

Monthly water situation report: Solent and South Downs Area

Summary - January 2023

Solent and South Downs (SSD) had above average rainfall in January, receiving 134% (117mm) of the long-term average (LTA) rainfall (87mm). Monthly mean river flows across SSD ranged from **normal** to **notably high**. Groundwater levels ranged from **normal** to **exceptionally high**. Soil moisture deficits ended the month above the LTA which means soils were drier than average for the time of year. End of month reservoir stocks were above average at Ardingly Reservoir (Ouse) and below average at Arlington Reservoir (Cuckmere).

1.1 Rainfall

SSD had above average rainfall in January, receiving 134% (117mm) of the LTA rainfall (87mm). The East Sussex Chalk areal unit received the most rainfall with 152% (143mm) of LTA (87mm). The Ouse areal unit had the least rainfall with 117% (101mm) of LTA (87mm). Over 95% of January's rainfall fell in the first half of the month. The highest daily total of 39.8mm was recorded on 15th January at the Hastings Baldslow rain gauge (Pevensey Levels). The second half of the month was mostly dry with colder conditions.

The September-January five month rainfall total was the 5th highest on record for Solent and South Downs. For the Cuckmere areal unit it was the 2nd wettest September-January period on record.

1.2 Soil moisture deficit and recharge

Soils across Solent and South Downs ended the month drier than the average for December.

1.3 River flows

Monthly mean river flows across SSD ranged from **normal** to **notably high**. Flows in the River Adur at Sakeham, the River Itchen at Allbrook and Highbridge, the River Meon at Mislingford, the River Rother at Iping Mill and the River Test at Broadlands were in the **notably high** range. Flows in the River Arun at Alfoldean, the River Cuckmere at Cowbeech, the River Medina at Blackwater, the River Lymington at Brockenhurst, the River Ouse at Goldbridge and the Wallington River at North Fareham were **above normal**. Only the River Test at Chilbolton was in the **normal** category. Many sites had **exceptionally high** daily mean flows in the middle of the month in response to highest rainfall events.

1.4 Groundwater levels

End of month groundwater levels ranged from **normal** to **exceptionally high**. The groundwater levels at Catherington and Lopcombe Corner were **exceptionally high**. Levels at Chilgrove, Preston Candover and West Meon were **notably high**. Levels at Beeding Hill, Clanville Gate, Cornish Farm Wigdens and Houndean Bottom and ended the month in the **above normal** category. Groundwater levels at all remaining reporting sites were in the **normal** category. Several groundwater flood alerts were in place during the month but levels at the more responsive sites receded by the end of the month due to the drier conditions.

1.5 Reservoir stocks

End of month reservoir stocks were above average at Ardingly Reservoir (Ouse) with 100% of total capacity (LTA 93%) and below average at Arlington Reservoir (Cuckmere) with 73.2% of total capacity (LTA 95%).

1.6 Environmental impact

In total there was 1 licence restriction (New Forest) during January. This was enforced in the last week of the month as the drier conditions took effect on flows. In Sussex there were 17 Flood Warnings, 22 Flood Alerts and 2 Groundwater Flood Alerts. In Hampshire and the Isle of Wight there were 11 Flood Warning and 22 Flood Alerts and 7 Groundwater Flood Alerts.

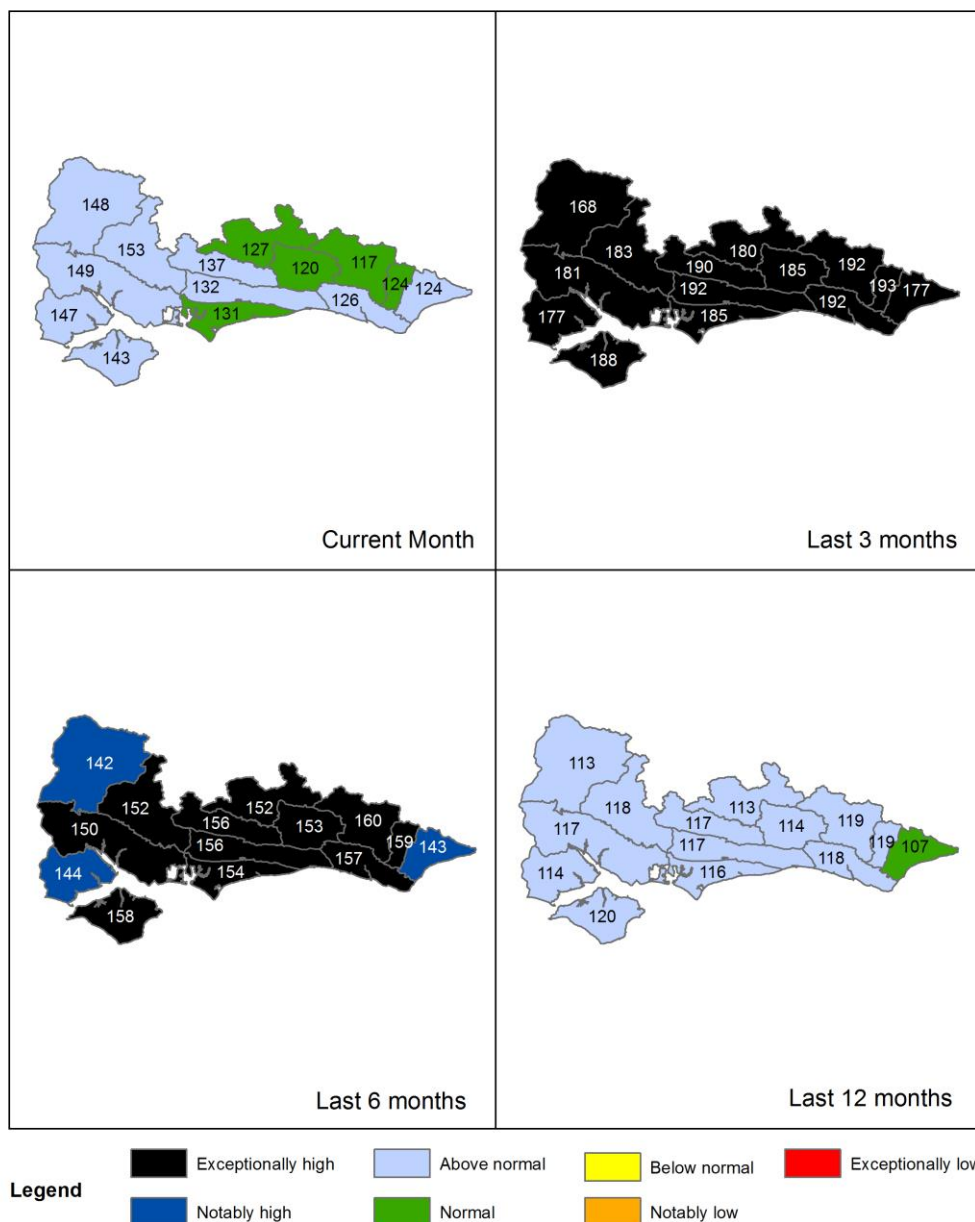
All data are provisional and may be subject to revision. The views expressed in this document are not necessarily those of the Environment Agency. Its officers, servants or agents accept no liability for any loss or damage arising from the interpretation or use of the information, or reliance upon views contained herein.

Author: [HydrologySSD](#)

2. Rainfall

2.1 Rainfall map

Figure 2.1: Total rainfall for hydrological areas for the current month (up to 31 January 2023), the last 3 months, the last 6 months, and the last 12 months, classed relative to an analysis of respective historic totals. Table available in the appendices with detailed information.

