

SUMMARY The Outlook for February is for normal to above normal river flows in northwest Britain, and normal to below normal flows elsewhere. Groundwater levels are likely to be normal to above normal in most aquifers, and normal to below normal in east Anglia. The outlook for February to April is for normal to below normal flows and groundwater levels across most of the UK, but with normal to above normal groundwater levels persisting in some parts of the southeast.

Rainfall:

In January, significantly above average precipitation was received across much of western Britain, and in the far south of England. In contrast, much of eastern Britain, central England and parts of northern Scotland were drier than average.

The forecast (issued by the Met Office on 30.01.2023) shows a slightly increased likelihood of above normal precipitation for both February and the February–April period. This is more likely in northwestern areas, with rainfall amounts across southern parts of the UK being less certain. Shorter-term forecasts show the dry conditions in southern England seen so far this month are likely to continue for a substantial part of February.

River flows:

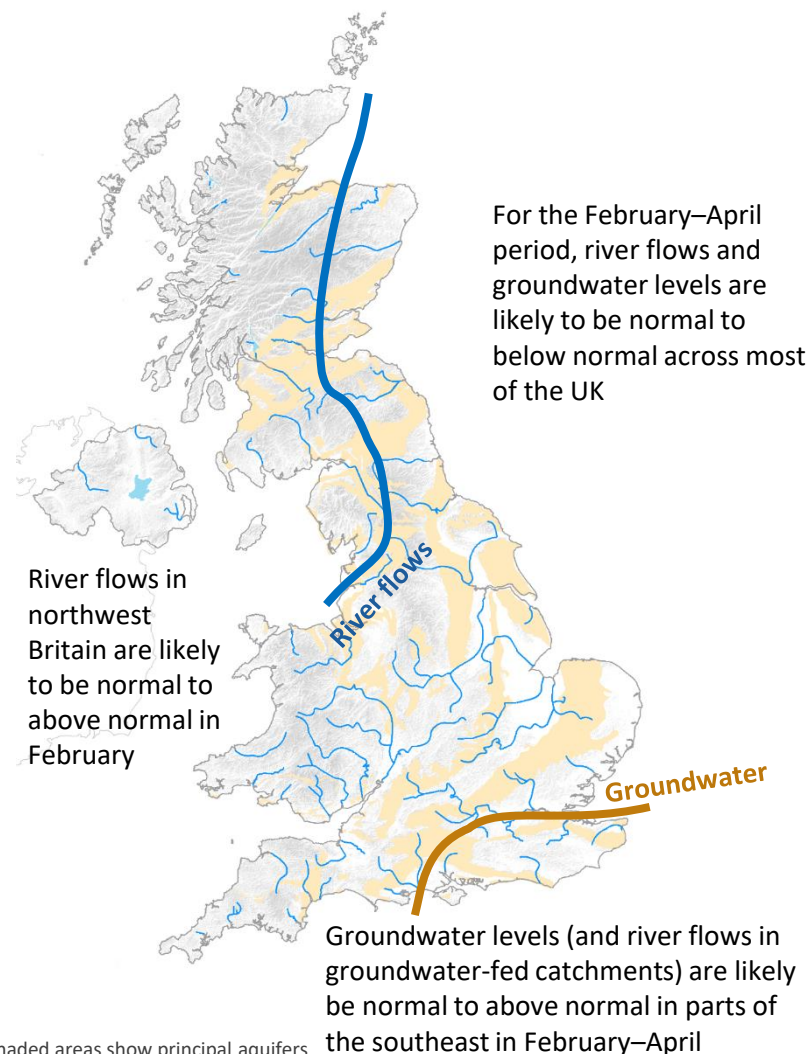
River flows in January were above normal for much of the UK, significantly so in many western catchments, and in the normal range in parts of eastern England and the far north of Scotland. The outlook for February is for normal to below normal flows across much of the UK, but with normal to above normal flows in northwest Britain, and in parts of the far southeast of England (mainly in groundwater-fed catchments). Below normal flows are more likely in localised parts of east Anglia. Over the February–April timeframe, normal to below normal flows are most likely and there is a greater tendency for flows to be below normal across wider areas.

Groundwater:

Across most aquifers, groundwater levels in January were predominantly in the normal range, and locally above normal – in the southern Chalk, levels were notably high. Levels were normal to below normal in the Chalk of the Chilterns and East Anglia.

The outlook for February is for normal levels to predominate in most aquifers, with normal to above normal levels in the southern Chalk, and normal to below normal levels in eastern England. Over the three month timeframe, normal to below normal levels are the most likely outcome, with below normal levels most likely in east Anglia. Normal to above normal levels may persist in the 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



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:

<https://www.hydoutuk.net/about/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

Disclaimer and liability:

The Hydrological Outlook partnership aims to ensure that all Content provided is accurate and consistent with its current scientific understanding. However, the science which underlies hydrological and hydrogeological forecasts and climate projections is constantly evolving. Therefore any element of the Content which involves a forecast or a prediction should not be relied upon as though it were a statement of fact. To the fullest extent permitted by applicable law, the Hydrological Outlook Partnership excludes all warranties or representations (express or implied) in respect of the Content.

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From April 2018 the Hydrological Outlook is supported by the Natural Environment Research Council funded [UK-SCAPE](#) and [Hydro-JULES](#) Programmes.

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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.

Contact:

Hydrological Outlooks UK, UK Centre for Ecology & Hydrology, Wallingford, Oxfordshire, OX10 8BB
t: 01491 692371 e: enquiries@hydoutuk.net

Reference for the Hydrological Outlook:

Hydrological Outlook UK, 2023, February, UK Centre for Ecology and Hydrology, Oxfordshire UK, Online, <https://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>

Natural Resources Wales: <https://flood-warning.naturalresources.wales/>

Scottish Environment Protection Agency: <https://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: <https://www.metoffice.gov.uk/#?tab=regionalForecast>

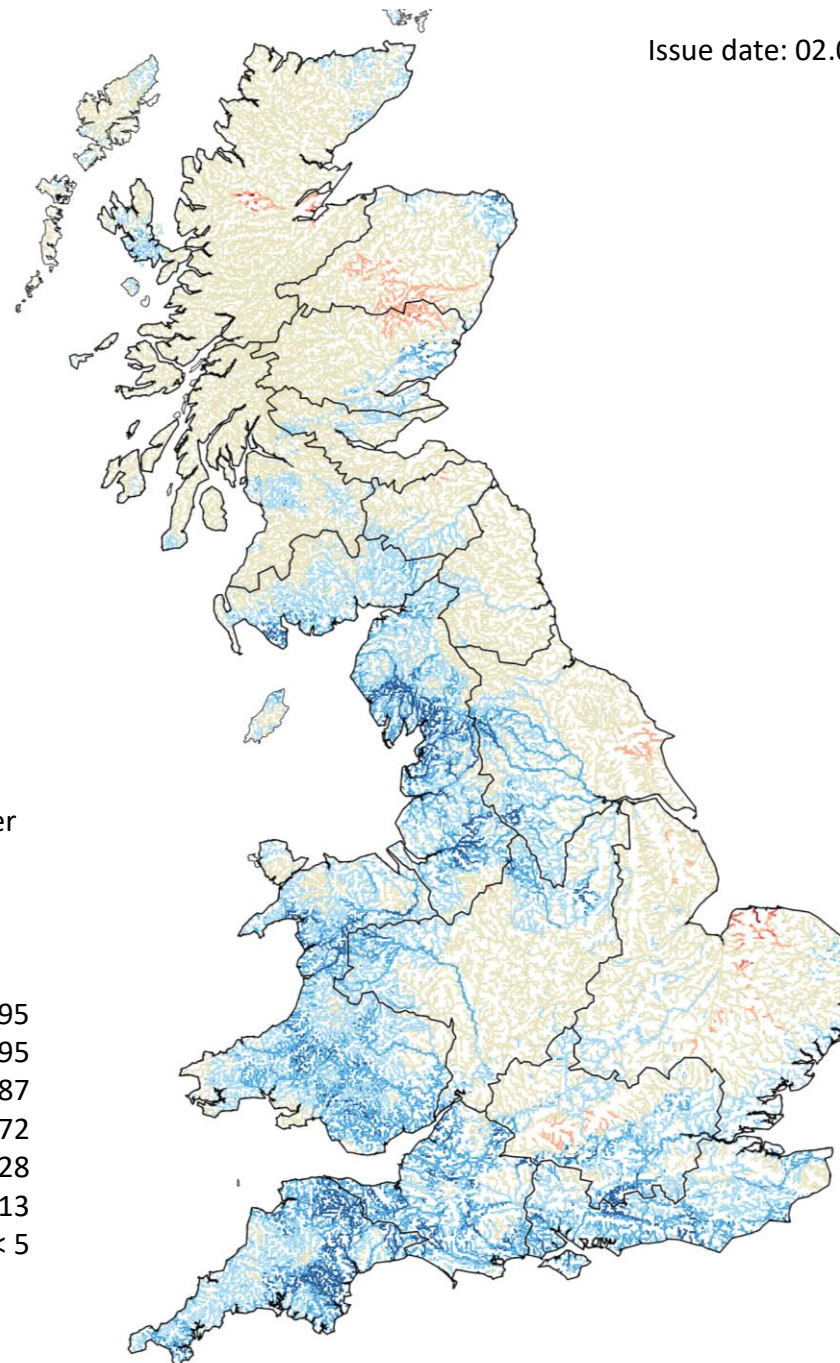
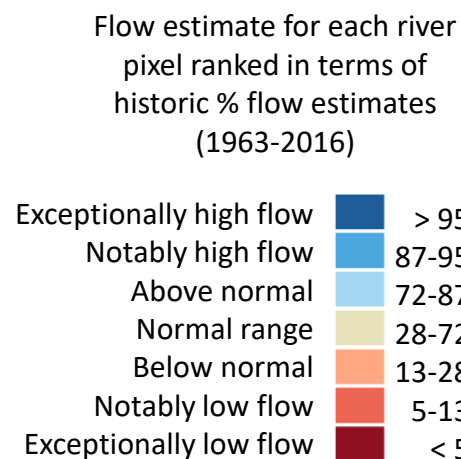
UK Water Resources Portal: monitor the UK hydrological situation in near real-time including rainfall, river flow, groundwater and soil moisture from COSMOS-UK:

<https://eip.ceh.ac.uk/hydrology/water-resources/>

This map shows the simulated monthly mean flow across Great Britain for last month, ranked in terms of 54 years of historical flow estimates (1963 – 2016).

