



IAHS Newsletter

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[International Hydrology Prize, Tison and other awards](#)

International Hydrology Prize, Tison Award and other awards





Gordon Young, Günther Blöschl and Bruce Stewart (WMO)

The winner of the 2013 International Hydrology Prize is Professor Günther Blöschl of TU Wien in Austria. The Prize, awarded annually by IAHS, UNESCO and WMO, was presented by Gordon Young (IAHS) and Bruce Stewart (WMO) at the IAHS Plenary meeting in Gothenburg. [The full citation and Günther's response.](#)

Federico Lombardo and Elena Volpi are the winners of the 2013 Tison Award for their paper: *Rainfall downscaling in time: theoretical and empirical comparison between multifractal and Hurst-Kolmogorov discrete random cascades* co-authored with Demetris Koutsoyiannis, and published in [Hydrological Sciences Journal 57\(6\),1052–1066](#). [Full citation and their response.](#)



The award for the Early Career Hydrological Scientist Best Paper published in one of the Gothenburg proceedings volumes (Red Books 358-362) was made to **Pouya Vahmani** for his contribution (co-authored with Terri S. Hogue) on:

Modelling and analysis of the impact of urban irrigation on land surface fluxes in the Los Angeles metropolitan area.

published in *Climate and Land Surface Changes in Hydrology* ed. by E. Boegh *et al.* (2013, [IAHS Publ. 359, 266-271](#)). Pouya was unable to get to Gothenberg and so his prize, free conference registration and a complimentary ticket for the IAHS dinner, will be valid at the IAHS Assembly in Prague in 2015.

[Old and new IAHS Decades, PUB / Panta Rhei](#)

A review of the PUB decade (2003-2012): [A decade of Predictions in Ungauged Basins \(PUB\)—A review](#) by Markus Hrachowitz *et al.*

and a summary of the Science Plan of the new decade, Panta Rhei, its targets, research questions and expected outcomes: "[Panta Rhei—Everything Flows](#)": [Change in hydrology and society—The IAHS Scientific Decade 2013–2022](#) by Alberto Montanari *et al.*

are now free to view in *Hydrological Sciences Journal* 58(6).

[IAHS, with UNESCO and WMO, establishes the Dooge and Volker medals under the International Hydrology Prize](#)

As of 2014, two medals will be awarded under the International Hydrology Prize: the Dooge medal and the Volker medal. Both medals are intended to distinguish outstanding achievements by hydrological scientists, but with a different focus. The Dooge medal is aimed at fundamental contributions to the science of hydrology, whereas the Volker medal is aimed at outstanding applications of hydrological science for the benefit of society at large.

Both Dooge and Volker were eminent hydrologists at a time when Hydrology was an emerging science. Both received the International Hydrology Prize (Dooge in 1983 and Volker in 1984) and both were Presidents of IAHS (Volker in 1963–1967 and Dooge in 1975–1979). A short description of their careers and achievements can be found on our web site under the [International Hydrology Prize Winners](#) listing. The criteria for the Dooge and Volker medals are specified below. Nominations for the medals should be made by IAHS national representatives and submitted to the Secretary General before 31 December of each year. The Committee consists of the President and a Vice-President of IAHS and representatives of UNESCO and WMO.

The following applies to both the Dooge and Volker medals:

- The International Prizes in Hydrology shall be awarded to persons who have made outstanding contributions to hydrology such as confers on the candidate universal recognition of his or her international stature.
- The contribution should have an identifiable international dimension extending beyond both the country of normal work and the specific field of interest of the candidate.
- The medals may be awarded to hydrologists of long international standing or to younger but active hydrologists who exhibit qualities of international leadership in the science or practice of hydrology.
- An active involvement in the work of IAHS and other international organizations in the field of hydrology should be counted as an advantage.
- Nominations should be received by the Secretary General no later than 31 December of the previous year.

Specific considerations for the Dooge medal:

- The Dooge medal is particularly intended for hydrologists who have demonstrated scientific excellence, and have made fundamental contributions to the science of hydrology as evidenced by publications in the international scientific literature and other evidence of high standard.
- Preference should be given to candidates who have recently exhibited outstanding international leadership in the science of hydrology.

Specific considerations for the Volker medal:

- The Volker medal is dedicated for hydrologists who have applied their research and hydrological expertise to the benefit of society, addressing issues of public interest and development.
- Applications of hydrology to the benefit of developing countries would count as an advantage.
- Preference should be given to candidates who have contributed through both scientific and practical work, and who have made outstanding contributions to the Hydrology community as demonstrated by active involvement in the work of IAHS or other international hydrological associations.

[Call for Abstracts - International Symposium on Erosion and Sediment Transport, December 2014](#)
CALL FOR ABSTRACTS

[ICCE/IAHS Sediment Dynamics: From the Summit to the Sea](#)

Location:

New Orleans, Louisiana, USA

Dates:

11–14 December 2014 (AGU Fall Meeting 2014 immediately follows)

Abstract Deadline:

10 October 2013

Announcing the opening of abstract submissions for the ICCE/IAHS 2014 Symposium -- Sediment Dynamics: From the Summit to the Sea. High attendance to this event at a unique and attractive city is anticipated, so please consider submitting your abstracts as early as possible as we are operating with limited space for oral presentations. For more information, visit the conference webpage at <http://www.rnr.lsu.edu/icce2014/>.