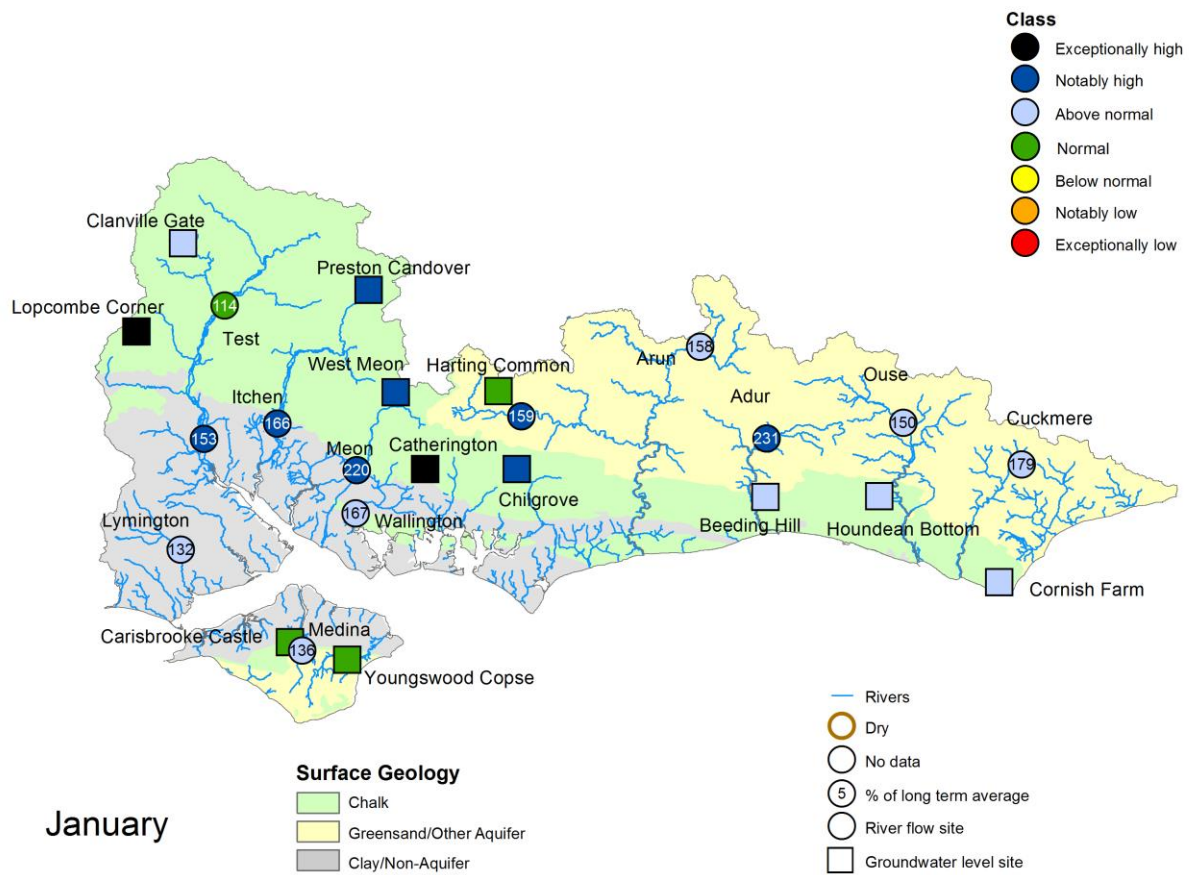


HadUK data based on the Met Office 1km gridded rainfall dataset derived from rain gauges (Source: Met Office. Crown copyright, 2023). Provisional data based on Environment Agency 1km gridded rainfall dataset derived from Environment Agency intensity rain gauges. Crown copyright. All rights reserved. Environment Agency, 100024198, 2023.

3 River flows and Groundwater levels

3.1 River flows and Groundwater level map

Figure 3.1: Monthly mean river flow and groundwater levels at our indicator sites for January 2023, expressed as a percentage of the respective long term average and classed relative to an analysis of historic January monthly means. Table available in the appendices with detailed information.

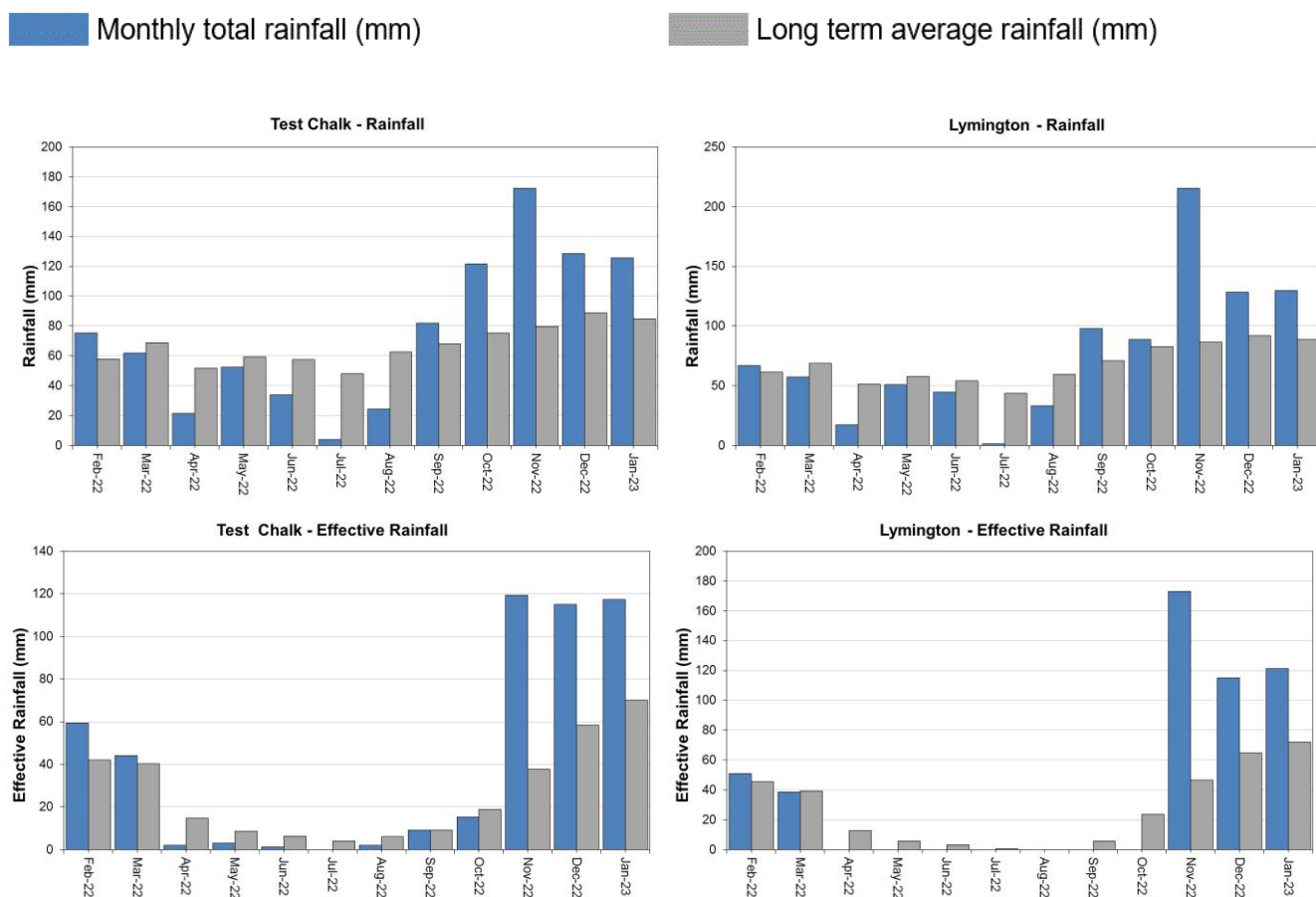


(Source: Environment Agency). Crown copyright. All rights reserved. Environment Agency, 100024198, 2023. Geological map reproduced with kind permission from UK Groundwater Forum, BGS copyright NERC. Crown copyright. All rights reserved. Environment Agency, 100024198, 2023.

