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## Hydrological response of LULC and climate change in Mediterranean basin: application to the Siliana catchment in Tunisia

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Land use/ Land cover (LULC) and climate change are two main factors affecting watershed hydrology. In this study, combined effects of changes in climate and LULC on hydrological processes are investigated by comparing baseline period (2000-2013) to future conditions (2030-2070) using the Soil and Water Assessment Tool (SWAT) hydrological model in the Siliana catchment in Tunisia.

The LULC future scenarios are modelled using the Cellular Automata (CA)-Markov chain while climate change scenarios were derived from the regional climate models (RCMs) in the coordinated regional climate downscaling experiment (CORDEX-Europe). The (CDF) matching approach with observed precipitation and temperature records is used for bias correction. Subsequently, bias corrected climate projections and LULC future scenarios are fed in the SWAT model to assess changes in catchment hydrology based on a set of hydrological indicators (e.g. monthly discharge and total water availability). Prediction uncertainty related to changes in LULC, climate conditions and SWAT model parameter are also assessed.

A significant decrease in pasture and an increase in irrigated lands will likely shape the future LULC in comparison to the baseline conditions. However, these changes will be combined by a warmer and drier climate and hydrological conditions in the future in the Siliana catchment. By considering only changes in LULC in the reference period, there was a slight reduction in the surface runoff and total available water in the catchment.

**KEYWORDS:** hydrologic response; land use change; climate change; uncertainty; Mediterranean catchment; SWAT model; CA-Markov