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[Abstract deadlines for Dooge-Nash and ICCE conferences](#)

The Dooge-Nash International Symposium

Dublin Castle, Ireland, 24-25 April 2014

Abstract deadline - 31 October 2013. Full details at www.dooge-nash.org

The Dooge-Nash International Symposium, to be held at Dublin Castle, Ireland, 24-25 April 2014, will celebrate the contributions of Irish Hydrologists Jim Dooge and Eamonn Nash in establishing, internationally, the key role of hydrology in many critical global issues.

The focus will be the role of hydrology in:

- Water resources and social justice
- Climate change and biomes
- Engineering disciplines
- Uncertainty and decision making

New Orleans ICCE conference

New Orleans, US, 11-14 December 2014

Abstract deadline - 10 November 2013. Full details at www.rnr.lsu.edu/icce2014/default.htm

A message from Prof. Paolo Porto, Secretary of IAHS-ICCE (International Commission on Continental Erosion) <http://www.icce.altervista.org/>

Dear all,

just an important update about the New Orleans ICCE conference.

Due to the US Federal Government shutdown, abstract submission deadline is extended to 10 November 2013.

So, for those of you that could not meet the first deadline (October 10) there is still some time to send an abstract to the conference committee by email:

ICCE2014NO@gmail.com

With my best wishes

Paolo

(International Commission on Continental Erosion) <http://www.icce.altervista.org/>
6th IAHS International Symposium on Integrated Water Resources Management DEADLINE APPROACHING

Bologna, Italy, 4-6 June 2014

The symposium is framed within the [Panta Rhei IAHS Scientific Decade 2013-2022](#) and will focus on **Evolving Water Resources Systems - Understanding, Predicting and Managing Water - Society Interactions**.

Proceedings will be published in an IAHS Red Book before the conference.

DEADLINE FOR ABSTRACT SUBMISSION (including publication in the Red Book): 1 OCTOBER 2013

DEADLINE FOR FULL PAPER SUBMISSION: 1 NOVEMBER 2013

Abstract submission (*without* publication in the Red Book) will remain open until 15 March 2014.

Further details on conference themes, financial support and focused debates are available at the web site www.iahs.info/bologna2014.

- Invited and confirmed speakers are presented at [Bologna IAHS 2014](#)
- A community paper will be produced during the conference to elaborate a vision of the future of water resources management. The paper will be authored by the conference participants who express their interest and deliver a significant contribution.
- The conference will host a discussion on scientific publishing and evaluation of scientific contributions. We are looking forward to seeing you in Bologna!

Alberto Montanari (On behalf of the [Bologna IAHS 2014](#) Team)

IAHS Adventure in Gothenburg

First, we would like to introduce our reason for writing this article. We are PhD students from Delft University of Technology and Kyoto University and were invited to write about our scientific adventure during the IAHS conference held in Gothenburg, as newcomers to IAHS. Here we share some of our experience and IAHS adventure with you.

The conference registration and ice-breaking session on Sunday was a perfect opportunity for conference participants to get to know each other, and prepare their mind for one week of fruitful conversations, presentations and discussions. The conference materials provided were very useful in guiding the participants through the entire assembly. We were amazed by the wide scope of the sessions and presentations. It was very easy to pick a session which was related to our topic, but it was unfortunate to have to miss other sessions which looked interesting but were held at the same time. The sections below describe our individual impressions of the main sessions that we attended during the conference. *Photo, from the left: Shervan, Cai, Jaqueline and Tomohiro*



Gothenburg, Sweden: for all of us it was our first visit Gothenburg and Sweden. Although as PhD students we are supposed to work hard during conferences, we still managed to visit the city and beautiful islands of the Southern Archipelago (Swedish: *Göteborgs skärgård*). From Amsterdam, it was a one-hour direct flight to Gothenburg, but from Kyoto the flight was much longer, about twelve hours, with a stop in Frankfurt. The summer weather in Gothenburg was comfortable, especially for Asian participants like Japanese, and we were happy to attend this conference under pleasant climate.

Jacqueline: I did a poster presentation for the Assembly because I was too late to submit a paper for oral presentation. Generally, most of the sessions were not really connected to my field of research (morphology and tidal dynamics in estuaries), but some of the techniques and ideas presented might be applicable to my work. The presentations in the symposium I was attending *Deltas: Landforms, ecosystems and human activities*, focused mostly on the sediment transport in a delta. Variation in the amount of sediment flowing downstream due to human intervention such as building dams, deforestation, and flow diversion for irrigation, strongly influence the morphological changes of a delta. For example, recent studies show that the Mississippi Delta is drowning because of the substantial decrease in the fluvial sediment transport resulting from dam construction upstream. These studies are important because deltas are the most densely populated areas in the world. As a result, it is important to protect and maintain the sustainability of deltaic environments.

My work, however, is mainly related to prediction in ungauged estuaries. The objective of my study is to link the river to the tidal region (delta area) utilizing hydraulic geometry theory, which later can be used

to predict the bankfull discharge from estuary shape. Research on hydraulic geometry theory in river regimes has been carried out for decades, but few studies have concentrated on the tidal region. Thus, it is interesting to investigate whether the hydraulic geometry theory for a river can also be applied to the tidal region.

