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hydrolink

THE EFFICIENCY OF A VERTICAL SLOT FISHWAY

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IAHR AIRH

International Association for Hydro-Environment Engineering and Research

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Spain Water and IWHR, China

IAHR PRESIDENT'S MESSAGE

Dear Member

At the beginning of the New Year I would first like to send you my very best wishes for the coming year and I hope that the year ahead will be a peaceful, prosperous and healthy one for you and your family.

This is my last year in office as IAHR President, and this is also my last New Year's message. I believe that we have achieved much together over the past 3-4 years and it has been an honour and privilege to have the opportunity of building on the success of previous presidents of our learned society. In particular, I would like to express my thanks and appreciation for the support given to me by current and past members of the Executive Team, including: Jean-Paul Chabard, Arthur Mynett, Marian Muste, Zhaoyin Wang and Ramon Gutierrez Serret. I am also much indebted to Chris George, our Executive Director, and all the IAHR Staff in the Madrid Office; we are very fortunate in having such excellent staff in helping us run our association. I am also very grateful to CEDEX, and their Director Mariano Navas for the financial support and the encouragement they have given us over the past 4 years and more.

These are exciting times for IAHR, with changes needed to develop our association for the future challenges of the 21st century. In particular, following the global financial crises of 2008, climate change and growing worldwide competition, there has been a noticeable enthusiasm to assess the "impact" of research in many countries. For example, in the UK the funding research councils and the recent Research Excellence Framework – REF2014 (where universities are assessed for the quality of their research) there has been a requirement to identify "pathways to impact" in grant applications and detailed Case Studies of Impact in the research framework exercise. These types of additional assessments of research have meant that academics are now encouraged much more than in the past to engage with practitioners from industry, government agencies and regional authorities etc. Hence, over the past 4 years we have focused IAHR's strategy on trying to engage more with practitioners and make IAHR more appealing to research organisations and end-users of research. In my opinion we have made a good start as described further on, but we still have much to do. I therefore believe that it is important that the next President, Executive Team and Council maintain our commitment to raising the impact and visibility of the research and engineering developments of our members.

Prof. Roger A. Falconer
CH2M HILL Professor of Water Management, Cardiff University, UK
IAHR President

In terms of our journals and monographs, we have made a number of developments to enhance our pathways to impact. Our flagship journal, namely the Journal of Hydraulic Research, is stronger than ever and I am very grateful to Vlad Nikora for all that he has done to maintain and enhance the rigor of refereeing etc. of our key journal. The Impact Factor has again risen – in 2013 by 30% to over 1.3; however, he has also brought in a strong team of excellent academics to maintain the high quality of the journal. I know from my own experience, as Chair of the UK REF Sub-Panel for Civil Engineering, that our journal is ranked on a par with the very best in terms of research quality and rigor.

I am grateful to my colleague Michaela Bray for taking over the editorship of the Journal of River Basin Management and it is encouraging to see the large number of papers now coming through for this journal. The journal has a citation index for Scopus and we hope that it will soon also have an Impact Factor with the Science Citation Index, although this is becoming less significant as Scopus is increas-

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Always an honour to meet up with my friend Joseph Lee at the DSD 25th Anniversary Conference in Hong Kong, where we both gave Keynote Talks

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International Association for Hydro-Environment Engineering and Research

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Cover picture: The Hydraulics Laboratory of the Centre for Hydrographical Studies (CEDEX), Spain

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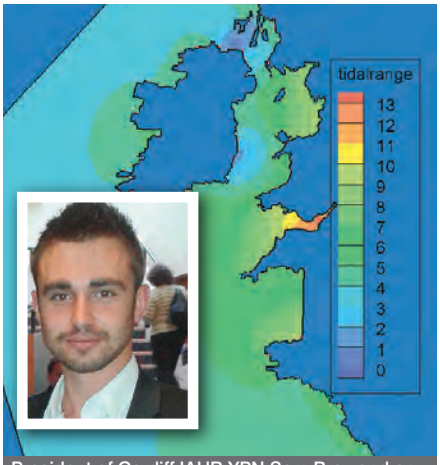
ingly used as the measure of publication visibility; for example, the Times Higher is now working with Scopus to provide relevant information to assess the world ranking of universities.

I am delighted with the success of our new journal, namely the Journal of Applied Water Engineering and Research, edited by Tobias Bleninger and Teodoro Estrela nominated by the World Council of Civil Engineers (our partner). The journal was launched at our last IAHR World Congress in Chengdu and is aimed at providing a forum for publishing practical papers on applied research and novel hydraulic project case studies etc. The journal has already attracted a considerable number of papers and is published for us by Taylor & Francis.

Our IAHR Asia Pacific Region launched the Journal of Hydro-environment Research in 2007 in collaboration with the Korean Water Resources Association, under the Editorship of Prof. Joseph Lee from Hong Kong and Prof. Kyung Soo Jun from South Korea. This journal has grown from strength to strength over the past four years and provides another important outlet for research in the field of hydro-environmental engineering and research. I am also most grateful to Peter Davies, who has done an excellent job as IAHR Book Series Editor in producing a number of state-of-the-art monographs including, for example, Large Eddy Simulation, by Wolfgang Rodi, Thorsten Stoesser and George Constantinescu. On a personal note I am delighted to be handing over the leadership now of our Hydro-environmental Research Centre at Cardiff University to my colleague Thorsten Stoesser, who will be an excellent successor and is always supportive of our close links with IAHR.

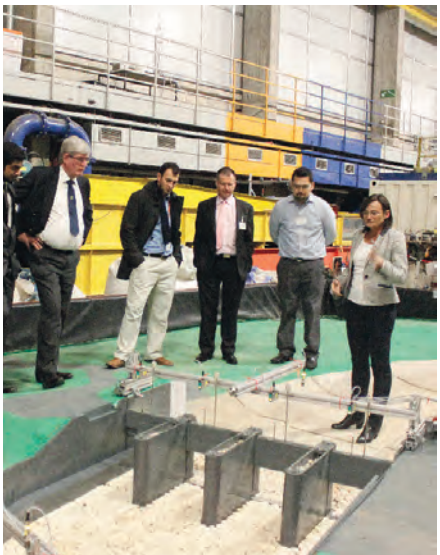
In developing closer links with practitioners and end-users, one of our key developments has been to change the direction and focus of Hydrolink, our flagship magazine, towards a greater emphasis on application of research. With the much appreciated support and encouragement of the editor, namely Michele Mossa, of the Technical University of Bari we have set up an Industrial Advisory Board, chaired most admirably by Angelos Findikakis of Bechtel. The magazine now focusses on interesting hydro-environmental projects and current topics of global interest, for example Global Water Security, as well as covering IAHR news items etc. The magazine provides an ideal outlet to attract practitioners and academics to write short and applied articles of general interest.

IAHR's new Spanish journal Ribagua



President of Cardiff IAHR YPN Sam Bray and an example model simulation which won an award from Fujitsu

Part of the membership of the IAHR BW YPN (Stuttgart)



Prof. Silke Wieprecht (Stuttgart) giving a lab tour at night

In catering for the interest of our Spanish-speaking members, and with the aim of attracting more Latin American members in the future, I am delighted to report that we have just published the first issue of the journal Ribagua, which is published in Spanish/ Portuguese by Elsevier and edited by Fabian Bombardelli from UC Davis and Ramiro Aurin of Intercom Strategys, Spain. The Journal was launched at the recent conference of CODIA (the conference of national water directors) in Panama which has also agreed to be a patron. This is a new and exciting development for our association and offers us a growing opportunity to develop more journals for our members in different languages.

I am also particularly enthused by the success of our new IAHR Young Professional Networks. In line with our increasing commitment to make our association more relevant to practitioners, we have re-focused our IAHR Student Chapter at Cardiff to include research students and post-doctoral research associates, as well as extending our network to include graduate engineers working for local companies. Our IAHR YPN at Cardiff now includes members from CH2M HILL, Arup etc. and 10 of our researchers recently gave elevator presentations to practitioner members in the region. The event was extremely successful and we have been asked to repeat this next year, focusing on other researchers from our Centre. At a similar recent event our research student Sam Bray, President of the Cardiff IAHR YPN, won an award from Fujitsu for his work on modelling the effects of a Severn Barrage on tides around the west coast of the UK.

More recently I had the pleasure of attending, and participating in the launch of the IAHR Baden Württemberg YPN, at Stuttgart University. This was a most encouraging experience for me and highlighted the tremendous enthusiasm of our young professional members and new Council Members.

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IAHR new logo identifying our new sponsors

However, what I will never forget, in particular, was the spontaneous tour of the water laboratories late into the night, organised and delivered with incredible enthusiasm, by my IAHR Council colleague Silke Wieprecht. I realised that, although this might be my last year as President of IAHR, we are fortunate in having such enthusiastic colleagues within our association. The meeting also convinced me that the change from a Student Chapter, first introduced by one of my predecessors - namely Forrest Holly, to a Young Professional Network is timely as we thrive to develop closer links with practitioners and other water stakeholders. My predecessor can be very proud of the legacy he initiated for our younger members; new IAHR YPNs are being launched almost monthly and I will not list them here, but details are given on the IAHR website.

One of the most exciting new developments for IAHR in 2015 is the launch of our new joint Head Office in Beijing. As from 1st January 2015 we will have two head offices undertaking complementary tasks to shape the future of IAHR. The China office is being well resourced by the Institute of Water Resources and Hydropower Research (IWHR) and to whom we are very grateful. IAHR's new Beijing office has been established in close discussion and collaboration with my Council colleague Dr Jing Peng, Director of International Co-operation at IWHR, and I cannot thank her enough for all she has done to deliver this new major expansion for IAHR. The new office will allow us to expand our services and membership and ideally, in association with other water learned societies, develop a new professional water qualification. I look forward to working with the new office manager, Mr. SUN Gaohu, and his colleagues.

In parallel with the inauguration of the new office in China, I am delighted to report that our support for the office in Spain has expanded too and brings us into closer contact with practitioners. Whereas in the past we were gratefully supported by CEDEX (the Spanish national public works research institute), this support has now been extended under the umbrella "Spain Water" to include the Ministry of Agriculture, Food and Environment as well as Aqualogy, which is the largest Spanish water company, focusing on its mission of being "a benchmark in the sphere of water and the environment through the sustainable creation of shared value". This is an exciting expansion of our Spanish office and is already leading to higher level links with Government.

Finally, I turn to the future and my key vision for IAHR, which would be to focus on the following:

- We are a small association in terms of membership numbers and income; in my view we need to develop closer associations with similar learned societies and, in due course, possibly even consider strategic mergers. Chris George and I have already started developing closer links with IAHS, IWRA and IWA. Most recently we have signed a collaboration agreement with PIANC. Closer links with other associations, such as IWA, could open up new opportunities in modelling water supply and water treatment processes, where current state-of-the-art CFD models being supported by laboratory studies, field data and hydroinformatics tools, could deliver improved designs for the water industry. We need to diversify our technical committee structure and develop a more flexible structure which is more able to take on new tasks as they develop. Furthermore, we need to relate our technical committees more towards the commercial incentives which drive business groups in hydro-environmental consulting companies etc. For example, in my view we need technical committees in market orientated topics where we have considerable strengths, such as: Flood Risk Management (including modelling), Water Security (including water resources, groundwater resources), Coastal Zone Engineering and Management (including coastal erosion) and Agricultural Engineering (including improved design of irrigation schemes). Whilst agricultural engineering may not appear to be an exciting topic to the traditional hydraulic engineer and researcher, 70% of the world's water is used in agriculture and one only has to look at a typical water spraying system and realise that this could be improved considerably to make better use of water for food production. In my view there are tremendous opportunities for members of our association to use CFD and hydroinformatics tools to improve considerably the efficiency of irrigation systems.

In conclusion I would like to leave you with a first glimpse of our new logo, which will be included on all IAHR media material as from 1st January 2015 and which highlights our future with head offices in China and Spain. I hope that you will be pleased with the new logo and that our association will flourish with the added resources at our disposal and for which my Council colleagues and I are very grateful.

I believe that our association faces really exciting times ahead and I am grateful to you all for your support and encouragement over the past 4 years. In the meantime, I would like to conclude this message by again extending to you my very best wishes for 2015 and on behalf of IAHR I would like to express my sincere thanks to all those members who have contributed so much of their time to the committees, workshops, journal editorships, books, monographs etc. and to all the Staff in the Madrid Office who do such an excellent job in supporting our association. In 2015 we will also have the benefit of support being provided by the Beijing office and I am confident that our association will go from strength to strength. I look forward to seeing you at our next World Congress in The Hague, in June 2015. Thank you and very best wishes.

LABORATORY STUDY OF THE EFFICIENCY FOR NATIVE IBERIAN FISH SPECIES OF A VERTICAL SLOT FISHWAY

BY FELIPE MORCILLO AND MIRIAM CASTILLO

IAHR Institute Member, the Hydraulics Laboratory of the Centre for Hydrographical Studies (CEDEX), Spain has in recent years examined fish passage behaviour in a specific vertical slot fishway. The hydraulics of this type of fishway, and its impact on the behaviour of four native Iberian fish species has been studied in order to evaluate the efficiency and thus improve the application of

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The Hydraulics Laboratory of the Centre for Hydrographical Studies (CEDEX) has examined in recent years the fish passage behaviour of a specific vertical slot fishway built in the laboratory. The project has been commissioned by the General Directorate for Water, of the Ministry of Agriculture, Food and Environment, Government of Spain, and it has been entrusted to CEDEX. The Department of Zoology and Physical Anthropology of the University Complutense of Madrid, the Civil Engineering School of A Coruña University and the Department of Forestry Engineering at the Politechnic University of Madrid have also been involved.

