Geophysical Research Abstracts
Vol. 13, EGU2011-10673, 2011
EGU General Assembly 2011

Regional hydrological simulation as a tool to manage drought vulnerability.

Elena Montosi (1), Juraj Parajka (2), Alberto Montanari (3), and Günter Blöschl (2)

(1) Università degli Studi di Bologna, DICAM, Bologna, Italy (elena.montosi@unibo.it), (2) Institue for Hydraulic and Water Resources Engineering, Vienna University of Technology, Vienna, Austria, (3) Università degli Studi di Bologna, DICAM, Bologna, Italy

Emilia-Romagna, a region located in the northern side of Italy, is prone to drought vulnerability: on the one hand it is rich of watercourses that, however, mainly behave like torrential rivers, while on the other hand there is a considerable employment of water for industrial and agricultural purposes. Under these circumstances drought events are a real concern. For instance, during Summer of 2007 the heavy drought that hit a large part of Europe induced relevant socio-economical consequences. Therefore the assessment of water availability on a regional scale and the development of future scenarios are urgent needs for managing drought vulnerability. Hydrological simulation is a potentially powerful tool for evaluating the regional water budget. We focus on the development of a spatially distributed rainfall-runoff model that performs continuous hydrological simulations at daily time scale on a wide geographic area. Our aim is to obtain long term simulations to assess the river flow regime in multiple cross sections of the Emilia-Romagna drainage network. Particular attention is paid to the simulation of low flows by using log transformed river discharges for model calibration and appropriate performance indexes. A practical problem is related to the computational time of spatially distributed rainfall-runoff models. A possible solution is to run the hydrologic simulation by keeping some of the model parameters constant on different catchments. To check the suitability of such assumption of spatial homogeneity we performed the calibration of the hydrological model to various catchments independently. By evaluating parameters uncertainty through an MCMC algorithm it is possible to check the above assumption on statistical grounds. We present some preliminary results referred to a mountainous subregion of Emilia-Romagna.