



# International Conference on Emerging Water Desalination Technologies in Municipal and Industrial Applications

CONFERENCE PROGRAM

AUGUST 28 - 29, 2015  
SAN DIEGO, CALIFORNIA USA



ORGANIZED BY:





# Welcome to DesalTech 2015

Thank you for attending the **2015 International Conference on Emerging Water Desalination Technologies in Municipal and Industrial Applications (DesalTech 2015)**.

Reverse osmosis (RO) has become the conventional seawater and brackish water desalination technology in both municipal and industrial water applications; however, RO is an energy-intensive process with a large carbon footprint. In response, global research and development is focusing on several emerging technologies that are less energy intensive and offer further opportunities for integration with renewable energy. These processes include, among others, forward osmosis (FO), membrane distillation (MD), adsorption desalination (AD), and capacitive deionization (CDI). While these technologies may not replace RO, they provide important niche applications, as well as potential hybrids in combination with other processes.

In addition to water production, interest is growing in exploiting desalination brines for (salinity gradient) energy production through processes like pressure retarded osmosis (PRO) and reverse electrodialysis (RED). While the municipal market for desalination is better understood, market forces are at work for desalination applications in industry, most notably in oil and gas extraction/production and mining.



A two-day conference, DesalTech 2015 will feature plenary sessions, 12 topic sessions, and 50 oral presentations, as well as poster presentations on emerging water desalination technologies.

Coordinating and planning this event required dedication and teamwork. We acknowledge those who were instrumental in making this conference a success:

- Staff at the National Water Research Institute (Brandi Caskey, Suzanne Faubl, Jaime Lumia, and Gina Vartanian) for their help and professionalism in planning, managing, and facilitating program development and all other aspects of DesalTech 2015.
- Web designer Ken Lenxner of Simple Lives Web Design and Tim Hogan of Tim Hogan Graphics for preparing conference products.
- The International Desalination Association (IDA) for its support of DesalTech2015 as a co-located event with the 2015 IDA World Congress.
- Conference organizers, including the National Water Research Institute (NWRI), the National Centre of Excellence in Desalination Australia (NCEDA), and the Water Desalination and Reuse Center (WDRC) at King Abdullah University of Science and Technology (KAUST).
- The many moderators, keynote speakers, and presenters whose knowledge and insight are the foundation of this conference.

Finally, we once again thank you, our guests, for attending the **2015 International Conference on Emerging Water Desalination Technologies in Municipal and Industrial Applications**. We hope you enjoy this event and find it to be a source of knowledge, inspiration, and understanding.

## CONFERENCE PLANNING COMMITTEE:

### **Gary Amy, Ph.D.**

*Water Desalination and Reuse Center,  
King Abdullah University  
of Science and Technology*

