



Long term statistics of riverflow in the Italian Alps: climatic or land use changes?

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Riverflow time series are far from being stationary and always experienced changes in the past, also dramatic in long time horizons. In recent years it seems that both climatic and anthropogenic factors are accelerating the variability of hydrological processes. It is not clear, however, whether climatic or anthropic factors, as land use changes and modifications of agricultural practices represent the major forcing to the hydrological cycle. Long term statistics of riverflow for four major Italian rivers in the Central Alps are presented and compared with precipitation, temperature, land use and glacierised areas data. It is shown that for some rivers the increased agricultural water demand and land use changes might be a major source of non stationarity, possibly more relevant than meteorological ones.

Another natural feedback is discussed which is being observed also at the global scale: the natural afforestation occurring, at least in Europe, over the last two centuries. Increase of forested areas for the Adige riverbasin since mid XIX century and comparison with today's conditions are shown. This afforestation process can play a major role in regulating the hydrological cycle, mitigating flood and drought extremes, but also enhancing evapotranspiration losses and thus reducing runoff volumes. This can be one of the most relevant reason of the decreasing trends observed for all the four rivers since early XX century, most of them being significant on a statistical basis.