Friends of the Gumstool Brook

Water Situation Update: Upper Churn catchment

Open Meeting

27th June 2022

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Daglingworth Stream at Stratton

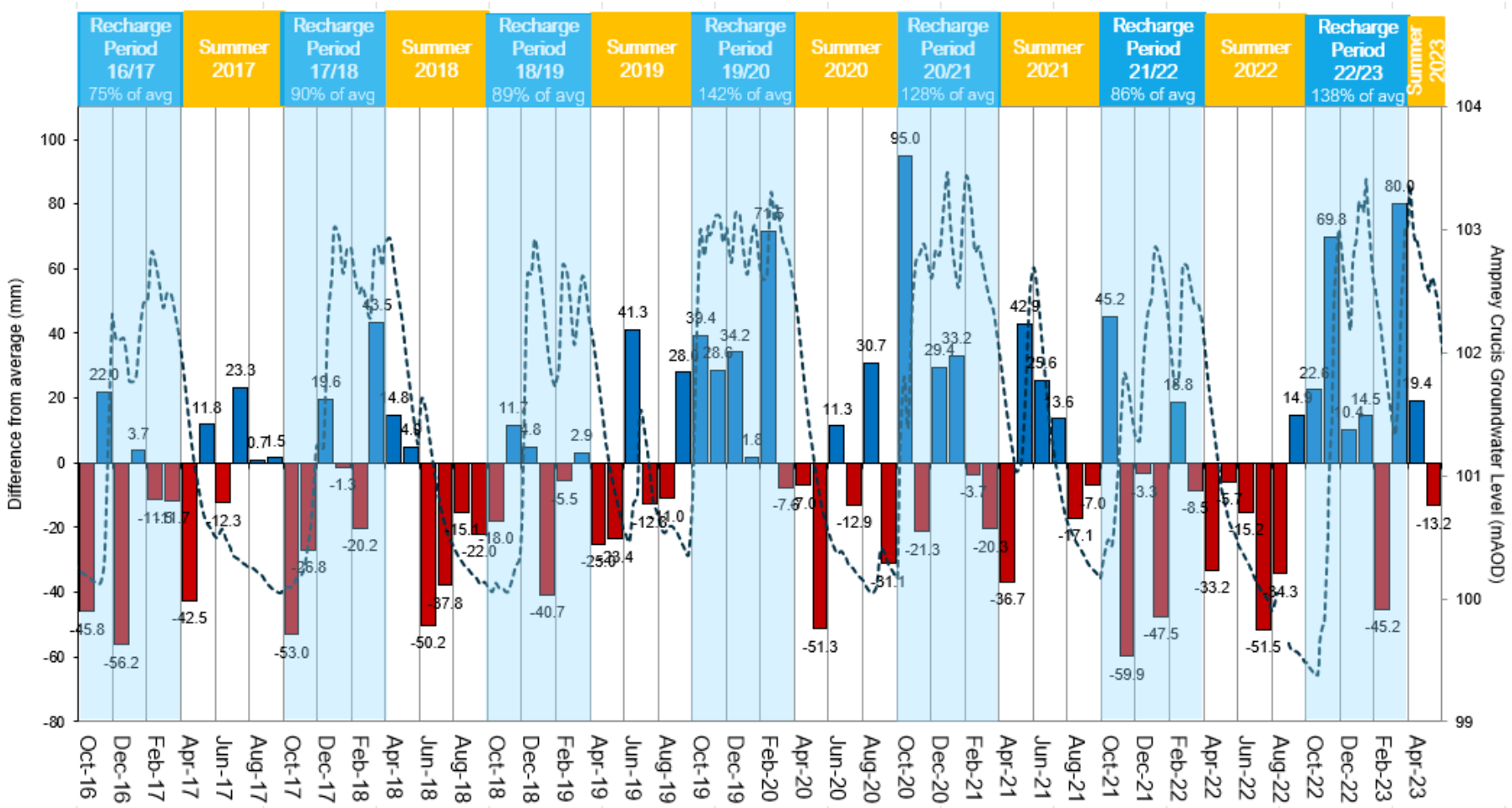
Water situation update

Key updates

- Rainfall, recharge & groundwater levels – A longer term perspective
- Current water situation in the upper Churn catchment
- Prognosis for summer 2023 watercourse health 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

