number 3 2010

hydrolink

See page 36

Welcome to the 34th IAHR World Congress - Brisbane 2011

See page 40

New Agreement between IAHR and CEDEX

See page 47

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Editorial by **Michele Mossa**

Prof. Michele Mossa
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Scraping the bottom of the barrel: What are the risks?

In my first editorial of two months ago, I highlighted the reasons why Hydrolink must increase the number of articles devoted to up-to-date news regarding different aspects of research and engineering in hydraulics, hydrology, fluid mechanics and water engineering, focusing on world news. Unfortunately the latest news which has recently appeared in newspapers and magazines and has been broadcasted on radio and television has been devoted to the disaster in the Gulf of Mexico. A oil well blow has created an environmental catastrophe. An oil slick has formed on the sea surface growning daily and drifting inexorably towards the coast of Louisiana, which had already been devastated by hurricane Katrina some years ago.

At the time of writing, the latest news was that after days of reporting failures, BP had made some progress in containing the ruptured oil well, being able to sever a damaged riser pipe. The success, however, was tempered by the grim reality that oil could continue gushing into the Gulf of Mexico at least until August, when BP hopes to have a relief well in place.

The leak will most likely cost BP billions. The USA National Oceanic and Atmospheric Administration (NOAA) has banned fishing in much of the Gulf and the oil had made its way to within miles of Louisiana shrimpers' home on the Mississippi delta. Oil is toxic to fish, shrimp and oysters and shorebirds that come into contact with the crude oil can end up smothered.

The damage will be measured in environmental and economic costs and it could even be political. Not just because President Obama's administration will surely be judged on its response to this new Louisiana disaster, but mainly because the USA President announced support for expanded offshore drilling as part of his energy policy.

The disaster in the Gulf of Mexico could rival those major incidents in the past (such as that of the Exxon Valdez in 1989, with an oil spilling of 41.3 million L, and the Santa Barbara, California, with an oil spilling of 15.9 million L). Many other disasters of this type have happened and, unfortunately, continue to happen around the world.

But the accident could at last improve the impetus to craft an energy policy that must be smart, pragmatic and green. It imposes many questions since steadily increasing oil and gas exploration and production from deepwater locations (water depths in excess of 300 m) are present in several other regions around the world, for example the North Sea, off shore West Africa, and off shore Brazil, which therefore are threatened by a disaster similar to that in the Gulf of Mexico.

The scientific community believe that soon the peak of oil production will be reached. The best scientific estimates show that this peak will occur between 2010 and 2020. In any case, it is difficult to have accurate estimates on this point. In fact, even if oil reserves are twice or triple the value which they are estimated to be, this will not have any practical relevance since the worldwide economic crises (also due to worldwide imbalance, like global warming, the exhaustion of fossil energy resources, overexploitation of other resources) mainly depends on the grim awareness that this peak exists, not on when it will appear. In other words the strategies and ideologies of the recent past implied the hypothesis that fossil energy was endless and growth was unlimited. Now our scenario is like that of the period when humanity realized that our planet is not flat nor infinite. In any case, while hoping that new energy sources may one day completely replace fossil fuels, all oil companies are "scraping the bottom of the barrel" with deeper and more environmentally dangerous offshore drilling. In 2007 it was estimated that the production from installations deeper than 800 m was about 70% of the total production. The oil industry plans to extend the exploration and production to as deep as 3000 m allowing the potential for an oil/gas spill to increase. But, as the recent disaster in the Gulf of Mexico has shown, concerns from a deepwater oil/gas spill should be taken into account.

In other words we must consider the matter from every angle.

The pressing questions linked to the before mentioned problems surely involve our hydraulic scientific and engineering community. In fact, for example, an environmental concern is whether oil will surface and if so, where, when, and what the oil slick thickness will be. To meet these new challenges, spill response plans need to be upgraded. An important component of such a plan would be models able to simulate the behaviour of oil and gasses, if accidentally released, in deepwater. On this interesting topic this issue of Hydrolink presents an article by Prof. Poojitha D.Yapa, expert of oil spilling modelling, and advisor to NOAA on deep oil spill.

The pressing questions are of interest for all branches of environmental engineering. In fact, in order to contain the spill the oil can be corralled and ignited (but this is a smoky solution that is viable only in calm water and light wind), or floating barriers could be laid to surround and redirect surface oil, or chemicals could be applied on the surface and directly at the leak site to break up slicks (but the dispersants can be toxic for wildlife). We must remember that the topic of oil spilling is one of many in a wide branch of hydro-environmental engineering and in order to solve these problems there is still much work to do for hydraulic engineers and scientists. We asked prof. Heidi Nepf of MIT for her opinions and our article "10 questions to..." will reveal her thoughts on this intricate situation.

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in this issue

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Editorial
Scraping the bottom of the barrel: What are the risks? page 34

How does oil and gas behave when released in deepwater
The recent Horizon spill in the Gulf of Mexico has generated wide scale awareness to issues related to deepwater oil spills. page 36

10 QUESTIONS TO...
Heidi Nepf, Professor of Engineer at the Massachusetts Institute of Technology. page 38

Brisbane: Australia's new world city
Both dynamic and down-to-earth, Brisbane holds strong appeal for the international traveller and will be an ideal destination for the 34th IAHR World Congress. page 40

Innovation and Professional Development Division
One of the structural changes adopted by the IAHR Council in Vancouver last August was the creation of the Innovation and Professional Development (IPD) Division. page 43

Education and Professional Development (EPD) – PART II page 44

New Agreement signed IAHR and CEDEX page 45

How does oil and gas behave

An impromptu meeting was held during the recent IAHR Symposium 6th ISEH – International Symposium on Environmental Hydraulics - to discuss the recent disaster in the Gulf of Mexico

From time to time there have been major oil spills that brought a lot of media and public attention to the environmental problems caused by them. However, underwater oil spills have been much less common. The only other oil and gas release from underwater is the IXTOC well blow out in 1979. In IXTOC incident oil was released from a water depth of 50m. The recent Horizon spill in the Gulf of Mexico has generated wide scale awareness to issues related to deepwater oil spills. The fact that Horizon spill originates from a water depth of 1500 m has confounded many problems on understanding the behavior of oil and how to deal with it.

