IAHR/IWA Joint Specialist Group on URBAN DRAINAGE

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2. CHAIRMAN'S THOUGHTS

Dear friends and colleagues,

A new year has begun, and I am convinced that 2009 will bring new challenges and opportunities for professionals working in the urban drainage field. But the beginning of a new year is also a time for reflection about the past. My personal reflections related to the JCUD start in June 1991 when I attended the International Conference on Urban Drainage and New Technologies, UDT □91 in Dubrovnik. This was my first international conference, and although it was a troubled time for the Balkan region. I still remember the welcoming atmosphere at the conference and the eagerness by which presenters and audience discussed a range of issues during the sessions as well as the social arrangements. In particular, I remember the meeting of the IAHR/IWA Joint Committee on Urban Drainage (JCUD) held during the conference. Here the JCUD chairman of the time, Jiri Marsalek, extended an open invitation to participate in JCUD affairs including a range of working groups on specific topics.

This openness was an important inspiration for me personally and a driving force for my involvement in JCUD activities including first the SOCOMA and GUR working groups and later membership of the JCUD management committee and co-organisation of the 10th International Conference in Urban Drainage (ICUD) in 2005, followed by election as chairman of the JCUD during the 11th ICUD in Edinburgh in August 2008. I would like to thank all the JCUD board members for the confidence they showed by electing me, and in particular to Jiri Marsalek, who has kindly agreed to continue as JCUD secretary for a while longer. Jiri's dedication to the JCUD and his efficiency and experienced advice are key to the continuing positive evolution of the JCUD as one of the most active groups under the umbrella of IAHR and IWA.

I wish to express my special thanks to Jean-Luc Bertrand-Krajewski, who served as JCUD chairman until the 11th ICUD in Edinburgh and has already let me in on many details. Jean-Luc will continue as an associate member of the JCUD, allowing us to continue benefiting from his

experience and continued effort towards an increasing international acknowledgement of the urban drainage field. In 2009 he will co-organise two sessions at the IAHR Congress in Vancouver. I also wish to thank the two leaving members for having served the JCUD well. Eric Strecker (USA) co-organised the 9th ICUD in Portland in 2002 and has contributed to enhancing the transatlantic collaboration between the US and Europe during his 6 years of service for the JCUD. Ana Deletic (Australia) has decided not to seek the second term of JCUD service, but will continue as the chair of the International Working Group on Data & Models (IWGDM) and the JCUD treasurer. Three new members have already been elected after a broad call for nominations was issued in October 2008. I'd like to welcome Neil Armitage (South Africa), Tim Fletcher (Australia) and Manfred Schütze (Germany). I look very much forward to their future contributions to the JCUD and to our fruitful cooperation in serving our profession. Finally, I would like to thank Alberto Campisano for setting up and running our own website (www.jcud.org). Having our own site gives us much more flexibility in sharing up-to-date information within our community. Alberto's dedication to this task is most appreciated.

The most important and visible JCUD activity in 2008 was the 11th ICUD, impressively organised by Richard Ashley, Adrian Saul, David Blackwood and their colleagues in Edinburgh, 31 August – 5 September 2008. 450 papers were presented orally or as posters at this ICUD, which attracted more than 600 participants from 40 countries. The Poul Harremoës Award was awarded for the second time in Edinburgh, this time to Philip G. Thomas from Thames Water Research and Development, UK who presented his paper on "Metals pollution tracing in the sewerage network using the diffusive gradients in thin-films technique" in a plenary session on the opening day in competition with Jorge Leandro from University of Exeter, UK and Annelies Van de Moortel from Ghent University, Belgium.

Many authors of papers presented at the 11th ICUD have been encouraged to submit revised versions of their papers to the journal *Water Science & Technology*. After a somewhat arbitrary delisting by the ISI Web of Science this journal has now been re-established as a journal with ISI ranking (1.24 in 2007), and it is now possible to submit manuscripts at any time just as for other journals. As the JCUD chairman, I can emphasize that the best way to maintain and increase the recognition of the JCUD is by publishing your work in internationally recognised journals and to continue supporting journals that are committed to publishing papers related to urban drainage, for example *Water Science & Technology* and *Urban Water Journal*, which both have several individuals from the urban drainage community involved as editors.

The variety of topics covered by the 11th ICUD illustrates the development of the urban drainage field since the first conference in Southampton, UK in 1978. Connection of hydraulics and water quality research was high on the agenda from the beginning. Hydraulic modelling of urban drainage systems has since then developed into a mature profession that has demonstrated its value to society. Water quality research related to pollution sources, runoff and processes in treatment systems and sewers, as well as receiving waters, is currently developing into a real science with an increasing amount of papers in highly ranked international journals. The importance of measurements is increasingly being recognised, both as a basis for calibrating models and characterising their prediction uncertainty and as a basis for understanding processes relating to the release, transport and fate of pollutants in the urban environment. Recently, and in particular during the 11th ICUD, research on planning has begun to move from top-down desk studies to bottom-up

field studies involving techniques from the social sciences enhancing the interaction between a multitude of disciplines that are needed when implementing water sensitive urban design and responding to future heavier rainfall patterns caused by climate change. Most presentations were however still from developed countries with existing and even old or degrading water infrastructure, and the global outreach is perhaps the largest challenge for the JCUD in the coming years. Thus it is a most welcome sign that the 12th ICUD will be held in South America for the first time, in Porto Alegre, Brazil in September 2011.

However, many JCUD activities will take place before we meet in Brazil in 2011. You will be able to find further information about many of them on the following pages of this newsletter. A (non-exhaustive) list of activities scheduled for 2009 includes:

- Call for proposals for hosting the 13th ICUD in 2014. The deadline for proposals is 1 June 2009 – see further details in Section 4.
- 1st Int. Conf. on Urban Drainage and Road Salt Management in Cold Climates: Advances in Best Practices, 25–29 May, 2009, University of Waterloo, Waterloo, Ontario, Canada.
- 33rd IAHR Congress, Vancouver, BC, Canada, 10–14 August, 2009.
- 8th International Conf. on Urban Drainage Modelling, UDM, Tokyo, Japan, 7–11 September, 2009, held jointly with the 2nd Int. conf. on Rainwater Harvesting and Management.
- 8th International Workshop on Precipitation in Urban Areas, St. Moritz, Switzerland, 10–13 December, 2009.

The JCUD will have its next meeting during the UDM in Tokyo, where several issues of importance to the group's further development will be discussed, including a revision of the statutes for the PH-Award. I cordially invite individuals interested in contributing to JCUD activities or becoming members of the JCUD working groups to attend this meeting, which as usual will be held in an open atmosphere. As always, you are welcome to contact me or the JCUD Secretary, Jiri Marsalek, if you wish to become involved.

Peter Steen Mikkelsen
Chairman of the IAHR/IWA Joint Committee on Urban Drainage

3. FROM THE SECRETARY'S DESK

Committee Newsletter – our annual newsletter is published to serve the international urban drainage community and meet the requirements of our parental organisations. The main purpose of the newsletter is to facilitate communications and interactions among specialists in our field, rather than presenting detailed information. It can be found on our website http://www.jcud.org.

Both IWA and IAHR now distribute newsletters only electronically, and place the newsletter on their websites. IAHR also distributes some excerpts from our newsletter in their Newsflash. Furthermore, thanks to the past efforts of Mitsuyoshi Zaizen and Shoichi Fujita, our newsletter was regularly translated into Japanese and 200 hard copies were distributed in Japan. We will also distribute the Newsletter to more than 1,200 colleagues on our JC mailing list, which is based on the IWA and IAHR memberships, and participation in ICUD and NOVATECH conferences.

Please share your electronic newsletter copy (or the link to our website) with colleagues, or refer them to the IAHR, IWA and Joint Committee websites. Your comments on this issue and contributions to future newsletters are most welcome.

Joint Committee Activities – The annual Committee meeting was held in Edinburgh, UK, on Aug. 30, 2008. The minutes of the meeting can be found on our new website (Thanks Alberto!). Future JC meetings: in 2009 at the UDM Conference in Tokyo, Japan (most likely on Sept. 6, 2009, just before the conference), in 2010 at the Novatech Conference in Lyon (June 27, 2010, tentative), and in 2011 in Porto Alegre, Brazil, during the 12th ICUD. Please note that the JC meetings are public.

Also note that the call for proposals to organise the 13th International Conference on Urban Drainage has been issued and can be found in Section 4. The proposals are due by June 1, 2009, sent to the Chairman (Peter) or Secretary (Jiri) (see their email addresses on p. 2 and 3).

From the Personal Department

I would like to share with you two items of personal nature. Firstly, our esteemed colleague and a long time collaborator, Prof. Dr. Ing. H. Brombach, has retired from his position of CEO of the company that he started, Umwelt- und Fluid-Technik Dr.H. Brombach GmbH, and will continue on as a partner, consultant, and emeritus founder. The CEO position was taken over by Dr. G. Weiss. On behalf of our community, I would like to extend many thanks to Hans for his past collaboration and support, and wish him, as well as his successor, much success in the future.

Secondly, on Oct. 31, 2008, Aalborg University, Aalborg, Denmark, conferred an honorary doctoral degree on our Secretary, Jiri Marsalek, in recognition of his contributions to the field of urban drainage. Many thanks are due to Prof. Torben Larsen and his colleagues from Aalborg University for nominating Jiri for this great honour.

Wishing you all the best in 2009 and many years to come,

Jiri Marsalek
JC Secretary

4. CALL FOR PROPOSALS TO ORGANISE THE 13th INTERNATIONAL CONFERENCE ON URBAN DRAINAGE IN 2014

The Joint Committee on Urban drainage of IAHR and IWA is inviting the interested parties to submit proposals to host the 13th International Conference on Urban Drainage in 2014. This conference will build on success of the previous conferences in this series which were held in Southampton (UK, 1978), Urbana-Champaign (USA, 1981), Gothenburg (Sweden, 1984), Lausanne (Switzerland, 1987), Osaka (Japan, 1990), Niagara Falls (Canada, 1993), Hannover (Germany, 1996), Sydney (Australia, 1999), Portland (USA, 2002), Copenhagen (Denmark, 2005), and Edinburgh (UK, 2008). The 12th conference is scheduled to be held in Porto Alegre (Brazil) in 2011.

The proposal format is fairly flexible, but it is a good practice to include the following information:

1. Conference title (sub-themes), dates and duration
2. Proponent team (conference chair or co-chairs, conference guarantor – i.e., who is ultimately responsible for the event, and how is the team connected, or plans to connect, to the Joint Committee)
3. Conference organization and management (Program committee, international committee)
4. Proposed conference program and format (list of concurrent sessions, seminars, workshops, oral and poster sessions, technical exhibition, technical tours)
5. Poul Harremoës prize competition
6. Selection of contributions (abstract/paper review) and publishing of papers/proceedings
7. Conference venue (meeting rooms)
8. Accommodation (with approximate 2009 pricing)
9. Financial issues (budget, registration fees – discounts for IAHR and IWA members, potential sponsors – documented by letters of support, if and where applicable)
10. Social program and post-conference tours, and
11. Any other points you may consider important.

Mandatory requirements:
The proposals (in English) must be submitted electronically in pdf or Word (2003 version) format, and the size of the file should not exceed 5 MB; the proposal layout should not exceed 20 pages, using 12 point font. The proposals must reach the Joint Committee Chair (Peter Steen Mikkelsen, psm@env.dtu.dk) or Secretary Jiri Marsalek(jiri.marsalek@ec.gc.ca) by June 1st, 2009. The Joint Committee will review the proposals in summer 2009 and notify all proponents of its decision in the fall of 2009.

5. WORKING GROUP REPORTS

5.1. International Working Group on Data and Models (IWGDM) (Chairman: Ana Deletic, Institute for Sustainable Water Resources, Dept. of Civil Engineering, Building 60, Monash University, Clayton, Vic 3800, Australia, Ph: 61 3 9905 2940, Fax: 61 3 9905 4944, E-mail: ana.deletic@eng.monash.edu.au ; Secretary: Prof Simon Tait, Pennine Water Group, School of Engineering Design and Technology, University of Bradford, Bradford, West Yorkshire, BD7 1DP, UK, Ph: 44 1274 233 878, Fax: , E-mail: s.tait@bradford.ac.uk).
Web site: http://iswr.eng.monash.edu.au/iwgdm

In conjunction with the 11th ICUD (held in Sept 2008, in Edinburgh, UK), the group organised a workshop on ***Challenges in Monitoring and Modelling of Stormwater Treatment Systems***. Nine presenters from eight countries presented at the workshop; extended abstracts of their presentations were published in the workshop booklet. The workshop attracted 25 participants from a number of countries, who all actively took part in discussions. The main outcome of the workshop was a wide recognition that there is lack of understanding the methodologies used for assessing uncertainties in both monitoring and modelling of urban drainage systems. For example, various groups are employing different tools to assess uncertainty in stormwater models without understanding the reliability of such tools. A need to develop shared understanding on both terminology and methods used in uncertainty analyses was recognised.
The annual meeting of the working group was held in conjunction with the 11th ICUD in September 2008, in Edinburgh. The main topics discussed were:

(1) Reports on activities from each country represented at the meeting;
(2) Organisation of the 8th International Conference on Urban drainage Modelling (8UDM): Prof. Hiroaki Furumai, Tokyo University, Japan, distributed the 1st announcement and call for abstracts for the 8UDM. It will be held in conjunction with the 2nd Inter. Conf. on Rainwater Harvesting and Management in Tokyo, Japan, between 7 and 11 Sept. 2009.
(3) A need for a joint project on 'Evaluating uncertainty methodologies': the group agreed to start a joint project on comparison of key methods currently used for model uncertainty assessment. Cinta Dotto from Monash University (Australia) and Manfred Kleindorfer from Innsbruck (Austria), agreed to take a lead on this project that will develop the testing of parameter uncertainties of a simple stormwater quantity and quality model using a number of different tools (such as GLUE, Metropolis, etc.). Group members from Italy, Germany and Denmark volunteered to take an active part in the project.
(4) Organisation of a workshop in 2009 in conjunction with the 8UDM in Tokyo: the results from the above project will be presented in a one-day workshop to be held in Tokyo in Sept. 2009 (preferably just before the main conference).
(5) Organisation of the 9th International Conference on Urban drainage Modelling (9UDM) to be held in 2012: the group agreed to hold the next UDM conference in Belgrade, Serbia in honour of Prof Cedo Maksimovic who is planning his retirement. Prof Maksimovic started the group almost 25 years ago, so this would be an opportunity to thank him for his long service.

In the past few months the group has done some work related to the above items. Organisation of the 8UDM is going very well; around 200 abstracts have been submitted to the Organising Committee and their review is in progress. We are all sure that the conference will be a great success! See also Section 10.

The project on methodologies for evaluating uncertainty is going well. A simple model and a data set have been sent to all the parties involved. They are currently assessing the model parameter uncertainties using their methods of choice. The group will meet in Tokyo (in a one-day workshop) and compare their results. We are hoping to write a journal paper on the findings.

A/Prof Dusan Prodanovic from Belgrade University agreed to Chair the 9UDM to be held in 2012 in Belgrade. A small Organising Committee has been formed to oversee the organisation. The conference will be announced at the end of 8UDM in Tokyo.

5.2. The Real-Time Control of Urban Drainage Systems (RTCUDS) Working Group

(Chairman: Dr Alberto Campisano, Department of Civil and Environmental Engineering, University of Catania, Viale Andrea Doria 6, 95125 Catania, Italy, Phone: +39 (0)95 7382730, Fax: +39 (0)95 7382748, e-mail: acampisa@dica.unict.it). Secretary: Dr M. Pleau, BPR-CSO, 5100 Sherbrooke St. E., Suite 400, Montreal, Quebec H1V 3R9, Canada; Phone: 001-514-257-2439, Fax: 001-514-257-2414, E-mail: Martin.Pleau@bpr-cso.com).
Web site: http://www.dica.unict.it/users/acampisa/rtcwg/

The group met in Lyon, France, in June 2007 during the Novatech 2007 Conference and in Edinburgh, UK in August 2008, during the 11th ICUD Conference.

