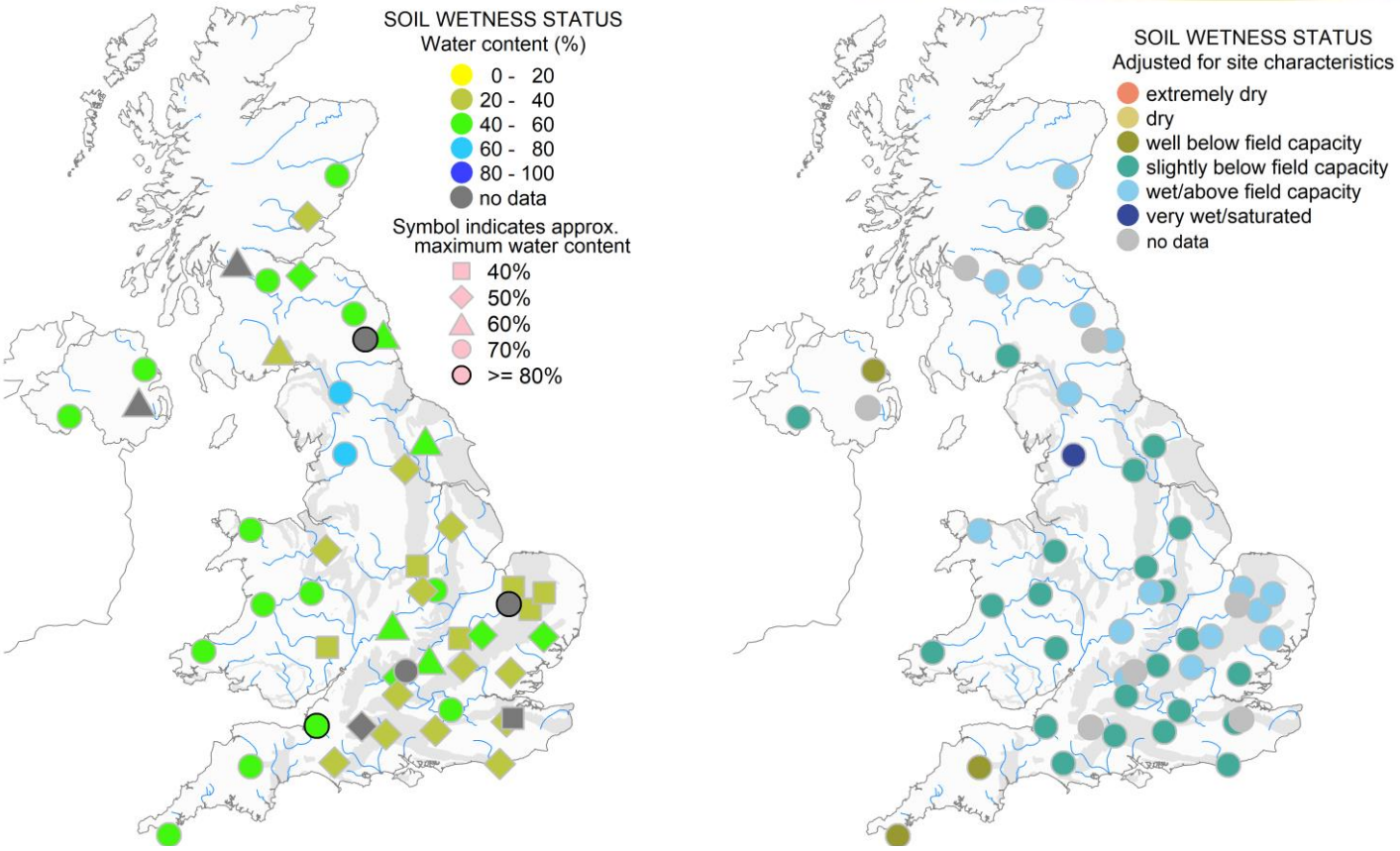
COSMOS-UK | soil moisture

Issued on 13 June 2024



Soil moisture on 31 May 2024 (see back page for explanatory comments).

Notes on the period to 31st May 2024

At the end of May, soil moisture remains high at many COSMOS-UK sites after a wet and mild month.

Provisional data indicate that rainfall in May was slightly above average for the UK, however there was much regional variation. England, Wales, and areas of Southern Scotland were generally wetter than average, whereas Northern Ireland and North-West Scotland were drier than average. The UK had its warmest May on record, particularly influenced by above average temperatures in Scotland and Northern England.

