International Association for Hydro-Environment Engineering and Research (IAHR) (Hg.)

Hydrolink 2010/1. Topic: Change Course JHR JRBM

Hydrolink

hydrolink

number 1 2010

2010: Change of Course for JHR and JRBM

The Future of Academic Publishing

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ASDECO Impacts Minimization of Desalination Plants

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Number 1 / 2010 (Supplement to JHR - Vol 48 - Number 1)

IAHR
International Association for Hydro-Environment Engineering and Research

IAHR Secretariat
Paseo Bajo Virgen del Puerto, 3
28005 Madrid SPAIN
Tel. : +34 91 335 79 08
Fax.: +34 91 335 79 35
www.iahr.org
iahr@iahr.org

Contact us:

Dr. Christopher George, Executive Director
tel.: +34 91 335 79 64
e-mail: christopher.george@iahr.org

Estibaliz Serrano
Publications Manager
tel.: +34 91 335 79 86
e-mail: publications@iahr.org

Beatriz Comesaña
Publications Assistant
tel.: +34 91 335 79 08
e-mail: office@iahr.org

Elsa Incio
Membership and subscriptions
tel.: +34 91 335 79 19
e-mail: membership@iahr.org

Carmen Sanchez
Accounts
tel.: +34 91 335 79 48
e-mail: accounts@iahr.org

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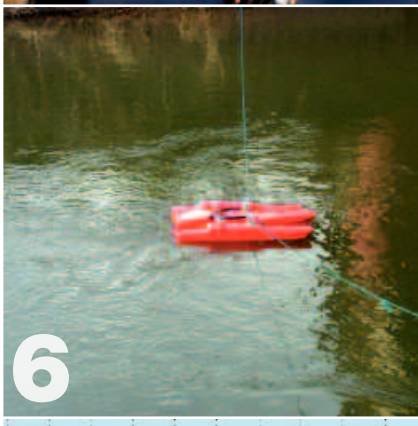
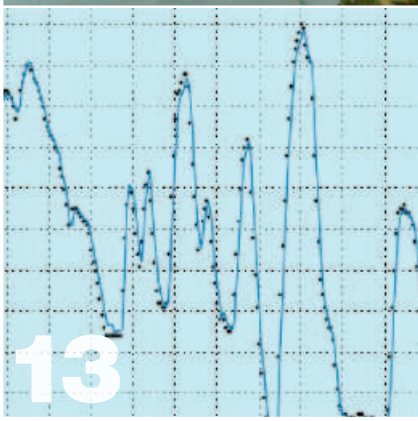




President's New Year Message for 2010

Put New Wine into New

Dear Members!
At the beginning of the New Year I would like to send my message for 2010 as President of IAHR.

A New Year under a New Name for the Association
The year 2010 is the first year for IAHR under its new name of "the International Association for Hydro-Environment Engineering and Research" which was announced in the "Highlights from the Vancouver Congress" in Hydrolink No.5, 2009. As President of IAHR I am fully-committed to fulfill my duty to bring about real change in the performance of IAHR under our new structure!

The year 2010 is our 75th anniversary and we will celebrate this with a special issue of Hydrolink and at our Regional Congresses. They say that we should consult the past if we want to learn about the future! The Seventy-fifth Anniversary is a good occasion for the new IAHR to consider the future.

I would like to draw your attention to one change related to the new structure which directly concerns each individual member. All individual members are requested to register their interest in up to three specific Technical Committees – this should be done on the IAHR website!.

The objective of this registration of member interests in a limited number of Committees is to enhance direct interaction between the Leadership Team of the Technical Committee/Technical Division and individual members. Members will be able to directly elect Committee Members once this new system is in place.

The implementation of the new Committee relationship with members will be managed through an e-membership platform which is under development as part of a new IAHR website. I hope the e-membership platform will facilitate closer contact amongst members and with the Council for "bottom-up" type activities in IAHR.

Academics in the Membership and the Vancouver Congress
IAHR has carried the word "Engineering" in the name of the Association since 1999. It has been a lasting desire of IAHR to develop a better bridge between engineering and research. An analysis of the Membership Directory on the IAHR website dated October 14, 2009, shows "984" entries with the key word "univ". On this basis the number of members in academia can be estimated at about 43% of the total membership as of the last day of 2008. Although the figure does not include all our academic members, I use this number in this article due to the lack of more detailed statistics. I carried out a simple survey on the distribution of contributors to the World Congress of IAHR from universities and others in order to determine the interests of registrants to the World Congress. I utilized the record of the LOC of the recent Vancouver Congress. The accepted abstracts submitted from university faculty and graduate students amounted to 73% of the total.

Coefficient of Paper Contributions
Based on the data of the Membership Directory and accepted abstracts in the Vancouver Congress, we can calculate a "coefficient of paper contributions" for the Congress by academics and practicing engineers. IAHR has many members who work in research institutes of national and public organizations as well as those of private sectors including consultants, contractors, and electric power companies. In this article members other than in academia are called "practicing engineers" for reasons of simplicity and given the fact that their targets are to contribute to real projects rather than basic research.

Forty-three percent of our members (academics) produced seventy-three percent of the papers presented at the Congress which corresponds to a "coefficient of paper contribution" for academics of 1.70. On the other hand, the "coefficient of paper contribution" for

"They say that we should consult the past if we want to learn about the future! The Seventy-fifth Anniversary is a good occasion for the new IAHR to consider the future."

practicing engineers works out at 0.47. This coefficient demonstrates that if each member in academia presents a paper in the Congress, only one engineer among four presents a paper in the Congress as a rounded number. What do you think of this ratio in coefficient, that is, 3.6 to 1? Is this good for IAHR and our community? If we consider that the category "practicing engineer" includes also our members working in research institutes then the number of non-research engineers presenting papers relating to projects is even fewer!

