SiP
Cross-ministerial Strategic Innovation Promotion Program

*Join us for*

INTERNATIONAL

# SEMINAR

ON

## Development of a Resilient Smart Network System against Natural Disasters

## Thursday 21st August, 2025

## 13:00-17:20

Sign up here!

**Chiyoda Broadcasting Hall**

**1-1 Kioicho Chiyoda-ku Tokyo**

**/ZOOM Webinar:** https://zoom.us/j/92901168814?pwd=Yaw7bzwR10SO5SQD2lXH7eUP10u4IL.1

## INVITED SPEAKERS

**Prof. Philippe Gourbesville**
*President, IAHR*

**Dean B. Durkee, PhD., P.E.**
*Honorary Vice President, ICOLD*

**David Gutierrez, P.E.,G.E.**
Vice President, GEI Consultants

We are delighted to welcome three leading specialists in dam management, each playing a pivotal role in advancing this vital field. Additionally, two emerging researchers from our project will share their latest findings.
This seminar features five sessions offering diverse perspectives—from technical advancements to social applications—aimed at fostering international collaboration for a safer and more sustainable future.
Join us for this engaging event where global experts will share cutting-edge research, best practices, and innovations in flood management, dam safety, and community-based disaster resilience.

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# PROGRAM

## Thursday 21st August, 2025
## 13:00-17:20

12:30 On-Site Registration

13:00 Opening Remarks
SIP Program Director Koichi Kusunoki *Professor, University of Tokyo*

13:10 Flood Management: Key Challenges and Mitigation Strategies - An International Review
Professor Philippe Gourbesville *President, IAHR*

13:50 State of Dam Safety Practice in the United States
Dean B. Durkee, Ph.D., P.E. *Honorary Vice President, ICOLD*

14:30 Q&A session

14:50-15:20 Coffee Break

15:20 New Bullards Bar ARC Spillway - Forecast Informed Reservoir Operations
David Gutierrez, P.E.,G.E. *Vice President, GEI Consultants*

15:50 Basin Wide Smart Dam Operation using Ensemble Rainfall Prediction for Flood Resilience and Energy Transition
Professor Tetsuya Sumi *Program Specific Professor, DPRI, Kyoto University*
*Vice President, ICOLD* *President, JSDE*

16:20 Development of Risk Information that Promotes Evacuation by Residents and Disaster Preparedness Actions by Businesses
Professor Koji Ikeuchi *President, FRICS* *President, JSCE*
*Emeritus Professor, The University of Tokyo*

16:50 Q&A session

17:10 Closing Remarks
SIP Sub Program Director Atsushi Omata *Chairman, River Foundation*

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# SPEAKERS

## Professor Philippe Gourbesville
*President, IAHR*

President of the International Association for Hydro-Environment Engineering and Research (IAHR, 2023–2027) and Professor of Hydroinformatics at Polytech Nice Sophia, Université Côte d'Azur, France. After earning his Ph.D. from Louis Pasteur University in 1993, he began his career as a hydraulic engineer, working on international projects across Europe, Africa, and Asia.
Since joining Université Côte d'Azur, he has led numerous hydro-environmental modelling projects, including 16 funded by the European Commission. He also helped establish the Tianjin International Engineering Institute (TIEI) in China, serving as its French director. Prof. Gourbesville regularly advises international organizations on water-related issues and is Vice President of the Asian Water Council.

### Flood Management: Key Challenges and Mitigation Strategies - An International Review

Each year, floods destroy assets worth billions of dollars. According to Munich RE, in the last five years alone, losses from flooding worldwide amounted to US$ 325bn (inflation-adjusted), of which roughly US$ 70bn was insured. The world's costliest flood-related catastrophe took place in July 2021 in central Europe, when devastating flash floods in western Germany's Ahr valley and in adjacent countries caused aggregate losses, adjusted for inflation, of US$ 59bn. It was also the costliest natural disaster of any kind in Europe for decades. The insured share of the losses, as is often the case with flood events, was comparatively low (more than US$ 15bn). Late 2024, another catastrophic event was targeting Valencia, Spain and killed more than 300 people. This last event is also related to a flash flood process initiated by a massive unprecedent rainfall event. This case is not isolated and numerous similar cases have been recording in various regions around the world. In July 2021, Zhengzhou, Henan (China) was affected by an extreme precipitation exceeding 600 mm. Obviously, the drainage infrastructure was not able to cope with the generated massive runoff and numerous infrastructures including subway tunnels were massively inundated. Again, more than 300 people have lost life during this event.
Under these new conditions and increased vulnerability of our modern built environments, the needs for an efficient flood management strategy are higher than never. The complexity of the situations requests to review develop and fine tune an operational approach able to mitigate floods' impacts. The presentation will revie the challenges in various environments (Europe, Asia mainly) and presents the various key concepts and tools selected in the various mitigation strategies.

## Dean B. Durkee, PhD., P.E.
*Honorary Vice President, ICOLD*

Vice President of the International Commission on Large Dams (ICOLD, 2022–2025).
He formerly served as President of the U.S. Society on Dams (USSD) and is a senior dam safety engineer at Gannett Fleming, Inc. with over 30 years of experience in the design, evaluation, and rehabilitation of various dam types for hydroelectric, flood control, and water supply purposes.

Dr. Durkee is FERC-approved as both a Part 12D Independent Consultant and a Risk Analysis Facilitator. For the past two decades, he has specialized in failure mode evaluation and risk-based dam safety, contributing to several of FERC's Risk Informed Decision Making (RIDM) pilot projects.

