

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

Notes on period to 31 August 2019

In the south-east quarter of the UK soils are drier than usual for the time of year, though not as dry as last year. Elsewhere soils are wetter but close to normal for the time of year, with the exception of soils in northern Scotland which are wetter than normal for the time of year.

Provisional rainfall data indicate that August as a whole was much wetter than average, particularly in Scotland and Northern Ireland, with the exception of south-east England which received below average rainfall.

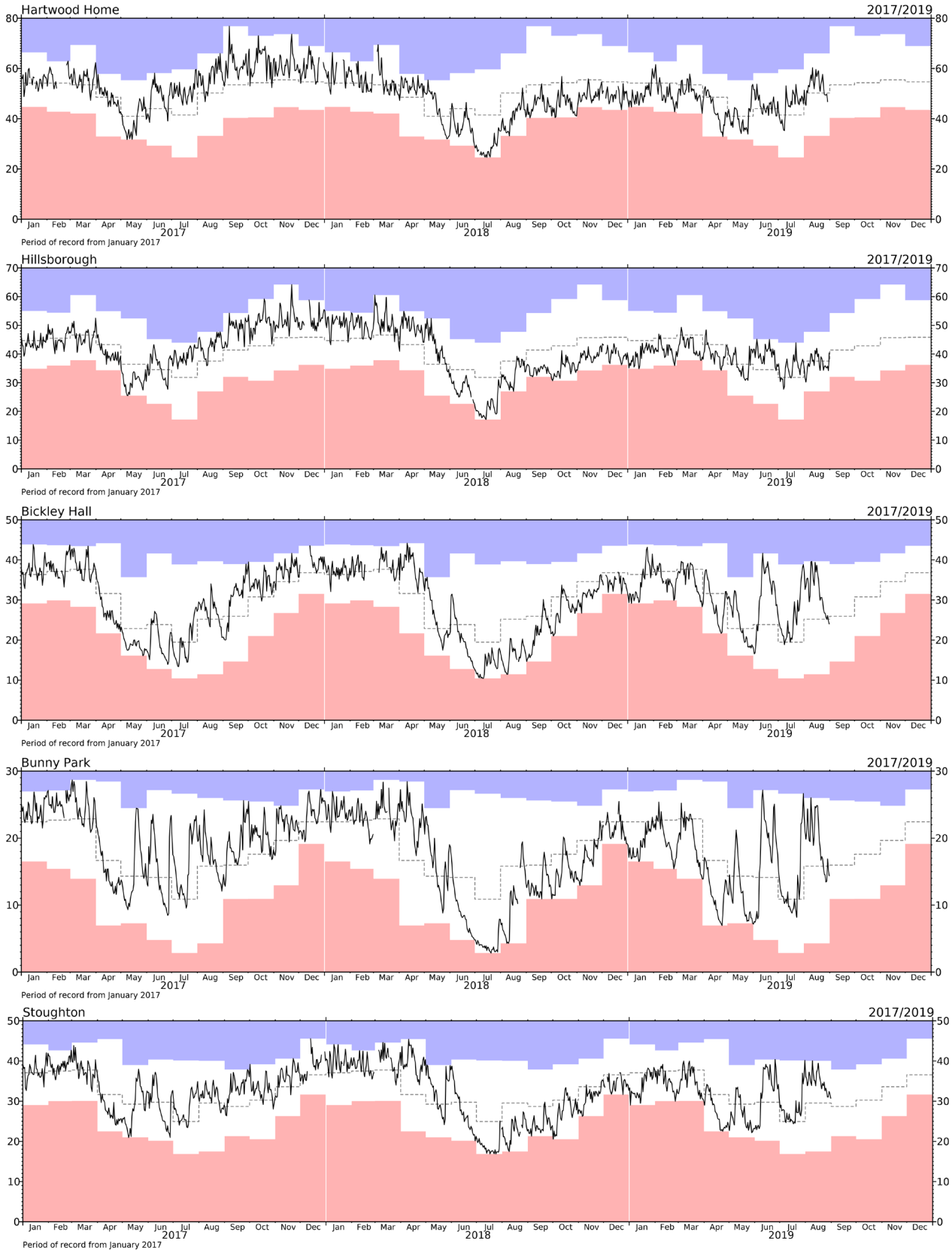
At the start of August, soils were close to normal for the time of year across the UK except for central and northern England where soils were much wetter than expected. Throughout August, heavy rainfall followed by a short-lived heatwave led to variation in soil moisture across the UK. By the end of the month soil moisture at northern sites were wetter than usual, central sites were close to normal, and soils in south-east England were drier than usual for the time of year.

