Monthly water situation report: Solent and South Downs Area

Summary - December 2024

Solent and South Downs (SSD) had below average rainfall in December, receiving 66% (59mm) of the LTA (88.8mm). Monthly mean river flows across SSD ranged from below normal to notably high. End of month groundwater levels ranged from below normal to exceptionally high. Soils across SSD ended the month wetter than the average for December. End of month reservoir stocks were above average at Ardingly Reservoir (Ouse) and below average at Arlington Reservoir (Cuckmere).

1.1 Rainfall

SSD had below average rainfall in December, receiving 66% (59mm) of the LTA (88.8mm). The areal units in Hampshire received lower rainfall, than most of the those in Sussex. The Lymington areal unit received the lowest rainfall with 52% (48mm) of LTA (91.8mm). The Cuckmere and Ouse areal units in the east of SSD received the highest rainfall with 82% (70mm and 71mm, respectively) of LTA.

Between the 2 and 5 December about 50% of the month's rainfall fell. The highest rainfall totals fell on the 4 December when 29mm was recorded at Plumpton (East Sussex Chalk) and 26mm at Duncton (Western Rother Greensand). Both Chilgrove House (West Sussex Chalk) and Carisbrooke RGs (Isle of Wight) also received about 21mm of rain on the 4 December.

However, the last 12 months (January to December) has been the eighth wettest on record for SSD (since 1871). The Test Chalk and East Sussex Chalk areal unit recorded their third wettest calendar year and the Ouse and Cuckmere units their fifth wettest. All the SSD areal units recorded rainfall in the top 10 wettest on record.

Over the longer time periods, the 14-month, 18-month and 24 month running totals remain exceptionally high and were the wettest on record for SSD.

1.2 Soil moisture deficit and recharge

Soils across SSD ended the month wetter (0mm) than the average for December (7mm).

1.3 River flows

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

Flows were below normal on the:

- River Wallington at North Fareham

Flows were normal on the:

- River Meon at Mislingford
- River Arun at Alfoldean
- River Ouse at Goldbridge
- River Cuckmere at Cowbeech
- River Lymington at Brockenhurst
- River Medina at Blackwater
- River Rother at Iping Mill
- River Adur at Sakeham

Flows were notably high on the:

- River Test at Chilbolton
- River Test at Broadlands
- River Itchen at Allbrook and Highbridge

The monthly mean flows for December for the River Test were the fifth highest on record at Chilbolton (1989), and the sixth highest at Broadlands (1958). Monthly mean flows were the seventh highest on the River Itchen at Allbrook & Highbridge (1959).

1.4 Groundwater levels

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

Groundwater levels were below normal at:

- Carisbrooke Castle (Isle of Wight)

Groundwater levels were normal at:

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

Groundwater levels were above normal at:

- West Meon (East Hampshire Chalk)

Groundwater levels were notably high at:

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

- Clanville Gate (Test Chalk)

Groundwater levels were exceptionally high at:

- Preston Candover (East Hampshire Chalk)
- Youngwoods Copse (Isle of Wight)

The exceptionally high groundwater levels for December were the second highest on record at Youngwoods Copse (1978), and fourth highest at Preston Candover (1975). The notably high levels for December were the fifth highest at Clanville Gate (1966) and Lopcombe Corner (1963). Conversely, the end of month groundwater level at Carisbrooke Castle (Isle of Wight represents the 10th lowest level for December on its record (1977).

1.5 Reservoir stocks

End of month reservoir stocks were above average at Ardingly Reservoir (Ouse) and below average at Arlington Reservoir (Cuckmere). Ardingly Reservoir (Ouse) was at 99.8% of total capacity (LTA 87%) and Arlington Reservoir (Cuckmere) was at 65% of total capacity (LTA 87%).

1.6 Environmental impact

During December only one licence restriction was in force on the River Meon and this was lifted by the end of the month.

No flood warnings were issued for SSD in December, but 4 fluvial flood alerts and 1 groundwater alert were issued. All the fluvial alerts were located in Sussex. The groundwater alert was issued in Hampshire for headwater catchments of the River Itchen.

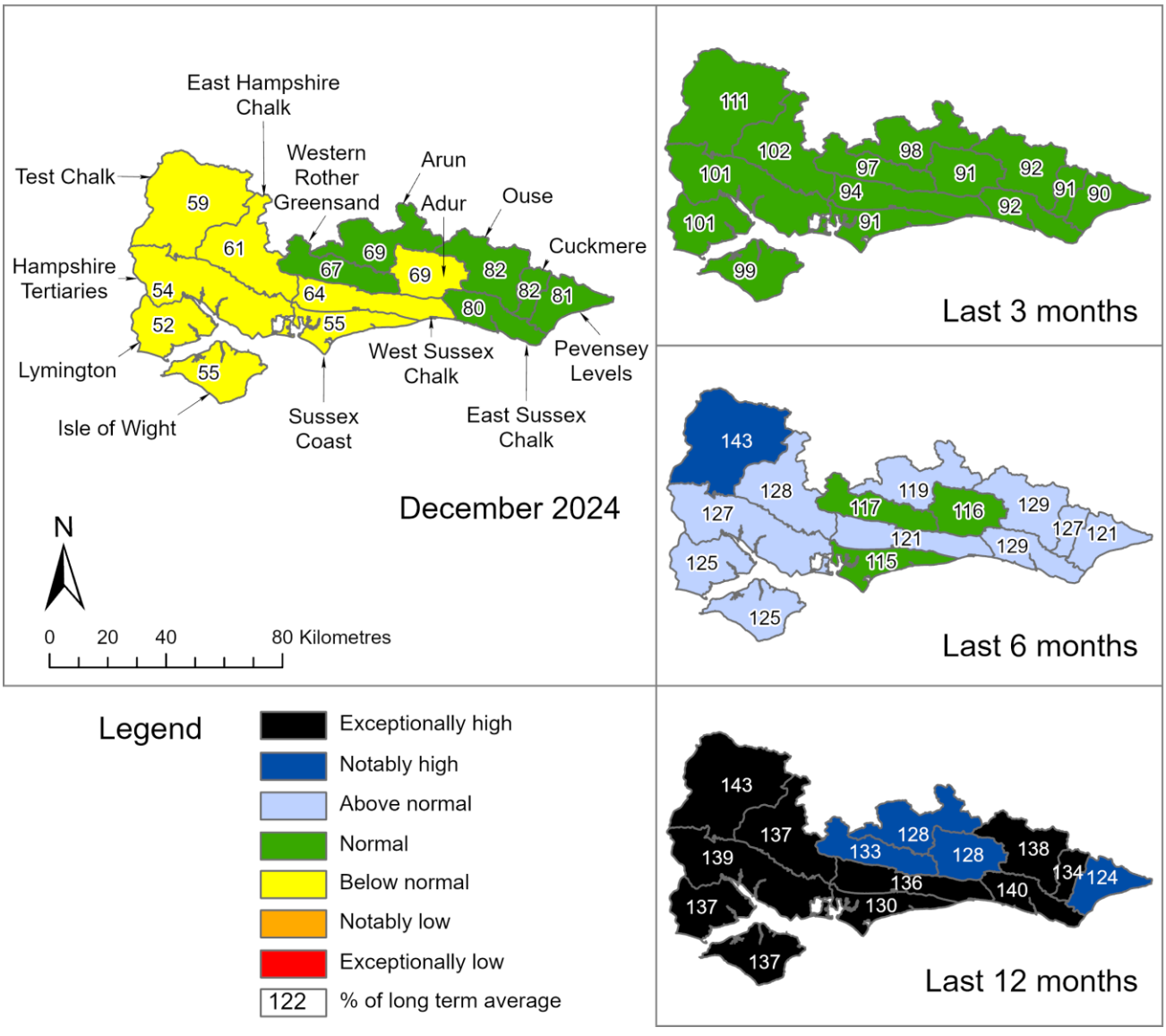
Author: HydrologySSD@environment-agency.gov.uk

