

# Monthly water situation report: Solent and South Downs Area

## Summary - April 2024

Solent and South Downs (SSD) had above average rainfall in April, receiving 151% (81.6mm) of the long term average (LTA) rainfall (53.9mm). Monthly mean river flows and groundwater levels across SSD ranged from above normal to exceptionally high. Soils across SSD ended the month wetter than the average. End of month reservoir stocks at Ardingly Reservoir (Ouse) and at Arlington Reservoir (Cuckmere) were both above average.

### 1.1 Rainfall

SSD had above average rainfall in April, receiving 151% (81.6mm) of the LTA (53.9mm). The month started with a wet period from 1 to 4 April, when about 40% of the month total rain was recorded. The driest week of the month was from 17 to 23 April, with less than 3% of the month total rain. The most rain fell in the period from 24 to 27 April, with about 45% of the month total rain. The highest daily total of 43.8mm was recorded on 27 April at Duncton RG (Western Rother Greensand), which was the wettest day of the month.

During the last 3 month period, between February and April, SSD area and 11 of our 14 areal rainfall units received record amount of rainfall:

- Test Chalk
- East Hampshire Chalk
- West Sussex Chalk
- East Sussex Chalk
- Isle of Wight
- Western Rother Greensand
- Hampshire Tertiaries
- Lymington
- Sussex Coast
- Adur
- Ouse

Arun recorded the second highest, while Cuckmere recorded the third highest, and Pevensy Level the fourth highest rainfall totals in the last 3 month.

The last 9 months, 12 months and 15 months periods were the second wettest on record for SSD area, since 1871.

The last 18 months period was the wettest on record for SSD area, and 10 areal rainfall units in the western part of the area. On the eastern part of the area, Adur, Ouse, Cuckmere and Pevensy Level recorded the second highest rainfall totals in the last 18 months.

## 1.2 Soil moisture deficit and recharge

Soils across SSD ended the month wetter than the average for April, which means catchments are more responsive to run off.

## 1.3 River flows

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

Flows were above normal:

- River Lymington at Brockenhurst
- River Arun at Alfoldean
- River Cuckmere at Cowbeech

Flows were notably high:

- River Ouse at Goldbridge

Flows were exceptionally high:

- River Test at Chilbolton
- River Test at Broadlands
- River Itchen at Allbrook&Highbridge
- River Meon at Misingford
- River Wallington at North Fareham
- River Rother at Iping Mill
- River Adur at Sakeham

There was no data available for River Medina at Blackwater.

The monthly mean flows for April for the River Wallington at North Fareham were the highest on record since 1976.

The monthly mean flows were the second highest at Broadlands (Test), at Chilbolton (Test), at Allbrook&Highbridge (Itchen), at Iping Mill (Rother), and at Sakeham (Adur).

## 1.4 Groundwater levels

End of month groundwater levels ranged from above normal to exceptionally

high. Groundwater levels were above normal at:

- Cornish Farm (East Sussex Chalk)

Groundwater levels were notably high at:

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

Groundwater levels were exceptionally high at:

- Clanville Gate (Test Chalk)
- Lopcombe Corner (Test Chalk)
- Preston Candover (East Hampshire Chalk)
- West Meon (East Hampshire Chalk)
- Catherington (East Hampshire Chalk)
- Youngwoods Copse (Isle of Wight)
- Harting Common (Western Rother Greensand)
- Chilgrove (West Sussex Chalk)

Groundwater level for April was the highest on record at Harting Common since 1984. The groundwater levels were second highest on record at Clanville Gate, at Lopcombe Corner and at West Meon, since 1966, 1963 and 1986, respectively. The groundwater levels were third highest at Youngwoods Copse, at Catherington, at Cornish Farm and at Preston Candover since 1978, 1969, 1981, and 1975, respectively.

## **1.5 Reservoir stocks**

End of month reservoir stocks were both above average. Ardingly Reservoir (Ouse) was at 100% of total capacity (LTA 98%) and Arlington Reservoir (Cuckmere) was at 97.7% of total capacity (LTA 97.16%).

## **1.6 Environmental impact**

No licence restrictions were in force in April.

There were 12 Flood Alerts issued in April. In Hampshire 5, on the Isle of Wight 2, and in Sussex 5; all fluvial.

There were 3 Flood Warnings issued in April. In Hampshire 2 and on the Isle of Wight 1; all fluvial.

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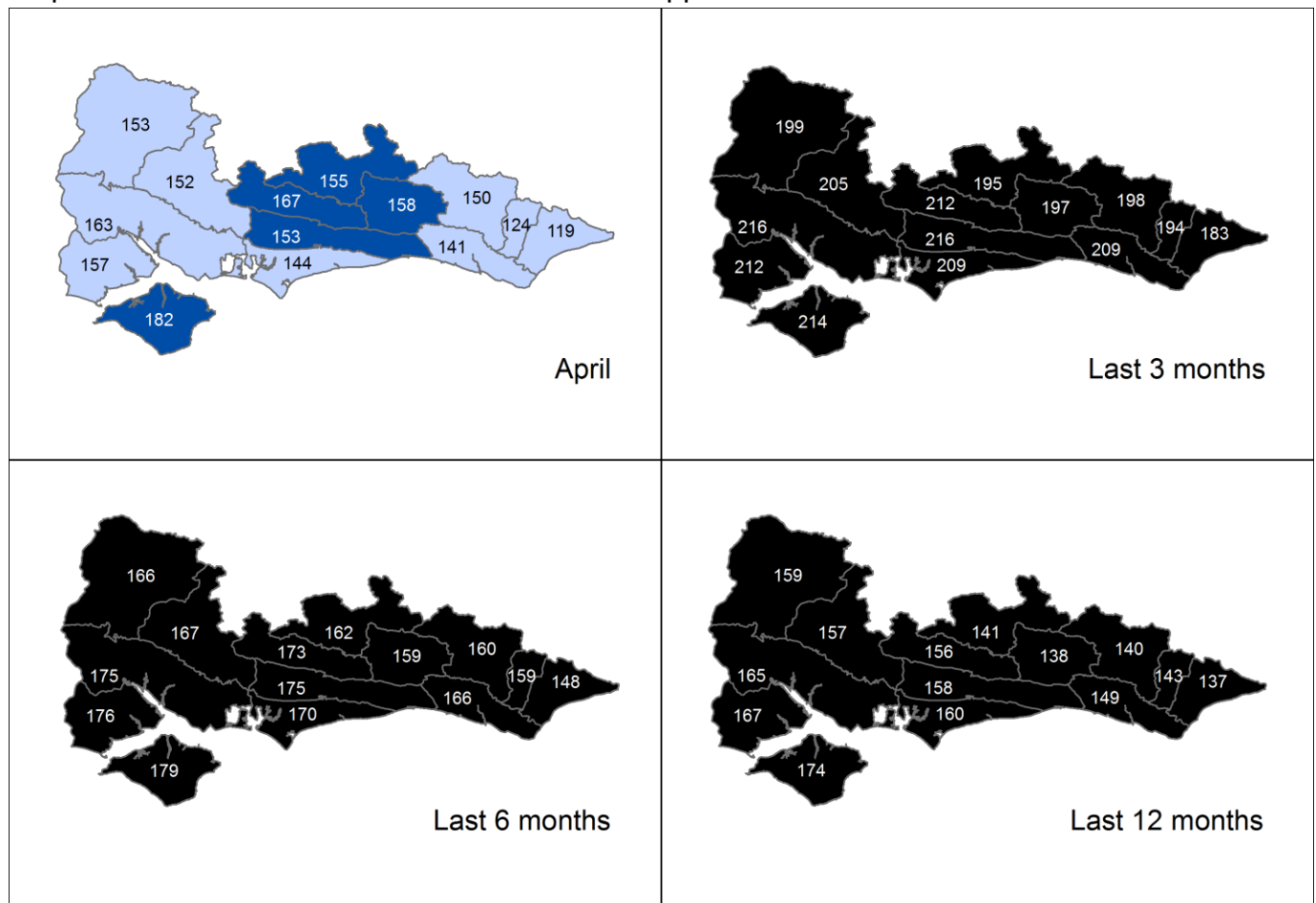
Contact details: 03708 506 506

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## 2. Rainfall

### 2.1 Rainfall map

Figure 2.1: Total rainfall for hydrological areas for the current month (up to 30 April 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.



