Monthly Water Situation Report

East Anglia

Summary – April 2022

April was a very dry month with an average of 12 mm rainfall, 26% of the Long-Term Average (LTA) falling across the region, with much of this rainfall falling in the first week of the month. April was the 12th driest month on record for East Anglia. Most catchments received notably low levels of rainfall with a few catchments receiving slightly more, mostly southern catchments. Due to the low levels of rainfall, Soil Moisture Deficit (SMD) was classified notably high for the time of the year with overall values increasing. River flows at most sites were below normal while groundwater levels at the majority of the indicator sites were normal for the time of year. However, a few sites were classified below normal.

Rainfall

Overall, East Anglia received notably low rainfall in April, with an average rainfall recorded 12 mm which was 26% of the LTA. Most catchments experienced notably low rainfall with the lowest rainfall total in the North Norfolk catchment with 10 mm (20% LTA) and the Broadland Rivers catchment with 8 mm (18% LTA) classifying them as exceptionally low. Slightly higher rainfall totals occurred in southern catchments such as the South Essex catchment with 17 mm (40% LTA) and the North Essex with 15 mm (35% LTA) classifying them as below normal. The rainfall accumulated for the past 3, 6 and 12 months across the area was highly variable from normal to below normal across East Anglia.

Soil Moisture Deficit/Recharge

SMD remained above normal for the first part of April with the overall value increasing from 23 mm to 58 mm by the end of April reaching Notably High values in response to the increased warming and reduced rainfall. These SMD levels responded consistently across the region except for a few slightly higher levels around the coast.

River Flows

Most river flow indicator sites (48%) across East Anglia were categorised as below normal levels for the time of year with the remaining 40% and 15% of the rivers respectively classified as normal and notably low. These rivers experienced lower flows this month compared to the previous month because of the low rainfall. Flows at all indicator sites across the area show decreased river flows compared to March (where 90% of the sites experienced normal flows).

Groundwater Levels

Groundwater levels at most indicator sites (94%) across East Anglia remained stable and were therefore classified as normal for April. Castle Farm in Offton in the mid Suffolk Chalk had below normal groundwater levels. Most (78%) groundwater sites show decreased recharging trend at the end of April. However, 22% of the sites including Old Primary School, South Creake and Therfield Rectory continued recharging.

Reservoir Storage/Water Resource Zone Stocks

All reservoir storage sites were classed as normal but appeared to be decreasing in the last week of the month except Alton which was classed below normal based on the Normal Operating Curve and the historical records.

Environmental Impact

Groundwater support schemes operations remained low by the end of April; the Rhee groundwater support scheme had 0 of the 8 pumps operating. The Lodes-Granta groundwater support scheme had

2 of the 6 pumps operating. All other pumping operations including the Thet and Little Ouse and the Hiz are not operating.

Forward Look

Probabilistic ensemble projections for river flows at key sites
June 2022: The Ouse (Ouse and Ely Ouse) have an increased probability of below normal to notably low flows; and all other sites are showing an increased probability of normal flows

September 2022: Most indicator sites are showing a reduced probability of notably low or lower flows, except for the Ely Ouse and the Gipping.

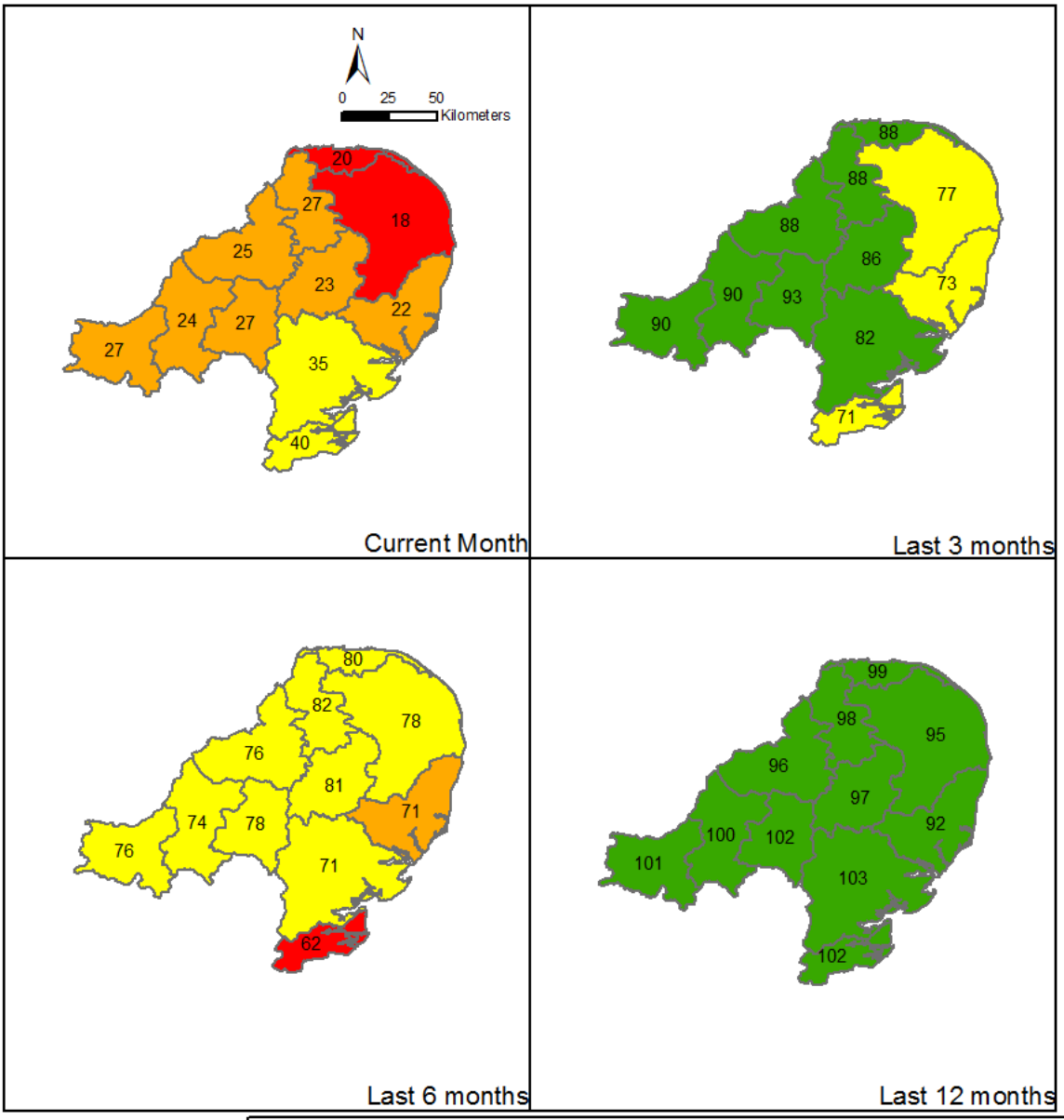
Probabilistic ensemble projections for groundwater levels in key aquifers
September 2022: Most indicator sites have a significantly increased probability of normal levels, other than Redlands Hall which is showing an increased probability of below normal levels.

March 2023: There is high probability of below normal or lower groundwater levels at all indicator sites except Therfield Rectory, Bircham Newton and Washpit which show an increased probability of normal levels.

Author: ANG-Hydrology Contact details: 03708506506

Rainfall

April 2022



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

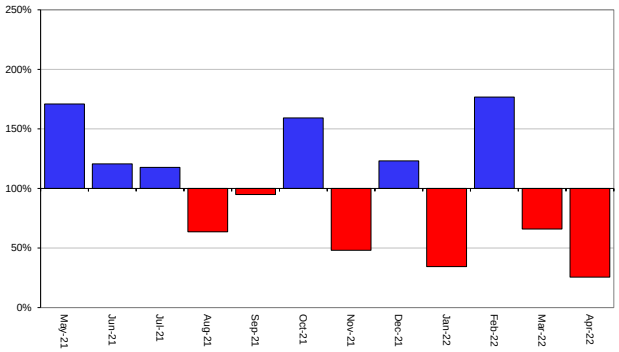
Rainfall expressed as percentage of 1961-1990 Long Term Average for the specified duration. Classes derived from data for the period 1891 to 2017 based on the HadUK dataset (Met Office © Crown Copyright)

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, 2021). 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, 2021.

