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IAHS Newsletter

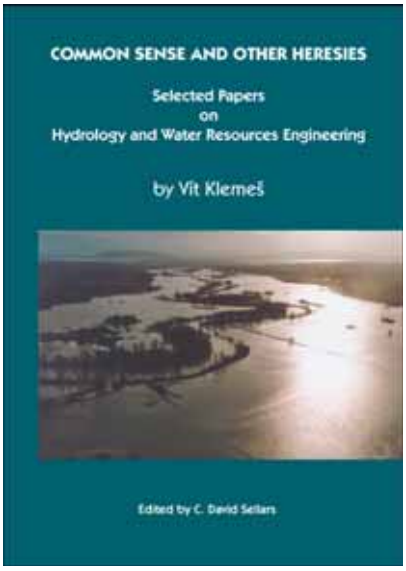
NL99 April 2011

IAHS at the IUGG2011 Assembly in Melbourne www.IUGG2011.com

A summary of the schedule for IAHS events is given on pages 4 and 5.

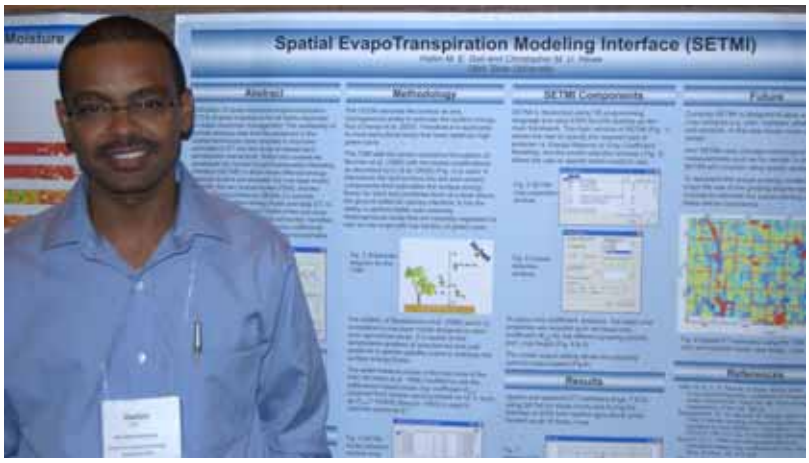
The programme of events organised by IUGG and the other associations will soon be available at the IUGG2011 website.

Common Sense and Other Heresies
in the context of Hydrology and Water Resources Engineering



Vít Klemeš (1932–2010) was one of the world's greatest hydrologists, as recognized, *inter alia*, by the award to him of the International Hydrology Prize in 1994 (jointly awarded by IAHS, the United Nations Educational Scientific and Cultural Organization (UNESCO) and the World Meteorological Organization (WMO)) and his election as President of IAHS (1987–1991).

Some of Klemeš's works were published collectively in a book with the striking title "*Common Sense and Other Heresies*", by the Canadian Water Resources Association (CWRA). The book was out of print but CWRA and IAHS, recognizing that Klemeš contributions are as pertinent now as when first published, have collaborated to produce a second edition with a new Foreword by C. David Sellars and Prolegomena by Demetris Koutsoyiannis, so that wider audiences can benefit from Klemeš's insight to the science and practice of hydrology. *See page 6.*



Remote Sensing and Hydrology

The Remote Sensing and Hydrology Symposium 2010 organized by the IAHS International Commission on Remote Sensing was held over four days last September at the Snow King Hotel in Jackson Hole, Wyoming, USA. The programme covered topics from Data Assimilation to New Satellite Missions, and Surface Flux Measurements to Flood Forecasting and Management. *See report page11*.

Hatim M. E. Geli, ready to discuss his poster on SETMI, the Spatial EvapoTranspiration Modeling Interface.

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News from UNESCO

UNESCO's water programme focuses on the assessment of the impact of global change drivers on flow regimes, with a strong emphasis on hydro-hazards such as floods and droughts, and has developed several flood-related tools such as early flood forecasting systems and methods for design floods. *See page 8.*

Young/Early Career Hydrological Scientists

Following on from the recommendations of the Young Scientists Meeting at the 8th IAHS Scientific Assembly in Hyderabad, India, in 2009, young hydrologists are more actively engaged as co-convenors of symposia and workshops in the IAHS programme for Melbourne … *See page 3.*

Message from the President

gordonyoung_wwap@yahoo.com

The Melbourne IUGG Assembly is drawing closer and I am pleased to report that 5825 submissions have been received for the Assembly as a whole, of which some 210 are for IAHS symposia and 439 for IAHS Workshops. We can look forward to a very stimulating series of Union lectures, keynote presentations on behalf of each of the eight Associations and invited papers by younger members of the community. Our six symposia (two of which are joint with other Associations) and 14 Workshops will produce a great deal of stimulating debate. Our IAHS Press in Wallingford is already well on the way to preparing the volumes of symposia proceedings.

The quadrennial Assembly is a time to take stock of our activities in the past four years and to prepare for activities in the years ahead. Thus we will be reviewing the activities of all the Commissions and Working Groups of the Association – there will be a process of self-review within each of the Commissions and the IAHS Bureau will over-view the progress made within the Association as a whole. In particular, it will be a time to evaluate the outputs from our principal single activity of the last many years – that of the *Decade on Prediction in Ungauged Basins*, which started in 2003 and will likely end in 2012 with a major symposium. The main leaders of the PUB initiative (Kuni Takeuchi, Murugesu Sivapalan, Jeff McDonnell, Günter Blöschl and John Pomeroy) are unanimous in their recommendation that PUB end in 2012; however the final decision will be made by the IAHS Bureau in Melbourne. We will be looking to learn from and synthesize the several PUB outputs currently underway, and to formulate the best way forward to implement lessons learned from the PUB process.

PUB was initiated only after a lengthy series of consultations involving soliciting the ideas from many individuals within the Association – in particular listening to the opinions of our younger members. This proved to be a very effective process; and it was because so many members, both young and old, were able to voice their opinions that PUB has generated so much enthusiasm. As the PUB process has been so successful, it would seem sensible to initiate a similar process to start a new initiative on a different, but equally important and stimulating topic as PUB. We will start this process in Melbourne, setting aside some time outside of the schedule for symposia and workshops, to informally solicit opinions on a suitable topic that will be the basis of a new initiative. I will be suggesting that, within each of the plenary sessions for Commissions and Working Groups, the topic of a new initiative be discussed. In addition I would like to hold an informal session before the IAHS Plenary session which would be open to anyone who has ideas to share, so that, at the Plenary session we might have further discussion on the way forward to start the new initiative. This process of discussion will commence soon as I will request ideas from the current members of the IAHS Bureau, and will be taken up again in Melbourne with further discussion there; we will likely have a major meeting in 2012 at which further discussion will be encouraged before the start of the new initiative envisaged for 2013.

