Monthly water situation report: Kent and South London Area

1 Summary - May 2024

The whole of the Kent and South London area received 120% of the long-term average rainfall during May. Rainfall received across catchments in the area ranged from normal to above normal. Soil moisture deficits increased since last month, due to the lower effective rainfall received but were still lower than the long-term average on the last day of May. Monthly mean river flows ranged from normal to exceptionally high. The majority of the key flow sites saw above average monthly mean river flows during May. Groundwater levels in the Chalk across Kent and South London area in May 2024 ranged from exceptionally high to above average for this time of the year. Groundwater levels are consistently falling across Kent and South London aquifers. Levels at the five water company reservoirs ranged from normal to exceptionally high in the Kent and South London area.

1.1 Rainfall

The whole of the Kent and South London (KSL) area received 120% of the long-term average (LTA) rainfall during May. Rainfall received across catchments in the area ranged from normal to above normal. Thanet Chalk, Stour and Dover Chalk in the east, Eastern Rother in the south and Upper Mole in the south-west of the patch received above average rainfall. All the other catchments in the KSL area received normal rainfall this month. The percentage of long-term average rainfall received across catchments ranged from 146% across Thanet Chalk rainfall area in the east to 99% in the Lower Mole in the west. The highest daily rainfall total of 36.1mm for May occurred on the twenty first day of the month and was recorded at Northfleet STW rain gauge in the Darent catchment. Days 2, 5, 6 and 31 had the next highest daily rainfall totals that ranged from 27.6mm to 14.8mm. In the previous 3 months, which spanned from March to May, rainfall was notably high in all catchments except for Upper Mole that received exceptionally high rainfall. In the previous 6 months, rainfall across the KSL area was exceptionally high in all catchments in the south and notably high in catchments in the north. The past 12 months saw rainfall that was exceptionally high in catchments in the south and mostly notably high and above normal in catchments in the north.

1.2 Soil moisture deficit and recharge

At the end of May soil moisture deficits (SMDs) at 11 of 13 of the rainfall areas in Kent and South London ranged between 11 and 40 millimetres. Although SMDs increased in comparison to April due to the lower effective rainfall received, SMDs were still lower than the long-term average on the last day of May. Across the whole area, on average, effective rainfall received this month was relatively low at 76% of the LTA.

1.3 River flows

Monthly mean river flows (MMFs) for May ranged from normal to exceptionally high. The majority of the key flow sites saw above average MMFs during May. Three flow sites saw normal MMFs, one in the north-west and 2 in the central south of the patch. Wandle at Connolly's Mill and Darent at Hawley in the north-west saw notably high monthly mean river flows. Dour at Crabble recorded the highest MMF at 170% of the LTA for the month of May. Dour also was the only flow site that was in the exceptionally high category.

1.4 Groundwater levels

Groundwater in the Chalk across Kent and South London area were at levels that for this time of the year (May 2024), ranged from exceptionally high to above average. In the KSL area, all monitoring points but Chipstead recorded groundwater levels that were either notably high or exceptionally high. Chipstead in the west was the only monitoring point, recording levels that for this time of the year, were above average only.

Although levels in the Chalk remain exceptionally high in the east of the patch, and notably high in most of the west, levels are now consistently falling across the area. This also applies to groundwater levels in the Greensand aquifer at Riverhead. The fall in groundwater levels is due to the reduced amount of effective rainfall received and increased soil moisture deficits recorded in May.

Due to the consistent fall in groundwater levels across the KSL area, at the end of May, groundwater flood alerts in East Kent and South East London areas were removed.

1.5 Reservoir stocks

At the end of May, reservoir levels were normal at Darwell at 92% and Powdermill at 94%, above normal at Bough Beech at 94%, notably high at Weir Wood at 100%, and exceptionally high for this time of year at Bewl also at 100%. Most of the levels in the reservoirs slightly decreased throughout the month of May, however water levels in Bewl and Weir Wood reservoirs remained unchanged.

1.6 Environmental impact

River flows have gradually declined in May, and as a result, we have begun applying Hands off Flow (HoF) constraints to certain licensed abstractions within the Medway catchment. The groundwater flooding alerts for South London East and East Kent were removed this month. Three flood alerts were issued on 6 and 7 of May.

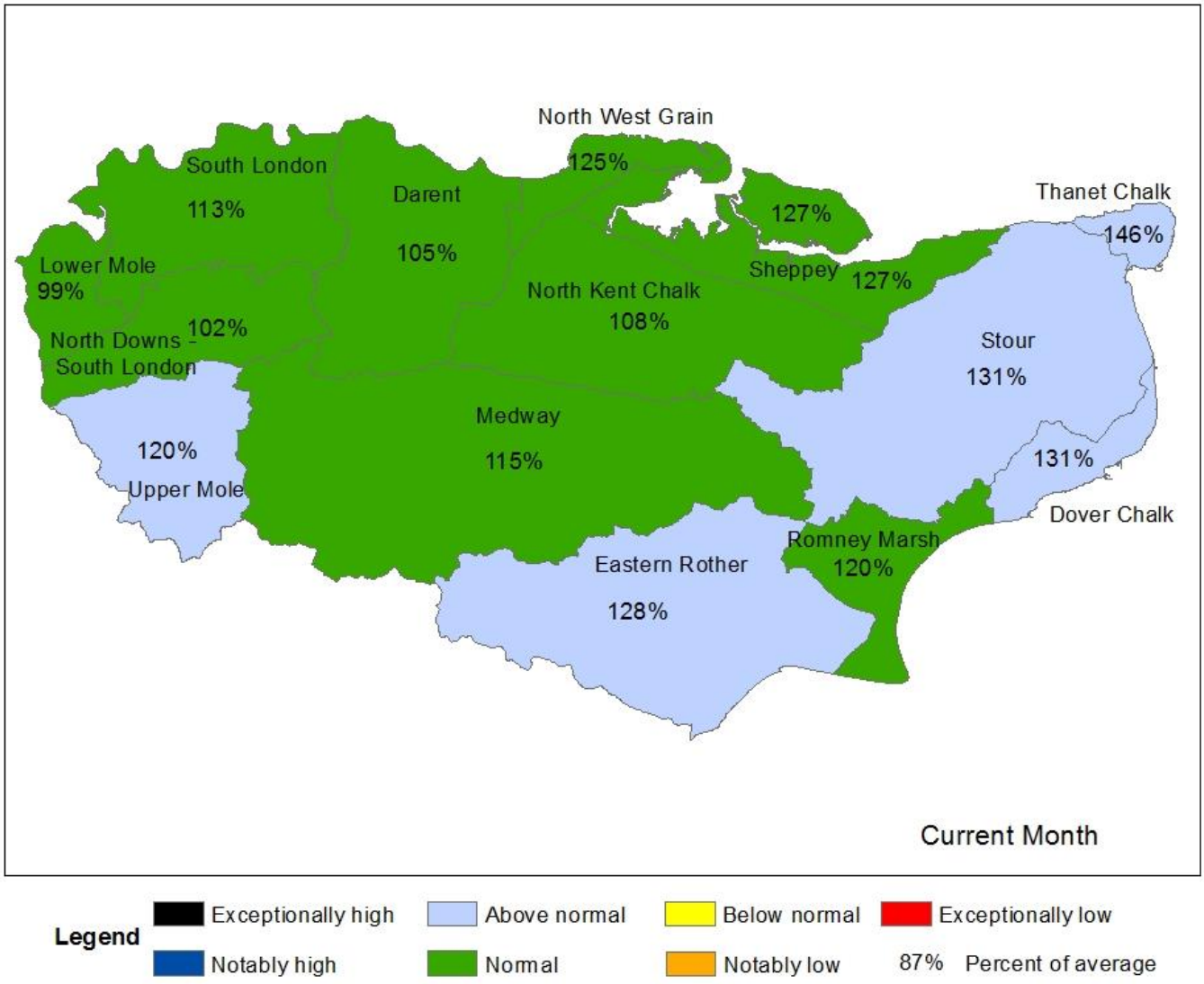
Author: Groundwater and Hydrology Team, ksl.gwh@environment-agency.gov.uk

