



Westcountry CSI – Our plans for the future...



Westcountry CSI – Our plans for the future...

- Where Westcountry CSI came from
- Where we are now
- Where we are headed





Where Westcountry CSI came from

In 2015 – we secured some funding from the National Lottery for a project called ‘Tamar CSI’



The brief was to sense check reports of minor pollution incidents and co-ordinate a response from the Environment Agency or South West Water

We teamed up with EarthWatch International to bring their Freshwater Watch scheme to the Westcountry for a six month pilot phase

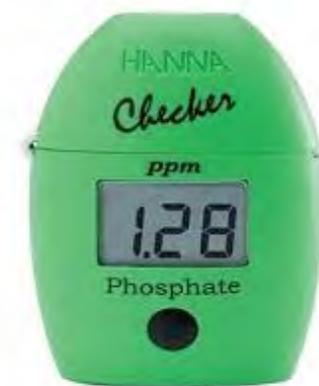




Where Westcountry CSI came from

We knew there was more to monitoring than pollution spotting so we set out to develop our own scheme that was tailored to the Westcountry

With a little bit more money from the People's Postcode Lottery we equipped volunteers on the Tamar under a project called River Buffs...



Are you a **River Buff?**





Where Westcountry CSI came from

... but enthusiasm for our rivers was not contained to the Tamar and the scheme soon flooded out across the Westcountry



This meant finding lower cost testing options suitable for mass participation





Where Westcountry CSI came from

Since then over 400 people have signed up – our instructions were basically

1. Find somewhere that interests you and is safe to access
2. Survey regularly – monthly is ideal
3. Call any pollution in to the EA hotline and get in touch if you have any questions

Data analysis was largely focussed on the entire data set to determine the range of measurements and behaviour – what made people stick with it?





Where we are now...

Since the first survey on the new scheme was recorded in November 2016 on the St Austell River – we have recorded 3,343 surveys between us

In November last year Lydia joined us having started out doing CSI surveys as a volunteer. Lydia is our first dedicated CSI co-ordinator

Of 424 enrolled volunteers 96 (23%) have submitted surveys in the last 12 months (this is considered a very good retention rate)





Where we are now...

Environment Agency resources have been severely reduced (monitoring budget cut by c.60%)

Reduction in monitoring of between 50% and 70% in some places (depending how you measure it)

EA Strategic Monitoring Review proposes further cuts

Surveillance monitoring' planned to go from c. 7000 sites per year to just 500.

100 sampled every year the other 400 will be on five year rotation – after five years they will have data from 1600 unique locations





Where we are now...

With Brexit looming there is doubt over whether we will keep our environmental protections

Environment Agency chief supports plan to weaken river pollution rules

Campaigners say Sir James Bevan is trying to 'rig system' and cover up decades of failure



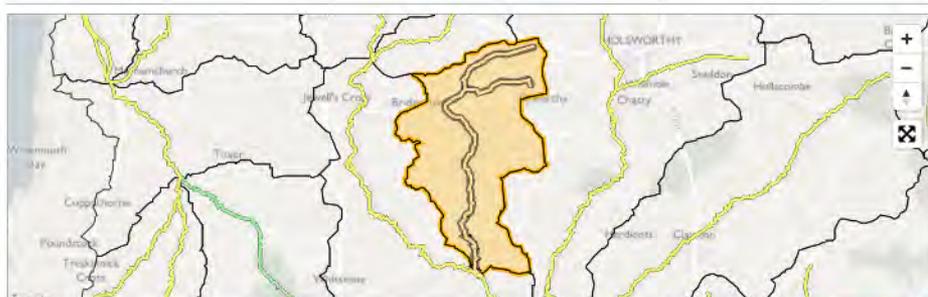
▲ Only 14% of rivers in England qualify as 'good' under the EU's water framework directive. Photograph: Andrew Fosker/Rex/Shutterstock

The head of the **Environment Agency** has endorsed a proposal to weaken laws on cleanliness of polluted rivers, lakes and coastlines after Brexit.



Where we are now...

