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IAHS Newsletter

No. 74 **April 2002**

IAHS at Sapporo, July 2003 (see page 14)

The "kick-off" meeting of the Hydrology 2020 Working Group held in Edinburgh (Scotland, UK) from 23 to 25 January 2002. From *left* to *right*: Johan Kuylenstierna, Guobin Fu, Pierre Hubert (Secretary General IAHS), Wolfgang Diernhofer, Susan Hubbard, Harouna Karambiri, Jeanna Balonishnikova, Stefan Uhlenbrook, Kate Heal, Stewart Franks, Caterina Valeo, Taikan Oki (Chair). ***See page 11 for report***

Contents

From the President

The gender issue has been one of the top challenges facing various organizations. The American Geophysical Union (AGU) seems one step ahead in the geosciences community on this matter. They have a very capable lady President, Marcia McNutt, an outstanding scientist in lithospheric tectonics and mantle geodynamics. I visited the AGU Fall Meeting in San Francisco last December to stimulate the IAHS Prediction of Ungauged Basins (PUBs) discussion to start at AGU. It was a success as I received a good number of supporting messages. In addition, thanks to Soroosh Sorooshian, the former President of AGU Hydrology Division, I had a chance to observe the AGU executive board meeting and join the AGU dinner. The board meeting was very efficient and brief, with a constructive atmosphere, because of the President's remarkable chairing. The dinner was very pleasant too, at a round table with friends including Robert Dickinson, President-Elect of AGU. It was the first time that I have participated in AGU. The venue was in the giant Moscone conference hall that receives several thousands of participants a week. There were many concurrent meetings in a number of rooms. Hydrology seemed to have two to three sessions at the same time. In a huge crowded poster room I was pleased to see a lady scientist presenting her work with a large glass of beer in her hand. It was also great to learn that our friend Jim Shuttleworth had received the AGU Hydrology Prize.

Although we have only three ladies in the total of over 60 current IAHS officers, I believe that IAHS has a promising perspective for the future on the gender balance. I am so glad to know that the first Hydrology 2020 Working Group meeting was successfully held in Edinburgh, Scotland, in January. Out of 12 members chaired by Taikan Oki, it is remarkable to have four lady hydrologists. I believe that the atmosphere of the hydrological community in 2020 will be significantly different from now, not only with different scientific focuses but also with an increase in the number of lady scientists.

It is my great pleasure to see that important IAHS activities are making progress. The IUGG/IAHS Sapporo programme has been decided and includes four IAHS symposia and eight IAHS workshops, as well as many symposia and workshops jointly organized with other IUGG Associations (more information later in this Newsletter). I appreciate very much what Pierre Hubert and all the convenors/co-convenors have done to prepare the programme. Let us make every effort to reach the intended objectives in Sapporo. I am particularly glad to see that several of the planned symposia and workshops are closely related to the PUBs, including erosion, remote sensing, scientific integration and model intercomparison. By the time you read this article, a preparatory workshop on the PUBs will have been successfully held in Kofu at the end of March. The meeting is being organized as part of a MEXT (Japan Ministry of Education, Culture, Sports, Science and Technology) Research-in-Grant exercise and I hope it will create a good starting point for the official kick-off of the IAHS Decade of the PUBs and that the meeting will be fruitful. In addition to AGU, as mentioned above, I know some sessions or discussions on PUBs are also planned during the European Geophysical Society General Assembly in Nice, France, in April and at the Canadian Geophysical Union meeting in Banff, Canada, in May. Thus the PUBs preparation seems to be steadily progressing in many ways. IAHS is a unique organization connecting the scientists and researchers of the developed and the developing world. I believe that PUBs will be another example of such integration, providing excitement both in the developing and the developed world.

Kuni Takeuchi

IAHS Newsletter

The International Association of Hydrological Sciences (IAHS) is a nongovernmental scientific organization dedicated to serving the science of hydrology and the worldwide community of hydrologists. The IAHS Newsletter is issued three times a year (usually in January, May and September) and is distributed free of charge to individuals (not libraries) at the discretion of the Secretary General. Recent issues have been sent to all IAHS members.
Both this Newsletter and previous issues are downloadable from the IAHS web site:
http://www.cig.ensmp.fr/~iahs

Articles should be sent to the IAHS Secretary General, preferably by e-mail to iahs@ensmp.fr, or on diskette in Word, Rich Text Format or ASCII format, or by fax or mail to:

Pierre Hubert, Secretary General IAHS
Ecole des Mines de Paris,
F-77305 Fontainebleau, France
tel.: +33 1 64694740; fax: +33 1 64694703

Next deadline for copy

Articles must be received at least six weeks before the month of publication. **The next issue will probably be published in July 2002 and the deadline for articles is 7 May 2002**.

The Newsletter is edited by Penny Kisby and published by IAHS Press, Centre for Ecology and Hydrology, Wallingford, Oxfordshire OX10 8BB, UK

IAHS Decade of the Prediction of Ungauged Basins

Since scientific hydrology started in the seventeenth century, one of the most difficult problems facing hydrologists is how to predict flow in basins without any records. As a scientific association IAHS is engaged in various activities using science to serve society. One recently launched is that on the Prediction of Ungauged Basins (PUBs). This is the celebrated policy-relevant science theme that came out of the discussions between the 3000 or so members of the Association on the worldwide web. It is a theme based on the current needs of the world, especially the needs of the developing countries, and the scientific readiness of the Association to take on a new commitment. IAHS urges you to contribute your scientific capacity to make the PUBs mission a success.

What is PUBs?

PUBs is an international research initiative to promote the development of science and technology to provide hydrological data where ground-based observations are needed but missing. PUBs consists of *theoretical hydrology, remote sensing, in situ observations and modelling* of the quantity and quality of hydrological phenomena, together with *capacity building* for the people in need so that they can really use the advanced science and technology and predict the hydrological phenomena for the basins concerned. PUBs is *connectivity* for existing programmes *both inside and outside* IAHS that provides *a forum, network and the framework for integration*.

Why PUBs?

Hydrological data are an endangered species. The ground-based observation network is declining in Africa, central Asia, southeast Asia and elsewhere including North America. Yet hydrological data are urgently needed, especially in developing countries, for use in water resources development and management, flood forecasting and for many other purposes. Indeed without these data the task of providing reliable water supplies and sanitation to the billions lacking them is seriously handicapped. While current theoretical and technological developments are remarkable in the case of hydrological process studies, scale issues, physically-based hydrological modelling, remote sensing etc., it is time to bring these developments together and provide the necessary data where they are needed. This will also demonstrate how science is the basis of progress in society.

Available options for PUBs

In order to provide the necessary data in ungauged basins, the following five options are available (obstacles are indicated in square brackets):

1. *Observations on site*: intensive measurements and observations. WHYCOS, FRIEND and stakeholder-driven HELP initiatives [funding problems]
2. By *analogy from nearby gauged basins*: statistical information transfer [spatial information transferability, lack of nearby basins with measurements]
3. *Observations by remote sensing*: TRMM (Tropical Rainfall Measurement Mission), GPM (Global Precipitation Mission), IGOS-Water (Water themes of the Integrated Global Observing Strategy), NOAA (National Oceanographic Administration), JERS (Japanese Earth Resources Satellite), SAR (Synthetic Aperture Radar**)**, GPS (Global Positioning System), laser altimeter (TOPEX/POSEIDON), GRACE**,** for groundwater monitoring etc. [resolution, measurement interpretation, ground truth data, revisiting time]
4. *Hydrological model simulation*: distributed physically-based hydrological models. VIC, TOP, TANK, HEC, SHE etc. [lack of available precipitation, radiation, land surface, water use, regulation and flow data; parameter identification (MOPEX), model transferability]
5. *Integrated meteorological and hydrological model simulation*: meteorological (four-dimensional data assimilation + mesoscale nesting) model + hydrological model [accuracy, data availability on the land surface]

For these options PUBs aims to provide the connectivity, the forum and the network for co-operation and the theoretical framework for integration.

Procedure

1. *Research plan.* The theoretical framework. The science questions that PUBs should address including the methodological framework, the observational requirements, and the evaluation criteria. To be prepared by the Working Group on Experimental and Theoretical Hydrology at All Scales with ICCE, ICASVR, ICGW and others.
2. *Observational plan.* What is feasible by using remote sensing and tracer techniques for PUBs? What *in situ* observations are required for remote sensing to become useful? ICRS to prepare with ICT and others.
3. *Model intercomparison plan.* Identify the available data for calibration and verification. Modellers group. A sub-working group to be established together with MOPEX and WMO.
4. *Connectivity plan with other international activities*:

(a) WHYCOS, IHP (FRIEND) and HELP, so the test catchments and the related data can be identified and compiled;
(b) WCRP/GEWEX programme, since the issue of transferability from the GEWEX continental scale experiment basins to other parts of the globe (mostly ungauged) is a critical GEWEX issue that PUBs can help with;
(c) MOPEX (John Schaake's plan to do a model calibration on a set of global basins);
(d) WMO HWRP for the model intercomparison. There was a series of model intercomparison workshops and publications in the late 1970s and 1980s which were organized as part of the WMO Commission for Hydrology activities.

5. *Capacity building plan.* Including researchers in developing countries and holding training courses at various symposia and workshops. Collaboration with UNESCO and WMO.

Time table

January 2002: Announcement of the initiation of PUBs to the global community

26–27 March 2002: Inter-group workshop in Kofu

June 2002: Approval of PUBs by the IAHS Bureau

1 July 2002: Research plan, observation plan, model intercomparison plan, connectivity plan and capacity building plan to be completed and proposals made

August 2002: The kick-off meeting to approve the PUBs master plan. The members, leadership and terms of reference of the IAHS Working Group on PUBs to be decided. [Place—somewhere in an ungauged basin?]

March 2003: Third World Water Forum in Kyoto. IAHS would like to organize a PUBs workshop on the Mekong led by the science group including IAMAS, IAPSO, WCRP, IGBP, IGOS etc.

July 2003: IAHS Symposium HS01 at the IUGG General Assembly, Sapporo, Japan (more information about this symposium can be found later in this Newsletter)

Indian symposia

Kuni Takeuchi, President IAHS

Stop Press

"A session room—Hydrology for Society: the IAHS PUBs Initiative" will be opened on the Virtual Water Forum (VWF) on 22 March at:
http://www.worldwaterforum.org/vwf
All hydrologists are kindly requested to register and contribute. There is also a link to the VWF from the IAHS web site.

Some Thoughts on Remote Sensing *vs* Extrapolation

In June 2001, President Kuni Takeuchi propagated the suggestion that IAHS should take the lead on a decade-long initiative to further the cause of hydrological science in currently ungauged catchments. This is a major challenge, and subsequent discussion of this proposal among the community has so far revealed a lack of consensus on how best to proceed. Broadly speaking, one portion of the scientific community has suggested placing emphasis on developing remote sensing techniques to estimate the missing data, while another portion is sceptical about the feasibility and reliability of this suggestion, and believe there is greater opportunity in extrapolating aspects of the data available for gauged catchments to ungauged catchments. Here, I argue that, at least at the scale of small catchments, neither of these approaches is sufficient on its own, and preferably both approaches should be used in a complementary setting.

One thing is obvious. If a catchment is currently ungauged, and gauging is needed, the preferred response is to introduce proven in-catchment monitoring systems and methods. Experience shows that the most effective way to obtain and retain deployment of in-catchment gauging is to demonstrate that sustained economic and/or social value results from it. Thus, IAHS can aid the introduction of new, or the retention of existing monitoring by continuing to lobby for this. However, it might be more effective to foster research and publish results that demonstrate the usefulness of gauging to stakeholders in the catchment. Symposia and workshops on the results of the stakeholder-driven research undertaken under the Hydrology for the Environment, Life, and Policy (HELP) programme is one way to do this. IAHS can also contribute to new and sustained monitoring by stimulating, through symposia and workshops, the development and deployment of new, reliable, inexpensive in-catchment monitoring technologies, and simpler and less expensive data collection methods.

If in-catchment monitoring using traditional methods is not feasible or fundable, what can we do then? The only way forward is to estimate the missing measurements in some way. One option is to estimate hydrometeorological forcing variables, or at least to estimate their statistical properties, by assuming similarity with actual measurements from a gauged catchment in the same general climatic region. Given an additional assumption that hydrological models can be made simple but robust enough to estimate the water balance of the ungauged catchment without substantial on-the-ground calibration, progress might then be made.

In the context of the approach just summarized, two important points are relevant.

First, cross-indexing of hydrometeorological information between catchments is greatly aided by the existence of at least some limited data in the otherwise ungauged catchment. It is, for instance, possible to make more reliable estimates of catchment-average precipitation if there are data available from just a single raingauge. Second, regional similarity in hydrometeorological statistics has become a less-credible assumption over the last decade because it is now recognized that there are influences on hydrometeorological variables associated with seasonal-to-interannual and decadal-to-centennial variations in the global system, and perhaps longer-term change resulting from global warming. It is likely, therefore, that the credibility of transferring information from ungauged to gauged catchments will benefit from learning how to use remotely sensed data as a bridge between them and as a measure of whether the common regional hydroclimatic field in which they lie is in some respect anomalous or evolving in time.

In principle, remote sensing systems should be able to estimate some of the most important hydrometeorological variables for ungauged catchments, and there are existing plans to attempt to do this in the current decade. Estimates of surface radiation can already be made routinely with good accuracy using data from weather satellites such as those in the GOES series. Based on the acknowledged success of the Tropical Rainfall Monitoring Mission (TRMM), NASA is now developing an important new mission, the Global Precipitation Mission (GPM), for launch in the current decade. It will involve a derivative of TRMM operating along with several less-expensive "drone" satellites with infrared sensors that will be calibrated against the main satellite to give global estimates of precipitation. The European Space Agency and the National Space Development Agency of Japan are proposing to launch satellites in a few years that will operate in the microwave portion of the electromagnetic spectrum to remotely sense near-surface soil moisture. Other satellite systems are also being investigated to remotely sense frozen precipitation cover and the river stage for large basins.

Developing and exploiting these new satellite-based global observations will obviously be an important and novel challenge for international hydrological science over the next decade that relates directly to IAHS's ungauged catchment initiative. However, the fact that some of the hydrometeorological measurements will only have worthwhile precision when averaged over areas significantly greater than that of many ungauged catchments is a major issue if they are to have practical value in hydrological applications. In due course, as computational capabilities increase, downscaling the remotely sensed data by assimilating them as area-average values into fine-scale coupled hydrometeorological models and making multi-member ensemble model simulations may provide a mechanism to generate substitutes for more traditional data in small ungauged catchments. This may even be feasible in the current decade, not least because several nations, notably Japan with their "Earth simulator" project, are now building computers capable of running global models with a grid scale of around 10 km.

However, there are very substantial unresolved problems associated with implementing models at 10 km worldwide beyond those associated with computational capability, most notably, the fact that some important parameterizations (e.g. globally applicable parameterizations of atmospheric precipitation processes) are not yet proven at this scale. One way to circumvent this last problem might be to relate the statistical properties of hydrometeorological variables observed for gauged catchments to the statistical properties of the remotely sensed or modelled fields, and then to use this relationship with the modelled or remotely sensed data to predict hydrometeorological variables in similar catchments in the same hydroclimatic region. Such an approach would have the advantage of allowing the statistical properties of hydrometeorological variables in both the gauged and ungauged catchments to change together in response to observed or modelled global influences or long-term change in the regional hydroclimatic fields.

Thus, approaching the problem of estimating the hydrometeorological variables in ungauged catchments from two different directions, by extrapolating from nearby catchments on the one hand, and by using remotely sensed data on the other, suggests the need for complementary use of both approaches. There is no conflict between these two approaches and, to gain the greatest benefit when addressing this difficult problem, both are needed.

Jim Shuttleworth, University of Arizona, USA

From the Editor

Another busy year has passed—for the Editor, definitely the busiest ever. In addition to my work at the Research Centre of Agricultural and Forest Environment, Polish Academy of Sciences, Poznan, Poland, I held a part-time appointment at the Potsdam Institute for Climate Impact Research, Germany, and was involved in work on the Third Assessment Report of IPCC. It has not been easy to process the growing stream of new submissions to *Hydrological Sciences Journal* (HSJ) and to cope with other urgent duties in times of peak workload, and I had no leisure time for even longer periods than usual. Fortunately, I could always count on Frances Watkins, the

reliable, concentrated, efficient and hard-working Production Editor. Frances is responsible for the day-to-day administration of the Journal and does the bulk of the copy editing and formatting work on papers accepted for publication. I could also frequently count on the Associate Editors and on an international pool of external referees, who served the journal over the year and whose names are listed in the February issue of vol. 47 (2002).

The new ranking of journals in the Science Edition of the 2000 ISI Journal Citation Reports has again been advantageous to our Journal. A year ago, I stated that a high jump in the impact factor could be a chance occurrence; an upwards oscillation, possibly not sustainable. Indeed, there was a drop in the impact factor this year, but the result is still satisfactory. Among the 47 journals listed in the Water Resources section, HSJ is ranked 12th (13th a year ago), with an impact factor value of 0.861 (1.009 a year ago). The value of the impact factor for the year 2000 was determined as an average number of fast citations (i.e. to papers published in HSJ in 1998 and 1999), calculated throughout all the journals in the ISI database. The total number of citations of HSJ papers in all journals published in 2000 was 613.

The immediacy index of HSJ in the ISI Journal Citation Reports is surprisingly high (0.246—fourth in the Water Resources section!). The immediacy index is the number of quotes to HSJ 2000 papers present in all the journals (in the ISI database) published in 2000, divided by the total number of papers published in HSJ in 2000. So, as a measure of very fast citations, it is a "small brother" of the impact factor. My thanks go to everyone who contributed to this achievement: to all scientists publishing their excellent papers in HSJ and to authors referring to HSJ articles in their journal contributions. Certainly, thanks also go to reviewers (both from the panel of Associate Editors and from outside), whose wise recommendations have helped sustain, and possibly improve, the quality.

According to the rules, the panel of HSJ Associate Editors has 30 members, nominated for a six-year period, who are usually active as authors, reviewers, advisors and promoters of the Journal. Every autumn, the Editor thanks retiring Associate Editors for their long-standing support and collaboration and invites new incumbents to serve. Thus, I had recently the very unhappy task to bid farewell to three loyal and long-serving Associate Editors, nominated in 1995, who have provided regular timely reviews and advice throughout the last six years. They are: Dr Jean-Claude Olivry (France), Dr Erich J. Plate (Germany), and Dr Renata Romanowicz (UK). They have served HSJ very generously and we thank them most warmly for all their help and wise advice over the years. It would be highly appreciated it they could occasionally assist us further when asked to review a paper.

The rotation policy aims at bringing in new ideas and new knowledge from emerging fields of hydrology, and extending the area of competence of the pool of Associate Editors. The new Associate Editors joining us this autumn are: Dr Don Burn (Canada), Dr Valentina Krysanova (Germany), Dr Árni Snorrason (Iceland), and Dr Charles Vörösmarty (USA). Wishing them every success in their new capacity, I look forward to closer collaboration with them and hope that they will be most reliable in competent and timely reviewing of submitted papers. It is expected that Associate Editors will not turn down a review request in their area of expertise, unless indicating another reliable referee.

I am very pleased to have collaborated efficiently with Associate Editors throughout 2001. It is encouraging to know that I can count on so many elite experts and I have been very pleased with the high response rate. I have contacted all of them about three things. As far as a master list of keywords and a more efficient procedure for the selection of reviewers are concerned, both issues turned out to be quite controversial. As no consensus was achieved, I decided not to change the existing procedures. The third request referred to the HSJ review form. Following the increase in the value of the impact factor of HSJ, the number of good papers submitted for possible publication has grown considerably. Referees, sometimes in quite a generous way, often recommend acceptance of new submissions and, as a result, the backlog of accepted papers grows. In addition, the pressure to publish special issues has increased, in which case, there would be less room for "regular" papers in a volume. The 2002 volume (vol. 47) will contain *c.* 160 pages more than the 1000 or so pages that have been published in the past few volumes, and is planned to consist of seven, rather than six, issues, with one special issue. So that the backlog of accepted papers does not continue to grow, we need to ask referees to be more critical.

