

Monthly Water Situation Report

East of England

Summary – March 2021

East Anglia received 77% of the long term average rainfall in March which is in the normal category. Soil moisture deficits has increased and ended the month with an average SMD of 15mm with monthly mean river flows ranging from normal to exceptionally high across the area. The groundwater levels have decreased at majority of the indicator sites and the reservoir levels at majority of the indicator sites are above their normal operating curve.

Rainfall

East Anglia as a whole received a total average rainfall of 35 mm, equivalent to 77% of the Long Term Average (LTA) which is in the lower part of the normal category. The majority of the rainfall fell in the first two weeks with a relatively dry weather towards the end of the month. There was slight variations of rainfall total across the catchments, with the lowest amount falling in the South Essex catchment which received a total of 23 mm (56% of LTA); and the highest amount falling in the Cam catchment which received a total of 37 mm rainfall (90% of the LTA). The 12 month rainfall surplus has increased to 706mm for the time of year.

Soil Moisture Deficit/Recharge

Soil Moisture Deficit (SMD) decreases during the first half of the month then began to increase towards the end of the month as the weather gets warmer. The SMD is fairly consistent across East Anglia in March with an average SMD of 15mm, which is classified as normal for the time of year.

River Flows

Monthly mean river flows has decreased at all the indicator sites in March, ranging from normal to exceptionally high flows across the area. The river flows in the North Norfolk catchments remains high with the River Burn at Burnham Overy, River Nar at Marham and River Heacham at Heacham reporting an exceptionally high flows. Further 10% of the indicator sites has reported above normal flow and 14% of the indicator sites reported notably high flows (out of the 21 indicator sites).

Groundwater Levels

The Groundwater level has started decreasing at majority of the indicator sites in respond to the increasing SMD and a normal amount of rainfall in the last two month. However, groundwater levels at all the indicator sites remain in the normal or higher category for the time of the year. Out of the 20 indicator sites 25% of the sites which are in the chalk aquifer have reported exceptionally high levels and 35% of indicator sites have reported notably high groundwater levels. There is one groundwater flood alerts that remain in place for Newmarket in March.

Reservoir Storage/Water Resource Zone Stocks

Reservoir storage levels have increased at all the indicator sites with the exception of Alton. Normal or higher storage levels are reported at majority of the indicator sites with the exception of Ardleigh which is reporting notably low storage level by the end of March. Reservoir levels at all sites are above their normal operating curves except at Ardleigh.

Environmental Impact

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

Forward Look

Probabilistic ensemble projections for river flows at key sites

June 2021: There is a reduced probability of exceptionally low river flows at all the key sites with an increased probability of normal flows at majority of the key sites in June.

September 2021: There is a reduced probability of exceptionally low and notably low river flows at all the indicator sites with the exception of the River Gipping where the probability of all the flow categories are relatively as expected in September.

Probabilistic ensemble projections for groundwater levels in key aquifers

September 2021: There is greatly a reduce probability of below normal or lower groundwater levels at all the key sites, with a greatly increased probability of exceptionally high levels at Kenninghall in the Little Ouse chalk and a greatly increased probability of notably high level at Therfield Rectory in the North Herts chalk.

March 2022: There is a reduced probability of exceptionally low groundwater levels at all the key sites in March.

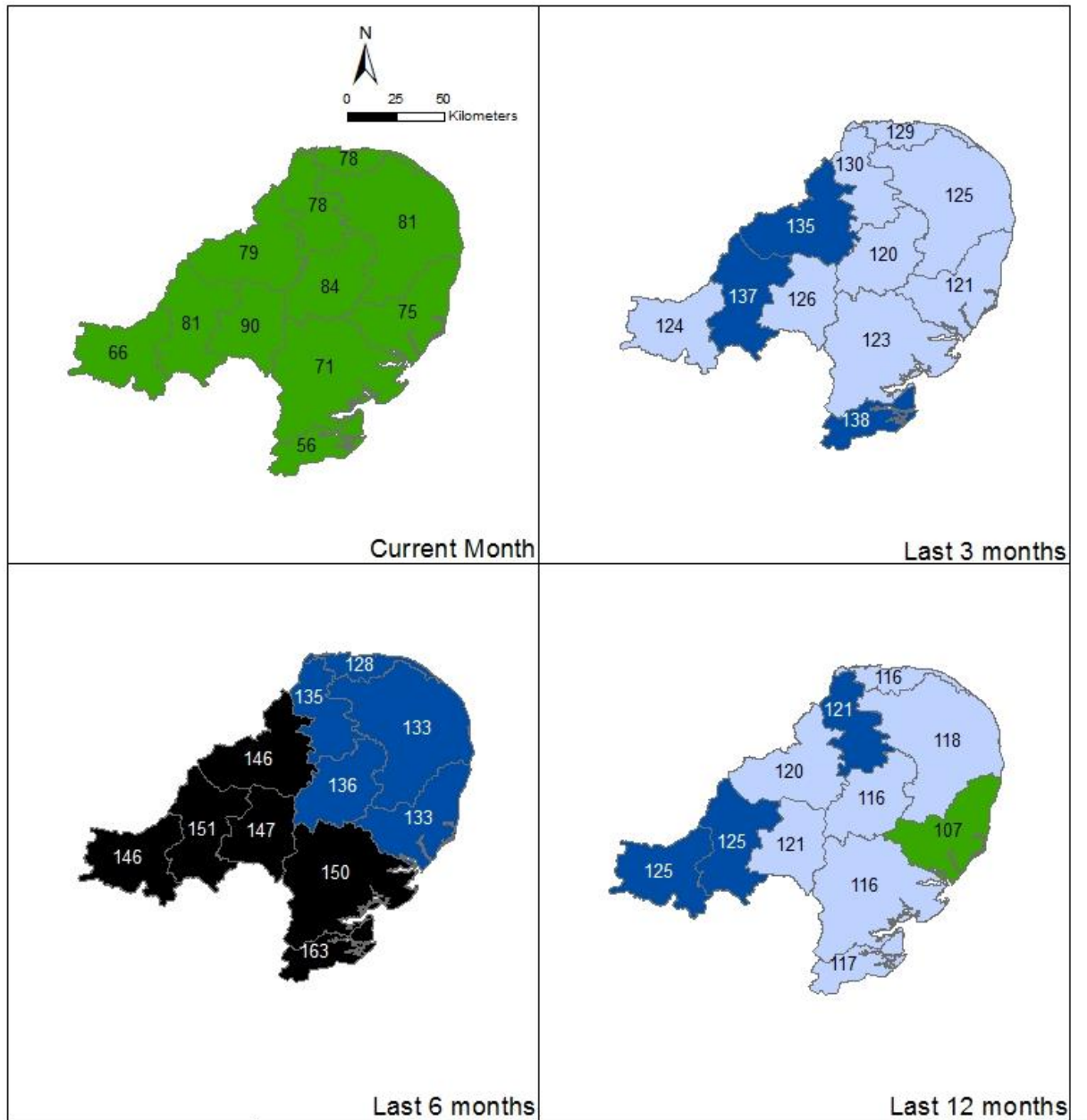
Author:

[Hydrology & Operations](#)

Contact details: 03708506506

Rainfall

March 2021



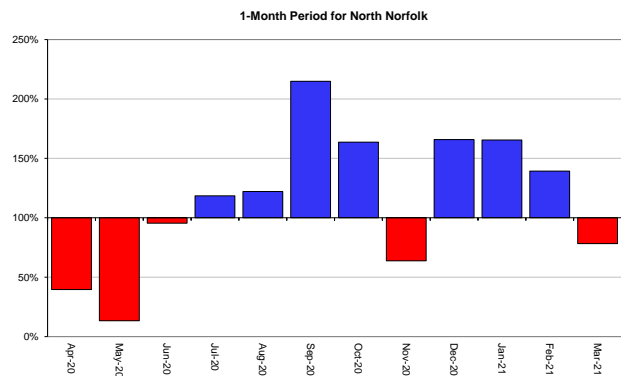
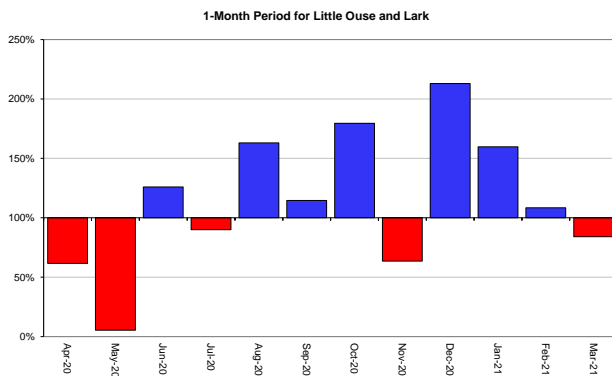
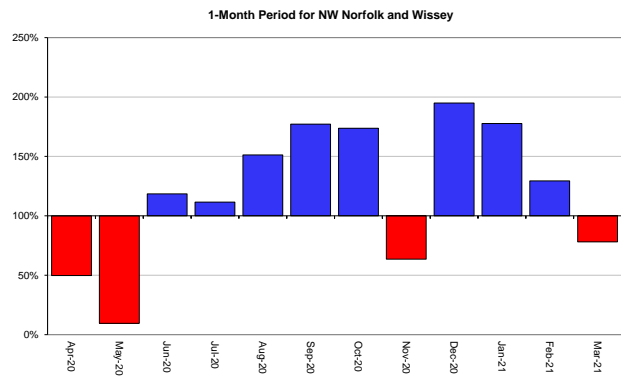
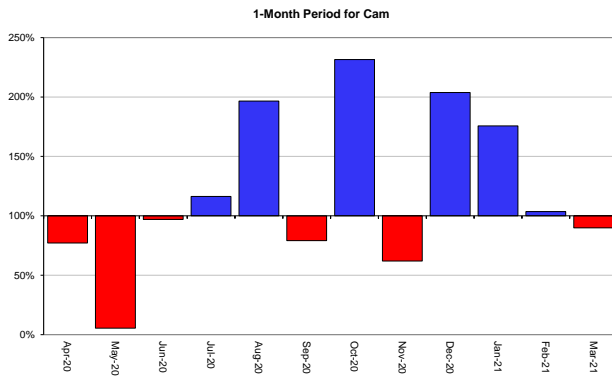
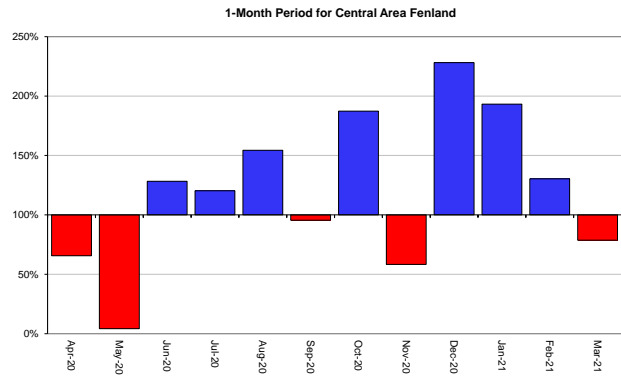
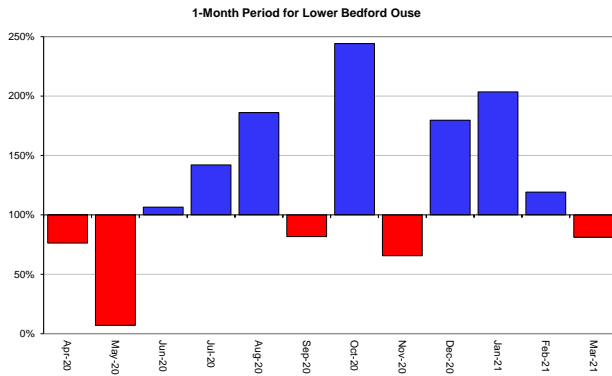
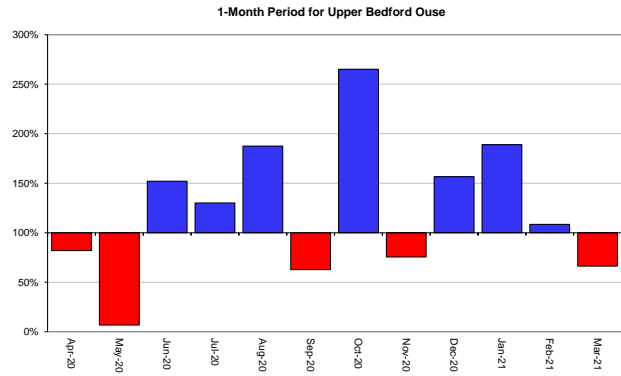
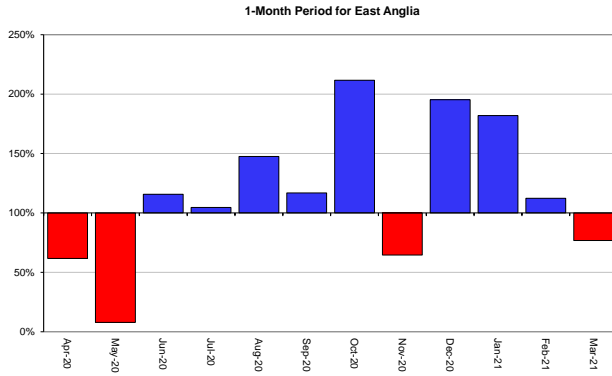
- Exceptionally high
- Notably high
- Above normal
- Normal
- Below normal
- Notably low
- Exceptionally low