Long awaited 2019 Water Framework Directive classifications show a continuing decline in river health



Derril Water Overview

[Download Water Body as CSV / GeoJSON](#)

Overall classification for 2019
Bad

Id	GB108047008070
Type	River
Hydromorphological designation ⓘ	not designated artificial or heavily modified
NGR ⓘ	SS3012801053
Catchment area	1298.26 ha
Length	11.687 km
Surveillance Water Body ⓘ	No
Catchment area	12.983 km ²

Classifications ⓘ

Cycle 2 classifications ⓘ

[Download as CSV](#)

Classification Item	2013	2014	2015	2016	2019
Overall Water Body	Poor	Poor	Moderate	Poor	Bad
▸ Ecological	Poor	Poor	Moderate	Poor	Bad
▸ Chemical	Good	Good	Good	Good	Fail

Just 14% meet ecological standard and 0% meet new chemical standard

but...

How much data are these assessments based on...?





Where we are now...

Is the Environment Agency's monitoring still up to the job?

Was it ever – really?

What role should there be for volunteer monitoring going forward?

How can we make Westcountry CSI more useful and relevant?



Where we are headed...

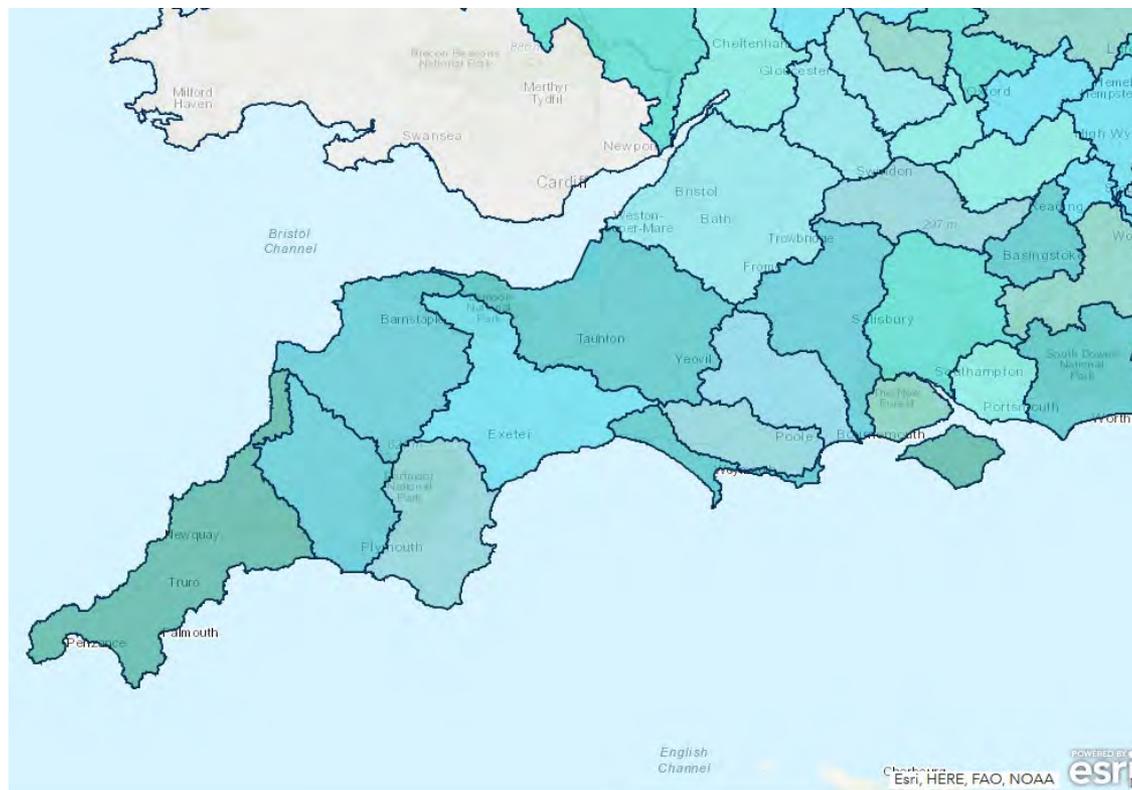
The Catchment Based Approach (CaBA)



“an inclusive, civil society-led initiative that works in partnership with Government, Local Authorities, Water Companies, businesses and more, to maximise the natural value of our environment.”

CaBA Working Groups:

- Catchment Data User Group
- Agriculture Working Group
- Abstraction Working Group
- Benefits Working Group
- Urban Water Group
- Biodiversity Working Group





Where we are headed...

Learning from the USA...



What is the Chesapeake Monitoring Cooperative?

