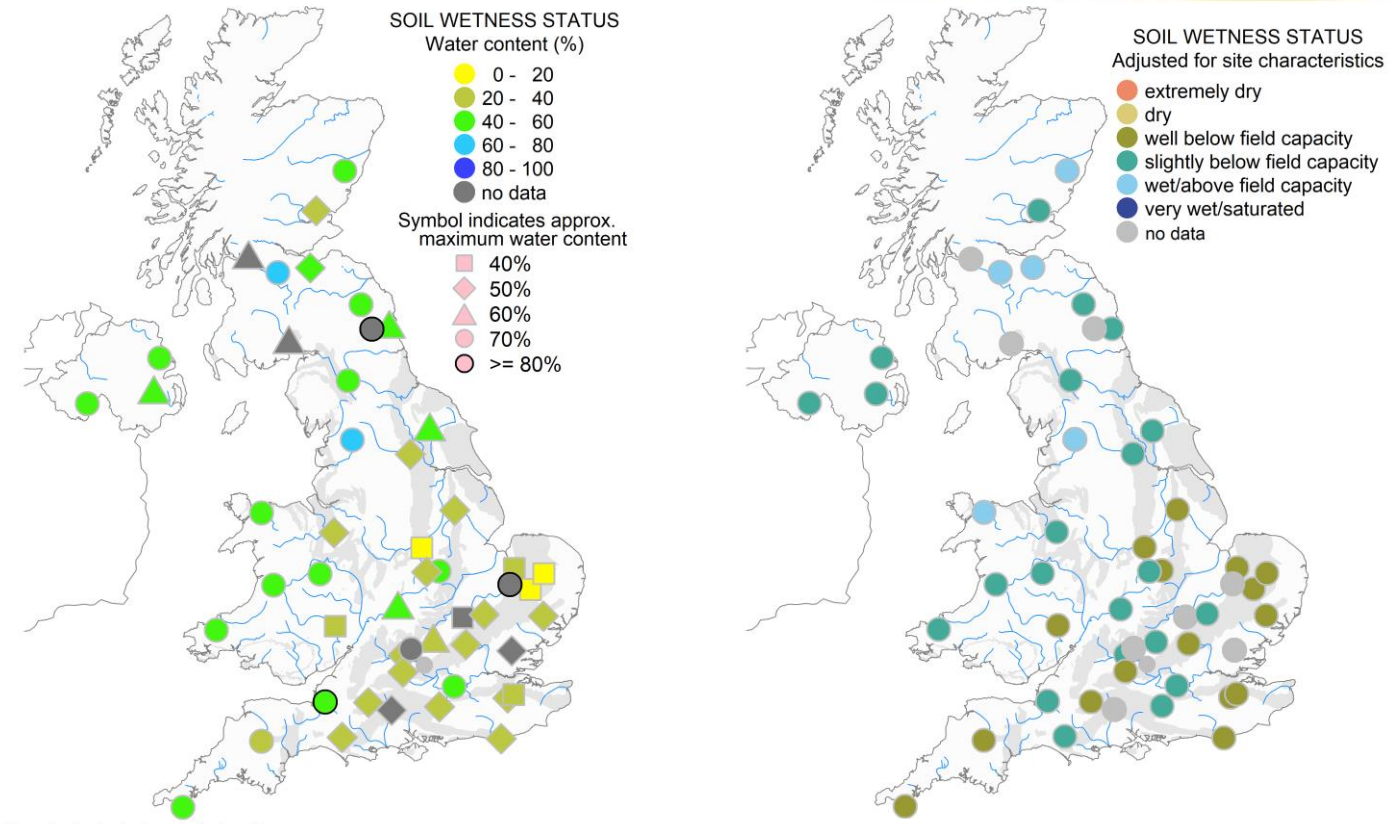
# COSMOS-UK | soil moisture

Issued on 14 April 2025




**Soil moisture on 31 March 2025** (see back page for explanatory comments).

**At the end of March, soil moisture levels across the COSMOS-UK network had dropped to within the normal to dry range due to warmer and drier weather conditions.**

High pressure dominated for most of the month, bringing more settled weather conditions to the UK. It was a very dry month, with provisional data indicating that UK rainfall was 43% of the long-term average. England recorded its sixth driest March on record, Wales its fourth, and Northern Ireland its ninth. It was a warm and sunny month, with mean temperatures 1.3°C above the long-term UK average for March.