Contact Details: 03708 506506

2. Rainfall

2.1 Rainfall map

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

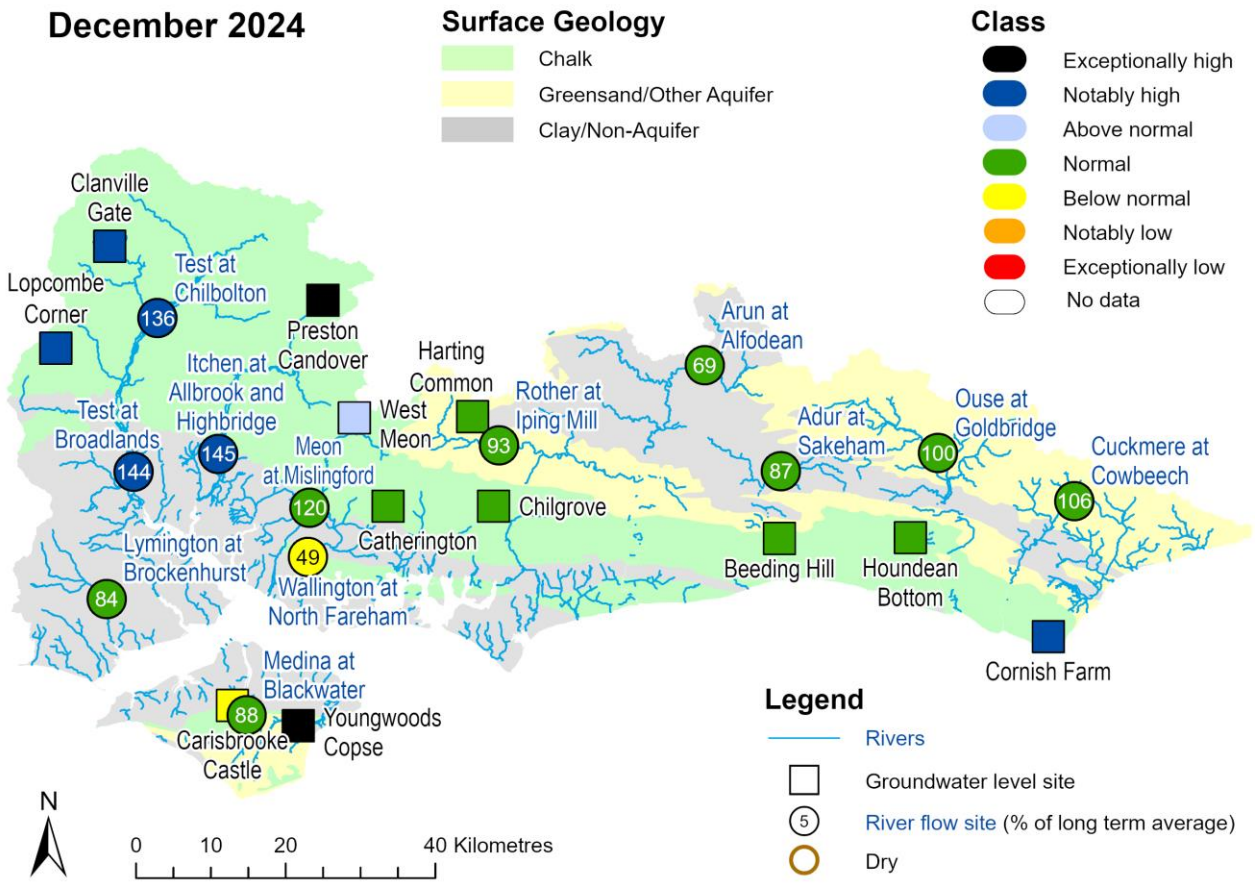


Rainfall data for 2024, extracted from Environment Agency 1km gridded rainfall dataset derived from Environment Agency intensity rain gauges. (Source: Environment Agency. Crown Copyright, 100024198, 2025). Rainfall data prior to 2024, extracted from Met Office HadUK 1km gridded rainfall dataset derived from registered rain gauges (Source: Met Office. Crown copyright, 2025).

3 River flows and Groundwater levels

3.1 River flows and Groundwater level map

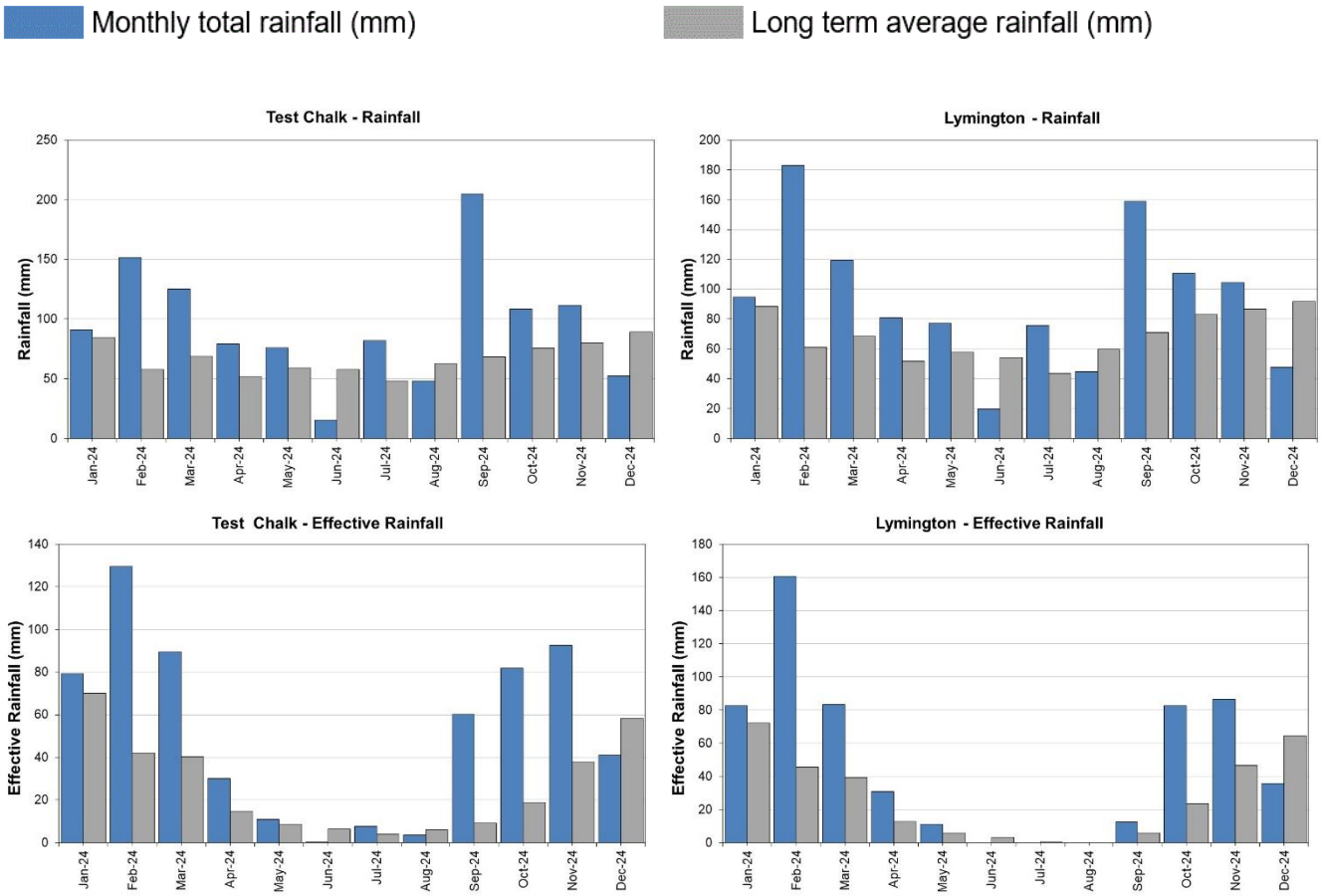
Figure 3.1: Monthly mean river flow and groundwater levels at our indicator sites for December 2024, expressed as a percentage of the respective long term average and classed relative to an analysis of historic December monthly means. Table available in the appendices with detailed information.



