Meeting Minutes
October 14, 2025

Hosted in-person at the Fremont County Annex Building in St. Anthony, ID and hybrid via Zoom

Attendance

- **20** in-person
- **37** via Zoom

Introductions and Community Building

Aaron Dalling, co-facilitator from Fremont-Madison Irrigation District, welcomed everyone to the hybrid meeting. The group went around with introductions and then called for a moment of silence before opening for announcements and community building.

Announcements

None.

Snake River above King Hill: River and Reservoir Operations (BOR)
Jeremy Dalling, U.S. Bureau of Reclamation

Jeremy Dalling began his presentation with an overview of the Upper Snake Reservoir System: a reservoir system with 9 reservoirs with a total storage capacity of 4.2 million acre-ft. The Upper Snake reservoir system is fully allocated, meaning that the U.S. Bureau of Reclamation contracts with irrigation entities for space in the reservoirs and USBR has water rights that allow for that space to be filled with water. Water is allocated to irrigation entities on a repayment agreement. These entities put water to beneficial use on their lands and whatever use they have is certified in the state of Idaho. USBR's role is to provide water supply to those contracting agencies.

Jeremy introduced the concept of natural flow as the amount of water that would flow past Milner without dams, reservoirs, or irrigation diversions. Natural flow is the most critical parameter for water supply in the Upper Snake—almost everything is based on it, including water rights and storage rights. If there is not enough natural flow to go around, people either don't divert or they need to use their storage accounts. For Irrigation Year 2025 (Nov 1 2024–Oct 31 2025), natural flow above Milner Dam is currently >7 million acre-ft so far, which is 81% of average. Compared to IY 2024, when water supply was 95% of normal, we're ~1.3 million acre-ft lower. So we have had significantly lower water supply this year. Some canals this year had to ration their water supply or shut off early.

As a result of limited natural flow, reservoir storage was drawn down heavily this year. Recent precipitation has helped us rebound some. Winter base flow conditions will be important for filling

the reservoir system going into 2026. We had pretty good storage going into 2025, so we did okay this year. But if we continue to a drought next year, we can expect more rationing and more reductions in water supply.

Jeremy Dalling highlighted the importance of April 1 runoff forecasting. This forecast estimates how much runoff we're going to get into our reservoirs, which is important for informing the future of water supply and how to regulate reservoirs, including flood risk management operations for Jackson and Palisades. Jeremy defined flood risk management as the management of available space in the reservoir to buffer the incoming runoff so people aren't flooded out downstream. This year, the April 1 forecast forecasted 102% of normal runoff April through July. But observed values were 833,000 acre-ft lower than what was forecast. This is likely the largest difference between forecasted and observed values ever seen in the basin, going back 40 years. As a result, the observed runoff was 77% of normal at Heise, compared to the 102% that was forecast. For Island Park, observed conditions were 63% of normal, but 85% of normal was forecast.

This year, the date of allocation was June 17. We did not fill our reservoir system to its 4.3 million acre-ft capacity by June 17, but only had 4 million acre-ft to allocate. This resulted in a 91% system-wide allocation for the Upper Snake. With perfect hindsight, we could have stored an additional 19,000 acre-ft, but with how quickly factors were changing this spring, managers were operating on a really tight margin.

In terms of irrigation diversion (not yet certified), water use increased in mid-April when it was very windy and dry. As a result, irrigators needed to keep their fields intact and keep them from blowing away, and were also able to plant earlier this year. Above-normal water usage continued through mid-May. After the date of allocation, water use was rationed down to below-normal. Compared to last year, there was less water available for recharge. Broadly speaking, on any given day in the Upper Snake, there is 55,000 acre-ft of water usage.

In terms of current conditions, Jeremy shared the current storage distribution—with Jackson Lake 65% full and Palisades at 6% full. He noted that this is by design. If you store water as high in the system as possible, you can always deliver it downstream. As a consequence, American Falls and Palisades have low reservoir levels which has impacted diversions, recreation, and water quality. The reservoir system is currently 23% full compared to 58% full (median). For people asking why certain reservoirs are low, the answer is that natural flow as not available to those water users so they had to use storage water. Jeremy highlighted that we are not at a historic low: 70% of years were higher and 30% were lower. Jeremy noted that the Henry's Fork (Island Park Reservoir and Grassy Lake) has fared well compared to other reservoirs. Outflow from Palisades currently 900 cfs, set low enough for American Falls to capture that water this winter period so it won't spill out of the system next spring.