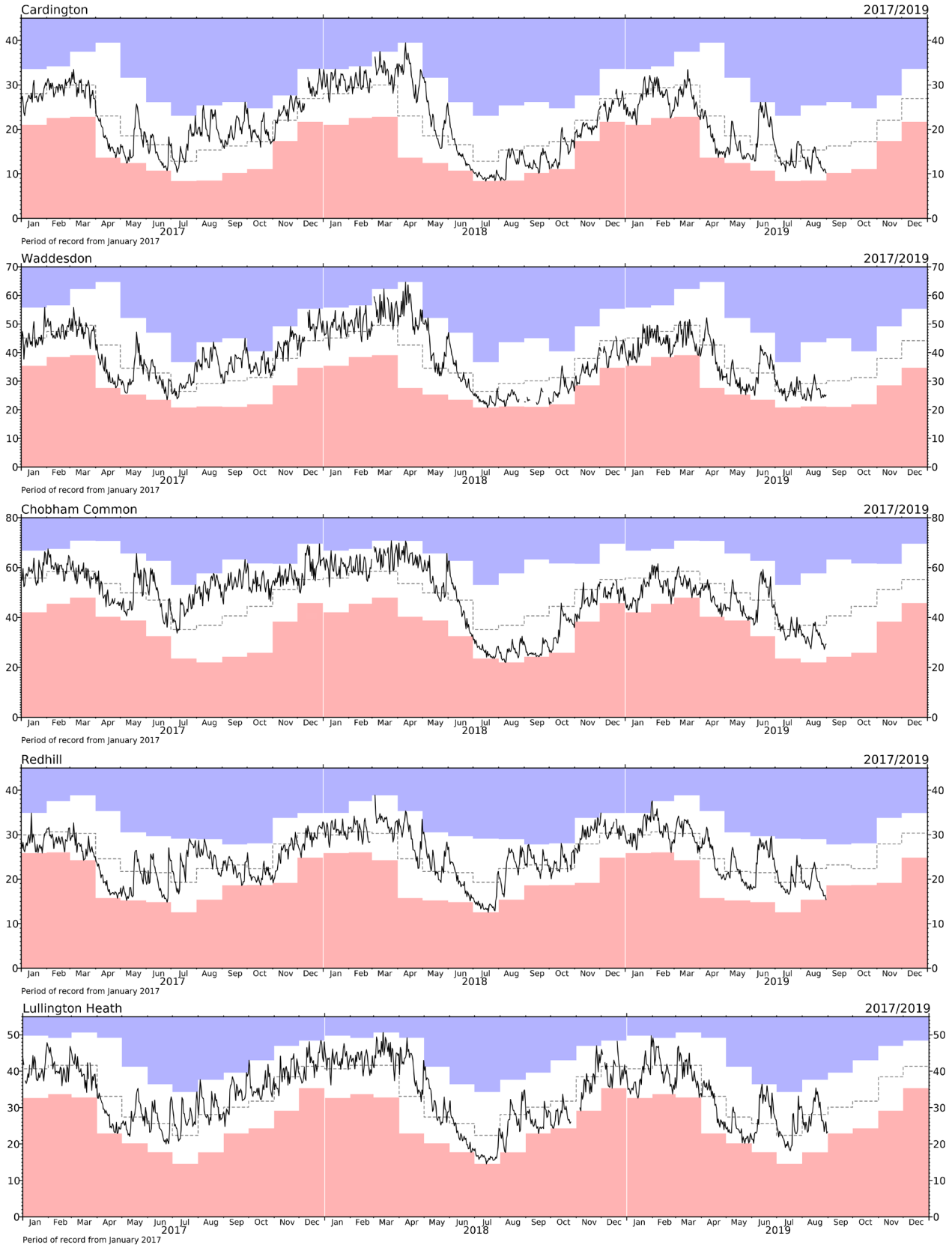
Throughout the first half of August northern England, Scotland, Wales and Northern Ireland remained unusually wet. Heavy rainfall across the UK between 9th and 16th August resulted in soil moisture more typical of winter for several sites (e.g. Bickley, Bunny Park, Stoughton). Although sites in the south-east also experienced significant rain events, responses in soil moisture were less intense. Warm and dry weather towards the end of the month led to many soils drying rapidly. The wetter soils dried to levels close to normal for the time of year (e.g. Hartwood Home, Hillsborough), and drier soils in the south-east quarter ended August particularly dry (e.g. Waddesdon, Chobham, Redhill). Rainfall on 30th and 31st August in Scotland and Northern Ireland caused a final peak in soil moisture for these regions.