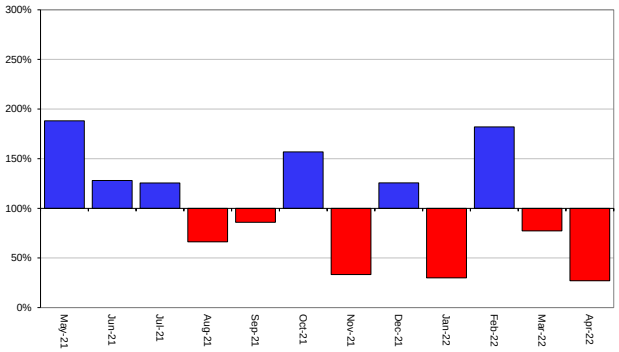
Above average rainfall

Below average rainfall

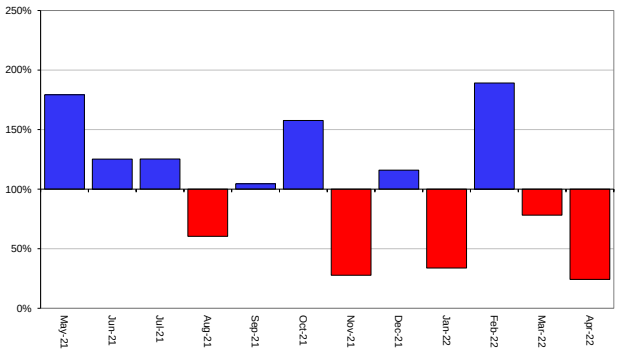
1-Month Period for East Anglia



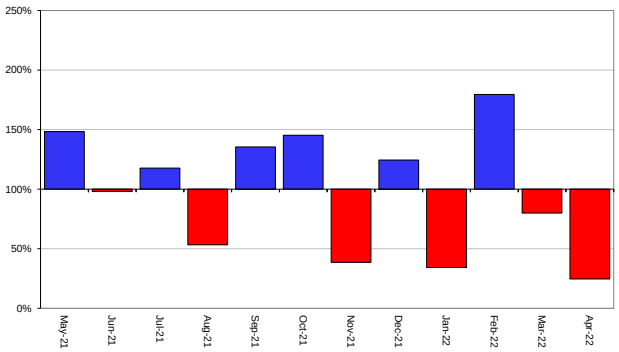
1-Month Period for Upper Bedford Ouse



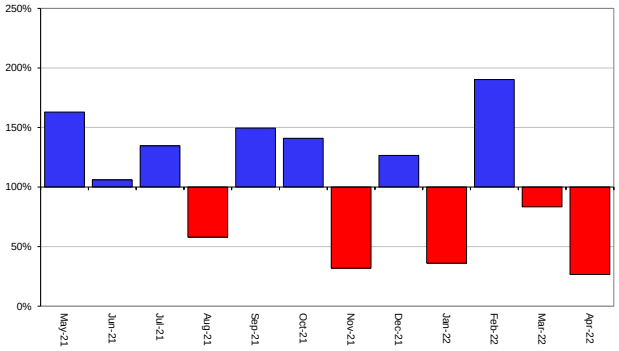
1-Month Period for Lower Bedford Ouse



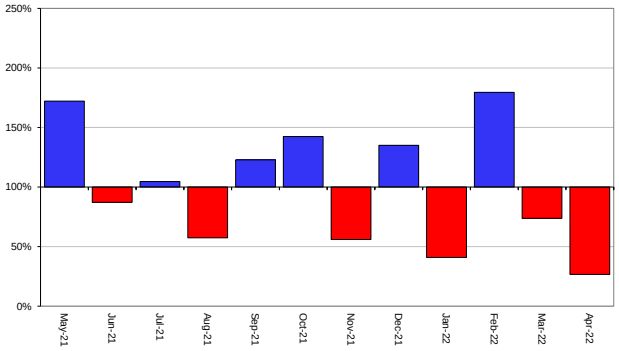
1-Month Period for Central Area Fenland



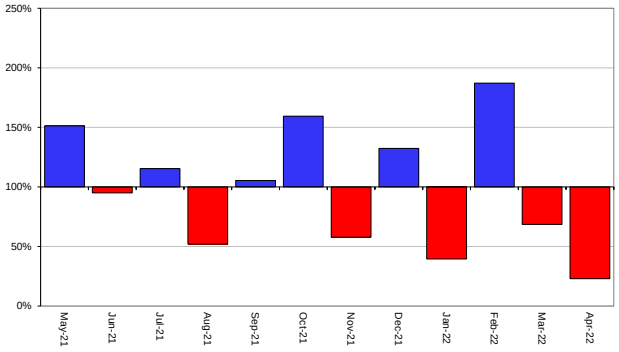
1-Month Period for Cam



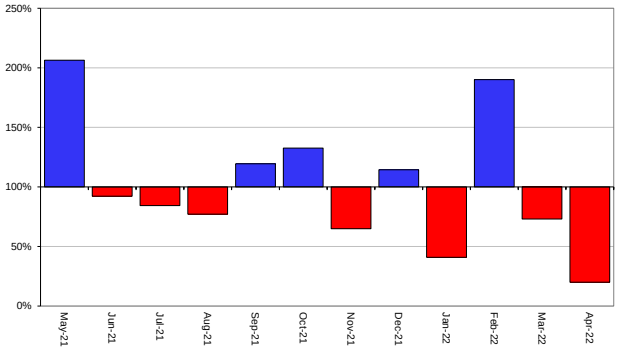
1-Month Period for NW Norfolk and Wissey



