



GOVERNANCE THINK TANK

Reservoir Center For Water Solutions | Washington, D.C. | February 27–March 1, 2023



Water is the world's most vital resource.



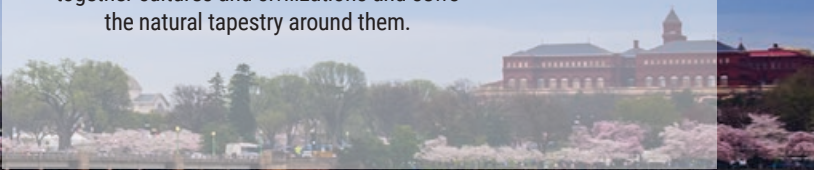
It supports all life, sustains the natural environment and undergirds national and local economies.



It grows food, transports goods, and keeps communities healthy and clean.



It is the common thread that stitches together cultures and civilizations and sews the natural tapestry around them.



Water also faces an uncertain future.

In the next 30 years, the most salient environmental and social issues will involve water: who has it, who does not, whether it is safe, whether it is affordable and accessible, how it is managed and by whom.

Water issues will impact economies, shift populations, and drive innovative technologies.

Water will be central to pivotal governance decisions, intractable social debates and climate initiatives.

But we are not powerless to create a bright water future. With bold thinking and collaboration, we can act to assure a successful and sustainable future.

It is out of this reality that Water 2050 was born.

Water 2050

Water 2050 is a collaborative initiative to envision the future of water and chart a course for future success and sustainability.

Under the leadership of the American Water Works Association (AWWA), this effort brings together diverse voices to explore water's long-term challenges and opportunities.

A central component of this journey is five intimate think tanks that examine water through the prism of these core drivers:

- Sustainability
- Technology
- Economics
- Governance
- Social/Demographics



At each gathering, a small group of influential thinkers engage in thoughtful, intentional discourse. They are experts from within and outside of the water profession. They are both experienced and emerging leaders and represent diversity from many perspectives.

Their charge is to explore together what our communities could look like in the year 2050 and examine how water could be managed, accessed and valued. Each collection of thought leaders is asked to emerge with a set of recommended actions that guides the water community toward a future in which the world's most vital resource is affordable and accessible for everyone.

AWWA's Role

AWWA is uniquely positioned to host the Water 2050 conversation.

With 50,000 members from North America and over 90 countries, AWWA is the largest and oldest water association in the world. Members represent the full spectrum of the water community, including utility professionals, consultants and manufacturers, regulators, elected leaders, academics and many others involved in an essential sector with a worldwide market size of \$500 billion.

Water 2050 Governance Think Tank

From Feb. 27–March 1, 2023, 27 influential thinkers and subject matter experts came together in Washington, D.C., for the Water 2050 Governance Think Tank. Think tank participants spent three days envisioning the future of water governance and discussing the core principles, frameworks and approaches to assure a successful and sustainable water future.

The think tank was hosted at the Reservoir Center for Water Solutions, located on the banks of the Anacostia River in Washington D.C.'s Navy Yard neighborhood. Designed to “bring together leaders and thinkers from across the water sector, policy world and beyond... to develop breakthrough ideas and solutions, eliminate barriers, and advance the water sector’s work,” Reservoir Center for Water Solutions is sponsored by water technology provider Xylem. It served as a perfect setting for deep conversations on the future of water policy, regulation, access and management.



Water 2050 Think Tank Process

Participants at the Water 2050 Governance Think Tank came together over three days to explore the future of water governance and to develop a set of recommended actions.

They engaged in a series of facilitated small and large group conversations, private reflection and panel discussions to identify and build upon common themes. The group included highly respected voices from the water and wastewater utility community, regulatory agencies, international development agencies, manufacturing and consulting firms, advocates, academics, and CEOs.

“A water rich community today may not be a water rich community in the future.”



Recommended Actions

Participants identified nine recommended actions that can be grouped into four broad categories: Implement a “One Water” Governance Approach, Optimize Utility Governance and Business Models, Develop Governance that Promotes Innovation and Sustainability, and Advance Collaboration to Drive (Governance) Innovation.

The recommendations are a starting point from which more detailed actions will be developed through future think tanks, scientific research and other contributions to the Water 2050 initiative.

