

AVAILABLE DATA, TOOLS AND OPPORTUNITIES



IAHS PUB

(Predictions in Ungauged Basins)

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PUB



- An IAHS initiative for decade 2003-2012

Motivation:

need for better predictive tools in hydrology for sustainable WR management as natural hydrological and ecological regimes have been disrupted.

- Water supplies are no longer secure
- Risks of floods & droughts are increasing
- Destruction of riparian ecosystems continues

- **Reference:**

“PUB Science and Implementation Plan” by M. Sivapalan et al. and
PUB Presentation by Sivapalan



Present practices in hydrological predictions

Predictive tools are data-driven (most widely) from gauged data and applications are based on the premise that

- past is a reasonable guide to future
- data from one basin is a useful guide to the response at another basin (hydrologically similar basin).



Difficulties with Predictions in Ungauged Basins

- spatial heterogeneity of climatic and landscape properties
- changes in climate - annual and decadal fluctuations in climatic inputs
- changes in land use
- decline of gauging networks

Goal of PUB



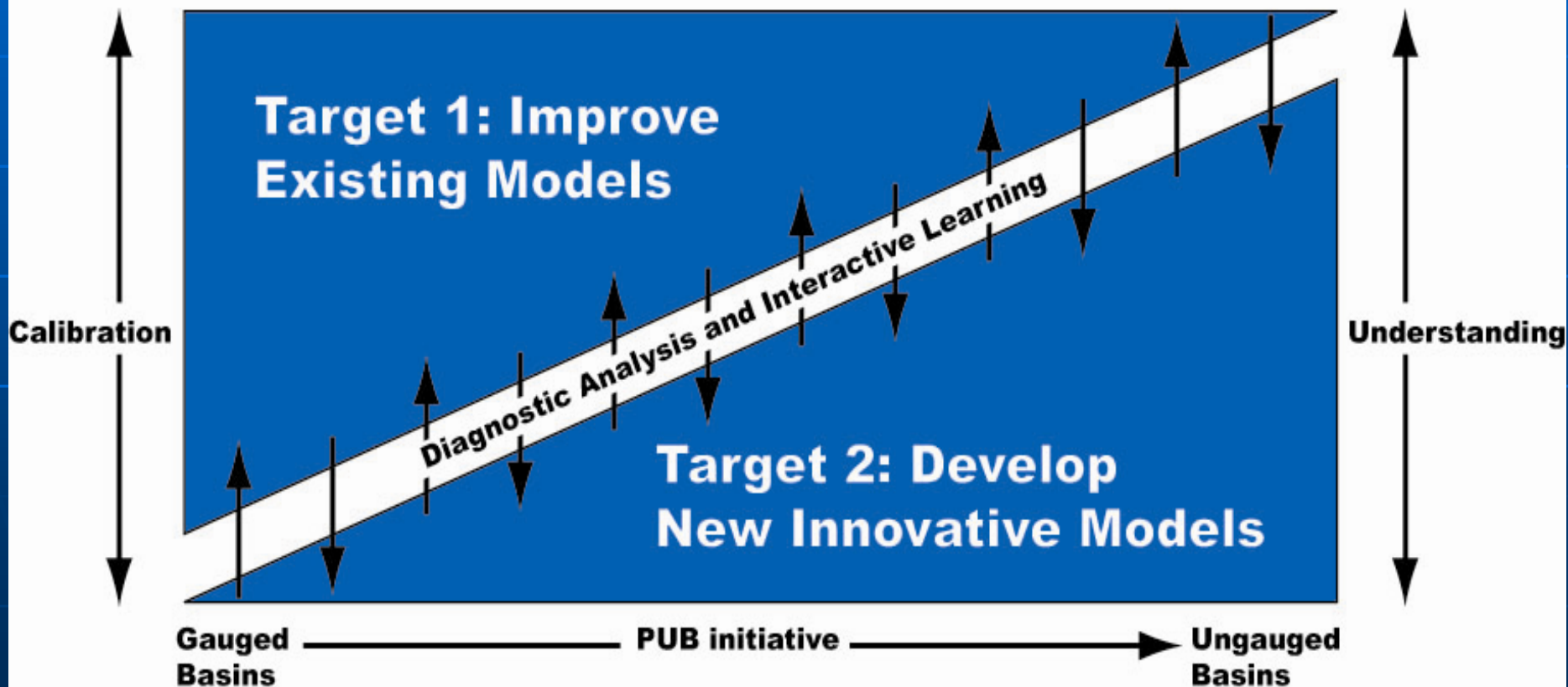
Reduction of the predictive uncertainty in hydrological science and practice.

