# Hydrological Summary

## *for the United Kingdom*

*March 2013*

### General

March was the coldest since 1962 for the UK, and colder than any of the preceding three winter months for the first time since 1975; exceptional spring snowfall and associated high winds were widespread and disruptive. Precipitation totals for the month were generally slightly below average, but displayed marked regional variations, and year-to-date rainfall deficiencies are moderate across the country. Scotland's driest March since 1969 resulted in the second highest soil moisture deficits on record in the Highlands and there were a number of wildfire outbreaks in northern and western areas toward month-end. Moderate spate conditions were widespread in southern Britain in mid-month before recessions resumed over the final week. However, for Scotland, Wales and northwestern England, the effects of frozen catchments and the delayed onset of snowmelt are reflected in river flows less than half the March average over wide areas. Groundwater levels in most index boreholes declined due to limited recharge, although given the high levels from which recessions began, levels remain above average for the time of year. End of month reservoir stocks were healthy across Lowland England, but limited replenishment of impoundments occurred in Scotland and northern England. The general water resources outlook remains healthy with groundwater stocks replenished prior to the end of the recharge season, but late spring rainfall will be very influential in determining the onset of the seasonal recessions in river flows and groundwater levels.

### Rainfall

Circulation patterns in March were dominated by anticyclonic conditions, with very persistent easterly airflows; March 2013 registered as the joint coldest since 1883 in the Central England Temperature series. Dominant high pressure restricted the passage of Atlantic frontal systems for most of March, with precipitation restricted to some notably wet interludes mid-month. Southern England received heavy snowfall on 11th/12th and parts of Oxfordshire were hit by localised falls on 16th/17th. Between 20th and 23rd, moist air from the Atlantic brought heavy rain across Lowland England as well as the most significant snowfall of the month, when low pressure systems interacted with the dominant anticyclonic conditions; Plymouth received 58mm of rain on 21st, and snowfall totals of 60-70cm in northeast Wales were reported. Eastern parts of Northern Ireland reportedly received 83mm of precipitation in 48hrs on 21st/22nd, most of it falling as snow, causing widespread disruption and power failures around Belfast. Nevertheless, away from wetter than average areas in Lowland England, monthly rainfall totals were significantly below average in March; the Highlands and Islands of Scotland received less than a quarter of average precipitation, although monthly precipitation totals may be underestimated due to the difficulties in assessing snowfall. Below average rainfall accumulations for the year-to-date for Scotland and the winter half-year (Oct-Mar) for the Highlands are in stark contrast to those for the rest of the UK. For England & Wales, winter half-year accumulations are above average, and 12-month accumulations from April 2012 remain remarkably high, a testament to the record-breaking April-December rainfall.

### River flows

Across much of the UK, rivers were in recession for prolonged periods at the beginning and end of March, in many areas reflecting frozen catchments and the limited snowmelt before month-end. March flows peaked around mid-month across southern England, and despite flood alerts in the South West from 21st-23rd, extreme flooding from rivers was not reported. In the Highlands of Scotland, frozen catchment conditions reduced river flows to their lowest, for March, on record; the Nevis fell below previous March daily minima for more than half of the month, and depressed flows characterised numerous rivers across northern Britain. In contrast, river flows in Lowland England remain above average in both responsive and baseflow-dominated catchments, in response to both above average March rainfall and continuing very healthy baseflow contributions. In spite of the moderately dry beginning to 2013, winter half-year outflows for England & Wales and Lowland England each rank second highest in their series from 1961. In Northern Ireland, the Lagan registered daily minima and the largest March flow on record within the same month, in response to heavy snowfall and the associated snowmelt event. At a national scale, outflows for Great Britain were barely above average throughout the whole of March, and for many UK rivers, mid-February to mid-March was the longest period of below average flow in the last 12 months. March outflows from Scotland were the lowest on record (series from 1961) and the Highlands are now experiencing river flow deficiencies over a range of durations up to 12 months.

### Groundwater

With reduced infiltration during March, groundwater levels in the Chalk fell in most areas (by over 10m in parts of the South Downs), moving back towards the normal range, although they are still above average. The only areas of the Chalk that saw rises were parts of the Chilterns, where the unsaturated zone is thick, and southern East Anglia. The chance of significant groundwater flooding has been reduced, although some Environment Agency warnings remain in effect. In the Permo-Triassic sandstones, water levels remain very high in the South West and North West, despite small declines, and are above average everywhere except the East Midlands, where they are still very low at Morris Dancers and below average at Weeford Flats. In the Upper Greensand of South West England, levels fell slightly but are above the previous March maximum. In the Magnesian Limestone, water levels in the indicator boreholes fell, however they remained above or close to record monthly maxima. In the other limestone aquifers they remain above average, falling in the Lincolnshire Limestone and fluctuating in the Cotswolds oolites and in the Carboniferous Limestone of South Wales in response to rainfall.

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# *Rainfall . . . Rainfall . . .*

## Rainfall accumulations and return period estimates

Percentages are from the 1971-2000 average.

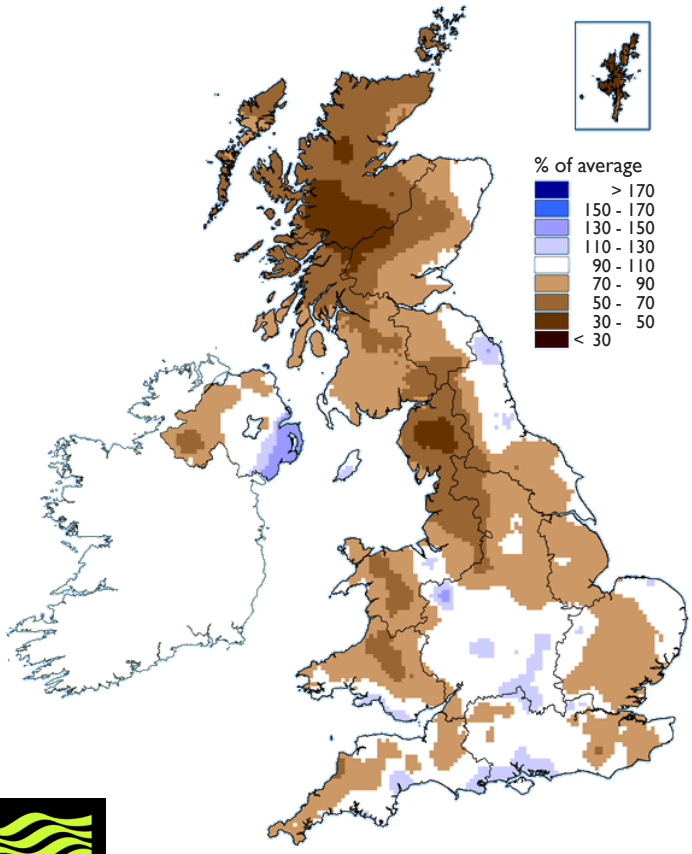
| Area | Rainfall | Mar 2013 | Jan13 – Mar13 | RP | Oct12 – Mar13 | RP | Apr12 – Mar13 | RP | Dec10 – Mar13 | RP |
|---|---|---|---|---|---|---|---|---|---|---|
| United Kingdom | mm | **62** | 229 | | 669 | | 1355 | | 2783 | |
| | % | **67** | 78 | 2-5 | 105 | 2-5 | 126 | >100 | 109 | 5-10 |
| England | mm | **64** | 182 | | 560 | | 1190 | | 2059 | |
| | % | **99** | 88 | 2-5 | 124 | 8-12 | 147 | >>100 | 108 | 2-5 |
| Scotland | mm | **50** | 274 | | 793 | | 1526 | | 3823 | |
| | % | **38** | 66 | 5-10 | 89 | 2-5 | 106 | 2-5 | 112 | 10-20 |
| Wales | mm | **86** | 311 | | 918 | | 1803 | | 3368 | |
| | % | **75** | 83 | 2-5 | 111 | 2-5 | 133 | >100 | 104 | 2-5 |
| Northern Ireland | mm | **74** | 282 | | 608 | | 1248 | | 2798 | |
| | % | **79** | 94 | 2-5 | 96 | 2-5 | 113 | 10-15 | 107 | 8-12 |
| England & Wales | mm | **67** | 199 | | 609 | | 1275 | | 2239 | |
| | % | **94** | 87 | 2-5 | 121 | 5-10 | 144 | >>100 | 107 | 2-5 |
| North West | mm | **46** | 193 | | 697 | | 1564 | | 3196 | |
| | % | **46** | 63 | 10-15 | 102 | 2-5 | 134 | >100 | 116 | 10-20 |
| Northumbria | mm | **67** | 195 | | 572 | | 1310 | | 2315 | |
| | % | **97** | 93 | 2-5 | 127 | 10-15 | 160 | >>100 | 120 | 20-30 |
| Midlands | mm | **61** | 172 | | 494 | | 1114 | | 1809 | |
| | % | **103** | 91 | 2-5 | 122 | 5-10 | 149 | >>100 | 103 | 2-5 |
| Yorkshire | mm | **61** | 165 | | 535 | | 1213 | | 2097 | |
| | % | **90** | 80 | 2-5 | 120 | 5-10 | 151 | >>100 | 111 | 2-5 |
| Anglian | mm | **50** | 123 | | 389 | | 862 | | 1422 | |
| | % | **111** | 90 | 2-5 | 128 | 5-10 | 145 | >100 | 103 | 2-5 |
| Thames | mm | **71** | 170 | | 500 | | 1022 | | 1693 | |
| | % | **132** | 100 | 2-5 | 134 | 8-12 | 148 | >100 | 105 | 2-5 |
| Southern | mm | **67** | 189 | | 566 | | 1102 | | 1886 | |
| | % | **114** | 97 | 2-5 | 127 | 5-10 | 144 | 35-50 | 104 | 2-5 |
| Wessex | mm | **75** | 222 | | 678 | | 1342 | | 2212 | |
| | % | **108** | 97 | 2-5 | 136 | 10-20 | 157 | >>100 | 109 | 2-5 |
| South West | mm | **111** | 320 | | 950 | | 1745 | | 3005 | |
| | % | **115** | 93 | 2-5 | 128 | 10-20 | 147 | >100 | 105 | 2-5 |
| Welsh | mm | **86** | 303 | | 891 | | 1759 | | 3247 | |
| | % | **78** | 84 | 2-5 | 112 | 2-5 | 135 | >100 | 104 | 2-5 |
| Highland | mm | **38** | 290 | | 848 | | 1559 | | 4351 | |
| | % | **23** | 57 | 5-10 | 78 | 2-5 | 90 | 2-5 | 106 | 5-10 |
| North East | mm | **59** | 182 | | 530 | | 1144 | | 2465 | |
| | % | **76** | 76 | 5-10 | 101 | 2-5 | 121 | 5-10 | 111 | 2-5 |
| Tay | mm | **58** | 250 | | 729 | | 1434 | | 3400 | |
| | % | **49** | 65 | 5-10 | 93 | 2-5 | 114 | 5-10 | 113 | 10-15 |
| Forth | mm | **57** | 239 | | 689 | | 1442 | | 3216 | |
| | % | **56** | 74 | 2-5 | 102 | 2-5 | 128 | 50-80 | 120 | 70-100 |
| Tweed | mm | **64** | 214 | | 639 | | 1446 | | 2873 | |
| | % | **79** | 85 | 2-5 | 119 | 5-10 | 153 | >>100 | 129 | >100 |
| Solway | mm | **64** | 309 | | 890 | | 1773 | | 4019 | |
| | % | **53** | 79 | 2-5 | 105 | 2-5 | 127 | >100 | 121 | >100 |
| Clyde | mm | **50** | 348 | | 994 | | 1837 | | 4788 | |
| | % | **31** | 69 | 2-5 | 93 | 2-5 | 106 | 2-5 | 117 | 30-40 |

