

Soil moisture on 30 April 2025 (see back page for explanatory comments).

At the end of April, soil moisture levels continue to decline, particularly in the South-East, with most of the COSMOS-UK network well below field capacity.

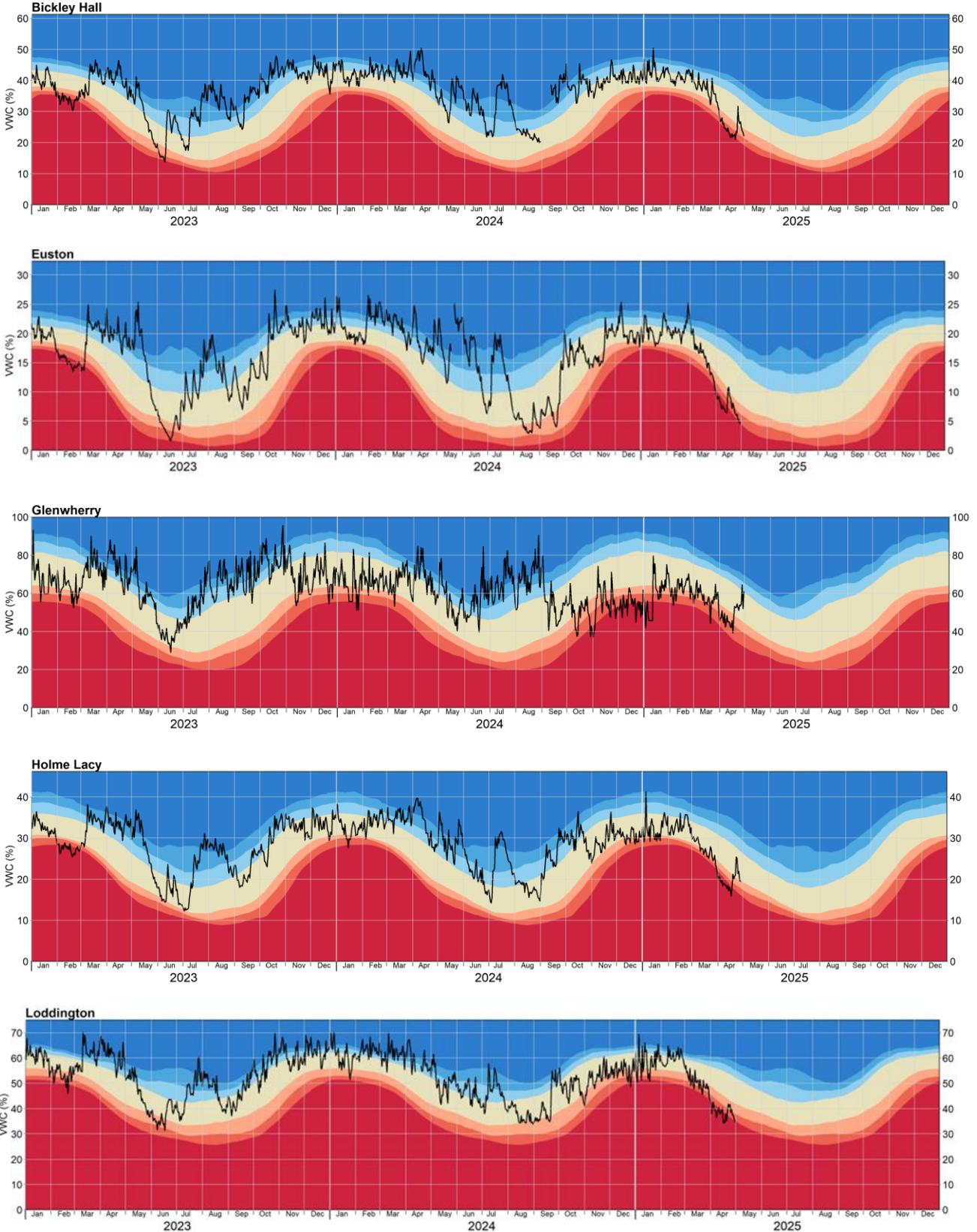
Provisional data indicate that April rainfall totals were below average for much of England, Wales and Scotland. Rainfall was largely absent across the UK for the first half of April. During mid-April, low-pressure conditions brought frontal rain to the UK, particularly Northern Ireland, Scotland and western areas of England and Wales. Settled and dry conditions returned for the rest of the month. Monthly sunshine and temperature were higher than the long-term average, producing the UK's third warmest April on record.

