

monthly water situation report

South East Region, North East Thames Area

Summary – December 2011

December saw 95 % of the long term average rainfall across the Area. However, this had little effect due to the unseasonably high soil moisture deficit. As a result, the rainfall did little to improve river flows and groundwater levels.

Rainfall

In a change to the situation over the last few months, the North East Thames Area (“the Area”) received 95 % of the long term average (LTA) for December. Showery days occurred throughout the month, with more persistent rainfall concentrated between 11 – 15 December. The heaviest and most widespread rainfall fell on 12 December, with daily totals exceeding 20 mm in north London. The fifteen month period from October 2010 has been the 2nd driest on record for Lee Chalk, after 1921.

Soil Moisture Deficit/Recharge

Despite the welcome return of the rainfall, soil moisture deficits (SMD), were still unseasonably high for December – on average 75 mm across the area, compared with a LTA of 7 mm. The Lee Chalk was the driest catchment at 91 mm (7 mm LTA), and the Chilterns-East-Colne was the wettest at 56 mm (3 mm LTA). North London, Lower Lee and Roding catchments recorded 0 % of their LTA effective rainfall.

Sustained above average rainfall for a number of months is required before recharge will commence.

River Flows

Many of our indicator sites on the clay catchments responded to the average rainfall, with improved river flow on the Crane, Colne, Brent, Mimram, Lee and Roding. Flows were still struggling at *exceptionally low* levels, on the Ash (Herts) and Ingreborne.

In addition, Upminster (Gaynes Park) recorded the lowest mean monthly flow on record for December. No flood alerts or warnings were issued during December.

Groundwater Levels

The high SMD had a lasting impact on our groundwater sites, and groundwater levels continued to fall in all key sites. All our groundwater indicator sites were at *below normal* or lower levels, with Ashley Green levels the lowest on record.

Environmental Impact

The table below shows the abstraction licence flow constraints that were in force in December, out of a Winter maximum of 51:

Week Commencing	5 Dec	12 Dec	19 Dec	26 Dec
Number of Constraints	39	No data*	27	29

*The national flow database was unavailable for w/c 12 Dec. The decision was taken to allow the clay-based abstractors to abstract, due to an extended period of rainfall that would have increased flows that week. Constraints remained in force for the chalk catchments.