Soil moisture at some sites across Central and Southern England remains generally high (e.g. Lullington Heath, Stoughton and Sydling), whereas other sites are in a more normal range for the time of year (e.g. Chobham Common). Henfaes Farm in Northern Wales is wetter than normal after high rainfall in May, whereas it was a relatively drier month in Southern Wales which corresponded with more normal soil moisture levels at Cwm Garw. Sites in Southern Scotland (e.g. Easter Bush, Hartwood Home) are very wet following a rainy end to the month in this region, continuing a period of high soil moisture at the sites in this region since Winter 2023.

Overall, soil moisture remains generally high for much of the COSMOS-UK network, following a wetter-than-average May and mild temperatures.

Network news

The Pluvio rain gauges have been replaced at Tadham Moor and North Wyke.

We are aware of problems with the COSMOS-UK API. This is impacting real-time updates, meaning data is only available up to 22 April 2024. Work is currently underway to resolve these problems.

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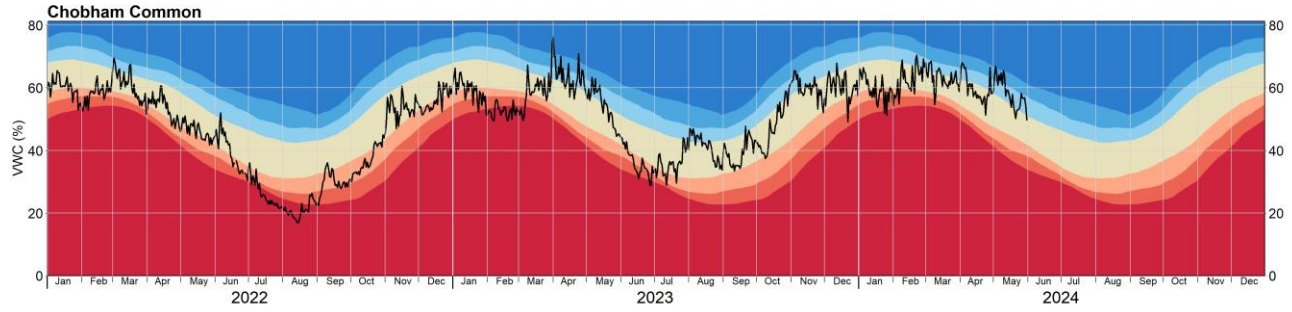

