Monthly water situation report: Kent and South London Area

1 Summary - June 2024

The whole of the Kent and South London (KSL) area received 36% of the long-term average (LTA) rainfall during June. Rainfall received across catchments in the area ranged from notably low to below normal. Soil moisture deficits (SMDs) increased considerably in June due to the much lower effective rainfall received. Monthly mean flows (MMFs) ranged from notably low to exceptionally high. The majority of the key flow sites saw normal or above normal MMFs during June. Groundwater levels in the Chalk in June 2024 ranged from exceptionally high to above average for this time of the year. Groundwater levels continue to fall consistently across Kent and South London aquifers. Levels in all 5 reservoirs in KSL decreased in June.

1.1 Rainfall

The whole of the KSL area received 36% of the LTA rainfall during June. Rainfall received across catchments in the area ranged from notably low to below normal. Below normal rainfall was recorded across catchments in the centre and in Dover Chalk in the east of the patch. Notably low rainfall was recorded across all the other rainfall areas. The percentage of LTA rainfall received across catchments ranged from 43% across Dover Chalk rainfall area to 27% in the Lower Mole. The highest daily rainfall total of 20.1mm for June was recorded at Eynsford PS rain gauge in the Darent catchment on the 15 June. The next highest daily rainfall totals were on 14, 9, 6 and 22 June and ranged from 13.2mm to 7.3mm. In June, approximately eight dry days where less than 0.2mm of rainfall was received were registered.

1.2 Soil moisture deficit and recharge

At the end of June, SMDs at all rainfall areas in KSL ranged between 78mm and 94mm. SMDs increased considerably in June due to the much lower effective rainfall received. Across the whole area, on average, effective rainfall received this month was low at 7% of the LTA. The difference in LTA in June was slightly higher for this time of year, ranging from 6 to 25mm. This is due to significantly less rainfall.

1.3 River flows

In June MMFs ranged from notably low to exceptionally high. The majority of the key flow sites in the central south of the patch saw normal MMFs during June. Four flow sites saw above

normal MMFs, one in the north-east, 2 in the north-east and one in the central south of the patch. Dour at Crabble recorded the highest MMF at 166% of the LTA for the month of June. Dour was the only flow site that was in the exceptionally high category. In contrast, Ravensbourne at Catford recorded the lowest MMF at 48% of the LTA, being the only flow site in the notably low category.

1.4 Groundwater levels

Groundwater levels ranged from exceptionally high to above average across the KSL area. All monitoring points but Chipstead recorded groundwater levels that were either notably high or exceptionally high, with Chipstead recording levels that for this time of the year (June 2024) are above average. Although levels in the Chalk remain exceptionally high in the east of the patch, and notably high in most of the west, levels continue to fall consistently across the area. This also applies to groundwater levels in the Greensand aquifer at Riverhead.

1.5 Reservoir stocks

At the end of June, reservoir levels were:

- normal at Bewl at 91%, Darwell at 83% and Powdermill at 81%
- above normal at Bough Beech at 86%
- notably high at Weir Wood at 97%

Levels in all 5 reservoirs in KSL decreased in June, although levels at Weir Wood had the least reduction.

1.6 Environmental impact

Hands off flow constraints were applied to certain licensed abstractions within the Upper Stour catchment.

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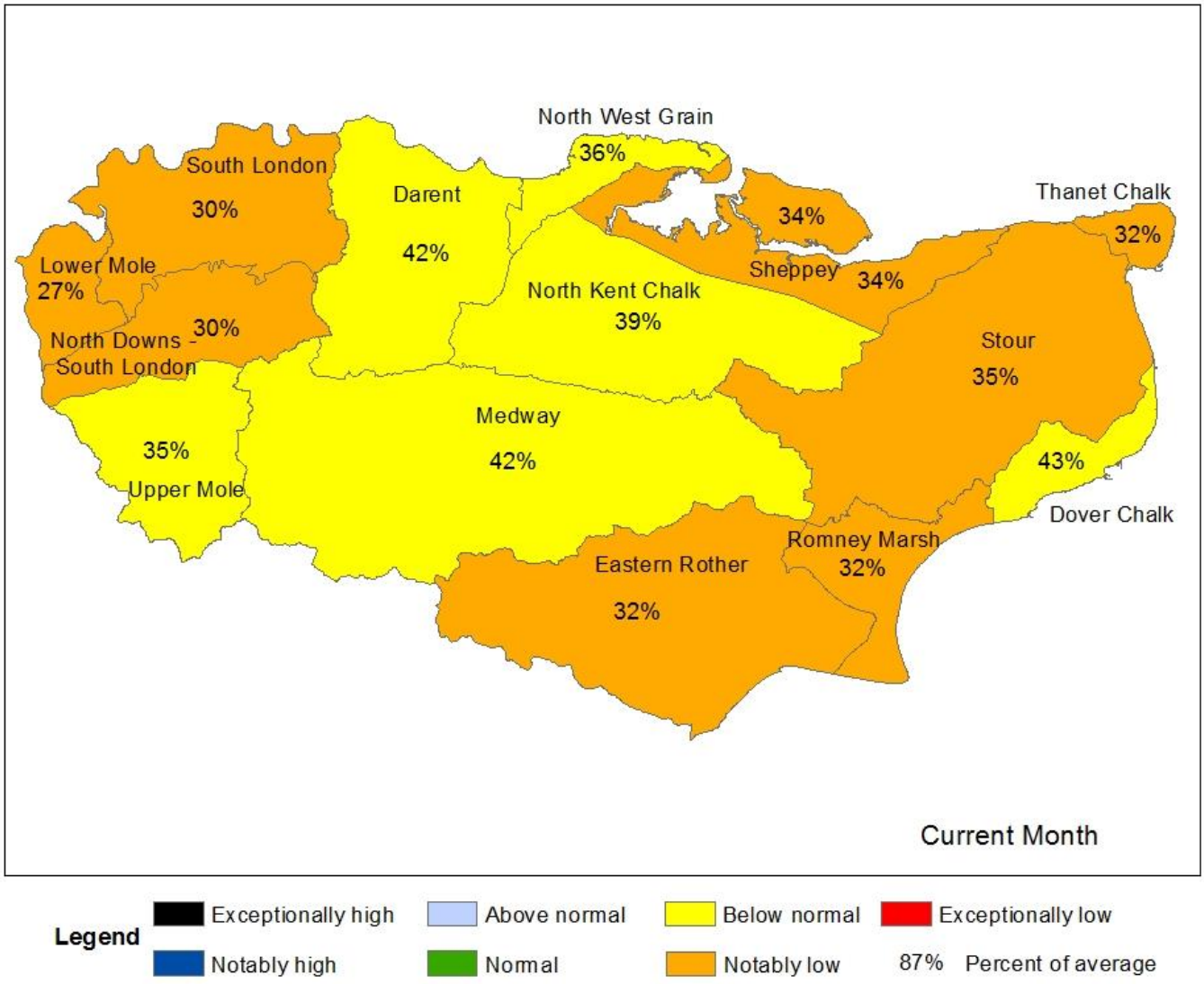
2 Rainfall

