

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

Notes on period to 31 January 2019

Across the UK soil moisture is generally within the expected range for the time of year, although there is considerable local variability.

Provisional data for January show that rainfall was well below average across most of the UK with many regions having just half of the long term average rainfall. Only in northern Scotland did rainfall approach normal for the time of year. However, it was notable that what rainfall there was occurred mainly in the second half of January. There was widespread snowfall at the end of the month.

The distribution of rainfall through January means that at the end of the month soil moisture is within the normal range for the time of year in most parts of the UK. In Northern Ireland and Scotland there is a general picture of below normal soil moisture (e.g. Hillsborough and Easter Bush). In southern England soil moisture is mainly above normal (e.g. Elmsett, Redhill, NorthWyke), but there are exceptions (e.g. Sheepdrove, Chobham Common).

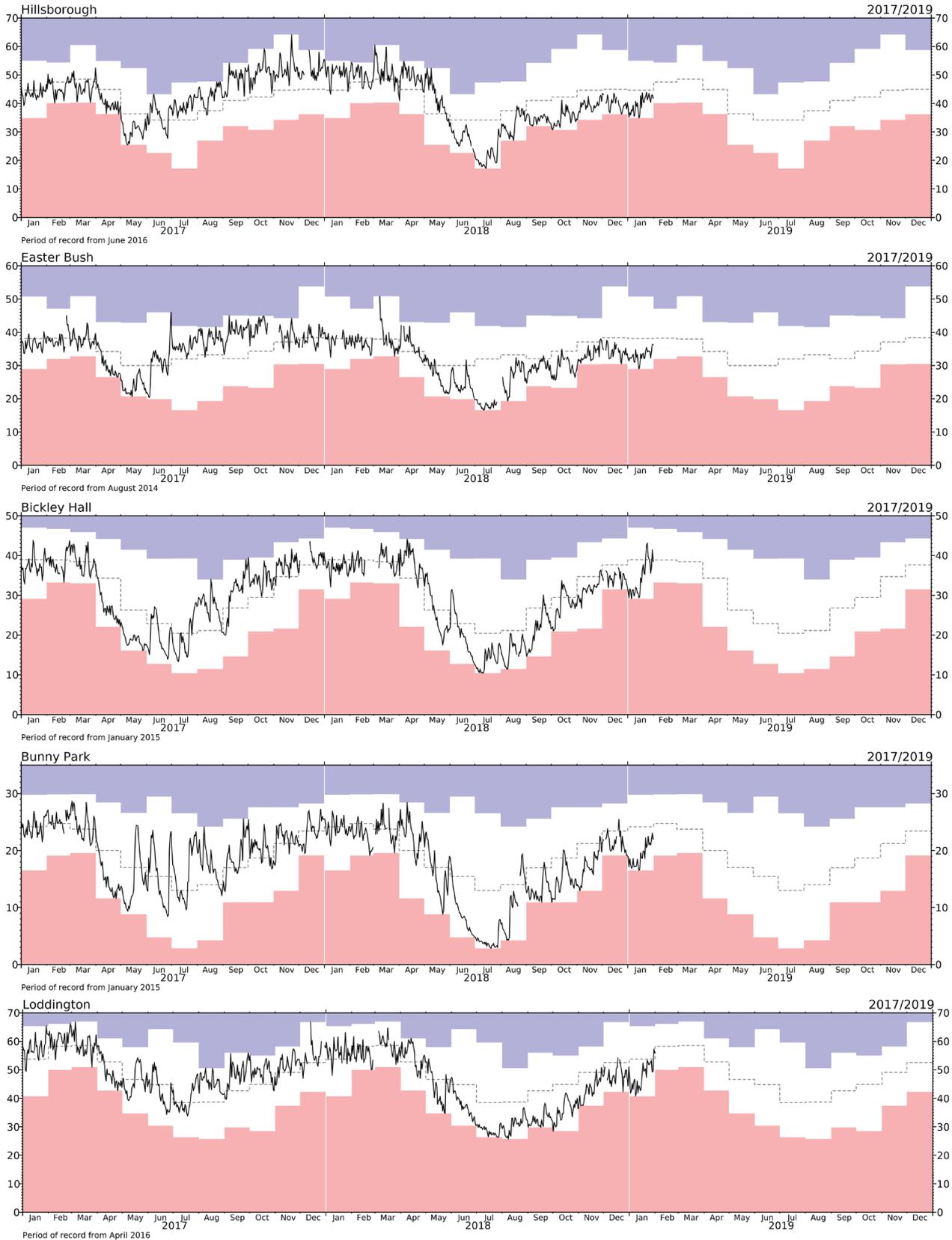
The local variability in soil moisture, caused by differences in rainfall and soil properties, is well illustrated by comparing Bunny Park with Loddington which are neighbouring sites in the East Midlands.