CATEGORY	RECOMMENDED ACTIONS
Implement a “One Water” governance approach	① Encourage national governance structures with a One Water focus and regulatory frameworks that include diverse stakeholders. ② Establish widely accepted fit-for-purpose standards.
Optimize utility governance and business models	③ Regionalize water utilities on the basis of watersheds. ④ Integrate water-related utilities and partner with other utilities, to contribute to a circular economy. ⑤ Set rates that reflect the full cost of service, while advancing affordable access and recognition of the human need for water.
Develop governance that promotes innovation and sustainability	⑥ Enable a flexible governance framework that advances water resource and system resilience. ⑦ Promote the integration of utility performance standards that support better technical, managerial and financial practices.
Advance collaboration to drive (governance) innovation	⑧ Integrate research and data across agencies to drive a culture of change and innovation. ⑨ Take a multilateral and cooperative approach to water governance.



Focus Areas

Water 2050 Governance Think Tank participants self-selected into three focus areas to initiate conversations. The focus areas were defined by the Water 2050 leadership team in advance of the gathering.

The nine recommended actions germinated in these focus areas and were nurtured through a series of discussions. They matured through an iterative process of engagement with all participants.

Focus areas included:

- Evolving today's regulations for tomorrow's world
- Reshape water utility governance to strengthen quality water service
- Water on the world stage: how much should water drive decisions or be responsive to them?

Focus Area 1

Evolving today's regulations for tomorrow's world

In the United States, for example, the Safe Drinking Water Act is nearly 50 years old and the Clean Water Act even older, and although both have undergone modest revisions, these regulatory frameworks are essentially unchanged. In addition to these regulatory frameworks, a variety of regulatory strategies have emerged around the world. Are regulations having their intended effect? Is the process of developing regulations working? Are we protecting public health and the environment with a reasonable burden on the utility community? Can regulatory models be updated by using lessons learned from other sectors or other parts of the world? What will future governance look like, and how do we get there?

"Absolutely critical to success here is having a knowledgeable, apolitical, competent utility board that understands the mission and vision of the executive team, and meets minimum capabilities and expertise criteria."

Focus Area 2

Reshape water utility governance to strengthen quality water service

Recent events have shown that governance challenges in the utility sector remain despite decades of emphasis on building and maintaining technical, managerial and financial capacity. Several recent significant utility incidents can ultimately be linked back to under-investment and lack of capacity. Are these incidents the beginning of a long chain of dominos that will fall and undermine the public's trust in water? What governance changes must be made to mitigate future service challenges? Should the water community decouple its operations from other political agendas? Is one or several new structures necessary to prevent this type of community challenge from recurring?

Focus Area 3

Water on the world stage: how much should water drive decisions or be responsive to them?

Numerous factors drive decisions around development and management of natural resources. Sometimes they are political, sometimes economic, and sometimes because of resource limitations. Although water resources drove much of early planning (e.g., locations of older cities), in recent history, water has usually been responsive to the demands of plans made regardless of the availability and proximity of water resources. To what extent should water resource concerns drive land use and development plans rather than the reverse? How do we assure sustainable resources while helping to meet global sustainable development goals as well as local needs in both water-rich and water-stressed areas? Where do the concepts of water rights (as it exists and ways it may change in the future), corporate stewardship (e.g., ESG), and virtual/embodied water fit into these concepts?

Recommended Actions

from Governance Think Tank Participants

1. Encourage national governance structures with a One Water focus and regulatory frameworks that include diverse stakeholders

To meet the water quality and quantity challenges of 2050, countries will increasingly develop national approaches to manage and regulate water. Broad governing bodies will introduce strategies to oversee multiple aspects of the water cycle, from source to use, to recovery and discharge. Resource and resiliency concerns will advance a “One Water” mindset, as governments incorporate source water protection, stormwater and wastewater management, potable and non-potable reuse into their management strategies.

Unifying water governance under one agency singularly focused on water in its various stages through the water cycle will allow for:

- 1) the integration of existing regulations into a single, holistic framework;
- 2) centralization of resources and data;
- 3) unified messaging and public education campaigns;
- 4) integrated approaches to overcome challenges throughout the full water cycle.

This governance structure will require a drastic shift – in mindset and operationally – in how water is managed today. It will engage a broader set of stakeholders, including atmospheric scientists, planners, land and water managers and many others to incorporate these standards into urban and regional development decisions. To support this shift, the water community will develop utility leaders and regulators whose expertise cut across many water disciplines and nurture a workforce that maximizes the value of water throughout the natural and built water environment.