Excellence in Engineering Practice

The Council approved the establishment of a Task Force on "Excellence in Engineering Practice", chaired by Prof. Anton Schleiss, Swiss Federal Institute of Technology at Lausanne. The action plan of the Task Force includes identifying better ways to encourage paper submission from practicing engineers, to propose special sessions for papers in "Excellence in Engineering Practice" in several technical themes, and to propose an appropriate review procedure for selection of papers from the standpoint of excellence in engineering practice. I hope that the IAHR World Congress develops into a melting pot for researchers, practicing engineers, water managers, manufacturers of instruments, and so on.

Challenges for IAHR in Innovative Areas

I would like to briefly describe the strategy of IAHR on innovative research areas and global water dialogues. IAHR has several Working Groups (WGs) under the Standing Committee on Global Water Issues. We need these WGs to stimulate both the internal and external activities of IAHR. From the internal point of view we need the WGs as a focal point for cross-sectoral and holistic research activities inside IAHR connecting to the activities of the various Technical Committees. For the "outside world" we need a gateway to connect the expertise of our community with other water disciplines and stakeholders.

I invite all members to actively take up the challenge of contributing to a reinvigorated hydro-environment engineering and research community occupying a central place in the water world!

The WG on International Flood Initiative is a doorway to UNESCO IFI. As you know we are suffering from severe flood damages every year in many countries around the world. The WG on Climate Change (CC) is a link point to world conferences on impacts of CC on the water world and adaptation to CC in engineering practice. There are many international conferences on CC and our community needs to be represented to show our achievements on this topic. The WG on Applied Hydrology is a doorway to the Commission on Hydrology of WMO. The new WG on Marine Renewable energy is a doorway to world conferences on mitigation of CC

How to Avoid Fragmentation

Suppose we have a white committee, a black committee, a red committee, a yellow committee, a blue committee, and a green committee in IAHR. As global water dialogues become intense under the pressure of Climate Change and water scarcity, IAHR needs to create a new color different from the primary colors mentioned above. This does not mean we should create a pink committee, for instance. If we follow this direction, we need to establish so many committees because the number of combination of primary colors is indefinitely large. I believe that instead we can accomplish our aims by management of the Association based on cross-sectoral and inter-disciplinary activities of committees, because IAHR is not a simple collection of committees. I suggested to the Council of IAHR to take a more flexible approach and to establish a WG which can select desirable level of combination of colors for each specific subject required for IAHR.

Concluding Remarks

Our Association has been restructured and a new name approved! Now I invite all members to actively take up the challenge of contributing to a reinvigorated hydro-environment engineering and research community occupying a central place in the water world!

I would like to conclude this message by extending my best wishes for 2010 and that it brings personal and professional satisfaction in your lives.

Prof. Nobuyuki Tamai
IAHR President
n_tamai@mba.ocn.ne.jp

Enabling Sustainability, Management and Conservation of Water Resources

The Science of Hydrometry

This article first appeared in ISO Focus - the Magazine of the International Organization for Standardization Volume 6, January 2009. Reprinted with permission of the ISO Central Secretariat (www.iso.org/isofocus)

Hydrometry is the science of water measurement. It embraces all features of the hydrological (water) cycle, including precipitation, evaporation, transpiration, soil moisture, groundwater and stream/river flow and level measurement.

Good quality hydrometric data is essential for the planning, development, operation and conservation of the world's water resources. Among the uses of hydrometric data are:

- water resources planning, development and control;
- flood warning and forecasting, protection, control and engineering design;
- water quality monitoring and pollution control;
- ecological studies, habitat protection and conservation;
- amenity and navigation management;
- assessment of the impacts of climate change.

Supporting Sustainable Water Management

The primary ISO committee addressing international standardization in water measurement is ISO/TC 113, Hydrometry. Established in 1964, and responsible for over 70 published ISO standards, it currently has five active subcommittees:

- SC 1, Velocity area methods;
- SC 2, Flow measurement structures;
- SC 5, Instrumentation;
- SC 6, Sediment transport;
- SC 8, Groundwater.

Velocity Area Methods

Within ISO/TC 113, *Hydrometry*, the work of subcommittee SC 1, Velocity area methods, covers standards on the determination of flows and discharge in open channels (e.g. rivers, streams and artificial watercourses) using techniques based on the velocity area method. Spot flow measurements in open channels have been carried out for decades using rotating element current meters. Because these are point velocity meters, it is necessary to take measurements at a number of positions across the flowing cross-section to determine mean velocity. It is also necessary to determine the area of the flowing cross-section.

In recent years, point velocity meters based on Faraday's law of electromagnetic induction and the Doppler effect have become widely accepted, which has lead to the widespread application of acoustic Doppler current profilers (ADCPs). This technology is mounted on a boat or flotation device and moved across the watercourse from bank to bank (see Figure 1). During this process a large number of velocity measurements are taken throughout the flowing profile and the bed profile is also determined, allowing the discharge to be calculated.

ADCP technology is commonly used for spot flow discharge measurements in watercourses where conventional current meter measurements are difficult or impossible. A new ISO technical report, ISO/TR 24578, *Hydrometry – Acoustic Doppler profiler – Method and application for measurement of flow in open channels*, is currently being prepared by ISO/TC 113/SC 1.

Not Forgetting the Fish

Continuous flow measurements in open channels can be obtained by making frequent measurements of water level relative to a fixed datum (stage), which can be recorded at regular intervals. The water level (or stage) measurements are then used to determine discharge by means of a stage-discharge relationship, addressed in ISO 1100-2:1998, *Measurement of liquid flow in open channels – Part 2: Determination of the stage-discharge relation*. These relationships are derived by taking spot flow measurements and corresponding stage readings over as wide a range as possible, and from these the stage-discharge relationship can

Figure 1 – ADCP gauging on the River Teme, England.

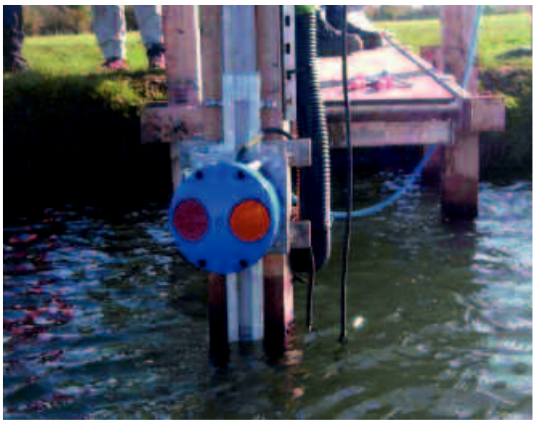


Figure 2 – H-ADCP being installed on the River Thames, England.

