

The 9th International Symposium on Environmental Hydraulics

July 19(Mon) - 21(Wed), 2021
Seoul National University, SEOUL, KOREA



*Advances in
Hydro-Environments
for an Era of Big Change*

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ALERTS FOR COVID-19

When entering the venue



Those subject to self-quarantine and those with symptoms are not allowed to attend the event



Cooperate temperature measurement when entering the venue



QR code check-in required

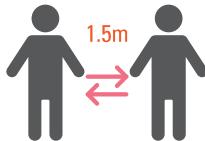


Wear a face mask



Use hand sanitizers

In conference



Maintain a distance and sit only in designated seat



Wear a face mask

For inquiries



+82-10-2721-4840

If you have mild fever, cough, or other respiratory symptoms, stay in your hotel or isolated place.

Call the numbers above first and follow the instructions.

Acknowledgement

Organizer

- Seoul National University
- Korea Water Resources Association (KWRA)



SEOUL
NATIONAL
UNIVERSITY



KOREA WATER
RESOURCES ASSOCIATION

Under the Auspices of

- International Association for Hydro-Environment Engineering and Research (IAHR)



International Association
for Hydro-Environment
Engineering and Research

Hosted by
Spain Water and IWHR, China

Sponsoring and Supporting Organizations



BK21Education & Research
Program for **InfraSPHERE**
Dept of Civil & Environmental Engineering Seoul National University



Institute of Construction and Environmental Engineering
Seoul National University



KOREA INSTITUTE of CIVIL ENGINEERING
and BUILDING TECHNOLOGY

Welcome from the Chairman of ISEH



On behalf of the Local Organizing Committee of the 9th International Symposium on Environmental Hydraulics (ISEH), it is my great pleasure to invite leading researchers, practitioners and students of environmental hydraulics from all around the world to the 9th ISEH from July 19-21, 2021 Seoul, South Korea. It will be hosted by the Seoul National University and the Korea Water Resources Association (KWRA) under the auspices of the International Association for Hydro-Environment Engineering and Research (IAHR). The 9th ISEH will be a hybrid conference, allowing for the attendees to join us in person at the venue or online everywhere. All participants will have an access to the virtual platform.

The main theme of the 9th ISEH is “Advances in Hydro-Environments for an Era of Big Change”. This symposium will span classical and advanced experimental and numerical approaches to recent applications of remote sensing and artificial intelligence. Experts and young talented researchers will be able to actively share research ideas in the wonderful surroundings of the campus of the Seoul National University. Also, the 10 Special Sessions will highlight specific topics related to the recent advances in environmental hydraulics.

The University is easily reached from the international airports and by public transportation, and it is well connected to popular attractions such as Gangnam area and the ancient palaces, which provide ideal settings to renew old friendships and to forge new academic connections. I look forward to welcoming you to ISEH 2021.

Sincerely,

Professor Il Won Seo
Chairman of the Local Organizing
Committee, the 9th ISEH



○ Program at a Glance

Day Time \ Day Time	July 19 th (Monday)	July 20 th (Tuesday)	July 21 th (Wednesday)
09:00-10:00	Registration (Foyer)	Opening Ceremony	Keynote IV
10:00-10:20		Break	
10:20-11:10		Keynote II	Mini-Symposium (W1)
11:10-12:00		Keynote III	
12:00-13:00		Lunch	
13:00-14:30	Mini-Symposium (M1)	Mini-Symposium (T1)	Mini-Symposium (W2)
14:30-14:50	Break		
14:50-16:20	Mini-Symposium (M1)	Mini-Symposium (T2)	Mini-Symposium (W3)
16:20-16:40	Break		
16:40-17:30	Keynote I	Mini-Symposium (T3)	Closing Ceremony
17:30-18:00			



○ Symposium Summary

Day 1. July 19 (Mon)

Sessions	Grand Hall (520)	Room A (515)	Room B (513)	Room C (517)
Monday 1st session (M1): 13:00-14:30	S1-M1: Rainwater Harvesting and Utilization	D1-M1: Morphodynamics	H-M1: Machine Learning	A2-M1: Particles Laden Flows
Break 14:30-14:50	Break			
Monday 2nd session (M2): 14:50-16:20	S2-M2: Hydro-environment in cities-water cycle, metabolism and management	A1-M2: Dispersion	D2-M2: Vegetation	
Break 16:20-16:40	Break			
Keynote Lecture 1 16:40-17:30	Longitudinal Dispersion in the Natural Environment Exploring Contributing Components Ian Guymer (University of Sheffield, UK)			

Day 2. July 20 (Tue)

Sessions	Grand Hall (520)	Room A (515)	Room B (513)	Room C (517)
Opening Ceremony 09:00-09:50	Opening Ceremony			
Break 09:50-10:20	Break			
Keynote Lecture 2 10:20-11:10	Initiatives for Water Resources Management Considering Korea's Natural Restoration of Rivers Jae-Hyeon Park (K-water, South Korea)			
Keynote Lecture 3 11:10-12:00	Vegetation Hydrodynamics for Climate Mitigation and Adaptation Heidi Nepf (Massachusetts Institute of Technology, USA)			
Tuesday 1st session (T1): 13:00-14:30	S4-T1: Smart Safety Management of River Facilities	S3-T1: Development of River Management Technology Using River Survey and Monitoring Drones	B-T1: Jets	D3-T1: Fish
Break 14:30-14:50	Break			
Tuesday 2nd session (T2): 14:50-16:20	S6-T2: Technical Strategy for Quality Control of Hydrological Data and Advanced Toolkits for IWRM	S5-T2: Development of Environment-Friendly Levee Technology Using Biopolymer-soil Mixture	F3-T2: Remote Sensing-1	F5-T2: Hydro-engineering
Break 16:20-16:40	Break			
Tuesday 3rd session (T3): 16:40-18:10	S7-T3: Higher Degree Education for Civil and Environmental Engineering	A3-T3: Environmental Flows	F4-T3: Remote Sensing-2	C1-T3: Density Current

○ Symposium Summary

Day 3. July 21 (Wed)

Sessions	Grand Hall (520)	Room A (515)	Room B (513)	Room C (517)
Keynote Lecture 4 09:00-9:50	Experimental and Numerical Study of Wave Attenuation by Live Phragmites Australis Pengzhi Lin (Sichuan University, China)			
Break 09:50-10:20			Break	
Wednesday 1st session (W1): 10:20-12:00	S8-W1: Green Energy & ICT of Clean Water	E1-W1: Coast	F1-W1: Experiment-1	G1-W1: Computational Fluid Dynamics
Wednesday 2nd session (W2): 13:00-14:30	S9-W2: Multi-dimensional River Operation and Management Techniques	E2-W2: Ocean	F2-W2: Experiment-2	G2-W2: Shallow Water Flows
Break 14:30-14:50			Break	
Wednesday 3rd session (W3): 14:50-16:20	S10-W3: Research Overview of Environmental Hydraulics Laboratory in Seoul National University	E3-W3: Estuary	C2-W3: Stratified Flows	G3-W3: Open Channel Hydraulics
Break 16:20-16:40			Break	
Closing Ceremony 16:40-18:00	Closing Ceremony			