1-Month Period for Little Ouse and Lark

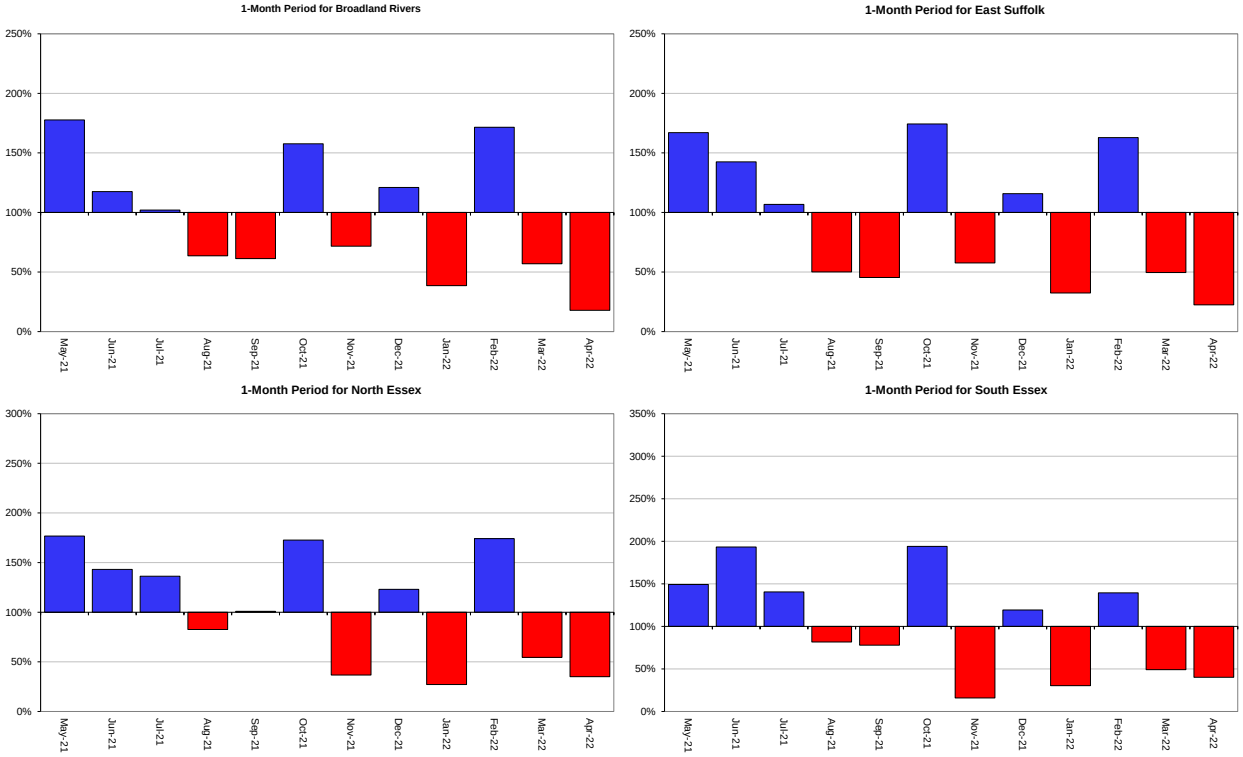


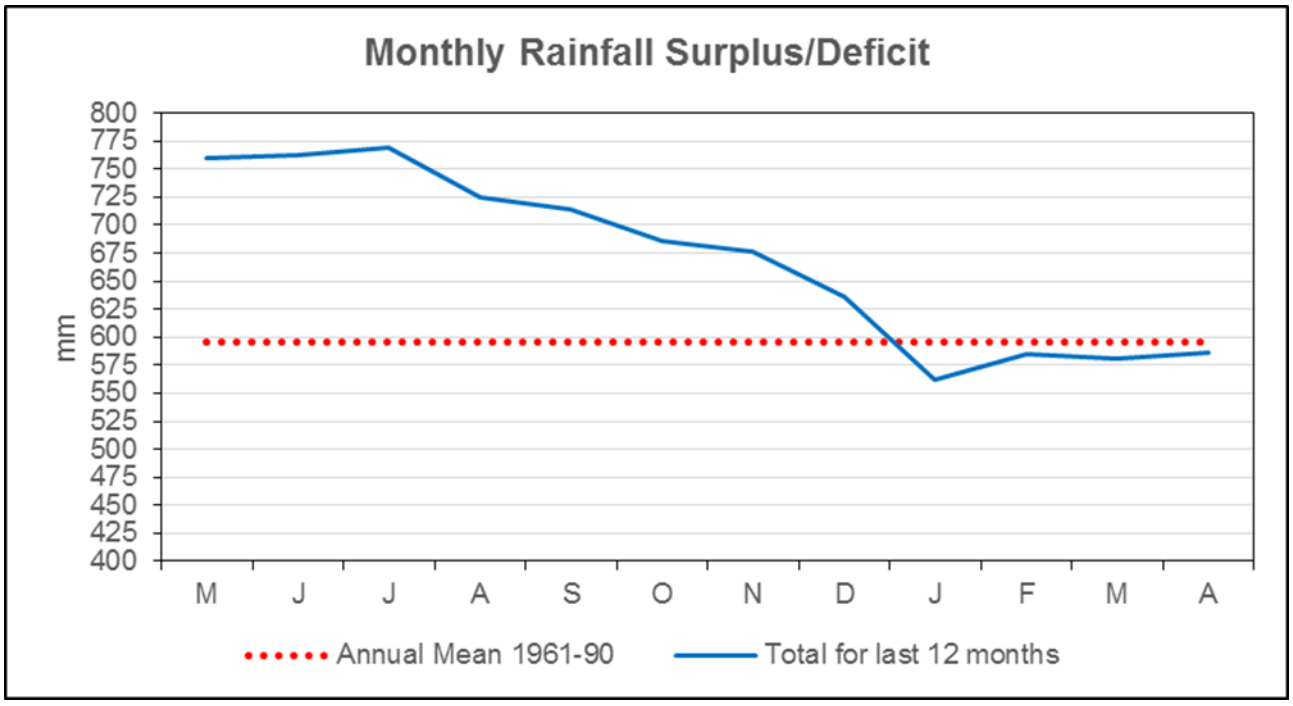
1-Month Period for North Norfolk



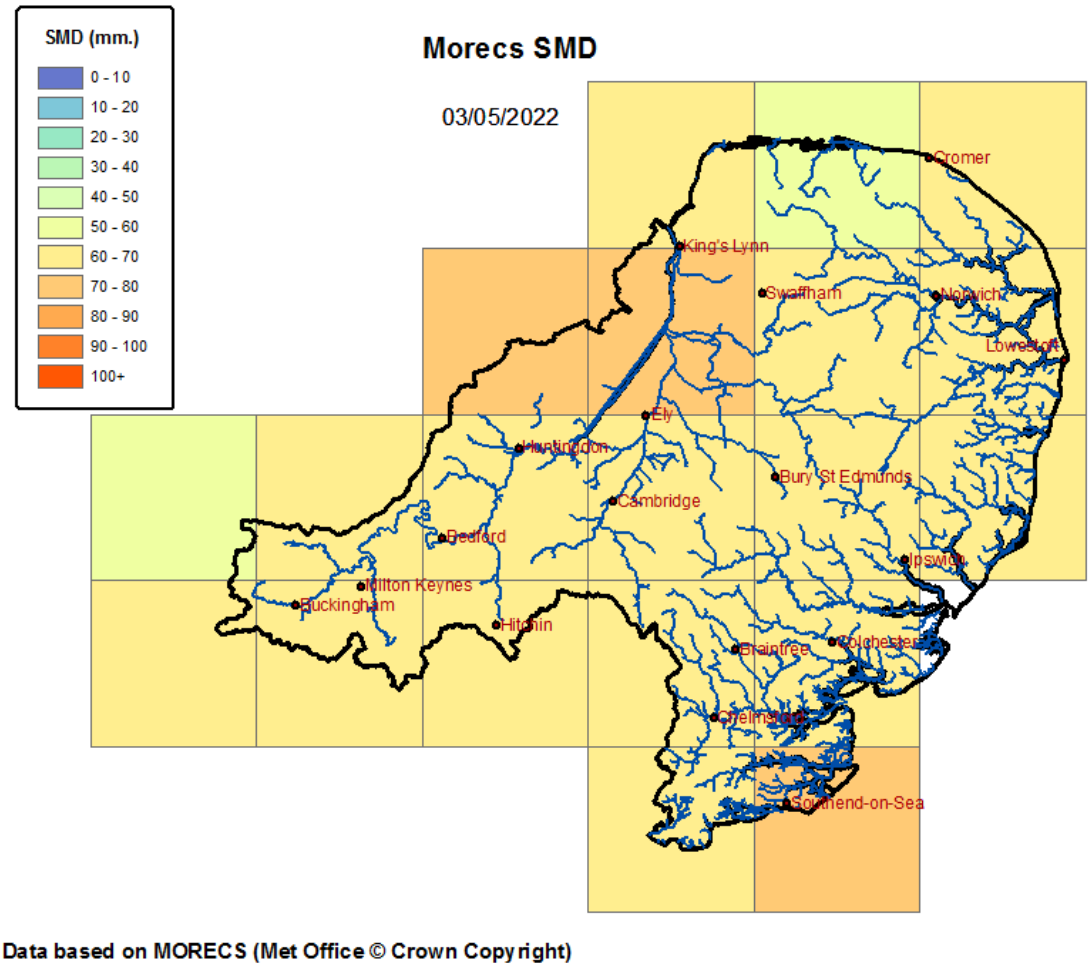
Above average rainfall

Below average rainfall





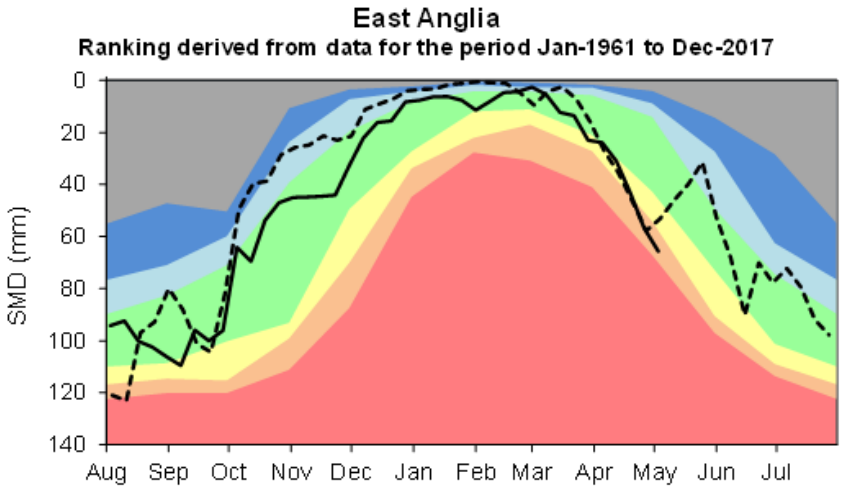
Soil Moisture Deficit



Data based on MORECS dataset (Met Office © Crown Copyright)

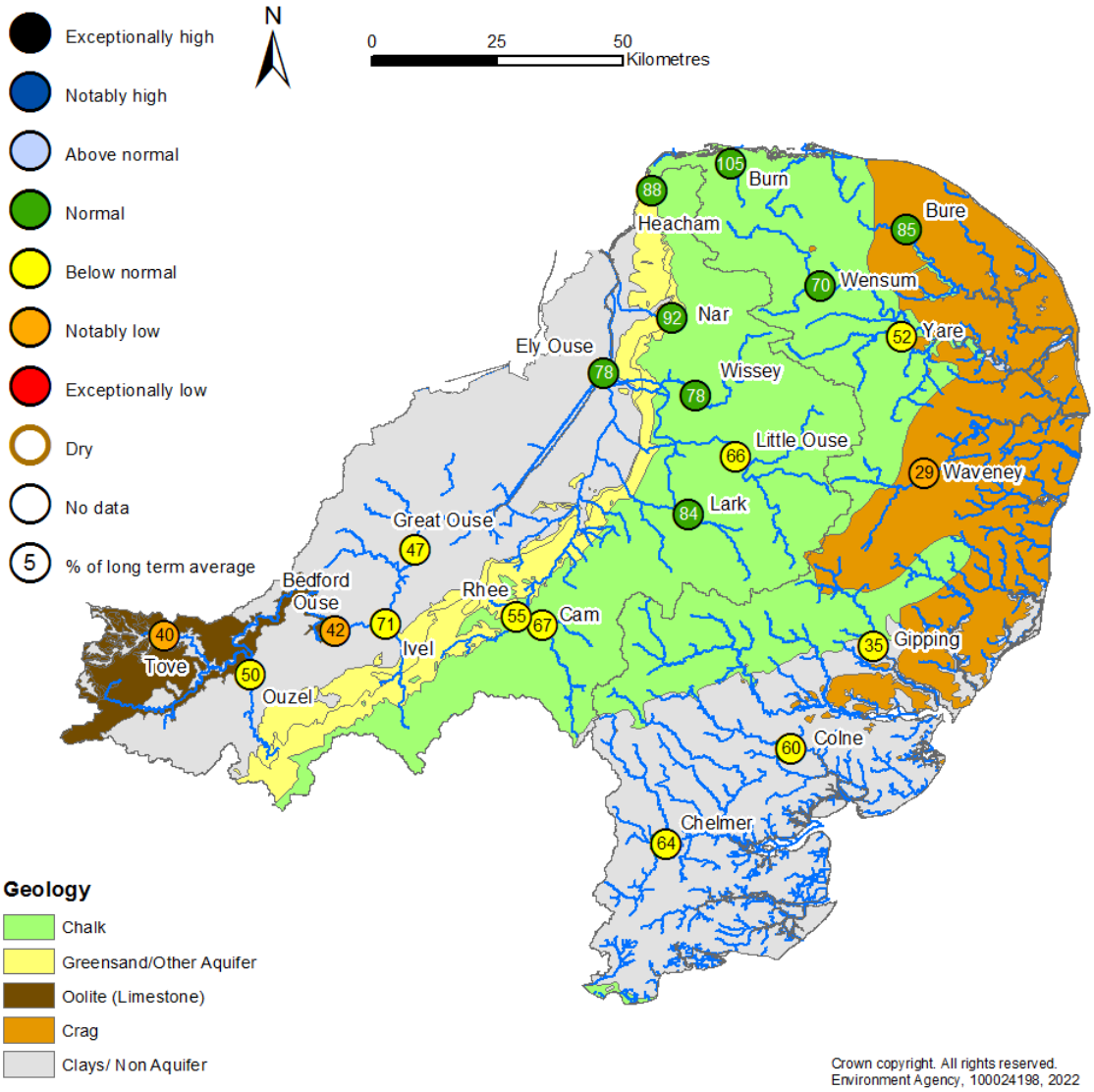
——2021-22 – – –2020-21

Exceptionally high	Notably high	Above normal	Normal
Below normal	Notably low	Exceptionally low	—— Latest data

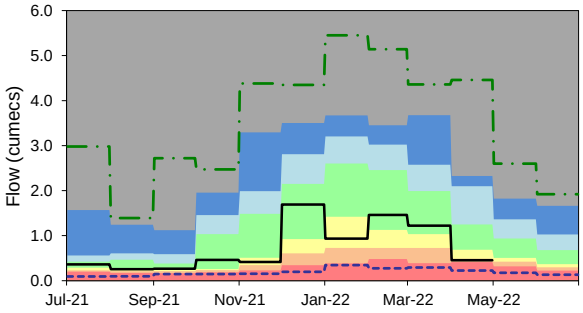


River Flow

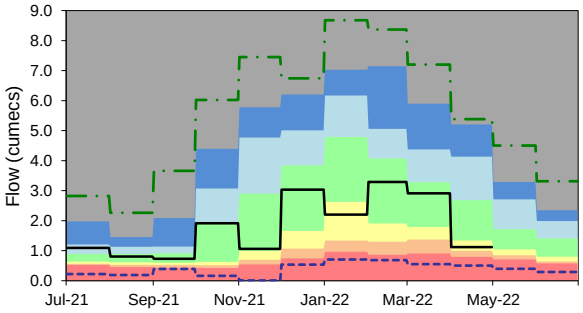
April 2022



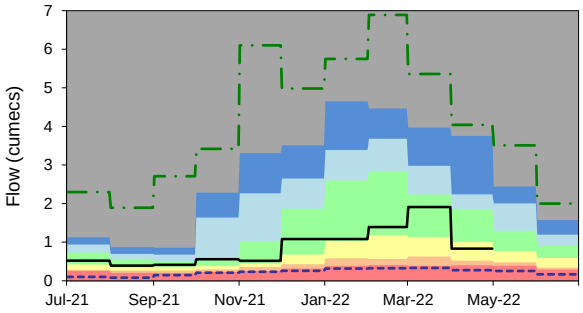
Cappenham, TOVE
Ranking derived from data for the period Feb-1962 to Dec-2017



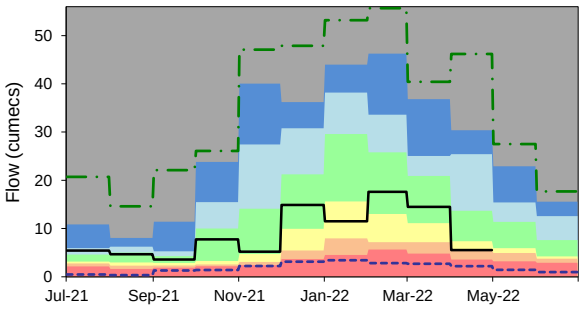
Willen, OUZEL
Ranking derived from data for the period Jan-1962 to Dec-2017



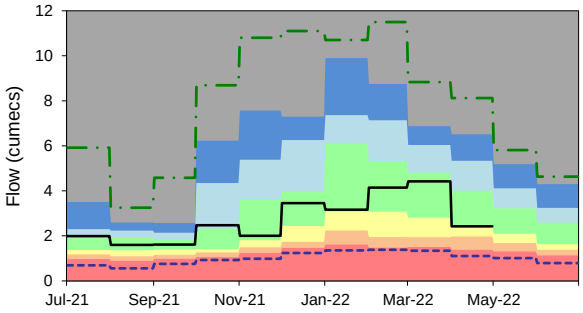
Burnt Mill, RHEE
Ranking derived from data for the period Oct-1962 to Dec-2017