Cai: My area of interest mainly focuses on the study of estuaries, the transition zone between river and sea. So, I attended the symposium on *Deltas: Landforms, ecosystems and human activities*, which was jointly organised by IAHS (River) and IAPSO (Sea). I was so excited because it was a great honour to present my PhD research to both hydrologists and oceanographers. However, I felt a bit nervous since I was the speaker immediately after the three keynote speakers in this session. I had a feeling that the audience's expectation would be rather high after the keynote presentations. I presented a paper on a consistent analytical framework for understanding the influences of external changes (e.g. human interventions or sea-level rise) on tidal hydrodynamics in estuaries.

Because knowledge of computational hydraulics is becoming popular, the quest for analytical solutions seems to become a curiosity rather than necessity. In the engineering community world-wide most of the impact studies of human interventions on tidal hydrodynamics in estuaries have been done by making use of numerical models. However, for an enhanced understanding of human influences on estuarine processes, nothing surmounts analytical models, especially when it comes to giving insight to the dynamics of flow and providing a rapid technique for assessing human impacts e.g. dam construction, flow withdrawal and dredging, on tidal wave propagation.

Shervan: Most sessions dealing with rainfall/runoff modelling were focused on applicability of models under changing conditions as well as transferability of models to unknown catchments. I participated in the workshop on *Testing simulation and forecasting models in non-stationary conditions*. Different research groups selected a basin from a set of basins provided by the workshop conveners to compare models for their non-stationarity of hydrological response within the selected catchments. The challenge for prediction under non-stationary conditions is the dependency of models on calibration. The parameters selected for a model are usually set as optimal parameter sets within the calibration period. However, any change in the hydrological regime of the system in future may not be reproducible by the optimal parameter sets.

I presented my work on simulating runoff without any need for calibration based on constraining a semi-distributed conceptual model. The method is based on hydrological response units derived from the HAND map. HAND is an abbreviation for *Height Above Nearest Drainage*, which can be easily extracted from a DEM (digital elevation model). I still have to investigate this new framework and its capabilities for different catchments. I appreciated the whole idea of the workshop for comparing models on different catchments. From my point of view, it gave us an insight to how models work on different catchments, which eventually helps us to understand our models and our catchments better.

Tanaka: My research field is rainfall/runoff modelling. Hence, I attended the *Testing simulation and forecasting models in non-stationary conditions* workshop, for which I conducted simulations for two basins, the Flinders River and the Garonne River catchments. I did a poster presentation to show preliminary results from my simulations and received much important advice from other participants. I had constructed a numerical model to deepen understanding as to what extent components have impacts on reproducibility. Many existing models have several components and they are usually complicated, but I think the impact of each component on simulation should be evaluated in order to provide more insights to unknown catchments.

I also gave an oral presentation in HW06, the *Anthropogenic radionuclide contamination of water and sediment: short-term and long-term consequences* workshop, to discuss radioactive substances released into the environment by nuclear accidents. In particular, a rainfall–sediment runoff model was used to simulate the runoff of Cs-137, released from the Fukushima Nuclear Power Plant, from a river catchment.

It was quite beneficial to share my research from the modelling side and to learn of important findings or perspectives from the measurement side. Meanwhile, what impressed me was that not only the Japanese participants, but also participants from other countries are quite familiar with this topic. I recognized that this topic is a worldwide one and we have to conduct further research to contribute to the solutions. IAHS assemblies are not entirely about scientific sessions. The plenary session of IAHS was one of the most interesting events during the conference; it was held on the Wednesday evening and chaired by Gordon Young. The most exciting moment of the meeting was the Tison Award ceremony. The award was made to **Federico Lombardo** and **Elena Volpi** (both from Italy) for their work on “Rainfall downscaling in time: theoretical and empirical comparison between multifractal and Hurst-Kolmogorov discrete random cascades”. Additionally, the IAHS International Hydrology Prize was given to Prof. Günter Blöschl (Austria) for his outstanding contribution to rainfall/runoff modelling as well his leadership within IAHS. At the end of this meeting, the presidency of IAHS for the next four years was handed to Prof. Hubert Savenije from Delft University of Technology.

The IAHS Early Career Hydrological Scientist meeting has given us great inspiration and confidence in choosing hydrology as our career path. The discussion and sharing sessions with the invited scientists and key speaker, Prof. Thorsten Wagener, provided a significant insight into the future in being a hydrologist. More generally, and apart from the detailed scientific discussions, the IAHS conference in Gothenburg increased our knowledge of the hydrological scientists’ community and their interaction. This is of course both important and interesting for young scientists like us. We had plenty of fun as we presented our own research as well as our philosophies and triggered cooperation with other researchers, which in turn has led to further development of our studies. Furthermore, this medium scale conference also serves as a good platform for us young scientists to be recognized by the community, and subsequently increases the opportunity of making our research known.

Jacqueline Isabella Gisen (TU Delft), Huayang Cai (TU Delft), Shervan Gharari (TU Delft), Tomohiro Tanaka (Kyoto University)

[How to become a successful scientist: pros and cons of research career pathways](#)

Report from the IAHS Early Career Hydrological Scientist meeting, Gothenburg, July 2013

The *IAHS Early Career Hydrological Scientist* meeting organized at the *IAHS-IAPSO-IASPEI Joint Assembly* in Gothenburg aimed to support networking among early career hydrological scientists and to encourage the involvement of young scientists in future IAHS activities. It was a success, attended by more than 50 young scientists.