- Connects initiatives across monitoring groups and regions
- Amplifies voices and enhances understanding of the health of the Chesapeake Bay watershed
- Provides technical, programmatic and outreach support in order to integrate volunteer-based monitoring data into a centralised data hub
- Assistance with method selection, study design and data interpretation





Where we are headed...

Our own 'Catchment Monitoring Cooperative'

- Consultation launched by new CaBA Monitoring Working Group
- *Aims to bring together local communities, NGOs, businesses and public agencies to integrate a volunteer-based environmental monitoring programme into catchment management planning*

How?

- Standardised methods and joined up data
- Training and support to enable collection of relevant and quality data
- Effective use of data to improve the environment
- Sustainable funding to support local community monitoring

Catchment Monitoring Cooperative





Where we are headed...

Westcountry CSI 'v2.0'

Westcountry CSI scheme already has many of these elements in place
Standard methods, training, quality assurance, unified data platform

... but there are two key areas we can tighten up on without major overhaul

Experimental design – ensuring monitoring is carried out regularly and at agreed locations

Effective use of data – we want to summarise and present the data gathered by you in an engaging, informative, easy-to-understand format

... and other areas that may take more work, such as - expanding the tests available, use of novel technologies, sample collection and lab analysis





Where we are headed...

Experimental design – where?

Under the EU Water Framework Directive the Environment Agency divided the country into...

- > River Basin Districts (e.g. South West)
- > Management Catchments (e.g. Tamar or North Devon)
- > Operational Catchments (e.g. Tamar Upper)
- > Water Bodies (e.g. Derril Water)



There are 992 water bodies in the area covered by Westcountry Rivers Trust

Our ambition is to have at least one regular monitoring point in each of them





Where we are headed...

Experimental design – where?

‘Tier 1’ monitoring point in each waterbody – this will be on the main river and ideally somewhere in the lower third

‘Tier 2’ sites – these can be in side tributaries and further upstream to give better representation of the whole waterbody

Where ‘live’ or recently live EA sampling points exist we’d like to use them where feasible

Many of your existing sites will be absolutely fine

We’re going to need a LOT more volunteers!





Where we are headed...

Experimental design – where?

We can help you to make sure you are monitoring in the most effective place, but there are also online data sources that you can use

EA Catchment Data Explorer – this shows the current waterbodies, their WFD status and ‘Reasons for Not Achieving Good’ (RNAGs) – where appropriate

Tamar

Cycle 2 classifications ⁱ

[Download as CSV](#)

Classification Item	2013	2014	2015	2016	2019
▼ Overall Water Body	Good	Moderate	Moderate	Moderate	Moderate
▼ Ecological	Good	Moderate	Moderate	Moderate	Moderate
▶ Biological quality elements	Good	Moderate	Moderate	Moderate	Moderate
▶ Hydromorphological Supporting Elements	Supports Good				
▶ Physico-chemical quality elements	Good	Good	Good	Good	Good
▶ Specific pollutants	High	High	-	-	
▼ Chemical	Good	Good	Good	Good	Fail
▶ Priority substances	Good	Good	Does not require assessment	Does not require assessment	Good
▶ Other Pollutants	Does not require assessment				
▶ Priority hazardous substances	Good	Good	Does not require assessment	Does not require assessment	Fail

 surface water operational catchment
 surface water management catchment





Where we are headed...

Experimental design – where?

Search EA Sampling points – this shows where current (open) and historic (closed) sampling points are. Choose the EA Area (Devon and Cornwall or Wessex) and ‘Freshwater’ in the Sampling point type box – then click on the map where you are interested and it will show the nearest sampling points - click on each point and you will see the sampling history and analysis results