Written by:
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Contrary to reports that no one has ever anticipated any accidental release of oil and gas from deepwater, there has been at least some preparation for such an event. About 15 years ago, a project was initiated by the US Minerals Management Services and the oil industry to develop a computer model to simulate the transport and fate of oil and gas when released in deepwater. Prof. Poojitha D. Yapa at Clarkson University, US was assigned the task of developing this model, which evolved as CDOG (Zheng, Yapa, Chen, 2003; and Chen and Yapa 2003 b). At about the same time, a similar model was developed at SINTEF, Norway, which evolved as DEEPBLOW (Johansen 2000). The computer model development was supported by some laboratory experiments and large scale field experiments, Deepspill, conducted off shore Norway in 2000. The field experiments were sponsored by the US Minerals Management Services and the oil industry. One of the objectives of the large scale field experiments was to provide data to test the computer models being developed.

Description of how an underwater oil and gas release behaves

The description here explains how oil and gas behave in general terms when they are released in deep water and unrelated to a specific event. These descriptions are based on principles of fluid mechanics, years of modeling experience, and the experience from observations of data from Deepspill (i.e large scale field experiments).

In general, when oil and gas are released from a deep water location, they are expected to breakup into bubbles or droplets of various sizes. These sizes can vary widely. The bubble sizes measured during Deepspill were generally between 1 mm and 10 mm. However, they can be much smaller or larger under different release conditions. Let's consider oil. The larger droplets are going to move faster towards the surface

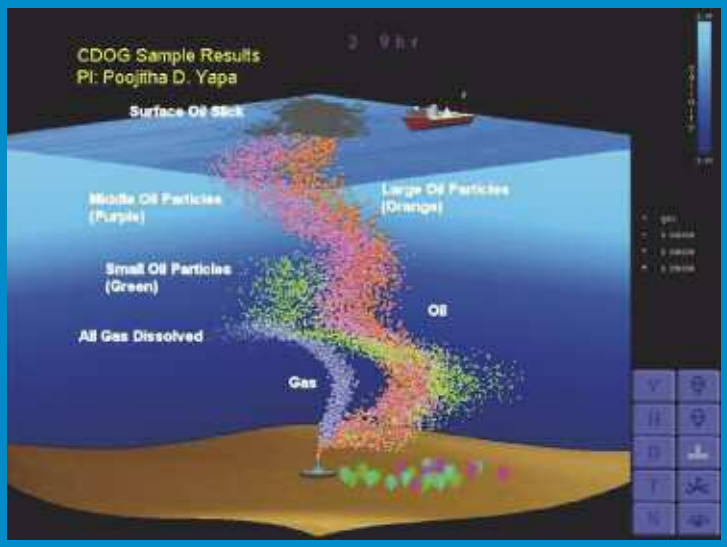

Figure 1: A Schematic representation of oil and gas behaviour when released underwater (Figure by Yapa and Xie)

when released in deepwater

while the smaller droplets move more slowly. Bubbles are subjected to cross currents which will move them laterally while they are moving upwards. Therefore, the larger droplets and the smaller droplets may not come to the surface at the same location, but quite a distance apart. Also they may reach the surface at different times. If there are droplets of very fine scale, like 100 microns or 500 microns they may take weeks or even months to reach the surface - assuming that the ambient water current doesn't have any downward component. If it has even a slight downward velocity, then that may negate the buoyant velocity of the smaller bubbles and they may stay under water for a very long time. Gas also breaks up into bubbles of many sizes. In many deepwater releases large amounts of gas bubbles will dissolve and may never make it to the surface (see Zheng and Yapa, 2002). Gas bubbles move faster than oil bubbles for the same size. Because of this, gases can separate from the main plume and move in a slightly different direction (Chen and Yapa 2004 a) as can also be seen in Figure 1. Although in reality many bubble sizes exist in a continuous distribution, for clarity this schematic uses only three oil bubble sizes and one gas bubble size. Gas bubbles are in purple color and oil bubbles are in orange, pink, and green. Orange are the largest size and come to the surface fastest, green are the slowest because they are the smallest bubbles. Gas bubbles, shown in purple color, in this case dissolve before they reach the surface. Gases when released in deep water also have the potential to be converted to hydrates. Methane has a level of hydrate dissociation generally around 550 m of water depth as shown in Figure 2. But this is not a fixed value. It depends on parameters like water temperature and gas type. Natural gas can be converted to hydrates at a much higher level. Therefore, in general, gases can be converted into hydrates upon release, and as they travel towards the water surface, (because of their buoyant nature). It should be noted that no hydrates were observed during the Deepspill experiments.

As hydrates travel towards the water surface they can be reconverted back into gas when they reach the lower pressure of the shallower regions. Figure 2 below, shows the thermodynamic equilibrium curve and the water temperature. This is for a location in the Gulf of Mexico. Figure 3 shows schematically how the gases (shown in yellow) are converted into hydrates (shown in blue).

In summary, it is important to understand that what has been described here is the general behavior of oil and gas, when it is spilled in deep water and each individual spill may have different conditions depending on the environmental factors, ambient factors like water temperature, salinity and the depth at which it was released, the type of oil.

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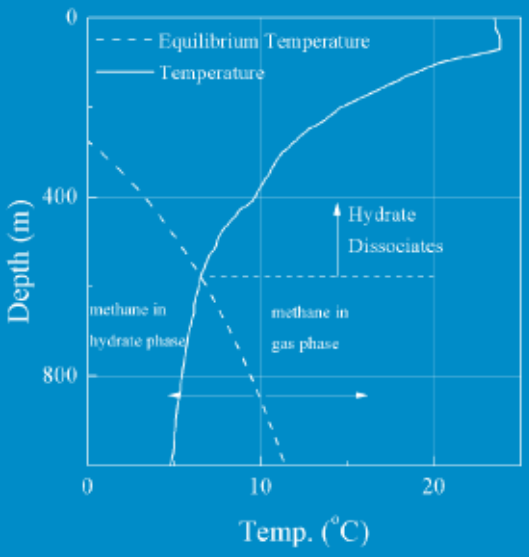

Figure 2: A typical ambient temperature and thermodynamic equilibrium curve for Methane (Yapa and Chen 2004)

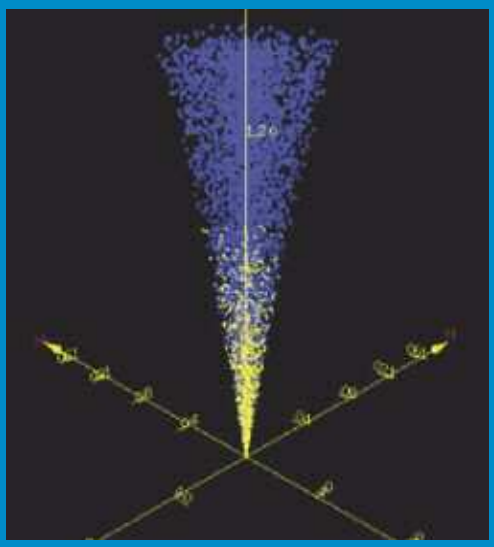

Figure 3: Schematic representation of gas (yellow) converting to hydrates (blue) as they travel upwards. Ambient current = 0 (Chen and Yapa, 2003)

10 QUESTIONS TO... Prof. Heidi Nepf

Interviewed by Michele Mossa

What do you think about the development of the research in Hydraulics in the next future?

