IAHS Newsletter

NL91 August 2008

REMINDER *Deadlines for the 8th IAHS Scientific Assembly to be held in Hyderabad, India, 6–12 September 2009, with the International Association of Hydrogeologists. See page 12.*

Jean Margat (with the silver medal) with Andras Szöllösi-Nagy (UNESCO Water Sciences), Arthur Askew (IAHS), and Gabriel Arduino (WMO Secretariat). See page 4 for the citation and response

Jean Margat receives the 2008 International Hydrology Prize

The prize was presented at UNESCO Headquarters, Paris, during the IHP Council meeting.

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The Court of Miracles of Hydrology

Participants at The Court of Miracles of Hydrology workshop.

The Court of Miracles of Hydrology is an unusual name for a one-of-a-kind workshop that took place at ENGREF in Paris, France, 18–20 June. The workshop was entirely dedicated to hydrological monsters and outliers, i.e. to those catchments, hydrometeorological situations and extreme events that somehow cause unexpected or apparently unsolvable problems in terms of measuring and observing, behaviour understanding and modelling, uncertainty quantification, and decision making in an operational context. *Continued on page 15*

Glaciers in watershed and global hydrology

More than 60 researchers from 20 countries gathered in the beautiful Austrian village of Obergurgl to attend the workshop "Glaciers in watershed and global hydrology" last year. The aim of the workshop was to bridge the intellectual gap at the glacier terminus —where glaciology traditionally ends and hydrology traditionally begins. Fittingly, those in attendance were from both disciplines and all shared an interest in the downstream effects of glaciers. *See page 7.*

HSJ impact factor increases again to 1.602

Hydrological Sciences Journal (*HSJ*), the IAHS journal, impact factor has risen again, to 1.602 (ISI Journal Citation Reports), a reflection of the quality of the work published, and the efforts of Editor, Zybszek Kundzewicz, his Deputy, Demetris Koutsoyiannis, the Associate Editors and all the referees involved in the peer-review process. The Tison award paper was published in *HSJ* and can be viewed open access at: *www.atypon-link.com/iahs/doi/abs/10.1623/hysj.52.4.625*

The 2008 Tison Award

Gregor Laaha is congratulated on winning the Tison Award for his paper: *A national low flow estimation procedure for Austria*, jointly authored with Günter Blöschl. *See page 5 for the citation and Gregor's response.*

A Note to Members

One of my jobs as President of IAHS is to attend meetings: scientific assemblies and business gatherings; long conferences and short discussions; some convened by IAHS and others to which the Association is invited. I will not exaggerate the total number that I attend, but I recently faced the forbidding prospect of attending six within the space of three weeks. The most important of these was that on 8 June 2008 when, following a long-standing tradition, the IAHS Bureau met at UNESCO Headquarters in Paris.

The Bureau session received reports in person or in writing from all its members. As always, it is both interesting and impressive to learn of the many activities being undertaken by the IAHS Commissions and Working Groups. The documents submitted to the meeting and the minutes of the meeting itself are, as usual, available on the IAHS website at: *http://iahs.info/archives/*. I recommend that all members look through these from time to time, not only to appreciate the full breadth and extent of the work of the Association, but also to identify where they themselves might be able to make a contribution.

Much of the Bureau's time was taken up with the preparations for the Assembly in Hyderabad; plans to prepare a mid-term PUB report; the impact factor of *HSJ*; a proposal to turn the Red Books into a new journal; and a paper on a vision for IAHS's future presented by Gordon Young as President-Elect (see opposite). One of the many topics raised in the discussion of Gordon's paper found its counterpart in two of the other meetings that I attended in June, namely a call to reconsider the existing structure and mode of work of the organizations concerned.

Over the years, the commission structure of IAHS has been questioned on a number of occasions but the arguments in favour of retaining it have always prevailed. The success of PUB, which we all applaud warmly, has raised this question once more: the thought being that we should base our work more on a series of time-limited projects rather than permanent bodies.

Immediately after the meeting of the IAHS Bureau, I attended the 18th session of the Intergovernmental Council of the IHP of UNESCO. It was at this meeting that I had the pleasure of awarding the International Hydrology Prize for 2008 to Jean Margat (see pages 1 and 4). Gordon Young joined me to represent IAHS at the session, and, as can be seen in the accompanying photograph, we met with two previous presidents of the Association – thus giving ample proof of the close links that we have always enjoyed with this important programme of UNESCO.

From its very start in 1975, the IHP has always had a clear and separate identity within the Programme on Natural Sciences of UNESCO, following a set of objectives related to freshwater and building an ever-expanding series of activities. In recent years its share of the UNESCO budget has increased substantially. However, at its session in October/November 2007, the General Conference of UNESCO cut the budget for the Programme by 16%. It also put it together with other programmes as part of a sectoral priority focusing on the promotion of research and technical capacity-building for the sound management of natural resources and for disaster preparedness and mitigation. Its separate "main lines of action" were absorbed into just four for the whole of the Natural Sciences. Water is clearly losing its previous status as a principal priority within UNESCO and it remains to be seen what effect this will have on the IHP itself. We offer our best wishes to our colleagues in Paris as they work to maintain the IHP as an effective force which could yet have so much to offer to the hydrological sciences.

One week later I found myself back in my former place of work representing IUGG and IAHS at the 60th session of the WMO Executive Council. Imagine my surprise when I met with difficulty in identifying the documents and agenda items related to the Hydrology and Water Resources (HWR) Programme.

In 2007, the 15th WMO Congress took a results-based budgeting system used for the WMO Secretariat and developed it into a results-based management system that is intended to be used in monitoring the work of the meteorological and hydrological services of the world. The system is based on three Objectives, five Strategic Thrusts and 11 Expected Results; one of the latter being "enhanced capabilities of members to provide better hydrological forecasts and assessments".

The Secretary-General has used this system as a basis for re-structuring the WMO Secretariat, which is why our colleagues there now work within the HWR Branch of the Climate and Water Department. Although various programmes, such as the HWR and World Climate Programmes continue to exist, their work is now reported and reviewed on the basis of the 11 cross-cutting Expected Results. Accordingly, there is no longer just one specific agenda item or document on the HWR Programme and WMO's activities in freshwater are considered under at least three agenda items.

While this facilitates the reporting of activities in relation to the Expected Results, it remains to be seen how well it will be accepted by the national services which do the actual work in the countries. It certainly presents a challenge to those of us from outside the Secretariat who wish to follow developments in a particular field, be it aeronautical meteorology or, in our case, hydrology. Far more important is the challenge of maintaining the HWR Programme as an effective focus for international co-operation in operational hydrology in the face of diminishing budgets, and therefore our best wishes go also to our colleagues in Geneva.

The basic structures of these three organizations have been in place since the 1920s in the case of IAHS, 1930s

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IAHS is a nongovernmental not-for-profit scientific organization dedicated to serving the science of hydrology and the worldwide community of hydrologists.

The Newsletter is distributed free of charge to members of IAHS. This Newsletter and previous issues may be downloaded from: *www.iahs.info*

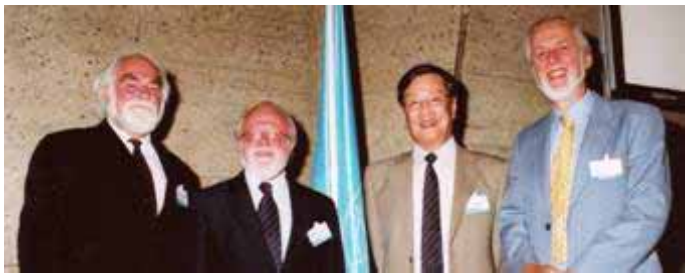
Articles from IAHS members on all aspects of hydrology and related topics are welcomed for publication in the Newsletter. They should be sent to the IAHS Secretary General, Pierre Hubert, preferably to: *pjy.hubert@free.fr*, or to: IAHS, UMR Sisyphe, Université Pierre & Marie Curie, Case 105, 4 Place Jussieu, 75252 Paris Cedex 05, France

Advertisements may be placed in the Newsletter, or inserts may be mailed with it, at the discretion of the IAHS Secretary General. Contact: *cate@iahs.demon.co.uk*

The next IAHS Newsletter will be published in November 2008

for WMO and 1970s for UNESCO. So why are they all being changed or at least challenged at this particular point in time? Pure coincidence – of this I am sure – because the reasons are quite different in each case. However, this coincidence does invite us to look with care at how we should review the structures of organizations, in our case IAHS.

