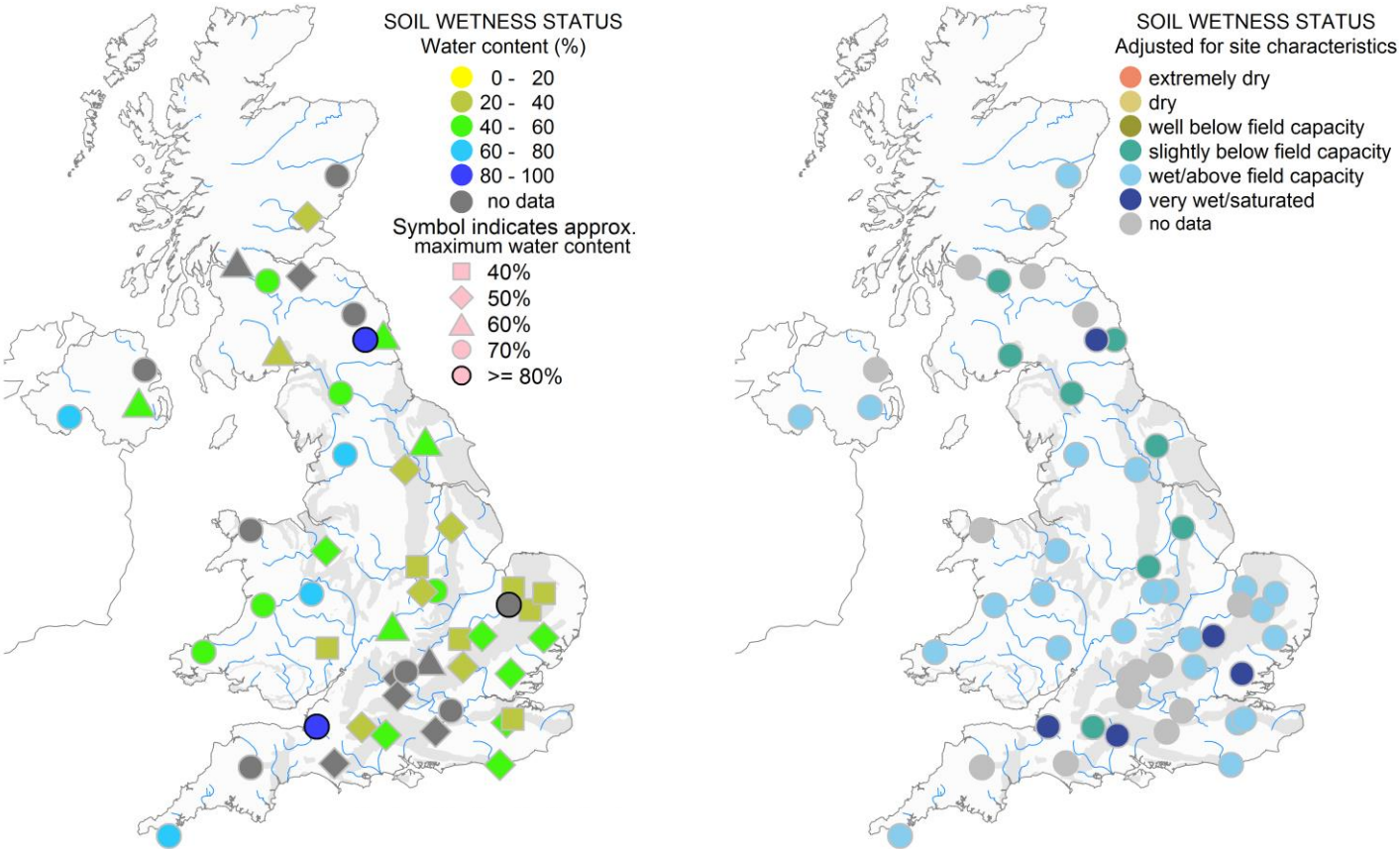
COSMOS-UK | soil moisture

UK Soil Moisture Monitoring Network

Issued on 1 February 2021



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

Notes on period to 31 January 2021

At the end of January soils to the south and east of the UK are close to, or at, saturation so that further heavy rainfall could cause surface water flooding. Elsewhere soils are closer to normal levels of soil wetness for the time of year.

Provisional precipitation data for January indicate that rainfall was generally above average in England and Wales, and in places very much above average, while in Scotland and Northern Ireland precipitation was close to normal. However, in all parts of the UK there appears to be considerable local variability in the monthly precipitation totals.