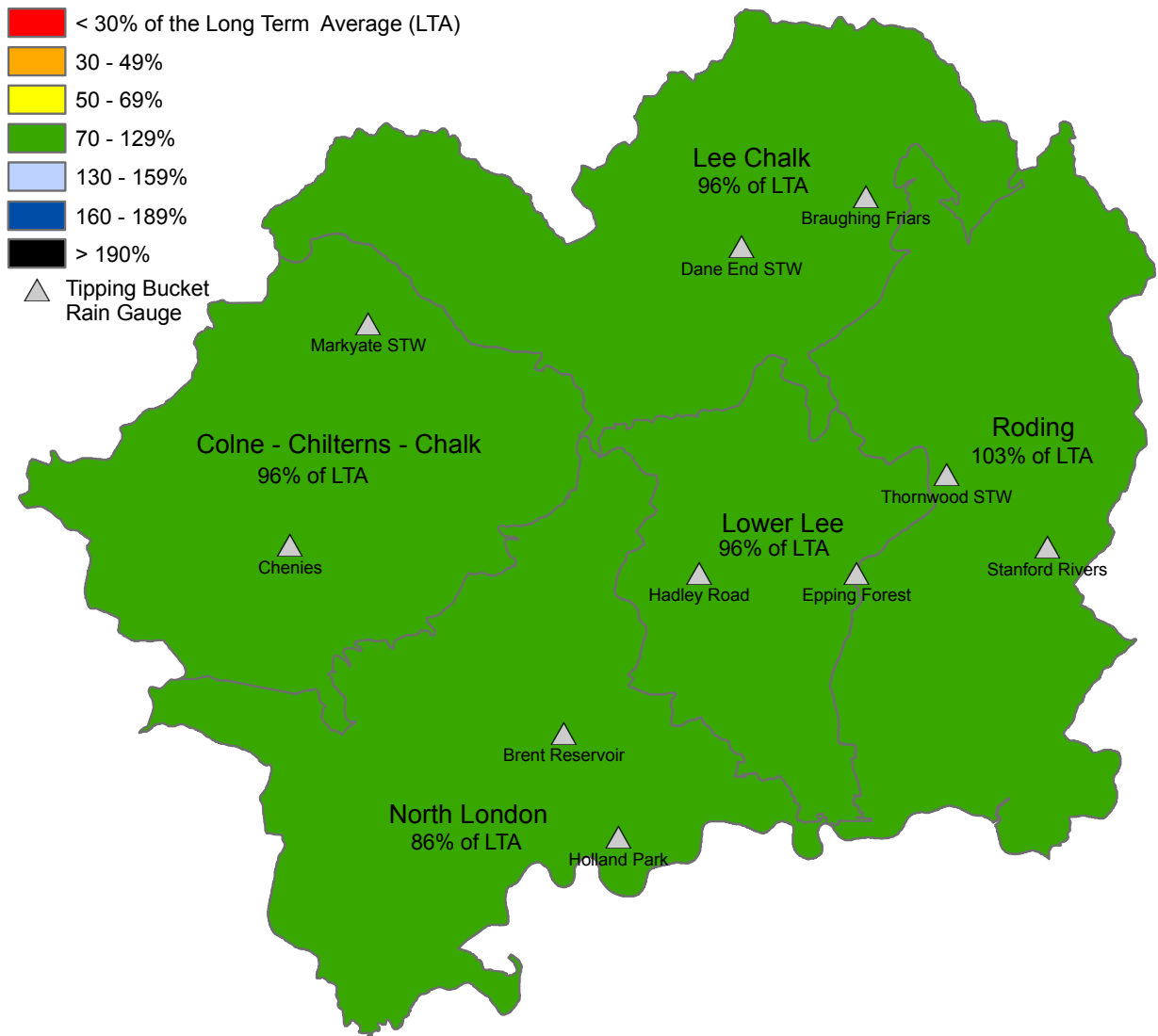
Sources

With the limited recharge and continued decline in groundwater levels, river flows continued to struggle throughout our chalk catchments, with sources remaining close to November locations. We included the Upper Lee in our springs and sources monitoring route, due to low flows through Luton.

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Rainfall Map

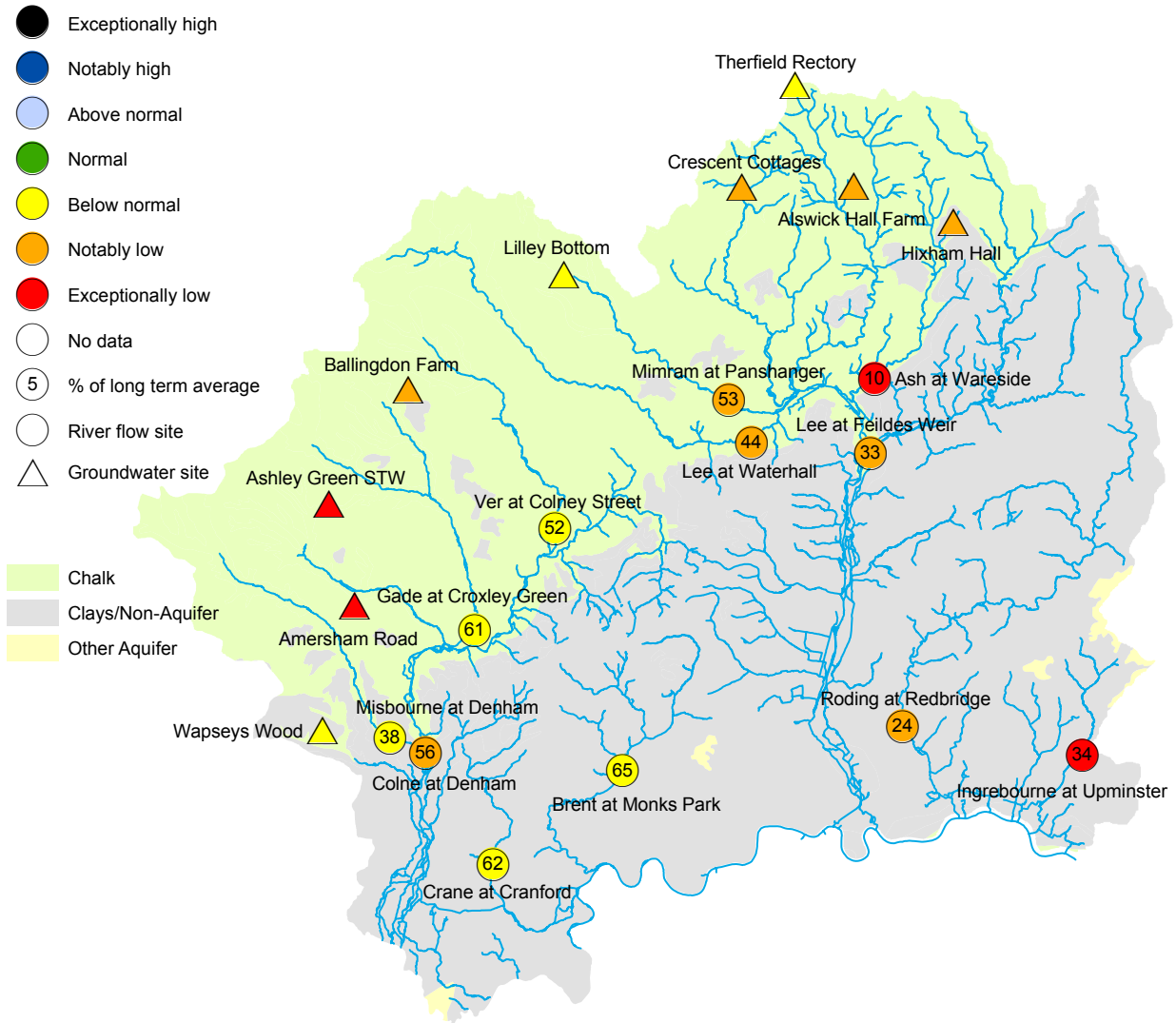


Data source: Rainfall calculated using Thames Soil Moisture Model.