Rainfall expressed as percentage of 1961-1990 Long Term Average for the specified duration. Classes derived from data for the period 1891 to 2017 based on the HadUK 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 HadUK data based on the Met Office 1 km gridded rainfall dataset derived from rain gauges (Source: Met Office © Crown Copyright, 2020). Provisional data based on Environment Agency 1 km gridded rainfall dataset derived from Environment Agency intensity rain gauges. Crown copyright. All rights reserved. Environment Agency, 100024198, 2020.

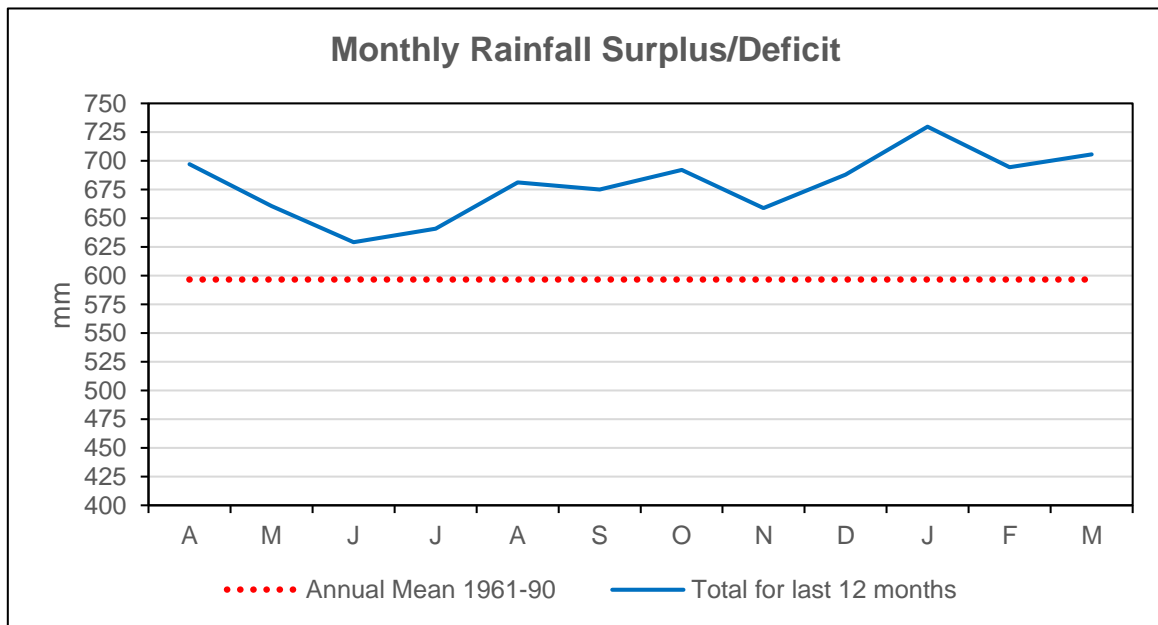
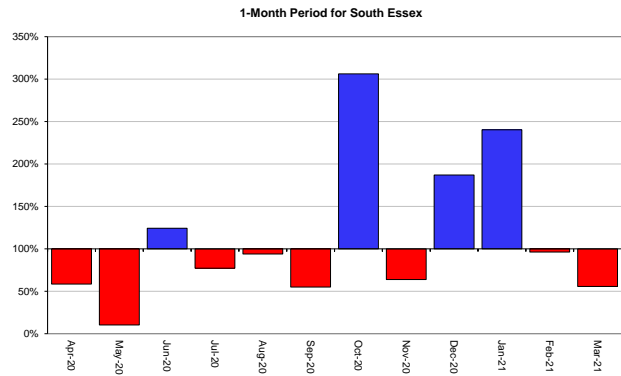
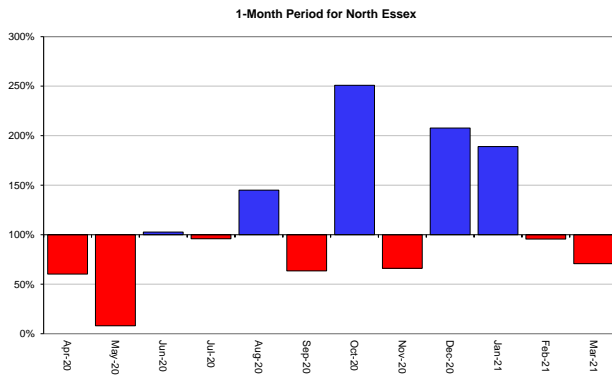
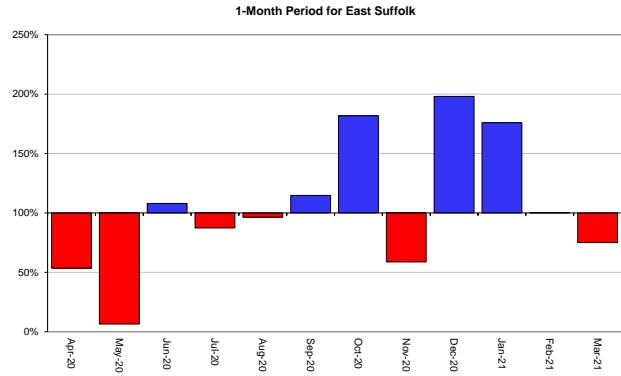
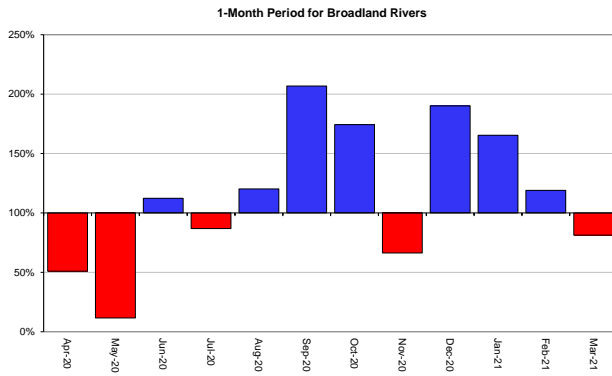
Above average rainfall

