Monthly water situation report: Kent and South London Area

1 Summary - October 2024

The whole of the Kent and South London area received 117% of the long-term average rainfall during October. Rainfall received across all catchments was normal for this time of year. In general, SMDs decreased throughout all rainfall areas during October, however some rainfall areas that had soil that was close to being fully saturated at the end of September saw a marginal increase. Monthly mean flows ranged from normal to notably high in October. Groundwater levels during October continued to fall across most of the KSL area and ranged from normal to notably high for this time of the year. Levels at the end of the month at the five water company reservoirs in the area ranged from normal to exceptionally high. Levels at most of the reservoirs increased throughout October, and levels at the other reservoirs either slightly decreased or remained stable.

1.1 Rainfall

The whole of the Kent and South London (KSL) area received 117% of the long-term average (LTA) rainfall during October. Rainfall received across all catchments was normal for this time of year. The percentage of LTA rainfall received across catchments ranged from 89% in the Darent rainfall area to 131% in the North Kent Chalk rainfall area. The highest daily rainfall total of 35.5 mm for October was recorded at Cranbrook STW rain gauge in the Medway catchment on the 8 September. The second to fifth highest daily rainfall totals were on 13, 16, 07 and 20 September and ranged from 28mm to 15.9mm across the North Downs - South London, Stour and Dover Chalk catchments. The driest day was 5 October, with only 0.3 mm of rain recorded across the whole area.

The whole KSL area recorded the fifth wettest twelve months ending in October on record since records began in 1871. The Medway catchment saw the second wettest twelve months on record. The Dover Chalk and Eastern Rother rainfall areas recorded the third wettest twelve months.

1.2 Soil moisture deficit and recharge

At the end of October, Soil Moisture Deficits (SMDs) were, on average, 30 mm. Soil Moisture Deficits tend to be higher than this at this time of year, in line with the expected end of October

LTA, which is 73 mm. In general, SMDs decreased throughout all rainfall areas during October, however some rainfall areas that had soil that was close to being fully saturated at the end of September saw a marginal increase. Soil Moisture Deficits (SMDs) in the south and west of the patch ranged from less than 10mm to 40mm. SMDs in the north and east of the patch were higher and ranged from 41mm to 130mm. SMDs decreased in most catchments to the East in October, attributed to the ongoing effective rainfall which stood at 154% of the Long-Term Average (LTA).

1.3 River flows

Monthly mean flows (MMFs) ranged from normal to notably high in October. Eight out of the eleven key flow sites saw notably high MMFs, and all of these are located near the centre and in the east of the patch. Two key flow sites located in the west of the area observed above normal MMFs, and the remaining key flow site, also located in the west of the area, saw normal MMFs. The highest MMF was recorded at the Rother at Udiam, which saw 266% of the LTA for the month of October. The lowest MMF, which was 75% of the LTA, was observed at the Ravensbourne at Catford.

1.4 Groundwater levels

In general, groundwater levels continued to fall across the KSL area. This is with the exception of Riverhead and Fleet Reservoir, where the groundwater levels have stabilised in October. In general, the slowdown or discontinuation of the fall of groundwater levels is consistent with the continued pattern of effective rainfall that in October was 158% of the LTA.

At the end of October, groundwater levels across the whole KSL area ranged from normal to notably high. The Lower Greensand aquifer at Riverhead continued to observe groundwater levels that are notably high for this time of year, with a slight rise continuing this month. Groundwater levels in the Chalk aquifer were also mostly notably high. The exception are the key monitoring points in the west of the patch registering levels in the Chalk at Chipstead and Sweeps Lane that are assessed as normal and above normal, respectively.

1.5 Reservoir stocks

At the end of October, levels at the water company reservoirs in KSL ranged from normal to exceptionally high. Levels at three of the five reservoirs in the area increased throughout October; Powdermill, Darwell and Bough Beech. Levels at Powdermill and Bough Beech reservoirs were above normal, at 88% and 73% respectively. Levels at Darwell, which had a live capacity of 80% on day 31 of the month, were notably high. In comparison, levels at Bewl reservoir, which had a live capacity of 63% at the end of October, decreased slightly during the month. Levels at this reservoir were normal for this time of year. Weirwood remained offline during October, and the levels at the reservoir, which were exceptionally high for this time of year at 100% live capacity, stayed stable.

1.6 Environmental impact

Thirty-two fluvial flood alerts were issued from 6 to 17 October.

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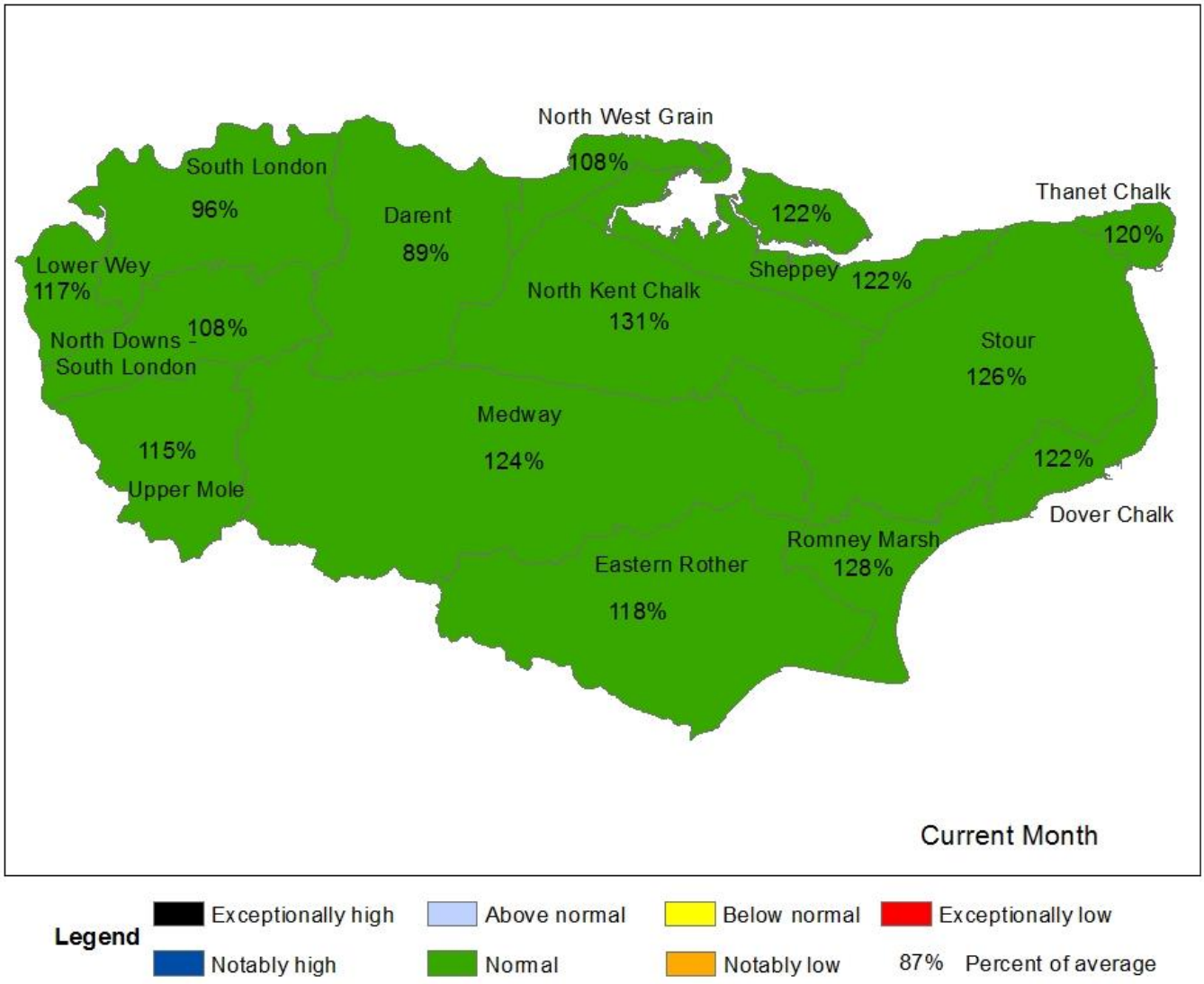
2 Rainfall

