

Soil moisture on 30 November 2024 (see back page for explanatory comments).

Notes on the period to 30th November 2024

At the end of November soil moisture levels across the UK were higher than the previous month, generally within the normal to high range for the time of year.

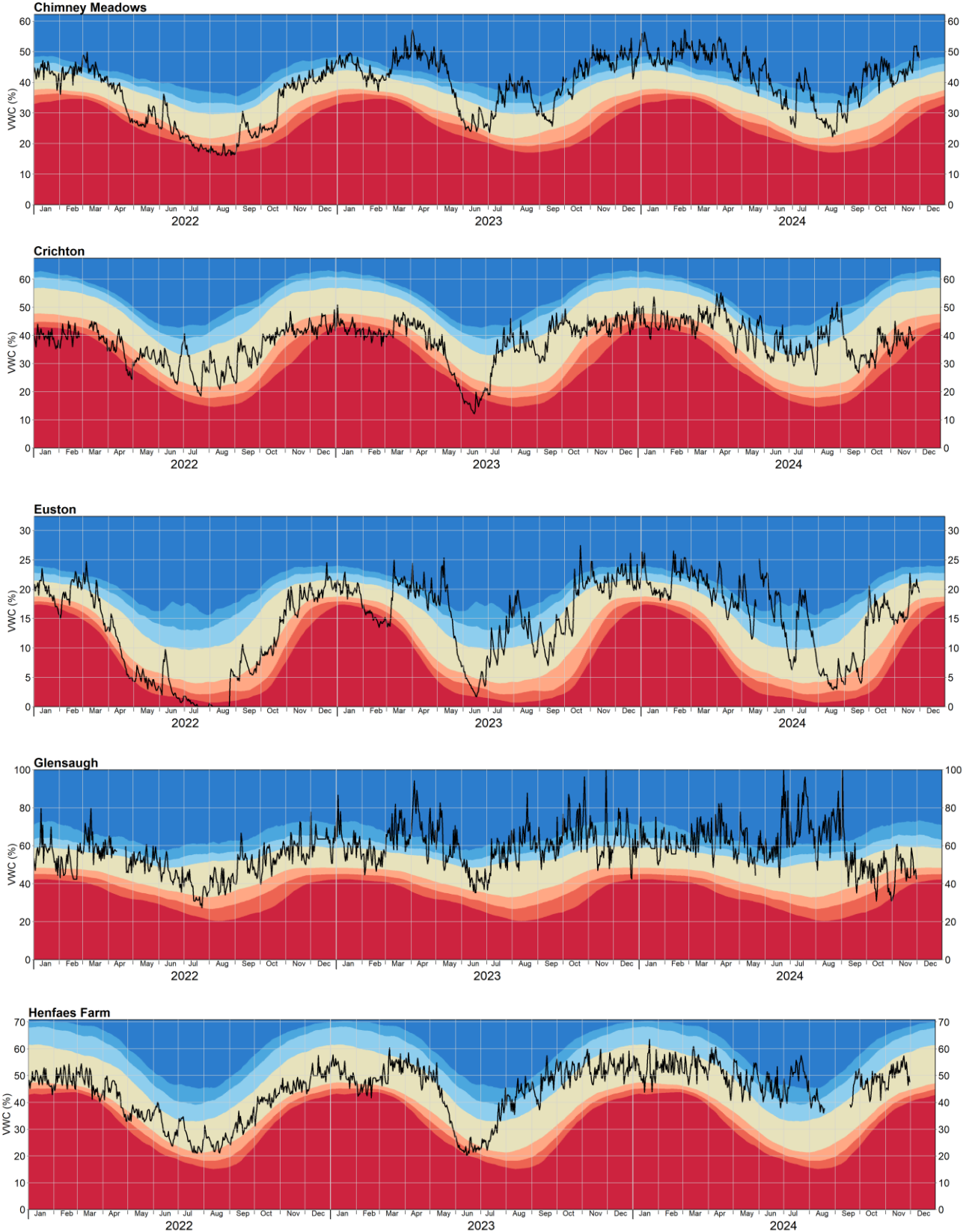
Provisional data indicates that November rainfall totals were below average across the UK, but it was a month of two halves. Mild, dry weather prevailed in the first half, with no region recording more than 10% of average rainfall by mid-month. In contrast, the latter half saw widespread heavy rain, colder temperatures, and extensive snow in some central and southern areas. Storm Bert hit the UK on 22nd November, bringing further wet and windy weather and localised flooding in many regions.