### **David Furukawa, P.E., Ch.E.**

*National Centre of Excellence  
in Desalination Australia*

### **Jeff Mosher**

*National Water Research Institute*



DAY 1: FRIDAY, AUGUST 28, 2015

# Emerging Processes and Municipal Applications

7:30 am - 9:00 am	<b>REGISTRATION</b>	Mezzanine Level Lobby
9:00 am - 10:30 am	<b>PLENARY SESSION</b>	
9:00 am - 9:30 am	<b>Welcome and Introduction</b> <ul style="list-style-type: none"> <li>• <b>David Furukawa, PE., Ch.E.</b> National Centre of Excellence in Desalination Australia (Australia)</li> <li>• <b>TorOve Leiknes, Ph.D.</b> Water Desalination and Reuse Center, King Abdullah University of Science and Technology (Saudi Arabia)</li> <li>• <b>Richard Stover, Ph.D.</b> International Desalination Association (USA)</li> </ul>	Room 15
9:30 am - 10:00 am	<b>Plenary Presentation:</b> <b>Overview and Roadmap for Membrane Process Development in Desalination</b> <b>Anthony Fane, Ph.D.</b> Singapore Membrane Technology Center (Singapore)	
10:00 am - 10:30 am	<b>Plenary Presentation: Energetics of Desalination</b> <b>Menachem Elimelech, Ph.D.</b> Yale University (USA)	
10:30 am - 11:00 am	<b>BREAK</b>	
11:00 am - 12:30 pm	<b>SESSION 1</b>	
	<b>TRACK A</b> <b>Room 15</b> <b>Forward Osmosis</b> <i>Moderator: Amy Childress, Ph.D.</i> University of Southern California (USA)	<b>TRACK B</b> <b>Room 14</b> <b>Membrane Distillation</b> <i>Moderator: Noreddine Ghaffour, Ph.D.</i> King Abdullah University of Science and Technology (Saudi Arabia)
11:00 am - 11:30 am	<b>Keynote Presentation:</b> <b>Forward Osmosis Principles, Trends, and Applications</b> <b>Tzahi Cath, Ph.D.</b> Colorado School of Mines (USA)	<b>Keynote Presentation:</b> <b>Opportunities for Membrane Distillation</b> <b>Stephen Gray, Ph.D.</b> Victoria University (Australia)
11:30 am - 11:50 am	<b>Forward Osmosis Membrane Design:</b> <b>Innovative Approaches to Rethinking Thin Film Composite Membranes</b> <b>Jeffrey McCutcheon, Ph.D.</b> University of Connecticut (USA)	<b>Mass and Heat Transfer Model for</b> <b>Vacuum Membrane Distillation in a Hollow Fiber Module</b> <b>Andrea F. Corral, Ph.D.</b> University of Arizona (USA)
11:50 am - 12:10 pm	<b>Polymer-Based Draw Solutions for Osmotically Driven Membrane Processes: Opportunities and Challenges</b> <b>Mamadou Diallo, Ph.D.</b> Korea Advanced Institute of Science and Technology (Korea) and California Institute of Technology (USA)	<b>Mechanical Vapor Compression/Membrane Distillation Hybrids for Reduced Specific Energy Consumption</b> <b>Jaichander Swaminathan</b> Massachusetts Institute of Technology (USA)
12:10 pm - 12:30 pm	<b>Pressure Assisted Fertilizer Drawn Forward Osmosis Desalination for Fertigation</b> <b>Ho Kyong (HK) Shon, Ph.D.</b> University of Technology, Sydney (Australia)	<b>Sustainable Operation of Vacuum Membrane Distillation for Mineral Recovery from Hypersaline Reverse Osmosis Concentration</b> <b>Saravanamuthu Vigneswaran, Ph.D.</b> University of Technology, Sydney (Australia)
12:30 pm - 1:30 pm	<b>LUNCH</b>	Room 16