2. Establish widely accepted fit-for-purpose standards

As climate change exacerbates water scarcity concerns, the water community will develop standards that allow for a more integrated and efficient approach to water treatment and management. By 2050, the scope of water regulations will expand from “drinking” and “wastewater” quality to include a range of fit-for-purpose standards, allowing for treatment specifically to the needs of the end user. Having widely accepted standards for a broad range of end uses - drinking, washing, toilet flushing, urban and agricultural irrigation, industry - will allow for expansion of reuse for non-potable and potable purposes. Advances in point-of-use treatment technologies will encourage standards that allow consumers and end-users to customize and monitor their own water quality. Still, a framework must be designed at the highest level of government in order to establish a set of consistent standards that can be applied broadly. To ensure true adoption, there will need to be regulatory flexibility for innovation and customization based upon local conditions.



3. Regionalize water utilities on the basis of watersheds

In the United States alone, there are more than [50,000 community water systems](#) and around [16,000 permitted wastewater treatment facilities](#). By 2050, the water community must be able to balance the efficiencies gained by consolidation with meeting the needs of communities. This can be achieved by viewing water management from the perspective of watersheds, i.e., making a shift towards a regional-focused water sector, made up of far fewer utilities, that is managed through collaboration among many partners. Regionalization could allow for the integration of regional infrastructure and technology and create opportunities for strategic partnerships within and beyond the water community, in particular, agriculture, manufacturing and land-use stakeholders within and across watersheds. Approaching water governance from a watershed rather than geo-political perspective will encourage collaboration to sustain and make efficient use of resources, while encouraging new and innovative water management strategies. The scale and complexities of a regionalized model would transcend traditional political boundaries and will demand a new portfolio of competencies from all stakeholders, including public officials and utility employees, with continuously evolving engagement and education required to achieve this scale of utility transformation.

4. Integrate water-related utilities and partner with other utilities, to contribute to a circular economy

Water utilities do not exist in a vacuum. They are part of a larger ecosystem of public service utilities, which intricately depend on one another. A clear example exists in the [water-energy nexus](#), where water treatment and management requires energy and energy production requires water. By 2050, the water community will develop and enhance a circular economy in which streams of “waste” are valued as renewable resources. For example, heat from wastewater treatment can be captured as energy to power other utility processes. As one think tank participant noted, “there is no such thing as wastewater, there is only wasted water.” Achieving a circular economy will require a One Water approach that integrates water, wastewater, reuse and stormwater utility services and increases overall operational and management efficiencies. However, to assure a sustainable water future, the water community will collaborate with all utilities, including waste management, energy and broadband. Strategic partnerships will lead to partially or completely integrated operations and shared common services, such as metering/billing, customer service, finance/accounting, procurement and asset management. As they pursue efficiencies, these partnerships will minimize utility costs and support customer affordability.



“The benefits of consolidation will be better economies of scale, better efficiency, and most importantly, improved public health.”

5. Set rates that reflect the full cost of service, while advancing affordable access and recognition of the human need for water

A successful water future requires sustainable funding for all water services. By 2050, as communities face increased resource and resilience challenges, new approaches will be required to make water services affordable and equitable throughout the full water cycle. While the [United Nations](#) recognizes “human right to water is indispensable for leading a life in human dignity,” cost-of-service pricing will remain critical. Rates that reflect the full cost of service will assure continuous investments are made to sustain water resources, provide drinking water and wastewater treatment that protects public health and the environment, and maintain and expand systems to serve people of all incomes and geographies. Providing universal access to water and affordable pricing is achievable. However, governments will need to play a role in supporting households with low incomes in order for full cost pricing and affordability to coexist. Government-led customer assistance programs will help struggling households pay their water bills, while also assuring utilities have the necessary revenue to maintain their systems. In addition, equitable allocation of water among communities will require a reexamination of water rights laws to assure that downstream or disadvantaged communities have access. Government programs will incentivize agriculture and industrial users to be responsible stewards of an increasingly stressed resource.

6. Enable a flexible governance framework that advances water resource and system resilience

Over the next three decades, the water community must proactively and purposefully focus on building resilient resources and systems. The coming challenges from climate change, including water scarcity and extreme weather events, as well as other natural or human-caused disasters, demand an all-hazards approach and collaboration among government at all levels. This can be achieved by establishing a coordinated governance structure or approach at the federal, state/provincial or local level that:

- 1) incentivizes communities, water suppliers and other industry stakeholders to be more accountable for evaluating and planning for sustainability and resilience risks, particularly as they impact economically stressed and vulnerable communities;
- 2) mandates proactive, holistic planning and regional collaboration across multiple sectors;
- 3) uses technologies to better predict and mitigate the impact of potential crises;
- 4) implements regulatory and legislative changes to water management based on uncertainties and extreme events.