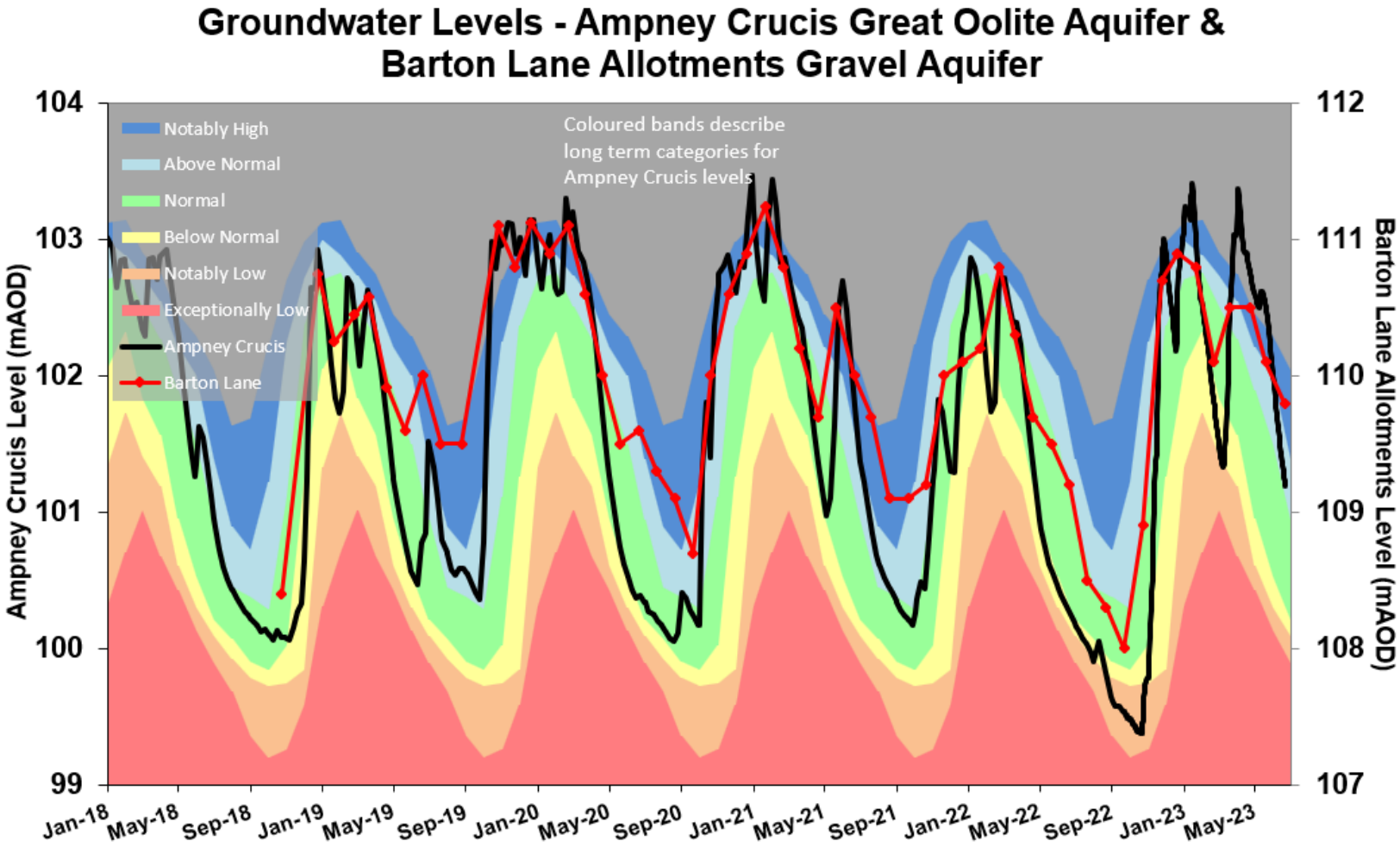
Rainfall, aquifer recharge & groundwater levels



- A longer term, historical perspective helps to illustrate the influence of rainfall on groundwater levels
- Rain during autumn-winter recharges aquifers causing groundwater levels to rise
- General pattern is similar each year, but significant variations occur from year to year
- Above average rainfall in 2020/21 resulted in high groundwater levels
- Significantly below average rainfall in 2021/22 resulted in Notably Low summer levels
- Above average rainfall in 2022/23 produced good recovery from these low levels

