

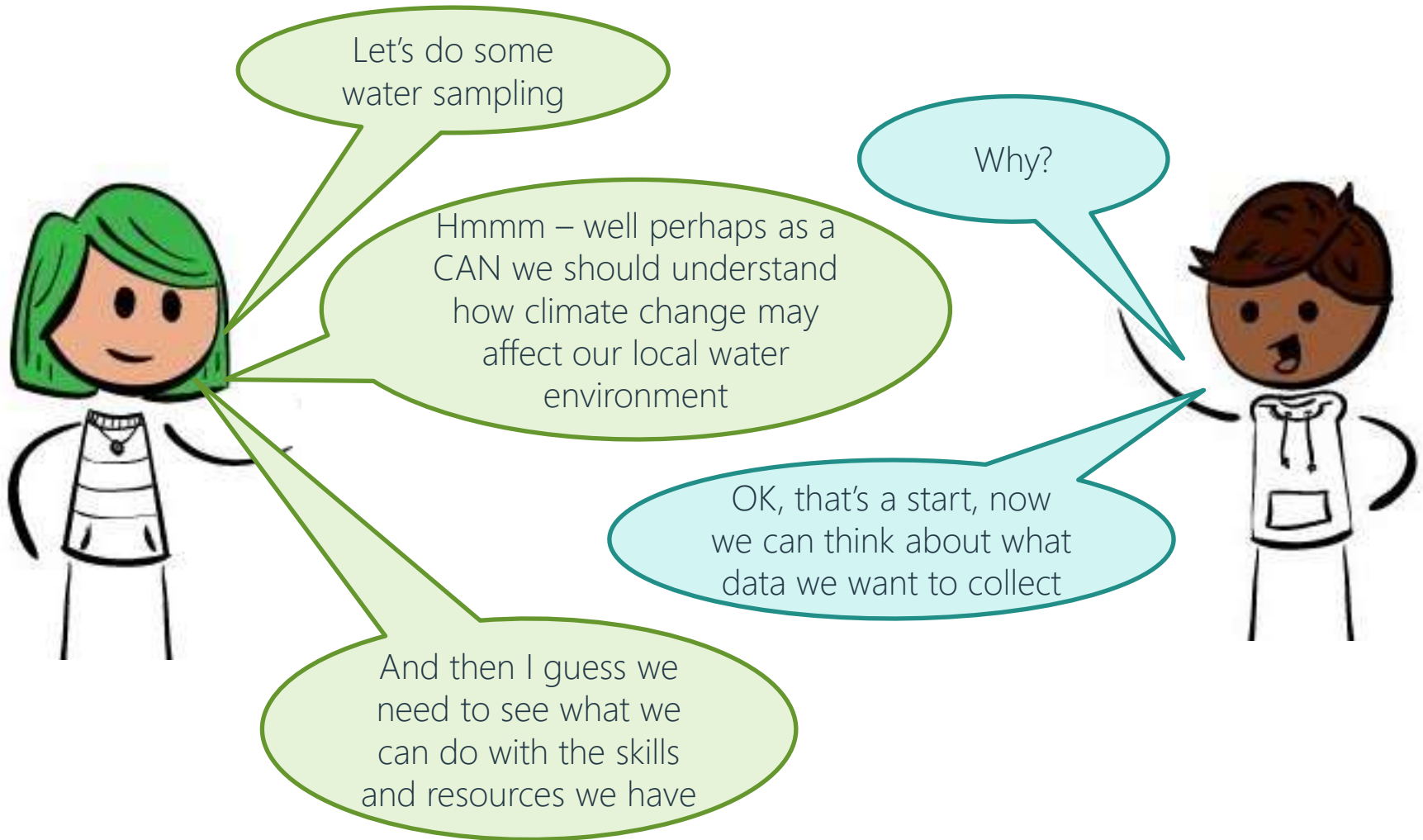
Water quantity and quality in Braunston Parish

Possible citizen science activities

Why? Where? What? When? How?

John Pomfret - February 2024

Let's do a survey – 'cos I want to go and play out



What data do we want to look at and why?

or excuses for going out to play

Some possible reasons to collect local water data

- Understand effect of climate change on future flood risks
 - is rainfall getting more intense in Braunston?
 - is flooding likely to happen more frequently?
 - so maybe we should monitor rainfall and river flows/levels?
- What then?
 - we could then put pressure on official bodies to do things to help minimize problems caused by flooding (e.g. improvements to drainage provision and maintenance, changes in water management)
 - what drives CAN's interest in collection of rainfall data?



