

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

### Notes on the period to 30th June 2024

**After a drier than average June, soil moisture is lower than previous months for much of the COSMOS-UK network, though many sites are still within their normal range for the time of year.**

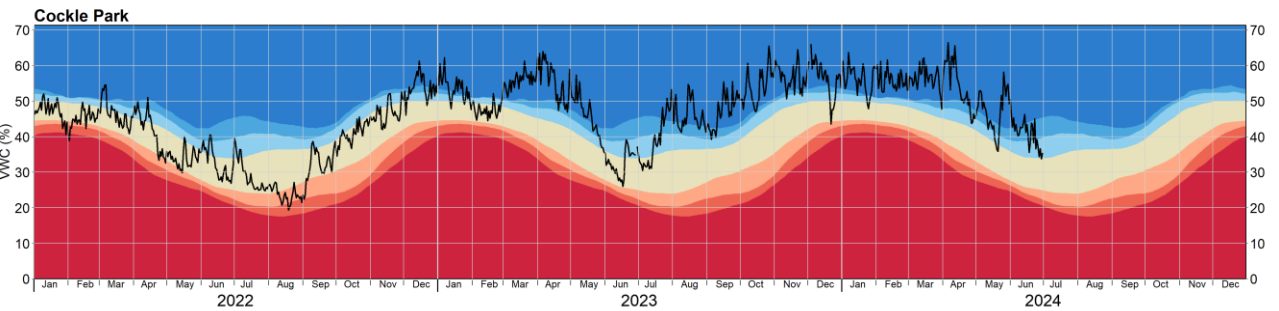
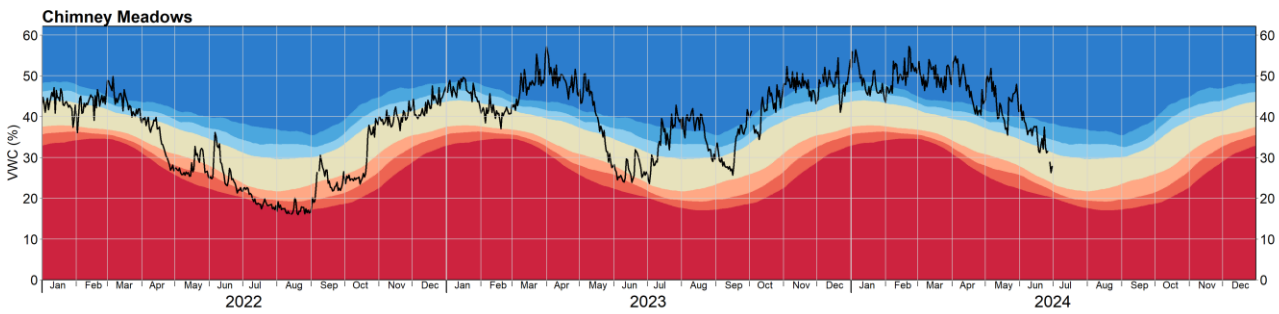
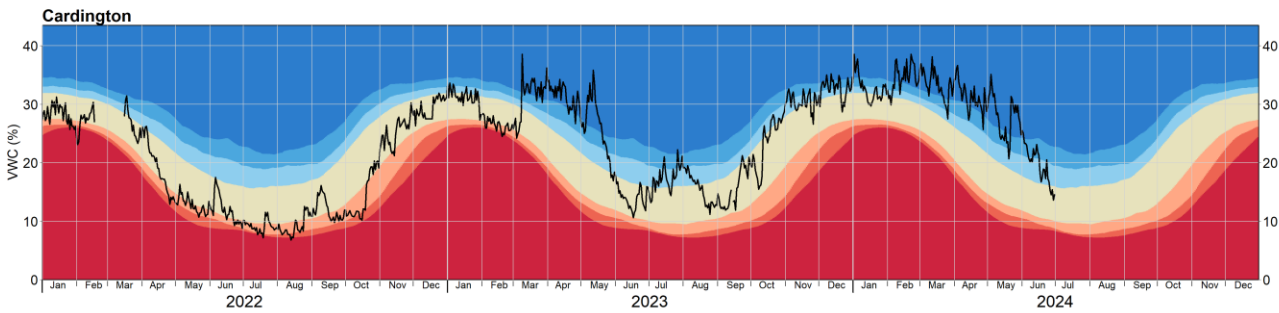
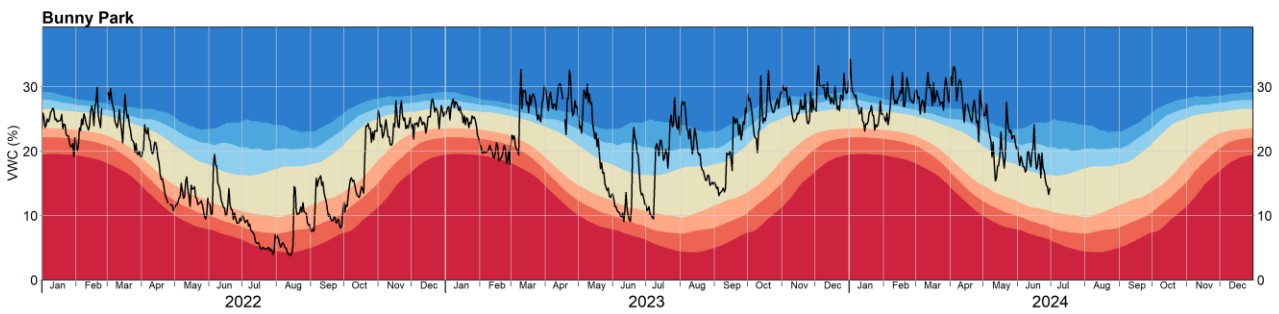
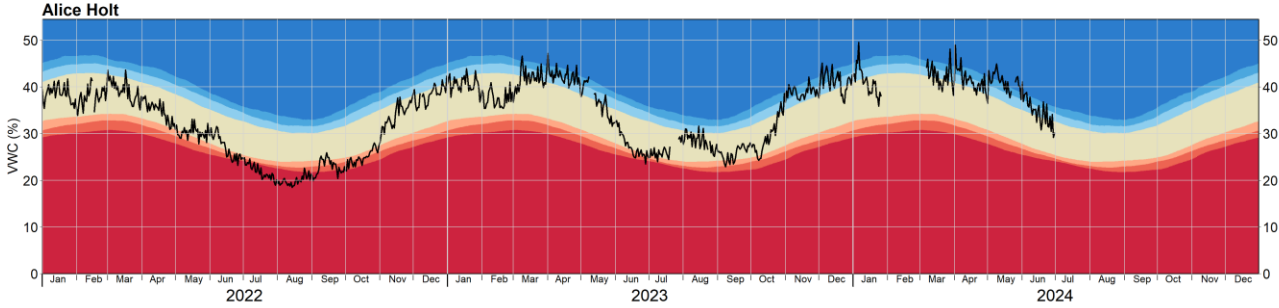
Provisional data indicate that rainfall in June was below average for most of the UK except for Northern Scotland, which was 15% above the long-term average. England and Wales recorded just over half their average rainfall, while Northern Ireland recorded 74% of their average. In contrast to a warmer-than-average May, June was 2°C cooler than average for much of the month as cold air was brought in from the Arctic.