PUB aims to shift the prediction of stream flow, sediment and water quality variables from calibration-based to new, and largely understanding-based methods.

- Improve the existing hydrological models
- Develop new, innovative models and approaches to capture space-time variability of hydrological processes

Targets

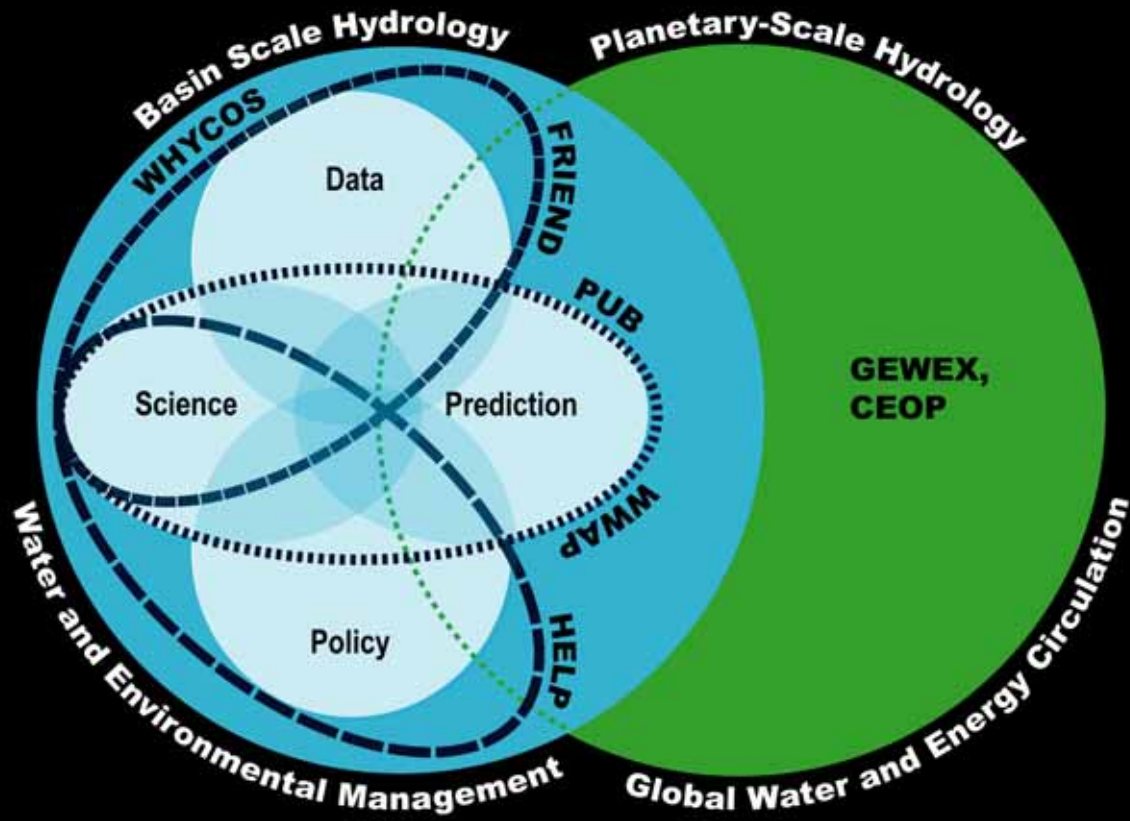
Towards Paradigm Change - From Calibration to Understanding





Place of PUB Amongst International Programmes on Water

Place of PUB Amongst International Programmes on Water



PUB is to provide the advanced predictive hydrological engines necessary to drive these related programmes



PUB Organization

PUB SSG:

**Jeff McDonnell, (PUB Chair), Oregon State University,
USA + 23 other eminent researchers (Theme troikas+2)**

<http://www.pub.iwmi.org>

**PUB International Secretariat
International Water Management Institute (IWMI),
127, Sunil Mawatha, Pelawatte, Battaramulla,
Sri Lanka.**

***PUB Secretariat in 2006-7 is managed by
Saman Weerakoon and
Vladimir Smakhtin (Principal Hydrologist, IWMI)***

PUB Themes



- Basin inter-comparison and classification
- Conceptualization of process heterogeneity
- Uncertainty analyses and model diagnostics
- Develop and use of new data collection approaches
- New hydrological theory
- New model approaches
- PUB national and multi-national working groups

Each PUB Theme is led by a troika . Troikas together with a PUB Chair and several additional members form the PUB Scientific Steering Group

Working Groups



- are the main engines for PUB activities and achievements. PUB Themes serve as the organizational basis for WGs. **New WGs are welcome.**

List of Working Groups:

WG1 - Top-Down Modelling Working Group

WG2 - MOPEX Working Group

WG3 - Orographic Precipitation, Surface & Ground Water Interactions and their Impact on Water Resources

WG4 - Japan Working Groups (7 Nos.)

