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Climate change impact on water resources – Example of an anthropized basin (Llobregat, Spain)

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The impact of climate change is one of the central topics of study by water agencies and companies. Indeed, the forecasted increase of atmospheric temperature may change the amount, frequency and intensity of precipitation and affect the hydrological cycle: runoff, infiltration, aquifer recharge, etc... Moreover, global change combining climate change but also land use and water demand changes, may cause very important impacts on water availability and quality. Global change scenarios in Spain describe a general trend towards increased temperature and water demand, and reduced precipitation as a result of its geographical situation and socio-economic characteristics.

The European project WATER CHANGE (included in the LIFE + Environment Policy and Governance program) aims to develop a modeling system to assess the Global Change impacts, and their associated uncertainties, on water availability for water supply and water use. Its objective is to help river basin agencies and water companies in their long term planning and in the definition of adaptation measures.

This work presents the results obtained by applying the modelling system to the Llobregat river basin (Spain). This is an anthropized catchment of about 5000 km2, where water resources are used for different purposes, such as drinking water production, agriculture irrigation, industry and hydroelectric energy production. Based on future global change scenarios, the water resources system has been assessed in terms of water deficit and supply. A cost-benefit analysis has also been conducted in order to evaluate every realistic measure that could optimize and improve the system.