Contact Details: 03708 506 506

2 Rainfall

2.1 Rainfall map one

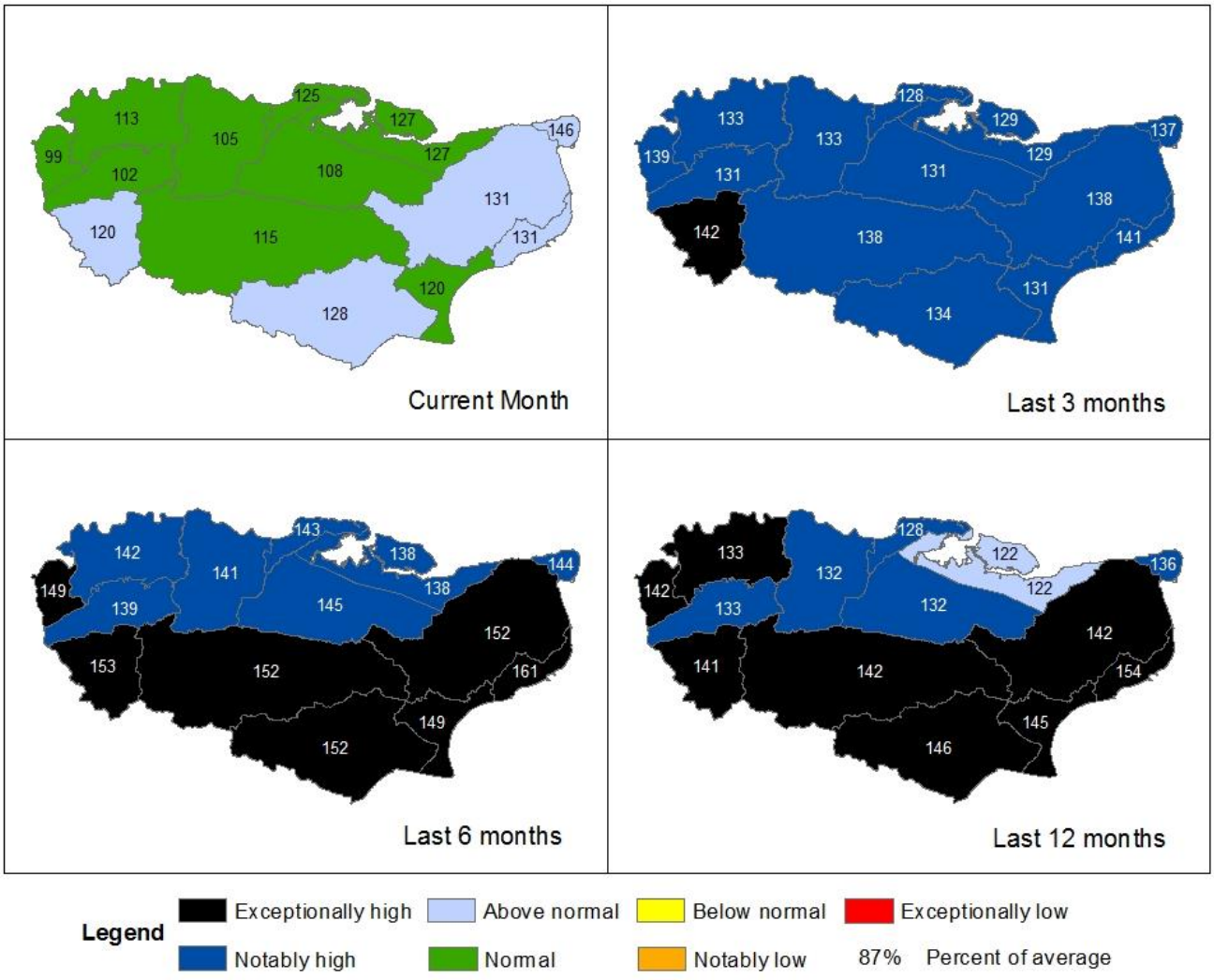
Figure 2.1: Total rainfall for hydrological areas across Kent and South London for the current month (up to 31 May 2024), classed relative to an analysis of respective historic totals. Table available in the appendices with more detailed information.



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

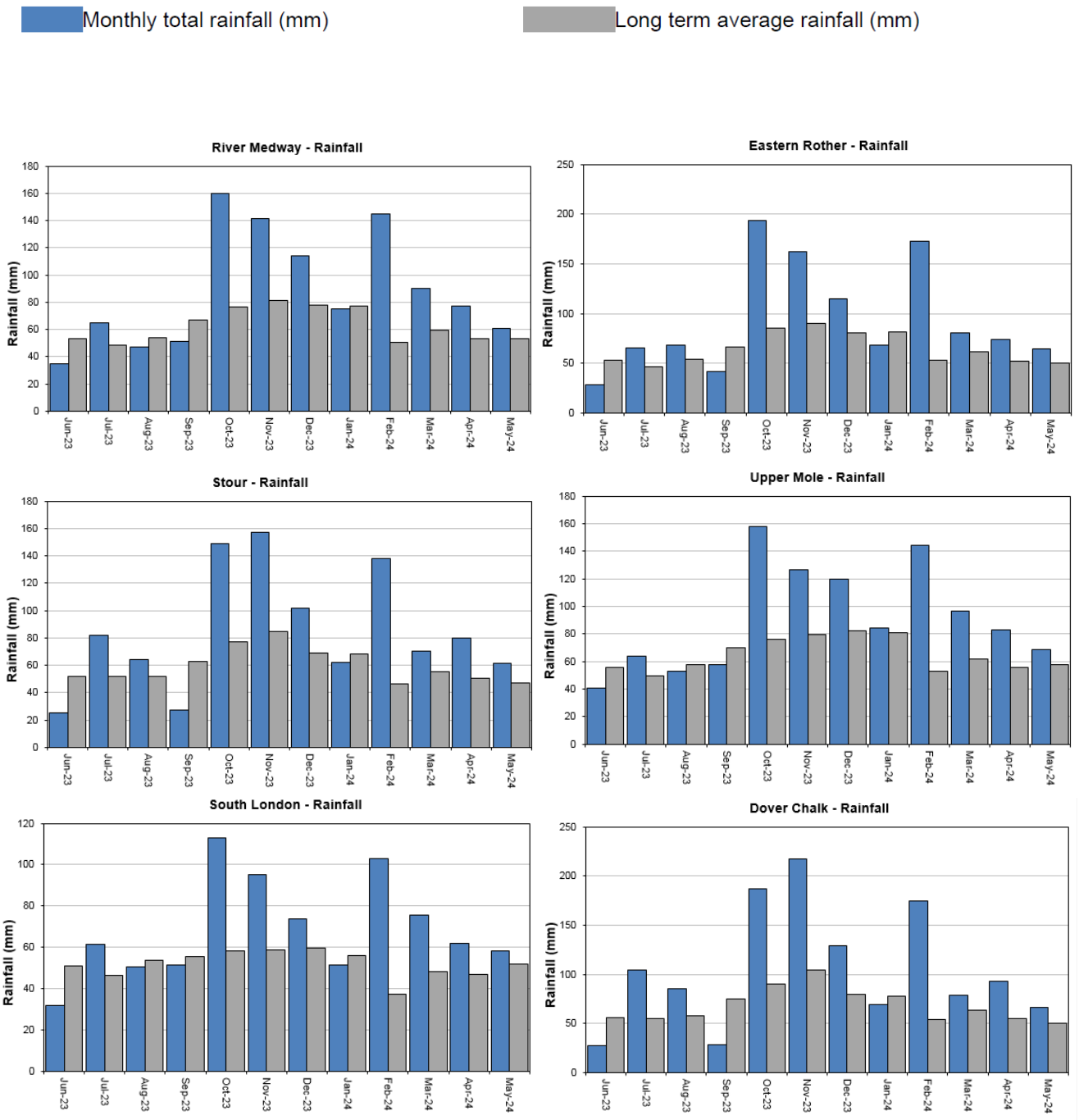
Figure 2.2: Total rainfall for hydrological areas for the current month (up to 31 May 2024), the last 3 months, the last 6 months, and the last 12 months, classed relative to an analysis of respective historic totals. Table available in the appendices with detailed information.