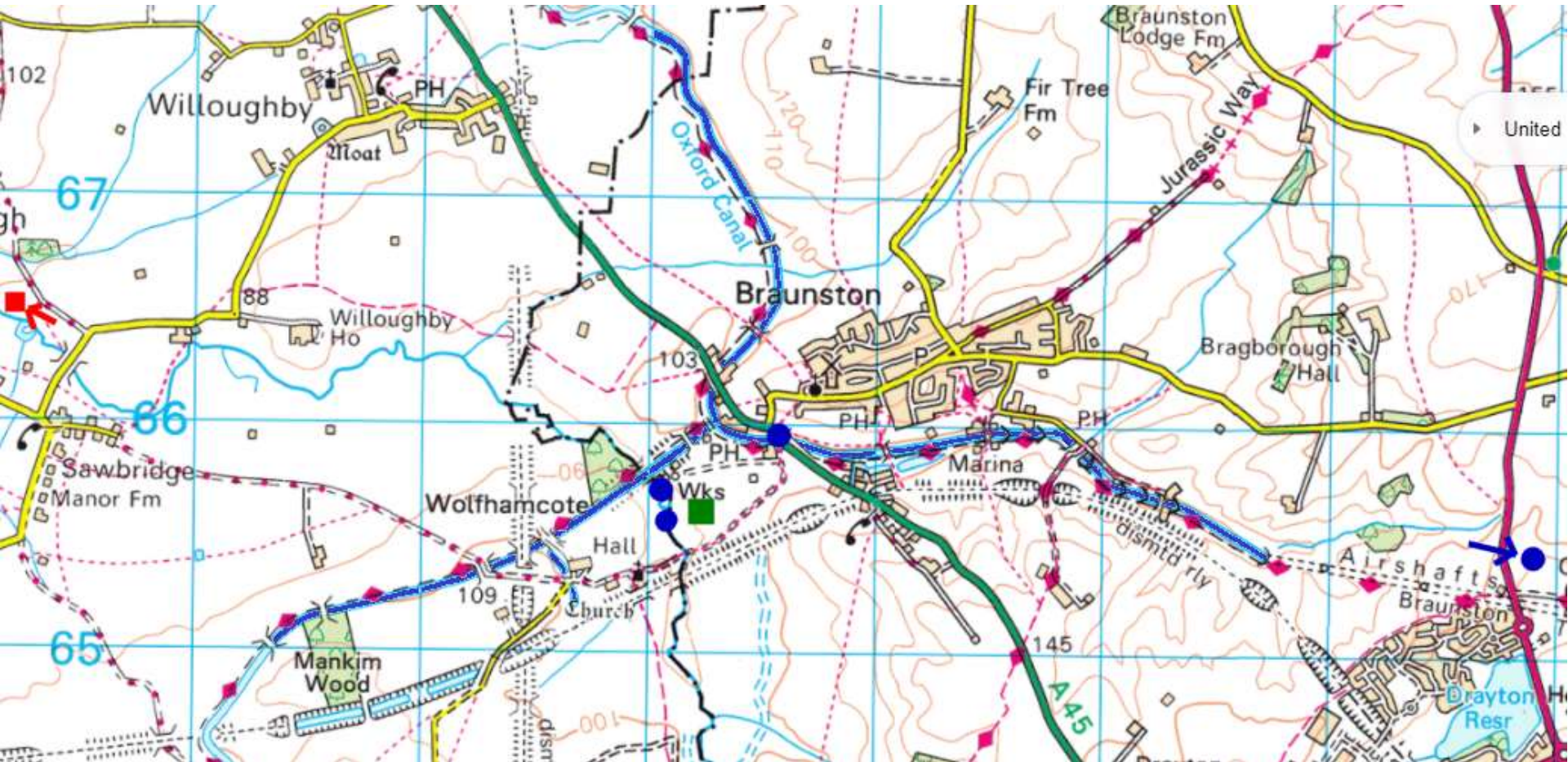
Some possible reasons to collect local water data

- Identify water quality problems that might get worse with climate change
 - do we suspect there are specific problems with water quality?
 - or do we just want to check to see if there are?
 - why the suggested focus on the canal?
 - would using the canal for water transfer cause any problems?
- Before you can even start planning a survey:
 - need to know why you are doing it
 - what parameters would you like to measure and why
 - what can you realistically measure – practically and financially



What do we have already?

