

THE 2024 UTAH WATER USERS WORKSHOP
March 18-20, 2024
The Dixie Center, St. George, Utah
<http://conference.usu.edu/uwuw/>

GENERAL SESSIONS

A. NWRA - CRITICAL NATIONAL WATER ISSUES

Dale Nellor - NWRA

National Water Resources Association (NWRA) Executive Vice President, Dale Nellor, will be providing insight on what congressional and regulatory officials are focusing on as we wade through a presidential election year and NWRA's policy priorities in 2024.

B. WATER OUTLOOK - DROUGHT RECOVERY

Jordan Clayton - NRCS

Glen Merrill - NWS

The speakers will present the current state of weather events and water supply for the 2023-2024 water year. They will discuss in detail weather patterns, precipitation and temperature anomalies, the Utah water supply forecast in addition to the current water supply outlook. The speakers will also discuss Utah's recovery from the drought due to record snowpack and runoff in 2023.

WORKSHOP SESSIONS

1. STATE ENGINEER UPDATE

Teresa Wilhelmsen - Division of Water Rights

State Engineer, Teresa Wilhelmsen, will give an update from the Division of Water Rights covering how 2023 runoff impacted water rights and water distribution; application process improvements; and other items.

2. ADJUDICATION UPDATE

Mike Drake - Division of Water Rights

The Division of Water Rights continues to move forward in water right adjudications throughout the state. Presently, adjudication work is ongoing in the Utah Lake and Jordan River, Bear River, Southeastern Colorado and Virgin River Adjudications. In this presentation, you will learn more about why the State of Utah conducts water right adjudications. You will also learn about what has recently been accomplished and what is planned as the adjudication program moves forward. Finally, you will learn about the adjudication process, and be able to ask questions so that you can be prepared if the adjudication moves into your area of the State.

3. UTAH DAM SAFETY UPDATE

Everett Taylor - Division of Water Rights

Current issues facing dam safety and stream alterations in the state include funding, federal grants, and an update of project construction including weathering the 2023 runoff will be presented. Yearly inspections, ongoing rehabilitation projects and proposed new construction will be discussed with details of the issues and challenges. An update on the State stream alteration program will be included.

4. DUTY VS. DEPLETION**Blake Bingham - Division of Water Rights**

As competing demands for water resources continue to grow, understanding the relationship between a water right's diversion duty and the amount depleted by the respective beneficial use becomes paramount. Join Blake Bingham (Deputy State Engineer) for an overview of duty and depletion as they relate to the relevant water rights processes.

5. WATER RIGHTS TITLE PROGRAM**Dana Dredge - Division of Water Rights**

The State Engineer's office serves only as an office of public record. The water right information provided here reflects that which has been filed with the State Engineer's office, by the public. Other title documents, court actions, etc., may exist that may conflict with or affect the ownership record. If an opinion of title assurance is desired, an attorney or other qualified professional should be retained.

6. APPLICATION DEVELOPMENT, RESPONDING TO PROTEST & HEARING PREPARATION**Eric Jones - Division of Water Rights**

This presentation will talk about tools the Division offers to assist in the production of applications. How to track an application as it travels through the review processes of the State Engineer. Sometimes applications are protested. Many protests can be resolved without a hearing, if the applicant provides adequate information. If the protests are not resolved in writing, then a hearing can be held to gather the necessary information. This presentation will provide aides, ideas, and tips on how best to address protests.

7. WATER RIGHTS ENFORCEMENT PROGRAM**Jacob Olsen - Division of Water Rights**

Water right enforcement is critical for protecting Utah's water resources and public welfare by ensuring compliance and deterring noncompliance. This presentation will examine the intricacies of water right enforcement statutes and rules, shedding light on the legal frameworks and mechanisms in place. Additionally, a comprehensive review of the enforcement metrics from recent years will be presented. Join us as we explore the challenges and opportunities in safeguarding Utah's water rights.

8. LEGISLATIVE UPDATE**Jeff Gittins - Smith Hartvigsen**

In recent years, the Utah Legislature has considered and passed an increasing number of water-related bills – and 2024 was no exception. Come learn about the water-related bills that were considered at the 2024 legislative session, and find out which bills passed, which bills failed, and which bills will likely be resurrected in 2025. Additionally, learn about water-related cases that were decided by the Utah Supreme Court and Utah Court of Appeals during the past year.

