

# **International Conference on Water Security and Management**

## **WSM 2019**

### **Conference Programme**

<http://www.wsm2019.org/>

Conference organized by  
Asia Pacific Institute of Science and Engineering (APISE)

2019.06.27-06.29 • Guilin • China

## CONTENTS

<b>WELCOME MESSAGE .....</b>	<b>3</b>
<b>CONFERENCE SPEAKERS.....</b>	<b>4</b>
<b>KEYNOTE SPEAKERE.....</b>	<b>4</b>
<b>PROGRAMME OVERVIEW.....</b>	<b>8</b>
<b>TECHNICAL SESSION.....</b>	<b>9</b>
<b>ABSTRACT INDEX .....</b>	<b>11</b>
<b>CONFERENCE VENUE.....</b>	<b>14</b>
<b>CONFERENCE COMMITTEE .....</b>	<b>15</b>
<b>NOTE PAGE .....</b>	<b>26</b>

## WELCOME MESSAGE

Water security and management is a core issue in pursuing sustainable development goals (SDGs). Concerns over the use and misuse of increasingly precious water resources have increased dramatically over the past decades, reaching a point where water-related issues from shortages, contamination, disaster to ecosystem integrity are being addressed with unprecedented momentum in a cross-disciplinary manner, and placed high on the political agenda.

Water Security and Management 2019 (WSM 2019) will bring together the key players in water-related sectors from around the globe. It provides a great opportunity for participants to learn and discuss latest researches and best practices in water-related fields, update your knowledge, obtain new ideas, and network with other specialists, researchers, and practitioners. The conference will be held in Guilin, China, where you can enjoy the fantastic landscape, which is perceived as the best landscape under heaven.

Therefore, on behalf of the organizing committee, it is my great pleasure to invite you to join WSM 2019. We are now preparing a challenging and attractive program covering a wide range of water-related topics. Post-conference publication in a well-known international journal is also being planned.

Hope you will not miss this great chance and I look forward to meeting in Guilin!



WSM 2019 Program Chair

Guangwei Huang, Sophia University, Japan

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## CONFERENCE SPEAKERS

### Keynote Speakers



**Prof. Guangwei Huang**  
Sophia University, Japan

**Biography:** Dr. Huang is a Professor in the Graduate School of Global Environmental Studies, Sophia University, Japan. He also serves as the Director of the Institute for the Study of the Global Environment, Sophia University at present. He received his Bachelor from Fudan University, China, Master and Ph.D. degrees from the University of Tokyo. His career includes Associate Professor in Graduate School of Frontier Sciences, the University of Tokyo; Professor for Joint Educational Program between International Center for Water Hazard and Risk Management under the auspices of UNESCO and National Graduate Institute for Policy Studies. Passionate about water, his study evolved from fluid dynamics to water quality modeling and to integrated watershed science and management. In recent years, his main research focus is sustainability science from water perspective such as wetland conservation and wise use, integration of flood risk analysis with urban planning and innovative water resources development. He has about 80 peer-reviewed publications and some of representative contributions were published in internationally well-known journals such as Sustainability, Hydrobiologia, Natural Hazards, Environmental Impact Assessment Review, International Journal of River Basin Management, Journal of Environmental Informatics and so forth.

**Keynote Lecture:** Post-audit of watershed management- a case study in Japan

Current scientific literature provides insufficient information and analysis on how today's environmental state of a watershed was shaped by management practices taken in the last century. Such a look back is crucial to better understand and predict how policy and countermeasure choices today may shape the world in the future. Following this line of reasoning, this paper presents a post audit analysis on the long-term consequence of a countermeasure against a major heavy metal pollution case caused by the operation of the Ashio Copper Mine in Japan. It examined this issue from both environmental and societal perspectives by document analysis, field investigation of soil and water quality, numerical simulation of water quality and questionnaire survey on the public knowledge with regard to the copper mining contamination case as well. It shed new light on how environment may evolve via the interaction with human activities by identifying drivers behind major changes. It also revealed a gap between the reality and the public perception towards the consequence of the copper contamination. Such insights will deepen the discussion on what is water security and motivate further study to pursue sustainable development.



