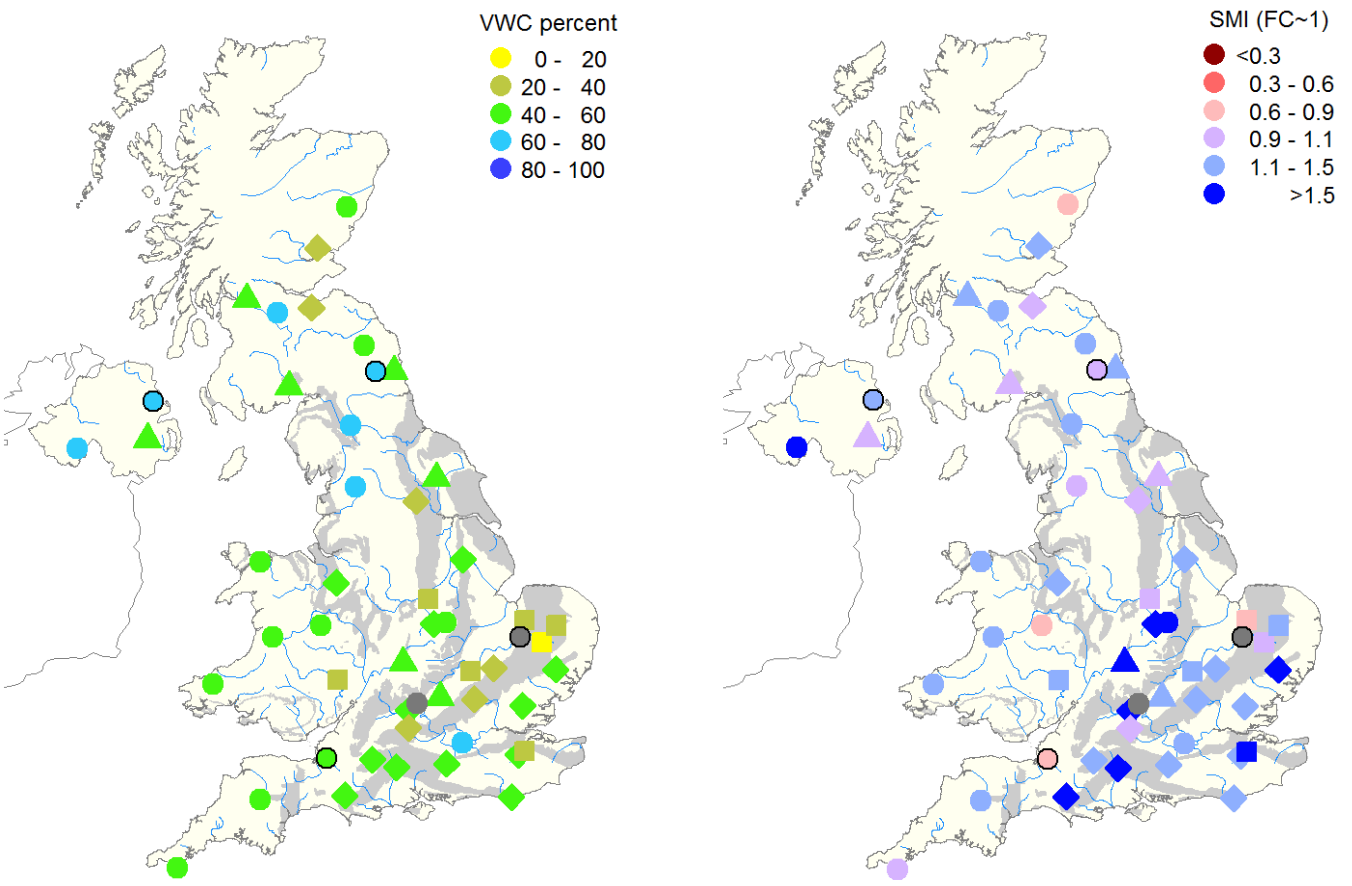
COSMOS-UK | soil moisture

UK Soil Moisture Monitoring Network

Issued on 3 February 2020



Soil moisture on 31 January 2020 (see back page for explanatory comments).