4 West Hampshire

4.1 West Hampshire Rainfall and effective rainfall charts

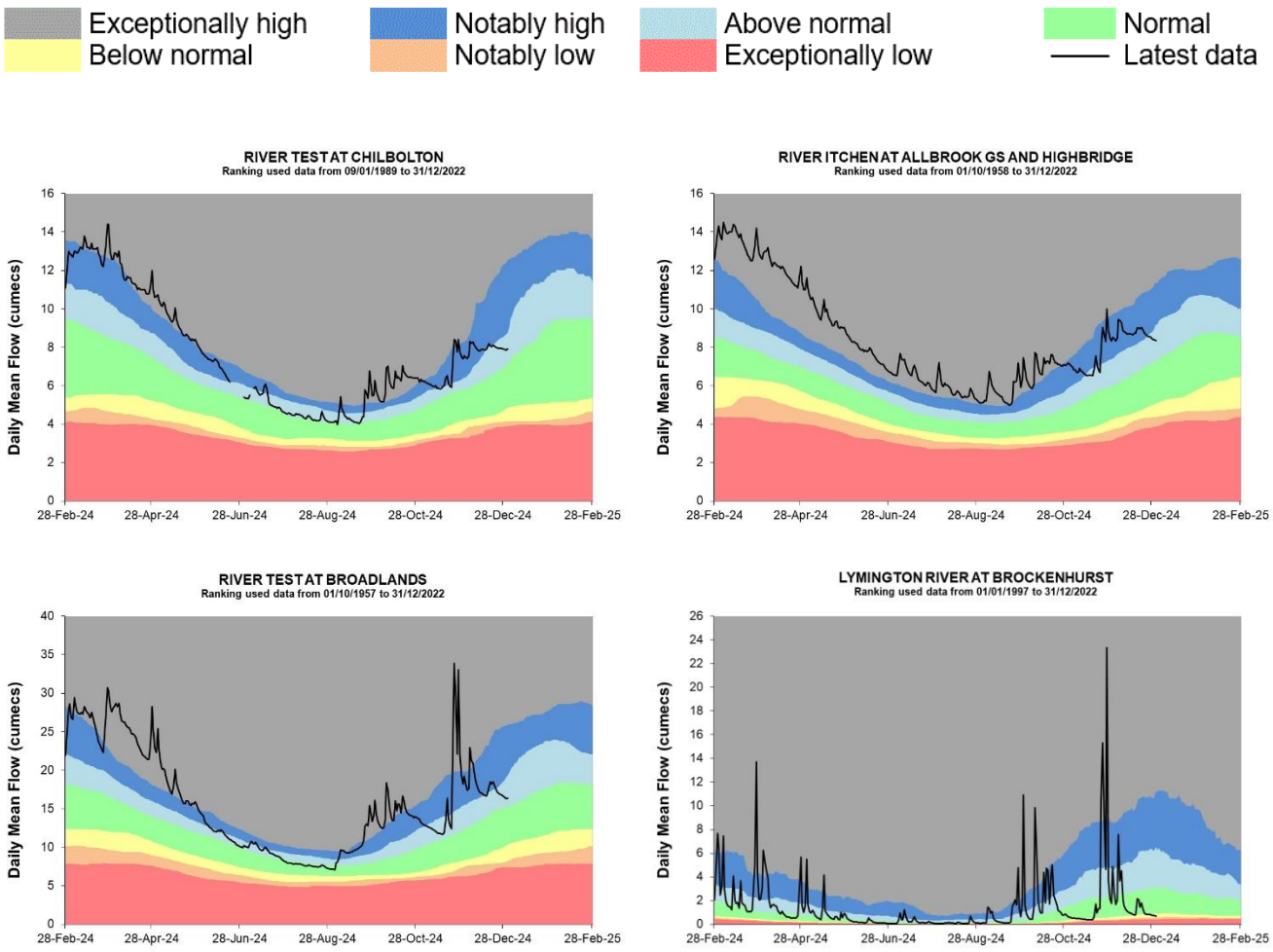
Figure 4.1: Monthly rainfall and effective rainfall totals for the past 12 months compared to the 1961 to 1990 long term average.



HadUK rainfall data. (Source: Met Office. Crown copyright, 2025).

4.2 West Hampshire River flow charts

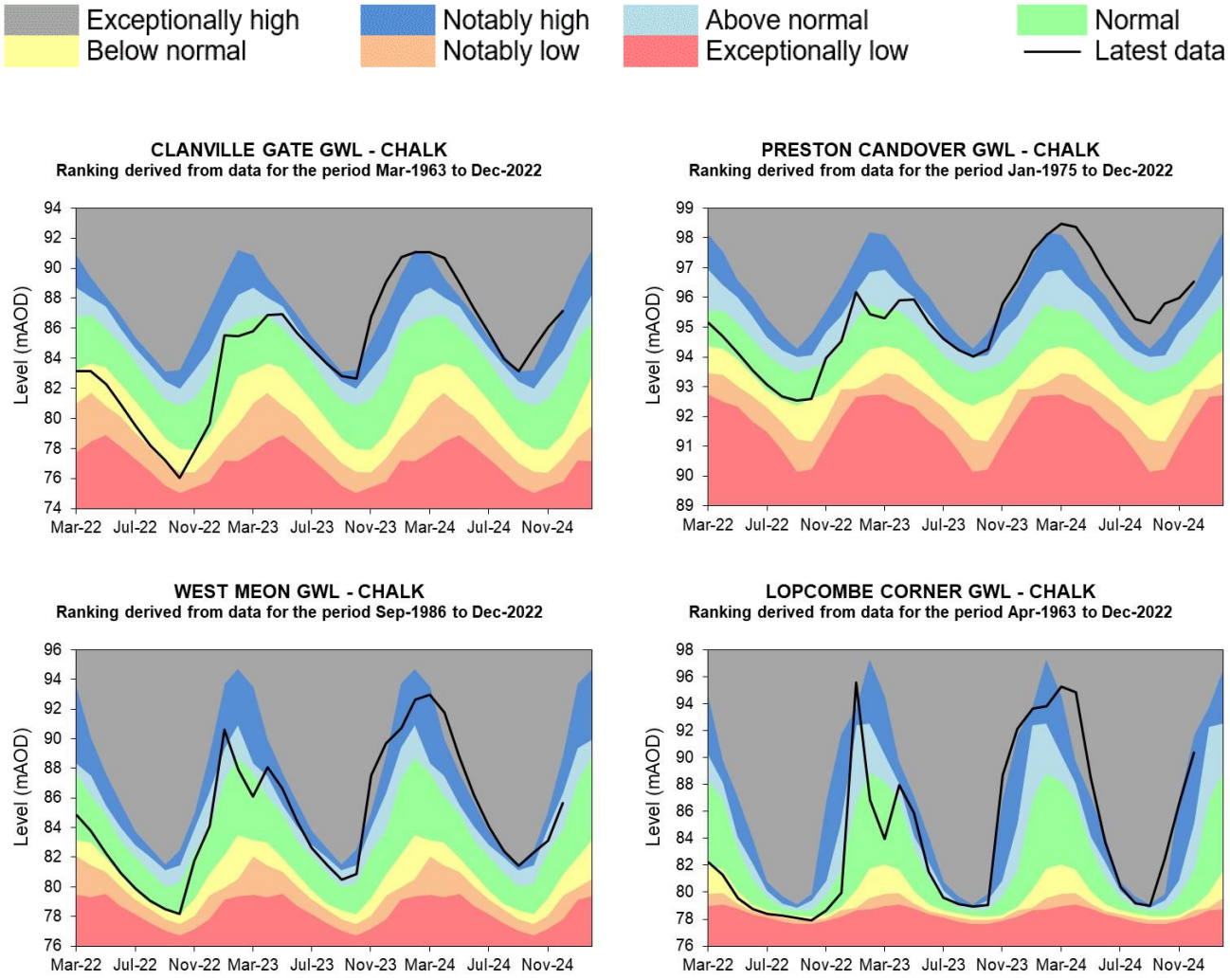
Figure 4.2: Daily mean river flow for index sites over the past year, compared to an analysis of historic daily mean flows, and long term maximum and minimum flows.



