Geophysical Research Abstracts
Vol. 15, EGU2013-11175, 2013
EGU General Assembly 2013

Lessons learned from a large scale multidisciplinary modeling project with the aim to evaluate the impact of global change on groundwater resources

Roland Barthel
University of Gothenburg, Department of Earth Sciences, Sweden (roland.barthel@gvc.gu.se)

Groundwater resources, activities of human actors and global change, including climatic change, are related in many different and complex ways because of the strong interactions between various influencing factors, including those that are natural-environmental and those that are socio-economic. The GLOWA-Danube research cooperation has developed the integrated simulation system DANUBIA to model water-related influences of global change in different spatial and temporal contexts. DANUBIA is a modular system comprised of 17 dynamically-coupled, process-based model components and a framework which controls the interaction of these components with respect to space and time. Being a long term research project with a duration of 10 years and by integrating the work of researchers from more than 20 research groups from many different disciplines (additionally by being accompanied by an intensive dialogue with many stakeholders) the GLOWA-Danube project is probably one of the largest research efforts in the field of integrated (ground-)water resources management. It is therefore important to critically evaluate its outcomes, extract the usable findings, identify problems and consequently, determine directions of future research. In this contribution, this will be done for the groundwater related aspects of GLOWA-Danube. The paper thereby has four main objectives: (i) to present the GLOWA-Danube approach and to describe the capabilities of DANUBIA with regard to the simulation of climate change impacts and human behavior on groundwater, (ii) to point out the challenges and limits of integrated regional scale groundwater resources assessment using numerical models and to propose alternative solutions that are adjusted to scale and data availability, (iii) to identify critical and crucial aspects of model integration, and (iv) to identify challenges arising from different objectives of scientists and those of stakeholders and decision makers. Since none of the four items can be covered in a comprehensive way, the contribution will mainly summarize the most important conclusions and point to publications that provide further details.
A comprehensive list of references providing a more detailed discussion of various aspects of GLOWA-Danube can be found in Barthel et al. (2012).

References:

Barthel, R., Reichenau T., Krimly, T., Dabbert, S., Schneider, K., Mauser, W. (2012) Integrated modeling of climate change impacts on agriculture and groundwater resources. Water Resources Management, 26,7, 1929-1951, DOI: 10.1007/s11269-012-0001-9.