

EGU24-7568, updated on 25 Jan 2025

<https://doi.org/10.5194/egusphere-egu24-7568>

EGU General Assembly 2024

© Author(s) 2025. This work is distributed under the Creative Commons Attribution 4.0 License.



Mapping UK Drought Teleconnections from Ocean to Land

Amulya Chevuturi¹, Marilena Oltmanns², **Maliko Tanguy**¹, Ben Harvey³, Cecilia Svensson¹, and Jamie Hannaford¹

¹UK Centre for Ecology & Hydrology, Maclean Building, Benson Lane, Wallingford, Oxfordshire OX10 8BB

²National Oceanography Centre, Southampton, UK

³National Centre for Atmospheric Science, Department of Meteorology, University of Reading, Reading, UK

Given the anticipated changes in future UK drought occurrences attributable to climate change, there is an imminent requirement for a thorough understanding of the underlying influences behind UK drought events, particularly the most extreme events. In this context, our study aims to understand the North Atlantic oceanic drivers responsible for drought events in the UK, subsequently tracing the teleconnection pathways that connect these drivers to meteorological and hydrological droughts within the region. We examine the teleconnection pathways associated with drought conditions by assessing the concurrent and lagged statistical links between the UK's standardized precipitation index (SPI) and standardized streamflow index (SSI) and two distinct North Atlantic Sea surface temperature (SST) patterns, which are associated with freshening events. Our findings reveal that these North Atlantic SST patterns exert varying influences on two distinct regions of the UK (northwest and southeast), each of which have distinct hydrometeorological characteristics. The identified SST patterns are linked to the dominant modes of SST variability in the North Atlantic, thereby contributing to the predictability of drought occurrences across seasonal to multi-annual timescales, including at some very long lead times. Our research therefore has significant potential in practical applications for quantifying and managing drought risk, and for advancing drought forecasting and early warning systems through the identification of novel, skilful predictors. Ultimately, our work endeavours to contribute to the progress of sustainable water resource management amidst the escalating drought risks in the UK.