Ofwat Ofwation Innovation

Learning report

From source to sea: harnessing nature and communities for whole catchment innovation



waterinnovation.challenges.org

Ofwat

Ofwat, the Water Services Regulation Authority for England and Wales, launched the Ofwat Innovation Fund in 2020. Ofwat is a non-ministerial government department established in 1989, when the water and sewerage industry in England and Wales was privatised. Ofwat regulates the water sector in England and Wales.

The Ofwat Innovation Fund is delivered in partnership with Challenge Works, Arup and Isle Utilities. Find more information about the Fund at **waterinnovation.challenges.org**



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Ofwat O Innovation Fund

About this report

Sharing knowledge, information and data is fundamental to ensure successful Innovation Fund projects are scaled up and adopted across the sector. It also reduces the need for multiple companies to trial the same solution.

It is important that knowledge and data are shared at all stages of a project – not just at the end – so that we can all learn from what works and, crucially, what doesn't. That is why these learning reports are so important. By sharing and learning from each other we can all help the sector meet the challenges it faces and build public trust.

Dr Jo Jolly,

Director, Environment and Innovation, Ofwat

Ofwat Innovation Fund

The Ofwat Innovation Fund is a £600 million initiative established in 2020 by Ofwat, the Water Services Regulation Authority for England and Wales. It aims to enhance the water sector's capacity to innovate and enable it to better meet the evolving needs of customers, society and the environment. We have distributed more than £190 million to 109 projects, as of May 2025. A further £400 million will be available between 2025-2030 to foster innovation.

The Ofwat Innovation Fund has always sought transformational change. At its core is learning and knowledge exchange through disseminating data, information and insights across the sector. By deploying the solutions the portfolio of funded projects have developed, the sector can realise impact at the greatest scale possible.

What you will learn from this report

This report is aimed at all water sector stakeholders including water companies, supply chain partners, academia, policymakers, (E)NGOs and third sector/civic society organisations.

Its purpose is to shine a light on partners' experiences, insights and learnings from across the breadth of the portfolio of funded projects. Sector feedback suggests there is appetite to see more active dissemination of knowledge and learning from funded projects, in line with Ofwat's ambitions to support the sector's innovation maturity and collaborative nature.

As we enter the early stages of Asset Management Period (AMP) 8^{*}, covering 2025-2030, and the funded projects are either finished, nearing completion or have made good progress towards their aims and objectives, this is a time to reflect, build connections and amplify the learnings and insights from the Fund. AMP8 has seen the most ambitious Price Review yet with Ofwat's Final Determination approving £104 billion of investment going into our water and wastewater services. However, innovation – and, crucially, scaling and adopting innovation – remains a challenge. It is an area where the water sector of England and Wales can deliver real value for customers, the environment and society by leveraging innovative approaches, technologies, processes, products and services – and in this way meet the aims and objectives laid out in AMP8 plans.

We see this report as a starting point for connections both within and outside the sector and a means to collaborate, adopt and scale Ofwat Innovation Fund initiatives that help us to rise collectively to the challenges of this AMP and into the future.

*AMP8 (Asset Management Period 8) refers to the regulatory investment cycle for the water sector in England and Wales, covering the period from 2025 to 2030. It sets out how water companies plan, finance and deliver services guided by Ofwat's priorities on resilience, sustainability and customer outcomes.

Foreword by Dr Jo Jolly, Director, Environment and Innovation, Ofwat



The water sector of England and Wales stands at a crucial juncture, where investment in nature-first approaches and innovation must be at the heart of how we build a sustainable water future for our customers, society and the environment. With $\pounds 3.3$ billion committed to nature-based solutions as part of the $\pounds 22.1$ billion Water Industry National Environment Programme^{*} (WINEP) in England and over $\pounds 1.6$ billion outlined investment in Wales' National Environment Programme in AMP8, we

are taking major steps to restore ecosystems, improve water quality and build resilience in our rivers, wetlands and coastal environments.

Through the Ofwat Innovation Fund, we have seen the sector embrace a more holistic, source-to-sea approach – one that recognises the interconnectivity of our water systems and the need for nature-led interventions. From upstream catchment management to innovative water reuse and flood mitigation, these projects show that working with nature is not only possible, but essential.

Outside of the Ofwat Innovation Fund we are seeing a significant rise in naturefirst and nature-based solutions involving our communities across England and Wales. From large-scale coastal wetland landscaping in <u>Somerset's Steart</u> Marshes – working with nature to tackle climate change – to the <u>Great North</u> Bog project, which is conserving peatland across nearly 7,000 square kilometres in northern England, we are truly embracing the power of nature and the benefits we feel when we work with it, not against it.

A recurring theme throughout this learning report, and across the entire portfolio of projects, is collaboration. Collaboration is essential for effective catchment and community-centric innovation as it brings together the diverse perspectives, knowledge and resources we need to address the complex environmental and social challenges facing the water sector. By better codesigning and co-creating solutions we can ensure they are not only technically fit for purpose but also inclusive, sustainable and capable of adapting to evolving sector challenges, not least the impacts of an increasingly hostile climate.

AMP8 is a critical opportunity to accelerate change, embed innovation at every stage of the water cycle and ensure that water security, environmental improvement and customer benefit go hand in hand. Ofwat will continue to champion collaboration and investment in long-term, nature-based solutions and transformative innovation to ensure the sector as a whole takes the actions urgently needed now, for future generations.

This learning report offers a source-to-sea perspective, highlighting a range of projects funded by the Ofwat Innovation Fund. These take "nature-first" approaches: community-centric and disruptive innovation within our upstream river catchments and downstream urban catchments. The breadth of actions, as well as the diverse solutions being trialled, highlight the ambition of the sector to improve outcomes and better navigate the interconnectedness of water systems, as well as the need to think differently and leverage innovation in all forms across the water cycle.

*WINEP (Water Industry National Environment Programme (England)) and NEP (National Environment Programme (Wales)) are statutory programmes developed by the Environment Agency and Natural Resources Wales. They outline the environmental improvement actions that water companies must undertake during each AMP cycle to meet environmental objectives, such as improving water quality, reducing pollution and enhancing biodiversity.

	COMPETITION	LEAD WATER COMPANY	ESTIMATED COMPLETION DATE	FUNDING AWARDED	PARTNERS
CatchmentLIFE	Innovation in Water Challenge	south east water	September 2025	£177,793	Bristol Water, Earthwatch Europe, Environment Agency, Loughborough University, Natural Resources Wales, SES Water, The River Restoration Centre, University of Huddersfield, Wessex Water Services
Seagrass Seeds of Recovery	Innovation in Water Challenge	AffinityWater	Complete	£249,791	Anglian Water Services, Cefas (Centre for Environment, Fisheries and Aquaculture Science), Department of Zoology and Wadham College, University of Oxford, Environment Agency, Natural England, Project Seagrass, Salix River & Wetland Services Limited, Swansea University, University of Essex
CaSTCo – Catchment Systems Thinking Cooperative	Water Breakthrough Challenge 1	Water for the North West	September 2025	£6,395,499	Affinity Water, Anglian Water, Agreena, Cardiff University, Defra, Dŵr Cymru Welsh Water, Earthwatch Institute, Environment Agency, Herts and Middlesex Wildlife Trust, Lune Rivers Trust, Mersey Rivers Trust, Natural Course EU Life Integrated Project, Natural England, Natural Resources Wales, Norfolk Rivers Trust, Northumbrian Water, Ribble Rivers Trust, River Lark Catchment Partnership, Severn Rivers Trust, Severn Trent Water, South East Water, Southern Water, South West Water, Thames Water Utilities, Thames21, The Freshwater Biological Association, The River Restoration Centre, The Rivers Trust, The Zoological Society of London, UK Centre for Ecology and Hydrology, University of Exeter, Wessex Water, Westcountry Rivers Trust, Western Sussex Rivers Trust, Wye & Usk Foundation, Yorkshire Water
Towards incentivisation for community-centric rainwater management	Water Breakthrough Challenge 2	Thames	Complete	£225,000	Anglian Water, Indepen Limited, Isle Utilities Limited, Our Rainwater Limited, South West Water, Wessex Water
Water Net Gain	Water Breakthrough Challenge 3	South West Water	May 2027	£999,800	Anglian Water, Duchy College, Environment Agency, Saputo Dairy UK, Severn Trent Water, The Rivers Trust, United Utilities, Westcountry Rivers Trust
Mainstreaming nature-based solutions to deliver greater value	Water Breakthrough Challenge 3	United Utilities Water for the North West	September 2028	£8,028,022	Affinity Water, Anglian Water, Arup, Dŵr Cymru Welsh Water, Jacobs UK, Mott MacDonald, North Star Transition, Northern Ireland Water, Northumbrian Water, Ribble Rivers Trust, RSK Group (ADAS, Salix, WRc), SES Water, Severn Trent, South East Rivers Trust, South West Water, Southern Water, The Nature Conservancy, The Rivers Trust, United Utilities, Water Resources South East, Westcountry Rivers Trust, Wildfowl and Wetland Trust
Developing a market-based approach to deliver SuDS through street works	Water Breakthrough Challenge 4	Thames	April 2026	£1,340,610	Affinity Water, Anglian Water Cadent Gas, Environment Agency, Greater London Authority, Greater Manchester Combined Authority, Liverpool City Region Combined Authority, London Boroughs of Camden, Enfield, Hammersmith & Fulham and Lambeth, Northumbrian Water, Scottish and Southern Electricity, Southern Gas Networks, Transport for London, Uisce Éireann, UK Power Networks
SuDS iQ: A National SuDS Collaboration & Evaluation Platform	Water Breakthrough Challenge 4	Southern Water.	August 2026	£959,243	Anglian Water, Brighton & Hove Council, Dŵr Cymru Welsh Water, East Riding of Yorkshire Council, HR Wallingford, Hull City Council, Thames Water, Yorkshire Water

