

# Monthly water situation report

## East Anglia

### Summary – June 2021

June had a normal amount of rainfall with an average of 62 mm falling across East Anglia. Soil Moisture Deficit (SMD) rose and fell during June in response to the mixed weather, ending the month at 76 mm. River flows decreased at all indicator sites but retained at least normal flows. Groundwater levels also reduced at the majority of sites but again all levels remain at normal or above. As such, environmental support remained minimal in June.

### Rainfall

East Anglia had an average of 62 mm of rainfall in June equating to 121% of the Long Term Average (LTA) and classified as normal for the time of year. The rainfall totals varied across catchments with South Essex receiving the highest total of 87 mm (184% of LTA – notably high), and NW Norfolk and Wissey recording the lowest total of 46 mm (83% of LTA – normal). East Suffolk, North Essex and the Upper and Lower Bedford Ouse catchments all received above normal totals for June. Accumulated rainfall over the past 6 months across East Anglia is classified as above normal, and the last 12 months as notably high. The 12 months to June were the 9<sup>th</sup> wettest recorded since 1891 for East Anglia as a whole, and the 3<sup>rd</sup> wettest 12 months to June in the Upper and Lower Bedford Ouse catchments.

### Soil Moisture Deficit/Recharge

SMD has varied through June in response to the changing weather. SMD rapidly increased during the first two weeks of June with the warm, dry weather to reach a peak of 90 mm in mid-June. Lower temperatures and higher rainfall amounts led to a decrease following this with SMD at the end of the month at an average of 76 mm. SMD varied across East Anglia with the Bedford Ouse catchment lower, and the Norfolk catchments higher.

### River Flows

River flows decreased at all indicator sites in June, however all sites recorded at least normal flows and 57% of sites retained flows classified as above normal or higher. The higher rainfall totals in South Essex were reflected in above normal flows in the Colne and Chelmer (112% and 118% of LTA respectively). River flows in the Bedford Ouse catchment also remained above normal, with the exception of the Tove which returned to normal flows. Flows in the eastern rivers in Norfolk and Suffolk retained or returned to normal flows (Bure, Yare, Waveney, Gipping).

### Groundwater Levels

Groundwater levels at all sites across East Anglia decreased in June with the exception of Hazlewood Common in the Suffolk Crag which remained steady. All indicator sites had groundwater levels that were classified as normal or above for the time of year. Of the 19 sites which had available data, 5 sites were classified as normal; 5 above normal; 7 as notably high; and 2 as exceptionally high (Bircham Newton in the NW Norfolk Chalk, and Breckland in the Wissey Chalk).

### Reservoir Storage/Water Resource Zone Stocks

Reservoir storage levels reduced at 3 of the 5 reservoirs by the end of June (Alton, Abberton, Hanningfield) but increased at Ardleigh and remained steady at Grafham. With the exception of Grafham, all reservoirs remained at or above the normal operating curve at the end of the month.

### Environmental Impact

Groundwater support scheme operations remained minimal in June. The Lodes-Granta groundwater support scheme had 1 of the 6 pumps operating, with no pumping taking place in the Rhee, Hiz, and Thet-Little Ouse schemes.

*All data are provisional and may be subject to revision. The views expressed in this document are not necessarily those of the Environment Agency. Its officers, servants or agents accept no liability for any loss or damage arising from the interpretation or use of the information, or reliance upon views contained herein.*

## Forward Look

### Probabilistic ensemble projections for river flows at key sites

**September 2021:** There is an increased probability of flows above normal or higher in the Ouse and its tributaries (Kym, Ivel, Bedford Ouse) in September. There is an increased probability of below normal flows in the Ely Ouse. All sites (except the Gipping) have a reduced probability of notably or exceptionally low flows in September.

**December 2021:** There is an increased probability of flows below the normal in the Ely Ouse in December. There is an increased probability of above normal flows in the Ouse and tributaries (Kym, Ivel and Bedford Ouse).

### Probabilistic ensemble projections for groundwater levels in key aquifers

**September 2021:** There is a significantly increased probability that groundwater levels will be normal or higher at all key sites in September. Therfield Rectory (North Herts Chalk) and Bircham Newton (NW Norfolk Chalk) are both highly likely to have groundwater levels above normal. At Kenninghall in the Little Ouse Chalk, it is highly likely that groundwater levels will be notably high in September.

**March 2022:** There is an increased probability of groundwater levels being above normal or higher at Therfield Rectory (North Herts Chalk) in March 2022. There is a reduced probability of exceptionally low groundwater levels at the majority of the key sites with the exception of Redlands Hall (Cam Chalk) and Smeetham (Essex Chalk).

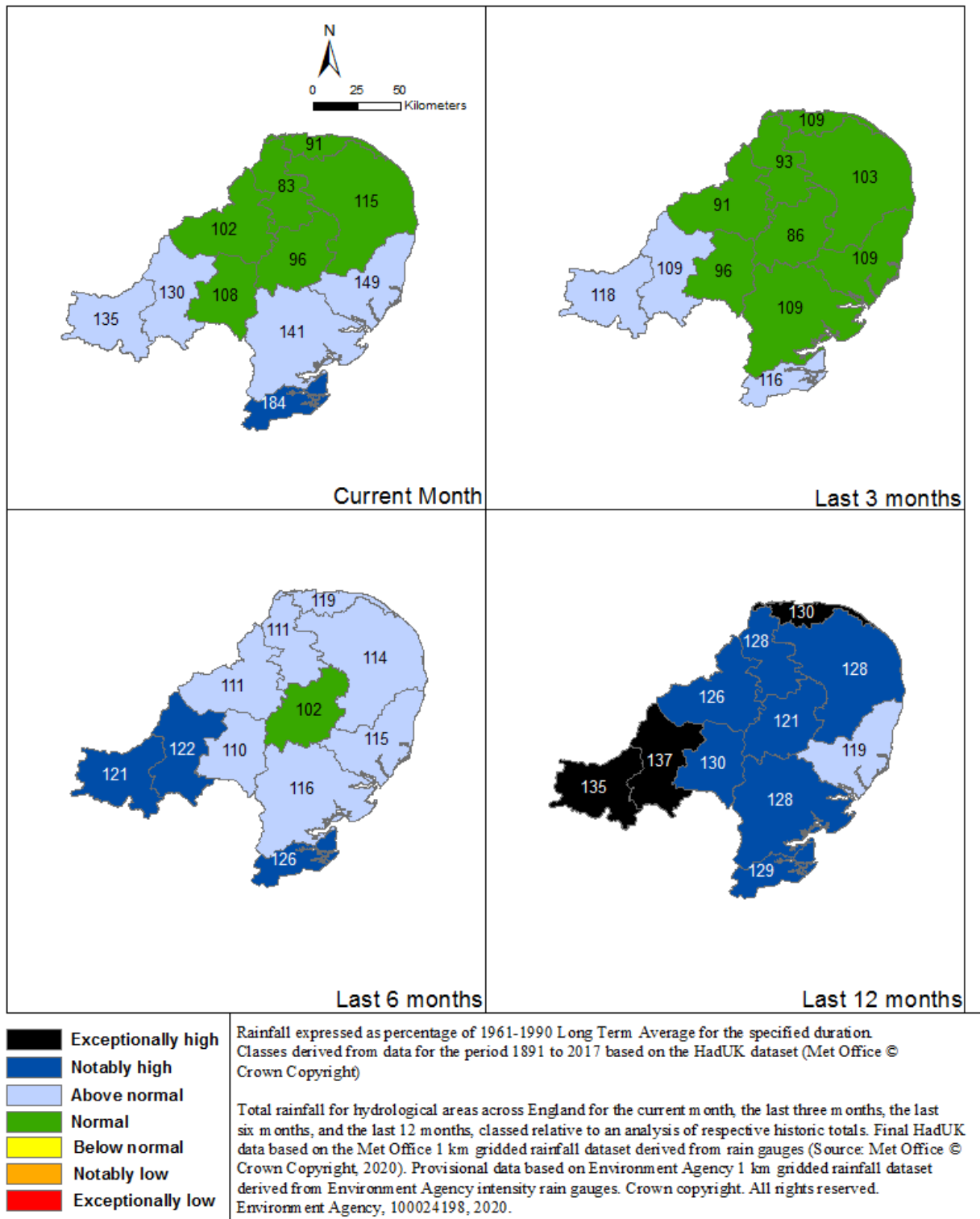
Author:

[ANG-Hydrology](#)

