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IAHS Newsletter

NL83 July 2005

2005 International Hydrology Prize awarded to Gert Schultz

From left to right, Avinash Tyagi (WMO), Arthur Askew (new IAHS President), ***Gert A. Schultz****, and Alberto Tejada-Guibert (UNESCO)*

The International Hydrology Prize is awarded annually to hydrologists who have made an outstanding contribution to the science. It is given by IAHS with the support of WMO and UNESCO. Dr Arthur Askew presented the 2005 award to Professor Gert Schultz in Foz do Iguaçu, on 4 April 2005. See p. 12 for Dr Askew's citation and Prof. Schultz's reply.

Seventh IAHS Scientific Assembly

Freshwater: Sustainability within Uncertainty

Foz do Iguaçu, Brazil, 3–9 April 2005

The Assembly, jointly organized with the ABRH (Associação Brasileira de Resursos Hidricos) was attended by 459 people from 56 countries. Generous funding from UNESCO, WMO and IAEA enabled the Organizing Committee to support the participation of about 50 scientists from countries in need. During the Assembly the presidency of IAHS was transferred from Prof. Kuni Takeuchi (Japan) to Dr Arthur Askew (Australia), and the 2005 International Hydrology Prize, and the Tison Awards for 2004 and 2005 were presented (see p. 10). Seven symposia and seven workshops were organized (see p. 4–10 for meeting reports).

S1 Sediment Budgets
S2 Sustainable Water Management Solutions for Large Cities
S3 Groundwater Resources Sustainability Indicators (report not available)
S4 Dynamics and Biogeochemistry of River Corridors and Wetlands
S5 Contribution from Glaciers and Snow Cover to Runoff from Mountains
S6 Regional Hydrological Impacts of Climatic Variability and Change
S7 Prediction in Ungauged Basins (PUB)
W1 Hydrology 2020: What shall we target now?
W3 Hydrological Basis of Dam Safety with Respect to Floods
W4 Andean Glaciology
W5 Model Parameter Estimation (MOPEX-5)
W6 Transferring Hydrological Data Across Scales
W7 Land-use and Water Quality Relationships in Ungauged Basins
W8 Isotope Tracers and Remote Sensing Techniques for Assessing Water Cycle Variability

Pierre Hubert, IAHS Secretary-General

Competition winners

Gwyn Rees (with Frances Watkins) drawing the winners from the correct entries.

The correct answer to the question:

> Which contributors to the *Hydrological Drought – Processes and Estimation Methods for Streamflow and Groundwater* book have won the IAHS Tison award?

is: Bente Clausen, Henrik Madsen and Lena Tallaksen.

The winners, drawn randomly from the correct entries, are: Hesham Fouli (Univ. Alberta, Canada), Sharad K. Jain, (NIH, Roorkee, India) and Fernando Lamego (SEAIA, Brazil). A copy of the book is on its way to each of them.

The book prizes were donated by the European Commission ASTHyDA project.

Contents

A Note to Members

Handing over the presidential plate.

When Cate Gardner asked me whether I wished to maintain my predecessor's tradition of writing a few words for each issue of the newsletter, I quickly replied "yes" without giving much thought as to what I would write. On this first occasion, however, there is no problem in finding a subject – the Foz Assembly.

So, let me start by applauding the success of the Assembly and expressing my thanks, and that of the whole Association, to all who worked so hard to bring about this success. In this I address myself to those of you who attended in such large numbers and to those institutions and agencies which paid your expenses so that you might do so. I salute in particular those who paid their own way to Foz. You came to Foz in large numbers, of course, because so many of you responded to the call for papers and put a lot of time and effort into presenting the results of your work. This leads me to thank those who convened and organized each of the various symposia and workshops. Their reports appear elsewhere in this issue and my pleasure is to thank them for the long hours they devoted to their task, with all its tensions and frustrations. Last, but not least, we owe much to our Secretary-General and to all the local organizers who ensured that everything went so well.

We should also thank Brazil, Argentina and Paraguay for sharing with us the natural wonder of the Iguaçu Falls, the man-made wonder of the Itaipu Dam and the vast invisible presence of the Guaraní Aquifer.

It was, of course, in Foz that I had the honour of taking over from Kuniyoshi Takeuchi the Presidency of the Association. The last four years have been a period of continued growth and activity for IAHS and we owe Kuni a great debt of gratitude for his leadership over this period, particularly the launch of the PUB initiative, the success of which was so evident in Foz.

After the Assembly, my wife and I visited Patagonia—a very beautiful region where the importance of the cryosphere is very evident. The photograph (opposite) could equally well be entitled "President contemplating future close cooperation between the newly formed ICSIH and CCS" (see p. 3).

Our attention must now turn to IAHS' participation in the next IUGG Assembly, which will be held in Perugia, Italy, 2–13 July 2007. Louise Heathwaite (VP) is working with the Commissions and others to prepare a programme for this and in September Pierre (SG) and I will be discussing it with the other Associations in the Union – after which we will be in a position to announce it more widely.

Thinking in the longer term, over the past 18 months I have been seeking your views on how well the Association serves you as individual hydrologists. In Foz, I was able to present a summary of the responses that I received. The following are a few of the points from that presentation:

I received 64 replies from 26 countries. All answered my questions and 19 specifically referred to IAHS as "their association". Fifty-four members made a total of 121 suggestions for action.

Some of the positive comments were:
- IAHS encourages a diversity of ideas and opinions from around the world.
- The Newsletter and web site are much appreciated.
- In IAHS publications, there is a good balance between papers from developed and developing countries.
- The PUB initiative is most welcome.
- The lack of a membership fee is important.

Some of the negative comments were:
- Papers published by IAHS are not very relevant to hydrological practice.
- IAHS appears too much as a club of research workers and academics.
- The rules and regulations of IAHS do not facilitate grass roots initiatives or offer any incentive for younger hydrologists.
- Meetings are too long and too expensive to attend.
- There is a lack of recognition of the Association at national level.

The suggestions included:
- Flatten the structure of the Association and reduce bureaucracy.
- Encourage the wider membership to come forward with ideas and initiatives.
- Develop a role for National Representatives and undertake joint activities with national hydrological societies.
- Keep in contact with individual members.
- Continue to develop the web site and Newsletter as a means of sharing information and thus promoting hydrological science.
- Establish a four or eight-year plan for conferences and other activities.
- Make available the results of scientific research to a wider non-specialist community and to practitioners.

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IAHS is a nongovernmental scientific organization dedicated to serving the science of hydrology and the worldwide community of hydrologists.

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

Articles and letters 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, preferably by e-mail to: *iahs@ensmp.fr*, alternatively to:

Pierre Hubert, Secretary General IAHS *Fax* +33 1 64694703
Ecole des Mines de Paris, 35 Rue Saint Honoré, F-77305 Fontainebleau, 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*

Next deadline for copy

Articles must be received four weeks before the month of publication. The next issue, NL84, will be published in November 2005; the copy deadline is 31 September 2005.

– Maintain objectivity and sensitivity in reviewing submitted papers.
– International meetings are vital to the IAHS. They should include a mix of both large and small and general and specialized events.

I agree with some of these comments and proposals and I disagree with others. I list them here only as examples of what was said in the replies I received. Over the next six to twelve months I will analyse further the full set of responses, in co-operation with VP Chris Leibundgut, and we will submit our findings to the Bureau and finally to the General Assembly in Perugia in 2007.

Finally, I turn to quite a different subject: our links with the World Water Council. IAHS has been a member of the Council since it was founded in 1979 and has held a seat on its Board of Governors throughout this period. Accordingly, I now sit on the Board on behalf of the Association and see my purpose as being to promote the interests of the hydrological sciences, and individual hydrologists, in the wider world of freshwater. At present the Council's main concern is to ensure that the Fourth World Water Forum, which will be held in Mexico City from 16 to 22 March 2006, will be as successful as its three predecessors.

In recent discussions with Daniel Zimmer, the Executive Director of WWC, Pierre and I tried to identify ways of making our membership of the Council of more direct benefit to you, our members. One outcome is that you will shortly receive a copy of the WWC newsletter with a proposal that, if you find it to be of interest, you advise the Council's Secretariat accordingly so that you might receive subsequent issues – all free of charge, of course.

As President-elect I sought your advice. As President, I have even more interest in your views – on what I write in these pages, on the activities of IAHS, and on the role that the Association might play in freshwater issues in general. So please feel free to write or call me—see the IAHS web site for my co-ordinates—or better still send a message to: *arthuraskew@greenmail.ch* I look forward to hearing from you and writing to you again in future issues of the Newsletter.

Onelli Lake, Patagonia, Argentina
Amazing place! A lake full of small icebergs that had been calved by a series of massive glaciers.

Arthur Askew, President

ICSI becomes CCS and ICSIH is born

The former International Commission on Snow and Ice (ICSI) became the Union Commission of Cryospheric Sciences (CCS; decision of the IUGG EC, at Boulder, August 2004) and should become a full IUGG Association in 2007. A new IAHS Commission devoted to Snow and Ice Hydrology, the International Commission on Snow and Ice Hydrology (ICSIH) was launched during the IAHS Assembly in Foz and its provisional Bureau has been appointed.

John Pomeroy
President of the new IAHS Commission on Snow and Ice Hydrology, ICSIH

Mission Statement for the International Commission on Snow and Ice Hydrology

Water stored as snow and ice is a critical contribution to the world's available freshwater supply and is essential to the sustenance of natural ecosystems, agriculture and human societies. The formation, vaporization and melting of snow, ice and soil frost are important and dynamic components of the hydrological cycle, and hold an inordinately important role in runoff formation and streamflow generation. Snowmelt water and soil frost play major roles in runoff generation and soil moisture replenishment for both cold regions and uplands, and river flow from these source regions is extremely important to more temperate and often downstream areas. River and lake ice affect water flow and may result in catastrophic flooding.

