



Proceedings
of 16th IAHR-APD Congress
and 3rd Symposium of IAHR-ISHS

Vol. VI: Hydropower Hydraulics

Advances in Water Resources and Hydraulic Engineering

Nanjing, China
October 20-23, 2008

Editors
Changkuan Zhang
Hongwu Tang



Tsinghua University Press



16th Congress of Asia and Pacific Division
of International Association of Hydraulic
Engineering and Research



and

3rd IAHR International Symposium
on Hydraulic Structures



Proceedings
of 16th IAHR-APD Congress
and 3rd Symposium of IAHR-ISHS

Vol. VI: Hydropower Hydraulics

Editors
Changkuan Zhang
Hongwu Tang

Advances in Water
Resources and Hydraulic Engineering

Nanjing, China
October 20-23, 2008



Tsinghua University Press

版权所有, 侵权必究。侵权举报电话: 010-62782989 13701121933

图书在版编目(CIP)数据

第16届亚太地区国际水利学大会暨第3届国际水工水力学研讨会文集=Proceedings of 16th IAHR-APD Congress and 3rd Symposium of IAHR-ISHS: 英文/河海大学主编. —北京: 清华大学出版社, 2008.10

ISBN 978-7-302-18662-5

I. 第… II. 河… III. 水利工程—水力学—国际学术会议—文集—英文 IV. TV13-53

中国版本图书馆CIP数据核字(2008)第150466号

责任编辑: 汪亚丁 徐晓飞

责任印制: 孟凡玉

出版发行: 清华大学出版社

地址: 北京清华大学学研大厦A座

<http://www.tup.com.cn>

邮编: 100084

社总机: 010-62770175

邮购: 010-62786544

投稿与读者服务: 010-62776969, c-service@tup.tsinghua.edu.cn

质量反馈: 010-62772015, zhiliang@tup.tsinghua.edu.cn

印刷者: 北京密云胶印厂

装订者: 三河市新茂装订有限公司

经销: 全国新华书店

开本: 203×283 总印张: 156.25

总字数: 4610千字

版次: 2008年10月第1版

印次: 2008年10月第1次印刷

印数: 1~650

定价: ¥1200.00元 €200.00(全6卷含光盘)

本书如存在文字不清、漏印、缺页、倒页、脱页等印装质量问题, 请与清华大学出版社出版部联系调换。联系电话: 010-62770177 转 3103 产品编号: 029520-01

Sponsored by
International Association of Hydraulic Engineering and Research (IAHR)



Co-sponsored by

National Natural Science
Foundation of China



Chinese Hydraulic
Engineering Society



China Society for
Hydropower Engineering



State Key Laboratory of Hydrology-water
Resources and Hydraulic Engineering



National Engineering Research Center of Water Resources
Efficient Utilization and Engineering Safety



Organized by
Hohai University



Co-organized by
Nanjing Hydraulic Research Institute



FOREWORD

As Asian countries continue to be some of most important branches of the International Association of Hydraulic Engineering and Research (IAHR), the IAHR Asia and Pacific Division (IAHR-APD) is playing an ever-increasing active role in the field of Hydraulic research and its practical application. In order to embrace the traditional use of hydraulic structures in water resource development, and to improve water management practices, water quality, and restoration of natural habitats, the International Symposium on Hydraulic Structures (IAHR-ISHS) is held every two years with the intention of advancing our knowledge and understanding of hydraulic phenomena near hydraulic structures.

The 16th Congress of Asia and Pacific Division of IAHR and the 3rd IAHR International Symposium on Hydraulic Structures will jointly be held in Nanjing, China, from October 20 - 23, 2008.

To meet the challenges of, and play vital roles in, improving the human demand and strain on water resources, the central theme of the congress / symposium is “**Water and Humanity — Friendship, Harmony and Sustainable Development**”.

Focusing on this central theme, the set of proceedings consists of six volumes. Each volume subsequently contains four or five sub-themes. In volume 4, the topic of the additional forum on “Resettlement and Social Aspects” is added. The volumes and sub-themes are as follows:

Volumes for the 16th IAHR-APD Congress

Vol. 1: Water Resources and Hydrology

- 1) Hydrology modeling and real-time flood forecasting
- 2) Flood management, risk analysis and hazard evaluation
- 3) Surface and groundwater hydrology, urban hydrology
- 4) Drought and efficient utilization of water resources

Vol. 2: Environmental and Ecological Hydraulics

- 1) Environmental effects and management of water resources
- 2) Flow, jet, plume and stratified flow, hydraulics and ecological hydraulics
- 3) Contaminant transport modeling and water quality control
- 4) Ground water pollution

Vol. 3: Fluvial Processes and River Engineering

- 1) Scour, sediment transportation, river dynamics and fluvial processes
- 2) Flood control and defense, and river rehabilitation
- 3) Sediment problems in environment and ecology
- 4) Soil erosion and watershed management

Vol. 4: Estuarine and Coastal Hydraulics

- 1) Numerical and physical modeling of coastal engineering
- 2) Coastal sediment transport and morphology change
- 3) Wave characteristics and wave-structure interaction
- 4) Coastal and estuarine environment
- 5) Resettlement and Social Aspects

