

Utah Section

Presents

The 50th Annual Utah Section Water Resources Conference

Saving Water: A Matter of Money and Data

May 25, 2023

Salt Lake City S.J. Quinney School of Law, University of Utah

Welcome!

Welcome to the American Water Resources Association (AWRA) Utah Section Annual Water Resources Conference. This year marks the 50th Utah Section of AWRA Conference. I hope the conference provides an opportunity for discussion, education and the advancement of informed water resources stewardship in Utah and elsewhere.

Founded in 1964, the AWRA is a non-profit, multi-disciplinary, professional association dedicated to the advancement of men and women in water resources management, research, and education. The purpose of the Utah Section of AWRA is to provide educational opportunities for members. Annual events include the Luncheon usually in January, the Annual Conference in May, and the Fall Tour.

The theme of this year's conference is "Saving Water: A Matter of Money and Data". Conserving water often requires an investment; changing our behaviors and infrastructure comes at a cost. Making good investments requires good information; an understanding of our systems, how they perform, and where our water is going. The presentations today address some of the most significant water challenges and opportunities that we are faced with today and, more specifically, how money and data are being leveraged as a means to create lasting solutions. We hope that the presentations and discussions we have today can serve as a catalyst for new opportunities throughout the State of Utah.

I extend my personal gratitude to all those who participated in the planning, coordination, and implementation of this conference. Also, thanks to each of the presenters who are sharing their knowledge and experience with us today. Thank you to the Executive Committee and Corresponding Members and the Section Officers who have volunteered their time and talents to making the Annual Conference a success. Also, thanks to our Sponsors for supporting our local association.

As an Executive Committee, we are committed to growing our Utah Section, expanding our exposure to professionals across a wide variety of water resource disciplines, and improving our annual section events. Thank you for your support of the AWRA Utah Section and enjoy the Conference.

Leila Ahmadi Conference Chair/President Elect

Saving Water: A Matter of Money and Data

- **7:45 8:20** Registration & Breakfast
- 8:20 8:45 Welcome, Introductions & Utah Section Update AWRA Utah Section President – Jeff DenBleyker, Jacobs Engineering
- 8:45 9:15 *Keynote Address:* The Three Pillars of Water Conservation: The Role of Education, Incentives, and Regulations in Reducing Municipal Water Use Alan Packard, General Manager, Jordan Valley Water Conservancy District

Morning Session A: Great Salt Lake

9:15 – 10:45 Moderator: Matthew Jensen, Parr Brown Gee & Loveless The Great Salt Lake Watershed Enhancement Trust Marcelle Shoop, National Audubon Society Great Salt Lake Basin Integrated Plan Laura Vernon, Utah Division of Water Resources Water Rights Considerations on Great Salt Lake Blake Bingham, Utah Division of Water Rights Future Water Distribution Efforts in the Great Salt Lake Basin Bethany Neilson, Utah State University

10:45 – 11:05 Morning Networking Break

Morning Session B: Role of Money & Data in Collaboration

11:05 – 12:00 Moderator: Peter Gessel, Smith Hartvigsen Great Salt Lake Basin Integrated Plan & Utah Watershed Council Act: Funding and Collaboration Dan Adams, The Langdon Group Water Marketing Strategies & The Utah Water Banking Act Emily Lewis, Clyde Snow & Sessions

12:00 – 1:30 Lunch (provided) Presentation of Utah Section Awards

Afternoon Session A: Colorado River

- 1:30 2:30 Moderator: Peter Gessel, Smith Hartvigsen Technology and Data as Drivers in Colorado River Management Betsy Morgan, Colorado River Authority of Utah Lily Bosworth, Colorado River Authority of Utah
- **2:30 2:50** Afternoon Networking Break

Afternoon Session B: Depletion Accounting

2:50 – 4:15 Moderator: Jeff DenBleyker, Jacobs Engineering Depletion Administration and Accounting in Utah Jared Manning, Utah Division of Water Rights By the Acre or by the Inch? How water should be measured to encourage conservation Randall Holt, Holt Farms Enterprise – Berryl Agriculture Irrigation Depletion Pilot Study Alfonso Torres, Utah State University Agriculture Water Optimization Program Hannah Freeze, Utah Department of Agriculture & Food

4:15 – 4:30 *Election Results and Conference Wrap-up*

Special thanks to our 2023 Utah Section sponsors that have generously supported our local association by becoming corporate members. To learn more about the benefits of a Corporate Sponsorship, please visit our website at: https://awrautah.org/ or call Marisa Egbert at 801-403-8077.