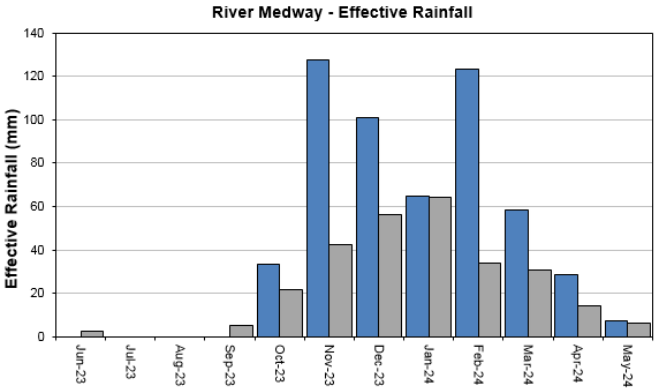


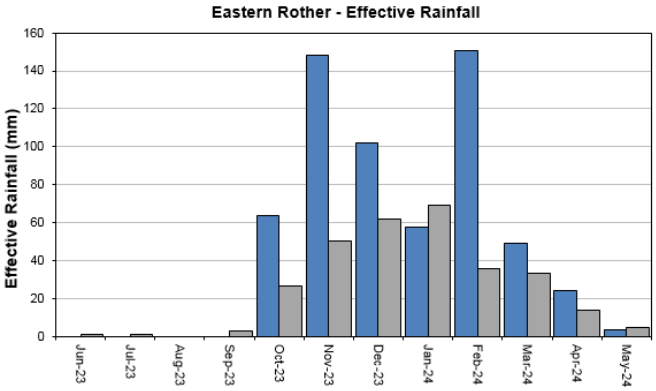
HadUK data based on the Met Office 1km gridded rainfall dataset derived from rain gauges (Source: Met Office. Crown copyright, 2024). Provisional data based on Environment Agency 1km gridded rainfall dataset derived from Environment Agency intensity rain gauges. Includes material based on Ordnance Survey 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.

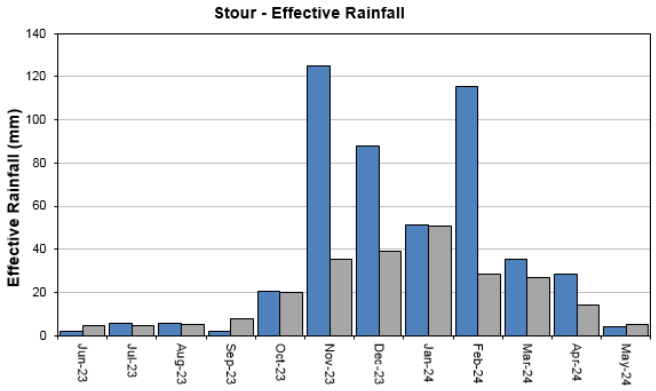
2.3 Rainfall and effective rainfall charts

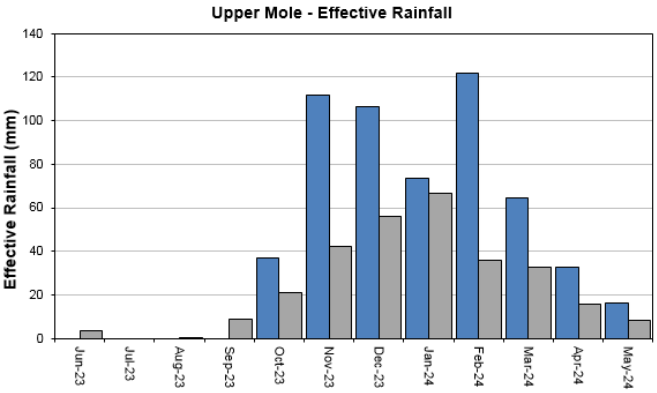
Figure 2.3: Monthly rainfall and effective rainfall totals for the past 12 months as a percentage of the 1961 to 1990 long term average (LTA) for a selection of areal units. HadUK rainfall data. (Source: Met Office. Crown copyright, 2024). EA effective rainfall data (Source EA Soil Moisture Model).

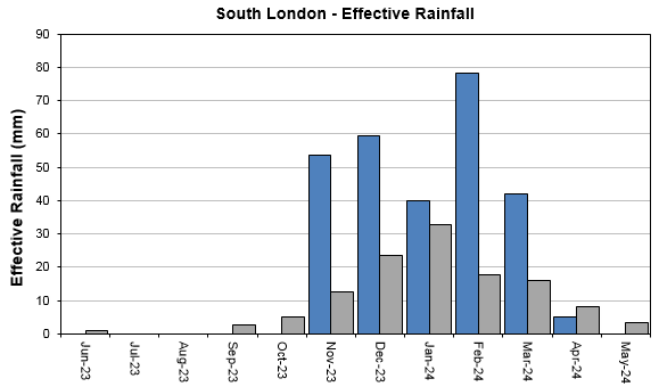


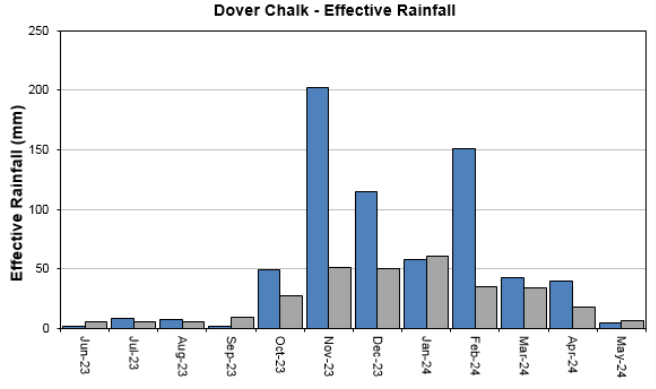

River Medway - Effective Rainfall
Effective Rainfall (mm)
0
20
40
60
80
100
120
140
Jun-23
Jul-23
Aug-23
Sep-23
Oct-23
Nov-23
Dec-23
Jan-24
Feb-24
Mar-24
Apr-24
May-24


