

# Monthly water situation report: Solent and South Downs Area

## Summary - July 2024

Solent and South Downs (SSD) had above average rainfall in July, receiving 165% (78mm) of the long term average (LTA) rainfall (47.2mm). Monthly mean river flows across SSD ranged from normal to exceptionally high. End of month groundwater levels ranged from normal to exceptionally high. Soils across SSD ended the month slightly drier than the average for July. End of month reservoir stocks were above average at Ardingly Reservoir (Ouse) and were just below average at Arlington Reservoir (Cuckmere).

### 1.1 Rainfall

SSD had above average rainfall in July, receiving 165% (78mm) of the LTA (47.2mm). The West Sussex Chalk areal unit in central SSD received the highest rainfall with 187% of LTA (50.7mm). The Pevensy Levels unit received the lowest rainfall with 122% of LTA (47.3mm).

July was a month of dry hot periods interspersed with heavy downpours from numerous thunderstorms. The highest daily rainfall totals for the month were all recorded on 15 July:

- 31mm was recorded at Ferry PS RG (Sussex Coast)
- 30mm at Broadwater RG (West Sussex Chalk)
- 27mm at Worlds End RG (Hampshire Tertiaries)
- 26mm at Ardingly RG (Ouse) and at Westergate RG (Sussex Coast)

These highest daily rainfall totals represent, on average, a third of the month's total rainfall in only one day. Heavy rainfall of up to 24mm was also experienced on 5 July and 13 July but the rainfall on these days was much more localised.

July rainfall, while above average, it is not notable. However, the water year from October to July is second wettest on record for SSD area, since 1871. All the SSD rainfall units ranked in the top three wettest October to July period on record. The Hampshire Tertiaries, Lymington, Isle of Wight, West Sussex Chalk, Sussex Coast, and Western Rother Greensand units all ranked as wettest for October to July.

### 1.2 Soil moisture deficit and recharge

Soils across SSD ended the month slightly drier (84mm) than the average for July (81mm).

### 1.3 River flows

Monthly mean river flows across SSD ranged from normal to exceptionally high.

Flows were normal on the:

- River Cuckmere at Cowbeech

Flows were above normal on the:

- River Arun at Alfoldean
- River Test at Broadlands
- River Lymington at Brockenhurst
- River Test at Chilbolton
- River Meon at Misingford
- River Wallington at North Fareham
- River Adur at Sakeham

Flows were notably high on the:

- River Ouse at Goldbridge
- River Rother at Iping Mill

Flows were exceptionally high on the:

- River Itchen at Allbrook and Highbridge

The recorded flow data for River Medina at Blackwater are correct but are not reflective of the current total flow of the river. Works upstream of the weir may have altered the flow split between the river and a flood relief channel. This may have resulted in flow bypassing the weir and therefore not recorded. Investigation is ongoing.

The monthly mean flows for July were the second highest on record at Allbrook and Highbridge (Itchen), in a record starting in 1959. Flows for Iping Mill (Western Rother) were the sixth highest on record for July since 1966.

## **1.4 Groundwater levels**

End of month groundwater levels for July ranged from normal to exceptionally high.

Groundwater levels were normal at:

- Carisbrooke Castle (Isle of Wight)
- Beeding Hill (West Sussex Chalk)

Groundwater levels were above normal at:

- Catherington (East Hampshire Chalk)
- Harting Common (Western Rother Greensand)
- Houndean Bottom (East Sussex Chalk)
- Chilgrove (West Sussex Chalk)
- 

Groundwater levels were notably high at:

- Cornish Farm (East Sussex Chalk)
- Lopcombe Corner (Test Chalk)

Groundwater levels were exceptionally high at:

- Clanville Gate (Test Chalk)
- Preston Candover (East Hampshire Chalk)
- West Meon (East Hampshire Chalk)
- Youngwoods Copse (Isle of Wight)

Groundwater levels for July were the second highest on record at West Meon (since 1986), Youngwoods Copse (since 1978), and Preston Candover (since 1975). Groundwater levels were the third highest on record at Clanville Gate and fourth highest at Cornish Farm since 1966 and 1981 respectively.

## 1.5 Reservoir stocks

End of month reservoir stocks were:

- above average at Ardingly Reservoir (Ouse) with 90.8% of total capacity (LTA 82%)
- below average at Arlington Reservoir (Cuckmere) with 70.4% of total capacity (LTA 73.4%).

## 1.6 Environmental impact

During July there was a reduced abstraction rates restriction on the river Meon in force and the Cuckmere and one cessation on the Loxwood Stream (Arun).

There were no Flood Alerts or Flood Warnings issued in SSD during July.

Author: [HydrologySSD@environment-agency.gov.uk](mailto:HydrologySSD@environment-agency.gov.uk)

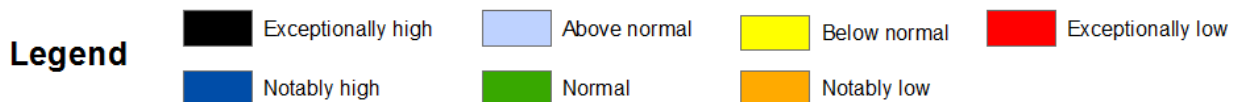
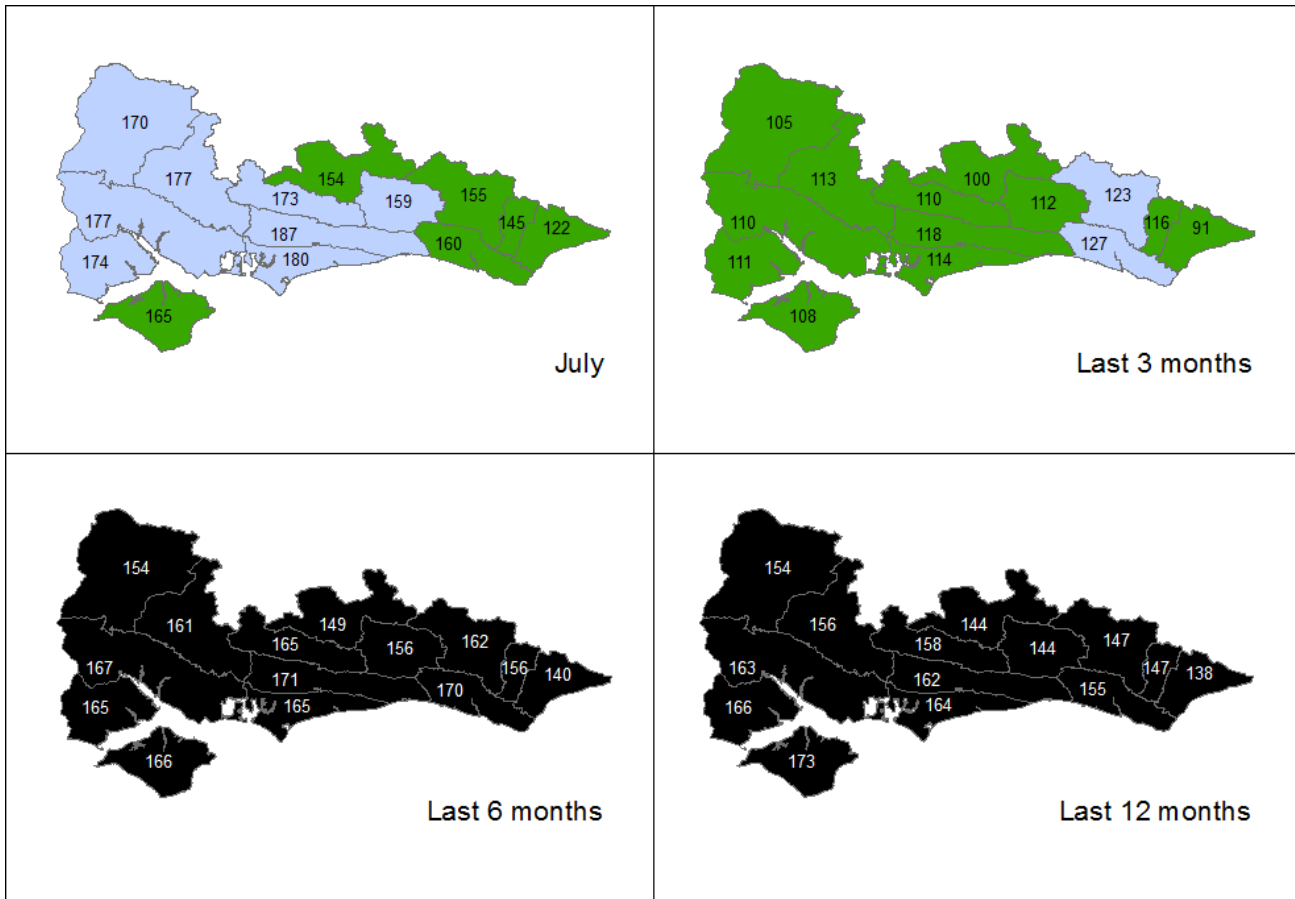
Contact details: 03708 506 506

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 in this report.

