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# Hydraulic Structures and Water System Management-ISHS2016 in Perspective

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## Hydraulic Structures and Water System Management-ISHS2016 in Perspective

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### ABSTRACT

*Hydraulic structures are vital features in our water infrastructure, as they help meet the diverse and challenging demands of society, including conveyance, flood protection, environmental and ecological impacts, and systems management. Indeed, there are a number of challenges facing engineers today. This 6<sup>th</sup> IAHR International Symposium on Hydraulic Structures (ISHS2016) brought together domestic and international expertise from research, practice, and implementation in a forum for knowledge exchange and networking discussion on critical issues related to hydraulic structure research, performance, operations, maintenance, and community implications. It continued the rich tradition of this series by stimulating interest on advancement in the development and use of hydraulic structure elements and systems. Presentations and discussions were held on advanced tools, applications, and unique approaches needed to develop and implement more effective, environmentally sound, and robust solutions. It is believed that the proceedings of ISHS2016 provide applicable state-of-the-art expertise in hydraulic structure analysis and design to the engineering profession.*

**Keywords:** *Hydraulic Structures, design, hydrodynamics, society demands, engineering challenges, water system management*

## 1. SYMPOSIUM ORGANIZATION

The 6<sup>th</sup> International Symposium on Hydraulic Structures was held the 27<sup>th</sup>-30<sup>th</sup> of June, 2016 on the shores of the Columbia River at the Red Lion Hotel Janzten Beach in Portland, Oregon, USA. A total of about 136 individuals attended ISHS2016 from 18 countries and 5 continents. Organization efforts were handled by two committees: the local organizing committee and the international scientific committee. The Local Organizing Committee consisted of 5 individuals (see following page) who worked closely with IAHR and USSD to organize this event. Special acknowledgement is given to Mr. Larry Stephens who assisted with event planning. The international scientific committee oversaw the technical program and publication of the proceedings. ISHS2016 took place over 4 days. A workshop was held the first day, followed by two days of technical content, and a concluding field tour. Details are discussed in the following sections.

## Local Organizing Committee ISHS2016

Martin J. Teal  
Chair



Brian M. Crookston  
Member



Eric Halpin  
Member



Greg S. Paxson  
Vice Chair



Michael Phillips  
Member



### 1.1. Workshop on Hydraulics of Stepped Spillways

A full-day workshop on the hydraulics of stepped spillways was organized by Brian Crookston, Hubert, Chanson, and Sherry Hunt (see Fig. 1). The instructors for the workshop were Prof. Dr. Hubert Chanson (University of Queensland) and Dr. Sherry Hunt (USDA-ARS). About 40 individuals attended this specialty workshop, which included hydrodynamics of stepped spillways, applied research, design, operational records, and group discussions. Attendees were provided with a 344-page binder that included instructor slides (in color) and key references (provided in black and white).



Figure 1. Workshop instructors Prof. Dr. Hubert Chanson of UQ (left) and Dr. Sherry Hunt of USDA-ARS (right) (photos courtesy Brian Crookston)

### 1.2. Technical Presentations

Technical presentations were given Tuesday and Wednesday (see Fig. 2), with three parallel tracks held in the afternoons. Each presentation was 20 minutes in duration, which included a question and answer period at the

conclusion. A total of 136 individuals attended this portion of the technical program. 13 technical sessions were held, each with two moderators. Session moderators included:

#### Moderators ISHS2016

Steven Barfuss	William Fiedler	Mazurek	Bruce Savage
Daniel Bung	Kevin Griebenow	Joshua Mortensen	Vijay Singh
Hubert Chanson	Brian Hughes	Mario Oertel	Marty Teal
Kathleen Clarkson	Sherry Hunt	Gregory Paxson	Blake Tullis
Brian M. Crookston	Robert Janssen	Michael Pfister	Tony Wahl
Laurie Ebner	Arturo Leon Kerry	Michael Phillips	Brian Wahlin
Sébastien Erpicum			

Four invited keynote lectures were given:

- Prof. Dr. Anton Schleiss, EPFL and ICOLD President – Topic: Interaction of Hydraulic Structures with Air, Water, and Rock – the Challenges of Researchers and Designers.
- Prof. Dr. Vijay Singh, Texas A&M University – Topic: Hydraulic Structures and Entropy-based Modeling
- Mr. Philip Burgi, Retired U.S. Bureau of Reclamation – Topic: Challenges in Design and Use of Hydraulic Structures in Response to New Realities
- Mr. Thomas North, U.S. Army Corps of Engineers – Topic: Hydraulic Structures, the Future of Design

The technical program also included a specialty session on large river basin management and the role of hydraulic structures. Marty Teal served as moderator and provided an introduction to the session. Speakers included:

- Keil Neff, Tennessee Valley Authority – Topic: Tennessee River System
- Daniel Bunk, U.S. Bureau of Reclamation – Topic: Colorado River Basin
- Peter Dickerson, U.S. Army Corps of Engineers – Topic: Columbia River Basin



Figure 2. From left to right: keynote address by Prof. Dr. Anton Schleiss; specialty session by USACE, Reclamation, and TVA; technical presentation by Dr. Michael Pfister; and closing dinner and ceremony (photos courtesy Brian Crookston)

### 1.3. Field Tour

The final day of the symposium included a technical tour of Multnomah Falls and Bonneville Lock and Dam (see Fig. 3). Approximately 60 individuals attended the tour. The local organizing committee worked closely with key U.S. Army Corps of Engineers personnel; those directly involved in organizing this tour included Michael Phillips, Brian M. Crookston, Gregory Webb, David Scofield, Peter Dickerson, William Fowler, Jessica Brownlee, Jerry Carroll, Robin Norris, Steven Barton, Brad Bird, Laila Berre, J. R. Inglis, and Greg Paxson. The field tour was restricted to areas open to the public and included the fish hatchery, the lock, a view of the gated spillway, the fish ladder system, and the hydropower house. During lunch, Certificates of Appreciation for David Scofield, Jerry Carroll, Greg Webb, Robin Norris, Laila Berre, and Michael Phillips were presented to those in attendance.



Figure 3. Multnomah Falls and Bonneville Dam Spillway (photos courtesy Brian Crookston)

#### **1.4. Awards**

The program also included a welcome reception and a closing ceremony and dinner. At the dinner, awards of appreciation were presented by Mr. Marty Teal and Dr. Blake Tullis to the workshop instructors, the keynote speakers, the specialty session speakers for their efforts and contributions to ISHS2016. The final award was presented to Dr. Brian Crookston for special acknowledgement of his many efforts in organizing ISHS2016.

## **2. SYMPOSIUM PROCEEDINGS**

### **2.1. Peer Review Process**

All papers published in the Proceedings and have been thoroughly peer-reviewed for technical quality and presented at ISHS2016. The Proceedings were published by Utah State University and is available open access at <http://digitalcommons.usu.edu/ishs/2016/>. Each manuscript includes the ISBN of the Proceedings as well individual direct object identifiers (DOI). Each manuscript is indexed by Scopus and Compendex. Each manuscript is available to users through the USU digital commons portal pursuant to a Creative Commons Attribution-NonCommercial CC BY 4.0 license. The ISHS2016 Scientific Committee was comprised of the following individuals:

## International Scientific Committee ISHS2016

Brian M. Crookston  
Chair



Blake P. Tullis  
Vice Chair



Sébastien Erpicum  
Member



Steven L. Barfuss  
Member



Michael Pfister  
Member



Hubert Chanson  
Member



Daniel Bung  
Member



Michele Palermo  
Member



Rita F. Carvalho  
Member



Salvatore A. Todaro  
Member



Robert Einhellig  
Member



Stefano Pagliara  
Member



Robert Janssen  
Member



Antonio Miglio  
Member



Under direction of this committee, a formal and rigorous single-blind peer-review was conducted for each submitted manuscript by the ISHS2016 International Scientific Reviewers. This panel was drawn from IAHR and USSD communities and other international and national experts in fields relevant to the themes of ISHS2016. This Panel was comprised of the following 65 individuals:

## International Peer Review Panelists ISHS2016

John Ackers	Rajib Das	Kem Kadavy	Greg Paxson
Mahmud Amin	Subhasish Dash	Korey Kadrmas	Andy Peters
Steven Barfuss	Patrick Dent	Kylan Kegel	Michael Pfister
Kortney Brown	Laurie Ebner	Mohanad Khodier	Michael Phillips
Daniel Bung	Robert Einhellig	Pankaj Kumar	John Renholds
Juan Cabrera	Sébastien Erpicum	Xinquian Leng	Bruce Savage
David Campbell	Stefan Felder	Jorge Matos	Jessica Schmidt
Iacapo Carnacina	William Fiedler	Kerry Mazurek	Roshni T
Rita Carvalho	Travis Ford	Jonny Meyer	Marty Teal
Hubert Chanson	Chris Goodell	Antonio Miglio	Sal Todaro
Guy-Michel Cicereo	Bryan Heiner	Joshua Mortensen	Blake Tullis
Bert Clemmens	Valentine Heller	Dana Moses	Daniel Valero
Gaetano Crispino	Brian Hughes	Mario Oertel	Tony Wahl
Brian Crookston	Sherry Hunt	Giuseppe Oliveto	Brian Wahlin
Loring Crowley	Robert Janssen	Stefano Pagliara	Hang Wang
Jemie Dababneh	Charles Johnson	Michele Palermo	Jeremy Young
			Gangfu Zhang

The Call for Papers was issued in 2015; in response, 112 abstracts were received by the International Scientific Committee by 1 September 2015. All abstracts were reviewed; of those accepted, 91 full draft manuscripts were received. All received manuscripts were reviewed by a minimum of two reviewers, according to the criteria set established by the International Scientific Committee. Special acknowledgements to Dr. Daniel Bung, Dr. Michele Palermo, Dr. Blake Tullis, and Dr. Brian Crookston for their contributions to this effort.