Introduction

Whole catchment innovation in the UK water sector: a source-to-sea perspective

Water is one of the most critical resources for human life and ecology, yet traditional approaches to its management are increasingly proving inadequate in the face of the polycrises we currently face - from climate change, rapid population growth and urbanisation to resource depletion, fossil fuel dependency and large-scale habitat and biodiversity loss. If the water sector is to play its part in addressing these challenges, it must embrace systemic innovation and different approaches that integrate **blue**, grey and green infrastructure. It must also leverage new approaches that harness nature, empower communities and embrace emerging technologies.

A key aspect of the systemic innovation in the water sector is integrating different types of water-related infrastructure, along with joined-up thinking across our catchments.

- **Blue infrastructure** includes natural and artificial water bodies such as rivers, lakes, wetlands and reservoirs. These play a vital role in water retention, flood mitigation and biodiversity conservation.
- **Grey infrastructure** refers to traditional engineered solutions such as dams, treatment plants, pipelines and sewer systems. Essential to the management of our water systems, they are increasingly

under the microscope as they face modernisation challenges and the need to be better integrated with nature-based solutions to enhance sustainability.

 Green infrastructure comprises naturefirst or nature-based solutions such as wetlands, permeable surfaces, rain gardens and other projects that leverage nature and natural resources to supplement more traditional approaches. These mimic natural processes to improve water quality, support biodiversity and enhance resilience to the extreme weather events we are increasingly experiencing.

The project learnings in this report show that catchment-related innovations (whether upstream and/or downstream) are not confined to individual jurisdictions or approaches. They represent interventions across the entire natural and built environment. By leveraging the power of people, these projects have succeeded in breaking down silos and integrating multiple perspectives to build more adaptive and inclusive approaches to managing water. Systemic approaches to innovation in the water sector are not just opportunities, they are a necessity. By integrating blue, grey and green infrastructure, leveraging nature-based solutions (NbS) and community engagement, and harnessing emerging technologies, the sector can navigate current and future challenges while ensuring the long-term health of water systems and the ecosystems and societies that depend on them. The future of water management lies in adaptive, interconnected and holistic solutions that recognise water as a shared resource essential for all life on Earth.

Building our knowledge

These project-specific learnings and insights aim to inform innovative practices and approaches as well as catalyse new relationships to create impact across the UK water sector – for the benefit of customers, the environment and society.

The Ofwat Innovation Fund delivery team worked alongside partners that had received funding and completed their projects, or were part of projects still in flight. Using the responses collected from a learning support survey, as well as other sources of information, the team surfaced insights and learnings that are applicable to others, whether they are delivering projects in similar fields, or looking to apply to future rounds of the Ofwat Innovation Fund.

Knowledge exchange remains a barrier to scaling innovation in the water sector and this has been recognised across a wide range of stakeholders, from water companies and supply chain entities to regulators and policymakers. These reports are part of a suite of measures the Ofwat Innovation Fund is taking, alongside other sector bodies, to catalyse the implementation of the knowledge, outputs and tools generated across all the funded projects. In this way, through collaborative innovation, we are increasing the capacity and capability of the sector to solve the challenges it faces.



CatchmentLIFE

COMPETITION	LEAD WATER COMPANY	ESTIMATED COMPLETION DATE	FUNDING AWARDED	PARTNERS
Innovation in 🗞 Water Challenge	south east water	September 2025	£177,793	Bristol Water, Earthwatch Europe, Environment Agency, Loughborough University, Natural Resources Wales, SES Water, The River Restoration Centre, University of Huddersfield, Wessex Water Services

The CatchmentLIFE project is developing userfriendly software to model and visualise the impacts of habitat degradation on wildlife and ecological communities in UK rivers. The software will allow experts and citizen scientists to assess the effects of various pressures, including engineering, abstraction, land use changes and climate change, on species and ecosystems. The software will also provide access to existing monitoring data on water quality, habitats and species, alongside models designed by experts. This will all help to produce a diagnostic of local river health and deliver action plans for restoring damaged environments. The interface will be user friendly with graphs and charts to promote better decision-making based on sound science. This approach supports greater understanding of local environmental challenges and promotes community engagement in conservation efforts. CatchmentLIFE aims to foster collaboration between different sectors and the public, ultimately driving mutually beneficial outcomes for water industry customers and their communities.

66 CatchmentLIFE is the result of years of dedicated research. It will help practitioners and the public better understand their local river ecology, giving them the tools to take meaningful remedial action. **99**

Dr Marc Naura, Science and Technical Manager, River Restoration Centre





- Open-source river network: the project is developing the first open-source and fully connected digital river network for Great Britain in collaboration with Geodata Institute and Ordnance Survey. The river network data was cleaned and corrected, and each river was split into sections (or reaches) that have constant habitat conditions. The network and river reaches will be used as part of CatchmentLIFE to summarise water quality, species and habitat data, assess pressures and impacts on the environment, and identify restoration actions.
- Model development: conceptual models were created for 17 groups of invertebrate and 23 fish species across different life stages, which will help with statistical modelling of pressure and impact relationships.
- Data collation: extensive information on fish, invertebrates, habitat quality, water quality and water resources is being gathered. This will further aid the creation of statistical models to better understand the environmental challenges ecosystems and communities are facing.

- Prototype interface: a prototype has been presented to practitioners and received feedback at River Restoration Centre conferences, which has helped refine the tool in preparation for the trial phase in 2025.
- Integrated approach: the project demonstrates the importance of combining hydromorphological, ecological and water quality data in catchment-scale assessments. By doing so the project can provide a more comprehensive understanding of river health and enhance decision-making for sustainable water management.
- Importance of data: to assess the impact of water companies' activities on freshwater environments, abstraction and discharge data needs to be readily accessible, as well as measured and modelled impacts on groundwater and flow. This enables models that highlight the relative impacts of engineering, water quality and land use on habitats and species.



Benefits

- Decision support tool: the final tool will help identify how environmental pressures and impacts – such as water abstraction, discharges, land use and engineering activities – are impacting ecological communities and species. Providing a clearer picture of these influences will enhance environmental management, enabling more targeted and effective conservation efforts.
- Standardisation of data: this project will standardise environmental data, making it more accessible to researchers, conservationists and decisionmakers. The improved data consistency will facilitate better trend analysis and evidence-based decision-making.
- ► Use of partnerships: collaboration has facilitated data collation, expert input and licensing agreements, which will support further development and dissemination.

