



Global Water  
Research Coalition



# Overview of Activities

2021 | 2022



## OUR MISSION

*"To maintain a strong partnership between leading world water research organisations to strategically generate, exchange and communicate knowledge through research collaborations to support safe and sustainable water supply and sanitation for the protection of public health and the aquatic environment."*





## Global cooperation for the exchange and generation of water knowledge

In 2002 twelve leading research organisations established an international water research alliance: the Global Water Research Coalition (GWRC).

The Global Water Research Coalition (GWRC) is a non-profit organisation that serves as the collaborative mechanism for water research.

The GWRC maximises its value to member organisations through collaboration to address critical research needs across the water sector, the prompt dissemination of the latest leading edge research findings, the facilitation of knowledge sharing across all member organisations, and access to a global network of leading researchers.

The need for the GWRC to exist has never been greater given the major challenges confronting the water industry across the world. The impact of globalisation, increased population and pollution, impact of climate change, a pandemic and the ageing of the water and wastewater infrastructure are global in nature, and transcend both national and continental boundaries. It is only through global collaboration that the water industry will be able to address these challenges. Despite all we have achieved so far, there is a compelling need to gear up and improve our working processes regarding the implementation of the research strategies and the execution of our joint activities.

The GWRC offers its members and partners the opportunity to leverage resources through cooperative planning and implementation of research.

The current members of the GWRC are listed below.

- Canadian Water Network (Canada)
- KWR Water Research Institute (Netherlands)
- PUB (Singapore)
- SUEZ (France)
- Stowa - Foundation for Applied Water Research (Netherlands)
- TZW DVGW - German Water Centre (Germany)
- UK Water Industry Research (UK)
- VEOLIA (France)
- Water Research Australia (Australia)
- Water Research Commission (South Africa)
- The Water Research Foundation (US)
- Water Services Association of Australia (Australia)

The US Environmental Protection Agency has been a formal partner of the GWRC since 2003. The Global Water Research Coalition is also affiliated with the International Water Association (IWA).

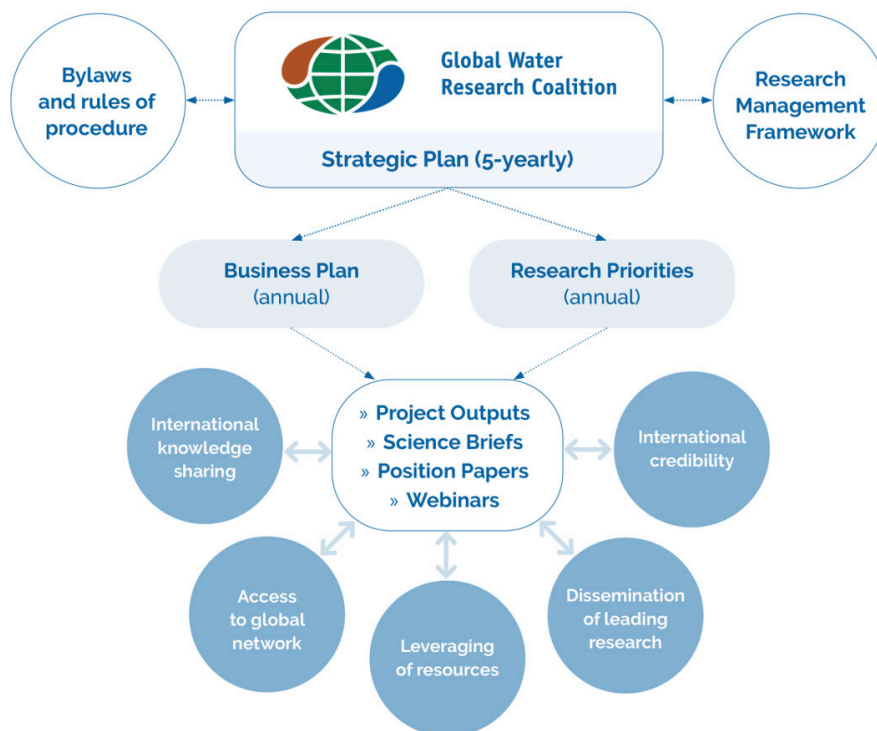
The research portfolio of the GWRC members spans the entire urban water cycle and covers all aspects of resource management.