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


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


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


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


Dover Chalk - Effective Rainfall
Effective Rainfall (mm)
0
50
100
150
200
250
Jun-23
Jul-23
Aug-23
Sep-23
Oct-23
Nov-23
Dec-23
Jan-24
Feb-24
Mar-24
Apr-24
May-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	May% LTA	Effective Rainfall (mm) 31 day Total	May % LTA
6230TH	North Downs - South London (W)	62	102%	7	64%
6505TH	Upper Mole	69	120%	16	195%
6508TH	South London	59	113%	0	0%
6706So	Darent	56	105%	4	51%
6707So	North Kent Chalk	55	108%	4	50%
6708So	Stour	62	131%	4	76%
6709So	Dover Chalk	66	131%	5	67%
6710So	Thanet Chalk	58	146%	4	108%
6809So	Medway	61	115%	7	119%
6810So	Eastern Rother	64	128%	3	76%

6811So	Romney Marsh	55	120%	0	0%
6812So	North West Grain	56	125%	0	0%
6813So	Sheppey	53	127%	0	0%
	Kent & South London Average	60	120%	4	76%

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.

Summer period 01/04/2024 to 30/09/2024

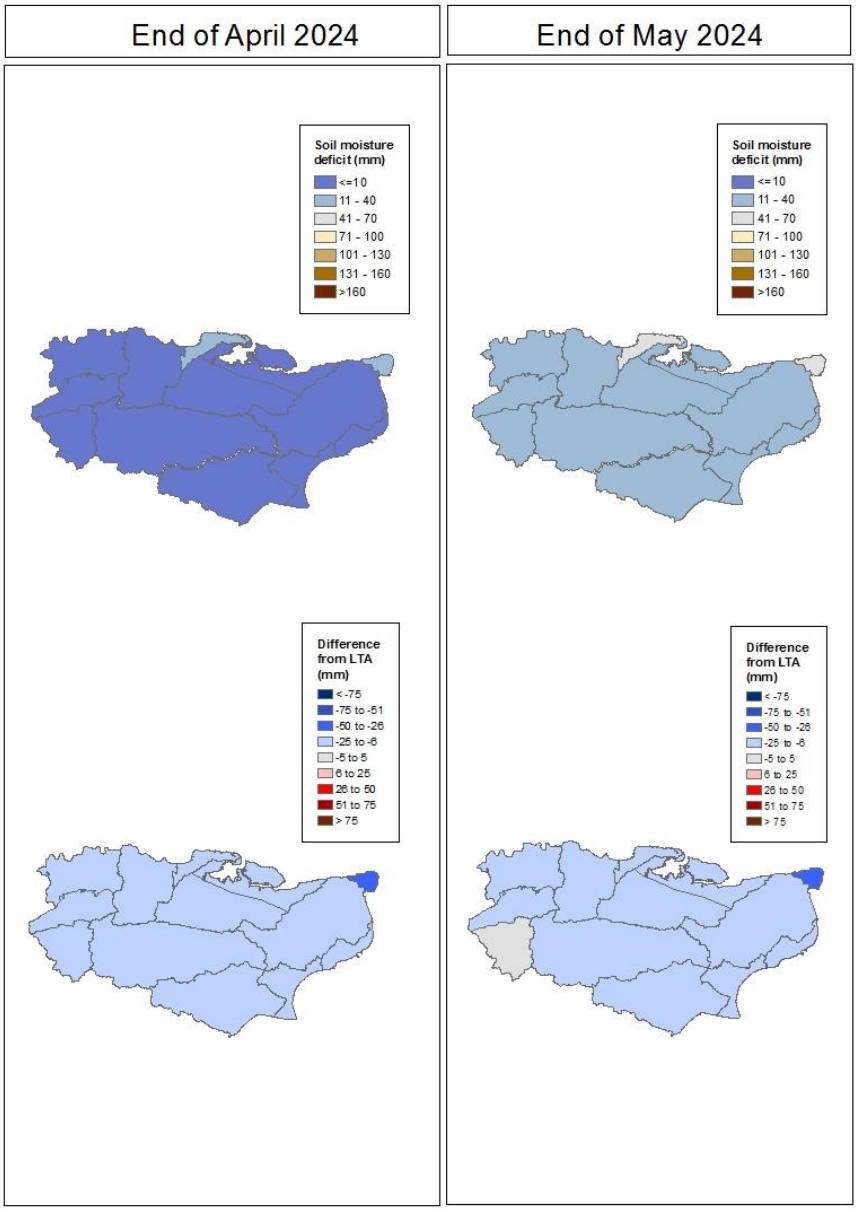
Number	Hydrological Area	Seasonal Rainfall (mm) Total	% LTA	Seasonal Effective Rainfall (mm) Total	% LTA
6230TH	North Downs - South London (W)	140	119%	36	119%
6505TH	Upper Mole	152	134%	49	205%
6508TH	South London	121	122%	5	44%
6706So	Darent	129	124%	27	119%
6707So	North Kent Chalk	123	119%	22	96%
6708So	Stour	141	144%	32	166%
6709So	Dover Chalk	159	151%	45	181%
6710So	Thanet Chalk	120	148%	10	117%
6809So	Medway	138	130%	36	174%
6810So	Eastern Rother	138	135%	28	151%

6811So	Romney Marsh	125	134%	21	168%
6812So	North West Grain	106	122%	6	68%
6813So	Sheppey	112	131%	6	82%
	Kent & South London Average	131	132%	25	139%

