

Integrated catchment management

We deliver innovative and integrated solutions to water quality challenges

We apply a multi-sector approach to understanding the sources of water quality issues, surface water and groundwater pathways, and receptors – human and environmental.

We successfully integrate our holistic understanding with policy, stakeholder engagement and natural capital. Our solutions focus on sustainability and are sensitive to external drivers.

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Our Services

1.

Understanding the problem

We take a holistic, multi-disciplinary approach to each project ensuring that our clients' challenges are fully understood and conceptualised before delivering appropriate solutions.

2.

From field to cloud

We bring added value to every project through promoting collaborative working with clients and stakeholders and constantly striving to innovate, generating efficiencies in approach and enhancing confidence in the solution.

3.

Working with nature

Our experts develop solutions that work with nature in both rural and urban landscapes to boost habitat and amenity quality and create value reaching beyond the project.

4.

Protecting water ecosystems

Water is a natural resource that must not be allowed to deteriorate. We assess how much water can be abstracted to avoid damage to ecosystems and recommend best practices to mitigate water quality problems.

5.

What measure, where?

Will the well-known solution to a problem work in a particular catchment or landscape? By using mapping and modelling approaches our experts can identify areas and measures to optimise outcomes.

6.

Plan investment wisely

We can help to understand the most cost-effective approach to improve water quality, to help target investment and build a case for wider environmental enhancement through understanding the wider opportunities for improving natural capital.

7.

Adapting to climate change

With continuous improvement in the science underpinning future climate predictions, we pride ourselves in leading the application of these predictions to our projects. We develop mitigation that can be adapted in the future, promoting sustainability in all our outcomes.

8.

Reinforce technical capabilities

We understand the benefits brought by working with clients to share and develop technical capabilities in all the steps of any analysis. We can help you to build your technical skills to enable robust decision making across your team and organisation.

9.

Multi-Stakeholder

We are experienced in participatory processes for water resources management and planning and can help you to achieve maximum benefit from stakeholder engagement.

10.

Thought Leadership

Through contributions to publications, such as the 'The Oxford Handbook of Food, Water and Society', our experts are dedicated to delivering thought leadership throughout the sector and towards delivering the 25 Year Environment Plan.

Coastal Investigations: Models for management

Opportunity

Dŵr Cymru Welsh Water (DCWW) commissioned the largest Welsh coastal investigation and modelling project ever undertaken to improve its understanding of the factors affecting water quality at 49 sites along the entire Welsh coastline. The evidence gathered would allow DCWW to:

- Identify which sources of pollutants were the largest contributors to water quality issues.
- Determine what measures – for example, asset improvement, catchment management, and reduction in misconnections – could deliver ‘excellent’ bathing water quality or ‘guideline’ quality standards in shellfish waters.
- Inform DCWW’s future asset investment.

Solution

We undertook a study which covered 1700km of coastline, including more than 10 major estuaries, over 900 assets and 70 sewer network models in both urban and rural areas, some of which were heavily influenced by seasonal tourism. Coastal models were created for the entire Welsh coastline and, to accommodate the number of model runs required, we used cloud computing to reduce calculation times and meet the stringent delivery schedules. In some areas, we reduced the run time from 6 months to 6 weeks, using more than 120 virtual computers.

Outcome

This was a truly multidisciplinary study. Our dedicated team undertook a range of work involving literature, model and data reviews, extensive sampling campaigns, data analyses, and network, hydrodynamic and water quality modelling. We were able to provide DCWW with detailed information for cost-efficient investment planning, and Natural Resources Wales with an enhanced and detailed understanding of water quality issues at the 49 sites.

Project

Coastal Investigations Programme

Location

Wales

Client

Dŵr Cymru Welsh Water

Expertise

Water quality, coastal modelling, water quality modelling, surveys, network modelling, cloud computation



Criccieth Beach in Tremadog Bay - Courtesy of DCWW Capital Delivery Alliance



The Fenlands - a balance between agriculture, water resources and the environment

Project

Catchment Management
Investigations

Location

East Anglia, UK

Client

Anglian Water

Expertise

Catchment management, water
quality modelling, diffuse pollution

Modelling in-catchment water quality solutions

Opportunity

Both surface and groundwater quality can be impacted by the way in which land is managed. In the Anglian Water region, specific emerging pesticides, which are not removed by conventional water treatment processes, are of concern in surface water, and nitrate is a problem in groundwater. The cost of treating raw water to remove these substances is high but catchment management solutions have the potential to reduce elevated pesticide and nitrate concentrations, and avoid the need for additional energy and carbon-intensive treatment.

Solution

For surface water, we developed a modelling approach to simulate

catchment hydrology and pesticide transport processes in each surface water catchment supplying Anglian Water's drinking water sources. Our approach takes a holistic view of the catchments, integrating hydrology, hydrogeology, water quality and agronomy. For groundwater, we combined existing modelling packages with a bespoke model spreadsheet to simulate nitrate transport through the soil zone, and unsaturated and saturated zones, to the groundwater source. We used our models to calculate how long it takes nitrate to travel from agricultural fields to Anglian Water's boreholes, and to identify the most effective way to target catchment management activities, allowing

Anglian Water to carefully focus their resources to improve groundwater and surface water quality.

Outcome

Anglian Water has used our results to inform its catchment management strategy. Following our recommendations, it employed a team of dedicated catchment advisors who work with farmers to implement its successful 'Slug It Out' campaign, addressing the metaldehyde problem and raising awareness of pollution from agriculture. We are continuing to work with Anglian Water to develop the modelling tools for use in new, innovative projects.