**Prof. Xiang Zhang**  
Wuhan University, China

**Biography:** Prof. Zhang Xiang, is now professor and doctoral supervisor of Wuhan University. In 1998, he received a doctor's degree in hydrology and water resources from Sichuan University. Currently, he is director of the hydrology and water resources experimental research center, director of the natural resources society of China, member of the water resources committee, member of the wetland resources protection committee, and member of the water resources committee of the China Association for Sustainable Development. Research interests: sustainable water resources

management based on ecohydrology, watershed ecohydrology model, river and lake ecological restoration, integrated water environment management in lake basins, isotope hydrology.

**Keynote Lecture: Urban Water Security: Opportunity and Challenges for the Sponge City Construction in China**

In this paper, the importance of urban water security was stressed according to water problems we are facing caused by the fast urbanization. “Sponge City” was proposed by China as a rapid urbanization country, which learns from the policies of the different countries to solve urban water problems. Wuhan, one of the first pilot cities in China’s sponge city construction, was selected as the example. Three experiments and lessons were discussed and summarized by the analysis of sponge city construction projects in Wuhan: (1) the system thinking is needed in the dealing with water issues in city; (2) the local conditions must be considered when the measures of sponge city are designed; (3) the monitoring system must be constructed in order to maintain the facilities. The opportunity and challenges of sponge city in China were concluded through the problems exposed by the construction of the sponge city in Wuhan: (1) the green development ideals for the development of city; (2) the integration of grey and green infrastructures; (3) the operation and maintaining of sponge city facilities; (4) the system treatment thinking of source-process-terminal. Facing the opportunity and challenges of sponge city, it may require the basic scientific research of urban hydrology and the multi-disciplinary cooperation.



**Prof. Gordon Huang**  
University of Regina, Canada

**Biography:** Dr. Gordon Huang is a Tier 1 Canada Research Chair in Energy and Environment, and Executive Director of the Institute for Energy, Environment and Sustainable Communities at the University of Regina, Canada. He holds BSc from Peking University (China), MSc from Simon Fraser University (Canada) and PhD from McMaster University (Canada).

Since the 1990s, Huang has led over 150 environment-related research projects, produced over 900 peer-refereed international journal papers (with an SCI-based H-index of 60 in Science Citation Index under Thomson Reuters' Web of Science), and supervised over 100 Master/PhD students. He is a Fellow of the Canadian Academy of Engineering, and the President of the International Society for Environmental Information Sciences. He also acts (or acted) as editor-in-chief for 2 international journals and editorial board member for over 10 journals, and was conference chair or keynote speaker at over 40 international events. He has also served the United Nations Development Programme as Chief Scientist for its Program of Chinese Rural Water Resources Management and Drinking Water Safety. His pioneering work in environmental risk management has been recognized as a significant innovation, and has influenced government and business approaches for tackling environmental challenges and formulating related policies. Over 30 of his PhD graduates were appointed as faculty members at universities in Canada, USA, UK, Singapore, Hongkong and China.

**Keynote Lecture: Water security and management under climate change**

Adapting to climate change has become a major focus of local policy makers and development practitioners. Sound decisions for adapting to eco-hydrological Impacts rely on profound simulation modeling, but the coarse-resolution outputs of global climate models (GCMs) are unsuitable for driving impact models, which usually require finer resolution projections at both spatial and temporal scales. Effective downscaling of GCMs projections is thus required, but it is practically difficult due to the lack of computational resources and/or long-term reference data. Such difficulty

has become a major barrier preventing informed climate change adaptation planning at regional scales. To address this challenge, a web-based and user-friendly public data portal with integration of advanced geographic information system (GIS) technology, named Climate Change Data Portal (CCDP, <http://ccdp.network>), has been established to allow intuitive and open access to high-resolution regional climate scenarios. CCDP offers functions of visual representation through geospatial maps and data downloading for a variety of climate variables (e.g., temperature, precipitation, relative humidity, solar radiation, and wind) at multiple temporal resolutions (i.e., annual, seasonal, monthly, daily, and hourly). The vast amount of information this portal encompasses can provide a crucial basis for assessing impacts of climate change on eco-hydrological systems and for supporting decisions water management under climate change.