Notes on period to 31 January 2020

Soils to the south and east of the UK are in general wetter than normal and in many parts close to saturation. Elsewhere, soils are somewhat drier being closer to normal for the time of year, or in some places below normal.

Provisional data indicate that precipitation in January was well below average in north east England, eastern Scotland and Northern Ireland. North west Scotland had above average precipitation. Elsewhere in the UK precipitation was close to average. In most places the precipitation occurred mainly in the first half of the month.

Generally, sites below a line from the Bristol Channel to the Humber are wetter than normal for the time of year (e.g. Elmsett, Redhill). However, within this region some sites are closer to normal (e.g. Morley, North Wyke), or even slightly below normal (e.g. Fincham, Sheepdrove). Very little rainfall would return many of these soils to saturation.

In the rest of the UK soil moisture is normal (e.g. Balruddery, Spen Farm) to below normal for the time of year (e.g. Crichton, Stiperstones).

Note that the COSMOS-UK records are too short to reliably estimate long-term monthly averages and departures from them; it is therefore only possible to give qualitative indications about averages and what is typical for the time of year.

Network News

- Generally, data capture during January has been very good with only minor issues with instrumentation.
- Bickley Hall and Bunny Park have now both been installed for five years, making a total of 25 sites that now have over five years of data.

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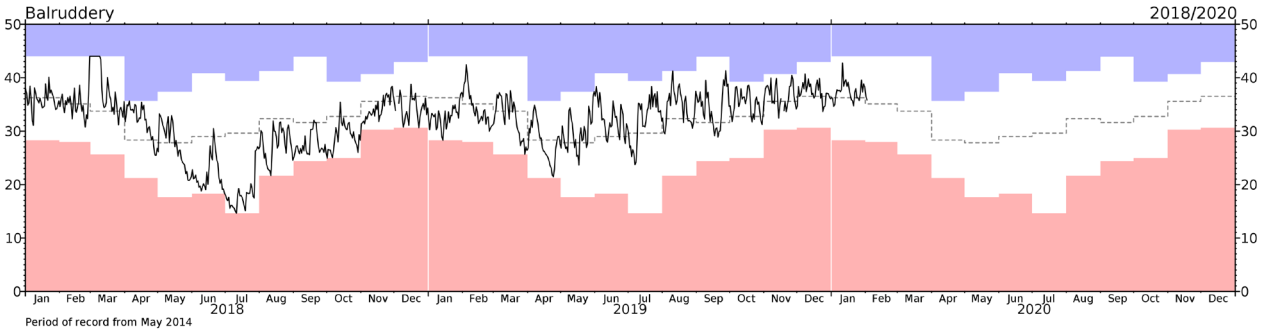
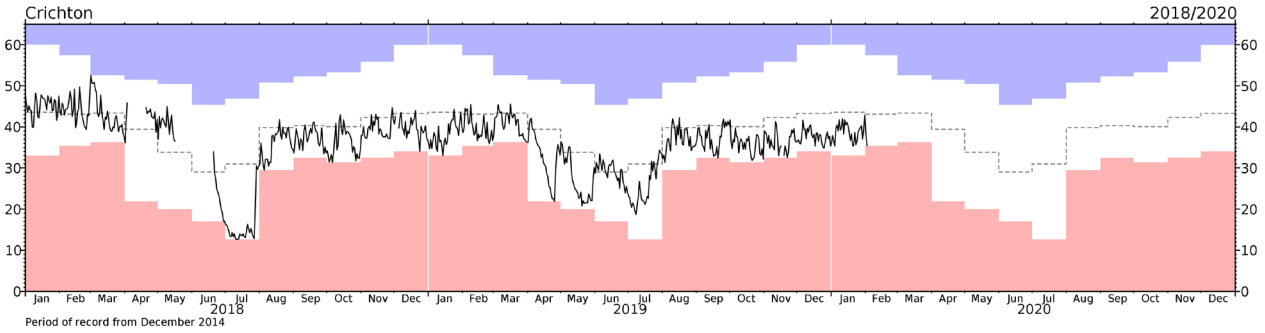


