

## **Multi-annual droughts in the water-stressed English Lowlands: long-term variability and climate drivers**

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**Abstract** The English Lowlands is the most populated part of the UK, and parts of the region are already water-stressed. The region is heavily dependent on groundwater resources, and is thus vulnerable to long, multi-annual drought episodes that include dry winters (winter being the time groundwater is replenished). This study uses a range of meteorological and hydrological datasets to characterise multi-annual droughts in the region from 1910 to 2012. As a prelude to a wider study of climate drivers affecting these historical long droughts, the role of ENSO in affecting dry winters in the English Lowlands is investigated. Many historical long droughts are associated with La Niña episodes, although the relationship is complex and more work is required to disentangle the many climatic drivers of multi-annual droughts in this region.

**Key words** drought; UK; precipitation; river flow; groundwater; Standardized Precipitation Index; ENSO