

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

Notes on the period to 31st October 2024

At the end of October, soil moisture levels across the UK were generally within the normal range for the time of year.

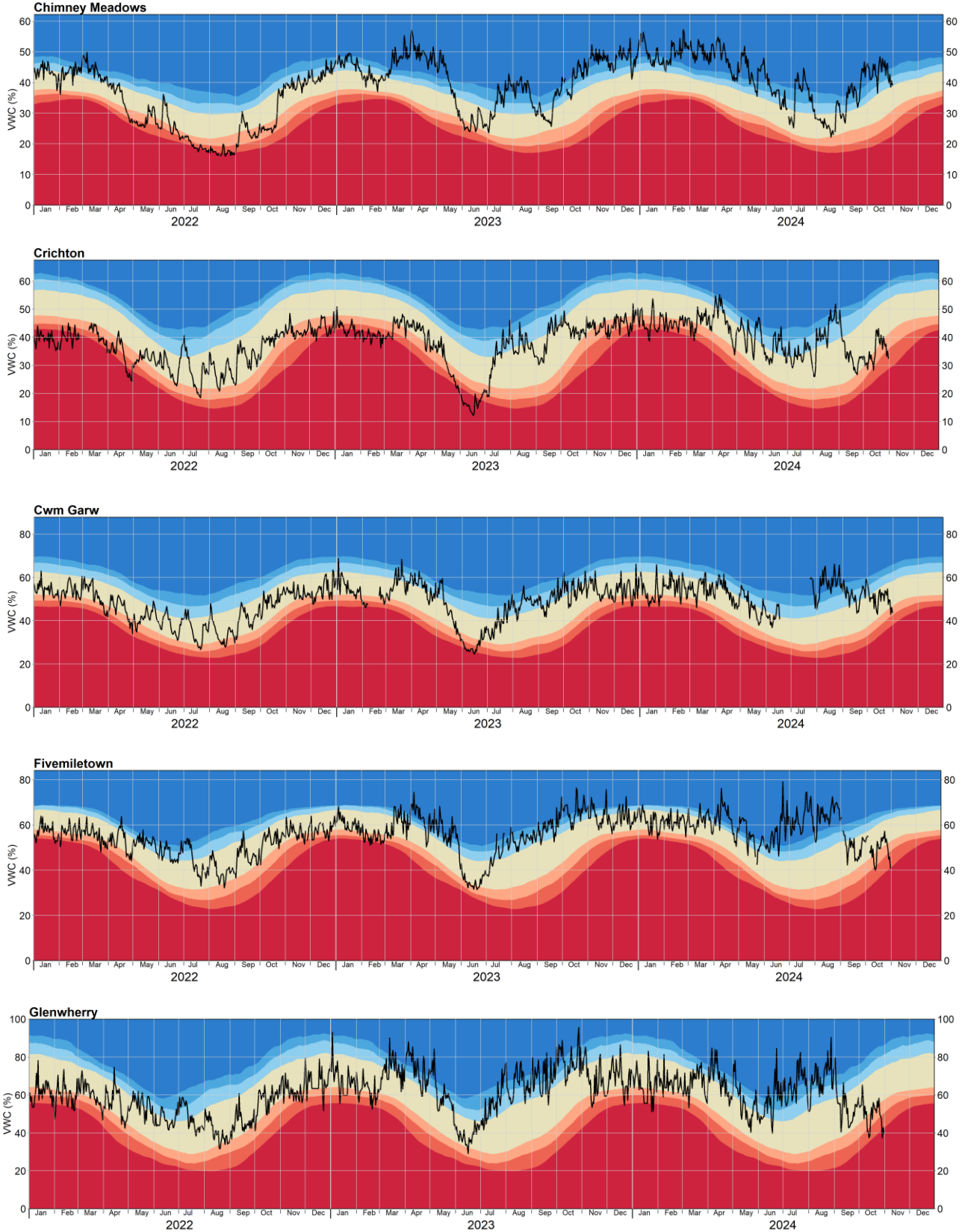
Provisional data indicate that rainfall was below average for the UK overall. Wales, Scotland, and Northern Ireland recorded less than 80% of their long-term averages, while England recorded around average rainfall. The first named storm of the season, Storm Ashley, arrived on the 20th, bringing heavy rain and strong winds to the north of the UK. It was a relatively mild month, with temperatures above average across the UK.

Soil moisture decreased across the COSMOS-UK network compared to September, following the drier conditions in October after the very wet end to September. Generally, soil moisture levels at most COSMOS-UK sites are within the normal range for the time of year, with some exceptions. Plynlimon and Cym Garw in Wales are much drier than normal, as are some sites across southern and eastern England (e.g., Bunny Park, Elmsett, and Riseholme). Sites in Northern Ireland (e.g., Fivemiletown and Glenwherry) and Scotland (e.g., Crichton) remain below field capacity. Meanwhile, some sites continue to maintain high soil moisture levels resulting from record rainfall in September (e.g., Chimney Meadows, Moreton Morrell, and Rothamsted).