## 2. Rainfall

### 2.1 Rainfall map

Figure 2.1: Total rainfall for hydrological areas for the current month (up to 31 July 2024), 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.

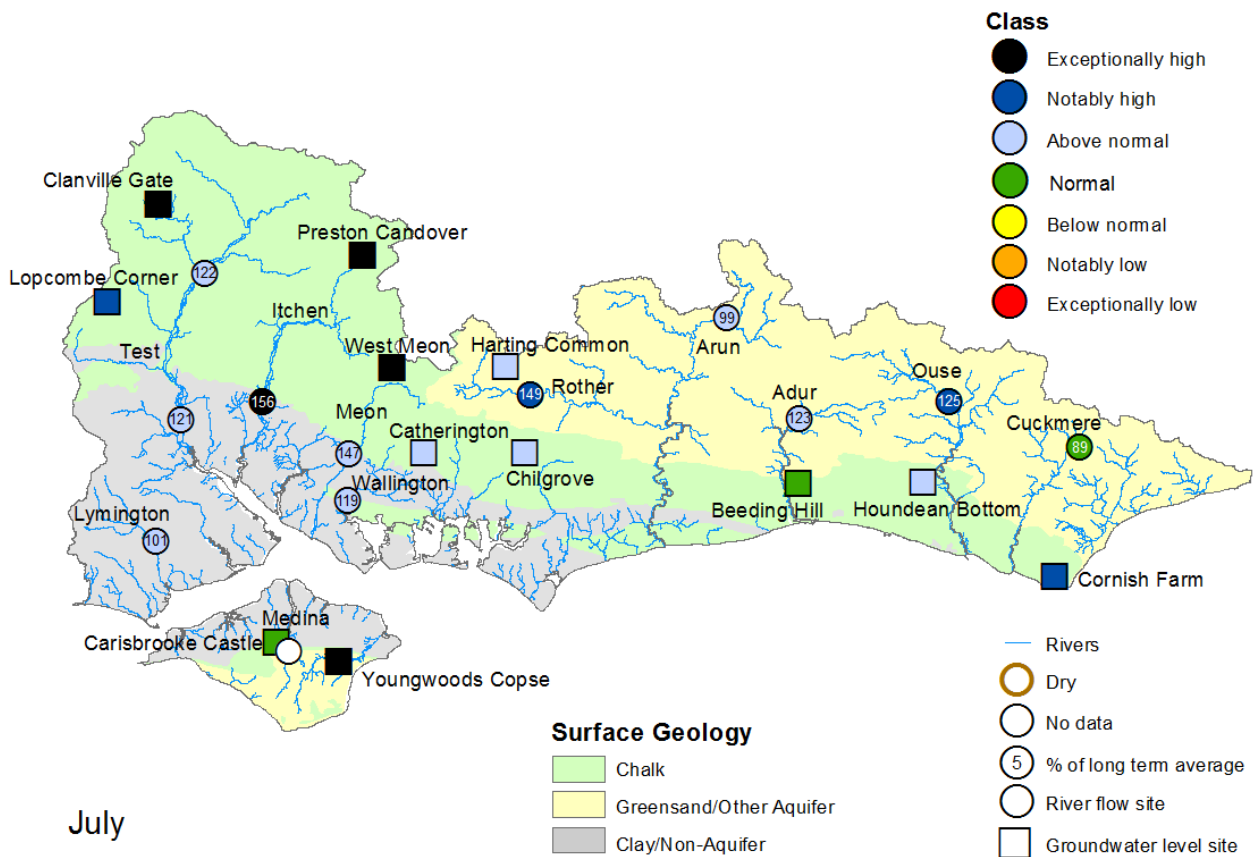


Rainfall data for 2024, extracted from Environment Agency 1km gridded rainfall dataset derived from Environment Agency intensity rain gauges. (Source: Environment Agency. Crown Copyright, 100024198, 2024). Rainfall data prior to 2023, extracted from Met Office HadUK 1km gridded rainfall dataset derived from registered rain gauges (Source: Met Office. Crown copyright, 2024).

# 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 July 2024, expressed as a percentage of the respective long term average and classed relative to an analysis of historic July monthly means. Table available in the appendices with detailed information.



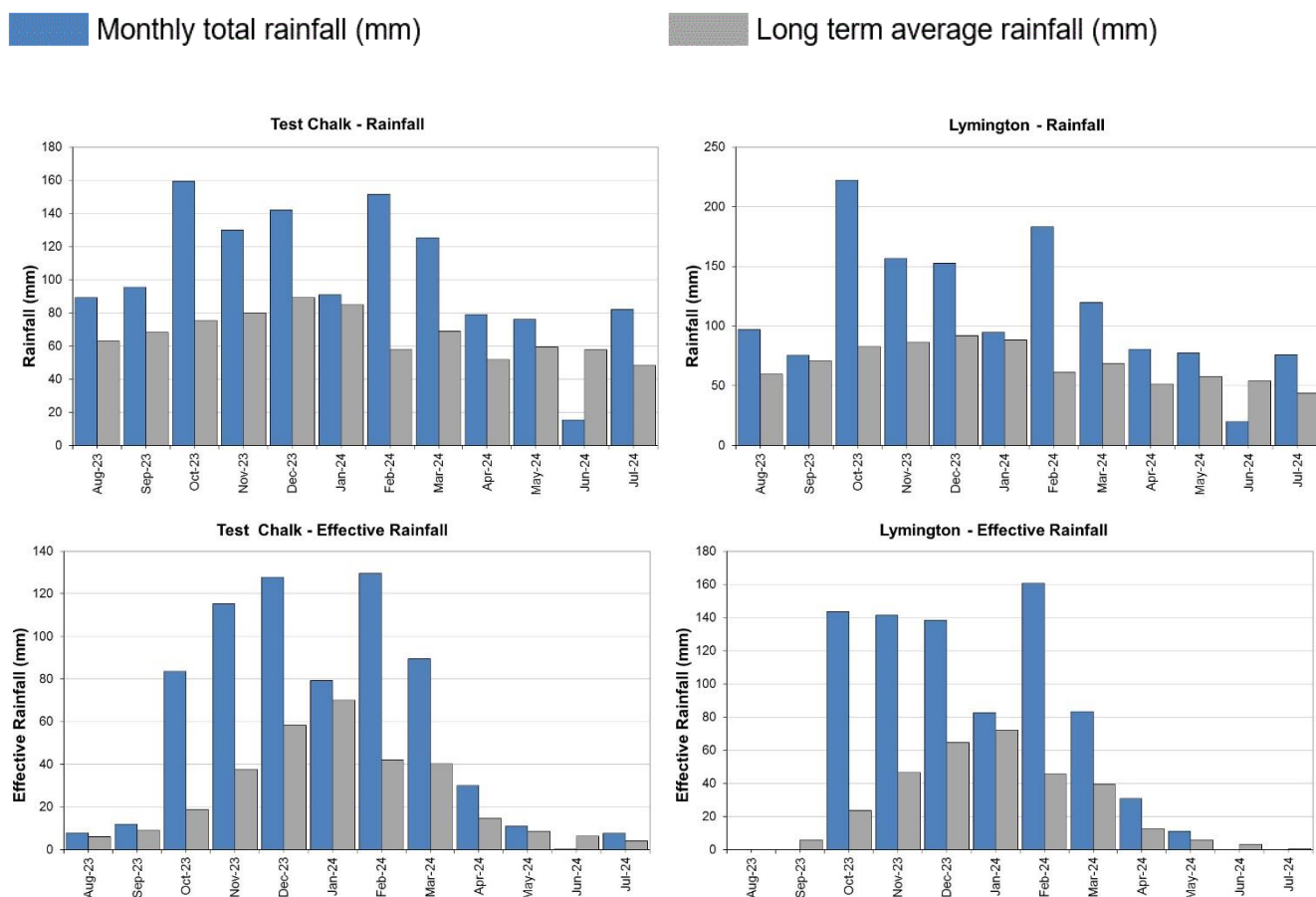
Note: No data shown for the River Medina due to flows at weir suspected to not be reflective of current total flow of Medina.