**Prof. Dawen Yang**  
Tsinghua University, China

**Biography:** Dr. Dawen Yang is a professor in the Department of Hydraulic Engineering, Tsinghua University. He is an expert in hydrology and water resources. He received his B. Sc. Eng. and M. Eng. degrees from Tsinghua University, Beijing, China, in 1988 and 1990, and his Dr. Eng. degree from the University of Tokyo, Japan, in 1998. He has years of experience in flood and debris flow. He worked as a research engineer in the China Research Institute of Railway Sciences from 1990 to 1995. He has also worked in hydrological modeling and water resources assessment during his PhD research and postdoctoral research (1996-2000) at the University of Tokyo, in teaching hydrology and hydraulics and researching hydrology and water resources when he worked as a lecturer (2001) and an associate professor (2002-2004) in the Department of Civil Engineering in University of Tokyo, and in teaching and re searching hydrology and water resources at Tsinghua University since 2004. Currently he is active in the following research fields: hydrological modeling approach and application to flood forecasting and water resources assessment, interaction between land surface and atmosphere, ecohydrology, and integrated river basin management. He is also leading several research projects on ecohydrological and water resources issues in the Yellow River and the Haihe River and on flooding issues in the Yangtze River.

**Keynote Lecture: Understanding hydro-eco-environment changes in the upper Yangtze River**

Climate change and human activities influence the hydrological and biogeochemical processes and impact on the ecosystem. This study investigated flow regime changes in the Upper Yangtze River using the eco-flow metrics (ecosurplus and ecodeficit) and the “Indicators of Hydrologic Alteration” (IHA), and analyzed the net anthropogenic nitrogen input (NANI) in this watershed and its impact on the river water quality using a distributed hydrological model. Results showed that annual streamflow decreased in 50 years. Autumn streamflow evidently decreased after the 1980s, which resulted from the decrease in precipitation and water storing by reservoirs. Summer high flow decreased after the 1980s which was also primarily attributed to the decrease in precipitation. Winter streamflow increased in the two most recent decades, which resulted from the reservoir release. Results also showed that the Three Gorges Reservoir (TGR) elevated low flow in the dry season and reduced peak flow in summer since 2003. The simulated results showed that annual total nitrogen loading in the watershed was 1.50 ton/km<sup>2</sup> in average. The amount of nitrogen loading in July and August took more than 65% of the annual total nitrogen loading. The export coefficient was influenced by the nitrogen supply and hydrological processes especially the rainfall-runoff processes. The concentration of total nitrogen was higher in rainy season. The decrease in autumn precipitation since the 1990s, suggests that TGR is facing a serious challenge in maintaining water storage in the reservoir and releasing the water to the downstream ecosystem



**Prof. Wen-yan Chiau**

National Taiwan Ocean University, Taiwan, ROC

**Biography:** Dr. Wen-Yan Chiau is a chair professor of National Taiwan Ocean University (NTOU) and National Sun Yat-sen University of Taiwan. He used to be the director and a professor of Institute of Marine Affairs and Resource Management as well as the dean of College of Ocean Law and Policy of NTOU. Dr. Chiau has been actively participating NGOs' activities for more than 25 years. He served as the President of "Wetlands Taiwan", the president of "Taiwan Association on Marine Pollution Control", the CEO of "Foundation of Ocean Taiwan" as well as an executive member with many environmental organizations. Dr. Chiau received his M.A. (1989) and Ph.D. (1991) from the University of Pennsylvania, U.S. after earning his B.S. (1976) and LL.M. (1980) degrees in Taiwan. He was honored with "Canadian Studies Award" in 1995 and 2002, "National Cheng Kung University Distinguished Alumni Award" in 2015 and "Lifetime Contribution Award" by Taiwan Institute of Landscape Architects in 2016. Chiau's specialties are environmental planning and management, especially with regard to the areas of city and regional planning, climate change, coastal zone management, wetland conservation, ecotourism, underwater heritage, ocean policies and environmental law. As an oceanographer and a planner, Chiau has drafted such marine blueprints as the "Vision of Maritime Countries" in 1996, the "Recommendations for Maritime Affairs Organization" in 2000, the "Ocean White Paper" in 2001, the "National Vision for the Golden Decade" concerning the ocean and wetlands protection policy in 2002, the "Ocean Policy White Paper" in 2006, the "Ocean Education White Paper" in 2007, and the "Blue Revolution and Ocean Nation" policy in 2008. Chiau also participated in rescuing the "Free China Junk". Chiau was appointed as the Deputy Minister of the Environmental Protection Administration (EPA), Executive Yuan in August 2008. In 2011, he was nominated by the Kuomintang Party as the legislator-at-large. In his 4-year term with the Parliament, he involved in the amendment of Water Act, drew up and successfully passed some 12 important laws including Underwater Cultural Heritage Preservation Act, Museum Act, Spatial Planning Act, Coastal Zone Management Act, Wetland Conservation Act, Greenhouse Gases Reduction and Management Act as well as the four laws on the organization of Council of Marine Affairs. Recently, he participated in an expert team to draft Ocean Basic Law for Ocean Affairs Council of Taiwan.