4 West Hampshire

4.1 West Hampshire Rainfall and effective rainfall charts

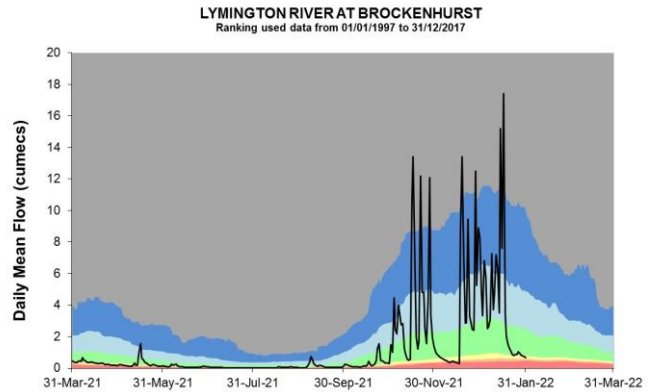
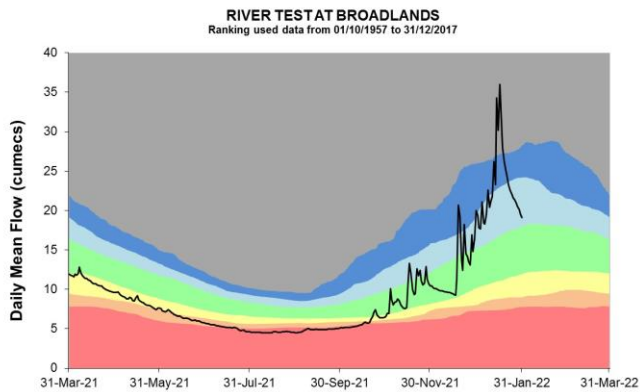
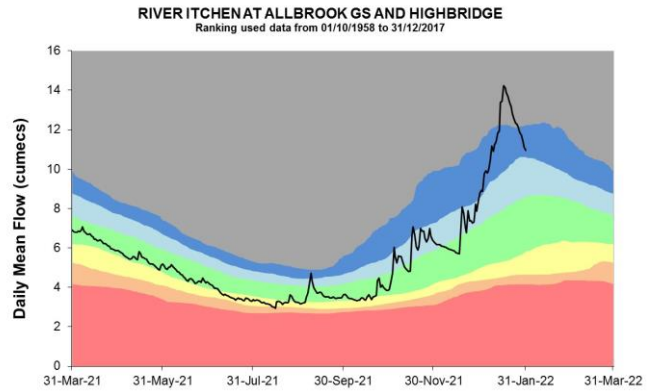
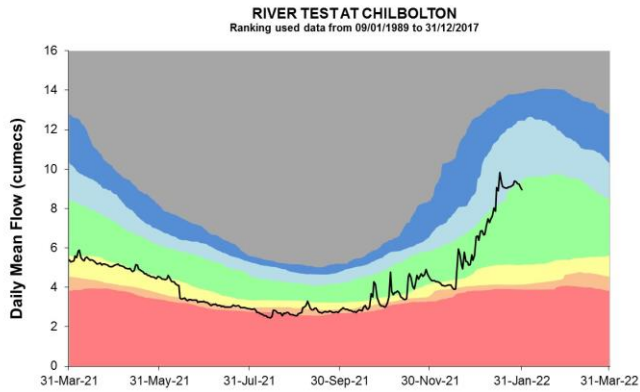
Figure 4.1: Monthly rainfall and effective rainfall totals for the past 24 months compared to the 1961 to 1990 long term average.



HadUK rainfall data. (Source: Met Office. Crown copyright, 2023).

4.2 West Hampshire River flow charts

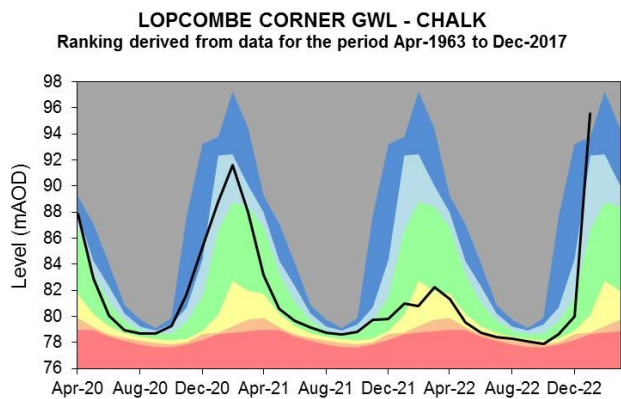
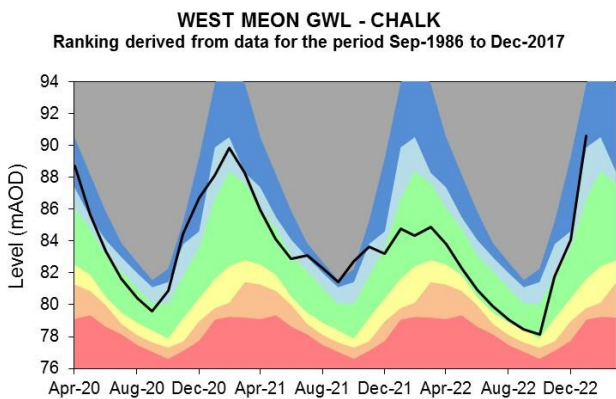
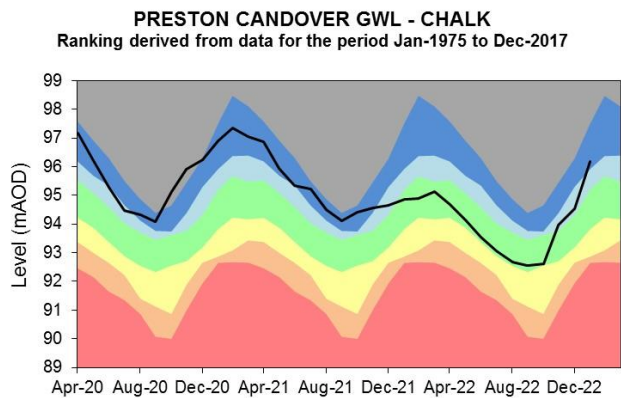
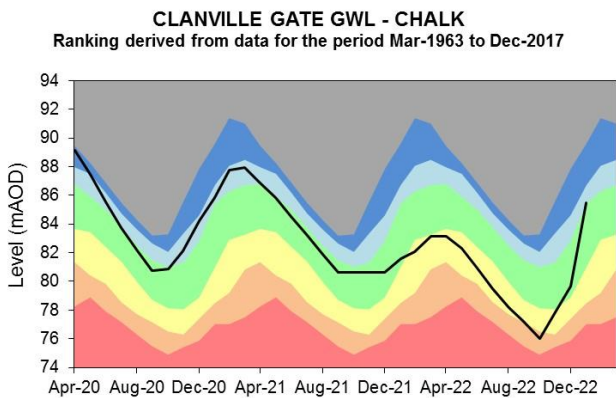
Figure 4.2: Daily mean river flow for index sites over the past year, compared to an analysis of historic daily mean flows, and long term maximum and minimum flows.



Source: Environment Agency, 2023.

4.3 West Hampshire Groundwater level charts

Figure 4.3: End of month groundwater levels at index groundwater level sites for major aquifers. 34 months compared to an analysis of historic end of month levels and long term maximum and minimum levels.