The theme was “**How to become a successful scientist: pros and cons of research career pathways**”. It included a keynote talk and a panel discussion with panel members representing researchers from universities, public sector research institutions and the private sector in different parts of the world. Drinks and a buffet also contributed to making the meeting a very successful event and allowing networking amongst young scientists.

The keynote talk on the meeting’s main theme was given by Prof. Thorsten Wagener (University of Bristol, UK). He gave a thoughtful and entertaining introduction to the topic from his perspective that was based on stories and experiences gained since his time as a student, and it included hints and advice for

young people choosing to enter a research career. Five invited discussion panel members then presented their career experiences. Members of the discussion panel were Corinna Abesser (British Geological Survey, UK), Zoubeida Bargaoui (Université de Tunis El Manar, Tunisia), Adrian Collins (ADAS Environmental Consultancy, UK), Walter Collischonn (Universidade Federal do Rio Grande do Sul, Brazil) and Elango Lakshmanan (Anna University, India). They each briefly talked about the very different opportunities and challenges they faced on their pathways to establishing their careers. Furthermore, questions such as “What does successful mean for a hydrological scientist?”, “To what kinds of success do possible career pathways likely lead?”, “What are the major hurdles to become a successful hydrological scientist?” and “What can a person do to encourage a satisfying career?” were addressed, and recommendations were given to young researchers choosing to enter into a career in hydrological science. Overall, the meeting was very engaging, and it provided useful, realistic and personal advice to the many young scientists wishing to pursue a hydrological research career. The meeting was organized by Eva Boegh (Roskilde University, DK), Kate Heal (University of Edinburgh, UK), Mary Hill (USGS, USA) and Wouter Berghuijs (Young Hydrologic Society, <http://younghs.com/>). We would like to thank all the speakers for their valuable contributions and helpful advice and the young scientists for raising questions and participating in the meeting. Sponsorship by Taylor & Francis for the buffet and drinks is also gratefully acknowledged (Taylor & Francis publish the IAHS journal, *Hydrological Sciences Journal*).

Young scientists who have ideas for themes of interest for future *IAHS Early Career Hydrological Scientist* meetings are most welcome to come up with suggestions and/or to be involved in further preparations. Please contact Eva Boegh (eboegh@ruc.dk) or Kate Heal (kate.heal@ed.ac.uk).
Eva Boegh and Kate Heal



The panel in session.

The Great Frisbee Challenge of 2013

As is now a tradition at IAHS meetings, a Frisbee game was organized at the Gothenburg Joint Assembly. Considering the book "*Runoff Prediction in Ungauged Basins*" had just been published and officially presented with great pomp and ceremony, some IAHS members suggested that the co-authors should also demonstrate their skills on the Frisbee field. However, there were 130 co-authors and it proved difficult to accommodate all of them on the Frisbee lawn!

Some were not present but there was still a large number, which compensated for the lack of Frisbee experience. Thus, they managed to tie the game (3-3) against the international IAHS team, which included a number of Frisbee experts. Some of the players regretted the lack of free sparkling refreshments to honour their contribution to this IAHS tradition, and the Secretary General was informed of this. He promised to correct this regrettable omission in two years time, at the next General Assembly in Prague.



Photo: Salvatore Grimaldi is beaten to the frisbee by Pierre Brigode

From this experiment and from the careful post-match autopsy of the game, we can conclude three things:

- Improving the Frisbee skills of all IAHS members should become one of the key goals of the Panta Rhei international decade, and a Frisbee working group should be immediately created, under the auspices of the President of IAHS himself;
- Frisbee skills should become an integral part of post-graduate hydrological curricula;
- The outcome of a Frisbee game played in the dark is just as uncertain as hydrological modelling!

Vazken Andréassian, Pierre Brigode, Laurent Coron, Carina Furusho, Salvatore Grimaldi, Anna Kuentz, Nicolas Le Moine, Julien Lerat, Federico Lombardo, Ludovic Oudin, Magdalena Rogger, José Salinas, Guillaume Thirel, Alberto Viglione, Massimiliano Zappa



[Land–Ocean Interaction of Hydrodynamics and biochemistry](#)

During the IAHS-IAPSO-IASPEI joint scientific assembly in Gothenburg, IAHS was the lead organizer of four joint symposia on:

- Advanced statistical methods for hydrology, oceanography and seismology (HPS1)
- Deltas: landforms, ecosystems and human activities (HP1)
- Land-ocean interaction – Hydrodynamics and biogeochemistry (HP2)
- Implications of sea-level change for the coastal zone (HP3)

These symposia were successful in gathering various scientific communities in order to address cross-cutting methodologies and key interfaces.

The *Land-Ocean Interaction – Hydrodynamics and Biochemistry* symposium addressed hot topics for both oceanographers and hydrologists, through a range of naturalistic and conceptual approaches. The spectrum of cocontributions covered most of the world, allowing the drawing out of some generalities and some specifics. The land-ocean interaction sessions were completed and enriched by several communications on land-lake and lagoon interactions.