All organizations should look at their objectives, statutes, structures and practices from time to time so as to ensure that they are still meeting real needs and doing so as effectively as possible. New members have every right to question past practices and experienced members may well feel the need for change. Changes should certainly be made if they are found to be in the interests of the organization and its members; but changes can be very disruptive and should not be made just for the sake of change. After all, there will always be a reason why things are as they are and that reason may still be valid and may well outweigh the demands for change.



Three presidents, and the President-Elect: left to right: Gordon Young (PE), Arthur Askew (P), Kuni Takeuchi (P: 2001–2005), and John Rodda (P: 1995–2001)

I am a civil engineer by training and so I think in terms of foundations beneath, that support functional units above. So I would suggest a two-pronged approach:

– retain a basic structure, revised from time to time as needed, that is founded on a long-term understanding of the science and technology involved and on the structure of counter-part organizations at national and international levels;
– implement time-limited activities that are relevant to the wider community and meet its current needs and, to be frank, also the prevailing fashion in such things.

To have only the basic structure stifles initiative and risks reducing the organization to a sterile bureaucracy.

To have only individual projects leads to there being no on-going foundation on which to build future work and that will remain when the individual projects finish. In the latter case, and at the risk of being melodramatic, failure of projects or a lack of viable new projects could lead to the collapse of the organization itself.

It is important for the future of IAHS that we give careful consideration to this question in the coming months as we plan for the future of the Association.

Arthur Askew, IAHS President

From the President-Elect

In this message I will briefly expand on the words of our President. Arthur made very good points about IAHS' relationships with UNESCO and WMO, and noted that in both those organizations changes and restructurings are taking place which impact on their water programmes. He also noted that there are suggestions from within IAHS that restructuring may also be needed for our Association. So we find ourselves in a world which is in constant evolution and we must be prepared to adapt to ensure that we are relevant to the needs of the hydrological community.

Of course, IAHS does not only interact with UNESCO and WMO, but also with many other entities. With our sister associations within IUGG, significantly with IAMAS and IAPSO, we hold joint sessions during Assemblies of the Union; and with our geological colleagues in IUGS, significantly with IAH – as in our up-coming Assembly in Hyderabad. Perhaps to a lesser extent, we cooperate with other professional organizations such as IAHR, ICID and IWA. We have the potential to interact more significantly with the relatively new organizations (just over a decade old) of WWC and GWP, particularly at the World Water Forums; we also have the potential to participate far more actively in the Stockholm Water Week, which has become a major annual event now attracting a significant number of top water managers and researchers. All of these organizations are constantly modifying their mandates and ways of operation and we, also, need to be dynamic.

In 2003 IAHS celebrated its 80th anniversary. During those many decades the Association has evolved, creating new Commissions, modifying the mandates of existing Commissions and changing Committees into Commissions in response to new and ever-evolving scientific and management challenges. But the underlying structure has always been modified and never fundamentally altered. As Arthur quite correctly points out, there would be significant risk involved to completely replace the existing structure. We do have the flexibility to create new Commissions, to modify the mandates of existing Commissions, to merge existing Commissions or to eliminate those that may no longer be relevant. We also have the opportunities to create Working Groups and Task Forces, normally time-limited, to address particular issues; and these are often the modalities which are especially attractive to the most active scientists. We have the necessary flexibility to evolve without the possible risks inherent in basic restructuring.

We must constantly be critically reviewing our activities to ensure their relevance. I have tried to encapsulate some of these concerns in the discussion paper which I prepared for the recent meeting of the IAHS Bureau and which may be found at:

http://iahs.info/archives/Paris2008/IAHS_Vision_for_the_Future_rev2.pdf

Let us keep our Association strong, dynamic, relevant and attractive to the scientific community and to society at large.

Gordon Young, President-Elect

GWP	Global Water Partnership
ICID	International Commission on Irrigation and Drainage
IAH	International Association of Hydrogeologists
IAHR	International Association of Hydraulic Engineering and Research
IAMAS	International Association of Meteorology and Atmospheric Sciences
IAPSO	International Association of Physical Sciences of the Ocean
IUGG	International Union of Geodesy and Geophysics
IUGS	International Union of Geological Sciences
IWA	International Water Association
UITA	Union of International Technical Associations
WWC	World Water Council

2008 International Hydrology Prize – Jean Margat

The International Hydrology Prize is awarded to a person who has made an outstanding contribution to hydrology such as confers to the candidate universal recognition of his or her international stature

It is always a great pleasure and honour to award the International Hydrology Prize. This year the pleasure and honour are heightened because the prize goes to one who has been a leader in the science and practice of hydrology for more than 60 years: Jean Margat.

I hope he will forgive me if I refer to him as one of the grand old men of hydrogeology – after all he was born in 1924. But while he may be old in years, he is certainly not old in spirit and he is now as keen as ever he was to promote the importance and study of groundwater – the "hidden resource" as it is sometimes called.

Jean Margat was born in Paris, studied at the Sorbonne gaining a Licence ès Sciences in 1946, after which he undertook further studies at the Ecole Nationale Supérieure de Géologie in Nancy, qualifying a year later as a geological engineer.

As with so many of his compatriots, he spent much of his early professional life in North Africa. For 14 years he studied the underground waters of Morocco, publishing his findings and working for the rational development of these precious resources. He then returned to France to work in Orléans for the Bureau de recherches géologiques et minières, which we all know as BRGM. There he took on the challenge of founding the Hydrogeology Department which he then headed for the next 10 years. This gave him the opportunity to apply the experience he had gained in Morocco to launch hydrogeological mapping in France. He was now "back home", but he maintained his international interests with work for UNDP, FAO and UNESCO.

In 1972 he was promoted to Deputy Director of BRGM, a post that he held for the following 17 years, completing a total of 27 years with the Bureau. During this period he undertook numerous missions, bringing his expertise to countries as diverse as Bolivia, Libya, Saudi Arabia and Mali – to quote only four from a very long list. The one common thread was his interest in arid regions.

He was also active within Europe and helped to compile the first European inventory of sites for nuclear waste disposal. Within France he launched and became Chief Editor of a new journal *Hydrogéologie* and was a key figure in establishing a methodology for the national water resource assessment.

Formally, we can record that Jean Margat retired in 1989 at the age of 65, but retirement has no real meaning to a man like Jean. So he not only retained a link with his old firm as an adviser to BRGM, but started a whole range of new projects, the most well-known being the launch of the Plan Bleu for the Mediterranean: a UNEP project based in Sophia-Antipolis near Nice in the south of France, where he held the post of Vice-President. He maintained his worldwide contacts as a consultant for such bodies as the World Bank, UNESCO, UNDP and FAO – his focus being on the mapping and assessment of groundwater resources and on terminology. Particular mention may be made of his close involvement in work on the 1:5 000 000 International Groundwater Map of Africa and the 1:25 000 000 map of the Groundwater Resources of the World published by IAH and UNESCO in 2007.

IAHS is not the first body to recognise the great contribution that Jean Margat has made to the science and practice of hydrology. As far back as 1961 he received the Henri Milon Prize of the Société Hydrotechnique de France. Twenty years later he was awarded the Louis Barrabé Prize of the Société Géologique de France. In 1998 he was made an Honorary Member of the International Association of Hydrogeologists (IAH) which, two years ago, awarded him its President's Prize.

There is much more that one could say about our esteemed colleague, but lack of time forces me to limit myself to just one brief excursion outside his professional life – to mention a very special woman for whom he has always harboured a great interest. She lives in a palace in Paris and is some 500 years old. She is of course none other than La Gioconda, known to many as the Mona Lisa. Jean Margat is recognized as the inventor of the term *Jocondologie* – or is it truer to say *Jocondoclastie* – an important element in the bizarre. From his home near Orléans, Jean presides over the Friends of Mona Lisa, a club of serious collectors of Giocondiana: friends who get together once in a while for a convivial lunch in Paris where they discuss and compare their collections. Which all goes to assure us that our prize winner is a man of diverse talents and one who lives a full and active life.