DAY 1: FRIDAY, AUGUST 28, 2015

# Emerging Processes and Municipal Applications

1:30 pm - 3:00 pm	<b>SESSION 2</b>	
	<b>TRACK A</b> <b>Room 15</b> <b>Salinity Gradient Energy: Pressure Retarded Osmosis</b> <i>Moderator: Tzahi Cath, Ph.D.</i> Colorado School of Mines (USA)	<b>TRACK B</b> <b>Room 14</b> <b>Membrane Distillation</b> <i>Moderator: Stephen Gray, Ph.D.</i> Victoria University (Australia)
1:30 pm - 2:00 pm	<b>Keynote Presentation:</b> <b>Pressure Retarded Osmosis (PRO): Should It Stay or Should It Go?</b> <b>Amy Childress, Ph.D.</b> University of Southern California (USA)	<b>Keynote Presentation:</b> <b>Comparative Assessment of Membrane Distillation Configurations and Modules</b> <b>Noreddine Ghaffour, Ph.D.</b> King Abdullah University of Science and Technology (Saudi Arabia)
2:00 pm - 2:20 pm	<b>Gross vs. Net Energy Output: A Rational Framework for Assessing the Viability of Pressure Retarded Osmosis</b> <b>Zhangxin Wang</b> Vanderbilt University (USA)	<b>Simplified Thermodynamic Analysis on Direct Contact Membrane Distillation</b> <b>Shihong Lin, Ph.D.</b> Vanderbilt University (USA)
2:20 pm - 2:40 pm	<b>Analysis of Pressure Retarded Osmosis under Varying Draw Pressure by a Novel Method</b> <b>Seungkwan (SK) Hong, Ph.D.</b> Korea University (Korea)	<b>Solar Membrane Distillation for Off-Grid, Decentralized Water Purification</b> <b>Wendell Ela, Ph.D.</b> National Centre of Excellence in Desalination Australia (Australia)
2:40 pm - 3:00 pm	<b>Fouling Characterization of Forward Osmosis Biomimetic Aquaporin Membranes Used for Water Recovery from Municipal Wastewater</b> <b>Agata Zarebska, Ph.D.</b> Technical University of Denmark (Denmark)	<b>Solar Membrane Distillation Desalination Research</b> <b>Mitchell Haws</b> U.S. Department of the Interior, Bureau of Reclamation (USA)
3:00 pm - 3:30 pm	<b>BREAK</b>	
3:30 pm - 5:00 pm	<b>SESSION 3</b>	
	<b>TRACK A</b> <b>Room 15</b> <b>Salinity Gradient Energy: Reverse Electrodialysis</b> <i>Moderator: Menachem Elimelech, Ph.D.</i> Yale University (USA)	<b>TRACK B</b> <b>Room 14</b> <b>Other Emerging Technologies</b> <i>Moderator: Anthony Fane, Ph.D.</i> Singapore Membrane Technology Center (Singapore)
3:30 pm - 4:00 pm	<b>Keynote Presentation:</b> <b>Overview of European and International Projects for Upscaling of Reversed Electrodialysis and Pressure Retarded Osmosis Applications in Relation to Desalination and Wastewater Treatment</b> <b>Frank Neumann, Ph.D.</b> Institute for Infrastructure, Environment and Innovation (Belgium)	<b>Keynote Presentation:</b> <b>Biomimetic Forward Osmosis and Pressure Retarded Osmosis Membranes</b> <b>Rong Wang, Ph.D.</b> Singapore Membrane Technology Centre (Singapore)
4:00 pm - 4:20 pm	<b>Techno-Economic Assessment of a Novel Osmotic Heat Engine for Energy Recovery from Low-Grade Heat</b> <b>Tzahi Cath, Ph.D.</b> Colorado School of Mines (USA)	<b>Forward Osmosis Under Pressure: Performances and Challenges of Pressure Assisted Osmosis</b> <b>Pierre Le-Clech, Ph.D.</b> University of New South Wales (Australia)
4:20 pm - 4:40 pm	<b>Masdar's Renewable Energy Water Desalination Program</b> <b>Mohammad El Ramahi</b> Abu Dhabi Future Energy Company (UAE)	<b>Performance Enhancement of Capacitive Deionization System by Modified 3D Single-Walled Carbon Nanotubes/Reticulated Vitreous Carbon Electrodes Using Microwave Irradiated Graphene Oxide</b> <b>Mohammed Almoiqil, Ph.D.</b> King Abdulaziz City of Science and Technology (Saudi Arabia)
4:40 pm - 5:00 pm	<b>Harvesting Renewable Energy from Waste of Reverse Osmosis Seawater Desalination Using Salinity Gradient Based Design of Capacitive System</b> <b>Haizhou Liu, Ph.D.</b> University of California, Riverside (USA)	<b>Energy Efficiency Modelling for Capacitive Deionization and Membrane Capacitive Deionization</b> <b>Xia Shang</b> University of Illinois at Urbana-Champaign (USA)
5:00 pm - 7:30 pm	<b>POSTER SESSION AND RECEPTION</b>	
	<b>Mezzanine Level Lobby/West Terrace</b>	



# Poster Presentations

**POSTERS WILL BE ON DISPLAY IN THE MEZZANINE LEVEL LOBBY**  
All day on Friday, August 28, and until 1:00 pm on Saturday, August 29

