

Soil moisture on 31 December 2019 (see back page for explanatory comments).

Notes on period to 31 December 2019

Soil moisture across the UK is generally above normal for the time of year, although soils in western areas of the UK are closer to, or slightly below, normal for the time of year.

Provisional data indicate that precipitation in December was above average across much of the UK especially to the south and east. To the north and east of Scotland, Yorkshire and across to north Wales precipitation was below average. There were several spells of heavy rainfall notably 12th-14th, 19th-21st, and to a lesser extent on the 26th.

In some parts of central and southern England soil moisture has now been above average since October (e.g. Waddesdon, Redhill, Elmsett, Stoughton). However, at other sites within this area soil moisture has been closer to normal throughout this period (e.g. North Wyke, Euston and Hollin Hill). These differences are caused by local variations in rainfall and soil type.

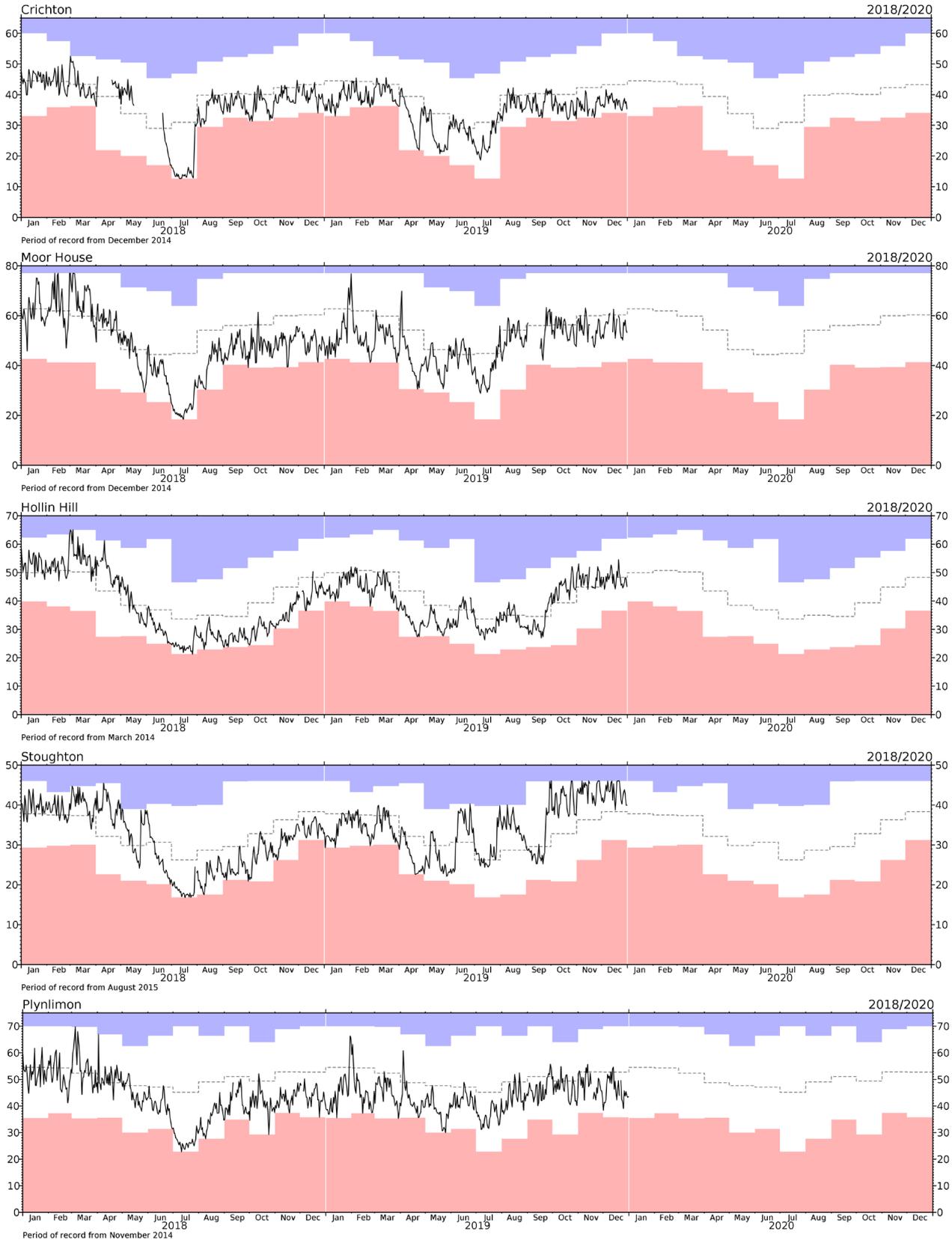
In contrast, at sites in south-west England, west Wales, north-west England and central Scotland soil moisture is slightly below normal levels for the time of year (e.g. Plylimon, Moor House and Crichton).