9. UTAH LAKE AUTHORITY UPDATE**Sam Braeger - Utah Lake Authority**

10. WATER RIGHT LEGAL UPDATE
Sharah Shecter - Division of Wildlife Resources

11. WATER BANKING UPDATE
Emily Lewis - Clyde, Snow & Sessions

12. COLORADO WATER RIVER AUTHORITY OF UTAH UPDATE
Gene Shawcroft & Amy Haas - CRAOU

13. GREAT SALT LAKE COMMISSION UPDATE
Brian Steed - Great Salt Lake Commission

14. WATER RESOURCES UPDATE
Candice Hasenyager - UDWR

15. RELIABLE WATER RESEARCH UPDATE
Easton Hopkins - BYU

Reliable water supply” does not have a clear definition in the Western United States, where water resources are limited and such a definition would be especially useful. In Utah, the three water agencies and 500 public water systems have no consistent method to define, evaluate, and report it, potentially leading to an inability to meet regulatory water demands. We propose a unified definition of reliable water supply for Utah’s public water suppliers that can also be used elsewhere. The qualitative definition we propose is necessary to precede quantitative evaluations, set policy, and provide consistency to water resources management. We derive our definition from a two-part qualitative analysis: 1) an extensive review of existing definitions in industry and academia and 2) semi-structured interviews with managers of six diverse Utah water utilities. We propose that water supply be defined by three overlapping components—hydrology, infrastructure, and governance—and that reliability be defined by the capacity of the limiting component.

16. WATERSHED PROTECTION PROGRAMS
Panel -

17. MILLSITE DAM REHABILITATION PROJECT
Eric Dixon - Division of Water Resources

18. GREAT SALT LAKE BASIN, GROUNDWATER MODEL
Kyle Davis - UGS0

19. NEW WATER PLANNERS (SB-76)
Panel: Rick Webster Division of Water Resource Michael Grainge Division of Drinking Water, Jay Olsen Department of Agriculture and Food.

Utah has been impacted by 20 years of drought, and our population continues to grow putting a strain on water resources. Legislators have passed bills to encourage reducing water use and tying water and land planning together. Each presenter will discuss their agency’s role in implementing the new legislation. The panel will address questions as time permitted.

20. AGENCY FUNDING OPTIONS FOR WATER PROJECTS

Panel -

21. EVALUATION OF SURFACE RUNOFF & GROUND WATER (EAST CANYON CREEK)

Casey Root - USGS

East Canyon Creek is a perennial snowmelt-dominated stream that lies in the Snyderville Basin, Summit and Morgan Counties, Utah. Its headwaters begin as McLeod Creek on the eastern slopes of the Wasatch Mountains and joins Kimball Creek to form East Canyon Creek, proper, below the Interstate 80 overpass where it flows north-northwest to East Canyon Reservoir. The reach between its waters and East Canyon Reservoir includes three U.S. Geological Survey streamgauge stations that monitor streamflow discharge and specific conductance. The baseflow component, or the fraction of total streamflow that sustains flow between snowmelt or precipitation events, was estimated on East Canyon Creek using daily specific conductance values from streamgages with a conductance mass balance hydrograph separation approach. Quantitative baseflow estimates can be used to inform water quality management or proactive steps in response to seasonal climate fluctuations including varying snowpack from year to year. Baseflow estimates and streamflow were tested for trends and correlation with snowpack telemetry (SNOTEL) data within the East Canyon Creek watershed to measure the strength of monotonic relationship between the two datasets. A robust nonparametric regression based on the median of one variable given another was calculated to provide the means to forecast streamflow and baseflow based on SNOTEL data. A flood frequency analysis uses annual peak streamflow to further offer a comprehensive assessment of streamflow likelihood in any given year. This study illustrates the benefits of long-term water quality monitoring by developing a model that can be directly used for water management in real time.

22. LOWER SEVIER DMAD DAM REHABILITATION PROJECT

Thayne Clark - Bowen, Collins & Associates

DMAD Reservoir is the penultimate reservoir on the Sevier River, located near the town of Delta, Utah. With a storage capacity of approximately 11,000 acre-ft, it primarily serves as intermediate storage prior to conveying irrigation water to the greater Delta area and cooling water to the Intermountain Power Plant. The 7,270 square-mile drainage basin upstream of the DMAD Dam required the spillway to pass a probable maximum flood (PMF) of 48,300 cfs, a significantly larger flow than that permitted by the old spillway's approximate 18,000 cfs capacity. To address the challenges in passing the PMF flows, a new labyrinth weir spillway design was ultimately selected and constructed. The 8-cycle labyrinth spillway increased the effective weir length to 1,200 ft but was contained within a 300 ft span. The owner and engineer will provide their perspectives on the lessons learned through the planning, design, and construction phases of this project, including key challenges in keeping the reservoir facilities operable through the entirety of construction.

