

## *Preface*

# **Integration of hydrological models on different spatial and temporal scales**

## *Proceedings of the 9. Workshop on Large-scale Hydrological Modelling*

Current hydrological problems like assessing the impact of global change on the water balance, flood forecasting or integrated water resources management demand detailed and often process-oriented models. Such models require much more data than simple conceptual approaches. The discrepancy between available and desired temporal and spatial resolution is often a serious problem.

As the complexity of the hydrological cycle prevents its exact reproduction, integrated models are a popular solution. They have the advantage to allow for a more detailed and physically-based simulation by modelling specific processes. But sectoral sub-models must be compatible and strategies for the calibration and validation of the sub-models and the integrated modelling complex are necessary. In both aspects, problems are far from being solved.

Hydrological questions range from long-term balances requiring only a low resolution to detailed simulations of flood events. Besides the spatio-temporal variability, data and parameters also exhibit a strong scale dependency. It is therefore questionable, if parameters measured on a specific scale can be transferred to another scale at all.

One main research focus of the past years has been the assessment of parameter and forecast uncertainty. But because of the many algorithms and methods available, a generally accepted procedure to judge the success of the simulations is still missing. Therefore this year's workshop has focused on the problems of model integration on different spatial and temporal scales

- Giertz et al., Lindenschmidt et al., Marx et al., Richter and Ebel, and Wagner et al. have contributed **case studies and strategies for model integration**

- Bormann and Krause et al. deal with the definition of the **adequate spatial and temporal model resolution**
- Barthel, Cullmann et al., Fleischbein et al., Götzingler et al., Rödel, and Rojanschi et al. focus on the **validity and transferability of data and parameters in space and time**
- Bogena et al., Helms et al., Kunstmann et al., Peters et al., Schuol and Abbaspour, and Wriedt and Rode have written papers about **tools and methods for objective model calibration**

The workshop was organised by the Institute for Hydraulic Engineering of the Universität Stuttgart and took place on the 10 and 11 November 2005 in Freudenstadt. About 50 participants and 30 contributions could be won for this event. The convenors of the workshop and editors of this special issue would like to thank all participants for the pleasant atmosphere of the workshop as well as the fruitful and interesting discussions during these two days. The commitment of all authors for the preparation of the papers and their efforts during the peer review are gratefully acknowledged. It is the second time that the proceedings of the Workshop on Large-scale Hydrological Modelling have been published in *Advances in Geosciences*. We want to thank the Copernicus GmbH, especially Nadine Deisel, for the successful cooperation and the smooth publishing process.

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