Period of record from May 2014



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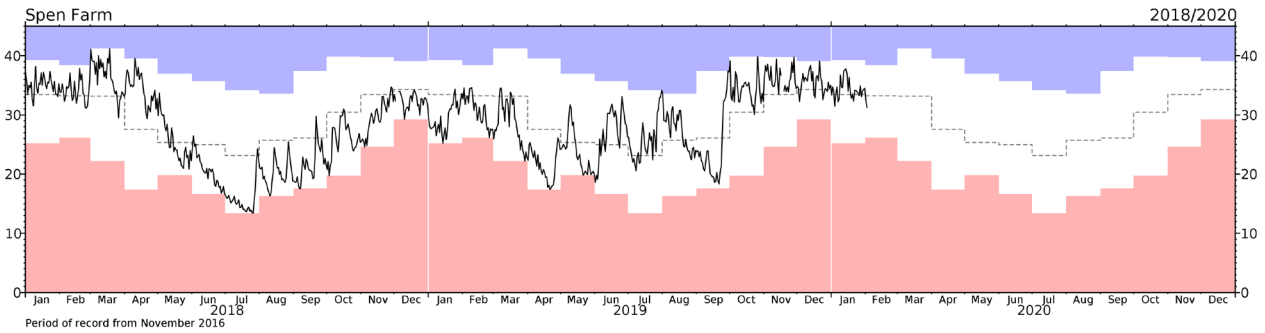
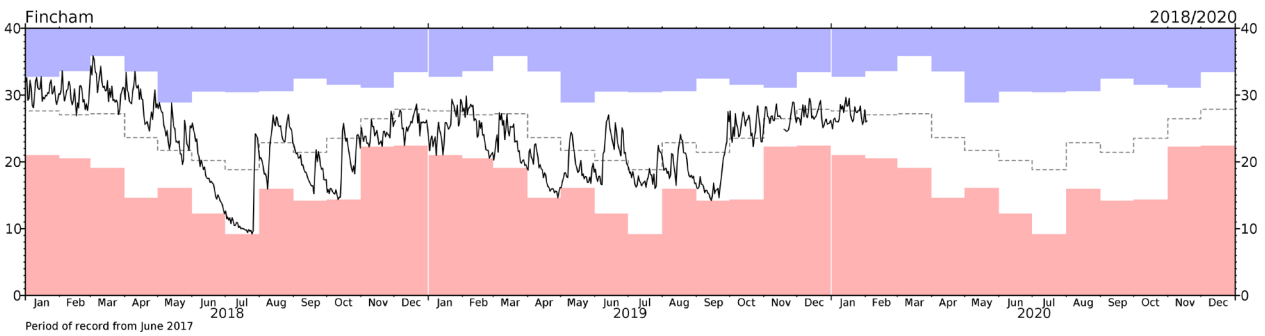
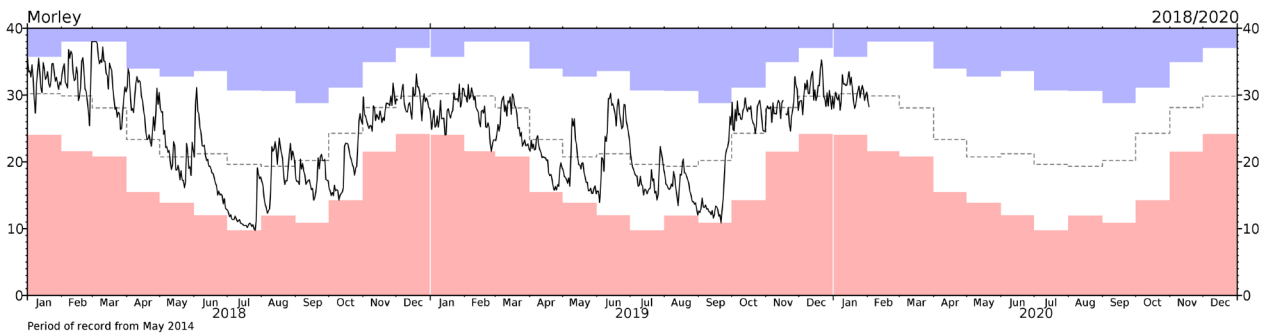