Main activities:

- The organisation of the 6th seminar on Real Time Control during the ICUD 2008 conference in Edinburgh: the seminar was attended by 33 delegates from different countries. Presentations given during the seminar were made available on the RTC WG web page. Different possibilities for holding the 7th RTC seminar were explored and a decision was reached to hold it in conjunction with the Novatech 2010.
- The main publications and products developed by members of the RTCUDS WG include:
    i. Italian members, belonging also to CSDU (Urban Hydraulic Research Centre) completed the preparation of a manual for operating RTC in urban drainage (autumn 2008);
    ii. Some RTCUDS WG members are working on the update of the IWA State-of-the-Art Report on RTC published in 1989. The updated version deals only with case studies;
    iii. DWA WG has produced the tool “Planungshilfe Abflusssteuerung – PASST” (Planning Aid - Real Time Control) as well as the DWA Guideline document M-180.

- Participation in reviewing abstracts and papers for the Novatech 2007 Conference, IAHR 2007 Congress in Venice, the 11th ICUD in Edinburgh and for national and international journals;
- the update of the WG website with news on main events and activities and new links to other web sites dealing with RTC topics; and,
- the collaboration of the RTC WG in the organisation of a RTC special session at the next ICA2009 conference.

RTC news from around the world

The participants at the RTCUDS WG meeting presented the activities and projects related to RTC that are in progress in their respective countries.

Canada and **USA** (Hubert Colas): In Quebec City, Phases II and III of the RTC project are almost completed. This 130 M$ project includes 14 storage tanks built to reduce CSOs. The objective is to reduce CSOs events discharging to the St. Lawrence River and the St. Charles River to 2 and 4 per year, respectively. This project was presented during the RTC Workshop. Hubert Colas mentioned that there is more and more interest in RTC in Canada and the USA, particularly in Hamilton (Canada), Buffalo (USA) and San Francisco (USA).

Denmark (Morten Grum): In Denmark, a 5-year RTC research project has started last summer. The total budget for this project is 3 million pounds. The research project will deal with major aspects of RTC systems including meteorological forecasting, instrumentation, uncertainties and implementation. Different control strategies will also be investigated such as regional control and integrated control. This project involves both the public sector (universities) and the private sector (consulting firms). Six Ph.D. students will work on this project (some openings may still be available).

France (Christian Roux): In Paris, the Mages decision support system has been implemented in 2007. This project was presented during the RTC Workshop. Les Hauts de Seine, also in the Paris region, is in the process of evaluating the benefits of using a RTC system to reduce CSOs. The idea is to better use the available in-line storage. The implementation of a RTC system would follow the renewal of the current SCADA system.

Germany (Manfred Schuetze and Lothar Fuchs): The DWA WG has produced a guidance document for the planning and design of RTC systems. The guideline document M-180 is now available in English.

Italy (Alberto Campisano): The Italian members of the CSDU are in the process of publishing a new book on RTC. The book deals with the implementation of RTC systems (e.g., storage tanks, pumping stations, etc.) and should be available, in its Italian version, during the winter 2008/09. Alberto mentioned that it is difficult to convince companies and cities to go forward with RTC in Italy. However, recently, cities like Milan, Rome and Genoa seem to be more open to this new technology.

Spain (Blanca Aznar): In Barcelona CLABSA has conducted in 2007 a study to identify the potential of using RTC to minimize flooding risk and CSOs in the Riera Blanca Catchment. Results have shown a good potential for RTC. Two technologies were compared, Csoft, developed by BPR-CSO and Coral. This project was presented during the RTC Workshop.

Worldwide (Dirk Muschalla): Some members of the RTC group are planning to develop a benchmark for RTC related to sewer systems. The benchmark would be similar to that available for Waste Water Treatment Plants. The objective is to provide a new tool for comparing and evaluating different RTC strategies and algorithms.

5.3. Sewer Systems and Processes Working Group (SS&PWG) (Chairman: Dr. Ghassan Chebbo, CEREVE, 6-8 Avenue Blaise Pascal, Cité Descartes, Champs-sur--Marne 77455 Marne la Vallee, Cedex 2, France, Phone: + 33 164 153 641, gksc@terra.net.lb . Vice-Chairman and Secretary: Dr. Zhiguo Yuan, The University of Queensland, Sta. Lucia, QLD 4072, Australia, Phone: + 61 733 654 374, Fax: +61 733 654 726, E-mail: zhiguo@awmc.uq.edu.au. Website: http://www.sspwg.org .

Selected papers from the 5th International Conference on Sewer Processes and Networks (5th SPN), held in Delft, Netherlands, were published in Water Science & Technology.
SS&PWG members have participated in reviewing manuscripts submitted to the IWA World Water Congress and Exhibition that was held in Vienna, Austria, 7-12 September 2008, and also in reviewing manuscripts and chairing sessions at the 11th ICUD, which was held in Edinburgh, UK, Aug. 31 – Sept. 5, 2008.

The 2008 Working Group meeting took place during the 11th ICUD. The main topics covered were: a) elections of a chairman and vice-chairman; b) the next SPN Conference (to be held in 2010, chaired by Dr Yuan, will also include "hot subjects" in Australia, such as odour and corrosion management); c) other WG activities - a Junior PhD Workshop was proposed by Günter Gruber, Austria, to be held in 2009, with emphasis on specific fields of sewer systems and processes.

A new website was created: www.sspwg.org. The webmasters are Jes Vollertsen and Asbjørn Nielsen.

Future meetings and conferences - The 7th International Conference on Sewer Systems & Processes will be chaired by Dr Zhiguo Yuan, Brisbane, Australia in 2010, probably in October or November.

5.4. Working Group on Source Control for Stormwater Management (SOCOMA) (Chairman: Gilles Rivard, Aquapraxis Inc, 948 Donat-Belisle, LAVAL (PQ), Canada H7X3W5; Phone: 001-450-689-2967, Fax: 001-450-689-2969, E-mail: GRivard@aquapraxis.com; Vice-chair & Secretary: Sylvie Barraud, INSA Lyon - LGCIE - Bâtiment Coulomb, 34 Avenue des Arts, F-69621 Villeurbanne Cedex. Phone: 04 72 43 83 88 - Fax: 04 72 43 85 21 - E-mail: sylvie.barraud@insa-lyon.fr).

The SOCOMA working group studies source controls, which are defined as all measures applied to control stormwater before it enters sewers or the surface receiving waters. The group's objective is to facilitate the development of these techniques, by conducting research and experiments, and disseminating the results by various means. As compared to the WSUD (Water Sensitive Urban Design) working group, which has related interests, SOCOMA focuses on more technical aspects related to source control technologies. The activities and participation at workshops would therefore be more oriented to provide a forum for exchanging technical details of design and implementation of source control mechanisms or BMPs.

A specialized workshop was planned as a part of the ICUD Conference in Edinburgh. The selected topic was "Infiltration as a Parameter in Source Control: Design Approaches, Modelling Tools and Performance", with invited speakers from different parts of the world. The Workshop had to be cancelled due to insufficient participation; it might be reintroduced in 2009 or 2010.

The Working group held a meeting at the ICUD Conference in Edinburgh and some ideas were discussed to enhance its activities and exposure. It was agreed that in the forthcoming years the group should focus on the following activities:

1. Updating and populating the Working group web site. The web site will be used for sharing research and practice articles on source control technologies, including infiltration systems, biofiltration systems, swales and trenches, as well as non-structural techniques. The site will include design guidelines, research papers and related documents as well as links to useful and relevant sites.

2. Organizing workshops at each of the upcoming conferences. Potential conferences in 2009 include the IAHR congress in Vancouver, Canada (August) and the 8UDM (Urban Drainage Modelling) in September in Tokyo (Japan). In 2010, a Workshop will be organized at the Novatech conference in Lyon, France. It was also envisioned that some regional workshops will be organized, for example in eastern Canada during the fall of 2009, enabling more focus on particular source control mechanisms for different climates and applications.

3. Publish in 2009 or early 2010 a review article on stormwater infiltration as related to source controls, discussing the advances and issues in stormwater infiltration technology.

4. Develop a more general technical document addressing the different techniques that could be used for source control, and striving to produce an international terminology for the professionals involved in the design and implementation of these technologies. This document could be officially presented at the 2010 conference in Lyon, France.

Strong links should also be maintained and developed with other working groups, especially the WSUD (Water Sensitive Urban Design) group, which has many common interests with SOCOMA.

5.5. International Working Group on Urban Rainfall (IGUR) (Chairman: Dr. Patrick Willems, Katholieke Universiteit Leuven, Hydraulics Division, Kasteelpark Arenberg 40, B-3001 Leuven, Belgium; Phone: +32-16-321658, Fax: +32-16-321989, e-mail: Patrick.Willems@bwk.kuleuven.be. Secretary: Dr. Thomas Einfalt, hydro & meteo GmbH & Co. KG, Breite Strasse 6-8, D-23552 Lübeck, Germany. Phone: +49-451-7027333 Fax: +49-451-7027339, e-mail: einfalt@hydrometeo.de. Group's web site: http:/www.kuleuven.be/hydr/gur

The IGUR met during the ICUD Conference at Edinburgh on Tuesday 2nd September 2008 for their annual meeting. During the meeting, GUR members reported on events where topics of urban rainfall were addressed, news from the JCUD was reported, the organization of the next workshop on Precipitation in Urban Areas was discussed, and an initiative was launched to prepare a review paper on climate change impact in urban drainage. The Group also decided to request the JCUD for a change of their name from GUR (Working Group on Urban Rainfall) to IGUR (International Working Group on Urban Rainfall), to make it clear that the group deals with the urban rainfall topic at an international level.

The minutes of this and previous annual meetings can be found on the group's website. The next annual meeting will be held at St. Moritz during the workshop on Precipitation in Urban Areas in December 2009.

During the 2008 annual meeting in Edinburgh, a new chairman has been elected: Dr. Patrick Willems. The 6 years period of the previous chairman, Dr. Guido Vaes, has reached the end as required by the statutes. The Group thanked Guido for the work done during the last six years. Dr. Thomas Einfalt will continue to serve as secretary as long as there are no other candidates for this post.

The most recent information related to IGUR activities can be found on the IGUR website which is regularly updated, see www.kuleuven.be/hydr/gur.

Future meetings and conferences: The 8th Workshop on Precipitation in Urban Areas from 10 to 13 December 2009 in St. Moritz, Switzerland; the first announcement is available at: http://www.ifu.ethz.ch/stmoritz/news/First_call.pdf.

5.6. Technology Exchange, Transfer and Training Working Group (TETTWG) – the group is being re-activated under Dr. M. Nor leadership (Dr Mohd Nor bin Mohd Desa, Director, Humid Tropics Centre Kuala Lumpur (HTC), No 2 Jalan Ledang off Jalan Duta, 50480 Kuala Lumpur, MALAYSIA; Phone: 603 2095 8700, Fax: 603 2095 3366, Email: drmohdnor@water.gov.my).
The Humid Tropics Centre Kuala Lumpur, The Regional Centre on Urban Water Management - Tehran (RCUWM) and the International Centre for Water Hazards and Risk Management (ICHARM), as Category II Centres, acting under the auspices of UNESCO, will conduct a joint

activity called Training Workshop on Risk Assessment and Flash Floods Mitigation Strategies sometime in mid 2009. JCUD/TETT working group will be invited to assist in organising this event.

The main goal of this workshop is capacity development and the target group would be 25-30 managers, decision makers and planners involved in natural water disasters management in Asia and Middle East. The workshop should enable the participants to prepare relevant strategic plans.

The objectives of the training workshop are as follows:

- To Promote a conducive atmosphere for collaboration through technology and information exchange, education and science.
- To increase scientific and technological knowledge about the hydrological cycle.
- To enhance the capacity of the three centres.

The proposed topics to be discussed during the training workshop are as follows:

- Theoretical bases of flash flood occurrence
- Technologies for flash flood detection and prediction
- Socio-economic and human health impacts of flash floods
- Methodologies for flash flood risk assessment
- Providing flash flood mitigation strategies and action plan, and
- Research and development on flash floods prediction, risk assessment and mitigation.

5.7. Urban Drainage in Cold Climate Working Group (UDCCWG) (Chair: Prof Maria Viklander, Division of Sanitary Engineering, Lulea University of Technology, S-971 87 Lulea, Sweden, Ph. 46 920 491 634, Fax: 46 920 491 493, Email: Maria.Viklander@sb.luth.se; the Secretary position is currently open).

At the start of a new year, it is a time for reflection and looking back on past cold climate urban drainage achievements and also looking forward to future events. During 2007 and 2008, a number of doctoral theses concerning urban drainage in cold climate were completed and published. Theses abstracts are presented in Section 11, a brief listing follows.

In March 2007, ***Tone Merete Muthanna***, NTNU, Norway, defended her thesis ”Bioretention as a Sustainable Stormwater Management Option in Cold Climates”. In colder climates, the performance of bioretention areas is unknown to a large extent. The main objectives of this thesis were to investigate the hydrologic function of bioretention as a stormwater treatment option in cold climate with respect to seasonal infiltration rates, storm lag times, and the effects of ice and snow cover during the cold months. For a PDF-version of the thesis, visit http://www.diva-portal.org/ntnu/abstract.xsql?dbid=1472.

In April 2007, ***Karin Reinosdotter***, LTU, Sweden, defended her thesis ”Sustainable Snow Handling”. The objective of her thesis was to study the conditions for developing an environmentally sustainable snow handling strategy. For a PDF-version of the thesis, visit http://epubl.ltu.se/1402-1544/2007/12/LTU-DT-0712-SE.pdf .

A few months later, in September 2007, ***Camilla Westerlund***, LTU, Sweden, defended her thesis "Road Runoff Quality in Cold Climates". The main objective of the thesis was to investigate complex processes and influencing factors affecting snowmelt-induced runoff and snowmelt quality in a cold climate under wintry conditions compared to non-winter conditions in areas with a warmer climate. For a PDF-version of the thesis, visit http://epubl.ltu.se/1402-1544/2007/37/LTU-DT-0737-SE.pdf

Finally, in January 2008, ***Annika Lundmark***, KTH, Sweden defended her thesis "Monitoring transport and fate of de-icing salt in the roadside environment – modelling and field measurements". This thesis presents an operational modelling tool for monitoring the transport and fate of de-icing salts in the roadside environment in order to quantify changes in the environment at various spatial and temporal scales, using salt application data, meteorological data, geology and generic descriptions of hydrogeological environments as main inputs. For a PDF-version of the thesis, visit http://www.diva-portal.org/kth/abstract.xsql?dbid=4615 .

In October 2008, a new report from the Water Environment Research Foundation, WERF, was published: Davidson, J.D., N.-J. LeFevre and G. Oberts (2008), Hydrologic bioretention performance and design criteria for cold climates. This document reports on bioretention hydrology in cold climates and has been posted at http://www.ndwrcdp.org/userfiles/04DEC13SGREPORT.pdf .

Upcoming events concerning urban drainage in cold climates in 2009 include the following;
The 1st International Conference on Urban Drainage and Road Salt Management in Cold Climates: Advances in Best Practices", May 25-29, 2009, University of Waterloo, Waterloo, Ontario, Canada.

The 8th International conference on urban drainage modelling will be held in Tokyo, Japan 7-11 September, 2009. Specific issues for the 8th UDM will be particular climates (humid tropic, arid, semi-arid and cold), see website for further information; http://www.env.t.u-tokyo.ac.jp/8UDM/

There will be a Junior workshop on Urban drainage in cold climates – keep your eyes open for submission dates!

From all of us to all of you, we wish you all the best in 2009!

5.8 Working Group on Water Sensitive Urban Design (Chair: Dr Rebekah Brown, Monash University, Faculty of Arts, Menzies Building, Victoria 3800, Australia, tel +61 3 9905 9992; fax +61 3 9905 2948; E-mail: Rebekah.Brown@arts.monash.edu.au; Secretary: Prof Richard M. Ashley, Pennine Water Group, Dept. of Civil and Structural Engineering, University of Sheffield, Sir Frederick Mappin Building, Mappin Street, Sheffield S1 3JD, UK, Phone: 44(0) 114 222 5766, Fax: 44(0) 0114 222 5700, E-mail: r.ashley@sheffield.ac.uk).

6. NEWS FROM IAHR AND IWA

IAHR News

IAHR Secretariat contacts: IAHR, Paseo Bajo Virgen del Puerto 3, 28005 Madrid, Spain; Tel: +34 91 335 7908; Fax: +34 91 335 7935; E-mail: iahr@iahr.org, URL http://www.iahr.org. For more information on IAHR activities and free subscription of the IAHR e-newsletter 'NewsFlash', please contact the IAHR Secretariat: IAHR@IAHR.org

Note that the 2009 membership fees are now due (for more information, visit the IAHR website). Since 2005, IAHR offers an "electronic" membership, which includes all normal membership benefits except the printed Journal of Hydraulic Research. Electronic access to the *Journal of River Basin Management* and the subscription to the *Urban Water Journal* are offered at a special reduced rate for IAHR members.

