

International Association of Hydrological Sciences
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Association Internationale des Sciences Hydrologiques



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NEWSLETTER

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IAHS SECRETARIAT:

HENNY J. COLENBRANDER
Secretary General IAHS, TNO Committee on
Hydrological Research, PO Box 297, 2501
BD The Hague, The Netherlands

Telephone: +31 70496537
Fax: +31 70455700
Telex: 31669 mogy NL

FROM THE PRESIDENT

When I practiced water resource engineering 30 years ago, I often had an uneasy feeling about my lack of hydrological knowledge (I don't any more — I have become used to it). I was making recommendations involving expenditures of tens and even hundreds of millions of dollars which all were duly justified by economically optimal sizes of dams, spillways, pumping stations, irrigated areas, etc., which in turn were carefully evaluated on the basis of standard methodologies for design floods, fitting of distributions of mean and maximum flows, hydrograph estimation, sustained aquifer yield, evaporation losses, etc. However, somewhere in the back of my mind there always was a discomfiting awareness that I did not understand these methods and formulae to my satisfaction, i.e. at a similar level as I did, for example, the Pythagoras theorem, the relation between forces and deformations in a frame structure, the transformation of the circle into an ellipse in the perspective projection, etc.

The only reassurance I had was my sincere belief that there were people who did possess this deep understanding — the authors of the methods and formulae I was using, the authors of the textbooks from which I had studied, the professors with the awe-inspiring names Of course, I was telling myself, in books meant for ordinary mortals, these experts cannot go into the necessary detail, display the wealth of their hydrological knowledge and convey all the subtlety and complexity of interactions that led to the end products used in practice. But I promised myself that one day I would find the time, go to the masters and drink from the fountains of their knowledge.

Eventually I did. That is, I did go to the masters; but I did not find there any great foundations of hydrological knowledge; driblets, yes — but definitely no fountains. Instead, there always was an unimpressive blackboard with a big "If ... then ..." or "Let's assume that ...". It was years before I realized that this indeed was the typical case, that textbooks on applied hydrology do not teach how to apply hydrological knowledge to solve water resource problems, but rather how to circumvent the lack of this knowledge when one is faced with the necessity to make decisions in the various water resource areas.

Another outcome of my search for hydrological knowledge and science has been a realization that — buried in journals that I would never be tempted to open, and scattered across sciences and disciplines from geology and pedology, through plant physiology, ecology, biophysics to thermodynamics, physical chemistry, and who knows what else — there perhaps may already exist many elements of knowledge from

which a foundation of the hydrological science could be built if they were brought together. The problem is that there hardly is anybody who could even find out and identify all of them, not to speak about synthesizing their hydrologically relevant information. We simply do not have hydrologists as such, that is, professionals adequately educated in the main sciences dealing with the processes and mechanisms partaking in the hydrologic cycle. We only have hydraulic engineers for whom all terms that reduce surface runoff in the water balance equation are losses, agronomists who label the surface runoff as a loss, geohydrologists for whom all terms except deep percolation are losses, etc., etc.

The simple truth is that we cannot have the science of hydrology unless we educate and train true hydrologists, not instead of hydraulic engineers, agronomists, foresters, etc., but in addition to them. Presently no university system worldwide provides for a proper education of hydrologists despite the fact that the recognition of the importance of hydrology in the context of global problems posed by climatic and other environmental changes is rapidly growing. Without such an education, no appeals for improvement of hydrological science will have a tangible effect and applied hydrology will not rise above an "as if" substitute.

In recognition of the urgent need for a restructuring of hydrological education in such a way that it produces professionals with a deep knowledge of the mechanisms operating in the hydrologic cycle, professionals who will be able to practise and advance hydrology as a geophysical science and, eventually, create the sorely missing fountain of hydrologic knowledge, IAHS and the UNESCO Division of Water Sciences have decided immediately to form a high-level joint "Panel for Hydrological Education" which will look into the possibilities how to remedy the present situation. I am glad to report that Professors J. E. Nash of the University College, Galway, Ireland, and Peter S. Eagleson of MIT, Cambridge, Massachusetts, have agreed to serve on this important panel.

Vit Klemes

IAHS SECRETARIAT

It is a sad task to announce the death of three well known colleagues: György Kovács, William Ackermann and Warren Hastings. All of them devoted a good part of their time to the interest of IAHS. Later in this Newsletter In Memoria to our colleagues can be found.

The Secretariat was very pleased with the many positive reactions to the "new look" of the IAHS Newsletter. During the recent IAHS

Bureau meeting in Paris there were proposals to improve the distribution network of the Newsletter. It was hoped, for instance, that many National Committees will be willing to distribute the Newsletter more effectively within their respective countries. Good examples of a very effective national distribution is the procedure followed by the Canadian and Dutch IAHS National Committees. These Committees reproduce the IAHS Newsletter, almost in its entirety in their national periodicals.

Apologies must be offered for the delay in the appearance of the present issue. Too many things arrived at the same time on the Secretariat desk, and the Secretary General of the Association took a much needed holiday in July. A comforting thought in this respect is that most people have little time in the summer months to read a Newsletter like this. Usually September is less busy.

An important IAHS activity during the past months was the IAHS Bureau meeting which took place at UNESCO headquarters on 20 June. Five IAHS Officers were present and most of the Commissions and the single Committee were represented by their President and/or Secretary. Representatives from UNESCO and WMO (the face of this delegate was very familiar indeed!) also attended. Dr Marshall Moss was present on behalf of the Organizing Committee for the IAHS Third Scientific Assembly (ITSA); whereas Dr Franz Nobilis took part as one of the organizers of the IAHS activities during the next IUGG General Assembly.

Items that were discussed at the Bureau meeting included: the IAHS contributions to IHP-IV and to the International Geosphere Biosphere Programme (IGBP); future activities of the IAHS Commissions, Committee and working groups; the preparation of the next Scientific Assembly (Baltimore, May 1989); first ideas on possible subjects for the IAHS symposia at the next IUGG General Assembly (Vienna, August 1991); the IAHS membership list; the IAHS Press; and last but not least, the financial status of the Association. In the next Newsletter a short report on the Bureau meeting will be presented. Detailed information on ITSA is given in the 19 July issue of EOS, published by the American Geophysical Union. A summary of the programme can be found elsewhere in this Newsletter.

Other matters that kept the Secretariat busy during the past months were: the implementation of the IAHS contributions to IHP-IV and the "common problems" of IAHS and IAMAP. In this connection some relevant information is given in other sections of this Newsletter.

IAHS PRESS

IAHS Yearbook 1987-1991

The new edition of the Yearbook published in June contains general information about the Association, its Officers, Commissions, Committee, and working groups. The Statutes and Bye-laws of both the Association and the Commissions and Committee, as well as names and addresses of National and Commission/Committee Representatives are also included. Copies are available from the IAHS Secretariat.

Catalogue of Publications 1988

A new edition of the Catalogue of Publications has also been produced. This includes a list of all titles in the Series of Proceedings and Reports, the Series on Snow and Ice, and forthcoming titles. Information on the Journal, standing orders for Proceedings and Reports (15% discount is given on standing orders!). Copies of the Catalogue may be obtained from:

IAHS Press, Institute of Hydrology, Wallingford, Oxfordshire OX10 8BB, UK

Office of the Treasurer IAHS, 2000 Florida Avenue, Washington, DC 20009, USA

Bureau des Publications de l'UGGI, 140 Rue de Grenelle, 75700 Paris, France

New Series: Monographs and Reports

The Bureau approved a proposal for a new series of short monographs and reports which will be published jointly by IAHS and the Delft International Institute for Hydraulic and Environmental Engineering. Mr H. Salz will be the Executive Editor for this series of publications and he will organize the preparation of the camera-ready copy at Delft.

The series will have an A4 format and titles in the series will not exceed 100 pages. They will be on sale from IAHS Press, and the cost of each, including postage and packaging will be in the region of \$15.