● Venue and Floor Plan

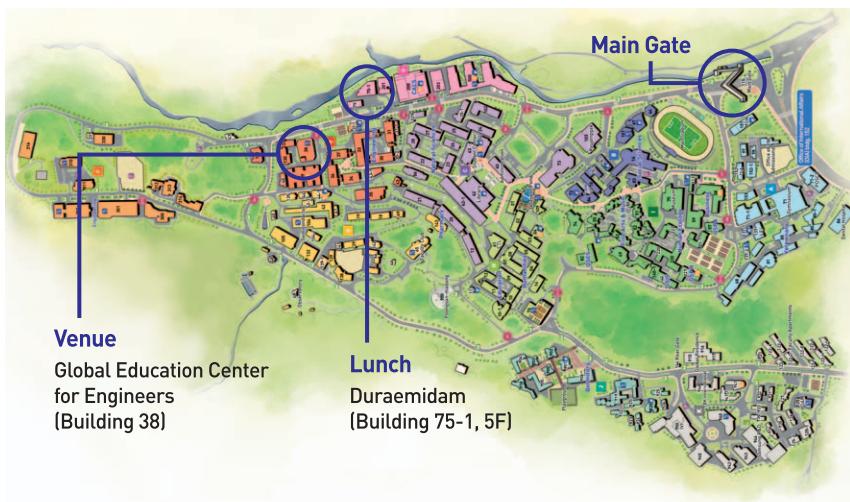
● Venue and Access



SEOUL NATIONAL UNIVERSITY

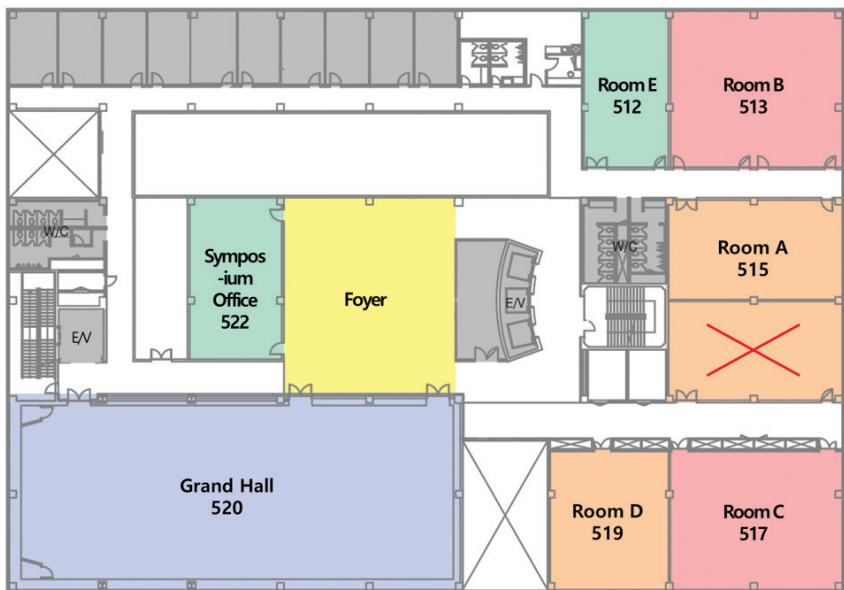
The symposium will be held at the Seoul National University, and the venue of the symposium is the Global Education Center for Engineers (Building 38) in the Gwanak campus of the Seoul National University.

Seoul National University was founded in 1946 as the first national university in Republic of Korea and is considered as the most prestigious university in the country. Seoul National University consists of 16 colleges, 1 Graduate School and 10 Professional Schools, 2,620 full-time faculty members, 16,511 undergraduate students and 12,119 graduate students. The university has an impressive portfolio of international partnerships, with as many as 289 universities in 58 countries collaborating with the school, and it is placed joint 37th and number one in South Korea in the QS World University Rankings 2021.



● Venue and Floor Plan

- Floor plan : Global Education Center for Engineers 5F (Building 38)



- Grand Hall: Ceremony, Keynote Speech, Special Session
- Foyer: Registration, Poster, Coffee Break
- Room A / B / C: Session Room
- Room D: Presenter Preparation Room
- Room E: Committee Meeting

● Venue

Global Education Center for Engineers 5F (Building 38)
08826, 38 5F Gwanak-ro 1, Gwanak-gu, Seoul, Korea
08826 서울특별시 관악구 관악로 1 글로벌공학교육센터 5층
Tel. +822-880-1544 / +822-880-1599

General Information

Conference Language

The official language of the 9th ISEH is English.

Registration

The registration fee includes: conference proceedings, access to all technical sessions, lunch and beverages at the coffee breaks. Thus, if your registration is complete, pick up your name tag at the Foyer. The name tags serves as an admission ticket for the conference, exhibition, and lunch. You are encouraged to wear the name tag during the conference.

Date	Location	Time
19-21 July	Global Education Center for Engineers 5F (Building 38) Foyer	08:00-17:00

Symposium Office

Symposium office is located in Room 522. The office will be open from 9am to 5pm Monday through Wednesday (19-21 July).

Instructions for Presenters

Please come to the presentation room at least 10 minutes before your session starts and identify yourself to the session chair(s) as being the speaker of the session. Please check the presentation material in advance. Make sure to speak only for the 12 minutes allotted for your presentation.

Instructions for Session Chair

Please come to the presentation room of your session at least 10 minutes before your session starts. Please check the attendance of the presenters. 12 minutes are assigned for the presentation of each contributed paper followed by 3 minutes discussion.

Please keep to the time schedule. If the presenter does not show up, the presentation can be substituted for pre-recorded video and the discussion can be skipped. Please suspend your session and do not move on to the next presentation. Please wait until the scheduled starting time of the next presentation.

○ General Information

● Exhibition

Date	Location	Time
19-21 July	Foyer	09:00-18:00

● Lunch and Coffee Breaks

Coffee breaks will be served in Foyer daily. On Tuesday and Wednesday, lunch will be served in designated restaurant (B1).

● Ceremony

Ceremony	Location	Time
Opening Ceremony	Grand Hall	09:00 - 09:50 July 20 th (Tue)
Closing Ceremony	Grand Hall	16:40 - 18:00 July 21 st (Wed)

● Committee Meeting

Meeting	Location	Time
IAHR Korea	Room E (512)	14:00 - 15:00 July 20 th (Tue)
IAHR YPN	Room E (512)	15:30 - 16:30 July 20 th (Tue)

● Awards

Award	Longlist	Awarder	Prize
Best Paper Award (1)	All participants	ISEH Chairman	USD 1,000 and plaque
Best Young Professional Award (2)	Students	KWRA President	USD 500 and plaque
Outstanding Special Session Award (2)	Participating Teams in Special Session	JHER Editor	USD 500 and plaque

○ Keynote Speech



● Keynote 1

July 19 (Mon) 16:40-17:30, Grand Hall (520)

Chair: **Kyong Oh Baek** (HKNU)



Longitudinal Dispersion in the Natural Environment Exploring Contributing Components

Ian Guymer (University of Sheffield, UK)

Prof. Ian Guymer studied for PhD at the University of Birmingham, UK, graduating in 1985. In January 2005, Ian was appointed Professor of Civil Engineering at the University of Warwick. He returned to his home city, and the University of Sheffield in 2018. Ian's research interests centre on the mixing and transport of contaminants in coastal and estuarine areas, rivers, urban drainage and most recently, pipe distribution systems. His work aims to identify and quantify the transport and mixing processes within areas of civil engineering hydraulics and the natural environment. His research projects have investigated the mixing processes in urban drainage systems, quantifying dispersion effects due to topographic variations, estuarine studies and coastal mixing processes. In recent years, fundamental research has been supported by EPSRC, NERC, and the EU, with applied research funded by Unilever, Water utilities, the Environment Agency and Highways England. Ian is a Chartered Engineer and a Member of the Chartered Institution of Water and Environmental Management. In 2017-19, Ian was the first Academic-in-Residence for the Institution of Civil Engineers' Shaping-the-World initiative, which uses the knowledge and experience of civil engineers to help find solutions to some of the world's most pressing problems, as detailed in the UN Sustainable Development Goals.

