

Non-stationary North Atlantic Oscillation forcing on Mediterranean hydrology since the middle Holocene

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The North Atlantic Oscillation (NAO) plays an important role on modern and past climate changes. However, studies suggested the non-stationary NAO behaviors could bias the future climate projections. Here, we present multi-annually resolved multi-proxy records from the northern Mediterranean region. Our records and model simulations indicate insolation-induced millennial non-stationary behaviors of the NAO, with irregularly-spaced hydroclimatic fluctuations of multidecadal-to-multicentennial wet/dry events, especially over the last 3 thousand years. The link of Atlantic climate and tropical Pacific sea surface temperature variations is also observed. Our results provide hints of potentially more frequent and rapid climate change in Atlantic region in the future.