## “New” Strategic Plan (2022-2027)

The Strategic Plan 2022 – 2027 has been drafted and describes the strategic direction of the Global Water Research Coalition (GWRC) for the next five years. It builds on the integration of the feedback received and discussions by the Board and the previous Strategic Plans.

Together with the Agreement of Cooperation, the Strategic Plan ensures a clear pathway forward and sets the framework for the annual Business Plan and the joint Research priorities.

### Strategic Partnership

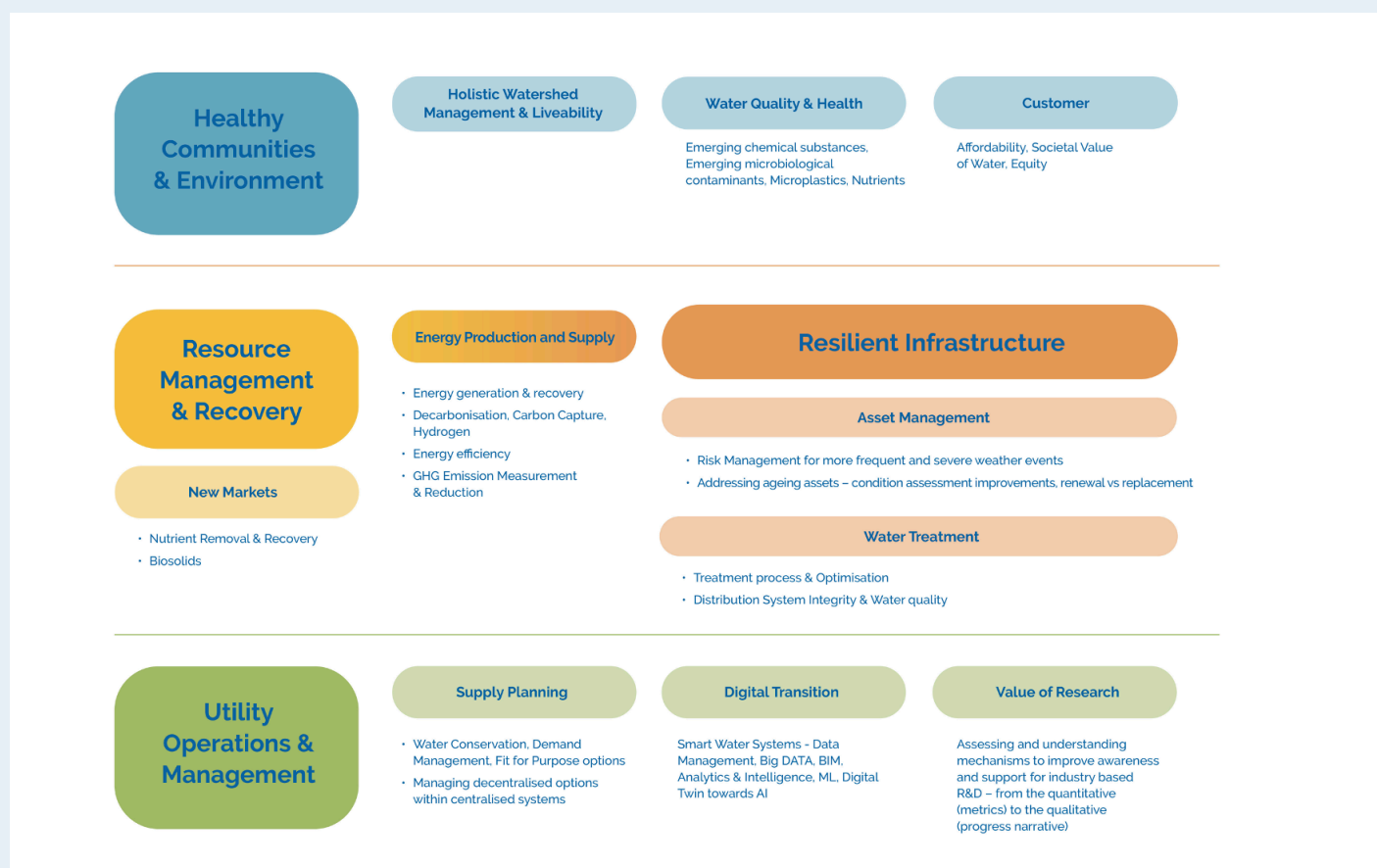


## GWRC Research Priorities

The joint research agenda of the GWRC addresses the urban water cycle and covers a number of research areas and in particular Water Quality and Health, Resource Management & Recovery, Resilient Infrastructure and the

operational and management of utilities which includes the transition into the digital era.

