

# **World Environmental and Water Resources Congress 2011**

**Palm Springs, California, USA  
22 – 26 May 2011**

**Volume 6 of 6**

**Editors:**

**R. Edward Beighley**

**Mark W. Killgore**

**ISBN: 978-1-61782-987-1**

<b>Turbulent Characteristics inside Ingoing Multi-Bend Rivers</b>	<b>4075</b>
Fariba Sadat Esfahani, Ali Reza Keshavarzi, and E. Zia Hosseinipour	
<b>Forecasting Benefits for Implementation of LID Practices in Future Developments within the Reedy River Watershed</b>	<b>4087</b>
C. V. Privette, S. W. Taylor, and J. C. Hayes	
<b>Geographical Basis for Regulating Pesticide Use That Prevents Contamination of California's Ground Water</b>	<b>4097</b>
John Troiano	
<b>Hydrological Applications of the Approximate Convection-Diffusion Equations</b>	<b>4109</b>
Muthiah Perumal, Ravindra V. Kale, and Bhabagrahi Sahoo	
<b>Hydrology Models for Climate Change Assessment: Inter-Decadal Climate Variability and Parameter Calibration</b>	<b>4121</b>
S. Steinschneider, C. Brown, R. N. Palmer, and D. Ahlfeld	
<b>Improvement of the Trap Efficiency of Vortex Chamber for Exclusion of Suspended Sediment in Diverted Water</b>	<b>4124</b>
Naser Niknia, Ali-Reza Keshavarzi, and E. Zia Hosseinipour	
<b>Improving Sustainable Sites through the Use of Native Species to Reduce Water Demand in Landscape Projects</b>	<b>4135</b>
Angélica Damasceno, Guilherme Fernandes Marques, and Maria Guadalupe Carvalho Fernandes	
<b>Indiana Rainfall Pattern Trends: The Influence of Large Wind Farms</b>	<b>4148</b>
James Kaiser, Vujadin Petrovic, V. Chandramouli, and A. G. Agwu Nnanna	
<b>Innovative Technology for Processing Plant</b>	<b>4156</b>
J. R. Bonner and K. M. Boykin	
<b>Integration of GIS and Hydraulic Modeling to Evaluate the Cost of Ecological Stream Flow Recovery in Irapé Dam, Brazil</b>	<b>4162</b>
Natália Ribeiro Caldas Fernandes and Guilherme Fernandes Marques	
<b>Investigation of Bridge Scour Reduction Due to Adding Vertical Walls below Bed Level</b>	<b>4172</b>
Sasan Heydari and Reza Ghiassi	
<b>Investigation of Hydraulic Conditions around Bridge Piers and Determination of Shear Stress Using Numerical Method</b>	<b>4176</b>

Mehdi Shahosseini, Amirabbas Kamanbedast, and Roozbeh Aghamajidi	
<b>Investigation of Reynolds Stresses Variation in Sudden Expansion Flow</b>	<b>4186</b>
Reza Ghiassi and Hanieh Tabkhi	
<b>Long Term Absorbed Energy Maximization Model of Large Scale Reservoir Systems by Multiple Power Grids</b>	<b>4196</b>
Xin-yu Wu, Chun-tian Cheng, Jian-jian Shen, and Sheng-li Liao	
<b>Irrigation with Magnetized Water: A Novel Tool for Improving Crop Production in Egypt</b>	<b>4206</b>
Mahmoud Hozayn, Amany A. Abdel-Monem, and Amira M. S. Abdul Qados	
<b>Mercer on Mission to Malawi, Africa</b>	<b>4223</b>
R. O. Mines, Jr., Z. M. Vokhiwa, R. Harshbarger, and C. T. McMahan	
<b>Modeling and Optimization of Fish Passage Structures</b>	<b>4232</b>
Guilherme Fernandes Marques, Jessica dos Santos Fernandes, Hersília Santos, and Inês La Sala	
<b>Modeling Sediment Transport in the Pantano Wash, Tucson</b>	<b>4246</b>
Ryan Hummel and Jennifer G. Duan	
<b>Monitoring and Surveillance of Groundwater Arsenic Contamination in the Brahmaputra Floodplain in Assam</b>	<b>4255</b>
Chandan Mahanta, Runti Choudhury, Pronobjyoti Borah, Lalseng Sailo, Sandip Mondal, Lalit Saikia, and Wazir Alam	
<b>Multi-Year Optimal Management of Quantities and Salinities in Water Supply Systems</b>	<b>4267</b>
Mashor Housh, Avi Ostfeld, and Uri Shamir	
<b>Numerical Simulation of Oil Spill Trajectory in Marina Environment</b>	<b>4278</b>
R. Ghiassi and J. Z. Heydariha	
<b>Observed Association between Historical Major Earthquakes and Lunisolar Alignments</b>	<b>4288</b>
Messele Zewdie Ejeta	
<b>Optimizing the Main Parameters of Landfill Leachate Chemical Treatment Based on Sediment Volume, COD, and Turbidity Reduction</b>	<b>4295</b>
M. R. Sabour, M. Ghanbarzadeh Lak, and A. Ghorban	
<b>Permeability Change Driving Effect on Embankment Dams Case Study: The Zonouz Embankment Dam</b>	<b>4303</b>
Bahador Fatehi Nobarian	
<b>Phenol Biodegradation Kinetics in an Anaerobic Batch Reactor</b>	<b>4313</b>
Tahere Taghizade Firozjaee, Ghasem D. Najafpour, Ali Asgari, Zeinab Bakhshi, Roya Pishgar, and Nafise Mousavi	

