Monthly Water Situation Report

East Anglia

Summary – April 2021

April was an exceptionally dry month with East Anglia receiving a total average rainfall of 6mm (13% of the Long Term Average (LTA)). The Soil Moisture Deficit (SMD) has reached 56mm at the end of the month with a notably high category across the area. Despite the lack of rainfall the river flows and groundwater levels at majority of the indicator sites remains at or above the normal category. Reservoir storage levels at majority of the indicator site are above their normal operating curve for the time of the year.

Rainfall

April was exceptionally dry, with an average rainfall of 6mm recorded across East Anglia which was 13% of the Long Term Average (LTA). There was slight variations of rainfall total across the catchments with majority of the catchment receiving an exceptionally low rainfall except the Upper Bedford Ouse, NW Norfolk & Wissey and North Norfolk, which received a notably low rainfall for the time of the year. The accumulated rainfall totals for the last 3 months are considered to be notably low and the 12 month rainfall accumulation remains above normal with a total of 683mm.

Soil Moisture Deficit/Recharge

With the exceptionally dry weather in April, the Soil Moisture Deficit (SMD) has increased over the month reaching a notably high category. The SMD varies across East Anglia ending the month with an average SMD of 56mm.

River Flows

River flows has decreased at all the indicator sites due to exceptionally low rainfall in April. However majority of the flow remains at or above the normal category. In general the indicator sites in the chalk catchment are recording higher flows as compared to the sites within the clay, oolite and crag. Mahram at the River Nar and Burnham Overy at the River Burn recorded a notably high river flows. Above normal flows were recorded at the River Heacham, Wissey and Lark for the time of the year.

Groundwater Levels

The Groundwater levels has decreased at majority of the indicator sites in April with the exception of Hazlewood Common in the Northern Herts chalk, and Therfield Rectory in the Suffolk Crag. Despite the lack of recharge through the month, levels at all sites has recorded a normal or above groundwater levels. Out of the 20 indicator sites 3 sites in the North- West Norfolk Chalk (i.e.,Bircham Newton, South Creak and Washpit Farm) recorded an exceptionally high groundwater levels, 6 sites recorded a notably high levels and 5 sites reported an above normal levels.

Reservoir Storage/Water Resource Zone Stocks

The reservoir storage level has increased at majority of the indicator sites with the exception of Hanningfield. Despite the dry weather, majority of the sites are above their normal operating curve and recorded a normal or higher storage level with the exception of Ardleigh which record a notably low storage level in April.

Environmental Impact

Groundwater support scheme operations have remained minimal in April. 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.

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Forward Look

Probabilistic ensemble projections for river flows at key sites

June 2021: There is a reduced probability of exceptionally low flows at all the key sites with the exception of River Kym. More than half of the sites shows an increased probability of normal river flows in June.

September 2021: There is a reduced probability of exceptionally low flows at all the key sites except at River Gipping with a reduced probability of notably low river flows at majority of the key sites.

Probabilistic ensemble projections for groundwater levels in key aquifers

September 2021: There is a greatly reduced probability of exceptionally low, notably low and below normal groundwater levels at all the key sites in September; with a greatly increased probability of normal groundwater levels at majority of the key sites.

March 2022: There is a reduced probability of exceptionally low groundwater levels at majority of the key sites with the exception of Redlands Hall and Smeetham in March.

Author: ANG-Hydrology Contact details: 03708506506

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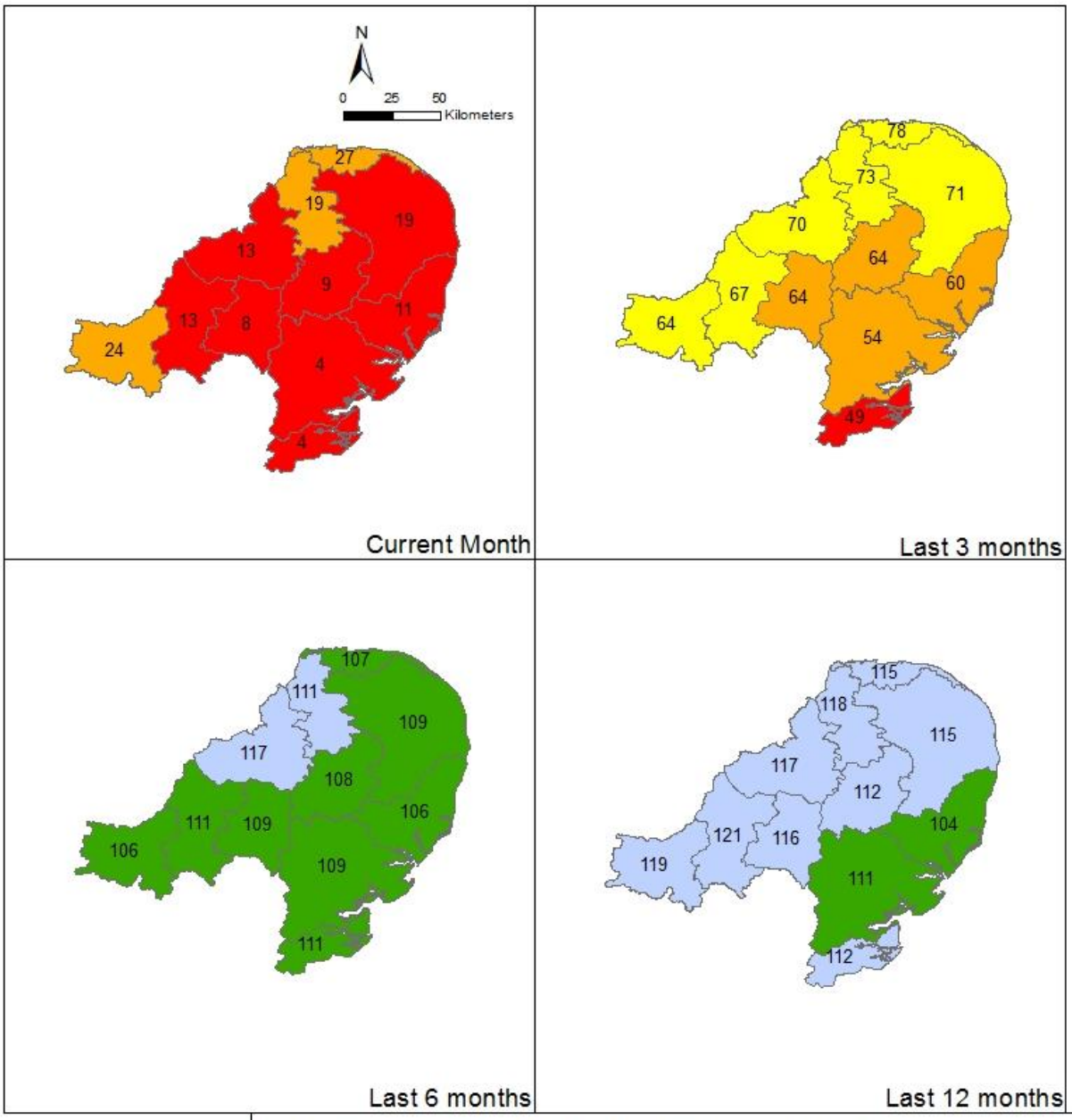
Rainfall

April 2021



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.

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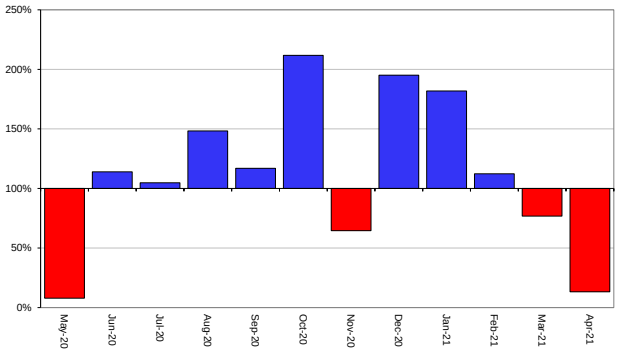
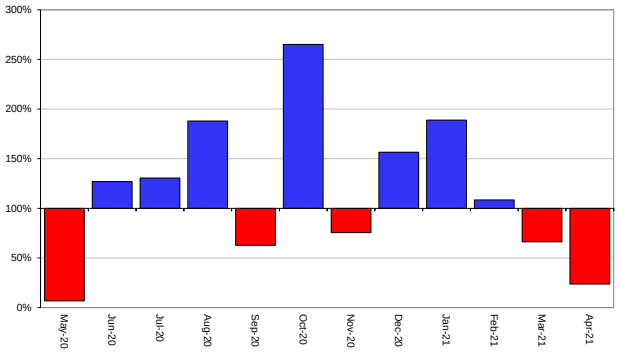
Above average rainfall