The GWRC Research priorities matrix (Figure below) was updated in 2022 with the members and partners.



### GWRC Research Priorities

Following a strategic planning session with the GWRC board, three focus areas were selected to explore further for the coming years, namely Greenhouse Gas Emissions, Water Quality & Treatment (includes emerging contaminants) and Resilient Infrastructure. To deliver on these focus areas, the GWRC has established Working Groups comprised of member and partners representatives.

The working groups provide the ability to share and exchange on previous, current and developing research. This approach serves to reduce duplication and highlight

opportunities for cross collaboration amongst GWRC members based on shared interests and needs. The objective is to determine knowledge gaps and develop research proposals. These proposals will be submitted for consideration by the board as a GWRC research project. The research proposals can cover a variety of formats (e.g., case studies, webinars/community of practice (CoP), research, white papers, workshops) and must articulate their relevance from a global point of view and relation to the purpose and objectives under the banner of the GWRC.



## Overview of Ongoing Projects and Activities

### Effect Based Monitoring in Water Safety Planning

This project is coordinated by the KWR Watercycle Research Institute and work package leaders are amongst others the GWRC members Veolia and Suez and Griffith University. A kick off meeting for the project took place at KWR on the 1 October 2019 at the KWR Headquarters (Netherlands) and a follow up workshop took place in September 2022 in Paris.

The main added value of this project is to combine substance based to effect-based monitoring tools to capture any adverse toxic pathways missing by substance based targeting.

The key challenge of this demonstration project is to assess under innovative effect based methods, the water quality profiles potentially triggered by residual organic micropollutants at different parts of the DWTP, from resource to tap and through the whole water cycle (water cycle DWTPs, WWTPs, conventional and alternative water treatment schemes and water reuse).

This project aims to demonstrate an innovative water quality and safety assessment framework in a practical setting, to support water experts in the implementation of effect-based monitoring in integrative and cost-effective monitoring programmes to detect emerging water quality issues. User guidance will be provided to operators and/or local authorities on the selection of bioassays, the interpretation of bioassay data, the establishment of decision-making support for the operating practices on the upgrading/improvement of the supply chain. Furthermore, a selection of case studies will be used to demonstrate the implementation of a combination of tools to assess the effectiveness of treatment stages, and the use of effect-based monitoring in Water Safety Plans. Ultimately, this leads towards a more efficient implementation of bioanalytical tools across the global water sector.

All the deliverables (fact sheets and reports) of the project are available to download from the GWRC and KWR websites. A new IWA/GWRC Book Edition entitled "Bioanalytical Tools in Water Quality Assessment" was also published in June 2021 in an Open Source format.

## Value of Research

Today's water management sector is facing increasing uncertainty about future conditions, heightened expectations about the role of water utilities in achieving community goals, and the need to develop financially sustainable solutions. In response to these challenges, water utilities have an increasing incentive to leverage research and innovation to effectively identify priorities for action and develop resilient and adaptive solutions.

The Canadian Water Network (CWN) is coordinating this GWRC project evaluating "International Trends" in valuing research & innovation which has commenced in 2019.

The GWRC members have identified a shared need to: (1) better understand how water utilities perceive and recognize value from research and innovation activities, and (2) Identify how and where investments in R&I provide value for end-users and funders and share a range of approaches and metrics that can be used to guide assessment of value.

This project will leverage the knowledge of all GWRC member participants by consolidating information on the nature of the research ecosystems and practices in the different jurisdictions, allowing members to access insights from the expertise in the group and apply them to their respective organizations. In addition, the project will provide a structure that enables the contribution of diverse, local information to a useful, high-level synthesis of international trends in research and innovation valuation.