I saw an opportunity to do this by making major changes to the review form. Based on my experience with a dozen or so journals, for which I reviewed papers (mostly before my time as HSJ Editor), and discussions I had with Frances Watkins and Dr Cate Gardner, I prepared a new review form and distributed it to Associate Editors for comments. Having received 14 suggestions from Associate Editors and IAHS Press, Frances and I finalized the new review form and it is now in use.

I have received several comments on Dr Pierre Hubert's idea of a "best reviewer" award. Apparently, there are as many opponents as supporters, so it is not likely to be implemented for the time being. **It is clear that what qualifies as a good review is a quick response, a 3C (competent, concise and critical) review, preferably sent electronically**.

I am very pleased that Dr Christophe Cudennec (France) continues to help HSJ with linguistic editing of the *titre, résumé et mots clefs*. The collaboration with Christophe is smooth and we appreciate his assistance very much. In addition to taking care of the quality of the French language, he has also provided some useful technical comments.

The work on a special issue, or special cluster(s) of papers, in HSJ in 2002 is progressing; but, as there are still several possible options, it is premature to announce any details now.

In my short article I have concentrated on the Journal, but obviously there is another very important product of IAHS Press—the series of publications and reports (Red Books). The work on Red Books has been proceeding well and in 2001, as every year, several valuable volumes have been published, as summarized in the IAHS Press article later in this Newsletter.

Zbigniew W. Kundzewicz

IAHS Press

Red Books

The following three new titles in the IAHS Series of Proceedings and Reports (Red Books) have been published. A description, the contents and abstracts of each contribution can be seen at the IAHS web site:

http://www.cig.ensmp.fr/~iahs

The Extremes of the Extremes: Extraordinary Floods

Edited by Árni Snorrason, Helga P. Finnsdottir & Marshall Moss

Extreme floods are among the most destructive forces of nature, and there is a perception that they are occurring with higher frequency now than in the past. This is a cause for international concern and calls for an understanding of the circumstances that might generate such disastrous events, and was the motive for the Reykjavík symposium on extraordinary floods, July 2000. The main focus of the papers included in this proceedings volume is the geophysical processes related to floods, but the statistical and mathematical aspects of flood analysis and forecasting are also addressed, and the issues of flooding and flood abatement are put into economic, social and ethical perspective. The papers have been grouped under the following themes:

- ***Physical processes related to floods***
  interplay of snow and ice with rain and temperature; intense mountain precipitation in semiarid areas; glacial outburst floods; volcanic activity and the flood at Vatnajökull Glacier, Iceland, 1996
- ***Prehistoric and historic floods***
  catastrophic floods in Iceland; floods during the North American glaciation; extreme floods on Mars
- ***Floods: case studies***
  from around the world, from the Himalayas to the Mediterranean to Norway
- ***Geomorphological and environmental questions related to floods***
  focusing on glacial floods
- ***Statistical analysis and forecasting of floods***
  extreme value analysis—multivariate considerations—forecasting: theoretical and methodological viewpoints—practicalities of forecasting and flood zone mapping—climate variability and change
- ***Predictability and abatement of floods***
  the fundamental nature of extreme events—how society does and should deal with the threat of flood hazards

Publ. no. 271 (March 2002), price £60.00 (2002 membership price £24.75), 394 + xiv pp., ISBN 1-901502-66-X

Integrated Water Resources Management

Edited by Miguel A. Mariño & Slobodan P. Simonovic

Over the last two decades the way in which we manage water and related natural resources in different regions of the world has changed fundamentally. The organizational models that have worked well for over a hundred years no longer exist, yet the models that will replace them are still in the process of being defined; we are in a period of major transition.

This volume is an outcome of the International Symposium on Integrated Water Resources Management (held at Davis, California, April 2000), which aimed to provide additional insight into the current thinking; and a forum for exchange of experiences. The 61 papers demonstrate that there is a need for much better coordination and planning based on a strong knowledge base. Small independent experiments need to be replaced by strategic programmes with well-defined targets and objectives, backed by technical expertise, good management and relevant research at all scales. One of the most exciting developments is the growing commitment from a wide range of stakeholders to a new framework for water resources management based on the principle of integrated watershed management, described in general terms as "a form of coordinated management of land and water resources within a region, with the objectives of preventing land degradation, protecting the quality of the freshwater resource, protecting biodiversity, and continuing sustainable use, within a context which includes genuine community/ government partnerships and recognition of socio-economic objectives".

Publ. no. 272 (December 2001), price £65.00 (price to members in financially disadvantaged countries only £13.00, price to all other members £48.75), 442 + xiv pp., ISBN 1-901502-71-6

FRIEND 2002—Regional Hydrology: Bridging the Gap between Research and Practice

Edited by Henny A. J. van Lanen & Siegfried Demuth
(co-editors Eric Servat, Richard Ibbitt, Christel Prudhomme, Muhammad F. Bari, Denis Hughes, Maria del Carmen Llasat & Simon H. Mkhandi)

One of the main objectives of the FRIEND (Flow Regimes from International Network Data) programme

is to study the variability of hydrological regimes in order to improve the management of water resources at a catchment, regional and global scale. Since the inauguration of FRIEND in 1985 the initiative has grown to a worldwide network of scientists belonging to eight different regional FRIEND groups. This Red Book is the proceedings of the Fourth International Conference on FRIEND held in Cape Town, South Africa, March 2002. The 63 papers cover the following conference topics:

- *Hydrological data—policy, international rivers, databases, real time, dissemination*
- *Managing hydrological risk—floods, surface and groundwater droughts*
- *Water scarcity–overexploitation and poverty reduction*
- *Sustaining water-related ecosystems—definitions, methodology and operation*
- *Continental hydrology—regimes, water sharing, teleconnections, snow, ice, international basins*

The papers demonstrate how advances in hydrology can be used for the development of integrated river basin management to ensure the sustainable development of water resources. Furthermore examples are given for incorporating research results in operational hydrology and water resources planning, including numerical and statistical models and visualization techniques.
Publ. no. 274 (March 2002), price £73.50 (2002 membership price £51.12), 518 + x pp., ISBN 1-901502-81-3

The next two Red Books to be published will be:

Agricultural Effects on Ground and Surface Waters: Research at the Edge of Science and Society

Edited by Joop Steenvoorden, Frans Claessen & Jaap Willems

Comprising 62 papers from a symposium held at Wageningen, The Netherlands, October 2000.
Publ. no. 273 (probably April 2002), provisional price £63.50, 414 + x pp., ISBN 1-901502-76-7

Natural and Enhanced Restoration of Groundwater Pollution

Edited by S. F. Thornton & S. E. Oswald

.Over 80 papers comprising the proceedings of the Groundwater Quality 2001 Conference held at Sheffield, UK, June 2001
Publ. no. 275 (probably July 2002), ISBN 1-901502-86-4

Hydrological Sciences Journal (HSJ)

The table on the next page lists the papers published in issue no. 1 of the 2002 volume, as well as those that have been accepted for publication and will appear in subsequent issues in 2002.

Production of HSJ

If you have already seen a copy of the February 2002 issue of *Hydrological Sciences Journal*, you may have noticed small changes in its appearance: the format is very slightly smaller and the cover more glossy than before. The main reason for this is that we have changed our printer to Krips BV (Meppel, The Netherlands). Krips have been printing IAHS Red Books for many years and we look forward to successful cooperation on Journal production.

To avoid delays and cut costs, while improving the service they provide, most printers have invested in digital pre-press (DPP) in recent years. They now have special software enabling them to process computer files to make up the printing plates ("computer-to-plate"—CTP) and cease to have the capability to produce plates via film from camera-ready copy (CRC).

Up to mid 2001, the journal was produced by creating CRC at IAHS Press from the text files and illustrations provided by authors. The new methods—introduced at IAHS Press in June last year—involve sending complete files (in PDF or postscript format) of papers and other text to the printers, from which the entire issue can be printed very rapidly.

One advantage of CTP production which is immediately apparent is that the quality of reproduction of many illustrations—photographs and colour graphics, in particular—is greatly enhanced. We ask authors to provide graphics files of their figures, where possible, so that a completely electronic version of their paper can be prepared. Occasionally, where graphics are not available, it is important to have clear black and white prints of illustrations, from which we can

Prices of year 2001 Red Books

IAHS members may buy these books for personal use at the discounted prices (80% discount for members in financially disadvantaged countries, and 25% discount for other members)

Publ. no.	Title	Full price	Price with 80% discount	Price with 25% discount
Publ. no. 266	***Hydro-ecology: Linking Hydrology and Aquatic Ecology***	£33.00	£9.00*	£24.75
Publ. no. 267	***Remote Sensing and Hydrology 2000***	£80.00	£16.00	£60.00
Publ. no. 268	***Regional Management of Water Resources***	£47.75	£9.55	£35.81
Publ. no. 269	***Impact of Human Activity on Groundwater Dynamics***	£59.50	£11.90	£44.62
Publ. no. 270	***Soil–Vegetation–Atmosphere Transfer Schemes and Large-Scale Hydrological Models***	£59.50	£11.90	£44.62
Publ. no. 272	***Integrated Water Resources Management***	£65.00	£13.00	£48.75

** The minimum price is £9.00.*

produce graphics files by scanning. It is also important that graphics files meet the requirements of our printers, especially in terms of the resolution (600 dpi minimum) and any fonts that might be embedded (e.g. in PostScript graphics, or in Excel figures). Full details about the kind of graphics we require are given in the *HSJ Author Instructions*, a copy of which may be obtained by contacting Frances (frances@iahs.demon.co.uk).

Needless to say, the introduction of these new production methods has involved all of us at IAHS Press in learning new processes and making changes to the way we work. One recurring problem involves non standard fonts in graphics files. **It is important to use only standard fonts, otherwise font substitution may drastically change the appearance of a figure and even mean that the labelling is incomplete (because a fixed sized text box is not big enough to accommodate text in a larger font).**

We hope that the delays in delivery of some of the recent issues of the Journal have not been too inconvenient and anticipate that the 2002 volume will be better than ever!

Hydrological Sciences Journal 2002

Papers in vol. 47, no. 1 *(February)*

J. WILK & D. A. HUGHES: Calibrating a rainfall–runoff model for a catchment with limited area

J. WILK & D. A. HUGHES: Simulating the impacts of land use and climate change on water resource availability in a large southern Indian catchment

SANJAY K. JAIN & M. K. GOEL: Assessing the vulnerability to soil erosion of the Ukai Dam catchments using remote sensing and GIS

CHEN XIQING, ZHANG ERFENG & XU JIANGANG: Large and episodic decrease of water discharge from the Yangtze River to the sea during the dry season

DAWEN YANG, SRIKANATHA HERATH & KATUMI MUSIAKE: A hillslope-based hydrological model using catchment area and width functions

ALISON WILLIAMS & DAVID ARCHER: The use of historic flood information in the English Midlands to improve risk assessment

JURAJ M. CUNDERLIK & DONALD H. BURN: The use of flood regime information in regional flood frequency analysis

PRATAP SINGH & S. K. JAIN: Snow and glacier melt contribution in the Satluj River at Bhakra Dam in the western Himalayan region

PAWEŁ M. ROWIŃSKI, WITOLD G. STRUPCZEWSKI & VIJAY P. SINGH: A note on the applicability of log-Gumbel and log-logistic probability distributions in hydrological analyses: I. Known pdf

STANISLAW WEGLARCZYK, WITOLD G. STRUPCZEWSKI & VIJAY P. SINGH: A note on the applicability of log-Gumbel and log-logistic probability distributions in hydrological analyses: II. Assumed pdf

Discussions

DANIEL SCHERTZER, IOULIA TCHIGUIRINSKAIA, SHAUN LOVEJOY, PIERRE HUBERT, HOCINE BENDJOUDI & MICHELE LARCHEVÊQUE: Which chaos in the rainfall–runoff process? Discussion of "Evidence of chaos in the rainfall–runoff process" and reply by BELLIE SIVAKUMAR, RONNY BERNDTSSON, JONAS OLSSON & KENJI JINNO

C. OTTLÉ, A. QUESNEY & S. LE HÉGARAT-MASCLE: Discussion of "Integration of remote sensing data into hydrological models for reservoir management" and reply by C. LOUMAGNE, M. NORMAND, M. RIFFARD & A. WEISSE

Forthcoming papers (in no particular order)

ZEKAI ŞEN & KHALID AL-SUBA'I: Hydrological considerations for dam siting in arid regions: a Saudi Arabian study

XU JIONXIN: Sediment flux into the sea as influenced by different source areas in the drainage basin: example of the Yellow River, China

SANJAY K. JAIN, PRATAP SINGH & S. M. SETH: Assessment of sedimentation in the Bhakra Reservoir in the western Himalayan region using remotely sensed data

SHIV KUMAR PANDEY, ABHAY KUMAR SINGH & S. I. HASNAIN: Grain-size distribution, morphoscopy and elemental chemistry of suspended sediments of the Pindari Glacier, Kumaon Himalaya, India

L. DESCROIX & J.-C. OLIVRY: Spatial and temporal factors of erosion by water of black marls in the badlands of the southern French Alps

ZUHAL AKYÜREK & A. ÜNAL SORMAN: Monitoring the snow-covered areas in the eastern part of Turkey from NOAA-AVHRR data

SHAHRAM ASHRAFI, ASHIM DAS GUPTA, MUKAND SINGH BABEL, NORIHIRO IZUMI & RANER LOOF: Simulation of infiltration from porous clay pipes in subsurface irrigation

MAGNUS PERSSON: Evaluating the linear dielectric constant–electrical conductivity model using time-domain reflectometry

V. HRISSANTHOU: Comparative application of two erosion models to a basin

ANNE COUDRAIN, MICHEL LOUBET, THOMAS CONDOM, AMAL TALBI, PIERRE RIBSTEIN, BERNARD POUYAUD, JORGE QUINTANILLA, CLAUDINE DIEULIN, BERNARD DUPRÉ: Données isotopiques ($^{87}Sr/^{86}Sr$) et changements hydrologiques depuis 15 000 ans sur l'Altiplano andin

MARTIJN J. BOOIJ: Modelling the effects of spatial and temporal resolution of rainfall and basin model on extreme river discharge

BETTY RICHARDS-PECOU: Scale invariance analysis of channel network width function and possible implications for flood behaviour

TÓMAS JÓHANNESSON: Propagation of a subglacial flood wave during the initiation of a jökulhlaup

JAQUES CALLEDE, JEAN-LOUP GUYOT, JOSYANE RONCHAIL, MICHEL MOLINIER & EURIDES DE OLIVEIRA: L'Amazone à Óbidos (Brésil): étude statistique des débits et bilan hydrologique

BELLIE SIVAKUMAR & A. W. JAYAWARDENA: The sediment transport phenomenon: an investigation into the presence of low-dimensional chaotic behaviour

G. BOULET, J. D. KALMA, Y. KERR & A. CHEHBOUNI: Deriving catchment-scale water and energy balance parameters using data assimilation based on extended Kalman filtering

B. PANIGRAHI, SUDHINDRA NATH PANDA & R. MULL: Prediction of hydrological events for planning rainfed rice

O. SEIDOU, M. LEFÈBVRE, J. ROUSSELLE, N. LAUZON & J. RIBEIRO: Modélisation de l'incertitude sur les séquences futures de débits en rivière

LAURENT PFISTER, JEAN-FRANÇOIS IFFLY, LUCIEN HOFFMANN & JOËL HUMBERT: Use of regionalized stormflow coefficients in view of hydro-climatological hazard mapping

TENALEM AYENEW: Recent changes in the level of Lake Abiyata, Central Main Ethiopian Rift

BENOÎT FOURCADE, ANNE COUDRAIN-RIBSTEIN & CLAUDE MARTIN: What can be deduced from chemical measurement in an open-field raingauge? An example in the Maures massif, southeastern France

Subscriptions 2002

It is not too late to subscribe to the 2002 volume! In view of the proposals to publish an additional issue of the Journal in 2002, the price has been set to reflect the additional production and printing costs. The full price of vol. 47 (2002) is £172 or US$250. The price for IAHS members (50% discount) is £86 or US$125 and for members in financially disadvantaged countries, receiving 80% discount, the price is £34.40.

Please send your payment now to Frances Watkins at the IAHS Press address. Payment may be made by VISA or MasterCard/Eurocard (giving card number, expiry date and the name and billing address of the cardholder) or by cheque drawn from a bank in the UK (GB pounds—payable to "IAHS Ltd") or the USA (US dollars—payable to "IAHS"). Please contact Frances for further information, or if you require an invoice. Remember, the discount for IAHS members is valid only if you are purchasing the journals for your personal use!

Penny Kisby, Frances Watkins,
Cate Gardner & Jill Gash

News from Commissions

International Commission on Groundwater (ICGW)

Eight months have passed quickly since the IAHS Scientific Assembly at Maastricht, when ICGW activities started under the leadership of a new President—Prof. Yoram Rubin (University of California at Berkeley). The report of ICGW plenary at Maastricht and a message from the President have been posted on our home page:

http://www.envr.tsukuba.ac.jp/~ICGW/

The Commission is involved with two major forthcoming conferences:

- *Bridging the Gap between Measurements and Modelling in Heterogeneous Media: International Groundwater Symposium*, Berkeley, California, USA, 25–29 March 2002
- *ModelCARE 2002: Fourth International Conference on Calibration and Reliability in Groundwater Modelling (A few steps closer to reality)*, Prague, Czech Republic, 17–20 June 2002

At the next IAHS General Assembly during IUGG2003, Sapporo, Japan, July 2003, ICGW is organizing and supporting the following symposia and workshops:

HS04: *Methodologies for Risk Assessment of Waste Water Re-use on Groundwater Quality*
HW01: *Effects of Human Activities on Hydrological and Biogeochemical Cycles*
HW03: *Quality Assurance in Hydrological Research*
HW05: *Groundwater Resources for Emergency Situations*
HW06: *Isotope Tracers in Water Cycle Models*
HW07: *Towards a Science Programme for Prediction in Ungauged Basins*
JSH02: *Groundwater and Volcanoes*
JSH03: *Quantitative Approaches to Hyporheic Flows and their Biogeochemical Consequences in Marine, Estuarine and Freshwater Systems*
JSP03: *Groundwater Inputs to the Ocean*

More information on these meetings can be found later in this Newsletter and on the IAHS web site.

In order to continue the highly successful series of conferences on Groundwater Quality and on Calibration and Reliability in Groundwater Modelling, we are seeking volunteers to host GQ2004 and ModelCARE 2005.

We also expect to support and be involved in IHP-VI activities such as:

- Effects of the global changes on groundwater, especially groundwater recharge in and around semiarid regions in relation to water resources management;
- Wetland hydrology as an ecotone of groundwater and surface water and their environmental roles;
- The comprehensive approach to arsenic in groundwater with international cooperation.

Details will be available after the next IHP meeting March 2002, and will be posted on our web site.

Participation in ICGW activities is strongly encouraged. Please contact:

Dr Norio Tase
Institute of Geoscience, University of Tsukuba, Ibaraki 305-8571, Japan
[tel.: +81 298 534750; fax: +81 298 519764; tase@atm.geo.tsukuba.ac.jp]

Norio Tase, Secretary ICGW

International Commission on Water Quality (ICWQ)

ICWQ President, Joop Steenvoorden, attended the Expert Meeting on Groundwater Resources Sustainability Indicators organized 10–11 January 2002 by UNESCO, together with IAH, IAEA and FAO. The main objectives of the meeting were to:

- evaluate the contribution given by Mr J. Margat (BRGM, France) and to review the paper on "Indices and indicators for measuring groundwater condition and vulnerability: groundwater quantity" prepared by Mr S. Gangopadhyay (University of Colorado);
- agree upon a conceptual model;
- set up recommendations for the preparation and definition of Groundwater Quality Indicators.

The outputs will be presented to the World Water Assessment Programme (WWAP) meeting at

FAO, 6–8 February 2002, in Rome. The leader of WWAP, Prof. Gordon Young, former IAHS Secretary General, explained the main objectives of WWAP and stated that the final version of the first World Water Development Report should be ready by July 2002. Joop Steenvoorden has assured the contribution of IAHS Commissions to the UNESCO project on Groundwater Resources Sustainability Indicators. Those IAHS members interested in participating in the development of indicators can contact Joop Steenvoorden (j.h.a.m.steenvoorden@alterra.wag-ur.nl).