These flows are produced by the 1km resolution Grid-to-Grid (G2G) hydrological model, which is run up to the end of each calendar month using observed rainfall and MORECS potential evaporation as input.

Note that the G2G model provides estimates of natural flows.



Current Daily Simulated Subsurface Water Storage Conditions

Based on subsurface water storage estimated for 31 January 2023

Issue date: 02.02.2023

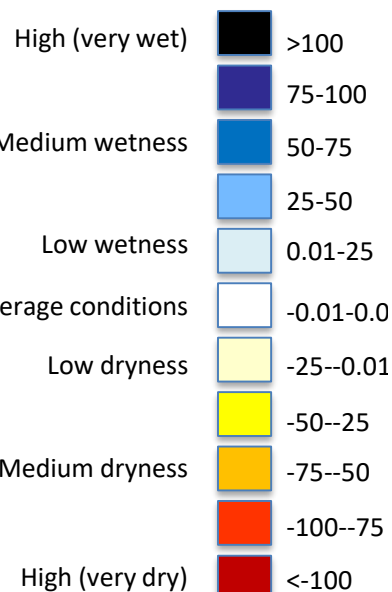
These maps are based on Grid-to-Grid (G2G) hydrological model simulated subsurface water storage, expressed as an anomaly from the historical monthly mean. To highlight areas that are particularly wet or dry, the storage anomaly is presented here using a colour scale highlighting water storage relative to historical extremes. The maps below show the “relative wetness” which combines maps previously shown separately as the “relative wetness” and “relative dryness”.

These maps do not provide a forecast and are not maps of soil moisture. Instead they indicate areas which are particularly wet or dry. Rainfall in areas with high positive relative wetness could result in flooding in the coming days/weeks. Areas of negative relative wetness provide an indication of locations which are particularly dry, and little or no rain in these areas could potentially lead to (or prolong) a drought.

SUMMARY: At the end of January, subsurface water levels were marginally lower (drier) than normal in most of England and the east of Scotland, but are much wetter than normal in the north and west of Scotland.

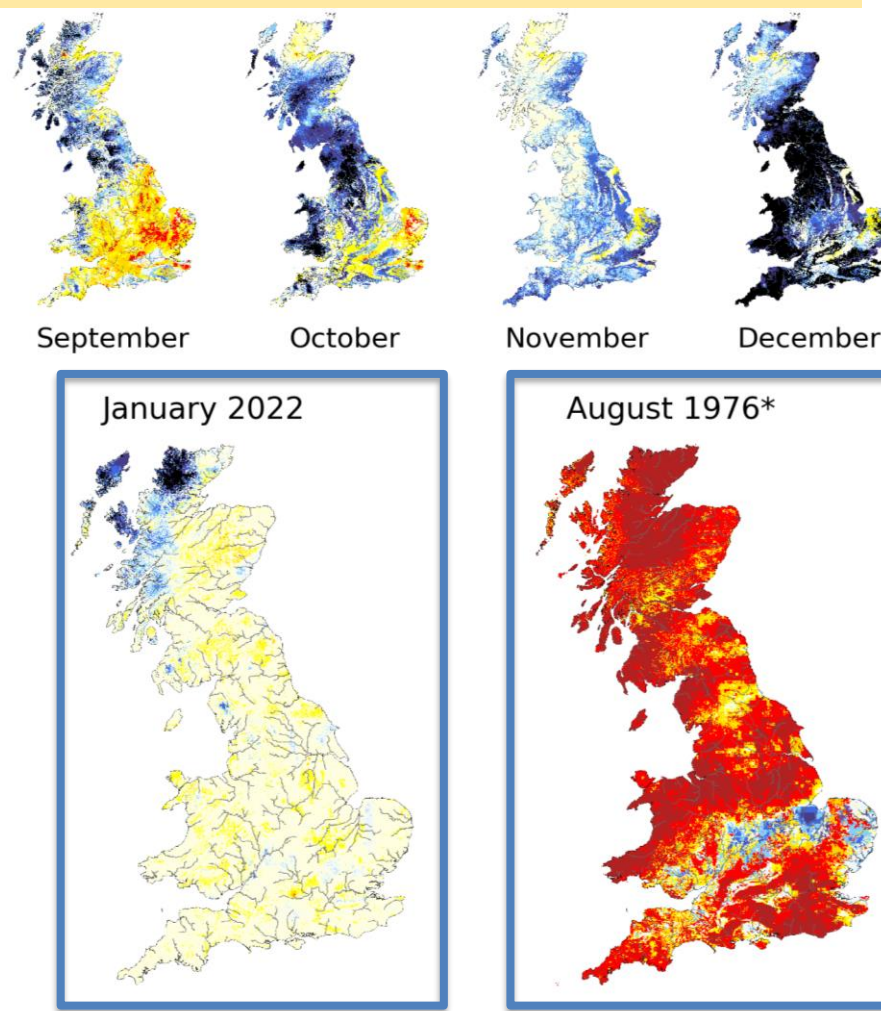
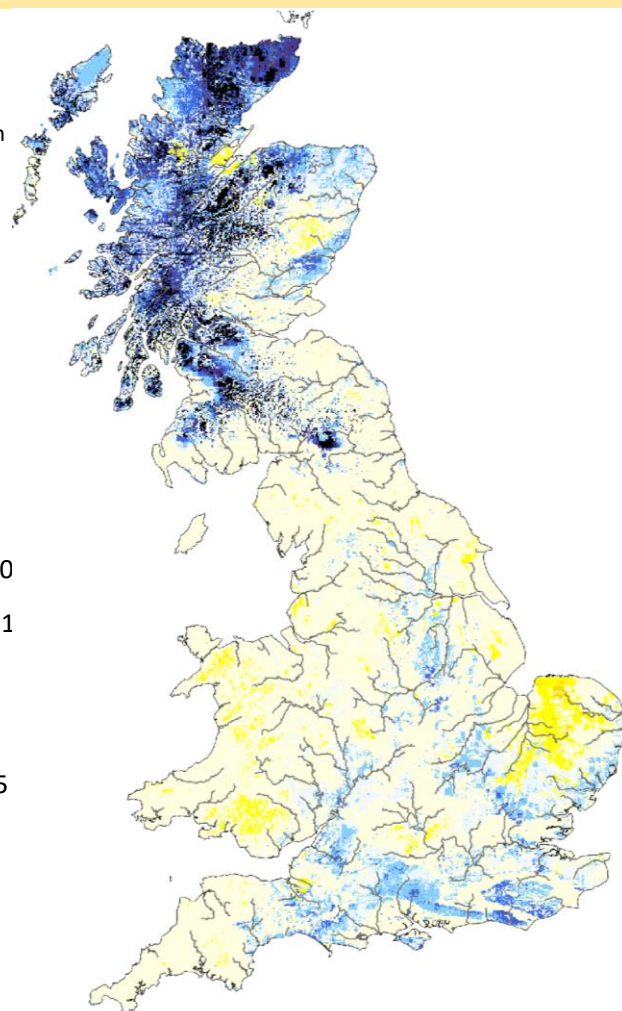
Relative wetness

Water storage anomaly as a % of maximum (positive wetness) or minimum (negative wetness) storage anomaly (zero indicates average value)



Major rivers

Labels refer to estimated storage on the final day of named month



* Example month displaying extreme negative wetness

Return Period of Rainfall Required to Overcome Dry Conditions

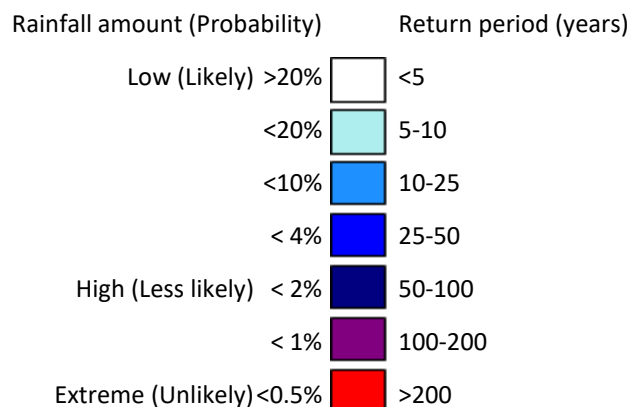
Period: February 2023 - July 2023

Issue date: 02.02.2023

These maps show the return period of the rainfall required to overcome dry conditions simulated using the Grid-to-Grid (G2G) hydrological model. The maps are coloured according to the return period of accumulated rainfall required to overcome the estimated current subsurface water storage deficit over the next few months.

These maps do not provide a drought forecast. Instead they indicate the return period of rainfall required to overcome the dry conditions for the following 6 months based on current conditions.

SUMMARY: During February to July, Great Britain will not require particularly unusual rainfall (<5 year return periods) to return to average conditions for the time of year.