Contact details: 03708506506

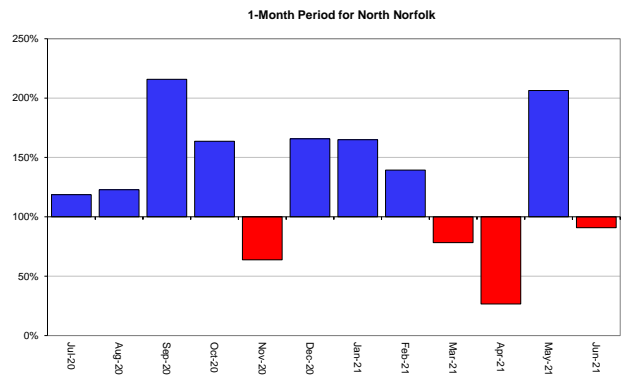
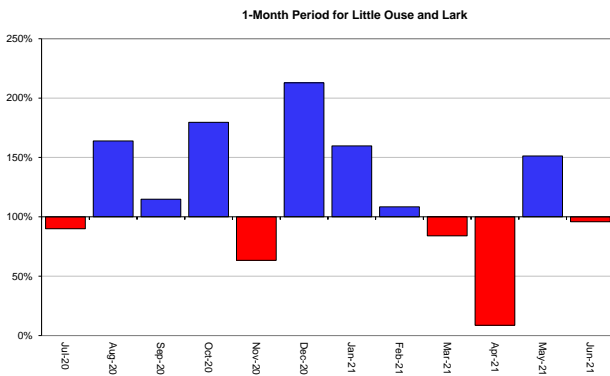
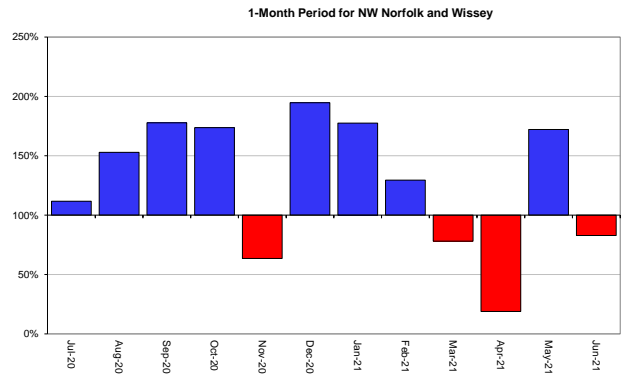
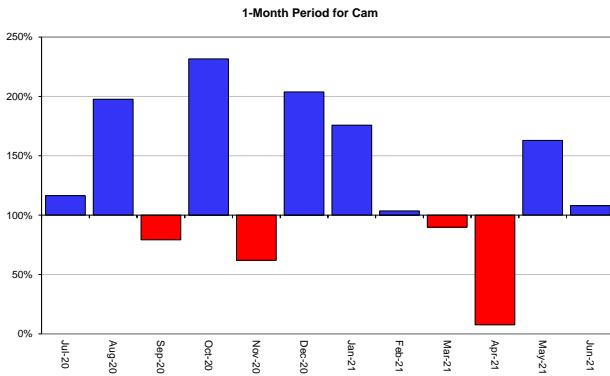
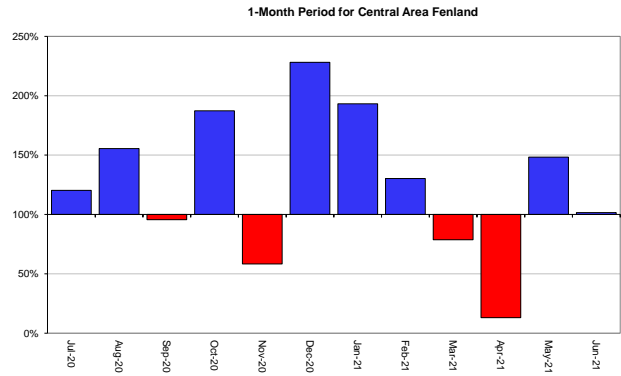
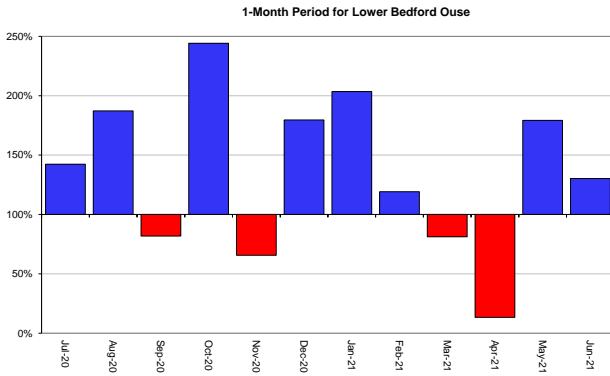
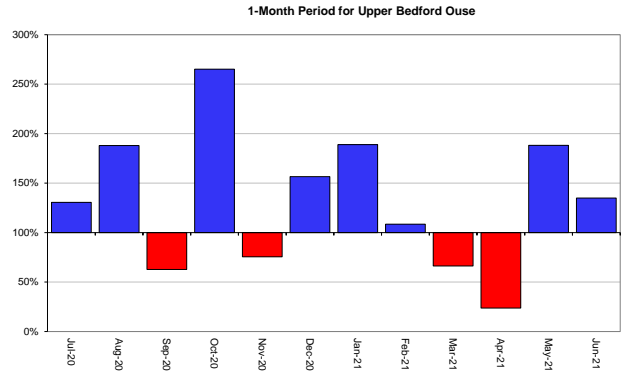
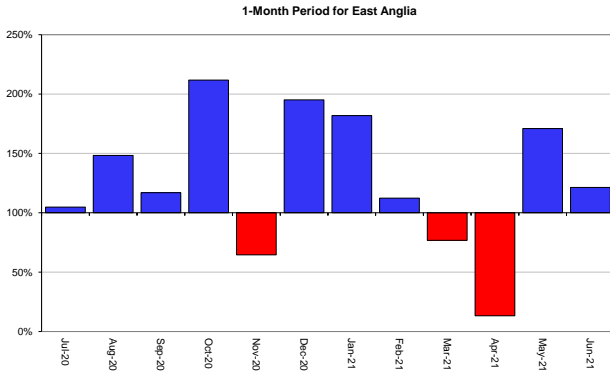
# Rainfall

June 2021



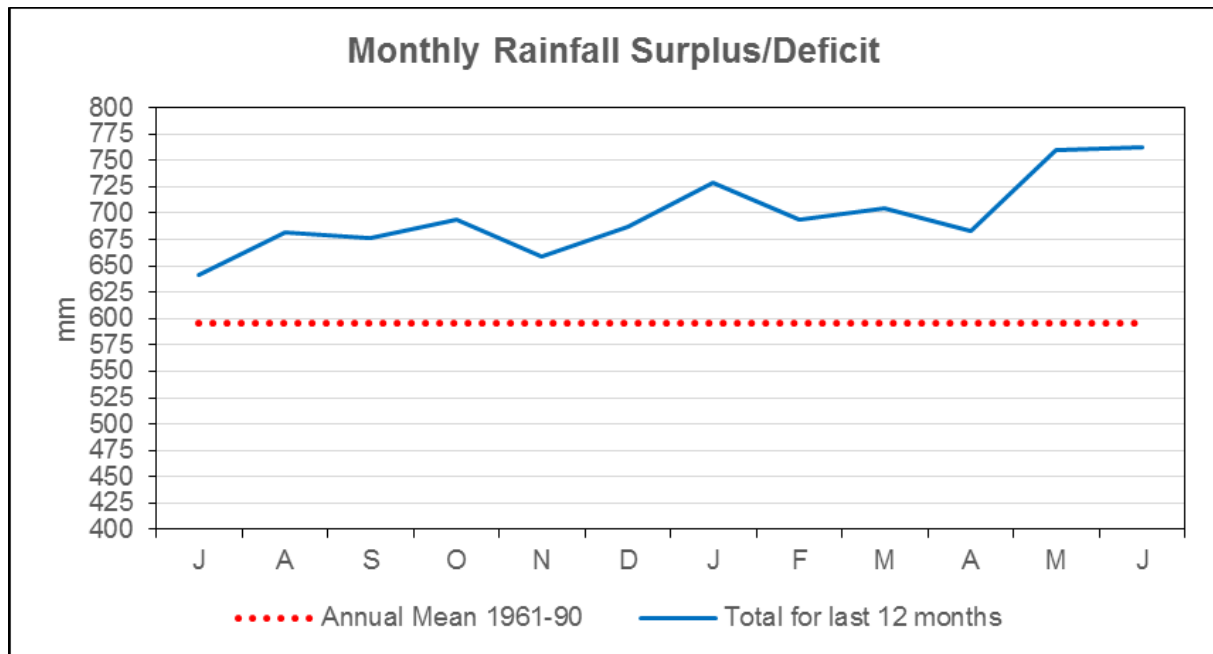
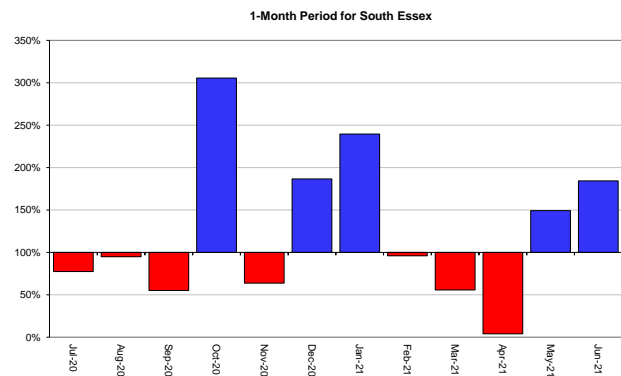
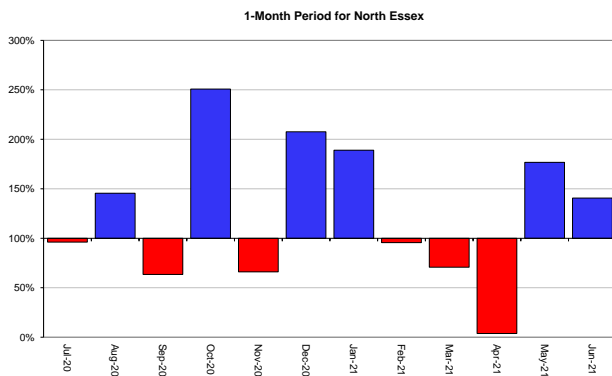
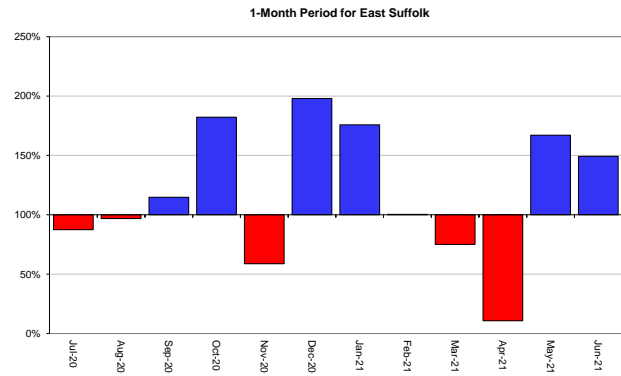
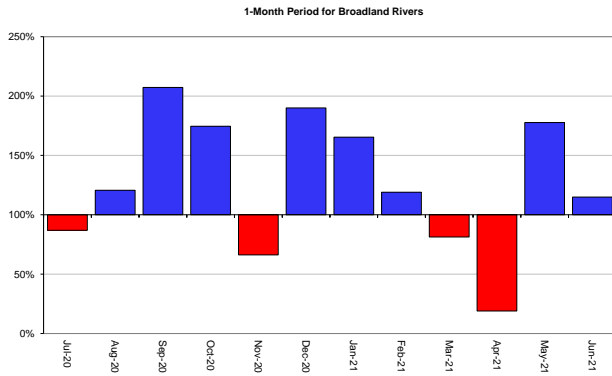
**Above average rainfall**