2.1 Rainfall map one

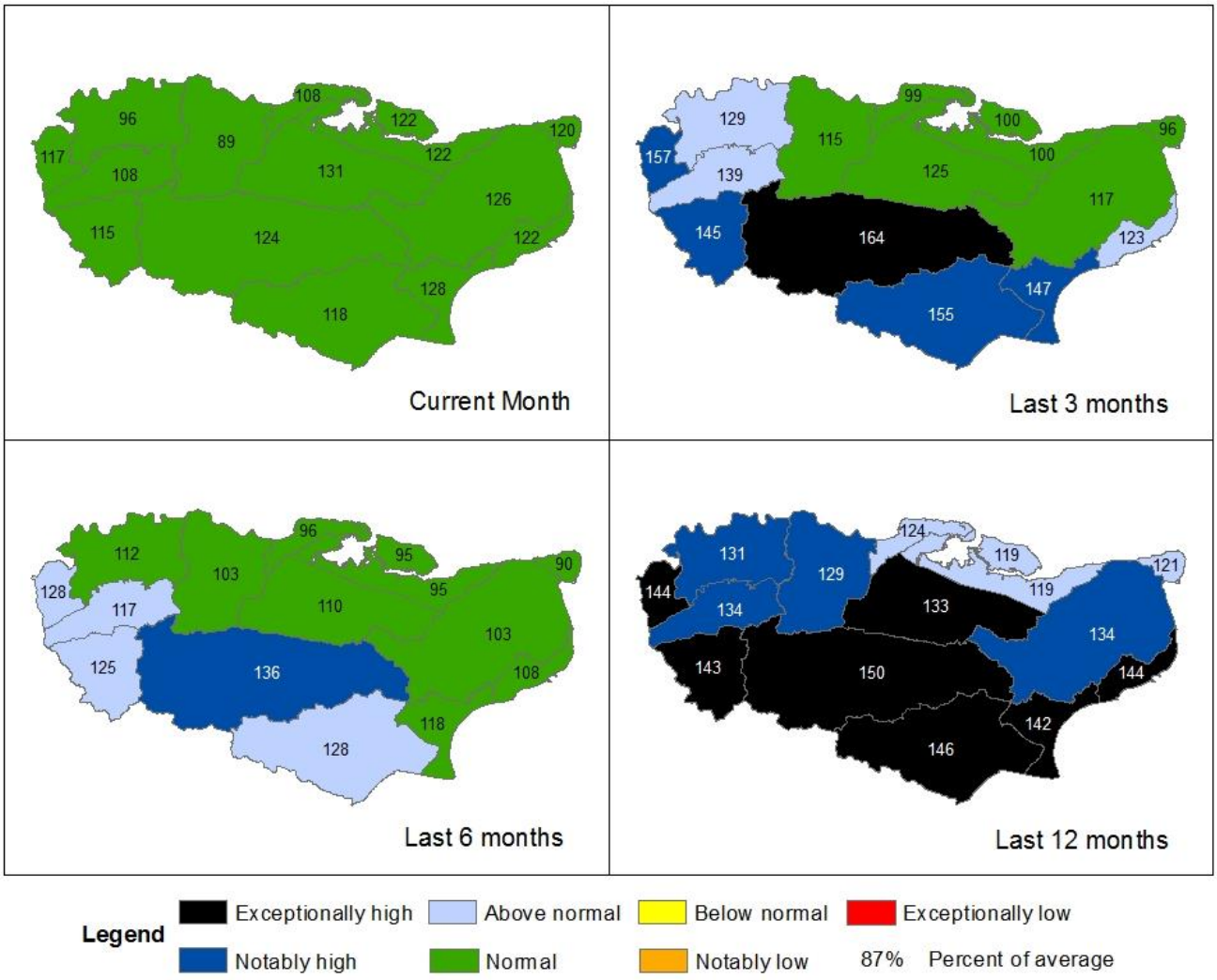
Figure 2.1: Total rainfall for hydrological areas across Kent and South London for the current month (up to 31 October 2024), classed relative to an analysis of respective historic totals. Table available in the appendices with more detailed information.



HadUK data based on the Met Office 1km gridded rainfall dataset derived from rain gauges (Source: Met Office. Crown copyright, 2024). Provisional data based on Environment Agency 1km gridded rainfall dataset derived from Environment Agency intensity rain gauges. Includes material based on Ordnance Survey 1:50 000 maps with the permission of the controller of His Majesty's Stationery Office © Crown copyright. All rights reserved. Environment Agency, 100026380, 2024.

2.2 Rainfall map two

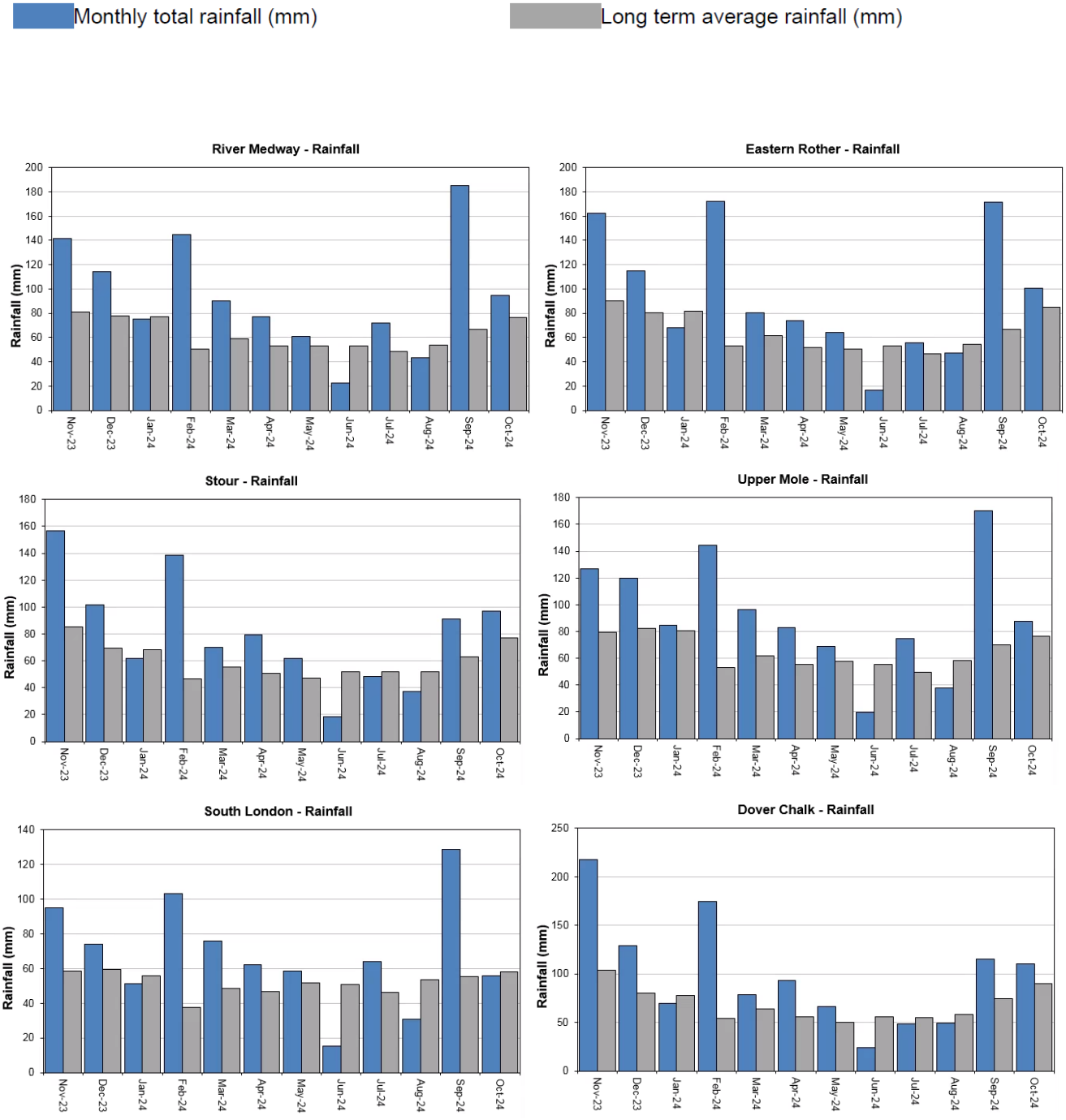
Figure 2.2: Total rainfall for hydrological areas for the current month (up to 31 October 2024), the last 3 months, the last 6 months, and the last 12 months, classed relative to an analysis of respective historic totals. Table available in the appendices with detailed information.

