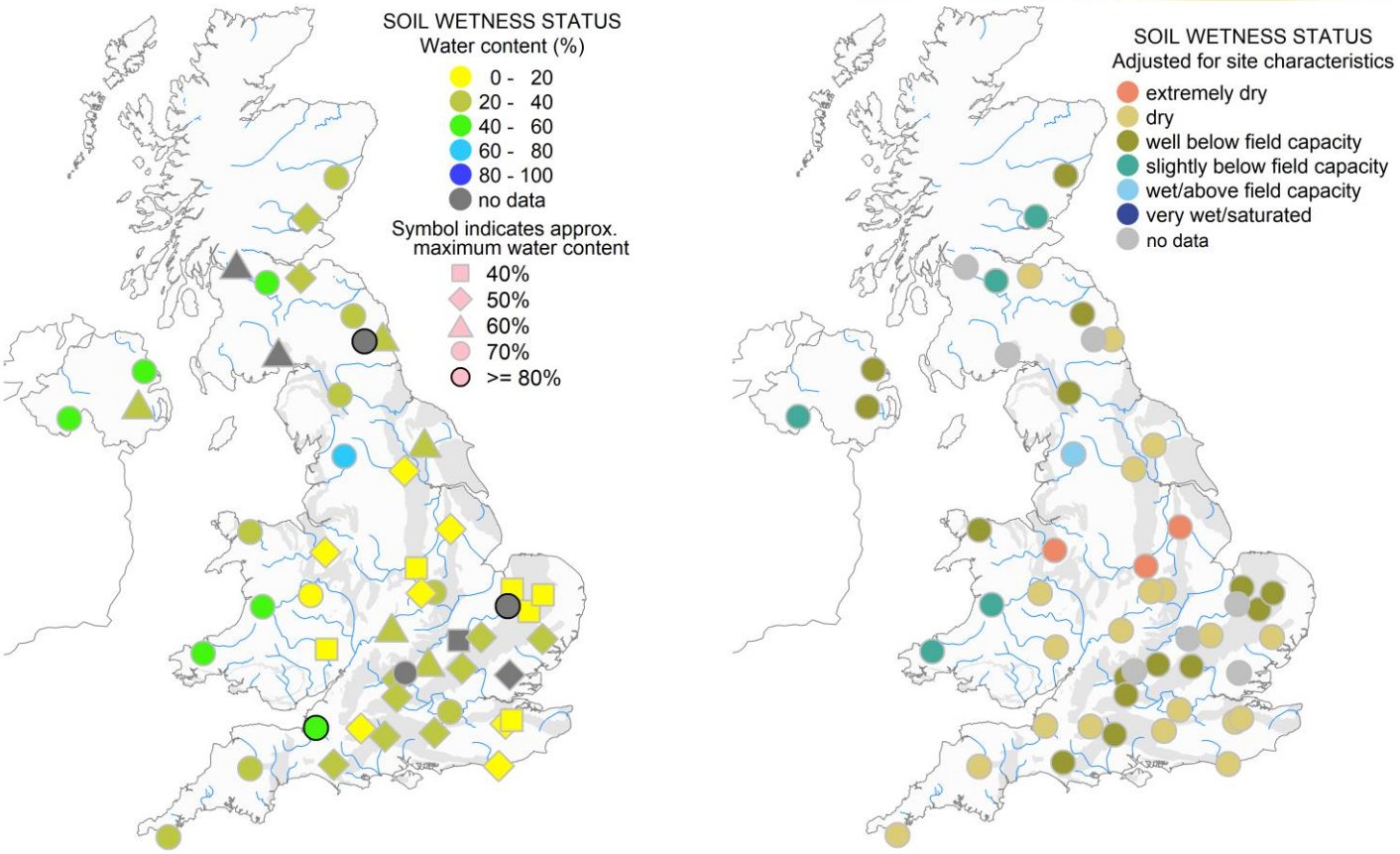
COSMOS-UK | soil moisture

Issued on 15 September 2025



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

Despite some recovery in July, soil moisture levels across the COSMOS-UK network remained dry at many sites throughout August, reflecting below-average rainfall and warm temperatures.