River connectivity and fish fauna biodiversity conservation are one of the main challenges of the EU Water Framework Directive. Freshwater ecosystems have been altered, chiefly during the last 100 years, as a consequence of the impact of hydraulic infrastructures such as dams and weirs. These works can pose a barrier to fish breeding and no-breeding movements. The most common mitigating measure is the construction of fishways. However, their design and assessment needs a detailed knowledge of the fishway hydrodynamics, as well as the fish swimming ability.

Methodologies applied

The hydraulics of this type of fishway design, together with the swimming abilitiy and the behaviour of four native species, has been studied in order to provide suitable design criteria. The species considered comprise the salmonid brown trout *(Salmo trutta)*, the cyprinids Iberian nase *(Pseudochondrostoma polylepis)*, the common barbel *(Luciobarbus bocagei)*, and Mediterranean barbel *(Luciobarbus guiraonis)*. Cyprinidae is the most important family of fish in the Iberian Peninsula because of its abundance, distribution, richness and biodiversity. Most of the studies about this subject which have been carried out have considered only and exclusively hydraulic criteria; in cases where the biology of fish have been considered, only the salmonid family has been the target species. However, fishways designed for salmonids are not necessarily as effective for cyprinids.

An aligned vertical slot fishway has been built in the Hydraulic Laboratory. Fish ascending in two flow conditions (100 l/s and 250 l/s, respectively), during 24 hours, have been monitored using an RFD system. Experiments were carried out in the breeding season for each species. Underwater cameras have been used to observe how the fish pass through the slot. Images captured by overhead cameras have been processed with a new technique based on an artificial neural network and computer vision techniques developed by the Civil Engineering School of A Coruña University. This technique allows knowledge of the complete fish trajectory and variables such as swimming velocities, accelerations or times of ascent for the different individuals.

Another approximation to the swimming ability is the fatigue status, characterized through physiological parameters in blood and muscle samples. The parameter levels of individuals that completed the ascent have been compared to parameter levels of individuals brought to maximum fatigue, and of individuals at rest.

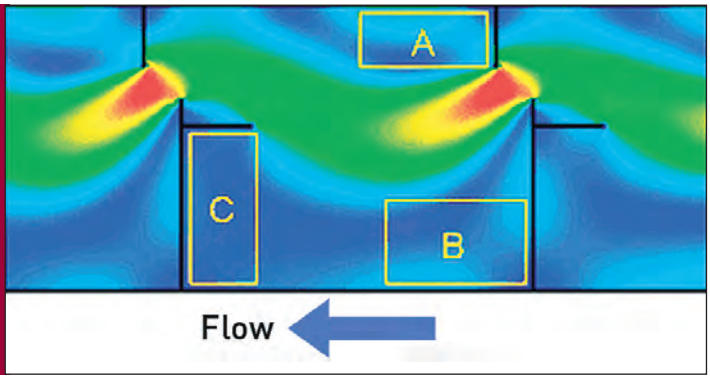

Diagram of slot configuration of the fishway built in the CEDEX Hydraulics Laboratory

Iberian nase individuals ascending the vertical slot fishway built in the CEDEX Laboratory

Results obtained

The results obtained until now have been published in two technical papers and they have been used to calibrate and improve a computer software designed by the Civil Engineering School of A Coruña University. This software has been created for the analysis and design of vertical slot fishways according to the requirements of the target species.

First of all, it has been observed that fish have ascended the vertical slot fishway using the recirculation areas as resting areas, avoiding if possible the main flow. Fish do that even when passing through the slot, and to do so, they have passed through the slot next to the baffle. Most of the barbels and brown trout have passed through nearby or at the bottom. On the other hand, most of the Iberian nase individuals have passed through the slot along the water column.

Besides that, differences in the percentage of ascents have been found among the target species, even between species of the same family of ciprinids. Common barbel is more successful than Iberian nase. The individuals' origin, fish farm or nature, must be avoided in order to control the influence of this parameter. For example, Iberian nase individuals originated from a fish farm whilst the common barbel came from the Cofio river.

Related to the slight velocity variations along the water depth in the slot according to the flow, a larger number of fish has ascended in the 100 l/s flow experiments than in the 250 l/s flow experiments. The more turbulence related to high flows, the smaller number of successful ascents registered, independently of the species.

Regarding to physiological and fatigue status, differences have been found among plasma glucose and lactate levels of the different experimental groups aforementioned. However the objective way to know which fishway design is the most efficient. The required input data are: total height of the obstacle where the fishway is placed, the target species and their size and the fishway type (to choose among different vertical slot fishway typologies). These input data must be completed together with the flow due to its influence on the efficiency as previously mentioned.

The computer software uses water velocity and depth restrictions to compute the design pool dimensions necessary to ensure the ascent of the fish. Focusing on water velocity restrictions, maximum flow velocities attained in the slot are compared with the fish burst speed, and the velocity field in the pools is compared to the fatigue curves of species. The fatigue curves indicate the maximum swimming distance of a fish related to a particular water velocity. The results of the experiments agree with the first restriction but not with the second one.

Differences were noticed between the theoretical computer software results and the observation in the experiments which could be explained because the fatigue curves used by researchers were for species other than the target ones in this study. Furthermore, the fatigue curves were obtained in open channels, respirometers or swimming chambers, and the fish behaviour in these devices where the fish is constrained could differ from the fish behaviour in a fishway.

A corrector coefficient has been obtained for each species and flow in order to calibrate the computer software with the experiment results until more realistic fatigue curves are available for each of the target species.

Finally, it is necessary to compare the results obtained in experiments in the laboratory with those obtained with a similar type built in a river in order to reach a better knowledge of this interesting subject.

Felipe Morcillo **has been involved in technical and scientific projects for IGME (Spanish Geologic and Mining Institute) related to environmental impact assessment for seven years. He has worked in the efficiency of mitigation measures of energy infrastructure projects and in the application of conservation and biodiversity policies from the European Union (Birds and Habitats Directives). In addition, he has considerable experience of working on several aspects of aquatic organisms and ecosystems, in particular those dealing with freshwater fish. After finishing his PhD in Biology, he started working at CEDEX in 2007. During this time he has been working on projects aiming to advance the understanding of behaviour and adaptability of native fish in vertical slot fishways, and to better understand the migrating path of fish and swimming costs.**

Miriam Castillo **started working in the Hydraulics Laboratory of the Centre for Hydrographical Studies (CEDEX) after finishing her Biology degree in the University Complutense of Madrid. She has completed a Masters in Hydrology and is currently working on a PhD in Biology related to Iberian native fish fauna in a vertical slot fishway, focusing in fish movements and physiologial studies.**

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THE HR WALLINGFORD FAST FLOW FACILITY

BY RICHARD WHITEHOUSE, DAVID TODD AND LIZZIE CHELLEW

International consultant and IAHR Institute Member, HR Wallingford opened the Fast Flow Facility, one of the world's largest marine test facilities, at the end of October at their headquarters in Oxfordshire, UK. Over 100 VIP guests from across industry and academia were present to see this versatile facility launched into operation.

Developments in exposed marine and coastal environments are high risk, with fast currents, deep water and energetic waves presenting significant technical challenges. Understanding the way waves, currents and sediment interact in these complex environments is vital. The Fast Flow Facility was developed to allow HR Wallingford to explore these interactions at a larger scale and in more detail than has been previously possible. Modelling at larger scales in a controlled environment means ruling out more simplifications and reducing scale effects so that the models tested perform more like the real thing. The closer you are to full scale, the more accurate your results and therefore the more confident you can be in the modelling that has been undertaken.

Design

The Fast Flow Facility is a dual-channel, race track shaped flume and the only large scale

physical modelling facility of this kind offering wave, fast tidal current and recirculating sediment capabilities. The 75 m long, 8 m wide and 2.5 m deep Fast Flow Facility has two working channels of 4 m and 2.6 m width. Holding up to a million litres of water the facility can generate waves of up to 1 m high and flows of up to 2 m/s (~4 knots).

The Fast Flow Facility was designed using state of the art 3D Computational Fluid Dynamics (CFD) numerical modelling. A 3D model within the OpenFOAM software was used to design the geometry of the flume and to assess its performance characteristics.

The initial focus of the CFD work was to optimise the geometry of the flume, starting with an almost rectangular shape and progressing to the curved and lowered shape finally constructed. The influence of the wave paddle on the flow and the performance of the sediment traps at each end of the flume were investigated, in addition to the likely forces on and reflection coefficients from the flow guides under both regular and irregular wave conditions.

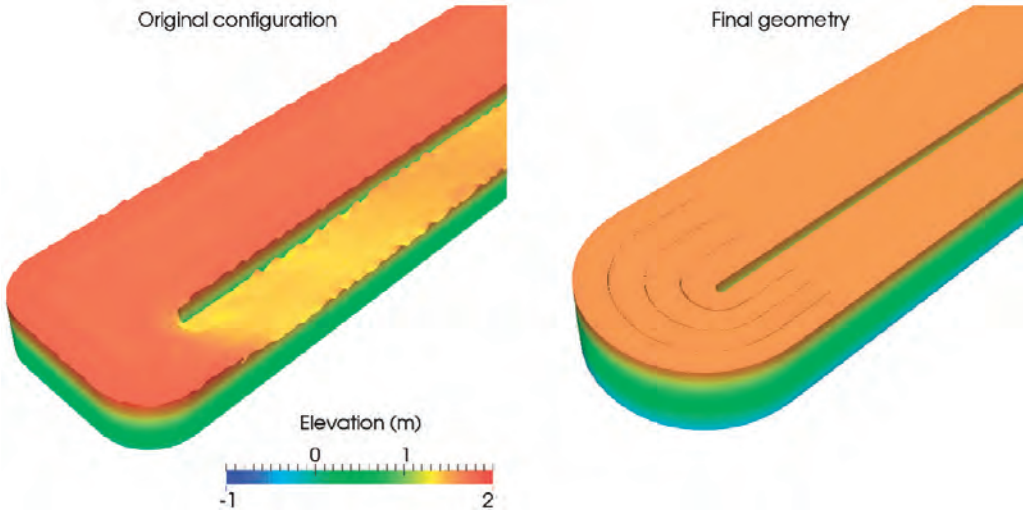

Figure 1 - Comparison of original and final geometry for an anti-clockwise discharge of 5 m^3/s

The Fast Flow Facility has several features which set it apart in terms of design:

- The wave absorbing beach has been designed specifically for the capabilities of the Fast Flow Facility and is height-adjustable so that it always provides optimum absorption for the varying water levels and wave heights possible within the flume.
- The wave maker unit has been designed by HR Wallingford to comprise ten independent wave paddles, each with their own real-time active absorption system. This system was developed by HR Wallingford engineers so that as reflected wave energy approaches the wave paddle, the paddle automatically compensates to remove the approaching waves while still generating the specified wave field. The result is smoother, more consistent wave generation. Having ten independent wave paddles with individual active absorption systems rather than a single paddle or single system means that any deformation that occurs to a reflected wave (e.g. as it passes a monopile or bed frame in the test section of the flume) is accounted for and the reflected wave is removed.
- The narrow, 2.6 m wide section of the flume has been designed to generate a hydraulic jump during low depth conditions – even at relatively low velocities. This jump causes an increase in the depth of the water at the pump intake, allowing the facility to run at lower water depths without entraining air into the pumps.
- The main working channel has a 16 m^3 sediment pit capable of holding in excess of 25 tonnes of sediment. While there are other large wave and current facilities around the world, many are incapable of working with sediment due to the problems it can cause to pumping systems. The Fast Flow Facility, however, has been designed to allow the continuous recirculation of suspended sediment through the pumping system without decreasing the pump performance over time. The pit also provides capability to remove rigid boundaries that limit scour development and stresses in the seabed around structures, and to test buried objects such as tunnel elements, submarine cables and pipelines.

"The ability to model large structures and arrays, without compromising on scale, means that we can help our clients to plan, install and maintain their assets in the most efficient way possible."

Specification

The Fast Flow Facility can generate waves, currents in both directions and a wide variety of combinations of waves and currents across water depths varying between 0.5 and 2 m in order that the interactions between waves, currents, structures and sediments can be evaluated. The ability to construct any kind of bathymetry, to install structures within the flume and to work with sediment of all sizes make this a truly versatile facility.

"The size of the Fast Flow Facility allows us to examine wave-current-sediment interactions at large scales, reducing simplifications and scale effects so that the models we test are as close to the real thing as possible" explains Prof Richard Whitehouse, HR Wallingford technical director. "The ability to model large structures and arrays, without compromising on scale, means that we can help our clients to plan, install and maintain their assets in the most efficient way possible."

The current speed of the water scales with depth, with a discharge of 5 m^3/s capable of generating velocities of up to 2 m/s. This allows the generation of real scale flows for hydrometric applications and stream gauging as well as building meandering river morphology at a large scale. The pumps also provide the ability to generate currents in both directions, allowing the simulation of tidal and estuarine systems with equal or asymmetric tidal phases.

