NWG
living water

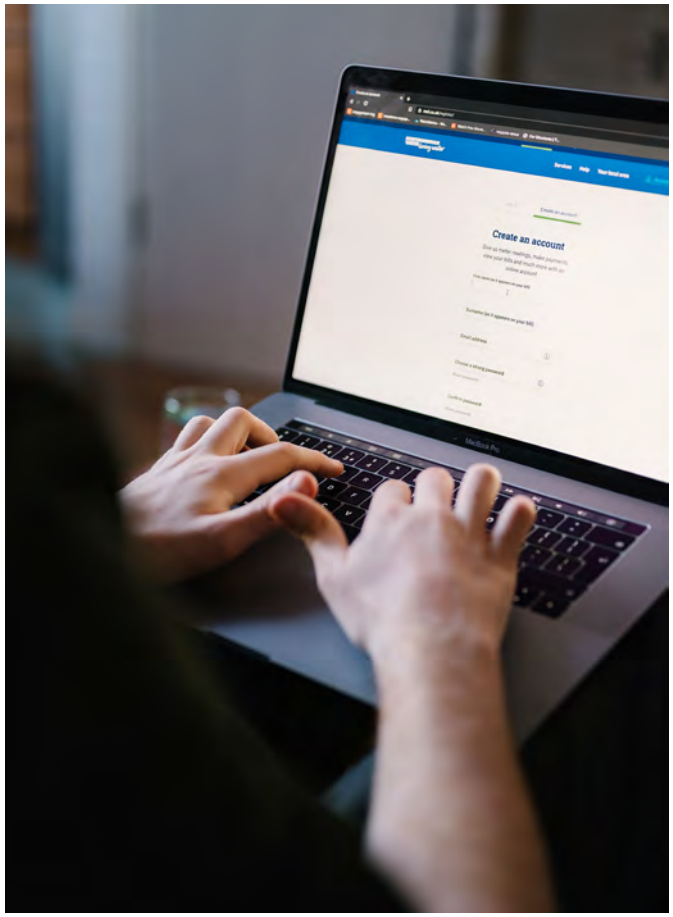
OUR OPEN DATA STRATEGY

Acknowledgements

Peer Review
Matt Webb (Chair of the Energy Networks Association Data and Digitalisation Steering Group / UKPN Head of Enterprise Data Management)

Subject Matter Consultation
Open Data Institute

Contents



Foreword by

Heidi Mottram

Chief Executive Officer, Northumbrian Water Group

Our purpose is caring for the essential needs of our communities and environment, now and for generations to come.

We do this by providing reliable and affordable water and wastewater services for our customers. We make a positive difference by operating efficiently and investing prudently, to maintain a sustainable and resilient business.

At Northumbrian Water Group (NWG) we have a long history of living Our Purpose and Our Values. These values, ethical, results driven, innovative, customer focused and one team, have always been at the heart of how we do business.

As a result, developing our capabilities regarding open data is the natural ethical thing for us to do. We have been opening up our data sets, collaborating widely and realising value for more than seven years now.

This has mainly been in the form of data hacks. A data hack is an orchestrated event where we prepare data sets, typically with several years worth of data. We then put out an open invite for people and teams outside of our organisation to analyse the data. We have had great success in this area, most recently with leaks, pollutions and interruptions to supply.

Data hacks have exposed us to new thinking that we have brought back into our business. The improvements we have seen have been notable, and are a key reason why we have been awarded 4 stars in our EPA for the three of the last four years.

Aside from improving our own business, this collaboration and co-creation has brought economic, societal and environmental benefits to our operating regions and beyond.

Our most famous example is undoubtedly the National Underground Asset Register – a common underground map of the country.

The need for this became clear during our 2017 Innovation Festival, where three separate sprints identified it as a critical requirement, and, during our 2018 festival, we brought it to life through collaboration with Northern Gas Networks, BT and Northern Powergrid.

During the course of a week, we were able to create a common underground map of four areas of Newcastle, which has since been used as a springboard to create a similar asset with Sunderland City Council.

We've shared this asset with the Geospatial Commission, part of the Cabinet Office, and resultant project is about to complete and is estimated to have an economic value of around £340m annually to UK PLC.

To support our ambitious goal to eradicate water poverty in our operating areas by 2030, we are now running similar initiatives to save our customers money across a range of services by sharing data to make it easier for customers in vulnerable circumstances to get the support that they need

We are also collaborating with the nuclear industry to extend the life of concrete assets to maintain a reliable and resilient service for our customers.

The water industry holds vast data sets, that can play a key role in unlocking value for the UK from open data.

These opportunities will only increase as we invest in smart networks, yielding ever more data about how our climate is changing and the impact it has.

We deliver vital services that can be subject to external influences, for example extreme weather events such as storms or drought.

Two years ago, we decided to influence a move towards open data for the industry. We named this initiative Stream.

This initiative secured innovation funding and is now a live collaboration supported by 11 water companies, covering over 60% of the UK's population.

While we have done a lot to unlock value from our data, we know there is more to be done.

The industry and our customers are facing challenging times, dealing with complex issues related to climate change and the current cost-of-living crisis. The industry needs to form new collaborations to find new solutions to best support our customers. We believe that open data has a big role to play in helping us to tackle these issues. We will continue to be brave, working with Ofwat to push forward with open data as a strategic priority and unlocking value for our business, for our customers and for our environment.

Heidi

Heidi Mottram
CEO, NWG

Introduction by

Nigel Watson

Chief Information Officer, Northumbrian Water Group

We have been innovating with data for the last seven years. It has been nothing less than transformational for our organisation.

We have seen a tremendous improvement in performance in key areas like pollution. We have also seen a significant shift in our culture here at NWG.

Getting value from our data has become second nature to our employees. Doing this in collaboration with others has become our preferred method.

As Heidi has said, one of our big success stories is Stream, which we are proud to have led from the very start.

Indeed, our innovation track record has been recognised independently in the annual Water Company Performance Survey carried out by British Water.

We are working hard on defining common data standards so that we can share data to drive performance improvements and adapt more rapidly to support reliable and resilient services. We will actively encourage as many water companies to participate in Stream as we can to maximise the effect we can have together as an industry.

Combining the data sets of our respective businesses will unlock value for ourselves which in turn will add value for our partners, our stakeholders, our industry, our customers and our environment.

We will be able to identify efficiencies through detailed analysis of our asset performance and we will be able to learn from one another as we adapt to climate change.