23. Severe Consequences on the Sevier: Lessons Learned on Yuba Dam Spillway Replacement

Thayne Clark, PE1; Jon Howe, EIT2; Andy Nickle3

Sevier Bridge (Yuba) Reservoir is the final major storage reservoir on the Sevier River, located in central Utah. At 92-ft tall and stretching 1,340-ft long, the earthen dam creates a 227,000 acre-foot reservoir, making Sevier Bridge Reservoir the largest privately owned reservoir in the state of Utah. With a 5,160 square-mile drainage basin the Sevier Bridge Dam is required to pass a probable maximum flood (PMF) of 53,200 cfs, significantly higher than the old spillway's approximate 17,000 cfs capacity. To correct these deficiencies a full spillway replacement was required and eventually implemented as part of this rehabilitation project. This presentation provides the owner's and engineer's perspectives and reflections on the planning, design, bidding, and construction of this large project. A lesson learned was the importance of creating and implementing a reservoir management and emergency action plan during construction. The project started in late 2022 with the removal of the spillway and downstream embankment excavation as the reservoir sat at record-low drought levels. Utah then experienced its wettest winter on record, which placed the dam in a vulnerable position with exceptional runoff forecasted to hit the lower river system. Execution of the reservoir management and emergency action plan helped with inflow forecasting and the emergency cofferdam design, allowing for the storage of all runoff inflows allowing construction to continue.

24. INTEGRATED WATER DISTRIBUTION SYSTEMS

Nathan Lunstad - Division of Drinking Water

25. ECONOMY OF SCALE OF ENERGY INTENSITY IN AQUIFER STORAGE & RECOVERY

Alyson Rapp - AE2S

More water utilities are adopting aquifer storage and recovery (ASR) to balance long-term water supply and demand. Due to large implementation and operation costs, ASR projects need to be optimized, particularly for energy use, which is a major operating expense. This study examines the relationships among energy use, recharge, and recovery at two ASR projects in the western United States. The major finding is an economy of scale for recovery processes, but not for gravity-fed recharge processes. The economy of scale found is as follows: the energy intensity recovered decreases with volume. This suggests it is more energy-efficient to recover large volumes of water in one interval instead of recovering smaller volumes at more frequent intervals. The H2Oaks recovery process experienced a 78% decrease in energy intensity from 0 to 50,000 m³ recovered, while the Sand Hollow site experienced a 43% decrease in energy intensity from 0 to 50,000 m³ recovered. Statistical analyses of the recovery process showed p values lower than 0.0001, R² values between 0.43 and 0.57, and a RMSE value between 0.55 and 2.1, indicating the presence of a moderate correlation between energy and volume. This economy of scale has been observed in multiple instances in water and wastewater treatment. This finding not only has applications to ASR but also to all recovery or recharge wells, whether or not they are paired with each other. Furthermore, this study confirms the need for more reliable and accessible energy data to fully understand the implications of the energy-water nexus.

26. ADOPTION OF AI IN DRINKING WATER OPERATIONS

Annelise Capner - BYU & Alyson Rapp - AE2S

In recent years, a vision has been shared of how artificial intelligence (AI) can optimize the increasingly complex operations of drinking water utilities. However, it has been unclear if and how water utilities use the technology. Here, we surveyed a simple random sample of 49 large US water utilities to provide a snapshot of progress. We found that 12 of them (24%) have used some form of AI. Of those that have not, the majority plan to use or may plan to use AI in the next 5 years. The reported AI uses were experimental, manual, or partial models rather than fully integrated, ongoing applications. Respondents are motivated to use AI for improving water quality, detecting leaks, and automating complex systems, but they cited payback uncertainty and lack of AI expertise as the most common barriers to implementation. To better demonstrate how AI can join other tools available to assist human operators, researchers should focus on the top motivations and barriers identified here and partner with water utilities on convincing case studies of full-scale AI projects. These steps will support further responsible adoption of AI to optimize water utility operations as part of more sustainable communities.