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River Flow and Groundwater Map




Groundwater site status based on end of month level. Surface water site status based on mean monthly flow.


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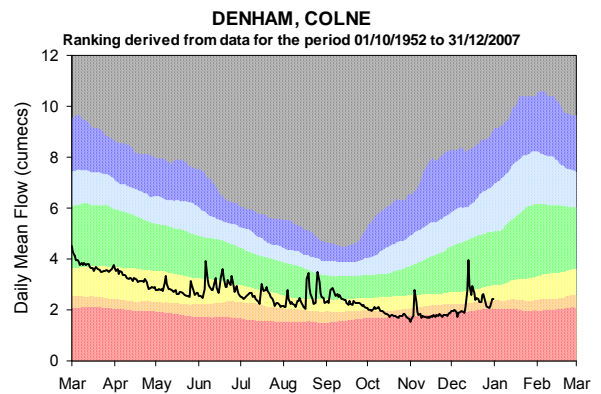
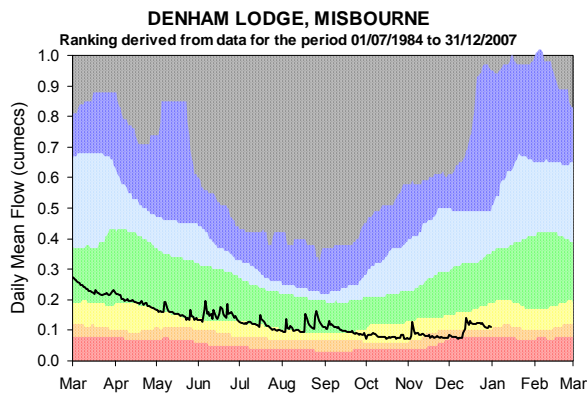
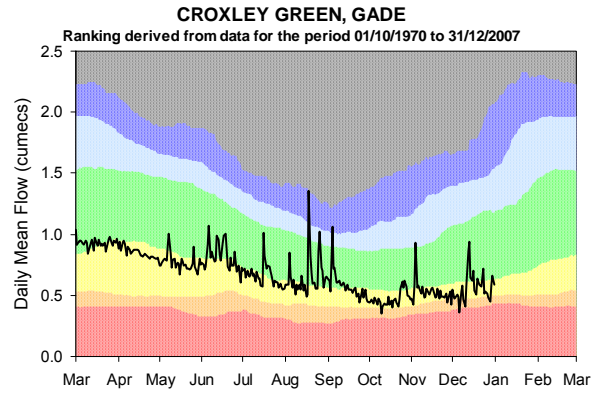
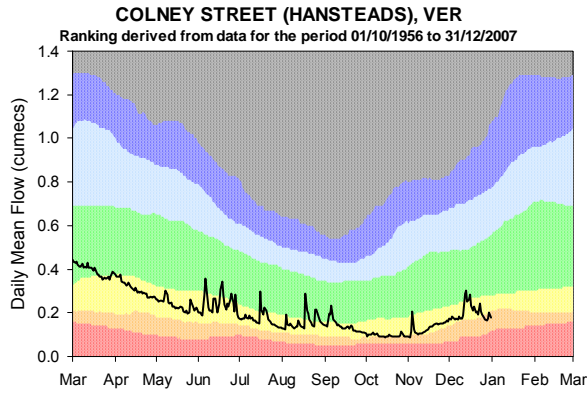
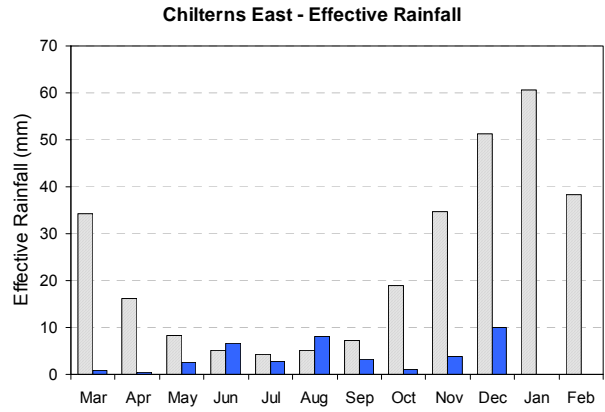
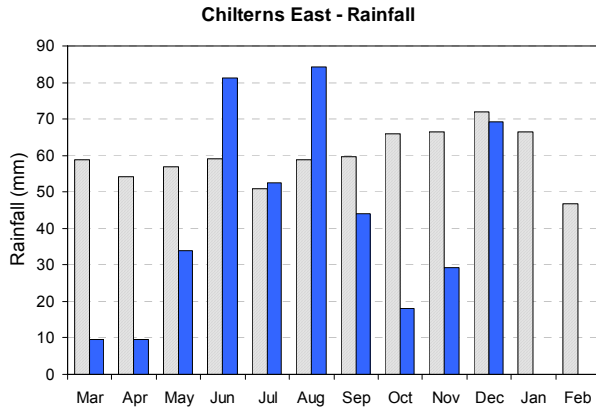
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
Colne



 Monthly total rainfall (mm)

 Long-term average rainfall (mm)