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.

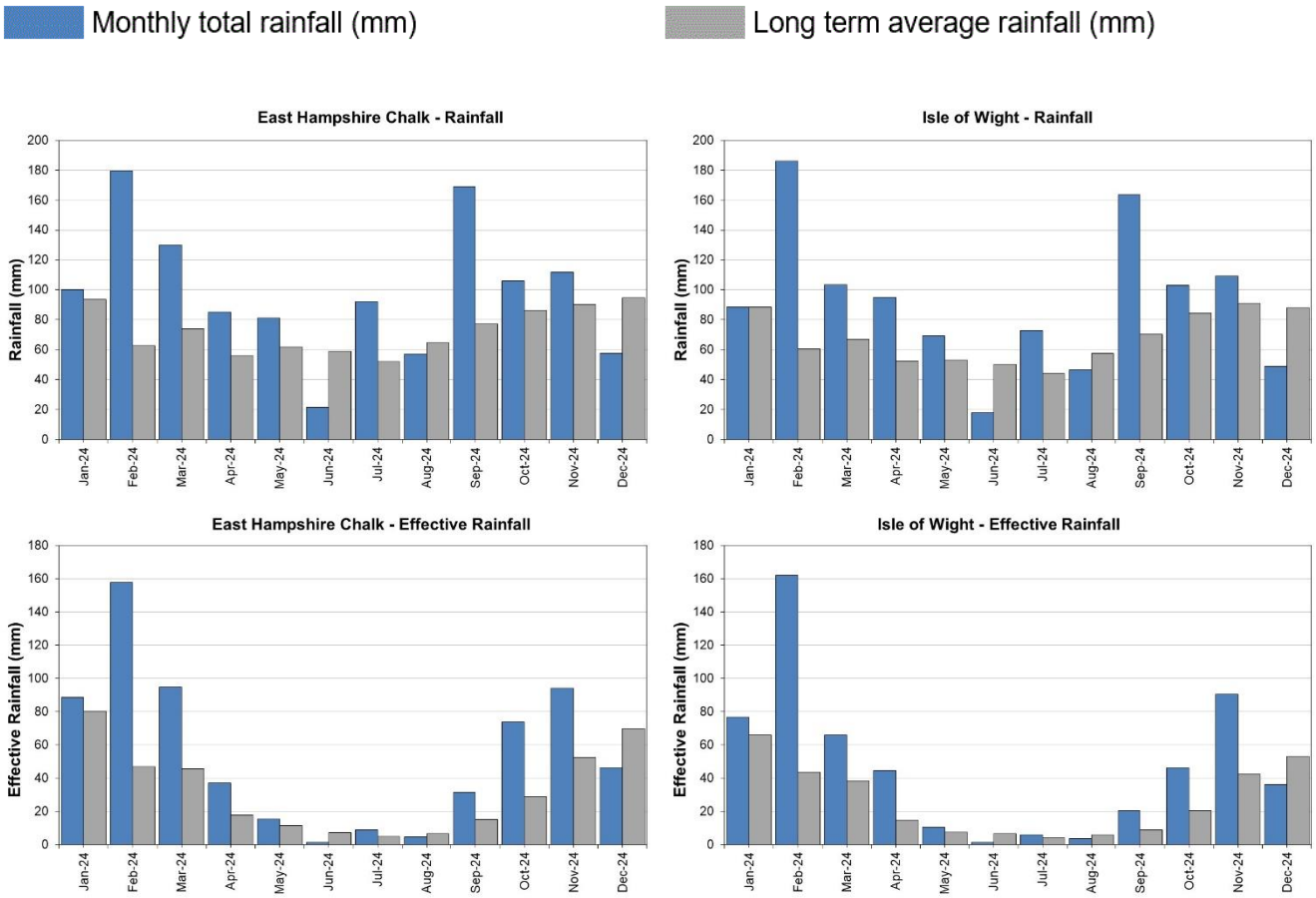


Source: Environment Agency, 2025.

5 East Hampshire and Isle of Wight

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

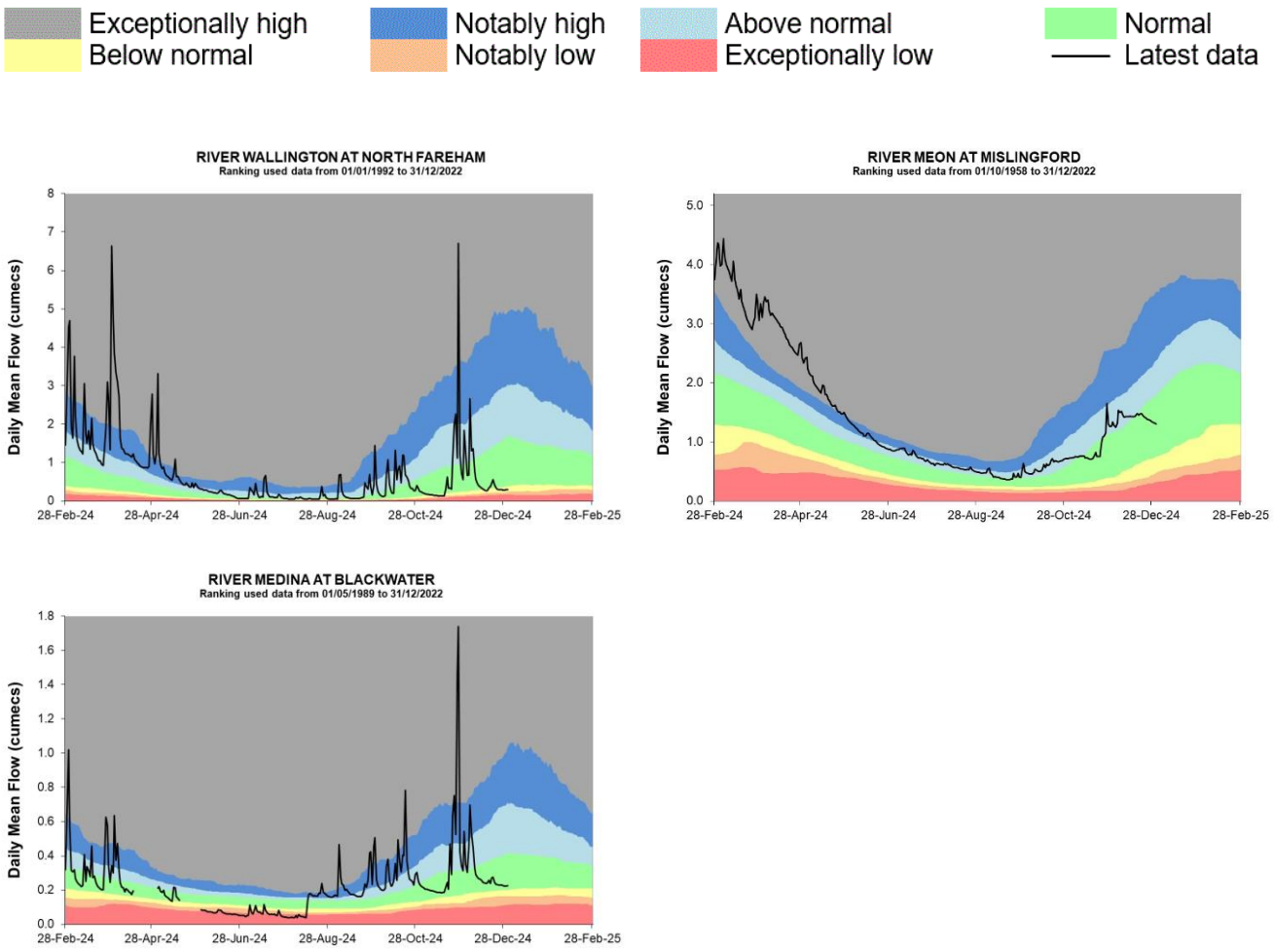
Figure 5.1: Monthly rainfall and effective rainfall totals for the past 12 months compared to the 1961 to 1990 long term average.