The first title in the series will be *Hydrological Phenomena in Geosphere-Biosphere Interaction: Outlooks to Past, Present and Future* by Malin Falkenmark.

Why Pre-publish?

The Association has a policy of pre-publishing the proceedings of the symposia for which it is responsible. What are the merits of this policy?

There are a number of points which favour pre-publication, points for the Association and for the author. For the Association the advantages are largely those of economics and scheduling of work. The sales of volumes at a symposium, as part of the registration fee, provide an immediate return to the Association. Because there is an obvious deadline for the production of a

pre-published volume, authors and editors are more disciplined in their work and this in turn makes the work of IAHS Press more efficient. Post-publishing invariably allows deadlines to slip and causes a lot of problems for IAHS Press, particularly when authors and editors have to be chased for their material. Post-publishing also incurs more costs for IAHS Press in the handling and mailing of volumes to purchasers: a large number of pre-published volumes can be distributed easily and efficiently at a symposium.

Authors have the satisfaction of seeing their material in print at the symposium where their paper is being presented and these printed papers being available permits better understanding of their results to be obtained by non English mother tongue (or non French mother tongue) participants. The long time between the completion of a paper and its appearance in print is invariably much shorter for preprinted than postprinted proceedings. At a symposium where the papers are pre-published, authors have the liberty to up-date their findings for the audience, rather than to present the printed papers with no changes. Presentations by non English mother tongue authors (or non French mother tongue authors) are facilitated when they have their preprinted papers available to them.

The Association has maintained its policy of pre-publishing since the early 1970s. The success of this policy is demonstrated by the large number of proceedings and the income derived from them. This income allows IAHS to maintain its various activities at a high level: the publications form the only lasting testimony to the endeavours of the Association. Other associations both inside and outside IUGG envy the success of the Association's publication policy and some are aiming to emulate it. Bodies in the UN family such as WMO and UNESCO are very supportive of IAHS publications and have often indicated that they favour the policy of pre-publication.

IAHS COMMISSIONS, COMMITTEE AND WORKING GROUPS

Most of the Commissions and other groups presented their plans during the IAHS Bureau meeting at Paris (June 1988). In the following some points of the discussion will be highlighted. Anyone interested in further details of the activities of one of the Commissions or groups should contact the relevant President or Secretary.

Besides the preparation of various symposia and workshops for the assemblies at Baltimore (1989) and Vienna (1991), the Surface Water Commission (ICSW) is involved in the organization of meetings on Flow Regimes (FRIEND Symposium, Norway, 1989) and on Regionalization

of Hydrological Parameters (Yugoslavia, 1990). Furthermore, ICSW is contributing to IHP projects 2.2 and 6.1 (Regionalization of Hydrological Parameters) and IHP projects 3.2 and 3.4 (Climatic Changes and Variabilities).

The main projects the Groundwater Commission (ICGW) is dealing with are IHP projects 2.4d (Spatial Variability) and project 2.11g (4th Land Subsidence Symposium). A further project that very recently has been started is on Uncertainties in assessing health risks of groundwater contamination.

ICGW is cooperating with the following Commissions: Commission on Hydrological Maps (COHYM/IAH) and the IAH Commission on Hydrogeology for Developing Countries. Furthermore, ICGW is involved in the organization of symposia for the next assemblies; the Symposium on Groundwater Management (Spain, 1989); and the Symposium on Hydrogeological Maps (FR Germany, 1989).

The Water Systems Commission (ICWRS) is also participating in the Groundwater Management Symposium in Spain; in addition it has taken the initiative to hold a symposium in China (October, 1990) on the hydrological basis for water resources management. The Commission is also planning to contribute to the ICGW project on assessing health risks of groundwater contamination and to some of the scientific meetings during the coming assemblies.

The Commission on Continental Erosion (ICCE) is involved in the organization of a number of symposia and workshops. To mention some: the Symposium on Sediment Budgets (Brazil, 1990), the Symposium on River Sedimentation (China, 1989) and a third one on Erosion and Volcanic Debris Flow Technology (Indonesia, 1989). ICCE has also started its own Newsletter. The first issue was produced March 1988.

The Snow and Ice Commission (ICSI) and the Water Quality Commission (ICWQ) were not represented at the Bureau meeting, so the future plans of these Commissions were not discussed.

The Committee on Remote Sensing and Data Transmission (ICRSDT) is dealing with the organization of the Symposium on Remote Sensing and Large Scale Global Processes (Baltimore, 1989) and it will co-sponsor a symposium on remote sensing and water resources (The Netherlands, 1990). Also activities are foreseen with respect to global change in relation to remote sensing.

Finally it must be mentioned that ICRSDT has also started its own Newsletter (first issue January 1988).

After the information on the Commissions and the Committee attention will now be paid to the working groups. The Chairman of the

Working Group on Atmosphere/Vegetation/Soil Relationships (Dr Kienitz) is busy getting the work off the ground. It becomes more and more clear that the task of this group (see the April Newsletter) is a crucial one. The IAHS must have an organizational structure which make it possible to adequately respond and contribute to research activities in this field. The problems, however, are quite complex as the issue is a part of many programmes, such as IHP-IV, WCP-Water and IGBP (see below).

Vit Klemeš reported during the IAHS Bureau meeting on the UNESCO/IAHS Educational Panel. The recent news of this group is discussed in the column FROM THE PRESIDENT, in this Newsletter.

When the IAHS Working Group on the IGBP was formed at Vancouver, Vit Klemeš took the chair. Now he prefers, however, to concentrate on the implementation of the GEWEX programme and the work for the Educational Panel. Prof. Malin Falkenmark was willing to take over the chair and there is no doubt, that this group is in very good hands. A further report on the IGBP was given by Prof. Dyck as member of ICSU's Special Committee for the IGBP. Because this programme will be very important to future research, it seems useful to present some more information on the plans of this Special Committee:

The second meeting of the Special Committee took place in Cambridge, USA, from 8 to 11 February 1988. The meeting confirmed the four underlying themes of IGBP already identified:

- * Documenting and predicting global change
- * Observing and improving our understanding of dominant forcing functions
- * Improving our understanding of transient phenomena
- * Assessing the effects of global change that would cause large-scale and important modifications affecting the availability of renewable and non-renewable resources.

It also considered preliminary reports from the Coordinating Panels set up to oversee the different research projects being developed:

- * Terrestrial Biosphere-Atmospheric Chemistry Interactions (Chairman P. J. Crutzen)
- * Marine Biosphere-Atmosphere Interactions (Chairman T. Nemoto)
- * Biospheric Aspects of the Hydrological Cycle (Chairman S. Dyck), and
- * Effects of Climate Change on Terrestrial Ecosystems (Chairman B. H. Walker);

and from the working groups established to assess the current state of knowledge and future prospects on:

- * Global Geosphere-Biosphere Modelling (Chairman B. Bolin);
- * Data and Information Systems (Chairman S.

I. Rasool);

- * Techniques for Extracting Environmental Data of the Past (Chairman H. Oeschger), and
- * Geo-Biosphere Observatories (Chairman R. Herrera).

The scope of the Panel on Biospheric Aspects of the Hydrological Cycle is of particular interest to IAHS. The Panel identified as a main goal for the IGBP the need to understand better the role of vegetation in the hydrological cycle for the purpose of modelling its linkage to global climatic change. It recommended that IGBP, together with other relevant bodies, plan for an integrated and coordinated research programme on soil-vegetation-atmosphere interactions with the following components:

- * **Diagnostics:** to assess the impact that natural and anthropogenic changes have on the soil-vegetation-atmosphere system and to determine the magnitude of the changes of energy and water-transfer resulting from land-surface transformations.
- * **Modelling:** to develop and improve a hierarchy of models (e.g. single process studies models (site scale), evaluation models (pixel scale), interaction models (grid scale of regional and global models)) needed for the interpretation of remote sensing data, and to study the interaction of different processes on the large scale.
- * **Experiments and pilot studies:** laboratory and field experiments (single parameter experiments on a small scale, complex experiments at fixed array scale, grid scale experiments) to study specific processes and to compile data sets needed to validate model outputs. Pilot studies conducted in sensitive transition areas (e.g. ecotones) to study changes of the soil-vegetation-atmosphere system.