3 Soil moisture deficit

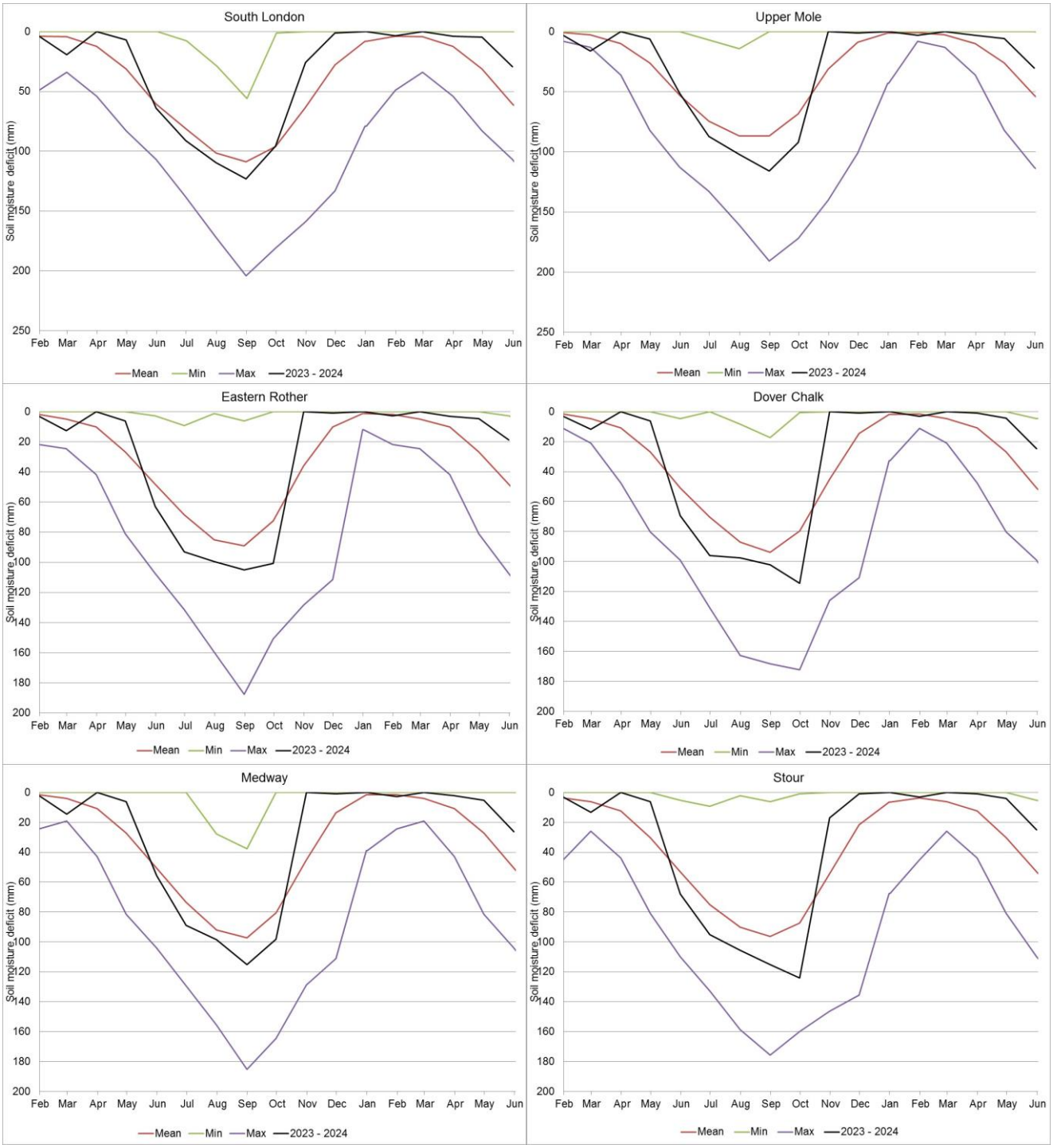
3.1 Soil moisture deficit map

Figure 3.1: Soil moisture deficits for weeks ending 30 April (left panel) and 31 May 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

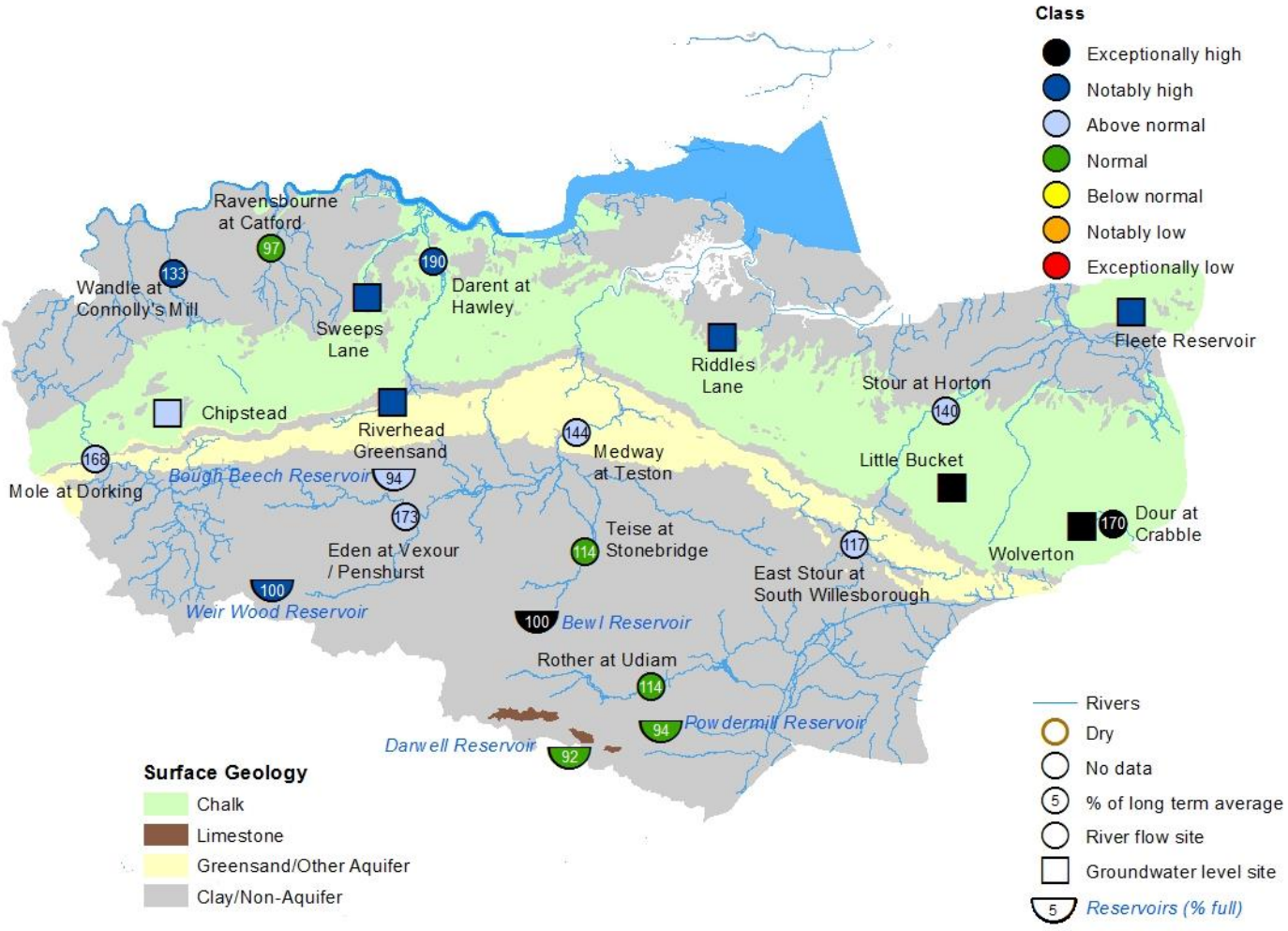
Figure 3.3: This is a second estimate of soil moisture deficit for the hydrological areas across the Kent and South London area. There may be significant variation within each area which must be considered when interpreting these data. EA soil moisture deficit data (Source EA Soil Moisture Model).