WG5 - Design Flows for Ungauged Basins

WG6 - China Working Groups (7 Nos.)

WG7 - Uncertainty Estimation for Hydrological Modelling

List of Working Groups Contd...



- WG8 - Remote Sensing and Data Assimilation (RSDA)
- WG9 - Mediterranean Working Group
- WG10 - Drought and Flood Risk: Hydrology and Sediment Transport in Mountain catchments
- WG11 - Andean Catchment Flow Estimation
- WG12 - Slope Inter-Comparison Experiment (SLICE)
- WG13 - The United Kingdom Working Group (UKWG)
- WG14 - The Waternet of Southern Africa
- WG15 - CNC- PUB : Canadian National Working Group
- WG 16 - IP3 in Cold Regions
- WG 17 - Low Stream Flows and Hydrologic Drought

New WGs are welcome

Technology Transfer



PUB Website: <http://www.pub.iwmi.org>

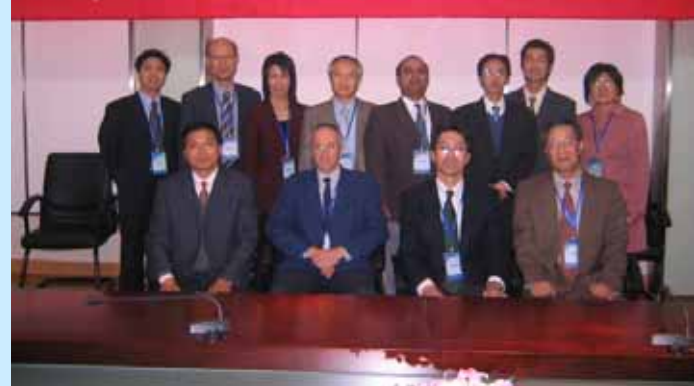
- News and Views
- List of Working Groups
 - links to the WG web sites
- Links to related activities
- Meetings - Past and Future
- Discussion page
- PUB Newsletters
- Ongoing Call for Proposals to set up PUB Working Groups (pro forma) and Projects

PUB Technical Sessions in Asia



PUB Special Session, Nanjing

International Symposium on Methodology
PUB Special Session, Nanjing, China, October 30 -



*PUB Special Session,
Singapore*



*PUB Special
Session, Nepal*



*A PUB Symposium by China
PUB in September 2006*

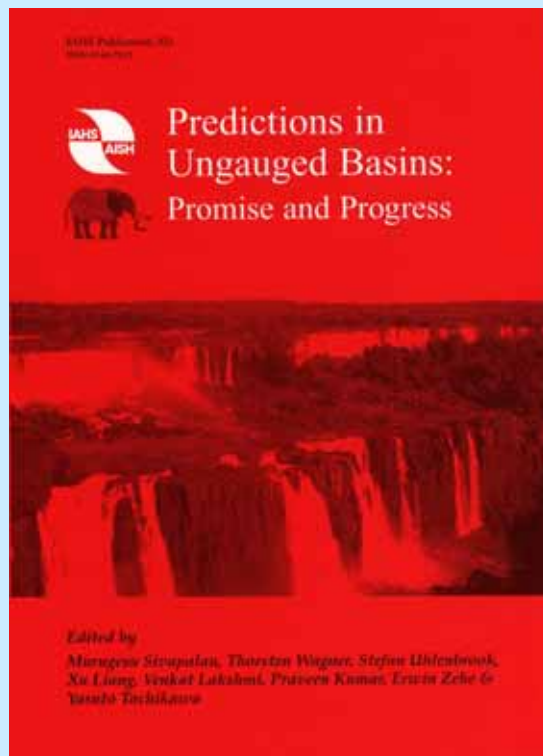
International Symposium on Flood Forecasting and Water Resources Assessment for IAHS-PUB
September 28-30, 2006, Beijing, China



