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Editorial ECRR Newsletter.



Dear readers,

Welcome to our newsletter, the second this year, all of which we hope have helped to keep you updated on our latest news and provide you with sound environmental tips. We hope you have enjoyed the summer months this year, with plenty of sun around to get us all up and being active in submission of great news.

We start presenting one of the finalists of the European River Prize 2016, the Trent River. This reach-scale restoration was based on a sound study of geomorphology and river dynamics, in order to apply the principle of "let the river do its work". The science-based innovative approach and detailed monitoring was for sure another strength of this project.

The second article explains the origin of the Finnish Watercourse Restoration Network, which coordinates the multiple efforts at different scales across Finland since 2013. This is a good example of the coordination between different kinds of entities for the restoration of rivers and lakes.

We also transmit very good news from France: the creation of a National River Restoration Centre, which will be dependent on ONEMA, and whose information is already available on-line. A first ECRR Board meeting will be celebrated this year in Paris.

The next article deals with the Guidelines for Preparation of the Drought Management Plans. Since the analyses of weaknesses in the implementation of the EU Water Framework Directive (WFD), a group of European countries decided to make this interesting document with support from the Integrated Drought Management Programme in Central and Eastern Europe (IDMP CEE).

And the fifth article on the Upper Yellow River (China) remarks the importance of the hydraulic and geomorphological models for the future implementation of a frequently-neglected component of the environmental flow regimes, i.e. the restoration of the peak flows and floods, necessary to restore the ecological dynamics and diversity of the floodplains. As such, this article reminds the relevance of applying models for a sound proposal of river restoration in Europe. In addition, as usual, you will find the event calendar for the next months.

We wish you pleasant readings!

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River and floodplain re-naturalisation in the Trent catchment, Staffordshire, English Midlands



Laser scanner, drone surveys: digital terrain models

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The River Trent, and its largest tributary, the River Tame, have had a rough time in the recent past! Large conurbations -including Stoke-on-Trent and the UK's second largest city, Birmingham- developed in the headwaters of both rivers have taken a heavy toll. Until a few decades ago the Tame and Trent were biologically dead rivers -two of the dirtiest watercourses in Europe- polluting significant areas of the North Sea. Tough legislation introduced in the 1970s has helped improve water quality year on year. However, another major problem was that these rivers have been engineered into uniform, deep, straight, single thread conveyance channels and effectively disconnected from their traditional floodplains.

Central Rivers is a wide ranging partnership that was set up in 1997 with a strong vision to integrate the regeneration of these river valleys into a multi-functional landscape- an attractive patchwork of lakes, wetlands, naturalising rivers, farmland and settlements and a destination for people to work and play. The main catalyst for realising this vision comes from an unlikely source: mining! Staffordshire is the largest producer of land-won sand & gravel in the UK and the vast majority of the aggregate is quarried from the Central Rivers area. Via the project, we are able to 're-build'

ecological networks of new floodplain habitat. Each quarry has a restoration plan to maximise the benefits for wildlife and people. The final challenge has been to restore diversity and biocomplexity back into the monotonous river channels and to connect them to these wonderful new wetlands created by quarrying.

The project partners have completed reach re-naturalisation at several locations including an innovative two kilometre river widening scheme at Dosthill and Middleton Hall quarries near Tamworth.

Opportunity mapping completed in 2007 identified a continuous fifteen kilometre stretch of the River Trent that was an ideal candidate to focus reach restoration effort and that would make a significant contribution to EU Water Framework Directive objectives for this 'failing waterbody'. Staffordshire Wildlife Trust led on the initial six kilometre restoration work carried out between Croxall and the Catton Estate in partnership with a team of hydromorphology experts from AECOM, JBA Consulting and the University of Salford. Since 2009, a series of ongoing reach restoration schemes have been carried out along this area of focus. The work has been a great success. It has demonstrated how to restore a degraded and monotonous watercourse to create a diverse and functional fluvially influenced landscape. It has also helped to improve water quality through the natural management of fine sediment which is now being deposited across seasonally-



Sand & gravel quarry – discussing restoration, June 2014



inundated wetlands rather than continuing to accumulate in the main river channels. This has led to a recovery of gravel based morphology within the channel, most notably where flow spreading allows material to drop out and local flow concentration then winnows these sediments to reveal the gravels, providing significant morphological and hydraulic habitat improvements.

