

IAHS and IAHS/WMO Working Group on GEWEX

Reporting period: October 2005 to September 2006

Starting date: 1985, circa GEWEX

URL: www.iahs.info

Chair: Alan Hall, 1999-Present

Objectives:

1. To promote the development and application of hydrological science to the aims of GEWEX;
2. To provide for discussion, comparison, and publication of research results and the requirements for future research through the organization of workshops, symposia at special sessions at the IUGG General Assemblies and IAHS Scientific Assemblies and stand alone workshops.

Past year activities:

MOPEX

The fifth Model Parameter Estimation Experiment (MOPEX) Workshop (Brazil, April 2005) was a follow-on from the MOPEX-4 Workshop organised by CEMAGREF held in Paris in July 2004 and utilised the US MOPEX datasets of 348 basins and the seven years of data for 65 basins in the south of France used in MOPEX-4. A full report of the Workshop including the active discussion session and the presentations is available on the new MOPEX web page: www.seas.ucla.edu/~thogue/MOPEX. Based on the papers from the 4th and 5th MOPEX Workshops an IAHS Red Book dealing with the current parameter estimation issues has been prepared and edited by Vazken Andreassian, CEMAGREF. Red Book 307 (in press) has 26 papers and will include a CD of the MOPEX database used in the Workshops. The publication has received financial support from CEMAGREF. Sixteen papers from the MOPEX-3 Workshop held as part of the IUGG in Sapporo in July 2003 have finally been published as a Special MOPEX Issue of the Journal of Hydrology, Vol. 320, 2006.

IAHS PUB

Three years into this 10-year project PUB has continued to grow with over 30 PUB workshops and meetings in the past year with particular involvement of younger scientists. A major success has been the establishment of a PUB Secretariat in Colombo, Sri Lanka funded by the IMWI and headed by Vladimir Smakhtin. Its website and the first newsletter (March 2006) is the best reference for reporting on PUB (link through www.iahs.info). New Working Groups had been established on Cold Regions and Low Flows and Hydrological Drought. These are relevant to GEWEX together with the existing MOPEX, HEPEX, orographic precipitation, model uncertainty, downscaling, top down modelling, and remote sensing and data assimilation Working Groups. The Links have been established with the UNESCO IHP, and like HELP and FRIEND is seen as a cross-cutting exercise as well as fitting in well with the WWAP. The linking of PUB activities with the evolving IHP VII 2007-2011 is being discussed. The new streamlined SSG for the Second PUB Biennium is operating under the Chairmanship of Jeff McDonnell and is based on the leaders of the main PUB themes of :

- Theme 1. Basin inter-comparison and classification
- Theme 2. Conceptualization of process heterogeneity
- Theme 3. Uncertainty analyses and model diagnostics
- Theme 4. Develop and use of new data collection approaches
- Theme 5. New hydrological theory
- Theme 6. New model approaches
- Theme 7 National Working Groups and PUB Tech Transfer

Two Red Books have been published based on the PUB workshop in Perth Western Australia in 2004 and the IAHS PUB Symposium in Brazil in 2005. A USA PUB meeting was held in July and the China PUB meeting will be held in September. Of interest is the decision in Canada to merge the Canada PUB and GEWEX committees.

In summary PUB is keen to link to and work with GEWEX to meet our many common aims.

IAHS/WMO Working Group on GEWEX

Was established to provide links to the hydrological scientific community and, through WMO, the operational hydrological services. The next meeting of the Working Group is scheduled to be held during the IUGG General Assembly in Perugia, Italy in 2007.

HEPEX

The Hydrological Ensemble Prediction Experiment (HEPEX) aims to bring the international hydrological and meteorological communities together to demonstrate how to produce reliable hydrological ensemble forecasts that can be used with confidence by the emergency management and water resources sectors to make decisions that have important consequences for the economy, for public health and safety. The main scientific theme of HEPEX will be how hydrological forecast uncertainty can reliably be quantified at each step of the forecast process and then communicated to, and applied by the end users. The recent well attended AGU and EGU HEPEX Workshops and other meetings have shown the developing interest in the project. The second HEPEX Workshop was hosted by NCAR in Boulder, Colorado, 19-21 July 2005 and was followed by a meeting on 22nd July to finalise the HEPEX planning, structure, Steering Group and User Group and the development of the Implementation Plan. Around 55 participants from 10 countries, primarily from North America, saw the presentation of 32 papers. Extensive discussion periods and Working Groups on Test beds, Datasets and Models, and Users developed material for HEPEX planning. There was considerable interest and enthusiasm for this project with an initial nine test beds proposed and actively supported focused subject areas established with links to several already developed projects. It is hoped to establish close links with THORPEX and WMO's hydrology risk management and Short-/long-term Hydrological Forecasting System activities. The Workshop presentations and minutes of the meeting are on the HEPEX website: <http://hydis8.eng.uci.edu/hepex/>.

