Hydrology for the Water Management of Large River Basins

edited by

F.H.M. van de Ven
*Rijkswaterstaat - Institute for Inland Water Management and Waste Water Treatment (RIZA)*
*Maerlant 16, 8224 AC Lelystad, The Netherlands*

D. Gutknecht
*Institut für Hydraulik, Gewässerkunde und Wasserwirtschaft, Technische Universität, Karsplatz 13, A-1040 Wien, Austria*

D.P. Loucks
*Department of Civil and Environmental Engineering, Cornell University, Hollister Hall, Ithaca, NY 14853-3501, USA*

K. A. Salewicz
*International Institute for Applied Systems Analysis, A-2361 Laxenburg, Austria*

Proceedings of an international symposium held during the XXth General Assembly of the International Union of Geodesy and Geophysics at Vienna, 11–24 August 1991. The symposium was organized jointly by IAHS, UNESCO and WMO

IAHS Publication No. 201
CONTENTS

Preface Frans H. M. van de Ven v

1 WATER MANAGEMENT AND CO-OPERATION IN LARGE AND/OR INTERNATIONAL RIVER BASINS

Prediction of hydrometeorological extremes in the Sudanese Nile region: a need for international co-operation K. Andah & F. Siccardi 3

Water resources management in the Zambezi valley: analysis of the Kariba operation C. Gandolfi & K. A. Salewicz 13

Co-operation in hydrology of the Rhine basin countries K. Hofius 25

Co-operation in hydrology of the Danube basin countries K. Hofius 37

Water resource developments and flow regimes on the Mekong River B. S. Piper, A. Gustard, C. S. Green & Pachem Sridurongkatum 45

Management of large international rivers — practical experience from a research perspective K. A. Salewicz 57

2 FLOW REGIMES AND WATER MANAGEMENT IN RELATION TO CHANGES IN CLIMATE, RIVER DEVELOPMENT AND LAND USE

Conceptual model for the calculation of the regional hydrologic effects of climate change A. Bárdoossy & H. J. Caspary 73

Long-term fluctuations of precipitation in the Danube River basin O. Behr 83

Commercial navigation in large rivers and the development of appropriate management alternatives N. G. Bhowmik 93

Evaluating modelling strategies for a complex water resource system D. M. Frick & J. D. Salas 105

The change of the hydrological cycle under the influence of global warming A. G. Georgiadi 119

Gestion des ressources hydriques en Tunisie centrale: les projets Sidi Saad et El Haouareb Ch. Guillaud & M. Trabelsi 129

Hydrologic regime of the Sapt Kosi basin, Nepal Richard Kattelmann 139

The impact of climate change and human activity on the hydrological cycle in North China Liu Chun-Zhen 149

The water balance of China and its large river basins Liu Guowei & Cui Yifeng 153

Changements climatiques et variations des écoulements en Afrique occidentale et centrale, du mensuel à l'interannuel G. Mahé & J. C. Olivry 163

Regional effects of climate change on water resources systems M. A. Mimikou, P. S. Hadjisavva & Y. S. Kouvopoulos 173
Development of a distributed hydrological model for flood forecasting and impact assessment of land-use change in the international Mosel River basin
M. Ott, Z. Su, A. H. Schumann & G. A. Schultz

The role of benchmark stations in water resources management

Change in flood regime of large rivers as a consequence of a significant water diversion: example of the hydropower plant Gabcikovo on the River Danube
A. Svoboda

Prediction of river runoff changes due to hydropower development on the Danube at Gabcikovo
J. Szolgay

The "ACRU" modelling system for large catchment water resources management
K. C. Tarboton & R. E. Schulze

Distributed parameter models to analyse the impact of human disturbance of the surface hydrology of a large tropical drainage basin in southern Africa
C. J. Vorosmarty, B. Moore III, A. Grace, B. J. Peterson, E. B. Rastetter & J. Melillo

Potential impacts of global climatic evolution on the optimal scheme of a hydroelectric complex
S. Weyman & P. Bruneau

Evaluating sustainable instream flow and water supply potential of a river by simulation
Yu Yun-Sheng & Jian Xiao-Dong

3 WATER QUALITY AND SEDIMENT TRANSPORT MANAGEMENT

Modelling nitrogen transport from a basin of mixed land use in southern Sweden
Maja Brandt

Evaluating contaminant transport using Lagrangian sampling in the St. Lawrence River, Canada
D. H. de Boer, C. Lemleux & K. R. Lum

Intensive sediment transport from the Upper Nile basin and water resources management in Sudan
S. Elsheikh, A. Kaikai & K. Andah

Bank erosion and meander migration of the Red and Mississippi Rivers, USA
Colin R. Thorne

4 OPERATIONAL FLOW AND WATER QUALITY FORECASTING

Flood forecasting for the River Meuse
H. E. J. Berger

Alarm system for accidental pollution on the River Rhine
G. J. A. A. Broer

On the development of "applicable" models for flood forecasting
D. K. Gutknecht

Runoff modelling and forecasting of river basins, and Himalayan Snowcover Information System (HIMSIS)
A. S. Ramamoorthi & H. Haefner

Hydrological forecasting and updating procedures
P. Serban & A. J. Askew

Operation of a multibasin hydrosystem
D. Stephenson & R. W. Taylor

Operational flood forecasting on the River Meuse using on-line identification
P. A. Troch, F. P. de Troch & D. van Erdeghem

Operational river-flood forecasting by Wiener and Kalman filtering
K. Wilke & F. Barth