**Below average rainfall**

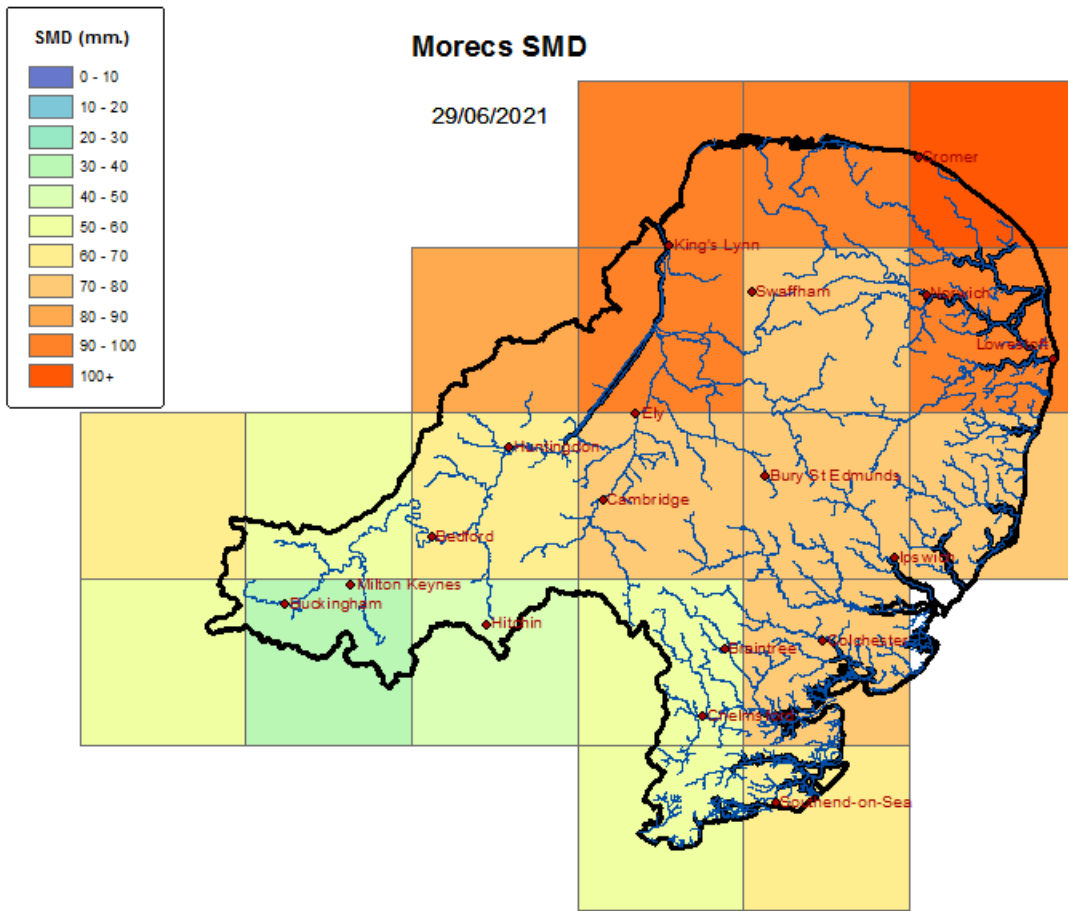


**Above average rainfall**

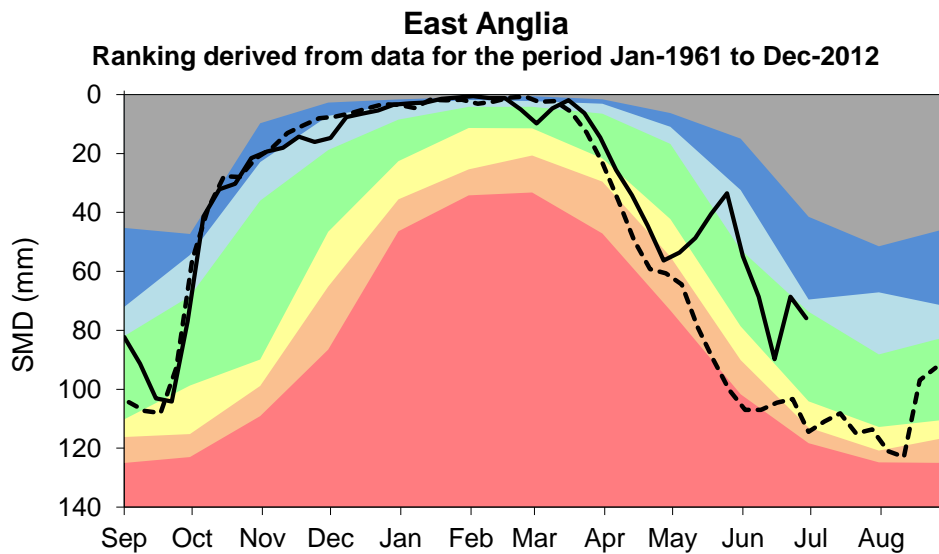
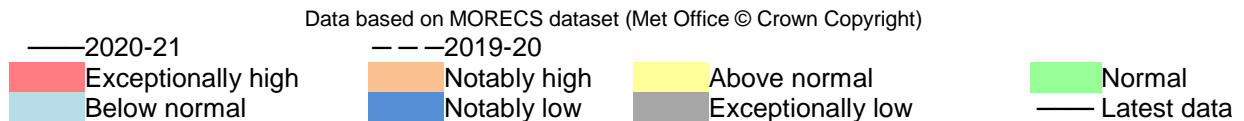
**Below average rainfall**



# Soil Moisture Deficit

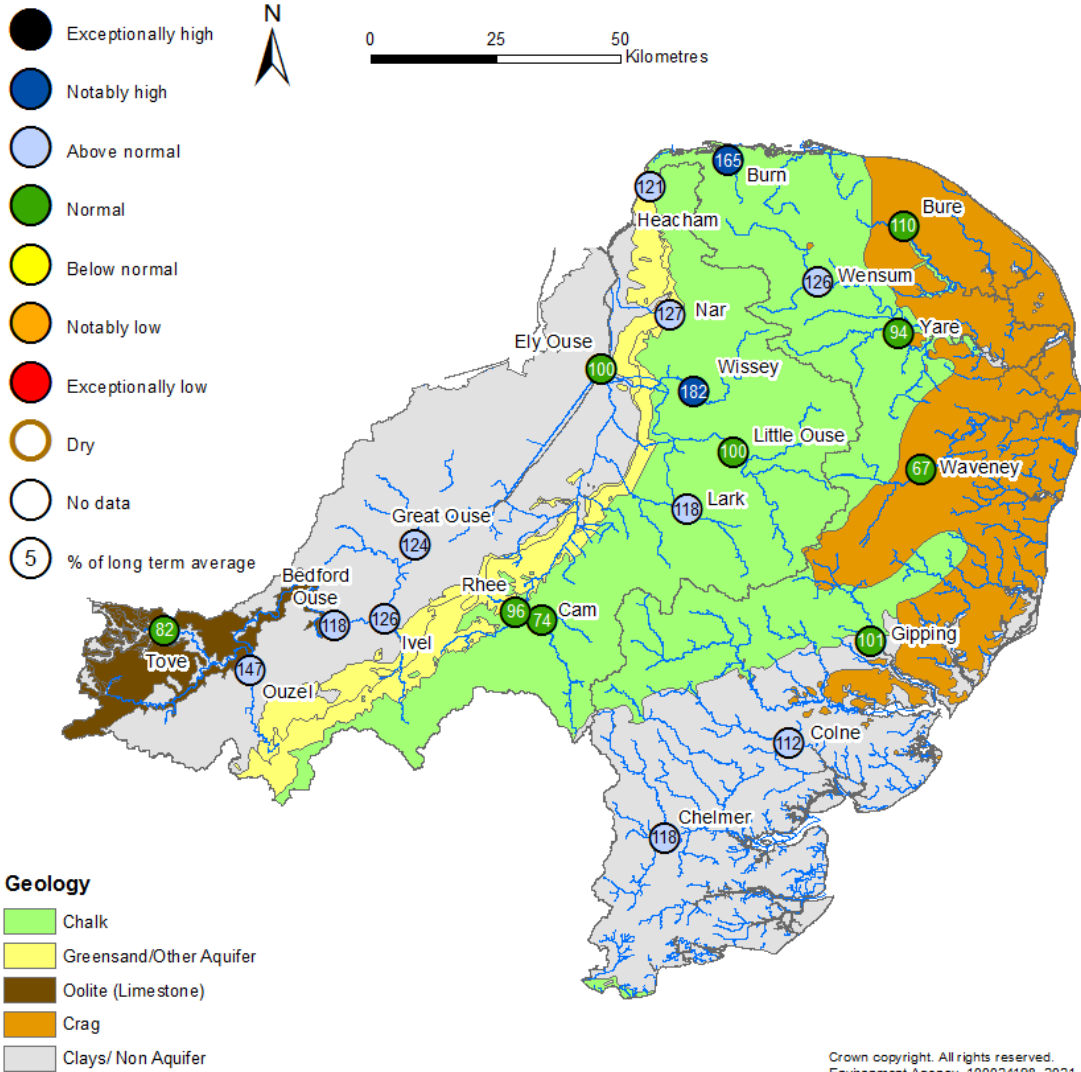


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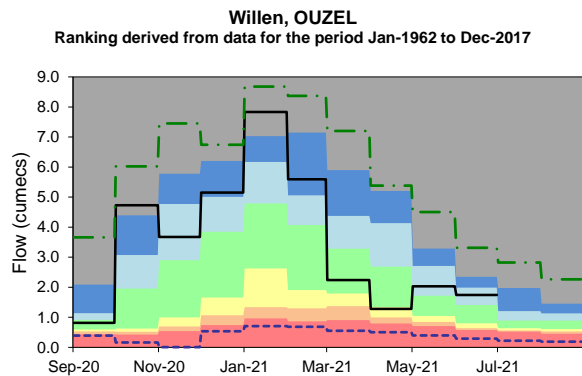
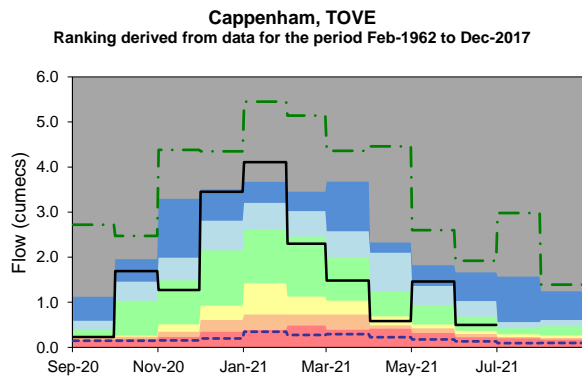


