

Monthly water situation report: Solent and South Downs Area

Summary - August 2023

Solent and South Downs (SSD) had above average rainfall in August, receiving 129% (78mm) of the long term average (LTA) rainfall (60mm). Monthly mean river flows across SSD ranged from normal to exceptionally high. Groundwater levels ranged from normal to notably high. Soils across SSD ended the month drier than the average for August. End of month reservoir stocks at Ardingly Reservoir (Ouse) and at Arlington Reservoir (Cuckmere) were both below average.

1.1 Rainfall

SSD had above average rainfall in August, receiving 129% (78mm) of the LTA rainfall (60mm). The rainfall pattern across SSD for August shows the lowest totals in the east of the area, Sussex, which received about 120% of the average rainfall and the Adur areal unit, had the least rainfall for 2 months in a row with 95% (57mm) of LTA (60mm) for August. At the same time the west of the area, Hampshire and the Isle of Wight, received about 150% of the average rainfall. The past 6 months were the second wettest on record for the Test Chalk areal unit, the third wettest for the Lymington and for the Isle of Wight, and the fourth wettest for the East Hampshire Chalk and the Hampshire Tertiaries areal units.

The 5 highest daily totals were all measured on the 17 August, 3 in the Hampshire Tertiaries and 2 in the Isle of Wight areal unit. The highest daily total of 33mm was recorded at Peel Common tbr (Hampshire Tertiaries).

The weather across SSD was variable throughout the month, with alternating drier and wetter periods. The wettest days were 17 and 18 of August with 30% to 50% of monthly LTA rainfall in two days. This was followed with the four driest days, between the 19 and 22 of August, with no rain above 1mm across the whole SSD.

1.2 Soil moisture deficit and recharge

Soils were drier than average in Sussex and were wetter than average in Hampshire and the Isle of Wight. Overall soils across SSD ended the month drier than the average for August.

1.3 River flows

Monthly mean river flows across SSD ranged from normal to exceptionally high. Flows in the River Itchen at Allbrook & Highbridge were exceptionally high. Flows were notably high in River Medina at Blackwater and in River Rother at Iping Mill.

Flows were above normal:

- River Test at Broadlands
- River Test at Chilbolton
- River Meon at Misingford
- River Cuckmere at Cowbeech

Flows were normal:

- River Lymington at Brockenhurst
- River Wallington at North Fareham
- River Arun at Alfoldean
- River Adur at Sakeham
- River Ouse at Goldbridge

The River Itchen at Allbrook & Highbridge was the third highest (since 1959), the River Medina at Blackwater was the fifth highest (since 1989) and the River Rother at Iping Mill was the eighth highest (since 1966) on their records for August monthly mean flows.

1.4 Groundwater levels

End of month groundwater levels ranged from normal to notably high.

Groundwater levels at Clanville Gate (Test Chalk) and Preston Candover (East Hampshire Chalk) were notably high.

Groundwater levels were above normal at:

- Lopcombe Corner (Test Chalk)
- West Meon (East Hampshire Chalk)
- Catherington (East Hampshire Chalk)
- Carisbrooke Castle (Isle of Wight)
- Youngwoods Copse (Isle of Wight)
- Cornish Farm (East Sussex Chalk)

Groundwater levels were normal at:

- Harting Common (Western Rother Greensand)
- Chilgrove (West Sussex Chalk)
- Beeding Hill (West Sussex Chalk)
- Houndean Bottom (East Sussex Chalk)

Groundwater levels for August at Clanville Gate were the sixth highest on record (starting 1966), at Preston Candover were the seventh highest on record (starting 1975) and at Cornish Farm were the eighth highest on record (starting 1981). Groundwater levels at Lopcombe Corner, West Meon, Carisbrooke Castle and Youngwoods Copse were all the ninth highest on their records.

1.5 Reservoir stocks

End of month reservoir stocks were both below average at Ardingly Reservoir (Ouse) with 65.3% of total capacity (LTA 73%) and at Arlington Reservoir (Cuckmere) with 51.5% of total capacity (LTA 62.75%).

1.6 Environmental impact

One licence restriction was in place at the start of August in the River Arun catchment. This was in force throughout the month except for the second week when flows briefly recovered. From the second week 2 licence restrictions came into force on the Shepherds Chine at Atherfield GS (Isle of Wight) and these continued to the end of the month. On the third week 4 more licence restrictions came into force on the River Medina at Shide (Isle of Wight) but the restrictions only lasted for a week.

There were 3 Flood Alerts issued in August, one on the River Test, one on the River Dever (Test Tributaries) and one on the River Itchen. There were 2 Flood Warnings issued in August, one on the River Dever (Test Tributaries) and one on the River Arun.

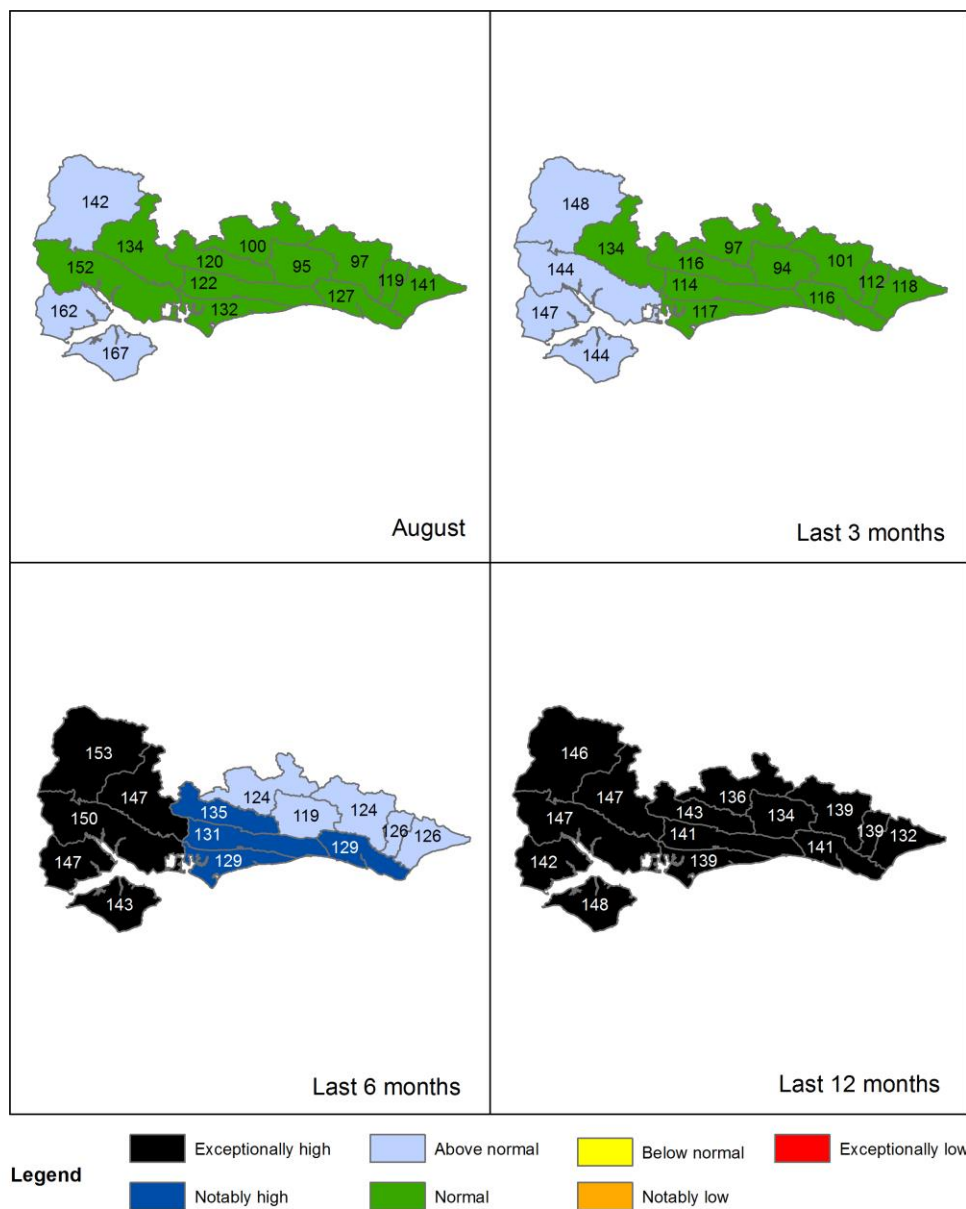
Author: [HydrologySSD](#)