*% = percentage of 1971-2000 average* *RP = Return period*

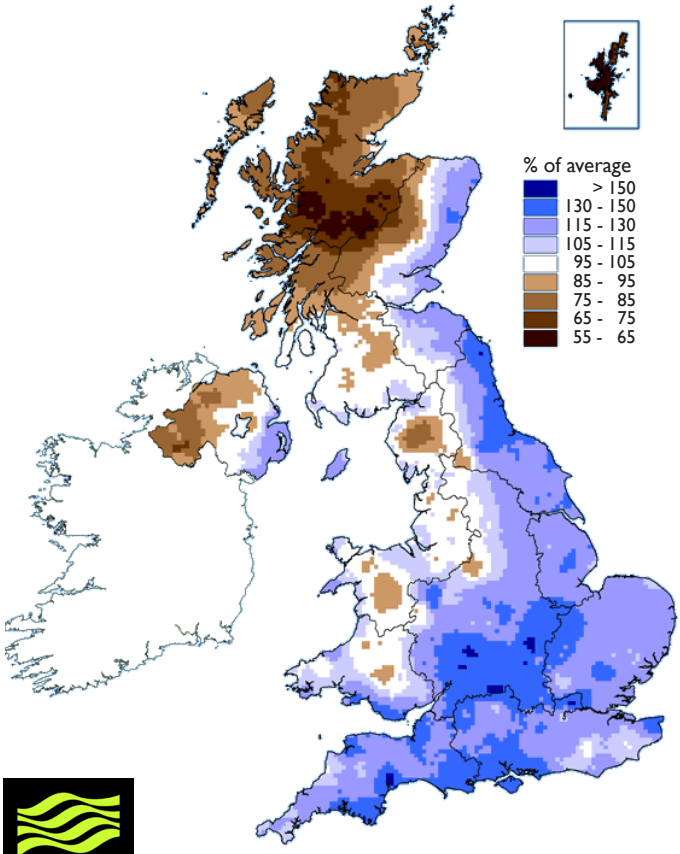
**Important note:** Figures in the above table may be quoted provided their source is acknowledged (see page 12). Where appropriate, specific mention must be made of the uncertainties associated with the return period estimates. The RP estimates are based on data provided by the Met Office and reflect climatic variability since 1910; they also assume a stable climate. The quoted RPs relate to the specific timespans only; for the same timespans, but beginning in any month the RPs would be substantially shorter. The timespans featured do not purport to represent the critical periods for any particular water resource management zone. For hydrological or water resources assessments of drought severity, river flows and/or groundwater levels normally provide a better guide than return periods based on regional rainfall totals. Note that precipitation totals in winter months may be underestimated due to snowfall undercatch. All monthly rainfall totals since October 2012 are provisional.

# *Rainfall . . . Rainfall . . .*

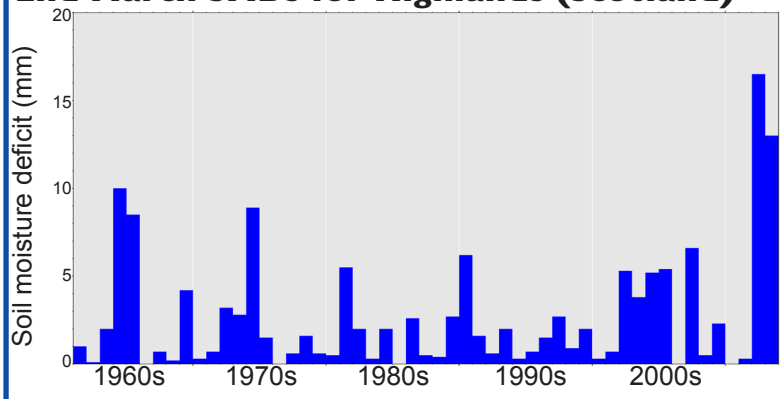
**January 2013 - March 2013**
**rainfall as % of 1971-2000 average**



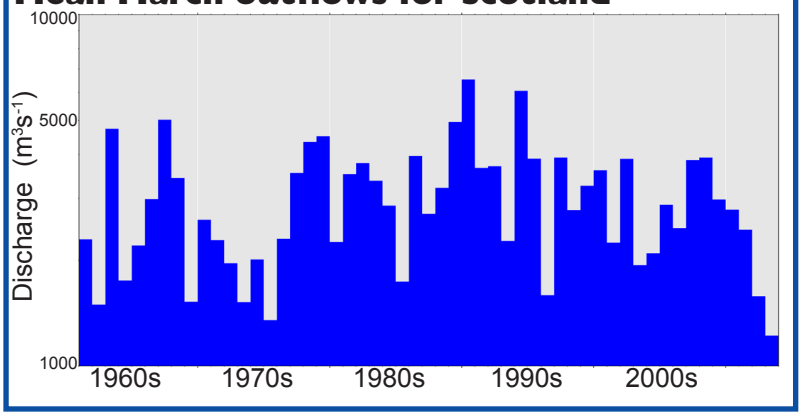

**October 2012 - March 2013**
**rainfall as % of 1971-2000 average**




## End March SMDs for Highlands (Scotland)




## Mean March outflows for Scotland




## Met Office 3-month outlook Updated: April 2013

For both April and April-May-June as a whole the uncertainty is large, leaving the forecast largely indistinguishable from climatology. The probability that UK precipitation will fall into the driest of our five categories is around 20% and the probability that it will fall into the wettest category is also around 20% (the probability for each of these categories is 20%).