(Source: Environment Agency). Crown copyright. All rights reserved. Environment Agency, 100024198, 2024. Geological map reproduced with kind permission from UK Groundwater Forum, BGS copyright NERC. Crown copyright. All rights reserved. Environment Agency, 100024198, 2024.

# 4 West Hampshire

## 4.1 West Hampshire Rainfall and effective rainfall charts

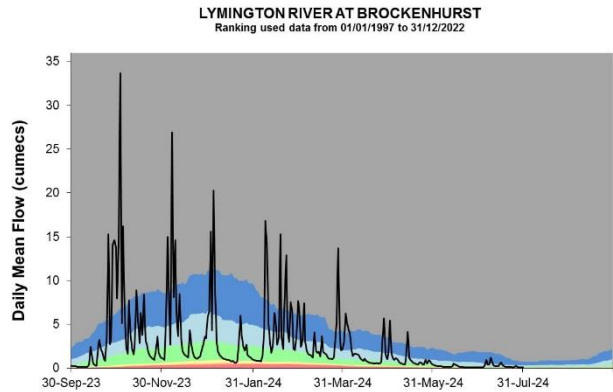
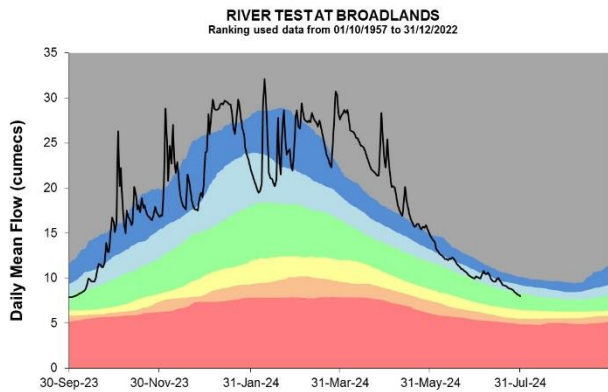
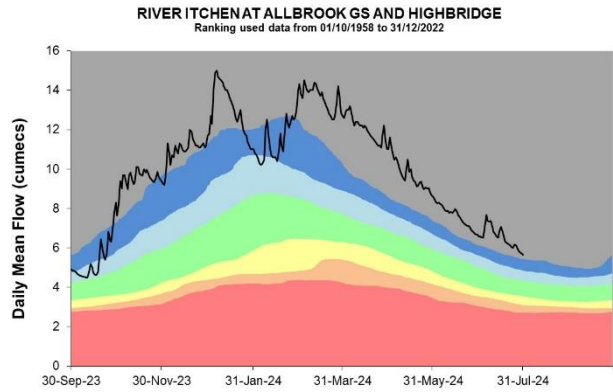
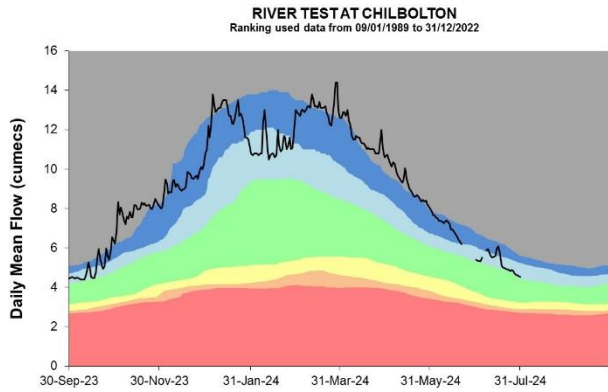
Figure 4.1: Monthly rainfall and effective rainfall totals for the past 12 months compared to the 1961 to 1990 long term average.



HadUK rainfall data. (Source: Met Office. Crown copyright, 2024).

## 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.

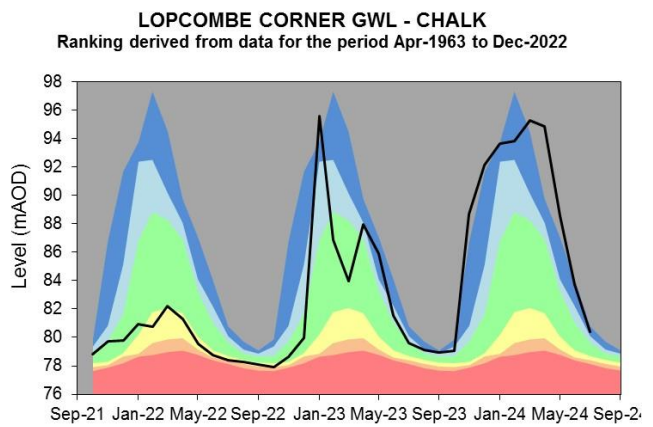
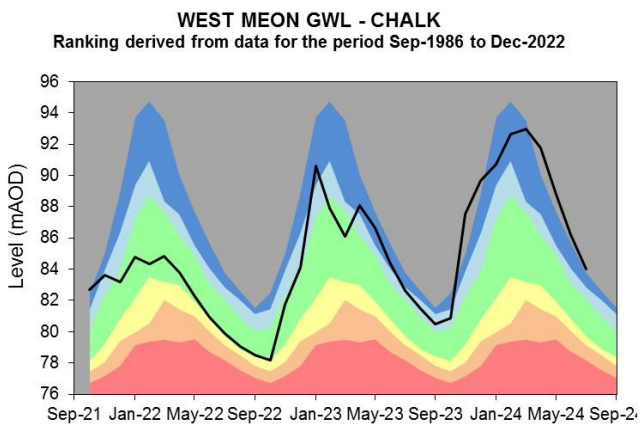
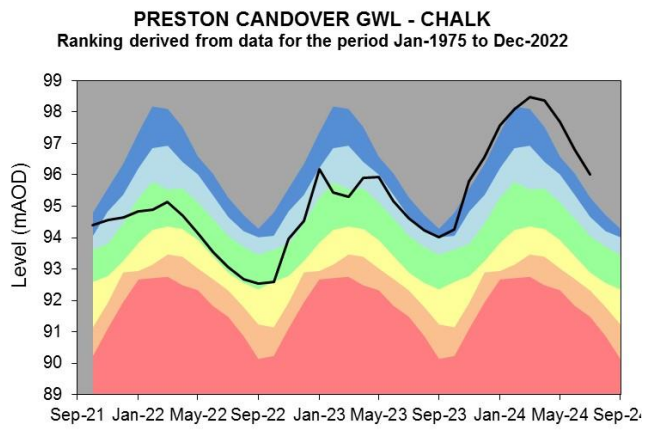
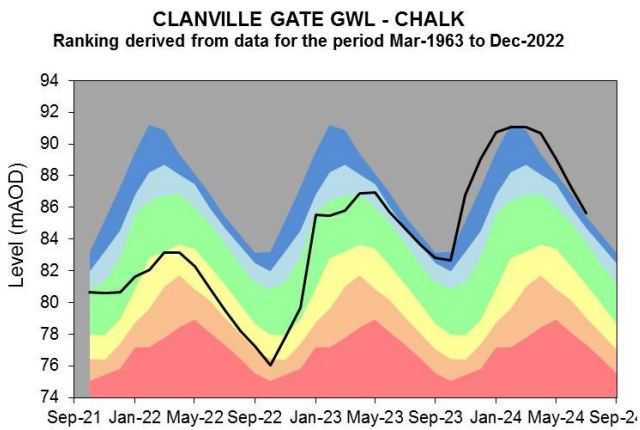


Source: Environment Agency, 2024.