Soil moisture conditions across much of the COSMOS-UK network were noticeably drier than the previous month. Although some sites remained within their normal range for this time of year, there was a notable drying trend through the month at most sites (e.g. Chimney Meadows, Fincham, Fivemiletown). Nine sites, predominantly across central and southern England, recorded their lowest average March soil moisture on record: Bunny Park, Elmsett, Euston, Glenwherry, Heytesbury, Holme Lacy, Lullington Heath, North Wyke, and Riseholme. A few sites, such as those in Southern Scotland (e.g. Easter Bush, Hartwood Home), maintained higher soil moisture levels due to some localised rainfall events.

Overall, soil moisture levels dropped from the previous month to within the normal to dry range at most COSMOS-UK sites, in line with the warmer, drier weather conditions. March has been a turning point in the retention of winter soil moisture.

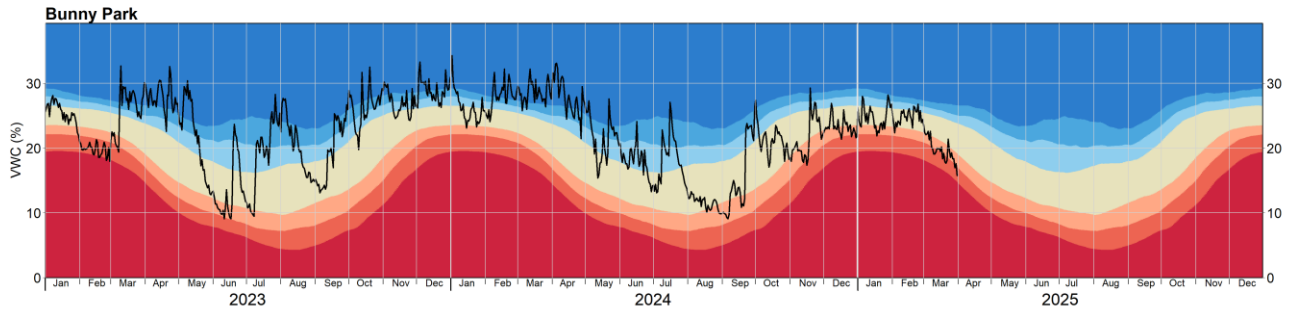
**Network news**

Our annual round of planned preventative maintenance has started, with Stoughton, Loddington, and Moreton Morrell all being visited. Heytesbury was also visited this week to replace a faulty humidity sensor.

