

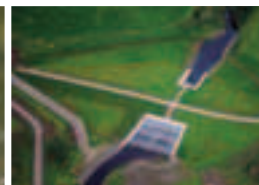
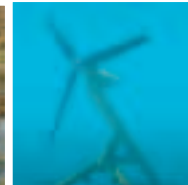
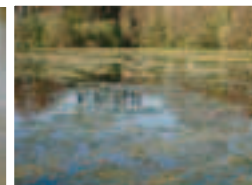
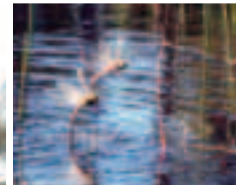
Managing Water



*The on-line magazine for Natural
Resource Management*

Flood Barrier Feature

Pages 14 - 23



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Storm Water Management
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Surface Pumps
Suction Erosion
Sustainable Drainage Solutions
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Telemetry Drilling Services
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Listing your company - Can you afford not to?

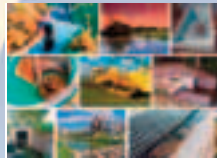
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What’s on in 2012

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10 May
www.bathandwest.com/trade-stands/214

Webinar - Modelling Made Easy
16 May
www.halcrow.com/isis/news.asp#news226

IWEX Waste & Water Exhibition
22/24 May
www.sustainabilitylive.com

All Energy
23/24 May
www.all-energy.co.uk

JUNE

Cereals
13/14 June
www.cerealsevent.co.uk

Surface Water Management 2012
27 June
www.coastms.co.uk/conferences/463

JULY

CLA Game Fair
20/22 July 2012
www.gamefair.co.uk

SEPTEMBER

Saltex
4-6 Sept 2012
www.iog.org

NOVEMBER

FLOOD RISK 2012
20 - 22 November 2012
www.floodrisk2012.net

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To add your event to future editions of Managing Water, please email the details to
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The event will also be added to the events section of the FADS Directory

Welcome

to the third issue of Managing Water Magazine.

The Managing Water Website was launched just in time for issue 2, which came out in early March. We have seen great increases in the number of subscribers wishing to receive the magazine and we have had a huge amount of positive feedback.

Issue 3 see’s columnist Alex Stephenson joined by Paul Cobbing, Chief Executive of the National Flood Forum and David Noble, a specialist, with 50 years experience, in flood defence and land drainage, now retired.

Since the last issue we have seen the launch of the new National Planning Policy Framework (NPPF) and we include a few responses from various organisations.

We have a 10 page feature on flood protection barriers, introduced by by Fola Ogunyoye, Technical Director at Royal Haskoning and including case studies from several manufacturers and suppliers of flood barriers.

"The wettest drought in history!"

The British press and TV documentaries have been constantly fuelling the public’s belief that the current drought and flood risk is all down to mismanagement rather than the weather - someone is too blame for too little water and now, too much water!

On a plus point - we haven't had cause to be worried about the hosepipe ban; gardens have never looked greener, cars haven't needed cleaning, or at least we haven't had the opportunity to clean them and the turf industry is happier. Whilst the rains have brought some relief to the reservoirs (an extra 12 billion litres for Yorkshire Water) it will take a lot more to replenish the shortfall from the last 20 months. What has also helped is that our usual consumption has dropped - giving even the water companies something to smile about.

I've included a couple of images of my East Anglian garden, clearly suffering the effects of a month long hosepipe ban - the grass, greener and fuller than it's ever looked, The only downside is that I can't get out to cut it, as the April showers continue into May!

Feedback is important to us so please do take a moment to tell us what you think and do enjoy the 3rd edition.

Richard Noble, Editor, Managing Water

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Flood Risk Insurance
The need for fairness
- *Paul Cobbing*

Flood Risk
Don't let the drought cloud our views
- *David Noble*

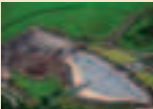


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Demountable Barriers
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Infrastructure and Flood Risk
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A waterwall for an entire estate
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A New Deal for nature & Water at Haweswater
Water company United Utilities has entered an innovative new land management partnership with the RSPB at its Haweswater
- *RSPB*



CIWEM Living Wetlands Award
-*CIWEM*

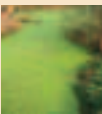
Government announces action to improve implementation of the Habitats and Wild Birds Directives
- *DEFRA*

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- *WWT*



Killer Shrimps in the Broad

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- *Jonathan Newman*



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FabTest is a marine energy test site in Falmouth, Cornwall



Irish-American cooperation in wave energy research

Tidal Project Agreed
Crown Estate that will support Wales in its ambition to become a world leader in marine energy.

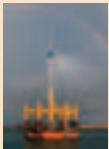
A further £103 million investment in Scotland's renewable industry

Panolin Powers Clean Energy Generators

Northumbrian Water invest in Hydro-power
Northumbrian Water has installed a £1.3m hydropower generator

World Leading Energy Firm Invests in the UK
Wind turbine manufacturer Gamesa have given a huge vote of confidence to the UK

Floating Wind Turbines
Floating wind turbines are to be the initial focus of a new agreement between Britain and the United States



The National Planning Policy Framework

On the 27th March 2012, in England, the National Planning Policy Framework (NPPF) replaced the Planning Policy Statement 25 (PPS25) 'Development and Flood Risk'. The principles of the policy remain the same, the processes have been simplified and streamlined, but views remain mixed.

Does it go far enough in protecting 'green' England? Does it ensure that flood risk assessments are carried out?

Is Climate change sufficiently factored in?

Can sustainability benefits really outweigh flood risk?

The NPPF will not apply in Wales. In Wales, Planning Policy Wales sets out Government policy on the subject.



"Today's statement from the coalition government is disappointing and a lost opportunity with the pursuit of growth failing to account for the very real value that the UK's countryside and natural capital provides. There are some improvements on the original draft NPPF; it is good to see local authorities getting longer to prepare for these changes, a definition of sustainable development that includes the principles from the 2005 SD Strategy and the removal of the "default yes" clause."

"Ultimately though, there is still no strong, clear guidance to local authorities on how they can use the sustainable development policy in the NPPF and apply it to their circumstances. What was needed was a better policy framework to make sustainable development a day to day exercise and a practical reality. Instead, what we have reinforces the status quo; the same old problems will again rise to the surface."

"It will take a year or so, when applications under the new framework start to become reality, before we can truly judge the full impact of these changes. However, our fear is that this system is simply not robust enough to protect our rural and open spaces from irreparable and costly damage."

Emmalene Gottwald, senior planning advisor



"I have to congratulate the Minister for listening to some of our concerns. He has used the right definition of sustainable development and this sends out a clear signal to developers that economic benefit must be balanced with social and environmental benefit."

"Now is not the time to take our eyes off the ball though. The framework is just for guidance and can be implemented with flexibility. There is plenty of opportunity as we go through this transition period for unscrupulous development to look for loopholes."

The NPPF is in principle good on protection for Sites of Special Scientific Interest (SSSIs) and 'priority habitat', much of which will be without specific designation.

It mentions locally designated sites, but potentially values them low quite low. There is some encouraging text on ecological networks – the wildlife linkages between nature reserves and the wider environment – but nothing that is binding for Local Authorities. Mr Spray added: "There are still missed opportunities. Wetlands bring real benefits for people, in flood prevention, water treatment and recreation, particularly in this time of drought and increased flood risk. The NPPF could have been a progressive document for the 21st century, but it doesn't capture and promote these benefits through the planning system in a way that they can be recognised and championed by Local Authorities."

WWF Chief Executive Martin Spray



"There are a number of important changes that have been made to the draft, responding to concerns that we and others raised. These include:

- the primacy of the plan is confirmed, ensuring that development must be consistent with the plan
- a better definition of sustainable development, based on the 2005 sustainable development strategy
- the insertion of references to the use of brownfield land and the need to promote town centres
- removal of the incendiary default 'yes' to development where there is no plan
- reference to the 'intrinsic character and beauty of the countryside', recognising the importance of countryside outside designated areas
- confirmation that existing plans will remain in force while the new NPPF is introduced, and that there will be a one-year transition for the preparation of new plans

'All these changes improve the document and give it a better tone and balance.

'Now the serious business of planning begins. The country needs huge effort at a local level to get plans in place that properly reflect the integration of social, economic and environmental goals, and protect places people value.

'The National Trust, along with many other organisations and people, will play our part and watch to see how it works in practice.

Dame Fiona Reynolds, Director-General



"While making the planning system more user-friendly is key to unlocking investment in infrastructure, energy, water and transport networks often sit above the local level requiring a high degree of cooperation from neighbouring authorities. We remain concerned that the 'Duty to Cooperate' is insufficient to overcome incentives for local authorities to prioritise very local

plans without full regard for how developments might impact on neighbouring localities. This must be monitored closely to ensure that in the drive to empower local authorities we do not make it even more difficult to deliver the infrastructure that all parties have agreed we so urgently need if we are to create jobs, raise skills and generate growth."

Director General Nick Baveystock



"Including a strong definition of sustainable development in the new planning guidelines is an important step forward, but this is undermined by confusing and contradictory information in the rest of the document.

"Ministers must make it crystal clear that the new planning system will encourage the low-carbon infrastructure and affordable homes our nation needs - and prevent poor quality developments that waste water and increases our reliance on expensive fossil fuels. "But the devil is in the detail - Friends of the Earth legal experts will be watching closely to ensure local people, future generations and our wildlife are properly protected."

Policy and Campaigns Director Craig Bennett



Association of Drainage Authorities

The final version of the NPPF has seen some significant changes, in relation to flood risk, that ADA called for in its consultation response to the draft document.

Primarily that Lead Local Flood Authorities and IDB's are named alongside the Environment Agency as flood risk management bodies from whom Local Plans should take account of advice from.

Also that a separate Technical Guidance be produced which sets out in greater detail the assessment of flood risk and how this should be taken into account.

"The true impacts of the NPPF will take a number of years to be felt as developments are built and their impact on their local surroundings, drainage, and flood risk becomes evident."



The NFF were relieved to see the new document and felt that it gives much greater confidence on the treatment of development-related flooding. There is an all-new Technical Guidance document which keeps all the key elements of the now scrapped PPS25.

"It's good to see Government listening to the sound argument put forward by the NFF."

Charles Tucker, Chairman



In responding to the draft consultation, the Agency welcomed many aspects including flood risk and coastal change, climate change mitigation and the natural environment being identified as amongst the strategic priorities for Local Plans.

• We believe the NPPF should state clearly that delivering environmental outcomes is an objective of the planning system with equal status to economic development.

• We believe the NPPF should state how the planning system should help to encourage the prudent use of natural resources, particularly water resources, and protect and enhance water

quality.

• We are concerned that an unintended consequence of applying the presumption in favour of sustainable development could be that, until Local Plans are updated and in place, some developments could be approved that have a negative impact on the natural environment.

• To avoid uncertainty and delay in the planning system, we would strongly support a commitment to producing advice on policy aspects of the NPPF and the implementation of the Localism Bill. We would also recommend that transitional arrangements are put in place until such advice is developed.

Climate Change

Climate Change report predicts more rain and more drought by 2050

The European Environment Agency predicts that Europe will be 1.5° warmer, on average, in the period 2021-2050 and 3° warmer in the period 2071 to 2100, compared with temperatures between 1960-1990.

Average Changes in Temperature

This is according to the regional climate projections from the ENSEMBLES project. The greatest regional warming is projected to occur over eastern Scandinavia, and southern and south-eastern Europe, with all areas of the continent warming by between 0.4° C and 2.5° C.

For the period, 2071-2100, the models predict that Europe will be on average 3 °C warmer than 1960-1990. In north eastern Scandinavia the temperature change could be up to 6° C higher than the reference period, while the Mediterranean basin and parts of Eastern Europe will also see much bigger changes than elsewhere. All areas are expected to see average annual temperatures at least 1.5° C warmer than the reference period.

The higher temperatures will lead to an increase in the number of heat waves and droughts, with correspondingly significant impacts on water supply, agriculture production and human health.

Annual changes in rainfall

The annual rainfall projections show a clear split over Europe. In northern regions models project an increase of up to 15% and in southern/ Mediterranean regions a decrease of up to 15%.

For the period 2021-2050 the projections show winter precipitation will increase all over Europe, while summer precipitation will decrease. Both of these trends are more pronounced in the maps showing projections for the period 2071-2100.

The North, with increasing precipitation can expect more flood events and the South, more frequent and longer lasting droughts, having significant effects on agriculture and tourism industries, especially in the Mediterranean area.

In some Mediterranean countries, agriculture is extremely water-intensive, accounting for up to 80% of water use. Many countries will need to adapt their agricultural systems to deal with less water, or water at different times of year.

The climate change data behind the maps comes from 25 different Regional Climate models, run in the frame of the ENSEMBLES project, under A1B emission scenario. The scenario assumes rapid economic growth, a global population that grows to 9 billion in 2050 and then gradually declines.

The EEA and the European Commission have recently launched Climate-ADAPT, a web resource aimed at helping policy makers and 'practitioners' – engineers, planners and administrators –to learn from the experience of others facing similar challenges who already carrying out adaptation actions elsewhere. The maps form part of a wealth of information in the Climate-ADAPT resource.

A 22 metre rise in sea levels

That is what has been suggested by reasearch published the the journal, Geology and a study by the Stockholme Environment Institute

Even if humankind manages to limit global warming to 2 degrees C (3.6 degrees F), as the Intergovernmental Panel on Climate Change recommends, future generations will have to deal with sea levels 12 to 22 metres (40 to 70 feet) higher than at present, according to research published in the journal Geology.

The researchers, led by Kenneth G. Miller, professor of earth and planetary sciences in the School of Arts and Sciences at Rutgers University, reached their conclusion by studying rock and soil cores in Virginia, Eniwetok Atoll in the Pacific and New Zealand. They looked at the late Pliocene epoch, 2.7 million to 3.2 million years

ago, the last time the carbon dioxide level in the atmosphere was at its current level, and atmospheric temperatures were 2 degrees C higher than they are now.

"The difference in water volume released is the equivalent of melting the entire Greenland and West Antarctic Ice Sheets, as well as some of the marine margin of the East Antarctic Ice Sheet," said H. Richard Lane, program director of the National Science Foundation's Division of Earth Sciences, which funded the work. "Such a rise of the modern oceans would swamp the world's coasts and affect as much as 70 percent of the world's population."

Professor Miller said that

the research highlights the sensitivity of the earth's great ice sheets to temperature change, suggesting that even a modest rise in temperature results in a large sea-level rise. "The natural state of the earth with present carbon dioxide levels is one with sea levels about 20 metres higher than at present," he said. Professor Miller said the current trajectory for the 21st century global rise of sea level is 2 to 3 feet (0.8 to 1 metre) due to warming of the oceans, partial melting of mountain glaciers, and partial melting of Greenland and Antarctica. Although sea levels won't get as high as depicted for a long time, the Rutgers scientists say a substantial rise is inevitable,

A cost of \$2 Trillion per year?

Climate change damage to oceans could cost \$2 trillion per year

A new study coordinated by the Stockholm Environment Institute shows climate change alone could reduce the economic value of key ocean services by up to \$2 trillion a year by 2100. The study, Valuing the Ocean, is the work of an international, multi-disciplinary team of experts, including SEI researchers.

The full report is due to be published as a peer-reviewed book later this year; a preliminary Executive Summary is being released to inform preparations for the Rio+20 Earth Summit in June.

A key part of the study is a groundbreaking analysis on ocean economics, designed to quantify the costs of ocean degradation, which are often invisible in the cost-benefit analyses that guide policy. The analysis calculates the cost over the next 50 and 100 years respectively in terms of five categories of lost ocean value (fisheries, tourism, sea-level rise, storms, and the ocean carbon sink) under high- and low-emissions scenarios.

A key point made in the report is that the convergence of multiple stressors – acidification, ocean warming, hypoxia, sea-level rise, pollution, and overuse of marine resources – could lead to damages far greater than just from individual threats.

By 2100, the annual cost of the damages from 'business as usual' emissions,

projected to lead to an average temperature rise of 4°C, is estimated to be 1.98 trillion USD, equivalent to 0.37 per cent of future global GDP. A rapid emission reduction pathway that limited temperatures increases to 2.2°C would 'save' (i.e. avoid) almost \$1.4 trillion of those damages.

