



2025 ANNUAL SALINITY SUMMIT

February 26–28, 2025 Tuscany Suites & Casino Las Vegas, NV

2025 Annual Salinity Summit Multi-State Salinity Coalition

Tuscany Suites & Casino • February 28-29, March 1, 2025

Greetings, MSSC Summit Attendees



Greetings, and welcome to the National Salinity Summit! The 2025 National Salinity Summit Planning Committee did an excellent job of bringing together a strong program. This year's Summit will include sessions that focus on salinity management, desalination project implementation strategies and approaches, water/power co-location, addressing regulatory and environmental hurdles, and future strategies to manage desalination and concentrate management.

I would like to extend my thanks to all of the 2025 Annual Summit's generous sponsors. The success of the Summit would not be possible without their support and dedication to the MSSC. All of the sponsors are listed in this brochure. We also have them listed on the MSSC website and will provide a link to their sites as advertisement to them. Please take a moment to thank them during the event. In addition to the success of the event, their support allows the MSSC to hold the event at a reasonable cost to Summit attendees.

It has been a pleasure to serve as the Multi-State Salinity Coalition President. I have enjoyed working with such an intelligent and talented planning committee. I look forward to seeing you here at the Summit!

Best Regards,

A handwritten signature in blue ink, appearing to read "Scott Reinert". The signature is fluid and cursive.

Scott Reinert
President, Multi-State Salinity Coalition

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Conference Schedule

Wednesday, February 26, 2025

1:00 p.m. – 4:00 p.m.	Bellagio Water System Tour
1:00 p.m. – 7:00 p.m.	Exhibitor and Poster Presentation Set-Up
4:00 p.m. – 7:00 p.m.	Summit Conference Registration
5:00 p.m. – 6:00 p.m.	MSSC Board Meeting
6:00 p.m. – 8:00 p.m.	MSSC Board & Platinum Sponsor VIP Party

Thursday, February 27, 2025

7:00 a.m. – 4:00 p.m.	Summit Conference Registration
7:30 a.m. – 8:30 a.m.	Breakfast and Networking
8:30 a.m. – 8:45 a.m.	Opening Remarks Moderator: Scott Reinert , <i>President, Multi State Salinity Coalition and Hydrogeologist /Water Resources Manager, El Paso Water</i>
8:45 a.m. – 9:15 a.m.	Keynote Session <u>Speaker:</u> Tim Davis , <i>Deputy Commissioner, The Great Salt Lake</i> Tim will speak about current conditions of the Great Salt Lake and address progress, challenges and concerns as the state works to preserve and protect it.
9:15 a.m. – 9:45 a.m.	The Water Research Foundation Projects Moderator: Sanjana Yagnambhatt , <i>Research Manager – Research Services, The Water Research Foundation, WRF</i> <u>Speakers:</u> Krystal Perez , <i>National Practice Leader for the Industrial Water Technical Practice, Brown and Caldwell, “Regional Brine Management Project”</i>
9:45 a.m. – 10:00 a.m.	Regional Water System Planning NAWI’s funding opportunity to support planning innovation. Regional Water System (RWS) planning is critical to municipalities, states and industries across the United States - and particularly in the Colorado River Basin. Forecasting future water supply requires modeling that accurately factors in changes to natural precipitation in a changing climate and the complex interactions between precipitation and

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surface and groundwater systems. Forecasting future demand requires complex technoeconomic analysis of the forces that drive water consumption and how those forces may change over time, and also factor in “black swan” developments such as the rise of water-thirsty data centers. Finally, the best plans also allow stakeholders to optimize supply and demand strategies across the full portfolio of “futures” – giving planners the best possible portfolio of infrastructure investments that balance present and future cost and portfolio “resiliency”.

The NAWI program will be launching a new funding opportunity in late 2025 to accelerate innovations in the regional water planning process. NAWI will invite regional water planning teams to submit proposals for funding to co-develop new and improved supply planning, demand forecasting, and water portfolio optimization tools and methods. In my presentation I will describe NAWI’s motivation to support innovation in the regional water planning process, and how the ~\$10M funding opportunity will be structured.

Speakers:

Dr. Peter S. Fiske, *Executive Director, National Alliance for Water Innovation (NAWI)*

10:00 a.m. – 10:15 a.m.