In particular I would encourage our younger members to put forward their own views on the most vital topics that might be the basis of a new initiative. I will be encouraging the Presidents of Commissions to suggest names of younger members whose opinions should be heard – hopefully many of them will be in Melbourne and thus be able to voice their opinions. However, I realise that because of the costs involved in participating in Melbourne, many of those who have opinions that should be heard will not be able to participate on the spot. I encourage those who will not be able to attend in Melbourne to write their opinions to me personally. What are the topics vital to hydrology that would justify a new intensive study for IAHS?

Fruitful discussion of the science of hydrology is, of course, the main reason for holding scientific assemblies. However, efficient administration of our endeavours is also important and thus we will hold meetings of the bureaux of the Association and all its Commissions. It is at the Assemblies of IUGG that elections are held for all officers of the Association and its Commissions, and new Working Groups are appointed by the IAHS Bureau. The process of electing officers is quite complex and

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Edited by Cate Gardner

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Articles from IAHS members on all aspects of hydrology and related topics are welcomed for publication in the Newsletter. They should be sent to the IAHS Secretary General, Pierre Hubert, preferably to: pjy.hubert@free.fr, or to:

IAHS, UMR Sisyphe, Université Pierre & Marie Curie,
Case 105, 4 Place Jussieu, 75252 Paris Cedex 05, France

Advertisements may be placed in the Newsletter, at the discretion of the IAHS Secretary General. Contact: cate@iahs.demon.co.uk

The next Newsletter will be published in August 2011; copy deadline: 31 July 2011.

IAHS National Representatives

Already in 2011 several new IAHS National Representatives have been appointed, and there have been other changes:

Albania, Agim Selenica
Costa Rica, Walter Fernandez
Iceland, Sigurdur M. Gardarsson
Italy, Alberto Montanari
Jamaica, Basil Fernandez
Mozambique, Lucas Chatruca
Nigeria, C. C. Mbajiorgu
Pakistan, Muhammad Arshad PN
Russia, Roald G. Dzhamalov
Slovenia, Lidija Globevnik

Welcome to all the newcomers. Full contact details for National Representatives are available at www.iahs.info/nreps.htm.

time-consuming. This year the Nomination Panel has been very effectively chaired by our Past President, Arthur Askew and I thank Arthur and members of the Panel, on behalf of all members of the Association, for their hard work. For those of you who may not be familiar with the nomination and election process I refer you to our website: www.iahs.info/handbook/statutes.htm; and under the *Bye-laws* you will find a section on *Nominations and voting for office* that explains the procedures. It is important to note that while nominations for particular posts have been made by National Representatives and current officers of the Association, and while the Nomination Panel has fulfilled its duty in informing National Representatives of the identities of all candidates and has offered recommendations for all posts, the official voting takes place at the IAHS Plenary session in July in Melbourne. If a National Representative cannot attend and cannot identify an alternate to vote on his/her behalf, only then can a vote be registered by correspondence through the formal procedure that has been announced.

Lastly, at the Melbourne Assembly we will announce this year's winners of the International Hydrology Prize and the Tison Award, for both of which there were many excellent candidates.

General information on the IUGG Assembly may be found at www.iugg2011.com, while information on the schedule of IAHS activities (to be up-dated periodically) may be found at www.iahs.info.

Gordon Young

Young/early career hydrological scientists at the XXV IUGG Assembly

In addition to greater involvement of younger IAHS hydrologists and scientists in co-convening symposia and workshops in Melbourne, the Inter-union Symposium U-12, "*Geosciences and the Future of Planet Earth*", is targeted at early career scientists. I am representing IAHS at this symposium, but since I am at the upper end of the age criterion to qualify as an early career scientist (up to 40 years), there are many future opportunities for REALLY young hydrological scientists to engage.

I look forward to meeting early career hydrological scientists in Melbourne at the Inter-union Symposium U-12 and at IAHS events.

Kate Heal
School of GeoSciences, The University of Edinburgh

3rd STAHY Official Workshop

Statistical Methods for Hydrological Applications

17–18 October 2011, in Tunis, Tunisia

Organized by the Laboratoire de Modélisation Hydraulique et Environnement of the Ecole Nationale d'Ingénieurs de Tunis and to be held at the Sheraton Tunis Hotel & Towers, in the central business and diplomatic district overlooking the city.

For further information, see the website www.stahytunis2011.org or contact info@stahytunis2011.org

CALIBRATION AND RELIABILITY IN GROUNDWATER MODELLING: Managing Groundwater and the Environment

Edited by *Yanxin Wang, Shemin Ge, Mary C. Hill & Chunmiao Zheng*

IAHS Publ. 341 (*2011*) ISBN 978-1-907161-15-5, 278 + x pp. Price £60.00

A peer-reviewed collection of papers selected from the seventh conference in the ModelCARE series on Calibration and Reliability in Groundwater Modelling. The most significant contributions are included and deal with:

- New advances and innovations in model calibration, model prediction, sensitivity analysis, and uncertainty assessment
- Parameterizing groundwater models
- Construction, calibration, reliability and use of models designed to address resources and environmental concerns
- Modelling of CO_2 sequestration and other groundwater model applications

Abstracts of the papers in this volume can be seen at: ***www.iahs.info***

*The programme of the **IAHS Scientific Assembly** at Melbourne:*

commences on Friday 2 July and runs to Thursday 10 July 2011, inclusive.

IUGG will begin on 28 June and there will be many events of interest to IAHS members, run by other IUGG associations, on the days preceding the IAHS events.

IAHS Assembly – Summary of the Scientific programme

*A summary of the programme is provided below (see opposite for details of events). In practice, there will be four sessions per day, two in the morning and two in the afternoon. The poster sessions will be held during a 1½ hour-long break between the two afternoon sessions each day. Details of the full programme will soon be available at: **www.IUGG2011.com**.*

The IAHS Plenary will be held on the evening of Wednesday 6 July. Commission and Working Group plenaries will be scheduled for the Monday and Tuesday evenings.