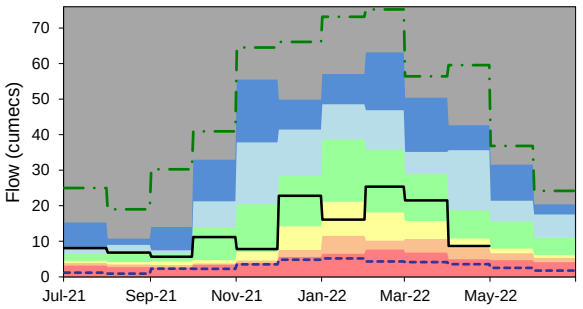
Roxton, GREAT OUSE
Ranking derived from data for the period Oct-1972 to Dec-2017



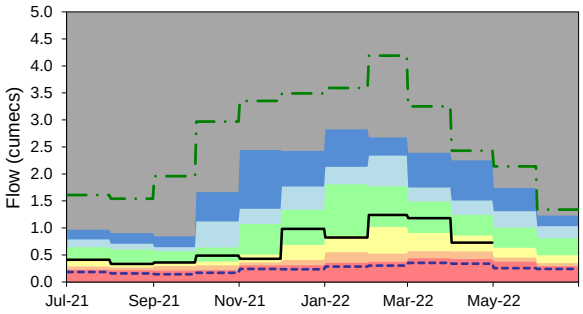
Blunham, IVEL
Ranking derived from data for the period Aug-1959 to Dec-2017



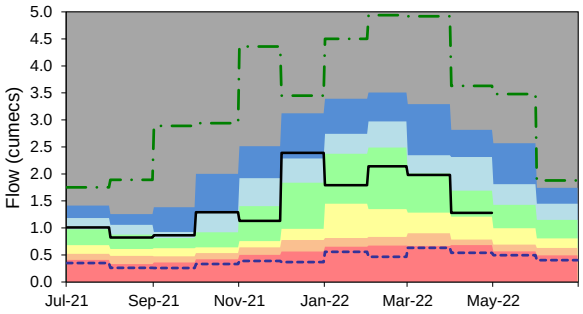
Offord (Gross Flows), GREAT OUSE
Ranking derived from data for the period Jan-1972 to Dec-2017



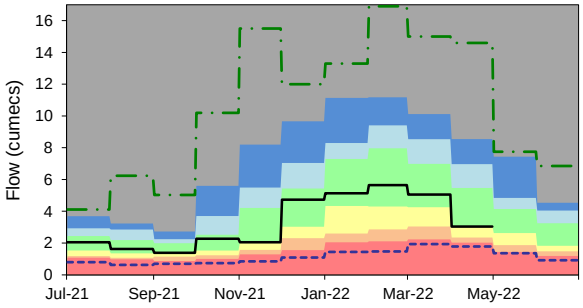
Dernford, CAM
Ranking derived from data for the period Feb-1949 to Dec-2017



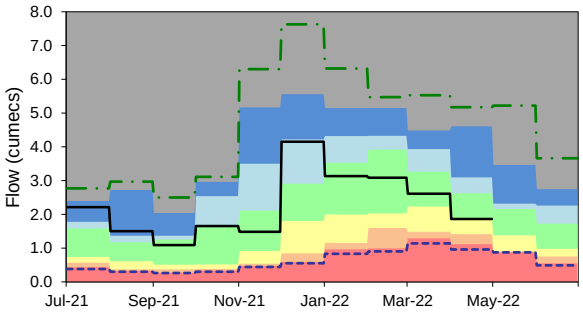
Temple, LARK
Ranking derived from data for the period Nov-1960 to Dec-2017



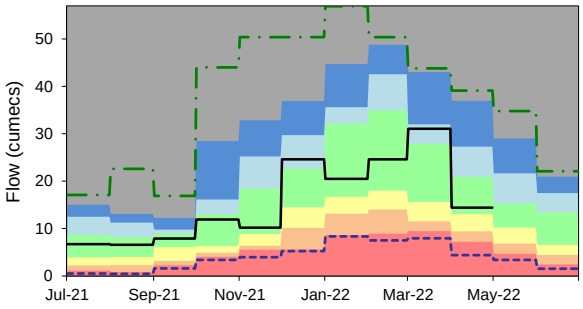
Abbey Heath, LITTLE OUSE
Ranking derived from data for the period Jun-1968 to Dec-2017



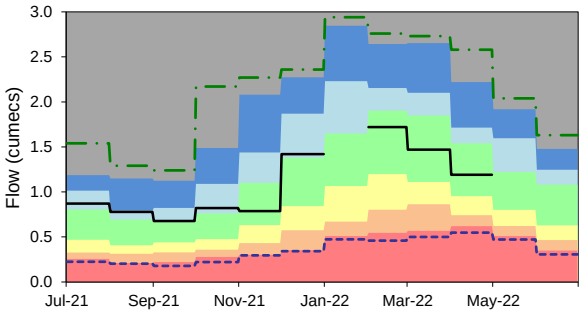
Northwold Total, WISSEY
Ranking derived from data for the period Jul-1983 to Dec-2012



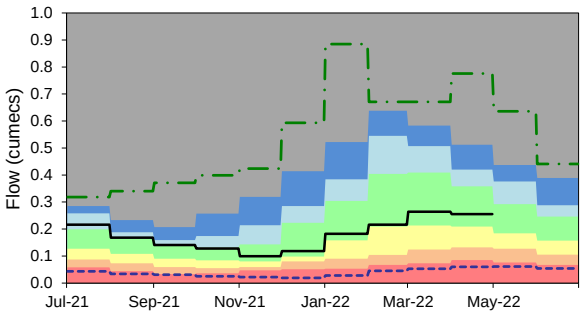
Denver, ELY OUSE
Ranking derived from data for the period Nov-1971 to Dec-2017



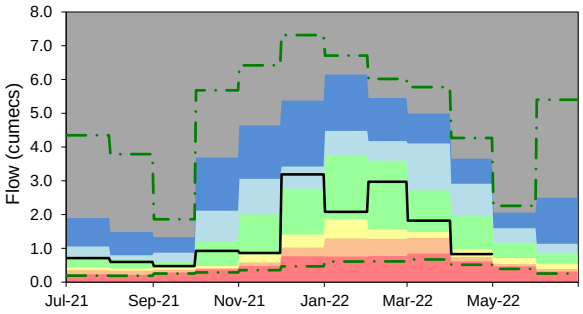
Marham, NAR
Ranking derived from data for the period Apr-1982 to Dec-2017



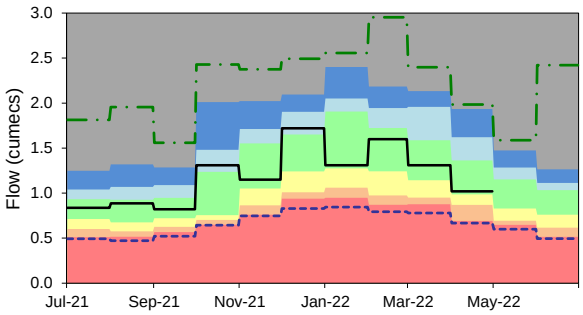
Heacham, HEACHAM
Ranking derived from data for the period Nov-1965 to Dec-2017



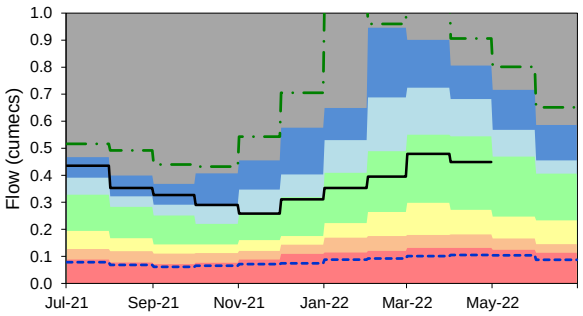
Colney, YARE
Ranking derived from data for the period Jan-1970 to Dec-2017



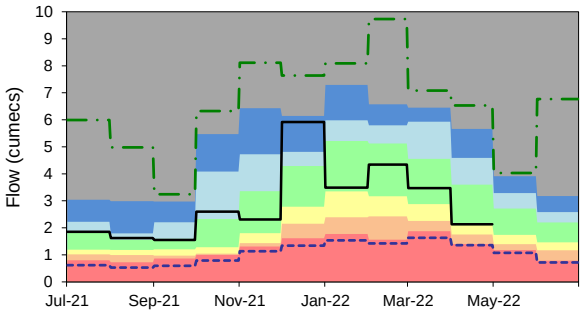
Ingworth, BURE
Ranking derived from data for the period Jan-1970 to Dec-2017



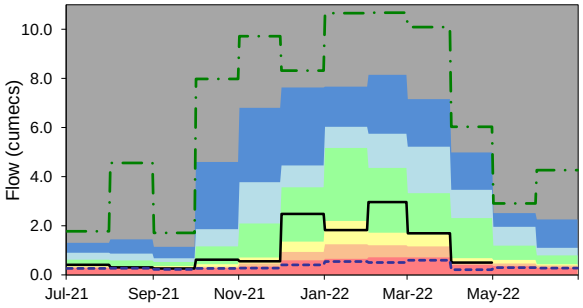
Burnham Overy, BURN
Ranking derived from data for the period Jan-1970 to Dec-2017



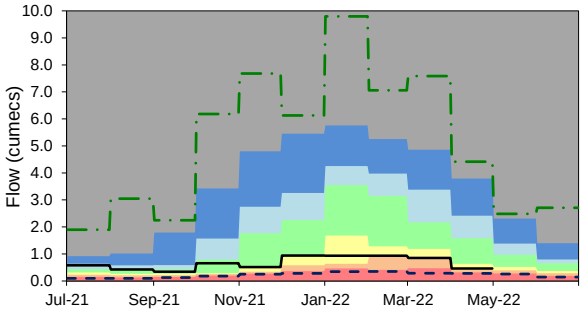
Swanton Morley Total, WENSUM
Ranking derived from data for the period Jan-1970 to Dec-2017



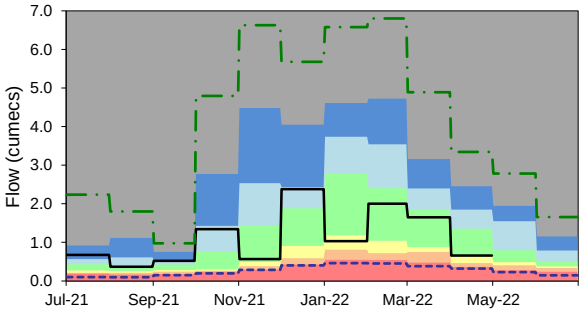
Needham Weir Total, WAVENEY (LOWER)
Ranking derived from data for the period Jan-1970 to Dec-2017