The project partners - led by the recommendations of the science team - placed river morphology and dynamics at the foundation of the restoration approach. The design encourages the river to do the work and to 'build its own habitat'. This has allowed much more to be achieved with limited money than would otherwise have been possible. The audit and modelling approaches were designed to deliver results at an appropriate scale to integrate with developing desired river, riparian and floodplain habitats. The biggest driver was to restore connectivity to the floodplain in acceptable locations as this was seen as the most important factor in system recovery and allowing it to re-naturalise. Importantly, reach scale restoration work was placed in the context of catchment processes to ensure a sustainable approach was developed. Strong science gave regulators confidence in permitting the innovative approaches for river restoration adopted at the sites.

Importantly, detailed monitoring programmes have been initiated that are utilising drone surveys and laser scanners to capture morphological and sedimentological response over time, alongside more detailed auditing and post-project appraisals recording ecological response. This shows a significant commitment to learning lessons (both positive and negative) that can be applied to further works throughout the catchment in the future as well as providing and sharing information with other practitioners, planners, regulators and decision-makers. Initial monitoring results suggest a transition from an impoverished bankside vegetation community dominated by ruderal species towards a more diverse assemblage of wetland and riparian plants. Local gravel bed recovery is also evident as part of the development of a mosaic of features in the channel with a cleaner coarse bed evident across higher energy flow areas and deposition of finer sediment on the lowered floodplain and in the anastomosed channel network.

Catton river re-naturalisation sequences

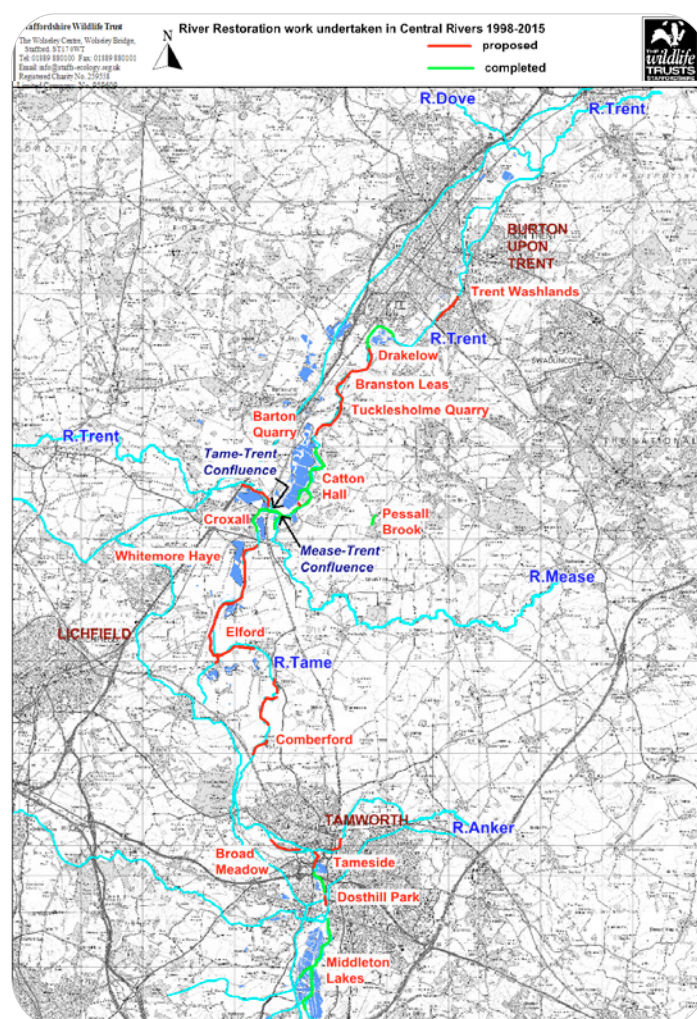


We want the river valleys to continue to develop into a major visitor destination replete with canoe trails, hiking trails, bike routes, wildlife observation towers, camp sites, visitor centres, outdoor activity centres and forest schools. River and floodplain re-naturalisation continues to be the key to unlock the area's potential.



