

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

Notes on period to 31 May 2020

Soils across the UK are drier than normal for the time of year, in many places very much drier than normal. Vegetation in many areas is already stressed, and with generally warm and dry weather forecast, there are concerns of an impending agricultural drought.

Provisional data for May indicate that precipitation was well below average across all parts of the UK except northern Scotland. Rainfall was lowest in south east England where precipitation was only 7% of the average total for May. In contrast, precipitation levels were very close to normal in north west Scotland.

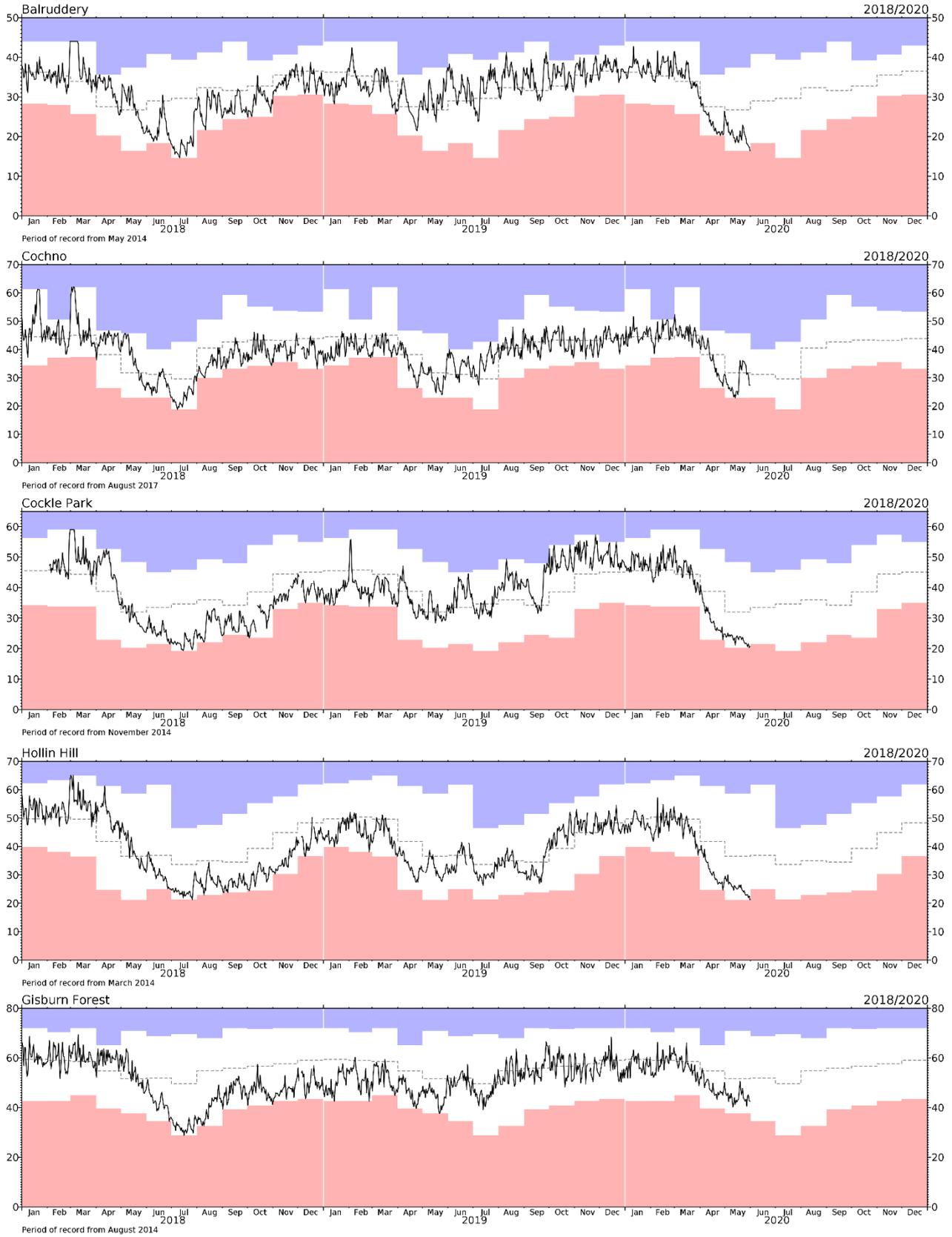
At the beginning of May, soils in northern areas of the UK were drier than normal for the time of year, and in the south east were wetter than normal following rain at the end of April. The unusually dry and warm weather throughout May has resulted in extremely dry soils across the UK. Some sites, particularly in central and eastern England, are now approaching or exceeding previous all-time lows in recorded soil moisture, albeit it rather short records (e.g. Cockle Park, Hollin Hill, Redhill, Riseholme). These previous lows were observed during 2018 but soils were not this dry until July.