2.1 Rainfall map one

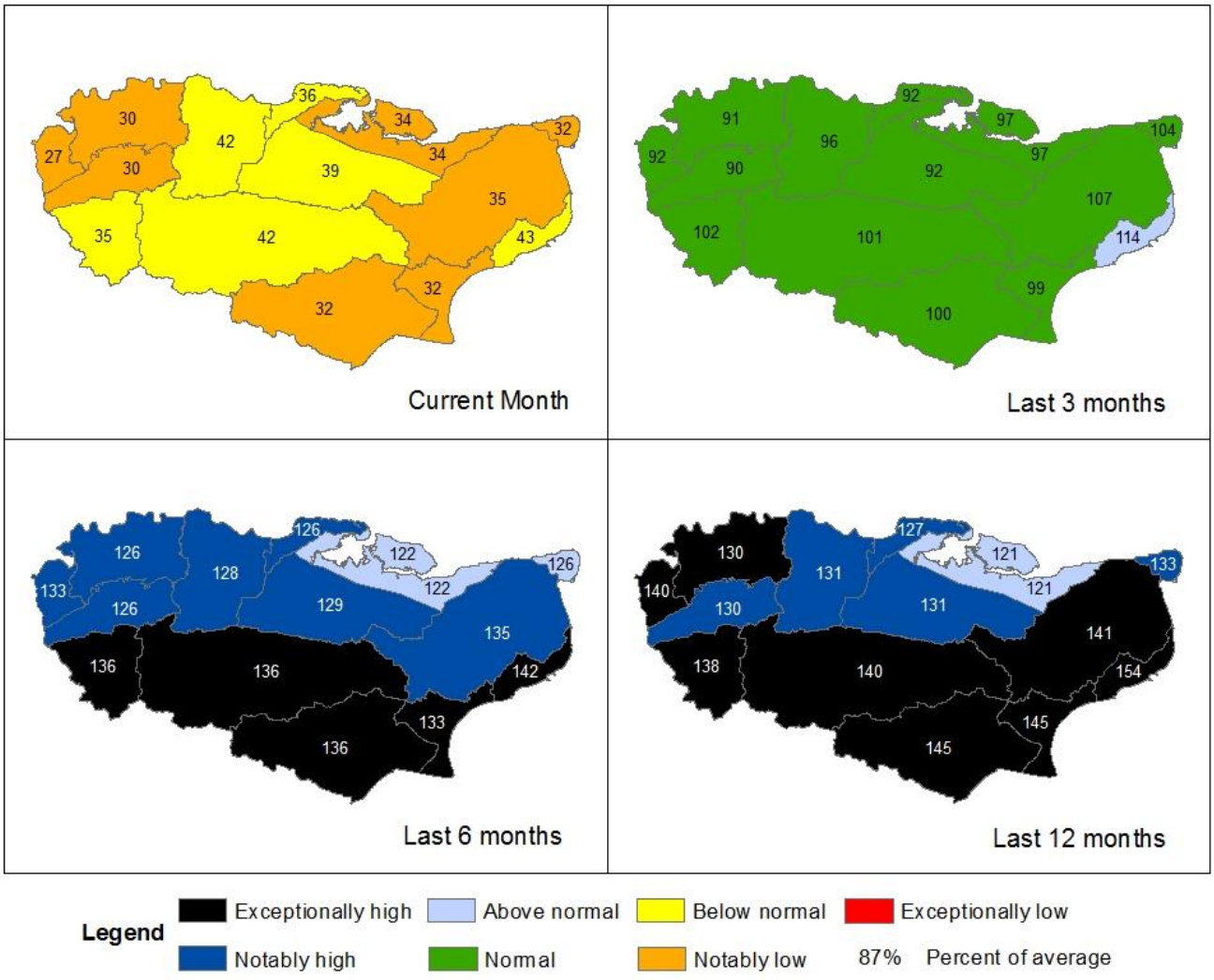
Figure 2.1: Total rainfall for hydrological areas across Kent and South London for the current month (up to 30 June 2024), classed relative to an analysis of respective historic totals. Table available in the appendices with more detailed information.



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

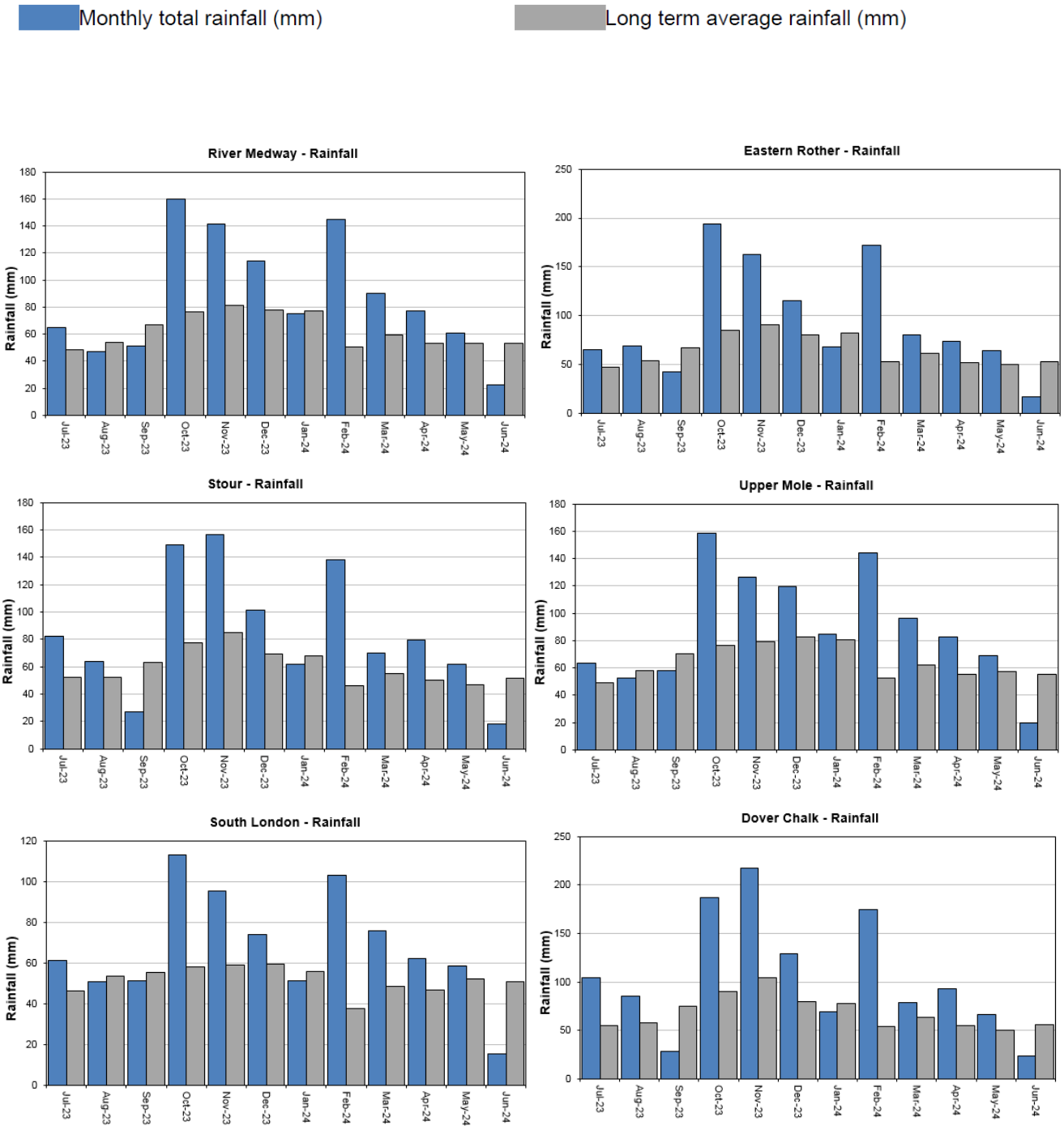
Figure 2.2: Total rainfall for hydrological areas for the current month (up to 30 June 2024), the last 3 months, the last 6 months, and the last 12 months, classed relative to an analysis of respective historic totals. Table available in the appendices with detailed information.