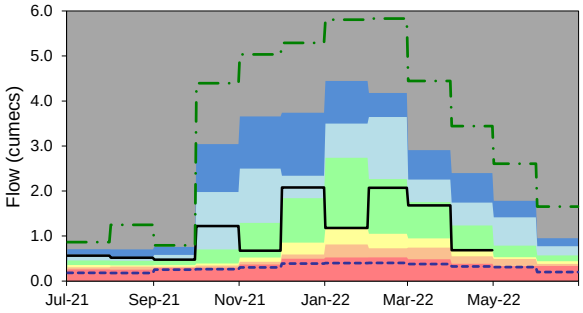
Bramford, GIPPING
Ranking derived from data for the period Jan-1970 to Dec-2017



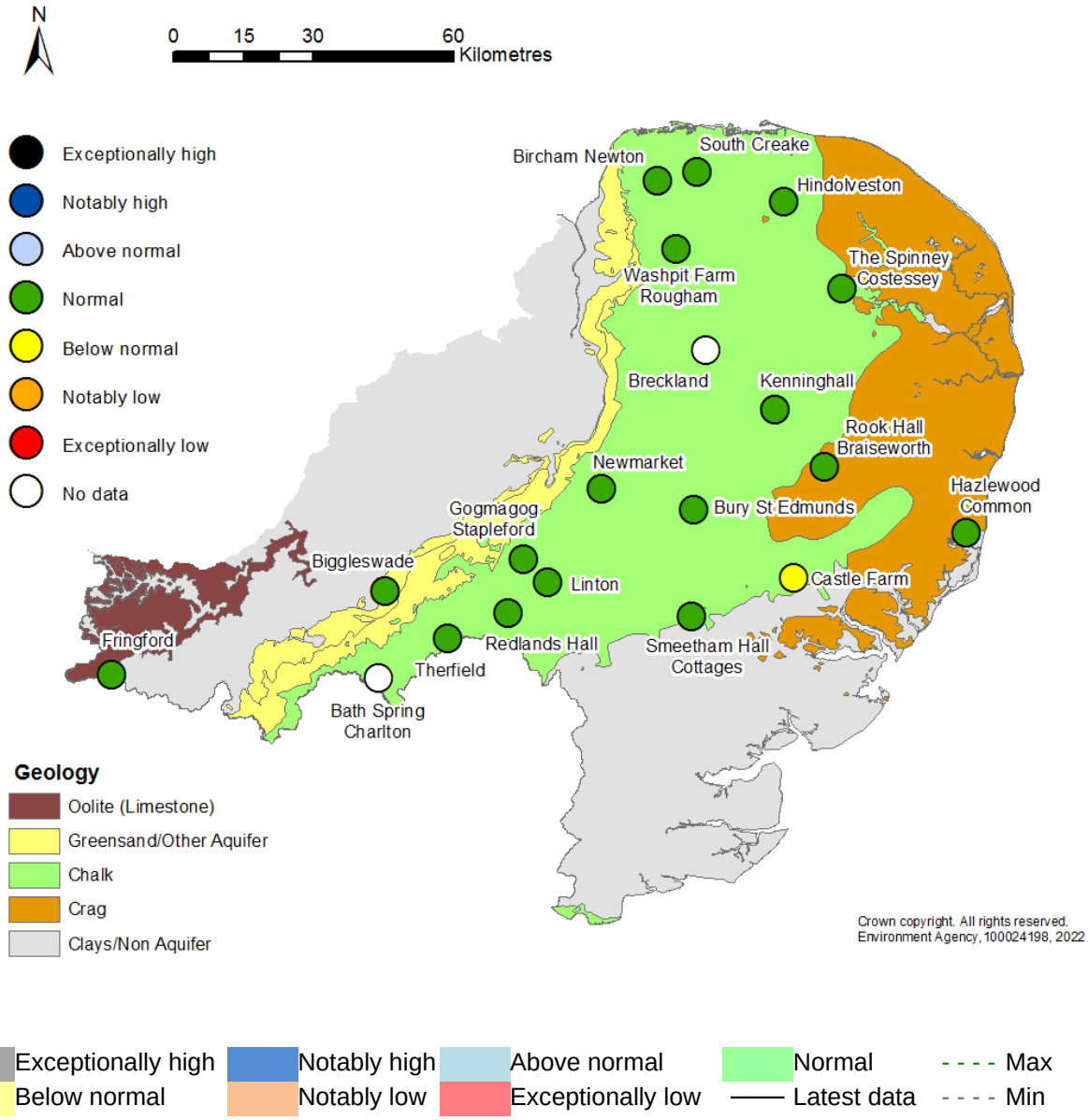
Lexden, COLNE
Ranking derived from data for the period Jan-1970 to Dec-2017



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

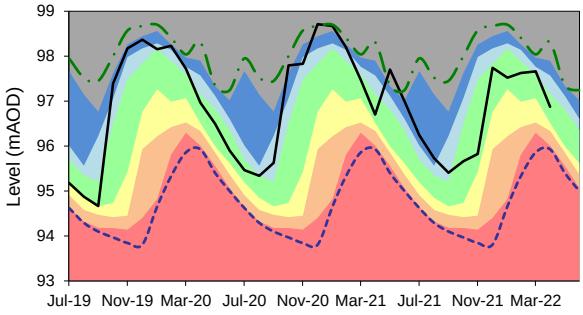


Groundwater Levels April 2022

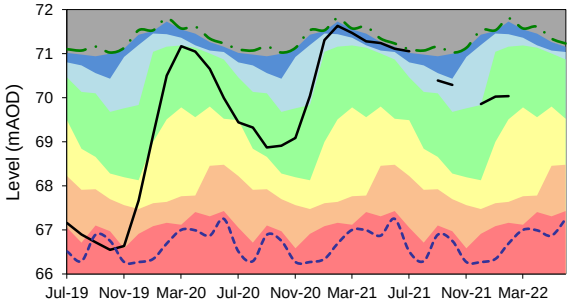


Exceptionally high | Notably high | Above normal | Normal | Max
Below normal | Notably low | Exceptionally low | Latest data | Min

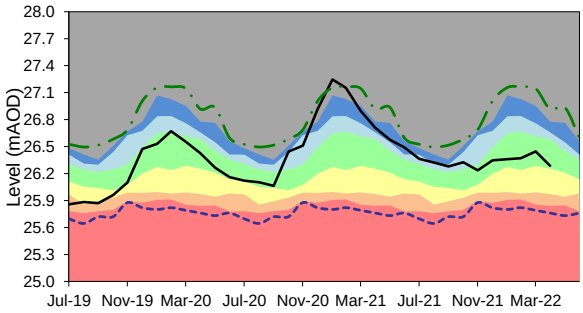
Fringford - GREAT OOLITE
Ranking derived from data for the period Sep-1980 to Dec-2017



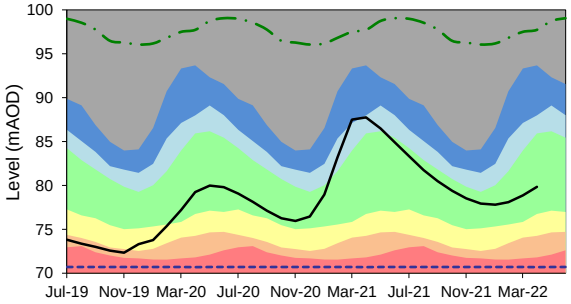
Bath Spring, Charlton - IVEL CHALK
Ranking derived from data for the period Mar-1993 to Dec-2017



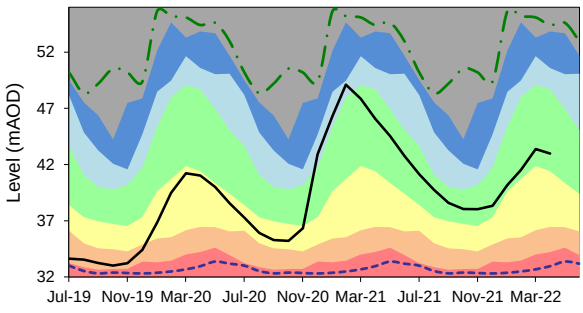
Biggleswade - IVEL SANDSTONE
Ranking derived from data for the period Mar-1968 to Dec-2017



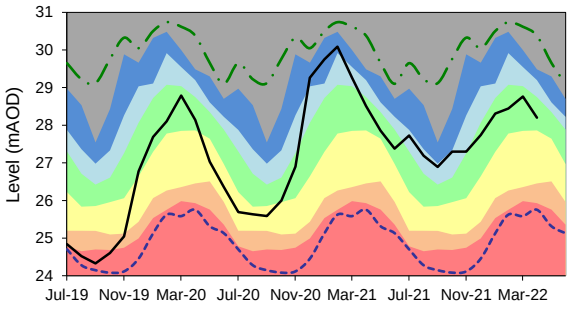
Therfield Rectory - N HERTS CHALK
Ranking derived from data for the period Jan-1883 to Dec-2017



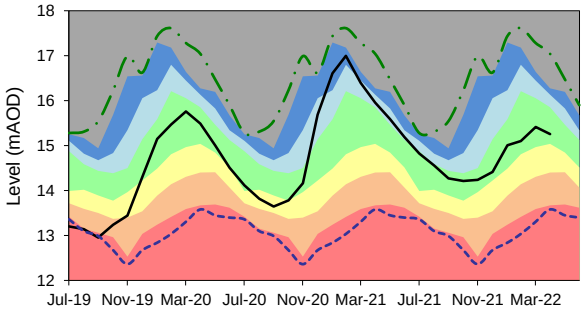
Redlands Hall, Ickleton - CAM CHALK
Ranking derived from data for the period Aug-1963 to Dec-2017



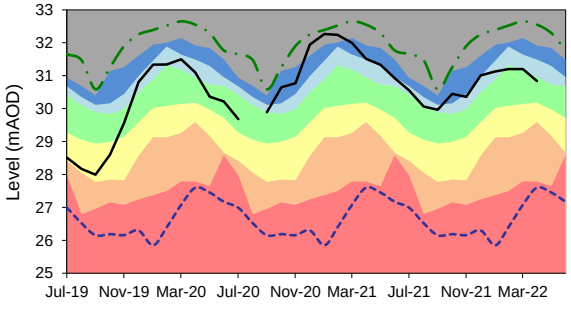
Linton - CAM CHALK
Ranking derived from data for the period Jan-1980 to Dec-2017