Volumes for the 3rd IAHR-HS Symposium

Vol. 5: Hydraulic Structures for Water Projects

- 1) New developments in design, construction, operation, monitoring and maintenance of hydraulic structures
- 2) Numerical and physical modeling
- 3) Risk and safety assessment
- 4) Instrumentation and technology in laboratory experiments and field tests
- 5) Sustainable design of hydraulic structures

Vol. 6: Hydropower Hydraulics

- 1) Intakes and outlets, spillways, fish ways and energy-dissipating structures
- 2) Two-phase flow, pipe flow, cavitation, vibration and aeration
- 3) Hydraulic machinery
- 4) Environmental and ecological impact of hydraulic structures

A total of 450 papers were submitted to the congress / symposium, one of the strongest responses we've had yet. After thorough review, 392 of these papers, representing 25 countries and regions, are published into six volumes for the proceedings, of which 86.72 % are from Asia, 7.91 % from Europe, 2.81 % from South America, 2.04 % from Australia and New Zealand, 0.26 % from Africa, and 0.26 % from North America.

We would also like to gratefully acknowledge the sponsors and co-sponsors of our Congress: International Association of Hydraulic Engineering and Research, National Natural Science Foundation of China, Chinese Hydraulic Engineering Society, China Society for Hydropower Engineering, State Key Laboratory of Hydrology-Water Resources and Hydraulic Engineering, National Engineering Research Center of Water Resources Efficient Utilization and Engineering Safety and etc.

Many people have contributed greatly to these proceedings. We would especially like to thank Professor Li Guifen, Professor Wang Lianxiang, Professor V. Sundar, and Professor J. Matos for their gracious guidance and help. We would also like to thank all of the members of the Local Organizing Committee, all of the members of the scientific committee, as well as all of the authors who entered their work into the conference. Also highly appreciated was the dedicated work of Professor Mao Ye, Professor Wang Lingling, Professor Cai Fulin, Professor Sheng Jinchang and Dr. Pan Hong. The editors are also grateful to the reviewers for their diligent work and professional contributions which help maintain the quality of the papers.

We hope that the proceedings will serve as a reference point for water-related issues for researchers, scientists, engineers and managers alike.



Professor C. K. Zhang

Chairman, LOC of the 16th IAHR-APD Congress and the 3rd IAHR-HS Symposium

President of Hohai University

Nanjing, China, Oct. 1st, 2008

Organization

International Committee of IAHR Section on Hydraulic Structures

Chairman	J. Matos	Portugal
Secretary	H. Chanson	Australia
Members	A. Marcano	Venezuela
	B. Westrich	Germany
	C. Gissonni	Italy
	C. Mateos	Spain
	C. Pugh	USA
	H. Knoblauch	Austria
	J. Attari	Iran
	J. Guo	China
	J. Koengeter	Germany
	S. Pagliara	Italy
	W. Hager	Switzerland
	Y. Yasuda	Japan
	P. H. Burgi	USA
Co-opted Member		

Local Organizing Committee

Chairman	C. K. Zhang	Hohai University
Vice-Chairmen	J. Y. Zhang	NHRI
	Y. X. Yan	Hohai University
Secretary	H. W. Tang	General, Hohai University
Co-Secretary	L. X. Wang	IWHR (for APD)
	L. L. Wang	Hohai University (for APD)
	J. Guo	IWHR(for ISHS)
	F. L. Cai	Hohai University (for ISHS)
	X. N. Zhang	Hohai University
	W. Zhang	Hohai University
	B. T. Zhang	CSHE
	G. Q. Shi	Hohai University
	J. C. Guo	Hohai University
	J. H. Wu	Hohai University
Joint- Secretary	J. Zhao	Hohai University
	L. L. Ren	Hohai University
	L. Liu	Hohai University
	S. Q. Wu	Nanjing Hydraulic Research Institute
	X. P. Dou	Nanjing Hydraulic Research Institute
	Y. Li	Nanjing Hydraulic Research Institute
	Z. L. Hua	Hohai University
Members	Z.T. Li	CHES

Scientific Committee for 3rd IAHR-ISHS

Chairman	G.F. Li	IWHR, China
Co-Chairman	J. H. W. Lee	Uni. of Hong Kong, Hong Kong, China (for APD)
	P. H. Burgi	IAHR Applied Hydraulics Division (for ISHS)
Members	A. Ervine	University of Glasgow, UK
	A. J. Odgaard	The University of Iowa, USA
	A. Lejeune	University of Liège, Belgium
	A. Marcano	EDELCA, Venezuela
	A. Schleiss	EPFL-LCH, Switzerland
	B. Petry	UNESCO-IHE Delft, Netherlands
	B. Westrich	Universitat Stuttgart, Germany
	C. Gisonni	Seconda Università di Napoli, Italy
	C. Mateos	Universidad Politécnica de Madrid, Spain
	C. Pugh	Water Resources Laboratory, USBR, USA
	D. Stephenson	University of Botswana, Botswana
	G. Q. Yu	Hohai University, China
	H. Chanson	University of Queensland, Australia
	H. D. Vriend	WL|Delft Hydraulics, The Netherlands
	H. Knoblauch	Graz University of Technology, Austria
	I. Nezu	Kyoto University, Japan
	J. Attari	Power & Water Institute of Technology, Iran
	J. Dolz	Technical University of Catalonia, Spain
	J. Gulliver	University of Minnesota, USA
	J. Guo	IWHR, China
	J. Koenigter	Aachen University, Germany
	J. Matos	Technical University of Lisbon, Portugal
	R. Janssen	Bechtel Australia, Australia
	R. Lopardo	Argentinean Nat. Water Institute, Argentina
	S. Pagliara	Università di Pisa, Italy
	W. Hager	ETH-VAW, Switzerland
	W. L. Xu	Sichuan University, China
	Y. Yasuda	Nihon University, Japan
	Z. R. Wu	Hohai University, China

