

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

Notes on period to 31 May 2019

In the south-east quarter of the UK soil moisture is lower than expected for the time of year, while in central and northern Scotland soils are considerably wetter than expected. Elsewhere, soil moisture is normal, or slightly below normal, for the time of year.

Provisional rainfall data for April indicate a pronounced north-south gradient with southern areas of England having roughly half of the long-term average, while northern Scotland received more than the long-term average, and considerably more in eastern Scotland. Southern Scotland and north-east England had close to average rainfall for the time of year.

Across much of England there was heavy rainfall around 8th May which in parts of the south-east caused a short lived peak in soil moisture interrupting an otherwise downward trend in soil moisture starting in mid-April (e.g. Lullington, Waddesdon). Elsewhere in England and Wales the fall in soil moisture has been interrupted or mitigated by other rainfall events but is, nevertheless, in the normal range or slightly below normal at the end of the month (e.g. Cardington, Elmsett, Rothamsted).

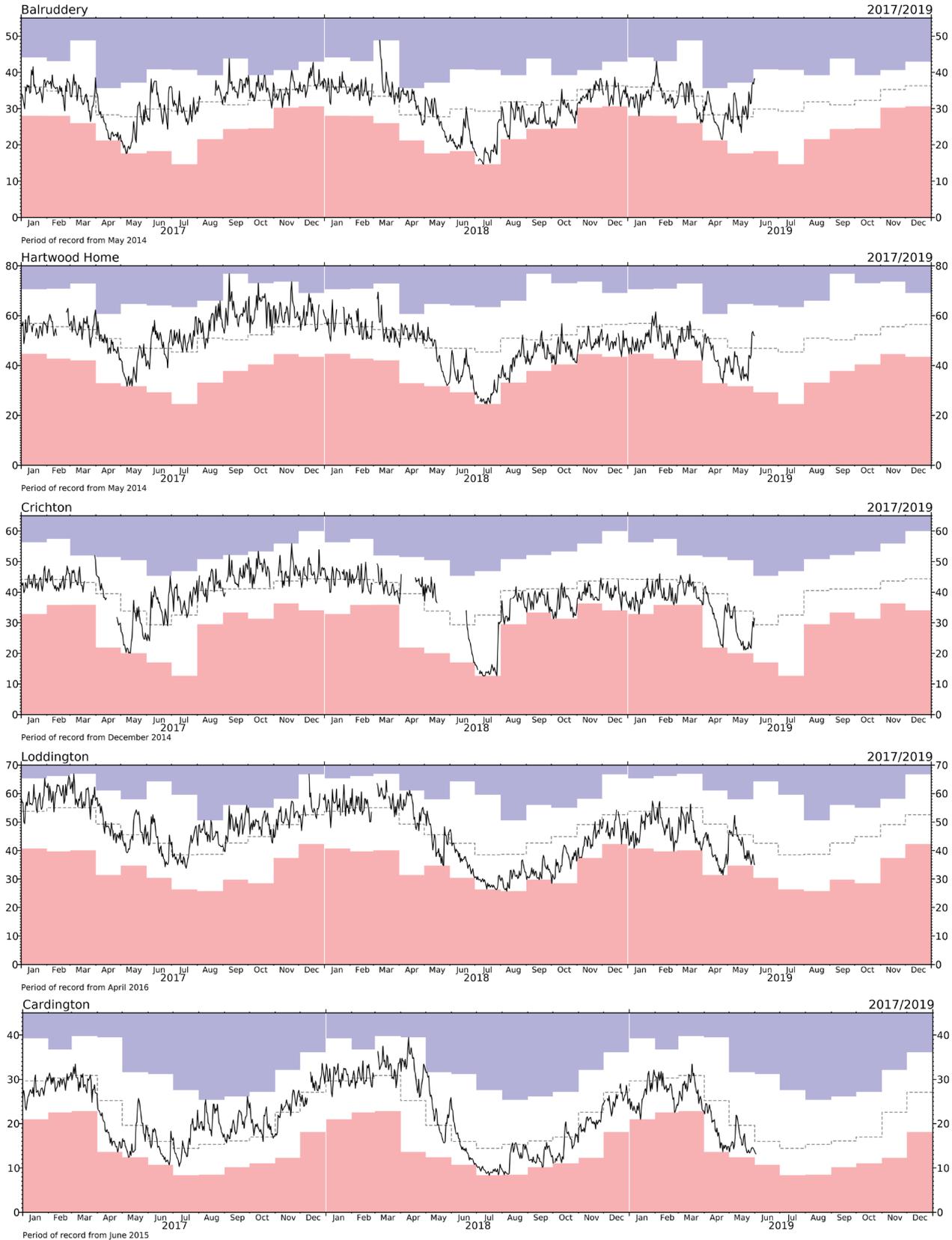
The situation was very different in parts of Scotland and Northern Ireland and at the end of May soil moisture was at levels more typical of winter than early summer (e.g. Balruddery, Hartwood Home).