SCOTLAND

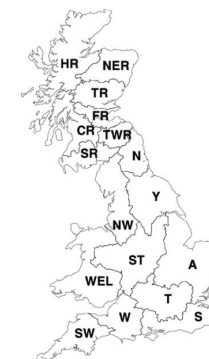
- HR Highlands Region
- NER North East Region
- TR Tay Region
- FR Forth Region
- CR Clyde Region
- TWR Tweed Region
- SR Solway Region

ENGLAND

- N Northumbria
- NW North West
- Y Yorkshire
- ST Severn Trent
- A Anglian
- T Thames
- S Southern
- W Wessex
- SW South West

WALES

- WEL Welsh



NORTHERN IRELAND

This method cannot currently be used in Northern Ireland

Estimate of Additional Rainfall Required to Overcome Dry Conditions

Based on subsurface water storage estimated for 31 January 2023

Issue date: 02.02.2023

These maps show the Grid-to-Grid (G2G) hydrological model simulated subsurface water storage, expressed as an anomaly from the historical monthly mean (1981-2010), presented on a 1km grid and as regional means.

Subsurface storage deficits, i.e. where the subsurface water storage anomaly is less than zero, are highlighted by the red/pink colours.

The subsurface storage deficit (mm) can be interpreted as an estimate of additional rainfall that would be required in future months to overcome dry conditions (i.e. rainfall in addition to what is expected on average). Regional mean values of additional rainfall required are provided in the table below.

Regional estimate of additional rainfall required (mm)

SCOTLAND

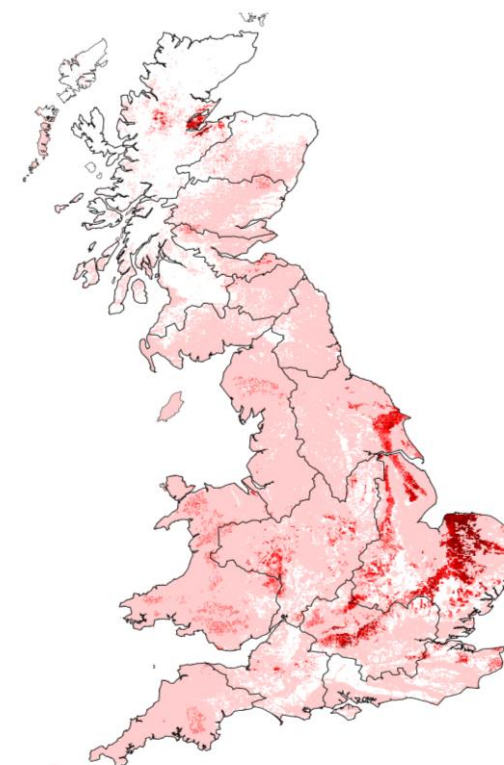
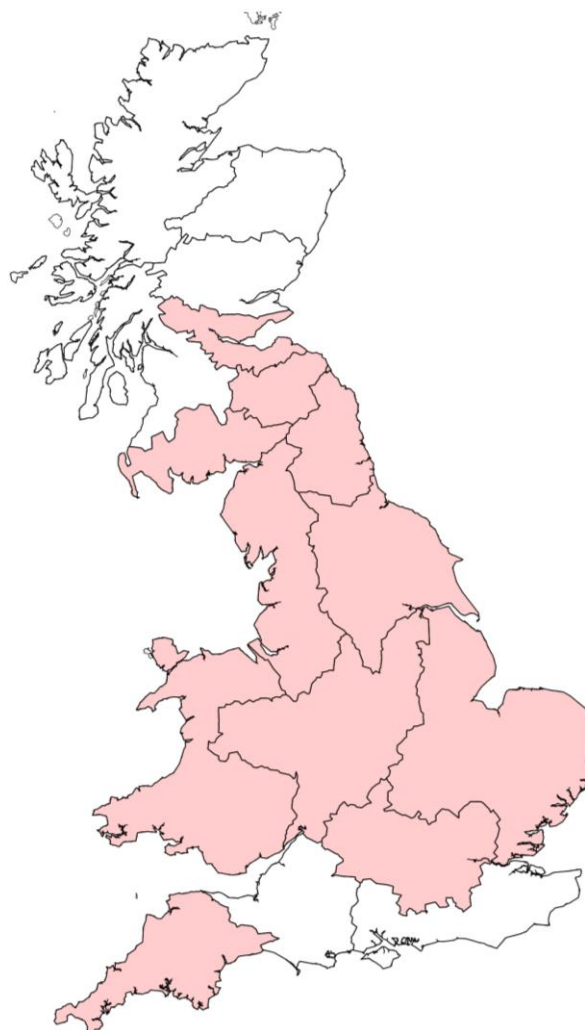
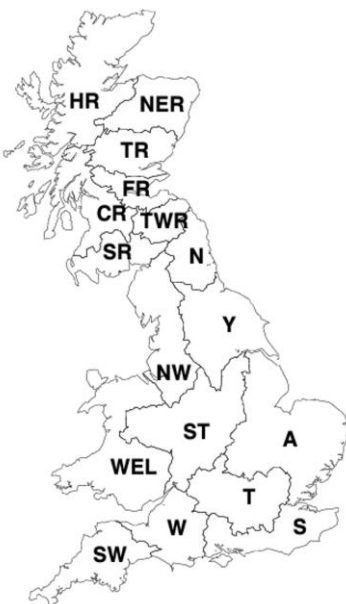
0	HR	Highlands Region
0	NER	North East Region
0	TR	Tay Region
3	FR	Forth Region
0	CR	Clyde Region
3	TWR	Tweed Region
4	SR	Solway Region

ENGLAND

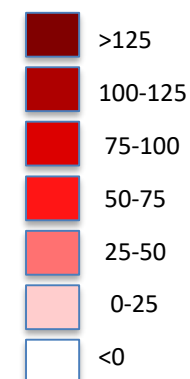
3	N	Northumbria
7	NW	North West
9	Y	Yorkshire
6	ST	Severn Trent
19	A	Anglian
5	T	Thames
0	W	Wessex
0	S	Southern
12	SW	South West

WALES

13	WEL	Welsh
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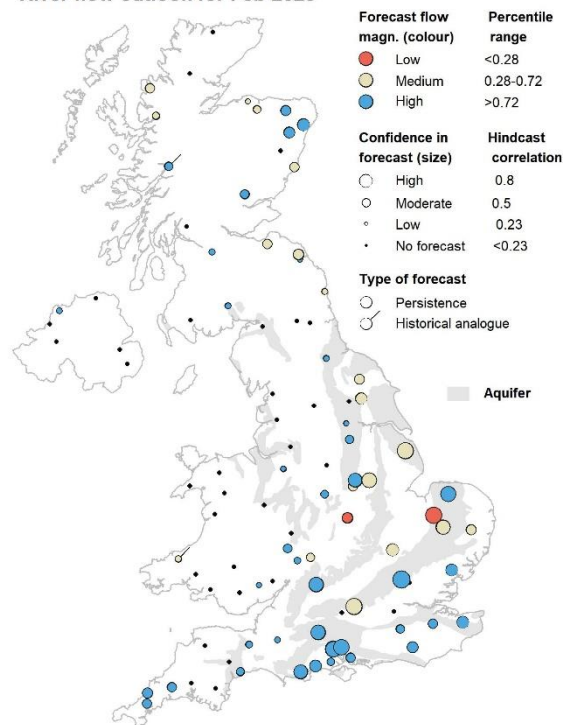
Water storage deficit
(anomaly; mm)



SUMMARY:

The outlook for February and for February to April is for mainly normal to above normal flows across most of the UK, with some exceptions of normal to below normal flows in central and eastern England. Please note there are few forecasts for the north and west of the country.

River flow outlook for Feb 2023



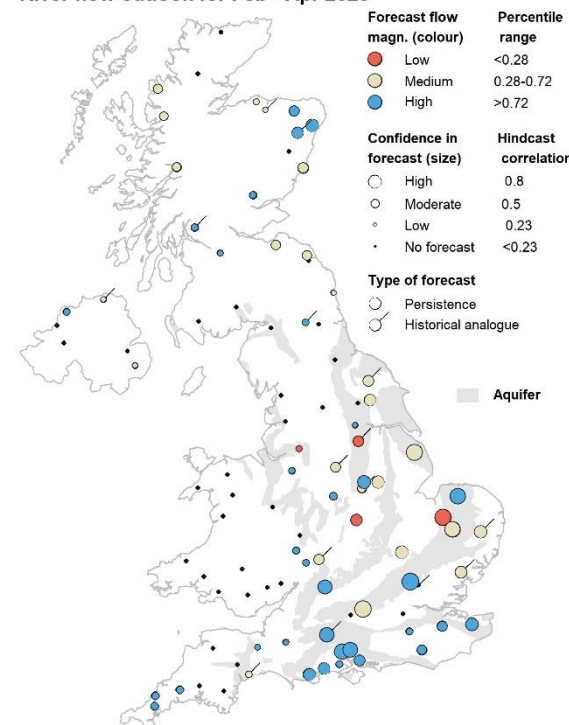
1-month flow outlook

Outlooks from hydrological analogues are based on a comparison of river flow during recent months with flows during the same months in previous years at a set of approximately 90 sites from across the UK. These sites are depicted on the two maps. Years with observed flows that most closely resemble current conditions are identified as the best analogues and the outlook is based on extrapolating from current conditions based on these analogues.

It is, however, often the case that a simpler forecast based on the persistence of river flow provides a better forecast than provided by analogy. This is particularly true for slowly responding catchments associated with aquifer outcrops.

Both methods are considered at each site and the forecast from the method with the higher confidence is presented. A simple classification of flows is used (high, medium and low) as indicated by the colours of the dots, with the confidence

River flow outlook for Feb - Apr 2023



3-month flow outlook

of the forecast being represented by the size of the dot. A tag on the dot indicates which method has been used in each instance.