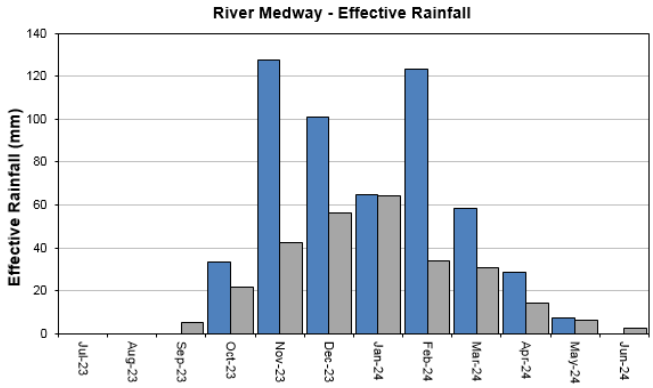


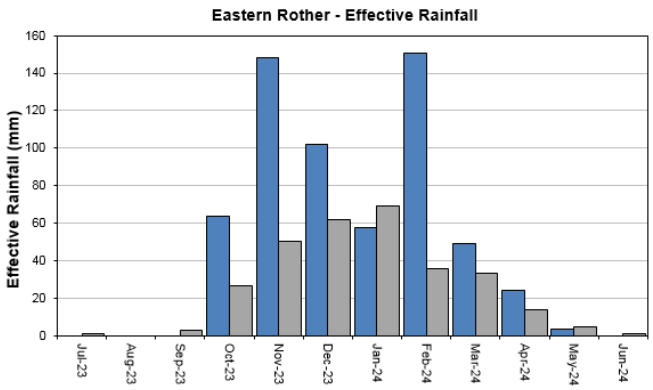
HadUK data based on the Met Office 1km gridded rainfall dataset derived from rain gauges (Source: Met Office. Crown copyright, 2024). Provisional data based on Environment Agency 1km gridded rainfall dataset derived from Environment Agency intensity rain gauges. Includes material based on Ordnance Survey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

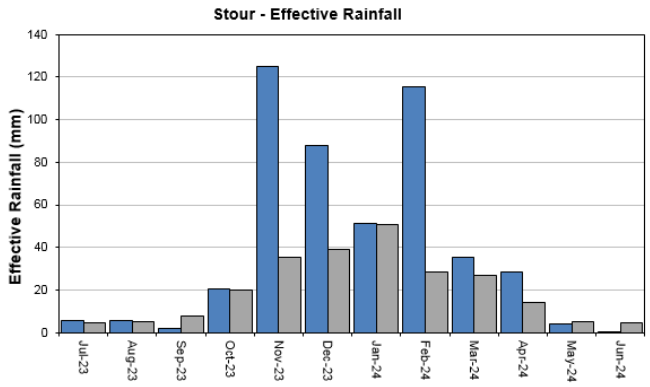
2.3 Rainfall and effective rainfall charts

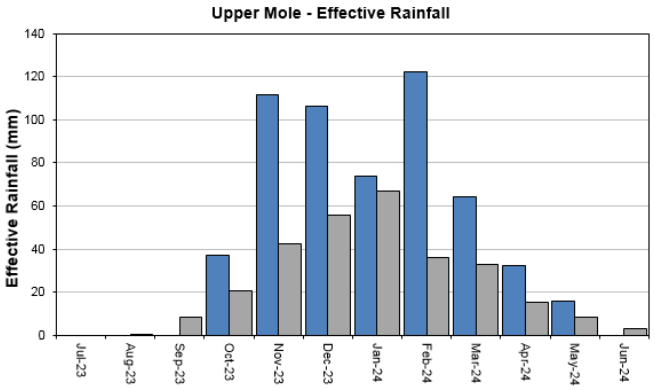
Figure 2.3: Monthly rainfall and effective rainfall totals for the past 12 months as a percentage of the 1961 to 1990 long term average (LTA) for a selection of areal units. HadUK rainfall data. (Source: Met Office. Crown copyright, 2024). EA effective rainfall data (Source EA Soil Moisture Model).

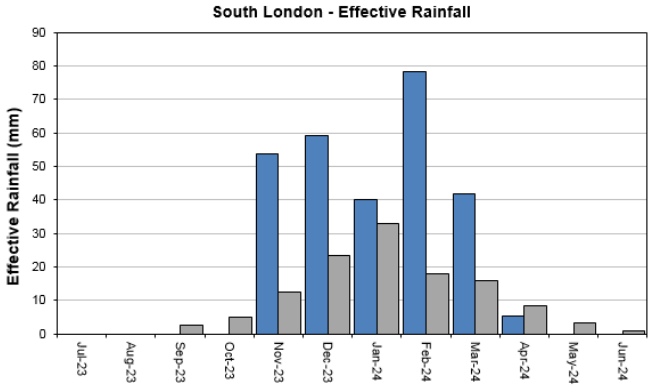


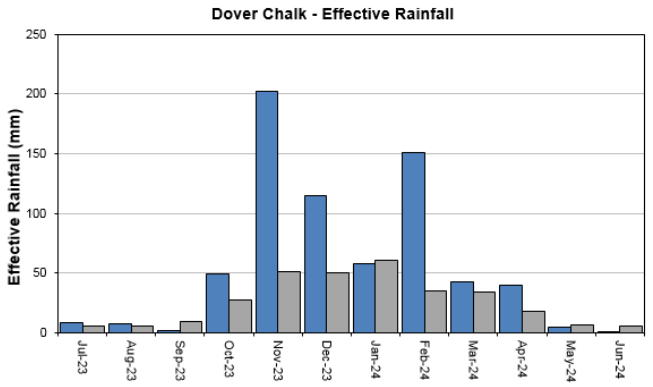

River Medway - Effective Rainfall
Effective Rainfall (mm)
0
20
40
60
80
100
120
140
Jul-23
Aug-23
Sep-23
Oct-23
Nov-23
Dec-23
Jan-24
Feb-24
Mar-24
Apr-24
May-24
Jun-24