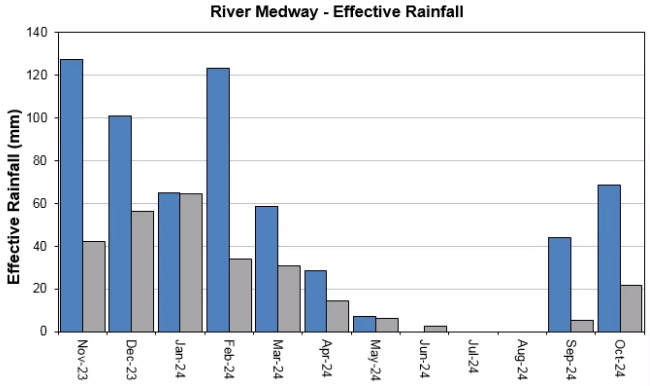


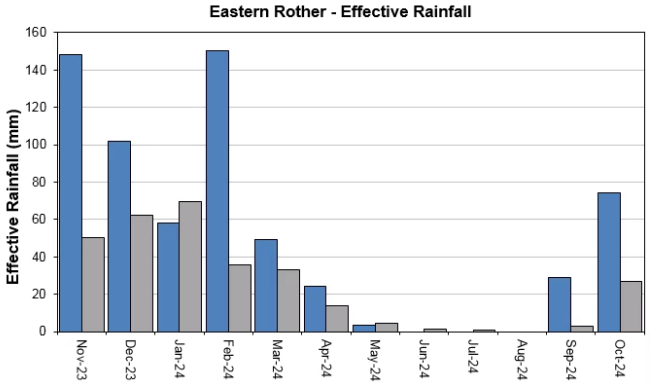
HadUK data based on the Met Office 1km gridded rainfall dataset derived from rain gauges (Source: Met Office. Crown copyright, 2024). Provisional data based on Environment Agency 1km gridded rainfall dataset derived from Environment Agency intensity rain gauges. Includes material based on Ordnance Survey 1:50 000 maps with the permission of the controller of His Majesty's Stationery Office © Crown copyright. All rights reserved. Environment Agency, 100026380, 2024.

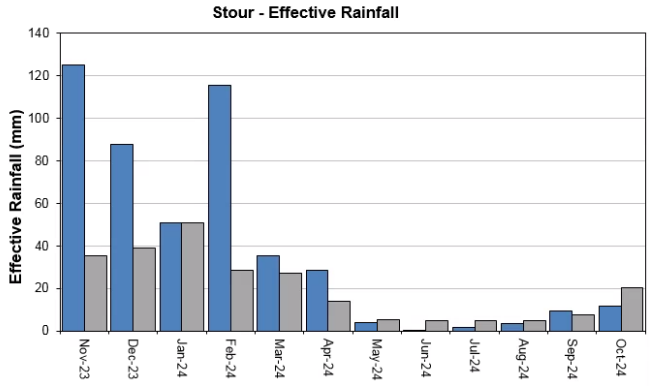
2.3 Rainfall and effective rainfall charts

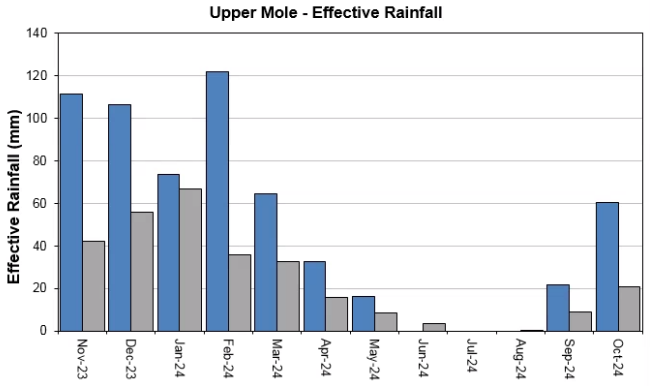
Figure 2.3: : Monthly rainfall and effective rainfall totals for the past 12 months as a percentage of the 1961 to 1990 long term average (LTA) for a selection of areal units. HadUK rainfall data. (Source: Met Office. Crown copyright, 2024). EA effective rainfall data (Source EA Soil Moisture Model).

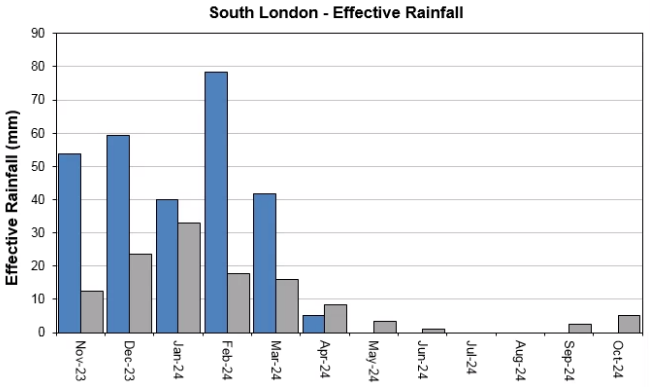


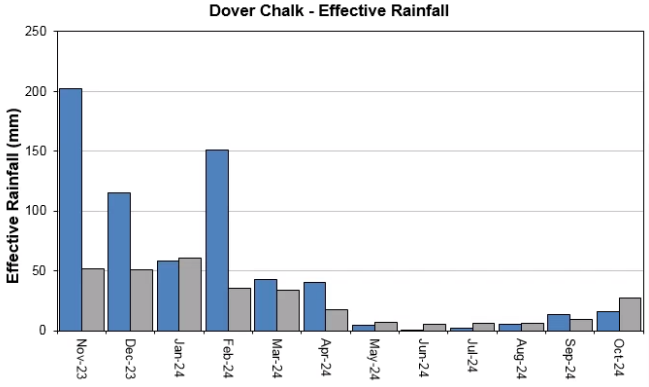

River Medway - Effective Rainfall
Effective Rainfall (mm)
0
20
40
60
80
100
120
140
Nov-23
Dec-23
Jan-24
Feb-24
Mar-24
Apr-24
May-24
Jun-24
Jul-24
Aug-24
Sep-24
Oct-24


Eastern Rother - Effective Rainfall
Effective Rainfall (mm)
0
20
40
60
80
100
120
140
160
Nov-23
Dec-23
Jan-24
Feb-24
Mar-24
Apr-24
May-24
Jun-24
Jul-24
Aug-24
Sep-24
Oct-24


