

monthly water situation report

Thames Region, North East Area

Summary – December 2010

December was a dry and cold month in the North East Area. November's snow accumulations melted at the start of December, but further significant snowfall fell during the month. December ended with a rapid thaw. Flows in many of the Area's rivers were below normal, and groundwater levels continued to fall at the majority of indicator sites.

Rainfall

North East Area received 45% of the long term average (LTA) rainfall for December and, with the exception of Lower Lee (*below normal*), all areal catchments received *notably low* levels of rainfall. The start of the month saw the snow which fell in November melting, with rain gauges recording melt-water rather than rainfall, e.g. Stanford Rivers TBR recorded a daily total of 9.2mm on 4 December. Widespread snow fell on 16/17 December and remained on the ground until the end of the month, and had melted by 28 December. Much of the Area's December rainfall total was derived from snowmelt. The highest daily rainfall total in the Area was recorded on 27 December in the Upper Colne, at Radlett (17mm).

Soil Moisture Deficit/Recharge

Soil moisture deficits across the Area were close to average for the time of year, with the exception of the North London area. Effective rainfall was calculated to be 24% of the long term average for December within the Area. However, since freezing conditions have been experienced for at least half of the month, the effective rainfall may have been overestimated.

River Flows

Most of our flow indicator sites were *below normal* for December, while the River Crane at Cranford was *notably low*. Only the Gade, Colne, Ingrebourne and Ver were *normal* for the time of year. The monthly mean flow at Cranford Park on the River Crane was the 3rd lowest December since the dry winter of 1996.

No flood alerts or warnings were issued for North East Area during December.

Groundwater Levels

The groundwater indicator sites continued to decline in December, with the exceptions of Wapseys Wood OBH and Alswick Hall Farm which showed a slight recovery. Ashley Green STW and Hixham Hall had fallen to *below normal* levels, while the remaining indicator sites fell within the *normal* range for the time of year.

Environmental Impact

The table below shows the abstraction licence flow constraints that were in force in December, out of a winter maximum of 56:

Week Ending	4 Dec	11 Dec	18 Dec	25 Dec	4 Jan
Number of Constraints	16	24	20	13	16