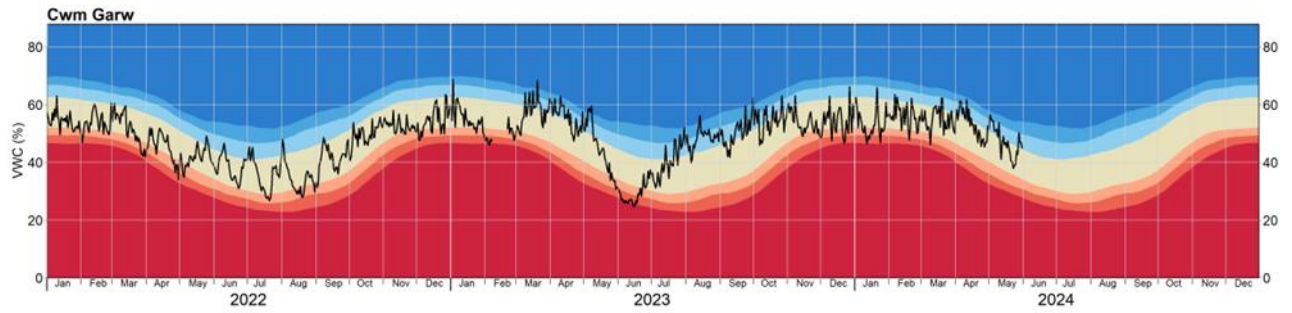

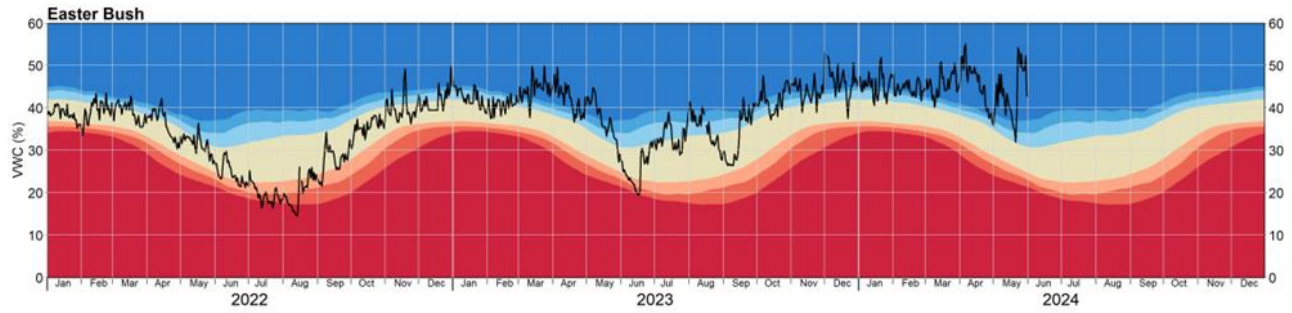

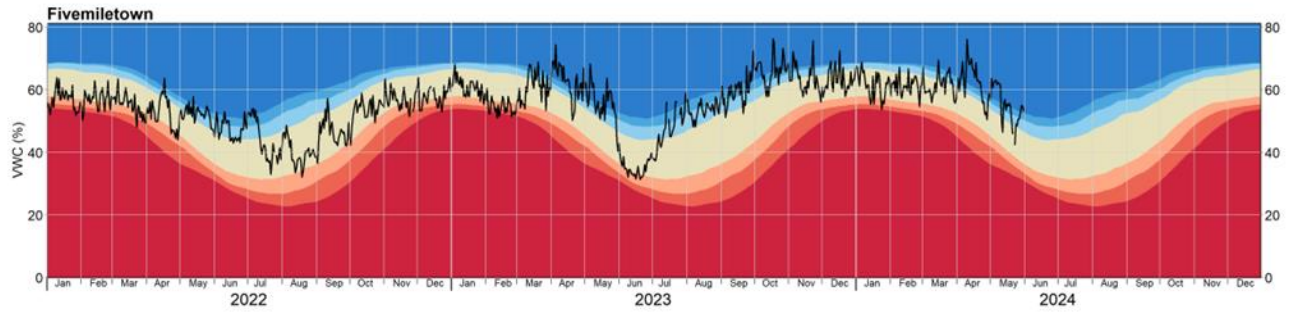

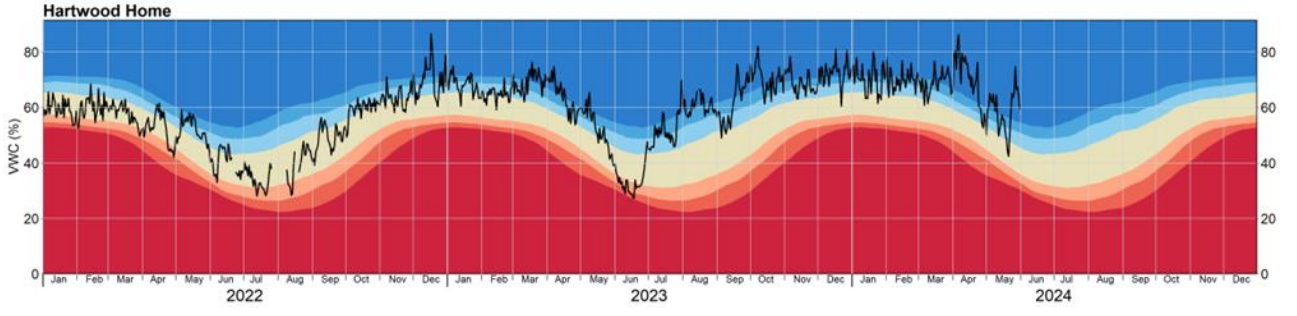

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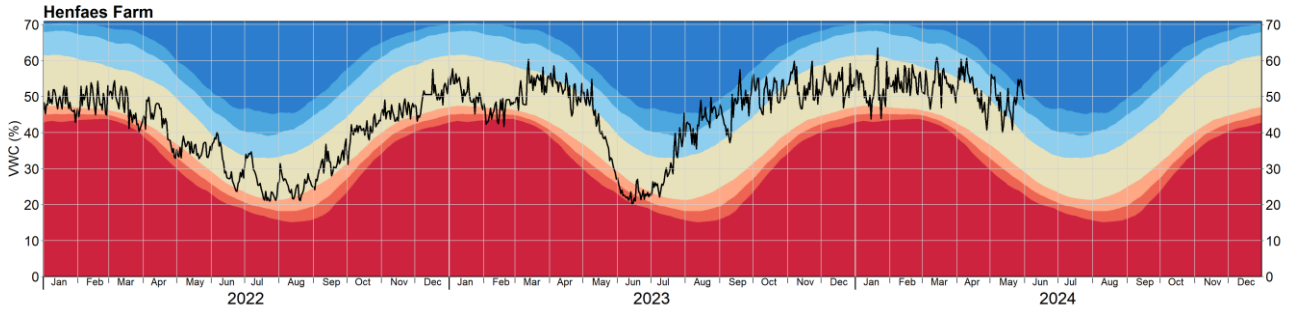