**Legend**

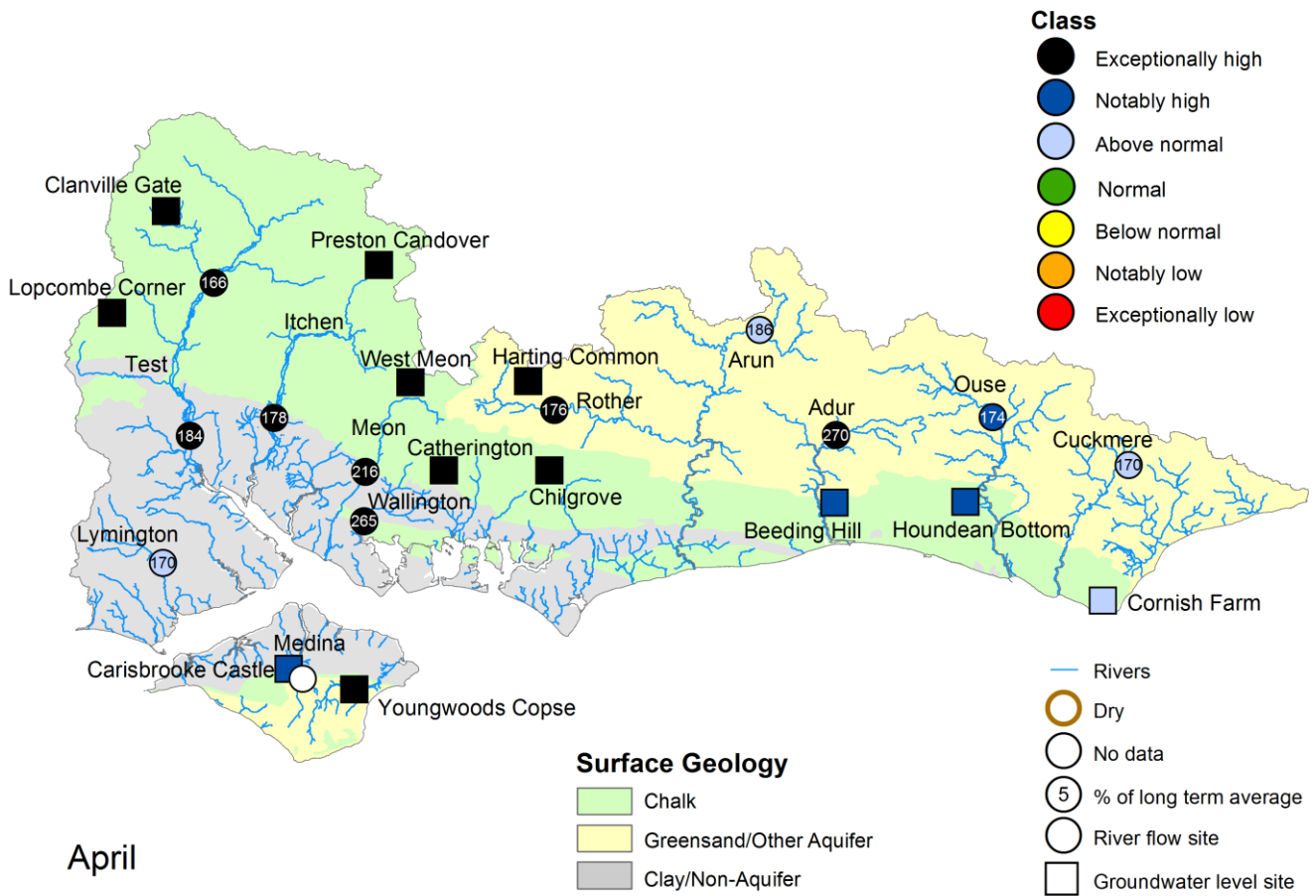
Exceptionally high	Above normal	Below normal	Exceptionally low
Notably high	Normal	Notably low	

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



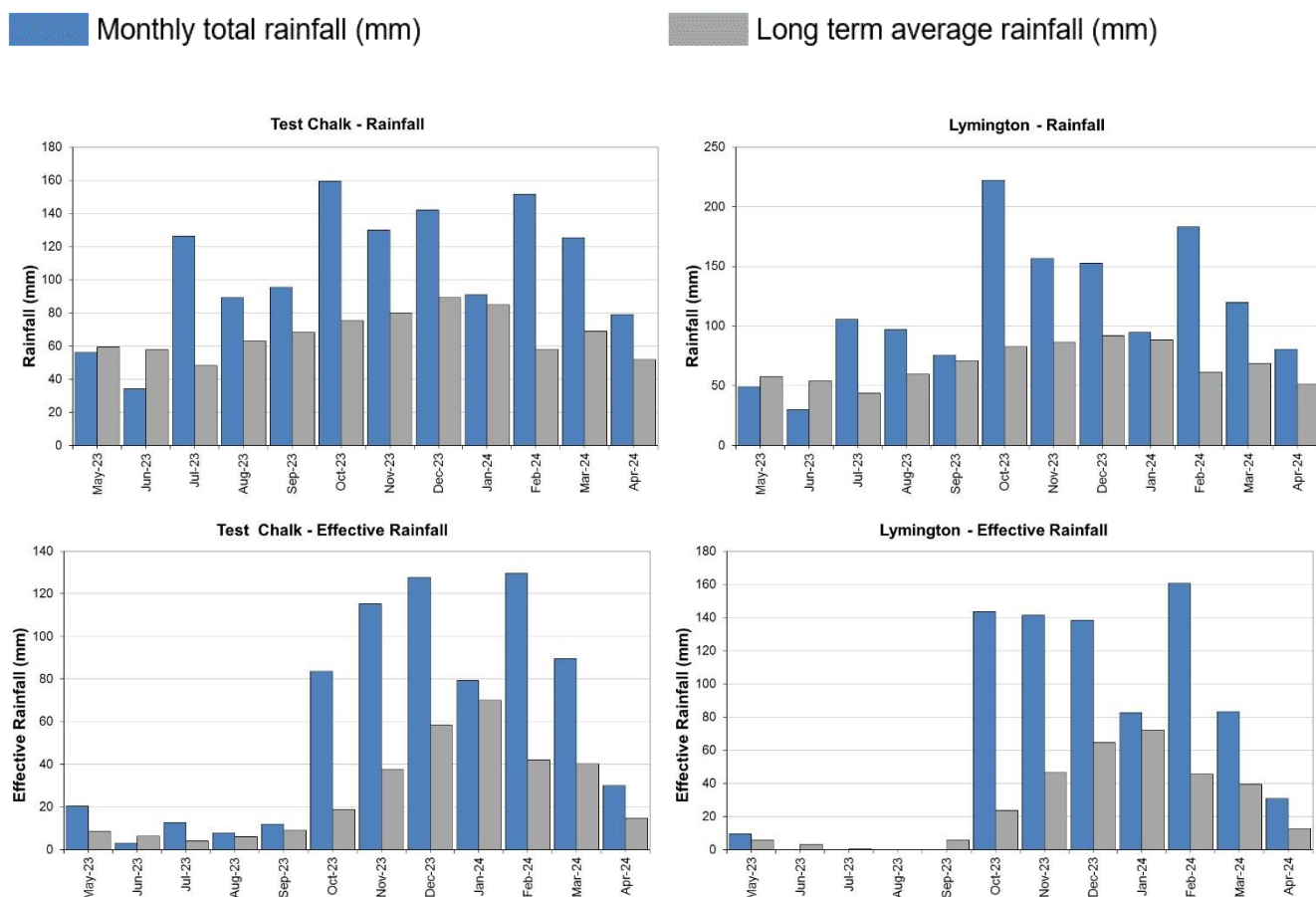
There was no data available for River Medina at Blackwater.

