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# Using open source software for the supervision and management of the water resources system of Athens

S. Kozanis (1), A. Christofides (1), A. Efstratiadis (1), A. Koukouvinos (1), G. Karavokiros (1), N. Mamassis (1), D. Koutsoyiannis (1), and D. Nikolopoulos (2)

(1) National Technical University of Athens, Department of Water Resources and Environmental Engineering, (2) EYDAP SA, Athens Water Supply and Sewerage Company

The water supply of Athens, Greece, is implemented through a complex water resource system, extending over an area of around 4 000 km$^2$ and including surface water and groundwater resources. It incorporates four reservoirs, 350 km of main aqueducts, 15 pumping stations, more than 100 boreholes and 5 small hydropower plants. The system is run by the Athens Water Supply and Sewerage Company (EYDAP)

Over more than 10 years we have developed, information technology tools such as GIS, database and decision support systems, to assist the management of the system. Among the software components, "Enhydris", a web application for the visualization and management of geographical and hydrometeorological data, and "Hydrognomon", a data analysis and processing tool, are now free software. Enhydris is entirely based on free software technologies such as Python, Django, PostgreSQL, and JQuery. We also created http://openmeteo.org/, a web site hosting our free software products as well as a free database system devoted to the dissemination of free data.

In particular, "Enhydris" is used for the management of the hydrometeorological stations and the major hydraulic structures (aqueducts, reservoirs, boreholes, etc.), as well as for the retrieval of time series, online graphs etc. For the specific needs of EYDAP, additional GIS functionality was introduced for the display and monitoring of the water supply network. This functionality is also implemented as free software and can be reused in similar projects.

Except for "Hydrognomon" and "Enhydris", we have developed a number of advanced modeling applications, which are also generic-purpose tools that have been used for a long time to provide decision support for the water resource system of Athens. These are "Hydronomeas", which optimizes the operation of complex water resource systems, based on a stochastic simulation framework, "Castalia", which implements the generation of synthetic time series, and "Hydrogeios", which employs conjunctive hydrological and hydrogeological simulation, with emphasis to human-modified river basins. These tools are currently available as executable files that are free for download though the ITIA web site (http://itia.ntua.gr/). Currently, we are working towards releasing their source code as well, through making them free software, after some licensing issues are resolved.