 Exceptionally high
 Below normal

 Notably high
 Notably low

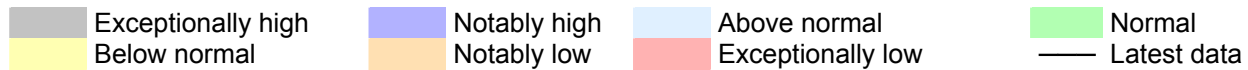
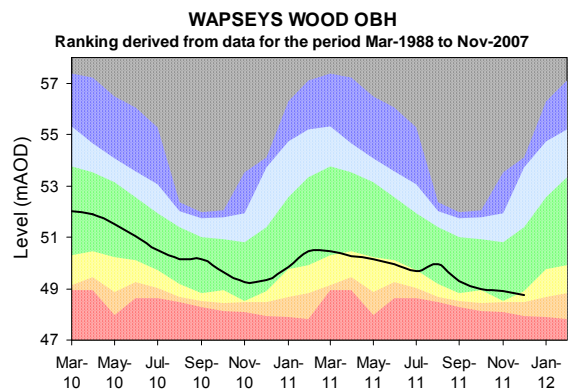
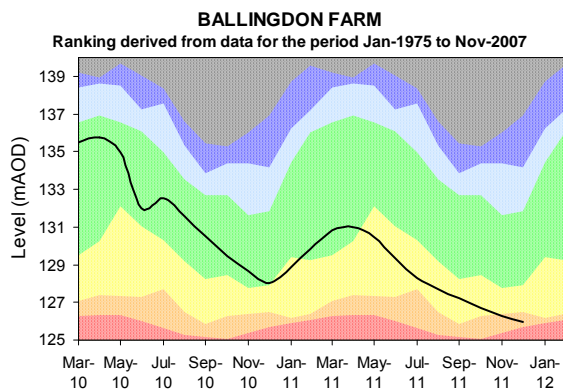
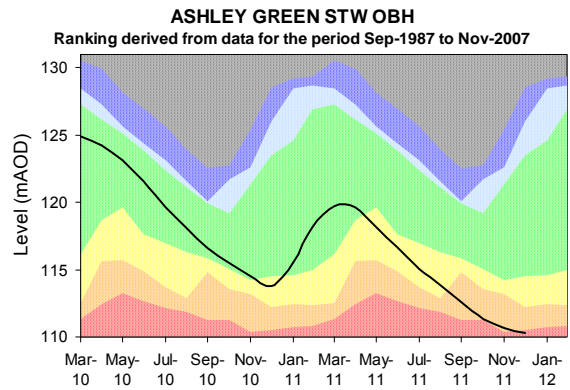
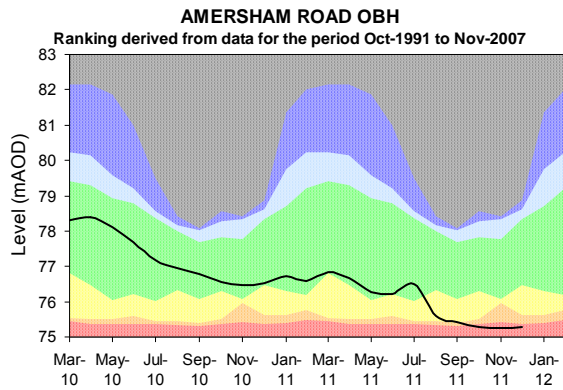
 Above normal
 Exceptionally low

