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eLac – Conceptual Model for Flood Management

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This article reviews the conceptual model of the decision support system (DSS) for flood management activities introduced in the scope of e-LAC project. Following the general system architecture which has an emphasize on the water management decision processes, hydrologic and hydraulic models are introduced and discussed according to their specific DSS integration potential.

Three directions are discussed in dedicated sections corresponding to the main modules defined in the conceptual model : the Water Basin Management Module (mainly implements the management decision flow, but manages also data exchange between hydrologic modeling module and hydraulic modeling module, allow real time visualization for hydrological data), the Hydrologic Modeling Module (manages all the modeling functionalities of rainfalls - runoff processes, providing continuous hydrologic forecasts with a variable time-step depending on the actual basin situation) and the Hydraulic Modeling Module (computes the flood's waves routing having as boundary upstream conditions the discharge hydrographs, generated both by catchment's upper area, river tributaries and inter-basins, respectively the rating curves, water level hydrograph or water surface slope as downstream condition).

The GIS concepts are contextually reviewed based on their use as geospatial database for water management modeling, integration within hydrologic time courses, hydraulic modeling (from both software and management perspective), expert knowledge or mathematical modeling results (knowledge database, rules).