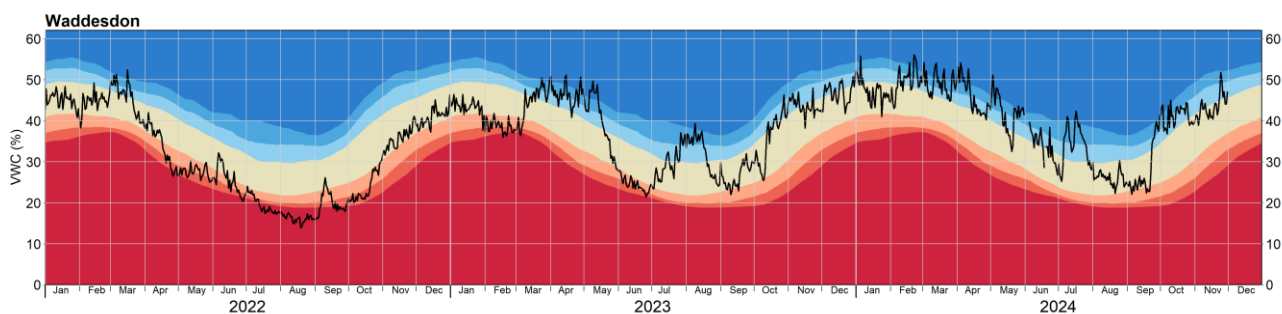
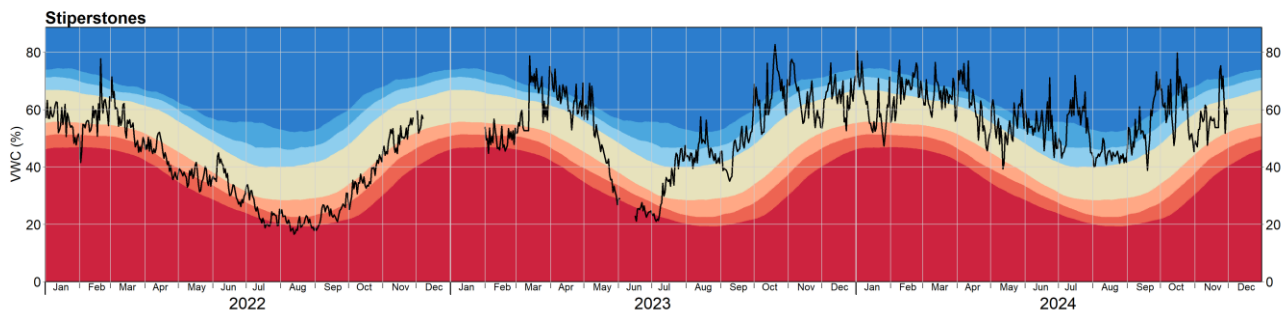
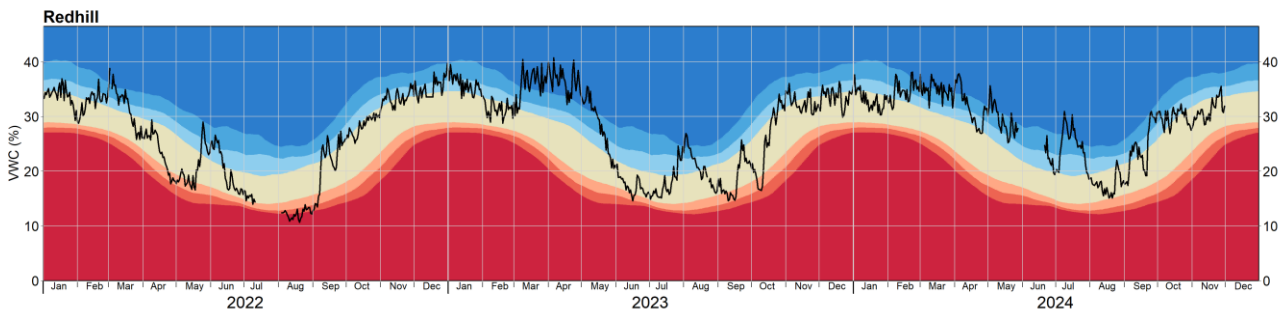
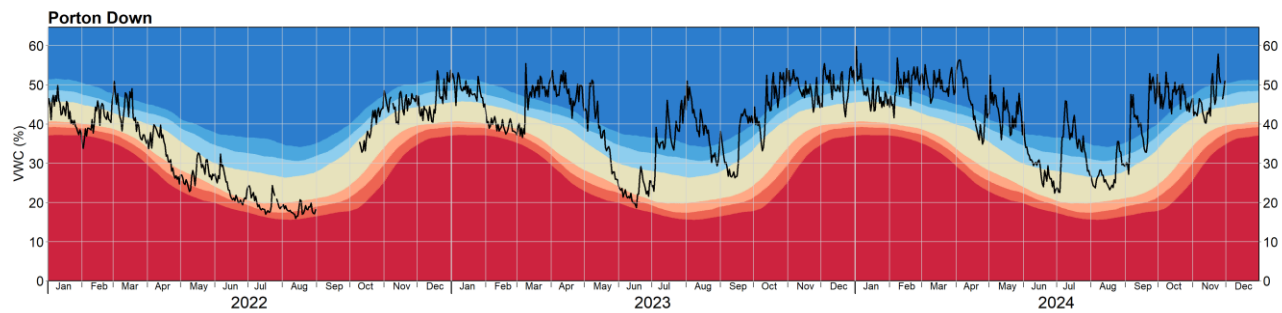
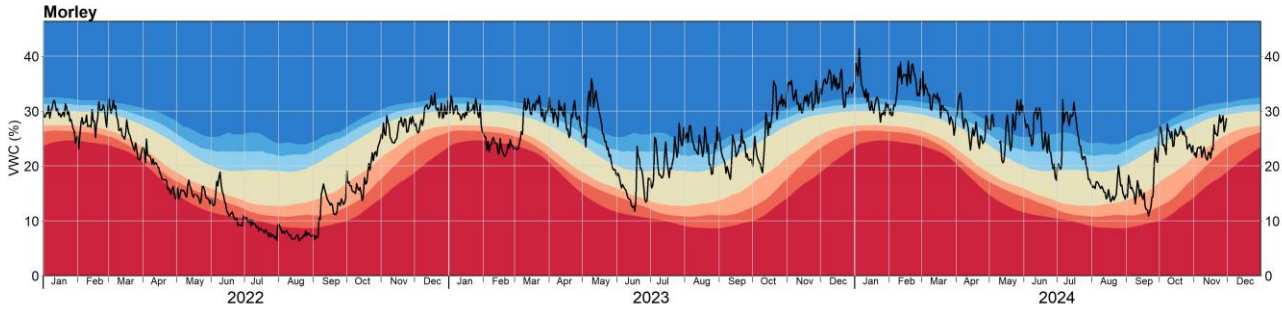
Soil moisture conditions across the COSMOS-UK network in November were mostly within the normal to high range. Wet weather late in the month caused localised increases in soil moisture, particularly at sites in central, southern, and eastern areas like Chimney Meadows, Porton Down, and Stoughton. However, the preceding drier weeks helped to mitigate against extremely wet soil moisture conditions, with many sites (such as Morly, Redhill, and Stiperstones) recording soil moisture within their normal range. Scotland had the least rainfall, and sites like Crichton and Glensaugh remain drier than normal.