The Panel has also reviewed programmes being developed by other international groups engaged in research on themes relevant to the future IGBP programme. These include the proposed Global Energy and Water Cycle Experiment (GEWEX) of the World Climate Research Programme (WCRP); the World Climate Programme/Water related to macro-scale hydrology; the International Satellite Land Surface Climatology Project (ISLSCP) initiated by COSPAR (Committee on Space Research) and IAMAP; the International Hydrological Programme (IHP) of UNESCO's draft plan for IHP-IV (1990-1995) with a component on "Hydrology in a changing environment"; a Land-Surface-Atmosphere-Vegetation Interaction Programme (LAVIP) which is being considered by IAMAP and IAHS; and a proposed IUGG project on "Hydrological Pathways to Global Biospheric Significance".

FORUM

Free Movement of Scientists In the present world, divided along many different lines, it is not uncommon that some scientists face difficulties when trying to attend international scientific meetings in some countries. This is why, since 1958, ICSU has repeatedly reaffirmed what has become known as its declaration on the free circulation of scientists. Such free circulation is essential for the fruitful international collaboration whose importance is steadily increasing as the problems facing science and mankind grow in number with many possessing global dimensions.

Recently the President of IAHS was faced with problems of this sort, problems similar to those a number of individual hydrologists have encountered over the years. These problems often stem from the policy of the government of a country where an IAHS symposium is being organized, or alternatively because of the attitude of the government of the host country to the policies of the government of a potential participant. In the recent case of the President, the interventions of ICSU, IUGG, UNESCO, WMO and IAHS itself together with that of the Canadian Government in invoking the declaration on the free circulation of scientists overcame the problem. However there may be a number of other cases where individuals failed to attend a symposium because permission to enter was withheld and where IAHS or ICSU was not notified. Hydrologists wishing to attend a particular symposium are asked to let the Secretary General know when they are unable to obtain the necessary entry documents from the host country. In the same way organizers of symposia should seek from their own authorities, at the earliest possible time, assurances (in writing) that individual scientists will not be prevented from entry. An important point to remember is that participants at IAHS meetings are representing only themselves and not the country where they may live.

Error in Discussion published in Forum Section of Previous Newsletter

Unfortunately a line was missed out from the Discussion article by Dr Klemeš. The sixth paragraph should have been as follows:

Dr Shamir did not like this conclusion which I had reached on the basis of premises with which he himself agrees. But he apparently did not see how this conclusion could directly be challenged – so he changed the subject and, instead of defending the legitimacy of IAHS involvement in water resources management as one would expect him to do, he defended instead the legitimacy of its involvement [through the International Commission on Water Resources Systems (ICWRS)] in which water resources systems analysis, namely in "viewing [the latter] via the perspective of hydrology". ...

GOVERNMENTAL ORGANIZATIONS

UNESCO

The eighth IHP-Council meeting took place in Paris from 21 to 25 June last. Dr Gordon Young from Canada was elected as Chairman of the Council for the period 1988–1990. The Vice-Chairmen are: Mr Fuschini Mejia (Argentina), Dr Riyadh Al-Dabbagh (Iraq), Mr Umar Kawu (Nigeria), and Dr Slavoljub Jovanovic (Yugoslavia).

The main points discussed at the council meeting were the report of the Secretariat on the 24th General Conference of UNESCO; the progress of IHP-III (including reports of the Secretariat on the 14th and 15th sessions of the Bureau and reports on the activities of the National Committees for the IHP and the Regional Commissions). The most important item on the Council agenda was, however, the determination of the outline plan for IHP-IV. The proposals of the IAHS Commissions and the Committee with respect to IHP-IV were summarized by the Secretariat and discussed by the council.

In the next Newsletter the outcome of the discussions will be highlighted.

UNESCO Conference and Next IHP-Council

UNESCO's conference to celebrate 25 years of IHD/IHP will be held in Paris from 19 to 21 March 1990 in conjunction with the ninth IHP Council meeting from 21 to 24 March 1990.

WMO

The eighth session of the Commission for Hydrology (CHy) will be held in Geneva from 24 October until 4 November 1988. Subjects to be discussed include::

- the Operational Hydrology Programme (OHP) including the Hydrological Operational Multipurpose Subprogramme (HOMS);
- the application and services to water resources;
- cooperation with water-related programmes of other international organizations;
- education and training activities.

During the session new officers and reporters will be elected and working groups established to act until the next session of the CHy (1992).

WMO Conferences and Workshops

A technical conference on the Hydrology of Disasters will be held in Geneva on 2 and 3 November 1988, in conjunction with the CHy meeting. Items to be discussed are not only extreme floods and severe droughts, but also the hydrological consequences of e.g. earthquakes, landslides, avalanches and volcanic eruptions.

A Conference on Climate and Water will be

held in Helsinki from 11 to 15 September 1989. This conference is organized within the context of WMO's Regional Association VI (Europe) and subjects to be discussed include: impact of climate variability and change on water resources on the environment, on land-use, on food and energy production etc.

A workshop on Developments in Precipitation Measurements and a meeting of the GEWEX-IAHS/WMO Working Group will be organized at St Moritz (Switzerland) in November 1989.

A further technical conference on the Economic and Social Benefits of Meteorological and Hydrological Services will take place in Geneva from 26 to 31 March 1990.

IMO Prize

The International Meteorological Organization (IMO) Prize was established in 1955 by the World Meteorological Organization in honour of the former nongovernmental organization which initiated international collaboration in meteorology in 1873. The Prize is awarded annually. The recipients of the Prize include many of the world's most distinguished meteorologists. The 1987 IMO Prize was presented to Professor M. I. Budyko (USSR) on 9 June 1988 during the 40th session of the WMO Executive Council.

Many international scientific programmes have benefitted from Prof. Budyko's investigations, including: the International Geophysical Year (1957-1958), the International Hydrological Decade and the International Hydrological Programme (UNESCO). His conclusions about the inevitability of anthropogenic warming processes were taken into account in the establishment of the World Climate Programme (WCP) of WMO. His present studies on natural and anthropogenic climate change, in which scientifically substantiated scenarios of the future changes in climate and water resources have been developed, are a major contribution in the implementation of the WCP.

ICSU-WMO Joint Scientific Committee

The Joint Scientific Committee (JSC) of the World Climate Research Programme (WCRP) met in Fort Lauderdale, USA, in March 1988. At the meeting, the JSC reviewed developments in the various parts of the Programme, such as the International Satellite Cloud Climatology Project (ISCCP) which is now producing mean monthly cloudiness data, the Tropical Oceans Global Atmosphere (TOGA) Experiment which is in its third year, and the scientific plan for implementing the World Ocean Circulation Experiment (WOCE) which is in its final drafting stage and will be presented at the International WOCE Conference to be held in Paris in November 1988.

The JSC is also proposing to launch a Global

Energy and Water Cycle Experiment (GEWEX), with the objectives of observing, understanding and modelling the processes of the global atmospheric water cycle and energy budget, as well as interactions with the underlying land and ocean surfaces. As atmospheric and near-surface hydrological processes have relatively short time scales from hours to a few days or weeks, GEWEX will be intimately related to dynamical weather prediction. It will also constitute an essential step toward understanding the climatic impact of greenhouse gases and other causes of global change, which must be founded on knowledge of the complex energy and water exchanges in the earth system. Thus, GEWEX is aiming to provide the global mathematical and physical framework for International Geosphere-Biosphere Programme (IGBP) studies.

In addition the JSC has begun a programme to model the coupled dynamic, physical and biochemical processes which control the distribution of greenhouse gases in the atmosphere. When fully developed, this programme will provide a global modelling tool to consolidate the new information on sources and sinks of chemical species which is being sought by IGBP.