### 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.



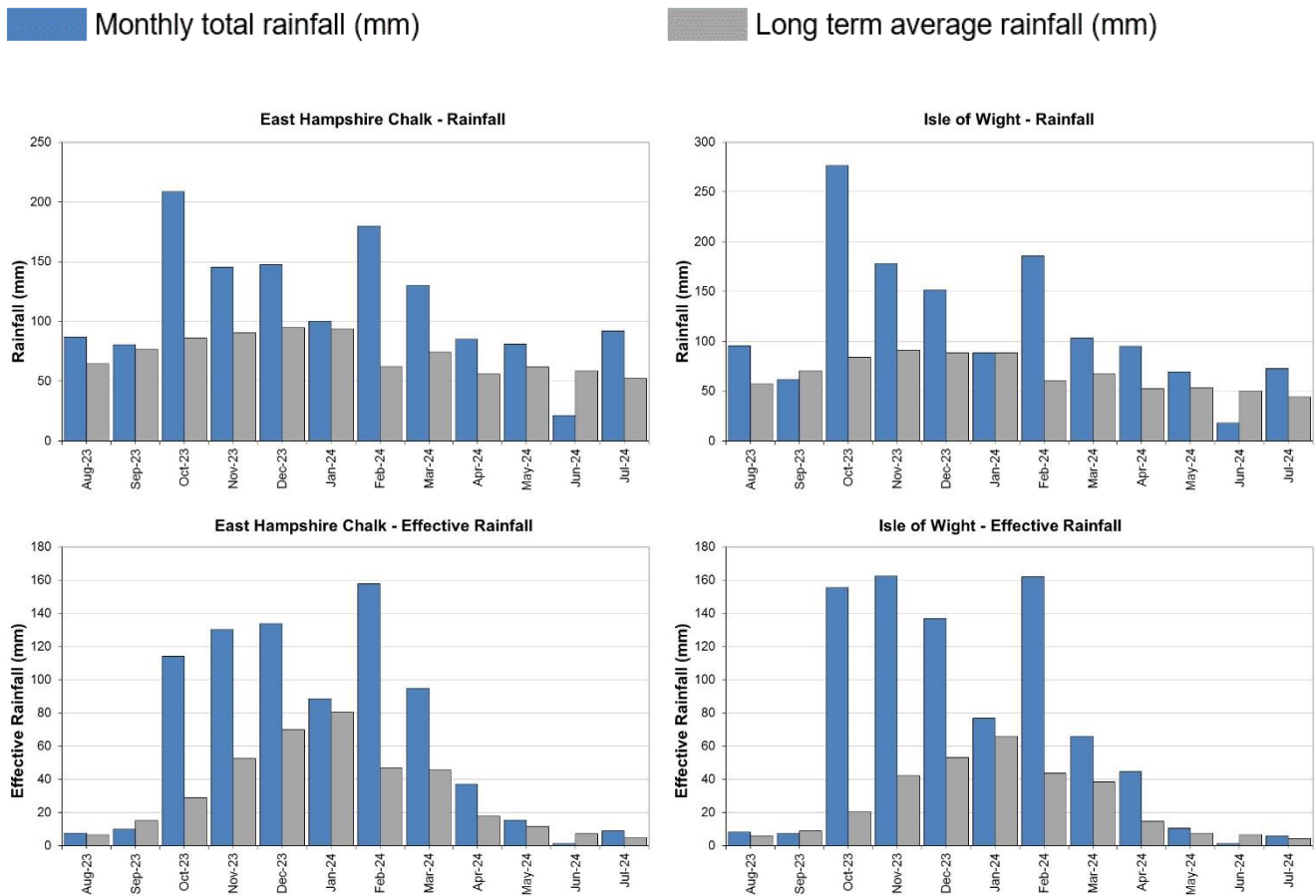
Source: Environment Agency, 2024.



# 5 East Hampshire and Isle of Wight

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

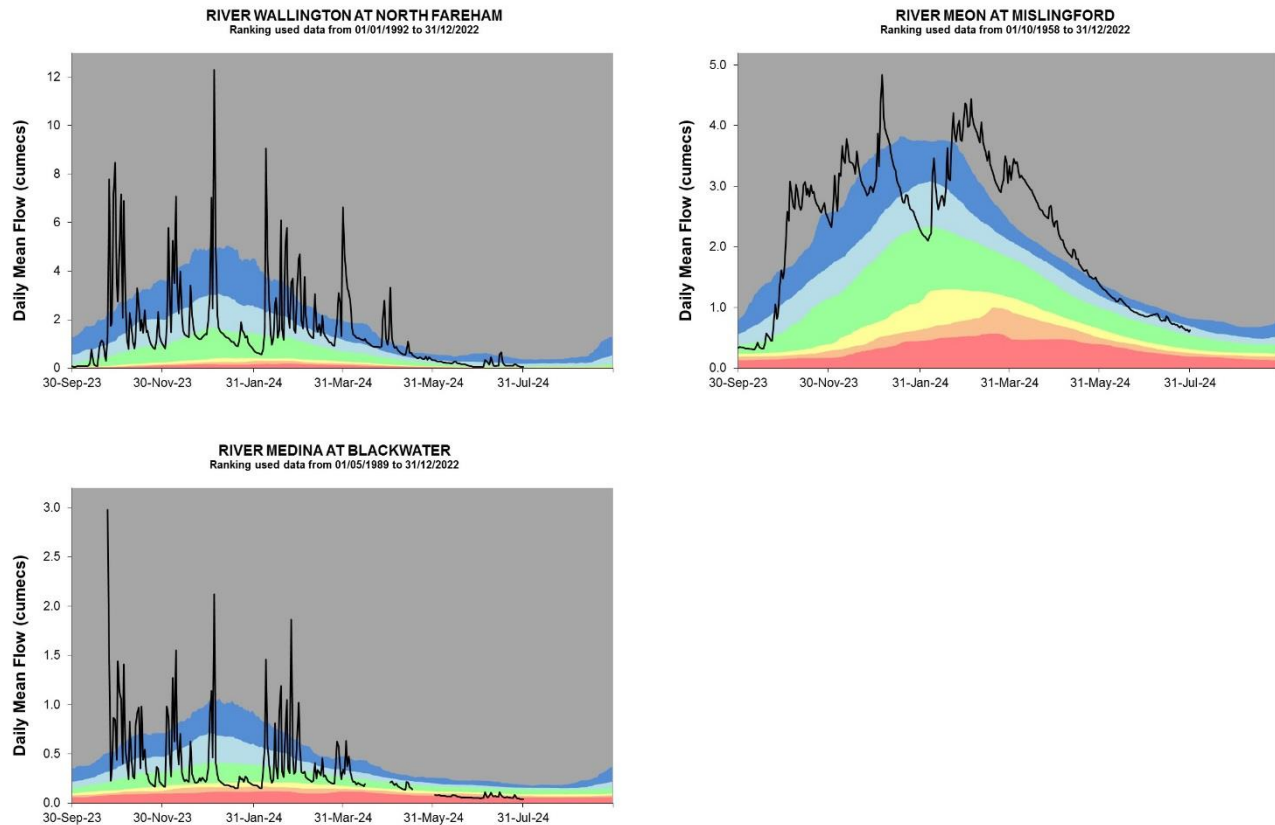
Figure 5.1: Monthly rainfall and effective rainfall totals for the past 12 months compared to the 1961 to 1990 long term average.



HadUK rainfall data. (Source: Met Office. Crown copyright, 2024).