Below average rainfall

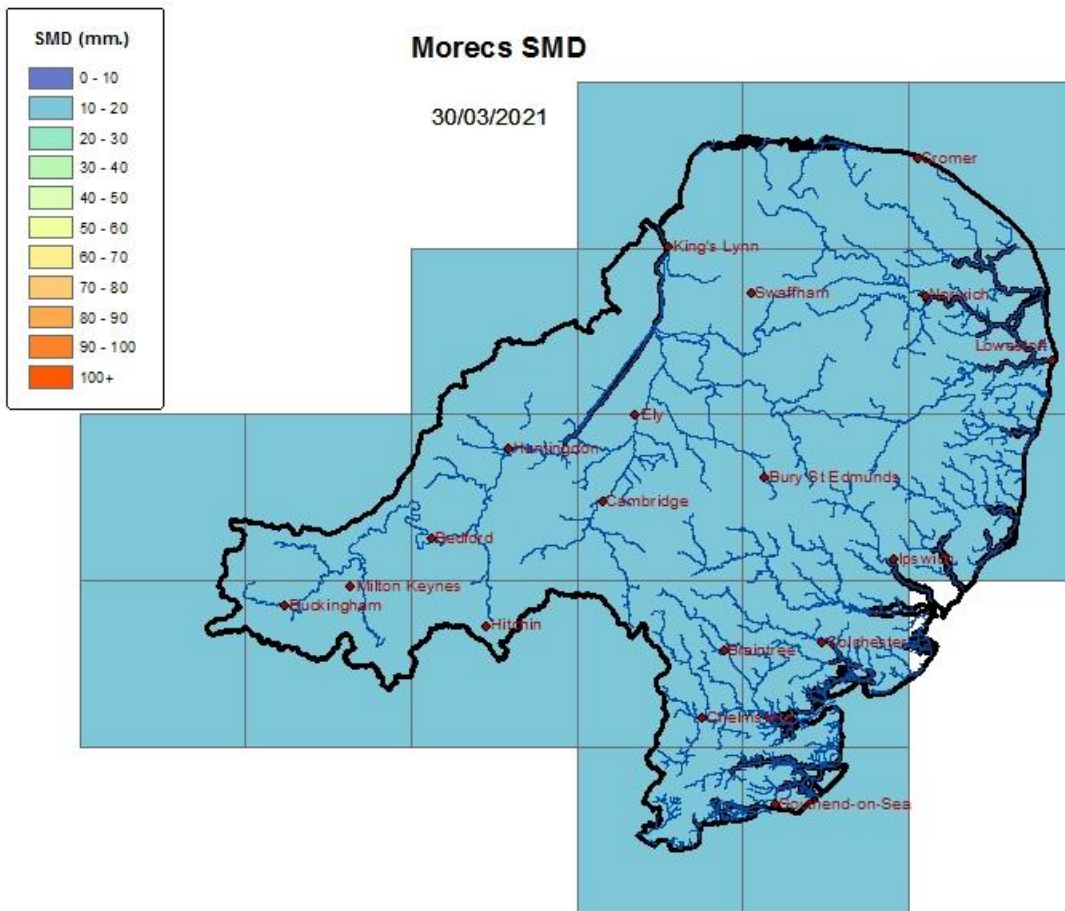


Above average rainfall

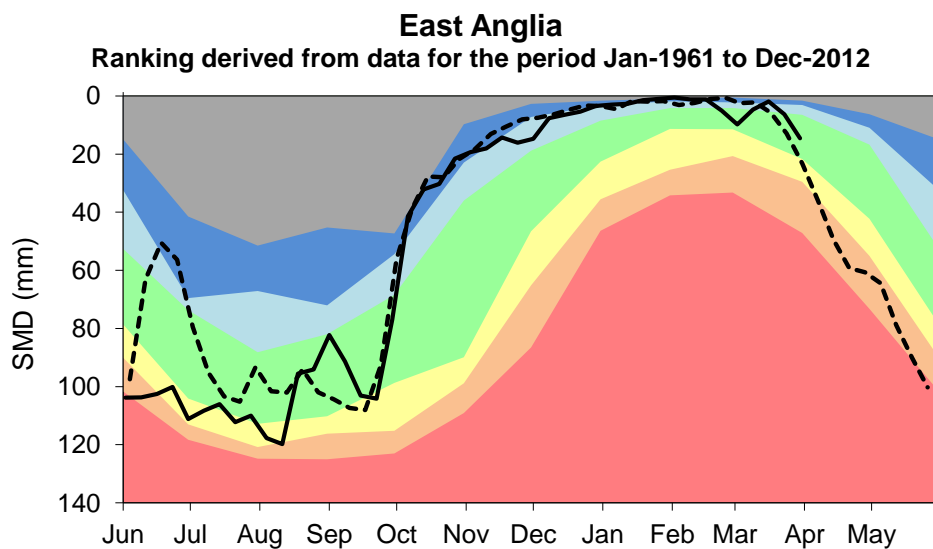
Below average rainfall



Soil Moisture Deficit

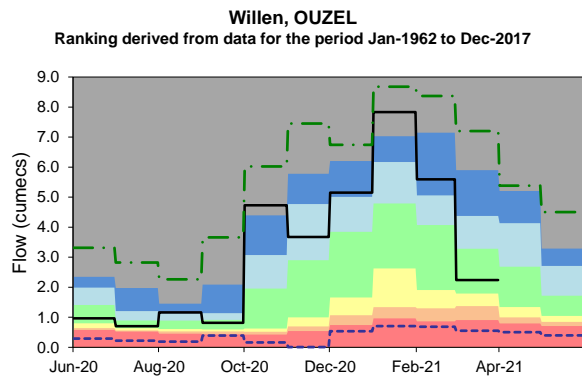
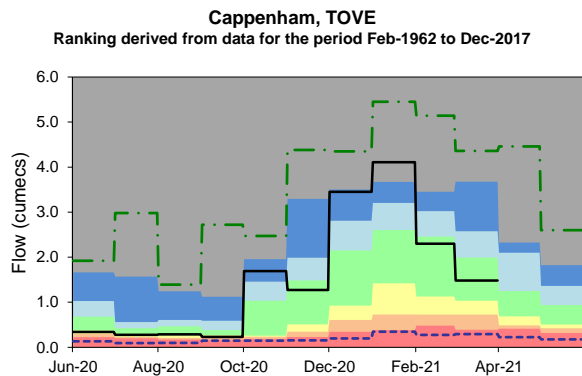
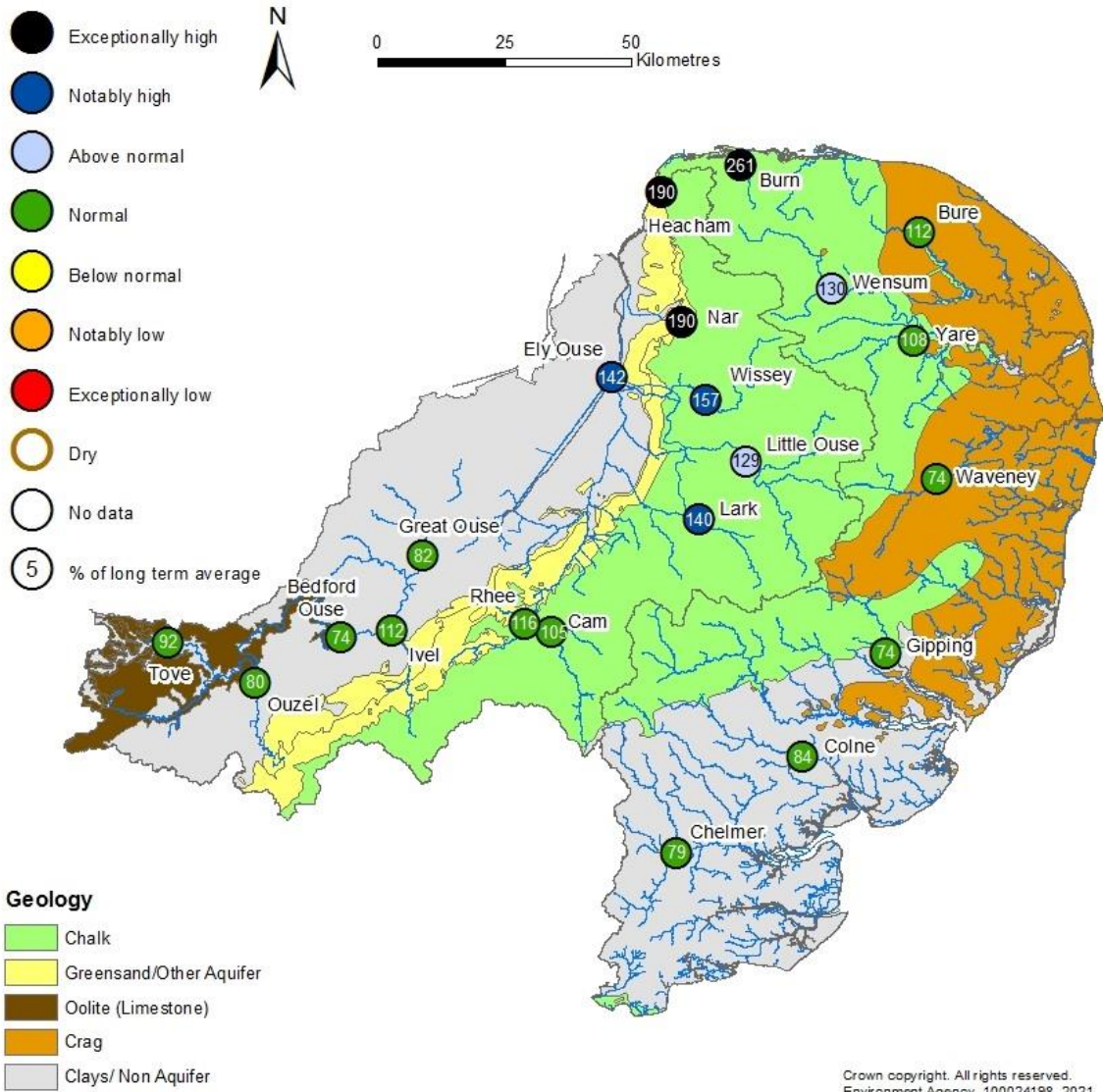