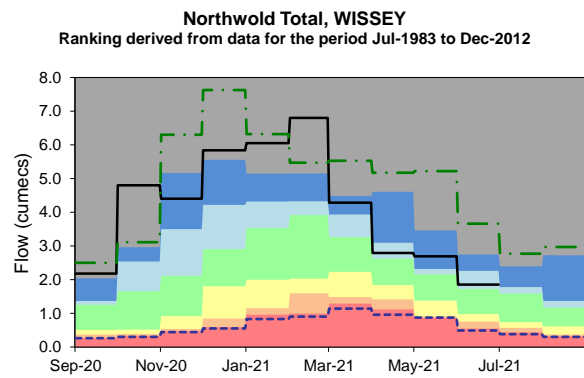
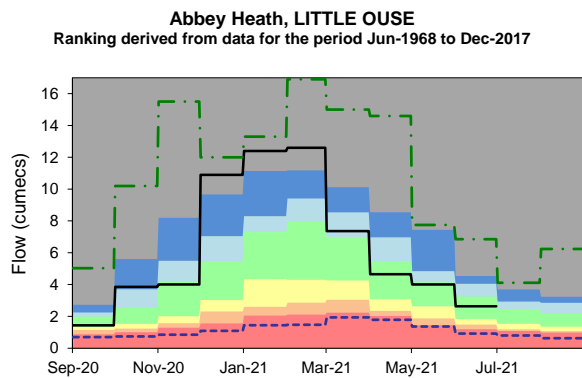
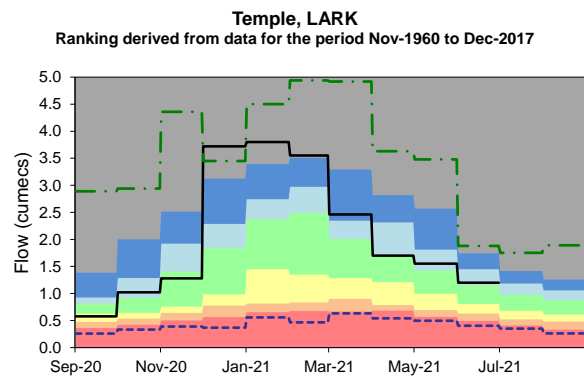
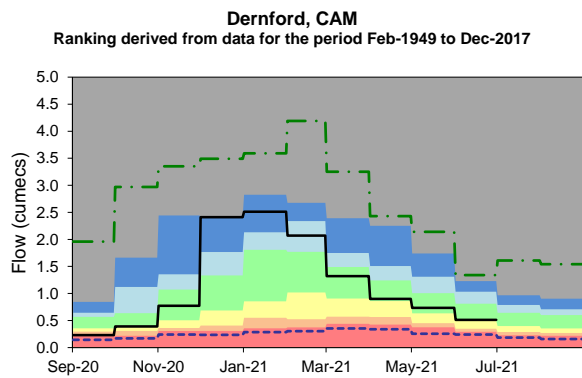
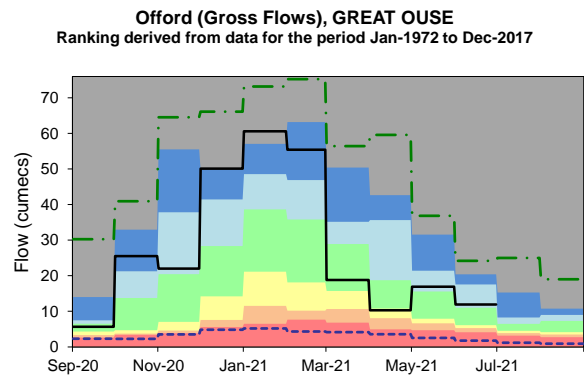
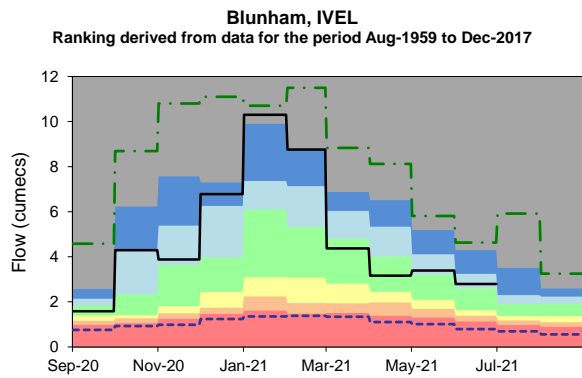
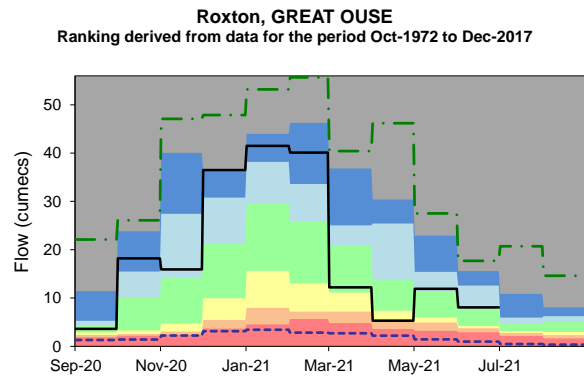
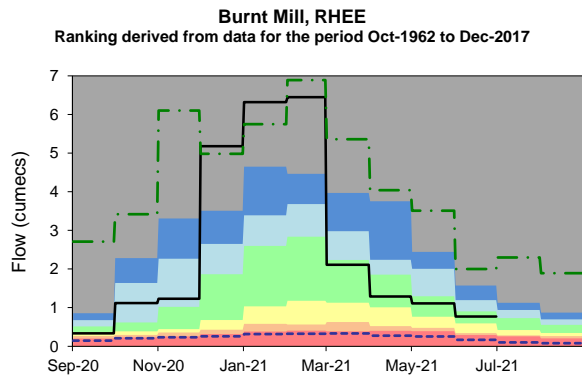
# River Flow

June 2021

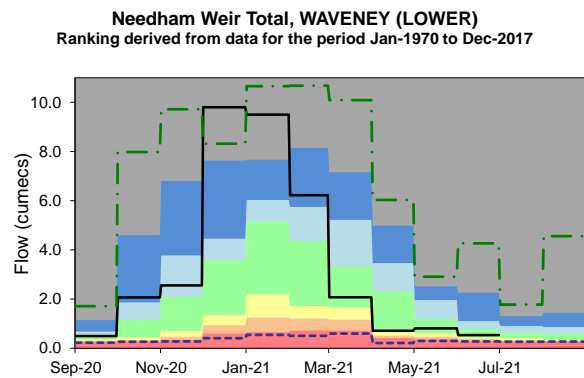
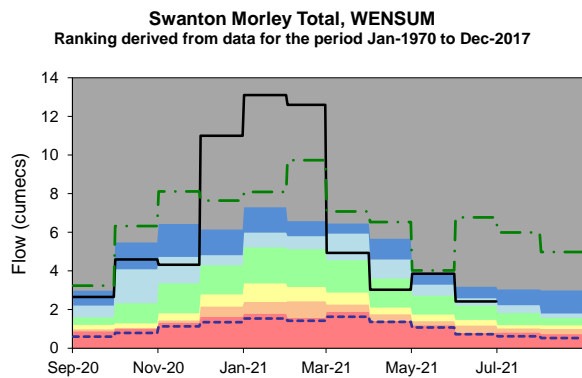
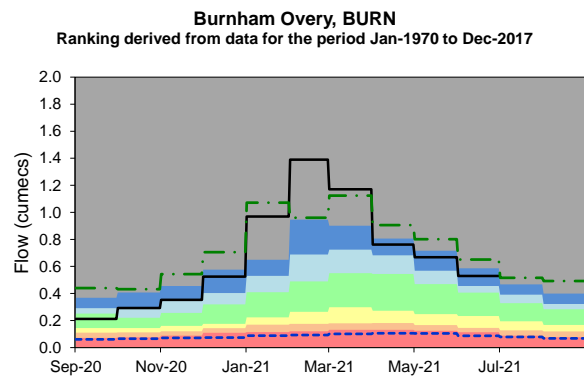
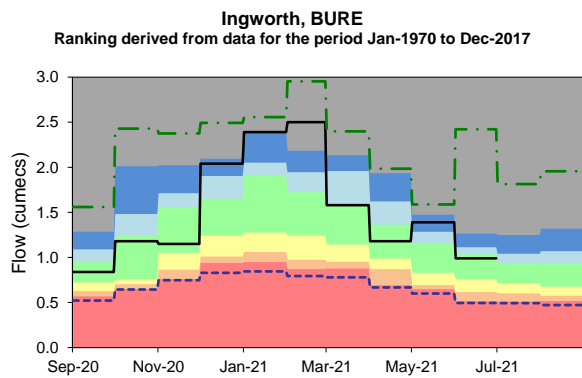
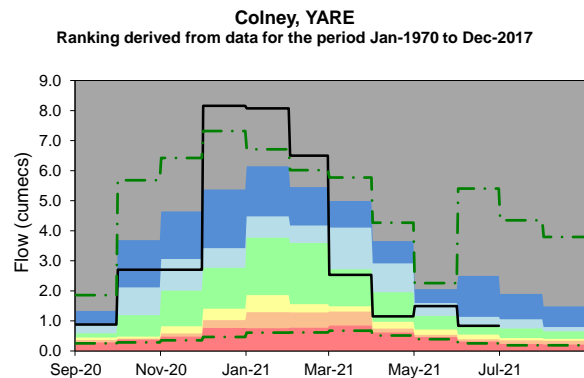
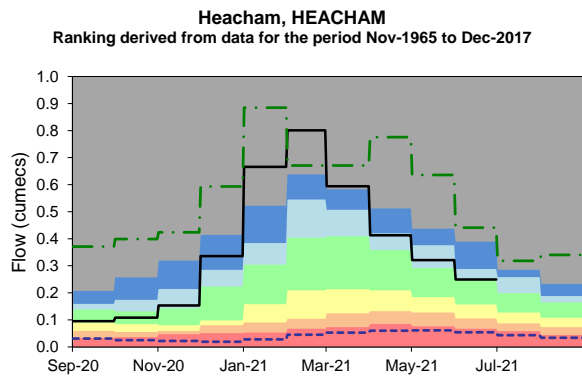
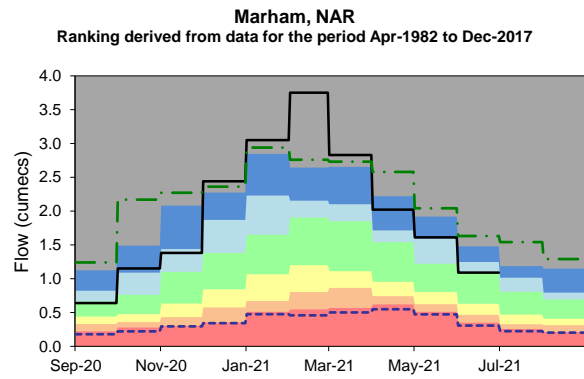
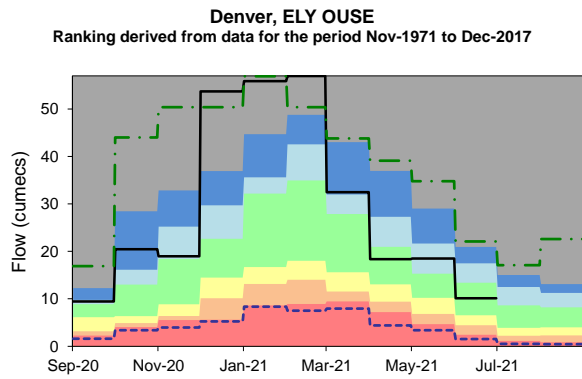


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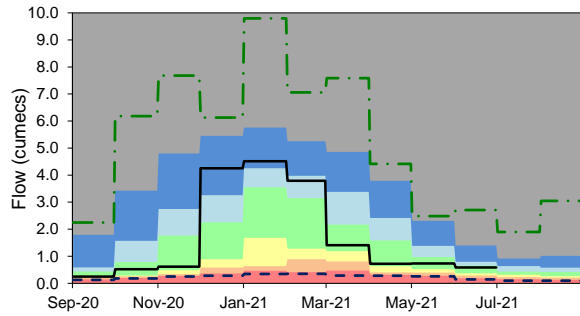