The XXXIII Congress of IAHR on Water Engineering for a Sustainable Environment will be in Vancouver, Canada, 9–14 Aug. 2009. An invitation from the IAHR website follows.

On behalf of the entire local organizing committee and IAHR council members, we invite you to join us in Vancouver, British Columbia for an event you will not want to miss!

We take great pleasure in announcing the **33rd International Association of Hydraulic Engineering & Research (IAHR) Biennial Congress**, August 9-14, 2009, located at the Downtown Vancouver Hyatt. Themed "Water Engineering for a Sustainable Environment," the Congress focuses on the central roles of hydraulic engineering and hydroinformatics in water engineering for a sustainable environment, and how these roles link to broader aspects of environment sustainability in watershed and coastal settings.

By 2009, it will have been 12 years since an IAHR Biennial Congress was held in North America. The last North American venue was San Francisco, in 1997. That Congress was well received and attracted approximately 1,000 registrants. The North American hydraulics community is extensively represented in IAHR's membership (some 15–20% of the total) and looks forward to once again welcoming international colleagues to an IAHR Congress at an attractive North American location.

Several organizations with broad representation from the North American water engineering community – namely EWRI-ASCE, COPRI-ASCE, UBC, and CSCE – are collaborating with IAHR to organize the 33RD IAHR Congress and the co-located 19th Canadian Hydrotechnical Conference.

Bookmark this web page now and revisit often as we will update the site frequently with the latest information to make your decision making process easier. We certainly look forward to your active participation.

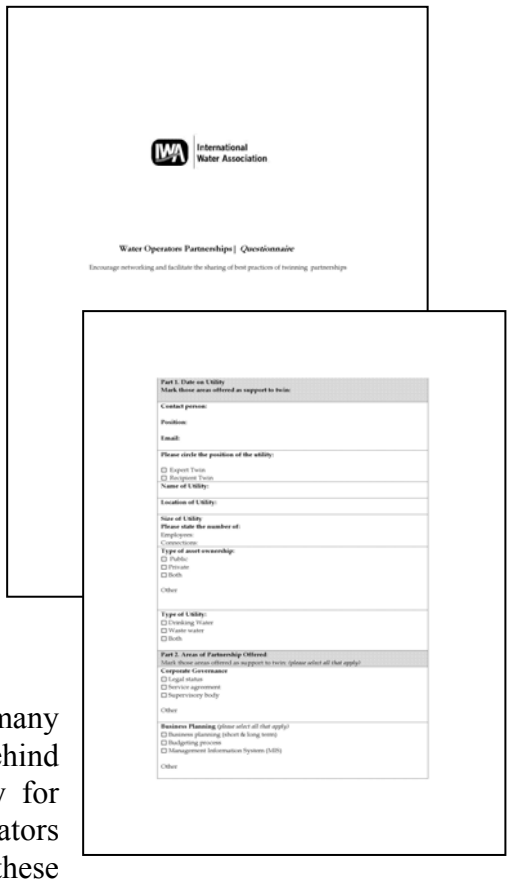
Jeffrey Bradley Ph.D., P.E., D.WRE, F.ASCE, Congress Chair

Robert Ettema Ph.D., P.E., M.ASCE, Technical Program Chair

News from IWA HQ

IWA Water Operators Partnerships (WOPs) Launch of Questionnaire

'Encourage networking and facilitate the sharing of best practices of twinning partnerships'



The WOPS survey is part of an IWA work plan currently being conducted to support the International Water Association's Water Operators Partnerships activities. The purpose of this survey is to establish a knowledge base on WOPs to catalogue experiences and to define workable WOP models that can be used across the sector.

A fundamental part of IWA's mission is to provide opportunities for members to learn from each other across the different subject areas and geographies. The IWA network provides opportunities for capacity strengthening and a variety of collaborations have been brokered over the years and many specialists throughout the global network have contributed with their expertise. Following contact from UNSGAB, UN-DESA, and UN-HABITAT, IWA was invite d by UN-HABITAT to develop and coordinate WOPs-related activities in developed and under-developed economies.

No current organisations have the capacity to reach the many thousands of water operators in the world. The rationale behind the WOPs concept is consequently that the most capacity for improving water and sanitation operators is within the operators themselves. The WOPs is based on mechanisms to allow these operators to systematically communicate amongst each other, without having to wait for donors, international financial institutions or other organisations to establish contacts and develop projects.

The main objectives of this WOPs Questionnaire are:

- To help encourage networking and facilitate the sharing of best practices of twinning partnerships;
- To better understand the institutional arrangements and the characteristics of the utilities which make up successful twinning partnerships in different regions of the world;
- To better understand the experiences and best practices of twinning partnerships;
- To identify the challenges in partnerships and the barriers in practice that may hinder the implementation of successful twinning models.

Accordingly, IWA seeks the most accurate, non-biased and factually-based answers to the survey questions. The results of this survey will help to ensure the appropriateness of actions of international supporting companies towards the implementation of successful WOPs models. To take part in this survey, please downloaded from the IWA website at:
http://www.iwahq.org/templates/ld_templates/layout_633184.aspx?ObjectId=679683

More information about the WOPs programme can be found at the following link: http://www.iwahq.org/templates/ld_templates/layout_633184.aspx?ObjectId=675379

World Water Monitoring Day – The Results are In!

Over 70,000 people monitored their waterways for WWMD 2008 in 70 countries worldwide. Results were reported from as far north as Mosfellsbaer, Iceland to as far south as Tortel, Chile; and as far east as Whakamarama, New Zealand to as far west as Hanapepe, Hawaii, USA.

World Water Monitoring is an international education and outreach program which builds public awareness and involvement in protecting water resources around the world by engaging citizens to conduct basic monitoring of their local water bodies. These easy-to-use test kits enables everyone from children to adults to sample local water bodies for a core set of water quality parameters including temperature, acidity (pH), clarity (turbidity) and dissolved oxygen (DO).

This programme is very significant and contributes to the school curriculum by educating and preparing students to cope with present and anticipated water problems. The WWMD programme acts as a great way to both engage and involve young people to understand and help protect their local water resources. The International Water Association and the Water Environment Federation (WEF), plan to expand participation to one million people in 100 countries by 2012.

Sincere thanks goes to all who contributed to this tremendous international effort. Results such as these demonstrate the amazing power we all have to make a positive difference in our communities, and ultimately our world! Take a moment to check out the results for 2008 online, or get inspired by the wonderful stories we received this year.

WWMD Announces Extended Monitoring Window

In an effort to take advantage of all the enthusiasm expressed for water quality in the past few years, the coordinators of WWMD have decided to extend the annual monitoring window from **March 22 until December 31**.

WWMD will continue to be officially observed on **September 18**. You are welcome to celebrate with us on the 18th, or to observe your own WWMD anytime during the monitoring window. All data entered by December 31 will be included in the results for WWMD '09. Check out the Resources section of the website to get started today!

Operation and Maintenance Network grows

Diarrhoeal diseases from preventable causes claim the lives of approximately 1.7 million people a year, most of them young children throughout the world. Evidence demonstrates that about 88 per cent of the burden of diarrhoeal diseases is caused by lack of safe drinking-water, adequate sanitation and poor hygiene behaviours. Sufficient and better quality drinking water and basic sanitation can cut this toll dramatically. Effective operation and maintenance of water supply and sanitation systems can play a crucial role in expanding water supply and sanitation services to the poor and to the underserved.

Throughout 2008, IWA has been providing technical inputs and Secretariat support to the Operation and Maintenance Network - a leading international network focused on O&M needs in low and middle-income countries. The Network - which was previously coordinated by the World Health Organisation - has in the region of 800 international members. IWA is currently working to support the Network's further development, in three critical areas:

- Expanding the knowledge base on O&M tools: an analysis of exisitng knowledge on O&M has been completed, and the outcomes of the knowledge mapping exercise will be applied to the commissioning of new knowledge products;
- Providing real time advice: by profiling and pooling the talent of IWA members and the existing O&M membership, a technical advisory service will be launched in 2009 that will provide immediate technical assistance to individuals and organisations in need of expert advice and opinion on a spectrum of O&M related subjects
- Extending capacity: in partnership with IWA's own Water Safety Plans programme, capacity building workshops on specific technical issues related to O&M are being planned in Asia Pacific, Latin America and other regions in 2009.

Further supporting activities, such as a revised website for the Network, will be prepared prior to March 2009. IWA is currently calling for IWA members with an interest and experience in O&M in low and middle income countries to join and support these activities. For further information, contact Darren Saywell at IWA's Den Haag office (darren.saywell@iwahq.org).

It's time to renew!

We now have a total of 450 corporate members, 3000 nominated representatives and 5000 individual members! Thank you! As a valued member of the IWA, we extend our gratitude to you for your support and the trust you have bestowed upon us.

Our promise to you is to continue to provide exceptional experiences, a vibrant community, and essential tools to help you develop yourself and your organisation as leaders within the water industry. We encourage you to continue taking advantage of a plethora of membership benefits by renewing online today:

- Engage with your peers through online and face-to-face networking opportunities;
- Enjoy the feast of resources available 24/7 at www.iwah.org.
- Nourish your intellect through publications, research, and learning opportunities tailored to the needs each of our member segments; and much more!

If you have any queries regarding your membership then please do not hesitate to contact the Membership Department at members@iwahq.org quoting your membership number in the subject line of the email.

Please accept our wishes of health, happiness, and continued success.

2009 IWA Membership Fees

INDIVIDUAL MEMBERSHIP RATES

	High Income Countries			Low Income Countries		
Individual (1yr - 2009)	£58	$116	€ 90	£26	$53	€ 40
Individual (3yr - 2009-2011)	£174	$348	€ 270	£78	$159	€ 120
Student/Retired (1yr - 2009)	£26	$53	€ 40	£16	$32	€ 24
Student/Retired (3yr - 2009-2011)	£78	$159	€ 120	£48	$96	€ 72

CORPORATE MEMBERSHIP RATES

Membership Type	High Income Countries			Low Income Countries		
Small (1yr - 2009)	£324	$648	€ 496	£162	$324	€ 248
Small (3yr - 2009-2011)	£875	$1,750	€ 1,338	£437	$875	€ 669
Medium (1yr - 2009)	£810	$1,620	€ 1,240	£405	$810	€ 620
Medium (3yr - 2009-2011)	£2,297	$4,374	€ 3,346	£1,094	$2,187	€ 1,673
Large (1yr - 2009)	£1,836	$3,856	€ 2,809	£918	$1,928	€ 1,405
Large (3yr - 2009-2011)	£4,957	$9,914	€ 7,585	£2,479	$4,957	€ 3,973

IWA EVENTS

Final Workshop of European MBR-Network Projects
31 March-1 April 2009, Berlin, Germany

The two main projects of MBR-Network (Amedeus and Eurombra) will terminate in May 2009, and a final 2-day workshop will be organised to present the main results. The workshop is proposed to be a joint event between the MBR-Network, the membrane technologies specialist group of IWA, with support if possible of the European Membrane Society (EMS), the European Membrane House (EMH), and the European Desalination Society (EDS).

The audience targeted will be mainly the European water industry and research community, including universities and research centres, but also as much as possible end-users and operators, equipment providers, consultants, regulators etc

5th International Specialised Conference on Sustainable Viticulture: Winery Waste and Ecological Impacts Management
1-3 April 2009, Trento and Verona, Italy

Wine industry has gained in recent years a prominent position in the market of agro-food. One drawback of this activity is the production of large amounts of polluted effluents, both liquid and solid, which have to be properly managed to prevent environmental problems and to preserve resources. According to this scenario, the conference will cover topics directly related to the effluent treatment as well as sustainable viticulture, with emphasis on the rational use of water.

Microbial Population Dynamics in biological Wastewater Treatment
24-27 May 2009, Aalborg, Denmark
The specialist group on Activated Sludge Population Dynamics (ASPD) organize the next IWA international Specialised Conference on Microbial Population Dynamics in Biological Wastewater treatment in Aalborg, Denmark in May 2009. The conference will examine the development in the field in the period 2005-2009, especially on the effectiveness of solutions unveiled by the new microbial toolbox we have experience the past few years.

2nd International Symposium on Water and Wastewater Technologies in Ancient Civilisations
28-29 May 2009, Bari, Italy
To reveal the cultural heritage in several regions of the world and to make visible the archaeological remnants of practices which have contributed to the development of the existing technologies in water and wastewater management.

To describe and evaluate the old technologies, which on a long term may contribute to water and wastewater management systems and to the development of integrated methodologies.

To develop small systems based on old technologies using new equipment, which may be of great significance for water, wastewater and environmental management in the future.

Asset Management of Medium and Small Wastewater Utilities
3-4 July 2009, Alexandroupolis, Greece
The effective management of wastewater infrastructure assets, such as collection systems, treatment works and disposal or recycling operations is a challenging issue for utility companies. The aim of effective management is to minimise the cost of ownership and operation, whilst providing an acceptable level of service to all customers and conform to regulator directives. Effective asset management is a function of operational, technical, environmental and financial parameters. This challenge is sometimes further complicated for small and medium size networks and facilities, where assets are geographically dispersed but must be managed to the same operational and quality standards as large systems.

2nd IWA Specialized Conference on Nutrient Management in Wastewater Treatment Processes
6-9 September 2009, Krakow, Poland
The conference will examine the emerging developments in the period 2005-2009 focusing on the most promising achievements in nutrient management and nutrient recovery on practical levels and in research. An important goal is to transfer technology on how to economically meet the increasingly more stringent nitrogen and phosphorus limitations in the face of low C/N and C/P ratios in raw wastewater and when the regulator demands treatment of all wastewater generated in a sewer-shed, including wet weather flows. We aim to bring together experts that will discuss issues of the most advanced limit-of-treatment technologies along with the experts presenting appropriate, most environmentally sustainable technologies.

5th IWA Specialist Conference on Efficient Use and Management of Urban Water Supply
25-28 October 2009, Sydney, Australia
Sydney, Australia is an ideal location for Efficient 2009, as for many years, Australia has taken a leading role internationally in research, implementation and evaluation for water efficiency programs for urban water. In recent years, urban water supply has been headline news in Sydney and around Australia as the country is experiencing extreme drought. The investment in water efficiency and effluent reuse programs has increased sharply, totalling hundreds of millions of dollars in Sydney and several tens of millions in other cities.

7. NEWS FROM IWA PUBLISHING

Geographic Information Systems in Water Resources Engineering
Author: Lynn E. Johnson

Geographic Information Systems in Water Resource Engineering presents a review of the concepts and applications of GIS in the various sub-fields of water resource engineering. After a summary review of analyses and database functions, the book addresses concepts and applications in the following areas:

- Surface Water Hydrology
- Groundwater Hydrology
- Water Supply and Irrigation systems
- Wastewater and Stormwater Systems
- Floodplain Management
- Water Quality
- Water Resource Monitoring and Forecasting
- River Basin Planning and Management

The book develops a general understanding of the nature of GIS and how it is used to create and analyze geographic data. The author first introduces primary field data collection methods and describes procedures for interpretation and analysis. The second portion of the book focuses on the linkage of GIS data with water resource analysis and management models. Applications are presented with descriptions of GIS database development, analysis background theory, and model integration with GIS.

The profound impact of GIS systems on water resources engineering continues to grow. **Geographic Information Systems in Water Resource Engineering** arms engineers and planners with an arsenal of tools to assist in the creation of a reliable, environmentally sensitive, infrastructure.

ISBN: 9781843392378 • January 2009 • 328 pages • Hardback
IWA Members price: £ 45.00 / US$ 90.00 / € 67.50
http://www.iwapublishing.com/template.cfm?name=isbn9781843392378

Sediment and Contaminant Transport in Surface Waters

Author: Wilbert J. Lick

- Presents models of the resuspension, erosion, deposition, flocculation, and transport of sediments
- Describes the sediment-water flux and transport of hydrophobic contaminants
- Examines the effects of large-scale events such as floods and storms on the transport of sediments and contaminants
- Develops detailed process models as well as sediment and contaminant transport and water quality models
- Details applications of these models as well as their strengths and weaknesses

Sediment and contaminant transport is an enormously rich and complex field that involves physical, chemical, and biological processes as well as the mathematical modeling of these processes. While many books have been written on these broad topics, **Sediment and Contaminant Transport in Surface Waters** takes a more focused approach, highlighting areas that have been recently investigated but not covered thoroughly elsewhere.