Stour - Effective Rainfall
Effective Rainfall (mm)
0
20
40
60
80
100
120
140
Nov-23
Dec-23
Jan-24
Feb-24
Mar-24
Apr-24
May-24
Jun-24
Jul-24
Aug-24
Sep-24
Oct-24


Upper Mole - Effective Rainfall
Effective Rainfall (mm)
0
20
40
60
80
100
120
140
Nov-23
Dec-23
Jan-24
Feb-24
Mar-24
Apr-24
May-24
Jun-24
Jul-24
Aug-24
Sep-24
Oct-24


South London - Effective Rainfall
Effective Rainfall (mm)
0
10
20
30
40
50
60
70
80
90
Nov-23
Dec-23
Jan-24
Feb-24
Mar-24
Apr-24
May-24
Jun-24
Jul-24
Aug-24
Sep-24
Oct-24


Dover Chalk - Effective Rainfall
Effective Rainfall (mm)
0
50
100
150
200
250
Nov-23
Dec-23
Jan-24
Feb-24
Mar-24
Apr-24
May-24
Jun-24
Jul-24
Aug-24
Sep-24
Oct-24

2.4 Rainfall and effective rainfall table

Figure 2.4: This is a second estimate of areal rainfall and effective rainfall (percolation or runoff) for a selection of the hydrological areas across the Kent and South London area. 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 2.5.

Number	Hydrological Area	Rainfall (mm) 31 day Total	October % LTA	Effective Rainfall (mm) 31 day Total	October % LTA
6230TH	North Downs - South London (W)	79	107%	34	154%
6505TH	Upper Mole	87	115%	60	288%
6508TH	South London	56	96%	0	0%
6706So	Darent	56	89%	6	43%
6707So	North Kent Chalk	91	131%	11	63%
6708So	Stour	97	126%	12	58%
6709So	Dover Chalk	110	122%	16	58%
6710So	Thanet Chalk	78	120%	9	91%
6809So	Medway	95	125%	69	317%
6810So	Eastern Rother	101	118%	74	276%

6811So	Romney Marsh	96	128%	27	197%
6812So	North West Grain	57	108%	0	0%
6813So	Sheppey	70	122%	0	0%
	Kent & South London Average	83	117%	24	154%

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

EA effective rainfall data (Source EA Soil Moisture Model)

2.5 Seasonal summary table of rainfall and effective rainfall

Figure 2.5: This is a seasonal estimate of areal rainfall and effective rainfall (percolation or runoff) for a selection of the hydrological areas across the Kent and South London area, expressed as totals and as a percentage of the LTA. 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.

Winter period 01/10/2024 to 31/10/2024

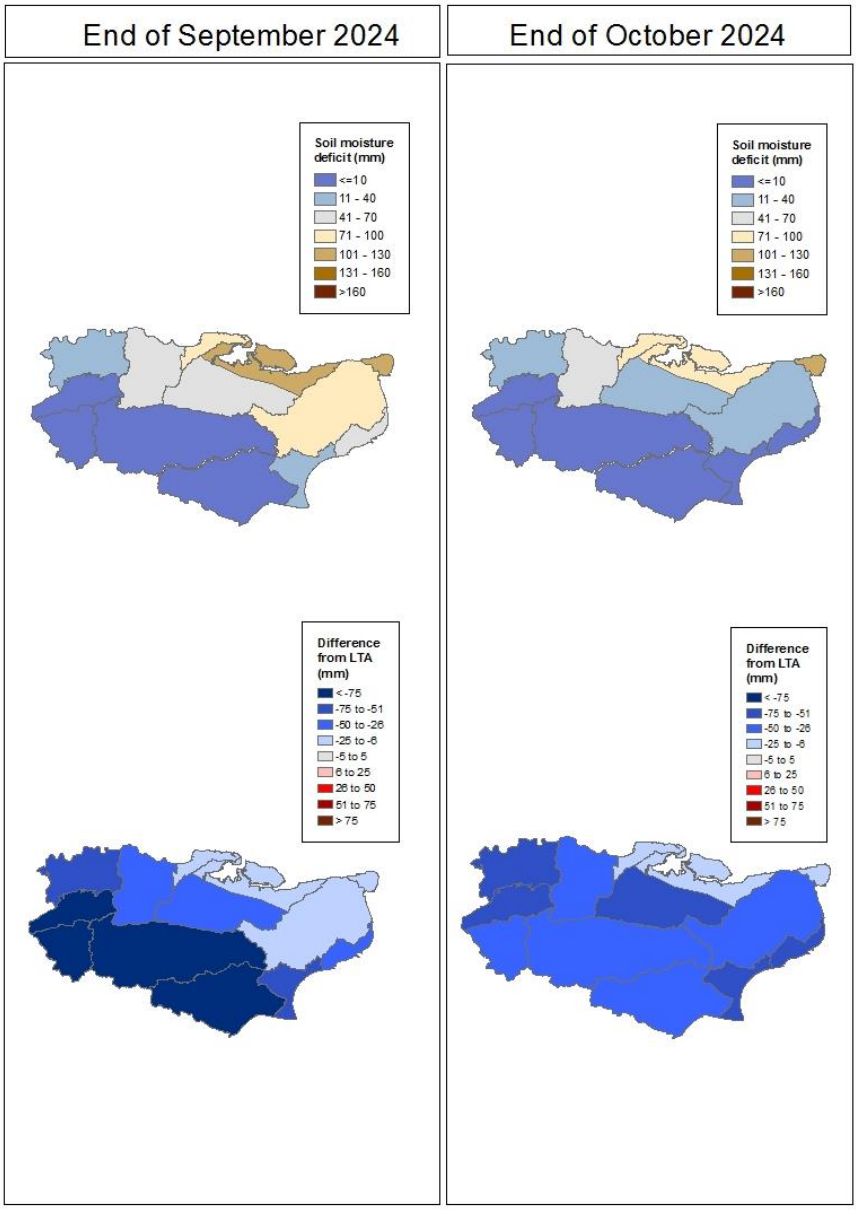
Number	Hydrological Area	Seasonal Rainfall (mm) Total	% LTA	Seasonal Effective Rainfall (mm) Total	% LTA
6230TH	North Downs - South London (W)	79	107%	34	154%
6505TH	Upper Mole	87	115%	60	288%
6508TH	South London	56	96%	0	0%
6706So	Darent	56	89%	6	44%
6707So	North Kent Chalk	91	131%	11	63%
6708So	Stour	97	126%	12	58%
6709So	Dover Chalk	110	122%	16	58%
6710So	Thanet Chalk	78	120%	9	91%
6809So	Medway	95	125%	69	317%
6810So	Eastern Rother	101	118%	74	276%

6811So	Romney Marsh	96	128%	27	197%
6812So	North West Grain	57	108%	0	0%
6813So	Sheppey	70	122%	0	0%
	Kent & South London Average	83	117%	24	154%