(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

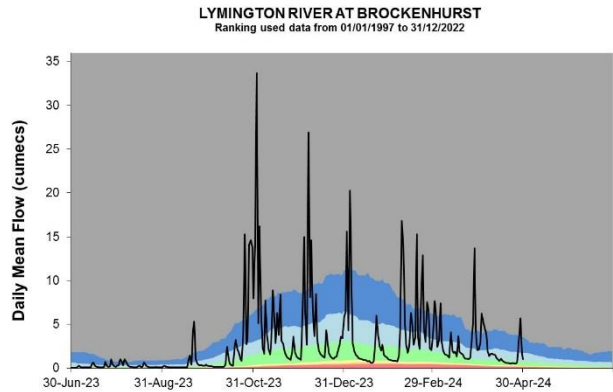
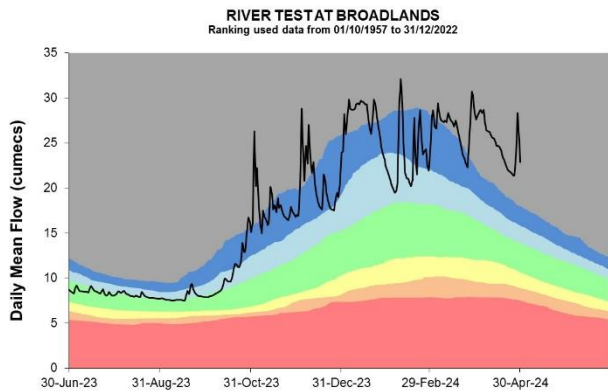
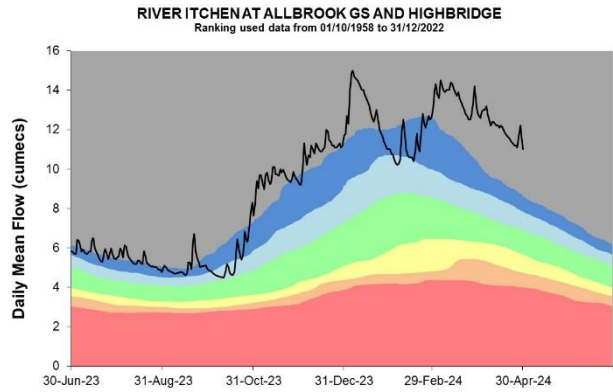
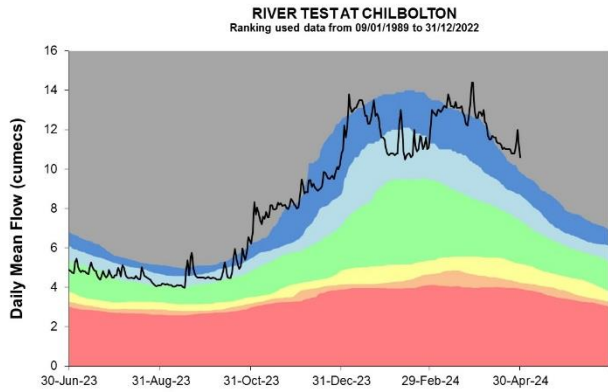
Figure 4.1: Monthly rainfall and effective rainfall totals for the past 12 months compared to the 1961 to 1990 long term average.



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

## 4.2 West Hampshire River flow charts

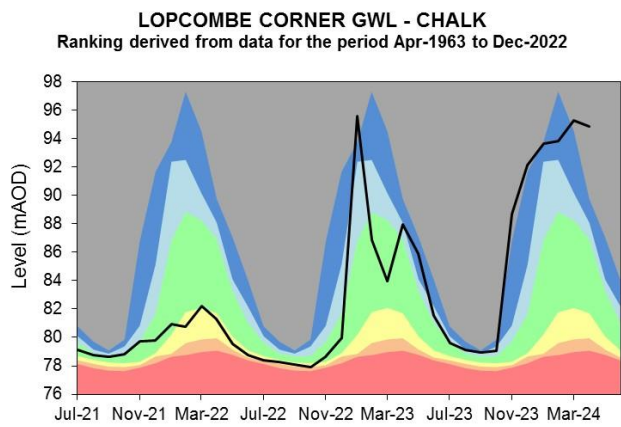
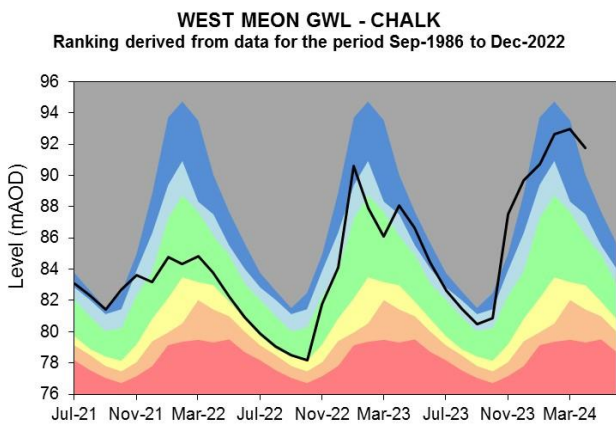
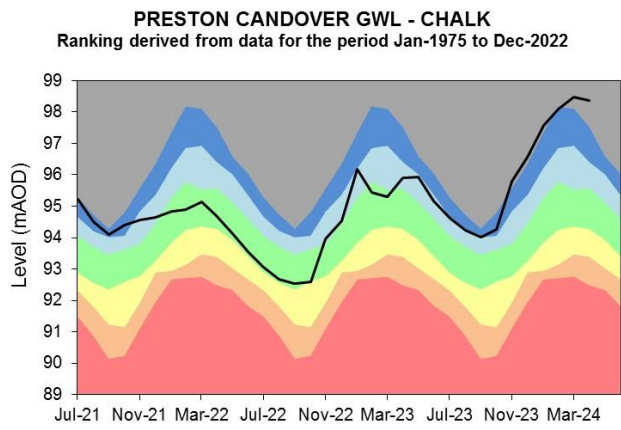
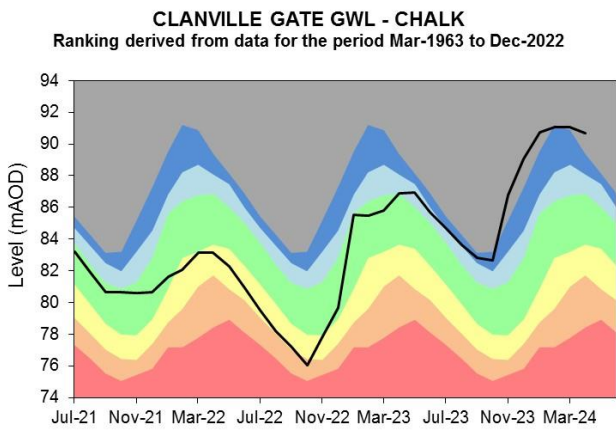
Figure 4.2: Daily mean river flow for index sites over the past year, compared to an analysis of historic daily mean flows, and long term maximum and minimum flows.