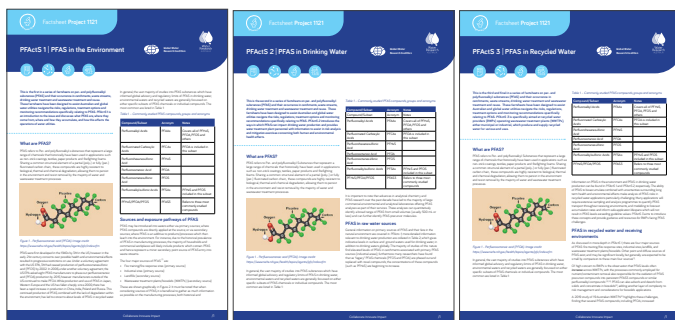
To date, reports have been submitted, representing overviews of the Dutch water landscape (collaboration between KWR and STOWA) and the Australian national water service and water research landscape (collaboration between the Water Services Association of Australia (WSAA) and Water Research Australia (WRA). Other reports submitted where overviews of the French, South African and Singaporean research landscapes. A Canadian landscape report was also developed by CWN. All project documents and related resources provided by project participants can be found on the project website:

[cwn-rce.ca/international-trends-in-research-and-innovation-valuation/](https://cwn-rce.ca/international-trends-in-research-and-innovation-valuation/)

## PFAS

**Per- and Poly-Fluoro Alkyl Substances (PFAS)** will be a major water quality issue in the 21st century. PFAS (PFOS, PFOA, etc.) are highly water soluble and resistant to degradation and hence widely present in the environment.

They bioaccumulate and are now a major concern in many countries with groundwater, soil and drinking water contamination, accumulation in wastewater and biosolids, and potential impacts on the environment and human health. PFAS is a priority on the agenda of most members and partners and it was deemed important to collate information on the current status of research within the membership. A series of 3 Fact Sheets have been drafted together with Water Research Australia (WRA) to remain up to date: PFAS in Drinking Water, PFAS in the Environment and PFAS in Recycled Water.



The fact sheets can be downloaded from the [GWRC Website](#).

## Sewage Surveillance of SARS-CoV-2

"The European Commission' Science Services together with the Global Water Research Coalition (GWRC) and key experts are collaborating in the drafting of a "High level overview and best practice guide to undertake Sewage Surveillance of COVID-19", entitled **"How to perform waste-water based surveillance of SARS-CoV-2? "The international cookbook for practitioners"**

a guide to be used by Operators and Practitioners in the context of the Commission recommendation". This works builds on the extensive SARS-CoV-2 research and practice contributions of the GWRC member organisations.

The objective is to have a coordinated approach bringing together experts and public health and water professionals to highlight sampling strategies and methods used, and explore how sewage data has been used and interpreted in making public health decisions with the overall agenda of advancing equity and health. Teaming up with the European Commission in this endeavour means to strategically align and consolidate international knowledge and best practice in a coordinated, open and inclusive way. The report is due to be published

early 2023 and will be available as a printed report version and a digital version that will be kept updated and will have all the links to additional case studies, videos and references that may not be included in the printed version. The site will be updated and maintained by the European Commission. It will be published directly by the Official Publication Office of the European Union in Luxembourg and distributed online as epub and PDF as well as printed by the EU Bookstore.

The WHO Interim Guidance report published in April 2022 entitled „ Environmental surveillance for SARS-CoV-2 to complement public health surveillance" is a high level overview which is complementary and will be cross-referenced. The GWRC was invited to be an external reviewer of this report. The report can be downloaded under this link ([apps.who.int/iris/rest/bitstreams/1417950/retrieve](https://apps.who.int/iris/rest/bitstreams/1417950/retrieve))

## Knowledge Exchange & Webinars

### GWRC COVID-19 Sewage Surveillance Research Working Group:

A "GWRC COVID-19 Sewage Surveillance Research Working" was created for the members, partners and other key researchers to have a discussion platform to share, exchange, and collaborate on the topic of sewage surveillance of COVID 19.

This committee met on a regular basis to share their research in this field and discuss requirements for harmonised protocols, interlaboratory studies, white papers and fact sheets.

