

Friends of the Gumstool Brook

Water Situation Update: Upper Churn catchment



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Open Meeting
Ingleside, Cirencester
29th November 2023

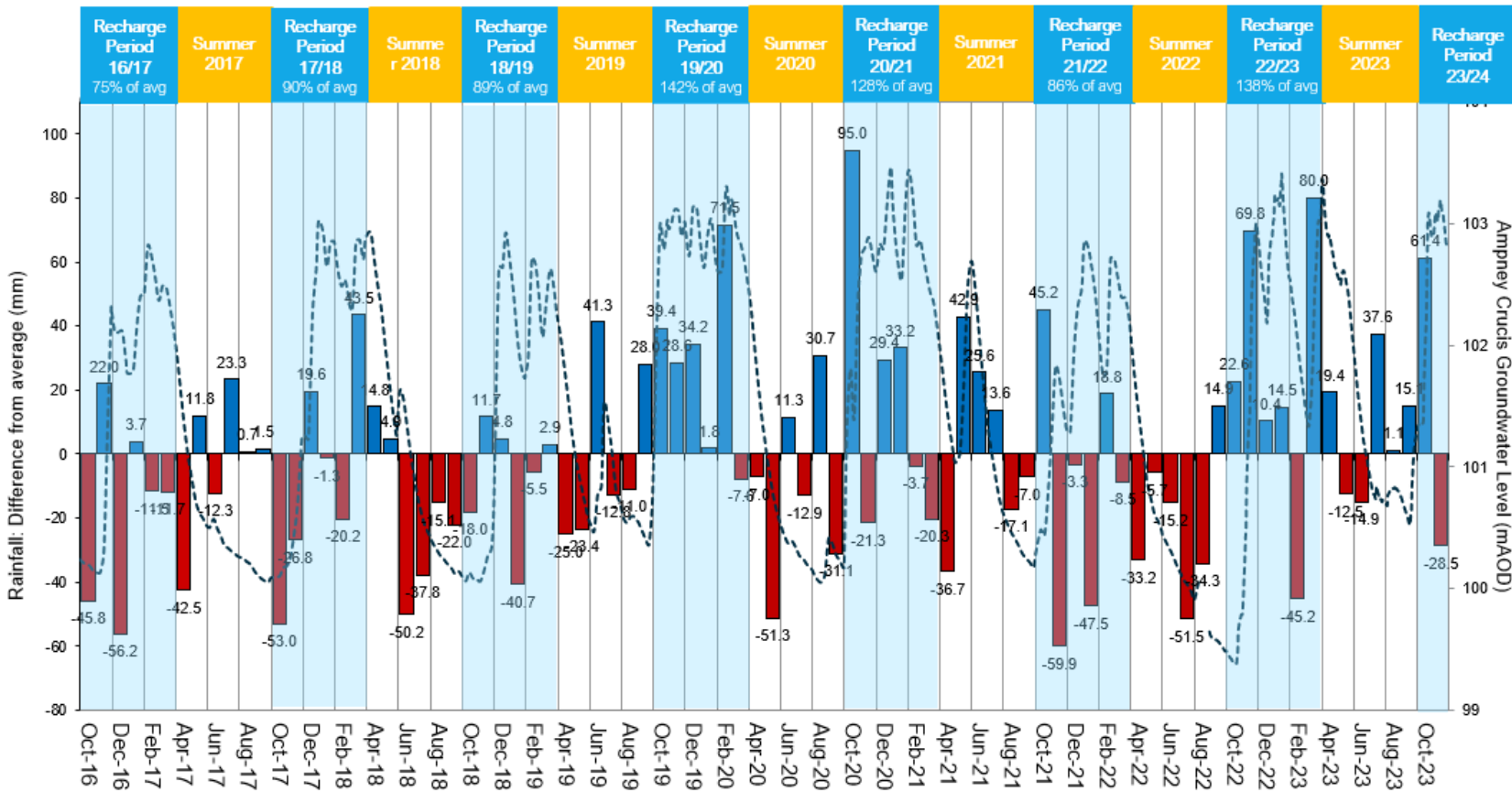
Water situation update

Key updates

- Rainfall, recharge & groundwater levels
- Current water situation in the upper Churn catchment
- Prognosis for winter 2023/24 in & around Cirencester

Note: The data used to update the water situation is publicly available from various websites, notably those of the Environment Agency and Thames Water

