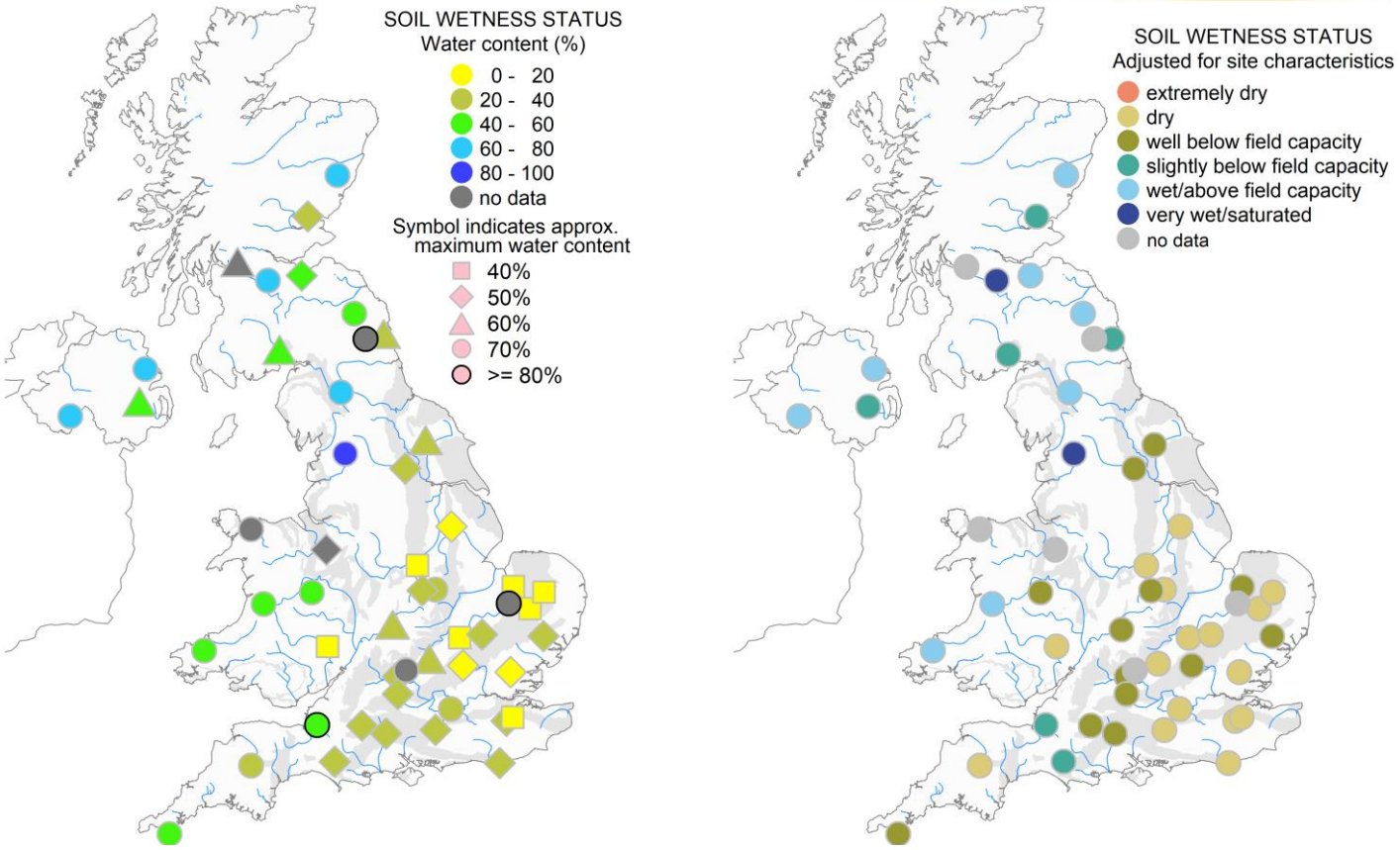
# COSMOS-UK | soil moisture

Issued on 13 September 2024




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

**Notes on the period to 31st August 2024**

**At the end of August, soil moisture is high in the North and West of the UK, with much drier conditions in the South and East.**

Provisional data indicate that rainfall was slightly above average across the UK, though with significant regional differences. Scotland experienced very wet conditions, particularly in the West, with the country as a whole recording over 160% of its average rainfall. England was much drier, experiencing prolonged dry spells and some areas in the South receiving half of the usual August rainfall. Temperatures were around average for August across much of the UK, though marked the end of the coolest summer since 2015.