Snow and ice have been studied as core components of hydrology since its inception and their dynamics are key to hydrological functioning for much of the world. There is a community of snow, ice and soil frost hydrologists who have need for international scientific exchange and dialogue with the greater hydrological community. Further, there is great value to be gained by international hydrology from advancing the level of understanding of, and expertise, in the dynamics of snow and ice in the hydrological cycle. The goal of the ICSIH is to promote the scientific study of the processes of snow and ice dynamics and the influence of snow and ice on the environment, runoff generation, rivers and lakes, with an emphasis on the seasons and regions where the solid phase of water and its subsequent runoff are prevalent. This goal will be achieved by:

(i) advancing the rigorous study of snow and ice dynamics in hydrology by enhancing collaboration and the exchange of information between various national research traditions relating to snow and ice hydrology,
(ii) promoting targeted research and collaboration on snow and ice topics of high priority for scientific and technical advancement in hydrology, and
(iii) making the state-of-the-art and practical tools available to researchers who deal infrequently with snow and ice hydrology through educational and informative initiatives.

The ICSIH will therefore promote both the advancement of snow and ice hydrology research and the familiarization of the international community with advanced techniques stemming from this research. ICSIH will also liaise with other groups interested in snow, ice and soil frost such as the Union Commission on Cryospheric Sciences, the International Permafrost Association and the International Association for Meteorology and Atmospheric Sciences.

Interim ICSIH Bureau, 2005–2007

President: Prof. John Pomeroy, Univ. Saskatchewan, Canada
VP: Prof. Lev Kutchment, Russian Academy of Sciences, Moscow, Russia
VP: Dr Daniel Marks, Dept of Agriculture, USA
VP: Dr Philip Marsh, NWRI, Environment Canada, Canada
Secretary: Dr Regine Hock, Stockholm Univ., Sweden

Reports from Foz do Iguaçu 3–9 April 2005

Sediment Budgets, S1

Main convenor: Des Walling

This very successful Symposium was organized by ICCE, and its success provides a clear indication of both the strength of current interest in the field of erosion and sedimentation and the vitality of the commission, which is often viewed as being somewhat peripheral to the main focus of IAHS. Because of the large number of abstracts submitted, the Symposium programme extended over the full five days of the Assembly and resulted in the production of two prepublished proceedings volumes (IAHS Publs 291 and 292) edited by Des Walling and Art Horowitz. These extend to a total of more than 700 pages and contain more than 80 papers. They were complemented by a CD, containing full versions of 26 of the poster papers and a further 23 abstracts, which had been compiled by Fernando Campagnoli, Newton Carvalho and Geraldo Wilson, and generously produced and distributed free of charge by the Brazilian Association for Engineering Geology and the Environment (ABGE) and the Brazilian Water Resources Association (ABRH). Most of the full papers included in the CD were presented as posters.

For a few of the older participants, the Symposium provided a very welcome opportunity to revisit both Brazil and the theme of Sediment Budgets, since ICCE had organized another very successful Symposium on the same topic in Porto Alegre, Brazil, almost 17 years ago, in 1988. It was, however, particularly sad that Marc Bordas, who had played a major role in staging that Symposium had passed away. Foz do Iguaçu was the final stop and dispersal point for the field excursion that followed the Porto Alegre Symposium and it was therefore particularly appropriate that this Symposium was able to link to both a theme and a location from nearly 17 years ago.

A brief perusal of the substantial (590 page) Red Book produced for the 1988 Symposium (IAHS Publ. 174) provides a useful basis for assessing scientific progress in the field of catchment sediment budgets. Back in 1985, attention was really only just beginning to be directed to the study of sediment budgets. Emphasis was still very much on monitoring and predicting sediment yields at the outlet of a catchment and there were few attempts to delve into the internal functioning of the catchment and to investigate sources, transfers and sinks, and thereby establish an overall sediment budget. Papers presented at Foz do Iguaçu clearly demonstrated our increasing awareness of the complexity of slope–channel transfer and the importance of flood plain and channel storage and our greatly improved understanding of these important aspects of sediment delivery.

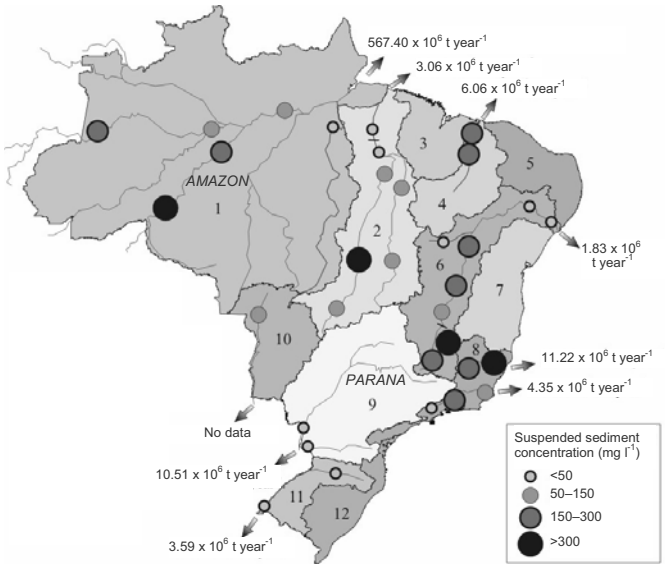
The programme for the Symposium at Foz do Iguaçu was logically structured to deal firstly with the main components of the sediment budget, namely, Sediment Mobilization and Sediment Sources, Sediment Transport and Transfer, Sediment Storage, and, finally, Sediment Yield. It then progressed onto Sediment Budgets *per se*, Modelling Sediment Budgets and their Components, Human Impacts on Sediment Budgets and Sediment Problems and Sediment Management Strategies. As with other recent IAHS Scientific and General Assemblies, where there is no direct link between the symposium convenors and the Assembly Organisers, who are responsible for registrations, etc., the problem of "no-shows" introduced some uncertainty into the programme schedule. Fortunately, however, most of those who were scheduled to present papers were present and there were very few gaps.

The Local Organization Committee provided excellent support for the Symposium, both in terms of the venue and its facilities, and by coordinating the pre-loading of Powerpoint presentations, which greatly assisted in providing a rapid and smooth transition between speakers. All presentations were of a high standard and it was interesting to note that all speakers made use of the digital projector and that slides and transparencies appear to have been totally superceded. There were useful discussion periods after many of the programme sessions and at the end of the final day.

With more than 70 papers presented over the five days of the Symposium, it is difficult to highlight particular contributions, but it is useful to give brief details of the coverage of some of the papers, in order to provide a clearer indication of the scope and content of the Symposium. The truly international flavour of the Symposium merits a special mention. There were papers from many different areas of the world, including North America, Australia, Europe, Africa, Asia and particularly South America, and authors came from more than 30 countries. The two Brazilian co-convenors, Newton Carvalho and Edmilson Teixera had, in particular, succeeded in encouraging the attendance of a good number of Brazilian participants. In addition, it was interesting to note the increasing level of international collaboration evidenced by a significant number of contributions.

In the sessions dealing with *Sediment Mobilization and Sources*, the work undertaken by the Laboratory of Soil Erosion and Fluvial Processes at Moscow State University, in documenting the sediment budgets of small slope catchments, provided the basis for two particularly interesting and valuable papers and the important contribution of studies involving the use of Cs-137 measurements and sediment fingerprinting or source tracing was emphasized by several of the papers presented. An interesting paper from a Belgian team documented the unusual example of a catchment, where a large proportion of the suspended load represented authigenic iron compounds originating as chemical precipitates, rather than particles eroded from the catchment surface or channel network.

Similarly, the papers presented within the *Sediment Transport and Transfer* session provided clear examples of the potential of new perspectives and new technology to provide an improved understanding of sediment behaviour. Work on the influence of wildfires on aggregate form and particle properties, behaviour and fate, reported by a joint UK–Australian study, and work on sediment cascades in mountain catchments in the Alps of southern Germany, provide two examples of such developments. Turning to *Sediment Storage*, the potential of new technology was graphically demonstrated by two papers dealing with the use of high-resolution field laser scanning for detailed mapping of surface topography, and by papers exploiting the potential of environmental radionuclides, and more particularly Cs-137 and excess Pb-210, to document sediment accumulation rates and to investigate the important role of river flood plains in storing fine sediment. The papers on *Sediment Yield* covered a wide range of topics, but those describing results from the host country were of particular interest. Important new work on documenting the sediment load of the River Amazon at Obidos, at the outlet of the world's largest river basin, undertaken by a joint French-Brazilian group was presented and



Suspended sediment fluxes in large river basins of Brazil. Diagram courtesy of Jorge Lima

Jorge Werneck Lima and his colleagues provided a valuable overview of the sediment loads of the major rivers basins of Brazil. A map produced for the latter paper was appropriately used to illustrate the covers of the two proceedings volumes.

The papers in the sessions dealing with *Sediment Budgets* covered both methodological aspects and the results of work on establishing budgets. Several emphasized the need to pay more attention to the organic component of the sediment budget, both in terms of carbon cycling and situations where the organic fraction represents a major, or even dominant, component of the total sediment yield from a catchment. Others provided valuable insights into the sediment budgets associated with arctic and alpine drainage basins and the use of sediment budgets in developing erosion control and sediment management strategies. The papers included in the sessions on *Modelling Sediment Budgets and their Components* covered a wide range of modelling techniques and applications, including cellular landscape models, the application of the WEPP Model in a small Austrian catchment, and the use of remote sensing information to improve the temporal resolution of the representation of vegetation cover density. Studies dealing with *Human Impact on Sediment Budgets* reported in the Symposium provided valuable examples of the sensitivity of sediment budgets to climate and land-use change and dam construction, drawn from many different areas of the world. These papers were usefully complemented by those in the final sessions, which focused on *Sediment Problems and Sediment Management*, and dealt primarily with countering reservoir sedimentation problems.

The Symposium provided clear evidence of considerable ongoing activity in the field of sediment budget investigations and of the importance of the sediment budget concept for erosion control and sediment management. Major advances have been made since the last ICCE Symposium on this topic was held in 1988 and there can be little doubt that further advances are ongoing and that it will merit further revisiting in the future.

I would like to take this opportunity to thank my co-convenors Art Horowitz, Newton Carvalho and Edmilson Teixera for their invaluable support throughout the process of organizing and staging the Symposium.

Des Walling, University of Exeter, UK

IAHS Press has a few copies of the CD, email us if you want one.

Sustainable Water Management Solutions for Large Cities, S2

Main Convenor: Dragan Savic

The theme of this Symposium was appropriate as urbanization and its associated environmental impacts are occurring at an unprecedented rate, thus making water for cities a topic of paramount importance for the sustainability of urban areas and for water resources.