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.

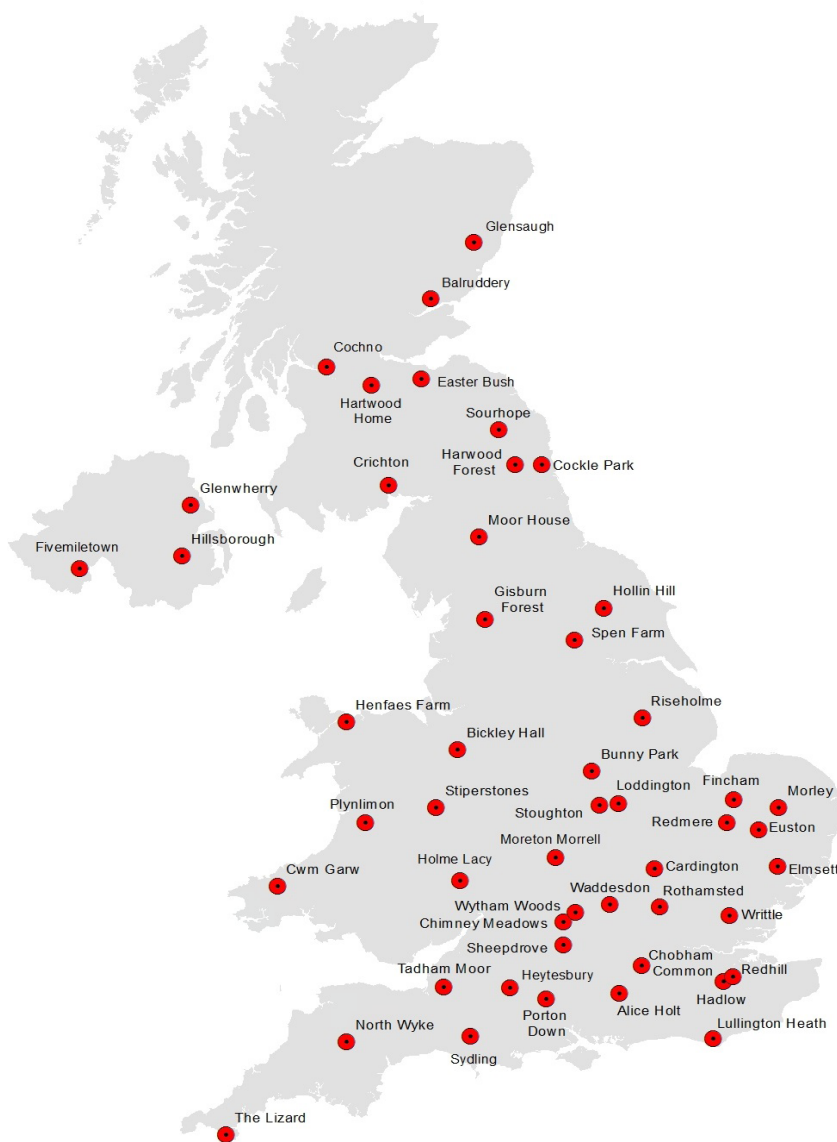
Network News

- There were five site visits to repair and maintain instruments, including resolving the CRNS fault at Riseholme.
- At several sites there are ongoing faults with the rain gauges. Two sites currently have telemetry problems.
- The Easter Bush and Gisburn Forest sites have now been running for five 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 funded as part of the NERC's National Capability.