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.



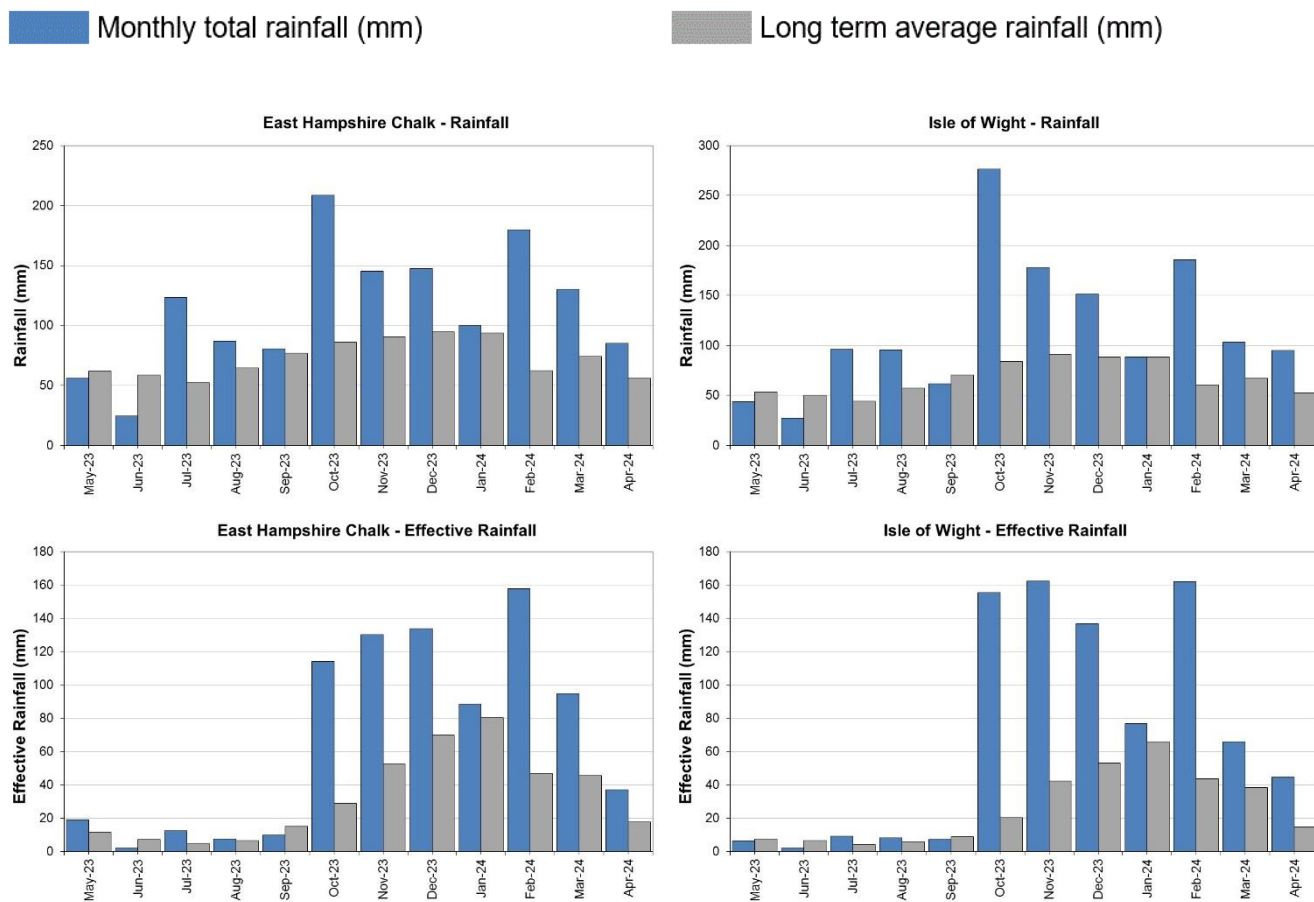
Source: Environment Agency, 2024.



# 5 East Hampshire and Isle of Wight

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

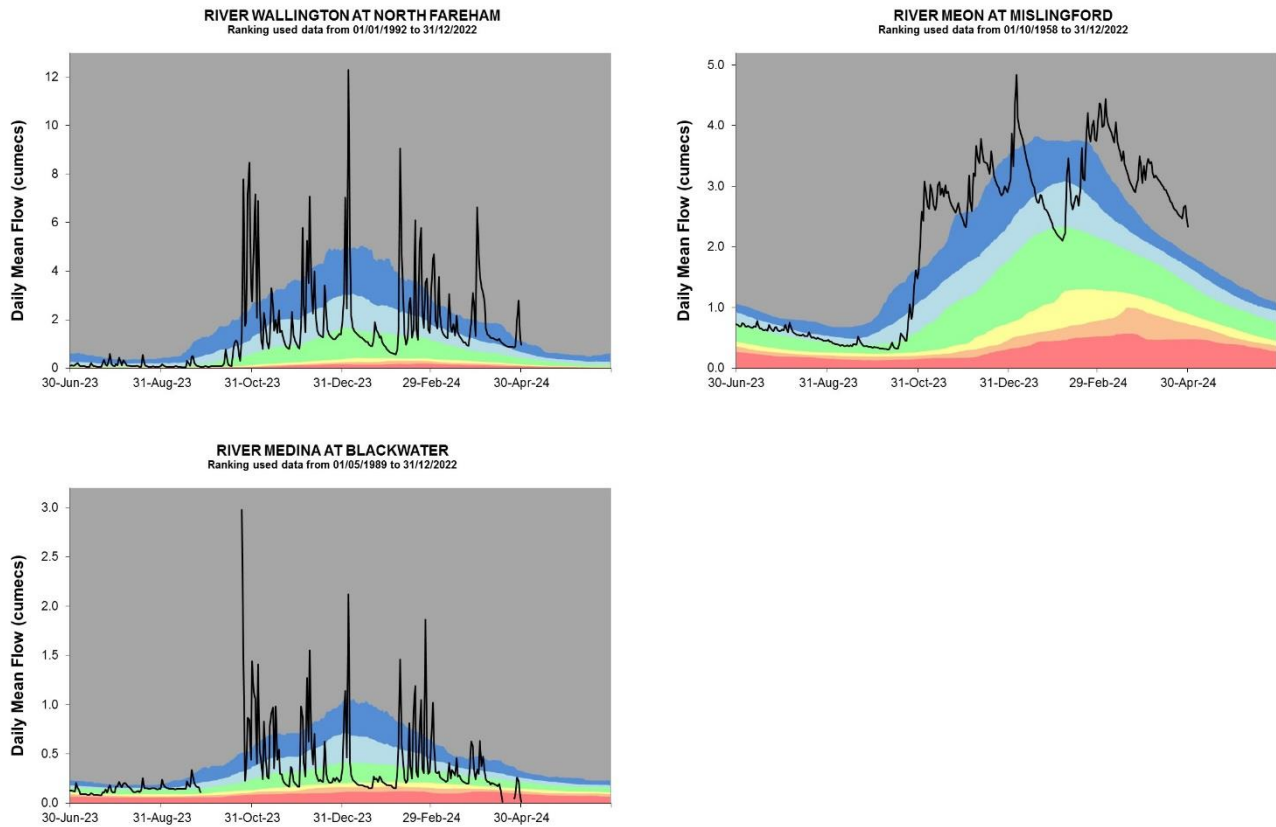
Figure 5.1: Monthly rainfall and effective rainfall totals for the past 12 months compared to the 1961 to 1990 long term average.



