

A distributed package for sustainable water management: a case study in the Arno basin

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Abstract MOBIDIC (MOdello di Bilancio Idrologico DIstribuito e Continuo) is a distributed hydrological modelling package for various applications. The main innovations concern: (a) the coupling of the water balance in the soil and vegetation with the surface energy balance, to the benefit of evapotranspiration computation and the use of remotely-sensed maps for calibration and validation; (b) the interaction between groundwater and surface water bodies, (c) the capability of easily managing data on withdrawals of water, reservoir operation and environmental flow. MOBIDIC-WRM can be used as an effective tool for the evaluation of basin scenarios (e.g. effects of changes in land cover/deforestation and irrigation strategies, exploitation policies for groundwater). It provides a reliable hydrological base for the assessment of crisis indicators such as vegetation stress and lack of environmental flow. In this work we present an application in the Arno basin, central Italy. The outcome of applying the package in order to determine the water budget management strategies is discussed.

Key words water resources monitoring and control; distributed hydrological models; remote-sensing; soil-atmosphere fluxes; environmental flow