

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

Notes on period to 31 December 2021

At the end of December soil moisture is close to normal for the time of year.

Provisional data indicate that December precipitation was generally close to, or slightly above, average for the time of year, although with marked local variability. Parts of northern and eastern Scotland had below average rainfall.

In December soil moisture is expected to be close to, or above, field capacity. At sites that have had recent rainfall soil moisture is above field capacity, whereas at sites that have had little recent rainfall, and a spell of uncharacteristically warm weather at the end of the month, soil moisture is slightly below field capacity. The map top-right shows this, and also that there is no clear regional pattern to soil wetness.

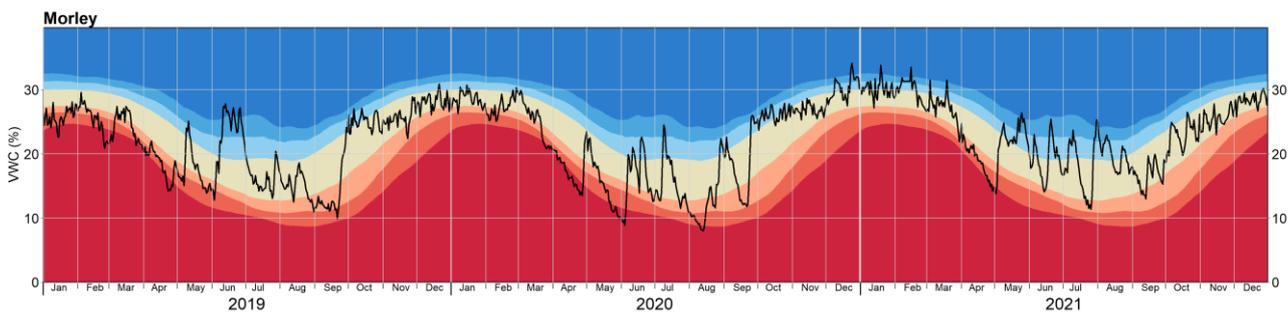
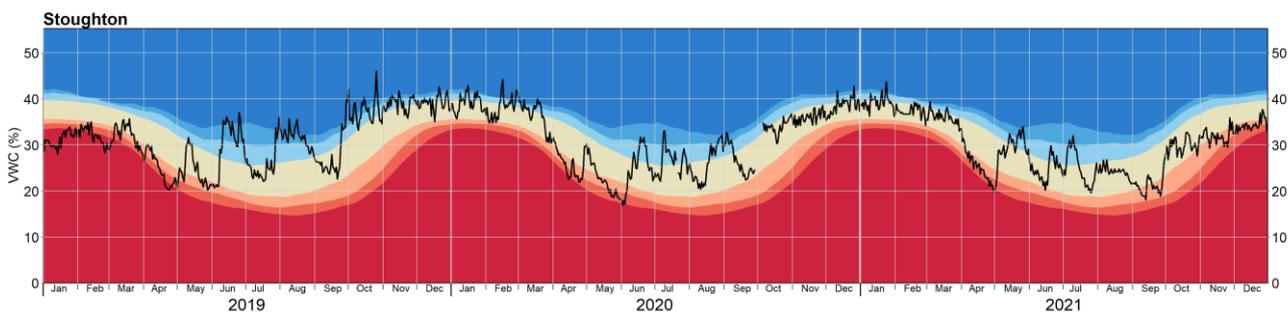
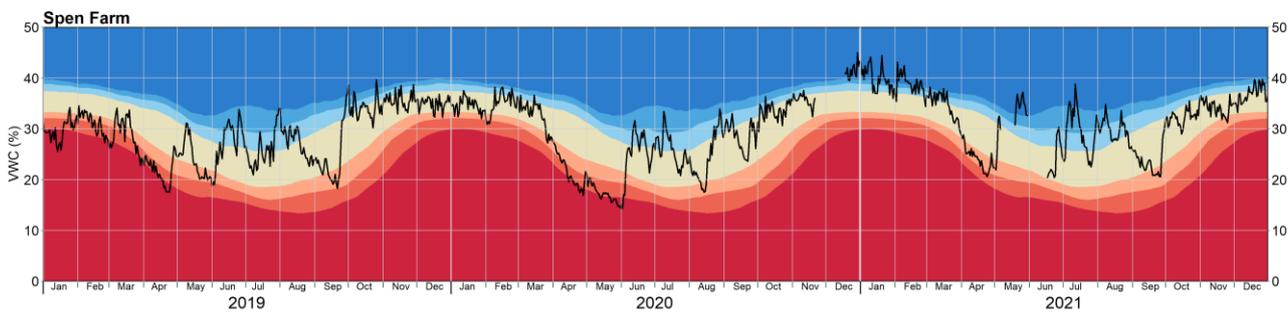
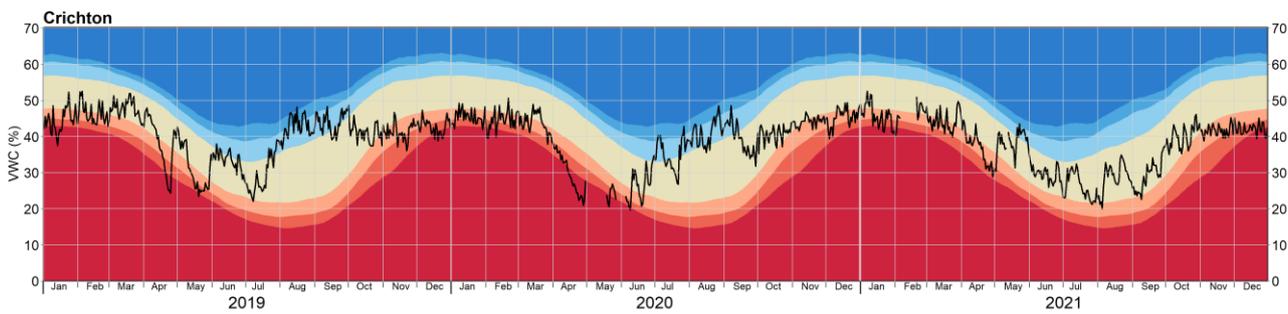
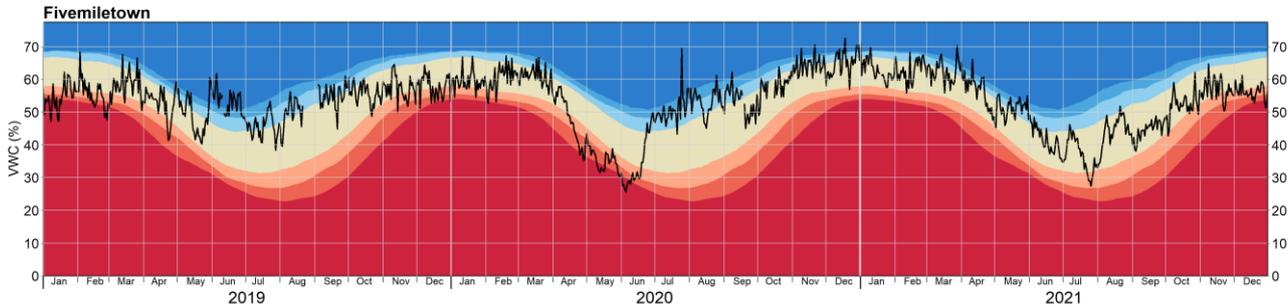
These conditions are in some cases drier, or perhaps more correctly not as wet, as normal since in some winters heavy rainfall will cause soils to become saturated. Crichton, Fivemiletown, North Wyke and Stoughton are all examples of where soils are drier than expected for the time of year.

