

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

Notes on period to 31 October 2020

At the end of October soils across the UK are wet, and in many places close to saturation, meaning that further heavy rainfall may cause surface water flooding.

Provisional data indicate that October was a very wet month with above average rainfall across the UK. Some eastern parts of the UK may have had more than twice the monthly average.

Many sites saw a remarkable transition in soil moisture at the end of September and the start of October caused by rainfall brought by storm Alex. In the south-east, some sites saw dramatic increases from below normal to above normal soil moisture for the time of year (e.g. Hadlow and Writtle); increases were marked but slightly less extreme elsewhere (e.g. Lullington).

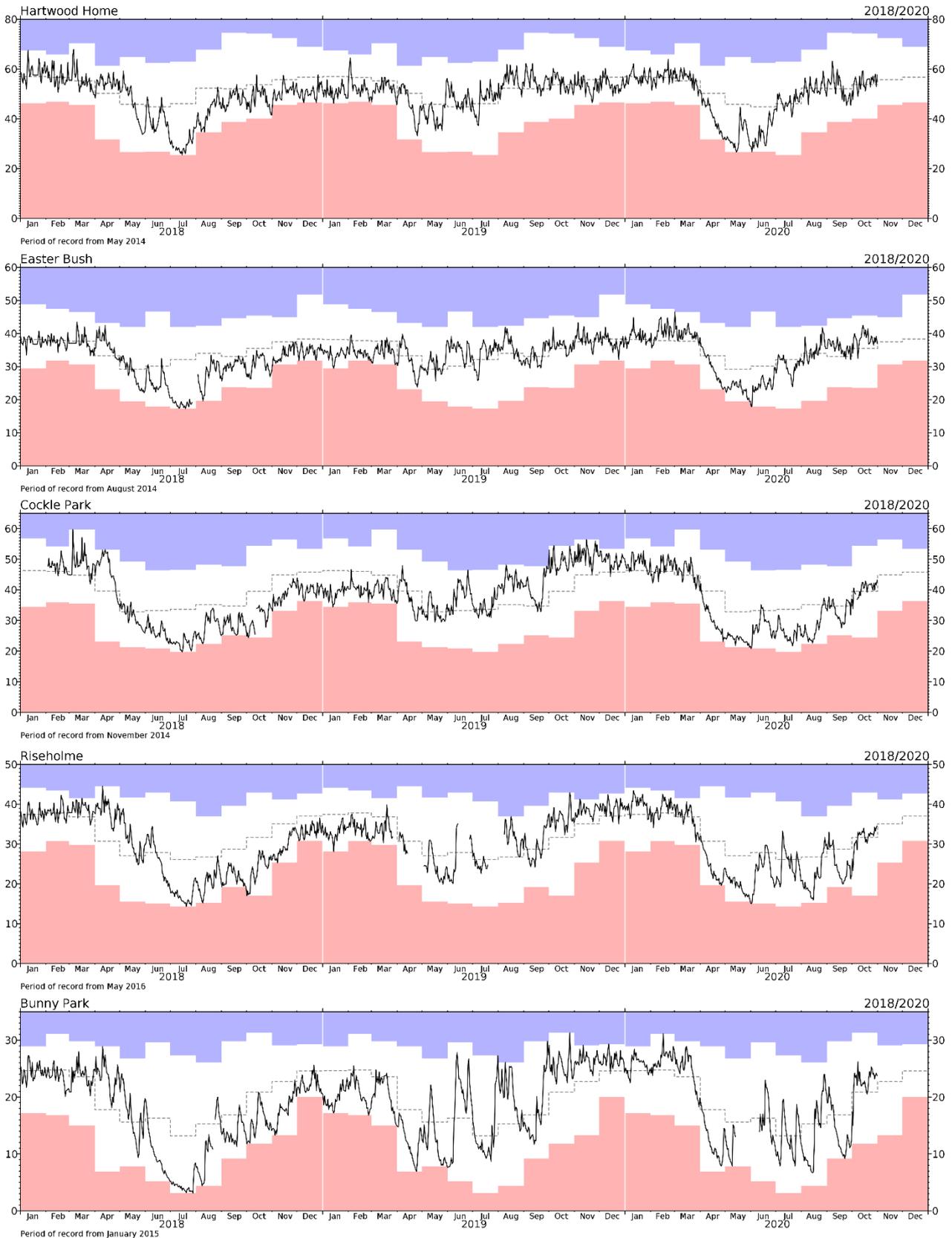
Away from the south-east, sites that had been below normal for the time of year saw an increase to normal conditions (e.g. Bunny Park and Riseholme), while sites that had started the month at conditions close to normal saw soil moisture increase to well above normal for the time of year (e.g. Bickley Hall, Porton Down).