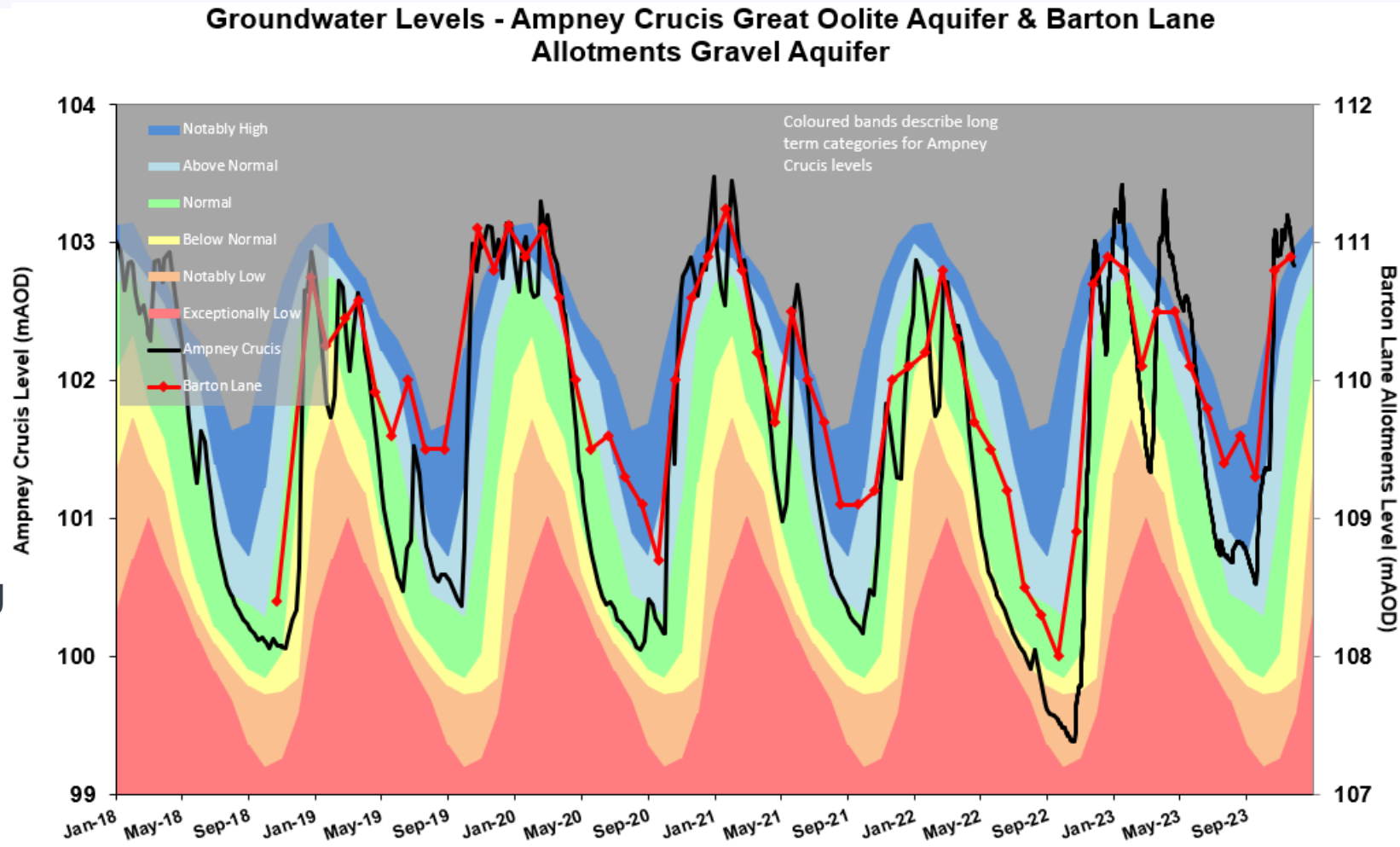
Rainfall, aquifer recharge & groundwater levels



- Longer term, historical perspective helps illustrate the influence of rainfall on groundwater & rivers
- Autumn & winter rain recharges aquifers causing groundwater levels to rise
- Similar pattern each year, but significant variations from year to year
- Above average rain in 20/21 & 22/23 resulted in high groundwater levels
- Below average rain in 21/22 resulted in Notably Low summer levels
- Above average rainfall in 22/23 produced good recovery from these low levels & higher levels this summer
- Rain in 23/24 has already produced Notably High groundwater levels