The call for abstracts attracted 82 submissions from 30 countries. Forty-nine were invited for full paper submission. The four conveners organized the review process for the full papers, which resulted in 27 high-quality submissions accepted for oral presentation and 12 as posters.

Sixteen papers grouped into four sessions were presented over two days (a relatively large number of authors were unable to attend the conference, mostly for financial reasons). However, the sessions were well attended and some of the empty slots were filled by impromptu, but topical and interesting presentations by several eminent scholars. For example, Prof. Uri Shamir presented results of a European-funded project on optimization of pump scheduling for the water distribution system of Haifa (Israel), while Prof. Ian Cluckie presented the UK Flood Risk Management Research Consortium and its views of urban flooding issues.

The first session *Integrated Water Resource Management, and Sustainability* began with the key-note presentation given by Prof. Slobodan Simonovic on: *The disaster resilient city: a water management challenge*. Starting from a definition of resiliency, he demonstrated both theoretical and practical work on utilising the fuzzy set theory for system performance evaluation. He finished his presentation by adding results from a real case study in Canada, which were not available at the time the paper was submitted for publication in the proceedings. Among the other nine papers in this, the longest session of the Symposium, that presented by Dr Adeloye on the *Sustainable water management solution for Ibadan City, Nigeria*, attracted much attention.

The second session was devoted to *Sustainable Development of Water Resources and Eco-environmental Issues*. In many regions there is a need for capacity building to promote integrated water resources management, pro-poor water management, water conservation, awareness of the importance of freshwater, water use efficiency, groundwater protection, public–private partnerships for the delivery of water supply and sanitation services, consistent with the goals set in the United Nations Millennium Declaration together with relevant commitments under the Johannesburg Plan of Implementation of the World Summit on Sustainable Development. The paper by Ducrot *et al*. addressed the issue of the development and application of participative simulation tools for Sao Paulo in Brazil and introduced multi-agent simulation tools and role-playing games. These tools were introduced to mitigate problems with the limited representation of local communities when dealing with water resources management problems in the area.

The second day began with *Urban Drainage/Flooding and Wastewater Management.* The devastation of urban flooding caused by low preparedness and risk awareness in Dresden (Germany) was brilliantly illustrated by Dr Kreibich, who presented the results of the study on consequences of the extreme flood event in August 2002. She also presented analysis of the situation after the flood and mitigation measures taken to improve the situation in the city. Another interesting paper presented by Dr Milisic introduced numerical

tools for sediment management in sewers. With increasing urbanization, increasingly strict laws on surface water pollution, and expected climate change, proper management of sediments in urban drainage systems is becoming more important. Current knowledge on sewer sediment behaviour such as erosion, transport, and deposition is limited. Dr Milisic introduced a CFD (computational fluid dynamics) model for solids transport in sewers and its application to storage-settling basins. Dangers of over-exploiting groundwater resources were brought to the attention of the participants by Dr Cisneros-Iturbe who presented the case of Mexico City. Because of groundwater over-exploitation and subsequent differential ground subsidence experienced over the last 50 years, the capacity of surface drainage channels in the city decreased from 60 to 7 $m^3 s^{-1}$. In order to increase the capacity to drain water out of the city, the deep drainage system was designed and the first phase implemented in 1975. The tunnels of the new system are built at depths ranging from 50 to 200 m below the city and have diameters of between 4 and 6.5 m! Although the system is considered an engineering success, it is effectively a monument to an unsustainable water management policy.

The final session was devoted to *Water Quality, Monitoring and Management*. The topics covered by these papers range from the design and implementation of a water quality monitoring network in Atlanta (USA), through the impact of wastewater discharges from Alexandria (Egypt) to effects of urbanization on water quality in Shijiazhuang (China).

The Symposium was successful in a variety ways. Although not available to delegates at the time, the proceedings (IAHS Publ. 293) provides a valuable reference document containing case studies, recommendations on improving water system management and tools for better understanding the behaviour of urban water systems. Many papers addressed problems and concerns that water managers have faced in recent years. Solutions for correcting or alleviating such problems were also proposed. The delegates listened attentively to the presentations, as demonstrated by the number and depth of the questions asked of the authors afterwards.

Dragan Savic, University of Exeter, UK

Dynamics and Biogeochemistry of River Corridors and Wetlands, S4

Main Convenor: Louise Heathwaite

This Symposium brought together dynamic and exciting biogeochemical research that focuses on a range of environments, from pristine wetlands to managed agro-ecosystems, and examined both natural and anthropogenically-driven processes.

Several contributions focused on South America. Pedro Depetris (Univ. Nacional de Córdoba, Argentina), gave an insightful background to the Paraná River and surrounding area (including Foz do Iguaçu), and examined episodic changes in river chemistry following ENSO-driven floods that connected flood-plain waters to the river network. Laura De Cabo (Museo Argentino de Ciencias Naturales, Argentina), looked at phosphorus and suspended sediment dynamics in the lower Paraná River and Virginia Barros (Univ. da Regiao de Joinville, Brazil) presented a study on the environmental pollution issues in Babitonga Bay, Brazil. Links between flood-plain lakes and the Amazon River were considered by Marie-Paule Bonnet (Laboratoire des Mécanismes et Transferts en Géologie, France) and Patricia Moreira-Turcq (IRD-Institut de Recherche pour le Developpement, Brazil), as part of a wider development programme funded by the IRD. Both speakers were able to show how flood-plain lakes were a key source of redox solutes, such as arsenic and organic carbon, to the Amazon River, with major implications for seasonal changes in the biogeochemistry of this river.

The role of flood plains as a solute source rather than a sink, as is commonly thought, was also considered by Louise Heathwaite (Lancaster Univ., UK). Here, combined field and laboratory evidence showed how bioavailable phosphorus was released from flood-plain sediments and subsequently transported into the river network during controlled flooding events. Managed flooding of this area of the Norfolk Broads, UK, was for bird conservation; however, the additional flooding caused a water quality problem through phosphorus mobilization and transport. In contrast to these environments where flood plains and rivers waters are closely connected, Katarzyna Glinska-Lewczuk (Univ. Warmia and Mazury, Olsztyn, Poland) was able to show how artificially disconnected oxbow lakes suffered from reduced water quality and habitat degradation. In this case, it was argued that oxbow lakes needed to be reconnected to the main river channel to improve these habitats.

The impact of long-term and short-term acidification was also considered. David Dewalle (Penn State Univ., USA) showed that long-term changes in nitrogen emissions in response to the US Clean Air Act has had no influence on stream nitrate concentrations in the Mid-Appalachians, as around 63–96% of the nitrogen inputs were retained within the catchment. In contrast, Joanna Clark (Leeds Univ., UK) showed how short-term acidification of peatland soil water due to sulphur redox reactions temporarily reduced organic carbon concentrations by reducing their solubility. These integrated field and laboratory studies provided contrary evidence to other explanations of reduced water colour during droughts, which have included physical changes in the peat structure and low flows from peatlands in general.

Ecohydrological models for management of water quality were also considered within this Symposium. The role of spatial complexity in terms of understanding key locations for certain biogeochemical processes (e.g. denitrification) was a key theme for both Gunter Wriedt (UFZ Environmental Research Centre Leipzig-Halle, Germany) and Valentina Krysanova (Potsdam Institute for Climate Impact Research, Germany) in studies of managed European catchments. The utility of models in less data rich areas that also have key management issues was addressed as well. For instance, Adrian Gallardo (Univ. Tsukuba, Japan) presented work on denitrification processes within an agrarian system in Japan, and Adriano Da Paz (Univ. Federal do Rio Grande do Sul, Brazil) showed how modelling could be used to understand vegetation dynamics in a pristine wetland (Taim wetland, southern Brazil) where environmental protection legislation prevented site access.

Other speakers also considered the link between hydrology and ecology. Don Rosenberry (USGS) showed how extreme climate change from exceptionally dry to exceptionally wet years caused radical and rapid changes in wetland ecology in North Dakota. Cong Zhentao (Tsinghua University, Beijing, China) gave perhaps the most memorable talk of the symposium on a river restoration project in China. Construction of a dam on the Tarim River, China, in 1972, caused extreme degradation of a once lush riparian habitat by the cessation of downstream flow. The project showed that the dust bowl created by the dam had been restored to its former state by simply diverting water into the old river channel.

Louise Heathwaite, Joanna Clark

Contribution from Glaciers and Snow Cover to Runoff from Mountains in Different Climates, S5

Main Convenor: Regine Hock

During this two-day Symposium, 27 oral and 10 poster presentations were given by participants from 17 countries. The presentations covered a wide range of topics and geographical regions including the Andes, Himalaya, North America and Europe. The methods employed spanned monitoring, modelling and remote sensing. A number of presentations addressed the effects of ongoing and future climate change on glacier runoff and water resources and others included state-of-the-art modern modelling approaches. The Symposium clearly demonstrated that, despite the significant recent advances in methods and modelling techniques, much uncertainty remains due to the lack of data series of sufficient length and quality for trend analyses, model input and model validation. More data are needed, particularly in the Andes, Himalaya and the Arctic.

Regine Hock, University of Stockholm, Sweden

Regional Hydrological Impacts of Climatic Variability and Change with an Emphasis on Less Developed Countries, S6

Main Convenors: Thorsten Wagener & Stewart Franks

This Symposium was the first organized by the newly formed International Commission for the Coupled Land–Atmosphere System (ICCLAS). We had a very large number of abstract submissions (almost 140) which resulted in a three-day Symposium and two pre-published Red Books (Wagener *et al*., 2005, and Franks *et al*., 2005; IAHS Publs 295 and 296).

The meeting room was close to full or even full during the entire symposium (capacity about 40 people). The problem of clashes with other sessions was noted, which made it difficult for some to attend all the talks they wished to. The poster sessions also seemed well attended.

Most talks were very interesting and good feedback was provided to the speakers in the subsequent discussion. It seems inclusion of the emphases on "hydrological impacts of climate" and "less developed countries" brought considerable attention to the Symposium and attracted many talks and papers.

Thanks to Harald Kunstmann for being a chair in this Symposium with the convenors. And, thanks also to Carlos de Oliveira Galvão and Carlos Nobre for their contributions to this ICCLAS Symposium.