Soil moisture at the start of the month had been at, or above, typical levels for the winter months. With above average precipitation in January soils remain very wet and close to, or at, saturation in most of southern England (e.g. Writtle, Hadlow, Lullington Heath, Moreton Morrell) and as far north as Bickley Hall in Cheshire. Further precipitation on these soils is very likely to lead to surface water flooding.

Further north, soil wetness was more typical of what is normal for the time of year (e.g. Bunny Park, Hollin Hill, Cockle Park).

Soil wetness at Crichton appears to be lower than normal for the time of year, but whether this is because of a change in land use or lingering effects of a very dry summer in 2018 is unclear. It is, nevertheless, a reminder of the difficulty in characterising the soil moisture regime from a relatively short record.

Network News

- There are currently several telemetry and sensor faults which are taking longer than normal to resolve because of COVID-19 restrictions.

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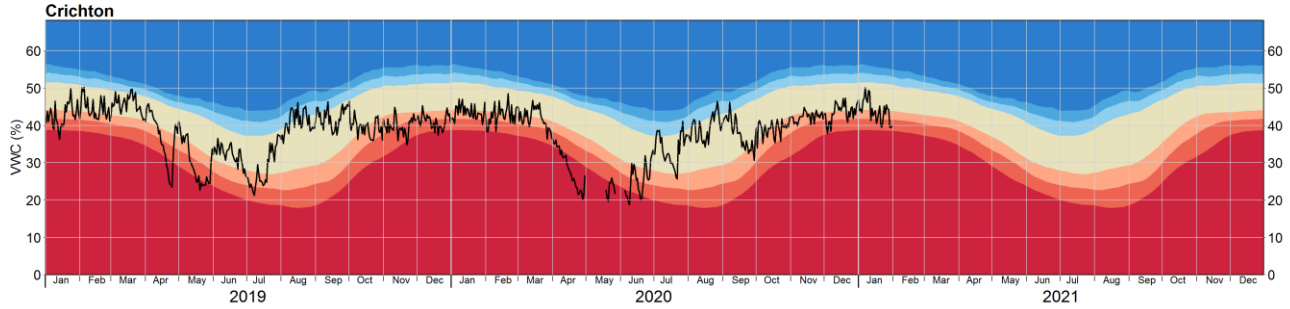
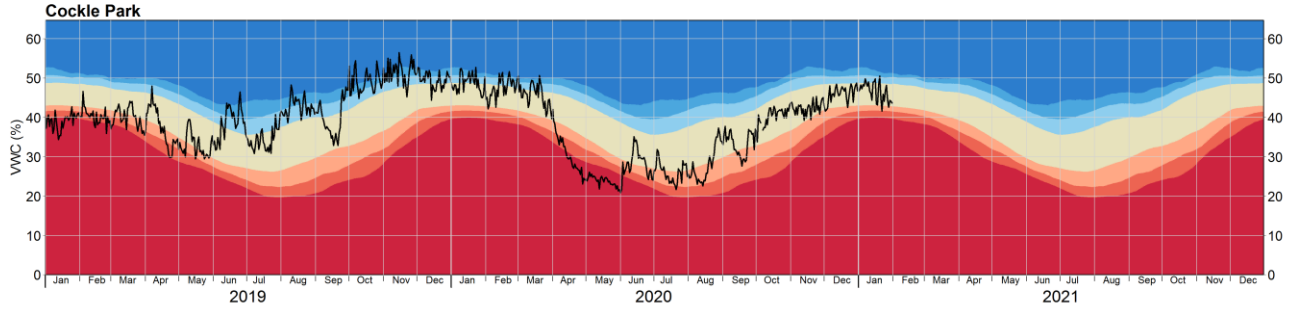
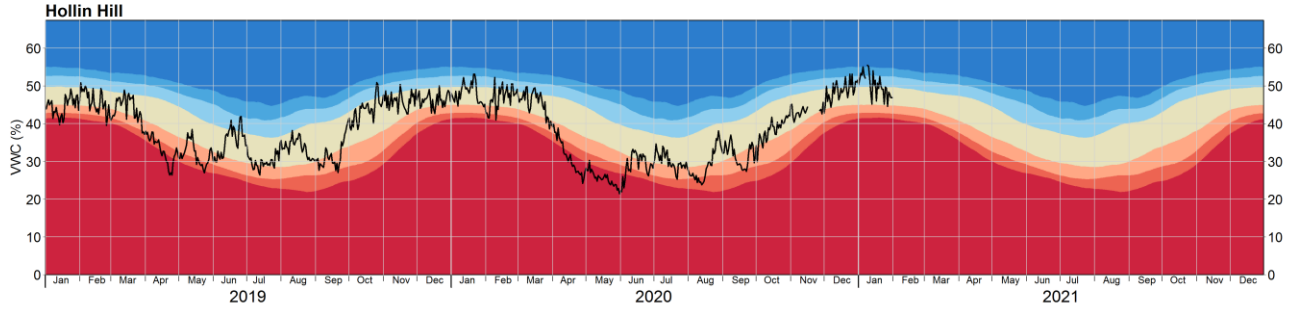
Crichton