 Normal
 Latest data

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Colne Groundwater



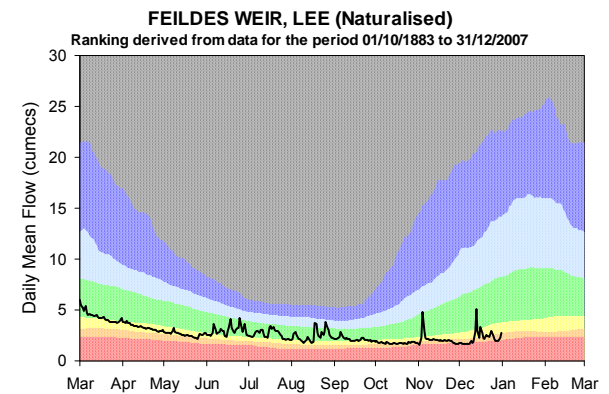
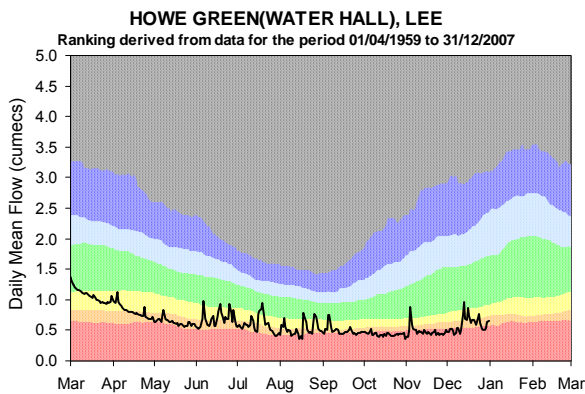
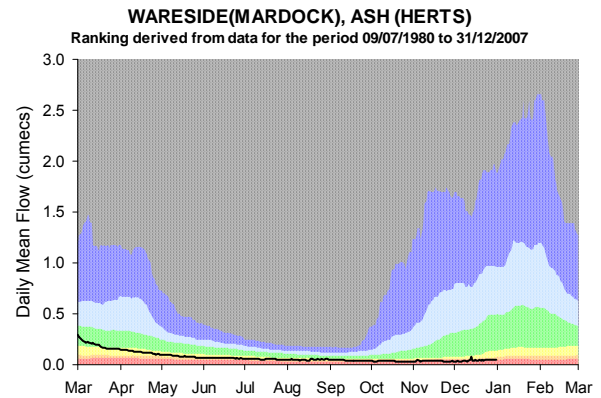
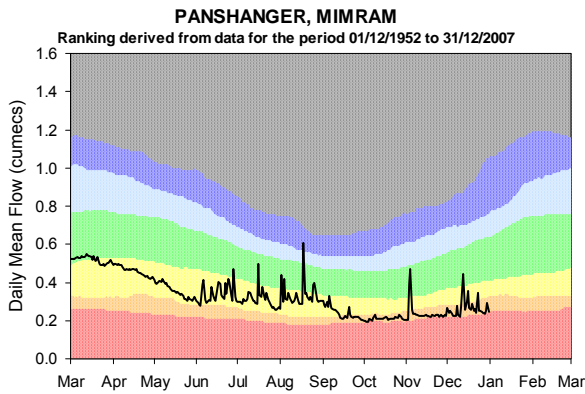
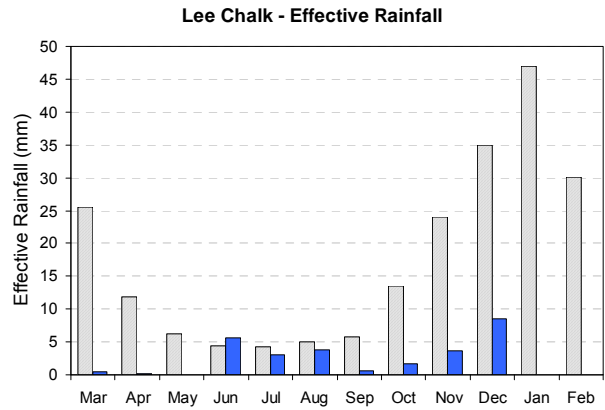
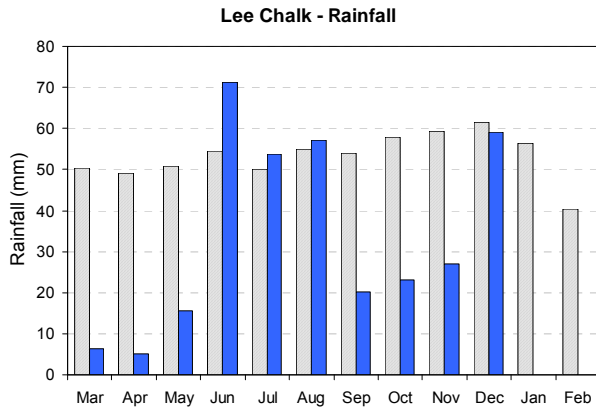
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Upper Lee

Monthly total rainfall (mm)

Long-term average rainfall (mm)