The committee is chaired by Gertjan Medema (KWR) and the administration and organisation of meetings is done by the MD.

### Other webinars organised included:

GWRC Webinar on PFAS in Wastewater and Biosolids, coordinated by STOWA and WRF (-27 October 2021).

GWRC Webinar: Effect based monitoring – perspectives and main barriers to wider uptake of micro-pollutants bioassays, coordinated by KWR (-29 November 2021).

**KWR**

Effect based monitoring with bioassays – perspectives and main barriers to wider uptake in water quality monitoring

Webinar -  
29th Nov 2021  
13.00 to 14.30 (Amst GMT+1)

The graphic features a background image of a person wearing a white lab coat and green gloves, working with stacks of purple bioassay cards on a table. The text is overlaid on the left side of the image.

GWRC Webinar on the Australian Urban Water Industry Research Agenda presented by Jason Mingo (WSAA) and Jacqueline Frizenschaf (WRA) (30 November 2021).

GWRC Webinar: "Global approach to managing constituents of emerging concern (CEC's) in water" coordinated by STOWA and WRF (16 February 2022).

## Workshops

The Global Water Research Coalition (GWRC) recognized the need of the water sector to understand the health risk associated with **antimicrobial resistance (AMR) in water**. A WRF/GWRC Workshop on "Critical Evaluation and Assessment of Health and Environmental Risks from Antibiotic Resistance in Reuse and Wastewater", took place on Sunday 11th of September 2022 in Copenhagen. The overall goal of this workshop was to present the outcomes of two WRF projects on evaluation of Health risk: Critical Evaluation and Assessment of Health and Environmental Risks from Antibiotic Resistance in Reuse and Wastewater (PI: Kerry Hamilton, ASU) and

Monitoring: Standardizing Methods with QA/QC Standards for Investigating the Occurrence and Removal of Antibiotic Resistant Bacteria/Antibiotic Resistance Genes (ARB/ARGs) in Surface Water, Wastewater, and Recycled Water (PI: Amy Pruden, Virginia Tech). As a follow up to this workshop we are exploring the drafting of a GWRC White paper on the current understanding of the contribution to antibiotic resistance from wastewater, wastewater treatment and the use of product of wastewater treatment e.g. recycled water and biosolids.

A GWRC Workshop on **Effect-Based Monitoring in Water Safety Planning** took place on Monday 19th of September 2022, in Paris and hosted by SUEZ. The overall goal of this workshop was to present the outcomes of the GWRC project on effect based monitoring. In this workshop project results were presented on: - Perception of effect based monitoring and main barriers to wider uptake in water quality monitoring - Applicability of effect based monitoring tools and best practice guidelines - Case study results and experiences - Potential for integration of effect based monitoring in water safety planning - Synthesis and outlook.



*GWRC members and partners and group of experts attending the Effect based monitoring Workshop at the SUEZ headquarters in Paris.*

As a follow up to this project the project team is recommending to have a final deliverable which will be a webtool that allows users to paste their raw bioassay data, step through the analysis process to ensure proper QAQC and produce results as bioanalytical equivalent concentration (BEQ) and/or toxic unit (TU), and then compare those results against effect-based trigger values (EBT) to provide an indication of whether the bioassay results indicate good, average or poor water quality (using a traffic-light indicator system).

## Conferences

The following conferences took place during the last two years and were attended either virtually or in person:

**Singapore International Water Week: 22 June – 2 July 2021** (Virtual/invited and presented on the GWRC sewage surveillance working group) and **17-21 April 2022** (in Singapore) (GWRC paper on sewage surveillance presented by co-author Dan Deere on behalf of Stephanie Rinck Pfeiffer)

**Stockholm World Water Week August 2022:** the GWRC was asked by Joan Rose and Dhesigen Naidoo to be co-convenor on a session on "Valuing wastewater for new solutions".

**IWA World Water Congress & Exhibition: 11-15 September 2022 in Copenhagen (Denmark)** Joint workshop with Gertjan Gedema To present the state-of-the-art on health risk assessment and monitoring of antimicrobial resistance in water.

Paper and posters were also presented on the effect based monitoring in water safety planning project.