CONTENTS

Vol. I Water Resources and Hydrology

Distribution of System Deviation in Real Time Correction of Hydraulic Model Combing With Kalman Filter	<i>Xiaoling Wu, Chuanhai Wang</i>	1
Stochastic Modeling and Prediction of The Ganges Flow	<i>Islam G.M. Tarekul, Kawahara Yoshihisa</i>	6
Distributed Water Balance Model in Watershed Coupling With River Dynamic Flow Routing Method	<i>Ahmed Hassan, Norio Tanaka, Nobuyuki Tamai</i>	12
Optimal Determination of The T-Hour Unit Hydrograph By Using Goal Attainment Method	<i>Xiaohua Dong, Yunfa Zhao, Jie Yua, Qiyong Peng</i>	18
Sensitivity Analysis of Distributed Rainfall-Runoff Models	<i>Freddy Soria, So Kazama, Masaki Sawamoto</i>	24
Genetic Programming To Forecast Stream Flow	<i>S B Charhate, Y.H.Dandawate, S N Londhe</i>	29
Constrained Scaling Approach For Design Rainfall Estimation	<i>YuePing Xu, YeouKoung Tung, Feifeng Cao, Yangbin Tong</i>	35
Artificial Neural Network Technique For Raingauge Based Rainfall Nowcasing	<i>Shan He, ShieYui Liong</i>	40
Analysis of The Regional Flow Duration Curve For Dongjiang Basin, South China	<i>Tao Jiang, Guoru Huang</i>	45
Daily Flow Estimation At Ungauged Regions Based On Regional Flow Duration Curves	<i>Guoru Huang, Chuanbo Zhu</i>	50
Calibration of The Conceptual Rainfall-Run Off Model's Parameters	<i>Shuiyan Li, Rongzhi Qi, Weiwei Jia</i>	55
Regional Climate Variations in South China Related To Global Climate Change and Local Urbanization	<i>Qinglan Li, Ji Chen</i>	60
Flash Flood Hydarologic Processes of A Small Headwater Catchment in Hong Kong	<i>Yanqiu Li, Ji Chen, Mervyn Peart, Liqun Sun, WingKan Lok</i>	66
Application of Vic and A Routing Scheme To Pearl River Basin in South China	<i>Jun Niu, Ji Chen</i>	72
Spatial Interpolation of Rainfall Based on DEM	<i>Bing Huang, Tiesong Hu</i>	77
A Grid-Based Kinematic Distributed Hydrological Model For Digital River Basin	<i>Jintao Liu, Jie Feng, Martins Y. Otache</i>	82
Uncertainty On A Short-Term Flood Forecast With Rainfall-Runoff Model	<i>Hadi Kardhana, Akira Mano</i>	88
Study On Safety Proofing of Flood Control in Water System Planning For The New Countryside of Southern Jiangsu		