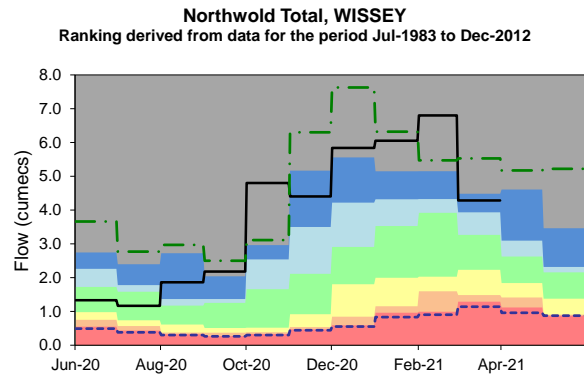
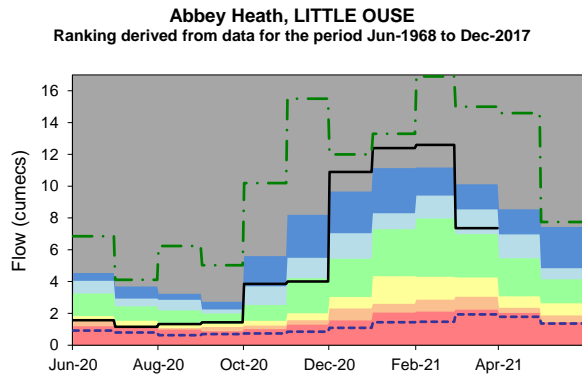
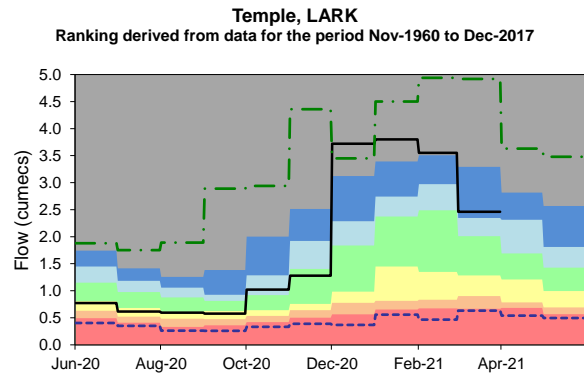
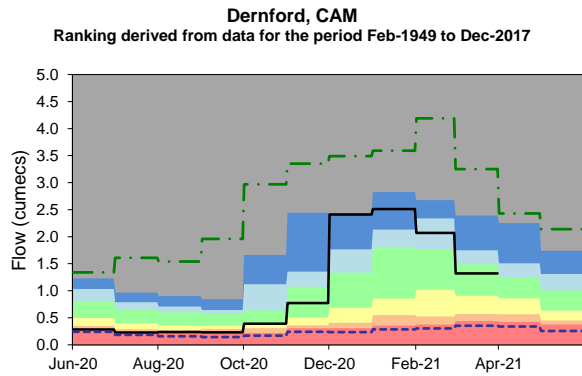
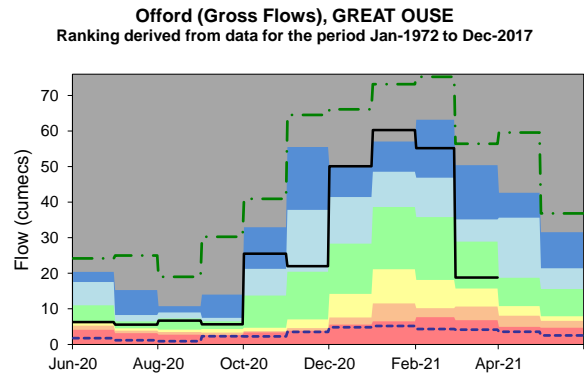
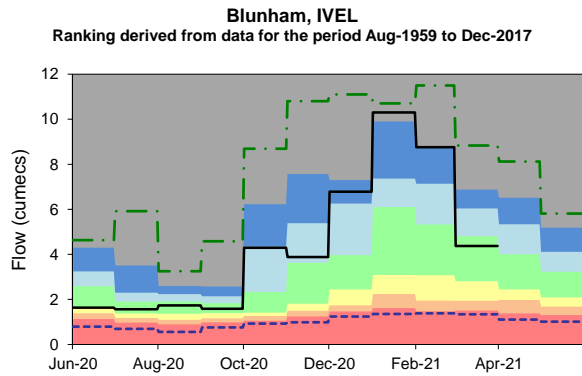
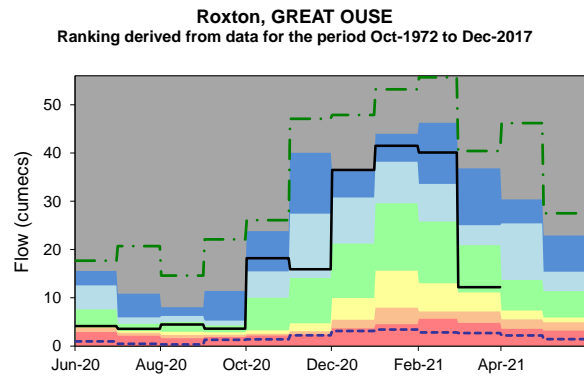
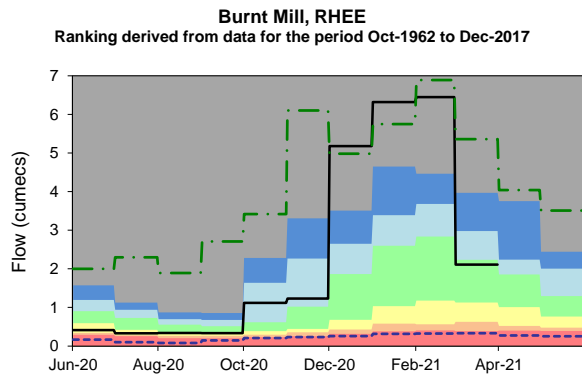
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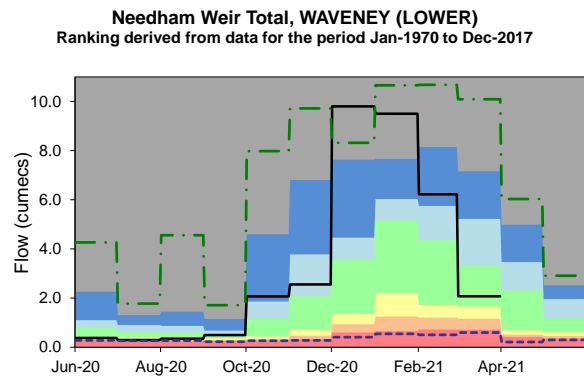
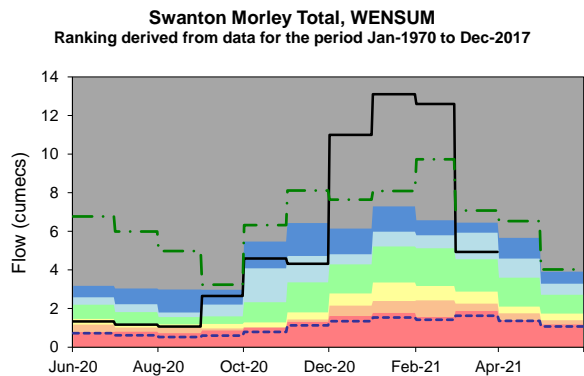
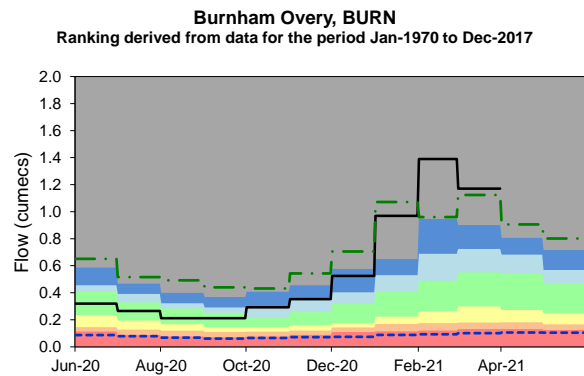
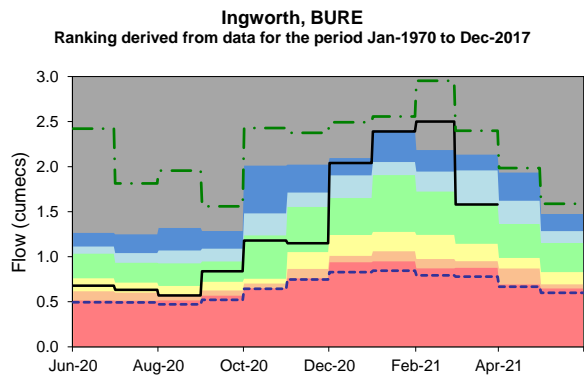
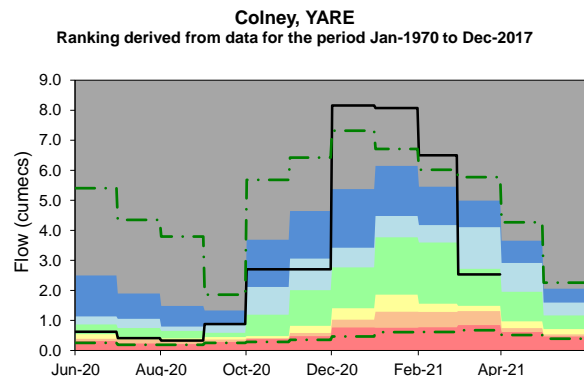
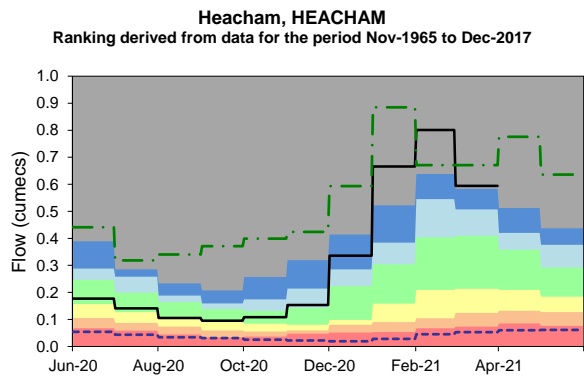
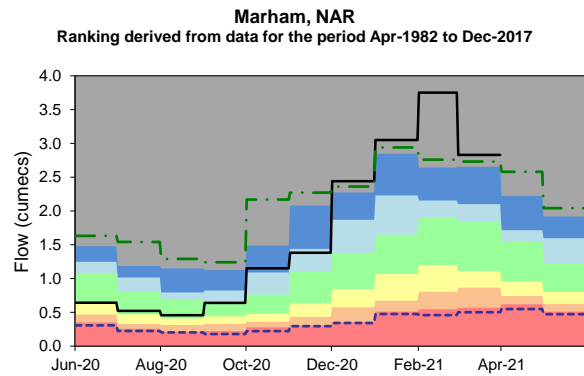
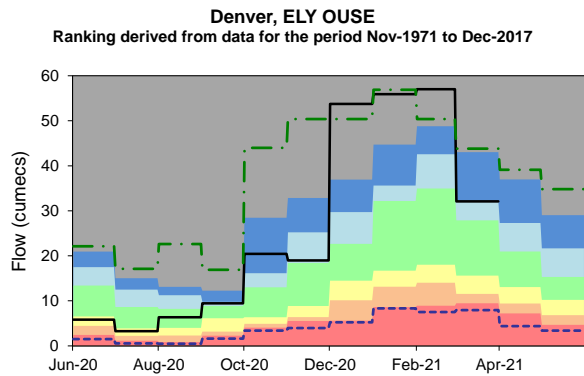