There are two extra reasons why it is a particular pleasure to award the International Hydrology Prize to Jean Margat:

– Firstly: he is a Frenchman and, given the strong links that IAHS has had with France over the years, it is surprising that he is only the second son of this great country to receive the Prize; the first being another Jean: the late Jean Rodier, a good friend to many of us, who was awarded the Prize back in 1985.
– Secondly: it helps to demonstrate that the Prize is awarded to those who have made major contributions to hydrology at international level and not just to IAHS. Over the years, Jean has published extensively in our Red Books (18 papers) and twice in the *Hydrological Sciences Journal*, but he has never held office in the Association. He has, on the other hand, been a central figure in the life of our sister Association, IAH, of which he has served as Vice-President and was for many years President of the French Chapter. This is particularly significant, given that the next Scientific Assembly of IAHS will be held in September 2009 in Hyderabad, India in conjunction with the 37th Congress of IAH.

At the start I referred to groundwater as the "hidden resource". Jean Margat has made it his life's mission to discover that resource and make its presence known to the world: to map it, to assess it, to develop it wisely and to protect it. He is a man old in years but young in spirit, small in stature, but a giant in his chosen field, who is recognized throughout the world as one of the fathers of

modern hydrogeology. It is for this reason that, together with UNESCO and WMO, the Association is pleased to award him the International Hydrology Prize for 2008.

Arthur Askew

Jean Margat's Response

I have still not yet recovered from the surprise – a wonderful surprise – at being told by Pierre Hubert that I was to be awarded the International Hydrology Prize and, while I very much appreciate this great honour and distinction, I am not sure that I merit it when I think of the eminent people whose company I now join: from Professor Tison to Jean Rodier, from Malin Falkenmark to Igor Shiklomanov, and whose standing I do not see myself even approaching. In my case, it is perhaps a reward for survival more than for what I have done.

Naturally, I am particularly appreciative of the fact that, for the first time, the Prize is being awarded to a hydrogeologist. I see this as a positive sign of progress in breaking down the barriers between the sciences of the water cycle, linked to an improved appreciation of the interdependence between surface and groundwater. I claim no credit for having understood this from the very start of my professional life because, in the arid zone of pre-Saharian Morocco, the evidence was there before my very eyes.

Nevertheless, I have often met with misunderstanding on this subject and have checked some cases that Ray Nace and later Ramón Llamas have justly focused on using the term "hydroschizophrenia". I have also been particularly satisfied at the success I have achieved in fighting to eliminate all future double counting in the global statistics of water resources of FAO (AQUASTAT).

In any case, what I have learnt most from more than half a century of study and research in water is that these are above all collective and interdisciplinary efforts. Therefore, with the honour that has been bestowed on me, I would like to associate those innumerable colleagues and collaborators with whom I have worked over the years. Thus I offer my grateful thanks to IAHS, and to UNESCO and WMO, for this encouragement for me to persevere.

2008 Tison Award – Gregor Laaha

The Award aims to promote excellence in research by young hydrologists (<41 years). The Award is granted for an outstanding paper published by IAHS in a period of two years previous to the deadline for nominations

The Jury of the 2008 Tison Award: Dr Z. W. Kundzewicz (Chair, IAHS Editor), and Drs Hafzullah Aksoy, Berit Arheimer, Jim Bogen, Paul A. Hsieh, John Pomeroy and H. H. G. Savenije, recommended bestowing the 2008 Tison Award upon Dr Gregor Laaha, from the Institute of Applied Statistics and Computing, University of Natural Resources and Applied Life Sciences in Vienna (Austria). The winning paper: *A national low flow estimation procedure for Austria*, jointly authored by Dr Gregor Laaha and Dr Günter Blöschl was published in the *Hydrological Sciences Journal* 52(4), pages 625–644, in August 2007. The co-author is not eligible for the Tison Award, in view of his age, as the Award is only made to younger authors (<41).

Austria is an Alpine country, and the Alps constitute a water tower of Europe. Destructive floods in Austria, such as the summer 2002 deluge, are well known to the international community, but droughts (in the sense of meteorological droughts and hydrological droughts, including streamflow droughts and low flows) do also happen and cause material losses, so that improved understanding of processes and better estimates of low flow characteristics are important for water resources management. Even if Austria's area is not very large, its landscapes are highly diverse and the low flow maps are very heterogeneous.

In the paper selected by the Jury for the 2008 Tison Award, a procedure for estimating Q95 low flows in both gauged and ungauged catchments was presented, using a number of alternative methods. A comprehensive Austrian national data set was used and intercomparison of alternative methods was carried out. Different sources of information were considered, including streamflow records and characteristics of drainage basins. Rather than providing Q95 estimates, lower and upper confidence bounds were determined.

The scope and complexity of this work is significantly greater than those of the other papers nominated for the 2008 Tison Award. The national procedure for estimating low flow must be applicable to 21 000 sub-catchments with diverse climatic and physiographic characteristics and having differing amounts of streamflow records. The authors have done an excellent and thorough job in developing a practical, coherent and well-reasoned estimation strategy. They did not simply pick one estimation method, but instead evaluated a number of alternative methods by cross-validation and then chose the method with the smallest cross-validation error. The result of this research is highly valuable for water resources management. This paper is an excellent example of the high impact of scientific work on society.

The paper contains maps of the lower and upper confidence limits of low river flows (exceeded 95% of the time) for an impressive 21 000 sub-catchments in Austria. The map can obviously be used for determination of low flow characteristics over ungauged sites in Austria, hence this work constitutes a contribution to the Hydrological Atlas of Austria.

The paper follows a pragmatic stance, trying to draw the most from the relevant information available in a particular case. It has to cope not only with sites with long river flow records, but also with sites with short records, and those without records at all. As such, the awarded paper is a contribution to the PUB initiative, making a small, but hopefully useful, step in the direction of prediction in ungauged basins. Estimation of hydrological process characteristics in ungauged basins is one of the major problems facing water resources management in both developed and developing countries. The problems caused by climate and land-use changes stress the importance of water resources assessment.

This is an interesting and innovative paper. The authors follow a thoughtful, tailored approach, rather than blindly following the "one-size-fits-all" stance. The methodology includes making adjustments for short records, grouping catchments according to seasonality, regional regression of low flows with catchment characteristics, spatial adjustments for exploiting local streamflow data, and uncertainty assessments. Where no streamflow data are available, a regional regression model is used.

The paper is a logical continuation of the good work done by the authors over the last years, and documented by many high-quality publications. It is a result of co-operation of scientists representing two universities in Vienna, Austria.

Dr Laaha has been known in IAHS and other international hydrological organizations, such as the EGU, for quite some time, for his publications and presentations. He has attended several IAHS assemblies and symposia. As Editor of *Hydrological Sciences Journal* I am looking forward to receiving further fine papers from Dr Laaha and co-authors. We receive more and more submissions to the *Journal*, but we are always pleased to get more material of the highest quality.

Finally, let me share a personal reflection. Twenty-one years ago, the Tison Award was given for the first time. I am proud to say that I was the first laureate. This Prize, whose monetary value is only symbolic, has had a considerable impact on my scientific career. Ladies and Gentlemen, I feel honoured and pleased to bestow the 2008 Tison Award to Dr Gregor Laaha. Let me wish that this Prize marks an important milestone in his scientific career. My congratulations and best wishes.

Z. W. Kundzewicz
IAHS Editor and Chair of the Jury of the 2008 Tison Award

Gregor Laaha's Response

Thank you very much Dr Kundzewicz. I'm much honoured by this award and to have my name added to such a list of distinguished colleagues. The awarded paper is on the topic of statistical modelling of low flow and drought, which has been in the centre of my research for the past 10 years. When I started this work, the public interest in the "low" hydrological extreme was rather weak, especially in a water abundant country such as Austria (Dr Kundzewicz, tellingly, called it a "water tower"). There were only a few examples of bigger low-flow studies in Europe at that time, notably the precious works of Alan Gustard in the UK and Siegfried Demuth in southwest Germany, and I am very grateful for their support. It was Franz Nobilis, former head of the Austrian Hydrological Service, who had the prospective idea to start a low-flow regionalisation study in Austria, and I want to thank him for this main impetus to my work.