Exceptionally high
Below normal

Notably high
Notably low

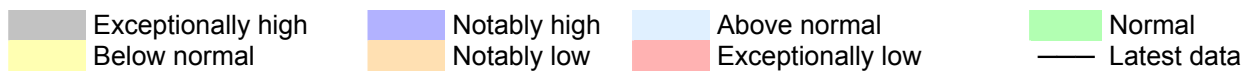
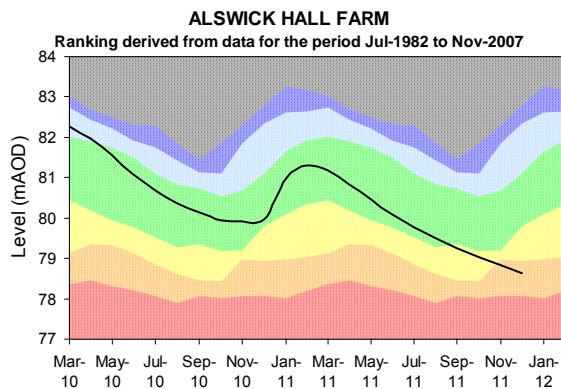
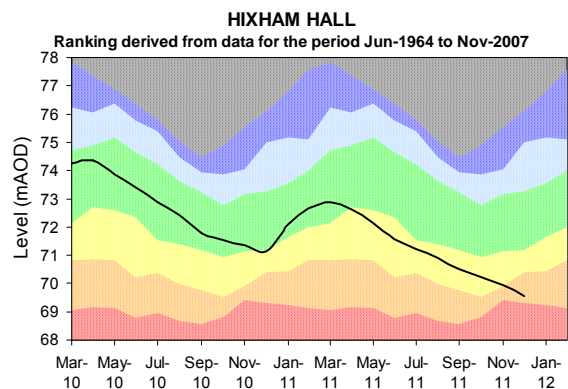
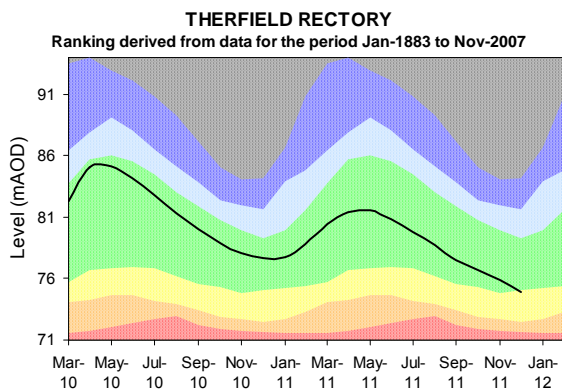
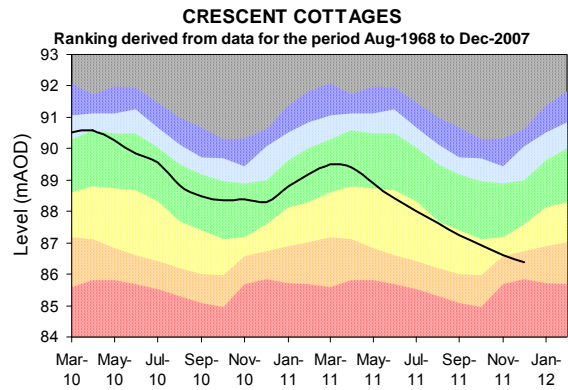
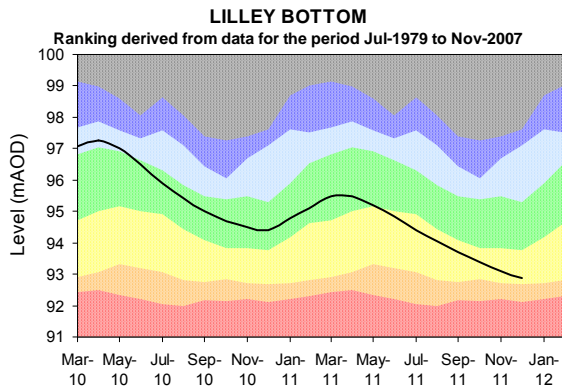
Above normal
Exceptionally low

Normal
— Latest data

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Upper Lee Groundwater



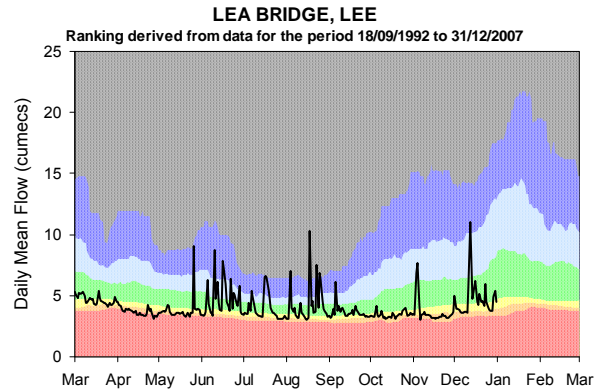
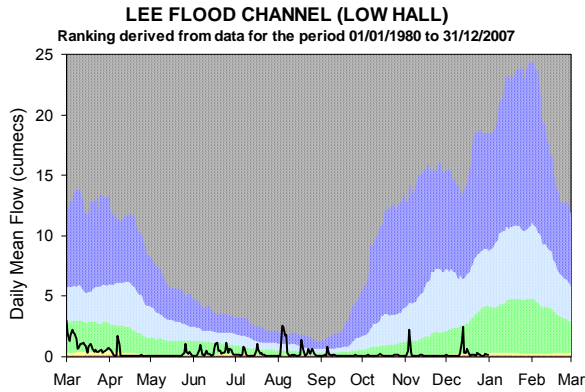
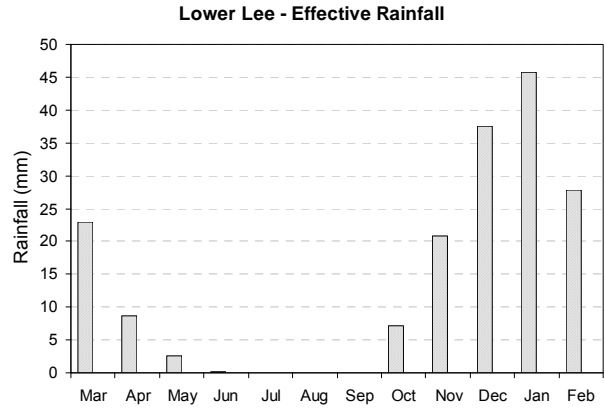
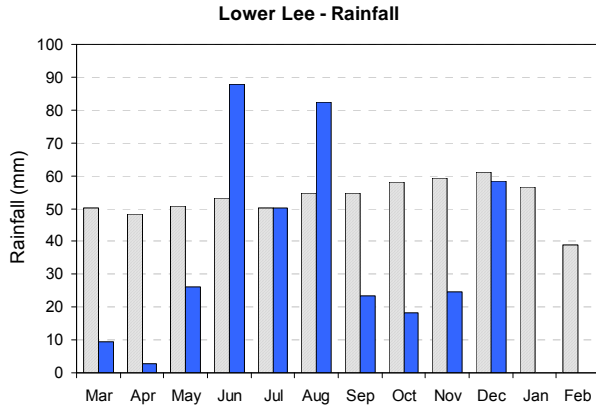
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Lower Lee