HR Wallingford designed the bottom hinge paddle wavemaker which is capable of creating regular and both irregular (spectral) waves with Hs of up to 0.5 m and maximum wave heights of up to 1 m. In addition, the in-house

developed wavemaker software is capable of applying second order corrections to the wave generation and generating focussed wave groups with a fully programmable wave height and focus point along the flume. More information on the facility can be found in the CoastLab paper by Whitehouse et al (2014).

Applications

Commercial applications for the Fast Flow Facility are already well advanced, with the first project for the offshore renewables industry beginning in early 2015. The facility also has many applications in research; HR Wallingford has already completed large scale wave and current scour testing around a monopile foundation, a collaborative sediment transport study with the University of Southampton was completed during late 2014, testing of hydrometric ADCP (Acoustic Dopper Current Profiler) units with the Environment Agency and a project with UCL on the development of a tsunami generator in the Fast Flow Facility is well underway.

Although designed to work with sediment, the Fast Flow Facility can also be used without sediment for hydraulic or biological studies. Specific applications include, but are in no way limited to:

- Testing of offshore steel and concrete gravity base foundations including analysis of the forces acting upon the foundations, scour around the foundations and stabilisation testing.
- Hydraulic loading, 3D scour and the stabilisation of subsea pipelines and cables.
- Scour development and protection.
- Floating structures including mooring options, station keeping and survivability.
- Installation tests for steel and concrete foundations, monopiles and caissons.
- Roundhead stability testing and sediment stability at the toe of breakwaters.
- Sediment transport and bedform dynamics of beaches and dunes.
- Station keeping tests and drag for floating structures.
- Scour around the foundations of bridge foundations including the temporary works erected during construction.
- Stability of river revetments against scour.
- Industrial intake and outfall discharge studies.
- Thermal dispersion studies.
- Flood defence product testing.
- Weir and fish pass testing.
- Aquatic environment testing – design of fish hides or observation of schooling behaviour.
- Wave-current interactions.
- Tsunami tests including the HR Wallingford tsunami generator.
- ROV training.
- Offshore renewable energy devices including:
  - marine current turbines – testing and analysis of wake effects between units;
  - scour around offshore wind turbines;
  - analysis of wave energy devices – performance testing.

David Todd **is a Marine Scientist at HR Wallingford with a Ph.D in sediment transport. He specialises in sediment transport, including both numerical and physical modelling and flocculation and works closely with the Fast Flow Facility.**

Lizzie Chellew **is a Coastal Engineer working with HR Wallingford in coastal sediment dynamics and scour in the fluvial and offshore environment. With an MSc in Coastal Engineering she is involved in both desk study assessments and physical modelling, now also working in the Fast Flow Facility**

Richard Whitehouse **is a Chartered Geographer and Technical Director at HR Wallingford with responsibility for the Fast Flow Facility. His main focus is on sediment transport and geomorphology in river, estuarine, coastal and subsea environments. He is the author of "Scour at Marine Structures" (Thomas Telford, 1998) and lead-author of the "Dynamics of Estuarine Muds: A Manual for Practical Applications" (Thomas Telford, 2000). He leads on HR Wallingford's Scour Research Programme and will be one of the organisers of the 8th International Conference on Scour and Erosion in Oxford/Wallingford in September 2016.**

For more information on the Fast Flow Facility go to www.hrwallingford.com/facilities/fast-flow-facility or contact fastflowfacility@hrwallingford.com

Conclusions

Overall, the robust nature and size of the facility provides the length and depth required for comprehensive testing. We look forward to carrying out a wide range of scientific and engineering research, and helping clients to solve real world problems to increase the certainty of delivering their projects. We welcome the challenges of complex projects requiring multidisciplinary inputs, international collaboration and innovative ideas in the coming years.

Acknowledgements

The design and construction of the new facility was funded by HR Wallingford.

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NEW PORT INSTALLATION IN A CORUÑA, SPAIN

BY FERNANDO J. NOYA ARQUERO

The new outer harbour of A Coruña is the result of an exhaustive multidisciplinary project in order to solve the existing problems in the current port of A Coruña, which can be summarized as depletion of space with no capacity for enlargement, and the physical and environmental risks associated with the handling and storage of certain solid and liquid bulk materials, exacerbated by the proximity of the city.

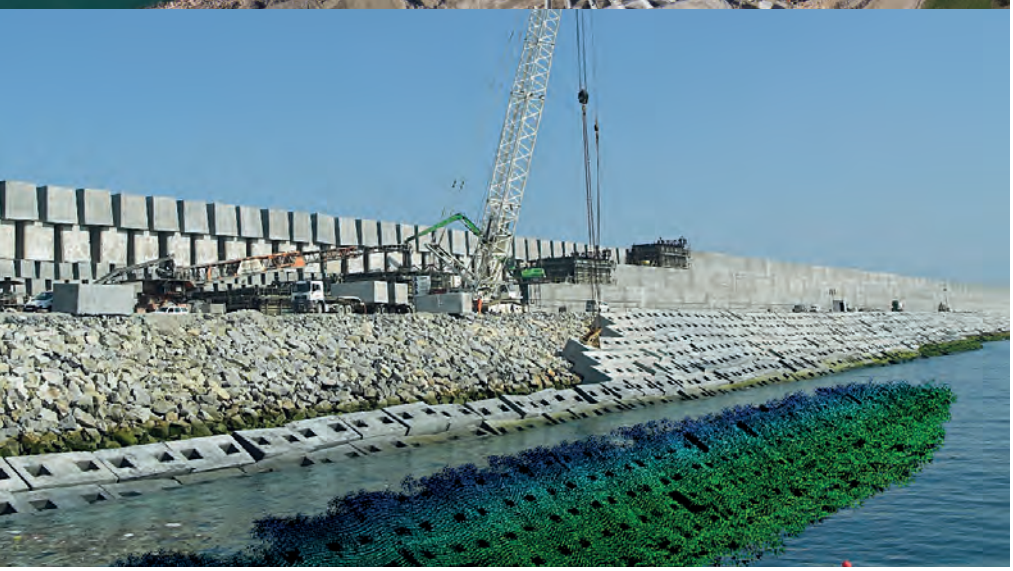
The feasibility studies of alternative designs showed that port expansion implied the need for the implementation of protection works on the outside of the estuary, on the Atlantic coast, with associated implications for extreme marine and environmental climatological conditions, with a significant design wave height of 15 m.
The new port project involved therefore a need for massive engineering works in which the most modern calculation tools to ensure the safety of the new port facilities, and resulting in a unique structure and in particular the breakwater with a depth of nearly -40 m (one of the deepest in the world), with crown at +25 m and having an armor layer composed of concrete blocks of some 150 t weight figures all of which are unparalleled in global port engineering!

The project was tendered on February 25, 2004, and was awarded by the Board of Directors of the Port Authority of A Coruña on 20th December 2004 to the Langosteira Consortium composed of Dragados, SATO, COPASA and FPS. Construction began on March 11th, 2005 with completion originally scheduled for September 11th, 2011. Finally, after the granting of an extension due to delays caused by two storms (Becky and Quirin in November 2010 and February 2011), the works were completed on December 28th, 2011, with a delay of 4.5%, which for a project of this nature may be considered irrelevant.

Description of the Project

This ambitious project involved the construction of a rubble-mound breakwater as the most significant element. The breakwater is approximately 3400 m long, with variable depth in its development, reaching 40 m in some sections, protected blocks of 150 t, and crowned with a shoulder elevation of +25 m and is topped with a sloping nose composed of high-density blocks of 178 t and 195 t.

The work is completed with a hammer of 390 m



Fernando Noya **is the Head of the Infrastructure Department of the Port Authority of A Coruña, where he has spent his professional life over the last 23 years, and thus participated in the creation of the new port since its inception in 1997.**

length, which on its inner side also serves as moorings for oil tankers, and a sloping breakwater 215 m long. The new port design is completed with a dock for solid bulk cargo, 900 m long and 22 m depth. The basin thus formed has an area of 230 ha of sheltered water and 150 ha of wharves, of which 91 will be reclaimed land.

Finally an access road to the port has been built from the Sabón Industrial Estate, already in the vicinity.

Breakwater - The structural design of the trunk of the breakwater presents a typology in slope capable of withstanding significant wave heights of up to 15.1 m and with a 16 seconds period, for a useful life of 50 years which corresponds to a return period of 140 years. As the depth increases and the predicted wave characteristics change, each section of the breakwater has been designed accordingly, and which as a function of the weight of the armor blocks has been divided into four main types:

- Section with the main armor layer of 70 t cubic blocks: Section Type A.
- Section with the main armor layer composed of 90 t cubic blocks: Section Type B
- Sections with the armor layer composed of 150 t cubic blocks: Type C Sections
- Sections with a sloping nose: Sections Type D

In all of these the sections have an outside slope of 2H: 1V, and under the main layer there are two layers of filter resting on a core of quarry stone.
The typical section of the sloping nose is formed by an outer mantle of 150 t to 195 t blocks, which rests on a foot berm to -25 and formed by 50 t cubic blocks with a covering layer some 5.5 m thick. In this case the slope is 1.75H:1V.

Jetty Caissons - The berthing length of the jetty is 900 m and consists of 28 reinforced concrete caissons lightened internally with rectangular cells, and a submerged concrete junction between breakwater and jetty. The caissons have a length of 31.5 m and a width of 16.25 m.

Hammer - The hammer has a length of 391m 390.90 m, located 230 m from the start of the nose, and consists of 10 caissons with rectangular cells internally lightened and grounded at an elevation of -23 m and with a crowned lightweight concrete superstructure at elevation +7 with a shoulder crowning elevation of +16 m.

Planning

The successful achievement of a project of this kind, in which over 32 billion cubic meters of quarry material has been extracted, and more than 3.5 million cubic meters of concrete cast into over 160,000 concrete blocks that make up the outer layers of the breakwater, and 41 floating caissons to form the jetty and hammer, requires an extraordinary amount of planning of each and every one of the activities planned, especially if we take into account the important role of the maritime weather conditions.
For this it was necessary to programme all the activities precisely, at the beginning of the works.

First, prior to the start of construction of the breakwater, issues such as accessibility to the location of works, construction of an auxiliary port for maritime equipment, opening of the quarries, building of an office area and facilities for more than 1000 workers, a plant for manufacturing the concrete blocks and an aggregate crushing plant.

Once the ancillary facilities were ready the breakwater construction activities could be scheduled in their various phases: construction of the final entrances, including the construction of a viaduct some 65 m long, the quarrying plan, general landfill, construction of the successive sections of breakwater, including the corresponding nose, shoulder, jetty, hammer and inner breakwater.

All this planning worked as perfectly as clockwork, and when a delay was encountered - almost invariably due to adverse weather conditions - once conditions improved it was possible to recover the time lost by providing sufficient

resources. In this way with the total involvement of all parties involved in the implementation it was possible to conclude the work with a minimum deviation from the planned schedule, with fulfilment of the milestones one after the other, regardless of the increasing difficulty of each one.

Construction of Works

Work officially began on March 11th, 2005. At that time the location of the project, despite its apparent proximity to the city of A Coruña, was an area of cliffs hardly accessible by land, having no natural shelter on the coast and totally lacking in any kind of basic service. Therefore, the early months were dedicated to implementation of the interim access roads and clearance of the necessary space to accommodate the entire project.

The first major challenge was the construction between 2005 and 2007 of the so-called auxiliary port, temporary facilities necessary to provide shelter, and a loading area for the maritime equipment needed for the discharge of material needed in the deeper areas. This port with a quay some 350 m long, was protected by a breakwater of 500 m length composed of 50 and 70 t concrete blocks, which until later dismantled having fulfilled its function, constitutes a port construction with few paragons in the spanish coastal area. Once the concourses were constructed sheltering the auxiliary port in 2007 work started on the installation of the final block work. The volume of concrete produced throughout the period of performance of this work, which amounted to three and a half million cubic meters, similar to the total production of ready-mixed concrete in Galicia in nine months - which was so high as to require installation of a dedicated concrete plant for casting the blocks which had the dimensions and characteristics of a permanent industrial factory rather than a temporary facility - with a production capacity of 400 cubic meters per day and storage for up to 24,000 blocks. In this way and in order to meet the demand for aggregates associated with the high volume of concrete it was also necessary to install a crushing plant with a nominal capacity of 640 t / h, making it one of the largest in Spain.

The implementation of this titanic work, constantly fighting inclement weather, was possible thanks to the commitment and dedication of a huge number of technicians who managed to share their allegiance to their employer whether construction companies, technical assistance or port authority as well as having the common goal of building a new port in A Coruña.

This work would never have been possible without the deployment of especially developed means and without the application of the latest construction techniques. As examples the following can be mentioned:

- The use of the largest tracked crane on the market designed specifically for the work.
- The RTD project is designed to keep a tight control of the weather forecasting to enable all work to be carried out under safe conditions (SAPO, SPOL and SAYOM).
- Managing the block park by a computer system developed specifically for the works similar to those used for the management of container parks in port terminals.
- The dust suppression system used in crushing plant.
- The GPS positioning system in advance terrestrial machines.
- Designing a platform dumper trailer able to carry up to 4 blocks of 150 tonnes each.
- System for 3D visualization in real time of placing the blocks in areas submerged dike.

International Recognition

The construction of the Langosteira project has been the subject of great interest, both from the scientific community, as well as from the maritime and port engineering world.