○ Keynote Speech

● Keynote 2

July 20 (Tue) 10:20-11:10, Grand Hall (520)

Chair: **Jungsun Oh** (KICT)



Initiatives for Water Resources Management considering Korea's Natural Restoration of Rivers

Jae-Hyeon Park (K-water, South Korea)

Dr. Jae-Hyeon Park is the CEO of K-water, Korea Water Resources Corporation. He received both his master's degree and a doctorate in Civil Engineering (specifically hydraulic engineering) at Seoul National University, Republic of Korea, before beginning his career in the field of academia. He worked as a professor in the College of Engineering at Inje University for about 20 years from 2000, and was a visiting professor at the University of California, United States. In addition to his professional academics experiences, Dr. Park is widely recognized as an expert in the water sector since he actively engaged in diverse water-related activities such as the National Water Management Committee, Presidential Committee on Balanced National Development, Integrated Water Management Vision Forum, etc. In 2020, in recognition of his work in this field, Dr. Park was elected as the President of the Asia Water Council, and presently serves as a member of the Board of Directors of the World Water Council, Federation of Korean Society of Water and Academic Societies, and Korea Water and Wastewater Association.

○ Keynote Speech



● Keynote 3

July 20 (Tue) 11:10-12:00, Grand Hall (520)

Chair: **Sung-Uk Choi** (Yonsei Univ.)



Vegetation Hydrodynamics for Climate Mitigation and Adaptation

Heidi Nepf (Massachusetts Institute of Technology, USA)

Prof. Heidi Nepf is the Donald and Martha Harleman Professor of Civil and Environmental Engineering at the Massachusetts Institute of Technology (MIT). She received a doctorate from Stanford University (1992) and was a Postdoctoral Fellow at Woods Hole Oceanographic Institution before beginning her career at MIT in 1993. She is internationally known for her work on the impact of vegetation on currents, waves, and sediment transport in channels, wetlands, and coastal zones. The Nepf Lab develops models for the physical processes that determine how vegetated habitats, such as seagrasses, marshes, and mangroves, provide coastal protection, impact landscape stability, improve water quality, and provide blue carbon reservoirs. In recognition of her work in this field, she was selected for a NSF Career Award, the Borland Lecture, the Chapman Lecture, the Harold Schoemaker Best Paper Award [IAHR], and Distinguished Alumni Award from Bucknell University. In 2018 she was elected as a Fellow of the American Geophysical Union, and in 2019 she received the ASCE, Hunter Rouse Hydraulic Engineering Award. Dr. Nepf served on the National Research Council panel that reviewed the Army Corps' Louisiana Coastal Protection and Restoration (LACPR) Program.

○ Keynote Speech

● Keynote 4

July 21 (Wed) 09:00-09:50, Grand Hall (520)

Chair: **Yong Sung Park** (SNU)



Experimental and Numerical Study of Wave Attenuation by Live Phragmites Australis

Pengzhi Lin (Sichuan University, China)

Prof. Pengzhi Lin obtained his Ph. D. degree from Cornell University in 1998. He conducted postdoctoral research at Cornell and Hong Kong Polytechnic University from 1998-2000. In 2000, he joined National University of Singapore as an assistant professor and became the tenured associate professor in 2005. Now he is a Professor at Sichuan University, China. His research interests cover hydraulic, coastal and ocean engineering. He is an expert in computational hydrodynamics and its applications in various water-related problems. He is the author of the book "Numerical Modeling of Water Waves" published by Taylor & Francis in 2008 and the co-author of "Water Environment Modeling" to be published in 2021. He has published about 100 peer-reviewed journal papers, which receive a total citations of over 5,000 times. He is the Chief Editor of Applied Ocean Research and the Associate Editor for Journal of Hydro-environment Research, Journal of Hydraulic Engineering, Journal of Ocean Engineering and Marine Energy, and Water Science and Engineering.



Technical Program

[Day 1] Monday July 19



○ Day 1_Technical Program

- Monday July 19, 13:00-14:30 (UTC+9)

Mini-symposium D1-M1

Morphodynamics

Chair: Un Ji (KICT), Yasuyuki Shimizu (Hokkaido Univ.)

D1-1

13:00-13:15

Investigation the impact of river interventions on fluvial morphodynamics

Gergely T. Török, Gary Parker

D1-2

13:15-13:30

Optimal shape of alternative gravel mounts in terms of flood control and aquatic habitat

Pietro Beretta Piccol, Youichi Yasuda

D1-3

13:30-13:45

Artificial formation of gravel mount with stacked boulders

Youichi Yasuda, Pietro Beretta Piccoli Marco

D1-4

13:45-14:00

A comparative study on sequent depth ratio and energy losses in hydraulic jumps on rough rectangular channels with adverse slopes

Maisnam Bipinchandra Singh, Mukesh Kumar Yadav, Victoria Ningthoujam Ngangbam Romeji Singh

D1-5

14:00-14:15

Sequent depth ratio and energy losses in hydraulic jumps on rough near-prismatic channels with sediment flows

Maisnam Bipinchandra Singh, Ngangbam Romeji, Mukesh Kumar Yadav Susilchandra Khurajam

D1-6

14:15-14:30

Impacts of riparian vegetation features on the shear layer in partly vegetated channels

Gerardo Caroppi, Kaisa Väistilä, Paola Gualtieri, Juha Järvelä, Maurizio Giugni, Paweł M. Rowiński

○ Day 1_Technical Program



Mini-symposium H-M1

Machine Learning

Chair: Sung Eun Kim (SI)

H-1

13:00-13:15

The prediction of turbulent features of drainage channels covered by reed beds by using a Machine Learning approach

Giuseppe Francesco Cesare Lama

H-2

13:15-13:30

The development of real time prediction system for urban flooding in Incheon, South Korea

Dongmin Jang, Sung Won Park, Chang Hoo Jeong, Won Su Kim

H-3

13:30-13:45

Machine learning based spatio-temporal characterization of marine water quality evolution in Hong Kong

Tianan Deng, Huan-Feng Duan

H-4

13:45-14:00

Improvement of algal bloom identification by a big-data analysis using satellite images

Hye-Suk Yi, Dong-Kyun Kim, Kwangsoon Choi, Youngsung Kim, Suna Chong, Nam-Il Won, Hojoon Kim, Sunghwa Choi, Eui-ho Hwang, Yongbae Jung

H-5

14:00-14:15

Three types of machine learning technique for three different problems in water resource engineering

Donghwi Jung, Soon Ho Kwon, Joong Hoon Kim

H-6

14:15-14:30

Watershed management in Nakdong river using big data analysis

Bu Geon Jo, Woo Suk Jung, Young Do Kim



○ Day 1_Technical Program

Mini-symposium A2-M1

Particle Laden Flows

Chair: Jungkyu Ahn (INU)

A2-1

13:00-13:15

Effect of turbulent motions on the sediment entrainment based on the three-dimensional PIV and PTV technique

