

# the cbec news stream

Issue 2, Summer 2013



Welcome to the second issue of cbec eco-engineering's newsletter! We aim to give you a taste of the work we have been up to over the last few months plus any upcoming news of interest, and provide some food for thought on issues relating to river restoration. This summer newsletter continues the 'natural processes' theme of our spring edition with a feature on 'Natural Flood Management'. We hope you will find it stimulating, and are always eager to hear your views or comments: email us at [news@cbecoeng.co.uk](mailto:news@cbecoeng.co.uk) or visit our website <http://www.cbecoeng.co.uk/news-newsletter.php>.



You can now also follow us on [Twitter](#), [Facebook](#) and [LinkedIn](#) to receive our year round 'News Stream' of interesting water-related news. Finally, please feel free to forward to anyone who may be interested!

Contents:	Events	Case Study	Update	Feature
<b>In this issue:</b>	cbec Calendar	NFM on the Dee and Nith	New Faces at cbec	Natural Flood Management

## Events

cbec has a busy conference schedule this year and they offer a good chance for you to meet our staff in person. Why not come along to discuss your needs?

- 11th - 13th September **5th European River Restoration Conference:** 'Celebrating successes and Addressing Challenges', ECRR, Vienna, Austria. Presenting in Session 7: River Restoration Techniques on "An application of the Process Restoration Philosophy on a Scottish upland river". A full programme can be found [HERE](#).
- 22nd - 24th October **Annual Conference, Institute of Fisheries Management:** 'What can fisheries do for us? – Learning from past successes, preparing for the future', IFM, Cardiff. Presenting on "Letting the river build habitat: the sustainable ecological benefits of applying the process restoration philosophy in river restoration". More information can be found [HERE](#).
- 9th - 13th December **Fall Meeting, American Geophysical Union** San Francisco, USA. More information can be found [HERE](#).



We attend conferences throughout the year, so visit our website for the latest additions plus links to the conferences above: [www.cbecoeng.co.uk/news.php](http://www.cbecoeng.co.uk/news.php). For any comments or enquiries, email [newsletter@cbecoeng.co.uk](mailto:newsletter@cbecoeng.co.uk).

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## Case Study - NFM on the Dee and Nith

Since March 2013 cbec has been working for SEPA on two major Natural Flood Management (NFM) projects in the Dee and Nith catchments. We are conducting fluvial audits, topographic surveys and geomorphic assessments over extensive geographical areas to provide SEPA with fully informed recommendations for priority restoration and flood management options. Our assessment of current geomorphological and hydrological conditions will be considered in relation to the catchment reference conditions (ascertained through analysis of historical records); in turn, this will allow us to identify prominent ecological stressors and for our restoration proposals to be targeted accordingly.

Owing to the spatial scale at which the projects are being undertaken, they have demanded careful consideration of a diverse spectrum of stakeholder interests, ranging from the conservation of the Dee's nationally important populations of the EU-protected freshwater pearl mussel to flood risk concerns in various localities. Correspondingly, cbec has formed partnerships on these projects with Walking-the-Talk (Dee and Nith) and Mott MacDonald (Nith).

## New Faces at cbec

The last few months have seen a rapid expansion of the cbec team. Gayathirry Krishnamoorthy is cbec's new Technical Assistant; Gordon Falconer has filled the role of Junior Hydraulic Modeller; and Thomas Aspin is completing a placement with us as he undertakes research on restoration measures on the Yorkshire Derwent.

**Gayathirry** has a BSc in Geography from Queen Mary, University of London. She has gained a broad knowledge of the environmental and social sciences as they relate to the functioning and management of the environment, with a particular emphasis on water courses in urban areas.



**Gordon** has an MA Honours in Geography from the University of Dundee and is currently studying for an MSc in Sustainable Catchment Management at the University of Dundee. His undergraduate degree provided him with a solid foundation in the social and physical aspects of the environment.



**Thomas** graduated with a BSc in Geography from the University of Bristol in 2012, and is currently studying for an MSc in Aquatic Resource Management at King's College London. He has acquired applied knowledge of environmental impact assessments in coastal settings, urban river restoration projects and aquaculture industry practice.



Detailed biographies of our new staff can be found on our website at:  
[www.cbecoeng.co.uk/news-newstaff.php](http://www.cbecoeng.co.uk/news-newstaff.php)

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## Natural Flood Management

Just as cbec's restoration projects are guided by the theory of process-based restoration, so the principles of natural flood management (NFM) underpin our flood risk services. In the following paragraphs we outline the concept of NFM, highlight its compatibility with process-based restoration and explain why we believe it to be a key component of holistic river management planning.

NFM aims to mitigate flood risk as a two-stage process: firstly, it exploits the capacity of natural catchment features (soil, vegetation, surface topography) to retain water and retard its delivery to river channels; subsequently, in-channel flow may be slowed by sympathetic adjustments to physical parameters (sinuosity, roughness, cross-sectional geometry). NFM thereby advocates an environmentally cognisant (and cost-efficient) alternative to more intrusive engineering-based approaches.