27. SECONDARY WATER METERING UPDATE

Shalain DeBernardi - Division of Water Resources

Come find out the current status of secondary metering throughout the State of Utah. Learn about the requirements, any exemptions, and recent changes to the law. We'll also discuss what the Board of Water Resources is doing to help, and the water conservation expected.

28. AIS UPDATE ON INVASIVE SPECIES

Bruce Johnson - Division of Wildlife Resources

Utah Division of Wildlife Resources Lt. Bruce Johnson will discuss the Aquatic Species Program. Lt. Johnson will describe the current status of the AIS Program, past and present trends, current operations, future plans. Lt. Johnson will also discuss the current technology in use by the AIS Program.

29. THE FUTURE OF AQUIFER REPLENISHMENT WELLS

Neil Burke & Gary Gin - LRE Water

Aquifer replenishment (recharge) wells are known to be difficult to operate and maintain, mostly due to clogging in the formation, filter pack or well. This talk will focus on returning aquifer replenishment wells to operation through redevelopment/rehabilitation and testing. Operational strategies to minimize clogging and maintain long-term recharge operations in these wells will also be presented along with a case study featuring a successful development/rehabilitation of a replenishment well and return to long-term recharge operations.

30. UTAH FLUX NETWORK PROGRESS UPDATE

Paul Inkenbrant & Greg Gavin - Utah Geological Survey

In this two part presentation we address the measurement and analysis of evapotranspiration (ET) in Utah. The first part will give an overview and update of the Utah Flux Network and the second part will discuss the Pahvant Valley area and how ET data were examined for this region.

The Utah Flux Network operates 7 eddy covariance stations throughout the state. The stations are used to better understand one of the biggest components of Utah's hydrologic balance: ET. Satellite-based ET estimates are emerging as one of the most spatially and temporally continuous ET datasets for the Western US, and can potentially harmonize water management for the Western States. However, these estimates still need to be fine-tuned and ground truthed for Utah. Pahvant Valley, Millard County is an agricultural hub located in central Utah that depends on a combination of surface and groundwater for its culinary and agricultural needs. The valley has undergone significant management changes over the past three decades, impacting its agricultural practices and water resource utilization. In this presentation we will explain how remote sensing helped estimate timing, location, and the magnitude of changes observed.

31. FLOW METER ACCURACY

Steve Barfuss - USU Water Research Lab

32. MICROPLASTIC POLLUTION ISSUES

Joanna Hou - USU Water Research Lab

The plastisphere, consisting of the microbial community inhabiting plastic debris, presents a critical area of study due to its potential environmental impacts. Within this microcosm, a diverse array of microorganisms, including harmful bacteria (e.g., antibiotic resistant bacteria) and plastic degraders, thrive. Understanding the dynamics of these populations is crucial for assessing the ecological consequences of plastic pollution. This presentation aims to delve into the intricacies of the plastisphere, focusing on the presence and activities of hazardous bacteria and plastic-degrading microorganisms. Through a synthesis of recent research and case studies in wastewater treatment plants and landfills, we aim to elucidate the mechanisms driving their proliferation and the potential risks they pose to ecosystems and human health. By shedding light on this pressing issue, we seek to contribute to the development of effective strategies for mitigating plastic pollution and its associated risks.

33. REMOTE SENSING OF ET

Alfonso Torres - Utah State University

At Utah State University, we're leveraging increasingly accessible remote sensing technologies to generate valuable data for agricultural and urban applications, particularly in Utah where irrigation is crucial for farm productivity and urban wellbeing. This presentation outlines three ongoing projects in Utah, a region grappling with continuous drought conditions impacting agriculture, cities, and natural landscapes. The first project uses drones over a golf course in Roy to correlate turfgrass water use and quality, offering insights on addressing water shortages while maintaining greenness. The second project in Santaquin employs drones and OpenET, an evapotranspiration estimation platform, to assess monthly water use and irrigation needs in cherry crops, with the aim of developing age-based guidelines. The third project in Cache Valley utilizes OpenET to identify water conservation opportunities at the farm and canal company scale during the season. The findings could inform additional farming opportunities or allocation of potential savings towards maintaining green urban areas or supporting environmental needs like the Great Salt Lake or riparian flow. These projects underscore the potential of remote sensing technologies in informing and enhancing water management strategies in Utah, heralding a future of more sustainable practices.