Search sampling points

Samples from 26 Nov 2014 to 18 Sep 2015

	Determinand	Units	26 Nov 2014 11:29	5 Jan 2015 09:46	18 Feb 2015 12:26	18 Mar 2015 11:20	16 Apr 2015 12:53	12 Jun 2015 11:48	29 Jun 2015 12:37	17 Jul 2015 14:09	14 Aug 2015 10:50	18 Sep 2015 14:47
0061	pH		7.9	7.8	7.9	8.1	7.9	7.7	7.8	7.9	7.8	8
0076	Temperature of Water	°C	9.9	10	6.1	7.2	11.9	13.5	14.8	16.2	15.5	12.7
0077	Conductivity at 25 C	µs/cm	348	325	376	375	381	371	401	410	213	358
0111	Ammoniacal Nitrogen as N	mg/l	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	0.054	0.077	
0116	Nitrogen, Total Oxidised as N	mg/l	2.78	2.97	3.05	3.43	2.89	2.72	2.83	2.88	1.55	
0117	Nitrate as N	mg/l	2.77	2.96	3.04	3.42	2.88	2.72	2.82	2.87	1.53	
0118	Nitrite as N	mg/l	0.0076	0.006	0.01	0.0083	0.0059	0.0046	0.0084	0.0103	0.016	
0119	Ammonia un-ionised as N	mg/l	< 0.00043	< 0.00035	< 0.00033	< 0.00045	< 0.0005	< 0.00036	< 0.00049	0.00124	0.00134	
0162	Alkalinity to pH 4.5 as CaCO3	mg/l	111	121	146	145	147	146	154	168	71	
0180	Orthophosphate, reactive as P	mg/l	0.029	0.054	0.029	0.023	0.02	0.04	0.049	0.063	0.162	
9901	Oxygen, Dissolved, % Saturation	%	97	95.2	94	98	97.8	96	94	88	92	97
9924	Oxygen, Dissolved as O2	mg/l	11	10.7	11.7	11.8	10.5	9.98	9.5	8.63	9.15	10.3





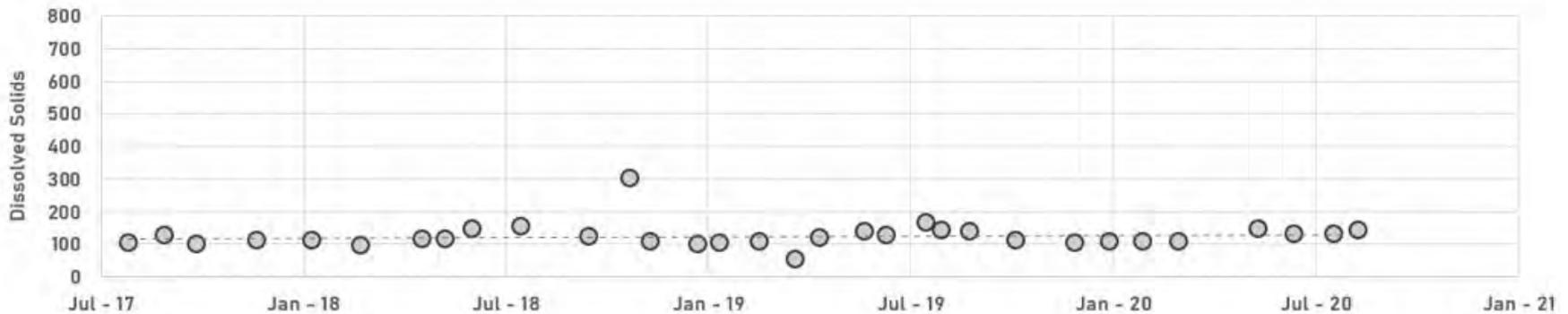
Where we are headed...

Experimental design – when?

For many years the Environment Agency’s default sampling frequency was monthly. As we have seen – this is no longer the case.

We are aiming for monthly sampling as a minimum – this will allow us to make a meaningful annual summary of data from each site.

Where we have enough people we can ‘double-up’ so we have fortnightly or even weekly sampling – some co-ordination will be needed to make this work well



Monthly TDS results for Coombe Water, North Cornwall



Where we are headed...

Effective use of data

Some volunteers have been surveying the same locations for over three years. They may not have detected any 'pollution' incidents but we can use all that data to provide a 'report card' or summary each year.

2007 PATUXENT RIVER REPORT CARD

Patuxent RIVERKEEPER

This newsletter introduces the first Patuxent River ecosystem health report card. This report card provides grades for three regions within the Patuxent River estuary (i.e., the tidal portion of the river). The report card grades are based on the progress of six indicators towards ecological targets. The report card shows that the Patuxent River estuary is mostly in poor condition and that substantially more effort is needed to see measurable improvements. This report card was produced in collaboration with the Patuxent Riverkeeper who recently started a citizen water quality monitoring program with the aim of using this information to assess the health of the region's creeks and estuary. Next year this data will be used to provide a more comprehensive report card.