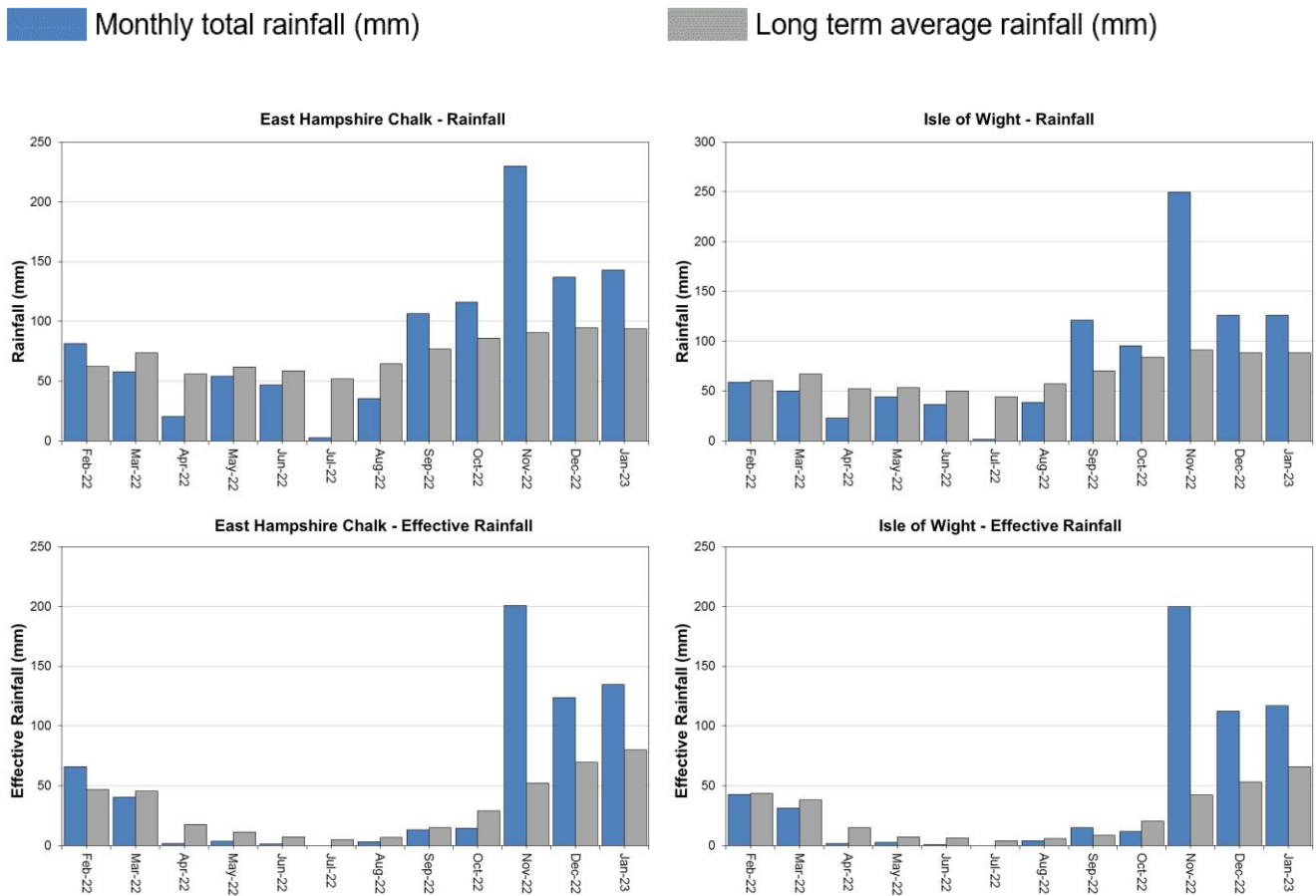


Source: Environment Agency, 2023.

5 East Hampshire and Isle of Wight

5.1 East Hampshire and Isle of Wight Rainfall and Effective rainfall charts

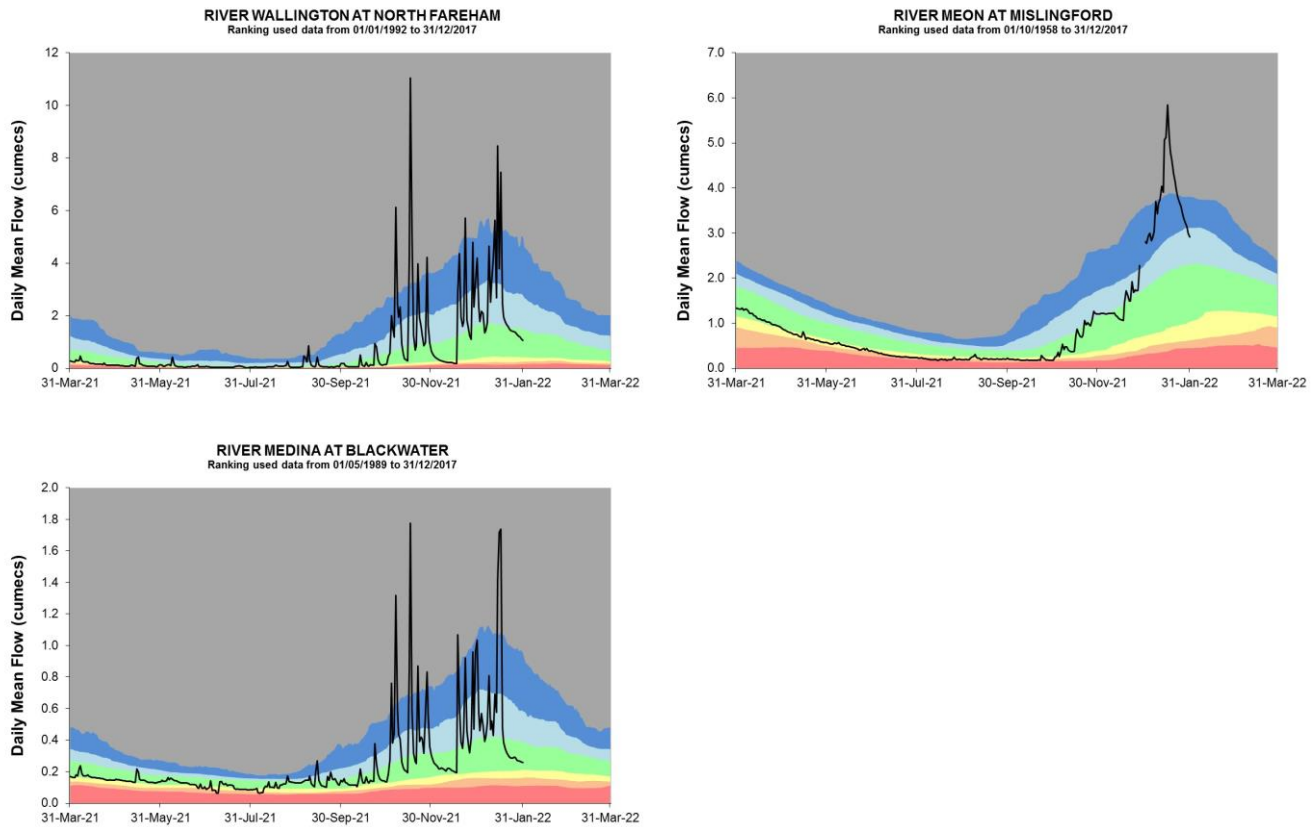
Figure 5.1: Monthly rainfall and effective rainfall totals for the past 24 months compared to the 1961 to 1990 long term average.



HadUK rainfall data. (Source: Met Office. Crown copyright, 2023).