Because of the increasing stress placed on water resources throughout the world, I see a resurgence and reinvention of hydraulic engineering, as communities try to improve the efficiency and capacity of water storage and delivery systems. At the same time, hydraulic research at the intersection with ecology and environmental processes will expand, as researchers respond to the need to manage and protect natural resources.

> *"There is a particular need to expand the database of field observations"*

Your main research activities examines physical mechanics which affect the transport and fate of contaminants and nutrients in surface water systems with key projects focusing on wetland and vegetated hydrodynamics. What is your opinion on the level of this research now in the world and which parts of it should be studied much more in deep?

The interplay between flow and natural roughness is a fascinating and complex problem that sets the habitat conditions for many species, e.g. mussels, aquatic grasses, kelps, terrestrial forests, corals. This area of research has grown rapidly in the last few years, and I think it will continue to expand, because it is at the core of so many ecosystem services, such as water clarity and water quality enhancement, habitat provision, and coastal protection, and also influences the engineering designs for flood routing, irrigation, and storm surge prediction. While there is much work to be done at many scales of these problems, there is a particular need to expand the database of field observations, including measurements of flow, transport and resistance, as well as surveys to characterize the range of natural geometric configurations [patch sizes, organism density].

Which are the main goals that your research team has reached in the last years?

My team explores how the presence of vegetation in channels and coastal zones alters the mean and turbulent velocity field associated with unidirectional currents and waves. Further, we examine how vegetation impacts the fate and transport of sediment, as well as the possible feedbacks between vegetation and bed morphology. At the scale of individual blades, we are studying the interplay between fluid motion and blade motion for different ratios of blade rigidity, blade buoyancy and hydrodynamic drag.

Which kind of interactions and cooperation with other research branches could be worthwhile on this topic?

There are obvious connections to ecology and plant physiology, as well as to sediment transport, geomorphology, and erosion science. Vegetation hydrodynamics also plays an important role in the engineering areas of treatment wetland design, channel and coastal restoration, and flood management.

Your research topics involve also physical hydraulic laboratories. Regarding the theme of pollutant transport, which future do you expect on these laboratories?

Proper hydraulic modeling usually requires a large physical laboratory. Unfortunately, many institutions have reduced the size of, or eliminated such laboratories to make space for other endeavors. I hope this trend can be reversed in the future, because properly scaled laboratory studies provide vital insight into physical processes, critical validation data for numerical modeling, and an essential bridge between idealized small-scale studies and field-scale application. I encourage institutions to continue their investment in facilities for large-scale physical modeling.

Dr. Heidi Nepf is a Professor of Civil and Environmental Engineering at the Massachusetts Institute of Technology. She received an MS and PhD in Civil Engineering from Stanford University (1992) and then spent one year as a Postdoctoral Fellow at the Woods Hole Oceanographic Institution, before coming to MIT in 1993. Her research team has produced over 60 refereed journal and conference articles in the field of environmental fluid mechanics. She recently served on the US National Research Council's Review of the Louisiana Coastal Protection Restoration (LACPR) Program. Active in educational outreach, Dr. Nepf has served as a technical advisor to several PBS, NSF, and ASCE sponsored programs. She is a member of the IAHR Fluid Mechanics Committee.

6

In order to reduce pollution generated by oil spills during the last 2 decades many countries sustained a strong scientific and technological effort for developing adequate pollution contingency. Anyhow some disasters still happen. In your opinion which role the research community has to have on this point?

It is the responsibility of the research community to ensure that their work is communicated to engineering practice and governing bodies as quickly as possible, and the tools for such engagement should be a part of an engineering education. In addition, the research community should be encouraged to respond quickly to disasters, both to support the rescue and recovery efforts as well as to gain valuable scientific understand of such events. Governments and foundations should facilitate access to funding that supports the rapid engagement of the scientific community after specific events.

7

Do you think that political authorities and administrations do not have sufficient sensibility on this theme and, generally speaking, on environmental themes?

Political authorities have become quite sensitive to environmental themes, but lack the financial resources and/or political consensus to make positive progress on many environmental issues. The situation is also hindered because the engineering activities associated with environmental protection and management typically lack the private sector financial backing seen in other fields of engineering, e.g. biotechnology, computing, energy, transportation.

8

Someone thinks that our development should be limited in the next future and that the period during which the development was without any limit is finished. What is your opinion on this point?

I agree that development should only proceed within the constraint of sustainability. Further, future development should put more focus on the elimination of the global inequities in the access to basic necessities [clean water, safe shelter, food] as well as modern necessities [telecommunication, clean power]. It is necessary to meet these needs as well in a sustainable way.

9

Contaminated water and poor sanitation is still a major cause of illness, with diarrheal disease being the principal cause of morbidity and mortality in children under 5 years in developing nations. […] Engineering solutions drove the reduction of water-related illness in the nineteenth century emergent conurbations of the industrialized nations of today. In your opinion how can the hydraulic community help to solve this worldwide problem?

Contaminated water supply and poor sanitation remain a major problem in developing regions. In many cases one cannot simply relocate conventional technology to these regions. More creative solutions are needed that apply the principles of appropriate technology, i.e. technology designed with specific consideration of the economic, cultural, and resource conditions of the community to be served. In many cases, the solution will be local, i.e. at the house to village scale, as opposed to the regional scale solutions currently in place for major metropolitan areas in developed regions.

"I see a declining interest in science and engineering among American youth"

10

As usual, the last question is not exactly a question. You are free to direct to our readers to send them a message of yours on a topic that is dear to your heart.