Frank Ackerman, director of the Climate Economics Group at SEI-US, commented:

"These figures are just part of the story, but they provide an indication of the price of the avoidable portion of future environmental damage on the ocean – in effect the distance between our hopes and our fears. The cost of inaction increases greatly with time, a factor which must be fully recognised in climate change accounting."

A key point made in the report is that the convergence of multiple stressors – acidification, ocean warming, hypoxia, sea-level rise, pollution, and overuse of marine resources – could lead to damages far greater than just from individual threats.

The study does not put a monetary value on the total projected damages, many of which involve "priceless" losses such as the eradication of species, but it argues that given how much is already known about the potential costs, world leaders should take a precautionary approach and take strong action to protect oceans, even in the absence of complete economic data.

"We must develop an integrated view of how our actions impact the ocean, and threaten the vital services it provides, from food to tourism to storm protection," says Kevin Noone, Director of the Swedish Secretariat for Environmental Earth System Sciences at the Royal Swedish Academy of Sciences, and co-editor of the report.

"The global ocean is a major contributor to national economies, and a key player in the earth's unfolding story of global environmental change, yet is chronically neglected in existing economic and climate change strategies at national and global levels."

**Alex Stephenson,**

Alex has over 36 years experience in stormwater drainage design and related issues.

As well as being the UK Stormwater Director with Hydro International he is also Chairman of the SuDS focus group. He is ideally situated to keep you up to date with the industry changes and legislation.

The Beauty of a Vortex

Admiring the beauty and elegance of natural patterns and processes is something that I believe all us engineers do. The vortex is a particular object of fascination for water and drainage engineers because of its simplicity and power. Yet, as Leonardo Da Vinci once said: "simplicity is the ultimate sophistication" - and simplicity can take a lot of hard work for designers to achieve.

As it uses no power other than the energy of the water itself, vortex technology is inherently sustainable. It therefore feels like a very contemporary solution, yet it is well proven.

Vortex flow controls are used in thousands of applications worldwide in all shapes and sizes - from giant flood prevention schemes, to everyday small-catchment drainage schemes.

Now latest step-changes in engineering development are moving the technology on once again, particularly in the design and application of the 'Hydro-Brake', which through its own success, has become an industry-standard term for flow controls.

National Standards

In the UK, new National Standards for Sustainable Drainage Systems (SuDS) will place increased expectations for controlling the flow and quantity of surface water in new developments. Vortex technology provides the ideal solution - but its design and specification need careful consideration to meet the required standards effectively. Compared with conventional technologies such as an orifice plate, penstock or slide gate valve, the flow of water out of a vortex flow control has much less energy per unit of cross-sectional area. It is therefore, much less likely to cause scouring or physical damage to downstream structures, protecting sensitive wetlands, ponds, basins or watercourses, even preventing damage to sewer infrastructure.

Alex Stephenson

Contact Alex by:

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Telephone: 01275 878371

**Paul Cobbing**

Paul is Chief Executive of the National Flood Forum, a national charity that supports and represents people and communities at risk of flooding. He has worked on many environmental issues throughout his career for public, private and voluntary organisations. The National Flood Forum is now trying to ensure that the needs of people at risk of flooding are at the heart of new policies on insurance.

Flooding and household insurance

With the onset of rain we have moved seamlessly from worries about drought to flooding. The problems of drought still remain and won't disappear for some months, but the worry of people who have been previously flooded quickly comes back, "When you have watched in disbelief water coming into your house, it's always at the back of your mind" is a comment I have heard a lot of lately.

The key difference between most civil disasters in the UK and flooding is that fire, explosions, industrial accidents, earthquakes, transport trauma, etc., are mainly one off incidents which rarely reoccur in the same locality and their frequency and impact is actively managed and reduced by legislation, planning and investment.

Flooding is different. Flooding incidents are increasing decade by decade and climate change and increasing urbanisation are unlikely to reduce this pattern. Furthermore the probability of a once flooded community being repeatedly affected is real, with the victims of flooding being serially traumatised and their communities blighted.

When it rains I suppose, yes, I feel quite depressed. I'd rather just set fire to the house, walk away and just never come back I think. I couldn't do it again. The result of flooding is often: Incredibly high stress levels

- Illness
- Anger
- Frustration
- Fear
- Loss of faith in those that manage the risk
- Resignation that nothing will happen to improve the situation
- Apathy to those that manage the risk
- Contentious communities

Although there have not been huge numbers of homes flooded so far during the latest rains, our advice line has been full of calls from people who are worried; because they can't

get insurance, can't get insurance companies to acknowledge that flood defences have been put in place and because their existing insurers have raised their premiums and excesses. We have even had some recent cases where people have been unable to move out of their homes because the purchasers can't get insurance. We are able to help most people, but are concerned that when the Statement of Principles (the agreement between the government and the insurance industry on covering flood risk in household insurance) we are going to see many more people struggling to get insured. Getting flooded is traumatic enough, but the prospect of not being able to get insurance is now worrying people. There is a real concern that they will get trapped in their homes, unable to sell, that their mortgages will be invalidated because they can't get insurance, that the value of their property will fall, and if they do get flooded they won't be able to afford to reinstate it.

That is why getting a new framework in place quickly is so important, one that the insurance industry can work with and one that the public can rely on. It is particularly important that we protect those who are most vulnerable, those who don't have the resources to buy themselves out of trouble, as well as the elderly, the disabled and the marginalised. It is also important that it is fair and seen to be fair, not just to individuals, but to communities too. That's why we are working hard to encourage Government and industry to get the right result; a just and fair approach that protects people's financial wellbeing, even if the rest of their lives have been turned upside down

Paul Cobbing

Contact Paul by:

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Telephone: 01299 403055

**David Noble, OBE**

David Noble spent a career spanning over 50 years in the flood defence and land drainage business, within the public sector and in running his own specialist consultancy, including the provision of services to the Association of Drainage Authorities, acting as it's Chief Executive. In very

much a part-time capacity he retains the position of Technical Advisor to the North East Lindsey Drainage Board, covering an area to the south of the Humber Estuary within which a large number of major industrial sites are established. Davids' contribution to the service was recognised with the award of an OBE in 2002.

Don't let the drought cloud the issue of flood risk

Periods of drought are not new, and going back beyond the drought experienced in 1975/76, historical rainfall records confirm the occasions when such conditions have prevailed..... and there are many.

Accompanying each period of drought is the widespread disbelief that any form of water restrictions should be necessary, accompanied by suggestions as to how these restrictions ought to have been avoided. The most common suggestions include the need for more reservoirs, constructing desalination plants and the establishment of a national water grid. These options are not without enormous promotional, technical and financial problems, some other suggestions verge on the eccentric, through their sheer impracticality.

The water supply of the country is substantially dependent on storage, be it surface reservoirs or underground aquifers, and that position will not change. In the search for additional storage, quite understandably, attention can be drawn to the extensive network of rivers, drainage channels and canals as potential linear reservoirs. Whilst this would not necessarily be considered as an eccentric proposition their role in supporting public water supply could not be delivered.

The primary function of rivers and drainage channels is to convey water, which both controls flood risk and enables vast areas of land to be developed and agricultural production sustained.

Elevating water levels in these waterways, only feasible in low-lying flat gradient areas, would inevitably increase flood risk and adversely impact on land use. Over many years in those channels the trend has been to retain higher water levels, in rivers to facilitate navigation, in drainage channels to maintain higher water tables commensurate with modern farming practice. These levels established very much taken into account the flood risk implications. The water 'stored' to meet these operational needs, even if it could be utilised, would provide a relatively small quantity, set against daily consumption, and would certainly not prevent the need for restrictions. Against what would be a marginal benefit, the means of feeding this water into the treatment and supply system may prove impossible.

In lowland rivers and drainage channels where water can, and indeed is stored /retained for operational reasons, the drawing down of that level is severely restricted by the need to retain bank stability and to protect the important aquatic habitats.

The solution to the drought in 1976 was the appointment in September of Dennis Howells MP as Minister of Drought, a day later it started raining, and an extremely wet autumn followed. Don't question the power of the politician.

David Noble



DESIGN.

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- Provision of high value technical support to local authorities who will be assuming the SuDS Approving Body (SAB) role.



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Protecting Property



FloodSax® wins award to help it go global

THE pioneering FloodSax® and BlastSax® have scooped an award to explore export markets worldwide.

Environmental Defence Systems came second in a high profile regional competition promoting export innovation amongst regional small and medium enterprises.

The win means that EDS can use UK Trade & Investment (UKTI) overseas services to the value of £3,000 along with two UKTI grants for overseas travel to target markets.

EDS managing director Richard Bailey said: "We have two global products that are ideal for global markets. "Despite the huge budget cuts Governments face worldwide, they remain committed to tackling both terrorism and

global warming and the FloodSax® and BlastSax® hit those two core markets.

The top three firms were among nine finalists who went head-to-head to pitch their export idea to an audience of influential business leaders and an expert judging panel at Harewood House near Leeds. The audience chose their top three using an electronic voting system before the judges – UKTI's Mark Robson, HSBC's Simon Bates, PwC's Andrew Devonald, and Colin Glass from WGN – led a final round of questions to determine the overall winner.

Mark Robson, UKTI International Trade Director for Yorkshire and the Humber, said: "The standard of entries was incredibly high and the creativity and innovation of all

the ideas was fantastic. Exporting is crucial for firms to sustain their business and grow which is why we urge all regional SMEs to take advantage of the support and opportunities out there."

Arif Ahmad, PwC partner and head of private business in Yorkshire added: "We've been really impressed with energy, enthusiasm and ambition shown by all the finalists.

"With export growth being critical to the government's desire to rebalance the economy, these businesses have demonstrated that, with the right offering and focus, there are unlimited opportunities that exist globally for their products and services."

Property-Level Flood Protection Scheme Officially Opened

The Bin Brook Individual Property Protection Scheme was officially opened last Friday (30 March) by the Chair of the Regional Flood and Coastal Committee, Steve Wheatley, and officers of the Environment Agency.

The measures installed included door barriers, air brick covers, non-return valves, toilet bungs, sealing around service pipes and waterproofing of walls to a total of 26 properties. The total cost of the scheme was approximately £96,000, funded by a £54,000 government grant and added to by Local Levy funding and £14,500 of residents contributions.

Steve Wheatley commented: "The Committee are very supportive of schemes like this to install flood resistance measures to individual properties. It's just a year since the first drop-in meeting was held to introduce the proposed scheme to the local community and it's now a reality."

"For schemes like this it is important to work with local people and it has greatly helped to have, working alongside us, the local flood group from the Gough Way Residents Association, who have been instrumental in the smooth implementation of the scheme. I am pleased that this hard work is continuing in the development of a local community flood plan, as it is vital that residents remain prepared for flooding and are able to respond to flood warnings given by the Environment Agency." "I congratulate everyone involved for the successful completion of this scheme."

20 local residents and guests, including Cambridgeshire County Councillor Ian Bates, both members of the Regional Flood and Coastal committee, attended the opening and were given demonstrations of the new flood protection measures installed in local properties.

A new flood insurance solution gets mixed views

A new insurance solution, Project Noah, is set to launch this Summer to help homeowners obtain insurance cover on flood risk properties.

What is Project Noah? 'Project Noah' is a new flood risk reinsurance pool created by broker and risk management firm Marsh UK and reinsurance intermediary service provider Guy Carpenter, together with the Landmark Information Group, who provide digital mapping and land data intelligence.

Project Noah claims that through its modelling system, it can identify and calculate the flood risk of every residential property in the UK, which will enable a more targeted approach to flood defense investment.

The Aims
The aim of Project Noah is to reduce the risk on insurers by allowing them to transfer their residential flood risk policies into the international reinsurance market. Insurers would pool their residential flood exposure across low and high-risk areas, limiting the scope for big payouts, and making the risk attractive to reinsurers for the first time. By reducing the flood risk element in household insurance policies, insurers will be able offer competitive and fairly priced cover, even to properties with a high flood risk.

Hutton Swinglehurst, head of flood risk for Marsh UK, said: "The provision of cost-effective home insurance for homes in areas exposed to flooding is a major challenge for the UK's

insurance industry."

"We have tested Project Noah with some of the UK's largest insurers, as well as leading global reinsurers, who believe that this state-of-the-art model provides an innovative solution to an intractable problem."

"We have the capacity available and pledged by the reinsurance companies, and we believe we have a critical mass of leading insurers to get going."

However, this week, British insurers cast doubt over the plan saying that it lacks industry support and will probably require taxpayer funding to work effectively.

The Association of British Insurers, who are currently in talks with the government about a rival pooling

scheme that would include a taxpayer guarantee, said that Project Noah, could still require funding from the public purse.

"We are not aware of an insurer who actually supports it, so we are sceptical," said an ABI spokesperson

However, DEFRA, who will be spending nearly £2.2 billion on flood defences between 2011 and 2015, came out in favour and welcomed the Marsh scheme.

"Industry-led solutions that allow insurers to compete even for the highest-risk homes, without government intervention in the market, would give the best value for taxpayers' money," a spokeswoman said.

News from the National Flood Forum

Supporting and Representing Flood Risk Communities

NFF Conference, 7th March 2012

Over 190 delegates attended the conference, from England, Scotland and Wales. Community groups mixed with insurance executives and brokers, EA delegates with university professors, flood product suppliers with councillors, MPs and the Minister for flooding, Richard Benyon.

The conference was divided into three sessions: Community perspectives: Views from some of the key institutions: What the politicians have to say. In between were workshop sessions on Property level protection, Community Flood Group insurance, A fair Insurance Industry, Local FRM strategies, the value of Flood groups, Insurance models and Partnership funding!



The full conference report can be found on the NFF website: www.floodforum.org.uk

Social Justice in Insurance – the Joseph Rowntree Foundation view

John and Martin O'Neill from JRF launched their Viewpoint document on "Social Justice and the Future of Flood Insurance" at the Conference. This examined two approaches to insurance 'individualistic, risk-sensitive' insurance and 'solidaristic, risk-insensitive' insurance. They looked at different concepts of fairness in setting Insurance costs – 'pure actuarial fairness', 'choice sensitive fairness' and 'fairness as social justice'. They concluded that 'pure actuarial fairness' – where insurance costs directly reflect risk levels - does not provide a compelling approach for flood insurance.

♦ **This is the competitive free-market model which seems to be strongly favoured by government.**

JRF argued that "fairness as social justice" required a more solidaristic flood insurance regime, stating that "the purely market based alternative threatens to leave many thousands of properties uninsurable, leading to extensive social blight". They concluded "If the UK flood insurance regime moves further towards a free market, it will be at the expense of fairness and social justice."

Views from the Communities

We were fortunate to have four community representatives speaking at the Conference.

Heather Shepherd of NFF talked about listening to communities, particularly on issues such as building in the flood plain. Her message on insurance was that it must be affordable and available, so that lenders would give mortgages and homes would stay sellable. On the new partnership funding, Heather warned that rural communities could lose out in the battle for funds.

Phiala Mehring of Loddon Valley Residents – which she described as a pre-emptive flood group, set up and working to prevent flooding. She outlined the importance of working in partnership. LVRA meets every 10 weeks with council, water company and others as the Wokingham Flood Partnership, to get things done. She reported that Insurance premiums of £2000 – 5000 were now common in their area, leading to a threat of "Insurance Poverty" like fuel poverty.

Philip Wright (Scottish Flood Forum) told how the SFF had been set up in 2008 with Paul Hendy seconded from the NFF and funding from the Scottish Government. The SFF would become an independent charity this year, but retaining strong links to the NFF. He outlined

some of the differences in legislation and practice between Scotland and England and described how they were carrying out a study to see how community-inspired action to mitigate flood risk could reduce the cost of flooding to Scotland.

Michael Sol Owen (Pwllheli Flood Project) described how the town had produced the Pwllheli Pilot Flood Climate Change Adaptation Strategy. His role as Community Flooding Ambassador had been to forge an informal link between the authorities



Heather Shepherd (NFF) and Phiala Mehring (Loddon Valley RA) at the NFF Conference

NFF puts consensus views to Defra and HM Treasury

Paul Cobbing and Charles Tucker attended a stakeholder forum with Defra/HMT on 23rd March, to hear an update on government work on flood insurance. The meeting reinforced the view that government plans to do very little to shape the market for flood insurance, seeing their role mainly as smoothing the transition to a free market.