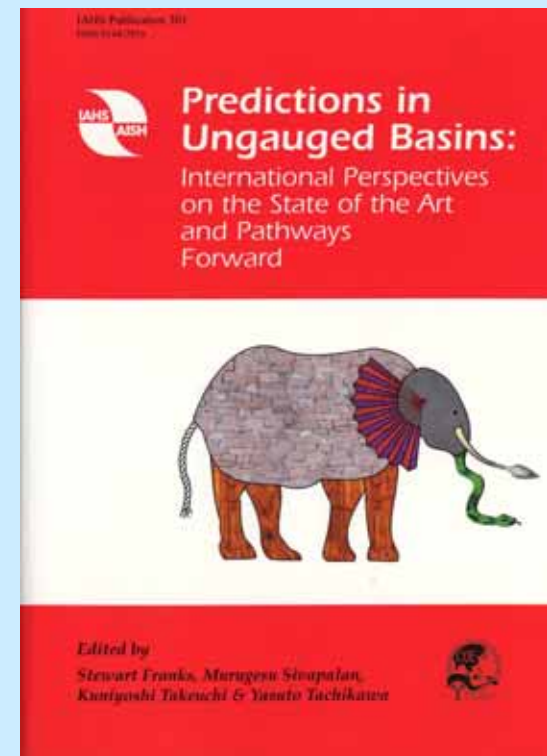
Also the National PUB Sessions are held

Publications

Predictions in Ungauged basins: promises and progress.
IAHS Publ. 303 (May 2006).
520 pp.



Predictions in Ungauged Basins: international perspectives on the state of the art and pathways forward. IAHS Publ.301
(December 2005), 348 pp.



PUB Newsletters



PREDICTIONS IN UNGAUGED BASINS

Issue 1.1
March 2006

Newsletter



PREDICTIONS IN UNGAUGED BASINS

Issue 1.2
June 2006

Newsletter



PREDICTIONS IN UNGAUGED BASINS

Issue 1.3
September 2006

Newsletter



PUB is an
The PUB



PUB is an IAHS initiative aimed at uncertainty reduction in hydrological practice
The PUB



IN THIS ISSUE

MESSAGE FROM
PUB OFFICE AT
WATER MANAG
PROMISE, BACK
FUTURE PERS
NEWS FROM P
FORTHCOMING
PUBLICATIONS

IN THIS ISSUE:

FROM THE PUB SECRETARIAT
PUB IN THE CONTEXT OF
NEW PUB WORKING GROUPS

- IMPROVED PROCESSES FOR PARAMETERIZATION OF COLD REGIONS
- LOW STREAM FLOW DROUGHT

 SHORT COMMUNICATIONS

- REGIONALIZING LOCAL SCALE NOVEL METHODOLOGIES FOR ERROR-COVARIANCE ANALYSIS

 FORTHCOMING PUB-RELATED PUBLICATIONS

IN THIS ISSUE:

UK CONTRIBUTIONS TO
PUB SESSION AT THE 10th INTERNATIONAL ENVIRONMENTAL MODELLING AND SOFTWARE SYMPOSIUM
PUB SESSION AT THE 3rd OF ASIA-OCEANIA SOCIETY OF GEOSCIENCES
PUB SESSION IN NEPAL
A NEW PUB-AFFILIATED JOURNAL
LAUNCH OF HYDROLOGICAL PUBLICATIONS
FORTHCOMING PUB-RELATED PUBLICATIONS

MESSAGE FROM THE SECRETARIAT

Welcome

On behalf of the Secretariat, we welcome you to the 2006 issue of the PUB Newsletter. The 2003 issue of the Newsletter was a veritable manifesto of the science of water—our reliance on calibrated models and our understanding of the



PREDICTIONS IN UNGAUGED BASINS

Issue 1.4
December 2006

Newsletter



PUB is an IAHS initiative aimed at uncertainty reduction in hydrological practice
The PUB Newsletter is published by the PUB Secretariat sponsored by IWMI



IN THIS ISSUE:

FROM THE PUB SECRETARIAT
PUB AND INTERNATIONAL CENTRE FOR WATER HAZARD AND RISK MANAGEMENT, JAPAN
INTERNATIONAL IAHS-PUB SYMPOSIUM ON FLOOD FORECASTING AND WATER

In 2007, we would like to make our dissemination products more dynamic, more interesting and less formal. Is it necessary? Is it possible? Is it worth our effort? If all the answers are 'yes', then how do we do it? We need your ideas, dear PUBers. We would certainly like to hear more about the on-going activities in each working group – at least once a year (better two!). 'News in brief' style could be an alternative to a longer essay, when time is short. We would encourage advertising vacant positions and funding calls through the available PUB media. However, most importantly,