The volume emphasizes the erosion, deposition, flocculation, and transport of fine-grained, cohesive sediments; the effects of finite rates of sorption on the transport and fate of hydrophobic contaminants; and the effects of major events such as floods and storms. Despite these emphases, the overall goal of the text is to present a general description and understanding of the transport of sediments and contaminants in surface waters as well as procedures to quantitatively predict this transport.

ISBN: 9781843392293 • October 2008 • 456 pages • Hardback
IWA Members price: £ 48.75 / US$ 97.50 / € 73.13
http://www.iwapublishing.com/template.cfm?name=isbn9781843392293

Performance Assessment of Urban Infrastructure Services
Drinking water, wastewater and solid waste

Editors: Enrique A Cabrera, Jr. and Miguel Angel Pardo
Performance assessment has been one of the hottest topics in the water industry in the past decade. In that period, the International Water Association has played a key role, and the performance indicators systems developed for drinking water and wastewater utilities have become a reference worldwide.

This book represents a collection of the papers presented to the Pi08 Conference, in Valencia, Spain (March 2008). The conference represents the final stage in the COST C18 Action, funded by the EU and brings together some of the most relevant professionals in the water industry.

The included papers cover the latest trends in performance assessment, as well as some relevant case studies from practical applications in utilities around the globe.

Themes:

- Performance Indicators
- Metric Benchmarking
- Process Benchmarking
- Asset Management
- Regulation
- Case Studies

ISBN: 9781843391913 • March 2008 • 540 pages • Hardback
IWA Members price: £ 63.75 / US$ 127.50 / € 95.63
http://www.iwapublishing.com/template.cfm?name=isbn1843391910

Adaptiveness of IWRM
Analysing European IWRM research

Authors: Jos G. Timmerman, Claudia Pahl-Wostl, Jorn Moltgen
The Adaptiveness of IWRM provides new insights and knowledge on the challenges and solutions that current water management faces in a situation of complexity and uncertainty.

Drawing on the available results from a wide range of European research projects under several framework programmes, the book provides an overview of the state of the art in European research on Integrated Water Resources Management on the topics of Participation, Transboundary regimes, Economics, Vulnerability, Climate change, Advanced monitoring, Spatial planning, and the Social dimensions of water management. The achievements of EU research projects are considered in view of the extent to which IWRM responds to the current complexity and uncertainty water management is facing. These achievements are positioned in a wider context of worldwide developments in the respective topics which account for the future challenges. From this, the book concludes with the required focus of European research in the near future and promotes the concept of Adaptive Water Management as the preferred direction for the development of IWRM.

The book presents the achievements of European IWRM research on a range of water management topics and offers conclusions and recommendations for research foci that will be invaluable to water managers, policy-makers and academic researchers working in the field of IWRM.

This title belongs to the European Water Research Series
ISBN: 9781843391722 • April 2008 • 156 pages • Paperback
IWA Members price: £ 52.50 / US$ 105.00 / € 78.75
http://www.iwapublishing.com/template.cfm?name=isbn1843391724

DayWater: an Adaptive Decision Support System for Urban Stormwater Management

Editor: Daniel R. Thevenot

The European DayWater project has developed a prototype of an Adaptive Decision Support System (ADSS) related to urban stormwater pollution source control. The DayWater ADSS greatly facilitates decision-making for stormwater source control, which is currently impeded by the large number of stakeholders involved and by the necessary multidisciplinary knowledge. This book presents the results of this project, providing new insights into both technical and management issues. The main objectives of its technical chapters are pollution source control modelling, risk and impact assessment, and evaluation and comparison of best management practices. It also covers management aspects, such as the analysis of the decision-making processes in stormwater source control, at a European scale, and stormwater management strategies in general. The combination of scientific-technical and socio-managerial knowledge, with the strong cooperation of numerous end-users, reflects the innovative character of this book which includes actual applications of the ADSS prototype in significant case studies.

As demonstrated in several significant case studies the challenge for stormwater managers is to make the benefits of urban stormwater management visible to society, resulting in active co-operation of a diversity of stakeholders. Only then, will sustainable management succeed. **DayWater: an Adaptive Decision Support System for Urban Stormwater Management** advances this cause of sustainable urban management through Urban stormwater management, and makes achievable (by means of risk and vulnerability tools which are included) the goal of integrated urban water management (IUWM).

This title belongs to the European Water Research Series
ISBN: 9781843391609 • February 2008 • 280 pages • Paperback
IWA Members price: £ 63.75 / US$ 127.50 / € 95.63
http://www.iwapublishing.com/template.cfm?name=isbn1843391600

Cities of the Future
Towards integrated sustainable water and landscape management

Editors: Vladimir Novotny, Paul Brown
This book is developed from and includes the presentations of leading international experts and scholars in the 12-14 July, 2006 Wingspread Workshop.

With urban waters as a focal point, this book will explore the links between urban water quality and hydrology, and the broader concepts of green cities and smart growth. It also addresses legal and social barriers to urban ecological sustainability and proposes practical ways to overcome those barriers.

Cities of the Future features chapters containing visionary concepts on how to ensure that cities and their water resources become ecologically sustainable and are able to provide clean water for all beneficial uses. The book links North American and Worldwide experience and approaches.

The book is primarily a professional reference aimed at a wide interdisciplinary audience, including universities, consultants, environmental advocacy groups and legal environmental professionals.

ISBN: 9781843391364 • September 2007 • 352 pages • Hardback
IWA Members price: £ 63.75 / US$ 127.50 / € 95.63
http://www.iwapublishing.com/template.cfm?name=isbn1843391368

Urban Water Resources Toolbox
Integrating Groundwater into Urban Water Management

Editors: Leif Wolf, Brian Morris, S Burn

This book describes holistic approaches for quantification and balancing of urban water and solute fluxes that have been developed by the joint Euro-Australian research project AISUWRS. The new tools comprise a chain of interconnected models that link urban water supply, urban drainage and urban groundwater resources. These include a new sewer exfiltration, model that is based on pipe asset conditions which permits flows to the environment to be estimated. The book provides details on the further processing of this information through the unsaturated zone down to aquifer, where numerical groundwater flow and transport models are applied. Concise documentation is provided on each of the models.

The practicability of applying the chain of models was tested by applying it in four case study cities in Australia, Germany, Slovenia and the United Kingdom that have diverse conditions in terms of hydrogeologic setup, climate and data availability. This permitted additional validation by field investigations, including problem-oriented monitoring campaigns aimed at assessing the impact of wastewater practice on groundwater.

The case studies have shown that the approach is valid and constitutes an important step towards integrated urban water management.
This title belongs to the European Water Research Series
ISBN: 9781843391388 • January 2007 • 309 pages • Hardback
IWA Members price: £ 70.50 / US$ 141.00 / € 105.75
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SELECTED RESEARCH REPORTS

Infiltration vs. Surface Water Discharge: Guidance for Stormwater Managers
WERF Report 04-SW-3
Authors: Shirley E Clark
Publication Date: Pre-order (July 2009) • ISBN: 9781843392811
Pages: 200 • Paperback
IWA Members price: £ 77.25 / US$ 154.50 / € 115.88
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Decentralized Stormwater Controls for Urban Retrofit and Combined Sewer Overflow Reduction, Phase 2
WERF Report 03-SW-3A
Authors: Neil Weinstein
Publication Date: Pre-order (June 2009) • ISBN: 9781843393535
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Fats, Roots, Oils, and Grease (FROG) in Centralized and Decentralized Systems
WERF Reports 03-CTS-16T + 16TA & 16TB
Authors: Joel J. Ducoste, Kevin M. Keener, John W. Groninger
Publication Date: February 2009 • ISBN: 9781843395232
Pages: 210 • Paperback +CD-ROM
IWA Members price: £ 105.00 / US$ 210.00 / € 157.50
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Protocols for Studying Wet Weather Impacts and Urbanization Patterns
WERF Report 03-WSM-3
Author: Larry Roesner
Publication Date: December 2008 • ISBN: 9781843397878
Pages: 150 • Paperback
IWA Members price: £ 77.25 / US$ 154.50 / € 115.88
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8. NEWS FROM AROUND THE WORLD

AUSTRALIA AND NEW ZEALAND (REPORTED BY ANA DELETIC)

Institute for Sustainable Water Resources (ISWR), Monash University in Melbourne (http://iswr.eng.monash.edu.au/), completed a number of projects including: (1) Evaluation of stormwater filters, (2) characterization and modelling of pathogens in stormwater, (3) Modelling of stormwater wetlands, and (4) Aquifer Storage and Recovery (ASR) for stormwater in Melbourne. In total ISWR graduated six PhD students in 2008. Some new projects commenced such as a Development of novel filters for stormwater pollution control and harvesting. This $1.2 million research project already resulted in the commercialisation of a new compact technology, known as Enviss (www.Enviss.com).

Facility for Advancing Water Biofiltration (FAWB http://www.monash.edu.au/fawb/), which is a joint venture between ISWR, Monash University and EDAW Australia, has delivered proof of concept for reliable design of stormwater biofiltration systems (also known as bioretention systems and rain gardens). Apart from publishing over 30 papers and reports, FAWB produced soil specifications that became standard for Australian practice. FAWB is close to delivering full Adoption Guidelines in 2009.

The Australian National Urban Water Governance Program (NUWGP) (http://arts.monash.edu.au/ges/research/nuwgp/index.php) led by A/Prof R. Brown is a large social research initiative of Monash University aimed at facilitating progress towards Water Sensitive Cities. In 2008 the group finished a large study on Perceptions of Institutional Drivers and Barriers to Sustainable Urban Water Management in Australia. Early next year NUWGP is to run special two-day workshops in five 5 Australian cities, aimed at building the capacity of the urban planning

and water management sector, and generating detailed recommendations for local and national urban water policy development and implementation (http://www.watersensitivefutures.org/).
For more information on research activities at Monash University please contact Ana Deletic (ana.deletic@eng.monash.edu.au), Tim Fletcher (tim.fletcher@eng.monash.edu.au) and Rebekah Brown (rebekah.brown@arts.monash.edu.au).

New South Wales, AU

The Centre for Water and Waste Technology (CWWT - http://www.cwwt.unsw.edu.au/) and Water Research Laboratory (WRL) (http://www.wrl.unsw.edu.au/index.php3), of the University of New South Wales, Sydney, currently conduct the following research projects:

1. Environmental microbiology and pathogen risk assessment
2. Sustainability assessment
3. Odour and atmospheric pollutant assessment and management in sewers, and
4. Trace Organics.

The NSW researchers are taking an active part in a large Australian Research Council Linkage project on difficult problems of corrosion and odour in sewers.

For more information please contact Richard Stuetz R.Stuetz@unsw.edu.au, and William Peirson (w.peirsonroberto@unsw.edujlo.au)

Queensland, AU

The sewer research team at The Advanced Water Management Centre at The University of Queensland(UQ) in Brisbane (www.awmc.uq.edu.au), led by Professors Jürg Keller and Zhiguo Yuan), investigates corrosion and odour control in sewers. In particular, they focus on the modelling of sulphide generation in sewer systems, and the evaluation of various sulphide control strategies. The key achievements of this group in 2008 are:

- The 2nd Australian Young Water Professionals conference, which was held 4-6 February 2008 at the University of Queensland. Dr Korneel Rabaey took 1st prize in the Case Studies for his presentation on building a pilot scale Microbial Fuel Cell at the Foster's Brewery and PhD Student Janani Mohanakrishnan won the 2nd place in the Short Presentation Category for her paper on the transformations of biofilms in sewer systems.
- A collaborative project, led by AWMC Researchers, entitled "Model Based Management of Hydrogen Sulfide in Sewers" was awarded the East Asia & Pacific Regional IWA Project Innovation Award 2008 in the category of Applied Research. The award, announced on the 26th June during the Singapore International Water Week, recognises excellence and innovation in water engineering projects throughout the world.
- Building on this success, the Sewer Networks team won the 2008 Excellence award in Research Development and Innovation by Engineers Australia - Queensland.

New Zealand
Auckland Regional Council (ARC), NZ, is working closely with the Landcare Research Centre on implementation of Water Sensitive Urban Design in Auckland. They have been deploying both structural and non-structural management measures to minimise stormwater pollution discharges into the bay.

AUSTRIA (REPORTED BY PROF WOLFGANG RAUCH)

With some delay a cooperative research project between University Innsbruck, Technical University Graz, Technical University Vienna and BOKU Vienna has started in 2008. The project denoted IMW 3 is aiming towards the development of innovative measurement methods in drainage systems and the application thereof in integrated approaches towards pollution prevention. IMW3 is a continuation of two earlier research efforts, e.g. an on-line sewer monitoring station has been installed in 2002 and operated at a combined sewer overflow structure at the outlet of the Graz West catchment (City of Graz, Austria). Runoff as well as pollutant concentrations (TSS, COD) are continuously recorded in intervals of 1 and 3 minutes, for wet-weather and dry-weather flows, respectively.

Based on the earlier research efforts the Austrian Association of Water and Waste Management published guidelines for combined sewer emissions based on long-term modelling. At the Environmental Engineering Unit, University of Innsbruck, a spinoff company hydro-it Gmbh that created the software KAREN, has been founded. The software - a conceptual rainfall-runoff model - enables the planning of CSO structures exactly according to the national Austrian guidelines. Furthermore, hydro-it Gmbh developed together with the Austrian Association of Water and Waste Management the software NIEDA that contains approximately 70 high resolution rain series across Austria. This rain data is both applicable in CSO design as well as in sewer system design (www.hydro-it.com).

The Environmental Engineering Unit at the University of Innsbruck in cooperation with the spin-off company hydro-IT engages itself in the development of innovative software and modelling tools. In 2008 a software tool called VIBe (Virtual Infrastructure Benchmarking) has been developed. The objective of the software tool VIBe is to implement the existing knowledge about conceptual models and modular design systems to generate a virtual municipality with the associated artificial infrastructure system. In the first step this software tool is limited to model urban drainage systems. Currently the software tool is extended for incorporation of water supply systems. The design algorithms implemented are based on generally accepted technical procedures. Therefore the user has to define the constraints to ensure, that the artificial infrastructure system generated is close to reality. The structures generated can be used to identify and understand best practices or successful practices applied to complex infrastructure systems. Up to now the performance of single engineering structures, like CSOs or vortex separators, or of measurements in the drainage catchment, can be exclusively evaluated in case studies. The disadvantage of such case studies is that the transferability of the results is generally restricted. The advantage of the software tool is the rapid construction of various virtual case studies, depending on the user's constraints. Therefore it

will be possible to assess the performance of measurements regarding local differences, which cover a wide range of factors potentially influencing the engineering structure. For drainage systems it will be possible to determine the most favourable configuration of CSOs or decentralized infiltration facilities in an existing catchment. So far there exist only a few works, like those by Gosh, Hellweger and Fritch, on the generation of urban infrastructure systems. VIBe is currently extended in terms of a dynamic development of the infrastructure. The aim is to include technical as well as socio-economic aspects in the development of infrastructure technology in order to investigate the dynamics of incentives and measures.

Another project aims to redesign the successful open source software CITYDRAIN (http://www.hydro-it.com/extern/IUT/citydrain). The aim is on the one hand to develop platform independent software and on the other to introduce parallel computing technology. While in the past the processors (CPUs) were becoming significantly more powerful (and thus faster) every year, presently, instead of refining the single CPU, the strategy is to increase the number of processors. To fully utilize such an available computing power one needs to adapt algorithms to the parallel nature of these new CPU-architectures. In this project a novel parallel simulation framework for integrated urban drainage models is developed and benchmarked against current implementations.

BRAZIL (REPORTED BY PROF NILO NASCIMENTO)

The **23rd Congress of the IAHR Latin American Division-LAD** (Congreso Lationamericano de Hidraulica) was held in Cartagena de Indias, Colombia, from Sept. 2-6, 2008. About 400 participants attended the meeting and 377 papers were presented according to the 15 themes focusing on flood mechanics, hydrology, hydromechanics, hydroinformatics, lab and field techniques, ecohydraulics, climate change, irrigation and drainage hydraulics, water supply systems, water resources planning, history of hydraulics, and urban hydrology. Papers on urban hydrology and urban drainage, comprising 24 contributions, mainly covered the following themes: water quality and wet weather diffuse pollution, suspended solids settling in retention facilities, rainfall analysis using multifractal approaches, flood assessment, and modelling urban hydrologic processes, among others. The IAHR LAD congress, organised on a bi-annual base, plays an important role in bringing together the Latin American community of researchers and practitioners working in the hydraulics. The number of papers related to urban hydrology presented at this conference is continuously increasing, reaching now about 7% of the total number of papers presented at the last conference in Colombia.