Overall, soil moisture levels across the UK were considerably drier than the previous month due to the drier weather, but they mostly remain within the normal range for the time of year.

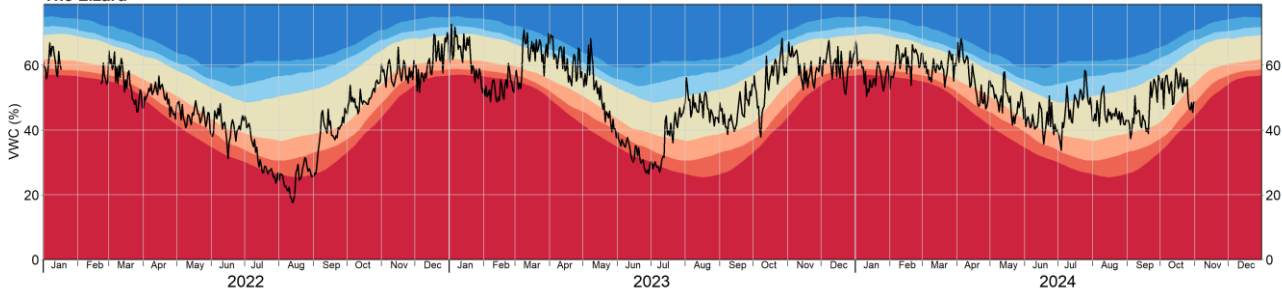
Network news

The site at Crichton is to be decommissioned in December, and relocated in the New Year. Cardington is also due to be decommissioned. Soil samples from 10 sites are currently being processed in the labs.