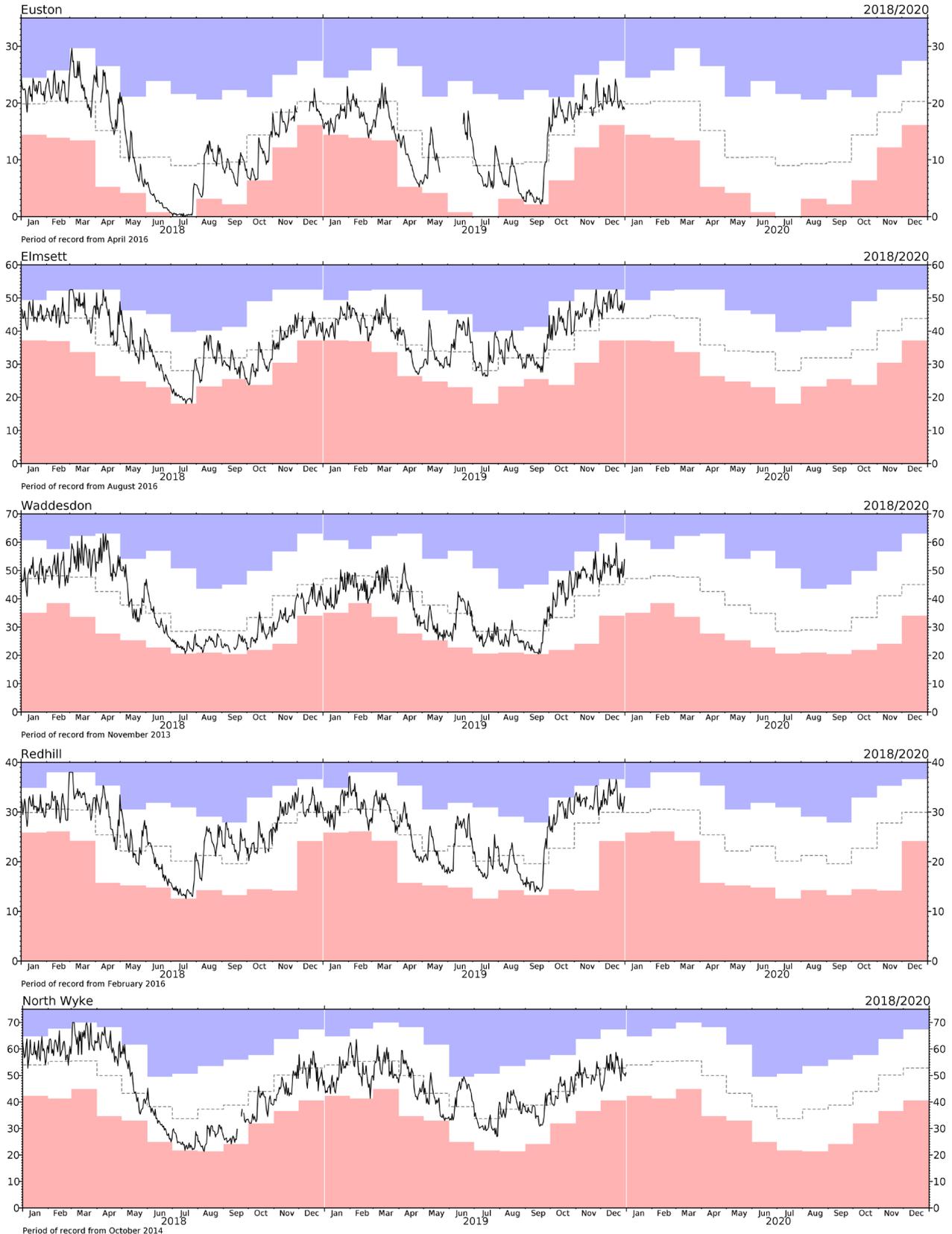
There has been a general fall in soil moisture during the drier few days at the end of the month, but with further precipitation soils could quickly return to saturation in all parts of the UK.

