
DANGER!
DEEP WATER

River Bulbourne Investigation into impacts of Canal & River Trust's abstractions

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Job title: Water Resources Specialist

Date: 21 February 2019

Environment Agency

Revitalising Chalk Rivers

Colne and Upper Lee Projects

Revitalising the river Ver
The Environment Agency, Affinity Water, St Albans City and District Council and Hertfordshire County Council's Countryside Management Service (CMS) are working together to improve the River Ver, the Verulamium Park lakes and the wider river area through St Albans. The 2.5 km project area has been split into six sections or 'reaches' which cover the River Ver from Verulamium Park through to Sopwell Mill Farm. Below are some of our plans.

Channel Restoration - Box Moor
Restored 1km length of the River Bulbourne between the Grand Union Canal, and Two Waters Road, Hemel Hempstead.
Awards won: - Highly Commended at Canal and Rivers Trust Living Waterways award
- Best medium scale-habitat enhancement scheme
- Best Practise Award for Small Scale Practical Nature Conservation

New Barnes Mill Weir Removal
As part of Revitalising Chalk Rivers, the Environment Agency have removed a weir and carried out in-channel improvements at New Barnes Mils to improve the river for fish, and enhance habitats for wildlife.

Gerrard's Cross Golf Club
Work was undertaken to restore the natural bed and banks by breaking out and removing the concrete, adding woody material and marginal shelves.

River Restoration at Digswell Lakes
300m stretch of chalk stream was restored using berms, large woody habitat features and an island at the ponded section of the lake outfall.

Lower Misbourne Enchancement works
In partnership with Berks, Bucks and Oxon Wildlife Trust, tree thinning, and in channel habitat enhancements were carried out. A beach was created to improve social space.

Denham Country Park Backwater
The project involved creating a backwater on the River Colne with a short channel excavated to connect to the river.

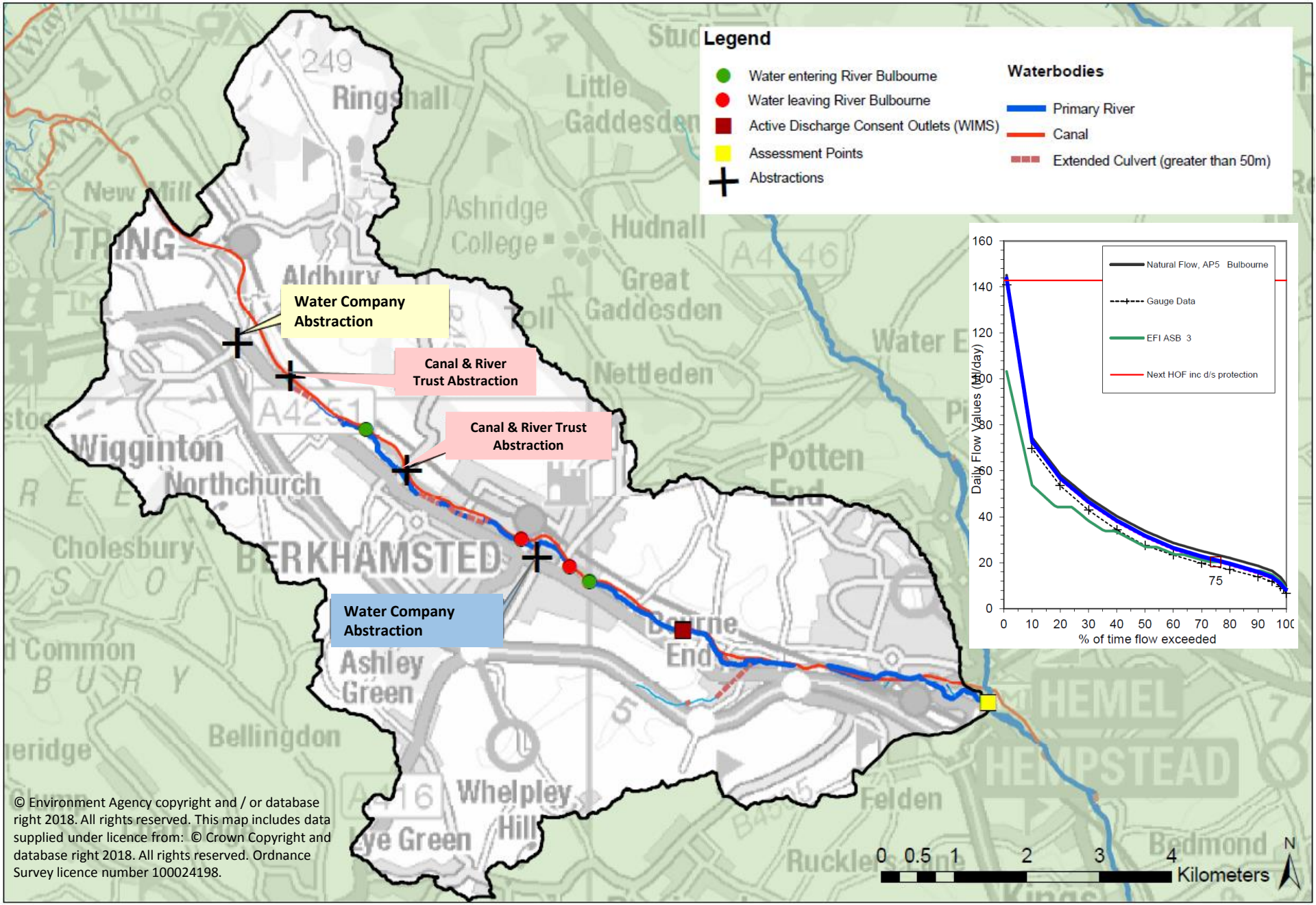
Legend

Investigation 2020 - 2025

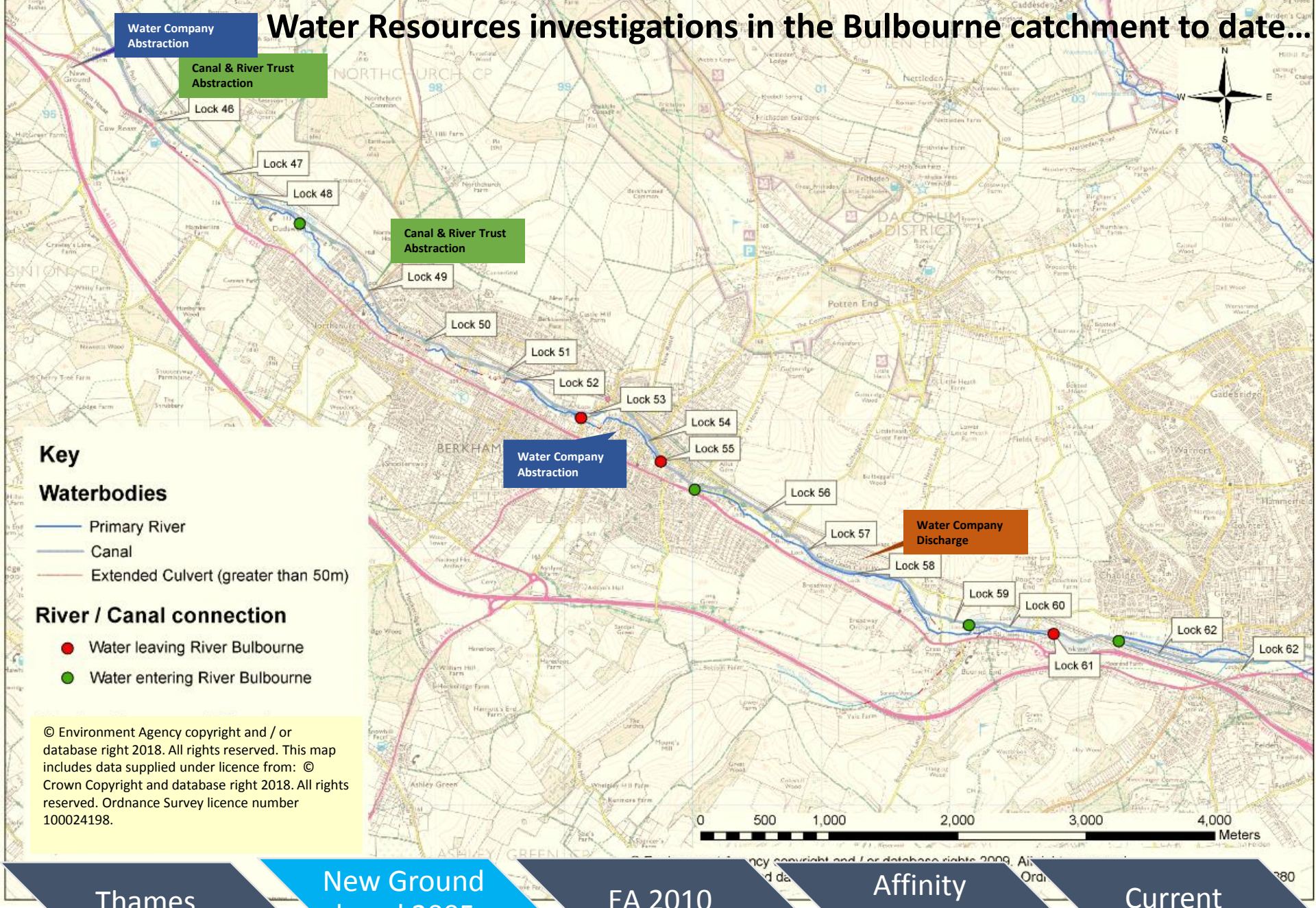
Deliver 2015-2025

St Albans City & District Council · Environment Agency · Affinity Water · Countryside Management Service · Revitalising Chalk Rivers · Berkshire Buckinghamshire Oxfordshire · Wildlife Trusts · The Box Moor Trust · Environment Agency