The year 2003 and subsequent years have pointed out that European societies are more vulnerable to droughts than expected. We now know that the damages of the 2003 drought, which affected most parts of Europe, were of the same order of magnitude (or even higher) than the damages of the 2002 flood, and this is also true for the "water tower" Austria. Mediterranean countries, notably Spain, suffer increasingly from water scarcity, partially caused by unusual dry conditions during recent years, and there are many further examples of possible changes of hydro-climatological conditions across Europe. For these reasons, low flows and drought are now a very active research field, and more and more a topic of public interest.

There are two initiatives which have done incredibly precious work in promoting drought research on an international scale and on the European scale. The first is the UNESCO-FRIEND programme, a cross-cutting programme of the IHP. I want to thank all members of the NE-FRIEND low flow group for providing such a valuable forum of low flow and drought research. I am especially grateful to Lena Tallaksen, University of Oslo, who co-ordinated the group for the last decade, for her kind support (she is also a former winner of the Tison award, it was in 1998). The second initiative is the European Drought Center, a virtual centre of European drought research and drought management organisations aiming to promote collaboration and capacity building between scientists and the user community. The precious work of both institutions is acknowledged.

My work on statistical low flow regionalisation would have been impossible without two people, Günter Blöschl and Harald Strelec. Günter Blöschl, who is the co-author of the awarded paper, guided my work during the past 10 years. He has been a fantastic mentor who initiated me in the world of hydrological regionalisation. I am grateful for his support and for our cooperation during the past decade, and I am looking forward to continuing this very fruitful cooperation in the future. I will always be grateful to the late Professor Strelec, former head of the Institute of Applied Statistics at the BOKU Vienna University, for his support to my work. I thank him for many critical comments which helped to improve the work, and for his continuous and amicable support.

Many thanks to my family, my wife Sabine, my children Maya and Boris, and to their grandparents for helping out with the children. Finally, I want to thank the jury for this honour, and the International Association of Hydrological Sciences for being what it is.

View the paper at: www.atypon-link.com/iahs/doi/abs/10.1623/hysj.52.4.625

Gregor (with certificate and $1000 cheque), and Zbyszek Kundzewicz, Arthur Askew and Ms Helene Steinhäusl - Minister, Deputy Permanent Delegate of Austria within UNESCO.

Reports from IAHS Commissions and Working Groups

ICSIH – Snow and Ice Hydrology

Glaciers in Watershed and Global Hydrology

More than 60 researchers from 20 countries gathered in the beautiful Austrian village of Obergurgl to attend the *Glaciers in watershed and global hydrology* workshop during 27–31 August 2007. The aim was to bridge the intellectual gap at the glacier terminus – where glaciology traditionally ends and hydrology traditionally begins. Fittingly, those in attendance were from both disciplines and all shared an interest in the downstream effects of glaciers.

The workshop comprised three days of presentations (33 oral and 14 poster) focused on:

1. Incorporation of glaciers in runoff models: How can glaciers be represented in runoff models? Which glacier melt and routing routines are necessary to capture the specific characteristics of glacial discharge? How can glaciers be included in global hydrological models? How is it best to deal with changing glacier geometries in runoff predictions?
2. Effects of climate change on glacier runoff and the hydrology of glacierized catchments: How will annual, seasonal and diurnal runoff characteristics change as glaciers continue to retreat? How does the response vary in different climate regions?
3. Glaciers as information repositories for hydrological modelling: What kind of information can be extracted from glaciers that can aid hydrological modelling? How can glacier measurements help to constrain model parameters or provide model input?

The pleasant conference location at the Universitäts-zentrum in Obergurgl, where most participants were accommodated, provided an excellent platform for the interactive and relaxed nature of the workshop (in sessions and at the bar) with ample opportunity for informal discussions and networking. A half-day hiking excursion in the local mountains provided an intermission during the workshop.

3-D glasses were required to view some presentations.

The rapid decline of glaciers and associated runoff changes came to life for more than 25 participants who attended the two-day excursion to the glacier Vernagt-ferner in the nearby Vent valley and toured the impressive gauging and meteorological station. Those who stayed overnight at the Vernagt mountain hut were rewarded with blue sky and sunshine, proving the miserable weather forecast wrong. The full-day hike across the glacier, through a spectacular 250-m ice cave and to nearby Schwarzkögele (>3000 m a.s.l.) was clearly a highlight of the workshop.

Sixteen participants have submitted papers to a special issue of *Hydrological Processes*, edited by the conveners of the meeting, which will be published later in 2008. The event was sponsored by ICSIH and the Union Commission for the Cryospheric Sciences (UCCS). We are grateful for financial support from UNESCO-IHP, the University of Innsbruck and IUGG, which enabled us to support five early-career scientists from Brazil, India, Nepal and Pakistan with travel grants, and to cover the organisational costs.

Conveners
Regine Hock, University of Alaska, Fairbanks
Tómas Jóhannesson, Icelandic Meteorological Office, Reykjavík
Gwenn Flowers, Simon Fraser University, Burnaby, Canada
Georg Kaser, University of Innsbruck, Austria

Participants assemble outside the ice cave on the Vernagtferner

Glacier Mass Balance Changes and Meltwater Discharge

Editors P. Ginot & J. E. Sicart

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ICGW – Groundwater

Organisation for the next ModelCare conference, ModelCare2009, is underway.

The ModelCARE conference series provides an international forum on state-of-the-art methodologies and techniques for model calibration and reliability assessment. The ModelCare2009 conference also addresses the applicability of such approaches to real-world problems through advanced case studies and identifies future needs and paths toward progress for research and development.

The conference theme is *Managing Groundwater and the Environment*. Within the context of model calibration and reliability, issues of groundwater quantity and quality will be addressed. Exploring and protecting groundwater resources in developing countries is of special interest. The conference will bring together researchers, industry, regulators, consultants, planners and water supply agencies to discuss the utility of models to managing groundwater and related environmental systems.

Yanxin Wang

Note: Michael Trefry of CSIRO, editor of the next in the GQ series of IAHS publications: *Groundwater Quality: Securing Groundwater Quality in Urban and Industrial Environments* has completed the review process and forwarded the papers for the volume to IAHS Press. It will be published later this year.

Managing Groundwater and the Environment

Wuhan, China 20–23 September 2009

http://www.modelcare2009.org

The conference is sponsored by the IAHS-ICGW and hosted by the China University of Geosciences at Wuhan, a beautiful city of hundreds of lakes in central China. For more information, please see the web site.

Calibration and Reliability in Groundwater Modelling: *Credibility of Modelling*

Edited by J. C. Refsgaard, K. Kovar, E. Haarder & E. Nygaard

ModelCARE 2007 (Copenhagen, September 2007) was the sixth in the international conference series on Calibration and Reliability in Groundwater Modelling, and focused on *Credibility of Modelling*.

IAHS Publ. 320 (*2008*) ISBN 978-1-901502-49-7, 358 + x pp.
Members price £50.25; full price £67.00
Order from IAHS Press: *jilly@iahs.demon.co.uk*

COWIfonden
This publication is sponsored by the COWI Foundation: *www.cowifonden.dk*

This book comprises 57 peer-reviewed papers selected from the conference organised in the following themes:

1) Development in modelling and uncertainty assessment
2) Credibility in modelling for practical approaches
3) New data types and monitoring systems
4) Integrated hydrological modelling
5) Reactive and density affected transport
6) Parameter estimation and model calibration
7) Geological models and conceptual model uncertainty

Abstracts of the papers can be seen at:
http://iahs.info/redbooks/320.htm

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The Court of Miracles of Hydrology

Continued from page 1.

Gathering more than 80 hydrologists from 13 countries, it succeeded in bringing modellers and managers together in order to share and discuss their failure stories.

On the origin of the workshop's title

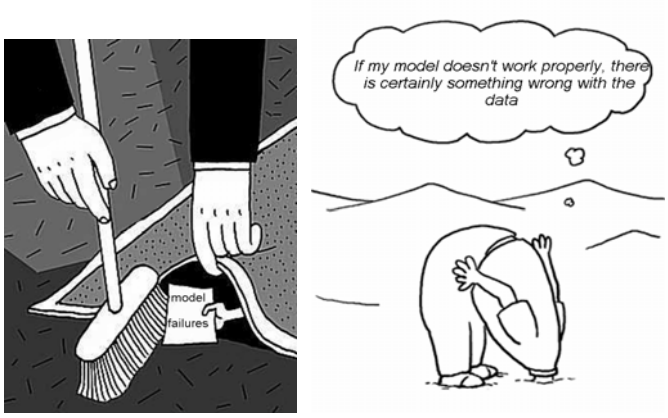
The workshop was named in reference to a hidden part of Paris that existed during the middle-ages, and was made famous by Victor Hugo in his novel *The Hunchback of Notre Dame* (*Notre-Dame de Paris*): the court of miracles was the secret gathering place for all the city's cripples, thieves and beggars. It was an extremely risky place, "*where the sergeants of the provostship, who ventured thither, disappeared in morsels…*" but also a marvellous place, where "*the blind see, and the lame run*" (because all the fake crippled beggars would metamorphose when arriving there, as there was no need to appear monstrous any more).