While we are excited by Stream, we know that on its own, it is not enough. Many of the challenges that we face today and into the future cannot be solved by the water industry alone.

We need to collaborate with the energy sector to help customers during the current cost-of-living crisis.

We need to work in partnership with agriculture to improve soil health and river water quality.

We have to reduce greenhouse gases and we can do this more effectively if we share more data with our supply chain.

There are numerous opportunities for us to improve outcomes for our customers and the environment that can be realised by being more open and collaborating with others.

Our Open Data strategy sets out our ambition and commitment to open data. In this strategy we will explain what open data means to us, the problems we can help to solve with it and our approach to using Open Data to add real value.

While developing this strategy, we have researched published best practices as well as inspiration from those who have demonstrated the ability to generate real, quantifiable value as a result of opening up data, such as governments from around the world.

We have consulted widely and challenged ourselves, our assumptions and our practices.

While we will be brave, we know that we must also be safe and secure. We will always make sure that we protect our customers' data.

We run Critical National Infrastructure and we will always fulfil the responsibility that comes with that.

Some of our data is complex and technical. We need to make sure that the context is well understood by anyone who uses it.

This document represents a clear commitment from NWG.

We have a growth mindset and we know that we learn by doing. We will review this strategy periodically and we will continue to scour the outside world for best practice that improves our performance.

If you ever have any ideas or insight that you think would enhance this initiative, please send them to me – nigel.watson@nwl.co.uk.

Nigel Watson
CIO, NWG

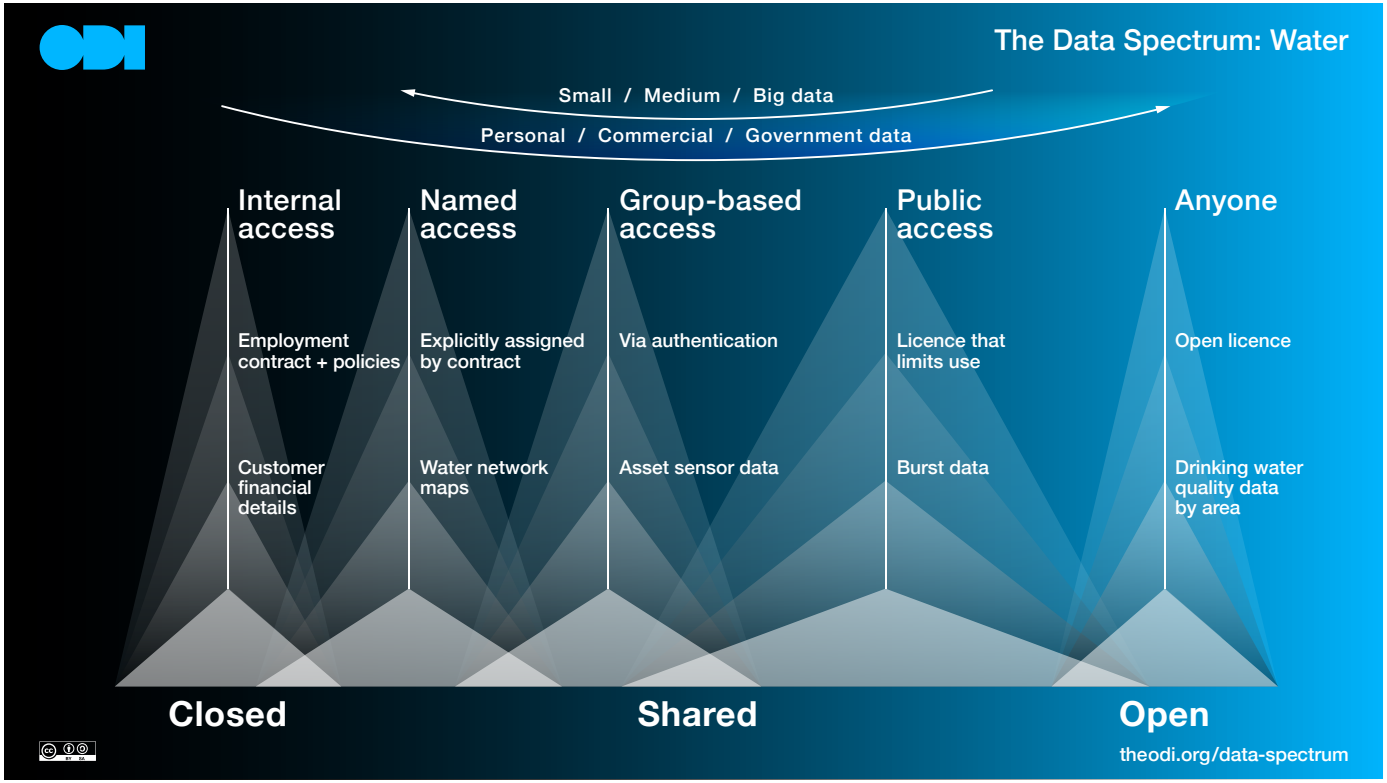
What is Open Data?

Open Data can mean different things to different people.

The data spectrum shows the spectrum of openness of data, including fully ‘open’ which is data that anyone can access use and share. We align to the Open Data Institute’s (ODI) definition of open data.

Our Open Data Strategy covers the entire spectrum, from data that will remain closed due to commercial, security or personal reasons through to data which is freely available for anyone to access, use and share without constraint.

This framework will be used internally to help identify and prioritise releases and by external users to help understand how we will be releasing our data and the ways in which they can get involved.



Our Open Data mission and vision

Our Vision

Our vision is to be the national leader in the water sector and beyond in the generation of tangible value through the use and publication of Open Data.

Opening up our data will provide new opportunities for research, innovation, engagement and greater efficiency for our industry and the adjacent sectors of the economy with the potential to generate business opportunities and stimulate economic growth in our operating regions and beyond.

This strategy has been drafted in consultation with the Open Data Institute and reviewed by our Executive Leadership Team. It is consistent with our wider vision, which is to be the national leader in the provision of sustainable water and wastewater services.

Our Mission

Our Open Data mission is to make available a wide range of useful data sets, along with contextual information to help others use and interpret our data as easily as possible. We will do this in a way that ensures sensitive data is protected at all times.

In doing so, we aim to stimulate and fuel the discovery of innovative solutions to improve our performance and enable the creation of new products and services.

This will in turn build trust in the water industry and improve the lives of our customers and positive outcomes for the environment.

