

Soil moisture on 31 May 2023 (see back page for explanatory comments).

Notes on period to 01 June 2023

At the end of May, soil moisture levels at most COSMOS-UK sites are low after a dry end to the month.

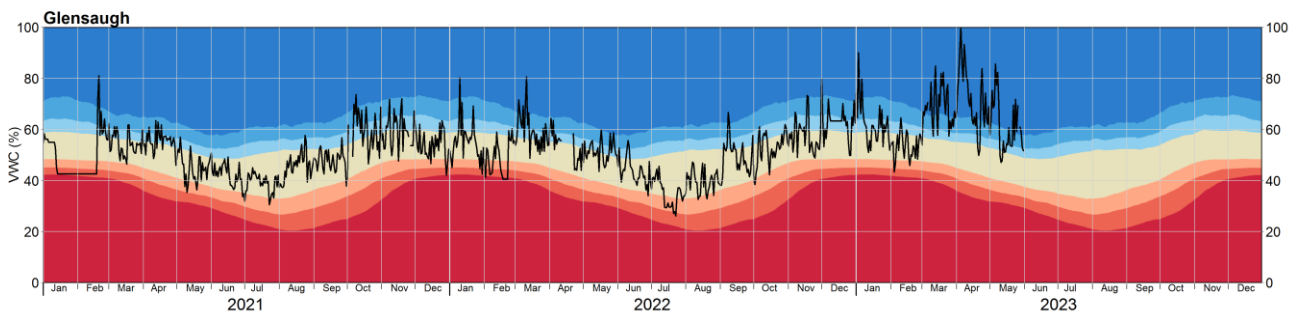
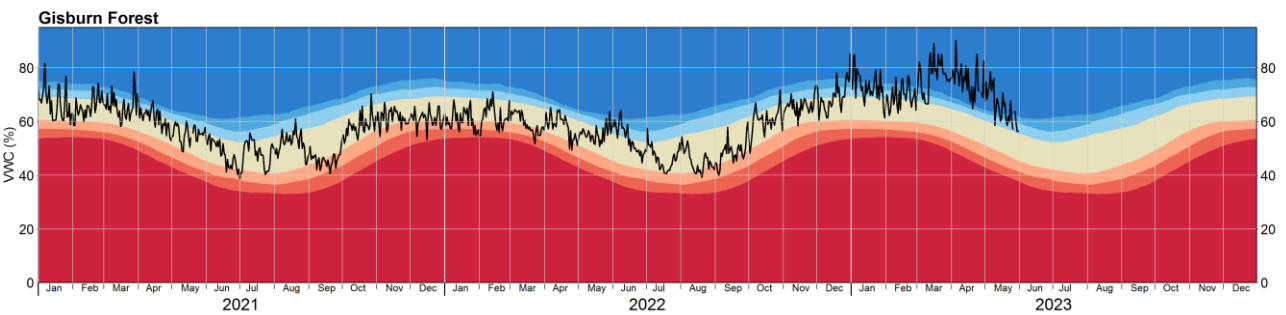
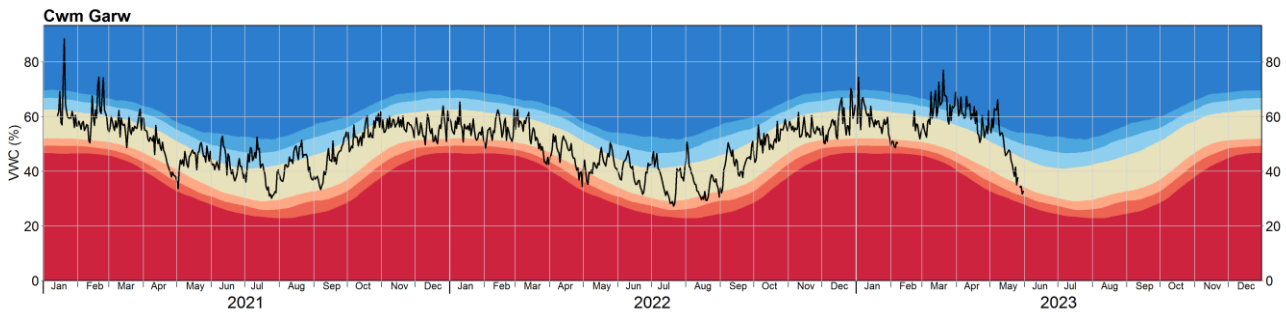
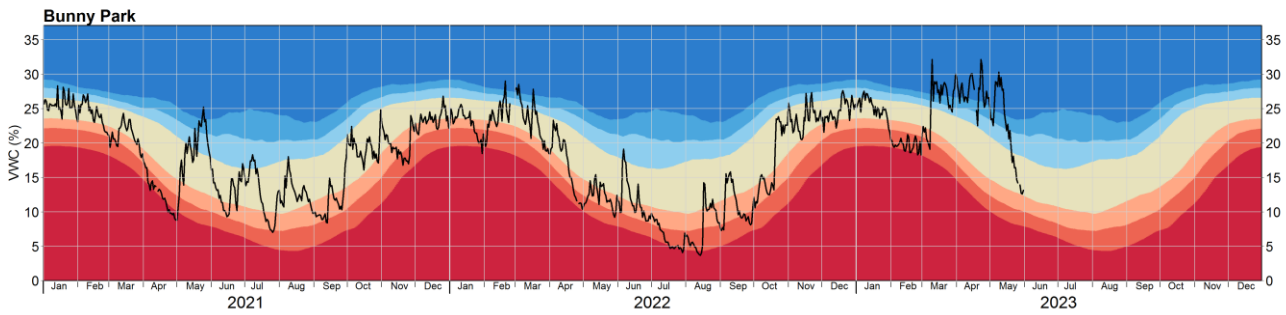
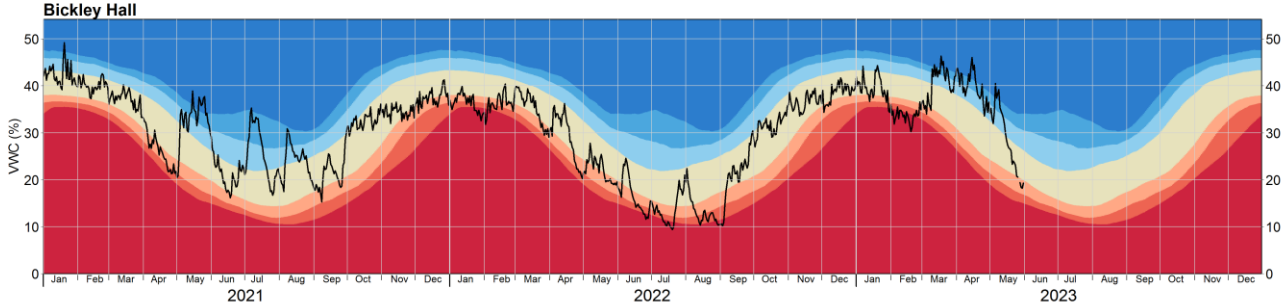
Provisional data indicate that May saw lower than average monthly precipitation totals across the UK. Wales and Scotland received less than 50% of the long-term average rainfall amount for the month. However, it was very much a story of two halves, with high rainfall in early-May and very low rainfall in late-May. The last 10 days in particular saw almost no rainfall across the country, coinciding with warmer than average temperatures.

