

Monthly water situation report

East Anglia

Summary – August 2018

The second driest May to July period since 1921 was followed in August by a month of average rainfall. In response to the rainfall and cooler temperatures the soil moisture deficit fell slightly this month although it is still within the above normal range for the time of year. River flows are now within the normal range at 65% of the indicator sites and flows in the Ely Ouse recovered significantly this month although are still classified as below normal. Groundwater levels continue their seasonal recession but the majority continue to be in the normal range. All licence restrictions in the level-based systems have now been lifted.

Rainfall

After three consecutive months of rainfall below LTA, East Anglia received 56 mm of rainfall in August (102% of LTA). This is almost as much as the 66 mm of rain received over the preceding three month period May-July. There was some variation across the area, with north Norfolk receiving only 41 mm (67% of LTA) and north Essex receiving 65 mm (135% of LTA). Rain fell throughout the month with the second week (9th to 15th) being the wettest. The last 12 months still show a rainfall deficit.

Soil Moisture Deficit/Recharge

The soil moisture deficit has fallen slightly this month across the area in response to received rainfall and cooler temperatures but is still classified as above normal for the time of year. Soil moisture deficits are lower in the east of the region and ended the month just into the normal range.

River Flows

River flows in August were generally similar to flows in July across the area: a notable exception is the Ely Ouse where flows increased significantly from July lows and are now in the below normal range. Flows at 65% of the indicator sites are now within the normal range. Flow in the Waveney remains exceptionally low this month.

Groundwater Levels

Groundwater levels across the area continue their seasonal recession, and continue to be in the normal range except in the Cam chalk where levels are now in the below normal category.

Reservoir Storage/Water Resource Zone Stocks

Reservoirs in Essex have been reported near their normal operating curves, except Hanningfield where levels are below the operating curve and close to 1995-96 levels. Grafham reservoir in the Ouse catchment is also below the operating curve and close to 1995-96 levels. This is due to increased demand in the area and rainfall deficit.

Environmental Impact

All voluntary and licence based irrigation restrictions in the level-based systems (Middle Level, Hundred Foot and South Level) have now been lifted. Sixteen abstraction licences on flowing rivers are currently restricted due to hands off flow conditions.

Forward Look

Probabilistic ensemble projections for river flows at key sites

September 2018: There is a decreased probability of flows being notably low or exceptionally low across the area this September. The Ely Ouse and Ivel catchments have an increased probability of flows being in the below normal category.

December 2018: There is an increased probability of flows being below the normal range across the area this December, except in the Ivel catchment where the probability of flows being below the normal range is broadly as expected.

Probabilistic ensemble projections for groundwater levels in key aquifers

September 2018: It is likely that groundwater levels will be within the normal range across the area.

March 2019: There is an increased probability of groundwater levels being below the normal range across the area next March. In the south there is also an increased probability of levels being notably or exceptionally low, except at Therfield Rectory in the Hertfordshire chalk which is slower to respond and is more likely to be classified as normal.

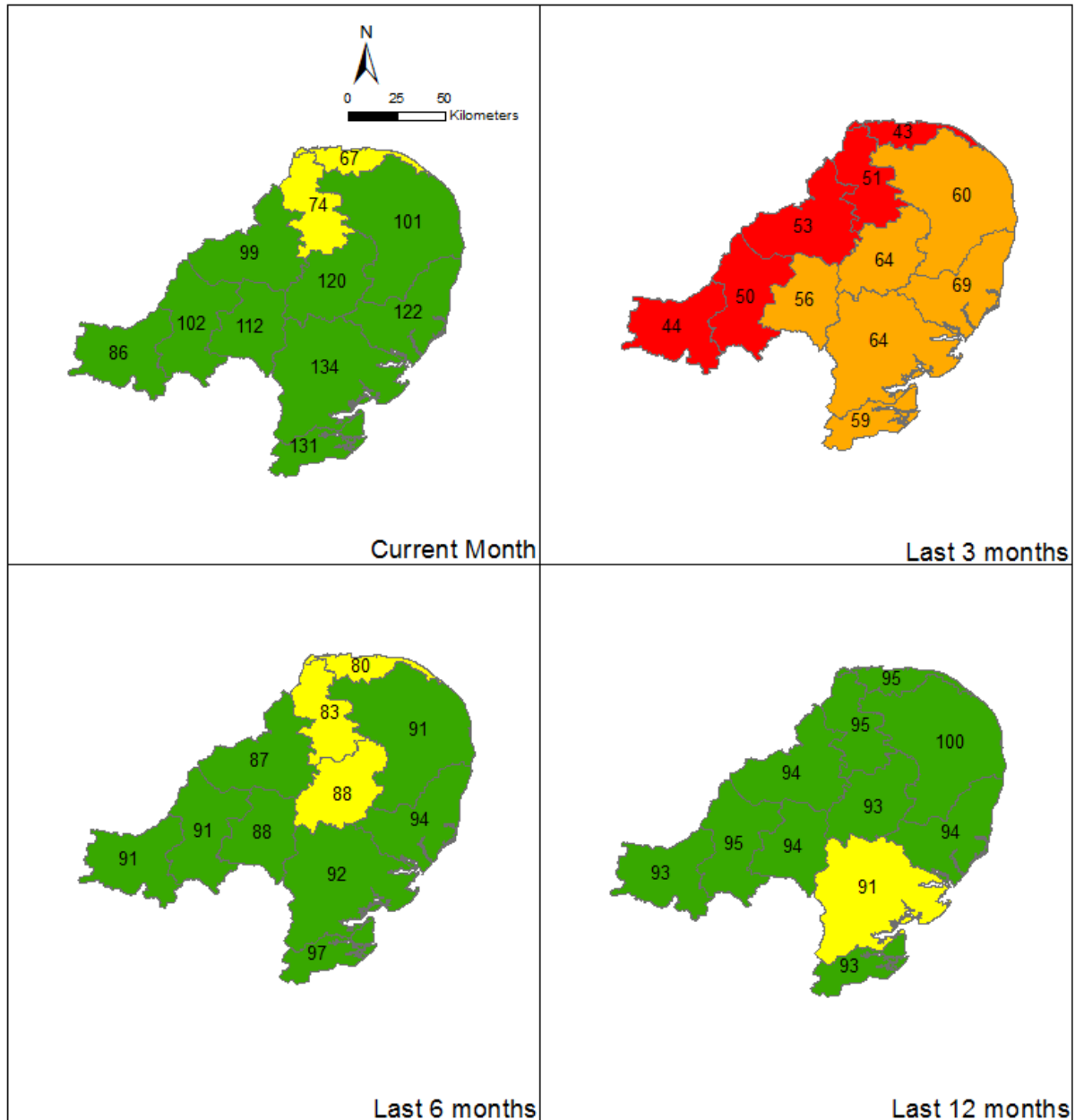
Author:

[Hydrology & Operations](#)

Contact details: 03708506506

Rainfall

August 2018



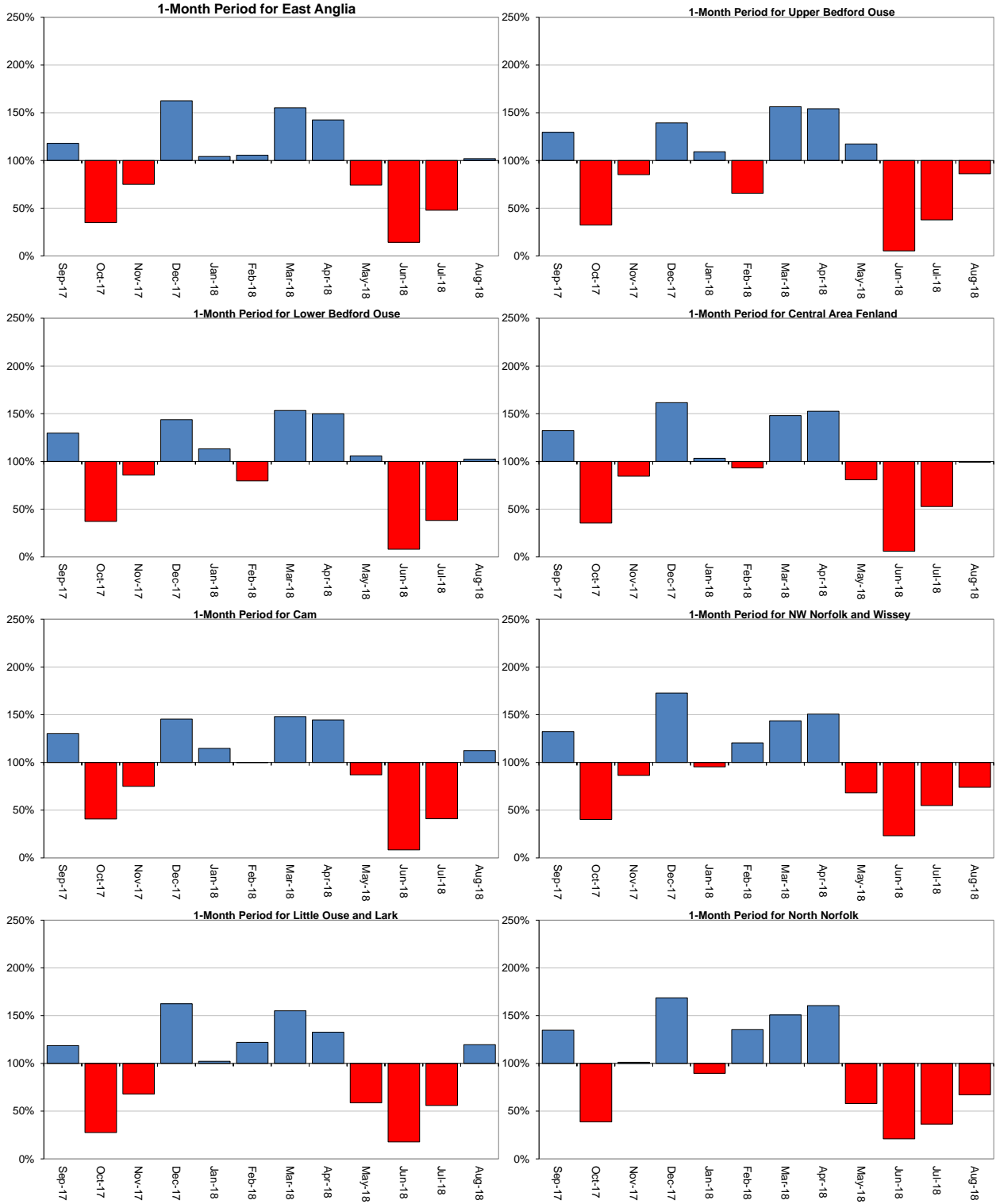
- Exceptionally high
- Notably high
- Above normal
- Normal
- Below normal
- Notably low
- Exceptionally low

Rainfall expressed as percentage of 1961-1990 Long Term Average for the specified duration. Classes derived from data for the period 1910 to 2012 based on NCIC dataset (Met Office © Crown Copyright)

Total rainfall for hydrological areas across England for the current month, the last three months, the last six months, and the last 12 months, classed relative to an analysis of respective historic totals. Final NCIC (National Climate Information Centre) data based on the Met Office 5km gridded rainfall dataset derived from rain gauges (Source: Met Office © Crown Copyright, 2017). Provisional data based on Environment Agency 1km gridded rainfall dataset derived from Environment Agency intensity rain gauges. Crown copyright. All rights reserved. Environment Agency, 100026380, 2018.