This will be achieved by our six-pillar strategy:

- We will continue to lead the water industry as it moves together towards Open Data.
- We will publish our data openly in an easy-to-consume way.
- We will focus our efforts on improving the lives of our customers and the precious environment in which we live.
- We will collaborate with other primary, secondary and third sector organisations such as utilities, higher education, social enterprises, and other businesses in our region in order to enable better cross-sector outcomes
- We will convene a vibrant local ecosystem, promoting citizen data science and building valuable skills in our region.
- We will build out the enabling people, process and technology capabilities for open data within our organisation.

The benefits of Open Data

Open Data has long been identified as a fundamental resource for governments, business and society.

The positive impacts of Open Data are wide ranging, yielding social, environmental and economic benefits. Studies have indicated that there is huge economic potential for Open Data. In 2013, McKinsey estimated a global market powered by Open Data would create an additional $3tn to $5tn a year across just seven sectors: Open data:

Unlocking innovation and performance with liquid information. In terms of reputation, the release of increased amounts of Open Data also allows for greater transparency and trust.

We generate a lot of data from our day-to-day operations. Technology innovation has changed all our lives and created an exponential growth in data.

Our data infrastructure has therefore become more and more critical to the running of our business. As the economics of data are non-rival or even anti-rival, we feel that the more it is shared and used by others as well as us, the more value it gains or produces.

More recently, in 2020, the European Data Portal estimated that the value of open data for the EU28+ was €184bn in 2019, and forecast it to reach between €199.51 and €334.21bn by 2025. The report also looked at employment figures, with 1.09 million open data employees in 2019 and 1.12 to 1.97 million open data employees forecast by 2025.

This data often has a value that extends far beyond its original purpose and we believe there are many opportunities we can collectively use data for to grow our economy, transform our services and improve societal and environmental outcomes.

For example, open data can help us achieve decarbonisation or harness the potential of the regions we serve.

Closer to home, research by Deloitte has documented how Transport for London (TfL), one of the earliest adopters of the open data movement, have added around £130m a year to London's economy. TfL achieved this by releasing information such as timetables, service status and disruption information.

The opening of this data has not only made people's journeys easier, it has also created jobs and provided opportunities for innovation.

Ofwat's paper H2Open - Open Data in the water industry: a case for change contains further examples where the value of open and shared data has been demonstrated.

We have learnt through experience that delivering such value is always most effective when we create the right conditions to enable others to innovate through our data and this needs to include managing data risks to ensure no harm is caused to people and communities.

We have a long track record of doing this through our annual Innovation Festival, which since the first event in 2017, has hosted 172 sprints, hackathons and daily dashes.

One major success which was born from such beginnings was the creation of the National Underground Asset Register, which has been predicted to deliver at least £350m per year of economic growth through increased efficiency, reduced asset strikes and reduced disruptions for citizens and businesses.

We have been, and plan to continue being, very active in driving innovation in our business and industry, some of which is enabled by the Ofwat Water Breakthrough Challenge initiative.

It is this belief and positive experience of sharing data that drives us on to open up and share data more broadly.

We want to be able to catalyse, support and amplify the creative power that exists beyond our company borders in order to deliver further benefits to our customers, society and the environment.

Opening our data will provide new opportunities for research, innovation, engagement and drive greater efficiency.

It also acts as an important contributor to the UK government's ambition to position the UK as a global champion of data use.

Here are just some of the benefits that we believe we can achieve through Open Data:

- Greater transparency and accountability leading to greater trust and performance.
- Inviting challenge on our performance and finding new opportunities for partnerships.
- Facilitate meaningful citizen participation creating opportunities for input into decision making and service design.
- Supporting business and service innovation and creation in the private, public and third sectors leading to wider economic growth.
- Helping to support and fuel research, development and action to solve and adapt to some of society's toughest challenges such as climate change and the cost-of-living crisis.
- Increase our reputation as a progressive and modern company.
- Improvements in data quality and underlying data management practices arising from a wider review of our data by our communities of re-users.

On the next few pages, we have documented a couple of our recent case studies which demonstrate the potential we see for opening up and facilitating collaboration through our data.

Case Study

What lies beneath

Beneath our roads and pedestrian pavements lie a network of pipes and cables required to deliver essential services such as gas, electricity, and water.

It is estimated that the total length of these buried assets is around five times the total length of the road network but with more than 650+ owners and various data systems involved there was no single overall view of what lies beneath.

In partnership with Ordnance Survey, we've been working hard to improve the efficiency and safety of underground works by creating a secure, auditable, trusted and sustainable platform – the National Underground Asset Register.

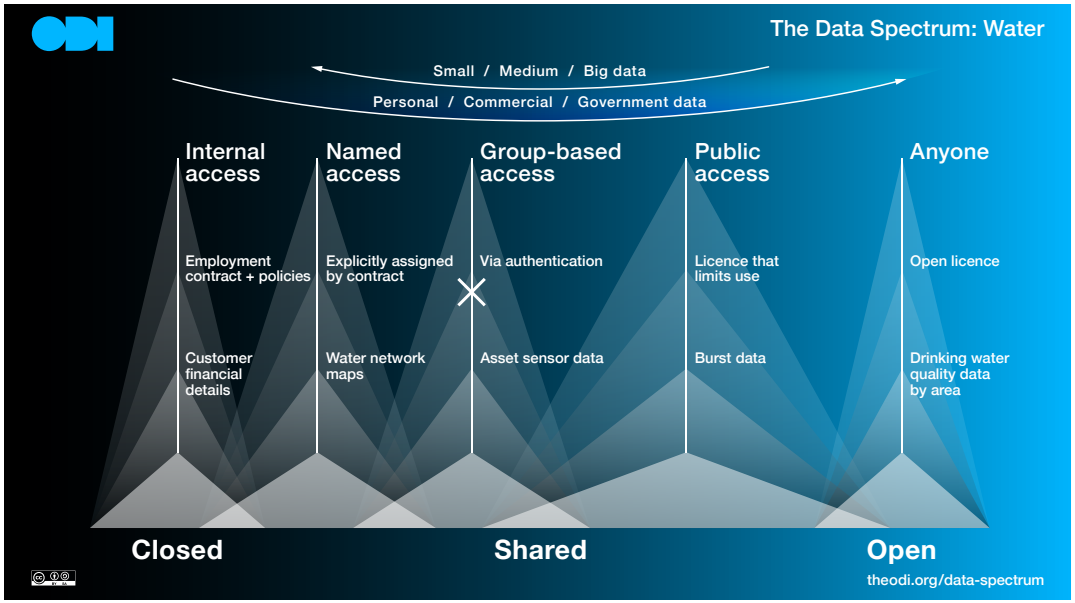
When designing any new pipeline scheme, information about the location and characteristics of existing buried assets is essential to make sure the design is optimised, even more so for trenchless projects where damage to existing buried assets may not even be identified at the time of the work. In fact, three of the sprints at our 2017 Innovation festival concluded that their underlying problems could be greatly eased by the introduction of a single digital map of what is under the ground, showing water, electricity, gas, telecom and other buried assets and planning-relevant zones.