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

## 5.2 East Hampshire and Isle of Wight River flow charts

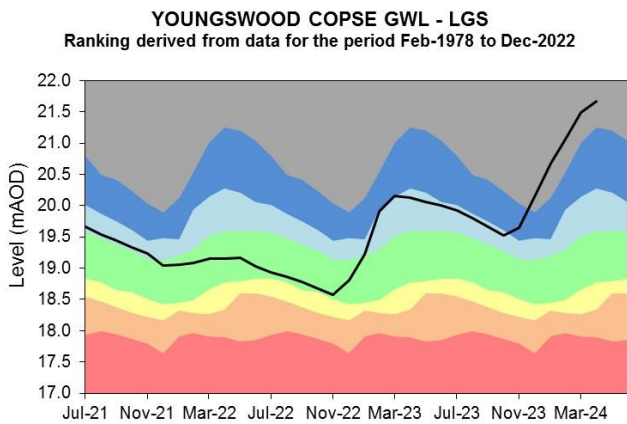
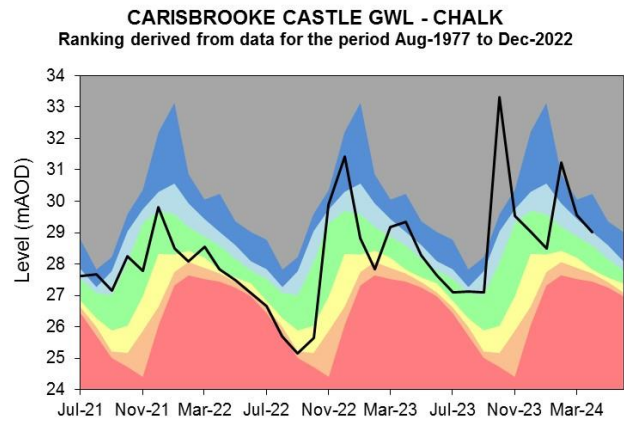
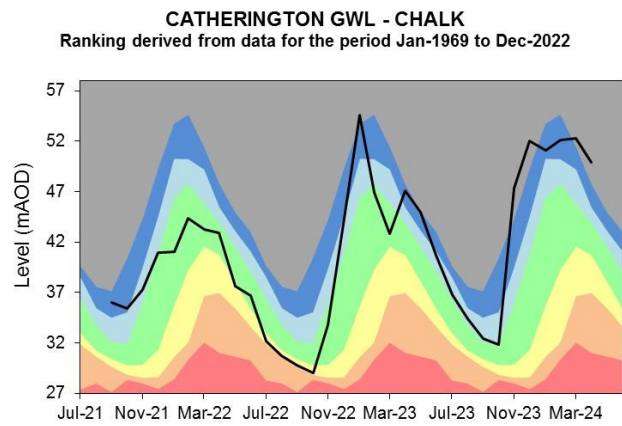
Figure 5.2 Daily mean river flow for index sites over the past year, compared to an analysis of historic daily mean flows, and long term maximum and minimum flows.



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.

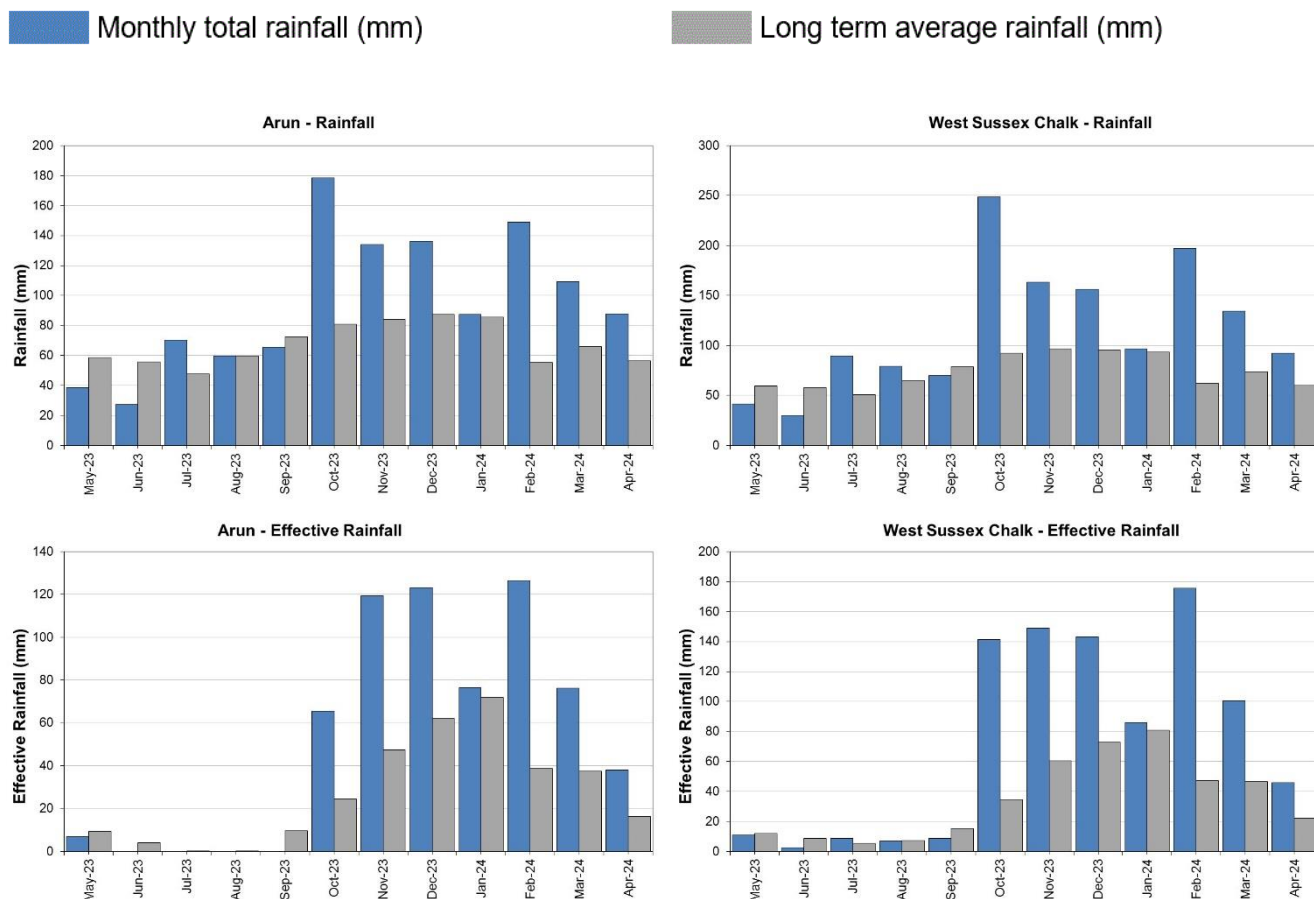


Source: Environment Agency, 2024.