- The River Trent project led by the Central Rivers Initiative and the science team was a 2015 European River Prize Finalist
- Key partners include: Staffordshire Wildlife Trust, Environment Agency, Staffordshire County Council, Hanson, Aggregate Industries, Tarmac, RSPB, National Forest Company and Local Authorities
- Science team led by AECOM, University of Salford and JBA Consulting

River Restoration proposed & completed 1998-2015.
Annotated map Dec 2015



Finnish river restoration centre and watercourse restoration network



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In Finland river restoration has been promoted mainly by the state organization consisting of Finnish Environment Institute SYKE, the regional environment authorities and the Ministry of Environment and the Ministry of Agriculture and Forestry. SYKE serves as the Finnish River Restoration Center. SYKE publishes guidelines, organizes seminars and congresses and keeps up the information system of water construction projects, including restoration cases.

The reason why the knowledge of river restoration was developed in the state organization was the need of restoring thousands of kilometers of rivers and brooks where logs had been floated until 1980's. The regional environment authorities got the responsibility of removing dangerous structures and placing stones back into rivers. In many rivers the restoration was renewed by restoring side arms and spreading out rivers to gain more good habitats mainly for salmonid fish. Some of these additional works are still ongoing in Lapland.

After 2000 the volume of restorations was decreasing and new interests were rising, like restoring brooks in urban and agricultural areas. Volunteer associations began to restore

brooks especially for trouts. Municipalities and regional associations for water protection began to employ designated river keepers to lead restoration works. Thus a part of the responsibility of river restoration has been shifted for local organizations, but regional environment authorities still accomplish restoration cases which need change of permits, like removal or modification of dams for fish migration.

To spread out information of river restoration for publicity, an idea of establishing an open network for river restoration was rising around 2010. The Finnish Watercourse Restoration Network was founded in 2013, with the initiative of the EU Life-project RESTORE. As lakes are important in Finland, the network also contains lake protection associations and water area owners. The network is hosted by SYKE and it gets funding from the Ministry of Environment. The network organizes a yearly restoration congress with special days for rivers and lakes and one day for sightseeing. As the events are organized every year in different locations, participants can get acquainted with activities in all parts of country. The network has proved to be essential in promoting interest for river and lake restoration on local level



A National River Restoration Centre in France



geoobject.ru

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Following a one day seminar in December 2015 in Paris, the need has been recognized by local river restoration practitioners attending the seminar, to create a National Center for River Restoration in France. The River Restoration Centre (RRC), the Italian Centre for River Restoration (CIRF), and the Finnish Environment Institute (SYKE) all shared their support and their experiences of what role their organisations play in key areas of policy, practice and supporting their own national networks of individuals committed to integrated management of our river systems. France already has a wealth of experience and information nationally, regionally and locally, but the ideal is to exchange this better and provide guidance and support to those less experienced, with the support of other approaches in other countries



National Seminar to create a French National River Restoration Centre

The aim of this centre is to promote river restoration benefits, raise awareness, facilitate information sharing between practitioners and to help river restoration uptake.

You can find out more about the one day event held in 2015: <http://www.onema.fr/journee-d-echanges-CNRR>

France will soon announce the creation of its National Centre for River Restoration and apply to join the ECRR network. The centre will be led by Onema (French National Agency for Water and Aquatic Environments) soon called Agence Française pour la Biodiversité (French Agency for Biodiversity) with the 6 water agencies at the Ministry of Ecology.