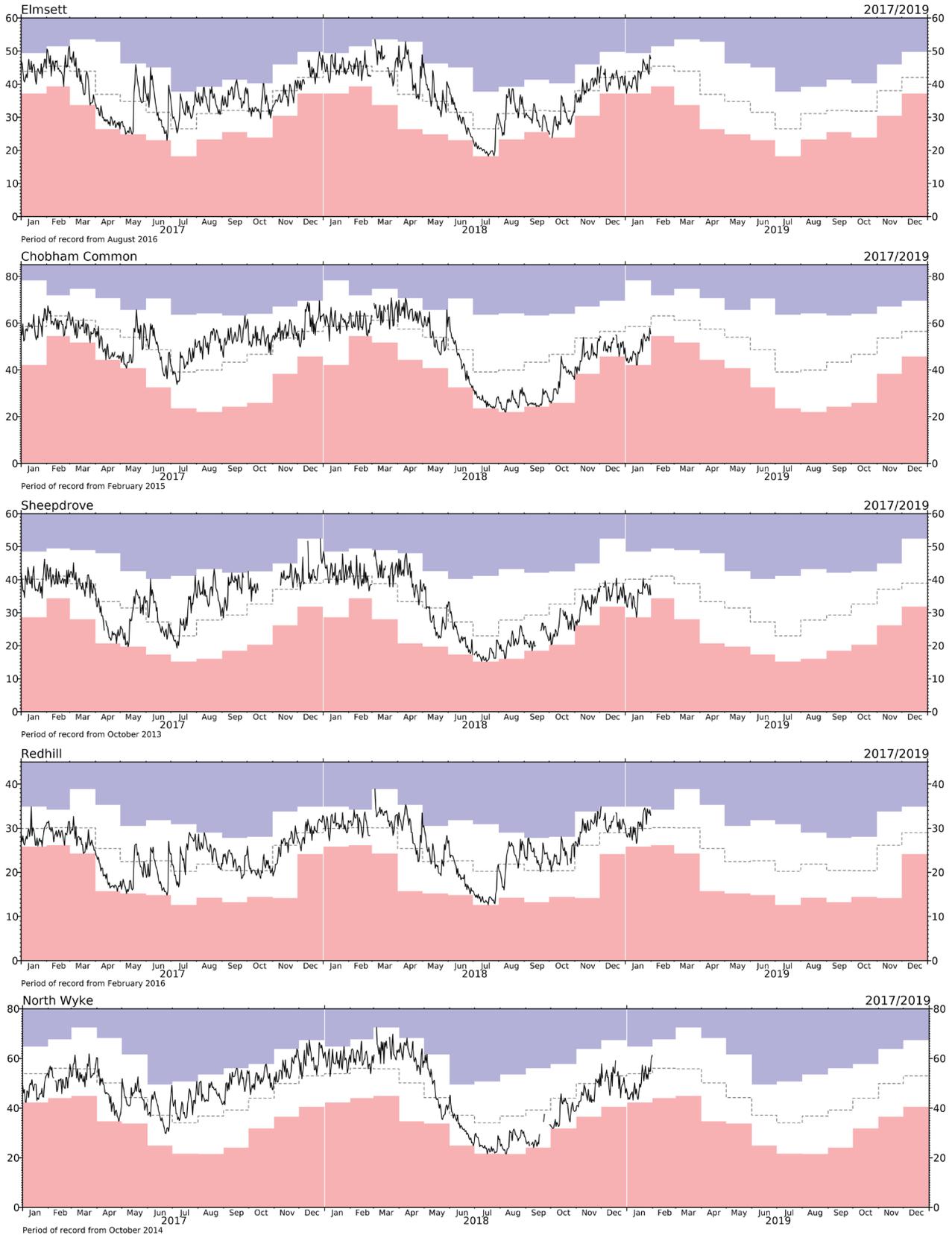
Note that the COSMOS-UK records are too short to reliably estimate long-term monthly averages and departures from them; it is therefore only possible to give qualitative indications about averages and what is typical for the time of year.