Below average rainfall

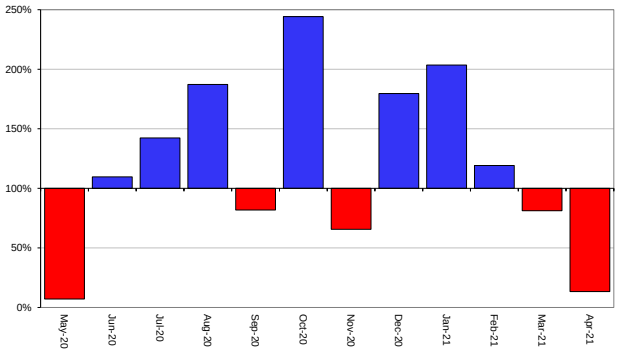
1-Month Period for East Anglia



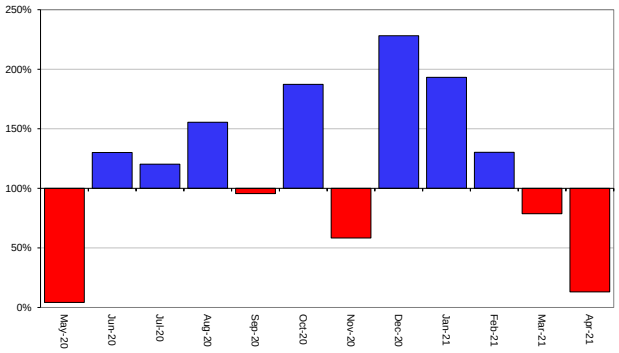
1-Month Period for Upper Bedford Ouse



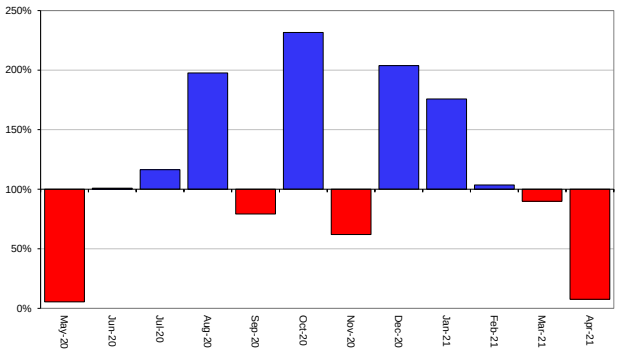
1-Month Period for Lower Bedford Ouse



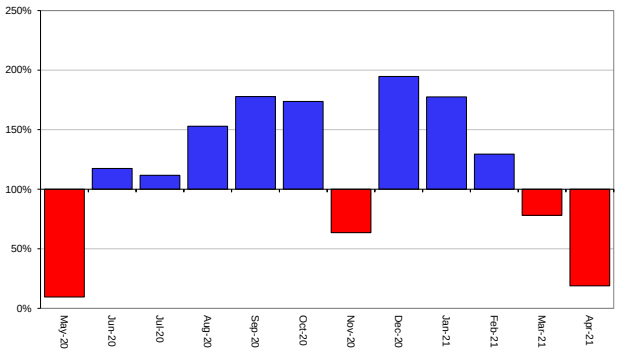
1-Month Period for Central Area Fenland



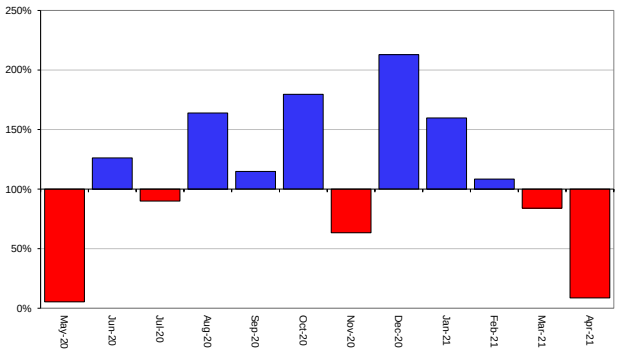
1-Month Period for Cam



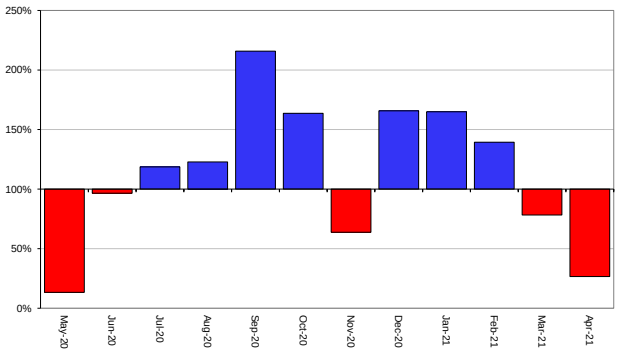
1-Month Period for NW Norfolk and Wissey



1-Month Period for Little Ouse and Lark



1-Month Period for North Norfolk



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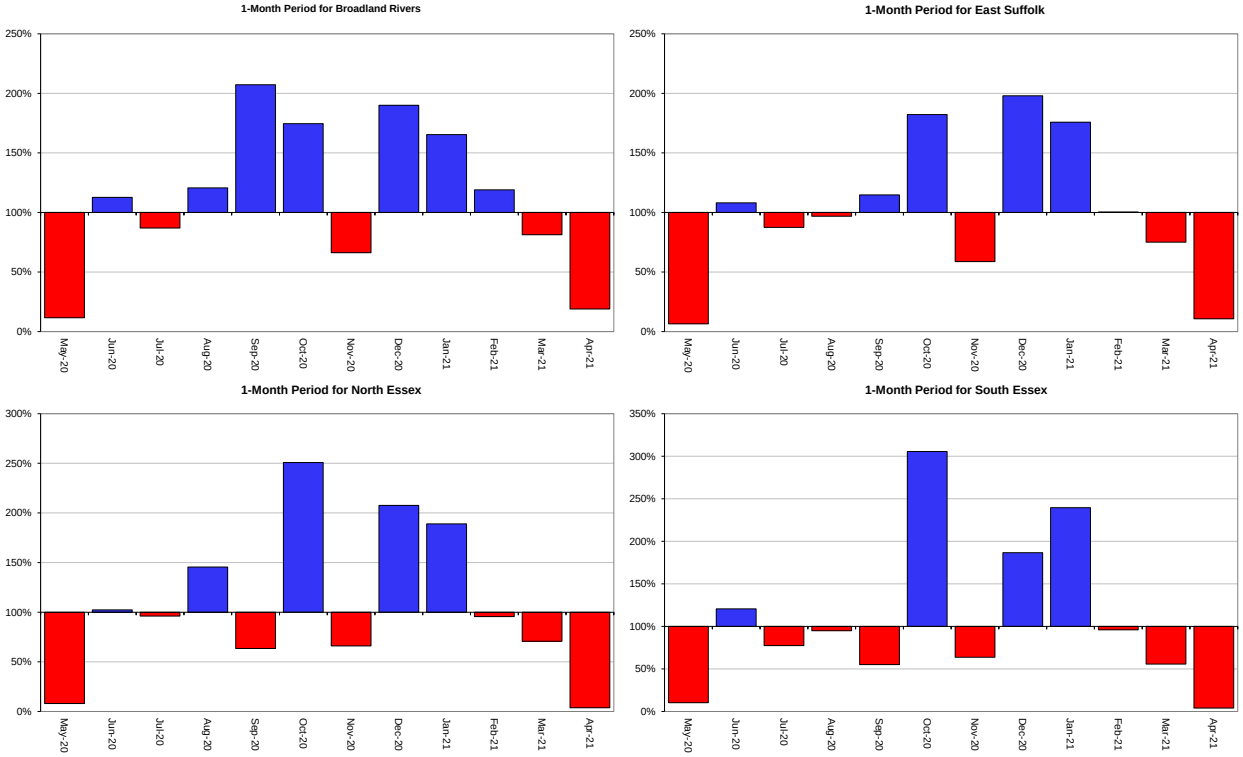
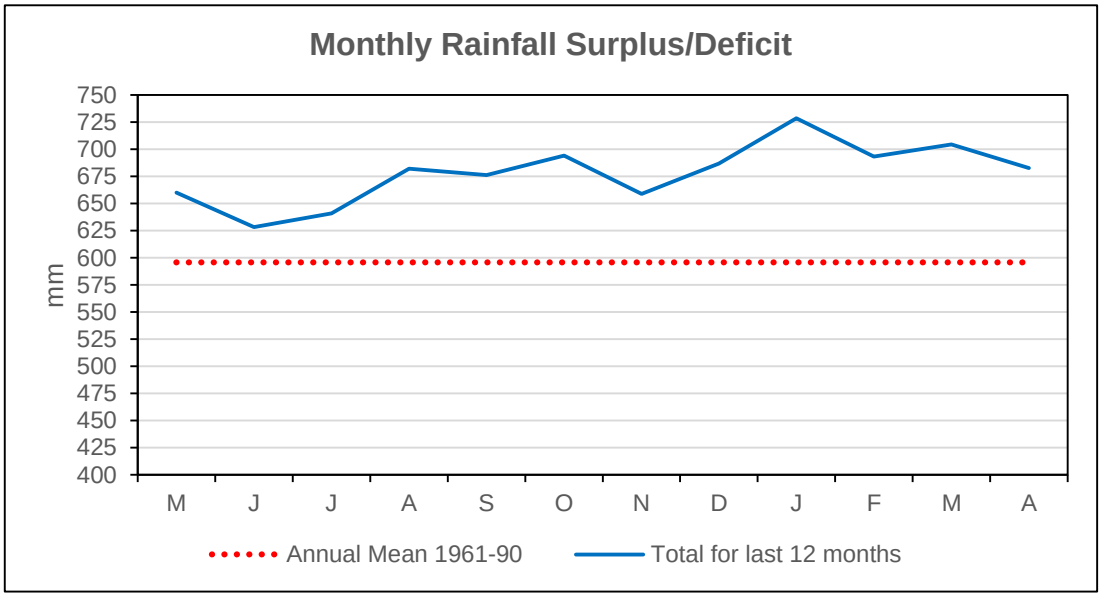
Above average rainfall

Below average rainfall





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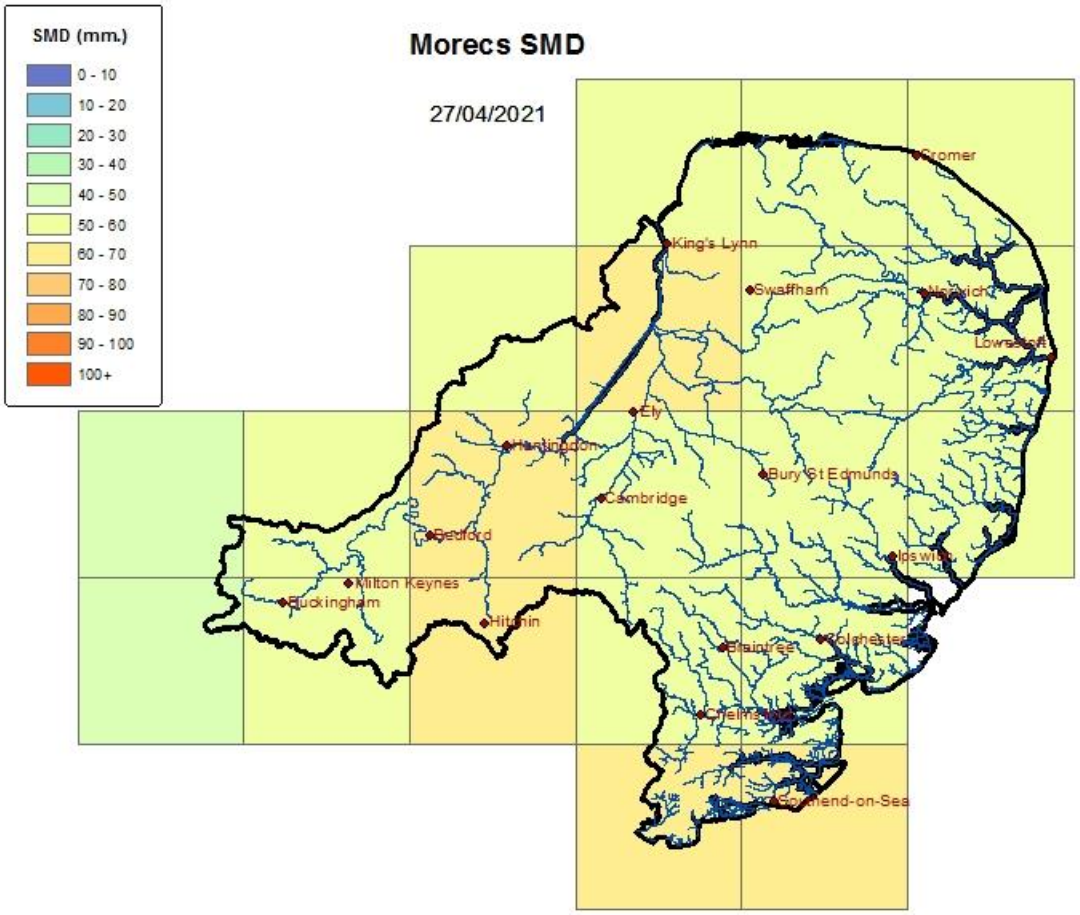
Soil Moisture Deficit