The Hydrology 2020 Working Group, which is made up of a multi-national group of young hydrologists and is charged with looking into the potential and opportunities for hydrological sciences in the foreseeable future, has begun its activities (see the report later in this Newsletter). Dr Kate Heal is the member of this working group nominated by ICWQ and she will be pleased to hear from you if you have thoughts about future directions and challenges in water quality or wider issues in hydrology. Dr Heal's coordinates are:

Institute of Ecology and Resource Management, University of Edinburgh, Edinburgh EH9 3JU, UK
[tel.: +44 131 6505420; kate.heal@ed.ac.uk]

The Hydrology 2020 Working Group is due to report to the General Assembly of IAHS being held in Sapporo, Japan, 3–11 July 2003. ICWQ will be participating in a substantial number of symposia and workshops at Sapporo including:

JSH03: *Quantitative Approaches to Hyporheic Flows and their Biogeochemical Consequences in Marine, Estuarine and Freshwater Systems*
HS04: *Methodologies for Risk Assessment of Waste Water Re-use on Groundwater Quality*
HW01: *Effects of Human Activities on Hydrological and Biogeochemical Cycles*
HW02: *Stream Temperature Changes and Effects*
HW03: *Quality Assurance in Hydrological Research*

More information on these meetings can be found later in this Newsletter and on the IAHS web site.

Bruce Webb, Secretary ICWQ

International Commission on Remote Sensing (ICRS)

Drs Toshio Koike and Massimo Mennenti are the ICRS representatives for the IAHS/WMO Working Group for GEWEX. This working group's mandate parallels that of IAHS and WMO—namely, to promote the development and application of hydrological science to the aims of GEWEX; and to provide for discussion, comparison, and publication of research results and the requirements for future research through the organization of workshops, symposia at special sessions during IUGG General Assemblies and IAHS Scientific Assemblies and stand-alone workshops.

The Hydrology 2020 Working Group will follow the pattern established by the Hydrology 2000 Working Group which was set up in Hamburg (1983) and reported in Vancouver (1987). The Hydrology 2020 Working Group was established in 2001 and will report at the IAHS Scientific Assembly in 2005. Dr Katerina Valeo (Department of Geomatics Engineering at the University of Calgary, Canada) was nominated by ICRS and accepted to be a member of this working group.

The Commission is sponsoring the *Advanced International Workshop on Earth Observation to Estimate Evapotranspiration*, to be held at Anacapri, Isle of Capri, Italy, 29–30 April 2002. This workshop is being organized by Associazione Italiana di Ingegneria Agraria, and Agenzia Spaziale Italiana. During recent years there has been much progress in understanding land surface–atmosphere processes and their parameterization in surface hydrology and water resources management. Observations of the Earth's surface in different regions of the electromagnetic spectrum by means of remote sensors have been used for about three decades to monitor the land surface. The use of remote sensing in the study of hydrological processes on the land surface can be mainly addressed to two broad issues:

- estimation of water balance terms, i.e. evaporation and soil moisture;
- mapping of parameters for the energy and mass balance of land surfaces.

Thermal and microwave regions have been exploited in the first type of approach. Observations in the visible and infrared range have found larger application within the second. In both cases, the spectral, spatial and viewing capabilities of new types of sensors available today or in the near future may provide innovative perspectives. The workshop is aimed at researchers working in hydrology, agro-meteorology, land and water management and related fields. The deadline for one-page abstracts was 22 February 2002. Participation is limited to 45 attendees. For more information and registration contact:

University of Naples Federico II, Department of Agricultural Engineering and Agronomy; Water Management Section, Via Università 100, Portici, Naples, Italy
[tel.: +39 081 7755341; fax: +39 081 7755344; durso@unina.it]

ICRS maintains a web site at http://hydrolab.arsusda.gov/~jritchie/. Many thanks to Dr Jerry Ritchie for his assistance in maintaining this site.

Al Pietroniro, Secretary ICRS

Hydrology 2020 Working Group

The Hydrology 2020 Working Group met on 23 January 2002 for a two-and-a-half day workshop in Edinburgh, Scotland, to discuss issues relevant to the future development of hydrology. Initiated by IAHS with support from UNESCO, WMO, Japan and Germany (National IHP/OHP Committee), working group members Taikan Oki (Committee Chair) of Japan, Jeanna Balonishnikova of Russia, Wolfgang Diernhofer of Austria, Pierre Etchevers of France (absentee), Stewart Franks of Australia, Guobin Fu of China, Kate Heal of the UK, Susan Hubbard of the USA, Harouna Karambiri of Burkina Faso, Johan Kuylenstierna of Sweden, Stefan Uhlenbrook of Germany, and Caterina Valeo of Canada, met with Pierre Hubert, the IAHS General Secretary, to kick off the group's first meeting. For more information on the group and its individual members, please see:
http://www.cig.ensmp.fr/~iahs/hydrology2020/H2020WG.htm
Dr Hubert welcomed the committee and provided initial guidance to the group. While most of the members were nominated from the individual IAHS Commissions, Dr Hubert released any constraints and gave the group the freedom to develop their own guidelines, mandates, agenda and tasks; but with the primary goal of identifying possible and recommended directions for the field of hydrology over the next 20 years. The meeting began with each member providing a brief overview of their research and perspectives. The committee demonstrated considerable breadth and depth covering many sub-fields of hydrology from global hydrological modelling to microscale estimates of hydrological parameters. The first meeting objective following the presentations was to determine the group's Mission Statement:

"We will explore how hydrological sciences can evolve into a discipline capable of meeting the world water challenges that are expected to prevail by 2020. We will undertake a broad range of tasks, from identifying knowledge gaps and hydrological research priorities to determining ways to improve communication between hydrological scientists and those involved with developing and implementing water policies. Our intention is to formulate a vision that will be embraced by practising hydrological scientists and will also persuade younger scientists to become involved in hydrological science research."

To address the Mission Statement, we began discussing key questions that the Mission Statement naturally invokes. Some of the first are: what are the world water issues, what will be demanded from society and how will the problems be solved? Increases in human population, urbanized areas, demand for food, development and energy consumption will result in ever escalating stresses on the hydrosphere. In general, the preservation of the world's water resources is vital to coping with anticipated land-use and land-cover changes, climatic changes, changes in hydrological cycles, provision of ecosystem services, hydrological extremes, the deficits of clean freshwater in many regions of the world, and rising water conflicts between stakeholders in common areas and different countries. We need to build robustness and resiliency into our water resource systems.

It is recognized that water plays a key role in all environmental and societal issues, and hydrology is an interdisciplinary science involving ecologists, geologists, (geo)chemists, soil physicists, geophysicists, social scientists, atmospheric scientists, geotechnical and civil engineers, and geographers. But despite this multidisciplinary nature, it is in itself a unique field with a number of distinguishing qualities. Unlike many other fields, it is believed that all hydrological research has some end use but its development rests on detailed fundamental physics. Hydrology has been a science that has been successful at providing solutions without fully understanding all governing processes. Principal concepts that are unique to hydrology include hydrological cycles, the conversion of precipitation heights to river discharges; un-saturated flow; contaminated flow of groundwater; statistics on the probability of exceedance; soil heterogeneity and the general measurement and modelling of water flow and water quality.

The key question then becomes: How can hydrological science help mitigate the anticipated water crises in the world? To begin addressing this question, the Hydrology 2020 Working Group started identifying several key bottlenecks facing hydrology today. The issues ranged from technical gaps to communication barriers, and funding.

As part of our Mission Statement we intend to provide information to a variety of groups including the IAHS, scientists, engineers, technicians, water managers, policy and decision makers, funding institutions, and the general public. The methods of disseminating this information will include an IAHS Red Book in 2005 (to provide specific recommendations); workshops, press articles, flyers, and newspapers articles. They will include information such as recommendations for action, summaries for policy makers, and research priorities. The group will also be soliciting input and comments from others in the hydrological community both nationally and internationally.

The group expects to produce a variety of outputs and to meet at least twice more in person but to correspond by e-mail regularly. We will meet prior to the Sixth Kovacs Colloquium in Paris in June 2002, at the IUGG/IAHS General

Assembly in 2003 in Sapporo, and again in 2004 and 2005.

Member tasks over the next six months include providing succinct reviews of knowledge gaps in ecohydrology and water quality; assessment and forecast of global water resources and their use; groundwater; downscaling/impact assessments; snow hydrology; application of hydrology to water resources management; remote sensing; hydrology and SVAT models; runoff process and tracers; linkage between hydrology and policy making and how hydrological sciences contribute to the economy; international collaboration; and erosion. The evaluation will be both critical of gaps and praising of milestones.

Comments on the working group's Mission Statement and goals are welcome and may be submitted to: taikan@iis.u-tokyo.ac.jp.

Reports on Meetings

I Mercosul Urban Drainage Seminar and V Brazilian Urban Drainage Seminar: Solutions for Urban Drainage in Latin America

11–13 June 2001, Porto Alegre, Brazil

The First Mercosul Urban Drainage Seminar and the Fifth Brazilian Urban Drainage Seminar were held in Porto Alegre at the Institute of Hydraulic Research (IPH), Federal University of Rio Grande do Sul (UFRGS). The seminars were supported by many South American institutions such as ABRH (Brazilian Water Resources Association), IAHR (Argentinean Water Resources Institute) and ANA (Brazilian Water Resources Agency) and international bodies including UNESCO, GWP (the Global Water Partnership: a nongovernmental organization with support from the World Bank, Sweden and other countries) and IAHS.

There were 175 participants from 10 countries and 16 Brazilians states. The event had two workshops: "Urban Drainage Master Plans" and "Problems and Conflicts in Latin American Cities". In the paper sessions there were 45 papers presented and the proceedings containing selected papers is in preparation (in Portuguese and Spanish). The invited presentations were: "Urban drainage management" by Joel Goldenfum, "Institutional aspects of urban drainage" by Rubem Porto, "Brazilian national programme on pollution control" by Dilma Pereira, and "Brazilian water resources research framework" by Carlos Tucci.

During the event there was a meeting of the Associate Program on Floods for South America which is in its infancy and has been developed by GWP, SAMTAC (South America Technical Advisory Committee) and WMO.

Carlos Tucci, Porto Alegre, Brazil

Symposium S3/4: Impact of Human Activity on Groundwater Dynamics

23–25 July 2001, Maastricht, The Netherlands

Human activities are intricately linked to the evolution and dynamics of groundwater quantity and quality. This symposium addressed several areas where human activities have a marked effect on groundwater. The main objectives of this symposium were to evaluate groundwater with respect to methods for quantifying recharge, impacts of human activities and land-use change on groundwater quantity and quality, aquifer characterization and transport modelling, and interactions between groundwater and surface water. The symposium was well attended with more than 75 scientists and managers present during most sessions. The presentations focused not only on the effects but on monitoring and data analysis techniques as well. Several recommendations for priority areas in groundwater hydrology were developed by the symposium participants (see below).

The quantification of groundwater recharge was addressed by the first set of presentations. Recharge was estimated using a variety of techniques including unsaturated zone tracer studies, hydrometric measures of soil water content, groundwater levels, micrometeorological measurements and groundwater models. The techniques were presented for case studies in both temperate and arid areas and several of them addressed the formulation of the upper boundary conditions in groundwater flow models. Human interferences on natural recharge were also addressed.

The effect of urbanization and land-use change on groundwater quantity and quality were addressed by several presentations. In addition to human influence on the quantity of recharge and abstraction, impacts of the changes in the quality of recharge water on the groundwater quality, including temperature, were presented. A couple of presentations focused on monitoring and design and impact of water management for counteracting groundwater quality degradation.

The next set of papers presented results of studies on groundwater and surface water interactions. Most of the papers in this set focused on lowlands and shallow aquifers. Several of the presentations were on the development of models for groundwater and surface water interactions at both the local (streambed) and regional scale, and the scale dependency of processes at the interface.

There were several presentations on the characterization of aquifers and transport modelling. Some of these papers addressed aquifer biogeochemistry, including redox processes and reactivity of the material in the aquifer. Specific sampling and analytical strategies were addressed in a couple of presentations.

Finally, several case studies were presented about groundwater contamination with many of them on nitrate and pesticide contamination due to agricultural activities. Several case studies were presented on specific organic contaminants. Two presentations, in particular, provided a excellent example of the use of isotopes, hydrology and hydrochemistry in improving process understanding of plume development and related methanogenesis at a site in Michigan, USA.

The subjects of many of the presentations fit within more than one theme, which was excellent in fostering communication among participants, who had a broad range in expertise. One result from the symposium was a set of recommendations for scientific foci in groundwater hydrology. The foci, which are listed below, generally reflect the need for additional knowledge:

- Linkages between land-use change and groundwater dynamics (quantity and quality)

- Standardized techniques are needed to assess groundwater recharge, which are tested and applied to many case studies reflecting the large range in geologic, climatic, and biotic characteristics globally, and the varying effects of human activities, particularly in areas undergoing rapid changes in land cover and land use
- The results of the monitoring and data analysis need to be used to develop and test groundwater and groundwater/surface water models and their combination for both water quantity and water quality
- A global suite of studies (such as in HELP basins) should focus on hydrological processes for assessing status and the impact of human activities. For example, studies should target methods for quantifying recharge, geochemical characterization of aquifers, and modelling of contamination transport
- Effects of land-use change, and urbanization in particular, on the general status and trends (occurrence and fate) of water quality and the dynamics of groundwater
- Sampling strategies for groundwater and aquifer materials need improvement and standardization
- Identification of transport properties, and the modelling of flow and transport
- Scaling issues: resolving empirical and modelling scaling questions and developing strategies for scale-appropriate monitoring
- Groundwater contamination and transport, particularly with respect to the increasing numbers of manmade compounds disposed as solid and liquid wastes to the environment
- More comprehensive monitoring of groundwater quality, particularly in urban areas and areas undergoing rapid land-use and population change
- Understanding of groundwater and surface water interactions and the modelling of the linkage at various temporal and spatial scales
- The geographic areas of highest concern are those undergoing rapid population growth with limited water supply in arid and semiarid areas
- Combining many of the issues above, a comprehensive long-term trend analysis of groundwater quantity (storage, water levels and flow) and quality and the development of suitable forecasting models. Many quality parameters, although present in the environment, have not been comprehensively (e.g. pesticides and herbicides) or systematically studies (e.g. salinization in non-coastal areas not only with respect to chloride but fluoride as well)
- Integrated basin resources management with respect to water flows and quality, and in this case, groundwater recharge and discharge affecting fluxes of water and elements/compounds

Several of the above recommendations and themes of IHP-VI deal with monitoring. Although each monitoring effort typically is developed for a specific objective or objectives in its own right, it is important to consider how monitoring networks can be optimized. For example, the number and location of sampling points, resolution in time, data to be collected (water quantity, aquifer properties, and water quality), and optimization techniques to detect early changes). It also is important to coordinate groundwater and streamwater monitoring networks.

Norman (Jake) Peters,
US Geological Survey, Atlanta, Georgia, USA

Workshop W3: The Role of Information Technology in Sustainable Water Resources Management: Case Studies from Developed and Developing Regions

24 July 2001, Maastricht, The Netherlands

We had 12 presentations (two sessions) and an audience of about 50 people throughout the workshop. Presentations covered 11 countries and all continents. Each presentation session was followed by a discussion session. The discussions were very intense and covered a broad range of topics on the role of information technology in sustainable water resources management—to mention a few: practical examples; data availability; web-based tools; participation; modelling and its practical value; ownership of the models; acceptance of the models. Topics discussed during the workshop included flood control and flood-plain management, water resources planning, runoff modelling, operation of dams and reservoirs, groundwater use, urban water management, water resources decision making, hydrological forecasting, and good modelling practice in water resources.

Slobodan Simonovic,
The University of Western Ontario, Canada

International Workshop on Applications of Remote Sensing in Hydrology

2–5 October 2001, Montpellier, France

This was the fifth workshop in a series designed to document up-to-date activities in the use of remote sensing in hydrology. The workshop was a cooperative venture between the Laboratoire Commun de Télé-détection in France, the US Department of Agriculture, Hydrology Laboratory and Environment Canada's National Water Research Institute. It is the first to be held in Europe (the previous workshops having been held in North America). The IAHS Commission on Remote Sensing sponsored the meeting.

The workshop themes were divided into two broad categories:

1. Remote sensing for the characterization of the hydrological environment with emphasis on special regions: semiarid, humid, cold regions (snow and ice).
2. Application of remote sensing in hydrological modelling; applications of GIS, vertical balances, SVAT models.

A special session was hosted on the AIMWATER project.

The closing discussions focused on scaling issues and the role remote sensing plays in scaling.

The workshop was attended by some 60 participants. A total of 30 papers and four posters were presented. The proceedings of the workshop will be published. Further information can be obtained from Dr Raoul Granger raoul.granger@ec.gc.ca) or Dr Christain Puech (christian.puech@teledetection.fr).

International Workshop on Environmental Risk Assessment of Pesticides and Integrated Pesticide Management in Developing Countries

Kathmandu, Nepal, 6-9 November 2001

Misuse of pesticides is an increasing problem in developing countries. Health problems and yield

reduction due to combined resistance, resurgence and secondary pest outbreaks are most obvious impacts. However, very little is known about the damage to natural resources like soils and water. The workshop created an interdisciplinary forum for all aspects connected to pesticides: lab analysis, environmental and socio-economic issues, pesticide application practices and IPM (integrated pesticide management) extension matters, hazards and risks of pesticides including health problems and pesticide regulations with a main focus on environmental issues. Water-bound pesticide transport and possible environmental risk is also a focal area in a collaborative research project at the Technical University of Braunschweig: http://www.tu-bs.de/institute/physhyd/forsch/pestizid_projekt.html in cooperation with several Nepalese institutions which was a starting point for organizing this workshop.

The following scientific conclusions drawn from the workshop seem remarkable:

Today's pesticides are less persistent and therefore imply less environmental risk. But this is not the only reason of minor contamination of soils, soil water and groundwater resources despite the observed very frequent pesticide applications to a single crop under the given tropical and sub-tropical environments which concern almost all developing countries. Climate and dominant fine-grained soils additionally contribute to the decay of active substances and slow seepage except through macropores. Preferential flow is therefore a priority task to investigate in tropical environments. On the other hand, too-short waiting periods after final applications before harvesting frequently occur and are dangerous for consumers.

The recommendations as a main practical output from the workshop cover pests and pesticides, environmental and IPM with pesticide regulation matters mainly. They touch both research deficiencies and practical future IPM extension/ administrative/ political needs.

Unfortunately workshop attendance suffered from the unstable conditions in the host country, in the region and worldwide at that time. Only half the announced number of approximately 90 participants attended from 11 countries, compared with 25 countries which were expected to be represented, and 26 oral and 5 poster presentations were given. The workshop supported UNESCO's IHP (IHP-V Theme 3: Groundwater resources at risk—Project 3.5: Agricultural threats to groundwater resources).

The workshop proceedings are planned for publication in spring 2002 in the *Landschaftsökologie und Umweltforschung* **38** series at TUBS (for more information contact: a.herrmann@tu-bs.de).

Andreas Herrmann, Braunschweig, Germany

IAHS General Assembly at Sapporo, Japan, 3–11 July 2003

Since it was founded in 1922, IAHS has been holding a General Assembly alongside those of the six other associations that make up the International Union of Geodesy and Geophysics IUGG). These assemblies come once every four years, while in between the Association convenes and cosponsors a large number of other international gatherings, some with other scientific associations, both national and international, and some jointly with bodies like UNESCO and WMO.

However the General Assembly is the Association's most important meeting because, in addition to the ambitious scientific programme, elections are held for the officers of the Association and those of its nine Commissions, business meetings are arranged to organize the affairs of these bodies and working groups meet to answer particular problems. This has been the pattern for past general assemblies, such as those held in Vienna (1991), Boulder (1995) and Birmingham (1999). It will be the plan for Sapporo in 2003.