Soil moisture levels across the UK showed regional variations due to the contrasting weather conditions during the month. Sites across central and southern England show soil moisture levels below field capacity, with a steady decrease throughout the month. Many of these sites are within their normal range for the time of year, as dry conditions are common through the summer, though some sites have reached drier than usual conditions (e.g. Bunny Park, North Wyke, Writtle). In contrast, sites in North England and Scotland (e.g. Hartwood Home, Moor House) maintain high soil moisture levels, reflecting the high rainfall of the month.

Overall, soil moisture conditions across the UK show a general North (Wet) - South (Dry) divide. Sites in central and southern England are starting to approach very dry conditions as we enter the Autumn months.

**Network news**

The second round of our Planned Preventative Maintenance is nearly completed, with Alice Holt and Chobham Common to be visited w/c 23 September. The 7th International COSMOS Workshop 2024 is being held at Hillsborough 24-26 September: https://www.cosmos2024.org/.

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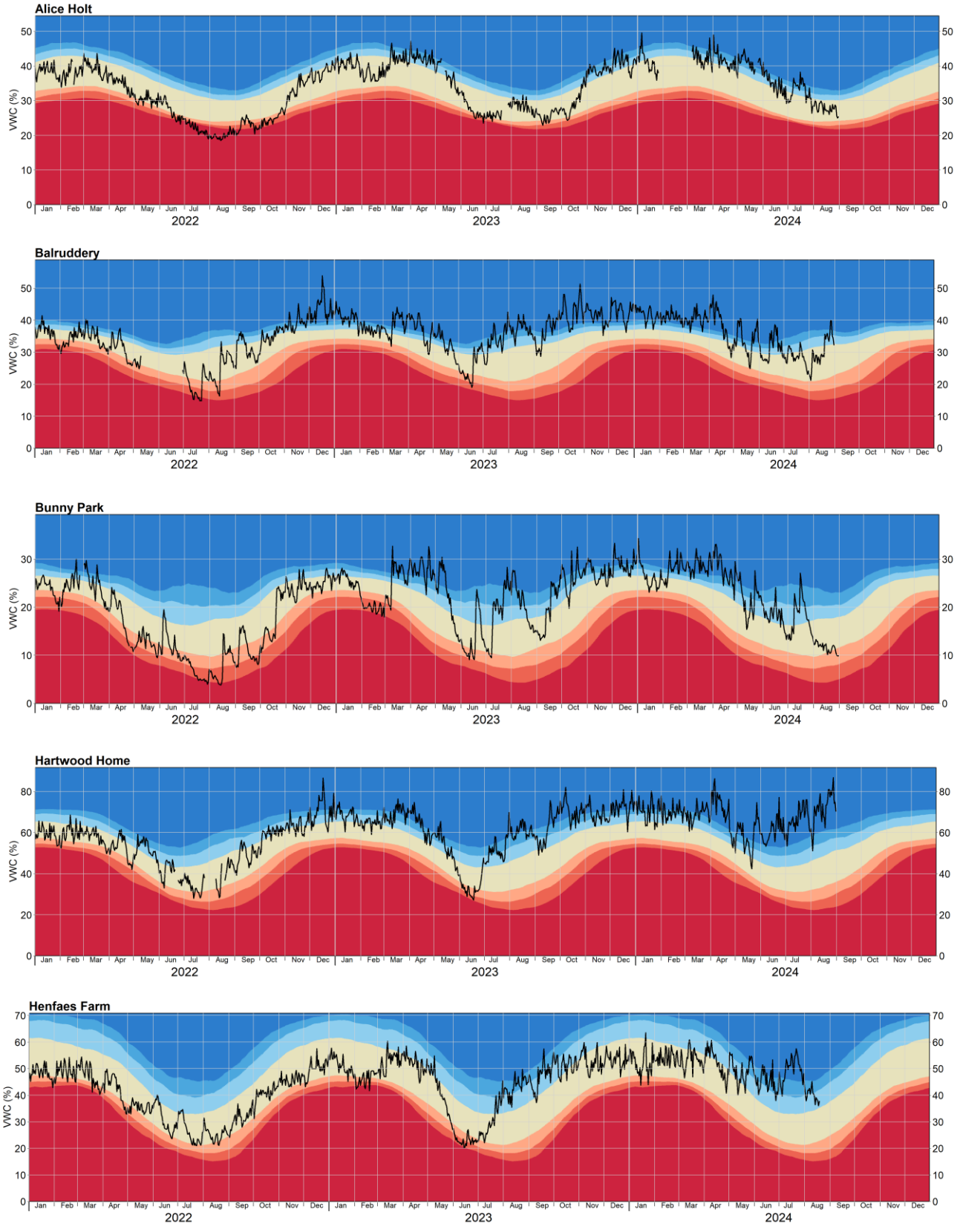