Reviews were uploaded into the USU ISHS2016 repository through digital commons and made available to authors. The authors were sent instructions for access and requested to revise their manuscripts in accordance to the reviewers; comments and recommendations by the Scientific Committee Chair and Vice Chair. The final number of revised papers accepted for oral presentation was 77. However, not all manuscripts were presented in Portland during ISHS 2016 technical sessions; a requirement for publication in the Proceedings. As a result, only 70 manuscripts have been published and included in the Proceedings. In addition, extended abstracts by the four invited keynote lecturers and the three specialty-session speakers have been included with the 70 full manuscripts, to document their participation and important contribution to ISHS 2016. These 7 individuals were:

Prof. Dr. Anton Schleiss – Keynote Speaker	Mr. Peter Dickerson – Specialty Session
Prof. Dr. Vijay Singh, Keynote Speaker	Mr. Keil Neff – Specialty Session
Mr. Phil Burgi, Keynote Speaker	Mr. Daniel Bunk – Specialty Session
Mr. Thomas North, Keynote Speaker	

The publication of the proceedings marked a significant contribution of this event, involving about 155 authors from 18 countries and 5 continents. Furthermore, the event website ([www.ishs2016.com](http://www.ishs2016.com)), to date, has received approximately 30,000 page views in about 13 months from 110 different countries.

## 2.2. Proceedings Reference

The Proceedings were published by Utah State University and is available open access at <http://digitalcommons.usu.edu/ishs/2016/>. The full bibliographic reference for the ISHS2016 symposium proceedings is:

Crookston, B.M. and Tullis, B.P. (Eds.) (2016). Hydraulic Structures and Water System Management. 6th IAHR International Symposium on Hydraulic Structures, Portland, OR, 27-30 June. doi: 10.15142/T3S59M (ISBN 978-1-884575-75-4).

Each paper of the proceedings includes a cover sheet that includes the correct manuscript reference, such as:

Crookston, B.M. and Tullis B.P. (2016). Hydraulic Structures and Water Systems Management-ISHS2016 in Perspective. In B. Crookston & B. Tullis (Eds.), Hydraulic Structures and Water System Management. 6th IAHR International Symposium on Hydraulic Structures, Portland, OR, 27-30 June (pp. i-viii). doi: 10.15142/T3WW24 X (ISBN 978-1-884575-75-4).

### 3. ACKNOWLEDGEMENTS

ISHS2016 would not have been possible without the generous and active involvement of the members of the local organizing committee, the international scientific committee, key individuals at U.S. Army Corps of Engineers including Mr. Steven Stockton, Mr. Sal Todaro, Mr. Eric Halpin, Mr. Peter Dickerson, Mrs. Robin Norris, and Mr. Michael Phillips. Key support was also provided by USSD President John Wolfhope, Executive Director Mr. Larry Stevens, and USSD Board Members. Sincere appreciation and thanks to the technical reviewers for valuable support during the review process. To keynote speakers, workshop instructors, specialty session presenters, all authors, presenters, and participants: thank you for your participation, support, and enthusiasm. Logistical support for the Proceedings was provided by Becky Thoms, head of digital initiatives at Utah State University – thank you for your patience and many efforts! Also, we wish to express appreciation to Brigitta Field of Utah State University for her assistance during the review process, and to Olivia Young undergraduate student at Cornell University for her efforts.

### 4. ORGANIZING INSTITUTIONS, SPONSORS, AND SUPPORTING ORGANIZATIONS

#### 4.1. Organizing Institutions



#### 4.2. Supporting Organizations

The following organizations (listed alphabetically) provided support and assistance for ISHS2016.

American Academy of Water Resources Engineer of ASCE  
Association of State Dam Safety Officials  
Bechtel Corporation  
École Polytechnique Fédéral de Lausanne  
FH Aachen University of Applied Sciences  
FH Lübeck University of Applied Sciences  
Instituto Superior Técnico  
International Association of Hydro-environment Engineering and Research  
International Congress on Large Dams  
Schnabel Engineering  
U.S. Army Corps of Engineers  
U.S. Bureau of Reclamation  
U.S. Federal Energy Commission Université de Liège



United States Society of Dams  
University of Queensland  
University of Pisa  
University of Coimbra  
USDA Agricultural Research Service  
Utah State University  
Utah Water Research Laboratory  
West Consultants

### 4.3. Sponsors

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