The JSC elected Prof. Gordon A. McBean (University of British Columbia, Canada) as its new Chairman.

FAO

Technology Transfer System: WATTS

Development and management of water resources have an important role to play in solving the problem of food production and development of rural areas in many parts of the world. The standard of planning, design, implementation and rehabilitation of water development projects in agriculture can be considerably improved and many failures avoided by the efficient transfer of knowledge and technology between countries.

A global and institutionalized technology transfer system does not yet exist, though many governmental and private institutions, involved in cooperation with developing countries, have organized the technology transfer for water in agriculture in individual, small and large-scale projects. Many of the bilateral governmental and in particular multilateral international organizations dealing with technical cooperation and investments in agriculture, including FAO, World Bank and IFAD noted however, that the social and economic environment at which such technology transfer is aimed is often entirely different from that for which the technology was developed. These considerations should be taken into account, as far as possible, in the technology transfer activities.

Bearing in mind the above considerations it is proposed to establish an institutionalized,

intergovernmental, multilateral technology transfer system for water development and management in agriculture under the name "WATER FOR AGRICULTURE TECHNOLOGY TRANSFER SYSTEM" (WATTS).

WATER-RELATED ASSOCIATIONS

The spring issue of the Water-related Associations Conferences (WAC)-Calendar was prepared by IWRA. The next meeting of the WAC/COWAR group will be in Geneva on 3 November 1988.

Further cooperation will be discussed, as well as a coordinated contribution to UNESCO's conference on 25 years of the IHD/IHP (March, 1990).

Newsletters/Bulletins

The Secretariat has received the following publications:

IAHR Bulletin, vol. 5, no. 2, 1988.

IAWR - Water International, vol. 13, no. 1, 1988.

IAH News/Information, July 1988.

NATIONAL COMMITTEES

Since the publication of the IAHS Yearbook 1987-1991 the following changes to the names and addresses of National Representatives and Commission/Committee Representatives have been received:

ARGENTINA

ICSW Representative: Ing. M. C. Fuschini Mejía, CONAPHI, Avenida 9 de Julio, 1925, Piso 15, 1332 Buenos Aires

(Mr Fuschini Mejía is already the National Representative)

BRAZIL

ICSW Representative: Prof. C. E. M. Tucci, Instituto de Pesquisas Hidráulicas, Caixa Postal 530, Porto Alegre, RS

(Prof. Tucci is already the National Representative)

KOREA (REPUBLIC OF)

National Representative: Prof. Kwan-Won Kang, President of the Korean Association of Hydrological Sciences, 35-1 Mapodong, Mapo-gu, Seoul 121-050

ICSW Representative: Prof. Jung-Ho Sonu, Department of Civil Engineering, Seoul National University, 56-1 Shinrim-dong, Kwanak-ku, Seoul 151-742

ICGWR Representative: Prof. Tae-Hoon Yoon, Department of Civil Engineering, Hanyang University, 17 Haengdang-dong, Sungdong-ku, Seoul 133-791

ICCE Representative: Dr Yong-Nam Yoon, Korean Institute of Construction Technology, Life Building, 61 Yoido-dong, Yongdungpo-ku, Seoul 150-010

ICWRS Representative: Prof. Kil-Seong Lee, Department of Civil Engineering, Seoul National University, 56-1 Shinrim-dong, Kwanak-ku, Seoul 151-742

ICRSDT Representative: Prof. Sun-Woo Nahm, Department of Civil Engineering, Dongkuk University, 26 Pil-dong, 3ka Chung-ku, Seoul 100-715

THE NETHERLANDS

ICSW Representative: Dr Ir J. W. van der Made, Rijkswaterstaat, Tidal Waters Division, PO Box 20907, 2500 EX den Haag

ICCE Representative: Dr C. J. Schouten, Institute of Geographical Research, University of Utrecht, PO Box 80115, 3508 TC Utrecht

ICSI Representative: Prof. Dr I. Simmers, Institute of Earth Sciences, Free University, PO Box 7161, 1007 MC Amsterdam

ICWQ Representative: Ir P. S. Griffioen, DBW/RIZA, PO Box 17, 8200 AA Lelystad

ICWRS Representative: Dr Ir R. J. Verhaeghe, Waterloopkundig Laboratorium, PO Box 177, 2600 MH Delft

NIGERIA

National Representative: Prof. L. Oyebande, Chairman HySAN, University of Agriculture, PMB 2240, Abeokuta, Ogun State

POLAND

National Representative: Dr Z. Kundzewicz, Instytut Geo-Geofizyki PAN, Pasteura 3, 00-973 Warszawa

ICSW Dr B. Wleziak, Instytut Inżynierii i Gospodarki Wodnej, Politechnika Krakowska, Warszawska 24, 31-155 Kraków

ICGW Dr M. Nawalany, Instytut Inżynierii Środowiska, Politechnika Warszawska, Nowowiejska 20, 00-653 Warszawa

ICCE Dr W. Froehlich, Zakład Geomorfologii i Hydrologii Gor i Wyzyn, Instytut Geografii i Zagospodarowania Przestrzennego PAN, Stacja Obserwacyjna Frycowa 113, 33-335 Nawojowa

ICSI Dr M. Grzes, Zakład Geomorfologii i Hydrologii Nizu, Instytut Geografii i Zagospodarowania Przestrzennego PAN, Kopernika 19, 87-100 Torun

ICWQ Dr M. Gromiec, Instytut Meteorologii i Gospodarki Wodnej, Podlesna 61, 01-673 Warszawa

ICWRS Dr J. Kindler, Instytut Inżynierii Środowiska, Politechnika Warszawska, Nowowiejska 20, 00-653 Warszawa

UNITED KINGDOM

ICRSDT Representative: Mr J. W. Trevett, Hunting Technical Services Ltd, Thamesfield House, Boundary Way, Hemel Hemstead, Hertfordshire

REPORTS ON SYMPOSIA

International Symposium on the Hydrology of Wetlands in Temperate and Cold Regions

The symposium was held in Joensuu, Finland, on 6-8 June 1988, with a two-day excursion on 9-10 June. It brought together 125 participants from 16 countries. The organizers of the symposium were the Academy of Finland (Committee for the IHP and National Committee for MAB); the Finnish National Board of Waters and Environment; the Finnish National Commission for UNESCO; and the University of Joensuu; in cooperation with UNESCO, IAHS and the International Peat Society.

The scientific programme of the symposium was divided into four sessions: conservation of wetlands; classification, geomorphology and properties of peatlands; hydrology of wetlands and man's influence on it; water quality of peatlands and man's influence on it.

The programme during the two-day excursion included peat production areas, peat-fuelled power plants and both agricultural and silvicultural use of peatlands. Also an experimental field with drainage, clearcutting and afforestation management was introduced.

The proceedings of the symposium are published in two volumes containing 56 papers including the keynote lectures. They are available from: The Academy of Finland, National IHP Committee, PL 57, 00551 Helsinki, Finland.

International Symposium on Hydrological Processes and Water Management in Urban Areas (URBAN WATER 88)

The symposium (24-29 April 1988) consisted of a three-day conference in Duisberg (FR Germany) and a two-day study tour to the Netherlands. Over 300 participants from 59 countries took part in the conference and 115 in the study tour. The symposium was organized by the IHP Committees of FR Germany and the Netherlands, with support from many national and international associations and agencies such as UNESCO and WMO.

Six themes were discussed: the urban hydrological cycle, functions and uses of water, concepts of urban drainage and flood protection, effects of urbanization on surface and groundwater, the role of water in city planning, and integrated water management in urban areas.

During the symposium 108 pre-published papers and posters were discussed. These pre-published contributions can be ordered from CHO-TNO, PO Box 297, 2501 BD The Hague, The Netherlands; price Dfl 100.

