

Soil moisture on 31 October 2018 (see back page for explanatory comments).

Notes on period to 31 October 2018

Soil moisture has been generally normal for the time year during October, although at the end of the month many sites are somewhat drier than normal.

Provisional data for October show that rainfall was above normal in northern Scotland, close to normal in north-east Scotland, north-east and central England, and below normal elsewhere in the UK. For many parts of the UK there was a period of wet weather between the 11th and 14th. The first snow of the season at a COSMOS-UK site was seen at Glensaugh on the 27th.

At most sites the mid-month rainfall led to a marked increase in soil moisture but with a subsequent fall over the following two weeks (e.g. Balruddery, Bunny Park, Porton Down). Of the sites with mineral soils, Hollin Hill is one of the few exceptions to this pattern with only a gradual increase in soil moisture from the minima recorded in July, and soil moisture remaining below normal.

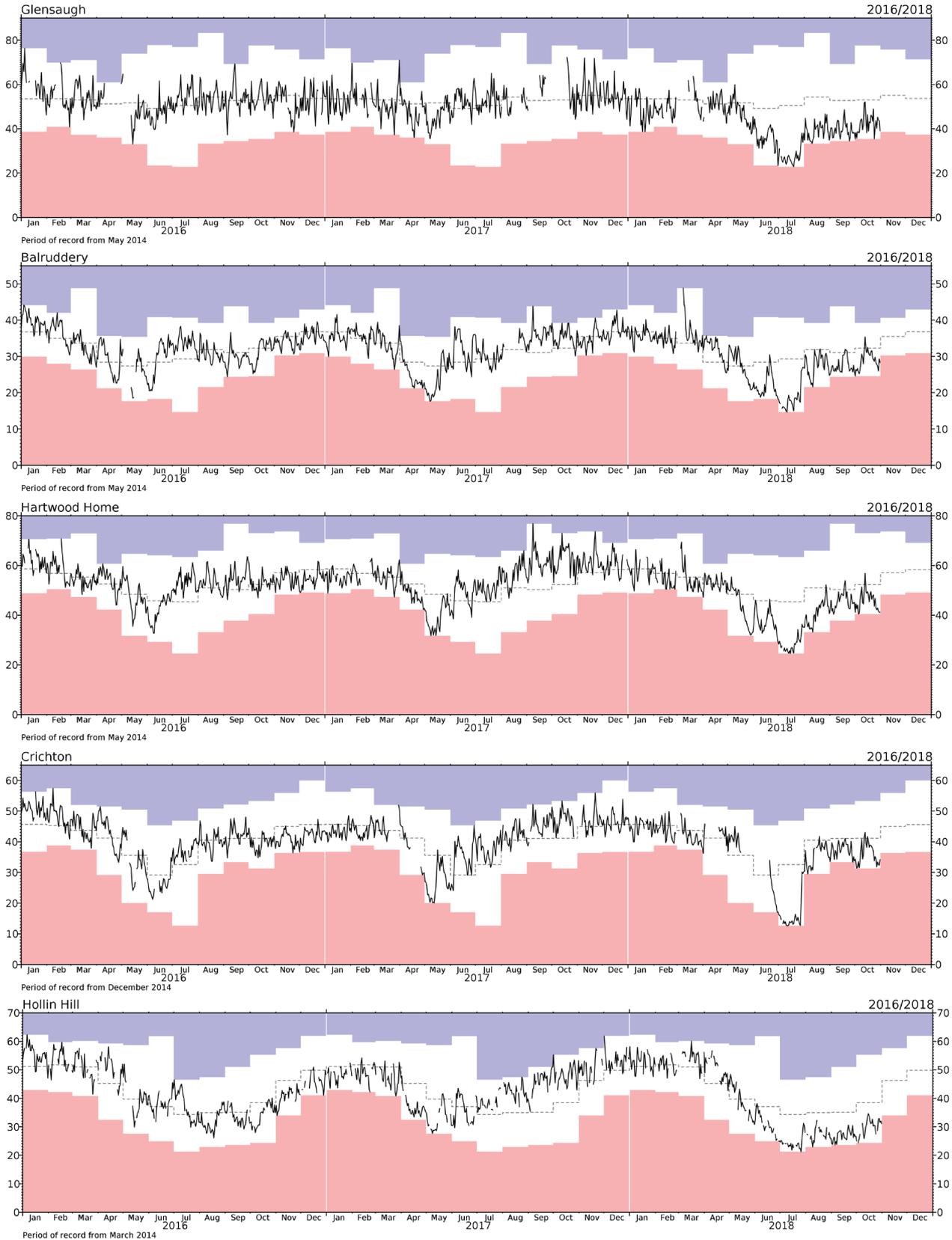
The recovery of soil moisture at sites with peat soils (e.g. Glensaugh) is very much slower than at sites with mineral soils.