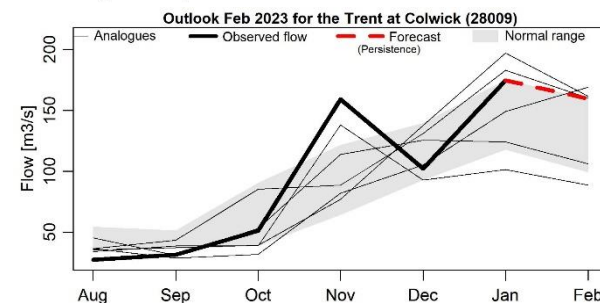
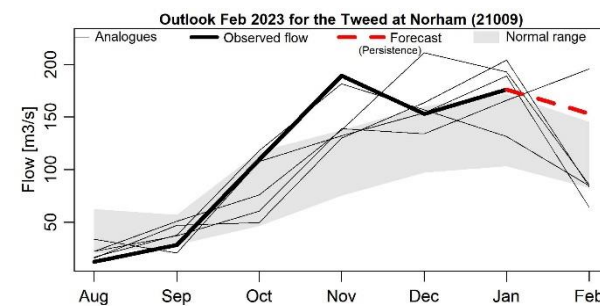
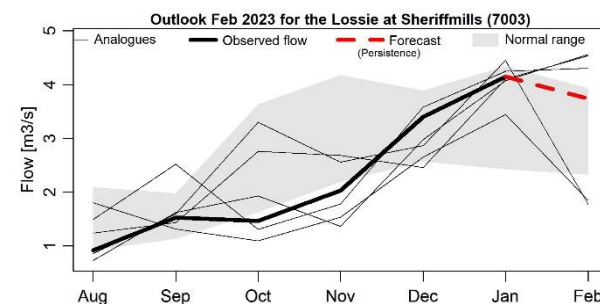
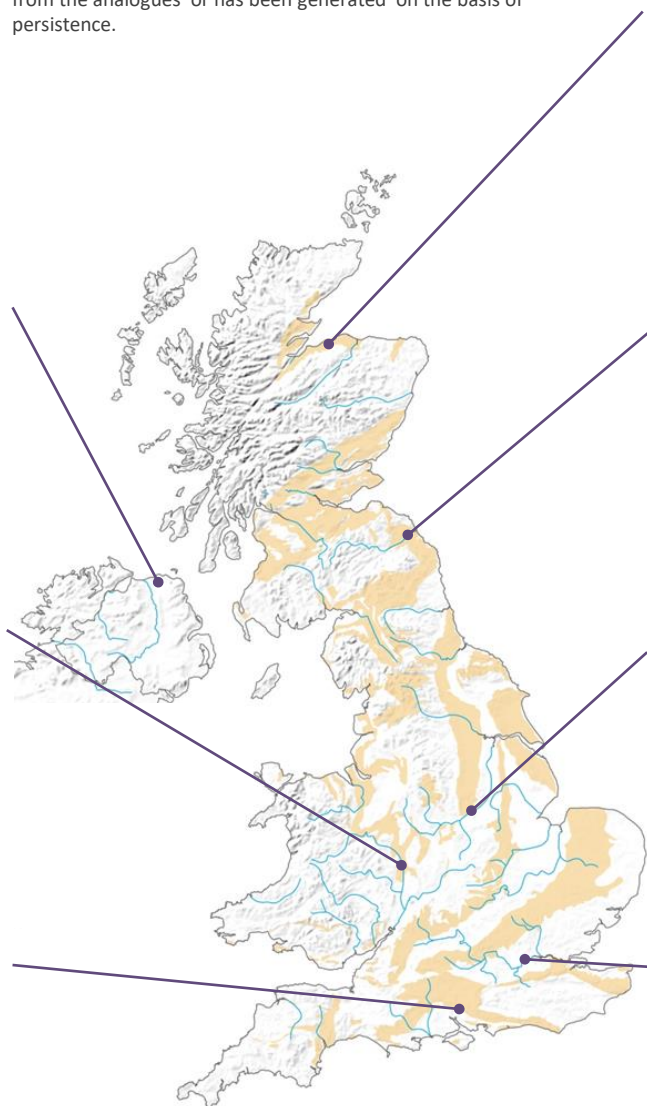
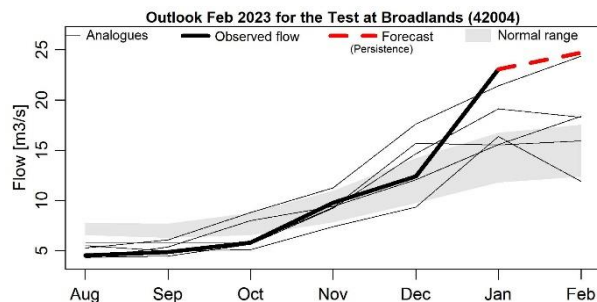
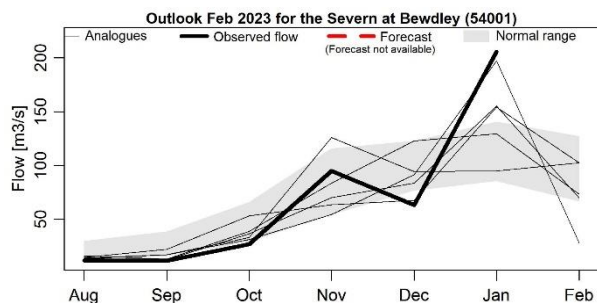
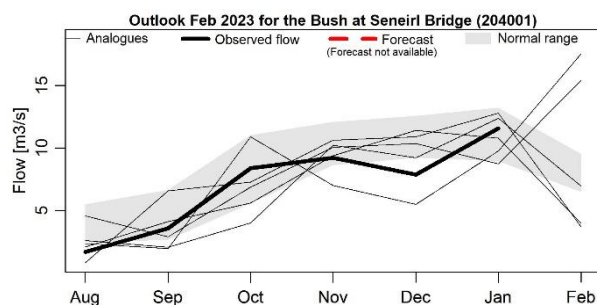
Period: February 2023

Issued on 06.02.2023 using data to the end of January 2023

These figures provide insight into the hydrological analogue methodology for a set of sites from across the UK.

In each of the time series graphs the bold black line represents the observed flow during the past six months. The grey band indicates the normal flow range (the normal band includes 44%

of observed flows in each month). The selected analogues are shown as thin lines and the trajectories that flows took in the following month are also shown. The forecast is shown as the dashed red line, and in each plot it states whether this has come from the analogues or has been generated on the basis of persistence.



No forecast
available

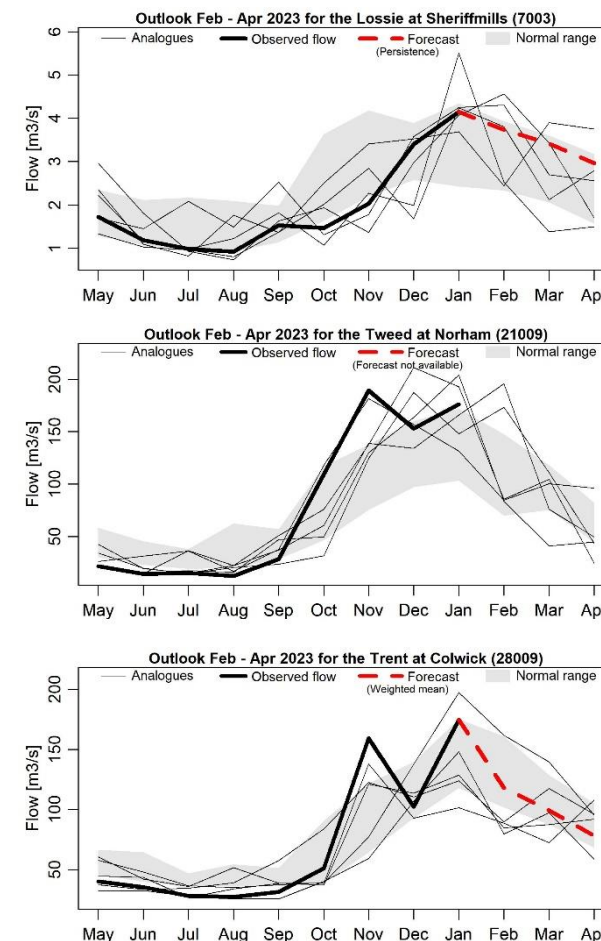
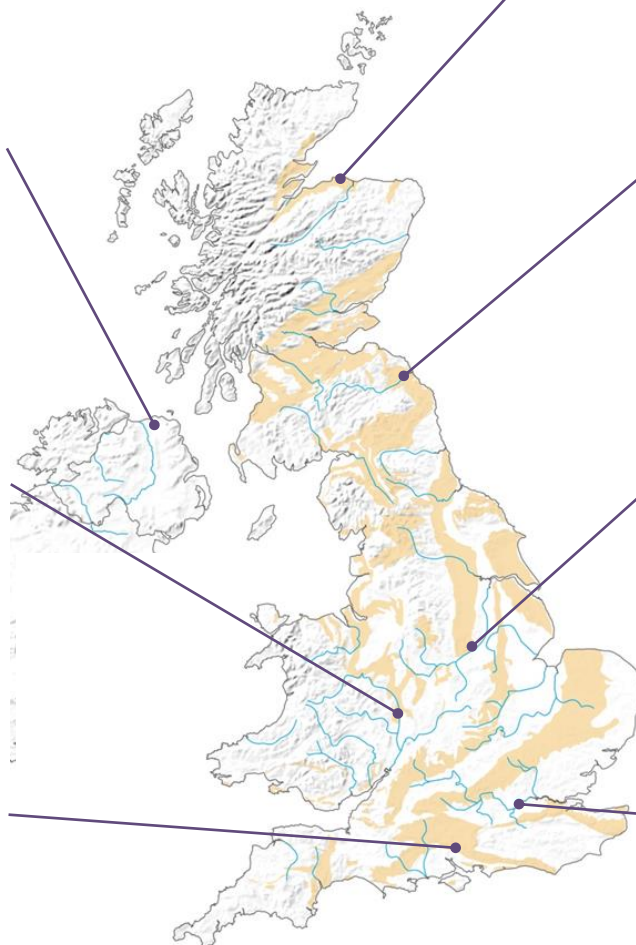
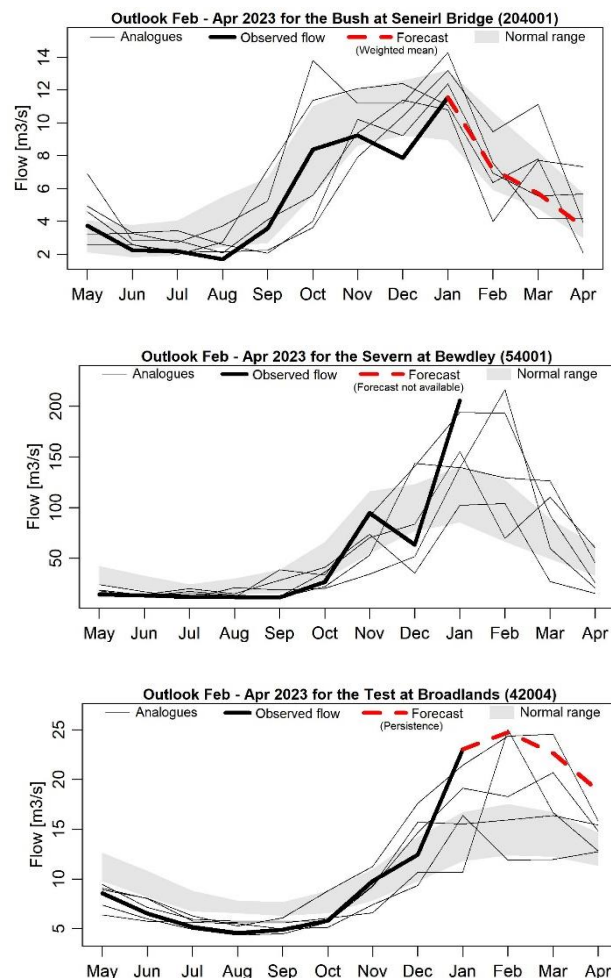
Period: February 2023 – April 2023