Forthcoming PUB Events

- PUB Session at the Fourth AOGS Meeting (Asia Oceania Geosciences Society Meeting), July 30 - August 4, 2007 at Bangkok
- PUB Session at the MODSIM07 Conference, December 10-13 , 2007 in Christchurch, New Zealand
- PUB Session at the Canadian Water Resources Association AGM, June 25-28, 2007 in Saskatoon, Saskatchewan
- PUB Session at the Canadian Geophysical Union AGM, May 28 - June 1, 2007 in Newfoundland
- PUB Session at the European Geosciences Union General Assembly, 15 – 20 April, 2007 in Vienna, Austria
- + +

PUB Website



<http://www.pub.iwmi.org>



Predictions in Ungauged Basins - Microsoft Internet Explorer

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**PUB: PREDICTIONS IN UNGAUGED BASINS**
SECRETARIAT AT THE INTERNATIONAL WATER MANAGEMENT INSTITUTE 

PUB Home | IAHS | IWMI | Joining PUB

ABOUT PUB	<p>Predictions in Ungauged Basins (PUB) is an IAHS initiative for the decade of 2003-2012, aimed at uncertainty reduction in hydrological practice. It is a bottom-up movement which engage hydrologists works-wide. This site is maintained by the PUB Secretariat located at the International Water Management Institute in Colombo, Sri Lanka.</p> 
THEMES	
WORKING GROUPS	
SECRETARIAT	
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NEWSLETTERS	
PUB LOGO	
CONTACTS	

NEWS

- World Water Week - Capacity and Partnership Building, Reviewing Implementation in Stockholm, August, ... [Read More](#)
- Session on PUB in the Asia Oceania Geosciences Society Meeting in Singapore, July ... [Read More](#)
- China-PUB hosts Int. Symp. on Flood Forecast and Water Resources Assessment in Beijing, ... [Read More](#)
- Slope Inter-Comparison Experiment (SLICE) Working Group has released the Poster. ... [Read More](#)
- Session on Developing New Hydrological Models in Vermont, USA from July 9-12, 2006: ... [Read More](#)
- USA PUB Workshop will be held from October 16-19, 2006 at Oregon State ... [Read More](#)
- HydroSHEDS data from the global hydrological database of World Wildlife Fund are available ... [Read More](#)
- PUB Newsletter Issue 1.1 was released and dispatched to the PUB MailingList. ... [Read More](#)
- IAHS PUB Secretariat is in operation at the International Water Management Institute (IWMI), ... [Read More](#)

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Done Internet

Thank You

Thank You

Water and Environmental Management at Basin Scale

- UNESCO International Hydrological Programme (IHP)
- Hydrology for the Environment, Life and Policy (IHP-HELP)
- Flow Regimes from Experimental and Network Data (IHP-FRIEND)
- WMO World Hydrological Observing System (WHYCOS)
- World Water Assessment Programme (WWAP)

Water and Energy Circulation at the Planetary Scale

- Global Energy Water Experiment (GEWEX)
- Coordinated Enhanced Observing Period (CEOP)

About PUB

- The IAHS Decade on Predictions in Ungauged Basins (PUB) is an initiative of the **International Association of Hydrological Sciences (IAHS)** aimed at formulating and implementing appropriate science programs to engage and energize the scientific community, in a coordinated manner, towards achieving major advances in the capacity to make reliable predictions in ungauged basins.
- Now two years into the effort, PUB participants have defined a set of community science questions in the hydrological sciences with broad consensus and community buy-in.
- Hydrologists worldwide have come to recognize the multi-disciplinary nature of their discipline and the need to establish efforts that will enable scientists from various sub-disciplines to integrate their work. This will surely lead to novel opportunities for scientific progress that would be unachievable with individual scientists working alone. In this context, the PUB initiative will undoubtedly lead to new predictive approaches based on a combination of current and new theories, and of existing and potentially new data sets, that are unimaginable at the present time. This international initiative to foster and enable multi-disciplinary approaches to hydrology must be matched by national initiatives with similar objectives in individual countries or regions.
- PUB is literally a grassroots-level movement, enabling open participation to everyone who is interested, and with a minimum of bureaucracy

Future PUB

In particular, over the next 10 years PUB will lead to:

- Development of a framework for, and implementation of, routine estimation of predictive uncertainty in all future hydrological predictions.
- A new suite of models and methodologies that can be used with confidence for predictions in ungauged basins in different hydro-climatic zones.
- A network of scientists and groups around the world, especially in developing countries, with the necessary scientific expertise and experience to solve emerging hydrological problems.
- An array of measurement networks in selected basins around the world and associated databases of hydrological measurements to serve as a reference pool for new emerging questions.