Significant abstractions in Bulbourne catchment and water resources situation



Water Resources investigations in the Bulbourne catchment to date…



Thames Water 1996 → New Ground closed 2005-2012 → EA 2010 → Affinity Water 2018 → Current Investigation

Summary of conclusions from the current investigation

- Chalk stream
- HMWB due to
  - recreation
  - urbanisation
- Ecology is failing WFD
- The key pressures are flow, morphology and sedimentation.
- Cow Roast and Northchurch abstractions are reducing baseflows into the upper River Bulbourne

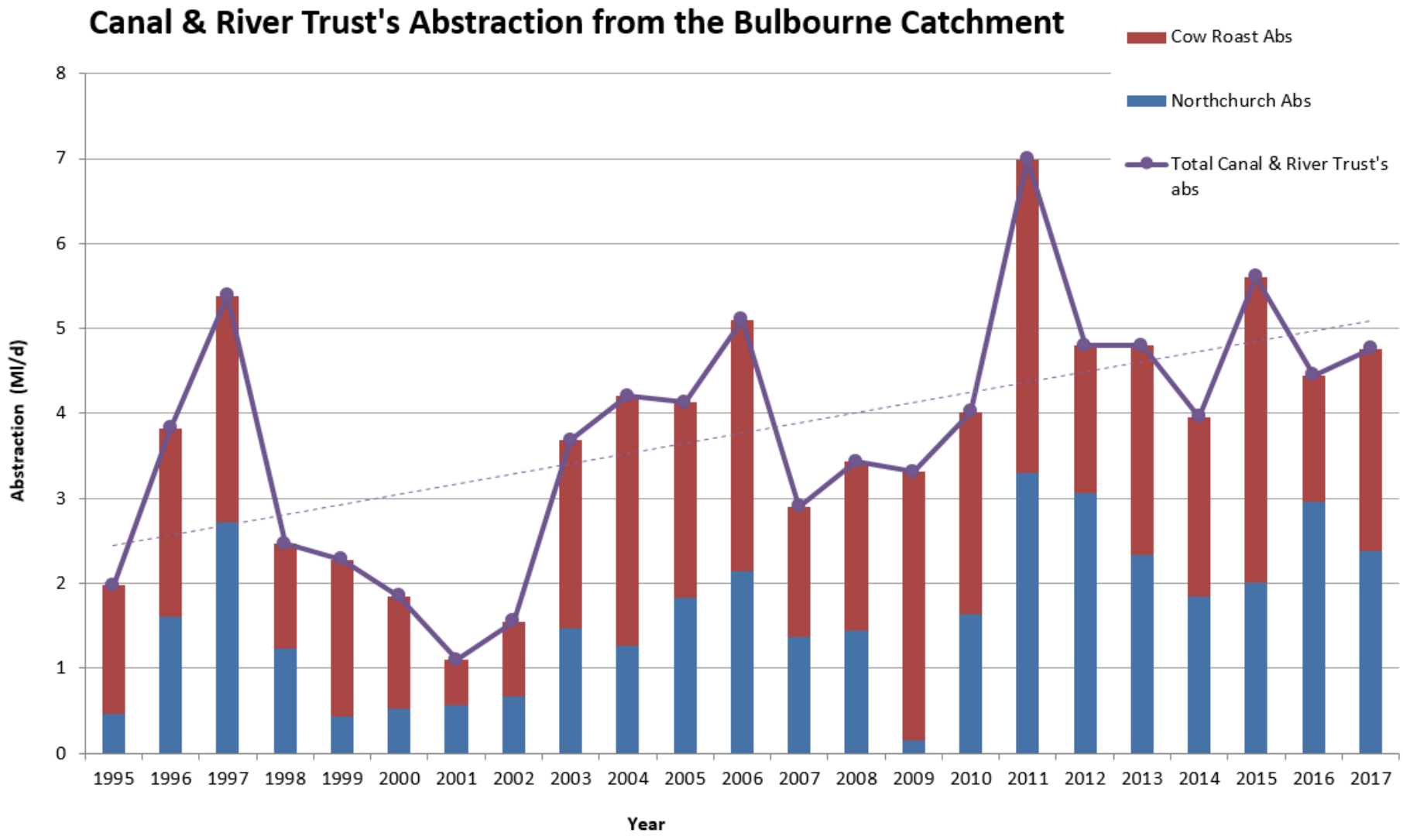
Reasons for current investigation …

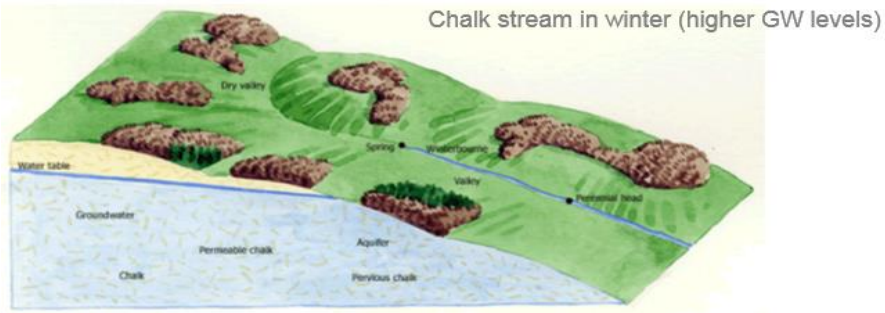
Classifications

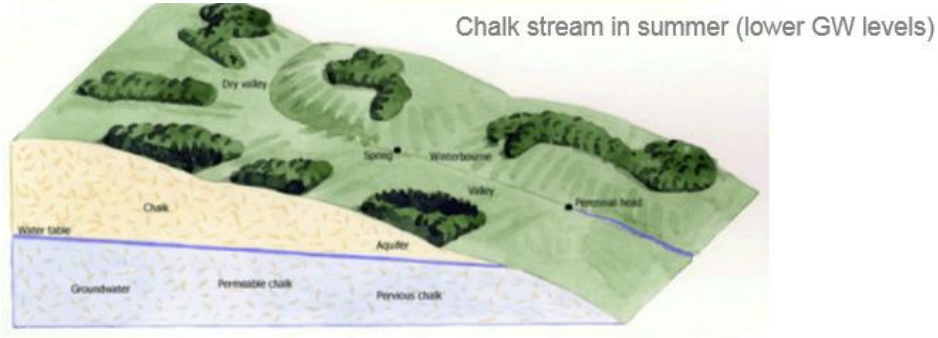
Yea	Overall	Ecological	Chemical	MMA	Invertebrates	Fish	Macrophytes and Phytobenthos Combined	Phosphate	Ammonia	Dissolved Oxygen	pH	Hydrological Regime
2013	Moderate	Moderate	Good	Mod/less								
2014	Moderate	Moderate	Good	Mod/less	Moderate			Good	High	High	High	DNSG
2015	Poor	Poor	Good	Mod/less	Moderate		Poor	Good	High	Good	High	DNSG
2016	Poor	Poor	Good	Mod/less	Moderate		Poor	Good	High	Good	High	DNSG

Note: DNSG = 'Does Not Support Good', DNRA = 'Does Not Require Assessment'

Reason for not achieving Good	Certainty	Sector
Groundwater abstraction	Probable	Navigation
Inland Navigation	Suspected	Navigation


Canal & River Trust's Abstraction from the Bulbourne Catchment
Cow Roast Abs
Northchurch Abs
Total Canal & River Trust's abs
Abstraction (Ml/d)
0
1
2
3
4
5
6
7
8
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
Year