Although an integrated web-based records system has existed in Scotland since 2012, in England, Wales and Northern Ireland the development of such a system has been rather more problematic. Several initiatives had been tried and failed.
In 2018 around 60 people from a range of different organisations took part in a 'Mapathon' that proposed a three phase plan:

1. a sandbox environment that would cover the whole of the city of Sunderland comprising about 140,000 households;
2. a regional pilot that would encompass the overlapping operating areas of gas, electricity and water companies, covering about four million households and several counties; and
3. an aspiration for the platform to be adopted as a national platform and deployed across the country.

The Geospatial Commission funded the pilot along with another pilot that was running in the London area.

After the successful conclusion of the two pilot projects, there was a strong desire from all participants to progress to a full implementation. The Geospatial Commission also saw the clear potential for a national initiative in England, Wales and Northern Ireland. A further phase was carried out in preparation for the procurement by central government of the delivery of such a national service – the National Underground Asset Register (NUAR) was born.



“NUAR is a vital UK asset that is demonstrating value in sharing data across organisations and importantly across sectors [and] is one of the best examples of national scale data sharing we have in the UK right now.”
Kevin Reeves, Industry Executive, Energy & Utilities, Microsoft

“We are excited to see the NUAR vision come a step closer to reality. Unlocking underground asset data will give rise to a plethora of use cases and enormous benefits to the utility sector and beyond.”
James Harris, Chief Executive Officer, one.network

Case Study

Supporting Citizen Science

In partnership with Wateraware, we're looking at innovative new ways to tackle complex environmental problems and create a living map of water quality in the UK.

Innovation in the water industry isn't just the preserve of those who work in the sector. The fresh and new perspectives that come from working with and enabling people from outside of the sector, from all backgrounds, can sometimes offer the most promising solutions to our challenges.

This is exemplified by the Wateraware Collective. The Wateraware Collective aims to create a living map of water quality in the UK by streamlining data collection through an architecture of low cost, adaptable sensing devices that water hobbyists can use to passively collect data. The aim is to help water companies manage pollution events, foster new innovation, empower communities to stay safe and ultimately enable eco-systems to thrive.

Working with others in this way helps to reduce the costs of water monitoring through innovation. This is an important part of our ambition for a long-term, local, and partnership-based approach to achieving the right environmental outcomes across our catchments.

Ryan and Luisa, founders of Wateraware, met each other and Northumbrian Water (NWG) through a relationship with the Royal College of Arts where our conversation grew around our shared objectives and passion to improve the water environment.

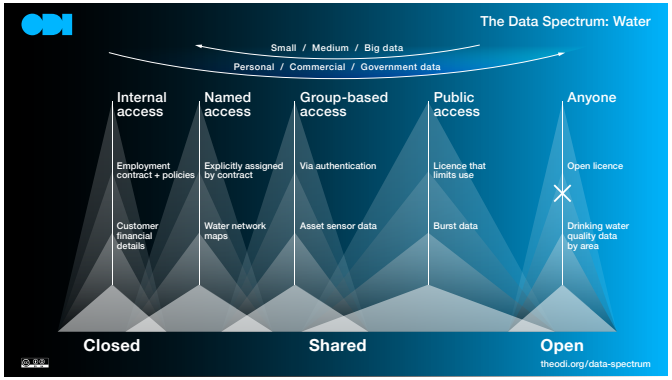
There are three key elements:

1 How can we make the data from low-cost sensors useful through the application of machine learning and artificial intelligence to understand what is happening in the environment?

2 How can we look at the broader data environment, linking historical and operational data together with sensor data to derive greater insight to support decision making?

3 How can we engage with communities to gather and incorporate further data to build a sense of ownership and agency in helping to improve and manage the water environment for the benefit of all?

The initiative started initially with the physical hardware, but the true value will come from combining the data generated by the hardware to target and drive improvements.



Ryan McClure Co-Founder and CTO, Wateraware Collective, said:

“NWG has been a very integral and supportive part of getting our business off the ground and into action.

“Having access to industry leaders and specialists has allowed us to delve deep into the world of water, giving a detailed perspective of the issues faced by many different groups of people, alongside support to start designing a viable solution.

“Coming from an environmental activism background, we want to show how activists and industry can work together to solve the major problems we face as citizens of our natural world - building bridges, not walls.

“It will become more and more important to see how new business opportunities which involve citizen science, technology, and industry support, can help drive the restoration and rejuvenation of our planet - of whom should be our only shareholder.”

Case Study

Supporting Citizen Science

Nigel Watson, Group Information Services Director at NWG, added:

“We believe that cognitive diversity is a key ingredient to innovation and innovation is an enabler to transformation.

“Our approach to enabling cognitive diversity in data-led innovation is two-fold.

“Firstly, we seek to attract diverse talent to come and work within our organisation and secondly, we seek to share our data broadly.

“By letting our data find diversity rather than trying to solely bring diversity to our data achieves a wider reach at greater speed.”

We will continue to explore additional ways to support the ambitions of the Wateraware Collective and at the same time, seek to inspire other entrepreneurs and citizen scientists to tackle challenges to drive positive outcomes for our customers, the environment and our economy.

We have already committed to introducing final effluent and in-river upstream and downstream monitoring to help improve our understand of environmental impacts of treated water by 2030, and we would like this data to be open to everyone to support Citizen Science.

The pillars of our Open Data Strategy

Our Purpose is caring for the essential needs of our communities and the environment, now and for generation to come.

We do this by providing reliable and affordable water and wastewater services for our customers. We make a positive difference by operating efficiently and investing prudently, to maintain a sustainable and resilient business.

Our Open Data Strategy aligns directly with our Purpose and is built on top of our core values, which are: customer focused, results driven, ethical, innovative and one team.

We have formulated six pillars to the Open Data Strategy. These represent the 'how' of our Open Data plan.