**Modeling Cross Flow Microfiltration of Oil from Effluent Using Multi-Channel Ceramic Membrane**

Yousef Alanezi, Ph.D.  
*College of Technical Studies (Kuwait)*

**Determination of Energy Consumption in an Electrodialysis Reversal Pilot Plant**

Fattaneh Naderi Behdani, Doctoral Student  
*New Mexico State University (USA)*

**Cross-Flow Microsand Filtration as Membrane Pre-Treatment**

Francis Bordeleau, M.Eng.  
*Sonitec (Canada)*

**Polymer Enhanced Forward Osmosis: Exploration of the Potential of Branched Polyethyleneimine as Draw Solute**

Manki Cho, Doctoral Student  
*Korea Advanced Institute of Science and Technology (Korea)*

**Evaluation of Membrane Distillation Performance Using Various Nanoparticle Porous Membrane**

June-Seok Choi, Ph.D.  
*Korea Institute of Civil Engineering and Building Technology (Korea)*

**Hybrid Electrochemical Seawater Desalination at Ambient Conditions with Energy Recovery**

Divyaraj Desai, Ph.D.  
*Palo Alto Research Center (USA)*

**Omniphobic Membrane for Anti-Wetting Membrane Distillation**

Shihong Lin, Ph.D.  
*Vanderbilt University (USA)*

**Clathrate Freeze Desalination Using Cyclopentane as the Clathrate Former**

Richard McCormack  
*HydroFreeze, a Division of Ramco Consulting Company (USA)*

**Benefits of Chemically-Enhanced Seeded Precipitation and Ozone as Pre-Treatments of Nanofiltration Brine in Reducing Fouling Propensity**

Minkyu Park, Doctoral Student  
*University of Arizona (USA)*

**The Next Generation of the Energy Recovery PX Pressure Exchanger®**

Juan Miguel Pinto  
*Energy Recovery, Inc. (USA)*

**Laminar Flow in Magnetic Labyrinth**

Jorge Sarmiento, M.E.  
*Del Sur Development, LLC (USA)*

**Improved Desalination Using Bubble Column Evaporator Method**

Muhammad Shahid, Doctoral Student  
*University of New South Wales, Canberra (Australia)*

**Anode Doped Poly(3,4-ethylenedioxythiophene) Asymmetric Carbon Electrodes for Capacitive Deionization**

Xia Shang, Doctoral Student  
*University of Illinois at Urbana-Champaign (USA)*

**High Recovery Forward Osmosis for Dewatering High Salinity Wastewaters**

Jayraj Shethji, Ph.D.  
*Hydration Technology Innovations, LLC (USA)*

**Impacts of Fouling on Capacitive Deionization and Membrane Capacitive Deionization Systems**

Laura Southworth, M.S. Student  
*University of Illinois at Urbana-Champaign (USA)*

**A Thermally Driven Membrane Process for Saline and Hypersaline Water Treatment Using Hybrid Organic-Inorganic Membranes**

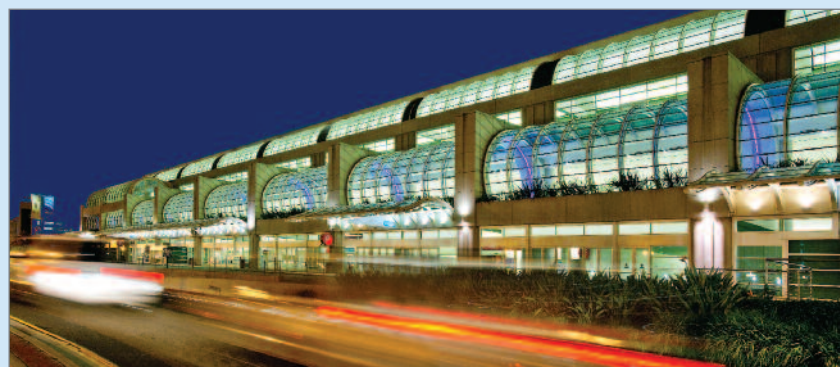
Dian Tanuwidjaja, Ph.D.  
*Water Planet Engineering (USA)*