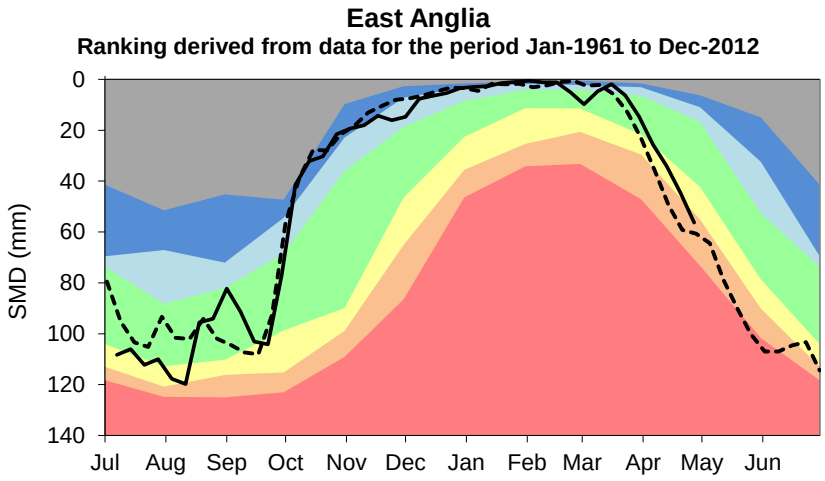


Data based on MORECS (Met Office © Crown Copyright)

——2020-21 – – –2019-20

Exceptionally high | Notably high | Above normal | Normal

Below normal | Notably low | Exceptionally low | —— Latest data



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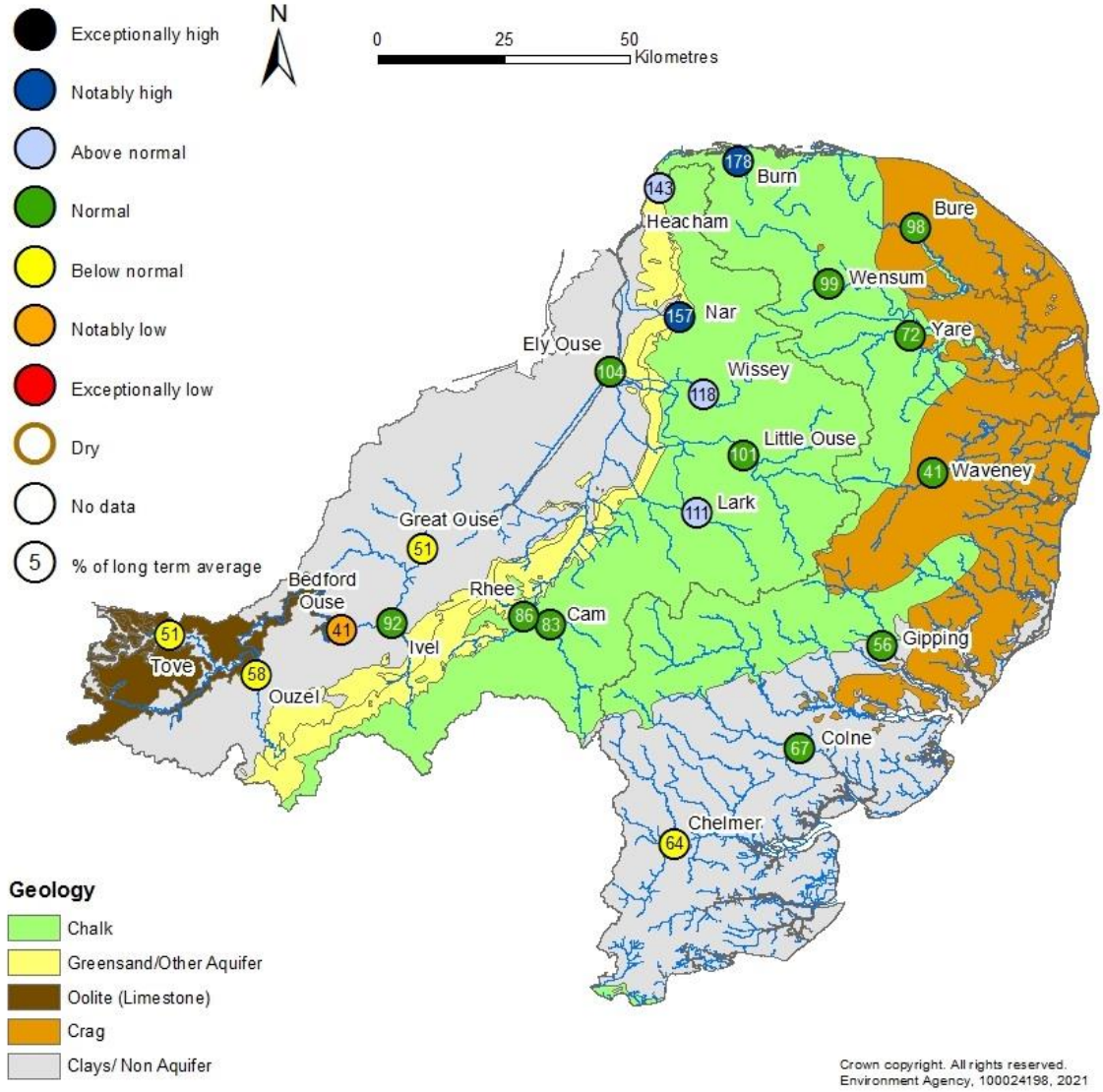
River Flow

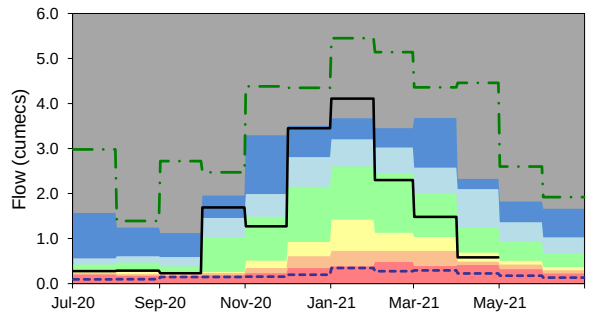
April 2021



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

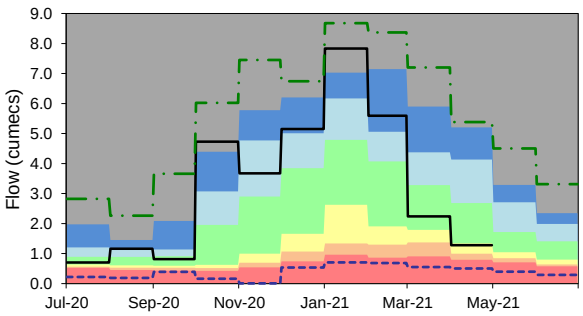
Cappenham, TOVE

Ranking derived from data for the period Feb-1962 to Dec-2017



Willen, OUZEL

Ranking derived from data for the period Jan-1962 to Dec-2017



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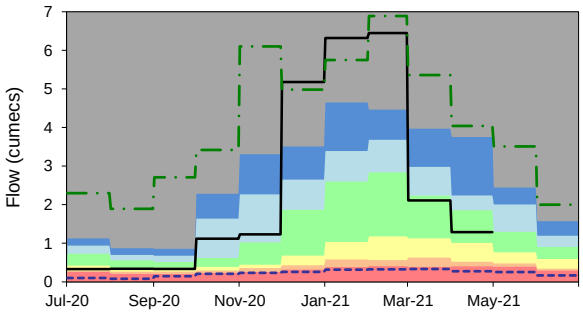
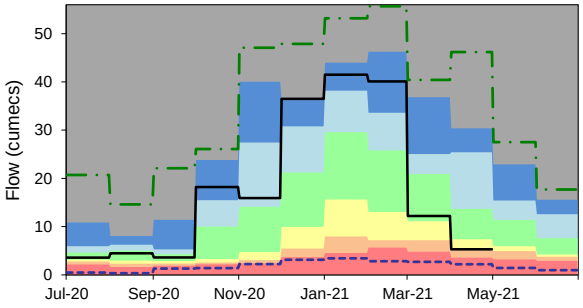
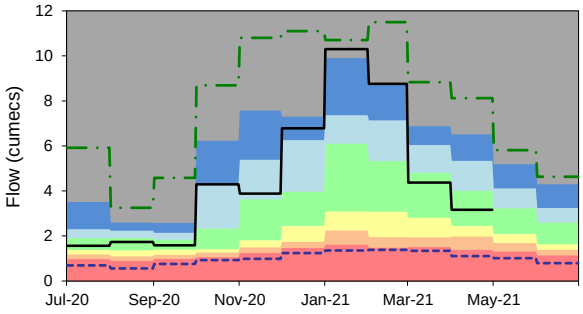
Burnt Mill, RHEE
Ranking derived from data for the period Oct-1962 to Dec-2017



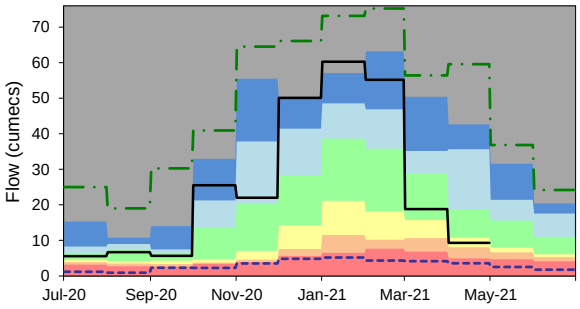
Roxton, GREAT OUSE
Ranking derived from data for the period Oct-1972 to Dec-2017