Figure 3 – Inspection of a flume on an effluent discharge channel to ensure compliance with the relevant flow measurement standards

be derived. Stage-discharge relationships in natural channels can often be unstable due to variations in channel properties over time, for instance seasonal variations in aquatic vegetation growth, scour and deposition.
On smaller watercourses it is possible to install purpose-built flow measurement structures. Provided these are designed, operated and maintained in accordance with the appropriate ISO standard, they are capable of producing accurate determinations of discharge. However, the cost of construction can be prohibitive and they are only suitable for smaller watercourses. In addition, flow measurement weirs can act as a barrier to fish movement, creating a further restriction on their use. ISO/TC 113/SC 2, Flow measurement structures is currently finalizing a new standard, ISO 26906, *Hydrometry – Fishpasses at flow measurement structures*.

Acoustic Technologies

On rivers where it is not possible to develop stable stage discharge relationships or to install flow measurement structures, the use of acoustic technologies can be a good alternative. Time-of-flight and transit-time acoustic technologies have been used successfully for river flow measurement since the 1970s. Their application is described in ISO 6416:2004, *Hydrometry – Measurement of discharge by the ultrasonic (acoustic) method.*
More recently, Doppler-based technologies have been used for continuous flow measurement purposes. In particular, derivatives of the ADCP technologies used for spot flow measurement have been produced, including the horizontal ADCP, also known as H-ADCP or side-looker. These devices, which can be fixed below the water surface on one bank of the watercourse, are relatively easy to install, operate and maintain (see Figure 2).
The instruments determine velocity in a portion of the channel. By undertaking spot flow measurements over a range of flows, it is possible to derive a relationship between the measured velocity (referred to as the index velocity) and the required mean velocity. These simple relationships between velocity and mean velocity can be made more complex by including stage as a parameter.
A new standard, ISO 15769, *Hydrometry – Guidelines for the application of acoustic velocity meters using the Doppler and echo correlation methods*, is also currently being prepared by subcommittee 1. This is a substantial revision and update of an earlier technical specification. H-ADCP technologies are now being used throughout the world for continuous flow measurement in a wide range of applications, from relatively small streams to large rivers. For example, the strategically located gauging station on the Yangtze River immediately downstream from the Three Gorges Dam is an H-ADCP.

Hydrometric Uncertainty

The difference between the true and measured values of a physical quantity is the measurement error. This measurement error, which cannot be known, causes uncertainty about the accuracy of the measured result. Since all measurements of a physical quantity are subject to uncertainties, a physical measurement is complete only when accompanied by a statement of its uncertainty. Irrespective of the technique used, open channel flow determinations are based on several measurements and assumptions, and the overall uncertainty is a combination of all of these. For example, the overall uncertainty in a flow determination for an H-ADCP gauging station is a combination of the uncertainties in the instrument-measured velocity, the instrument sampling period, water level measurement, surveyed cross-section, gauged data used to derive the velocity index rating, velocity index rating, and the water level vs. cross-sectional area relationship.
An ISO technical specification focusing on hydrometric measurements specific to open channel flow measurement, i.e. ISO/TS 25377:2007, *Hydrometric uncertainty guidance* (HUG), has been developed. This guidance document is based on the methodology in the *Guide to the expression of uncertainty in measurement* (GUM), recently republished as ISO/IEC Guide 98-3. Developed by the European Committee for Standardization (CEN), the HUG has been adopted by ISO under the Vienna Agreement on technical cooperation between ISO and CEN. It is now being used as a guide to assist with the writing of uncertainty clauses in new and revised standards, since all ISO hydrometric standards contain clauses on uncertainties.

Decision-making Essentials

Many users of hydrometric data have no direct experience in measurement and data collection, and there is a general tendency to accept published data as an accurate estimate of the true value. Due to the difficulties of taking measurements and determining flows under difficult field conditions, it is not unusual to derive flow estimates with uncertainties of 5 – 7,5 % at one standard deviation – in other words, the acknowledged standard uncertainty of approximately 68 % confidence level.
At extreme flows, both low and high, the uncertainties can be even larger. It is therefore essential that users of hydrometric data are made aware of associated uncertainties, and that these uncertainties are considered in the subsequent decision-making process. A statement of uncertainty should accompany measurements, and a risk-based approach should be adopted, as well as a sensitivity analysis undertaken. An example of this would be a statement of the estimated impact on the need for a new water supply scheme if low flows were 10% higher or lower.

