



Sensitivity of the hydrological response in a Mediterranean catchment to different climate

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The Climate Induced Changes on the Hydrology of Mediterranean Basins (CLIMB) Project is a multi-institutional research project, funded by 7th EU Framework Programme, which has the main goal of reducing uncertainties in the quantification of climate change impact in Mediterranean basins. Current studies including IPCC indicate, in fact, that the water budget in these areas will be very likely affected by climate change, with severe impacts on agricultural productivity and drinking water supply. One of the CLIMB study sites is the Rio Mannu at Monastir, a 470 Km² catchment located in an agricultural area in southern Sardinia (Italy) with gently rolling topography. In this study, we show preliminary results on the sensitivity of hydrological response in this basin under climatic changes conditions. For this aim, outputs of several climate models are used to force the TIN-based Real-time Integrated Basin Simulator (tRIBS), a fully distributed, physically based model able to continuously simulate hydrological processes occurring in a basin, by explicitly taking into account variability of meteorological forcing and basin properties. We first present results of the calibration effort, based on a relatively limited dataset consisting of: (i) hydrometeorological data available over 26 years in the period 1925-1964 and including daily rain gage observations, daily streamflow data at the outlet and temperature observations from four stations, (ii) a 10-m Digital Elevation Model, (iii) a digitized soil texture map, (iv) the CORINE land cover map. Once calibrated, we use tRIBS to simulate the hydrological response in the Rio Mannu basin, under a number of climate change scenarios, generated by several numerical climate models collected by the PRUDENCE project of the FP5, the ENSEMBLES project of the FP6 and the US project PCMDI/CMIP3. Finally, we present and discuss preliminary comparisons and analysis of the hydrological impacts of the different climatic scenarios.