HadUK rainfall data. (Source: Met Office. Crown copyright, 2025).

5.2 East Hampshire and Isle of Wight River flow charts

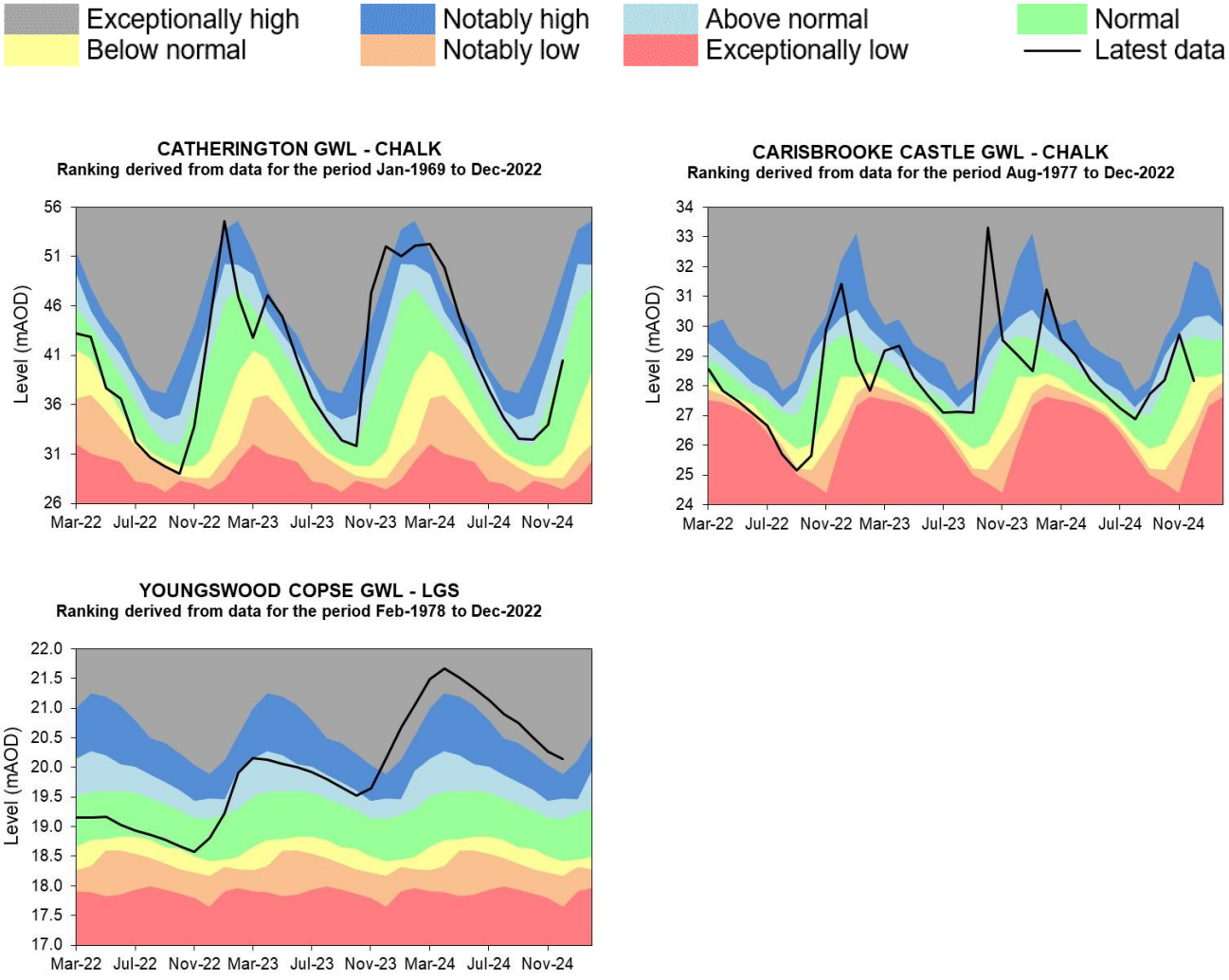
Figure 5.2 Daily mean river flow for index sites over the past year, compared to an analysis of historic daily mean flows, and long term maximum and minimum flows.



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.

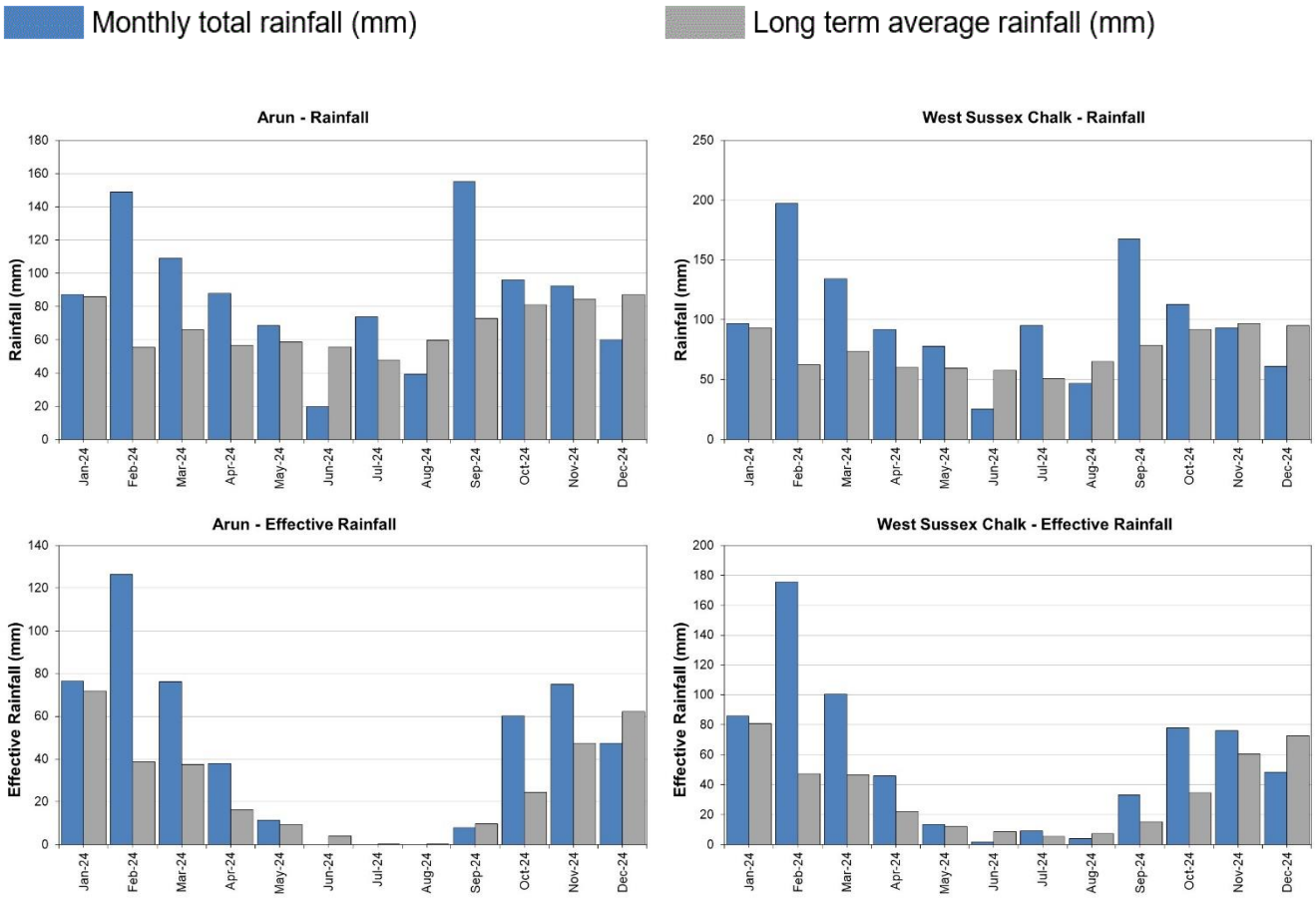


Source: Environment Agency, 2025.

