

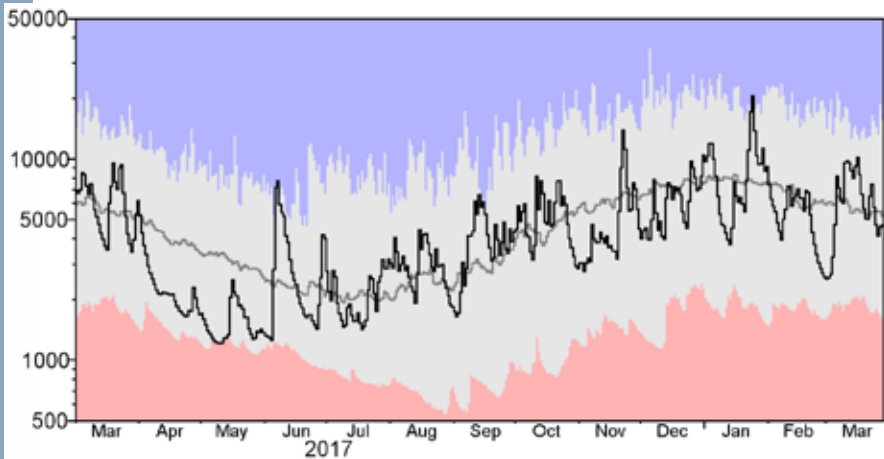
# UK Hydrological Bulletin: February – April 2018

The late winter and early spring of 2018 underlined the inherent variability of weather conditions across the UK. Unseasonably warm episodes contrasted with persistent freezing conditions with snow forming a more substantial fraction of total precipitation than in recent years — particularly in southern Britain. Depressed river flows characterised much of the country during late February and early March but, thereafter, runoff rates recovered dramatically and widespread floodplain inundations continued well into April. In most regions, the counterbalancing effect of this hydrological turbulence resulted in near-average runoff at the national scale over the three months. With groundwater level recoveries gathering momentum through the spring, and reservoirs stocks generally close to capacity, the water resources outlook is healthy.

Synoptic patterns in February were dominated by a strong easterly airflow bringing disruptive blizzards and sustained freezing conditions to much of the UK. With a much reduced frequency

of Atlantic low pressure systems, precipitation totals were notably low – less than 50% of the monthly average in parts of central Scotland and south-west England. Correspondingly, river flows declined steeply over the last 10 days of the month – frozen catchments were a contributory factor. By month-end, seasonally depressed flows were registered at most index gauging stations across the country and, in England, depressed groundwater levels were recorded in a few southern and eastern aquifer outcrop areas. Fortunately the benefits of abundant replenishment during January meant that most reservoir stocks remained well within 10% of capacity at month end.

March was another cold month – on the 2nd Oxford reported its lowest March temperature since 1845 – and

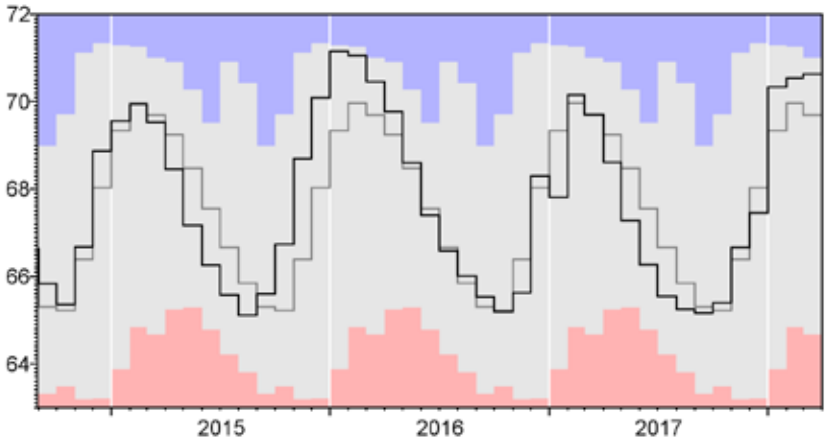


**Fig 1** Daily outflows ( $\text{m}^3\text{s}^{-1}$ ) from Great Britain (black trace); the blue and pink envelopes are the long term daily max. and min. Outflows and the grey trace is the long term daily average.

pipe-bursts associated with the freezing conditions caused localised water supply stress. Precipitation at the national scale was near-average but much of England and Wales was notably wet, the Wessex region registered its second wettest March since 1947. Flood alerts were widespread across England by the end of the first week – and in many catchments snowmelt was an appreciable aggravating factor whilst, in Northern Ireland, levels in Lough Neagh were notably high. In contrast, early March runoff in north-western Britain was very meagre and some rivers, e.g. the Nevis in the Scottish Highlands, closely approached their lowest recorded flow for the time of year. Elsewhere, March runoff totals were generally well above average and, for England, the second highest (provisionally) since 1982. In the South-West, the Exe and Tone were among a number of rivers establishing new maximum runoff totals for the month.

Entering April, many catchments were very vulnerable to further rainfall and a multi-fronted low pressure system tracking north overnight (1st/2nd) triggered over 200 Flood Alerts across England and Wales. The continuing saturated soil conditions also created problems for agriculture, delaying the planting of spring-sown crops and the release of livestock from their winter quarters. By the second week, the impact of abundant early spring recharge to most aquifers (see Fig. 2) became evident, particularly in Dorset as groundwater flood alerts began to be issued. Rivers were generally in high spate across England, but although the wet weather resulted in significant transport disruption, the natural drainage function of floodplains was well demonstrated and generally the community impacts of this high flow episode were limited. Synoptic patterns changed dramatically on the 18th and 19th (when London recorded its warmest April day since 1949) and runoff rates declined substantially as soil moisture deficits began their seasonal increase.

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25/4/18*



**Fig. 2** Monthly mean groundwater levels for the Ashton Farm well in Dorset. The blue and pink envelopes are the long term monthly max. and min. average; the grey trace is the long term monthly average.