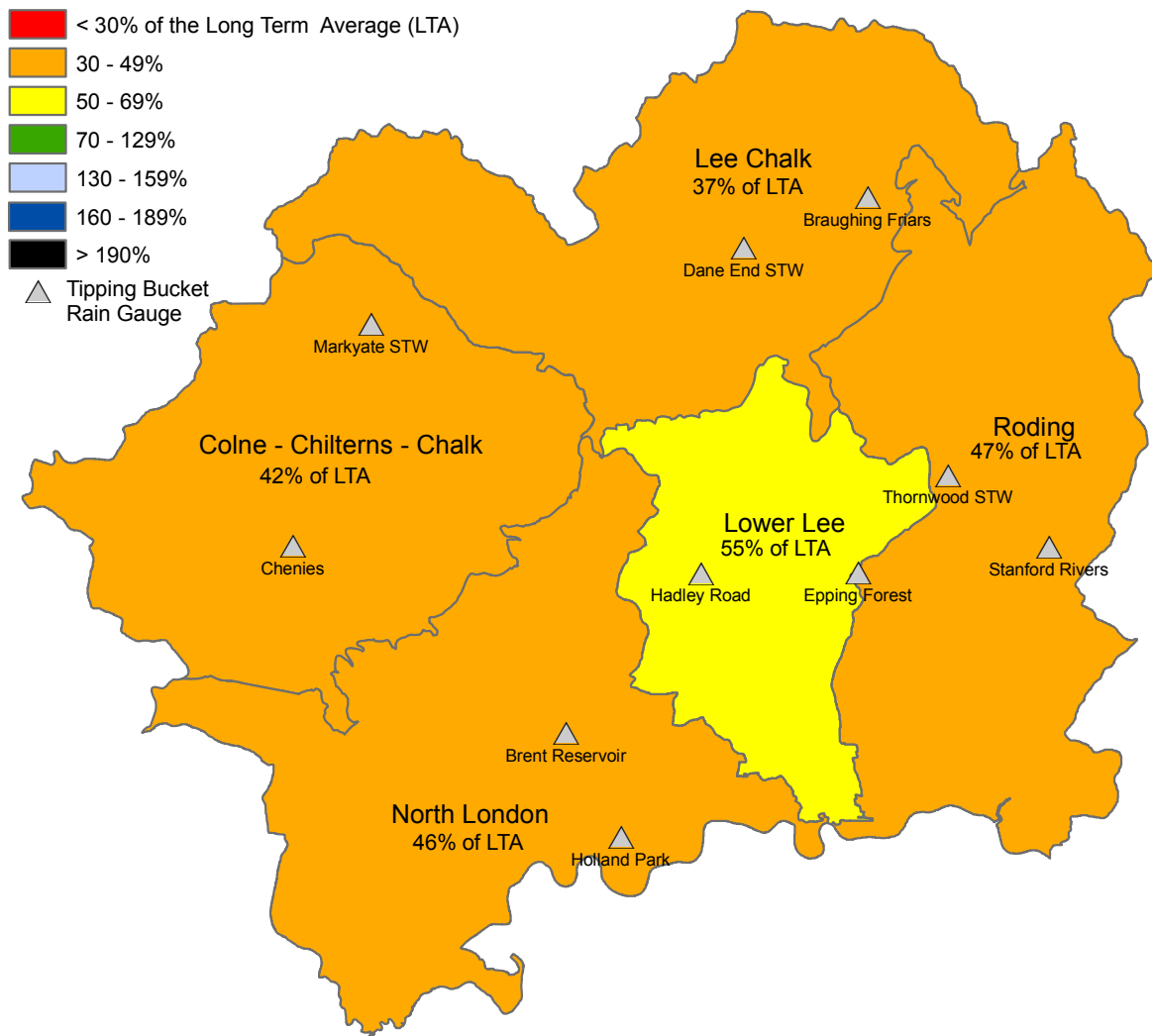
Sources

With the limited recharge and continued decline in groundwater levels, the sources of the Upper Lee chalk rivers remain close to their November locations. The River Rib was the exception, as its source has migrated upstream. The Colne chalk rivers were not surveyed during December.

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Rainfall Map



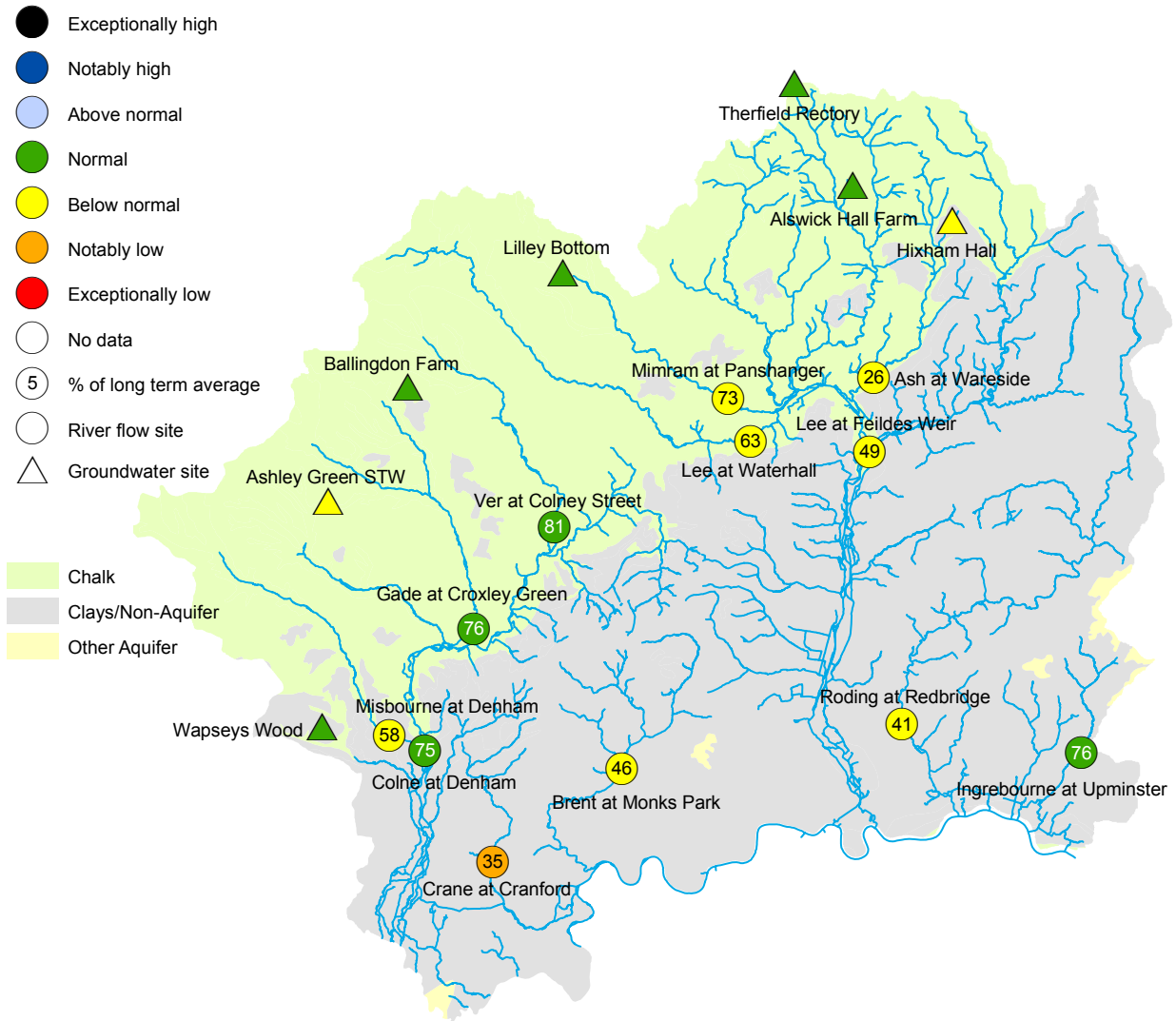
It should be noted that during snow events, the total recorded amounts of precipitation from the automated gauges used in this report are most likely to be underestimated.