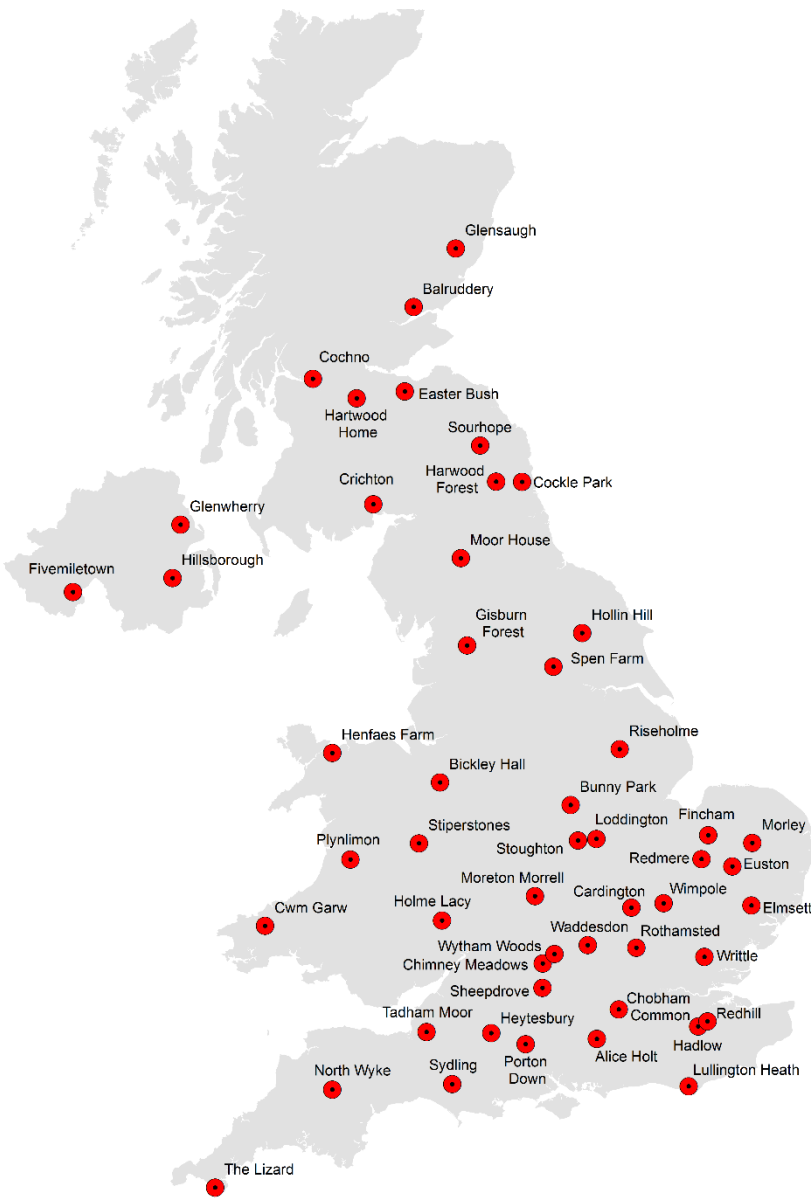
Overall, soil moisture levels across the UK have increased towards the end the month, and are generally within the normal to high range for the time of year.

Network news

The site at Crichton is to be decommissioned during the w/c 16th December, and relocated in the New Year. There have been maintenance visits to Morton Morrell and Rothamsted to fix some communication issues.







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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