The next step is to raise the profile of the National Centre for River Restoration and communicate on its role and mission and build up the national network with regional relays and international contacts.

Practical information is already accessible about river restoration in France, in English language, at the Onema web site: English: <http://www.river-restoration.onema.fr/> French: <http://www.onema.fr/rubrique/preserver-et-restaurer-l-hydromorphologie-et-la-continuite-des-cours-d-eau>

In these pages , you can find information about:

- who is involved in France in river management,
- practical information and technical guides on river restoration related subject,
- case studies,
- information about the upcoming French National River Restoration Center.



Step-by-step guidance towards Drought Management Plans



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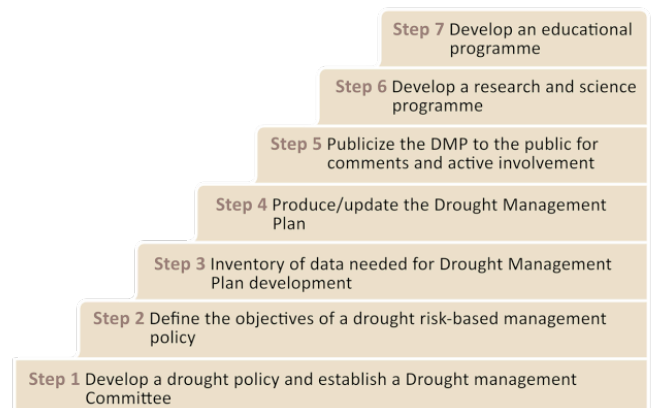
Download the [Guidelines for preparation of the Drought Management Plans](#). Photo credit: Dinev/GWP CEE

In the last decades it has become more and more clear that Europe is vulnerable to droughts, water scarcity and floods. The future climate scenarios in the region forecast increased frequency and severity of extreme weather events, which will result in the increase of droughts. Several river basins in Central and Eastern Europe (CEE) have a transboundary character. Currently, however, there is no suitable mechanism to share information and knowledge among countries, and regional integration of drought monitoring and early warning is not at the desired level.

Therefore, a transnational integrated approach is needed for the successful tracking of drought, comparing its impacts using a common methodology and assessing the vulnerability of various sectors to drought occurrence. Currently, all of the countries within the CEE region need to improve both their short-term and long-term responses across sectors to meteorological, agricultural and hydrological droughts. Although most European countries have well-developed meteorological and hydrological monitoring, these systems are not translated into concerted efforts to support decision-makers in other sectors of the national economy, such as agriculture, energy and tourism.

The [Integrated Drought Management Programme in Central and Eastern Europe \(IDMP CEE\)](#), is a joint programme of the Global Water Partnership (GWP) and World Meteorological Organization [Integrated Drought Management Programme](#) which was launched in 2013. The Programme aims to build the capacity of stakeholders at different levels to use a proactive integrated drought management approach, and also tests innovative approaches for future drought management planning in ten countries of CEE.

How to integrate drought into planning process for development of the RBMPs?



Drought policy development and production of Drought management plan.

A key objective of the IDMP CEE is to fill gaps in implementing the EU Water Framework Directive (WFD), being one of the main policy instrument in drought management. One of the important concepts of the WFD is the organisation and regulation of water management at the level of river basins. The central administrative tools are the River Basin Management Plans (RBMPs) and it is highly recommended (although not obligatory) to include also drought management plans. RBMPs are therefore appropriate tools for the implementation of drought management. Recent studies (e.g. by the UN and GWP) confirmed the increasing vulnerability of the CEE region to drought and water scarcity. IDMP CEE further found that DMP development in CEE was unsatisfactory: most countries had not produced a DMP in accordance with WFD guidelines.