Since Maastricht there has been much discussion, both within IAHS and outside of IAHS, on the topics proposed by the nine IAHS Commissions. The Sapporo Scientific Programme of the XXIII IUGG General Assembly (IUGG2003) to be held at Sapporo, Hokkaido, Japan, 30 June–11 July has now been finalized. The full programme will be available soon on the official Sapporo web site:

http://www.jamstec.go.jp/jamstec-e/iugg/index.html

but information on the symposia and workshops organized either by IAHS alone, or jointly with other associations, is presented below and details are also available on the IAHS web site:

http://www.cig.ensmp.fr/~iahs

In response to requests received at Maastricht, nearly all the IAHS events are during the second week (7–11 July). Two IAHS plenary sessions are scheduled for Monday 7 July and Thursday 10 July; the election of Bureau officers will take place during the second plenary. A **provisional time table** is on the IAHS web site.

It is very important to note that all the abstracts should be submitted through the Local Organizing Committee:

IUGG2003 Secretariat
Japan Marine Science and Technology Center (JAMSTEC), 2-15 Natsushima-cho,
Yokosuka 237-0061, Japan
[fax: +81 468 679315; iugg_service@jamstec.go.jp]

The deadline for submission of abstracts for the four IAHS symposia HS01, HS02, HS03 and HS04 is 31 July 2002, as papers for these meetings will be pre-published. The deadline for submission of abstracts for all the other meetings is 31 January 2003. So it is now time to think about preparing and submitting abstracts for the four IAHS symposia (abstracts should be submitted to the Local Organizing Committee—not to symposium convenors)!

The abbreviations used can be found in the table of acronyms later in this Newsletter. If you have any queries please contact the main convenor of the relevant meeting or Pierre Hubert (iahs@ensmp.fr).

Pierre Hubert, Secretary General IAHS

IAHS Symposia

HS01: International Symposium on Erosion Prediction of Ungauged Basins (PUBs): Integrating Methods and Techniques

abstract deadline 31 July 2002

8–9 July 2003

ICCE, ICRS and all IAHS Commissions

Human impact on runoff and erosion is increasing worldwide because of growing pressure to develop land and water resources. In many parts of the world, however, runoff and erosion rates are not monitored, precluding an accurate assessment of human impact and sustainable practices. The objective of this symposium is to review recent developments in a wide range of methods and techniques that can be used to characterize runoff and erosion in ungauged basins, and to evaluate how to integrate the information obtained using remote sensing, GIS, modelling and other methods into a coherent view of the ungauged basin.

Main convenor: **Dr Dirk H. de Boer**
Department of Geography, University of Saskatchewan, 9 Campus Drive, Saskatoon, Saskatchewan S7N 5A5, Canada
[tel.: +1 306 9665671; fax: +1 306 9665680; deboer@duke.usask.ca]

Co-convenors: **Prof. Wojciech Froehlich, Institute of Geography, Polish Academy of Sciences, Frycowa 113, PO Box 2, 33-335 Nawojowa, Poland**
[tel.: +48 18 4436791; fax: +48 18 4436791; wfroehlich@pro.onet.pl]

Dr Takahisa Mizuyama, Division of Forest Science, Graduate School of Agriculture, Kyoto University, Kitashirakawa, Sakyo-ku, Kyoto 606-8502, Japan
[tel.: +81 75 7536087; fax: +81 75 7536088; mizuyama@kais.kyoto-u.ac.jp]

Dr Alain Pietroniro, National Water Research Institute, 11 Innovation Boulevard, Saskatoon, Saskatchewan S7N 3H4, Canada
[tel.: +1 306 9754394; fax: +1 306 9755143; al.pietroniro@ec.ga.ca]

HS02: International Symposium on Water Resources Systems—Global Change, Risk Assessment and Water Management

abstract deadline 31 July 2002

10–11 July 2003

ICWRS, ICASVR, ICSW and ICWQ

The symposium will address problems related to the quantity and quality of water resources under global change arising from changes in water demand, use and supply, e.g. by a growing population, a changing climate and changes of the global economy. The focus will be both on the assessment of changing water resources availability and quality at different space–time scales and on the risk associated with extreme events. Methods for optimum short-term operation and long-term planning of water resources systems and water quality management, and methods for forecasting and managing floods, droughts and ecosystem change both under present day and projected changed conditions will be discussed in the context of balancing regional development.

Main convenor: **Dr Günter Blöschl**
Technische Universität Wien, Institut für Hydraulik, Gewässerkunde und Wasserwirtschaft, Karlsplatz 13/223, A-1040 Vienna, Austria
[tel.: +43 1 5880122315; fax: +43 1 5880122399; bloeschl@hydro.tuwien.ac.at]

Co-convenors: **Prof. Katumi Musiake, Institute of Industrial Science, University of Tokyo, 4-6-1 Komaba, Meguro-ku, Tokyo 153-8505, Japan**
[tel.: +81 3 54526381; fax: +81 3 54526383; prof@hydro.iis.u-tokyo.ac.jp]

Dr Dan Rosbjerg, Environment and Resources DTU, Technical University of Denmark, Building 115, DK-2800 Kongens Lyngby, Denmark
[tel.: +45 45251449; fax: +45 45932850; dr@er.dtu.dk]

Dr Stewart Franks, Department of Civil, Surveying and Environmental Engineering, University of Newcastle, Callaghan 2308, New South Wales, Australia
[tel.: +61 2 49216053; fax: +61 2 49216991; ceswf@civeng.newcastle.edu.au]

HS03: International Symposium on Information from Weather Radar and Distributed Hydrological Modelling

7–8 July 2003

abstract deadline 31 July 2002

ICSW

As radar hydrology is rapidly developing, its combined use with distributed hydrological modelling creates powerful numerical tools for forecasting storms, floods and related natural disasters. Such tools when used with long data records can also contribute much information to water resources assessments. However, fundamental issues of model development associated with the existence of uncertainties or errors in radar rainfall estimation and prediction, and in distributed model parameters, require further study. This symposium will focus on the issues of radar hydrology and distributed hydrological modelling.

Main convenor: **Prof. Y. Tachikawa**
Disaster Prevention Research Institute, Kyoto University, Gokasho Uji, Kyoto 611-0011, Japan
[tel.: +81 774 384126; fax: +81 774 384130; tatikawa@rdp.dpri.kyoto-u.ac.jp]

Co-convenors: **Dr B. E. Vieux, School of Civil Engineering and Environmental Science, University of Oklahoma, 202 West Boyd Street, CEC 334, Norman, Oklahoma 73019, USA**
[tel.: +1 405 3253600; fax: +1 405 3254217; bvieux@ou.edu]

Prof. K. P. Georgakakos, Hydrologic Research Center, 12780 High Bluff Drive, Suite 250, San Diego, California 92130, USA
[tel.: +1 858 7942726; fax: +1 858 7922519; kgeorgakakos@hrc-lab.org]

Prof. E. Nakakita, Department of Global Environment Engineering, Kyoto University, Yoshida-Honmachi, Sakyo-ku, Kyoto 606-8501, Japan
[tel.: +81 75 7535109; fax: +81 75 7535109; nakakita@info.gee.kyoto-u.ac.jp]

HS04: International Symposium on Methodologies for Risk Assessment of Waste Water Re-use on Groundwater Quality

7–8 July 2003

abstract deadline 31 July 2002

ICWQ (ICGW)

Re-use of waste waters is one method for conserving regional water resources. However (pre)treated waste waters contain elements and compounds that may damage environmental quality. Poor management of waste-water treatment facilities can also harm the environment. Pre-treated waste water can also be used for irrigation of agricultural crops. But what pre-treatment is necessary and at what rate can the treated waste water be applied to soils without soil degradation occurring? What are the relevant physical, chemical and biochemical processes in the topsoil after application and during its transport to greater depth?

Convenor: **Ir Joop Steenvoorden**
Alterra, Wageningen University and Research Centre, Postbox 47, 6700 AA Wageningen, The Netherlands
[tel.: +31 317 474311; fax: +31 317 419000; j.h.a.m.steenvoorden@alterra.wag-ur.nl]

IAHS Workshops

HW01: International Workshop on Effects of Human Activities on Hydrological and Biogeochemical Cycles

9–10 July 2003

ICWQ (ICGW)

Many factors affect hydrological and biogeo-chemical cycles including geology, vegetation, soil types, atmospheric deposition, erosion intensity, and climate. Deciphering and quantifying the primary processes controlling the cycles has been the focus of many studies for several decades. The objective of this workshop is to assess the status of these relations and to explore new technologies, such as tracers, in elucidating these processes and testing hydrological transport and hydrochemical models. Presenters are encouraged to take a holistic approach in comparing and contrasting processes among basins at a range of temporal and spatial scales and with respect to human activities.

Main convenor: **Dr Nobuhito Ohte**
Laboratory of Forest Hydrology, Division of Environmental Science and Technology, Graduate School of Agriculture, Kyoto University, Kyoto 606-8502, Japan
[tel.: +81 75 7536093, fax: +81 75 7536088; nobu@bluemoon.kais.kyoto-u.ac.jp]

Co-convenor: **Dr Norman (Jake) Peters, US Geological Survey, WRD, 3039 Amwiler Road, Suite 130, Atlanta, Georgia 30360-2824, USA**
[tel.: +1 770 9039145; fax: +1 770 9039199; nepeters@usgs.gov]

HW02: International Workshop on Stream Temperature Changes and Effects

11 July 2003

ICWQ

This workshop will deal with different aspects of stream and river temperatures ranging across subjects such as impacts of future warming, ecological implications, human effects, fundamental physical and hydrological processes involved, and managing and controlling temperatures in rivers.

Convenor: **Prof. Bruce Webb**
University of Exeter, School of Geography and Archaeology, Amory Building, Rennes Drive, Exeter EX4 4RJ, UK
[tel.: +44 1392 263334; fax: +44 1392 263342; b.w.webb@exeter.ac.uk]

HW03: International Workshop on Quality Assurance in Hydrological Research

11 July 2003

ICWQ, ICSW, ICGW, ICWRS, ICASVR and ICCE

In hydrological research scientists are confronted with demands regarding quality assurance of results. The quality of hydrological modelling depends on the quality of data, suitability of the approach, and expertise of the hydrologist. The workshop aims to exchange information on how quality assurance in hydrological research can be improved and communicated to society by addressing the following issues: statistical methods for evaluation of hydrological data; level of model complexity for different problems/scales; new approaches to sensitivity and uncertainty analyses and parameter calibration; steps necessary for regionalization and modelling of ungauged catchments; how model validation can assure exploration of future trends.

Convenor: **Dr Valentina Krysanova**
Potsdam Institute for Climate Impact Research, PO Box 601203, Telegrafenberg, D-14412 Potsdam, Germany
[tel.: +49 331 2882515; fax: +49 331 2882600; valen@pik-potsdam.de]

HW04: International Workshop on Systems Modelling of Global Water Dynamics

9 July 2003

ICWRS

Modelling global water resources requires an understanding of the complex structure of water systems and their interactions with population, economy, industrial development, food production and persistent pollution. A limited set of tools is available for the appropriate description of complex systems. Capturing the dynamic behaviour of global water systems and describing important feedbacks and delays is being done using system dynamics simulation. The proposed workshop will address: (a) the most important issues in describing the complex structure of global water resources systems; (b) the power of system dynamics simulation modelling tools; and (c) the interdisciplinary nature of global water dynamics. The proposed format of the workshop is for participation of experts from different disciplines.

Main convenor: **Dr Tomoharu Hori**
Department of Civil Engineering, Kyoto University, Kyoto, Japan
[tel.: +81 75 7535095; fax: +81 75 7534907; hori@wr.kuciv.kyoto-u.ac.jp]

Co-convenors: **Dr Toshiharu Kojiri, Water Resources Research Center, Kyoto University, Gokasyo, Uji 611-0011, Kyoto, Japan**
[tel.: +81 774 384269; fax: +81 774 323093; tkojiri@wrcn2.dpri.kyoto-u.ac.jp]

Prof. Slobodan P. Simonovic, Department of Civil and Environmental Engineering, The University of Western Ontario, London, Ontario N6A 5B9, Canada
[tel.: +1 519 6614075/6614271; fax: +1 519 6613779/6614273; simonovic@uwo.ca]

HW05: International Workshop on Groundwater Resources for Emergency Situations

10 July 2003

ICGW

This workshop will focus on the identification and management of groundwater resources for emergency situations as a result of extreme hydrological events like earthquakes, droughts and floods, which may result in a breakdown of the water supply system for long periods. Especially in densely populated urban environments this may result in the need for emergency drinking water supplies. How should groundwater resources and water supply be managed to secure water availability after such events? What measures could be taken to prevent exploitation of all available groundwater resources and what methods are available to support decision making?

Convenor: **Dr Norio Tase**
Institute of Geoscience, University of Tsukuba, Ibaraki 305-8571, Japan
[tel.: +81 298 534750; fax: +81 298 519764; tase@atm.geo.tsukuba.ac.jp]

HW06: International Symposium on Isotope Tracers in Water Cycle Models

7–9 July 2003

ICT, ICGW and IAEA

This workshop will explore a number of questions concerning how isotopic information can be used to formulate, calibrate and test models of water flow pathways, water sources, water age and transit time at catchment, regional and global scales. Contributions are encouraged on conceptual, analytical and numerical modelling of the water cycle and isotope processes at the local to global scale, including application of isotopes in general circulation models (GCMs), regional climate models (RCMs), land surface schemes, watershed hydrological models, lake basin models, and hillslope/catchment models.

Main convenor: **Prof. Jeffrey J. McDonnell**
Department of Forest Engineering, Oregon State University, Corvallis, Oregon 97331-5706, USA
[tel.: +1 541 7378720; fax: +1 541 7374316; jeff.mcdonnell@orst.edu]

Co-convenors: **Pradeep K. Aggarwal, Isotope Hydrology Section, International Atomic Energy Agency, PO Box 100, Wagramer Strasse 5, A-1400 Vienna, Austria**
[tel.: +43 1 260021735; fax: +43 1 26007; p.aggarwal@iaea.org]

Dr John J. Gibson, Isotope Hydrology Section, International Atomic Energy Agency, PO Box 100, Wagramer Strasse 5, A-1400, Vienna, Austria
[tel.: +43 1 260021741; fax: +1 775 2554911; efax: +1 530 3248826 (USA); j.gibson@iaea.org]

HW07: International Workshop: Towards a Science Programme for the Prediction of Ungauged Basins

10–11 July 2003

All IAHS Commissions

In river basins everywhere, man's activities have disrupted the natural hydrological and ecological regimes. This is particularly true for those basins in developing country regions where climatic

variability and basin development undertaken with little or no data have frequently led to the depletion of water resources, ecosystem degradation, and poor quality of life. New advances in understanding and predictive capacity are needed to support the sustainable management of ungauged or poorly gauged basins. The workshop will focus on the formulation of a PUBs science programme which can mobilize the scientific community in a coordinated and effective way to address this major challenge over the next 10 years.

Main convenor: **Prof. P. E. O'Connell Department of Civil Engineering, University of Newcastle upon Tyne, Cassie Building, Claremont Road, Newcastle upon Tyne NE1 7RU, UK**
[tel.: +44 191 2226405; fax: +44 191 2226669; p.e.o'connell@ncl.ac.uk]

Co-convenors: **Prof. Levent Kavvas, Department of Civil and Environmental Engineering, University of California, Davis, California 95616, USA**
[tel.: +1 916 7520586; fax: +1 916 7527872; mlkavvas@ucdavis.edu]

Prof. Murugesu Sivapalan, Department of Environmental Engineering, Centre for Water Research, University of Western Australia, 35 Stirling Highway, Crawley, Western Australia 6009, Australia
[tel.: +61 8 93802320; fax: +61 8 93801015; sivapalan@cwr.uwa.edu.au]

Prof. Jeffrey J. McDonnell, Department of Forest Engineering, Oregon State University, Corvallis, Oregon 97331-5706, USA
[tel.: +1 541 7378720; fax: +1 541 7374316; jeff.mcdonnell@orst.edu]

HW08: International Workshop on Parameter Estimation Techniques

7–9 July 2003

IAHS/WMO Working Group on GEWEX, ICSW and ICASVR

The aims of this workshop are: to report on the experience of a preliminary workshop on this topic held at the University of Arizona in April 2002; to review the current techniques being actively used by different groups to estimate the parameters of hydrological models; to test the ability of some of these techniques to make *a priori* parameter estimates and to simulate streamflow for several common basins encompassing different climatic regions; to determine future activities to address parameter estimation.

Main convenor: **Dr John Schaake National Weather Service, 1325 East-West Highway, Silver Spring, Maryland 20910, USA**
[tel.: +1 301 7130640 ext. 144; fax +1 301 7130963; john.schaake@noaa.gov]

Co-convenors: **Dr Alan Hall, 17 Crisp Street, Cooma, New South Wales 2630, Australia**
[tel./fax: +61 2 64521920; hallalan@acr.net.au]

Dr Stewart W. Franks, Department of Civil, Surveying and Environmental Engineering, University of Newcastle, New South Wales 2308, Australia
[tel.: +61 2 49216053; fax: +61 2 49216991; ceswf@civeng.newcastle.edu.au]

Prof. Qingyun Duan, Hydrology Laboratory, National Weather Service, W/OHD12, 1325 East-West Highway, Silver Spring, Maryland 20910, USA
[tel.: +1 301 7131018, ext. 113; fax: +1 301 7131051; qingyun.duan@noaa.gov]

Prof. Hoshin V. Gupta, SAHRA, The University of Arizona, Hydrology and Water Resources Department, Tucson, Arizona 85721, USA
[tel.: +1 520 6266974; fax: +1 520 6267770; hoshin@hwr.arizona.edu]

Dr George H. Leavesley, US Geological Survey, WRD, Box 25046, MS 412, Denver Federal Center, Denver, Colorado 80225, USA
[tel.: +1 303 2365026; fax: +1 303 2365034; george@usgs.gov]

Joint association symposia and workshops led by IAHS

JSH01: International Symposium on Remote Sensing of the Cryosphere

7–8 July 2003

IAHS (ICSI, ICRS), IAMAS and IAPSO

Techniques of remote sensing are proving to be valuable research tools in tracking the evolution of the cryosphere and in elucidating processes for the development of models for cryospheric systems. Topics of interest solicited for this symposium include the remote sensing of: snow accumulation and ablation; the physical structure and dynamics of glaciers and ice caps; inputs to snow and glacier melt runoff models; sea, lake and river ice; frozen ground; the assessment of climatic change effects in cold regions. Presentations on remote sensing/cryospheric research inputs to international programmes such as HELP, GEWEX, WWAP, and the Climate and Cryosphere Project under the WMO World Climate Research Programme are particularly welcome.

Main convenor: **Dr Richard Armstrong National Snow and Ice Data Center, 449 UCB, University of Colorado, Boulder, Colorado 80309-0449, USA**
[tel.: +1 303 4921828; fax: +1 303 4922468; rlax@kryos.colorado.edu]

Co-convenors: **Dr Eric Brun, Météo-France/ CNRM, Centre d'Etudes de la Neige, 1441 Rue de la Piscine, F-38406 Saint-Martin d'Hères, France**
[tel.: +33 4 76637917; fax: +33 4 76515346; eric.brun@meteo.fr]

Prof. Julian Dowdeswell, Scott Polar Research Institute and Department of Geography, University of Cambridge, Cambridge CB2 1ER, UK
[tel.: +44 1223 336541; fax: +44 1223 336549; jd16@cam.ac.uk]

Dr Martyn Tranter, Bristol Glaciology Centre, School of Geographical Sciences, University of Bristol, Bristol BS8 1SS, UK
[tel.: +44 1179 288307; fax: +44 1179 283746; m.tranter@bristol.ac.uk]

JSH02: International Symposium on Groundwater and Volcanoes

4 July 2003

IAHS (ICGW) and IAVCEI

Although groundwater is one of the most important characteristics of volcanoes, groundwater hydrology is perhaps the least well understood component. The purpose of the symposium is to bring together hydrologists, volcanologists, geophysicists, geochemists, geographers, and civil engineers, to exchange current ideas and information concerning groundwater in volcanoes. The topics to be covered include: recharge processes, flow paths, and residence times for groundwater; origins and occurrence of groundwater; groundwater contribution to slope disasters; influence of groundwater on volcanism; interaction between groundwater and surface waters; and groundwater usage. Studies involving geothermal hydrological systems are also appropriate for this symposium.

