



Hydromentor: An integrated water resources monitoring and management system at modified semi-arid watersheds

Lampros Vasiliades, Pantelis Sidiropoulos, John Tzabiras, Konstantinos Kokkinos, Marios Spiliotopoulos, George Papaioannou, Chrysostomos Fafoutis, Kalliopi Michailidou, George Tziatzios, Athanasios Loukas, and Nikitas Mylopoulos

University of Thessaly, Dept. of Civil Engineering, Volos, Greece (aloukas@civ.uth.gr)

Natural and engineered water systems interact throughout watersheds and while there is clearly a link between watershed activities and the quantity and quality of water entering the engineered environment, these systems are considered distinct operational systems. As a result, the strategic approach to data management and modeling within the two systems is very different, leading to significant difficulties in integrating the two systems in order to make comprehensive watershed decisions. In this paper, we describe the “HYDROMENTOR” research project, a highly-structured data storage and exchange system that integrates multiple tools and models describing both natural and modified environments, to provide an integrated tool for management of water resources. Our underlying objective in presenting our conceptual design for this water information system is to develop an integrated and automated system that will achieve monitoring and management of the water quantity and quality at watershed level for both surface water (rivers and lakes) and ground water resources (aquifers). The uniqueness of the system is the integrated treatment of the water resources management issue in terms of water quantity and quality in current climate conditions and in future conditions of climatic change. On an operational level, the system provides automated warnings when the availability, use and pollution levels exceed allowable limits pre-set by the management authorities. Decision making with respect to the apportionment of water use by surface and ground water resources are aided through this system, while the relationship between the polluting activity of a source to total incoming pollution by sources are determined; this way, the best management practices for dealing with a crisis are proposed. The computational system allows the development and application of actions, interventions and policies (alternative management scenarios) so that the impacts of climate change in quantity, quality and use of water resources could be evaluated and managed.

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