The Great MSSC Water Taste Test

Moderator: **Troy Svede**, *Project Engineer, Moreno Cardenas Inc.*

10:15 a.m. – 11:40 p.m.

PFAS Policy Session

This will be the 4th year in a row of the “PFAS track” where speaker will discuss a range of topics from PFAS treatment projects for federal facilities to USGS groundwater mapping efforts, PFAS treatment selection trees and the EPA’s effort to research “electrified” PFAS treatment and destruction systems. To keep the trend going on the legal aspect of PFAS litigation to assist PFAS mitigation, we will have one of the country’s top PFAS attorney discuss best practices to take if PFAS becomes an issue in your water supply.

Moderator: **Eric Dole**, *Water & Energy Practice Builder, Kimley-Horn*

Speakers:

Kimberly Beisner, *Research Hydrologist, New Mexico & Arizona Water Science Centers, USGS, “USGS Research on Per- and Polyfluoroalkyl Substances in Water Resources”*

Craig Wenger, *Project Manager, Kimley-Horn, “PFAS Treatment Decision Making Tree for ADEQ”*

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Jeff Kray, *Managing Partner, Marten Law*, "Legal Steps to Consider When PFAS Comes Knocking at Your Door"

Ashley (Hesterberg) Butzlaff, *Environmental Engineer, US Environmental Protection Agency (EPA), Center for Environmental Solutions & Emergency Response (CESER)*, "Electrified PFAS Mitigation and Degradation Research Initiative at EPA"

11:40 a.m. – 12:00 p.m.

Keynote Speaker

Moderator: **Charlie Ester**, *Director, Water Supply, Salt River Project*

Speaker:

Michael Gabaldon, *Client Director, Black & Veatch (Former USBR Technical Resources Director)*, "History of Water Development and Management in the West: How Have These Approaches Impacted Salinity?"

12:00 p.m. – 1:00 p.m.

Special Recognition & Luncheon

Moderator: **Scott Reinert**, *President, Multi State Salinity Coalition and Hydrogeologist/Water Resources Manager, El Paso Water*

Platinum Sponsors:

- Arizona Public Service
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- HDR
- John Shomaker & Associates Inc.
- Kimley-Horn
- Metropolitan Water District of Southern California
- North American Weather Consultants Inc.
- The Water Research Foundation

"Salt of the Earth Award"

"Student Scholarship Award"

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1:00 p.m. – 2:15 p.m.

Salinity in AG Session

Salinity in Agriculture is the presence of salts in the soil. These salts can harm plant growth and can limit crop yields. Panelists will discuss their concerns about increased salinity and its effects on agriculture.

Causes for these increases in salinity are numerous including dry climates, high evaporation, poor drainage systems and too much fertilizers. In this session, our subject matter experts will discuss best management practices that help to minimize the impacts of increased salinity in agriculture.

Moderator: : **Jeff Biggs**, *Principal Management Consultant & Associate Vice President, Carollo*

Speakers:

Theresa (Tess) Dunham, *Partner, Kahn, Soares & Conway LLP, "Water Quality Law"*

Tom W. Davis, *General Manager, Yuma County Water Users' Association YCWUA*

Todd Skaggs, *Supervisory Research Hydrologist (Research Leader), USDA Agricultural Research Service*

Raghupathy Karthikeyan, *Charles Carter Newman Endowed Chair, Natural Resources Engineering, Clemson University, "Integration of Hydroponics Controlled Environment Agriculture with Brackish Water Resources"*

2:15 p.m. – 2:30 p.m.

Break

2:30 p.m. – 3:30 p.m.

Collage of Water Professionals

The aim of the "Collage" session is to help lend some perspective on the broader environment in which we - as water treatment/desal professionals - operate. I think, we tend to focus on the promise or ingenuity of a particular solution to a particular problem without a comprehensive understanding of the things that affect its potential.

