

Economic, societal and public health benefits of improving water quality at designated bathing waters to a good or excellent standard in Scotland: Literature review

Section 1: Project Overview

Introduction

The Centre of Expertise for Waters (CREW) intends to commission a **capacity building project** aligned with CREW's Water Quality and Health that supports the development of a framework approach to understanding and calculating the benefits of improving bathing water quality in Scotland, with an indicative way of calculating these benefits which can be applied to individual sites.

Background & knowledge gap

Open water swimming, often referred to as wild swimming¹, typically takes place in the sea, lakes and rivers; anywhere that isn't a swimming pool. Popular areas for open water swimming are designated as bathing waters. There are over 80 designated bathing water sites in Scotland ([Bathing Waters | Home | Scottish Environment Protection Agency \(SEPA\)](#)), and more than 600 sites in total in the UK ([Bathing waters | Water UK](#)). The majority of the designated bathing water sites in Scotland are found along the coast with a few located on inland lochs.

Scottish Ministers and SEPA have a statutory requirement, as prescribed in The Bathing Waters (Scotland) Regulations 2008, to ensure that all bathing waters are classified as "sufficient" or "better". They must also take such realistic and proportionate measures as they consider appropriate with a view to increasing the number of bathing waters classified as "good" or "excellent".

Designated bathing water sites are monitored under The Bathing Waters (Scotland) Regulations 2008 for the bathing season (a period each year determined by Scottish Ministers, typically encompassing the time when large numbers of bathers are expected). Generally, this has been from 1 June to 15 September with a pre-season beginning 15 May. The samples are analysed for the presence of faecal indicator organisms *Escherichia coli* and intestinal enterococci. Additionally, visual observations are made for other water quality indicators including cyanobacterial (blue-green algae) blooms, macroalgae (seaweed), marine phytoplankton, sewage solids and other waste during sampling ([Bathing Waters | FAQs | Scottish Environment Protection Agency \(SEPA\)](#)).

Health risks of poor water quality experienced during open water swimming include increased risk of gastrointestinal illnesses, or stomach bugs, which may cause diarrhoea and/or vomiting, as well as respiratory, skin, ear and eye infections. There is also a risk of more severe infections caused by micro-organisms such as *E. coli* O157 ([Swim healthy - GOV.UK](#)).

In recent years the popularity of wild swimming has soared during and post-pandemic as travel and cost of living pressures encouraged people to look for local low-cost opportunities to swim.

With expanded interest and participation in wild swimming, expectations of water quality have increased and now have a high public profile. SEPA regularly receives political, public and media queries about water quality issues.

At a designated bathing water location¹ with a “sufficient” classification, the current target for designated bathing waters in Scotland, there is an average probability of one case of gastroenteritis in 20 exposures and approximately one case of acute febrile respiratory illness in 50 exposures. Heavy rain typically reduces water quality due to operation of sewage assets and run off from agricultural and urban areas.

Ayr (South Beach) and Portobello (Central) are Scotland’s busiest designated bathing waters, close to urban centres with good public transport links. In recent years these bathing waters have had, or been at risk of, only achieving the minimum sufficient classification. Further improvements to water quality at these locations and others would likely require significant investments in infrastructure improvements.

The knowledge gap to be addressed

Overall, Scottish Government and SEPA would like to increase our knowledge of the benefits to the economy, society and public health benefits (including health economic benefits) to improving bathing water quality above the general level of ‘sufficient’ and the approaches, investment level, ambition, achievements in other parts of the UK.

Whilst the Scottish Government published a report in 2018 on the value of bathing waters and influence of bathing water quality, many elements of the previous report have been bypassed by the increased popularity of wild swimming as described in section 1 and an updated proactive approach is required. It is of particular importance to understand long term benefits and trends alongside any disproportional costs.

Whilst we have knowledge of costs involved in improving water quality beyond the sufficient standard, we do not have a good understanding of the benefits of this including averted costs to NHS Scotland services from cleaner bathing water for conditions such as Otitis externa (Swimmer’s ear) etc, reflecting the increased popularity and usage.

As Scottish regulations state that Scottish Ministers and SEPA must take such realistic and proportionate measures as they consider appropriate with a view to **increasing the number of bathing waters classified as good or excellent**, a fuller understanding of the benefits of improvements are needed to inform these decisions. We need to identify and set out factors to be used in determining a water body-specific proportionality threshold which is then compared to the projected costs of improving status of bathing waters.

¹ Designated bathing waters are areas where the Bathing Waters (Scotland) Regulations apply. The criteria for designation are that (i) a large number of people is expected to bathe there and (ii) no permanent advice against bathing there has been introduced. Designations decisions are made by Ministers.

Ultimately, this work will help Scottish Government and SEPA build a framework to assess water quality improvement investment decisions and advise Ministers. The methodology developed will be tested empirically at Ayr (South Beach) and Portobello (Central).

Similar challenges apply to parts of the UK with devolved administrations; it would be beneficial to understand and learn from approaches being taken.

Aim and key questions

The overall aim of this project is to provide information on the benefits to the economy society and public health (including health economic benefits²), to improving bathing water quality in Scotland, and; the approaches, investment levels, ambition, achievements in other parts of the UK.

