

Friends of the Gumstool Brook

Citizen Science Monitoring: Current status of the waterways



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Open Meeting
Ingleside, Cirencester
29th November 2023

Citizen Science Monitoring

Key updates

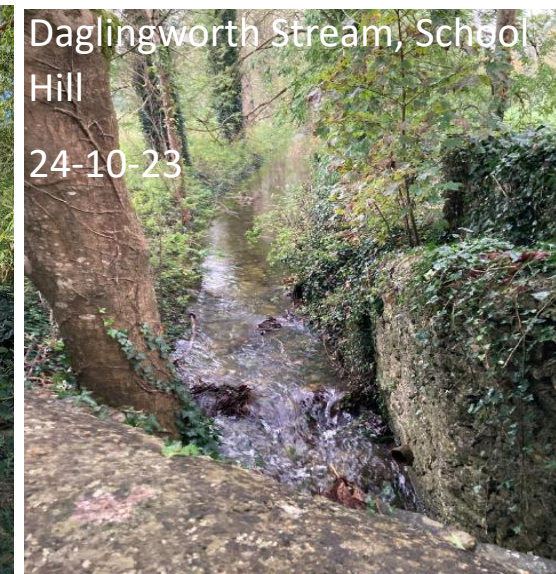
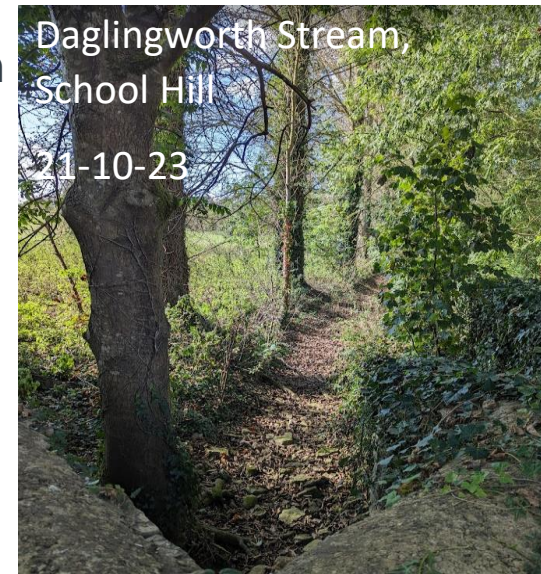
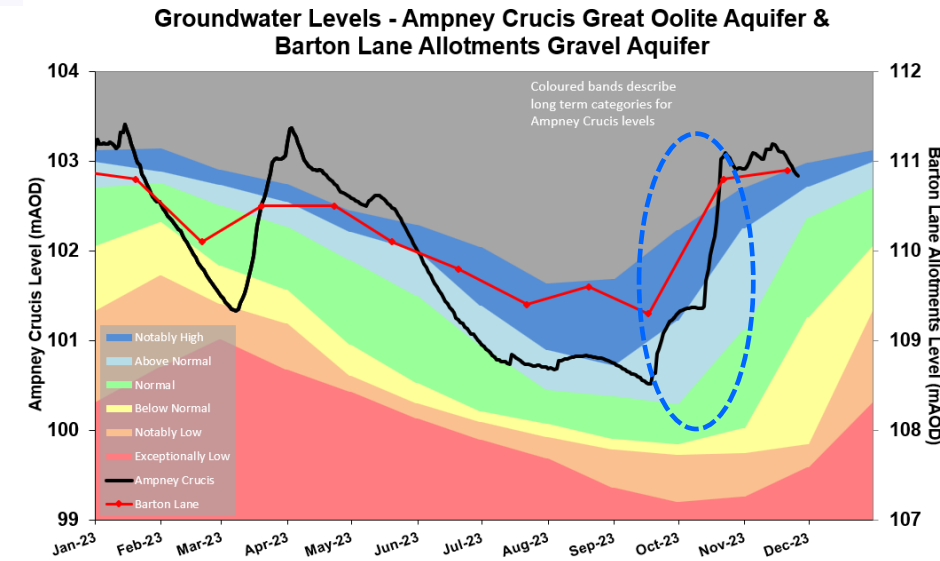
- Review & update of monitoring network
- Autumn 2023 key stream flow observations
- Investigation of intermittent flow in the Daglingworth Stream