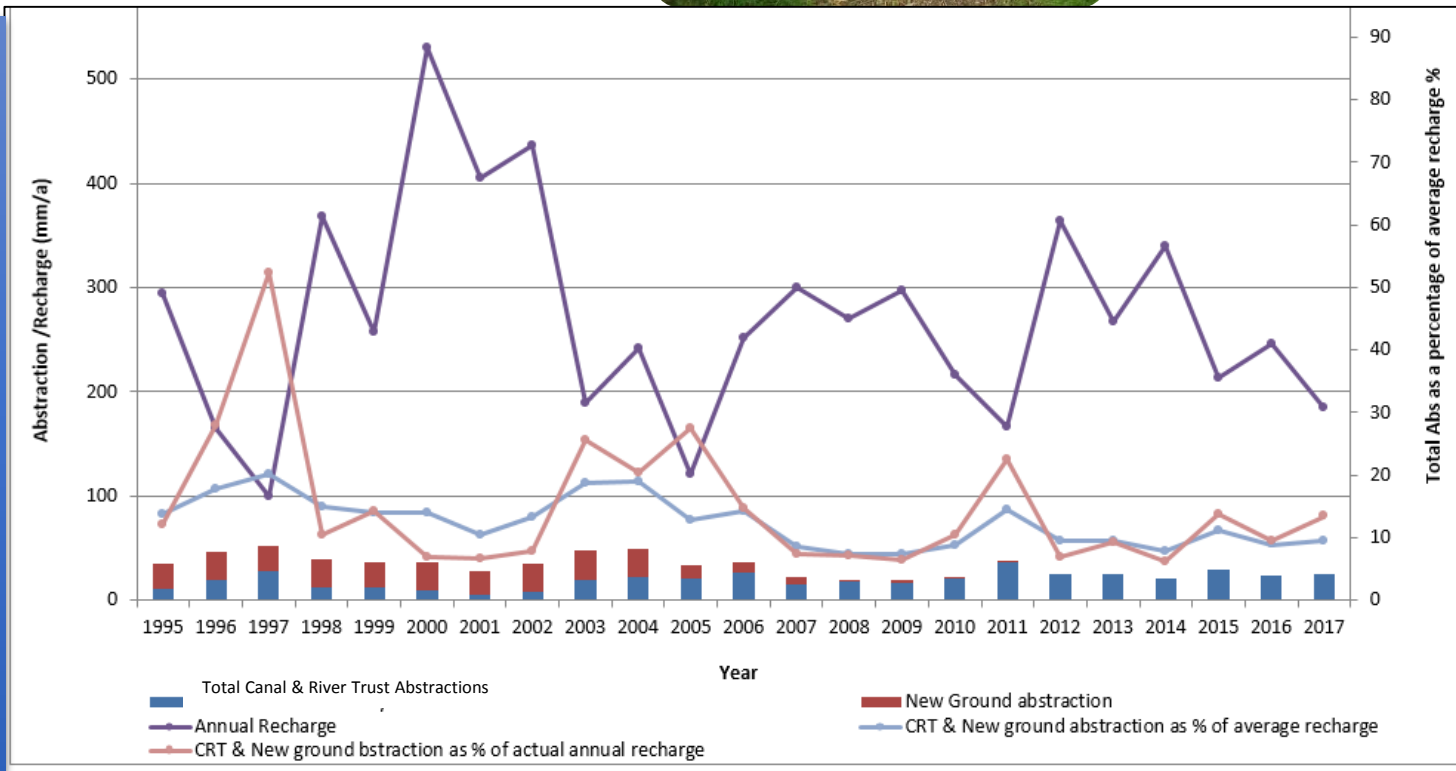


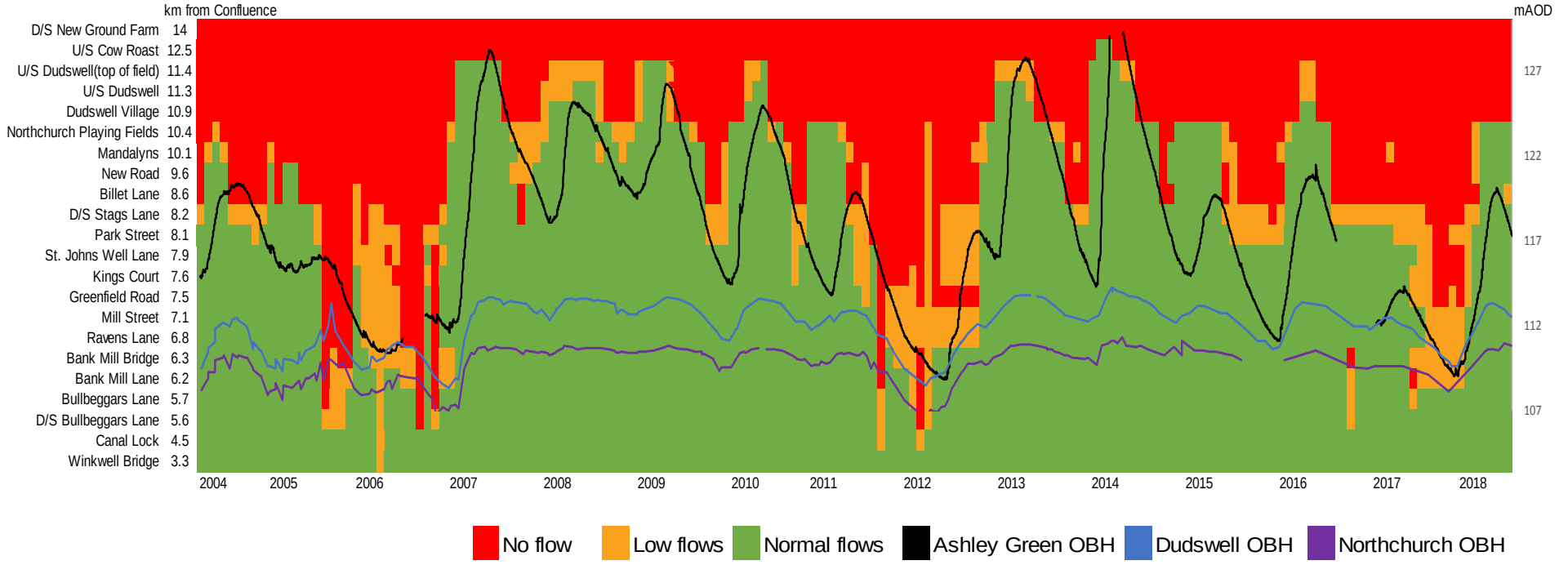


Source:
Schematics - Affinity Water;
Photos: Environment Agency.

Groundwater **recharge** is the replenishment of an aquifer with water from the land surface.

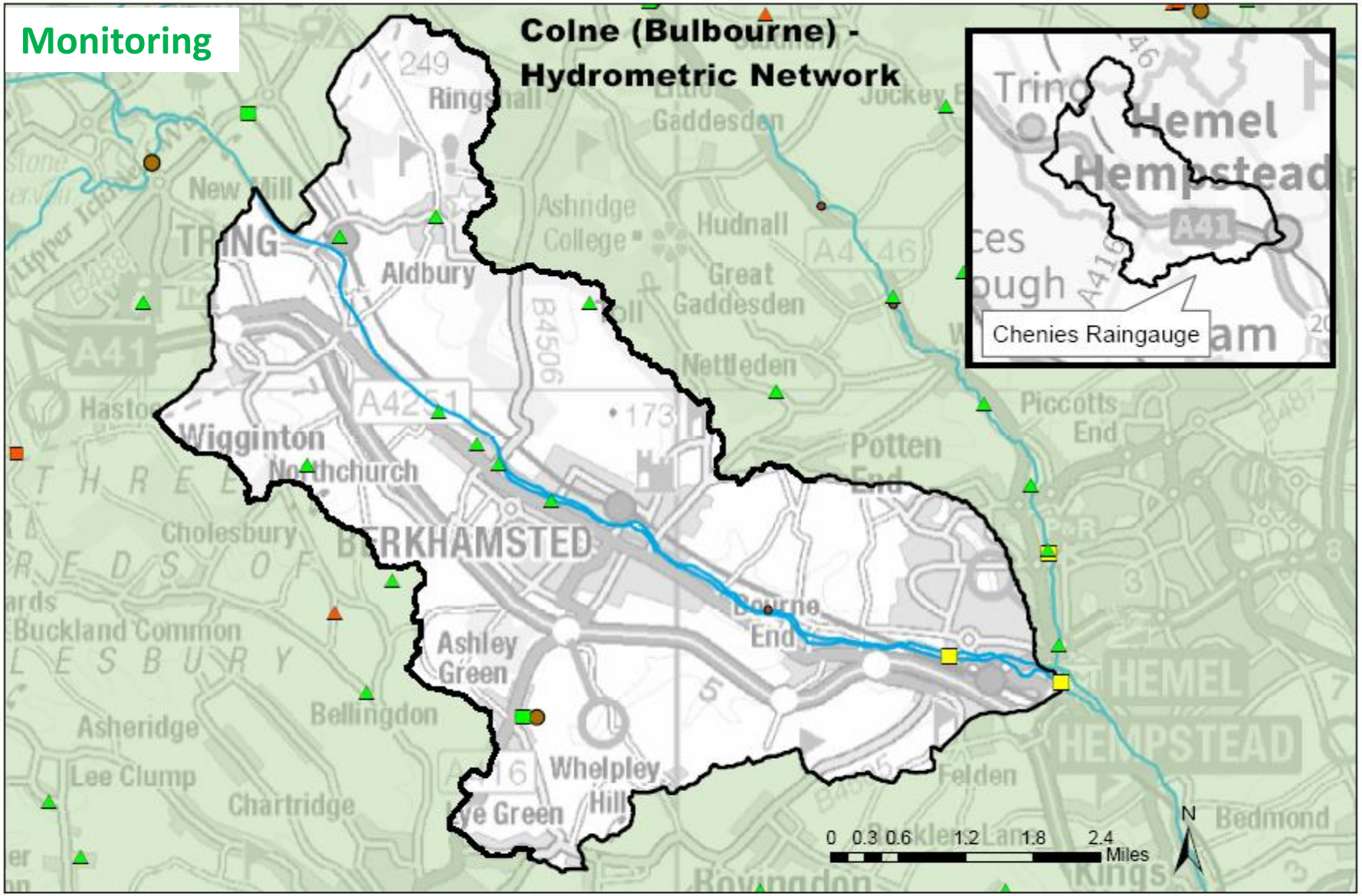
When the sole source of such potential **recharge** is precipitation, it is usually called potential natural **recharge**.