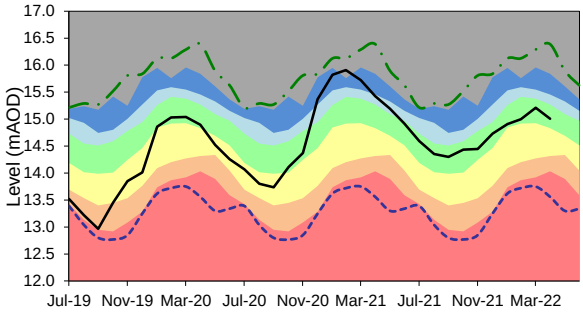
Gog Magog, Stapleford - CAM CHALK
Ranking derived from data for the period Jan-1980 to Dec-2017



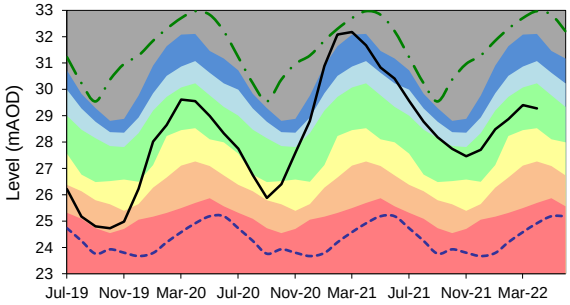
Bury St Edmunds - UPPER LARK CHALK
Ranking derived from data for the period May-1983 to Dec-2017



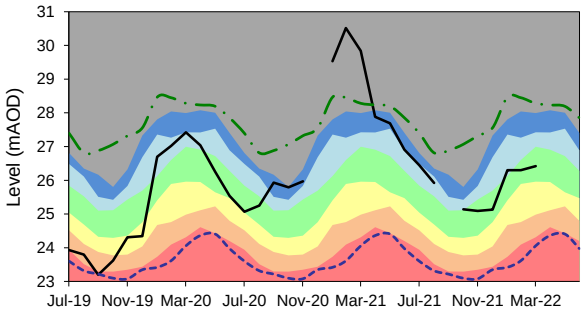
Newmarket - SNAIL CHALK
Ranking derived from data for the period Feb-1983 to Dec-2017



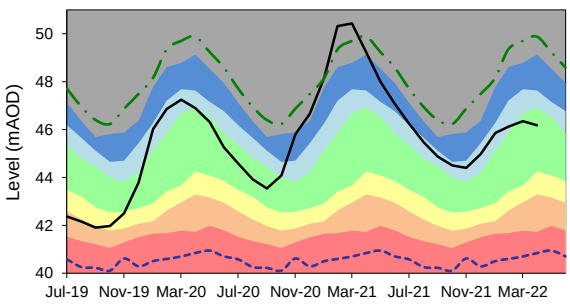
Kenninghall - LITTLE OUSE CHALK
Ranking derived from data for the period Aug-1973 to Dec-2017



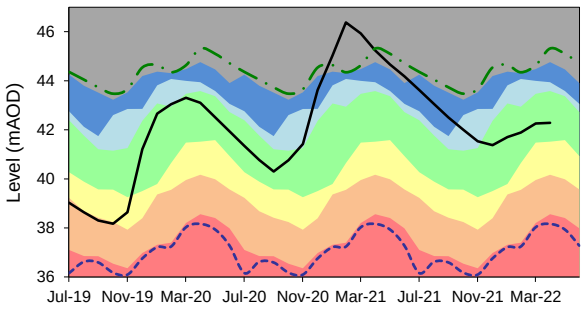
Breckland - WISSEY CHALK
Ranking derived from data for the period Jan-1971 to Nov-2017



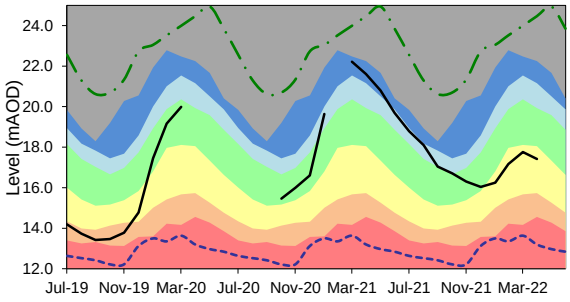
Washpit Farm, Rougham - NW NORFOLK CHALK
Ranking derived from data for the period May-1950 to Dec-2017



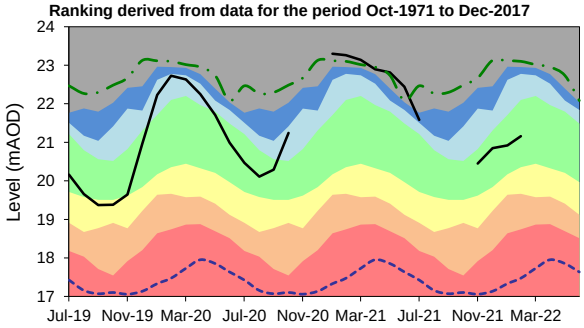
Bircham Newton - NW NORFOLK CHALK
Ranking derived from data for the period Mar-1995 to Sep-2017



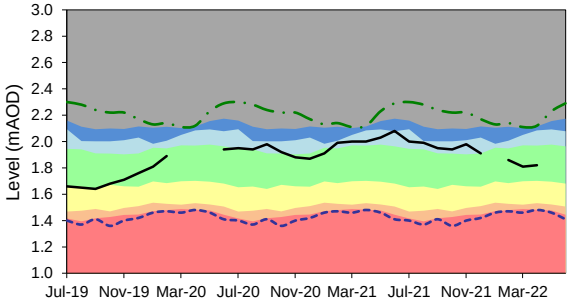
Castle Farm, Offton - MID SUFFOLK CHALK
Ranking derived from data for the period Mar-1967 to Dec-2017



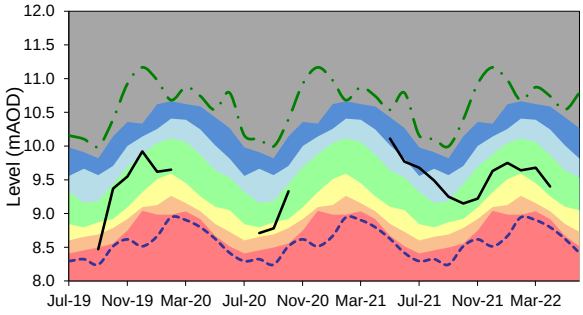
Old Primary School, South Creake
NW NORFOLK CHALK
Ranking derived from data for the period Oct-1971 to Dec-2017



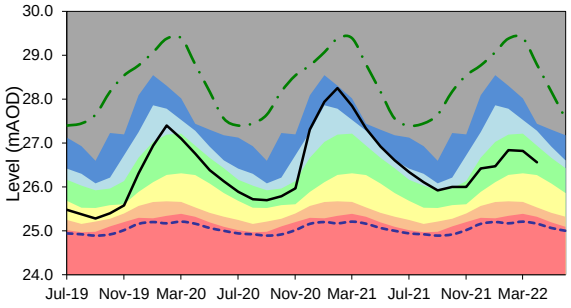
Hazlewood Common, SUFFOLK CRAG
Ranking derived from data for the period Oct-1988 Feb-2020



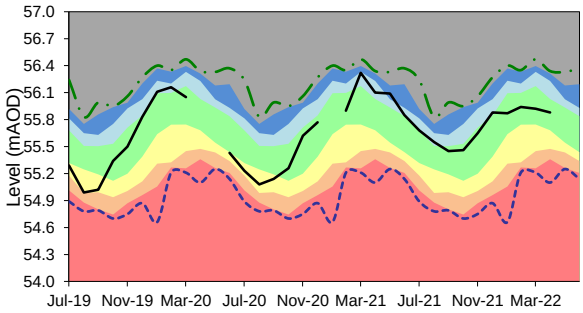
The Spinney, Costessey - WENSUM CHALK
Ranking derived from data for the period Oct-1971 to Dec-2017



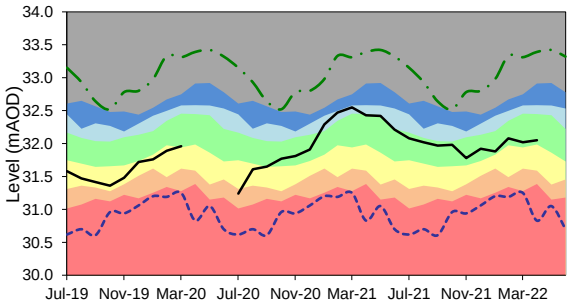
Smeetham Hall Cottages, Bulmer - ESSEX CHALK
Ranking derived from data for the period Jan-1964 to Dec-2017



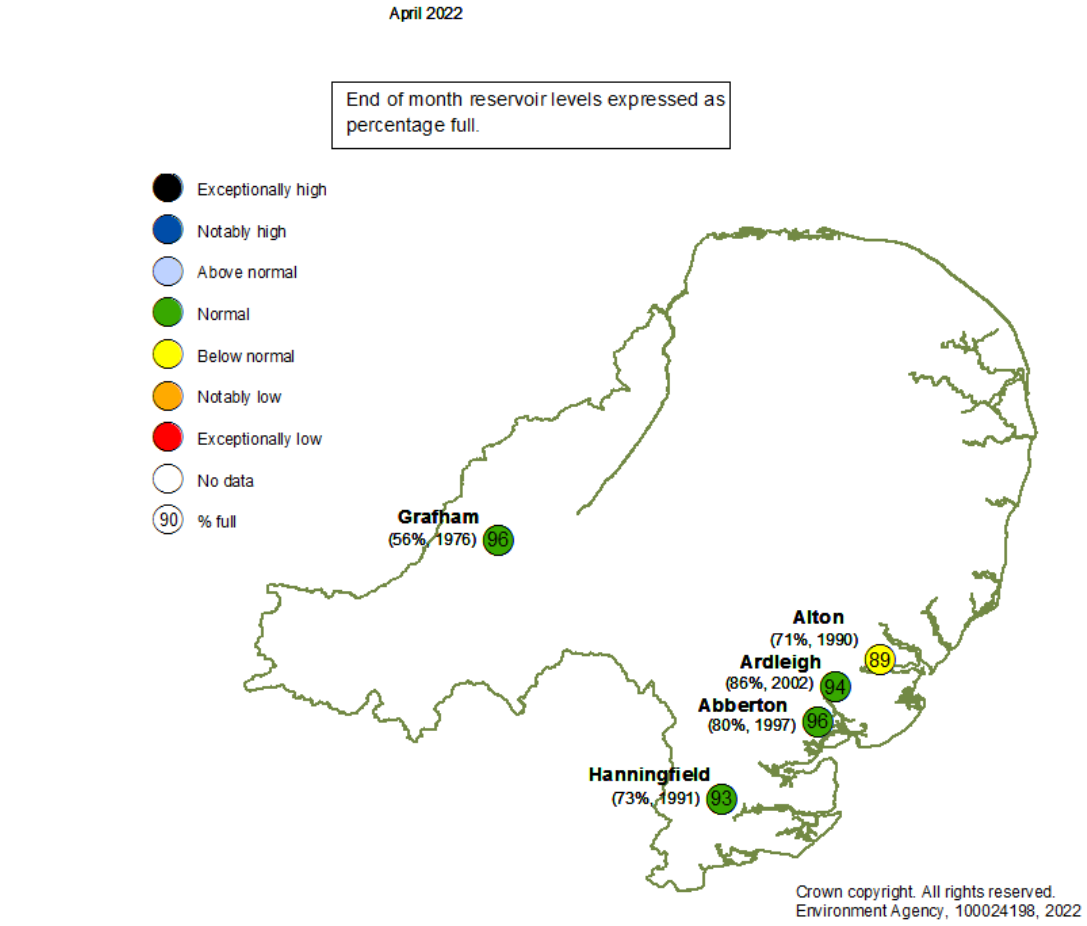
Hindolveston - NORFOLK CHALK
Ranking derived from data for the period Sep-1984 to Nov-2017