They are:

LEAD THE INDUSTRY - we will continue to lead the water industry as it moves together towards data sharing and opening. This will allow us to collectively learn faster and increase interoperability to support a broader approach to solving some of our shared, national challenges.

MAKE IT EASY - we will publish our data openly in an easy-to-consume way, supporting and encouraging our local stakeholders and citizen scientists. Our data will be made available in a timely manner.

Some of our data is technical and complex and so we will provide appropriate mechanisms to support data re-users to understand it. Our data will be made available to people and organisations under license. As with all of our data published under open licence, it will be free to use.

OUTCOME FOCUSED - we will focus our efforts on improving the lives of our customers and the precious environment in which we live. We will tackle local issues that our customers tell us they care about as well as national ones that require us to come together with others to solve.

COLLABORATE WITH OTHER SECTORS - we will collaborate with other sectors and in particular energy, accelerating the move to net zero, enabling better cross-sector outcomes.

We need to work symbiotically to decrease stress on scarce resources as energy transitions to renewable sources.

As part of a group of companies that includes energy distributors such as Northern Gas Networks, Wales and West and UK Power Networks, we believe that we are uniquely positioned to do this. As a recent example, together with UK Power Networks we have become founding members of the Industry Data for Society Partnership.

BUILD AN ECOSYSTEM - we will convene a vibrant local ecosystem, promoting citizen science and building valuable skills in our region. We will strengthen our existing partnerships within our region such as with the National Innovation Centre for Data and forge new ones both locally and nationally.

We will help the growth of our ecosystem of data re-users and innovators through supporting and promoting citizen science and partner with educational organisations to both bring diverse talent into the sector and build valuable skills in our regions.

STRENGTHEN OUR CAPABILITY - we will build out the enabling people, process, and technology capabilities for open data within our organisation. We need to make sure Open Data becomes business as usual for us, that it is easy for us to execute. That means we will recruit, develop, and retain the right skills. We have invested significantly in our data strategy since 2015 , but we want to go further to make sure we continually increase the trust in and value of our data to our data-reuser communities.

The pillars of our Open Data Strategy

Lead the industry

In April 2020 we started a conversation among water companies to see if we could enable the sector to move towards Open Data. We authored an initial thought leadership publication and then worked together to recruit other interested parties.

To move forward at greater pace, we applied for innovation funding from the Ofwat Water Breakthrough Challenge (WBC) competition, which was successful in May 2022.

This initiative is now known as Stream and includes 11 of the 17 UK water companies, which together cover over 60% of the UK's population.

The vision of Stream is to 'unlock the potential of water data to benefit customers, society, and the environment'.

With the funding from the WBC made available in July 2022, Stream has been able to complete a blueprinting exercise between July and December 2022 to understand and create a high-level design for all the elements that need to be put in place to develop a common framework for long-term collaboration, standards development, operational and legal capabilities in order to enable sector-wide and cross-sector data sharing.

This scalable Open Data framework is seeking to make it as easy as possible for water companies to publish data and for innovators and other data-re-users to address key sector and cross-sector challenges, some examples of which are listed below:

- Preventing environmental incidents.
- Reducing absolute carbon emissions associated with water extraction, use, and treatment.
- Bringing down the cost of water, particularly for customers in vulnerable circumstances.
- Catalysing innovation and new ways of working.
- Enabling our people, communities and partners to carry out exciting, meaningful work.

We believe that the work and scope of Stream is a vital parallel activity to our own Open Data activities, for us to be able to address challenges which rely on a national or cross-sector approach. We also believe in the power of working collaboratively to make sure the water industry moves forward at pace, for the benefit of all.

Through our activities at NWG, we will also seek to lead the industry in using open data to drive benefits to customers, society and the environment. We will commit to building on our independently assessed status as a leader in innovation by encouraging further open innovation and the use of and contribution to open standards and open source. We will work to create a culture of openness in all that we do.

OPEN DATA – data that anyone can access, use and share – is provided and consumed by organisations and individuals across the city. Data sharing for the same purposes is also encouraged when data cannot be fully open.
OPEN SOURCE – code that is published under an open licence, allowing anyone to use, share and improve the software.
OPEN STANDARDS – reusable agreements that make it easier for people and organisations to publish, access, share and use better quality data, and can be both technical and non-technical.
OPEN INNOVATION – sharing data and ideas, and supporting innovative projects from citizens, environmental organisations, startups, and business or academia.
OPEN CULTURE – building data infrastructure that is as open as possible, encouraging data literacy and capability for all, and advocating for open innovation, with a specific focus of leveraging collaborative technology towards ethical, equitable and just goals.

We will measure our success by:

- Securing funding through the Water Breakthrough Challenge funding (due to be announced May-2023).

- Delivering against the milestones and commitments as set out in the Stream delivery plan.

The pillars of our Open Data Strategy

Make it easy

We commit to publishing useful data that is easy to use, understand, access and is available for everyone.

Part of achieving this will be by ensuring we adopt the FAIR principles of Findability, Accessibility, Interoperability and Re-usability and make use of relevant open standards. Open standards for data are reusable agreements that make it easier for people and organisations to publish, access, share and use better quality data

We want our data re-user community to derive as much value as possible from the data we publish and so we will adopt a user-centred design approach to how we publish our data.

We will engage with our community to seek feedback on the usefulness of features and support for data re-use.

We will also follow best practice guidance and make sure we seek out, learn and incorporate valuable lessons from other Open Data publishers to make it the best user experience it can be. We will keep our offering under constant review using analytical tools to spot where users may be having difficulties and move to address these swiftly and iteratively.

Some of our data is more technical in nature. For example, understanding sewer overflow data requires an understanding of the difference between validated and unvalidated events or what constitutes a spill event and how it is calculated.

We will publish comprehensive metadata (data about the data) alongside the data itself to help users understand it better.

Where we feel it would add value, or based on direct feedback, we will also publish additional content to explain the context and background. We will also provide a communication channel to help users request additional support from our data and business subject matter experts This channel will also be used to encourage feedback from users on the usability of our data, identifying any problems they may detect when using our published data such as data quality issues.

Alongside our data, we will also publish information on our sector challenges and set our communities challenges to make sure our data re-users can be guided on what might be valuable problems to solve in water.

We have a long history of running successful data hacks and will continue to pursue this activity, primarily at our annual Innovation Festival. These events, which started in 2017 attract an audience from around the world. In 2022 we had 3,000 participants, from 900 organisations across 40 countries.