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


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


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


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


Dover Chalk - Effective Rainfall
Effective Rainfall (mm)
0
50
100
150
200
250
Jul-23
Aug-23
Sep-23
Oct-23
Nov-23
Dec-23
Jan-24
Feb-24
Mar-24
Apr-24
May-24
Jun-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) 30 day Total	June% LTA	Effective Rainfall (mm) 30 day Total	June % LTA
6230TH	North Downs - South London (W)	17	30%	0	6%
6505TH	Upper Mole	19	35%	0	0%
6508TH	South London	15	30%	0	0%
6706So	Darent	22	42%	1	20%
6707So	North Kent Chalk	21	39%	1	18%
6708So	Stour	18	35%	0	2%
6709So	Dover Chalk	24	43%	0	6%
6710So	Thanet Chalk	16	32%	0	1%
6809So	Medway	22	42%	0	0%
6810So	Eastern Rother	17	32%	0	0%

6811So	Romney Marsh	16	32%	0	-
6812So	North West Grain	16	36%	0	0%
6813So	Sheppey	15	34%	0	0%
	Kent & South London Average	18	36%	0	7%

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

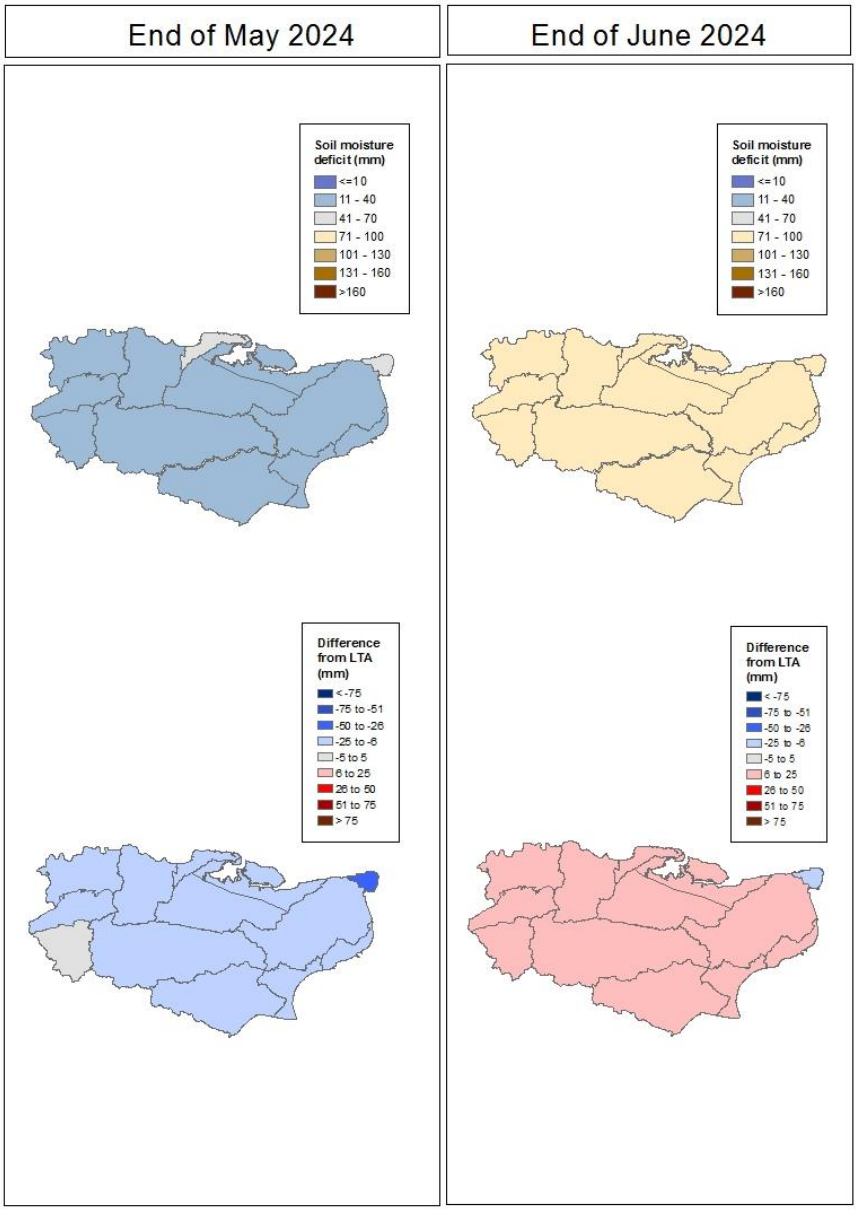
Number	Hydrological Area	Seasonal Rainfall (mm) Total	% LTA	Seasonal Effective Rainfall (mm) Total	% LTA
6230TH	North Downs - South London (W)	157	90%	36	97%
6505TH	Upper Mole	171	102%	49	180%
6508TH	South London	135	91%	5	41%
6706So	Darent	151	97%	28	99%
6707So	North Kent Chalk	144	92%	24	81%
6708So	Stour	159	106%	32	135%
6709So	Dover Chalk	183	114%	45	149%
6710So	Thanet Chalk	136	104%	10	79%
6809So	Medway	161	101%	36	154%

6810So	Eastern Rother	156	100%	28	142%
6811So	Romney Marsh	140	99%	21	168%
6812So	North West Grain	122	92%	6	66%
6813So	Sheppey	127	97%	6	81%
	Kent & South London Average	149	99%	25	119%