River Flow

March 2021



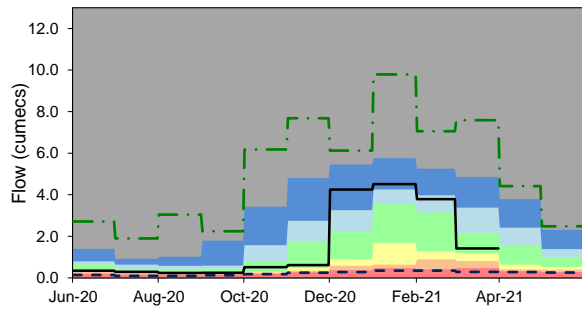






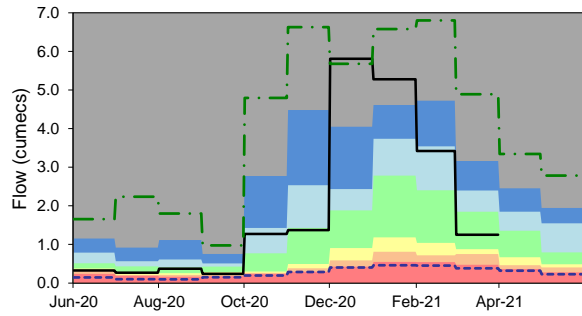
Bramford, GIPPING

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



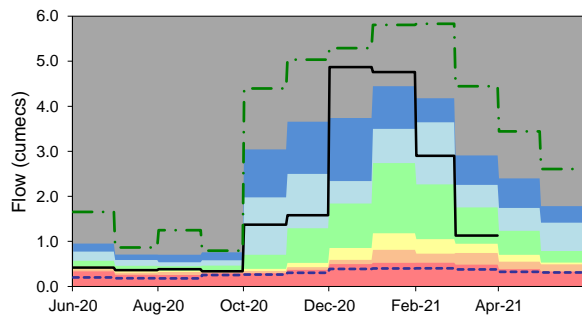
Lexden, COLNE

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

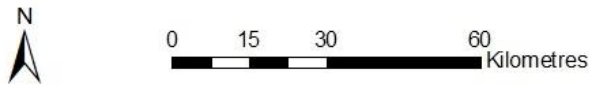


Springfield, CHELMER

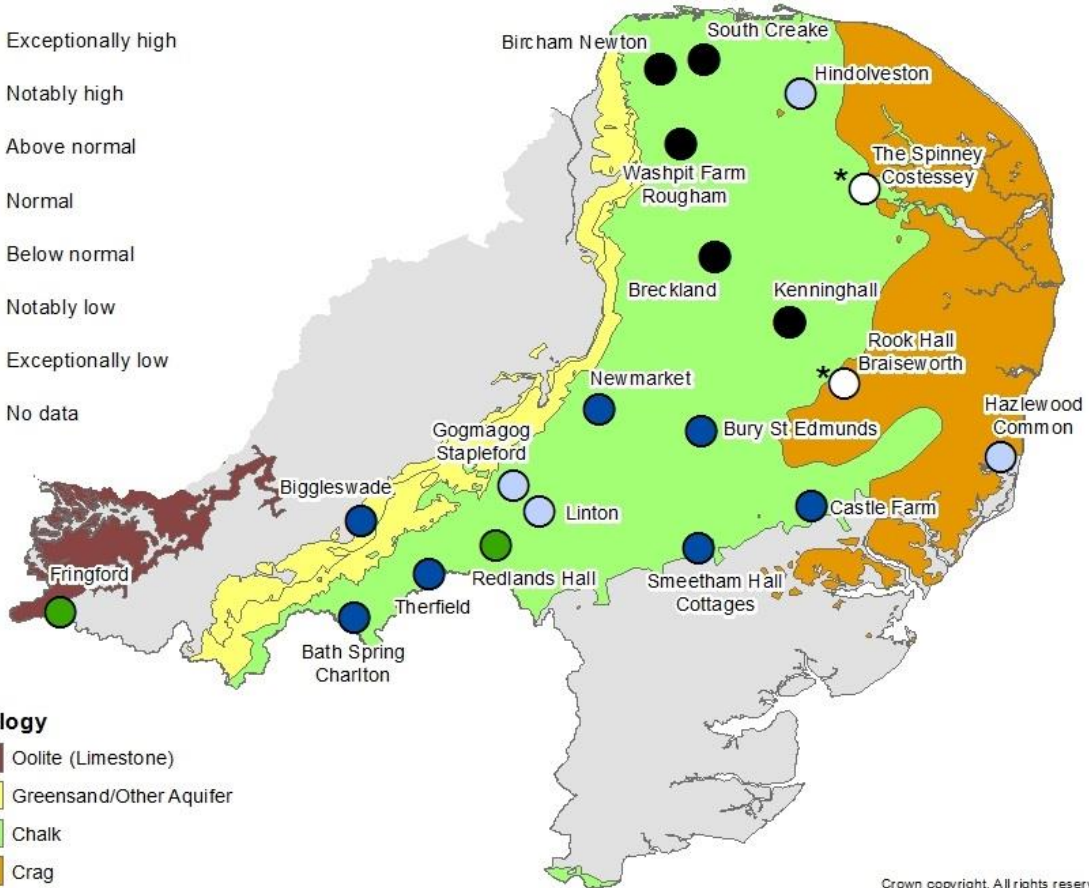
Ranking derived from data for the period Jan-1970 to Dec-2017



Groundwater Levels March 2021



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

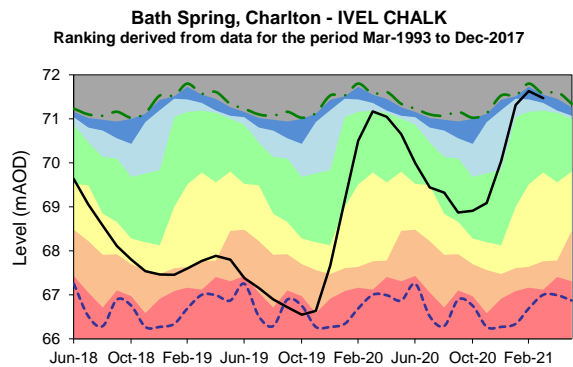
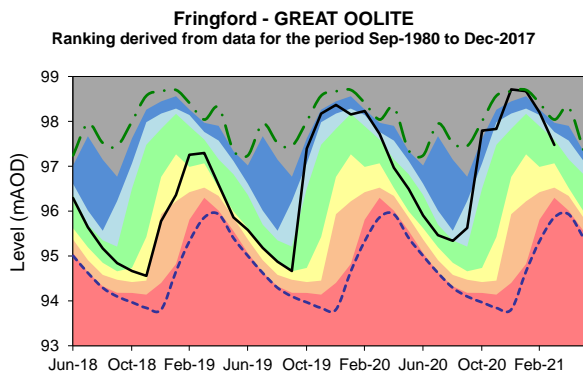


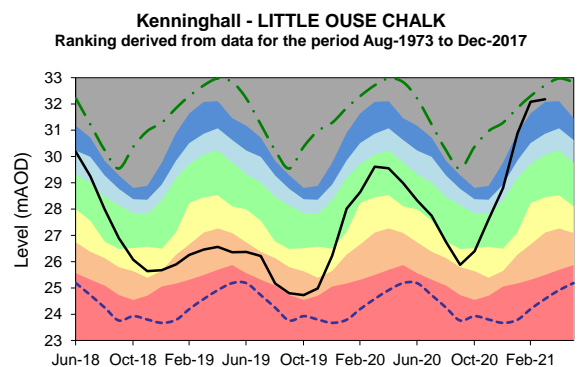
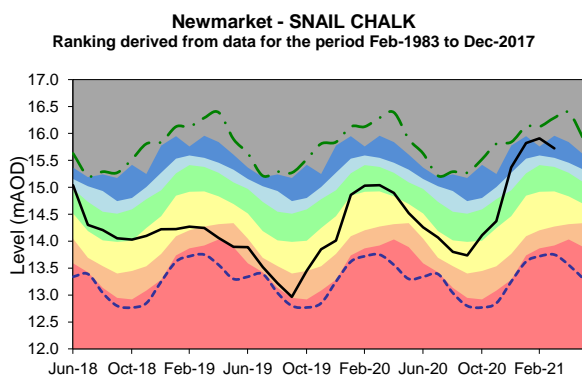
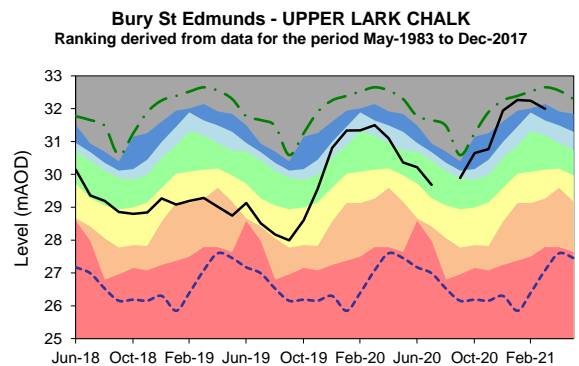
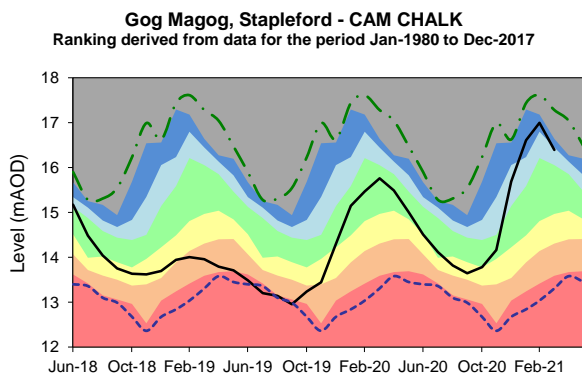
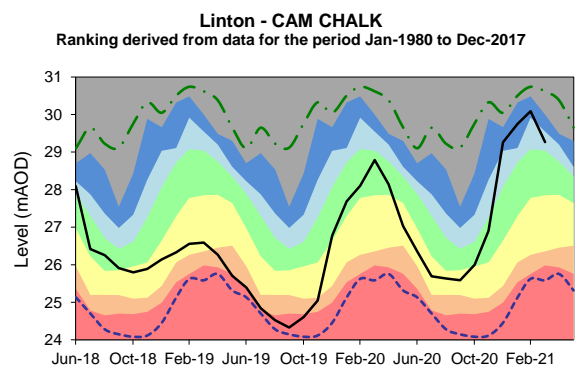
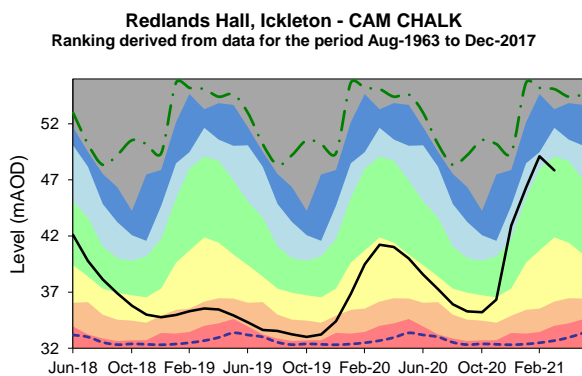
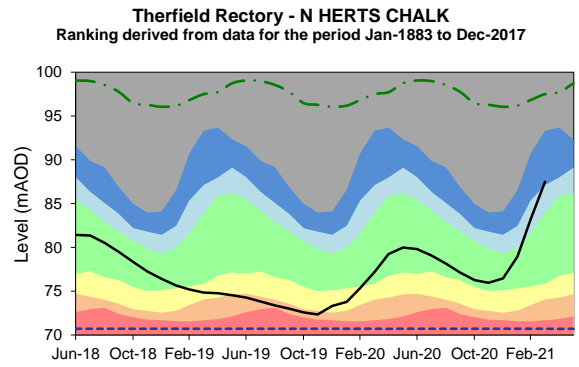
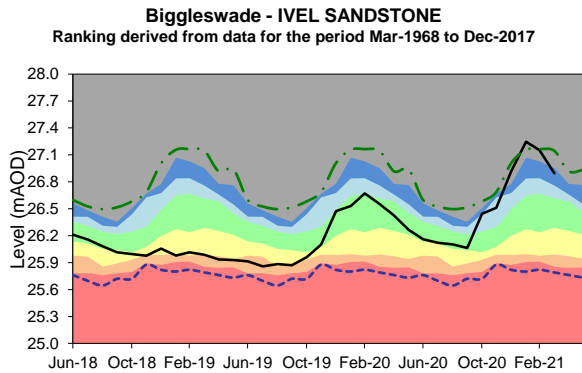
Geology

