

2016 CLARKE PRIZE CONFERENCE

Research and Innovations in Urban Water Sustainability

November 4, 2016 • Newport Beach Marriott Hotel and Spa • Newport Beach, California USA

Presented By:

National Water Research Institute

Conference Program

Supported By:

NWRI Member Agencies

Inland Empire Utilities Agency
Irvine Ranch Water District
Los Angeles Department of Water and Power
Orange County Sanitation District
Orange County Water District
West Basin Municipal Water District

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Black & Veatch	Kennedy/Jenks Consultants
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Newport Beach,
California

Welcome to the 2016 NWRI Clarke Prize Conference

Thank you for attending the **2016 NWRI Clarke Prize Conference**, organized by the National Water Research Institute to highlight “Research and Innovations in Urban Water Sustainability.” The conference, which features presentations from our esteemed NWRI Clarke Prize Laureates and many others, is focused on identifying, developing, and managing sustainable water supplies in the urban setting. This year, we are emphasizing water quality, specifically emerging issues and new assessment methods.

The Clarke Prize Conference is held in conjunction with the annual NWRI Clarke Prize Award Ceremony and Lecture, where a researcher from the United States is presented with a \$50,000 award and medallion for outstanding achievements in water science. The recipient of the 2016 Clarke Prize is **Dr. Mark Sobsey**, the Kenan Distinguished Professor of Environmental Sciences and Engineering at the University of North Carolina Chapel Hill. A public health microbiologist, Dr. Sobsey was selected as the 2016 recipient because of his leadership and contributions to minimizing the risks of exposure to waterborne disease. He is the twenty-third recipient of the Clarke Prize.



Coordinating these two events required dedication and teamwork. We would like to acknowledge all those who were instrumental in making the award ceremony and conference a success.

First and foremost, we are grateful to the Joan Irvine Smith & Athalie R. Clarke Prize Foundation for supporting the Clarke Prize these past 23 years in memory of Mrs. Athalie Richardson Irvine Clarke, co-founder of NWRI.

We appreciate our conference supporters, whose contributions have been invaluable in putting together this event. These supporters include the NWRI Member Agencies: Inland Empire Utilities Agency, Irvine Ranch Water District, Los Angeles Department of Water and Power, Orange County Sanitation District, Orange County Water District, and West Basin Municipal Water District.

In addition, we appreciate the support of our Clarke Prize Sponsors, made up of consulting firms from the water industry: Black & Veatch, Carollo Engineers, Inc., CDM Smith, CH2M, Hazen and Sawyer, Kennedy/Jenks Consultants, RMC Water and Environment, TrussellTechnologies, Inc., Water Planet, Inc., and Xylem. We also appreciate the help provided by our newest industry partner, the Water Environment & Reuse Foundation.

Certain individuals must be acknowledged for their tremendous efforts towards the Clarke Prize. Notably, we appreciate the outstanding assistance of Ms. Brandi Caskey, Ms. Eileen Chao, Ms. Suzanne Faubl, Ms. Jaime Lumia, and Ms. Gina Vartanian of the National Water Research Institute, who spent significant time and effort planning and managing all aspects of the conference and award ceremony. In addition, we appreciate the services of Tim and Kim Hogan of Tim Hogan Graphics and Ken Lanxner of Simple Lives Orange County Web Design. Special thanks are extended to the moderators and speakers whose knowledge and insight are the foundation of this conference.

We also thank the Clarke Prize Executive Committee, who selected Dr. Sobsey as the 2016 Clarke Prize recipient from among a number of impressive and accomplished candidates. The committee members include: Dr. George Tchobanoglous of the University of California, Davis (Chair of the committee), Dr. Menachem Elimelech of Yale University, Dr. Joan Rose of Michigan State University, Dr. Jerald Schnoor of the University of Iowa, and Mr. Michael Wehner of the Orange County Water District.

Finally, we once again thank you, our guest, for attending the 2016 NWRI Clarke Prize Conference. We hope that you enjoy this unique event and find it to be a source of inspiration and understanding.