MISCELLANEOUS

In Memoria

IAHS Past-President György Kovács 1925-1988

News of the death of György Kovács on 21 April brought sadness to the hearts of officers, of members of IAHS and to the world community of hydrologists; for György had played a leading role in the affairs of the Association over the last 20 years. It was in 1970 that he was appointed Secretary General after the enforced retirement of Professor L. J. Tison and was faced immediately with the difficult tasks of managing the affairs of the Association and preparing for the Moscow Assembly. He was an active member of the International Commission on Groundwater and

later as one of the Association's Vice-Presidents, he was responsible for the Committee on Reorganization and presented the new statutes and bye-laws to the General Assembly at Hamburg. He was elected President of IAHS at that Assembly and during his term of office he was also elected to the Presidency of the UNESCO/IHP Intergovernmental Council. The illness which prevented him from attending the Vancouver Assembly made it difficult for him to continue his work at IIASA where he had moved after retiring from VITUKI in 1986.

Academician György Kovács was a former Director General of VITUKI and a well known researcher in the field of flow in porous media and a number of other areas such as flat lands and scale problems. His books and the large number of papers he had published reflect these wide-ranging interests. More recently he had been responsible for the IIASA project on managing large international river basins; he was one of the leaders of the IHP project on comparative hydrology and he was demonstrating his continuing interest in representative and experimental basins. George will be greatly missed.

IAHS Past-President William C. Ackermann 1914-1988

With great regret it is announced that on 9 June 1988 Dr William C. Ackermann passed away. Dr Ackermann was well known in the hydrological world. He began his professional career in 1935 as a water resources engineer with the Tennessee Valley Authority. He worked there for 19 years after which he went on to be Head of the Watershed Hydrology Section of the Agricultural Research Service in Beltsville, Maryland. Two years later he became the Chief of the Illinois State Water Survey. In addition Dr Ackermann was active in many national and international organizations including IAHS. He served the Association as President in the years 1970-1971 taking over the chair from Dr Szezsztay (Hungary). Though Dr Ackermann's presidency lasted only about a year IAHS has benefitted much longer from his great experience and his gift for engendering cooperation among people.

IAHS Past-Treasurer Warren W. Hastings 1911-1988

Warren W. Hastings, 77, a retired official of the US Geological Survey's Water Resources Division, died June 18 at Arlington Hospital of cardiac arrest. He had been a resident of Arlington for the past 18 years.

Mr Hastings began a 36-year career with the USGS in 1937 at its Water Quality Branch laboratory in Washington and in 1939 was assigned to quality-of-water investigations in Texas. He returned to Washington in 1947 and served in

several branch management positions until 1961 when he was transferred to the Survey's regional office in Menlo Park, California. He was the Regional Hydrologist until 1972 when he returned to the Survey's Washington headquarters as Assistant Division Chief. He retired in 1973 but continued until 1982 to advise the Survey and to serve as Treasurer of the International Association of Hydrological Sciences.

Mr Hastings was born in San Antonio, Texas. He graduated from the University of Maryland with a degree in Agricultural Chemistry. During his college years and for two years prior to his service with the USGS he worked for the Department of Agriculture on plant genetics and on the chemistry of cotton fibres.

Mr Hastings received the Interior Department's Distinguished Service Award in 1968. He was a member of many associations including the American Chemical Society, American Geophysical Union, American Water Works Association and American Association for the Advancement of Science.

Cavanaugh Memorial Award

The T. Cavanaugh Memorial Award of the American Society for Testing Materials (ASTM) was for the first time awarded in January 1988. The recipient was A. Ivan Johnson, Honorary President of IAHS.

The Award recognizes outstanding eminence in the US and the international standards field. This award carries with it the title of ASTM Honorary Member.

IAHS likes to congratulate Ivan sincerely.

New IHP Chairman

During the IHP Council meeting in Paris, June 1988, Dr Gordon Young from Canada was elected as Chairman for the period 1988-1990. This election is welcomed by IAHS as we are sure Gordon will do a very good job. Gordon is well known for the excellent way he organized the IAHS symposia and workshops during the IUGG General Assembly in Vancouver (August 1987). We are pleased to offer Gordon our congratulations and we wish him much success.

New AGU General Secretary

Dr Marshall E. Moss was recently elected as General Secretary of the American Geophysical Union (AGU). Marshall who is member of the Organizing Committee of IAHS Third Scientific Assembly (Baltimore, May 1989) served the Association before as convenor and editor of the Budapest Symposium on Integrated Design of Hydrological Networks (1986). Congratulations!

Earth Science Data Directory

The Earth Science Data Directory (ESDD) is

being developed by the US Geological Survey as a nationwide system for readily determining the availability of specific earth-science and natural-resources data. It offers online access to a USGS mainframe computer repository of information about earth-science and natural-resource data bases. The referenced data bases are both automated and non-automated, and they belong to many different entities. ESDD participants are governmental agencies, academic institutions, and the private sector.

ESDD data bases include those concerned with the geologic, hydrologic, cartographic, and biologic sciences. Data bases that support the protection and management of natural resources are also included. These data bases reference geographic, sociologic, economic, and demographic data. Many of them offer potential as base and/or overlay input for geographic information systems (GIS).

Participation in the ESDD is solicited from organizations that use, need, produce, handle, archive, or are concerned with or about earth-science and natural-resource data sets and products. Full information will be provided on request to the ESDD Project Manager at (703) 648-7112 or FTS 959-7112, or write to ESDD Project Manager, US Geological Survey, 801 National Center, Reston, Virginia 22092, USA.

Publications received

ICSU Yearbook 1988
ICSU Newsletter, June 1988.
IUGG Chronicle, December 1987.
UNESCO IHP Information, no. 13, January/March 1988.
WMO Bulletin, vol. 37-3, July 1988.
WCP Newsletter, no. 10, April 1988.
UNEP: The International Satellite Land-Surface Climatology Project (ISLSCP report no. 10) 1987.
Nat. Research Council Canada (Ass. Committee on Hydrology: Hydrological Events, vol. 13, no. 1, 1988.
Science Council of Canada: Water 2020; Sustainable Use for Water in the 21st Century.
LAG Journal of the Association of Geodesy, nos. 1&2, 1988.
IUPAC News Magazine, July 1988.
ISSS Bulletin of the International Society of Soil Science, no. 73, 1988.

FORTHCOMING EVENTS

IAHS Third Scientific Assembly (ITSA)

Detailed information on ITSA (Baltimore, 10-19 May 1989) is published in EOS, Transactions American Geophysical Union, vol. 69, no. 29, 19 July 1988.

Very shortly the 2nd Information note of the Assembly will be distributed. This information note comprises all scientific information as well information on housing and registration. A registration form is published at the back of this Newsletter. The tentative programme of the Assembly is as follows:

Thursday, May 11

- (S1) Atmospheric Deposition (IAHS, IA-MAP, AGU)
- (S7) Groundwater Contamination (ICGW, AGU)
- AGU technical sessions and exhibits
- Opening Ceremony (evening)

Friday, May 12

- (S1) Atmospheric Deposition (IAHS, IA-MAP, AGU)
- (S7) Groundwater Contamination (ICGW, AGU)
- AGU technical sessions and exhibits
- ICGW Commission Meeting (evening)

Saturday, May 13

Tours and Field Trips

Sunday, May 14

Tours and Field Trips

Monday, May 15

- ITSA Plenary Meeting
- (S3) Surface Water Modeling—New Directions for Hydrologic Prediction (ICSW)
- (S4) Regional Characterization of Water Quality (ICQW)
- (S5) Glacier and Snow Cover Variations (ICSI)
- (W4) PC Methods for Image Processing and Geographic Information Systems (ICGW) ICSI and ICQW Commission Meetings (evening)
- LAHS Bureau Meeting (evening)

Tuesday, May 16

- (S3) Surface Water Modeling—New Directions for Hydrologic Prediction (ICSW)
- (S4) Regional Characterization of Water Quality (ICQW)
- (W1) PC Methods in Water Resource Systems and Precipitation Analysis (ICWRS)
- (W4) PC Methods for Image Processing and Geographic Information Systems (ICGW)
- Banquet at the B&O Railroad Museum (evening)