## White Paper

"The Digital Water Utility of the Future" (Enablers, Applications and Risks of Digitalisation) white paper has been finalised and incorporates in-depth case studies that correspond with each step of the water loop (i.e. watershed management – water treatment – networks and distribution – used water treatment).

The water industry has changed radically in the last two decades. Water utilities' duties to supply water and wastewater services have expanded into resilience planning, acting as conduits between all water users and the water environment, and adjusting to ever more demanding customer service expectations. Replacing analogue with digital systems has already enabled companies to rise to these requirements more efficiently but now 'digitalisation' offers more significant step changes.

A new report by the Global Water Research Coalition, 'The Digital Water Utility of the Future', defines the many components of digitalisation and provides detailed descriptions of the opportunities and risks, enablers and barriers. It suggests a 4-step path towards digital maturity, moving from building a strong internal to a strong external focus, and identifies specific opportunities to optimise efficiencies within and between business units, enhance the interface with suppliers and customers, and leverage tighter integration with the community and external agencies. Benefits are achievable at each stage, and different water utilities will find themselves at different stages. Progress requires not just understanding and adopting new technological opportunities, but also transitioning leadership and workforce culture to embrace digital mentalities and ways of working.



The four components of a mature digital water utility, from an internal focus (left) moving to an increasingly external focus (right).

This discussion paper lays out the many opportunities the digital age offers water utilities, along with the risks and challenges, and how these can be managed. The paper is available on the GWRC website and is in the public domain. It was also published in the IWA Source Magazine in 2022.

## GWRC Board of Directors

Board meetings, workshops and topic discussions were organised for the Board of Directors via zoom in 2021 (April and October) and face to face in London (UK) in April 2022 and Copenhagen (Denmark) in September 2022 in the same week as the IWA World Water Congress.

At the April 2022 Board Meeting Peter Grevatt was elected to the position of Chair and Marielle van der Zouwen was elected to the position of Vice Chair.

The previous Chair Adam Lovell (WSAA) and Vice Chair Bernadette Conant (CWN) acted from 2018-2022 and throughout the pandemic and were thanked for their support, guidance and time.

An informative session took place during the Board meetings in London entitled "Race to Zero" with UK representatives and in particular Water UK & UKWIR who presented on the Carbon Management Challenges in the UK Water Sector and Practical activities and current research programmes in the UK.

During the Board meeting in September 2022 in Copenhagen members and partners presented their priorities and challenges for the years ahead. The exchanges of information between members and partners has developed into a very valuable part of the Board meetings. The presentations by the hosting organisations and their stakeholders give an additional dimension to the Board events.

The GWRC Board of Directors is made up of the representatives of the GWRC members.



*Peter Grevatt (Chair) and Marielle van der Zouwen (Vice Chair)*



*Board of Directors meeting in London (UK), April 2022 hosted by the UK Water Industry Research*



*Board of Directors Meetings in Copenhagen (Denmark), September 2022*



## Members of the Board (as per September 2022)

Nicola Crawhall	CEO, Canadian Water Network
Marielle van der Zouwen	Deputy Director, KWR (Netherlands) (Vice-Chair)
Chee Meng Pang	Chief Engineering and Technology Officer, PUB (Singapore)
Joost Buntsma	Executive Director, STOWA (Netherlands)
Flavia Zraick	CIRSEE Head of Performance & Promotion, SUEZ (France)
Josef Klinger	CEO, TZW (German Water Centre) (Germany)
Steve Kaye	Executive Director, UK Water Industry Research
Ismahane Remonnay	RI Partnerships & Megatrends Director, Veolia
Jennifer Molwantwa	CEO, Water Research Commission (South Africa)
Karen Rouse	CEO, Water Research Australia Limited (Australia)
Peter Grevatt	Executive Director, Water Research Foundation (US) (Chair)
Adam Lovell	Executive Director, Water Services Association of Australia
Stéphanie Rinck-Pfeiffer	Managing Director, GWRC (secretary/treasurer)

Suzanne van Drunick (National Program Director Safe and Sustainable Water Resources, US EPA) and Kala Vairavamoorthy (Executive Director, IWA) have an ex-officio position on the Board and are partners of the GWRC.



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