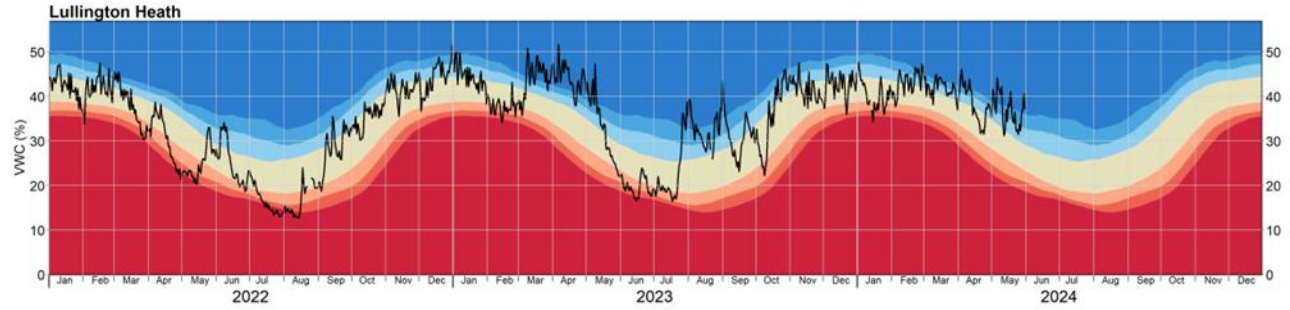

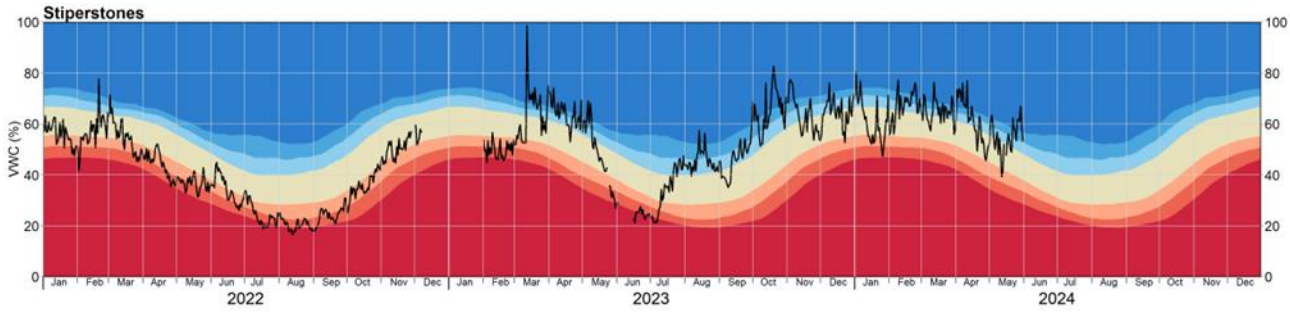

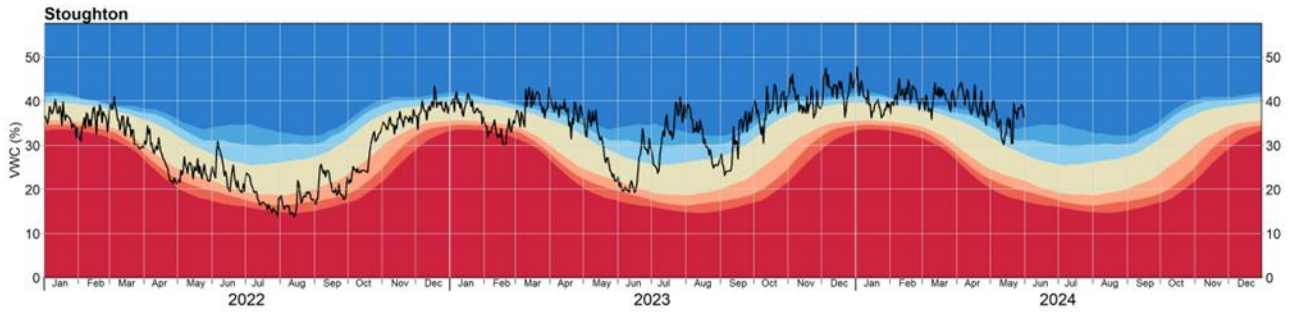

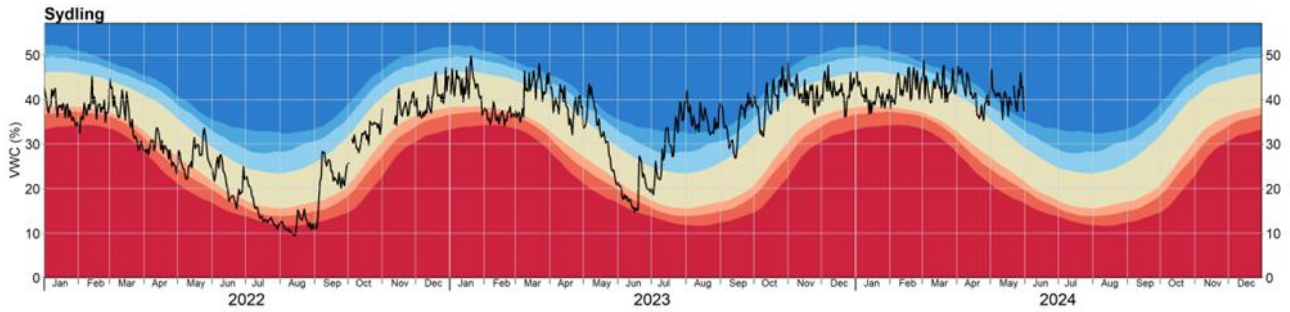

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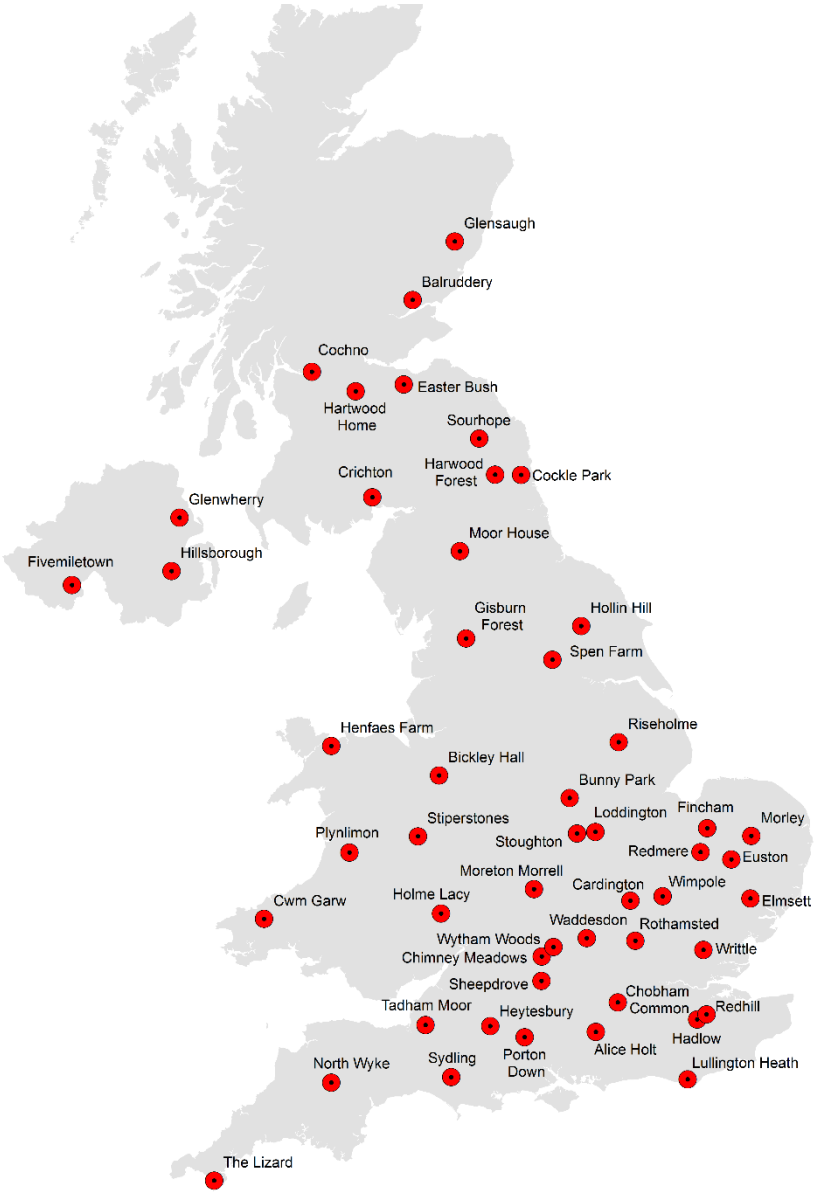

About the maps on page 1: The maps show daily mean soil moisture on the last day of the month. Colours indicate wetness as in the legends.

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.

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