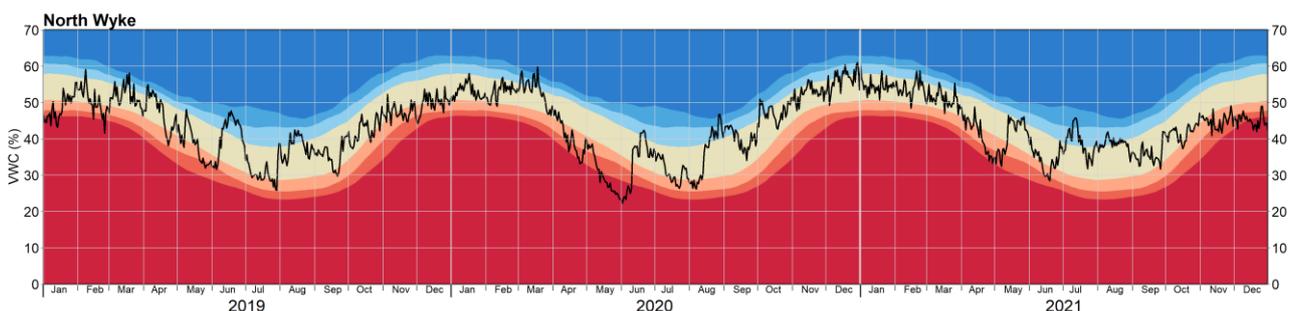
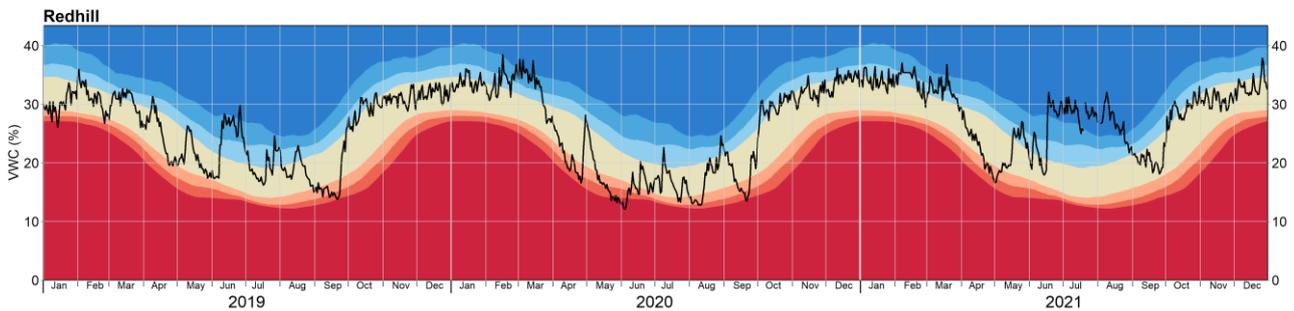
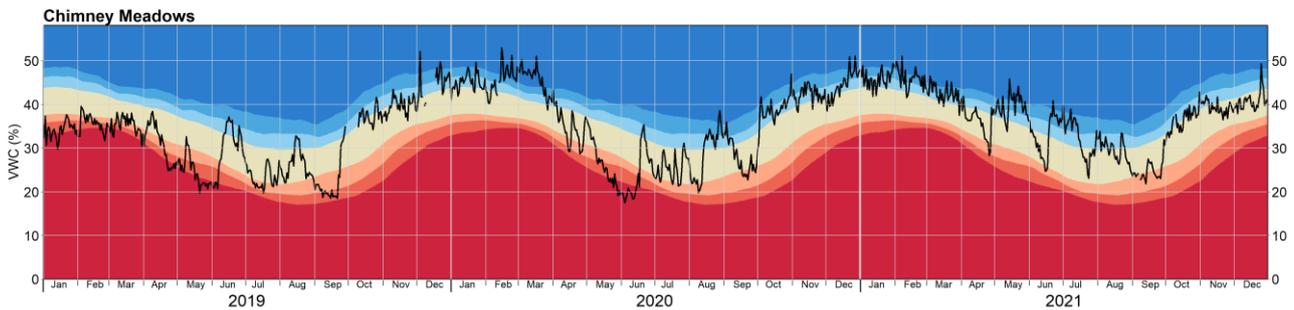
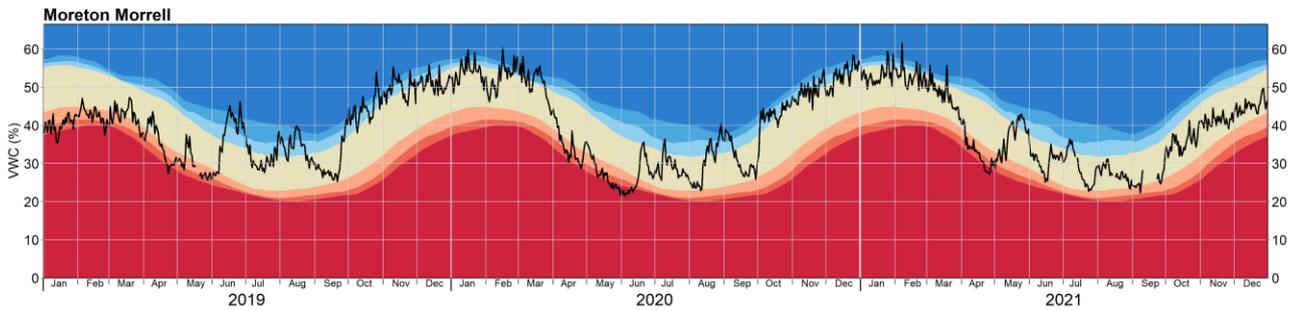
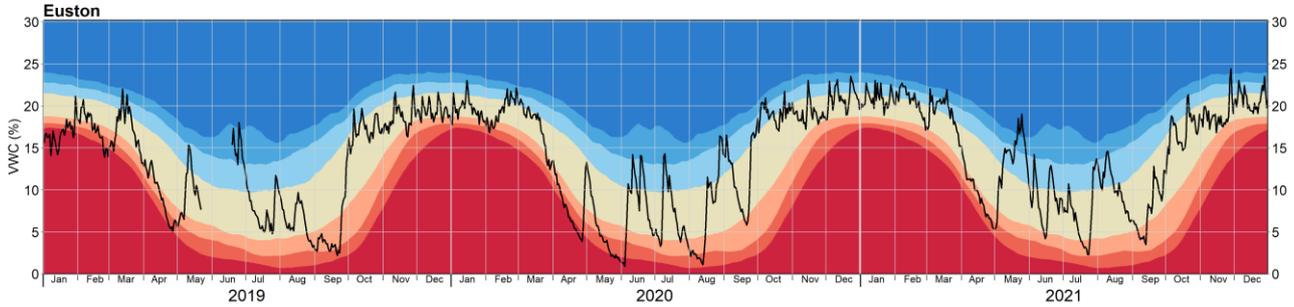
Elsewhere, soils hover around normal soil wetness with short-term increases to above normal conditions in response to rainfall events, as seen at Chimney Meadows, Euston, Redhill and Spen Farm.