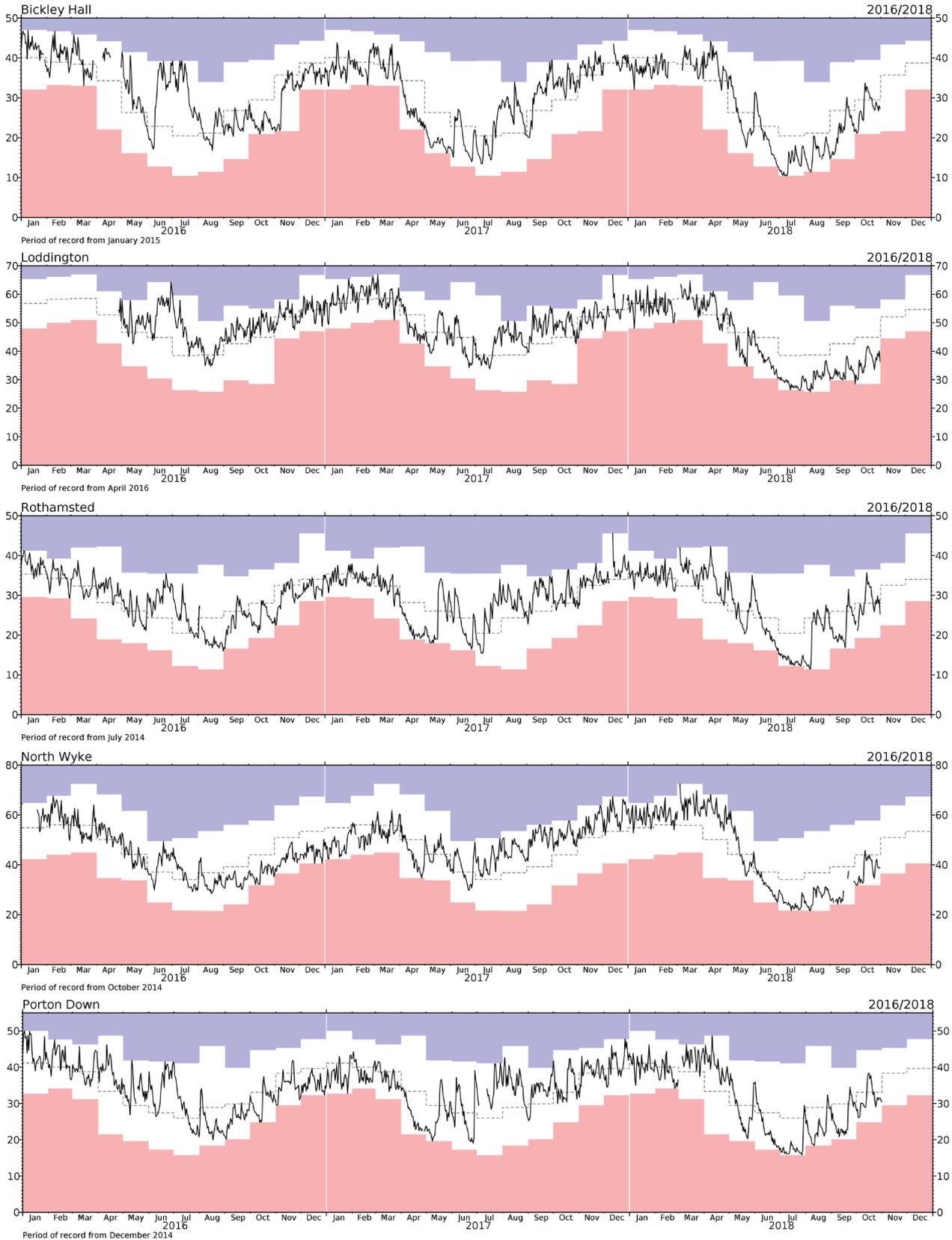
In the coming months an increase in soil moisture is expected as evaporation rates fall.