This type of framework for long-term, interconnected planning will promote informed, responsible system management and development decisions and ultimately increase the resiliency of water resources and systems.



7. Promote the integration of utility performance standards that support better technical, managerial and financial practices

By 2050, water governance and regulatory frameworks will expand far beyond water quality standards to encompass effective utility management. Best practices in utility operations and financial practices – defined and promoted by the water community – will be better understood by decision-makers, businesses and consumers, encouraging accountability in the utility sector and strengthening public trust in water services. Performance metrics and targets will be established for water management throughout the water cycle, allowing utilities to track and report on key performance outcomes and incentivizing utilities to demonstrate excellence. Management standards will range from controlling water losses, to asset management, to preparing for climate change, while financial standards will promote full-cost rate-setting, assure that water revenues are properly collected and used, and encourage consumer assistance programs. In some cases, key performance indicators (KPIs) will be used as criteria for receiving government funding. Whether these governance standards are voluntary or integrated into new or existing regulatory frameworks, they will require flexibility in implementation and alignment with federal, state/provincial and local oversight agencies.



8. Integrate research and data across agencies to drive a culture of change and innovation

Over the next 30 years, the water community will embrace a culture of innovation and collaboration that will allow it to overcome a host of resource and resilience challenges. Doing so will require access to credible, integrated, and current research and data that are easily shared and accessible across the water community. This knowledge sharing can be achieved through a number of mechanisms, including the development of regional, national and global research centers of excellence, partnerships across a broad network of research organizations within and beyond the water community, and national and global repositories that take inspiration from examples like the [National Oceanic and Atmospheric Administration \(NOAA\) Institutional Repository](#) or the [U.S. National Library of Medicine's ClinicalTrials.gov](#) database. Regardless of the infrastructure put in place to coordinate, consolidate and integrate research and data outcomes, ultimately this effort will only be successful if the water community takes a truly One Water approach that explores solutions across the full water spectrum. Public education about the meaning of water quality information will be as important as the data itself.

9. Take a multilateral and cooperative approach to water governance

Access to water is a cross-boundary issue spanning communities, municipalities, states/provinces and countries. By 2050, with climate change, population growth and other factors impacting water resources, a multilateral collaborative approach will be needed to address inequities in water access and diminish the potential for conflicts. While cases of global transboundary and multilateral cooperation exist today – the [Convention on the Protection and Use of Transboundary Watercourses and International Lakes \(Water Convention\)](#) of 1992, for example – truly sustainable water management will require broader participation. The [United Nations Economic Commission for Europe \(UNECE\)](#) notes that “more than 3 billion people depend on water that crosses national borders,” and over 60% of the world’s freshwater flow is comprised of transboundary rivers, lakes, and groundwater reserves shared by 153 countries. The water community must take action to mitigate conflict and address water disparities. It is noteworthy that only 24 of the 153 have operational agreements in place for all their transboundary basins. Multilateral cooperation at this scale will require a dedicated effort to bring together, understand, and align the interests of a variety of regional, national and international organizations.

“Fundamentally, water is going to be part of cross-border conflict ... It will require collaboration across borders, in a multilateral sense, to mitigate a complex conflict.”



Get Involved!

A vital component of the Water 2050 process is broad engagement – tapping into the diverse perspectives of voices from within and outside of AWWA and the greater water community. A collaborative exploration is essential to challenge currently held beliefs, put forth bold solutions and cultivate the most resilient course for the future.

“For Water 2050 to reach its potential, it needs your voice.”

AWWA CEO David LaFrance

Water 2050 invites participation beyond the think tanks in many ways. At the 2022 AWWA Annual Conference and Exposition, the opening general session featured a video of young professionals sharing their thoughts on water in the year 2050. In the exhibition hall, an artist collected insights from attendees and created colorful sketches expressing the combined vision for each Water 2050 driver. Board members have engaged in multiple deep-dive discussions. AWWA members and staff answered Water 2050 surveys in the weeks following the initiative’s launch, and each of the organization’s six volunteer leadership councils and 43 sections are also providing insights.

But Water 2050 is far upstream from its final destination. Ultimately, the recommended actions from each think tank will be aggregated and analyzed for common themes and synergies. What emerges will help guide AWWA and the entire water community for decades to come.

To navigate toward a sustainable water future, Water 2050 needs your voice. If you, someone you know, or an organization you recommend want to be part of this journey, please contact the Water 2050 team at Water2050@awwa.org.



