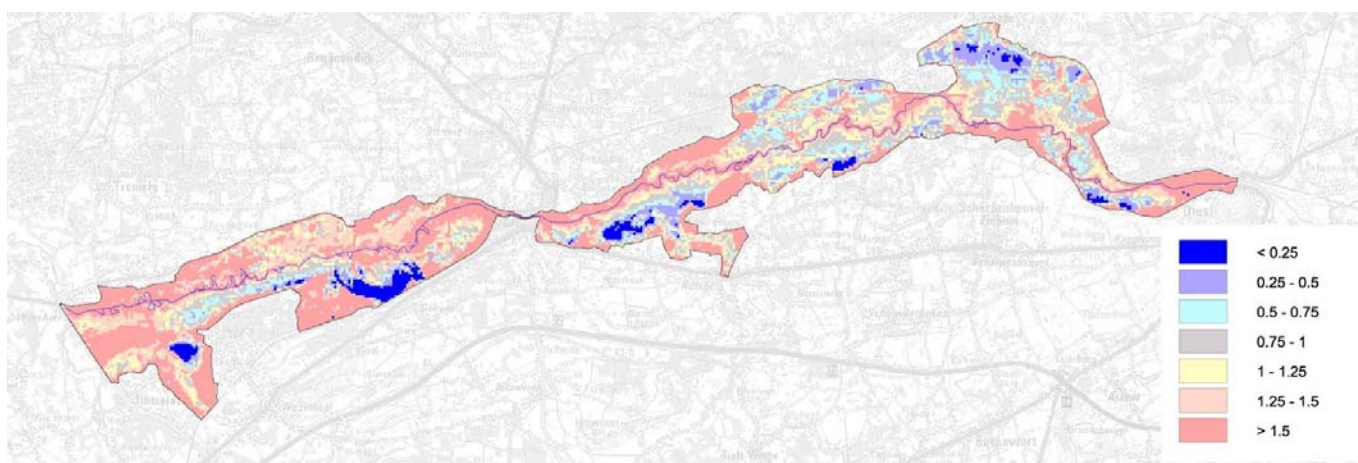
Dikes in Rotselaar during the flooding in 1998

Based on these simulations, the necessary steering variables were identified to further develop the ecological, rural and spatial potentials in the river basin. In this respect, flooding depths and groundwater table depths were used in combination with groundwater quality and geological data to forecast the development potentials of vegetation types.

By the interactive contacts with the clients and the many stakeholders in the study area, the scenarios were further optimised towards flood protection, ecology and agriculture. The final river basin management plan is therefore the most optimal and economically feasible proposal which guarantees flood protection at flood discharge and high water levels at low discharge (cf. ecohydrological remediation).



Predicted flooding depth for the storm of September 1998 in the modelled Demer valley



Predicted yearly average of the groundwater tabel depth in the modelled Demer valley