We believe that this will allow prices to rocket, lead to injustice on a growing scale and produce future blight, so Charles presented a note to the meeting representing the consensus view of the NFF, Morpeth and Joseph Rowntree. It was also endorsed at the meeting by Matt Cullen of ABI. This called for government to adopt the Morpeth/Oxera model, funded by a contribution from all household policy holders.

□ With all the warnings about social injustice and future blight arising from a free market, we firmly believe that Government must find a way to adopt this, or a similar, model. The consensus note is printed on page 5. Government will announce its decision "in the Spring".

... while working together

Paul Cobbing is working closely with Defra and the Treasury on proposals to help reduce insurance problems, such as a dedicated insurance phone-line, run by the NFF. We're proposing to work on community pilots to test out new ideas for flood risk management; and finding ways to ensure that those on the lowest incomes have access to affordable insurance.

□PLP and insurance

Defra has given the National Flood Forum a grant to investigate the extent to which Property Level Protection of homes makes it easier to get household insurance or to get lower premiums or reduced excesses. We will be undertaking a survey and following that up with some more in depth interviews – more details in the next bulletin or see our website for more details in the next week.

□ If you have had property level protection fitted you can really help this work. We would love to hear from you. Please contact Chris Wright on 01743 741725 or chris.wright@floodforum.org.uk

Working with the EA

The Environment Agency has provided a grant for the NFF to research the financial value of the market in Property Level Protection measures, looking at scale of demand and projected growth in supply. Contact Paul Cobbing paul.cobbing@floodforum.org.uk for more information

Want to protect your home or small business from flooding? Ask the NFF!

Phone Amanda on 01299 403055 or Heather on 01743 741725.

White Cart Water

Flood Prevention Scheme

Normally a shallow river, the White Cart Water is prone to flash flooding. As little as 12 hours of rain can cause water levels to rise by up to six metres with the potential to turn the river into a raging torrent as it gathers momentum downstream towards the vulnerable suburbs of the city.

Iain Macnab, Glasgow City Council
Alan McGowan, Halcrow

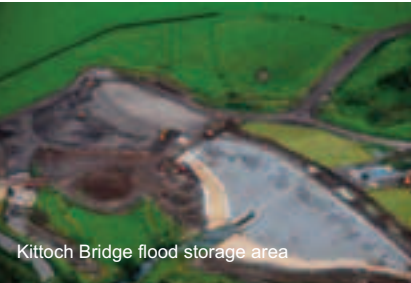
Client:
Glasgow City Council

Consulting Engineers: Halcrow

Contractors:
Volker Stevin - Urban flood defences
Carillion - Flood Storage areas

White Cart - A brief history

- Over 20 significant floods since 1908
- 1984 – over 500 homes flooded twice in 12 days
- 1990 – Severe flooding
- 1994 – River burst it's banks
- 1999 – Severe flooding
- 2006 – Flood scheme approved
- 2011 – Scheme fully operational



The Scheme

White Cart is Scotland's largest completed flood prevention scheme and provides protection from an up to a 1: 200 year storm. It has reduced the risk of flooding for around 1,750 homes and businesses as well as providing an improved wildlife habitat.

The total cost of scheme was £53 million and includes the worlds largest hydro-brake, at 8m long and 6m high.

The scheme was divided into two parts:

Flood Water Storage

Construction of the 3 flood storage areas began in 2008 after 33 possible locations were reduced down to the final 3; Blackhouse (Earn Water), Kirkland Bridge (White Cart Water) and Kittoch Bridge (Kittoch Water). The storage areas were formed by constructing earth embankments across the river valley. The river passes through the embankment in a reinforced concrete culvert which contains a vortex flow control limiting the volume of water that can pass through the culvert with the excess water being held back in the storage areas. Together the three flood storage areas have the capability to hold back more than 2.6 million cubic metres of flood water. Each dam is capable of storing over 0.7M cubic metres of water, with the largest storing 1.1M cubic metres,

Water is then released downstream at a controlled rate so that it does not overspill the new flood defences protecting the city.

Flood Defences

The construction of the defences began in January 2009 and was completed in October 2011. It comprised the construction of approximately 4.5km of flood defence walls and embankments together with the raising of two footbridges and the construction of six underground pumping stations. The design philosophy was to make sure that all accessible parts of the river were not severed by high flood fence walls and with an average height of 0.85m above ground level, this has been comfortably achieved. Particular attention was paid to the alignment of the flood defence wall and where possible the alignment sought to maximise the retention of the natural flood plain and follow existing boundary walls and features to avoid the reduction in size of private gardens.

Active Consultation

The project has involved active consultation and participation of a range of stakeholders from affected land owners to the general public and various statutory and non statutory consultees. Through one-to-one discussions, workshops and an extensive public exhibition, the views and opinions of affected parties were obtained and, where appropriate, incorporated within the final design. Stakeholders were kept fully informed of the development and progress of the project through the distribution of regular newsletters, meetings

Environmental Consideration

The development of engineering designs for the scheme were complemented by the creation of an environmental working group (EWG) comprising stakeholders from the Scottish Environment Protection Agency, Scottish Natural Heritage, Scottish Water, local angling/ fisheries groups and the Royal Society for the Protection of Birds as well as environmental professionals from the three local authorities involved. The establishment of the EWG was a unique approach and an early example of effective collaborative working. The work of the EWG helped to minimise the environmental impact of the scheme, and, where possible, to enhance the natural environment and assist in developing a sustainable flood prevention scheme.

Upstream water storage to hold back the water during storm events would enable downstream flood defences along the river in the urban areas to be reduced in height and length. This reduction in height and length has significant benefits not only in engineering terms but more importantly in the associated visual and environmental impact. High walls would have created a barrier between the river and its wildlife and those that live and work alongside.

The dams and culverts have been designed to ensure they do not prevent the movement of fish and mammals up or downstream. The base of the culverts incorporate baffles and boulders to ensure a varied flow pattern and to retain a minimum depth of water for fish passage in low flows.

The flood storage areas were used to enhance biodiversity through the creation of artificial wildlife habitats, woodland, scrub, and over 90,000 m2 of species-rich wet grasslands, shallow scrapes and ponds.

Wildlife

The scheme has been responsible for new habitat creation. The wet grassland at Kirkland with its pond and scrapes, has proven popular with a wide variety of different birds including swallows, sand martins, various geese species, plover, oystercatcher and lapwings. As well as species which are less common in the UK, as a whole, but which are flourishing along the White Cart. These include the dipper, kingfishers and grey wagtails. An artificial sand martin wall, with nest tunnels provided, was built at Kirkland Bridge and has been successful in encouraging the sand martins back to the area. Artificial otter holts were constructed attracting otters and bat boxes and Dipper nesting boxes have also been extremely effective.

and the creation of a dedicated project website. The concerns of the affected stakeholders primarily related to the visual impact of the flood storage areas, traffic impacts and also the impact on the local ecology and water environment. Despite the size and scope of the project, only limited objections were received, all of which were subsequently resolved through discussion without the need for a Public Local Inquiry, a first for a flood prevention scheme of this size.

Scheme Awards

The scheme has recieved several awards as well as being in the running for one more.

An award was also made to the urban flood defence contractors.

CEEQUAL Awards

The scheme has received two Excellent CEEQUAL awards; one for the storage areas and one for the urban defences

Saltire Awards

Commendation in the Saltire Awards 2011

Considerate Contractor

VolkerStevin received a Silver and Bronze Considerate Constructors Scheme 2011 National Award

Waterways Renaissance Awards

The scheme has been shortlisted and is a finalist in this years Waterways Renaissance Awards

An immediate test - *Passed*

Just four weeks after the White Cart Flood Prevention Scheme had its official inauguration, the new flood defences successfully held back rising water and helped protect hundreds of homes and businesses within Glasgow.

Heavy rain and wind at the end of November 2011 caused flooding across many parts of Scotland. Officials at Glasgow City Council said that all the defences were monitored throughout the flood threat and they worked extremely well during the storm.

It is estimated that nearly £11 million of flood damage would have been inflicted on homes and businesses in the south side of the city without these new defences.

Gordon Matheson, Leader of Glasgow City Council, said: *"This was a major test for these new flood defences since its inauguration and they have passed with flying colours.*

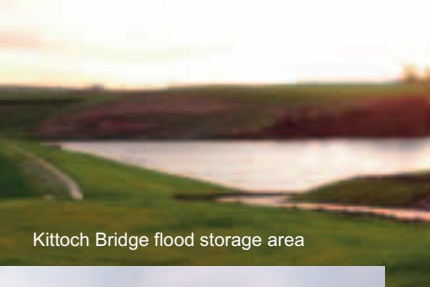
"This was a major investment and commitment by the council to protect homes within the south side of the city. I am sure that these new defence have brought huge comfort to local Glasgow residents and businesses that heavy rains now won't cause havoc and flooding to their properties."

During the last days of November, the three reservoirs held a total of 237 million gallons of flood water, the same amount as approximately 350 Olympic-size swimming pools – which is about 43% of the total storage volume.

Pictures taken during the November 2011 flood event, demonstrating the effectiveness of the holding areas.



Kirkland Bridge flood storage area



Kittoch Bridge flood storage area



Blackhouse flood storage area

The World's largest Hydro-Brakes

The Hydro-Brake® Flow Controls were installed into three dams, they are designed to hold back water in three flood storage areas upstream of Glasgow, which together have the capability to hold back millions of gallons of floodwater generated by extreme rainfall.



Manufacturer **Hydro International** had to pioneer new manufacturing and installation techniques to construct the eight-metre long, six metre-high, cone-shaped Hydro-Brake® Flow Controls which were positioned in dams at Blackhouse and Kittoch. A further three Hydro-Brake® Flow Controls were installed in the dam at Kirkland Bridge. The hydro-brakes have a combined stainless steel weight of more than 60 tonnes and all five are the biggest ever produced.

Since Hydro International developed and pioneered the Hydro-Brake® Flow Control's unique vortex technology 30 years ago, it has become an industry-standard method of flow attenuation. Most frequently used in much smaller dimensions as part of urban surface water drainage designs, the Hydro-Brake® Flow Control's internal geometry is designed to enable water to flow through unrestricted for as long as possible. A self-activating vortex is created when the water reaches a pre-determined height, for example in a flood situation, holding back the water, and releasing it at a measured, controlled rate.



Hydro
International



Would the real
Hydro-Brake® please step forward

Hydro-Brake Optimum™ Flow Control

There is no equivalent.

Optimum Hydraulics
Tailored hydraulic response curves.

Optimum Value
Increased efficiency; can reduce on-site storage requirements by up to 15% in comparison with other vortex flow control devices.

Optimum Flexibility
Now with the additional option of post-installation flow rate adjustment of up to 20%.

Optimum Installation
A wide range of installation options and accessories available.

For further information call the Hydro-Brake® hotline: 01275 337937 or visit www.hydro-int.com

Flood Barriers Feature

Bewdley: courtesy of IBS Engineering.

Non-Permanent Flood Protection Systems



Fola Ogunyoye

Fola is a Technical Director at Royal Haskoning with over 20 years of experience in the management of water, flood and coastal risk. His unique blend of experience as a consultant, researcher, operations manager and contractor enables him to develop innovative, yet pragmatic solutions and guidance to the challenges at the interface between flood risk, people and the environment.

Fola has a wealth of experience in non-permanent flood protection systems and is the lead author of key industry best practice guidance in the area, including, **The Temporary and Demountable Flood Defence Guide (Environment Agency, 2011)** and **PAS 1188 for Flood Protection Products (BSI, 2009)**.

Non-permanent flood protection has been around for decades in the form of filled containers such as sand bags, part pre-installed demountable barriers such as stop logs and fully pre-installed demountable barriers such as flood gates. The last few decades has seen a significant increase of innovation in non-permanent flood protection products across Europe and the USA, at property level and strategic scales. Significant use within the UK only commenced in the past 10 years, with no recorded use during the April 1998 flood event, and very little use during the autumn 2000 floods. An increase in their deployment in the UK was noticed during the summer 2007 and more recent flood events.

Non-permanent flood protection such as the more strategic temporary and demountable flood protection systems and Property Level Flood Protection (PLP) measures provide the opportunity to reduce flood risk where permanent measures are not technically feasible, environmentally acceptable, economically viable or financially affordable. Non-permanent solutions are sometimes the only feasible structural solutions to reduce flood risk where some level of flexibility is required that cannot be provided by permanent solutions, such as managing dual use of the same space for flood protection and access.

Temporary and demountable flood defences and PLP now form part of the portfolio of measures that the UK government promotes to manage future flood and coastal erosion (FCERM) risk. This is backed in England by Defra's Making Space for Water and the National FCERM Strategy for England.

The Environment Agency carried out a number of tests and trials on temporary flood products over the past 10 years, including the major trials on the Upper Severn between 2002 and 2004. In the past few years Defra has provided over £5 million grant to fund PLP measures as part of its PLP grant pilot scheme. Following these and other R&D outputs confirming the cost effectiveness of PLP for properties with high probability of flooding, Defra has now allowed for PLP to be considered alongside other FCERM measures within its new Flood and Coastal Resilience Partnership Funding Policy. This provides additional incentive for using PLP for appropriate sites.

There are four typical types of non-permanent flood protection systems:

- **Temporary Barriers** are barriers which are completely deployed when flooding is forecast and completely removed afterwards

- **Demountable systems**, are part or fully pre-installed, but requiring some operation (automatic or manual) when flood is forecast

- **Building skirt systems** are used to completely surround individual buildings

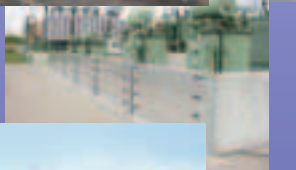
- **Building aperture barriers** seal gaps within buildings such as doorways and air bricks when flood is forecast. Closure of building aperture barriers can manual or automatic.

Compared to permanent defences, there is an additional operational risk of non-closure before flood water reaches the lowest level of natural or permanent defence. For those requiring manual installation, there is a need to receive flood alert in time to enable erection and/or closure. This in turn requires a reliable forecast or detection system, some alerting mechanism, someone to receive and act on the alert with sufficient lead time before flood water arrives. For automatic systems such as flap valves or mechanical/electrical products, there is no reliance on alert, except to check that automatic action can occur / has occurred. The particular closure action still needs to occur and can be prevented by some form of blockage, malfunction or loss of power (electrical products).

In the case of PLP, the process of sealing a building against water entry effectively turns it into a retaining wall. Current UK guidance suggests the need for structural designs or checks where property level flood resistance is proposed to resist a depth of more than 600mm to prevent structural damage. Where there are full length flood resistance products such as flood doors, it is important that water is allowed to weir over at 600mm or some other designed depth.

Addressing operational reliability and PLP structural safety issues paves the way for non-permanent flood protection systems to revolutionise extreme flood risk management. They come in a wide range of forms. Flexible ones enable non-standard applications, while strong/rigid ones exist for high impact uses. Automatic ones are particularly useful for fast catchments where lead times from forecast, if any, are very short, while fully installed ones that only require manual closure can help reduce deployment time, resources, equipment and access requirements. Various product types have their strengths and publications such as the temporary and demountable flood defence guide can support the selection of appropriate systems. Products with Kitemarks such as from BSI also give some confidence that they have passed conformance testing, and their ongoing quality is being monitored.

Fola Ogunyoye



Temporary Barriers

Where permanent or demountable flood protection systems are unable to provide the full protection required for an area, flood protection systems which require full installation prior to the onset of flooding and complete removal after the event may be required.

There are various reasons why temporary measures may be preferable:

- Can not economically justify a permanent or demountable system.
- Stopgap during development and construction of a permanent or demountable system.
- Dual use of function such as the need for access through a flood protection system.
- Unacceptable environmental impact of a permanent protection.

A big advantage of these barrier types is the speed and flexibility with which they can be deployed. They range from straight forward sandbags to large hollow walls. Although traditional sand-filled bags are now being replaced with better alternatives. Temporary barriers, because they are moved in their entirety need to be lightweight and also ideally compact for storage. They can be stored either on or off site and transported quickly to wherever they might be required. The barriers are often held in place by the weight of the water and therefore require no fixing, meaning that they can be used on all surfaces.