5.2 East Hampshire and Isle of Wight River flow charts

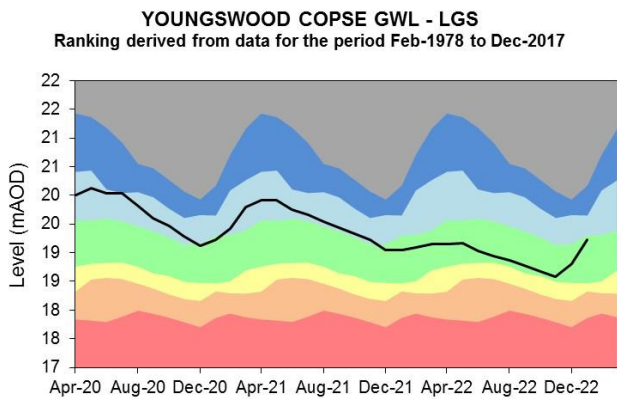
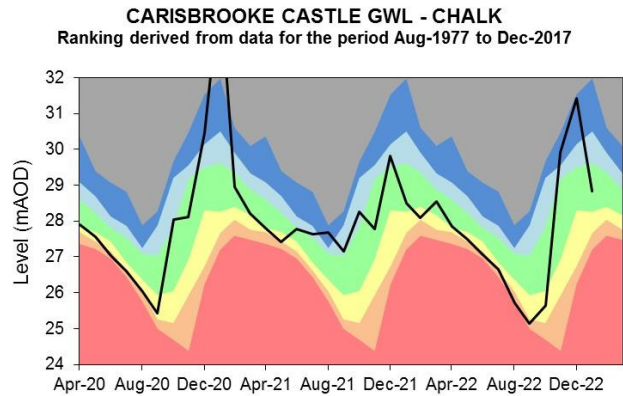
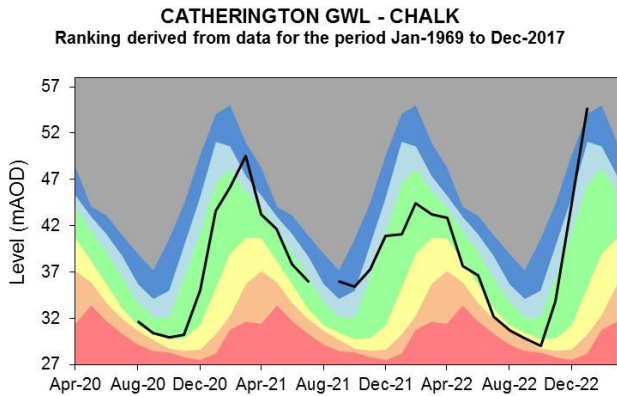
Figure 5.2 Daily mean river flow for index sites over the past year, compared to an analysis of historic daily mean flows, and long term maximum and minimum flows.



Source: Environment Agency, 2023.

5.3 East Hampshire and Isle of Wight Groundwater level charts

Figure 5.3: End of month groundwater levels at index groundwater level sites for major aquifers. 34 months compared to an analysis of historic end of month levels and long term maximum and minimum levels.

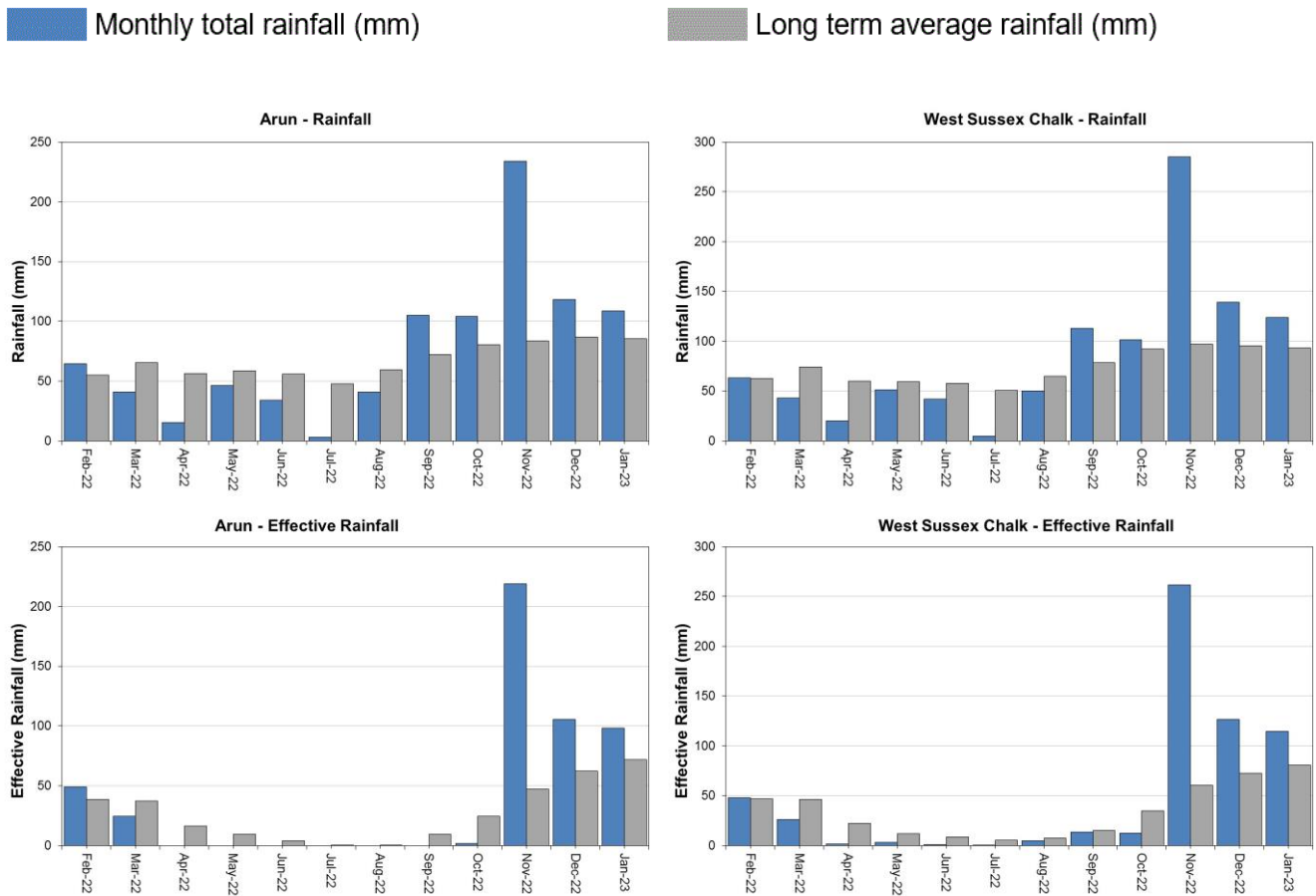


Source: Environment Agency, 2023.

6 West Sussex

6.1 West Sussex Rainfall and Effective Rainfall charts

Figure 6.1: Monthly rainfall and effective rainfall totals for the past 24 months as a percentage of the 1961 to 1990 long term average.

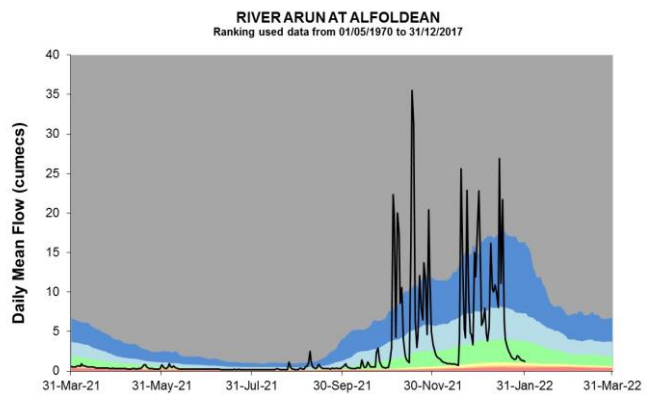
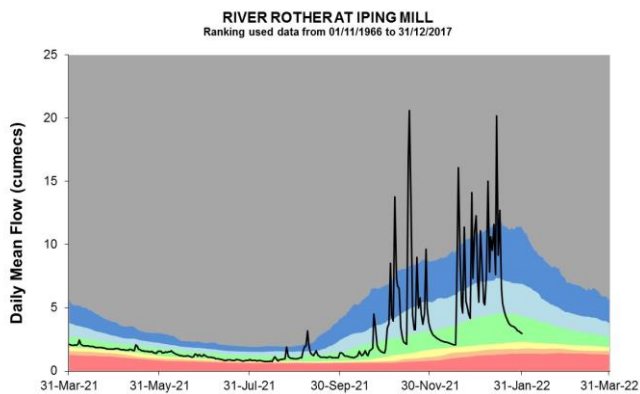


HadUK rainfall data. (Source: Met Office. Crown copyright, 2023).