3 Soil moisture deficit

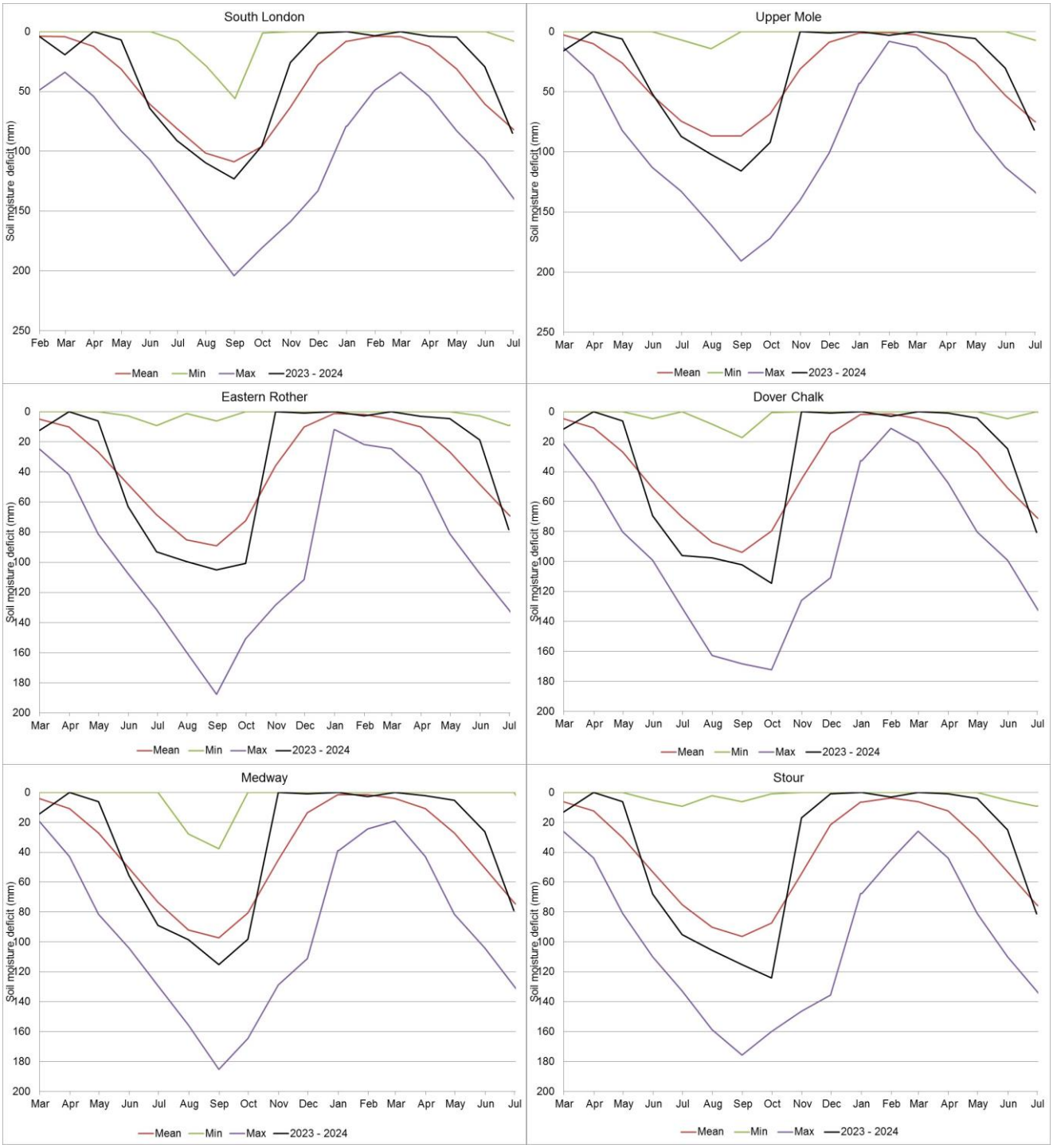
3.1 Soil moisture deficit map

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

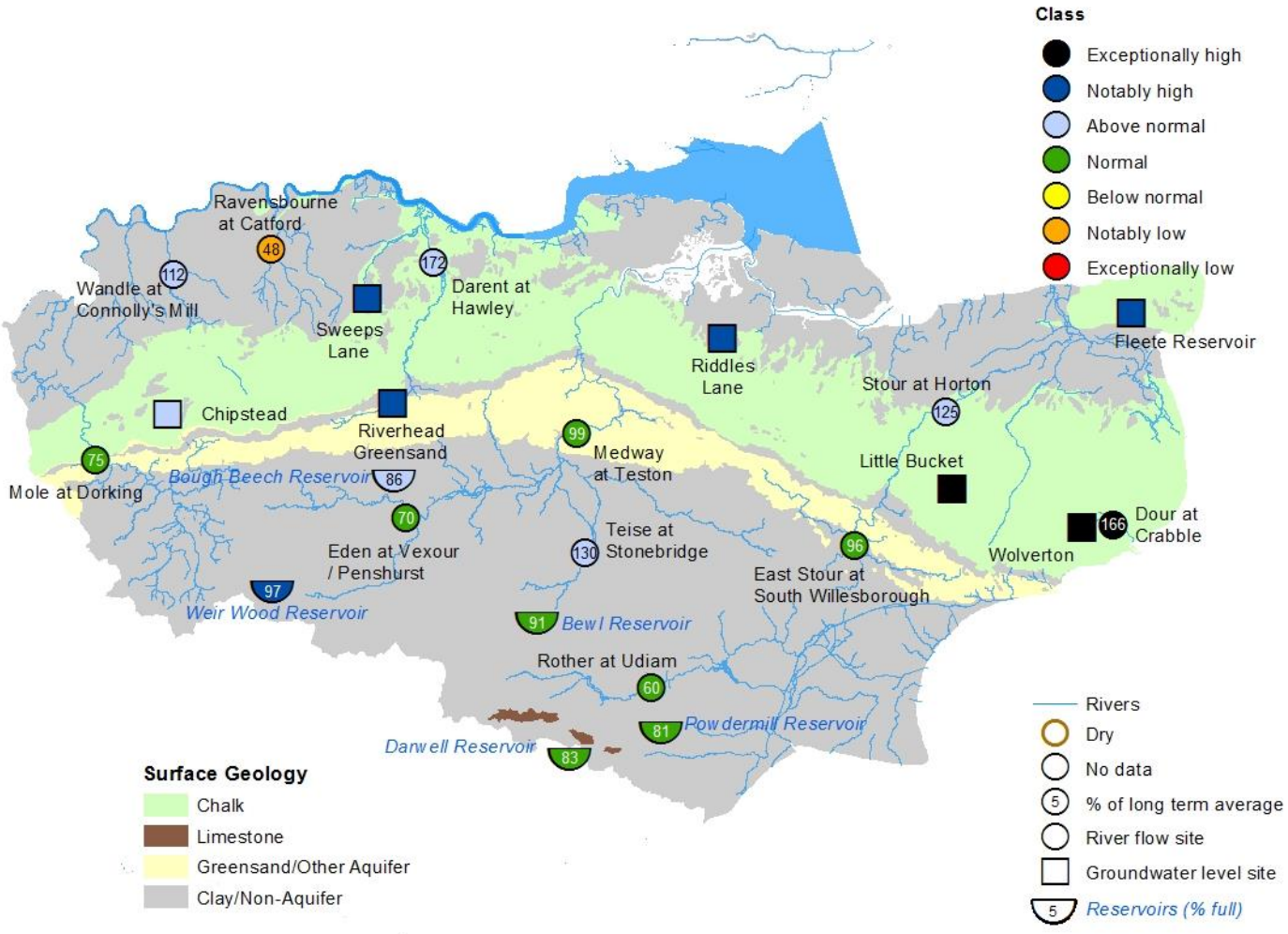
Figure 3.3: This is a second estimate of soil moisture deficit for the hydrological areas across the Kent and South London area. There may be significant variation within each area which must be considered when interpreting these data. EA soil moisture deficit data (Source EA Soil Moisture Model).