Review & update of monitoring network

- Citizen science monitoring locations were reviewed in October ahead of expected commencement of annual groundwater level rise
- In particular, the review focussed on those reaches of the Daglingworth Stream known to dry up, which are also reaches where there are significant gaps between monitoring locations
- Key aim was to enable regular, monthly monitoring of flow in the Daglingworth Stream to observe where & when stream flow commences and dries up
- Outcome is that 5 new monitoring locations have been identified between Daglingworth and Stratton, with the Monitoring Network now comprising a total of 20 locations
- The Stream Flow Monitoring Record has also been collated and reformatted to capture available data from all 20 current monitoring locations, starting from May 2014

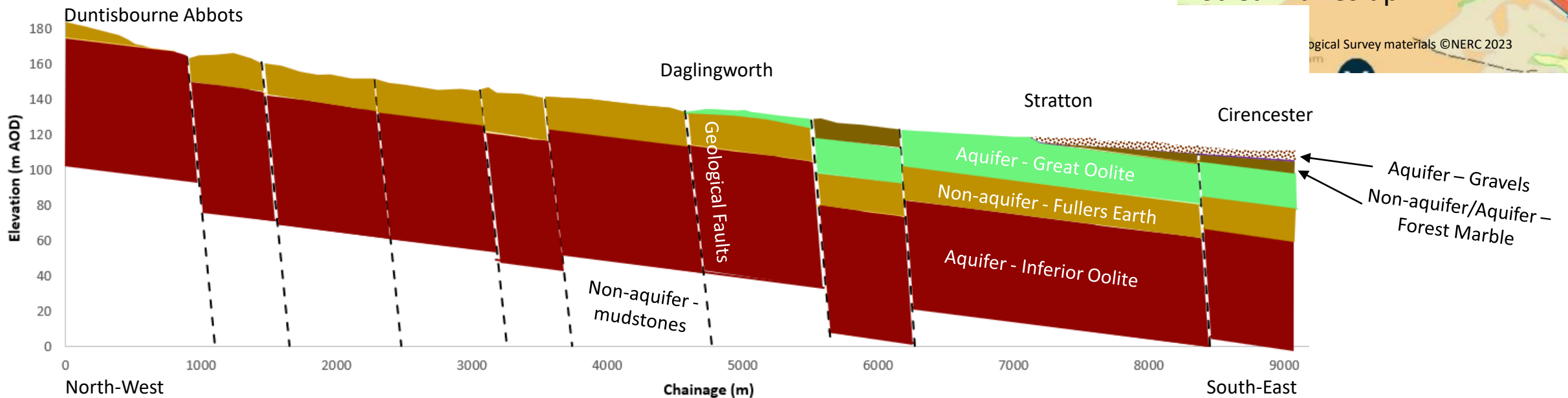
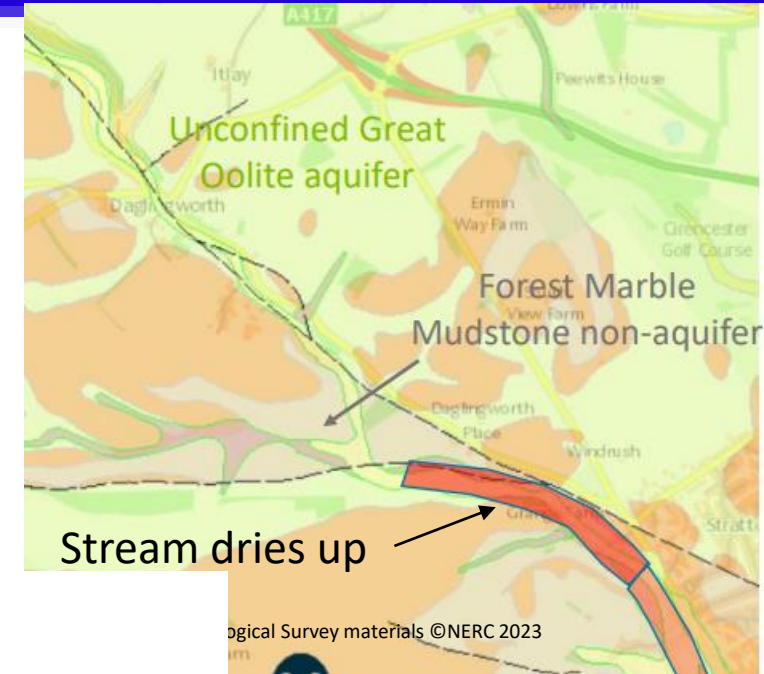
Autumn 2023 key stream flow observations