# 6 West Sussex

## 6.1 West Sussex Rainfall and Effective Rainfall charts

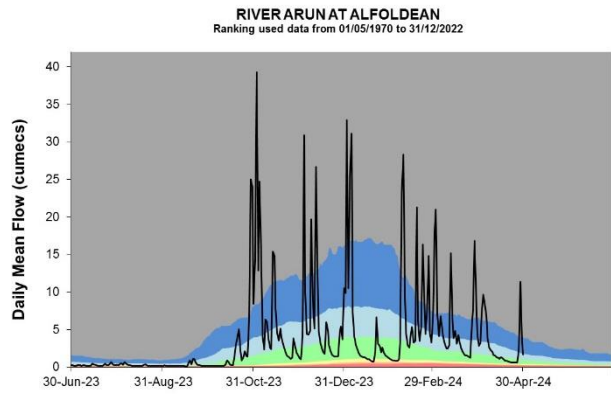
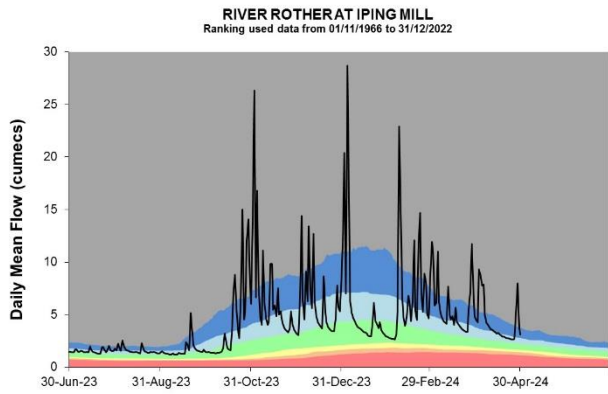
Figure 6.1: Monthly rainfall and effective rainfall totals for the past 12 months as a percentage of the 1961 to 1990 long term average.



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

## 6.2 West Sussex River flow charts

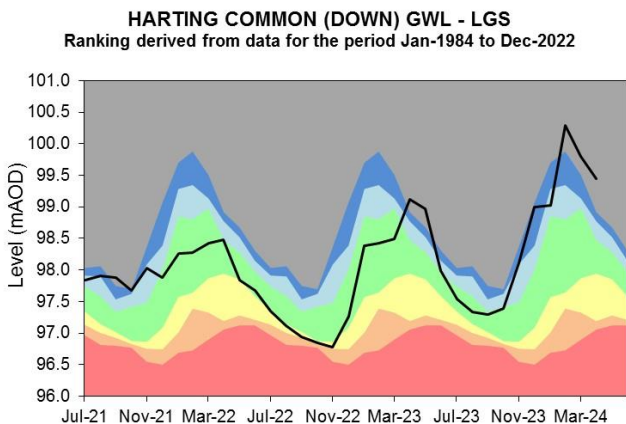
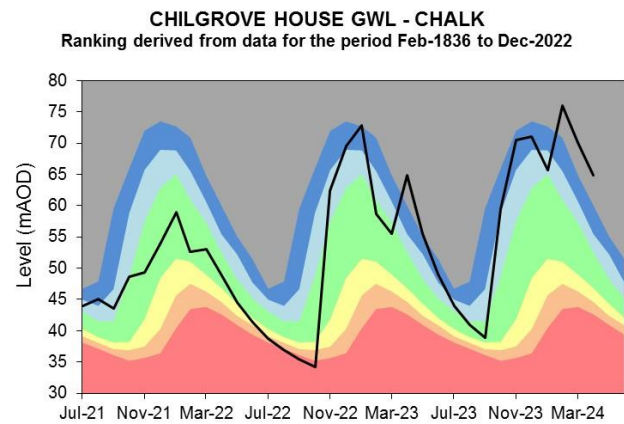
Figure 6.2: Daily mean river flow for index sites over the past year, compared to an analysis of historic daily mean flows, and long term maximum and minimum flows.



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.

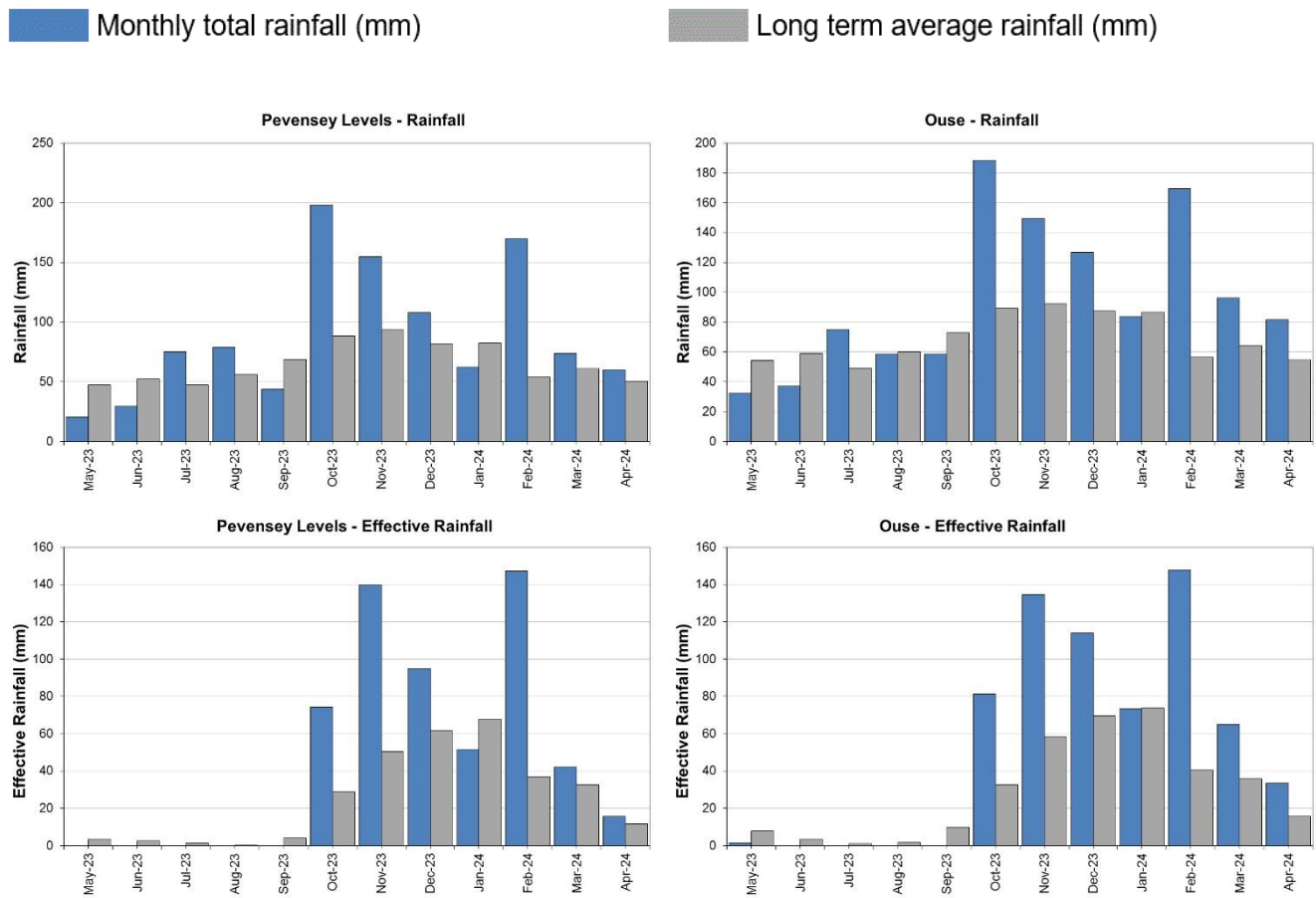


Source: Environment Agency, 2024.