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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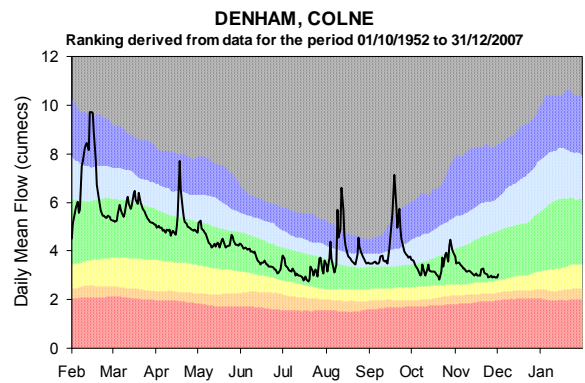
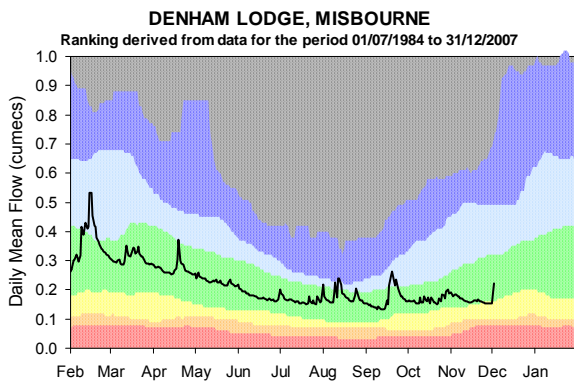
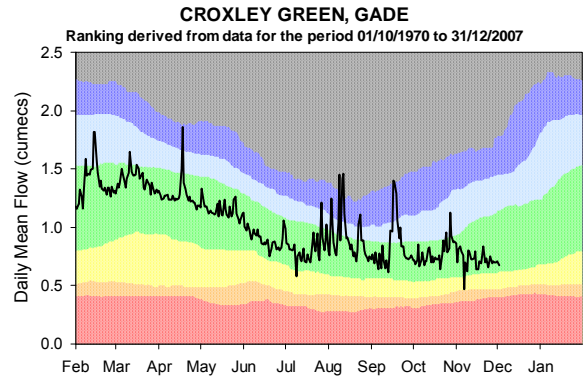
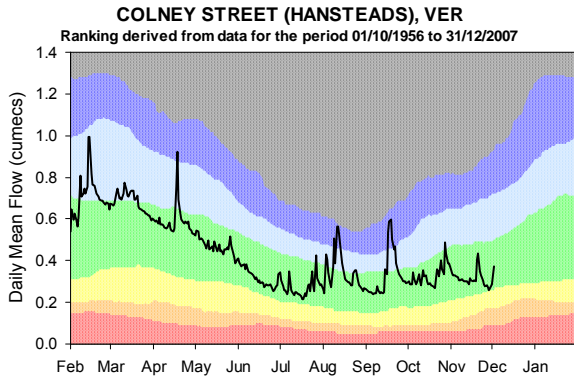
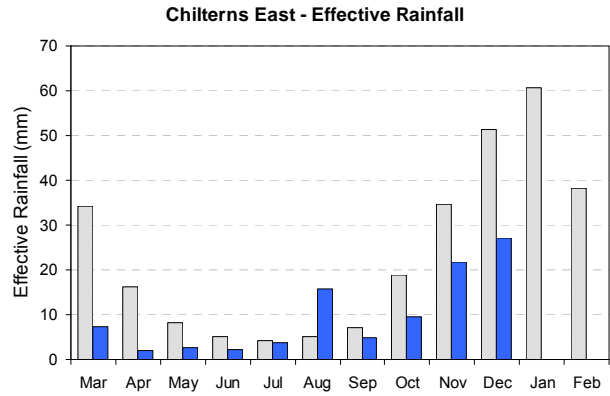
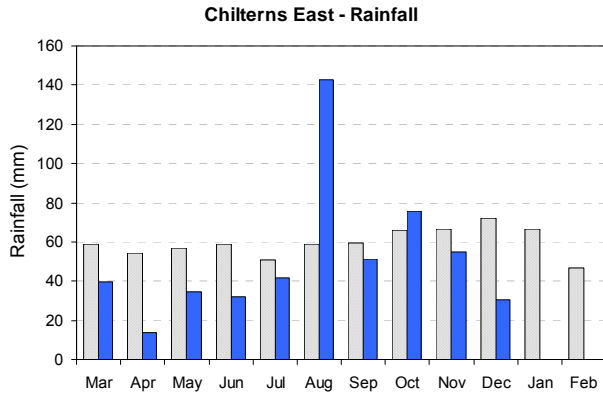
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Colne



 Monthly total rainfall (mm)

 Long-term average rainfall (mm)