At first, this might seem a strange analogy for a scientific workshop. After all, "*normal*" conferences on hydrology usually focus on success stories, and not on monsters. In *normal* workshops, we are used to hearing about our peers' successes, to witnessing the everlasting progress of new hydrological models.

And failure stories?

Not many of us care for them – whether consciously or not, failures are given only a marginal place in scientific meetings.

This is why we wished to put on stage the "Court of Miracles of Hydrology", with the firm conviction that mistakes and failures may teach us as much (or perhaps more) than the conventional success stories.

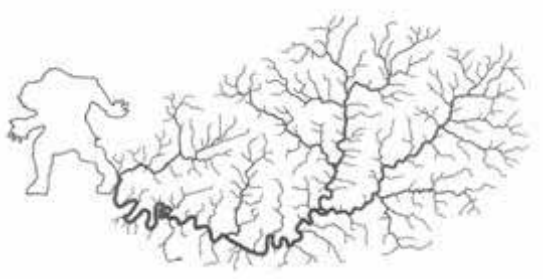


Two common strategies to deal with modelling problems and outlier catchments in hydrology

What benefits can we expect from exploration of the Hydrological Court of Miracles?

By hiding model failures, so reducing the variability of results, hydrologists sometimes imagine that they can increase the confidence of users towards our tools and our results. This is a short-sighted view: our users, when confronted with the actual variability of possible results, will lose confidence towards hydrological tools. Besides, knowing that an approach is a dead end could be useful to others (if published … which seldom happens).

Thus, we believe that we can benefit from a renewed look at all the outliers discarded from hydrological studies:



– First by identifying new ways to improve the predictions of our models. By hiding our failures, we miss the opportunity to learn what was wrong. So the initial damage is scientific.
– Second, regaining the confidence of our model users by a more realistic assessment of model uncertainty. Indeed, the gap between the satisfactory performances published in scientific articles and the actual practice in operational conditions results in a loss of credibility from model end-users.

A few insights from the Court of Miracles of Hydrology

The workshop was structured into four sessions. Each one starting with an invited presentation, followed by a poster session, after which a general discussion was organized with some thought-provoking introductions provided by two or three participants.

Session 1: How bizarre is really bizarre?

The invited speakers of this session were Rémy Garçon and Thibault Mathevet of EDF-DTG (French hydropower producer). They started by noting that, generally, we all consider objects that deviate from an expected standard as bizarre or monstrous and that hydrology is not an exception to this rule! Hence, the bizarre or the monstrous represents every object that has a low probability of occurrence or that our models are unable to represent. However, the bizarre or the monstrous does not characterise an object under study, but the limits of our models to describe this object. Considering this definition, they focused on very practical examples from the operational world, and showed how our interpretation of data is often based on an implicit and simplistic model, which may be wrong in some instances. They also discussed special hydrological monsters, in the field of hydrometry, catchment conceptualisation, extreme floods evaluation and operational forecasting. They concluded that the bizarre is not something to reject. Conversely, hydrologists should encourage and develop the study of the bizarre: the speakers concluded that bizarre objects are a first-class opportunity for hydrologists to improve the explanatory and predictive capacity of their models.

Session 2: A priori good-looking and weird catchments: why do they turn into a modeller's nightmare?

Professor Jens-Christian Refsgaard of GEUS, the invited speaker, presented the paradoxical results of a recent modelling study in the Odense Pilot River Basin in Denmark. In this catchment, where a lumped rainfall–runoff model linked to a distributed groundwater model had given good results in the past, new questions had arisen from the Ministry of Agriculture on the impact of

the location of agro-environmental measures. Surprisingly, the complex distributed model implemented to answer this question provided worse results than the previous simpler lumped model, without clear explanations of this situation. Jens-Christian Refsgaard discussed the rather naïve treatment of sub-grid heterogeneity in distributed hydrological models, and concluded by stressing the importance of not overselling models to end-users, and of working on the representation of heterogeneity in any model (lumped or distributed). He also underlined the need to follow a good modelling practise protocol.

Session 3: There are no hydrological monsters, only models with huge uncertainties

Professor George Kuczera of the University of Newcastle (Australia) gave the keynote for Session 3. He began by insisting on the danger of shunning "deviant" catchments, which are extremely valuable in that they expose the frailties of our science, and could hopefully spur us to improve our hydrological models. After discussing the structure of errors in hydrological modelling, he presented a Bayesian approach allowing modellers to "live with errors". He provided two illustrations, one for an Australian catchment, and the other for a deviant French catchment, to which he had courageously agreed to apply his tools in a "blind" manner.

As a conclusion, he suggested that there are no real monsters in hydrology, but just hydrologists hampered by a lack of information, who need more observed fluxes to close the water balance, and more field data to get closure on model errors.

Session 4: There are no hydrological monsters, only decision-making issues

The speaker invited for Session 4 was Professor Roman Krzysztofowicz of the University of Virginia (USA). He addressed the question of model evaluation, first pointing out the follies of the plethora of *ad hoc* measures that have been used to evaluate the performance of hydrological models and, second, offering a coherent verification theory (and practical measures) from the viewpoint of a Bayesian decision maker.

The last morning of the conference was dedicated to a general discussion, which was innovative in that four groups of "young" participants (i.e. the PhD students and post-docs) had been entrusted with the task of presenting a general summary. This yielded a refreshing view on the conclusions of this conference.

As all meetings, this one concluded on the need to organize a follow-up meeting in the future … And from a practical point of view, it was proposed to set up a benchmark of catchments presenting various difficulties representative of commonly-found natural hydrological monstrosities, as a tool to assess the robustness of existing and new hydrological models.

Vazken Andréassian and Charles Perrin, Cemagref, Antony
Eric Parent, Engref-AgroParisTech, Paris
András Bárdossy, Institut für Wasserbau, Stuttgart, Germany
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Acknowledgements

We gratefully acknowledge the financial support of Cemagref and EDF-DTG, the material support of ENGREF-AgroParisTech, and the animation provided by the Club International d'Hydrologie Sociale, with a special mention for the catchment-based cheese and wine tasting they organised (www.hydrologiesociale.org).

References

The detailed workshop programme, presented posers and list of participants can be found at:
www.cemagref.fr/hydro-miracles

Grand Venue, Great Meeting: the Kovacs Colloquium 6–7 June 2008

River Basins – From Hydrological Science to Water Management

The Kovacs Colloquia, organised jointly by IAHS and the UNESCO International Hydrological Programme (IHP), every two years, are remarkable from several perspectives. The colloquia are held at UNESCO headquarters in Paris, a building which is worth a visit. Built in the Modernist style, Ayers (2004) describes it as a showcase of quality 1950s design that "today charms in its manifestation of a certain cold-war-chic". There are paintings, sculptures and tapestries (all enormous) by Picasso, Moore and le Corbusier, among others, plus the Garden of Peace (by Noguchi) to admire. And, because the colloquia are held at UNESCO, there are no registration fees.

Hydrologists assemble amidst a variety of exhibitions and other events that are the diversity of UNESCO (UN Educational, Scientific and Cultural Organisation): I have taken in exhibitions ranging from *Central African Hair Styles* to *Children in Palestinian Refugee Camps*. Room IV, the usual venue, is a grand and comfortable lecture theatre with armchairs and headsets for audiences of 300+. Glass-fronted booths for translators overlook the proceedings, and what is going on there can be diverting – as far as I can make out, four translators were on duty this year, two for English to French, and two for *vice versa*, and they swap over every 15 minutes or so – and the simultaneous translation they do is incredible. The style with which the audience wears the headsets is notable too, from the functional to nonchalant, to jaunty, to disguise (balanced on bridge of nose/spectacles—seen for the first time in 2008).

