An assessment of the use and acceptability of citizen science data to support better water quality for Wales

NRW has an action under the river pollution summit action plan to explore the acceptability of citizen science data. This is under the theme of addressing planning constraints in Special Areas of Conservation (SAC) river catchments.

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In addition to addressing the specific focus of the action plan, this assessment document provides more general recommendations on the potential contribution of citizen science data to NRW's work towards better water quality for Wales.

Addressing planning constraints in SAC rivers

Citizen science data from bank side auto-analysers, hand held phosphorus (P) meters or P test strips, is not suitable for assessing compliance with the SAC P targets. The targets relate to phosphate measurements derived from water samples analysed to a standard method in an accredited laboratory.

There is potential for data from third parties including citizen science groups to contribute to the assessment of compliance with SAC targets if the data have been collected and analysed to this standard. For example, our 2021 WFD classification assessment included river and groundwater water quality datasets collected by Dŵr Cymru Welsh Water and Cardiff Port Authority.

Citizen science data from hand-held P meters or analysers could provide additional evidence to support NRW's assessments. Examples of how this could work are set out in the box on the next page. The citizen science data would need to be quality assured and subject to routine statistical checks (eg. for outliers) in the same way as NRW data.

At present, data from phosphate test strips are not considered suitable for this purpose: a report from Cardiff University concluded that phosphate test strips trialled on the Wye by citizen scientists did not perform as well as expected.

Potential uses of citizen science data from hand-held meters and bank side analysers (Subject to availability of resources in NRW)
To provide additional context and support for NRW SAC P target assessments by providing information from additional locations in a water body and/or additional sample dates. Although we would not be able to combine the citizen science data directly with the laboratory analysed data, it could be helpful to know what that separate and potentially large, dataset suggests. There is potential for citizen science data to provide corroborating evidence to help with the investigation of any outliers in NRW data.
To provide an indication of whether P levels in a water body have changed since NRW's last assessment. This could help us to decide where to target additional collection of lab accredited data. It would be particularly valuable for the small number of water bodies where we have no/ limited NRW monitoring data. We would need to bear in mind that differences between NRW laboratory data and citizen science data are likely in part to be explained by the different methods used.

Recommended use of citizen science data to support better water quality for Wales

NRW's priorities for developing our use of citizen science water quality data are:

- to contribute to our understanding of catchments and to help us prioritise locations and issues for NRW to investigate.
- To contribute to assessing the effectiveness of specific management interventions in specific local areas. e.g. creation or restoration of a riparian wetland.

These are the work areas which most readily lend themselves to making use of large volumes of citizen science data. The data do not necessarily need to be water chemistry data: habitat information or photographic information can be of great value.

Developing the use of citizen science to support better water quality

NRW and Welsh Government support UK level development of citizen science through the UK Environmental Observation Framework Citizen Science and Data Advisory Working Groups and through JNCC support of surveillance monitoring schemes and the Terrestrial Evidence Partnership of Partnerships.

The Catchment Systems Thinking Cooperative (CaSTCo) is a £7 M OFWAT funded project supporting the development of UK citizen science water monitoring. NRW is actively engaged with the project at a national level and on the CaSTCo Usk pilot project.

NRW are updating our position statement on citizen science and are producing guidance to support citizen science groups.