 Exceptionally high
 Below normal

 Notably high
 Notably low

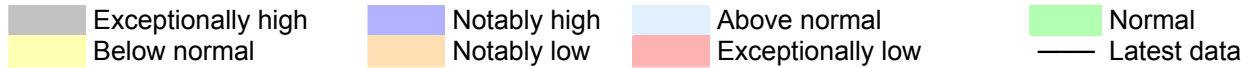
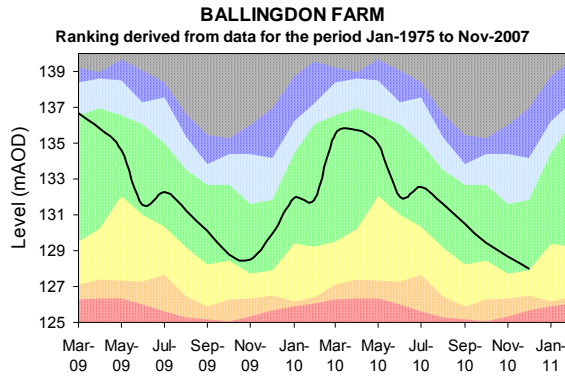
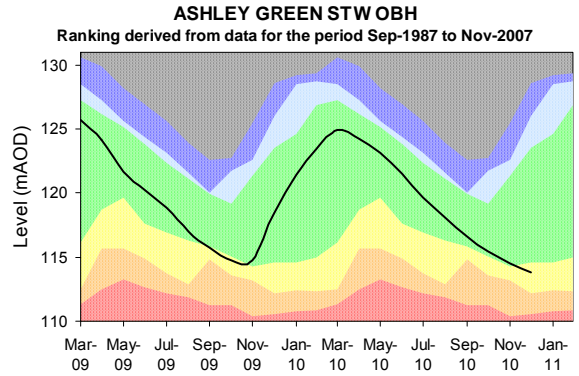
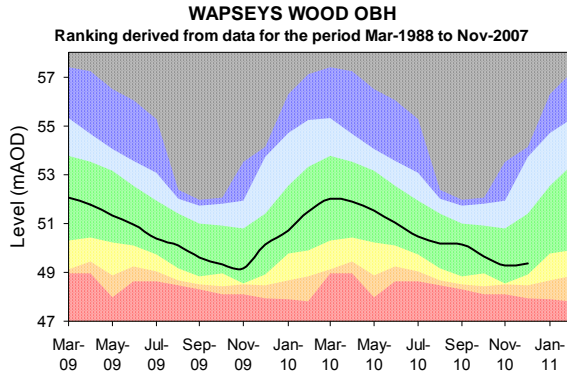
 Above normal
 Exceptionally low

 Normal
 Latest data

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Colne Groundwater



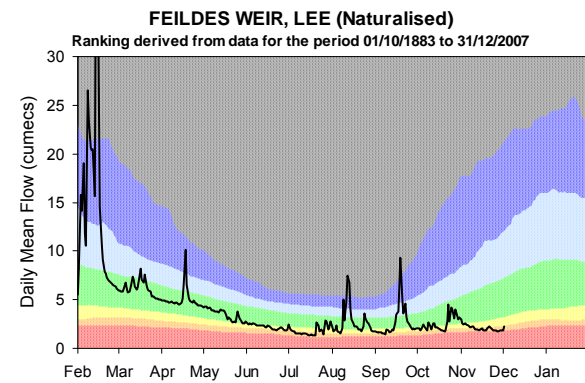
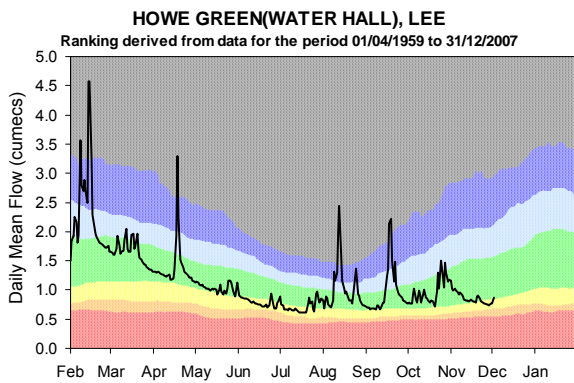
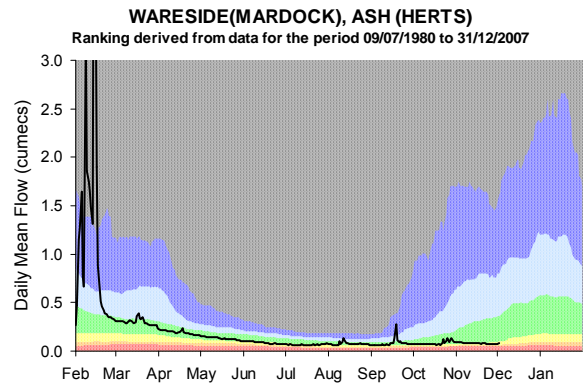
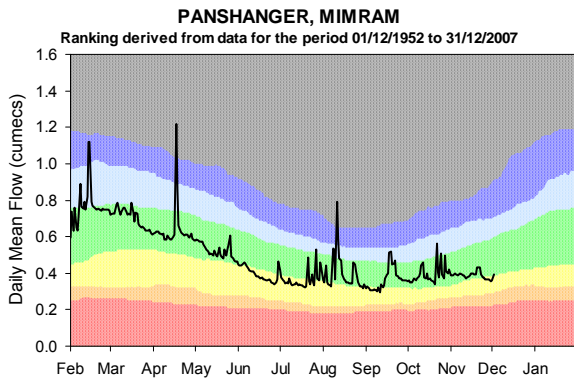
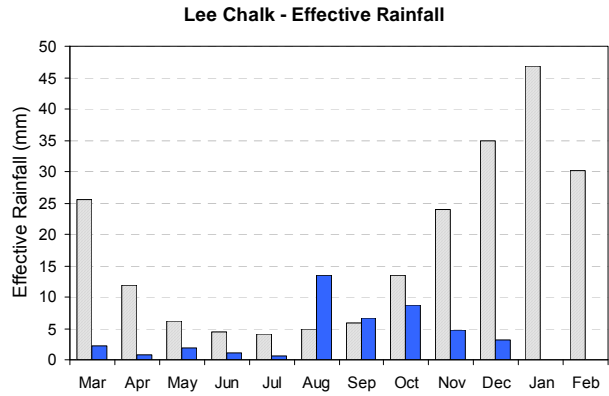
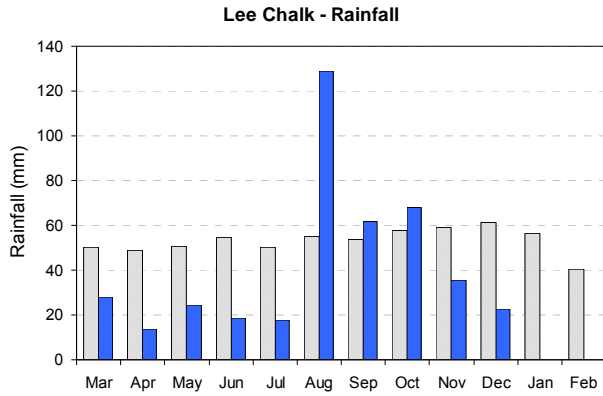
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Upper Lee