**Keynote Lecture: Water and Sustainable Development: Taiwan's Policy and Legislation**

Water is an important resource of the earth and is related to the sustainable development of mankind. The focus of Taiwan's water policy has been becoming wider and wider. The initial "Water Basic Policy" (1986~2000) focused on flood control, water use, drought and flood reduction. Afterwards, in view of the increasingly obvious impact of climate change, the Water Resources Agency (WRA) has targeted 2030 as a target year for the "New Age Water Conservancy Program" (20003- 2022) to strengthen water source management, cross boundary coordination, multiple strategies, and promote citizen participation. In terms of specific disaster prevention plans, Taiwan has enacted special regulations for twice. Namely, the "Special Act for Flood Management" of 2006 and the "Special Statute for the Comprehensive Management of River Basins" of 2014. In view of the extreme events of climate anomalies in recent years, the Water Law added the seventh chapter 7-1, "Runoff Allocation and Outflow Control" in 2018. This chapter represents the latest thinking on strengthening water security in Taiwan. In addition to emulating the establishment of the "Sponge City" in other countries or regions, Taiwan has also promoted the "independent disaster prevention community" system since 2010 to assist the government in regional joint flood prevention. In May 2019, "Water as Heritage" Conference was held in Taiwan. It is hope that the sustainability of water will be a part of life and culture, and shared the concern for mutual benefits of global water.

## PROGRAMME OVERVIEW

<b>Date</b>	<b>Time</b>	<b>Programme</b>	<b>Location</b>
<b>June 27, 2019</b>	14:00-17:00	Registration	Hotel Lobby
<b>June 28, 2019</b>	09:00-09:10	Opening Ceremony	DU XIU Conference Room 2 <sup>nd</sup> floor
	09:10-09:50	Keynote Lecture Prof. Guangwei Huang	
	09:50-10:30	Keynote Lecture Prof. Xiang Zhang	
	10:30-11:00	Group Photo + Coffee Break	
	11:00-11:40	Keynote Lecture Prof. Gordon Huang	
	12:00-14:00	Lunch	Western Restaurant 1 <sup>st</sup> floor
	14:00-14:40	Keynote Lecture Prof. Dawen Yang	DU XIU Conference Room 2 <sup>nd</sup> floor
	14:40-15:20	Keynote Lecture Prof. Wen-yan Chiau	
	15:20-15:40	Coffee Break	
	15:40-17:25	Technical Session	
	17:25-18:00	Poster Session	
18:00-19:00	Dinner	QI XING Restaurant 1 <sup>st</sup> floor	
<b>June 29, 2019</b>		Technical Tour	Pending

## TECHNICAL SEESION

<b>Keynote Lecture (Morning)</b> <b>June 28, Friday, DU XIU Conference Room</b>			
Time	No.	Content	Page
09:10-09:50	K1	Post-audit of watershed management- a case study in Japan <i>Guangwei Huang</i> , Sophia University, Japan	4
09:50-10:30	K2	Urban Water Security: Opportunity and Challenges for the Sponge City Construction in China <i>Xiang Zhang</i> , Wuhan University, China	4
10:30-11:00	Group Photo + Coffee Break		
11:00-11:40	K3	Water security and management under climate change <i>Gordon Huang</i> , University of Regina, Canada	5
<b>Keynote Lecture (Afternoon)</b> <b>June 28, Friday, DU XIU Conference Room</b>			
Time	No.	Content	Page
14:00-14:40	K4	Understanding hydro-eco-environment changes in the upper Yangtze River <i>DawenYang</i> , Tsinghua University, China	6
14:40-15:20	K5	Water and Sustainable Development: Taiwan's Policy and Legislation <i>Wen-yan Chiau</i> , National Taiwan Ocean University, Taiwan, ROC	7
15:20-15:40	Coffee Break		
<b>Technical Session</b> <b>Session Chair: DawenYang</b> <b>June 28, Friday, DU XIU Conference Room</b>			
15:40-15:55	M1001	Return period of low tide level in the Yangtze Estuary based on nonstationarity analysis <i>Yicen Zhou</i> , Tongji University, Shanghai, China	11
15:55-16:10	M1002	Study on flood risk characteristics and disaster prevention countermeasures in the Taihu Basin <i>Shuguang Liu</i> , 1.College of Civil Engineering, Tongji University, Shanghai 200092, China 2.UNEP-Tongji Institute of Environment for Sustainable Development, Shanghai 200092, China	11