Moderator: **Orestes Morfin**, *Planning Analyst, Central Arizona Project*

Speakers:

Todd Flanagan, *Project Manager/Meteorologist, North American Weather Consultants Inc.*

Michael Irlbeck, *Director of Business Development, EPCOR USA, "Public-Private Partnerships (P3), How to get Projects Funded"*

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Roger Peery, *CEO/Principal Hydrogeologist, John Shomaker & Associates,*
“Where Brackish Groundwater is Present, and Relevant Drilling Methods”

Vineetha Kartha, *Colorado River Programs Manager, Central Arizona Project, CAP*

3:30 p.m. – 4:00 p.m.

Meet and Greet with Our Water Experts Round Table

Each exhibitor has five minutes to share with three minutes between to move to next exhibit. Discuss Companies, Projects, Products, Sponsors, Posters, Funding Opportunities, etc. Make certain your passport is stamped to quality for a great prize!

4:00 p.m. – 5:00 p.m.

Let’s Concentrate on the Concentrate Round Table Interview Session

Concentrate management is a challenge facing many of the innovative water supply projects in the future. Long term management (disposal) of the concentrate is important for water reuse and desalination projects. This panel will discuss a variety of concentrate management alternatives being used in the industry. Some are mainstream and some are considered new and innovative. We look forward to having an interesting conversation on this important topic facing our industry. In this session, we are going to concentrate on the concentrate!

Moderator: **Scott Miller**, *Water Resource Analyst, Water Resources Management, APS*

Speakers:

Don Barnett, *Executive Director, Colorado River Basin Salinity Control Forum,*
“Paradox Valley Unit”

Fannie Howard, *Professional Engineer, Kimley-Horn,* “Turf Management, Brackish Water Treatment for Golf Course Irrigation Water that Required No RO Treatment”

Russell Vreeland, *President, Eastern Shore Microbes*

Tom Pankratz, *Editor, Water Desalination Report, USA/Global Water Intelligence*

5:00 p.m. – 7:00 p.m.

Game Night Reception with heavy hors d’oeuvres

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Friday, February 28, 2025 Coffee Table Conversations - NO SLIDE FRIDAY!

- 7:30 a.m. - 12:00 p.m.** **MSSC Summit Conference Registration**
- 8:00 a.m. – 8:40 a.m.** **Breakfast**
- 8:45 a.m. – 9:00 a.m.** **Results of The Great MSSC Water Taste Test**
Moderator: **Scott Reinert**, *President, Multi State Salinity Coalition and Hydrogeologist/Water Resources Manager, El Paso Water*
- 9:00 a.m. – 9:30 a.m.** **Celeste Cantu**, *Public Policy Institute of California, Vice Chair Water Foundation, Vice President of Water Education Foundation, "Drought, Fire and Flood! Wind: The Deadly Accelerator"*
- 9:30 a.m. – 10:00 a.m.** **Interview with Salt of the Earth Winner Session**
Moderator: **Lanaya Voelz Alexander**, *Assistant General Manager; Planning, Engineering & Construction, Eastern Municipal Water District*
Speaker:
Jack Simes, *Former Area Manager for the Southern California Area Office, Bureau of Reclamation*
- 10:00 a.m. – 11:15 a.m.** **Professional Women in Water Session**
Join us this year at MSSC 2025 to learn from our inaugural Women in Water session. We will have five amazing women who are trailblazers in the water industry. Come listen and learn from their experiences, achievements, personal and professional challenges, and where they are today. Meet the inspiring Women in Water!
Moderator: **Yuliana Porras Mendoza**, *One Water Practice Leader, Garver*
Speakers:
Michelle Chapman, *Retired Physical Scientist, Bureau of Reclamation Advanced Water Treatment Team*
Tayia Oddonetto, *Student, University of Texas, El Paso, UTEP*
Meagan Mauter, *Associate Professor, Stanford University School of Engineering*
Mary Elizabeth Mach, *West Region Water Director, Garver*
- 11:15 a.m. – 11:45 a.m.** **Interactive Dialogue, Discussion and Water Trivia**
Moderator: **Scott Reinert**, *President, Multi State Salinity Coalition and Hydrogeologist/Water Resources Manager, El Paso Water*
- 11:45 a.m. – 12:00 p.m.** **MSSC Closing Remarks, Summary & Adjourn**

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Arizona Public Service generates clean, reliable and affordable energy for 2.7 million Arizonans. Our service territory stretches across the state, from the border town of Douglas to the vistas of the Grand Canyon, from the solar fields of Gila Bend to the ponderosa pines of Payson. As the state's largest and longest-serving energy provider, our 6,300 dedicated employees power our vision of creating a sustainable energy future for Arizona. Customers can depend on us all year long, particularly during our hot Arizona summers. We're proud to be among the top energy companies in the nation for reliable service. Advanced technologies are enhancing our ability to detect and respond to outages while maintaining a safe, more flexible grid. By continually investing in the energy grid, we ensure our customers have access to clean, reliable and affordable power whenever they need it.

