UK Hydrological Bulletin: November 2017 – January 2018

Rainfall for the November 2017 to January 2018 period was moderately above average at the national scale but, as is often the case, with considerable regional contrasts. The late autumn saw the onset of seasonal recoveries in river flows in western and northern catchments but substantial soil moisture deficits remained across the English Lowlands where groundwater levels and some reservoir stocks continued to fall, and drought conditions intensified in Kent. This water resources stress eased during late December and through January as the focus of hydrological concern switched decisively to flood risk. The latter half of January saw sustained high flows and widespread flood alerts — on occasions, snowmelt was a significant contributory factor. By month end, overall reservoir stocks for England & Wales were appreciably above average for the time of year and groundwater levels were generally in the normal late-winter range.

Regional rainfall totals for November were mostly below average, particularly in the South East where, in many catchments, the October–November period was the driest since 1978. This is directly reflected in the runoff for the Great Stour in Kent where during the second week flows fell below the previous minimum for November (in a 52-year series), see Fig. 1. In addition, the sustained meagre inflows to Bewl reservoir left end-of- November stocks at a third of capacity (the lowest for at least 25 years) whilst several wells in the Chalk of the South East were dry. In contrast, parts of northern and western Britain experienced a wet month. During the fourth week a sequence of active Atlantic fronts brought sustained heavy rainfall. 24-hr rainfall totals of over 80 mm were recorded at both Capel Curig (north Wales) and Shap (Cumbria), falling on already wet catchments. Correspondingly, flood warnings were common and road and rail transport disrupted, particularly in Lancashire.

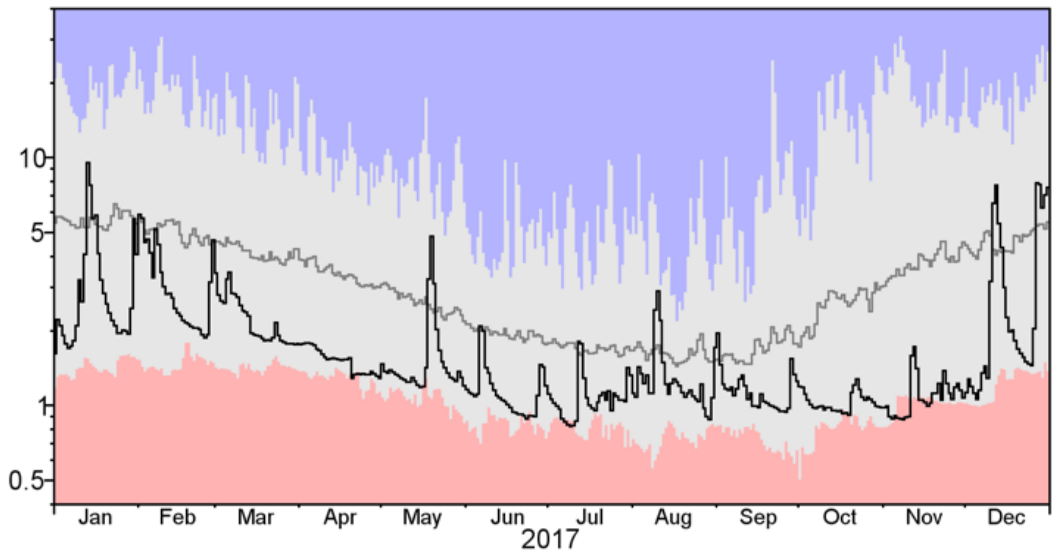

Fig 1 *Daily mean flows (m^3s^{-1}) for the Great Stour at Horton. The blue and pink envelopes are the pre-2017 daily max. and min.; the grace trace is the long term daily mean*

Some landslides were reported in Scotland and, in Cumbria, the River Eden registered a new maximum daily flow for November in a series from 1964. The associated heavy groundwater recharge resulted in notably high groundwater levels in the Permo-Triassic sandstones of Dumfries and Galloway.