34. USU WATER INITIATIVE PROJECTS I

Scott Jones & Kelly Kopp - Utah State University

In 2019, the state's Division of Water Resources established regional water conservation goals to be pursued in nine municipal and industrial areas of the state. The goals established targeted water use reductions for the years 2030, 2040, and 2065, contingent on reductions achieved during each time frame. The regional goals focused primarily on outdoor uses of water and USU's Center for Water Efficient Landscaping has conducted multiple research projects, with the support of the Extension Water Initiative, to help the state achieve the goals. Integrated land and water planning efforts, smart water monitoring technologies, low water use plant development and trialing, irrigation auditing, and informational provision projects, among others, have been conducted by the Center and the results of these projects will be shared.

Plant available soil water plays a vital role in the sustainability of dryland and rangeland agriculture, especially in regions facing episodic drought such as in the Western US. We are developing an approach for both understanding depth of root water extraction as well as modeling that uptake through the integration of water content sensor depth and measured data coupled with machine learning algorithms. We estimate crop root water extraction profiles and correlate these with soil moisture sensor readings within the root zone to approximate water uptake functions. These functions are then correlated to growing degree days and to biomass production for yield prediction. Machine learning algorithms are used to analyze these interactive data patterns and to learn relationships between seasonality and plant root water uptake to understand how much water is available. The integration of water content sensor historical data and machine learning algorithms holds promise for improved understanding of the water use by plants and their biomass production. By accurately estimating soil hydraulic properties and predicting soil profile water uptake, we hope to improve estimation of crop and rangeland yield for improved management of land resources in water-limited regions.

35. USU WATER INITIATIVE PROJECTS II

David Rosenburg & Wei Zhang - Utah State University

36. DEER CREEK INTAKE PROJECT UPDATE

Jeff Budge & Brad Jorgensen - Provo River Water Users

The Provo River Water Users Association is nearing completion of its first year of construction of a major 3-year project improving the Deer Creek Outlet. This project was designed by AE2S and is being constructed by Granite as CM/GC. Recent activities included underwater construction of a new exit portal and entry portal pre-tunneling activities (retaining walls, preconstruction grouting, microtunnel Boring Machine (MTBM) thrust frame, etc.). FY24 will be a very historic year with microtunneling a new 72" diameter bypass pipe through the canyon sidewall bedrock and exiting into Deer Creek Reservoir. The MTBM will be recovered in the wet with the assistance of divers, barges, cranes, etc.

37. WHERE'S THE DATA? UTAH WATER RIGHTS & USGS

David Jones - Utah Water Rights

Ryan Rowland - USGS

The United States Geological Survey (USGS) Water Resources Mission Area stores most of its water-related data in the National Water Information System (NWIS - <https://maps.waterdata.usgs.gov/mapper/index.html>), a publicly available database. Several web-based tools have been developed to help users access NWIS data in just a few clicks. We will demonstrate several of these easy-to-use tools including the National Water Dashboard (NWD) for accessing real time and historic data at active sites, and NWIS Mapper for accessing historic data at active and inactive sites. Data access will be discussed in the context of streamgauge operation and USGS' data approval process. The State Engineer is statutorily responsible for the measurement of waters of the State. The Division of Water Rights gathers water measurement data from many different sources. We will discuss the different types of water measurement information that the Division collects and how that data can be accessed on our website.

38. INNOVATIVE SOLUTIONS FOR INFRASTRUCTURE SUSTAINABILITY

Jared Hansen & Will Garner - Central Utah Water Conservancy District

The Bonneville Unit of the Central Utah Project is currently nearing completion, however many of the project facilities are approaching/exceeding 50 years of operation. In this presentation, we will discuss lessons learned in maintaining this infrastructure to operate at a high level of reliability. Several examples of normal maintenance up to the complete replacement of a feature will be presented.

39. EMERGENCY MANAGEMENT RESPONSE FOR UTILITIES

Tyler Harvey - Central Utah Water Assoc.

Joel Ferry, Executive Director of the Utah Department of Natural Resources, will share an update on recent water legislation and its impacts on the state's water supply. Over the past several years, Utah has seen significant investment and a long list of bills targeting water conservation, efficiency and infrastructure aimed at addressing the state's growing water challenges. New laws have been enacted to encourage efficient agricultural water use, incentivize the adoption of water-saving technologies, and improve infrastructure for water storage and distribution. The state remains committed to implementing comprehensive strategies to secure a resilient and sustainable water future, emphasizing conservation, innovation, and equitable water allocation to meet the needs of its expanding population while safeguarding its valuable water resources.