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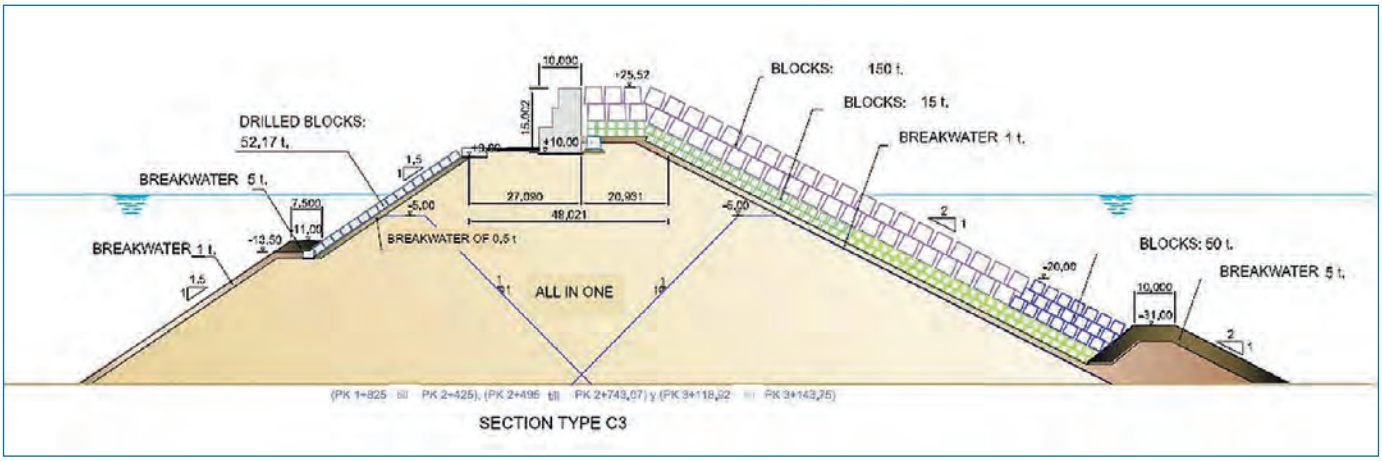

EDUCATIONAL CONCEPT SUPPORTING A RENEWABLE ENERGIES TRAINING SCHOOL IN AFRICA

BY CHRISTOPH RAPP AND ANDREAS ZEISELMAIR

A depictive teaching concept for hydraulics and hydraulic engineering has been developed at Technische Universität München (TUM). The concept's principle is the process of perception.Its final step is the application of the learnt subjects. In the framework of an initiative for international knowledge exchange founded at TUM the implementation of the gathered knowledge has been carried out in several hands-on projects in developing countries. There, universities and local people have been involved.

After briefly describing the educational concept and the university collaborations the design of a small hydro power plant for the power supply of a vocational training school for renewable energies is being presented.

Educational Concept

A discovery starts with an observation. The best proof for this thesis is the endlessly cited story of the apple falling down on Isaac Newton's head. Newton, it is said, started thinking of why such things happen, eventually deriving mechanics. Tracing the train of thought even further back it was Plato who deduced the anamnesis. He stated that the immortal soul already knows everything but forgets upon its birth. Humans have to recall their notion through external triggers – percipience. Indeed, without ever taking notice of the stars mankind would never have derived the heliocentric system and the orbits.

Hence, education in natural sciences should always start with the observation, or the sensing in general, of the phenomenon. Through the notion of what is going on one comprehends and deduces interrelated theory. The findings have to be thoroughly questioned and finally applied to certain problems (Rapp, 2012). This goes along with a permanent comparison of experiments and theory.
The approach has been implemented in hydraulics education at TUM. The following example stands for more than fifty simple hydraulic experiments developed for this teaching purpose. The fundamental deduction of the equations is not neglected.

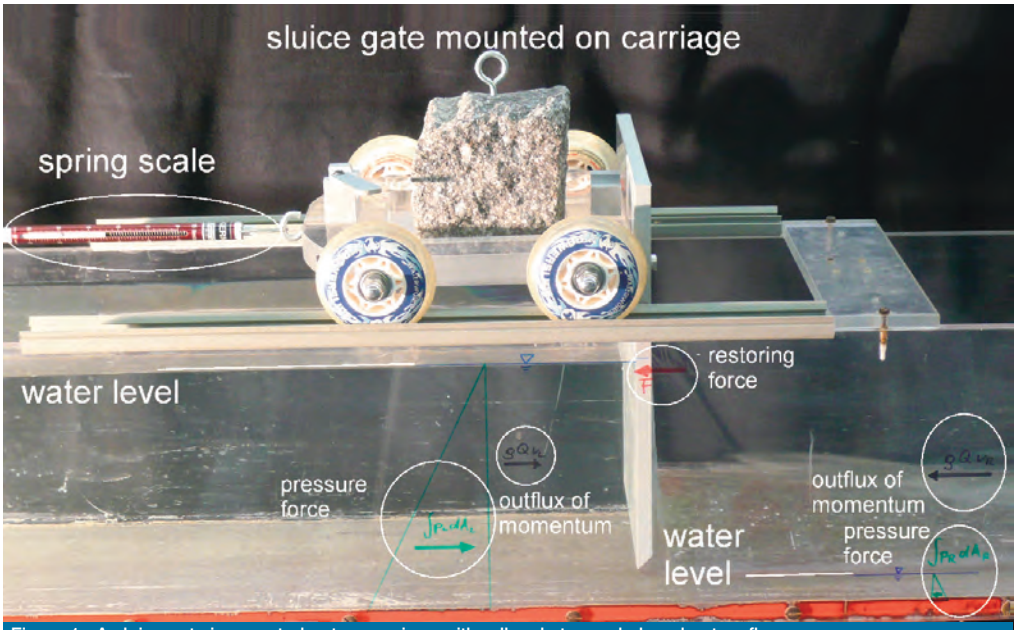

Figure 1 - A sluice gate is mounted onto a carriage with roller skates and placed onto a flume

Observe - A sluice gate is mounted onto a carriage with roller skates and placed onto a flume (see Figure 1). The carriage is fixed with a simple spring scale. When the water cycle of the flume is being started one can see that the carriage moves downstream as the flow rate and water level increase. While the sluice gate moves downstream the spring scale extends. However, at a steady state the sluice gate does not move any further. One can assume that the forces acting on the sluice gate are in balance with the reacting force.

Comprehend - Why has the carriage got to be held? The flow must apply a horizontal force onto the gate and the spring reacts with a restoring force in the opposite direction. Ideally, the force resulting from hydrostatic pressure has been explained before through various examples like in (Rapp, 2012) so that everyone is aware that the hydrostatic pressure increases linearly with depth. The outflux of momentum can be experienced by the students holding their hands in the flume upstream and downstream from the sluice gate. While doing

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Andreas Zeiselmair **studied geography and environmental engineering where he specialized in renewable energies and hydraulics at TUM . He worked as an assistant at the chair for hydromechanics and was project manager of small hydro power projects in Cameroon and Ecuador. He is co-founder of the social entrepreneurship initiative mobile hydro that aims to empower people through low-cost hydropower.**

so one can even distinguish between sub- and supercritical flow by watching the waves propagating.

Deduce - In theory the forces acting on a structure can be determined with the momentum equation (1), of which Ludwig Prandtl said (Prandtl, 1944):
"The value of these momentum equations is that they reveal conditions at the boundaries only, so that one can reason phenomena that are not comprehended in detail."
A volume fixed in space is being cut free and all forces acting onto that volume to keep it in place and in shape are being marked on the flume's wall. The volume has to be held against gravity for instance or the flow has to be deflected somehow. The forces can be derived through the Cauchy equation.

Question - In the present example the flume has got a width $b = 0.200\ \mathbf{m}$, an upstream flow depth $y_L = 0.176\ \mathbf{m}$ and a downstream flow depth $y_R = 0.020\ \mathbf{m}$. With a discharge $Q = 5.7 \times 10^{-3}\ \frac{\mathbf{m}^3}{\mathbf{s}}$ the spring force results $F = 22.8\ \mathbf{N}$.

$$F = \int p_L dA_L + \rho Q v_L - \int p_R dA_R - \rho Q v_R = 30.4 + 0.9 - 0.4 - 8.1 = 22.8\ \mathbf{N} \quad (2)$$

The spring scale shows a value of approx. 22 N, which complies in a reasonable manner with the calculated restoring force; however, the question of the discrepancy pops up. The answer can be found in the experiment itself again. The carriage is not placed on the flume friction free and also, in a lesser manner, the friction losses of the flow have to be mentioned as well.
The questioning of the deduction should be continued with appropriate examples, e. g. the restoring force of a nozzle exposed to a flow.

Apply - The application of the findings to new problems is an essential part of the learning process.
Apart from the application to certain assignments the practice of the comprehensive knowledge within a concrete project is mandatory. To do so several hands on student projects have been done at TUM in collaboration with institutions in developing countries. One of these projects is being elaborated in the following.

Knowledge exchange – hydro power project

Developing countries face the challenge to provide rural areas with electricity. According to official sources the rural electrification rate in Sub-Saharan Africa is only 18.3% which implies almost 600 million people without access to electricity in total plus approximately the same number in Developing Asia; in Latin America there are still 24 million people without power (IEA, 2013). Since energy is the precondition for socio-economic progress as it forms the basis of education, basic social and health services as well as economic growth, this fact heavily reduces chances of local development. On the other hand the above mentioned regions have an enormous potential for small hydro power plants. In Western and Middle Africa the installation/potential ratio is 11% and 23% respectively, whereas Western Europe reaches 87% (Liu, et al., 2013).

One of the integrated projects that were followed in the framework of the initiative is the design of the electricity supply for a vocational training school for renewable energies at the northern foothill of Foumban, Cameroon (Rapp, et al., 2012a). The project's scope is diverse. Firstly, the generated electricity shall supply the school and its workshops with electricity. Secondly, people living close to the planned plant who do not have access to the power grid shall be connected to satisfy their basic needs. Thirdly, a curriculum for renewable power generation with theoretical and practical lessons shall be created for the vocational school. And finally the plant is meant to serve as an example for the course. For these reasons an easy but depictive layout is aimed for. The overall paradigm is an ecofriendly design. The feasibility of various renewable energy systems has been assessed during a field trip. The high regional hydro power potential which is a consequence of the reliable and extensive rainfall and the topography, the relatively low costs and the ecological friendliness have made it first choice.

Such projects can only succeed if future associates, residents and local authorities are involved from the beginning on. The people have to identify themselves with the proposition and they have to be involved. Moreover, decisive concerns are legal and administrative issues and yet knowledge of place. Additionally, the mutual exchange implies benefits and precious experiences for both sides.
Collaboration has been set up with ADEID, a Bafoussam based non-profit organization.
The proposed site is located in the proximity of the school plot where a small weir (max height approx. 1.5 m) already exists (see Figure 2). In the concept a 100 m long penstock with a gross head of 8.5 m will feed a crossflow

Prince Sultan Bin Abdulaziz
International Prize for Water

Recognizing Innovation

Winners for the 6th Award (2014)

Creativity Prize: The prize is awarded to the team of Dr. Eric F. Wood and Dr. Justin Sheffield (Princeton University, USA) for their development of a state-of-the-art system for accurately monitoring, modeling, and forecasting drought on regional, continental and global scales.

Creativity Prize: The prize is awarded to the GPS Reflections Group led by Dr. Kristine M. Larson (University of Colorado, Boulder), and including Dr. Eric E. Small (University of Colorado), Dr. Valery U. Zavorotny (NOAA) and Dr. John J. Braun (UCAR), for their discovery that standard geodetic GPS instruments are sensitive to hydrological influences and their subsequent development of a new, unexpected, and cost-effective technique, GPS Interferometric Reflectometry (GPS-IR), to measure soil moisture, snow depth, and vegetation water content.

Surface Water Prize: The prize is awarded to Dr. Larry W. Mays (Arizona State University, USA) for his comprehensive work in surface water hydrology and water resources engineering, culminating in three leading and innovative textbooks in the field, and for his applying this extensive knowledge base to develop optimization models in practical hydrology for current problems, including real-time optimal dam release during flood conditions and watershed development in urban areas.

Groundwater Prize: The prize is awarded to Dr. Jesús Carrera Ramirez (Institute for Environmental Assessment and Water Research (IDAEA), CSIC, Barcelona, Spain) for contributing decisively to the development of mathematical hydrogeology and transport modelling in groundwater systems. As a result, he has helped in the quantitative identification of the mechanisms and possible solutions for the globally critical problem of seawater intrusion and water salinisation in arid regions, as well as making advancements in the reliable prediction of the long-term fate of pollutants in environmental systems.

Alternative Water Resources Prize: The prize is awarded to Dr. Polycarpos Falaras (National Center for Scientific Research "Demokritos", Athens, Greece), coordinator of the European Union's CLEANWATER Project, for developing a novel water detoxification technology by taking advantage of solar light and advanced titania photocatalysts combined with ceramic and composite membranes.

Water Management and Protection Prize: The prize is awarded to Dr. William W-G. Yeh (University of California, Los Angeles, USA) for pioneering the development of optimization models to plan, manage and operate large-scale water resources systems throughout the world. His methodology, and the algorithms he developed for the real-time operation of complex, multiple-purpose, multiple-reservoir systems, have been adopted in a large number of countries, including the United States, Brazil, Korea, Taiwan and the People's Republic of China.

