



Prediction in Ungauged Basins (PUB)
The 'Top-Down modelling
Working Group (TDWG)



TDWG Newsletter #4

PUB and TDWG

The International Water Management Institute (IWMI) has taken on the role of PUB Secretariat, and is hosting the official PUB website (<http://pub.iwmi.org/>). The website gives an overview of the structure of PUB and the current and future activities. Working Groups have now been associated with one of the 7 PUB themes, with the TDWG located under Science Theme 1 (Basin intercomparison and classification, lead by Gunter Bloschl, Marc Stieglitz and Ross Woods). This does not constrain the activities of the TDWG, rather the link to Theme 1 is for administration purposes, and provides a conduit between the TDWG and the SSG (the theme troikas form the SSG).

IWMI also produce the PUB Newsletter, which is available on the website (latest PUB Newsletter is #3, dated September 2006).

TDWG-related Meetings/Workshops

MODSIM05, Melbourne Australia, 12 – 15 December, 2005

The theme of MODSIM05 was “Advances and Applications for Management and Decision Making”. The TDWG organised a session “Top-Down modelling and PUB”, for which 18 papers were submitted. These covered a broad range of topics, including remote sensing approaches (e.g. use of GRACE gravity measurements for assessing large scale hydrological models); applications and testing of existing models (e.g. IHACRES and SIMHYD); development of new models (e.g. ROVER – a model for estimating the hydraulic resistance of vegetation); characterising model error; and groundwater models (including the interactions between surface water and groundwater). Following the presentation of papers, a discussion session was held to encourage interaction between the authors, as well as other interested participants.

Session 1

Freeman Cook (CSIRO Land and Water): Steady groundwater flow to drains on a sloping bed

Zahra Paydar (CSIRO Land and Water): Application of 1-D and 3-D models in a regional context

Justin Costello (The University of Melbourne): Recharge rates to shallow groundwater from streamflow in arid zone catchments

Brett Anderson (The University of Melbourne): ROVER: introducing a unified model to estimate the hydraulic resistance of vegetation



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Jeff Walker (The University of Melbourne): National airborne field experiments for prediction in ungauged basins

Kevin Ellett (The University of Melbourne): GRACE gravity fields as a new measure for assessing large scale models

Session 2

Cressida Savige (The University of Melbourne): Obtaining surface energy fluxes from remotely sensed data

Cornelia Scheffler (Friedrich-Schiller University, Jena): Hydrological modelling for quantification of coarse scale soil moisture in Southern Africa

Senlin Zhou (The University of Melbourne): Testing the VB95 land surface model against catchment runoff

Neil Viney (CSIRO Land and Water): Ensemble modelling of the hydrological impacts of land use change

Hyeon-jun Kim (Korean Institute of Construction Technology): An experimental catchment to assess the hydrological effect by the Pangyo new town development in Korea.

Session 3

Brett Watson (Deakin University): Hydrologic response of SWAT to single site and multi-site daily rainfall generation models

Mark Thyer (University of Newcastle): Characterizing model error in conceptual rainfall-runoff models using storm-dependent parameters

Lu Zhang (CSIRO Land and Water): Water balance modelling over variable time scales

Francis Chiew (The University of Melbourne): Estimation of SIMHYD parameter values for application in ungauged catchments

K.S. Tan (The University of Melbourne): Calibration of a daily rainfall-runoff model to estimate high daily flows

Session 4

Vazken Andressian (CEMAGREF): How to account for groundwater exchange in rainfall-runoff models?

Barry Croke (The Australian National University): Comparison of alternative loss modules in the IHACRES model: an application to 7 catchments in Wales.

The papers are available on-line from the conference website (<http://www.mssanz.org.au/modsim05>)

Discussion session

The discussion session was initiated by 2 short presentations:

Barry Croke described the datasets that are available for the TDWG, and David Post gave an example of combining top-down and bottom-up approaches to modelling sediment delivery. While there was still a strong bias towards top-down modelling in the discussion session, this session marked the start of the process of building



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collaborations between members of the top-down and bottom-up communities – with this process continued further at iEMSs2006.

iEMSs2006, Burlington, Vermont, USA, 9-12 July 2006

The International Environmental Modelling and Software Society (iEMSs) held its 3rd biennial meeting in Burlington, Vermont, USA from July 9th to 13th. (website www.iemss.org/iemss2006) This conference was a combination of paper presentation sessions and workshop sessions. Following on from a successful session run by the TDWG at the previous iEMSs meeting in Onsabruck, Germany in 2004, a session was organised by Theme 6 and the TDWG with the focus on merging of top-down (TD) and bottom-up (BU) approaches (session S12). There were 15 papers presented by authors from 10 countries (papers are available online from the conference website). The papers were followed by a discussion session that addressed a number of topics including uncertainty in models, selection of performance indicators as well as potential approaches for linking TD and BU approaches (e.g. using BU models to propose new functional forms for TD models, and using comparisons between TD and BU models as a validation tool). A report on the PUB session held at the iEMSs conference is presented in the 3rd PUB Newsletter (<http://pub.iwmi.org/>).