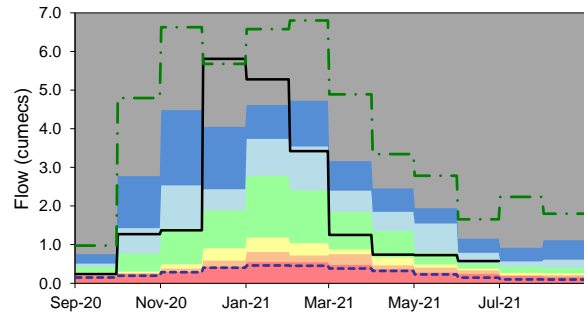
**Bramford, GIPPING**

Ranking derived from data for the period Jan-1970 to Dec-2017



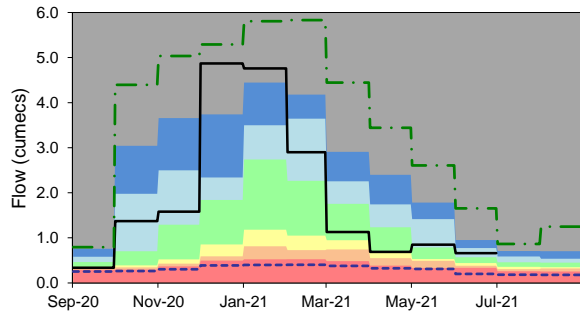
**Lexden, COLNE**

Ranking derived from data for the period Jan-1970 to Dec-2017

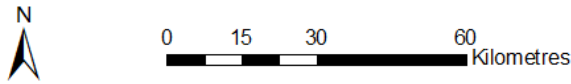


**Springfield, CHELMER**

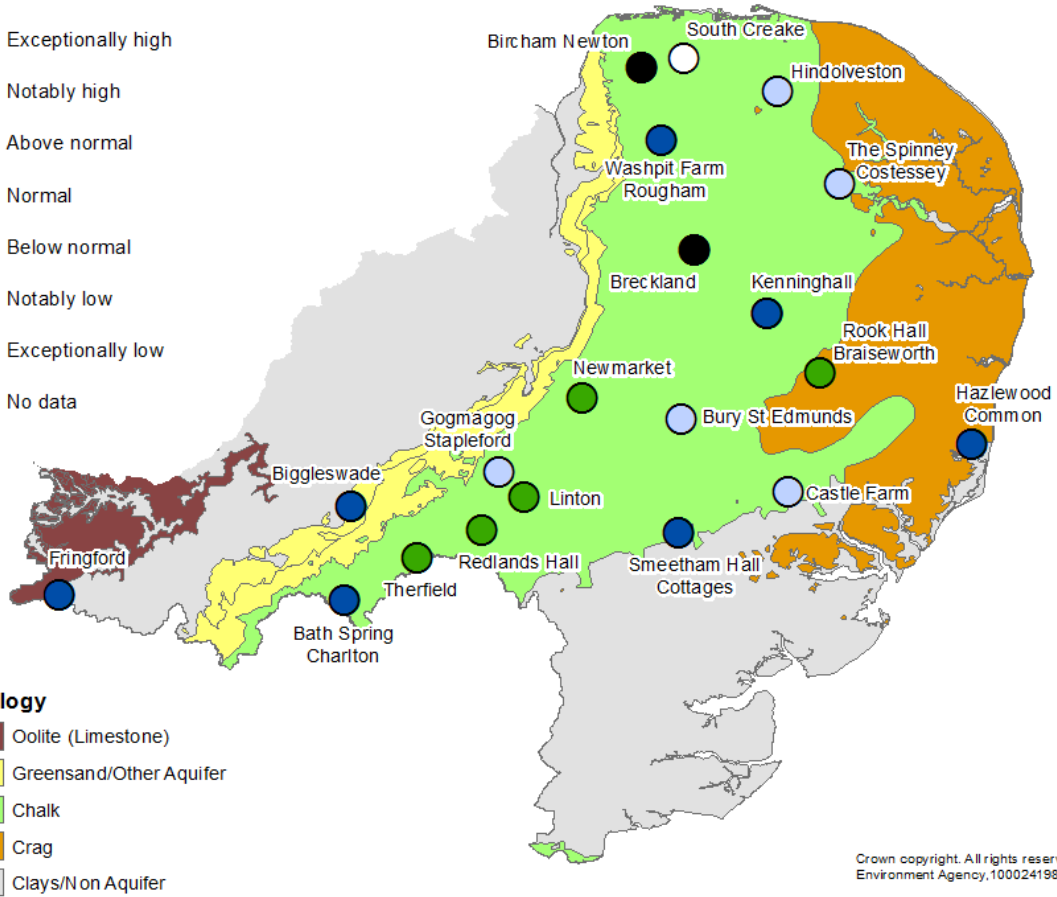
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# Groundwater Levels June 2021

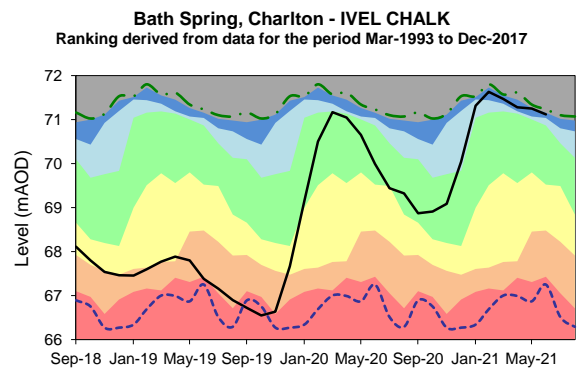
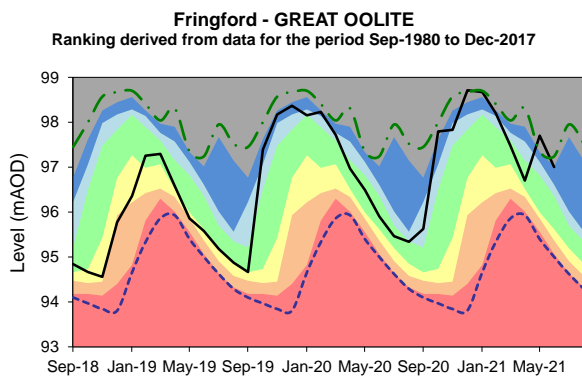


- Exceptionally high
- Notably high
- Above normal
- Normal
- Below normal
- Notably low
- Exceptionally low
- No data



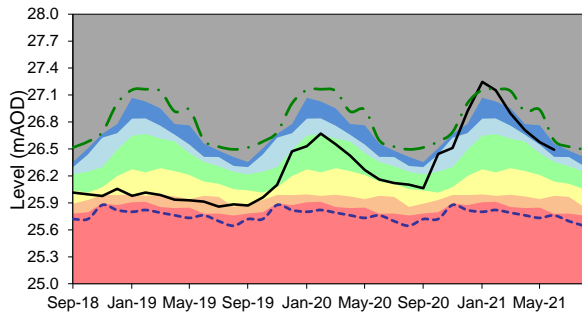
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- Exceptionally high
- Notably high
- Above normal
- Normal
- Max
- Below normal
- Notably low
- Exceptionally low
- Latest data
- Min

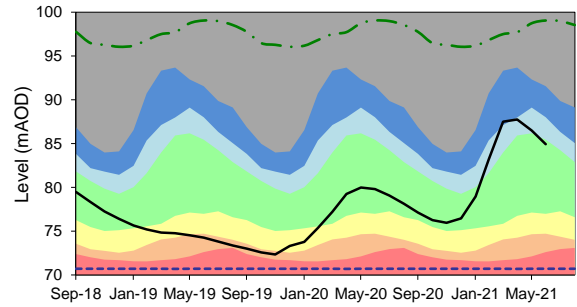




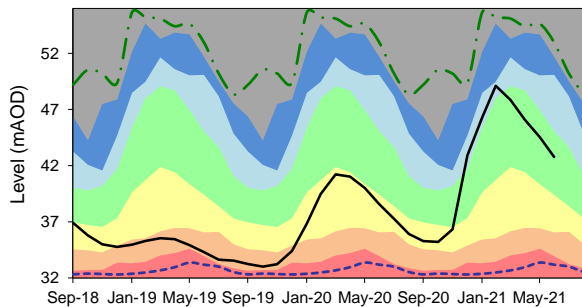
**Biggleswade - IVEL SANDSTONE**  
Ranking derived from data for the period Mar-1968 to Dec-2017



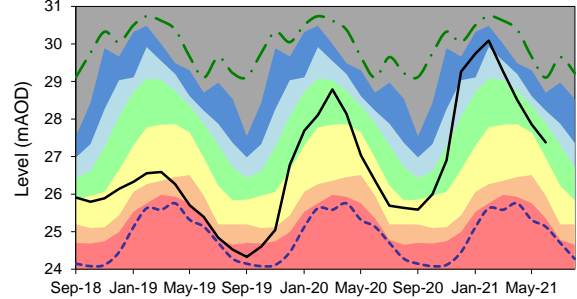
**Therfield Rectory - N HERTS CHALK**  
Ranking derived from data for the period Jan-1883 to Dec-2017



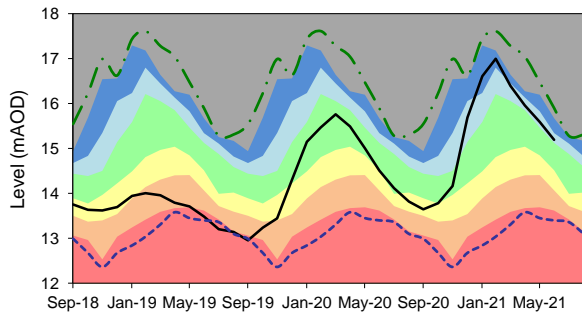
**Redlands Hall, Ickleton - CAM CHALK**  
Ranking derived from data for the period Aug-1963 to Dec-2017



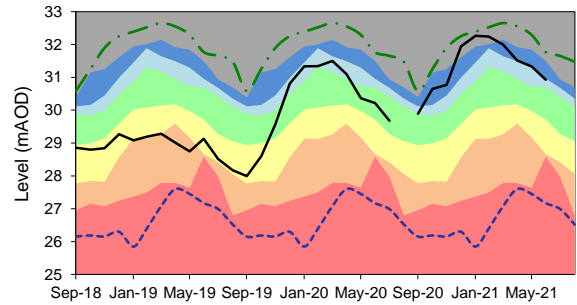
**Linton - CAM CHALK**  
Ranking derived from data for the period Jan-1980 to Dec-2017