Number	Hydrological Area	SMD (mm) Day 30	End June LTA
6230TH	North Downs - South London (W)	81	59
6505TH	Upper Mole	82	59
6508TH	South London	85	70
6706So	Darent	82	66
6707So	North Kent Chalk	82	66
6708So	Stour	81	68
6709So	Dover Chalk	80	66
6710So	Thanet Chalk	94	108
6809So	Medway	79	59
6810So	Eastern Rother	78	60
6811So	Romney Marsh	83	66
6812So	North West Grain	88	75
6813So	Sheppey	88	76
	Kent & South London Average	83	69

4 River flows, groundwater levels and reservoir stocks

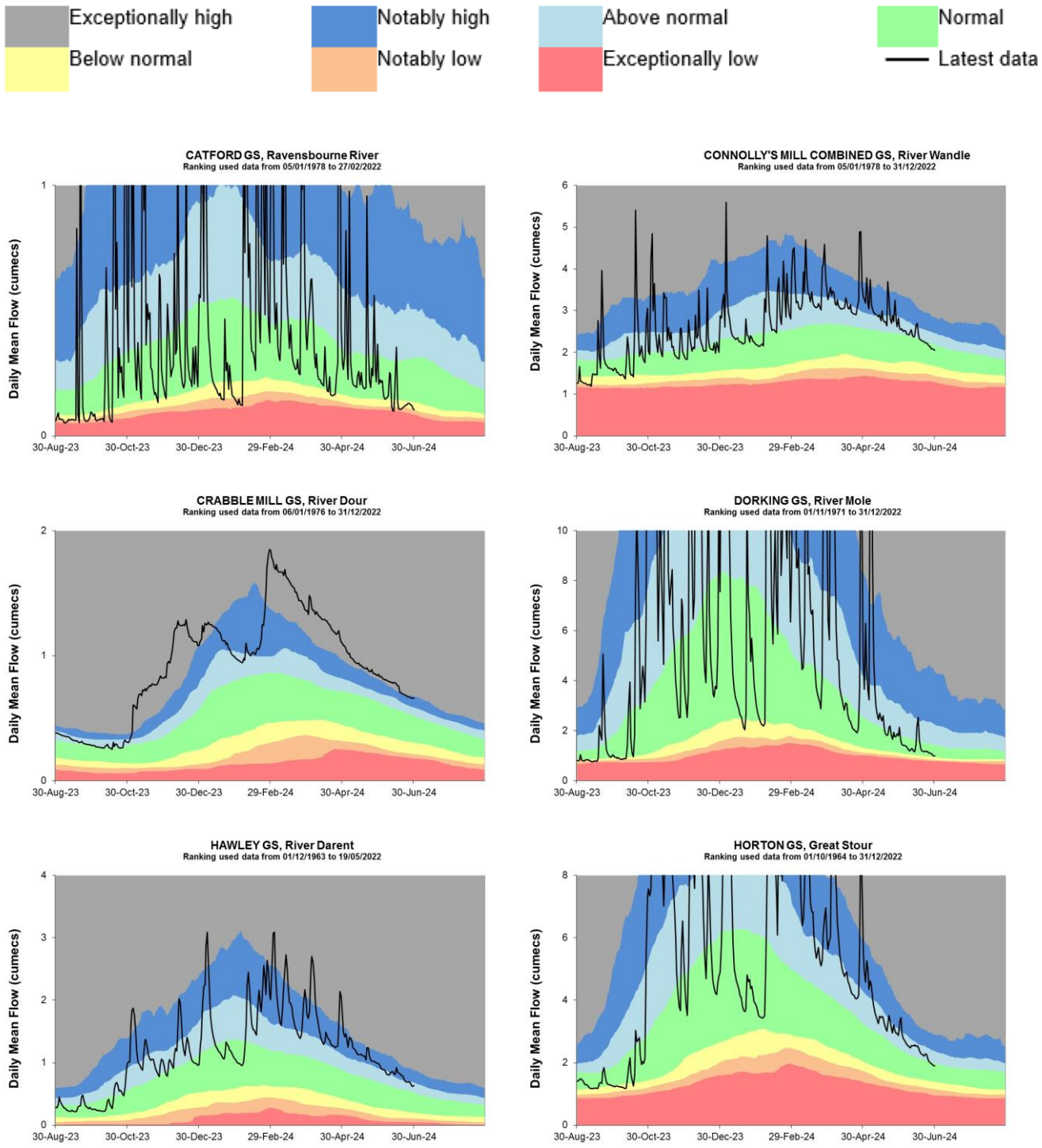
4.1 River flows, groundwater levels and reservoir stocks map

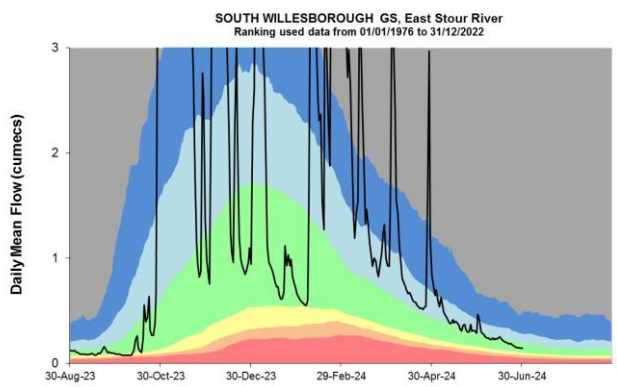
Figure 4.1: Monthly mean river flows for indicator sites for June 2024, expressed as a percentage of the respective long term average and classed relative to an analysis of historic June monthly means. End of month groundwater levels for indicator sites for June 2024, expressed as a percentage of the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

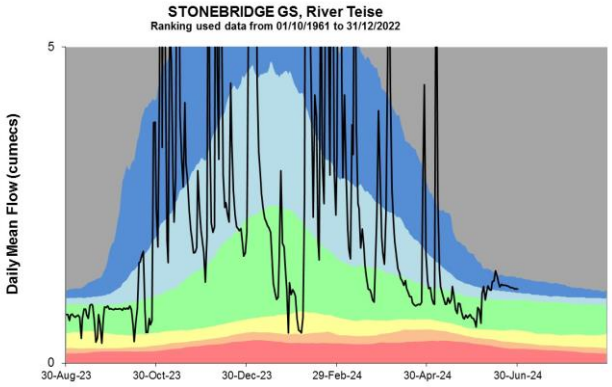


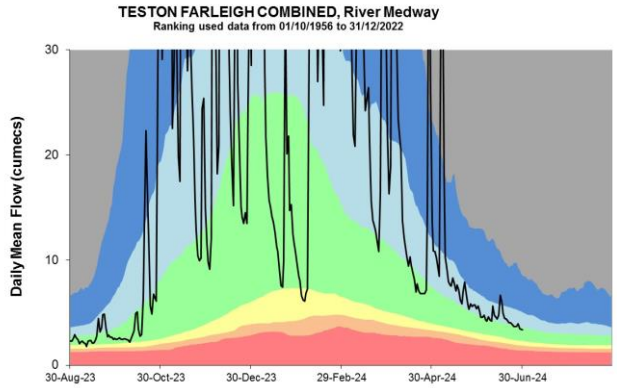
4.2 River flow charts

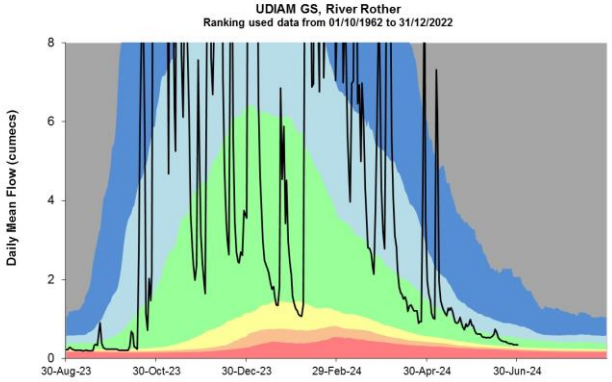
Figure 4.1: Daily mean river flow for index sites over the past year, compared to an analysis of historic daily mean flows, and long term maximum and minimum flows.