Challenges and gaps

- ► Species-habitat relationships: there is a limited understanding of specieshabitat relationships, particularly for aquatic plants and algae, with few reference condition models available for hydromorphological influences. Improving on this would result in better understanding of species and habitat relationships, helping to shape the overall picture of an ecosystem.
- Water data: the lack of a centralised, open-access dataset for water abstraction, discharges and their ecological impacts presents a major barrier to more refined modelling. This also contributed to delays in the project and made coordination a key challenge.
- Future efforts: the project highlights the need for improved coordination among water companies to develop an openly accessible national dataset on river restoration. By also supporting applied innovative research projects, academic institutions can become more actively involved, fostering greater collaboration and more effective collation of currently dispersed datasets.



Deliverables, tools and resources: see updates on this project on the **CatchmentLIFE** webpage and the **Fund website**

Find out more: contact rrc@therrc.co.uk

Seagrass Seeds of Recovery

COMPETITION	LEAD WATER COMPANY	ESTIMATED COMPLETION DATE	FUNDING AWARDED	PARTNERS
Innovation in Water Challenge	AffinityWater	Complete	£249,791	Anglian Water Services, Centre for Environment, Fisheries and Aquaculture Science, Department of Zoology and Wadham College, University of Oxford, Environment Agency, Natural England, Project Seagrass, Salix River & Wetland Services Limited, Swansea University, University of Essex

The Seagrass Seeds of Recovery project focused on developing knowledge and capacity for restoring seagrass meadows across the UK to enhance biodiversity, improve water quality and strengthen coastal resilience. By investigating pathways to capture the value of seagrass's ability to sequester carbon, the project also feeds into blue carbon debates and provides a platform for developing frameworks to integrate seagrass into climate change mitigation strategies. A key objective was to collate the available data required to establish a blue carbon framework and finance mechanism, and identify remaining data gaps to be addressed to facilitate the use of carbon credits for seagrass restoration. This approach represents a potential future funding avenue for restoration efforts and will create investment opportunities in nature-based solutions for the water industry and other sectors.

44 There remain significant bottlenecks to restoring seagrass at scale. This project supported vital work towards addressing some of the significant challenges around seed and plant supply, consolidating carbon data gaps, and advancing restoration expertise in the UK. Collaboration between multiple and varied stakeholders is critical to seagrass and broader marine recovery and this project represented an exemplar of what can be achieved through equitable partnership working. **99**

Dr Leanne Cullen-Unsworth, CEO, Project Seagrass





- ► Seagrass nursery: the project created a fully working seagrass nursery at an inland site in Wales, which will continue to facilitate habitat restoration. The nursery currently has a seed storage facility able to hold 1.3 million seeds as well as 6,005 mature seagrass plants and is the first site in the UK to be growing Zostera noltii (dwarf eelgrass). It is working towards implementing new policy frameworks that could further accelerate investments in seagrass restoration.
- Blue carbon code report: as part of the project, the University of Oxford conducted a literature review to understand how to implement a seagrass blue carbon code. This was shaped into a full report and acts as a roadmap to implementation.
- Seagrass transplantation: extensive mapping along the Essex coastline provided a clear overview of the spatial extent of Zostera noltii, which informed the decision to trial transplantation of the seagrass at selected sites. Project Seagrass joined the Zoological Society of London (ZSL) and the Fieldwork Company to learn how to conduct Zostera noltii transplantation. An international collaboration was established to replicate the planting design across four different sites: Essex and Suffolk (Project Seagrass), the Medway (ZSL) and the Netherlands (the Fieldwork Company). Since these trials, the method is now used by numerous restoration projects across the UK.
- Collaboration: learning from domestic carbon codes for other habitat types and global seagrass codes has enabled a more informed and efficient path to developing and publishing a UK seagrass carbon code.



Benefits

- Ecological benefits: seagrass restoration offers benefits such as providing nursery grounds for marine life, which enhances local biodiversity. Coastal resilience is also improved, leading to strengthened sediments and overall reduced erosion. Excess carbon can also be stored in the seabed, providing another valuable benefit to the environment and humans.
- Seagrass carbon code: developing a seagrass carbon code will help to safeguard the environment and communities while also working to use the most relevant information and carbon accounting principles.

Challenges and gaps

- ► Blue carbon finance framework: the absence of an established financial framework supporting investment in the conservation of coastal ecosystems has created a barrier to issuing carbon credits.
- Data shortage: data gaps on seagrass coverage and surrounding ecosystems affect targeted restoration. There is a need to fill these gaps, particularly around seagrass spatial extent and condition, along with data on net carbon sequestration, and methane and N2O emissions over time.
- Collaboration: cross-sector collaboration is needed, as policies and funding must align to be most effective. Potential conflicts of interest may arise due to stakeholders' differing opinions on the conflicting uses of a seagrass restoration site. Therefore, close collaboration with local communities is essential.
- Policy alignment and change: regulatory and governance barriers also exist, which emphasises the importance of aligning the carbon code with existing structures. It is also necessary to address the barriers that hinder the creation of an environment that enables seagrass restoration and protection.



Deliverables, tools and resources: the project's outputs have been shared in Developing a UK Seagrass Carbon Code (June 2023)

Find out more: contact info@projectseagrass.org or see updates on this project on the Fund website

Catchment Systems Thinking Cooperative (CaSTCo)

COMPETITION	LEAD WATER COMPANY	ESTIMATED COMPLETION DATE	FUNDING AWARDED	PARTNERS
Water Breakthrough Challenge 1	United Utilities Water for the North West	November 2025	£6,395,499	Affinity Water, Anglian Water, Agreena, Cardiff University, Defra, Dŵr Cymru Welsh Water, Earthwatch Institute, Environment Agency, Herts and Middlesex Wildlife Trust, Lune Rivers Trust, Mersey Rivers Trust, Natural Course EU Life Integrated Project, Natural England, Natural Resources Wales, Norfolk Rivers Trust, Northumbrian Water, Ribble Rivers Trust, River Lark Catchment Partnership, Severn Rivers Trust, Severn Trent Water, South East Water, Southern Water, South West Water, Thames Water Utilities, Thames21, The Freshwater Biological Association, The River Restoration Centre, The Rivers Trust, The Zoological Society of London, UK Centre for Ecology and Hydrology, University of Exeter, Wessex Water, Westcountry Rivers Trust, Western Sussex Rivers Trust, Wye & Usk Foundation, Yorkshire Water

The Catchment Systems Thinking Cooperative (CaSTCo), led by United Utilities and The Rivers Trust, is a collaborative initiative aiming to revolutionise how data about England and Wales' water environment is gathered and shared, with a focus on river health. CaSTCo is developing a national framework for standardised environmental monitoring methods, including citizen science and real-time monitoring. The project supports local evidence gathering and community engagement across eight demonstration catchments. By creating consistent monitoring approaches and optimising data quality, CaSTCo seeks to enable better decision-making and improved outcomes for water and people. The project also aims to connect communities with nature, transform understanding of freshwater pressures and contribute to healthier rivers and more resilient catchments.

66 Every day, we're making critical water management decisions with limited data – but that's changing. The Catchment Systems Thinking Cooperative (CaSTCo) is revolutionising how we gather river health data by combining expert insights with citizen science. Our demonstrator areas are proving that collaboration leads to robust, transparent and trusted data – driving smarter, more effective decisions. There's still work to do, but CaSTCo and its partners are showing that when we join forces and act on solid evidence, we create real, lasting improvements for our rivers and the communities that depend on them.



- Citizen science impact: this project is highlighting the significance of citizen science in monitoring and enhancing water management strategies. By involving volunteers, water sector stakeholders and environmental organisations, the initiative is showcasing how collaboration strengthens data collection and decision-making. Through cooperative efforts and data sharing, the project fosters transparency and is addressing data gaps and identifying supplementary data that could be valuable for integration. As a result, it is providing a more comprehensive understanding of river health, catchment conditions and prioritisation needs.
- Data integration: the project has developed publicly accessible data platforms to integrate citizen science data with professional/statutory datasets. This is enabling the broader use of collected information, supporting long-term water quality assessments and environmental planning.
- Policy influence: key discussions have emerged around the need for more collaborative monitoring of headwaters (river sources), showcasing the project's potential to shape regulatory frameworks. CaSTCo is also working with sector-wide stakeholders to help shape and inform future catchment monitoring policy, seeding its insights into the Cunliffe Review.
- Stronger partnerships: fostering collaboration and demonstrating mutual value between regulatory bodies, water companies and citizen scientists will be key to maintaining momentum and scaling up the impact of citizen-led environmental monitoring initiatives.





