Research Theme: Environment

Case Study

Improving the Quality Standards for Recreational Waters

RESEARCHERS

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THE OVERVIEW

Modelling the fluctuation of indicator bacteria and pathogens in places where people come into contact with them is important for the management of bathing waters.

Research conducted by the Centre for Research in Environment and Health (CREH) at Aberystwyth University has informed the development, implementation and improvement of global recreational water quality standards.

THE CHALLENGE

In environmental research and modelling, catchment (an area where water is collected by the natural landscape) microbial dynamics have been lower on the agenda than, for example the study of nutrients. Accurate, and publicly available information about water quality is important to enable bathers to make informed decisions about entering the water.

> **"The CREH team are key members of the WHO technical advisory group on water quality. In this capacity, WHO has drawn on CREH experts to provide an updated review of evidence to inform revision of both EU BWD and WHO Guidelines and also to provide rapid technical advice to Member States as needed."**
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> **LEAD SCIENTIST, WHO BATHING WATER GUIDELINES, 2019**

THE SOLUTION

Since 2000, CREH at Aberystwyth University has developed new risk-assessment methodology for bathing water exposures and implemented this at recreational bathing sites across Wales. CREH provided, for the first time, real-time and within-day predictive modelling, facilitating pollution forecasts that have driven notification procedures and permitted user choice. This improved public health amongst bathers and safeguarded Blue Flag status.

CREH's work has supported a revision of World Health Organisation (WHO) and European Union (EU) water quality guidelines and the Environment Agency's (UK-wide) Pollution Risk Forecasting system. CREH also served as technical adviser for the (world-wide) Blue Flag Awards and for bathing water quality at the 2016 Rio de Janeiro Olympic Games.

THE IMPACT

INFLUENCING INTERNATIONAL AND UK PUBLIC POLICY

CREH influenced the revision of the WHO 'Guidelines for Safe Recreational Water Environments' and, on behalf of the WHO, advised the EU on the revision of the EU Bathing Water Directive 2006/7/EU, which sets standards for EU bathing waters across more than 22,000 European beaches. This significantly benefited the EU coastal tourism sector, which contributes EUR 183 billion to the economy per annum.

IMPROVING IMPLEMENTATION OF AND INCREASING COMPLIANCE WITH ENVIRONMENTAL POLICY

Scientists from CREH oversaw the implementation of real-time water quality predictive modelling and water management advisory notification approach in Swansea Bay between 2013 and 2020. Between 2017 and 2020, this work extended to Cemaes Bay (Anglesey) New Quay North and Traeth Gwyn (Ceredigion) and Nolton Haven (Pembrokeshire). Following these long-term projects, both Swansea Bay and Cemaes Bay passed EU water quality standards and the latter achieved a 'Excellent' EU classification in 2021. This also protected and enhanced public health as bathers were told in real-time when recreational waters were safe to use.

BENEFITTING PUBLIC HEALTH, THE LOCAL ECONOMY AND ECOSYSTEMS

Part-funded by the European Regional Development Fund, Acclimatize (2017 – 2023) is a project being carried out by researchers in Wales (CREH at Aberystwyth University) and Ireland (University College Dublin (UCD). The aim, in Wales and Ireland, is to work out how bathing waters at the seaside become polluted in a way that can impact on public health, and how climate change may affect the quality of these waters in the future. The Acclimatize project is further developing and implementing risk assessment methodology and has increased the modelled Welsh beaches to five including Swansea Bay.