Numerical Simulation of Flood Estimation For Gis-Based Local Inundation Map	<i>Chao Zhang, Xiangyang Xu</i>	93
Analysis On Mass Storm Flood in The Upper Minjiang River Since 1980s	<i>Jin Woo Lee, Seung Oh Lee, Yong-Sik Cho</i>	98
Numerical Analysis For Evacuation Possibility from Small Underground Space in Urban Flood	<i>Baoming Jin</i>	102
Spatial and Temporal Prediction of Flash Floods in Ungauged Area Based On Gis	<i>N. Yoneyama, K. Toda, S. Aihata, D. Yamamoto</i>	107
Research of Region Water Security Evaluation By Set Pair Analysis	<i>Guangcai Chen, Ping Xie, Lihua Xiong, De Li</i>	113
Functional Requirements and Deployment Analysis For Multi-Reservoir-Based Flood Control and Management Software System	<i>Qian Huang, Shougang Tian, Baoxiang Zhang, Jiwen Huang</i>	119
Construction of Evaluation Index System and Evaluation Model of Flood Disaster Risk	<i>Shengyang Li, Arthur E. Mynett</i>	124
Risk Evaluation of The Dahuangpu Flood Detention Area	<i>Guohua Fang, Yuqin Gao</i>	130
Assessment of Safety On Evacuating Route During Underground Flooding	<i>Chaohong Zhou, Feiyu Jiao and Xiaorong Gu</i>	136
An Indoor Test For Seepage Characteristic of Crossed Karst Pipe and Fissure	<i>Taisuke Ishigaki, Ryuji Kawanaka, Yoshizumi Onishi, Hiroaki Shimada Keiichi Toda, Yasuyuki Baba</i>	141
Numerical Simulation of Upconing and Freshwater Lens Breakage in A Coral Island	<i>Zhenzhong Shen, Fen Chen, Jian Zhao</i>	147
Investigation of Inertial Effect in Simplified Porous Media Flow	<i>Congzhi Zhou*, Qin Yang, Zhengdong Fang, Hengguo Liang, Hao Wang</i>	154
Underground Inundation Analysis By Integrated Urban Flood Model	<i>Zhiyong Hao, Niansheng Cheng, Soon Keat Tan</i>	160
Analytical Solution of Groundwater Tidal Response in Estuarine Aquifer	<i>Toda K., Kawaike K., Yoneyama N., Fukakusa S., Yamamoto D.</i>	166
Groundwater Movement in The Estuarine Deltaic Region of Yangtze River	<i>Jing Chen, Zhifang Zhou</i>	172
Tracing Groundwater With Strontium Isotopic Compositions in The Hexi Corridor Basin, Northwestern China	<i>Jing Chen, Zhifang Zhou</i>	178
Isotopic Exchange of Soil Water in Water Cycle	<i>Yongsen Wang, Jiansheng Chen, Liang Chen</i>	184
Seasonal Change of Groundwater Flow and Its Effect On Temperature Distribution in Sendai Plain	<i>Haiying Hu, Weimin Bao, Tao Wang, Simin Qu</i>	188
Tentative Hydrologic Soil Classification For Tropical Soils	<i>Luminda Gunawardhana, Kazama So, Sawamoto Masaki</i>	193
Reserach On Inverse Geochemical Simulation of Phreatic Water in Western Jilin Province	<i>Aderson Sartori, Abel Maia Genovez, Francisco Lombardi Neto</i>	199

..... <i>Chao Du, Changlai Xiao, Bo Feng, Xiujuan Liang, Zhe Ma, Dongdong Zhang</i>	205
Analysis of Groundwater Function in Western Jilin Province	
..... <i>Xiujuan Liang, Changlai Xiao, Wei Fan, Chao Du, Guangming Wang, Songlin Deng</i>	209
Groundwater Numerical Simulation of Multi-Aquifers in Songnen Plain	
..... <i>Changlai Xiao, Xiujuan Liang, Zhang Fang, Bo Feng, Shaoming Xie</i>	214
The Treatment of Source and Sink Data in Groundwater Numerical Simulation in The North Foot of Tianshan Mountain	
..... <i>Xufeng Liang, Xiaoling Xu*, Wenke Wang, Zhao Wang, Junhai Lou, Jinliang Yang</i>	219
Sequential Prediction of Daily Groundwater Levels By A Neural Network Model Based On Weather Forecasts	
..... <i>C. A. S. Farias, K. Suzuki, A. Kadota</i>	225
Hydrograph Separations Based On Isotopic- Chemical Mixing Models	
..... <i>Zhongcheng Tan, Baohong Lu, Jiyang Wang</i>	231
Site Suitability Analysis For Riverbank Filtration in The Han River, Korea	
..... <i>Sang Il Lee, Sang Sin Lee</i>	236
Design of Road Surface Drainage Facilities Based On Varied Flow Analysis	
..... <i>HyeJin Ku, KyungSoo Jun</i>	240
Experimental and Numerical Study On Inundation Flows in Urban Areas	
..... <i>Yoshihisa Kawahara, Yasushi Ito, Tatsuhiko Uchida</i>	246
Experimental and Analytical Study of Hydrau- Lic Fracturing of Cylinder Sample	
..... <i>Meili Zhan, Jinchang Sheng, Jian Cen</i>	252
Permeability Changes in A Rock Fracture During Coupled Fluid Flow and Chemical Dissolution Processes	
..... <i>Jinchang Sheng, Xiaochen Xu, Meili Zhan, Shuyuan He, Baoyu Su, Jishan Liu</i>	257
Characteristics of Streamflow Infiltration in The Piedmont Plain of Hebei Province, China	
..... <i>Shengyong Lu, Xubo Gao, Xuhui Fu</i>	263
Estimation of Annual Ground Water Recharge in The Sedimentary Basin of The River Peixe, Paraíba, Brazil	
..... <i>Brito, Gracieli L M., Schuster, Hans D., Srinivasan, Vajapeyam S</i>	269
Numerical Simulation of Urban Waterlogging Disaster Due To Plum Storm	
..... <i>Zhiyong Dong, Jiarong Lu</i>	275
Development of Dualistic Model For Integrated Water Resources Management in The Haihe River Basin	
..... <i>Yangwen Jia, Hao Wang, Hong Gan, Zuhao Zhou, Yaqin Qiu, Jinjun You, Zhiguo Gan, Cunwen Niu</i>	281
The Development and Application of Wacm	
..... <i>Yuansheng Pei, Yong Zhao, Chuiyu Lu, Changhai Qin, Weihua Xiao</i>	288
Drought and Water Supply Reliability of East River (Dongjiang) Basin in South China	
..... <i>Runrun Zhang, Ji Chen, Guangbai Cui</i>	296
Connotation of Reservoir Sustainable Utilization and Framework of Evaluation Index System	
..... <i>Xinyang Liu, Jinyao Luo</i>	301
Water Security Scenario Analysis: Methodology and A Case Study	
..... <i>Fang Tong, Zengchuan Dong</i>	307
Regional Low Flow Frequency Analysis Using Bayesian Regression and Prediction At Ungauged Catchment in Korea	