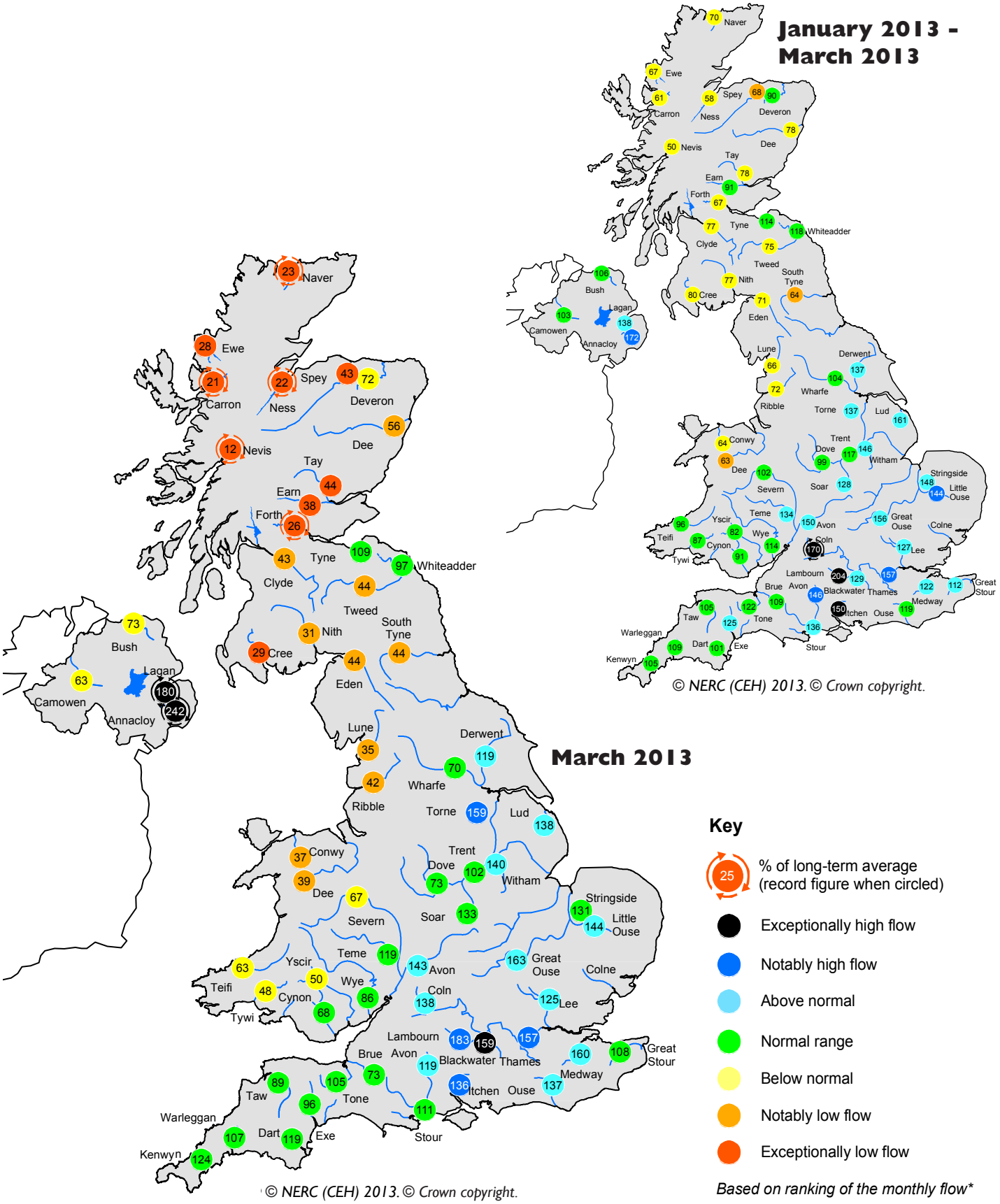
On average, spring is the driest season of the year. In general, through spring rainfall becomes increasingly difficult to predict given that the likelihood of localised convective rainfall increasingly dominates the rainfall distribution. With modest late-March soil moisture levels, increased evapotranspiration could further increase the risk of heavy convective rainfall as the season progresses.

For the latter part of the period model signals become weak, but favour transition to westerly or southwesterly winds, which would suggest periods of unsettled weather. However, the signals from models, for rainfall amounts through the spring, are very indeterminate and largely indistinguishable from climatology.

The complete version of the 3-month outlook may be found at:
http://www.metoffice.gov.uk/publicsector/contingency-planners
This outlook is updated towards the end of each calendar month.

The latest shorter-range forecasts, covering the upcoming 30 days, can be accessed via:
http://www.metoffice.gov.uk/weather/uk/uk_forecast_weather.html
These forecasts are updated very frequently.

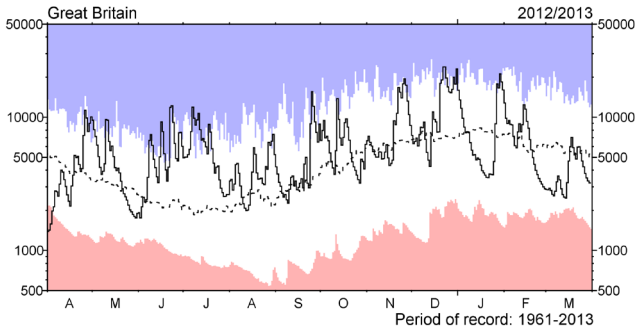
# *River flow . . . River flow . . .*

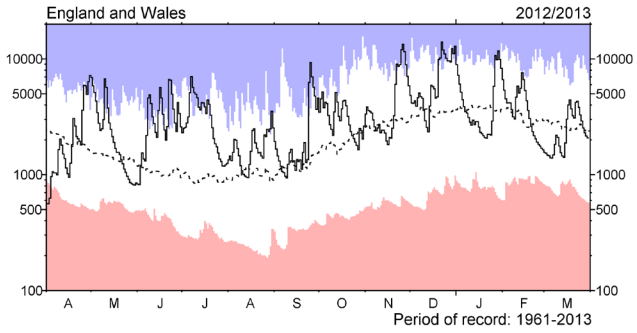


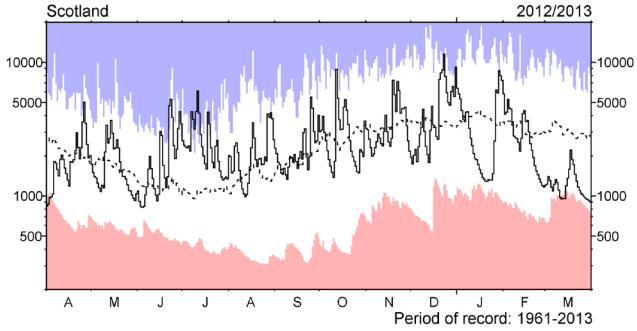

## River flows

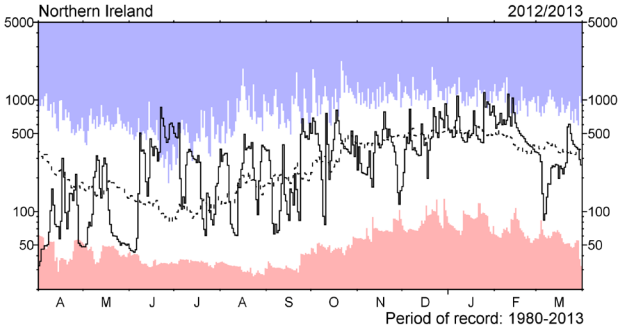
*Comparisons based on percentage flows alone can be misleading. A given percentage flow can represent extreme drought conditions in permeable catchments where flow patterns are relatively stable but be well within the normal range in impermeable catchments where the natural variation in flows is much greater. Note: the period of record on which these percentages are based varies from station to station. Percentages may be omitted where flows are under review.

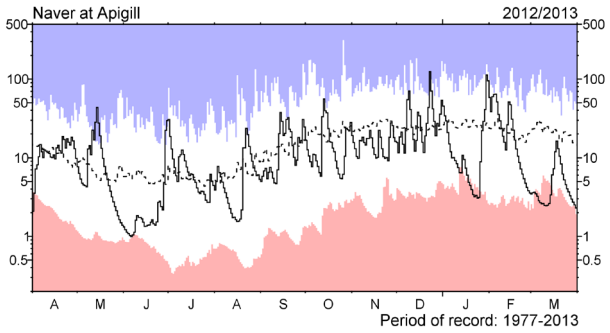
# River flow . . . River flow . . .