I encourage state and local governments as well as individuals to invest in our youth. I see a declining interest in science and engineering among American youth, yet these disciplines are essential for solving our environmental and resource problems. Further, a basic scientific literacy should be provided to all youth, so they are prepared to make the critical societal choices they will face in the future.

BRISBANE: AUSTRALIA'S NEW WORLD CITY

www.iahr2011.org

IAHR 34th Congress 2011 Brisbane Australia

Positive and forward-thinking, generous and optimistic, Brisbane is Australia's new world city. Both dynamic and down-to-earth, Brisbane holds strong appeal for the international traveller and will be an ideal destination for the 34th IAHR World Congress.

Located on the east coast of Australia in the heart of one of the country's fastest growing regions, Brisbane is the capital of Queensland – a state well known for its unrivalled weather, natural beauty and world-class tourism attractions.

Home to almost two million people and boasting a year-round reputation for blue skies and golden sunshine, a great outdoors lifestyle and the greatest variety of native wildlife (dugongs, wild dolphins and koalas just to name a few) of any capital city in Australia, Brisbane offers an impressively diverse and distinct menu of leisure and recreational activities. From art lover to outdoor adventurer, Australia's third largest city caters to all tastes.

Urban essentials

Brisbane has all the essential offerings of a growing, modern city – the shopping, the restaurants, the nightlife, the entertainment.

From high-end to handcrafted, Brisbane's Queen Street Mall is Queensland's premier shopping destination. This half-kilometre shopping strip is home to 700+ retail outlets and an enviable mix of local, national and international designer labels and flagship stores. And with its prime location in the heart of the city, it's the best place to collect unique Australian items and travel mementos.

It's also a great launch pad for exploring Brisbane's wining and dining scene. From casual café to fine-dining to farmers markets, the city offers a cosmopolitan mix of opportunities to indulge in fresh produce and tropical flavours. Alfresco dining is an everyday part of the local lifestyle and an afternoon spent in one of the city's friendly beer gardens enjoying a grand steak or succulent seafood provides a wonderful insight into the laid-back character and generous spirit of Australia.

For after dark entertainment, Brisbane's Fortitude Valley is globally acknowledged as a vibrant hub of chic bars, urban clubs and live music. Designated as Australia's first special entertainment precinct and recognised in 2007 as a "new global hotspot" by influential US music magazine Billboard, the Valley is firmly established as one of Australia's leading nightspots.

Not to be outdone, Brisbane's South Bank precinct is a thriving hub of arts and cultural entertainment. Here on the bank of the river, visitors can while away hours exploring the state's premier cultural institutions including the Gallery of Modern Art (Australia's largest gallery of modern art and most recently the exclusive Australian host to Warhol and Picasso exhibitions), the Queensland Museum (home to Dandiiri Maiwar – the Aboriginal and Torres Strait Islander Cultures Centre – which showcases the stories, history, creativity and cultural diversity of the local Indigenous people) and the Queensland Performing Arts Centre (the Paris Opera Ballet's choice for its 2009 international performances).

Outdoors and active

Urban enticements aside, Brisbane lives and breathes outdoor experiences. From kayaking

Brisbane - Gallery of Modern Art

on the river in the morning to hand-feeding wild dolphins at sunset, Brisbane offers visitors a range of unique and memorable experiences.

Home to more than 1,820 parks and reserves, Brisbane is a sub-tropical oasis of shady spots and rainforest retreats. The South Bank Parklands are one of the city's premier tourist attractions and with a prime location just a few minutes walk from the city centre and Queen Street Mall, it's a must-do experience. Across 40 acres, South Bank presents a wealth of unrivalled leisure activities. Visitors can be found swimming in the lagoon, relaxing on Australia's only inner-city beach, wandering through the gardens, visiting the markets or indulging in some of the fine food experiences offered by the local restaurants, cafés and pubs. Also located in the city, the Roma Street Parkland – the Southern Hemisphere's largest city sub-tropical rainforest – provides a quiet retreat that's perfect for leisurely explorations.

Locals who love the outdoors also recommend that visitors pay a visit to the Riverlife Adventure Centre. From a glorious riverside site at the base of the ochre coloured Kangaroo Point Cliffs, visitors can embrace the great outdoors with a range of activities including leisurely kayaking tours and cliff abseiling classes. The Story Bridge Adventure Climb – one of only three bridge climb experiences in the world – gives visitors a once-in-a-lifetime opportunity to journey up and over one of Brisbane's favourite landmarks – the 65-year-old Story Bridge. The 2½ hour climb rewards climbers with uninterrupted 360° views that take in the city skyline and nearby mountain ranges and Moreton Bay.

Fresh outings

With a marine sanctuary on its doorstep and the world's largest koala sanctuary located along an idyllic stretch of the Brisbane River, Brisbane also has a bounty of Australian animal experiences to enjoy. Here, in Australia's new world city, visitors can cuddle a koala and mingle with kangaroos, or enjoy an easy day-trip to Moreton Island where whale-watching cruises and the nightly dolphin feeding sessions are just part of the island getaway offer.

Brisbane's prime location and excellent transport infrastructure also make it the ideal launch pad for day-trips to some of the country's most well-loved tourist attractions. The world famous Gold Coast lies one hour's drive to the south; the Sunshine Coast lies little over an hour to the north; and major attractions and family-friendly destinations like Australia Zoo, the Australian Outback Spectacular, Dreamworld | WhiteWater World, and Warner Bros. Movie World are all located within an hour's drive.

IMPORTANT DATES

Deadline of abstracts submission:
15 July 2010
Confirmation of acceptance:
September 2010
Deadline of papers submission:
28 October 2010

For the avid traveller, Brisbane's extensive network of domestic flights easily allows visitors to include other iconic Australian destinations – such as Fraser Island, the Great Barrier Reef and the Outback – in their itineraries.

Transport

In the air and on the ground, Brisbane offers excellent transport options. Having made a name for itself as one of the world's best airports, Brisbane Airport is one of the most popular Australian entry points for international travellers. The close proximity to Asia and extensive international links, make Brisbane Airport a frequent flyer favourite and the premier gateway to some of Australia's best travel experiences.

Within the city itself, a simple grid system of city streets and an expansive network of pedestrian

paths, parks, bridges and boardwalks offer visitors the freedom to explore the city and access key venues on foot. Alternatively, the fully-integrated public transport system provides a city-wide network of first-class transport links. Buses and trains service all corners of the city and key centres of interest, while high-speed catamarans known as CityCats cruise the river providing a popular alternative for reaching major riverside locations. Along with the new Green Cab pedicycles, the CityCats are an experience in themselves and provide one of the cheapest and most enjoyable ways to see the city sights.