Hyoungchul Park, Jin Hwan Hwang

A2-2

13:15-13:30

Modeling of scour process under two-dimensional wall jet: insights in the scour development stage

Geng Li, Binbin Wang

A2-3

13:30-13:45

Reservoir sedimentation and flushing for the management of the Patrind hydro-power dam

Joonwoo Noh, Yeonsoo Kim, Jisoo Yu

A2-4

13:45-14:00

Using image conversion for suspended solid transport for 2D particle dispersion modeling

Jaehyun Shin, Hoje Seong, Inhwon Park, Dong Sop Rhee

A2-5

14:00-14:15

Identifying total sediment loads—suspended sediment load relationship using a two-level unsupervised clustering method

Hyoseob Noh, Yong Sung Park

Mini-symposium S1-M1

Rainwater Harvesting and Utilization

Chair: Mooyoung Han (SNU)

S1-1

13:00-13:15

Multi-purpose decentralized rainwater management: Philosophy, theory and a case study

Mooyoung Han

S1-2

13:15-13:30

Effects of multi-purpose rainwater management for responding to the climate crisis

Dong Geun Kwak, Mooyoung Han

○ Day 1_Technical Program



S1-3

13:30-13:45

Rainwater use efficiency and optimization of Seoul Botanic Park in South Korea

Zion Kang, Kyungho Kwon

S1-4

13:45-14:00

Innovative technology to maintain clean rainwater in rainwater harvesting systems

Janith Dissanayake, Mooyoung Han

S1-5

14:00-14:15

Sustainable RFD (Rainwater for Drinking) system for rural health care facilities (HCF): A case study at Ly Nhan HCF in Vietnam

Hakyung Lee, Mooyoung Han



○ Day 1_Technical Program

- Monday July 19, 14:50-16:20 (UTC+9)

Mini-symposium A1-M2

Dispersion

Chair: Kyong Oh Baek (HKNU)

A1-1

14:50-15:05

Simulation of the near-field mass transport processes through a fishing net panel using OpenFOAM

Yang Xinyue, Carlo Gualtieri, Dongdong Shao

A1-2

15:05-15:20

Mixing characteristics of river confluence using water quality indicator in slow flow conditions

Geunsoo Son, Dongsu Kim, Siwan Lyu, Young Do Kim

A1-3

15:20-15:35

Improving an observation method on pollutant dispersion for analysis of two-dimensional river mixing

Donghae Baek, Il Won Seo

A1-4

15:35-15:50

Investigation of pollutant transport at upstream of notch installed weir

Sung Hyun Jung, Il Won Seo

A1-5

15:50-16:05

Non-Fickian transport induced by horizontal flow recirculation in meandering open channels

Jun Song Kim, Il Won Seo, Donghae Baek

A1-6

16:05-16:20

Experimental investigation on longitudinal dispersion in a reach with willow patches

Kaisa Västilä, Un Ji, Juha Järvelä, Fred Sonnenwald, Hyung Suk Kim, Ian Guymer, Jungsun Oh

A1-7

16:20-16:35

An autoregressive model for sewage flow prediction for chlorine dosage control

Yuqing Liu, King Wah Choi, Joseph H. W. Lee

○ Day 1_Technical Program



Mini-symposium D2-M2

Vegetation

Chair: Jungsun Oh (KICT)

D2-1

14:50-15:05

Numerical study on the effects of vegetation on the intradelta lobe avulsion

Dongxue Li, Weilun Gao, Dongdong Shao, Baoshan Cui

D2-2

15:05-15:20

Experimental and numerical modelling of Reynolds shear stress in open channel flows with double-layer vegetation

Hamidreza Rahimi, Xiaonan Tang, Toktam Hatamisengeli, Prateek Kumar Singh

D2-3

15:20-15:35

Velocity reduction and drag in submerged canopies under oscillatory flow conditions

Dominic van der A, Otto Neshamar, Niels G. Jacobsen, Tom O' Donoghue

D2-4

15:35-15:50

Experimental reach scale methodology for analyzing integrated flow resistance due to woody vegetation patches

Inhyeok Bae, Un Ji, Juha Järvelä, Kaisa Västilä

D2-5

15:50-16:05

Study on the physical habitat of river channel vegetation designated as an endangered species

Takayuki Tanaka, Syunya Hazama, Ryuki Harata

D2-6

16:05-16:20

The impact of vegetation existence on flow structure in compound channels

Yutong Guan, Xiaonan Tang



○ Day 1_Technical Program

Mini-symposium S2-M2

Hydro-environment in Cities-Water Cycle, Metabolism and Management

Chair: Yongju Choi (SNU)

S2-1

14:50-15:05

Feasibility of waste heat recovery from sewage in metropolitan cities

Jinsung An

S2-2

15:05-15:20

A pilot scale study for semiconductor wastewater reuse and ultrapure water production

Chong Min Chung

S2-3

15:20-15:35

Stochastic approaches for risk and resilience of groundwater systems under uncertainty

Jinwoo Im

S2-4

15:35-15:50

Development and application of a polar organic chemical integrative sampler (POCIS) for monitoring micropollutants in a drinking water treatment plant

Hyun-ah Kwon, Yongju Choi

S2-5

15:50-16:05

Oxidation of aldehydes found in finished recycled wastewater with heterogeneous transition metal catalysts and dissolved oxygen

Euna Kim, Georgia Cardosa, Daniel L. McCurry

S2-6

15:50-16:05

Development of sensor technologies for smart water quality management in future cities

Jong Kwon Choe, Junyoung Park



Technical Program

[Day 2] Tuesday July 20



○ Day 2_Technical Program

- Tuesday July 20, 13:00-14:30 (UTC+9)

Mini-symposium B-T1

Jets

Chair: Sung Won Park (KISTI), Adrian Law (NTU)

B-1

13:00-13:15

Self-preserving characteristics in 2D submerged offset jets

Subhasish Dey, Galla Ravi Kishore, Sk Zeeshan Ali

B-2

13:15-13:30

Mathematical model of Reynolds shear stress in a turbulent plane jet with Coandă effect

Sk Zeeshan Ali, Galla Ravi Kishore, Subhasish Dey

B-3

13:30-13:45

Effect of ambient turbulence on the entrainment into a turbulent jet - mean properties and processes at the turbulent/turbulent interface

Rana Sahebjam, Khashayar F. Kohan, Susan J. Gaskin

B-4

13:45-14:00

Estimate of attraction flow propagation as turbulent rectangular surface jet

Veronica Wiering

B-6

14:00-14:15

Prediction of transport and dissolution of oil & gas released from diverse oil blowout scenarios in the offshore canada

Inok Jun, Rebekah Jeter, Scott A. Socolofsky, Ruixue Liu, Michel C. Boufadel, Youyu Lu, J. Samuel Arey

B-7

14:00-14:30

Chemically reacting chlorine jet mixing with CEPT sewage effluent

Q.S Qiao, Joseph H. W. Lee

○ Day 2_Technical Program



Mini-symposium D3-T1

Fish

Chair: Sung-Uk Choi (Yonsei Univ.)

D3-1

13:00-13:15

Surface roughness in billfishes: a guide to improving the design of engineered surfaces?