Frequency (%) that indicators meet target levels	Overall					
	Watershed	Discharged nitrogen	Water clarity	Chlorophyll a	Aquatic grasses	Biotic community
Upper estuary	43	94	6	53	57	13
Middle estuary	30	43	0	43	24	50
Lower estuary	17	67	6	3	2	24
Overall	20	66	5	9	9	28

Figure 1: 2007 report card grades and indicator scores for the three estuarine regions of the Patuxent River. Note: Overall scores are area weighted. See www.eco-check.org for methods and additional data.

Overall health of the Patuxent River estuary in 2007 was poor, scoring 20 out of a possible 100 points (Figure 1). A comparison of the 3 smaller regions shows that there are substantial differences in habitat health among different areas of the estuary. The upper estuary region had the best report card score (43%), largely due to the relatively high aquatic grasses cover (43%), although much decreased from last year, and chlorophyll a and dissolved oxygen conditions that more frequently met the target levels. The lower estuary region scored the worst (17%), with all indicators performing poorly relative to the target levels. Most indicator scores differed greatly among regions; however, water clarity was consistently poor throughout the estuary (0 to 6%), a trend that is consistent with the entire Chesapeake Bay. While the report card does not account for the health of fish and shellfish, it does provide an assessment of aquatic grasses and benthic community conditions that are critical to healthy fish and shellfish populations. Future report cards will incorporate citizen monitoring data collected by the Patuxent Riverkeeper. To see how Patuxent River health compares to other regions of Chesapeake Bay, view the Chesapeake Bay report card at www.eco-check.org.

From left to right: Solomon Island Bridge, autumn in the Patuxent watershed, Bonnie Fowler Wade in sunset over the Patuxent River freshwater swamp. Photo credits: Patuxent Riverkeeper and University of Maryland Center for Environmental Science.

Summary and Trends

Continued impacts from 2018's record-breaking rainfall influenced grades in 2019. The River scored a C+, the same grade as in 2018, while the Creeks declined to a C+. Fishing Bay scored a D+, matching its 2018 grade. In particular, nutrients that entered waterways during 2018's rain events caused widespread algal blooms throughout most of the season.

Nanticoke Creekwatchers Program 2019 Grades and Trends

Figure 1

Figure 1 (Above): The map shows the 2019 grades for the Nanticoke River, its creeks, and Fishing Bay. The map also includes trends, indicating if grades improved, declined, or were flat when compared with 2018 grades.

BE A BOHEMIAN!

Your help and support! Everybody wants clean water. Join us as we gather in a spirit of fun and cooperation to make our community as vibrant as can be. Please consider making a membership and participating in our activities. Your ideas and input are!

To hear about you and your interests. Fill out the information below, his flap and mail it with your check to: Friends of the Bohemia, Inc., 650, Chesapeake City, MD 21915

You also donate online using your credit/debit card at our website: www.friendsofthebohemia.org

on Facebook at: www.facebook.com/FriendsOfTheBohemia

is at? friendsofthebohemia@gmail.com or call 443.566.3513

<input type="checkbox"/> Really Good Friend!	\$150
<input type="checkbox"/> Family Membership	\$30
<input type="checkbox"/> Individual Membership	\$20
<input type="checkbox"/> Student Membership	\$5
<input type="checkbox"/> Other	

Friend:

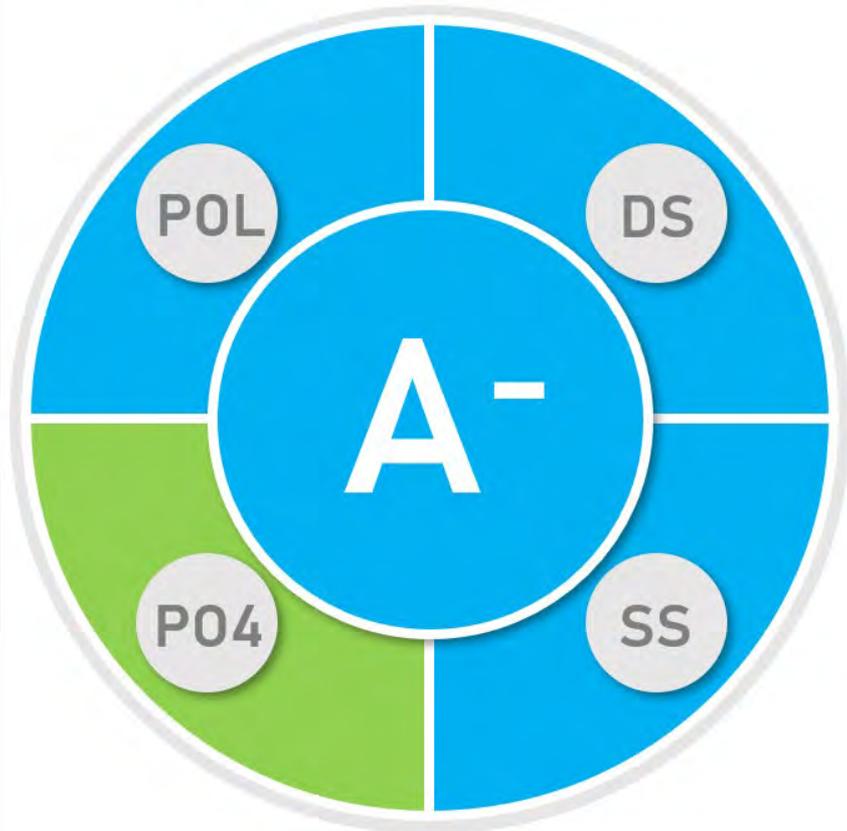
Be Bohemia, Inc. is 501(c)(3) nonprofit and contributions are deductible to the maximum allowed by law. For more information, contact Friends of the Bohemia, Inc., 650 Chesapeake City, MD 21915. Phone: 443.566.3513. Accounts and information submitted to Friends of the Bohemia, Inc. under the described circumstances are held in the Secretary of State for the use of copies and postage. Federal ID No. 47-399848



Where we are headed...

Effective use of data

As well as background information – local catchment issues, explanations of terms and grades, tips to help keep rivers healthy – these all tend to have a simple grading system to summarise volunteer monitoring data



We have been working on turning your data into an overall grade based on:

DS = Total dissolved solids results

SS = Turbidity results

PO₄ = phosphate results

POL = evidence of pollution section

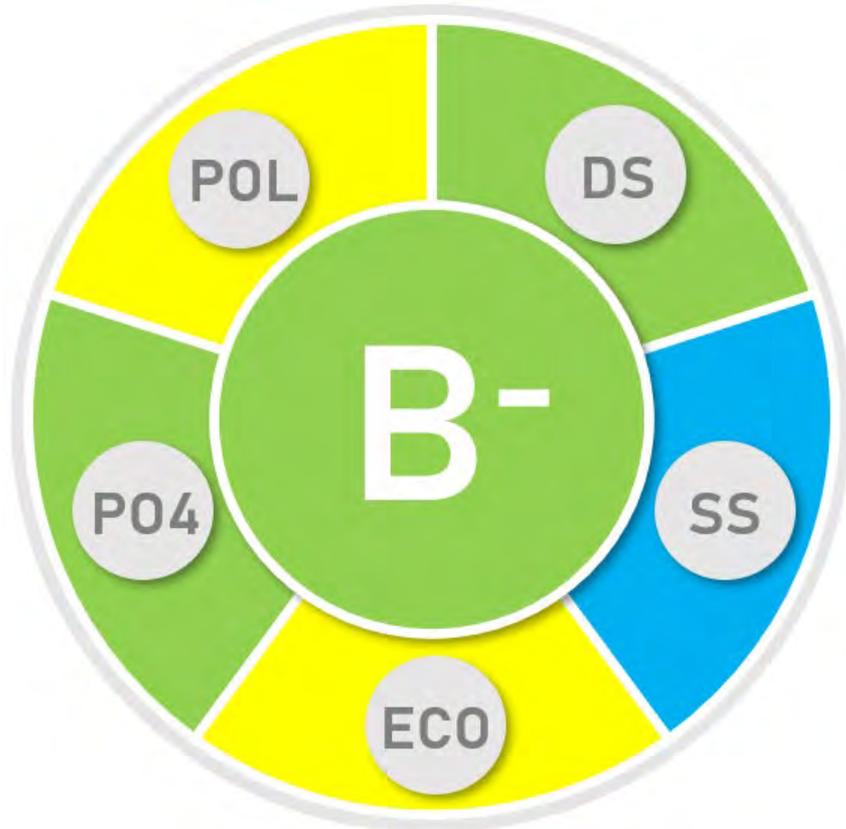




Where we are headed...