Springs and Sources Survey

Monitoring

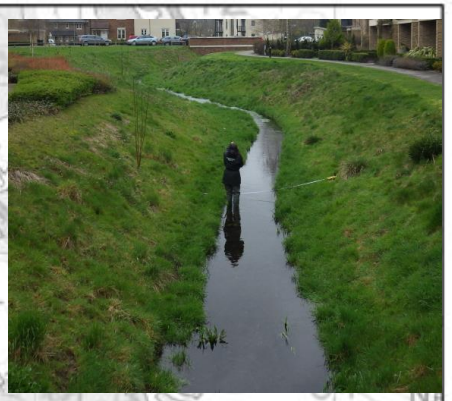


Legend

SITESUBTYP

- Closed
- Effluent site
- Groundwater level (observation boreholes) continuous recording
- Groundwater level (observation boreholes) manually read
- Operational Control
- Precipitation - manually read
- Precipitation - recording
- River flow - continuous
- Surface water level (including tide and lake level) - continuous
- WFDC2_RIVER_CATCHMENTS selection
- WFDC2_RIVERS

Bulbourne - Groundwater & Spot Flow Gauging Sites



DUDSWELL OBH

NORTH CHURCH OBH

MARYS SCHOOL OBH

Legend

- Spot Flow Sites
- Groundwater OBH sites
- Abstractions

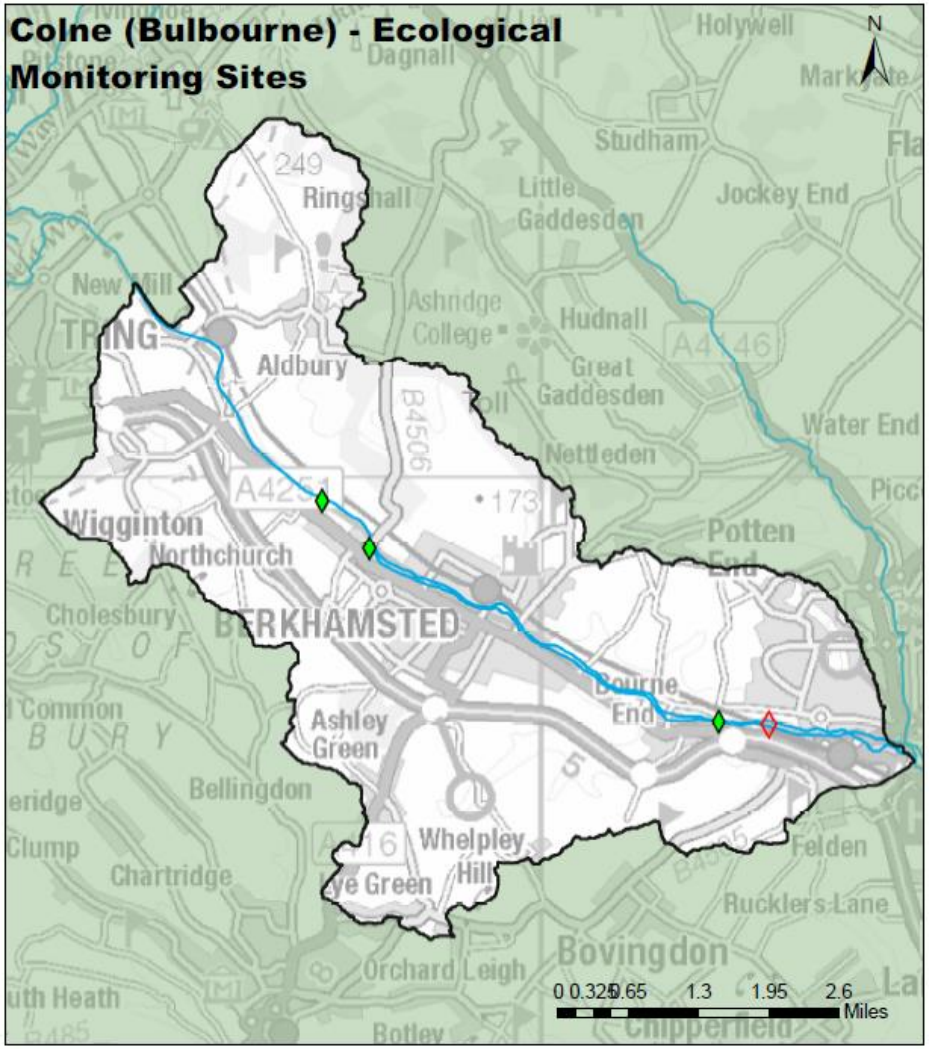
WFDC2_RIVERS

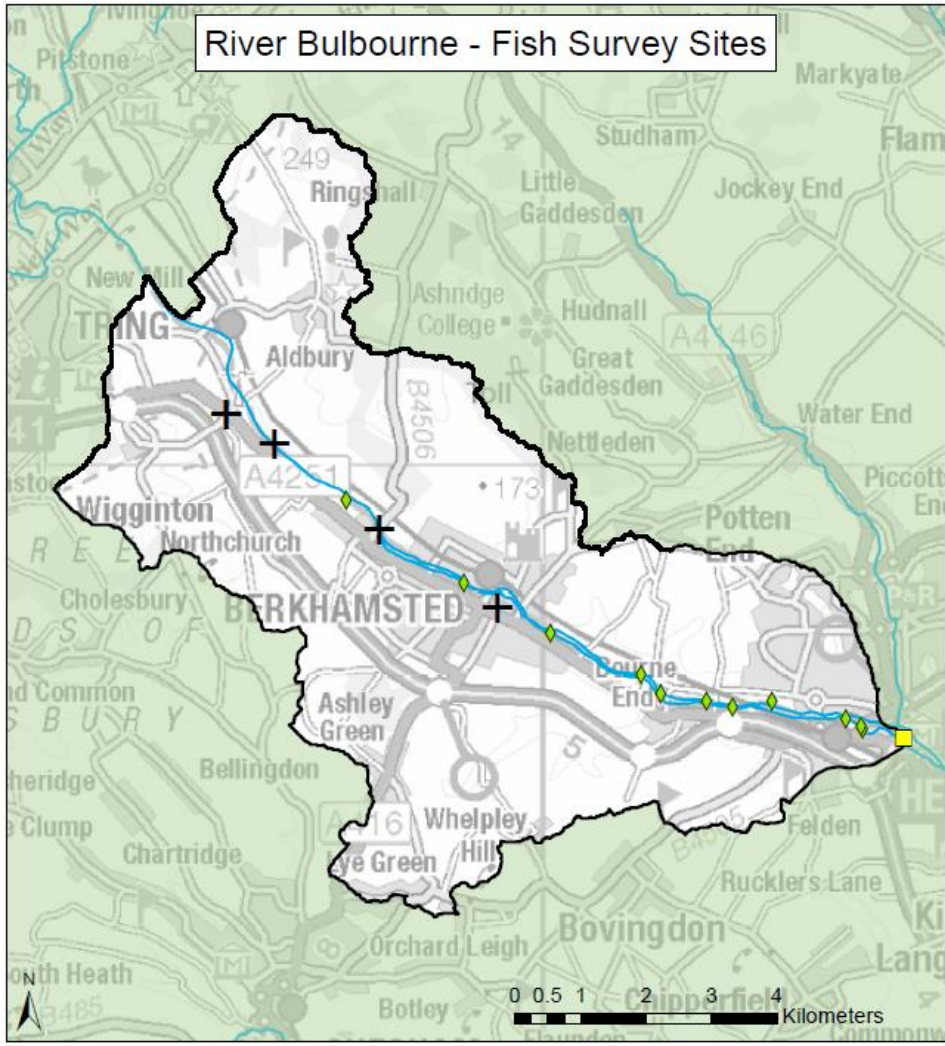
WATER_CATEGORY

- Canal
- River
- Surface Water Transfer
- Bulbourne_Catchment

0 0.175 0.35 0.7 1.05 1.4 Miles

Ecological Monitoring





Legend

- Bulbourne_Catchment
- Invertebrates_monitoring_sites_2 Events
- Macrophytes_monitoring_sites
- WFDC2_RIVERS

Legend

- Fish Survey Sites
- Assessment Points
- Abstractions
- WFDC2_RIVERS

Ecological analysis using Hydroecological Validation (HEV) plots assessment

Dudswell

Spring 2015

Spring2017

- Flow and sedimentation linked to low flows/ drying is the pressure;
- Highly impoverished community with drought resistant and opportunistic invertebrate species in wet years;
- Spring and Sources data 2007-2016 show 69% prevalence of dry channel