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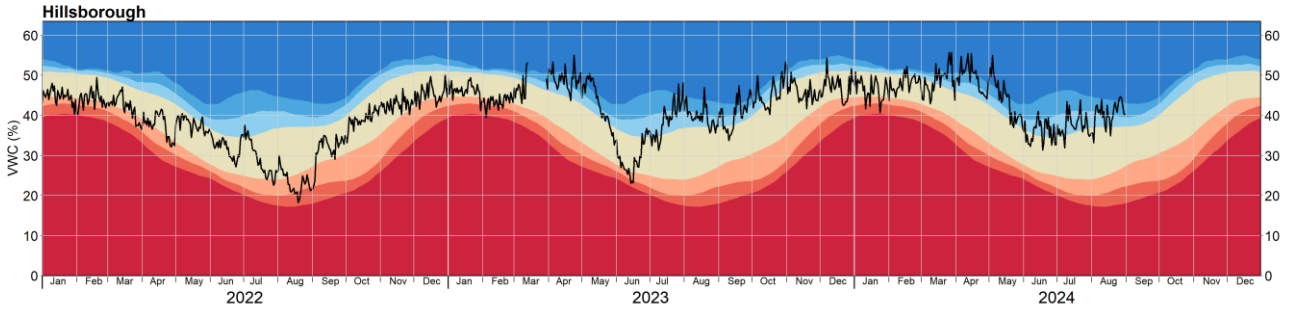