Period of record from November 2016



Period of record from June 2017



Period of record from May 2014

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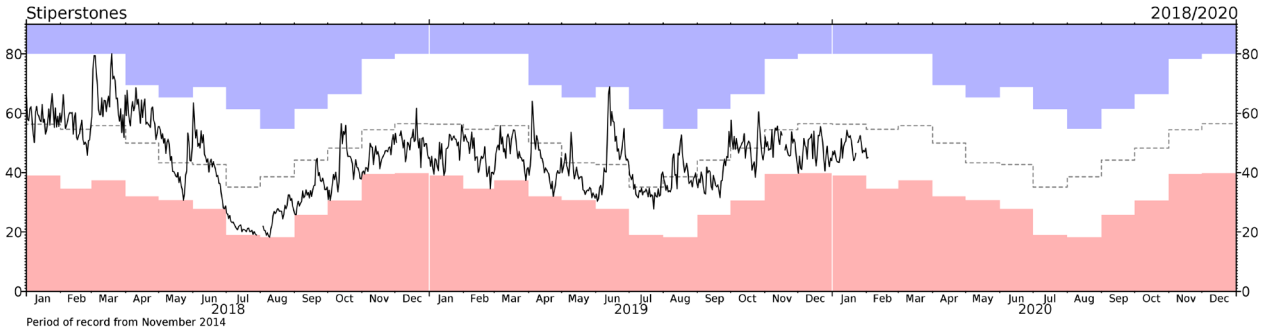

