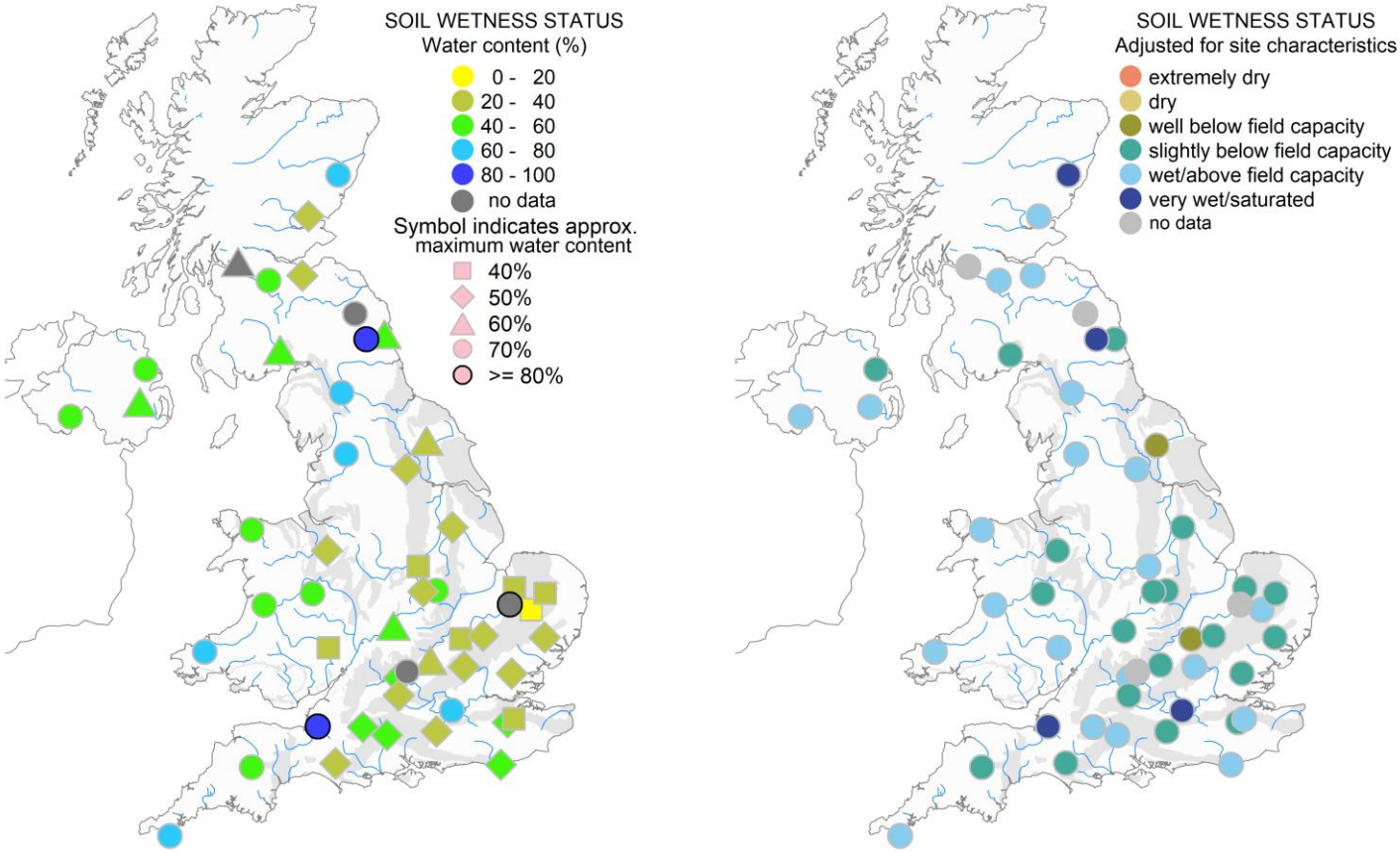
COSMOS-UK | soil moisture

Issued on 1 November 2021



Soil moisture on 31 October 2021 (see back page for explanatory comments).

