

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

### Notes on period to 31 March 2020

#### Most soils across the UK are drier than normal for the time of year.

Provisional data for March indicate that precipitation was close to, or just below, normal for most of the UK, with the exception of eastern Scotland, central and eastern England where precipitation was approximately half of the expected total. However variability in the rainfall totals within these regions was high. Most of the rainfall was in the first half of the month with very little precipitation since the middle of the month.

At the beginning of March, soils across the UK were much wetter than usual and many were at, or close to, saturation. Due to high rainfall during the first half of the month, soils at many sites remained much wetter than normal for the time of year. However, with low rainfall in the second half of the month soils have begun to dry everywhere.

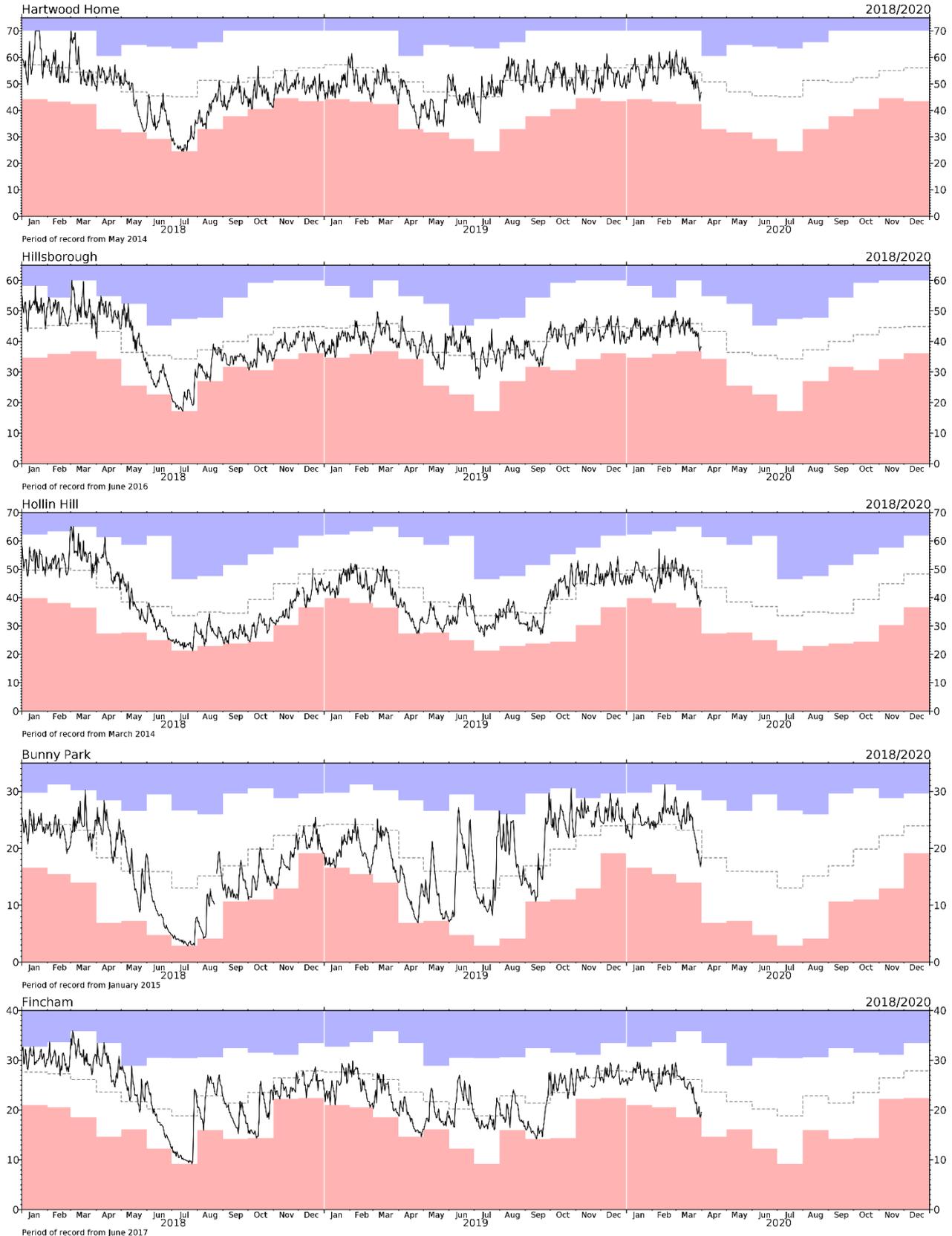
At some sites soils have been very wet for as long as six months, and have now returned to normal levels for the time of year (e.g. Chimney Meadows, Porton Down, Rothamsted).

