

Hydrological Outlook UK

Period: From December 2020

Issued on 08.12.2020 using data to the end of November 2020

SUMMARY

The outlook for December is for normal flows, and normal to above normal groundwater levels across the majority of the UK. River flows across the Chalk aquifer of the south-east are likely to be above normal over the next one-to-three months, and groundwater levels in the south-western parts of this aquifer are also likely to be above normal for December and notably to exceptionally high over the next three months. For December-January-February as a whole, river flows and groundwater levels across northern and western parts of the UK are likely to be above normal to notably high.

Rainfall:

Rainfall in November was significantly below average for most of the UK. Across the eastern parts of the UK, precipitation was as low as 30% of average. North-western parts of the UK saw average to above average rainfall.

The rainfall outlook for December (issued by the Met Office on 29.11.2020) is that the chance of above-average precipitation is close to normal. For December-January-February as a whole, above-average precipitation is more likely than below-average precipitation. The probability that UK-average precipitation for December-January-February will fall into the driest of five categories is around 10% and the probability that it will fall into the wettest of five categories is around 45% (the 1981-2010 probability for each of these categories is 20%). A moderate to strong La Niña, among other atmospheric drivers, is expected to affect the latter part of this winter.

River flows:

River flows in November continued to show the fairly consistent pattern that has been established over the past six months. Flows in north-western parts of the UK, and the chalk aquifer driven catchments of the south-east have been above normal to notably high. Flows across the north-east have been normal to below normal. Elsewhere flows have been within the normal range.

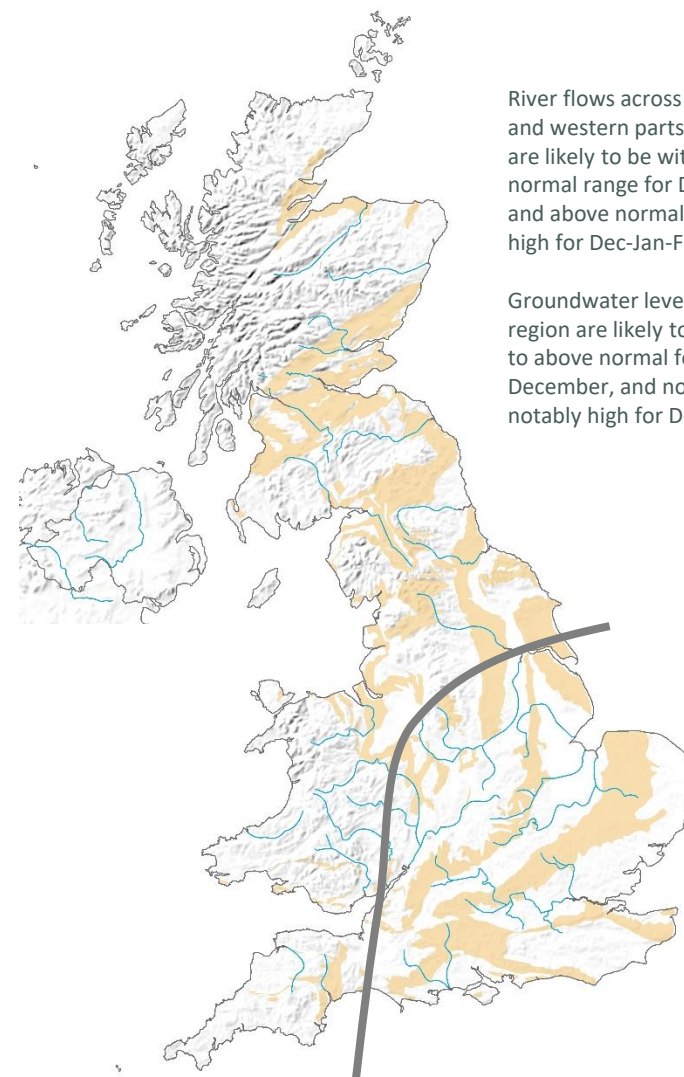
Flows at this time of year demonstrate two modes of predictability. In the south-east, where river flows over groundwater aquifers can be predicted using persistence, we expect flows to remain above normal for the next one-to-three months. Catchments elsewhere in central and south-eastern England are likely to be within the normal range for the next one-to-three months. In the north and western parts of the UK, river flows in winter are strongly driven by atmospheric weather patterns. For this reason, river flows in the north and west are likely to be within the normal range for December, but are then forecast to be above normal to notably high for December-January-February as a whole.