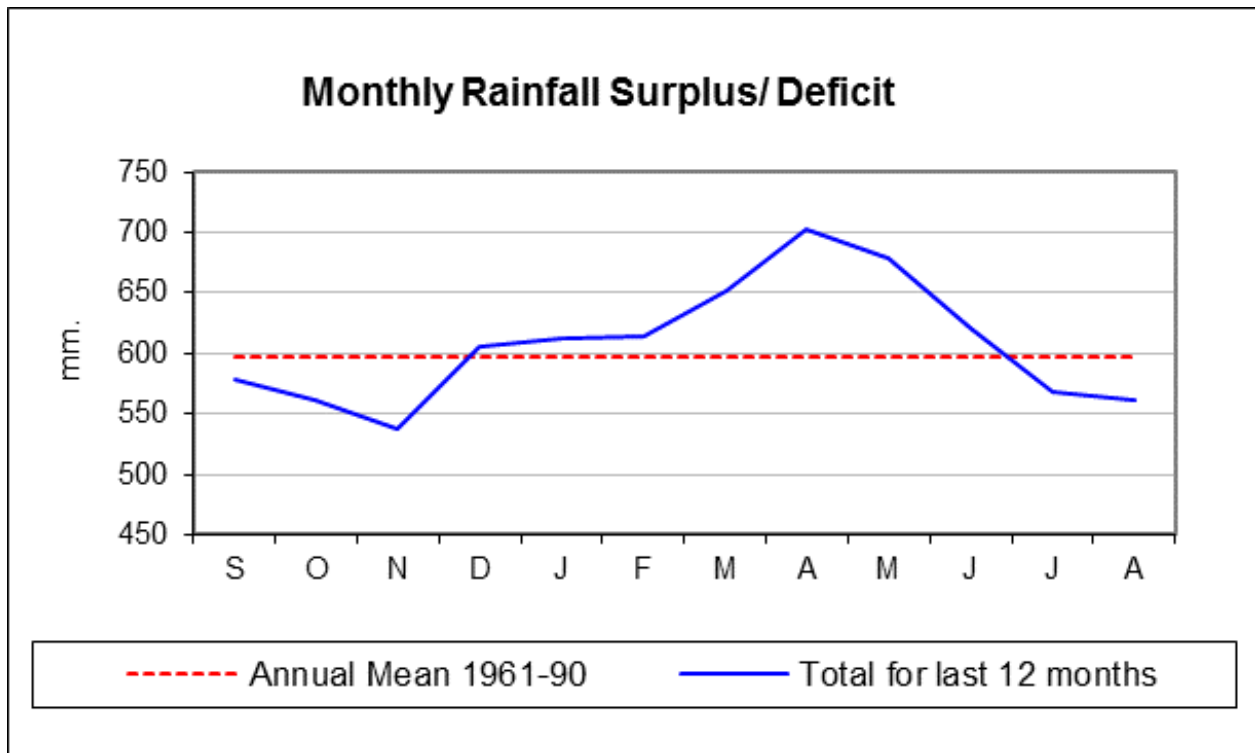
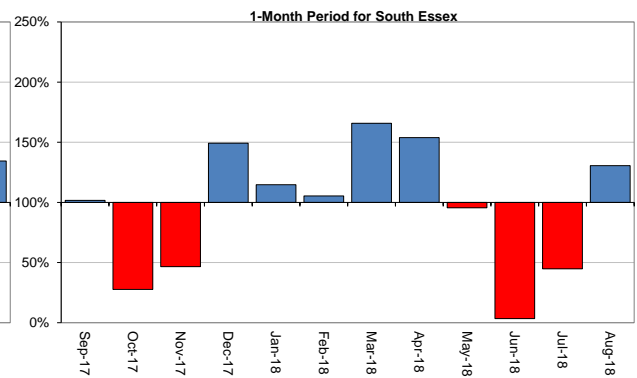
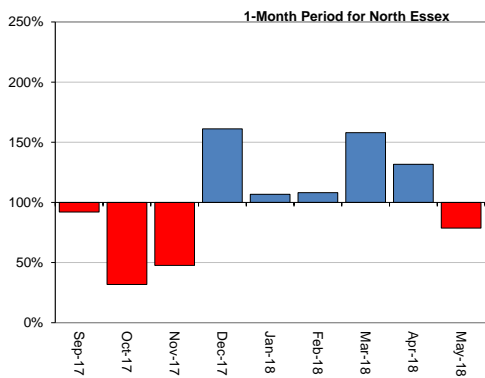
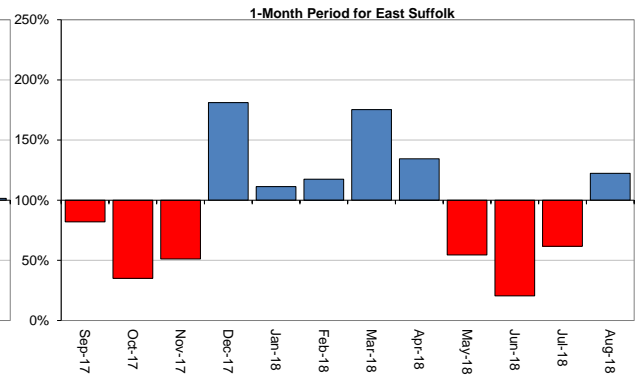
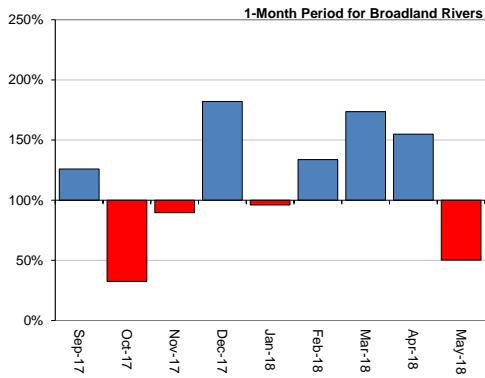
Above average rainfall

Below average rainfall

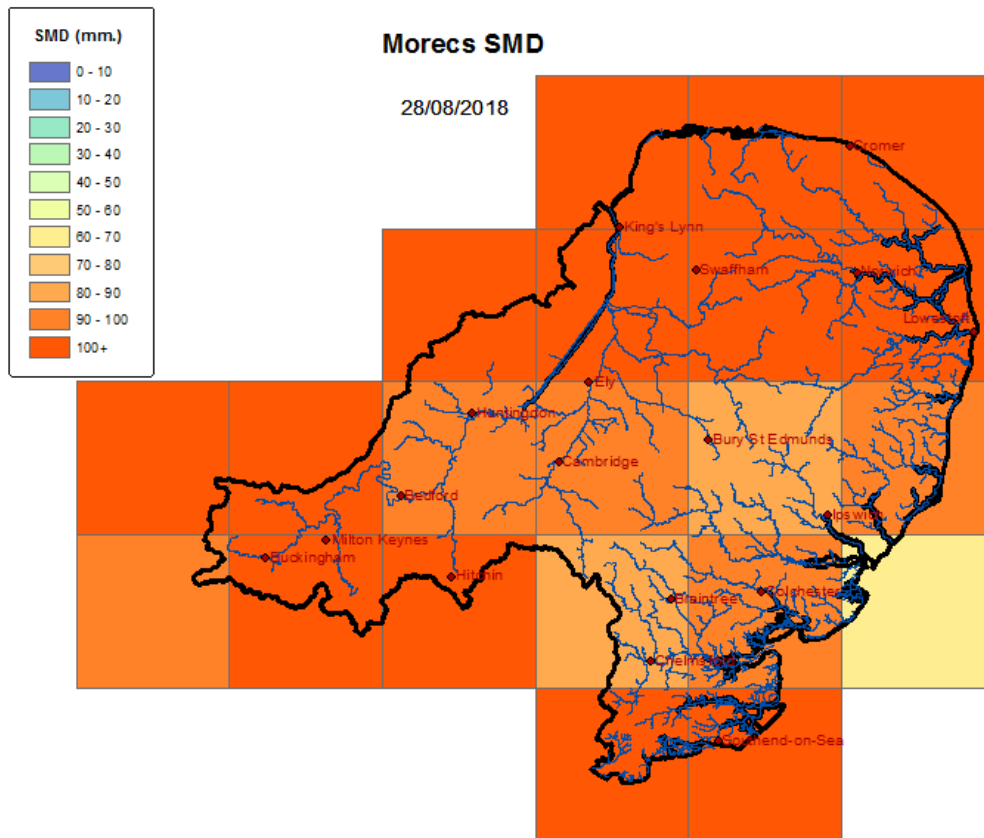


Above average rainfall

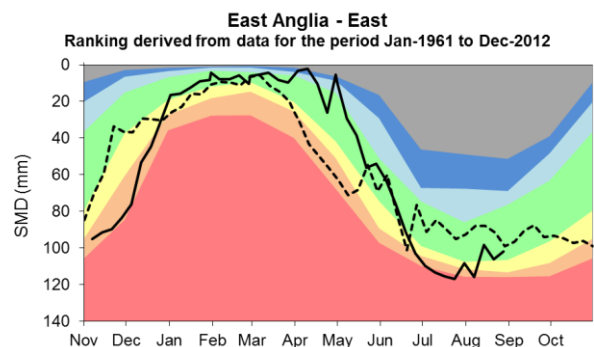
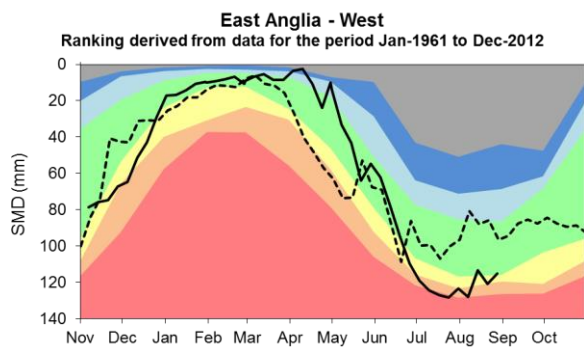
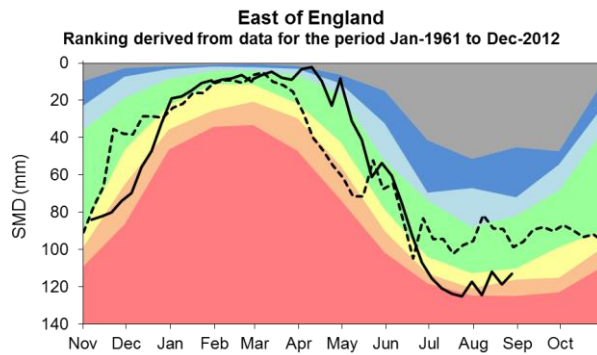
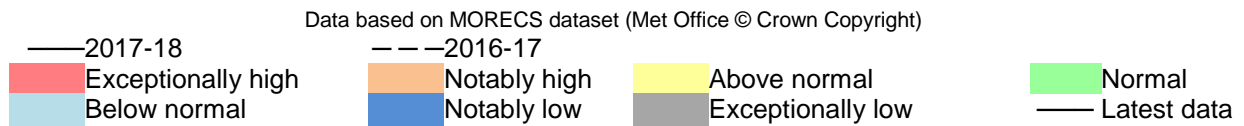
Below average rainfall