Issued on 06.02.2023 using data to the end of January 2023

These figures provide insight into the hydrological analogue methodology for a set of sites from across the UK.

In each of the time series graphs the bold black line represents the observed flow during the past nine months. The grey band indicates the normal flow range (the normal band includes 44%

of observed flows in each month). The selected analogues are shown as thin lines and the trajectories that flows took in the following three months are also shown. The forecast is shown as the dashed red line, and in each plot it states whether this has come from the analogues or has been generated on the basis of persistence.



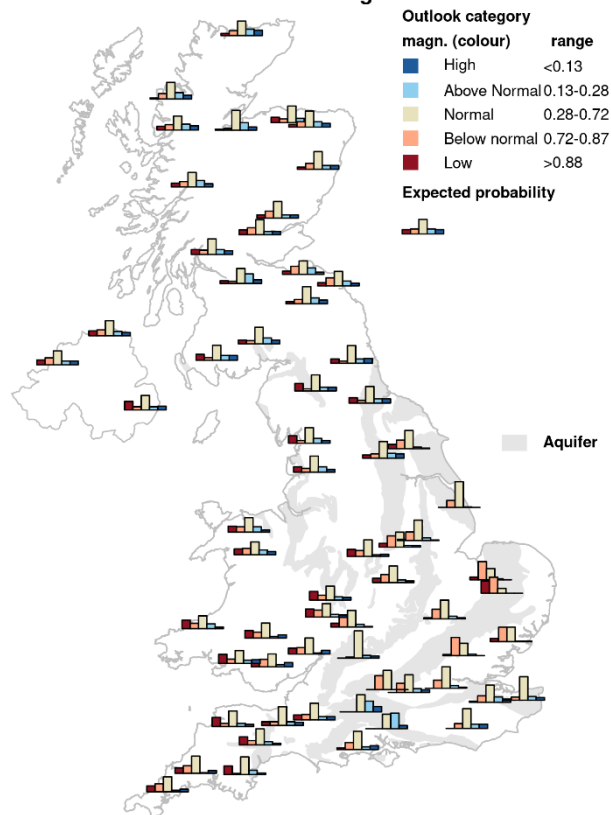
No forecast available

Period: February 2023 – July 2023

Issued on 02.02.2023 using data to the end of January 2023

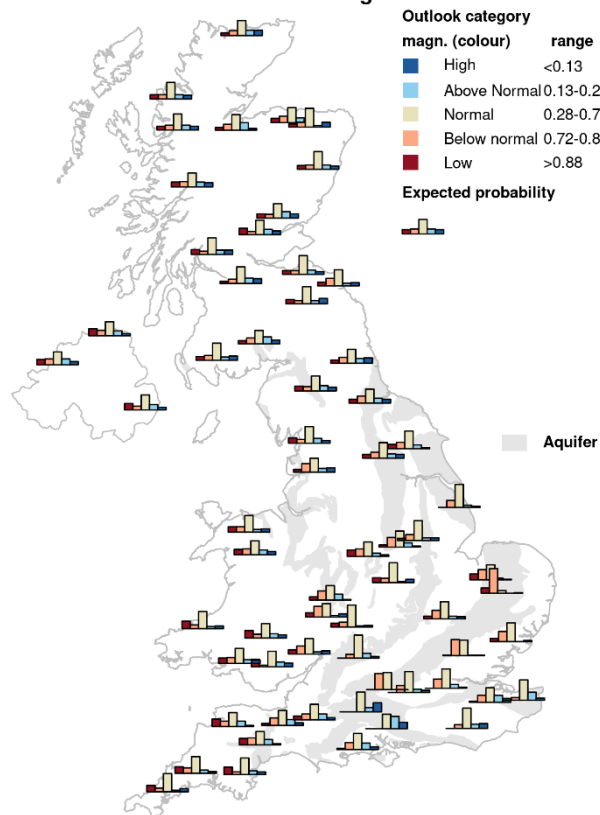
The outlook for February indicates that flows are most likely to be normal across most of the UK, except in south-western and central England where they are likely to be normal to below normal, and a small number of catchments in southern England which are likely to be normal to above normal. The February-March-April outlook indicates that this pattern is likely to persist for the UK over the next 3 months.

1-month river flow outlook starting Feb 2023



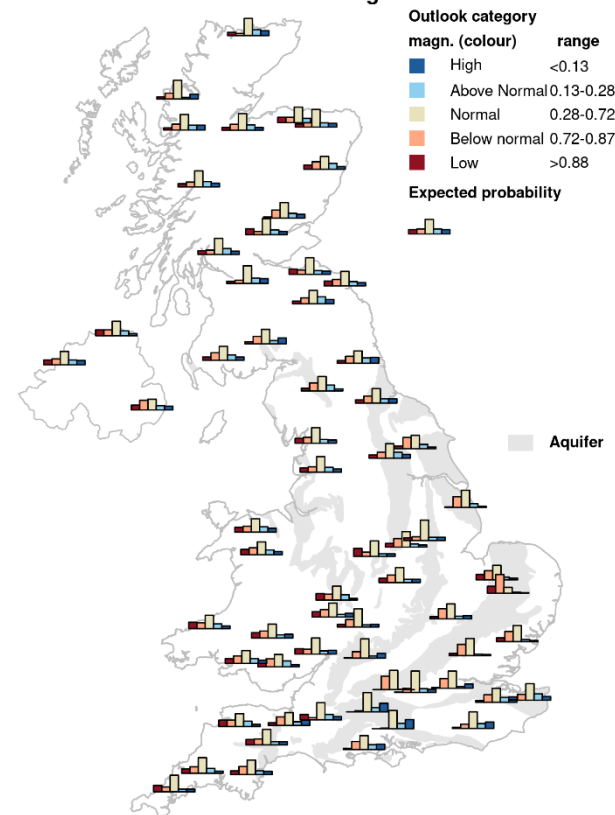
This outlook is based on monthly ensembles of historical sequences of observed climate (rainfall and potential evapotranspiration) that form input to a hydrological model. The outputs are probabilistic simulations of the average river flow over the forecast period (1 to 12 months ahead), at each location. The simulations are generated by the GR4J conceptual rainfall-runoff model from IRSTEA (France) calibrated on observed or naturalised flows.