.....	<i>Sang Ug Kim, Kil Seong Lee, Kyungshin Park</i>	314
Effects of Gravel and Date-Palm Mulch On Heat Moisture and Salt Movement in A Desert Soil	.....	
.....	<i>Hiroaki Terasaki, Teruyuki Fukuhara, Masaki Ito, Chao He</i>	320
The Economic Impacts of Water Shortage During A Drought in Korea: Using Intraregional I-O Analysis	.....	
.....	<i>Dooho Park</i>	326
Evaporativity and Productivity of A New Tubular Solar Still	.....	
.....	<i>Amimul Ahsan, Teruyuki Fukuhara</i>	333
Influences of Angstrom'S Coefficients On Estimate of Solar Radiation and Reference Evapotranspiration By Penman-Monteith Equation	.....	
.....	<i>Junzeng Xu, Shizhang Peng, Yufeng Luo, Zheng Wei</i>	339
A Simple Model To Estimate Wetted Soil Volume from The Trickle By Use of The Dimensional Analysis Technique	.....	
.....	<i>Farhad Mirzaei, Mojtaba Hatami, Fatemeh Mousazadeh</i>	345
The Replicate Compression Heuristic For Improving Efficiency of Urban Water Supply Headworks Optimization	.....	
.....	<i>Lijie Cui, George Kuczera</i>	353
Multi-Objective Risk Assessment On Water Resources Optimal Allocation	.....	
.....	<i>Wenquan Gu, Dongguo Shao, Xianfeng Huang, Tao Dai</i>	361
Preliminary Evaluation of The Current Level of Flood Water Resource Utilization in The Yellow River Basin	.....	
.....	<i>Xuejun Shao, Jian Zhang, Zhongjing Wang, Sihui Liao</i>	367
Study On Cybernetic Model of Optimal Allocation of Water Resources	.....	
.....	<i>Fang Guohua, Zhong Linjuan, Sun Cuiqin</i>	373
Study On Optimal Regulation Modelling of Reservoir Discharge	.....	
.....	<i>Xianyun Cheng, Yicheng Wang, Honglu Liu</i>	379

Vol. II Environmental and Ecological Hydraulics

Flood Flow Analysis During Rising And Falling Stages in A Doubly Meandering Compound Channel	.....	
.....	<i>Islam G.M. Tarekul, Kawahara Yoshihisa, Tamai Nobuyuki</i>	387
Study on Evaluation Index and Methods of River Ecosystem Health	.....	
.....	<i>Fengcun Yu, Guohua Fang, Yongxiao Cao</i>	393
Structure & Function Based Approaches to Reconstructing Urban River System in River Network Area of China	.....	
.....	<i>Hui Xu, Yang Du, Cen Cui, Cuie Wei</i>	399
Modelling of the Riparian Vegetation Dynamics Due to Reservoir Operations Through an Integrated Cellular Automata	.....	
.....	<i>Fei Ye, Qiuwen Chen, Desuo Cai, Arthur Mynett</i>	405
Depth-Avegraged Modeling of Vegetated Open-Channel Flows Using Finite Element Method	.....	
.....	<i>Tae Beom kim, Sung-Uk Choi</i>	411
Research on Inactivation of Blue-Green Algae Using Water Hammer Pressure	.....	
.....	<i>Tatsuhisa hamada, Yasumasa yamada, Shigekatsu endo, Hajime ogawa</i>	417
Connotation and Evaluation Indicators System of River Health	.....	
.....	<i>Wenxian Guo, Ziqiang Xia, Hongxiang Wang</i>	423

