UK Hydrological Bulletin: August 2015 – October 2015

Weather patterns through the late summer and early autumn of 2015 underlined the variability that is an enduring characteristic of the UK climate but, hydrologically, it was a relatively quiescent period. Whilst flash flooding incidents were common in late August and steep recessions characterised many Scottish rivers through much of September, river flows and groundwater levels generally remained within the normal seasonal range. In early October stocks in the great majority of index reservoirs were moderately above average and groundwater levels, with a few exceptions, were typical of the time of year. Correspondingly, the overall water resources outlook remains healthy.

August was a relatively cool and very unsettled month with large regional and local variations in rainfall totals. Whilst some localities in central southern Scotland recorded less than half of the monthly average, the southern region of England registered its wettest August since 1946. Convective downpours made a significant contribution particularly in mid-month when thunderstorms triggered many local incidents of flash flooding. On the 13th, a 60 mm storm total – most falling within two hours – was reported from Eastbourne and a number of daily totals exceeding 50 mm were reported during a stormy three-day interlude beginning on the 23rd. Correspondingly runoff rates rose steeply in many areas and spate conditions were common, particularly in western catchments during the latter part of the month. For a few rivers, including the Kenwyn (Cornwall) and Blackwater (Hampshire) previous maximum August daily flows were exceeded. In contrast, August runoff for some index rivers in the Midlands was only a little above half of the long term average. Generally however seasonal river flow recessions tracked well above late-summer minima. With a few exceptions, includingTilshead in Wiltshire, this was true of levels in index boreholes across the country also. For the summer as a whole (June-August), rainfall clearly exceeded the average in all regions. For England, after a preponderance of dry summers from the mid-1970s to mid-1990s, seven of the last nine have been above average (a couple only marginally) – see Figure 1.

September was another relatively cool month, and notable for the narrow range of regional rainfall totals across the UK; it is very rare for the Thames and Highland regions to record identical monthly totals. Above average rainfall was generally confined to south-eastern Britain whilst for Scotland as a whole it was the second driest September (after 2014) since 1972. The unusual rainfall distribution was reflected in river flow patterns. Runoff rates were depressed across much of Scotland by month end and, in the north-west, the River Carron recorded only 25% of the average September flow. In contrast, the Great Stour in Kent recorded its highest September runoff

