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Long- term discharge variability of the main rivers in the Mediterranean Sea basin

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Rivers discharging into the Mediterranean Sea strongly influences salinity regionally and circulation in the sea. At long-term, river discharge for most of the rivers within the Mediterranean Sea basin have been strongly controlled by human activities such as construction of dams and water use for irrigation. However, a climatic signal on a scale of years to decades can still be observed at the discharge of many of these rivers. This work explores the effects of long-term climate variability over the main rivers that discharge at the Mediterranean Sea using observed time series long enough to provide a reliable information of annual to decadal variability. The studied rivers are Rivers Po, Rhône, Nile, Ebro, Adige, Tiber, Arno, and Moulouya. It is shown that trends in the discharge of most of these rivers have a large human component, but also a strong climatic one. Results enhance that, considering the hydrological year average discharge, Scandinavian Oscillation, and North Atlantic Oscillation, in this order, are climate modes that most influence the discharge of these rivers into the Mediterranean Sea.