# 7 East Sussex

## 7.1 East Sussex Rainfall and Effective Rainfall charts

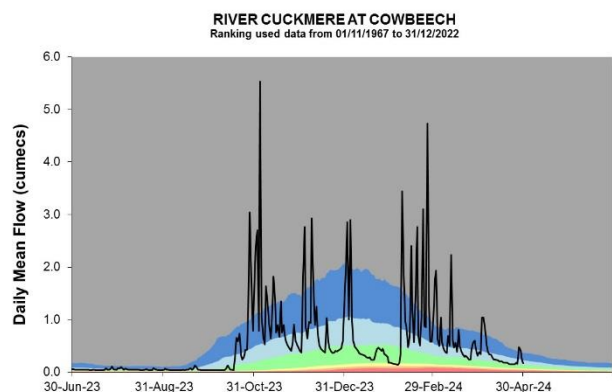
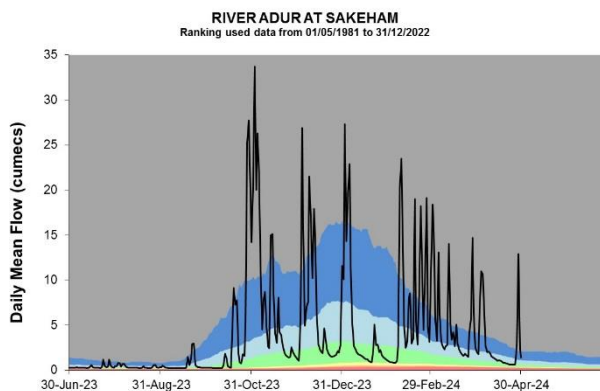
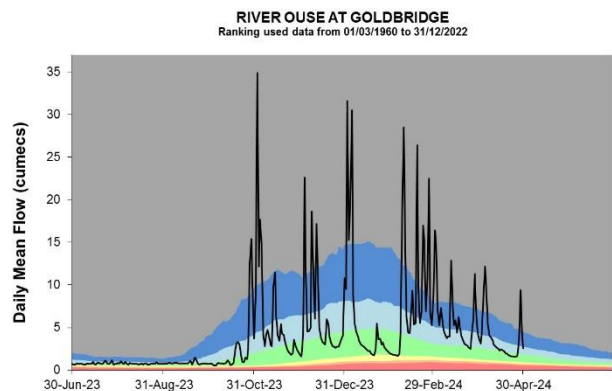
Figure 7.1: Monthly rainfall and effective rainfall totals for the past 12 months compared to the 1961 to 1990 long term average.



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

## 7.2 East Sussex River flow charts

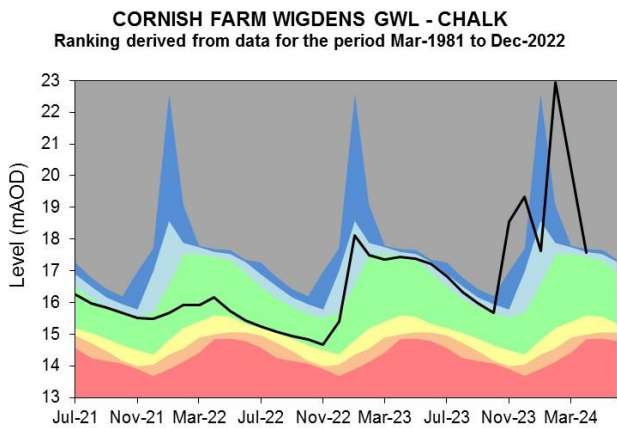
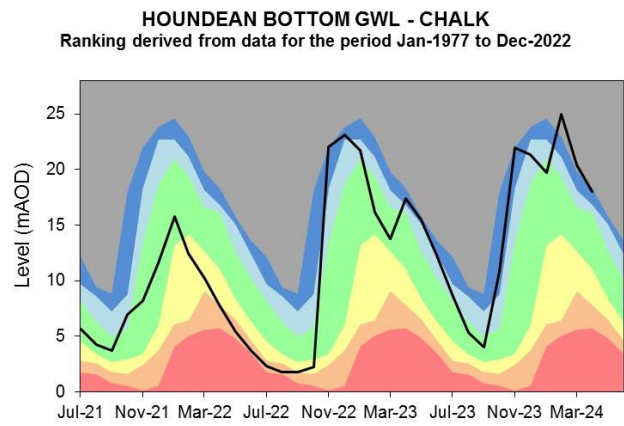
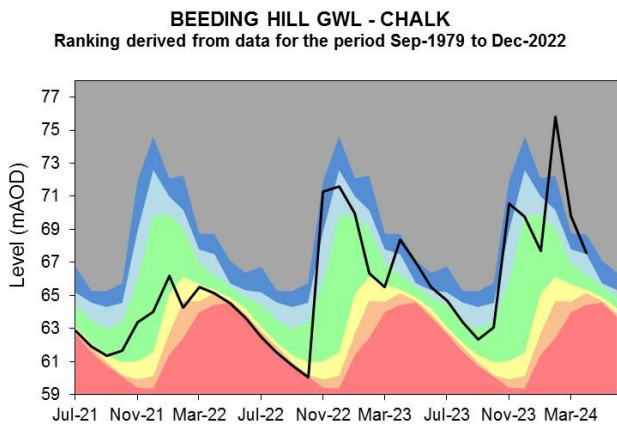
Figure 7.2: Daily mean river flow for index sites over the past year, compared to an analysis of historic daily mean flows, and long term maximum and minimum flows.



Source: Environment Agency, 2024.

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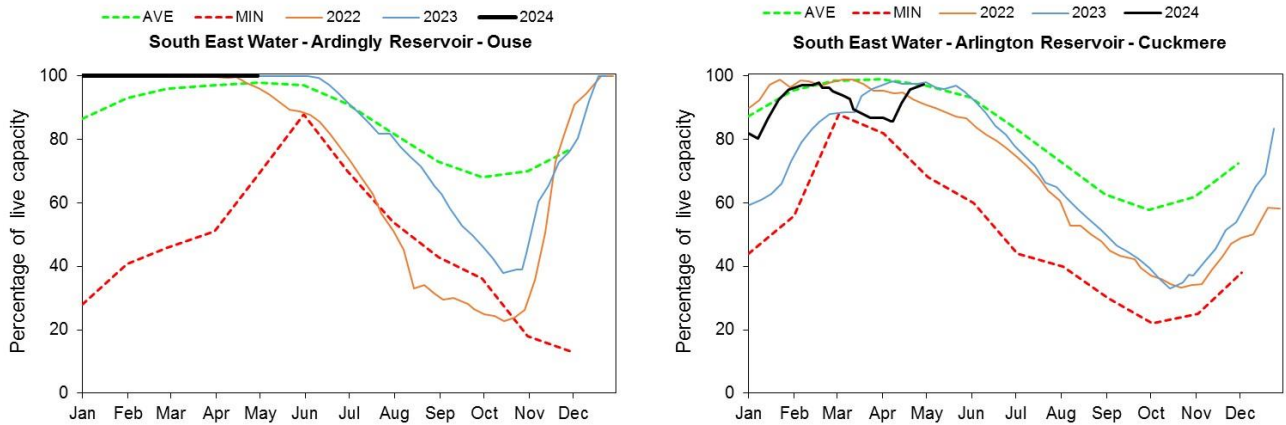


Source: Environment Agency, 2024.