Hydrologically, it is an occasion to see, hear and meet some of THE personalities in international hydrology. The quality of the papers is high – as you would expect because they are all invited. This year, Keith Beven (UK) gave the first on a Friday of lectures by established male hydrologists. A contrast to the Saturday when a quartet of competent, younger female hydrologists from El Salvador (Ana Deisy López Ramos), Romania (Daniela Radulescu), Russia (Elena Asabina) and South Africa (Caryn Seago) presented papers mostly rooted in water management in their own countries. How differently countries approach essentially similar tasks, a reflection of history, geography and funding. The recent implementation of hi-tech gauging and remote sensing systems for operational use in El Salvador and Romania is impressive and facilitating improvements to water management there. Elena Asabina described an area-based basin-development threshold beyond which sustainable water use is likely compromised, an approach for areas with extensive "natural" landscapes but not appropriate to the UK, for example. Caryn Seago provided a tour of water resources modelling in South Africa, and reminded us of her country's recent successes in international rugby and football. In all cases, a recurring discussion point was: how are stakeholders (domestic consumers/farmers/industry) involved in decision making? This referred to Bernard Barraqué's (France) presentation on the Friday, of a social scientist's perspective on participative water management, which identified the problem of operating public participation in developing countries.

Also on the Friday, Jean-Paul Villeneuve (Canada) summarised decision making succinctly with an apparently simple integration, until that is, one took in the previous decisions variable (!), in his paper that reviewed the progress from watershed hydrology to integrated management. Rajendra Prasad (India) gave an account of the changing scenario re: water in India, a frustrating situation of continuing imbalance between the possibilities and opportunities and the poor quantity and quality of water available to much of the population. Giselher Kaule (Germany) emphasized the time required to establish trust between hydrologists and policy makers/practioners and how, now in the later part of his career, he could attend to such, unlike younger scientists who need to focus on innovative, publishable projects rather than the practical (he also indicated that in Ireland, pubs could facilitate development of trust!). Water quality was Jake Peter's (USA) theme, which he developed with international examples of collaborative work on monitoring and process understanding for environmental management, while recognising that there is still much to improve. Which leads back to a fundamental tenet of Keith Beven's presentation: How can we show we are doing better given the uncertainties in the data we are working with? If asked for a shopping list for hydrology's future, his focus would be on data and new approaches to measurement, because "we have enough models".

Those who were not there can catch up with the formal presentations as all 10 have been published in IAHS Publ. 323, with an extended *Preface* that provides an overview and the *Conclusions and Recommendations* arising from them. The book is available now from IAHS Press. A Summary Report of the meeting and the Discussion will be published shortly.

Cate Gardner, IAHS

Joint IAHS & IAH International Convention 2009
Water: A Vital Resource Under Stress – How Science Can Help

Hyderabad, India, 6–12 September 2009

http://www.appliedhydrology.org/iahs

The *8th IAHS Scientific Assembly* has been combined with the *37th IAH (International Association of Hydrogeologists) Congress* to form a Joint IAHS–IAH International Convention to be held at NGRI, India. IAHS and IAH have each scheduled a full programme of events for their respective associations, but the arrangement has also enabled several joint IAHS–IAH symposia to be organised. Participants will be welcome to attend any of the sessions.

The venue for the joint IAHS–IAH convention is NGRI, the National Geophysical Research Institute at Hyderabad, Andra Pradesh, in southeast India. NGRI, one of the premier Earth Science research establishments in India, has all the facilities the convention will require to accommodate several parallel sessions at once, and the auditorium at the nearby Osmania University will be used for the opening ceremony. A series of half-day and longer scientific excursions will be available, as well as cultural excursions.

Hyderabad, known both as the *City of the Nizams* (the native sovereigns of Hyderabad state) and as the *City of Pearls*, is known for its rich history, culture and architecture, reflecting its unique character as a meeting point for North and South India. Its most enduring symbol is Charminar – the Tower of the Four Minarets, built in 1591.

The city has many hotels (2–5 star; € 75 to >200 per day) and guest houses (€ 25–50 per day). Registered participants can book accommodation via the convention website.

This major city has good links by road, rail and internal flight with the other principal Indian cities, and there are direct international flights to Hyderabad from a variety of places worldwide.

Registration will only be complete when the registration fee has been paid in full. Participants must register for either IAHS or IAH, but are welcome to attend any session. Provisional registration is necessary to submit abstracts.

The registration fee includes many extras:

– One of the Red Books published for the conference
– Attendance at the opening and closing ceremonies, including the Banquet following the opening event
– Free access to the Internet at the venue
– Daily transport from your hotel and back
– Lunch each day, plus morning/afternoon refreshments
– One or two Evening Entertainments
– Transport from the airport to your hotel, and back

Registration fees

	Before 31 May 2009	After 31 May 2009
Members of IAHS and IAH	300 €	350 €
Non-members	350 €	400 €
Students and accompanying persons	150 €	175 €

Note: payment for registration by credit card is preferred. Amounts equivalent to the euro fee will be deducted in rupees.

Summary of the Scientific Programme

Programme Committee Chairs: IAHS – Prof. Dan Rosbjerg (Denmark), IAH – Dr Shivendra Nath Rai (India), IAH VP

	JOINT IAHS–IAH SYMPOSIA JS.1–4
JS.1	Ecohydrology of surface and groundwater dependent ecosystems: Concepts, methods and recent developments
JS.2	Trends and sustainability of groundwater in highly stressed aquifers
JS.3	Improving integrated surface and groundwater resources management in a vulnerable and changing world
JS.4	Hydroinformatics in hydrology, hydrogeology and water resources
	JOINT IAHS–IAH WORKSHOPS JW.1–4
JW.1	Measuring and modelling interactions between surface water and groundwater
JW.2	Transboundary water management: Science and policy ICGW, IAH, ICWQ
JW.3	Rural and urban water systems: Minimizing adverse impacts of global change on water resources
JW.4	Isotope tracing for water balance, hydrodynamics and hydrological processes, including groundwater recharge, as indicators of water resources sustainability
	IAHS SYMPOSIA HS.1–3
HS.1	High mountain snow and ice hydrology
HS.2	New approaches to hydrological prediction in data sparse regions
HS.3	Hydrological theory and limits to hydrological predictability in ungauged basins
	IAHS WORKSHOPS HW.1–7
HW.1	Regionalisation of models for operational purposes in developing countries
HW.2	Sediment problems and sediment management in Asian river basins
HW.3	Flood risk management
HW.4	Space–time scaling for ET and soil moisture modelling using remote sensing
HW.5	PUB – a benchmark report
HW.6	Precipitation variability and water resources
HW.7	New statistics in hydrology

See ***www.appliedhydrology.org/iahs*** for the full programme

Symposia *(JSx and HSx) = Sessions for which full papers will be published in a Red Book available at the convention.*
Abstracts for all symposia are due by 30 November 2008
Acceptance of abstracts for symposia will be announced to authors in January 2009
The deadline for full papers for symposia is 28 February 2009.

IAHS Workshops *= Sessions for which the only submission is the abstract.*
31 May 2009 is the deadline for abstracts for IAHS workshop sessions.

ABSTRACTS *Submit ALL abstracts electronically through the Convention website: www.appliedhydrology.org/iahs*
There is a link to it from the IAHS website
To submit abstracts, it is necessary first to make a provisional registration via the website.

Papers published in *Hydrological Sciences Journal* in 2008, to date.

HSJ 53(1) February 2008

Rapid Communication

Z. W. Kundzewicz et al. The implications of projected climate change for freshwater resources and their management. 3–10.

Scientific papers

Yanjun Shen et al. Projection of future world water resources under SRES scenarios: water withdrawal. 11–33

Patrick Arnaud et al. Régionalisation d'un générateur de pluies horaires sur la France métropolitaine pour la connaissance de l'aléa pluviographique. 34–47.

X. Lana et al. Return period maps of dry spells for Catalonia (northeastern Spain) based on the Weibull distribution. 48–64.

Jochen Wenninger et al. Identification of runoff generation processes using combined hydrometric, tracer and geophysical methods in a headwater catchment in South Africa. 65–80.

Emmanuel Roux et al. Daily water stage estimated from satellite altimetric data for large river basin monitoring. 81–99.