Prediction in Ungauged Basins: Promises and Progress, S7

Model improvements through detailed process studies, S7-1

Convenors: Stefan Uhlenbrook & Xu Liang

One of the major sources contributing to large uncertainties in hydrological predictions for ungauged basins comes from inadequate understanding of important physical processes and how to represent/parameterize them adequately in a model framework across different scales. This topic found wide interest at the Symposium and about 50 abstracts were submitted for this session. The main goal was to bring together researchers who investigate different aspects of reducing model prediction uncertainties through better understanding of physical processes and better incorporation of this understanding into modelling schemes across different scales. The session was successful with these objectives, as the quality of the presentations, both oral and poster, was very high. Many case studies from various hydroclimatic areas were presented. This clearly demonstrated the amount of research that is carried out in this research direction. The session was also very well attended and many participants contributed to the discussion.

Stefan Uhlenbrook, Delft, The Netherlands

Model evaluation and comparison: uncertainty analysis and diagnostics, S7.2

Convenors: Stewart Franks & Thorsten Wagener

We received 65 abstracts for this session, which were spread out over oral (one day) and 24 poster presentations. Approximately 150 people attended the sessions.

The general quality of presentations and posters was high, illustrated by the high attendance being maintained until the end of the 40-minute discussion at 17.30.

Some of the highlights were the talks by David Post: Linking sediment budgets to land-use characteristics, Neil McIntyre: Error treatment regarding ungauged streamflow predictions in the UK, and Berit Arnheimer: Value of modellers' experience in reduction of model uncertainty.

A gap (missing speaker) in the morning was filled with intense discussion, that centred on the question of what amount of process complexity is required in hydrological models to solve the PUB problem.

A few themes were dominant: reducing and representing model structure uncertainty, distinguishing sources of uncertainty; appropriate methods for less developed countries; and applications in Brazil. Much of the discussion related to reduction of uncertainty through both improved methods of regionalization and improved process understanding; also, the development and sharing of hydrological databases, the need for international collaborations, and the general need for better data to support advances in modelling. Although the subject was touched upon by a few presentations, there was little on new methods of model diagnosis.

Thanks to Erwin Zehe, Neil McIntyre and Hoshin Gupta for covering as chairs for this Symposium.

New data collection approaches and model development, S7.3

Convenors: Venkat Lakshmi & Peter Troch

This session dealt with the use of remote sensing and data assimilation in solutions to the PUB problem. The papers had varying techniques: a few were completely observations, some were modelling-based studies and a few integrated data and models to carry out assimilation. The remote sensing papers covered a host of sensors from ground-based (for gravity) to satellite-based (microwaves for soil moisture, visible and infrared for vegetation estimation). The geographical regions were well represented with studies on basins in Asia, Europe, North and South America and Australia.

The invited papers dealt with data assimilation in the context of field experiments and the use of gravity to estimate

the water stored in the soil column. Estimation of soil moisture, rainfall and runoff and the techniques that were used to determine them, were the major hydrological themes. The use of GIS and Digital Terrain Models helped to tie some of these techniques together.

Venkat Lakshmi, Univ. South Carolina, USAi

New distributed modelling approaches and methods for testing models against observations, S7.6

Convenor: Erwin Zehe

The quality of most of the oral and poster presentations was very good to excellent, and addressed a wide range of themes:

- the Representative Elementary Watershed (REW) approach as a novel framework for hydrological models and related closure problems,
- possible benefits from coupling models from hydrology and ecology (e.g. habitat models),
- use of the hillslope storage Boussinesq model to derive response functions depending on the shape of hillslopes,
- questions of parameter upscaling,
- regionalization,

with a focus on the fact that parameter uncertainty does not look as bad as usually presented by, e.g. Beven, if we look not at the mariginal distributions but at the structure of the parameter space.

The posters addressed the following main topics:

- the REW model,
- scaling framework of the topographic index when using DEM of different resolutions,
- threshold behaviour in catchments and how to represent them in process models,
- application of wavelets to analyse rainfall and possibly streamflow,
- novel approaches for modelling groundwater flow in fractured aquifers.

Discussion in the poster session as well as in the oral sessions was very good. There was a strong positive feedback from several participants, that the session was one of the highlights in the PUB Symposium.

Erwin Zehe, PIK, Potsdam, Germany

Hydrology 2020: What should we target now? W1

The Hydrology 2020 Working Group organized this workshop. Six (Taikan Oki, Stefan Uhlenbrook, Kate Heal, Harouna Karambiri, Jeanna Balonishnikova and Pierre Etchevers) of the dozen members of the Group were present in Foz do Iguaçu. The aim was to present the "first final" draft of the Group's report and to ask for comments and inputs from the attendance; the report will be published in the IAHS Red Book series later in 2005.

At the start of the day-long workshop, there were about 20 people in the room, but a few hours later, the room was full with about 40 people, including many personalities: Kuni Takeuchi (outgoing IAHS president), Arthur Askew (incoming IAHS president), Gert A. Schultz (International Hydrology Prize 2005), Avinash Tyagi (WMO), etc.

The seven chapters of the H2020 report were presented prior to open discussion:

Introduction (Preface & Chapter 1). Taikan presented an overview of the group (origin of its formation, members, etc.) and its activities (water issues and crisis, group's meetings, mission statement, H2030WG as post-H2020WG, etc.).

Hydrology and Water Resources Management for Sustainable Development in the 21st Century (Chapter 2). Kate presented a summary of the biggest chapter of the Red Book about water issues, societal needs and the roles hydrologists and hydrology have to play.

World Water Resources, Water Use and Water Management (Chapter 3). Jeanna presented a global view of water resources distribution and uses, and also the future water availability scenarios.

Contemporary Issues in State of the Art (Chapter 4). Pierre described the current gaps in hydrological knowledge and the future trends. These included hydrological processes, measurement techniques and modelling.

Intersection of Hydrology and Other Disciplines (Chapter 5). Harouna presented the uniqueness of hydrology and its interactions with other sciences taking the examples of urban systems, agriculture and hydroecology.

Scientific, Technological and Organizational Bottlenecks (Chapter 6). Kate presented the current bottlenecks of hydrology organized in three groups (scientific, technological and organizational). She also demonstrated how the group proposed to overcome some of these bottlenecks, using flow charts.

Conclusions: Key Messages, Recommendations, Concluding Remarks (Chapter 7). Taikan presented the conclusions of and recommendations.

At the end of the first part of the session, poster authors were invited to discuss their posters, but unfortunately, only one (Florian Pappenberger) was present. He gave a short presentation about his poster entitled: *Disillusioned visions for hydrological and hydraulic modelling at my retirement age beyond (in?) 2020*, by F. Pappenberger & K. J. Beven.

The discussion session consisted first of drawing up a list of all questions and comments, followed by answers and comments on these from the Hydrology 2020 Group members.

The questions and comments included:

- A global hydrological Secretariat, as proposed by the group, could centralize all information related to funding sources.
- What do we propose as alternatives to the "polluter pays principal" approach?
- What is the independence between the urban water supply and surroundings, mainly for big cities?
- People felt that there was too much emphasis on quantitative hydrology and not enough on water quality.
- In developing countries, diffuse pollution is a problem as well as massive point pollution (also the case in more developed countries).
- What can we do, as a hydrological community, to prevent pollution in developing countries? What is our role there? This concerns the problem of big firms from rich countries, which produce in developing countries and do not care enough about the environment rules.
- What will/should happen with the recommendations of the H2020 report?
- Water management should not be the focus of the report, the focus should be on hydrological science.
- Who will be the target users of the H2020 report? Reply: scientists, policy makers (two-page summary), young scientists
- How to develop better education in hydrology? How can we involve more young people in hydrology?
- We have to think of developing a global cooperative network for young hydrologists. Reply: Yes, this can be a duty for IAHS.
- Remote sensing requires close cooperation with other disciplines and needs more emphasis in our book.
- We need to define strategies to implement our recommendations. People would like to see specific actions after all the recommendations in the H2020 report.
- Resources should be put into the observation and less into the calibration of models.

- Interdisciplinary projects often do not work, as there is very often no real cooperation between the disciplines. How can we bridge the gap between disciplines?
- How far did we consider the needs of the water managers?
- It was suggested to add more personal views, less reviewing of current issues.
- Look carefully at the mission statement of H2020 and fulfill that.
- Make clearer how we expect the recommendations to be realized.

Harouna Karambiri

Hydrological basis of dam safety with respect to floods, W3

Main Convenor: Andreas Schumann

Seven presentations (of nine accepted abstracts) were given. Though small, the workshop was a success as all presentations were of good quality and stimulated interesting discussions. It became obvious that the strong practical orientation of the workshop, which was attractive for more than 20 participants, limited the number of submitted contributions. Often a mixture of different scientific methods and tools (e.g. hydrological modelling and statistics) has to be used to estimate design floods. Some of the methodological developments in these fields (e.g. in hydrological modelling) were also discussed in other parts of the Assembly. As a result, the attraction of this workshop (the only event at the Assembly specifically dedicated to dams), was a bit limited. Nevertheless the discussions have shown existing gaps in methodologies which are applicable for the estimation of design floods. The comparison of country-specific solutions demonstrated that the different preferences are mostly based on traditions, as no method seems to be significantly better than others. One of the results was the tendency to unification of deterministic and stochastic approaches (e.g. by differentiation between different types of flood events in statistical approaches or stochastic generated input series for deterministic hydrological models).

Andreas Schumann, Ruhr University Bochum, Germany

Andean Glaciology, W4

Main Convenors: Jefferson C. Simões & Georg Kaser

Seventeen papers on a wide spectrum of Andean glaciology, from mass balance studies of small tropical glaciers to the morphology of Patagonian fjords, were discussed. Other topics included the impact of the Andean glaciers recent melting on the water resources of the South American countries.

On the second day, the third meeting of the Andean Snow and Ice Group of the IHP (PHI-LAC UNESCO) discussed proposals for joint glaciological work and data exchange in South America. Scientists from Argentina, Bolivia, Brazil, Chile, Ecuador, France and Peru presented reports about current and future glaciological research in the region. There will be a field course on glacier mass balance studies in Bolivia this August, supported by UNESCO.