3-month river flow outlook starting Feb 2023

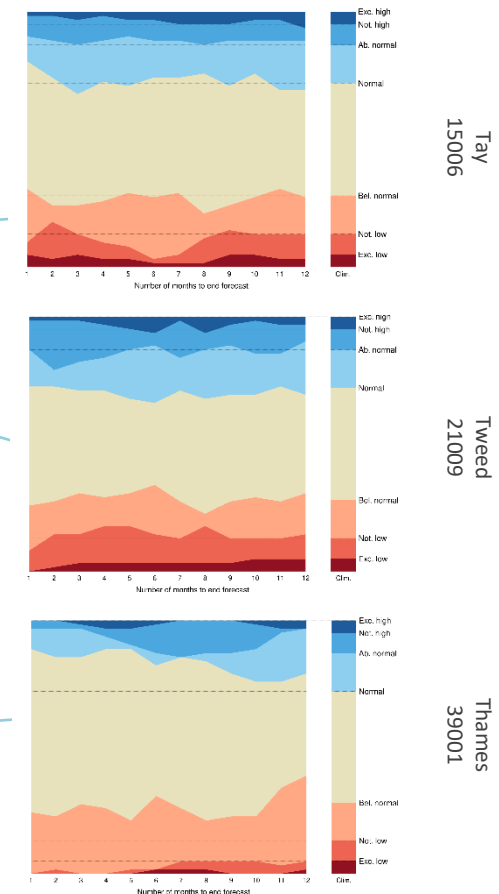
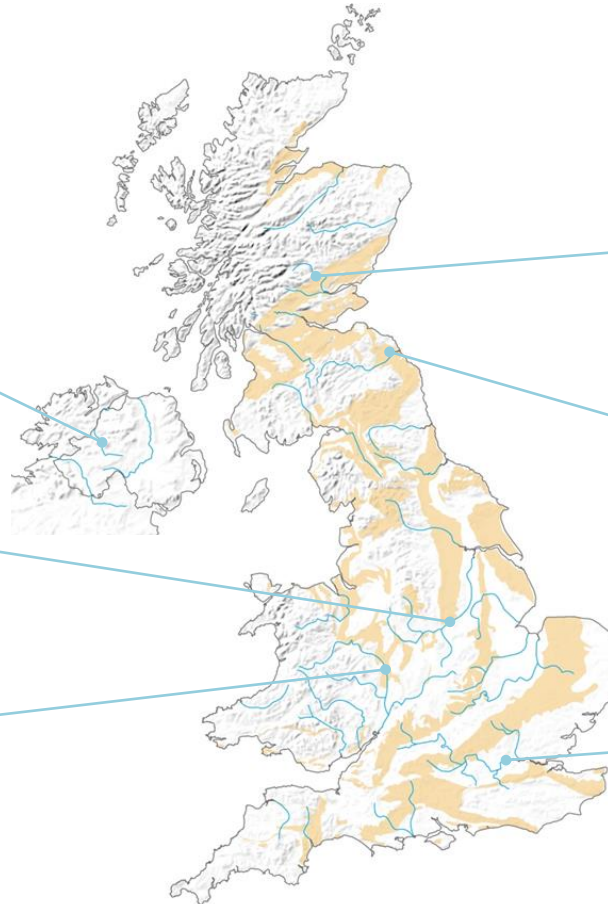
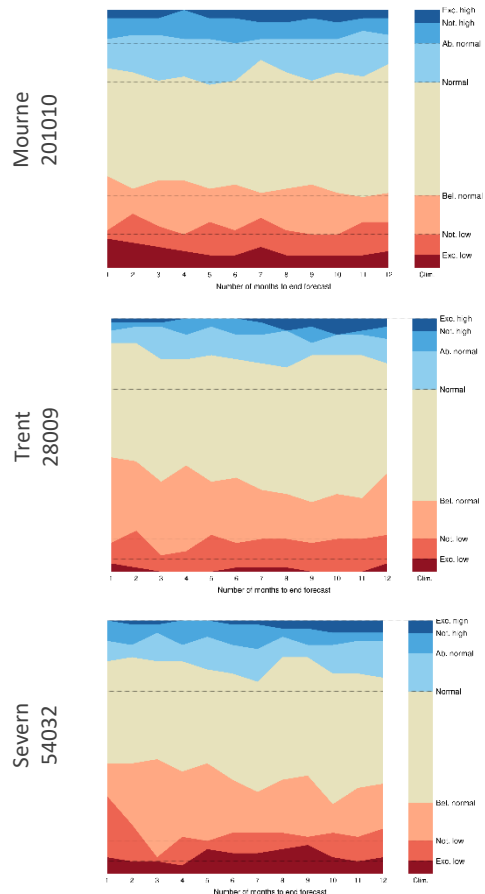


The bar plot maps show the outlook distribution for 1, 3 and 6-month period for 64 catchments across England and Wales. Each bar plot represents the probabilistic distribution of the simulated river flow compared to the historical river flow, for the same n-month period. The probabilities fall within five categories, classified as: low, below normal, normal, above normal and high.

6-month river flow outlook starting Feb 2023



This outlook is based entirely on historical sequences and therefore does not contain any knowledge of the state of the atmosphere and ocean. It is hence possible that some of the historical sequences used might be inconsistent with current large-scale atmospheric conditions and would therefore be unlikely to occur in the next few months.



This outlook is based on monthly ensembles of historical sequences of observed climate (rainfall and potential evapotranspiration) that form input to a hydrological model. The outputs are probabilistic simulations of the average river flow over the forecast period (1 to 12 months ahead), at each location. The simulations are generated by the GR4J conceptual rainfall-runoff model from IRSTEA (France) calibrated on observed or naturalised flows.

The stack diagrams show the variation over time of the outlook distribution for a number of individual catchments. Each graph represents variation over time of the number of simulated river flows, in each month ensemble, that fall within each of seven categories: exceptionally low, notably low, below normal, normal, above normal, notably high and exceptionally high. The categories represent cumulative flow conditions, e.g. For 3-month, the simulated total 3-month flow compared to the historical 3-month flow distribution. The monthly variations can be compared to the long-term average distribution of river flows (shown as columns

on the right of each timeline graph).

This outlook is based entirely on historical sequences and therefore does not contain any knowledge of the state of the atmosphere and ocean. It is hence possible that some of the historical sequences used might be inconsistent with current large-scale atmospheric conditions and would therefore be unlikely to occur in the next few months.

Outlook based on Modelled Flow from Rainfall Forecasts

Period: February 2023 – April 2023

Issued on 02.02.2023 using data to the end of January

SUMMARY: During February, river flows are likely to be in the *Normal range* or *Below normal* in the South of England and the Midlands, and in the *Normal range* or *Above normal* in the North of England, Wales, and Scotland.

Over the next 3 months river flows will likely be in the *Normal range* or *Below normal* in much of the country, except in west Scotland where flows are likely to be in the *Normal range* or *Above normal*.

These forecasts are produced by using five members of the Met Office rainfall forecast ensemble as input to a water balance hydrological model to provide the five estimates of river flows shown on the left for one month and three months ahead.

Regional forecast monthly-mean river flows are derived from the average of 1km river flow estimates within each region and ranked in terms of 54 years of historical flow estimates (1963 – 2016).

The five maps illustrate the wide range of possible flows and while there is a 50% chance of flows between the 1st and 3rd quartiles, actual flows may be more extreme than the flows derived using the highest or lowest rainfall forecasts.

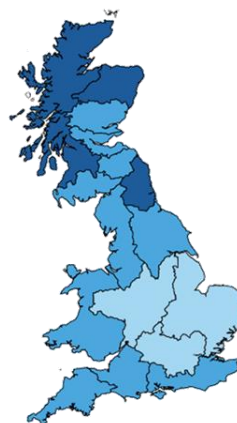
Lowest rainfall forecast

1st quartile

Median

3rd quartile

Highest rainfall forecast



Key

Exceptionally high flow
Notably high flow
Above normal
Normal range
Below normal
Notably low flow
Exceptionally low flow

Percentile range of historic values for relevant month

> 95
87-95
72-87
28-72
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< 5

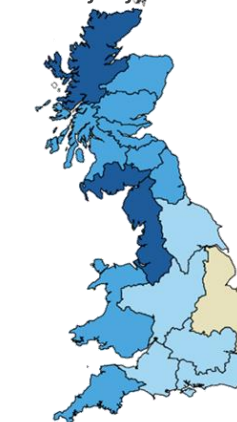
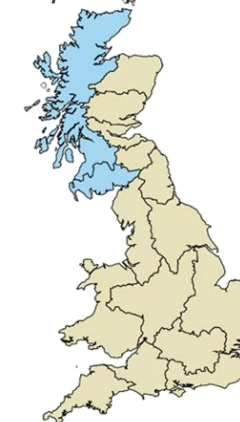
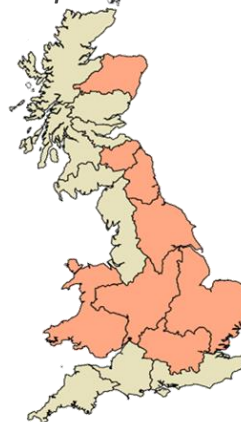
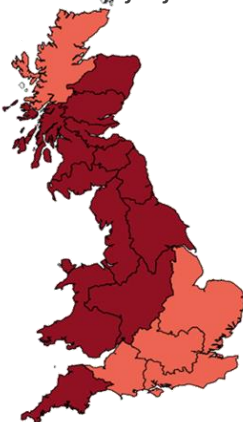
Lowest rainfall forecast

1st quartile

Median

3rd quartile

Highest rainfall forecast



SCOTLAND

HR Highlands Region
NER North East Region
TR Tay Region
FR Forth Region
CR Clyde Region
TWR Tweed Region
SR Solway Region

ENGLAND

N Northumbria
NW North West
Y Yorkshire
ST Severn Trent
A Anglian
T Thames
S Southern
W Wessex
SW South West