Benefits

- Standardised framework: September 2025 will see the publication of a structured framework for citizen science efforts, integrating volunteer data with professional and regulatory datasets. This will result in improved monitoring coverage across multiple catchments, filling critical data gaps.
- Community engagement: engagement with local communities has fostered stewardship, raising awareness of freshwater conservation issues. By involving residents in monitoring and restoration efforts, the project empowers communities to take an active role in protecting their local water environments.
- Awareness and data governance: the project will raise awareness of the existing landscape and key stakeholders, while fostering cross-sector engagement. This will ensure that corporate water stewardship aligns with broader catchment management goals.
- Upskilling farmers on soil health: the Western Sussex Rivers Trust codesigned a citizen science soil health toolkit with local farmers for biannual soil monitoring. A soil health method audit was also created to assess the cost, accuracy and usability of different in-field, citizen science soil tests, with guidance available on the CaSTCo website.

Deliverables, tools and resources: see updates on this project on the **Fund website**

Find out more: contact the project through the CaSTCo website

Challenges and gaps

- ► Data accessibility: limited access to certain datasets, as well as restrictions around data licensing and sharing, have hindered national integration of data and the creation of comprehensive environmental assessments.
- ► Volunteer recruitment and retention: maintaining momentum and recruiting long-term volunteers has been a challenge, particularly in retaining those who genuinely value citizen science beyond personal interests or motivations. To create a more cohesive and sustainable approach, dedicated volunteer coordinators are needed, along with a standardised citizen science framework that ensures consistency.
- Methodology refinement: further investment is needed to refine monitoring methodologies for consistency and accuracy to ensure reliable data collection. Standardised protocols, data infrastructure and quality controls will enhance comparability across different regions and projects, improving the quality of environmental assessments.



Towards incentivisation for community-centric rainwater management

COMPETITION	LEAD WATER COMPANY	ESTIMATED COMPLETION DATE	FUNDING AWARDED	PARTNERS
Water Breakthrough Challenge 2	Thames Water	Complete	£225,000	Anglian Water, Indepen Limited, Isle Utilities Limited, Our Rainwater Limited, South West Water, Wessex Water

The Community-Centric Rainwater Management project, led by Thames Water, encouraged communities to adopt rainwater capture methods and reduce the strain on sewer networks during heavy rainfall, thereby mitigating surface water flooding and sewage discharges. The project used a combination of digital and in-person engagement strategies to incentivise local communities. An online platform offered free water butts, while community events and social media campaigns raised awareness about the benefits of rainwater capture. By empowering residents to manage local water resources, the project promoted a more sustainable urban water management system.

66 By empowering communities to capture rainwater at its source, we're directly reducing the burden on our sewers. This collaborative project, leveraging digital tools and local engagement, has demonstrated how flooding and pollution risks can be reduced. It's a testament to how collective action can create a more resilient and sustainable water system. ??

Rachel Cunningham, R&D Manager-Networks, Thames Water





- ► Community engagement: digital tools alone proved to be insufficient: a mix of online engagement, community events and targeted communication was necessary for sustained participation. While community engagement was a focus, the project learned that different methods have varying effectiveness. More detailed upfront research into specific community characteristics and then tailoring engagement strategies accordingly could have improved participation rates. That said, in certain locations the project saw a 66% conversion rate from initial engagement to water butt installation. The project provided a range of devices, highlighting the value of being inclusive and accommodating residents' diverse needs.
- Tangible benefits: demonstrating reduced sewer overflows and potable water savings was crucial to gaining support from customers, policymakers and industry stakeholders.
- Flexibility in implementation: different property characteristics required adaptive solutions to ensure broad adoption and effectiveness. By coordinating deliveries, managing stock control and addressing postinstallation issues proactively, bespoke needs were effectively planned for and handled to ensure an efficient process.

Benefits

► Power of the people: communities can significantly impact surface water, which further helps to offset stormwater overflows. Widespread adoption could have enough impact to slow the flow across a neighbourhood. One key finding of the project was that strong community involvement is essential for the successful adoption of rainwater harvesting solutions. Working closely with local champions and existing community groups proved to be highly effective in increasing participation, as people were more inclined to install rain planters when they saw their neighbours doing the same.

The project demonstrated that social norms play a critical role in influencing behaviour, reinforcing the idea that engagement should be approached at the community level rather than targeting individuals in isolation. With 127 water butts installed, 500+ households engaged, and three diverse pilot locations tested, the project has promoted sustainable water use and fostered community awareness.

- ► Development of a digital platform: the Our Rainwater platform was developed to enable customers to analyse rainfall, track data and receive incentives, empowering them to make informed decisions about water conservation and engage more actively in sustainable practices.
- Scalable framework: the project has developed a framework for future participation by testing incentives and implementation across three pilot locations: a flood-affected community, inner-city residents and a market town. Each had different aggregators, allowing analysis of varied approaches and incentives to optimise engagement.
- ► Industry adoption: the Our Rainwater platform's success led to broader industry adoption, signalling a potential for sector-wide transformation. Southern Water has now adopted the platform within its operations.

Challenges and gaps

- ► Limited scale: the project faced challenges due to its limited scale, which hindered its ability to measure the long-term impact and move beyond early adopters, with a reduced monitoring period further limiting measurements. To address this, future projects should consider extending the monitoring period to fully capture the long-term effects of the implemented solutions. Extending the monitoring period would allow for a more comprehensive evaluation of the project's impact over time, capturing crucial data points such as the longevity of implemented rainwater management solutions and any changes in community behaviour and engagement with rainwater management practices.
- Resources: the project's funding did not fully encompass the initial scope, which included both operational and behavioural science components. As a result, the project prioritised delivering a meaningful outcome on the operational side, primarily focusing on the installation of rainwater harvesting devices.
- Regulatory and data barriers: variability in local permitting requirements and data-sharing restrictions slowed the rollout and created logistical challenges. Future initiatives would benefit from a comprehensive regulatory mapping exercise at the beginning of the project to allow for a more nuanced understanding of regulatory and data-related barriers. This would enable proactive adjustments that mitigate the impact of these barriers.



- Installation logistics: scheduling, site-specific issues (such as shared downpipes and parking constraints) and communication gaps between customers and contractors created inefficiencies. To address the challenges in the installation process, the project could have invested more time in planning and piloting the end-to-end process of customer sign-up, scheduling and contractor communication.
- ► Partnership and stakeholder challenges: sharing customers' personal data between project partners and contractors presented a significant barrier early in the project. This was mitigated by consulting with Thames Water's in-house data protection team. The project also highlighted the need for streamlined contracting processes to enable future partnerships with SMEs as well as the importance of engaging with diverse communities and tailoring approaches to their specific needs and concerns.

Deliverables, tools and resources: the project has developed a Blueprint for Community Rainwater Management which can be used by water companies, local authorities and other organisations to design and implement their own rainwater management programmes. The Our Rainwater digital platform can be adopted by other water companies to enhance customer engagement, promote rainwater harvesting and track the performance of rainwater management initiatives. See updates on this project on the Fund website.

Find out more: contact the project at **innovation.PMO@ thameswater.co.uk** and see updates on the **Thames Water website**

Water Net Gain

COMPETITION	LEAD WATER COMPANY	ESTIMATED COMPLETION DATE	FUNDING AWARDED	PARTNERS
Water Breakthrough Challenge 3	South West Water	May 2027	£999,800	Anglian Water, Duchy College, Environment Agency, Saputo Dairy UK, Severn Trent Water, South West Water, The Rivers Trust, United Utilities, Westcountry Rivers Trust

The Water Net Gain project is led by South West Water and aims to develop a scheme for creating a distributed network of water storage on farmland. It is focusing on the southwest of England but is looking to provide a scheme that can be implemented nationally. By compensating farmers to store water in intelligent/smart ponds (a network of automated ponds able to respond to weather forecast alerts by either releasing or storing water) and lakes, the project addresses water scarcity, improves water quality and enhances ecosystem resilience.