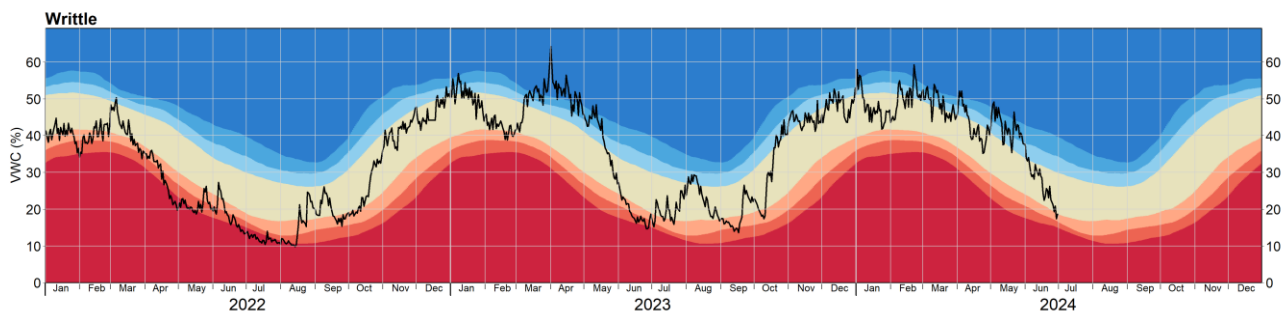
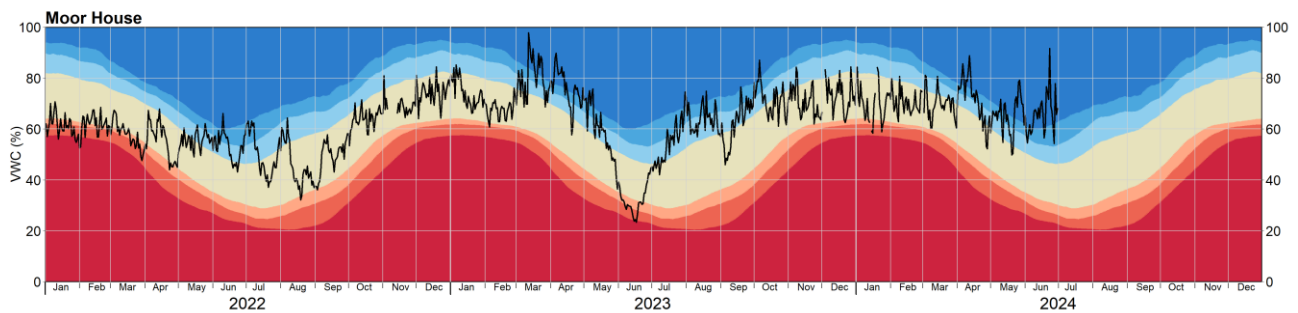
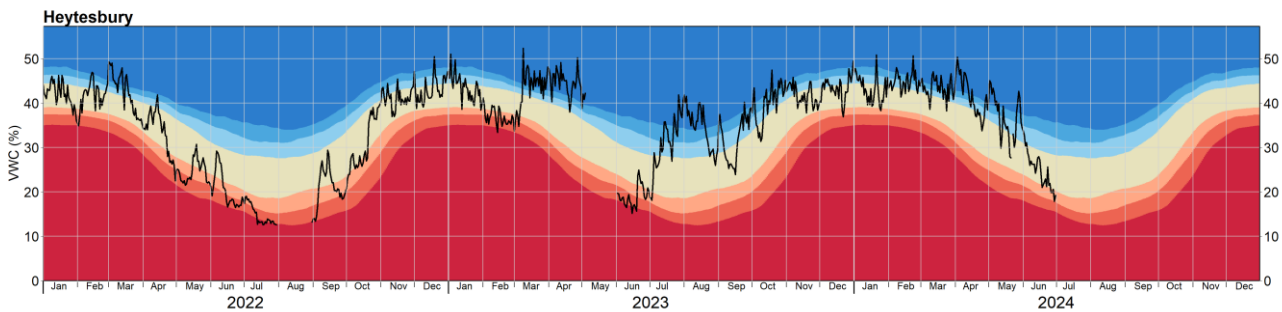
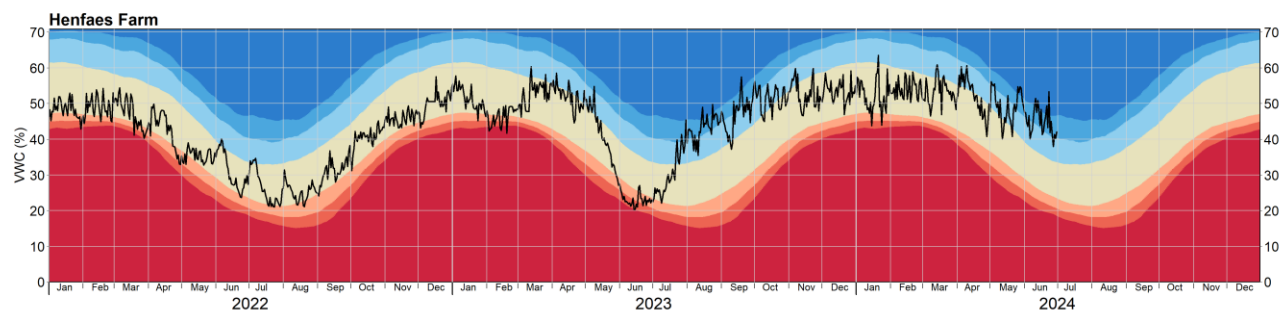
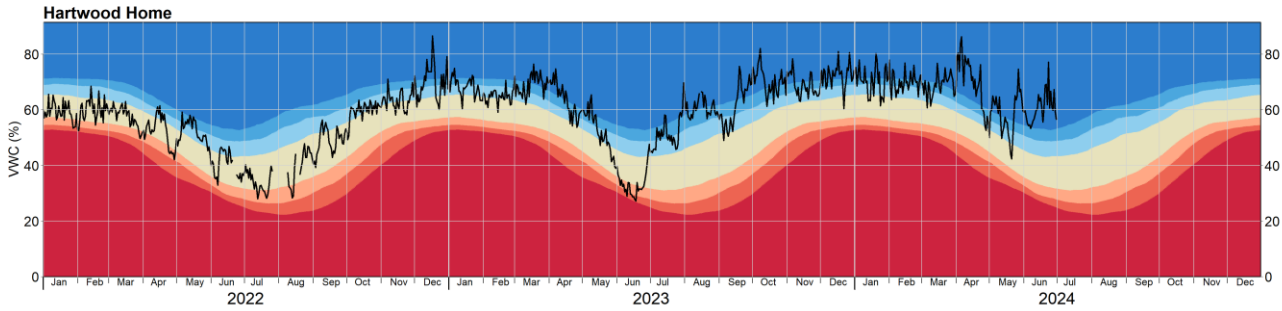
Soil moisture for many COSMOS-UK sites is lower than previous months, though still within the normal range for the time of year (e.g. Alice Holt, Bunny Park, Cardington, and Chimney Meadows). Some sites remain wetter-than-usual, limited to Northern England, North Wales, and Scotland (e.g. Henfaes, Hartwood Home, Cockle Park, and Moor House). Some sites in Southern England reached drier-than-usual conditions towards the end of the month (e.g. Heytesbury and Writtle).