Northchurch

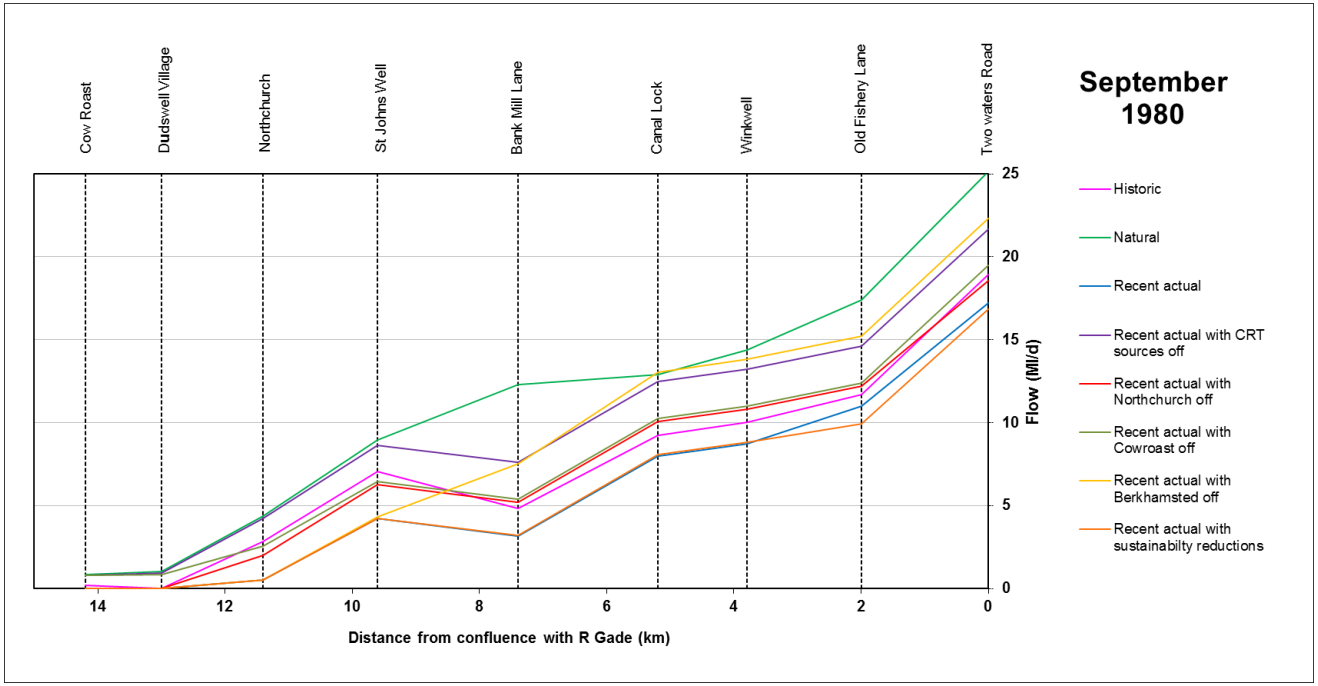
Spring 2014

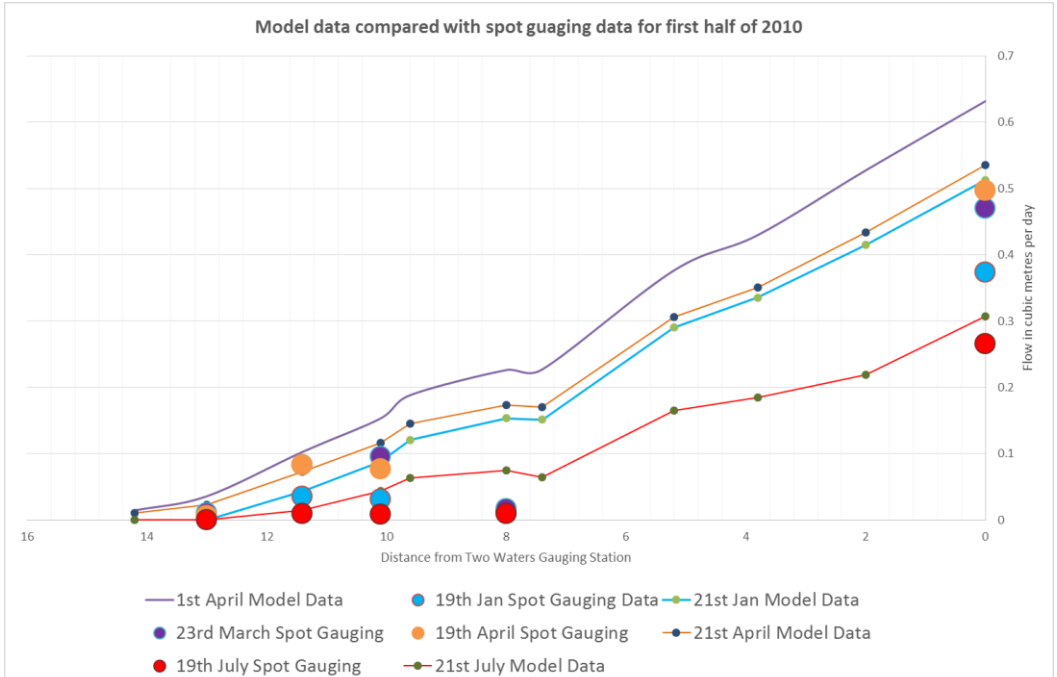
Spring 2017

- Flow and sedimentation linked to low flows/ drying is the pressure;
- Water Quality issues when in wet phase, likely exacerbated by run-off following dry phase;
- Spring and Sources data 2007-2016 show 29% prevalence of dry channel

Environment Agency

Vale of St Albans Groundwater Model

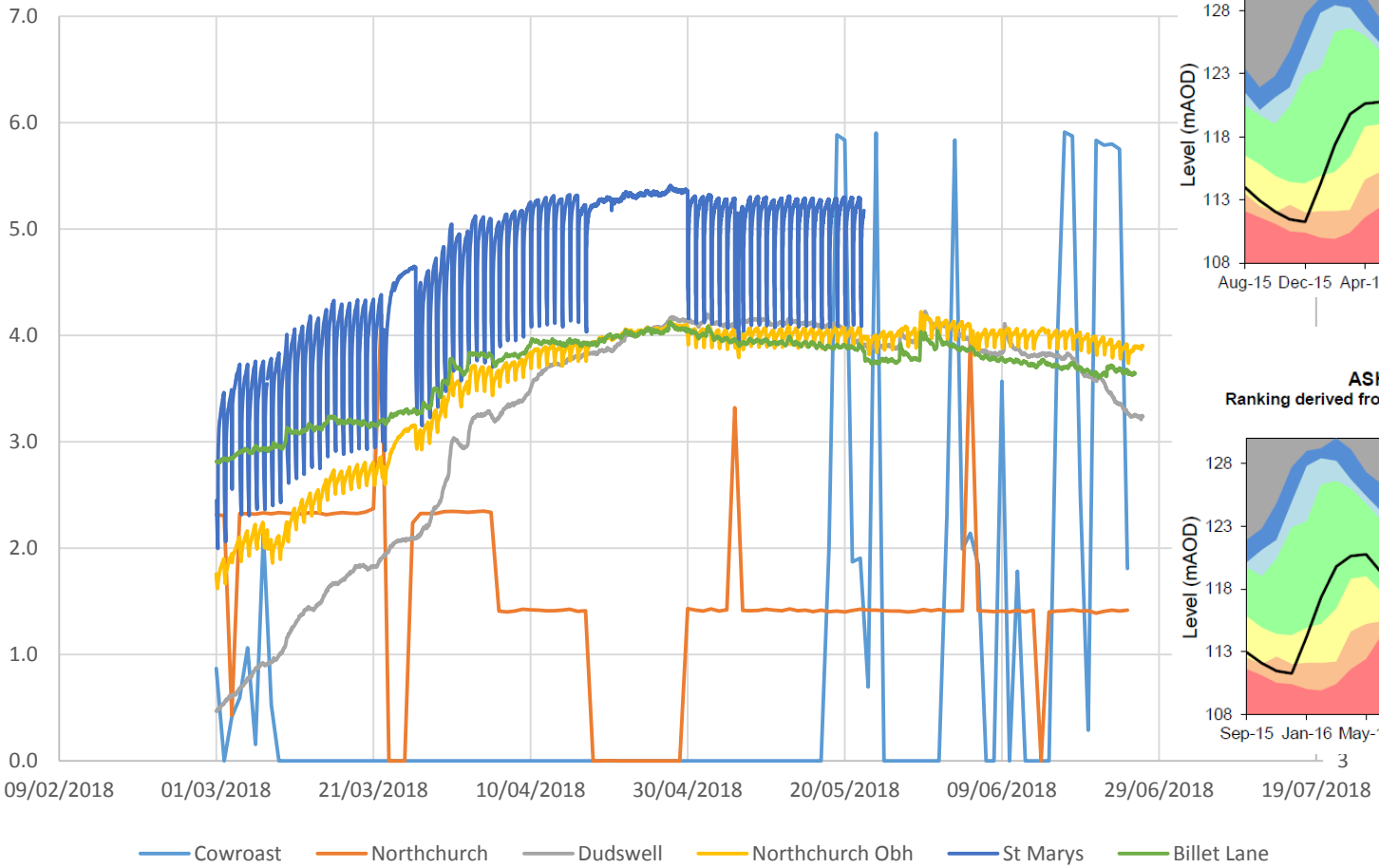


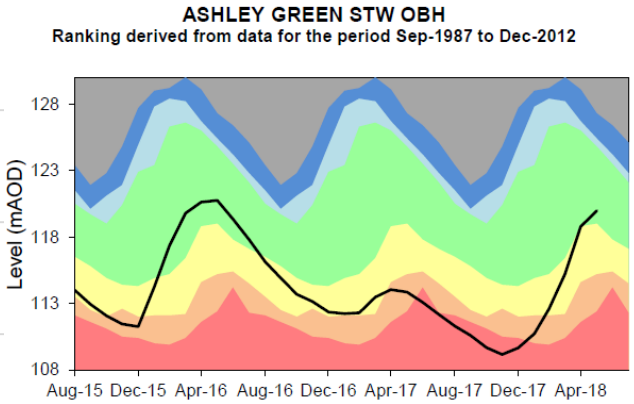


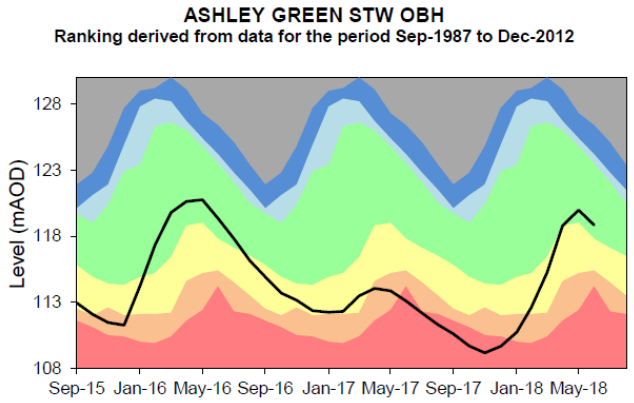
Signal tests

- Cowroast off for 13 days from 16 October 2017
- Northchurch off for 14 days from 23 January 2018
- **Cowroast off for 74 days from 9 March until the 18 May 2018**
- **Northchurch also off from 17 to 29 April 2018**