**2019 International Conference on Water Security and Management (WSM 2019)**

**June 27-29, 2019 • Guilin, China**

16:10-16:25	M1008	Research on Ecological Compensation Standard and Spatial Optimization of the Five Major River Basins in Jiangxi Province <i>Kai Xiong</i> , Nanchang Institute of Technology, China	12
16:25-16:40	M1009	Study on Water Related Music Works—A Case Study in Gaomei Wetland <i>CHEN CHEN</i> , Sophia University, Japan	12
16:40-16:55	M1010	Research on the Construction of Sponge City in Karst Region of Guizhou Province <i>Chao Wang</i> , Wuhan University of Science and Technology, China	12
16:55-17:10	M1013	The Role of Religion Facilities in Flood Management in Thailand <i>Sizhuo Liu</i> , Sophia University, Japan	13
17:10-17:25	M1015	Analysis of Water quality index Based on Knowledge Mapping <i>Lei Zhang</i> , Graduate School of Global Environmental Studies, Sophia University, Tokyo, Japan	13

**Poster Session**

**17:25-18:00, June 28, Friday, DU XIU Conference Room**

M011	Study on the initial rainwater control in central area of Shanghai and its impact on the water environment of the Yangtze estuary <i>Han Yan</i> , Shanghai Water Planning and Design Research Institute, Shanghai Bibo Water Design and Research Center, China
M012	Research on the Construction of Flood Early Warning and Runoff Integrated Management and Control Platform in the Downtown Area of Shanghai <i>Zhenbao Shi and Qingran Shen</i> , Shanghai Water Planning and Design Research Institute, Shanghai Bibo Water Design and Research Center, China
M1003	Application Analysis of Low Impact Development in Sponge City Construction <i>Chao Wang</i> , 1. Qiannan Polytechnic for Nationalities, China 2. Wuhan University of Science and Technology, China
M1004	Study on the Construction Value and Development Strategy of Ecological Sports Park under the Background of Sponge City <i>Qunli Xing</i> , Qiannan Polytechnic for Nationalities, China
M1006	Simulation of hydraulic infrastructures in 2D high-resolution urban flood modelling <i>Yunsong Cui</i> , Hohai University, China
M1007	The Significance of Low Impact Development on Urban Water Resources <i>Chao Wang</i> , 1. Qiannan Polytechnic for Nationalities, China 2. Wuhan University of Science and Technology, China
M1016	Research on Solution of Ship Low Sulphur Fuel Based on IMO Sulphur Limitation Regulation <i>Zihui Wang</i> , Zhejiang Ocean University, China

