

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

### Notes on period to 31 August 2020

**At the end of August soil moisture is generally above normal for the time of year, and in some places at levels typical of winter months.**

Provisional precipitation data for August show that rainfall was well above average across most of the UK, perhaps 150% of the long term average or above. Only in eastern and northern Scotland was precipitation close to, or below, average.

At the end of July there had been a strong trend in soil moisture from high in the north-west of the UK to low in the south-east. The above average rainfall has led to a remarkable transition in soil moisture at some sites with soil moisture increasing from exceptionally low to exceptionally high levels for August (e.g. Elmsett and Spen Farm). At other sites the transition from dry to wet has been slightly less extreme (e.g. Cardington and Fincham).

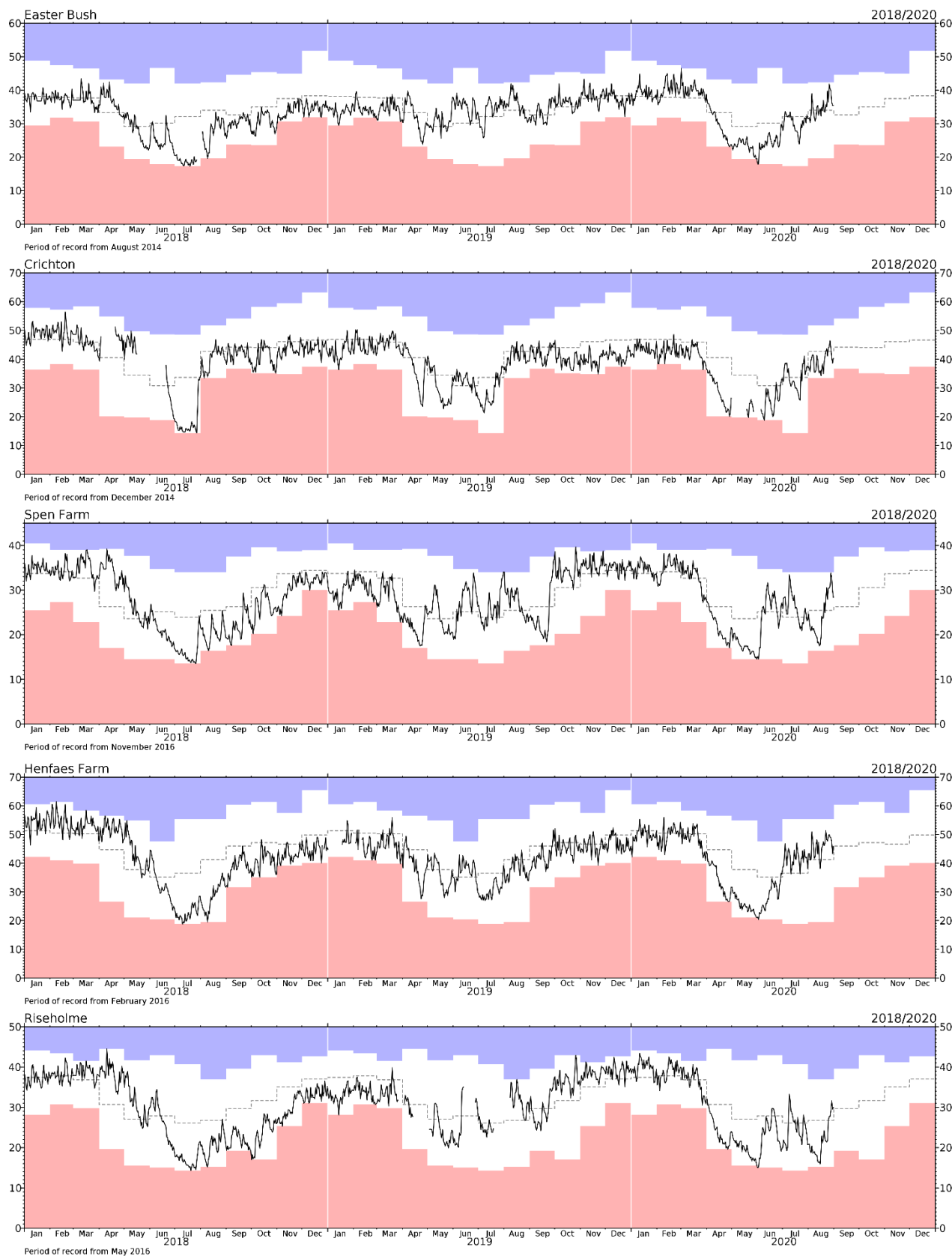
Perhaps surprisingly given the widespread above average rainfall, a few sites generally in central and southern England now have soil moisture close to, or even slightly below, normal for the time of year (e.g. The Lizard, Lullington Heath, Rischolme).