6 West Sussex

6.1 West Sussex Rainfall and Effective Rainfall charts

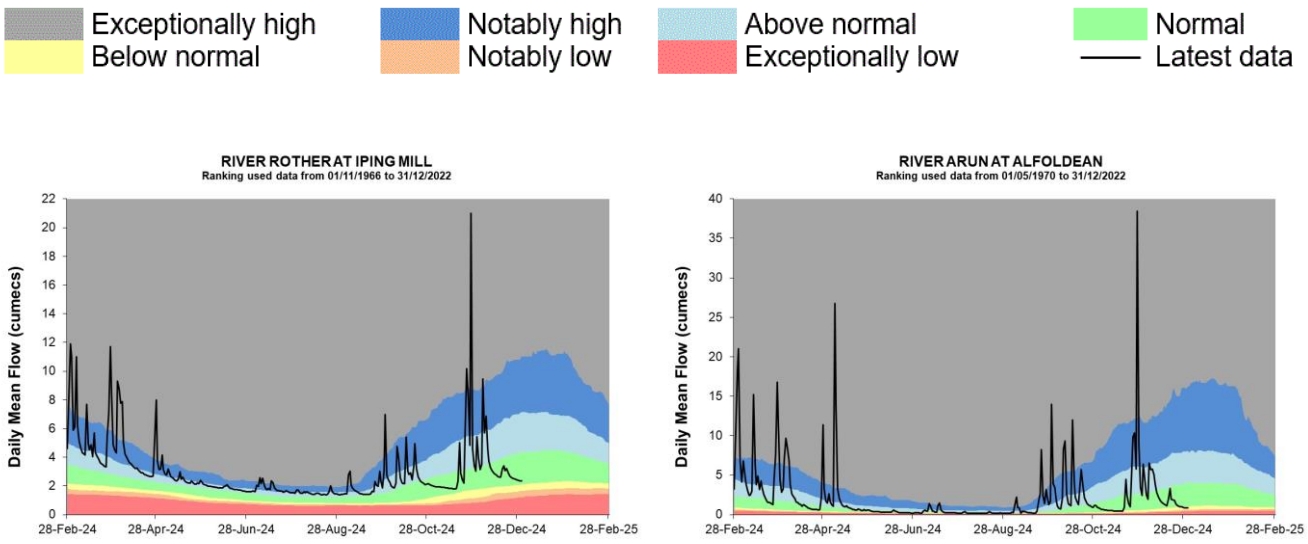
Figure 6.1: Monthly rainfall and effective rainfall totals for the past 12 months as a percentage of the 1961 to 1990 long term average.



HadUK rainfall data. (Source: Met Office. Crown copyright, 2025).

6.2 West Sussex River flow charts

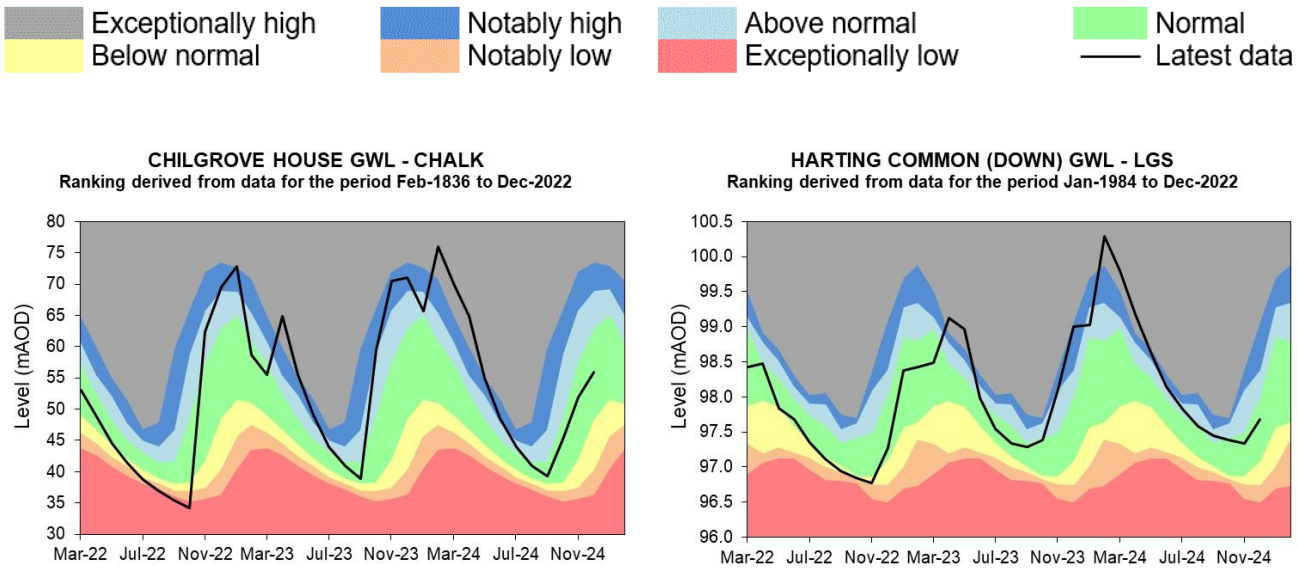
Figure 6.2: Daily mean river flow for index sites over the past year, compared to an analysis of historic daily mean flows, and long term maximum and minimum flows.



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.