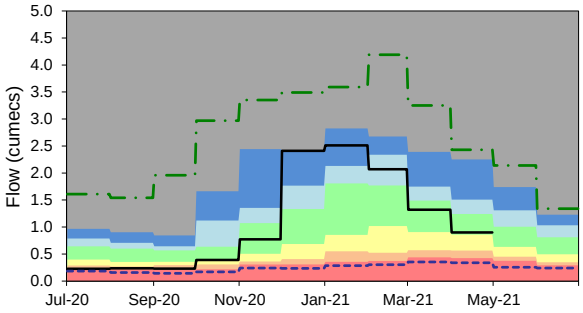
Blunham, IVEL
Ranking derived from data for the period Aug-1959 to Dec-2017



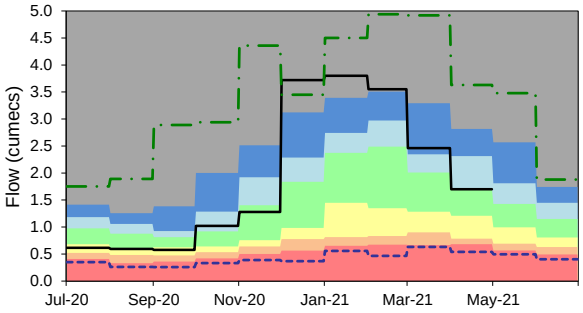
Offord (Gross Flows), GREAT OUSE
Ranking derived from data for the period Jan-1972 to Dec-2017



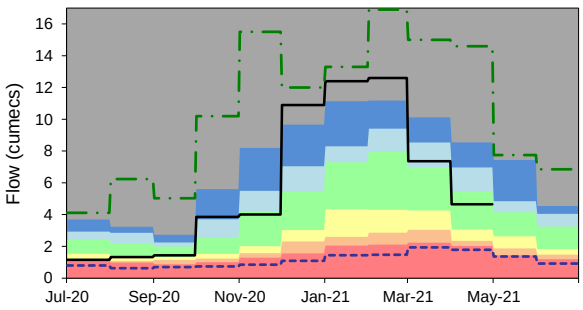
Dernford, CAM
Ranking derived from data for the period Feb-1949 to Dec-2017



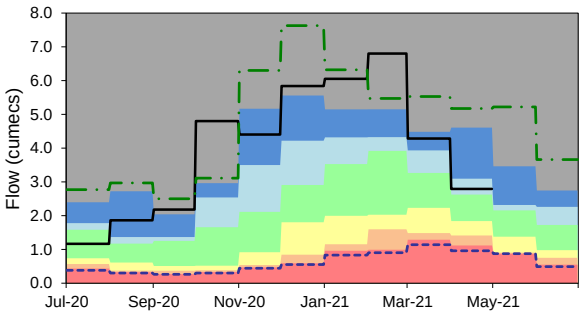
Temple, LARK
Ranking derived from data for the period Nov-1960 to Dec-2017



Abbey Heath, LITTLE OUSE
Ranking derived from data for the period Jun-1968 to Dec-2017



Northwold Total, WISSEY
Ranking derived from data for the period Jul-1983 to Dec-2012



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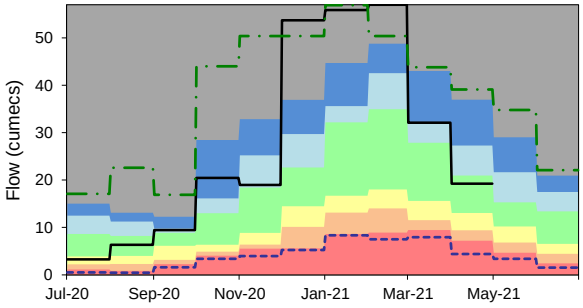
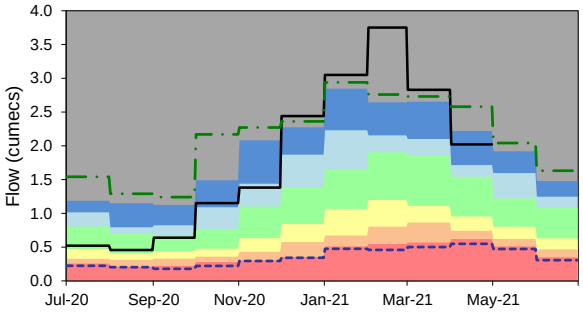
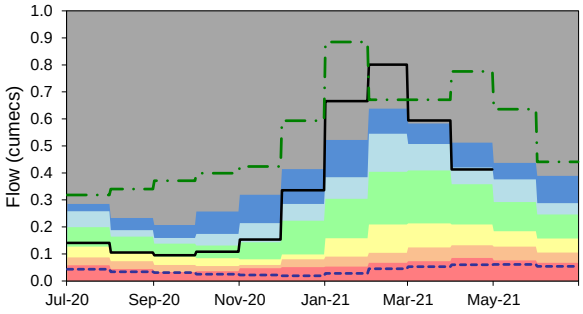
Denver, ELY OUSE
Ranking derived from data for the period Nov-1971 to Dec-2017



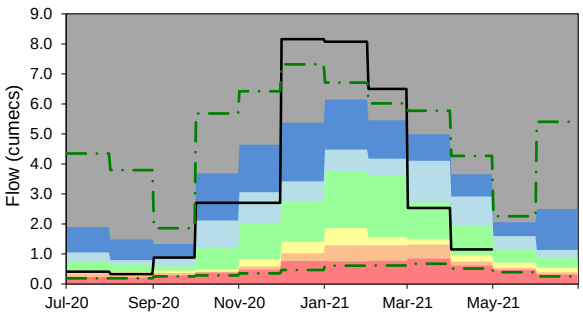
Marham, NAR
Ranking derived from data for the period Apr-1982 to Dec-2017



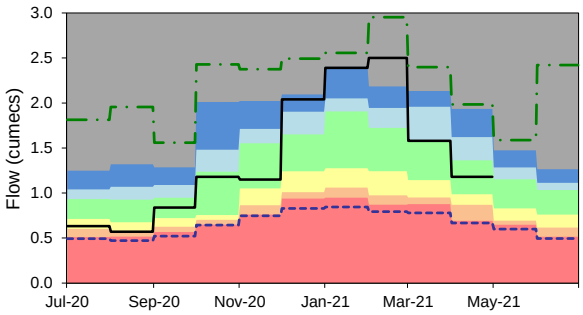
Heacham, HEACHAM
Ranking derived from data for the period Nov-1965 to Dec-2017



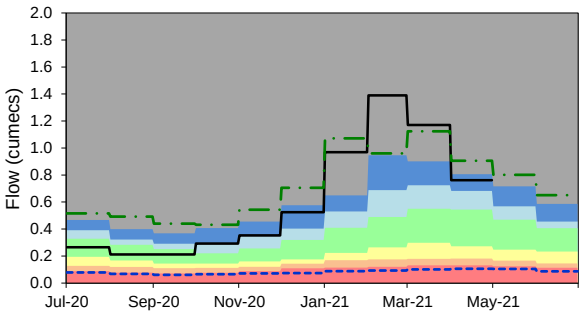
Colney, YARE
Ranking derived from data for the period Jan-1970 to Dec-2017



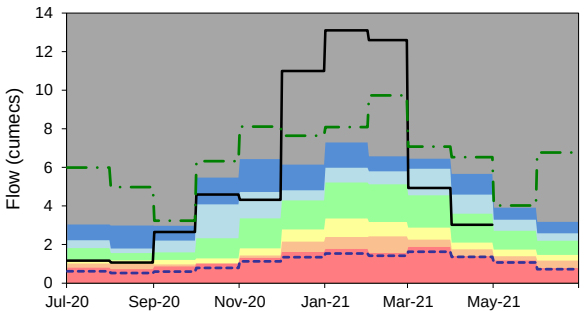
Ingworth, BURE
Ranking derived from data for the period Jan-1970 to Dec-2017



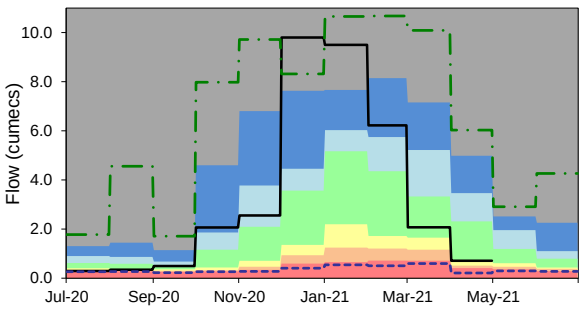
Burnham Overy, BURN
Ranking derived from data for the period Jan-1970 to Dec-2017



Swanton Morley Total, WENSUM
Ranking derived from data for the period Jan-1970 to Dec-2017



Needham Weir Total, WAVENEY (LOWER)
Ranking derived from data for the period Jan-1970 to Dec-2017



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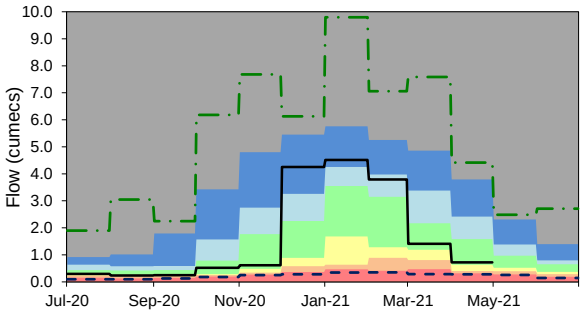
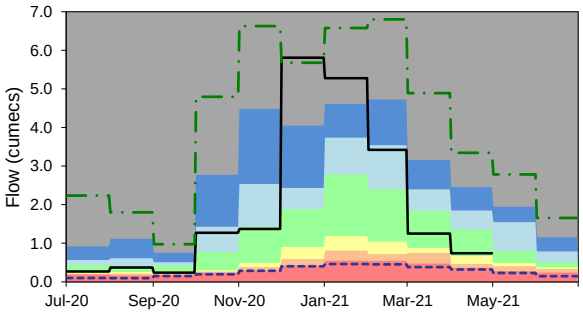
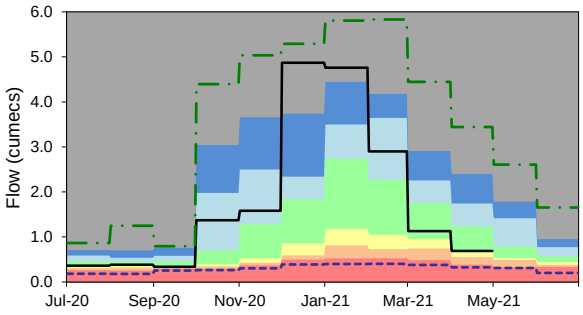
Bramford, GIPPING
Ranking derived from data for the period Jan-1970 to Dec-2017