In closing, Jeremy shared that Ryan Alcorn is now the acting area manager as Brian Hornsberg has retired.

Q&A: Snake River above King Hill: River and Reservoir Operations (BOR)

- Eric Jackson asked why the runoff prediction didn't materialize, asking if it was due to lack of precipitation or heat. Jeremy Dalling offered multiple reasons: 1) uncertainty is presented when the model is trained on historical data, 2) runoff is also subject to future conditions not known at the time of the model run, and 3) the USBR forecast presents the middle range of values and the

range on top of that. Jeremy noted that dry conditions may result in lower runoff yield and clarified that the observed runoff yield being different from the prediction doesn't necessarily mean that April 1 forecasts are inaccurate, just that the modeled range did not capture what was observed.

Henry's Fork Watershed Phosphorus Study
Ryan Sargeant, Professor, Brigham Young University—Idaho

Ryan Sargeant introduced the audience to his watershed monitoring research program at BYU-Idaho, established in 2019 to train students to become water quality scientists. As a result, some data are truncated as the training goals supersede data goals. This year, 21 students participated in the program.

Ryan centers his program on the Oregon Water Quality Index as a framework for understanding water quality, an index that works well for Idaho given similar geography. The program takes field samples and analysis in the laboratory. Students evaluate total solids, temperature, pH, dissolved oxygen, biological oxygen demand, nitrogen, ammonia, nitrate, total phosphorus or phosphate, and fecal coliform (primarily E. Coli). Numeric data are plugged into a model to output a more intuitively scaled value from 0 to 100, where 100 represents the best quality water and 0 is the worst.

Ryan shared results from nitrogen monitoring. The results do have a sampling bias, as the project started in Teton Valley (where nitrogen levels are the highest in the watershed) and then moved to Island Park (where the nitrogen levels tend to be very low). Quite a bit of nitrogen accumulates in the Teton River as it flows through Rexburg where it is physically related to the gold course, but may not be associated with the golf course.

Ryan introduced the audience to several instruments his program uses, noting how expensive, fragile, and non-user friendly the IC is—requiring high maintenance costs. Using this instrument, the program has identified a lot of fluoride in the Fremont County water system. In terms of nitrogen monitoring, nitrate is the primary chemical form of nitrogen in the system and surface water nitrate levels were low in the watershed in 2024 and 2025.

Moving on to the results from a recent phosphate study, Ryan highlighted the how understanding phosphate is key to understanding algal blooms in Henry's Lake and Island Park Reservoir. Broadly, the program has samples phosphate in Teton Valley, Island Park, Henry's Lake, the lower Henry's Fork, and Kilgore. The program has identified large amounts of phosphorous coming off of one hillside in Teton Valley, home to Hill Creek and Slocum Creek. When you average that data into the system, it unnecessarily penalizes Teton Valley for high levels of phosphate, whereas the rest of the mainstem doesn't show a lot of phosphate in the system. Ryan noted that, for the sake of convenience, the program assumes that most of the phosphate exists as orthophosphate. If that assumption is incorrect, then the phosphate levels they have been monitoring aren't valid across the system.

In terms of the Henry's Lake study, students monitored phosphate in all tributaries that feed into Henry's Lake and at the dam outlet. In the months monitored (May–July), there is not much coming in and only a little phosphate coming out. Ryan was surprised to learn that Henry's Lake has regular algae blooms, because he assumed it was a low-phosphate environment given the data. But algae

blooms tend to happen after his program's monitoring ends for the year and, in talking with Jack McLaren at the Henry's Fork Foundation, has learned that phosphorus in Henry's Lake is largely tied to lakebed sediment. So a student (Chris Lewis) scoped out how the program can measure sediment phosphate within their field and lab capabilities. Unfortunately, measuring orthophosphates is no longer going to be sufficient and for this project to work, the program's laboratory capabilities will need to expand. But the team was able to get three weeks of data in July 2025 before the BYU-I hard-closure on Pioneer Day. Chris used a sediment core drill to collect sediment from the Henry's Lake shoreline and outlet. As the project continues into 2026 and 2027, Ryan expects they'll be able to develop a detailed sediment map akin to one created for Cherry Creek Reservoir (in Colorado). Ryan noted that he is open to collaborate with people who would like to understand orthophosphate, and to be patient if collaborators are interested in understanding total phosphate as those data are harder to pull out of the sample model.