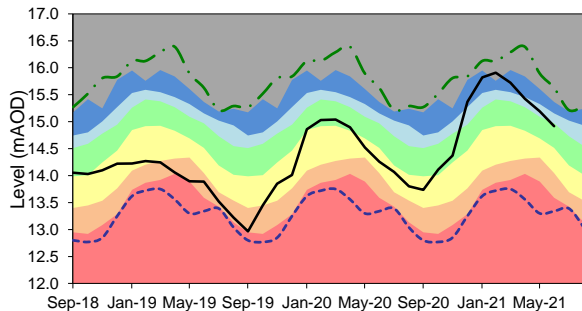
**Gog Magog, Stapleford - CAM CHALK**  
Ranking derived from data for the period Jan-1980 to Dec-2017



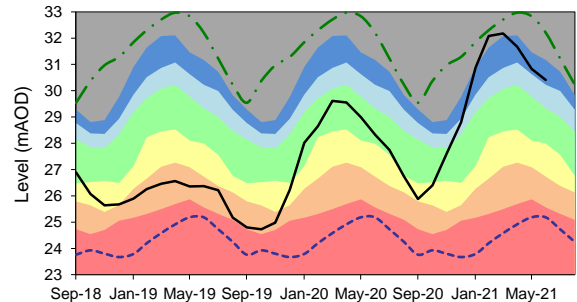
**Bury St Edmunds - UPPER LARK CHALK**  
Ranking derived from data for the period May-1983 to Dec-2017



**Newmarket - SNAIL CHALK**  
Ranking derived from data for the period Feb-1983 to Dec-2017

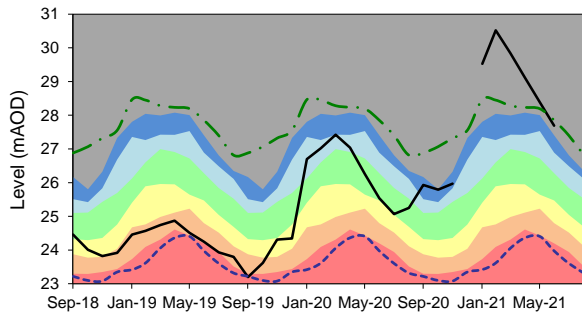


**Kenninghall - LITTLE OUSE CHALK**  
Ranking derived from data for the period Aug-1973 to Dec-2017

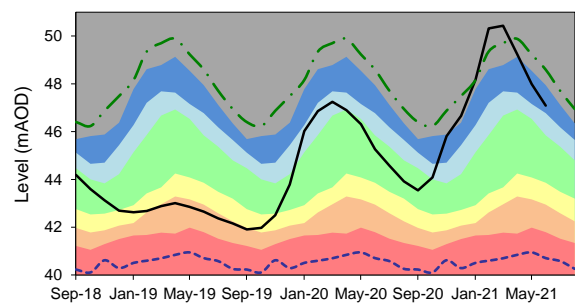




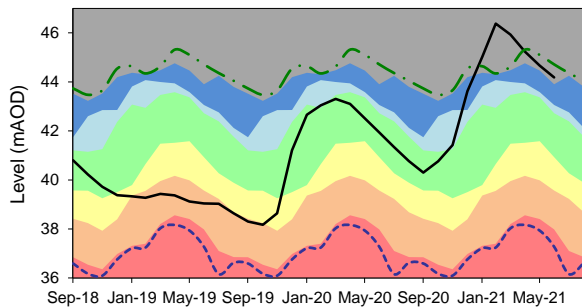
**Breckland - WISEY CHALK**  
 Ranking derived from data for the period Jan-1971 to Nov-2017



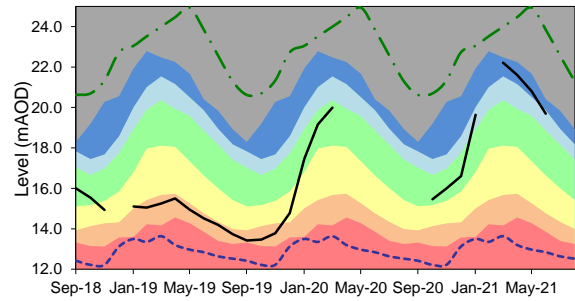
**Washpit Farm, Rougham - NW NORFOLK CHALK**  
 Ranking derived from data for the period May-1950 to Dec-2017



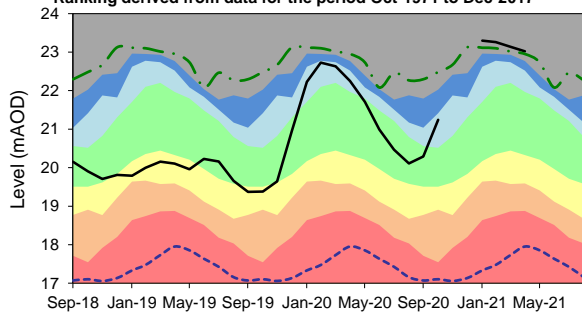
**Bircham Newton - NW NORFOLK CHALK**  
 Ranking derived from data for the period Mar-1995 to Sep-2017



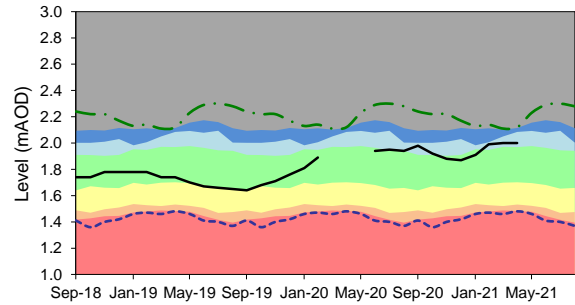
**Castle Farm, Offton - MID SUFFOLK CHALK**  
 Ranking derived from data for the period Mar-1967 to Dec-2017



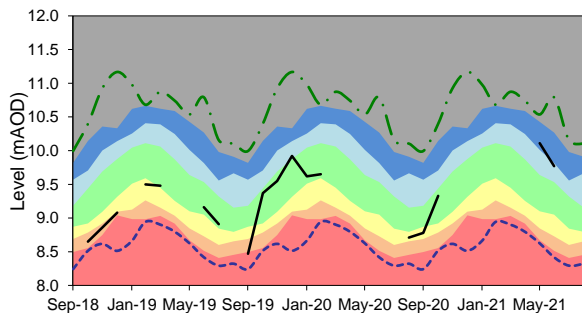
**Old Primary School, South Creake - NW NORFOLK CHALK**  
 Ranking derived from data for the period Oct-1971 to Dec-2017



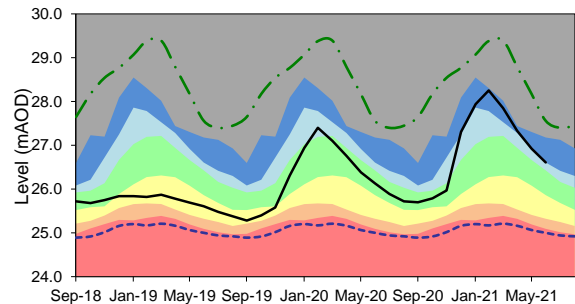
**Hazlewood Common - SUFFOLK CRAG**  
 Ranking derived from data for the period Oct-1988 to Feb-2020



