



Calibration/data assimilation approach for integrating GRACE data into the WaterGAP Global Hydrology Model (WGHM) using an ensemble Kalman filter

Annette Eicker (1), Maike Schumacher (1), Hannes Müller Schmied (2), Petra Döll (2), and Jürgen Kusche (1)

(1) University of Bonn, Institute of Geodesy and Geoinformation, Bonn, Germany (annette@geod.uni-bonn.de), (2) University of Frankfurt, Institute of Physical Geography

Global hydrological models contribute to the understanding and quantification of the global water cycle. However, large model uncertainties persist due to insufficient model realism and climate forcing data not being available with sufficient spatial/temporal resolution on the global scale. The GRACE mission provides an independent observation of water storage change with global coverage, which can be used to improve global hydrological models. Here, we introduce an ensemble-based approach to calibrate the WaterGAP global hydrological model (WGHM) against measured water storage change, and to assimilate GRACE data into the model. New is that the method makes use of the full spatial resolution of the GRACE data, and that it incorporates the full error information of the GRACE solutions into the ensemble Kalman filter.

In this presentation, we will show first assimilated model runs together with the corresponding ensemble evolution, which represents an estimation for the uncertainty of the assimilated model.