

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

### Notes on period to 31 July 2020

**At the end of July there is a pronounced gradient in soil moisture across the UK from wetter than normal for the time of year in the north west to drier than normal in the south east.**

Provisional precipitation data for July show that rainfall was below average in southern England and above average in Northern Ireland, Scotland and north east England. Elsewhere in England and Wales precipitation was close to average.

In the south east of England, notable rainfall events around the 7<sup>th</sup> and 25<sup>th</sup> saw significant but short term peaks in soil moisture so that by the end of the month soils were again very dry (e.g. Morley and Writtle). Slightly further to the north and west, the distribution of the rainfall was similar but left soil moisture closer to normal for the time of year (e.g. Cardington and Rothamsted).

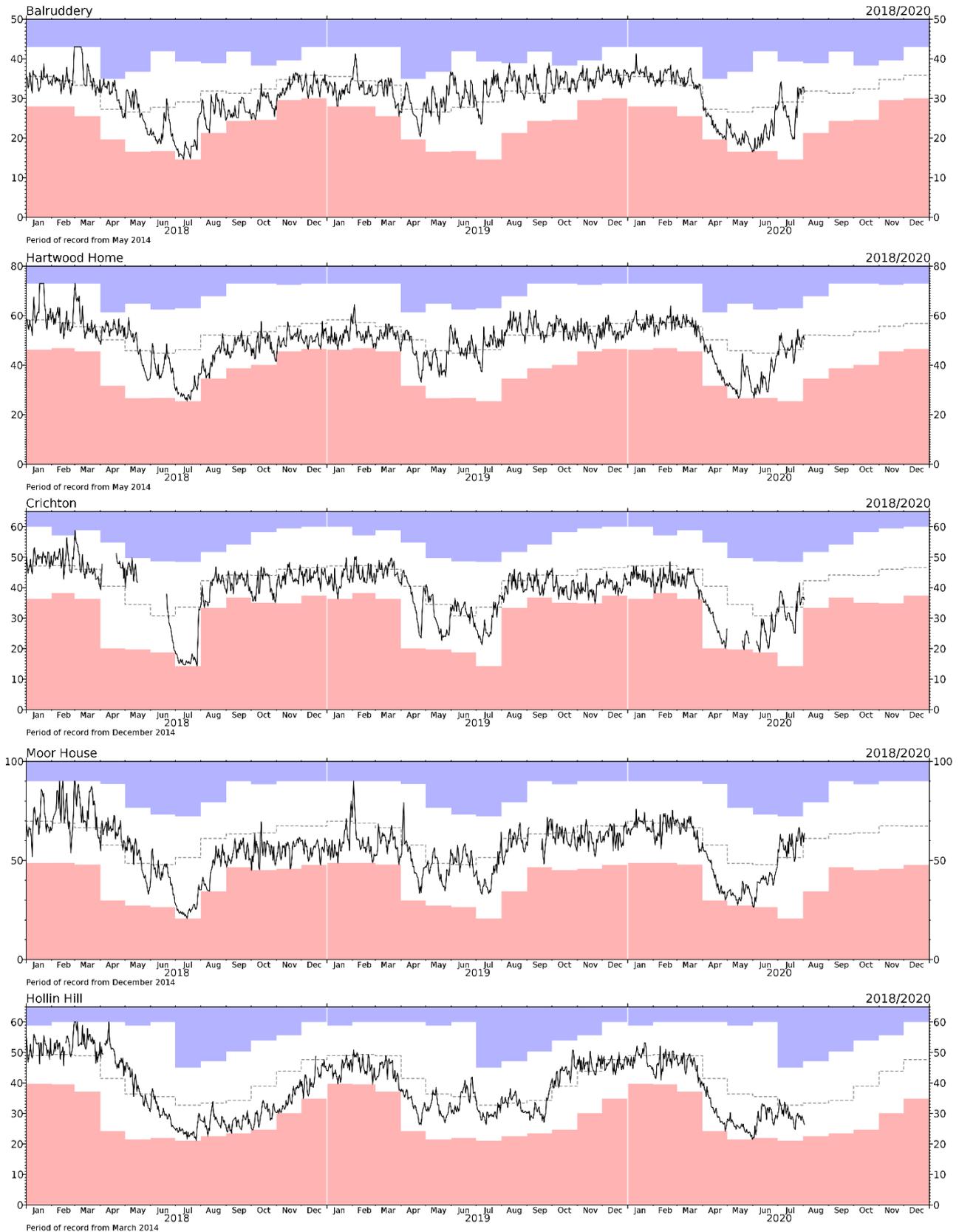
Further north again rainfall was more evenly distributed through the month. At some sites the balance between rainfall and evaporation led to a drift through the month towards drier soil moisture conditions (e.g. Bickley and Hollin Hill), whilst further north again this balance was reversed with a small increase in soil moisture (e.g. Hartwood Home and Moor House).