Jóna Finndís Jónsdóttir A runoff map based on numerically simulated precipitation and a projection of future runoff in Iceland. 100–111.

Christian Reszler et al. Identifying runoff routing parameters for operational flood forecasting in small to medium sized catchments. 112–129.

Maritza L. Arganis-Juarez et al. Génération d'échantillons synthétiques des volumes mensuels écoulés vers deux barrages selon la méthode de Svanidze modifée. 130–141.

Demetris Koutsoyiannis et al. Medium-range flow prediction for the Nile: a comparison of stochastic and deterministic methods. 142–164.

Paweł M. Rowiński & Adam Piotrowski Estimation of parameters of the transient storage model by means of multi-layer perceptron neural networks. 165–178.

Continued overleaf

Massimiliano Zappa Objective quantitative spatial verification of distributed snow cover simulations—an experiment for the whole of Switzerland. 179–191.

Lahoucine Hanich et al. Une approche multicritères pour l'implantation de forages dans les zones productives des systèmes fissurés. 192–203.

A. Fadlelmawla et al. Hydrogeochemical investigations of recharge and subsequent salinization processes at Al-Raudhatain depression in Kuwait. 204–223.

Peter Bača Hysteresis effect in suspended sediment concentration in the Rybárik basin, Slovakia. 224–235.

Yves Tramblay et al. Frequency analysis of maximum annual suspended sediment concentrations in North America. 236–252.

Fethi Bouksila et al. Soil water content and salinity determination using different dielectric methods in saline gypsiferous soil. 253–265.

Wilson Suarez et al. Modelling the water balance in the glacierized Parón Lake basin (White Cordillera, Peru). 266–277.

Vincent Favier et al. Evidence of groundwater flow on Antizana ice-covered volcano, Ecuador. 278–291.

HSJ 53(2) April 2008

Scientific papers

Luc Feyen et al. Semi-distributed parameter optimization and uncertainty assessment for large-scale streamflow simulation using global optimization. 293–308.

Pratap Singh et al. Modelling and estimation of different components of streamflow for Gangotri Glacier basin, Himalayas. 309–322.

Kwan Tun Lee et al. Derivation of variable IUH corresponding to time-varying rainfall intensity during storms. 323–337.

P. K. Bhunya et al. A variable storage coefficient model for rainfall–runoff computation. 338–352.

Deepesh Machiwal & Madan K. Jha Comparative evaluation of statistical tests for time series analysis: application to hydrological time series. 353–366.

Krzysztof Kochanek et al. The PWM large quantile estimates of heavy tailed distributions from samples deprived of their largest element. 367–386.

Antti Taskinen et al. Statistical analysis of the effects on overland flow of spatial variability in soil hydraulic conductivity. 387–400.

V. K. Bhatt & A. K. Tiwari Estimation of peak stream flows through channel geometry. 401–408.

Mohamed Saffi & Abdelkhaler Cheddadi Explicit algebraic influence coefficients: two-dimensional aquifer model. 409–420.

Pratap Singh et al. Basin-wide assessment of temperature trends in northwest and central India. 421–433.

S. K. Jain & P. K. Bhunya Reliability, resilience and vulnerability of a multipurpose storage reservoir. 434–447.

Abderrahmane Ghenim et al. Variation temporelle de la dégradation spécifique du bassin versant de l'Oued Mouilah (nord-ouest Algérien). 448–456.

Qiang Zhang et al. Periodicity of sediment load and runoff in the Yangtze River basin and possible impacts from climatic changes and human activities. 457–465.

Yasser Hamed et al. Comparison of soil salinity and solute transport for different cultivated soil types in northeastern Egypt. 466–478.

HSJ 53(3) June 2008

Scientific papers

T. C. Sharma & U. S. Panu Drought analysis of monthly hydrological sequences: a case study of Canadian rivers. 503–518.

Valentina Krysanova et al. Detection of change in drought frequency in the Elbe basin: comparison of three methods. 519–537.

Donald H. Burn et al. Identification and quantification of streamflow trends on the Canadian Prairies. 538–549.

Carlos Escalante Sandoval & Jose Raynal-Villaseñor Trivariate generalized extreme value distribution in flood frequency analysis. 550–567.

Emad Habib et al. Analysis of radar-rainfall error characteristics and implications for streamflow simulation uncertainty. 568–587.

Alejandra Stehr et al. Hydrological modelling with SWAT under conditions of limited data availability: evaluation of results from a Chilean case study. 588–601.

Raquel Nieto et al. Dynamic identification of moisture sources in the Orinoco basin in equatorial South America. 602–617.

F. Gallart et al. Investigating hydrological regimes and processes in a set of catchments with temporary waters in Mediterranean Europe. 618–628.

Estela Nadal-Romero et al. Temporal variability in hydrological response within a small catchment with badland areas, Central Pyrenees. 629–639.

Loubna Benyahya et al. Comparison of non-parametric and parametric water temperature models on the Nivelle River, France. 640–655.

Mesut Çimen Estimation of daily suspended sediments using support vector machines. 656–666.

HSJ 53(4) August 2008

Rapid Communication

D. Koutsoyiannis et al. On the credibility of climate predictions. 671–684.

Scientific papers

Ian G. Littlewood & Barry F. W. Croke Data time-step dependency of conceptual rainfall–streamflow model parameters: an empirical study with implications for regionalisation. 685–695.

Demetris F. Lekkas Using complementary methods for improved flow forecasting. 696–705.

Yusuf M. Mohamoud Prediction of daily flow duration curves and streamflow for ungauged catchments using regional flow duration curves. 706–724.

Pablo F. Dornes et al. Influence of landscape aggregation in modelling snow-cover ablation and snowmelt runoff in a sub-arctic mountainous environment. 725–740.

Stefan Uhlenbrook et al. Source areas and mixing of runoff components at the hillslope scale—a multi-technical approach. 741–753.

Yukiko Hirabayashi et al. Global projections of changing risks of floods and droughts in a changing climate. 754–772.

Hugo Hellebrand et al. The potential of winter stormflow coefficients for hydrological regionalization purposes in poorly gauged basins of the middle Rhine region. 773–788.

Gaston Liénou et al. Evolution des régimes hydrologiques en région équatoriale camerounaise: un impact de la variabilité climatique en Afrique équatoriale? 789–801.

Emna Gargouri-Ellouze & Assia Chebchoub Modélisation de la structure de dépendance hauteur–durée d'événements pluvieux par la copule de Gumbel. 802–817.

Chaiyuth Chinnarasri et al. Field validation of two river morphological models on the Pasak River, Thailand. 818–833.

Gustavo Orioli et al. The impact of agricultural land use on stream chemistry and inputs to an inland water reservoir: the case of the Sauce Grande River, Argentina. 834–843.

Alexander Vandenbohede et al. Study of the feasibility of an aquifer storage and recovery system in a deep aquifer in Belgium. 844–856.

Pieter R. Van Oel et al. The impact of upstream water abstractions on reservoir yield: the case of the Orós Reservoir in Brazil. 857–867.

Altay Altinörs & Halil Önder A double-porosity model for a fractured aquifer with non-Darcian flow in fractures. 868–882.

Youssef Al Ali et al. Water and sediment balances of a contour bench terracing system in a semi-arid cultivated zone (El Gouazine, central Tunisia). 883–892.

Ali Aytek et al. An explicit neural network formulation for evapotranspiration. 893–904.

Elzbieta Kubrak et al. Vertical velocity distributions through and above submerged, flexible vegetation. 905–920.

Virginia Hernández-Santana & José Martínez-Fernández TDR measurement of stem and soil water content in two Mediterranean oak species. 921–932.

HSJ 53(5) October 2008

SPECIAL ISSUE Advances in Ecohydrological Modelling with SWAT *(Soil and Water Assessment Tool)*

A Special Issue, guest-edited by Valentina Krysanova & Jeffrey Arnold, of papers developed from presentations at the SWAT modelling workshop held in Potsdam, Germany, in October 2006.