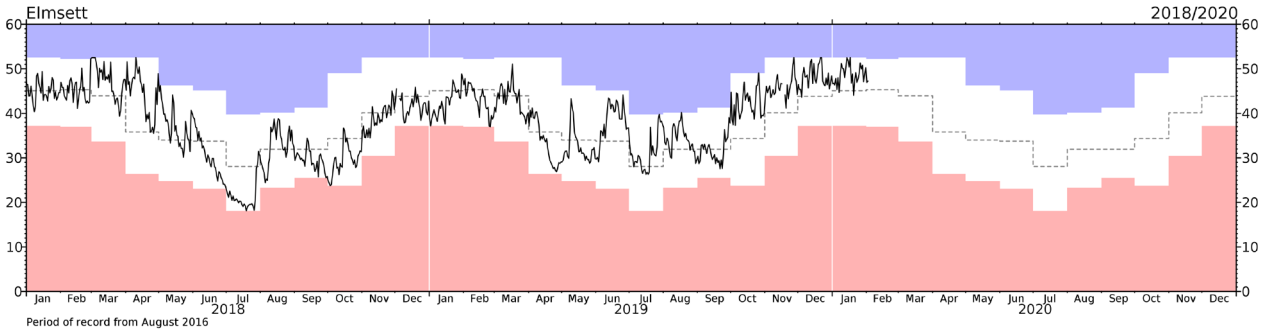

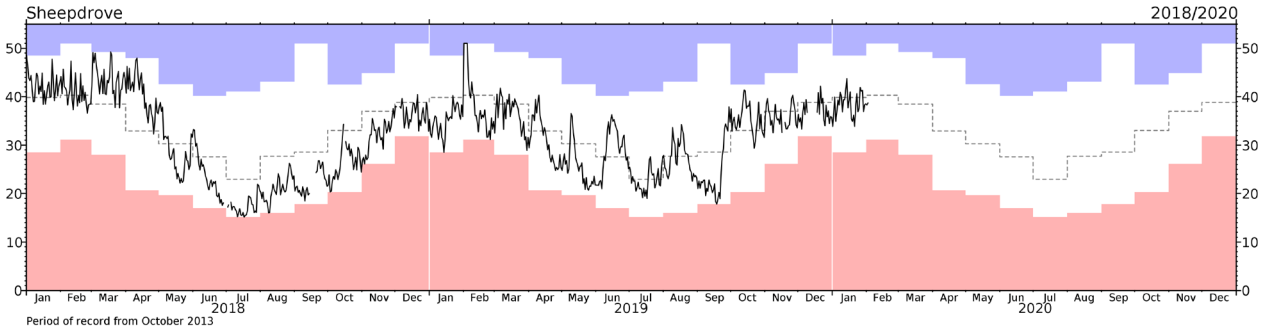

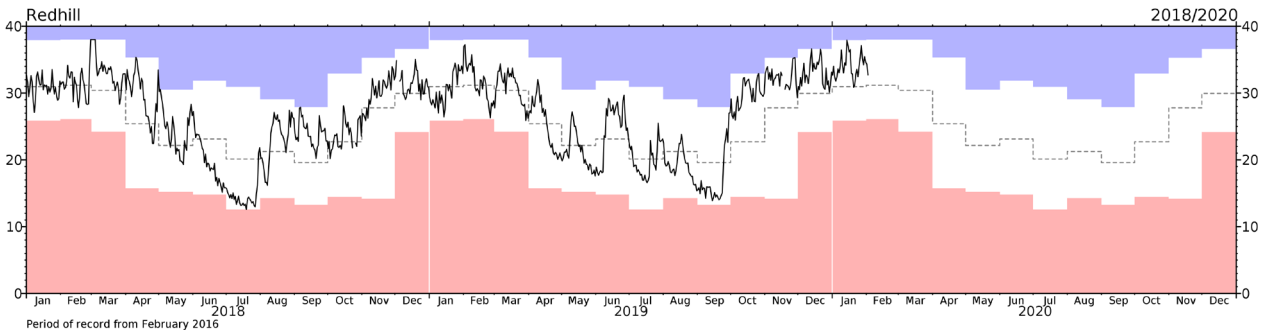

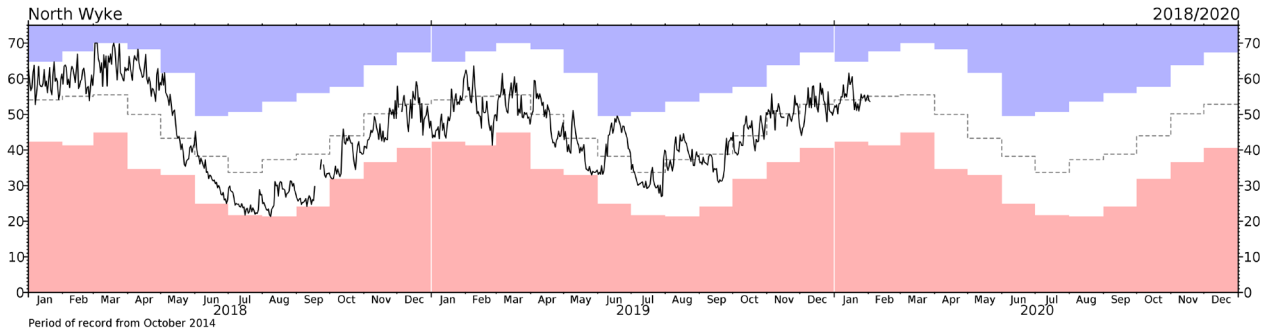

COSMOS-UK

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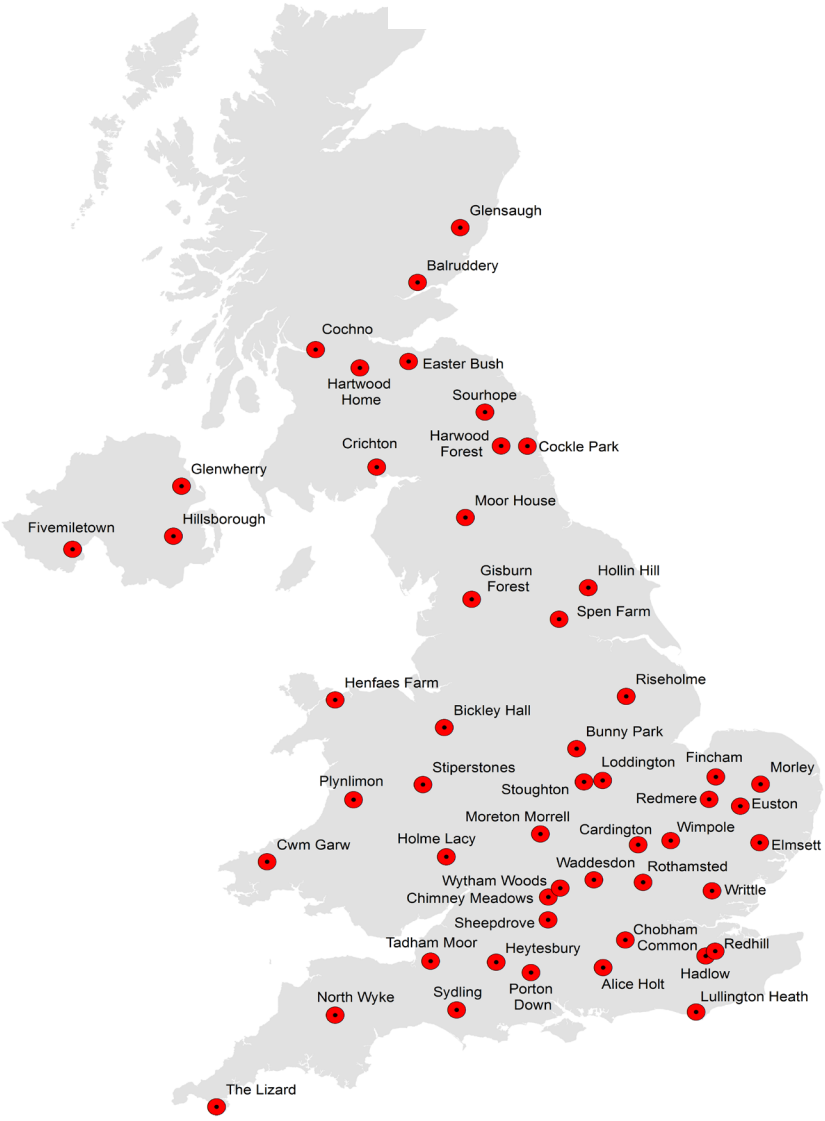
COSMOS-UK site locations



About the maps on page 1: The maps of volumetric water content (VWC) and soil moisture index (SMI) show average daily soil moisture at the end of the month. Colours indicate wetness as in the keys. Grey symbols represent missing data.

The symbols represent groups of sites with similar soil maximum water content, i.e.

~ 30%	■
~ 40%	◆
~ 50%	▲
~ 60%	●
>=~ 70%	●

VWC – This is the percentage water content and reflects both capacity of the soil to store water as well as actual moisture content.

SMI – This is an index of soil moisture that is adjusted for the capacity of the soil to store water. A value of around 1.0 represents field capacity (FC) which is typical moisture content in late autumn and early spring. SMI will generally be lower than this in the summer and higher in the winter.

Nearby sites with the same symbol (i.e. similar rainfall and soils) should be in similar VWC and SMI classes; however neighbouring sites with different symbols (i.e. similar rainfall but different soils) can be in different VWC and SMI classes. Sites represented by circles with an outline are generally poorly draining and wet, and therefore often have VWC and SMI values different from their neighbours; data from these sites are less reliable than from other sites.

Grey shaded areas represent principal aquifers.

About the graphs on pages 2 and 3: These show the VWC over a three year period. The black line shows the daily soil moisture, the shaded areas show the monthly minima (pink) and maxima (blue) from the period of record, and the dashed grey line indicates the period of record monthly mean. These extremes and means are currently derived from very short records; they do nevertheless give some indication of the seasonal variability of the moisture content.

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 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

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UK Centre for Ecology & Hydrology

CosmosUK@ceh.ac.uk

cosmos.ceh.ac.uk