They can also be used in conjunction with permanent pillars or ground fixings for pre-defined flood risk sites.



Floodsax

Following a £250,000 claim for flood damage, the following renewal CoGri found themselves refused any flood insurance cover.

However, when torrential floodwaters hit them once again, they were prepared for it. Just 30 FloodSax® protected £360,000 worth of equipment

Twenty FloodSax® fit into a cardboard box so can be ready for action anytime, any place, anywhere unlike sandbags that need vast warehouse storage space, are heavy and expensive

'Just add water!'



to shift involving health and safety issues and specialist manual handling techniques and require huge manpower and lorries to get them to the scene.

Landrover - Designed to cope in floods!unfortunately the showrooms are not!

One of Scotland's premier Land Rover dealerships, Frank Ogg & Son of Elgin, was flooded in 2001 at a cost of £500,000 and has been refused flood insurance cover ever since.

Local flood defences were not sufficient to provide the level of protection required to prevent extreme flooding events and so the dealership had to take responsibility into their own hands. They needed a protection system that was fully removeable due to the nature of the location and access requirements. It also had to be a system that could be stored on site and erected with the minimum of training, effort and time. RapiDam fitted the bill!

"If a flood happened to us again, that would be it," says Mr Ogg. "We needed a flood protection system that is fast and easy to set up and we chose RapiDam. In our first flood alert after installation, it took just 20 minutes to erect. RapiDam did exactly what they said it would. I'm impressed."



For known locations a concrete beam is fixed into position for the RapiDam Bolt Down system to be secured to



RAPIDAM is a lightweight, easy to store and very quick to install, flood defence barrier. It can be erected instantly and installation is simple and straight forward. It is ideal for locations when there are no mounting positions for fixed or part-fixed barriers.

A 100m long 1m high barrier is compact enough to fit onto the purpose built RapiDam Handling Unit (RHU) that could be stored in a nearby "lock-up" and easily towed behind a small vehicle.

For known locations a concrete beam is fixed into position for the RapiDam Bolt Down system to be secured to. This connection on the leading edge of the RapiDam apron is to prevent any sliding motion when the flood waters initially rise up. Once a head of water is on the apron it will anchor the barrier to the ground and seal any leak paths caused by the undulating surface.

For soft surfaces or more temporary installations the RapiDam Free Standing unit can be deployed and simply secured into place with earth anchors, sandbags or fixings to any street furniture.

Indeed a section of 0.5m high barrier 30m long can be

manhandled by a single person and swiftly laid out and erected to prevent flash flooding at a moments' notice. A great asset for any local council, highways agency of fire service we would have thought as it is so much simpler, faster and lighter than placing sandbags everywhere.

Rapidam has been used in many places across the UK with many in Scotland at Eyemouth harbour (to prevent a high tide from disrupting the harbour front), Murrayfield (where it is used to block the water passage through a tunnel) and with Ogg & Son in Elgin.

Not only is Rapidam fast and versatile to install but it is also the most cost effective temporary barrier available in the UK.

Call us to see how we can assist with your flooding issues, whether it be a commercial/business/retail park, the curtilage of a factory/warehouse or a large detached property.

Rapidam is one of many solutions Revetment can offer that include in-situ (lift-up, drop down or gated) products as well as permanent glass-wall barriers.

Why Passive Defences Represent the Future of Flood Protection

As flooding is becoming an increasingly frequent global issue – resulting from a number of factors including climate change – it is essential to put in place effective solutions that protect communities, and properties, from the devastating effects. However, despite all the current protective measures that can be deployed, **Frank Kelly, CEO of UK Flood Barriers**, explains why it is vital that the market evolves with purely passive flood defences at the helm to ensure that every eventuality is safely and effectively catered for.

Recent research from the Environment Agency, which has backed-up the earlier released Defra report, as well as a number of other international studies, has concluded that flooding is going to become a more frequent, and more devastating, part of life as a result of global warming. As such, it's imperative that people listen, stand-up and take action now, to ensure that homes, infrastructures and lives are all protected from the full potential of the natural disaster.

There is undoubtedly many defensive options available, all of which have served their purpose in the past, but as floods are expected to reach new extremes, it's

imperative that they evolve to be able to withstand external forces. Immense pressures they will be placed under include not only fast-flowing flood waters but, also survive heavy impacts from floating debris such as trees, which will undoubtedly happen as a consequence of extreme weather conditions.

But, what is equally important is that these defences are able to perform their job at a moment's notice. Flash floods are responsible for the large majority of flood related insurance claims in this country and can wreak havoc in a very short period of time – night or day. Should flooding occur when people are asleep for example, reactive defences that require human interaction to erect are, by and large, pointless. Further to this, in extreme flooding situations, erecting these defences can put lives in serious danger.

These two points can however be avoided, simply, with passive defences. This is what we see the future of flood defences to be as they are, under normal conditions, entrenched in the ground but, when approaching water starts to fill the trench, it causes a floating wall to rise, thus blocking the flood in its tracks and preventing damage to the

property or community they are protecting. As they require no human interaction to deploy, it doesn't matter what time of day flooding strikes, they don't place human life at risk.

As passive defences for communities, such as our SCFB™ (part of the Self Closing Flood Barrier range) are effectively buried in the ground when not in use, they also don't interrupt the aesthetic appeal of the location where they are installed – an important factor for the residents, and at times the local economy, of the at risk communities. National heritage or tourist sites certainly don't want to risk driving tourists away with unsightly defences. Previously this was a catch 22 situation – protect the community or damage the local economy – with passive defences, it needn't even be a consideration as they're practically invisible when not deployed.

We invest heavily in research and development to ensure that our products remain at the top of their game and give communities peace of mind that they, and their properties and businesses, are continually safe from flooding.

As such, UKFB is a global ambassador for passive defences and is taking control and driving the industry forward through these innovative defences in order to provide the most effective solutions to guarantee flood protection. We want to educate the world about the growing risk of flooding to ensure that at-risk communities, properties and vital infrastructures are always safe from the social and financial effects of flooding – from small, localised flash floods through to potentially devastating tsunamis.

The UK may have experienced one of the warmest March's since records began and despite some parts of the country being imposed with a hosepipe ban, this represents one side of the consequences of global warming. The other is more frequent, more severe flooding, as witnessed this April, and to avoid damage to vital infrastructures, communities, business and the loss of human life, we all need to be prepared – and the only way of being truly prepared is to install passive defence solutions.

Frank Kelly,
CEO of UK Flood Barriers

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The alternative to traditional sandbags



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FLOOD PROTECTION

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Revetment is a specialist flood protection company offering a range of solutions for critical infrastructure, government, buildings heritage sites, commercial and residential property.

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Demountable Barriers

In addition or as an alternative to permanent flood protection systems, use may have to be made of defences which remain open or have the ability to be left open during normal conditions and require part installation or operation during high water levels to form a barrier.

Reasons that a demountable flood barrier may be chosen:

- Dual use of function such as the need for access through a flood protection system.
- Unacceptable environmental impact of a permanent flood protection system.
- Management of flood risk above permanent standard of protection.

Demountable barriers are part or fully pre-installed, but requiring some operation (automatic or manual) when

flood is forecast. The big advantage is that they offer a permanent fixed solution when in place but when not required allow 'access as usual'.

The demountable flood protection system therefore includes the temporary and permanent elements, the foundations, the seals and joints within the structure, the connections between the structure and the surface or bedding layer, the end connections and fixing details.

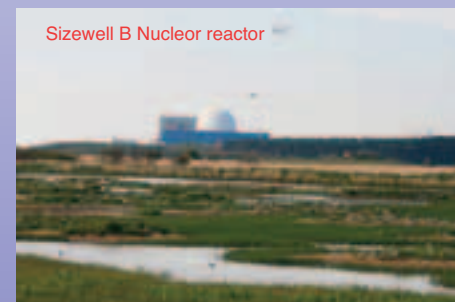
The demountable flood protection system also includes the operational procedures required to close the system such as mobilisation, installation and closure processes.

They include systems where pillars or supports are pre-fitted allowing barriers to simply slot into place. They may be hinged gates, or barriers that either drop or rise into place. There are also sliding barriers that usually operate on wheels in pre-set grooves.

Infrastructure and Flood Risk

Within England and Wales there are just over 200 operational major electricity power stations and over 400,000 substations. Of the total number of sites in England, 14% are in flood risk areas. Add to this the number of water treatment plants, the gas infrastructure and you start to get an idea as to how dependant we are on flood control measures in order to continue providing our power and clean water. A breached flood defence may result in flooding to properties, maybe hundreds of properties, but the result of flooding to a power station, water treatment works etc may impact upon hundreds of thousands of people.

Nine nuclear sites in the UK are currently sited in flood risk areas and as flood risk increases through climate change then others may also fall into that bracket.



Sizewell B Nuclear reactor

Fort Calhoun, Nebraska

The Fort Calhoun Nuclear plant was engulfed in flood waters, last June, from the Missouri, causing shut down for a prolonged period. Fortunately the plant had already been 'switched off' in the April for refueling but the floods produced some dramatic and worrying images. With advance warning of the imminent flooding, in early June, attempts made to protect the facility using a combination of sand bags and earth berms to hold back the waters. The plant had been designed to withstand a 1:500 year flood event so these were deemed as precautionary measures. As the images in the news showed the plant was engulfed by flood waters and although catastrophe was avoided in this case, the situation could have been a lot worse.



Flood waters surround the Fort Calhoun nuclear power plant in Nebraska

THE WATER STOPS HERE.

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Flood Control International supplies the widest range of flood barriers, flood gates and flood doors to the commercial, industrial and utility sectors: from simple modular barriers and flood gates through to fully automated rising or drop-down barriers.

Our 17 years' experience in the design, supply and installation of flood defences across the globe guarantees solutions that are innovative, effective, easy to operate and above all else, dependable.

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Protecting Utility Sites from flooding

by Flood Control International

The floods of 2007 highlighted the vulnerability of the UK's critical infrastructure when the Mythe Water treatment works was cut off by rising floodwaters and water supply to 350,000 people was cut off for up to 11 days. The Walham electricity substation was also effected with 42,000 people losing power for up to 24 hours.

Following on from this event a number of reviews and reports highlighted the need to protect utility sites from flooding and a number of programmes of work were commissioned which are planned to continue until 2020 and beyond. Flood Control International is fully involved in delivering these flood mitigation programmes and is working with the majority of utility companies in the UK to provide solutions. We have been providing flood protection to these sites since 2003, when our first programme of 26 electricity substations



Swing floodgate to River Intake Site

commenced. We have now delivered over 60 utility flood protection projects for water, power distribution and power generation companies, and the list is growing. Issues associated with utility sites are that they are often remote and unmanned, are visited by a variety of personnel and they must be secure. The number of sites, and their remote locations mean that they generally need to be left 'flood-safe', as there may be insufficient time to check or install flood defences once a flood alert is issued. There are two main solution types – either surrounding the entire perimeter with a concrete flood wall and gates or floodbarriers, or where this is not possible, to protect at the



Combination flood gate/ demountable barrier to wide vehicle access

building line. Where perimeter concrete walls are chosen, our unique lightweight aluminium Lift-Hinged floodgates are chosen for vehicle accesses up to 4.5m wide. These gates are chosen as they can operate over a level threshold and do not need steps or ramps to close against. Most sites need wider accesses infrequently for transformer or large plant deliveries, and so we developed a way to integrate lift hinged gates with other gates using demountable centre posts, or demountable barrier runs making openings as wide as they



Double flood door to water treatment control room

needed to be. Our gates are normally of aluminium and stainless steel construction, giving ease of use, minimal maintenance requirement and dependability. Where there is no room to swing a floodgate, we have designed floodbarriers that pivot upwards out of the way, for easy one person operation to deploy rapidly should the need occur. Smaller pedestrian gates are used where steps are allowed at thresholds. Our standard solutions here are suitable for flood depths of 1.6metres, although we have designed and supplied flood gates and flood barriers for flood depths of up to 4.5metres where required. Many utility sites do not have the space to incorporate a perimeter concrete wall. In these instances protecting the building line with tanking and duct sealing is often specified. As the condition of existing buildings, the number of cable/ service entries and condition of any foundations are often unknown, sump pumps are normally provided to discharge any floodwater that does seep into buildings to keep levels

down during a sustained flood event. Infrequently used openings are protected with lightweight aluminium demountable barriers which can be fully removed when required. Our steel flood security doors are specified where regular access is required. Our flood doors are watertight to full depth due to a unique sealing system and can be specified as 60minute fire doors. Flood Doors come with the full range of furniture options including windows, emergency escape bars and security rated fittings. The flood doors are watertight when closed, and are usually specified as always requiring key access from the outside. These features give our clients confidence that whoever has visited each site, that it will be left secure and flood-proof. In addition to protecting simple openings, we have installed complete barrier surrounds around plant items or to hatches below flood level allowing continued access in time of flood, and have linked some barriers to a building management system to identify when barriers are in place.



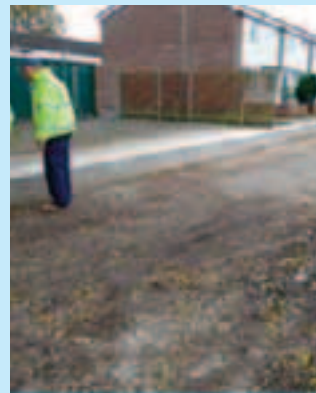
Demountable barriers to transformers



Demountable flood barrier around plant item

DEFRA's recently published Climate Change Risk Assessment states that 'The risks of flooding are projected to increase significantly across the UK in the coming years'. With increasing numbers of assets at risk, and increased flood protection requirements, our expertise in delivering the right solution for utility sites looks set to continue well into the future.

by Tim Collingwood
Flood Control International



The perfect solution for Local Authorities seeking large scale property protection

Oxford City Council protect an entire estate from flooding

After a series of floods on a Housing Estate in Oxfordshire, the most recent in 2007 which caused £250,000 worth of damage to a number of homes, Oxford City Council decided that they needed to look at a property level flood protection system.

To look at protecting individual properties would prove too costly so the other option was to look to protect the entire estate with one barrier. It couldn't be a permanent barrier as access still had to be maintained but it would need to be a system that could be deployed at a moments notice. It also needed to be easily removed and stored away when not in use.

The system chosen was Caro's **WaterWall** and 103 linear metres of barrier were duly supplied and installed.

Caro FDS Director Roger Wood commented; "We are absolutely delighted that Oxford City Homes saw our WaterWall Flood Protection System as the ideal solution to an issue which has caused distress to their local residents in the past."

"This project is just one of a growing number of installations that have been completed for Local Authorities throughout the UK and shows the variety and flexibility of the WaterWall and WaterDoor system from Caro."

If you would like further information on how the WaterWall and WaterDoor can help protect your property/premises then please call us on 01763 244446 or alternatively you can email us at info@caro.co.uk.

The Historic City of Cologne.



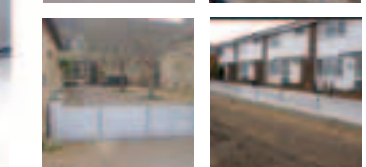
When Cologne required a flood barrier system that would be in keeping with the characteristics, beauty and quality of life of the residential areas adjacent to the river, they turned to IBS's demountable barrier system. Demountable flood defence barriers covering an area 9.3 km long in total and approx. 13,200 m2 have been implemented.

The system's mobile building parts consist of two components.

- The centre support posts, which in a flood are bolted at regular intervals to the permanent reinforced concrete substructure using tapped bushes.
- The dam beams, which interlock and seal to each other are then press-fitted vertically between the posts using a pressing tool.



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Sliding Barriers - perfect for Roads & Bridges

Sliding barriers are an excellent solution for roadways, bridges etc where there is quite a wide gap. The advantages of the sliding barrier system are:

- the ease and speed of deployment.
- slides neatly away when not in use
- no construction or fitting required when deployment is necessary
- no transportation to site required.

The barriers will be purpose built for a water-tight seal and when not in use will allow normal access for traffic/pedestrians.

Perhaps the only downside is that being permanently in situ, there has to be regular on-site checks and maintenance in order to ensure that 'when the day comes' the barrier will fulfil its function.