6.2 West Sussex River flow charts

Figure 6.2: Daily mean river flow for index sites over the past year, compared to an analysis of historic daily mean flows, and long term maximum and minimum flows.

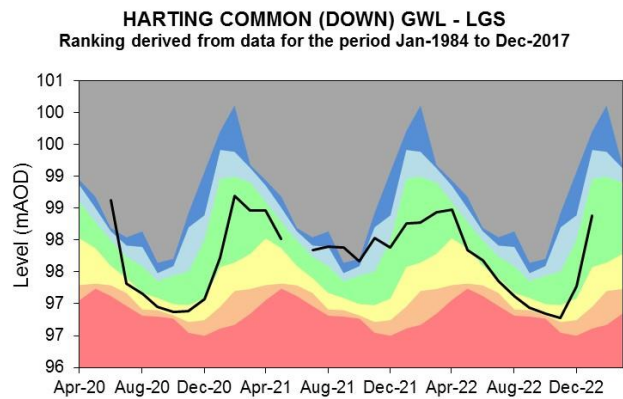
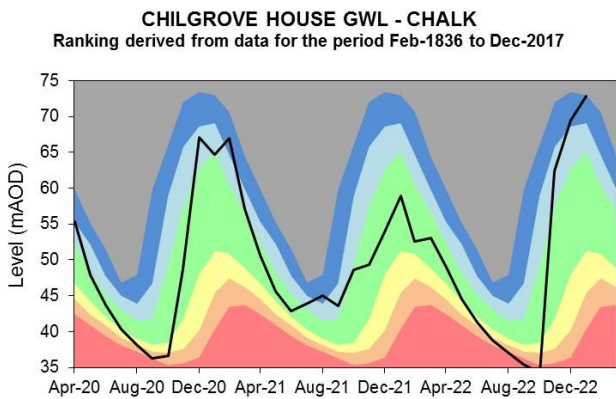




Source: Environment Agency, 2023.

6.3 West Sussex Groundwater level charts

Figure 6.3: End of month groundwater levels at index groundwater level sites for major aquifers. 34 months compared to an analysis of historic end of month levels and long term maximum and minimum levels.

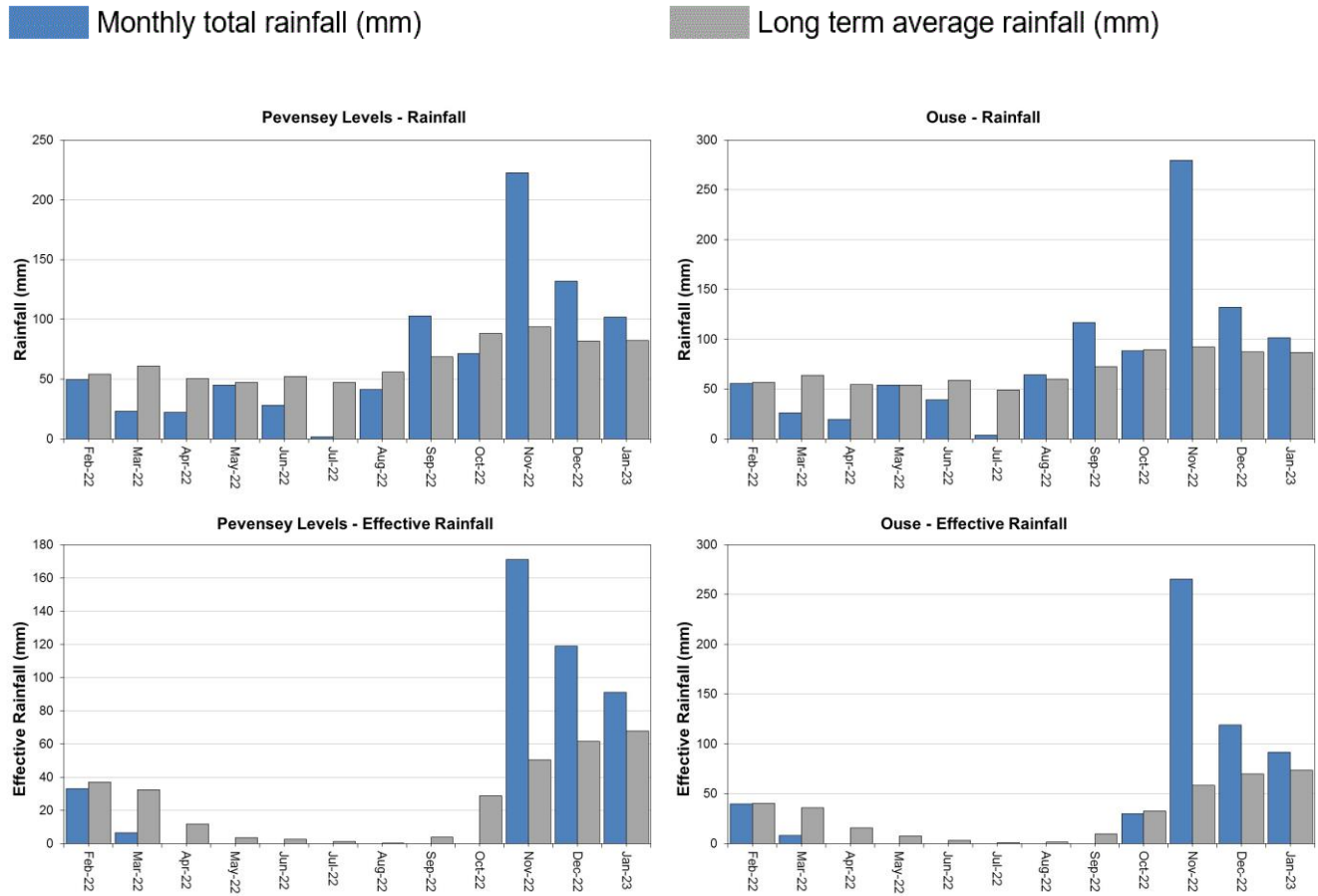


Source: Environment Agency, 2023.