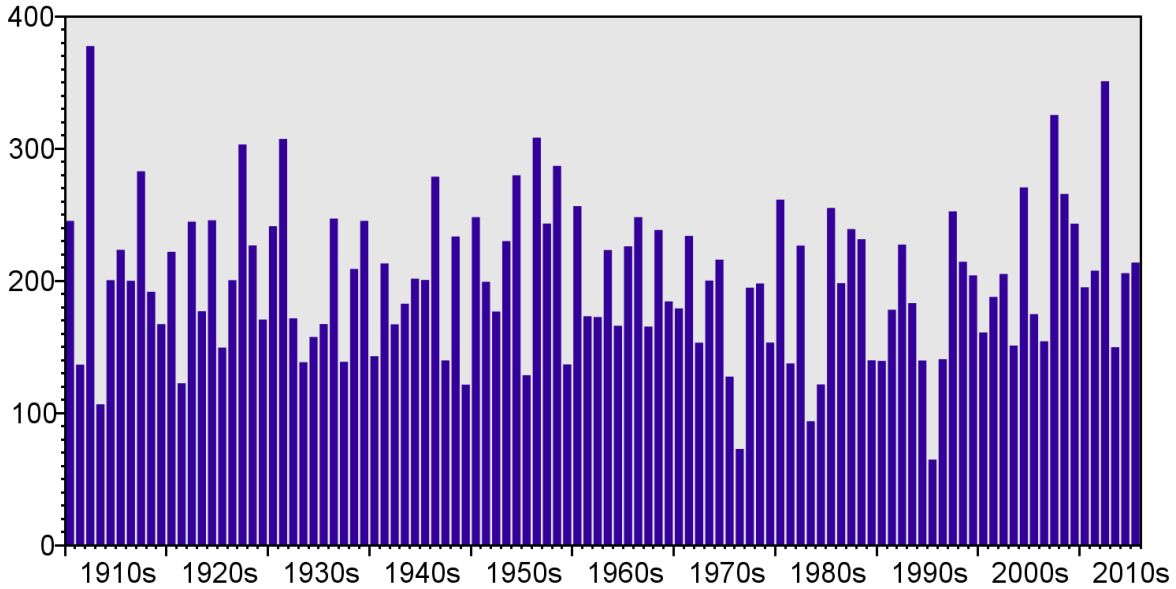

Fig 1 *Summer rainfall totals (in mm) for England* *Data source: Met Office*

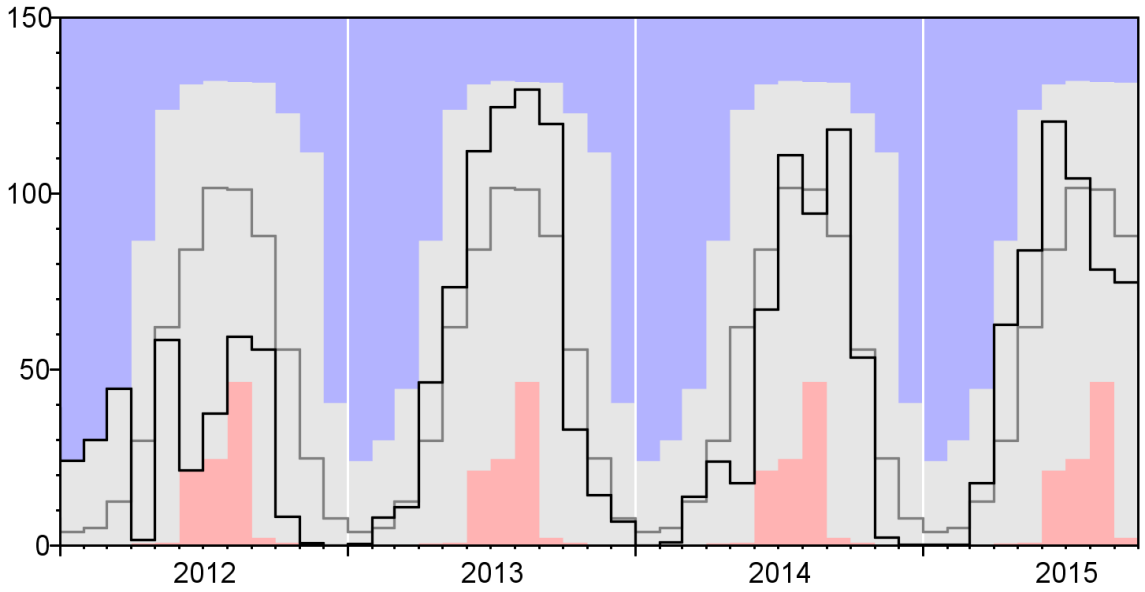

Fig 2 *End-of-month soil moisture deficits (mm) averaged across the Chalk outcrop; monthly averages (grey trace) and max. and min. also shown. Data source: MORECS*

in a series from 1965. A few clusters of flood alerts were operational around mid-month across southern England – most were associated with fast-responding impermeable catchments; many incidents of surface flooding with significant local transport disruption were also reported. In this context, the western extension of a European high pressure cell during the fourth week usefully heralded a 10-day rainless spell across much of southern England.

Despite this dry interlude, overall reservoir stocks for England & Wales remained appreciably above average entering October; this was true of most major impoundments in Scotland and Northern Ireland also. The dry spell ended decisively on the 5th when a sequence of Atlantic frontal systems, with embedded convective cells, crossed much of the country. The associated intense downpours triggered a number of flood alerts (mostly in London) and, by the 7th, further alerts were operational in northern England and Scotland (e.g. on the Isla). There we few reported outstanding flows however and, generally, recessions dominated until the 21st when a sequence of low pressure systems triggered moderate spates across much of the UK. By mid-October groundwater levels in most index wells were a little below the seasonal average except for a few index wells in the slow-responding Permo-Triassic sandstones where the benefit of the record recharge through the winter of 2013/14 can still be recognised. With soil moisture deficits across most aquifer outcrop areas close to the seasonal average (see Figure 2) a general recovery in groundwater levels should, given normal rainfall patterns, be initiated during the next six-eight weeks.

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