Provisional data indicate that total UK rainfall was below the long-term average, though distribution was highly variable. Scotland and Northern Ireland received around three-quarters of the average (73%), while England and Wales received less than half (42%). Storm Floris brought heavy rain and strong winds to northern Scotland at the start of the month. Many parts of central and eastern England experienced a mid-August heatwave. Mean UK temperatures were 1.2 °C above the long-term average, with summer 2025 provisionally the warmest on record.

Soil moisture conditions across the COSMOS-UK network were generally below normal for the time of year, with regional differences reflecting contrasting rainfall and temperature patterns. Nine COSMOS-UK sites, spread across the country, recorded their driest August soil moisture levels since their monitoring began. Bickley and Bunny remained very dry throughout, while sites such as Cockle Park, Easter Bush, Elmsett, Glensaugh, and Moor House became gradually drier as the month progressed. Others, including Hillsborough, Holme Lacy, and Wimpole, became drier mid-month but recovered back into the normal range by the end.

Overall, below-average rainfall and warm temperatures have resulted in soils drying out at many sites, following July's brief recovery. Wetter soils were generally limited to northerly and westerly regions.

Network news

The second round of planned preventive maintenance is nearing completion, with a final site visit to Wimpole scheduled for 9th September. Actual evaporation data across the network is intended for ingestion in the coming months.

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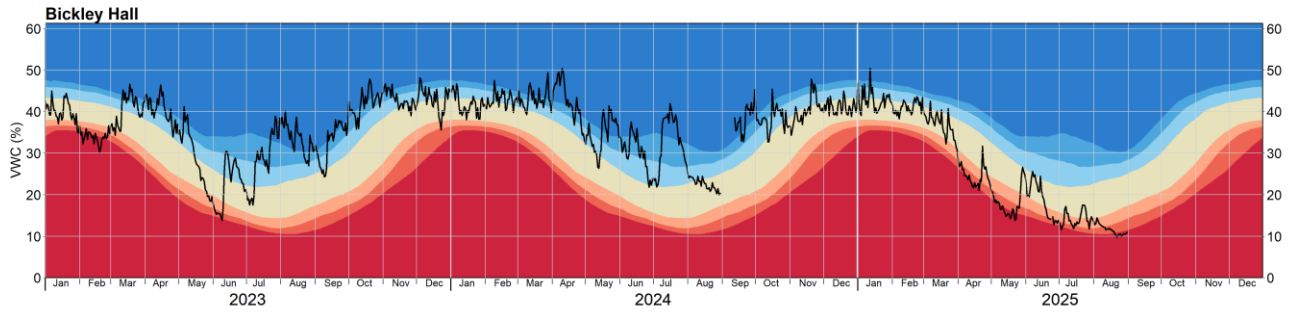