7 East Sussex

7.1 East Sussex Rainfall and Effective Rainfall charts

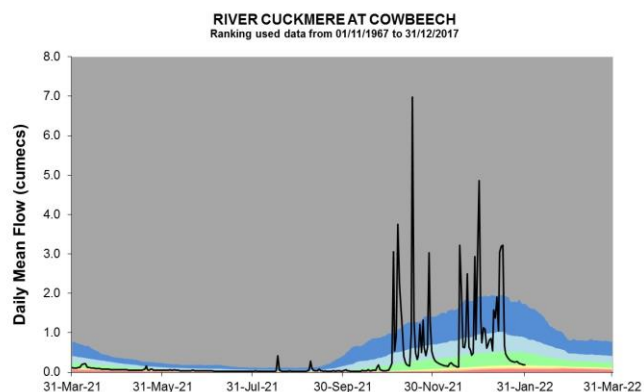
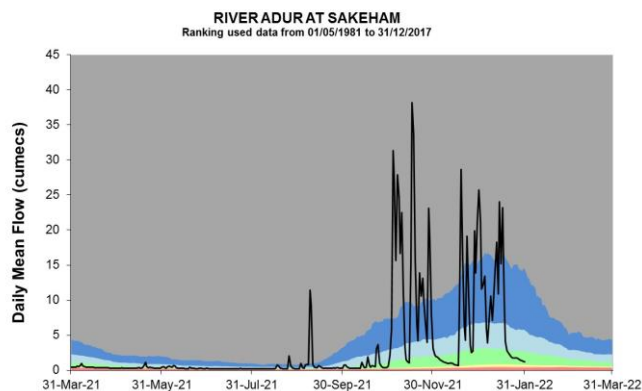
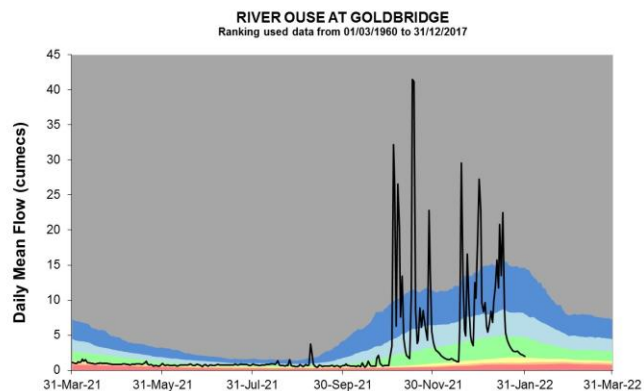
Figure 7.1: Monthly rainfall and effective rainfall totals for the past 24 months compared to the 1961 to 1990 long term average.



HadUK rainfall data. (Source: Met Office. Crown copyright, 2023).

7.2 East Sussex River flow charts

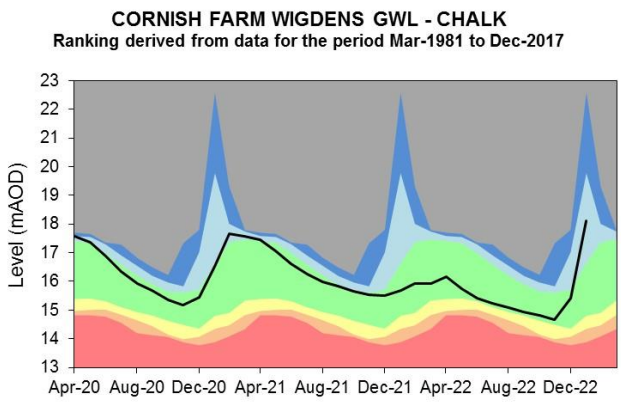
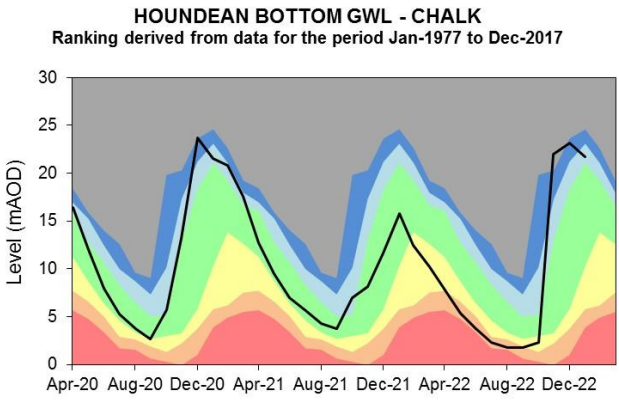
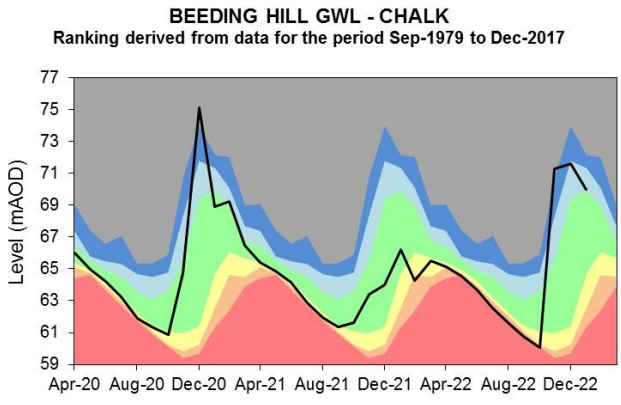
Figure 7.2: Daily mean river flow for index sites over the past year, compared to an analysis of historic daily mean flows, and long term maximum and minimum flows.



Source: Environment Agency, 2023.

7.3 East Sussex Groundwater level charts

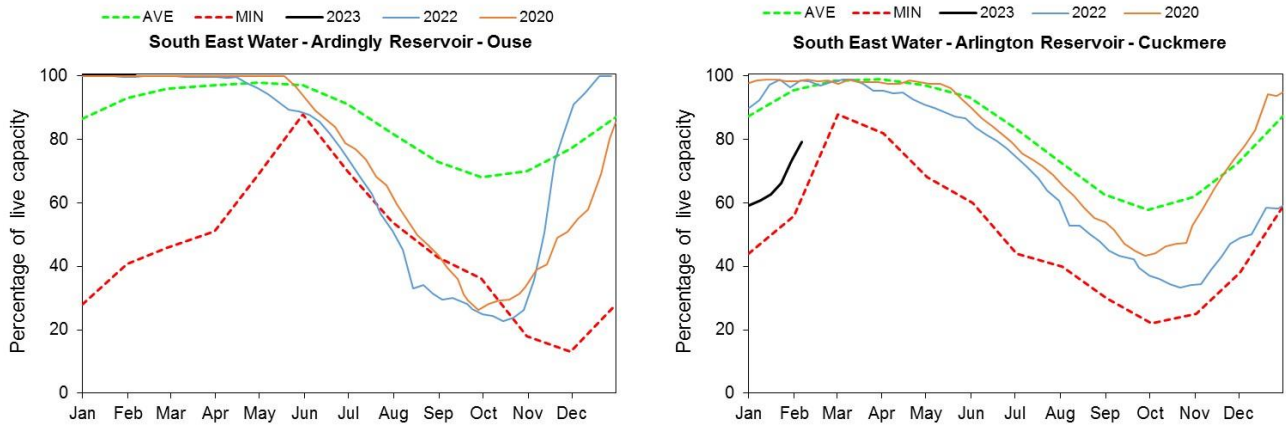
Figure 7.3: End of month groundwater levels at index groundwater level sites for major aquifers. 34 months compared to an analysis of historic end of month levels and long term maximum and minimum levels.



Source: Environment Agency, 2023.

8 Reservoir stocks

Figure 8.1: End of month reservoir stocks compared to long term maximum, minimum and average stocks. Note: Historic records of individual reservoirs and reservoir groups making up the regional values vary in length.



(Source: water companies).

9 Glossary

9.1 Terminology

Aquifer

A geological formation able to store and transmit water.

Areal average rainfall

The estimated average depth of rainfall over a defined area. Expressed in depth of water (mm).

Artesian

The condition where the groundwater level is above ground surface but is prevented from rising to this level by an overlying continuous low permeability layer, such as clay.

Artesian borehole

Borehole where the level of groundwater is above the top of the borehole and groundwater flows out of the borehole when unsealed.

Cumecs

Cubic metres per second (m^3s^{-1}).

Effective rainfall

The rainfall available to percolate into the soil or produce river flow. Expressed in depth of water (mm).

Flood alert and flood warning

Three levels of warnings may be issued by the Environment Agency. Flood alerts indicate flooding is possible. Flood warnings indicate flooding is expected. Severe flood warnings indicate severe flooding.

Groundwater

The water found in an aquifer.

Long term average (LTA)

The arithmetic mean calculated from the historic record, usually based on the period 1961 to 1990. However, the period used may vary by parameter being reported on (see figure captions for details).

mAOD

Metres above ordnance datum (mean sea level at Newlyn Cornwall).