Damage can occur, either accidentally or deliberately and the barriers, therefore require regular maintenance checks. The sliding mechanism and seals will also need routine servicing and maintenance. Repairs and servicing may require heavy duty lifting equipment, such as a crane or hydraulic jacks and any work will generally need to be carried out in situ.



An ACE Flood Barrier

ACE Slide Flood Barriers are subtle small scale flood barriers designed for road and bridge revetment which is secured within a purpose built enclosure to prevent theft and vandalism. ACE Slide Flood Barriers are uniquely designed to slide along rails for quick deployment in flood events.

INNOVATIVE SEAL DESIGN

The design of the barrier is unique in that the seals can be easily changed without the use of lifting equipment. This is achieved by using the sliding mechanism to allow full access to the seal around the gate. This alleviates the cost of cranes at regular service intervals and makes regular maintenance on ACE Flood Barriers cheap and effortless.

ACE Slide Flood Barriers are also fitted with chamfered wheels which run in a V-shaped groove. The unique design of these ensures that the seal is only in contact with the surrounding structure when it is in the closed



'regular maintenance on ACE Flood Barriers is cheap and effortless'



position, again, improving the seal lifespan.

RAPID DEPLOYMENT

ACE Flood Barriers contain chamfered wheels which are fitted to jacking screws. This feature lifts the door clear of the frame, allowing the barriers to glide into position with minimal effort. Once deployed, the barrier seal is clamped and locked to prevent unauthorised removal, providing a virtually drop-tight seal even at full head.

ACE Flood Barriers simple and effective design has drastically reduced the resource on man hours when deploying more traditional flood methods. This was estimated in our latest installation at Jubilee Bridge at about 95% deployment efficiency. ACE Slide Flood Barriers have meant this area can now be safe from flooding in minutes.

Aquatic Control Engineering Ltd

Aquatic Control Engineering are leading UK suppliers of water flow control devices, as well as waterway maintenance machinery.

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Website: www.aquaticcontrol.co.uk



Barriers don't have to be an eye sore!

In September 2011, IBS Engineered Products Ltd was awarded a contract by main contractor VolkerStevin to design, supply and install a glass wall flood defence system for Keswick, Cumbria. The glass wall panelling forms part of the Environment Agency's £6.1 million flood risk management scheme in Keswick. The glass wall system itself is a superb demonstration of design and engineering working together. Totalling 94 sq. metres, it is the largest wall IBS Engineered Products have supplied in the UK so far and is believed to be the largest wall of its type (in terms of square metres) installed in the UK.

In this picturesque location, aesthetic considerations are paramount and thus the system had to be carefully reconciled with the need for an affordable, high-performance solution

that would protect nearby residential buildings and the areas beyond them. As well as being a permanent flood defence needing very little human interaction, the glass element of the structure will help to preserve views of the river and minimise the wall's overall impact on its environment. This last factor was a key requirement of the project brief and meant that the new wall needed to cause as little disruption as possible to the local atmosphere and the lifestyles of the people who live in and visit Keswick.

Ray Moulds, IBS Engineered Products Business Development Manager, said: "The wall is built to withstand impact loading as well as hydrostatic head and is a great example of IBS Engineered Products' ability to devise innovative yet workable solutions that meet every specific criteria of a

client's brief, whatever the challenge. Mike Harper, Environment Agency Project Manager, said: "This work is essential to reduce the risk of flooding to people and homes in Keswick, and we are pleased that these glass flood defences will complement the town whilst providing protection to homes and businesses." Stuart Eckersley, VolkerStevin contracts manager, said: "For this design and build project VolkerStevin worked closely with the Environment Agency and the local residents of Keswick to ensure that the design of the flood defence fitted in with its natural surrounding as much as possible. The innovative glass solution installed meant that views of the picturesque landscape have not been compromised and has received positive feedback from those affected by the works."



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Demountable Barriers

Temporary Barriers

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Flood Gates

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Demountable Flood Barrier



Penstocks



Flood Gates



Stop Logs



Glass Walls



Flow Control Systems

UK Flood Barriers Put All Products to the Test as Flooding is Anticipated to Only get Worse

Many reports, including the 2012 Defra report, as well as recent Environmental Agency research, have all concluded that as a consequence of global warming, flooding is going to become a lot more regular, and potentially more devastating, occurrence in the near future. As a result, it is vital that flood defences are ready and able to withstand and survive natural forces far beyond that ever witnessed in the UK and ensure the safeguard of properties, businesses vital infrastructures and of course, lives.

Extreme flood events in the UK, such as those witnessed by the residents of Cockermouth in 2009 when the Rivers Derwent and Cocker both broke their banks causing over £200 million worth of damage, are at the moment still a relatively rare occurrence. However, they are anticipated to increase as the harsh effects of global warming starts to become a reality.

Well aware of the impending increase in threat, to guarantee that all its products not only meet, but exceed even its very own high expectations, leading provider of sustainable, passive flood solutions, UK Flood Barriers (UKFB) continually

invests in cutting-edge research and development to help it create the most innovative and effective passive defences currently available on the market.

To ensure the ongoing evolution of its products, UKFB has established a separate group company, Environmental Enterprises, in Droitwich, Worcestershire, which is home to an unique, exclusive state-of-the-art, BSI approved, flood testing centre. Here it is able to scientifically examine the boundaries and limitations of existing and prototype flood defences in a controlled flood environment, giving them first mover advantage in designing, developing and launching new innovative, patented products that are built to withstand high-level impacts, fast-flowing flood water and, the test of time. It's testing also ensures that its products meet a high specification in terms of sustainability and impact on the environment.

Through this leading-edge facility, and as a result of it acquiring the sole distribution rights to many existing flood defence technologies, UKFB now offers an expansive and pioneering range of solutions – both of a passive and

reactive nature. Whilst reactive solutions require some human intervention to operate, its new product development strategy is to concentrate on the extension of its passive products which are activated by the power of the flood water, requiring no manual deployment and with minimal operational costs.

Frank Kelly, CEO of UK Flood Barriers, commented: "Testing is a vital element of launching any product, no matter what the industry is but, none more-so than when peoples' lives are concerned. As many recent global catastrophes have highlighted, flooding can be unpredictable and the effects difficult to forecast, so we don't want anyone unnecessarily putting their lives at risk erecting defences. As such, we're putting much of our focus on the development of innovative, passive, technology. Through our testing facility, we're able to take control of flood defence and continually adapt and improve our products to suit new markets and environmental situations."

For more information about UK Flood Barriers, please visit www.ukfloodbarriers.co.uk.

Although they can't be classed as temporary, we finish with a couple of images of the 2 largest moveable barriers in the world:

The Oosterscheldekering, in Holland is the worlds largest at 9km in length. It was initially designed, and partly built, as a closed dam, but after public protest huge sluice-gate-type doors were installed in the remaining four kilometres. These doors are normally open, but can be closed under adverse weather conditions.



The Thames Barrier is the world's second-largest movable flood barrier. It needs to be raised (closed) only during high tide; at ebb tide it can be lowered to release the water that backs up behind it.





Turbo installation for Ridgistorm-XL

A Bespoke stormwater solution



Polypipe, the UK's leading manufacturer of plastic sustainable drainage and water management products, has seen its Ridgistorm-XL large diameter pipe utilised as a below ground water attenuation tank, designed specifically to supply water to a fire sprinkler system in West Yorkshire.

This application is a first of its kind for the market-leading Ridgistorm-XL system with the installation being carried out by main contractors Shanco Construction at Turbo Technologies in Huddersfield.

Ridgistorm-XL was specified for the project due to the flexibility of the system's design and Polypipe's expert water management solutions teams' ability to pre-fabricate vital inspection points into the tank design.

Manufactured at Polypipe's own water management solutions in-house fabrications department utilising 135m of 2.1m diameter pipe, the tank was designed to exact specification, including a series of pre-fabricated fittings including two T-junctions and six elbows featuring turrets.

"The site constraints during this particular project threw up some interesting challenges for us," comments Declan Armour at Shanco Construction. "As the tank was installed on a live site with a construction footprint of just 700m², speed of installation was essential in order to negate any potential health and safety risks associated with prolonged

installation. However, the light-weight nature of the plastic pipes and the use of pre-fabricated fittings ensured that installation occurred quickly and with minimal disruption."

Polypipe's water management solutions technical team were able to carry out structural calculations to value engineer the project, determining that a stiffness classification of 1kN2 would be suitable for the tank. Shanco's installation team were also trained in how to joint the pipes on-site using Polypipe's electro-fusion welding technology, which further contributed to the speed of installation.

Emma Thompson, Marketing Communications Manager at Polypipe, comments: "The adaptability of our Ridgistorm-XL large diameter pipe system enables us to create bespoke solutions to many applications. This project is a great example of the capabilities and performance of the product.

"Direct benefits to Shanco Construction on-site included speed of installation and improved health and safety benefits when handling the product. Further to this, there was a reduced need for heavy plant on-site for the installation, bringing further cost and time savings."

More information on Polypipe's Ridgistorm-XL large diameter pipe system can be found at www.polypipe.com/wms or by calling 01509 615 100

A New Standard in Vortex Flow Control



Hydro International is launching the Hydro Brake OptimumTM, a new flow control that represents a major advance in vortex technology. Hydro Brake OptimumTM promises to set new performance standards and achieve significant construction cost savings.

The Hydro-Brake OptimumTM dispenses with the need to choose from a range of sizes and types and instead offers built-in flexibility to size each unit for absolute fit. From now on, one type of Hydro-Brake®, the Hydro-Brake OptimumTM, will perfectly balance flow rates and surface water storage requirements to suit each drainage project without approximation.

Hydro's existing range of Hydro-Brake® Flow Controls already provides significant savings in surface water storage over conventional flow controls. Now the Hydro-Brake Optimum™ offers up to a further 15% saving when compared to other vortex flow control devices.

By saving on surface water storage, Hydro-Brake OptimumTM therefore promises outstanding savings in excavation costs and frees up more land for building to maximise the developers' Return on Investment.

"Hydro International first pioneered vortex flow controls in the 1980s and has been advancing the technology ever since," said Alex Stephenson, Director of Hydro's UK Stormwater Division. "It's no secret that other

products on the market are based on Hydro technology. With Hydro-Brake OptimumTM we have set the next generation performance standard.

"In future it will be particularly important for designers and contractors to realise that there is no direct equivalent to the new Hydro-Brake OptimumTM. It can be tempting for a contractor to try to change from the specified flow control, but in the case of Hydro-Brake OptimumTM this would result in a change of the engineered performance and could render the designer or contractor liable for a design failure."

The ultimate flexibility in Hydro-Brake OptimumTM unit sizing enables fine-tuning according to the site priorities. For example, it may be important to maximise hydraulic performance or to choose a more compact design to account for site constraints such as pipe diameter or for chamber retrofit.

New adjustable inlet plates are available to provide up to 20% alteration in the forward flow rate, to provide clients with the option of future-proofing against climate change or site-modifications. The new Hydro-Brake OptimumTM also offers up to 20% larger clearances than other vortex flow controls leading to a reduced risk of blockage. Manufactured out of high grade Stainless Steel, Hydro-Brake OptimumTM is able to withstand the forces of even the most

intense storm event without deforming.

Hydro has increased the range of time-saving installation options including, lugs, push-fit spigots, flat or curved mounting plates, penstock or slide mounts and removable units. The Hydro-Brake OptimumTM is also available pre-fitted to a purpose-built precast reinforced concrete chamber.



Designing the 'optimum' Hydro-Brake® is made possible with the help of Hydro's unrivalled technical support services. Via a dedicated Hotline, Hydro International's full-time design team are available to provide detailed technical support during both design and installation.

Hydro-Brake OptimumTM has received independent accreditation for its performance and design from both the BBA and WRc.

Backed by Hydro's ongoing commitment to technological development and R&D, the new Hydro-Brake OptimumTM will help designers and specifiers to meet the requirements of the proposed new National SuDS Standards in England and Wales, as well as corresponding regulatory requirements in Scotland and Ireland.

For more information about **Hydro-Brake® Flow Controls** or any of Hydro's sustainable solutions for stormwater control and treatment. Telephone: **01275 337977** Email: enquiries@hydro-international.co.uk or visit www.hydro-international.biz



ISIS Professional Case Study

by Vijay Jain, Halcrow



Managing tidal flood risk in London

Cost-effective integrated modelling solutions.

Much of London is built on the floodplain. Notable floods from the River Thames leading to loss of life occurred in 1099, 1236, 1663, 1791, 1928 and 1953. The Thames Barrier and associated flood defences now protect much of London and ISIS is the model of choice for informing the operation of the Barrier. ISIS is also used to support many other flood risk management activities in London and the Thames Estuary.

Key features of ISIS that make it the ideal tool for modelling the Thames include:

- Accurate representation of the operation of major structures such as the Thames Barrier.
- Flexibility to select either a one-dimensional representation (1D), two-dimensional (2D) representation or a coupled 1D (channel) to 2D (floodplain) model.
- Robust and rapid calculation engine.
- Ability to run within the Delft FEWS-based National Flood Forecasting System.
- Inclusion of wind shear effects.
- High quality support and maintenance.

These attributes mean that those using it to support critical operational decisions, such as when to close the Thames Barrier to protect London, can be fully confident in the model's ability to provide robust water level estimates on demand.

ISIS has been successfully used on the Thames to:

- Calculate extreme water levels, which are used to inform the design of new defences and assess the risk from breaching to new developments.
- Undertake daily operation forecasts of water levels to support operational decision making for the Thames Barrier and associated gates.
- Produce design water level boundaries for a TUFLOW model of the floodplain, which determined the tidal Flood Zones across London.
- Support emergency planning via implementation in the THEMIS software, which enables real-time rapid analysis of breaching and overtopping scenarios.
- Inform the development of the Environment Agency's Thames Estuary 2100 long term flood risk management strategy (TE2100), by modelling a wide range of future climate conditions and flood risk management responses.



Solutions to modelling complex river structures

Halcrow will be holding their latest 'Modelling Made Easy' webinar on Wednesday 16th May at 13:00 (GMT). The free 30 minute (including questions) webinar will discuss the issues associated with modelling complex river structures. It will focus on flow gauging stations for which careful schematisation and modelling is required to accurately represent the often complex hydraulics at these sites. Complex and unusual weirs, out of bank flows, data limitations, modelling approaches, uncertainty and calibration against observed data will all be considered.

The webinar will be hosted by Adam Parkes and is aimed towards relatively new users of ISIS, but the more experienced modeller may also pick up a useful tip or two.



Adam has vast consultancy experience and is responsible for a number of ISIS and TUFLOW training courses. He has worked on a wide variety of projects ranging from small site specific flood risk assessments in ungauged catchments through to very large scale flood risk mapping and flood alleviation projects requiring utilisation of large amounts of observed and gauged data. Our free webinar combines real-time desktop sharing with phone conferencing so that everyone can see and hear the same thing. It eliminates the need for travel - all you need is access to the internet and a telephone.

Reserve your place

To reserve your place at the webinar, please contact Alastair Sheppard at sheppard@halcrow.com. Specific information on how to access the session will be provided directly to those wishing to attend.

Please note that spaces are limited and are allocated on a first come, first serve basis. Due to the limited number of spaces, it is recommended that organisations use a conference or meeting room to hold the webinar as this will allow several people to attend at each office via one registration.

More Information

If you have any questions about ISIS, please do not hesitate to contact our dedicated technical support team on +44 (0)845 094 7994 or at isis@halcrow.com. Additional information about ISIS can also be found at www.halcrow.com/isis.

CW Engineering: riding the storm.

Double dip recession, budget cuts, drought... and we are only in May! But according to King's Lynn based C W Engineering, the above have had minimal effect on business.

"With our range of services from design engineering to plant refurbishment operations, we can offer drainage boards and civil engineers a more cost effective answer to the ever present demands of flood prevention. Even in drought conditions, flash floods can happen!" says Managing Director Tony Jolley.

Moreover the weak pound has made British manufactured weed screen cleaners more competitive at home and abroad. This was a factor in CW Engineering's recently shipped export order to Iraq for a major irrigation project in Babil Governorate to re-establish water ways to optimise water usage, reduce losses and control water distribution, meeting the requirement for extensive agricultural irrigation. The company manufactured a 31.5 metre long weed screen cleaner to clean 5 individual debris screens. Each of the 5 screens was 3.6 metres wide with 2 sets of stop logs and stainless steel supporting frames for each bay.