Wednesday, May 17

- (S2) Closing the Gap Between Theory and Practice (ICWRS)
- (S3) Surface Water Modeling—New Directions for Hydrologic Prediction (ICSW)
- (S6) Sediment and Environment (ICCE)
- (W1) PC Methods in Water Resource Systems and Precipitation Analysis (ICWRS)
- (W3) PC Methods for Image Processing and Geographic Information Systems (ICRSDDT)
- ICSW, CCWRS Commission Meetings (evening)

Thursday, May 18

- (S2) Closing the Gap Between Theory and Practice (ICWRS)
- (S6) Sediment and Environment (ICCE)
- (S8) Remote Sensing and Large-Scale Global Processes (ICRSDDT)

- (W2) PC Methods for Flood Frequency Analysis and Flood Forecasting (ICSW)
- (W3) PC Methods for Image Processing and Geographic Information Systems (ICRSDDT)
- ICRSDDT and ICCE Commission Meetings (evening)

Friday, May 19

- (S2) Closing the Gap Between Theory and Practice (ICWRS)
- (S8) Remote Sensing and Large-Scale Global Processes (ICRSDDT)
- (W2) PC Methods for Flood Frequency Analysis and Flood Forecasting (ICSW)
- Closing Ceremony (evening)
- IAHS Plenary Meeting

Social Events

• Opening Reception

Thursday, May 11
6:30–7:30 P.M.
Omni Hotel
International Ballroom
Open to all attendees

• Reception, Banquet and Dancing

Tuesday, May 16
7:00–10:30 P.M.
B&O Railroad Museum
Tickets \$25 each

The banquet will be held at the B&O Museum in Baltimore. The B&O Museum, America's first passenger depot (and the largest rail exhibit in the country), was built in two parts, with the station entrance completed in 1830, and the Roundhouse in 1884. The circular building is constructed of 22 panels of equal size. There is a variety of exhibits, including antique steam engines and a working model train display. Participants wishing to take tours of the museum will be allowed to do so. Music will be provided throughout the evening for your listening enjoyment and dancing pleasure. Transportation will be provided to and from the museum and the hotels.

New deadline for PC workshops at ITSA

Scientists who have developed computer programs in the broad field of hydrological sciences are invited to offer papers for the computer workshops that are scheduled as part of the IAHS Third Scientific Assembly. The deadline for abstracts has been extended to **1 December 1988**.

PCs are expected to be available for the hands-on workshops which will run concurrently with a number of symposia during the second week (15–19 May) of the Assembly. Authors of specially developed programs will have the opportunity to present their programs for a variety of hydrological modelling and data manipulation topics. The programs will be presented orally, or by poster, and by demonstration on the computers. Attendees will then have hands-on practice in the use of the programs. The titles of the workshops have been modified since the announcement in the last IAHS Newsletter (April 1988 issue). The titles and organizers are:

Overall Convenor: Professor D. P. Lettenmaier, Department of Civil Engineering, FX-10, University of Washington, Seattle, Washington 98195, USA [tel.: (206) 543 2532]

W1. Water Resources Systems Analysis and Precipitation Analysis

Workshop Organizer: Professor D. P. Lettenmaier (address as above)

W2. Flood Frequency and Flood Forecasting

Workshop Organizer: Dr J. R. Wallis, Thomas J. Watson Research Center, PO Box 218, Yorktown Heights, New York 10598, USA [tel.: (914) 945 2828]

W3. Image Processing and Geographic Information Systems

Workshop Organizer: Dr R. M. Ragan, Department of Civil Engineering, University of Maryland, College Park, Maryland 20742, USA [tel.: (301) 454 3107]

W4. Groundwater Quantity and Quality Analysis

Workshop Organizer: Dr P. Van der Heijde, International Ground Water Modeling Center, Holscomb Research Institute, Butler University, Indianapolis, Indiana 46208 [tel.: (317) 283 9458]

Authors of programs within one of these subject areas are invited to submit abstracts of 600-800 words (not more than two single-space typewritten pages). The abstract should describe the PC program and its applications; should include the name, affiliation and mailing address of the author(s); and should indicate the computer workshop number and subject for which it is being submitted.

International Conference on Water Resources in Mountainous Regions

This conference is being held in Lausanne, Switzerland, 27 August-1 September 1990. The conference is being convened jointly by IAHS and IAH, and sponsors include UNESCO, WMO and IAEA. It is also the XXII Congress of IAH.

There will be eight simultaneous symposia, four treating surface water problems and four directed towards groundwater problems. A relatively flexible and open programme will make it possible for participants to attend discussions at more than one symposium. A number of plenary sessions will be organized to facilitate multidisciplinary contacts. The symposia and topics are as follows:

- Symposium 1: Improved methods of hydrological measurements in mountainous areas
- Symposium 2: Quantitative and qualitative water cycle aspects in heterogeneous basins
- Symposium 3: Impact of artificial reservoirs on hydrological equilibrium
- Symposium 4: The role of water in the morphological evolution of slopes
- Symposium 5: Evaluation of underground water resources by surface prospecting in regions of rugged relief
- Symposium 6: Flow modelling in massifs of complex geological structure

Symposium 7: Groundwater response in multi-aquifer flow systems

Symposium 8: Exploitation, management and protection of groundwater resources

The registration fee will be FS 350 for IAHS or IAH members registering by 1 January 1990. The fee for non-members will be FS 550. The registration fee includes a copy of the abstracts presented at the conference and the proceedings of the eight symposia (symposia 1-4 will be published by IAHS in its series of Proceedings and Reports; symposia 5-8 will be published by IAH as the Mémoires of the XXII Congress of IAH, and they will be distributed to all members of IAH as well as participants in the conference).

The official languages will be English and French and there will be no simultaneous translation.

Initially authors are invited to submit the title only of each proposed paper. Later an extended abstract will be asked for, and finally complete papers in camera-ready form will be required. Important dates are:

- 30 September 1988** Deadline for article titles
- 31 March 1989** Deadline for extended abstracts and preliminary registration
- 30 November 1989** Deadline for receipt of camera-ready copy for full papers

All correspondence should be sent to:

Dr Aurèle Parriaux
 Laboratory of Geology EPFL (GEOLEP),
 CH-1015 Lausanne, Switzerland
 [tel: (021)47 23 55, from 12 November 1988: 693 23 55; telex: 454478 EPFV CH; fax: (021) 47 50 60]

IAHS-sponsored symposia at 5th IAMAP Scientific Assembly

During the 5th IAMAP Scientific Assembly at Reading, UK, 31 July-11 August 1989 there will be four major symposia each running four or five days. IAHS is sponsoring the following symposia:

Symposium on Global Energy and Water Fluxes
 Global precipitation and related observations; inference of energy and water vapour fluxes from satellite observations; modelling of water cycle and energy fluxes; results of validation experiments; status review of projects; the role of vegetation.

Symposium on Atmospheric Trace Constituents and Climate/Global Change
 Changing composition of the atmosphere; chemical processes and transport; ozone; radiation effects.