The 31st Inter-American Congress on Sanitary and Environmental Engineering was held in Santiago (Chile), from 12th to 15th October 2008, organized by the Inter-American Association of Sanitary and Environmental Engineering (AIDIS). Over 2,000 people attended the conference, coming mainly from different American countries. The AIDIS congress is one of the most traditional regional conferences of the Americas, bringing together researchers and practitioners from all the American countries. During the conference, 543 papers were presented, covering different aspects of drinking water, industrial and municipal wastewaters, solid waste, stormwater, water resources, public health, air pollution, environmental management and renewable energies. These subjects were also addressed in 10 round table discussions. The 1st Inter-American Forum on

Water Supply and Sanitation Services was also held in Santiago, Oct. 13th & 14th , addressing management models for water supply and sanitation services, institutional issues related to legislation, regulation and service provision control, public participation, public information and related subjects. During the Forum, 4 keynotes and 27 papers were presented on the main subjects of the meeting.

The 8th Brazilian Meeting on Urban Drainage was held in Rio de Janeiro, from 10th to 13th November 2008. It was organized, for the first time, as a joint meeting with the **6th French-Brazilian Meeting on Urban Hydrology**. The Brazilian Meeting on Urban Drainage is a bi-annual conference hosted by the ABRH Committee on Urban Drainage, gathering professionals and researchers from different Brazilian regions working in this domain. The French-Brazilian Meeting on Urban Hydrology is an annual conference organized alternatively in France and Brazil, as an initiative of Brazilian and French researchers who have been leading for a long time co-operative projects on urban water management, mostly funded by the bi-lateral French-Brazilian co-operation agreement on research and development. During these joint meetings five round tables were organised on such themes as "Climate Change: challenges for urban water management"; "River restoration in urban areas: experiences and perspectives"; "Integrated urban water management" and "Flood risk assessment and control". During the meetings, 31 papers were presented, covering such themes as: flood modelling and mapping; flood control and mitigation measures; field experiences on the use of different types of BMPs for stormwater management (e.g., infiltration and storage devices, green roofs, …); pollution loading and diffuse pollution control in urban areas; and, different institutional aspects related to stormwater management.

The **3rd SWITCH Scientific Meeting** was held this year in Belo Horizonte, Brazil, from Nov. 29 to Dec. 4, 2008. The 6th EU Framework SWITCH project "Managing Water for the City of the Future", is an action research programme, implemented and co-funded by the European Union and a cross-disciplinary team of 33 partners from 15 countries around the world. The central purpose of SWITCH is to bring about a paradigm shift in urban water management away from existing *ad hoc* solutions to urban water management and towards a more coherent and integrated approach. The 3rd meeting was jointly organised by the SWITCH management team and the scientific committee in co-operation with the municipality of Belo Horizonte and the Federal University of Minas Gerais (UFMG). During the meeting 42 oral presentations were given and 20 posters were presented and organised according to the main topics of the SWITCH project: water sensitive urban design, decentralised wastewater systems, sustainable urban drainage, natural systems for treatment, institutional systems and financial instruments in urban water management. Four keynotes and two round tables were organised on the following themes: urban water management, with experiences from Belo Horizonte (Brazil) and Zaragoza (Spain) described and discussed; the European experience in integrated urban water management, the politics of water governance and integrated urban water management at different territorial scales (the city, the conurbation and the river basin). A special session was organised on the demonstrations projects developed in 12 different cities around the World (Accra, Alexandria, Belo Horizonte, Beijing, Birmingham, Bogota, Chongqing, Hamburg, Lima, Lodz, Tel Aviv and Zaragoza) and the Bottrop, Waltrop, Emscher and Dortmund areas, in Germany. A workshop dealt with the issues related to long-term urban water management planning and implementation. About 120 participants from Latin America (Argentina, Brazil, Chile, Colombia, Peru), Europe (UK, The Netherlands, Germany, Switzerland, Greece, Poland, Spain), Africa (Ghana and Egypt), and the Middle East (Israel and Palestine) attended the meeting.

CANADA (REPORTED BY JIRI MARSALEK)

Gilles Rivard advises that the Provincial Guidelines for Stormwater Management (Guide de gestion des eaux pluviales) for Québec, which have been in preparation during the last 15 months, should be released in 2009. The document written in French discusses overall planning aspects for stormwater management and design criteria for different control techniques. For further information, please contact Gilles Rivard (GRivard@aquapraxis.com) or visit the http link of the Ministry of sustainable development and parks for the Province of Québec http://www.mddep.gouv.qc.ca/

Innovative Stormwater Management Project. In 2007, The Canadian Water Network (CWN) has initiated a two-year knowledge translation project on innovative stormwater management that has the following aims: 1. Share experiences and identify case studies where some of the above listed innovations have been successful, 2. Compare how the function of these systems varies across the country and how some of these systems have to be modified depending on the prevailing climate conditions. 3. Identify knowledge gaps and research needs, and 4. Provide a forum for dissemination of these innovations to practitioners. Three workshops scheduled under this project have been held in Vancouver, Calgary, and Toronto (May 2008), and provided a forum for sharing experiences in low impact development (LID) technique practices in various Canadian climates. The workshops were well received and the information presented at these workshops is available at: www.ires.ubc.ca/projects/ism
Authors of the selected papers from these workshops have been invited to submit their presentations in the form of journal papers, which were reviewed and ten papers were selected for a special issue of the Water Quality Research Journal of Canada, which will be published in March 2009. For information re acquiring this issue please contact Janet Jardine (Email: janet.jardin@ec.gc.ca).

Water Balance Model. The Water Balance Model promotes a watershed-based approach that manages the natural environment and the built environment as integrated components of the same watershed (http://www.waterbalance.ca/waterbalance/home/wbnIndex.asp). Initially developed under a British Columbia-based Inter-Governmental Partnership as an extension of *Stormwater Planning: A Guidebook for British Columbia,* it led to the decision by Environment Canada, Canada Mortgage & Housing Corporation (CMHC) and the Province of British Columbia to join forces to create a truly national Water Balance Model for Canada. This partnership now also includes a number of Canadian provinces. Further modifications and extensions of the model are currently underway.

The Sustainable Technologies Evaluation Program (STEP) is a multi-agency program based in Ontario (Canada) and led by the Toronto and Region Conservation Authority (TRCA) (http://www.sustainabletechnologies.ca/). The program was developed to provide the data and analytical tools necessary to support broader implementation of sustainable technologies and practices within a Canadian context. Its main objectives are to:

- Monitor and evaluate sustainable technologies in the areas of water and air
- Assess potential barriers to implementing sustainable technologies
- Provide recommendations for guideline and policy development, and
- Disseminate study results and recommendations and promote the use of effective technologies at a broader scale through education and advocacy.

Technologies evaluated under STEP are not limited to physical structures; they may also include preventative measures, implementation protocols, alternative urban site designs, or other practices that promote more sustainable lifestyles. Since the previous report on this program in the Feb. 2008 newsletter, results of new BMP studies have been added to the above website.

CZECH REPUBLIC (REPORTED BY DAVID STRANSKY AND IVANA KABELKOVA)

The Czech Water Association (CzWA) was transformed from the Association of Wastewater Treatment Experts in 2008. The new organization covers the whole field of water supply and urban drainage and aims to be an expert partner to the Czech administration in sustainable urban water management. CzWA is a partner organization of both EWA and IWA and wants to play an active role in these organizations in the future.

In the last year, a major shift concerning water resources was reached in the Czech Republic, which is related to the necessity to fulfil the requirements of the Water Framework Directive and the corresponding Czech legislation. The main change occurred in the attitude of the Czech administration towards rainwater in urban areas, where water management experts have been calling for the application of sustainable urban drainage for a long time. The Specialist Group on Urban Drainage under CzWA (SG UD) was tasked to develop a basis for the best management practices for public bodies. This new concept encourages the philosophy of transferring the obligation of the sustainable treatment of rainwater arising on impervious areas to the owner of the property for newly developed areas. In already urbanized areas, the motivation for the implementation of the best management practices should be created (e.g. sewerage charge reduction). This concept has already partly gained ground in the newly prepared amendment of the Water Act.

The amendment of the Water Act covers for the first time also aspects of combined sewer overflows. They have not been considered as pollution sources in the Czech legislation yet and their correct function used to be assessed in a very vague way (usually by the dilution ratio). The amendment introduces a change in the combined sewer overflows assessment starting with the year of 2013, when the receiving water impacts should be considered. In 2007 a literature study on

foreign procedures was elaborated for the Ministry of Agriculture by the Czech Technical Society. The selected approaches were tested before becoming a basis for the national methodology.

Another project worked on by the SG UD is the Code of Good Practice for Rainfall-Runoff Modelling, which was commissioned by the State Environmental Fund of the Czech Republic. It should provide a background for the assessment of projects applying for EU grants and set the state of the art of urban drainage masterplans with respect to quality control.

On the academic ground (which is also involved in the above mentioned activities), a joint project of the Czech Technical University in Prague (CTU) and Brno University of Technology dealing with the design, operation and reconstruction of sewer systems on unstable grounds was finished. The project further developed outputs for the European project CARE-S and proposed suitable rehabilitation procedures.

The most important item in the practical sphere of urban drainage has been intensive infrastructure reconstruction supported by EU financial sources aiming at the improvement of the quality of surface and ground waters by 2010.

Experts from the Czech Republic participated in many international conferences such as the 11th International Conference on Urban Drainage in Edinburgh and the IWA World Water Congress and Exhibition in Vienna. At the Civil Engineering Faculty of the CTU in Prague, the 6th International Symposium on Ultrasonic Doppler Method for Fluid Mechanics and Fluid Engineering was organised in cooperation with the Academy of Sciences of the Czech Republic, Institute of Hydrodynamics and IAHR. About 70 participants from the whole world discussed topics such as development of new algorithms for velocity field measurement in pipe and sewer systems and development of methods for the suspended solids analysis based on the damping of the ultrasonic signal in the fluid stream.

DENMARK (REPORTED BY JES VOLLERTSEN, MARINA BERGEN JENSEN AND PETER STEEN MIKKELSEN)

TREASURE project. Pollution from stormwater runoff is receiving much attention, and one of the ongoing projects addresses the treatment for colloidal and dissolved pollutants. The project is called TREASURE and is financed in the context of the EU LIFE Environment framework. The project partners are three municipalities, Århus University and Aalborg University, and the project has a budget of 4.2 million Euro. Three full-scale wet retention ponds were constructed and are monitored, implementing three different technologies for sorption/precipitation. In addition to these technologies, each pond consists of a silt trap, a vegetated area and vegetated sand filters. The sorption/precipitation technologies demonstrated are: Sorption to fixed media, enrichment of the bottom sediments with iron, and precipitation by addition of alum.

The preliminary results indicate, e.g. that the treatment train consisting of a detention pond, vegetated sand filter and sorption filter has proven very effective in reducing e.g. zinc and copper loads by more than 95%. Furthermore, the system is very robust. It effectively mitigated the effect of a large copper-spill within the catchment, which resulted in copper concentrations in the wet pond above 1 mg/L. Even under such high loads, the filters managed to keep the outlet concentrations below 10-20 µg/L – i.e., providing a 99% treatment efficiency or better. More information can be found on the project web site: www.life-treasure.com.

Black, blue, green - Integrated infrastructure planning for sustainable urban water systems (2BG) is a strategic Danish research project focusing on three specific aspects of stormwater management in the urban landscape:

1) Water quantity - what is the capacity of the urban landscape to retain and infiltrate stormwater at an urban/city level, how can specific solutions - with or without overflow to the existing sewer system - be dimensioned, and what will be the consequences for the urban water flows and balances?

2) Water quality - how can an adequate quality of the stormwater managed in the urban landscape be ensured, i.e. by which means can groundwater be protected from pollution, streams and rivers be protected against erosion and pollution from toxic compounds, and citizens enjoy clear and safe surface waters originating from roof- and road runoff?

3) Socio-cultural assets of water - how can the urban areas that will gain, or suffer, from introduction of elements of stormwater management be identified and appropriately incorporated into the development plans for the city, and how can specifications concerning hydrological and water treatment entities be developed to facilitate their integration into landscapes designed by landscape architects and urban planners?

The expected outcomes of the project include methods and tools for enhancing the socio-cultural and environmental functions and values of the urban landscape through sustainable urban drainage systems, from strategic planning at the city level to design solutions at the site level. The project started in 2007 and will end in 2011.

In 2008 all PhD-students started, or continued their projects. In total 7 PhD-students are associated with the 2BG-project:

- Jan Jeppesen, University of Aarhus, hydrogeology, is modelling the interactions between groundwater and stormwater infiltration.
- Heidi Birch, DTU, water quality, is deriving information on total event contaminant load from a limited number of stormwater samples.
- Maria Bergman, DTU, water flow, is modelling flow in individual SUDS in order to extend existing urban drainage models and link them with groundwater models.
- Simon Toft Ingvertsen, University of Copenhagen, water quality, is benchmarking different stormwater treatment technologies.
- Ole Fryd, University of Copenhagen, urban planning, is describing the water and city interactions at the city level.
- Antje Backhaus, University of Copenhagen, landscape architecture, is describing the water and city interactions at the project level.

- Toke Emil Panduro Petersen, University of Copenhagen, economy, is assessing the economic value of water in the urban landscape.

A 4-day course for professional administrators and urban planners on enhancing knowledge sharing and advancing integrated urban water management has been tested on four Danish municipalities: Århus, Greve, Odense and Copenhagen. The course was developed by DTU and University of Copenhagen together with DANVA and the Danish Town Planning Institute. The course will be offered on a commercial basis in 2009 to other Danish end-users.

In 2009 the PhD students will perform a joint case study. It will focus on the options for reducing combined sewer overflows to the Harrestrup River in Copenhagen, which today suffers from several hundred overflows each year, by use of the urban landscape for disconnections and introduction of SUDS. The river catchment contains some of the most densely build-up areas in Copenhagen. It has been estimated that satisfactory conditions can be achieved by investing some 500 million Euro in conventional systems, mainly detention basins. So the landscape-based solution can be compared with conventional solutions also at the economic level.

The joint case study has been prepared at a 3-day workshop in October 2008, in which the PhD-students, their supervisors and also the Copenhagen End-users participated. Another workshop will be held in March 2009 to plan the case study in more detail. Read more about the project at www.2BG.dk or contact Marina Bergen Jensen (mbj@life.ku.dk).

The **Urban Water Technology (UWT)** graduate school was created in January 2007 as a strategic collaboration between the Technical University of Denmark (DTU) and Aalborg University (AAU) and has been active for more than one year. The overall mission of UWT is to enhance the education of PhD candidates and procure basic scientific knowledge that protects public health and ensures a high quality of water discharged into nature while maintaining a sustainable development of urban water systems. A range of leading water and wastewater utility companies, consulting agencies, technology providers, research institutes as well as authorities participate in the graduate school.

The website, see www.urbanwatertech.dk, lists the names and topics of the first four UWT PhD graduates (which all started before the graduate school formally started). Two of these are with in the urban drainage field, Søren Thorndahl (Uncertainty assessment in numerical long term modelling of urban storm water drainage) and Thomas Ruby Bentzen (Analysis of water and pollutants transport from highways) who are both from Aalborg University. 16 PhD students are currently enrolled under UWT, among which many are within the urban drainage field. The above website lists the topics and students and contains links to more detailed information including contact details.

Several PhD courses will be organized over the next years on selected relevant topics within the urban water technology area, partly supported by UWT and some of the current major Danish research projects in the urban water area. These will also be open to PhD students from abroad. The first PhD course, on "Xenobiotics in the Urban Water Cycle", is scheduled for 8-18 June 2009 at the Technical University of Denmark, Denmark. Keep an eye on www.urbanwatertech.dk for

further information or contact Peter Steen Mikkelsen (psm@env.dtu.dk), Jes Vollertsen (jv@bio.aau.dk) or Michael Rasmussen (mr@civil.aau.dk) to learn more.