Photocredit: Bodakova/GWP CEE

In response, experts from ten countries involved in the IDMP CEE developed *Guidelines for Preparation of the Drought Management Plans*. The *Guidelines* aim to provide a better understanding of how to integrate drought management into RBMPs in CEE. They focus on seven steps that relate specifically to the environment of CEE countries and which should be used by public bodies and competent authorities responsible for national drought planning.



Photo credit: Muller/GWP CEE

The *Guidelines* are targeted primarily at public bodies and competent authorities responsible for national drought planning. The *Guidelines* have a clear and simple structure to increase understanding by stakeholders and the broad public. The publication also provides information on other issues related to drought that are included in the WFD: quantitative status, prolonged drought, and climate change.

Photo credit: Baranciuc/GWP CEE



Impact of peak discharges in the Upper Yellow River, China

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Introduction

Discharge regulation and attenuation of peak discharges are important issues in European river management, among others to prevent flooding and cope with the effects of changing climate and land use. However, what happens if the high peak discharges are restored?

In our case study, the Yellow River in Northeast China has been controlled by hydropower reservoirs for several decades. The river morphology has adapted accordingly. Recently, plans were made to adjust the discharge released by the hydropower dams and to restore the originally high annual peak discharges. The morphological impact is one of the uncertainties and required further investigation.



Upper Yellow River in the city Lanzhou, China.

Objectives and Methods

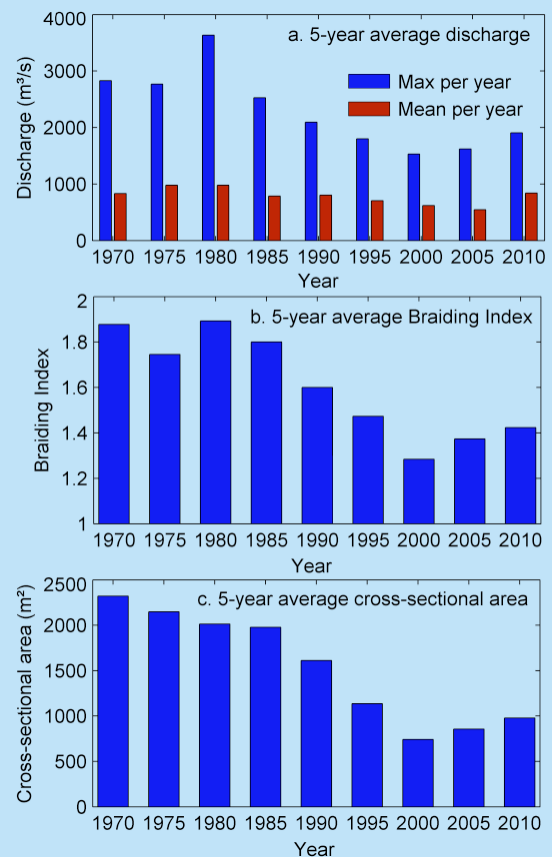
Therefore, Royal Haskoning DHV conducted a joint research with the Chinese Key Laboratory of Desert and Desertification in Lanzhou, to estimate the adjustment of the Upper Yellow River and the morphological behaviour after the increase in annual peak discharge. We selected two study reaches of the Upper Yellow River in Inner Mongolia: a meandering and a braiding reach. We used field data and satellite images to understand the river behaviour in both reaches over the last decades with relatively low discharge peaks. Next, computer models were applied to simulate the river behaviour and morphodynamics for high annual peak discharges, ranging from 2000 to 5000 m³/s. First for the period 1999-2015 to calibrate and validate the models, and second for 2015-2040 to help predicting the impact of higher discharge peaks.



Locations of the study reach, with the braiding reach in the red circle and the meandering reach in the blue circle.