Closer to home a diverse order book has kept the CW factory busy and their installation engineers occupied. Current projects include 3 new weed screeners for the Hull area, lock gate work, safety walkways and more orders for the company's unique 'dipping' Snipe weed screen cleaner.

New screen cleaner installations include several 90 degree L shaped system delivering debris to a convenient collection point with easy lorry access (see photo).

Weed screen refurbishment work continues to expand as more IDBs recognise the major savings that can be made

when faced with failing equipment, specifically ageing screen cleaners and lock gates.

"Our ongoing success has also proved that the investment in hours and money we committed to achieving ISO 14001 (Environmental) and OHSAS 18001 (Health & Safety) were worthwhile" says Tony Jolley. *"At a time when the market has become very competitive, it is important to have recognised proof of the high standards you offer"*.

For more information please contact Tony Jolley on 01553 775565 or visit www.cw-engineering.co.uk

New 'Snipe Billy' needs no mates

CW Engineering have developed a stand alone version of their 'dipping' Snipe weed screen cleaner for remote sites with no available power supply, meeting the needs of HSE officers and forward planners.

Installation is easy and could be retrofitted into existing site situations without the need for civil modifications which makes it very cost effective. The machine can operate fully automatically and is started by timer, differential level, external signal or manual.

The machine is especially suitable for gravity intakes where no power supply is at hand. It can turn 180 degrees to dump into containers without further transport applications.

The tilting extending arm design which lowers the weed cleaning grab head into the watercourse before vertically clearing any debris from the weed screen (max 4m high). Grab widths are available up to 3m with a safe working load of 250kg.

Snipe Billy eliminates the need for 'lone working' in remote locations or at night and removes the need for regular inspection visits.

Snipe 'Billy' has been developed as a totally self-contained and automatic unit monitored by telemetry (SMS text) and camera for up to 3 months unattended use. Billy is fitted with a 5.5 Kva 3 phase 'silent' diesel generator and two 24v battery packs powered by solar panel and wind turbine.



**For further details please contact
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The 'Love Your River' campaign

If you could make small changes to your lifestyle to protect and 'Love Your River', would you do it?

That is the question that is being asked of everyone following the launch of a groundbreaking campaign to raise public awareness about the link between the health of our rivers and water use.

The 'Love Your River' campaign is being launched and backed by Defra, the National Trust, the Environment Agency, the Wildlife Trusts, Keep Britain Tidy, water companies and Waterwise, to promote the value and benefits of our rivers to our everyday life. The need to protect our rivers has become more urgent in light of droughts being declared in various parts of the country, with some of southern Yorkshire joining the list of drought affected areas today.

The campaign will concentrate on the issues that affect rivers and encourage people to think about:

- how the water we use in our homes or businesses affects the water in our local river;
 - how the pollutants we dump down our drains harms our local water;
 - the fact that there is likely to be less water available for people and businesses in the future and the knock-on effect this will have on the natural world around the river; and
 - how we could get by with less in the event of drought measures in our areas.
- On average we use nearly 150 litres of water per person per day and it is easy to forget that our actions have a direct consequence on the health and wellbeing of our local rivers. That is why people are being asked to look at their own lifestyle to see if there are any changes they could make to help our rivers flourish.

The 'Love Your River' campaign is not just about educating people about the difficulties that many rivers face. It is also about celebrating the importance of rivers to local people – for their health, well-being, leisure and sport. It's about recognising the great work that local groups already do to look after their rivers. It's about honouring the community spirit and the inspirational individuals who give up their time and energy to improve their local environment.

Speaking from the River Itchen at the launch of the 'Love Your River' campaign, Rivers Minister Richard Benyon said:

"We all love our rivers. They are the lifeblood of our country. They've shaped our landscape, and our towns and cities have been designed around them. They are vitally important for our everyday lives and

our environment, and we've all got a role to play in making sure our rivers are as healthy as they can be.

"I hope the 'Love Your River' campaign will inspire people to value their local rivers and take action to look after them. It's especially important that we care for our rivers when they're facing the added pressure of drought, as well as the constant threats they face from over-use and pollution. The fact that so many organisations have come together to back this campaign shows the depth of feeling about this issue, and the importance we all place on making sure our actions don't damage our rivers."

Paul Wilkinson, Head of Living Landscape for The Wildlife Trusts, said:

"The amazing wildlife of our rivers and wetlands is under immense pressure from drought and other factors. Many of us would like to help but don't know what action to take. There are simple steps around water use that can make a real difference including turning off taps when cleaning our teeth. As well as saving water, you might also want to find out more and get involved with what your local Wildlife Trust is doing for rivers and wetlands near you."

Lord Smith, Chairman of the Environment Agency said:

"The amount of water that we use at home and in our businesses has a direct effect on the amount of water available in our rivers and for wildlife. We would urge all water users – including consumers, businesses and farmers – to use water wisely to help protect our valuable rivers."

Simon Pryor, Natural Environment Director at the National Trust, said:

"We're delighted to be involved in the Love Your River campaign an amazing 43 per cent of the land in England and Wales drains to the boundary of National Trust owned land. Whether you earn your living from, travel on or play in the rivers of the UK, rivers can join us together, connect us back to the natural world and provide natural corridors for our wildlife. This campaign will help raise awareness of

Backed by:

- Defra
- the National Trust
- the Environment Agency
- the Wildlife Trusts
- Keep Britain Tidy
- Water Companies
- Waterwise

how actions we all take can affect the health of our rivers and wildlife they support. We all have a role to play in using water wisely."

Richard Aylard, director of sustainability for Thames Water, said:

"Following one of the driest two-year periods in our region since records began, many of the tributaries which feed the River Thames are running low. In some cases whole stretches of these rivers – for example the Pang in Berkshire and the Kennet in Wiltshire – have dried up completely, and we are only in March.

"We all need to recognise that the water coming out of our taps comes from our local river or from the aquifer feeding that river. The less water we all use the less

we need to take from the local river, and from the habitats and wildlife it supports.

"The current drought is not just our problem, it's everyone's problem and we can all do our bit to help by doing simple things like turning off taps while we brush our teeth and taking shorter showers."

Paul Butler, Managing Director, South East Water, said:

"Rivers are such an important part of our daily lives and yet it is a connection that is easily forgotten. Whenever we turn on the tap we should remember that the water we use may be from a river, and when we let the plug out of the bath much of this water will return back to the environment."

"Water companies work hard to protect this natural environment, carefully managing the amount of water we take from rivers, and then ensuring water is treated to high standards before it is returned to the environment. By reducing leaks and making our treatment works more efficient we are investing in our rivers for the future."

"We hope everyone is encouraged to 'Love Your River' and that together we can all take steps to use water wisely and know that in doing so we are helping protect this vital water habitat."

If people are going to make changes to the way they live to protect their local river, they are being encouraged to let everyone know on twitter at #loveyourriver

A spokesperson for Keep Britain Tidy said:

"Keep Britain Tidy is delighted to support the Love Your River campaign. We believe its vital to reconnect people with the river environment and help them understand how making small reductions in their use of water in the home can have a really positive impact on their local river and the wildlife it supports. We already work to help communities look after their rivers through our RiverCare programmes and we hope that Love Your River will encourage more of us to take action and to understand how our lifestyles can impact on our local environment."

The new website for the 'Love Your River' campaign can be found at <http://www.defra.gov.uk/loveyourriver>

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Drought

The story so far



The Drought Summit

The Drought Summit held on the 20th of February marked the official start of the drought. Lincolnshire, Cambridgeshire, parts of Bedfordshire and Northamptonshire, and west Norfolk were listed as being in drought with other areas coming close.

Yorkshire

16th April - Midlands officially in drought

On the 28th March, parts of Yorkshire were declared as being in drought, following a prolonged dry period leaving river levels and underground water supplies depleted. Areas from Chesterfield in the south of Yorkshire to Scarborough in the east fall into the drought zone, with areas around Sheffield, Doncaster, Hull and Driffield also affected. But while the Rivers Don, Rother, Hull and Derwent were low or very low for the time of year, public water supplies were unlikely to be affected.

5th April - Hosepipe Bans come into effect

Some areas of Yorkshire have seen the driest 12 months since 1910, and with river levels continuing to fall, the Environment Agency is appealing to farmers and businesses that take water from rivers to look for ways to use water wisely, and share the resources that are available.

28th March - Parts of Yorkshire in drought

Having already seen fish kills this year caused by dry weather, the Environment Agency and is preparing for an increase in environmental incidents over the summer by stepping up river monitoring and increasing its supplies of water aeration and fish rescue equipment. They are also working to help farmers top up their storage reservoirs, to ensure there are better supplies for the summer months. It has introduced a fast track process for farmers to apply to take additional water when river flows are high, and continues to be as flexible as possible around existing regulations to help farmers, who suffer significant impacts in times of drought.

Important wildlife sites were also given help last week, as the Environment Agency announced new measures to help protect nationally important wildlife sites.

Water companies before applying for drought permits must demonstrate that

they have stepped up their water efficiency publicity campaigns and have taken measures to increase leakage detection.

Hosepipe Bans

On the 5th April, 7 water companies introduced hosepipe bans as part of their water restriction programmes, affecting 20m people.

- Thames Water
- Southern Water
- South East Water
- Anglian Water
- Sutton and East Surrey
- Veolia Central
- Veolia Southeast

and other companies threatened to follow if the dry weather continues.

The firms said the bans were necessary to preserve essential water supplies and protect the environment and at this stage there is no clear indication as to how long the bans will remain in place, but a later report suggested that it could well go beyond Christmas.

Midlands

On the 16th April, the Environment Agency confirmed that the Midlands was officially in drought.

The decision to declare drought was taken after the driest year on record in 2011, a second winter of below-average rainfall and only just over 40% average rainfall in February and March.

The drought conditions apply to the River Sever, Trent and Wye catchments in Nottinghamshire, Leicestershire, Derbyshire, Staffordshire, West Midlands, Warwickshire, Shropshire, Worcestershire, Herefordshire and Gloucestershire.

The lack of rain has led to low groundwater levels and exceptionally low river levels across the Midlands. Although we are seeing more rain in April, it will take months of sustained rainfall to improve underground water and river levels.

The Agency has already had rescue fish

from the River Lathkill in Derbyshire when the river receded four months earlier than usual. Four Midlands rivers also recorded the lowest monthly average flows on record during March. These were the River Tern at Walcot (near Telford), Shropshire, River Leadon at Wedderburn Bridge, Gloucestershire, River Sow at Great Bridgeford, Staffordshire and the River Soar at Kegworth, Leicestershire.

South West

In the South West rivers are also suffering and nationally important chalk streams, such as the Hampshire Avon and the Dorset Stour, which support rare trout and salmon species, are exceptionally low.

The South West region covers:

- Cornwall
- Devon
- Dorset
- Somerset
- Bristol
- South Gloucestershire
- Parts of Hampshire
- Most of Wiltshire.

Wales is also feeling the effects of the drought with The Wye, Usk and the Ebbw now at or near their lowest levels on record for the time of year and rivers like the Taff and Monnow also very low. Whilst reservoirs in Wales are more than 90% full, the concern is that any further dry period could begin to affect wildlife and the wider environment.

Despite the fact that it has rained almost everyday since the hosepipe ban was imposed, in East Anglia, it is unlikely at this stage to have any impact on improving the underlying drought situation.

The current heavy rains are more likely to cause flash flooding than top up reservoirs. The hard ground will cause greater volumes of run-off which is likely to cause flash flooding and water that does fall is more likely to be absorbed by plants than find its way into the reservoirs.

A steady wet winter is what is required to restore rivers and groundwaters, but the prospect of facing a third dry winter will really start to test the supplies.

Saving the fish

Fish rescued as levels drop in the River Lathkill

In what is becoming a regular news piece, in early April, the Environment Agency fisheries teams, once again had to rescue stranded fish, caught out by the receding water levels. This time it was the River Lathkill in Derbyshire on Friday last week, as river levels started to recede four months earlier than usual.

A 3km stretch of the River Lathkill regularly dries up in the summer, but with last year being the driest in Midlands for over 90 years and two drier than average winters, the river has dried up much earlier than usual.

The fish are caught using electric fishing equipment to lightly stun the fish, which can then be caught in a hand net and put into a tank of water with oxygen before being relocated to an area downstream that flows all year.

Technical Officer for the Environment Agency, Alex Lumsdon, says "Generally this length of the river dries up between June and August and the water returns in October, but last year the flow didn't return until mid December. Due to the river remaining dry until very late on last year, it appears that the Brown Trout have not migrated back upstream to spawn in the upper reaches of the River Lathkill as they usually would."

"We are concerned that the continuing dry weather may affect more wildlife, including fish and plant life in and around rivers and lakes. This is due to the reduced river flows and lower water levels in lakes and ponds. We are monitoring the situation closely and, like today, will act quickly to alleviate such problems if they occur."

Fish removed from the Maxey Cut



The Environment Agency decided to remove fish from the Maxey Cut, which is located between Peterborough and Market Deeping, before the ongoing drought caused water levels to drop further.

Fish were removed from the 9 km cut – which was created as a flood relief channel for the River Welland - in an operation which took were then released into the Welland.

Water will be diverted from the Maxey Cut by opening sluice gates at Tallington into the Welland millstreams. This will allow the whole of the water flow to pass through Market Deeping and Deeping St James to help maintain the River Welland and its habitat. Flows through the towns will still be lower than normal, however, due to the low rainfall over the past year.

Flows will return to the Maxey Cut once the drought is over and flows in the River Welland return to normal. Fish will then re-colonise the Maxey Cut naturally.

Clearing the way for fish in the River Ecclesbourne

Barriers preventing fish migration will be removed at Duffield, Derbyshire this week, as the Environment Agency completes the restoration of 175 metres of original river channel.



Low water levels, old weir structures and silt build up had contributed to the river channel running dry, stopping fish from migrating upstream to spawn. The fish were unable to use the alternative, newer section of channel, due to a weir, that prevented them from passing.

The Environment Agency has been working to restore flow to the original channel, allowing fish to pass upstream, whilst also enhancing wildlife at the site.

Environment Agency Fisheries Officer, Alex Lumsdon said:

"The newly restored channel will provide excellent habitat for fish, in particular brown trout and grayling, which previously wouldn't have been able to migrate upstream. We have also planted a mixture of flowering aquatic plants and created a wildflower meadow to improve wildlife at the site.

"Together with our partners, we are striving to deliver the Government's ambitious plan for improving the environment and this project is just part of the work taking place in the Ecclesbourne river catchment to increase fish populations."

The Environment Agency will return to monitor the site in the summer and evaluate the success of the project. Ecclesbourne is just one of ten water catchments in England to be selected for a government pilot scheme designed to improve our rivers and waterways. As part of the pilot, the Environment Agency are working with local organisations and groups to improve the wildlife habitat right across the Ecclesbourne river catchment area.

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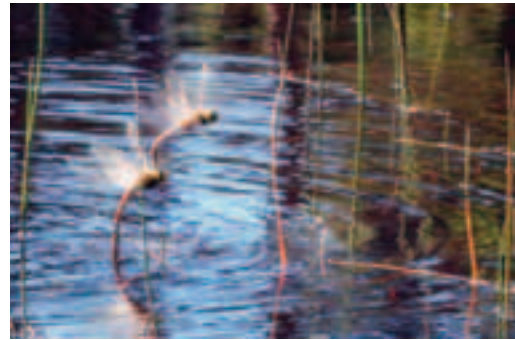


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Drought, Storage & Irrigation



Dragonflies, warns the Environment Agency, are just one of the species that will be severely affected if the drought continues - along with water voles, great crested newts, and wading birds such as curlews and lapwings.

The traditional summer scene of dragonflies skimming over a glistening stream could be a rare sight in parts of England this year as the widespread drought begins to take its toll on the nation's wildlife.

The Environment Agency has taken measures to help protect nationally important wildlife sites and help wetland managers to maintain water levels in nationally important wetland sites during drought.

They include provisions to extend the licence season, make use of unused licensed water, or allowing higher pumping rates to capture water during any rainfall periods that occur.