Number	Hydrological Area	SMD (mm) Day 31	End May LTA
6230TH	North Downs - South London (W)	27	36
6505TH	Upper Mole	30	35
6508TH	South London	29	46
6706So	Darent	31	41
6707So	North Kent Chalk	31	40
6708So	Stour	25	41
6709So	Dover Chalk	25	39
6710So	Thanet Chalk	52	81
6809So	Medway	26	34
6810So	Eastern Rother	19	35
6811So	Romney Marsh	29	40
6812So	North West Grain	42	49
6813So	Sheppey	40	50
	Kent & South London Average	31	44

4 River flows, groundwater levels and reservoir stocks

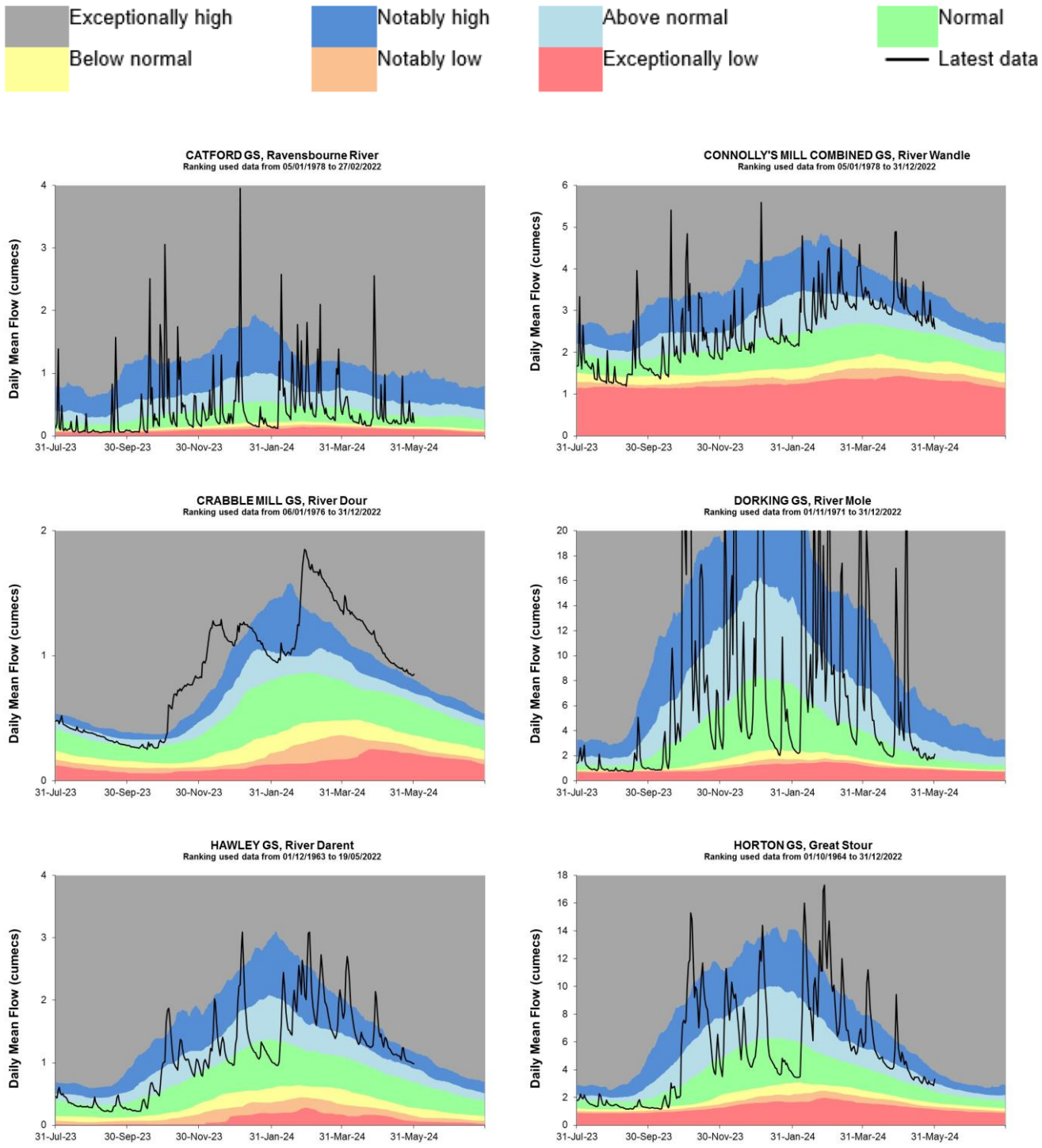
4.1 River flows, groundwater levels and reservoir stocks map

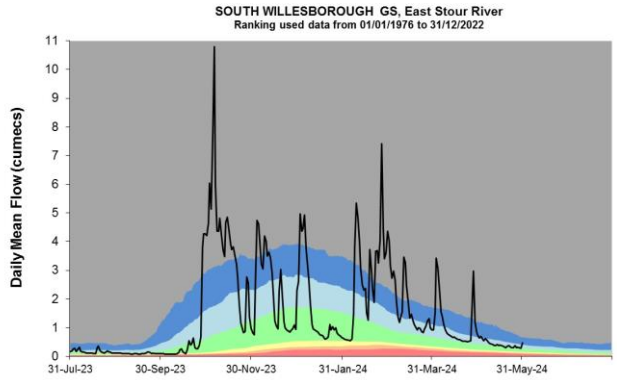
Figure 4.1: Monthly mean river flows for indicator sites for May 2024, expressed as a percentage of the respective long term average and classed relative to an analysis of historic May monthly means. End of month groundwater levels for indicator sites for May 2024, expressed as a percentage of the respective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