Participants

The Water 2050 Governance Think Tank brought together a diverse group of 27 experts from within and beyond the water community. They included:



Caitlin Berretta

Director, Government Affairs
and Sustainability

Evoqua Water Technologies

Ms. Berretta serves as the government affairs and sustainability director at Evoqua Water Technologies. In this role, Ms. Berretta is responsible for leading cross-functional efforts to drive Evoqua's Sustainability initiatives as well as building the first Government Affairs program for Evoqua. She holds a Bachelor of Science and Master of Engineering degrees in Environmental Engineering from the University of Florida and brings 15 years of experience across a broad background of sectors including water treatment, power and clean energy.



Chelsea Boozer

Government Affairs Manager

Central Arkansas Water

Ms. Boozer works with government, community, wholesale partners and stakeholders on policy, economic development and regionalism efforts. Prior to the water industry, she was a government reporter in Memphis, Tennessee, Washington, D.C., and Little Rock, Arkansas. She has a Master of Public Administration from Syracuse University. Ms. Boozer is a YP advisor to the AWWA Executive Committee and Board of Directors, YP liaison to the AWWA Water Utility Council, member of AWWA's Young Professionals Committee, member of the Strategic Planning Committee for the Partnership for Safe Water, and she co-founded the statewide Arkansas Water YP Network.



Alain Borghijs, Ph.D.

Deputy Representative,
North American
Representative Office

Asian Development Bank

Dr. Borghijs is the deputy representative in the North American Representative Office, ADB. In this capacity, he mobilizes financing and support for ADB's developing member countries, shares development knowledge and experience, establishes and deepens partnerships with public, private and nonprofit organizations in North America, and raises public awareness of ADB with key stakeholders in Canada and the United States. He previously served as principal economist in ADB's Central and West Asia Department, where he led the development of ADB's Country Partnership Strategies for Afghanistan and Kazakhstan. Dr. Borghijs holds a Ph.D. in Applied Economics from the University of Antwerp, Belgium.

Participants



Adam Carpenter, Ph.D.

Manager of Energy and
Environmental Policy

AWWA

Dr. Carpenter is the Manager of Energy and Environmental Policy at AWWA's Water Policy and Leadership department in Washington, D.C. He serves as an expert and advocate on a diverse set of drinking water issues including source water protection, the energy-water nexus, cyanotoxins, climate change, consumer confidence reports and other environmental policy concerns. Along with his colleagues, he works to further AWWA's mission of supporting clean, affordable drinking water through sound application of science into policy, sensible regulation, public awareness, and building stakeholder consensus. He holds a Ph.D. in environmental science and public policy from George Mason University.



Marcus Firman

Director

AWWA Ontario Section

Mr. Firman has over 45 years of experience in the water sector. He has 14 years of international experience having worked for a UK water authority and a national government in the Middle East. In 1990, he emigrated to Canada and worked for consultants designing both water and wastewater facilities. In 2003, he joined a public utilities commission and became the COO before leaving in 2015 to become the director of water and wastewater services for a regional municipality. He now provides advice to select clients in the design and operation of water and wastewater facilities.



Maury Gaston

Manager of Marketing
Services

AMERICAN Cast Iron Pipe

Mr. Gaston is a manager of marketing services for AMERICAN Cast Iron Pipe. He has worked in AMERICAN stations coast-to-coast and is vice-chair of AWWA's A21 Standards Committee handling ductile iron pipe and fitting products. Mr. Gaston is chairman of the Alabama Iron and Steel Council, Director, and past chair of the state of Alabama Engineering Hall of Fame, and past chair of the Auburn Alumni Engineering Council. He is a frequent presenter at technical conferences including those sponsored by AWWA and is a published author in Journal AWWA.

Participants



David Goldwater

Vice President

Stantec

Mr. Goldwater is a vice president at Stantec – a global engineering and architecture firm – where he leads the North American Public Policy team. In this role, Mr. Goldwater leads public policy, legislative and regulatory affairs and growth for all business lines in North America. Prior to this role, Mr. Goldwater served as the director of external relations for North America and the director of business development and strategy for the firm's water business in the 26-state Northeast, Midwest and Great Lakes regions, bearing responsibility for business development planning and performance.