AWRA Utah Section Leadership 2023

Utah Section Officers

Jeff DenBleyker, President Nathan Bracken, Past-President Leila Ahmadi,Conference Chair/ President Elect Marisa Egbert, Secretary/Treasurer

Executive Committee

Leila Ahmadi Marisa Egbert Nathan Lunstad Chris York Nathan Bracken Peter Gessel Jon Oldham Jeff DenBleyker Matthew Jensen Roger Pearson

Student Section Advisors

Emily Marron University of Utah David E. Rosenberg Utah State University Gus Williams Brigham Young University

Utah Section Officers 2023

Jeff DenBleyker, P.E. – President

Jeff DenBleyker has been a water resources planner and engineer with Jacobs for 25 years here in Utah. He brings extensive experience in collaboratively solving some of Utah's most acute water resource challenges by integrating science and engineering with the people and uses that are affected. Jeff earned a Bachelor of Science in Civil Engineering from Calvin College and a Master of Science in Civil and Environmental Engineering from the University of Iowa. He has served on the AWRA Utah Section Committee for the past 4 years.

Nathan Bracken – Past President

Nathan Bracken is a partner at Smith Hartvigsen, PLLC. A trained mediator and facilitator, as well as an attorney and lobbyist, Nathan represents cities, local districts, public water suppliers, water companies, and private entities on water, public policy, and local government issues. Previously, he served as the Assistant Director and General Counsel for the Western States Water Council, where he represented state water managers from 18 western states and spearheaded multi-stakeholder efforts that influenced federal legislation and policies involving the Clean Water Act, groundwater, and tribal and federal reserved water rights. Nathan has spoken around the country and published research on these and other western water issues, including water rights, water reuse, and drought, among others. He is a graduate of the University of Utah's S.J. Quinney College of Law and Brigham Young University.

Leila Ahmadi, PhD – President-Elect

Leila Ahmadi has been with the Utah Division of Water Resources as part of the Hydrology and Modeling Section for the past four years. She has worked on projects involving the state's water budget, agricultural economics, Great Salt Lake Integrated Model, and water demand programs. She has prior experience as a postdoctoral researcher and an adjunct professor and has worked on flood hydrology, sediment transport, water reuse, water quality analysis and environmental issues. She earned her PhD degree from the Civil and Environmental Engineering Department at the Utah State University with a dissertation on management of treated wastewater reuse. Her master's and bachelor's degrees were both obtained at Shiraz University focused on water resources and agricultural engineering.

Marisa Egbert, P.E. – Secretary/Treasurer

Marisa Egbert has worked for the Utah State Division of Water Resources for the past 20 years. She is the Manager of the Funding Section at the Division. The section provides financial assistance for water-related projects throughout Utah. Ms. Egbert earned her Bachelor of Science in Civil Engineering from Utah State University and has served on the Executive Committee of the AWRA Utah Section for the past 18 years, including the past 17 years as Secretary/Treasurer. She has two fantastic kids that each have an amazing sense of humor and keep her laughing and young(er).



AWRA (Utah Section) Corporate Sponsors 2023

We would like to thank our Corporate Sponsors for their financial contribution to the AWRA Utah Section. The support that our Corporate Sponsors provide is critical to the success of our organization and essential for the Section activities held throughout the year. Corporate Sponsors receive name recognition at all Section events and may register an unlimited number of employees for all Section activities at member rates. For more information on sponsorship, please visit our section website at: https://awrautah.org/.

Please take a moment during the conference to express your gratitude to representatives of these Corporate Sponsors for their generous support of the AWRA Utah Section:



Advanced Engineering and Environmental Services, Inc. (AE2S) is a specialized civil and environmental consulting engineering firm that provides professional services for municipalities and regional utility providers. Established in 1991, AE2S has over 20 offices throughout the Rocky

Mountain and upper Midwest regions, including an office in Lehi, which opened in 2013. With thousands of successfully completed water system projects, AE2S provides exceptional technical capabilities, supported and enhanced by the latest technologies, training, communication systems, support staff, and equipment. Our core focus is water – meaning drinking water, wastewater, and water resources consulting. We complement our core water engineering services with the seamless integration of electrical, structural, and civil engineering, as well as surveying, mapping, and GIS services.

AE2S believes in being an extension of staff and helping clear major hurdles for the implementation of successful projects. For this reason, AE2S has both a public outreach and a financial arm of the business, AE2S Communications and AE2S Nexus respectively. AE2S Communications has worked with over 135 public entities to assist with branding, strategic communication planning, and stakeholder engagement. AE2S Nexus has helped our clients secure billions of dollars of federal, state, and local funding.

Bowen Collins & Associates, Inc. (BC&A) is a Utah and Idaho engineering firm that provides professional services in water, wastewater, site civil, structural, industrial, electrical, mapping/GIS, and environmental services throughout the Intermountain West. The



company was established in 1997 and employs nearly 100 engineers, scientists, hydrogeologists, landscape architects, biologists, and administrative staff. We currently have three offices in Utah and one in Idaho.