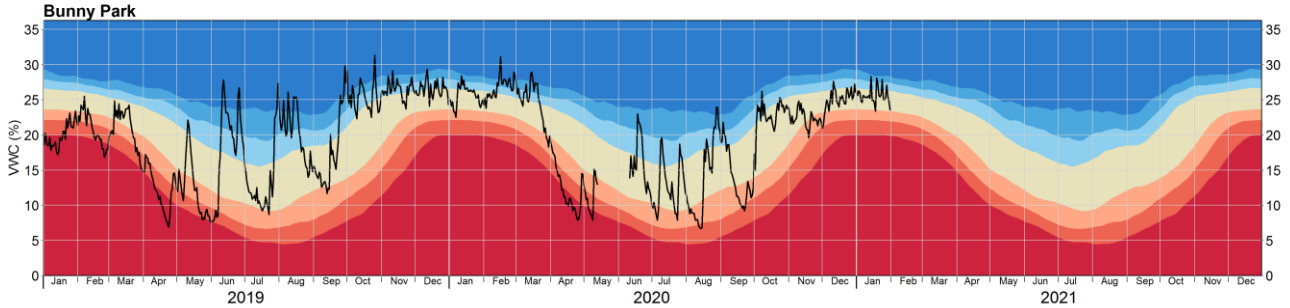
Cockle Park



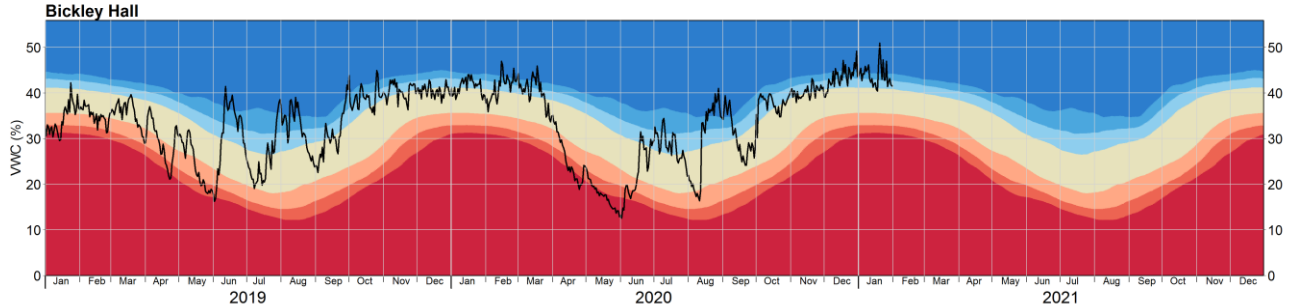
Hollin Hill



Bunny Park



Bickley Hall



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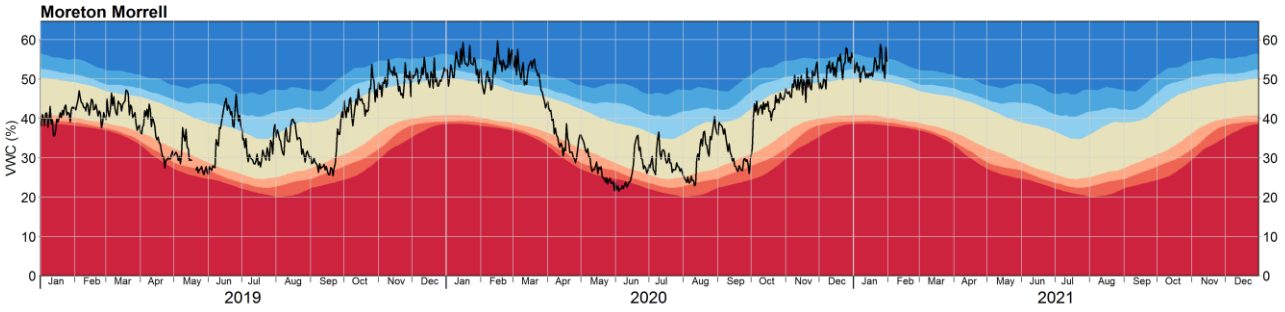