Effective use of data

As well as background information – local catchment issues, explanations of terms and grades, tips to help keep rivers healthy – these all tend to have a simple grading system to summarise volunteer monitoring data



We have been working on turning your data into an overall grade based on:

DS = Total dissolved solids

SS = Turbidity

PO₄ = phosphate

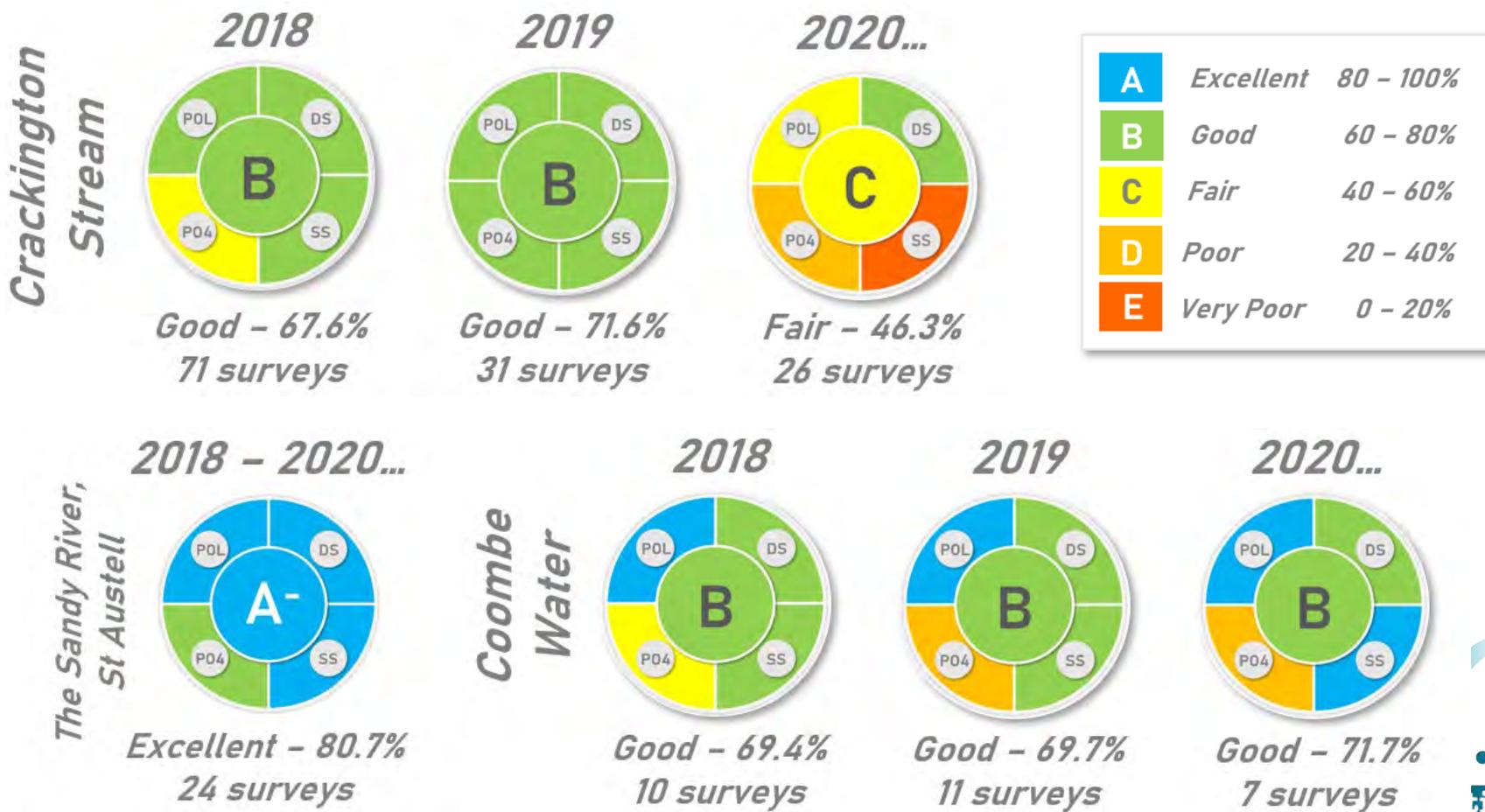
POL = evidence of pollution

and a fifth 'slice' 'ECO' for ecology – based on 'Ecosystem observations' section

Where we are headed...