In practice, NFM shares common ground with river ecosystem restoration. Planting of the riparian zone with native vegetation may reduce total surface run-off and attenuate overland flows; restoring meanders also slows the propagation of a flood wave through increased resistance to flow, increased channel length and reduced energy slope; and re-connecting a channel with its historic floodplain may re-establish access to important off-channel storage space (for water, sediments and nutrients).

Careful consideration of NFM should include existing land use practices. While NFM is not always compatible with traditional agricultural practices, it can be compatible with recent, more holistic farming practices, such as Catchment Sensitive Farming. NFM need not result in the conversion of agricultural land on floodplains to ecological preserves. Some farming practices can tolerate periodic inundation associated with NFM, such as grazing and certain types of arable practices that may result in fallow land during winter inundation periods. Insurance schemes can be developed such that agricultural production loss as a result of inundation due to NFM may be compensated after infrequent flooding.

These examples of practical, synergistic measures demonstrate that flood management objectives often coincide with the goals of ecologically-driven river rehabilitation schemes. Indeed, NFM is founded upon the same fundamental principles as process-based restoration: firstly, both endeavour to address the root cause of flood risk/ ecological degradation; secondly, both concepts acknowledge the importance of adopting a catchment-scale perspective to river management; and thirdly, both recognise the need to set realistic targets that reflect catchment-specific constraints on project feasibility imposed, predominantly, by land use.

NFM is a framework capable of fostering cost-effective, environmentally sensitive solutions to issues of river flooding. We believe that the NFM approach is a viable means to tackle flood risk without jeopardising the ecological objectives of river restoration efforts and, as such, regard it as a core component of any holistic river basin management plan.

What is your opinion on natural flood management? Comment by email [newsletter@cbecoeng.co.uk](mailto:newsletter@cbecoeng.co.uk) or our Facebook: [www.facebook.com/cbececoengineeringUK](http://www.facebook.com/cbececoengineeringUK)

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### A Reminder of cbec...

We focus on innovative and sustainable solutions for the water resources industry. Our research and experience enable us to combine the demands of flood-risk reduction with ecosystem enhancement and other considerations such as agricultural and urban development.

We couple this with cbec's extensive experience in a broad range of past projects: from total management of large, multi-disciplinary, multi-stakeholder water resources projects within one of our specialised Focus Areas; to providing specific modelling, surveying or data analysis within an individual Technical Service.

### Focus Areas

Our services can be tailored to each project's requirements and can be used separately or in conjunction with our other offerings.

#### Flood Risk Management

We combine the needs of flood risk management, ecosystem enhancement, urban development and agriculture to develop multi-objective, holistic, and sustainable solutions to floodplain and channel management issues.

#### River Restoration

We use advanced hydrological, hydrographical and topographical survey techniques. These combine with the latest hydrodynamic and ecological modelling methods to enhance floodplains without impacting related factors.

#### Diffuse Pollution Control

As pioneers in the field of hydromodification planning and design, we are influencing the way water sensitive design is incorporated into new and infill development. We cover urban and rural diffuse pollution analyses, planning and design.

#### Fisheries Management

Our fisheries services include habitat surveys, barrier assessment, fish pass and screening evaluation, design, placement of hydraulic structures and experimental fieldwork - for various species including salmonid and coarse fish.

#### Hydropower Support

We perform a variety of desk-based and field services to support the development of hydropower projects, licensing and applications, post-commissioning monitoring, surveys, assessments and installations.

### Technical Services

We provide a range of technical services, available both individually or in combinations applied to a 'Focus Area'.

#### Field Surveying

Our services include bespoke fluvial audits, discharge gauging, water quality monitoring, long-term meteorological monitoring, topographic and bathymetric surveying, sediment characterisation and transport monitoring and many more.

#### Hydrology

For years, our staff have applied hydrological theory and practice, pioneering new methodologies and techniques. We conduct hydrologic modelling assessments investigating drainage, runoff, flood risk, water budgets and so forth.

#### Hydraulics

Applied analyses range in complexity from simple spreadsheet models to complex 3D computational fluid dynamics simulations. These include bridge scour, fish swimming and passage, tidal and fluvial sediment transport and water quality.

#### Geomorphology

We conduct geomorphic reconnaissance and detailed analyses. We use our own Moir Fluvial Audit methodology and offer geomorphic interpretation and assessment, historical channel analysis, stream power assessment, habitat and GPS mapping.

#### Design

Our services cover streams, rivers, estuaries and tidal zones, including channel realignment, wetland design, river restoration and catchment plans. We also offer SUDS, SuDS, and modelling-based habitat design.

Feel free to contact us for more information, past experience, for quotes or just to discuss your preliminary ideas  
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