40. HISTORY OF STRAWBERRY TUNNEL TRANSBASIN DIVERSIONS **Joe Crawford - Central Utah Water Conservancy District**

On June 20th, 1912, the final blast of dynamite opened the Strawberry Tunnel. This transbasin project began in early 1906 when the United States Reclamation Service began digging a 19,000-foot hole through solid rock to divert water from the Colorado River Basin into the southern end of Utah County. The main purpose of the project was to bring enough water through the tunnel to irrigate up to 70,000 acres of land that had previously been lacking the moisture to do so. This forward-thinking truly was revolutionary for the State of Utah. The Strawberry Tunnel and other such successful transbasin diversions have allowed the population of the State to expand to areas that would otherwise be uninhabitable. These diversions have also played a crucial role in helping the residents of Utah weather the extreme drought conditions that have plagued its territory off and on since its completion.

41. TEE TALK: TEN TIPS FOR EFFECTIVE LEADERSHIP **Jim Brooks - Central Utah Water** **Mitch Dabline - HDR Engineering**

We're not that naive to not know that many of you come to this conference in St. George for warmer weather, green grass, golf, attend a few conference sessions...and play some more golf!

In that vein, we will discuss effective leadership practices, in golf parlance, that can help you identify critical leadership traits, select the right employees, play it forward on the right fairway, celebrate successes, coach employees through sub-par performance, as well as other timely leadership topics.

We may yell "fore" on some unacceptable practices but, for the most part, we'll have a great round, including discussion about some interesting leadership scenarios.

So, after your 18-hole round on Monday (if you play in the tournament), come tee it up with us at our leadership presentation.

42. EMPLOYMENT LAW ISSUES FOR THICK EEJITS **Robert Moore - Central Utah Water Conservancy District**

"Whether yer man is some thick eejit or dead on", let's talk employment law just after St. Patrick's Day. Whether you employ a bunch of hooligans or a bunch of cracking employees, I will take you down a little Irish country road and provide some knowledge of employment law along the way.

43. ENDANGERED SPECIES UPDATE

Sarah Seegert - Utah Geological Survey

Utah is one of the fastest growing states in the country and also one of the driest. These two facts bring unique challenges to native species management in the State. In some cases, native species have been impacted to such a degree that they have been listed on the federal Endangered Species list. In the face of these challenges, Utah established the Endangered Species Mitigation Fund to direct funds toward the protection, conservation, and recovery of federally listed species and species of greatest conservation need as identified in the Utah Wildlife Action Plan. Since the establishment of the ESMF, Utah has successfully prevented more than 25 ESA listings and has developed a model program for cooperative down- and delisting from the ESA. Two species have been downlisted from Endangered to Threatened, with another recommended for downlisting. Ute Ladies Tress has also been recommended for removal from the Endangered Species List. In addition, Utah is a participant in four formal endangered fish Recovery Programs. These programs are focused on the recovery of seven ESA-listed species, with joint goals of recovering the species and allowing continued development of water for human needs. These cooperative programs have been highly successful at both their goals and have provided essential ESA-compliance to existing and new water projects that would otherwise have to go through individual consultation with the Fish and Wildlife Service. Utah continues to be committed to its growing human population while conserving and recovering its native species and the Endangered Species Mitigation Fund remains an important tool for accomplishing these goals.

44. DEPARTMENT OF NATURAL UPDATE

Joel Ferry - Utah Department of Natural Resources

Joel Ferry, Executive Director of the Utah Department of Natural Resources, will share an update on recent water legislation and its impacts on the state's water supply. Over the past several years, Utah has seen significant investment and a long list of bills targeting water conservation, efficiency and infrastructure aimed at addressing the state's growing water challenges. New laws have been enacted to encourage efficient agricultural water use, incentivize the adoption of water-saving technologies, and improve infrastructure for water storage and distribution. The state remains committed to implementing comprehensive strategies to secure a resilient and sustainable water future, emphasizing conservation, innovation, and equitable water allocation to meet the needs of its expanding population while safeguarding its valuable water resources.

