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Small farms dams modelling in highly anthropized basins : case of the Garonne catchment in the South-West of France

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Abstract:

One of the aims of the REGARD project is to evaluate the influence of human activities in the modelling of water resources in the South-West of France, at the scale of the Garonne Watershed (~55 000 km²). Since 2009 the French government introduced a new regulation of agricultural water withdrawals, to avoid regular crisis due to water resources issues. Our approach consists in accounting for small farm dams in the Safran-Isba-Modcou (SIM) model and to evaluate their impact on river discharges. Several scenarios with different volume capacities, filling catchment sizes and filling periods were tested to assess how the aquifer water supply is delayed by these reservoirs filled by surface runoff and infiltration. Evaporation of small farm dams is an important process that is not accounted for in the model. To overcome this lack, preventing small farm dams to be filled several times a year, evaporation was accounted for and evaluated over the basin. The results show the importance of a good knowledge of small farms dams characteristics for size and water supply. We present how a better representation of natural (Alluvial Aquifer) and anthropogenic processes (small farms dams) can improve the performances of the SIM model.

Keywords: *Small Farms dams*; hydrological model; anthropized; water management