Our staff is specialized in water, wastewater, civil, and natural resource related fields. We provide engineering, environmental, and construction management services to most of the Intermountain West. We offer services in the study and design of flood control and drainage facilities; water facilities including storage tanks, pump stations, pipelines, wells, reservoirs, and canals; wastewater treatment and collection facilities; groundwater wells, hydrogeologic studies, structural design, construction management, master

planning, feasibility studies, environmental documents, environmental compliance/permitting, and landscape architecture. Technical expertise, responsive client service, and cost-effective solutions in a rewarding corporate culture form the foundation of our company. For more information, visit us at https://www.bowencollins.com/

For 90 years, **Carollo Engineers** has provided a full range of innovative planning, design, and construction management services to meet the water and wastewater needs of municipalities,



public agencies, private developers, and industrial firms. Carollo's water management strategies leverage collaboration, provide multi-benefit solutions, and achieve sustainability and resilience. We are proud to have been a part of the Utah community for the last 70 years, from the design of some of the first treatment facilities along the Wasatch Front to our most recent implementation of some of the state's most innovative water and wastewater treatment facilities and water infrastructure, condition-assessment techniques. As one of the most respected workplaces in the water industry, Carollo has more than 1,300 employees located in 50+ offices in North America.



For over 65 years, **Clyde Snow** has represented clients throughout the West in the areas of Natural Resources and Water Law, Business and Finance, Family Law, White Collar Crime and Regulatory matters, Litigation, Labor and Employment, Real Property, Estate Planning and Tax, and Bankruptcy.

We counsel and assist clients in resolving legal disputes by using efficient and cost-effective legal strategies founded upon a thorough analysis of legal, business, and industry ramifications.

Our attorneys understand that certain situations call for experience, connections, and expertise that reach beyond legal advice and counsel to achieve the best results for their clients. From the routine to novel and complex matters, our attorneys analyze the costs and benefits of potential strategies and recommend the solution that promises the greatest value to each client.



CONSERVANCY DISTRICT

The **Central Utah Water Conservancy District** is a political subdivision of the State of Utah, formally established in 1964 to acquire, develop, conserve and preserve water resources, including a substantial portion of Utah's allotted share of Colorado River water by the federally sponsored Central Utah Project, to construct, operate and maintain facilities associated with these water resources, preserve stream and/or watershed ecosystems where necessary to maintain water quality standards and aquatic ecosystem balances, and to maintain responsible management of

the District's physical facilities, financial, water and human resources. Consistent with its purpose and mission, the District acts as the provider of wholesale raw and finished culinary water from its various dams, reservoirs, tunnels, aqueducts, pipelines, water treatment plants, groundwater wells, and storage reservoirs to various water conservancy districts, metropolitan water districts, municipalities, individuals, and corporations within all or parts of eight (8) counties in the State of Utah.

Franson Civil Engineers exists to provide quality services to those who have stewardship to conserve, develop, and manage water resources. We value our clients' needs, objectives, and desires. We commit to uphold our clients' best interests as we perform our role as consultants.

Our experience applies throughout the project life cycle, including planning, funding acquisition, environmental compliance, data and analysis, design of water systems, project management, bid and award, construction observation, contract management, and operation and maintenance. Our capabilities cover many water

resources project types, such as agricultural irrigation, dams, diversions & canals, flood control, groundwater & wells, hydropower, municipal water utilities (culinary, sewer, & storm drain), and water storage tanks.

Our motivation stems from varied and challenging job responsibilities; we foster collaboration, creativity, excellence, and service. We excel at collaborating with all parties involved, including clients, permitting agencies, the public, and funding partners. Our innovative techniques and practices enable us to deliver projects with cost effective and efficient results. We achieve excellence throughout projects by establishing a framework which encourages peer reviews, consistency, and quality work. Our commitment to service manifests in a high frequency of repeat work from satisfied clients. We focus our service on the value our service adds to their projects and how well we meet client needs.

Founded in 1951, **Hazen** is a national water-focused engineering firm with talented local resources and a reputation for technical quality and the ability to deliver. This equates to exceptional responsiveness, client service, and best-value solutions. We have been serving the Utah market since 2005 and our local team is backed by the strength

and depth of offices nationwide with over 1,400 employees that focus solely on "all things water". We have assembled a pool of technical resources specialized in water projects to help utilities overcome challenges of all shapes and sizes. Our team members bring a broad, national perspective to offer fresh ideas.

Ranked as the nation's No. 5 Water firm in 2022 by Engineering News Record, **HDR**'s professionals combine the latest technical innovations with practical solutions. Our water consulting services are comprehensive and range from source water development, system master planning and regulatory compliance services to infrastructure design, management and sustainable operation. In response to the growing need to optimize system operations, HDR delivers solutions that provide long-term value and help our clients achieve exceptional customer service. Our practice includes experts in:

- Asset management and financial planning
- Integrated water planning, management, and energy conservation
- Water quality management and advanced treatment technologies
- Program management and construction management
- Pipeline rehabilitation/replacement and tunneling
- Alternative project delivery methods

Our Utah Area offers local expertise in water resources planning, water quality modeling, stormwater drainage and flood control, wetland

delineation and mitigation, conveyance, and regulatory compliance. For more information, please go to <u>www.hdrinc.com/markets/water</u>.







