

# UK Hydrological Bulletin: May – July 2017

**Following the lowest October–April rainfall for Great Britain since the extreme drought of 1975/76, drought conditions continued to intensify during May when estimated runoff from the country as a whole was the second lowest for the month in a series from 1961. The stress on water resources, agriculture and river ecology increased during the late spring but an exceptionally cyclonic episode in early June triggered a seasonally unusual, and spatially uneven, recovery in river flows. Moderate floodplain inundations were common during an episode which, across much of the country, demonstrated that substantial early summer rainfall can have a very material impact on drought risk. Nonetheless, groundwater levels remained depressed in a few parts of lowland England throughout both June and July.**

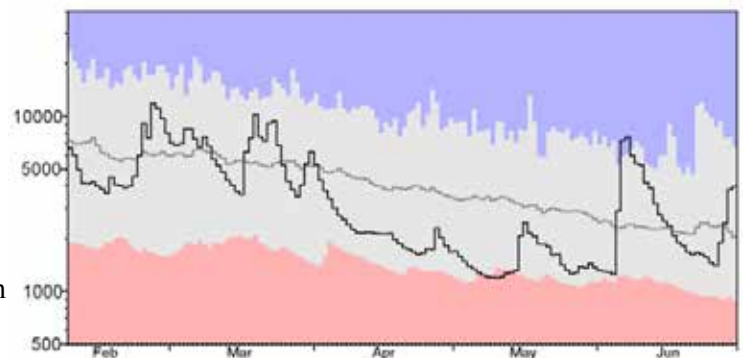
Regional rainfall totals for May featured an unusual degree of uniformity — implying a notable contrast between relatively wet conditions in the English Lowlands and substantial rainfall deficiencies to the west and north. In the latter regions, many rivers registered less than 50% of their average monthly flow and a few, including the Spey and Tyne (Northumbria) reported new minimum runoff totals for the month. More notably in a water resources context, total outflows from Great Britain over the October–May period was the lowest since 1975/76 (see Fig 1).

In Northern Ireland the exceptional 8-month rainfall deficiency was reflected in the runoff from the Mourne basin — the lowest for May in a series from 1982. Whilst reservoir stocks were generally holding up well, soil moisture deficits increased steeply through the spring and groundwater levels in some Chalk wells showed little or no recovery over the 2016/17 recharge season. This was a primary factor in calls by the water industry to moderate water demand, particularly in much of south-east England.

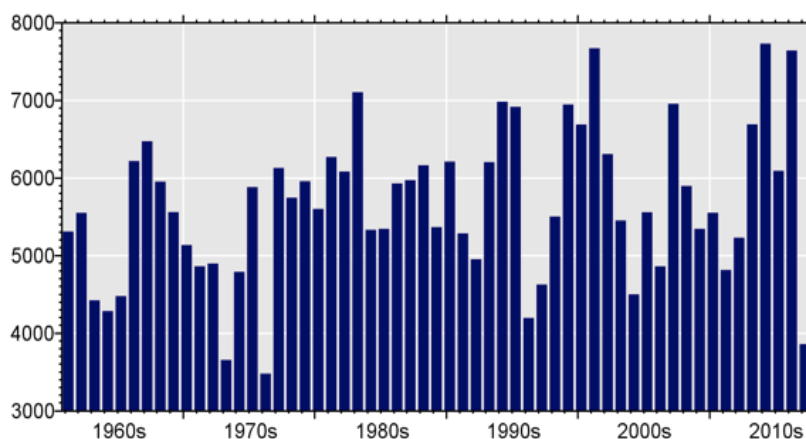
With the exception of parts of central England, June rainfall totals were generally well above average, particularly in eastern Scotland where a 48-hr rainfall

total of 84 mm for Edinburgh during the first week — part of a continuing intense cyclonic episode — contributed to Scotland’s wettest June in a series from 1910.

Correspondingly, recoveries in runoff rates were exceptional with significant flooding, particularly in parts of northern Britain (e.g. at Portsoy, Aberdeenshire). Outflows from Great Britain as a whole eclipsed previous daily maxima early in the second week (see Fig. 2) confirming the notable nature of the hydrological transformation, albeit much less dramatic than that



**Fig 2** Daily outflows from Great Britain ((m3s-1). (Blue envelope: pre-2017 daily max, pink envelope: daily min. The grey trace is the long term average)



**Fig. 1** October–May water-year outflows from Great Britain

experienced in the summer of 2007. Steep recessions became re-established during the heatwave conditions of the third week but thereafter thunderstorms were common with localised flash flooding (e.g. in Newcastle) and a number of flood warnings — mostly in southern Scotland and northern England. The spate conditions contributed to well above average June runoff in catchments away from the English Lowlands. In north-east Scotland the Lossie registered its highest June runoff for 50 years while, in contrast, modest mean flows characterised many southern and eastern rivers including the Tone (Somerset), Coln

(Gloucestershire) and Stringside (Norfolk) each reporting less than 60% of the June mean.

Following substantial late-June downpours (with some flash flooding), soil moisture deficits in early July generally remained below average for the time of year. Exceptions included much of southern England where a spray irrigation demand remained high. Generally, the unsettled early summer ensured that reservoir stocks were mostly within 10% of the average for time of year but relatively depressed in some southern impoundments, including Roadford and Wimbleball in the South West and — most notably — Bewl (Kent) which was at its lowest for early July since 1990.

Groundwater levels remained below average although within the normal range across most major aquifers but close to seasonal minima in a few southern outcrops, e.g. at Bussels in the South West and Little Bucket Farm (Kent) where levels closely approached the lowest on record for July (see Fig. 3). Generally however the drought threat was greatly diminished relative to the

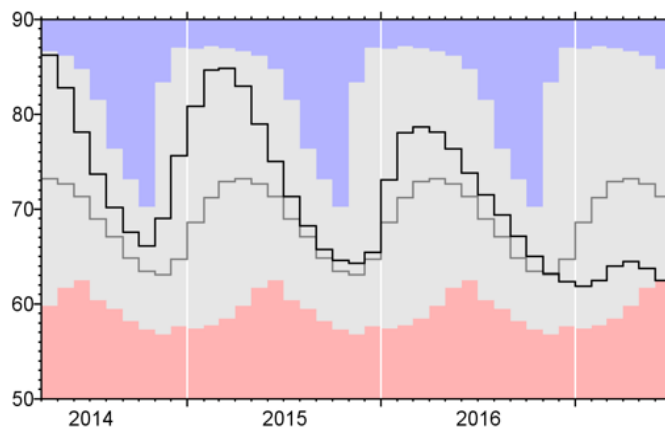


Fig. 3 Monthly groundwater levels in the Chalk at Little Bucket (Kent)

late spring, reinforced by unsettled weather through July with a cluster of Flood Alerts in responsive — mostly urban — catchments with significant transport disruption, as in Carlisle on the 22nd and Belfast on the 26th.

Terry Marsh  
29/07/17