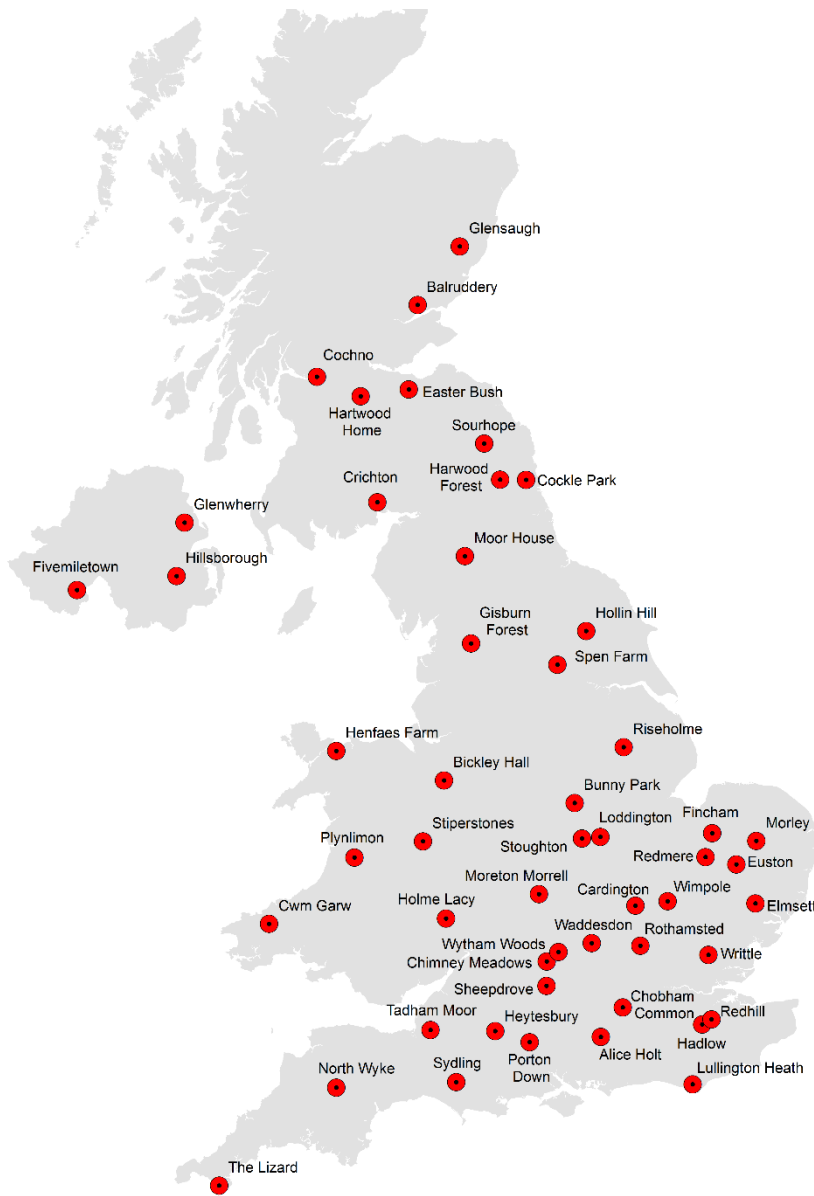
Overall, soil moisture is drier than previous months after lower-than-average rainfall for much of the UK in June.

### Network news

The second round of our Planned Preventative Maintenance is underway. Its purpose is to replace any sensors that may need recalibrating and fix any known issues that could affect data quality. An update is underway to fix the data sharing issues that have affected the API and automated data emails.







**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.

