



J-Hydro, an implementation of the digital watershed concept

R Rigon (1), D Giacomelli (1), A Antonello (2), E Ghesla (1), S Franceschi (2)

(1) Università di Trento, Dipartimento di Ingegneria Civile ed Ambientale/ CUDAM, (2) Hydrologis S.r.l.

Recently projects like CUAHSI bring to the attention of the community the needs for the definition of the digital watershed concept, i.e. of a computer framework in which collect and organize catchments data and models, and provided a few design guidelines. The guidelines have an abstract design and, in principle can be realized in different ways. However the examples provided have clear reference to commercial products. This is instead a completely Open Source implementation of those ideas based on the JGrass GIS, HSQL, Posgresql-Postgis and an OpenMi based internal command structure. HSQL serves as internal database to JGrass, Posgresql-Postgis as a server database and the OpenMI standards (implemented in Java) are used to connect commands in cascade. A part of the deployment details, the J-Hydro scheme starts from the hierarchical partitioning of a river basins in subcatchments which extends the Pfafstetter method and any hierarchical level of the river remains present in this partition in order to be able to access the river networks data at different level of resolution. In practice, tools are implemented to extract the river network from a DEM and produce derived shapefiles and/or to elaborate existing shapefiles which parts are stored in the database(s). The river network hierarchy, in turn, identifies a basin partition, and is used to indexes other features (as monitoring stations) present in the basins. In parallel a set of hydrological and geomorphological models was implemented in such a way that they can be executed for any subbasin inside the basin. In fact J-Hydro provides tools for semi-automatically preparing the necessary data sets (when present) to feed the simulations.