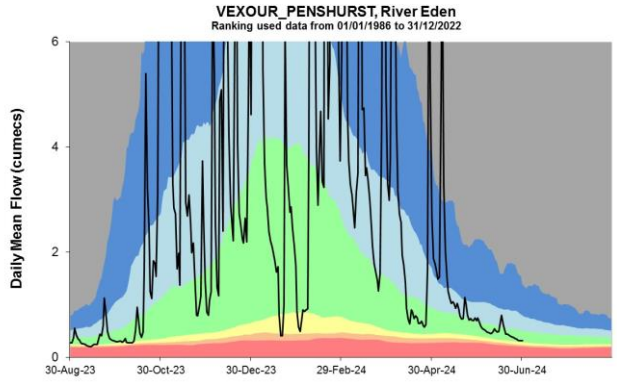










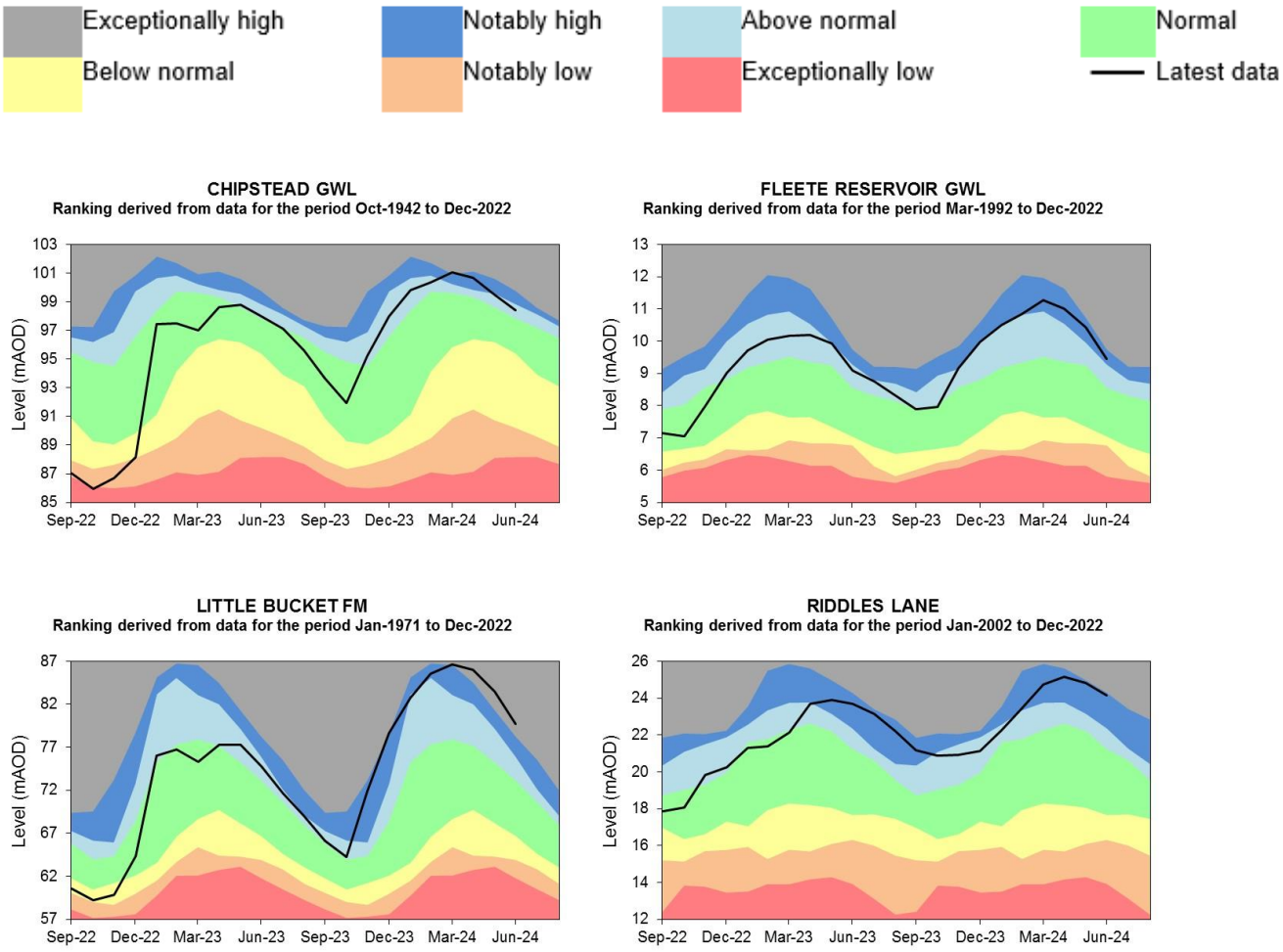


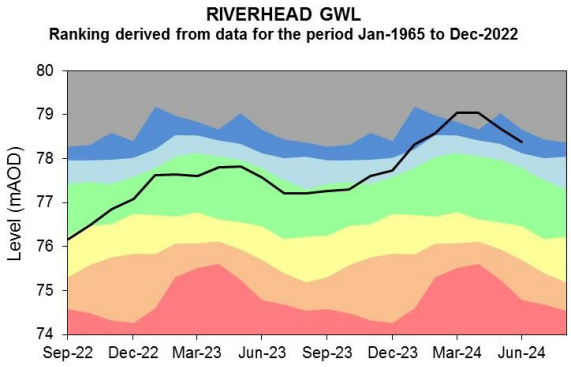
Source: Environment Agency.

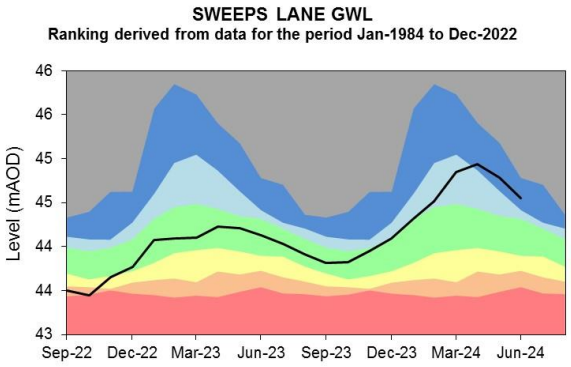
5 Groundwater levels

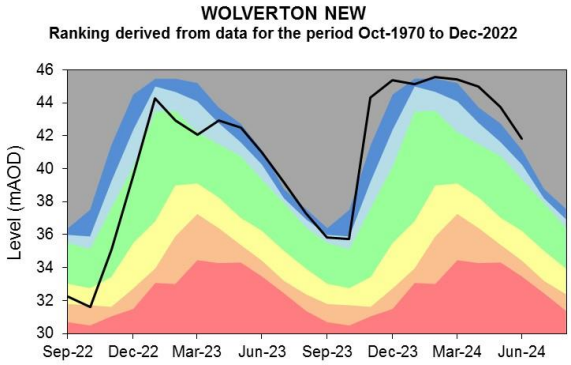
5.1 Groundwater level charts

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.