Mean and Turbulence Structures of Open-Channel Flows with Submerged Vegetation	Wonjun Yang, Sung Uk Choi	429
Study on Reason Why Ayu Migrates from Sea To River	Takayuki Nagaya, Yoshiki Shiraishi, Kouki Onitsuka, Makoto Higashino, Tohru Takami, Hitoshi Higashi, Juichiro Akiyama, Atsushi Ono*, Yoshinobu Akaki	435
Planning Methodology of Destratification System in a Reservoir Against Algal Bloom	M Umeda, S Furuya, H Tanaka	441
Effects of Transmitted Light and Bubbles in Open-Channel Flows on Fish Behaviors	Kouki Onitsuka, Juichiro Akiyama, Tatsuya Kobayashi, Takuya Watanabe, Yohei Iguni	447
The Comparison on Water Resources Effect of Typical Soil-Saving Dams in the Loess Plateau	Xiaoling Xu, Xufeng Liang*, Junping Yan	453
Effect Assessment of Low Temperature Water in Reservoir on the Growth of Wheat	Jiapeng Wu, Yusheng Huang, Kaiqi Chen	459
Edge-Effect of Ecological Riparian Zone	Jihong Xia, Ling Hu, Qianchao Pu	465
Study on Turbidity During Flood in Myoginohana Area of Lake Kasumigaura	Keisuke Yoshida, Tadaharu Ishikawa, Yuu Kobayashi*, Fumi Sasaki, Sadao Aoyama, Makoto Ichiyama	472
Effects of Vegetation Arrangement Pattern on Flow Resistance in an Open Channel	Terunori Ohmoto, Takayuki Tanaka	478
A Study of Pollutant Mixing and Evaluating of Dispersion Coefficients in Laboratory Meandering Channel	Il Won Seo, Sung Won Park, Hwang Jeong Choi	485
Derivation of Boundary Condition for Quasi-3d Model of Water Exchange Between Neijiang and the Yangtze River	Lianfang Zhao, Keisuke Yoshida, Tadaharu Ishikawa, Wei Zhu, Keisuke Futagi	491
Study on The Diagnoses Index System for River Health	Longhua Wu, Qingfang Hao, Wenbin Li	497
Environmental Hybrid Solution for Energy Optimization in Water Supply Systems	H M Ramos, F Vieira	502
The Study on General Evaluation of Regional Eco-Environmental Water Demand	Weijun Wang, Jiezhen Wu, Xiaode Zhou, Wen Cheng	508
The Extended Kalman Filter for Short Term Prediction of Algal Bloom Dynamics	Joseph H.W. Lee, J.Q. Mao, K.W. Choi	513
Evaluation of Environmental Impact of Tigris River Pollution (Between Jadirriya and Dora Bridges)	Al-Shalchi Thana, Al-Ani Najmiddin, Al-Shami Alaa	518
A Study on Impact of Livestock and Poultry Breeding Pollution on Water Environment Safety in Shandong Province	Taiying Huo, Guihua Lu, Yumei Wang, Lijun Ren	525
Environmental Releases in Arid Areas	Stephenson, David	531
Study on Pollution Deduction and Environmental Impact of Water-Saving Irrigation for Paddy Fields	Suigao Ye, Shizong Zheng, Xue Chen	539

Web-Based Virtual Environment for Decision Support System in Water Based System	Xuan Zhu, Arthur E. Mynett	545
Entrainment and Shear Instability of Stratified Flow in Curved Flume with 90° Bend	Kejian Chu, Zulin Hua, Linghang Xing, li Gu	551
Experiments on Pollutant Transport of Centerline Discharge into the Braided River	Zulin Hua, Li Gu	556
A Study on Hydrological and Hydraulic Features of <i>Trachidermus Fasciatus</i> Migration	Dongsheng Wang, Xiuying Wang	562
Numerical Study on Mixing Characteristics of Elliptic Jets in Co-Flow	Zhu Gao, Hongwu Tang, Hechun Chen	568
An Improved Integral Model for A Round Turbulent Buoyant Jet Based on the Turbulent Measurements	Hongxuan Yang, Minjiao Lu, Kumakura Toshiro, Hayakawa Norio	574
Equation for Streamwise Variation of Secondary Flow in Sinuous Channels	Kyong Oh Baek, Il Won Seo	580
Study on Laser Induced Fluorescence in Elliptic Jet	Hong Chen, Jiantong Huang, Limo Tang, Hakem Mebarka	586
Observational Analysis of Bubble Plume in Two-Layer Density Stratified Water	Baoshi Shiau, Huangfu Lai	592
Numerical Simulation of Plane Buoyant Jets With Regular Waves	Qinghua Yue, Lingling Wang	597
Modelling of Dense Jet in Co-Flow and Counter Flow	KW Choi, Daeyoung Yu, Joseph HW Lee	603
2D Turbulent Jet Study Based on Fluent	Xunbo Lu, Lingling Wang	608
Study on Efficiency of Aeration Type in Biological Aeration Filter on the Sewage Disposal	Baowei Hu, Chundi Yang, Wen Cheng	614
Digital Simulation of Dominant Eddies of A Co-Flowing Jet	Chris C.K. Lai, Joseph H.W. Lee, K.M. Lam	618
Application of Unstructured Cellular Automata on Ecological Modelling	Yuqing Lin*, Arthur Mynett, Qiuwen Chen	624
Enveloping Flow Region of Axisymmetric Turbulent Jets	Bidya S. Pani	630
Vorticity Characteristics of Chinese Sturgeon Spawning Ground	Yu Yang, Zhongmin Yan, Jianbo Chang	635
Roughness Coefficient Relations of Open Channel with Flexible Submerged Vegetation	Bing Shi, Chuanyuan Wang, Yin Zegao, Lin Zhao	639
The Effect of Vegetation Rigidity on Flow Resistance	Zhongmin Yan, Xiaoyan Wang	643
Experimental Studies on Aeration Performance of Hydraulic Tunnel Excavation	Haifei Sha, Lili Fan, Shiqiang Wu, Hui Zhou, Huijing Chen	646
Mixing of Coflowing Jets in Rivers	B.S. Pani, J.H.W. Lee, A.C.H Lai	651