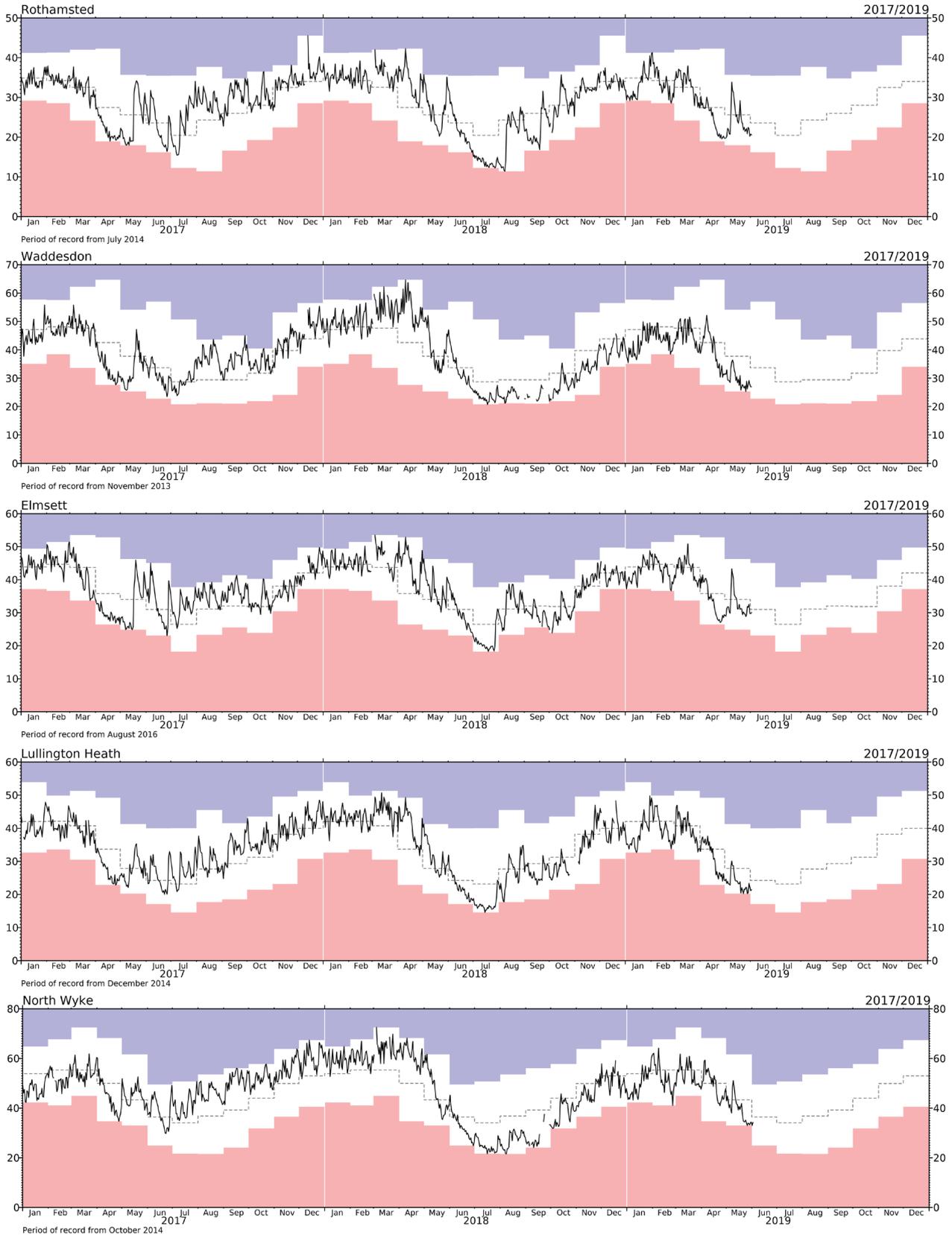
Note that the COSMOS-UK records are too short to reliably estimate long-term monthly averages and departures from them; it is therefore only possible to give qualitative indications about averages and what is typical for the time of year.