Water Net Gain is developing a trading mechanism for farmers to sell stored water to buyers such as water companies, while also exploring legal, tax and regulatory aspects. In 2025 the project team is designing smart pond systems with monitoring technology and plans to conduct a Willingness to Accept study with farmers to determine how much compensation is needed to adopt sustainable practices. This will help design a fair and effective incentive structure.

66 Water Net Gain comes at a pivotal point for South West Water as climate change forecasts predict even more challenges for managing water. By making the most of the rain we receive we can ensure enough water for our communities and for the habitats and wildlife in our rivers. **99**

Carolyn Cadman, Director of Net Zero and Natural Resources, South West Water





- Stakeholder engagement: while the concept is simple, the execution is complex due to various barriers. Engaging stakeholders, including farmers – where trust needs to be established with government bodies – water companies and regulators, has proven essential for understanding the feasibility and value of the scheme. Farmers need a clear, compelling case, where the benefits outweigh the risks, offering profitable diversification with minimal investment or bureaucracy. Trusted intermediaries such as the Rivers Trust should be given a role to support farmers achieve these goals within a well-structured regulatory and financial framework.
- Pond progress: while technical and legal guidance on pond creation has been developed, more accessible decision-support tools and monitoring solutions are needed for effective implementation. Ponds provide significant biodiversity benefits, but further work is needed to fully quantify their value. By enhancing water storage in catchments, ponds can improve water retention and help replenish water courses depleted by drought, making them a crucial component of sustainable water management.
- Complex environment: given the diversity of landscapes, farms and climates, many influencing factors lie beyond the project's control. Market dynamics, costs and policy implications at local and national government levels, as well as decisions from agencies, public bodies and key industry players (such as utilities, developers and financial institutions), add complexity. The project has helped provide some clarity for beneficiaries and stakeholders to better understand the opportunities and challenges.



Benefits

- Sustainable water use: the project aims to demonstrate the potential of storing water within catchments by implementing intelligent pond networks. These networks will improve water retention during winter, allowing farmers to use water more sustainably while monitoring their impact on biodiversity. Water companies also benefit because there will be more water available in times of drought, which will directly benefit customers, too.
- Moving forward on multiple fronts: this initiative benefits multiple stakeholders by increasing water security, buffering river low flows and promoting nature-based solutions. Farmers gain more control over water resources, reducing dependency on external supplies, while water companies benefit from an additional water source during droughts.



Challenges and gaps

- Starting small: developing a standardised national framework for such a localised intervention is complex. Suggestions from the project include focusing on one region first before rolling out the scheme in other regions. However, having the national outlook and regional collaboration is still extremely useful. The project is working on making the scheme as standardised as possible while leaving room for local adaptation.
- Policy gaps: the lack of an open-access national dataset for water trading and uncertainty about how ponds can be integrated into broader water management policies have proved to be a challenge for this project.
 However, working with regional water resource groups and the Environment Agency has enabled the project to keep up to date with policy changes and challenges, as well as having a platform to work with stakeholders directly involved with policymaking and the implementation of these policies.
- Phased approach: the project would benefit from additional time and funding to design large-scale demonstrators, refine governance structures and leverage international insights from a successful Europe Horizon project (working with 22 partners across the EU to deliver a Smart Water Grid).

Deliverables, tools and resources: see updates on this project on the **Water Net Gain website** and the **Fund website**

Find out more: contact the project via the **Water Net Gain website**

Mainstreaming nature-based solutions to deliver greater value (MNbS)

COMPETITION	LEAD WATER COMPANY	ESTIMATED COMPLETION DATE	FUNDING AWARDED	PARTNERS
Water Breakthrough Challenge 3	United Utilities Water for the North West	September 2028	£8,028,022	Affinity Water, Anglian Water, Arup, Dŵr Cymru Welsh Water, Jacobs UK, Mott MacDonald, North Star Transition, Northern Ireland Water, Northumbrian Water, Ribble Rivers Trust, RSK Group (ADAS, Salix, WRc), SES Water, Severn Trent, South East Rivers Trust, South West Water, Southern Water, The Nature Conservancy, The Rivers Trust, United Utilities, Water Resources South East, Westcountry Rivers Trust, Wildfowl and Wetland Trust

This programme is a collaborative initiative integrating nature-based solutions into standard water management practices by breaking down the barriers to adoption. This effort focuses on addressing flooding, drought and water quality issues at a landscape scale by leveraging multisectoral expertise. Having completed its initial scoping and review stage in September 2024, the MNbS programme is now identifying barriers and enablers to NbS and preparing to test recommendations in Phase 2, starting in October 2025. The programme emphasises using data and evidence to underpin its activities, testing regulatory and technical enablers, and promoting the broader benefits of NbS, making them the first choice. By doing so, it aims to deliver better value for money for customers, while also providing broader societal benefits such as a more resilient and high-quality environment and biodiversity.

44 Just over one year in, the Mainstreaming NbS project is already delivering key insights that should help the industry to scale up delivery of nature-based solutions. Additionally, the collaborative relationships built through the project have enabled a rapid review of the scale of NbS funded at PR24, and collation of evidence to feed into other activities, such as the Cunliffe Review. **99** Sarah Jenner, Head of Catchment Planning, Conservation and Partnerships, United Utilities





- Regulatory engagement: ongoing engagement with regulators through the programme is proving both insightful and impactful. For example, the programme's review of the <u>PR (Price Review) 24</u> draft determination contributed towards an increase in sectorwide funding for NbS from £2.2 billion at draft to £3.3 billion at final determination.
- Stakeholder engagement: collaboration across multiple sectors, including water companies, regulators, environmental groups and landowners, has aided alignment of goals and effective communication.
- ► **Regional tests**: tests are ramping up as Phase 2 of the programme starts later in 2025 and

will serve as a foundation to build the evidence base for key enablers that support the adoption of NbS. Ongoing efforts are focused on establishing clear and effective plans, with these projects playing a crucial role in testing concepts and refining strategies for largescale implementation.

Benefits

- Implementation and upscaling the delivery of NbS: by ensuring that the multiple benefits of NbS are properly evaluated, an increase in scale of delivery is expected, enhancing overall environmental resilience and quality. Customers will have more access to nature and biodiversity as well as healthier and more resilient catchments.
- Creating an investable pipeline of NbS projects: scaling up NbS is essential for climate resilience, nature recovery and securing the ecosystem services that support society. The project aims to help enable the widespread adoption of NbS

solutions. The Funding and Finance Workstream of this project is looking at integrating NbS into financial models, ensuring long-term funding mechanisms.

- Shifting the balance between grey and green infrastructure: the Policy and Regulation Workstream is working to influence policy and align regulations to enable NbS adoption at scale, providing clear evidence to policymakers and regulators on its benefits.
- Cross-sector collaboration: the project has convened large groups of stakeholders who

would not otherwise have collaborated, enabling a wider conversation across the sector. These include water companies, regulators, ENGOs and land managers all working together to effectively address water security and environmental pressures at their source and coordinating efforts across different sectors. The project is further highlighting the power of bringing together different sectors to solve problems holistically and deliver the best value in the catchment. Greater collaboration between the water companies and water regulators is key to facilitating greater innovation.

Challenges and gaps

- Regional differences: MNbS involves navigating a wide range of regionally varied challenges. Prioritising key recommendations and aligning demonstrators nationally while considering local barriers is crucial. A balance between standardised approaches and flexible, tailored solutions is needed.
- Model refinement: future efforts should focus on refining risk-sharing models in many areas, including planning, delivery and regulation, securing longterm funding, and strengthening cross-sectoral partnerships to sustain momentum. Establishing clearer success metrics, enhancing knowledgesharing mechanisms and further refining decision-making tools will be crucial to ensuring that NbS are fully embedded into water management practices, and become business as usual.
- Stakeholder challenges: challenges have emerged around different timescales and organisational/sectoral language barriers, due to the variety of different stakeholders. Establishing how programme governance and coordination function in practice, rather than just in theory, has also been complex. Additionally, keeping track of interlinked parallel initiatives, both within the sector and across other industries, including international efforts, has been challenging. To mitigate these challenges, early alignment is crucial to define clear roles, expectations and a shared understanding from the outset.
- Long-term funding: budget constraints have created uncertainty around long-term funding for NbS, making it difficult to secure sustained investment. The five-year regulatory funding cycles do not always align with the long-term timescales needed for NbS to deliver their full benefits. Failing to secure cross-sector collaboration early on can also lead to siloed decision making and delays in implementation. Additionally, it is a challenge to advance NbS projects that fall outside of regulatory requirements, as many stakeholders prioritise mandatory commitments.