In closing, Ryan shared that he has unlimited freedom to pursue projects in a very short amount of time with a group of students subject to large turnover. Over the last five years, Ryan has trained 100 students, some of whom have indeed gone on to pursue careers as water quality scientists.

Q&A: Henry's Fork Watershed Phosphorus Study

- Eric Jackson suggested that Ryan Sargeant reach out to relevant county commissioners for some help with funding, as this research would be a great benefit to them in knowing what's going on in their areas and although funds may differ from county to county, they typically have small amounts available. Ryan Sargeant thanked Eric for the helpful suggestion, noting that his course operates on a relatively small budget—with 2025 having a budget of <$10,000 to cover student pay, travel expenses, and laboratory reagents.
    - Christina Morrisett added that Fremont County has expressed concern with Henry's Lake from a recreational standpoint, and also suggested reaching out to the Henry's Lake Foundation. Ryan Sargeant noted that he has been waiting to find a relevant avenue to reach out to HLF—thinking that E coli monitoring might add some value.
- Rob Van Kirk commented that Ryan Sargeant's overall observations align with 30 years of research:
    - Rob noted that there is not a lot of nitrogen in the river system as a result of agricultural runoff (expect maybe a little bit in the Teton River) because we don't really have agricultural runoff in the watershed. Any excess irrigation water goes through the soil and into groundwater, we don't have overland flow that sends chemicals into the river system.
    - Rob also noted that phosphorus in Henry's Lake is likely similar to Island Park, in that the phosphorous present is legacy phosphorus present in lakebed sediment that has been there on geological timescales, before these dams were built. We don't have a lot of new material coming into reservoirs—as is supported by Dr. Sargeant's tributary samples—but that phosphorus is mobilized through biogeochemical cycles seasonally in Island Park Reservoir and Henry's Lake.
    - Ryan Sargeant asked about the timing of these seasonal cycles—that they're usually in September and October in his understanding.

- Rob confirmed that we do see a lot in the fall, but that we observe multiple cycles throughout the summer in Island Park where anoxic conditions release phosphorus, generating algae blooms that decay and start the cycle over again. Rob also confirmed that the fall is the worst for algae blooms on Henry's Lake.
- Ryan added that he would like to shift the research focus for Henry's Lake beyond May–July to improve monitoring.
- Rob added that Jack McLaren (Henry's Fork Foundation) will continue to talk with Ryan about opportunities for HFF and Ryan to collaborate.

- Eric Jackson asked if the photo from the final slide was taken below Heise. Ryan confirmed, noting it's from Crest Creek. Eric encouraged the group to take a hike here—it's a paved trail, beautiful little hike, and great for kids and older people. Ryan noted to be aware of poison oak.

Microplastics Found in Fish from Remote Locations in the Upper Snake River Watershed
Mitchell Davis, Student, Brigham Young University–Idaho

Mitchell Davis oriented the audience to the issue of microplastic contamination in the environment at the global scale. Mitchell defined microplastics as plastic <5 mm. Microplastics pose harm to aquatic environments as they accumulate and degrade when exposed to UV radiation to become nanoplastics. These plastic particles take thousands of years to fully degrade to their base components and research from multiple U.S. federal agencies have documented the presence of microplastics on beaches, in seafood, and in the human body. Health risks of microplastics include neurotransmitter and mitochondrial dysfunction, as well as DNA damage. In the fisheries discipline, there is a study in Illinois looking at microplastics in gizzard shad and large mouth bass. Currently, the Nez Perce tribe is researching microplastics in smallmouth bass.