Some parts of the country have seen the driest 18 months since records began, and in drought affected areas it is likely that some streams, ponds and shallow lakes will be completely dry before aquatic insects like dragonflies are fully formed, and the insects will consequently perish. Newly hatched

tadpoles from toads and frogs, as well as from protected great crested newts, face a similar fate.

Birds will also suffer as suitable wetland breeding sites for wading birds dry up. Waders such as Snipe, Redshank, Lapwing, Curlew and Black-tailed Godwit all need moist soils to probe with their long bills to extract food such as worms to feed themselves and their young. These species have declined rapidly in much of England in recent



Redshanks suffer as wetlands dry up

Helen Perkins, spokesperson for The Wildlife Trusts, said:

"There is no doubt that a wildlife tragedy is unfolding in parts of the country and wildlife is suffering the consequences of our unsustainable water use. We welcome the Environment Agency taking measures to enable water levels to be maintained at important wildlife sites. After such a long period of low rainfall, some species may not recover and could be lost from some rivers and wetlands if we don't act now. We urgently need to change the way we use water at home and across businesses. Saving water now could save wildlife from an absolute disaster."

Drought, Storage & Irrigation

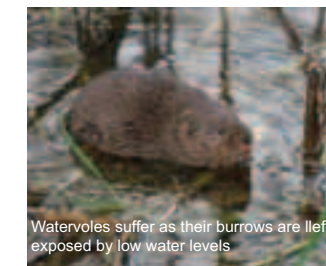
Phil Burston, RSPB water policy officer, said:

"Wading birds like lapwings, redshank and avocets rely on shallow pools and boggy marshes. As we come into the breeding season, if these birds manage to breed at all, then their chicks will need to feed on the insects that live close to the edge of pools. If they dry up then the chicks will be forced to look elsewhere putting them in danger. Our reserves are designed to help wetlands and their wildlife cope with drought but we still need to do more to adapt to an increasingly unpredictable climate. The problem in the wider countryside outside managed nature reserves is likely to be even more desperate with wildlife that relies on healthy rivers, ponds and lakes left struggling this summer."

decades and this spring drought could be the final straw in some of the smaller breeding sites.

The Environment Agency has already seen a number of fish deaths this year caused by dry weather, and is stepping up river monitoring and increasing its supplies of water aeration and fish rescue equipment in order to respond quickly to reports of distressed fish.

Other impacts of drought on wildlife include a reduction in the numbers of water voles, as dwindling water levels in ditches and streams leave their burrows exposed to predators such as stoats and weasels. Long dry spells and low soil moisture levels can lead to the death of some trees - especially beech and birch, and fruits of trees and shrubs are likely to be smaller in size. Forest fires also become an increasing concern.



Water voles suffer as their burrows are left exposed by low water levels

The Environment Agency is working with Natural England and other environmental organisations to actively monitor the environmental impact of the drought and is taking action to mitigate impacts wherever possible. Although nature is very resilient it is likely that the effects of climate change will impact on the numbers and distribution of some of the more susceptible wildlife.

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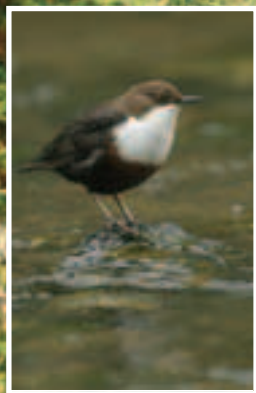
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The role of biodiversity in Welsh rivers



The world's only specialist aquatic song-bird, the dipper *Cinclus cinclus*, will be a focus of the DURESS project

A team led by Cardiff University has received a major research award, to investigate the importance of river organisms to the function and economic value of Wales' river ecosystems.

The investigation will range from small catchments around Llyn Brianne in central Wales to the whole Welsh uplands. The team will look at the role played by biodiversity in preserving the quality and wildlife of Welsh rivers and the many livelihoods that depend upon them.

Named **DURESS** (Diversity of Upland Rivers for Ecosystem Service Sustainability), the £3 million project forms part of the £13 million Natural Environment Research Council (NERC) Biodiversity and Ecosystem Services Sustainability (BESS) initiative. BESS is investigating the role of biodiversity in maintaining and improving ecosystem services – goods and functions provided by nature on which peoples' lives and livelihoods depend.

At a time when rivers face critical challenges from changing land use and climate, DURESS aims to:

- quantify how river organisms might regulate water quality, enhance fish production and underpin culturally valuable assets such as fishing or river birds
- determine how river ecosystem services are affected by changes in land use and climate
- address how resilient river ecosystems are to changes over time from months to decades.

Wales was considered ideal for the project because its rivers are particularly highly valued for water supply, biodiversity and recreation such as sport fisheries. The country is extremely rich in the types of scientific data required and excellent river science is already well established. Cardiff University last year led the freshwater aspects of the UK Government National Ecosystem Assessment, making it an ideal candidate to take forward this research.

Researchers from the University's School of Biosciences and Sustainable Places Research Institute will lead a team of around 30 scientists also including Lancaster University, Queen Mary University London and Aberystwyth; the British Trust for Ornithology; the NERC Centre for Ecology and Hydrology, Forest Research and NHS Wales; and the specialist freshwater consultancy, APEM Ltd. The consortium is headed by Dr Isabelle Durance, senior research fellow in Cardiff's Sustainable Places Research Institute, who spearheaded the proposal.

"We all need clean water, and the UK water infrastructure is valued at over £200 billion," said Dr Isabelle Durance. "Yet, we so often overlook the value of the catchments that supply our water. Even more, we overlook the processes carried out by billions of river organisms that together help to maintain water quality. These same organisms are part of an intricate web of life that fuels everything from Atlantic salmon to dippers and otters, yet we still know very little of how different parts of this web fit and function together."

The pioneering project has already won active support from a wide range of partners, including the Welsh Government, Environment Agency, Countryside Council for Wales, Forestry Commission, Dwr Cymru/Welsh Water, the RSPB and the Welsh Rivers' Trusts (Afonydd Cymru). Welsh communities will also be consulted widely during the project.

Head of Cardiff School of Biosciences and Chair of the Biological Sciences panel for the Research Excellence Framework, Professor Ole Petersen said *"Wales' rivers are a major asset to its population. This is a vitally important ecological and environmental project which will have a bearing on people's lives and livelihoods."*

Isabelle Durance and Steve Ormerod.

Water company United Utilities has entered an innovative new land management partnership with the RSPB at its Haweswater Estate in the Lake District, aimed at integrating hill farming with habitat restoration to create more space for nature and improve drinking water quality. Haweswater is the biggest source of drinking water in North West England – supplying approximately two million people.

The conservation organisation has taken a tenancy of Naddle Farm, an upland sheep farm comprising approximately 500 ha (1250 acres) of enclosed farmland and woodland, with substantial common grazing rights on the open fells.

The vision for Naddle Farm is to improve biodiversity and water quality, while managing the land as a viable farm enterprise. This long-term project aims to restore a range of upland habitats including upland heath, broad leaf woodland and blanket bog. This restoration work will benefit many types of upland wildlife and reduce the risk of erosion, which can affect raw water, making it more difficult and costly to treat.

Mike Fishpool, Haweswater Development Manager for the RSPB said: "By restoring upland habitats we aim to create a 'win win' situation for both wildlife and water. However, the lessons we learn from this project will only be relevant to the wider farming community if we integrate it with a viable farming system. To this end we have appointed experienced sheep farmer Richard Postlethwaite, to manage the agricultural business at Naddle Farm.

"Our tenancy of Naddle Farm forms part of our wider Lakes High Fells Futurescape, a landscape-scale conservation initiative in the North and East lakes, which seeks to work with others to inspire the creation of an upland landscape rich in wildlife, while respecting the history and traditions

that have shaped the distinctive cultural heritage of the Lake District."

Paul Phillips, United Utilities Catchment Manager for Cumbria including Haweswater and Thirlmere, commented: "Haweswater is a hugely important source of drinking water. A quarter of the water we drink in the North West comes from here. Part of what makes it

so good is the surrounding land, which is a natural filter. Farming this land sustainably helps make sure the water is clearer and cleaner, so it needs less costly chemically-intensive treatment. That's got to be good for the environment and our customers.

"We're hoping, with the RSPB, to show how a modern working farm can be sustainable while maintaining upland traditions and making money. United Utilities has led the way in developing water-friendly farming and many other companies are now following suit. This new development is another first for the industry."

The Naddle Farm tenancy builds on many years of successful partnership working at Haweswater between the RSPB and United Utilities. The RSPB first became active at Haweswater in the 1960s following the return of golden eagles to the reservoir and, in 1987, entered a management agreement covering 499 ha (1233 acres) of

woodland, and a wardening and monitoring agreement over the remainder of the 10,000 ha (24,700 acres) estate.

In November, the RSPB will also take a tenancy of Swindale Farm, another United Utilities land holding in the Haweswater catchment, which will be managed with similar objectives to Naddle Farm.



New deal for nature and water at Haweswater



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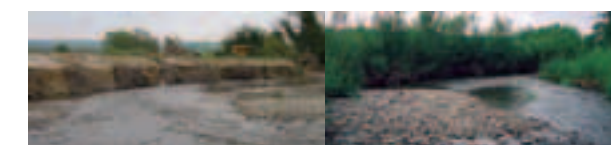
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CIWEM Living Wetlands Award 2012

BROCKHOLES NATURE RESERVE WETLAND PROJECT, WINS WITH A BIRDIE!



CIWEM are pleased to announce that CIWEM Living Wetlands Award 2012 has been awarded to Brockholes Nature Reserve, in Lancashire. CIWEM's Living Wetlands Award was co-founded in 2002 /3 with RSPB and recognizes multi-functional projects that demonstrate the sustainable use of wetland habitats.

Brockholes is a 106-hectare site made up of former gravel workings located in Central Lancashire within reach of the city of Preston. It offers a major opportunity to sustain and further develop a high value biodiversity asset which is accessible to large numbers of people, many of whom live close to the site in areas of high social deprivation.



Julia Bradbury and Countryfile pay a visit and work on reed planting

Since the site's purchase in December 2006 by The Wildlife Trust for Lancashire, Manchester and North Merseyside, the reserve has managed to proactively protect some key UK Biodiversity Action Plan (BAP) habitats and species.

Brockholes nature reserve is very much at the leading edge of the widely accepted need to bring wildlife and people together in a way that meets long term targets in sustainability.

CIWEM's Director of Policy, Justin Taberham said: *"The Brockholes project was particularly recognised for its high level of visitor attraction, excellent BREEAM visitor centre, and its high potential for increases in BAP species. All 5 judges were very impressed with the entry which was unanimously voted as the winner amongst some very high quality contenders"*

CIWEM also commended the 'Hambrook Marshes' project entered by the Kent Enterprise Trust for its uniqueness in involving different social groups, particularly the unemployed and disadvantaged in society, and the 'Severn Vale Living Landscape' project entered by Gloucestershire Wildlife Trust for its impressive linkages and long term vision.

The Living Wetlands Award will be presented at CIWEM's prestigious Annual Dinner and Awards Ceremony on 17th May 2012. The prize fund this year was donated in memory of Dr. Rick Leah, Aquatic Ecologist.



A Sand martin

Government announces action to improve implementation of the Habitats and Wild Birds Directives



A new cross-Government unit is to be set up to help developers deliver large infrastructure projects that promote sustainable development by supporting growth and protecting our most valued habitats and species, Environment Secretary Caroline Spelman announced today.

The new Major Infrastructure and Environment Unit is one of the key recommendations to emerge from a review into the way the Habitats and Wild Birds Directives are being applied in England.

There will also be new guidance published which will explain in much clearer terms what needs to be done to comply with the Directives. The new streamlined guidance will be easier for both developers and regulators to follow.

The Review focused on the processes within the Directives that most affect businesses. It made recommendations which will reduce the burden on business while maintaining, and where possible, enhancing the environmental benefits.

Commenting on the publication of the Review report, Environment Secretary Caroline Spelman said:

"I strongly support the aims of the Habitats and Wild Birds Directives, and I have said all along that I want them to continue to be effective in protecting important wildlife sites. Central to that is ensuring that we maintain their

integrity, and the best way of doing that is to make it as simple as possible for people to comply with them. What the Review has shown us is that the Directives have been working well to provide the vital protection nature needs, but that there are cases where problems arise and delays occur, which is not good for business, the environment or local communities.

"That's the sort of thing which can undermine the reputation of the Directives, which was why it was important to have the Review in the first place. The action we are taking will make it clearer for developers to understand how to comply with the Directive, and will ensure that our wildlife still receives the high level of protection it deserves. This in turn allows genuine green growth, boosting our economy whilst looking after the environment."

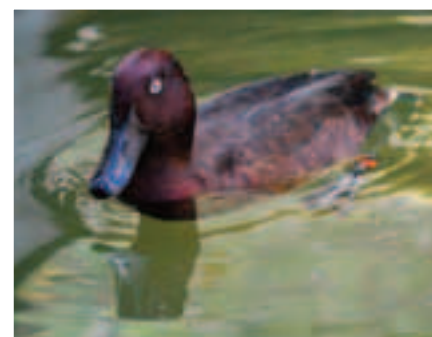
The Review also sets out the actions that bodies such as Natural England, the Environment Agency and the Marine Management Organisation will take to continue to improve the service they offer to customers, including developers.

The Review, which was announced in the Autumn Statement by the Chancellor and led by Defra, has involved detailed work with stakeholders and other Government departments.

The full report can be found at <http://www.defra.gov.uk/habitats-review>



Ducklings signal hope for world's rarest bird



The Madagascar pochard - arguably the world's rarest bird - has bred successfully in captivity building hope that it can be saved from extinction.

Eighteen precious pochard ducklings are being reared at a specially built centre in Antsohihy, Madagascar, opened last year by Dr Lee Durrell. The birth of the ducklings is a key milestone in the conservation of the species, including an emergency expedition two years ago to take eggs into captivity. It is the ducks from those eggs that have now bred for the first time.

The pochard breeding programme is part of a joint project to save the bird by Durrell Wildlife Conservation Trust and Wildfowl & Wetlands Trust (WWT), the Peregrine Fund, Asity Madagascar and the Government of Madagascar.

Dr Glyn Young, a conservation biologist with Durrell, has spent much of his life studying the Madagascar pochard. He said: *"The ducklings represent an incredible step forward in the fight to save the pochard from extinction. Seven years ago, people thought this bird was already extinct and yet the discovery of one small population and now the arrival of these ducklings has led to real hope that the birds can one day flourish again."* The pochard was believed to be extinct until its rediscovery in 2006 on a single small lake, Lake Matsaborimena (or Red Lake), in northern Madagascar. Numbering just 22 birds, the ducks remain extremely vulnerable to extinction from a single event such as pollution or a disease outbreak.

In order to restore the species to suitable wetlands within its former range across the high plateau region of Madagascar, scientists are studying the remaining wild population to understand the reasons behind the species'

decline and to determine the right conditions for releasing birds. Particularly worrying is that the wild birds appear to have very low breeding success.

Peter Cranswick, Head of Species Recovery at WWT said: *"Although Lake Matsaborimena is the last hiding place for the ducks, it is far from ideal as a habitat. Our initial investigations suggest there is too little food and this may be leading to the low survival of the ducklings; in effect, they are starving to death."*

"We have identified some lakes where the physical conditions are potentially right for the pochard, but success will depend on support of the local community. Fishing is thought to be one factor that led to the pochard's decline but many rural Malagasy people earn their livelihood from fishing. The challenge is to find a solution that helps both the people and the birds."

In addition to the breeding centre where the ducklings are being reared, a major facility will be developed this year where young birds will be trained prior to release into the wild. Malagasy conservationists are learning the skills needed to breed and rear pochards.

Invasive Plants - *Algal Bloom*

Killer Shrimps found in the Broads



The Environment Agency, Natural England and the Broads Authority have been working together to investigate the presence of the shrimp, *Dikerogammarus villosus*, in Barton Broad.

Andrea Kelly Senior Ecologist for the Broads Authority said: 'The shrimp were found through a dedicated monitoring programme. Fortunately we've only found the shrimp in a very localised area in the Broads so far. People checking, cleaning and drying their equipment after use is essential to help stop the spread of all non-native species and we would really appreciate their full cooperation in doing this.'