Monthly total rainfall (mm)

Long-term average rainfall (mm)



Exceptionally high
 Below normal

Notably high
 Notably low


Above normal
 Exceptionally low


Normal
 Latest data

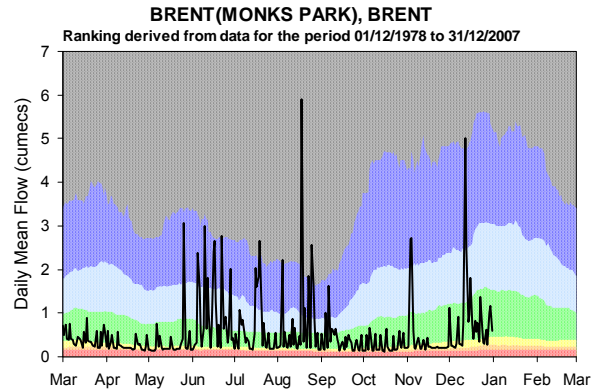
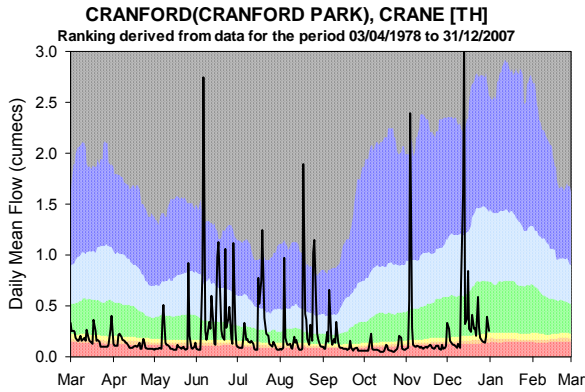
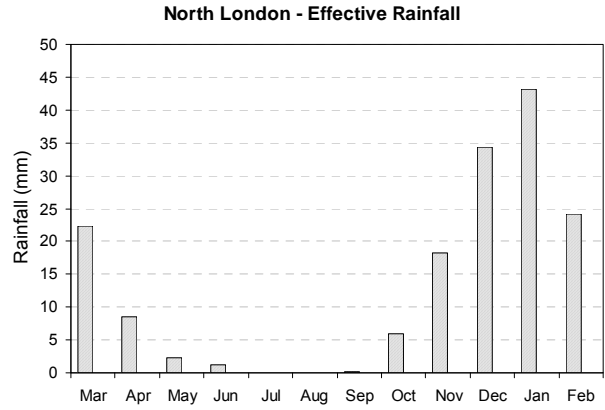
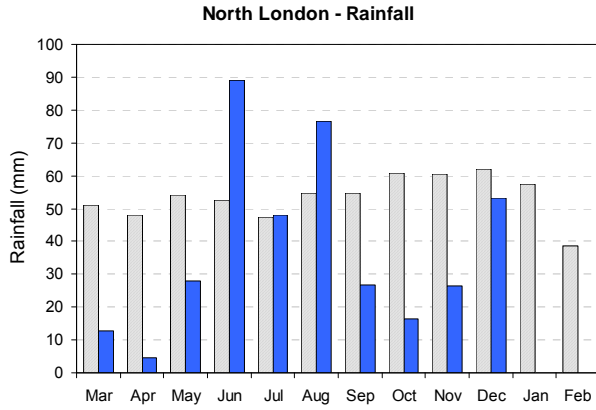
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
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North London



 Monthly total rainfall (mm)

 Long-term average rainfall (mm)