Soil Moisture Deficit

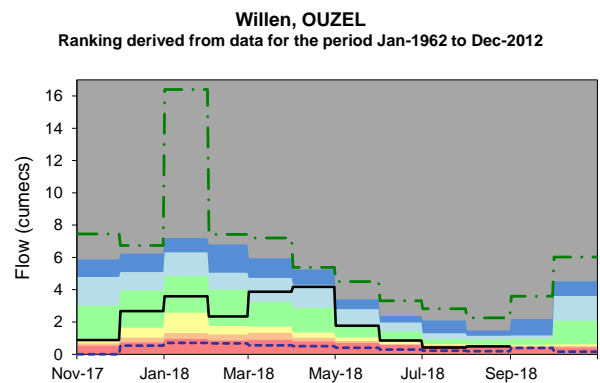
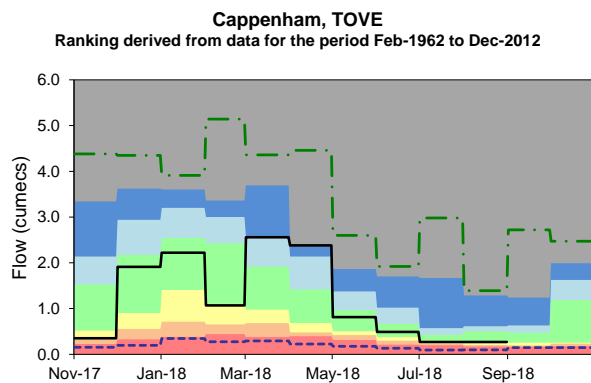
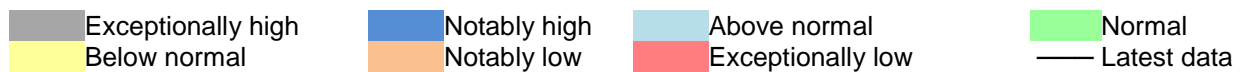
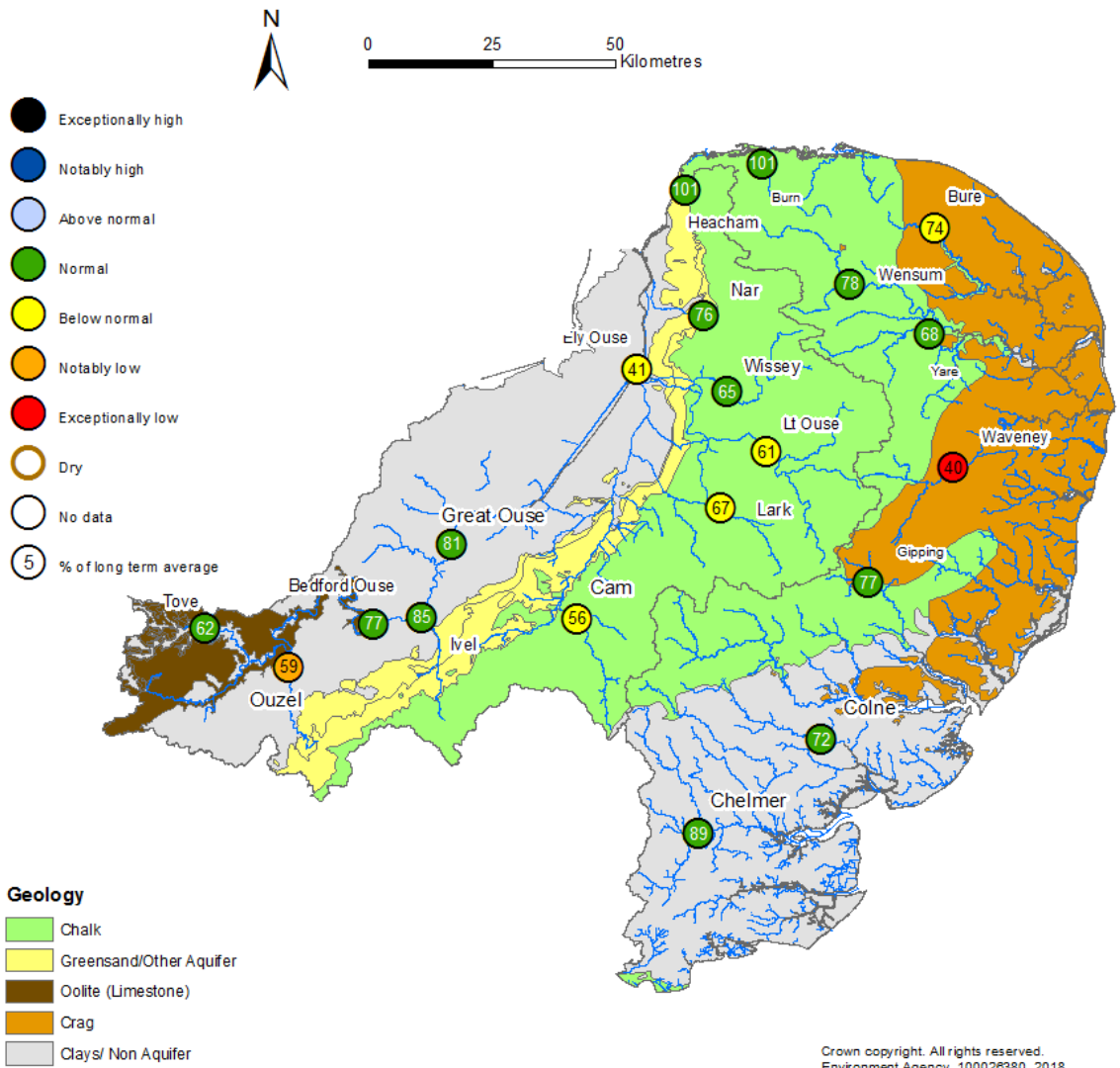


