



## **Hydronomeas: A water resources planning and management software system**

**A. Efstratiadis** (1), G. Karavokiros (1), and D. Koutsoyiannis (1)

(1) Department of Water Resources, School of Civil Engineering, National Technical University of Athens, Greece. [Contact Email: andreas@itia.ntua.gr /Fax: +30 210 7722832]

Hydronomeas is an operational software tool for the management of complex water resource systems. It is suitable to a wide range of hydrosystems, incorporating numerous physical, operational, administrative and environmental aspects of integrated river basin management. The mathematical framework follows the parameterisation-simulation-optimisation scheme; simulation is applied to faithfully represent the system operation, expressed in the form of parametric management rules, whereas optimisation is applied to derive the optimal management policy, which simultaneously minimises the risk and cost of decision-making. Hydrological inflows are synthetically generated, thus providing stochastic predictions for all system outputs (reservoir storages and withdrawals). Real economic criteria in addition to virtual costs are appropriately assigned to preserve the physical constraints and water use priorities, ensuring also the lowest-energy transportation path of water from the sources to the consumption. Hydronomeas is developed to operate within the framework of a decision support system, with a graphical user interface allowing users to create any configuration of hydrosystems consisting of reservoirs, groundwater facilities, pumping and hydropower stations, aqueduct networks, demand points, etc. Data structures are controlled by a database management module, whereas simulation is accompanied by a visualisation module. Results, including the optimal operating rule for each component of the system, the failure probability for each water use, the water and energy balance, as well as prediction curves for all hydrosystem fluxes, are presented in graphical plots. Saved scenarios can also be retrieved in the form of printable reports, which are automatically generated through the database management module. From year 2000, Hydronomeas is the central supporting tool of the Athens Water Supply and Sewage Company (EYDAP).