Results

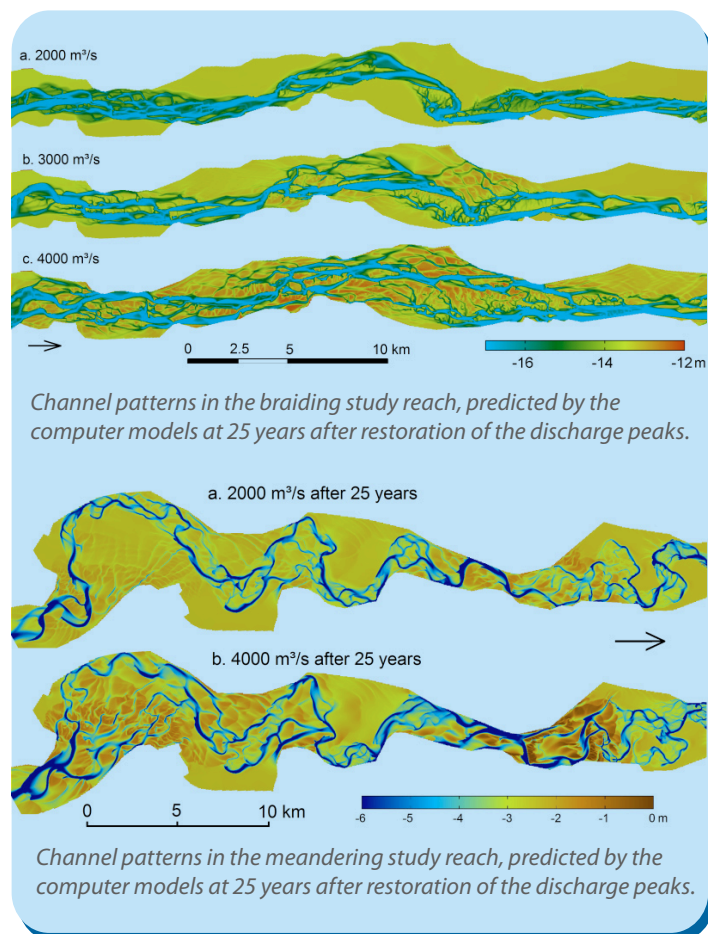
The field data demonstrated a large impact of the discharge regulation by the construction of two large hydropower dams in 1968 and 1986, see figure below. In that period, the annual peak discharges declined from about 3000-4000 m³/s to 1000-2000 m³/s. As a result, the average number of channel branches ('Braiding Index') in the braiding study reach declined from nearly 2 to about 1.3. Also, the cross-sectional area decreased by a factor of 3. Both patterns are significant for behaviour and management of the river.



Field measurements in the braiding reach in the last decennia: discharge, average Braiding Index, and average cross-sectional area.



The computer simulations showed that restoration of peak discharges also has an enormous impact on the river shape and river dynamics, see figures below. The largest impact occurred on the floodplains. For example, in the scenarios with high peak discharges (3000 and 4000 m³/s), many new channels on the floodplains were created in the simulations. And the Braiding Index in the braiding reach increased to about 3-4, and large parts of the floodplain became part of the main channel. The river pattern changed accordingly: from mildly braiding to heavily braiding, or from meandering to mildly braiding. Furthermore, a higher peak discharge increased bank erosion, and accelerate shift of bars and channel branches.



In summary, the joint research with our Chinese partner gave a clear image about what effects can be expected when peak discharges in the Upper Yellow River are restored. This example study highlights a valuable experience for the practice of river management worldwide, including our European rivers.



Yellow River in the city Lanzhou, China.