There will be one IAHS Bureau meeting on Friday 1 July and another on Friday 8 July.

	Fri 1 July		Sat 2 July		Sun 3 July		Mon 4 July		Tue 5 July		Wed 6 July		Thur 7 July	
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JHW03														
JHW04														

Code	Symposia/Workshop	Lead convenor
H01	Conceptual and modelling studies of integrated groundwater, surface water, and ecological systems	Gunnar Nützmann
H02	Cold regions hydrology in a changing climate *ICSIH, PUB*	Daqing Yang
H03	Risk in water resources management	Günter Blöschl
H04	Assessment of water quality under changing climate conditions	Jake Peters
HW01	Tracer applications in sediment research *ICCE, ICT, ICWQ, PUB*	Valentin Golosov
HW02	Understanding and quantifying physical and geochemical processes during artificial recharge of groundwater *ICGW, ICWQ*	Henning Prommer
HW03	Regional groundwater modelling: approaches, challenges and future directions *ICGW, ICT*	Howard Reeves
HW04	Snow and ice hydrology: principles, processes and prediction *ICSIH, ICGW, ICSW*	Tim Link
HW05	Revisiting paired catchment experiments in forest hydrology *ICSW, ICRS*	Vazken Andréassian
HW06	Expert judgement *versus* statistical goodness-of-fit for hydrological model evaluation *ICSW, ICWRS, STAHY*	Charles Perrin
HW07	Hydro-geomorphology *ICSW, ICCE*	Christophe Cudennec
HW08	Tracer hydrology as a tool for estimating flow parameters, groundwater dynamics, pollution transport and bioremediation processes in heterogeneous systems *ICT, ICGW*	Gian Maria Zuppi
HW09	Revaluing system knowledge in water resources management *ICWRS, ICWQ*	Nick van de Giesen
HW10	Water quality and sediment prediction in ungauged basins *ICWQ, ICCE*	Berit Arheimer
HW11	Water supply and water quality in large metropolitan areas and megacities *ICWQ, ICWRS*	Valentina Krysanova
HW12	Quality and quantity aspects of green and blue water: impact on agriculture, environment, energy and industry *ICWQ, ICWRS*	Uttam Sharma
HW13	Recent development of statistical tools for hydrological application *STAHY, ICSW, ICWRS*	Salvatore Grimaldi
HW14	Education in the hydrological sciences *EDU*	Arthur Askew
J-H01	GRACE, other remote sensing platforms and ground-based methods for estimating multi-scale surface water budgets, groundwater system characterization and hydrological processes *IAHS (ICRS, ICSW, ICGW, ICWRS, PUB, GRACE), IAG, IAMAS*	Moshin Hafeez
J-H02	Hydro-climatology: variability and change *IAHS (ICCLAS, ICSW, HYDROMET), IAMAS*	Stewart Franks
J-HW01	Integrated flood management *IAHS (ICSW, ICWRS), IAMAS, WMO, BOM Australia*	Bruce Stewart
J-HW02	Interaction between freshwater and ecosystems in the coastal zone *IAHS (ICGW, ICWQ), IAPSO*	Makoto Taniguchi
J-HW03	Impacts of changing climate, snow and ice on mountain hydrology *IAHS (ICSIH, ICLAS, ICRS, ICGW, ICSW, PUB), IAMAS, IACS*	Danny Marks
J-HW04	Subglacial water: properties, processes and role in ice-mass dynamics *IAHS (ICSIH), IACS*	Bryn Hubbard

*The **IAHS Red Books** to be published for each of symposia J-H01, J-H02, H01, H02, H03 and H04 are in preparation and will be available in Melbourne. Please order your copy online as part of your registration fee so that we have a good idea as to how many copies need to be sent to Melbourne for the Assembly.*

Common Sense and Other Heresies
in the context of Hydrology and Water Resources Engineering
Excerpts from the Prolegomena to the new editon of the book by Vít Klemeš

In 2000, when the first edition of his book, *Common Sense and Other Heresies*, was published, Vít Klemeš decided not to publish any more hydrological papers and not to interfere with hydrology in the 21st century.[1] Therefore, one may think that the collection of papers reproduced in this second edition is somewhat outdated as little new is included. But we know now, better than earlier, that Vít was both classic and innovative. Reading his papers continues to be a refreshing, enlightening and inspiring experience.

In fact, in the last ten years of his life (he died in March 2010 at the age of 78) Vít did not cease his creativity. He just felt free to widen his domain of thinking, reading and writing, or, better, to elaborate further and express publicly what he had done during his life. For Vít differed from typical over-specialized modern scientists and resembled more an ancient philosopher. In addition, he was a conscious and active citizen of the world, having strong positions on all contemporary political, economic and even religious affairs and problems. Perhaps the fact that, following the Soviet-led invasion of Czechoslovakia in 1968, he, together with his wife Marie and his two sons, decided to leave his mother country and move to Canada made him more sensitive to political and human issues. His book entitled "*An Imperfect Fit: Advanced Democracy and Human Nature*", published in 2004,[2] summarizes his reflections of this type. No doubt, he was happy to work on this wider scientific, philosophical and political domain: "*There is life after hydrology!*" he exclaimed.[3]

Reading "*Imperfect Fit*" we can see the extraordinary richness of Vít's reading sources, from the Bible and Homer, to Plato and Aristotle, and to modern philosophers such as Karl Popper and Isaiah Berlin. We can expand our own knowledge of the fields discussed by Vít and perhaps follow his approach to found our professional research on a sound philosophical basis. Take, for instance, Vít's quotation from Isaiah Berlin: [4] "*We must listen to history, which is 'experimental politics', that is, the only reliable teacher of this subject: 'She will never tell us the opposite of the truth'. One genuine experiment blows up hundred volumes of abstract speculation*". Substitute 'hydrology' for 'politics'. Is not this the philosophical basis of Vít's paper "Operational testing of hydrological simulation models"?[5] The latter is Vít's most cited paper and one of the super-hits of *Hydrological Sciences Journal*. But, despite this positive sign, it is doubtful if the premise that history will "*never tell us the opposite of the truth*" has been assimilated. For example, the debate as to whether climate models (and in turn, hydrological models that use their outputs), which supposedly predict what will happen in a century, have been properly tested against reality or not, is still ongoing.[6] Some claim that such models, despite possible disregard of historical reality, are useful because of the underlying "noble ends", e.g. to support policies to save the planet. However, Vít warned us: "*The more the reality diverges from the way prescribed by the ideology, the more ruthlessly it is forced in the prescribed channels and the more brutal are the means by which the noble ends are pursued*".[7]