Nominations are open for the 7th Award. Nominations can be made online until 31 December 2015.

www.psipw.org
email: info@psipw.org

Figure 2 - View onto the existing weir from downstream and overhaul measures

turbine to generate about 15 kW (approx.. 120.000 kWh/a). A hydrological approach has been developed to cope with the scarce data available.

Turbine - Various reasons have contributed to the distinct decision for a crossflow turbine. They are robust, relatively unsophisticated, easy to maintain locally and, most importantly, they are designed and optimized for these site parameters. Furthermore, crossflow turbines deal with comparatively low velocities wherefore they are not prone to sediment-induced abrasion and cavitation.

Constructional tasks - The weir capturing approx. 10.000 m³ leaks at several spots (see Fig. 2) what makes an entire overhaul mandatory. An intake structure, the penstock on the left embankment and a small power house will be erected.

Ecological and social impacts of the plant - Special emphasis has been placed on the ecological and social impact and an improvement of the current situation. The dimensions of the weir will stay untouched to exclude negative effects on flora, fauna and flood security. Endemic fish species like cyprinids and catfish will be prevented from entering the penstock and the turbine by a fine rack at the intake structure.

What electricity means to people living in rural Africa can best be examined in William Kamkwamba's book (Kamkwamba & Mealer, 2009). The Malawi uneducated brilliant engineer has brought electricity to his village by means of a self-designed wind turbine made from scrap. Electrical power is the foundation of development and therefore the hydro power plant for the supply of a vocational training center on renewable energies is being regarded as a local lighthouse project.

Conclusion

In this contribution an educational concept for an international knowledge exchange project has been presented. The application of theory through a concrete hydro power project for the benefit of the local population has been shown. Unfortunately, administrative decision for the hydro power plant has not been approved yet. Mutual support, knowledge exchange and collaboration are the keywords of the Association's projects conducted for instance in Jordan, Ecuador (see Fig. 3 and 4), Mozambique and Tanzania. For more information see: www.knowledgExchange.org

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Figure 4 - Tibi, Ecuadorian Indigena carrying a showcase model of a water wheel that illustrates the functional principle of hydropower

Figure 3 - German and Cameroonian student surveying the site

RIVER FLOW 2014: A RETROSPECT

SEPTEMBER 2-5, 2014 LAUSANNE, SWITZERLAND

BY ANTON J. SCHLEISS, GIOVANNI DE CESARE, MÁRIO J. FRANCA, AND MICHAEL PFISTER

Held at École Polytechnique Fédérale de Lausanne (EPFL) and organized by the Laboratory of Hydraulic Constructions (LCH), the 7th International Conference on Fluvial Hydraulics (River Flow 2014) created an environment for reflection, discussion and exchange of knowledge regarding fluvial hydraulics and river morphology.

It was a sound opportunity to meet, to discuss and to learn about the interaction between water, sediments and structures in natural or built environments. A total of 466 participants attended the event, representing more than 40 countries. The largest delegations originated from Switzerland, Japan, Italy, France, the USA, Germany and Canada, each counting more than 20 persons. Some 64% of the participants were professionals and senior academics (full registration), and 36% were Master or PhD students (student registration). The rate of female participants was around 25%.

The event included, besides the traditional Master classes and the Conference on Fluvial Hydraulics, also Special Sessions on Reservoir Sedimentation and on Swiss Competences in River Engineering and Restoration. Despite the mechanisms of reservoir sedimentation being well known for a long time, sustainable and preventive measures are rarely taken into consideration in the design of new reservoirs. Research and development is still urgently needed to identify efficient mitigation measures adapted to the main sedimentation processes involved in reservoirs.

Each year the Commission for Flood Protection (KOHS) of the Swiss Association for Water Management (SWV) organizes a symposium on river engineering and restoration. Professionals, officers of public administrations and researchers exchange their experiences on special topics and on-going projects. In 2014 this symposium was organized as a special session of River Flow 2014. Aside from the 110 Swiss participants, mainly practitioners, scientists and professionals from all over the world participating at River Flow 2014 were informed about the Swiss competences in river engineering and restoration.

Confirming the vitality of the fluvial hydraulics community, six master classes were held by 13 masters, enrolling 65 students from 15 countries. These were:

- Complex 3D flows, directed by André Roy, Koen Blanckaert and Thorsten Stoesser,
- Mechanics of sediment transport, directed by Francesco Ballio and Rui M. L. Ferreira,
- River morphology and morphodynamics, directed by Ana Maria Silva and Stuart Lane,
- River restoration – link between morphology and habitats, directed by Lukas Hunzinger and Silke Wieprecht,
- Turbulence and mixing processes, directed by Vladimir Nikora and Wim Uijttewaal, and
- Unsteady flows over fixed and mobile beds, directed by Mustafa Altinakar and Sandra Soares-Frazão.

Following the master classes, participants and organizers had the opportunity to continue their exchanges during a barbecue dinner on EPFL campus.

During the River Flow conference, four keynote lectures were held by experts with an outstanding international reputation, namely:

- River networks as ecological corridors, by Prof. Dr. Andrea Rinaldo.
- River turbulence: current state, challenges, and prospects, by Prof. Dr. Vladimir Nikora.
- Climate forcing of sediment flux in mountain river systems, by Prof. Dr. Stuart Lane, and
- A sediment journey through the Bermejo River of Argentina and Bolivia: from debris flows to meandering, ending in washload, by Prof. Dr. Marcelo H. García.

A technical tour to the ongoing river training and restoration works of the Upper Rhone River was organized with the Service des Routes et des Cours d'eau of the Canton of Wallis/Valais on Saturday after the conference, which was attended by 93 participants. This is the most important river engineering project in Switzerland, with a total investment of some 1.3 Billion Swiss Francs over the next 20 years. The participants had the opportunity to visit several on-going or recently finished river training and restoration works in the Upper Rhone valley, which is also a touristic destination. Within the technical tour was the visit to the Braided river Rhone stretch "Pfynwald – Bois de Finges", which is the last fully natural stretch of the Rhone River.

Scientific contributions to the River Flow conference were numerous. The number of oral presentations was 324, divided into five parallel sessions with a large audience. Following the reception and evaluation of more than 650 abstracts, 410 papers were submitted and peer-

Prof. Dr. Andreas Dittrich giving his welcome address perfectly respecting the time frame

Swiss alphorn concert and flag throwing during opening ceremony


Impression of the welcome reception with the speech of Prof. Dr. Walter H. Graf (with red tie)

reviewed, of which 365 were finally accepted for publication. These papers were included in three books published by CRC Press, Leiden NL (Taylor & Francis Group). A DOI number was attributed to every individual paper, and the papers are online accessible in the database of the publisher. The three books are:

- Proceedings River Flow 2014 (7th International Conference on Fluvial Hydraulics). The book includes 316 peer-reviewed papers covering the three main conference themes (ISBN: 978-1-138-02674-2, DOI: 10.1201/b17133. Book of extended abstracts and USB key with full papers. 2546 pages. Editors: Anton J. Schleiss, Giovanni De Cesare, Mário J. Franca, and Michael Pfister).
- Reservoir sedimentation. The book includes 28 peer-reviewed invited or selected papers, which give an overview on the latest developments and research regarding reservoir sedimentation as well as case studies (ISBN: 978-1-138-02675-9, DOI: 10.1201/b17397. Proceedings of the Special Session on Reservoir Sedimentation of the 7th International Conference on Fluvial Hydraulics. 259 pages. Editors: Anton J. Schleiss, Giovanni De Cesare, Mário J. Franca, and Michael Pfister).
- Swiss competences in river engineering and restoration. The third book summarizes the KOHS Symposium. It includes 21 peer-reviewed invited or selected papers on the latest tendencies and key-projects in Switzerland (ISBN: 978-1-138-02676-6, DOI: 10.1201/b17134. Proceedings of the Special Session on Swiss competences in river engineering and restoration of the 7th International Conference on Fluvial Hydraulics. 201 pages. Editors: Anton J. Schleiss, Jürg Speerli, and Roger Pfammatter).

The valuable contributions of sponsors were crucial for the success of River Flow 2014, especially to keep the registration fees for students on a low level. HYDRO Exploitation, the Swiss Federal Office for the Environment (FOEN), and BG Ingénieurs Conseils generously sponsored the conference. Institutional support, too, was vital for the success of the event, namely provided by IAHR, EPFL, the Swiss National Science Foundation (SNSF), the Swiss Association for Water Management (SWV), and the Hydrotechnical Society of France (SHF).

The Local Organizing Committee thanks all the participants for the inspiring atmosphere; the masters, keynote lecturers and speakers for having shared their knowledge; the sponsors for the financial support; and the auxiliary staff for their motivated and efficient background work.

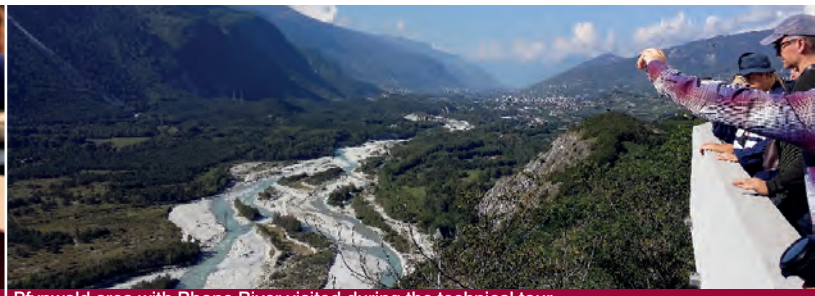
Anton J. Schleiss **graduated in Civil Engineering from ETH Zurich, Switzerland, in 1978. After joining the Laboratory of Hydraulic, Hydrology and Glaciology (VAW) as a research associate and senior assistant, he obtained a Doctorate of Technical Sciences in 1986. Thereafter, he worked for 11 years for Electrowatt Engineering in Zurich, focusing on the design of many hydropower projects around the world. Until 1996 he was Head of the Hydraulic Structures Section in the Hydropower Department. In 1997 he was appointed Full Professor and Director of the Laboratory of Hydraulic Constructions (LCH) in the Civil Engineering Department of EPFL. In 2012, he was elected Vice-President of ICOLD, and is Chair of the IAHR Europe Regional Division.**

Giovanni De Cesare**, PhD, is a Senior research associate and the vice-director of the Laboratory of Hydraulic Constructions (LCH) of EPFL. He is in charge of the hydraulic laboratory. He has more than 20 years of experience in physical and numerical modelling in all domains of hydraulic structures and schemes. He is author of more than 100 scientific papers in peer-reviewed journals, publications and conference proceedings.**

Mário J. Franca**, co-opted member of the IAHR Fluvial Hydraulics Committee, graduated in Civil Engineering from the Technical University of Lisbon in 1998, and completed his PhD in 2005 at the Laboratory of Environmental Hydraulics (EPFL). He joined the Laboratory of Hydraulic Constructions (EPFL) in 2012, where he pursues his research activity in Fluvial Hydraulics. He served in the private sector for the periods 1998-2002 and 2008-2010, and as Assistant Professor in the University of Coimbra (2007-2008) and in the New University of Lisbon (2010-2012).**

Michael Pfister **graduated in Civil Engineering from ETH Zurich, Switzerland, in 2002. He then joined the Laboratory of Hydraulics, Hydrology and Glaciology (VAW) as a research- and senior-assistant, and obtained a Doctorate in Sciences in 2007. In 2010 he joined the Laboratory of Hydraulic Constructions (LCH) of EPFL, as a Research and Teaching Associate, continuing his research activity mainly focusing on spillway hydraulics and high-speed two-phase air-water flows. He is a member of the IAHR Hydraulic Structures Committee.**

Concentrated atmosphere during a Master class



Pfynwald area with Rhone River visited during the technical tour.

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IAHR HEADQUARTERS SECRETARIAT GOES GLOBAL

BY CHRISTOPHER GEORGE

From 1st January the central administrative headquarters of the association – the IAHR Secretariat – becomes itself global with the opening of a second parallel office hosted by IWHR in Beijing, China! The new office, and the existing office in Madrid will be managed as one integrated operation and the resulting expanded administration is very good news for our members as it will enable us to provide much better support for the activities of the association and with no change in membership fees! As an example of this change IAHR now has a dedicated IT professional based in the Beijing office which will help us more rapidly embrace the potential offered by the internet and the further development of our new iMIS association management platform!

The Secretariat acts as linking pin in internal and external communication and day-to-day management of the association. It supports the elected council by implementing the decisions and strategic plans of the Association.
IAHR is from January 2015 supported both physically and financially by two organisations: Madrid office (with four staff) which has been hosted by CEDEX (the national public works research institute) since 2001 is now supported by a newly established public-private grouping called "Spain Water"; this currently consists of CEDEX itself, the Ministry of Agriculture, Food and Environment (MAGRAMA), and Aqualogy (which is the largest water company in Spain and part of the Suez group). Our new Beijing Office, which is similar in size to Madrid, is hosted and supported by the China Institute for Water Resources and Hydropower Research (IWHR) a longstanding IAHR institute member which is affiliated to the Ministry of Water Resources in China! Overseeing both offices as Executive Director I will be dividing my time between Madrid and Beijing to help consolidate the new joint operation! We are very grateful indeed for the confidence shown in the future of IAHR, and the commitment of these two organizations to support us in the coming years! Both Spain in the old continent and China in the new have developed considerable experience in tackling a wide range of water challenges and both understand the need to invest in scientific research in order to improve professional practice! Our members and the wider hydro-environment community will undoubtedly benefit from the experience of our two hosts and their support will make our association grow stronger!