Ammonium Ion Adsorption on Clays and Sand Under Freshwater and Seawater Conditions	
..... <i>F Abdulgawad, Evans Bettina Bockelmann, D Sapsford, KP Williams, Roger Falconer</i>	656
Study on the Triggering Factors of Algal Bloom in Fuchunjiang Reservoir Based on A Vertically Integrated Hydrodynamic Model	
..... <i>Tingfeng Wu, Liancong Luo, Guangbai Cui, Boqiang Qin</i>	662
Modeling of The Sewage Water Distribution in the Sea Near Hanko City of Finland	
..... <i>Huachen Pan, Marika Orava</i>	667
Turbulence Modeling of Solute Transport in Open-Channel Flows Over Submerged Vegetation	
..... <i>Hyeongsik Kang, SungUk Choi</i>	674
3D Hydro Environmental Model of Dissolved Oxygen Distribution in Yangtze Estuary	
..... <i>Yigang Wang, Xi Li</i>	680
New Approach for Estimation of Pollutant Load by Using Artificial Neural Network	
..... <i>Minghuan Liu, Kenji Yoshimi, Tadaharu Ishikawa, Kentaro Kudo</i>	683
Numerical Simulation of Improving Water Quality with A Restored Canal at Dongbin Harbor	
..... <i>Seong Soo Park, Yongsik Cho</i>	689
Numerical Modeling of Two-Dimensional Pollutnant Transport in Nakdong River	
..... <i>Jae Dong Kim, Young Do Kim, Siwan Lyu, Il Won Seo</i>	694
Two-Dimensional Numerical, Eco-Toxicological Modeling of Chemical Spills	
..... <i>Suiliang Huang, Yafei Jia, Sam S. Y. Wang</i>	699
A Study on Water Quality Modeling of Seonakdong River Using Ce-Qual-Riv1	
..... <i>Hwang Jin Young, Kim Young Do, Noh Joon Woo, Kwon Jae Hyun</i>	705
Numerical Simulation of Hydrodynamic Characteristics and Water Quality in Yangchenghu Lake	
..... <i>Yuliang Zhu, Juan Yang, Jialing Hao, Hongyan Shen</i>	710
Biodegradation of Alogenated Anilines in River Water	
..... <i>Guanghua Lu, Wenting Song, Bijun Xu, Chao Wang</i>	716
Study on The Adsorption of Aniline by Macroreticular Resin	
..... <i>Haizhen Zhang, Guanghua Lu</i>	722
Flow and Contaminant Transport in a Multiply Connected Domain of Natural River	
..... <i>Liren Yu, Jun Yu</i>	727
Theory and Practice About the Elimination of Salted Fog and Froth by Combining Main Pressure Flow with Assistant Open-Channel Flow	
..... <i>Ruixia Hao, Xinsheng Han, Ruisheng Li</i>	732
A Pilot Study for an Enhanced Algal Spatial Pattern Prediction Using Rs Images	
..... <i>Hong Li, Mijail Arias, Anouk Blauw, Steef Peters, Arthur E. Mynett</i>	738
Water Quality Forecast of the Tributaries of Three-Gorge Reservoir	
..... <i>Chao Ma, Jijian Lian</i>	744
Analysis of Nonpoint Source Pollution in Dahuofang Reservoir Watershed	
..... <i>Shiguo Xu, Chengwei Han, Dianwu Wang</i>	750
Distribution of System Deviation in Real Time Correction of Hydraulic Model Combing with Kalman Filter	
..... <i>Xiaoling Wu, Chuanhai Wang</i>	758
Do-Bod Modeling of River Yamuna Using Stream-Ii For Nct Region, India	
..... <i>Deepshikha Sharma, Ram Karan Singh</i>	763

Geochemical Evidence of Arsenic Transport in Shallow Ground Water, Bangladesh	
..... <i>Rahman Md.Tauhid-Ur, Mano Akira, Keiko Udo, Yoshinobu Ishibashi</i>	769
Experimental Research on Solute Transport in Fractured Rock Masses	
..... <i>Meili Zhan, Ruxiong Zhu, Shuyuan He, Jinchang Sheng</i>	775
Evaluation on the Groundwater Environmental Vulnerability Of Jidong County	
..... <i>Jinfeng Liu, Changlai Xiao, Xiujuan Liang, Bo Feng, Chao Du, Chuanyin Xu</i>	780
Experimental Research on Effect of Tide for Alongshore Groundwater Table	
..... <i>Longhua Wu</i>	785
Groundwater Behaviour in Subsurface Area of Underground Dams	
..... <i>Gregory DE COSTA, Hamaguchi Toshio</i>	789