Monthly total rainfall (mm)

Long-term average rainfall (mm)



Exceptionally high
Below normal

Notably high
Notably low

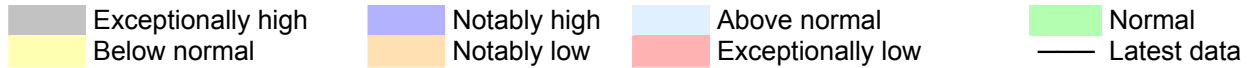
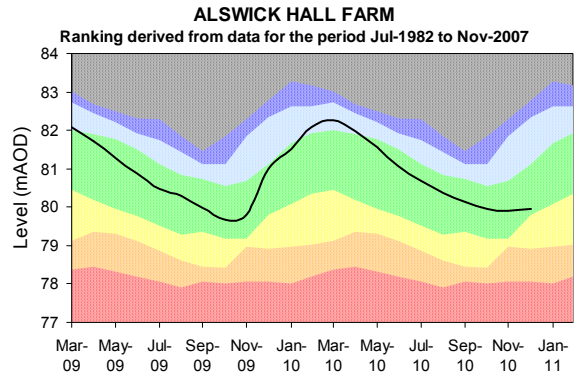
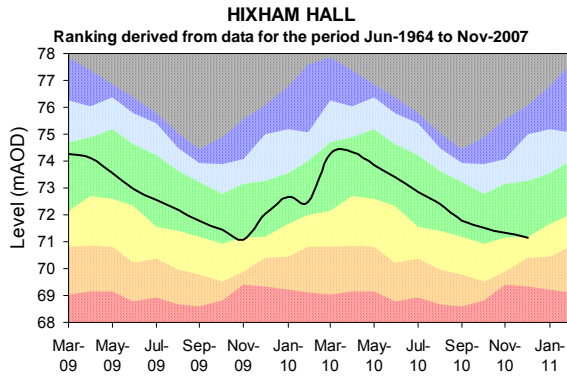
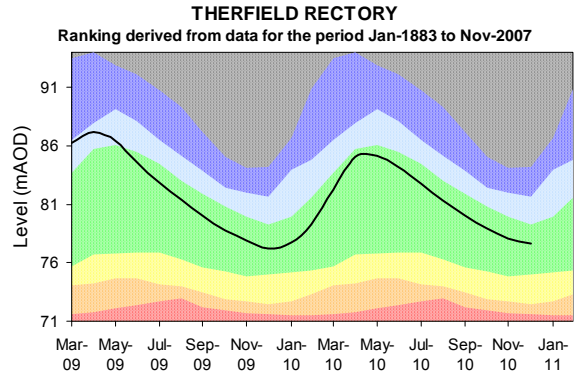
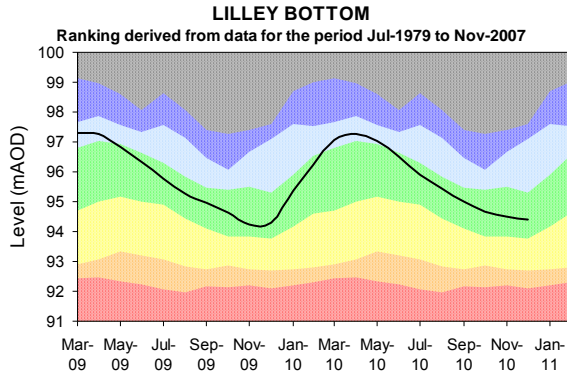
Above normal
Exceptionally low