**Forward Osmosis: A Promising Technology**

Coimbat Veda, P.E.  
*Entrepreneur in Membrane Systems (India)*

**Performance Evaluation of HTI's Latest High-Flux Thin-Film Composite Forward Osmosis Membrane for Municipal and Industrial Applications**

Daniel Wandera, Ph.D.  
*Hydration Technology Innovations, LLC (USA)*





DAY 2: SATURDAY, AUGUST 29, 2015

# Process Hybrids, Material Science, and Industrial Applications

8:00 am – 9:00 am	<b>REGISTRATION</b>	Mezzanine Level Lobby
9:00 am – 10:10 am	<b>PLENARY SESSION</b>	
9:00 am – 9:10 am	<b>Welcome and Introduction</b> <ul style="list-style-type: none"> <li>• <b>David Furukawa, P.E., Ch.E.</b> National Centre of Excellence in Desalination Australia (Australia)</li> <li>• <b>Gary Amy, Ph.D.</b> Water Desalination and Reuse Center, King Abdullah University of Science and Technology (Saudi Arabia)</li> </ul>	Room 15
9:10 am – 9:40 am	<b>Plenary Presentation:</b> <b>Desalination Needs and Opportunities in the Oil and Gas Industry</b> <b>Samer Adham, Ph.D.</b> ConocoPhillips (Qatar)	
9:40 am – 10:10 am	<b>Plenary Presentation:</b> <b>Polymeric Membranes for Clean Water and Osmotic Power Generation</b> <b>Neal Chung, Ph.D.</b> National University of Singapore (Singapore)	
10:10 am – 10:40 am	<b>BREAK</b>	
10:40 am – 12:10 pm	<b>SESSION 4</b>	
	<b>TRACK A</b> <b>Room 15</b> <b>Industrial Applications</b> <i>Moderator: Samer Adham, Ph.D.</i> ConocoPhillips (Qatar)	<b>TRACK B</b> <b>Room 14</b> <b>Other Emerging Technologies</b> <i>Moderator: Tom Pankratz</i> Water Desalination Report (USA)
10:40 am – 11:10 am	<b>Keynote Presentation:</b> <b>Extraction of Water and Minerals from Coal Seam Gas Produced Water for Beneficial Uses</b> <b>Neil Palmer</b> National Centre of Excellence in Desalination Australia (Australia)	<b>Keynote Presentation:</b> <b>Adsorption Desalination</b> <b>Kim Choon Ng, Ph.D., P.E.</b> National University of Singapore and King Abdullah University of Science and Technology (Saudi Arabia)
11:10 am – 11:30 am	<b>Influence of Draw Solution on Performance of Forward Osmosis Process for Shale Gas Wastewater Treatment</b> <b>Sungyun Lee, Ph.D.</b> Korea Institute of Machinery and Materials (Korea)	<b>Electrodialysis Metathesis to Prevent Scaling in Desalination of Gypsum-Rich Groundwater</b> <b>Thomas Davis, Ph.D.</b> Center for Inland Desalination Systems, University of Texas, El Paso (USA)
11:30 am – 11:50 am	<b>Use of Membrane Distillation for Treatment of Produced Water from Unconventional Onshore Gas Extraction</b> <b>Omkar Lokare</b> University of Pittsburgh (USA)	<b>Electro-Distillation with Brine Bulb Technology: An Emerging Treatment Technology for Aggressive, High Total Dissolved Solids Waste Streams</b> <b>Eric Dole, P.E.</b> Hazen and Sawyer (USA)
11:50 am – 12:10 pm	<b>Zero Liquid Discharge Desalination of Oilfield Produced Water: Survey of Likely-Feasible Systems by Simplified Computations and Experimental Testing</b> <b>Essam El-Sayed, Ph.D.</b> Kuwait Institute of Scientific Research (Kuwait)	<b>Effect of Transverse Vibration and Aeration on the Mass Transfer and Crystal Formation in Submerged Vacuum Membrane Distillation and Crystallization</b> <b>Helen Julian</b> University of New South Wales (Australia)
12:10 pm – 1:10 pm	<b>LUNCH</b>	Room 16