The *Land-Ocean Interaction* symposium was scheduled in sequence with the one on *Implications of Sea-level Change for the Coastal Zone*, which formed a very complete and comprehensive Friday at the assembly. A post-published Red Book is in preparation to capitalize the added value of these two symposia. This future Red Book, together with the one already published from the “Deltas” symposium, are major outputs of the cooperation between hydrologists and oceanographers. Christophe Cudennec, IAHS SG and lead convener HP2

[Deltas: Landforms, Ecosystems and Human Activity](#)

Gothenburg symposium HP1, focused on deltas, was very successful, comprising 7 invited keynote papers, 15 full papers and 6 poster papers. The set of papers within the published volume (IAHS Publ. 358) provides overviews on delta processes and covers almost all types of delta environments, mostly marine, but also inland deltas.

The scene is set with an overview paper on the “*Delta Decadal Initiative: A framework of actionable research towards delta sustainability*” followed by papers on changing fluvial sediment inputs and on the general theory of delta formation and evolution. A series of papers on the human influences on and uses of deltas, and on their geomorphology and ecosystem characteristics follows. The special conditions of Arctic deltas and both inland and marine deltas within the Niger River basin round out the volume. Gordon Young, symposium co-convener

Climate and land surface changes in hydrology

Symposium H01 on *Climate and Land Surface Changes in Hydrology* was conducted over four days at the *IAHS-IAPSO-IASPEI Joint Assembly* in Gothenburg, 22-26 July 2013. The programme comprised nearly 50 oral presentations and more than 50 poster presentations, and 69 peer-reviewed proceeding papers of high quality were published in an IAHS redbook (IAHS Publ. 359). The symposium addressed the complications and challenges in hydrological modelling and water management due to spatial and temporal variability resulting from climate and land use changes. Important objectives were to address the effects of past, current and future climate and land use changes on hydrological processes, including climate-hydrology feedback-processes, and to evaluate the impacts of such changes on water resources and flood and drought risks.

The symposium was organized in five main thematic sessions that were each opened by a Keynote presentation:

- Climate Change and Extreme Events
- Climate Change and Water Resources
- Climate and Spatial Hydrological Processes
- Land-Atmosphere Research in Hydrology
- Land Cover Change and Hydrological Processes

For the first theme “Climate Change and Extreme Events”, Florian Pappenberger (*European Centre for Medium-Range Weather Forecasts*, UK) gave a Keynote talk entitled “Seamless forecasting of extreme events on a global scale” where the latest developments of high spatial resolution ECMWF early warning forecasting applications were presented for floods, droughts, wildfire and malaria. Other presentations under this theme addressed historical data- and model-based analyses of climate and land use impacts on floods as well as experiences with strategic adaptation and flood designs.

Dieter Gerten (Potsdam Institute for Climate Impact Research, Germany) gave a Keynote presentation on *Global climate change impacts on freshwater availability – an overview of recent assessments* under the theme *Climate Change and Water Resources*. The presentation highlighted the importance of vegetation and carbon cycle dynamics for evaluation of “green” water availability, and an integrated global vegetation/water balance model was applied to large ensembles of global climate scenarios to assess green-blue water scarcity. A suite of global hydrological and land surface model schemes was also used, and the large differences in results from the various hydrological models were discussed to further increase uncertainty in climate impact assessment studies. Many other studies under this theme addressed the role of post-processing and uncertainty of climate predictions. Climate impacts on observed, simulated or predicted water resources were also analyzed in a number of regional case studies in various parts of the world including remote and data-scarce regions.

Michael Butts (DHI, Denmark) gave a Keynote talk *Embedding complex hydrology in the climate systems – towards fully coupled climate-hydrology models*” which was presented in relation to the theme *Climate and Spatial Hydrological Processes*. He presented the status of a long-term effort to develop a full dynamic coupling of the MIKE SHE and HIRLAM models. The coupling of the comprehensive spatially

distributed hydrological model MIKE SHE and the regional climate model HIRLAM is based on the physics of a soil-vegetation-atmosphere transfer (SVAT) model, and it was found that the coupled simulations can be very different from uncoupled model results. A number of other very interesting hydrometeorological and spatial surface-subsurface-atmosphere model integration studies were presented under this theme, and a variety of studies addressing spatial hydrological processes and the use of multi-source data for hydrological modeling was included.

The theme on *Land-Atmosphere Research in Hydrology* was opened by a Keynote presentation by Peter J. van Oevelen (International GEWEX Project Office, USA) entitled *GEWEX Land-Atmosphere Research: An Outlook*. The presentation highlighted the objectives of GEWEX and its developments in Land-Atmosphere Research which in the early days had a strong emphasis on Earth Observations. Lately the modeling of atmospheric processes and land-surface atmosphere interactions is becoming more important. Within GEWEX, the panel GLASS (Global Land-Atmosphere System Study) is currently starting up a benchmark activity to evaluate the capability of different land surface models. A number of comprehensive model-based land surface-atmosphere studies was also presented under this theme of which several presentations applied the meso-scale model WRF (Weather Research and Forecasting) for simulating spatio-temporal variations in land surface energy fluxes and atmospheric processes. A number of empirical and model-based regional studies on land surface heat flux development and evapotranspiration was also presented.

The final theme on *Land Cover Change and Hydrological Processes* was opened by Stan Schymanski (ETH Zurich, CH) who gave a Keynote presentation on *Long-term response of vegetation to environmental change – the role of observations and models*". The presentation highlighted the role of leaf stomata and vegetation cover to adapt to environmental conditions thereby impacting

[Tracer hydrology and groundwater systems](#)

During the International Commission on Tracers workshop HW07, at Gothenburg, the presentations covered many branches of hydrology.