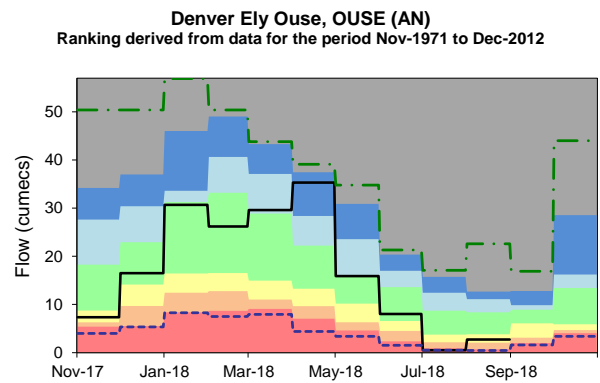
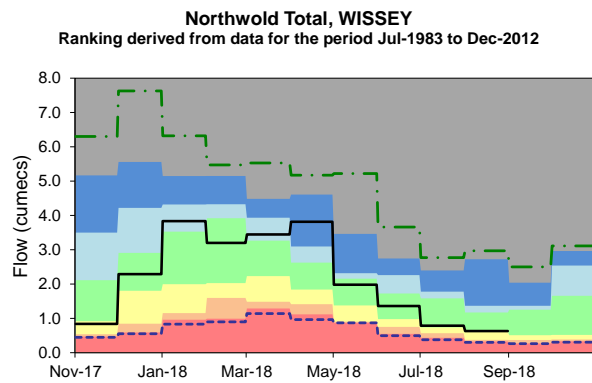
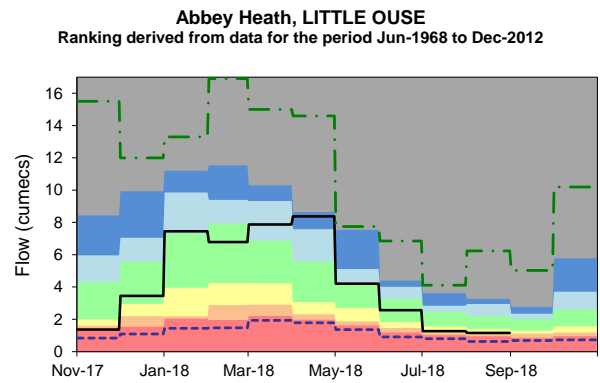
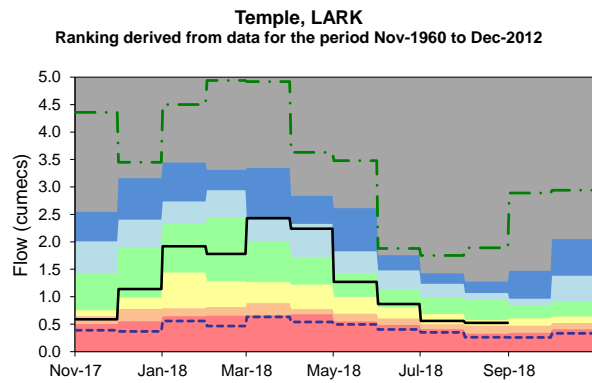
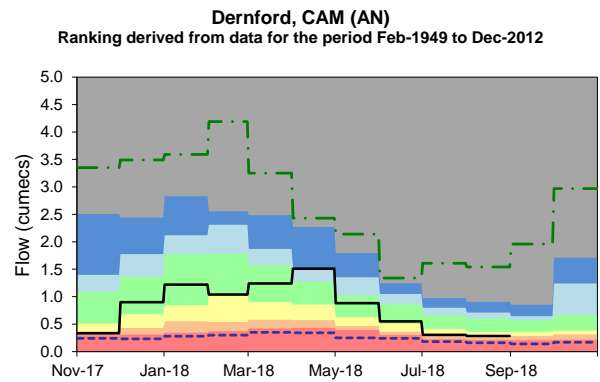
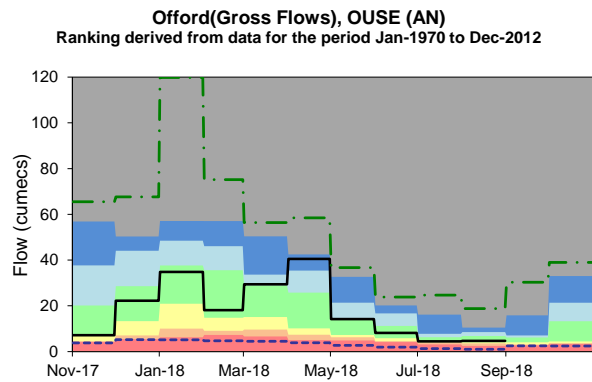
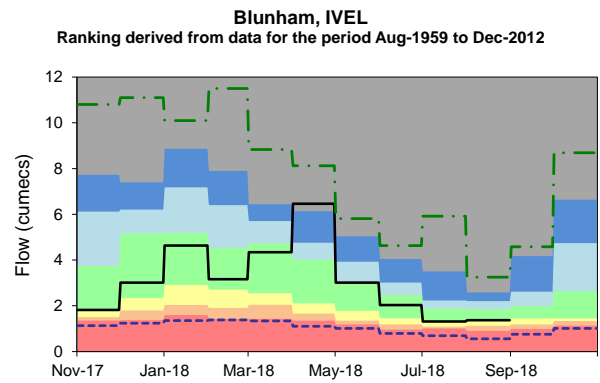
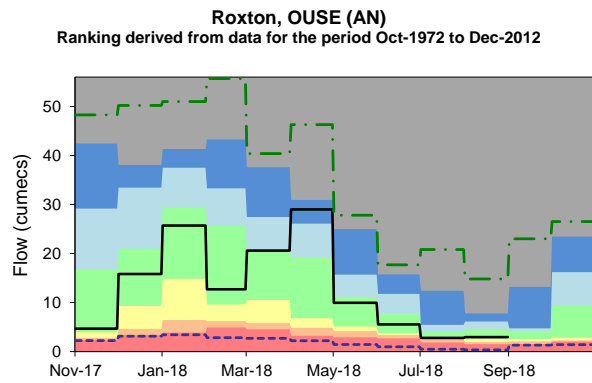
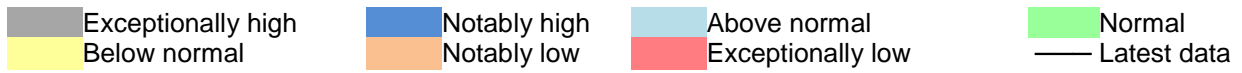
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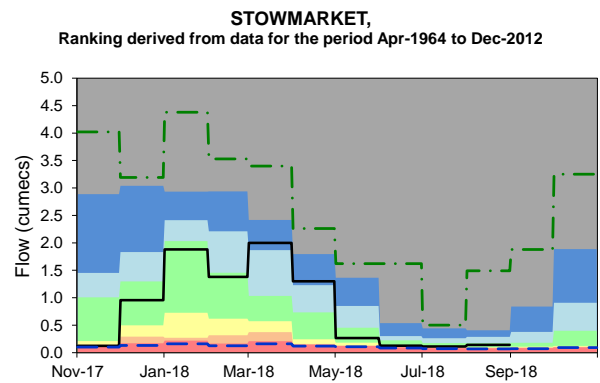
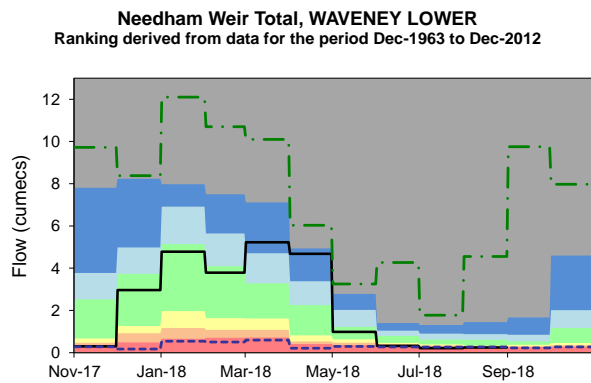
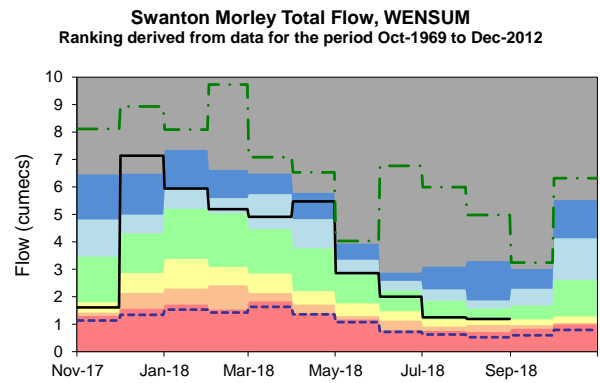
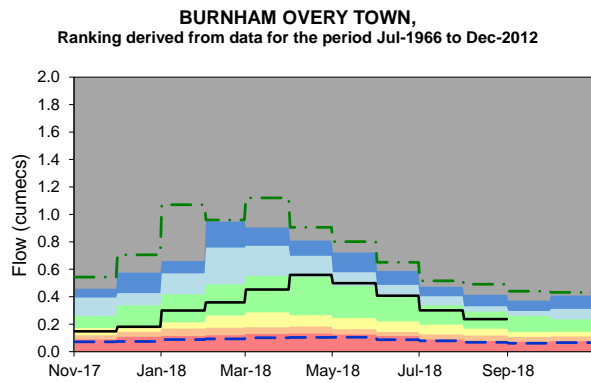
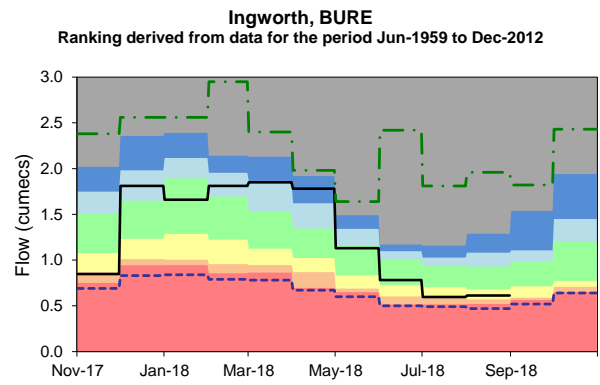
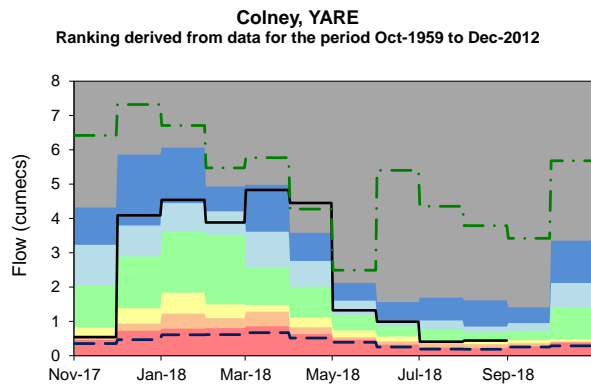
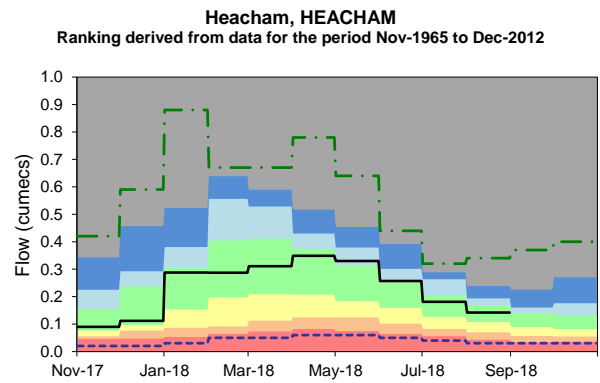
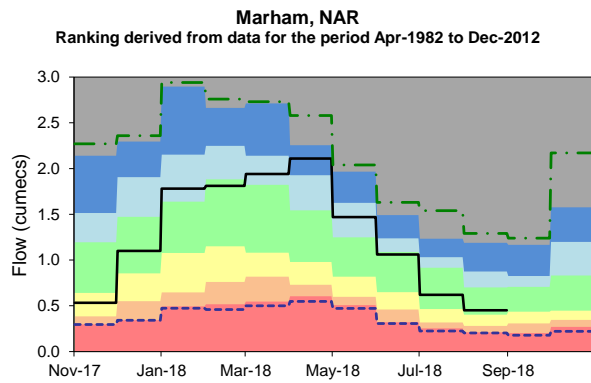


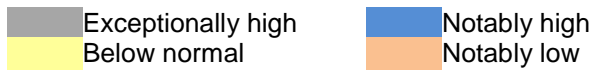
River Flow

August 2018

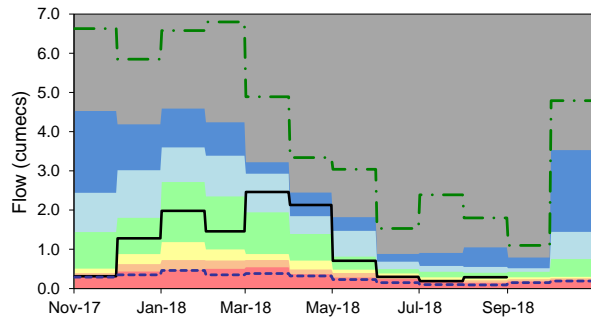




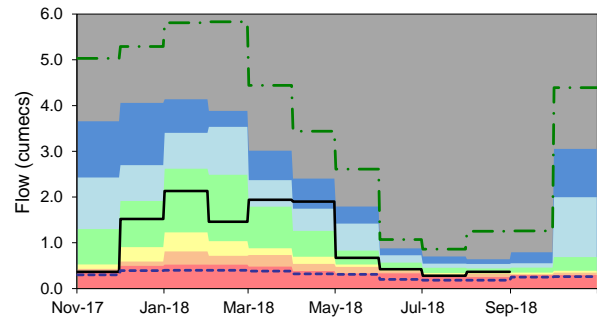




Lexden, COLNE (AN)
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Springfield, CHELMER
 Ranking derived from data for the period Nov-1965 to Dec-2012