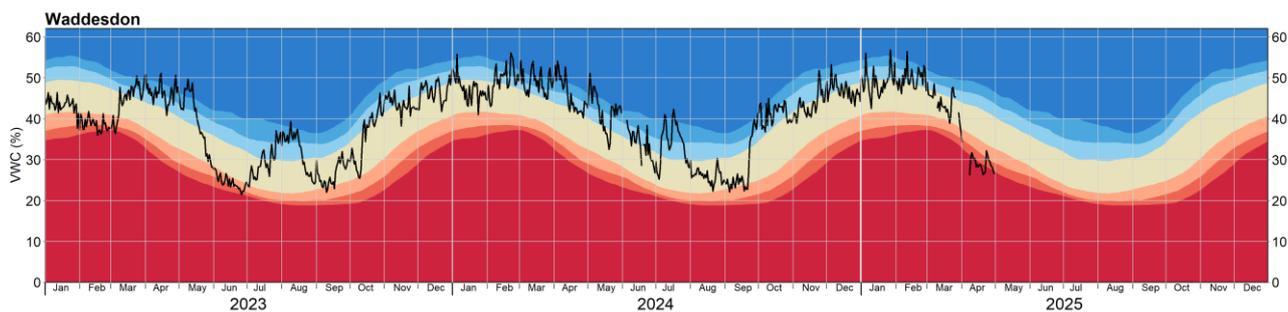
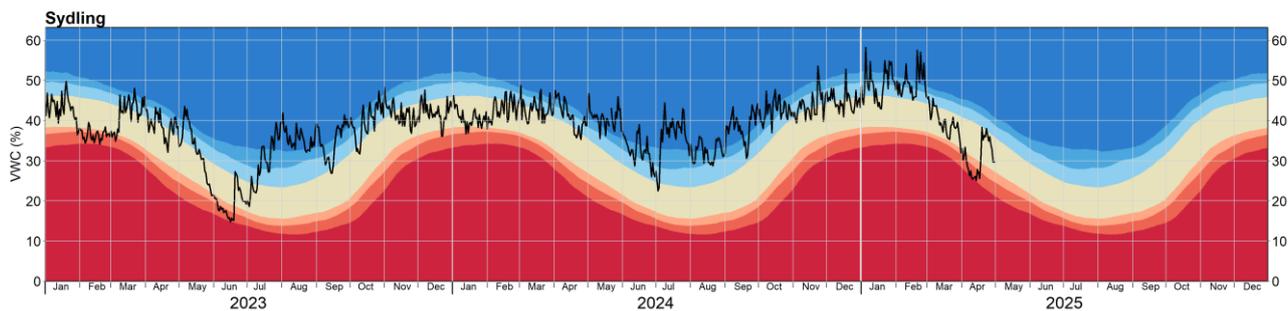
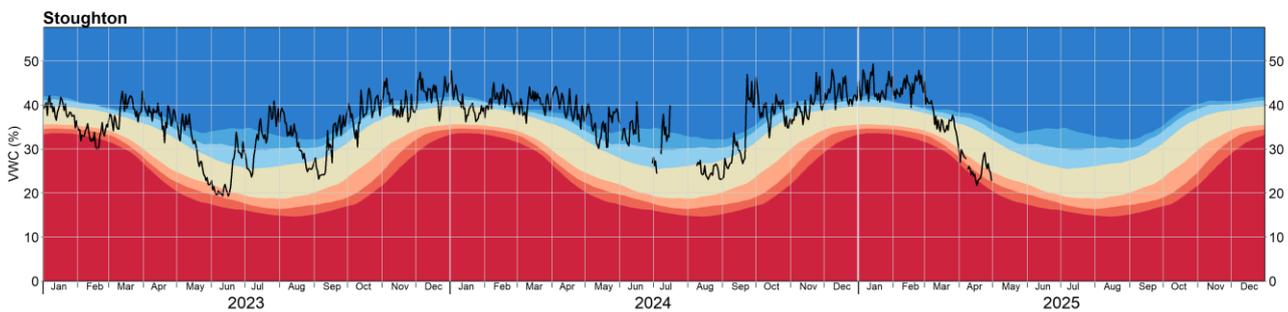
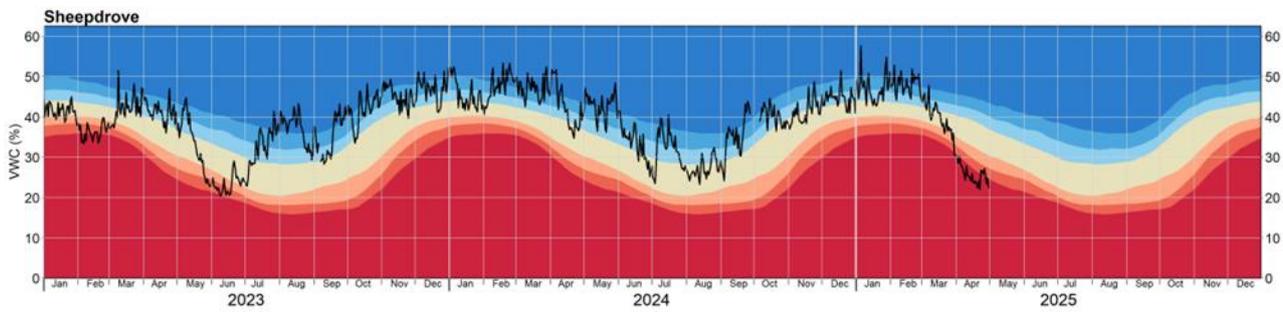
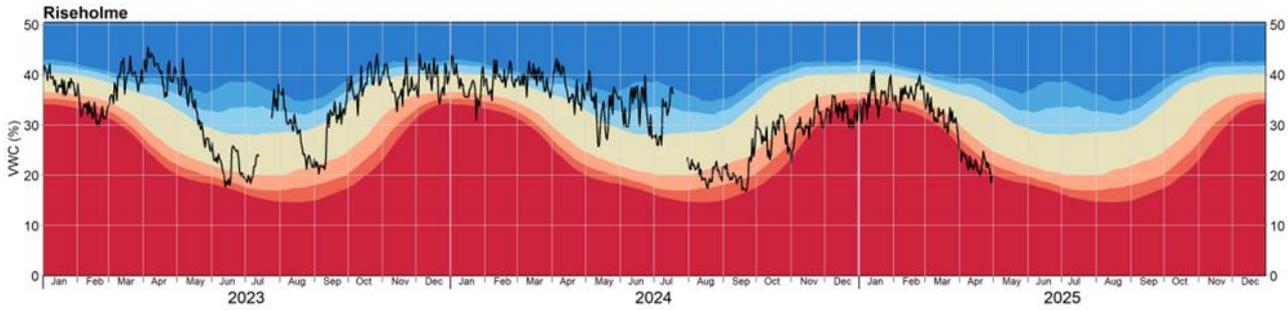
April soil moisture levels were exceptionally low compared with long-term averages across many COSMOS-UK sites, continuing the drying trend from the previous month. Eleven sites across the network, predominantly in the south and east of England, recorded their lowest average April soil moisture on record: Bickley Hall, Euston, Glenwherry, Holme Lacey, Heytesbury, Loddington, Porton Down, Riseholme, Sheepdrove, Stoughton and Waddesdon. The rain in the latter half of April helped some sites in western areas to recharge soil moisture to more normal conditions by the end of the month, e.g. Glenwherry, Hillsborough, Cwm Garw.