Source Control Options for Controlling Emissions of Priority Pollutants (ScorePP) is a European research project funded under the Energy, Environment and Sustainable Development section of the European Community's Sixth Framework Programme for Research, Technological Development and Demonstration. The aim is to develop comprehensive and appropriate source control strategies that authorities, cities, water utilities and chemical industry can employ to reduce emissions of priority pollutants (PPs) from urban areas into the receiving water environment. The project started in late 2006 and is now in its final year. Several deliverables have been made available on the project's website, www.scorepp.eu, and more will follow during 2009. Contact Hans-Christian Holten Lütshøft (hhl@env.dtu.dk) or Peter Steen Mikkelsen (psm@env.dtu.dk) if you are interested to know more about this project.

Storm- and Wastewater Informatics (SWI) is a strategic Danish research project starting in 2008 and lasting for 5 years. Around the world a very high number of large and ageing wastewater systems can be found nowadays. Many of these systems are located in densely populated city areas, making it impossible or very expensive to carry out major re-design of the systems. Today's wastewater treatment plants apply real time optimisation of the plants, whereas nearly all sewer systems are static, meaning that once the sewer pipes, pumps, basin and overflows have been put in the ground, no further, or very little, action is taken to optimise the performance of the sewer system in real time.

The project participants include the Technical University of Denmark, Aalborg University, the Danish Meteorological Institute (DMI), three companies (DHI Water Environment Health, Krüger and PH-Consult) and 4 municipalities/utility companies (Avedøre Wastewater Services, Copenhagen Energy, Lynettefællesskabet A/S and Århus municipality).

The first PhD student connected with the SWI project has just started, Morten Borup (Uncertainty and adaptive estimation in storm- and wastewater system modelling), and several more PhD scholarships and postdoc positions will be announced during 2009. Information about the project will be made available on http://swi.env.dtu.dk.

FRANCE (REPORTED BY JEAN-LUC BERTRAND-KRAJEWSKI)

OTHU (Field Observatory for Urban Hydrology) is celebrating the first 10 years

In 1999, several research laboratories in Lyon, France decided, with the help of the Greater Lyon, to develop a long term field-observatory for urban water management named OTHU, implementing a multidisciplinary approach linked to the end-user needs.

This observatory is dedicated to the study of a wide range of phenomena associated with urban drainage and urban water management. Since 2001, OTHU has continuously monitored climatic parameters, water flows and pollution at four main experimental sites, in addition to many regular and specific monitoring campaigns. The observatory now provides research support to more than fifteen research laboratories working in a wide range of complementary fields including geography, climatology, hydrology, soil mechanics, soil science, hydraulics, chemistry, biology, social sciences and economics.

In 2009, as done every two years, a technical OTHU conference for end users and scientific partners will be organized in Lyon in October 2009. This event aims to present the main results and operational tools developed from the observatory data and programmes, and will demonstrate the value of long-term observatories. It will provide a useful resource based on 10 years of experience.

The OTHU observatory encourages collaborations among scientists and promotes data sharing. Therefore, please don't hesitate to contact us or to participate in the 2009 conference.
For more information: http://www.othu.org.

SAP-LCPC (Multi-disciplinary urban experimental site)

The SAP (Secteur Atelier Pluridisciplinaire - Multi disciplinary urban experimental site) was created in Nantes (France) in January 2006 in the frame of the federal research network IRSTV (Research Institute for Urban Sciences and Techniques). Its objectives are to study the interactions between the city and its environment, and to assess balances of water, pollutants and energy fluxes. The data collected in the frame of this hydrological observatory will be helpful in creating a research database.

The SAP is located in the eastern part of the City of Nantes, between the Loire and the Erdre rivers; it also includes the Chézine watershed. It comprises both an urban area and suburban environments.

The main research topics concern:
- the sources of pollutants in urban environments
- hydrological and energy fluxes
- continuous measurements in sewer networks (turbidity, suspended solids)
- modelling of water and pollutant fluxes in sewer networks and hydrological modelling.

The main partners are: the LCPC - Laboratoire Central des Ponts et Chaussées, the Ecole Centrale de Nantes, The University of Nantes, Air Pays de la Loire and Nantes Métropole. For more information, contact: Véronique Ruban (Veronique.Ruban@lcpc.fr).

HURRBIS

The three French observatories for urban drainage and urban hydrology (OPUR in Paris, OTHU in Lyon, and SAP in Nantes) have created a common network of observatories to increase their collaboration and research capacities in the field of wastewater and stormwater management. The network is named HURRBIS (Hydrologie Urbaine Réseau de Recherche Bassins Inter Sites). It has been launched with the support of the Ile de France regional council.

The main topics addressed by HURRBIS are: (a) knowledge of water and pollutants transfers in urban areas, (b) impacts of stormwater discharges on natural water bodies, and (c) interactions between the stormwater management infrastructure and the urban landscape.

Sharing long term data sets is also an important objective of HURRBIS, which aims to: (a) optimise field data acquisition and use, (b) test and verify urban water models with more data representing various contexts, and (c) develop decision support tools for urban management, including both quantity and quality aspects. For more information, visit: http://www.hurrbis.org

Hy2Ville project

From 2006 to 2008, the French project "Hy²Ville" (Hydrology and Hydraulics in urban zones) gathered five French laboratories involved in research on severe urban flooding, with different and complementary skills. An experimental facility (LMFA laboratory, Lyon) allows characterizing the distribution of discharges at an intersection of four open channels. Results are compared to different numerical simulations based on 1D or 2D Saint-Venant's shallow water equations, or full 3D Navier-Stokes equations. These simulations are also compared with each other in a virtual city district which is used as a benchmark. The objective is to obtain guidance for choosing the most adaptable numerical tool for a given scale: local (neighbourhood scale) or global (city scale). Contact: Nicolas Rivière (nicolas.riviere@insa-lyon.fr)

JDHU – French Urban Drainage Doctoral Days

Every two years since 2004, the French working groups on urban drainage (see their website www.shfastee.free.fr) organise the JDHU (Journées Doctorales en Hydrologie Urbaine - Urban Drainage Doctoral Days). After Lyon in 2004 and Nantes in 2006, the JDHU 2008 has been held in Nancy on 14-15 October, with 23 presentations. All proceedings are available on-line at http://shfastee.free.fr/activites/index.html . The next event will be held in Paris in 2010.

After each JDHU, a selection of the conference papers (approximately 50% of those presented) is reviewed and improved for publication in two French journals: "La Houille Blanche" published by SHF (French member of IAHR, www.shf.asso.fr) and "TSM" published by ASTEE (French member of IWA, www.astee.org). Previous publications are indicated on the website. The JDHU facilitates knowledge sharing among PhD students and encourages their direct collaboration on research projects. In addition, the JDHU are fully open to the public and the audience is larger than only PhD students and post-docs.

Contact: Jean-Luc Bertrand-Krajewski (jean-luc.bertrand-krajewski@insa-lyon.fr).

JAPAN (REPORTED BY HIROAKI FURUMAI)

Accelerated release of the Flood Risk Maps to the public

We have a long history of frequent torrential rainfalls brought by typhoons and other climatic phenomena in Japan. It is not easy to forecast such localized downpours. However, continuing efforts should be made to develop a system for more accurate and detailed rainfall forecasts. At the same time, it is important to make the flood risk maps available to the public and make the residents aware, in advance, of possible inundation situations and evacuation methods in an easy-to-understand way. This information encourages citizens' self-help capability by increasing their awareness of disaster prevention. Citizens should realize that there can be rain-related hazards anywhere. The Ministry of Land, Infrastructure and Transport (MLIT) recently amended the preparation manual for flood risk mapping published in March 2006. Only 81 cities/towns have published their maps by October 2008, while there are more than 850 potential hazard maps indicating river flooding. The Ministry strongly recommends to local governments to accelerate the development of flood risk maps in relation to the existing ones, and prepare updated flood risk maps through this amendment.

Safety manual for work in sewers under the threat of suddenly occurring downpours

On October 10, 2008, the Ministry of Land, Infrastructure and Transport (MLIT) published the security manual for sewer works exposed to sudden heavy rainfalls, after intensive committee discussions. This action was originated by the most unfortunate accident, which occurred on August 5, 2008. Five workers doing repair work inside an old trunk sewer in Tokyo were swept away by an extreme inflow of stormwater into sewers. After the onset of rain, the rainfall intensity grew heavier for about 30 minutes. Around that time, the Japan Meteorological Agency issued an extreme rainfall advisory for Tokyo's 23 wards at 11:35. It was upgraded to a warning at 12:33, but it was too late for the workers working inside sewers. What is troubling is the fact that torrential rains that look like tropical squalls hit Japan more frequently today than in the past. The data of the Japan Meteorological Agency show high-intensity rainfall burst of 80 mm/hour or more occurring 10.3 times at 1,000 locations annually between 1976 and 1987. This national average rose to 18.5 times between 1998 and 2007.

We are facing the need of rehabilitation and restoration of old sewer pipes. In that sense, sewer maintenance and repair works are expected to further increase. We have made an investment of more than 80 trillion Japanese yen and constructed almost 380,000 km of the sewer pipes in total. Therefore, under financial restrictions, stable and efficient sewerage service should be managed and secured by prolonging the life time of sewer facilities. Highly advanced safety in practical sewer maintenance and repair works is expected as a result of following this manual.

JAWA publication: Sewage Works in Japan 2008

Japan Sewage Works Association (JSWA) has published a series of books on "Sewage Works in Japan" every year. This book is written in both English and Japanese. The last edition of 2008 just has been published and its subtitle is "Introduction of Sewage Works in Japan". It contains a lot of pictures, tables and figures related to sewage works in Japan which are characterized by rapid construction. In addition, a special article is included focusing on contribution of sewage system to public sanitation as a tribute to the international year of sanitation. For reference, the old issue of 2002 is available on the following website. http://www.jswa.jp/en/jswa-en/allabout.html

MALAYSIA (REPORTED BY DR. M. NOR)

Implementation of the Urban Stormwater management Manual (MSMA), DID 2000 – Erosion and Sediment Control (ESC) Programs in Malaysia (contributed by Urban Drainage Division, Department of Irrigation and Drainage, Malaysia).

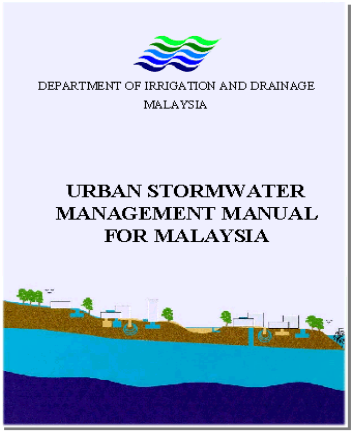

Fig. 1: MSMA Manual

Introduction. As a developing nation, Malaysia's pace of development has doubled since the last decade resulting in various cross-cutting issues, including especially environmental deterioration. Silts generated from construction activities are major threats to waterways during heavy downpours. Previous studies showed that uncontrolled land development activities like construction sites, agriculture and logging activities, could contribute as much as 50% of non-point source pollution in rivers.

Background. In 2000, the Department of Irrigation and Drainage Malaysia (DID) published the MSMA (Fig. 1) to guide consultants and project proponents in controlling water quantity and quality issues including erosion and sedimentation. This manual was launched in January 2001 and became a mandatory reference for various professional disciplines. Nowadays every project has to submit an Erosion and Sediment Control Plan prior to approval, with strict monitoring and supervision during the construction stage.

Erosion and Sediment Control. Erosion and sediment control (ESC) activities during construction works are based on the preparation of the Erosion and Sediment Control Plan (ESCP) comprising two components, i.e. erosion control Best Management Practices (BMPs) and sediment control BMPs. Control measures like topsoil stockpiling, preservation of vegetation, seeding and planting of vegetation, mulching, stabilization, and provision of earth banks, diversion channels, slope drains, outlet and inlet protection, check dams, sediment fences, sand bank barriers, brush or rock filters, sediment traps (Fig. 2) and basins are becoming common practices.

Fig. 2: Sediment Trap BMPs

Enforcement Activities. Collective approaches by various Government Agencies have been initiated to combine various expertise in this field. Current legislation like Street, Drainage and Building Act (SDBA) has been used widely emphasizing the polluter pays policy. Hefty penalties have been imposed, with the maximum fine up to 0.5 million Malaysian Ringgit (MYR) per conviction. To ease the prosecution process, the Government has embarked on compound mechanism without bringing the case to the court of law through direct payment to Local Authorities at a total value set at 0.25 million MYR maximum.

Strategic Directions. Under the Vision 2020, Malaysia is targeted to become a developed nation. The current manual paves the way for the nation to achieve its vision in a sustainable way. To ensure achievable goals, the strategic direction was set especially to examine existing problems arising among stakeholders and streamline specific actions that should be taken by decision makers. The National Stormwater Management (SWM) Goal was set – "Stormwater shall be managed so that it contributes towards sustainable development of the country". The strategic direction is divided into three areas: 1) SWM infrastructure assets, 2) Stormwater and related eco-system as a resource, and 3) Stakeholders and users of the resource and the SWM infrastructure asset.

The way forward and conclusions. Future activities that uphold the strategic directions are addressed in a sensitive way to ensure that stormwater management programs support the Malaysia's goal of becoming a developed nation by 2020. Among the important future activities are establishing the Total Maximum Daily Loads (TMDL) in various catchments, tax incentive initiatives for developers and investors that fully complied with the MSMA requirements, and revisions of the existing manual and guidelines to include additional needs like climate change.

To provide well-prepared experts and close the knowledge gaps, capacity building programs were embarked on by DID and will focus on training and accreditation processes. Consultants, contractors and site supervisors shall be required to engage in training and pass certain minimum standards before being allowed to submit drainage and ESC plans. The program also ensures the competency of consultants responsible for the design, while competent site supervisors will handle site supervision works. Most of the training courses conducted by DID nowadays focus on hands-on programs so that the level of knowledge increases according to the current and future needs.

References
1. Department of Irrigation and Drainage Malaysia (2000). Urban Stormwater Management Manual for Malaysia.
2. Md. Noh, M. N. (2006). The Stormwater Management Manual for Malaysia: A Tool for Soil and Water Conservation Practice for Agriculture Area. 3rd Asian Regional Conference, ICID 2006, Kuala Lumpur, Malaysia, September.
3. Ibrahim, Z. R., Md. Noh, M. N. and Zainudin, S. Z. (2007). Strategic Direction for Urban Stormwater Management Program in Malaysia. 3rd South East Asia Water Forum, Kuala Lumpur, Malaysia, October.
4. Md. Noh, M. N. (2008). Role of MSMA in Promoting Sustainable Urban Drainage System in Malaysia. The 3rd WEPA International Forum on Water Governance in Asia, Putrajaya, Malaysia, October.

Research and Development on Application of Water Sensitive Urban Drainage Design for Integrated Stormwater Management at local scale in Kuala Lumpur, Malaysia.

Project Description. Rapid urbanization and development in Malaysia cause negative impacts on water quality and other environmental issues. Furthermore, the tropical climate in Malaysia with heavy rainfalls of short duration also contributes to increasing stormwater runoff. The paved surfaces do not allow water to infiltrate and thus increase the surface runoff which will be eventually discharged into rivers. This surface runoff transports many pollutants, debris and sediments. Hence, the Humid Tropic Centre Kuala Lumpur has initiated the Research and Development on Application of Water Sensitive Urban Drainage Design for Integrated Stormwater Management at Local Scale in Kuala Lumpur to be the pilot project addressing the earlier listed problems.

The general objective of this project is to develop more appropriate management strategies and best practices and mitigation measures to counter negative effects of urbanization, with the application of various water sensitive urban drainage designs described in the literature and the Urban Stormwater Measurement Manual for Malaysia (MSMA). The project execution will have both applied engineering and research character which also significantly contributes to capacity building of Malaysian specialists, Malaysian post-graduate education programs and international cooperation via The Humid Tropics Center's activities.

The water sensitive urban drainage design (WSUD) for integrated urban stormwater management at a local scale in Kuala Lumpur is to be applied in the area of the existing office compound of the Humid Tropic Centre (HTC) located at Jalan Ledang, Kuala Lumpur. The proposed components to be designed and constructed at the study area are a green roof, porous pavement, bioretention, rainwater tank, greywater system and constructed wetland system. All these components incorporate the water cycle management strategy, which integrates the WSUD elements: demand management, rainwater harvesting and stormwater quality treatment.