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2. Rainfall

2.1 Rainfall map

Figure 2.1: Total rainfall for hydrological areas for the current month (up to 31 August 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.

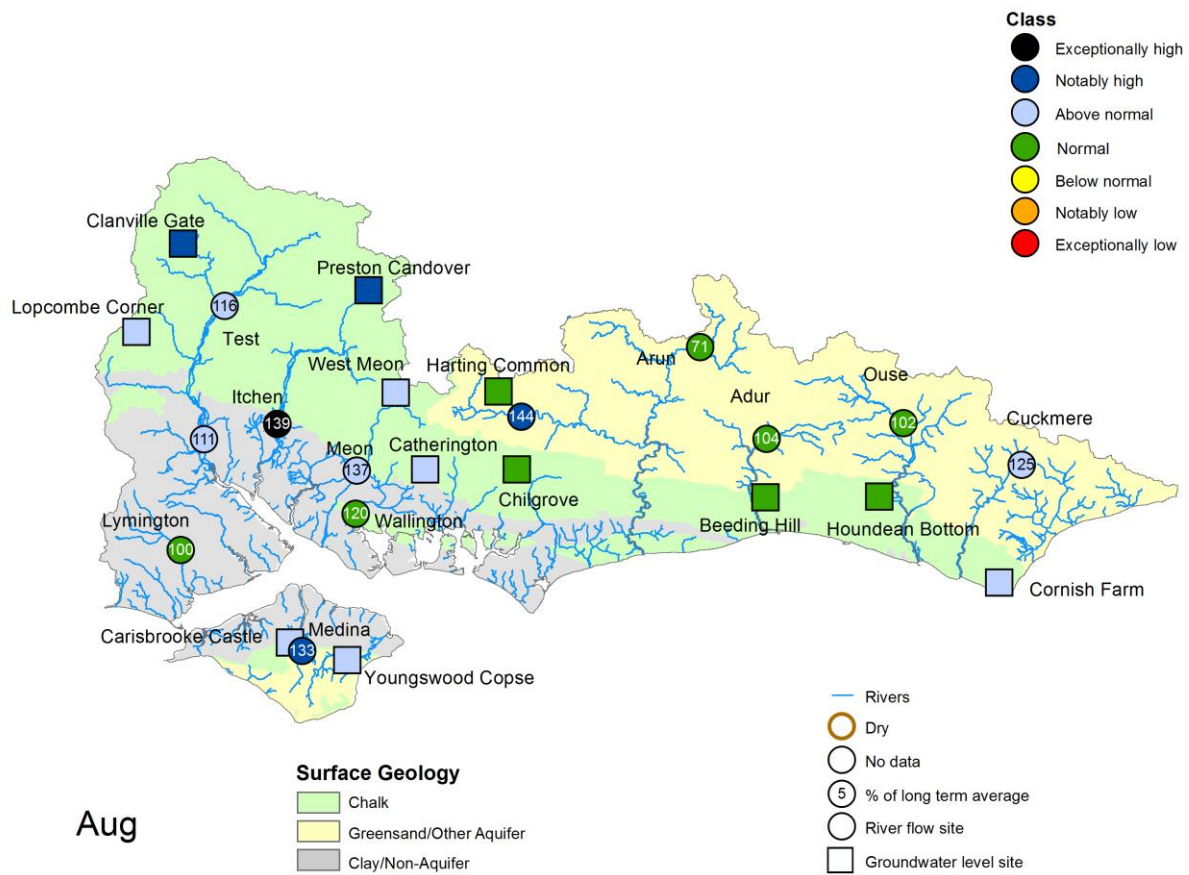


HadUK data based on the Met Office 1km gridded rainfall dataset derived from rain gauges (Source: Met Office. Crown copyright, 2023). Provisional data based on Environment Agency 1km gridded rainfall dataset derived from Environment Agency intensity rain gauges. Crown copyright. All rights reserved. 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 August 2023, expressed as a percentage of the respective long term average and classed relative to an analysis of historic August monthly means. Table available in the appendices with detailed information.