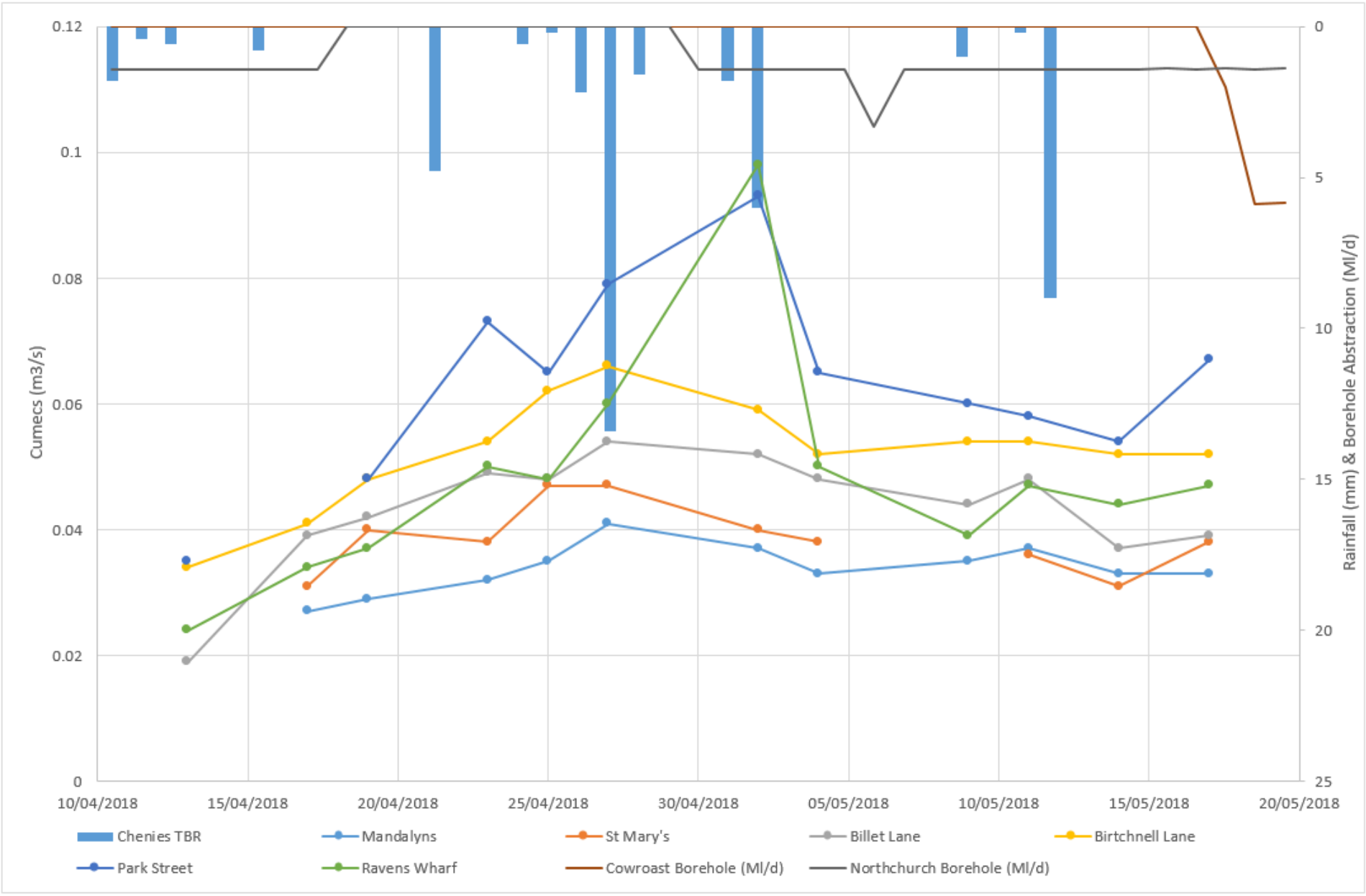
Groundwater levels





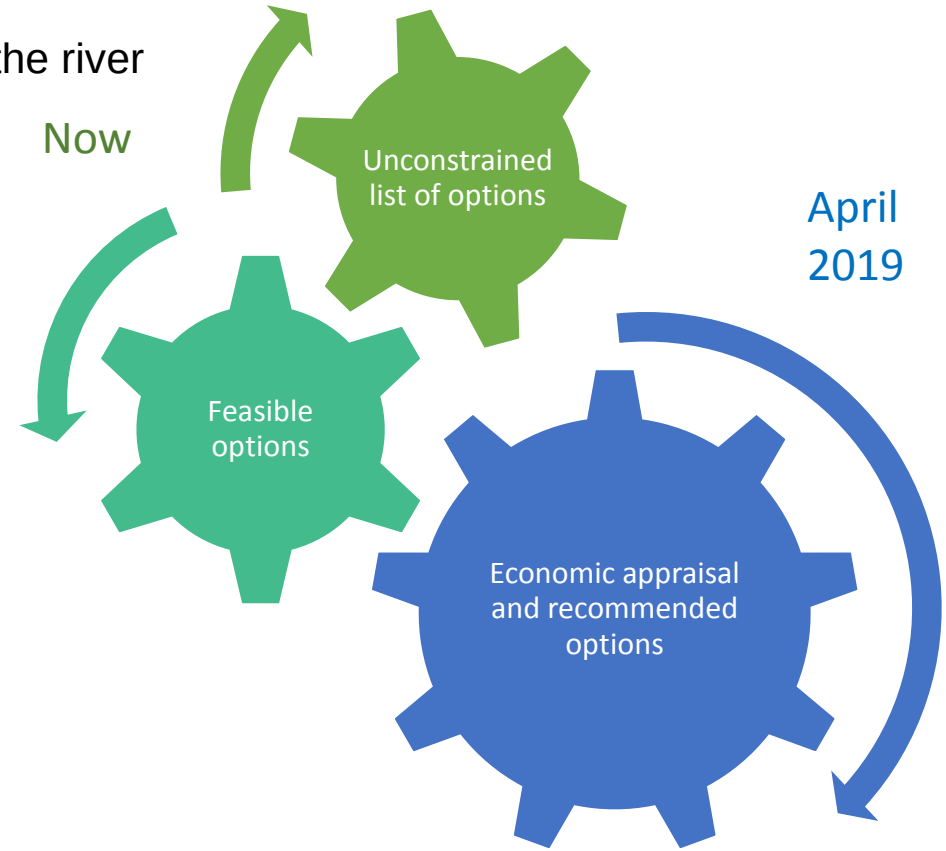


Signal test (17 - 29 April) - River flows and rainfall



Options Appraisal

- High level options
  - Changing abstraction regime
  - Augmentation
  - Demand management
  - River Restoration
  - Invasive species
  - Increase access to the river







River Bulbourne and Grand Union Canal Activities Survey

Environment Agency

Canal & River Trust
Making life better by water

1. Enter Information

What activities do you do at that location? (required)

Select...

In the past 12 months, how often did you do these activities? (required)

Select...

How many people were with you on the visit? (required)

Select...

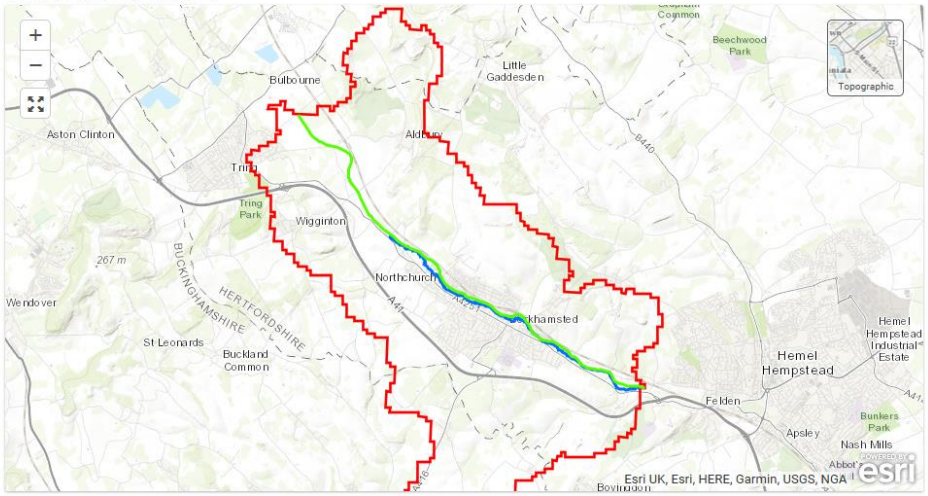
2. Select Location

Specify the location for this entry by clicking/tapping the map or by using one of the following options.