- From summer and extending into autumn, Daglingworth Stream was dry between Daglingworth & Stratton as was Gumstool Brook Balancing Stream, with low flows in Daglingworth Stream in Cirencester
- Ahead of significant groundwater level rise in October, monitoring including the new locations commenced, revealing the following:
 - Flow in the Gumstool Brook Balancing Stream commenced no later than 21st October
 - Flow in the Daglingworth Stream at School Hill, Stratton commenced no later than 24th October
 - Flow in the Daglingworth Stream at Grange Farm, Stratton commenced no later than 25th October
- These observations suggest stream flow recovery starts downstream when groundwater rises above 101.5 mAOD & moves progressively upstream as levels exceed 103 mAOD



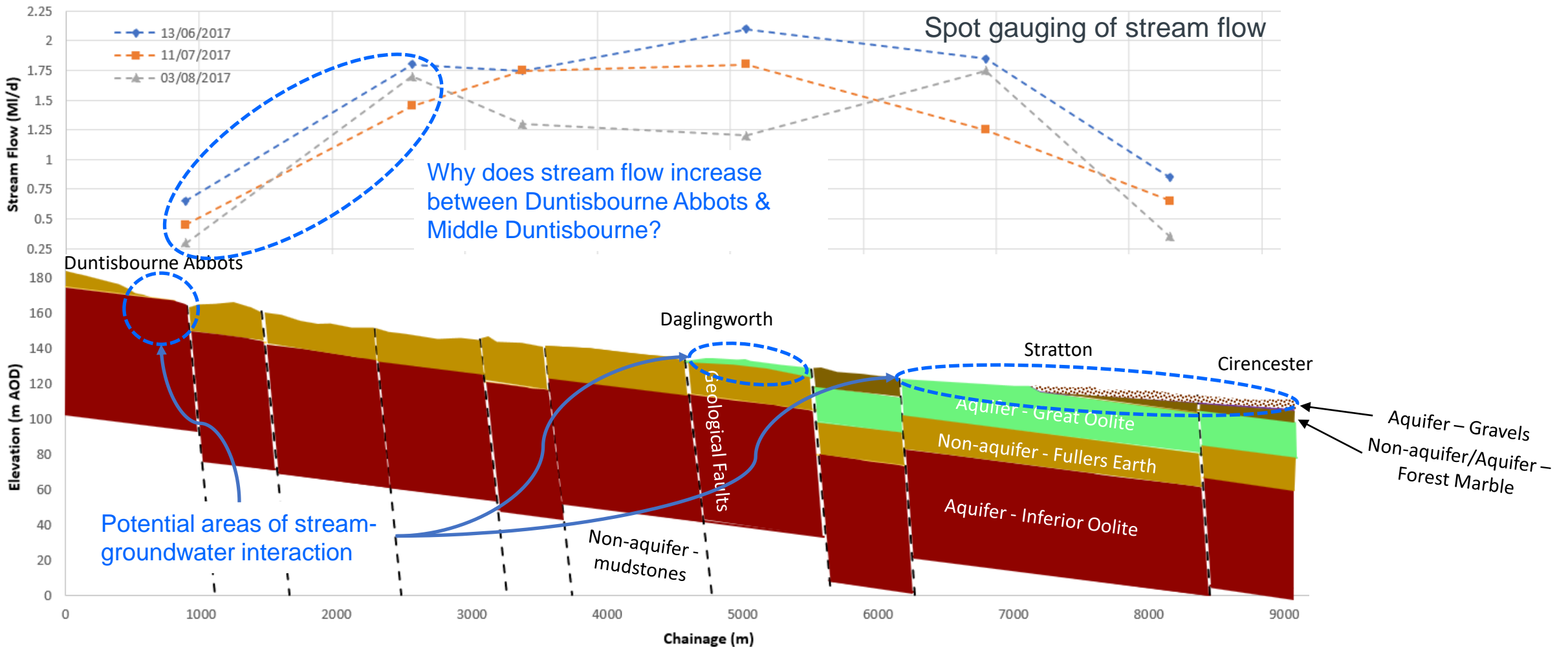
Investigation of flow in Daglingworth Stream

