

AVAILABLE DATA, TOOLS AND OPPORTUNITIES



# IAHS PUB

## (Predictions in Ungauged Basins)

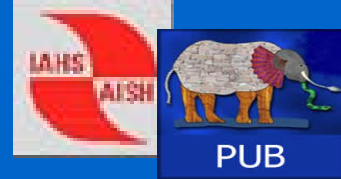
S. B. Weerakoon

University of Peradeniya, Sri Lanka

*Workshop on*

*CAPACITY BUILDING IN ASIA "EARTH OBSERVATIONS IN THE SERVICE OF WATER MANAGEMENT" September 26-28, 2006, Bangkok, Thailand*

# PUB



- An IAHS initiative for decade 2003-2012

## Reference:

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

## 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



# Present practices in hydrological predictions

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

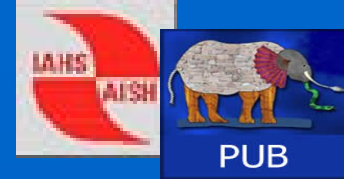
- past is a reasonable guide to future
- data from one basin is a useful guide to the response at another basin (hydrologically similar basin).



# 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



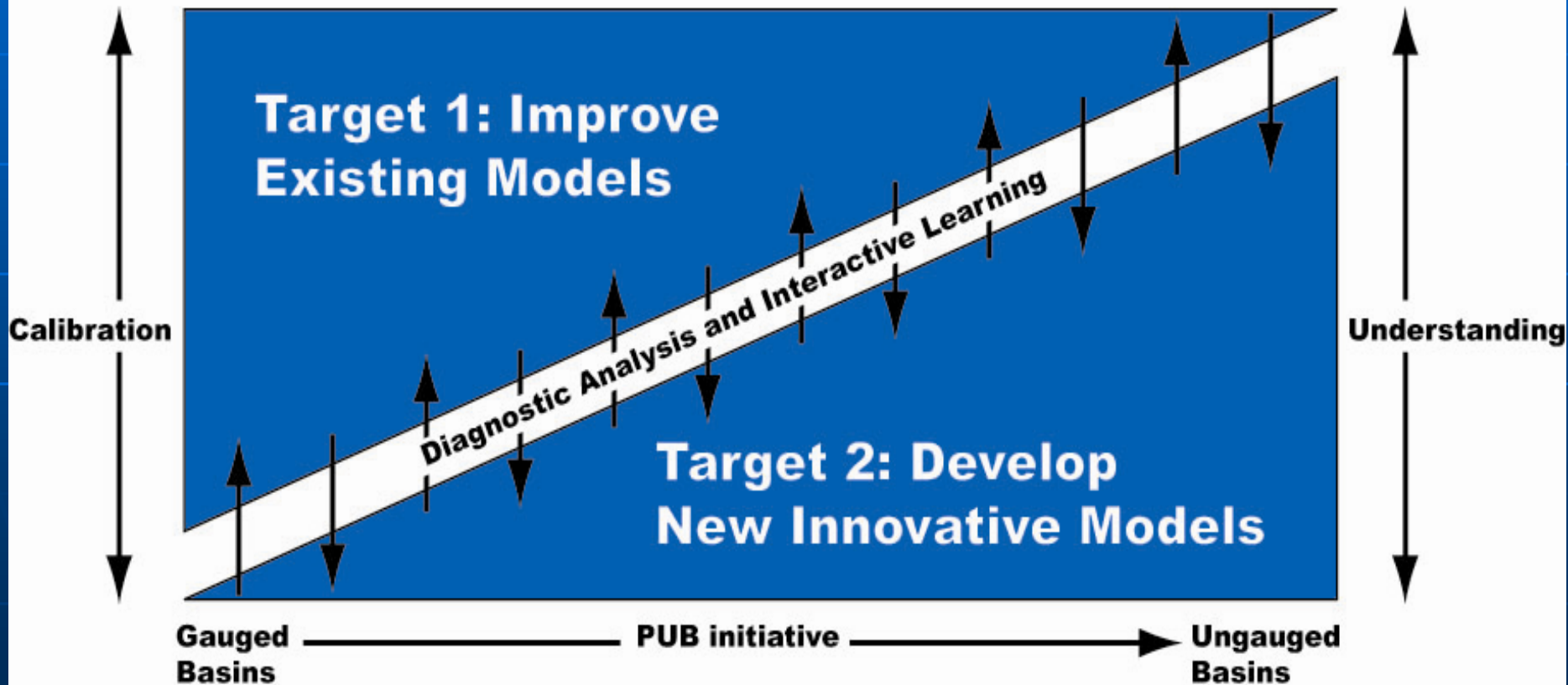
**Reduction of the predictive uncertainty in hydrological science and practice.**