 Exceptionally high
 Below normal

 Notably high
 Notably low

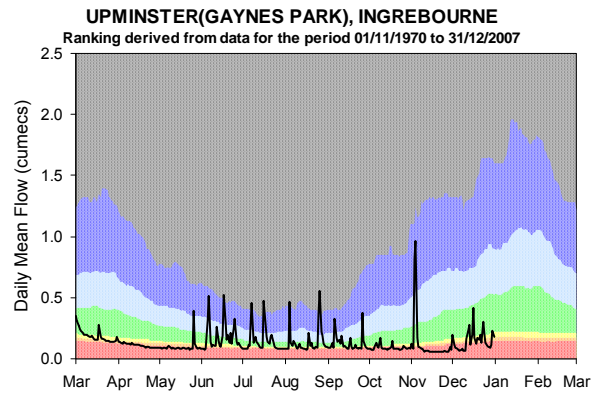
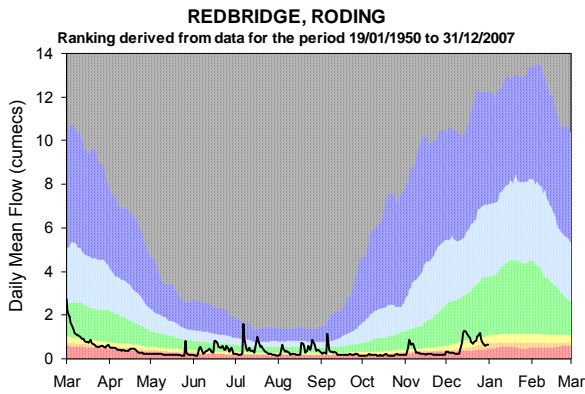
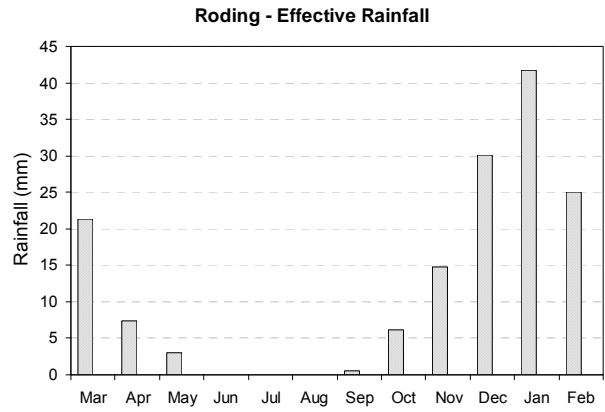
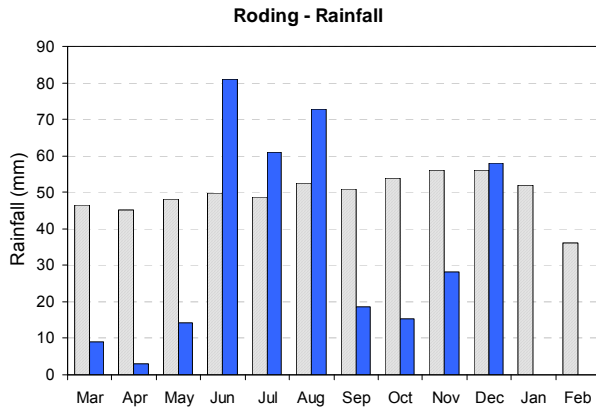
 Above normal
 Exceptionally low

 Normal
 Latest data

Roding

Monthly total rainfall (mm)

Long-term average rainfall (mm)



Exceptionally high
 Below normal

Notably high
 Notably low

Above normal
 Exceptionally low

Normal
 Latest data

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Summary of rainfall, effective rainfall and soil moisture deficit

Rainfall and Effective Rainfall – December 2011

Area	Rainfall (mm)			Effective Rainfall (mm)		
	Total (mm)	LTA (mm)	% of LTA	Total (mm)	LTA (mm)	% of LTA
Chilterns- East - Colne	69	72	96	10	51	20
Lee - Chalk	59	61	96	9	35	26
North London	53	62	86	0	34	0
Lower Lee	58	61	96	0	38	0
Roding Catchment	58	56	103	0	30	0
North East Thames Area Average	59	62	95	4	38	10

Soil Moisture Deficit (SMD) - December 2011

Area	End of Month SMD (mm)	End of Month SMD LTA (mm)
Chilterns- East - Colne	56	3
Lee - Chalk	91	7
North London	78	8
Lower Lee	77	5
Roding Catchment	73	6
North East Thames Area Average	75	6

Rainfall and Effective Rainfall – Winter total for period 1 October 2011 to 31 December 2011

Area	Rainfall (mm)			Effective Rainfall (mm)		
	Total (mm)	LTA (mm)	% of LTA	Total (mm)	LTA (mm)	% of LTA
Chilterns- East - Colne	117	204	57	15	105	14
Lee - Chalk	109	178	61	14	72	19
North London	96	184	52	0	59	0
Lower Lee	101	178	57	0	66	0
Roding Catchment	102	166	61	0	51	0
North East Thames Area Average	105	182	58	6	71	8

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Glossary

Term

Aquifer

Areal average rainfall

Effective rainfall

Groundwater

Recharge

Reservoir live capacity

Soil moisture deficit (SMD)

Definition

A geological formation able to store and transmit water.

The estimated average depth of rainfall over a defined area. Expressed in depth of water (mm).

The rainfall available to percolate into the soil or produce river flow. Expressed in depth of water (mm).

The water found in an aquifer

The process of increasing the water stored in the saturated zone of an aquifer. Expressed in depth of water (mm).

The reservoir capacity normally usable for storage to meet established reservoir operating requirements. It is the total capacity less that not available because of operating agreements or physical restrictions. Only under abnormal conditions, such as a severe water shortage might this additional water be extracted.

The difference between the amount of water actually in the soil and the amount of water that the soil can hold. Expressed in depth of water (mm).

Categories

Exceptionally high

Notably high

Above normal

Normal

Below normal

Notably low

Exceptionally low

Value likely to fall within this band 5% of the time

Value likely to fall within this band 8% of the time

Value likely to fall within this band 15% of the time

Value likely to fall within this band 44% of the time

Value likely to fall within this band 15% of the time

Value likely to fall within this band 8% of the time

Value likely to fall within this band 5% of the time

Units

cumecs

mAOD

Cubic metres per second ($\text{m}^3 \text{s}^{-1}$)

Metres Above Ordnance Datum (mean sea level at Newlyn Cornwall).