DCU Water Institute Strategy 2022 - 2025

Inspiring innovation through interdisciplinary partnerships to tackle some of the greatest water challenges of our time.

DCU
Ollscoil Chathair Bhaile Átha Cliath
Dublin City University

The Sea

I need the sea because it teaches me.
I don't know if I learn music or awareness,
if it's a single wave or its vast existence,
or only its harsh voice or its shining
suggestion of fishes and ships.
The fact is that until I fall asleep,
in some magnetic way I move in
the university of the waves.

It's not simply the shells crunched
as if some shivering planet
were giving signs of its gradual death;
no, I reconstruct the day out of a fragment,
the stalactite from the sliver of salt,
and the great god out of a spoonful.

What it taught me before, I keep.
It's air ceaseless wind, water and sand
It seems a small thing for a young person,
to have come here to live with his own fire;
nevertheless, the pulse that rose
and fell in its abyss,
the crackling of the blue cold,
the gradual wearing away of the star,
the soft unfolding of the wave
squandering snow with its foam,
the quiet power out there, sure
as a stone shrine in the depths,
replaced my world in which were growing
stubborn sorrow, gathering oblivion,
and my life changed suddenly:
as I became part of its pure movement.

Pablo Neruda (1904-1973)

Foreword

The 2022-2025 DCU Water Institute strategic plan highlights our expansion, and our recognition of the importance of transdisciplinary research for water.

In this Ocean Decade (2021-2030) we are working at achieving the ocean we want through science. Similarly, we are driven by climate change and the water crisis that it is creating. The Intergovernmental Panel on Climate Change has reported that global heating of at least 1.5 °C is likely in the next two decades. This will have a knock-on effect on weather patterns experienced. The climate crisis is a water crisis. Water availability is becoming less predictable across the globe, and extreme weather events are leading to water scarcity and contamination of water supplies. The impact of the water crisis will be unequal across areas of gender, economy and socio-political interests. An integrated view on water, the biosphere and environmental flows are so important. Research plays a critical role in our understanding and in driving sustainable management of water globally. We continue to work collaboratively with academics, businesses, NGOs, agencies and the public to build solutions to many water-related problems. We believe that the development of talent is critical to our growth as world leaders in water research and development.

We recognise the opportunity of Water Digitization – which starts with data. This means data that is already gathered by water and other utility companies has the potential to build a resilient and sustainable water future, providing much-needed help in managing and making better decisions. New modes of collecting water data like satellites, sensors, cameras etc, and interpretation, are therefore an important initial phase and it concerns all of the processes that make up the water cycle. Integrated solutions that provide real-time information, critical recommendations, and predictions, provide new and innovative ways to manage water and its impact on society.

While the European Green Deal has the ambition of Zero Pollution, the World Economic Forum tells us that pharmaceutical pollution of the world's rivers is so extensive that it now poses a global threat to environmental and human health. DCU Water Institute will expand its research work on understanding chemical cocktails in our water, and improved monitoring methods, with the aim of influencing policy for at-source reduction and improved wastewater management.

Nationally, our freshwater ecosystems and biodiversity are continuing to be under pressure. Ireland will face critical decisions around water quality, water availability and flooding, and the underinvestment in ageing infrastructure. Through resilience design, collaboration and communication to find solutions to shared water challenges, DCU Water Institute will be at the forefront in aiding the future-proofing of Ireland's water development and the welfare of the citizens.

As an international centre of excellence in water, DCU Water Institute will focus on impact for society through talent growth, technology development and innovative bio-design and ethical approaches. We hope you will join us as we continue our campaign to Love Water, which is a simple message that can have lasting and valuable outcomes.

In our strategy, 2022-2025, our strategic objectives are aligned with the Sustainable Development Goals as set out by the United Nations and we aspire to deliver on these grand challenges through a spirit of embracing talent, discovery and transformation.

Prof Fiona Regan
Director
DCU Water Institute

MISSION

Our mission is to inspire, support and nurture talent to carry out multi and transdisciplinary research, and generate innovative solutions to global water challenges.

VISION

Our vision is to be globally recognised for innovations in water research and education.