As Utah's supply and demand for water intensify, solving our most complex water challenges demands different thinking, and that is where

Jacobs Cha

Challenging today. Reinventing tomorrow.

we come in. **Jacobs Engineering Group Inc.** leads the global professional services sector delivering solutions for a more connected, sustainable world. In 2017, CH2M HILL joined Jacobs, to become a global leader in water and environmental consulting services. With over 100 full-time professionals in Utah, Jacobs provides a full spectrum of services to our clients here in Utah including scientific, technical, professional, construction and program management for private, government and infrastructure sectors. Our new, combined and local resource depth enables us to offer to our clients world-leading technical and environmental expertise to address their most complex water, wastewater, flood control and environmental challenges – tailored to their unique needs.

We know that Utah's awareness of the effects of water management decisions will intensify as water issues become more acute. Decisions at one point in the water cycle affect all the others—from water supplies to treatment, conveyance, wastewater treatment, reuse and return to the natural environment. Our expertise across the water cycle puts Jacobs in a unique position to provide outstanding, cost effective, integrated solutions to our clients. Please visit us at: <u>https://www.jacobs.com/solutions/markets/infrastructure/water</u>



Jordan Valley Water Conservancy District is a political subdivision of the State of Utah and one of the largest water districts in the state. On a wholesale level, it serves some of the fastest-growing cities and communities in Utah, including Bluffdale, Draper, Herriman, Kearns, Magna, Midvale, Riverton, South Jordan, South Salt Lake, Taylorsville, West Jordan, and West Valley. In addition to its wholesale deliveries, Jordan Valley Water provides 8,700 homes and businesses with direct retail service. Altogether, more than 750,000 people are served water by Jordan Valley Water at over 180 million

gallons every single day in the summer. Over the course of a year, Jordan Valley Water delivers approximately 30 billion gallons of high-quality drinking water. All of this takes dedicated employees and lots of infrastructure, including three treatment plants, dozens of wells, pump stations, reservoirs, and over 300 miles of pipelines ranging in size from 6 inches to 78 inches.

PARR BROWN GEE & LOVELESS

ATTORNEYS AT LAW

Parr Brown Gee & Loveless is a leading Utah law firm providing corporate clients and individuals with transactional, litigation, and regulatory assistance. The firm's talented Utah attorneys are consistently recognized by The Best Lawyers in America, Mountain States Super Lawyers, Chambers USA, Benchmark Litigation, and Utah Business Magazine's Legal Elite. Parr Brown has, for

decades, assisted its clients in all their water law needs, meeting their transactional, administrative, regulatory, corporate, and title needs. Parr Brown also has the experience and depth to handle the most complex water law disputes in court or otherwise. Clients include businesses, individuals, real estate developers, ranchers, municipalities, special service districts, homeowners associations, irrigation companies, ski resorts, consultants, banks, mineral operators, utilities, refineries, and manufacturers.

Smith Hartvigsen is a law firm that helps municipalities, counties, districts, water companies, developers, businesses, and individuals with their legal issues in many areas of the law, including water law, land use law, and local government law. Smith Hartvigsen attorneys have been on the cutting edge of water law issues for more than 30 years. They have assisted public and private entities in planning, financing, and implementing a broad range of water projects. They have extensive administrative, trial, and appeals experience on many water-related issues, including water rights, water quality, and sewage treatment and reuse



LAND WATER LIFE

issues. Smith Hartvigsen attorneys are active in the water community. They have taken a leading role in drafting and lobbying laws related to water rights, land use, and local government law. Additionally, their attorneys have held leadership positions in organizations such as the AWRA, and the water law committees of the American Bar Association and the Utah State Bar. Smith Hartvigsen attorneys are respected by their peers and clients. They have received AV Preeminent[®] peer ratings from Martindale-Hubble (the highest rating) and have also been chosen as members of Utah's Legal Elite by their peers as reported in Utah Business. Smith Hartvigsen attorneys also assist clients in the areas of energy and environmental law, land use law, real estate law and transactions, redevelopment, condemnation, eminent domain, commercial litigation, employment law, construction law, family law, and appeals.



The Utah Division of Drinking Water's core function is to implement and enforce the Safe Drinking Water Act for the state by safeguarding the quality and quantity of Utah's drinking water through balanced regulation. The Division is governed by the Utah Drinking Water Board appointed by the Governor. The Board is empowered to adopt rules governing the design, operation, and maintenance of Utah's public drinking water systems. Utah has about 1,100

public water systems. The Division implements the rules that the Board adopts. As such, it is engaged in a variety of activities related to the design and operation of Utah's public drinking water systems including monitoring and compliance, enforcement, engineering design review, source protection, operator certification, financial assistance, and emergency response.



