Geophysical Research Abstracts
Vol. 20, EGU2018-3314, 2018
EGU General Assembly 2018

J2000-Rhône: a distributed hydrological model including water use representations to assess sustainability of the water resources

Isabelle Braud (1), Flora Branger (1), Isabelle Gouttevin (1), Eric Sauquet (1), Francois Tilmant (1), and Marielle Montginoul (2)

(1) Irstea, UR RiverLY, Villeurbanne cedex, France (isabelle.braud@irstea.fr), (2) Irstea, UMR G-Eau, Montpellier, France

We present a distributed hydrological model, J2000-Rhone, built from the J2000 model (Krause et al., 2006) developed at the University of Jena in the JAMS modelling platform (http://jams.uni-jena.de/), that was enhanced with water-use modules (hydro-power, irrigation and drinking water supply) and set-up over the whole Rhone river basin (Switzerland and France, 96 000 km2). The J2000-Rhone model is based on the concept of Hydrological Response Unit (HRU), which define the finest scale on which processes are simulated. The Rhone River basin is divided into 12345 HRUs (average size = 5 km^2), allowing for robust results for catchments over 50 km^2. The project was co-funded by one of the French water agencies, with a view of assessing human influence on river flow regime and the sustainability of water resource management under changing climate. The model's skills were tested at more than 200 control gauging stations monitoring both near natural and influenced observed daily discharge. Coarse socio-economic scenarios were built for the evolution of the water demand, each corresponding to possible public incentives. The model highlights zones of possible upcoming tensions and the opportunity of mitigation by changes of practices. Data-collection and interpretation was both the cornerstone and the most limiting step of our construction: we encourage an effort in data collection and management by the water management institutions if they want research to help them anticipate the future at their scales of interest.

References

Krause, P., et al., 2006, Multiscale investigations in a mesoscale catchment – hydrological modelling in the Gera catchment, Adv. Geosci., 9, 53–61.