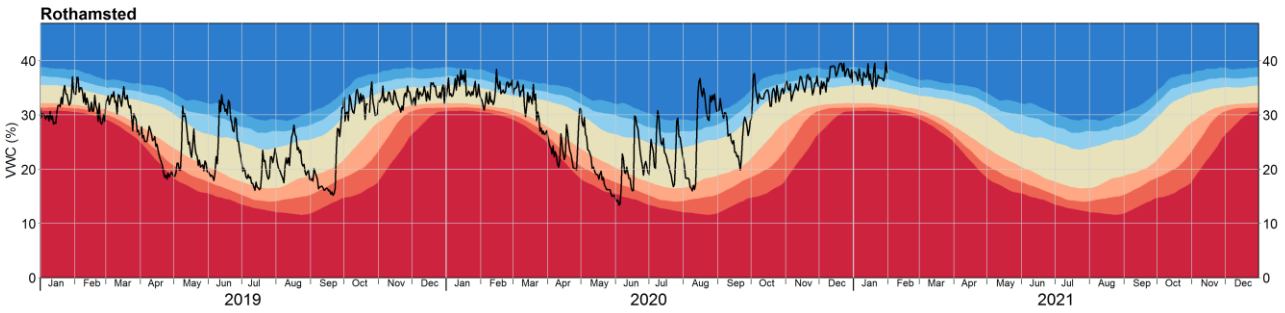

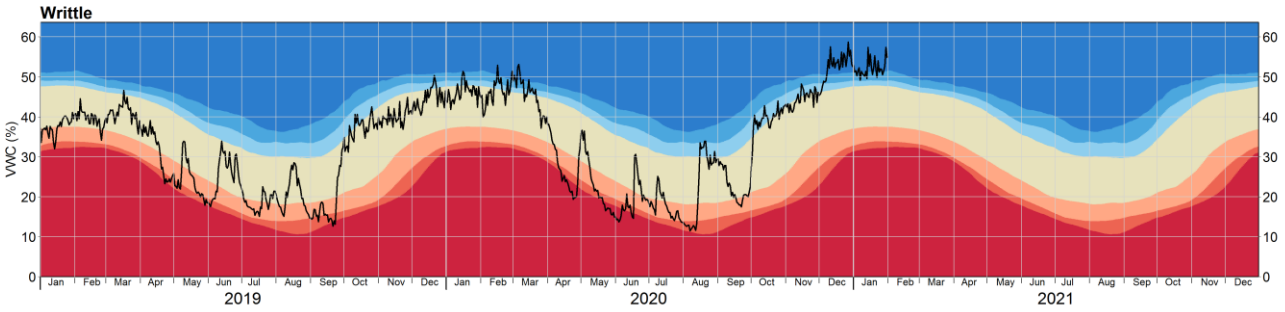

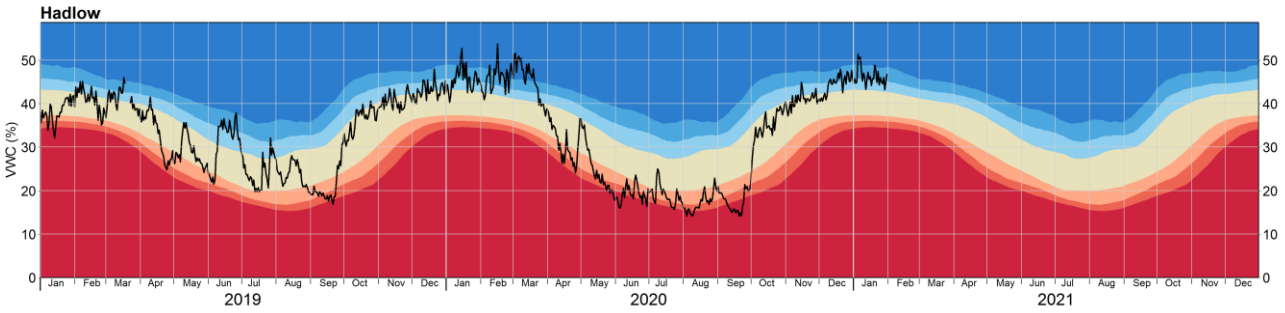

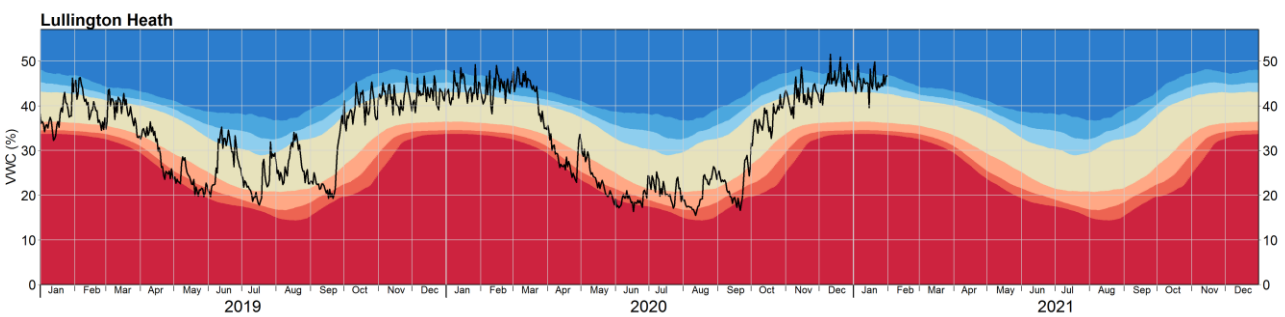

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