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.

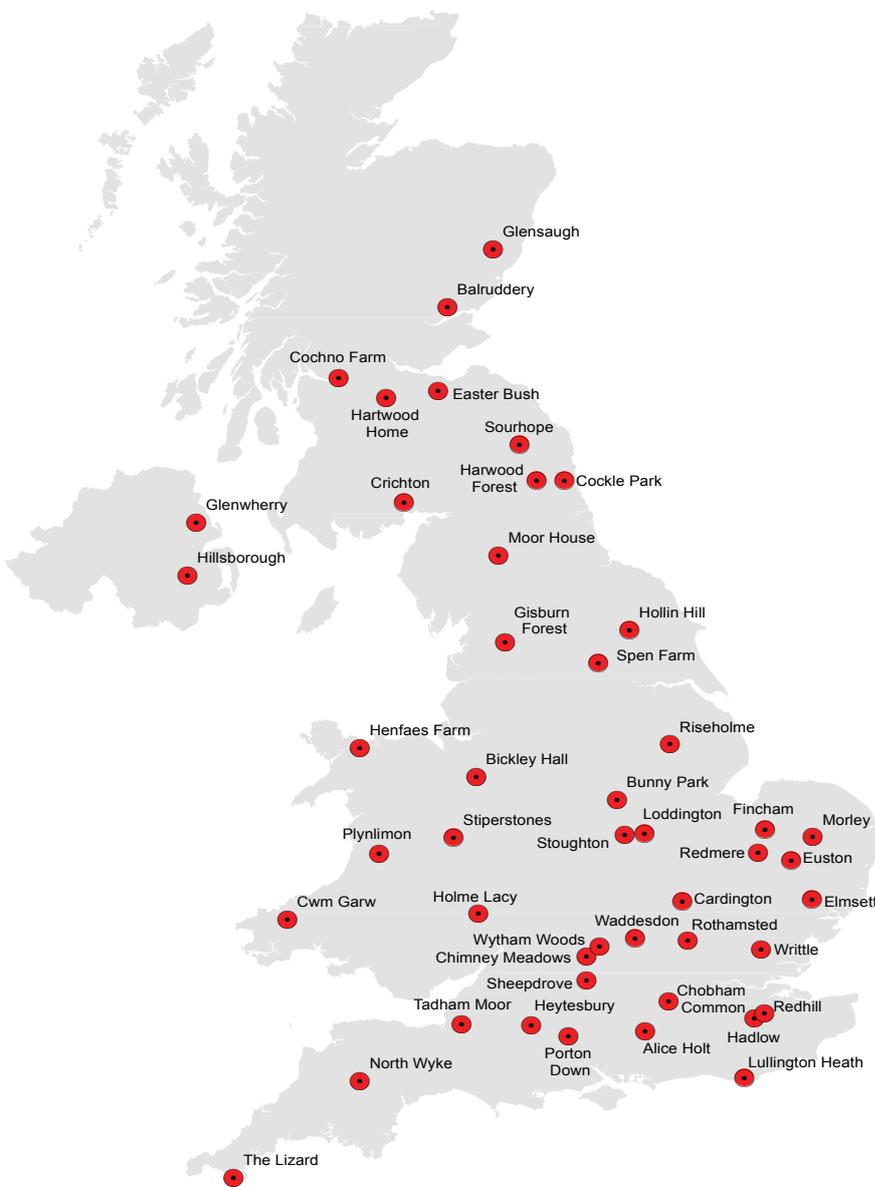
Technical issues during October

Cosmic ray neutron counter:	Hollin Hill
Telemetry:	Cwm Garw, Hadlow, Heytesbury, North Wyke, Sourhope, Waddesdon
Logger:	Cockle Park, Euston, Fincham, Riseholme, Spen Farm
Raingauge:	Chimney Meadow, North Wyke, Plynlimon
Minor issues:	Bickley Hall, Chobham Common, Morley, Rothamsted, Sheepdrove





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.

The 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 funded as part of the NERC's National Capability.