The execution period of this project will take approximately 24 months. The stormwater management measures of the HTC will be monitored to gain a better understanding of WSUD. This evaluation will lead to an improved design methodology that will ensure that WSUD is cost effective as well as unobtrusive in its function. Monitoring will include the condition and performance of WSUD components such as permeable paving surfaces, bioretention, green roof and constructed wetland. Prior to that, it will also include the operation of stormwater reuse systems and

specifically the quantity of rainwater used in the building. The expected results of the research aspects of this project will comprise designing and applying WSUD techniques as well as preparing a detailed WSUD technical design and specifications for urban site setup, an applied computer modelling package for estimating runoff and pollutant loads, development of WSUD decision support tools (including spreadsheet of WSUD local scale models for Malaysia) and guidelines for WSUD design and application for all decision makers as a recommended solution for suitable land development.

PORTUGAL (REPORTED BY MARIA DO CÉU ALMEIDA AND JOSÉ MATOS)

IWA Specialist group on Strategic Asset Management (SAM SG) (Contact member: Maria do Céu Almeida)
The SAM SG meeting took place in Vienna, during the IWA World Water Congress. Current activities include: organisation of a Specialist Conference on Asset Management for Medium and Small Wastewater Utilities, to be held in Alexandroupolis, Thrace – Greece, 3 - 4 July 2009 (Deadline for full papers: 15th January); follow up of standards development, namely, the revision of the PAS 55 on Asset Management, the ISO/TC 224/WG6 on Asset Management and the ASTM Standard Guideline for the Resource Efficient Management of Water and Wastewater Assets; and, organisation of the second Leading Edge Conference on Asset Management, LESAM 2009, to be held in Miami, in November 2009.

UNITED KINGDOM (REPORTED BY DAVID BUTLER)

Urban flooding

As in the last few years, the issues surrounding urban flooding provide a strong focus for UK research. Much of this is linked to the Flood Risk Management Research Consortium (www.floodrisk.org.uk). Flow modelling work is led by the Centre for Water Systems (University of Exeter, s.djordjevic@exeter.ac.uk), the Urban Water Research Group (Imperial College London, c.maksimovic@imperial.ac.uk) and the Pennine Water Group (University of Sheffield, a.j.saul@sheffield.ac.uk). A novel GIS-based procedure for automatic creation of one-dimensional (1D) surface flood flow paths and ponds has been enhanced and tested on a number of case studies at different scales and with different hydraulic models. New visualisation methods for 1D/1D modelling results have been developed. A novel algorithm for calibration of 1D/1D dual drainage model via the results of 1D/2D model has been formulated and implemented on two case studies. Much of the work was presented at the recent ICUD conference in Edinburgh. e.g. Chen, A., Djordjevic, S., Leandro, J., Evans and Savic, D. (2008). Simulation of the building blockage effect in urban flood modeling. Proc. 11th International Conference on Urban Drainage, Edinburgh, Scotland, UK.

The University of Newcastle upon Tyne (j.hall@newcastle.ac.uk) and the Centre for Water Systems (University of Exeter, s.djordjevic@exeter.ac.uk) have developed a flood risk attribution methodology and used it on a synthetic urban system downstream of a rural catchment such that

combined pluvial/fluvial flooding effects are investigated. A sensitivity-based approach implemented in this study involved variation of inputs (rainfall) and sewer system parameters and then calculation of flood damage using flood-damage curves for individual properties and local flood depths obtained from 1D/1D dual-drainage hydraulic model. The method allows responsibility for flood risk to be apportioned in situations where there are several organisations responsible for flood risk management. Dawson, R.J., Speight, L., Hall, J.W., Djordjevic, S., Savic, D. and Leandro J. Attribution of flood risk in urban areas (2008), Hydroinformatics, 10(4), 275-288.

The issue of pluvial flood risk and its management has been taken further forward by work led by the Centre for Water Systems (University of Exeter, d.butler@Exeter.ac.uk) and Imperial College London (c.maksimovic@imperial.ac.uk). A methodology has been developed that determines flood stage at property boundaries by coupling a long term flow time series generated from an urban drainage model with a flood catchment delineation approach. Flood consequence is obtained from the relationship between the flood stage and the corresponding damage cost. Annual average flood risk for properties is identified by linking flood probability, stage and damage. Options for sewerage rehabilitation and management can then be evaluated and compared within a cost-benefit framework. Ryu, J. & Butler, D. (2008). Managing sewer flood risk. Proc. 11th International Conference on Urban Drainage, Edinburgh, Scotland, UK.

Reports (07/RG/07/9 & 10) on related work by UKWIR on the role and application of cost benefit analysis in sewer flooding is available commercially at www.ukwir.org.uk.

Heriot-Watt University (s.Arthur@hw.ac.uk) is the UK lead partner in a pan-European project with more than 20 partners in five countries; Norway, Sweden, the Netherlands, Germany and the United Kingdom. The project aims to investigate adaptive flood risk management within the context of the EU Floods Directive and the Water Framework Directive. This work will focus on the engineering, social and capacity issues associated with flood risk management plans. The work planned undertaken at Heriot-Watt will focus on the interaction between urban drainage systems and urban watercourses.

Rainfall modelling

The stochastic rainfall generator software RainSim developed by the University of Newcastle (c.g.kilsby@ncl.ac.uk) has recently been developed further leading to the latest release, version 3. This rainfall generator samples a Spatial Temporal Neyman Scott Rectangular Pulses model. Burton, A., Kilsby, C.G., Fowler, H.J., Cowpertwait, P.S.P., O'Connell, P.E. (2008) RainSim: A spatial-temporal stochastic rainfall modelling system, Environmental Modelling and Software, 23, 1356-1369, doi:10.1016/j.envsoft.2008.04.003.

Sustainable drainage systems

The University of Edinburgh (m.scholz@edinburgh.ac.uk) continues to be very active in the SUDS field with particular emphasis on wetland systems and is currently developing universal guidelines for wetland systems to control runoff, in association with Nankai University and funded by the UK's Royal Society. Also see: Hedmark Å. and Scholz M. (2008), Review of Environmental Effects and Treatment of Runoff from Storage and Handling of Wood, Bioresource Technology, 99 (14), 5997-6009.

The Centre for Water Systems (University of Exeter, d.butler@Exeter.ac.uk) is carrying out long-term monitoring, modelling and evaluation of rainwater harvesting systems. The most recent work uses a bottom-up approach to develop an operational framework to enhance the willingness and ability of a range of stakeholders such as property users/managers, the public, schools and small-medium enterprises. The evidence base collected will be used to construct a framework which could be used to support the enhanced uptake of RWH technologies within these groups. Ward, S., Butler, D. and Memon, F.A. (2008). A pilot study into attitudes towards and perceptions of rainwater harvesting in the UK In: Sustainable Hydrology for the 21st Century, Proc. 10th BHS National Hydrology Symposium, Exeter. 366–372.

UNITED STATES (REPORTED BY LINDA PECHACEK, P.E., CHAIR UWRRC)

The Urban Water Resources Research Council is having a productive year. The Council started 2008 with the development of a draft Strategic Plan. The plan is for three areas which reflect the goal of the Council to be the leader in research, guidance, and consultation to the urban water resources community. The mission statement reads "The UWRRC promotes and conducts research, advances the State-of-Practice, and disseminates the resulting guidance for use by water resource professionals to improve the stewardship of the built and natural environments." The plan should be finalized by the end of the year.

In May 2008, the Council sponsored the 5th Urban Watershed Management Symposium at the EWRI Water Congress in Honolulu, Hawaii. Seventeen sessions relating to green infrastructure, BMP treatment technology, LID design, storm water pathogens and total watershed management were presented.

In September 2008 the Council sponsored a session on BMPs at the 11th ICUD at Edinburgh, Scotland where Richard Field, past UWRRC Chair (2005 - 2008), presented a keynote address on advancements in sewerage system CSO control. A special Forum on Advanced Drainage Concepts was successfully conducted by the UWRRC working together with the US EPA Office of Research & Development's Urban Watershed Management Branch.

Council members also co-organized the 2008 International Low Impact Development Conference held in Seattle, Washington in November 2008 with over 430 attendees. Technical topics included LID and Sustainability, Codes and Regulations, Monitoring/Performance Findings, Computational Methods, Advances in Lid BMP Design – Lessons Learned and Site Design Considerations. Look for an article about the conference in EWRI's Currents newsletter.

The 6th IUWMC is being co-organized by the UWRRC for the sixth time. The conference will be held in Nanchang, China, at the University of Nanchang in April 2009.

The UWRRC is in the process of organizing the 6th Urban Watershed Management Symposium containing 23 sessions and the Plenary Session on Green infrastructure in KC, hosting US Congressman Clever, the Kansas City Major, the US EPA Regional Administrator for the 6th EWRI Congress to be held in Kansas City in May 2009.

The UWRRC is organizing and presenting at two sessions devoted to stormwater management and wastewater treatment at the 33rd IAHR Congress to be held in Vancouver, BC in August 2009.

The UWRRC's website is in beta testing and should be on-line shortly. The URL will be www.uwrrc.org , and after activation, the UWRRC's strategic plan, various documents and reports from over 30 standing and task committees will be available for download.

9. REPORTS ON CONFERENCES AND WORKSHOPS

11th International Conference on Urban Drainage (ICUD), August 31 – September 5, 2008, Edinburgh, UK
(Reported by Prof Richard Ashley, Conference Chairman).

The 11th ICUD proved to be very successful. In total there were 602 registrations from 40 countries, which included 110 day delegates. In addition there were 42 accompanying persons. This was an increase of 20% on the previous (10th) ICUD in Copenhagen in 2005, despite the weak dollar and strong pound, although the Euro was rising in value in the run up to the conference.

The conference was preceded by 4 workshops that ran on Sunday 31st August with 98 in attendees (most of whom were registered as full-time delegates). These were: Water Sensitive Urban Design; Challenges in Monitoring and Modelling; Real Time Control; Delivering Flood Resilience. Two other proposed workshops on Source Control and on Asset Management were not sufficiently popular to hold.

Of 650 abstracts submitted, this resulted in 420 full presentations, plus 30 posters, arranged around the following themes: Urban Flooding, Data Instrumentation Monitoring and Modelling, Asset Management, Receiving Water Impacts, New and Emerging Technologies, Sewer Processes, Diffuse Pollution, Management Near Source, Climate Change and Water & Society.

The papers were published on a CD with ISBN 9781899796212 or 1899796215. The CD is available for purchase from L.Hopcroft@sheffield.ac.uk.

There were 5 keynote presentations delivered by: Jiri Marsalek (Canada); Rich Field (USEPA); Geoff O'Loughlin (Australia); Adrian Saul (UK); and Bob Andoh (US/UK).

There were a number of invited speakers that included Scottish and English perspectives: Colin Bayes (SEPA); David Rooke (EA) and also a special evening event organised by the USEPA to review the future of urban drainage systems and another by Yorkshire Water on delivery of the Water Framework Directive.

To attract more day delegates special Themed Days were arranged around two themes: SUDS/BMPs/WSUD/LID and Asset Management.

There were a number of technical tours (Wednesday afternoon) which included innovative urban drainage systems at: DEX, South-East Wedge, new Bank HQ, Edinburgh, Seafield WWTP. In addition an innovative waterway transport lock system was visited – the Falkirk Wheel. Over 200 delegates participated. There were also full events for accompanying persons available on demand and virtually each day of the conference.

There were 19 exhibitor stands, including those from sponsors: Gold = 3 (Hydro International; Scottish Water, SEPA), Silver = 4 (MicroDrainage; PolyPipe; Waterman Group; WSP), Bronze = 6 (including FormPave; Halcrow and WRc).

There were 15 papers selected from the submitted abstracts for the Poul Harremoes award which was sponsored by MWH. The three shortlisted papers were presented at a special plenary on Monday and the award announced and presented at the conference Dinner.

The shortlisted papers were:

- A dynamic-objective-function algorithm to calibrate a 1D/1D coupled hydraulic model versus a 1D/2D model, by Jorge Leandro, UK
- Use of floating macrophyte mats for treatment of CSOs, by Annelie Van de Moortel, Belgium
- Metals pollution tracing in the sewerage network using the diffusive gradients in thin-films technique, by Phillip Thomas, UK

The last of these was selected for the award.

The Conference Dinner was held at the Edinburgh Corn Exchange, with after dinner entertainment from a traditional Scottish Celiedh with all delegates warmly welcomed to participate in Scottish Country Dancing, guided by the band.

Feedback, at the event and subsequently, has been extremely complimentary from delegates and exhibitors. The EICC proved to be an ideal venue – expensive, but value for money especially given the exceptional attention to detail and to the delegates' needs. It was universally acclaimed as a great location, especially for overseas visitors.

Highly positive articles on the conference are to be/have been published in IWA Newsletter; SHSG Bulletin, German Water Federation Journal Wasser-Abwasser 149 (2008) Nr 11, and Japanese journals.

Overall the organising universities met their financial targets and just about managed to cover their direct costs.

Quality of the papers was variable and the scientific committee took the view that as wide a participation as possible was to be encouraged especially from newly participating countries and young scientists. Hence, although the paper abstracts were reviewed by 3 referees and then the selected papers reviewed by two more referees, in some cases feedback was given to authors to encourage improvement. The majority of presentations were restricted to a total of only 8 minutes. Nonetheless there were very few complaints about the shortness of time and most presenters said that they found the need to be brief had helped them to focus on the main points of their work. This time the numbers of social and institutionally related papers further increased compared with the 10th ICUD and this is a growing cohort within the ICUDs. There was, however, some consternation that none of the papers submitted in this area for consideration for the Harremoes Award were even selected for the final run-off. This is an issue that the JCUD and organisers of the 12th ICUD are aware of.

A number of papers were selected as of the requisite standard for submission to *Water Science and Technology* and authors were advised accordingly after the conference that they needed to reformat and edit their papers for a further reviewing process.

Appendix Committees and organisation

Executive Committee
Richard Ashley (Conference Chair), University of Sheffield.
David Blackwood (Conference Vice-chair), University of Abertay Dundee.
Adrian Saul (Scientific Committee Chair), University of Sheffield.
Scott Arthur**,** (Scientific Committee Vice-Chair), Heriot Watt University.
David Butler, University of Exeter
Jim Conlin, Scottish Water, UK.
Mike Faram, Hydro International Plc, UK.
Maureen Golden (Conference Administrator), University of Abertay Dundee.
Chris Jefferies, University of Abertay Dundee.
Neil McLean, Scottish Environment Protection Agency.
Charles Rowney, Consultant, USA.
Dragan Savic, University of Exeter.
Bob Crabtree, WRc plc.

International Scientific Committee
Adrian J Saul – Chair, United Kingdom
Scott Arthur, Vice Chair, United Kingdom
Richard Ashley, United Kingdom
David Blackwood, United Kingdom
David Butler, United Kingdom
Brian D'Arcy, United Kingdom
Mike Faram, United Kingdom
Christopher Jefferies, United Kingdom
Cedo Maksimovic, United Kingdom
Dragan Savic, United Kingdom
Bob Crabtree, United Kingdom
Maria do Ceu Almeida, Portugal
Neil Armitage, South Africa
Jean-Luc Bertrand-Krajewski, France
Alberto Campisano, Italy
Francois Clemens, Netherlands
Ana Deletic, Australia
Eran Frieldler, Israel
Hiroaki Furumai, Japan
Kapil Gupta, India
Mike Hulley, North America
Peter Krebs, Germany
Joseph Hun-Wei Lee, Hong Kong
Suiqing Liu, China
Jiri Marsalek, Canada
Peter Steen Mikkelsen, Denmark
Nilo Nascimento, Brazil
Mohd Nor, Malaysia
Jaroslav Pollert, Czech Republic
Charles Rowney, USA
Brian Sharman, New Zealand
Eric Strecker, USA
Kala Vairavamoorthy, United Kingdom
Maria Viklander, Sweden
Chengqing Yin, China
Dong Hoo Yoo, Korea

Supported by:
Meeting Makers Ltd, Crawford Building, Jordanhill Campus, 76 Southbrae Drive, Glasgow G13 1PP. United Kingdom.

10. FUTURE MEETINGS AND CONFERENCES

A table listing the proposed JC and WG conferences and workshops (as of January 2009) appears below; additional information on some events is also presented. All information about conferences, seminars, workshops, summer schools, etc. dealing with urban drainage is welcome and will be added to this table. Please send such information to Jiri Marsalek or Peter Steen Mikkelsen. You should also use this table when proposing new events - to avoid overlaps in time and topics.