Normal
— Latest data

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Upper Lee Groundwater



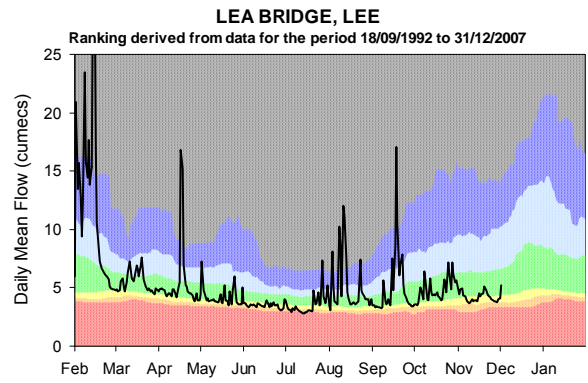
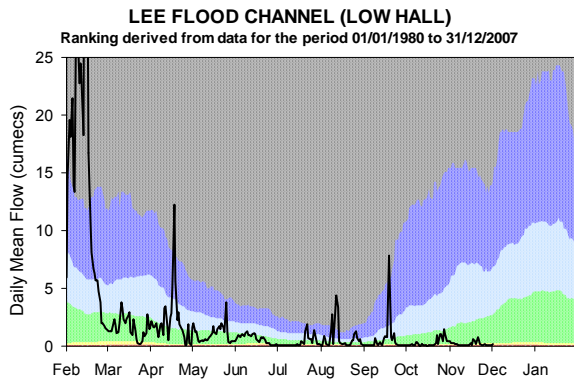
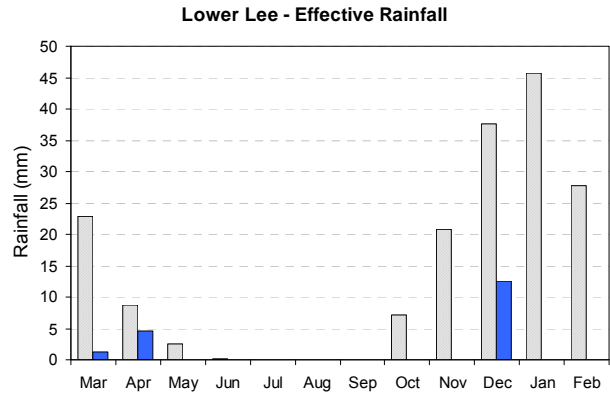
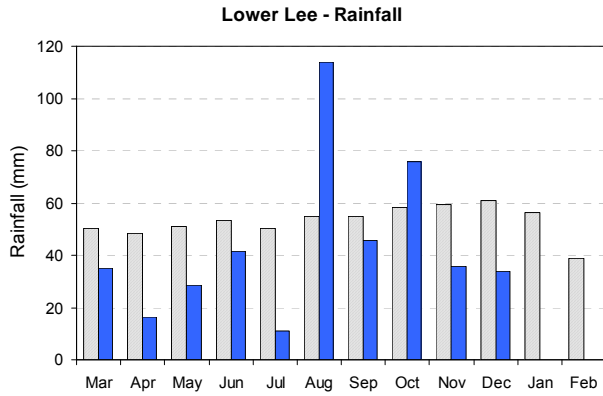
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Lower Lee

Monthly total rainfall (mm)

Long-term average rainfall (mm)