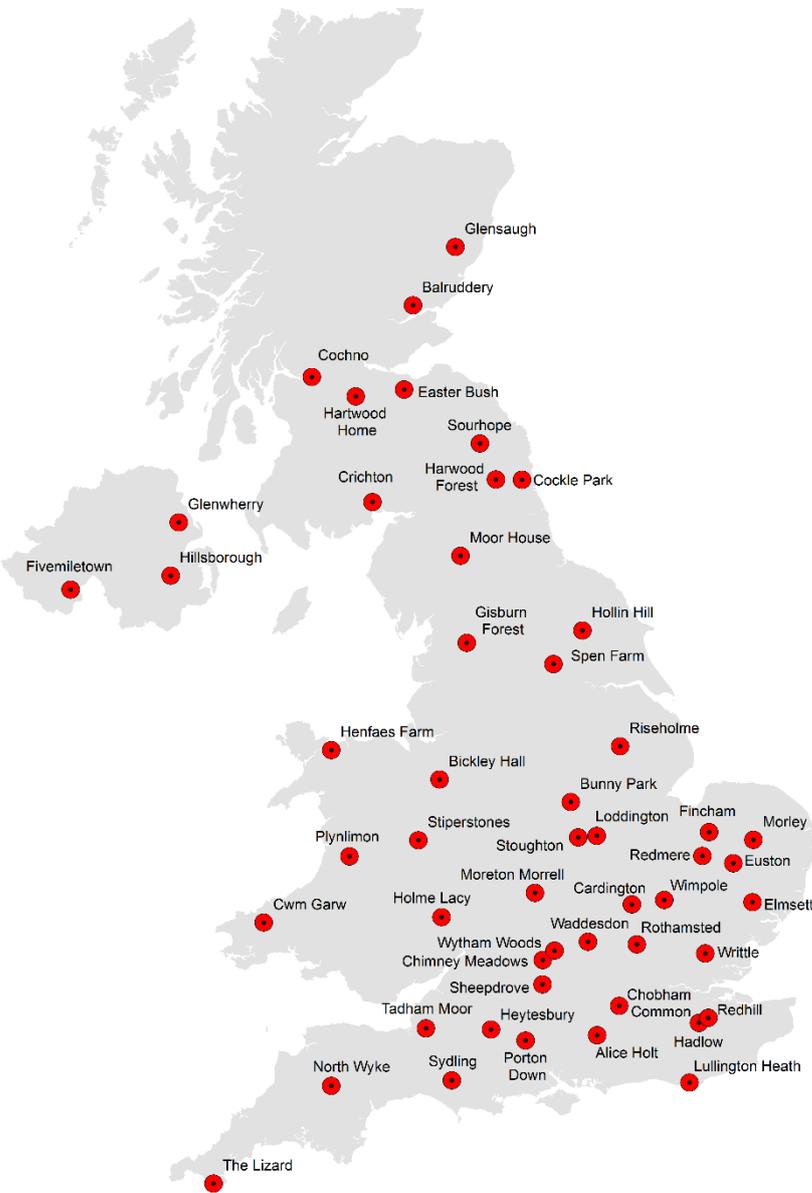
The limited rainfall and warm temperatures pushed many COSMOS-UK sites into drier conditions than usual for this time of year, with soil moisture levels at some sites resembling conditions typically seen in the summer.

Network news

Planned preventative maintenance site visits continue across the network, maintaining the precision and accuracy of COSMOS-UK sensors. A recent site visit to Sheepdrove Farm provided evidence of soil cracking due to the dry conditions.







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/R016429/1 as part of the UK-SCAPE programme delivering National Capability.