M.T. Stewart, D.K. Wainwright, V.I. Nikora, S.M. Cameron, M. Thunert, T. Stoesser

D3-2

13:15-13:30

Fish swimming behaviour and kinematics in the wake of a vertical axis turbine

Stephanie Müller, Valentine Muhamenimana, Pablo Ouro, Catherine Wilson, Jo Cable

D3-3

13:30-13:45

Exploration of the active sensory space of fish through CFD

Ali Hassan Khan, Stefan Hoerner, Jeffrey A. Tuhtan

D3-4

13:45-14:00

Transient physical habitat modelling - simulation of stream macrozoobenthos habitat suitability using fuzzy logic approach

Sengdavanh Theppachanh, Jürgen Stamm

D3-5

14:00-14:15

Attracting juvenile silver perch into the tube fishway with different diameters

Maryam Farzadkho, Stefan Felder, Iain M Suthers, William L Peirson, Richard T Kingsford, John H Harris

D3-6

14:15-14:30

An investigation of the hydrodynamic and fish behavior characteristics in brush-type fish passage: A pilot study in Iyidere, Turkey

Serhat Kucukali, Reinhard Hassinger



○ Day 2_Technical Program

Mini-symposium S3-T1

Development of River Management Technology Using River Survey and Monitoring Drones

Chairs: Dong Sop Rhee (KICT)

S3-1

13:00-13:15

The development of the drone operation platform for river survey and monitoring

Jaehyun Shin, Hoje Seong, Dong Sop Rhee

S3-2

13:15-13:30

Creation of a digital twin using LiDAR point cloud and high-resolution imagery acquired in river basins

Yun-Jae Choung

S3-3

13:30-13:45

Bathymetric Observation with UAV-based hyperspectral Image in Shallow Rivers

Hojun You, Dongsu Kim, Yeonghwa Gwon

S3-4

13:45-14:00

Development and application of HDM-2DF for analyzing river inundation and inland flooding

Chang-Geun Song

S3-5

14:00-14:15

Discharge calculation using surface velocity measured by surface image velocity meter

Youngsin Roh, Seo Jun Kim

S3-6

14:15-14:30

Prediction of long-term bed elevation change based on gate operations: For Geum River

Chang Sung Kim, Seong Jun Kim

S3-7

14:30-14:45

Prediction of bed elevation change according to weir open operations: For Nakdong River

Seong Jun Kim, Chang Sung Kim

○ Day 2_Technical Program



Mini-symposium S4-T1

Smart Safety Management of River Facilities

Chair: Jong-wook Lee (K-water)

S4-1

13:00-13:15

Utilization of ROV for safety inspection of underwater structures
Eun Sang Im

S4-2

13:15-13:30

River levee surface erosion mitigation using eco-friendly biopolymer-based soil treatment (BPST)
Yeong-Man Kwon, Sojeong Lee, Ilhan Chang

S4-3

13:30-13:45

Development of an algorithm for outlier detection processing of water level data measured by ultrasonic sensor
Inhyeok Bae, Un Ji

S4-4

13:45-14:00

Study on advanced early warning system for dam safety measurements
Seong-Bae Jo, Eun-Sang Im, Kichun Kang, Sukmin Yoon

S4-5

14:00-14:15

Drone application for water infrastructure reality modeling
Dong Soon Park, Taemin Kim



○ Day 2_Technical Program

- Tuesday July 20, 14:50-16:20 (UTC+9)

Mini-symposium F3-T2

Remote Sensing-1

Chair: Donghae Baek (KICT), Adrian W.K. Law (NTU)

F3-1

14:50-15:05

Development of an image based method to track the fate of floating litter in rivers

Péter Grivalszki, Gábor Fleit, Alexander Anatol Ermilov, Sándor Baranya

F3-2

15:05-15:20

Assessing performance of a novel UAV-borne green LiDAR on vegetated rivers characterization: comparison with traditional airborne LiDAR bathymetry

Md Touhidul Islam, Keisuke Yoshida, Satoshi Nishiyama, Koichi Sakai

F3-3

15:20-15:35

Riparian land-cover classification methodology of airborne laser bathymetry assisted deep learning of aerial photographs

Shijun Pan, Keisuke Yoshida, Junichi Taniguchi, Akihide Watanabe

F3-4

15:35-15:50

Water level monitoring for Hwang-Gang dam in North Korea using satellite remote sensing and inflow estimation for Gun-Nam flood control reservoir in South Korea

Jin-Gyeom Kim, Boosik Kang, Wansik Yu, Euiho Hwang

F3-5

15:50-16:05

Rapid extraction of water area using SAR remote sensing data

Ki-mook Kang, Eui Ho Hwang, Sunghwa Choi, Wansik Yu, Jingyeom Kim

F3-6

16:05-16:20

Study on optimum UAV photogrammetry operation using river information from local residents at small and medium-sized rivers in Japan

Ken Ichikawa, Masakazu Hashimoto, Shosuke Sato, Fumihiko Immura, Arata Nasuno, Kaori Amaya, Susumu Naradate

○ Day 2_Technical Program



Mini-symposium F5-T2

Hydro-engineering

Chairs: Young-Oh Kim (SNU)

F5-1

14:50-15:05

Effects of the absence/presence of river bathymetric data in DEMs used for hydraulic modelling and flood prediction

Nancy Joy Lim

F5-2

15:05-15:20

Evaluation of reservoir capacity of Singda reservoir using bathymetric data and geospatial techniques

Victoria Ningthoujam, Maisnam Bipinchandra Singh, Ngangbam Romeji Singh

F5-3

15:20-15:35

Climatic impact and water balance analysis of Singda reservoir using hydrologic models and geo-hydrographic techniques

Victoria Ningthoujam, Ngangbam Romeji, Gunadas Singh Keisam, Sylvia Nongthombam

F5-4

15:35-15:50

Using hydrological distributed model to evaluate the CHRS rainfall in generating discharge of Cileunsgsi River, Indonesia

M. Pramono Hadi

F5-5

15:50-16:05

Development of the GeoCRP for the smart river management in the smart city

Bonhyun Koo, Kyucheoul Shim, Eunjeong Lee

F5-6

16:05-16:20

Nature-based solutions as an overarching concept and river corridor management

Hyoseop Woo

F5-7

16:20-16:35

Daily algal bloom risk forecast system for Lo Tik Wan, Hong Kong

Juhao Guo, Joseph H. W. Lee



○ Day 2_Technical Program

Mini-symposium S5-T2

Development of Environment-Friendly Levee Technology Using Biopolymer-soil Mixture

Chairs: Doo-han Lee (KICT)

S5-1

14:50-15:05

State-of-the-art of the utilization of biopolymer-soil mixture to the civil engineering field

Gye-Chun Cho

S5-2

15:05-15:20

A high-speed experimental channel test of the biopolymer-oil mixture to flow erosion

Doo-han Lee

S5-3

15:20-15:35

A full-scale test of levee slope failure covered with the biopolymer-soil mixture

Jun-koo Kang

S5-4

15:35-15:50

A full-scale test of internal erosion of levees along in the interface of soil and embedded hydraulic structure

Young Uk Kim

S5-5

15:50-16:05

Development of a light, hand-carrying prototype device of direct measurement of bed shear stress

Young Do Kim

Mini-symposium S6-T2

Technical Strategy for Quality control of Hydrological Data and Advanced Toolkits for IWRM

Chair: Junwoo Noh (K-water)

S6-1

14:50-15:05

Study on driftwood generation and deposition patterns by tsunami flow using numerical simulation