## 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.

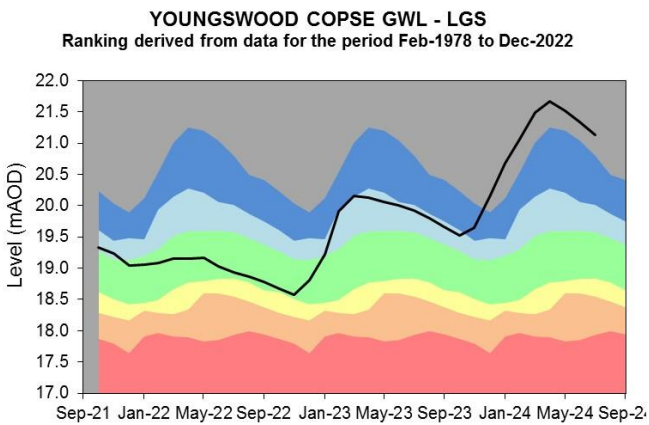
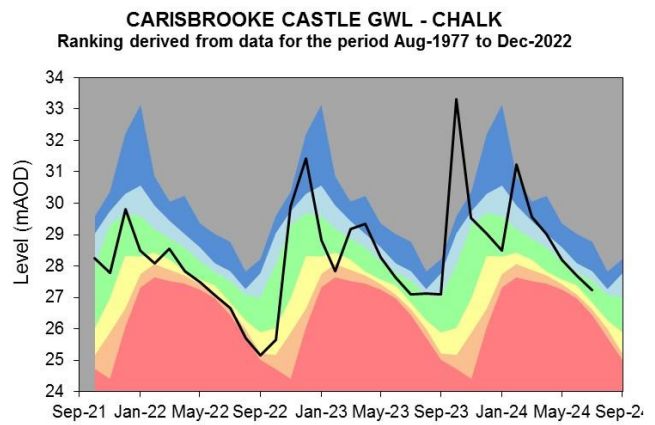
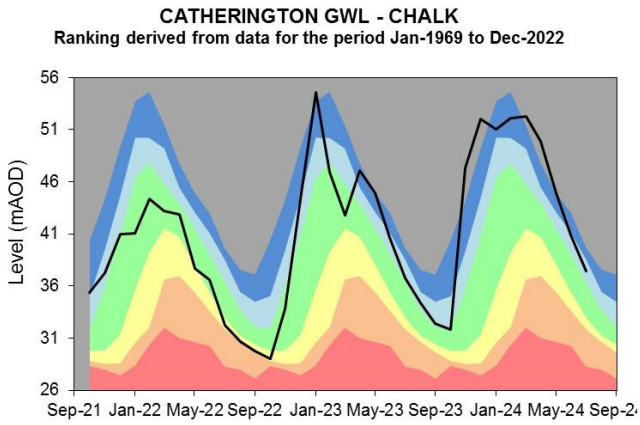


Note: The recorded flow data for River Medina at Blackwater are correct but are not reflective of the current total flow of the river compared to a downstream gauge. It is suspected that works upstream of the weir have altered the flow split between the river and a flood relief channel resulting in flow bypassing the weir. Investigation is ongoing.

Source: Environment Agency, 2024.

### 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.

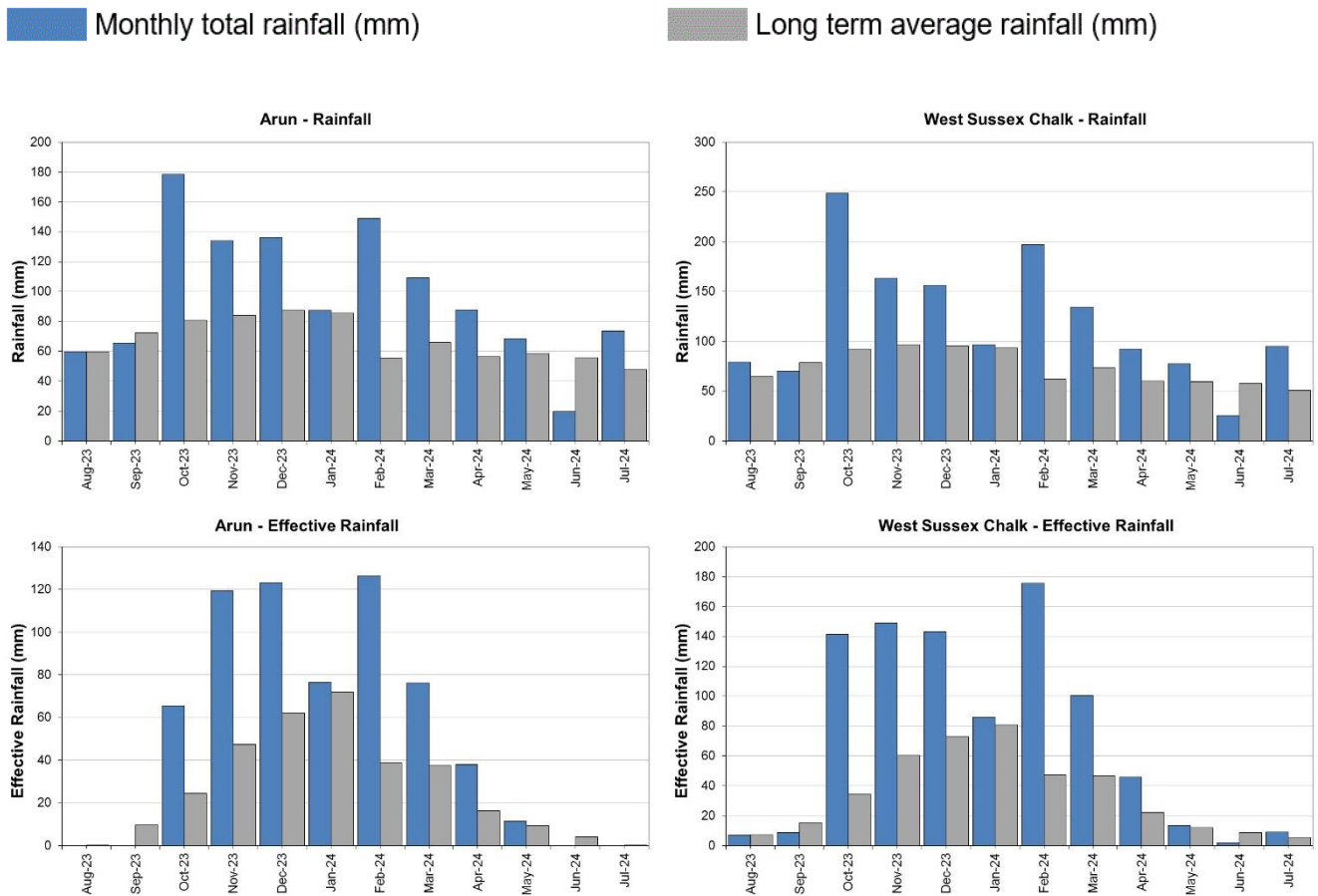


Source: Environment Agency, 2024.

# 6 West Sussex

## 6.1 West Sussex Rainfall and Effective Rainfall charts

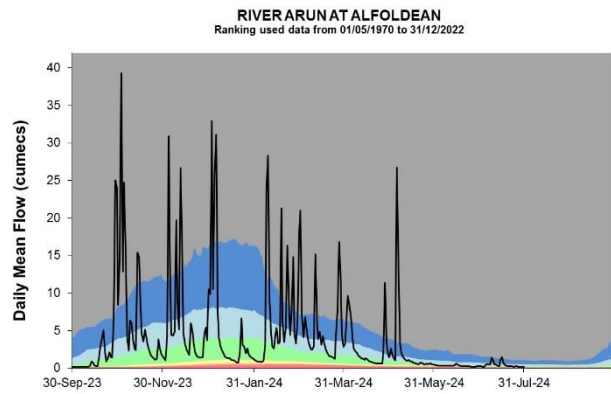
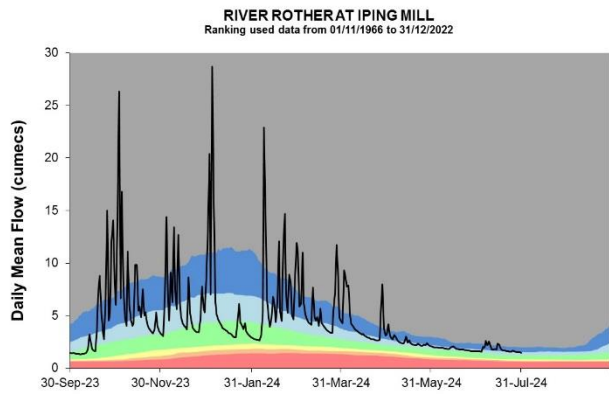
Figure 6.1: Monthly rainfall and effective rainfall totals for the past 12 months as a percentage of the 1961 to 1990 long term average.