WALES

WEL Welsh



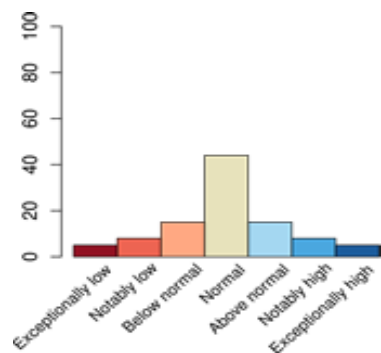
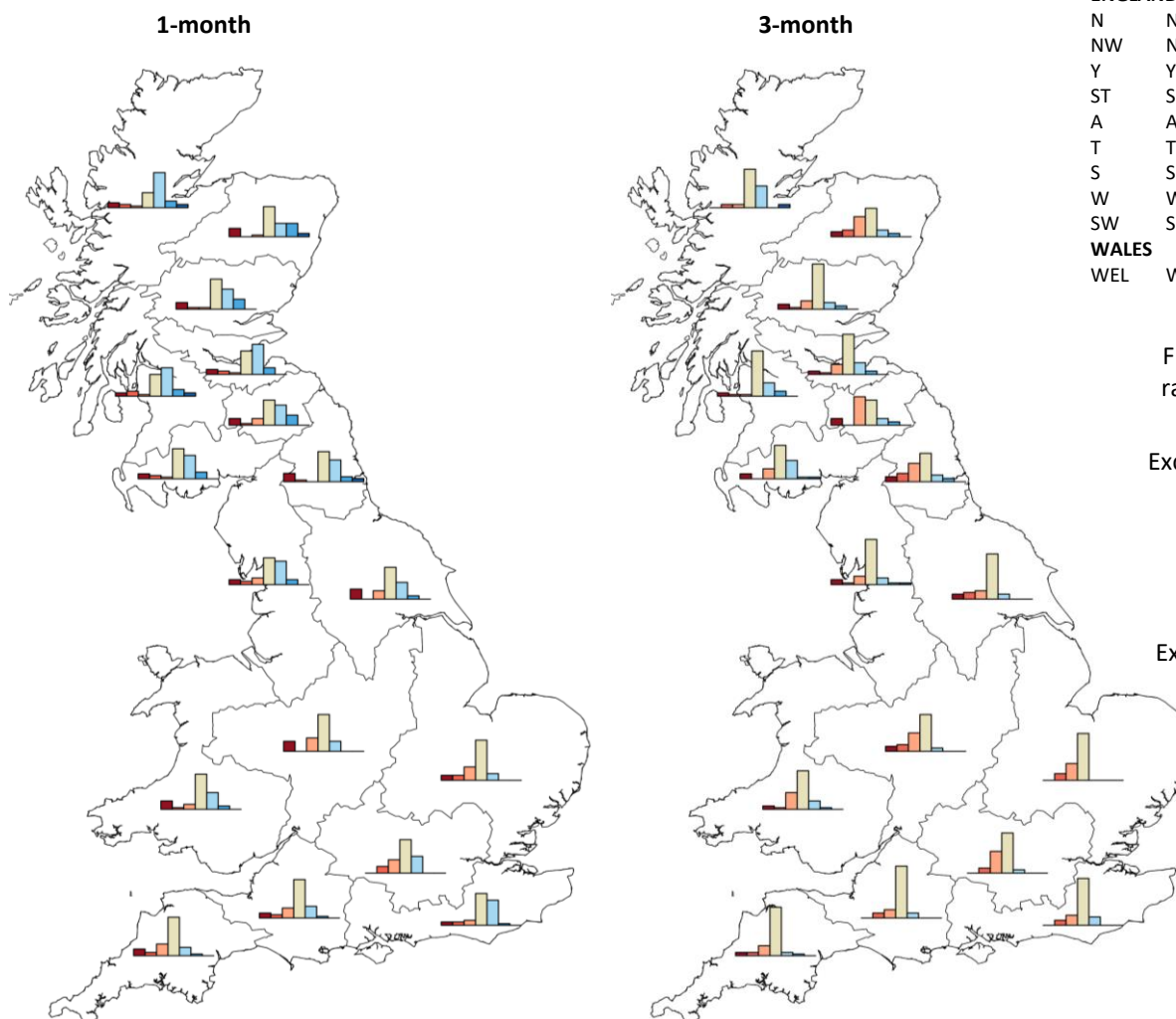
NORTHERN IRELAND
This method cannot currently be used in Northern Ireland

The regional maps illustrating the regional river flows for five members of the Met Office ensemble of rainfall forecasts give some indication of the range of possible river flows in the coming months. As noted previously, the actual flows could be more extreme than the flows generated by either the lowest or highest members of the rainfall ensemble.

The bar charts (below) give further insight into the range of river flow forecasts by considering all members of the forecast rainfall ensemble. The regional bar charts show the percentage of ensemble forecasts falling in each of the flow categories as generated by the monthly-resolution water-balance model. As before results are averaged by region then ranked in terms of 54 years of historical regional flow estimates (1963 – 2016).

SUMMARY: During February, river flows are likely to be in the *Normal range or Below normal* in the South of England and the Midlands, and in the *Normal range or Above Normal* in the North of England, Wales, and Scotland.

Over the next 3 months river flows will likely be in the *Normal range or Below normal* in much of the country, except in west Scotland where flows are likely to be in the *Normal range or Above normal*.



SCOTLAND

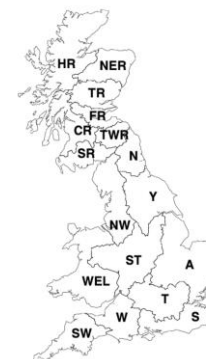
HR Highlands Region
NER North East Region
TR Tay Region
FR Forth Region
CR Clyde Region
TWR Tweed Region
SR Solway Region

ENGLAND

N Northumbria
NW North West
Y Yorkshire
ST Severn Trent
A Anglian
T Thames
S Southern
W Wessex
SW South West

WALES

WEL Welsh



NORTHERN IRELAND

This method cannot currently be used in Northern Ireland

Outlook based on Modelled Flow from Rainfall Forecasts

Period: February 2023 - April 2023

Issue date: 02.02.2023

The maps illustrating the regional river flows for five members of the Met Office ensemble of rainfall forecasts give some indication of the range of possible river flows in the coming months. As noted previously, the actual flows could be more extreme than the flows generated by either the lowest or highest members of the rainfall ensemble.

The tables below give further insight into the range of river flow forecasts by considering all members of the forecast rainfall ensemble. The numbers in the tables are the percentage of ensemble forecasts falling in each of the flow categories as generated by the monthly-resolution water-balance model. As before results are averaged by region then ranked in terms of 54 years of historical regional flow estimates (1963 – 2016).

SUMMARY: During February, river flows are likely to be in the *Normal range* or *Below normal* in the South of England and the Midlands, and in the *Normal range* or *Above normal* in the North of England, Wales, and Scotland.

Over the next 3 months river flows will likely be in the *Normal range* or *Below normal* in much of the country, except in west Scotland where flows are likely to be in the *Normal range* or *Above normal*.

SCOTLAND

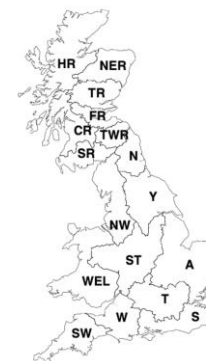
HR Highlands Region
NER North East Region
TR Tay Region
FR Forth Region
CR Clyde Region
TWR Tweed Region
SR Solway Region

ENGLAND

N Northumbria
NW North West
Y Yorkshire
ST Severn Trent
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WEL Welsh



NORTHERN IRELAND
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1-month ahead	A	NW	N	ST	SW	S	T	WEL	W	Y	CR	FR	HR	NER	SR	TR	TWR
Exceptionally high flow	0	0	5	0	0	0	0	0	0	0	5	0	5	5	0	0	0
Notably high	0	7	7	0	2	2	0	5	2	5	10	10	10	19	10	14	14
Above normal	10	33	31	14	12	36	24	24	17	24	40	43	50	19	33	29	29
Normal range	57	38	43	52	55	45	48	50	55	45	31	33	21	43	43	43	36
Below normal	19	10	0	19	17	7	19	7	14	12	2	2	2	2	2	2	10
Notably low	7	5	2	0	5	5	10	2	5	0	7	5	5	0	5	2	2
Exceptionally low flow	7	7	12	14	10	5	0	12	7	14	5	7	7	12	7	10	10

3-month ahead	A	NW	N	ST	SW	S	T	WEL	W	Y	CR	FR	HR	NER	SR	TR	TWR
Exceptionally high flow	0	2	0	0	0	0	0	0	0	0	0	0	5	0	2	0	0
Notably high	0	2	5	0	2	0	0	2	0	0	7	5	0	5	2	5	5
Above normal	0	10	10	5	5	12	5	12	7	7	19	17	31	10	26	10	10
Normal range	67	64	40	52	69	67	57	55	74	64	64	57	55	40	48	64	36
Below normal	24	12	26	26	14	14	31	24	12	12	2	14	5	29	14	12	40
Notably low	10	2	12	10	5	7	7	2	7	10	2	2	5	10	0	2	0
Exceptionally low flow	0	7	7	7	5	0	0	5	0	7	5	5	0	7	7	7	10

