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North Atlantic controls on wintertime warm extremes and aridification trends in the Middle East

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The Middle East is one of the most water stressed regions in the world, receiving the majority of its hydrological input during the winter, in the form of highly variable and scattered precipitation. The persistence of anticyclonic conditions during the cold season can thus result in extended wintertime spells of exceptionally hot weather, favoring the onset of prolonged droughts and ultimately posing a threat to water resources in the region.
Despite their potential impact on water-security, anomalous winter warm spells (WWS's), and their connection to the states of natural prominent climate modes, are still largely unexplored.
We investigate their relationship with the internal modes of variability in the Atlantic Ocean, already known to influence winter circulation and extremes in the Northern Hemisphere. We show that the occurrence of WWS's in the Middle East is strongly correlated with Atlantic variability over decadal time scales. We also propose a teleconnection mechanism linking Atlantic variability to WWS's via the propagation of Rossby waves from the North Atlantic pool, and the mediation of the Mediterranean circulation, thereby providing a basis to better predict future warming and aridification trends in the Middle East.