Helping Achieve Objectives

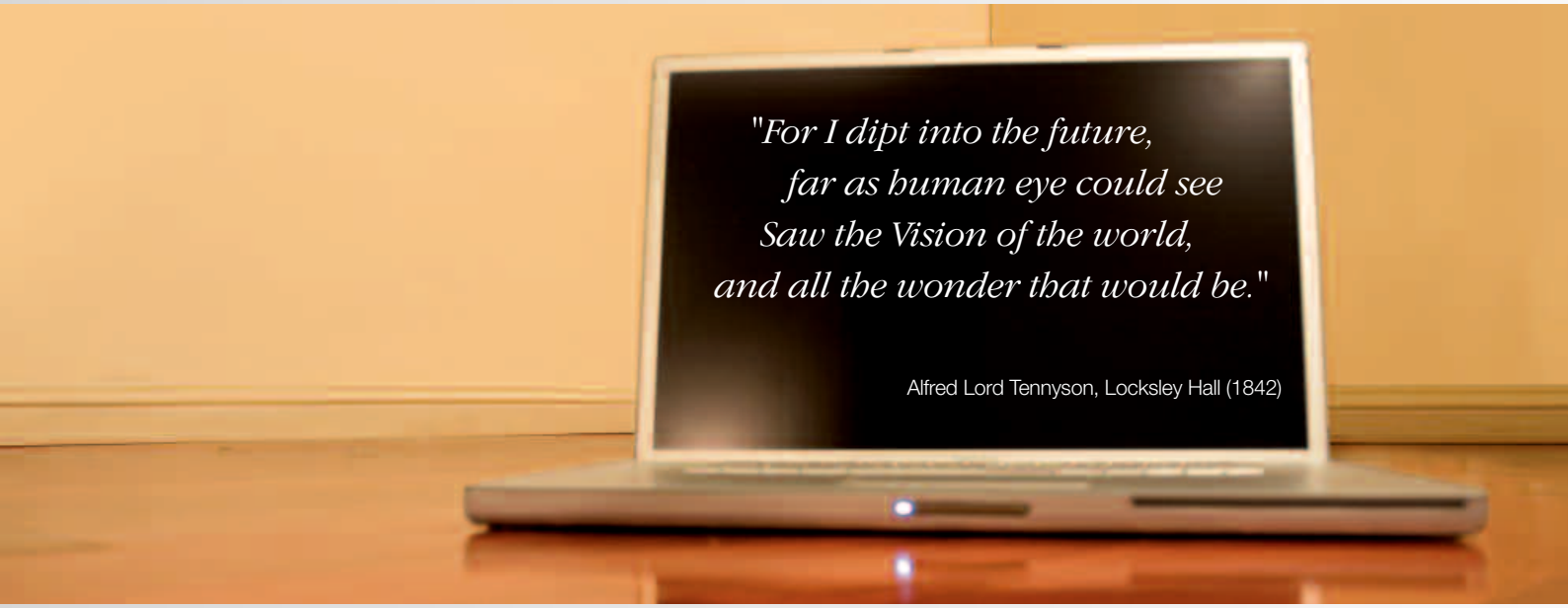
Water engineers and scientists will continue to face challenges in the coming years and decades. Sustainable development, management and conservation of the world's water resources can only be achieved with high quality hydrometric data.
This need will put greater demands on hydrometric practitioners, who will be expected to provide even more good quality data while operating within increasingly tighter budget constraints. This will require the embracing of new techniques – along with established conventional procedures – supported by uncertainty analysis. It is essential that up-to-date, appropriate standards are available to hydrometric practitioners to help achieve these objectives.

Dr. Stewart Child, Chair of ISO/TC 113/SC 1, Velocity area methods

About the author
Stewart Child has more than 35 years' experience in the fields of hydrology and water resources. He is currently Principal Consultant (formerly a Director) of Hydro-Logic Ltd., a UK-based water resources management and monitoring consultancy. His current interests include hydrometry, uncertainties in hydrometric data and water resources planning. He is currently Chairman of ISO/TC 113/SC 1, *Velocity area methods* and of CEN/TC 318 – *Hydrometry*. He also serves on the British Standards Committee on Hydrometry and the Sub-committees on Velocity area methods and Flow measurement structures.

The Future of Academic P

From 2010, IAHR has entered into a publishing partnership with Taylor & Francis (T&F), an international academic publisher (www.tandf.co.uk/journals). Journal of Hydraulic Research and International Journal of River Basin Management are now published by Taylor & Francis on behalf of IAHR. As a commercial publisher, T&F is committed to keeping abreast of technological developments within the publishing industry and the larger commercial market. Below they outline some of their thoughts on the future of academic publishing and the strategies that they have in place in response.



While the possession of either a crystal ball or the means to look into the future would certainly be desirable to anyone operating in today's market conditions, it is possible to prepare for the future by reviewing trends and forecasting based on data already to hand.

Is the End of Print Nigh?

The electronic journal has seen a gradual rise in popularity and, over the past five years, has been outstripping its print counterpart in terms of subscription renewals. Trends indicate a steady movement of subscriptions from print to electronic media; this movement at present shows no sign of decelerating. The advantages to the electronic format are obvious (ease of access, minimal storage costs, usability) with financial considerations further encouraging libraries to change to online-only subscriptions, rather than the more costly print and online option.

Does this spell the impending doom of the print journal? Statistics provide strong evidence to suggest that at some point in the future the print subscription as we know it will no longer exist, rather becoming an optional 'add on' to an electronic subscription. T&F are already using the Print On Demand model on a number of titles, thanks in part to the onset of digital printing which allows for a constant price per unit cost unaffected by the number of copies produced, without diminishing print quality. Nonetheless, there are other factors which play to the favour of the print medium; an online only subscription carries with it a significant VAT or sales tax element which dissuades some subscribers from ending the print component of their subscription; dependence on an external server, rather than a library's own storage area can also sit poorly with certain institutions; and of course reading off a screen compares poorly to the tactile sensation of a print publication. At present, the online-only publication is viewed as somewhat of a unique animal and the legacy of the codex format remains powerful. Certainly, this will change over the next ten years, but it seems that the era of the print journal has yet to come to an end.

Online Early Publication - i*First*

Although relatively unheard of five years ago, the publication of articles online ahead of their appearance in print is now an everyday occurrence for many journals. The importance of the Impact Factor has played a significant part in this phenomenon; the earlier an article is

ublishing

available for researchers to read, the higher the likelihood that the article will influence subsequent research and be cited in the articles derived from that research. In response, Taylor & Francis have developed a proprietary early-online-publication system, known as *iFirst*, to ensure the rapid online publication of peer-reviewed research.

For some of our journals, newly accepted articles are immediately assigned to the next available issue of the journal. They are rapidly copy-edited and typeset and appear online as part of their assigned issue or volume, identical to the print edition in every way, including page numbers. For other journals, accepted articles are copy-edited and typeset and appear in a "forthcoming articles" list on the journal's webpage. They are identical to the print edition in every way except that they lack page spans.

T&F Brings Changes to JHR and JRBM

Taylor & Francis will publish JHR (and its companion journal JRBM) on behalf of IAHR from 2010. Here they outline their plans for the journals' development this year and the benefits that they hope to bring to the journals, IAHR and its members.