Tae Un Kang, Chang-Lae Jang

S6-2

15:05-15:20

Probabilistic flood risk assessment in the downstream area of dam

Beomjin Kim, Byunghyun Kim, Kun-Yeon Han

○ Day 2_Technical Program



S6-3

15:20-15:35

Analysis of riverbank erosion risks using an advanced DSS toolkit for Sesan and Srepok river basin in Vietnam

Jeongkon Kim, Le Van Thin

S6-4

15:35-15:50

Cast study: smart water management technology for the development of new capital city of the Indonesia

Sang Young Park, Jin Hyeog Park

S6-5

15:50-16:05

A practical application of hybrid flood modeling in river

Wanshik Yu, Yonsu Kim, Sunghoon Kim, Jiyoung Jung, Joonwoo Noh



○ Day 2_Technical Program

- Tuesday July 20, 16:40-18:10 (UTC+9)

Mini-symposium A3-T3

Environmental Flows

Chairs: Jaehyun Shin (KICT), Pawel Rowinski (Polish Academy of Science)

A3-1

16:40-16:55

The effect of turbulent flow motion on the sea urchin fertilization

Hyounchul Park, Hojung You, Jin Hwan Hwang

A3-2

16:55-17:10

The effect of obstacle configuration on the transport of neutrally buoyant particles

Hojung You, Rafael O. Tinoco

A3-3

17:10-17:25

A turbulence-based, two-layer model to predict sediment resuspension in vegetated flows

Chien-Yung Tseng, Rafael Tinoco

A3-4

17:25-17:40

Disparity of nutrient loading estimates associated with extreme-event observation

Dong-Kyun Kim, Kwangsoon Choi, Youngsung Kim, Hye-Suk Yi, Suna Chong, Nam-Il Won, Hojoon Kim, Seung-Yoon Lee, Seungbin Yang, Hyung-Seok Park

A3-5

17:40-17:55

Analysis of residence time distribution in retention zone of natural rivers

Byunguk Kim, Il Won Seo

A3-6

17:55-18:10

Hyporheic exchange driven by rocks

Anzy Lee, Antoine Aubeneau, M. Bayani Cardenas, Xiaofeng Liu

A3-7

18:10-18:25

Electrochemical model for galvanic corrosion in drinking water supply systems

Lu Chang, Joseph H. W. Lee

○ Day 2_Technical Program



Mini-symposium C1-T3

Density Current

Chairs: Jin Hwan Hwang (Seoul Nat. Univ.)

C1-1

16:40-16:55

The hydraulics of the salt tip in the estuarine contraction

Nguyen Ngoc Minh, Jin Hwan Hwang

C1-2

16:55-17:10

Numerical study of confluence channel flow with gravity currents

Minjae Lee, Yong Sung Park

C1-3

17:10-17:25

LES of colliding gravity currents

Angelos Kokkinos, Panagiotis Prinos

C1-4

17:25-17:40

Effects of rotation on stratified exchange flows over a submerged sill

Alan Cuthbertson, Jarle Berntsen, Janek Laanearu, Magdeli Asplin

C1-5

17:40-17:55

Experimental turbidity current dynamics responding to a simultaneous loss of confinement and break of slope

Jonathan Wilkin, Alan Cuthbertson, Sue Dawson, Dorrik Stow, Karl Stephen, Uisdean Nicholson

Mini-symposium F4-T3

Remote Sensing-2

Chairs: Donghae Baek (KICT)

F4-1

16:40-16:55

The implementation of a surface image velocimetry to a small-sized river using images taken with drone-mounted camera

Kwonkyu Yu, Binghao Liu, Namjoo Lee

F4-2

16:55-17:10

Estimating dispersive behavior using UAV-based spatio-temporal hyperspectral image

Yeonghwa Gwon, Eun Jin Han, Hojun You, Dongsu Kim, Young Do Kim



○ Day 2_Technical Program

F4-3

17:10-17:25

Remote sensing for suspended sediment concentration using hyperspectral images in rivers

Siyoon Kwon, Il Won Seo

F4-4

17:25-17:40

A study on the establishment of algae mapping based on hyperspectral images

Gwang Soo Kim, Dong Gyu Jung, Jong Min Kim, Young Do Kim

F4-5

17:40-17:55

Analysis of flow characteristics using GPS floater in estuary

Jeong Min Lee, Chang-Hyun Lee, Young Do Kim

F4-6

17:55-18:10

Research on technology to calculate algae concentration in river based on hyperspectral image using UAV

Jong Min Kim, Gwang Soo Kim, YeongHwa Gwon, Dong Soo Kim, Young Do Kim

Mini-symposium S7-T3

Higher Degree Education for Civil and Environmental Engineering

Chairs: Young-Oh Kim

S7-1

16:40-16:55

International course program in civil engineering department

Sunmin Kim

S7-2

16:55-17:10

InfraSPHERE education and research program

Junho Song

S7-3

17:10-17:25

Environmental Engineering postgraduate program in NUS

Jianyong Hu

S7-4

17:25-17:40

Graduate program and internationalization in NTUCE

Kuo Hsin Yang



Technical Program

[Day 3] Wednesday July 21



○ Day 3_Technical Program

- Wednesday July 21, 10:30-12:00 (UTC+9)

Mini-symposium E1-W1

Coast

Chairs: Yong Sung Park (Seoul Nat. Univ.), Dominic van Der A (Univ. of Aberdeen)

E1-1

10:30-10:45

OpenFOAM modeling of wave pressures on a caisson armored with double-layer tetrapods on the rubble stones

Deok Ah Lee, Gun Hyeong Kim, Sung Bum Yoon, Sang-Ho Oh

E1-2

10:45-11:00

A novel approach to estimate the coastal protection provided by different saltmarshes species

Maria Maza, Javier L. Lara, Iñigo J. Losada

E1-3

11:00-11:15

Siphon well for protection of coastal aquifer from saltwater intrusion

Byunghee Nam, Roshina Babu, Namsik Park

E1-4

11:15-11:30

Simulation-optimization for sustainable groundwater management in small islands under drought conditions

Roshina Babu, Byunghee Nam, Namsik Park

E1-5

11:30-11:45

Calibration and assessment of numerical modelling in an embayed beach in case of presence or absence of submerged breakwaters

Minsang Cho, Kideok Do, In-Ho Kim, Hyun-Doug Yoon

Mini-symposium F1-W1

Experiment-1

Chairs: Yonguk Ryu (Chonnam Nat. Univ.), Scott Socolofsky (Texas A&M Univ.)