Search | Lat/Lon

Find address or place | LOCATE ME

Latitude: 51.73877, Longitude: -0.72633



3. Complete Form

Add this information to the map.

SUBMIT ENTRY | VIEW SUBMISSIONS

https://atkinsgeospatial.maps.arcgis.com/apps/GeoForm/index.html?appid=f211770f5c2c40178448b37f83335603


Thank you

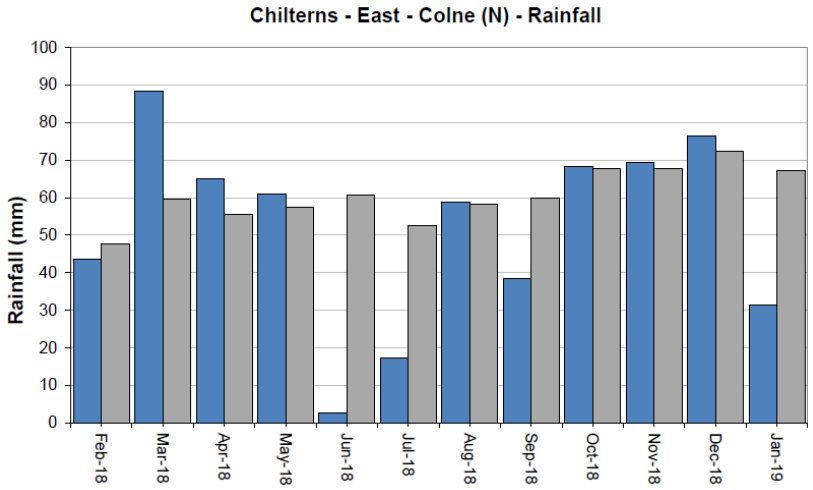
Water Situation Report

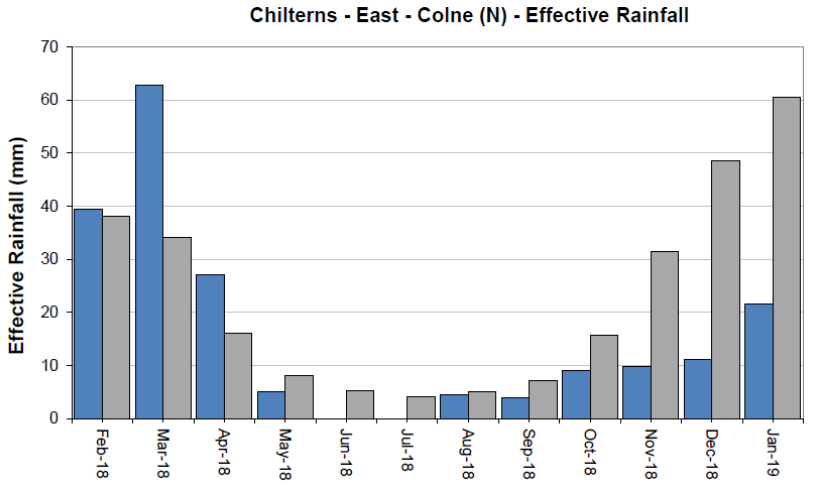
January 2019

Environment Agency

Water Situation January 2019

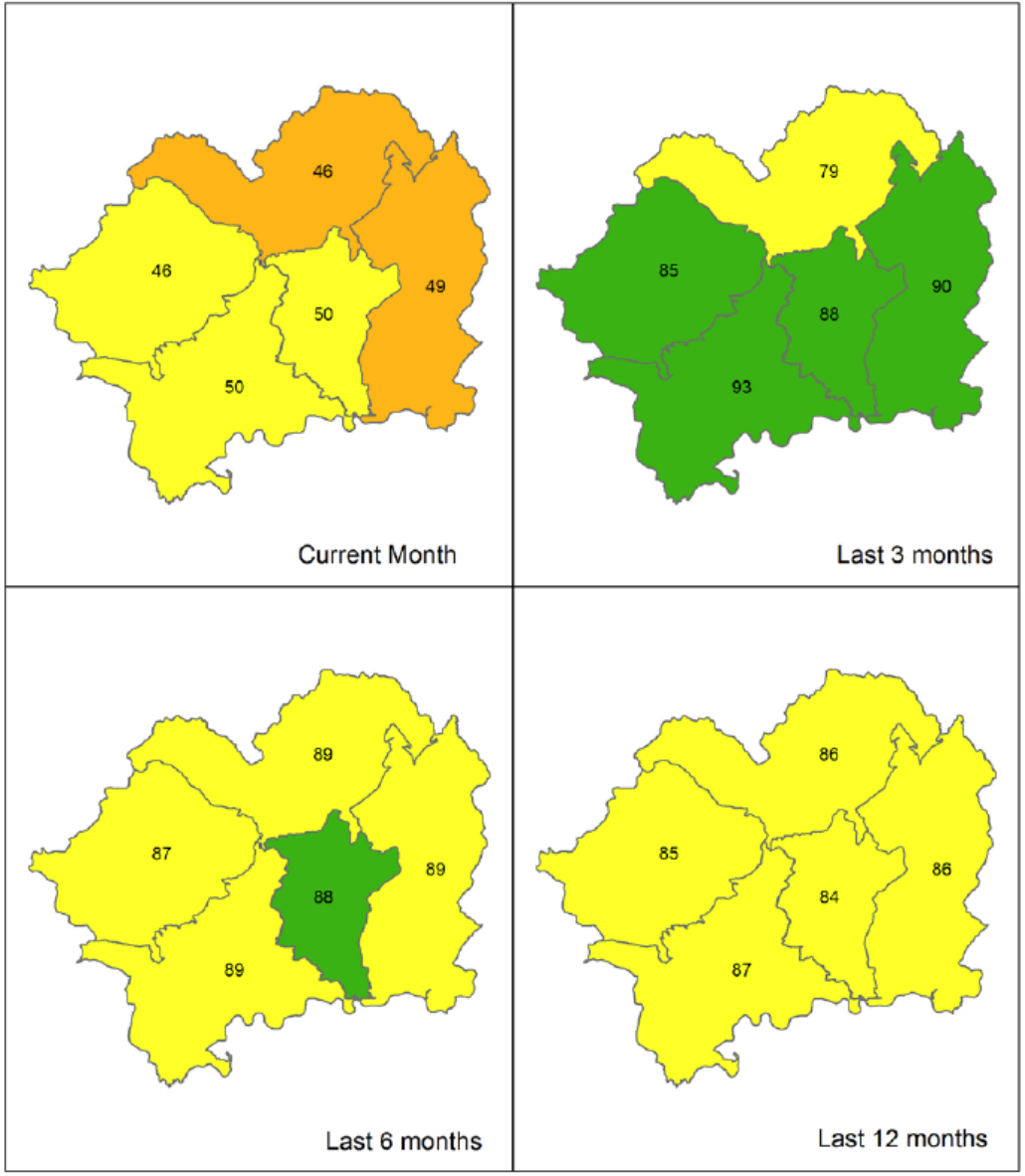
Rainfall





Long term average rainfall (mm)