Each year we will run three to four data-based challenges. To date, we have covered topics as wide-ranging as leaks, flooding and rats. Our methodology for running these is well-established and includes the presence of experts to help guide teams of data analysts from beyond our sector as they develop fresh thinking and new hypotheses.

We will measure our success by:

- User feedback online and from our community events.
- Usage statistics, trends and analytics on our published data.

The pillars of our Open Data Strategy

Outcome focused

Customers are at the heart of our business.

This guiding principle has directed all that we do as a company over many years, including the way in which we consult with customers and take their views into account in our business plans. We believe that customer participation taps into a wider movement to connect people to the things that matter in their lives, giving them not only a voice but also more control.

We believe that customer engagement is essential to enabling us to deliver outcomes that are important to customers, society and the environment, at the right time, at a price they are willing to pay. This aligns to the Ofwat principle 'the right outcomes at the right place, at the right time'.

We engage with customers through a wide range of channels, including our community portal, customer research and discussions, our People Panels, tracking research and groups such as the Water Forum which challenges us and hold us to account on behalf of customers.

We will continue to use these channels as a means to understand what challenges and opportunities are important to our customers and stakeholders and where open data can support. We will seek to achieve equitable outcomes across demographic or socioeconomic lines and focus particularly on customers and communities in vulnerable situations.

We ask our customers about their priorities regularly – for example, we know that their top priority is good quality water.

Our business plan and performance commitments already reflect these priorities and to help show how we are performing, we will also seek to make our key performance data (such as on leakage, pollutions and bursts) more available in a form that can be utilised beyond a simple annual summary.

We also know that our customers support environmental improvements, but don't always want to pay for this through their bills.

So we will publish the information we hold about the local environment to support long-term, outcome-focused decision making in the future – supporting others in their efforts to make environmental improvements too.

Alongside customer priorities our data publication roadmap will also be guided by other stakeholder priorities such as historical requests received under the Environmental Information Regulations 2004.

We will look to publish the most commonly requested information types in a form that data users will find most useful.

Finally, we will review the data we have previously shared as part of our Innovation Festival data hacks and sprints to assess whether any of these datasets can be published.

Not all data shared for the purposes of a data hackathon may be suitable for sharing on an open licence, but we will assess each case and decide on an appropriate mechanism by which we can share the data as openly as possible.

We will act ambitiously and grow the quantity and range of published data sets over time by working closely with data stewards in our business and data re-users and will publish a list of datasets released or due to be published with an indication of timeframe.

Where datasets are requested but not published, the business data owner will provide clear reasons why not. This information will also be published openly to improve transparency and discoverability.

We will measure our success by:

- Being able to demonstrate how our open data publication roadmap is in line with the priorities of our customers and stakeholders.
- Feedback from our customers, community and interest groups as to the relevance and usefulness of our data.
- Responding, as far and as fast as possible, to requests for datasets from our communities of data re-users where there is a valuable outcome at stake.
- Collecting and publishing case studies demonstrating the impact our published data has enabled for our customers, communities and the environment.

The pillars of our Open Data Strategy

Build an ecosystem

To generate as much value as we can from the data we publish we need to build and support a community of data re-users.

There are three main strands to our approach to building an open data ecosystem:

1. Developing partnerships.
2. Supporting citizen science and open data communities.
3. Building data skills in our communities.

DEVELOPING PARTNERSHIPS

We believe that we can catalyse an open data movement in our regions, one that is ultimately cross-sectoral in nature. We do business with everyone in the regions we serve, and we have good coverage of data with regards to the local environment in which we operate.

This positions us strongly to play a convening role when it comes to open data. By leveraging our existing partnerships and working with key universities, we believe we can support insight into key social and environmental problems and create economic opportunities.

There are a variety of sectors and organisations with who we can share data to create fresh insight. One prime example of this is storm overflows.

We are partnering with the National Innovation Centre for Data at Newcastle University, together with our existing partners in the Northumbria Integrated Drainage Partnership.

We believe that combining our large datasets, we will be able to find novel ways of diverting rainwater away from the combined sewer system without creating flood risk – or provide data to others who can. This should ultimately lead to a reduction in flooding and storm overflows into our local rivers.

We are also working strongly with agriculture, using novel measures and data to help catalyse a drive towards regenerative agriculture techniques. This will improve river water quality and soil health, while helping the farmer earn a good living in a post-Common Agricultural Policy regime and also manage the risks associated with the transition.

We believe that there is considerable scope for improving the lives of our customers too. For example, we have launched a project looking at securely sharing customer details (with their permission) to support other utilities in providing proactive support with other household bills. We need to verify our customer details including household income to provide them with our social tariff, and sharing this information could help those households to access other services to help reduce household bills in the face of the cost of living crisis.
In 2022 we were successful in securing Water Breakthrough Challenge innovation funding for Support for All, a project that will design and build a solution to securely host and share customers registered for priority services.
All providers of critical services currently hold their own version of a priority services register, which details customers in need of additional support in certain circumstances.
This will continue to be true, but Support for All will provision a 'tell us once' style service that will enable customers of all services to go to one place and update their details.
Once we have the foundation of a complete and up-to-date services register in place, we believe we can go on to collaborate with other providers of vital services.

Houses and meters are getting smarter. These can provide valuable insights such as highlighting if an older person living alone is not adhering to their normal daily routines.
With the right security measures in place along with the permission of the customer, we believe we can provide valuable insights to help extend independent living.

SUPPORTING CITIZEN DATA SCIENCE AND OPEN DATA COMMUNITIES

We believe that Citizen Data Science can play a key and complimentary role to our own work, enabling us to tap into data sources and expertise that would otherwise be beyond our reach. In 2022 we hired two 'activists' to help us to understand how we can be good partners to this community and how we can both get good value from the collaboration (see Citizen Science case study).

To empower citizen data science we will create a comprehensive ecosystem that includes and connects people, tools, data and processes. Complementary roles such as business translators, developers, data engineers and data scientists will work together to support citizen data scientists to fill in any skill or knowledge gaps.

We will work deliberately with Citizen Data Science as an extension of our own efforts. Given the nature of the work we do, there are certain areas where this is likely to add a lot of value. Perhaps the most obvious example of this is river water quality. People are seeking more recreation in our rivers, in some cases all year round. We will be deploying sensors to track water quality. These will be highly calibrated and likely to be deployed near our assets. Where this means we wouldn't be monitoring the whole river, Citizen Scientists could help us to fill in the gaps.

