

UK Hydrological Bulletin: February 2015 – April 2015

Overall, and at the national scale, near average rainfall and temperatures characterised the late winter and early spring but with notable temporal and spatial variability. Precipitation totals for the winter (Dec-Feb) were substantially above average across much of northern and western Scotland but zones of significant deficiency extended across large parts of eastern Britain, southern catchments in Northern Ireland also. Scotland added a further wet winter to a large cluster since the late 1980s and, generally, healthy rainfall accumulations over longer timespans ensured that most major reservoir stocks, and groundwater levels in most index wells, exceeded the seasonal average entering the spring. Much of eastern and southern Britain was notably dry during March as high pressure dominated synoptic patterns. By contrast, northern Scotland remained wet, with further significant snowfall on the hills. This very unsettled interlude culminated in the second week when outstanding 2-3 day precipitation totals triggered the most extensive flooding in north-west Scotland for a quarter of a century. Entering April the water resources outlook remained healthy but a sustained dry spell, extending beyond three weeks in some areas, caused a steep decline in river flows and, particularly, in parts of eastern England, may have signalled the end of the 2014/15 aquifer recharge season.

For the UK as a whole, the February rainfall total was close to the long term average but the tracks favoured by most low pressure systems resulted in distinct regional contrasts. Generally above average rainfall was confined to the north-western and south-eastern regions of the UK whilst significant deficiencies characterised many eastern catchments from the Humber to the Moray Firth. An extreme contrast may be drawn between a 24-hr rainfall total of 90.8 mm rainfall for Tiree (10/11th Feb) and a February total of 11 mm reported for Chillingham Castle (Northumberland) in the rain shadow of the Pennines. Generalising broadly, the first half of the month witnessed sustained river flow recessions, which were particularly steep in some frozen northern catchments, whilst moderate spate conditions were common during the third week with a few, widely scattered, flood alerts – tidal blocking was an exacerbating factor in the lowest reaches of a number



Fig 1 River Beauly in flood, Lovat Caravan Park near Beauly

Photo: SEPA

of rivers. For the winter as a whole most regions of England & Wales registered rainfall totals within 15% of the long term average but some areas – mostly

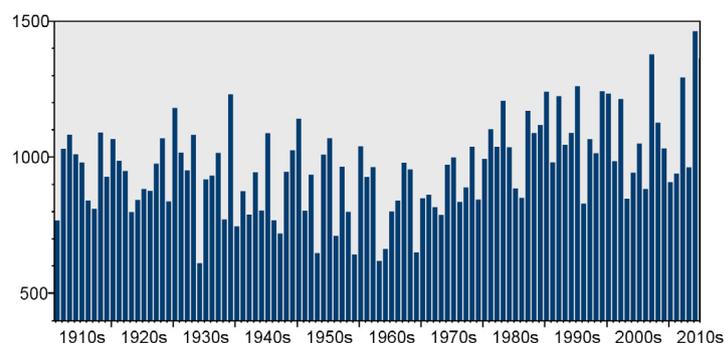


Fig 2 October-March rainfall totals for western Scotland

Data source: Met Office

in Yorkshire – fell below 80%. Correspondingly, the River Derwent recorded its 2nd lowest winter runoff in the last 20 years. By contrast, many Scottish catchments (from the Clyde to the Naver) reported winter runoff well above average. Recharge to most major aquifers was markedly episodic during February but, generally groundwater levels remained well within the normal range for the late winter, and remained notably high in parts of the slow-responding Permo-Triassic sandstone aquifer; a legacy of the outstanding recharge during the winter of 2013/14.

Weather patterns in early March were very unsettled, a vigorous westerly airflow brought significant snowfall to northern hills (Malham Tarn, North Yorkshire, reported 17 cm on the 3rd) and, in Scotland, exceptional precipitation totals were

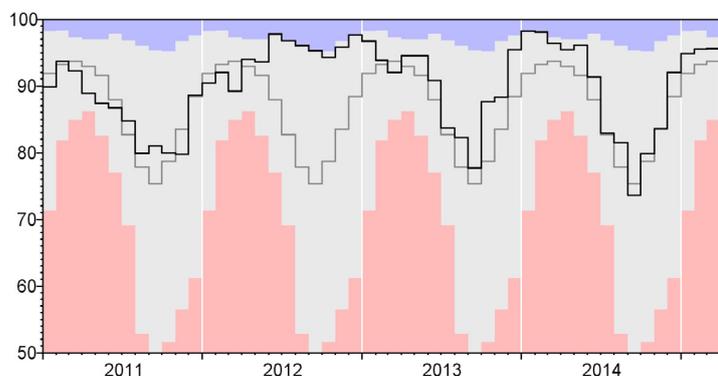


Fig 3 *A guide to overall reservoir stocks for England & Wales. End-of-month stocks shown by the black trace, the grey trace is the long term monthly mean and the blue/pink envelopes show the highest and lowest monthly stocks in a series from 1988.*

registered between the 5th and the 9th in the north-west Highlands. Many raingauges reported accumulations of >100 mm; Cluanie Inn registered 235 mm. The mild south-westerly airflow also served to boost meltwater rates from snow accumulations in the Scottish Highlands. With lochs and reservoirs also fairly high at the onset of this very wet interlude, an exceptional runoff episode was inevitable. The peak flow on the Conon was the highest for 23 years and on the Ness the peak has been exceeded only once in a series from 1972. Floodplain inundations were widespread (including at the Lovat Caravan Park, near Beaulieu, see Fig. 1) and transport disruption was locally severe, aggravated by a number of landslides; the Caledonian Canal was breached at Loch Oich. Generally however, the impact of the flooding was moderated by the low population density across most of the affected region. This exceptionally wet spell contributed to the third highest Oct-Mar rainfall total for western Scotland in a series from 1910 (but the 2013/14 winter half-year was considerably wetter, see Fig. 2). To the east and, particularly, the

south, March rainfall totals were much more modest – falling to <30% in parts of Sussex and Hampshire). Nonetheless, at the end of March overall reservoir stocks for England & Wales were appreciably above average (Fig. 3) and stocks all UK index reservoirs were within 10% of capacity (a not unusual circumstance for the early spring) with the exception of Stithians in Cornwall.

Across much of the country the mid-March river flow recessions were interrupted by a short cyclonic interlude which extended into early April. Thereafter however much more settled weather patterns predominated with a warm sub-tropical airflow bringing notably warm conditions, and seasonally high evaporation rates, during the second week of April. Thereafter high pressure continued to dominate synoptic patterns and, although a colder northerly airflow on the eastern flank of a persistent HP cell, moderated temperatures considerably, rainfall accumulations were nugatory. The Centre for Ecology's Met Station (Wallingford) registered less than 1 mm in the three weeks beginning on the 4th. Soil moisture deficits increased smartly, particularly across southern England where a number of heathland fires were reported (e.g. in Dorset and Sussex). The dry spell, coming at a time when evaporative demands are increasing, may mark the end of the recharge season in many eastern and southern aquifer outcrop areas. Generally however the seasonal recessions in groundwater levels are beginning from within the normal late-spring range albeit a little below average in parts of the eastern Chalk outcrop (e.g. in Yorkshire).

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