The December rainfall total for the UK was close to the long term average but, generally, southern regions were wetter than average — East Anglia particularly so. By contrast, north-east Britain was drier than average with a substantial rainfall deficiency across the Grampian region. Vigorous cyclonic conditions early in the month resulted in notable precipitation totals in north-west Scotland: during the 6/7th a 24-hr total of 73 mm was recorded at Cluanie Inn. Of greater general significance was the exceptional recovery in river flows through the month across much of southern Britain.

By the final week, over 100 flood alerts were in operation across England & Wales and, in Kent, flows in the Great Stour (see above) rose to well above the late-December average. Importantly also, reservoir stocks at Bewl increased by around 10% during the month and aquifer recharge was heavy in most southern outcrop areas.

Despite the notable December river flows, estimated runoff from England & Wales for 2017 was appreciably below average (Fig. 2). In judging the

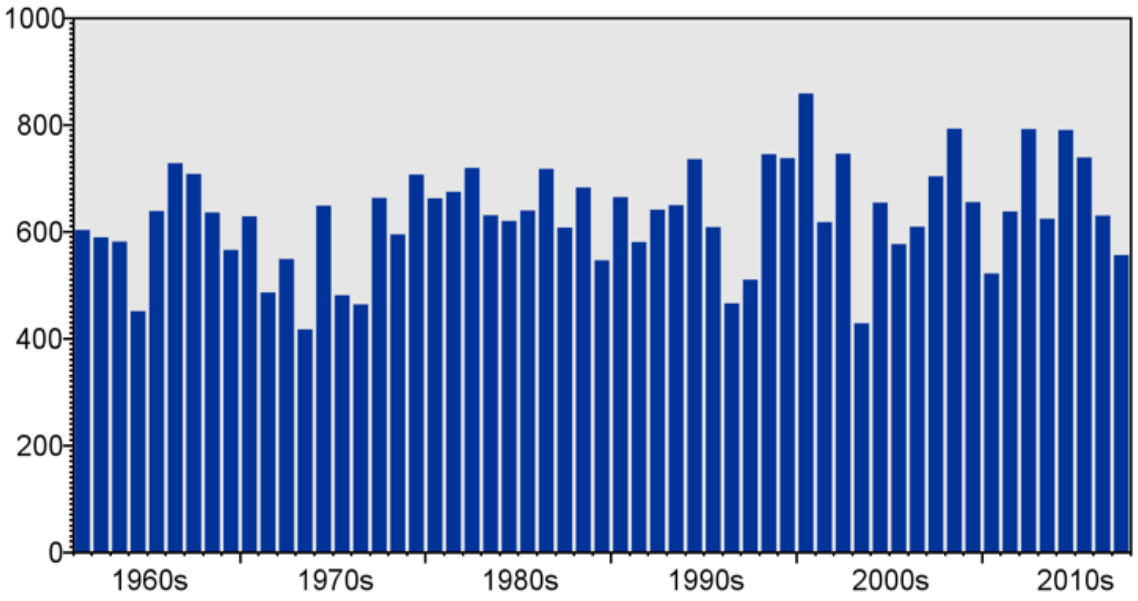

Fig. 2 *Annual runoff totals (mm) for England & Wales – based on a representative network of gauging stations across the country*

significance of the moderate increase in runoff since 1960 it is important to note the exceptional dryness of the 60s and 70s; if pre-1960 runoff figures were available the trend
would be rather more muted.

January was a very unsettled month, with a sequence of deep Atlantic low pressure systems causing significant wind damage
and triggering many further fluvial and tidal flood alerts — and a few landslips. Floodplain inundations were mostly moderate but excess surface water caused significant transport disruption. Following the passage of Storm Eleanor (on the 3rd) flood alerts were widespread and had extended to a cluster of rivers in the English Lowlands (e.g. the Thames and Little Ouse). With catchments near-saturated and snowmelt contributing to runoff rates in many catchments, most rivers remained in spate, particularly during the fourth week when moderate floodplain inundations were common (e.g. in York). On the positive side, the continuing abundant infiltration ensured that groundwater level recoveries gained further momentum in most parts of the country. This, together with a high proportion of index reservoirs being within 15% of capacity, makes for a generally healthy water resources outlook.

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27/1/2018