Exceptionally high
Below normal

Notably high
Notably low

Above normal
Exceptionally low

Normal
Latest data

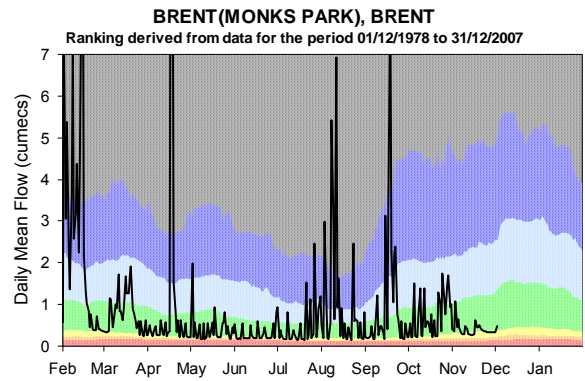
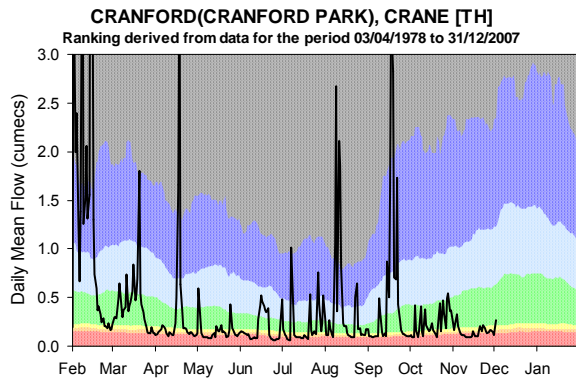
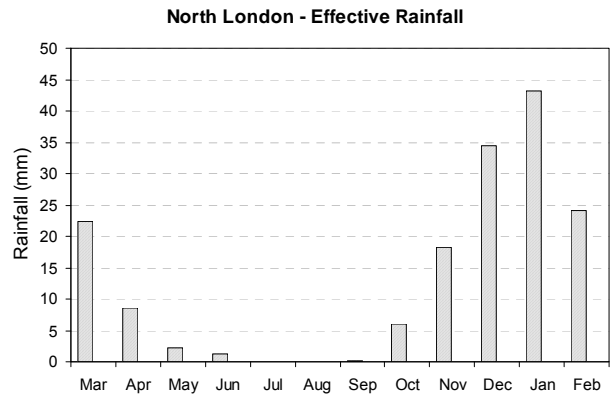
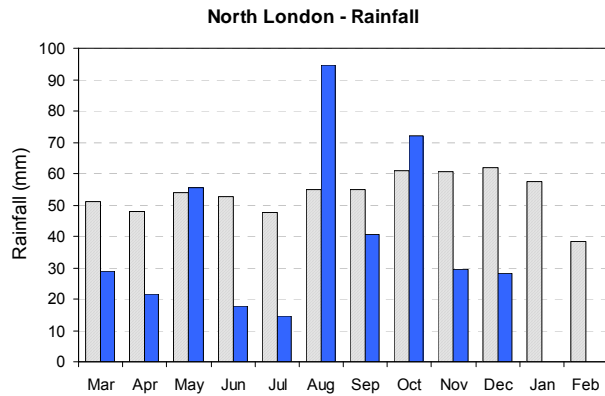
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North London

Monthly total rainfall (mm)

Long-term average rainfall (mm)



Exceptionally high
 Below normal

Notably high
 Notably low


Above normal
 Exceptionally low


Normal
 Latest data

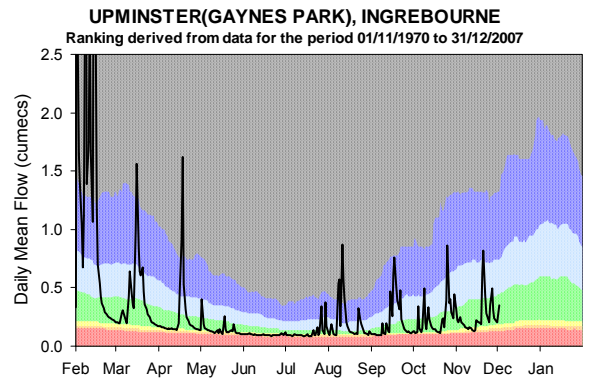
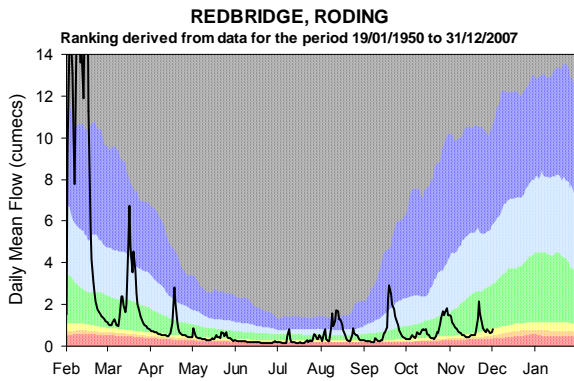
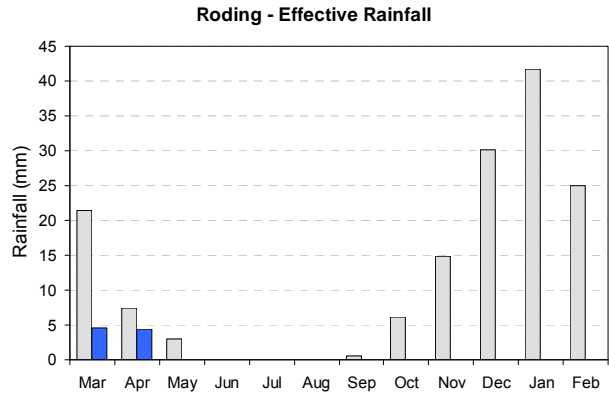
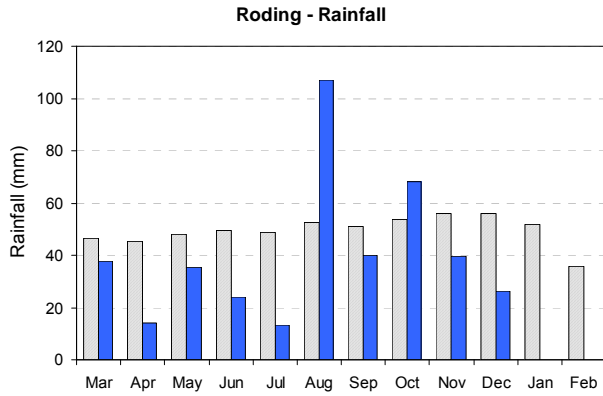
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