Vol.III Fluvial Processes and River Engineering

Analysis of the Characters of Erosion and Deposition Downstream from the Reservoir	
..... <i>Fei Chen, Yitian Li</i>	797
A Bed form Based Resistance Function for Alluvial Channels from Experimental Data	
..... <i>Srinivasan, Vajapeyam S, Alcántara, Hugo M</i>	803
Transport Characteristics of Suspended Sediment on Mud Flat in A Tidal Channel	
..... <i>Kiyoshi Kawanishi, Tomoya Yokoyama</i>	809
Fine Sediment Deposition by Floods on the Upstream of A Weir With A Channel Bend	
..... <i>Yoshiyuki Shirotori, Kozo Watanabe, Keiko Udo, Akira Mano</i>	815
Local Scour Around Lateral Intakes in 180 Degree Curved Channel	
..... <i>A A Dehghani, M Ghodsian, K Suzuki, S Alaghmand</i>	821
On the Energy Used for Suspended Sediment by Water in Open-Channels	
..... <i>Caian Huang, Jin Zhang</i>	826
Hydraulic Experiments on Waves and Deformation of Mobile Riverbed with Sand Around Narrow Pass	
..... <i>Won-Il Kim, Jong-Woon Kim, Samhee Lee, Won-Sik Ahn</i>	832
Statistical Analysis of Bedforms Developed Under Unidirectional Flow	
..... <i>Heide Friedrich</i>	838
Numerical Computation of Turbulence Development in Flow Over Sand Dunes	
..... <i>N.Th. Fourniotis, N.E. Toleris, A.A. Dimas, A.C. Demetracopoulos</i>	843
Statistical Analysis of Collision Between Saltation Particle and Bed Surface	
..... <i>Limo Tang, Hongwu Tang, Hong Chen, Niansheng Cheng</i>	849
Bankfull Area Prediction Method Based on Erosion and Sedimentation	
..... <i>Lingyun Li, Baosheng Wu</i>	854
On the Characteristics of Flow Movement in the Bending and Bifurcated River	
..... <i>Jia Zhuang, Jiong Zhang, Dong Huang, Guodong Zheng, Guanwen Lai</i>	859
Modelling Dynamic Bed Roughness Associated with Bed form Development	
..... <i>WB Rauhen, B Lin, RA Falconer</i>	865
2-D Numerical Simulation of Flow in A Curved Open Channel	
..... <i>Gang Zhou, Hong Wang, Xuejun Shao Dongdong Jia</i>	871
Locally-Adaptive Grid System for 3D Numerical Simulation of Meander Migration	
..... <i>Dongdong Jia, Xuejun Shao, Hong Wang, Gang Zhou</i>	877

Improved Method for Non-Equilibrium Sediment Transport Equations with Confluence	<i>Dangwei Wang, Guolu Yang, Min Wang</i>	883
Trends in Water Runoff and Sediment Load in Selected World'S Rivers	<i>Bingfeng Xu, Jin Liang, Baosheng Wu</i>	889
Effects of Human Activities on Hydrology and Fluvial Process of Boluo Reach of the East River	<i>Rongyao Ji, Yongjun Lu, Liqin Zuo</i>	895
A New Estimation Method of Scour Depth in Energy Dissipation of Ski Jump Type	<i>Xin Zhou Zhang, Hui Xu, Hongling Qu</i>	901
Wall-Normal Velocity, Turbulent Structures and Sediment Transport	<i>Shuqing Yang</i>	907
Simultaneous Measurements of Particle Settling Velocity and Oscillating-Grid Turbulence	<i>Qi Zhou, Niansheng Cheng</i>	913
The Breakup of Armor Layer in A Gravel-Bed Stream with No Sediment Supply	<i>Tao Wang, Xingnian Liu</i>	919
Longitudinal Dispersion of Particle Motion Over Inclined Rough Plane	<i>Tao Liu, Hongwu Tang, Niansheng Cheng</i>	924
Sediment Carrying Capacity of Open Channel Flow Around Spur Dike	<i>Pengfei Hei, Zhicong Chen, Xiang Ding</i>	928
Study on Riverbed Evolvement of the Four Shoals of Xijiang Middle Reaches in Guangdong Province	<i>Mingyuan Yang, Bingsheng Zou, Chaoming Lin</i>	933
Downstream Grain-Size Variation To Interpret River-Channel Process-form in the Middle-Lower Yangtze River, China	<i>Zhanjiao Wang, Zhongyuan Chen</i>	939
Current Modeling of Water in A River Meander Considering Civil Engineering Problems in Building the Coastal Walls	<i>S. M. Mosaddad, A. A. Bidokhti, M. Ezam</i>	945
Quasi-3D Solver of Meandering River Flows by Cip-Soroban Scheme in Cylindrical Coordinates with Support of Boundary Fitted Coordinate Method	<i>Keisuke Yoshida, Tadaharu Ishikawa</i>	951
Effects of Spur Dike Directions on River Bed forms and Flow Structures	<i>Terunori Ohmoto, Ryuichi Hirakawa, Kunitoshi Watanabe</i>	957
Characteristic of Roughness Coefficient Associated with Discharge in Gravel-Bed River	<i>Jisung Kim, Won Kim, Chanjoo Lee, Yong Jeon Kim</i>	963
A Mathematical Model for the Channel Bed Evolution During the Construction of Dongjiang Hydro-Project	<i>Yilin Zhou, Jing Lu, Zhiliang Wang, Zaisen Xia</i>	969
Influence of Near-Bed Coherent Structures on the Entrainment of Bed Gravels	<i>Jianmin Ma, J. J. R. Williams</i>	975
Flow Structures and Sedimentation Characteristics Around Colony-Type Vegetation At Flood Events	<i>Norio Tanaka, Shiho Ito, Junji Yagisawa</i>	981
Influence of Channel Width on the Flood Flows in A Stream Valley	<i>Kazuhiko Hattori, Taisuke Ishigaki, Tetsuo Ueno</i>	987