

UK Hydrological Bulletin: August – October 2017

The August-October period was characterised by relatively wet conditions and substantial regional, and more local, variations in rainfall amounts. Cyclonic weather patterns predominated as the drought stress, which was still evident in mid-summer, diminished rapidly in almost all areas. The favoured track of the Jet Stream was the primary driving factor in this transformation and by late September reservoir stocks, away from the far South-East, were generally above the seasonal average and the focus of hydrological concern had switched to flood risk particularly across northern and western parts of the country.

At the national scale August was a wet month but with notable spatial variability in rainfall totals, in part reflecting the frequency of convective storm events. On the 9th, 24-hour rainfall totals in excess of 30 mm were common — triggering moderate summer spates but significant flash flooding (e.g. in Grimsby, Bath and west London). Exceptional rainfall on the 22nd/23rd (South Uist in the Outer Hebrides registered 90.6 mm in 48 hrs), generated widespread fluvial flooding in the Western Isles and, particularly, Northern Ireland where flows in the Mourne basin were extreme (see Fig. 1). At the Drumnabuoy House gauging station on the River Mourne the peak discharge is likely to have exceeded $1000 \text{ m}^3\text{s}^{-1}$. As with most such extreme events this outstanding flow is subject to further scrutiny but it may well have established a new gauged flow record for Northern Ireland. By contrast, August flows in some groundwater-fed streams across southern England (e.g. the Coln in the Cotswolds) were well below average and, whilst overall reservoir stocks for England & Wales were healthy, the decline in stocks in many southern reservoirs continued. Considering Great Britain as a whole, the June–August rainfall total added to a cluster of wet summers in the 21st century thus far but, in contrast to the very notable increase in temperatures since the beginning of the 20th century, summer rainfall totals exhibit no discernible overall trend.

September rainfall totals were above average for almost all regions of the country and daily outflows from Great Britain exceeded the long term mean for much of the month (Fig. 2). Modest runoff was largely confined to catchments in northern Scotland and South East England. By contrast, very wet conditions in western Wales were directly reflected in exceptional monthly runoff totals; the River Teifi registered its highest September runoff in a series from 1959. Meanwhile, river flows were generally below average across much of central, eastern and southern England. In the Cotswolds, the groundwater-fed river Coln recorded less than half of the monthly average



Fig. 1 Demolished gauging hut on the River Owenkillew at Crosh (Northern Ireland) following the extreme flood on August 22nd. (Photo: Gary Galbraith, Rivers Agency).

and, with soil moisture deficits still very substantial — largely a reflection of the exceptionally dry spring — groundwater recoveries in the major aquifer outcrop areas had yet to gather any momentum. Fortunately, and contrary to the normal seasonal trend, overall reservoir stocks for England & Wales increased modestly through the month and stood appreciably above the early autumn average entering October. In Kent however, stocks at Bewl Reservoir continued to decline and by month-end were the lowest for late September since 1990.

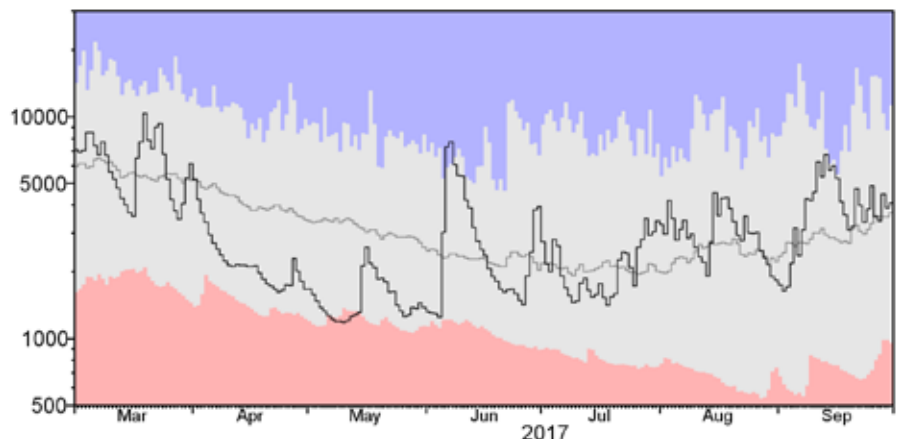


Fig. 2 Daily outflows from the UK (black trace); the blue and pink envelopes are the long term daily max and min outflows and the grey trace is the long term daily average (flows in m^3s^{-1}).

As is often the case in the autumn, regional hydrological contrasts were further accentuated during October. The Jet Stream fed a succession of deep low pressure systems, accompanied by damaging winds and flood-generating rainfall, across the UK. On the 11th a 24-hour rainfall total of 211 mm was registered at Honister in the Lake District; flood warnings were triggered for a number of northern rivers including the Eden and Ure. In Scotland, many rivers were in high spate also but the most notable flows were generally in areas with low population densities. On the 16th ex-hurricane Ophelia caused very severe wind damage across Ireland and both tidal and fluvial flood alerts were common, particularly across northern Britain.

The fourth week witnessed further notable storm events; 24-hr rainfall totals included 55 mm at Capel Curig (Snowdonia) and 46.6 mm at Achnagart (northern Scotland). Correspondingly, replenishment to most upland reservoirs in October was considerable. By contrast much of the English Lowlands recorded only around a third of the average monthly rainfall. Many winterbournes remained dry and, with soil moisture

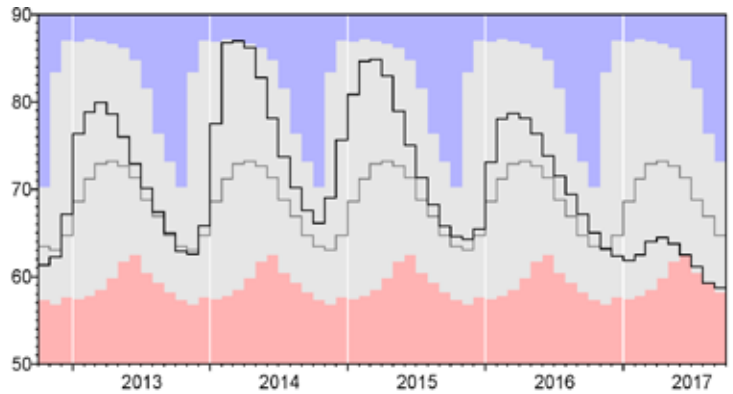


Fig. 3 Monthly mean groundwater levels (black trace) at Little Bucket Farm (Kent). The max. and min. monthly averages are shown by the blue and pink envelopes; the grey trace is the long term monthly average.

deficits still substantial, groundwater levels remained appreciably below average in parts of the Chalk outcrop, and depressed at the Little Bucket monitoring site in Kent where levels were at their second lowest for mid-autumn since 1976 (Fig. 3).

Terry Marsh
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