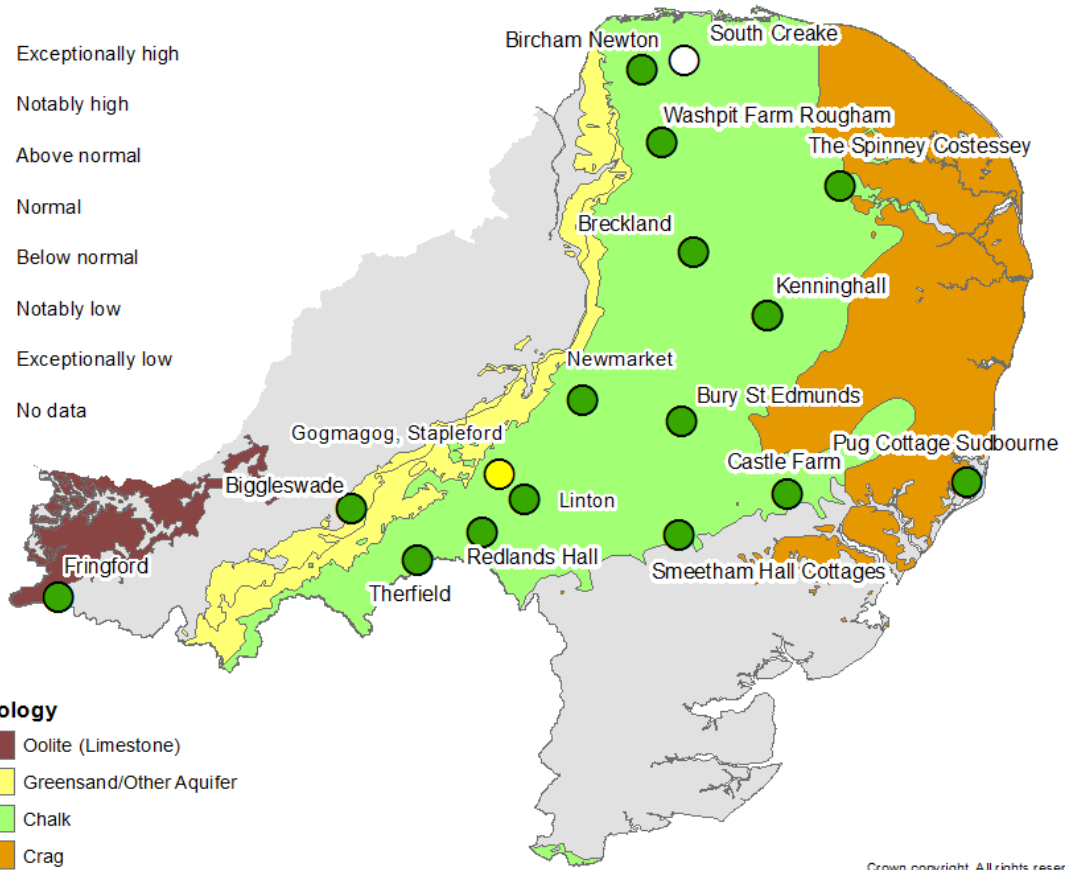


Groundwater Levels August 2018



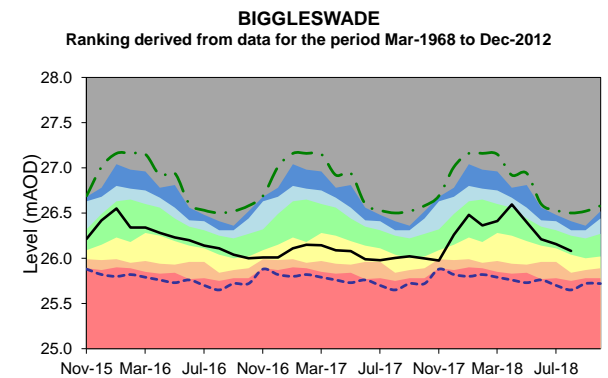
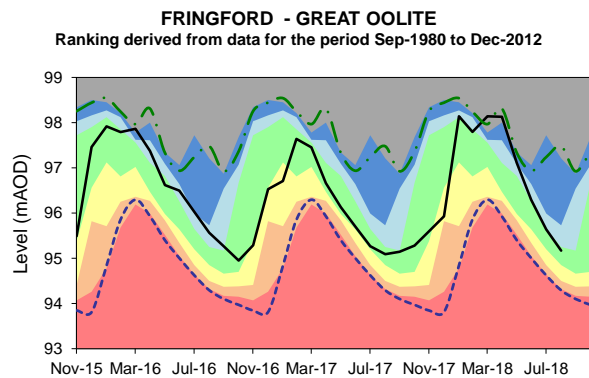
- Exceptionally high
- Notably high
- Above normal
- Normal
- Below normal
- Notably low
- Exceptionally low
- No data

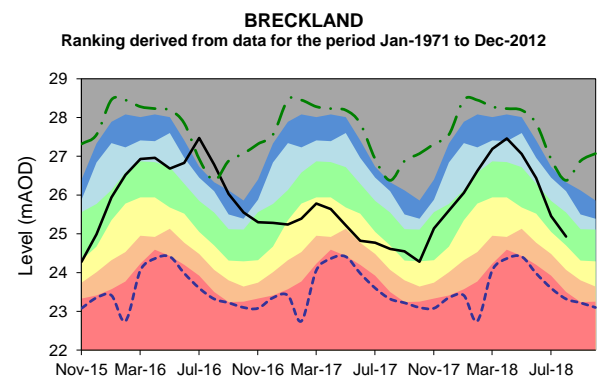
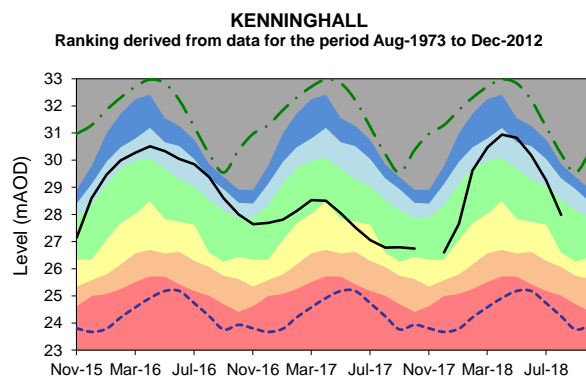
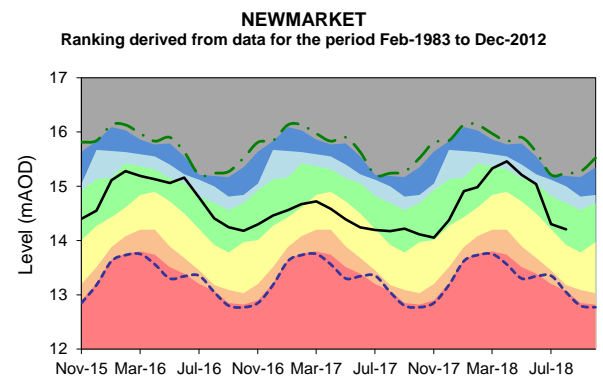
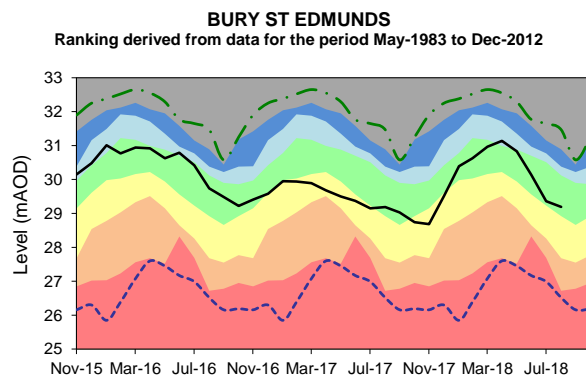
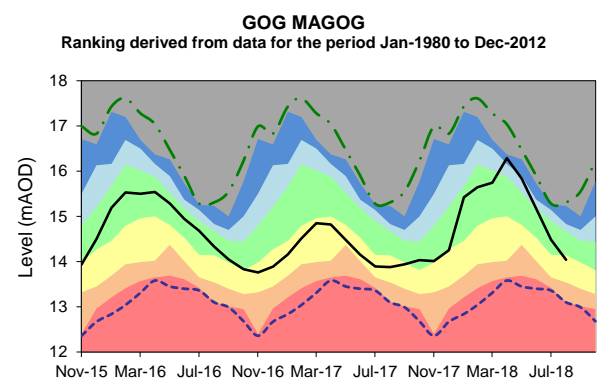
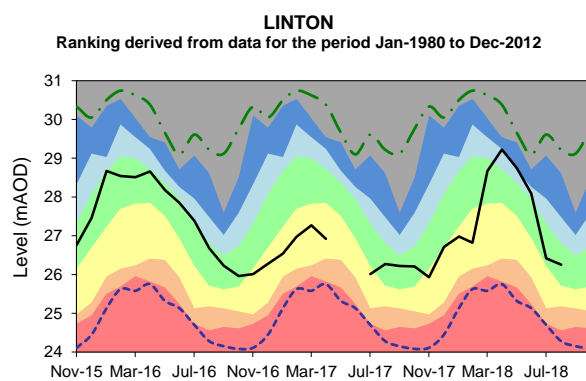
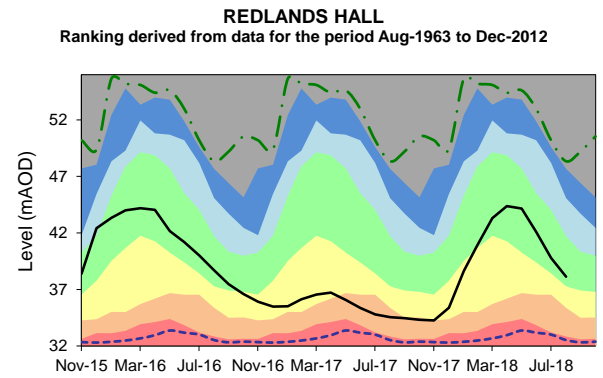
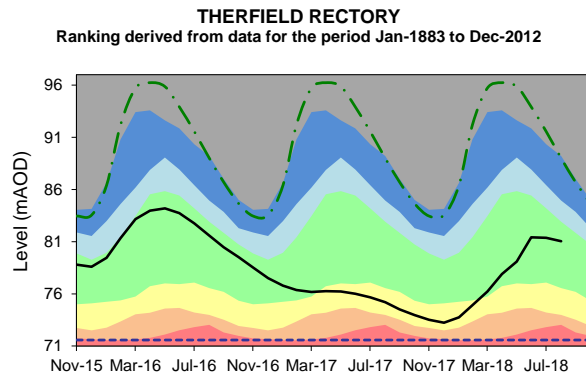
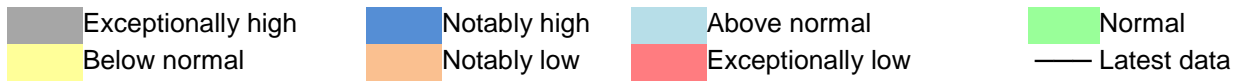
- Geology**
- Oolite (Limestone)
 - Greensand/Other Aquifer
 - Chalk
 - Crag
 - Clays/N on Aquifer