3 Soil moisture deficit

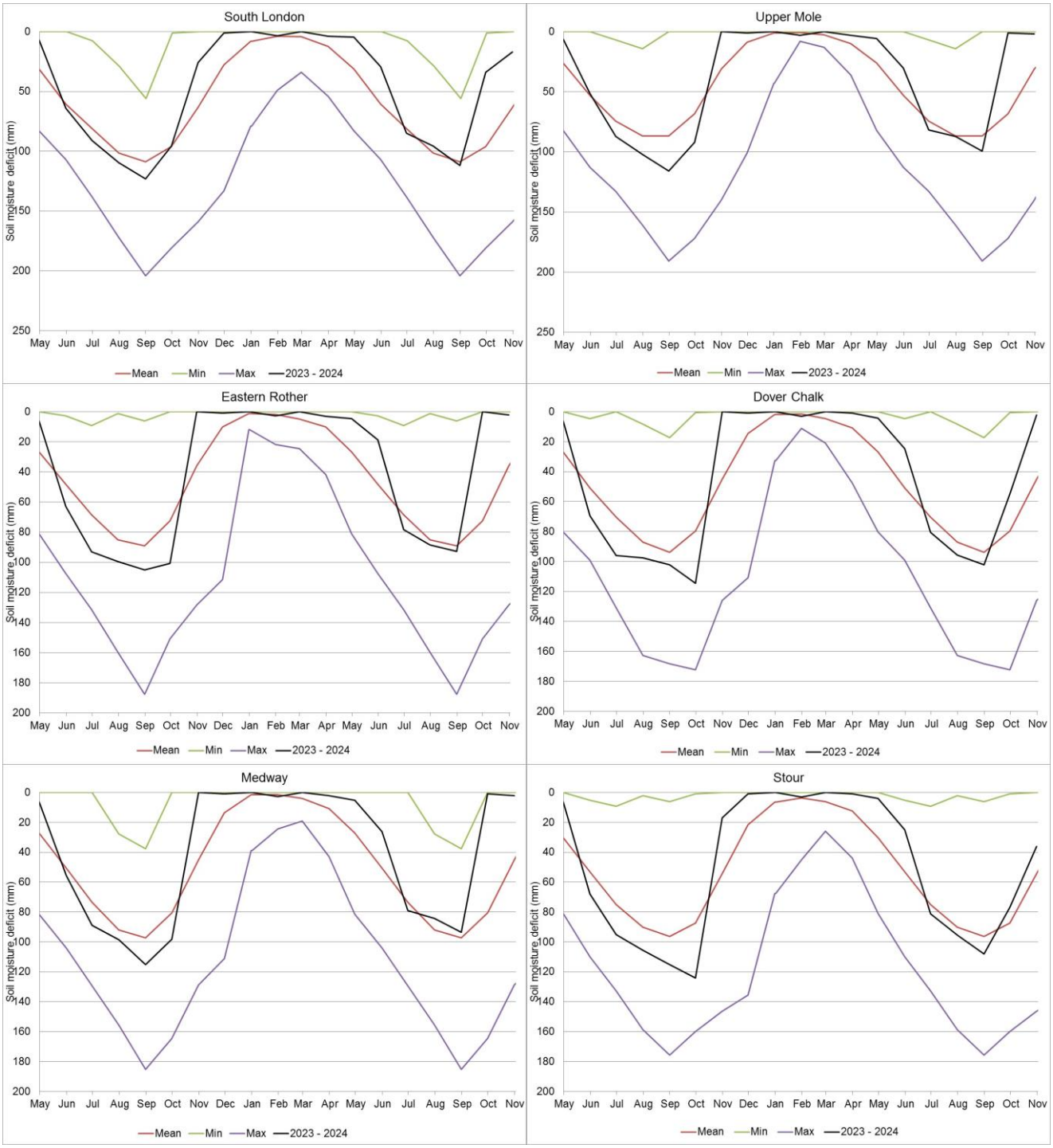
3.1 Soil moisture deficit map

Figure 3.1: Soil moisture deficits for weeks ending 30 September (left panel) and 31 October 2024 (right panel). Top row shows actual soil moisture deficits (mm) and bottom row shows the difference (mm) of the actual from the 1961 to 90 long term average soil moisture deficits. EA Soil Moisture Deficit data (Source EA Soil Moisture Model).



3.2 Soil moisture deficit charts

Figure 3.2: Latest soil moisture deficit compared to maximum, minimum, and 1961 to 1990 long term average. EA soil moisture deficit data (Source EA Soil Moisture Model).



3.3 Soil moisture deficit table

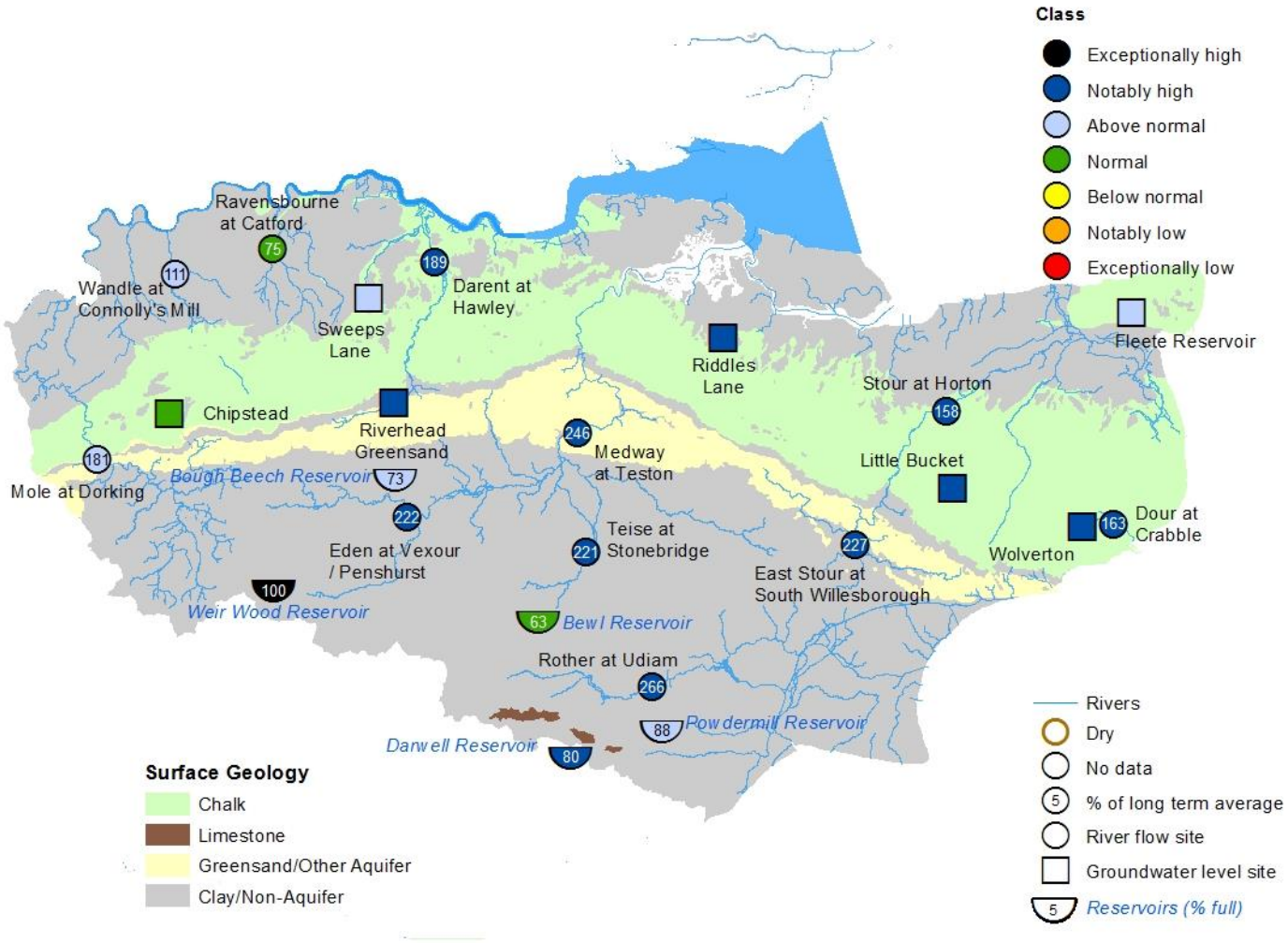
Figure 3.3: This is a second estimate of soil moisture deficit for the hydrological areas across the Kent and South London area. There may be significant variation within each area which must be considered when interpreting these data. EA soil moisture deficit data (Source EA Soil Moisture Model).