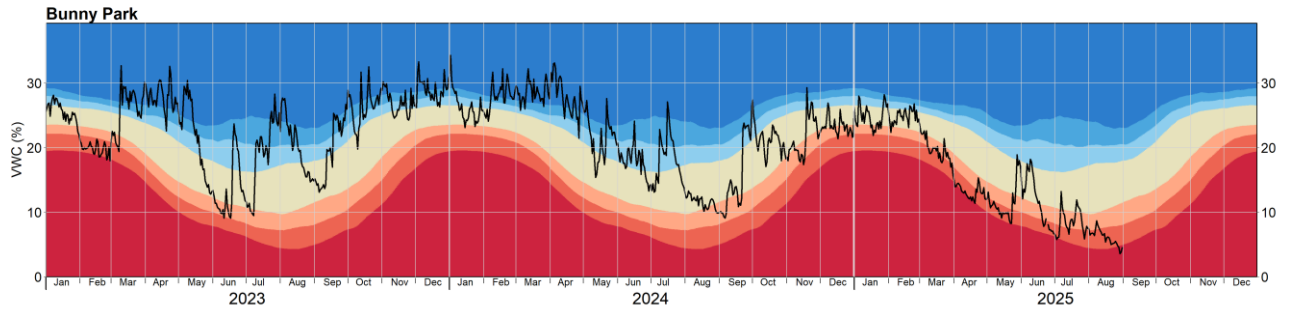

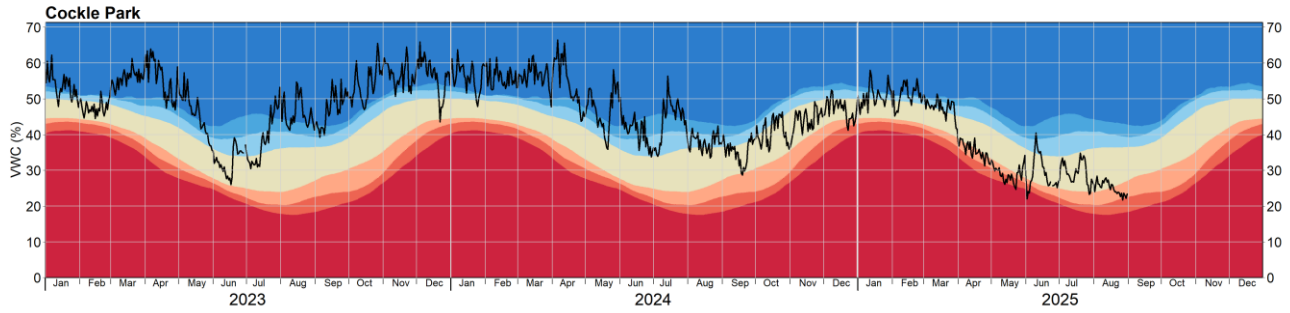

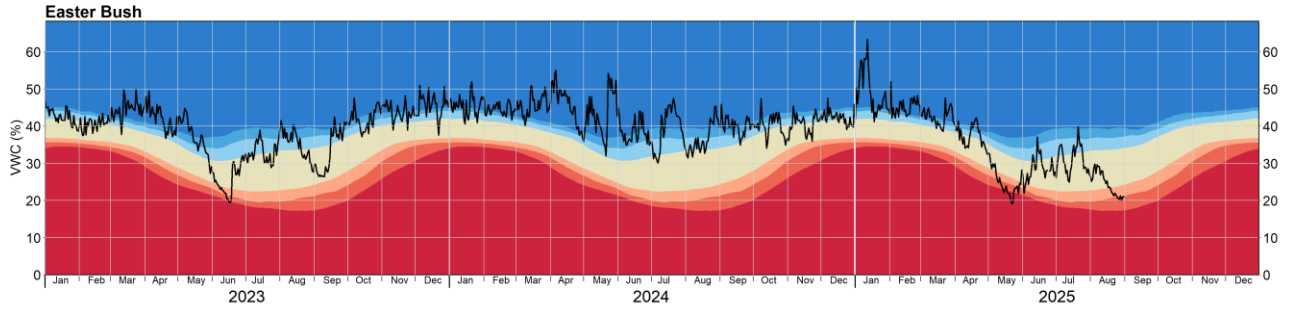