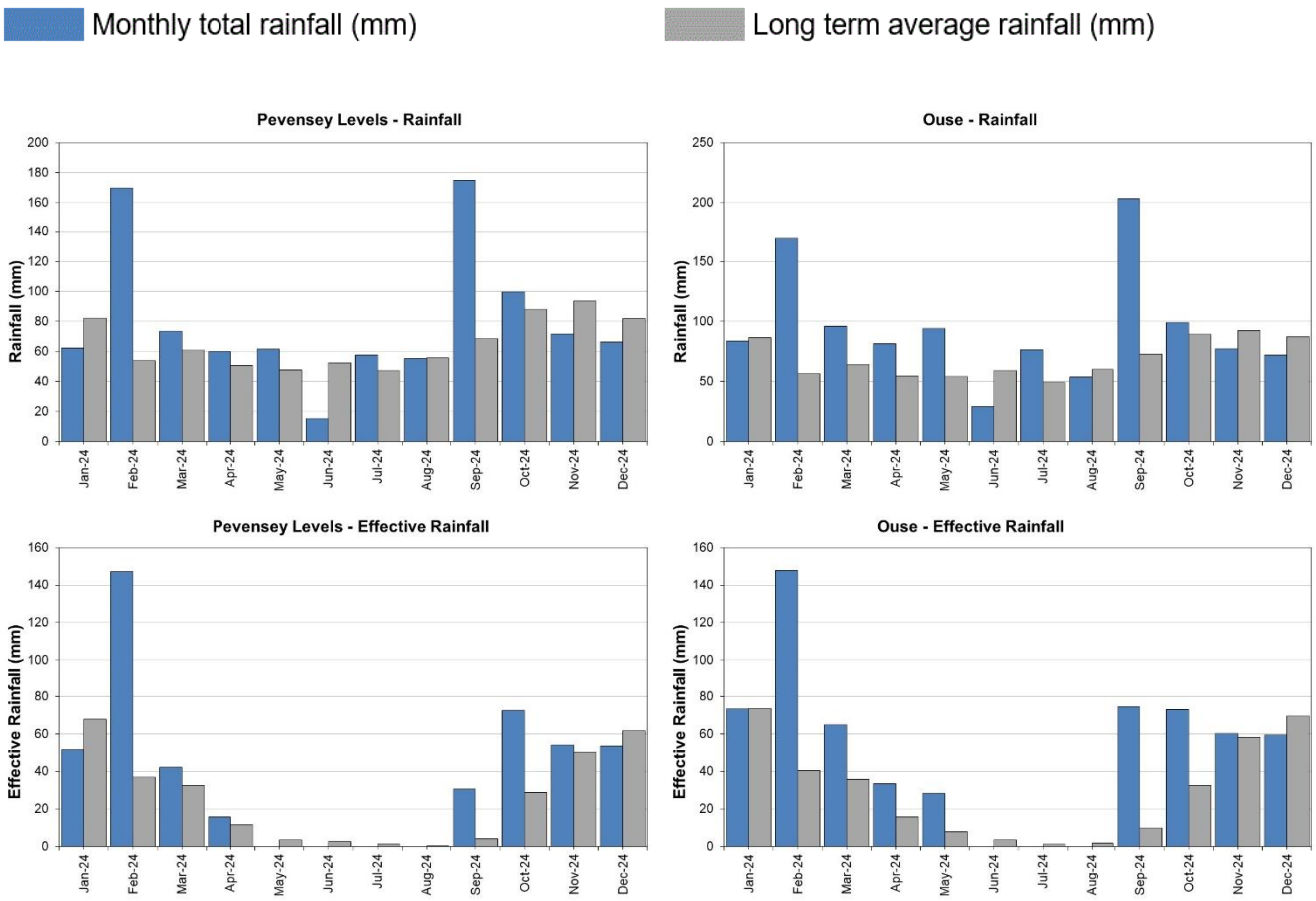


Source: Environment Agency, 2025.

7 East Sussex

7.1 East Sussex Rainfall and Effective Rainfall charts

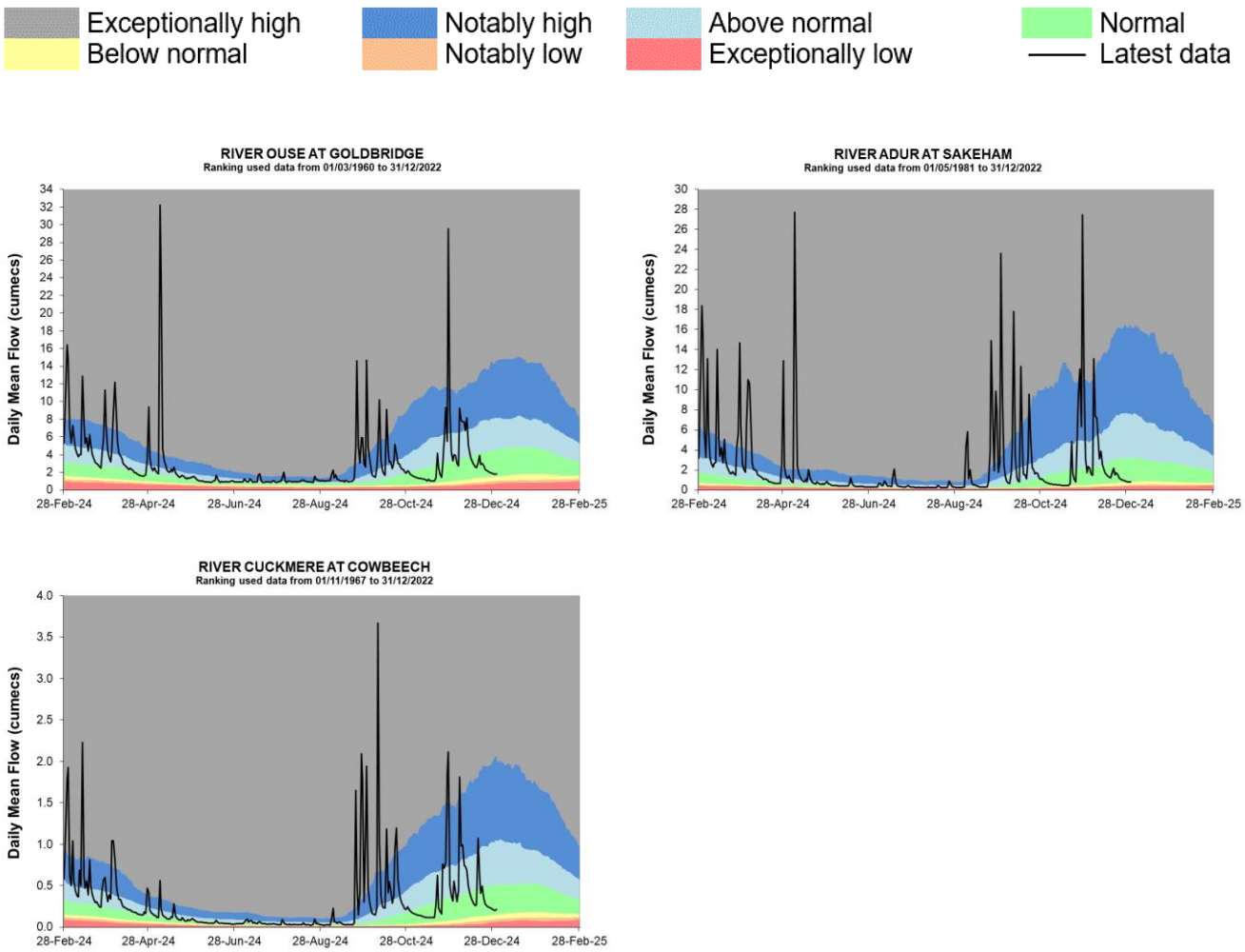
Figure 7.1: Monthly rainfall and effective rainfall totals for the past 12 months compared to the 1961 to 1990 long term average.



HadUK rainfall data. (Source: Met Office. Crown copyright, 2025).

7.2 East Sussex River flow charts

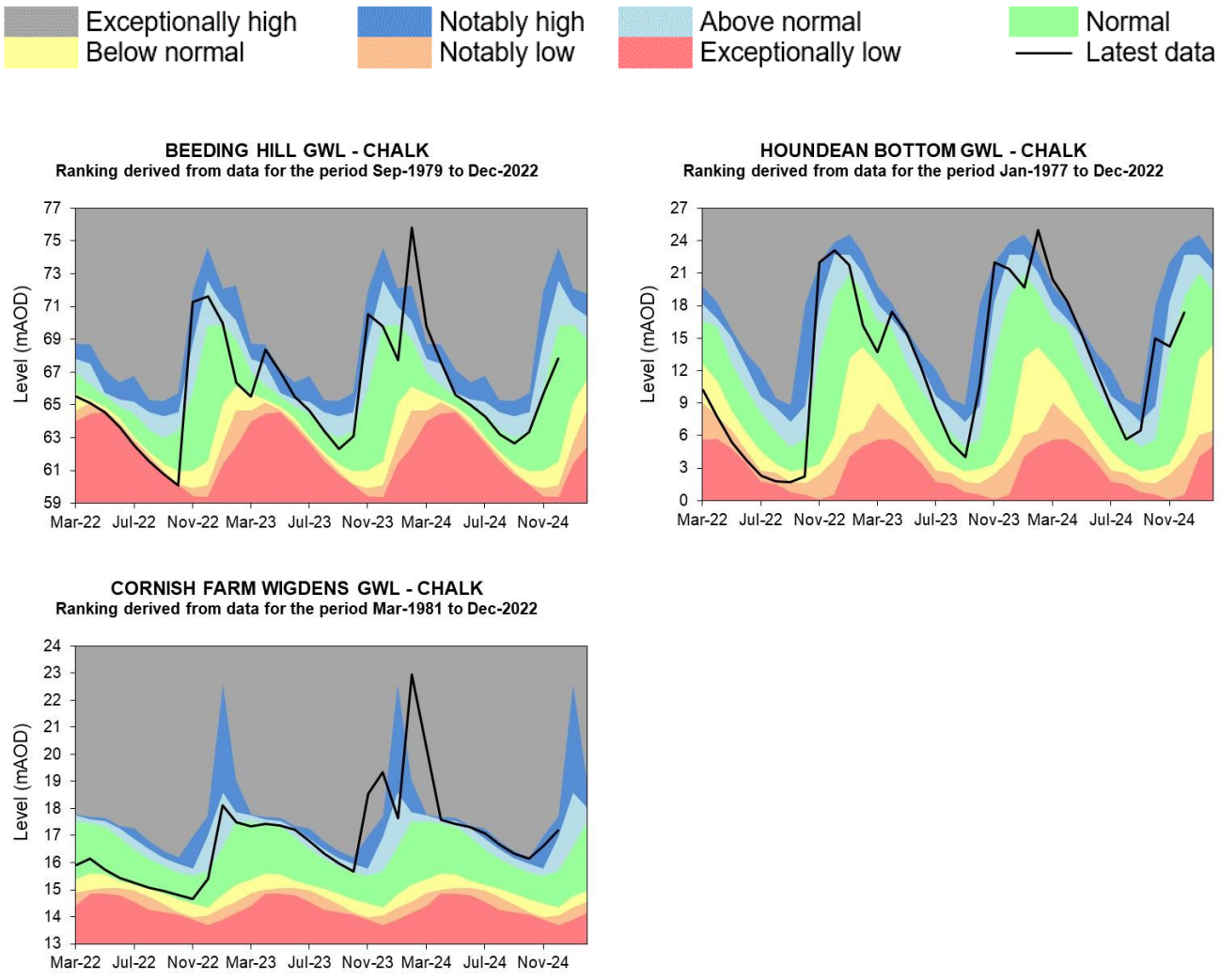
Figure 7.2: Daily mean river flow for index sites over the past year, compared to an analysis of historic daily mean flows, and long term maximum and minimum flows.



