



## **Coupling scenarios of climate and land use change with assessments of ecosystem services at river basin scale**

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Climate change and human interventions are modifying freshwater-related ecosystem services on both supply and demand side. A better understanding of the dynamic of these services, driven by the interactions among above-mentioned factors, could bring benefits to water resources management and society. In this work, we develop an integrated modeling approach, driving the Integrated Valuation of Ecosystem Services and Tradeoffs model (InVEST) with future projections of climate and land use data until 2050. Scenarios are developed by Euro-Mediterranean Center on Climate Change (CMCC) considering the more pessimistic, business as usual, RCP8.5. The core outcomes are set of maps and indicators to quantify the alterations in water availability and in quality such as annual average water yield and nutrient retention. This approach is tested in the case study of the Taro River basin (Emilia Romagna Region), within the activities of INTERREG-CE PROLINE project (<https://bit.ly/2JGH1Gm>). Preliminary results demonstrate that different ecosystem services respond differently to climate and land use change, i.e. reductions up to 32% for water yield service expected driven by increases in evapotranspiration demand and changes in rainfall patterns; and mean increases of about 4% for nutrient retention service. Moreover, the rate of change results different over time with maximum changes between 2020-2030 and slower changes afterwards. Finally, the responses are sensitive to the distribution of land use, i.e. more changes are found in the urban and agricultural areas while the woodland and meadowland areas are more stable. Ultimately, these results could be used to identify and prioritize the best management practices, balancing the tradeoffs among services and improving the resilience and biodiversity of the freshwater ecosystem at river basin level.