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Carollo is an environmental engineering firm specializing in the planning, design, and construction of water and wastewater facilities and infrastructure. Our firm has over 1,100 employees and currently maintains 46 offices in 19 states. We are a full-service company with the experience and qualified professionals to successfully manage projects of any size.

During our 87-year history, Carollo has successfully completed more than 25,000 projects for public sector clients. Carollo is currently ranked within Engineering News Record's top 500 design firms. More importantly, ENR's annual Source Book ranks Carollo among the top 10 firms for water and wastewater treatment plant design. Unlike many of our competitors, Carollo provides only water and wastewater engineering services.

With our focus on water and wastewater, we recruit nationwide and hire technical staff who have the extensive background and training specific to this field. For that reason, the quality and professional standing of our core group of water and wastewater professionals equals or exceeds that provided by some of the largest engineering firms in the United States.

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Clean Methane Systems advances solutions at the waste and energy nexus, developing innovative approaches that transform biogas challenges into profitable renewable energy opportunities. As a forward-looking, results-based company, we propel our customers with energy project delivery, technology integration, and regulatory compliance—delivering systems that consistently exceed performance requirements while reducing operational complexity. Our portfolio of over 200 global installations demonstrates our ability to optimize waste-to-energy projects across municipal, industrial, and agricultural applications.

We understand that successful renewable energy projects demand more than advanced technology—they require practical solutions that work within real-world operational and financial constraints. Our flexible delivery models are tailored to fit your specific needs and resources. Each approach leverages our comprehensive gas conditioning and upgrading expertise to deliver measurable outcomes: guaranteed outlet specifications, reduced operating costs, and maximized energy value from your biogas resources.

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Eastern Municipal Water District (EMWD) is the water, wastewater service and recycled water provider to more than 825,000 people living and working within a 555-square-mile service area in western Riverside County. It is California's sixth-largest retail water agency and its mission is "to deliver value to our customers and the communities we serve by providing safe, reliable, economical and environmentally sustainable water, wastewater and recycled water services." With more than 50 years of experience, the board members and staff of EMWD are proud, confident and ready for the future.

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El Paso Water is the regional planner and provider to water, wastewater, reclaimed water and stormwater services to nearly 700,000 people in the greater metropolitan area. It is a component part of the City of El Paso and its governed by a seven-member Public Service Board. Its mission is to furnish, at a fair and reasonable cost to customers, high-quality potable water in sufficient quantities to satisfy domestic, industrial and fire protection requirements, along with collection of liquid waste for treatment and disposal without risk to public health and the environment.

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Founded in 1919, Garver is an employee-owned multi-disciplined engineering, planning, architectural, and environmental services firm with nearly 900 employees across the United States. Offering a wide range of services focused on aviation, construction, facilities design, federal, survey, transportation, water, and wastewater, Garver sits in the top 125 of the Engineering News-Record's prestigious Top 500 Design Firms list and is consistently recognized as a best firm to work for.

Every community deserves safe, affordable drinking water and clean rivers and streams. That's the mission Garver and our partnered utilities work toward every day. And every day, these utilities are faced with challenges of aging infrastructure, increasing water quality requirements, and concerns over funding. Garver's Water Team is uniquely built with client-focused, local teams that provide constant support, four design centers providing sophisticated design of all engineering disciplines, and a Water Technology Team comprised of national experts that can innovatively solve the most challenging water and wastewater quality concerns.

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Since 1917, HDR Engineering Inc. (HDR) has served as a trusted partner to our clients throughout the world. With more than 13,000 employees in over 220 offices worldwide, we are global leaders in engineering, architecture, environmental and construction services. We work side by side with our clients to improve lives, grow communities and accelerate progress. While we are most well-known for adding beauty and structure to communities through high-performance buildings and smart infrastructure, we provide much more than that. We create an unshakable foundation for progress because our multidisciplinary teams also include scientists, economists, builders, analysts and artists.