Number	Hydrological Area	SMD (mm) Day 31	End October LTA
6230TH	North Downs - South London (W)	5	60
6505TH	Upper Mole	2	50
6508TH	South London	17	80
6706So	Darent	44	75
6707So	North Kent Chalk	19	70
6708So	Stour	36	70
6709So	Dover Chalk	2	64
6710So	Thanet Chalk	110	134
6809So	Medway	2	51
6810So	Eastern Rother	2	49
6811So	Romney Marsh	2	63
6812So	North West Grain	78	92
6813So	Sheppey	77	90
	Kent & South London Average	30	73

4 River flows, groundwater levels and reservoir stocks

4.1 River flows, groundwater levels and reservoir stocks map

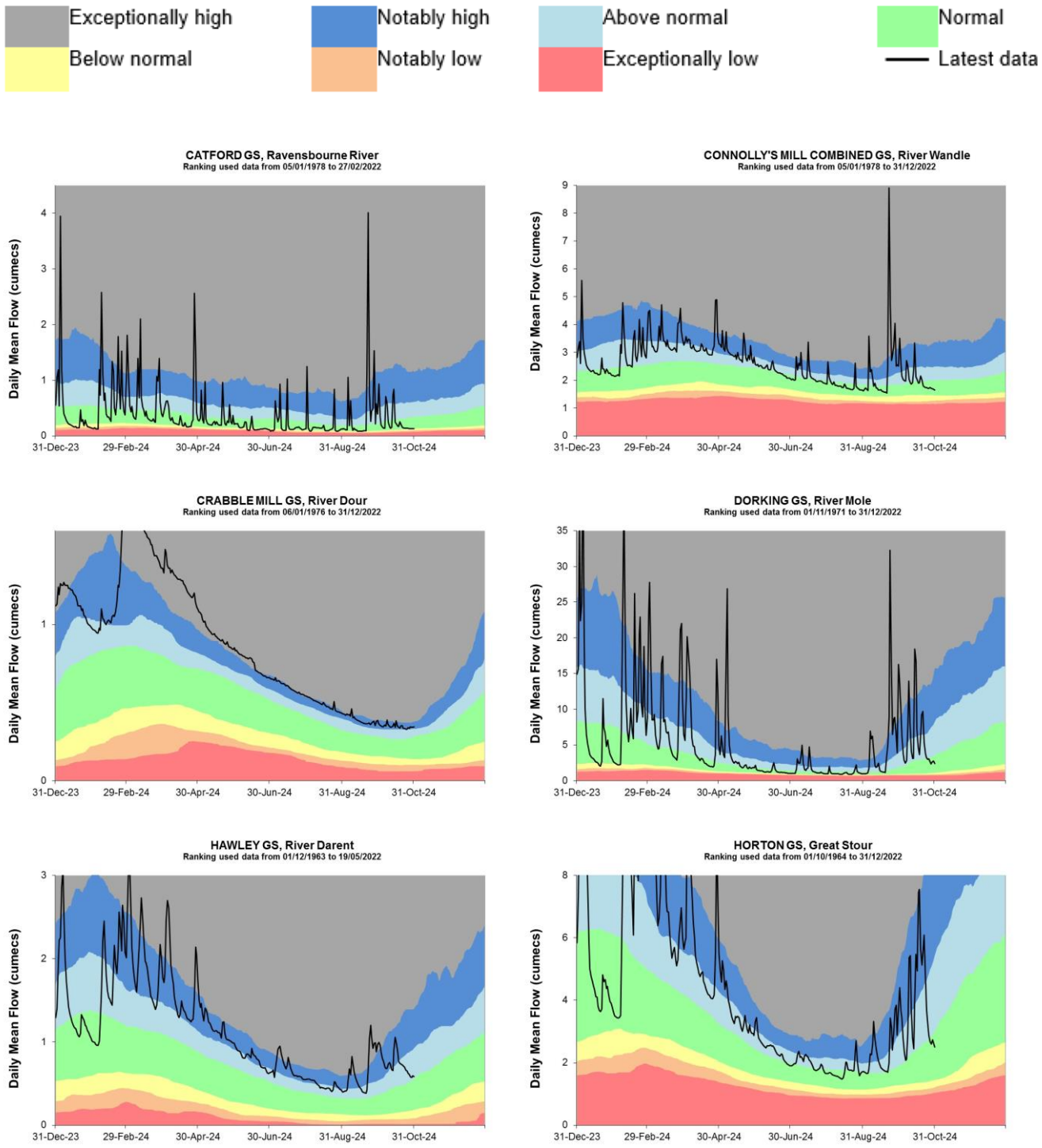
Figure 4.1: Monthly mean river flows* ** *** for indicator sites for October 2024, expressed as a percentage of the respective long term average and classed relative to an analysis of historic October monthly means. End of month groundwater levels for indicator sites for October 2024, expressed as a percentage of the respective long term average and classed relative to an analysis of historic October levels. Tables available in the appendices with detailed information. End of month levels for reservoirs for October 2024, expressed as percent full. (Source: Water Companies).

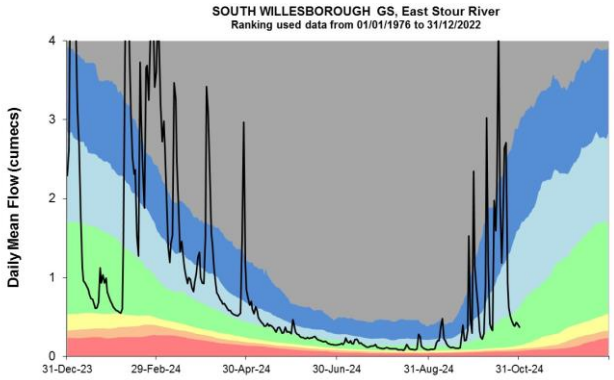


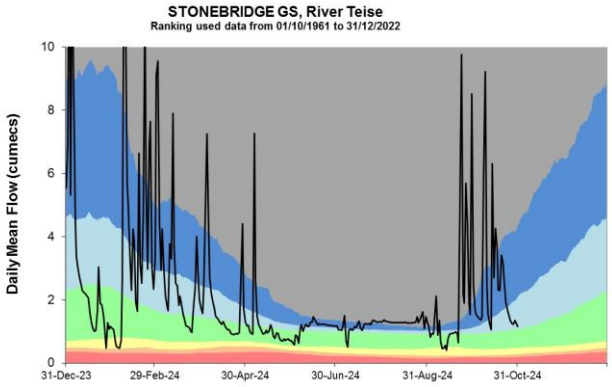
*Weir Wood Reservoir is currently offline
**Flows at gauging stations in the Medway catchment might be affected by upstream reservoir releases
***Bands above 10 cumecs for Udiam are under review following ultrasonic modifications

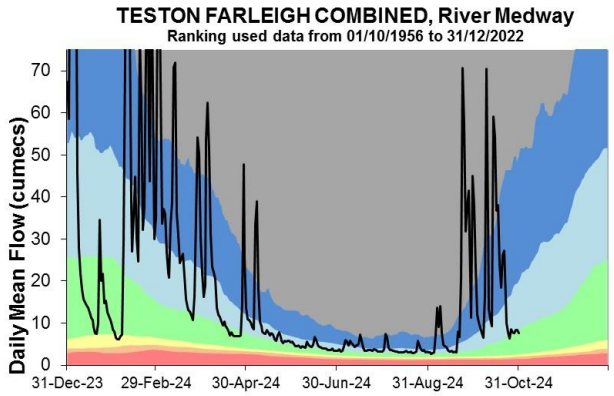
4.2 River flow charts

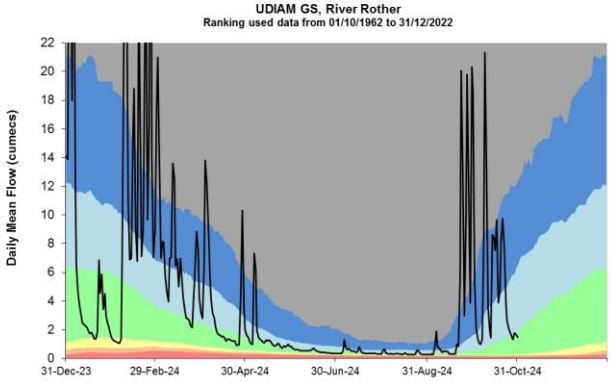
Figure 4.1: Daily mean river flow for index sites over the past year*, compared to an analysis of historic daily mean flows, and long term maximum and minimum flows.