Current water situation in the upper Churn catchment

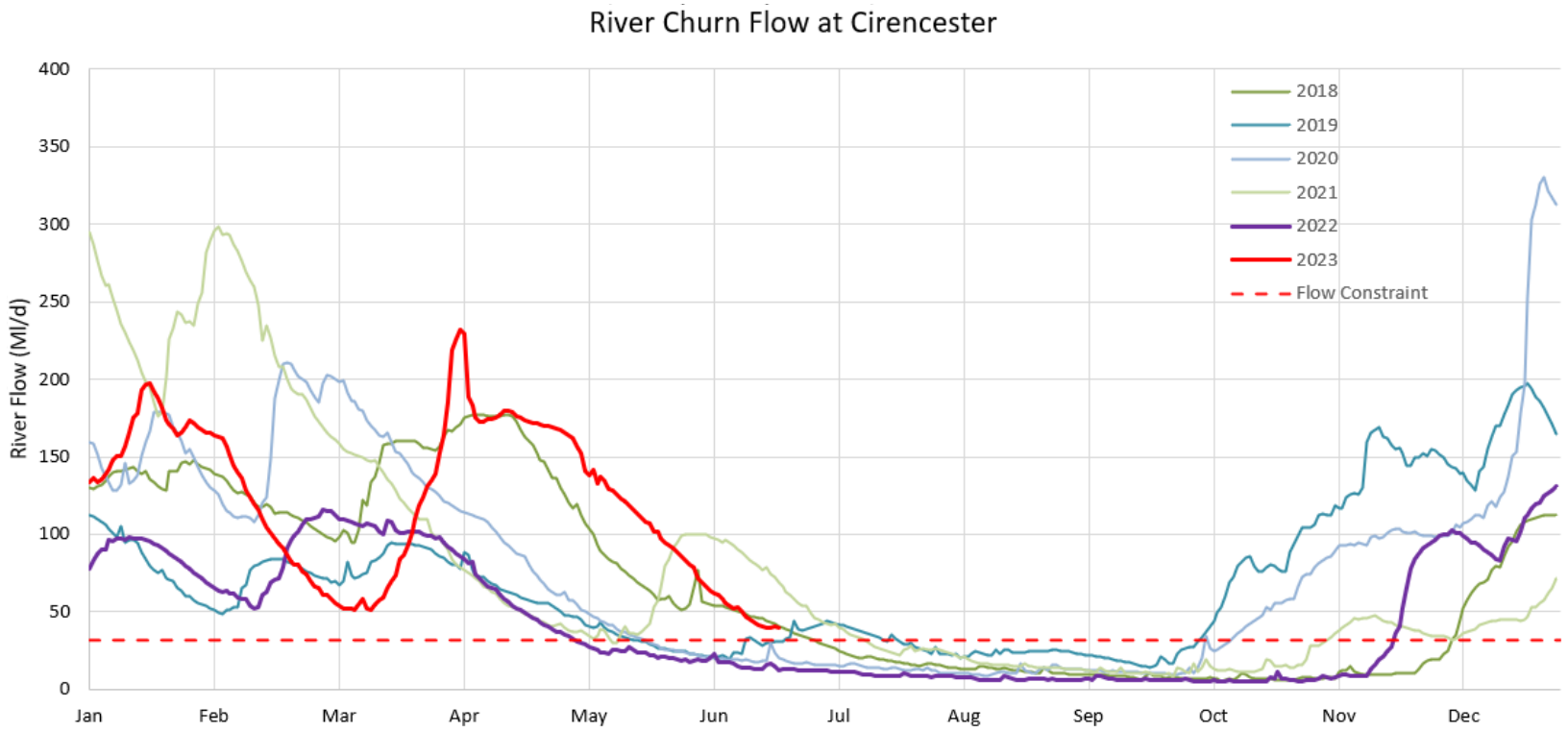
- Despite a very dry February, the 2022/23 recharge period had 38% above average rainfall across the Thames catchment
- Despite a dry May, this wet recharge period has maintained Exceptionally High groundwater levels in the Great Oolite aquifer until mid-May
- The decline from an exceptional early April peak has continued as expected throughout May & June but remain Above Normal
- Levels in the Gravel aquifer have continued to decline in June, but remain significantly higher than levels at the same time in 2022