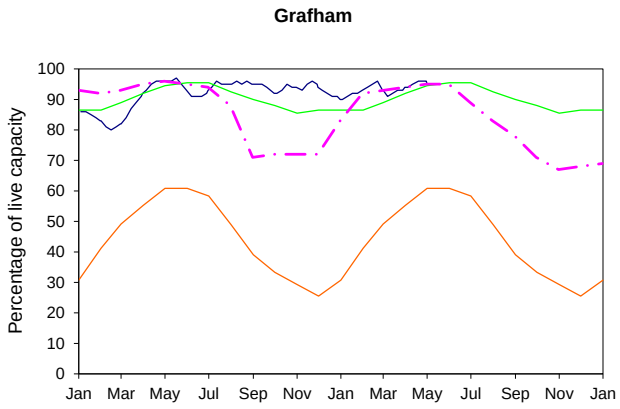
Rook Hall, Braiseworth - SUFFOLK CHALK
Ranking derived from data for the period Jan-1980 to Dec-2017

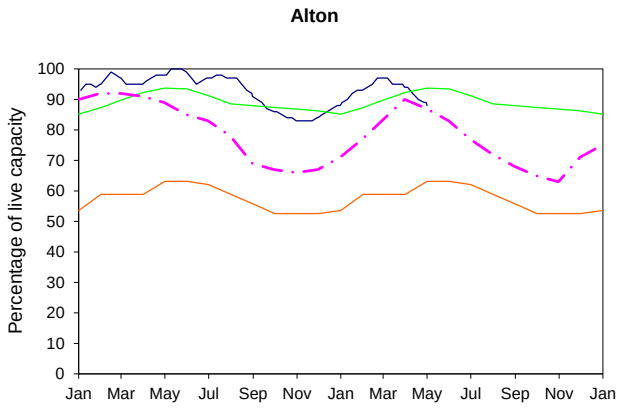


Reservoir Stocks April 2022



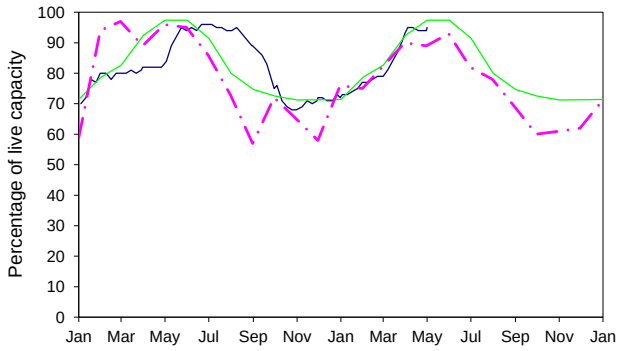
2021-2022 Normal Operating Curve Drought Alert Curve 1995-1996