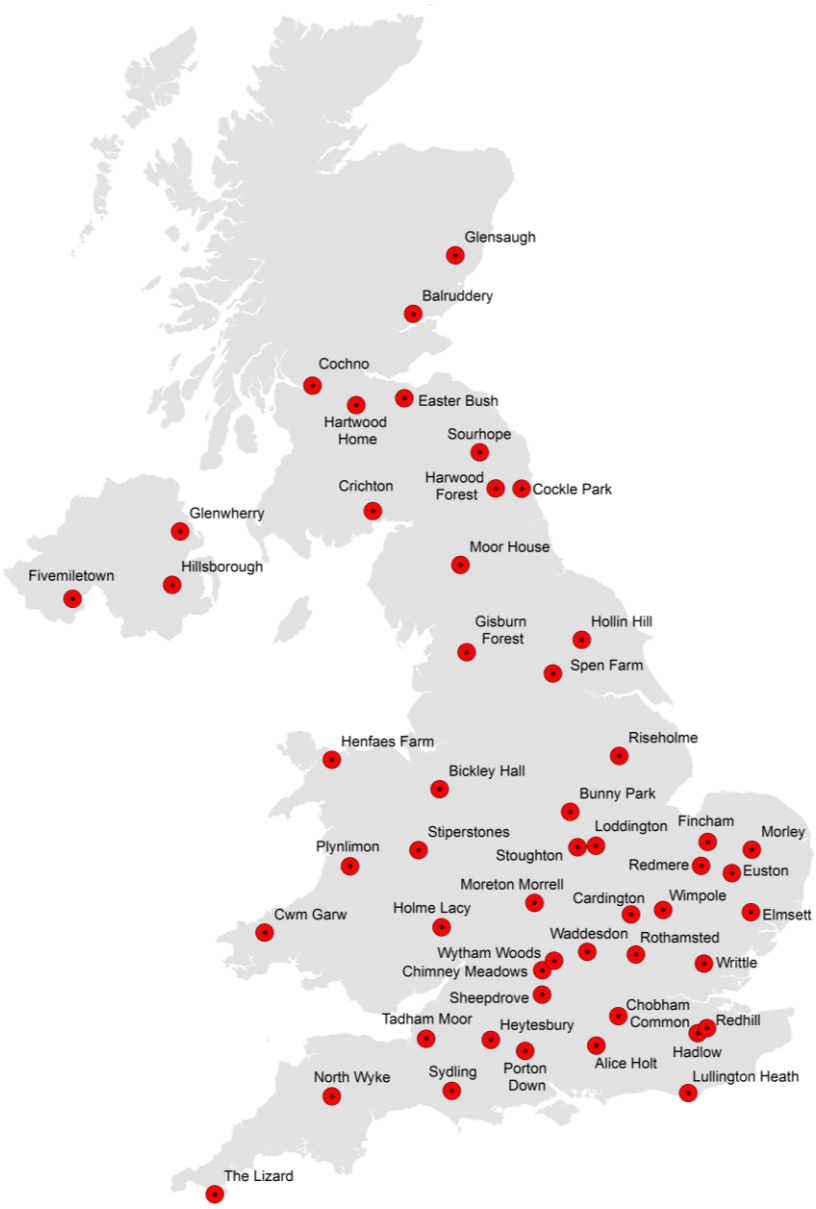
COSMOS-UK site locations



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.

UK Centre for Ecology & Hydrology

CosmosUK@ceh.ac.uk

cosmos.ceh.ac.uk