

# WORLD ENVIRONMENTAL AND WATER RESOURCES CONGRESS 2017

*HYDRAULICS AND WATERWAYS AND WATER DISTRIBUTION  
SYSTEMS ANALYSIS*

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SELECTED PAPERS FROM THE WORLD ENVIRONMENTAL AND  
WATER RESOURCES CONGRESS 2017

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## Preface

We are excited to offer an engaging and challenging array of technical sessions, posters, and accompanying published papers at our Environmental and Water Resources Institute's (EWRI) 17<sup>th</sup> annual Congress in Sacramento, California. This meeting is a leading venue for professional interaction among engineers and scientists, covering disciplines relating to the needs of critical infrastructure in water and environment. As is pointed out in the American Society of Civil Engineers' Report Card for America's Infrastructure, an investment of over \$3.6 trillion is needed to return the nation's infrastructure to a state of good repair. This Congress contributes in many ways to innovative solutions to this critical problem. We proudly host the meeting under the auspices of the American Society of Civil Engineers (ASCE).

Within the five (5) volumes of the proceedings of the Congress you will find nearly 300 written technical papers from more than 700 oral and poster presentations dealing with the subject areas of the EWRI Councils; a list of subject area tracks is included in the acknowledgements below. Our profession advances through presentations in special state-of-knowledge tracks represented at the Congress. We hope these proceedings serve to enhance your knowledge in these areas and encourage you to follow up with more detailed publications by the same authors, typically found in ASCE technical journals.

*World Environmental and Water Resources Congress 2017: Hydraulics and Waterways and Water Distribution Systems Analysis* contains papers organized by the following EWRI Councils, Committees and conference Symposium:

- **Hydraulics and Waterways Council** whose purpose is to represent EWRI in technical matters pertaining to all aspects of hydraulic engineering of natural and man-made environmental systems. The Council promotes responsible water resources management and protection to foster sustainability and enhancement of the environment through the development, collection and dissemination of information and technology regarding the advancements and application of hydraulic engineering.
- **Symposium: WDSA (Committee)**: Water distribution systems analysis (WDSA) involves the quantitative planning, design, operations, management, modeling, and monitoring of hydraulics and water quality of water distribution systems. The purpose of the committee is to provide coordination for all activities within EWRI related to the field of water distribution systems analysis.

## Acknowledgments

Preparation and planning for this Congress strongly depends on the dedication of those who plan track subjects, solicit abstracts and papers, oversee reviews of all this material and then “encourage” all authors to provide their material in a timely manner! We are deeply grateful to all who have provided this considerable effort, especially the track chairs listed below:

Track	Chairs
Hydro-Climate/Climate Change Symposium	Dr. M. Levent Kavvas – Volume 3
14th Urban Watersheds Management Symposium	Shirley Clark – Volume 5
Groundwater Symposium	Dr. Amy Chan Hilton – Volume 3
Water Distribution Systems Analysis Symposium	Juan Saldarriaga – Volume 4
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History and Heritage	Lawrence Magura, J. David Rogers – Volume 1
Hydraulics and Waterways	Christina Tsai – Volume 4
International	Ali Mirchi, Dr. Erfan Goharian – Volume 1
Irrigation and Drainage	Thomas W. Ley – Volume 2
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Smart Water Symposium	Sudhir Kshirsagar
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We also acknowledge the Congress Organizing Committee members, without whose time and efforts the event would not be possible. We also thank others not mentioned here.

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Finally, we acknowledge and thank the staff of the EWRI of ASCE who, in the end, makes it all happen. Most particularly, we thank Gabrielle Dunkley, EWRI's Manager, whose patience, perseverance, good humor, and great organizational talent ensure yet another successful EWRI Congress!

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