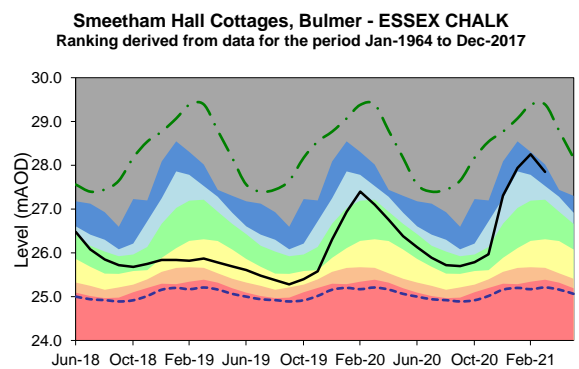
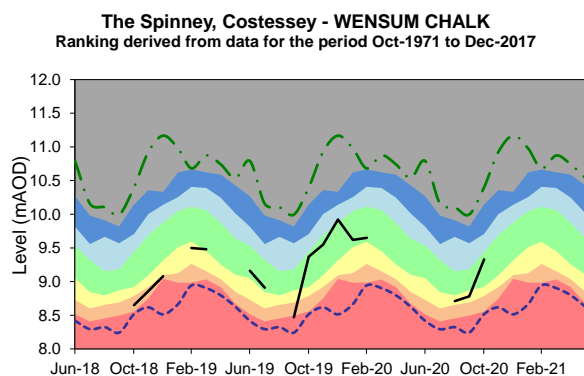
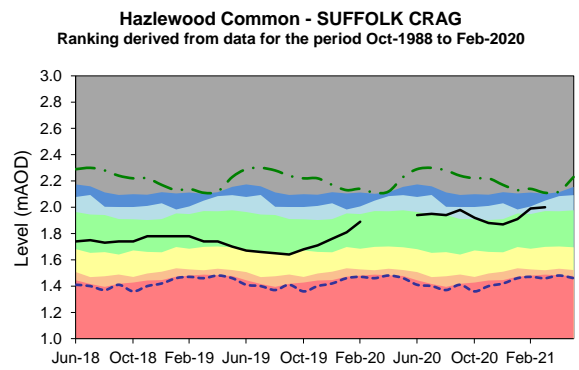
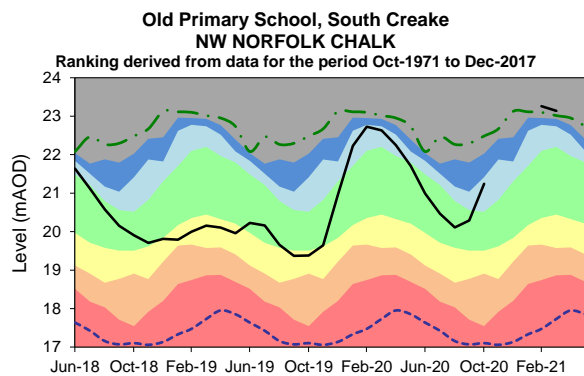
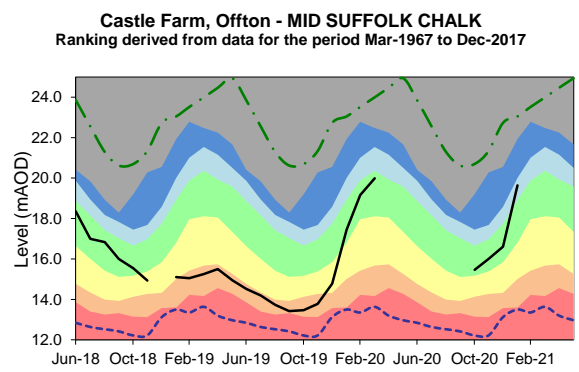
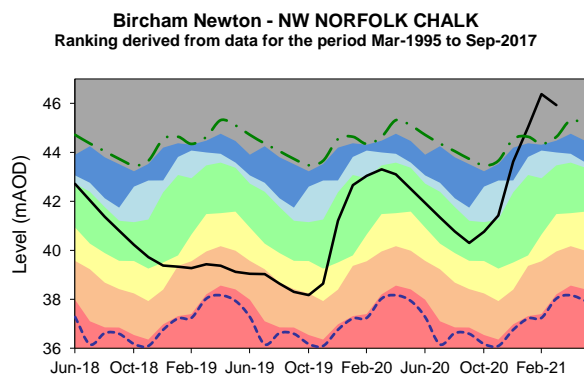
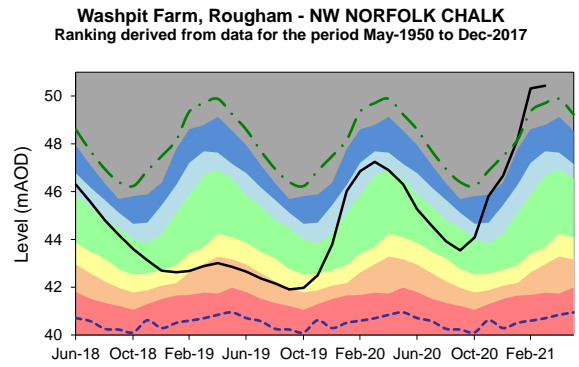
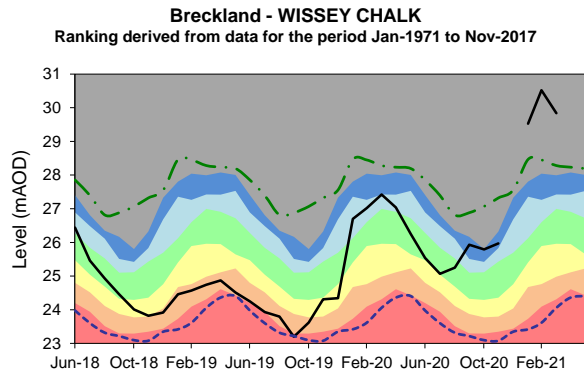
- Oolite (Limestone)
- Greensand/Other Aquifer
- Chalk
- Crag
- Clays/Non Aquifer

*Monitoring activities suspended due to the COVID19 incident.

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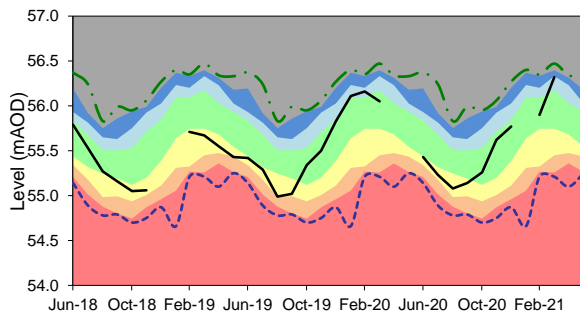




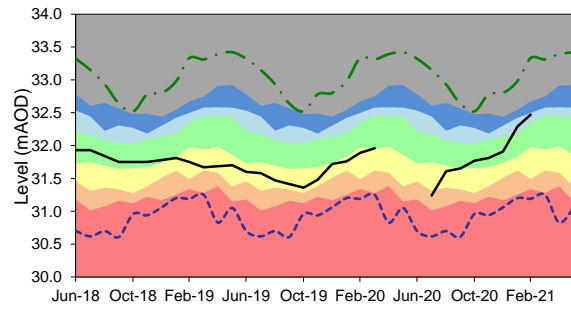




Hindolveston - NORFOLK CHALK
Ranking derived from data for the period Sep-1984 to Nov-2017

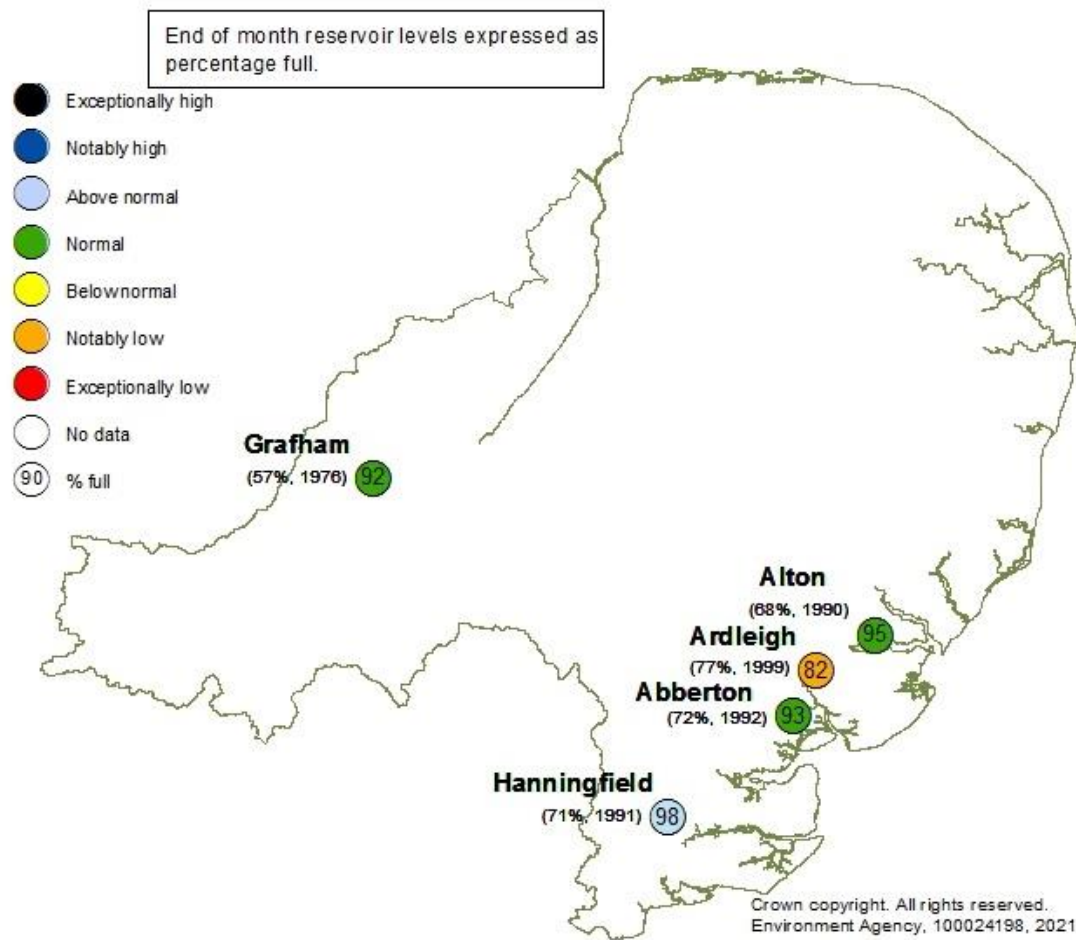


Rook Hall, Braiseworth - SUFFOLK CHALK
Ranking derived from data for the period Jan-1980 to Dec-2017