Notes on period to 31 October 2021

At the end of October soil moisture is mostly normal or above normal with some locations being very wet especially in the south of England.

Provisional data indicate that in October precipitation across the UK was generally above normal, with many areas having around 150% of the long-term mean. Rainfall was closer to normal in some locations in a band running from Northern Ireland across central parts of England.

The autumn is usually a transitional time with soil moisture recovering from summer minima towards wetter winter conditions. This is seen clearly at some sites in southern England that show a significant change from mid-September, leaving soils wetter than normal for the end of October (e.g. The Lizard, Heytesbury, Chimney Meadows, Lullington Heath).

In parts of Scotland and northern England there has been a steadier increase in soil moisture resulting in soil moisture being normal to slightly above normal at the end of the month (e.g. Balruddery, Easter Bush, Cockle Park).

Between these areas, where rainfall has been closer to normal and rainfall was interspersed with periods during which soils dried, soil moisture is normal or slightly below normal for the time of year (e.g. Crichton, Hollin Hill, Cardington).

Network News

- Sites at Chimney Meadows and Sheepdrove have now been operating for eight years.
- Tadham Moor is now back online having been offline since the end of September.

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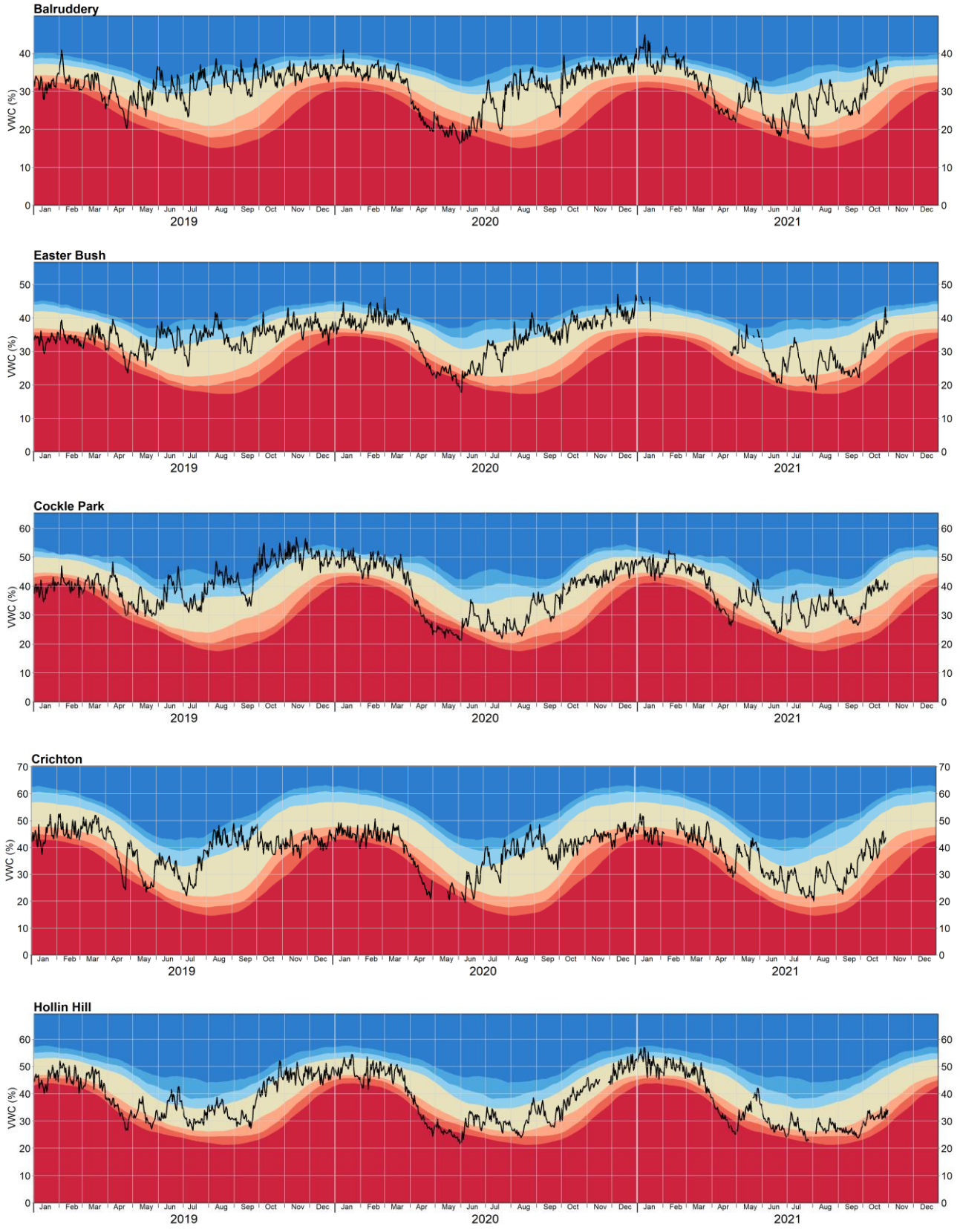