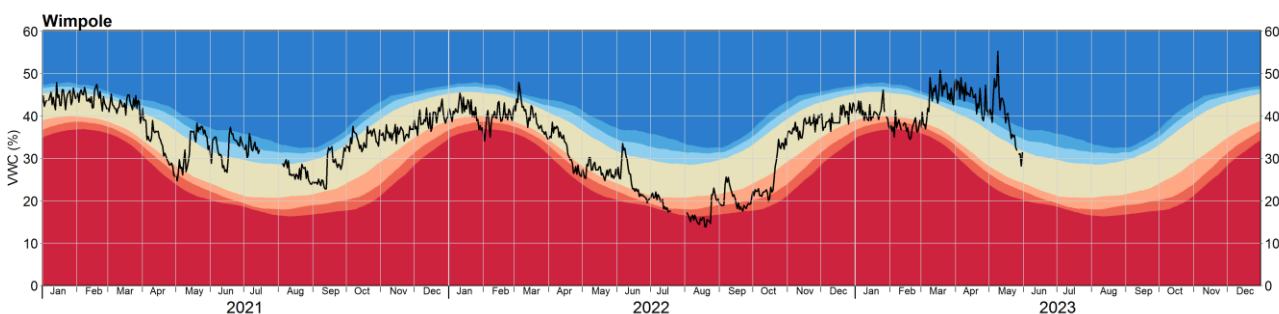
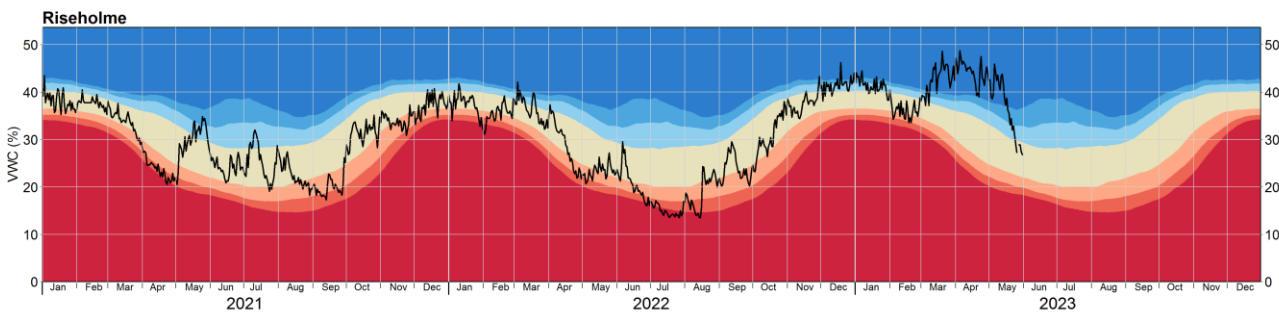
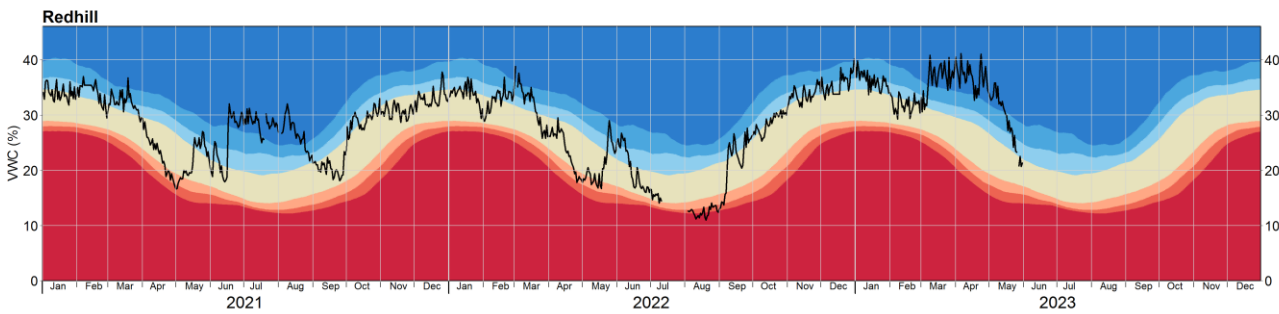
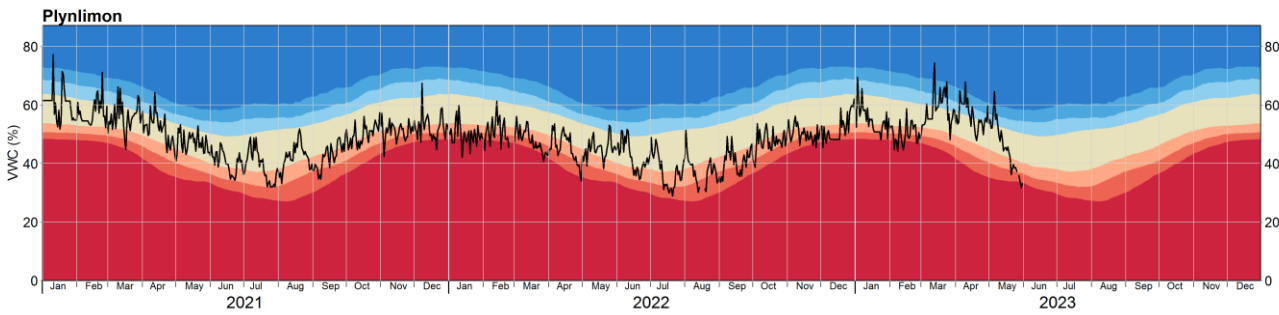
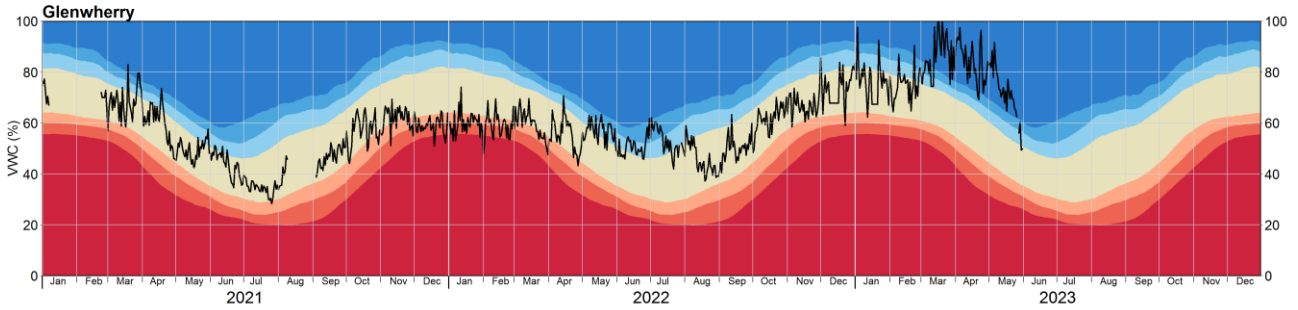
Soil moisture levels at most COSMOS-UK sites largely followed the pattern of precipitation, with wet soils at the start of the month, dropping to drier levels at the end of the month. Some sites, particularly those in Wales and Western England (e.g. Cym Garw, Plynlimon, Bickley Hall), showed a marked decline in soil moisture through the month, dropping from very wet to very dry conditions. Other sites saw soil moisture levels decrease, but from very wet to more normal conditions for the time of year, such as Redhill, Riseholme and Wimpole along Eastern England. A few sites remain wet, despite the dry conditions, such as Glensaugh in Scotland, Glenwherry in Northern Ireland, and Gisburn Forest in Northwest England.