Main convenor: **Dr Masaya Yasuhara**
Geological Survey of Japan, Higashi, Tsukuba, Ibaraki 305-8567, Japan
[tel.: +81 298 612409; fax: +81 298 613749; masaya-yasuhara@aist.go.jp]

Co-convenors: **Dr Stephen B. Gingerich, US Geological Survey, 677 Ala Moana Boulevard #415, Honolulu, Hawaii 96813, USA**
[tel.: +1 808 5872411; fax: +1 808 5872401; sbginger@usgs.gov]

Kohei Kazahaya, Geological Survey of Japan, Higashi, Tsukuba, Ibaraki 305-8567, Japan
[tel.: +81 298 613861; fax: +81 298 613749; kazahaya-k@aist.go.jp]

Yuichi Suzuki, Rissho University, 1700 Mankichi, Kumagaya, Saitama 360-0194, Japan
[tel.: +81 48 5391648; fax: +81 48 5391648; ysuzuki@ris.ac.jp]

Dr Joseph S. Walder (IAVCEI)**, US Geological Survey, Cascades Volcano Observatory, 1300 SE Cardinal Court, Building 10, Suite 100, Vancouver, Washington 98683-9589, USA**
[tel.: +1 360 9938948; fax: +1 360 9938980; jswalder@usgs.gov]

JSH03: International Symposium on Quantitative Approaches to Hyporheic Flows and their Biogeochemical Consequences in Marine, Estuarine and Freshwater Systems

3 July 2003

IAHS (ICWQ, ICGW) and IAPSO

Hyporheic flows in porous sediments transport pore water and particles through sandy sediments in rivers and estuaries at rates far greater than those that occur in muddy sediments. As a consequence, sediment biogeochemistry in porous sediments differs from that in diffusively controlled mud sediments. These processes have been investigated by hydrologists, biogeochemists, microbiologists, and other specialists. The proposed symposium will provide a forum for the presentation of the results of different disciplines, and by doing so, stimulate co-operation, identify critical research areas, and speed the dissemination of novel techniques and theoretical approaches to the topic as a whole.

Main convenor: **Dr Richard Davis**
Environment Department, World Bank, Mailstop MC5-512, World Bank, 1818 H Street, Washington, DC 20433, USA
[tel.: +1 202 4736267; fax: +1 202 5220367; jdavis@worldbank.org]

Co-convenors: **Prof. Bill Burnett, Department of Oceanography, Florida State University, Tallahassee, Florida 32306-4320, USA**
[tel.: +1 850 6446703; fax: +1 850 6442581; wburnett@mailer.fsu.edu]

Dr Phillip Ford, CSIRO Land and Water, GPO Box 1666, Canberra, ACT 2601, Australia
[tel.: +61 2 62465559; fax: +61 2 62465560; phillip.ford@csiro.au]

Prof. Shinichi Onodera, Faculty of Integrated Sciences, Hiroshima University, Kagamiyama1-7-1, Higashihiroshima 739-8521, Japan
[tel.: +81 824 246496; fax: +81 824 240758; sonodera@hiroshima-u.ac.jp]

JWH01: International Workshop on Snow Processes: Representation in Atmospheric and Hydrological Models

9–10 July 2003

IAHS (ICSI) and IAMAS

This workshop will bring together researchers from the hydrological and climatological communities to examine current methods of representing snow and snow–vegetation interactions in order to develop more comprehensive approaches to snow modelling. The workshop will have sessions on snow representation in open and in forested environments and a synthesis session on improvements to snow models. Papers presenting models which address snow redistribution, shrub interactions, snowmelt energetics, sublimation, interception, canopy interactions and advection and intercomparison of snow models are particularly welcome.

Main convenor: **Dr John Pomeroy**
Institute of Geography and Earth Sciences, University of Wales, Aberystwyth, Ceredigion SY23 3DB, UK
[tel.: +44 1970 622781; fax: +44 1970 622659; john.pomeroy@aber.ac.uk]

Co-convenors: **Richard Essery, Hadley Centre for Climate Prediction and Research, Met Office, London Road, Bracknell, Berkshire RG12 2SY, UK**
[tel.: +44 1344 854776; fax: +44 1344 854898; richard.essery@metoffice.com]

John King, British Antarctic Survey, High Cross, Madingley Road, Cambridge CB3 0ET, UK
[tel.: +44 1223 221487; fax: +44 1223 221279; j.c.king@bas.ac.uk]

Prof. Lev S. Kuchment, Institute of Water Problems, Russian Academy of Sciences, 3 Gubkin Street, GSP 1, Moscow 199991, Russia
[tel.: +7 095 1355403; fax: +7 095 1355415; kuchment@hotmail.com]

Dr Eric Martin, Météo-France/CNRM, Centre d'Etudes de la Neige, 1441 Rue de la Piscine, F-38406 Saint-Martin d'Hères, France
[tel.: +33 4 76637901; fax: +33 4 76515346; eric.martin@meteo.fr]

Dr Tetsuo Ohata, Institute of Low Temperature Science, Hokkaido University, Kita-19, Nishi-8, Kita-ku, Sapporo 060-0819, Japan
[tel.: +81 11 7065488; fax: +81 11 7065488; ohata@pop.lowtem.hokudai.ac.jp]

JWH02: International Workshop on the Role of GEWEX Hydrometeorological Science in Improved Water Resources Management

3–4 July 2003

IAHS and IAMAS

Invited keynote speakers will articulate the results of previous meetings held between GEWEX researchers and the water resource management community and the GEWEX products available to meet these requirements. Presentations are invited on: case studies on the use of GEWEX products to improve water resource management; planned GEWEX products under development; the special needs of water resource managers under different climate regimes; quantification and effects of errors and/or bias in models; the assessment of risk and the quantification of the probability distribution associated with GEWEX products; coupling atmospheric and hydrological models for water resource applications.

Main convenor: **Dr Alan Hall**
17 Crisp Street, Cooma, New South Wales 2630, Australia
[tel./fax: +61 2 64521920; hallalan@acr.net.au]

Co-convenors: **Prof. Lawrence Martz, Department of Geography, University of Saskatchewan, 9 Campus Drive, Saskatoon, Saskatchewan S7N 5A5, Canada**
[tel.: +1 306 9665667; fax: +1 306 9665680; martz@skyway.usask.ca]

Dr Ronald E. Stewart, Climate Processes and Earth Observation Division, Meteorological Service of Canada, 4905 Dufferin Street, Downsview, Ontario M3H 5T4, Canada
[tel.: +1 416 7394122; fax: +1 416 7395700; ron.stewart@ec.gc.ca]

Symposia and workshops led by IAMAS with IAHS participation

JSM03: International Symposium on Land–Ocean–Atmosphere Interactions in the Coastal Zone

(2 days)

This symposium will include topics encompassing the physics, chemistry, and biology of coastal meteorology and oceanography as well as terrestrial processes and interactions. Papers are solicited covering physical aspects of topics such as sea breeze circulations; surface momentum, heat, and radiative fluxes; topographic steering of currents and winds; radiative balances; wind erosion and along-shore transport in the water column; cross-shelf transport of biological and chemical materials in all compartments; system integration and assessment; and forecasting. In addition, chemical and biological aspects will include topics such as pollution transport and transformation processes; dry and wet processing; and interactions with coastal flora in both the atmosphere and the ocean. The symposium, where possible, will place emphasis on innovative approaches which address coastal issues and which involve new measurement methods, new modelling approaches, combined approaches of solving problems using statistical and dynamical modelling tools.

Main convenor: **Gerald L. Geernaert Frederiksborgvej 399, Postboks 358, DK-4000 Roskilde, Denmark**
[tel.: +45 46301101; fax: +45 46301214; glg@dmu.dk]

Co-convenor (IAHS): **Dr Mikhail V. Bolgov, Water Problems Institute, Russian Academy of Sciences, Gubkin Street 3, GSP 1, Moscow 199991, Russia**
[tel.: +7 095 9516841; fax: +7 095 1355415; bolgov@cityline.ru *or* caspian-sea@mtu-net.ru]

JSM04: International Symposium on Terrestrial Ecosystems, Atmospheric Composition, Climate

(1 day)

Interactions between the terrestrial ecosystems and the atmosphere are changing the atmospheric composition and influencing climate. In particular tropical ecosystems are suffering important changes in land use and land cover, with significant impact in the atmospheric aerosol loadings, that change the CCN population and characteristics, influencing cloud formation mechanisms and regional climate. Also alterations in trace gas emissions are strongly coupled with vegetation changes. Carbon dioxide exchange in forested areas is also changing in the last decades, with relevant impacts on the global budget of this key greenhouse gas.

Main convenor: **Paulo Artaxo**
Instituto de Fisica, Universidade de Sao Paulo, Rua do Matao, Travessa R 187, CEP 05508-900, Sao Paulo, Brazil
[tel.: +55 11 38187016; fax: +55 11 38186749; artaxo@if.usp.br]

Co-convenor: **Alexander Gershunov** (IAHS)**, Scripps Institution of Oceanography, University of California, San Diego, 9500 Gilman Drive, La Jolla, California 92093-0224, USA**
[tel.: +1 858 5348418; fax: +1 858 5348561; sasha@ucsd.edu]

JSM10: International Symposium on Cryosphere–Climate Interactions

(2 days)

The cryosphere is an integral part of the global climate system with important linkages and feed-back generated through its influence on surface energy and moisture fluxes, clouds, precipitation, hydrology and atmospheric and oceanic circulation. The cryosphere plays a significant role in global climate, in climate model response to climate change, and as an indicator of change in the climate system. Interactions between cryosphere and climate occur on a range of time scales, from seasonal in the sea ice zone to several hundred years for changes to mass balance of ice sheets. The Climate and Cryosphere Project under the WMO World Climate Research Programme has identified key processes in the climate and cryosphere system, indicating better observations are required to improve parameterizations of these processes in a range of models. This symposium will focus on observations and models of these high latitude processes. Interactions of individual cryospheric components—ice sheets, ice shelves, icebergs, high latitude glaciers, snow and sea ice—with atmospheric, oceanic and hydrological processes will be discussed. Papers are invited on ice sheet models, global climate models, regional models, for present-day climate and future climate scenarios. Papers dealing with the surface mass balance of ice sheets for past and present polar climates are particularly welcome.

Main convenor: **S. O'Farrell**
CSIRO Atmospheric Research, Private Bag no. 1, Aspendale, Victoria 3195, Australia
[tel.: +61 3 92394573; siobhan.ofarrell@dar.csiro.au]

Co-convenors: **T. Lachlan-Cope, British Antarctic Survey, High Cross, Madingley Road, Cambridge CB3 0ET, UK**
[tel.: +44 1223 221484; tlc@bas.ac.uk]

Dr E. M. Morris (IAHS)**, Scott Polar Research Institute, University of Cambridge, Lensfield Road, Cambridge CB2 1ER, UK**
[tel.: +44 1223 336540; emmo@pcmail.nerc-bas.ac.uk]

JSM11: International Symposium on Global Sea Level Rise, Global Climate Change and Polar Ice Sheet Stability

(2 days)

A significant enigma which persists in the most recent IPCC assessment of climate change concerns the absence of a consensus explanation of the observed rate of rise of global sea level. Recent re-analyses of the contributions from the melting of small ice sheets and glaciers, and from the steric effect of the thermal expansion of the oceans, strongly suggest that these contributions may explain no more than half the rate that has been inferred on the basis of the analysis of tide gauge recordings. This suggests that the great polar ice sheets on Greenland and Antarctica must be contributing significantly to global sea level rise, yet *in situ* measurements of the mass balance of these cryospheric structures have yet to reveal definitive evidence of retreat. New satellite missions have been designed (e.g. GRACE) and data sets from previous missions are being analysed (e.g. TOPEX/POSEIDON) that are providing new insights on this problem. Similarly, coupled atmosphere–ocean general circulation models are providing a complementary means of assessing, through the application of data assimilation methodologies, the quality of the existing constraint on the magnitude of the steric effect. The intent of this symposium is to bring together scientists working on the sea level problem from the full range of subdisciplines from which input is required to further the progress towards understanding.

Main convenor: **Anny Cazenave**
GRGS, Centre National d'Etudes Spatiales, Avenue Eduard Belin 18, F-31401 Toulouse Cedex 4, France
[tel.: +33 5 61332922; fax: +33 5 61253205; anny.cazenave@cnes.fr]

Co-convenors: **W. Richard Peltier, Department of Physics, University of Toronto, Toronto, Ontario M5S 1A7, Canada**
[tel.: +1 416 9782938; fax: +1 416 9788905; peltier@atmosp.physics.utoronto.ca]

Dr Jon Ove Hagen (IAHS/ICSI)**, Department of Physical Geography, Faculty of Mathematics and Natural Sciences, University of Oslo, PO Box 1042 Blindern, N-0316 Oslo, Norway**
[tel.: +47 22854038; fax: +47 22857230; j.o.hagen@geografi.uio.no]

JSM14: International Symposium on Dynamics and Predictability of Severe Weather Events

(2 days)

Severe weather events associated with intense meso-cyclones, rotating storms, squall-lines, torna-does, strong local winds over mountain regions,

severe thunderstorms and floods are examples of meso- and micro-scale air flows with complex dynamics and a very short time period of dynamical predictability. This symposium will provide an opportunity to bring together papers on fluid dynamics, diagnostics, contemporary numerical modelling and forecasting of these and related phenomena and to discuss recent advances in our basic understanding of their dynamics and predictability as well as our current forecasting capability.

Main convenor: **David Hudak**
Cloud Physics Research Division, Meteorological Service of Canada, 4905 Dufferin Street, Toronto, Ontario M3H 5T4, Canada
[david.hudak@ec.gc.ca]

Co-convenors: **Michael V. Kurgansky, Department of Atmospheric and Oceanic Physics, Faculty of Physics and Mathematics, University of Concepcion, Casilla 160-C, Concepcion, Chile**
[tel.: +56 41 203154; fax: +56 41 220104; kurgansk@udec.cl *or* kurgansk@awi-potsdam.de]

Franco Prodi, Institute of Atmospheric and Oceanic Sciences, National Research Council, Via P. Gobetti 101, CAP, I-40129 Bologna, Italy
[tel.: +39 051 6399561; +39 051 6399658; f.prodi@isao.bo.cnr.it]

JSM15: Special Nakaya–Magono Celebration on the Growth of Ice Crystals and Snow

(½ day)

On the occasion of the IUGG Assembly in Sapporo, IAMAS wishes to honour and celebrate two of the great scientists of the Low Temperature Institute of the Hokkaido University who, as world leaders, made exciting contributions to the understanding of the growth of ice crystals and snow. This international symposium will address the modern state of our knowledge in the field.

Main convenor: **Roland List**
Department of Physics, University of Toronto, Toronto M5S 1A7, Canada
[tel.: +1 416 9782982; fax: +1 416 9788905; list@atmosp.physics.utoronto.ca]

Co-convenors: **George A. Isaac, Cloud Physics Research Division, Meteorological Service of Canada, 4905 Dufferin Street, Toronto, Ontario M3H 5T4, Canada**
[tel.: +1 416 7394605; fax: +1 416 7394211; george.isaac@ec.gc.ca]

Paul M. B. Foehn (IAHS/ICSI), **Swiss Federal Institute for Snow and Avalanche Research, Fluelastrasse 11, CH-7260 Davos Dorf, Switzerland**
[tel.: +41 81 4170111; fax: +41 81 4170110; foehn@slf.ch**]**

JSM16: International Symposium on the Role of Atmospheric Processes in Mass Balance Exchange in the Polar Regions

(1 day)

The symposium will cover both observational and modelling aspects of blowing snow, precipitation and sublimation at high latitudes.

Main convenor: **Richard Bintanja**
Institute for Marine and Atmospheric Research Utrecht (IMAU), Utrecht University, PO Box 80005, 3508 TA Utrecht, The Netherlands
[tel.: +31 30 2533259; fax: +31 30 2543163; r.bintanja@phys.uu.nl]

Co-convenors: **Michel Van Den Broeke, Institute for Marine and Atmospheric Research Utrecht (IMAU), Utrecht University, PO Box 80005, 3508 TA Utrecht, The Netherlands**
[tel.: +31 30 2533259; fax: +31 30 2543163; m.r.vandenbroeke@phys.uu.nl]

Kouichi Nishimura, Institute of Low Temperature Science, Hokkaido University, N19W8, Sapporo 060-0819, Japan
[tel.: +81 11 7065461; nishi@lowtem.hokudai.ac.jp]

Dr E. M. Morris (IAHS/ICSI)**, Scott Polar Research Institute, University of Cambridge, Lensfield Road, Cambridge CB2 1ER, UK**
[tel.: +44 1223 336540; emmo@pcmail.nerc-bas.ac.uk]

JSM18: International Symposium on the Measurement and Distribution of Precipitation

(1 day)

The symposium will focus on quantitative estimation of uncertainties associated with precipitation estimates. Particularly, the symposium encourages contributions related to (a) the error modelling and validation of remotely sensed precipitation (space- and ground-based systems); (b) the stochastic, statistical and scaling models of remotely sensed precipitation and their implications for the space–time dependence of the estimates; (c) the differentiation of errors into random, systematic and those errors which depend upon the physics of precipitation, and (d) papers related to observational strategies for reducing uncertainties in the future.

Main convenor: **Chris Kummerow**
Department of Atmospheric Science, Colorado State University, Fort Collins, Colorado 80523, USA
[tel.: +1 970 4917473; fax: +1 970 4918449; kummerow@atmos.colostate.edu]

Co-convenors: **Edward Zipser, University of Utah, Meteorology Department, Salt Lake City, Utah 84112-0110, USA**
[tel.: +1 801 5859482; fax: +1 801 5853681; ezipser@met.utah.edu]

Shaun Lovejoy (IAHS)**, Physics Department, McGill University, 3600 University Street, Montreal, Quebec H3A 2T8, Canada**
[tel.: +1 514 3986537; fax: +1 514 3988434; lovejoy@physics.mcgill.ca]

JWM01: International Workshop on Water and Energy Budgets

(1½ days)

The purpose of this workshop is to examine our capability to close water and energy budgets over continental-scale regions. The focus is on time scales up to interannual and includes extremes such as drought and wet periods. The workshop will comprise scientific presentations as well as a discussion period aimed at summarizing our capabilities and weaknesses as well as identifying the key outstanding scientific challenges. A summary report will be produced on the basis of the workshop. Presentations based upon atmospheric and coupled models, land data assimilation systems, as well as observations are requested. Studies that compare model and observational data sets are especially encouraged.

Main convenor: **John Roads**
Scripps Institution of Oceanography, University of California at San Diego, 0224 La Jolla, California 92093-0224, USA
[tel.: +1 858 5342099; fax: +1 858 5348561; jroads@ucsd.edu]

Co-convenors: **Ronald Stewart, Climate Processes and Earth Observation Division, Meteorological Service of Canada, 4905 Dufferin Street, Downsview, Ontario M3H 5T4, Canada**
[tel.: +1 416 7394122; fax: +1 416 7395700; ron.stewart@ec.gc.ca]

Dr Alan Hall (IAHS)**, 17 Crisp Street, Cooma, New South Wales 2630, Australia**
[tel./fax: +61 2 64521920; hallalan@acr.net.au]

Symposia led by IAG with IAHS participation

JSG02: International Symposium on Interdisciplinary Earth Science from Improved Gravity Field Modelling

(½ day)

IAG, IAHS, IAPSO and IASPEI

The new satellite gravity field missions (CHAMP, GRACE and GOCE) and improvements in ground-based and airborne measuring technology have improved our knowledge of the gravity field of the Earth at new temporal and spatial scales. This has given possibilities for advances in oceanography (ocean circulation, climate modelling), solid geophysics (understanding of geodynamic processes), hydrology and glaciology (water mass storage, land-ice changes) and in geodesy (geoid, height system unification). This symposium will primarily consist of invited contributions, but unsolicited papers as well as posters are also welcome.