## ABSTRACT

Technical Session I	
Time	Content
15:40-15:55 June 28	<p><b>M1001:</b> Return period of low tide level in the Yangtze Estuary based on nonstationarity analysis</p> <p><b>Presenter:</b> Yicen Zhou, Department of Hydraulic Engineering, Tongji University, Shanghai, China</p> <p><b>Abstract:</b> Due to the influence of climate change and human activities, stationarity of hydrologic time series is being challenged. The Yangtze Estuary is a region with highly developed hydraulic structures and shipping. Stationarity analysis of water level in the Yangtze Estuary is of great significance. In this study, the return period of low tide level in the Yangtze Estuary is estimated with nonstationarity considered. Conventional frequency analysis and the time-varying moment method are used to analyze the annual minimum tide level (AMTL) records of Wusongkou Station and Baozhen Station on the basis of temporal change analysis. Abrupt changes are detected at 1996 and 1990 for Wusongkou Station and Baozhen Station separately. The GEV distribution with linear time-varying parameter fits best for Wusongkou Station and Baozhen Station. The AMTL series of both stations reveal a slight increasing trend. The 100-year low tide level of Wusongkou Station is approximately 0.261 meters, which is about -0.041 meters for Baozhen Station. The corresponding return period is 150 years and 119 years respectively, which indicates the existing channel standard more secure and the recalculation of design water level necessary in the Yangtze Estuary.</p>
15:55-16:10 June 28	<p><b>M1002:</b> Study on flood risk characteristics and disaster prevention countermeasures in the Taihu Basin</p> <p><b>Presenter:</b> Shuguang Liu, 1.College of Civil Engineering, Tongji University, Shanghai, China 2.UNEP-Tongji Institute of Environment for Sustainable Development, Shanghai, China</p> <p><b>Abstract:</b> The Yangtze River Delta is the region with the strongest comprehensive strength in China. Taihu Basin is the economic core region in the Yangtze River Delta, and it plays a significant role in the economic development of the Yangtze River Delta, as well as in China. The basin is characterized by rapid urbanization, exploitation of natural resources and environmental pollution. After several decades of governance, the flood control system in the Taihu Basin has been significantly improved. Owing to exceptional weather conditions, geographical location and topographical features; the basin is extremely vulnerable to flood hazard. It presents a significant challenge for flood risk management when combined with global developments such as sea level rise. A comprehensive overview of flood management systems and considerations are of great value. In this paper, the characteristics of flood risk are summarized after the basin experienced dramatic development of urbanization over the last twenty years, and the existing problems and potential threats to the basin flood control system are analyzed. In view of a strategic perspective of disaster prevention, this paper presents various countermeasures to deal with the challenging situation in the Taihu Basin, including the structural systems and non-structural measures.</p>

**2019 International Conference on Water Security and Management (WSM 2019)**

**June 27-29, 2019 • Guilin, China**

<p>16:10-16:25 June 28</p>	<p><b>M1008:</b> Research on Ecological Compensation Standard and Spatial Optimization of the Five Major River Basins in Jiangxi Province</p> <p><b>Presenter:</b> Kai Xiong, Nanchang Institute of Technology, China</p> <p><b>Abstract:</b> Based on the actual situation of the river basin in Jiangxi Province and the related literature, we construct an estimation model for the ecological compensation standards of the Fiver Major River Basins in Jiangxi Province, and have measured the ecological compensation standard of each research area. We use ArcGis and Geoda software to analyze spatial autocorrelation and hot spots of ecological compensation standards. The above research results are used as the basis for spatial optimization of watershed ecological compensation standards, contributing to the further improvement of ecological compensation of the Five Major River Basins in Jiangxi Province.</p>
<p>16:25-16:40 June 28</p>	<p><b>M1009:</b> Study on Water Related Music Works—A Case Study in Gaomei Wetland</p> <p><b>Presenter:</b> CHEN CHEN, Sophia University, Japan</p> <p><b>Abstract:</b> Wetland environment plays an essential role in integrated watershed management and has been studied from different perspectives ranging from ecology to tourism. However, there is still little research on the relationship between wetland environmental characteristics and music works. On the belief that music works can be part of wetland environment conservation, the present research explored the possibility to characterize wetland environments with music works. It was focus on the perception of local residents towards to a wetland in terms of music works. It was a case study in Gaomei Wetland, Taiwan, which is a coastal wetland. There are 3 hypotheses in this work: (1) there is a significant difference in the music types selected for the image of the wetland by the locals in different ages and living with different distances from the wetland; (2) there a significant difference in the music speed and rhythm selected by the locals in different ages and living with different distances from the wetland; (3) there is a preference on the music segments by the locals who are older and living closer to the wetland. Through survey conducted on-site, some interesting findings were obtained and presented in this paper.</p>
<p>16:50-16:55 June 28</p>	<p><b>M1010:</b> Research on the Construction of Sponge City in Karst Region of Guizhou Province</p> <p><b>Presenter:</b> Chao Wang, Wuhan University of Science and Technology, China</p> <p><b>Abstract:</b> The unique mountainous plateau topography and Karst Geological conditions in Guizhou are the important reasons for the complexity and fragility of the natural environment in Guizhou, and also the main factors that lead to the increasing imbalance of population distribution and the shortage of population in some areas. At the same time, the urbanization process in China is gradually accelerating, and the increase in the proportion of impervious surface area in cities leads to the phenomenon of water logging in cities. The Karst area of Guizhou province is a typical engineering water shortage area, and the ecological imbalance of water is very significant. The construction of sponge city in Karst area of Guizhou province is based on the above background. This paper analyzes the research ideas and achievements of sponge cities at home and abroad, combining the population distribution, hydrological characteristics and water problems in the process of urbanization in Karst area of Guizhou province. It is concluded that the construction of sponge city in Karst area of Guizhou province should combine</p>