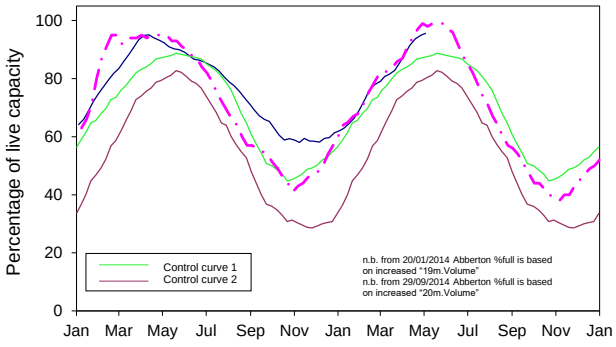


2021-2022 Normal Operating Curve Drought Alert Curve 1995-1996

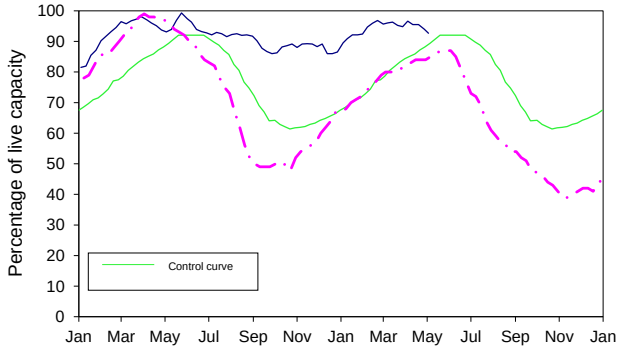
Ardleigh



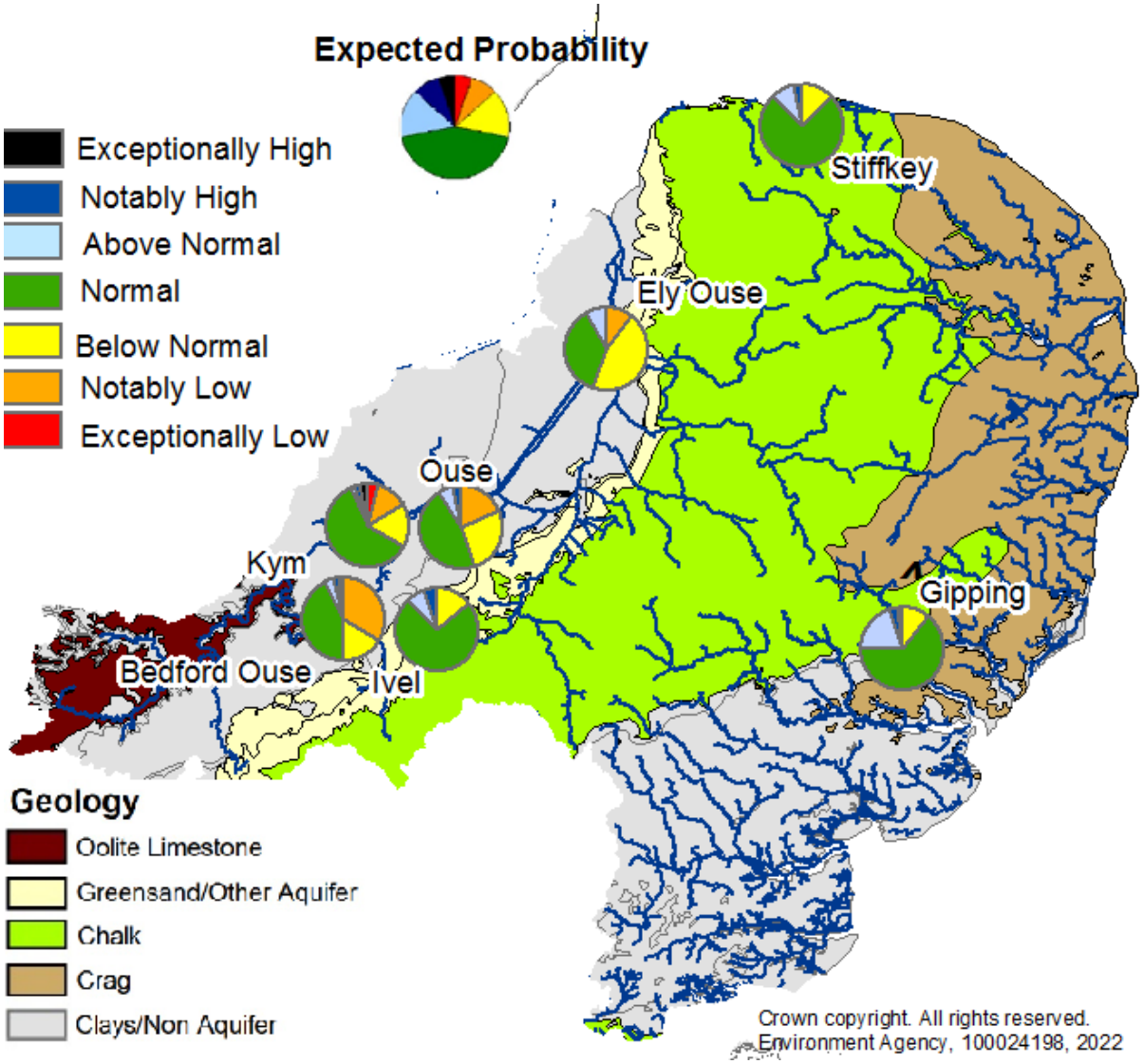
Abberton



Hanningfield



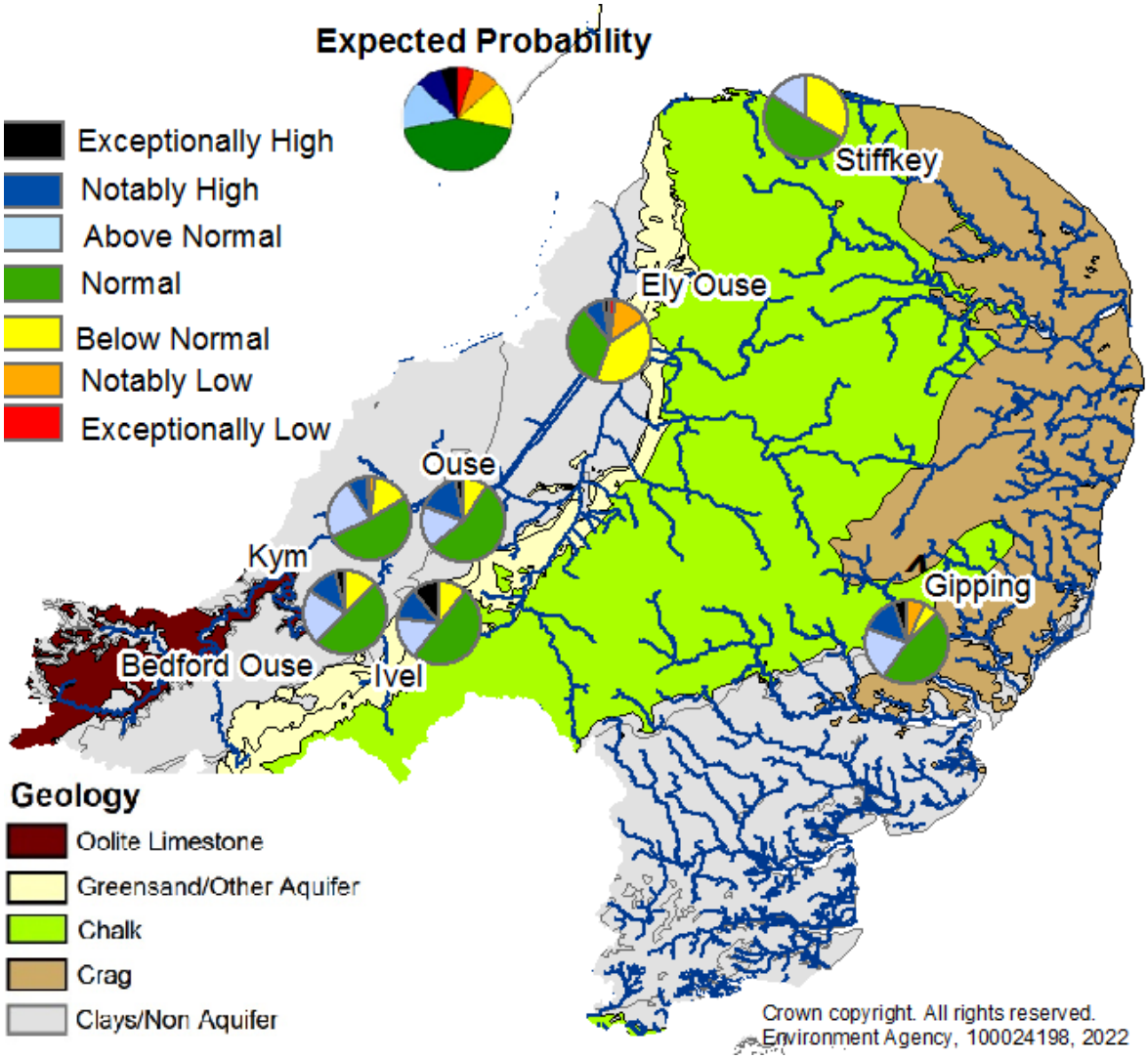
Forward Look – River Flows



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 2022. 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, 2022.

^ *"Naturalised" flows are projected for these sites'*



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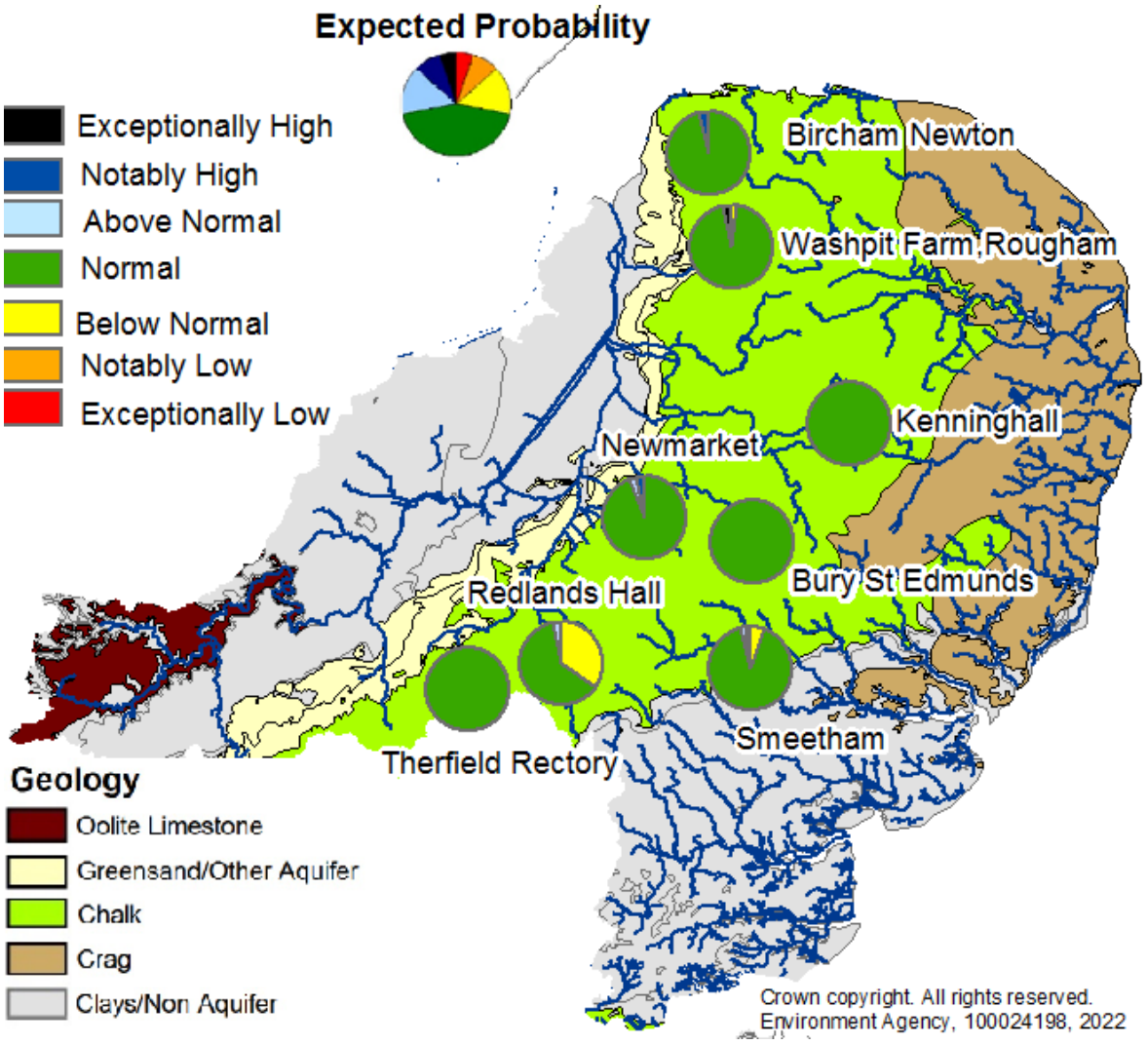
Probabilistic ensemble projections of river flows at key indicator sites in September 2022. Pie charts indicate probability, based on climatology, of the surface water flow at each site being e.g. exceptionally low for the time of year. (Source: Centre for Ecology and Hydrology, Environment Agency) Geological map reproduced with kind permission from UK Groundwater Forum, BGS © NERC. Crown copyright. All rights reserved. Environment Agency, 100026380, 2022

Forward Look – Groundwater



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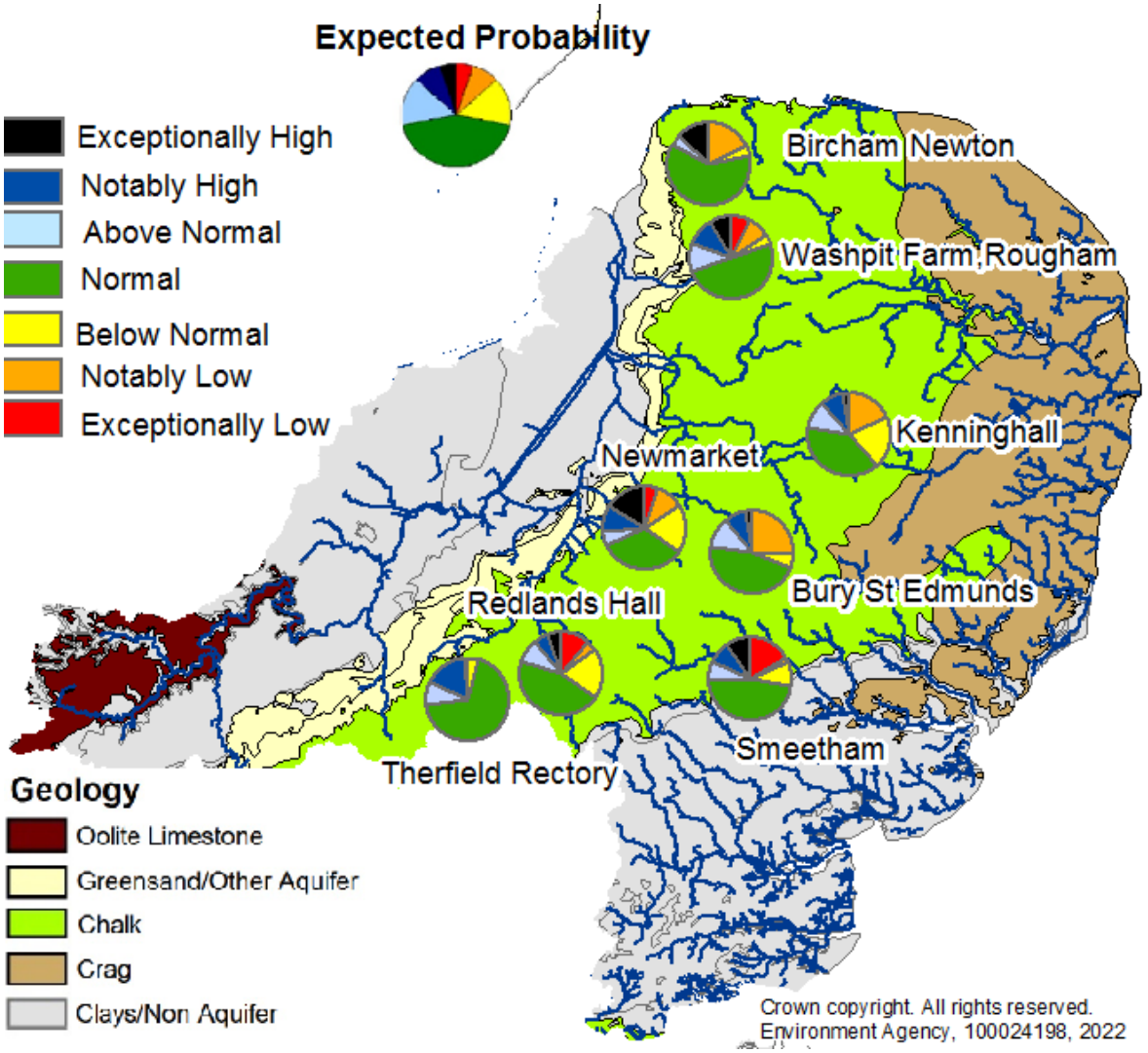
Probabilistic ensemble projections of groundwater levels at key indicator sites for end of September 2022. Pie charts indicate probability, based on climatology, of the groundwater level at each site being e.g. exceptionally low for the time of year. (Source: Environment Agency) Geological map reproduced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



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Probabilistic ensemble projections of groundwater levels at key indicator sites for end of March 2023. 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, 2022.

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).

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.