

# **The MOBIDIC model in the hydrological forecast system of Tuscany Region**

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The model MOBIDIC (MOdello di Bilancio Idrologico DIistribuito e Continuo - Distributed and Continuous Model for the Hydrological Balance) is used for the hydrological forecast and monitoring at the Centro Funzionale Regione Toscana. MOBIDIC is a physically-based model that allows the estimation of the components of the hydrologic balance in the subsurface layer, the soil-vegetation system and surface water bodies. In the representation of physical processes, the main innovations with respect to existing models concern the coupling of the water balance in soil and vegetation with surface energy balance (to the benefit of evapotranspiration computation and use of remotely sensed maps of Land Surface Temperature for calibration and validation) and the detailed interaction between groundwater and surface water bodies. In the real-time operational version for hydrological forecast at Centro Funzionale Regione Toscana, new modeling schemes and algorithms have been added, as well as specific modules for the integration of MOBIDIC into the Centro Funzionale data flow system (i.e. processing of Quantitative Precipitation Forecasts from four different meteorological models, real-time assimilation of data from the hydrometeorological network). Current research activities regarding the model include a new parameterization of soil hydraulic properties and experiments on advanced assimilation techniques.