DAY 2: SATURDAY, AUGUST 29, 2015

# Process Hybrids, Material Science, and Industrial Applications

1:10 pm - 2:40 pm	<b>SESSION 5</b>	
	<p><b>TRACK A</b> Room 15 <b>Commercialization Landscape</b> Moderator: <b>Gary Amy, Ph.D.</b> Water Desalination and Reuse Center, King Abdullah University of Science and Technology (Saudi Arabia)</p>	<p><b>TRACK B</b> Room 14 <b>Process Hybrids</b> Moderator: <b>Masaru Kurihara, Ph.D.</b> Toray Industries (Japan)</p>
1:10 pm - 1:40 pm	<p><b>Keynote Presentation:</b> <b>The Singapore Commercialization Ecosystem</b> <b>Harry Seah</b> Public Utilities Board (Singapore)</p>	<p><b>Keynote Presentation:</b> <b>Challenges in Future Desalination: Brine Management</b> <b>Seung-Hyun Kim, Ph.D.</b> Kyungnam University (Korea)</p>
1:40 pm - 2:00 pm	<p><b>Going Big with Forward Osmosis</b> <b>MaryTheresa M. Pendergast, Ph.D.</b> Oasys Water (USA)</p>	<p><b>Polymer-Enhanced Forward Osmosis: Exploration of the Potential of Branched Polyethyleneimine as Draw Solute</b> <b>Manki Cho</b> Korea Advanced Institute of Science and Technology (Korea)</p>
2:00 pm - 2:20 pm	<p><b>Process Commercialization Landscape for Forward Osmosis</b> <b>Erik Desormeaux</b> Porifera, Inc. (USA)</p>	<p><b>Design of Forward Osmosis/Reverse Osmosis Hybrid System for Saving Energy Consumption at Desalination</b> <b>Sangho Lee, Ph.D.</b> Korea Institute of Civil Engineering and Building Technology (Korea)</p>
2:20 pm - 2:40 pm	<p><b>Aquaporin-Based Biomimetic Membranes for Reverse Osmosis and Forward Osmosis</b> <b>Jiang Wei, Ph.D.</b> Aquaporin (Denmark)</p>	<p><b>Integrating Tunable Anion Exchange with Reverse Osmosis for Enhanced Recovery During Inland Brackish Water Desalination</b> <b>Ryan Smith, Ph.D.</b> Lehigh University (USA)</p>
2:40 pm - 3:10 pm	<b>BREAK</b>	
3:10 pm - 5:00 pm	<b>SESSION 6</b>	
	<p><b>TRACK A</b> Room 15 <b>Commercialization Landscape</b> Moderator: <b>Gary Amy, Ph.D.</b> Water Desalination and Reuse Center, King Abdullah University of Science and Technology (Saudi Arabia)</p>	<p><b>TRACK B</b> Room 14 <b>Process Hybrids and Biofouling</b> Moderator: <b>Seung-Hyun Kim, Ph.D.</b> Kyungnam University (Korea)</p>
3:10 pm - 3:40 pm	<p><b>Keynote Presentation:</b> <b>Brine Management and Zero Liquid Discharge Options</b> <b>Tom Pankratz</b> Water Desalination Report (USA)</p>	<p><b>Keynote Presentation:</b> <b>Role of Pressure Retarded Osmosis in the Mega-Ton Project</b> <b>Masaru Kurihara, Ph.D.</b> Toray Industries (Japan)</p>
3:40 pm - 4:00 pm	<p><b>High-Recovery, Low-Fouling, Low-Energy Reverse Osmosis</b> <b>Richard Stover, Ph.D.</b> Desalitech (USA)</p>	<p><b>Self-Sustained Microbial Electro-Deionization Cell for Desalination and Wastewater Treatment</b> <b>Noura Shehab, Ph.D.</b> King Abdullah University of Science and Technology (Saudi Arabia)</p>
4:00 pm - 4:20 pm	<p><b>Brine Reuse Desalination Using Forward Osmosis Technology</b> <b>Sophie Walewijk, Ph.D.</b> Trevi Systems (USA)</p>	<p><b>Magnetic Pickering Emulsions Coupled to Membrane Filtration for Fouling Free Oil/Water Separation</b> <b>Alexander Dudchenko</b> University of California, Riverside (USA)</p>
4:20 pm - 4:40 pm	<p><b>Pilot Testing of an Integrated Mechanical and Membrane System in a Steam-Flood Produced Water Treatment Application</b> <b>Arian Edalat, Ph.D.</b> Water Planet Engineering (USA)</p>	<p><b>Radioluminescence Membrane Biofouling Control: Generating Germicidal Ultraviolet Radiation Inside Membrane Modules Using X-Rays</b> <b>Ezra Cates, Ph.D.</b> Clemson University (USA)</p>
4:40 pm - 5:00 pm	<p><b>Membrane Distillation: Ready for the Market? Comparative Assessment of Commercial Systems</b> <b>Guillermo Zaragoza, Ph.D.</b> Plataforma Solar de Almería-Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas (Spain)</p>	<p><b>Forward Osmosis/Low Pressure Reverse Osmosis Hybrid for Indirect Desalination of Seawater</b> <b>Zhenyu Li, Ph.D.</b> King Abdullah University of Science and Technology (Saudi Arabia)</p>
5:00 pm	<b>CONFERENCE ADJOURNS</b>	



