Hydrological Sciences for Managing Water Resources in the Asian Developing World

Edited by:

XIAOHONG CHEN
Center for Water Resources and Environment, Sun Yat-sen University, Guangzhou, China

YONGQIN DAVID CHEN
Department of Geography and Resource Management, and Institute of Space and Earth Information Science, The Chinese University of Hong Kong, Hong Kong, China

JUN XIA
Institute of Geographic Sciences and Natural Resources Research, Chinese Academy of Sciences, Beijing, China

HAILUN ZHANG
Nanjing Institute of Hydrology and Water Resources, Nanjing, China

IAHS Publication 319
in the IAHS Series of Proceedings and Reports
Contents

Preface  by Xiaohong Chen, Yongqin David Chen, Jun Xia & Hailun Zhang

1  Novel Techniques for Hydrological Analysis

Wavelet analysis on inter-annual variation of precipitation in Guangdong, China 3
Xiaohong Chen & Dedi Liu

A parallel adaptive metropolis algorithm for uncertainty assessment of Xinanjiang model parameters 10
Chun-Tian Cheng, Xiang-Yang Li & K. W. Chau

ANN models for groundwater dynamics in the lower reach of Shiyang River basin, northwest China 17
Zailin Huo, Shaoyuan Feng, Shaozhong Kang, Wangcheng Li & Shaojun Chen

Application of ANN for runoff forecasting: an analysis of the methodology 25
Yajiao Li, Bing Shen & Jiake Li

Application and testing of a new flood stochastic simulation model in China 31
Yuangfang Chen, Wenpeng Wang, Guoxin Chen, Shujiang Li & Aomi Chen

A hybrid fuzzy and neural network model for hydrological forecasting in ungauged basins 39
Ranhang Zhao & Shouyu Chen

A fuzzy pattern recognition model for water quality evaluation based on the principle of maximum entropy 49
Juliang Jin, Youfu Zhang, Yiming Wei & Lihua Tang

Appropriate spatial scales to achieve model output uncertainty goals 57
Martijn J. Booij & Charles S. Melching

Application and evaluation of methods for identifying hydrologically homogeneous regions 68
Jingyi Zhang, Haiqing Xu & Hui He

A new design flood hydrograph method based on bivariate joint distribution 75
Yi Xiao, Shenglian Guo, Pan Liu & Bin Fang

Stable isotopic characterization of precipitation, soil water and groundwater in Taihang Mountain, north China 83
Fadong Li, Xianfang Song, Changyuan Tang, Changming Liu, Akihiko Kondoh & Wanjun Zhang
2  Hydrological Modelling

Monthly streamflow simulation for Upper Changjiang Basin above the Three Gorges in China  Tian-Yu Long, Ming-Ko Woo & Robin Thorne

Application of the SIMHYD rainfall–runoff model to two catchments in China  Xiang Zhang, Xiaodan Chen, Francis Chiew & Caiyun Liu

Low flow simulation for Dongjiang Basin using the Xinanjiang watershed hydrological model  Guoru Huang & Yongqin David Chen

Exploring hydrological process features of the East River (Dongjiang) basin in south China using VIC and SWAT  Ji Chen & Yiping Wu

GIS-based hydrological modelling: a comparative study of HEC-HMS and the Xinanjiang model  Mohammad Bakir & Xingnan Zhang

Rainfall–runoff relation for porous pavements under artificial rainfall  Lizhou Hou, Shaoyuan Feng, Yueyuan Ding & Fengxin Wang

Development and application of an infiltration rate curve for runoff analysis in the North China Plain  Haoyun Hu, Chenghua Dang & Xiaoli Ren

Modelling and predicting the unsaturated hydraulic transport properties with a new characteristic model  Y. Wang, S. M. Grove, M. G. Anderson & L. F. Liu

A hybrid finite analytical method for numerical simulation of jets in co-flowing conditions  Xiaohua Wei & Wensheng Luo

3  Hydrological Impacts of Global Change and Human Activities

Evaluating the influence of land-cover change on catchment hydrology through the modified Xinanjiang model  Fei Yuan & Liliang Ren

Analysis of hydrological changes of lakes and rivers in Xinjiang using GIS techniques and remote sensing data  Dilinuer Aji, Akihiko Kondoh & Changyuan Tang

Impact of human activities on the flow regime of the Yellow River  Guobin Lu, Qiongfang Li, Zhenhua Zou, Hongjie Wang, Ziqiang Xia & Xirong Ma

Modelling of water availability response to climate change: a case study of Dongjiang (East River) basin, south China  Tao Jiang, Yongqin David Chen, Xiaohong Chen, Tao Yang, Zufa Liu & Kun Li