Deliverables, tools and resources: see updates on this project on the **Fund website**

Find out more: access project deliverables and contact the project through the **Mainstreaming Nature-based Solutions website**

Breakthrough 4 projects

The following projects were funded in the Water Breakthrough Challenge round four (WB4). Entrants were notified of their award in late spring 2024 and, as a result, have not long been operational at the time of this report being published.

For this reason, the insights they have been able to share are naturally limited to those one would expect with project mobilisation – contractual agreements, project management, partnership and collaboration aspects.

Developing a market-based approach to deliver SuDS through street works

COMPETITION	LEAD WATER COMPANY	ESTIMATED COMPLETION DATE	FUNDING AWARDED	PARTNERS
Water Breakthrough Challenge 4	Thames	April 2026	£1,340,610	Affinity Water, Anglian Water, Cadent Gas, Environment Agency, Greater London Authority, Greater Manchester Combined Authority, Liverpool City Region Combined Authority, London Boroughs of Camden, Enfield, Hammersmith & Fulham and Lambeth, Northumbrian Water, Scottish and Southern Electricity, Southern Gas Networks, Transport for London, Uisce Éireann, UK Power Networks

This scheme aims to create a structured mechanism for integrating Sustainable Drainage Systems (SuDS) into routine streetworks, using utility reinstatements as an opportunity for green infrastructure. The project is developing and testing a market-based system where utilities and highways authorities can be incentivised to include SuDS in their planned works. One of the biggest barriers to SuDS implementation is the cost of excavation and permissions. Since utility companies are already digging, this project seeks to incentivise them to reinstate excavated sites with permeable surfaces and materials, creating SuDS at a lower cost and on a much larger scale. With London facing increasing flood risk due to heavy rainfall and overloaded drainage networks, this initiative aims to incentivise utility companies to incorporate SuDS, such as rain gardens, into the 160,000 planned street works that happen every year. These measures will reduce pressure on drainage systems, mitigate flooding and contribute to greener, more resilient neighbourhoods. The project has made significant progress towards achieving its aims and objectives. It is structured around six key workstreams, covering data, piloting, technical deep dives, market operator development, testing and training. Notable milestones include the completion of the data mapping, processing and analysis needed to identify delivery opportunities for SuDS and street works through the bidding area and eligible area process. Additionally, the requirements for a data platform to host stakeholder data have been identified, with the first version successfully built and tested. 66 We already work with the GLA and other utility companies to deliver shared streetworks projects to reduce disruption to Londoners. This project will take it to the next level, using the opportunities created by street works to deliver green flood risk solutions that will benefit customers, society and the environment. ??

Nevil Muncaster, Engineering and Asset Director, Thames Water



- Effective stakeholder engagement: given the complexity of the subject matter, well-designed engagement has been essential to ensuring stakeholders remain involved and engaged throughout the journey. This was achieved by bringing the concept to life through hands-on simulations or role-playing rather than relying solely on presentations and reports.
- Multi-stakeholder buy-in is crucial for success: the success of this model relies on collaboration between utilities, local authorities and funders. Early engagement with stakeholders has helped clarify roles and responsibilities, preventing misalignment down the line. Improving coordination among stakeholders through an independent market operator model could further facilitate the systematic and strategic implementation of SuDS.

Benefits

- ► Integrating green infrastructure into preplanned works: three real-world pilot projects will demonstrate how SuDS can be integrated into existing streetworks programmes, building on the 'dig once' approach. By doing so the project seeks to minimise disruption, allowing for efficient use of resources and reducing the impact on residents and businesses.
- Financially viable systems: the project aims to create a financially viable system where funding bodies (for example, Thames Water, lead local flood authorities) can support work promoters (such as utilities, contractors, etc) to incorporate SuDS without adding excessive financial burden.
- Scaling beyond London: the market-based SuDS approach has national and international potential, providing a replicable model for integrating green infrastructure into urban planning, improving water management and biodiversity in public spaces.



Challenges and gaps

- Shifting mindsets and standardising SuDS: the project aims to shift stakeholder mindsets from funding individual SuDS projects to investing in a service that delivers distributed SuDS where they are most needed. While SuDS are highly adaptable to different urban settings, this flexibility poses challenges in standardising their design for a scalable market.
- Funding: while the development of frameworks, tools and data platforms has progressed effectively, financial constraints surrounding pilot implementation have been a critical barrier. This highlights the need to demonstrate tangible benefits of the SuDS market to potential stakeholders. The project can refine its approach by presenting robust, data-backed evidence of the long-term value of the SuDS market and exploring innovative funding mechanisms (public-private partnerships or grants), to attract further investment.
- Compatibility with existing street works processes: coordinating SuDS integration with utility and highway works requires collaboration among multiple stakeholders, each with different operational timelines and priorities. Incorporating SuDS into standard permit systems and design workflows remains a technical challenge that is still being addressed.



Deliverables, tools and resources: see updates on this project on the Fund website

Find out more: contact the project at innovation.PMO@thameswater.co.uk and see updates on this project on the Thames Water website

SuDS-iQ: A National SuDS Collaboration & **Evaluation Platform**

COMPETITION	LEAD WATER COMPANY	ESTIMATED COMPLETION DATE	FUNDING AWARDED	PARTNERS
Water Breakthrough Challenge 4	WATER for LIFE Water.	August 2026	£959,243	Anglian Water, CIRIA, CIWEM, Dŵr Cymru Welsh Water, HR Wallingford, Thames Water, United Utilities, Yorkshire Water

SuDS-iQ is a national online collaborative platform focused on helping stakeholders plan, design and evaluate Sustainable Drainage Systems (SuDS). The platform aims to enhance understanding of SuDS, their functionality, the hydraulic and water quality benefits they can provide, and their likely costs and carbon impact. By fostering collaboration and providing a mechanism for

sharing and storing scheme options and details, SuDS-iQ seeks to accelerate the adoption of environmentally beneficial drainage solutions, improve water management, and address challenges such as flooding and pollution. Through this initiative, SuDS-iQ aims to support sustainable urban development and promote nature-based drainage solutions.

Before the start of the project, HR Wallingford and other project partners undertook a number of early preparatory activities to support the development of SuDS-iQ. These included the initial draft of the SuDS-iQ Impact and Engagement Plan, Technical Scoping Document and an industry survey on SuDS practitioner needs. In addition, a dedicated SuDS-iQ web page has been created to share more information, available at the link below.

4 Through investment in Sustainable Urban Drainage, Southern Water is aiming to drive a future of cleaner rivers and seas in the water industry. The SuDS-iQ tool will work to promote collaboration between the stakeholders required for adoption of nature-based solutions. We're aiming to build future resilience and regenerate the environment. ??

Greg Mullet, Chief Engineer, Southern Water



Deliverables, tools and resources: see updates on this project on the **SuDS-iQ website** and the **Fund website**

Find out more: contact suds-iq@hrwallingford.com

2 Insights from the global community

International case studies

This section shares insights and best practice from the global water community, showcasing projects and broader initiatives that push the envelope of innovative practice within nature-led, NbS and community-centric solutions.

By providing this context, UK water sector stakeholders can reflect on where there might be gaps in our knowledge or operations, as well as where there are areas of excellence in the UK that could inform global practice on these topics at the core of nature and communitycentric whole-catchment innovation. By sharing these learnings, we aim to further increase the ambitions of the water innovation ecosystem and forge new and lasting connections in the UK and across the world.