Current water situation in the upper Churn catchment

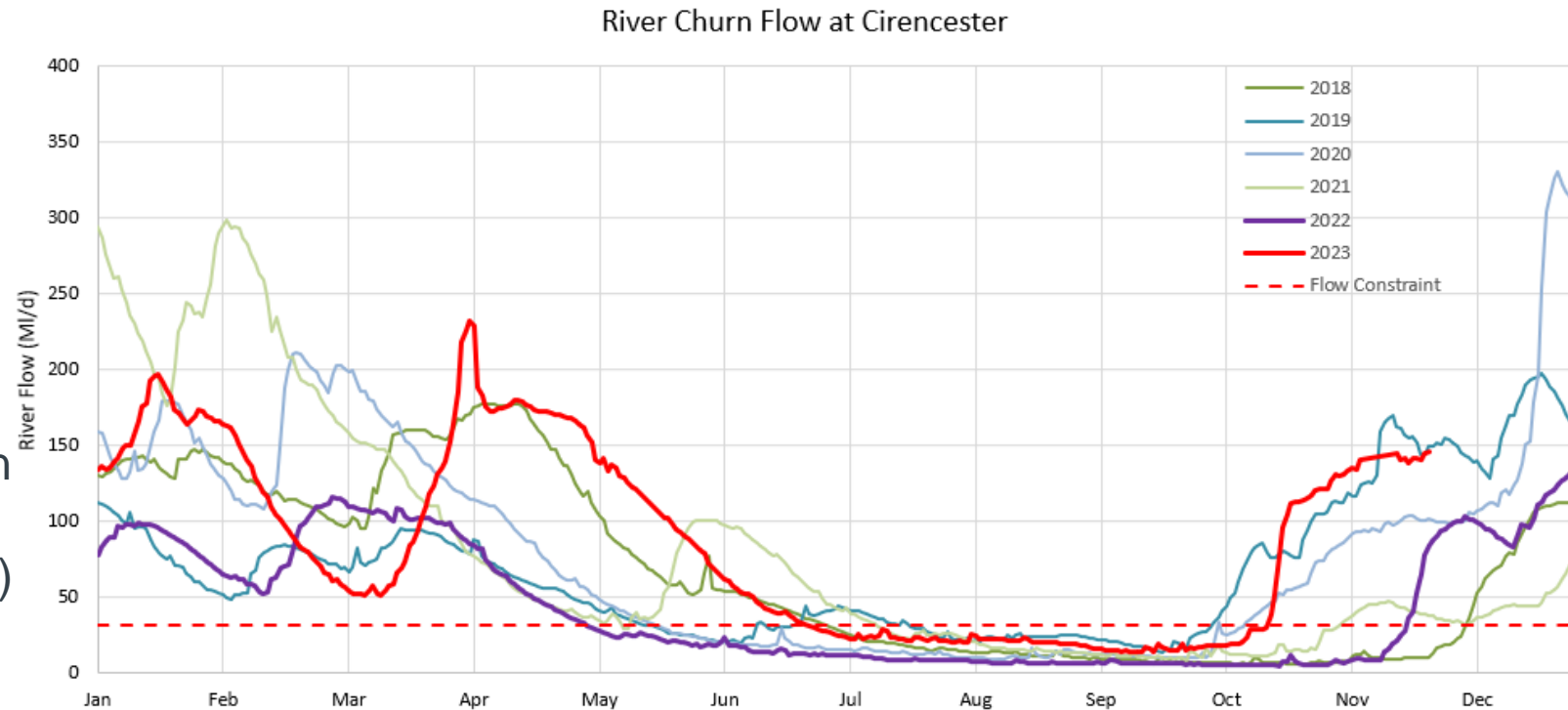
- Exceptionally High groundwater levels in the Great Oolite aquifer this spring are uncommon
- This helped the usual decline in levels remain at Above Normal for much of the summer
- Rain in September caused aquifer recharge to begin a few weeks earlier than in recent years
- In wet October groundwater rose to Exceptionally High levels, falling to Notably High during the drier November
- Levels in the Gravel aquifer have also risen significantly in response to autumn rain



Current groundwater levels are
Notably High for the time of year

Flow in the River Churn

- With groundwater levels & river flows higher this spring than recent years, river flows declined later & remained higher than in most recent summers
- Although relatively late, river flows still fell below the constraint at which pumping at Thames Water's Baunton site must cease
- Rain & groundwater rises in autumn caused Churn flows to increase from ~17 million litres per day (MI/d) to 120 MI/d in October, exceeding the Baunton pumping constraint
- Churn flow continues to increase, although the EA note recent data as “suspect”, but flows remain well below peak April rates



River flows have risen rapidly this autumn and are higher than in most recent years

Seasonal prognosis for watercourse health

- Autumn began with dry weather in early September, followed by significant storms resulting in almost average rainfall for the month. In October, heavy rain fell mostly in the middle of the month contributing to almost 150% of average rainfall for the month.
- Although some rain is forecast for the last few days of November, this month has been drier, with total rainfall likely to be less than 66% of average.
- Headlines from the [Met Office outlook](#) for the UK from December 2023 to February 2024 are:
 - Mild weather is a little more likely than cold weather, with the greatest chance of cold at the end of winter.
 - Increased chance of a wet winter, especially in December with heavy rain and strong winds possible.



- Groundwater levels are Notably High for the time of year, with a fluctuation pattern similar to 2019 although currently flows in the Churn are significantly lower than 2019 suggesting a lower flood risk.
- It is conceivable that a wet December could result in groundwater levels & river flows as high as those experienced in winter 2020 and, as a result, an increase in flood risk.

Thank you

- If you have any questions, I'll do my best to answer them now or later if it requires further consideration
- If you'd like to engage more generally, check out [@GroundwaterMike](#) on X (formerly Twitter) for mainly [#groundwater](#) themed topics
- Groundwater Vision: "Often out of sight, but never out of mind"