At HDR, we assist clients in evaluating or developing alternative supply sources. We have the in-house resources to manage all of the challenges inherent in executing a desalination project. Starting with identification of the environmental impact concerns through conceptual feasibility study – including funding, environmental and construction permitting, public outreach, treatment evaluation and pilot studies – to the design, construction and start-up phases, we have the technical resources to deliver for our clients. We even have licensed water treatment plant operators to partner with you to optimize plant function and train operations staff.

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John Shomaker & Associates, Inc. (JSAI) is an employee-owned corporation, which has been providing professional services in the areas of fresh and brackish water-resource development, groundwater flow modeling, drilling specifications for large capacity wells, geochemistry, environmental assessment and reclamation, and expert witness testimony for over 41 years. Our technical staff consists of hydrogeologists, hydrologists, geochemists, geologists, and GIS/AutoCAD specialists. JSAI has ongoing projects in New Mexico, Texas, Nevada, California, South Dakota, Argentina, Chile, Guatemala, and British Columbia.

JSAI has developed drilling specifications for brackish water wells completed in unconfined and confined aquifers, hydrogeologic assessments for concentrate disposal wells, and performed field oversight and data collection for all aspects of drilling, completing and testing of concentrate disposal wells, and interpreted water quality and hydraulic property test data. The success of JSAI's water-resource and environmental projects comes from careful scientific practice and experience.

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At Kimley-Horn, we do things differently. People – clients and employees – are at the forefront of our business. Clients know we are laser-focused on their success. Employees know our culture and approach to business are built on a desire to see our staff flourish, one and all. Both groups know that with Kimley-Horn, they can expect more and experience better.

Clients know they can count on Kimley-Horn – that’s why almost 90% of our business comes from repeat clients. They know that our engineers, planners, and environmental scientists apply creativity and rigor to deliver outstanding results. We have a long track record of developing solutions that save our clients time and money, and can share real-world examples of cases where we’ve identified savings that surpass our fees. Whether your business is national or local, and whether your projects involve public infrastructure or private development, we seek to reduce your risk and increase your success. With offices nationwide, let Kimley-Horn be your one-stop consultant for superior solutions in a wide range of services.

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THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

The Metropolitan Water District of Southern California serves 26 public water agencies — cities, municipal water districts and one county water authority — that then deliver supplies directly or indirectly to 19 million people in Los Angeles, Orange, Riverside, San Bernardino, San Diego and Ventura counties.

We have imported water from the Colorado River since 1941 and from Northern California since the early 1970s. We are the largest single contractor of the State Water Project and a major supporter of Southern California water conservation and water recycling programs, along with other local water management activities.

Whether it's historic drought or the longer-term threat of climate change, we're here to protect the region and provide high-quality affordable water in an environmentally responsible way.

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North American Weather Consultants (NAWC) provides a host of meteorological services to private and public sector clients. These services include Cloud Seeding, Specialized Forecasting, Intensive Storm Monitoring, Air Quality Monitoring and Long Term Impact Studies, Weather Station Installation and Maintenance, Forensic Storm Evaluations and various meteorological consultative services.

– Cloud Seeding-

North American Weather Consultants (NAWC) has been involved in cloud seeding research and operational programs since the early 1950's. NAWC's cloud seeding programs currently cover over 20,000 square miles (13 million acres) across the western United States, with operational sites in California, Utah, Colorado, Idaho and Wyoming.

With over 250 ground seeding installations NAWC has the largest collective ground-based seeding program in the world. NAWC also provides aerial cloud seeding, with aerial programs located in California and Utah.

Long term target vs control climatological studies indicate an increase in seasonal runoff of 300,000 acre-feet, in targeted areas, resulting from NAWC's cloud seeding programs.