As part of the BYU-I Water Quality Monitoring program established by Dr. Ryan Sargeant, Mitchell sought to understand the presence of microplastic contamination in regional freshwater environments. Mitchell sampled fish via hook and line at Birch Creek, 3 Mile Reservoir, Hancock Lake, Kilgore, East Fork Dry Creek, Island Park, Ashton Reservoir, Teton River, and Ririe Reservoir. In total, the team collected 48 samples across all sites. Fish were frozen and their GI tract removed. The GI tract was blended with a strong base, digested, filtered, and stained for microscope analysis on filter paper. Mitchell's team found that using a brine solution to density separate the digestive tract allowed for faster microplastic isolation.

In terms of results, Mitchell's team found that yellow perch (caught in Ririe Reservoir) had the highest average microplastic contamination by species. Of the microplastics found in all fish, most were black fibers. There was no correlation between fish length, fish mass, or GI tract mass and microplastic contamination, driving the conclusion that contamination is not based on fish size. In comparing contamination by sex, males had higher contamination, but the sample size was small. In examining other organs, one rainbow trout had twice as much microplastic contamination in the liver compared to the GI tract. Across all samples, gonads also had higher microplastic contamination than the GI tract.

In summary, the team was successful in finding microplastics in freshwater fish within the region. Moving forward, the team wants to start longitudinal monitoring different tissues, conducting a trophic level analysis, investigating where microplastics come from, and understanding how microplastics are metabolized and excreted.

Q&A: Microplastics Found in Fish from Remote Locations in the Upper Snake River Watershed

- Adam Peterson noted that there was no correlation found between microplastic contamination, GI tract, and fish size and asked if there were higher levels of microplastics in other tissues. He clarified his interest in possible accumulation—with microplastics increasing with older and larger fish. Mitchell Davis noted that although he did not look into accumulation in other tissue, but said it would be a good thing to consider for next time—especially since organs like the liver filter blood.
- Via Zoom, Maggie Jordan asked about the presence of nurdles, a plastic product from plastic processing/manufacturing and shared a link in the Zoom chat. In the East Coast, Maggie shared that people are cutting open fish bellies and finding a lot of nurdles—akin to what we see in silicone packets. Mitchell Davis answered that they did not find nurdles in this study.
    - In a follow up, Ryan Sargeant asked if Mitchell's team dropped the GI tract wholesale in the blender or if they dissected it to see what it held. Mitchell confirmed wholesale blending. Ryan noted that, in the future, dissection for visual analysis would be good to see if they're getting aggregates of plastic clumping together.
- Christina Morrisett asked if Mitchell had any additional stories to share about discovery and scientific learning from the research process that he'd like to share, noting how he switched the filtering processes to be more efficient after the initial methodology proved too time intensive. Mitchell Davis shared about the challenges of dissolving the fish tissue—first attempting potassium hydroxide with heat, but that it was messy, and ultimately switched to sodium hydroxide to avoid the heat component. Mitchell also shared that in addition to being less time intensive, the density separation was improved identification of microplastics—as the filtration process left a lot of fish guts. Ryan Sargeant added that learning about fish anatomy and where the digestive system starts and stops took some time when it came to dissections. Mitchell added that ensuring the GI tract dissolved enough in becoming "fish gut soup" was also a challenge—and also made his team well known on campus as the "fish gut guys."

Optimizing Data Collection, Data Availability, and Streamflow Forecasts to Enhance Fisheries in the Snake River Watershed
Otto Lang, Boise State University and the Henry's Fork Foundation

Dr. Otto Lang introduced a new project funded by a USBR WaterSMART Applied Science grant to expand existing hydrologic monitoring in the Snake River above Menan to inform management of USBR facilities. The project seeks to improve knowledge of how much water we have in the watershed, when that water actually translates into streamflow, and when it is going to be most useful downstream.

The first step will be expanding the existing monitoring network via the Henry's Fork Foundation's data dashboards. Rob Van Kirk and Christina Morrisett (HFF) have already added streamflow gages and SnoTel data from the Snake Headwaters to the dashboards. They will be developing predictive models for water rights priority and irrigation demand in those regions as well.