Vít Klemeš, laurelled by local admirers in the Greek island of Cephalonia in June 2005, with Demetris Koutsoyiannis

Common Sense was certainly Vít's leitmotif in his papers, and is also reflected in the title of this book and his Preface to it, where he cites Alden Foster, stating "*Common sense is always a prerequisite to the application of any mathematical theory to practical work*". I share Vít's belief—as implied in the book title—that Common Sense is nowadays so uncommon as to regard its practise as a heresy. Throughout history, heresy, the departure from orthodoxy and catholicism,[8] has certainly had a negative meaning. Still today, people are scared of the risk of being characterized as

[1] The first thing he mentioned when he wrote to me for the first time (8 Aug. 2003) was his "*resolution to stop reading and writing about the science of hydrology by the end of the XXth century*". Later (19 Mar. 2004) he clarified "*I had resolved not to publicly interfere in hydrological science in the 21st century — my deliberately last paper 'Tall tales about tails of hydrological distributions' was published in 2000*".

[2] A preview of this book can be seen at http://books.google.com/books?id=lJnFojBvksQC.

[3] Quoted from his personal message (28 Feb. 2004) on the postcard announcing his book.

[4] From p. 24 of "*Imperfect Fit*".

[5] *Hydrol. Sci. J.* 31(1), 13–24, 1986.

[6] Cf. the very recent discussion in *Hydrol. Sci. J.*, i.e.: (a) Editorial: Kundzewicz, Z. W. & Stakhiv, E. Z., Are climate models "ready for prime time" in water resources management applications, or is more research needed? *Hydrol. Sci. J.* 55(7), 1085–1089, 2010. (b) Opinion paper: Wilby, R. L., Evaluating climate model outputs for hydrological applications, *Hydrol. Sci. J.* 55(7), 1090–1093, 2010. (c) Research paper: Anagnostopoulos, G. G., D. Koutsoyiannis, A. Christofides, A. Efstratiadis, and N. Mamassis, A comparison of local and aggregated climate model outputs with observed data, *Hydrol. Sci. J.* 55(7), 1094–1110, 2010.

[7] Page 208 of "*Imperfect Fit*".

[8] Here both these terms are used with their literal Greek meaning, i.e. orthodoxy: right opinion; catholicism: universalism, something close to the modern notion of "consensus view".

heretics, even within the scientific community (typical examples can be found in the climatological community). Vít's message is that heresy can be positive when orthodoxy is problematic and, in particular, when science is reduced to dogma. It takes courage, which Vít had—and also advised us to find: "*be brave, be proud, be heretics if necessary, and above all, use your common sense*".[9]

The interaction of science with politics was the subject of his last (to my knowledge) talk at a conference, in 2008, which was entitled "Political pressures in water resources management: Do they influence predictions?" [10] Two quotations from this talk are characteristic of his views: (a) "*[P]olitical pressures often set the agenda for what is to be (or not to be) predicted, and sometimes even try to impose the prediction result thus transforming prediction into prescription.*" (b) "*Well, how anybody in his right mind could propose wasting precious resources on such petty things when political pressures command their use for the noble cause of saving the planet from Climate Change? But, could it not be that the present climate-change-impact models and all sorts of Al-Gore-ithms aimed at helping this noble cause will repeat the history of the noble causes of the past, like the previously mentioned environmental quality models or the ill-fated 'socialist model' meant to save the planet by imposing a 'climate change' on the social fabric itself?*"

I earlier mentioned Vít's three most cited papers. I wish to mention a fourth one, "The Hurst phenomenon: A puzzle?". [11] The importance of this paper, particularly to hydrological stochastics but with significance far beyond hydrology, relies on the fact that it proposed a conceptual explanation of the omnipresent "Hurst phenomenon". Vít showed that natural change, rather than the mathematical concept of infinite memory, is the basis to understand the origin of this natural behaviour. I have personally cited this paper many times[12] and, in general, it is one of the well cited hydrological papers. However, compared with Hurst-related papers from other disciplines (e.g. in informatics and economics), the number of citations is clearly unjustifiably low. But for Vít, the hunting of citations was not an incentive. Rather, he was driven by the search for the truth. This is evident in his paper on "Apocrypha", while in his "Political pressures" talk he stated: "*I have never seen this […] paper*[13] *cited, while the paper that I had originally criticized has become widely cited and itself became a model for a whole generation of similar models.*"

I have also mentioned some of Vít's 21st century contributions, which are mostly focused beyond hydrology, are not journal papers (except one), and are not included in this volume, but can be accessed online.[14] I cannot refrain from strongly suggesting reading his "An unorthodox physically-based stochastic treatment of tree rings". I regard it a 'must' for hydrologists and geoscientists beyond hydrology. It demonstrates Vít's heretic humour and is illustrated by great photos of him, which also allow us to imagine his good relationship with nature and real life, and his tenderness for his family.

I started this foreword by quoting Vít's wish not to interfere in hydrological science in the 21st century. I conclude with my wish that Vít and his legacy greatly interfere in hydrological science in the 21st century. In this respect, I think that this collection of his papers is destined to be a substantial contribution to the progress of hydrological science.

Demetris Koutsoyiannis
Co-Editor, Hydrological Sciences Journal
National Technical University of Athens, Greece

[9] From his talk "20 years later: What has changed – and what hasn't", *XXIV General Assembly IUGG*, Perugia, IAHS 2007 (available at http://iahs.info/perugia/2007IAHS20YearsAfter.pdf).

[10] *International Interdisciplinary Conference on Predictions for Hydrology, Ecology, and Water Resources Management*, Prague, 2008.

[11] *Water Resources Research*, 10(4), 675–688, doi:10.1029/WR010i004p00675, 1974.

[12] My initial misquotation of this paper in 2002 was very fortunate for me as it triggered Vít's reaction with a severe letter and, in turn, produced a series of discussions, full of fruitful disagreements and agreements, including an in-person "Socratic dialog", as he called it, on the island of Cephalonia, Greece, in 2005.