As of 2010, IAHR has entered into a new publishing partnership with the academic publisher, Taylor & Francis. Journal of Hydraulic Research and International Journal of River Basin Management are now published on behalf of IAHR by Taylor & Francis (T&F), joining a stable of other (perhaps familiar) titles such as Hydrological Sciences Journal (published on behalf of IAHS), International Journal of Computational Fluid Dynamics, Urban Water Journal and Water International (official journal of IWRA).

IAHR members will continue to enjoy a preferential subscription rate to both JHR and JRBM. They are also offered the opportunity of taking up a free online subscription for 2010 to one of the five following titles: International Journal of Water Resources Development, Civil Engineering and Environmental Systems, International Journal of Computational Fluid Dynamics, International Journal of Geographical Information Sciences and Lake and Reservoir Management .

During 2010, Taylor & Francis and IAHR will work together to raise the readership and visibility of JHR and JRBM. T&F has a notable presence at a number of key meetings (such as the annual American Geophysical Union Fall meeting) and will ensure that both journals are marketed extensively to a global audience, whilst not losing focus on key markets with a presence at many of IAHR's conferences and congresses. T&F has a worldwide Sales reach; however they are also dedicated to pursuing philanthropic initiatives that allow academics from all over the world access to important research, working with organisations such as the UN and the WHO to disseminate research for free or for a greatly reduced rate to lower income countries.

T&F is committed to providing excellent publishing services to its society partners, supplying the services of a commercial publisher (specialist typesetting and printing, rapid turnaround times, cutting edge publishing technologies and so on) with a personal approach. Each of our journals has a small team dedicated to its smooth and successful publication. In JHR and JRBM's case we will maintain the high Production values that are in place at the moment, whilst providing added-value technologies such as our online early publication initiative, iFirst, and the ability for authors to add interactive materials to the online version of their articles.

Both JHR and JRBM have a dedicated webpage on Taylor & Francis' InformaWorld platform . Upload of the first 38 volumes of JHR is already complete– allowing users to access content online from the inaugural volume in 1962 to 2000, (with the back digitisation of the 2001-2009 volumes scheduled for completion in 2010). The InformaWorld platform will host JHR and JRBM articles in PDF and HTML formats, will provide rich reference linking through initiatives such as CrossRef (a resources that allows online users to click on references and access the cited article), 'Next Generation' functionality such as forward citation linking and advanced plagiarism checking software such as CrossCheck. Users will be able to set up alerts or RSS feeds to inform them when content is available online, or to use social networking tools to bookmark any articles of interest, whether these be just-published papers or articles from JHR's rich back archive (figure 1).

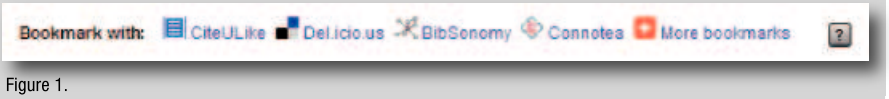


Figure 1.

Our hope is that technologies such as these will serve to both raise the journals' profile globally and to make the user experience as fulfilling and intuitive as possible.

Another important development for both journals is the implementation of an online submission and peer review system, ScholarOne Manuscripts (formerly Manuscript Central), with the aim of facilitating the review and production processes. This is already in place for JRBM (please visit the journal's website at www.tandf.co.uk/journals/TRBM) and the system will be implemented for JHR over the next few months.

We hope that this brief update has been of some interest and would welcome your thoughts and feedback. Please direct these either to the IAHR Publications Manager, Estibaliz Serrano or Victoria Gardner, T&F Acting Managing Editor.

These “forthcoming articles” are later assigned to a particular issue of the journal, given page numbers, and published in final form.
We are currently trialling another possible online-early publication workflow, where the author's version of the accepted manuscript is posted as a .PDF on the journal webpage immediately following acceptance, prior to undergoing any typesetting or proofing. These Accepted Manuscripts (AMs) will be available online within five days of acceptance, ensuring they are available to the academic community as early as possible. Once these manuscripts have been copy-edited and typeset, they will be replaced by a traditional *iFirst* version. This will form the Version of Record (VoR) and will constitute the official online publication of the article in question. For more information on *iFirst*, please visit www.informaworld.com/ifirst.

InformaWorld

InformaWorld is T&F’s online platform, upon which we host content and information on all of our journals. InformaWorld launched in 2007 and subsequently online usage of our titles increased by 52% from 2006. T&F has a dedicated Online Production team and Editorial Projects team who regularly implement new technologies on InformaWorld to future-proof the platform. They do not attempt to anticipate the changing needs of users in a vacuum, rather they carry out regular focus groups within the research community. A number of developments have taken place over the past year and these are outlined briefly below.

Searching on InformaWorld

InformaWorld aims to make the user experience as fulfilling as possible, by offering a number of search options. Researchers can use the ‘site search’ option to browse through the whole platform; can use advanced search options

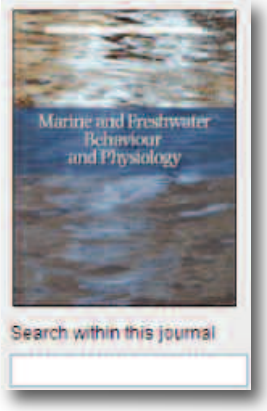


Figure 1 – One of the search options offered by InformaWorld

Figure 2 – the Multimedia tab is easily accessible on InformaWorld

when their needs are more specific and can also browse within a journal (figure 1).

The ‘related articles’ tab also allows for users to click through to content linked to the article previously being browsed.
Whilst the above search options are continually being refined, the possibility of developing semantic search options is becoming more likely as time goes on. Once considered too technologically advanced to implement (after all computers, not people, drive searches) in the not too distant future, T&F aim to develop our online platform so that meaning, rather than words themselves drive a search. This will be a very gradual transition but trends indicate that change indeed will come.

Multimedia

Clearly, the online format offers authors and users a number of features unavailable in the print medium. A notable advantage of publishing articles online through InformaWorld is its Multimedia tab. This allows authors to publish online content which supports, or is related to, their paper and which also previously would have been inaccessible to most readers. This can take the form of additional datasets, graphics, animation or video clips and is easily accessible via the Multimedia tab on the article’s abstract page, as shown in figure 2.