Main convenor: **Dr Georges Balmino**
CNES/GRGS, 18 Avenue Edouard Belin, F-31401 Toulouse, France
[tel.: +33 5 61332980/2889; fax +33 5 61253098; georges.balmino@cnes.fr]

Co-convenors: **Victor Zlotnicki** (IAPSO) **, NASA Jet Propulsion Laboratory, Pasadena, California 91109, USA**
[tel.: +1 818 3545519; fax: +1 818 3936720; [vz@pacific.jpl.nasa.gov]

Prof. Nicolas Florsch (IAHS)**, Département de Géophysique Appliquée, UMR 7619 "Sisyphe", Case 105, Université Pierre et Marie Curie, 4 Place Jussieu, F-75252 Paris Cedex 05, France**
[tel.: +33 1 44274828; fax: +33 1 44274588; florsch@ccr.jussieu.fr]

JSG03: International Symposium on Interdisciplinary Science from Remote Sensing—Radar Altimetry, ATSR, SAR, Ocean Colour and Other Sensors

IAG, IAPSO, IAHS and IASPEI

Satellite and airborne remote sensing has a new challenge in combining data from the many new sensor or one-instrument systems. New satellites (including CHAMP, ENVISAT, CRYOSAT, ICESAT) have been launched which give new opportunities for interdisciplinary research. This symposium will highlight recent results from these new missions.

Main convenor: **P. Knudsen**
Kort & Matrikelstyrelsen, Rentemestervej 8, DK-2400 Copenhagen NV, Denmark
[pk@kms.dk]

Co-convenor: **Dr Manfred Owe** (IAHS),
Mail Code 974, NASA/Goddard Space Flight Center, Greenbelt, Maryland 20771, USA
[tel.: +1 301 6145783; fax: +1 301 6145808; owe@hsb.gsfc.nasa.gov]

Symposium and workshop led by IASPEI with IAHS participation

JSS04: International Symposium on Thermally Controlled Processes within the Earth

The Earth is a thermally driven planet. Most of the phenomena investigated in geosciences are controlled by internal thermal conditions and by thermally driven processes. Understanding of the internal thermal regime of our planet is derived from both direct geothermal observations as well as models and indirect evidence based on a wide spectrum of geophysical and geological observations and measurements. This symposium aims at a broad presentation and discussion on the state of the art of internal temperatures and thermal regime of the Earth as a planetary body. The release of heat and thermally controlled phenomena in the interior of our planet are the major driving forces of most geological and geophysical processes, such as plate tectonics, mantle convection or generation of the magnetic field of the Earth.

Interaction of internal and external processes of the planet produce couplings between volcanism, atmosphere, hydrosphere and climate. Thermally controlled processes of the Earth are studied in many disciplines, and we invite contributions in geothermics, active and passive seismology, magnetics, electromagnetics, high-PT laboratory experiments, volcanology as well as interactions between internal and external Earth processes.

Main convenor: **Dr Ilmo T. Kukkonen**
Geological Survey of Finland, PO Box 96, Betonimiehenkuja 4, FIN-02151 Espoo, Finland
[tel.: +358 205 502270; fax: +358 205 5012; ilmo.kukkonen@gsf.fi]

Co-convenors: **Dr Vladimir Cermak, Geophysical Institute, Czech Academy of Sciences, Bocni II, CP 1401, 141-31 Prague 4 – Sporilov, Czech Republic**
[tel.: 420 2 67103385; fax: 420 2 72761549; cermak@ig.cas.cz]

Prof. David S. Chapman, Department of Geology and Geophysics, University of Utah, 719 WBB, 135 S 1460 E, Salt Lake City, Utah 84112, USA
[tel.: +1 801 5816820; fax: +1 801 5816749; dchapman@park.admin.utah.edu]

Dr Walter D. Mooney, US Geological Survey, Mail Stop 977, 345 Middlefield Road, Menlo Park, California 94025, USA
[tel.: +1 650 3294764; fax: +1 650 3295163; mooney@usgs.gov]

JWS04: International Workshop on Subsurface Thermal Signatures of Tectonics, Hydrogeology and Palaeoclimate

While deeper crustal temperatures and heat flow studies provide important information on the thermal conditions deep within the Earth, understanding the shallow thermal regime, in particular its changes with time, can contribute to a number of different geophysical, geological, hydrogeological and environmental problems. The signals associated with various surface processes propagate downward and influence the subsurface temperature field at depths reached by many shallow boreholes. Long-term climate changes and changes in land cover, large natural and even some man-made manifestations may have left their signature underground. Similarly subsurface groundwater flows and their changes, tectonic movements, crustal deformation and local stresses in areas of high seismicity, as well as many recent geological processes have imprinted their traces in the temperature field. The workshop welcomes the results of either field experiments or modelling studies, which demonstrate practical use of precise temperature measurements in subsurface environments.

Main convenor: **Prof. Makoto Taniguchi**
Department of Earth Sciences, Nara University of Education, Takabatake, Nara 630-8528, Japan
[tel.: +81 742 279202; fax: +81 742 279291; makoto@nara-edu.ac.jp]

Co-convenors: **Dr Vladimir Cermak, Geophysical Institute, Czech Academy of Sciences, Bocni II, CP 1401, 141-31 Prague 4 – Sporilov, Czech Republic**
[tel.: +420 2 67103385; fax: +420 2 72761549; cermak@ig.cas.cz]

Prof. Christoph Clauser, Applied Geophysics, Aachen University of Technology (RWTH), Lochnerstrasse 4-20, D-52056 Aachen, Germany
[tel.: +49 241 8099384; fax: +49 241 8092132; c.clauser@geophysik.rwth-aachen.de]

Symposia led by IAPSO with IAHS participation

JSP03: International Symposium on Groundwater Inputs to the Ocean

4 July

The process of submarine groundwater discharge (SGD) is now recognized as significant for water and material pathways from the land to the ocean. The study of the chemical and ecological effects of SGD in the coastal zone is an emerging science. This symposium will focus on physical, chemical and biological aspects of SGD and will be hosted by a new joint Commission on Groundwater–Seawater Interactions. Papers are invited on relevant topics, including submarine groundwater discharge, environmental and ecological effects in estuaries and coastal zones, as well as other subjects related to groundwater–seawater interactions.

Main convenor: **Evgeni A. Kontar**
P. P. Shirshov Institute of Oceanology, Russian Academy of Sciences, Moscow 117218, Russia
[tel.: +7 095 1292181; fax: +7 095 1245983; kontar@cityline.ru *or* e_kontar@hotmail.com]

Co-convenors: **Prof. William C. Burnett, Department of Oceanography, Florida State University, Tallahassee, Florida 32306-4320, USA**
[tel.: +1 850 6446703; fax: +1 850 6442581; wburnett@mailer.fsu.edu]

Prof. Makoto Taniguchi (IAHS/ICGW)**, Department of Earth Sciences, Nara University of Education, Nara 630-8528, Japan**
[tel.: +81 742 279202; fax: +81 742 279291; makoto@nara-edu.ac.jp]

Toshitaka Gama, Division of Earth and Planetary Sciences, Graduate School of Science, Hokkaido University, N10 W8, Sapporo 060-0810, Japan
[tel.: +81 11 7062725; fax: +81 11 7460394; gamo@ep.sci.hokudai.ac.jp]

JSP04: International Symposium on Arctic Environmental Change

The Arctic has experienced rapid change during the last few decades: i.e. reduction of sea ice extent, the intensification of the Polar Vortex, an increase in cloud cover, and deteriorating permafrost. A significant reduction of the North Atlantic deep water formation and an increase in Atlantic water underneath the Arctic halocline may be tied to these changes as well. Thus, changes in the Arctic

have the potential to influence the global system. Papers are invited in the fields of climatology and the dynamics of the cryosphere, the ocean and the atmosphere. The foci of this symposium are: the signals from and roles of the ocean and land surface influenced by the atmosphere and/or their feedback to the atmosphere; the mechanisms and consequences of ocean–land interactions through the atmosphere and rivers; oceanic and terrestrial chemical tracer studies related to the Arctic; interactions with biosphere and geochemical processes; and palaeoclimatic studies.

Main convenor: **Prof. Motoyoshi Ikeda**
Graduate School of Environmental Earth Science, Hokkaido University, North 10, West 5, Kita-ku, Sapporo 060-0810, Japan
[tel.: +81 11 7062360; fax: +81 11 7064865; mikeda@ees.hokudai.ac.jp]

Co-convenors: **Prof. Lawrence Mysak, Department of Atmospheric and Oceanic Sciences, McGill University, 805 Sherbrooke St W, Montreal, Quebec H3A 2K6, Canada**
[tel.: +1 514 3983768; fax: +1 514 3986115; mysak@zephyr.meteo.mcgill.ca]

Prof. Manfred A. Lange (IAHS/ICSI)**, Institute for Geophysics and Centre for Environmental Research (ZUFO), University of Münster, Corrensstrasse 24; D-48149 Münster, Germany**
[tel.: +49 251 8333591; fax: +49 251 8336100; langema@uni-muenster.de]

Grants

The IUGG2003 Local Organizing Committee, IUGG, and the seven Associations are working together to offer a limited number of financial assistance grants to support participation at the IUGG2003 General Assembly. An application for a grant can be made only by persons who have submitted one or more abstracts to the scientific programme.

Financial assistance funds are limited. Most awards will be for the registration fee only. It is unlikely that full support will be possible.

The deadline for receipt of grant applications is 31 January 2003. Applications should be sent only to the IUGG2003 Secretariat at Japan Marine Science and Technology Center. More information can be found on the IAHS web site.

Other Forthcoming Events

(all meetings are organized or sponsored by IAHS and/or its Commissions)

Workshop on Erosion and Sediment Transport Measurement: Technological and Methodological Advances

Oslo, Norway, 19–21 June 2002

Call for abstracts

Due to a growing awareness of the important role of fluvial sediment in a wide range of environmental problems, there is an increasing need for a better understanding of the processes of erosion and sedimentation and their impact on the transport of sediment in rivers. Despite the need for better and more consistent information, data collection in this field still lags behind other areas of hydrology. New problems also call for new approaches, new strategies and new methods in order to develop an improved understanding of the cause and effect relationships for different activities within a river basin.

This workshop will focus on new sediment measurement technologies and present a review of the status of current research and development in this field. The programme will include both invited speakers and contributions from participants. The following invited speakers will present papers:

Ian Droppo (Environment Canada): A new definition of suspended sediment: implications for the measurement and prediction of sediment transport

Andrew Nicholas (University of Exeter, UK): Modelling and monitoring flow and sediment transport in lowland river flood-plain environments

Wojciech Froehlich (Polish Academy of Sciences): Monitoring of bed-load transport in streams by use of acoustic and magnetic devices

David H. Schoellhamer (US Geological Survey): Continuous monitoring of suspended sediment in rivers by use of optical sensors

Des Walling (University of Exeter, UK): Using environmental radionuclides as tracers in sediment budget investigations

Damian Lawler (University of Birmingham, UK): Automated monitoring of bank erosion dynamics and the wider geomorphological challenge: new developments in the Photo-Electronic Erosion Pin (PEEP) system

Helmut Habersack (Universität für Bodenkultur, Vienna, Austria): The stochastic nature of bed-load transport—results from radio-tracking gravel particles

Jonathan Laronne (Ben Gurion University of the Negev, Israel): Technical and scientific issues regarding bed-load flux monitoring using automated slot samplers

Jim Bogen & Knut Møen (Norwegian Water Resources and Energy Directorate, Oslo): Bed-load measurements with a new passive ultrasonic sensor

Peter Ergenzinger (Freie Universität Berlin, Germany): Perspectives in bed-load measurements

Participants are invited to submit short abstracts of contributions (indicating their preference for oral or poster presentations). The deadline for receipt of **abstracts** was **1 April 2002**. Authors of accepted papers and posters will be required to submit extended abstracts that will be mailed to participants prior to the workshop in order to facilitate workshop discussions.

The address for abstracts and more information is:

Dr Jim Bogen/Tharan Fergus
Norwegian Water Resources and Energy Directorate, PO Box 5091, Majorstua, N-0301 Oslo, Norway
[fax: +47 22959000; jbo@nve.no *or* tfe@nve.no]

The workshop proceedings will be post-published as an IAHS Red Book. All papers will be subject to scientific review. A copy of the proceedings volume will be sent to all participants after the workshop.

The registration fee is NOK 1800 before 1 May and NOK 2000 after this date. The deadline for

submitting extended abstracts of accepted contributions and for payment of the registration fee is 25 May 2002.

Hydroinformatics 2002: Fifth International Conference on Hydroinformatics

Cardiff, UK, 1–5 July 2002

Call for participation

The conference will be held in Cardiff, the capital city of Wales. Cardiff is easy to reach from all major London airports. It also has its own international airport within easy reach.

Hydroinformatics is a relatively new discipline concerned with the application of computer and networking technology for the planning, management and protection of the water environment. The objective of Hydroinformatics 2002 is to bring together environmental managers, engineers and scientists with a common interest in exchanging ideas and experiences in this rapidly developing field. Over 350 papers covering the following themes have been accepted:

- Decision support and management systems
- Integration of technologies
- Geographic information systems (GIS)
- Tools, environments and languages
- Numerical engines
- Data acquisition and management
- Data mining
- Neural networks in hydroinformatics
- Internet, intranets and extranets
- Inverse modelling and data assimilation
- Uncertainty and risk
- Ecology and water quality modelling
- Experiences with modelling systems

For conference registration and further details see the web site at:

http://www.cf.ac.uk/engin/news/confs/hydro

For queries please contact:

Cherrie Summers, Conference Secretariat
ENGIN, PO Box 925, Newport Road,
Cardiff CF24 0YF, UK
[tel./fax: +44 29 20874421; summersc@cardiff.ac.uk]

International Workshop on Vulnerability of Water Resources to Environmental Change

Beijing, China, 18–20 September 2002

Call for abstracts

This joint international workshop on climate and hydrology, ecology and water resources management is being organized by the Chinese National Committee of the Biospheric Aspects of the Hydrological Cycle of the International Geosphere–Biosphere Programme (IGBP-BAHC) and co-sponsored by IAHS.

From the international perspectives of global-change science, and the process leading to the third World Water Forum in March 2003, this workshop will provide a much needed regional contribution, in particular to: (a) the Joint Water Project of the three global change programmes (IGBP, the International Human Dimension Programme (IHDP) and WCRP); and (b) the Dialogue on Water and Climate. China and other parts of south and east Asia are extremely important regions of anticipated and actual water problems, in terms of water availability, water use and water quality. The workshop will be instrumental in linking regional expertise more closely with the above international initiatives.

It is planned that the workshop will focus on three main topics:

1. **Understanding interactions between the hydrological cycle, the biosphere, land-use and land-cover change** (climate variability, climate change, floods and droughts; water cycle processes and distributed hydrological modelling to consider impacts of natural change and human activities; water resources renewability in the changing environment; ecosystem degradation due to water scarcity; interactions between the vulnerability of water resources and climate change/natural landscape change, land management practice, local human population, and ecosystem dynamics)
2. **Approaches to assess vulnerability of water resources to changing environmental conditions** (hydrological modelling and prediction in gauged and ungauged basins; the scenario approach to assess vulnerability; the endpoint approaches to assess vulnerability; quantifying the carrying capacity of water resources; other approaches to deal with uncertainty in water resources vulnerability assessment)
3. **Case studies and new challenges in the world** (population, economic development, urbanization, and their consequences for water use; environmental protection and recovery; institutional aspects (e.g. river basin authorities, irrigation schemes), water use efficiency (e.g. via water pricing) and their roles in water management; water resources safety issues; dam building, inter-basin transfers and their effects on hydrology and water resources; soil erosion and its effects on water quality; sustainable development constrained by water resources)

Papers are invited on these topics. Case studies from China and other countries including new techniques or methodologies are particularly requested. **Abstracts** of approximately 1000 words, in English, including some preliminary results and/or conclusions, should be submitted to the Local Organizing Committee no later than **31 March 2002**. The working language will be English.

For further information, please contact:

Dr Xia Jun
Hydrology and Water Resources Branch, Institute of Geographical Science and Natural Resources, Anwai, Datun Road, 917 Building, Beijing 100101, China
[tel./fax: +86 10 64856534; jxia_mail@263.net]

16th IAHR International Symposium on Ice

Dunedin, New Zealand, 2–6 December 2002

Reminder of abstract deadline

The IAHS International Commission on Snow and Ice is co-sponsoring the International Symposium on Ice that is being organized by IAHR. The symposium will cover a range of issues in river, lake and sea ice research. A fuller announcement with the topics was published in *Newsletter 73.*

The deadline for abstracts was **1 March 2002**. Camera-ready typescripts are due by **2 August 2002**.

A Workshop on Ice Crushing will be held during the week of the conference. Other specialist workshops may also be organized.

For the latest information on this meeting see:
http://www.physics.otago.ac.nz/~nzice/
or contact:

Pat Langhorne
16th IAHR International Symposium on Ice, Department of Physics, University of Otago, PO Box 56, Dunedin, New Zealand
[tel.: +64 3 4797749; fax: +64 3 4790964; nzice@physics.otago.ac.nz]

Second International Symposium on Integrated Water Resources Management (IWRM): Towards Sustainable Water Utilization in the 21st Century

Stellenbosch, Western Cape, South Africa, 22–24 January 2003

Call for abstracts

The IAHS International Commission on Water Resources Systems is organizing the Second International Symposium on Integrated Water Resources Management (IWRM): *Towards Sustainable Water Utilization in the 21st Century* at the University of Stellenbosch in January 2003. The symposium objectives include:

- To promote understanding of the interconnectedness of the physical and biotic components of water resources systems
- To report on decision support systems and model applications in support of all aspects of IWRM
- To explore the roles that statutory, legal, institutional and administrative measures and processes may play in the implementation of IWRM
- To contribute to the search for a balance between the ecological protection of water resources and the social and economic contexts of water requirements
- To review the prediction of hydrological extremes—floods and droughts—and to explore their impacts on human communities
- To promote understanding of the impacts of large-scale land use, system operating rules and climate change on the water quality and the assurance of supply of water resource systems.

Each day of the symposium will start with an extended plenary session focusing on two of the objectives, followed by parallel sessions. The plenary sessions will begin with two keynote addresses.

Participants can stay at economical rates at a conveniently located modern university residence. There are also three pleasant hotels and guest houses within 1 km of the campus.

On 25 January, there will be a one-day technical tour around the catchments that feed the integrated bulk water supply systems of the greater Cape Town metropolitan area. Apart from innovative multi-impoundment inter-catchment transfer systems of tunnels and canals, pump-storage schemes, environmental water requirement research sites and demand management projects, this part of the Western Cape has dramatic landscapes and, with its Mediterranean climate, is the heart of the wine- and deciduous fruit industry in South Africa.

Abstracts for oral papers or posters that address any of the above objectives are keenly invited. The reported research may conform to any of the following characteristics: fundamental, field-based, applied, conceptual, or case studies. Abstracts (250–300 words) should provide a sound overview of the research being reported as well as a summary of findings and conclusions. An international review panel will screen the abstracts and the subsequent full oral papers. Selected oral papers will be post-published as an IAHS Red Book. Posters need not be submitted prior to the symposium.

The following dates are important:
15 April 2002: closing date for abstracts
31 July 2002: closing date for full oral papers
31 August 2002: authors of accepted papers notified
Abstracts may be either faxed or e-mailed to:

Prof. André Görgens
Department of Civil Engineering, University of Stellenbosch, Private Bag X1 Matieland, Stellenbosch 7602, South Africa
[tel.: +27 21 4245544; fax: +27 21 4245588; andre.gorgens@shands.co.za]

More information is available on the following web site: http://www.civeng.sun.ac.za/

Third International Conference on Debris-Flow Hazards Mitigation: Mechanics, Prediction and Assessment

Davos, Switzerland, 10–12 September 2003

Reminder of abstract deadline

This conference will provide a forum for debris-flow researchers in the international community to exchange ideas on how to cope with debris-flow hazards using the most advanced, state-of-the-art methodology both in mechanics and hazard prediction and risk assessment. A more detailed announcement was published in *Newsletter 72*.