Groundwater:

Groundwater levels in the UK were predominantly normal to above normal for November, with localised notably and exceptionally high levels in the Permo-Triassic sandstones of the north-west.

Groundwater levels in December are likely to be within the normal range, with some above normal and notably high levels in the north of England and in the south-western Chalk. For December-January-February as a whole, groundwater levels are likely to be normal to above normal, with some exceptionally high levels predicted in the north-western sandstones, and southern Chalk.

The Hydrological Outlook UK provides an outlook for the water situation for the UK over the next three months and beyond. For guidance on how to interpret the outlook, a wider range of information, and a full description of underpinning methods, please visit the website: www.hydoutuk.net



River flows across northern and western parts of the UK are likely to be within the normal range for December, and above normal to notably high for Dec-Jan-Feb.

Groundwater levels in this region are likely to be normal to above normal for December, and normal to notably high for Dec-Jan-Feb.

River flows and groundwater levels for the next three months are likely to be above normal across chalk aquifers in southern and eastern parts of the UK, and within the normal range elsewhere in this region.

Shaded areas show principal aquifers

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About the Hydrological Outlook:

This document presents an outlook for the UK water situation for the next 1 – 3 months and beyond, using observational datasets, meteorological forecasts and a suite of hydrological modelling tools. The outlook is produced in a collaboration between the UK Centre for Ecology and Hydrology (UKCEH), British Geological Survey (BGS), the Met Office, the Environment Agency (EA), Natural Resources Wales (NRW), the Scottish Environment Protection Agency (SEPA), and for Northern Ireland, the Department for Infrastructure – Rivers (DfIR).

Data and Models:

The Hydrological Outlook depends on the active cooperation of many data suppliers. This cooperation is gratefully acknowledged. Historic river flow and groundwater data are sourced from the UK National River Flow Archive and the National Groundwater Level Archive. Contemporary data are provided by the EA, SEPA, NRW and DfIR. These data are used to initialise hydrological models, and to provide outlook information based on statistical analysis of historical analogues.

Climate forecasts are produced by the Met Office. Hydrological modelling is undertaken by UKCEH using the Grid-to-Grid, PDM and CLASSIC hydrological models and by the EA using CATCHMOD. Hydrogeological modelling uses the R-groundwater model run by BGS and CATCHMOD run by the EA. Supporting documentation is available from the Outlooks website: <http://www.hydoutuk.net/methods>

Presentation:

The language used in the summary presented overleaf generally places flows and groundwater levels into just three classes, i.e. below normal, normal, and above normal. However, the underpinning methods use as many as seven classes as defined in the graphic to the right, i.e. the summary uses a simpler classification than some of the methods. On those occasions when it is appropriate to provide greater discrimination at the extremes the terminology and definitions of the seven class scheme will be adopted.

	Percentile range of historic values for relevant month
Exceptionally high flow	> 95
Notably high flow	87-95
Above normal	72-87
Normal range	28-72
Below normal	13-28
Notably low flow	5-13
Exceptionally low flow	< 5

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Further information:

For more detailed information about the Hydrological Outlook, and the derivation of the maps, plots and interpretation provided in this outlook, please visit the Hydrological Outlook UK website.

The website features a host of other background information, including a wider range of sources of information which are used in the preparation of this Outlook.

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Reference for the Hydrological Outlook:

Hydrological Outlook UK, 2020, December, UK Centre for Ecology and Hydrology, Oxfordshire UK, Online, <http://www.hydoutuk.net/latest-outlook/>

Other Sources of Information:

The Hydrological Outlook should be used alongside other sources of up-to-date information on the current water resources status and flood risk.

Environment Agency Water Situation Reports: provides summary of water resources status on a monthly and weekly basis for England: <https://www.gov.uk/government/collections/water-situation-reports-for-england>

Flood warnings are continually updated, and should be consulted for an up-to-date and localised assessment of flood risk:

Environment Agency: <https://flood-warning-information.service.gov.uk/map>
Scottish Environment Protection Agency: <http://www.sepa.org.uk/flooding.aspx>

Hydrological Summary for the UK: provides summary of current water resources status for the UK: <https://nrfa.ceh.ac.uk/monthly-hydrological-summary-uk>

UK Met Office forecasts for the UK: www.metoffice.gov.uk/public/weather/forecast/#?tab=regionalForecast

UK Water Resources Portal: monitor the UK hydrological situation in near real-time including rainfall, river flow, groundwater and soil moisture from COSMOS-UK: <https://eip.ceh.ac.uk/hydrology/water-resources/>