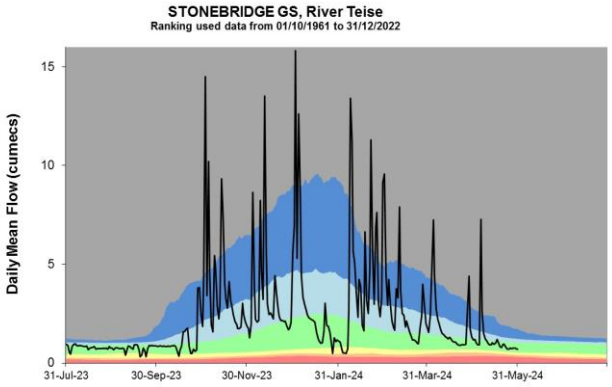


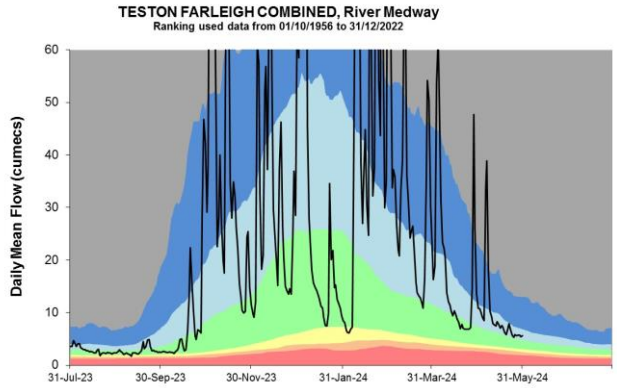
4.2 River flow charts

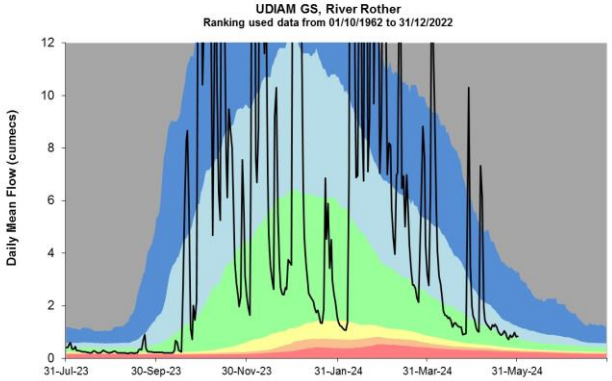
Figure 4.1: Daily mean river flow for index sites over the past year, compared to an analysis of historic daily mean flows, and long term maximum and minimum flows.

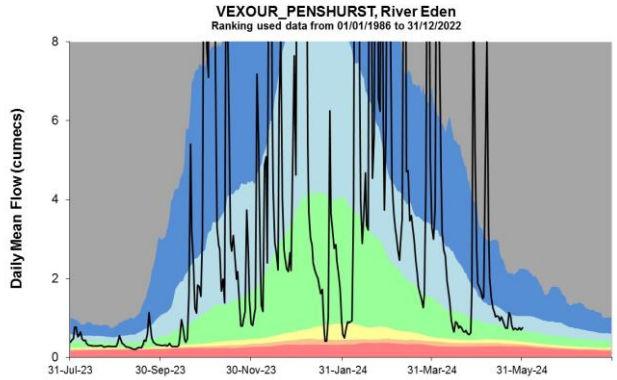










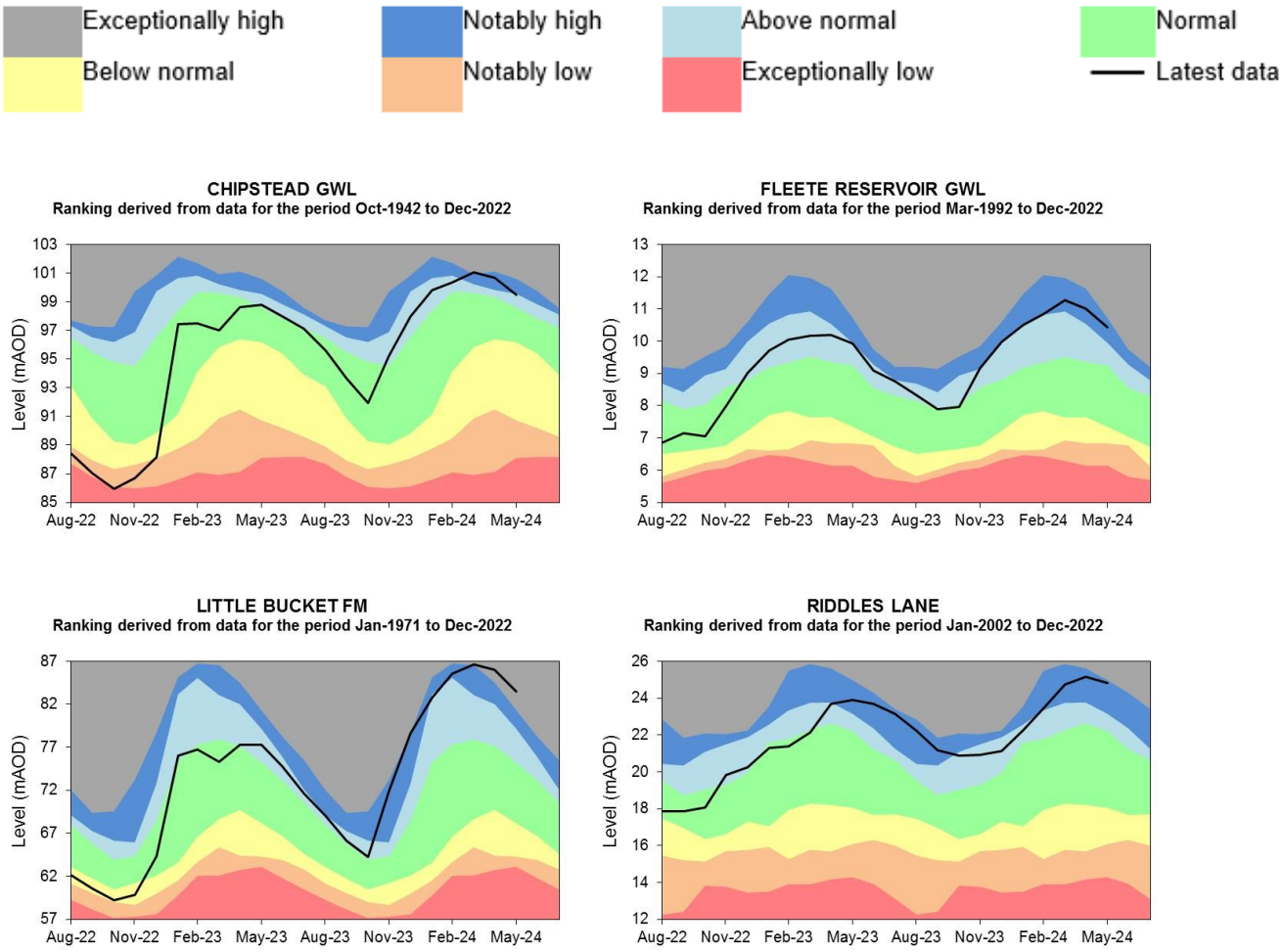


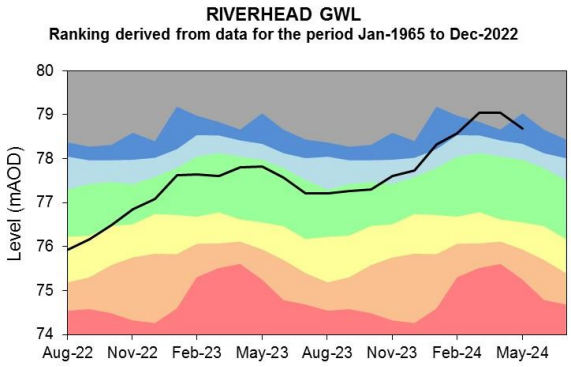
Source: Environment Agency.