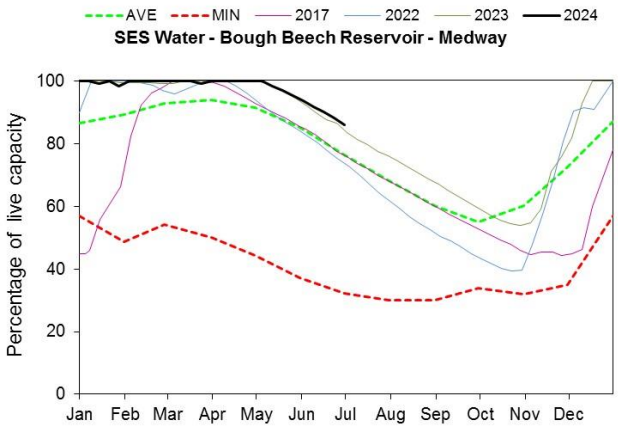


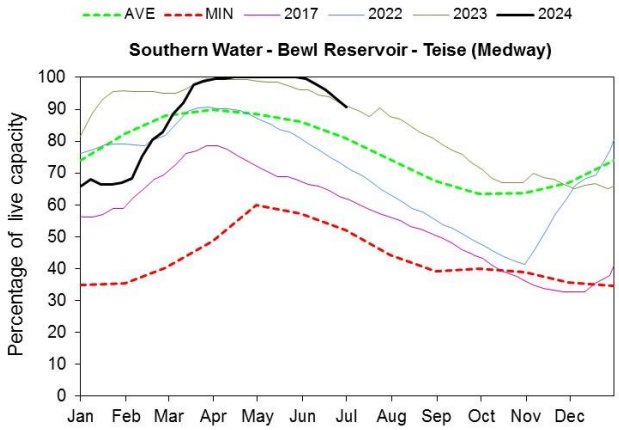
Source: Environment Agency, 2024.

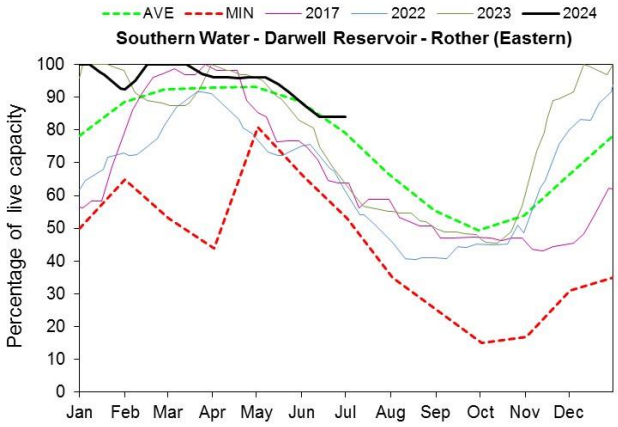
6 Reservoir stocks

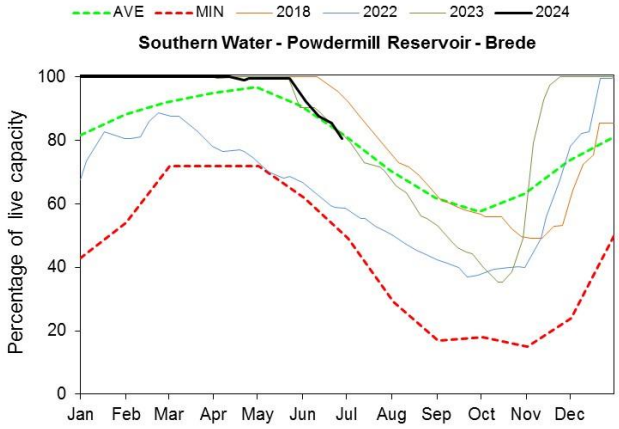
6.1 Reservoir stocks charts

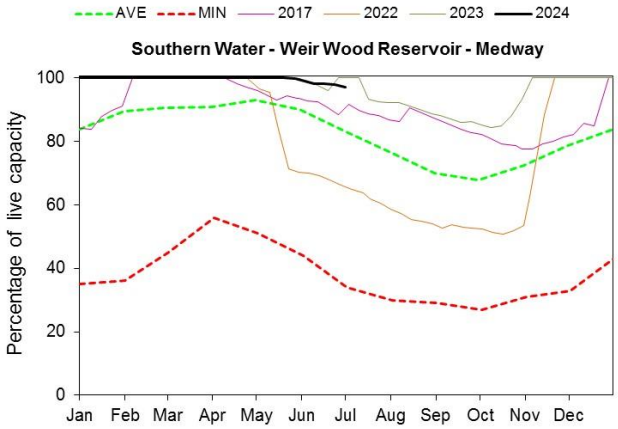
Figure 7.1: End of month regional reservoir stocks compared to long term maximum, minimum and average stocks. (Source: Water Companies). Note: Historic records of individual reservoirs and reservoir groups making up the regional values vary in length.











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	Jun 2024 rainfall % of long term average 1961 to 1990	Jun 2024 band	Apr 2024 to June cumulative band	Jan 2024 to June cumulative band	Jul 2023 to June cumulative band
North Downs - South London	30	Notably Low	Normal	Notably high	Notably high
Upper Mole	35	Below Normal	Normal	Exceptionally high	Exceptionally high
South London	30	Notably Low	Normal	Notably high	Exceptionally high
River Darent	42	Below Normal	Normal	Notably high	Notably high
North Kent Chalk	39	Below Normal	Normal	Notably high	Notably high
Stour	35	Notably Low	Normal	Notably high	Exceptionally high
Dover Chalk	43	Below Normal	Above normal	Exceptionally high	Exceptionally high
Thanet Chalk	32	Notably Low	Normal	Above normal	Notably high
River Medway	42	Below Normal	Normal	Exceptionally high	Exceptionally high

Eastern Rother	32	Notably Low	Normal	Exceptionally high	Exceptionally high
Romney Marsh	32	Notably Low	Normal	Exceptionally high	Exceptionally high
North West Grain	36	Below Normal	Normal	Notably high	Notably high
Sheppey	34	Notably Low	Normal	Above normal	Above normal

8.2 River flows table

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

8.3 Groundwater table

Site name	Aquifer	End of Jun 2024 band	End of May 2024 band
Fleete Reservoir Gwl	Isle Of Thanet Chalk	Notably high	Notably high
Chipstead Gwl	Epsom North Downs Chalk	Above normal	Above normal
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	Notably high
Sweeps Lane Gwl	West Kent Chalk	Notably high	Notably high
Wolverton New	East Kent Chalk - Stour	Exceptionally high	Exceptionally high