Roding



 Monthly total rainfall (mm)

 Long-term average rainfall (mm)



 Exceptionally high
 Below normal

 Notably high
 Notably low

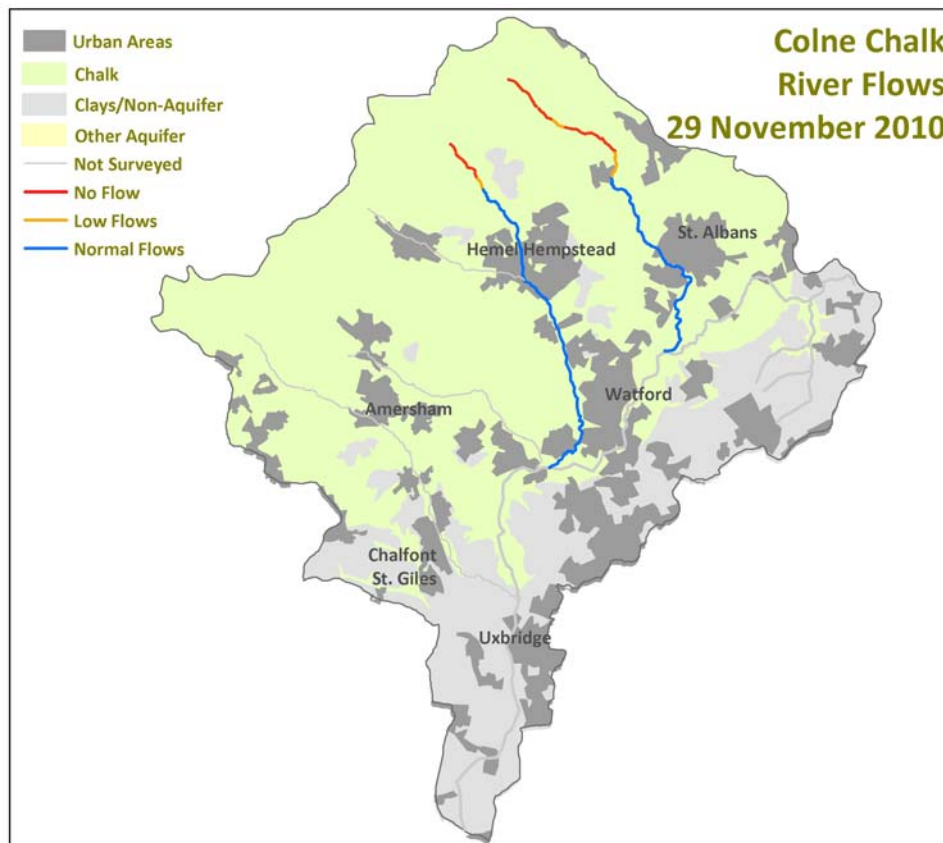
 Above normal
 Exceptionally low

 Normal
 Latest data

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Flows in the chalk fed rivers – December 2010



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Summary of rainfall, effective rainfall and soil moisture deficit

Rainfall and Effective Rainfall – December 2010

Area	Rainfall (mm)			Effective Rainfall (mm)		
	Total (mm)	LTA (mm)	% of LTA	Total (mm)	LTA (mm)	% of LTA
Chilterns- East - Colne	30	72	42	27	51	53
Lee - Chalk	23	61	37	3	35	9
North London	28	62	46	0	34	0
Lower Lee	34	61	55	13	38	34
Roding Catchment	26	56	47	0	30	0
North East Area Average	28	62	45	9	38	24

Soil Moisture Deficit (SMD) - December 2010

Area	End of Month SMD (mm)	End of Month SMD LTA (mm)
Chilterns- East - Colne	0	3
Lee - Chalk	11	7
North London	29	8
Lower Lee	0	5
Roding Catchment	7	6
North East Area Average	9	6

Rainfall and Effective Rainfall – Winter total for period 1 October to 31 December 2010

Area	Rainfall (mm)			Effective Rainfall (mm)		
	Total (mm)	LTA (mm)	% of LTA	Total (mm)	LTA (mm)	% of LTA
Chilterns- East - Colne	161	204	79	59	105	56
Lee - Chalk	127	178	71	17	72	24
North London	130	184	71	0	59	0
Lower Lee	146	178	82	13	66	20
Roding Catchment	134	166	81	0	51	0
North East Area Average	140	182	77	18	71	25

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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).