Year	Month	JCUD	Data and Models WG	Sewer Systems & Processes WG	WGUR (urban rainfall)	Drainage in Cold Climate
		P.S. Mikkelsen J.–L. Bertrand–Krajewski	A. Deletic B. Tait	G. Chebbo Z. Yuan	P. Willems T. Einfalt	M. Viklander
2009	May					1st Int. Conf. on Urban Drainage and Road Salt management in Cold Climates, May 25–29, 2009, Waterloo, ON, Canada
2009	Aug.	10–14, Aug., 33rd IAHR Congress, Vancouver, BC, Canada.				
2009	Sept.		7–11, Sept., 8th UDM (Urban Drainage Modelling), Tokyo, Japan			
2009	Dec.				8th Workshop on Precipitation in Urban Areas, St. Moritz, Switzerland, Dec. 10–13, 2009	
2010	June/July	7th Int. Conf. on Sustainable Techniques and Strategies for Urban water management, (NOVATECH), Lyon, France, June 28 – July 1, 2010				
2010	Sept.	IWA World Water Congress and Exhibition, Montreal, Canada, Sept. 19–24, 2010				
2010	Oct./Nov.			6th Int. Conf. on Sewer Processes and Networks (6th SPN), Brisbane, Australia, Oct./Nov.		
2011	Aug./Sep.	12 Int. Conf. On Urban Drainage, Porto Alegre, RS, Brazil				
2012			9th UDM, Belgrade, Serbia			

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http://www.iwahq.org/templates/ld_templates/layout_633184.aspx?ObjectId=633912,
or www.jcud.org

1st International Conference on Urban Drainage and Road Salt Management in Cold Climates: Advances in Best Practices
May 25-27, 2009, University of Waterloo, Waterloo, Ontario, Canada.

The conference is sponsored by IAHR, Canadian Association for Water Quality (member of IWA), and the JC Cold Climate Urban Drainage Working Group.

The conferences will provide:
(1) an overview of urban drainage issues and state-of-the-art practices in cold climates, with a special emphasis on prevention and treatment of best management practices for mitigating chloride transfer from snowmelt/stormwater via overland drainage and storm sewers to the environment;
(2) the current state-of-the-art knowledge on interactions between road salting and the environment, with respect to their understanding, measurement, modelling and particularly management techniques; and
(3) a forum for improving the scientific basis for policy decisions related to the impacts of winter maintenance and road salt on infrastructure, terrestrial and aquatic ecosystems and water resources.

It is intended to bring together specialists, practitioners and researchers who have an interest in improving urban drainage design and operation in cold climates, and an understanding of mitigating the impact of road salts on infrastructure, water supply and the environment.

Eight conference themes are proposed:
- Session A: Urban drainage and road runoff in cold climate
- Session B: Design and operation of best management practices in cold climate
- Session C: Impacts of road salt on the environment
- Session D: Impacts of road salt on infrastructure
- Session E: Modelling road salt transfer in the environment
- Session F: Evaluating the utility of best management practices (BMPs)
- Session G: Management, legal and regulatory issues
- Session H: Assessing the effectiveness of BMPs

Information for potential authors: Presentations will be made by invited keynote speakers, researchers, and practitioners working in this research area. Details of the conference are found on the conference webpage http://www.environment.uwaterloo.ca/research/roadsalt/. If you intend to present a paper or poster, submit a 250 word abstract by email to Dr. M. Stone mstone@uwaterloo.ca by February 15, 2009. In view of possible delay of distributing this newsletter, extensions of the deadline will be considered/granted on an individual basis.

Location: The conference will be held May 25 to 27, 2009 at the University of Waterloo in the Arts Lecture Hall, Waterloo, Ontario, Canada. A map can be found online at http://communications.uwaterloo.ca/howtoreach.php. On campus accommodation is available at the Conference Centre at a rate of $45.00/night (plus taxes) for a Single Room and $31.75/night (plus taxes) per person for a Double Room. Registration to the conference and accommodation reservations can be made online at https://info.uwaterloo.ca/conferences/registration.html. If you have any questions regarding accommodation please call 1-800-565-5410 or send an email to accombook@uwaterloo.ca.

Registration: The registration fee for this conference is $400.00 Canadian (about 250 euros, including applicable taxes). The fee includes the following: Welcome Reception, Morning & Afternoon refreshment breaks, Daily Lunch, and Memory stick with presentations. Workshop attendance is limited to 200 people – register early to reserve your spot!

Contact: Prof. Michael Stone, Department of Geography, University of Waterloo
Phone: 519-888-4567 ext. 33067 Fax: 519 725-2827 Email: mstone@uwaterloo.ca

Additional information can be also obtained from Prof Maria Viklander (Maria.Viklander@sb.luth.se) or Jiri Marsalek (jiri.marsalek@ec.gc.ca).

International Short Course on Advances in Knowledge of Urban Drainage: from the Catchment to the Receiving Waters, Technical Solutions for Management of Rainwater, organized by Prof. P. Piro, University of Calabria, in Guardia Piemontese, Italy, June 18, 2009

The course is organised by Centro Studi Acquedotti e Fognature, Dipartimento di Difesa del Suolo (University of Calabria), Laboratorio di Idraulica Urbana (LIU) and Associazione Idrotecnica Italiana, Calabria division. It aims to provide both basic theoretical knowledge as well as practical know-how, in comparing international experiences in technical solutions for rainwater / stormwater management. The organizers wish to bring together practitioners and researchers with common interest in improving urban drainage design and operation. Special attention will be paid to addressing controls of CSO impacts on water resources, particularly those in coastal areas. Calabria, which has more than 700 km of coastline, is a most appropriate place for addressing this issue.

Finding a satisfactory solution to mitigate the effects of pollutant discharges is a formidable task, when recognizing the complexity of the underlying problem due to high variability of CSOs with respect to frequency of occurrence, flow rates, and pollutant concentrations. To meet these challenges, the conference program and expert presentations will address the following points:

- An overview of technical solutions and the state-of-the-art in urban drainage practice
- Stormwater and CSO quality analysis, including the relationships between total chemical oxygen demand (TCOD), dissolved COD, particulate COD, and total suspended solids (TSS);
- Index for selection and optimisation of treatment facilities for CSO loads and BMPs adopted for removing heavy metals and solids
- Relationship between the settling tank dimensions and solids removal efficiency
- Control of coupling between the hydrology of, and pollutant transport from, urban areas, based on analysis of the first-flush phenomenon.

Furthermore, presentations by specialised companies will address recent advances in urban drainage technologies, with respect to the understanding of their operation, performance measurement, modelling and management aspects.

Who should attend? Practicing civil, hydraulic and environmental engineers, as well as graduate students and junior researchers; young professionals from other countries are particularly welcome to come and share their ideas and research topics with Italian colleagues.

Location: Guardia Piemontese (Calabria, Italy) is a beautiful sea-side resort town located a short distance north of Paola, which can be reached by train from Naples (2.5 h) or Rome (5 h).

Further information: Prof. Patrizia Piro, Dipartimento di Difesa del Suolo "V. Marone", Università della Calabria, Ponte Pietro Bucci, Cubo 42/b, 87036 Arcavacata di Rende (CS), Tel. +039.0984.496546/47 Fax. +039.0984.494050, e-mail: patpiro@dds.unical.it , or visit the website www.liu-cs.it .

The 8th Urban Drainage Modelling (UDM) and The 2nd Rainwater Harvesting and Management (RWHM) Conferences to be held in Tokyo, Japan, Sept. 7-11, 2009.

The 8th International Conference on Urban Drainage Modelling (8UDM) will be held from September 7 to 11, 2009, in Tokyo, Japan. This will be the first opportunity to hold the UDM conference in Asia and in conjunction with The 2nd International Conference on Rainwater Harvesting and Management (2RWHM). We have received more than 200 abstracts from 28 countries to 8UDM, while the 2RWHM extended the submission deadline to the end of December 2008. The chairman of 2RWHM, Prof. Mooyoung Han, expected around 50 abstract submissions. The submitted abstracts will undergo a review process by the conference international and scientific committee members. The acceptance and presentation style will be announced in January 2009 and full paper submissions will be requested from the authors. The full papers will be reviewed before the conference for prompt publication in international journals such as Water Science and Technology, Water Practice & Technology, Urban Water Journal and others.

We plan to prepare 4 session rooms for the joint conference so that good opportunities could be provided for diverse and attractive oral presentations as well as poster presentation. From the regional concern, it is planned to have a special workshop on East Asian urban water management in the monsoonal climate. In addition, in cooperation with the Japan Sewage Work Association we plan to publish an annual book of "Sewage Works in Japan 2009" focusing on urban flood management in Japan. This book will be included in the conference participant package. We will also make the conference attractive by preparing an interesting technical tour around Tokyo and a conference gala dinner at a Japanese Garden Restaurant. The registration information will be open soon, offering reduced rates for early birds, students and participants from low-income countries.

All the information on conference details is available on the website listed below. For further information, contact the conference secretariat; 8UDM@env.t.u-tokyo.ac.jp.
8UDM website http://www.env.t.u-tokyo.ac.jp/8UDM.

8th International workshop on Precipitation in Urban Areas, St. Moritz, Switzerland, December 10–13, 2009
Details can be found on the conference website: http://www.ifu.ethz.ch/stmoritz/news/First_call.pdf; specific themes will be announced shortly.

Novatech 2010: June 28 – July 1st, 2010
The 7th international conference on sustainable techniques and strategies for urban water management will be held in the Lyon Congress Centre, France, from June 28 to July 1st, 2010. The Novatech conferences, organized every three years since 1992 and supported by the JCUD, are among the key international scientific and technical symposia dealing with urban water management with reference to wet-weather conditions. In 2010, the conference themes will address:

- integrated strategies and approaches for water management in urban areas: from individual buildings to city-wide scale;
- innovative technologies for stormwater management: design, implementation and operation; and,
- management of aquatic environment, assessment and control of urban wet-weather discharges.

Key dates: The call for papers will be issued in May 2009, the deadlines for authors' intention declaration and full papers submission are set in July and October 2009, respectively.

For any further information, please contact the Novatech secretariat:
Lucie DUPOUY (novatech@graie.org)
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11. RECENT PUBLICATIONS OF INTEREST

For a comprehensive listing of IWA publications, see Section 7 (News from IWA Publishing). Selected other publications of interest are listed here, starting with Ph.D. theses from Denmark and Sweden.

Tone Merete Muthanna (2007). "Bioretention as a Sustainable Stormwater Management Option in Cold Climates". Ph.D. Thesis, NTNU, Trondheim, Norway. In colder climates, the performance of bioretention areas is to a large extent unknown. The main objectives of this thesis were to investigate the hydrologic function of bioretention as a stormwater treatment option in cold climate with respect to seasonal infiltration rates, storm lag times, and the effects of ice and snow cover during the cold months. To investigate the seasonal metal retention in the system, and whether the type of the precipitation event, rainfall or snowmelt, or temperature affect the metal retention in the system. Pollutant pathways through the bioretention were studied during snowmelt, with respect to the occurrence of pollutant release enrichment, which is typically found in snowpack melt events. As a

final objective, the observed data were used to evaluate the design and sizing criteria for bioretention facilities and their applicability in cold climate areas, where snow storage is required. For a PDF-version of the thesis, visit; http://www.diva-portal.org/ntnu/abstract.xsql?dbid=1472

Karin Reinosdotter (2007). "Sustainable Snow Handling". Ph.D. Thesis, LTU, Lulea, Sweden. The objective of the thesis was to study the conditions for developing an environmentally sustainable snow handling strategy. The research was carried out in three parts: snow handling strategies, pollution in urban snow, and pollution pathways from urban snow. First, a survey was conducted dealing with snow handling strategies used in a number of Swedish municipalities. The results concerning pollution in snow were based on field studies. Snow samples were collected in two Swedish municipalities and along a highway in the northern part of Sweden; the snowmelt process and the influence of road salt were studied through a laboratory experiment. For a PDF-version of the thesis visit http://epubl.ltu.se/1402-1544/2007/12/LTU-DT-0712-SE.pdf

Camilla Westerlund (2007). "Road Runoff Quality in Cold Climates". Ph.D. Thesis, LTU, Lulea, Sweden. The main objective of the thesis was to investigate the complex processes and influencing factors affecting snowmelt-induced runoff and snowmelt quality in a cold climate under wintry conditions compared to non-winter conditions in areas with a warmer climate. In order to improve the understanding and knowledge of road-runoff quantity, quality and pollutant transport, snowmelt and rainfall runoff were studied and characterised in the laboratory and in the field, respectively. Special requirements of cold-climate conditions should be considered in planning processes related to the applicability, operation and need to specially design best management practices, snow handling strategies, and environmental management practices as well as improving models. For a PDF-version of the thesis visit http://epubl.ltu.se/1402-1544/2007/37/LTU-DT-0737-SE.pdf

Annika Lundmark (2008). "Monitoring transport and fate of de-icing salt in the roadside environment – modelling and field measurements". Ph.D. Thesis, Royal Institute of Technology, Stockholm, Sweden. This thesis presents an operational modelling tool for monitoring the trans-port and fate of de-icing salt in the roadside environment in order to quantify changes in the environment at various spatial and temporal scales, using salt application data, meteorological data, geology and generic descriptions of hydrogeological environments as main inputs. A combination of modelling and various independent field measurements provided an efficient means for evaluating and describing the spread of de-icing salt from the road to the surroundings, the deposition of salt and ploughed snow on the roadside, and the corresponding increase in chloride concentration in soil and groundwater. Both the spatial and seasonal variation in soil chloride concentration was significantly affected by de-icing salt application. The importance of the soil type, vegetation type, groundwater conditions and distance from the road was clearly demonstrated for modelling the transport and fate of de-icing salt in the roadside environment. For a PDF-version of the thesis visit http://www.diva-portal.org/kth/abstract.xsql?dbid=4615

Thomas Ruby Bentzen (2008). "Accumulation of pollutants in highway detention ponds". Ph.D. Thesis, Dept. of Civil Engineering, Aalborg, Denmark. This PhD study deals with runoff and pollutant transport from highways, with the main objective to quantify the removal of pollutants from highway runoff, including heavy metals and polycyclic aromatic hydrocarbons. The challenge is to develop a simplified but accurate description of flow and pollutant transport adequate for long-term simulation of the pollutant transport from highways by runoff. Measurements of water and pollutant transport were carried out in different highway drainage systems. A geometrically well-defined test pond was selected, wherein the deposition of particulate matter could be measured. The results from the test pond were transferred to real detention ponds in which the three-dimensional flow was described by a numerical CFD model. The particulate matter was analyzed for particle size distributions, settling velocity distributions and corresponding heavy metal and PAH concentrations. Erosion/resuspension experiments for detention pond sediments were carried out in the laboratory with currents and waves. In general the study showed that the bulk of hydrocarbons, PAHs and heavy metals accumulated in detention pond sediments and the removal efficiency for particulate matter in the detention ponds was around 80%. An important parameter for the retention of particulate matter in Danish ponds is wind; currents and turbulence generated by wind in ponds interferes with pond settling. The impact from wind can reduce the pollutant removal efficiency significantly and even result in negative efficiencies due to resuspension of already settled particulate matter. Finally, a well calibrated one-dimensional transport model was set up for describing (a) The build up of particulate pollutants on highway surfaces, (b) The removal of particulate pollutants from highway surfaces by rain, and (c) Transport of runoff water and particulate pollutants through the drainage system to the receiving detention ponds. This model can be used for prediction of storm event loads in detention ponds for periods of several years.

Other publications

Davidson, J.D., N.-J. LeFevre and G. Oberts (2008). "Hydrologic bioretention performance and design criteria for cold climates". This document reports on bioretention hydrology in cold climates and has been posted at http://www.ndwrcdp.org/userfiles/04DEC13SGREPORT.pdf

Encyclopedia of Hydrological Science (2005), M.G. Anderson (Editor in Chief), John Wiley & Sons, Hoboken, NJ, USA. Bryan Ellis reported that Article 97 on Urban Water Quality, contributed by three past JC chairmen, J.B. Ellis, J. Marsalek and B. Chocat, belongs to the group of "most frequently accessed articles" from this encyclopedia.

12. WORKING GROUP CONTACTS

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