This successful meeting was the last of the International Commission on Snow and Ice (ICSI). This IAHS commission became the Commission for the Cryospheric Sciences of the International Union of Geodesy and Geophysics (IUGG/CCS) shortly after the IAHS meeting in Foz do Iguaçu. Under IAHS' umbrella, a new commission has been formed called the Commission for Snow and Ice Hydrology (ICSIH).

Jefferson C. Simões, Porto Allegre, Brazil

MOPEX Model Parameter Estimation, W5

Main convenor: Alan Hall

The fifth Model Parameter Estimation Experiment (MOPEX) workshop, held at Foz do Iguaçu, was a follow-on from the MOPEX-4 workshop organized by CEMAGREF (Paris, July 2004), and utilized all or part of the US MOPEX data sets of 348 basins and the seven years of data for 65 basins in the south of France used in MOPEX-4. Thirteen papers and one poster were presented from France, USA, Canada, China and Denmark. These considered different parameter estimation techniques and associated issues:

- local and global parameter optimization using 313 world-wide basins
- use of vegetation characteristics from 221 French basins to determine GR4J model parameters
- comparison of lumped and distributed (4 km) snow and runoff model parameters using the NWS HL Research Modelling System
- transferability of soil-based algorithms using the Sacramento model in 12 US MOPEX basins
- comparison of *a priori* and calibrated NOAH model parameters in 12 US MOPEX basins
- the effect of different time steps in several rainfall–runoff models in 40 French basins; use of point measurements and physical and climate characteristics to classify basins into categories in more than 1000 basins from which mean parameters are determined from gauged "hydrological neighbours"
- local and global search algorithms applied to increasingly complex models, based on the MIKE SHE model, to define the desired level of model complexity
- comparison of calibrated and uncalibrated parameters derived for the VIC-3L model and their sensitivity
- use of a filtering approach of *a priori* estimates from physiographic and phonologic data to reduce the degrees of freedom in the automatic calibration of distributed models using an efficient pattern search technique, Stepwise Line Search, in 23 NWS Texas basins
- use of similarity measures and multi-model simulations in ungauged basins using 40 French basins
- the use of comparatively high resolution land surface characteristics compared to a coarser global parameter data set from the Global Soil Wetness Project in the land surface SWAP model applied to 12 US MOPEX basins
- the impacts of using physical heterogeneities of basins on the performance of lumped and semi-distributed approaches in 307 French basins.

The final session of the workshop was a review of the results of the three distributed and ten lumped model results used in the MOPEX-4 workshop to simulate hourly runoff on 3, 12 and 40 French basins in both gauged/calibrated and ungauged/*a priori* mode and the conclusions drawn from this analysis. This was followed by a review of the issues of model parameter estimation and future directions of MOPEX.

Alan Hall, Hoshin Gupta, John Schaake, Vazken Andreassian

Transferring Hydrological Data Across Spatial and Temporal Scales, W6

Main Convenor: Lawrence Martz

This workshop was convened to jointly address the goals of the Continental Scale Experiments (CSE) and the Water Resource Application Project (WRAP) of GEWEX and those of the PUB initiative of IAHS. It does so by examining an issue frequently raised in earlier WRAP workshops, namely, that the capacity to downscale global and regional data and model outputs is a prerequisite to the widespread application of GEWEX and similar research results to address many

important water resource management issues. The primary goal of PUB is to reduce the uncertainty of hydrological predictions for small and intermediate sized basins. For many data-sparse areas of the world, the ability to extract information of an appropriate scale from available global and regional datasets will be critical to achieving that goal. Cold regions are one of the most extensive poorly gauged areas on Earth and, therefore, submissions concerning some of the unique scaling problems encountered in these regions were encouraged. The Workshop attracted a series of papers focussed on the issues of down-scaling of precipitation fields (a primary driver of hydrological models), and on the possibilities of fractal methods for down-scaling a variety of model parameters and inputs. The workshop provided an opportunity for a series of papers reviewing the science plan and possibilities of the Hydrologic Ensemble Prediction Experiment (HEPEX).

Lawrence Martz, Univ. Sakatchewan, Canada

Land Use and Water Quality Relationships in ungauged basins, W7

Conveners: Kate Heal & Heyddy Calderon

The presentations covered a wide range of techniques and scales for investigating the relationships between land use and water quality.

Session 1 focused on modelling and global scale relationships, including presentations on using genetic algorithms in river water quality models and assessing uncertainty in sediment fingerprinting methods. The presentation on modelling anthropogenic nitrogen loads in rivers, given by Charles Vörösmarty (Univ. Virginia, USA), generated much discussion.

Session 2 concentrated more on case studies of land use and water quality relationships from river basins in northern Argentina, the Ecuadorian Amazon and southwest Scotland. These demonstrated that specific water quality monitoring and flux calculation methods are required for individual basins, depending on the water quality issues. In the final oral presentation, the continuing relevance of a modified version of the SCS curve number equation was shown for a water supply basin in the USA.

The single poster presentation described the selection of background basins for assessing water quality change in northern Argentina.

Kate Heal, The University of Edinburgh, Scotland, UK

Isotope Tracers and Remote Sensing Techniques for Assessing Water Cycle Variability, W8

Workshop W8, organized jointly by ICT and ICRS, included a total of 16 oral and six poster papers. These highlighted multi-disciplinary approaches including tracer hydrology, remote sensing and integrated modelling which are required to embrace the challenge of prediction in ungauged basins (PUB). Stable isotope tracers were discussed mainly in view of their use for field-based assessment of variability in streamflow sources, flow pathways, groundwater–surface water interaction, residence times, evaporation–transpiration partitioning and precipitation–runoff processes. Remote sensing techniques were discussed, including capabilities for defining basin morphology, surface state variables, precipitation and evapotranspiration heterogeneity, as well as recent advances that establish potential for measuring a wider range of dynamic processes such as riverine discharge. The workshop was a great success in that it encouraged interdisciplinary discussion beyond illustrating the specific contributions of tracers and advanced technologies for defining predictability in regional and global water cycles.

John Gibson

Tison Awards, 2004 & 2005

Left:
Dr Francis Chiew
2004 Tison Award winner

Right:
Dr Sheng Yue
2005 Tison Award
winner with Dr Askew

Dr Francis Chiew was presented with the 2004 Tison Award (see NL80 or the web site for the citation), and then the 2005 award was made to Dr Sheng Yue. The citation was as follows: The Jury of the 2005 Award, Dr Zbigniew W. Kundzewicz (Chair), Dr Katumi Musiake and Dr Demetris Koutsoyiannis, decided to recommend making the 2005 Tison Award to Dr Sheng Yue. The winning paper, *Canadian streamflow trend detection: impacts of serial and cross-correlation* was published by Yue, S., Pilon, P. & Phinney Y, B. in *Hydrological Sciences Journal* in February 2003 (vol. 48(1), 51–63).

When publishing the winning paper, Dr Yue was employed by Environment Canada. Since then he has moved to the United States, working first with the US Environment Protection Agency and recently with Hazen & Sawyer, Environmental Engineers and Scientists, in New York.

The authors of the winning paper compared the power of statistical tests to assess the significance of monotonic trends. Beyond simulation studies, they applied the methodology to practical assessment of the significance of trends in the annual maximum daily flows of 30 Canadian pristine river basins. The winning paper, studying impacts of serial and

cross-correlation, emphasized important, and commonly overlooked, restrictions of considerable practical importance in change detection. In the competition for the 2004 Award this paper was also nominated and narrowly lost to Dr Chiew.

Dr Yue has been very supportive to *HSJ*, publishing several papers (another was on the list of candidates for the 2005 Award and the June 2005 issue contains a paper by Yue & Pilon) and providing competent, useful, and timely reviews.

There were ten candidate papers competing for the 2005 Tison Award, that is far more than in any other year. Sometimes, one single paper is unanimously regarded by all evaluators as THE top candidate and the matter is clear and easy, but this was not the case in 2005. Seven co-authors under 41 years of age, eligible for the Tison Award, that is: Dr Aksoy, Dr Cigizoglu, Dr Kiem, Dr Kisi, Dr Tchiguirinskaia, Dr Xiong, and Dr Yue deserve warm congratulations.

View from an IAHS novice

Having been a (passive) member of IAHS for some years, this was my first opportunity to experience IAHS "in action". The VII IAHS Scientific Assembly was held at the Rafain Palace Hotel in the small city of Foz do Iguaçu, situated next to the common border of Brazil, Argentina and Paraguay, and only a few kilometres from the spectacular Iguaçu Falls. The hotel made an excellent choice of venue providing cool, spacious conference rooms for the numerous symposia and workshops as well as general meeting areas including café-bars, swimming pools and hammocks under palm trees. The meeting atmosphere was very friendly and relaxed and it was easy to meet and talk to people, be it during a debate over a controversial poster (Florian Pappenberger's poster on the utility, or otherwise, of modelling, springs to mind) or while queuing for access to the Internet.

A huge amount of science, social activities and meetings was fitted into the five days of the Assembly. Symposia and workshops were held in parallel and the choice of where to be at any time was sometimes difficult. I took a "pick and mix" approach. Dashing in and out of the various lecture rooms, I managed to attend most of the talks that I had pencilled into my schedule (and to keep fit at the same time). A personal highlight was W8 (Isotope tracers and remote sensing techniques), in particular Jeff McDonnell's presentation on: Isotope tracers and terrain analysis techniques. I was also very interested in Joanna Clark's presentation (S4–Dynamics and Biogeochemistry of River Corridors and Wetlands) on the sulphate controls on dissolved organic carbon dynamics in blanket peat. My own presentation, placed in S7–PUB), was conveniently scheduled for the first conference day and was well attended and received.

Various scientific and social trips were on offer, including a technical visit to the world famous Itaipu Power Scheme as well as trips to the Brazilian and/or the Argentinean side of the Iguaçu Falls.

Most evenings were taken up by meetings and/or social gatherings. I was particularly interested in the meetings of the IAHS commissions and workgroups as this provided an opportunity to gain some insight into the organization and work of IAHS. Working mostly on groundwater chemistry, I joined the International Commission on Groundwater (ICGW) and was immediately encouraged to get involved in the organization of the IUGG meeting in Perugia in 2007. As a novice to IAHS as well as to the international hydrology "scene", I welcomed the encouraging attitude towards young scientists that I (and, I hope, others) experienced during the meeting.