### State of Dam Safety in the United States

Hydropower owners in the United States have invested considerable resources in performing Potential Failure Mode Analyses (PFMA) for their dams, to meet Federal Energy Regulatory Commission (FERC) requirements as an element of dam safety assessments. While PFMAs provide a much-improved understanding of the safety of a dam, PFMAs stop short of providing a portrayal of the dam safety risk. Risk, by definition, includes both likelihood and consequences of failure. The PFMA process does not typically provide adequate differentiation of the likelihood or consequences of failure to allow for distinction or prioritization of individual potential failure modes for dam safety actions or decisions. As a result, FERC has released Draft Risk-Informed Decision Making (RIDM) Guidelines for use by licensees to supplement their dam safety program. The presentation will focus on the state of dam safety practice leading up to the Oroville Spillway Incident and how lessons learned following the incident have shaped the approach to dam safety in the United States today.

# SPEAKERS

**David Gutierrez, P.E.,G.E.**
Vice President, GEI Consultants

David Gutierrez has worked in various capacities over his 40-year engineering career. He is considered an expert in overall water management and dam safety. He is currently a senior vice president for GEI Consultants working on dam projects throughout the United States. He previously worked for and led some of the most complex water management programs for the State of California, Department of Water Resources.

## New Bullards Bar ARC Spillway - Forecast Informed Reservoir Operations

The Central Valley of California, in the United States, which includes the Sacramento Valley to the north and San Joaquin Valley to the south, has had historical flooding over the past century. The valley is now protected by a series of levees and dams that provide flood protection for millions of people. Following devastating floods in 1997 that claimed three lives and resulted in billions of dollars in economic losses, significant improvements to the levees were completed. To provide protection beyond minimum requirements, Yuba County Water Agency (Yuba Water) initiated studies for supplemental flood control measures at New Bullards Bar Dam. This included a new secondary lower-level spillway known as the Atmospheric River Control (ARC) spillway, which could be operated in conjunction with Forecast-Informed Reservoir Operations (FIRO).

New Bullards Bar Dam is a 635 feet (193 meters) variable arch concrete dam. The proposed ARC spillway will allow Yuba Water to release flows in advance of threatening storm events operating under FIRO. Releasing water will free up space in the reservoir to hold back peak flows when the biggest part of the storm arrives.

The ARC Spillway will decrease flood risk downstream for approximately 100,000 residents. This will improve flexibility and reduce the water level on levees downstream resulting in less stress on the levees, and a reduced risk for communities.

This presentation will describe FIRO and the important features of the project, and steps Yuba Water has taken to maximize the benefit of the ARC spillway.

# SPEAKERS

## Professor Tetsuya Sumi
**SIP sub project D: Principal Researcher**
Program Specific Professor, DPRI, Kyoto University
Vice President, ICOLD　President, JSDE

Prof. Tetsuya Sumi graduated from the Graduate School of Engineering, Department of Civil Engineering Kyoto University in 1985.
He worked for the Ministry of Construction, Japanese government for 14 years.
From 2009, he was working as a full Professor of the Water Resources Research Center, the Disaster Prevention Research Institute, Kyoto University. From 2024, he established the current new laboratory mainly focusing on dam upgrading and reservoir sedimentation management under collaboration with hydropower companies, consultant firms and governmental research institutes. He is now appointed as the vice president of ICOLD and chairing Asia Pacific Regional Club.
He is also the president of the Japan Society of Dam Engineers.

### Basin Wide Smart Dam Operation using Ensemble Rainfall Prediction for Flood Resilience and Energy Transition.

As part of efforts to improve river basin flood control, efforts are being made to maximize the flood storage effect of existing infrastructure within the river basin. In SIP Phase 2, methods were examined for advanced operation of multipurpose dams and hydropower dams within the river basin using ensemble rainfall forecasts, and it was demonstrated that water level drawdown can be started approximately 5 to 7 days in advance while generating electricity, rather than the current pre-release operation approximately 3 days in advance. In response to this, BRIDGE is promoting advanced operation at each stage before and after floods, and expanding the use of ensemble rainfall forecasts to various dams, including pumped-storage hydropower plants. Furthermore, in SIP Phase 3, a system is being developed to improve the storage function of the entire river basin, utilizing irrigation dams and other facilities. This presentation will provide an overview of these technological developments.

## Professor Koji Ikeuchi
**SIP sub project B:Lead for Social Implementation**
President, FRICS　President, JSCE
Emeritus Professor, The University of Tokyo

Koji Ikeuchi is President of the Foundation of River & Basin Integrated Communications (FRICS), President of the Japan Society of Civil Engineers (JSCE), and Emeritus Professor at the University of Tokyo. For over 40 years, he has been engaged in disaster risk reduction and flood management policies and projects. At the Ministry of Land, Infrastructure, Transport and Tourism (MLIT), he served as Director General of the Water and Disaster Management Bureau and as Vice Minister for Engineering Affairs. After retiring from government service, he served as a professor at the University of Tokyo for six and a half years before assuming his current roles.

### Development of Risk Information that Promotes Evacuation by Residents and Disaster Preparedness Actions by Businesses.

Flood damage persists despite the availability of hazard maps and disaster information, largely because residents and companies do not perceive flood disasters as their own problems. This has led to inadequate evacuation, insufficient preparedness, and severe impacts on local communities, including business disruptions and secondary disasters.
This project is developing an information provision system that enables people to realistically recognize flood dangers both in normal times and during disasters. The system will also provide quantitative projections of future flood frequency and magnitude under climate change, supporting corporate investment and preparedness decisions. A prototype is being developed and tested through field demonstrations, with the goal of being adopted by national and municipal governments.
By fostering realistic risk perception and promoting timely, appropriate action, the project aims to establish a societal framework that reduces vulnerability and strengthens resilience against flood disasters.