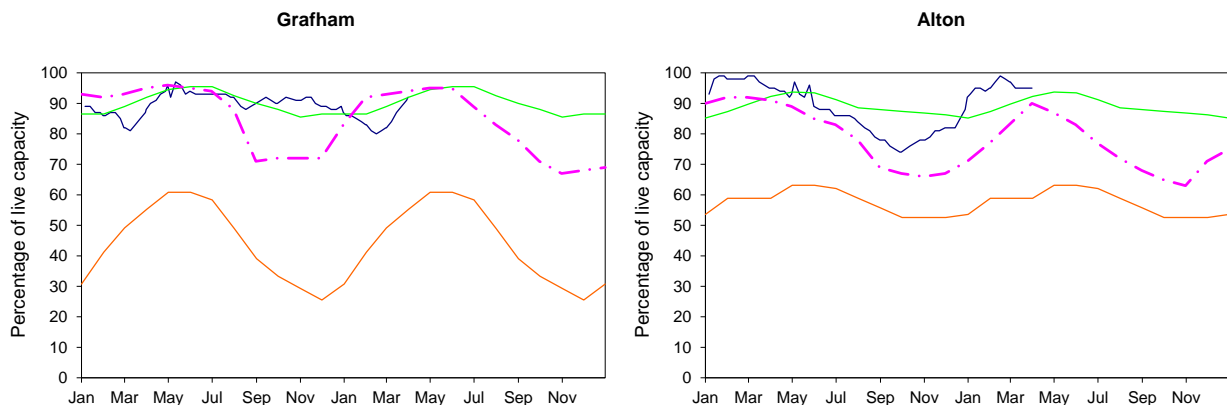


Reservoir Stocks

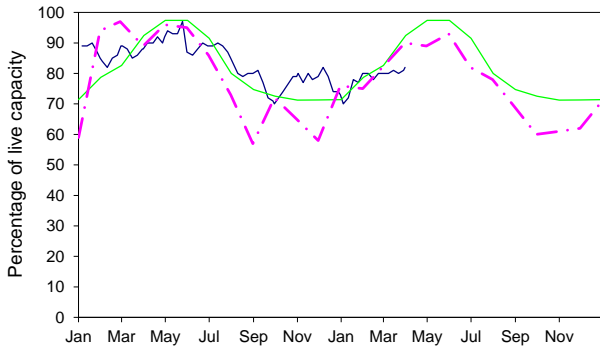
March 2021



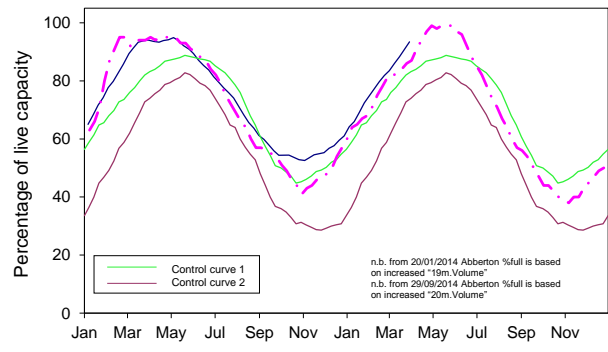
— 2020-2021 — Normal Operating Curve — Drought Alert Curve - - - 1995-1996



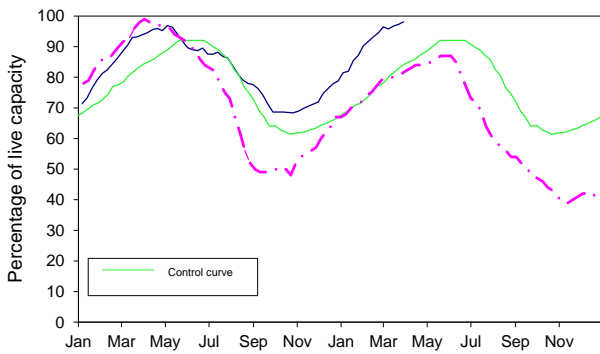
— 2020-2021 — Normal Operating Curve
Ardleigh



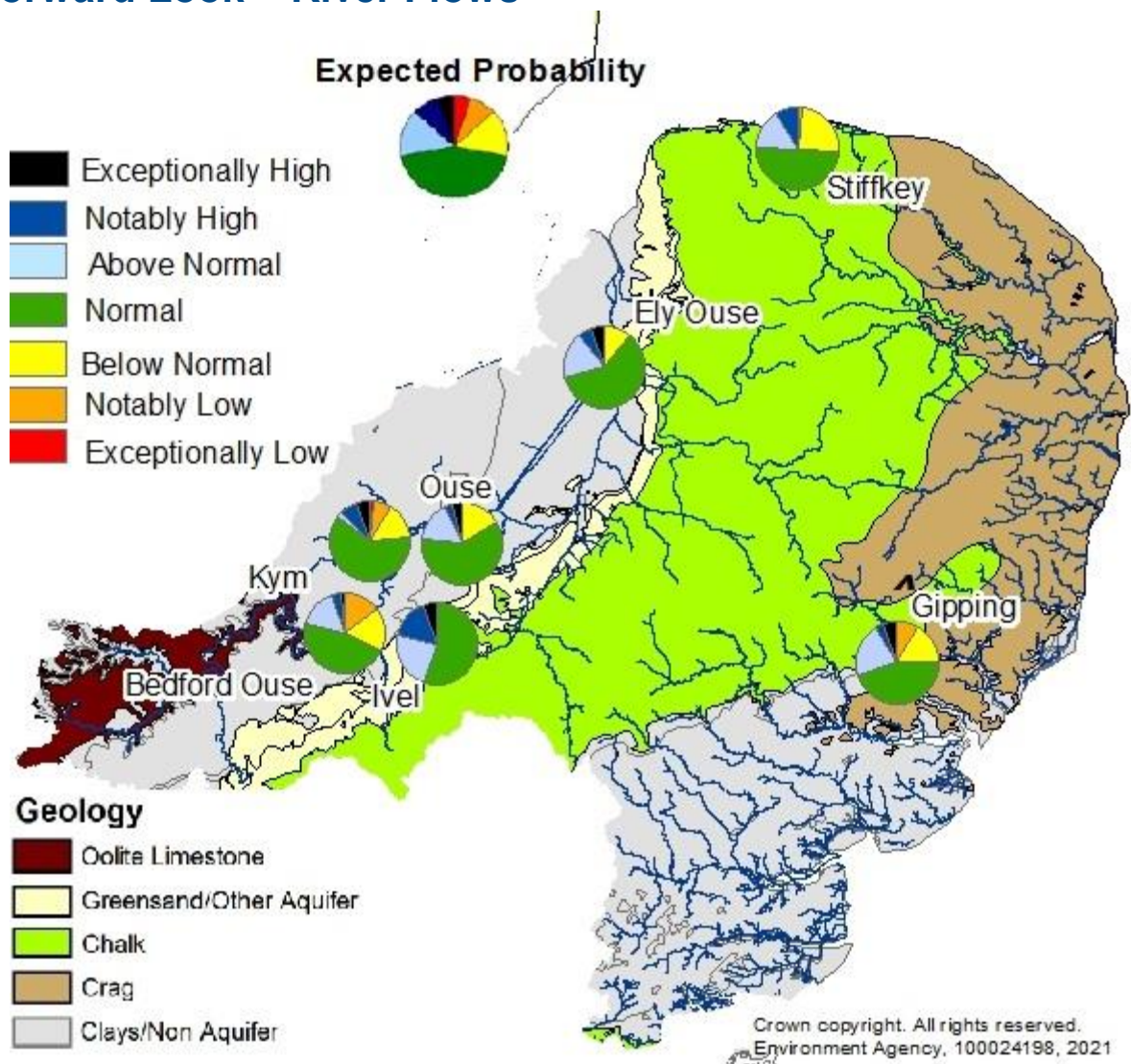
— Drought Alert Curve — 1995-1996
Abberton