The IAHS banquet was held under the palm trees of the Rafain and was accompanied by Brazilian music and dancers. Dinner and dance were followed by "swimming pool" activities which could best be described as some sort of water-rugby and were well attended by international delegates.

Corinna admiring the view, in Rio de Janeiro

For me, the Assembly has proved an interesting and enjoyable start to what I hope will be a long-lasting involvement in IAHS activities and events. Before finishing my report, I would like to thank IAHS and the organizers for a successful conference and express my gratitude to the British Geological Survey as well as to the British Hydrological Society (Exeter Fund) whose generous financial support enabled me to attend this meeting.

Corinna Absesser

2005 International Hydrology Prize Citation and Reply

Dr Askew's citation was as follows:

"It is a great pleasure and honour for me to present the 2005 International Hydrology Prize to Gert Schultz.

Gert was born in Wuppertal in what was then referred to as West Germany. He obtained a diploma in civil engineering from Munich, a Masters degree from the University of the Witwatersrand in South Africa, and he returned to Munich to obtain his Doctorate in 1967. Within civil engineering, he specialized in hydrology, developing the first computerized rainfall–runoff model in Germany.

For a couple of years he worked for a consulting company, before Erich Plate engaged him to lead research projects at the University of Karlsruhe. There he developed further his interest in water resources management and obtained his Habilitation, the key to his long and distinguished carrer as a university professor.

It was during this time that we first met, appropriately at the much-quoted Symposium on Mathematical Models in Hydrology convened by IAHS in Warsaw in July 1971.

Some six years later, he was engaged to head the newly-established Hydrology and Water Management Institute at the University of Bochum in the position of a full professor—a position that he held until his retirement four years ago.

Gert's academic career involved a one-year sabbatical leave which he spent touring water institutes in the USA, but he has also been engaged over the years in numerous consulting projects in Africa and Asia and it is from this close association with the practice of hydrology that he gained his passion for the application of our science to real-world problems, in particular the use of remote sensing, that is so evident in the many papers that he has published—something over 160 in total. It is worth noting that a quarter of these papers are to be found in IAHS publications and so Gert must rank as one of the most faithful IAHS authors.

However, his contact with developing countries has not been restricted to the role of visiting expert. He has been very active in arranging for overseas students to study in Bochum and he has a worldwide reputation as a great teacher. I recall the lectures that he gave to a class of some 250 in Nanjing back in 1978, patiently and slowly presenting his material under the restriction of sequential interpretation—not an easy task for any speaker!

I have mentioned the many papers that Gert has published, but his output has also involved work with WMO and UNESCO. In the early 1970s he contributed to the second edition of the WMO Guide to Hydrological Practices and in the 1980s he served UNESCO as their Rapporteur on Remote Sensing. He was also a member of the WMO/UNESCO Joint Working Group on Hydrological Data for Water Resources Projects. He is therefore one of the many who have been associated with all three of the organizations which support the International Hydrology Prize.

Using IAHS as an avenue for publishing papers is welcome, of course, but Gert went further and offered his services to the Association and during the 1980s and 1990s he held many positions, including Vice-President and then President of ICRSDT, Associate Editor of HSJ, Chair of the IAHS/WMO Working Group for GEWEX and member of the IAHS Bureau. More than this, in 1998 he joined with our good friend Chris Leibundgut to found the German IAHS National Committee.

IAHS, WMO and UNESCO, but more—from 1991 to 1994 Gert was a Regional Director and then Vice-President of the International Water Resources Association, while at national level, he served for many years on the Senate Commission for Water Research and as a member of the Board of Directors of the German Water Resources Association.

Gert Shultz—an engineer with his feet on the ground, and his eyes on those high-flying instruments that give us remote sensing data; a man with a concern for the sustainable management of water resource; with a passion for applying the results of cutting-edge research in the hydrological sciences; a professor concerned to pass on knowledge to future generations; and one who has committed much of his life to the international dimension of our discipline, wading through the hours of meetings and piles of paperwork which are necessary if that dimension is to serve the world comunity as it should. It is therefore with great pleasure that I present Gert with the 2005 International Hydrology Prize."

Reply by Gert Schultz:

"Dear Arthur, dear friends and colleagues, if my parents were still alive, my father would be very proud of me today and my mother, she would have believed every word, you said, Arthur! I wish to thank you, Arthur, very much for your friendly speech, I want to express my gratitude to those, who nominated me, to the jury who selected me and to IAHS, UNESCO and WMO for the prize.

When the past IAHS president John Rodda sent me his congratulations, he wrote "I am very happy that you are joining the band". I am not quite sure, however, which instrument I am supposed to play in the band, if we were a musical band. If I look at the famous squad of the previous prize winners, I am afraid I may be good enough only for playing the triangle or the drum, or perhaps the third violin.

If somebody wins a prize, it is rarely due to the work of one single person alone. Usually it results from the cooperation between many people. Therefore I wish to mention here my three academic teachers:

1. Prof. Des Midgley from South Africa, who was the supervisor of my Master's Thesis in Johannesburg.
2. Prof. Fritz Hartung of the Technical University Munich, Germany, with whom I did my PhD work, and
3. Prof. Erich Plate, with whom I did my Habilitation work to become a senior lecturer at the University of Karlsruhe, Germany.

Furthermore I wish to thank the large number of highly qualified colleagues, who worked with me at the Ruhr University Bochum.

I have often been asked: "how come that you became a hydrologist and not—as a civil engineer—a hydraulics man or an expert in hydraulic structures?" The answer is simple. When comparing my early scientific work at a hydraulics lab with my activities in hydrology I made an interesting discovery: in the field of hydraulics we were able to improve the efficiency of some hydraulic structures by say 3 to 5%. In hydrology, however, we could improve the efficiency of water management systems by something between 20 and 25%. And thus I decided to invest my modest intellectual capital, where I got the higher interest rate!

When I began my work at the newly installed institute in Bochum in the late seventies, I had a wonderful task: I had a reasonable number of staff, money for an interesting research programme and I was free to decide what I intended to do. So,

first I wanted to set up the basic principles for our new research programme and I ended up with two maxims:

1. Since there was at that time an unhealthy separation of hydrology from water management I wanted to establish a reconciliation of research in the field of hydrology with the development of scientific methods in water management,
2. I wanted a reconciliation between theory and practice by bridging the gap between the two in our field of hydrology and water resources management.

On the basis of these two maxims the research programme was established and combined with consulting work in Germany and other countries, mainly in Africa and Asia, in order to verify our research results in practice.

Now I wish to say a few words, about how I personally experienced IAHS over more than three decades. If I compare our association with other national and international associations, of which I am a member, I must say that IAHS is unique! This is due not only to the fact that its hydrologists are working on a very high scientific level, it's rather due to its members and the way they deal with each other. In other associations I am Dr Schultz, in IAHS I am Gert; in others we are colleagues, here we are friends; in others there is rivalry, here nobody grudges anybody anything; in other associations they have formal dinners with boring speeches, in IAHS we have banquets, where we sing—all together or country by country!

It is due to this spirit and attitude, that I like so much to go to IAHS meetings and why I am happy to have become an IAHS prize winner. Belonging now to this band I had a closer look at the previous prize winners and came to the conclusion that most of them are not only excellent scientists, but also real characters. So I thought, it might be worthwhile to shed some light on two of these characters, thus getting some insight into the psychology of International Hydrology Prize winners.

Example 1: Eamon Nash from Ireland, the inventor of the famous "Nash-Cascade-Model", 1989 Prize.

Eamon and I got to know each other quite well while we were giving a hydrology course in 1978 in Nanjing, China, on behalf of WMO shortly after China had opened to the world. So Eamon and I had to spend most of our time in our hotel doing things like learning to eat with chopsticks. Thus we tried and succeeded in eating single peanuts with chopsticks. Then Eamon suggested: "let's try to eat two peanuts in parallel with chopsticks", which is rather difficult. Eamon succeeded, I did not.

For our last evening in China we were invited for dinner by a high-ranking politician in Beijing. It was very formal, many toasts were proposed: "on peace and friendship", "on friendship and peace and cooperation", and so on. During our conversation the politician suddenly said to me: "you are not very good at eating with chopsticks". Unfortunately this was true, since several pieces of food were lying around my plate. Eamon Nash didn't like what the politician said to me. So he took his chopsticks and said to the politician: "can you do this?" And he picked up two peanuts in parallel from his plate with the sticks and ate them. The politician watched that, puzzled, took his chopsticks and tried to do the same and failed. He tried again, failed again and gave up. So Eamon looked at him reproachfully and said: "by the way, you are also not very good at eating with chopsticks!"

Example 2: Igor Shiklomanov, from Russia, 2001 Prize 2001.

Igor and I served for many years as members of the Scientific Steering Group for GEWEX, a major research project of the World Climate Research Programme. We had our annual meetings in many cities of the world and one year we met in Frascati, Italy. One day a group of us walked through town to find a restaurant for dinner. We were surprised to see Igor carrying his bag all the way and told him, he could have left it in the meeting room. But Igor said: "You wait!". Later, in the restaurant we ordered our food and wine and I was served a soup. When I started eating, Igor said with a smile: "Gert, you can't eat your soup that dry!". I asked: "what do you mean by a dry soup?" He then opened his bag, pulled out a bottle of good Russian Vodka and started to pour some Vodka into my glass. We were rather surprised and said: "Igor, you shouldn't do that, the manager of the restaurant may not appreciate it!". So Igor, who had brought the bottle all the way from Russia—not for his own delight, but rather to bring some pleasure to his international friends—said a little disappointed: "I will put the bottle away only under the condition, that you will drink some Vodka with me in my hotel room after dinner". So we agreed and had a very pleasant dinner. When back in the hotel, Igor requested our presence in his room, each with his toothbrush-glass in hand. He poured a big chunk of Vodka into our glasses and we made bottoms-up and shouted "Nastravje". Around midnight we wanted to go to bed. But Igor said: "not before you have finished the Vodka". So we drank the whole bottle and eventually staggered along the hotel corridors back to our rooms. The next morning we were late at the meeting and had headaches, but remembered joyfully—thanks to Igor—an unusual evening and night.