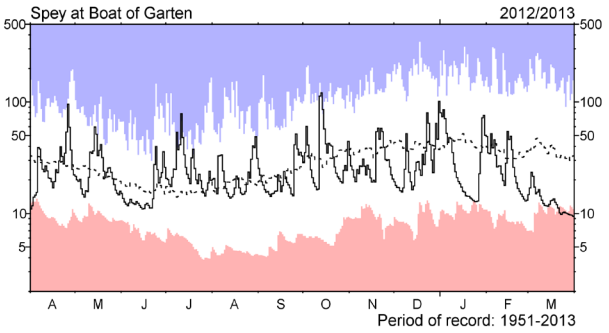


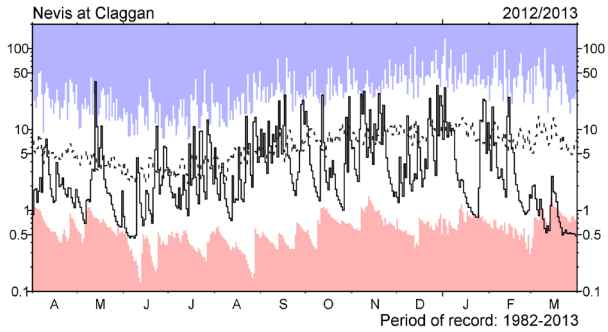



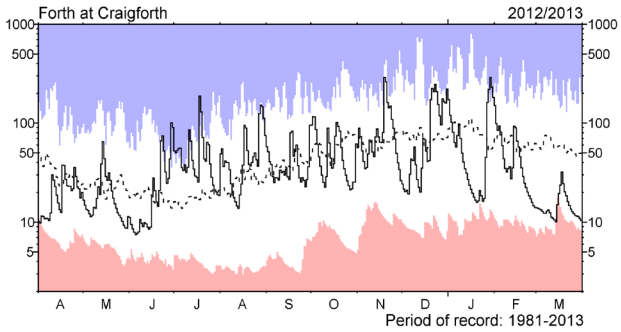



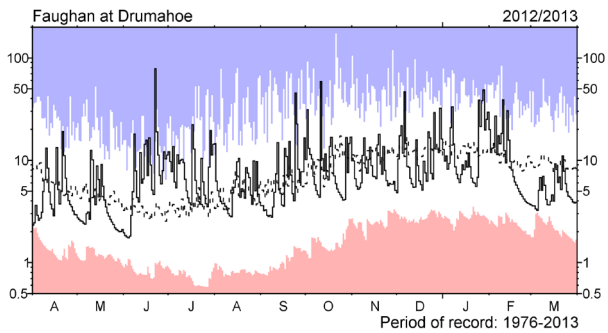



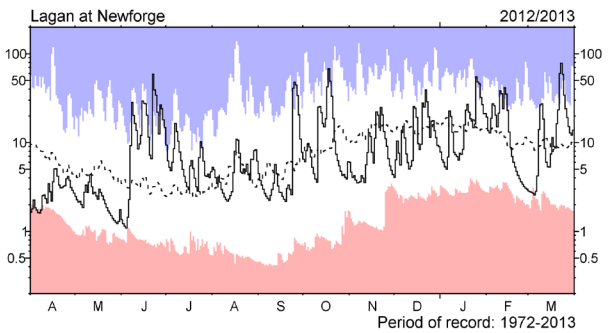



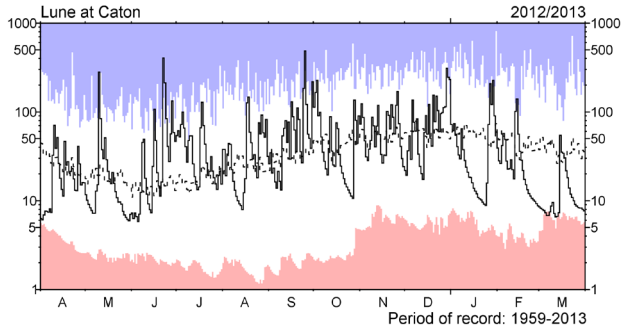



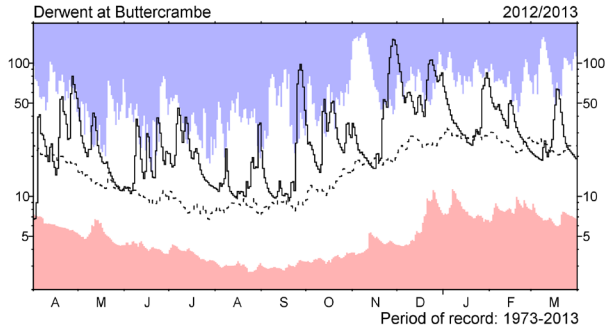



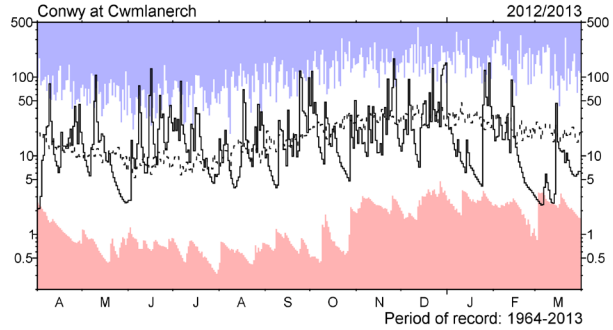

## River flow hydrographs

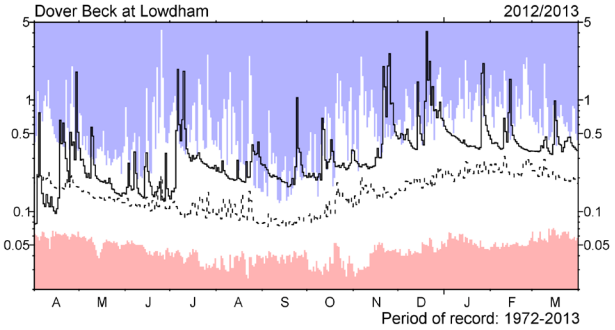
The river flow hydrographs show the daily mean flows together with the maximum and minimum daily flows prior to April 2012 (shown by the shaded areas). Daily flows falling outside the maximum/minimum range are indicated where the bold trace enters the shaded areas. Mean daily flows are shown as the dashed line.

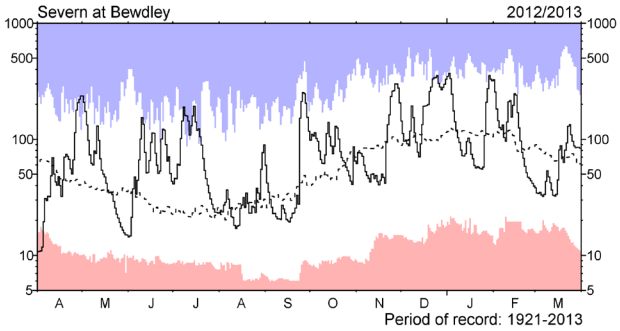
# River flow . . . River flow . . .