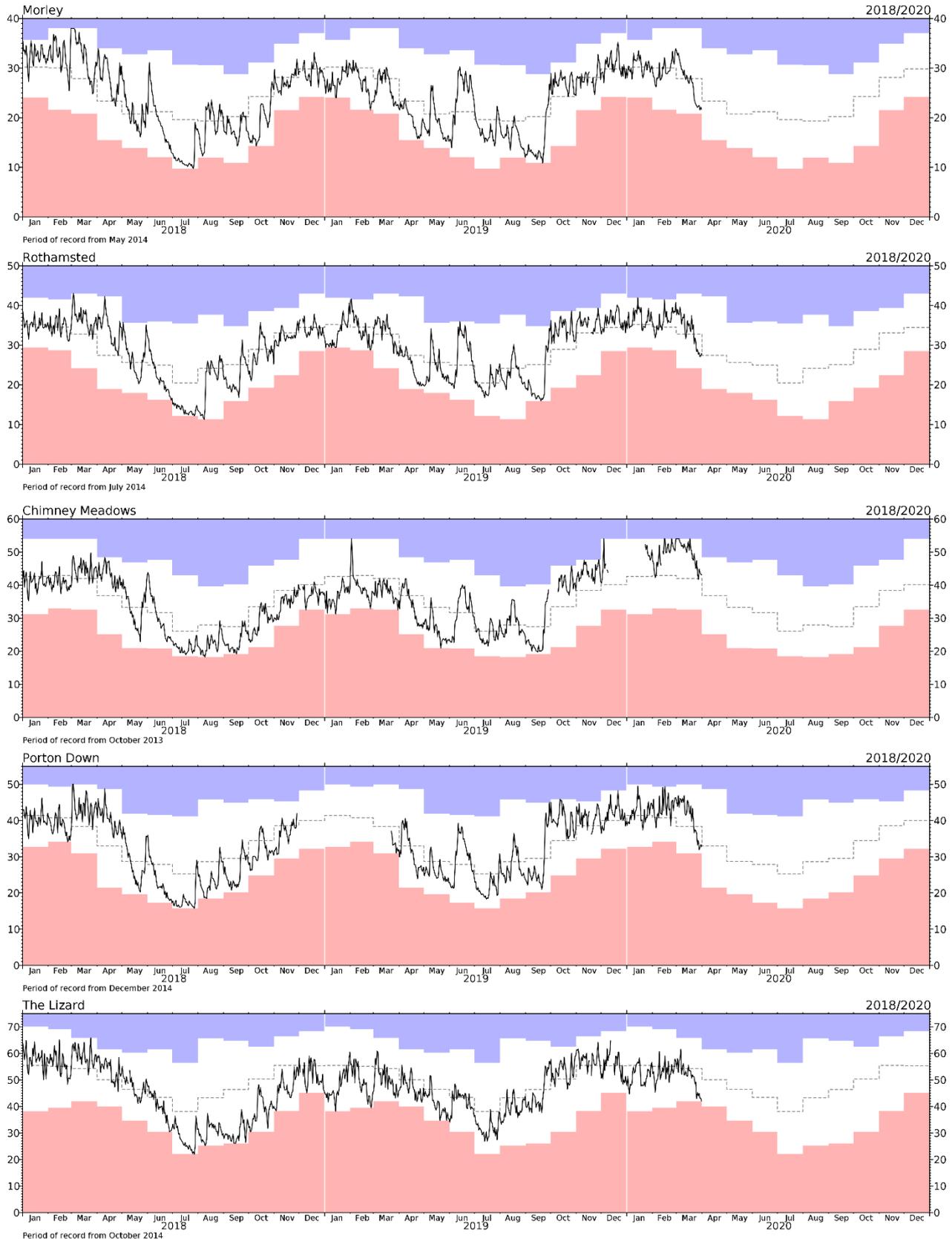
Elsewhere soil moisture has decreased further and is now typical of what would be expected in late spring (e.g. Bunny Park, Hillsborough, Hollin Hill, Morley), or in some cases summer (e.g. Fincham, Hartwood Home, The Lizard).

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

- The COSMOS-UK site at Hollin Hill has now been collecting data for over six years.
- Ongoing faults with the radiometer at Easter Bush and anemometer at Henfaes.
- Data completeness remains high for March, with >95% data capture.





### 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