At the end of my talk I would like to briefly touch on two developments in the field of hydrology, which, to me, seem also significant for the future:

1. Hydrology and meteorology grow together. We can hope now that after, say, 10 years there will be coupled atmospheric and hydrological models being able to produce ensemble predictions of future conditions in hydrology (e.g. after a climate change) with a reasonable degree of accuracy expressed in the form of a narrow bandwidth of the predictions. Then, hopefully, the proliferation of more-or-less useless modelling results based on just one single GCM and only one single set of initial and boundary conditions pretending to predict climate change impact on hydrology will come to an end.
2. Presently we observe a fascinating development: hydrology moves away from its monodisciplinary perspective. Since the principle of Sustainable Development became dominant, it is necessary to consider the impact of hydrological modelling results and their consequences on several other disciplines. It became necessary to quantify and evaluate this impact not only on technical systems, but also on ecology, economies and social conditions. This recently gave rise to many complex multidisciplinary research projects, some of which intend to develop formalized Decision Support Systems which will help to find good—if not optimum—solutions for the benefit of mankind. A really fascinating task!

I was glad to learn this morning that the "Hydrology 2020" Working Group of IAHS, in its present report, sees this interdisciplinary approach also striving for "desperately needed holistic solutions".

Ladies and gentlemen, Eamon Nash once had to give a General Report at a symposium and was speaking for too long—like me—and the chairman indicated that he should come to the end. So—in the middle of a sentence—he interrupted and said: "the chairman tells me to shut up and go away, and that is exactly, what I am going to do". And that, Ladies and Gentlemen, is also exactly what I am going to do now.

Thank you very much!"

Consortium of national hydrological organizations

Origin

Further to discussions held with the IAHS Secretary General- by different national associations on various occasions and within some of the national associations, a meeting attended by Arthur J. Askew, President IAHS; Pierre Hubert, Secretary-General, IAHS; Jose Nilson B Campos, President, Brazilian Water Resources Association (ABRH); P. Rajendra Prasad, Secretary, Association of Hydrologists of India (AHI); and Lekan Oyebande, Nigerian Hydrological Association, was held in Foz do Iguaçu.

In the light of the acute water problems experienced by many nations, it is felt that a concerted effort with a synergic approach can address many of these issues. It is high time the national hydrological organizations used their collective expertise to advocate suitable action plans for local and regional development, taking into account also the valuable experience of IAHS. To realize this, it is suggested that a network of national organizations acting as a Consortium for international cooperation, under the banner of IAHS, be created. It was agreed that such a Consortium could have a vital role to play in strengthening the national associations through channeling information and technology from international to national associations. Other international organizations could also be important partners with IAHS in nurturing this Consortium. The representatives of the national associations of Brazil, India and Nigeria were asked to provide a brief write-up on the possible scope and objectives of the Consortium and the expectations from IAHS.

Scope

National hydrological and water resources associations have been established in many countries. The effectiveness and visibility of these associations varies considerably from one country to the next. In most cases, many of these associations are desperately isolated and have no or limited international exposure to developments in hydrology. It is therefore highly desirable and beneficial if these associations are assisted to pool together to form a Consortium. The Consortium expects guidance and help in getting exposure to the state-of-the-art technologies, professional approaches to local and regional problems, eventually leading to in-house capacity building.

Objectives/functions

To expand the scope and influence of IAHS by providing an avenue for channeling expertise already developed within IAHS for the benefit of the national associations.

The involvement of IAHS may include sponsoring of experts, bi-annual Consortium conventions in association with a national association in their country followed by training workshops, etc.

To generate a resource bank consisting of free domain software, a virtual library containing scientific contributions by individuals and institutions (perhaps by providing links), and selected IAHS publications in electronic form which may not undermine its revenue prospects.

Efforts to impart and improve professionalism and research capabilities among the scientific community of the developing nations.

In addition to the above mentioned scientific activities, the international cooperation is expected to lend its contacts and credibility to facilitate the national associations to persuade their governments to involve the pool of expertise available in their nations to design and develop proper strategies for the development of the water sector.

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IAHS Commission and PUB Officers, National Representatives and Correspondents

IAHS Commission Officers

Please note that the presidency of several IAHS commissions changed hands at Foz do Iguaçu (presidents elected at Sapporo in 2003 were installed), and also that the the PUB Working Group is now chaired by Jeff McDonnell; see the back page. Full details of all officers are available at *www.iahs.info*

Newly appointed representatives

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Calendar of Meetings Organized/Sponsored by IAHS

2005	Conference	Contact details
Midrand, Gauteng, South Africa 5–7 September	12th South African National Hydrology Symposium: *Managing Water for People and the Environment*	Lesley Stephenson, PO Box 327, Wits 2050, South Africa stephenson1@ebe.wits.ac.za; http://www.ru.ac.za/institutes/iwr/index.html
Menton, France 7–10 September	Sixth EWRA International Confrence: *Sharing a Common Vision for Our Water Resources*	M. Jean-Marie Monget, CIG, Ecole des Mines de Paris, Rue Claude Daunesse - BP 207, F-06904 Sophia Antipolis Cedex, France tel: +33 4 93957513; fax: +33 4 93654304; jean-marie.monget@geointelligence.org http://www.cig.ensmp.fr/~iahs/conferences/2005mentonewra.pdf
Belgrade & Kotor, Serbia 14–19 September	*Water Resources & Environmental Problems in Karst* – Cvijic 2005	Igor Jemcov, Faculty of Mining & Geology, Belgrade University, Djušina 7 St 11000 Belgrade, Serbia & Montenegro tel/fax: +381 11 3241 557; science@cvijic-karst2005.org.yu
Guangzhou and Three Gorges, China 17–23 September	International Conference on Reservoir Operation & River Management (ICROM)	Chairman of FM2S, c/o Prof. Yangbo Chen, Sun Yat-Sen University, Center of Water Resources & Environment, 135 Xingangxi Rd, Guangzhou 510275, Guangdong, China fax: +86 20 3402 2397; hydrolab@zsu.edu.cn
Irkutsk, Russia 19–25 September	Second International Conference on: *Fundamental Problems of Investigation and Use of Water Resources*	Prof. Leonid Koritni, Institute of Geography, Ulanbatorskay, 1, Irkutsk 664033, Russia tel: + 7 3952 426460; fax: 7 3952 422717; koritni@irigs.irk.ru
Shanghai, China 23–28 October	Seventh International Symposium on Land Subsidence	Prof. Agen Zhang, The Centre for Land Subsidence, China Geological Survey
Nanjing, China 30 October–1 November	International Symposium on: *Methodology in Hydrology*	Prof. Liliang Ren, College of Water Resources and Environment, Hohai University No 1 Xikang Road, Nanjing 210098, P.R. China fax: +86 25 83787364; hydro2005@hhu.edu.cn
Montpellier, France 22–24 November	International Seminar in the UNESCO–IHP–FRIEND programme: *Climatic and Anthropogenic Impacts on the Variability of Water Resources*	gil.mahe@msem.univ-montp2.fr http://www.hydrosciences.org heading: Conference
2006/2007		
Mexico City, Mexico 16–22 March 2006	Fourth World Water Forum: *Local Actions for a Global Challenge*	http://www.worldwatercouncil.org
Ohrid, Fyr, Macedonia 23–26 May 2006	BALWOIS 2006: *Water Observation and Information Systems for Decision Support*	Mr Marc Morell, BALWOIS Project Coordinator, c/o IRD AGROPOLIS, BP 64501 F-34394 Montpellier, France tel: +33 4 67 63 64 20; GSM: +33 6 08 35 22 48; fax: +33 4 67 41 21 33 secretariat@balwois.net
Guangzhou, China 8–10 June 2006	*Hydrological Sciences for Managing Water Resources in the Asian Developing World*	Prof. Chen Xiaohong, Dr Tao Jiang and Mr Dong Ke, Dept Water Resources and Environment, Sun Yat-Sen University, Guangzhou 510275, China tel.: +86 20 8411 5901; fax: +86 20 8411 4575; eesjt@zsu.edu.cn; eeskd@zsu.edu.cn
Paris, France 30 June–1 July 2006	VIIIth IAHS-UNESCO Kovacs Colloquium	Pierre Hubert, IAHS Secretary-General iahs@ensmp.fr
Dundee, Scotland 3–7 July 2006	ICCE International Conference: *Sediment Dynamics and the Hydromorphology of Fluvial Systems*	John Rowan, Environmental Systems Research Group, Department of Geography, University of Dundee, Dundee DD1 4HN, UK tel: +44 (0)1382 344024; fax: +44 (0)1382 344434; j.s.rowan@dundee.ac.uk http://www.dundee.ac.uk/geography/IAHS2006
Bochum, Germany 26–28 September 2006	3rd Symposium on Integrated Water Resources Management: *Reducing the Vulnerability of Societies Against Water Related Risks at the Basin Scale*	Andreas Schumann, Secretary ICWRS, Ruhr-Universität Bochum; Fakultät für Bauingenieurwesen, Lehrstuhl für Hydrologie, Wasserwirtschaft und Umwelttechnik D-44780 Bochum, Germany tel: +49-234/32-24693; fax: +49-234/32-14153; andreas.schumann@rub.de
Belgrade, Serbia & Montenegro September 2006	XXIII Conference of Danubian Countries on Hydrological Forecasts and Hydrological Water Management Bases	Tioslav Petković, Hydrometeorological Institute of Serbia tel: +381 11 35 37 834; fax +381 11 35 37 821; t.petkovic@hidmet.sr.gov.yu
Havanna, Cuba 27 November–1 December 2006	Fifth World FRIEND Conference: *Water Resources Variability: Processes, Analysis and Impacts*	Dr Eduardo Planos Gutierrez, Chairperson Local Organizing Committee, Instituto de Meteorologia, Loma de Casablanca S/N, Municipio Regla, CP 11700, APDO, 17032 Ciudad de la Habana, La Habana, Cuba planos@met.inf.cu http://www.friend-amigo.org/conferencia2006/
Perugia, Italy 2–11 July 2007	XXIVth IUGG General Assembly	Prof. Lucio Ubertini lucio.ubertini@uniroma1.it http://www.iugg2007perugia.it/