45. DIVISION OF DRINKING WATER UPDATE

Nathan Lunstad - Division of Drinking Water

46. DIVISION OF WATER QUALITY UPDATE

John Mackey - Division of Water Quality

47. GREAT SALT LAKE WATER QUALITY UPDATE**Hugh Hurlow & Emily Jainarain - Utah Geological Survey**

This multidisciplinary, collaborative project aims to improve understanding of the mechanisms, locations, chemistry, and volume of groundwater inflows to Great Salt Lake (GSL). Existing estimates of groundwater inflows to GSL are essentially derived from water budget residuals (i.e., inflow needed to balance the overall GSL water budget), not direct measurements. Independent measurements of groundwater inflows are needed to verify and improve water budgets and to evaluate the complex interplay between lake water and groundwater in wetlands. Recent work, including groundwater modeling (Masbruch et al., 2016), stream chemistry (Godsey et al., 2009), streamflow modeling (Brooks et al., 2021), and stream hydrograph analysis (Wolf et al., 2023) indicated that groundwater inflow (both directly into GSL and into streams within the GSL watershed) was previously underestimated. In addition, a study of stream, spring, and lake water chemistries suggested groundwater accounts for ~ 10% of the GSL brine (Bunce, 2022); and a large-scale, GIS-based analysis of groundwater levels surrounding GSL estimated ~ 10% groundwater contribution to the total annual GSL water budget (Zamora and Inkenbrandt, 2024).

Our project includes installing monitoring wells along transects from the GSL margin to the playa; geochemical sampling and groundwater-level analyses; measuring vertical groundwater seepage to the land surface; geophysical surveys; and analyzing aerial imagery. Farmington Bay is our current primary focus area, but our study includes sites near Saltair, the very north end of Tooele Valley, and the west shore of Antelope Island to compare groundwater inflows in various hydrogeologic settings. To date we have (1) conducted seepage measurements of groundwater flow to the land surface in Farmington Bay, (2) cored sediment to as deep as 100 feet at five sites, (3) installed groundwater monitoring wells at four sites, and (4) measured pore water conductivity in two of the cores. Future work includes sampling and analyzing core pore water and well water for chemistry, installing long-term monitoring equipment, installing more wells, resistivity measurements, and investigating possible areas of diffuse groundwater inflow using small unmanned aircraft systems (sUAS)-collected thermal imagery and seepage meters.

48. CANCELLED

49. USU EXTENSION - MEET WITH IRRIGATION CANAL OPERATORS**Burdette Barker - Utah State University**

50. AG WATER OPTIMIZATION PROGRAM & EFFICIENCY PROJECT STATUS

Hannah Freeze - Utah Department of Agriculture and Food

The Agricultural Water Optimization Program works with agricultural water users to help them optimize water use while maintaining or improving agricultural production. This session will outline general program information, how an agricultural water user can participate if interested, and highlight the accomplishments of the program to date.

51. AG WATER OPTIMIZATION GUIDANCE COMMITTEE

**Hannah Freeze - Utah Department of Agriculture and Food
Brent Barker - Chairman of Ag Water Optimization
Guidance Committee**

This breakout session will be an opportunity to have an informal question and answer session with the Chairman of the Agricultural Water Optimization Committee and UDAF staff. The Agricultural Water Optimization Committee governs the program, makes decisions regarding priorities and makes project funding recommendations to the Utah Conservation Commission.

52. AG VOLUNTARY INCENTIVE PROGRAM

Katie Slebodnik - Utah Dept. Of Agriculture & Food

"The Agricultural Voluntary Incentive Program (AgVIP) is a voluntary, incentive-based conservation program for agricultural producers looking to implement nutrient management practices on their operation. During their three-year contract, producers implement nutrient management plans to maximize economic opportunities while building soil health and protecting water quality. Since 2020, the program has enrolled over 77,000 acres and 116 operations throughout the State. Moving forward, the program is looking to expand to include additional best management practices through partnerships with other conservation organizations such as Saving Tomorrow's Agriculture Resources (STAR)."

53. SOIL HEALTH & WATER HOLDING CAPACITY

Tony Richards - Utah Department of Agriculture and Food

This presentation delves into the intricate relationship between soil properties and water dynamics, examining how various factors, such as soil structure, organic matter content, and carbon levels, influence water behavior in the soil environment. By investigating the mechanisms behind water infiltration, retention, and movement through the soil profile, we aim to uncover the key drivers that govern water availability for plants and ecosystems. Furthermore, this presentation explores the role of soil health-focused practices in enhancing water use efficiency. By adopting practices that promote soil health, such as cover cropping, conservation tillage, and organic amendments, we can improve soil structure, increase organic matter content, and boost water-holding capacity. These improvements not only benefit agricultural productivity but also contribute to sustainable water management practices and improvements in water quality.