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.

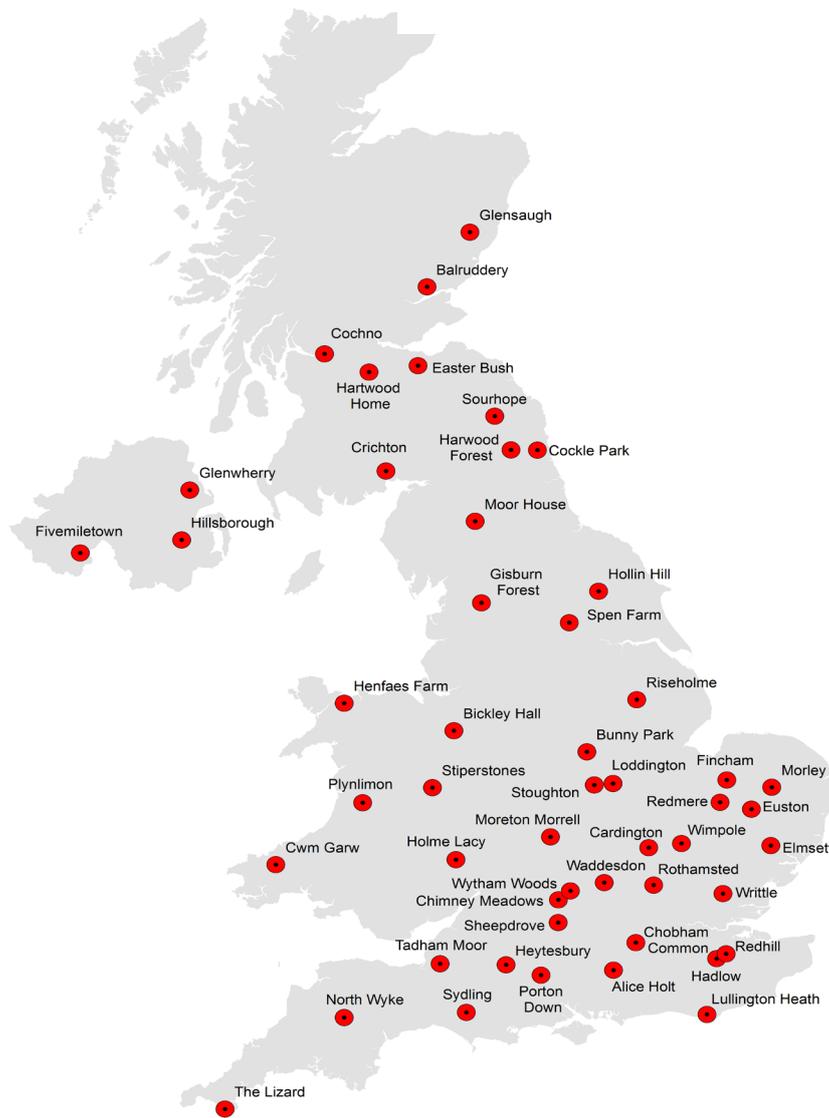
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- Systems and instruments have generally remained operational during the Christmas and New Year period but three sites are currently off-line: Harwood Forest, Lullington and Stiperstones.





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.



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.

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