[13] Here he means his 1983 joint paper with J. Němec, "Assessing the impact of climate change on the development of surface water resources", *II International Meeting on Statistical Climatology*, 8.2.l–8.2.8, Instituto Nacional de Meteorologia e Geofisica, Lisbon.

[14] Links to these works can be found at the end of the IAHS web page http://iahs.info/history/klemes.htm or located via the search utility of the IAHS Publications Database, http://perekos.free.fr/indextopEN.htm. In addition, I have gathered all the new contributions that he sent me at the web site http://itia.ntua.gr/en/documents/?title=&authors=klem. The site contains also some older contributions including two videoed talks.

News from the UNESCO Water Division

UNESCO's water programme focuses on the assessment of the impact of global change drivers on flow regimes, with a strong emphasis on hydro-hazards such as floods and droughts, and has developed several flood-related tools such as early flood forecasting systems and methods for design floods. UNESCO's role is to help build capacity in our Member States, explore potential management gaps and provide a platform for further bilateral and multilateral collaborative efforts, and support a holistic, multi-sectoral approach which encourages partnership so that science and technology better serve to mitigate future threats and reduce disaster vulnerability.

UNESCO and Drought Management for Africa

The UN's response to recurring drought and famine emergencies in Africa remains highly challenging, because of sparse observation data, either historically or in real time. An experimental macro-scale hydrological modelling approach has been developed, adapted for the Africa Region, to provide near real-time monitoring of land surface hydrological variables based on modelling supported by remote sensing and a long-term retrospective database. This system, already available in the United States, was developed by the Land Surface Hydrology Group of Princeton University, with the support of the International Hydrological Programme (IHP) of UNESCO. A recent workshop was held at UNESCO headquarters with participation from several key research centres in Africa to develop a roadmap for the implementation of the Africa Drought Monitor. The roadmap calls for testing, validation, and technology transfer mechanisms to be established for optimal utility of drought monitoring products in a regionally coherent context.

Operational experience for drought forecasting is still very limited at the regional and national levels. UNESCO facilitates the sharing of experience through international collaboration (e.g. the US Drought Monitor, the European Drought Centre and organizations in Australia and South Africa responsible for issuing weekly and seasonal drought forecasts). For example, drought forecasting at the catchment and basin scale seeks to combine pan-European seasonal forecasts (qualitative pre-warnings) with shorter-term quantitative forecasts issued at the catchment and river basin scale (quantitative warnings), introduced as a nested forecasting scheme.

Education and Capacity Building

UNESCO, in cooperation with the Ministry of Economic Affairs of Bhutan and the Norwegian Water Resources and Energy Directorate, organized a regional study course on Hydro-hazards in a Changing Climate in Thimphu, Bhutan, from 28 November to 3 December 2010. The course was organized within the framework of the Hindu-Kush-Himalaya IHP-FRIEND network of UNESCO. A prerequisite for an adequate assessment and management of the impacts of hydrological hazards, and associated policy-making (pro-active and re-active) is thorough knowledge of the generation and development of floods and drought. This applies to both current and future conditions, the latter related to climate change adaptation. The study course on hydro-hazards in a changing climate entitled "Climate Change, Hydrological Drought and Flood" provided a unique opportunity for the participants from the countries in the region (Bangladesh, Pakistan, India, China, Bhutan and Nepal) to advance their knowledge about floods, droughts and climate change. The participants learned basic and advanced techniques to analyse floods and droughts and the effects of climate change on these extremes.

Siegfried Demuth

Course participants during a lecture at the Ministry of Economic Affairs of Bhutan, Thimphu (source: Henny van Lanen, University of Wageningen, The Netherlands)

International Commission on Water Resources Management

Report of 5th International Symposium on Integrated Water Resources Management held at Hohai University, Nanjing, China

The IWRM symposium delegates assembled outside the conference hall.

There is hardly a process on Earth where water is not involved in some form or another. Evidence is building that human-induced climate and land-use/cover changes have a direct influence on processes and elements of the hydrological cycle. The International Commission on Water Resources Systems (ICWRS) of IAHS has, for many years, embraced Integrated Water Resources Management (IWRM) as the main topic for its research agenda. The ICWRS has organized regular symposia on Integrated Water Resources Management. On the basis of the Discipline Innovation Base of China's "111 Project" (no. B08048), the 5th International Symposium on Integrated Water Resources Management was held at the State Key Laboratory of Hydrology – Water Resources and Hydraulic Engineering, and College of Hydrology and Water Resources, Hohai University, Nanjing, China, in November 2010, focusing on the topic "*Water Resources Sustainability in a Changing Environment*". More than 200 participants from the USA, Canada, UK, France, Germany, the Netherlands, Spain, Norway, Japan, Australia, Mexico, Malaysia, Pakistan, China, assembled in Nanjing. Prof. Liliang Ren, ICWRS Vice-President, and Dr Pierre Hubert, the Secretary General of IAHS hosted the opening ceremony. Prof. Weiya Xu, Vice-President of Hohai University, and Dr Pierre Hubert, delivered welcome speeches on behalf of Hohai University and IAHS, respectively.

Invited Keynote Lectures and the Plenary Session were arranged for the first day. Academician Changming Liu, Academician Hao Wang, Academician Jianyun Zhang (the President of the Chinese National Committee for IAHS), Prof. E. Sudicky from University of Waterloo, Prof. V. P. Singh from Texas A & M University (Editor-in-Chief of the ASCE *Journal of Hydrologic Engineering*), Prof. A. Schumann from Ruhr-Universität Bochum (ICWRS Vice-President) Prof. Nick van de Giesen from Delft University of Technology (ICWRS Secretary), Dr I. Littlewood (Editor-in-Chief of *Hydrology Research*), Prof. N. R. Saelthun from University of Oslo, and Dr Pierre Hubert gave their presentations. The following day there were nine parallel sessions held in three meeting rooms, including the following themes: hydrological processes in a changing environment, water resources assessment in a changing environment, water resources management, water environment, ecohydrological approach to water resources sustainability, uncertainty in

Prof. Hao Wang, Academician of Chinese Academy of Engineering, delivering his keynote lecture.

hydrological modelling, hydrological modelling supported by multi-source information, hydrological data retrieval by remote sensing methods, hydrological data mining and data assimilation.