Brisbane is a vibrant, exciting destination that embodies the great Australian experience. Fresh, authentic and engaging, Brisbane is a warm and welcoming city that looks forward to welcoming you in June 2011. For more ideas and inspiration visit www.visitbrisbane.com.au.

Useful information-Visa

All international visitors to Australia (the sole exception being citizens of New Zealand travelling on New Zealand passports) must obtain a visa in advance. You are urged to apply for a visa not later than six weeks prior to travel. Residents of many countries may now apply for a visa on line, others will need to apply at an Australian Embassy, Consulate or High Commission. For information on how and where to apply for a visitors visa to Australia, please visit http://www.iahr2011.org.

You will need to register for the Congress and pay your fees before you apply for a visa

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Call for 2014 APD Congress

IAHR Members are cordially invited to submit expressions of interest to host the the 2014 APD Congress to the IAHR Executive Director, Christopher George or to the APD Secretary General Prof. Lianxiang Wang at *lxwang@iwhr.com*

The next APD Congress will be in Korea in 2012.

Obituary

Gerhard H. Jirka
1944 – 2010

Professor Gerhard H. Jirka, one of the leading scientists in hydraulic and environmental engineering of our days, passed away unexpectedly on February 14, 2010, at the age of 65. Born on September 14, 1944 in Kasten, Austria, he studied at the Agricultural University of Vienna, from where he received his Diploma in 1969. He then moved to the US becoming a research assistant at the Massachusetts Institute of Technology (MIT), where he pursued studies in water resource systems and hydrodynamics and earned his Ph.D. in 1973. He stayed at MIT as research engineer and Lecturer until 1977 when taking up a faculty position at Cornell University, then associate and from 1987 full professor. In 1984 he founded at Cornell the DeFrees Hydraulics Laboratory specializing in environmental fluid mechanics research and became its first director. In 1995 he accepted an offer to become a chair holder at and director of the Institute for Hydromechanics at University of Karlsruhe, now Karlsruhe Institute of Technology (KIT), Germany. This position he held until his retirement in September 2009. He there provided excellent leadership to the laboratory he directed and had considerable impact on modernizing the education of civil engineers. From 2008 he was also Associate Director of the Centre for Climate and Environment at KIT and, also beyond his retirement, provided vision and guidance to KIT in forming an Excellence Centre for water research.

For more than 30 years Gerhard Jirka made consistently important and lasting contributions to many areas of hydraulic and environmental engineering, of which only a few can be mentioned here. He was a world expert in the field of pollutant, mostly buoyancy affected discharges into water bodies and covered in his research a wide variety of discharge and ambient flow conditions. He summarized his vast experience in key publications, which will remain standard references on the topic, and he also fed his knowledge into the development of the expert system CORMIX, which is a powerful, now widely and routinely used tool for analyzing practical problems associated with thermal and pollutant discharges. Another area where he made major contributions is gas transfer at the water surface, a topic closely associated with turbulence phenomena near the surface. He studied these processes in detail and also started a successful series of conferences on this topic. More recently, Gerhard concentrated on the study of jets and wakes in shallow layers and the associated large-scale flow structures using both the most advanced experimental techniques and stability analysis. His research always covered a wide range from fundamental studies to the development of engineering methods and hence had both great scientific and practical impact.

Gerhard was a prolific writer, disseminating the results of his research and his knowledge through some 250 publications, many of them in the most renowned journals, and also many providing the primary source of information on a number of important topics. Through this he earned himself worldwide recognition as one of the top experts in the field of hydraulic and environmental engineering as is manifested by prestigious awards he received, among them the Freeman Hydraulics Prize and the Walter L. Huber Civil Engineering Research Prize as well as the Hunter Rouse Hydraulic Engineering Lecture Award, all from ASCE, the Arthur T. Ippen Award of IAHR and a membership of the Academy of Sciences of Argentina, to name only a few. He was often invited as lecturer, as visiting scientist and as a member of international expert panels such as the one for the stormflood barrier of Venice Lagoon.

During all his professional life, Gerhard provided extensive and valuable service to the Hydraulic and Environmental Engineering Community. He served on various committees of ASCE and was the chairman of the Hydraulics Division of ASCE from 1989 to 1990. In Germany, he was an influential member of various hydraulics committees and advised the German Research Foundation (DFG) on their strategies on water research. He was closely associated with and particularly active in IAHR, where he served on various committees and was the chairman of the Fluid Mechanics Committee from 1990 to 1996. He helped to set up the European Graduate School – Environment Water (EGW) and coordinated a number of Summer Schools in the area of Environmental Fluid Mechanics. From 2001 to 2009 he was a member of the IAHR Council and from 2005 to 2009 a Vice-President of the IAHR. In this function he chaired its Structure Change Task Force and was instrumental in introducing a new, modern structure in IAHR and a new name that represents better IAHR's environmental activities. He had planned to help with the implementation of the changes and was therefore elected as co-opted Council member at the IAHR Congress in 2009, but due to his untimely death IAHR now cannot count on his input and experience and has to manage the changes without him – and it is tragic that he cannot reap the fruits of his engagement for IAHR.

Gerhard will be remembered not only for his great scientific work and professional engagement, but also as a fine and interesting human being who managed to transfer his vitality, enthusiasm and optimism to all who were around him. We will sadly miss him as a wonderful colleague and friend.

Wolfgang Rodi
Institute for Hydromechanics
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Innovation and Professional Development (IPD) Division

Written by:
Prof. Jean-Paul Chabard
IPD Division Chair
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One of the structural changes adopted by the IAHR Council in Vancouver last August was the creation of the Innovation and Professional Development (IPD) Division. The objectives of the IPD Division include the promotion of innovative, high impact activities, the promotion of strategic initiatives towards the solution of global problems within IAHR's field, and the exploration and encouragement of emerging fields within the organization. In addition, the IPD Division will work to enlarge the IAHR membership, support member professional development, and publicize and promote IAHR activities to media, government agencies and sister organizations.