STRATEGIC PILLARS

Pillar 1	**Pillar 2**	**Pillar 3**
Technology Innovation	Policy Impact	People and Ethics

STRATEGIC OBJECTIVES

Delivery of innovative engineering, science, data analytics, DSS and knowledge transfer of multidisciplinary research and innovation capabilities. Development of novel strategies, capability and excellence in bio-design approaches for water management and future emerging technologies.	Partnering with university, industry and agencies to support commercialisation of discoveries and transformative approaches. Monitor and track projects, and build trust in the use of technology to inform regulation and policy.	Attract, select, motivate and retain talent with innovative skills, and advance the design and deployment of technological solutions without harm. Achieving societal impact and the way people behave around water.

VALUES

Research, Integrity and Excellence

Knowledge Transfer

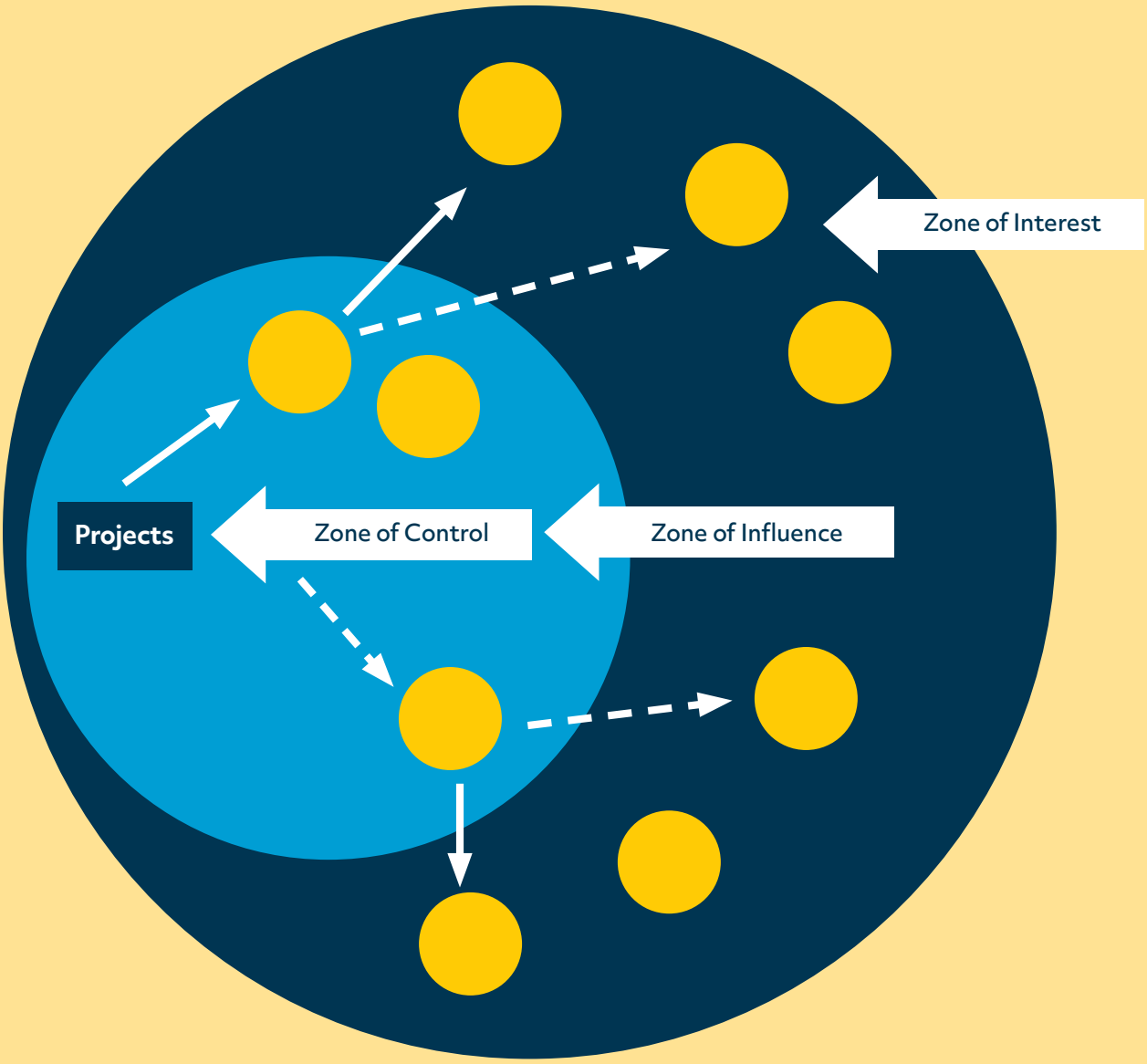
Doing More with Water

Foster a Culture of Collaboration

Drive Innovation

Project Mapping to Assessment of Impact

At the core DCU Water Institute's strategy, we believe it is important not only to assess projects based on their final outcome, but their resultant societal impact. As part of this, we develop an individual, project-specific 'Impact Assessment', whereby knowledge transfer and avenues of collaboration can be fully studied from the outset. Within the zone of control are our DCU Water Institute collaborating partners and in the zone of influencers are those areas where we seek to have impact and the stakeholders who can benefit from the research.



A Centre of Excellence for Water Research

The Water Institute has had significant success in attracting funding enabling world-class water research to take place. Its success has grown substantially, accelerating focus on pioneering areas of novel innovative technologies, elevating a platform for research talent to thrive and flourish, and addressing real-life challenges and behavioral change.

Projects involve national and international collaborations with numerous government bodies, academic institutions, industry partners and state agencies which deliver cutting edge research outputs. These are communicated through strong marketing channels making it an international centre of excellence for water research. The four platform areas shown will enable the sustainable development of the Institute in the coming years.