The Utah Division of Water Resources is one of seven divisions housed within the Department of Natural Resources. Tasked with "Planning, Conserving, Developing and Protecting Utah's Water Resources", the Division earnestly strives to be Utah's water steward. Utah is a semi-arid state and its water future is one of the most significant challenges facing us today. The State of Utah and the Division recognize the vitality in finding sustainable solutions to ensure Utah families have reliable water, that agriculture and businesses can be successful and that the environment can prosper. It is our belief that we will meet the future water needs through a combination of multi-faceted solutions that include conservation, efficiency, optimization, agriculture conversion and water

development. Such an approach will help us prepare, plan and sustain Utah's water future.



The Utah Division of Water Rights (otherwise known as the Office of the State Engineer) is responsible for regulating the appropriation and distribution of the waters within the State of Utah. As one of the oldest state agencies (established in 1897), the Office of the State Engineer has been instrumental in shaping the allocation and use of Utah's waters for over 125 years. As we look forward to the next century, the Division of Water Rights remains steadfast in its commitment to embracing innovative approaches to address the challenges of growing demands and diminished supplies. With a legacy of excellence behind and a vision of resilience and collaboration ahead, the division stands poised to continue its crucial role in shaping a water-secure future for the great state of Utah.

As the regional water supplier within the Ogden and Weber River drainages, Weber Basin Water Conservancy **District** provides a wide variety of water supplies within our community and is continually developing new strategies to conserve our water, maintain and expand infrastructure, and extend existing supplies. The District delivers annually over 235,000 acre-feet of treated wholesale municipal



water, wholesale and retail agricultural irrigation water, wholesale and retail secondary irrigation water, treated and untreated industrial water, and replacement exchange water. Over 700,000 residents within Davis, Weber, Morgan, Summit, and Box Elder counties receive water from District sources. Supplies are managed and delivered through the District's operation of seven large storage reservoirs, three hydropower generation plants, 21 wells, four water treatment plants, and hundreds of miles of canals, tunnels, aqueducts, and pipelines.



2022-2023 Year in Review

Annual Luncheon

Our Annual Luncheon, held on February 14, 2023, featured Joel Ferry, Director of Utah Department of Natural Resources. Dir. Ferry provided a recap of the important legislation passed in 2022 and described how the Legislature was carrying that momentum forward in 2023 through 7 proposed House bills and 7 proposed Senate bills. The House and Senate bills included:

- Addressing liability to canal companies due to urbanization (HB 33)
- Preference of water use during shortage (HB 150)
- Representation on Compact Commissions (HB 207)
- A new statewide public/private partnership to address water conservation (HB 307)
- Limit new water reuse projects in the Great Salt Lake watershed (HB 349)
- Clarifications for groundwater use (SB 53)
- Address coordination of growth and water conservation planning (SB 76)
- New incentives for water efficient landscaping (SB 118)
- Reporting of per capita consumptive use (SB 119)
- Water instream flows in the Colorado River basin (SB 144)
- Almost \$493M in new funding for water efforts

He also provided an overview of the significant efforts the State is undertaking to reduce the risks and impacts of a declining Great Salt Lake, improve and invest in water conservation efforts, and make resources available for making better informed decisions. Dir. Ferry closed with his vision of a community working together to break down barriers, find lasting solutions, and make investments today to ensure our future.

Utah Section Awards

Each year, the AWRA Utah Section Executive Committee receives nominations for individuals that have demonstrated outstanding commitment to Utah's water resources community throughout their careers. Nominations are received for each of three categories—private, public, and academic sectors—and the final selection of award recipients is made by the Executive Committee. We honor those individuals that are being recognized this year as well as those that have been previously recognized.

It is a pleasure for the AWRA Utah Section to present this year's award selections and to recognize these individuals that have not only demonstrated outstanding commitment to Utah's water resources community, but have had a significant impact on Utah's precious water resources. Congratulations and thank you to each of these water professionals for their many years of dedication and significant contributions!

Outstanding Service in the *Private Sector*

2004	Dee Hansen
2005	Carly Burton
2006	David Hartvigsen
2007	Mike Mickelson
2008	Warren Peterson
2009	Jay W. Franson
2010	Jack Barnett
2011	Rick Wheadon
2012	Steve Clyde
2013	Michael Collins
2014	Keith Denos
2015	Dallin W. Jensen
2016	David E. Hansen
2017	Steven M. Thurin
2018	Craig Bagley
2019	Greg Poole
2020	David Hartvigsen
2021	Jim Riley
2022	Bill Loughlin
2023	Tim Hawkes

