

Hydrological alterations in the Adige catchment (Italy)

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Climate change in Alpine areas has been demonstrated to be stronger than in other areas. Here, the impact of increasing temperature and land use change on water resources and flood hazard is already evident. In fact, these changes affect more and more the evapotranspiration dynamics and the hydrological behavior of Alpine catchments, leading to an increasing interest for this issue both by the scientific community and local authorities. Although a number of studies have been published with the aim to identify the consequences and the main drivers of climate change on hydrology, the complex interplay between changes in the climatic forcing and hydrological fluxes in Alpine catchments deserves further investigation. In this work, we analyze long time series of daily discharge and other hydrological parameters in Trentino Alto Adige, and we attempt to identify the drivers controlling the observed changes. Multi-temporal and spatial correlations are used to distinguish between natural variability, direct anthropogenic (e.g., hydropeaking), and land use change effects. Moreover, changes of the coefficients of variation (indexes of variability) of discharge are detected. The results show interesting spatial patterns of changes, indicating that resilience to changes is not uniformly distributed along the catchment and depends on local conditions.