Adam Roy Gordon

Interim Executive Director

United National Global
Compact Network USA

Mr. Gordon is the interim executive director at United Nations Global Compact Network USA – the U.S. Network of the Secretary-General's corporate sustainability initiative – where he was the organization's founding employee. He is a well-known public speaker on corporate sustainability topics, a contributor to The Atlantic, an adjunct professor at Columbia University and was named to the Environment+Energy Leader 100. Previously, Mr. Gordon worked at CDP, supporting the integration of climate change, water and deforestation disclosure into corporate performance.



Ben Grumbles

Executive Director

Environmental Council
of the States (ECOS)

Mr. Grumbles is the executive director of the Environmental Council of the States (ECOS), the nonprofit association of the 50 United States' top environmental regulators. From 2015 to May 2022, he was secretary of the environment for Maryland. Grumbles has also served as president of the US Water Alliance, Director of Arizona Department of Environmental Quality, US EPA assistant administrator for water, and senior staff and counsel for the transportation and infrastructure and science committees in the U.S. Congress.

Participants



Stephanie Hubli

Project Engineer

Woodard & Curran

Ms. Hubli, project engineer at Woodard & Curran, brings a unique and holistic, One Water perspective that bridges the gap between engineering and planning. Her expertise, developed over five plus years of industry experience, includes hydraulic modeling and master planning, water resources planning, urban water management plan preparation, as well as infrastructure design and construction management. Ms. Hubli is passionate about developing the next generation of the water workforce through outreach to young professionals and students. She currently serves as chair of the CA-NV AWWA Young Professionals Committee and vice chair of the Association Young Professionals Committee.



Joe Jacangelo, Ph.D.

Vice President,
Director of Research

Stantec

Dr. Jacangelo is President of AWWA. With over 30 years of experience in environmental health engineering, he specializes in water quality and treatment, water and wastewater disinfection, membrane technology, and public health. He has had several different positions in his years with Stantec, including global manager of the water knowledge center and manager of municipal technology. As technical director, principal investigator, project manager, or engineer, Dr. Jacangelo has contributed to the completion of over 80 water and wastewater projects.



Keith Kohut

Process Engineer

Associated Engineering Ltd

Mr. Kohut is a process engineer with 20 years of experience in the design and operation of drinking water systems in British Columbia, Alberta and the northern Territories. He has been involved in the development and review of drinking water standards and provincial regulations in British Columbia and is the principal teacher for the BC province-wide "Capacity Building Program for Small Water Systems" program. Mr. Kohut is a named author of the Design Guidelines for First Nations Water Works, the design standard used for First Nations drinking water systems across Canada. He is currently providing technical support to the Atlantic First Nations Water Authority in implementing self-determination and autonomous management and financing of First Nations water systems in Atlantic Canada.

Participants



Adam Krantz

CEO

National Association of Clean
Water Agencies (NACWA)

Mr. Krantz is the CEO of the National Association of Clean Water Agencies (NACWA), where he has served in several positions since May 2001. Mr. Krantz directs a team in Washington, D.C., that advocates on behalf of the nation's public clean water agencies on an array of regulatory, legislative, legal and communication initiatives geared toward ensuring sustainable clean water agencies and a move toward the Utility of the Future. Mr. Krantz served three years as the President of the Federal Water Quality Association, and he served as the first Vice President of the Clean Water America Alliance (now the U.S. Water Alliance).



David LaFrance

CEO

AWWA

Mr. LaFrance leads American Water Works Association, the world's largest and oldest association of water professionals, with 50,000 members worldwide. Overseeing a staff of approximately 150 in Denver and Washington D.C., LaFrance guides AWWA's extensive scientific, educational, and public policy work to build a better world through better water. Prior to joining AWWA, he was the CFO for Denver Water.



Ken Lykens

General Manager

Meridian Metropolitan District

Mr. Lykens is a business executive with over 25 years of experience in large infrastructure engineering, from planning through design and construction. His experience primarily consists of leading multi-discipline teams to execute and deliver complex infrastructure and natural resource projects. His expertise includes management, operations and engineering for all aspects of drinking water, wastewater, reclaimed water and stormwater utilities. His experience also includes local, state, and federal environmental compliance issues.

Participants



Paula MacIlwaine

Deputy CEO

AWWA

Ms. MacIlwaine was promoted to Deputy CEO in 2004 where she has specific responsibilities and oversight for AWWA's conferences and events, publishing, engineering and technical services, human resources and international, as well as governance. Ms. MacIlwaine's 30 plus years of leadership has allowed her the opportunity to work with staff, members and the Board.