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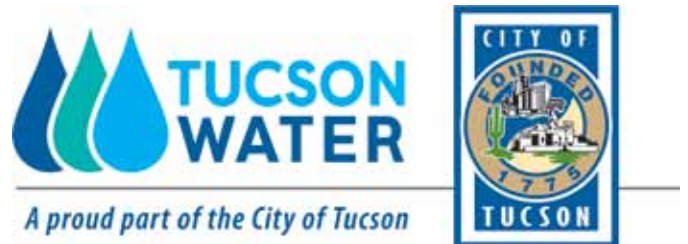
THE
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The Water Research Foundation is the premier not-for-profit research cooperative advancing the science of water to protect public health and the environment. Governed principally by utilities, the foundation delivers scientifically sound research solutions and knowledge to serve subscribers and stakeholders in all areas of drinking water, wastewater, stormwater, and reuse. The new foundation will have approximately 1,200 subscribers, 2,300 research studies, and a \$700M portfolio.

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Exhibitors

Eastern Shore Microbes

Texas Water Development Board

SAVE THE DATE



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Poster Presentation

Evaluating a Real-Time Soil Nitrate Sensor for Precision Nutrient Management and Groundwater Protection

Cassandra Bonfil

University of California Davis, Department of Land, Air & Water Resources
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Isaya Kisekka

University of California Davis, Department of Land, Air & Water Resources
University of California Davis, Department of Biological & Agricultural Engineering
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The agricultural use of nitrogen fertilizers is widely recognized as a major contributor to nonpoint source nitrate contamination of groundwater. Consequently, in many areas with intensive agriculture, domestic wells often exceed the U.S. Environmental Protection Agency's (EPA) maximum contaminant level (MCL) of 10 mg/L of nitrate-N in drinking water. Improving nitrogen use efficiency is increasingly challenging due to complex soil nitrogen dynamics and the limitations of traditional monitoring methods. To address this issue, we developed a novel real-time soil nitrate sensor that enables continuous monitoring. During the 2024 growing season, we deployed and evaluated this sensor in a 1-acre subsurface drip-irrigated processing tomato field alongside suction lysimeters. The nitrate sensor recorded daily measurements, while the suction lysimeters were used to extract soil pore water weekly for laboratory nitrate analysis. Preliminary results indicate that the real-time sensor detected nitrate concentration patterns similar to those measured by the lysimeters, while also capturing daily fluctuations missed by weekly measurements. We observed soil nitrate concentrations peak after fertigation and decline approximately two weeks later, demonstrating the sensor's ability to track rapid changes in nitrate availability. This approach enhances our ability to monitor soil nitrate at a finer scale and shows strong potential as a decision-support tool for precision nitrogen management.

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Poster Presentation

Desalination in Texas – Highlights from the Texas Water Development Board’s 2024 Biennial Report on Seawater and Brackish Groundwater Desalination in Texas

William Delgado, Ph.D.; Erika Mancha; James Golab, Ph.D., P.G.

Texas Water Development Board

1700 North Congress Avenue, Austin, Texas 78701-1496

William.Delgado@twdb.texas.gov • 512-936-9488

The Biennial Reports on desalination in Texas by the Texas Water Development Board (TWDB) originated in 2003 when the 78th Texas Legislature directed the TWDB to provide updates on the state of seawater desalination projects throughout the state by December 1st of even-numbered years. Since 2006, the TWDB has included updates on brackish groundwater desalination projects in this report series. In 2015, the 84th Texas Legislature passed House Bill 30, which requires the TWDB to report on brackish groundwater desalination projects and designated brackish groundwater production zones. The 2024 Biennial Report on Seawater and Brackish Groundwater Desalination in Texas is the 11th of these reports since 2003 and the 10th to include brackish groundwater desalination projects.

The 2024 Biennial Desalination Report shows that desalination continues to grow as a water source for Texas. As of 2024, Texas had 60 desalination facilities with a production capacity of at least 0.025 million gallons per day (MGD). Forty-three of these plants treat brackish groundwater, 16 treat brackish surface water, and one treats reclaimed water. There are currently no desalination facilities in Texas that treat seawater. The cumulative production capacity of these facilities is 172 MGD. This is an increase from 53 desalination plants with a cumulative production capacity of 157 MGD in 2020. When the TWDB first collected data on desalination plants in Texas in 1999, there were only 12 facilities with a cumulative production capacity of 22 MGD. The 2022 State Water Plan contains 44 recommended brackish groundwater and brackish surface water projects, which could add up to 196 MGD of new desalination capacity if implemented.