<b>Physical Tests for Estimating the Water-Hammer Wave Speed in Pipes and Tunnels with Local Weak Wall Stiffness</b>	<b>4322</b>
F. E. Hachem and A. J. Schleiss	
<b>Post-Fire Watershed Response Following the 2009 Station Fire in Southern California, USA</b>	<b>4332</b>
Kristina Cydzik, Philip J. Shaller, Jon R. Wren, and Douglas Hamilton	
<b>Profiling Nodal Water Demands in Statistical Perspective</b>	<b>4338</b>
Shanbin Xie, Huaide Jiang, and Suiqing Liu	
<b>Projecting the Impact of Climatic Change on Coldwater Fish Habitat in Minnesota Lakes</b>	<b>4349</b>
Xing Fang, Shoeb R. Alam, Heinz G. Stefan, Peter C. Jacobson, and Donald L. Pereira	
<b>Quantification of the Interrelation between Hydrology Alteration and Degradation of Typical Steppe Using Remote Sensing</b>	<b>4362</b>
Chen Zang, Shiyong Shang, Xixi Wang, Zhiguo Wang, Fang Lv, and Limin Liu	
<b>Rainwater Harvesting and Green Roof Irrigation Design for a Peaked Roof: A Graduate Directed Study</b>	<b>4370</b>
Cheryl A. Smith and Edmund E. Yuen	
<b>Rapid Infiltration Measurement of LID Best Management Practices</b>	<b>4379</b>
Farzana Ahmed, John S. Gulliver, and John L. Nieber	
<b>Resilience Analysis of Complex Climate Change Systems</b>	<b>4389</b>
Mustafa M. Aral and Jiabao Guan	
<b>Resilience Analysis of Savanna Systems for Sustainable Management</b>	<b>4396</b>
Jiabao Guan, Andi Zhang, and Mustafa M. Aral	
<b>Rural Water Consumption Behavior: A Case Study in Southwest Coastal Area, Bangladesh</b>	<b>4403</b>
M. A. Islam, H. Sakakibara, M. R. Karim, and M. Sekine	
<b>Saline Intrusion Due to the Accelerative Sea Level in the Red River System in Vietnam</b>	<b>4413</b>
N. H. Duc and M. Umeyama	
<b>Scenarios of Future California Water Demand through 2050: Growth and Climate Change</b>	<b>4423</b>
Mohammad Rayej, Rich Juricich, David Groves, and David Yates	
<b>Solar Insolation on Uniformly Sloping Terrain in a Changing Climate</b>	<b>4433</b>
Hugo A. Loáiciga	
<b>Sorption Dynamics and Process Development for Removal of Copper from Aqueous Solution Using a Biosorbent Based on Mango Tree Leaves</b>	<b>4453</b>