F1-1

10:30-10:45

Interfacial compound section transverse flow variation in symmetric and asymmetric compound open channel flow

P. Singh, X. Tang

F1-3

10:45-11:00

Lateral diffusion of stabilized air bubbles in a counterflow water tunnel

Soobum Bae, Scott A. Socolofsky, Binbin Wang

○ Day 3_Technical Program



F1-4

11:00-11:15

Flow patterns and sediment transport at the Initial phase of the local scouring at the downstream of bed protection

Sung Won Park, Jin Hwan Hwang, Jungkyu Ahn

F1-5

11:15-11:30

Experimental study on throughflow and water purification characteristics of rockfill porous media

Ilyeong Han, Jaejoung Lee, Gyoo bum Kim

F1-6

11:30-11:45

Direct measurement of critical tractive force for revetment material

Dong Gyu Jung, Gwang Soo Kim, Young Do Kim, Yong Sung Park

F1-7

11:45-12:00

The effects of air cavity propagation on transient full pipe flows during emptying process

Rolando Perez, Arman Rokhzadi, Musandji Fuamba

Mini-symposium G1-W1

Computational Fluid Dynamics

Chairs: Joongcheol Paik (GWNU), Fabian Bombardelli (UC Davis)

G1-1

10:30-10:45

Numerical Study on the Hydrodynamics of a Vegetated Lateral Cavity

Luiz Oliveira, Taís Yamasaki, Johannes Janzen, Carlo Gualtieri

G1-2

10:45-11:00

SPH simulation of vortex flow in open channel expansion

Chunli Wang, S. Samuel Li

G1-3

11:00-11:15

LES prediction of bistable flow in open-channel expansion

Rui Zeng, S. Samuel Li

G1-4

11:15-11:30

Numerical Investigation of air entrainment in a hydraulic jump

Byung Joo Kim, Joongcheol Paik



○ Day 3_Technical Program

G1-5

11:30-11:45

Implicit primal discontinuous Galerkin formulation for turbulent stresses in shallow water equations

Haegyun Lee, Namjoo Lee

G1-6

11:45-12:00

A numerical study on pressure fluctuations in free jump and submerged jump

Seongwook Choi, Sung-Uk Choi

Mini-symposium S8-W1

Green Energy & ICT of Clean Water

Chairs: Jong-min Choi (Hanbat Nat. Univ.)

S8-1

10:30-10:45

Heat source and sink trends for internet data center cooling system

Kwesi Mensah, Selorm Kwaku Anka, Tae In Ohm, Jong Woong Choi, Yong Cho, Sung Hoon Chu, Han-Young Kim, Jong Min Choi

S8-2

10:45-11:00

Eco-friendly floating photovoltaic power plant of K-water

Hyunsik Jo, Hyunjun Kim

S8-3

11:00-11:15

Development of AI-driven composite sensor to expand energy management system in water treatment plant

Sang Byeong An, Sung Taek Hong, Kuk Il Kim, Jin Hoon Kim

S8-4

11:15-11:30

Seismic behavior analysis of an RTU panel with friction pendulum system by tri-axial shaking table tests

Bub Gyu Jeon, Sung Wan Kim, Da Woon Yun, Woo-Yong Jung

○ Day 3_Technical Program



- Wednesday July 21, 13:00-14:30 (UTC+9)

Mini-symposium E2-W2

Ocean

Chairs: Sang-Ho Oh (Changwon Nat. Univ.), Yusuke Uchiyama (Kobe Univ.)

E2-1

13:00-13:15

Evaluation of effects of river discharge on development of salinity stratification and hypoxia due to climate change in the Ariake Sea, Japan

Hao Lin, Shinichiro Yano

E2-2

13:15-13:30

Development of blue carbon dynamics ecological model considering the effects of stratification in the Yatsushiro sea, Japan

Bing Xiong, Naoki Saito, Hiroto Komori, Shinichiro Yano, Keisuke Nakayama, Katsuaki Komai, Hiroshi Yajima

E2-3

13:30-13:45

Improvement of long term integration results of one-way nested regional ocean model by applying a new boundary small eddy additions technique

Van Sy Pham, Jin Hwan Hwang

E2-4

13:45-14:00

Transport of Microplastics Contained in the Wastewater Discharged from the King Sejong Station in the West-Antarctica

Bo-Kyung Kim, Jin Hwan Hwang

E2-5

14:00-14:15

Assessing the interplay of Sea Level Rises and Mangrove Species Richness: A Meta-analysis Approach

Giuseppe Francesco Cesare Lama

E2-6

14:15-14:30

UAV-Based Remote Sensing for Coastal Environment

Hieu Trung Kieu, Cuc Duong, Hui Ying Pak, Dawn Pang, Adrian Wing-Keung Law



○ Day 3_Technical Program

Mini-symposium F2-W2

Experiment-2

Chairs: Jin Hwan Hwang (Seoul Nat. Univ.), Nimish Pujara (Univ. of Wisconsin)

F2-1

13:00-13:15

Near body flow field measurements on a fish robot

Dennis Powalla, Shokoofeh Abbaszadeh, Karla Ruiz, Stefan Hoerner, Dominique Thévenin

F2-3

13:30-13:45

Analysis of natural gas bubbles in the NETL high pressure water tunnel (HPWT) experiment and its application to natural seeps

Byungjin Kim, Scott A. Socolofsky, Binbin Wang

F2-4

13:45-14:00

Using GPS electronic floater in lab-scale study on the method of collecting river information

Chang Hyun Lee, Jeong Min Lee, Young Do Kim

F2-5

14:00-14:15

Effect of non-axial velocity component on the mean axial velocity measurements in thermal plumes using an air velocity transducer

Maria K. Stefanidou, Aristeidis A. Bloutsos, Panayotis C. Yannopoulos

F2-6

14:15-14:30

Estimation of carbon: chlorophyll ratio for phytoplankton using in-situ imaging FlowCytobot

Yaoyao Ma, Joseph H. W. Lee

Mini-symposium G2-W2

Shallow Water Flows

Chairs: Chang Geun Song (INU), Van Thin Nguyen (SNU)

G2-1

13:00-13:15

High order method for shallow water flows over irregular topography with vegetation

Jaeyoung Jung, Jin Hwan Hwang

G2-2

13:15-13:30

Optimal layout of a tidal fence in a rectangular channel flow

Jisu Han, Jaeyoung Jung, Jin Hwan Hwang

○ Day 3_Technical Program



G2-3

13:30-13:45

Development of 1-dimensional river hydraulic model (K-River)

Yeonsu Kim, Youngteck Hur, Junwoo Noh, Hyunuk An

G2-4

13:45-14:00

Simulations of pollutant storage effects within emergent vegetation using particle dispersion model

Inhwan Park, Sunmi Lee, Sanha Kim, Taewon Yoon

G2-5

14:00-14:15

Development of GPU-accelerated 2DH hydrodynamic and transport model

Sooncheol Hwang, Sangyoung Son

Mini-symposium S9-W2

Multi-dimensional River Operation and Management Techniques

Chairs: Jun-koo Kang (KICT)

S9-1

13:00-13:15

Levee monitoring using mobile mapping system

Jisang Lee, Hong-Gyoo Sohn

S9-2

13:15-13:30

Probabilistic mapping of flood risk using multivariate statistical model

Min-Kyu Jung, Hyun-Han Kwon

S9-3

13:30-13:45

A study on life cycle management through the performance evaluation model of river facilities

Sooyoung Kim, Hyung-Jun Kim, Boram Kim, Kwang Seok Yoon

S9-4

13:45-14:00

Geospatial analysis and model development for specific degradation of ungauged watersheds in South Korea using multiple regression analysis and data mining

Woochul Kang, Eun-kyung Jang, Pierre Y. Julien

S9-5

14:00-14:15

Vulnerability assessment of watershed water quality for flow conditions

Woo Suk Jung, Sung Eun Kim, Jae Hyun Kwon, Young Do Kim



○ Day 3_Technical Program

- Wednesday July 21, 14:50-16:20 (UTC+9)

Mini-symposium C2-W3

Stratified Flows

Chairs: Inhwan Park (SEOULTECH)

C2-1

14:50-15:05

Turbulent mixing across a sharp density interface

Arefe Ghazi Nezami, Blair A. Johnson

C2-2

15:05-15:20

Numerical simulation of aeration column in stratified environments

Seongeun Choi, Jin Hwan Hwang

C2-3

15:20-15:35

Examining the bio-physical processes of dam reservoir by spatio-temporal vertical profiling

Jin Hwan Hwang, Dong-Hyun Kim, Hyung-Cheol Park, Seoung-Eun Choi, Dong-Kyun Kim, Ho Joon Kim, Nam-Il Won

C2-4

15:35-15:50

Buoyancy-driven exchange flows in inclined ducts

Adrien Lefauve, Paul Linden

C2-5

15:50-16:05

The anisotropy of symmetric Holmboe instabilities in stratified flows

Adam J.K. Yang, E.W. Tedford, J. Olsthoorn, A. Lefauve, G.A. Lawrence

C2-6

16:05-16:20

Assessment of the water circulation plan for water quality improvement of the Seonakdong River

Sanguk Lee, Young Teck Hur, Youngsung Kim, Eul Rae Lee

Mini-symposium E3-W3

Estuary

Chairs: Myung Eun Lee (HDEC), John Shi (Shanghai Jiao Tong Univ.)

