Coupled hydrological models, with emphasis on the estimation of groundwater recharge

Gonzalo Sapriza[(1)], Jorge Jódar[(2)], Jesús Carrera[(2)]

(1) Universidad Politécnica de Cataluña (UPC)
C/Jordi Girona 1-3, Módulo C2, 08034 Barcelona, España
gonzalo.sapriza@upc.edu

(2) Instituto de Diagnóstico Ambiental y estudios del Agua (IDÆA)
Consejo superior de Investigaciones Científicas (CSIC)
C/Lluís Solé i Sabarís, s/n, 08028 Barcelona, España
jorge.jodar@idaea.csic.es
jesus.carrera@idaea.csic.es

Abstract

The impact of climate change on the hydrologic cycle is a social issue. Changes on the components of the hydrological cycle driven by climate change have direct implications on the evolution and management of available water resources. In this framework, to properly simulate the interaction between climate, surface water and ground water systems, it is necessary to use coupled and distributed hydrological models. These complex models use the temporal evolution of the spatially distributed climate variables generated by Regional Climate Model (RCM) as an atmospheric boundary condition.

In this work we present the obtained results of the sensitivity analysis conducted for the aquifer recharge in terms of different conceptual models for accounting the hydrometeorological water balance. To this end, a numerical model of the Upper Guadiana hydrological system has been implemented in PROOST (LJ Slooten, 2009), adding two new capabilities to this simulating platform: 1) two soil-water balance models, including a number of analytical and empirical models for evaluating potential evapotranspiration. 2) Simulation of surface runoff and river water routing.