Network News

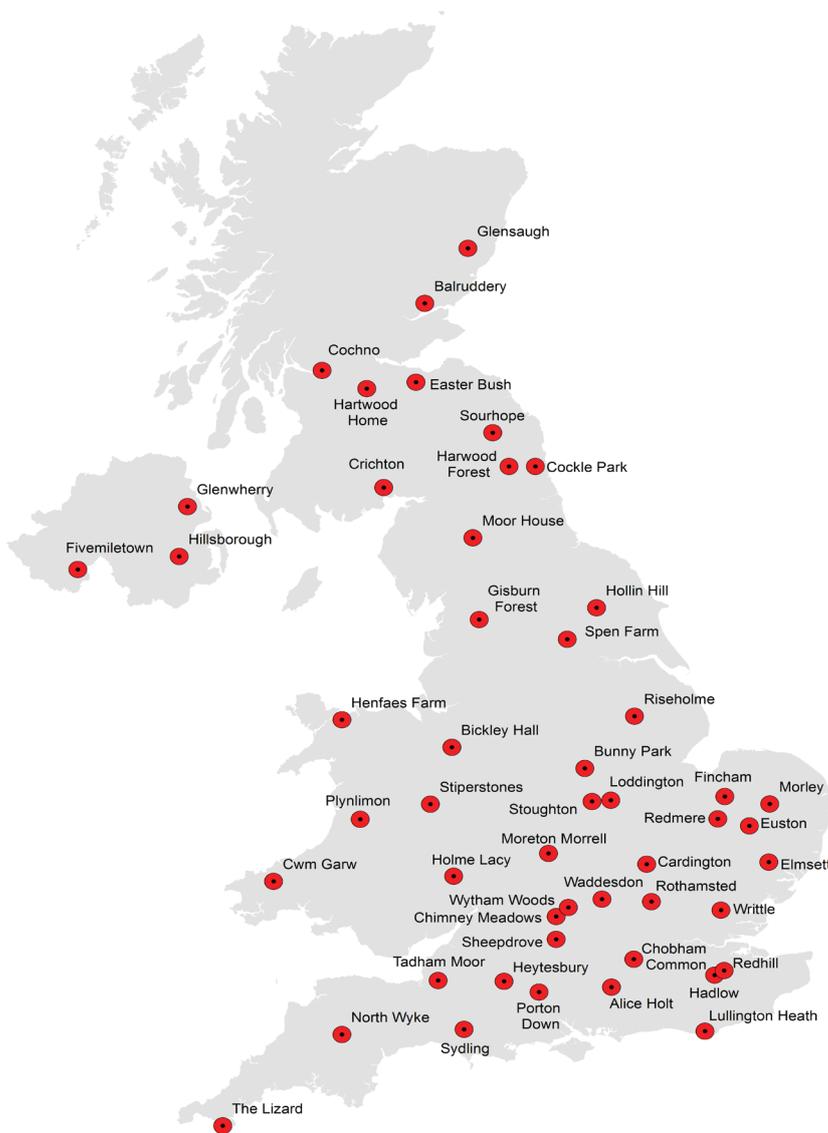
During May four sites reached the fifth anniversary of their installation: Morley, Glensnagh, Balruddery and Hartwood Home. There are now eight sites with more than five years of data.

Of the 48 sites currently operating, 44 were providing soil moisture data from the “cosmos” sensor at the end of May. Three sites currently have telemetry problems, and five sites have raingauge faults.





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.