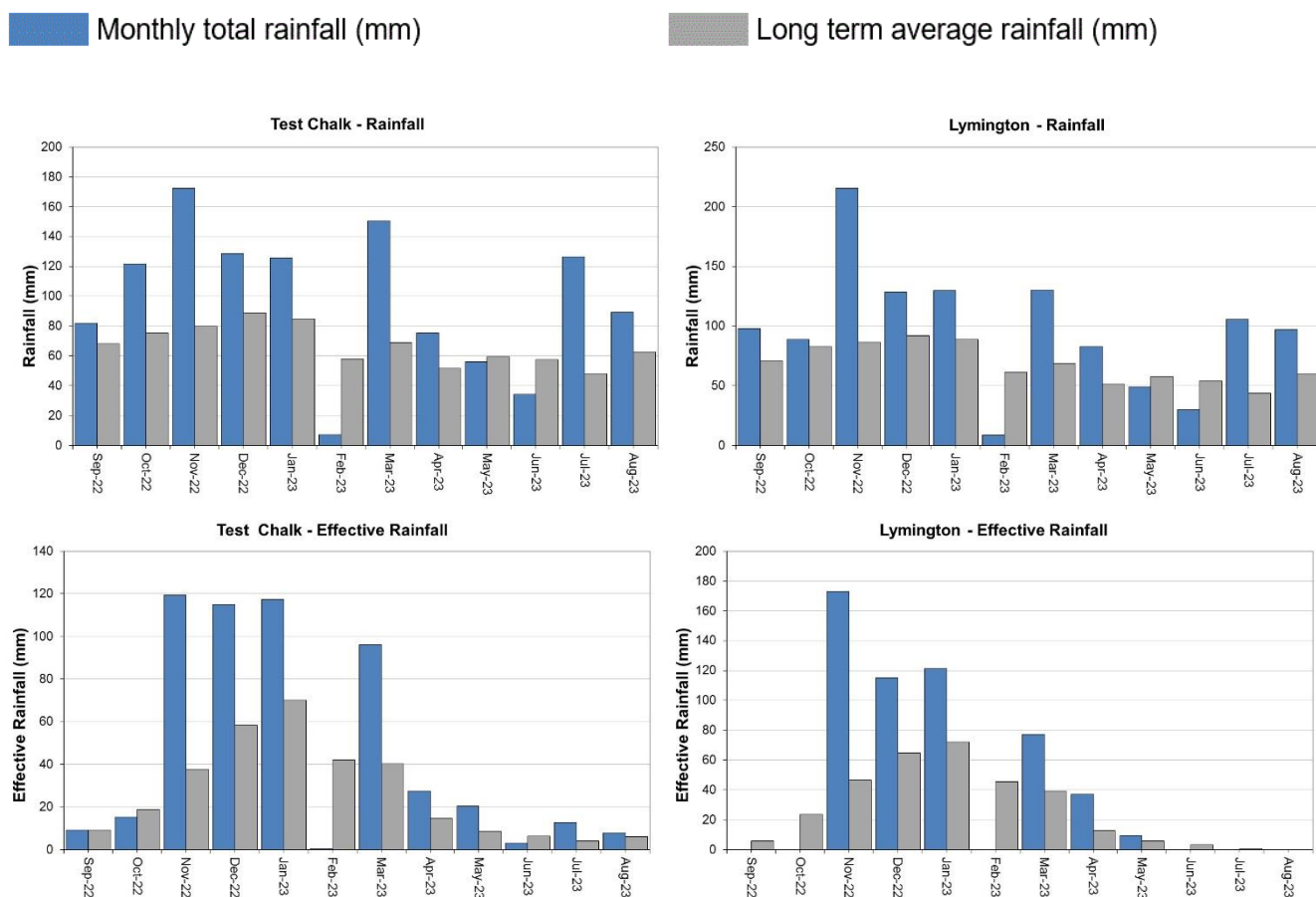


(Source: Environment Agency). Crown copyright. All rights reserved. Environment Agency, 100024198, 2023. Geological map reproduced with kind permission from UK Groundwater Forum, BGS copyright NERC. Crown copyright. All rights reserved. Environment Agency, 100024198, 2023.

4 West Hampshire

4.1 West Hampshire Rainfall and effective rainfall charts

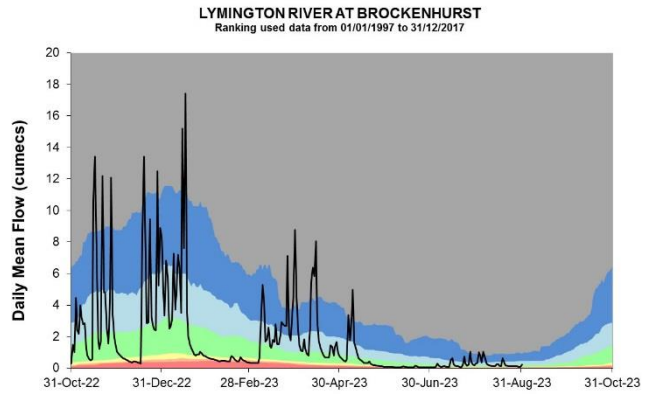
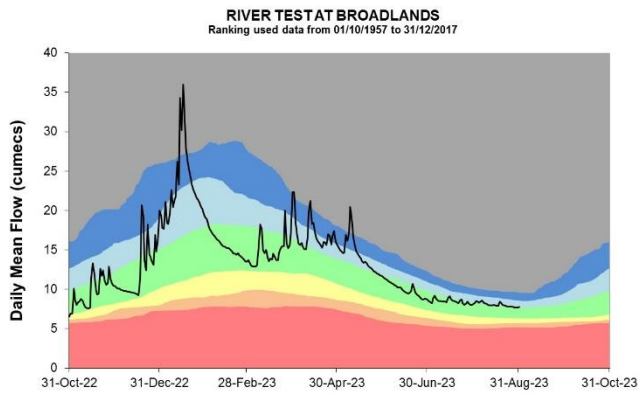
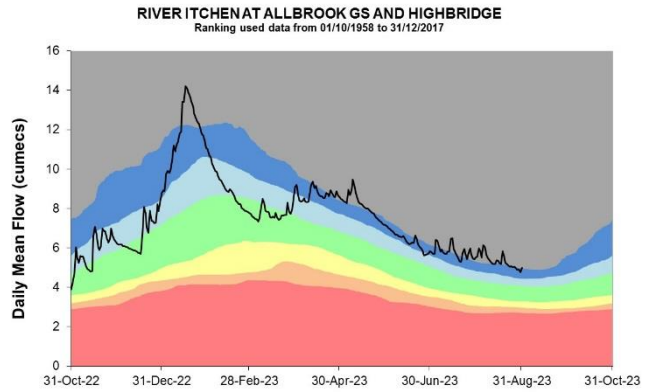
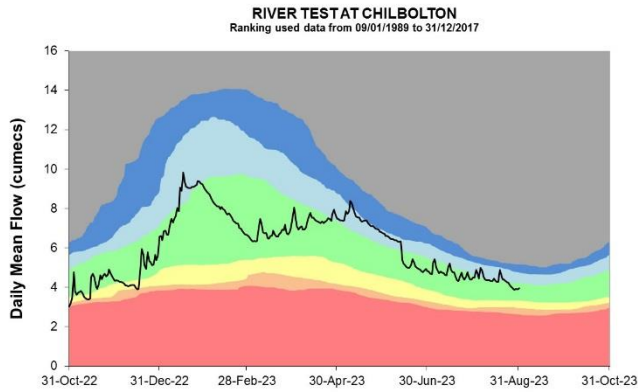
Figure 4.1: Monthly rainfall and effective rainfall totals for the past 12 months compared to the 1961 to 1990 long term average.



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

4.2 West Hampshire River flow charts

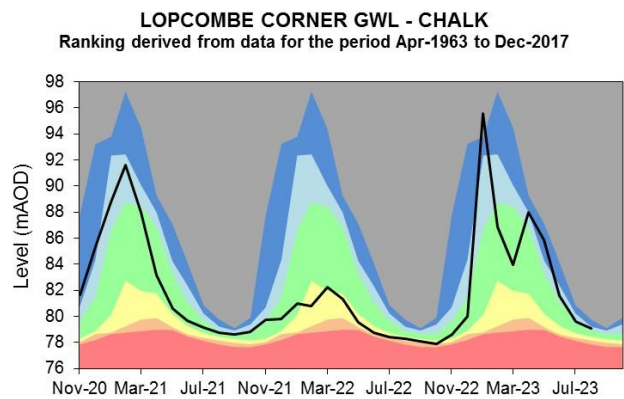
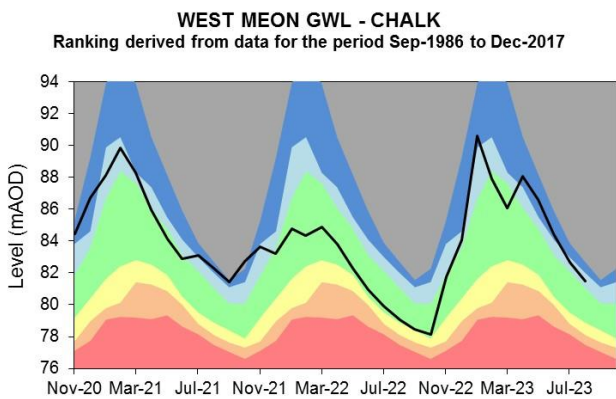
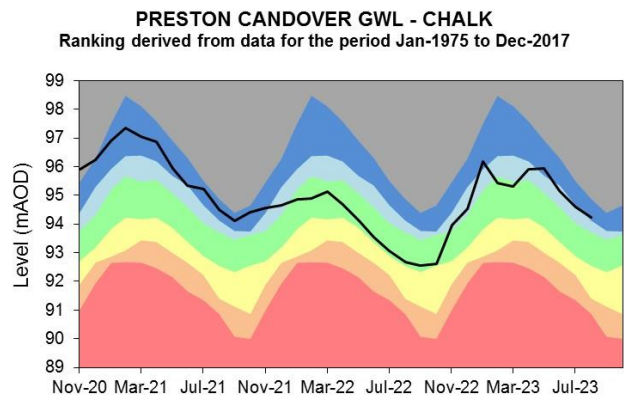
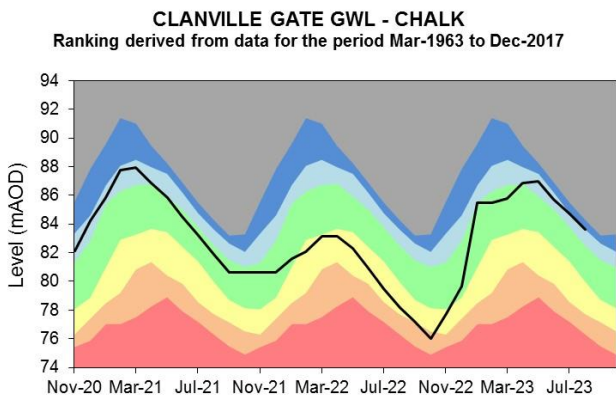
Figure 4.2: Daily mean river flow for index sites over the past year, compared to an analysis of historic daily mean flows, and long term maximum and minimum flows.