Outstanding Service in the Public Sector

2004	Larry Anderson
2005	Ivan Flint
2006	Robert Morgan
2007	Mike Reichert
2008	Don Christiansen
2009	Jerry D. Olds
2010	Representative Patrick Painter
2011	Ron Thompson
2012	Roger Hansen
2013	Florence Reynolds
2014	Dennis Strong
2015	Harold Lee Wimmer
2016	Dave B. Cole
2017	Eric K. Klotz
2018	Craig Miller
2019	David Pitcher
2020	Ying Ying Mcauley
2021	Norman Johnson
2022	Tage Flint
2023	Bart Forsyth

Outstanding Service in the Academic Sector

LaVere Merritt
Ronald Sims
Donald Hayes
David Tarboton

2008	Robert W. Adler
2009	J. Paul Riley
2010	Mac McKee
2011	Robert Hill
2012	Steve Burian
2013	Darwin L. Sorensen
2014	Rollin Hotchkiss
2015	David E. Rosenberg
2016	Norman L. Jones
2017	Randall P. Julander
2018	Joanna Endter-Wada
2019	Wayne Wutsbaugh
2020	Michael Barber
2021	Bonnie Baxter
2022	Jaimi Butler
2023	Gus Williams



Presenter Bios

Keynote Address

Alan Packard, Jordan Valley Water Conservancy District

Alan Packard began his career as an engineer with Jordan Valley Water Conservancy District in 1990 and has been involved with planning, design, construction management, operation, and maintenance of a wide variety of water supply, treatment, storage, pumping, and conveyance projects. He received a bachelor's degree in civil engineering from Utah State University. As General Manager, he leads a team of over 150 employees committed to protect the District's water resources and the infrastructure used to deliver that water, and to promote the efficient use of those water resources to enable sustainable prosperity for the communities served by the District.

Morning Session A: Great Salt Lake

Marcelle Shoop, National Audubon Society

Marcelle Shoop serves as the Executive Director of the Great Salt Lake Watershed Enhancement Trust, which is co-managed by National Audubon Society and The Nature Conservancy. The Trust was established to help enhance and retain water flows for Great Salt Lake. Marcelle also launched and now directs the Saline Lakes Program for Audubon. The program is part of Audubon's Western Water initiative that strives to advance balanced solutions to water use in the arid West so birds, ecosystems, people, and economies thrive.

In Utah, Marcelle has worked with many partners to advance water policy and solutions to benefit Great Salt Lake and its surrounding wetlands. She contributed to the 2020 Great Salt Lake HCR10 Steering Group Recommendations Report and steered a collaborative effort to secure water for Great Salt Lake through water donations from Rio Tinto Kennecott and the Central Utah Water Conservancy District. Marcelle serves as a representative of the environmental conservation interests on the Utah Watersheds Council. She also is a board member for Project WET Foundation, an organization dedicated to advancing water education to understand global challenges and inspire local solutions. Marcelle holds a Bachelor of Science degree in Business Management and a Juris Doctor degree, both from the University of Wyoming.

Laura Vernon, Division of Water Resources

Laura Vernon is the Great Salt Lake Basin Planner with the Utah Department of Natural Resources Division of Water Resources. For over 15 years she has worked with federal, state, and local governments and industry leaders on contemporary planning and environmental policy issues in the West. She has worked on numerous exciting and innovative Great Salt Lake-related projects over the last 10 years including the development of the 2013 Great Salt Lake Comprehensive Management Plan and recently the exploration of the economic and ecological impacts of a declining Great Salt Lake. Currently, Laura is managing the first-ever Great Salt Lake Basin Integrated Basin Plan.

Blake Bingham, Utah Division of Water Rights

Blake Bingham is the Deputy State Engineer at the Utah Division of Water Rights. He joined the State Engineer's Office in July of 2011 as the Adjudication Section Program Manager and Assistant State Engineer until May of 2020, when he was assigned as the Assistant State Engineer responsible for the Applications and Records Section. In April of 2022, Mr. Bingham took on his current role as Deputy State Engineer. Mr. Bingham earned his B.S. in Civil Engineering from the College of Engineering at Utah State University in 2003. He is a registered Professional Engineer in the State of Utah.

Bethany Neilson, Utah State University

Bethany Neilson is a Professor in Civil and Environmental Engineering at Utah State University. She has a dual appointment in the Utah Water Research Laboratory and is the Co-Director of the Logan River Observatory.

Morning Session B: Role of Money & Data in Collaboration

Dan Adams, The Langdon Group

Dan Adams is a mediator/facilitator, public engagement strategist, and organizational development consultant. Dan has been a consultant to local, state, federal and tribal agencies since 1997 and is a senior executive with The Langdon Group. He is a nationally known expert in collaboration on highly complex cases involving science and policy.

Emily Lewis, Clyde Snow & Sessions

Emily Lewis is a partner at the law firm of Clyde Snow. Her expertise is working at the nexus of water law, policy, technology, and finance. She excels at assisting clients with large and complex water matters and strives to bring the water community together to accelerate problem solving.