At all of these sites in the warmer and drier parts to the south and east of the UK, soil moisture could return to below normal levels during September. At cooler and wetter sites to the north and west of the UK, soil moisture is now at levels typical of winter months and soil moisture will probably remain high until next spring (e.g. Crichton, Easter Bush, Henfaes).

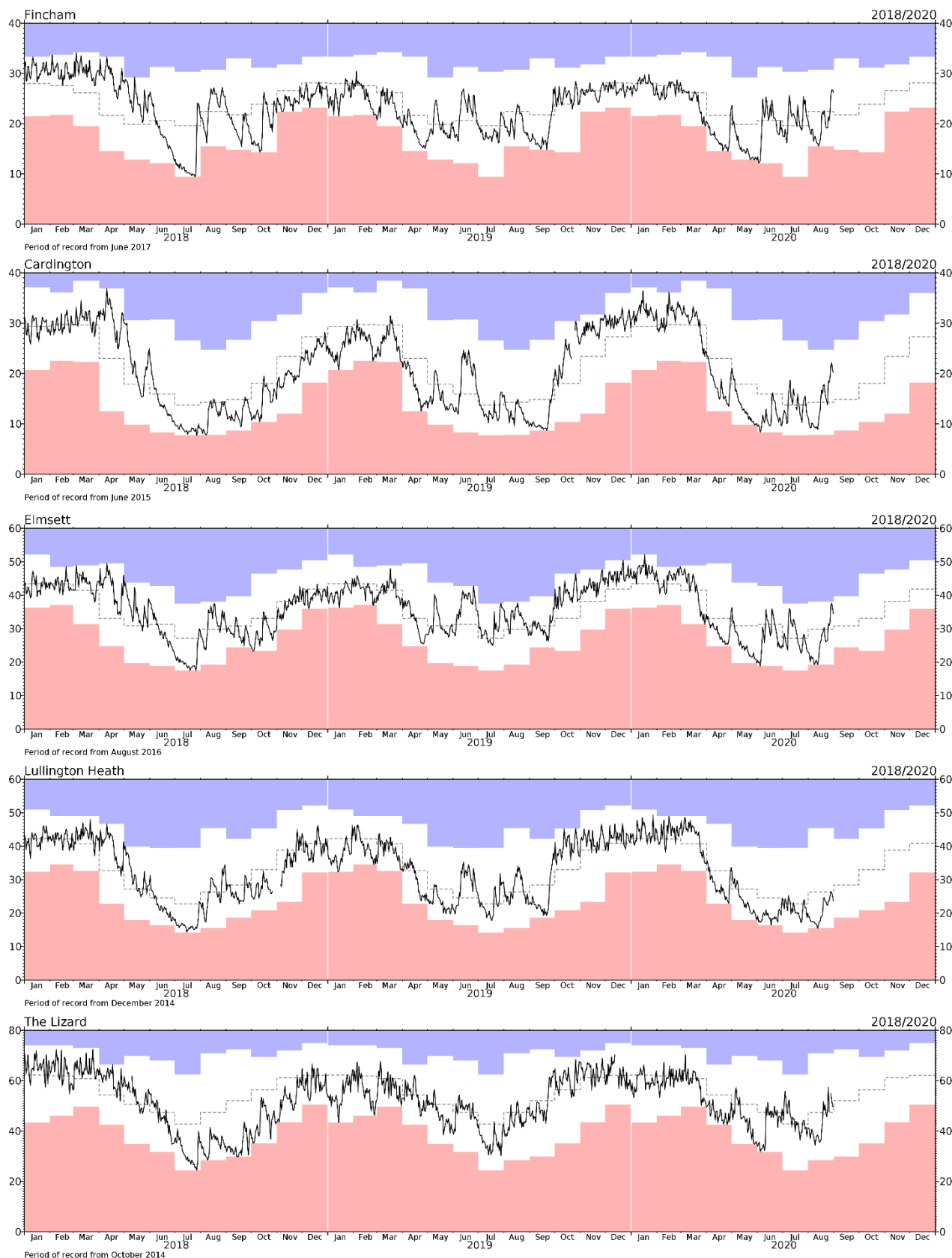
### Network News

- Telemetry and cosmic-ray sensor faults ongoing at Glenwherry, Hadlow, Hillsborough and Sydling.
- COSMOS-UK sites at Easter Bush and Gisburn Forest have now been recording data for six years.

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### 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.

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