Jean-Paul Chabard (of EDF, France) is the Division Chair, and Angelos Findikakis (of Bechtel, USA) is the Division Secretary. The IPD Division includes the following Committees and Groups, whose chairs are given in parenthesis: Committee on Professional Education and Training (M. Mossa), the Standing Committee on Global Water Issues (Arthur Mynett), the Working Groups on Climate Change (Toshiharu Kojiri), on the International Flood Initiative (Mustafa Atinakar) and Applied Hydrology (Roberto Ranzi), the Task Force on Excellence in Engineering Practice (Anton Schleiss), Awards Committee (Jean-Paul Chabard), Task Force on Institute Members Support and Development (Arthur Mynett) and the Student Chapters Support and Development Committee (Marian Muste). IAHR IPD is supported in Madrid by Estibaliz Serrano as Programme Officer in the Madrid Secretariat.

One of the first initiatives of the IDP Division is an initiative to create a Think Tank that will organize events focussing on issues of global interest at different IAHR conferences. The first such event will be the IAHR Hydro-Environment Summit that will be organized during the Environmental Hydraulics Symposium in Athens, Greece on June 23-25, 2010. The Think Tank Initiative is led by Roger Falconer.

Education and Professiona

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As new Chair of the Educational and Professional Development (EPD) Committee of IAHR I would like to thank first of all the people who nominated me to this position.

I would also like to thank also Prof. Reinhard Hinkelmann who preceded me as Chair for his work during the last two-year period.

Herebelow I report on the work which in the near future I plan to start with the help of the new EPD Vice Chair, Dr. Ioana Popescu, the members of the new Leadership Team Rob Ettema, Frank Molkenthin, Guillermo Palau Salvador and the Past Chairman Reinhard Hinkelmann.

As regards the EPD web page, whose main aim is providing information on our activities, it will be ready in the near future. In it we will insert also the IAHR Multimedia activities and news in a single IAHR web page.
I would like to merge the IAHR Media Library promotion and information with the more general activities of EPD on the same IAHR EPD web pages. Anyhow, in order to better continue the activities of IAHR Media Library the IAHR Media Library web site will remain separate.

The problem of Young Researchers' attendance at upcoming IAHR congresses should also be addressed. I would like to start with the IAHR Media Library Web TV. We could also use this new facility (I hope) for researchers of developing countries or young researchers that have economical difficulties, in order to enable them to see the main events of the congress free of charge and in real time on the web site. Some technical problems could be faced and possibly solved if we think that could be a solution (or a part of the solution) of the problem. Other incentives could be grants offered by the organization or by sponsorship of companies involved in hydraulics to the researchers who need economical help, taking into account the long and expensive trip from some countries. This help could be limited, for example, to the needy researchers who will have written the best papers. A commission could evaluate their work.

In the near future I would be very glad also to extend the EPD Committee Leadership Team by including more members, especially from Asia and Latin America.

As regards master classes this must be co-ordinated with the IAHR Technical Divisions and Committees and, in my opinion, even if we have to delegate the local organizers much of the work, all the master classes organized under the aegis of IAHR should be promoted by IAHR but involving EPD in some way.

IAHR has been experimenting with FaceBook during the last two years and our group – called IAHR Young Researchers – now has 550 members. Kevin Denn of the IAHR Iowa Student Chapter has managed this and we organised a meeting in Vancouver to discuss the value of the FB group. Our conclusion was that it is very valuable when used to prepare for and follow up student meetings during the Congresses. We have a Student Intern in IAHR Madrid who will help the Committee develop these activities further during 2010.

A further activity directed by former EPD Chair Prof. Aronne Armanini is the development of a database of PhD Theses which will help doctoral students publicise their thesis topics in the early phase of their research - before they are able to publish! This development has started as an initiative of the IAHR Europe Division – but it is the intention to open it up to students from all countries once functional.

As Past Chairman, Reinhard Hinkelmann will be further responsible for the Engineering Graduate School Environment Water (EGW). Most of the remaining successful courses run under a bi-annual basis. They have in common that they aim at higher education, that they are of high quality and that they foresee a national or international lecturer team. The transition of EGW from the European to a global dimension has not been as successful as expected. As different further education activities are running within the other IAHR Committees, all new chairs are encouraged to put these activities under the EGW umbrella. Lecturers are encouraged to open their specialized PhD courses also to students of other EGW partners and to announce them to EGW which will spread this information. As the exchange of students is ongoing and increasing in Europe within the Bologna process and as the academic recognition of courses from other universities has become easier in the last years, EGW activities will be maintained in the future.

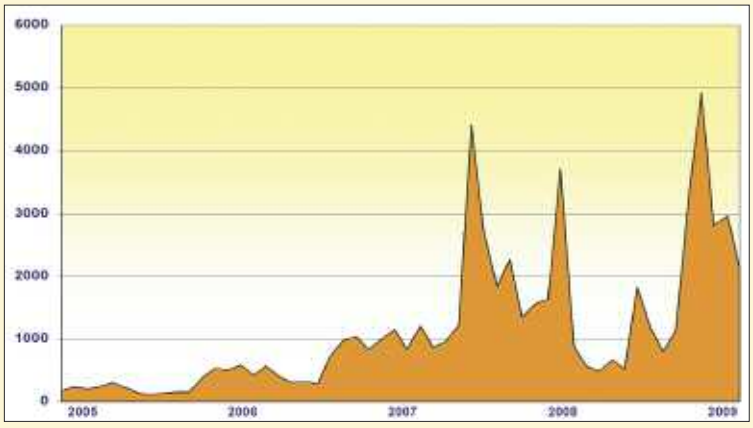

Figure 1. Page views from January 2005.

l Development (EPD) – PART II

As regards the IAHR Media Library (the web resource for the storage and dissemination of photographic, animation and video material relating to hydraulics, hydrology and water resources, www.iahrmedialibrary.net). Figure 1 shows the web page views from January 2005. The total number is 66,506. It is important to highlight that this number does not take into account the same visitor twice or more, i.e. if the same user visits the same page twice or more, his/her visit is counted only once. The figure also shows cyclical events, with peaks in conjunction with events that were particularly innovative and important for the web resource – for example, a news item in the IAHR NewsFlash. Moreover, the figure shows an increasing general trend of the page view numbers of the IAHR Media Library with extraordinary peaks, some of which are in conjunction with the following main events that could have had positive effects on the website:
1) September 2007: after the International IAHR Congress in Venice.
2) December 2007: publishing and distribution of leaflets and posters of a restyling of the IAHR Media Library and International ISEH Congress 2007 in Arizona.
3) April 2008: launch of the new IAHR Media Library with a new section devoted to didactic tools.