**The Spinney, Costessey - WENSUM CHALK**  
 Ranking derived from data for the period Oct-1971 to Dec-2017

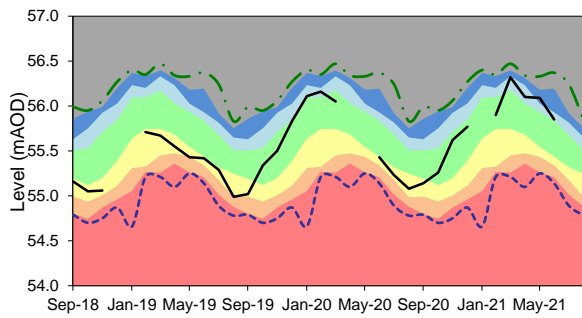


**Smeetham Hall Cottages, Bulmer - ESSEX CHALK**  
 Ranking derived from data for the period Jan-1964 to Dec-2017

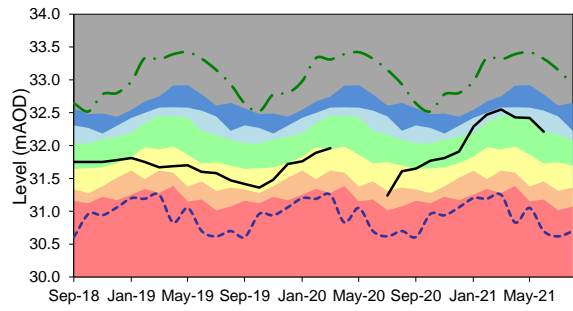




**Hindolveston - NORFOLK CHALK**  
Ranking derived from data for the period Sep-1984 to Nov-2017

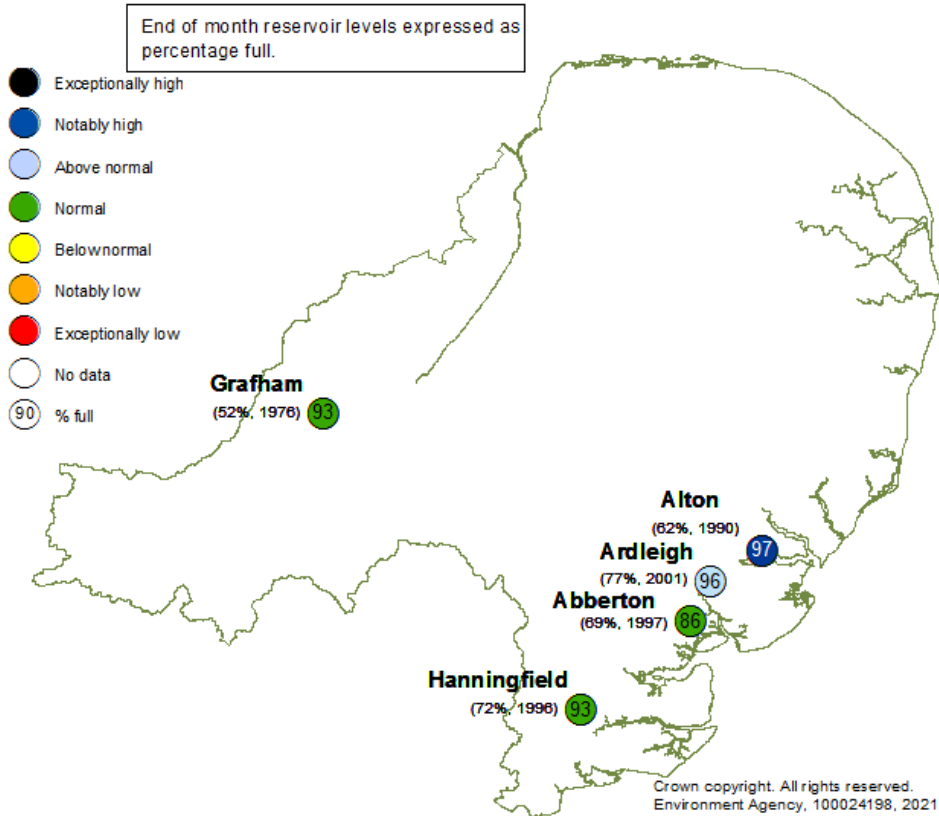


**Rook Hall, Braiseworth - SUFFOLK CHALK**  
Ranking derived from data for the period Jan-1980 to Dec-2017

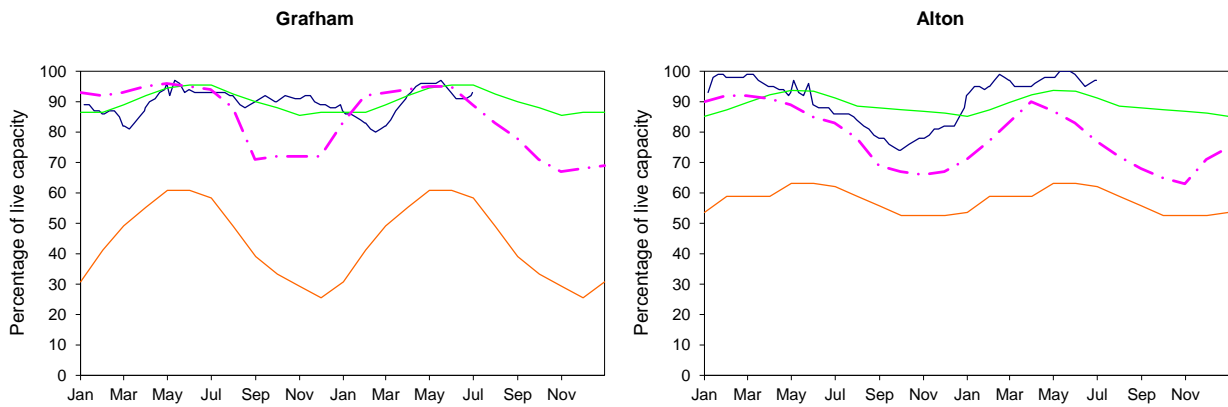


# Reservoir Stocks

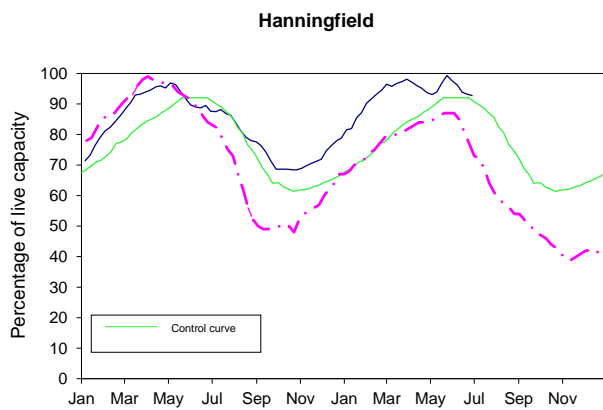
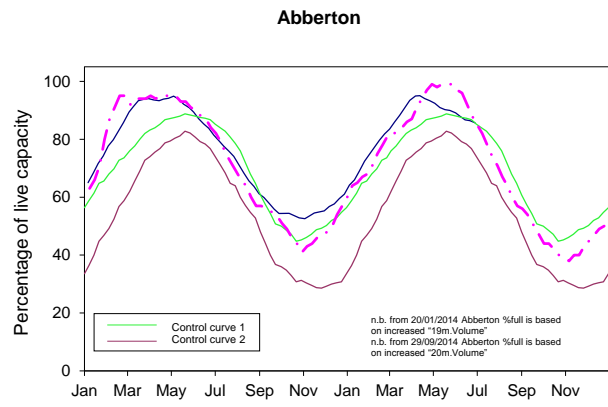
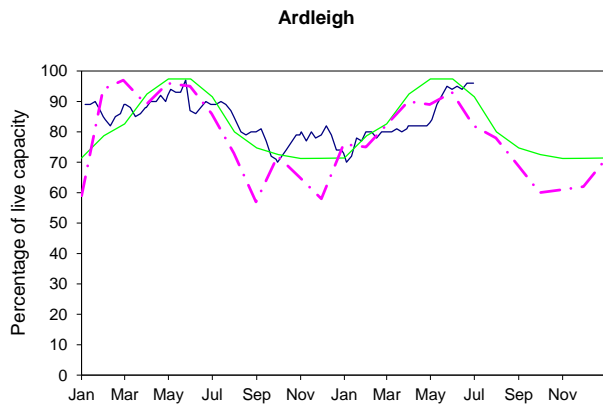
June 2021



— 2020-2021    — Normal Operating Curve    — Drought Alert Curve    — 1995-1996

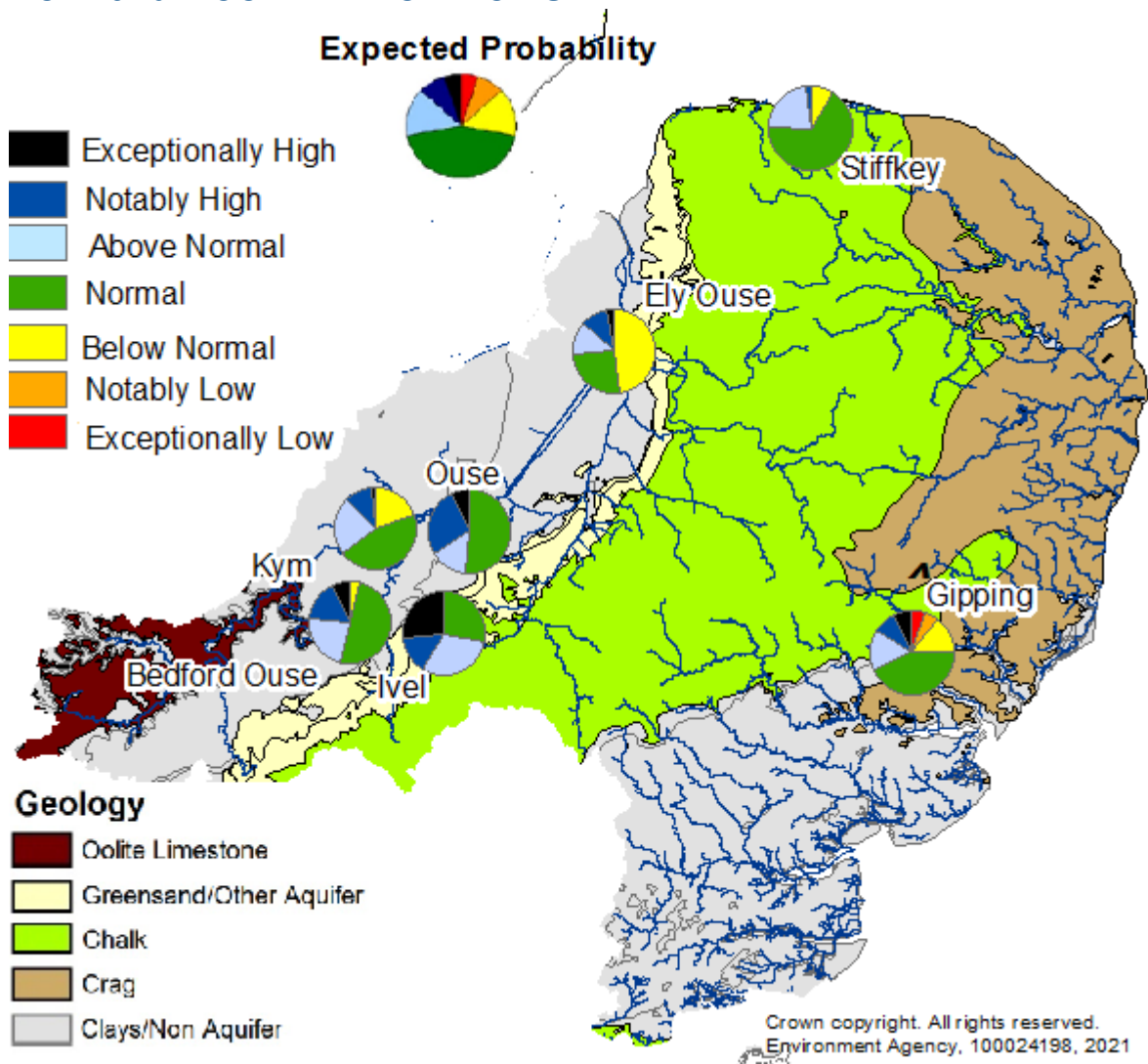


— 2020-2021      — Normal Operating Curve      — Drought Alert Curve      - - - 1995-1996