Groundwater levels are currently healthy, being Above Average for the time of year

Flow in the River Churn

- With river flows dependent on groundwater levels & rainfall runoff in winter & periods of intense rainfall, peak April flows in River Churn were not unexpected
- As groundwater declined to Above Normal in June, River Churn flows declined significantly to around normal for the time of year
- In early July, flows may reach those at which pumping at Thames Water's Baunton site would need to cease; this is relatively late but not exceptional
- The water situation is far less challenging than the summer 2022 when the Churn was flowing at less than half its current rate

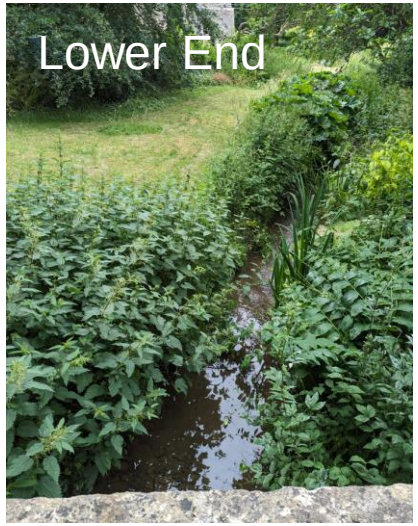


River flows levels remain reasonably healthy, being around Normal for the time of year

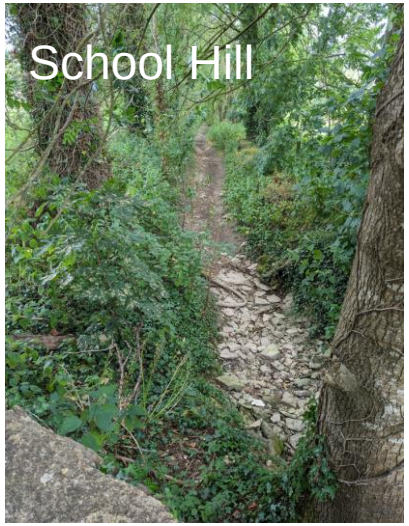
Daglingworth Stream & Gumstool Brook

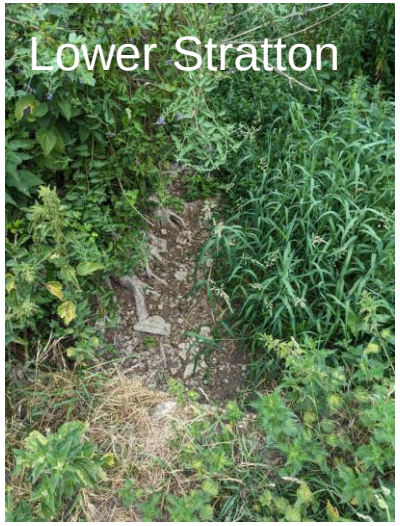
- Photographic record from today (27th June 2023)

