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Groundwater flow and transport modelling at regional scale: lessons learned from different applications in the Walloon Meuse basin

by

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ABSTRACT

An overview is proposed of the recent groundwater modelling works, at the groundwater body scale, performed by the Hydrogeology & Environmental Geology team of the University of Liège. The developed modelling tools are built in the general objective of improving our understanding and management, at short, middle and long terms, of the groundwater bodies. The general strategy to be followed implies that conceptualization, parameterization and calibration must be adapted to the actual objectives of each model (Wildemeersch *et al.*, 2014).

3 specific applications are illustrated involving two main groundwater bodies:

- application of the HFEMC method (Wildemeersch *et al.*, 2010) within the SUFT3D code for groundwater flow modelling of the 'Synclinorium of Dinant' (Orban *et al.*, 2010 and Brouyère *et al.*, 2011);
- application of the HFEMC method and the SUFT3D code for the nitrate trends (Batlle-Aguilar *et al.*, 2007) simulations in the Geer basin (Orban *et al.*, 2010) for different scenarios of nitrate inputs;
- application of the HGS integrated model for assessing the impact of climate change on the groundwater reserves in the Geer basin (Brouyère *et al.*, 2004, Goderniaux *et al.*, 2009 and 2011) with quantification and comparison of the different uncertainty sources (Goderniaux *et al.*, 2015)

Lessons and perspectives are learned and proposed from these modelling experiences at the scale of the groundwater body.

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