E3-1

14:50-15:05

2-D numerical modelling of meandering estuaries

S. Haddout, K.L. Priya, Joan Cecilia C. Casila, A.M. Hoguane

○ Day 3_Technical Program



E3-2

15:05-15:20

Study on the relationship of salinity front characteristics and runoff in the north branch of the Yangtze River Estuary

Cuiping Kuang, Kuo Chen, Yunlong Wu, Jie Wang

E3-3

15:20-15:35

Seasonal variation of sediment transport - a case study of Hyeongsan River Estuary, South Korea

Donghyeon Kim, Jin Hwan Hwang

E3-4

15:35-15:50

An experimental study on the effects of physical factors in transport of microplastics in coastal area

Dongwook Hwang, Yong Sung Park

E3-5

15:50-16:05

Investigation of bathymetry data and groin structures effect on the numerical results of the flow and salinity intrusion in the estuarine part of Yoshii river reach, Japan

Mohammed Al-Baghdadi, Ryosuke Akoh, Takahiro Hiratsuka, Shiro Maeno

E3-6

16:05-16:20

Hydrodynamic velocities and forces beneath a tidal bubble bore

Muhammad Zain Bin Riaz, Shu-Qing Yang, MuttucumaruSivakumar

Mini-symposium G3-W3

Open Channel Hydraulics

Chairs: Won Kim (KICT)

G3-1

14:50-15:05

Numerical investigation on turbulence structure over backward-facing step for various step angles and Reynolds numbers

Jeonghu Lee, Van Thinh Nguyen

G3-2

15:05-15:20

Development of two-dimensional river flow analysis model using Godunov's scheme and TVD limiter

Eun-Taek Shin, Chang Geun Song



○ Day 3_Technical Program

G3-3

15:20-15:35

Flow-3D CFD model of bifurcated open channel flow: 1. Setup and Validation

Nur Adani Adnan, Izihan Ibrahim, Saerahany Legori Ibrahim

G3-4

15:35-15:50

Study of the jet flow into a plunge pool using OPENFOAM

Rita Carvalho

G3-5

15:50-16:05

Numerical study of flow structure and pollutant mixing at river confluences

Se Hun Yun, Il Won Seo

Mini-symposium S10-W3

Research Overview of Environmental Hydraulics Laboratory in Seoul National University

Chair: Kyung Oh Baek (HKNU)

S10-1

14:50-15:05

Dispersion coefficients for analysis of intermediate mixing in rivers

Kyong Oh Baek, Dong Yoel Lee, Il Won Seo

S10-2

15:05-15:20

Modeling of non-Fickian transport incorporating transient storage zones in natural rivers

Byunguk Kim, Il Won Seo

S10-3

15:20-15:35

Development and application of two-dimensional hydrodynamic model (HDM-2D) for river flow analysis

Chang Geun Song, Il Won Seo

S10-4

15:35-15:50

Development and application of two-dimensional Contaminant Transport Model (CTM-2D) for water quality analysis in rivers

Jun Song Kim, Il Won Seo

S10-5

15:50-16:05

Prediction of river water quality using machine learning models

Siyoon Kwon, Il Won Seo



9th International Symposium on Environmental Hydraulics



○ Social Program

● Opening Ceremony: July 20, 2021

Time	Event	Presenter
09:00~09:10	Opening Words by LOC Chair	Prof. Il Won Seo
09:10~09:20	Opening Speech by President of IAHR	Prof. Joseph H.W. Lee
09:20~09:30	Congratulatory Speech by President of KWRA	Prof. Deuk-hyo Bae
09:30~09:40	Congratulatory Speech by President of AWC	Dr. Jae-Hyeon Park
09:40~09:50	Congratulatory Speech by Vice-president of SNU	Prof. Haecheon Choi

● Closing Ceremony: July 21, 2021

Time	Event	Presenter
16:40~17:00	Summary Words by LOC Secretary	Prof. Yong Sung Park
	Award Ceremony	Prof. Sung-Uk Choi
17:00~17:20	BPA: Chairman of ISEH	Prof. Il Won Seo
	BYPA: President of KWRA	Prof. Deuk-hyo Bae
	OSSA: Editor of JHER	Prof. Sung-Uk Choi
17:20~17:30	Concluding Speech by President of IAHR	Prof. Joseph H.W. Lee
17:30~17:40	Concluding Speech by President of KWRA	Prof. Deuk-hyo Bae
17:40~17:50	Concluding Speech by President of AWC	Dr. Jae-Hyeon Park
17:50~18:00	Concluding Words by LOC Chairman	Prof. Il Won Seo

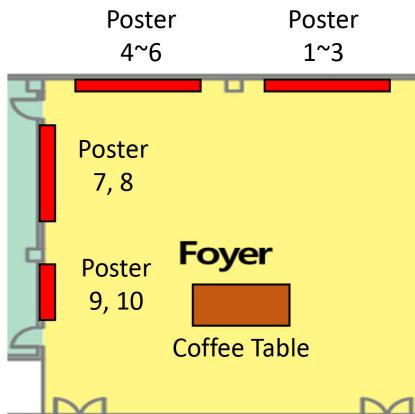
● Lunch

Date	July 20-21, 2021
Time	12:00 ~ 13:00
Location	Duraemidam (Building 75-1, 5F)

● Exhibition



● Booth layout



● List of Exhibitors

Poster number	Title	Chairs
1	S1-M1: Rainwater Harvesting and Utilization	Mooyoung Han (SNU)
2	S2-M2: Hydro-environment in cities-water cycle, metabolism and management	Yongju Choi (SNU)
3	S3-T1: Development of River Management Technology Using River Survey and Monitoring Drones	Dong Sop Rhee (KICT)
4	S4-T1: Smart Safety Management of River Facilities	Jong-wook Lee (K-water)
5	S5-T2: Development of Environment-Friendly Levee Technology Using Biopolymer-soil Mixture	Doo-han Lee (KICT)
6	S6-T2: Technical Strategy for Quality control of Hydrological Data and Advanced Toolkits for IWRM	Junwoo Noh (K-water)
7	S7-T3: Higher Degree Education for Civil and Environmental Engineering	Young-Oh Kim (SNU)
8	S8-W1: Green Energy &ICT of Clean Water	Jong-min Choi (Hanbat Nat. Univ.)
9	S9-W2: Multi-dimensional River Operation and Management Techniques	Jun-koo Kang (KICT)
10	S10-W3: Research Overview of Environmental Hydraulics Laboratory in Seoul National University	Kyong Oh Baek (HKNU)



○ Local Organizing Committee

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