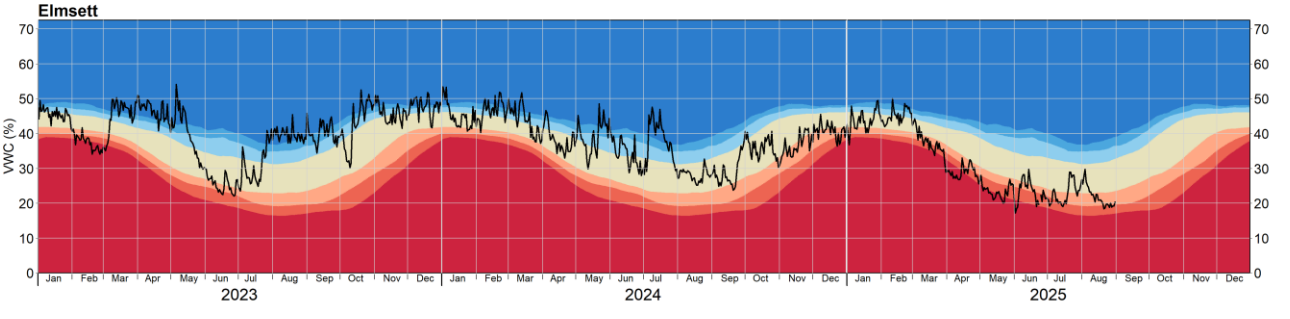

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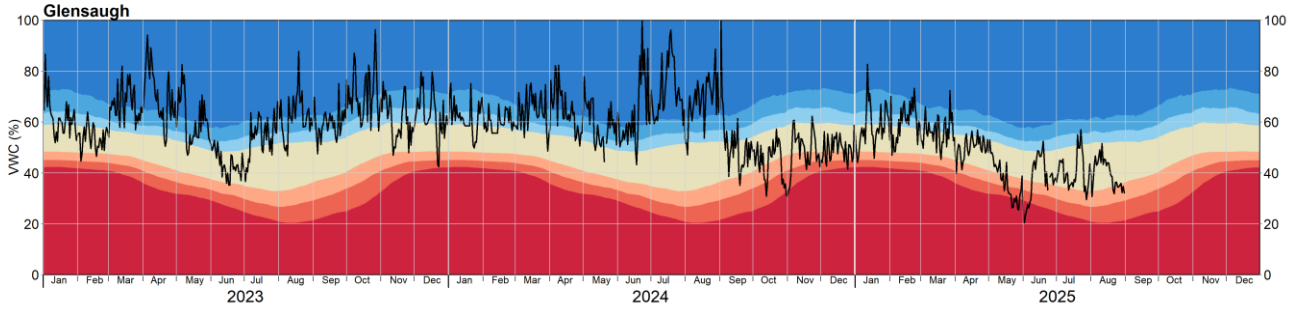