IAHR International Association for Hydro-Environment Engineering and Research
AIRH

Supported by
Spain Water and IWHR, China

Modified IAHR logo reflecting our new status!

Madrid Office is supported by Spain Water

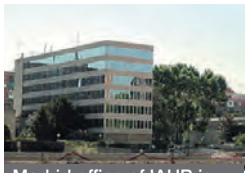
"Spain Water" is the name of the Spanish support structure for the IAHR Madrid Office. Spain Water is a public private initiative which includes: organisations which have agreed to support IAHR facilitating the continued permanence of its Secretariat in the offices of the Centre for Hydrographic Studies of CEDEX, where it has been located since 2001. Prior to 2001 we were for many years (since our foundation in 1935) supported by Deltares (formerly Delft Hydraulics).

CEDEX The Spanish National Civil Engineering Research institute

CEDEX is an autonomous organisation of the central Spanish State Administration, belonging organically to the Ministry of Public Works and functionally to the Ministries of Public Works (Fomento), and of Agriculture, Food and the Environment (MAGRAMA).
CEDEX is an organisation with multi-disciplinary teams of highly-qualified professionals dedicated to the study and solution of problems relating to civil and environmental engineering and in particular in the area of water, both fresh and marine; for which within it's seven centres it has three specialised in water and the environment: the Centre for Hydrographic Studies (CEH) dedicated to fresh water; the Centre for Harbours and Coastal Studies (CEPYC) working in the marine field, and the Centre for Applied Technique Studies (CETA) which is responsible for ecological aspects related to water in general.

Christopher George,
Executive Director

CEDEX was established in 1957 as a merger of laboratories of different disciplines in civil engineering, including "Laboratory of Hydraulics" and "Laboratory of Ports" of the former Madrid School of Roads, Canals and Ports when it was part of the Ministry of Education which until then was part of the Ministry of Public Works. In this respect CEDEX has a university origin and as such continues to pay attention to academic activities by means of. Furthermore, it should be noted that Spain is a country with a strong tradition in water matters. In the case of inland waters it has more than 1,300 large dams and is a pioneer in the management of water resources. In the maritime sphere it is the European country with the longest coastline (7,880 km) with a large number of beaches, 44 large commercial ports and many fishing and leisure harbours. Furthermore, both at the continental and coastal level the last years have seen considerable activity in the design and execution of works and in R&TD, which all attests to the importance of hydraulic themes in Spain.
For more information visit: http://www.cedex.es



Madrid office of IAHR is located in the CEDEX Centre for Hydrographic

Directorate General for Water (DGA)

The General Directorate of Water (DGA) is part of the Secretariat of State for the Environment. This is the highest organ of the Ministry of Agriculture, Food and Environment, which, under the authority of the Minister, directs and coordi-

Welcoming our new office staff in IAHR Beijing

Gaohu SUN, Office Manager
Gaohu graduated from Wuhan University in River Dynamics in 2003, and received a Masters Degree from the China Institute of Water Resources and Hydropower Research (IWHR) in Sediment in 2006.
From April 2006 to June 2014, Gaohu had experiences both in academic research in sediment in Department of Sediment IWHR and managerial engagement of Transboundary River Affairs in Department of International Cooperation of Ministry of Water Resources of China.
From March to September 2011, he had experience of working in Mekong River Commission.

Sally FENG (Shi FENG in Chinese), Administrative Officer
Sally is responsible for internal and external communication, activities organization and day-to-day administrative affairs. Sally is a graduate in Public Management from Renmin University in China and she also holds a Masters degree in Economics. Before joining IAHR, she worked for the Research Center for Sustainable Hydropower Development, IWHR and was mainly engaged in scientific research on hydropower sustainability assessment, CSR of hydropower industry, policy and standard of sustainable hydropower development and so on. She once took a part-time job in China National Office of International Hydropower Association (IHA), and worked in IHA Central Office in London for two months in 2013.

Joyce ZHOU (Tong ZHOU in Chinese), IT Officer
Joyce is responsible for the management and maintenance of IT equipment and network components in the IAHR Beijing Office.
Joyce graduated from Hohai University in 2005, and then she joined IWHR. Her major is computer science and technology. During her work, she completed a master degree in software engineering. Joyce has worked on the research of the computer monitoring system of hydropower station for six years, and accumulated plenty of practical experience in her work. Before joining IAHR, She worked for three years in the Comprehensive Management Department where she was responsible for external and internal communication and coordination.

nates the execution of the powers of this department in relation to the formulation of policies on environmental quality and pollution prevention, climate change, environmental assessment , promoting the use of clean technologies and habits of cleaner and more sustainable consumption.
For more information visit: http://www.magrama.gob.es/es/agua/temas/default.aspx

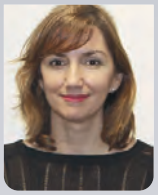
Aqualogy

Aqualogy Water Solutions and Technologies SLU (AQUALOGY) is an enterprise that integrates all activities related to water technologies and solutions for sustainable development forming part of the Agbar Group , which has been developing its activities in the field of water since 1867 AQUALOGY offers a full range of services covering all aspects of engineering and water management and the environment from water planning, to integrated prevention and pollution control.
Its main fields of action, in more than twenty countries, are: water treatment, purification and desalination, water and energy efficiency, drainage and sanitation, water resources and reuse, design and construction of water infrastructure, automation and management of water infrastructure, irrigation, quality and environmental control (water, air and soil) , industrial water treatment, waste management , recovery of biosolids and training and development.

Beijing Office is supported by IWHR - the Institute for Water Resources and Hydropower Research

The Beijing office of IAHR is located in IWHR
IWHR is affiliated to the Ministry of Water Resources, P.R. China and its history can be traced back to 1933. Over the years of development, IWHR has now become a comprehensive scientific research and technological development center at the national level in the fields of water resources and hydropower with a wide range of disciplines and obvious talent advantage. Main research fields of IWHR include hydrology and water resources, water environment and ecology, flood control and drought relief, soil and water conservation, river and lake governance, water resources in rural and pastoral areas, water resources history, hydraulics, geotechnical engineering, hydraulic structures and materials, earthquake engineering, hydraulic electromechanical equipment, automation, engineering monitoring and examination, renewable power resources, informati-

In addition to this, the Madrid Office keeps its 4 people staff comprises:



Estibaliz Serrano, Publications Manager and IPD Division Programme Manager

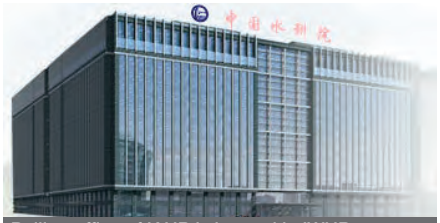
Elsa Incio, Membership Manager and Hydraulics Division Programme Manager (currently on maternity leave)

Carmen Sanchez, Accountant and LAD Programme Manager

Maria Galanty, On-line Media Officer and Hydro-Environment Division Programme Officer

zation and remote sensing technology, etc. By the end of 2013, IWHR had a staff complement of some 1420, including 2 academicians of the Chinese Academy of Sciences, 5 academicians of the Chinese Academy of Engineering, 236 senior engineers at professor level and 419 senior engineers.

IWHR has many research centers and laboratories, including one international center (International Research and Training Center on Erosion and Sedimentation), four national level centers (National Center of High Efficient Hydropower Utilization and Dam Safety Technology Research, National Center of Efficient Irrigation Engineering and Technology Research-Beijing, National Center of Agricultural Irrigation and Drainage Instrument Monitoring and Test, and National Research Center for Sustainable Hydropower Development), one national key laboratory (State Key Laboratory of Simulation and Regulation of Water Cycle in River Basin), two ministerial level key laboratories (Key Laboratory for Construction and Safety of Water Project of the Ministry of Water Resources, and Key Laboratory for Hydraulic and Sedimentation Science and River Training of



Beijing office of IAHR is located in IWHR

the Ministry of Water Resources), and eighteen professional laboratories at the institute level. Over the years, IWHR has organized a large number of national key scientific and technological projects and undertaken research works on key technological topics of almost all major water resources and hydropower projects in China. IWHR has also carried out a wide range of professional services at home and abroad including technical consultancy, evaluation and technical services. By the end of 2013, IWHR has won 86 prizes for progress in science and technology at national level, 528 provincial or ministerial prizes and has edited or participated in the preparation of 333 professional standards.

The Institute occupies a very important position in the international arena of water resources and hydropower and has built up extensive relationship for exchange and cooperation with important international academic organizations, famous foreign scientific research institutes and well-known universities. IWHR also hosts the secretariats of the International Research and Training Center on Erosion and Sedimentation (IRTCES, under the auspices of UNESCO), Chinese National Committee on Large Dams (under ICOLD), Chinese National Committee on Irrigation and Drainage (under ICID), International Association for Hydro-Environment Engineering and Research (IAHR) China Chapter, Global Water Partnership (GWP)-China, etc.

The Institute currently offers two postdoctoral research programs of first-level disciplines, and eight doctoral degree and master degree programs in geotechnical engineering, hydrology and water resources, hydraulics and river dynamics, hydraulic structures, hydraulic and hydropower engineering, water environment, hydroinformatics, and water hazard reduction and water safety.
For more information visit:
http://www.iwhr.com/english/

YOUNG PROFESSIONAL MEMBERS BECOME A GROWING STRENGTH OF IAHR

BY MARIAN MUSTE

Marian Muste **– IAHR Vice-President, Chairman of Innovation & Professional Development Division**

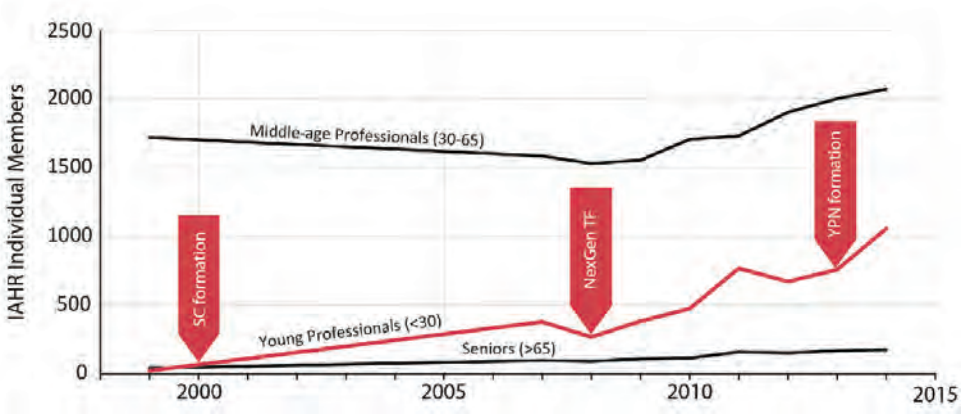
More than a decade ago, the IAHR Student Chapters (SC) have been formed following year-long discussions and assiduous efforts of IAHR's senior visionaries Helmut Kobus and Forrest Holly. SCs were created in 2000 with the aim of enabling students to organize locally professional and social group activities and create a network for their future careers. In 2008, the Innovation and Professional Development (IPD) established a Task Force (NextGen TF) to revitalize the SC activities with the long-term goal to encourage students to become full members of IAHR after their graduation. For this purpose, a suite of well-organized congress activities covering a variety of forms (training courses, student forum, SC general meetings, student night, student networking corner) have been systematically prepared starting with the Vancouver World Congress in 2009. The response of the young professionals to these initiatives was immediate as reflected by the continuous increase of the student participation at the biennial congresses (from 150 participants in Vancouver to 400 in Chengdu).

In 2011, the NExGen TF initiated a new effort with the intention to conceptualize a new organizational structure aimed at bridging the gap between students and young graduates. The result of the wide dialogue between NexGen TF and the IAHR leadership led to the creation of the Young Professional Network (YPN) framework in 2013. YPNs assemble students in water-related departments from universities in a region or a country with young professionals (i.e., under the age of 30) from academia, research and practice in that region. An YPN can entail a mix of registered students, postdocs and fresh graduates or just one of these categories whatever fits best the specific conditions. The new framework facilitates interaction between young professionals and the wider IAHR community during the scientific events and "on-the-ground" socio-professional activities geared to young professionals between these events.

The main differences between the single-school structure of the previous SCs and the new YPN structures are that the latter provide increased and more diverse membership in one organization and assemblage of more resources for supporting a wider range of activities. The YPN structure inherently includes aspects of mentoring as the fresh graduates are in direct contact with students making possible the sharing of professional experiences and peer guidance. Moreover, they newly created YPNs have more opportunities to establish international cooperation in their geographic area, a critically important aspect of a global organization such as IAHR. The new organizational scheme is supported by attractive membership rates and offers discount fees at IAHR events for young professionals who belong to an YPN. For more information about all these aspects visit the YPN website at: http://www.iahr.org/YPN

The YPN model took off quickly after the release of the by-laws in 2013. New YPNs have been formed through conversion of previous SCs (Cardiff, Iowa, Baden-Württemberg, Madrid, Delft, and Ecuador). More notably, several new regional or country-wide YPNs have been (or are in the process to be) created after the by-laws release in places where there were no SCs before (Colombia, Paris-East, Portugal, Barcelona, Kuwait, Koblenz-Landau, Peru, Pakistan and Viena). Eventually, all the existing SCs will transition to the YPN structure. The long-term strategy promoted by the IAHR leadership paid off leading to an unprecedented young membership growth. Currently there are 33 YPNs (the newly formed and the transitioning SCs) engaging 1165 individual members. That is a four time increase in young memberships since the creation of the NexGen TF (see enclosed chart).