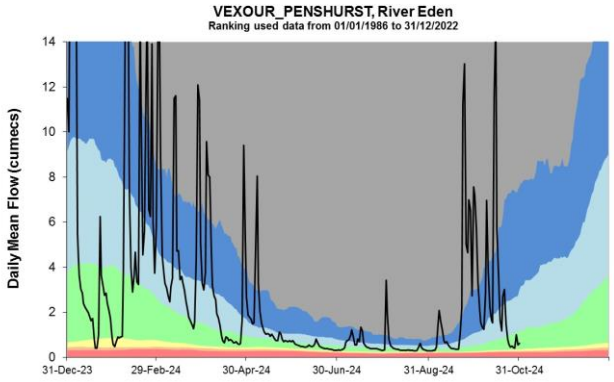












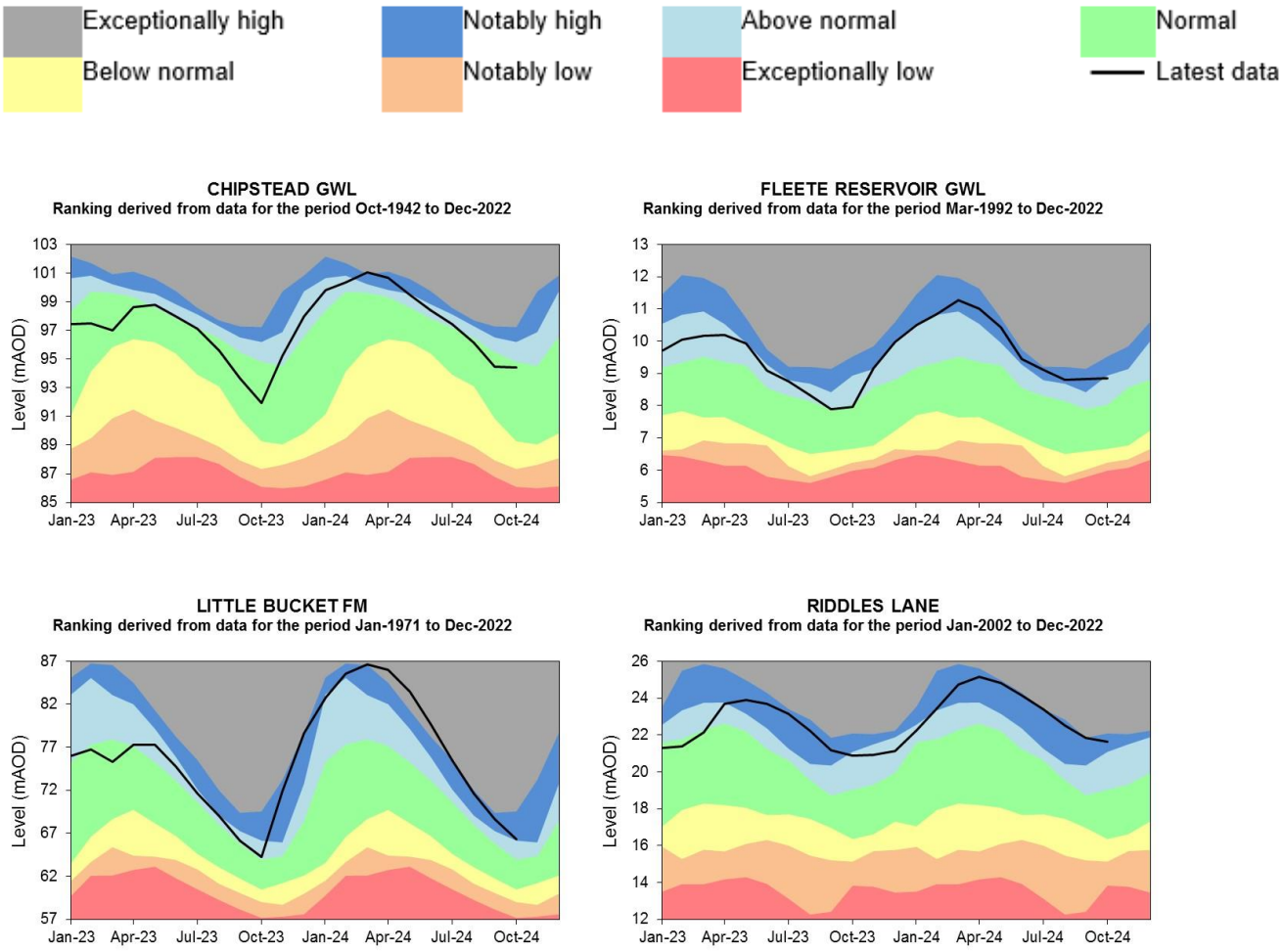
*Bands above 10 cumecs for Udiam are under review following ultrasonic modifications

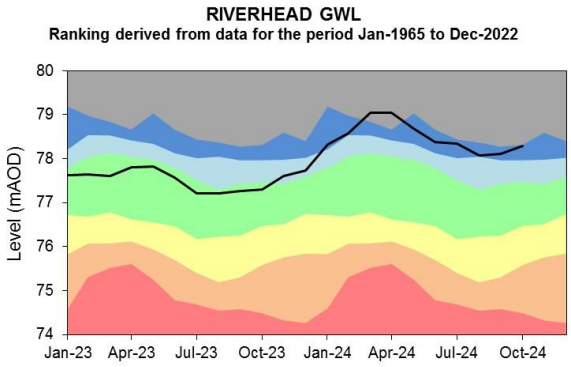
Source: Environment Agency.

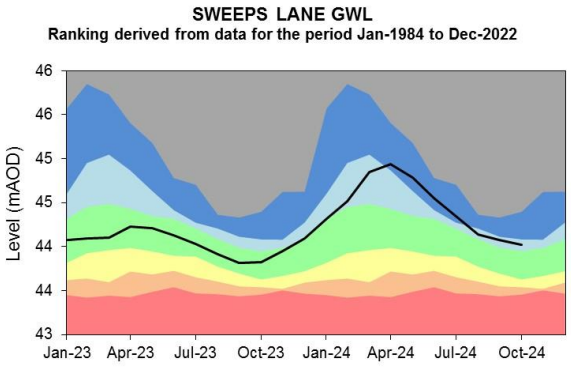
5 Groundwater levels

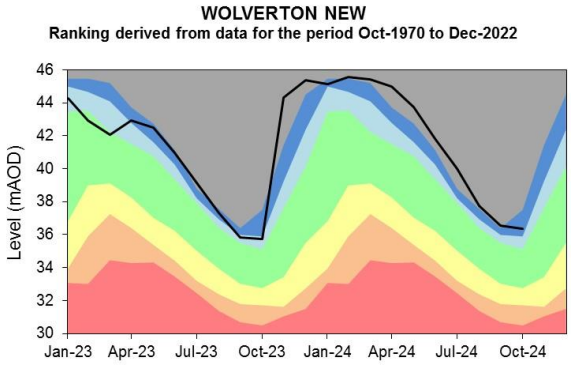
5.1 Groundwater level charts

Figure 5.1: End of month groundwater levels at index groundwater level sites for major aquifers. 22 months compared to an analysis of historic end of month levels and long term maximum and minimum levels.