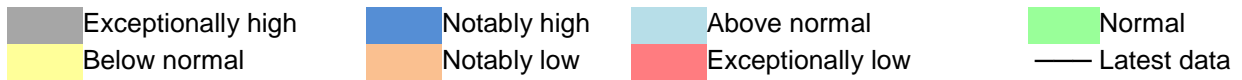


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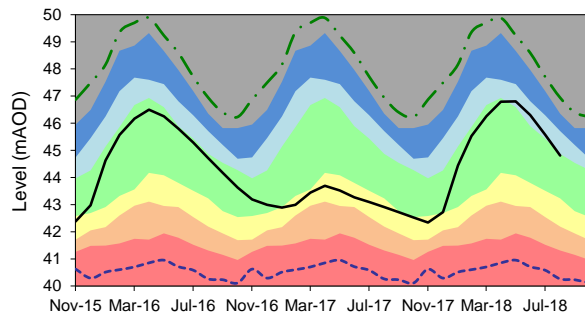
- | | | | |
|---|--|--|--|
| Exceptionally high | Notably high | Above normal | Normal |
| Below normal | Notably low | Exceptionally low | Latest data |



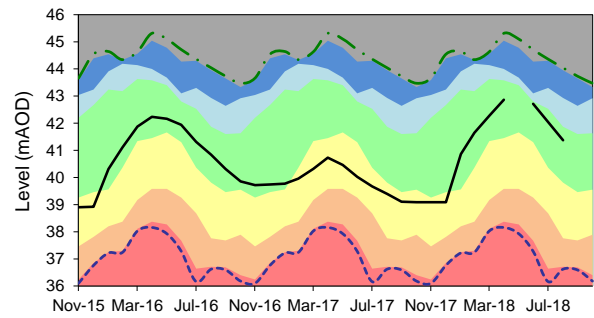




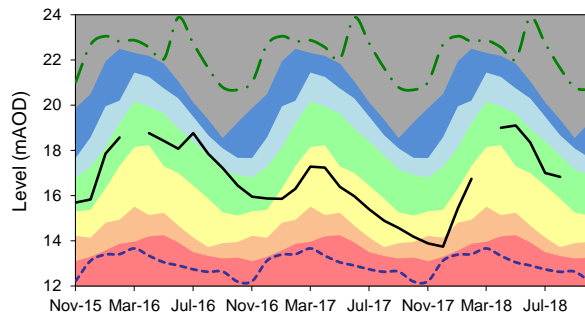
WASHPIT FARM ROUGHAM
Ranking derived from data for the period May-1950 to Dec-2012



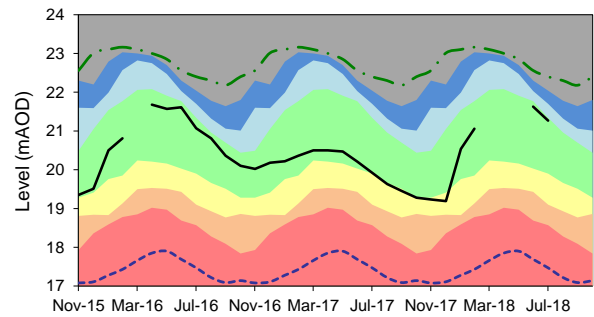
BIRCHAM NEWTON
Ranking derived from data for the period Mar-1995 to Dec-2012



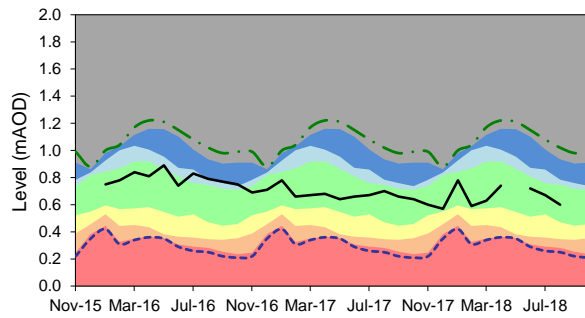
CASTLE FARM
Ranking derived from data for the period Mar-1967 to Dec-2012



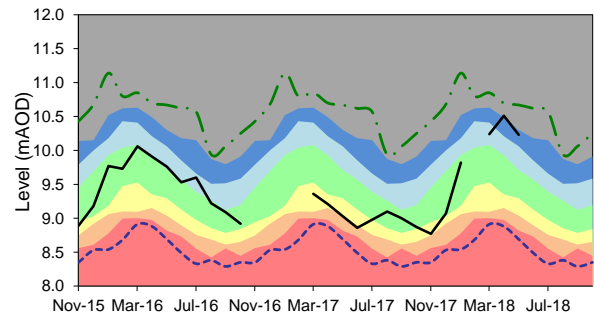
OLD PRIMARY SCHOOL, South Creake
Ranking derived from data for the period Sep-1952 to Dec-2012



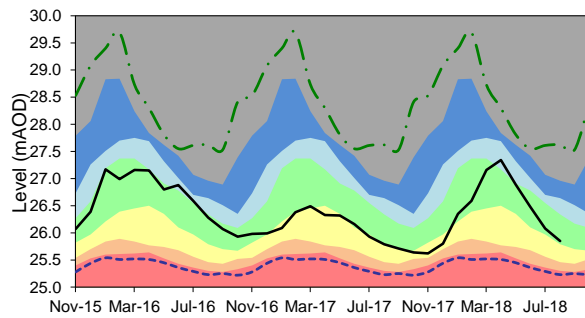
PUG COTTAGE
Ranking derived from data for the period Feb-1991 to Dec-2012



THE SPINNEY
Ranking derived from data for the period Nov-1952 to Dec-2012

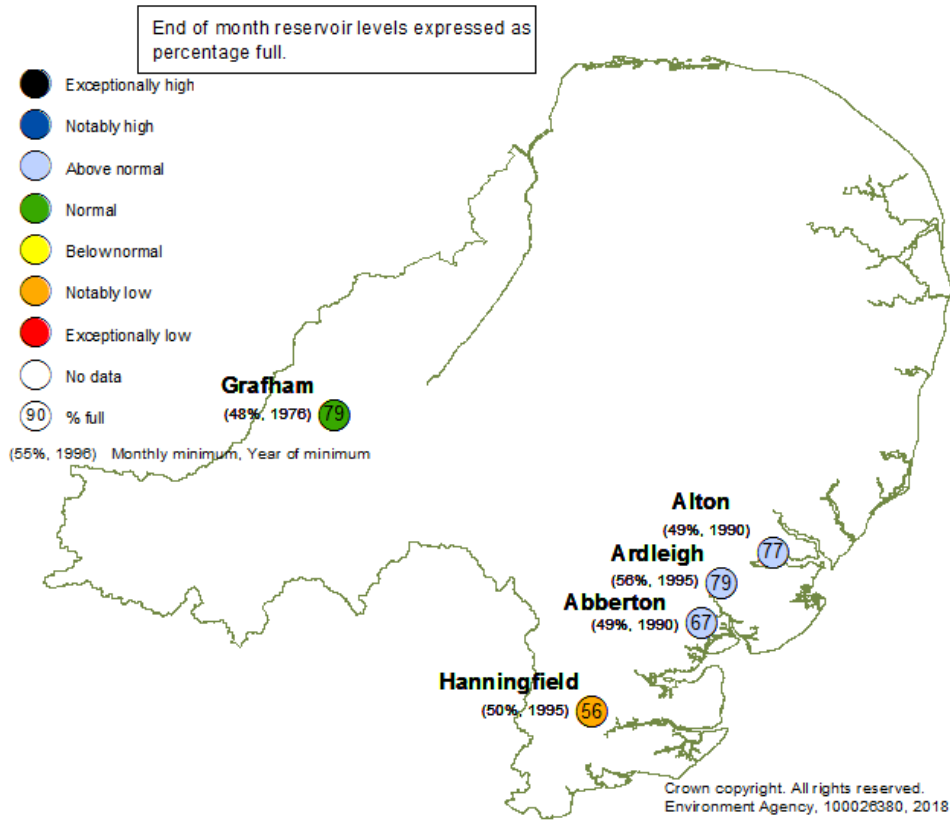


SMEETHAM HALL COTT.
Ranking derived from data for the period Jan-1964 to Dec-2012

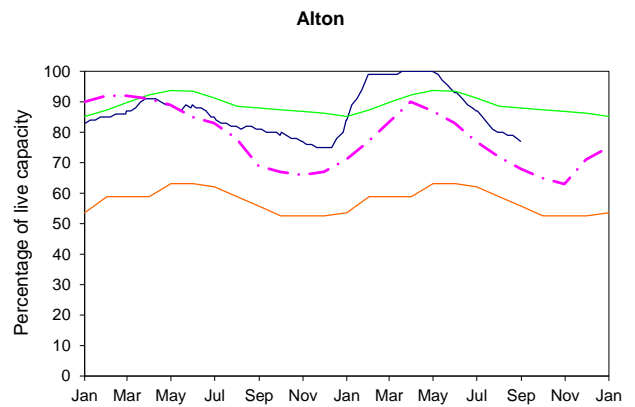
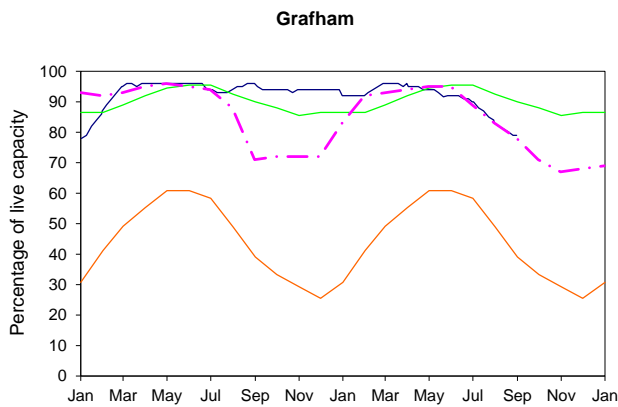