The deadline for **abstracts** (in English), not exceeding 500 words and including full contact details of all authors (one designated as the contact person) was **1 March 2002**. Final manuscripts must be submitted both as camera-ready copy and in electronic format by 15 March 2003. All papers accepted for presentation at the conference will be published in a proceedings volume, which will be distributed to registrants at the conference.

The address for abstracts is:

Dr Dieter Rickenmann
Swiss Federal Research Institute WSL, Zürcherstrasse 111, CH-8903 Birmensdorf, Switzerland
[tel.: + 41 1 7392442; fax: + 41 1 7392488; rickenmann@wsl.ch]

For general information regarding the conference contact: dfc3_inf@wsl.ch or look at the web site:
http://www.wsl.ch/3rdDFHM

Other News

International Conference on Freshwater

Bonn, Germany, 3–7 December 2001

Starting in 1977 with the UN World Water Conference, there has been a series of international gatherings discussing world water problems and how to deal with them. The latest

was convened by the Government of Germany in Bonn and held in the former parliament buildings on the banks of the Rhine. At the same time a few kilometres upstream, the German Government was hosting another conference—the conference which brought together the different Afghan factions to agree on a way forward for that war-torn country.

Also known as the "Dublin+10 meeting", the International Conference on Freshwater was designed to prepare the water input to the UN World Summit on Sustainable Development (WSSD), just as the Dublin Conference, the International Conference on Water and the Environment (ICWE), was convened 10 years before to provide the water input to the UN Conference on Environment and Development (UNCED), which was held in Rio de Janeiro in June 1992. Of course IAHS was one of the financial contributors to Dublin and was represented there by the President (Uri Shamir) and the Secretary General (Henny Colenbrander). The World Summit is due to take place in Johannesburg in August 2002 and will mark the tenth anniversary of UNCED—the Rio Earth Summit and the signing of Agenda 21 by 150 or more presidents and prime ministers, including Mr George Bush.

Well over 1000 delegates and observers attended the Bonn Conference, including many accredited representatives of the media. There were 118 government delegations, 46 with ministers, along with 47 delegations from international organizations and 73 from groups and civil society. Although the International Water Resources Association, the International Water Association and several other water-orientated scientific organizations were invited to Bonn, it was disappointing that IAHS was not. During the five days there was a closed ministerial session which produced a ministerial statement, a series of plenary sessions which came up with a report on "Recommendations for Action", several working group sessions, together with over 40 side meetings. Each conference pack contained a series of: issue papers, background papers and discussion papers in addition to the usual material. Once participants had negotiated the security screening in the entrance hall, they could wander through a number of stands and exhibits, many technical, some describing UN-based programmes and some announcing future events such as the Third World Water Forum. There were also several excursions and a number of social events, including a performance of Beethoven's Sixth Symphony and a Christmas market.

The Opening Ceremony consisted of speeches from ministers of the German Government, the Mayor of Bonn and from Mr Nitin Desai (UN Under Secretary General) and Mr Klaus Topfer (UNEP Executive Director). These speeches were interspersed with a sequence of modern dances performed by a polished professional troop. Unlike the Second World Water Forum in the Hague in 2000, there were no demonstrators or protesters to interrupt the proceedings. Several of the speakers stressed the conference theme "Water—a Key to Sustainable Development" and the importance of water to modern civilization. None voiced the thoughts which must have been shared by many of the participants that water *is the key to sustainable development.*

The initial plenary sessions were on "Multi-stakeholder dialogues" with contributions by representatives of nongovernmental organizations, local authorities, workers, business and industry and other groups under three different themes. In one of the plenary sessions, Gordon Young, Coordinator, described progress in the UN World Water Assessment Programme and the stage reached in the preparation the first edition of the World Water Development Report, which is due to be launched at the Third World Water Forum.

The first working group session dealt with "Governance, integrated management and new partnerships". The second was concerned with "Mobilizing financial resources" and the third with "Capacity development and technology transfer". Each session was introduced by several invited papers followed by discussions on the different themes. For example, Arthur Askew (WMO) took the lead on one of the issues Working Group III considered, which was water data, the lack of these data in many parts of the world, access to data and the policies involved in exchanging data.

One of the side meetings marked the launch of the dialogue on Water and Climate instituted by the World Water Council:

http://www.worldwatercouncil.org

Drawing mainly on the work of the IPCC, several invited speakers considered the state of knowledge on climate change and the likely impact of forecast changes in climate on the hydrological cycle and on water resources. It was reported that there was little evidence of contemporary changes in river flows that might have resulted from climate change.

Reports from the working groups were presented to the Plenary session on the penultimate day and they were blended into the draft recommendations of the conference which were then considered. Their consideration was a rather difficult process despite the best efforts of Margaret Cately-Carlson who acted as the facilitator for this part of the programme. These recommendations were one of the outputs from the conference: another was the five Bonn Keys (*see next page*). They go on for discussion at the Preparatory Committee of the WSSD. The Swiss

THE BONN KEYS

Water is essential to our health, our spiritual needs, our comfort, our livelihoods and our ecosystems. Yet everywhere water quality is declining, and the water stress on humanity and our ecosystems increases more and more people live in very fragile environments. The reality of floods and droughts touches increasing numbers and many live with scarcity. We are convinced that we can act and we must. We have the keys:

1. The first key is to meet the water security need of the poor.
2. Decentralization is a key. The local level is where national policy meets community needs.
3. The key to better water outreach is new partnerships.
4. The key to long-term harmony with nature and neighbours is cooperative arrangements at the water basin level, including across waters that touch many shores.
5. The essential key is stronger, better performing governance arrangements.

delegation made a proposal for an open-ended Intergovernmental Forum on Water that might be modelled on IPCC. Unfortunately this was not accepted by the conference.

For the hydrologists present, the Bonn Conference may have been a little disappointing. Many of the issues discussed were more concerned with matters of: governance, mobilizing financial resources, gender perspectives, private sector participation and capacity development—all important topics. Indeed there were complaints that science and engineering were being neglected, but others contended that water had been for too long in the hands of the concrete pourers and the mathematical modellers. The agenda has moved on, they said!

One thing that was satisfying for those who had worked for and taken part in the Dublin Conference was the series of references to the Dublin Principles. After ICWE the Conference was criticized and the organizers were made to feel that it had been a failure. However, subsequently, the four Principles played an important part in shaping the water programmes of the bodies and agencies of the United Nations, as well as of those of national development agencies. They have also promoted the debate on whether water should be treated as an economic good. Now it is apparent that Dublin was a success!

John Rodda, Past President

2003: International Year of Freshwater

The United Nations General Assembly has proclaimed the year 2003 as the International Year of Freshwater. The resolution, adopted on 20 December 2000, was initiated by the Government of Tajikistan and supported by 148 other countries. It encourages Governments, the United Nations system and all other actors to take advantage of the Year to increase awareness of the importance of sustainable freshwater use, management and protection. For more information contact Mr Manuel Dengo (dengo@un.org) or Ms Marcia Brewster (brewster@un.org).

Carlos A. Fernandez-Jauregui moves to Paris

From 1 December 2001 Carlos A. Fernandez-Jauregui began a new appointment as Deputy Coordinator of the World Water Assessment Programme (WWAP) formed by 23 agencies of the UN System and hosted by UNESCO in Paris. This means Carlos is working with Dr Gordon Young, former Secretary General of IAHS. For the objectives and expected results of WWAP see:

http://www.unesco.org/water/wwap/index.shtml

For many years Carlos A. Fernandez-Jauregui was based in Montevideo, Uruguay, as the UNESCO Regional Hydrologist for Latin America and the Caribbean. A replacement for this position is now being actively sought—the deadline for applications is 28 May 2002.

We wish Carlos success in his new job!

New brochure published on the EU Water Framework Directive

Recently the long-awaited brochure by the European Commission on the Water Framework Directive was published. You can get it via:

http://europa.eu.int/comm/environment/water/water-framework/index_en.html

New vadose zone journal

Submissions are now being accepted for the inaugural volume of *Vadose Zone Journal* (VZJ). VZJ is published by the Soil Science Society of America, with the Geological Society of America as a cooperator. This new peer-reviewed electronic journal covers all physical, chemical, and biological aspects of the vadose zone in the environmental, agricultural, and earth sciences. The first issue will appear in September 2002. Visit:

http://www.vadosezonejournal.org

to learn more. Hard copy submissions of manuscripts can be sent to the Editor:

Dr Rien van Genuchten
US Salinity Laboratory, 450 West Big Springs Road, Riverside, California 92507-4617
[tel.: +1 909 3694847; vzjeditor@ussl.ars.usda.gov]

Changes to IAHS National Representatives

Please note the following changes to the list of IAHS National Representatives published in the *IAHS Handbook* (pp. 87–94) in 2000:

Argentina/Argentine
Maria Josefa Fioriti
Secretaría de Recursos Naturales y Desarrollo Sustentable, Subsecretaría de Recursos Hídricos, Paseo Colón 189, Piso 8, Oficina 807 (1109ADA), Buenos Aires, Argentina
e-mail: mfiori@miv.gov.ar
fax: +54 11 43497453
tel.: +54 11 43497453
NEW National Representative

Iraq/Irak
Prof. Riadh Hamid Al-Dabbagh
College of Engineering, Mustansiria University, Baghdad, Iraq
e-mail: mkj60@uruklink.net
fax: +964 1 4168877
tel.: +964 1 4166226
NEW address, e-mail, fax and tel.

Jordan/Jordanie
Mr Izzeddin M. Waynakh
Royal Jordanian Geographic Centre, PO Box 20214, Amman 11118, Jordan
e-mail: izwainakh@yahoo.com
fax: +962 6 5347694
tel.: +962 6 5345188
NEW National Representative

Macedonia/Macédoine
Prof. Zivko Skoklevski
National Committee for IAHS, Albert Ajnstajn 111, 1000 Skopje, Macedonia
e-mail: skoklevz@mkinter.net
tel.: +389 92 137250
NEW address and tel.

New Zealand/Nouvelle-Zélande
Dr Lindsay Rowe
Landcare Research New Zealand Ltd, PO Box 69, Lincoln 8152, New Zealand
e-mail: rowel@xtra.co.nz
fax: +64 3 3252418
tel.: +64 3 3256701
NEW e-mail

Palestinian Authority/Autorité palestinienne
Dr Ayman Rabi
Palestinian Hydrology Group, Jerusalem-Shufat, PO Box 25220, Palestinian Authority
e-mail: ayman.rabi@phg.org *or* phg@palnet.com
fax: +972 2 5857688
tel.: +972 2 6565887 *or* 6565890
NEW National Representative

Philippines/Philippines
Dr Leonardo Q. Liongson
National Hydraulic Research Centre, University of the Philippines, Diliman, Quezon City 1101, Philippines
e-mail: lql@engg.upd.edu.ph *or* leonardo.liongson@up.edu.ph
fax: +63 2 927190
tel.: +63 2 9277149 *or* 927176
NEW e-mails

Portugal/Portugal
Prof. Rui Raposo Rodrigues
Instituto da Água, Av. Almirante Gago Coutinho 30, 1049-066 Lisbon, Portugal
e-mail: rrr@inag.pt
fax: +351 21 8409218
tel.: +351 21 8430300
NEW National Representative

Slovak Republic/Slovaquie
Prof. Ján Szolgay
Slovak University of Technology, Faculty of Civil Engineering, Department of Land and Water Resources Management, Radlinského 11, 813-68 Bratislava, Slovak Republic
e-mail: szolgay@svf.stuba.sk
fax: +421 2 52923575
tel.: +421 2 59274498
NEW e-mail and tel.

Spain/Espagne
Dr Emilio Custodio
Instituto Geológico y Minero de España, Rios Rosas 23, 28003 Madrid, Spain
e-mail: e.custodio@igme.es
fax: +34 91 3495817
tel.: +34 91 3495962
NEW National Representative

The full and revised list of IAHS National Representatives can be found at:
http://www.cig.ensmp.fr/~iahs

Some abbreviations used in the Newsletter

IAHS Scientific Commissions

ICASVR	the International Commission on Atmosphere–Soil–Vegetation Relations
ICCE	the International Commission on Continental Erosion
ICGW	the International Commission on Groundwater
ICRS	the International Commission on Remote Sensing
ICSI	the International Commission on Snow and Ice
ICSW	the International Commission on Surface Water
ICT	the International Commission on Tracers
ICWQ	the International Commission on Water Quality
ICWRS	the International Commission on Water Resources Systems

Other IUGG Associations

IAG	the International Association of Geodesy
IAGA	the International Association of Geomagnetism and Aeronomy
IAMAS	the International Association of Meteorology and Atmospheric Sciences
IAPSO	the International Association of Physical Sciences of the Ocean
IASPEI	the International Association of Seismology and Physics of the Earth's Interior
IAVCEI	the International Association of Volcanology and Chemistry of the Earth's Interior

Other abbreviations

BAHC	Biospheric Aspects of the Hydrological Cycle (of IGBP)
FAO	the Food and Agriculture Organization
FRIEND	Flow Regimes from International Experimental Network Data
GEWEX	the Global Energy and Water Experiment
HELP	Hydrology for Environment, Life and Policy
HWRP	the Hydrology and Water Resources Programme (of WMO)

IAEA	the International Atomic Energy Agency
IAH	the International Association of Hydrogeologists
IAHR	the International Association for Hydraulic Engineering and Research
IGBP	the International Geosphere Biosphere Programme
IGOS	Integrated Global Observing Strategy
IHP	the International Hydrological Programme (of UNESCO)

IPCC	the Intergovernmental Panel on Climate Change
PUBs	Prediction of Ungauged Basins
WCRP	the World Climate Research Programme (of WMO)
WHYCOS	the World Hydrological Cycle Observing System
WMO	the World Meteorological Organization
WWAP	World Water Assessment Programme

Calendar of Meetings Organized/Sponsored by IAHS

2002		
Nice, France 22–26 April	Dr Carmen de Jong, Berlin Environmental Research Group (BERG), Institut für Geographische Wissenschaften, FR Angewandte Physische Geographie, FU Berlin, Malteserstrasse 74–100, D-12249 Berlin, Germany tel.: +49 30 83870254/252; fax: +49 30 77391758; cdjong@geog.fu-berlin.de; http://www.copernicus.org/EGS/egsga/nice02/programme/HES.program.htm	Session HSA4.03: Hydrological and Meteorological Coupling in Mountain Areas at the XXVII General Assembly of the European Geophysical Society
Anacapri, Isle of Capri, Italy 29–30 April	University of Naples Federico II, Department of Agricultural Engineering and Agronomy; Water Management Section, Via Università 100, Portici, Naples, Italy tel.: +39 081 7755341; fax: +39 081 7755344; durso@unina.it	Advanced International Workshop on Earth Observation to Estimate Evapotranspiration
Paris, France 13–15 June	UNESCO, Division of Water Sciences, 1 Rue Miollis, F-75732 Paris Cedex 15, France tel.: +33 1 45684001; fax: +33 1 45685811; ihp@unesco.org	Kovacs Colloquium on Scientific Achievements of IHP-V Projects
Prague, Czech Republic 17–20 June	Conference Secretariat ModelCARE 2002, Guarant Ltd, Opletalova 22, 11000 Prague 1, Czech Republic tel.: +420 2 84001444; fax: +420 2 84001448; modelcare2002@guarant.cz; http://www.guarant.cz/ModelCARE2002	ModelCARE 2002: Fourth International Conference on Calibration and Reliability in Groundwater Modelling (A few steps closer to reality)
Oslo, Norway 19–21 June	Dr Jim Bogen, Norwegian Water Resources and Energy Directorate, PO Box 5091, Majorstua, N-0301 Oslo, Norway fax: +47 22959000; jbo@nve.no	International Workshop on Erosion and Sediment Transport Measurement: Technological and Methodological Advances
Capri, Italy 24–27 June	Dr Rossella Monti, Centro Studi Idraulici par l'Ambiente, Politecnico di Milano, Piazza Leonardo da Vinci 32, I-20133 Milan, Italy tel.: +39 02 6683624; fax: +39 02 23996298; monti@marina.iar.polimi.it	Second International Conference on New Trends in Water and Environmental Engineering for Safety and Life: Eco-compatible Solutions for Aquatic Environments
Cardiff, UK 1–5 July	Cherrie Summers, Conference Secretariat, ENGIN, PO Box 925, Newport Road, Cardiff CF24 0YF, UK tel./fax: +44 29 20874421; summersc@cardiff.ac.uk; http://www.cf.ac.uk/engin/news/confs/hydro	Hydroinformatics 2002: Fifth International Conference on Hydroinformatics
Galway, Ireland 8–10 July	Prof. Con Cunnane, Department of Engineering Hydrology, National University of Ireland, Galway, Ireland tel.: +353 91 750425; fax: +353 91 524913; conleth.cunnane@nuigalway.ie; http://www.nuigalway.ie/hydrology/celtic.htm	The Third Inter-Celtic Colloquium on Hydrology and Management of Water Resources: Celtic Water in a European Framework—Pointing the Way to Quality
Dresden, Germany 22–26 July	Cathleen Schimmek, Conference Secretariat ICWRER 2002, Institute of Hydrology and Meteorology, Dresden University of Technology, Wuerzburger Strasse 46, D-01187 Dresden, Germany tel.: +49 351 4633931; fax: +49 351 4637162; icwrer2002@mailbox.tu-dresden.de; http://www.tu-dresden.de/fghhihm/hydrologie.html	Third International Conference on Water Resources and Environment Research (ICWRER): Water Quantity and Quality Aspects in Modelling and Management of Ecosystems
Kalmar, Sweden 18–22 August	Lise-Lotte Wallenius, The Swedish Research Council, S-10378 Stockholm, Sweden fax: +46 8 54644180; lise-lotte.wallenius@vr.se	International Symposium on Towards Integrated Catchment Management: Increasing the Dialogue between Scientists, Policy Makers and Stakeholders
Bucharest, Romania 2–6 September	Valentina Ungureanu, National Institute of Meteorology and Hydrology, Sos. Bucuresti-Ploesti 97, Sector 1, 71552 Bucharest, Romania tel.: +40 1 2309507 or 2302157; fax: +40 1 23003143; ungureanu@meteo.inmh.ro	XXIth Conference of the Danubian Countries on the Hydrological Forecasting and Hydrological Bases of Water Management
Alice Springs, Australia 2–6 September	Dr Fiona Dyer, School of Resource, Environment and Heritage Sciences, University of Canberra, Canberra ACT 2601, Australia tel.: +61 2 62012267; fax: +61 2 62012328; fiona.dyer@canberra.edu.au; http://lake.canberra.edu.au/~iahs2002	International Symposium on the Structure, Function and Management Implications of Fluvial Sedimentary Systems
Bremerhaven, Germany 9–12 September	Gerhard Strigel, Bundesanstalt für Gewässerkunde, IHP/OHP Secretariat, PO Box 200253, D-56002 Koblenz, Germany tel.: +49 261 13065421; fax: +49 261 13065422; strigel@bafg.de; http://www.bafg.de	International Symposium on Low-lying Coastal Areas: Hydrology and Integrated Coastal Zone Management