The key questions to be addressed, via review of academic and grey literature, are:

1. What factors should be considered when assessing the economic, societal and public health benefits (including health economic benefits) of improving bathing water quality from sufficient to good or excellent? Consideration of a broad range of factors is anticipated including:
 - a. visitor spend
 - b. restorative impacts of blue space visits
 - c. mental and physical health benefits of open water swimming
 - d. mental and physical health benefits of convenient, routine access to open water swimming (e. g., water quality routinely supporting bathing activities, such as a weekly swim habit, at an individual's local beach). This may be particularly relevant to lower income groups.
 - e. how degree of confidence in water quality impacts participation in bathing activities and related mental and physical health benefits
 - f. how degree variability in water quality (e. g., deterioration after heavy rain) impacts participation in bathing activities and related mental and physical health benefits
2. What approaches, investment levels, ambition and achievements have been set/achieved in other parts of the UK and EU of improving bathing water quality beyond the sufficient classification, with values where possible, and who set these (Government, Local Authorities Water Companies or other bodies)?
3. What cost benefit analysis, or other method of assessing proportional cost, including health economic benefits has been used for any decisions worldwide on water quality improvements to support recreational water use?

Deliverables

- Communications and impact plan – supported by CREW at the start and throughout the project
- A final report of 20-30 pages, excluding annexes and the bibliography, and including:
 - A literature (including grey literature) review
 - A summary of benefits of improving bathing water quality, approaches to achieving this, examples of methods of assessing costs to improve water quality globally
 - A concise set of recommendations
 - Cover image(s) with associated photo credits

² The research team should include expertise in health economics.

- A plain English summary of aims and results (up to 1 page)
- Website summary (200 words)
- Policy brief

Events/meetings

- 3 Project Steering Group online meetings (throughout the project lifecycle³)
- One stakeholder online workshop (or equivalent focus group(s)/interviews) during the project

Intended impacts

There are multiple pathways for a project to achieve impact, and multiple factors that can impact the project's ability to achieve what it intends to do; both along the project lifecycle (A.IMPACT) and beyond project completion (B.IMPACT) (Figure 1).

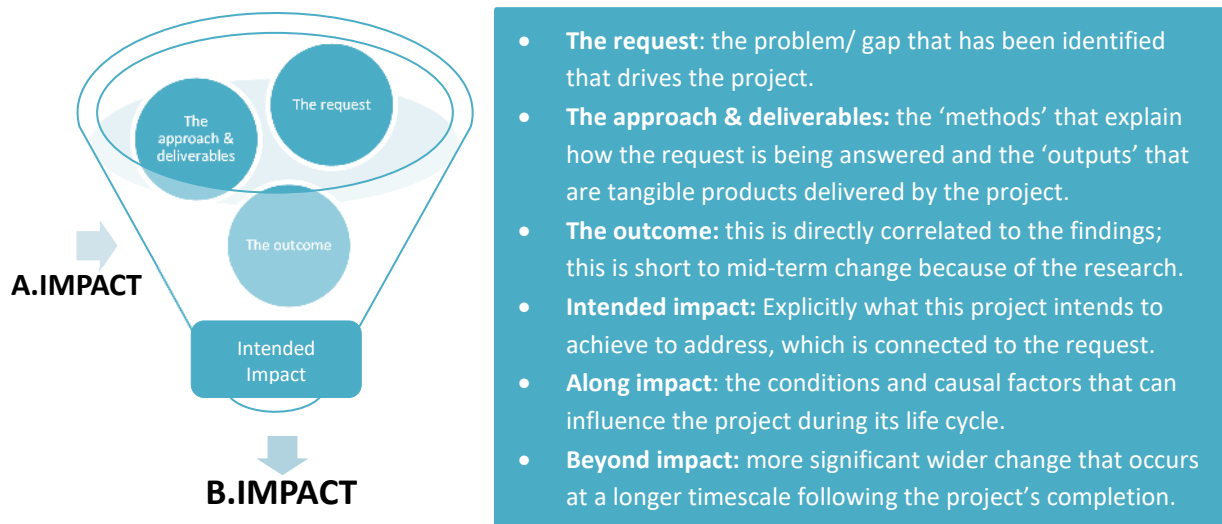


Figure 1: Pathways to impact

Along Impact (A.Impact):

These stakeholders are anticipated to be a key influence on this project: SEPA, Scottish Government, Consumer Scotland, Public Health Scotland, and public health boards.

Beyond Impact (B.Impact):

The popularity of wild swimming since the pandemic has been ongoing and is likely to continue. Reasons given for this include:

- Disconnecting from technology and connecting with nature: Wild swimming provides an opportunity to manage stress and improve mental health.
- Low-impact and low-cost activity: Accessible to people of all ages and abilities.

³ Please note, CREW requests a brief written update c. two weeks prior to project steering group meetings.

- Physical and mental health benefits: Including being a great workout, metabolism booster, stress reliever, immune booster, and pain reliever.
- Joy of being in open water: Enriching experience for many.