HadUK rainfall data. (Source: Met Office. Crown copyright, 2024).

## 6.2 West Sussex River flow charts

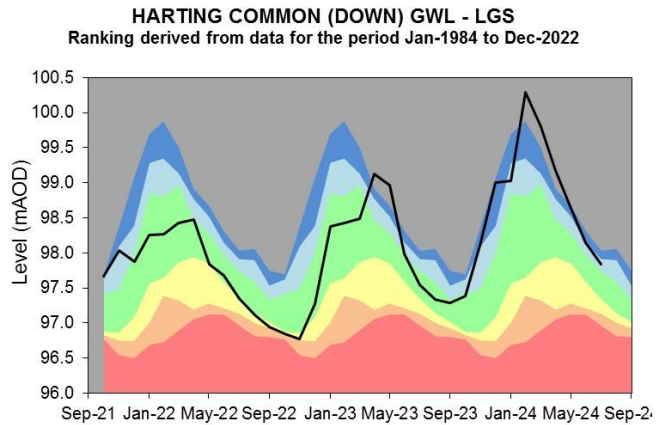
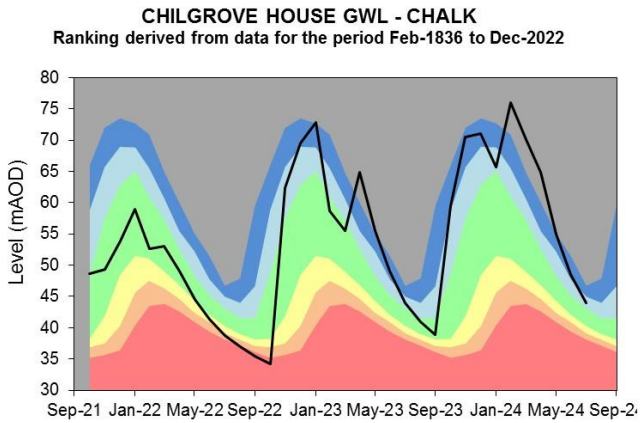
Figure 6.2: Daily mean river flow for index sites over the past year, compared to an analysis of historic daily mean flows, and long term maximum and minimum flows.



Source: Environment Agency, 2024.

### 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.

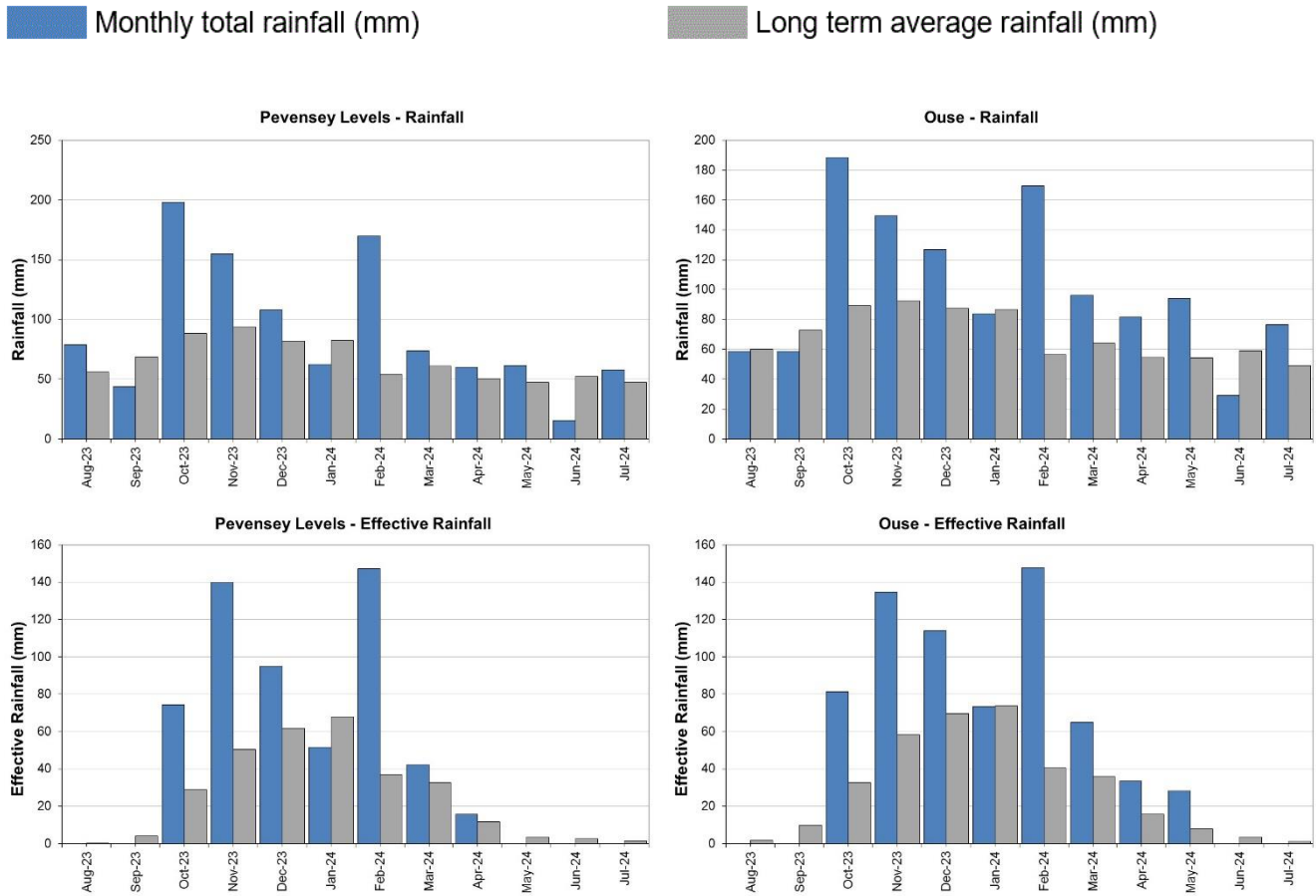


Source: Environment Agency, 2024.

# 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.

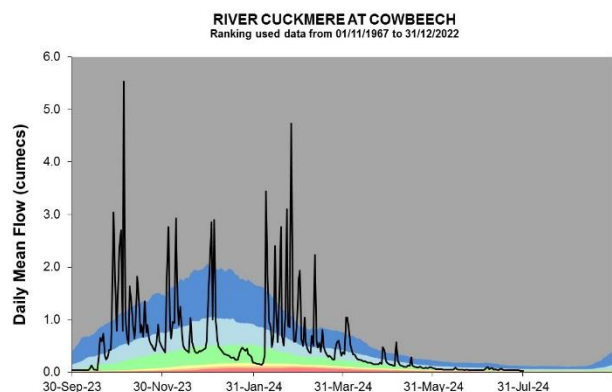
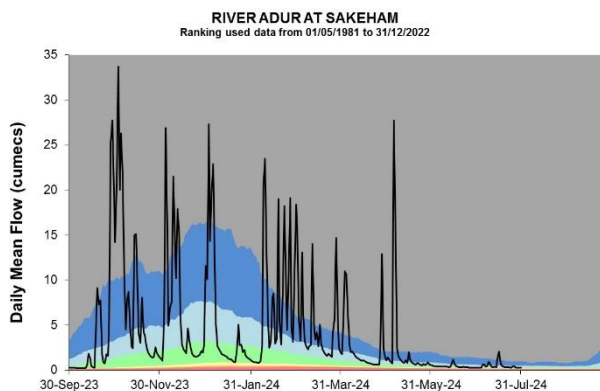
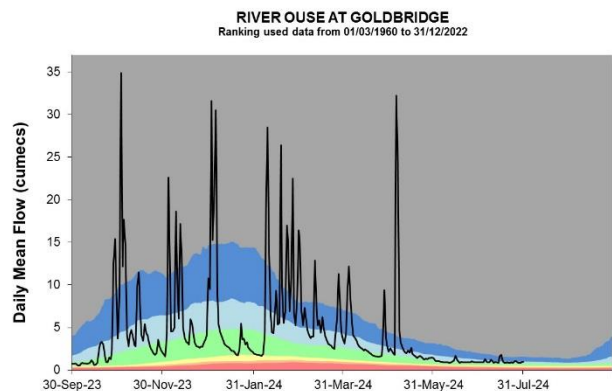


HadUK rainfall data. (Source: Met Office. Crown copyright, 2024).