Beijing, China 10–13 September	Dr Baosheng Wu, ISFD2002 Secretary, Department of Hydraulic Engineering, Tsinghua University, Beijing 100084, China tel.: +86 10 62772097; fax: +86 10 62772463; baosheng@tsinghua.edu.cn; http://www.irtces.org/isshhu/2ISFD.htm	Second International Symposium on Flood Defence: Prospect of Living with Floods in the 21st Century (ISFD'2002)
Beijing, China 18–20 September	Prof. Xia Jun, Hydrology and Water Resources Branch, Institute of Geographical Science and Natural Resources, Anwai, Datun Road, 917 Building, 100101 Beijing, China tel.: +86 10 64856534; jxia_mail@263.net	International Workshop on Vulnerability of Water Resources to Environmental Change
Warsaw, Poland 18–21 September	Prof. Janusz Kindler, Local Organizing Committee, Faculty of Environmental Engineering, Warsaw University of Technology, 20 Nowowiejska Street, 00-653 Warsaw, Poland tel.: +48 22 6214560; fax: +48 22 6257377; dziekan@is.pw.edu.pl; http://www.iche2000.pl	ICHE-2002: International Conference on Hydro-science and Hydro-engineering
Kuala Lumpur, Malaysia 14–18 October	Dr Mohd Nor bin Mohd Desa, HTC Kuala Lumpur, Department of Irrigation and Drainage Malaysia, Km 7, Jalan Ampang, 68000 Ampang, Kuala Lumpur, Malaysia tel.: +60 3 42552507/502/508/575; fax: +60 3 42561894; htckl@pop.moa.my; http://htc.moa.my/htc/icuh2002/icuh2000.html	International Conference on Urban Hydrology for the 21st Century
Barcelona, Spain 16–18 October	Varyl Thorndycraft (PHEFRA Workshop), Centro de Ciencias Medioambientales, CSIC, C/ Serrano 115-bis, E-28006 Madrid, Spain tel.: +34 91 7452500 ext. 213; fax: +34 91 5640800; varyl@ccma.csic.es	International Workshop on Palaeofloods, Historical Data and Climatic Variability: Applications in Flood Risk Assessment
Timisoara, Romania 21–22 November	Prof. Gheorghe Cretu, Conference Secretariat, "Politehnica" University Timisoara, Facultatea de Hidrotehnica, Str. George Enescu nr 1A, 1900 Timisoara, Romania tel./fax: +40 56 221481; gcr@mail.dnttm.ro; http://www.utt.ro/pfhd	International Conference on Preventing and Fighting Hydrological Disasters
Dunedin, New Zealand 2–6 December	Pat Langhorne, IAHR 16th International Symposium on Ice, Department of Physics, University of Otago, PO Box 56, Dunedin, New Zealand tel.: +64 3 4797749; fax: +64 3 4790964; nzice@physics.otago.ac.nz; http://www.physics.otago.ac.nz/~nzice/	16th IAHR International Symposium on Ice
	2003	
Stellenbosch, South Africa 22–24 January	Prof. André Görgens, Department of Civil Engineering, University of Stellenbosch, Private Bag X1 Matieland, Stellenbosch 7602, South Africa tel.: +27 21 4245544; fax: +27 21 4245588; andre.gorgens@shands.co.za; http://www.civeng.sun.ac.za/	Second International Symposium on Integrated Water Resources Management (IWRM): Towards Sustainable Water Utilization in the 21st Century
Montpellier, France 7–10 April	Muriel Tapiau, Conference 2003, Laboratoire HydroSciences Montpellier, UMR 5569, BP 5045, F-34032 Montpellier Cedex, France tel.: +33 4 67149020; fax: +33 4 67149010; montpellier2003@msem.univ-montp2.fr; http://mpl.ird.fr/montpellier2003	International Conference on the Hydrology in the Mediterranean and Semiarid Regions
Tallinn, Estonia June	Dr Elve Lode, Conference Secretary, Ecohydrological Processes in Northern Wetlands, Department of Landscape Ecology, Institute of Ecology, TPU, Kevade 2, EE-10137 Tallinn, Estonia fax: +372 66 22283; icewetland@eco.edu.ee	International Conference and Educational Workshop on Ecohydrological Processes in Northern Wetlands
Sapporo, Japan 30 June–11 July	Secretariat of IUGG2003, IUGG2003 Secretariat, Japan Marine Science and Technology Center (JAMSTEC), 2-15 Natsushima-cho, Yokosuka 237-0061, Japan fax: +81 468 679315; iugg_service@jamstec.go.jp; http://www.jamstec.go.jp/jamstec-e/iugg/htm/frist.htm	IUGG2003: XXIII General Assembly of the International Union of Geodesy and Geophysics
8–9 July	Dr Dirk H. de Boer, Department of Geography, University of Saskatchewan, 9 Campus Drive, Saskatoon, Saskatchewan S7N 5A5, Canada tel.: +1 306 9665671; fax: +1 306 9665680; deboer@duke.usask.ca	HS01: International Symposium on Erosion Prediction of Ungauged Basins (PUBs): Integrating Methods and Techniques
10–11 July	Dr Günter Blöschl, Technische Universität Wien, Institut für Hydraulik, Gewässerkunde und Wasserwirtschaft, Karlsplatz 13/223, A-1040 Vienna, Austria tel.: +43 1 5880122315; fax: +43 1 5880122399; bloeschl@hydro.tuwien.ac.at	HS02: International Symposium on Water Resources Systems—Global Change, Risk Assessment and Water Management
7–8 July	Prof. Y. Tachikawa, Disaster Prevention Research Institute, Kyoto University, Gokasho Uji, Kyoto 611-0011, Japan tel.: +81 774 384126; fax: +81 774 384130; tatikawa@rdp.dpri.kyoto-u.ac.jp	HS03: International Symposium on Information from Weather Radar and Distributed Hydrological Modelling
7–8 July	Ir Joop Steenvoorden, Alterra, Wageningen University and Research Centre, Postbox 47, 6700 AA Wageningen, The Netherlands tel.: +31 317 474311; fax: +31 317 419000; j.h.a.m.steenvoorden@alterra.wag-ur.nl	HS04: International Symposium on Methodologies for Risk Assessment of Waste Water Re-use on Groundwater Quality
9–10 July	Dr Nobuhito Ohte, Laboratory of Forest Hydrology, Division of Environmental Science and Technology, Graduate School of Agriculture, Kyoto University, Kyoto 606-8502, Japan tel.: +81 75 7536093; fax: +81 75 7536088; nobu@bluemoon.kais.kyoto-u.ac.jp	HW01: International Workshop on Effects of Human Activities on Hydrological and Biogeochemical Cycles
11 July	Prof. Bruce Webb, University of Exeter, School of Geography and Archaeology, Amory Building, Rennes Drive, Exeter EX4 4RJ, UK tel.: +44 1392 263334; fax: +44 1392 263342; b.w.webb@exeter.ac.uk	HW02: International Workshop on Stream Temperature Changes and Effects

11 July	Dr Valentina Krysanova, Potsdam Institute for Climate Impact Research, PO Box 601203, Telegrafenberg, D-14412 Potsdam, Germany tel.: +49 331 2882515; fax: +49 331 2882600; valen@pik-potsdam.de	HW03: International Workshop on Quality Assurance in Hydrological Research
9 July	Dr Tomoharu Hori, Department of Civil Engineering, Kyoto University, Kyoto, Japan tel.: +81 75 7535095; fax: +81 75 7534907; hori@wr.kuciv.kyoto-u.ac.jp	HW04: International Workshop on Systems Modelling of Global Water Dynamics
10 July	Dr Norio Tase, Institute of Geoscience, University of Tsukuba, Ibaraki 305-8571, Japan tel.: +81 298 534750; fax: +81 298 519764; tase@atm.geo.tsukuba.ac.jp	HW05: International Workshop on Groundwater Resources for Emergency Situations
7–9 July	Prof. Jeffrey J. McDonnell, Richardson Chair in Watershed Science, Department of Forest Engineering, Oregon State University, Corvallis, Oregon 97331-5706, USA tel.: +1 541 7378720; fax: +1 541 7374316; jeff.mcdonnell@orst.edu	HW06: International Symposium on Isotope Tracers in Water Cycle Models
10–11 July	Prof. P. E. O'Connell, Department of Civil Engineering, University of Newcastle upon Tyne, Cassie Building, Claremont Road, Newcastle upon Tyne NE1 7RU, UK tel.: +44 191 2226405; fax: +44 191 2226669; p.e.o'connell@ncl.ac.uk	HW07: International Workshop: Towards a Science Programme for the Prediction of Ungauged Basins
7–9 July	Dr John Schaake, National Weather Service, 1325 East-West Highway, Silver Spring, Maryland 20910, USA tel.: +1 301 7130640 ext. 144; fax +1 301 7130963; john.schaake@noaa.gov	HW08: International Workshop on Parameter Estimation Techniques
½ day	Dr Georges Balmino, CNES/GRGS, 18 Avenue Edouard Belin, F-31401 Toulouse, France tel.: +33 5 61332980/2889; fax +33 5 61253098; georges.balmino@cnes.fr	JSG02: International Symposium on Interdisciplinary Earth Science from Improved Gravity Field Modelling
	P. Knudsen, Kort & Matrikelstyrelsen, Rentemestervej 8, DK-2400 Copenhagen NV, Denmark pk@kms.dk	JSG03: International Symposium on Interdisciplinary Science from Remote Sensing—Radar Altimetry, ATSR, SAR, Ocean Colour and Other Sensors
7–8 July	Dr Richard Armstrong, National Snow and Ice Data Center, 449 UCB, University of Colorado, Boulder, Colorado 80309-0449, USA tel.: +1 303 4921828; fax: +1 303 4922468; rlax@kryos.colorado.edu	JSH01: International Symposium on Remote Sensing of the Cryosphere
4 July	Dr Masaya Yasuhara, Geological Survey of Japan, Higashi, Tsukuba, Ibaraki 305-8567, Japan tel.: +81 298 612409; fax: +81 298 613749; masaya-yasuhara@aist.go.jp	JSH02: International Symposium on Groundwater and Volcanoes
3 July	Dr Richard Davis, Environment Department, World Bank, Mailstop MC5-512, World Bank, 1818 H St NW, Washington, DC 20433, USA tel.: +1 202 4736267; fax: +1 202 5220367; jdavis@worldbank.org	JSH03: International Symposium on Quantitative Approaches to Hyporheic Flows and their Biogeochemical Consequences in Marine, Estuarine and Freshwater Systems
2 days	Gerald L. Geernaert, Frederiksborgvej 399, Postboks 358, DK-4000 Roskilde, Denmark tel.: +45 46301101; fax: +45 46301214; glg@dmu.dk	JSM03: International Symposium on Land–Ocean–Atmosphere Interactions in the Coastal Zone
1 day	Paulo Artaxo, Instituto de Fisica, Universidade de Sao Paulo, Rua do Matao, Travessa R 187, CEP 05508-900, Sao Paulo, Brazil tel.: +55 11 38187016; fax: +55 11 38186749; artaxo@if.usp.br	JSM04: International Symposium on Terrestrial ecosystems, Atmospheric Composition, Climate
2 days	S. O'Farrell, CSIRO Atmospheric Research, Private Bag no. 1, Aspendale, Victoria 3195, Australia tel.: +61 3 92394573; siobhan.ofarrell@dar.csiro.au	JSM10: International Symposium on Cryosphere–Climate Interactions
2 days	Anny Cazenave, GRGS, Centre National d'Etudes Spatiales, Avenue Eduard Belin 18, F-31401 Toulouse Cedex 4, France tel.: +33 5 61332922; fax: +33 5 61253205; anny.cazenave@cnes.fr	JSM11: International Symposium on Global Sea Level Rise, Global Climate Change and Polar Ice Sheet Stability
2 days	David Hudak, Cloud Physics Research Division, Meteorological Service of Canada, 4905 Dufferin Street, Toronto, Ontario M3H 5T4, Canada david.hudak@ec.gc.ca	JSM14: International Symposium on Dynamics and Predictability of Severe Weather Events
½ day	Roland List, Department of Physics, University of Toronto, Toronto M5S 1A7, Canada tel.: +1 416 9782982; fax: +1 416 9788905; list@atmosp.physics.utoronto.ca	JSM15: Special Nakaya—Magono Celebration on the Growth of Ice Crystals and Snow
1 day	Richard Bintanja, Institute for Marine and Atmospheric research Utrecht (IMAU), Utrecht University, PO Box 80005, 3508 TA Utrecht, The Netherlands tel.: +31 30 2533259; fax: +31 30 2543163; r.bintanja@phys.uu.nl	JSM16: International Symposium on the Role of Atmospheric Processes in Mass Balance Exchange in the Polar Regions
1 day	Chris Kummerow, Department of Atmospheric Science, Colorado State University, Fort Collins, Colorado 80523, USA tel.: +1 970 4917473; fax: +1 970 4918449; kummerow@atmos.colostate.edu	JSM18: International Symposium on the Measurement and Distribution of Precipitation
4 July	Evgeni A. Kontar, P. P. Shirshov Institute of Oceanology, Russian Academy of Sciences, Moscow 117218, Russia tel.: +7 095 1292181; fax: +7 095 1245983; kontar@cityline.ru *or* e_kontar@hotmail.com	JSP03: International Symposium on Groundwater Inputs to the Ocean

	Prof. Motoyoshi Ikeda, Graduate School of Environmental Earth Science, Hokkaido University, Japan tel.: +81 11 7062360; fax: +81 11 7064865; mikeda@ees.hokudai.ac.jp	JSP04: International Symposium on Arctic Environmental Change
	Dr Ilmo T. Kukkonen, Geological Survey of Finland, PO Box 96, Betonimiehenkuja 4, FIN-02151 Espoo, Finland tel.: +358 205 502270; fax: +358 205 5012; ilmo.kukkonen@gsf.fi	JSS04: International Symposium on Thermally Controlled Processes within the Earth
9–10 July	Dr John Pomeroy, Institute of Geography and Earth Sciences, University of Wales, Aberystwyth, Ceredigion SY23 3DB, UK tel.: +44 1970 622781; fax: +44 1970 622659; john.pomeroy@aber.ac.uk	JWH01: International Workshop on Snow Processes: Representation in Atmospheric and Hydrological Models
3–4 July	Dr Alan Hall, 17 Crisp Street, Cooma, New South Wales 2630, Australia tel./fax: +61 2 64521920; hallalan@acr.net.au	JWH02: International Workshop on the Role of GEWEX Hydrometeorological Science in Improved Water Resources Management
1½ days	John Roads, Scripps Institution of Oceanography, University of California at San Diego, 0224 La Jolla, California 92093-0224, USA tel.: +1 858 5342099; fax: +1 858 5348561; jroads@ucsd.edu	JWM01: International Workshop on Water and Energy Budgets
	Prof. Makoto Taniguchi, Department of Earth Sciences, Nara University of Education, Takabatake, Nara 630-8528, Japan tel.: +81 742 279202; fax: +81 742 279291; makoto@nara-edu.ac.jp	JWS04: International Workshop on Subsurface Thermal Signatures of Tectonics, Hydrogeology and Palaeoclimate
Davos, Switzerland 10–12 September	Dr Dieter Rickenmann, Swiss Federal Institute WSL, Zürcherstrasse 111, CH-8903 Birmensdorf, Switzerland tel.: +41 1 7392442; fax: +41 1 7392488; rickenmann@wsl.ch; http://www.wsl.ch/3rdDFHM	Third International Conference on Debris-Flow Hazards Mitigation: Mechanics, Prediction and Assessment
Visakhapatnam, India 16–18 October	Prof. C. Subbarao, AHI International Seminar, Department of Geophysics, Andhra University, Visakhapatnam 530003, India tel.: +91 891 702239/40/41/42; fax: +91 891 755547; chalamks@hotmail.com	International Seminar on Watershed Development Special Colloquium on Drinking Water Supply in SAARC Countries
Warangal, India December 2003/ January 2004	Dr N. V. Umamahesh, Water and Environment Division, Department of Civil Engineering, Regional Engineering College, Warangal 506004, Andhra Pradesh, India tel.: +91 8712 459191; fax: +91 8712 459547/459119; mahesh@recw.ernet.in *or* mahesh_n@nettlinx.com	International Conference on Advanced Modelling Techniques for Sustainable Management of Water Resources

IAHS Press Office
Mrs Penny Kisby
[tel.: +44 1491 692288; fax: +44 1491 692448; penny@iahs.demon.co.uk]
Dr Cate Gardner
[tel.: +44 1491 692515; fax: +44 1491 692448; cate@iahs.demon.co.uk]

Hydrological Sciences Journal
Mrs Frances Watkins
[tel.: +44 1491 692405; fax: +44 1491 692448; frances@iahs.demon.co.uk]

Sales of Red Books and Special Publications
Mrs Jill Gash
[tel.: +44 1491 692442; fax: +44 1491 692448; jilly@iahs.demon.co.uk]

IAHS Membership Secretary
Mrs Jill Gash
[tel.: +44 1491 692442; fax: +44 1491 692448; jilly@iahs.demon.co.uk]

IAHS web site: http://www.cig.ensmp.fr/~iahs
Dr Pierre Hubert, Secretary General IAHS
[tel.: +33 1 64694740; fax: +33 1 64694703; iahs@ensmp.fr]

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To ensure you keep receiving the Newsletter we need accurate contact information for all members. Do let us know about changes to your address, tel. no., fax no. and e-mail (also any change in the subjects that interest you—based on the titles of the IAHS International Commissions given on the back cover of this Newsletter). Please send any changes to:

Mrs Jill Gash
Centre for Ecology and Hydrology, Wallingford, Oxfordshire OX10 8BB, UK
[tel.: +44 1491 692442; fax: +44 1491 692448; jilly@iahs.demon.co.uk]

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Dr Pierre Hubert, Secretary General IAHS, Ecole des Mines de Paris, F-77305 Fontainebleau, France
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Scientific Commissions

Some Commissions have their own web site which can be accessed through that of IAHS (see above). Information about the activities of the Scientific Commissions of the Association may be obtained from their Secretaries:

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Contact: Prof. SIEGFRIED DEMUTH, Institute of Hydrology, University of Freiburg, Fahnenbergplatz, D-79098 Freiburg, Germany
[tel.: +49 761 2033538; fax: +49 761 2033594; demuths@uni-freiburg.de; http://www.uni-freiburg.de/hydrology/icsw]

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Contact: Dr NORIO TASE, Institute of Geoscience, University of Tsukuba, Ibaraki 305-8571, Japan
[tel.: +81 298 534244; fax: +81 298 519764; tase@atm.geo.tsukuba.ac.jp; http://www.envr.tsukuba.ac.jp/~ICGW]

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Contact: Dr DIRK DE BOER, Department of Geography, University of Saskatchewan, 9 Campus Drive, Saskatoon, Saskatchewan S7N 5A5, Canada
[tel.: +1 306 9665671; fax: +1 306 9665680; deboer@duke.usask.ca; http://duke.usask.ca/~deboer/icce/]

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Contact: Dr GEORG KASER, Geographical Department, University of Innsbruck, Innrain 52, A-6020 Innsbruck, Austria
[tel.: +43 512 5075407; fax: +43 512 5072895; georg.kaser@uibk.ac.at; http://geowww.uibk.ac.at/research/icsi]

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Contact: Prof. BRUCE WEBB, School of Geography and Archaeology, University of Exeter, Amory Building, Rennes Drive, Exeter EX4 4RJ, UK
[tel.: +44 1392 263334; fax: +44 1392 263342; b.w.webb@exeter.ac.uk; http://www.ex.ac.uk/~BWWebb/icwq]

International Commission on Water Resources Systems (ICWRS)
Contact: Dr ANDREAS SCHUMANN, Ruhr University Bochum, Institute for Hydrology and Water Management, D-44780 Bochum, Germany
[tel.: +49 234 7002688; fax: +49 234 3214153; andreas.schumann@ruhr-uni-bochum.de; http://www.ruhr-uni-bochum.de/iahs-icwrs

International Commission on Remote Sensing (ICRS)
Contact: Dr ALAIN PIETRONIRO, National Water Research Institute, 11 Innovation Blvd, Saskatoon, Saskatchewan S7N 3H5, Canada
[tel.: +1 306 9754394; fax: +1 306 9755143; al.pietroniro@ec.gc.ca; http://hydrolab.arsusda.gov/~jritchie/]

International Commission on Atmosphere–Soil–Vegetation Relations (ICASVR)
Contact: Dr JIRKA SIMUNEK, US Salinity Laboratory, USDA, ARS, 450 W. Big Springs Road, Riverside, California 92507, USA
[tel.: +1 909 3694865; fax: +1 909 3424964; jsimunek@ussl.ars.usda.gov]

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[tel.: +49 761 2033531; fax: +49 761 2033594; chrisle@uni-freiburg.de; http://www.lgih.ulg.ac.be/ict]

Hydrological Sciences Journal

The Association has produced a scientific journal since 1956—now called *Hydrological Sciences Journal*. As well as scientific papers on all aspects of hydrology, the Journal contains announcements on worldwide hydrological activities organized or sponsored by IAHS, book reviews, and a diary of forthcoming events. August issues sometimes comprise a collection of papers on a single topic. These Special Issues are available as separate publications.

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