Hydrological Sciences
for Managing Water Resources
in the Asian Developing World

Hydrological science and engineering for solving water problems—Sustainable water resources management—Management of the water environment

International conference: 8–10 June 2006 Baiyun Hotel, Guanzhou, China Language: English

Conference website: http://cwre.zsu.edu.cn/mwra Abstract submission deadline: 31 October 2005

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International Association of Hydrological Sciences
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Ecole des Mines de Paris, 35 Rue St Honoré
F-77305 Fontainebleau, France

Registration, please use the form at the web site and contact::

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For information about the Commissions and other groups visit their web sites via www.IAHS.info or contact:

ICSW, Surface Water
President: Siegfried Demuth, demuth@bafg.de
Secretary: Hege Hisdal, Norwegian Water Resources and Energy Directorate, Middlethunsgate 29, PO Box 5091Maj., N-0301 Oslo, Norway
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ICGW, Groundwater
President: Mary C. Hill, mchill@usgs.gov
Secretary: Aldo Fiori, Universita di Roma Tre, Dipartimento di Scienze dell'Ingegneria Civile, Via V. Volterra 62, I-00146 Rome, Italy
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ICCE, Continental Erosion
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Secretary: Dirk de Boer, Department of Geography, University of Saskatchewan, 9 Campus Drive, Saskatoon, Saskatchewan S7N 5A5, Canada
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PUB, Prediction in Ungauged Basins
Chair: Jeff McDonnell, jeff.mcdonnell@orst.edu

ICSIH, Snow and Ice Hydrology
President: John Pomeroy, pomeroy@usask.ca
Secretary: Regine Hock, Dept of Physical Geography, University of Stockholm, SE-10691 Stockholm, Sweden
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ICWQ, Water Quality
President: Bruce Webb, b.w.webb@exeter.ac.uk
Secretary: Peter Heininger, Division G "Qualitative Hydrology", Federal Institute of Hydrology (BfG), Am Mainzer Tor 1, D-56068 Koblenz, Germany
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ICWRS, Water Resources Systems
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Secretary: Andreas Schumann, Ruhr University Bochum, Institute for Hydrology and Water Resources Management, D-44780 Bochum, Germany
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GEWEX Working Group
Chair: Alan Hall, hallalan@acr.net.au

ICRS, Remote Sensing
President: Alain Pietroniro, al.pietroniro@ec.gc.ca
Secretary: Manfred Owe, NASA-Goddard Space Flight Center, MC 974, Greenbelt, Maryland 20771, USA
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ICCLAS, Coupled Land–Atmosphere Systems
President: Hoshin V. Gupta, hoshin@hwr.arizona.edu
Secretary: Thorsten Wagener, Dept of Civil Engineering, The Pennsylvania State University, Sackett Building, University Park, Pennsylvania 16802, USA
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President: John J. Gibson, john.gibson@ec.gc.ca
Secretary: Allan Rodhe, Uppsala University, Dept of Earth Sciences, Air & Water Science Programme, Villavagen 16, SE-75236 Uppsala, Sweden
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Hydrology 2020 Working Group
Chair: Taikan Oki, taikan@iis.u-tokyo.ac.jp

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New and planned IAHS Publications

Seventh IAHS Assembly proceedings volumes—*available from IAHS Press now*

Sediment Budgets 1 Part 1 of the proceedings of Symposium S1
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Publications with selected papers from S3, S5 & W4, S7 (PUB), W5, and the H2020 report (W1) are planned for later in 2005/early 2006.

Just published

Permeable Reactive Barriers

edited by Genevieve A. Boshoff & Brian D. Bone

To meet the growing challenge of groundwater pollution we need to look beyond traditional methods of clean up to "alternative" technologies. Permeable reactive barriers (PRBs) have had success in the remediation of chlorinated solvent contaminated groundwaters and are now recognised for the treatment of other contaminants, both inorganic and organic. Innovations in the field and the long-term performance of PRBs are the focus of this volume.

Publ. 298 (*2005*) ISBN 1-901502-40-6; 176 pp.; price £38.00

Available July 2005

Bringing Groundwater Quality Research to the Watershed Scale

edited by Neil R. Thomson

Pressure on groundwater resources has forced the groundwater science, engineering and regulatory community to recognize the current limitations of research and resource management. Integrated and technically feasible approaches tackling local issues and watershed-scale concerns concurrently are required. After introductory contributions with global and national perspectives, this volume tackles: Contaminant input processes, Site characterization, Management and decision making, Natural attenuation processes and applications, *In situ* remediation, Flow and transport modelling at the national, the watershed and smaller scales.

Publ. 297 (*2005*) ISBN 1-901502-18-X; 560 pp.; price £85.00

Postscript to IAHS Newsletter 83 (July 2005)

The final Symposium report from VIIth IAHS Scientific Assembly

Foz do Iguaçu, Brazil, 3–9 April 2005

Groundwater Resources Sustainability Indicators, S3

Main convenor: Bruce Webb

This Symposium took place on Wednesday 6th and Thursday 7th April, 2005. It was dedicated to the memory of Joop Steenvoorden who, as President of the International Commission of Water Quality, had taken a leading role in developing the ideas for a meeting on sustainability indicators for groundwater resources, but who very sadly and unexpectedly passed away in June 2004.

The Symposium attracted an audience of 20–30 throughout, and in the first session, the papers introduced the topic and focused on the general issues of the indicators and indices appropriate for classification. A keynote address by Jaroslav Verba and his colleagues set the scene very well, and was followed by an entertaining and informative presentation by Roger Parsons, which focused more on specific approaches for classifying groundwater in South Africa.

Modelling was the second theme addressed, and Mary Hill gave a very erudite exposition of the use of models to manage systems subject to sustainability indicators, while Jonathan Whittier presented an interesting account of the use of a groundwater flow model to assess sustainability of riparian habitats in the Lower San Pedro River basin (USA). This was followed by a presentation from Maciek Lubczynski which demonstrated well how modelling studies in Spain (Sardon area) and Botswana (Serowe area) have been used to analyse sustainability of groundwater resources under different hydrogeological conditions and different degrees of socio-economic impact.

The final session of the first day addressed the theme of irrigation and agriculture and included three fascinating presentations from contrasting areas by Abelardo Montenegro and his colleagues dealing with small-scale irrigation in northeast Brazil, by E. P. Querner and his colleagues who explained the use of performance indicators in analysing irrigation water use in the Mendoza area of Argentina, and by Qiuhong Tang and his colleagues, who discussed hydrological processes in the intensively cultivated alluvial plain in the arid upper Tarim River of central Asia.

The programme during the second day was somewhat disrupted by a number of "no-shows" and had to be re-arranged and consolidated to a certain extent. Papers continued the theme of irrigation and agriculture, but also introduced new topics focused more on the quality of groundwater, as well as its quantity, and included discussion of nitrates, surface–groundwater interactions and contamination by industry. The latter included interesting presentations by Mónica D'Elia and her colleagues concerning the role of wetlands in mediating the local impact of industrial effluent in Bahco, Argentina, and by P. Rajendra Prasad and his colleagues, who analysed the role of water quality and groundwater fluctuations in understanding sustainable development and management of groundwater resources in the coastal and urban aquifers of Visakhapatnam, India.

Eduardo Kruse and his colleagues provided further information in the context of irrigation and agriculture through a fascinating presentation on water table fluctuations in the northwest regions of the Buenos Aires Province of Argentina, while Ian Foster and his colleagues very ably demonstrated the use of geoinformatics to estimate nitrate leaching to groundwater in the Azraq Basin of Jordan. The different and intriguing approach of using isotopes to study surface–groundwater interactions was explained in a lively presentation by Xia Jun and his colleagues.

The presented papers were of high quality and generated good discussions. Although it was not possible to pre-publish the proceedings of this Symposium, it is hoped a volume will be produced before the end of 2005. Great thanks are due to my co-convenors, Jaroslav Verba, Ricardo Hirata and Eduardo Kruse, not only for their help in preparing the proceedings, but also in the process of selecting papers for this successful event.

Bruce Webb, University of Exeter, UK

Hydrological Sciences Journal

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In the latest ISI journal citation report (*2004 JCR Science Edition*), the impact factor (IF) of *HSJ* has increased to 1.326. *HSJ* is ranked eleventh in terms of IF in the ISI water resources list (55 journals), and among the top 11, *HSJ* comes second in terms of its immediacy index, 0.382.

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Availability of IAHS Publications in Developing Countries

In the last IAHS Newsletter, NL82, it was anticipated that the list of libraries receiving publications free of charge from IAHS would have been finalized in time for inclusion in NL83. It has not been possible to complete the list as yet, although another six organizations in addition to those listed in NL82 are now receiving publications. They are:

Algeria
Ecole Nationale Supérieure d'Hydraulique
Laboratoire d'Hydrologie
BP31 Blida
Mme B. Touaibia *TFDC 094*

Argentina
Instituto de Hidrología de Llanuras
Republica de Italia 780, CC 44
B7300 Azul
Buenos Aires
Senor Director *TFDC 045*

Cameroon
Centre de Recherches Hydrologiques
BP 4110
Yaoundé
Daniel Sighomnou *TFDC096*

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frances@iahs.demon.co.uk

The organizations receiving free IAHS publications are expected to make them available to all staff, students and visitors.

Multi-lingual Resources for Hydrologists

Dictionary of Hydrological Engineering

Lexique hydrologique pour l'ingénieur

Coordinated by V. Andréassian
With contributions from V. Andréassian, V. Sarkissian, W. Chełmicki, V. A. Stănescu & R. Moussa.

Cemagref Editions, Antony, France, 2005
213 + xxvii pp. ISBN 2-85362-648-2. Paperback. Price €50

The dictionary can be downloaded free of charge at:

http://www.cemagref.fr/Informations/Produits/Lexique_hydro/index.html

Contains a collection of 1936 terms in hydrology and related fields (hydroengineering, hydroclimatology, hydrogeology, hydraulics, metrology, water supply, geomorphology, physical hydrology) in seven languages (English, French, Armenian, Russian, Polish, Romanian, and Arabic).

Electronic version of the WMO/UNESCO ***International Glossary of Hydrology***

Access the glossary free of charge at:

http://www.cig.ensmp.fr/~hubert/glu/aglo.htm

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