Research Themes

POLICY, GOVERNANCE AND RESEARCH INTEGRITY

THEMES

WATER AND HEALTH	MARINE	ENERGY AND AGRICULTURE	GOVERNANCE AND SOCIETY
SOME PROJECTS			
– Emerging Contaminants – Micro and Nano Plastics – Water reuse	– Biofouling and Antifouling – Marine Sensing – Ocean Energy	– Water Treatment – Circular Economy and Resilience – Nutrient Pollution	– Policy Impact – Societal Engagement – Citizen Science

TECHNOLOGY ATTRIBUTES

Autonomous sensing, data analytics, sensor networks, membrane technologies, fluid flow characterisation, advanced and conventional waste water treatment, artificial Intelligence and cloud technologies.

SOCIAL SCIENCE ATTRIBUTES

Hydro politics, water poverty, water corruption, water rights, water conflict, WASH practices, social justice, impact evaluation, behavioural change, gender impacts, water economics, water ontologies, water history and culture.

Our Values

Our five core values underpin our research which impacts national and international policy. We provide an environment where members can thrive and be innovative in a fair, safe and secure environment.

Research Integrity and Excellence
To ensure all research is carried out to the highest integrity using excellent research standards and practices.

Knowledge Transfer
All research will be impactful and will be translated to knowledge for dissemination to all stakeholders within society.

Doing More with Water
We will work to change how we value and use water resources.

Drive Innovation
To encourage curiosity, motivate new ideas and strive to exceed expectations through innovative practical solutions to the global water challenges we face today.

Foster a Culture of Collaboration
Teamwork internally and collaboration externally will be fostered within DCU Water Institute.

Strategic Pillars

The Strategic Plan 2022-2025 is based on three pillars that represent a pathway towards achieving our vision. Each pillar is assigned a series of strategic objectives SO1 to SO6 and associated actions. The success in achieving each objective is reviewed on a quarterly basis with the assistance of the advisory board.