K. G. Bhattacharyya, Arunima Sarma, and Prava Barua	
<b>Spatial Analysis of Rainfall Erosivity Trends in South Korea</b>	<b>4469</b>
Joon-Hak Lee, Younghun Jung, and Jun-Haeng Heo	
<b>Statistical Downscaling of Daily Rainfall Processes for Climate-Related Impact Assessment Studies</b>	<b>4477</b>
Van-Thanh-Van Nguyen and Myeong-Ho Yeo	
<b>Studies on Treatment of Heavy Metals</b>	<b>4483</b>
E. Johal, M. K. Jha, and M. S. Saini	
<b>Study on Hydraulic Simulation Model of Pipe Break</b>	<b>4488</b>
Jianyong Hu, Jian Zhang, and Xiaodong Yu	
<b>Study on Urban Water Resources Sustainable Development of Public Evaluation Theory</b>	<b>4498</b>
Cuimei Li, Jianhua Wang, Hao Wang, and Shaoguang Zhang	
<b>Surveying the Possibility of Constructing Water Quality Trading Market among Point-Sources in Zarjoob Watershed (Gilan, Iran)</b>	<b>4508</b>
Pegah Jalali	
<b>The Comparison of the Value Engineering Method and Hydraulic Method on Water Distribution Systems Performance Evaluation</b>	<b>4514</b>
Cuimei Li, Shuping Li, Jianhua Wang, Hao Wang, and Shaoguang Zhang	
<b>The Impact of Infiltration Barriers on the Lateral Seepage Flow</b>	<b>4523</b>
Yuan Cheng	
<b>The Value of a Constructed Wetland in Southern Iraq to Sustainably Enhance Water Quality</b>	<b>4532</b>
Thomas Deardorff, Trey Flowers, Douglas Hamilton, Andrea Cattarossi, and Julien Lecollinet	
<b>Theory and Practice of Leakage Control in Water Distribution Pipeline</b>	<b>4538</b>
Jianyong Hu, Canhui Xuan, and Hong Ji	
<b>Tracking Potential Trends in the Discharge of Stream Flow into Lake Michigan</b>	<b>4544</b>
Vujadin Petrovic, James Kaiser, V. Chandramouli, and A. G. Agwu Nnanna	
<b>Transient Study and Design of a Deep Injection Well System</b>	<b>4554</b>
Jinsheng Huo	
<b>Uncertainties of Flash Flood in Context of Climate Change in Sunamganj District, Bangladesh</b>	<b>4564</b>
Shubhra Bhattacharjee	
<b>Uncertainty Analysis of Downscaled Precipitation Using LARS-WG Statistical Model in Shahrekord Station, Iran</b>	<b>4572</b>

<b>Use of HSPF for Design Storm Modeling in Semi-Arid Watersheds</b>	<b>4579</b>
Mark Bandurraga, Bruce Rindahl, and Jon Butcher	
<b>Using Software Quality and Algorithm Testing to Verify a One-Dimensional Transport Model</b>	<b>4587</b>
E. Ateljevich, K. Zamani, F. A. Bombardelli, and J. Anderson	
<b>Utilizing a Decision Support System to Optimize Reservoir Operations to Restore the Natural Flow Distribution in the Connecticut River Watershed</b>	<b>4597</b>
Brian E. Pitta and Richard N. Palmer	
<b>Waller Creek Tunnel Design and Elimination of Entrained Air Blow Back Conditions</b>	<b>4605</b>
A. R. Marks, B. K. Reis, and G. Hughes	
<b>Wastewater Storage Pond Design and Mounding Analysis</b>	<b>4615</b>
Xuheng Kuang	
<b>Water Balance Analysis on Upo Wetland, Korea, under Climate Change</b>	<b>4626</b>
Duck Gil Kim, Yong Won Lee, Jae Won Kwak, and Hung Soo Kim	
<b>Water Quality Degradation in the Tributaries of the Brahmaputra-Barak Basin and Their Environmental Management Strategy</b>	<b>4636</b>
C. Mahanta, A. K. Sarma, and B. Sarma	
<b>Water Supply System Dispatching Considering the Influence of Salt Water Intrusion in Coastal City</b>	<b>4649</b>
Jianyong Hu, Jian Zhang, and Longxi Han	
<b>NEXRAD Rain Data Analysis</b>	
<b>Assessment of Estimation Bias around Rainfall Gage Sites for Five Years of WSR-88D Data over the Mississippi River Basin</b>	<b>4658</b>
Michael J. Rogalus III and Fred L. Ogden	
<b>Average Recurrence Interval of Rainfall in Real-Time</b>	<b>4667</b>
Tye W. Parzybok, Beth Clarke, and Douglas M. Hultstrand	
<b>Deriving Radar Specific Z-R Relationships for Hydrologic Operations</b>	<b>4682</b>
Samuel H. Rendon, Baxter E. Vieux, and Chandra S. Pathak	
<b>NEXRAD Rain Data Application</b>	
<b>Advantages of Using NEXRAD Data in Watershed Rainfall-Runoff Modeling with HSPF Model</b>	<b>4688</b>
Madhusudhan Narayana and V. Chandramouli	
<b>Synthetic Weather Generator SYNTOR: Implementing Improvements in</b>	<b>4698</b>