They included reports on the tracer approaches and studies in Japan, China and some European countries, as well as an overview of how tracer techniques contribute to the understanding and quantification of water dynamics and pollutant origin, applying new methods for water-age estimation using data from simultaneous measurements of different environmental tracers, 3-D mathematical modelling of lowland transport processes, mathematical modelling and quantifying of the heterogeneity of water flux in the unsaturated zone by using artificial tracers in lysimeter experiments.

Dr Martin Elsner, from Germany, in his invited talk, presented extremely interesting new aspects of using tracer methods: the application of compound-specific isotope values of groundwater pollutants to understand biodegradation processes and their quantification.

In total, there were three oral and one poster session. The oral presentations represented only two continents (Asia 7 and Europe 9); most were from Japan (5) and Germany (3).

Based on the experience of this workshop, the ICT commission decided to propose one workshop for the IAHS General Assembly in Prague 2015 titled: *Tracer methods for understanding response of hydrological systems to transient contamination inputs*.

Piotr Maloszewski, Convener

[How can models help to solve water quality problems?](#)

How can models help to solve water quality problems was the focus of workshop HW13, which included a round-table discussion, organised at Gothenburg by ICWQ and ICSW. During the first two sessions the keynote lecture and papers presented by authors from UK, Finland, Estonia, Brazil, Sweden, South Africa, Poland and Germany provided useful, interesting information on application of water quality models for solving real water quality problems in different countries and regions, as did the poster session. The third session was devoted to the round-table discussion; two suggested questions were discussed in two groups, who then presented their responses to the whole audience.

The questions were:

1. What are the conditions for success in application of water quality models for solving water quality problems?
2. What are most important obstacles and barriers preventing successful application of water quality models to real management.

The discussion outcomes are summarized below:

Question 1. What are the conditions for success in application of water quality models for solving water quality problems?

The answers were structured into five categories, as conditions related to: the state of knowledge, models, data, collaboration between scientists and stakeholders, and policy.

State of knowledge

- sound knowledge of governing processes in a given catchment
- data and parameter uncertainties are well known (related to point 1)
- effects of measures are clearly identifiable

Model

- suitability of the model to the task (all key processes and needed outputs included)
- sufficient knowledge and experience of the modeller
- previous test of the model in similar conditions, with successful hydrological and water quality validation

Data

- sufficiently good quality input data, full dataset needed

Collaboration

- joint working of stakeholders and scientists in developing/using models to solve water quality problems (model should not be seen as a black box by authorities)
- open discussions to get rid of misunderstandings, to explain model limitations and uncertainties, and to enhance confidence in the modeling results
- common interests between modellers and stakeholders, and a common will to improve the water quality status

Policy

- policy framework that encourages changes in land use and management practices to implement the solutions to water quality problems identified from modelling

Question 2. What are most important obstacles and barriers preventing successful application of water quality models to real management?

The answers were structured into four categories, as obstacles and barriers related to the modeller side, to the stakeholder side, to differences in perception/preferences, and other problems.

From the modeller side

- process knowledge is too weak to understand inter-relationships and define process rates for a variety of the real catchment conditions
- lack of appropriate water quality and flow data to calibrate and validate water quality models properly (e.g. for checking components at different hydrological pathways)
- public data sometimes is hard to compile and get access to; even state owned institutes sometimes prohibit usage of such data (or in some cases demand money).
- modelling does not provide sufficient spatial detail to assess specific management measures
- communication with stakeholders is very time-consuming and difficult to organize

From the stakeholder side

- lack of capacity (time, education, training) for managers to use models
- lack of motivation and stakeholder fatigue (too many projects require stakeholder collaboration)
- not enough reliability of modelling results leading to low level of acceptance by the stakeholders
- managers resistance to change from existing traditional methods to the new ones
- inadequate communication between modellers and stakeholders (motivation from one of the sides is usually missing)

Differences in perception/preferences between modellers and stakeholders

- difference in spatial scales, e.g. often modellers prefer smaller scales while stakeholders may be interested in the whole catchment of a large sea or a large administrative region
- differences between modellers and stakeholders regarding level of details and the drivers/factors regarded most important
- normally there is a need for a long-term process that can take years whereas the authorities want a quick answer

Other problems

- the problem is not large enough to force management decisions (not only related to modelling but to decision making)
- another dilemma is that research institutes compete with pure consultancy firms.

The roundtable session was convened, and reported on, by Valentina Krysanova (workshop convener), Ahti Lepisto, Kate Heal and Michael Rode.

[Cold- and mountain region hydrological systems](#)

Cold- and mountain region hydrological systems under climate change: towards improved projections
Gothenburg symposium H02 was organized by the International Commission for Snow and Ice

Hydrology (ICSIH) together with the International Commission on the Coupled Land-Atmosphere System (ICCLAS). It addressed major issues both in modelling cold- and mountain regions hydrological processes and in adapting these models to changing climatic conditions.