This two-day symposium brought together experts from different disciplines to present research results on describing the hydrological cycle in a changing environment and discriminating among impacts caused by various factors, to exchange experiences about quantitative methodologies for water resources assessment in a changing environment and eco-hydrological approaches to water resources sustainability by balancing water for humans and nature, so that we ensure water security in a changing background. During the preparation for this symposium, the secretariat received more than 190 submissions. The selected papers will be published after peer-review as an IAHS Red Book in 2011, entitled "*The Hydrological Cycle and Water Sustainability in Changing Environments*".

Liliang Ren, Vice-President ICWRS

An emphatic Pierre Hubert, Secretary General of IAHS presents his keynote lecture.

International Commission on Water Quality

2010 was the year of water quality. World Water Day, on 22 March 2010, was dedicated to the theme of water quality and the Stockholm Water Week focused on "The Water Quality Challenge". There is a continuing strong water quality theme in the IAHS programme at IUGG2011 in Melbourne. ICWQ officers are leading and co-convening a number of IAHS symposia and workshops which relate to water quality in all spheres – surface water, groundwater, coastal waters, megacities – and also in applied situations and in uncertainty in changing climates and ungauged basins.

These include the interdisciplinary inter-union workshop J-HW02 "Interaction between freshwater and ecosystems in the coastal zone" and the IAHS Symposia H01 "Conceptual and modelling studies of integrated groundwater, surface water, and ecological systems" and H04 "Assessment of water quality under changing climate conditions".

Amongst the IAHS Workshops, ICWQ is leading or co-convening:

HW02 – Understanding and quantifying physical and geochemical processes during artificial recharge of groundwater
HW10 – Water quality and sediment prediction in ungauged basins
HW11 – Water supply and water quality in large metropolitan areas and megacities
HW12 – Quality and quantity aspects of green and blue water: impact on agriculture, environment, energy and industry

The ICWQ looks forward to inter-disciplinary interactions of water quality with hydrological and other Earth sciences during the IAHS-led and inter-union events in the Assembly's programme. Participation is also invited at the ICWQ meeting during the Assembly, particularly by young/early career scientists, to contribute to the development of the Commission's activities.

Kate Heal
Secretary, ICWQ

Hydrological Sciences Journal

The first three issues of volume 56 of *Hydrological Sciences Journal* are published and available on the InformaWorld platform. Everyone can read the editorials, abstracts and certain free-to-view/open access papers at: *www.tandf.co.uk/journals/thsj* or click on the link at the IAHS website. Library and individual subscribers can access the full papers. The backfile, volumes 1–53, is available open access.

Free online access to the journal has been arranged for IAHS members in the poorest countries. Eligible members should go to the Membership Area at the IAHS website, enter their personal userid and password, then click on HSJLink.

Personal subscription prices for 2011 for all other IAHS members are the same as in 2010: £27 for an online-only subscription, and £48 for a print + online subscription

VAT is payable on the online component of subscriptions by members in the EU.

Please order from Jill Gash: *jilly@iahs.demon.co.uk* at IAHS Press

International Commission on Remote Sensing

The Remote Sensing and Hydrology Symposium 2010 was held on 27–30 September 2010 at the Snow King Hotel in Jackson Hole, Wyoming, USA, and organized by ICRS. The Symposium Chair was Dr Christopher M. U. Neale, VP of ICRS and Professor in the Department of Civil and Environmental Engineering, Utah State University. The technical committee included:
William P. Kustas (USDA-ARS)
Richard de Jeu (VU University Amsterdam)
Christopher M.U. Neale (Utah State University)
Thomas Jackson (USDA-ARS)
Wade T. Crow (USDA-ARS)
Martha Anderson (USDA-ARS)
Hendrik A. R. de Bruin (Scintec)
Christopher Hopkinson (Nova Scotia Community College)
John H. Prueger (USDA-ARS)
Michael H. Cosh (USDA-ARS)
Yangbo Chen (Sun Yat-Sen University, China)
Joseph G. Alfieri (USDA-ARS)

The Symposium was attended by more than 180 people including 48 students, with 152 oral presentations and 51 poster presentations. The keynote presentations were given by Dr Christa Peters-Lidard, Branch Head, Hydrological Sciences Research, NASA Goddard Space Flight Center and Prof. Dr Massimo Menenti, Chair Optical and Laser Remote Sensing, Faculty of Aerospace Engineering, Delft University of Technology, the Netherlands.

The oral paper presentations were distributed between three concurrent sessions with 20 minute slots. Session topics included: Data Assimilation, Surface Energy Balance and Evapotranspiration Modeling, New Satellite Missions, General Applications, Model Validation Issues using Surface Flux Measurements, GIS Applications, Scintillometry, Lidar Applications, Monitoring Invasive Species, Flood Forecasting and Management, Microwave Applications, Advances in Thermal Infrared Remote Sensing, Soil Moisture Algorithms, Application of Vegetation Indices for Evapotranspiration Modeling, Glaciers and Snow, Irrigation Water Management.

The papers will be published in a forthcoming Red Book proceedings with selected papers in a special issue of the *Hydrological Sciences Journal*.

Symposium Webpage: http://www.remotesensinghydrology.org/

The cover of the conference programme illustrates the fabulous location of the meeting.

Participants enjoying the meeting at Jackson Hole.

International Commission on Groundwater

The two Red Books from the recent ICGW ModelCARE and GQ10 conferences, are now available from IAHS Press; see pages 3 and 14, respectively, in this Newsletter.

ICGW is lead convenor for one of the IAHS symposia at IUGG2011: Conceptual and Modelling Studies of Integrated Groundwater, Surface Water and Ecological Systems (H01) papers from which will be published as IAHS Publ. 345. And, ICGW is co-convening:

J-H01 – GRACE, other remote sensing platforms and ground-based methods for estimating multi-scale surface water budgets, groundwater system characterization and hydrological processes

J-HW02 – Interaction between freshwater and ecosystems in the coastal zone

HW02 – Understanding and quantifying physical and geochemical processes during artificial recharge of groundwater

HW03 – Regional groundwater modelling: approaches, challenges, and future directions

Roger Lee, Secretary ICGW

After Melbourne, the next major groundwater meeting will be GwFR2012, see overleaf for details.