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



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



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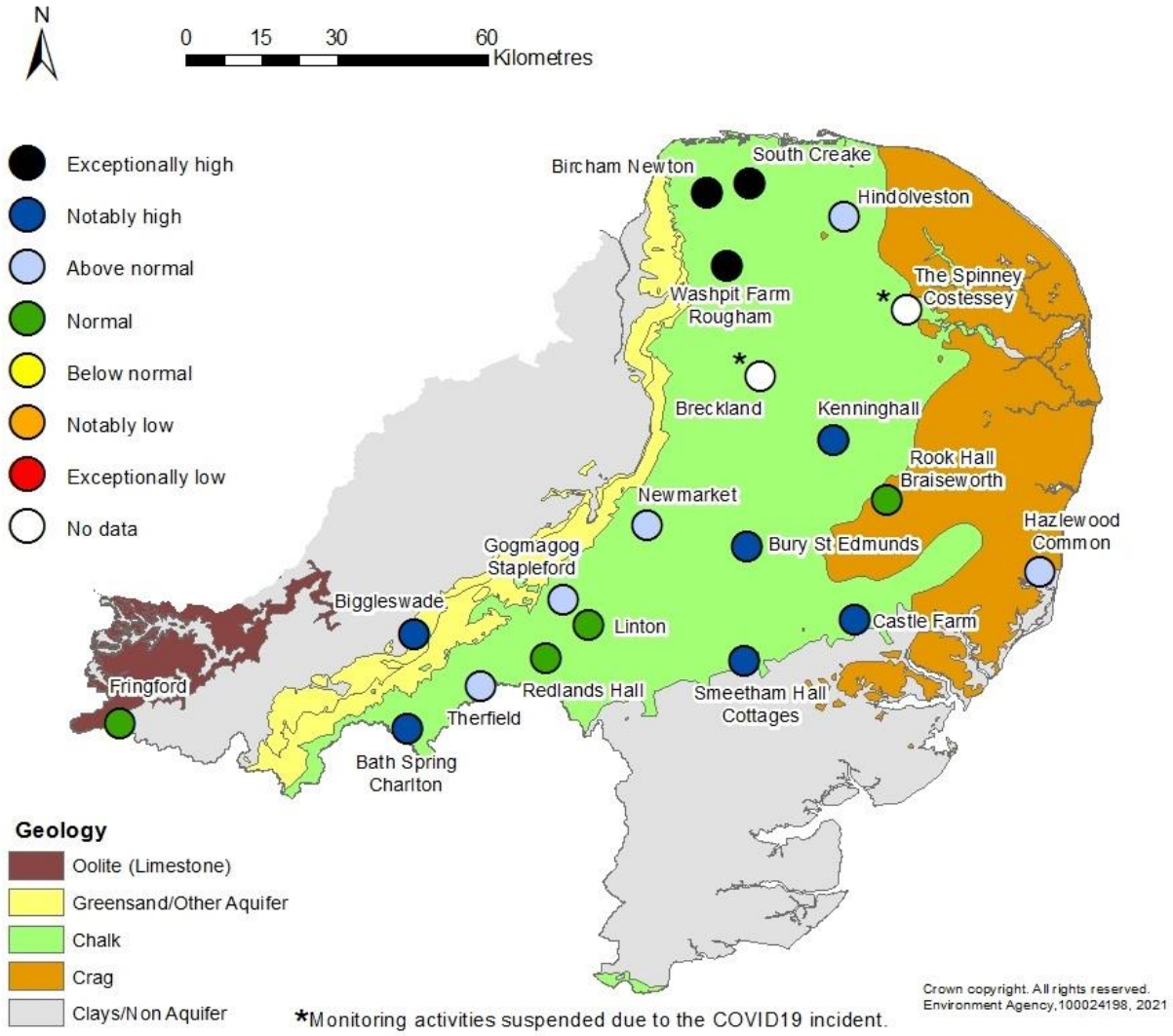
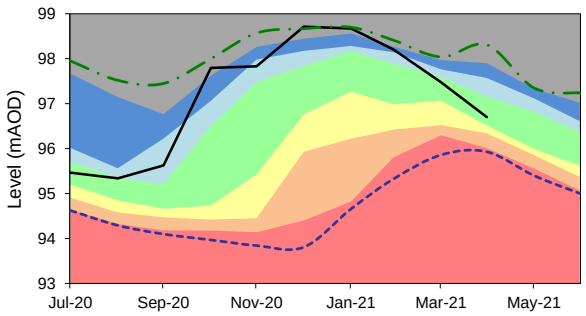
Groundwater Levels April 2021

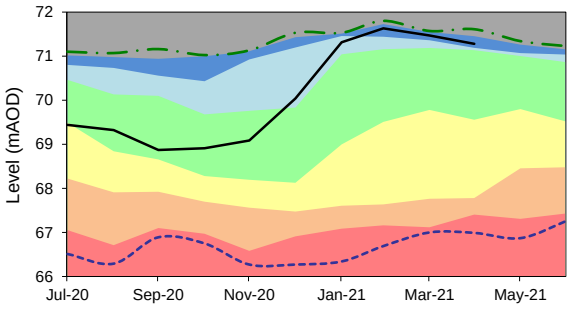


Exceptionally high | Notably high | Above normal | Normal | Max
Below normal | Notably low | Exceptionally low | Latest data | Min

Fringford - GREAT OOLITE
Ranking derived from data for the period Sep-1980 to Dec-2017



Bath Spring, Charlton - IVEL CHALK
Ranking derived from data for the period Mar-1993 to Dec-2017



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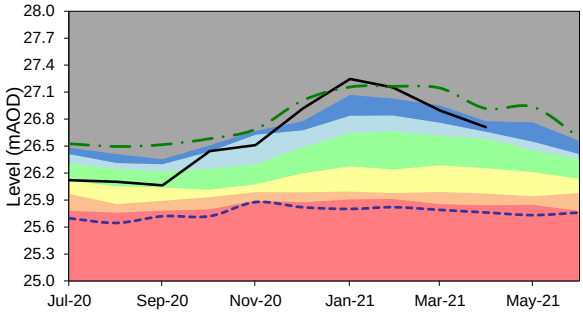
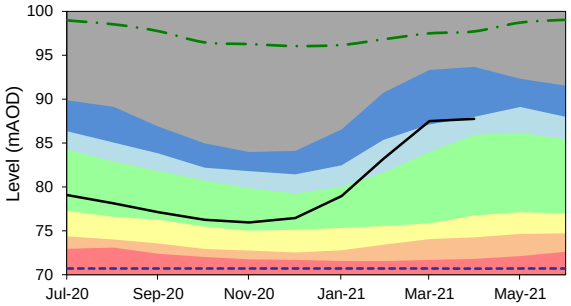
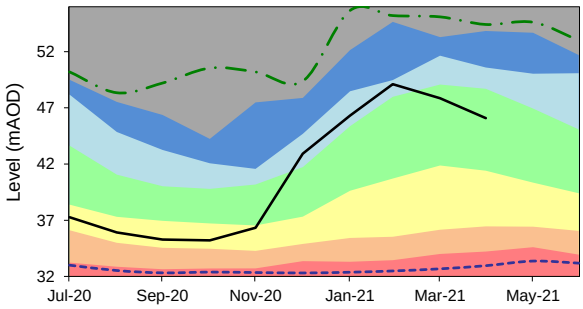
Biggleswade - IVEL SANDSTONE
Ranking derived from data for the period Mar-1968 to Dec-2017



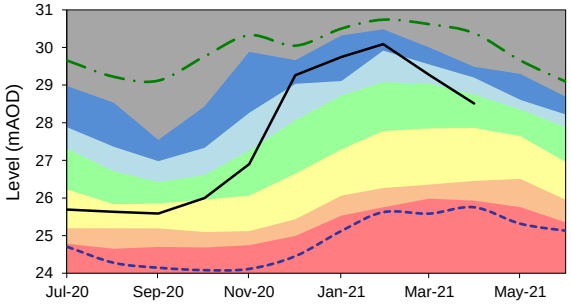
Therfield Rectory - N HERTS CHALK
Ranking derived from data for the period Jan-1883 to Dec-2017



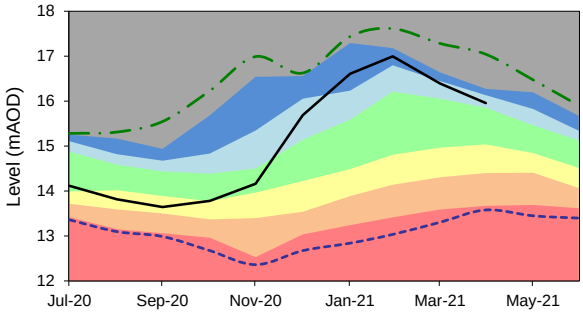
Redlands Hall, Ickleton - CAM CHALK
Ranking derived from data for the period Aug-1963 to Dec-2017



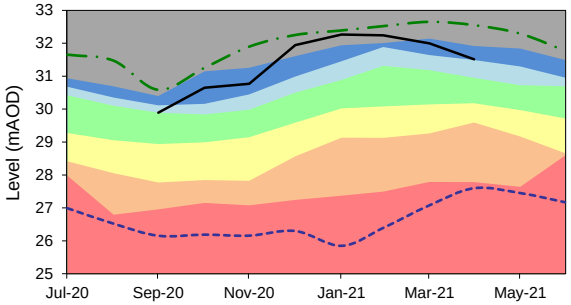
Linton - CAM CHALK
Ranking derived from data for the period Jan-1980 to Dec-2017



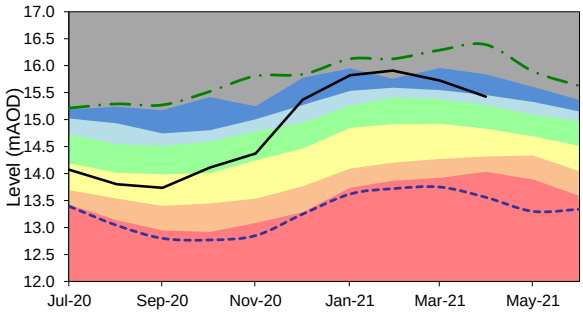
Gog Magog, Stapleford - CAM CHALK
Ranking derived from data for the period Jan-1980 to Dec-2017