The increase of the IAHR young membership achieved so far is not sustainable if it is not supported by a community-wide effort to provide relevant and appealing set of activities in all IAHR scientific meetings as well as in between them. For this purpose there is a need for initiating new models for continuous local and international collaboration for the young professionals. Relevant templates in this regards are the global events organized for the young professional by various technical committees such as the IAHR International Junior Researcher & Engineer Workshop on Hydraulic Structures, Gerhard Jirka Summer School in Environmental Fluid Mechanics, and the



European Junior Scientists Workshop: Monitoring Urban Drainage Systems, and the well-established Master Classes series initiated by the Fluvial Hydraulics Technical Committee. Equally valuable are the regional events such as the annual IAHR- BW Colloquium series (Stuttgart, Germany) and the Young Persons' Paper Competition organized by the IAHR-UK Chapter. Another highly relevant example is the IAHR European Division Congress series that, taking advantage of the reasonable travel costs for the events, place a high-level priority on offering young professional members ample opportunities for activities during the congresses. All the above proof-tested examples can readily be adopted and multiplied by other IAHR technical committees and regional divisions.

In order to make IAHR a hub of continuous interest for young members, there is a need to create tailored activities between scientific events. A sound example of such an activity is the Hydroweb online project organized by Frank Molkenthin between 1999 and 2003. Each year, the online project brought together 70-75 students from 8-10 world universities to work collaboratively on a project for about two-month period. This young professional-focused activity sets apart IAHR among the sister water-related organizations by offering to the participants opportunities to prepare for international careers where problem-solving is made online by teams geographically dispersed. Given the high success and impact of this IAHR-signature initiative, the IPD has successfully solicited Frank to revive the project once more this year. The 2014 Hydroweb was officially launched at the Hydroinformatics Conference (August 2014, New York) with the intention to engage this committee in taking ownership of the technical and logistical aspects of future project deliveries. The 2014 Hydroweb edition is currently engaging 70 students from 9 universities. This year's project delivery will be closely monitored by Michael Tritthart (IPD committee member) and Sun Gaohu (IAHR Beijing office coordinator) to make inferences of the resources needed for sustainable continuation of this project for the years to come.

The initiators and promoters of young professional-focused activities are hopeful that they will have a positive and long-lasting impact on the organization as a whole. The rapidly-evolving numbers and activities of the young professional members ensure that IAHR has today a solid basis to connect water scientists and engineers of all generations better than ever before. Let's welcome them in the IAHR family and give them the attention and support needed for a long journey in addressing together the challenges of the future!

CHENGDU YOUNG PROFESSIONALS DECLARATION: A CALL FOR ACTION

BY EVA FENRICH, LIU MIN AND SILKE WIEPRECHT

Background

IAHR's commitment to raise the profile and role of the organization's young members has been always a high priority on the leadership agenda. One milestone along this line was the creation of the first IAHR Student Chapters (SC) in Stuttgart and Iowa in 2000. From their tender start, SCs have continuously grown and engaged water-related students in socio-professional activities all over the world. All along these years, the IAHR's intention to integrate students and young engineers and researchers into the organisation has been going strong. As a result, SC evolved in a new organizational structure the Young Professional Network (YPN) that was officially created in 2013. The purpose of this briefing is to report recent developments of the IAHR students and young professionals to attention of the community and hopefully take them to even higher levels of action.

Since 2008, the Innovation and Professional Development Division of IAHR has been searching for means to revitalize the young member participation and engagement in the life of our organization (see the companion paper on YPN). The efforts along these lines culminated during the Chengdu IAHR Congress with a major overhaul of the structure and activities targeting the younger colleagues. Pioneered by the Vice President Marian Muste with the strong backing from the Executive Committee, the Council has recently approved the establishment of Young Professional Network. YPNs are self-led IAHR structures organized locally (at one university or water-related institution) or regionally to include IAHR members under 30-year old from academia, research, and practice. Currently, existing SCs are transitioned to YPNs to enforce the idea that the new structure focuses on a closer relation not only between the research and teaching institutions but also with some recent graduates working in industry and firms.

The prototype for IAHR YPN has been tested by young members in South-West Germany universities since 2010. A pilot activity was then started to broaden the Stuttgart University SC into a more regional group. The expanded SC brought together students from five different universities in the German state of Baden-Württemberg (BW) including Karlsruhe Institute of Technology and three regional universities of applied sciences. YPN-BW has an already established tradition of combining scientific and technical activities with social events to strengthen the networking aspect of their local organization. On the technical side, a very successful event is the Annual Colloquium series that brings together young professionals and students as well as experienced senior experts (http://www.iahr-bw.org/). The event is also an opportunity for members of other YPNs to come for a visit. Furthermore, BW-YPN organizes every year a football tournament with students and young professionals from the universities as well as from companies that gives a chance to get to meet each other in an informal environment. Other successful activities of different YPNs are short technical and soft skills (including language) courses, seminars and excursions as well as informal outings and get-togethers.

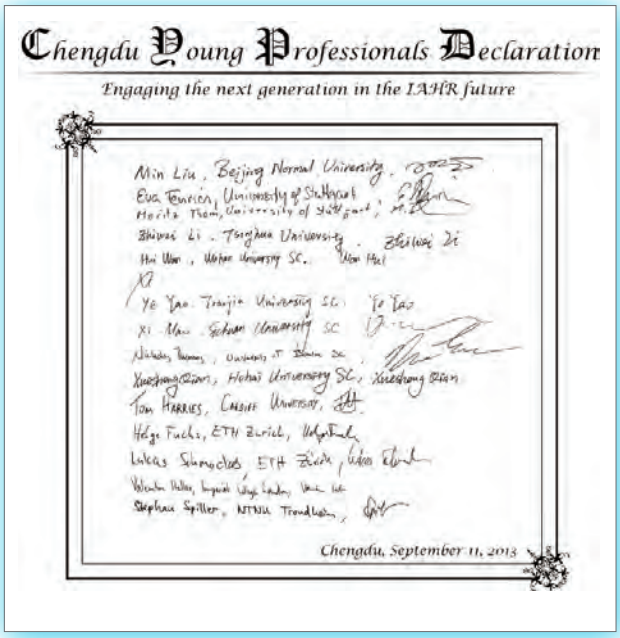
Declaration

The most recent major event for the IAHR's global community of students and young professional was the IAHR World Congress in Chengdu (September 8-13, 2014, China). This congress benefitted from the presence of over 400 students, a record breaking number of registered students for our congresses. The students, under the thoughtful and resourceful assistance of the Local Organizing Committee, planned a series of special activities organised by the student leaders themselves (http://www.iahr2013.org/student.html). During the Congress, the current IAHR young member leadership brainstormed along with their colleagues on ideas for the future. These ideas were encapsulated in the strategic document called "Chengdu Young Professionals Declaration" supported by signatures of the representatives of attending SCs. This is a visionary document that not only proofs the growth in strength of the young IAHR generation but also their desire to play a more active role in the life of our organization. The main ideas put forth by the young professionals in their Declaration are: 1) representation in the IAHR Council; 2) funding for professional activities; 3) creation of an online networking platform; 4) creation of a mentoring system.

The Chengdu Declaration was placed on the agenda of the IAHR Council in the spring of 2014. The Council approved the addition of an YPN delegate as an observer in the Council meetings. This will help to facilitate communication between the leadership of IAHR and the young professionals. This move also supports the training of younger members to take leading roles on all levels of our organisation. Currently, several of the Chengdu Declaration ideas are working items on the Council's agendas. Among those ideas are: a) creation of a sustainable mechanism to fund excellent YPN activities; b) launching an yearly competition for the best YPN projects; c) finding activities to connect the IAHR YPN network throughout the year with online activities delivered via the Internet. There is strong hope that the implementation of these initiatives will catalyse greater collaboration between IAHR young members in academia, research, and practice and encourage graduating students to stay within our community.

Future

It is expected that the Chengdu Young Professionals Declaration spirit will be continued in the 2015 IAHR World Congress in The Hague and Delft. In anticipation of this major opportunity to continue the inter-generational dialogue and spur more action, the young IAHR members from water institutes in Delft region have created their own YPN. They plan to organize a week of courses and fun specifically aimed at the younger generation, and, the welcome students from developing countries without congress participation fee. See you there!


Chengdu Young Professionals Declaration

Engaging the next generation in the IAHR future

Min Liu, Beijing Normal University
Eva Fenrich, University of Stuttgart
Zhiwei Li, Tsinghua University
Ye Yao, Tianjin University SC
Tom Harries, Cardiff University
Helge Fuchs, ETH Zurich
Lukas Schmocker, ETH Zürich
Stephanie Spiller, NTNU Trondheim

Chengdu, September 11, 2013

***Eva Fenrich* - Baden-Württemberg IAHR Young Professional Advisor**

***Liu Min* – IAHR Young Professional Network Global Coordinator**
Dr. Min Liu was the former president of IAHR Stuttgart student chapter during his PhD study. He isLecturer at Beijing Normal University, and active in international and national IAHR activities.

***Silke Wieprecht* - IAHR Council Member, NexGen Task Force**

For more information on the new YPN structure visit our website or contact Elsa Incio in the IAHR Madrid office at membership@iahr.org.

For more information on recent YP Network News go to People and Places at page 126

IAHR CONSTITUTION CHANGES
PROPOSAL FOR APPROVAL OF THE 2015 IAHR GENERAL MEMBERS ASSEMBLY, THE HAGUE

The following proposed amendments to the Constitution have been approved by the IAHR Council following discussions at (and following) the 2014 Porto Council Meeting.

1. Amendments to the constitution of the association are regulated by the following Article in the Constitution:

Article 25

Decisions on amendments of the constitution and on the dissolution of the association can only be arrived at by a general members assembly with a majority of two thirds of the votes in favour of it.

Proposals on amendments of the constitution and dissolution of the association shall be circulated in writing to the members at least two months prior to the general members assembly that coincides with the World Congress and at which action is to be taken.

2. Proposed Constitution Amendment to Accommodate Multiple Sponsoring Organisations by Creation of Additional Posts of Secretary General

The IAHR Council approved in the Chengdu Council Meeting a proposal for IAHR to have two World Secretariats from 2015: one in Madrid supported by CEDEX (and sponsored by Spain Water, composed by CEDEX, General Water Directorate and Aqualogy), and the other in Beijing supported and sponsored by IWHR. In order to ensure parity in the IAHR leadership between the two sponsors, and to ensure that the sponsors have an important role in the central executive committee of the Association the following changes are proposed:

Article 18 – current

Article 18

The elected portion of council shall consist of thirteen members including a president, three vice-presidents and a secretary general. Only members of the association may be elected council members.

The president, the three vice-presidents and the secretary general shall constitute the executive committee.
The president, three vice-presidents, and the secretary general are elected in the year of the world congress for a term of two years according to a procedure described in the by-laws of the association. The other eight elected members of the council are elected for a period of four years (not re-eligible) in the year of the world congress.

The chairmen of the regional divisions serve as co-opted members of the council. The council may, if it so desires, co-opt three additional members from members of the association who preferably have served on council.
The term of office of members of council is from the beginning of the month following election. The entire council shall retire at the day the newly elected council shall enter upon its duties.
Members of council shall generally be elected on individual merit, but so far as possible a fair representation on council from all parts of the world should be maintained. At each election at least four new members shall be elected who have not served on the retiring council. Not more than two persons from the same country shall serve on the part of the council elected by the members. The president and the three vice-presidents shall be each from a different country.

An elected member of council may be only once elected to that office, except the secretary general who is always eligible for re-election. Any member of the retiring council, however, not being a member of the retiring executive committee, may be elected as vice-president or president and can be once immediately re-elected in that office, and any retiring vice-president may be elected as president and can be once immediately re-elected in that office. Council members can be suspended and discharged by the body that nominated them.

Article 18 – proposed

Article 18

The elected portion of council shall consist of thirteen members including a president, and three vice-presidents *~~and a secretary general~~*. Only members of the association may be elected council members.

The president, and the three vice-presidents shall constitute the executive committee *together with one or more secretary general(s) nominated by the supporting organisations of IAHR and appointed by Council. The executive director is an ex officio member of the Executive Committee.* The president, and the three vice presidents are elected in the year of the world congress for a term of two years according to a procedure described in the by-laws of the association. The other eight elected members of the council are elected for a period of four years (not re-eligible) in the year of the world congress.

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The term of office of members of council is from the beginning of the month following election. The entire council shall retire at the day the newly elected council shall enter upon its duties.
Members of council shall generally be elected on individual merit, but so far as possible a fair representation on council from all parts of the world should be maintained. At each election at least *three* new members shall be elected who have not served on the retiring council. Not more than two persons from the same country shall serve on the part of the council elected by the members. The president and the three vice-presidents shall be each from a different country.

An elected member of council *(excluding the vice presidents and president)* may be only once elected *to that office*. Any member of the retiring council, however, not being a member of the retiring executive committee, may be elected as vice-president or president and can be once immediately re-elected in that office, and any retiring vice-president may be elected as president and can be once immediately re-elected in that office. Council members can be suspended and discharged by the body that nominated them.