GwFR'2012

A major international conference on **Groundwater in Fractured Rocks**

Prague, Czech Republic 21–24 May 2012

GwFR2012 focuses on the occurrence and properties of groundwaters in fractured rocks, nowadays the most dynamic developing field in hydrogeology. These rocks exist all over the world, but for a long time were much neglected from the viewpoint of hydrogeology. European hydrogeologists paid attention to the so-called hard rocks in developing countries of Africa where these rocks in many arid and semi-arid areas were the only source of potable water. Hydrogeological studies in temperate climatic zones (thus in most of Europe) were directed mostly at basinal structures. Only the last decade has shown that fractured rocks represent in many respects attractive hydrogeological environments, deserving attention. Other reasons for the change of attitude include:

– Natural groundwater resources of hardrock areas, mainly those originating in mountains as source areas, have been proved large enough to cover water consumption and to maintain flow of water courses in adjacent piedmont zones during dry periods.
– Due to global climatic change water stress, groundwater resources of hardrock areas have become the only sources of drinking water in large areas.
– Regarding possibilities of groundwater abstraction, under the present-day general trend of water demand increase, adequately sited water wells or other water intake systems in hardrock areas typically can cover requirements on water supply for small communities, plants or farms and for domestic water consumption. In some areas groundwater abstraction possibilities are high enough to supply even small towns.

Contribution to UNESCO / IHP VII
The Conference provides a contribution to the implementation of the IHP VII 2008–2013 Programme – Water Dependencies: Systems under Stress and Societal Responses

Jointly convened by:
– International Association of Hydrogeologists (IAH), IAH Commission on Hydrogeology of Hard Rocks
– IAH National Chapter of Czech Republic
– International Association of Hydrological Sciences (IAHS)
– Faculty of Science, Charles University (Univerzita Karlova), Prague, Czech Republic
– T. G. Masaryk Water Research Institute (VÚV), Prague, Czech Republic

Deadline for abstract submission: 30 September 2011

Lots more information at:
http://web.natur.cuni.cz/gwfr2012/

For further information please feel free to contact the Organizing Committee: Zbynek_Hrkal@vuv.cz, Karel.Kovar@Pbl.Nl

PUB Workshop on Intermittent Streams: Zeroflow

This PUB workshop was held on 23–25 February at the Dinosaur Trail Golf and Country Club in Drumheller, Alberta, Canada. We hosted seven invited speakers, four poster presentations, and an additional 30 attendees from various sectors of academia, government and industry. Participants came from across the country, highlighting the importance of intermittent streams to many regions of Canada. The workshop centred on three key themes.

(1) Measurement and reconstruction: Historical and emerging techniques for measuring ephemeral/intermittent streamflow in Canada, and how zero flow is or is not captured in the national hydrometric records, especially given gauge removal during winter months for many small watersheds (i.e. seasonal flow stations).
(2) Analysis: Tools and techniques – both statistical and modelling-based – for analysis and interpretation of intermittent streamflow records, both independently and in the context of topographic and climatic drivers.
(3) Applications: Integration of outcomes from (1) and (2) to assess the importance of intermittent streams to our water resource, and provide recommendations on how to apply statistical and modelling tools to better quantify these systems.

The invited speakers have provided their presentations in PDF format, which will be posted on the workshop website (http://www.sfu.ca/~zeroflow). We are also working on a special issue of the *Canadian Water Resources Journal*, which will contain papers from this workshop.

As a follow-up to the workshop, we invited participant input on two key points that arose from our discussions: data visualization and temporary stream classification:

(1) What do you see as useful tools for visualizing data from or about temporary streams? What tools do you currently use and why?
(2) We agreed that temporary stream systems require some type of classification technique or unique 'barcode'. What parameters might we include in this classification system, and how might we ensure that it remains dynamic?

We welcome additional input from the PUB community on these topics, and hope to host a second workshop to build on the progress from this one.

Conference organizers: Sarah Boon (U. Lethbridge), Emily Huxter and Ilja Tromp-van Meerveld (Simon Fraser U.) Daniel Peters, Chris Spence and Paul Whitfield (Environment Canada)

Statistics in Hydrology Working group at EGU

The STAHY Working group co-sponsored the session HS7.5/NP6.7 at the EGU (European Geophysical Union) annual assembly in Vienna, early in April.

The session was on *Hydroclimatic Stochastics* and convened by Demetris Koutsoyiannis, with co-conveners: Alin Andrei Cârsteanu and Salvatore Grimaldi.

The session involved just six oral contributions and 11 posters but was attended by more than 250 people. All the authors delivered interesting presentations followed by a rich discussion.

Particularly interesting was the solicited lecture given by Prof. Robin T. Clarke from the Instituto de Pesquisas Hidráulicas, Universidade Federal do Rio Grande do Sul, Brazil. He emphasized the importance of appropriate application of statistical methods in hydro-climatological analysis, and especially the role of spatial correlation in trend analysis of groups of time series.

I would also like to mention the nice presentation (2 in 1) given by two students, Dimosthenis Tsaknias and Dimitris Bouziotas, about temperature and rainfall extremes.

As usual after STAHY events, pdfs of the oral presentations and the poster pdfs will be made available online. Access them at: http://www.stahy.org/Events/ReportofSTAHYEGU2011/tabid/102/Default.aspx or via the STAHY page at the IAHS website.

Robin Clarke presents "A critique of some aspects of statistical usage in hydroclimate research", his keynote lecture.

I would like to thank Demetris Koutsoyiannis and Alin Cârsteanu for this fruitful collaboration between the EGU Precipitation and Climate Committee and STAHY-IAHS.