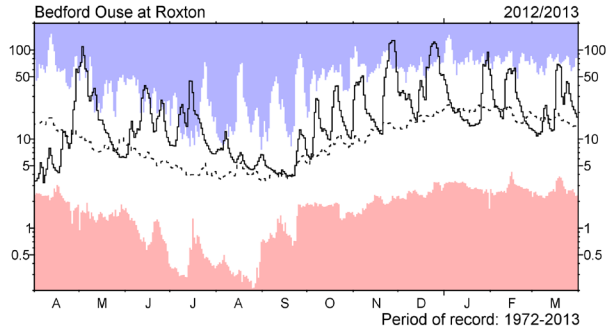


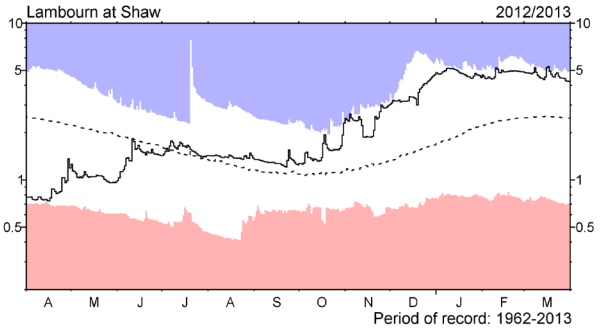



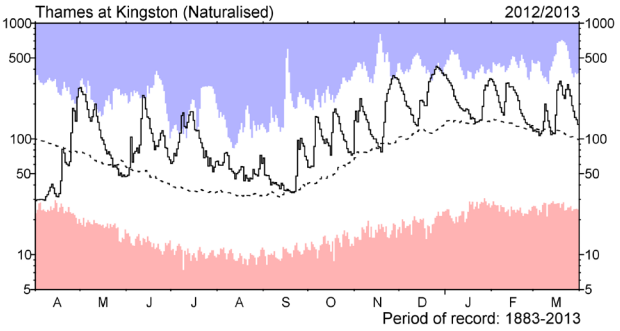



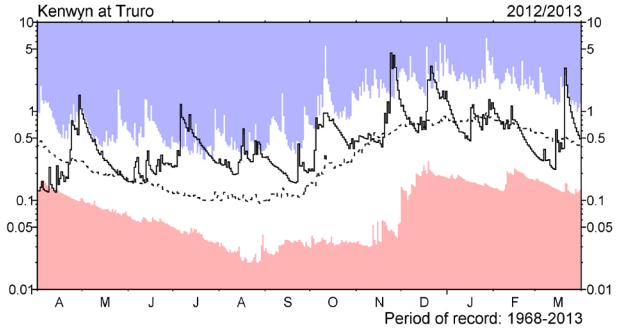



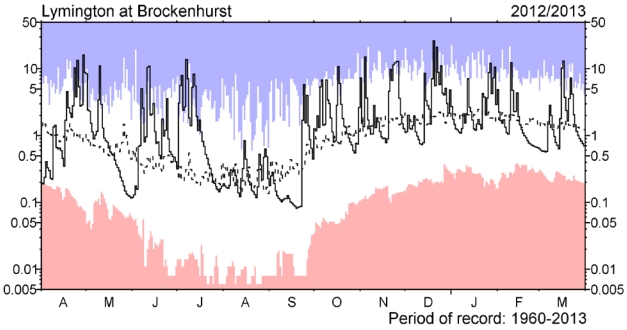




## Notable runoff accumulations (a) Oct 2012 - Mar 2013 (b) Apr 2012 - Mar 2013

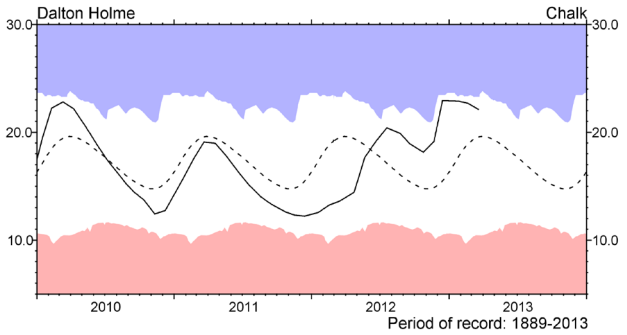
| | River | %lta | Rank |
|---|---|---|---|
| (a) | Tweed (Norham) | 128 | 50/51 |
| | Wharfe | 147 | 56/56 |
| | Ouse (Skelton) | 140 | 39/40 |
| | Derwent | 186 | 39/40 |
| | Trent | 153 | 53/55 |
| | Dover Beck | 267 | 38/38 |
| | Soar | 170 | 41/42 |
| | Lambourn | 200 | 50/51 |

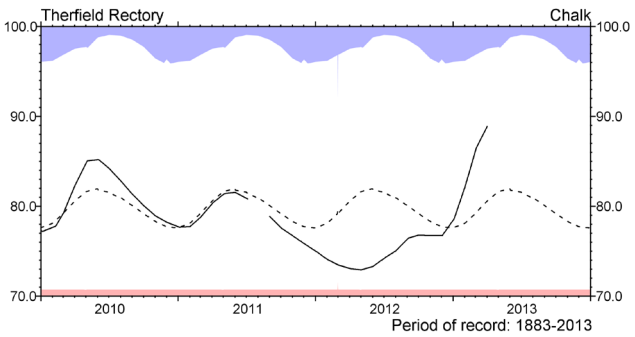
| | River | %lta | Rank |
|---|---|---|---|
| (a) | Coln (Bibury) | 208 | 50/50 |
| | Avon (Amesbury) | 168 | 46/48 |
| | Stour (Throop) | 178 | 39/40 |
| | Exe | 162 | 57/57 |
| | Otter | 173 | 50/51 |
| | Tone | 178 | 51/52 |
| | Severn (Saxons Lode) | 146 | 40/42 |

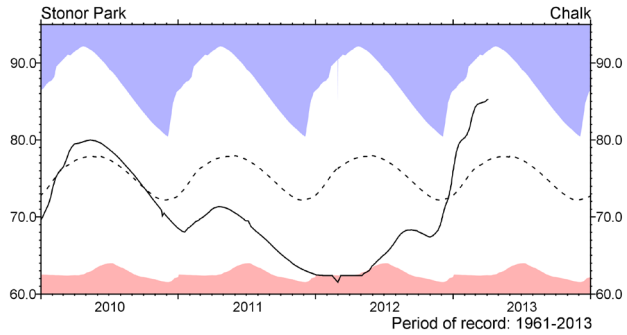
| | River | %lta | Rank |
|---|---|---|---|
| (b) | Tyne (Spilmersford) | 213 | 43/43 |
| | Whiteadder | 208 | 43/43 |
| | Torne | 222 | 41/41 |
| | Witham | 198 | 53/53 |
| | Bedford Ouse (Beford) | 223 | 79/80 |
| | Lymington | 223 | 49/50 |
| | Avon (Evesham) | 212 | 76/76 |
| | Teme | 206 | 43/43 |

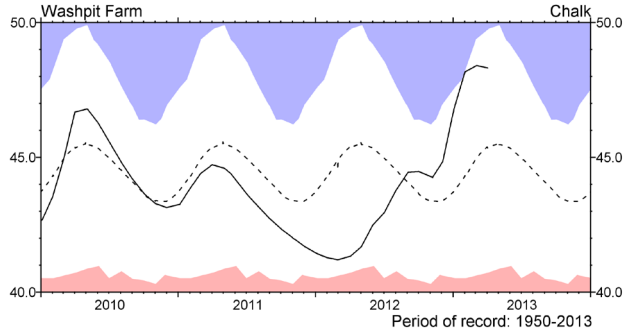
*lta = long term average; Rank 1 = lowest on record*