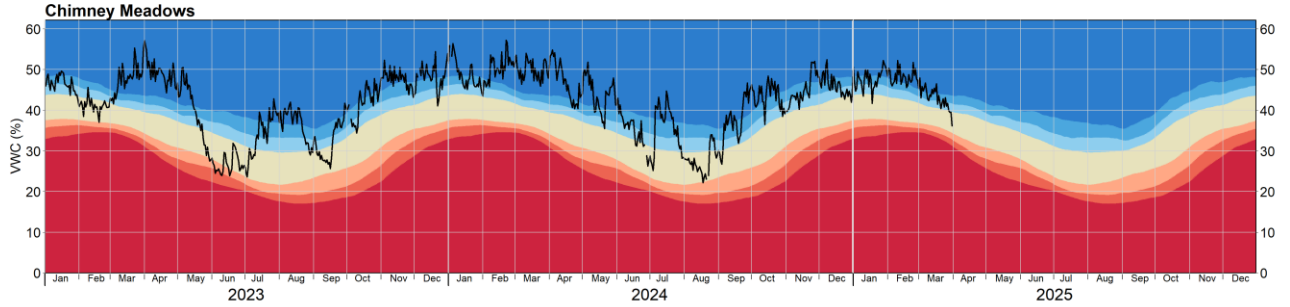
# COSMOS-UK | soil moisture

Issued on 14 April 2025

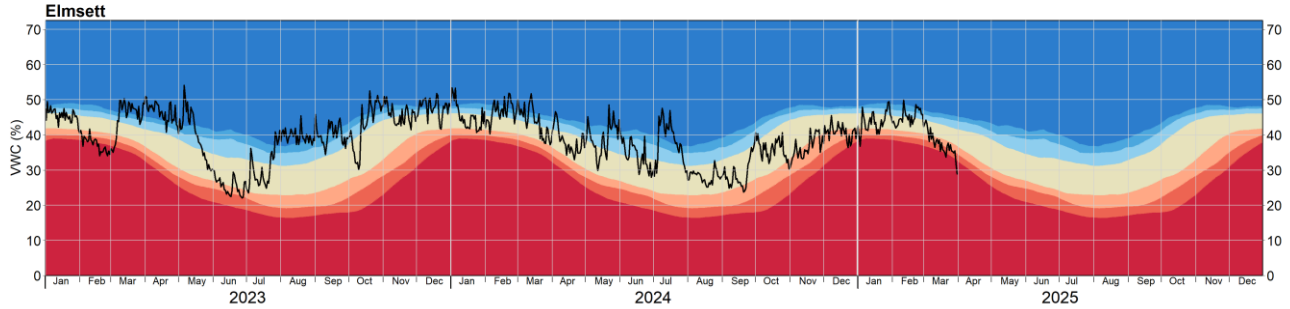
**Bunny Park**



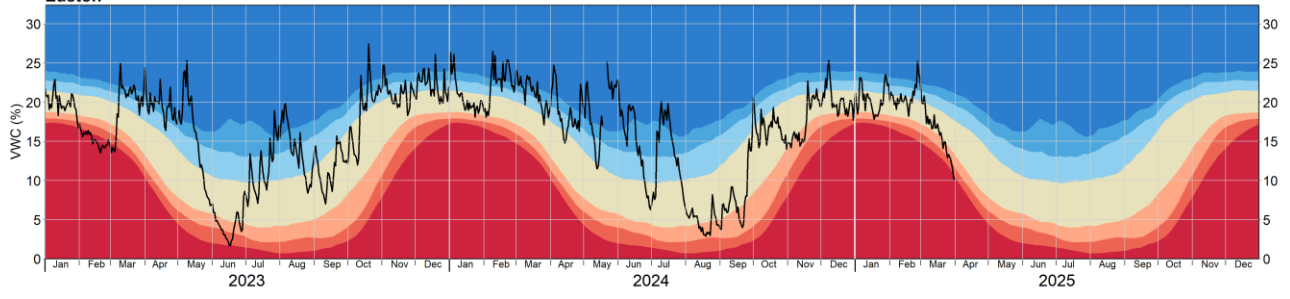

**Chimney Meadows**



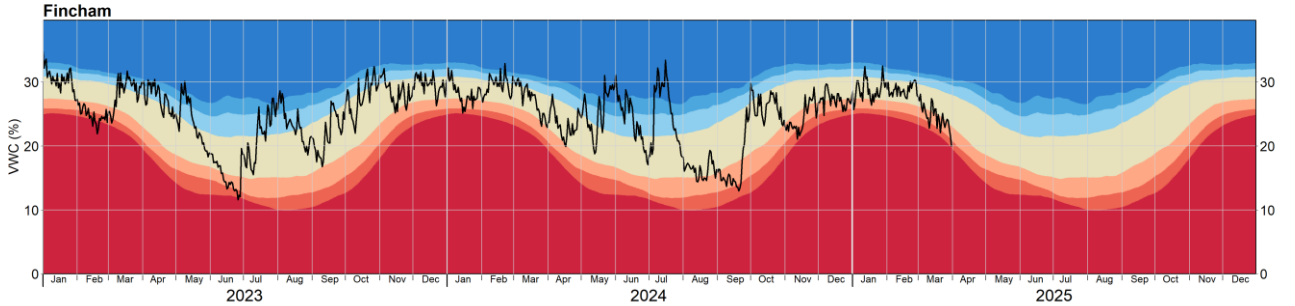

**Elmsett**




**Euston**

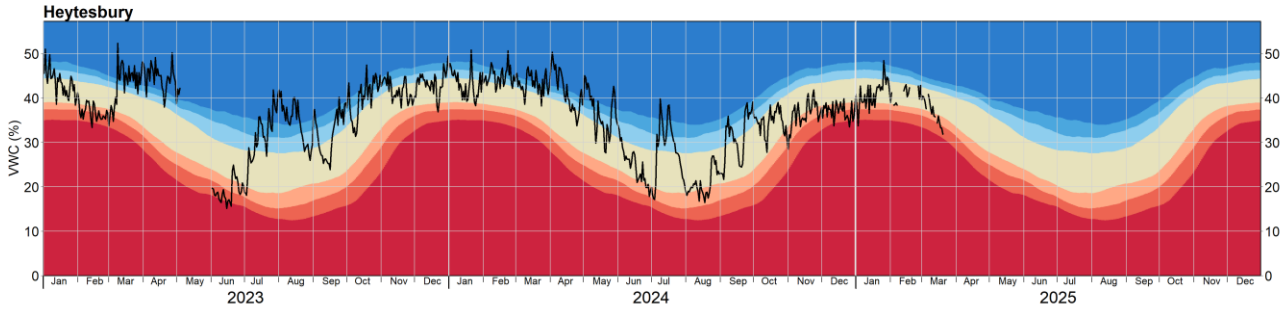


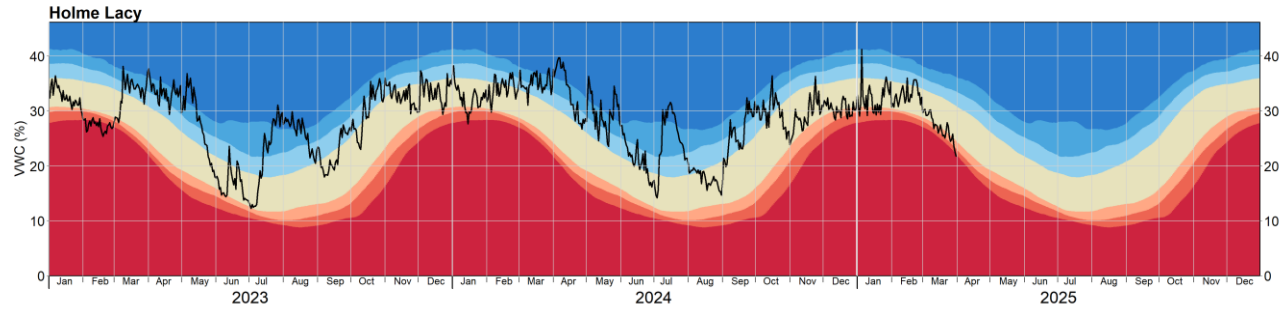

**Fincham**

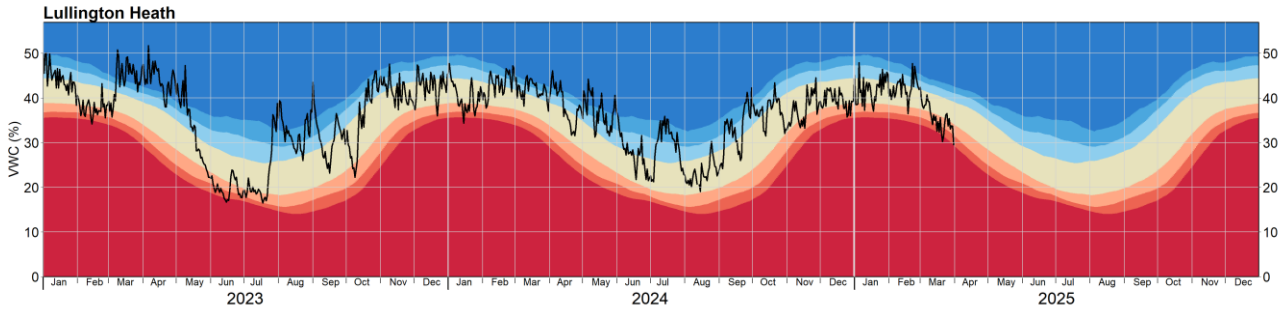


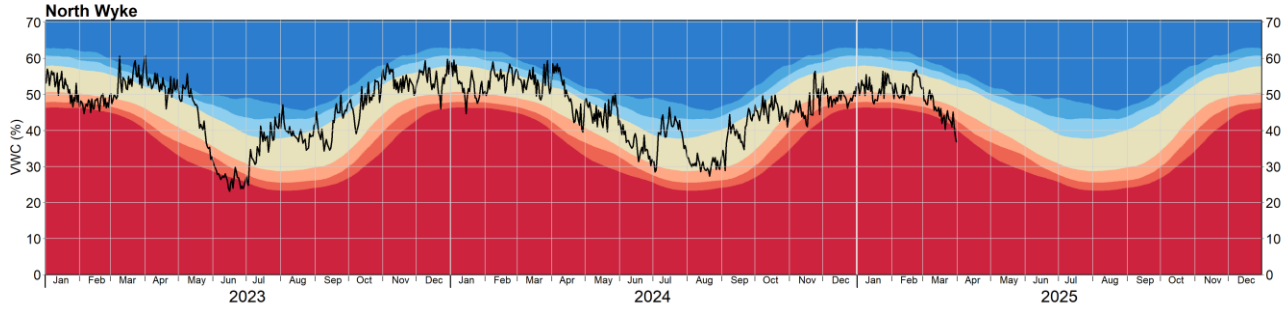
# COSMOS-UK | soil moisture

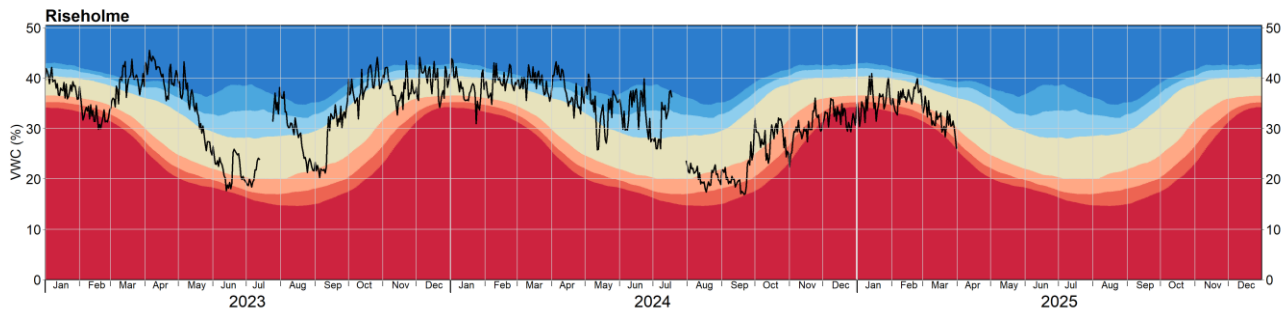
Issued on 14 April 2025



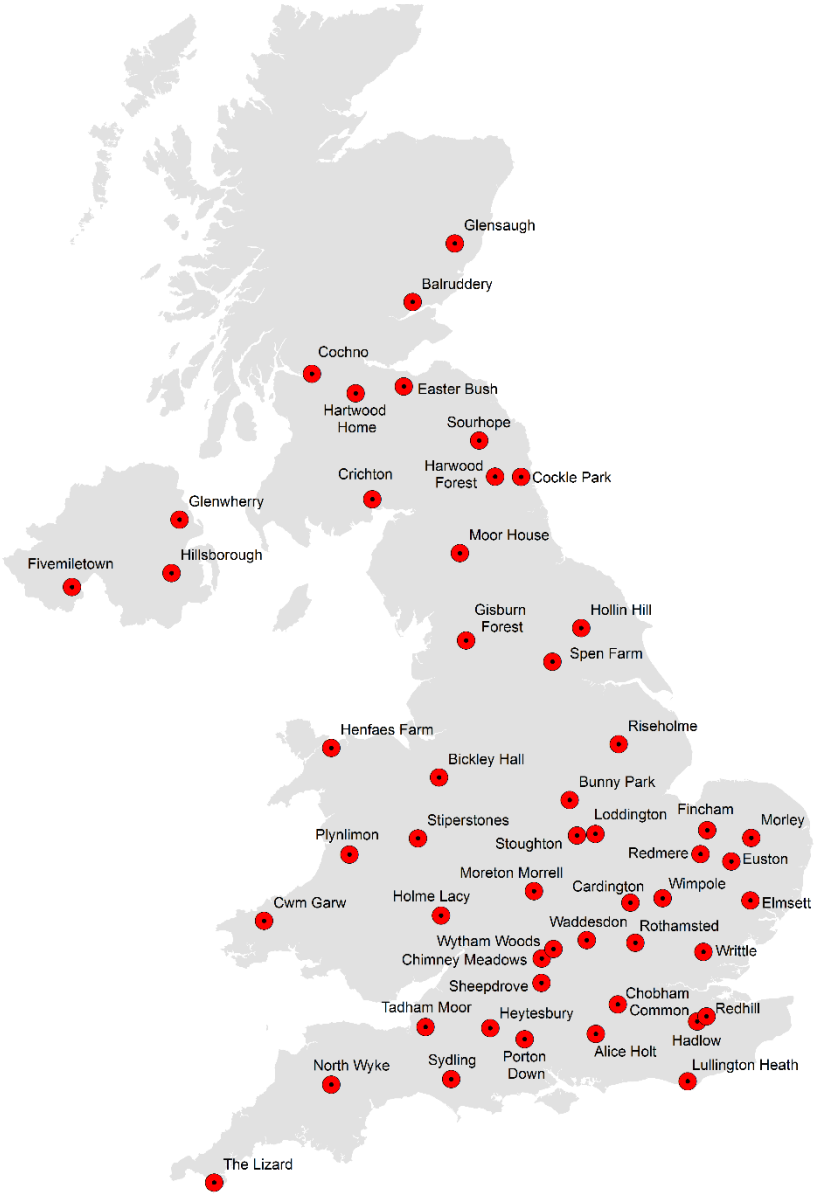



# COSMOS-UK | soil moisture

Issued on 14 April 2025