The future for the IAHR media library in the EPD committee of IAHR

During the IAHR 2007 Congress in Venice I showed the slide in Figure 4, observing that in order to follow the aims and scope of the web resource it was necessary to develop a second branch of the web site hosting lectures, freeware software, e-books and so on. This was promptly achieved some months later.

Any future consideration of the IAHR Media Library now has to take into account that its outstanding success requires new efforts to improve and eliminate certain flaws that are still present in this service. First of all, it is important to underline that in order to update the web resource, it should not only be used for downloading materials, but also uploading new movies, photo, software, e-books and so on. This responsibility is down to all of us. Therefore, I would like to ask all the participants at the IAHR

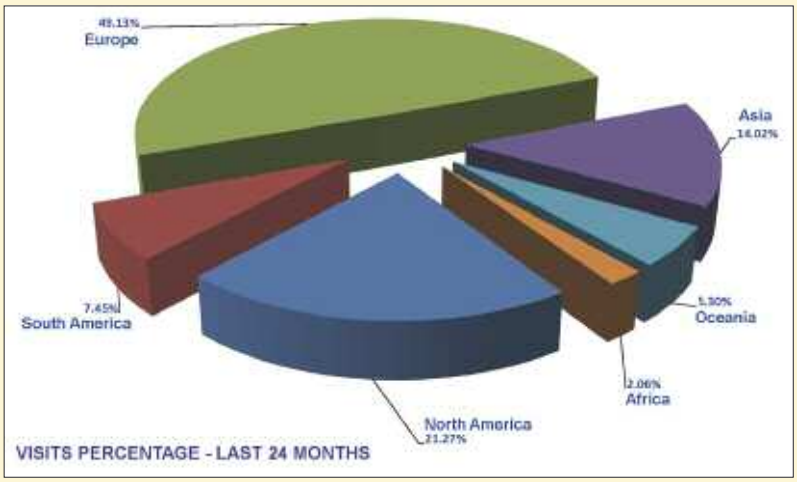

Figure 2. Percentage of the geographic distribution over the last 24 months (July 07-June 09).

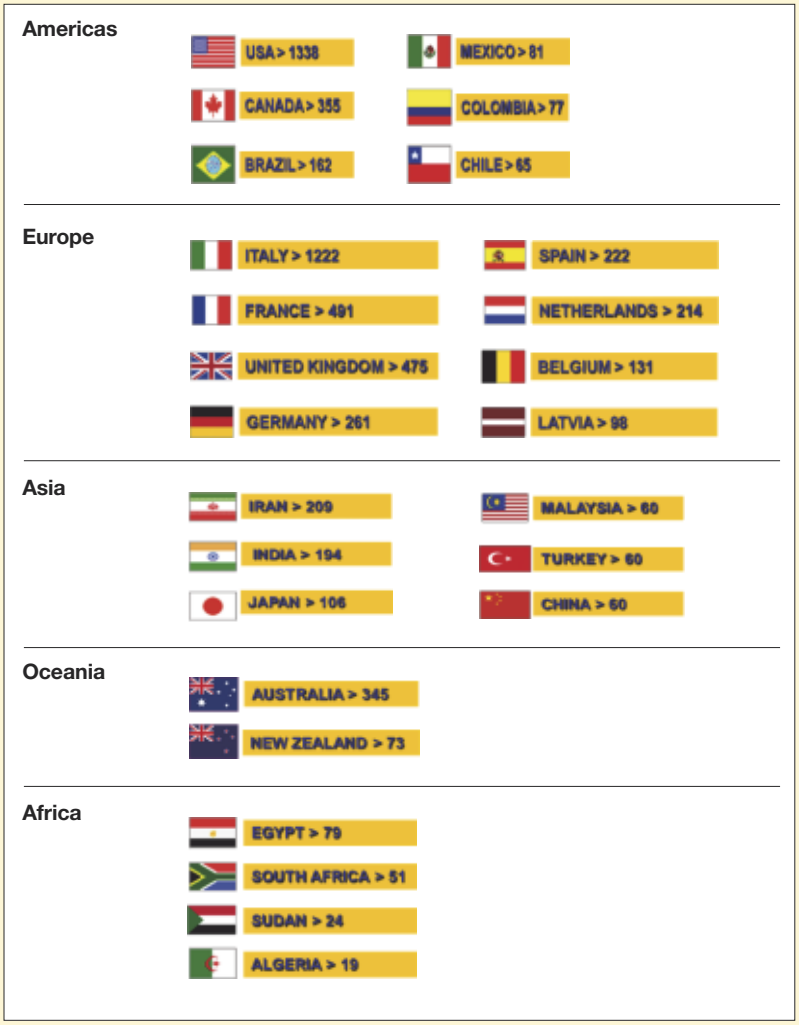

Figure 3. Details of the geographic distribution of visits from July 07 to July 08 in North, South and Central America, Europe, Asia, Oceania and Africa.

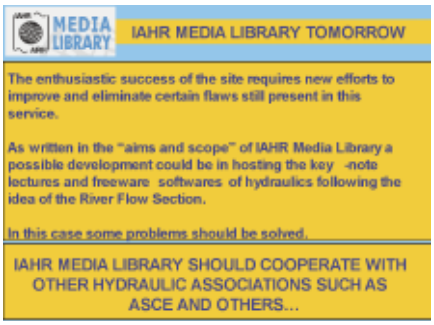

Figure 4. A slide presented during the 2007 IAHR Congress in Venice, the illustrated aim of which was achieved some months later.

Congress and all IAHR Media Library users to contribute much more enthusiastically to this project, so helping both me and the entire Editorial Board.
Furthermore, as written before, the IAHR Media Library could become a more effective and operative tool with a web TV service broadcasting congresses on demand.

Anyone who may be interested in collaborating or proposing improvements can contact me at my e-mail address. At the moment the IAHR Media Library has been set up with the funding of the Fondazione Caripuglia (Research Project LIC-MON of 2003) and of the Project IMCA (Integrated Monitoring of Coastal Areas, financed by the Department of University and Scientific Research of Italian Government, MIUR PON D.M. 593/00). Both projects are of the Coastal Engineering Laboratory of the Water Engineering and Chemistry Dept. of the Technical University of Bari, Italy.