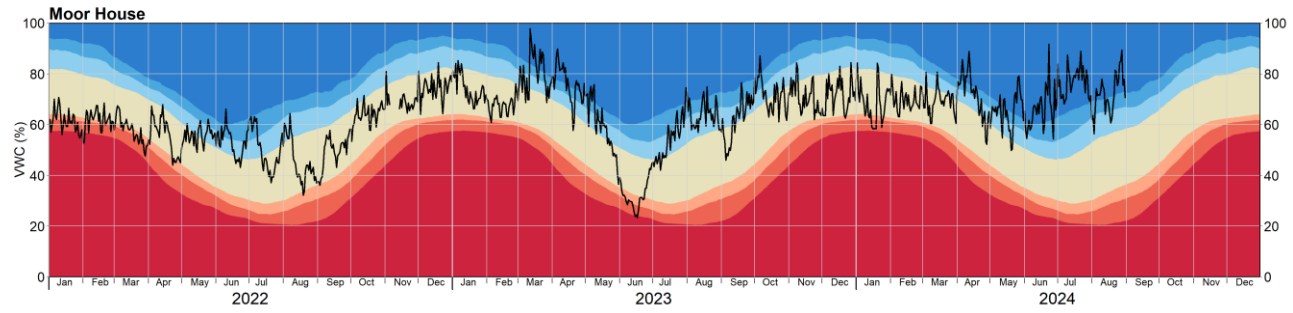


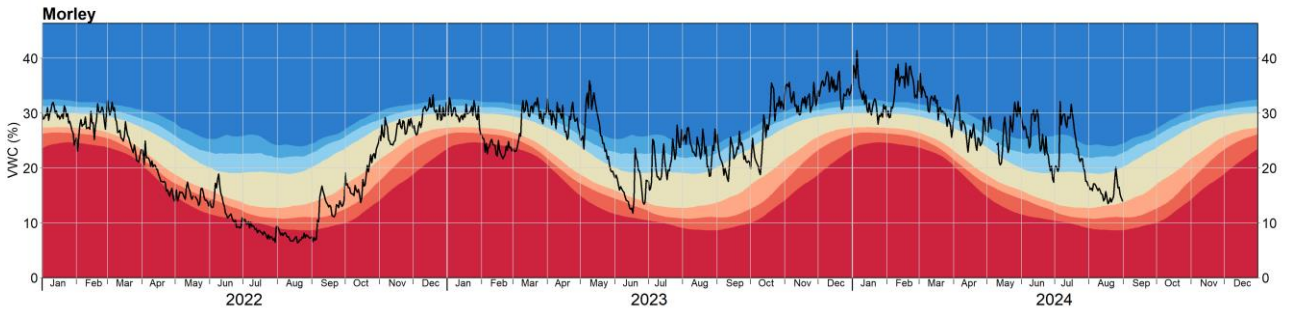


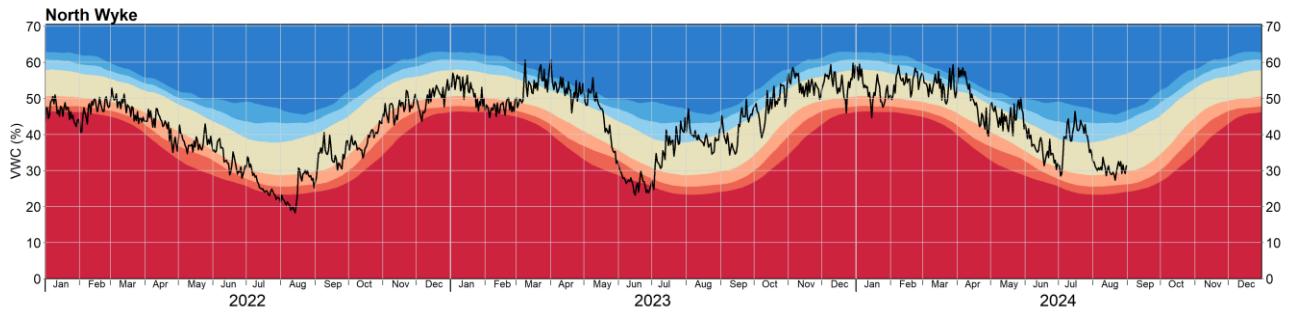


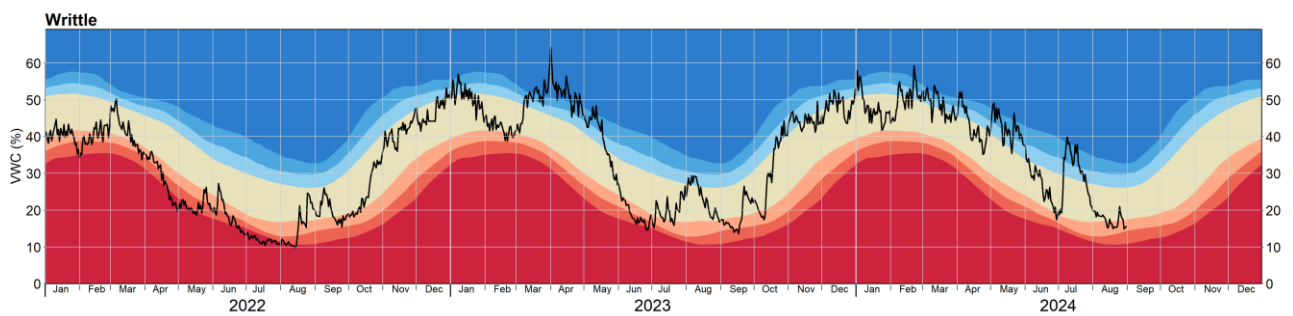

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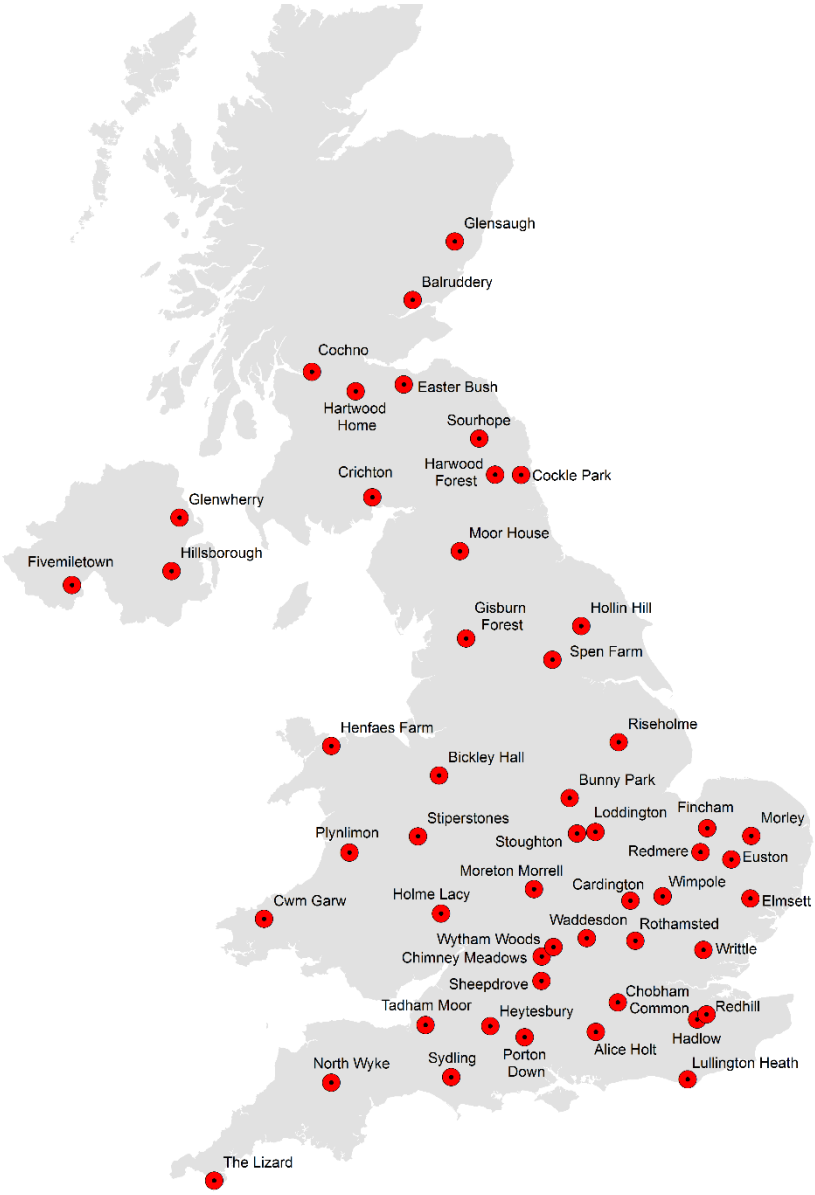


***About the maps on page 1:*** The maps show daily mean soil moisture on the last day of the month. Colours indicate wetness as in the legends.

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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