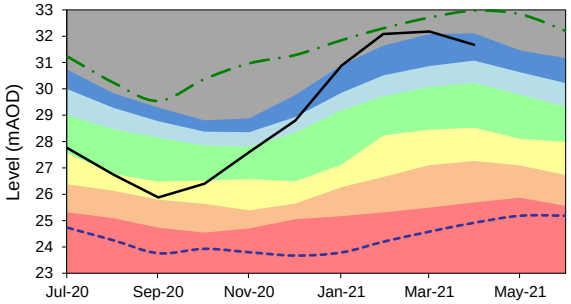
Bury St Edmunds - UPPER LARK CHALK
Ranking derived from data for the period May-1983 to Dec-2017



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



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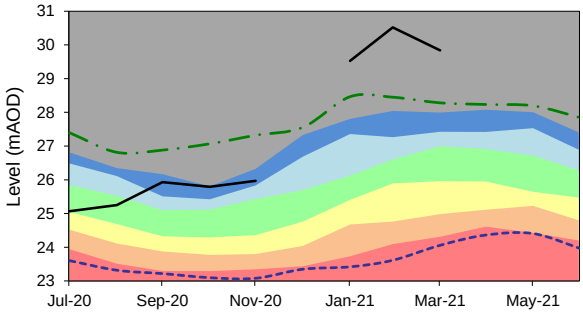
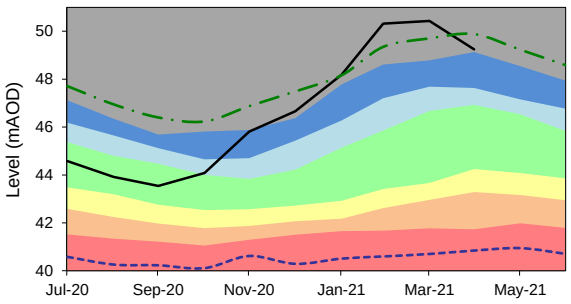
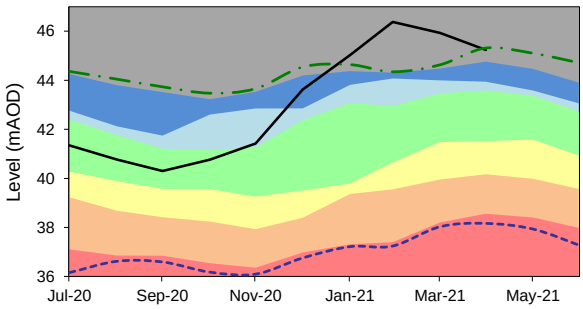
Breckland - WISSEY CHALK
Ranking derived from data for the period Jan-1971 to Nov-2017



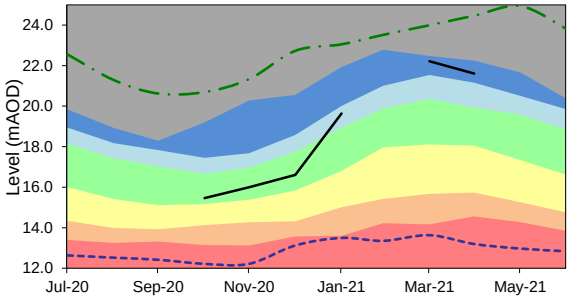
Washpit Farm, Rougham - NW NORFOLK CHALK
Ranking derived from data for the period May-1950 to Dec-2017



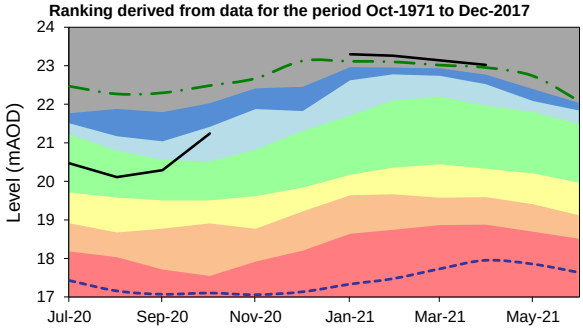
Bircham Newton - NW NORFOLK CHALK
Ranking derived from data for the period Mar-1995 to Sep-2017



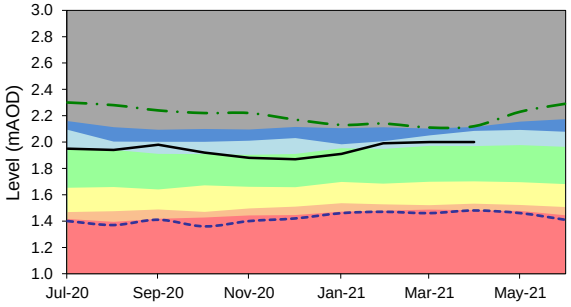
Castle Farm, Offton - MID SUFFOLK CHALK
Ranking derived from data for the period Mar-1967 to Dec-2017



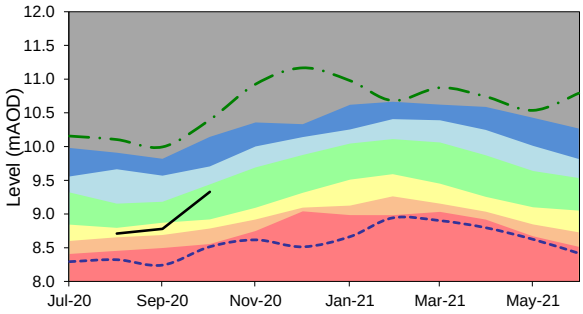
Old Primary School, South Creake
NW NORFOLK CHALK
Ranking derived from data for the period Oct-1971 to Dec-2017



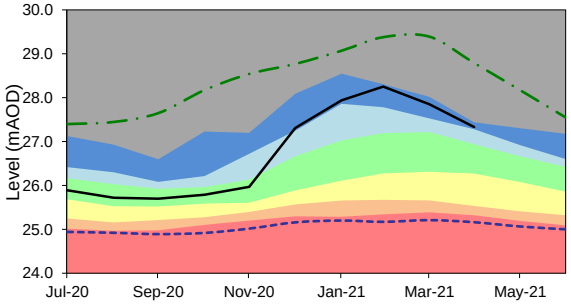
Hazlewood Common - SUFFOLK CRAG
Ranking derived from data for the period Oct-1988 to Feb-2020



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



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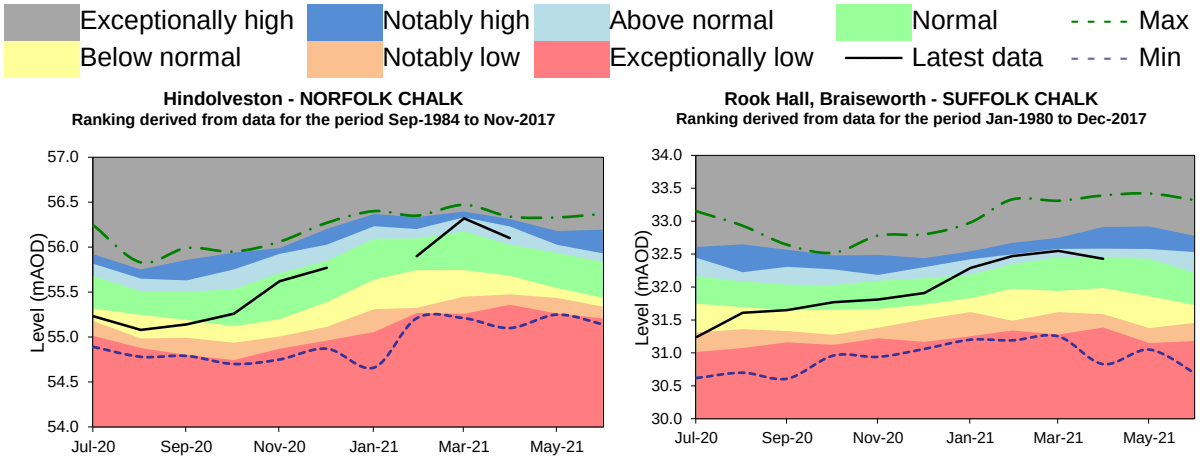

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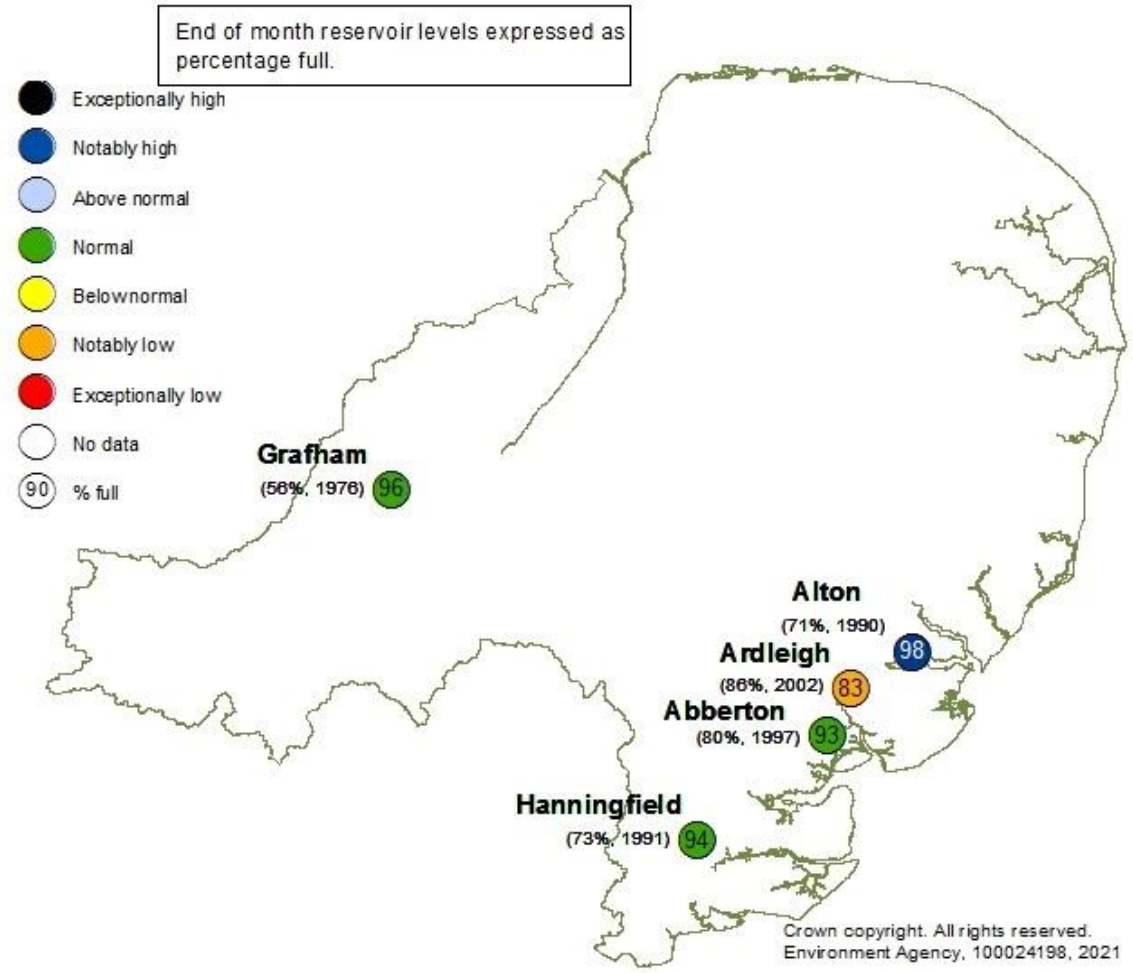
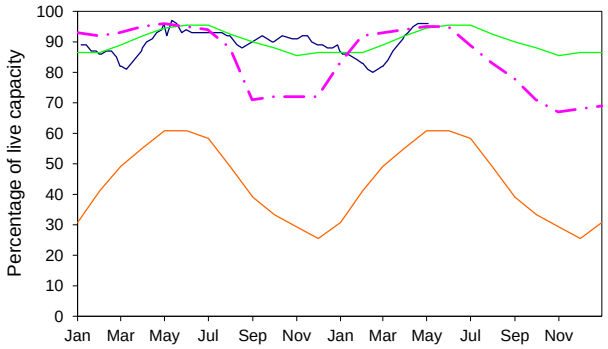
Reservoir Stocks April 2021