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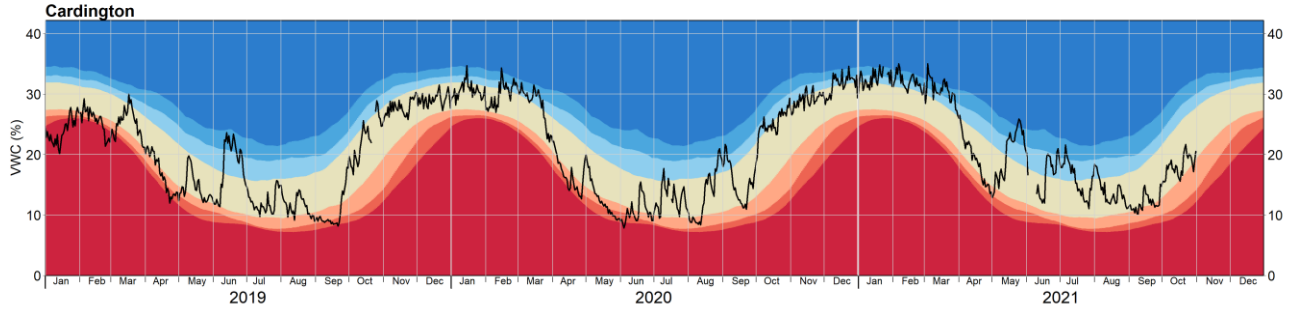
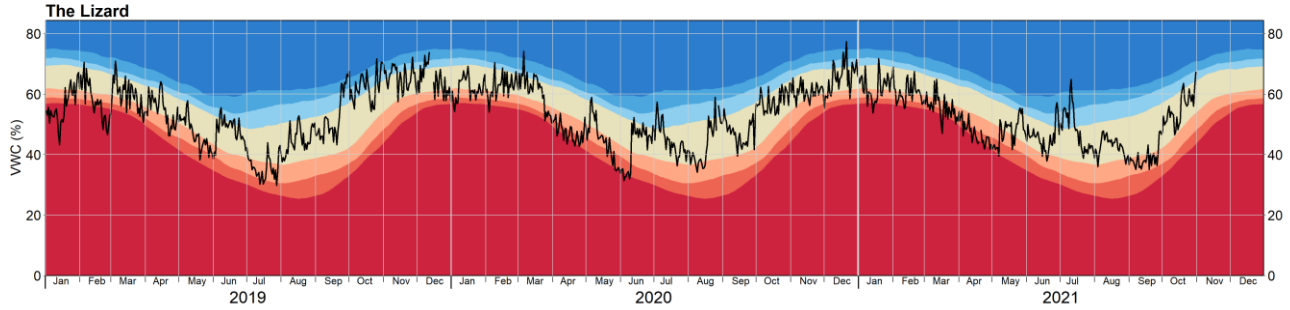
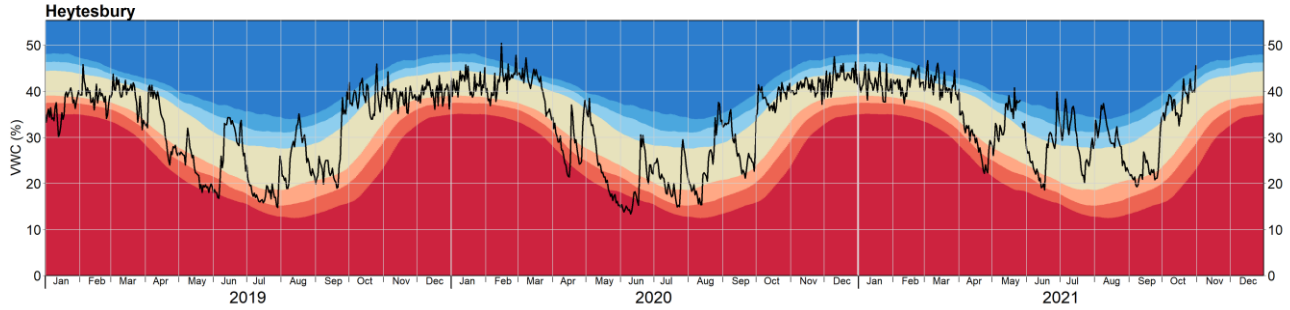
Cardington