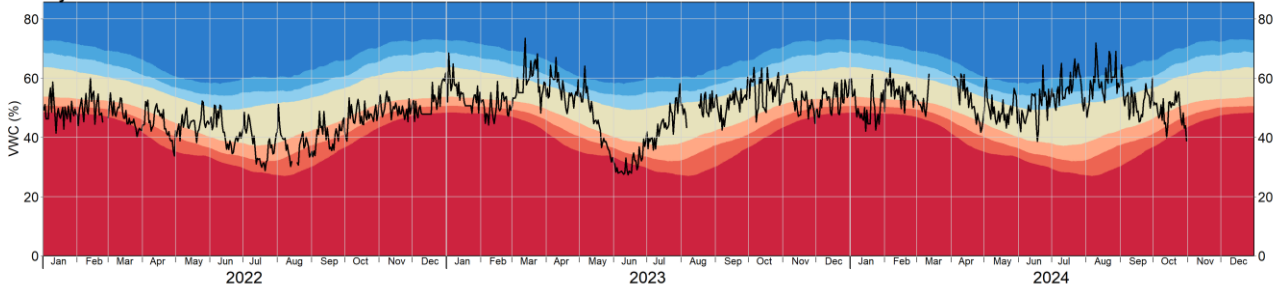




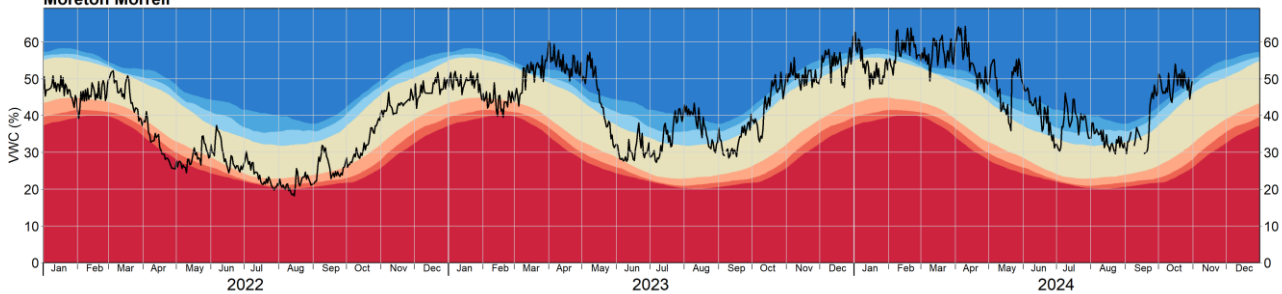
The Lizard



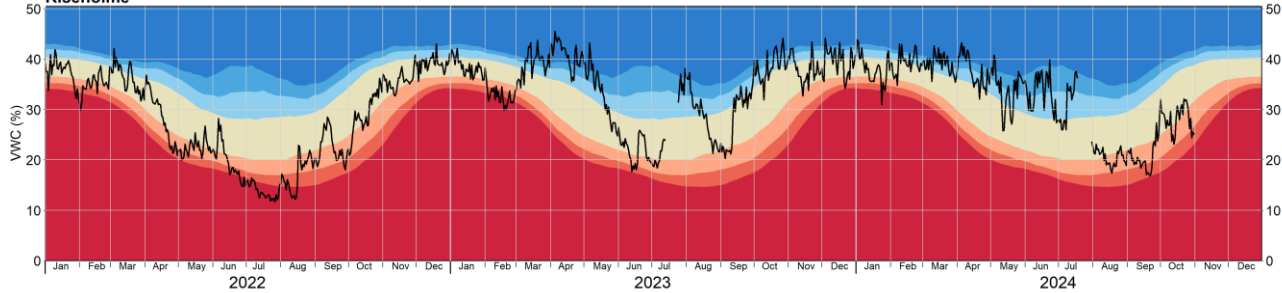
Plynlimon



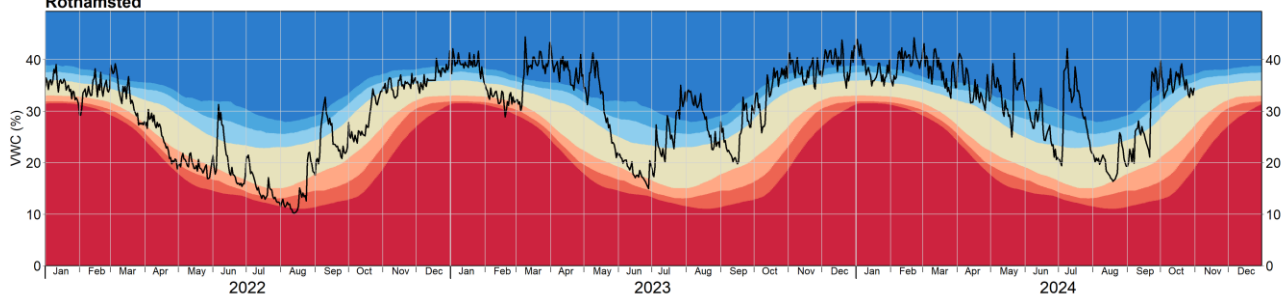
Moreton Morrell

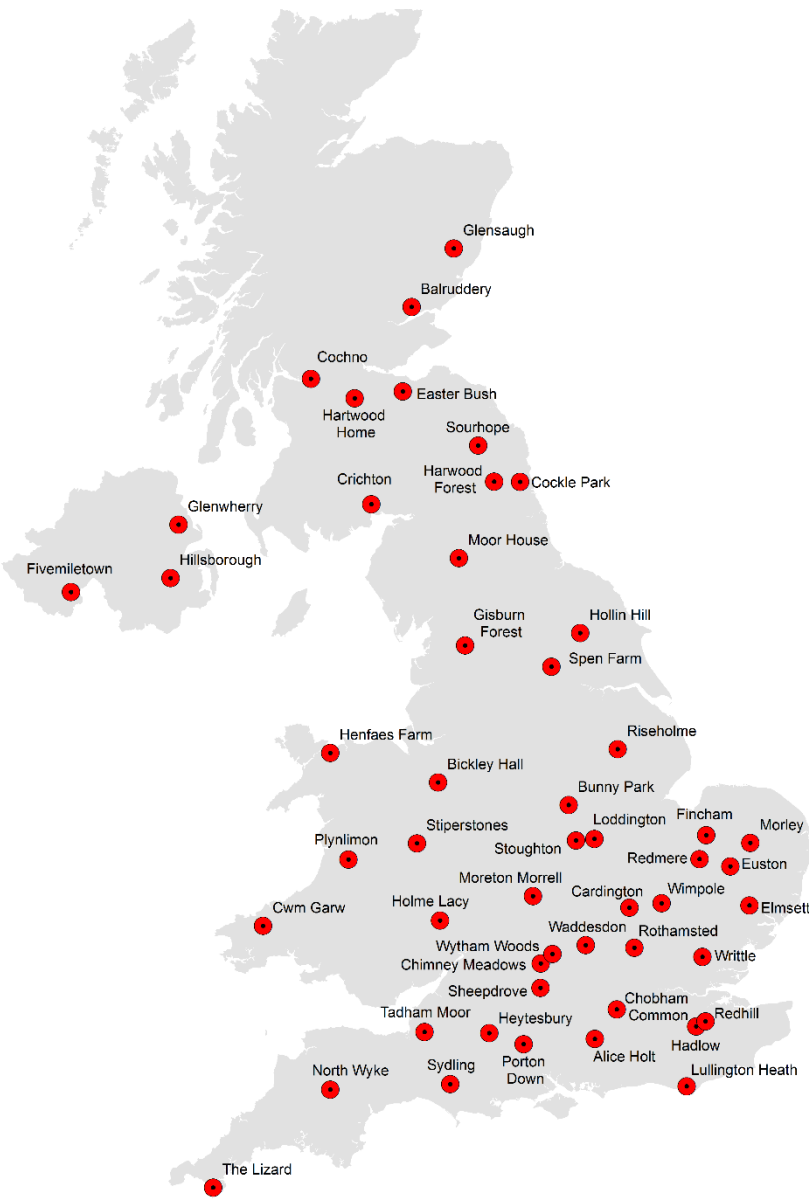


Riseholme



Rothamsted





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.

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