Although Texas does not have a seawater desalination plant, the state continues to make progress toward developing its first. The 2022 State Water Plan recommends seven seawater desalination plants. Five of these projects are in the Corpus Christi area, one is near Houston, and one is close to Port Isabel. If these projects are implemented, their production capacity could be up to 171 MGD.

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Poster Presentation

Volcanism; The Natural Acidification Process; And Processing Water

Terry R. Gong

Harmon Systems International LLC and Earth Renaissance Technologies LLC

westernso2@aol.com • 925-250-4559

Everything is oriented and based upon Nature, and while we may not always understand what Nature is doing, everything, including volcanism, exists for a reason. We just need to discover what that purpose is. And to do that, let's examine the way we process water... and compare it to the way Nature does it. This will enable us to recognize the deficiencies within our current treatment methods and differentiate the various types of things we need to omit, and what we must learn to include, to improve and make whatever we are doing more efficient and sustainable. After all, in-order to become sustainable, instead of trying to re-invent the wheel, wouldn't it be a lot easier if we just follow and utilize the same process Nature uses?

This year's poster will, once again, illustrate how the chemistry of volcanism is the foundation to the formation and recycling of water, and how replicating and integrating it into the way we process and use our water supplies, can help us to solve the many water-related environmental challenges that we are facing. This includes amending water to: solve the age old problem of soil salinity; improve crop quality and yields; use water & energy more efficiently; process and purify potable water; extend the industrial cooling system water cycles; disinfect, stream-line, and reduce the overall amount of salts being added into the environment while processing wastewater & sewage; optimize the creation of bio-fuels & renewable energy; improve reverse osmosis filtration systems; enable us to brine-mine valuable materials from contaminated flow-streams; refine & amend produced water from oil & gas extraction and energy production; amend and transform water in such a way to accelerate the sequestration of atmospheric carbon; bio-remediate and restore ecosystems; etc.

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Poster Presentation

A Salt-Free Future: Electrodialysis Metathesis for Inland Brackish Water Brine Management

Tayia Oddonetto, Abdiel Lugo, Punhasa Senanayake, Pei Xu, Ivonne Santiago, Shane Walker

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Reverse osmosis (RO) is a primary method for water desalination, but its efficiency is limited by a hydraulic recovery typically capped at 75-80%. This, combined with the substantial cost of concentrate disposal which often accounts for up to one-third of total plant investment, poses significant challenges for inland communities with limited disposal options. Electrodialysis metathesis (EDM) offers a promising solution by providing a viable and cost-effective approach to managing brackish water desalination concentrate in inland regions because it produces two highly soluble concentrate streams. EDM has been observed to achieve recoveries exceeding 98%. However, conventional EDM requires the continuous addition of aqueous sodium chloride to match the transport of divalent ions in the feed stream. Salt-free EDM presents a unique solution by overcoming the limitations of both conventional EDM and traditional concentrate disposal. This process eliminates the need for sodium chloride, resulting in an 80% cost reduction. Salt-free EDM has been demonstrated in both continuous flow and batch mode, and generates two highly soluble concentrate streams: one calcium- rich and the other sulfate-rich. This presentation will provide an overview of the salt-free EDM process including system performance, ion transport, and energy consumption.

2025 Annual Salinity Summit Multi-State Salinity Coalition

Tuscany Suites & Casino • February 28-29, March 1, 2025

Poster Presentation

Swansong for the Softener?

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Ever since the ion exchange softener was invented, the search has gone on for a better alternative solution to the issues created by hard water. The negatives of cost, the space requirements, the brine servicing, the short life and the detrimental environmental issues caused by traditional softening have all been tolerated whilst seeking something better. Over the years there have been many products offered to the market but so many of these have been tainted with doubtful provenance, unproven claims and limited endurance such that market acceptance has been limited.

The IAPMO IGC 335-2018 Rapid Scaling Test protocol has resolved the issue of performance verification as it is a very accurate, simple and inexpensive test to measure the scaling propensity of a sample of water, with or without treatment. The Aqua-Rex electronic water softener was the first to prove the effectiveness of this independent third-party performance protocol when it was shown to reduce scaling of Las Vegas water heated to 180oF for 23 hours by 83%.