**2019 International Conference on Water Security and Management (WSM 2019)**

**June 27-29, 2019 • Guilin, China**

	<p>green construction, blue construction, grey transformation, smart construction and so on, take into account the prevention and control of water resource loss, and achieve the goal of water ecological balance by strengthening ecological construction, and finally realize the scientific water management in Karst area.</p>
<p>16:55-17:10 June 28</p>	<p><b>M1013:</b> The Role of Religion Facility in Flood Management in Thailand  <b>Presenter:</b> Sizhuo Liu, Sophia University, Japan  <b>Abstract:</b> The purpose of this work is to explore the potential of religious facilities in flood management in Thailand. Since Thailand is a country of Buddhism with a huge number of temples, this potential includes two aspects: the use of temples as evacuation shelters during a flood disaster and the use of temples to raise the awareness of Thai people for better preparation during normal days. Surveys were conducted along the Chao Phraya River, which is the largest river in Thailand and runs across Thailand from north to south. A particular-focus was the roles temples and monks played in the 2011 flood disaster, which occurred in the Chao Phraya River Basin. Monks and local-residents were interviewed for reconstructing the activities in temples before, during and after the flood disaster. It was found that temples had multipurpose roles, which contributed to the flood disaster emergency management. Besides, it was also revealed that local-residents helped in preserving some temples on low land for evacuation.</p>
<p>17:10-17:25 June 28</p>	<p><b>M1015:</b> Analysis of Water quality index Based on Knowledge Mapping  <b>Presenter:</b> Lei Zhang, Graduate School of Global Environmental Studies, Sophia University, Tokyo, Japan  <b>Abstract:</b> WQI has been one of the hottest fields in water quality management. Based on the research published in the Web of Science core collection database of 20 years (1997 to 2017) , analyzed by using CiteSpace software. The paper shows the direction, frontiers and hotspots of WQI research from the aspects of countries, research institutes, research keywords, word frequency, quoted literature and researchers. The result indicates the increase of the research about the direction of water quality index. In view of the international environment, India, China, America and Iran are major countries. From the hotspots and frontiers of research, key words such WQI, water quality management, groundwater quality, surface water quality, the main research hot spots and frontiers of social network lie in the contamination of water and water quality problem in China and India. this study shows a knowledge map of the water quality index, provide a useful method for scientists to keep up with the progress and situation of the study on water quality management., and puts forward suggestions for the further research on WQI (water quality index).</p>

## CONFERENCE VENUE

### Guilin Bravo Hotel

#### 桂林宾馆

**Add:** 14 South Ronghu Road, Guilin, 541002, Guangxi, P. R. China

中国广西桂林市榕湖南路 14 号

**Tel:** +86 18677305610

**E-mail:** 237396999@qq.com

### Transportation Information

#### 1. Guilin Liangjiang International Airport → Guilin Bravo Hotel

桂林两江国际机场→ 桂林宾馆

##### A. Taxi (出租车)

About 45mins, 28.4 kilometres

约 45 分钟, 28.4 公里

#### 2. Guilin Railway Station → Guilin Bravo Hotel

桂林火车站→桂林宾馆

##### A. Taxi (出租车)

About 10 mins, 2.4 kilometres

约 10 分钟, 2.4 公里

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Jincun Zhang, Shandong University, China

KATO Taku, Tokyo University of Agriculture, Japan

Pingan Zhong, Hehai University, China

P. V. Naga Prapurna, Chaitanya Bharathi Institute of Technology, India

Ramesh S. V. Teegavarapu, Florida Atlantic University, USA

Tiesong Hu, School of Water Resources and Hydropower Engineering, Wuhan University, China

W.Y. Szeto, The University of Hong Kong, HK