Afternoon Session A: Colorado River

Betsy Morgan, Colorado River Authority of Utah

Betsy is a staff engineer for the Colorado River Authority of Utah. She graduated from Oregon State University with a Bachelor of Science in Ecological Engineering and also attended Utah State University and received a Master of Science in Civil Engineering with a minor in Climate Adaptation Science. While pursuing her master's, Betsy led two research projects focused on water management in northern California: one on environmental water management and another on water availability for legal cannabis cultivation. Betsy also worked for the Wyoming Game and Fish Department as an Aquatic Habitat Biologist, and prior to joining the Authority, served as an engineer for the Utah Division of Water Resources within the interstate streams section.

Lily Bosworth

Lily is a Staff Engineer for the Colorado River Authority of Utah. Lily completed bachelor's degrees in Honors Geological Engineering and Environmental Geoscience at the University of Utah, with a thesis on the hydrology of beaver dam analogs. Lily also completed a master's degree in Hydrologic Science and Engineering at the Colorado School of Mines, with a thesis on water treatment with engineered wetlands.

Afternoon Session B: Depletion Accounting

Jared Manning, Utah Division of Water Rights

Jared Manning, P.E. is a Deputy State Engineer at the Division of Water Rights where he has worked for 25 years. He received a B.S. and M.S. in Civil and Environmental Engineering from BYU.

Randall Holt, Holt Farms

Randall Holt is a farmer in Southern Utah. He and his wife Dee Dee have raised eight children and are grandparents to eight grandchildren. He graduated from BYU in 1991 with a degree in accounting. After working in Portland, OR in computer networking and accounting systems, he returned to the family farm. He is currently the manager of Holt Farms, LLC and farms with his father, brothers, and two sons and enjoys watching his grandchildren grow up "on the farm". Holt Farms was started in 1964 by Robert Holt primarily raising potatoes. Today, they operate over 11,000 crop acres, raising alfalfa, corn and triticale. (trit a kay lee, similar to winter wheat) export alfalfa to Japan, operate a cow-calf ranch, a 5,500 head milking cow dairy and a 10,000 head beef feedlot. Randall is passionate about technology, farm machinery, and crop production.

Alfonso Torres, Utah State University

Alfonso Torres-Rua is an Assistant Professor of Civil and Environmental Engineering at Utah State University. His research builds and supports agriculture and urban irrigated lands adaptation and assessment, capability development, and connects state-of-the-art remote sensing technology with precision irrigation and farm management. Current and past activities include the use of drone technologies for precision farming and irrigation over vineyards, almonds, cherries, avocado, olive, rice, and urban green areas (California, Chile, Israel, Turkey, Peru).

Hannah Freeze, Utah Department of Agriculture & Food

Hannah Freeze has been working for the Utah Department of Agriculture and Food since 2015. She started her career as a conservation planner working with private landowners to implement various conservation projects across many landscapes including numerous irrigation systems ranging from improved flood irrigation, center pivots, and drip systems on vegetable crops. She previously developed and ran the Agriculture Voluntary Incentives Program for the Department of Agriculture and Food which helped producers get and implement nutrient management plans on their operations. Hannah accepted her new position running the Agricultural Water Optimization Program in early April and is excited to continue to build on the successes of the program thus far. She has a deep love for agriculture and will always say that working with our farmers and ranchers across the state is the absolute best part of her job.

Presenter Abstracts

Keynote Address

The Three Pillars of Water Conservation: The Role of Education, Incentives, and Regulations in Reducing Municipal Water Use

Alan Packard, Jordan Valley Water Conservancy District

In Utah, using our limited water resources wisely is a necessity. Jordan Valley Water Conservancy District has been a leader in promoting water conservation in the municipal use sector. Jordan Valley's approach has evolved, beginning over twenty years ago with investments in education programs (e.g. Slow the Flow – Save H2O, water-wise demonstration garden, etc), then providing financial incentives for landscape conversions and plumbing fixture replacement, and more recently state and local regulations to ensure long-term water conservation. Education, Incentives, and Regulations are the key pillars to achieving the durable change in municipal water use.

Morning Session A: Great Salt Lake

The Great Salt Lake Watershed Enhancement Trust

Marcelle Shoop, National Audubon Society

The Great Salt Lake Watershed Enhancement Trust ("GSLWET" or the "Trust") was established in January 2023 pursuant to the Great Salt Lake Watershed Enhancement Program (Utah Code Title 65, Chapter 16 (the "Act"). The legislature appropriated \$40 million to fund the Trust. The primary purpose of the Trust is to enhance water quantity and water quality for Great Salt Lake and its wetlands. The Trust is co-managed by National Audubon Society's Saline Lakes Program (NAS) and The Nature Conservancy in Utah (TNC). The Utah Division of Forestry, Fire and State Lands (FFSL) has regulatory authority concerning the management and implementation of the Trust. A nine-member statutorily defined Trust Advisory Council advises on matters related to the mission and objectives of GSLWET, plays an important role in helping set the strategic direction of the Trust. The Trust is just one important new tool within a growing suite of strategies to save the fragile ecosystem of Great Salt Lake. This talk will provide information on the operation of the Trust and its work.