It is now well established that prevention of scale in heaters, in plumbing systems and on fixtures such as faucets and shower heads can be achieved without softening the water. Softening water is beneficial to improve lathering in laundries as well as in the home where the benefits of soft water for washing the hair and in skin care are enthusiastically welcomed, especially by women.

Until recently the Water Quality Association (WQA) have stated that while Physical Water Conditioners (PWC) can reduce scale, they can't soften the water because "they don't remove the calcium". Aqua-Rex has demonstrated in hot water that, while total calcium stays the same, calcium ions are reduced in favour of particulate Calcium Carbonate in suspension. The nucleation seeds generated by the device actually stimulate precipitation of the ions. Aqua-Rex has demonstrated softening from 170 ppm to less than 50 ppm or 3 grains.

The WQA have updated their website to acknowledge that PWC's can also soften water.

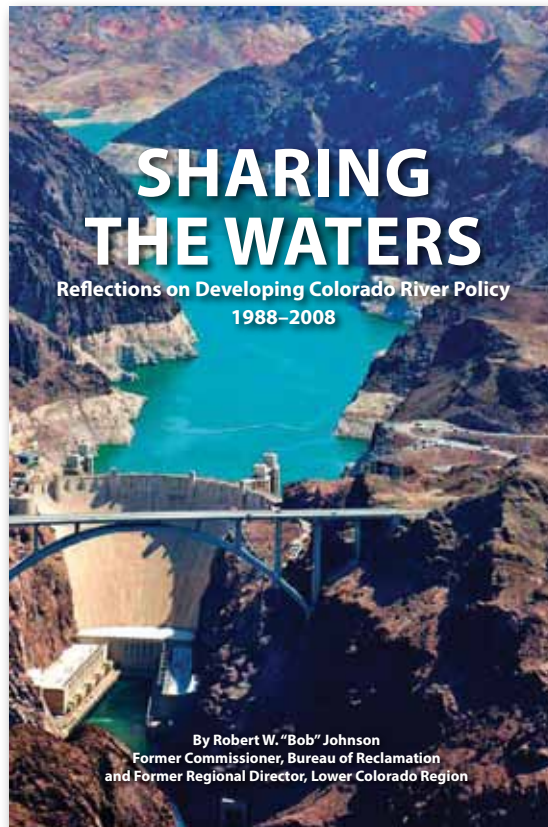
If alternate technologies such as Aqua-Rex can both reduce scaling and soften water, then what is the need for traditional softening with all its obvious drawbacks? Aqua-Rex acknowledges that there are three areas where traditional softeners would be the preferred solution. They include multi tank "Flight" type dishwashers, pre-treatment of RO systems and make up water for steam generation with condensate recovery. Outside of these areas they no longer see any real need for traditional softening.

LESS SALT. MORE WATER.



Multi-State Salinity Coalition

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These are contentious times for Colorado River policy, with strained relations between the Upper and Lower Basin states in public view. It is, therefore, perfect timing for me to recommend adding the book, ***Sharing the Waters: Reflections on Developing Colorado River Policy 1988-2008***, by Robert W. "Bob" Johnson, to your 2025 reading list. At only 124 pages, this powerful little book is packed with concise explanations of key Colorado River management matters, along with personal insights on how highly contentious river matters have been effectively navigated in the past— insights that are highly relevant today. The book, published posthumously, also features many great photos, including this review's accompanying photo heralding peace on the Colorado River.

Book Review by Dr. Sharon Megdal, PhD, University of Arizona

Guidance for Restoring Peace on the Colorado River | Water Resources Research Center | The University of Arizona
<https://wrrc.arizona.edu/publication/guidance-restoring-peace-colorado-river>

Cost: \$25 or go to:

Multi-State Salinity Coalition – Creating reliable water from alternative sources.

<https://www.multi-statesalinitycoalition.com>

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Our Mission: To promote advancements in technologies for desalination and reuse, salinity control strategies, water/energy efficiencies and related public policies that will assist communities in meeting their water needs.

Our Vision: Creating reliable water from alternative sources.

Our Goal: We work to achieve our mission and vision through fostering collaboration on the policy and technology of desalination and salinity management through communication, quarterly meetings, and an annual national salinity summit.



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