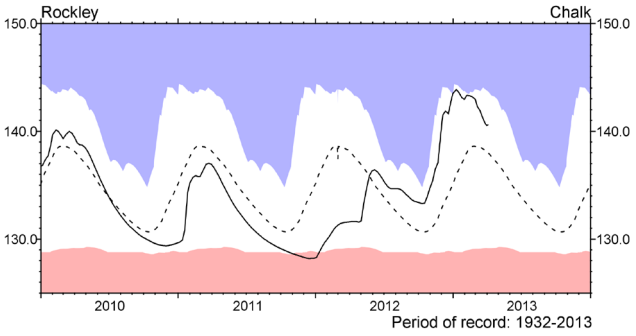
# Groundwater…Groundwater

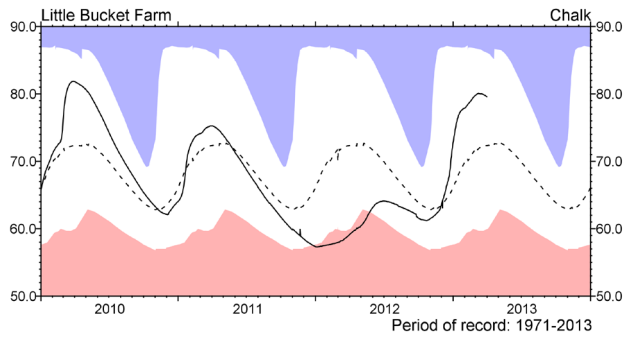


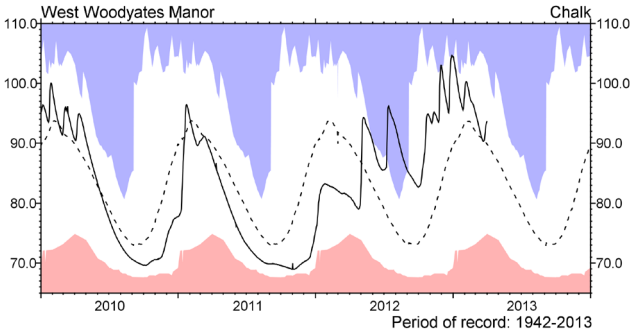



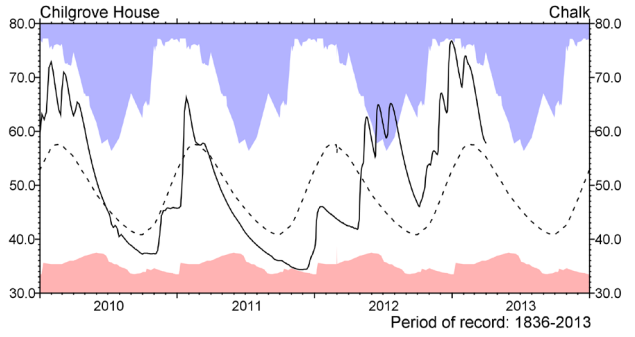



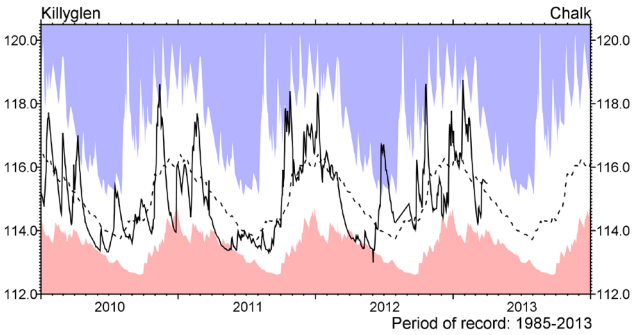



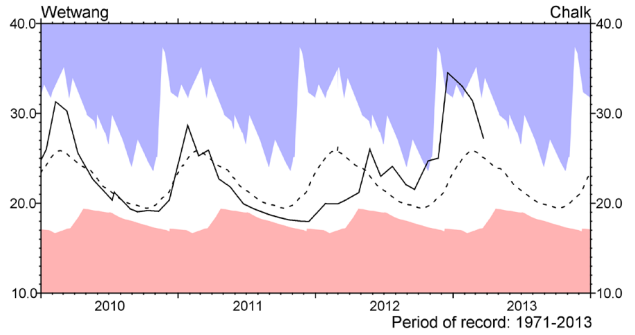



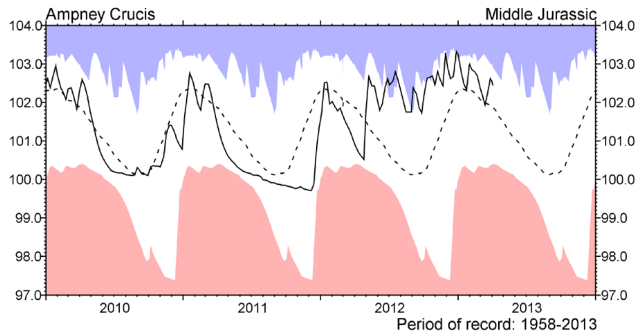



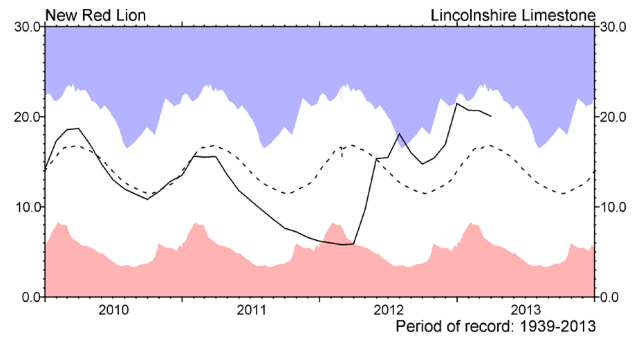



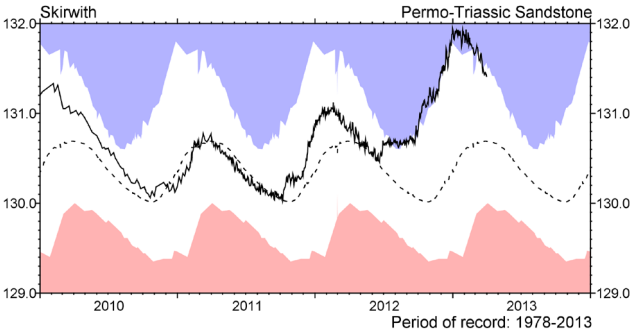



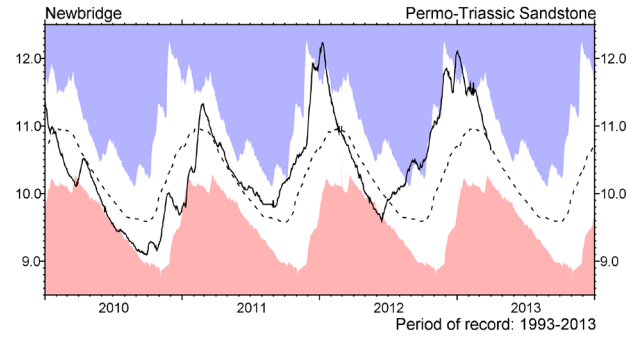

Groundwater levels normally rise and fall with the seasons, reaching a peak in the spring following replenishment through the winter (when evaporation losses are low and soil moist). They decline through the summer and early autumn. This seasonal variation is much reduced when the aquifer is confined below overlying impermeable strata. The monthly mean and the highest and lowest levels recorded for each month are displayed in a similar style to the river flow hydrographs. Note that most groundwater levels are not measured continuously and, for some index wells, the greater frequency of contemporary measurements may, in itself, contribute to an increased range of variation. The latest recorded levels are listed overleaf.