Cheaper sensors may lack functionality (that is, less parameters) and accuracy, however, they can still provide valuable insight and we will work collaboratively with Citizen Scientists to maximise the value of aggregating these datasets.

BUILDING DATA SKILLS IN OUR COMMUNITIES

We recognise that one of the keys to success with our Open Data Strategy is to make sure that the right levels of data skills and data literacy exist to get value from our data and data in the wider ecosystem. We see data skills as essential for the use and analysis of data and data literacy is the ability to think critically about data in different contexts and examine the impact of different approaches when collecting, using and sharing data and information.

Data literacy focusses on elements such as:

- Comparing and contrasting how different people use numbers, graphs and infographics to convey important messages.
- Evaluating the impact of bias and limited sampling on important decisions.
- Examining the ways that data is collected. and the purposes of this collection.
- Being able to understand the ethics surrounding a dataset or piece of analysis.

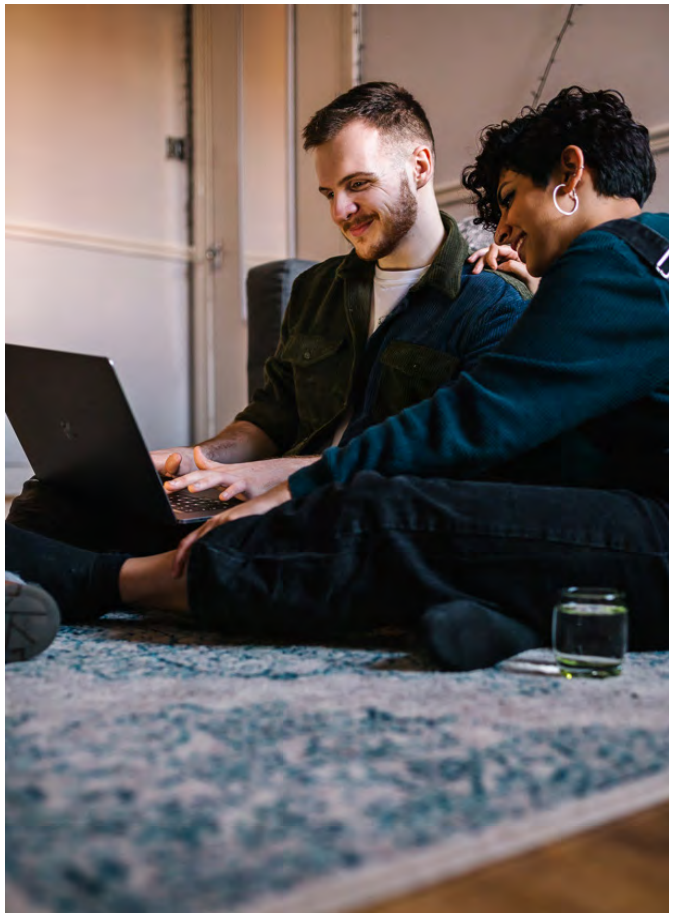
It is widely recognised that there is a national skills shortage in this area. The government's own National Data Strategy (May 2021) states that 178,000 to 234,000 UK companies were recruiting for roles requiring hard data skills and that half of these companies were finding it hard to find people with the right skills.

We will seek to engage the educational facilities in the regions we serve to use our Open Data to support the delivery of the national curriculum and further education. We will provide data, challenges and expertise to help engage our local community, especially in solving the environmental challenges we face.

We will use our Open Data as a means to support the growth of in-demand skills in our region to not only raise regional prosperity but to build a talent pipeline for the sector. We will do this by working with our educational organisations to design and run challenges supported by our data and teams of experts. The discipline that is data science leads to the codification and operation of algorithms that become part of day-to-day operations in an organisation like ours.

We will measure our success by:

- Create and measure the scale and impact of our data re-user community
- Number of users contributing to discussions or data updates.
- Number of applications developed on published data.
- Successfully design and deliver an open data community challenge to be run at the week-long Innovation Festival 2023 encouraging our educational institutions to take part
- Lead and promote a water themed challenge as members of the Industry Data for Society Partnership (challenge to be run over 3 months).



The pillars of our Open Data Strategy

Collaborate with other sectors

There is a clear and obvious nexus between the water and energy sectors, so we will focus significant effort in working with energy partners to share data and solve common problems.

This nexus starts with the household customers that we both serve. Around 18% of energy consumption in UK homes is spent heating water. The water sector is following the energy sector closely with its deployment of smart meters, which will lead to fresh insights. This obviously needs to be done carefully to avoid open access to personally identifiable data.

However, through techniques such as representative synthetic data this should be possible. If it is, the prize is significant for both customers and producers.

We can jointly leverage this knowledge to drive innovation, making it easier for customers to lower consumption and bills – and linking water and energy efficiency, in new homes and retrofits. This will have the added benefit of reducing carbon and increasing resilience.

One of the impacts of climate change that we have already experienced is the increased incidence of large storm events which can cause significant impact to our customers and the services that we, and other utilities, provide.

All the long-range predictions relating to climate change suggest that we will see these kind of storm events more often – and although we are investing in more resilience to help maintain services in these extreme circumstances, we will still rely on effective recovery.

So, we need to make sure that we plan and coordinate our resources more effectively to recover our services quickly once the storm has passed. Sharing data and accessing Open Data sources is key to achieving this. Local resilience forums will work much more effectively if they are collectively leveraging the widest set of real time data available. For example, it could be that the first action everyone should take in the wake of the storm is to coordinate on clearing the key transport links.

Water and energy also need to work symbiotically to decrease stress on scarce resources as energy transitions to renewable sources. We are a significant energy user as well as a renewable energy producer. Working together and sharing some of this data could help make us all more efficient.

Water scarcity is already having an impact on energy production and reliability in some countries, with desalination's share of total energy consumption in the Middle East projected to increase from 5% now to almost 15% by 2040. Our WRMP (Water Resources Management Plan) includes potential alternative pathways that include desalination in the future, too. We may also see large water demand from green industry, such as battery production and green hydrogen.

We could see new wastewater energy generation and reuse of chemicals. Sharing data and making optimal, joined-up decisions will be critical for the UK to make a successful transition.

Finally, we will watch with interest the progress of the Smart Data initiative led by the Department for Business and Trade within the energy and telecoms sectors to understand and prepare for any future implications for the water sector.