Additionally, the equality of access to bathing waters with high water quality is important for environmental justice.

The intended audience for the project deliverables include SEPA, Scottish Government, local authorities, and other Bathing Water regulators.

The project deliverables will be used by Scottish Government and SEPA to build a framework which identifies and sets out factors to be used to determine a water body-specific proportionality threshold which is then compared to the projected costs of improving status of bathing waters. This will serve as a complementary tool to support SG's advice to ministers who make decisions on realistic and proportionate measures as they consider appropriate with a view to increasing the number of bathing waters classified as "good" or "excellent".

Planning for the next River Basin Management Planning cycle and Scottish Water Investment cycle is currently underway. This will run 2027 to 2033 and information on benefits is needed as a matter of priority to inform priorities for planned spending during this period.

Section 2: Further information for applicants

Project management

Day-to-day communication will be between the research/review team (the contractor) and a CREW Project Manager and is likely to involve short catchups as agreed.

Project steering group

A small group including representatives of Scottish Government and its delivery partners plus a CREW representative, will meet with the preferred bidder for a pre-contract meeting and provide feedback on the bidder's proposed approach.

Anticipated timescale

A precontract meeting will be held in May 2025. The project will commence **late May 2025**, depending on contract processing and signage, with the project outputs signed off by the CREW Director by **mid-November 2025**. Note intermediate deadlines for preliminary outputs will be discussed during the precontract meeting.

Funding

The maximum amount of funding available **exclusive of VAT** (where applicable) is £62,000

Submitting a proposal

Please send a completed application form using the most recent version (the link to this form is available on the CREW Call for Proposal webpage ([Call for Proposals | CREW | Scotland's Centre of Expertise for Waters](#)) addressing the project requirements.

A copy of expectations and the award criteria are provided below for reference.

Proposals need to be submitted to Procurement@crew.ac.uk for evaluation **by noon on Tuesday 29th April 2025**. We aim to notify the preferred bidder **w.b. 19th May 2025**.

Please contact Procurement@crew.ac.uk if you would like any clarification on any of the above by **Tuesday 22nd April 2025**.

Please contact Procurement@crew.ac.uk if you would like any clarification on any of the above. You should highlight any potential conflicts of interest in your proposal. For queries about what may constitute a potential conflict of interest please contact the CREW Deputy Manager (Nikki.Dodd@hutton.ac.uk).

Expectations

No.	Criteria	Descriptor
1	Duration	The proposed duration will align closely to the details provided in the anticipated timescales section of the specification.
2	Staff time and effort	The proposed allocation of staff time and effort is appropriate and includes all deliverables. The proposal provides a commitment that named staff members will be available to work on the contract if the bid is successful. For any unnamed staff, appropriate risk identification and mitigation measures are provided.
3	Project costs	The estimated breakdown of project costs is realistic and inclusive of all deliverables.

Award criteria

No.	Criteria	Descriptor
1	Understanding the project ask and policy background	The proposal should include an introduction which demonstrates a clear understanding of the project requirements. This should include an understanding of the policy background and the supporting role of this project; the need for this research; the project aim; and how the proposal will address this aim.
2	Proposed methodology	The proposal should demonstrate a high quality and workable methodology, including: how the evidence will be identified, reviewed and assessed; consulting relevant stakeholders and/or experts where appropriate to address the key questions and produce the deliverables in the timescales required. It should explain the suitability, robustness and limitations of the proposed methodology.
3	Milestones	The project milestones are logical, practical and include all deliverables.
4	Project Management	The staff, resources and expertise are appropriate for conducting the proposed project. The proposal should name the project lead and outline their project management experience.
5	General and specific topic expertise and experience	The proposal should provide details of individual staff members who will work on this project and demonstrate how they will meet the project requirements, specifically: general research experience and expertise; specific experience and expertise on the topic of bathing water quality and health economics in Scotland, and in other parts of the UK.
6	General communication and deliverables	The proposal should describe the approach to producing the deliverables, which will be published on the CREW website. It should detail who will take lead responsibility for report-writing and overall report quality. It should provide examples of previously published relevant reports/policy briefs including any on bathing water quality and health economics in which they have been involved.
7	Quality assurance	The proposal should provide details of quality assurance procedures to demonstrate how the contract will be continuously delivered to a high standard. It should specifically address issues of quality control at different stages of the project, including evidence gathering, analysis and report writing. It should include a timetable for delivery of tasks, project milestones and allocation of staff and staff time against each task, covering the duration of the contract.
8	Risk	The proposal should provide a risk assessment matrix detailing any risks identified in relation to the delivery of this contract, and proposed mitigation measures to minimise their probability and impact, focused particularly on risk to completion on time.

Annex A. Relevant reports, studies and policies

- [The value of bathing waters and the influence of bathing water quality: Final Research Report](#)
- [Summary of key findings - Value of bathing waters and influence of bathing water quality: research findings - gov.scot](#)
- [Recommendations for bathing water / beach management in Scotland - Value of bathing waters and influence of bathing water quality: literature review - gov.scot](#)
- [About BlueHealth - BlueHealth](#)