Summary

Key outcomes

Location: Hamilton City, California, US Date: 2014 Duration: ongoing

Organisation(s) involved: local citizens José Puente and Lee Ann Grigsby Puente, The Nature Conservancy, The Army Corps of Engineers, local farmers, Congressman John Garamendi

Hamilton City is a small, flood-prone farmworker town in California, which has faced

Citizens in Action (CIA) and overcoming bureaucratic hurdles that favoured wealthier

eligible for funding. In 2014 funding was secured and the new levee was built, providing the town with flood protection and also creating a restored floodplain ecosystem.

communities. They partnered with The Nature Conservancy and proposed a setback

levee that combined flood protection with habitat restoration, making the project

The project significantly improved flood protection, giving Hamilton City residents

conceived for flood protection became a model for climate change adaptation by

"making room for the river" and restoring natural habitats.

greater security during storms. It also restored a large floodplain ecosystem, enhancing

wildlife habitats and the health of the Sacramento River. It shows how a project initially

decades of vulnerability due to a failing levee. Residents José Puente and Lee Ann

Grigsby Puente spearheaded an effort to secure funding, forming Hamilton City



Location: Berlin, Germany Date: 2012 Duration: 3 years

Organisation(s) involved: Biodiversa, The Beijer Institute of Ecological Economics, Dutch Research Institute for Transition, Erasmus University Rotterdam, Humboldt University Berlin, ICLEI, ICTA, IUCN, Kiel Institute, Mistra, Stockholm University, Technical University of Munich, Universitat Autònoma de Barcelona, Salzburg University, Urban and Landscape Ecology

Summary

URBES investigated the relationship between functional diversity, urban ecosystem services, NbS and resilience science. The project explored the drivers behind the loss and enhancement of urban ecosystem services through NbS, such as urban green space, and the valuation of biodiversity in the urban landscape. A case study in Berlin focused on calculating and valuing general ecosystem services at the city level. The project also sought to raise stakeholder awareness and develop scenarios for urban planning changes.

Key outcomes

Key outcomes of the URBES project include a quantification of ecosystem service demand and supply in four cities, including Berlin. The project also analysed the implementation of ecosystem services and related governance challenges in green space planning. Research findings and policy recommendations highlighted the value of biodiversity and ecosystem services for human health and wellbeing. The project found that the accessibility and availability of green spaces are more important than relative size, and that socio-cultural factors strongly influence the use of urban green spaces. The results were analysed with stakeholders, and a participatory scenario development exercise helped share and disseminate results on the impact of urban planning changes on ecosystem services.

Hearn more about this project in this 99% Invisible podcast episode

URBES Berlin

32 Ofwat Innovation Fund: From source to sea: harnessing nature and communities for whole catchment innovation



Location: Indus River, Pakistan Date: 2019 Duration: ongoing

Organisation(s) involved: World Wildlife Fund (WWF), Government of Pakistan, Green Climate Fund, collaboration of local communities in DI Khan, the Ramak Watershed, Manchar-Chakar Lehri Watershed, United States Agency for International Development, The Coca-Cola Foundation



Location: Staten Island, New York, USA Date: 2021 Duration: 3 years

Organisation(s) involved: New York Governor's Office of Storm Recovery, SCAPE Landscape Architecture, COWI, Arcadis, SeArc Ecological Marine Consulting, WSP, MFS Engineers, Prudent Engineering, Billion Oyster Project, Weeks Marine, Ramboll , Baird, AKRF

Summary

Recharge Pakistan focuses on restoring wetlands across the Indus River basin to mitigate extreme flooding and replenish aquifers. By rehabilitating natural floodplains, the initiative reduces disaster risks while improving water storage and availability for millions of people. The project also enhances biodiversity and provides co-benefits such as improved livelihoods for local communities through sustainable land management practices.

Key outcomes

Key results for this project are the reduction of flood extent by 50,800 hectares as well as the capture of 20 million m3 of water. The initiative strengthens climate adaptation at the landscape level, reduces flood risks and improves groundwater recharge. It also delivers ecosystem services that benefit both people and nature, showcasing the potential of large-scale wetland restoration.

Summary

Living Breakwaters was an innovative coastal defence system that combined engineered breakwaters with oyster reef restoration. It consisted of 2,400 linear feet of partially submerged stone and concrete units designed to break waves and therefore reduce erosion. The structure features ridges and grooves that encourage reef formation, creating a natural barrier against wave energy and storm surge. This NbS not only protects the coastline but also enhances marine habitats and promotes ecological resilience.

Key outcomes

The project reduced coastal erosion and storm damage in the coastal community of Tottenville as well as enhancing marine biodiversity via 'reef ridges and streets' in the breakwaters. The project aimed to create new recreational and educational opportunities for the community alongside building overall social resilience. A Living Breakwaters curriculum was developed following this project.

🕜 Recharge Pakistan

H Living Breakwaters



Location: River Erne and River Derg catchments (Northern Ireland and Ireland) Date: 2017 Duration: 5 years

Organisation(s) involved: Department of Agriculture, Environment and Rural Affairs, Interreg, Department of Housing, Local Government and Heritage, Northern Ireland Water, Irish Water, East Border Region, Agri-Food & Biosciences Institute, Ulster University, The Rivers Trust

Summary

Source to Tap was a €4.9 million cross-border initiative aimed at improving water quality in the Erne and Derg catchments. It focused on developing sustainable ways to protect water sources by exploring innovative solutions to improve land use management practices. The project worked with farmers, land managers, forestry providers and the wider community to identify and share best practices for protecting drinking water sources. Among those were sediment reduction methods to reduce soil loss during forest felling, restoration of a peatland to reduce soil run-off into nearby waterways and onfarm interventions to reduce levels of the herbicide MCPA and improve water clarity in raw water source areas.

Key outcomes

Source to Tap resulted in a €1.16 million investment in water protection measures on 118 farms. The introduced methods led to a 24% reduction of herbicides, decreasing turbidity and new insights into pesticide dynamics in river systems. Sediment loss from forestry was also significantly reduced. The project was also able to develop an online and in-person education programme for primary students as well as a Sustainable Catchment Area Management Plan for future replication.



Location: EU Date: 2015 Duration: 3 years

Organisation(s) involved: Ecologic Institute, Leibniz Institute of Freshwater Ecology and Inland Fisheries, Intergovernmental Oceanographic Commission of the United Nations Educational, Scientific and Cultural Organization, Wageningen Marine Research, Fundación IMDEA Agua, University of Natural Resources & Life Sciences, Institute of Hydrobiology and Aquatic Ecosystem Management, Universidade de Aveiro, ACTeon – Innovation, Policy, Environment, University of Liverpool, Royal Belgian Institute of Natural Sciences, University College Cork, National University of Ireland, Stockholm University, Stockholm Resilience Centre, Danube Delta National Institute for Research & Development, Eawag, International Union for Conservation of Nature, BC3 Basque Centre for Climate Change

Summary

AQUACROSS aimed to support EU efforts to protect aquatic biodiversity and ensure the provision of aquatic ecosystem services. It focused on advancing knowledge and application of ecosystem-based management for aquatic ecosystems to support the timely achievement of the EU 2020 Biodiversity Strategy targets. The project developed innovative management tools, concepts and business models for aquatic ecosystems at various scales, relevant to different ecosystem types.

Key outcomes

Key outcomes include the development of the AQUACROSS Assessment Framework, a conceptual guide for implementing ecosystem-based management in aquatic ecosystems. Eight diverse case studies across freshwater, coastal and marine ecosystems (North Sea, Spain/Morocco, Danube, Lough Erne (Ireland), Ria de Aveiro (Portugal), Lake Ringsjön (Sweden), Swiss Plateau and the Azores) helped shape concepts and provided feedback on project outputs. This project demonstrated the potential of ecosystem-based management to protect biodiversity more efficiently than non-integrative management approaches.

3 Collaboration in practice

A notable success of the Ofwat Innovation Fund in the period 2020-2025 has been the step change in collaboration across the UK water sector. The increase in partnership activities and maturity of the sector in its approach to knowledge sharing and pursuit of mutual benefits will be a lasting positive legacy of the fund.

Beyond the project and topic-specific learnings and insights highlighted in this report, partners across the Ofwat-funded portfolio have also gathered valuable experience in other aspects of project delivery, management and governance.

In this section we delve deeper into these learnings, across topics such as partnerships, legal agreements and other collaborative learning themes.

We also shine a light on the challenges and barriers to effective scaling and implementation of project tools, outputs and results.