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

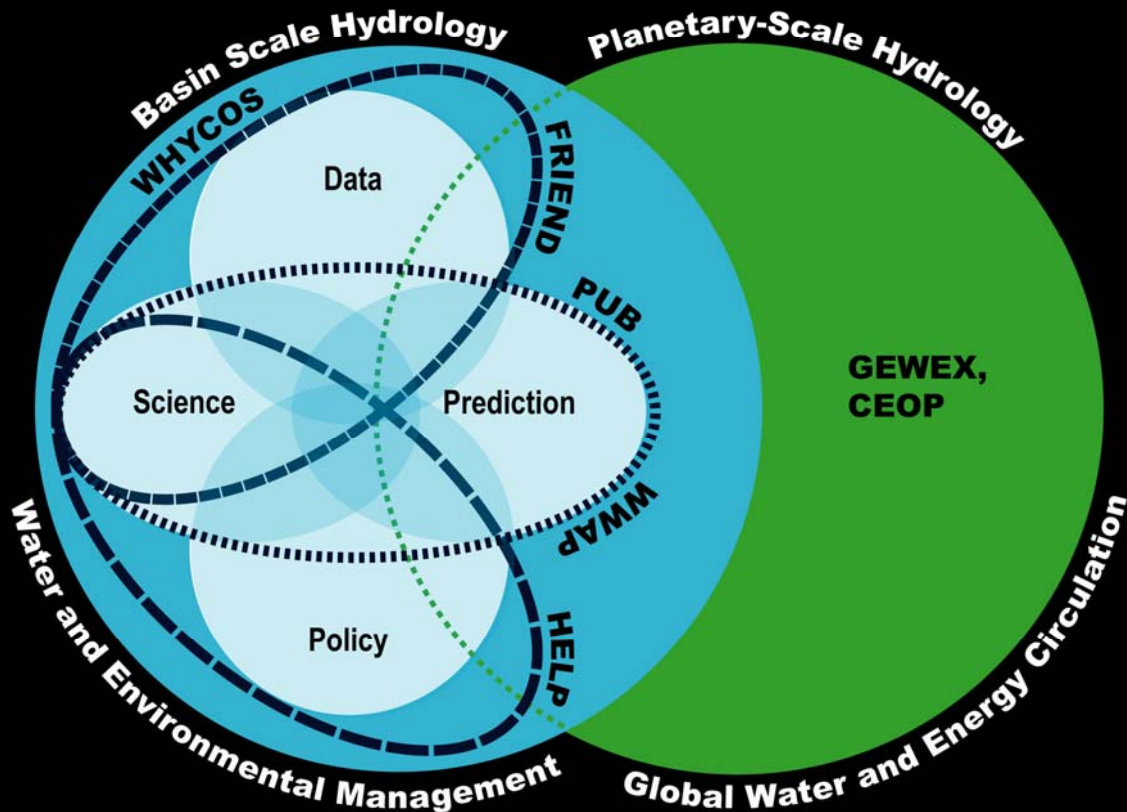
## Towards Paradigm Change - From Calibration to Understanding