Source: Environment Agency, 2024.

7.3 East Sussex Groundwater level charts

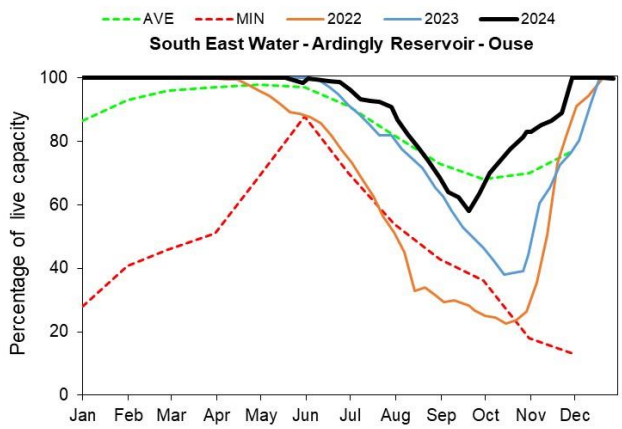
Figure 7.3: End of month groundwater levels at index groundwater level sites for major aquifers. 34 months compared to an analysis of historic end of month levels and long term maximum and minimum levels.

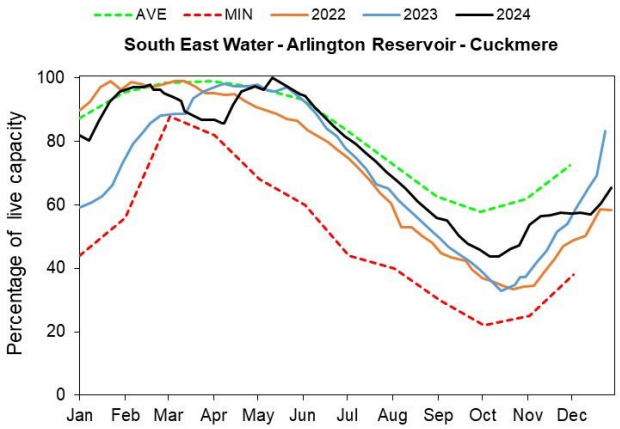


Source: Environment Agency, 2025.

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

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 December as %LTA	Effective Rainfall (mm) 30 day Total	Effective Rainfall December as %LTA	Soil Moisture Deficit (SMD) Day 30	SMD End of December LTA
Test Chalk	52	58%	41	70%	2	11
East Hampshire Chalk	58	61%	46	66%	1	7
West Sussex Chalk	61	63%	48	67%	0	5
East Sussex Chalk	71	80%	59	92%	0	7
Isle of Wight	49	55%	36	68%	1	16
Western Rother Greensand	67	67%	54	73%	0	6
Hampshire Tertiaries	47	53%	35	60%	1	8
Lymington	48	52%	36	55%	1	7
Sussex Coast	43	55%	30	64%	0	12
Arun	60	69%	47	76%	0	6
Adur	59	69%	47	72%	0	4
Ouse	71	82%	59	85%	0	3
Cuckmere	70	82%	58	85%	0	2
Pevensey Levels	66	81%	54	87%	0	4
SSD Average	59	66%	47	73%	0	7

10.2 Seasonal summary table of rainfall and effective rainfall

Winter season: 01/10/2024 to 31/03/2025

Hydrological Area	Seasonal Rainfall (mm) Total	Seasonal Rainfall as % LTA	Seasonal Effective Rainfall (mm) Total	Seasonal Effective Rainfall as % LTA
Test Chalk	272	111%	215	187%
East Hampshire Chalk	276	102%	214	142%
West Sussex Chalk	267	94%	203	121%
East Sussex Chalk	258	92%	201	132%
Isle of Wight	261	99%	172	149%
Western Rother Greensand	275	96%	196	118%
Hampshire Tertiaries	252	101%	192	163%
Lymington	263	100%	205	152%
Sussex Coast	215	91%	110	116%
Arun	248	99%	182	136%
Adur	235	90%	180	122%
Ouse	248	92%	193	120%
Cuckmere	246	91%	192	117%
Pevensey Levels	237	90%	180	128%
SSD Average	254	96%	188	134%

10.3 Rainfall banding table

Hydrological area	December 2024 band	October 2024 to December 2024 cumulative band	July 2024 to December 2024 cumulative band	January 2024 to December 2024 cumulative band
Test Chalk	Below normal	Normal	Notably high	Exceptionally high
East Hampshire Chalk	Below normal	Normal	Above normal	Exceptionally high
West Sussex Chalk	Below normal	Normal	Above normal	Exceptionally high
East Sussex Chalk	Normal	Normal	Above normal	Exceptionally high
Isle of Wight	Below normal	Normal	Above normal	Exceptionally high
Western Rother Greensand	Normal	Normal	Normal	Notably high
Hampshire Tertiaries	Below normal	Normal	Above normal	Exceptionally high
Lymington	Below normal	Normal	Above normal	Exceptionally high
Sussex Coast	Below normal	Normal	Normal	Exceptionally high
Arun	Normal	Normal	Above normal	Notably high
Adur	Below normal	Normal	Normal	Notably high
Ouse	Normal	Normal	Above normal	Exceptionally high
Cuckmere	Normal	Normal	Above normal	Exceptionally high
Pevensey Levels	Normal	Normal	Above normal	Notably high

10.4 River flows table

Site name	River	Catchment	December 2024 band	November 2024 band
Alfoldean Gs	Arun	Arun	Normal	Normal
Allbrook Gs+ Highbridge	Itchen (so)	Itchen	Notably high	Notably high
Blackwater	Medina	Isle of Wight	Normal	Above normal
Broadlands	Test	Test Lower	Notably high	Notably high
Brockenhurst GS	Lymington	New Forest	Normal	Above normal
Chilbolton GS	Test	Test Upper	Notably high	Notably high
Cowbeech Gs	Cuckmere	Cuckmere	Normal	Normal
Goldbridge Gs	Ouse [so]	Ouse Sussex	Normal	Normal
Iping Mill Gs	Rother	West Rother	Normal	Above normal
Mislingford GS	Meon	Meon	Normal	Normal
North Fareham GS	Wallington	Wallington	Below normal	Normal
Sakeham GS	Adur	Adur	Normal	Above normal

10.5 Groundwater table

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

10.6 Abstraction licence flow constraints

Number of flow constraints in force between 1 to 09 December 2024	Number of flow constraints in force between 10 to 16 December 2024	Number of flow constraints in force between 17 to 23 December 2024	Number of flow constraints in force between 24 to 31 December 2024
1	1	1	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
SSD Average	**87.3**	**58.0**	**66.9**	**53.9**	**55.6**	**55.2**	**47.2**	**60.0**	**71.8**	**85.3**	**89.6**	**88.8**