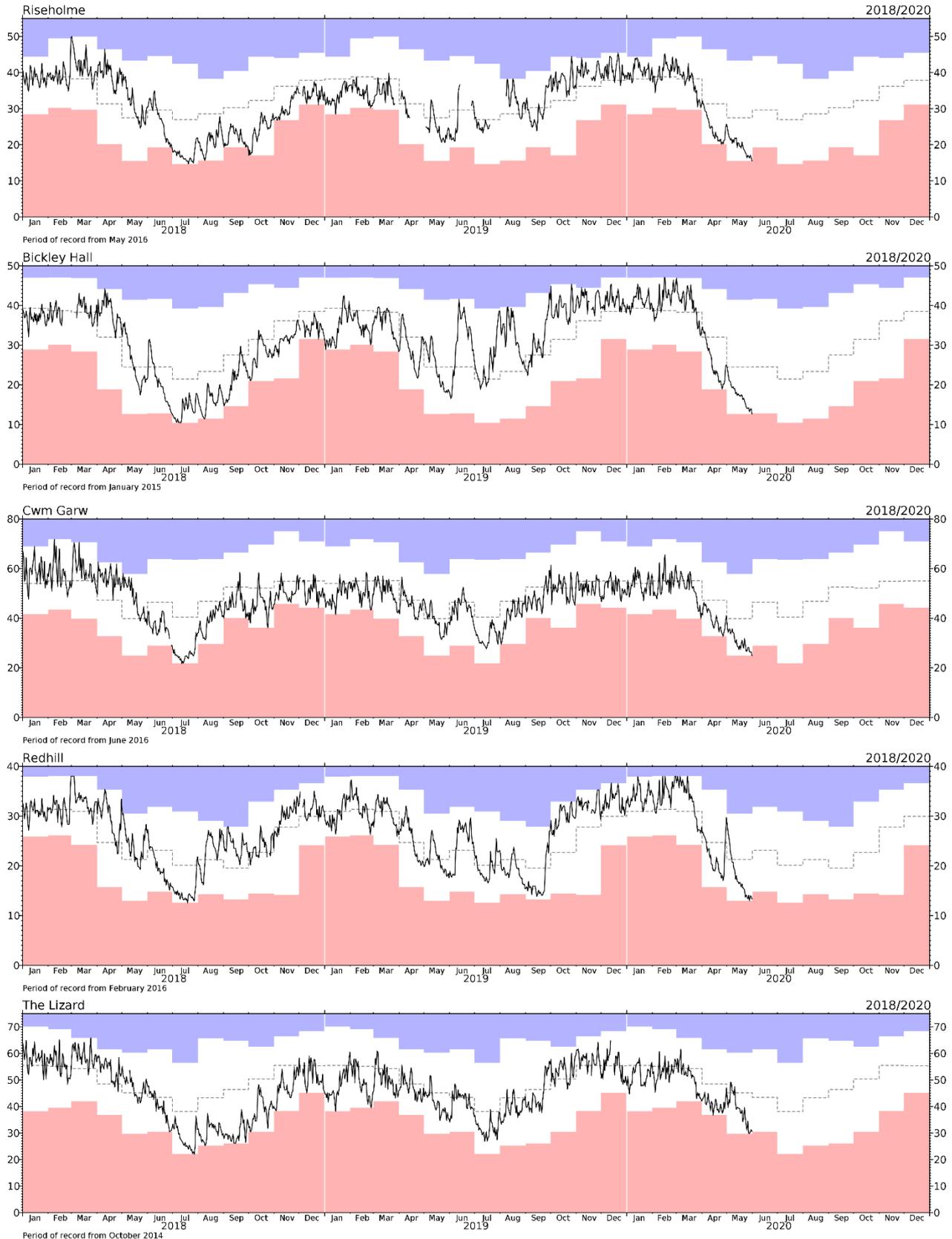
Further west, soil moisture is very low for May but not yet reaching the levels observed in 2018 (e.g. Balruddery, Bickley, Cwm Garw, The Lizard). Following some rainfall in May, soil moisture in some areas in the north west of the UK is somewhat closer to normal for the time of year (e.g. Cochno, Gisburn Forest).

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

- Several sites are experiencing technical faults that cannot be rectified because of restrictions on site visits imposed because of COVID-19.





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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