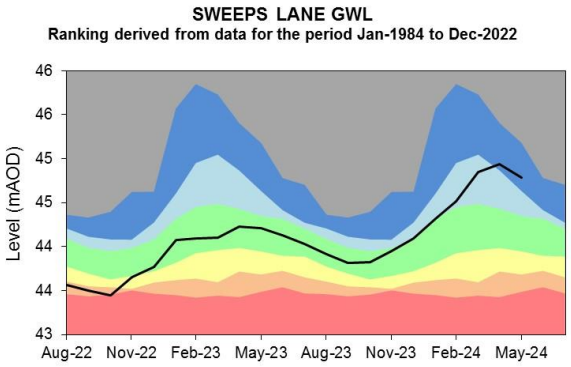
5 Groundwater levels

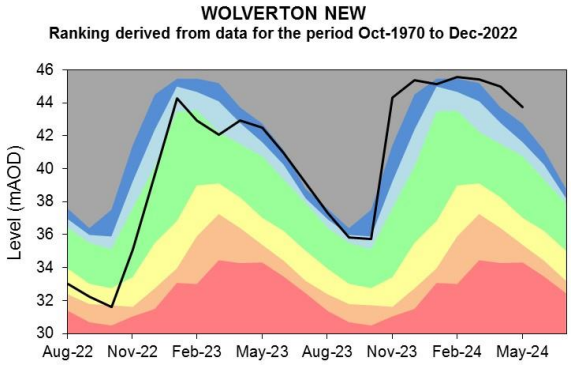
5.1 Groundwater level charts

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.







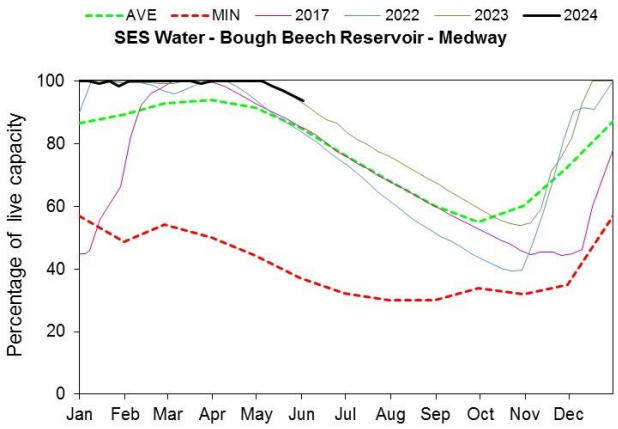


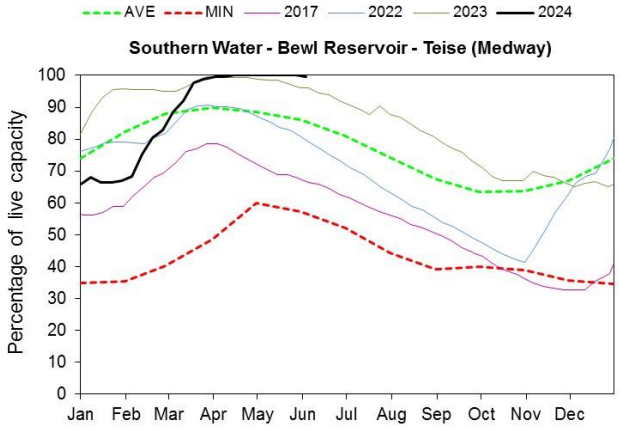
Source: Environment Agency, 2024.

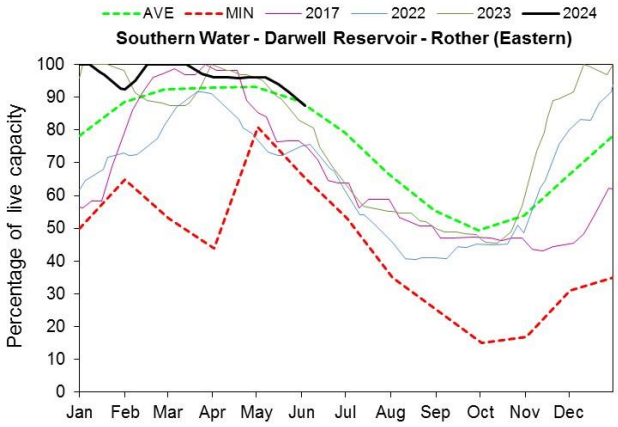
6 Reservoir stocks

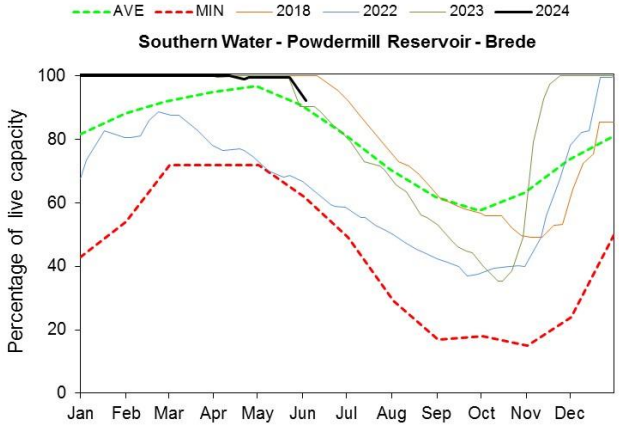
6.1 Reservoir stocks charts

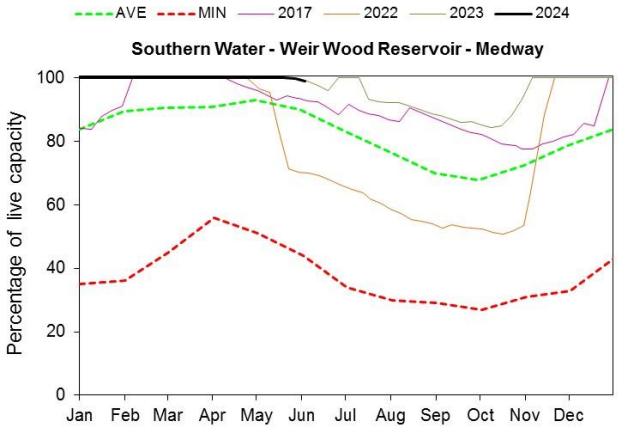
Figure 7.1: End of month regional reservoir stocks compared to long term maximum, minimum and average stocks. (Source: Water Companies). Note: Historic records of individual reservoirs and reservoir groups making up the regional values vary in length.











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	May 2024 rainfall % of long term average 1961 to 1990	May 2024 band	Mar 2024 to May cumulative band	Dec 2023 to May cumulative band	Jun 2023 to May cumulative band
North Downs - South London	102	Normal	Notably high	Notably high	Notably high
Upper Mole	120	Above Normal	Exceptionally high	Exceptionally high	Exceptionally high
South London	113	Normal	Notably high	Notably high	Exceptionally high
River Darent	105	Normal	Notably high	Notably high	Notably high
North Kent Chalk	108	Normal	Notably high	Notably high	Notably high
Stour	131	Above Normal	Notably high	Exceptionally high	Exceptionally high
Dover Chalk	131	Above normal	Notably high	Exceptionally high	Exceptionally high
Thanet Chalk	146	Above Normal	Notably high	Notably high	Notably high
River Medway	115	Normal	Notably high	Exceptionally high	Exceptionally high

Eastern Rother	128	Above Normal	Notably high	Exceptionally high	Exceptionally high
Romney Marsh	120	Normal	Notably high	Exceptionally high	Exceptionally high
North West Grain	125	Normal	Notably high	Notably high	Notably high
Sheppy	127	Normal	Notably high	Notably high	Above normal

8.2 River flows table

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

8.3 Groundwater table

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