Hanningfield



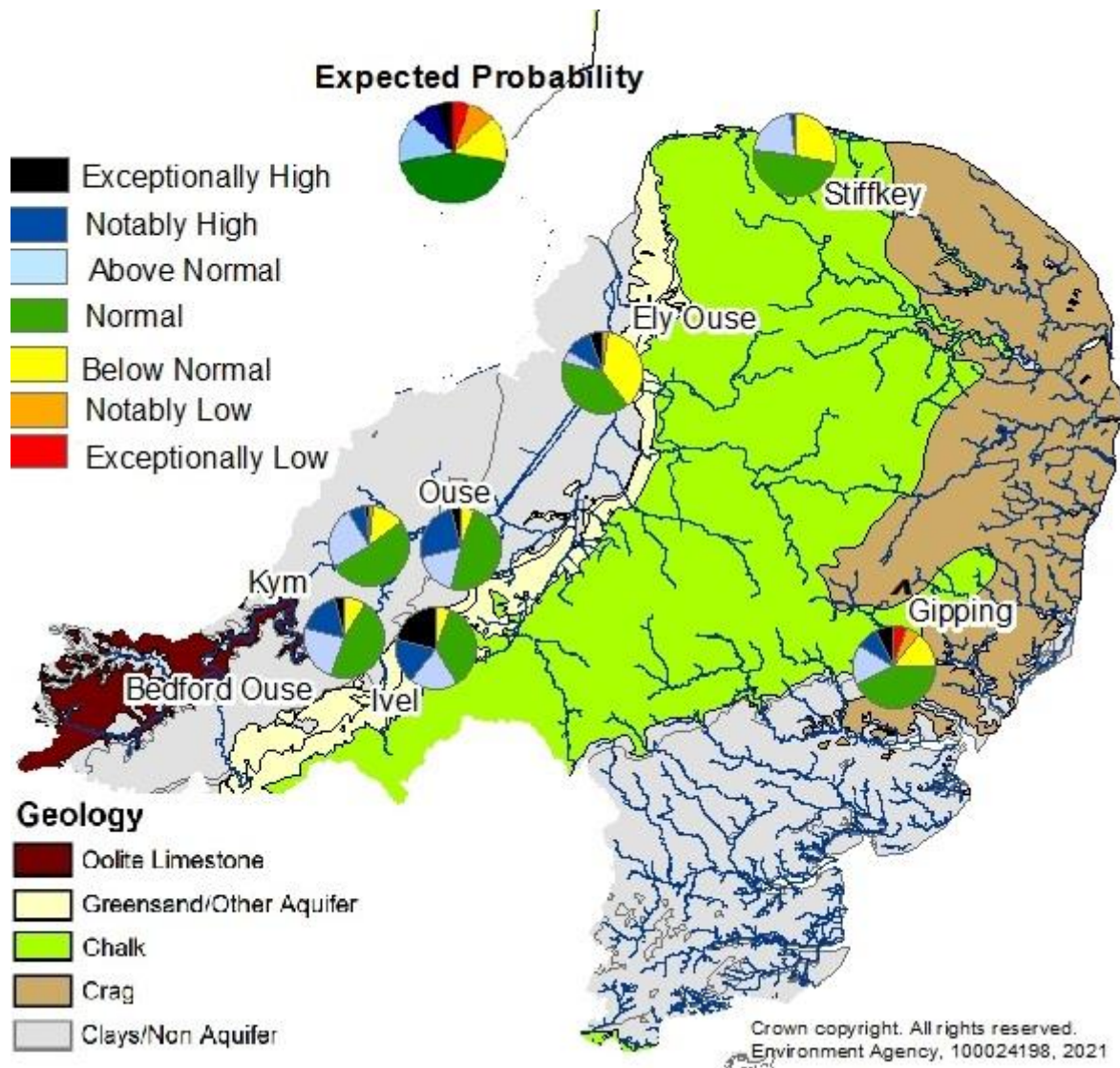
Forward Look – River Flows



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 June 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.

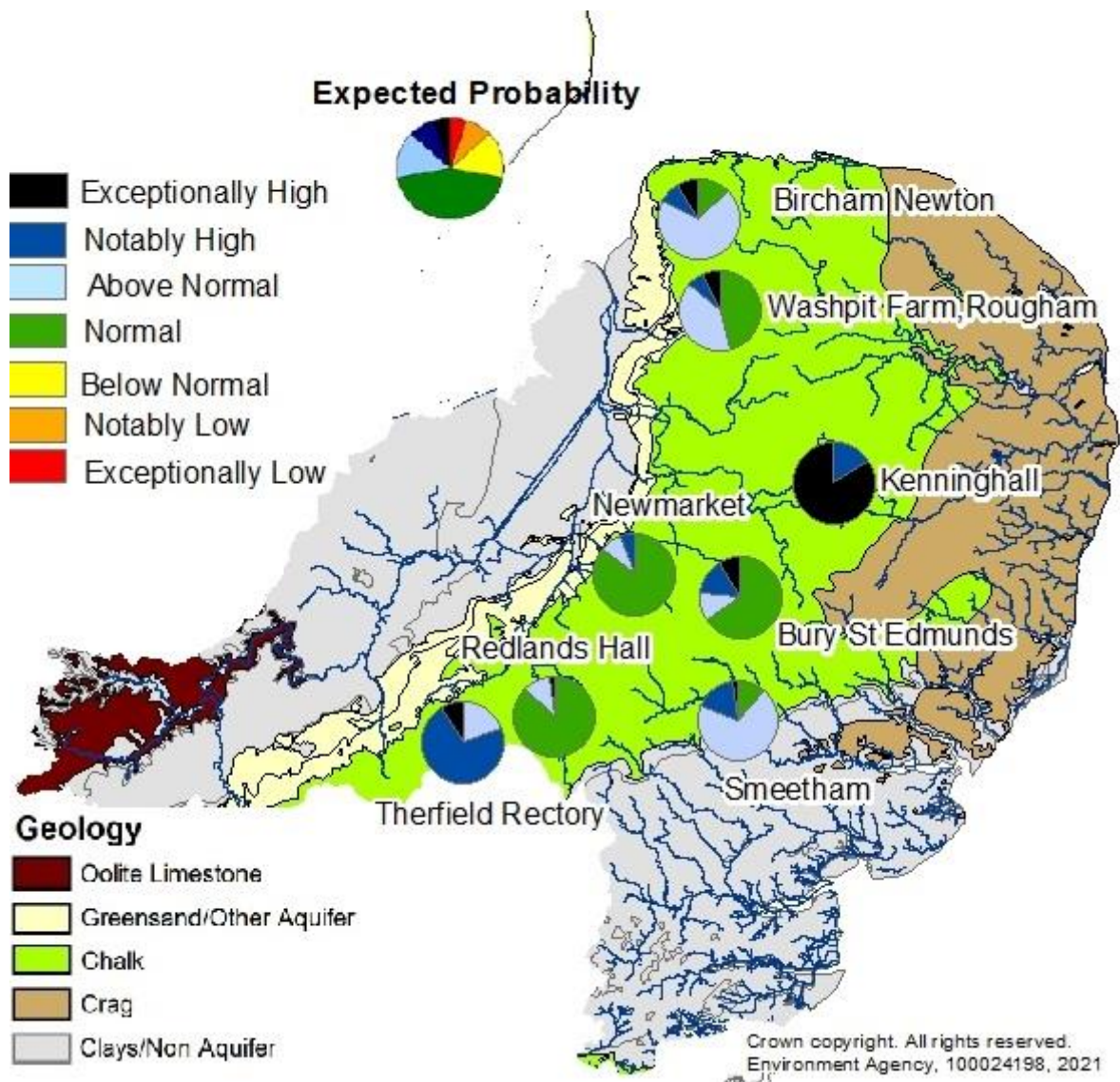
[^] "Naturalised" flows are projected for these sites'



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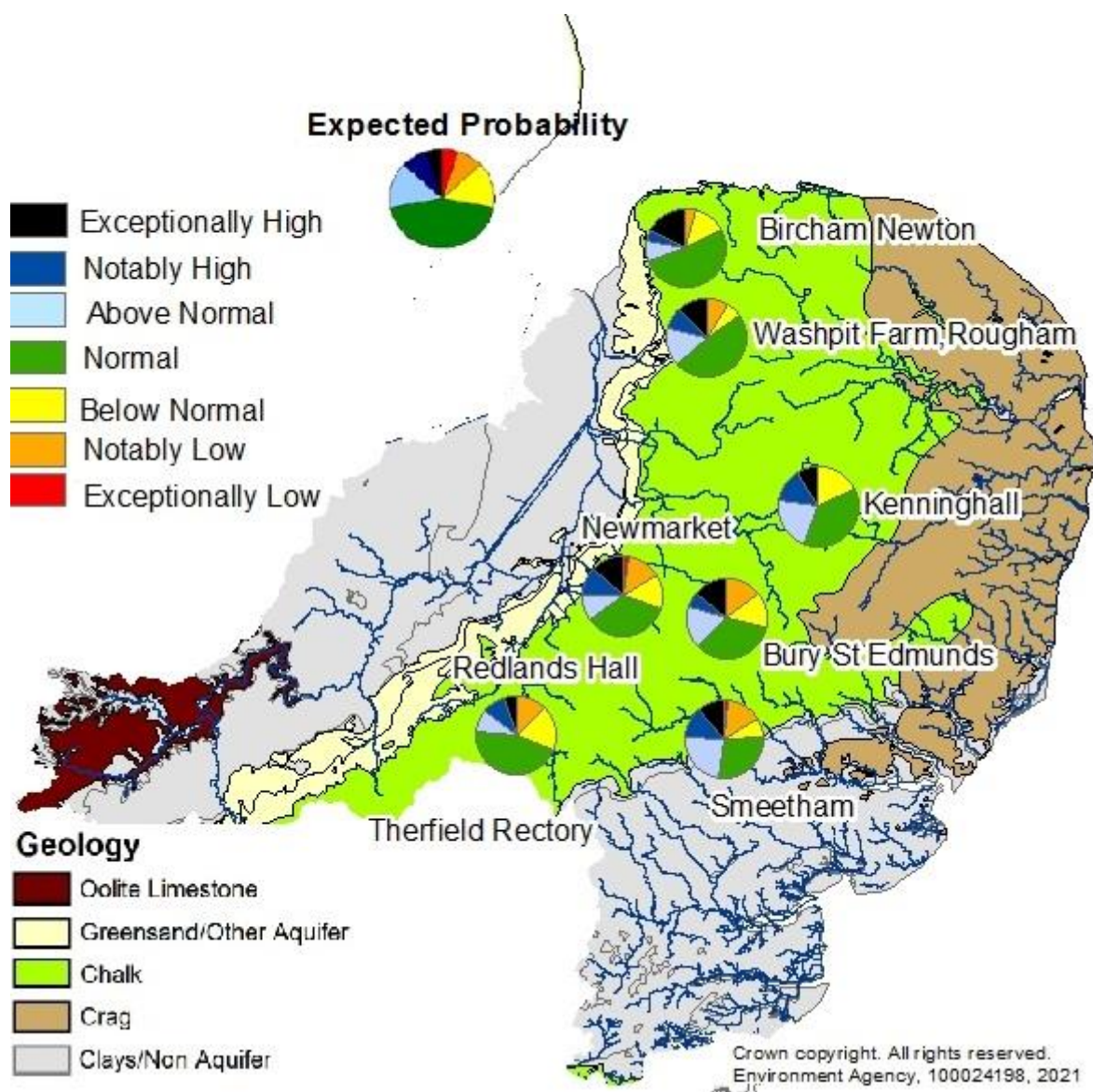
Probabilistic ensemble projections of river flows at key indicator sites in September 2021. Pie charts indicate probability, based on climatology, of the surface water flow at each site being e.g. exceptionally low for the time of year. (Source: [Centre for Ecology and Hydrology](#), Environment Agency)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

Forward Look - Groundwater



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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.



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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.
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.