## 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).

## 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 April as %LTA	Effective Rainfall (mm) 30 day Total	Effective Rainfall April as %LTA	Soil Moisture Deficit (SMD) Day 30	SMD End of April LTA
Test Chalk	78.9	153%	30.1	203%	6	19
East Hampshire Chalk	85.4	152%	36.9	211%	5	18
West Sussex Chalk	91.9	153%	45.7	206%	6	16
East Sussex Chalk	75.8	142%	26.6	161%	6	17
Isle of Wight	95.0	182%	44.6	302%	7	20
Western Rother Greensand	101.4	167%	54.2	254%	6	17
Hampshire Tertiaries	81.9	163%	30.1	283%	5	20
Lymington	80.7	157%	30.7	244%	5	19
Sussex Coast	71.9	143%	21.7	180%	7	20
Arun	87.5	155%	38.1	234%	6	16
Adur	87.4	158%	39.2	241%	6	16
Ouse	81.5	150%	33.4	215%	6	16
Cuckmere	63.0	123%	17.4	134%	8	16
Pevensey Levels	60.2	119%	15.8	135%	12	17
SSD Average	81.6	151%	33.2	216%	6	18

## 10.2 Seasonal summary table of rainfall and effective rainfall

Summer season: 01/04/2024 to 30/09/2024

Hydrological Area	Seasonal Rainfall (mm)	Seasonal Rainfall as % LTA	Seasonal Effective Rainfall (mm)	Seasonal Effective Rainfall as % LTA
	Total		Total	
Test Chalk	78.9	153%	30.1	203%
East Hampshire Chalk	85.4	152%	36.9	211%
West Sussex Chalk	91.9	153%	45.7	206%
East Sussex Chalk	75.8	142%	26.6	161%
Isle of Wight	95.0	182%	44.6	302%
Western Rother Greensand	101.4	167%	54.1	254%
Hampshire Tertiaries	81.9	163%	30.1	283%
Lymington	80.7	157%	30.7	243%
Sussex Coast	71.9	143%	21.7	181%
Arun	87.5	155%	38.1	234%
Adur	87.4	158%	39.2	240%
Ouse	81.5	150%	33.4	215%
Cuckmere	63.0	123%	17.4	134%
Pevensey Levels	60.2	119%	15.8	135%
SSD Average	81.6	151%	33.2	216%

### 10.3 Rainfall banding table

Hydrological area	April 2024 band	February 2024 to April 2024 cumulative band	November 2023 to April 2024 cumulative band	May 2023 to April 2024 cumulative band
Test Chalk	above normal	exceptionally high	exceptionally high	exceptionally high
East Hampshire Chalk	above normal	exceptionally high	exceptionally high	exceptionally high
West Sussex Chalk	notably high	exceptionally high	exceptionally high	exceptionally high
East Sussex Chalk	above normal	exceptionally high	exceptionally high	exceptionally high
Isle of Wight	notably high	exceptionally high	exceptionally high	exceptionally high
Western Rother Greensand	notably high	exceptionally high	exceptionally high	exceptionally high
Hampshire Tertiaries	above normal	exceptionally high	exceptionally high	exceptionally high
Lymington	above normal	exceptionally high	exceptionally high	exceptionally high
Sussex Coast	above normal	exceptionally high	exceptionally high	exceptionally high
Arun	notably high	exceptionally high	exceptionally high	exceptionally high
Adur	notably high	exceptionally high	exceptionally high	exceptionally high
Ouse	above normal	exceptionally high	exceptionally high	exceptionally high
Cuckmere	above normal	exceptionally high	exceptionally high	exceptionally high
Pevensey Levels	above normal	exceptionally high	exceptionally high	exceptionally high

## 10.4 River flows table

Site name	River	Catchment	April 2024 band	March 2024 band
Alfoldean Gs	Arun	Arun	above normal	exceptionally high
Allbrook Gs+ Highbridge	Itchen (so)	Itchen	exceptionally high	exceptionally high
Blackwater	Medina	Isle of Wight	no data	above normal
Broadlands	Test	Test Lower	exceptionally high	exceptionally high
Brockenhurst GS	Lymington	New Forest	above normal	notably high
Chilbolton GS	Test	Test Upper	exceptionally high	exceptionally high
Cowbeech Gs	Cuckmere	Cuckmere	above normal	exceptionally high
Goldbridge Gs	Ouse [so]	Ouse Sussex	notably high	exceptionally high
Iping Mill Gs	Rother	West Rother	exceptionally high	exceptionally high
Mislingford GS	Meon	Meon	exceptionally high	exceptionally high
North Fareham GS	Wallington	Wallington	exceptionally high	exceptionally high
Sakeham GS	Adur	Adur	exceptionally high	exceptionally high



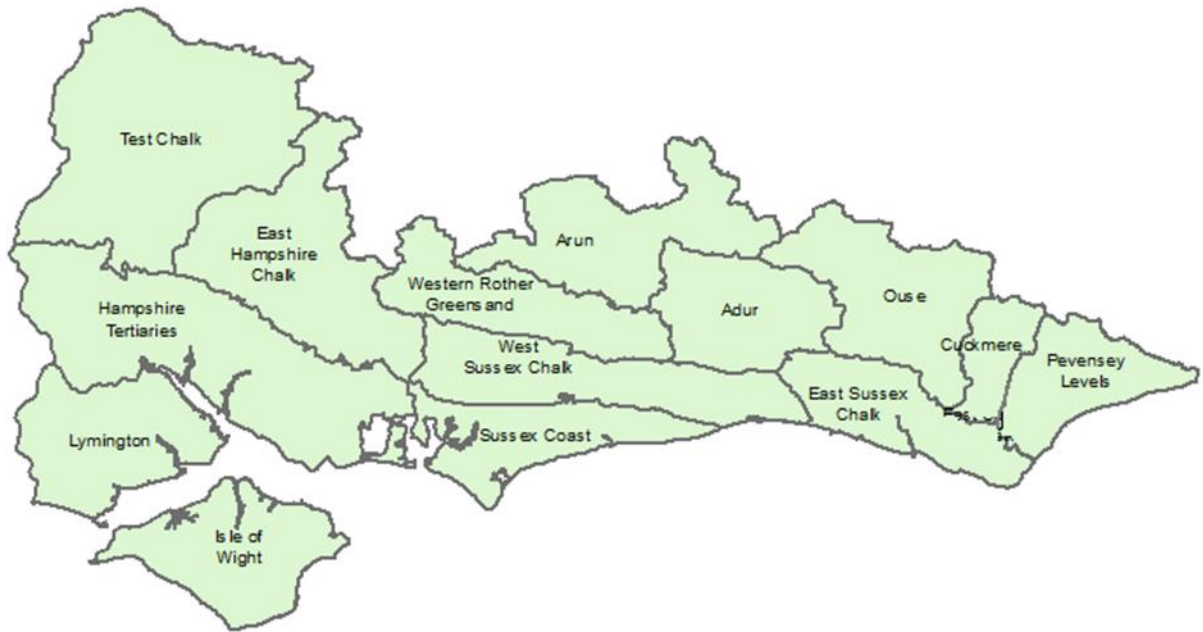
## 10.5 Groundwater table

Site name	Aquifer	End of April 2024 band	End of March 2024 band
Houndean Bottom Gwl	Brighton Chalk Block	notably high	exceptionally high
Chilgrove House Gwl	Chichester-Worthing-Portsdown Chalk	exceptionally high	exceptionally high
Carisbrooke Castle	Isle Of Wight Central Downs Chalk	notably high	notably high
West Meon Hut Gwl	River Itchen Chalk	exceptionally high	notably high
Clanville Gate Gwl	River Test Chalk	exceptionally high	exceptionally high
Lopcombe Corner Gwl	River Test Chalk	exceptionally high	exceptionally high
Beeding Hill Gwl	Brighton Chalk Block	notably high	exceptionally high
Catherington	River Meon Chalk	exceptionally high	exceptionally high
Cornish Wigdens Gwtr	Eastbourne Chalk Block	above normal	exceptionally high
Harting Common Down	Western Rother Lower Greensand	exceptionally high	exceptionally high
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 from 1 to 8 April 2024	Number of flow constraints in force from 9 to 15 April 2024	Number of flow constraints in force from 16 to 22 April 2024	Number of flow constraints in force from 23 to 30 April 2024
0	0	0	0

## 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>