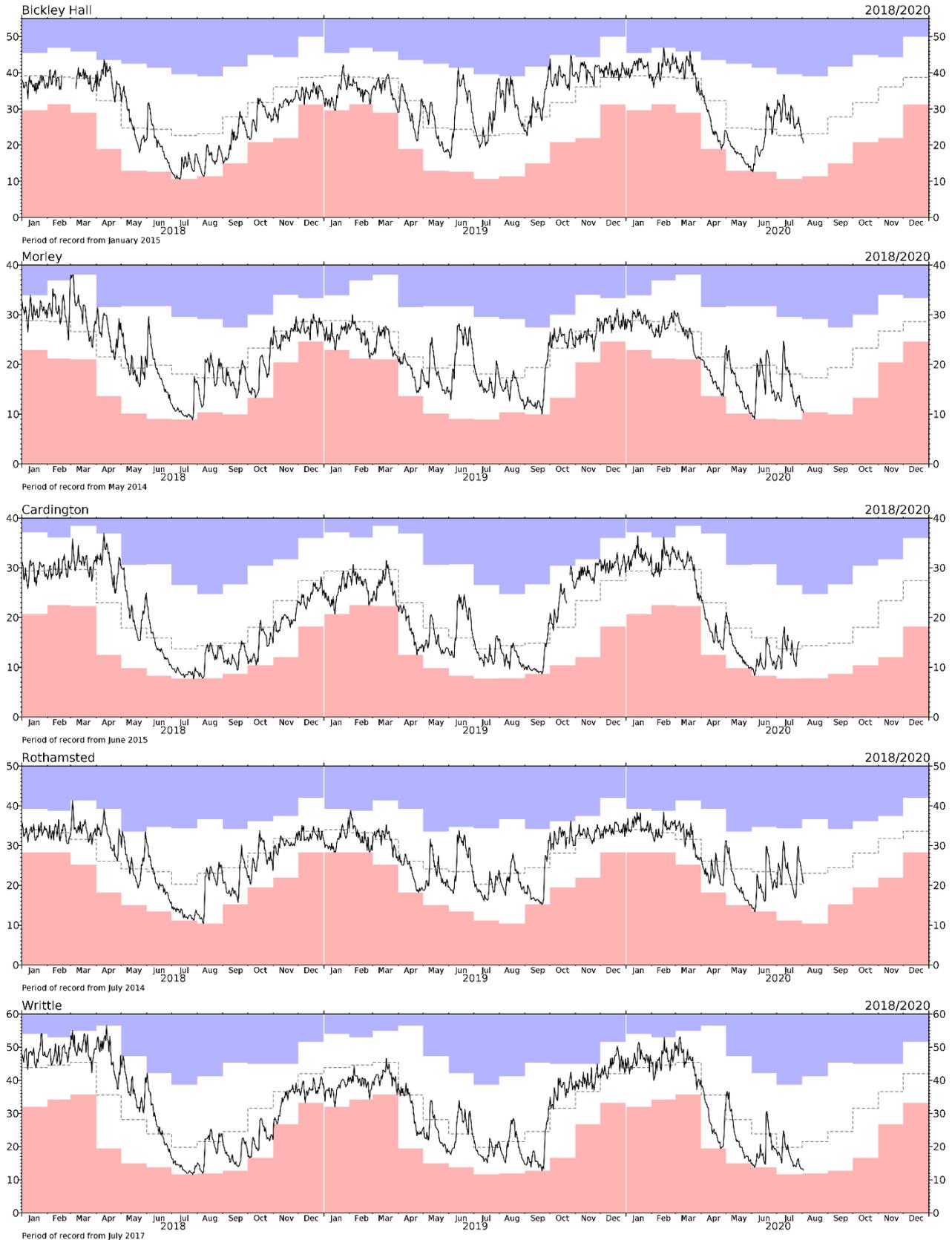
In parts of eastern Scotland, rainfall was again concentrated in two wet spells towards the start and end of the month, so while sites started and ended July with soil moisture close to normal for the time of year there was a noticeable mid-month dip in soil moisture (e.g. Balruddery and Crichton).

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

- Ongoing major faults at Cardington, Hillsborough, Riseholme, Stoughton and Harwood Forest.





### 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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