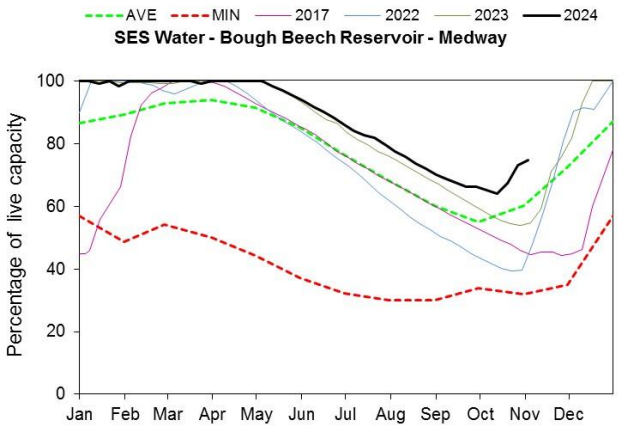


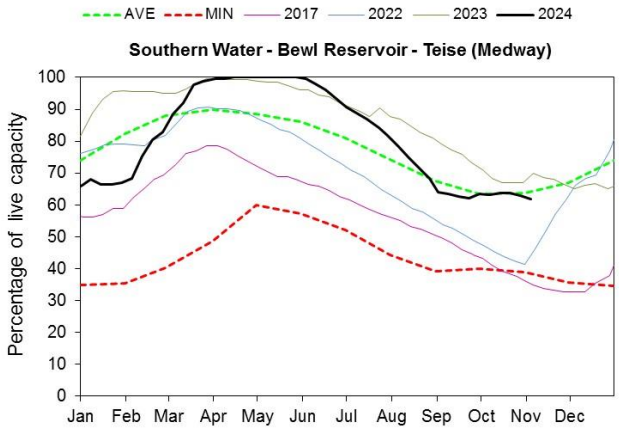
Source: Environment Agency, 2024.

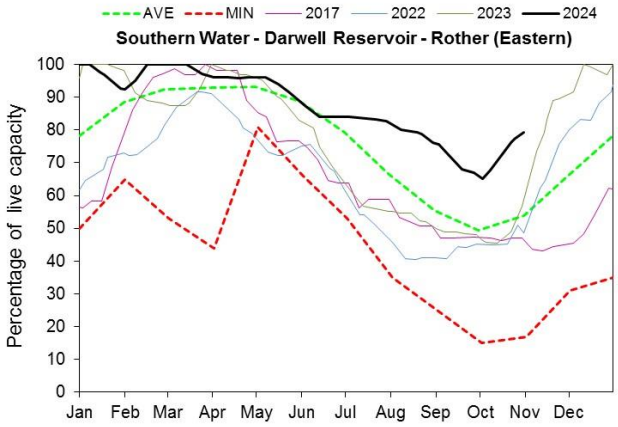
6 Reservoir stocks

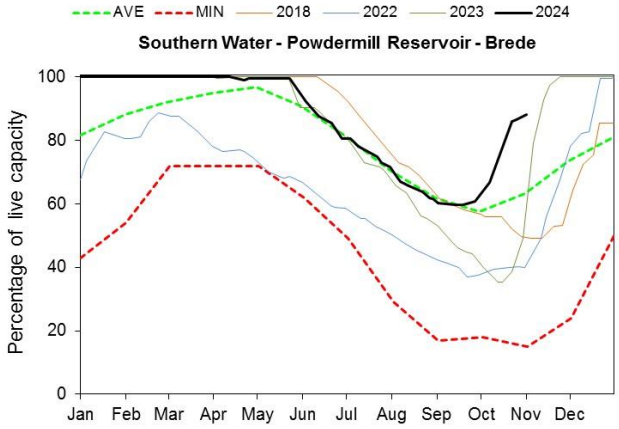
6.1 Reservoir stocks charts

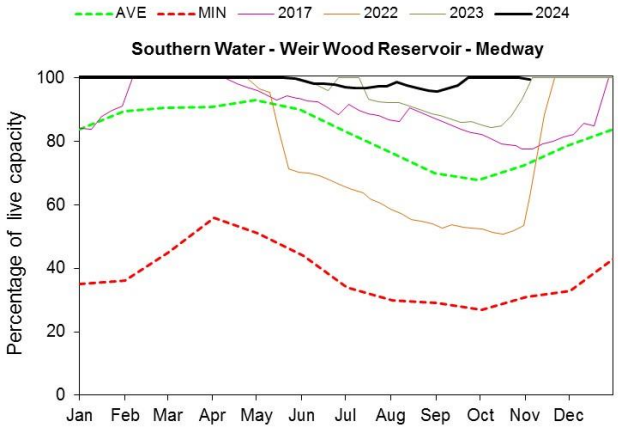
Figure 7.1: End of month regional reservoir stocks compared to long term maximum, minimum and average stocks. (Source: Water Companies). Note: Historic records of individual reservoirs and reservoir groups making up the regional values vary in length.











7 Glossary

7.1 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).

7.2 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.

8 Appendices

8.1 Rainfall table

Hydrological area	Oct 2024 rainfall % of long term average 1961 to 1990	Oct 2024 band	Aug 2024 to October cumulative band	May 2024 to October cumulative band	Nov 2023 to October cumulative band
North Downs - South London	108	Normal	Above normal	Above normal	Notably high
Upper Mole	115	Normal	Notably high	Above normal	Exceptionally high
South London	96	Normal	Above normal	Normal	Notably high
River Darent	89	Normal	Normal	Normal	Notably high
North Kent Chalk	131	Normal	Normal	Normal	Exceptionally high
Stour	126	Normal	Normal	Normal	Notably high
Dover Chalk	122	Normal	Above normal	Normal	Exceptionally high
Thanet Chalk	120	Normal	Normal	Normal	Above normal
River Medway	124	Normal	Exceptionally high	Notably high	Exceptionally high
Eastern Rother	118	Normal	Notably high	Above normal	Exceptionally high

Romney Marsh	128	Normal	Notably high	Normal	Exceptionally high
North West Grain	108	Normal	Normal	Normal	Above normal
Sheppy	122	Normal	Normal	Normal	Above normal

8.2 River flows table

Site name	River	Catchment	Oct 2024 band	Sep 2024 band
Catford Gs	River Ravensbourne	Ravensbourne	Normal	Exceptionally high
Connolly's Mill Combined Gs	River Wandle	Wandle	Above normal	Exceptionally high
Crabble Mill Gs	River Dour	Dour	Notably high	Notably high
Dorking Gs	River Mole	Mole Surrey	Above normal	Exceptionally high
Hawley Gs	River Darent and Cray	Darent and Cray	Notably high	Exceptionally high
Horton Gs	Great Stour River	Great Stour	Notably high	Notably high
South Willesborough Gs	East Stour River	East Stour	Notably high	Notably high
Stonebridge Gs	River Teise	Teise	Notably high	Exceptionally high
Teston Farleigh Combined	River Medway	Medway (Middle)	Notably high	Exceptionally high
Udiam Gs	River Rother	Rother (Kent)	Notably high	Exceptionally high
Vexour_penshurst	River Eden	Eden (Kent)	Notably high	Exceptionally high

8.3 Groundwater table

Site name	Aquifer	End of Oct 2024 band	End of Sep 2024 band
Fleete Reservoir Gwl	Isle Of Thanet Chalk	Above normal	Notably high
Chipstead Gwl	Epsom North Downs Chalk	Normal	Normal
Little Bucket Fm	East Kent Chalk - Stour	Notably high	Notably high
Riddles Lane	North Kent Swale Chalk	Notably high	Notably high
Riverhead Gwl	Kent Greensand	Notably high	Notably high
Sweeps Lane Gwl	West Kent Chalk	Above normal	Above normal
Wolverton New	East Kent Chalk - Stour	Notably high	Exceptionally high