UK Hydrological Bulletin: February – April 2017

For the UK as a whole, the February–April period was generally very mild and featured a hydrologically very valuable wet spell in late February and early March. However, a remarkably dry episode lasting until late April then increased long term rainfall deficiencies in most regions and initiated sustained river flow recessions. It probably also signalled the termination of the groundwater recharge season across much of southern Britain. Whilst late-March reservoir stocks were generally healthy, a subsequent dry late-spring and summer could potentially be accompanied by localised water supply, agricultural and ecological stress, in South East England especially.

Anticyclonic synoptic patterns which had been dominant through much of the late autumn and early winter began to break down in late January and February rainfall totals were close to the average for the UK as a whole. Some parts of northern and southern Britain were however particularly dry (Dartmoor for example) and, in Northern Ireland, moderate February rainfall contributed to the driest September–February period since 1933/34. Most of the UK was notably dry in this timeframe also.

Modest spate conditions characterised many rivers in early February but sustained recessions ensued, with well below average runoff generally in the third week when especially depressed flows were reported in Northern Ireland (see Fig. 1). Thereafter a very mild Atlantic airflow dominated synoptic patterns. The associated frontal rainfall — particularly that resulting from the passage of Storm Doris on the 23rd — generated a smart recovery in runoff rates with some flood alerts (e.g. in Wales and northern England) and, in a few southern areas, initiated a belated recovery in groundwater levels. Nonetheless, despite the February spates, the winter (Dec–Feb) runoff total for the UK was the lowest since the extreme drought of 1975/76, with a significant minority of index rivers reporting less than half their average winter runoff.

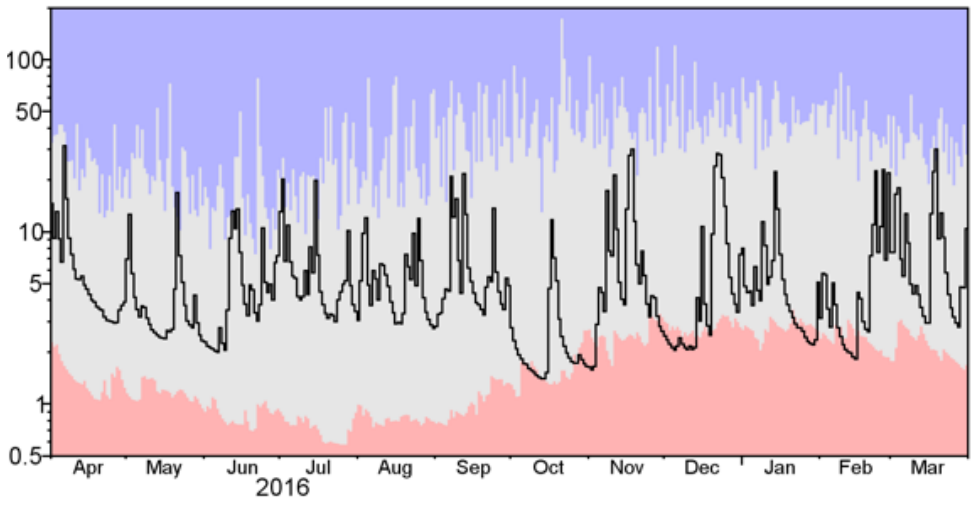

Fig 1 *Daily mean flows for the River Faughan (Northern Ireland). The blue and pink envelopes show the long term min. and max. for the pre-2016 record.*

The wet inter-lude continued into March — often a transformative month in terms of the water resources outlook. Eight-day rainfall totals in excess of 200 mm were reported in parts of Snowdonia and very wet conditions characterised the Sperrins in Northern Ireland also. Flood alerts were common during the first week and again around mid-month.

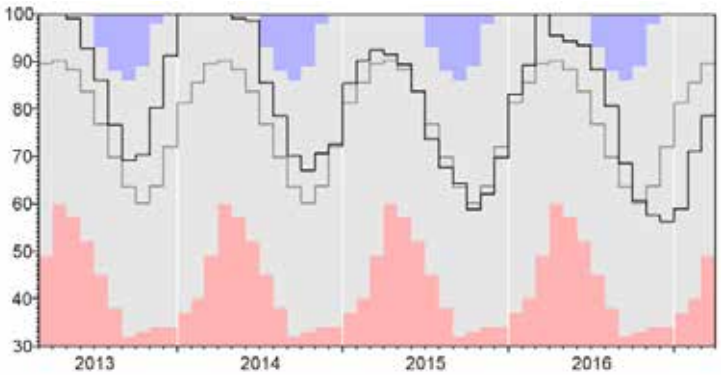

Fig 2 *End-of-month stocks for Bewl Reservoir (black trace). The grey trace is the long term monthly average, the blue and pink traces show the long term max. and min. for the pre-2016 record.*

Correspondingly, replenishment of many major reservoirs in Wales and northern England was substantial, ensuring that stocks in most index reservoirs across the UK were marginally above the late-March average. Roadford (Devon) and Bewl (Kent – see Fig 2) were exceptions but stocks remained considerably above drought minima for the time of year.

However, March rainfall totals were below average in much of Scotland and, importantly, much of southern and eastern England. Correspondingly, groundwater recharge to much of the Chalk aquifer was modest — at a time when increasing soil moisture deficits threatened an early termination to the 2016/17 recharge season (e.g. in the South East). In the Chilterns groundwater levels in the Chalk remained well below

the early spring average but considerably above drought minima (Fig 3).

A remarkably arid and exceptionally warm episode, began in the fourth week of March and continued throughout most of April. Rainfall accumulation of less than 2 mm over the sequences of 30 days or more were registered in some southern areas (including at the Centre for Ecology & Hydrology's Met Station). This, following the second driest October–March since 1975/76 for Great Britain as a whole, testifies to a very notable rainfall deficiency. It's impact has been moderated by the cluster of preceding wet winters — with associated very healthy reservoir stocks and groundwater resources — in many areas and the general resilience of water resources in the UK to single-year drought episodes. Nonetheless, a dry late spring would very likely foreshadow very moderate summer river flows, particularly in spring-fed rivers and streams and a concern for the water resources outlook if rainfall totals through the autumn are modest also.

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26/4/17

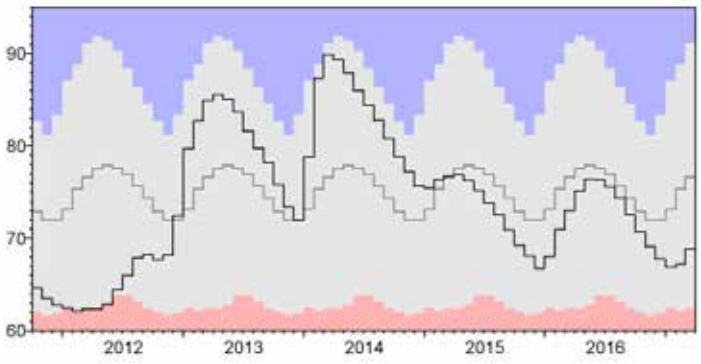

Fig 3 *Monthly groundwater levels in the Chalk at Stonor Park (black trace). The grey trace is the long term monthly average, the blue and pink traces show the long term max. and min. for the pre-2016 record.*