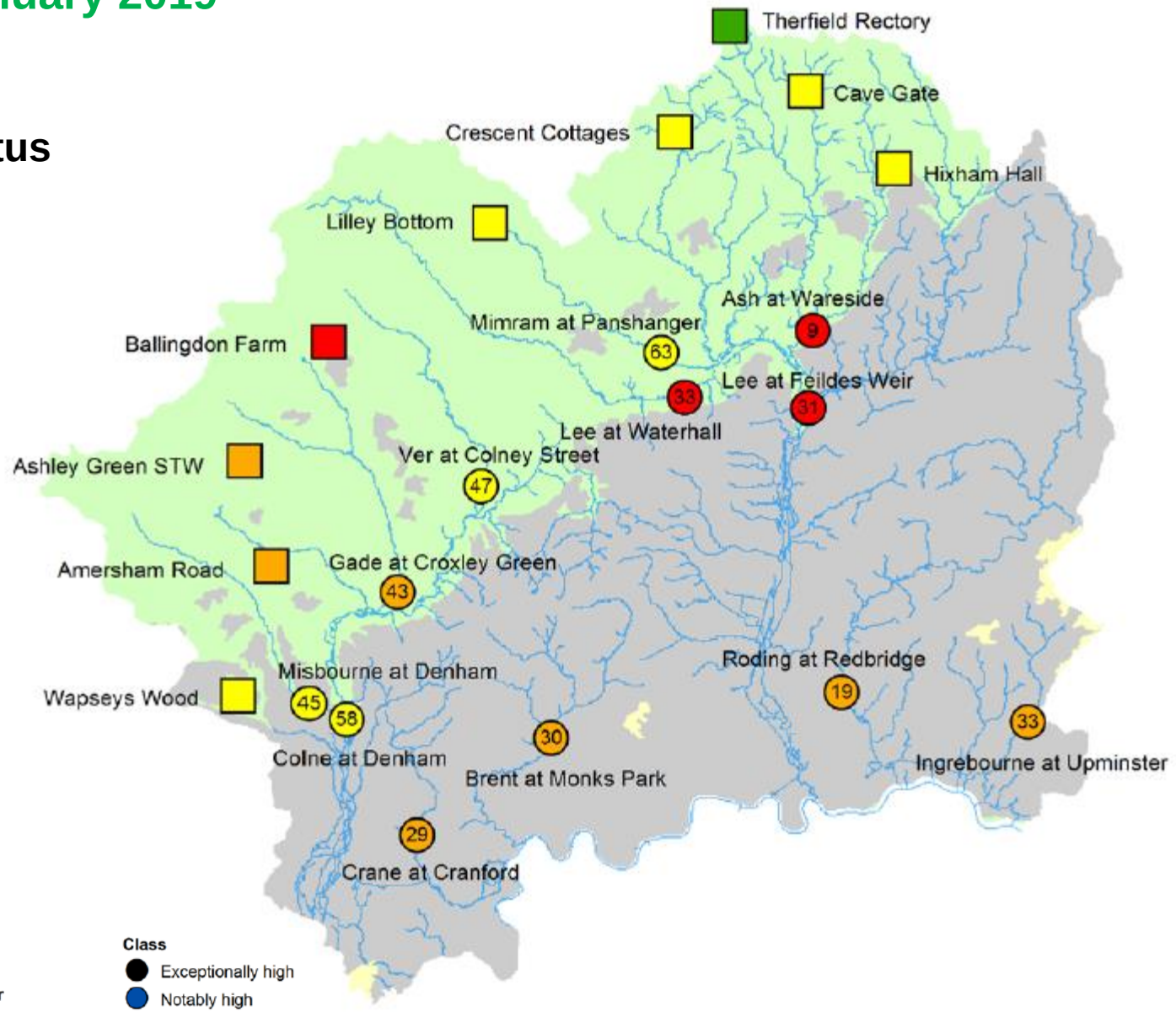
Monthly total rainfall (mm)



Environment Agency

Water Situation January 2019

River flows and groundwater status



Legend
- Rivers
- Dry
- No data
- 5 % of long term average
- River flow site
- Groundwater level site

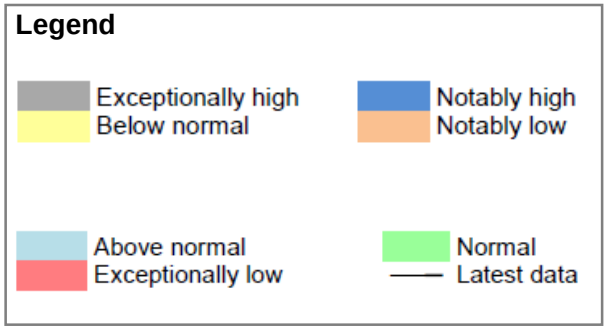
Geology
- Chalk
- Other Aquifer
- Clay/Non-Aquifer

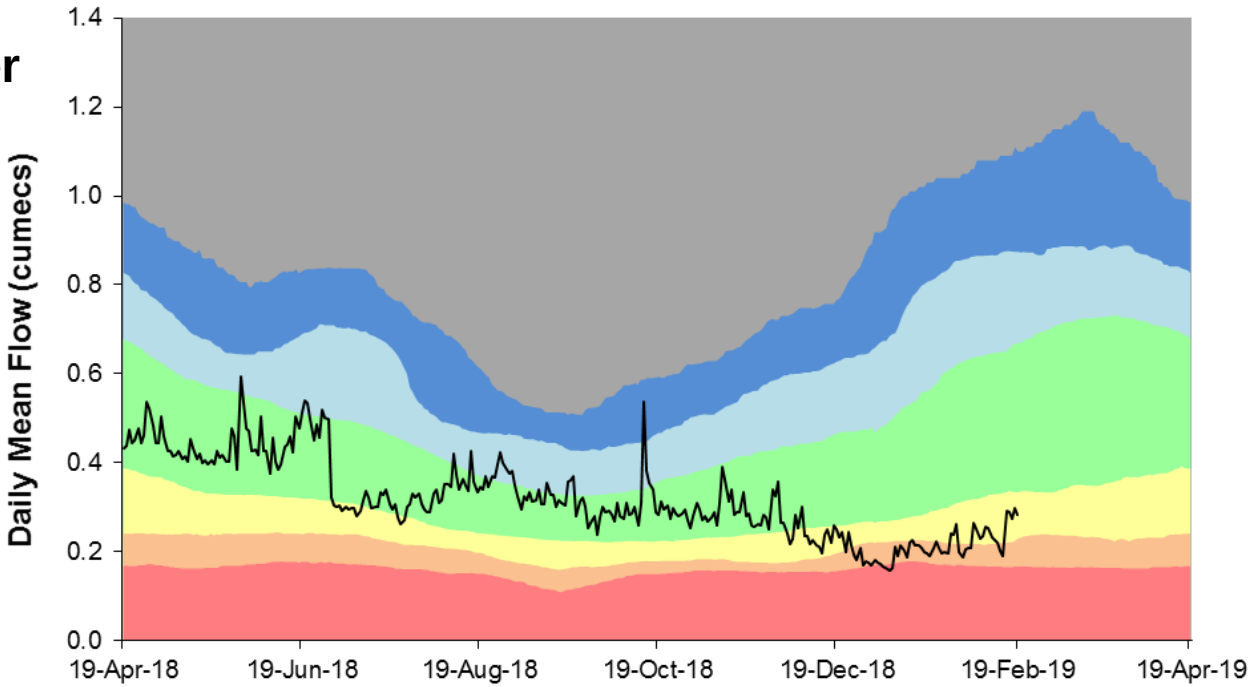
Class
- Exceptionally high
- Notably high
- Above normal
- Normal
- Below normal
- Notably low
- Exceptionally low

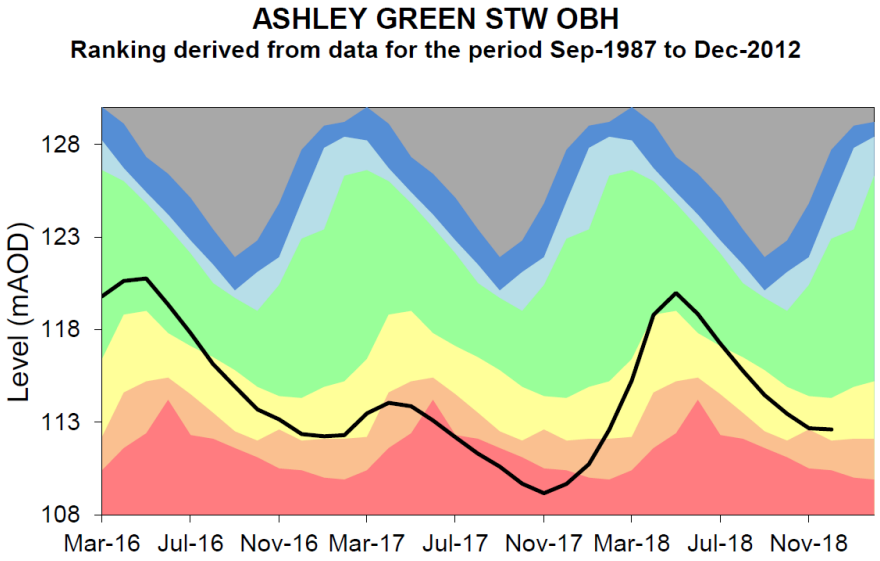
Environment Agency

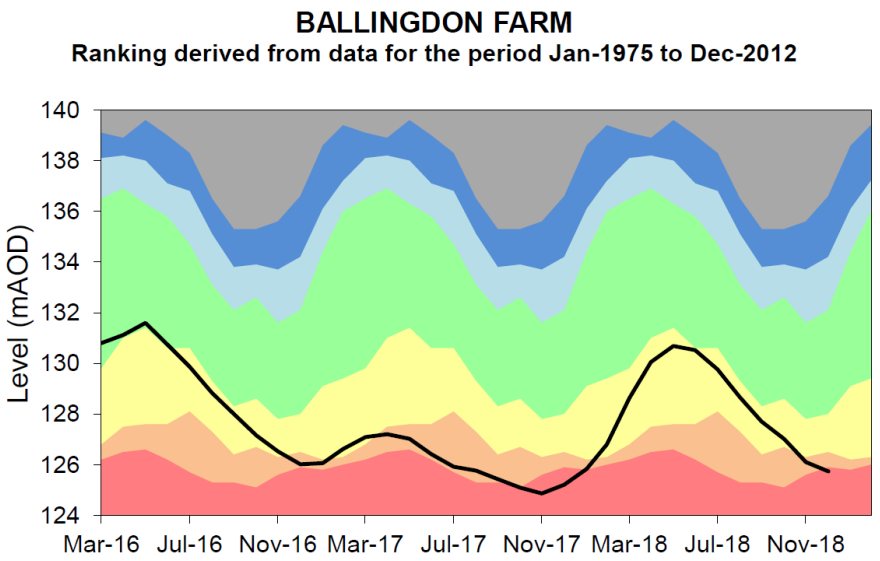
Water Situation January 2019

River flows and groundwater Hydrographs









Water Situation January 2019