Reservoir Stocks

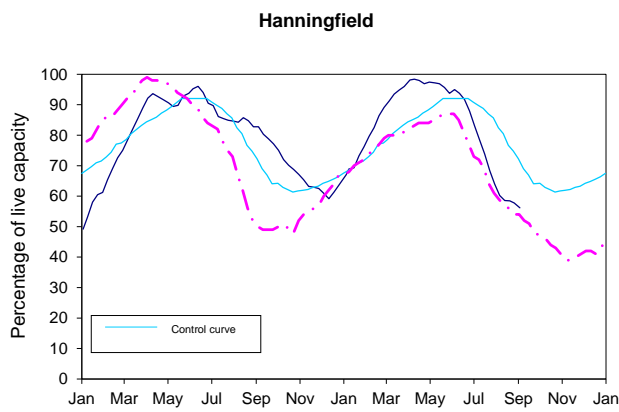
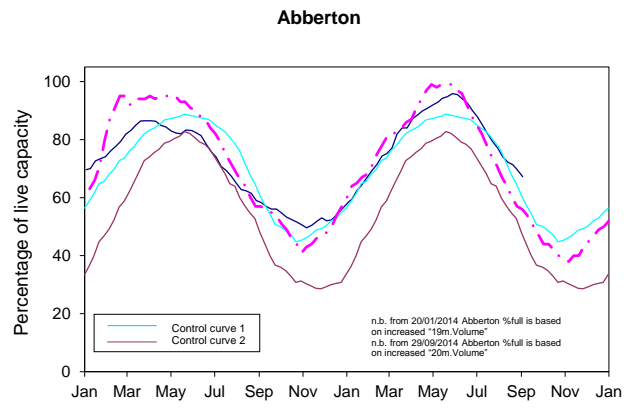
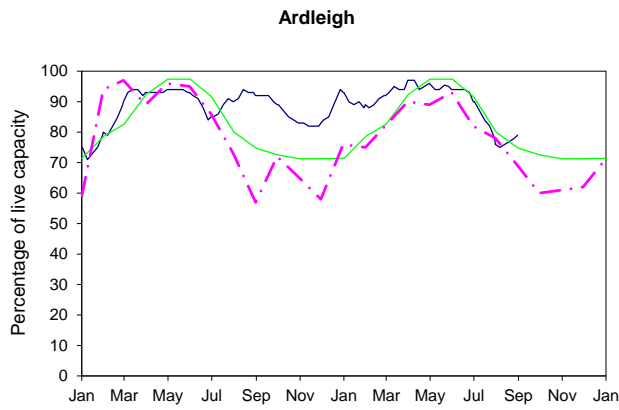
August 2018



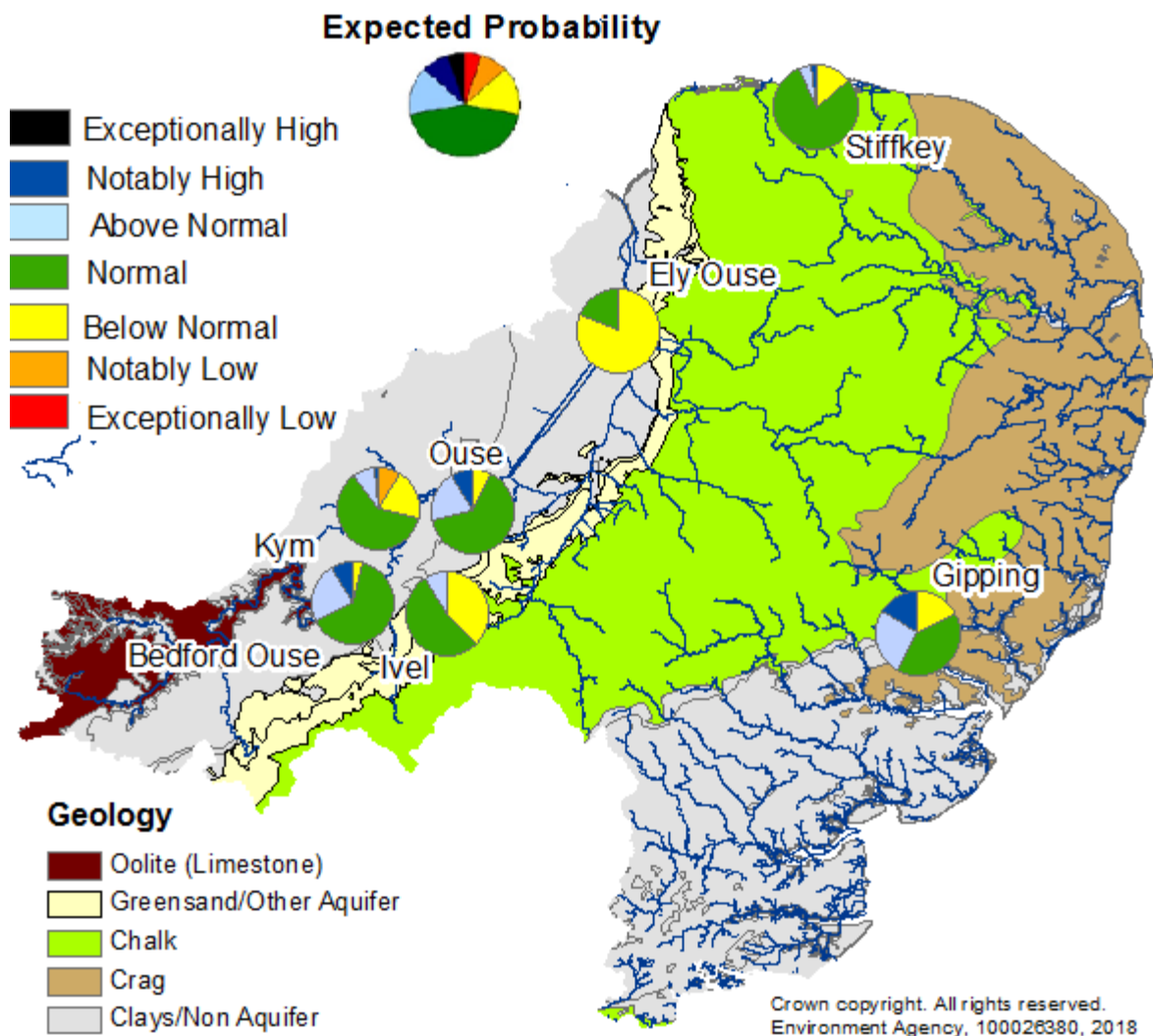
— 2017-2018 — Normal Operating Curve — Drought Alert Curve - - - 1995-1996



— 2017-2018 — Normal Operating Curve — Drought Alert Curve — 1995-1996



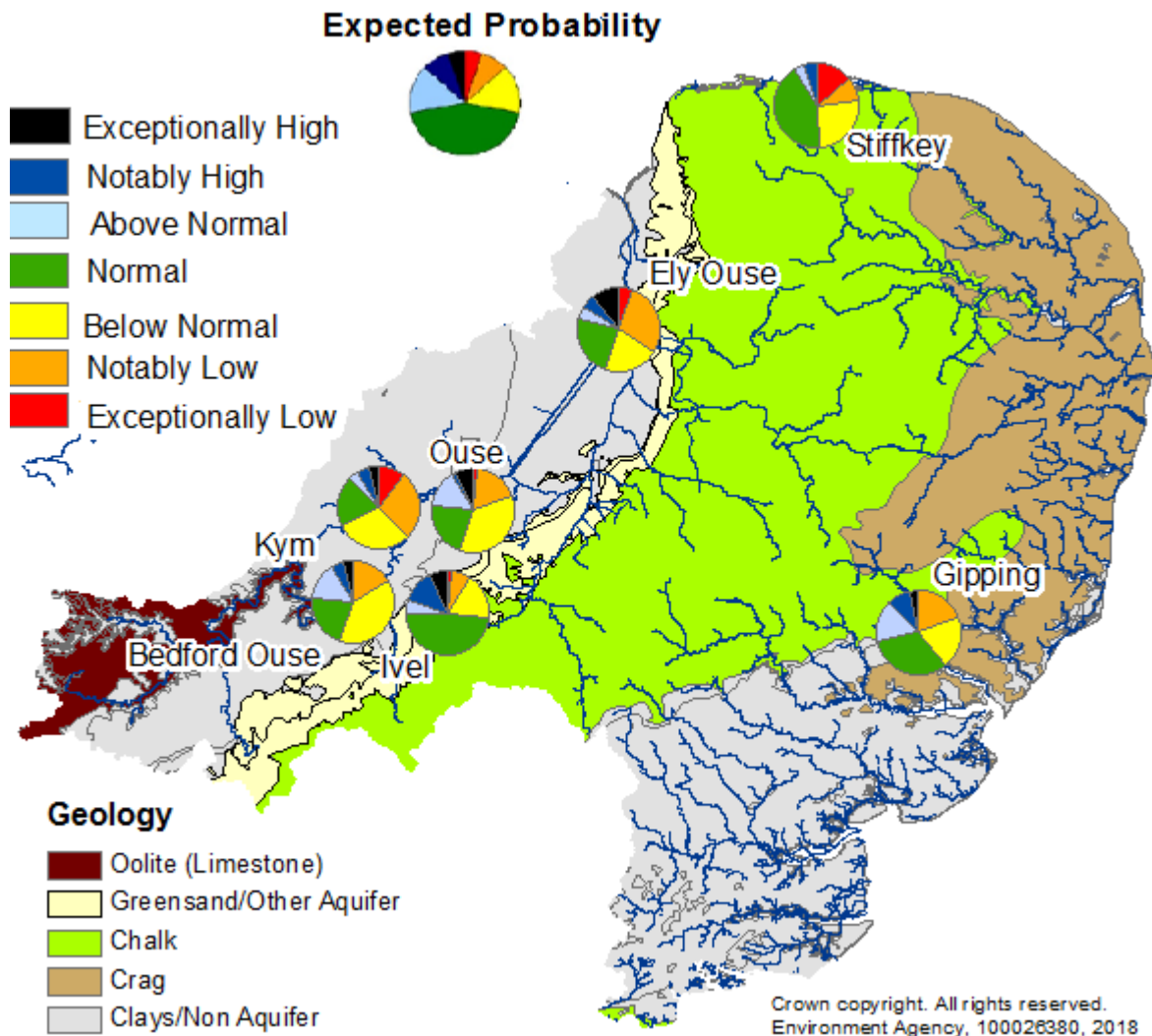
Forward Look – River Flows



Exceptionally high or low levels are those which would typically occur 5% of the time within the historic record. Notably high or low levels are those which would typically occur 8% of the time. Above normal or below normal levels are those which would typically occur 15% of the time. Normal levels are those which would typically occur 44% of the time within the historic record.