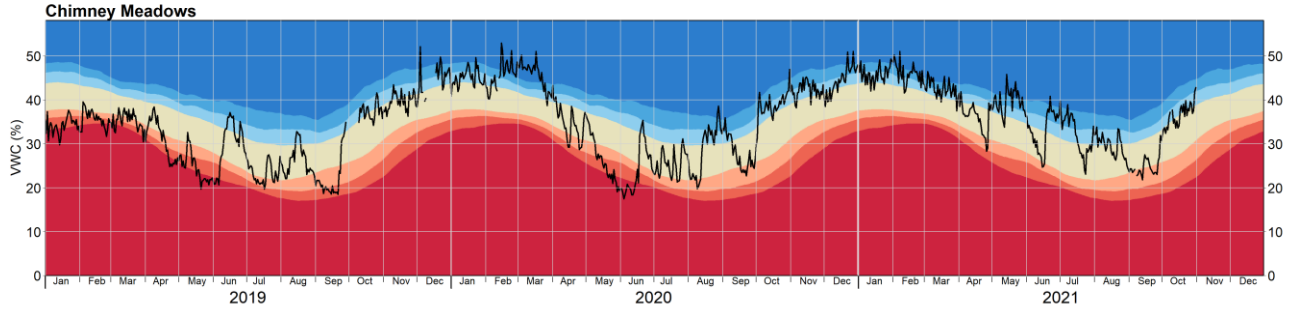
The Lizard



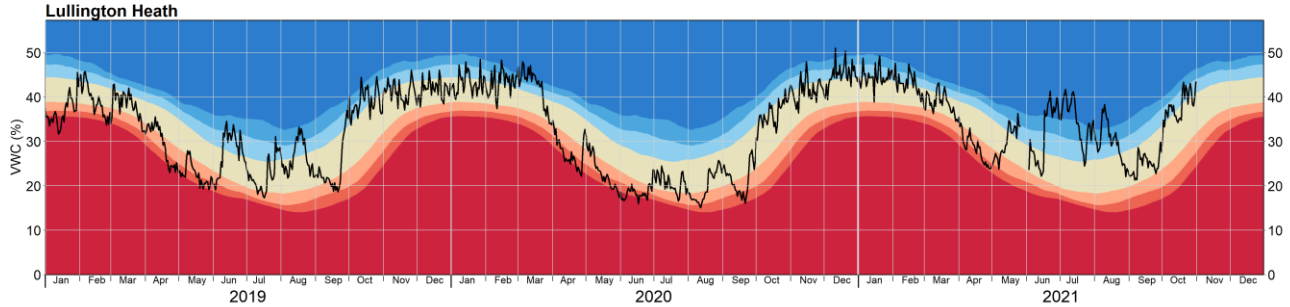
Heytesbury



Chimney Meadows



Lullington Heath



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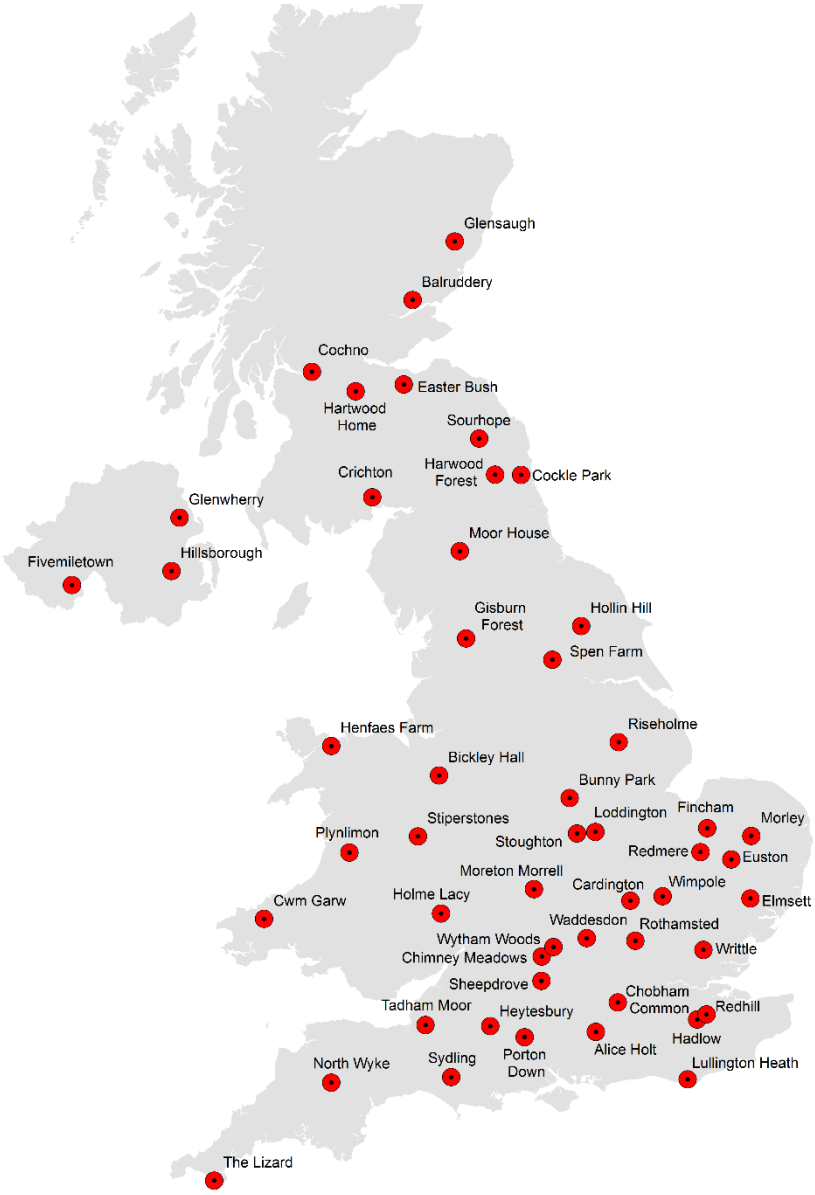

About the maps on page 1: The maps show daily mean soil moisture on the last day of the month. Colours indicate wetness as in the legends.

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, field capacity; additional rainfall either cannot enter the already saturated soil and flows across the land surface as overland flow, or infiltrates but drains quickly through the soil. 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.

About this summary: Every reasonable effort is made to publish this review on the first working day of the month.

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