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.

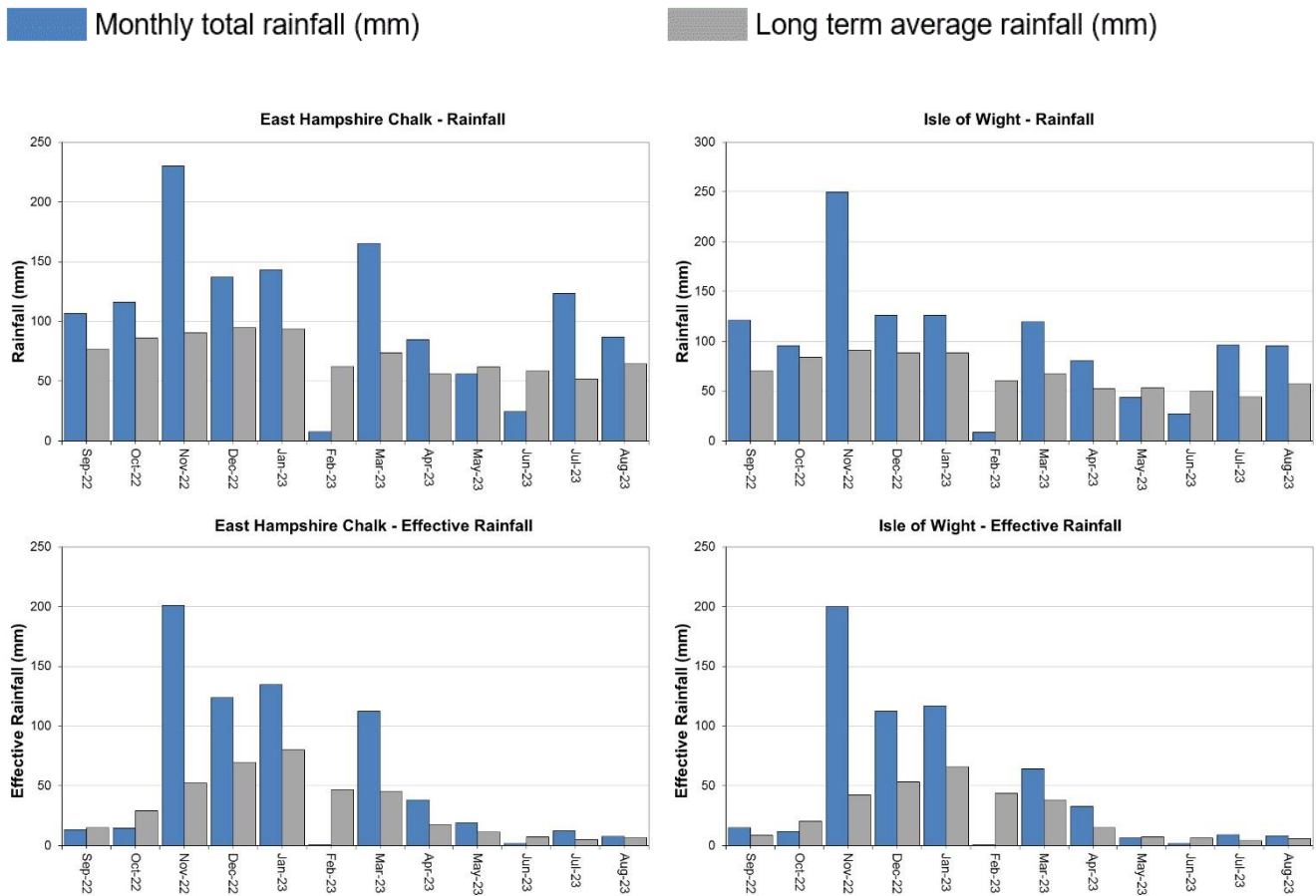


Source: Environment Agency, 2023.

5 East Hampshire and Isle of Wight

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

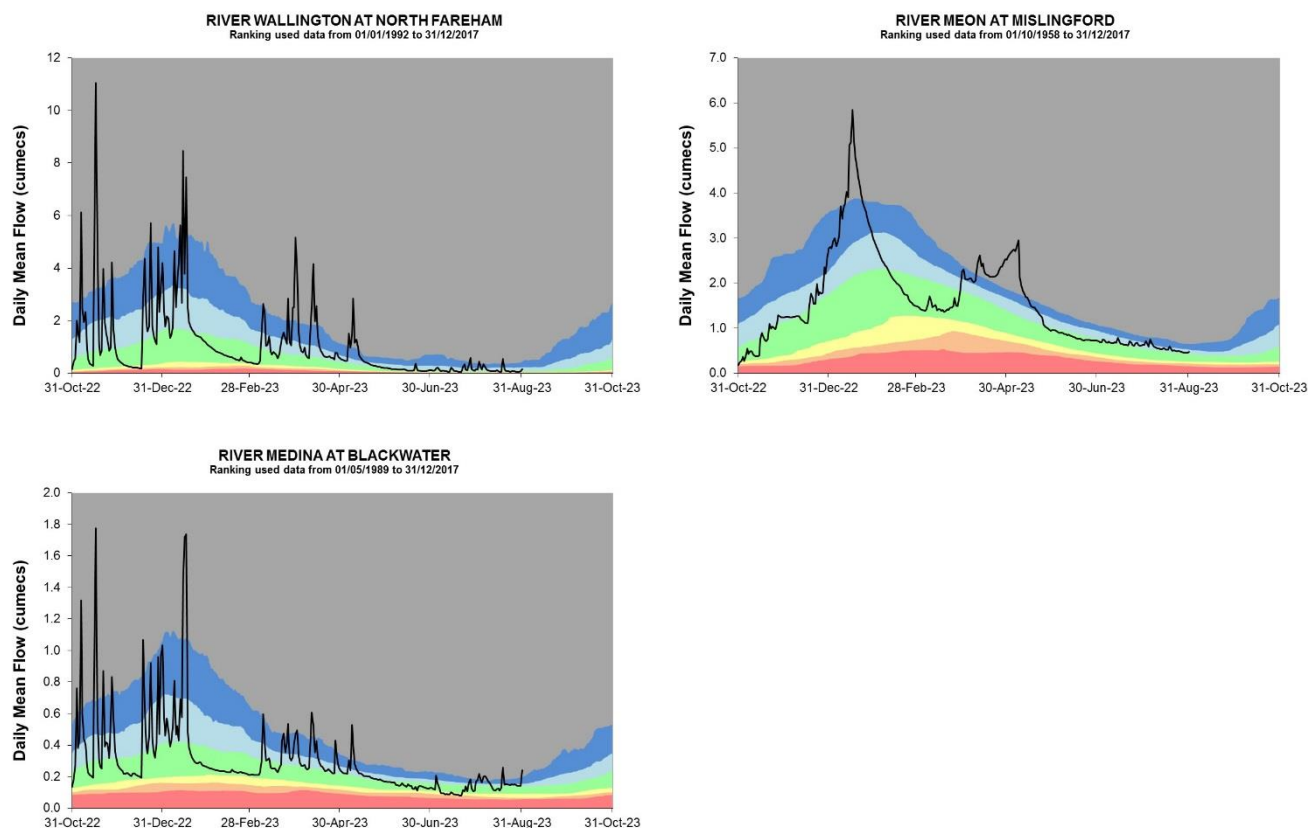
Figure 5.1: Monthly rainfall and effective rainfall totals for the past 12 months compared to the 1961 to 1990 long term average.



