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Multicentennial-scale hydrological changes in the Black Sea and northern Red Sea during the Holocene and the Arctic/North Atlantic Oscillation.

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It is now well accepted that the Arctic Oscillation/North Atlantic Oscillation (AO/NAO), the Northern Hemisphere's dominant mode of atmospheric variability at interannual to interdecadal timescales, exerts a strong influence on mid- and high-latitude continental climate. These changes are particularly evident around the North Atlantic but also considerably affect climates of remote regions, such as Turkey and the Middle East. Comparatively little is however known on the impact and interference of AO/NAO changes beyond the last millennium. Proxy data for past surface ocean properties and continental rainfall based on two high resolution sediment cores from the south-western Black Sea and the northernmost Gulf of Aqaba were used to infer hydrological changes in northern Anatolia and the northern Red Sea region during the last 7,500 years. Spatial correlations of the AO/NAO index with instrumental records of precipitation demonstrate that AO/NAO presently affects these regions in an opposite manner. In the south-western Black Sea sediments are annually laminated, with frequent intercalations of homogeneous clay layers which are interpreted as suspension fallout events from the Sakarya river plume related to increased winter-rain in western Anatolia. The frequency of these layers shows distinct variations on centennial time-scales, which imply long-term changes in Anatolian rainfall throughout the last ca. 7500 years. In the northernmost Gulf of Aqaba, Holocene aridity variations are documented by distinct changes in the eolian dust content. Multi-species stable oxygen isotope data indicate concomitant variations in the local hydrography. These proxy records of hydroclimatic changes in northern Anatolia and the northern Red Sea region show multicentennial scale variations during the last ca. 7,500 years that strongly resemble modern AO/NAO-related temperature and rainfall anomalies sug-

gesting a prominent role of the AO/NAO during the Holocene beyond interannual to interdecadal timescales.