Upstream

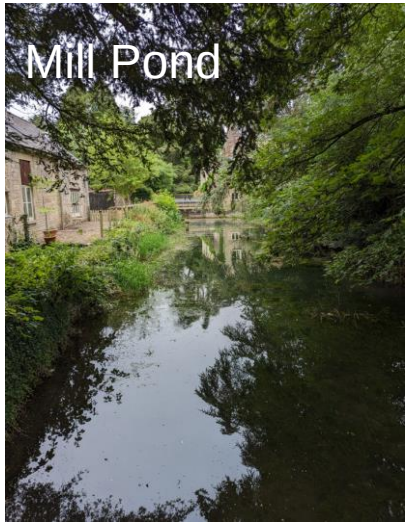


Daglingworth Stream Flowing

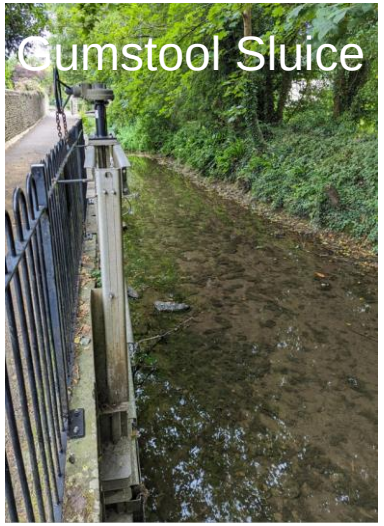




No flow in Daglingworth Stream

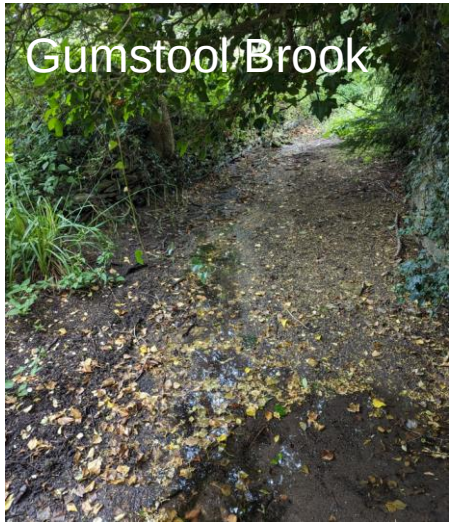


Flow from River Churn



Flow from Churn & Daglingworth Stream

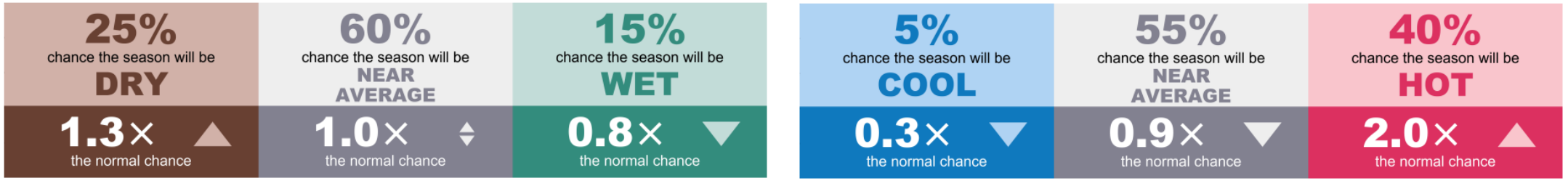
Downstream



No flow into Gumstool Brook

Seasonal prognosis for watercourse health

- In May only ~60% of average rain fell in upper Churn catchment and with most of June being largely dry, but with recent storms & intense rainfall, only ~40% of average rain has fallen to 19th June
- Some rain was forecast for Cirencester area on many of the days remaining in June, but the probability of significant rainfall appears low, and it is likely that monthly rainfall will remain below average
- Headlines from the Met Office weather outlook for July – September 2023 across the UK are similar to the previous outlook, but with an increased chance of dry weather & a reduced chance of hot weather:
  - For the UK as a whole, there is double the usual chance of a hot summer and, although a near average or cool summer remains possible, there is an increased likelihood of heatwaves particularly in July.
  - While the chances of a wet or dry summer are similar to normal, the Met Office notes that drier than normal conditions are more likely in the north and wetter than normal weather in the south.
  - Across the UK there is an increased chance that the summer rainfall will occur in thunderstorms, but these may be more prevalent in the south.



Met Office UK 3 month weather outlook

Seasonal prognosis for watercourse health

- Despite May and June being significantly drier than average, the prognosis for the summer 2023 water situation is for cautious optimism
- Although the weather will continue to influence groundwater levels and river flows in the Churn and Daglingworth catchments, the currently healthy groundwater levels & river flows mean that this summer, the waterways around Cirencester may remain more healthy
- The water situation is far less challenging than summer 2022 when the Churn was flowing at less than half the current rate, but the potential remains for low flows in Daglingworth Stream & Gumstool Brook
- This potential for low flows in the Daglingworth Stream & Gumstool Brook results from groundwater in the Great Oolite aquifer being below the tentative trigger level (101.5 mAOD) at which some reaches of the streams may dry
- From the 27th June photographic records, it is clear that some watercourse reaches are already dry, but this is likely to have occurred later than in previous years, although the lack of flow in the Daglingworth Stream around Stratton appears to be a persisting issue
- With low river flows, especially in the Churn tributaries, water quality & ecological health will be more susceptible to high temperatures should the weather be hot

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 Twitter for mainly #groundwater themed topics
- Groundwater Vision: "Often out of sight, but never out of mind"