## 7.2 East Sussex River flow charts

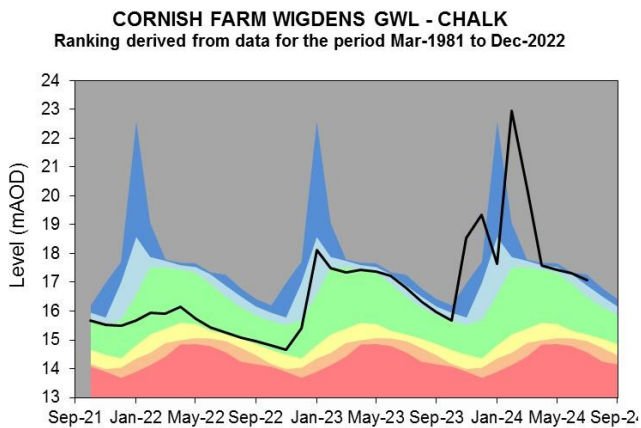
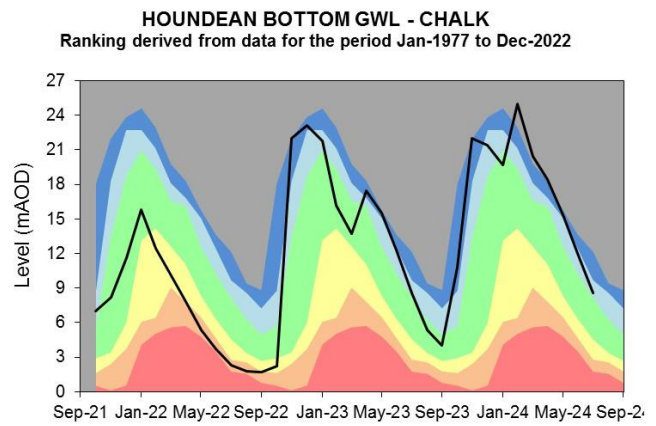
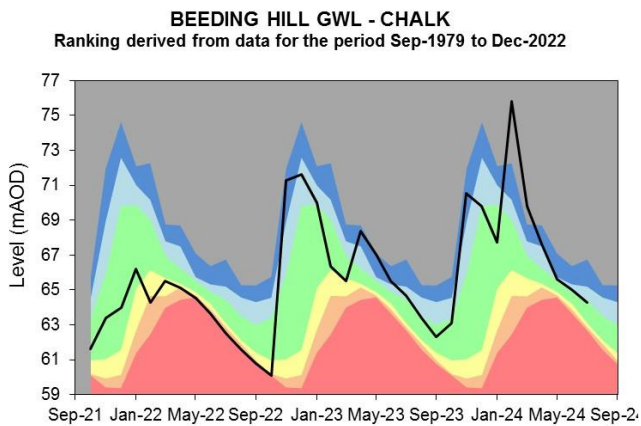
Figure 7.2: Daily mean river flow for index sites over the past year, compared to an analysis of historic daily mean flows, and long term maximum and minimum flows.



Source: Environment Agency, 2024.

### 7.3 East Sussex Groundwater level charts

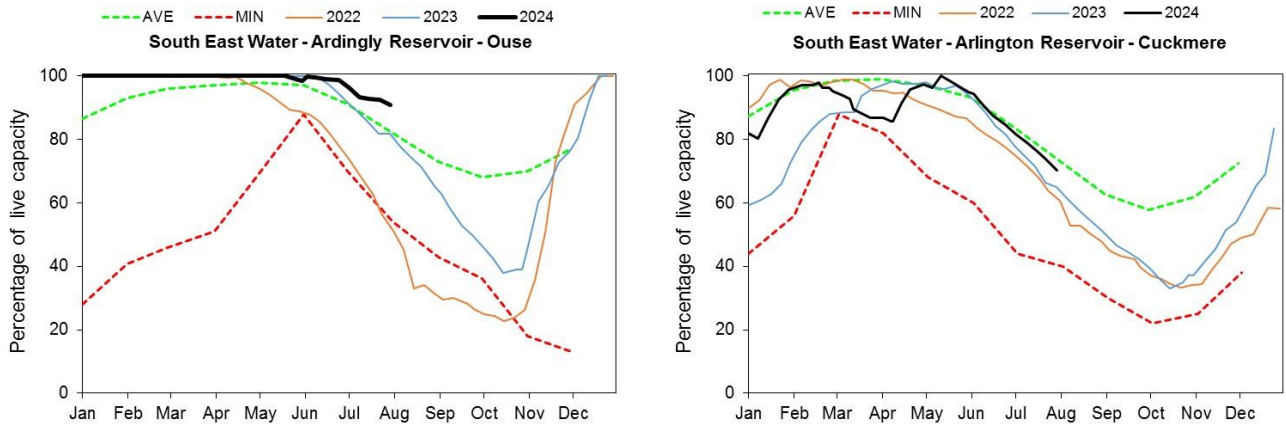
Figure 7.3: End of month groundwater levels at index groundwater level sites for major aquifers. 34 months compared to an analysis of historic end of month levels and long term maximum and minimum levels.



Source: Environment Agency, 2024.

## 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, 2024).

# 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 ( $\text{m}^3\text{s}^{-1}$ ).

### **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, 2024). All rights reserved. Environment Agency, 100024198, 2024

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 July as %LTA	Effective Rainfall (mm) 30 day Total	Effective Rainfall July as %LTA	Soil Moisture Deficit (SMD) Day 30	SMD End of July LTA
Test Chalk	82	171%	8	188%	86	84
East Hampshire Chalk	92	177%	9	181%	81	80
West Sussex Chalk	95	187%	9	170%	74	79
East Sussex Chalk	79	161%	6	117%	81	81
Isle of Wight	72	164%	6	146%	94	89
Western Rother Greensand	88	174%	8	165%	81	80
Hampshire Tertiaries	79	177%	0	0%	89	85
Lymington	76	174%	0	0%	85	80
Sussex Coast	75	180%	0	-	91	89
Arun	74	156%	0	0%	86	78
Adur	73	159%	0	0%	82	77
Ouse	76	156%	0	0%	77	74
Cuckmere	71	147%	0	0%	77	75
Pevensey Levels	58	122%	0	0%	93	81
SSD Average	78	165%	3	135%	84	81



## 10.2 Seasonal summary table of rainfall and effective rainfall

Summer season: 01/04/2024 to 31/07/2024

Hydrological Area	Seasonal Rainfall (mm) Total	Seasonal Rainfall as % LTA	Seasonal Effective Rainfall (mm) Total	Seasonal Effective Rainfall as % LTA
Test Chalk	252	117%	49	144%
East Hampshire Chalk	280	122%	62	153%
West Sussex Chalk	290	127%	70	146%
East Sussex Chalk	277	131%	63	164%
Isle of Wight	254	127%	62	191%
Western Rother Greensand	289	125%	75	157%
Hampshire Tertiaries	252	123%	40	239%
Lymington	253	122%	42	191%
Sussex Coast	232	122%	31	177%
Arun	249	114%	50	166%
Adur	264	124%	57	194%
Ouse	281	130%	62	222%
Cuckmere	245	118%	29	122%
Pevensey Levels	195	99%	16	83%
SSD Average	258	122%	50	165%