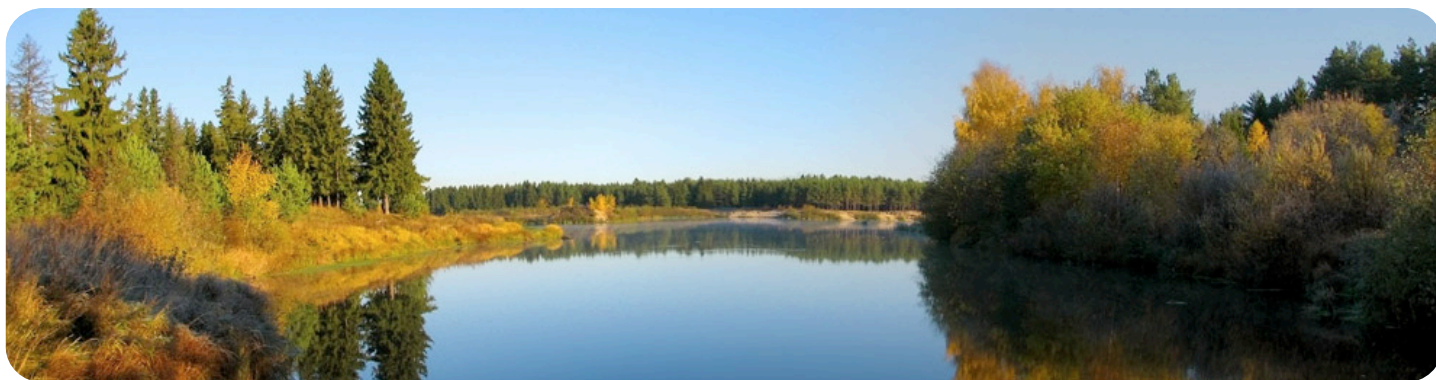
Yellow River, China.

EU River Wiki

The **RiverWiki** is an interactive database for sharing river restoration knowledge. It was one of the key outputs from the **EU LIFE+RESTORE** project. The UK **River Restoration** Centre (RRC) manages the content of the RiverWiki on behalf of the **European Centre for River Restoration**, with the aim to facilitate a shared resource from which we can all learn and develop our skills. Anyone can view the RiverWiki and registered users can upload their projects with information such as objectives, techniques, costs, ecosystem benefits, monitoring results and outcomes. Our anticipation is that the RiverWiki will be populated with project from around the world. For more information and instruction: [EU RiverWiki Instruction](#)

ECRR Events calendar 2016 – 2017

Date / period	Title / issue	Location	Links
14 – 15 November	Dam Removal Europe workshop	León, Spain	https://www.eventbrite.nl/e/dam-removal-europe-workshop-tickets-27407303984
9 – 11 December	2016 International Conference on Water Pollution Control Engineering (WPCE 2016)	Sanya, China	http://www.wpce.org/
12 – 15 December	International Conference on Water: From Pollution to Purification	Kottayam, India	http://www.ctamgu.in/icw2016/
12 – 14 April 2017	XIV International Scientific/practical Symposium and Exhibition "Clean Water of Russia"	Ekaterinburg, RF	https://www.uv66.ru/vystavka/ekaterinburg/2017/water_2017/
13 – 15 June 2017	International Eel Science Symposium	London, UK	http://www.sustainableeelgroup.org/
14 – 17 June 2017	10 th International SedNet Conference "Sediments on the move"	Genoa, Italy	http://www.sednet.org/
19 – 21 July 2017	"River Basin Management – 2017" 9 th Conference on River Basin Management	Prague, Czech Republic	http://www.wessex.ac.uk/conferences/2017/river-basin-management-2017



Call for articles

The newsletter of the ECRR should also be a way to share with one another what interesting work is being done, information about seminars or literature. One way of doing this is by writing an article of any project, event or literature you may be acquainted with. Send this article (**maximum of 500 words**) to the secretariat of the ECRR at info@ecrr.org

We will take a close look to the content and if it is coherent with the philosophy of ECRR (ecological river restoration and sharing knowledge) your article will be published with pleasure in the next edition (s) of the ECRR Newsletter.

The secretariat of the ECRR hopes to receive any article on ecological river restoration from any of its members

Free ECRR Network Subscribent

All who are interested in river restoration and sustainable water management are encouraged to join the ECRR. Subscribers receive the ECRR Newsletter about four times a year and are the first to be informed about activities by the ECRR, its members and partner organisations. To register, go to www.ecrr.org.

If you want to unsubscribe for the newsletter, please send an email to info@ecrr.org.

