



Integrating hydrology into catchment scale studies – need for new paradigms?

G. Teutsch

Helmholtz Centre for Environmental Research - UFZ, Leipzig, Germany (georg.teutsch@ufz.de)

Until the seventies, scientific development in the field of groundwater hydrology concentrated mainly on a better understanding of the physics of subsurface flow in homogeneous or simply stratified porous respectively fractured media. Then, since mid of the seventies, a much more complex vision of groundwater hydrology gradually developed. A more realistic description of the subsurface including its heterogeneity, predominant physico-chemical-biological reactions and also technologies for the efficient clean-up of contaminants developed during the past 30 years, much facilitated by the advancement in numerical modelling techniques and the boost in computer power.

Even though the advancements in this field have been very significant, a new grand challenge evolved during the past 10 years trying to bring together the fields needed to build Integrated Watershed Management Systems (IWMS).

The fundamental conceptual question is: Do we need new approaches to groundwater hydrology, maybe even new paradigms in order to successfully build IWMS - or can we simply extrapolate our existing concepts and tool-sets to the scale of catchments and watersheds and simply add some interfaces to adjacent disciplines like economy, ecology and others?

This lecture tries to provide some of the answers by describing some successful examples.