Among the issues related to hydrological modelling, deepening the process understanding and physical foundation of models, adapting models to new data sources, and PUB-related issues were addressed. Among the issues related to model adaptability, problems of model parameterization, calibration and validation taking into account changing climate conditions, and the demonstration of a model's readiness for use in cold environmental conditions were examined. The symposium also brought together experimental and modelling experts to discuss a broad range of issues related to understanding specific features of cold hydrological systems which are responsible for their visible sensitivity to climate change. A total of 36 abstracts were received for H02. From these, 21 contributions from colleagues in 12 countries of five continents were presented at four oral sessions. Alexander Gelfan, Daqing Yang and Harald Kunstmann served as chairpersons of these sessions.

Alexander Gelfan began the symposium with a minute of silence to mark the memory of Dr Andrei Shmakin – a talented scientist and invited speaker to the symposium – who passed away shortly before the Gothenburg assembly, at the age of 52.

The contributed oral presentations were grouped into three sessions: (1) Mountain Hydrological Systems under Changes; (2) Lowland Cold Regions: Changes in River Flow; (3) Changes in Cryo- and Eco-Systems. They demonstrated new research results obtained from both experimental and modelling studies of river basins, snow cover, permafrost, glaciers, ecosystems, etc., in regions located in very different physiographic and climatic conditions, from the Andes to the Siberian tundra. Collectively, these studies provide opportunities to reveal physical mechanisms that control hydrological responses to climate change, to understand sources and magnitude of uncertainties, and to improve projections of these responses under different geographical conditions and at various time scales. It is hoped that this symposium will be a step toward in this improvement.

The symposium proceedings book, edited by A. Gelfan, D. Yang, H. Kunstmann, and E. Gusev is published in the IAHS Red Book series (IAHS Publ. 360). It consists of 25 papers, most of which were presented during the symposium.

Alexander Gelfan, Lead symposium convener

[Characterising water quantity and quality: new approaches and future directions](#)

The Gothenburg HW03 workshop contained three keynote presentations focusing on surface water quality and groundwater techniques, and looking to the future. The first keynote by Arthur Horowitz (US Geological Survey) challenged many of the practices within monitoring dissolved and particulate water quality parameters and gave the audience plenty to think about in their past and future activities. (If readers want to find out more, Art's presentation is based on his review paper in *Environmental Science and Technology* (2013) 47, 2471-2486). Jim Butler *et al.*'s keynote gave an overview of new and enhanced tools for hydrogeological characterisation, such as for rapid assessment of subsurface hydraulic properties to depths of 30 m.

Between the keynotes, presentations reported on a variety of new techniques being applied within hydrology – ranging from trialling biological water quality indicators in Chinese rivers, to a portable fluorescence device being developed with UK water companies for continuous monitoring of water quality at drinking and wastewater treatment works. The workshop closed with the keynote by Wouter Buytaert entitled “*Environmental virtual observatories: managing catchments with wellies, sensors and*

smartphones” which encapsulated cloud computing and community hydrology monitoring in the Peruvian Andes. (For those unfamiliar with the term, “wellies” are waterproof boots!). The workshop was well attended and enabled hydrologists at all stages of their careers to present and participate in the good discussions both during the workshop and at the breaks.

Kate Heal (ICWQ), Workshop convener

Jim Butler (ICGW) and Wouter Buytaert (ICWQ), co-conveners

[Awards to IAHS Groundwater Commission President](#)

Chunmiao Zheng, President of the International Commission on Groundwater (ICGW), was named as the recipient of two prestigious awards during the summer: the [O.E. Meinzer Award of the Geological Society of America](#), and the [M. King Hubbert Award of the National Ground Water Association](#).

Congratulations to Chunmiao

[More hydrology papers available to download from the IAHS website](#)

The full content of several IAHS Red Books has recently been added to the IAHS website so that all content in Pubs 1 to 300 (except Pubs 24, 25, 26 and 50) is now available. The PDFs of papers/book chapters can be downloaded without charge. The books recently added are:

291 (2005)

Sediment Budgets 1 ed. by D. E. Walling & A. J. Horowitz. 372 + xii pp. 978-1-901502-87-9

292 (2005)

Sediment Budgets 2 ed. by A. J. Horowitz & D. E. Walling. 358 + xii pp. 978-1-901502-92-3

293 (2005)

Sustainable Water Management Solutions for Large Cities ed. by

D. A. Savic *et al.* 302 + x pp. 978-1-901502-97-8

294 (2005)

Dynamics and Biogeochemistry of River Corridors and Wetlands ed. by L. Heathwaite *et al.* 192 + viii pp. 978-1-901502-03-9

295 (2005)

Regional Hydrological Impacts of Climatic Change—Impact Assessment and Decision Making ed. by T. Wagener *et al.* 356 + x pp. 978-1-901502-08-4

296 (2005)

Regional Hydrological Impacts of Climatic Change—Hydroclimatic Variability ed. by S. Franks *et al.* 300 + x pp. 978-1-901502-13-8

297 (2005)

Bringing Groundwater Quality Research to the Watershed Scale. ed. by N. R. Thomson. 576 + xiv pp. 978-1-901502-18-3

298 (2005)

Permeable Reactive Barriers ed. by G. A. Boshoff & B. D. Bone. 176 + viii pp. 978-1-901502-23-7

299 (2005)

Geomorphological Processes and Human Impacts in River Basins. ed. by R. J. Batalla & C. Garcia. 244 + xii pp. 978-1-901502-28-2

300 (2006)

Hydrology 2020: An Integrating Science to meet World Water Challenges. ed. by T. Oki *et al.* 190 + xxxii pp. 978-1-901502-33-6

Note that print copies of these books are still available from IAHS (price 15 GBP including postage).