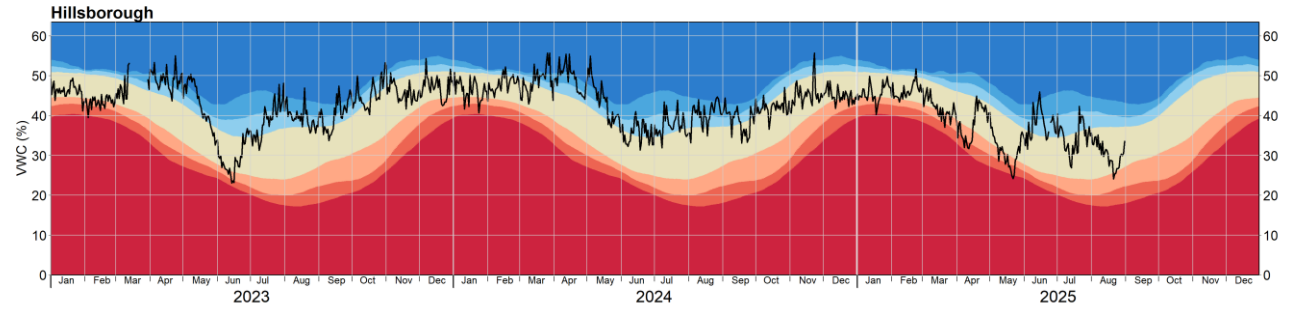

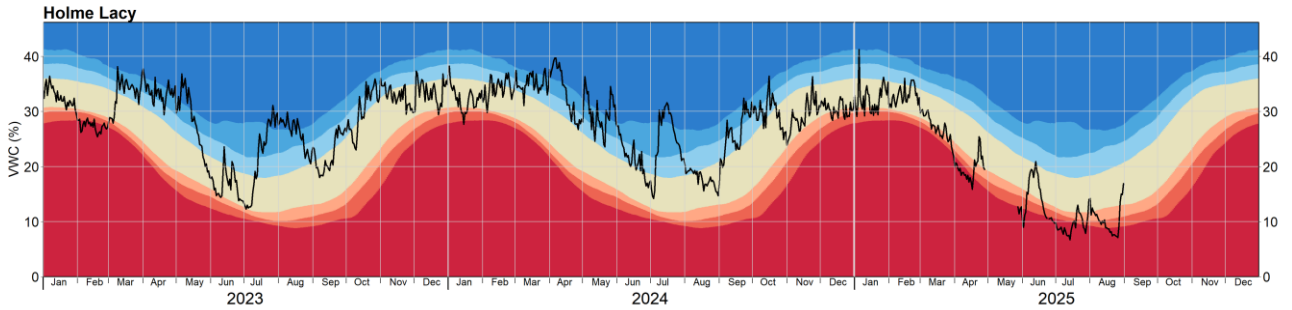

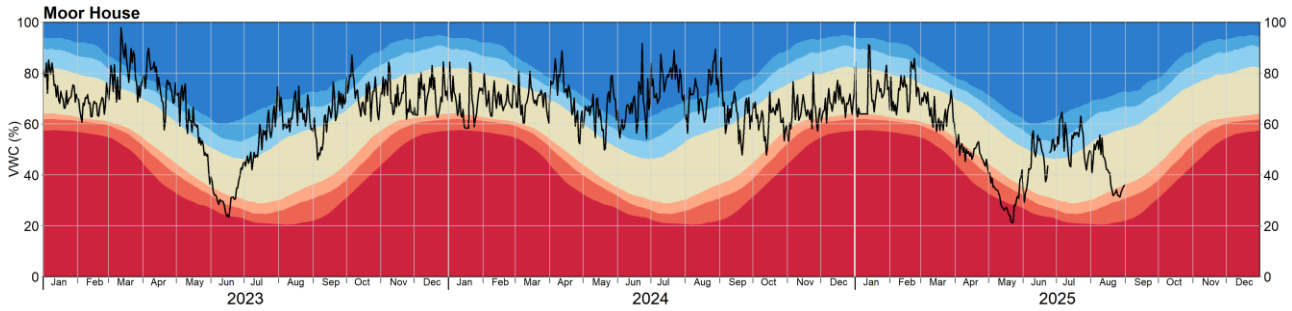

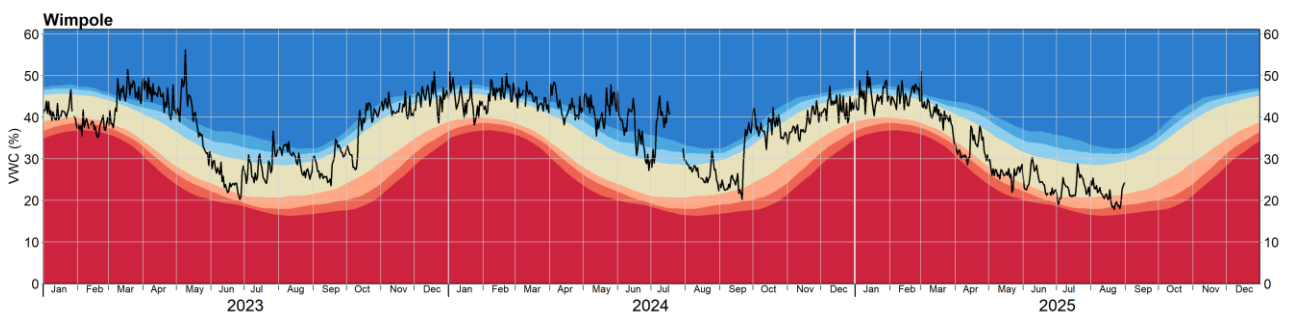

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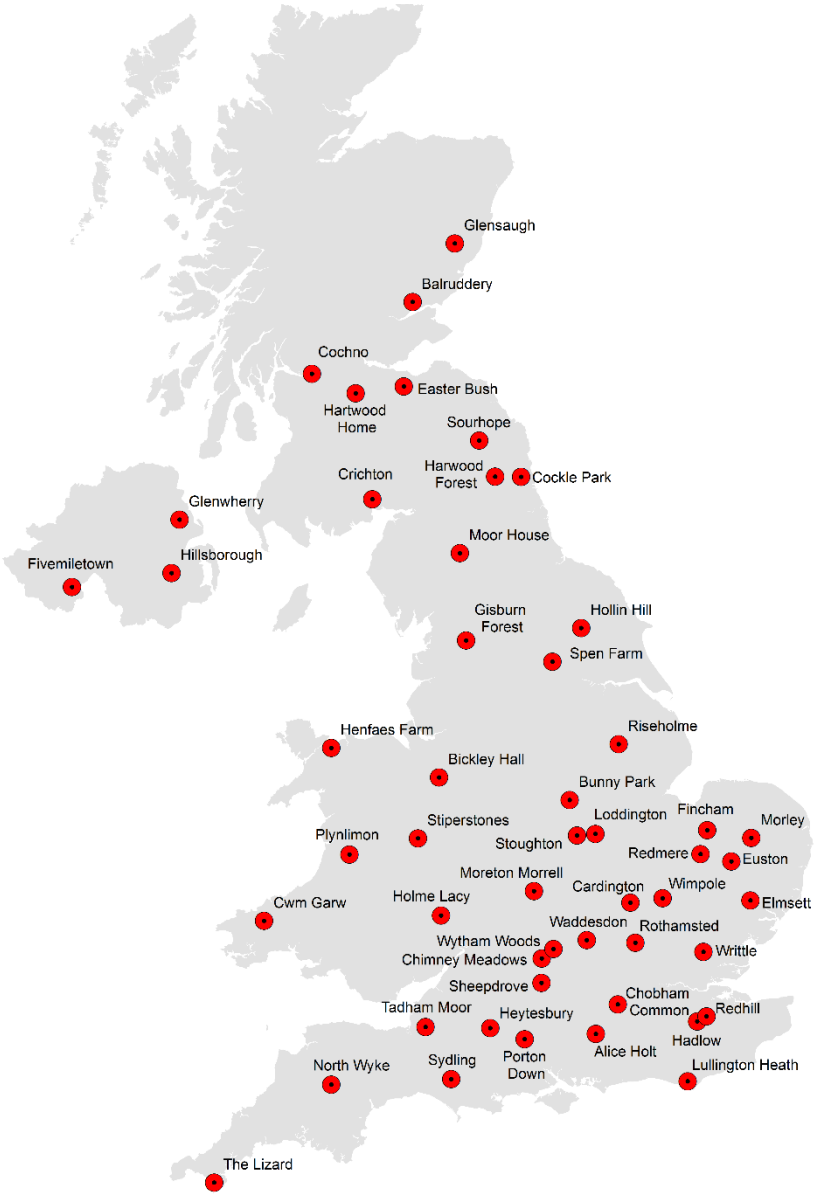

About the maps on page 1: The maps show daily mean soil moisture on the last day of the month. Colours indicate wetness as in the legends.

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/partially supported by NERC, through the UKCEH National Capability for UK Challenges Programme NE/Y006208/1.

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