54. AG LAND PRESERVATION PROGRAMS

Jeremy Christensen - Utah Department of Agriculture & Food

In 2016, 80% of all owner-operated land nationwide was owned by individuals who were 55 years or older (Bigelow et al., 2016). The average age of producers in Utah is 58.7 years old. This explains why Utah farm and ranch producers have listed succession planning as one of the most important programmatic needs from USU Extension.

UDAF has begun working with landowners & producers, as well as those seeking access to land for farming and ranching, to plan for their transition in a way that creates opportunities for the incoming generation, as well as preserves agricultural land for future generations. The presentation will discuss the present and future of agriculture in Utah, farm and ranch succession planning, conservation easements, and the LeRay McAllister Working Farm and Ranch Fund.

55. CONSERVATION DISTRICTS, KEY TO UDAF LOANS

Jim Bowcutt & Amy Weingren - Utah Department of Agriculture & Food

Conservation Districts, Key to UDAF Loans Water conservation in the agricultural community has been a hot topic as of late. The State's 38 Local Conservation Districts have played an important role in helping inform producers and help them utilize State and Federal programs to better conserve their water. This presentation will highlight the roles that the Local Conservation Districts have played, and highlight the Agricultural Resource Development Loan program, and how it can be utilized by agricultural producers to implement more water conservation projects on their operations.

56. CANCELLED

57. SURFACE IRRIGATION PERFORMANCE RESULTS

Burdette Barker - Utah State University

58. LEVERAGING GAMIFICATION FOR EFFECTIVE WATER CONSERVATION

Jesse Empry -

59. BUILDING A 50 MGD PUMP STATION - LESSONS LEARNED

Travis Christensen & Sam Fankhauser -

The Jordan Valley Water Conservancy District (JVWCD) has a reputation of providing high-quality water and proactively addressing growth with sustainable solutions. When one of the District's primary pumping facilities approached its maximum capacity, JVWCD hired AE2S to design and support construction of a new 50 MGD pump station to serve the District's growing service area for many years to come.

Some of the design elements included: equipment and material sizing based on growth projections, accommodations for future Southwest Aqueduct connection, a new penetration and connection to the existing 3MG reservoir on site, transient analysis to handle unexpected surges at loss of power, automatic transfer to standby power generation, site drainage design to address lack of existing stormwater infrastructure.

The spike in material and equipment cost and lead times post-COVID occurred during the construction of this project. Other challenges surfaced during construction as well. We would like to share with other water providers our approach to completing this project and lessons we learned along the way.

60. FEAST OR FAMINE: MANAGING HARD SWINGS IN WATER CONDITIONS

Mark Chandler

61. KOOSHAREM DAM REHABILITATION PROJECT

Mike Christiansen & Bryan Frank

62. CALMING FEARS THROUGH FACTS: LESSONS LEARNED IN PFAS COMMUNICATIONS

Shawn Harkness

This presentation discusses how water providers can effectively and responsibly share PFAS test results, what they mean for customers, and how culinary water providers can address any issues. Proposed US EPA regulations would establish significantly reduced Maximum Contaminant Levels (MCLs) for PFAS constituents, with enforcement beginning in 2027. These new standards would push water providers out of compliance once those standards change. The presentation examines current state regulations and available resources, along with case studies related to PFAS and other emerging constituents.

63. GUEST PROGRAM: LIFE UPGRADE KIT: SEVEN GAME CHANGING TOOLS FOR YOUR BEST CHAPTERS YET**Charity Lighten - Life Coach**

Discover the keys to unlocking a happier version of yourself, as we delve into the secrets that go beyond the ordinary. In this unique and interactive class, you'll gain valuable insights into the science of happiness, practical tips for cultivating joy, and tools to navigate life's challenges with resilience and grace.

In a world filled with hustle and bustle, it's easy to overlook the simple yet powerful strategies that can transform your life. Join us for a transformative class that blends the magic of morning rituals, mindset mastery, and self-care secrets. Release emotional baggage, embrace a holistic approach to well-being, and redefine your narrative.

You'll learn how to prioritize self-care, nurture meaningful relationships, and tap into your inner strength. This class is not just about fleeting moments of happiness; it's about creating a lasting foundation for a more fulfilling and joyful life. Can't wait to see you all there! (Oh, and did I mention that there will be sourdough :)!