Vienna, April 2011 Salvatore Grimaldi, Chair STAHY

Note, the next STAHY meeting will take place in Tunis as planned, 17–18 October 2011. See *www.stahytunis2011.org*

Calendar of Meetings Organized/Sponsored by IAHS and Its Commissions

2011	Conference	Contact details
Vienna, Austria 2–5 May	HydroEco2011: 3rd International Multidisciplinary Conference on Hydrology and Ecology: *Ecosystems, Groundwater and Surface Water – Pressures and Options*	Hans-Peter Nachtnebel or Karel Kovar, Universität für Bodenkultur Wien (BOKU), University of Natural Resources and Applied Life Sciences, Institute of Water Management, Hydrology and Hydraulic Engineering, Vienna, Austria tel: +43 1 360065501; hans_peter.nachtnebel@boku.ac.at or karel.kovar@pbl.nl
Western Canada 13–14 May	International PUB meeting	John Pomeroy: john.pomeroy@usask.ca http://www.pub-iahs.orrg/pub2011/index.php
Tirana, Albania 19–21 May	International Balkans Conference on Challenges of Civil Engineering	BCCCE-2011 Conference Secretariat, EPOKA University, Tirana, Albania; BCCCE2011@epoka.edu.al http://www.BCCCE2011.epoka.edu.al
Golden, Colorado, USA 5–8 June	MODFLOW and More 2011: Integrated Hydrologic Modeling	Eileen Poeter: epoeter@mines.edu www.igwmc.mines.edu
Alger, Algérie 7–8 June	Atelier Scientifique International. Relations homme/environnement et transports solides: une approche spatialisée	http://www.iahs.info/conferences/2011_Alger_SIGMED_MEDFRIEND.pdf
Padova, Italy 14-17 June	5th International Debris Flow Hazards Mitigation Conference	http://www.geoscienze.unipd.it/~5th-DFHM/index.htm
Résistance, Argentina 22–25 June	XXIII Congreso Nacional del Agua "Agua: factor de inclusión social"	http://www.conagua2011.com.ar
Melbourne, Australia 27 June–8 July	XXVth IUGG General Assembly	http://www.IUGG2011.com
Besançon, France 1–3 September	H2Karst, the 9th Conference on Limestone Hydrogeology	Prof. Jacques Mudry: h2karst.besancon@gmail.com http://www.sites.google.com/site/h2karst
Gdansk, Poland 5–8 September	WMHE 2011, 12th International Symposium on Water Management and Hydraulic Engineering	http://www.wmhe2011.wilis.pg.gda.pl
Lima, Peru 6–9 September	Hydrology and present geodynamics of South American basins. 4th HYBAM Scientific Meeting	www.ore-hybam.org
Vienna, Austria 11-14 September	Water Policy 2011 – Harmonizing water management strategies at multiple scales to sustain ecological, agricultural, and urban/industrial needs	Water Policy 2011 Secretariat, Institute of Water Management, Hydrology and Hydraulic Engineering, Muthgasse 18 - 1190 Vienna, Austria doris.steinbauer@boku.ac.at
Manaus, Brazil 13–16 September	International Workshop on Hydrometry	Director Dalvino Troccoli Franca, dalvino.franca@ana.gov.br
Leipziger Kubus, Germany 19–22 September	ModelCare 2011, 8th International Conference on Calibration and Reliability in Groundwater Modelling: *Repositories of Knowledge*	modelcare2011@fu-confirm.de
Tsukuba, Japan 27–30 September	5th International Conference on Flood Management	PWRI/ICHARM, 1-6 Minamihara, Tsukuba, Ibaraki, 305-8516 Japan tel: +81 29 879 6809; fax: +81 29 879 6709; info@ifi-home.info
Tunis, Tunisia 17–18 October 2011	Statistical Methods for Hydrological Applications – 3rd official STAHY Workshop	info@stahytunis2011.org www.stahytunis2011.org
2012	**Conference**	**Contact details**
London, UK 26–29 March	Planet under Pressure: New knowledge towards solution	http://www.igpb.net
Prague, Czech Republic 21–24 May	GFR2012 International Conference on Groundwater in Fractured Rocks Jointly convened by IAH Czech National Chapter, IAH Commission on Hydrogeology of Hard Rocks, and International Commission on Groundwater (ICGW) of IAHS	Dr Zbynek Hrkal, Charles University, Prague, and T.G. Masaryk Water Research Institute (VÚV), Prague, Czech Republic. Also Secretary of Czech National Chapter of IAH; tel: +420 220 197 463; zbynek_hrkal@vuv.cz Karel Kovar, VP IAHS/ICGW: karel.kovar@pbl.nl http://web.natur.cuni.cz/gwfr2012/
Niagara Falls, Canada 16–23 September	IAH Congress. Confronting Global Change	
Chengdu, China 11–15 October	International Symposium of IAHS-ICCE	Prof. Xiubin He, Prof. Xinbao Zhang, Dr. Yuhai Bao http://iahs.info/conferences/2012_Chendu_ICCE.pdf
2013	**Conference**	**Contact details**
Göteborg, Sweden 22–26 July	Joint IAHS-IAPSO-IASPEI Scientific Assembly	

International Association of Hydrological Sciences
Association Internationale des Sciences Hydrologiques

Contacting IAHS and the Commissions

Information about all aspects of IAHS is available from the IAHS web site: ***www.iahs.info*** or:

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Registration, please register online at the web site or contact:

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ICRS, Remote Sensing
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Secretary: Yangbo Chen, eescyb@mail.sysu.edu.cn

ICT, Tracers
President: Giovanni Zuppi, gmzuppi@igag.cnr.it
Secretary: Kimpei Ichiyanagi, kimpei@jamstec.go.jp

ICCLAS, Coupled Land–Atmosphere Systems
President: Stewart Franks, stewart.franks@newcastle.edu.au
Secretary: Eva Boegh, eboegh@ruc.dk

ICSIH, Snow and Ice Hydrology
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Secretary: Regine Hock, regine.hock@gi.alaska.edu

ICWQ, Water Quality
President: Valentina Krysanova, valen@pik-potsdam.de
Secretary: Kate Heal, k.heal@ed.ac.uk

ICGW, Groundwater
President: Chunmiao Zheng, czheng@ua.edu
Secretary: Roger W. Lee, roger@simsassociates.net

ICSW, Surface Water
President: Eric Servat, eric.servat@univ-montp2.fr
Secretary: David Hannah, d.m.hannah@bham.ac.uk

ICWRS, Water Resources Systems
President: Günter Blöschl, bloeschl@hydro.tuwein.ac.at
Secretary: Nick van de Giesen, n.c.vandegiesen@tudelft.nl

PUB, Predictions in Ungauged Basins
Chair: John Pomeroy, pomeroy@usask.ca

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Hydrometeorology Working Group
Alain Pietroniro (Canada) al.pietroniro@ec.gc.ca and Eleanor Blyth (UK) emb@ceh.ac.uk

Panel on Hydroinformatics
Ian Cluckie (UK) i.d.cluckie@bristol.ac.uk

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