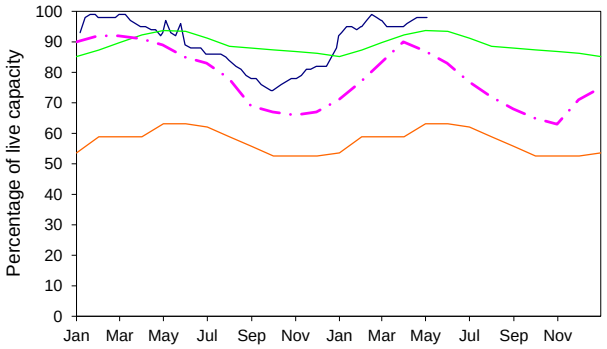


2020-2021 Normal Operating Curve Drought Alert Curve 1995-1996

Grafham



Alton



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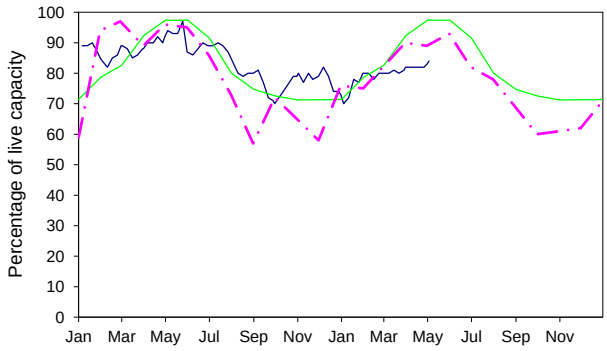
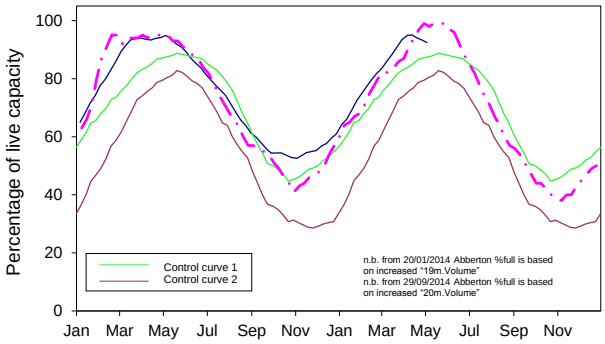
2020-2021 Normal Operating Curve Drought Alert Curve 1995-1996

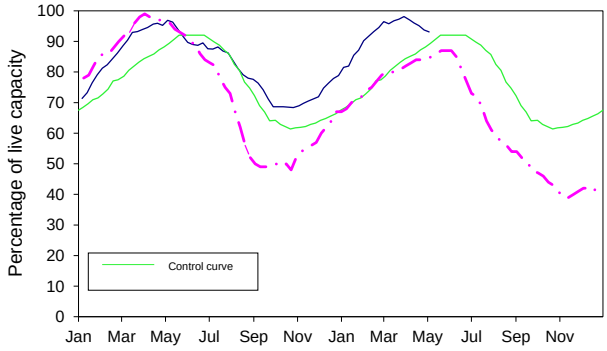
Ardleigh



Abberton



Hanningfield



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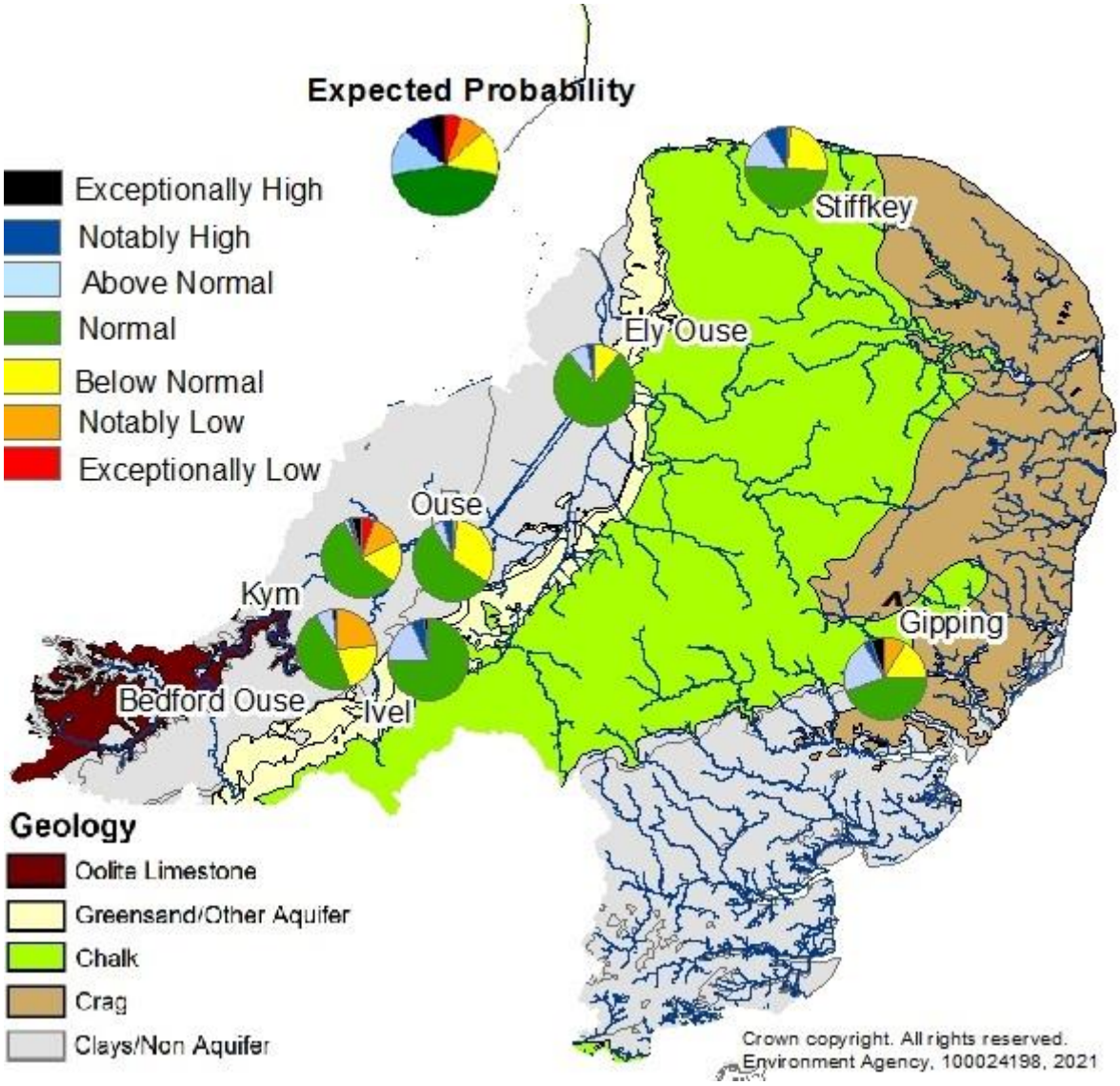
Forward Look – River Flows