The deadline for abstracts is 1 March 1989. Further information may be obtained from:

Mr Ross Reynolds
 IAMAP 89, Department of Meteorology, University of Reading, 2 Earley Gate, Reading RG6 2AU, UK

Conference on Soils and the Greenhouse Effect
 An International Conference on this subject will be

held at Wageningen, The Netherlands, from 14 to 18 August 1989. The aims of the conference are to give estimates of fluxes of greenhouse gases, evapotranspiration and albedo for the major soils of the world and their land cover types, quantify global land use changes and their effects on greenhouse gas fluxes, evapotranspiration, albedo, and to identify research gaps with regard to the above. For more information contact:

A. D. Bouwman, Conference Secretary, ISRIC, PO Box 353, 6700 AJ Wageningen, The Netherlands

Seminar on Conflict Analysis in Reservoir Management

A seminar on this topic will be held at the Asian Institute of Technology (AIT) in Bangkok, Thailand, from 6 to 13 December 1988. The seminar aims to provide a forum to discuss appropriate decision making modelling techniques and reservoir operation methods. For further

information contact:

Dr Nicanor C. Austriaco, AIT, GPO Box 2754, Bangkok 10505, Thailand

4th International Symposium on Land Subsidence

The fourth in the series of symposia on Land Subsidence is being developed by a special organizing committee of the IAHS Groundwater Commission. Present plans are tentatively considering Mexico City, Mexico, or Huston, Texas, both of which are sites of subsidence, as locations for the symposium, which will probably be held early in 1990. Anyone interested in offering a paper or being put on the mailing list for future more detailed information should contact:

Mr A. J. Johnson, 7474 Upham Court, Arvada, Colorado 80003, USA

Other Meetings

Details of some of the other meetings organized/sponsored by IAHS are given below:

1988

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|------------|-------------------------------|---|--|
| 7-11 Nov. | Ouagadougou, Burkina Faso | M. le Secrétaire Général, CIEH, BP 369, Ouagadougou, Burkina Faso [tel: 33 34 76/33 35 18; telex: 5277 BF] | International Seminar on the State of the Art of Hydrology and Hydrogeology in the Arid and Semiarid Areas of Africa |
| 1-3 Dec. | Roorkee, Uttar Pradesh, India | Dr S. M. Seth, International Seminar on Hydrology of Extremes, National Institute of Hydrology, Jal Vignyan Bhawan, Roorkee 247667, India [tel: 01332 2107/2106; telex: 0597205 NIH IN] | International Seminar on Hydrology of Extremes (Floods and Low Flows) |
| 11-15 Dec. | Porto Alegre, RS, Brazil | International Symposium on Sediment Budgets, IHP/UFRGS, CP 530, 90001 Porto Alegre, RS, Brazil [tel: (0512) 36 0266/36 0457] | International Symposium on Sediment Budgets |

1989

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|----------------|-----------------------------|--|---|
| 1-6 April | Bolkesjo, Norway | Norwegian National Committee for Hydrology, PO Box 5091, Majorstua, 0301 Oslo 3, Norway [tel: 472 469 800 ext 383/327; telex: 79397 NVEO N; fax: 472 696151] | International Conference on FRIENDS in Hydrology (Flow Regimes from International Experimental and Network Data Sets) |
| 4-6 April | Stuttgart, FR Germany | Mr W. Kinzelbach, Institut für Wasserbau, Universität Stuttgart, Pfaffenwaldring 61, D-7000 Stuttgart 80, FR Germany [tel: 0711 685 4714; telex: 7255445 UNIV] | International Symposium on Contaminant Transport in Groundwater |
| 10-19 May | Baltimore, Maryland, USA | Mr A. J. Johnson, TSA Organizing Committee, 7474 Upham Court, Arvada, Colorado 80003, USA [tel: (303) 4255610] | IAHS 3rd Scientific General Assembly: FOR DETAILS OF SYMPOSIA AND WORKSHOPS SEE pages 10-12 and 14 OF THE NEWSLETTER |
| 30 May-2 June | Hannover, FR Germany | Mr W. Struckmeier, PO Box 510153, D-3000 Hannover 51, FR Germany [tel: (0511)64 30; telex: 923730 BGR HA D; fax: (0511)643 2304] | International Symposium on Hydrogeological Maps as Tools for Economic and Social Development |
| 5-9 June | Beijing, China | Prof. D. E. Walling, Department of Geography, University of Exeter, Amory Building, Rennes Drive, Exeter EX4 4RJ, UK [tel: (0)392 263345] | 4th International Symposium on River Sedimentation |
| 7-9 June | Fort Collins, Colorado, USA | Dr R. C. Ward, Agricultural and Chemical Engineering Department, Colorado State University, Fort Collins, Colorado 80523, USA [tel: (303) 491 5252] | International Symposium on the Design of Water Quality Information Systems |
| July | Espoo, Finland | Prof. W. I. Axford, MPI für Aeronomie, Pf 20, D-3411 Kailenburg-Lindau, FR Germany [tel: 49 5556 41414; telex: 965527 AERLJ D] | Workshop on Microwave Observations of Snowpack and Soil Properties |
| 31 July-3 Aug. | Yogyakarta, Indonesia | Mr H. Pramudo, Secretary of the Organizing Committee, Tromol Pos 23/KBT Kebayoran Baru, Jakarta, Selatan, Indonesia [telex: 47473 DN LA] | International Symposium on Erosion and Volcanic Debris Flow Technology |
| 31 July-7 Aug. | Reading, Berkshire, UK | Mr R. Reynolds, Department of Meteorology, University of Reading, 2 Earley Gate, Whiteknights, Reading RG6 2AU, UK | LAMAP 5th Scientific Assembly including joint symposia with IAHS on Global Energy and Water Fluxes; and Atmosphere Trace Constituents and Climate/Global Change |
| 21-25 Aug. | Ottawa, Ontario, Canada | Mr K. Charbonneau, Conference Services Office, National Research Council of Canada, Ottawa, Ontario, Canada K1A 0R6 [tel: (613)993 9009; telex: 0533145; fax: (613)993 0603] | 23rd Congress of IAHR: Hydraulics and the Environment |
| 2-5 Oct. | Benidorm, Spain | Dr J. Andreu, ETS de Ingenieros Caminos, Universidad Politécnica, Camino de Vera, s/n, 46071 Valencia, Spain [tel: (96) 361 30 51 ext 352; telex: 62808 UPVA E] | International Symposium on Groundwater Management: Quantity and Quality |

1990	23-26 April	Ljubljana, Yugoslavia	Prof. M. Brilly, Department of Civil Engineering, University of Ljubljana, Hojdrihova 28, 61000 Ljubljana, Yugoslavia	International Symposium on Regionalization in Hydrology
	12-15 June	Winnipeg, Manitoba, Canada	Mr S. P. Simonovic, Civil Engineering Department, The University of Manitoba, Winnipeg, Manitoba, Canada R3T 2N2 [tel: (204) 474 9220; telex: 075 87721; Btinet: SLOBODA UOFMCC]	International Symposium on Water Resources Systems Application
	27 Aug.-1 Sept.	Lausanne, Switzerland	Dr A. Parriaux, Laboratoire de Géologie EPFL, CH-1015 Lausanne, Switzerland [tel: (021) 57 23 55; telex: 454478 EPFV CH; fax: (021) 47 5060]	International Conference on Water Resources in Mountainous Regions
	16-19 Oct.	Beijing, China	Dr Chen Jiaqi, The Water Conservancy and Hydroelectric Power Scientific Research Institute, PO Box 366, Beijing 100044, China [tel: 365331 4263; telex: 22466 MWREP CN]	International Symposium on Water Resources Management
1991	11-24 Aug.	Vienna, Austria	Mr Dipl. Ing. F. Wiederstein, BM für Land- und Forstwirtschaft, Hydrographisches Zentralbüro, Marxergasse 2, A-1030 Vienna, Austria	20th General Assembly of IUGG

IAHS THIRD SCIENTIFIC ASSEMBLY

REGISTRATION FORM

Return this form with payment to:

IAHS Assembly

c/o American Geophysical Union
2000 Florida Avenue, N.W.
Washington, DC 20009, or to register by phone, call
202-462-6903 (in the D.C. area or
outside the U.S.)
800-424-2488 toll free

Please type or print clearly

Name for Badge _____

Affiliation for Badge _____

Mailing Address _____

City _____ State _____ Zip _____

Country _____ Country Code _____

Telephone No. _____

Telex No. _____

Accompanying person(s) (not attending scientific meetings)

