eartH2Observe: Global Earth Observation for Integrated Water Resource Assessment: current status and the road ahead

J.Schellekens

[a] *Deltares, Delft, The Netherlands*
Email: jaap.schellekens@deltares.nl

Abstract:

The overall objective of the EU FP7 project eartH2Obsere is to integrate available earth observations, in-situ datasets and models to construct a consistent global water resources reanalysis dataset of sufficient length. Furthermore, the resulting datasets will be downscaled for application in case-studies at regional and local levels and optimized based on European and local needs for water management and decision making. After 22 months a number of important milestones have been reached. An updated version of the WATCH-ERA-Interim (WFDEI) global forcing dataset has been made available and a total of ten global sand surface and global hydrological models have been run with this forcing to construct a first version of the water resource reanalysis; a multi model ensemble. In these first unconstrained model runs the ensemble mean of total runoff into the ocean was 46268 km^3/yr (334 kg/m^2/yr) while the ensemble mean of total evaporation was 537 kg/m^2/yr. Preliminary results of validation on measured discharge show that models that have been calibrated generally perform the best.

At the same time a large amount of earth observation (EO) data was gathered, updated and made available. These will now be used in a number of models in data assimilation and validation to further constrain the results in the second version of the water resources reanalysis. This version is expected to be available at a resolution of 0.25x0.25 degree and will include an updated version of the forcing and a number of EO precipitation datasets will be used to evaluate the propagation of errors in precipitation estimates. Important in the design of this second version is to cater for the different needs of the hydrological models vs. the land surface models. While the first group of models hope to run at an ever increasing resolution (up to 1 minute spatial resolution using daily time steps) the latter aim for higher temporal resolution data (3 hourly or even hourly) while going from 0.5 arc degree to 0.25 arc degree for these models already pushes the current computing capability to the max.

Key to the project is the applicability of the global for basin scale studies. Here, the datasets and models will be validated and improved based on end-user defined performance criteria on the basis of case studies covering most continents and climate conditions and with different degrees of data richness. First work in Australia demonstrates that a global model can benefit significantly from the assimilation of EO based soil moisture data.

Keywords: *eartH2Observe, global water resources, global hydrology,*