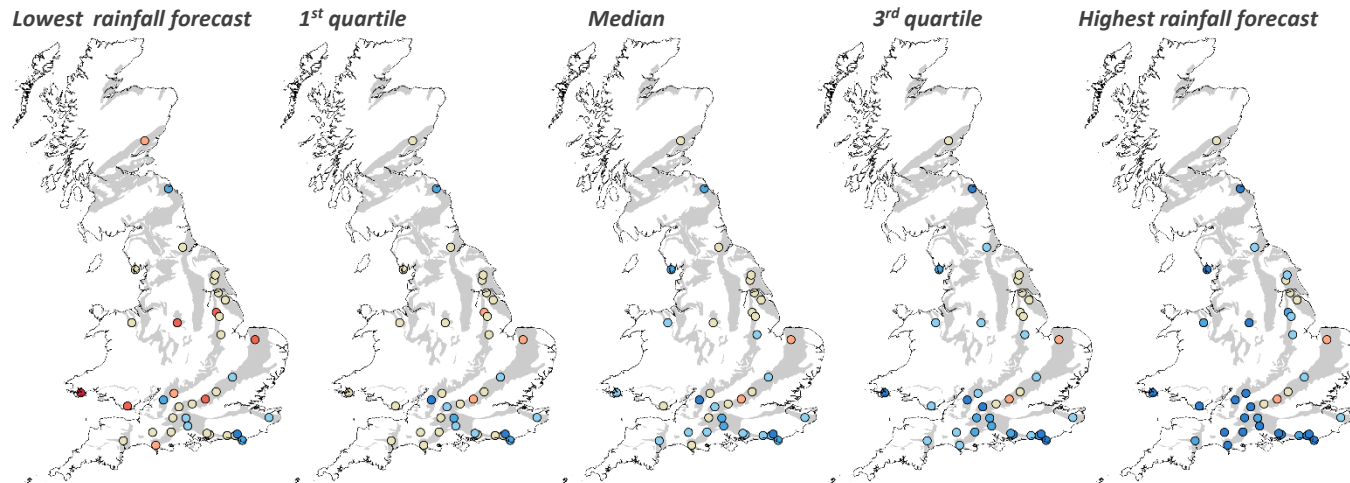
Period: February 2023 – April 2023

Issued on 06.02.2023 using data to the end of January

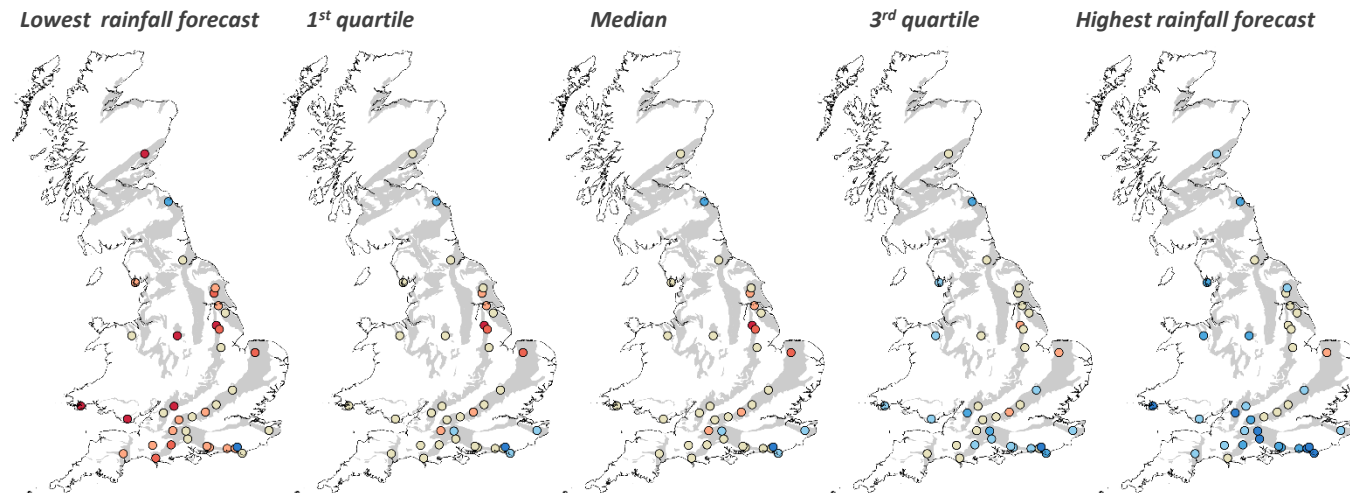
Groundwater levels are responsive to rainfall over this part of the year, and the forecasts reflect this. Under median rainfall conditions, normal to above normal groundwater levels are expected at most sites in the next month. Higher levels are continued to be forecast in the Wessex and South Downs Chalk. The 3 month forecasts have a similar regional distribution but with levels returning to normal at many sites where they were above normal, and becoming below normal elsewhere, particularly in the northern Jurassic limestones and the northern Chalk.

These forecasts are produced by running five members of the Met Office ensemble climate forecast through groundwater models of observation borehole hydrographs at 42 sites across the country. The sites are distributed across the principal aquifers.

Based on the distribution of observed historical groundwater levels in a given month, seven categories have been derived for each site: very low, low, below normal, normal, above normal, high, and very high. The forecast groundwater level is assigned to one of these seven categories depending on where it falls within the distribution of the historically observed values.

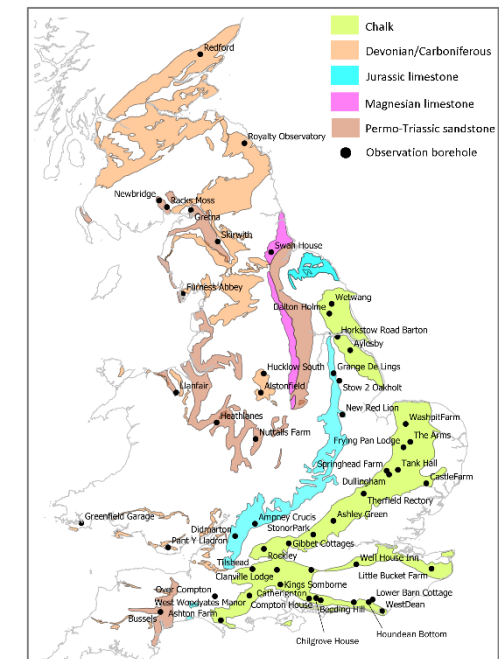


1-month outlook



3-month outlook

Key	Percentile range of historic observed values for relevant month
Exceptionally high levels	> 95
Notably high levels	87-95
Above normal	72-87
Normal	28-72
Below normal	12-28
Notably low levels	5-13
Exceptionally low levels	< 5



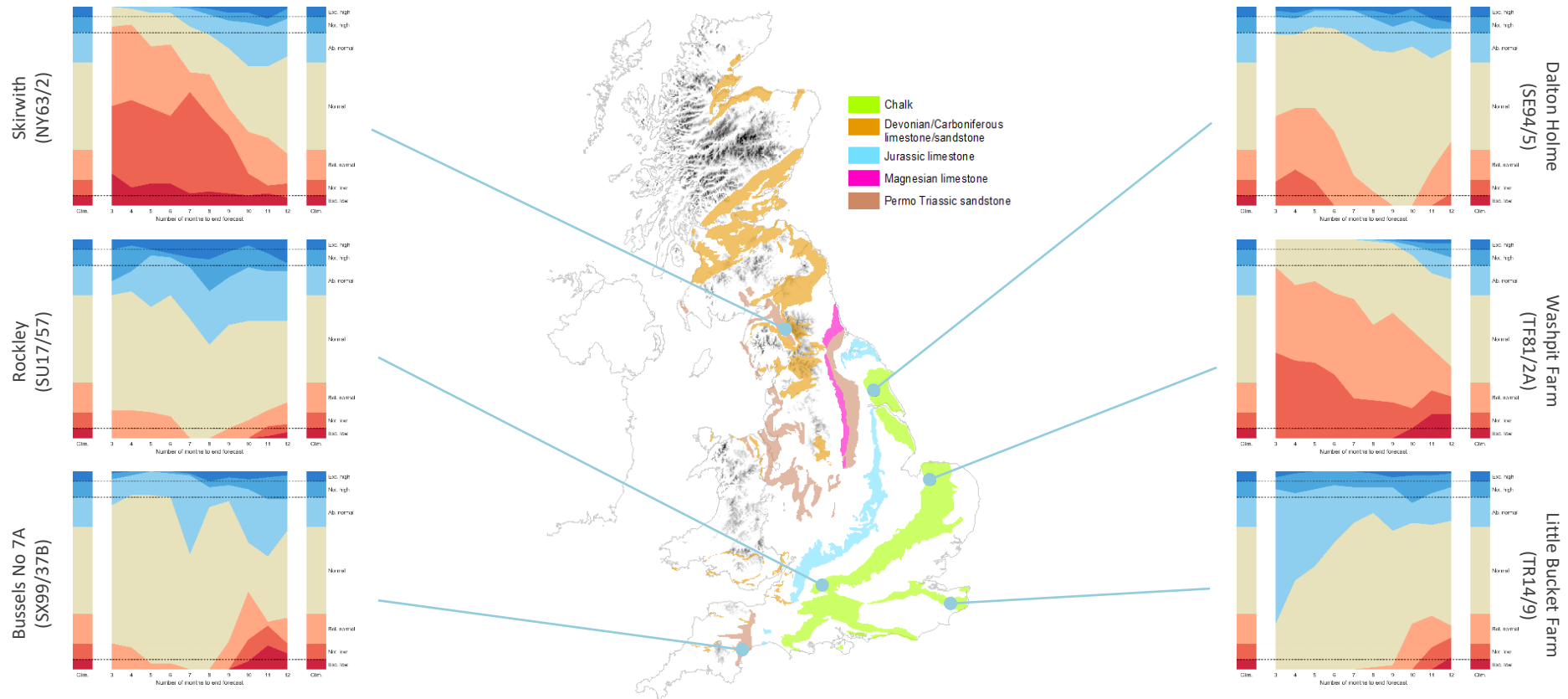
The Hydrological Outlook UK provides an outlook for the water situation for the UK over the next three months and beyond. For guidance on how to interpret the outlook, a wider range of information, and a full description of underpinning methods, please visit the website: www.hydoutuk.net

Outlook based on modelled groundwater from historical climate

Period: January 2023 – December 2023

Issued on 06.2.2023 using data to the end of January

Groundwater levels at Skirwith and Washpit Farm are expected to be below normal to notably low for much of the next year. Predominantly normal levels are forecast for Rockley and Bussels No 7A over the next 3 to 12 months; Little Bucket Farm is likely to be above normal at the start of the period, returning to more normal levels from about 6 months ahead. Dalton Holme levels are expected to be below normal some 3 to 6 months from now, but then to return to normal.



This outlook is based on monthly ensembles of historical sequences of observed climate (rainfall and potential evapotranspiration) that form input to hydrological models. The outputs are probabilistic simulations of the average groundwater level over the forecast horizon (3 to 12 months ahead), at each location.

The graphs show variation over time of the number of simulated groundwater levels in each monthly ensemble,

that fall within each the seven categories: exceptionally low, notably low, below normal, normal, above normal, notably high and exceptionally high. The monthly variations can be compared to the long-term average distribution of levels, which are shown as columns on the left and right of each graph.

This outlook is based entirely on historical sequences and therefore does not contain any knowledge of the state of

the atmosphere and ocean. It is hence possible that some of the historical sequences used might be inconsistent with current large-scale atmospheric conditions and would therefore be unlikely to occur in the next few months.