***About the maps on page 1:*** The maps show daily mean soil moisture on the last day of the month. Colours indicate wetness as in the legends.

The map on the left shows wetness as the volumetric water content (VWC) of the soil which is constrained by soil type, i.e. some soils are able to hold more water than others as indicated by the shape of the symbol.

The map on the right presents soil wetness adjusted for site specific characteristics, i.e. taking account of the possible range of soil wetness at each site. Field capacity (FC) is a key point in this range. When soil moisture is below FC soil moisture is said to be in deficit, i.e. there is a (positive) soil moisture deficit (SMD).

Grey shaded areas on these two maps represent principal aquifers.

***About the graphs on pages 2 and 3:*** The black line shows VWC. The coloured bands indicate how VWC compares to historical variability for the site and time of year.

- exceptionally dry
- notably dry
- drier than normal
- normal
- wetter than normal
- notably wet
- exceptionally wet

***About soil moisture:*** Soil moisture varies in the short term (hours to days) with rainfall and as water drains through the soil. Longer term variation is driven by the seasonal difference between rainfall and evaporation. Thus soil moisture decreases in the summer when evaporation exceeds rainfall but increases when this is reversed. In most winters under UK conditions, soil moisture reaches a relatively constant value, known as the field capacity. Field capacity is a measure of how much water the soil can hold against gravity and is strongly dependent on the soil type. Soils are expected to be around field capacity after being wetted to above field capacity and the excess water (e.g. from macropores) has drained away under gravity, which can take several days after heavy rain, to reach a near steady state. Differences in soil type and weather patterns cause variations in soil moisture between sites including when the soil returns to field capacity in autumn/winter and when soil moisture decreases in the spring/summer.

***About COSMOS-UK:*** COSMOS-UK is supported by the Natural Environment Research Council award number NE/Y006208/1 as part of the UKCEH NC-UK programme delivering National Capability.



UK Centre for Ecology & Hydrology

CosmosUK@ceh.ac.uk
cosmos.ceh.ac.uk