Pillar 1: **Technology Innovation**	**Pillar 2:** **Policy and Impact**	**Pillar 3:** **People and Ethics**
Design, development and deployment of technologies using a hierarchy of approaches, taking into account need, demand, market uptake and disruption.	Define a systematic approach to carry out high quality, relevant research whilst understanding policy processes and engaging with policymakers.	To scientifically address societal needs and challenges we strive to engage the best talent and expertise to deliver solutions in an ethical fashion.
Strategic Objective 1	**Strategic Objective 3**	**Strategic Objective 5**
Delivery of innovative engineering, science, data analytics, decision support systems and knowledge transfer of multidisciplinary research and innovation capabilities.	Partner with academic, industry and agencies to support commercialisation of discoveries and transformative approaches.	Attract, select, motivate and retain talent with innovative skills and to advance the design and deployment of technological solutions without harm.
Action	**Action**	**Action**
Lead on the development of test and demonstration infrastructures to transfer research from the lab to the field.	Engaging with all stakeholders including policy makers to understand relevant research priority areas and interests.	Grow the Water Institute membership to further academic expertise. Along with retaining and expanding support staff and networks.
Strategic Objective 2	**Strategic Objective 4**	**Strategic Objective 6**
Development of novel strategies, capability and excellence in bio-design approaches for water management and future emerging technologies.	Monitor and track projects, and build trust in the use of technology, to inform regulation and policy.	Achieving Water4All. Achieving societal impact and the way people behave around water.
Action	**Action**	**Action**
Using bio-inspiration to develop technologies for water management, through biofilm management, membrane and materials development.	Research outcomes must be measured, disseminated and transferred to all stakeholders impacting approaches and policies.	Educate society on the value of water and water resource management within their communities and the impact they can make.

Global Reach

DCU Water Institute has a broad global network of collaborators, partners and alliances, all underpinned by the shared focus on water.

DCU Water Institute has been collaborating with GOAL and WaterShare to investigate a range of rural water reliability challenges in Eastern Uganda and Sierra Leone. Along with this, DCU Water Institute is working with the European Consortium of Innovative Universities (ECIU) to develop a pilot study for a pan-European citizen science arena under the theme of water.

Collaborations with academic institutions such as the University of Southampton has addressed the desire for diverse and multidisciplinary research needs in oceanography. DCU Water Institute is a partner of the ide3a and as such it has been contributing to lectures and hosting Master's theses from visiting Technological University Berlin students.

On a national scale, DCU Water Institute had lead a consortium of cross-border academic water experts with a vision to create a shared All Island Water Centre that would provide an interconnected-multidisciplinary experience for post graduate students and state of the art research. Encouraging diversification, DCU Water Institute has developed a long term partnership with Nua na Mara – a new marine innovation hub based in the Gaeltacht area in Ireland.

Being part of influential networks such as the Norman Network and GEMs Water Ireland enables DCU Water Institute to disseminate research outcomes on a global scale, and being part of Water Joint Programming Initiative (JPI) ensures the priority research needs are met, addressed and aligned to policy needs.

Our Policy Landscape

DCU Water Institute is a technology-focused institute that generates and transforms knowledge to inform decision-making for sustainable water management.

DCU Water Institute is at the forefront of research, development and deployment of technological and social solutions and its efforts focus on the grand challenges of water scarcity, pollution, disaster risk reduction and flooding.

We have seen the value of citizen engagement and the importance of translating research to application. The partnerships with businesses, agencies and NGOs are critical to demonstrate value and to grow talent with water domain expertise.

We operate in a dynamic policy environment that provides opportunities to influence and direct the future water agenda. The Significant Water Management Issues in Ireland document was published in 2020 in preparation for the third River Basin Management Plan (2022-2027). This outlines the water issues in Ireland – of which there are many. DCU Water Institute can play a role in making sure the list of priorities for measures, does not leave behind other important water challenges. Along with the Water Framework Directive, there are at least 13 other pieces of legislation interacting with it. This complex web of policy provides protection for our water, but DCU Water Institute will continue to question its fitness to achieve the objectives.

Sustainable Development Goals

There are 8 years remaining to achieve the 2030 Agenda for the Sustainable Development Goals. Water is interconnected throughout each goal playing a major role in addressing the core focus of the SDGs: people, planet, prosperity, peace and partnership. The integrated vision of "leaving no one behind" represents the unequivocal commitment of all UN Member States to eradicate poverty in all its forms, end discrimination and exclusion, and reduce the inequalities and vulnerabilities that leave people behind and undermine the potential of individuals and of humanity as a whole.

However, it is now evident that many parts of the globe are experiencing the fundamental impacts of climate change that scientists had predicted in the past. Unfortunately, most vulnerable communities are disproportionately impacted and are least able to prepare for, and recover from, extreme environmental disasters such as flooding and drought.

DCU Water Institute commits to include the Sustainable Development Goals in each and every part of its research so that it contributes directly to achieving Goal 6 and 14, and indirectly impacts so many others.

The 17 Sustainable Development Goals

Find out More

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