For further information about adding supplementary material to online content please visit http://www.informaworld.com/smpp/authors_journals_submit_supplement~db=all.

A Helping Hand for Researchers

Although somewhat of a cliché, younger researchers tend to be more apprised of the latest technological developments than their more mature counterparts. Data suggest that, in the future, researchers will expect technology to make the information gathering process both more efficient and more interactive, with resources such as Google® and social networking sites paving the way.
T&F have already added social bookmarking links to IW, enabling researchers to be more fluid in their research habits as they can simply ‘bookmark’ any articles of interest within their personal email account, social networking site or academic service and return to this repository of research at a later point.
Furthermore, rather than having to regularly check journal homepages, users have the option to sign up for online alerts, use forward citation links and set up RSS feeds.

Into the Future

The publishing industry has undergone a renaissance in the past decade, arguably witnessing more change in the past ten years than in the previous thirty. Rather than slowing down, these changes will only take place more rapidly over the next ten years and, to paraphrase the good poet, a Wonder indeed they should be.

Dr. Victoria Gardner
T&F Acting Managing Editor
victoria.gardner@tandf.co.uk.

Education and Professional Development (EPD)

The latest meeting of the IAHR Committee on Education and Professional Development (EPD) was held together with the meeting of the Engineering Graduate School Environment Water (EGW) and it took place on Sunday, August 11th, 2009 in Vancouver, Canada during the XXXIII IAHR Congress. It was chaired by Prof. Reinhard Hinkelmann and attended by about 20 participants.

The activities in the period summer 2007 until summer 2009 mainly focussed on the preparation of the Vancouver Congress, the IAHR Multimedia Library and further education courses within the EGW framework. A detailed activity report was presented and discussed.

Concerning the Vancouver Congress, EPD considerably contributed to organizing Topic F: Education, History, Social / Economic Impacts and the John F. Kennedy Student Paper Competition. EPD will also contribute to the upcoming IAHR Congresses. The activities will be planned in the next months. The initiatives of the IAHR Media Library regarding films of interest in the field of Fluid Mechanics were previously the same as those of ASME, as can be read in the Journal of Fluid Engineering, June 1976, pp. 151-155. The IAHR Media Library represents the evolution of that idea. Therefore in 2004, thanks to the initiatives of Michele Mossa's didactical and research group at the Technical University of Bari (Italy), in cooperation with IAHR and the Editorial Board, the IAHR Media Library became a web resource for the storage and dissemination of photographic, animation and video material relating to Hydraulics, Fluid Mechanics, Hydrology, Water and Fluids Engineering and Water Resources.

From July 2008 the first stage of IAHR Media Library was expanded, also including a second new area devoted to teaching tools, which can be uploaded or downloaded

free of charge, as is the norm for this web resource.

Therefore, the web resource now consists of two areas. The first one is devoted to movies and photos, whereas the second one is primarily devoted to any kind of educational resources in electronic format, such as:

- slides of class lectures and seminars
- didactic computational software
- documentation of appropriate field cases
- e-learning tools
- e-books
- bibliographies.

The basic features and rules of the initiative are:

- no charge
- the authors of tools are identified and users are encouraged to acknowledge the authors
- the authors have the right to ask for the removal of their material from the web page whenever they like
- tools should be available as open sources, so that that users can freely use them as they are, or take and modify any part of them. Computational software may be an exception.

Within EGW, six courses have been carried out. 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.

After a discussion it was decided to keep the old name 'Committee on Education and Professional Development' (EPD) instead of the suggested name 'Professional Education and Training'. EPD better reflects that academic education is an important part of this committee.

For the transition of EPD into the new IAHR structure as a Committee within the new Division III - IPD, Innovation and Professional Development, a Leadership Team was started to be established. After the Congress Michele Mossa, the previous Secretary, became the New Chairman and Ioana Popescu the new Secretary. Reinhard Hinkelmann will serve as Past Chairman and he will also contribute to IAHR within the new Council. The following persons agreed to join the Leadership Team: Rob Ettema, Frank Molkenthin and Guillermo Palau Salvador. Two further members, one from Asia and one from Latin America, are currently searched for to have a well-balanced regional distribution in the Leadership Team.

The new Committee EPD will have the same status as all other Committees of the Divisions I and II. This also includes the circumstance that the IAHR members can give a full or half a vote to this committee. The Chairmen suggest that the participants should give at least half a vote to EPD.

Peter Godwin briefly spoke about the student chapters. A new task force headed by Marian Muste has been initiated by the Council to improve the situation in the student chapters and their participation in the IAHR congresses.

Ana Maria da Silva reported about the Master classes which she organized with further colleagues for the Vancouver Congress.

Aronne Armanini presented a new database about 'Doctoral Research in Hydraulics - European Doctoral Students and Subjects' where students can register under www.iahr.eu to come into contact with PhD students with similar subjects.

Via the IAHR web-page, there is a direct link to the Facebook initiative 'IAHR Young Professionals' which is a group established by IAHR for young researchers in all aspects of hydraulic and water engineering and environmental sciences to enhance contacts and exchange experiences and knowledge, see www.facebook.com/group.php?gid=8630407386&ref=share.
IWA hast started a Wikipedia for water, see http://water.wikia.com.

A further article describing the future plans of the new EPD team will follow soon.

Dr.-Ing. Reinhard Hinkelmann, Berlin, Germany ***reinhard.hinkelmann@wahyd.tu-berlin.de***
Prof. Michele Mossa, Bari, Italy ***m.mossa@poliba.it***

ASDECO a Real Time Monitoring and Decision Support System for Impacts Minimization of Desalination Plant Brine Discharge into the Marine Ecosystem

During the last decades desalination has experienced a great growth as an alternative for solving water scarcity problems, for decreasing pressure on surface and groundwater water resources, or for improving water quality intended for human consumption or irrigation. This development has been especially notable in the Gulf, Red Sea, Oriental Mediterranean (Israel) and Occidental Mediterranean (Algeria, Spain). These areas hold more than 75% of the worldwide desalination capacity. This fact leads us to think about the possibility of transferring pressures from continental waters to the coastal ones. In that case it is necessary to evaluate the effect of these pressures on the marine ecosystem. In this sense, important research I sunderway, such as that co-ordinated by Tecnoma in Spain. The aim of this research is to improve monitoring and forecasting in real time of the impact of the hypersaline plumes in the marine environment.