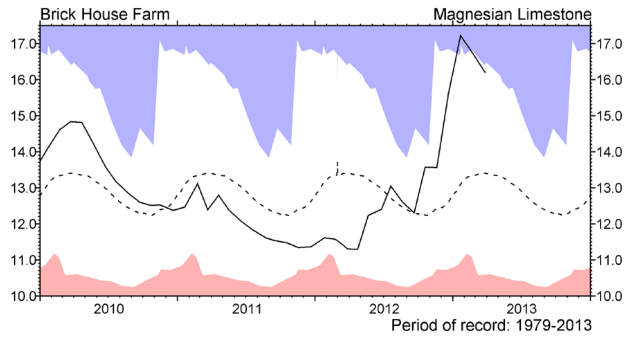
# Groundwater... Groundwater

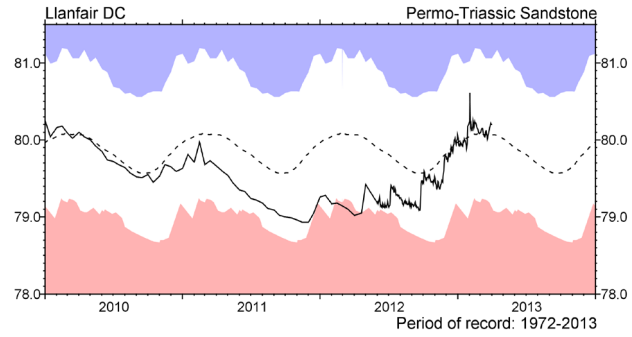


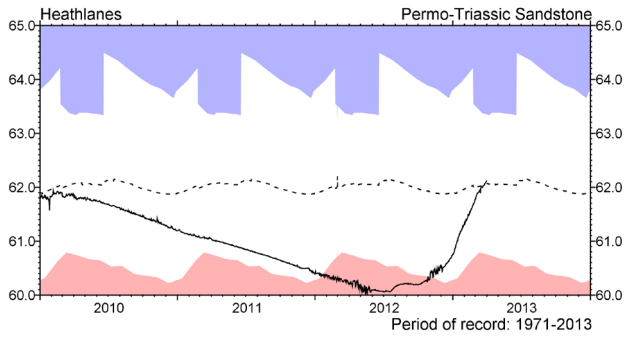



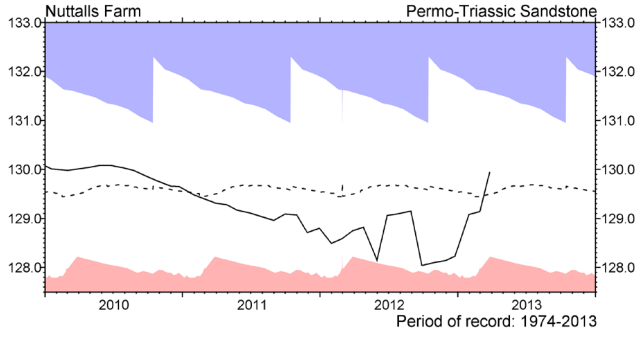



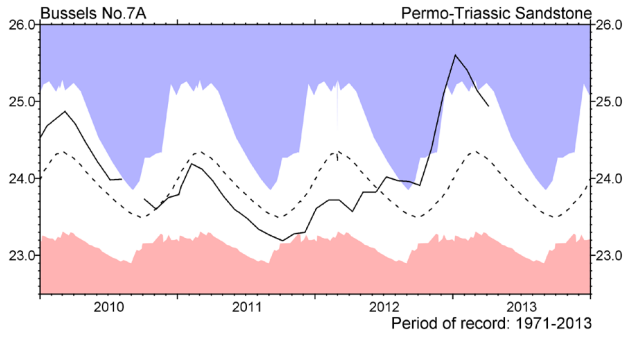



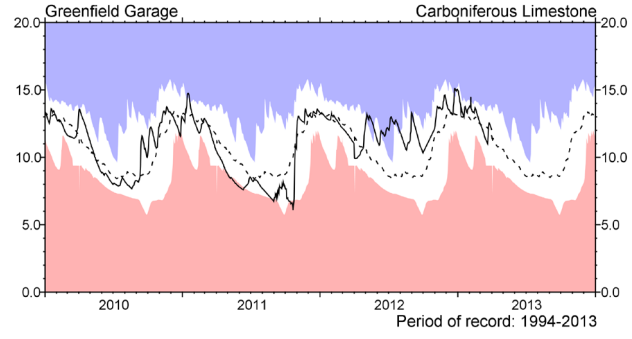



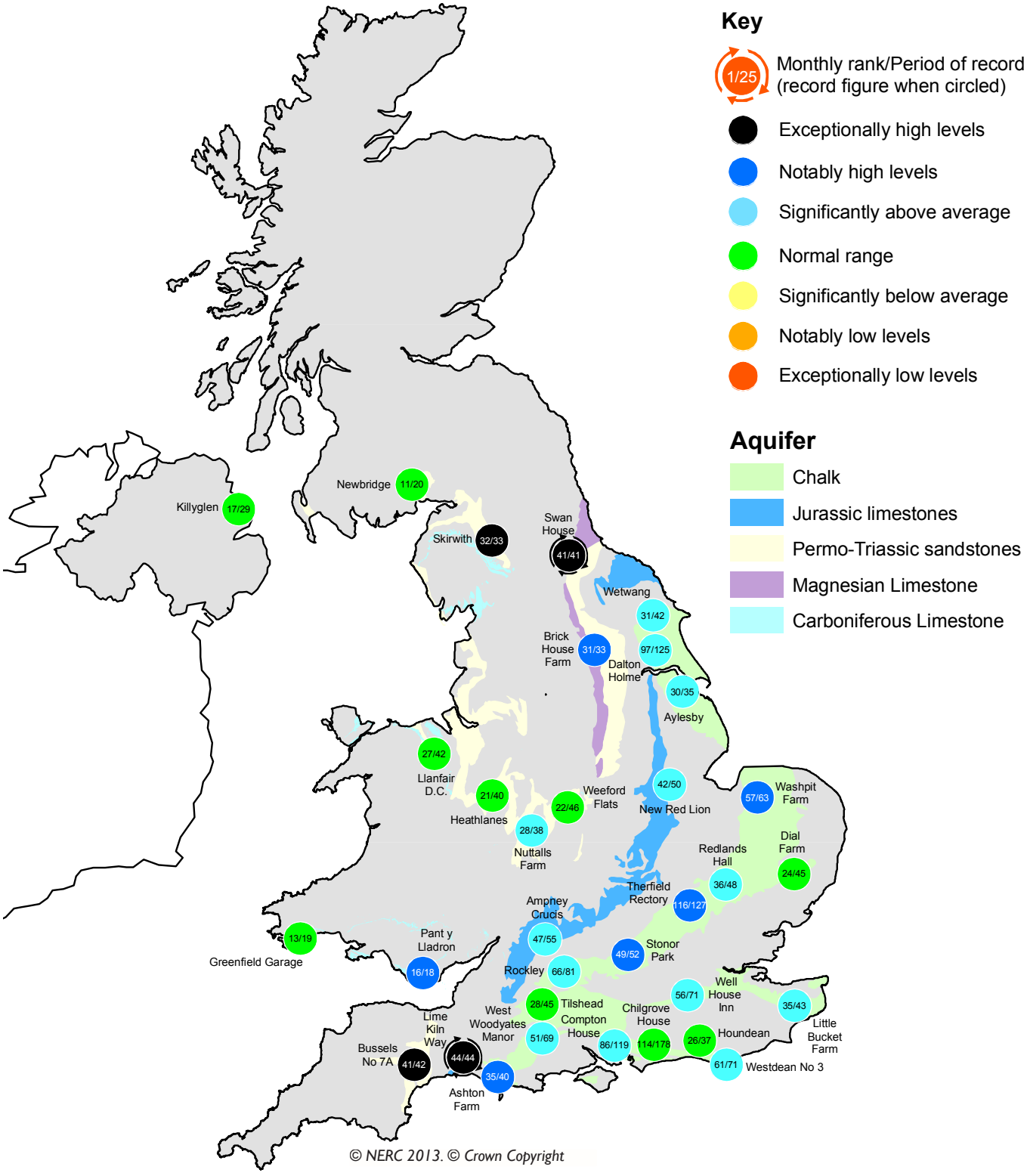




## Groundwater levels March / April 2013

| Borehole | Level | Date | Mar av. | Borehole | Level | Date | Mar av. | Borehole | Level | Date | Mar av. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Dalton Holme | 22.12 | 19/03 | 19.46 | Chilgrove House | 57.80 | 31/03 | 55.53 | Brick House Farm | 16.20 | 27/03 | 13.31 |
| Therfield Rectory | 88.85 | 01/04 | 79.27 | Killyglen (NI) | 115.49 | 31/03 | 115.43 | Llanfair DC | 80.20 | 31/03 | 80.04 |
| Stonor Park | 85.26 | 03/04 | 76.41 | Wetwang | 27.25 | 22/03 | 25.33 | Heathlanes | 62.11 | 31/03 | 61.93 |
| Tilshead | 95.34 | 31/03 | 93.71 | Ampney Crucis | 102.45 | 03/04 | 101.99 | Nuttalls Farm | 129.94 | 26/03 | 129.43 |
| Rockley | 140.58 | 03/04 | 138.38 | New Red Lion | 20.04 | 31/03 | 16.46 | Bussels No.7a | 24.94 | 05/04 | 24.31 |
| Well House Inn | 100.04 | 03/04 | 96.82 | Skirwith | 131.42 | 31/03 | 130.72 | Greenfield Garage | 12.05 | 31/03 | 12.08 |
| West Woodyates | 93.59 | 31/03 | 90.66 | Newbridge | 10.65 | 31/03 | 10.82 | | | | |

*Levels in metres above Ordnance Datum*



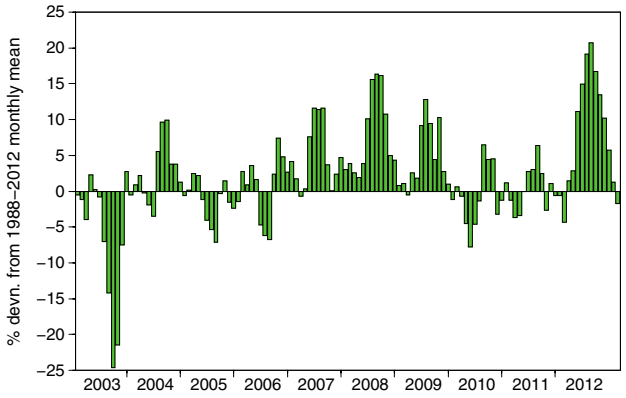

## Groundwater levels - March 2013

The calculation of ranking has been modified from that used in summaries published prior to October 2012. It is now based on a comparison between the most recent level and levels for the same date during previous years of record. Where appropriate, levels for earlier years may have been interpolated. The rankings are designed as a qualitative indicator, and ranks at extreme levels, and when levels are changing rapidly, need to be interpreted with caution.