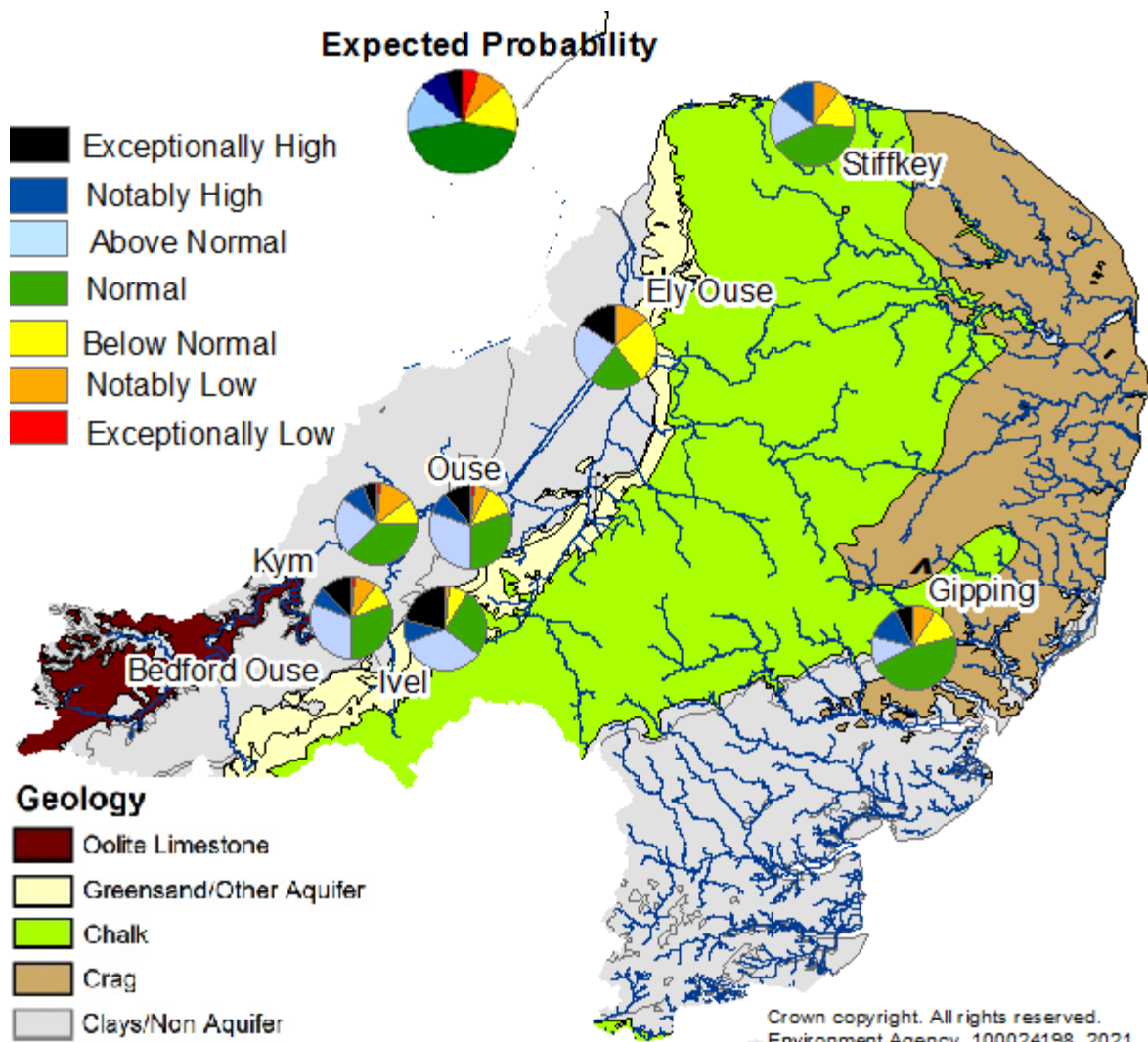
# Forward Look – River Flows



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 2021.** 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, 2021.

<sup>^</sup> "Naturalised" flows are projected for these sites'

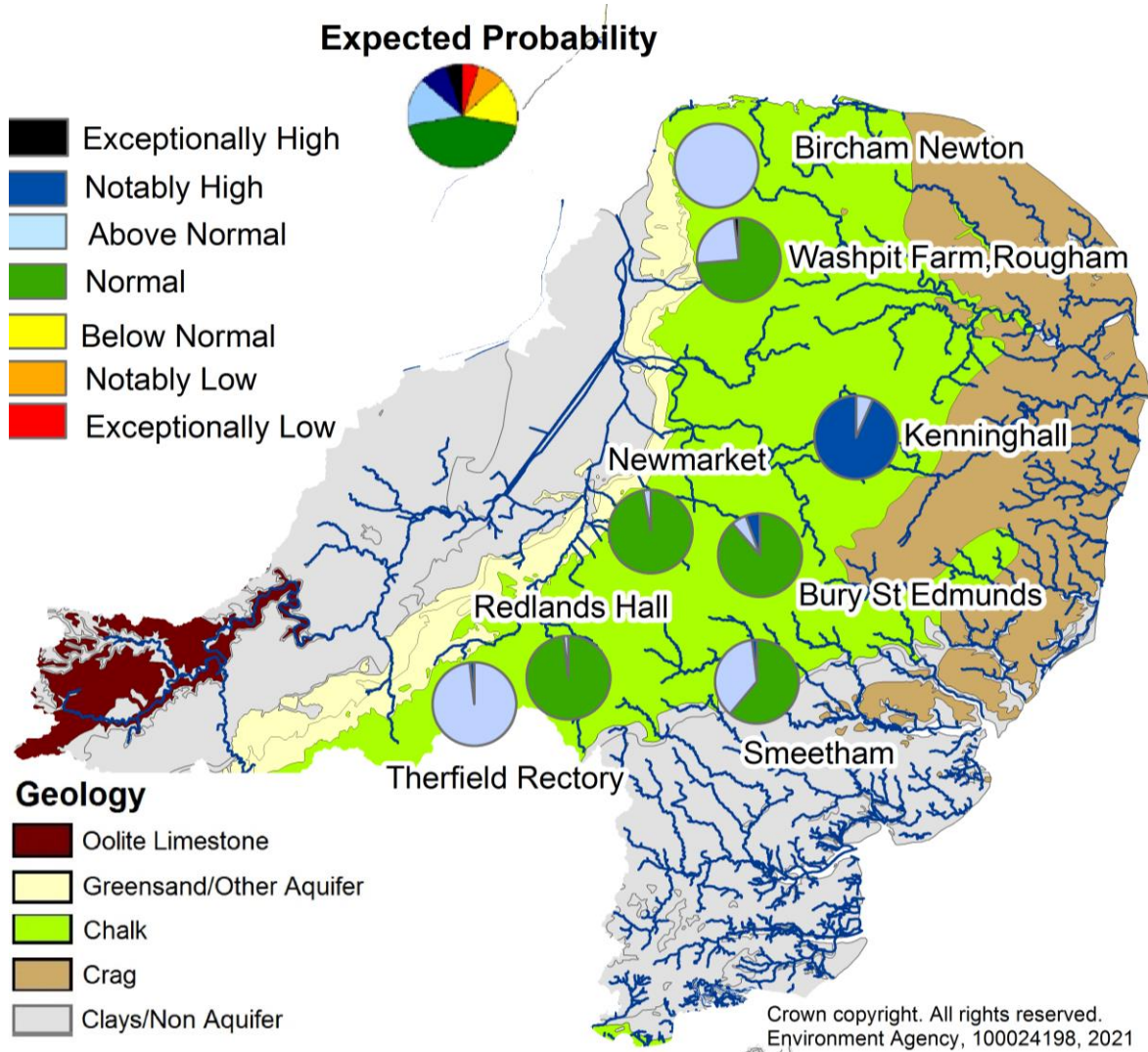


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Exceptionally high or low levels are those which would typically occur 5% of the time within the historic record. Notably high or low levels are those which would typically occur 8% of the time. Above normal or below normal levels are those which would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

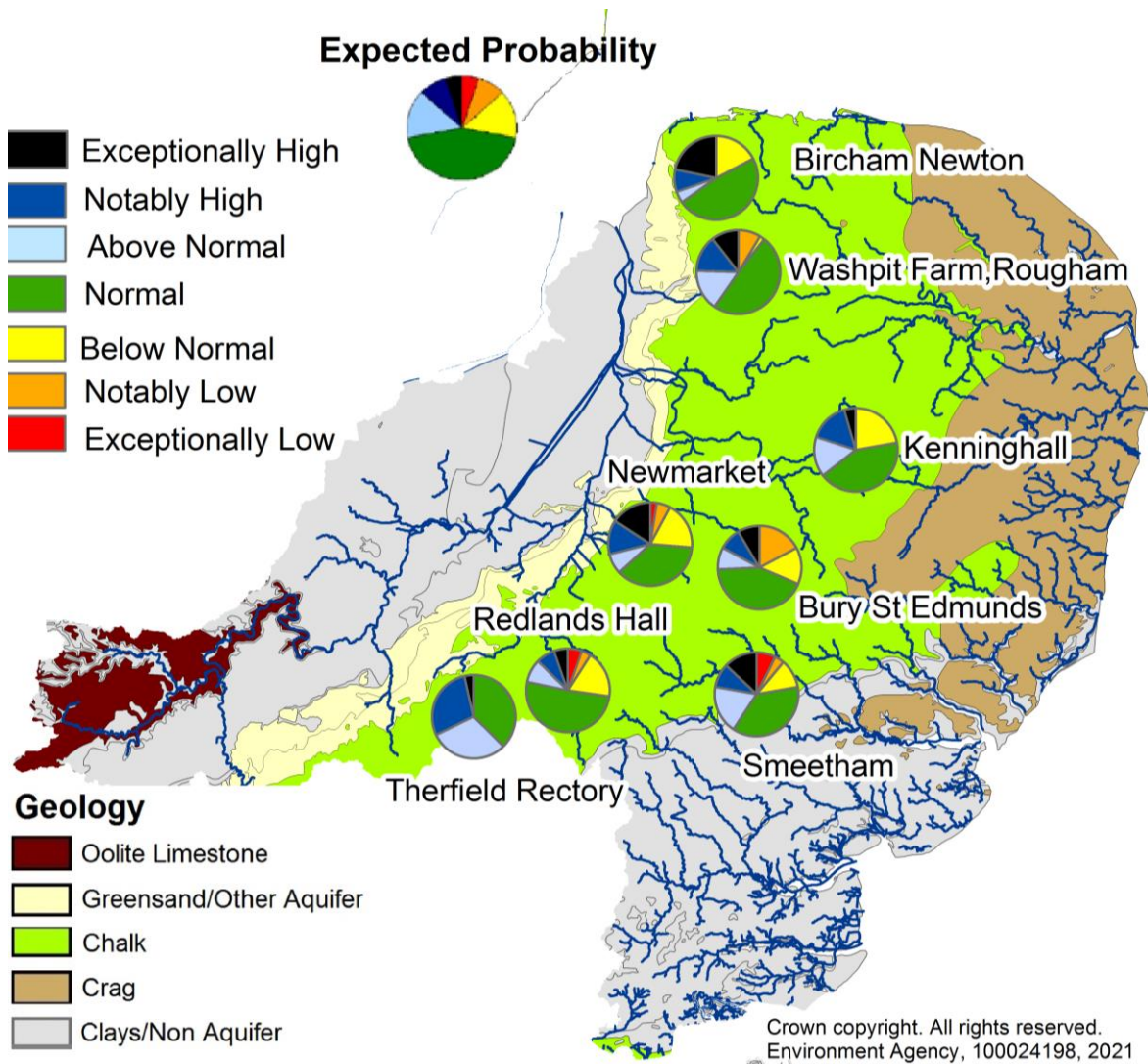
**Probabilistic ensemble projections of river flows at key indicator sites in December 2021.** Pie charts indicate probability, based on climatology, of the surface water flow at each site being e.g. exceptionally low for the time of year. (Source: [Centre for Ecology and Hydrology](#), Environment Agency) Geological map reproduced with kind permission from UK Groundwater Forum, BGS © NERC. Crown copyright. All rights reserved. Environment Agency, 100026380, 2021

## Forward Look - Groundwater



*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 2021.** 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, 2021.



*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 2022.** 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, 2021.

## 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 <sup>3</sup> s <sup>-1</sup> )
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.
Groundwater level	The water level measured in the aquifer at a borehole, which may include the impacts of artificial influences.
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.
River Flow	The flow in the river measured at a gauging station which includes the upstream impact of artificial influences.
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 within the historic record.
Notably high	Value likely to fall within this band 8% of the time within the historic record.
Above normal	Value likely to fall within this band 15% of the time within the historic record.
Normal	Value likely to fall within this band 44% of the time within the historic record.
Below normal	Value likely to fall within this band 15% of the time within the historic record.
Notably low	Value likely to fall within this band 8% of the time within the historic record.
Exceptionally low	Value likely to fall within this band 5% of the time within the historic record.