The development of Seawater Desalination Plants (SWDP) for urban supply and agricultural purposes in different world areas has increased greatly in recent years as a way of lessening water scarcity [1].

From an environmental point of view, waste discharge management, where brine is the main component, is the most important problem [2]. When the raw water is taken from the sea, the effluent salinity can increase between 10% and 70%, depending on the technology used [1]. In the case of effluent discharge into the sea, and especially in the presence of communities of particular biological interest (such as marine phanerogam grasslands that have a poor tolerance to increases in salinity [3]), outfall management should be carried out based on the principles of caution and sustainability. In order to achieve appropriate discharge management, we must increase our knowledge and provide the authorities and the entities that are developing and managing the installations with appropriate tools to improve discharge efficiency and to increase the effectiveness of brine dilution into the sea. The implementation of many of the above-mentioned desalination projects in Spain requires meeting the requirements of the Environmental Impact Declaration (EID), which involve strict monitoring programs that activate protocols for the periodic stoppage of the plant mainly by the activation of alarms when the salinity values are exceeded in the protection perimeters of the most vulnerable biological elements.

The pioneer project, named ASDECO [4] (Automated System for Desalination Dilution control) is lead by Tecnoma with the SIDMAR partnership collaborating with instrument integration. Likewise, the project has the expert advice from the Polytechnic University of Madrid's Port & Coast Laboratory and the Polytechnic University of Valencia's Hydraulics and Environment Engineering Institute.

This applied research project aims to create a prototype that adapts and improves the control of desalination plant discharges in the marine environment. The goal is to combine the capacity of a Decision Support System (DSS) and latest instrument innovation to predict the behavior of the hypersaline plume, which will allow an Adaptive Management to be implemented in the desalination plant. As a pilot case for the development of the system, we are currently implementing the prototype at the Alicante Channel Desalination Plant (Alicante, Spain), thanks to the collaboration of the "Canales del Taibilla" water company.

The prototype developed is a powerful prediction, alarm and information tool for the promoting authorities, the companies operating the Plant and the controlling environmental authorities.

ASDECO has been developed in the following phases:

a. Design and integration of the instrumentation. A prototype of the ocean-meteorological data acquisition station was designed. The basic objective was to design a compact and reliable solution that allows the integration of a large number of sensors: CTD, current, wind, and wave height profilers and water quality (dissolved oxygen, temperature, turbidity, redox, chlorophyll a, green algae, etc).

b. Development of an Alarm and Information System. The information system allows the compilation and validation of time series acquired in real time by multiple instrument systems. This information system generates automated reports in an easy-to-use web environment, providing development authorities with the necessary tools for control and vigilance of the desalination plant discharges. This tool can be shared with environmental agencies or be made available to the public. The alarm system is especially useful when certain salinity threshold values [3] are exceeded over certain periods of time (exceeded percentile). These thresholds can define several action levels (alarm level, emergency level, etc.) in accordance with the criteria defined in the EID or in the discharge authorization.

c. Development of a Decision Support System (DSS). This phase is mainly dedicated to the production of a decision tool that analyzes the instant and seasonal operation of the brine discharge. This tool provides management measures to maximize the brine dilution and thus reduce its impact on the receiving medium. The core of the tool is based on a forecast module that uses a combination of fuzzy logic and neural networks [5] to forecast the distribution of the plume and predict salinity levels in the protection perimeters. The use of neural networks associated to oceanographic forecasts has been extensively used [6] [7] [8]; however, their combination with fuzzy logic techniques are very recent, for example those associated with predicting the ecological state of continental surface water bodies [8] or the analysis of reservoir water quality [7].

This forecast system makes use of the implemented sensors to train and validate the neural network in such a way that, at a monitoring point, the salinity will depend on the ocean-meteorological conditions of the marine environment and the flow and salinity of the desalination plant discharge (Figure 1). This facilitates an Adaptive Management by providing feed back data to the predictive system. The system will create predictive alarms similar to the ones provided by the real time control that allow the desalination plant managers to advance the discharge impact and adapt the management to reduce it.

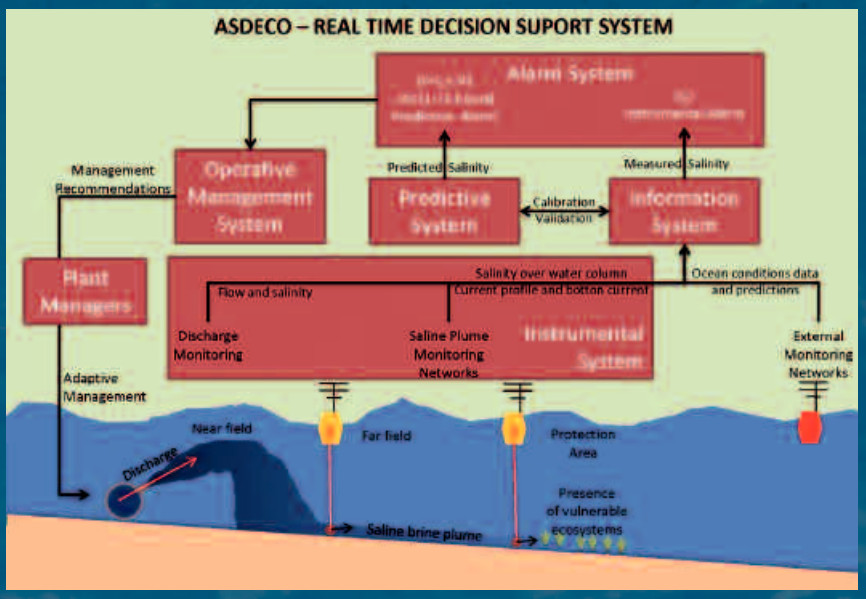


Figure 1.- Decision Support System Outline. Systems integrations and their interaction.