We hope that by acknowledging these learnings we enable future applicants and stakeholders to overcome these challenges, improving the outcomes and impact of the Ofwat Innovation Fund and its portfolio of funded projects.





Drafting and signing the CA took significantly longer than expected for nearly all project teams. It is valuable to start the CA process with partners as early as possible to allow time to focus on the project scope, delivery planning and recruitment. Without an agreement in place, many partners were working on goodwill and were exposed to an unfavourable degree of risk, especially for smaller organisations. More experienced partners now start drafting a high-level CA as part of the entry process to the Water Breakthrough Challenge. They can then agree the CA, up to proceeding to signature, between the winners' announcement and the project start.



Transdisciplinary teams, with a diversity of skills and expertise, and clear roles and responsibilities, work best. Any gaps should be identified early as recruiting the right talent, especially if on shortterm contracts, can take time. Partners all agreed that the lead partner organisation should ensure appropriate project management capacity is in place from the start. Recruiting communications and marketing roles early enables robust communications and dissemination plans, which are essential for the widest impact and uptake of project outcomes. Adopting an agile methodology allowed projects to adapt swiftly to changing requirements, especially with an iterative approach with frequent feedback loops and user-centric design.



The need for co-design and co-creation with end users was stressed by projects. Taking time to plan these engagements and thinking through how a project engages across different end users pays dividends. Using human-centred design techniques to ensure the customer/end user voice is at the heart of design processes is highly effective, yielding longer-lasting, more profound impact. Some partners suggested a funded co-creation phase to enable a deeper understanding of the problem space – its people, their needs and pain points. This would ensure the relevance and targeted nature of future project interventions. Partners stressed the need for a transparent and collaborative culture of co-creation within the project, too. Without this, learnings were less easily shared, and risks less well managed.



As the portfolio of funded projects has grown with each competition cycle, so have the opportunities for these projects to share their learnings with the rest of the sector. These learning reports are just one way the Fund is doing this. Using the insights provided by projects through the monitoring process, the Fund shares a quarterly learning newsletter with the cohort of active projects, and updates the learning database, which contains information and insights shared by projects, for the sector to learn from. The monitoring process itself has evolved with the recent introduction of Monitoring Officers. These are technical experts, across a range of different subject areas, who are providing an additional layer of rigour and positive scrutiny of the projects. And finally, we know that where a project has developed deep expertise in a particular area, they provide direct support to other projects seeking support or advice in their own project delivery – ultimately building a culture of innovation in the sector.



Considering and defining what success looks like before project delivery starts enables far better evaluation of objectives and key results, ensuring a continuous reflective culture from the outset. Partners shared insights on the merits of engaging the breadth of end users and adopters early in the project to ensure the project offer is relevant and can secure adoption. Consultative, consensus-driven planning with the regulators, other external partners, water companies, customers and even internal colleagues is critical to an innovation project's smooth delivery. It enabled partners to secure engagement, creating relationships that would benefit the project, plugging resource and skill gaps and helping shape the delivery programme.



Some of the projects shared insights around how water companies' hard and soft infrastructure, as well as processes and systems, were significant barriers to project delivery and how they were unable to capitalise fully on the expertise, technology or capabilities of external partners as a result of this. Providing data to external partners could be a challenge due to sensitivity of the data or attempts to link systems that were incompatible.



Many partners cited current regulations and the policy landscape as a significant barrier to achieving the full potential of their innovation projects, highlighting fragmented regulations working against a systemic approach. There is an opportunity for these innovation projects to act as a sandpit/testbed to trial new regulatory models, with dispensation that may impact their regulatory compliance in the short-term as these new models are embedded in water company operations. Given that one of the fundamental principles of innovation is that if a project is delivered in a collaborative, consultative way then regulation can and will change, if necessary, partners should not be deterred. Partners also remarked on the importance of a project's alignment to strategies beyond the water sector that can enable change at a wider and deeper level, as they cross government agendas and other investment opportunities.

🖲 8. Data

Partners reported concerns over access to data from project partners, in particular water company-held datasets. Lack of access to data resulted in a reduced impact to the project through having to rely solely on publicly available data that was of lesser quality and lacked the granularity required in certain cases. It often required interpretation and wider input to validate assumptions, introducing inefficiencies and margin for errors. The sector now benefits from the growing support of the <u>Stream</u> open data initiative, championing the use of open data and the positive impacts it can bring to innovation in the water sector.

The time for action is now

Ofwat's hope is that the insights and learnings in this report will be useful in implementing and scaling the knowledge and resources shared by these Innovation Fund projects.

As we suggested at the beginning of this report, this is a starting point for connections, further collaboration and development. It is also a catalyst for change, for a positive impact for the water sector, its customers, society and the environment. If you would like to discuss any of the topics described in the report, we invite you to reach out directly to the projects and their partners, or to the Ofwat Innovation Fund delivery team at waterinnovation@ challengeworks.org

The time for action is now! We urge you to embed and deploy the learnings you have discovered through reading this report. Reach out and connect with these trailblazers and innovators. Seize the opportunity to further develop systemic approaches to whole-catchment systems-led innovation that embraces blue and green solutions. Only when nature and people work in harmony will we overcome the challenges we face.

We must all now look to greener, cleaner and more sustainable choices that not only restore but also regenerate our water environments and local economies.



Further reading

- Nature-based Solutions in UK Adaptation Policy This report was prepared by the Nature-based Solutions Initiative at the University of Oxford for WWF UK and RSPB. It details the range of NbS that are currently being deployed in the UK and how they might help mitigate climate change impacts.
- WWF Nature Based Solutions Public Report Prepared by Terranomics for WWF UK and the Climate Solutions Partnership between WWF, HSBC and WRI, the report explores the global finance sector's perspectives on barriers to investing in NbS, identifying key challenges. The insights will help shape the design of solutions to those barriers.



• The Big River Watch

The Big River Watch is a citizen science initiative by The Rivers Trust that empowers people to monitor and report on river health. Through community engagement and data collection, it aims to drive action for cleaner, healthier rivers.

• Community Involvement in UK Catchment Management

This Review of Current Knowledge (ROCK) by the Foundation for Water Research explores the challenges of monitoring and managing complex river catchments under multiple pressures. It highlights local-level management efforts, community involvement and the potential of emerging technologies to improve river system management.

Flood and coastal innovation programmes
 The UK government has introduced three
 innovative programmes that will work to
 improve coastal resilience. Between 2021 and
 2027, the Environment Agency's Flood and
 Coastal Resilience Innovation Fund will invest
 £150 million in 25 local projects to enhance
 flood and coastal resilience, £36 million in the
 Coastal Transition Accelerator Programme to
 support coastal adaptation, and £8 million in the
 Adaptation Pathways Programme for long-term
 climate planning in key estuaries and valleys.

• Nature-Based Technologies for Wastewater Treatment and Bioenergy Production

This book (2025, edited by Imran Ahmad and Norhayati Abdullah) explores the integration of natural systems and advanced technologies for wastewater management and renewable energy. It covers solutions such as constructed wetlands, biofiltration and microalgae cultivation for pollutant removal, resource recovery and biofuel production, highlighting their role in building a sustainable bioeconomy.

- Nature-Based Solutions for Urban Sustainability The book (2025, edited by Piet NL Lens and Xuan-Thanh Bui) explores innovative, naturebased approaches for water, wastewater and waste treatment. It covers process fundamentals, engineering challenges, resource recovery and integration with innovative practices such as bioelectrochemical systems and protein production, with case studies from countries in transition.
- Multiple benefits of nature-based solutions This report was written by the Environment Agency and synthesises evidence from 135 studies on the environmental impacts of freshwater-related NbS in English catchments. It assesses NbS effects on hydrological extremes, water quality and biodiversity, drawing from peer-reviewed research to inform sustainable water management.



Ofwat Innovation Fund is overseen by Ofwat, the Water Services Regulation Authority for England and Wales. The Ofwat Innovation Fund is delivered by Challenge Works, supported by Isle Utilities and Arup.

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Challenge Works, the new name for Nesta Challenges, is part of Nesta, a registered charity in England and Wales 1144091 and Scotland SC042833. Our main address is 58 Victoria Embankment, London, EC4Y ODS.