## **Precipitation Generation**

Jurgen D. Garbrecht and Xunchang J. Zhang

## **Runoff Modeling**

- Development of a Modified Rational Equation for Arid-Region Runoff Estimation** **4702**

Xixi Wang, Tingxi Liu, Changyou Li, Zhongyuan Zhu, Shengwei Zhang, and Assefa M. Melesse

## **Sediment Modeling**

- Development of a Comprehensive Sediment Transport Method in First Order Watersheds with Contour Coal Mining** **4717**

D. K. Martin, N. A. Adams, J. F. Fox, A. Jones, H. Rowe, S. Kelly, and K. Foley

- Sediment Discharge Scaling in Large Rivers of the World** **4735**

Hugo A. Loáiciga

- The Coupling of WEPP and 3ST1D Numerical Models for Improved Estimation of Runoff and Sediment Yield at Watershed Scales** **4749**

D. C. Dermisis, A. N. (Thanos) Papanicolaou, B. Abban, D. C. Flanagan, and J. R. Frankenberger

## **Uncertainty Analysis and Methods in Hydrology**

- An Experimental Hydrometeorological Investigation to Address Infiltration-Redistribution Modelling** **4759**

R. Morbidelli, C. Corradini, C. Saltalippi, A. Flammini, and E. Rossi

- Comparison between Different Approaches for Stochastic Generation of Spatial-Temporal Rainfall Patterns** **4769**

S. Camici, A. Tarpanelli, L. Brocca, M. Franchini, T. Moramarco, and F. Melone

- Evapotranspiration Network Design Study: Ground Sensor Network Design for Wind Speed** **4779**

Chandra S. Pathak, Bijay K. Panigrahi, Ananda V. Aduvala, and Ali Sadeghi Nad

## **Uncertainty Assessment Methods**

- Addressing the Uncertainty Assessment for Real-Time Stage Forecasting** **4791**

S. Barbetta, L. Brocca, F. Melone, T. Moramarco, and V. P. Singh

- Predicting Hydrologic Effects of Land-Use Change: Problems with the Curve Number Approach** **4801**

Fred L. Ogden, Nawa Raj Pradhan, E. James Nelson, and Charles W. Downer

## **Uncertainty Estimation of Water Quality Data**

- Dynamic Multidimensional Visualization for Water Quality Data in Rivers** **4811**

Caleb Amoa Buahin, Oliver Obregon, Gustavious P. Williams, and E. James Nelson

- Laboratory Investigation of Sedimentation Effects on V-Notch Weirs** **4820**

## **Wetland Hydrology**

- Flow Dynamic Modeling of a Large-Scaled Vegetated Constructed Wetland 4828**

Liqiong Zhang, Jie Zeng, Chandra Pathak, and Emile Damisse

- Spatial and Temporal Expansion of Reed Marsh in the Wuliangsu Hai Wetland in Inner Mongolia 4840**

Shiyong Shang, Yang Cao, Ruihua Guang, Zhiguo Wang, Chen Zang, and Yan Li

- Stemming the Tide: Lessons Learned from the Loss and Restoration Efforts of the Iraqi Wetlands with Comparisons to San Francisco Bay 4849**

Thomas Deardorff, Trey Flowers, and Douglas Hamilton

## **Wetland Treatment Modeling**

- Performance of Constructed Wetland for the Treatment of Pulp and Paper Mill Wastewater 4856**

Ashutosh Kumar Choudhary, Satish Kumar, Chhaya Sharma, and Parveen Kumar

- Use of the Kiliszek Water Quality Indices (KWQI) to Assess the Impact of a Manure Collection System on Surface Water Quality within a Small Agricultural Watershed 4866**

Anastasia E. M. Chirnside and Alison Kiliszek