Existing sources of water data



Existing sources of water data

- Rainfall
 - rain gauge at Braunston Sewage Works
 - data downloadable from EA's Hydrology Data Explorer
<https://environment.data.gov.uk/hydrology/explore>
 - daily rainfall
 - 15 minute rainfall
 - no need for additional data collection – available for data analysis
- River flow and levels
 - River Leam at Kites Hardwick (GS)
 - data downloadable from EA's Hydrology Data Explorer
<https://environment.data.gov.uk/hydrology/explore>
or from National River Flow Archive
<https://nrfa.ceh.ac.uk/data/station/info/54112>
 - no need for additional data collection – available for data analysis



Existing sources of water data

- Water quality
 - Environment Agency monitoring locations
 - Buckby Wharf – ongoing monitoring – data 2000-2023
 - A45 canal bridge, Braunston – data 2000 to 2010
 - River Leam upstream, of Braunston STW effluent – data 2000-2021
 - Braunston STW final effluent – ongoing – data 2000-2023
 - River Leam downstream, of Braunston STW effluent – data 2000-2013
 - Buckby Wharf data is upstream of Long Buckby STW inputs to the canal so should be fairly representative of the quality of the supply through Braunston Tunnel
 - But it does not show any effects of boating activity at Braunston Locks, Braunston Marina and boatyards on canal water quality?
 - What about the streams and rivers?
 - Is this something of interest in relation to climate change and CAN interests?



Water quality

- Current water quality
 - Buckby Wharf
 - generally complies with EQS for things that have been measured
 - dissolved oxygen very good – no major organic pollution
 - exception is phosphate - 68µg/l against EQS of 14 µg/l in 2022
 - Canal at Braunston
 - consistent with Buckby Wharf data
 - River Leam
 - Similar picture – high phosphorus
 - No recent samples downstream of Braunston STW but STW effluent monitoring shows big improvement in phosphate levels since tertiary treatment was installed



Water quality

- Things to monitor
 - Water Framework Directive
 - includes most substances that have environmental quality standards (EQS) – EQS are useful otherwise how do you know what is OK?
 - these include:
 - effects of pollution (e.g. dissolved oxygen)
 - physico-chemical parameters supporting the biology (e.g. nutrients)
 - things of concern because they are toxic
 - microbiological quality for bathing waters
 - there are other parameters of concern with no official EQS (e.g. turbidity/suspended solids, litter etc)
 - EQS can be found in:
 - The Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015
- How
 - range of methods:
 - simple observation – field test meters/kits – lab equipment



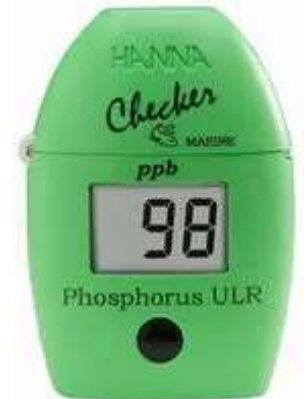
What could/should CAN measure?

What could Braunston CAN do?

- Dissolved oxygen
 - essential for fish but excessive levels may indicate algal bloom – some algae can produce neurotoxins
 - need a meter - £50-£100
- pH
 - can use test papers – but is it worth it in our moderately 'hard' water?
- Turbidity
 - can do simply with a Secchi disc
- Oil
 - can use simple observation
- Phosphate
 - key parameter of concern in canal and river in Braunston
 - causes 'eutrophication' – adverse effects from excessive algal growth
 - need to filter sample (big plastic syringe and inline filter – very easy)
 - need field kit (colorimeter) to do the analysis £100-£150 plus consumables)



What could Braunston CAN do?



Next steps

- Decide monitoring objectives
 - what is the link with climate action?
- Select parameters you would like to measure
- Decide whether you can do it
 - volunteers available?
 - funds available?
 - possible to achieve appropriate limit of detection (LoD)?
 - training needs?
- How will you use the data
 - campaign for use of phosphate-free detergents by boaters? – and householders?
 - encourage use of oil filters when pumping bilge water from engine bilges? – do they work?
 - ‘bag it and bin it’ campaign?
(different - data to support = observations of sewer overflows)