To view/download the content of these Red Books go to www.iahs.info/publications

We will continue to add book content to the website over the next few months so that everything published before 2010 will be available to download.

[Da Vinci's Water Theory - Review](#)

***Leonardo Da Vinci's Water Theory* by L. Pfister, H.H. Savenije and F. Fenicia**

The August 2013 issue of *Geoscientist* carried a review of this book published by IAHS.

" The book demonstrates nicely how science progresses through a combination of need and curiosity. Da Vinci's life-long interest in water was triggered by knowledge of devastating floods, and a need to better protect cities and populations, leading to work on flood-control projects. But as an observer and artist, he was also fascinated with water and its power for its own sake, as in the book's cover illustration of a storm.....

..... Of 13,000 pages of notes at his death, only half remain, and in dispersed collections. The authors must therefore be commended for their detective work in piecing together Da Vinci's water theories in an informative and entertaining read."

Excerpt from [book review by Peter Easton](#) (reproduced by permission).

The book, IAHS Special Publication 9, is available from the [IAHS bookshop](#).

[Five new titles from IAHS - the Gothenburg books](#)

The following titles resulting from the [Knowledge for the Future Assembly, 22-26 July 2013 in Gothenburg, Sweden](#) are now available from the [IAHS Bookshop](#).

Deltas: Landforms, Ecosystems and Human Activities

Editors Gordon Young & Gerardo M. E. Perillo; Associate Editors Hafzullah Aksoy, Jim Bogen, Alexander Gelfan, Gil Mahé, Phillip Marsh & Hubert Savenije

IAHS Publ. 358 (2013) ISBN 978-1-907161-36-0, 246 + x pp. Price £65.00

Deltas are environmental and economic hot spots, occupy about 1% of the global land surface, are home to some 500 million people and often are vibrant ecosystems. Physically they are complex systems, the end-products of catchment processes involving water supply, sediment delivery and water quality – elements that reflect changes in human influences and climatic drivers. Tides, waves, sea level changes, storm surges, tsunamis and littoral currents all impact. The contributions result from a joint symposium of the International Associations of Hydrological Sciences (IAHS) and Physical Sciences of the Ocean (IAPSO)

Climate and Land Surface Changes in Hydrology

Editors Eva Boegh, Eleanor Blyth, David M. Hannah, Hege Hisdal, Harald Kunstmann, Bob Su & Koray K. Yilmaz

IAHS Publ. 359 (2013) ISBN 978-1-907161-37-7, 470 + x pp. Price £95.00

Focuses on field-based and modelling studies addressing the sensitivity of hydrological and hydrometeorological fluxes of the coupled land-atmosphere system to climate and land-use change at local, regional and global scales. The volume includes significant model-based studies evaluating methodologies and impacts of using climate and weather prediction data including downscaling and uncertainty analyses. Hydrological sensitivity and impacts due to spatial and temporal land-use and land-cover variability are reported for a wide variety of environmental settings.

Cold and Mountain Region Hydrological Systems Under Climate Change: Towards Improved Projections

Editors Alexander Gelfan, Daqing Yang, Yeugeniy Gusev & Harald Kunstmann

IAHS Publ. 360 (2013) ISBN 978-1-907161-38-4, 184 + viii pp. Price £57.00

The 25 contributions present new research results obtained from both experimental and modelling studies of river basins, snow cover, permafrost, glaciers and ecosystems in cold regions from the Andes to the Siberian tundra. Collectively, the studies reveal physical mechanisms that control cold region hydrological responses to climate change, and consider the sources and magnitude of uncertainties to improve projections of these responses under different geographical conditions and at various time scales: (1) Mountain hydrological systems under changes; (2) Lowland cold regions: changes in river flow; and (3) Changes in cryo- and eco-systems.

Understanding Freshwater Quality Problems in a Changing World

Editor Berit Arheimer; Co-editors Adrian Collins, Valentina Krysanova, Elango Lakshmanan, Michel Meybeck & Mike Stone

IAHS Publ. 361 (2013) ISBN 978-1-907161-39-1, 372 + xii pp. Price £87.00

Contributions are included from each continent providing a review of water quality problems worldwide, with articles describing present regional/local freshwater quality status and highlighting research needs. How the situation may develop into the future, given on-going changes in environment and society, is discussed. Questions addressed are: How to understand the behaviours of changing hydrological systems. How to effectively bring together theoretical and experimental hydrology, and new measurement techniques to advance knowledge of water quality processes for the future? How can the typical timescales of change be identified? How to estimate and predict freshwater quality with uncertainty assessment to support risk evaluation?

Considering Hydrological Change in Reservoir Planning and Management

Editor Andreas Schumann; Co-editors Vladimir Belyaev, Emna Gargouri, George Kuczera, Gil Mahé & Stephen Mallory

IAHS Publ. 362 (2013) ISBN 978-1-907161-40-7, 214 + x pp. Price £61.00

Provides an excellent overview of contemporary problems in reservoir management, from planning aspects of large multi-objective reservoirs and regarding small farm dams in Africa, to governmental matters, to sedimentation issues, to climate change impacts. Given the stochastic nature of hydrological conditions, the limited information available to characterize it and the multi-faceted targets of reservoir management, reservoir planning and operation are ambitious challenges for hydrologists and water managers.



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