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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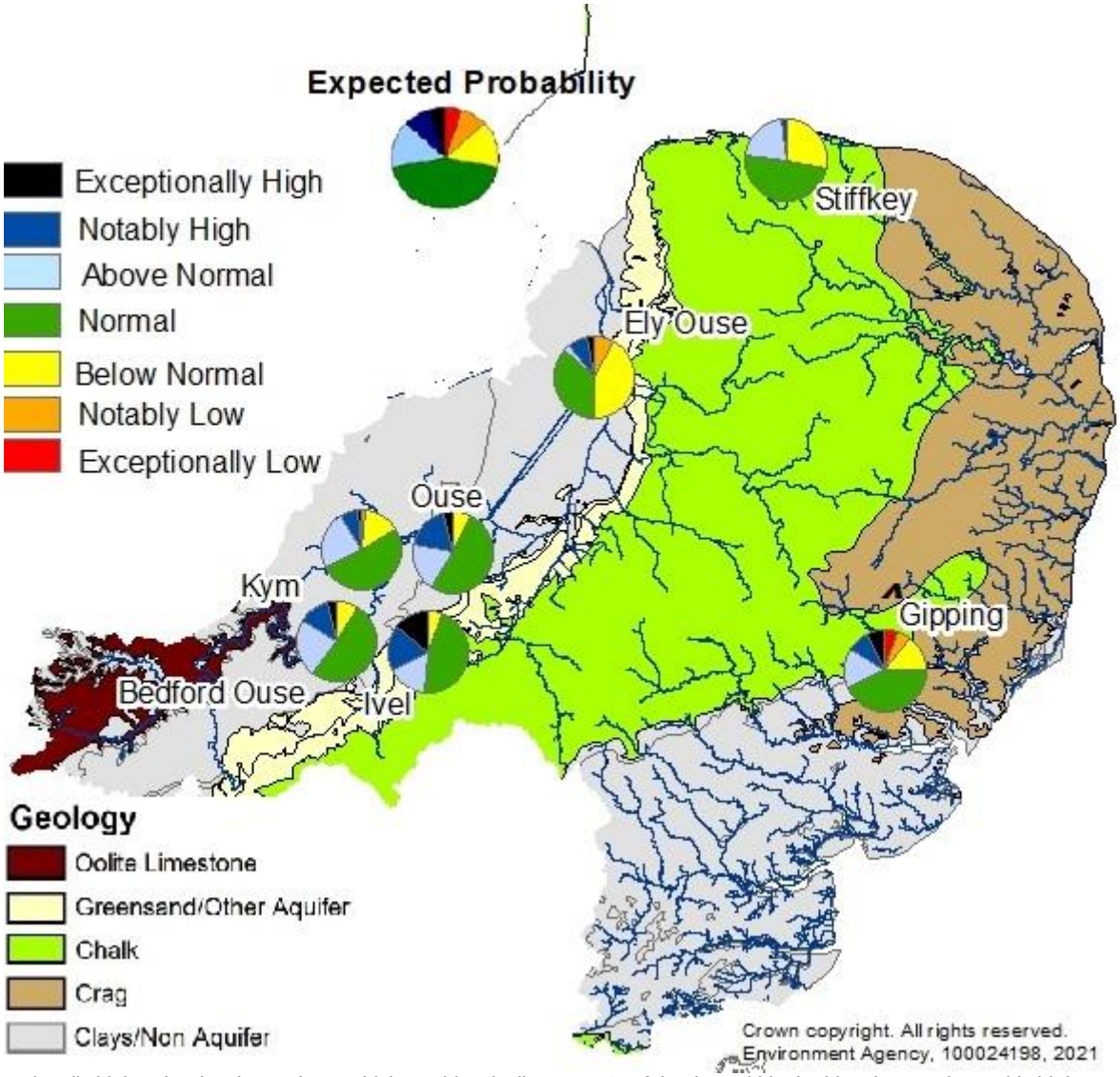

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Probabilistic ensemble projections of river flows at key indicator sites in September 2021. Pie charts indicate probability, based on climatology, of the surface water flow at each site being e.g. exceptionally low for the time of year. (Source: Centre 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

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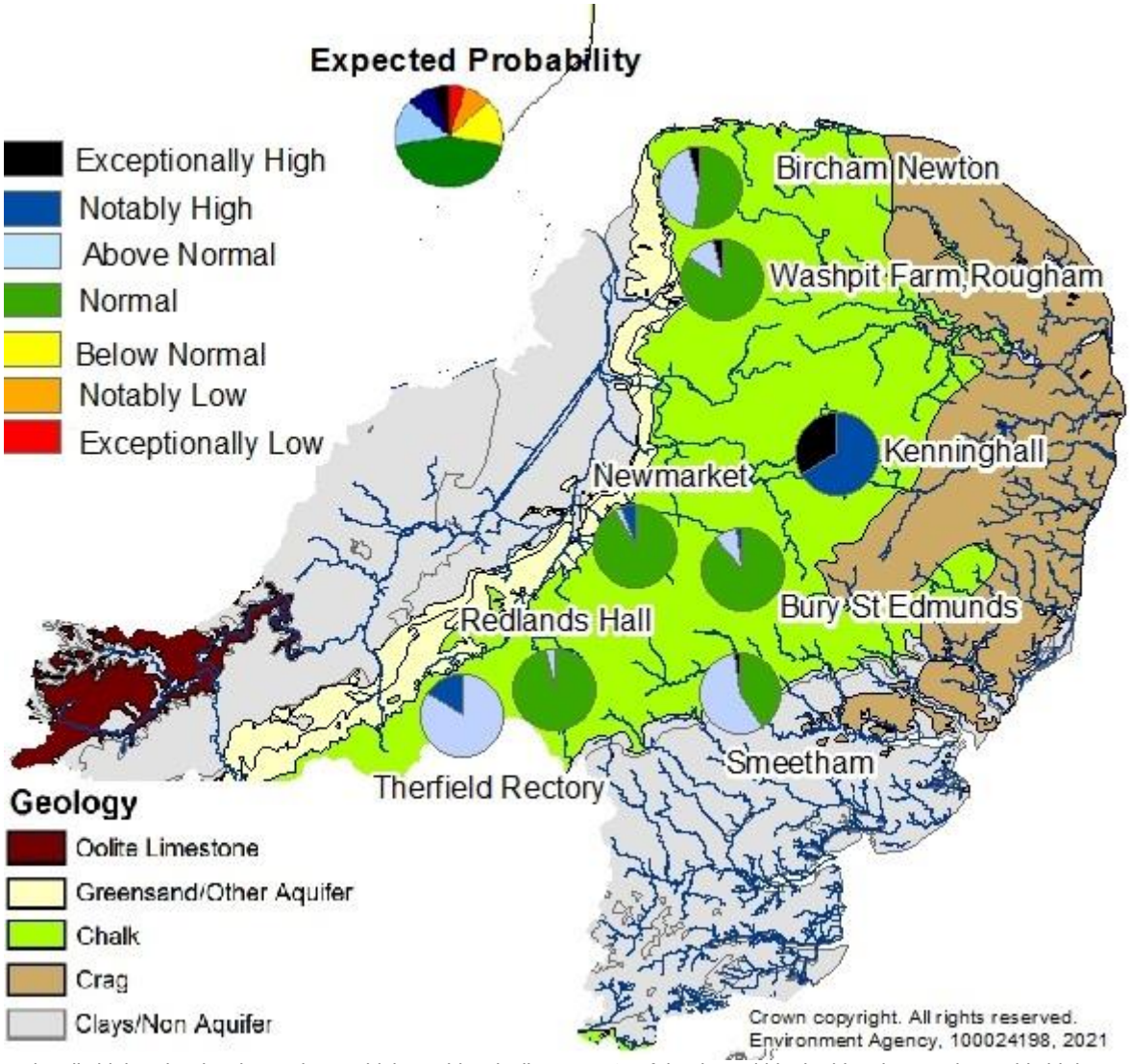
Forward Look - Groundwater



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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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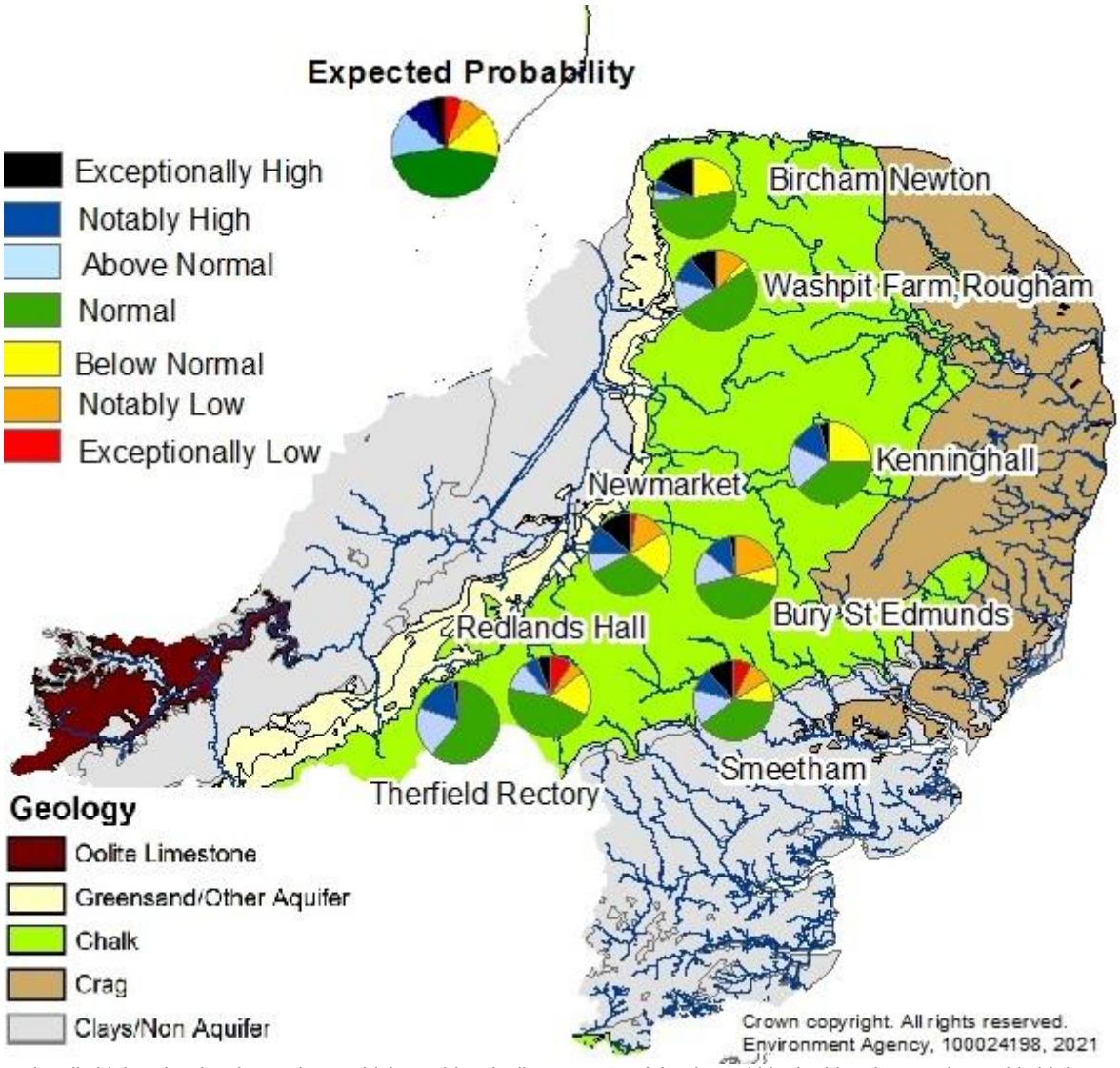

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Probabilistic ensemble projections of groundwater levels at key indicator sites for end of March 2022. Pie charts indicate probability, based on climatology, of the groundwater level at each site being e.g. exceptionally low for the time of year. (Source: Environment Agency) Geological map reproduced with kind permission from UK Groundwater Forum, BGS © NERC. Crown copyright. All rights reserved. Environment Agency, 100026380, 2021.

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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^3s^{-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).

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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.

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