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Hydrological study of climate change impact on the Llobregat basin

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Climate change may cause a progressive increase of atmospheric temperature and consequently may change the amount, frequency and intensity of precipitation. All these changes of meteorological variables may modify the water cycle: run-off, infiltration, aquifer recharge, etc... In Spain, climate change scenarios describe a general trend to increase temperature and reduced precipitation. This would result in a reduction of available water between 5 and 14% that can rise to 20-22% for the scenarios of the XXI century (AEMET, 2008).

This work has focused on studying the impacts of climate change in one of the most important basins in Catalonia (Spain), the Llobregat river basin. It is a highly populated and urbanized catchment, where water resources are used for different purposes, such as drinking water production, agriculture irrigation, industry and hydro-electric energy production. This work is part of the European project "Water Change" (included in the LIFE + Environment Policy and Governance program) which deals with medium and long-term water resources modelling as a tool for planning and global change adaptation.

Usually, to study the impact of climate change, future climate scenarios produced by general circulation models (GCMs) are used. To adapt the large-scale information provided by GCMs to a [U+FB01]ner spatial scale required for regional and environmental impact studies, downscaling techniques have been developed. Here, an analogues downscaling method has been applied to simulate daily precipitation projections at rain gauge locations. The HBV hydrological model has been chosen to evaluate the discharges for strategic points (dam, channel and water extractions) in different areas within the watershed. The first results have shown that the water available for supply has a tendency to decrease, implying that measures have to be taken to face the future miss.