Great Salt Lake Basin Integrated Plan

Laura Vernon, Division of Water Resources

The Division of Water Resources is leading a collaborative effort to develop a Great Salt Lake Basin Integrated Plan. When implemented, this action plan will ensure a resilient water supply for Great Salt Lake and its watershed. This first-ever water resources plan will coordinate projects, research, data, models, tools and ideas at an unprecedented scale. Water users and policy makers will gain a comprehensive foundation for making decisions as well as a better understanding of their impacts within the watershed.

Water Rights Considerations on Great Salt Lake

Blake Bingham, Utah Division of Water Rights

As competing demands for water resources continue to grow, understanding the complexity and the interconnectedness of water rights, distribution systems, and historical practices within the Great Salt Lake Basin becomes paramount. Join Blake Bingham (Deputy State Engineer) for an overview of water rights considerations for the Great Salt Lake.

Future Water Distribution Efforts in the Great Salt Lake Basin

Bethany Neilson, Utah State University

The Utah Division of Water Rights and Utah State University are working together to identify and prioritize locations for new stream gages, establish how to best track small quantities of water through river basins, share real-time flow information, and communicate water rights accounting data in a user-friendly format. This presentation will provide an overview of planned efforts to further facilitate water distribution and deliveries to the Great Salt Lake.

Morning Session B: Role of Money & Data in Collaboration

Great Salt Lake Basin Integrated Plan & Utah Watershed Council Act: Funding and Collaboration

Dan Adams, The Langdon Group

Water Marketing Strategies & The Utah Water Banking Act Emily Lewis, Clyde Snow & Sessions

Afternoon Session A: Colorado River

Technology and Data as Drivers in Colorado River Management

Betsy Morgan, Colorado River Authority of Utah Lily Bosworth, Colorado River Authority of Utah

As the Colorado River water supply becomes increasingly stressed, the technology and tools for managing and operating the supply become increasingly important. Thankfully, we live in a time when unprecedented technical advancements and data management capabilities are available to those that are willing to explore their limits. The Colorado River Authority of Utah (Authority) recognizes technology and data as a key component in protecting, conserving, using, and developing Utah's waters of the Colorado River. This presentation will focus on initiatives that leverage technology and data as part of the Authority's Management Plan to achieve a more resilient water supply for the Colorado River system in Utah.

Afternoon Session B: Depletion Accounting

Depletion Administration and Accounting in Utah

Jared Manning, Utah Division of Water Rights

There is a lot of buzz around the phrase "depletion accounting." But what does it really mean? And what is it supposed to accomplish? The answers to these questions depend on who you talk to in the water community. Here, I'll talk about depletion accounting from the perspective of the Division of Water Rights.

By the Acre or by the Inch? How water should be measured to encourage conservation Randall Holt, Holt Farms

The historical application of the Doctrine of Beneficial Use does not encourage water conservation. The term "use it or lose it" has been coined from this doctrine. Can the Doctrine of Beneficial Use be slightly modified to encourage and reward water conservation? Holt Farms operates in a closed basin where our basin's water rights will be curtailed by 50% to meet "safe yield." By working with the Division of Water Rights and the Agricultural Water Optimization Program, we've changed practices, crop types, and water accounting. Can we make More Crop per Drop a sustainable step in the right direction by changing how water is measured?

Enterprise – Berryl Agriculture Irrigation Depletion Pilot Study

Alfonso Torres, Utah State University

As climate change effects increase and pressure to increase agricultural water productivity deepens, accurate estimation and continuous monitoring of evapotranspiration (ET) is important for Utah producers and water canal companies. Nowadays, significant advancements in crop water use or depletion estimates provide us with multiple options that differ in instrumentation, analysis, and complexity. These differences cause variations in results from the methods, posing the question of which one balances accuracy, efficiency, and accessibility. This pilot research, sponsored by the Utah Agricultural Water Optimization Task Force, aims to evaluate and recommend methods for estimating crop water use in sprinkler-irrigated corn and alfalfa fields based on results from soil moisture data, satellite imagery, state-recommended consumptive use, surface renewal, eddy covariance measurements for the 2021 growing season in Modena, UT. The study developed a method to estimate ET from soil moisture measurements, used ET estimates from satellite imagery from the OpenET [www.openetdata.org] and expert-calibrated METRIC model, installed a couple of ground ET monitoring stations (Eddy Covariance and Surface Renewal), and included consumptive water use estimates from a Utah Department of Natural Resources report. Overall, the results of this study show different levels of agreement and recommendations of the evaluated methods as well as highlight the necessary effort to generate ET information that can describe field conditions.

Agriculture Water Optimization Program

Hannah Freeze, Utah Department of Agriculture & Food



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