MORECS

Met Office Rainfall and Evaporation Calculation System. Met Office service providing real time calculation of evapotranspiration, soil moisture deficit and effective rainfall on a 40 by 40 km grid.

Naturalised flow

River flow with the impacts of artificial influences removed. Artificial influences may include abstractions, discharges, transfers, augmentation and impoundments.

NCIC

National Climate Information Centre. NCIC area monthly rainfall totals are derived using the Met Office 5 km gridded dataset, which uses rain gauge observations.

Recharge

The process of increasing the water stored in the saturated zone of an aquifer. Expressed in depth of water (mm).

Reservoir gross capacity

The total capacity of a reservoir.

Reservoir live capacity

The capacity of the reservoir that is normally usable for storage to meet established reservoir operating requirements. This excludes any capacity not available for use (for example, storage held back for emergency services, operating agreements or physical restrictions). May also be referred to as 'net' or 'deployable' capacity.

Soil moisture deficit (SMD)

The difference between the amount of water actually in the soil and the amount of water the soil can hold. Expressed in depth of water (mm).

9.2 Categories

Exceptionally high

Value likely to fall within this band 5% of the time.

Notably high

Value likely to fall within this band 8% of the time.

Above normal

Value likely to fall within this band 15% of the time.

Normal

Value likely to fall within this band 44% of the time.

Below normal

Value likely to fall within this band 15% of the time.

Notably low

Value likely to fall within this band 8% of the time.

Exceptionally low

Value likely to fall within this band 5% of the time.

10 Appendices

10.1 Rainfall, effective rainfall and soil moisture deficit table

(Source: Met Office. Crown copyright, 2023). All rights reserved. Environment Agency, 100024198, 2023

Figure 10.1: This is a second estimate of areal rainfall, effective rainfall (percolation or runoff) and soil moisture deficit for the hydrological areas across the Solent and South Downs. There may be significant variation within each area which must be considered when interpreting these data. When additional meteorological data is available estimates are revised which will affect the period totals in section 10.2

Hydrological Area	Rainfall (mm) 31 day Total	Rainfall January as %LTA	Effective Rainfall (mm) 31 day Total	Effective Rainfall January as %LTA	Soil Moisture Deficit (SMD) Day 31	SMD End of January LTA
Test Chalk	126	148%	117	168%	6	2
East Hampshire Chalk	143	152%	135	168%	5	1
West Sussex Chalk	124	132%	115	142%	4	1
East Sussex Chalk	110	126%	100	140%	4	1
Isle of Wight	126	143%	117	178%	6	4
Western Rother Greensand	136	137%	127	148%	5	1
Hampshire Tertiaries	128	149%	119	172%	6	1
Lymington	130	147%	121	168%	5	1
Sussex Coast	100	130%	91	152%	5	2
Arun	109	127%	98	137%	3	1
Adur	101	120%	92	129%	4	1
Ouse	101	117%	92	124%	4	1
Cuckmere	105	124%	95	132%	3	1
Pevensy Levels	102	124%	91	134%	3	1
Solent & South Downs Average	117	134%	108	149%	4	1

10.2 Seasonal summary table of rainfall and effective rainfall

Hydrological Area	Seasonal Rainfall (mm) Total	Seasonal Rainfall as % LTA	Seasonal Effective Rainfall (mm) Total	Seasonal Effective Rainfall as % LTA
Test Chalk	548	167%	367	198%
East Hampshire Chalk	625	171%	474	205%
West Sussex Chalk	650	172%	516	207%
East Sussex Chalk	612	167%	483	215%
Isle of Wight	597	170%	441	243%
Western Rother Greensand	671	174%	523	207%
Hampshire Tertiaries	570	169%	404	216%
Lymington	562	160%	409	198%
Sussex Coast	527	168%	361	235%
Arun	565	168%	425	206%
Adur	569	165%	447	204%
Ouse	602	169%	507	216%
Cuckmere	594	168%	503	213%
Pevensey Levels	528	153%	381	182%
Solent & South Downs Average	587	167%	446	210%

10.3 Rainfall banding table

Hydrological area	Jan 2023 band	Nov 2022 to Jan 2023 cumulative band	Jul 2022 to Jan 2023 cumulative band	Feb 2022 to Jan 2023 cumulative band
Test Chalk	Above normal	Exceptionally high	Notably high	Above normal
East Hampshire Chalk	Above normal	Exceptionally high	Exceptionally high	Above normal
West Sussex Chalk	Above normal	Exceptionally high	Exceptionally high	Above normal
East Sussex Chalk	Above normal	Exceptionally high	Exceptionally high	Above normal
Isle of Wight	Above normal	Exceptionally high	Exceptionally high	Above normal
Western Rother Greensand	Above normal	Exceptionally high	Exceptionally high	Above normal
Hampshire Tertiaries	Above normal	Exceptionally high	Exceptionally high	Above normal
Lymington	Above normal	Exceptionally high	Notably high	Above normal
Sussex Coast	Normal	Exceptionally high	Exceptionally high	Above normal

Arun	Normal	Exceptionally high	Exceptionally high	Above normal
Adur	Normal	Exceptionally high	Exceptionally high	Above normal
Ouse	Normal	Exceptionally high	Exceptionally high	Above normal
Cuckmere	Normal	Exceptionally high	Exceptionally high	Above normal
Pevensey Levels	Above normal	Exceptionally high	Notably high	Normal

10.4 River flows table

Site name	River	Catchment	Jan 2023 band	Dec 2022 band
Alfoldean Gs	Arun	Arun	Above normal	Notably high
Allbrook GS+ Highbridge	Itchen	Itchen	Notably high	Above normal
Blackwater	Medina	Isle of Wight	Above normal	Normal
Broadlands	Test	Test Lower	Notably high	Normal
Brockenhurst Gs	Lymington	New Forest	Above normal	Normal
Chilbolton GS	Test	Test Upper	Normal	Normal
Cowbeech Gs	Cuckmere	Cuckmere	Above normal	Notably high
Goldbridge Gs	Ouse	Ouse Sussex	Above normal	Above normal
Iping Mill Gs	Rother	West Rother	Notably high	Above normal
Mislingford GS	Meon	Meon	Notably high	Normal
North Fareham GS	Wallington	Wallington	Above normal	Normal
Sakeham GS	Adur	Adur	Notably high	Notably high

10.5 Groundwater table

Site name	Aquifer	End of Jan 2023 band	End of Dec 2022 band
Houndean Bottom Gwl	Brighton Chalk Block	Above normal	Notably high
Chilgrove House Gwl	Chichester-Worthing-Portsdown Chalk	Notably high	Notably high
Carisbrooke Castle	Isle Of Wight Central Downs Chalk	Normal	Notably high
West Meon Hut Gwl	River Itchen Chalk	Notably high	Above normal
Clanville Gate Gwl	River Test Chalk	Above normal	Normal
Lopcombe Corner Gwl	River Test Chalk	Exceptionally high	Normal
Beeding Hill Gwl	Brighton Chalk Block	Above normal	Above normal
Catherington	River Meon Chalk	Exceptionally high	Above normal
Cornish Wigdens Gwtr	Eastbourne Chalk Block	Above normal	Normal
Harting Common Down	Western Rother Lower Greensand	Normal	Normal

Preston Candover	River Itchen Chalk	Notably high	Above normal
Youngwoods Copse	Isle of Wight Lower Greensand	Normal	Normal

10.6 Abstraction licence flow constraints

Number of flow constraints in force between 1 to 8 January 2023	Number of flow constraints in force between 9 to 15 January 2023	Number of flow constraints in force between 16 to 23 January 2023	Number of flow constraints in force between 24 to 31 January 2023
0	0	0	1

10.7 SSD Areal Rainfall Units Map