Effective use of data

We're working on pilot report card summaries for locations where we have sufficient data





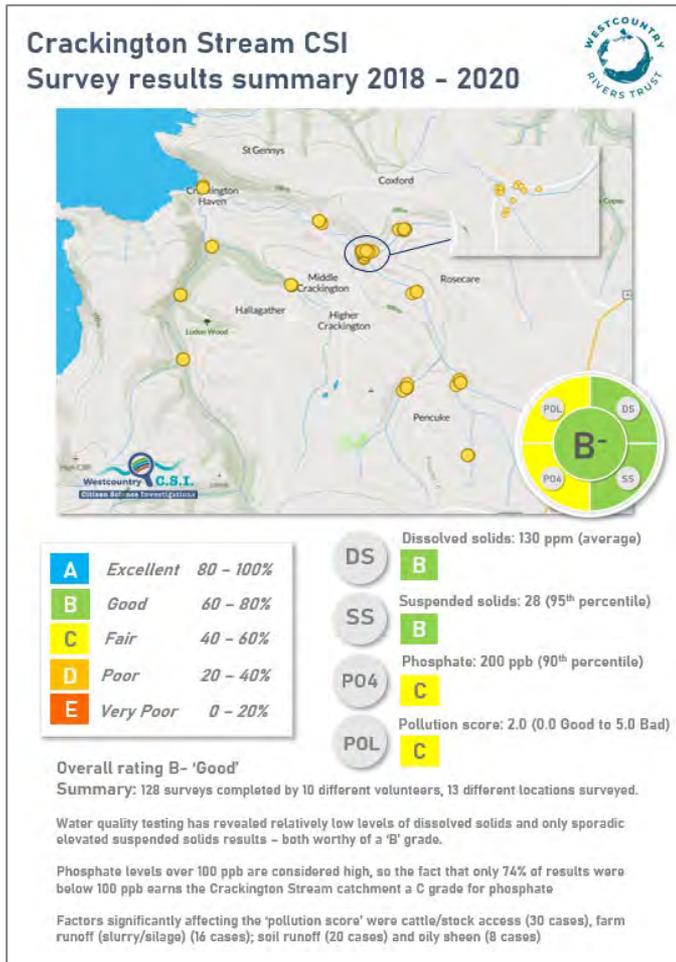
Where we are headed...

Effective use of data

Our aim is to issue a number of demo report cards in the next few months so that we can seek your views on the format and content

Aim to get all 2020 report cards complete by March 2021

We will need to get in touch with individuals and groups to make sure we all understand which sites are critical for reporting – so that we can assemble as many report cards as possible for 2021





Where we are headed...

Effective use of data

Some considerations...

Working up these summary report cards will take some time, please be patient

It does mean that we need to be consistent when reporting issues such as 'Farm run-off', 'Sewage fungus' etc. These score highly (bad) on the grading system

If you are struggling to cover a priority tier 1 site then let us know and we can try and recruit helpers in your area

These are not designed to replace EA Water Framework Classifications – but in some places (esp. small coastal catchments) there is no WFD assessment

None of this is set in stone – but we need to act with some urgency as many of our rivers are going untested





Where we are headed...

Other areas for development

Other areas where we are considering enhancing the CSI scheme are:

Additional tests

We know there are effective, low cost tests for ammonia and nitrate – tests for coliform bacteria are also available. These could be introduced on a limited trial basis to start with



Novel technologies

We are working with universities to develop low cost sensors, suitable for deployment by volunteers



– these could collect continuous data on temperature, depth and total dissolved solids

Sample collection and analysis

Many schemes in the US involve sampling and analysis at a local lab for more advanced determinands





Westcountry CSI – Our plans for the future...

To sum up...

We've come a long way in five years – thanks to the enthusiasm, dedication and patience of our volunteers

We're committed to Westcountry CSI and see it as a fundamental part of our work going forward

We have reached a level of participation that means we can step up and provide a safety net for our rivers, ensuring fewer of them go unmonitored

We need to make some changes to the way the scheme operates to ensure robust, consistent quality data - but the basic building blocks are in place

We are not alone – volunteer / community monitoring is receiving a lot of attention nationally and internationally
- this is only the beginning!





Westcountry CSI – Our plans for the future...

Thanks... any questions?