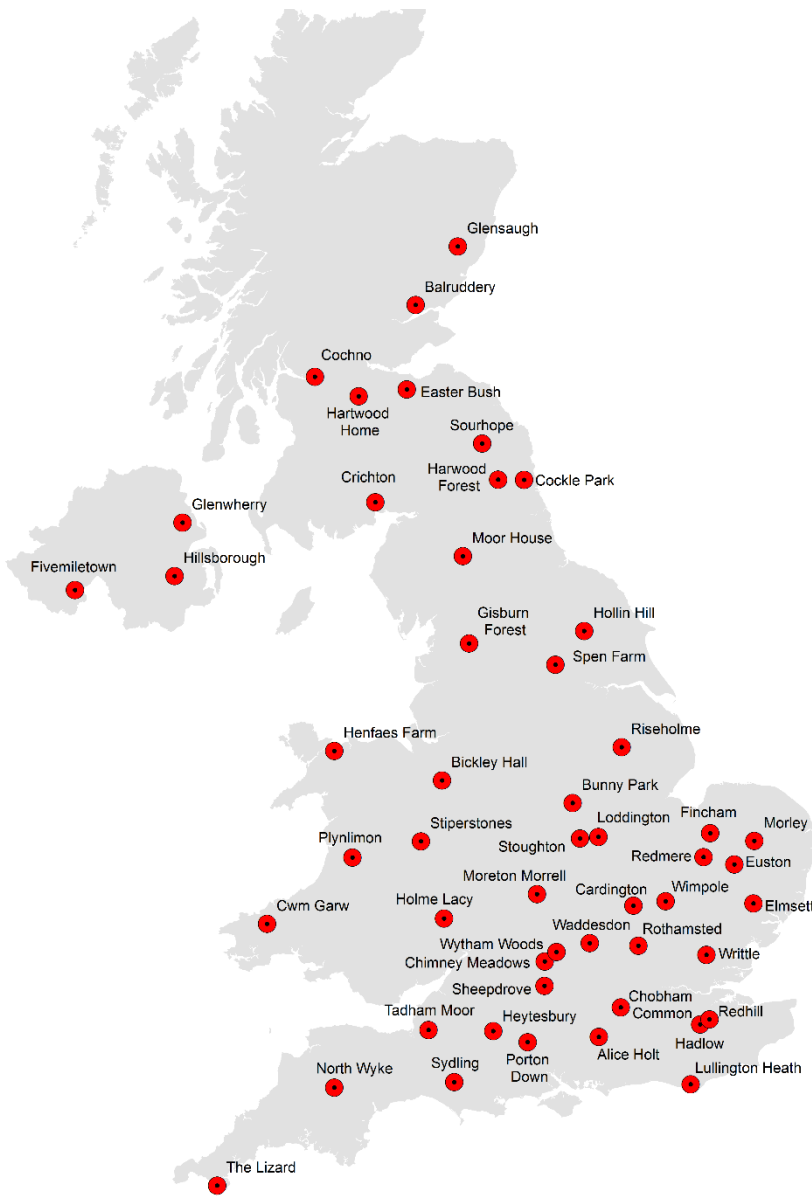
Overall, soil moisture declined through May following a period of dry and warmer conditions.

Network News

Annual planned preventative maintenance is underway; Campbell Scientific engineers have already visited nearly half the COSMOS-UK sites. Cockle Park, Fivemiletown and Stiperstones have been experiencing some connectivity issues; additional maintenance work is scheduled.







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.