Conference Administrators

Michael Wehner and **Robert P. Ghirelli**

Acting Interim Co-Executive Directors

National Water Research Institute

Fountain Valley, California

Jeffrey J. Mosher

Advisor

National Water Research Institute

Fountain Valley, California



Conference Program

Friday, November 4, 2016

7:30 am	Registration Opens	Grand Pacific Ballroom Foyer
8:30 am	Conference Begins	Grand Pacific Ballroom, Salons A to C
8:30 am	Welcome from the Conference Partners Jeffrey J. Mosher, <i>National Water Research Institute (Fountain Valley, CA)</i> and <i>Water Environment and Research Foundation (Alexandria, VA)</i> , and Douglas M. Owen, P.E., <i>Water Environment and Research Foundation (Alexandria, VA)</i>	
8:45 am	Acknowledgement of 2016 Clarke Prize Recipient and Summary of the Clarke Prize Lecture	Mark D. Sobsey, Ph.D. <i>University of North Carolina (Chapel Hill, NC)</i>
9:00 am – 10:15 am	Session 1: Emerging Issues in Urban Water Quality <i>Moderated by George Tchobanoglous, Ph.D., P.E., NAE, University of California, Davis (Davis, CA)</i>	
9:00 am	<i>Legionella</i> and the Revolution in Water Distribution Microbiology	Joan B. Rose, Ph.D. <i>Michigan State University (East Lansing, MI)</i>
9:30 am	Antibiotics ... Resistance is Futile! The Presence, Impact, and Treatment and Removal of Antibiotic Resistant Bacteria in Water	Walter Jakubowski, M.S. <i>WaltJay Consulting (Spokane, WA)</i> Ryan Reinke, Ph.D. <i>Los Angeles County Sanitation Districts (Los Angeles, CA)</i>
10:15 am – 10:30 am	Break	Grand Pacific Ballroom Foyer
10:30 am – 12:00 pm	Session 2: Addressing the Challenges of Urban Water Sustainability <i>Moderated by Amy Childress, Ph.D., University of Southern California (Los Angeles, CA)</i>	
10:30 am	The Fifth Water Revolution	David Sedlak, Ph.D. <i>University of California, Berkeley (Berkeley, CA)</i>
11:00 am	Nanotechnology-Enabled Water Treatment: A Vision to Enable Decentralized Water Treatment and Reuse	Pedro J.J. Alvarez, Ph.D., P.E. <i>Rice University (Houston, TX)</i>
11:30 am	Public Health Guidance on Implementing Decentralized Nonpotable Water Systems	Sybil Sharvelle, Ph.D. <i>Colorado State University (Fort Collins, CO)</i>
12:00 pm – 1:00 pm	Lunch	Rose Garden
1:00 pm – 1:30 pm	Keynote Presentation	
	Keynote Speaker Introduction	Jeffrey J. Mosher <i>Water Environment and Research Foundation (Alexandria, VA)</i>
1:00 pm	USEPA Drinking Water Research: 2017 and Beyond	Christopher A. Impellitteri, Ph.D. <i>National Risk Management Research Laboratory U.S. Environmental Protection Agency (Cincinnati, OH)</i>
1:30 pm – 2:30 pm	Session 3: New Methods to Assess Water Quality <i>Moderated by Michael Webner, Orange County Water District (Fountain Valley, CA)</i>	
1:30 pm	Advances in Methods to Assess Microbial Water Quality	Channah Rock, Ph.D. <i>University of Arizona (Maricopa, AZ)</i>
2:00 pm	Water Quality Assessment for Direct Potable Reuse	Rhodes Trussell, Ph.D. <i>Trussell Technologies, Inc. (Pasadena, CA)</i>
2:30 pm	Application of Bioassays for Monitoring Chemicals in Water from the Standpoint of Human Health	Daniel Schlenk, Ph.D. <i>University of California, Riverside (Riverside, CA)</i>
3:00 pm	Wrap Up	
3:15 pm	Adjourn Conference	

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