Josh Mahan

Director, Government and
Industry Relations

Xylem

Mr. Mahan leads the global government affairs portfolio for Xylem out of Washington, D.C. He manages strategic engagement with the U.S. government and oversees Xylem's engagement with trade associations. In addition, he oversees the Reservoir Center for Water Solutions, a center for thought leadership in Washington, D.C., created to advance the collective interests of the water sector and to take action to address global water challenges. Mr. Mahan joined Xylem in May 2021, after over a decade working for the federal government on a range of water issues, including roles with the Senate Committee on Indian Affairs, the Department of Interior's Office of Congressional Affairs, and the House Natural Resources Committee.



Barb Martin

Director Engineering and
Technical Services

AWWA

With 25 years of water sector experience, Ms. Martin is Director of Engineering and Technical Services at the American Water Works Association, where she leads a team of more than 25 staff and thousands of volunteers in the development of technical resources and programs. She previously worked for global water sector service providers, which included North American business development responsibility for process treatment technologies and analytical instrumentation. She is a licensed drinking water treatment operator in the State of Colorado and a member of the Women in Standards Board of Directors.

Participants



Brenley McKenna

Chief of Subscriber Services
The Water Research Foundation

For the last 12 years, Ms. McKenna has worked in various positions in the water sector, including utility and consulting roles. She and her team ensure that The Water Research Foundation subscribers continue to receive personalized service for their research needs and substantial value for their investment. Before joining The Water Research Foundation, she worked as a Program Manager at Denver Water, Reclaimed Water System Coordinator with the City of Westminster, and an Environmental Scientist at Arcadis.



G. Tracy Mehan III

Executive Director,
Government Affairs
AWWA

Mr. Mehan is Executive Director, Government Affairs for AWWA. He was an independent consultant and served as Interim President of the U.S. Water Alliance and national Source Water Protection Coordinator for the U.S. Endowment for Forestry and Communities. He is also an Adjunct Professor at the Antonin Scalia Law School at George Mason University and Carnegie Mellon University's Heinz College. He has served as Principal with The Cadmus Group, Inc., an environmental consulting firm, Assistant Administrator for Water at the U.S. Environmental Protection Agency, Environmental Stewardship Counselor to the 2004 G-8 Summit Planning Organization, director of the Michigan Office of the Great Lakes and as Associate Deputy Administrator of EPA, and director of the Missouri Department of Natural Resources.



William F. Moody

Director, Bureau of Public
Water Supply
Mississippi State Department
of Health

Mr. Moody serves as director of the Bureau of Public Water Supply in Mississippi. As director, he oversees the compliance/enforcement, monitoring, engineering, and operator certification branches while maintaining supervisory control over the Drinking Water State Revolving Loan Fund and its supporting set-asides. He currently serves as president of the Association of State Drinking Water Administrators (ASDWA). He also serves as ASDWA's representative to the Microbial and Disinfection By-Products (MDBP) Rule Revisions Working Group that will be exploring specific issues and identifying potential MDBP rule revision options for the National Drinking Water Advisory Council's (NDWAC) consideration as the council develops its recommendations to the EPA.

Participants



Shannon Murphy

VP GM

Aquamor

Mr. Murphy is VP GM at Aquamor. Previously, he worked at NSF International for 10 years, primarily managing NSF 61/9 and NSF Drinking Water Treatment Unit (DWTU) Certification programs. He also worked for 10 years at Watts Water Quality as VP of municipal programs working directly with state, federal regulators, EPA, Health Canada, ASDWA, State Primacy Agencies, AWWA, RWA, engineering firms and directly with small systems to develop and oversee POE/POU Small System Solutions. At Aquamor as VP GM, he serves as galvanizer, manager, mentor and trainer for multiple facets of the business.



Kate Nutting

General Manager,
Southwest District

Golden State Water Co

Ms. Nutting manages customer service, community relations and water system operations and maintenance in potable water systems in southwestern Los Angeles County. She actively participates in wholesale and regional water agency meetings, programs and functions. Ms. Nutting also oversees the development of operations and maintenance budgets and analyzes and reports on variances and makes operational adjustments as necessary to ensure compliance with authorized budgetary levels. She provides key data and information in preparation of asset planning documents and capital budgets. Ms. Nutting participates in the preparation of general rate case applications and long-term planning for the district.



Andy Richardson

Former Chairman and CEO

Greeley and Hansen

Mr. Richardson is the former Chairman and Chief Executive Officer of Greeley and Hansen. In his more than four decades with the firm, Richardson worked on almost every aspect of engineering projects, such as feasibility studies, designs, construction and start-up commissioning for many major water, water reuse and wastewater treatment programs across the country. He has authored over 70 technical papers and led numerous presentations at national and international water and wastewater conferences. He is a past president of AWWA and was inducted into the AWWA Water Industry Hall of Fame.

