



A decision support tool for flash flood control in large dams

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Large dams equipped with appropriate control devices like fully operational spillway gates give change for a variety of strategies during flood control situations. When the reservoir volume is far from the capability to absorb extraordinary inflow volumes, the flow peak attenuation process is strongly affected by the operational criteria followed during the event, and it is certainly a complex task, if not impossible to determine optimal operations in real time. In fact, such task is even difficult under a careful analysis of an historical flood recorded in the past.

Computer applications incorporating real time hydrological and hydraulic information for a real world system can be of great help to improve actions to be taken during the occurrence of a flood. Such tools should handle gaps and errors in the received real time data, complete and aggregate it to the most convenient time intervals. Additionally, they should provide in real time simple and clear graphs informing of the present state of the system through the most relevant and informative variables, such as past inflows to the reservoir, reservoir level, past and future discharges depending on possible gate operations for the coming hours and meteorological predictions and associated inflow predictions for the next hours.

An application including such features is presented herein, developed for a large dam located in the South West of Spain. The dam has three radial gates with a total discharge capacity of 1400 m³/s, and reservoir capacity of 59 million m³. Main components of the essential computer routines are described, including real time data pre-processing (10-min rainfall, water level sensors in reservoir and gates openings), inflow estimation, hydraulic calculus and hydrological real time forecasts.