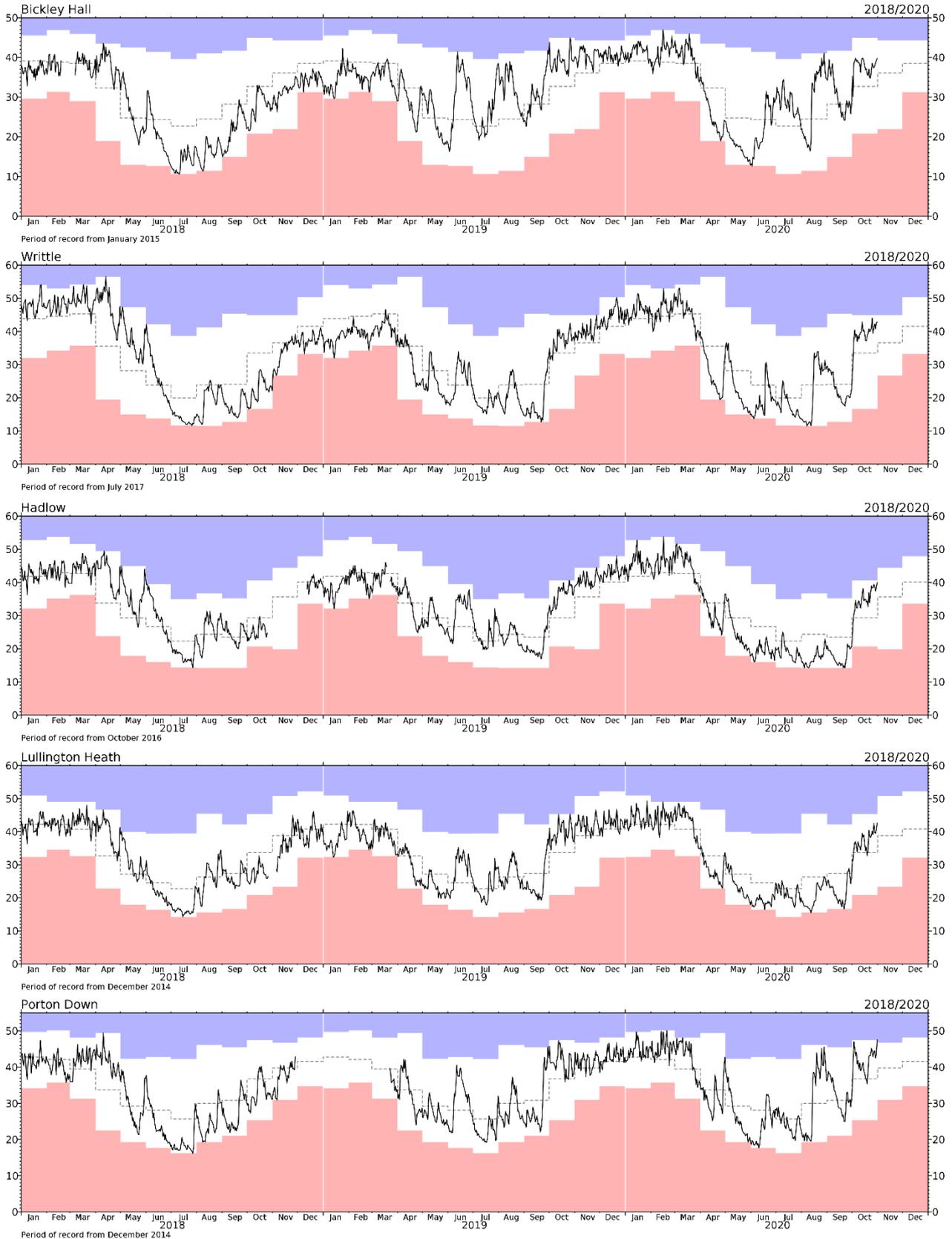
In northern England and Scotland many sites that started the month with normal levels of soil moisture for the time of year saw these conditions maintained through the month (e.g. Hartwood Home, Easter Bush, Cockle Park).

Soils are now wet, and in many places close to saturation, meaning that there is little capacity to hold more water as winter approaches. Further heavy rainfall is therefore likely to result in surface water flooding.

Network News

- Telemetry faults at Cwm Garw, Gisburn Forest and Glenwherry.
- Sites at Chimney Meadows and Sheepdrove have now been recording data for seven years.





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.

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