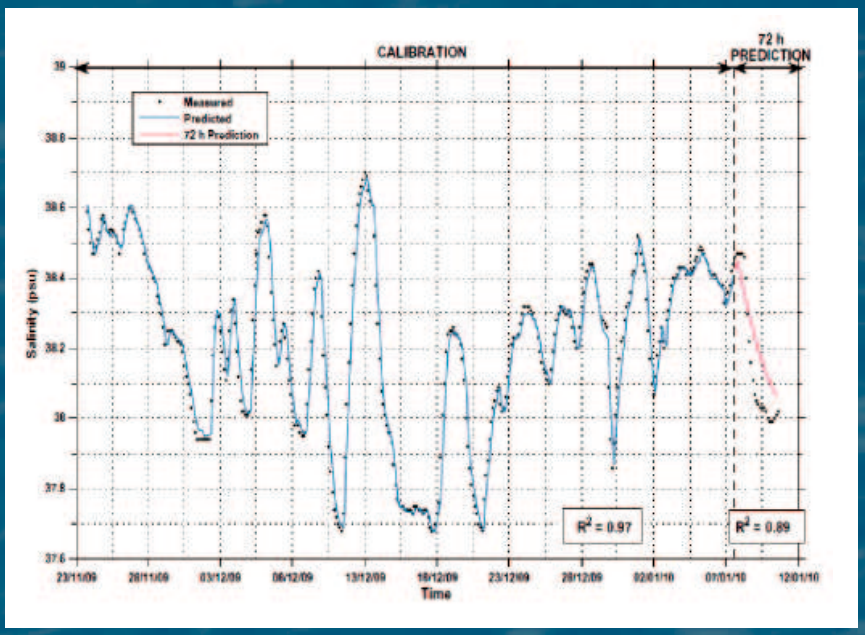


Figure 2.- Measured, calibrated and predicted (72 h) time series comparison in a far field monitoring point.

Project Validation and Results

The prototype system has been implemented into the Alicante Channel desalination plant discharge. The desalination plant is a Reverse Osmosis (RO) Plant with a treatment capacity of 130.000 m^3/day. The brine is diluted and discharged on the surface of the coastline. The Plant generally operates with a dilution rage of 1:2/1:4, using seawater and generates 7 m^3/s discharge flow with a salinity of 50 psu. This discharge is currently the object of an intensive monitoring program due to the existence of Posidonia oceanica grasslands that are located approximately 1.6 km in front of the discharge point.

The integration of this pilot system consists of the installation of an Acquisition System for Oceanographic Data in near-field and far-field, and has been adapted to the specific conditions of the brine discharge. The buoys and data acquisition instrumentation are complemented with a CTD field due to the characteristics of the seabed during the calibration phase. These data provide knowledge about the plume behavior and they also provide a large number of records for the training and validation of the forecast system. The pilot installation and integration of the system has been underway since November 2008.

During the pilot implementation several tests have been performed in order to reduce the number of monitoring variables and for the identification of the variables with most influence in saline plume mixing and persistence. The results indicate the cumulative mixing energy great influence in the brine plume dispersion [11]. This energy has been expressed as the 3 days cumulative maximum daily wave height (WH). The evolution of bottom salinity is also sensible to the previous salinity persistence. Of course the experiences shows also the important dependency due to the increase in salt load ([Flow]*[Salt concentration]) discharged.

The prediction is based on multiple neurodifuse networks calibrated at the monitoring points. The network is based in a two rules neuron with 0.8 of cluster radio.
With regard to the calibration of the forecast system, some favorable adjustments have been obtained with R2 greater than 0.90 (Figure 2). Actually the system works based on an on-line retraining that will be extended waiting for wide representativeness of monitored ocean-climatic scenarios.

The pilot application has been also useful to validate the ability to anticipate alarms for the forecast system. Figure 2 shows the calibration obtained and the 72 hours prediction values. These predictions will be useful to anticipate the potential impact of changes on discharge conditions and also to evaluate the effect of environmental conditions (WH) on plume dispersion. The predictions in Figure 2 show that the prototype is able to predict the plume trend with a high correlation with measured data with minor errors for the feasibility of predictive alarm implementation.

It is worth mentioning that only three variables explain the average dispersion condition of the plume in the sea or the occasional peaks of salinity. This prediction fit has been reached for extended periods of calm where the salinity increase with respect to the salinity base values is high, and also periods with relevant wave height, where the plume undergoes more dispersion.

The pilot implementation shows that the use of neural diffusion can be a very useful option for the follow-up and control of waste brine into the sea. At least, until the deterministic models finally adjust correctly to the turbulent dispersion processes in the problem of transport and dispersion of brine plumes and the computational requirements are feasible for real-time applications. The data compiled through the project will be useful information to help in these model developments.

Project Diffusion

An International Symposium related to brine discharge took place in Valencia (Spain) last 5th and 6th of October. It was organized by Tecnoma as a meeting point for the different professionals, technicians, scientists, and other who were involved in the issue of desalination in order to create an environment where the transmission of knowledge plays a decisive role.
The symposium had a participatory format with a primarily scientific and technical approach. Experts from different institutions (Figure 3) discussed the different tools that are available for carrying out Environmental Impact Studies for desalination plants (instrumentation, data capture, physical models and vulnerability of marine ecosystems against brine effluent).

For more information please contact Jose M. Hernandez (Tecnoma S.A. – TYPSA GROUP) ***jhernandez@tecnoma.es*** or visit www.proyec-toasdeco.com.

The goal for ASDECO is to facilitate the preventive and adaptive management of desalination plant outfalls, by making possible the prediction of impacts over the time.

Acknowledgement

This research is subsidized within the National Program of Environmental Science and Technology behind the Spanish National R&D Plant 2004-2007 and is coordinated by the Ministry of the Environment and Rural and Marine Affairs of Spain.
Special thanks to R. Molina and M. Martin for their expert advisory along the project.

Dr. Jose M. Hernandez Torres
ADECO Project Coordinator
Tecnoma, S.A.

jhernandez@tecnoma.es *www.tecnoma.es*

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