Article 19 – Current

The council shall meet at least once a year and is entitled to make conclusive decisions provided not less than four members, elected by the membership, of different countries are present at the meeting.
In the absence of the president, the vice-president in order of age shall discharge the functions of the president. In the absence of all vice-presidents, an elected member in order of age, except the secretary general, shall officiate for the president.
Every council member is entitled to be represented, by written proxy, by another council member. Besides, every council member is entitled to be represented, by written proxy, by an IAHR member from the council member's country, who will be admitted to the council meetings as observer with an advisory function only.
A vacancy of the office of president or secretary general shall be temporarily filled by council until the next general members assembly which shall approve and ratify the nomination.
The secretaries of the technical divisions may be invited to participate in the council meetings with an advisory function. The general management of the association shall be vested in the council which is entitled to delegate functions to the executive committee. Individual council members can be charged with special assignments.

Article 19 – Proposed

The council shall *convene* at least once a year and is entitled to make conclusive decisions provided not less than four members, elected by the membership, of different countries are present at the meeting.
In the absence of the president, the *most senior* vice-president in order of age shall discharge the functions of the president. In the absence of all vice-presidents, an elected member in order of age, ~~*except the secretary general,*~~ shall officiate for the president.
Every council member is entitled to be represented, by written proxy, by another council member. Besides, every council member is entitled to be represented, by written proxy, by an IAHR member from the council member's country, who will be admitted to the council meetings as observer with an advisory function only.
A vacancy of the office of president ~~*or secretary general*~~ shall be temporarily filled by council until the next general members assembly which shall approve and ratify the nomination.
The secretaries of the technical divisions may be invited to participate in the council meetings with an advisory function. The general management of the association shall be vested in the council which is entitled to delegate functions to the executive committee. Individual council members can be charged with special assignments.

Further Changes to various other Articles are needed to reflect the de facto role of the Executive Director and changes in the role of Secretary General.

Various Articles - Current

Representation

Article 20

1. The association shall be represented in legal and other proceedings by the president and the secretary general together, or by the president together with one of the other council members, or by the secretary general together with one of the other council members.
2. The council is entitled to:
   a. contract loans;
   b. purchase, alienate, mortgage, hire and let real property.

By-laws

Article 21

Council is entitled to frame and amend the by-laws provided the contents do not conflict with the constitution and provided that at least two thirds of the entire council have approved them.
Distinctive amendments to the by-laws can only take place after all members of the association have been notified thereof and it can reasonably be assumed and/or it has been found that the majority of the members agree to these amendments. Distinctive amendments in the sense of this article are considered in any case: amendments regarding nominating procedures of officials who, to a large extent, determine or contribute to determining the association's policy.

General members assembly

Article 22

The general members assembly is held any place in the world, annually on the last day of the month of June, not considering a Saturday or a Sunday a last day, unless at least two months prior to that day the secretary general convenes the meeting in writing at an earlier or a later date. For the announcement of the date, venue and time of the general members assembly together with the agenda the association's periodical may be used. At this meeting the council shall report to the members about the activities of the association during the past association year and the council shall render account of the financial management. The secretary general shall deposit the relevant records of members' inspection at the office of the association at Delft one month prior to the general members assembly, and shall forward to members who request in writing a copy of these records.
At the annual general members assembly the financial report shall thus be validated and the annual report of the council shall be submitted to the general members assembly for approval.
The annual financial report shall be submitted to an official auditor for checking and he/she reports on his/her findings in writing to the general members assembly.

Various Articles - Proposed

Representation

Article 20

3. The association shall be represented in legal and other proceedings by the president and the *executive director* together, or by the president together with one of the other council members, or by the *executive director* together with one of the other council members.
4. The council is entitled to:
   a. contract loans;
   b. purchase, alienate, mortgage, hire and let real property.

By-laws

Article 21

Council is entitled to frame and amend the by-laws provided the contents do not conflict with the constitution and provided that at least two thirds of the entire council have approved them.
Distinctive amendments to the by-laws can only take place after all members of the association have been notified thereof and it can reasonably be assumed and/or it has been found that the majority of the members agree to these amendments. Distinctive amendments in the sense of this article are considered in any case: amendments regarding nominating procedures of officials who, to a large extent, determine or contribute to determining the association's policy.

General members assembly

Article 22

The general members assembly is held any place in the world, annually on the last day of the month of June, not considering a Saturday or a Sunday a last day, unless at least two months prior to that day the *executive director* convenes the meeting in writing at an earlier or a later date. For the announcement of the date, venue and time of the general members assembly together with the agenda the association's periodical may be used. At this meeting the council shall report to the members about the activities of the association during the past association year and the council shall render account of the financial management. The *executive director* shall deposit the relevant records *for* members' inspection ~~*at the office of the association at Delft*~~ one month prior to the general members assembly, and shall forward to members who request in writing a copy of these records.
At the annual general members assembly the financial report shall thus be validated and the annual report of the council shall be submitted to the general members assembly for approval.
The annual financial report shall be submitted to an official auditor for checking and he/she reports on his/her findings in writing to the general members assembly.

Votes	***Votes***
Article 23 Resolutions at the general members assembly and at the meeting of the council and of the executive committee shall be decided by a simple majority of votes except for the cases in which this constitution prescribes otherwise. At a general members assembly each individual member, institutional member, or sustaining member present, shall have one vote and each represented institution member shall have six votes. The president decides how the votes are cast. However, voting by acclamation is permitted provided none of the voting members present objects to this method.	**Article 23** Resolutions at the general members assembly and at the meeting of the council and of the executive committee shall be decided by a simple majority of votes except for the cases in which this constitution prescribes otherwise. At a general members assembly each individual member, institutional member, or sustaining member present, shall have one vote and each represented institution member shall have six votes. The president decides how the votes are cast. However, voting by acclamation is permitted provided none of the voting members present objects to this method.
Secretariat/Financial management	***Secretariat/Financial management***
Article 24 The council shall establish a secretariat under the management of the secretary general, who also acts as treasurer. The duties and powers of the secretariat shall be determined by the by-laws of the association.	**Article 24** The council shall establish a secretariat under the management of the *executive director*, who also acts as treasurer *and is an ex-officio member of the council*. The duties and powers of the secretariat shall be determined by the by-laws of the association.

3. Proposed Constitution Amendment to accommodate the co-opting of a Vice President The new election system with multiple candidates may on occasions not provide the continuity of experience in the executive committee provided by the old election system. In these circumstances the proposed change will provide more flexibility for an incoming executive committee to ensure continuity by permitting in certain circulstances the co-opting of an additional Vice president:

Article 18 – current	**Article 18 – proposed**
Article 18 The elected portion of council shall consist of thirteen members including a president, three vice-presidents and a secretary general. Only members of the association may be elected council members. The president, the three vice-presidents and the secretary general shall constitute the executive committee. The president, three vice-presidents, and the secretary general are elected in the year of the world congress for a term of two years according to a procedure described in the by-laws of the association. The other eight elected members of the council are elected for a period of four years (not re-eligible) in the year of the world congress. The chairmen of the regional divisions serve as co-opted members of the council. The council may, if it so desires, co-opt three additional members from members of the association who preferably have served on council. The term of office of members of council is from the beginning of the month following election. The entire council shall retire at the day the newly elected council shall enter upon its duties. Members of council shall generally be elected on individual merit, but so far as possible a fair representation on council from all parts of the world should be maintained. At each election at least four new members shall be elected who have not served on the retiring council. Not more than two persons from the same country shall serve on the part of the council elected by the members. The president and the three vice-presidents shall be each from a different country. An elected member of council may be only once elected, except the secretary general who is always eligible for re-election. Any member of the retiring council, however, not being a member of the retiring executive committee, may be elected as vice-president or president and can be once immediately re-elected in that office, and any retiring vice-president may be elected as president and can be once immediately re-elected in that office. Council members can be suspended and discharged by the body that nominated them.	**Article 18** The elected portion of council shall consist of thirteen members including a president, three vice-presidents and a secretary general. Only members of the association may be elected council members. The president, the three vice-presidents and the secretary general shall constitute the executive committee. The president, three vice-presidents, and the secretary general are elected in the year of the world congress for a term of two years according to a procedure described in the by-laws of the association. The other eight elected members of the council are elected for a period of four years (not re-eligible) in the year of the world congress. The chair~~men~~ of the regional divisions serve as co-opted members of the council. The council may, if it so desires, co-opt three additional members from members of the association who preferably have served on council. *One of the co-opted members who has preferably served on the executive committee may in exceptional circumstances be appointed as a vice president.* The term of office of members of council is from the beginning of the month following election. The entire council shall retire at the day the newly elected council shall enter upon its duties. Members of council shall generally be elected on individual merit, but so far as possible a fair representation on council from all parts of the world should be maintained. At each election at least four new members shall be elected who have not served on the retiring council. Not more than two persons from the same country shall serve on the part of the council elected by the members. The president and the three vice-presidents shall be each from a different country. An elected member of council may be only once elected, except the secretary general who is always eligible for re-election. Any member of the retiring council, however, not being a member of the retiring executive committee, may be elected as vice-president or president and can be once immediately re-elected in that office, and any retiring vice-president may be elected as president and can be once immediately re-elected in that office. Council members can be suspended and discharged by the body that nominated them.

PEOPLE & PLACES

New Chief Executive for HR Wallingford

Dr. Bruce Tomlinson has been appointed as Chief Executive of HR Wallingford.
Bruce joins HR Wallingford from UK-based Fugro EMU, a marine survey and consultancy, where he was Managing Director.

Professor Emeritus

Yuichiro Fujita has become Professor Emeritus of Gifu University after his retirement

Chair in Civil and Environmental Engineering

Marcelo H. García has recently been invested as the M.T Geoffry Yeh Endowed Chair in Civil and Environmental Engineering at the University of Illinois at Urbana-Champaign

A sad moment

Prof. Tiit Koppel has passed away
Prof. Koppel was Head of the Department of Mechanics at the Tallinn Technical University in Estonia.
He was an IAHR Member since 1998

Mr. Guido J.H.E. Van Langenhove has passed away
He worked at the Department of Water Affairs of the Head Hydrological Service
In Namibia and was involved in organising our last Africa Division Congress in Windhoek.

Recent IAHR YPN Activities

Opening of the IAHR-CICCP Madrid YPN

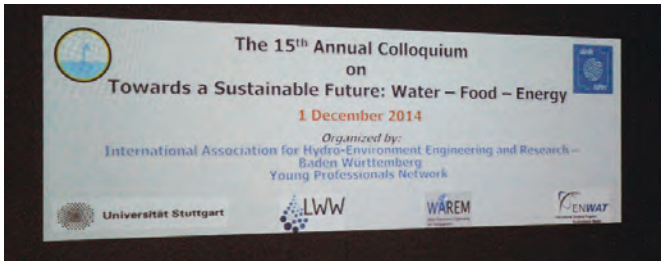
In addition to the speaches from the President and Vice President of the Spanish network plus the IAHR and CICCP officers, the event included a practical skype-call with the Vice President of the Cardiff YPN, who is also from Spain! and it was followed by a tour to the laboratory of CEDEX. through the UCF Student Government Association.

Supported by CIWEN, the Cardiff YPN organized a meeting on December 3rd 2014 with exciting presentations by the members network. They also announced the activities planned for 2015

- A quarterly Newsletter focused on the upcoming/past YPN events,
- Conference attendance and presentations. Members of the YPN will be attending and presenting at several world-renowned conferences over the next year, including:
  - 2015 Gulf of Mexico: Oil Spill & Ecosystem Science Conference. Houston, USA.
  - 36th IAHR World Congress. The Hague, Netherlands.
  - 11th Young Coastal Scientist and Engineers Conference, Manchester.
- A second micro-presentation evening in collaboration with CIWEM.
- Workshops. One of the main tasks of the Cardiff YPN for 2015 is the organisation of workshops to which people from industry and academia will be invited. The workshops will focus on various environmental fields, with the aim of utilising the vast experience from both industry and academia to demonstrate and teach practical skills in hydro-environmental engineering e.g. grid generation, and to discuss and debate wider issues such as tidal renewable energy in Wales.

15th Annual Colloquium

The IAHR-BW YPN organized the 15th Annual Colloquium, on the topic of "Towards Sustainable Future: Water Food and Energy" on Monday, 1st December 2014



PEOPLE & PLACES

IAHR welcomes the new Young Professionals Networks!

IAHR Vienna YPN

University of Natural Resources and Life Sciences Vienna
Institute of Water Management, Hydrology and Hydraulic Engineering
Department of Water, Atmosphere and Environment, Austria

President
Michael Schwenn

Vice President
Nikolaus Clemenz

Treasurer
Florian Reisinger

IAHR Pakistan YPN

University College of Engineering Sciences and Technology (UCEST)
Campus, University Boulevard, West Wood Colony, Thokar Niaz Baig
Lahore - Pakistan

President
Hafiz Majid Hussain Abubakar

Vice President
Mirza Khizer Ali

Secretary
Jahangir Khan

IAHR Paris YPN

President
Alex Ghaitanellis
EDF

Vice President
Radja Elandaloussi
ESTP/Ecole des Ponts

Secretary
Agnès Leroy
EDF

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36th IAHR WORLD CONGRESS

28 June - 3 July, 2015

Delft-The Hague, the Netherlands

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