Recognition of climatic drought in Anzali wetland basin on the southwestern coast of the Caspian Sea  Bahman Ramezani

Flow and sediment regulation and its effects in the Yellow River  Dong Wang, Shaoming Pan, Jichun Wu, Qingping Zhu, Ling Wang & Chang Liu
4 Optimal Allocation of Water Resources

Sustainable-development-oriented optimal allocation of water resources: a case study in Foshan City, Guangdong, China Dedi Liu, Xiaohong Chen & Bingjun Liu

An improved optimization method for long-term operation of cascade multipurpose reservoirs in Yellow River, China Yadong Mei & Ying Xiong

Optimal water resource allocation in the water source area of the Middle Route of the South-to-North Water Transfer Project Bingjun Liu, Dongguo Shao & Xingpin Shen

Measures for ensuring security and safety of water supply in Dongguan City, south China Bing Ji, Jinchun Fan, Jin Tao & Jian Liang

Models for optimum distribution of water resources at three hierarchies and their applications Qiting Zuo, Zening Wu & Junxia Ma

Influence of the South-to-North Water Transfer Project on water resources carrying capacity of the Yangtze River Basin Jun Yan, Jun Wang, Zhanwen Ding, Xiaolei Zhang & Hucheng Li

A two-stage dynamic game model for water resources optimal allocation Jian-Cang Xie, Fan Sun, Yu-Peng Wang, Ker Kong & Yew-Gan Thian

Optimal design of seasonal flood control water levels for the Three Gorges Reservoir Pan Liu, Shenglian Guo & Wei Li

5 Water Resources and Watershed Management

Reform of water rights system in China: theory and practice Shaohua Li, Zengchuan Dong & Xuetao Sun

A comprehensive benefit evaluation for the Xiangjiang River basin rehabilitation project Yunqing Wu, Dongguo Shao & Yi Xiao

Participatory approach in groundwater management and ecological restoration in a coastal area affected by seawater intrusion Shisong Qu, Weiping Wang & Liting Xing

Application of the FOSM method in water project management Jian Pan, Wenyao Yan, Naiji Zhang, Huiting Liu, Rongjun Mai & Hui Chen

Governance and regulation in the drinking water sector for Karnataka State, India H. K. Ramaraju

Institutional reform of water resources management in China Meinan Liu, Zufa Liu, Tao Jiang, Xiaohong Chen & Haixia Yu

An analysis of urban water resources carrying capacity: a case study of Shenzhen city Junhe Chen & Chunyuan Huang
6 Water Environment and Aquatic Ecosystem

EO-1 Hyperion and ALI inter-sensor comparison of retrieval of river suspended solid concentration in the Pearl River Estuary  
Shuisen Chen, Ligang Fang, Yuhuai Zeng & Lixin Zhang

Assessment models for anti-pollution capability of karst groundwater in north China  
Liting Xing, Fengxin Kang, Weiping Wang & Zhenmin Ma

Assessment of nitrate pollution using stable isotopic and geochemical methods in the Pearl River Delta, south China  
Yintao Lu, Changyuan Tang, Jianyao Chen & Sakura Yasuo

Characteristics and distribution of rare earth elements in suspended sediments of the Zengjiang River, south China  
Zhen Tao, Quanzhou Gao, Xiaohong Chen, Zufa Liu & Jian Ding

Calculation of pollutant flux of the Qiantang River based on ADCP  
Haixia Yu & Liqiang Xu

Adsorption and desorption of phosphate by wetland sediments in Hong Kong  
Yuk Fo Lai & Kin Che Lam

Hydrochemical analysis on groundwater in shallow aquifer of Manukan and Mabul Islands, Malaysia  
Ahmad Zaharin Aris, Mohd Harun Abdullah & Baba Musta

A multi-parametric eco-hydrological model for the spawn field of Acipenser sinensis downstream of Gezhouba Dam  
Yongbo Chen, Xuan Ban & Damei Li

Revegetation with Panicum repens on the water fluctuation belt of reservoirs in south China  
Hua Fang, Jian-Ping Lin, Jiang-Ming Mo, Qi-Feng Fu & Shu-Bin Lin

Non-point source water pollution and water quality protection in Guangdong Province  
Zufa Liu, Tao Jiang, Xiaohong Chen, Haixia Yu, Wenjie Lin, Xia Liu & Mingyu Huo

Modelling the impact of land use changes on nonpoint source pollution loading  
Wing Chi Hui & Yongqin David Chen

Key word index