### 10.3 Rainfall banding table

Hydrological area	Jul 2024 band	May 2024 to Jul 2024 cumulative band	Feb 2024 to Jul 2024 cumulative band	Aug 2024 to Jul 2024 cumulative band
Test Chalk	Above normal	Normal	Exceptionally high	Exceptionally high
East Hampshire Chalk	Above normal	Normal	Exceptionally high	Exceptionally high
West Sussex Chalk	Above normal	Normal	Exceptionally high	Exceptionally high
East Sussex Chalk	Normal	Above normal	Exceptionally high	Exceptionally high
Isle of Wight	Normal	Normal	Exceptionally high	Exceptionally high
Western Rother Greensand	Above normal	Normal	Exceptionally high	Exceptionally high
Hampshire Tertiaries	Above normal	Normal	Exceptionally high	Exceptionally high
Lymington	Above normal	Normal	Exceptionally high	Exceptionally high
Sussex Coast	Above normal	Normal	Exceptionally high	Exceptionally high
Arun	Normal	Normal	Exceptionally high	Exceptionally high
Adur	Above normal	Normal	Exceptionally high	Exceptionally high
Ouse	Normal	Above normal	Exceptionally high	Exceptionally high
Cuckmere	Normal	Normal	Exceptionally high	Exceptionally high
Pevensey Levels	Normal	Normal	Exceptionally high	Exceptionally high

## 10.4 River flows table

Site name	River	Catchment	Jul 2024 band	Jun 2024 band
Alfoldean Gs	Arun	Arun	Above normal	Below normal
Allbrook Gs+ Highbridge	Itchen (so)	Itchen	Exceptionally high	Exceptionally high
Blackwater	Medina	Isle of Wight	No data	No data
Broadlands	Test	Test Lower	Above normal	Notably high
Brockenhurst GS	Lymington	New Forest	Above normal	Normal
Chilbolton GS	Test	Test Upper	Above normal	Notably high
Cowbeech Gs	Cuckmere	Cuckmere	Normal	Normal
Goldbridge Gs	Ouse [so]	Ouse Sussex	Notably high	Normal
Iping Mill Gs	Rother	West Rother	Notably high	Above normal
Mislingford GS	Meon	Meon	Above normal	Notably high
North Fareham GS	Wallington	Wallington	Above normal	Normal
Sakeham GS	Adur	Adur	Above normal	Normal

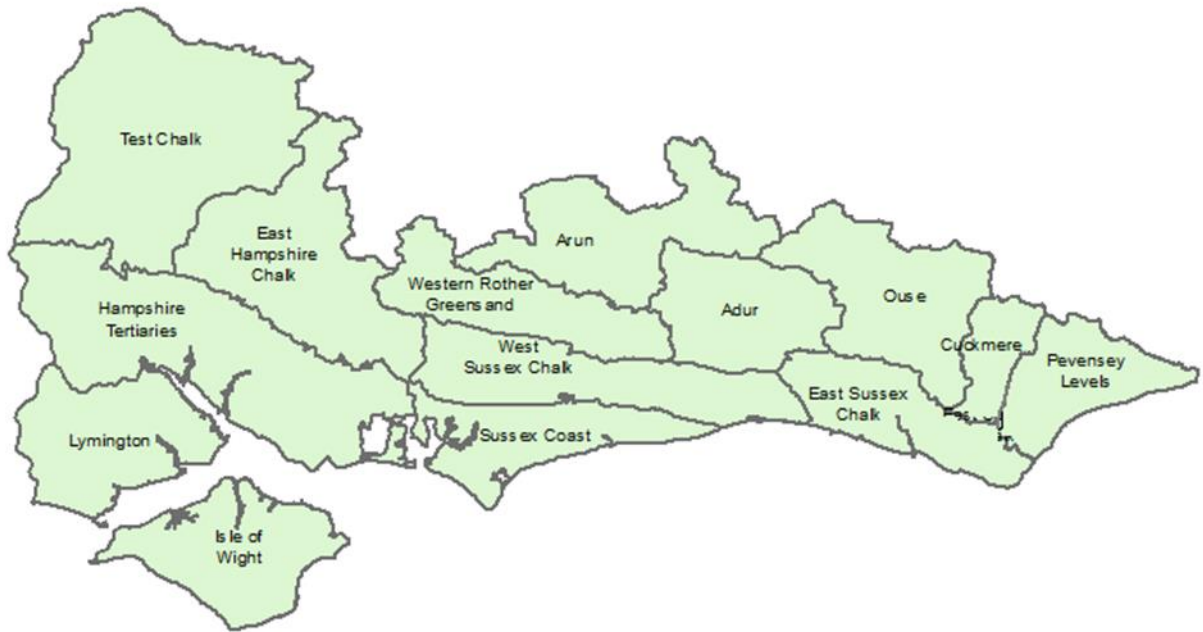
## 10.5 Groundwater table

Site name	Aquifer	End of Jul 2024 band	End of Jun 2024 band
Houndean Bottom Gwl	Brighton Chalk Block	Above normal	Above normal
Chilgrove House Gwl	Chichester-Worthing-Portsdown Chalk	Above normal	Notably high
Carisbrooke Castle	Isle Of Wight Central Downs Chalk	Normal	Normal
West Meon Hut Gwl	River Itchen Chalk	Exceptionally high	Exceptionally high
Clanville Gate Gwl	River Test Chalk	Exceptionally high	Exceptionally high
Lopcombe Corner Gwl	River Test Chalk	Notably high	Notably high
Beeding Hill Gwl	Brighton Chalk Block	Normal	Above normal
Catherington	River Meon Chalk	Above normal	Above normal
Cornish Wigdens Gwtr	Eastbourne Chalk Block	Notably high	Notably high
Harting Common Down	Western Rother Lower Greensand	Above normal	Above normal
Preston Candover	River Itchen Chalk	Exceptionally high	Exceptionally high
Youngwoods Copse	Isle of Wight Lower Greensand	Exceptionally high	Exceptionally high

## 10.6 Abstraction licence flow constraints

Number of flow constraints in force on 1 July 2024	Number of flow constraints in force between 2 to 8 July 2024	Number of flow constraints in force between 9 to 15 July 2024	Number of flow constraints in force between 16 to 22 July 2024	Number of flow constraints in force between 23 to 31 July 2024
3	1	1	3	1

## 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	84.8	57.9	68.7	51.7	59.0	57.3	47.9	62.5	67.9	75.4	79.9	89.1
East Hampshire Chalk	93.8	62.5	73.9	56.2	61.9	58.7	51.7	64.6	77.0	86.2	90.5	94.8
West Sussex Chalk	93.5	62.5	73.9	60.2	59.5	57.6	50.7	64.8	78.5	92.0	97.0	95.5
East Sussex Chalk	87.1	56.9	65.1	53.5	51.5	57.4	48.9	60.3	72.7	92.9	97.9	88.7
Isle of Wight	88.2	60.4	67.0	52.3	53.2	50.2	44.1	57.4	70.2	84.3	91.2	88.1
Western Rother Greensand	99.5	64.5	75.5	60.6	62.6	57.3	50.4	65.6	78.8	90.8	94.7	99.7
Hampshire Tertiaries	86.1	59.2	67.0	50.4	56.8	52.8	44.5	58.7	69.6	78.8	83.4	88.7
Lymington	88.5	61.2	68.5	51.5	57.9	54.3	43.4	59.3	71.0	83.0	86.8	91.8
Sussex Coast	76.6	51.3	60.7	50.2	50.2	47.7	41.9	53.0	63.7	77.2	80.8	78.9
Arun	85.5	55.1	65.5	56.5	58.5	55.6	47.2	59.4	72.4	80.5	83.9	86.9
Adur	84.8	55.1	63.8	55.3	56.2	55.6	46.0	59.6	71.5	85.7	88.8	86.0
Ouse	86.6	56.4	64.0	54.4	54.0	58.6	48.7	60.0	72.5	89.1	92.9	87.6
Cuckmere	84.8	55.2	61.8	51.2	50.1	57.5	48.5	59.8	71.5	90.8	93.7	85.0
Pevensey Levels	82.2	54.0	60.9	50.6	47.5	52.2	47.3	55.6	68.5	88.1	93.6	82.0
<b>SSD Average</b>	<b>87.3</b>	<b>58.0</b>	<b>66.9</b>	<b>53.9</b>	<b>55.6</b>	<b>55.2</b>	<b>47.2</b>	<b>60.0</b>	<b>71.8</b>	<b>85.3</b>	<b>89.6</b>	<b>88.8</b>