We will measure our success here by:

- Lead a water and energy themed challenge as members of the Industry Data for Society partnership.
- Work with the energy sector to define, launch and successfully deliver a series of open and shared data challenges to address our key, shared issues.

The pillars of our Open Data Strategy

Strengthen our capability

We will seek to grow our internal capability in line with best practice.

We will adopt the ODI Open Data Certification scheme to measure our ability to achieve great quality open data publication

We will aim to achieve a minimum of Silver rating, which is regarded as the general level for great quality Open Data publication. We will also work hard to align to FAIR principles (findable, accessible, interoperable and re-usable).

To achieve this, we will work internally to increase our open data capability, accountability, governance, leadership and culture making sure we have solid data foundations on which to build.

We will use the ODI Open Data Maturity model to guide our activities to improving our effectiveness. The Open Data maturity model complements our use of the ODI Open Data Certifcates as the certification scheme provides us with feedback on how effectively we are publishing individual datasets and the maturity model assesses our effectiveness at the organisational level. With increasing organisational maturity we expect to be able to publish datasets to a higher level of certification where appropriate.

We will create learning pathways to ensure we continually improve how we collect, curate, manage and delete data through effective governance, management and stewardship.

We will focus on building data skills and data literacy, fostering a culture of openness and ethical use of data so that our colleagues understand the value of data, the social impact it can create and the risks of improper collection, use and sharing of data.

We will provide appropriate guidance to our colleagues on how to identify whether third party data is appropriately licenced for reuse and make suggestions on how to find and source reliable, high quality data through services such as government or industry portals or open data certificates.

We will continue to work closely with data experts such as the National Innovation Centre for Data, the Open Data Institute, Icebreaker One and the Hartree Centre to help support us achieve our open data aspirations.

We will refresh our Open Data Strategy every year to incorporate new learning, feedback or best practice. Feedback will be sought from our community of users to feed into this annual review. We will work to increase the quality of the datasets we publish building on work we have already started as an integral part of our digitally enabled transformation programmes. This has already led to a significant improvement and we recognise that we have more to do.

We are currently investing in improvements in our asset data. We are also seeking to demonstrate that we have appropriate control on asset health, with maintenance regimes grounded in operational facts.

We clearly need to make sure that we have sufficient data and analytics skills ourselves. We have been investing in analytical skills across our workforce for the last four years in the form of the (level 4) Intelligence Ops programme. We will continue to build out this culture, but also invest in the awareness of the possibilities of Open Data, so that our people are minded to seek answers beyond the boundaries of our organisation.

We are appointing, for the first time, a Head of Open Data which will report directly to our CIO. This role will work across the business to promote Open Data, ensuring that we publish our data sets responsibly and reliably and engage with a rich ecosystem whenever possible.

We will measure our success here by:

- Achieve level 3 (Defined) maturity by the end of March 2024 and have a plan in place to achieve level 4 (Managed) by the end of March 2025. We will invite the ODI to undertake an independent assessment of our Open Data maturity and will publish these results and our plans openly.

- The number of data sets meeting a minimum of Silver standard, with greater than 50% of our published datasets achieving this standard in the first year.

Our Values

Our Vision sits alongside our Purpose and clearly sets out what we want to achieve:

Our vision is to be the national leader in the provision of sustainable water and wastewater services.

As important as what we do is how we do it. Our values define how we work to deliver our outcomes and achieve our vision.

Our five core values for open data align directly with our company values and are based on the six International Open Data Charter Principles developed in 2015.

They are:

ETHICAL AND CUSTOMER FOCUSED – we will adopt an open first stance but we will not compromise on the fundamental right to the protection of confidential personal, commercially or security sensitive data as set out in UK legislation.

Where confidentiality and/or sensitivity prevents us from publishing the dataset as fully open, we will not let this be a barrier to innovation by adopting a 'named or group-based access' approach or method of desensitisation instead, where possible.

In summary, we will maintain high data protection standards without creating unnecessary barriers to use.

We are committed to making sure our colleagues understand the importance of the ethical collection, use and sharing of data and seek to demonstrate leadership in what it is to be a responsible data user and steward.

RESULTS DRIVEN – we will continually expand the datasets we publish to deliver more value, including considering adding or signposting non-company data that may be considered valuable.

CUSTOMER FOCUSED AND RESULTS DRIVEN - we will work to meet established best practice standards for Open Data, aim to achieve a minimum silver certification rating for the datasets we publish, and make specific commitments to the long-term support and maintenance of released, high value data that users can rely on.

ONE TEAM - we believe that together we are more effective and so we will work with our water industry peers to make sure there is a consistent and coherent approach across the sector.

We aspire to achieve interoperability through standardisation, taking into account that not all standards are technical and even actions such as aligning language can deliver value.

We will continue to lead the Stream initiative to do so and we won't reinvent the wheel where artefacts and frameworks from other sectors are available and relevant.

CREATIVE, INNOVATIVE AND ONE TEAM - we will engage with a broad community of users, both locally and nationally, to promote and encourage the use of our data to deliver transparency as well as societal, environmental, and economic benefit.

We will seek feedback from the same to inform improvements, measure benefits and promote good exemplars, use cases and champions of open data.

We will support our users to understand and explore our data to enable inclusive development and innovation.

Our plan for Open Data

Open Data roadmap for 2023/24

Q1 2023

- 2023/24 strategy and plan published
- Partnership mapping completed
- Comms plan and community outreach commenced
- Baseline maturity assessment completed and capability plan in place
- Stream funding decision received

Q2 2023

- Education and outreach plan drafted
- IDSP challenge agreed
- Open Data governance forum and processes esta
- Open Data portal developed, tested and launched
- Initial publication scheduled agreed and publishe
- Community engagement to identify use cases
- Joint energy / water open data collaboration even Festival)

ablished

d with first dataset published

d

nt developed (Innovation

Q3
2023

- First quarter review completed and forward plan adapted to incorporate feedback
- Deliver against education plan
- IDSP challenge launched (TBC)

Q4
2024

- 2023/24 review complete
- Re-run maturity assessment, findings reviewed, published, new target maturity level set and capability plan updated
- 2024/25 strategy and plan ready for publication April 2024

- Identifying and progressing towards target maturity state
- Broadening the range of datasets and associated metadata
- Improving data quality
- Strengthening our relationships with our data re-user communities
- Incorporating user feedback into our Open Data products and services
- Deepening the connection between open data and business strategies to exploit the potential of Open Data
- Expanding Open Data educational programmes

NWG
living water

March 2023