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

5.2 East Hampshire and Isle of Wight River flow charts

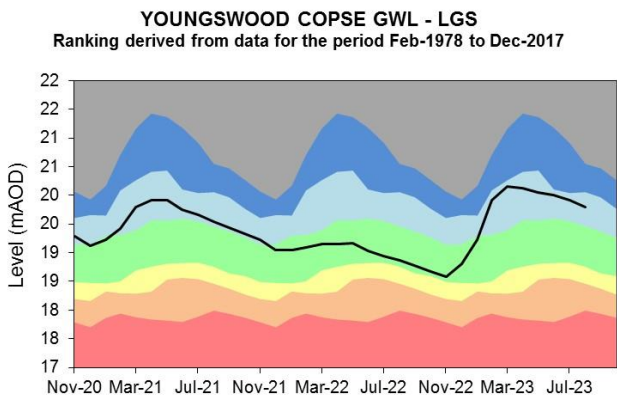
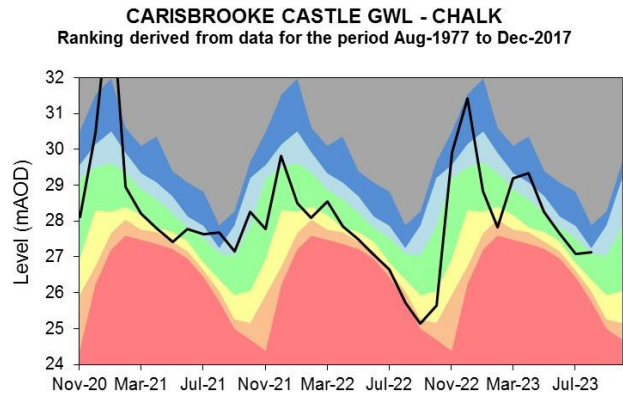
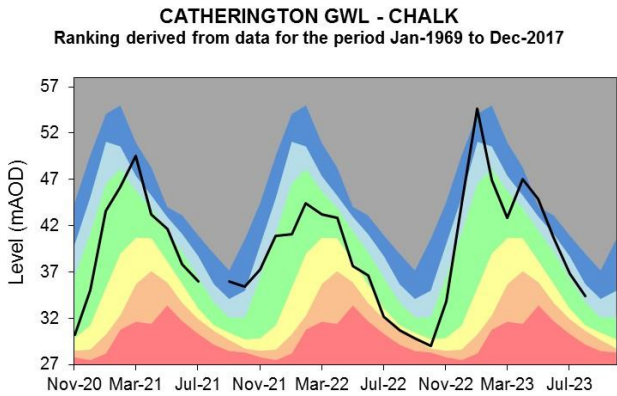
Figure 5.2 Daily mean river flow for index sites over the past year, compared to an analysis of historic daily mean flows, and long term maximum and minimum flows.



Source: Environment Agency, 2023.

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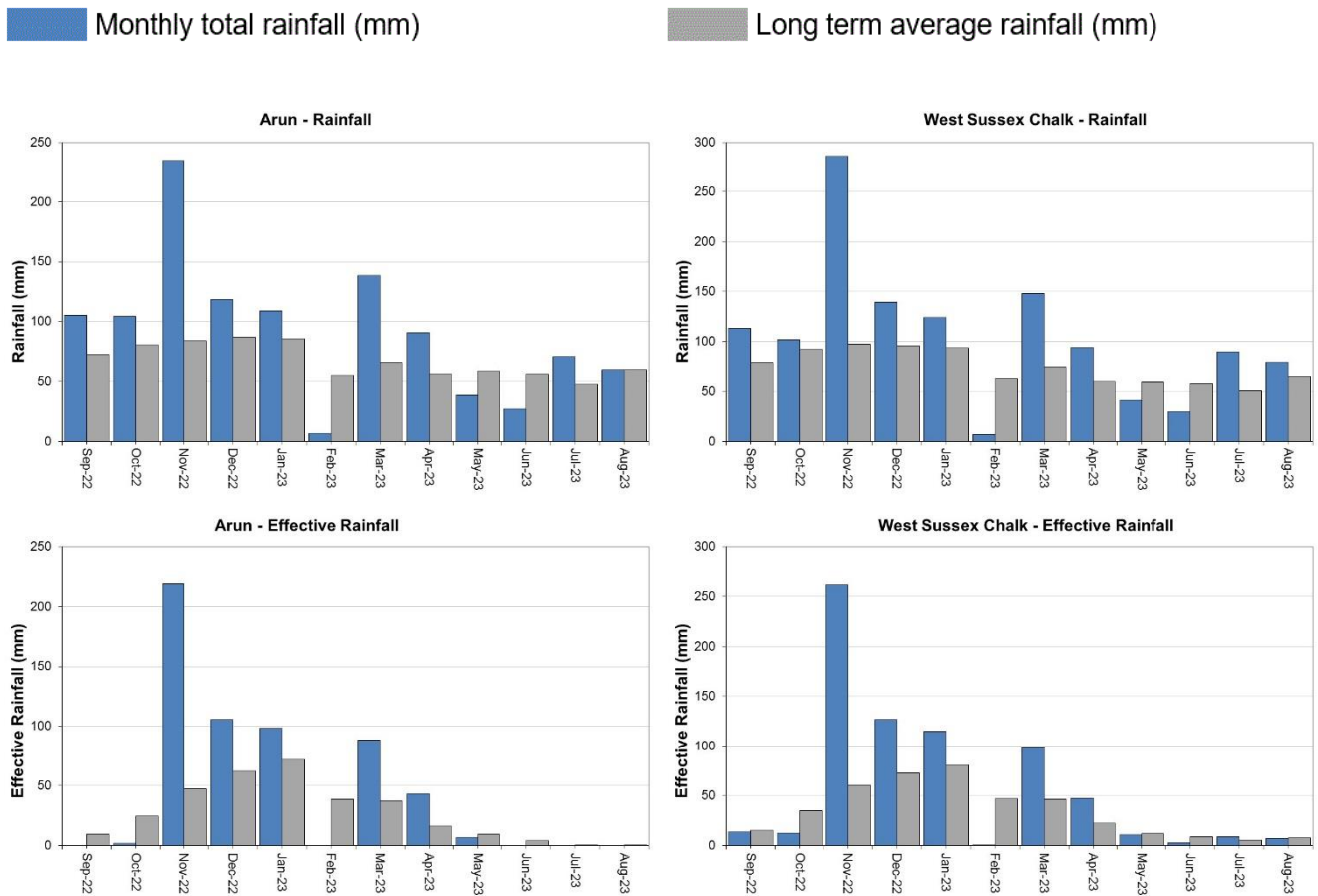


Source: Environment Agency, 2023.