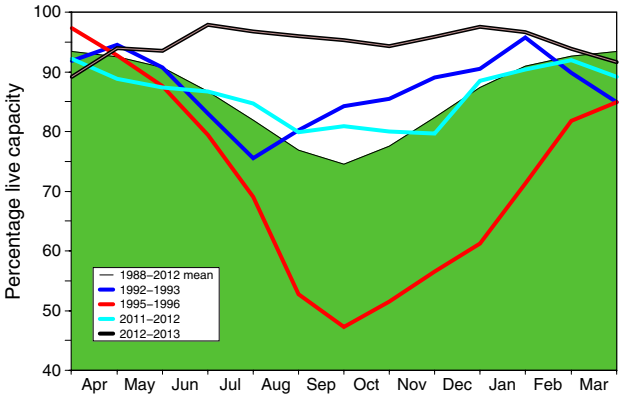
Notes: i. The outcrop areas are coloured according to British Geological Survey conventions.
ii. Yew Tree Farm levels are now received quarterly.

# Reservoirs . . . Reservoirs . . .

## Guide to the variation in overall reservoir stocks for England and Wales




## Comparison between overall reservoir stocks for England and Wales in recent years




These plots are based on the England and Wales figures listed below.

## Percentage live capacity of selected reservoirs at end of month

| Area | Reservoir | | Capacity (Ml) | 2013 Jan | 2013 Feb | 2013 Mar | Mar Anom. | Min Mar | Year* of min | 2012 Mar | Diff 13-12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| North West | N Command Zone | • | 124929 | 96 | 88 | 81 | -11 | 77 | 1993 | 84 | -3 |
| | Vyrnwy | | 55146 | 99 | 96 | 92 | -2 | 64 | 1996 | 91 | 1 |
| Northumbrian | Teesdale | • | 87936 | 97 | 90 | 83 | -10 | 77 | 2003 | 92 | -9 |
| | Kielder | | (199175) | 98 | 88 | 86 | -6 | 81 | 1993 | 88 | -2 |
| Severn Trent | Clywedog | | 44922 | 96 | 95 | 97 | 2 | 86 | 1996 | 99 | -2 |
| | Derwent Valley | • | 39525 | 100 | 94 | 90 | -5 | 54 | 1996 | 90 | 0 |
| Yorkshire | Washburn | • | 22035 | 97 | 94 | 95 | 2 | 70 | 1996 | 96 | -1 |
| | Bradford supply | • | 41407 | 99 | 96 | 91 | -3 | 59 | 1996 | 90 | 1 |
| Anglian | Grafham | | (55490) | 73 | 80 | 88 | -3 | 77 | 1997 | 96 | -8 |
| | Rutland | | (116580) | 96 | 95 | 96 | 6 | 73 | 2012 | 73 | 23 |
| Thames | London | • | 202828 | 96 | 96 | 96 | 2 | 88 | 1990 | 97 | -1 |
| | Farmoor | • | 13822 | 95 | 97 | 80 | -15 | **80** | **2013** | 100 | -20 |
| Southern | Bewl | | 28170 | 99 | 100 | 100 | 11 | 49 | 2012 | 49 | 51 |
| | Ardingly** | | 4685 | 100 | 100 | 100 | 3 | 51 | 2012 | 51 | 49 |
| Wessex | Clatworthy | | 5364 | 100 | 100 | 100 | 3 | 82 | 1992 | 92 | 8 |
| | Bristol WW | • | (38666) | 96 | 96 | 96 | 3 | 71 | 1992 | 80 | 16 |
| South West | Colliford | | 28540 | 100 | 99 | 100 | 14 | 58 | 1997 | 75 | 25 |
| | Roadford | | 34500 | 99 | 95 | 93 | 9 | 37 | 1996 | 81 | 12 |
| | Wimbleball | | 21320 | 100 | 100 | 100 | 4 | 78 | 1996 | 97 | 3 |
| | Stithians | | 4967 | 100 | 100 | 100 | 6 | 52 | 1992 | 87 | 13 |
| Welsh | Celyn and Brenig | • | 131155 | 100 | 99 | 99 | 1 | 72 | 1996 | 98 | 1 |
| | Brianne | | 62140 | 99 | 96 | 96 | -2 | 90 | 1993 | 91 | 5 |
| | Big Five | • | 69762 | 96 | 98 | 96 | 0 | 78 | 1993 | 93 | 3 |
| | Elan Valley | • | 99106 | 100 | 98 | 92 | -5 | 89 | 1993 | 93 | -1 |
| Scotland(E) | Edinburgh/Mid Lothian | • | 97639 | 97 | 99 | 93 | -2 | 71 | 1998 | 96 | -3 |
| | East Lothian | • | 10206 | 100 | 100 | 100 | 1 | 95 | 2012 | 95 | 5 |
| Scotland(W) | Loch Katrine | • | 111363 | 87 | 91 | 81 | -12 | 74 | 2010 | 94 | -13 |
| | Daer | | 22412 | 90 | 97 | 77 | -21 | **77** | **2013** | 100 | -23 |
| | Loch Thom | • | 11840 | 100 | 100 | 90 | -7 | 83 | 2010 | 100 | -10 |
| Northern Ireland | Total+ | • | 55540 | 100 | 95 | 100 | 11 | 83 | 2002 | 86 | 14 |
| | Silent Valley | • | 20634 | 100 | 94 | 100 | 15 | 57 | 2000 | 84 | 16 |

( ) figures in parentheses relate to gross storage • denotes reservoir groups *last occurrence

** the monthly record of Ardingly reservoir stocks is under review.

+ excludes Lough Neagh

Details of the individual reservoirs in each of the groupings listed above are available on request. The percentages given in the Average and Minimum storage columns relate to the 1988-2012 period except for West of Scotland and Northern Ireland where data commence in the mid-1990s. In some gravity-fed reservoirs (e.g. Clywedog) stocks are kept below capacity during the winter to provide scope for flood attenuation purposes. Monthly figures may be artificially low due to routine maintenance or turbidity effects in feeder rivers.

# Location map…Location map

## National Hydrological Monitoring Programme

The National Hydrological Monitoring Programme (NHMP) was instigated in 1988 and is undertaken jointly by the Centre for Ecology & Hydrology (CEH) and the British Geological Survey (BGS) – both are component bodies of the Natural Environment Research Council (NERC). The National River Flow Archive (maintained by CEH) and the National Groundwater Level Archive (maintained by BGS) provide the historical perspective within which to examine contemporary hydrological conditions.

## Data Sources

River flow and groundwater level data are provided by the Environment Agency (EA), the Environment Agency Wales, the Scottish Environment Protection Agency (SEPA) and, for Northern Ireland, the Rivers Agency and the Northern Ireland Environment Agency. In all cases the data are subject to revision following validation (high flow and low flow data in particular may be subject to significant revision).

Reservoir level information is provided by the Water Service Companies, the EA, Scottish Water and Northern Ireland Water.

Most rainfall data are provided by the Met Office (address opposite).

To allow better spatial differentiation the monthly rainfall data for Britain are presented for the regional divisions of the precursor organisations of the EA and SEPA.

The monthly, and n-month, rainfall figures have been produced by the Met Office, National Climate Information Centre (NCIC) and are based on gridded data from raingauges. They include a significant number of monthly raingauge totals provided by the EA and SEPA. The Met Office NCIC monthly rainfall series extends back to 1910 and forms the official source of UK areal rainfall statistics which have been adopted by the NHMP. The gridding technique used is described in Perry MC and Hollis DM (2005) available at http://www.metoffice.gov.uk/climate/uk/about/Monthly_gridded_datasets_UK.pdf

The regional figures for the current month are based on limited raingauge networks so these (and the return periods associated with them) should be regarded as a guide only.

The Met Office NCIC monthly rainfall series are Crown Copyright and may not be passed on to, or published by, any unauthorised person or organisation.

From time to time the Hydrological Summary may also refer to evaporation and soil moisture figures. These are obtained from MORECS, the Met Office services involving the routine calculation of evaporation and soil moisture throughout the UK.

For further details please contact:

The Met Office
FitzRoy Road
Exeter
Devon
EX1 3PB

Tel.: 0870 900 0100
Email: enquiries@metoffice.gov.uk

Reference for Central England Temperature series:
Manley, G. 1974. Central England temperatures: monthly means 1659 to 1973. *Quarterly Journal of the Royal Meteorological Society*, 100, 389–405.

*The National Hydrological Monitoring Programme depends on the active cooperation of many data suppliers. This cooperation is gratefully acknowledged.*

## Enquiries

Enquiries should be addressed to:

Hydrological Summaries for the UK
Centre for Ecology & Hydrology
Maclean Building
Crowmarsh Gifford
Wallingford
Oxfordshire
OX10 8BB

Tel.: 01491 692599
Email: nhmp@ceh.ac.uk

A full catalogue of past Hydrological Summaries can be accessed and downloaded at:
http://www.ceh.ac.uk/data/nrfa/nhmp/nhmp.html

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