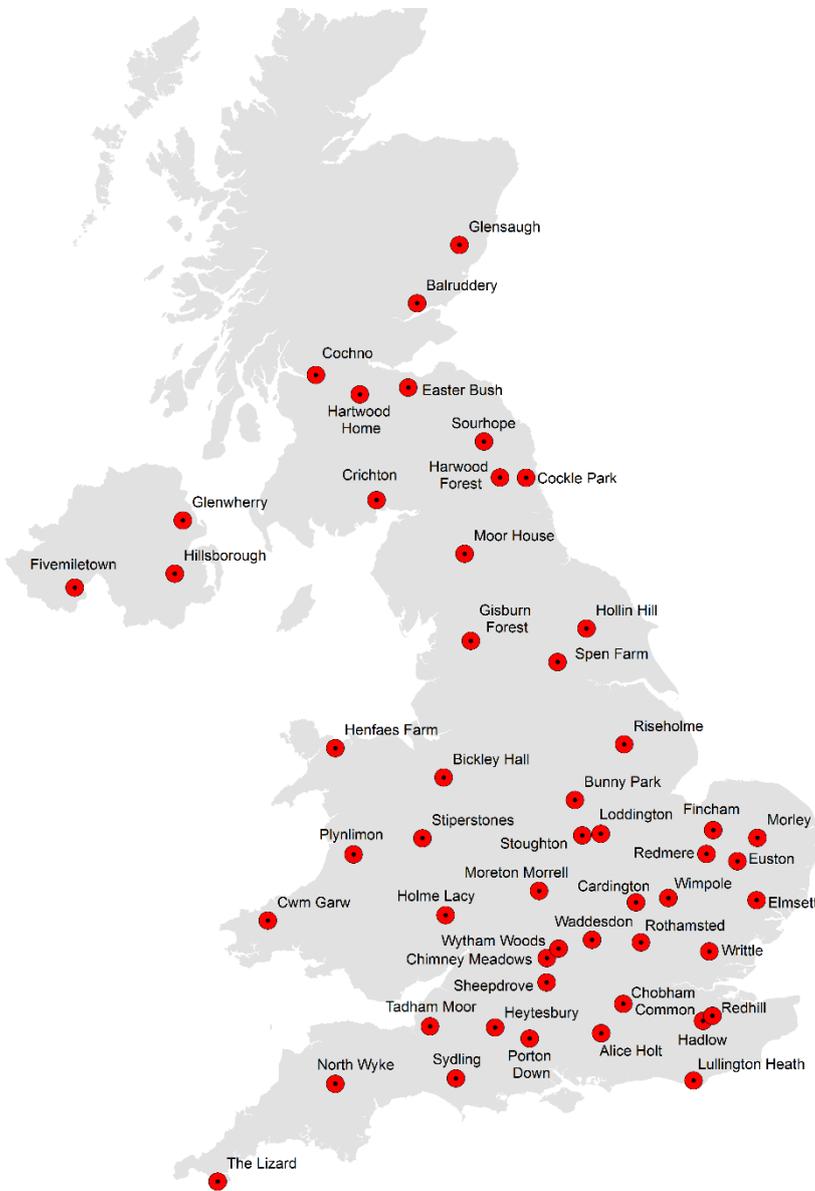
Some sites have seen soil moisture track in the normal range for several months (e.g. Moreton Morrell and Morley).

Network News

- Soil moisture derived from the 'cosmos' sensor at Hollin Hill and Harwood Forest is being reviewed.
- The power system issue at Henfaes has been resolved. Cwm Garw is currently offline.







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.

