5 Progress in PUB Implementation (PUB Working Groups)

Working Groups (WGs) are the main engines of PUB activities and the focus of the PUB implementation plan. The PUB Science and Implementation Plan (Sivapalan *et al*., 2003) envisaged the formation of multiple WGs from the grassroots, in a self-organizing manner. These WGs could be formed around selected river basins, applications, quantities of interest (floods, droughts, water quality etc.), particular methodologies, particular climatic or hydrological regimes, and WGs can also be localized, regional and national, and even multi-national, covering a certain geographical region.

In the two years since the PUB Science and Implementation Plan was published over 20 PUB WGs have been officially registered with PUB, and appear on the PUB website: http://www.iahs.info.

In this book, we include papers that describe the motivation, specific aims, workings and the progress made so far for six of these WGs. It so happens that these WGs cover the full spectrum of possibilities regarding the motivation of WGs and these descriptions will be valuable to other groups who may be in the process of forming WGs. By the time of the IUGG meeting in Perugia in Italy in 2007, we expect not only more progress with existing WGs, but also an increase in the number of WGs.

SUMMARY OF PAPERS

The first paper by Littlewood *et al.* introduces the Top-Down Working Group (TDWG), which is focused on a modelling approach (top-down or downward), which is presented as an alternative to the dominant modelling paradigm. The TDWG, being the first WG to register itself with PUB, has already demonstrated a significant record of organization and activity.

The paper by Wagener *et al.* introduces the Uncertainty WG, with its focus on promoting and supporting uncertainty estimation and reduction in all hydrological predictions. Considering that this is indeed the entire focus of the PUB initiative as a whole, this is a critical WG. The Uncertainty WG have set themselves ambitious goals and are already active internationally propagating their vision, and they intend to carry the message and transfer available expertise and experience in this regard to hydrologists everywhere.

Just like the TDWG and Uncertainty WGs, the MEDCLUB WG has a global outlook, focusing on hydrological predictions in Mediterranean climates, which are located not just in southern Europe, but also in Australia, and North and South America. Yet, as the paper by Fiorentino *et al.* indicates, the initial focus of their activities is restricted to Italy. A number of regional experimental and modelling studies are planned under the umbrella of MEDCLUB, and they intend to eventually do comparative studies across the world.

Remaining within Italy, the paper by Polemio *et al.* deals with the issue of groundwater quality in the Apulia region of southeastern Italy, and proposes a water quality classification system that highlights the quality degradation risks in this region due to natural causes and human impact. Groundwater pollution is low in inland areas that constitute the groundwater recharge zone, and increases with distance to the sea because of human impact.

The next two papers describe national (country-based) WGs. The paper by Spence *et al.* describes the activities of the very successful Canadian PUB WG. Canadian PUB is by far one of the most advanced and most mature WGs of the many national WGs that have been formed. Right from the start the Canadians have taken the PUB ideals to heart; no doubt, this is due to the large size of their country, the extent of the country that remains ungauged, and the unique focus on cold regions. The Canadian WG has been so well organized that they have had their second national PUB workshop, and they are well on the way to receiving government funding for their activities.

The paper by Dutta *et al.* describes the progress and activities of the Thai PUB initiative. Right from the start PUB has been very popular in Asia (Japan, China, Korea, India and Sri Lanka). The WGs formed in many of these countries are much more focused on water related problems and hazards, and Thai PUB is no exception. Another aspect that PUB is able to bring is a level of coordination, urgency and respectability to otherwise disjointed activities in these countries, and it can also help form links to like-minded national and other types of PUB WGs (e.g. TDWG, Uncertainty WG) for the benefit of all.

Finally, the paper by Liang *et al.* describes the activities of a smaller WG focused on mountain hydrology. It is focused on issues of orographic precipitation, the role of snow and snowmelt, surface water–groundwater interactions, data analysis and numerical modelling, and data assimilation. This WG is presently centred in North America, although there are plans to link up with similar groups operating in Europe and Japan.

CONCLUDING REMARKS

These six papers present and highlight the diversity of approaches that are possible and are encouraged by PUB. The papers demonstrate the progress that has been made in the short period of their existence and serve as excellent examples for WGs yet to be formed, or that have been formed relatively recently. We hope and trust that their inclusion here will encourage other interested scientists to either join with these WGs, or form separate WGs to carry forward the mission of PUB.

REFERENCE

Sivapalan, M., Takeuchi, K., Franks, S. W., Gupta, V. K., Karambiri, H., Lakshmi, V., Liang, X., McDonnell, J. J., Mendiondo, E. M., O'Connell, P. E., Oki, T., Pomeroy, J. W., Schertzer, D., Uhlenbrook, S., & Zehe, E. (2003) IAHS Decade on Predictions in Ungauged Basins (PUB), 2003–2012: Shaping an exciting future for the hydrological sciences. *Hydrol. Sci. J.* **48**(6), 857–880.

Murugesu Sivapalan
Departments of Geography & Civil and Environmental Engineering, University of Illinois at Urbana-Champaign, 2220 Davenport Hall, 607 S. Matthews Avenue, Urbana, Illinois 61801, USA
sivapala@uiuc.edu