Probabilistic ensemble projections of river flows at key indicator sites in September 2018. Pie charts indicate probability, based on climatology, of the surface water flow at each site being e.g. exceptionally low for the time of year. (Source: [Centre for Ecology and Hydrology](#), Environment Agency) Geological map reproduced with kind permission from UK Groundwater Forum, BGS © NERC. Crown copyright. All rights reserved. Environment Agency, 100026380, 2018.

[^] "Naturalised" flows are projected for these sites'



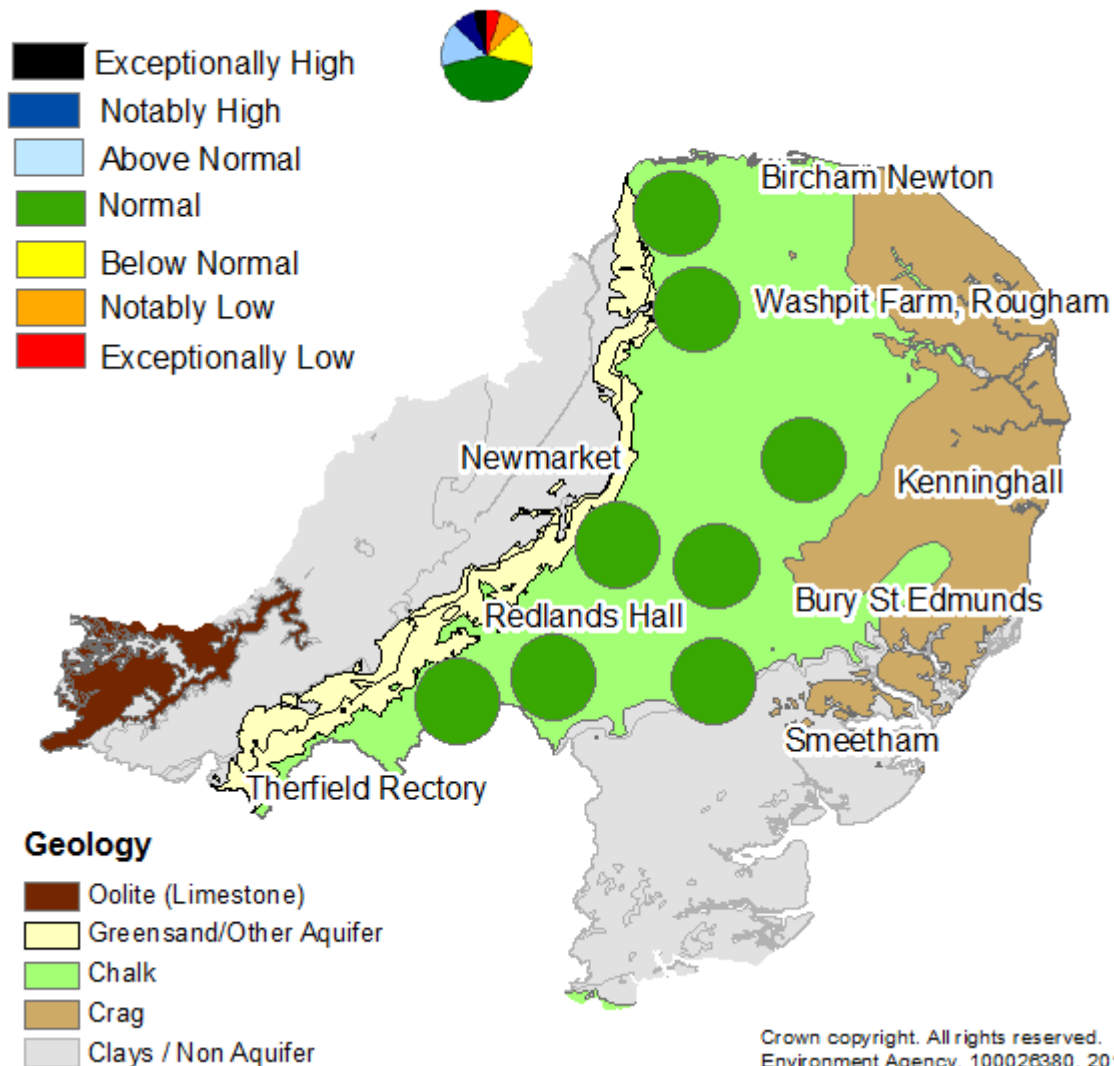
Exceptionally high or low levels are those which would typically occur 5% of the time within the historic record. Notably high or low levels are those which would typically occur 8% of the time. Above normal or below normal levels are those which would typically occur 15% of the time. Normal levels are those which would typically occur 44% of the time within the historic record.

Probabilistic ensemble projections of river flows at key indicator sites in December 2018. Pie charts indicate probability, based on climatology, of the surface water flow at each site being e.g. exceptionally low for the time of year. (Source: [Centre for Ecology and Hydrology](#), Environment Agency) Geological map reproduced with kind permission from UK Groundwater Forum, BGS © NERC. Crown copyright. All rights reserved. Environment Agency, 100026380, 2018.

[^] "Naturalised" flows are projected for these sites'

Forward Look - Groundwater

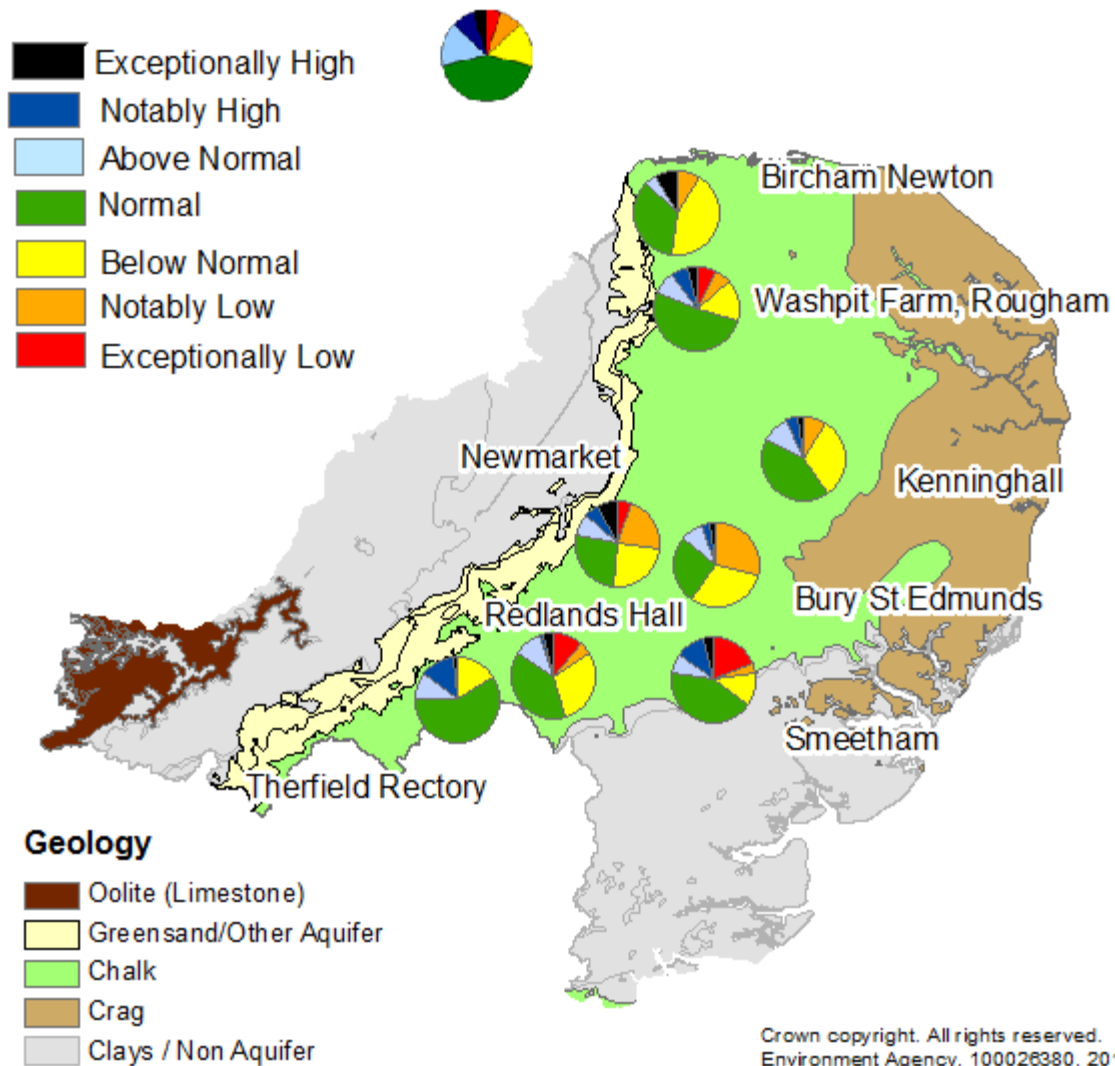
Expected Probability



Exceptionally high or low levels are those which would typically occur 5% of the time within the historic record. Notably high or low levels are those which would typically occur 8% of the time. Above normal or below normal levels are those which would typically occur 15% of the time. Normal levels are those which would typically occur 44% of the time within the historic record.

Probabilistic ensemble projections of groundwater levels at key indicator sites for end of September 2018. Pie charts indicate probability, based on climatology, of the groundwater level at each site being e.g. exceptionally low for the time of year. (Source: Environment Agency) Geological map reproduced with kind permission from UK Groundwater Forum, BGS © NERC. Crown copyright. All rights reserved. Environment Agency, 100026380, 2018.

Expected Probability



Exceptionally high or low levels are those which would typically occur 5% of the time within the historic record. Notably high or low levels are those which would typically occur 8% of the time. Above normal or below normal levels are those which would typically occur 15% of the time. Normal levels are those which would typically occur 44% of the time within the historic record.

Probabilistic ensemble projections of groundwater levels at key indicator sites for end of March 2019. Pie charts indicate probability, based on climatology, of the groundwater level at each site being e.g. exceptionally low for the time of year. (Source: Environment Agency) Geological map reproduced with kind permission from UK Groundwater Forum, BGS © NERC. Crown copyright. All rights reserved. Environment Agency, 100026380, 2018.

Glossary

Term

Definition

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 ³ s ⁻¹)
Effective rainfall	The rainfall available to percolate into the soil or produce river flow. Expressed in depth of water (mm).
Flood Alert/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 1961-1990. 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 x 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 (e.g. 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).

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