Calendar of Meetings Organized/Sponsored by IAHS

Details of these plus many non-IAHS meetings are provided at the IAHS web site: click on meetings

2008	Conference	Contact details
Prague, Czech Republic 15–18 September	HydroPredict'2008: *International Interdisciplinary Conference on Predictions for Hydrology, Ecology and Water Resources Management: Using Data and Models to Benefit Society*	Mary C. Hill, US Geological Survey, USA, tel: +1 303 541 3014; mchill@usgs.gov or Karel Kovar, Netherlands Environmental Assessment Agency, The Netherlands tel: +31 30 274 3360; karel.kovar@mnp.nl http://www.natur.cuni.cz/hydropredict2008/
Kraków, Poland 18–20 September	*12th Biennal Conference of Euromediterranean Network of Experimental and Representative Basins (ERB 2008) Hydrological Extremes in a Small Basin*	Wojciech Chelmicki, Jagiellonian University, Institute of Geography and Spatial Management, Kraków, Poland; w.chelmicki@geo.uj.edu.pl
Bucharest, Romania 22–24 September	*International Conference on Water Resources Management in Extreme Conditions*	Andrei Mihai, Head, International Relations and Programs Bureau, National Institute of Hydrology and Water Management, sos. Bucuresti-Ploiesti, nr.97, 013686 Bucharest, Romania tel : +40 213181115, ext. 123; fax: +40 213179991; andrei.mihai@hidro.ro
Kyoto, Japan 1–3 October	*HydroChange 2008*	Dr Makoto Taniguchi, tel: +81 757072255 makoto@chikyu.ac.jp; http://www.chikyu.ac.jp/HC_2008/index.htm
Capri, Italy 14–16 October	*The Role of Hydrology for Water Resources Management*	Crescenzo Violante, IAMC-CNR, Calata Porta di Massa, Porto di Napoli I-80133 Napoli, Italy tel: +39 0815423847; fax: +39 0815423888; crescenzo.violante@iamc.cnr.it
Johannesburg, South Africa 29–31 October	*9th WaterNet/WARFSA/GWP-SA Symposium*	Prof. Hubert Savenije, ICWRS-IAHS; Delft University of Technology Stevinweg 1, 2628 CN Delft, The Netherlands; h.h.g.savenije@tudelft.nl
Chengdu, China 7–9 November	International IAHS-PUB Symposium and 2nd International China-PUB symposium: *Hydrological Modelling and Integrated Water Resources Management in Ungauged Mountainous Watersheds*	Xinhua Zhang, Tianqi Ao, Dawen Yang and Zongxue Xu xhzhang@scu.edu.cn, aotianqi@scu.edu.cn, yangdw@tsinghua.edu.cn, zongxuexu@vip.sina.com; http://iahs.info/conferences/2008chengduPUB.pdf
Tullamore, Ireland 11 November 2008	Irish National Hydrology Conference 2008: *Hydrology in Spatial Planning and Development*	Oliver Nicholson, Office of Public Works, 17–19 Lower hatch Street, Dublin 2, Ireland; oliver.nicholson@opw.ie
Christchurch, New Zealand 1–5 December	ICCE International Symposium: *Sediment Dynamics in Changing Environments*	Jochen Schmidt, NIWA, PO Box 8602 Christchurch, New Zealand tel: +64 (0)3 343 8058; fax: +64 (0)3 348 5548; j.schmidt@niwa.co.nz http://www.civil.canterbury.ac.nz/icce2008/
Republic of Djibouti 14–17 December	International Symposium on Hydrogeology of the Volcanic Rocks	Mohamed Jalludin, General Director, CERD Centre d'étude et de recherche de Djibouti, BP 486, Djibouti, Republic of Djibouti; jalludin_med@intnet.dj
2009		
New Delhi, India 12–16 January	International Conference on Water, Environment, Energy and Society (WEES-2009)	National Institute of Hydrology, Roorkee-247667 (Uttarakhand), India wees09@yahoo.com
Port Elizabeth, South Africa 23–26 February	*International Conference on Implementing Environmental Water Allocations*	The Secretariat (Cilla Taylor Conferences), PO Box 82, IRENE, 0062 South Africa tel: +27 (0)12 6673681; fax +27 (0)12 6673680; confplan@iafrica.com
Goslar-Hahnenklee, Germany 30 March–2 April	*International Workshop on Status and Perspectives of Hydrology in Small Basins*	Ulrich Schröder, schroeder@bafg.de; Sybille Schumann, s.schumann@tu-bs.de http://www.ws.small-hydro-basins.org
Vienna, Austria 20–23 April	HydroEco'2009 *Hydrology and Ecology: Ecosystems Interfacing with Groundwater and Surface Water*	Karel Kovar, Netherlands Environmental Assessment Agency, The Netherlands tel: +31 30 274 3360; karel.kovar@mnp.nl; *www.natur.cuni.cz/hydroeco2009*
Ohrid, Macedonia 1–5 September	WMHE2009, 11th International Symposium on Water Management and Hydraulic Engineering	Violeta Gesovska, tel: +389 (2) 3116066/ext. 120/210; fax: +389 3118834; violeta@gf.ukim.edu.mk
Hyderabad, India 6–12 September	8th IAHS Scientific Assembly and 37th IAH Congress	Pierre Hubert, IAHS Secretary General; pjy.hubert@free.fr http://www.appliedhydrology.org/iahs
Bratislava, Slovakia 21–24 September	2nd Int. Conf. BIOHYDROLOGY 2009: *A Changing Climate for Biology and Soil Hydrology Interactions*	L. Lichner, Institute of Hydrology, Slovak Academy of Sciences, Racianska 75, 83102 Bratislava, Slovakia; lichner@uh.savba.sk. http://www.ih.savba.sk/biohydrology2009
Plitvice Lakes, Croatia 23–26 September	*Sustainability of the Karst Environment - Dinaric Karst and other Karst Regions*	Jadranka Pejnovic, Centre for Karst, Budacka 12, 53000 Gospic, Croatia tel: +385 53 575 649; fax: 385 53 575 649; jadranka.pejnovic@gs.t-com.hr
Wuhan, China 21–25 October	ModelCARE 2009	Yanxin Wang, China University of Geosciences, Wuhan yx.wang@cug.edu.cn; http://www.modelcare2009.org

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www.iahs.info

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International Workshop on

www.ws.small-hydro-basins.org

Status and Perspectives of Hydrology in Small Basins

30 March–2 April 2009, *Goslar-Hahnenklee, Germany*

Convened jointly by: the Technical University of Braunschweig (TUBS), Germany; the National Committee of Germany for the International Hydrological Programme (IHP) of UNESCO and the Hydrology and Water Resources Programme (HWRP) of WMO

In cooperation with: the Northern European FRIEND Project 5 (NE FRIEND 5); the Alpine and Mediterranean Hydrology FRIEND AMHY; the Euromediterranean Network of Experimental and Representative Basins (ERB); and the IAHS PUB Initiative

Objectives and Key Aspects of the Workshop
The aim is to highlight the overall hydrological research results and benefits to hydrology derived from work in small basins. Based on these deliverables, activities shall focus on questions concerning the need for further operation of small research basins and their role in meeting future challenges in hydrological research.

The workshop will comprise paper and poster presentations with discussion of the results in plenary sessions as well as working group activities. Working groups will be set up at the beginning of the workshop. All workshop participants will be invited to join a working group.

1. Achievements and State of the Art Papers and posters
1.1 Presently operated small hydrological research basins;
1.2 Fundamental results drawn from studies in small basins;
1.3 Hydrological process knowledge drawn from small basin studies
1.4 Importance of data and results from small basins for modelling (regionalisation, forecasting water balances and high/low flows).

2. Heading for Knowledge Working groups with introductory papers
2.1 Concepts and strategies for future research in small basins;
2.2 Research on hydrological processes: Which achievements are expected in the coming decades?
2.3 Which contribution to the monitoring and understanding of changes in physical processes, water fluxes, water balance and global warming effects is expected from small basin research?
2.4 Research in small study basins: What may be the scientific contribution to the PUB initiative and what is expected *vice versa*?
2.5 Do we need research results from small basins for the further development of mathematical hydrological models?
2.6 What future contribution to capacity building of specialists and researchers is expected from operating small study basins?

The main outcomes of the workshop will be included in a special Braunschweig Declaration that will point out future demands and challenges for scientific activity in small-basin-scale hydrology. The Declaration is meant to address scientists, professionals, stakeholders and policy makers as well as potential donors and invite them to start, continue or renew their support of research in small study basins and their maintenance.

Deadline for Abstracts: 30 September 2009