'We are working with our partners to investigate the shrimps' current population and range in the Broads and to investigate and implement measures to limit its spread to and from other water courses. There is no risk to the public or their pets from it.'

Dikerogammarus villosus, commonly known as 'killer shrimp', is an invasive non-native species. If the shrimp became established and widespread, as other invasive species such as floating pennywort and Signal crayfish have, it could threaten populations of native species. Although the shrimp only grows to a maximum of 30mm (1 1/4 inches) it feeds on insect life including our native species such as damselfly nymphs, water boatmen and small fish.

The Check Clean Dry campaign asks all water users to take simple steps to help prevent the spread of non-native species between rivers, lakes and reservoirs. Clothing and equipment that has come in contact with the water should be checked for any living organisms and then thoroughly washed-down. Any organisms found should be returned to the water body they came from. Equipment and clothing should be dried as some species can survive for days in damp conditions.



'Algal Bloom is a naturally occurring plant, but can become harmful if certain conditions prevail'

What is Algal Bloom? and how is it identified?

An algal bloom is a rapid increase or accumulation in the population of algae (typically microscopic) in an aquatic system.

Blooms can occur in freshwater as well as marine environments.

Typically, only one or a small number of phytoplankton species are involved, and some blooms may be recognized by discoloration of the water resulting from the high density of pigmented cells.

Although there is no officially recognized threshold level, algae can be considered to be blooming at concentrations of hundreds to thousands of cells per milliliter, but can reach millions of cells per milliliter.

Algal blooms are often green, but they can also be other colors such as yellow-brown or red, depending on the species of algae. Bright green blooms are a result of cyanobacteria (colloquially known as blue-green algae) such as *Microcystis*. Blooms may also consist of macroalgal (non-phytoplanktonic) species. These blooms are recognizable by large blades of algae that may wash up onto the shoreline.

Of particular note are harmful algal blooms (HABs), which are algal bloom events involving toxic or otherwise harmful phytoplankton such as dinoflagellates of the genus *Alexandrium* and *Karenia*, or diatoms of the genus *Pseudo-nitzschia*. Such blooms often take on a red or brown hue and are known colloquially as red tides.



Algal Treatment - Dr Jonathan Newman

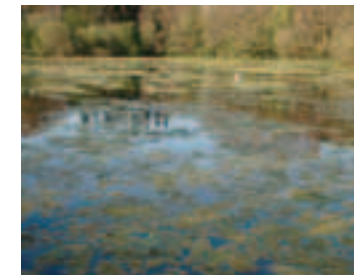
In Europe all professional herbicides to treat algae have been **banned**. Options for control are few but the best include ultrasonic treatment using mixture of low power frequencies, the use of harmless bacteria to compete with algae for nutrient supplies and some shading technologies using dyes.

Ultrasonic Treatment

Research work, undertaken at the Centre for Aquatic Plant Management, showed that exposure of *Spirogyra* and *Scenedesmus* to ultrasound for less than a week induced changes in the algal cells. The interior of the cell shrunk away from cell wall and the cells died.

Measurements of the chlorophyll content of cells also declined, and exposed cells did not regrow after 3 weeks of exposure. In outdoor pond tests, algal growth was much lower than in tanks without any treatment, and there were no effects on *Daphnia*, an invertebrate used as a test organism.

Fish are not effected because the sound level produced is half the required decibels to effect fish. They do not affect submerged plants, water lilies or other desirable aquatic plants, and are highly specific to algae.



The 2 images were taken one year apart and demonstrate the effectiveness of ultrasonic treatment.



Reducing Nutrients

Most aquatic plants need nutrients from the surrounding water or from the sediment in which they are rooted to be able to grow and reproduce. If you take away the nutrient supply the algae die very quickly.

Products are available that reduce nutrient availability for algae by locking it up in bacterial biomass, reducing growth and clearing water bodies.

There are a number of factors to take into account when using this type of product

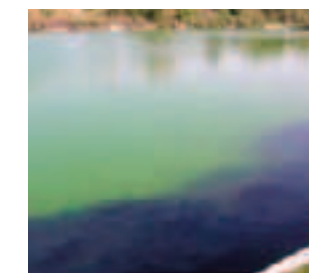
- Nutrient management techniques work best in static systems, with little or no flow through
- Nutrient management systems work best when applied early in the season, starting no later than March or very early April
- Nutrient management techniques need to be applied throughout the growing season to provide continuous control

Shading Technologies

Pond dye is designed to limit the amount of sunlight reaching the lower layers of a pond.

Algae, weeds and plants all require sunlight to thrive; by limiting the sun you naturally reduce algae and plant growth.

Pond dye is also used to improve the appearance of water. For example, Black Onyx lake and pond colorant is a high concentrated colorant that helps create the unique natural look of black water lakes and ponds favoured in golf courses and resort locations.



Lyn Padarn & Algal Bloom 'an ecosystem in decline'

Lyn Padarn is a lake that has suffered, in the past, from the effects of algal bloom, causing damage to fish wildlife and the local economy. The effects can be devastating and the possibility of a reoccurrence is always a concern if same conditions happen again.

A hydro-acoustic survey recently revealed that the charr population in the lake is extremely low and could potentially disappear from the lake in just 5 to 10 years. Charr reared from fish caught at the lake have been introduced to boost their numbers as well as a back-up population of the Llyn Padarn charr being established at a second north Wales lake.

One issue causing this concern is the possibility of **Algal bloom** returning, which had a great impact on the lake and the local economy in 2009. The cause, then, was a combination of weather conditions and nutrients such as phosphorous entering the lake, particularly from the nearby sewage treatment works and storm overflow.



An independent study commissioned in 2010, confirmed that the phosphates responsible for the nutrients are found in shower gel, dishwasher powder and washing machine powder and would have indeed come from the discharges.

These nutrients not but also remove oxygen from the water, which is vital for the fish that live there.

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Renewable Energy

Wave & Tidal

First wave device for FabTest

FabTest is a marine energy test site in Falmouth, Cornwall, which will enable wave energy generation device developers to conduct sea trials of their devices in moderate seas, close to port facilities. It is a stepping stone to the deployment of arrays of devices at Wave Hub, the world's largest grid-connected wave energy demonstration facility installed ten nautical miles off the north coast of Cornwall.

The test site has welcomed its first wave converter to its waters - Fred Olsen's BOLT "Lifesaver", previously called BOLT 2, and was manufactured at A&P's yard facility in Falmouth. The BOLT Lifesaver will undergo tests on structural integrity, response



behaviour, moorings and umbilicals, subsea components, monitoring systems and deployment procedures.

The device may subsequently be deployed in more energetic offshore waters at the grid-connected Wave Hub site near Hayle.

Falmouth Harbour Commissioners Chairman David Ellis said: "The

deployment of the BOLT "Lifesaver" device is a historic moment, not only for Falmouth but for the entire marine renewable sector in the South West."

He added: "The pre-consented area in Falmouth Bay is licensed to test up to three devices at a time. Judging by the high level of interest, we expect there will be a steady stream of device deployments to follow."

Wave Hub general manager Claire Gibson said: "We hope the Lifesaver trials at FabTest go well and look forward to welcoming Fred Olsen at Wave Hub for grid-connected trials of an array of Lifesavers in the near future."

Irish-American cooperation in wave energy research

A Memorandum of Understanding (MoU), on offshore renewable energy research cooperation, has been agreed with the United States Department of Energy.

The memorandum was signed on behalf of the Irish Energy Minister, Pat Rabbitte, in Washington during a trip to the US, in March.

Ireland's location at the edge of the Atlantic Ocean gives it the resources to be one of the best wind and wave energy providers in Europe. There is very significant potential in utilising these resources in the medium to long term to generate carbon free renewable electricity.

Minister Rabbitte said:

"Wave energy technology is still very much at the research, development and deployment stages and the Memorandum signed will result in increased co-operation between Ireland and the US. Both countries have an interest in

encouraging and improving technology development in this sector and the Memorandum builds on an excellent working relationship fostered by previous joint marine renewable events held in Galway, Washington and Farmleigh over the past few years."

Collaboration under this Memorandum will involve research co-operation in the field of wave and tidal energy, involving marine and hydrokinetic energy technologies.

The Minister added:

"The co-operation is planned to be strategic, concentrating mainly on technologies which are not yet commercially viable but which might offer significant renewable energy potential. Mutual co-operation will lead to increased investment opportunities in the Sector, initially as projects develop through the research and demonstration phases and also through increased academic cooperation."

Tidal Project agreed

Welsh Environment Minister John Griffiths has welcomed an announcement by the Crown Estate that will support Wales in its ambition to become a world leader in marine energy.

The Minister was reacting to the Crown Estate's decision to grant a lease agreement for a tidal energy project off St David's Head in Pembrokeshire.

The agreement will enable Eco2 Ltd and its subsidiary Tidal Energy Limited to start to take early steps to develop their tidal project including the preparation of applications for the necessary marine consents.

If Tidal Energy Limited is able to secure the necessary agreements the company should then be granted a full lease that would enable them to construct and operate the tidal energy scheme.

Speaking about the announcement by The Crown Estate, the Environment Minister said:

"The Welsh Government is strongly committed to unlocking the energy in our seas. We have significant expertise across government, industry and academia and we are

bringing that expertise together to focus on the delivery of marine energy.

"The energetic waters off Wales are ideally suited to the current stage of technology development and will play a vital role in the growth of the industry.

"We believe that Wales has the potential to be a world-leader in the marine energy market as a significant generator and, just as importantly, as an exporter of marine energy knowledge, technologies and services.

"This signal from the Crown Estate is a positive next step in helping us to realise this ambition. Not only is it great news for Tidal Energy Ltd, it is also great news for marine energy in Wales and for the wider Welsh economy."

Martin Murphy, Managing Director of Tidal Energy said:

"We are delighted to have secured this Agreement for Lease off St David's Head. It is an important step as, together with our existing project in nearby Ramsey Sound, we look to be able to demonstrate the real prospects for marine renewable energy in Wales."

A further £103 million investment in Scotland's renewable industry

In March, the Scottish Energy Minister, Fergus Ewing, announced a new £103 million investment fund which will drive the growth of renewable energy in Scotland for generations.

The Renewable Energy Investment Fund (REIF) will initially focus on supporting communities and rural businesses to develop their own local renewable projects, on supporting district heating, and on supporting wave and tidal developers with the development and deployment of array projects.

The fund will seek to leverage additional finance from other sources, and will be designed to have a legacy for many years to come as the money is repaid and reinvested.

The funding is in addition to the £200 million already committed by the Scottish Government in the Spending Review over the next three years, which includes funding to improve renewables infrastructure.

The REIF will complement funding from the Green Investment Bank (GIB), which has also received a funding boost from the Fossil Fuel Levy in Scotland. While the GIB is designed for projects at a "near commercial" stage, the REIF will be used to support projects at an earlier stage of development.

Alongside the REIF, Mr Ewing also announced a further £2 million support for community renewables for 2012-13. This is to build on the existing Community and Renewable Energy Scheme

(CARES) while arrangements are made to support community projects through REIF.

Energy Minister Fergus Ewing said:

"This £103 million Renewable Energy Investment Fund will allow communities all over Scotland to reap the benefits of our green energy revolution.

"Scotland has astounding green energy potential and vast natural resources, and we have a responsibility to make sure our nation seizes this opportunity to create tens of thousands of new jobs and secure billions of pounds of investment in our economy.

"This fund will help us make the most of our potential. Some have called on us to increase funding for

marine technologies – this fund does that, demonstrates our commitment to marine and will ensure marine renewable projects become commercial realities. It will help ensure district heating is rolled out throughout Scotland, and will support communities developing their own local renewables projects.

"The fund will not replicate existing grant and loan support. Instead, it will focus on investment by offering new and innovative instruments which complement existing funding routes.

"That is what this fund is all about – investing money from the technologies of the past to secure our energy future."

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UK distributor, Environmental Technologies, also employs experienced technicians who are trained to provide a wide variety of support activities to ensure customer satisfaction.

Northumbrian Water invests in Hydropower

Northumbrian Water has installed a £1.3m hydropower generator at the Mosswood water treatment works.

The £1.3million plant at Mosswood works, in County Durham, has taken eight months to construct by engineering firm JN Bentley, one of the contractors in Northumbrian Water's AMP5 framework.

The new 185kw generator unit will create enough power to meet a third of the electricity needed to run the treatment works and save the water company £200,000 a year. The site's power bill will now be cost

neutral when Government subsidies are also taken into account.

Northumbrian Water is at the forefront of the water industry for renewable energy initiatives. It already has the biggest hydropower plant in England at Kielder Water as well as the country's most advanced anaerobic digestion plant, operating at the mouth of the Tees.

The schemes have brought Northumbrian Water national acclaim. The company won the award for 'Best initiative by a large business' in the Climate Week Awards 2012.

Off-shoreWind

World Leading Energy Firm Invests in the UK

Wind turbine manufacturer Gamesa have given a huge vote of confidence to the UK offshore wind industry by announcing their plans to build a major manufacturing facility in Leith which will produce the giant wind turbines that are set to be built around the British coast.

The project could be worth up to £125m and is expected to support over 800 direct jobs. The new factory is expected to make the enormous blades for wind turbines – which can be longer than an Olympic swimming pool – as well as the generator units that sit at the top of the turbine.

Along with their Research and Development centre in Glasgow and their offshore wind HQ in London, this announcement shows Gamesa's commitment to establishing the UK as the main focus of their worldwide offshore wind business.

Welcoming Gamesa's announcement, Prime Minister David Cameron said:

"This is fantastic news for Scotland and shows that the UK remains an attractive place for foreign investment."

"Scotland benefits from UK wide initiatives to promote renewables and access to the entire UK consumer market. That coupled with the economic security that comes from being part of one of the world's most successful unions makes Scotland an obvious place for companies like Gamesa to invest in."

Energy Secretary Ed Davey added:

"I am delighted that Gamesa has chosen to invest in Leith and cement its commitment to the UK offshore wind market. The Government has been working with the company on this project for some time so it is great to see real progress being made."

"This was clearly a closely run race between two excellent locations - a powerful message to the offshore wind industry that the UK is the place to be."

"Projects like this have the potential to bring investment and support jobs across the whole of the country. Being a United Kingdom means we can attract the large investment necessary and keep costs down."

Floating Wind Turbines A UK & US collaboration

Floating wind turbines are to be the initial focus of a new agreement between Britain and the United States this week as international talks convene in London to accelerate the deployment of clean energy technologies.

Much of the deeper waters off the UK's coast, between 60 and 100 metres, is currently off-limits to wind turbines, with the depth being too great for fixed structures, but benefit from consistently higher wind speeds.

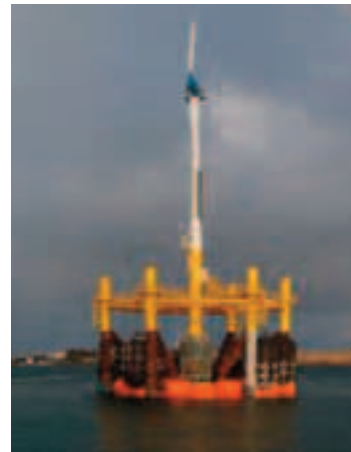
Floating wind technologies could therefore open up new areas off the coast of the UK. This will ultimately increase the potential of this sector, particularly post 2020 as the available shallow water sites are developed, and will help to meet our decarbonisation and energy security targets.

Major repairs on floating wind platforms can also take place when the devices are towed back to dock which will also help to reduce costs.

In the UK, the Energy Technologies Institute is currently in the process of commissioning a £25m offshore wind floating system demonstrator.

Energy Secretary Edward Davey said:

"Britain has more wind turbines installed around its shores than any other country in the world and our market is rated year after year as the most attractive market among investors."



"Offshore wind is critical for the UK's energy future and there is big interest around the world in what we're doing."

"Floating wind turbines will allow us to exploit more of our wind resource, potentially more cheaply."

"Turbines will be able to locate in ever deeper waters where the wind is stronger but without the expense of foundations down to the seabed or having to undertake major repairs out at sea."

"The UK and US are both making funding available for this technology and we're determined to work together to capitalise on this shared intent."

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