- Between Daglingworth & Stratton the Daglingworth Stream has intermittent flow, but the causes remain uncertain although could be natural
- The reaches with intermittent flow correspond, at least partly, with the geology changing from a non-aquifer to the Great Oolite aquifer
- The geology may influence where water can leak out from the stream into the aquifer & where groundwater can flow out of the aquifer into the stream
- Understanding the factors influencing stream behaviour is helped by visualising the geology beneath the stream in a cross-section



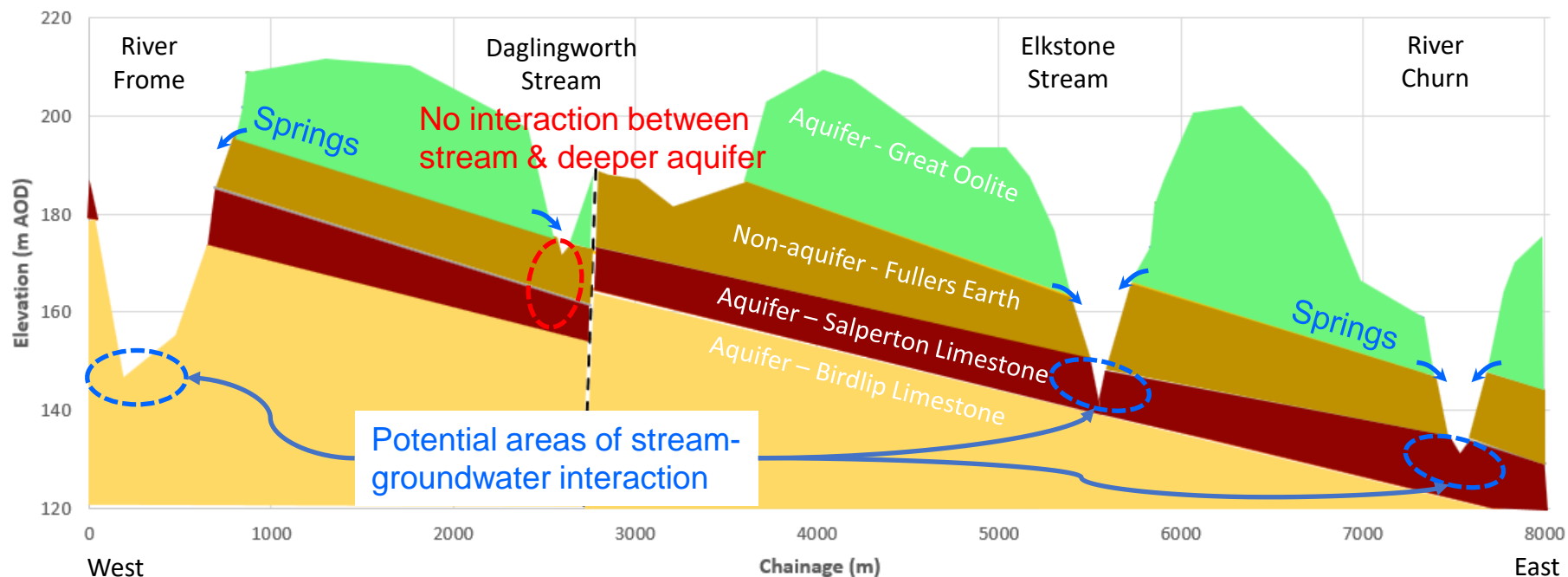
Investigation of flow in Daglingworth Stream

- When groundwater levels are high, aquifers could contribute flow to the stream
- When groundwater levels are low, streams could leak through their beds and lose water into aquifers



Investigation of flow in Daglingworth Stream

- In the Daglingworth Stream headwaters, the geology shows the Great Oolite aquifer has potential for springs to occur at its contact with the Fullers Earth, so providing groundwater flow to the stream
- The Great Oolite aquifer underlies the sides of much of the upper reaches of the Daglingworth valley and so can provide groundwater via springs along at least 4 km of the Daglingworth Stream
- Visualising the geology in this cross-section shows the different hydrogeological interactions between the streams and rivers of this part of the Cotswolds



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"