In order to maintain the web site and to develop it with a web TV service we require the following tools and / or services:

- Professional high capacity hosting (1000Mb) with video streaming technology until 31/12/2013, with an updating of the present web site
- Management and input of new material (similar to what has been achieved over the past two years) and maintenance of the website in question until 31/12/2013 with helpline and online assistance.
- Establishing a channel for live video streaming platform for transmission of events from any location.
- Statistical surveys and access to the site
- Backup and full offline content of the library with annual generation of offline content index.

Introducing EPD Committee Leadership

Chair: Prof. Michele Mossa

Prof. Michele Mossa is full professor of Hydraulics at the II Faculty of Engineering (Taranto) of the Technical University of Bari (Italy), where he has taught Hydraulics and Maritime Hydraulics.
His expertise areas are the mechanisms of waves, sea currents, local erosion phenomena, buoyant and non-buoyant jets issued in steady or wave environment or in crossflow, also with macroroughness at the bottom (ripples or vegetation), channel flows and their local phenomena, such as hydraulic jumps. He has been editor and reviewer of many international journals of Hydraulics and Maritime Hydraulics. He has been involved in many national and international research projects of Hydraulics and Maritime Hydraulics also as Examiner.

Some of the principle positions held in the last years

Since September 2009: president of the IAHR Education and Professional Development committee (IAHR EPD Committee) and Editor of IAHR magazine Hydrolink.
Since October 2008: coordinator of the PhD course in Environmental Engineering.
From December 2007 to 2009: secretary of the IAHR Education and Professional Development (EPD) Committee.
Since December 2007: person in charge of the Coastal and Maritime Hydraulics of the Italian Universities Consortium of the Sea Sciences (www.conisma.it).
Since June 2007: president of the Apulian Section of the Italian Association of Hydrotechnique (www.idrotecnicapugliese.it).
Since 2005: Editor of the web resource for the storage and dissemination of photographic, animation and video material relating to hydraulics, hydrology and water resources IAHR Media Library www.iahrmedialibrary.net
For further details and information visit the web site www.michelemossa.it

Vice Chair: Dr. Ioana Popescu

Dr. Ioana Popescu is Senior Lecturer in Hydroinformatics at UNESCO-IHE Institute for Water Education in Delft, The Netherlands. Her expertise areas are mathematical modelling and ICT. This foundation has led to her current research interest and expertise in the development and application of modelling systems for water related areas. Particularly she is having experience in Hydroinformatics in the area of numerical methods (theory and application), river system modelling and use of water related tools for modelling
Her experience with ICT technology and modelling software has led to an increasing competence in designing knowledge management applications, particularly in the areas of knowledge mapping and e-learning systems. She has been actively involved in developing on-line courses, such as Flood Modelling for Management in two set-up: the classical teacher centered approach in parallel with the student-centered approach.
She has been involved in national and international research projects related to floods in rivers, as well as educational development projects, such as FloodSite (www.floodsite.net), Thematic European network for Competence development (www.tencompetence.org), EnviroGRIDS (www.envirogrids.net), lenvis (www.lenvis.eu)

In the Educational and Professional Development Committee of IAHR she will act as a deputy, and together with Prof. Michele Mossa, who is the Head of the EPD section of IAHR, will help in organising classes and keeping the community up to date with relevant information regarding their professional development.

IAHR Secretariat in Madrid: New Agreement Signed between IAHR and CEDEX

IAHR and CEDEX, Centre for Studies and Experimentation of Public Works (the Spanish national research centre for public works) recently signed a new agreement for hosting the IAHR Secretariat at its offices in Madrid for a further five years until 2015.

Written by:
Dr. Christopher George, IAHR Executive Director

The IAHR Secretariat is the executive and administrative arm of the Association, and was relocated to Madrid in 2001 following the signing of a ten-year collaboration agreement with CEDEX. Until that time IAHR and since its foundation in 1935 IAHR was hosted by WL | Delft Hydraulics (now Deltares), in Delft, the Netherlands.

The new agreement signed by IAHR President, Prof. Nobuyuki Tamai, and CEDEX Director General, Mariano Navas, replaces the original agreement and incorporates various changes designed to strengthen and improve the working collaboration.

CEDEX is a well-respected organisation based in Madrid, Spain with multi-disciplinary teams totalling around 625 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; three of the seven institutes which constitute CEDEX specialise in water and the environment: the Centre for Hydrographic Studies dedicated to fresh water; the Centre for Harbours and Coastal Studies working in the marine field and the Centre for Applied Technique Studies which is responsible for ecological aspects related to water in general.

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 (4th highest in the world) 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 ports and many fishing and leisure harbours. Furthermore, both at the inland and coastal level there has been considerable activity in the design and execution of works and in R&TD, all of which attests to the importance of hydraulic themes in Spain and interest in the activities of IAHR.

This renewed collaboration will allow IAHR members and all the hydro-environment community to benefit from the experience and knowledge of Spain and at the same time ensure that Spanish engineers and scientists can in the future be more visible part of the worldwide network which IAHR represents. In particular the agreement will better enable to connect the English-speaking and Spanish-speaking water engineering communities.

A key element of the new accord includes the direct employment by IAHR of all the former Secretariat staff; this will simplify the operation of the Madrid Secretariat under the direction of our Executive Director, Dr. Christopher George. Under the former agreement the local staff was provided to IAHR by CEDEX as a service.

In another important new development IAHR is launching a new version in Spanish of our NewsFlash e-magazine which will focus on issues of relevance to water engineers and scientists in Latin America and the Iberian Peninsula. The Editors of Newsflash Iberoamerica will be Rafael Val, from UAM, Mexico and Maribel Verga from CEDEX. This new electronic publication will be provided free-of-charge to all members in Europe. The "main"

NewsFlash, which now has over 12,000 subscribers, will be renamed "NewsFlash Global".

IAHR will develop other initiatives in Spanish in collaboration with CEDEX staff and the IAHR Spanish National Chapter including a bi-annual meeting for water specialists in Spain called "Jornadas de Ingenieria del Agua" in conjunction with the FFIA, Foundation for the Water Engineering Development, and events coinciding with the holding of the IAHR Executive Committee meeting in Spain. IAHR will also collaborate in the development of books and monographs in Spanish.

Another development is that the financial arrangements in the new Agreement have been modified to the benefit of both parties - significantly reducing the cost of CEDEX support whilst at the same time enabling IAHR to build up our reserves for the future!

For more information on CEDEX visit www.cedex.es

For more information on the Agreement contact IAHR Executive Director Christopher.george@iahr