HEPEX has continued to be of considerable interest to the scientific community and has been the subject of sessions at the Fall (December 2005) and Spring (April 2006) AGU; EGU 2006 (April); Joint three day International Conference for ACTIF, FLOODMAN and FLOODRELIEF, 17-19 October 2005, Tromsø, Norway; Commission of the Hydrology of the Rhine in conjunction with RA VI and CHY, December 2005; International Workshop on Ensemble Predictions and Uncertainties in Flood Forecasting, 30-31 March 2006, Berne, Switzerland - organised in co-operation with the WMO Sub Group on Flood Forecasting and Warning; COST 731 / NetFAM Workshop, Vilnius, Lithuania, 26-27 April 2006 on Propagation of Uncertainty in Advanced Meteo-hydrological Forecasting Systems; 2nd Symposium on QPF and Hydrology, Boulder, June 2006; and the AGU Western Pacific Meeting, Beijing, July 2006. There will be a HESS Special issue on Hydrologic Ensemble Prediction in which most of the papers came from presentations at the 2005 EGU HEPEX special session. John Schaake has had a key role in these and is also leading the GEO task WA-06-02 - a HEPEX contribution to GEO. FLOODRELIEF is a 5th framework research project funded by the European Commission. The overall aim of the project is to improve flood forecasting methodologies and has been undertaken by a group of seven European partners. Papers on this project have been presented at the 4th World Water Forum - EC Session on Knowledge Generation and Technologies for Sustainable Water Management, Mexico, 19 March 2006 and the 4th Annual Mekong Flood Forum held at Siem Reap, Cambodia, 18-19 May, 2006.

The 3rd HEPEX workshop will be hosted by the EU Joint Research Center at Ispra and held in Stresa, Italy on Lake Maggiore at the Hotel La Palma from June 27 to June 29, 2007. This is scheduled to precede the IUGG meeting in Perugia, Italy and will be hosted by the EU Joint Research Centre at Ispra. Discussions are being held with the Chairman of the WMO Working Group on Flood Forecasting and Warning with the aim of linking their meeting to the HEPEX Workshop. An AGU Chapman Conference has been proposed for Brazil entitled The Combined Use of Atmospheric Models with Precipitation-Runoff Models for Predicting Watershed Behaviour: Outstanding Questions.

CEOP

IAHS is assisting in establishing hydrological reference basins associated with the CEOP flux towers with data for basins close to the two Australian sites. These data have been sent to the CEOP Data Manager.

Future:

- Continue attempts to involve and cooperate with WMO's HWRD and CHy on GEWEX related activities of common interest and to cooperate with WCP-Water. IAHS and WMO have agreed to hold a conference on Hydrometry in Manaus, Brazil in late 2007
- Promote the expansion of HEPEX, particularly the involvement of countries outside of the Americas and Europe (current participants) and of WMO's hydrology risk management and Short-/long-term Hydrological Forecasting System activities
- Establish links with UNESCO's International Flood Initiative (IFI) and ICHARM in Japan
- Preparation of an IAHS Red Book on MOPEX based on Workshops held in 2004 and 2005
- Promote cooperation with IAHS PUB, particularly with GLASS and the use of global Land Information Systems
- Assist CEOP in establishing hydrological reference basins
- Maintain links with GWSP and facilitate the use of GEWEX products
- Work with IAHS ICLASS, ICWRS, ICRS and IAMAS ICCL on the preparation and pre-publication of papers for the 2007 IUGG General Assembly in Perugia, Italy Symposium on the Quantification and Reduction of Predictive Uncertainty for Sustainable Water Resources Management

Publications:

- Franks S W, Sivapalan M, Takeuchi K, Tachikawa Y 2005. *Predictions in Ungauged Basins: International Perspectives on the state of the art and pathways forward* (Proc. Australia-Japan Workshop on PUB Working Groups) IAHS Publ. **301**. Wallingford, UK, IAHS Press
- Sivapalan M, T Wagener, S Uhlenbrook, E Zehe, V Lakshmi, X Liang, Y Tachikawa, P Kumar. 2006. *Predictions in Ungauged Basins (PUB): Promise and Progress* (Proc. PUB Symposium, Foz do Iguacu, Brazil). IAHS Publ. **303**. Wallingford, UK, IAHS Press
- Andréassian V, A Hall, N. Chahinian, J Schaake (in press). *Large Sample Basin Experiments for Hydrological Model Parametisation* IAHS Publ. **307**. Wallingford, UK, IAHS Press

List of Members:

Alan Hall (Australia) Chairman
Wolfgang Grabs (WMO) Secretary
Pierre Hubert (France) SG of IAHS
Gert Schultz (Germany) Past Chairman
John Schaake (USA) Past member, MOPEX and HEPEX
Boris Sevruk (Switzerland) Past member and precipitation
Ken Mitchell (USA) Past member and atmospheric modelling
Eric Wood (USA) GAPP
Phil Marsh (Canada) MAGS
Sten Bergstrom (Sweden) BALTEX
Taikan Oki (Japan) GAME
Javier Tomasella (Brazil) LBA
Alan Seed (Australia) MBA
Thierry Lebel (France) AMMA
LPB to be nominated
Lawrence Martz (WRAP)
Alan Gustard (ICSW)
Eric Bruin (ICSI)
Dan Rosbjerg (ICWRS)
Charles Vorosmarty (ICLASS and GWSP)
Toshio Koike and Massimo Menenti (ICRS)
Jeff McDonnell (PUB)
Mike Bonell (HELP and UNESCO)

Note: Meetings are held every two years at IUGG or IAHS Assemblies. Prior to the meeting members are asked to provide input and/or nominate a colleague who will be attending. Where appropriate other Assembly attendees are invited to attend and have included the IAHS President, GEWEX IGPO, etc