6 West Sussex

6.1 West Sussex Rainfall and Effective Rainfall charts

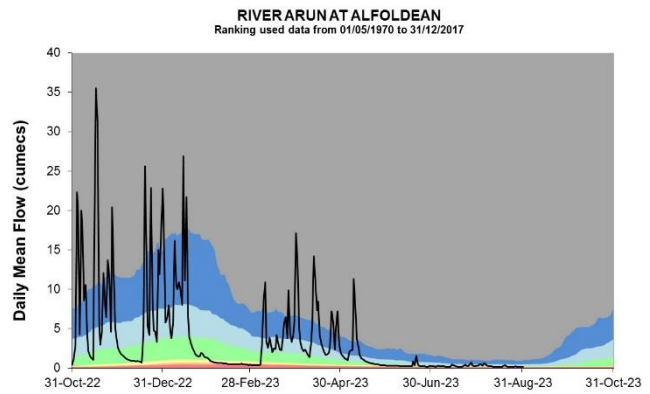
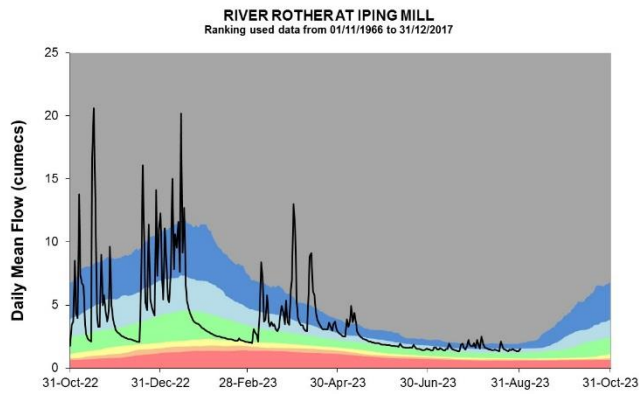
Figure 6.1: Monthly rainfall and effective rainfall totals for the past 12 months as a percentage of the 1961 to 1990 long term average.



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

6.2 West Sussex River flow charts

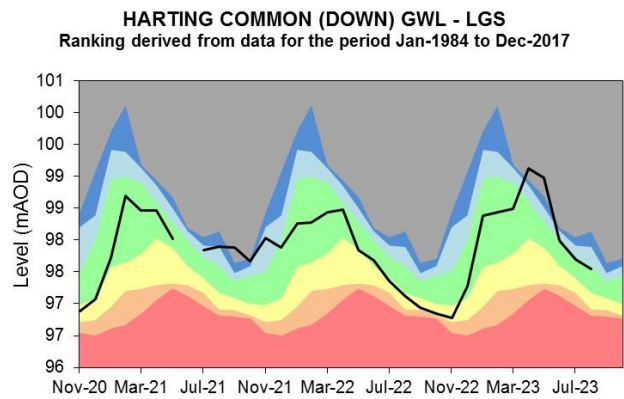
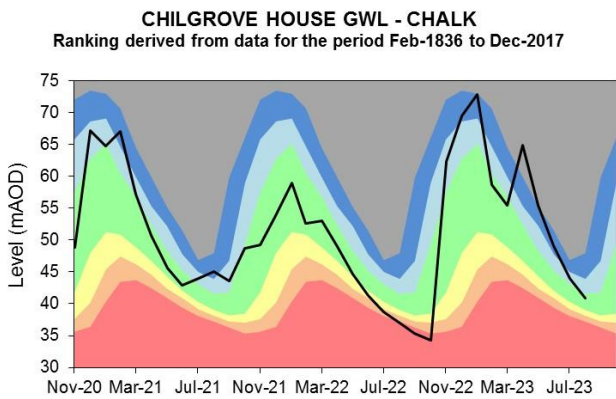
Figure 6.2: Daily mean river flow for index sites over the past year, compared to an analysis of historic daily mean flows, and long term maximum and minimum flows.



Source: Environment Agency, 2023.

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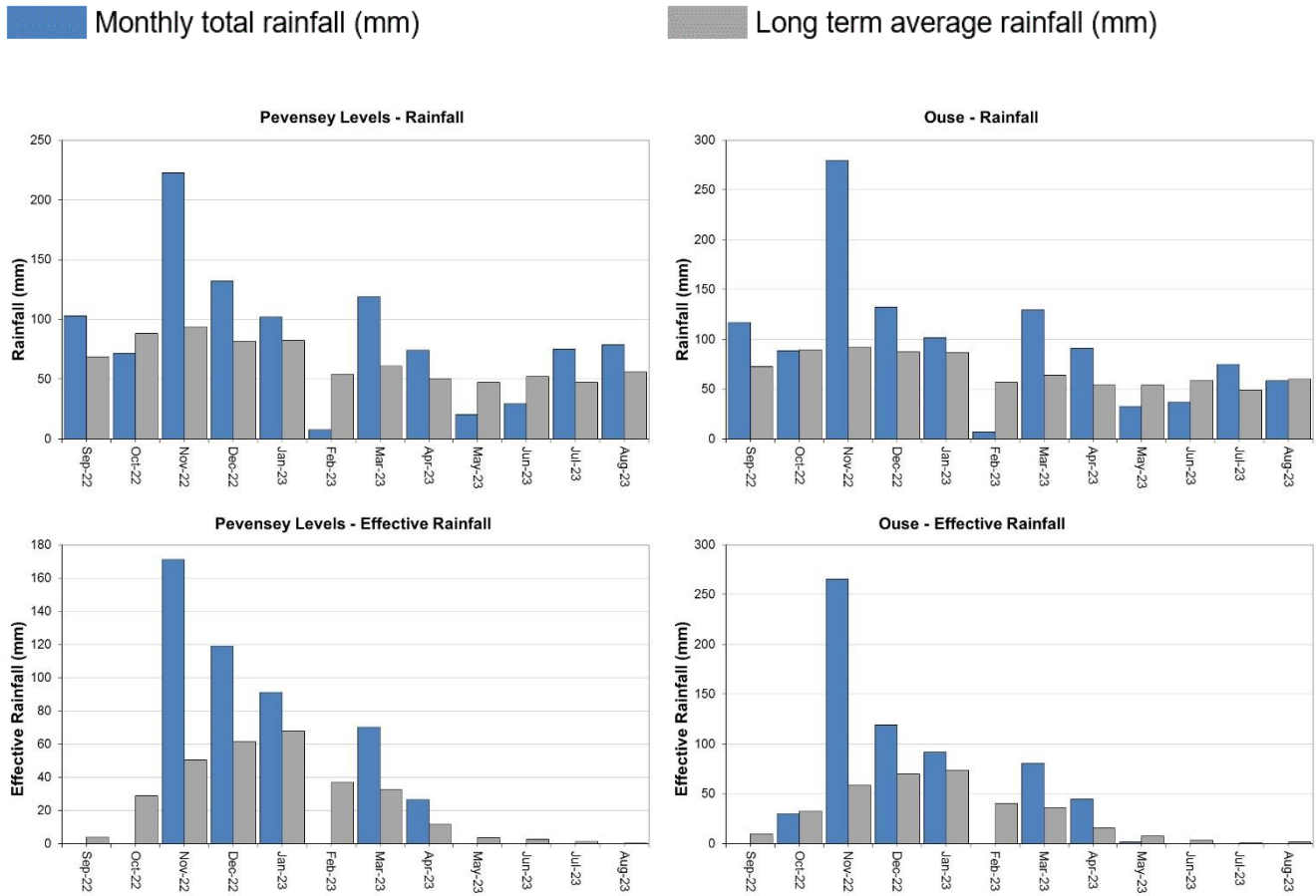


Source: Environment Agency, 2023.