USA PUB meeting, 16-19 October 2006, Corvallis, Oregon

The TDWG was represented by David and Ian at this landmark PUB meeting for the USA. Ian spoke about the formation of national working groups, while David presented an example showing how top-down and bottom-up modelling approaches can be used in conjunction, yielding a better model than would have been derived using either approach on its own. For details, see articles and other material to appear, e.g. in EOS, the PUB Newsletter and on the website of the USA's CUAHSI (Consortium of Universities for the Advancement of Hydrologic Science <http://www.cuahsi.org/>).

UK national meeting on PUB, 14 June 2006, London

The TDWG was represented at this meeting, convened by the UK Working Group (UKWG) for PUB and held as a one-day national meeting of the British Hydrological Society (BHS). For details, see a report of the meeting in the BHS quarterly Newsletter, *Circulation*, 90, 12-16 (a summary of that report appeared in PUB Newsletter 1.3, September 2006 <http://pub.iwmi.org/>).

Eleventh Biennial Conference of the Euromediterranean Network of Experimental and Representative Basins (ERB2006), 13-17 October 2006, Luxembourg, "Uncertainties in the 'monitoring-conceptualization-modelling' sequence of catchment research".

See <http://erb2006.lippmann.lu/> for the programme etc. (much of relevance to TDWG). Session 5 of the Conference was "PUB – Prediction in Ungauged Basins",



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with a keynote by Gunter Blöschl. The Proceedings of ERB2006 will be published in 2007 as a volume of the UNESCO Technical Documents in Hydrology Series (as were previous ERB Conference Proceedings). Ian Littlewood presented a paper “The Prediction in Ungauged Basins (PUB) Decade: a view from the United Kingdom” during which he introduced some results from his paper for the Proceedings “Rainfall–streamflow models for ungauged basins: uncertainties due to modelling time-step”. Ian would like to hear from others working on this topic.

Future meetings

IUGG XXIV General Assembly in Perugia, Italy, 2-13 July, 2007. Symposium on the Quantification and Reduction of Predictive Uncertainty for Sustainable Water Resources Management

The next general assembly of the International Union of Geodesy and Geophysics (IUGG) will be held in Perugia, Italy. TDWG members are encouraged to attend the meeting, and abstracts for IAHS joint sessions are due by February 28 (electronic submission). Please see the conference website (<http://www.iugg2007perugia.it/>) for more information.

MODSIM07, Christchurch, New Zealand, 10-13 December, 2007

The next meeting of the Modelling and Simulation Society of Australia and New Zealand (<http://mssanz.org.au/>) will be held at the University of Canterbury, Christchurch, New Zealand in December 2007. While the Society is based in Australia and New Zealand, it has members from 50 countries, including Canada, China, France, Germany, Japan, The Netherlands, South Africa, Spain, Switzerland, the United Kingdom and the United States. A session is being organised by Science Theme 6 and the TDWG titled PUB: Building towards new hydrological models.

Description of proposed session:

The aim of the Prediction in Ungauged Basins (PUB: <http://pub.iwmi.org>) initiative is to reduce the predictive uncertainty in estimating fluxes of water and contaminants at ungauged sites. This session will build on previous sessions held at MODSIM and iEMSs conferences with the focus on the development of new models (PUB science theme 6) using top-down, bottom-up or hybrid approaches. This includes model development to utilise new datasets (e.g. remotely sensed data), developments based on the analysis of existing models and/or field data, and improved techniques for estimating parameter values at ungauged sites. While papers related to the general topic are welcome, papers discussing the influence of uncertainty in observations, as well as the impact of temporal resolution on model parameterisation and performance are particularly encouraged.



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The deadline for submission of abstracts is March 16, 2007. The conference website is <http://modsim.lincoln.ac.nz/>.

TDWG Membership

There are currently 47 members of the TDWG, spanning 16 countries (though approximately half the members are from either the UK or Australia). For a list of current members see “TDWG membership and contact points” on the website. Would members please let the organisers know if their details are incomplete or incorrect. It was decided to not show email addresses, initially at least. Would members who wish their email addresses to appear in the List of Members please email Barry to give permission for this. Your email address will not appear in the website List of Members unless you give your permission explicitly. Since an important objective of the TDWG is networking we hope that most members will agree to their email addresses appearing on the website.

As the TDWG develops further we envisage that individual members will be willing to be associated with particular tasks or functions. Ideas along these lines are always welcome.

Publications

New IAHS Red Book – Andréassian, Hall, Chahinian and Schaake (eds) 2006. *Large sample basin experiments for hydrological model parameterization: results of the Model Parameter Experiment – MOPEX*, IAHS Publ. 307, 347pp + data CD. This is a compilation and discussion of papers presented at MOPEX workshops in Paris (July 2004) and Foz do Iguazu (April 2005). In a paper on ‘MOPEX: its structure, connection to other international initiatives and future directions’ Thorsten Wagener et al., say “Two other working groups with which we [MOPEX] anticipate particularly strong interaction are the Top-Down Modelling Working Group ... and the Working Group on Uncertainty Estimation for Hydrological Modelling ...”.

The TDWG is maintaining a list of relevant publications (or at least citations) on its website. Any members with publications they would like to have included on the website, please contact Barry.

Best regards

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