Name (1) _____

Name (2) _____

Registration Fees

	By March 20	After March 20
Assembly Registrant	\$150	\$175
Joint IAHS/AGU Registrant	\$185	\$210
Student Registrant	\$ 39	\$ 64
One-Day Registrant	\$ 98	\$123
Accompanying Person	\$ 55	\$ 80

Total Registration Fee \$ _____

If one-day IAHS registrant please indicate the date: _____

Arrival date: _____

Departure date: _____

Social Event

	price	number of tickets	total
Banquet, May 16, 1989 (\$25 per ticket)	\$25	× _____	= \$ _____

Field Trips

(indicate number of tickets and include payment)

	price	number of tickets	total
[F1] Groundwater Effects of Urban and Agricultural Management	\$40	× _____	= \$ _____
[F2] Acid Rain in the Appalachian Mountains	\$60	× _____	= \$ _____
[F3] Water Quality Issues on the Potomac River	\$80	× _____	= \$ _____
[F4] Water Quality in Chesapeake Bay: Influence of Bottom Sediments May 13, 1989	\$70	× _____	= \$ _____
[F5] Water Quality in Chesapeake Bay: Influence of Bottom Sediments May 14, 1989	\$70	× _____	= \$ _____

Total Amount Enclosed \$ _____
(Include payment for registration, banquet fees, and field trips)

Check or Money Order Enclosed or
Charge to:

American Express MasterCard Visa

Card Number _____

Signature of card holder _____

Expiration date on card _____

Payment may be made by American Express, MasterCard, Visa, Choice, check, postal money order or UNESCO coupons. AGU accepts (at current exchange rates) checks in British pounds drawn on British banks, checks in Canadian dollars drawn on Canadian banks, or Eurochecks in British pounds.

Free Symposium Preprint

Each meeting registrant will receive one free symposium volume. Other volumes will be available at the meeting for purchase. Please select ONLY ONE VOLUME of your choice.

- Symposium 1: Atmospheric Deposition
- Symposium 2: Closing the Gap Between Theory and Practice
- Symposium 3: Surface Water Modeling—New Directions for Hydrologic Prediction (may become two separate volumes; if so, you will have your choice of one)
- Symposium 4: Regional Characterization of Water Quality (ICQW)
- Symposium 5: Glacier and Snow Cover Variations
- Symposium 6: Sediment and Environment
- Symposium 7: Groundwater Contamination
- Symposium 8: Remote Sensing and Large-Scale Global Processes

**IAHS Third International Assembly
May 10-19, 1989**

DO NOT MAIL THIS FORM TO AGU

Omni International Hotel
101 West Fayette Street
Baltimore, Maryland
301-752-1100

Comfort Inn
24 West Franklin Street
Baltimore, Maryland
301-576-8400

**Hotel Accommodation Form
Deadline: March 20, 1989**

No deposit necessary (unless guaranteeing for late arrival)

Return form promptly to ensure your preferred accommodation

Complete and mail this form directly to the hotel of your choice. The mailing addresses are listed below.

Circle type of accommodation desired.

OMNI	Single \$80	Double \$95	Twin \$95	Triple \$111	Extra Person \$16
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Mailing Address: Omni International Hotel, Attention: Reservations,
101 West Fayette Street, Baltimore, MD 21201.

COMFORT INN	Single \$49	Double \$57	Twin \$57	Extra Person \$5
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Mailing Address: Comfort Inn, Attention: Reservations, 24 West
Franklin Street, Baltimore, MD 21201.

Note: The above charges do not include sales tax. Currently (July 1988) that tax is 11% per room per night.

Please print or type. List names of all persons occupying room. (Send only one reservation form per room.)

Name (1) _____

Arrival Date/Time _____ Departure Date/Time _____

Name (2) _____

Arrival Date/Time _____ Departure Date/Time _____

Name (3) _____

Arrival Date/Time _____ Departure Date/Time _____

Confirmation to be mailed to: (Only one confirmation will be mailed per room).

Name _____

Address _____

City _____ State _____ Zip Code _____

Country _____ Country Postal Code _____

Telephone # _____

(include country telephone number)

Telex # _____ Fax# _____

Type of accommodation (please check one).

- | | |
|---|--|
| <input type="checkbox"/> single (room with one bed one person) | <input type="checkbox"/> twin (room with two beds two persons) |
| <input type="checkbox"/> double (room with one bed two persons) | <input type="checkbox"/> triple (room with two beds, three persons)
to add rollaway bed, add \$10 |

If you are arriving late you must guarantee your late arrival by using a credit card or sending a money order or check in order to secure the room. Please complete the information below or if not using a credit card, be sure to include a money order or check.

Guarantee late arrival to: (please check one)

American Express

Visa

MasterCard

Card Number _____

Signature of card holder _____

Expiration date on card _____

or check enclosed or money order enclosed

INTERNATIONAL ASSOCIATION OF HYDROLOGICAL SCIENCES

IAHS adheres to the International Union of Geodesy and Geophysics

Officers of IAHS elected for the period 1987-1991

President: V. KLEMEŠ, Canada
Secretary General: H. J. COLENBRANDER, The Netherlands
First Vice-President: S. DYCK, GDR
Second Vice-President: D. A. RICKERT, USA
Third Vice-President: CHEN JIAQI, China
Editor: T. O'DONNELL, UK
Treasurer: H. C. RIGGS, USA
Honorary President: A. I. JOHNSON, USA

Information

Individual membership of the Association is *free* and open to anyone who has played, or is playing, a part in IAHS activities, such as participating in IAHS symposia, workshops, working groups. Further information may be obtained from the Secretary General:

Mr H. J. Colenbrander, Secretary General IAHS, CHO-TNO, PO Box 297, 2501 BD, The Hague, The Netherlands

Information about the activities of the Commissions instituted by the Association can be obtained from the Presidents of these Commissions:

Dr H. J. LIEBSCHER, *President of the IAHS International Commission on Surface Water*, Federal Institute of Hydrology, PO Box 309, D-5400 Koblenz, FR Germany.

Dr S. M. GORELICK, *President of the IAHS International Commission on Groundwater*, Department of Applied Earth Sciences, Stanford University, Stanford, California 94305, USA.

Prof. D. E. WALLING, *President of the IAHS International Commission on Continental Erosion*, Department of Geography, University of Exeter, Amory Building, Rennes Drive, Exeter EX4 4RJ, UK.

Prof. V. M. KOTLYAKOV, *President of the IAHS International Commission on Snow and Ice*, Institute of Geography, USSR Academy of Sciences, Staromonetny St. 29, Moscow 109017, USSR.

Dr R. A. GRAS, *President of the IAHS International Commission on Water Quality*, EDF, Direction des Etudes et Recherches, Service AEE, 6 Quai Watier, 78400 Chatou, France.

Prof. U. SHAMIR, *President of the IAHS International Commission on Water Resources Systems*, Faculty of Civil Engineering, TECHNION, 32000 Haifa, Israel.

Hydrological Sciences Journal

The Association has produced a scientific journal since 1956. From 1956 to 1971 it was called *Bulletin of the International Association of Scientific Hydrology*, from 1972 to 1981 the title was changed to *Hydrological Sciences Bulletin*, and the present title, *Hydrological Sciences Journal*, came into effect from 1982. From 1988 the frequency will be increased from quarterly to bimonthly. As well as scientific papers on all aspects of hydrology the Journal contains announcements on and news of worldwide hydrological activities organized or sponsored by IAHS, book reviews, and a diary of forthcoming events.

Publication of Proceedings

For over 60 years the proceedings of many of the symposia organized by the Association have been published, and these publications may be ordered from:

Office of the Treasurer, IAHS, 2000 Florida Avenue NW, Washington, DC 20009, USA

IAHS Press, Institute of Hydrology, Wallingford, Oxon OX10 8BB, UK

Bureau des Publications de l'UGGI, 140 Rue de Grenelle, 75700 Paris, France

A catalogue of all IAHS publications which includes prices and availability of back issues of the Journal may be obtained from any of these addresses.

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