Participants



Chi Ho Sham, Ph.D.

Independent Consultant

Dr. Sham is the AWWA Immediate Past President. He has worked on drinking and source water protection, water quality assessment, watershed management, underground injection control and natural resources conservation issues for over three decades. As an independent consultant, he has developed “total water solutions” strategies for organizations to integrate into practice areas including wastewater management, water conservation, aquifer recharge, water resource planning, drinking water protection and water quality restoration.



Claudio H. Ternieden

Senior Director, Government
Affairs and Strategic
Partnerships

Water Environment Federation
(WEF)

Mr. Ternieden is the Senior Director for Government Affairs at WEF and directs WEF’s legislative and regulatory efforts in Washington, D.C., with both Congress and federal agencies and works to represent water professionals in our nation’s capital. Before coming to WEF, he worked with Concurrent Technologies Corporation (CTC), and before that with the Water Environment Research Foundation (WERF) (now The Water Research Foundation) helping lead innovative research. Previously, he worked with the US EPA in Washington, D.C., and helped in the development of numerous federal regulations.



John Young

Sole Member

John S. Young JR, LLC

Mr. Young has served in numerous positions at American Water, including COO, AW service company president, and VP-engineering before retiring in 2010. He has spent the last decade assisting numerous “troubled water systems” with technical, management and financial challenges.

Water 2050 Advisory Board & Staff / Consultant Support

Advisory Board

Sue McCormick

Former CEO of Great Lakes Water Authority

Ms. McCormick is CEO of 4Leaders, LLC supporting leaders developing high performance teams, engagement and public partnerships. She has over 40 years of water utility leadership, including as CEO during the standup of one of the nation's largest public water authorities with more than 120 communities, the Great Lakes Water Authority. She achieved a 96 %-member satisfaction rating within the first years, earning many awards and recognitions and championed engagement strategies and innovations in the Detroit area and in Ann Arbor and public partnerships in the Lansing area.

Andrew Richardson

Former Chairman and CEO of Greeley and Hansen

In his more than four decades with the Firm, Mr. Richardson worked on almost every aspect of engineering projects, including feasibility studies, designs, construction, and start-up commissioning for many major water, water reuse and wastewater treatment programs across the country. He has authored over 70 technical papers and made numerous presentations at national and international water and wastewater conferences. He is a past president of AWWA and was inducted into the AWWA Water Industry Hall of Fame.

Jennifer Sara

Global Director, Climate Change Group, World Bank Group

Ms. Sara is responsible for overseeing the key strategic priorities and implementation of the World Bank Group's Climate Change Action Plan and leading five Practice groups on: Climate Operationalization and Impact, Climate Economics and Finance, Climate Funds Management, Climate Investment Funds Secretariat, and Strategy, Knowledge and Outreach. Prior to taking on this position, Ms. Sara served for eight years as Director and Global Director for the Water Global Practice, overseeing the Bank's \$30B water portfolio, analytics, trust fund management and knowledge agenda.

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Water 2050 Technology Think Tank Photography
by Chris Barber

"Resilient" is the most common word AWWA members believe will best describe the water community in 2050.

[AWWA Water 2050 Member Survey](#)

Recommended Reading & Resources

Developing, Protecting and Managing Water Resources. AWWA Policy Statement. 2017.

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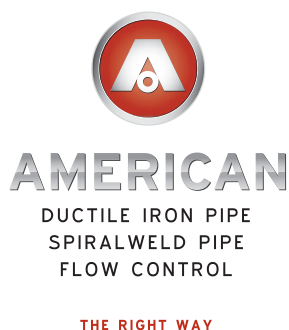
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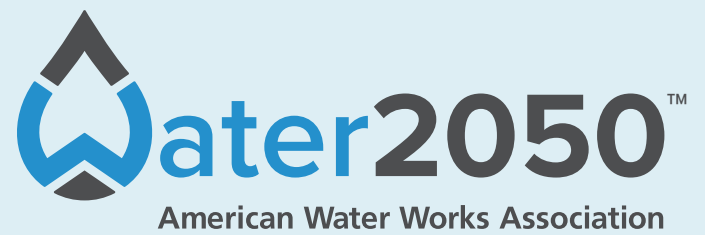
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Washington, D.C.
February 27–March 1, 2023