Technical issues during January

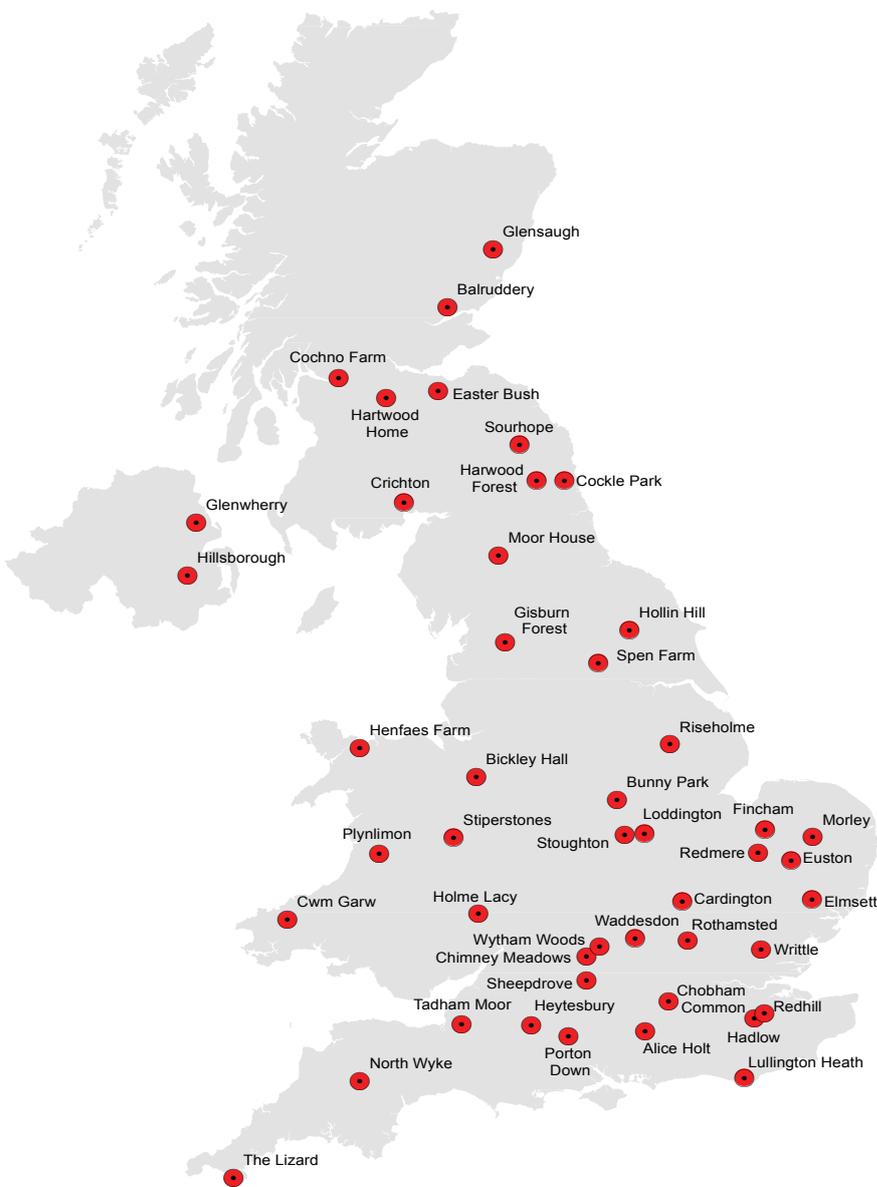
Telemetry:	Porton Down, Sourhope, Alice Holt, Cwm Garw
Power system:	Henfaes
Humidity sensor:	Spennymoor, Euston
Rain Gauge:	Bickley Hall

Soil moisture from the cosmos sensor require further quality control during periods of snow and as a consequence may be reprocessed to remove spurious peaks.





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.