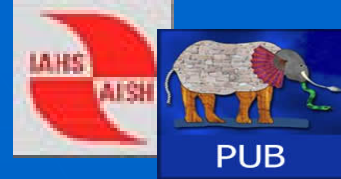


# Place of PUB Amongst International Programmes on Water

## 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

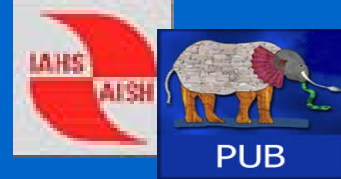
**PUB SSG:**

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

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

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

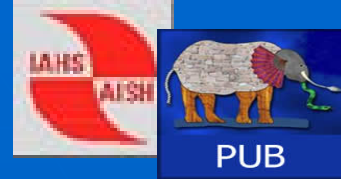
# PUB Themes



- 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**

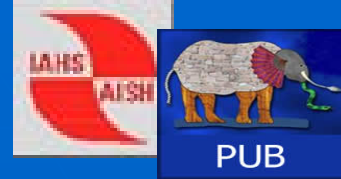
# List of Working Groups Contd...



- 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*



*PUB Special Session,  
Singapore*

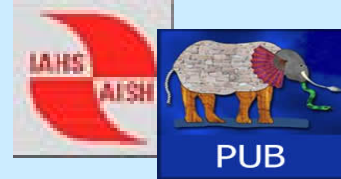


*PUB Special  
Session, Nepal*



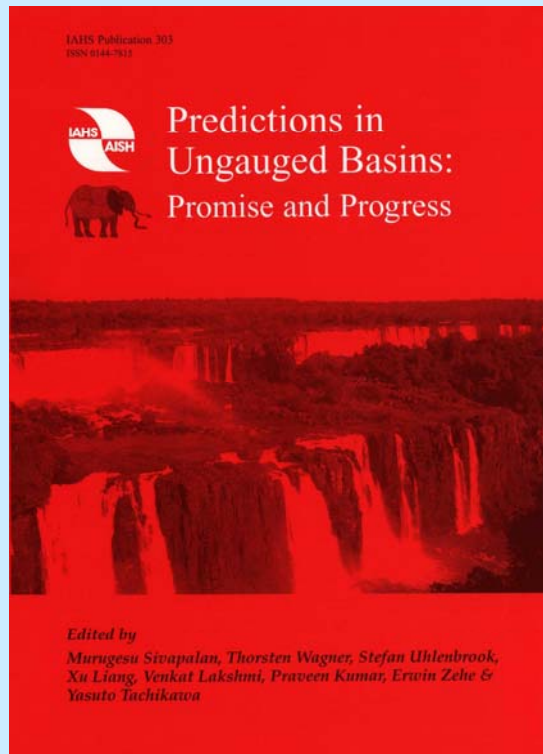
*A PUB Symposium by China  
PUB in September 2006*

*Also the National PUB Sessions are held*

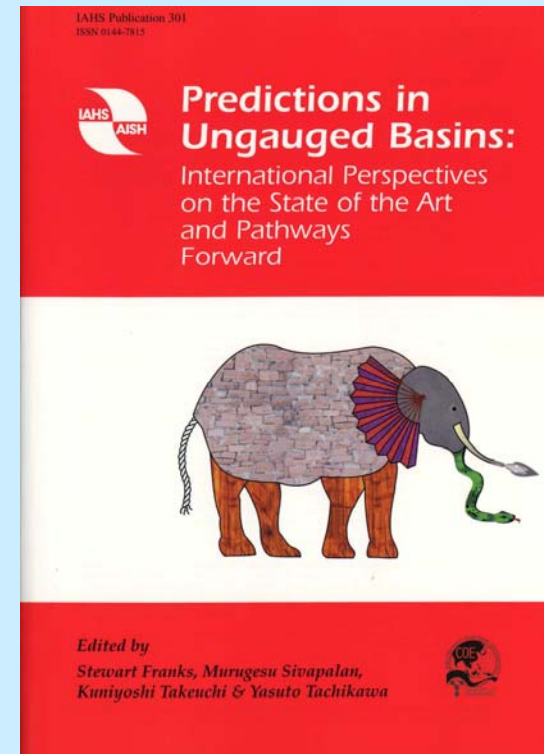


# PUBlications

**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



PUB is an IAHS  
The PUB Ne



## PREDICTIONS IN UNGAUGED BASINS

Issue 1.2

June 2006

# Newsletter



PUB is an IAHS initiative aimed at  
The PUB Newsletter is pub



## PREDICTIONS IN UNGAUGED BASINS

Issue 1.3

September 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:

MESSAGE FROM THE PUB

PUB OFFICE AT THE INTERNATIONAL WATER MANAGEMENT INSTITUTE

PROMISE, BACKGROUND AND FUTURE PERSPECTIVES OF PUB

NEWS FROM PUB WORKING GROUPS

FORTHCOMING PUB EVENTS

PUBLICATIONS

### MESSAGE FROM THE PUB SECRETARIAT

#### Welcome

On behalf of the PUB Scientific Steering Group, we welcome you to this first PUB Newsletter. The PUB Science Plan, published in the 2003 issue of the *Hydrological Sciences Journal*, has set the vision for the PUB initiative.

### IN THIS ISSUE:

FROM THE PUB SECRETARIAT

PUB IN THE CONTEXT OF FRIEND AND NEIGHBOURHOODS

NEW PUB WORKING GROUPS:

- IMPROVED PROCESSES AND PARAMETERIZATION FOR PREDICTIONS IN COLD REGIONS
- LOW STREAM FLOWS AND HYDROLOGICAL DROUGHT

SHORT COMMUNICATION:

- REGIONALIZING LOW FLOW INDICATORS: A NOVEL METHODOLOGY FOR ESTIMATING ERROR-COVARIANCE MATRIX

FORTHCOMING PUB-RELATED EVENTS

### IN THIS ISSUE:

UK CONTRIBUTIONS TO THE PUB DECADE

PUB SESSION AT THE MEETING OF THE INTERNATIONAL ENVIRONMENTAL MODELING AND SOFTWARE SOCIETY

PUB SESSION AT THE 3d ANNUAL MEETING OF ASIA-OCEANIA SOCIETY OF GEOSCIENCES

PUB SESSION IN NEPAL

A NEW PUB-AFFILIATED PROJECT

LAUNCH OF 'HYDROLOGY 2020' REPORT

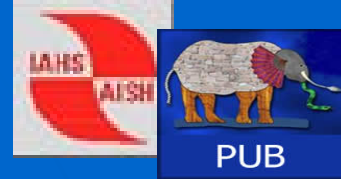
PUBLICATIONS

- to provide an open forum for discussion towards a coherent UK response to the PUB Decade, and
- to enable the UKWG to gather views and information to assist with a 'PUB in the UK' report to the PUB Scientific Steering Group (SSG), helping to shape the further evolution of PUB.

This article is based on a full report of the meeting published in the BHS Newsletter (*Circulation*, No. 90, August 2006, 12-16), downloadable from the PUB website, <http://www.pub.iwmi.org>.

Delegates represented 15 organisations, including most of the leading university departments active in numerical hydrological sciences, key public-sector research organisations, consultants and the Environment Agency. John Rodda (IAHS President 1995-2001) opened the meeting, stressing the genesis of the PUB initiative and referring to the consolidation of relevant modeling activity over many years.

# PUB Website



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



**Predictions in Ungauged Basins - Microsoft Internet Explorer**

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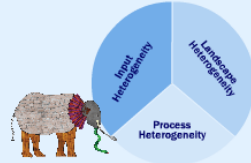

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**PUB: PREDICTIONS IN UNGAUGED BASINS**  
SECRETARIAT AT THE INTERNATIONAL WATER MANAGEMENT INSTITUTE 

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 world-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	
EVENTS	
DOCUMENTS	
LINKS	
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](#)

[More News](#)

© 2006 Predictions in Ungauged Basins (PUB) Product by Genesis Software ?

Done Internet



Devon waterfall  
( Upper Kotmale Subbasin  
Sr Lanka)

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)