7 East Sussex

7.1 East Sussex Rainfall and Effective Rainfall charts

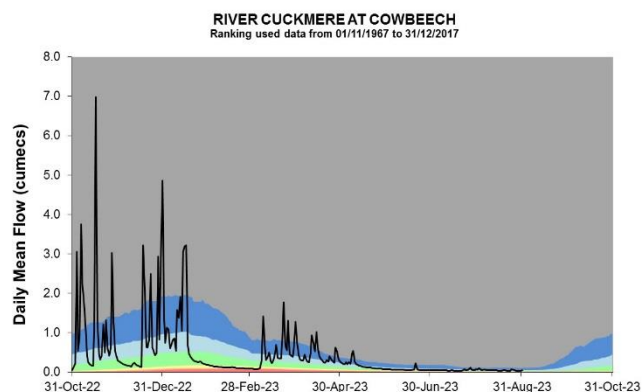
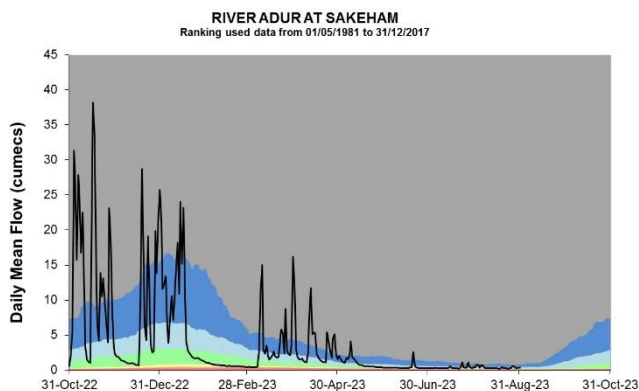
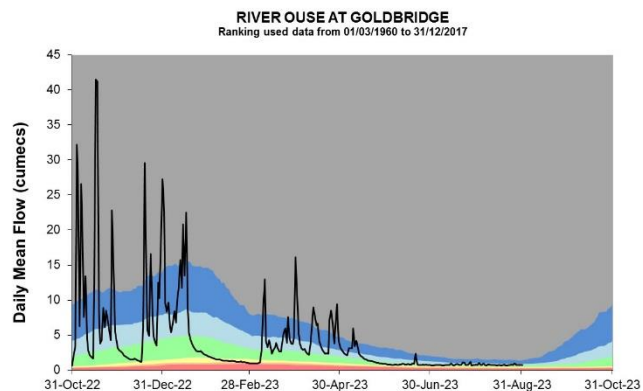
Figure 7.1: Monthly rainfall and effective rainfall totals for the past 12 months compared to the 1961 to 1990 long term average.



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

7.2 East Sussex River flow charts

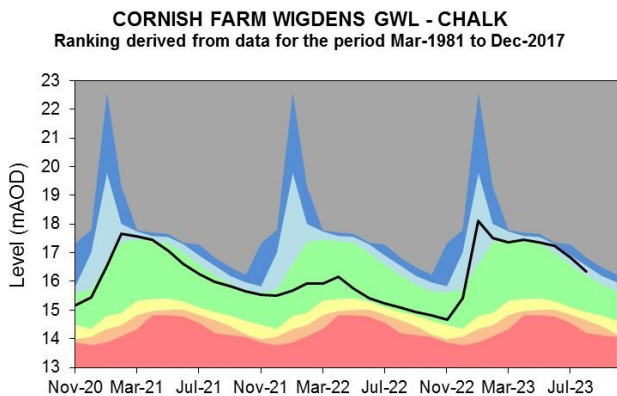
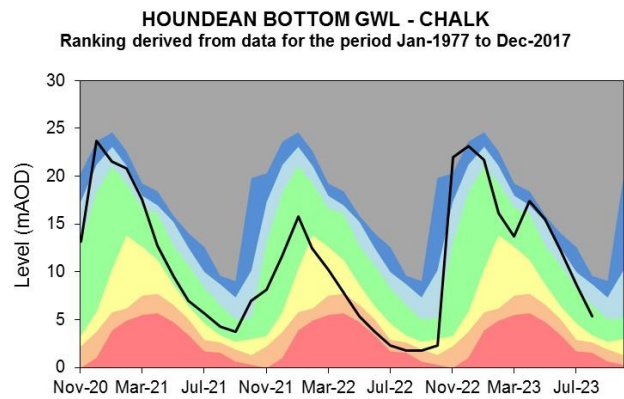
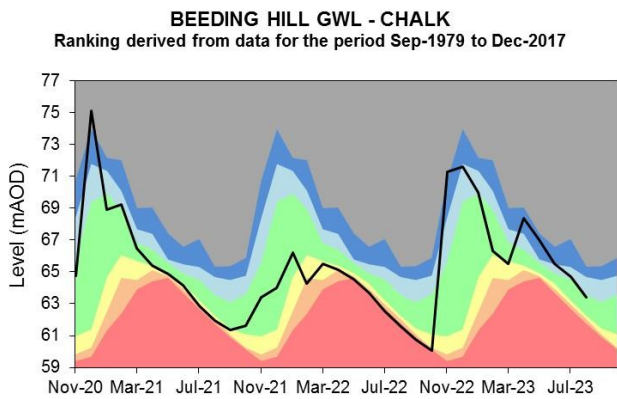
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Source: Environment Agency, 2023.

7.3 East Sussex Groundwater level charts

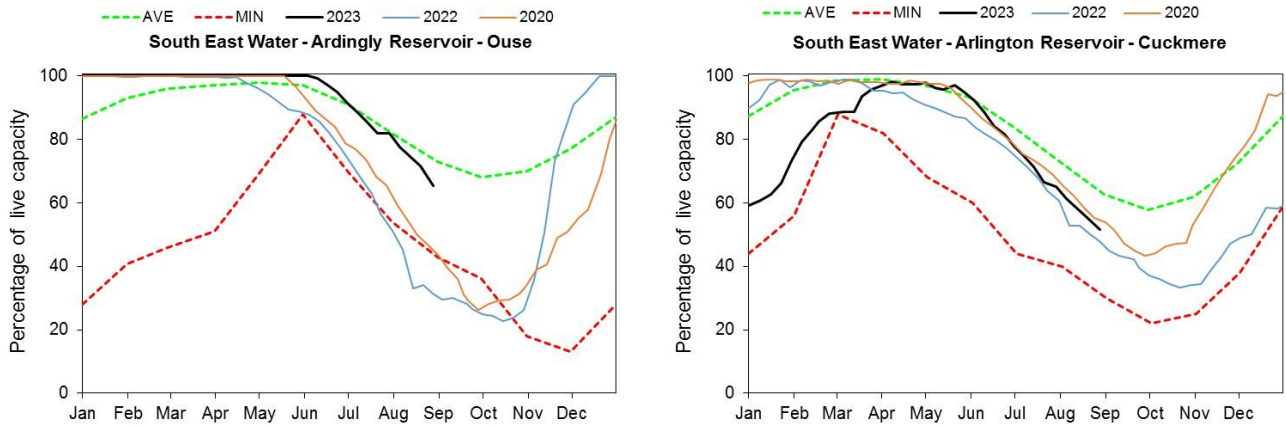
Figure 7.3: End of month groundwater levels at index groundwater level sites for major aquifers. 34 months compared to an analysis of historic end of month levels and long term maximum and minimum levels.