# DesalTech 2015 Conference Organizers

## NWRI

National  
Water  
Research  
Institute

Since 1991, the **National Water Research Institute** (NWRI) – a science-oriented 501c3 nonprofit – has sponsored projects and programs to improve water quality, protect public health and the

environment, and create safe, new sources of water. NWRI specializes in working with researchers across the country with the best available facilities, such as laboratories at universities and water agencies, and is guided by a Board of Directors made up of representatives of water and wastewater agencies in California. NWRI hosts the annual Athalie Richardson Irvine Clarke Prize, one of only a dozen prizes that awards scholarly and practical achievements in water research. To learn more about NWRI, please visit [NWRI-USA.ORG](http://NWRI-USA.ORG).



National Centre of  
Excellence in Desalination  
AUSTRALIA

The **National Centre of Excellence in Desalination Australia** (NCEDA) was established in 2010 with funding from the Australian Government's Water for the Future initiative to lead research and build national capacity and capabilities in desalination. NCEDA is highly regarded as a global leader in desalination research, with particular strength and relevance in inland water desalination and salt management, as well as small-scale plants. Specifically,

NCEDA strives to reduce desalination costs, decrease energy consumption, increase the feasibility of using renewable energy sources, and develop innovative technologies to more efficiently separate salt from water. To learn more about NCEDA, please visit [DESALINATION.EDU.AU](http://DESALINATION.EDU.AU).

The **Water Desalination and Reuse Center** (WDRC) at **King Abdullah University of Science and Technology** (KAUST) is a globally active research center focusing



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للعلوم والتقنية  
King Abdullah University of  
Science and Technology

## WDRC

on (1) emerging technologies for low-energy and renewable energy-driven desalination processes and hybrids and (2) sustainable (energy-neutral) wastewater treatment processes for safe reuse. WDRC research is performed along the entire industrial value chain, including process scale-up, with technology commercialization as a driver. Process-related research is underpinned by material science research in developing improved membranes, as well as nano-adsorbents and nano-catalysts. To learn more about WDRC, please visit [WDRC.KAUST.EDU.SA](http://WDRC.KAUST.EDU.SA).

DESALTECH 2015 IS ADMINISTERED BY:

**National Water Research Institute**

18700 Ward Street ♦ P.O. Box 8096 ♦ Fountain Valley, California 92728-8096 ♦ (714) 378-3278

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