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 areal rainfall, effective rainfall (percolation or runoff) and soil moisture deficit for the hydrological areas across the SSD. 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) 30 day Total	Rainfall August as %LTA	Effective Rainfall (mm) 30 day Total	Effective Rainfall August as %LTA	Soil Moisture Deficit (SMD) Day 30	SMD End of August LTA
Test Chalk	89	143%	8	129%	77	92
East Hampshire Chalk	87	134%	8	116%	84	86
West Sussex Chalk	79	122%	7	92%	96	83
East Sussex Chalk	77	128%	7	115%	95	86
Isle of Wight	96	166%	8	142%	90	98
Western Rother Greensand	79	121%	7	95%	98	85
Hampshire Tertiaries	90	153%	0	0%	84	92
Lymington	97	163%	0	0%	70	86
Sussex Coast	70	132%	0	0%	115	98
Arun	59	100%	0	0%	115	82
Adur	57	95%	0	0%	112	81
Ouse	59	98%	0	0%	101	76
Cuckmere	72	120%	0	0%	81	76
Pevensey Levels	78	141%	0	0%	88	84
SSD Average	78	129%	3	105%	93	86

10.2 Seasonal summary table of rainfall and effective rainfall

Summer season: 01/04/2023 to 30/09/2023

Hydrological Area	Seasonal Rainfall (mm) Total	Seasonal Rainfall as % LTA	Seasonal Effective Rainfall (mm) Total	Seasonal Effective Rainfall as % LTA
Test Chalk	380	137%	68	169%
East Hampshire Chalk	375	128%	74	156%
West Sussex Chalk	333	114%	69	124%
East Sussex Chalk	308	113%	50	111%
Isle of Wight	342	133%	56	145%
Western Rother Greensand	340	115%	70	127%
Hampshire Tertiaries	357	136%	39	233%
Lymington	365	137%	42	192%
Sussex Coast	280	115%	26	151%
Arun	286	103%	42	140%
Adur	276	101%	38	129%
Ouse	294	107%	38	128%
Cuckmere	292	109%	25	99%
Pevensey Levels	279	110%	20	104%
SSD Average	322	118%	47	139%

10.3 Rainfall banding table

Hydrological area	Aug 2023 band	Jun 2023 to Aug 2023 cumulative band	Mar 2023 to Aug 2023 cumulative band	Sep 2022 to Aug 2023 cumulative band
Test Chalk	Above normal	Above normal	Exceptionally high	Exceptionally high
East Hampshire Chalk	Normal	Normal	Exceptionally high	Exceptionally high
West Sussex Chalk	Normal	Normal	Notably high	Exceptionally high
East Sussex Chalk	Normal	Normal	Notably high	Exceptionally high
Isle of Wight	Above normal	Above normal	Exceptionally high	Exceptionally high
Western Rother Greensand	Normal	Normal	Notably high	Exceptionally high
Hampshire Tertiaries	Normal	Above normal	Exceptionally high	Exceptionally high
Lymington	Above normal	Above normal	Exceptionally high	Exceptionally high
Sussex Coast	Normal	Normal	Notably high	Exceptionally high
Arun	Normal	Normal	Above normal	Exceptionally high
Adur	Normal	Normal	Above normal	Exceptionally high
Ouse	Normal	Normal	Above normal	Exceptionally high
Cuckmere	Normal	Normal	Above normal	Exceptionally high
Pevensey Levels	Normal	Normal	Above normal	Exceptionally high

10.4 River flows table

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

10.5 Groundwater table

Site name	Aquifer	End of Aug 2023 band	End of July 2023 band
Houndean Bottom Gwl	Brighton Chalk Block	Normal	Above normal
Chilgrove House Gwl	Chichester-Worthing-Portsdown Chalk	Normal	Above normal
Carisbrooke Castle	Isle Of Wight Central Downs Chalk	Above normal	Normal
West Meon Hut Gwl	River Itchen Chalk	Above normal	Above normal
Clanville Gate Gwl	River Test Chalk	Notably high	Above normal
Lopcombe Corner Gwl	River Test Chalk	Above normal	Normal
Beeding Hill Gwl	Brighton Chalk Block	Normal	Above normal
Catherington	River Meon Chalk	Above normal	Above normal
Cornish Wigdens Gwtr	Eastbourne Chalk Block	Above normal	Above normal
Harting Common Down	Western Rother Lower Greensand	Normal	No data available in July
Preston Candover	River Itchen Chalk	Notably high	Above normal
Youngwoods Copse	Isle of Wight Lower Greensand	Above normal	Above normal

10.6 Abstraction licence flow constraints

Number of flow constraints in force between 1 to 7 August 2022	Number of flow constraints in force between 8 to 14 August 2022	Number of flow constraints in force between 15 to 21 August 2022	Number of flow constraints in force between 22 to 28 August 2022	Number of flow constraints in force between 29 to 31 August 2022
1	2	7	3	3

10.7 Solent and South Downs Areal Rainfall Units Map



10.8 SSD Areal Rainfall Monthly Long Term Averages

Hydrological Area	Jan LTA mm	Feb LTA mm	Mar LTA mm	Apr LTA mm	May LTA mm	Jun LTA mm	Jul LTA mm	Aug LTA mm	Sep LTA mm	Oct LTA mm	Nov LTA mm	Dec LTA mm
Test Chalk	85	58	69	52	59	58	48	63	68	75	78	89
East Hampshire Chalk	94	63	74	56	62	59	52	65	77	86	90	95
West Sussex Chalk	93	63	74	60	60	58	51	65	79	92	97	95
East Sussex Chalk	87	57	65	54	52	58	49	60	73	93	98	89
Isle of Wight	88	60	67	52	53	50	44	58	70	84	91	88
Western Rother Greensand	100	65	76	61	63	57	51	66	79	91	95	100
Hampshire Tertiaries	86	59	67	50	57	53	45	59	70	79	83	87
Lymington	89	61	68	52	58	54	44	60	71	83	87	92
Sussex Coast	77	51	61	50	50	48	42	53	64	77	81	79
Arun	85	55	66	56	58	56	48	59	72	81	84	87
Adur	85	55	64	55	56	56	46	60	72	86	89	86
Ouse	87	56	64	54	54	59	49	60	73	89	93	88
Cuckmere	85	55	62	51	50	58	49	60	72	91	94	85
Pevensey Levels	82	54	61	51	47	52	47	56	69	88	94	82
SSD Average	87	58	67	54	56	55	47	60	72	85	90	89