In predicting unregulated water supply (or natural water supply), seasonal snow is the focus. In our region, >70% of precipitation falls as snow during the cool season. This snow creates a natural storage reservoir and is the region's main water supply. Key questions to predicting water supply include how much snow water equivalent (SWE) do we have at any given time, when will that SWE melt, when will that SWE translate to streamflow, and how much streamflow will we get from that snow? To answer these questions, it is important to understand how snow actually melts. Key variables to understanding snow melt include solar radiation, long wave radiation, sensible heat, latent heat, air temperature, wind speed, and humidity. In our mid-latitude snowpacks, snowmelt is often controlled by solar radiation and weather, as well as snowpack memory or winter conditions. This memory relates to how warm or cold the winter was—warmer snowpacks will melt faster, whereas cold snowpacks have to warm to 32*F first before they start to melt. Once snow melts, not all water becomes streamflow as some melt gets taken up by trees, recharges soil moisture deficits, and recharges groundwater. Understanding snow melt behavior can better indicate what the streamflow response will be. This relationship differs seasonally as well as regionally. For example, streamflow responses differ in groundwater-dominated systems like the Henry's Fork compared to the Teton River or Snake River Headwaters that tend to be more alluvial, flashier systems.

For this project, Otto will be developing a physically-based model to predict unregulated water supply. This effort requires installing 6 additional snow monitoring stations in the basin. Three of these sites will be co-located with existing SnoTel stations (Island Park Dam, Togwotee Pass, and Salt River Summit) and three sites will be in relatively new locations where there is no snow monitoring currently (Teton Pass, Madison Plateau, Big Hole Mountains). The sensors at these sites won't measure snow water equivalent but will measure variables that potentially control snow melt (ex. wind speed, humidity, radiation) to understand why snow is melting at a given location at a given time. These sensors will also vary in their tree canopy cover compared to traditional SnoTel sites. These stations will be installed in Summer 2026. This winter, Otto will visit the sites and collect basic snow data.

A physically-based model is a gridded, computer model designed to build the snowpack over the winter and melt it. These models use physics and thermodynamics of snow accumulation and snowmelt, and are different from the water forecasting models used currently. Otto will use iSnoBal, an open-source, publicly-available model developed by ARS in Boise. The model will take inputs and calculate values for each individual grid cell to compute total snowmelt energy. If total energy is greater than zero, the snow will melt. If it is less than zero, it will continue cooling and not melt. In order to have an accurate snowmelt forecasing model for our region, we need to incorporate forest and forest change (ex. from wildfire).

Rather than run the model out of the box, Otto has started with looking at a small portion of the watershed south of Togwotee Pass where a wildfire burned last summer. Otto has tested how the

model performs under different canopy covers and using leaf area index values from satellite imagery, comparing modeled snowmelt outputs for pre- and post-wildfire vegetation, as well as different vegetation specifics. Preliminary results show that updating the vegetation type (and not using the default specification) creates a bigger difference in model outputs than the pre- and post-wildfire vegetation parameters. These preliminary results highlight the need for high-quality model inputs to ensure high-quality outputs.

In closing, Otto emphasized that this work seeks to improve spring and summertime reservoir management using science-based information.

Q&A: Optimizing Data Collection, Data Availability, and Streamflow Forecasts to Enhance Fisheries in the Snake River Watershed

- Christina Morrisett asked about project duration and feasibility within that timeline. Otto Lang shared that his part of the project is 2 years—June 2025 to June 2027—giving him two winter seasons to conduct this work. The hope is to have stations on the ground and recording data before Winter 2026. Ideally, these stations are installed and monitoring longer than the initially funded project.
- Jeremy Dalling added that Idaho Power and the River Forecasting Center each have their own physically-based models. RFC's model is called CHIPS, but they are based in Portland and not able to calibrate models for basins as small as ours. Jeremy suggested getting in touch with these entities. Otto Lang noted that this project is planning on using two models: iSnoBal and Snow Model. The plan is not to say one model is better than the other, but to leverage multiple models. Jeremy Dalling asked if it would be using an ensemble approach, spaghetti plots. Otto confirmed, adding that more information is better.
- Via Zoom, Craig Chandler asked about Otto Lang's familiarity with the NISAR satellite and its efforts to measure snow water equivalent at a 50-m resolution. Otto shared that the satellite was launched a few months ago. It is a radar-based satellite and can give information on snow water equivalent in snowpack. Otto highlighted one limitation of this satellite data is its usefulness once snowpack is wet, such as in the spring and early summer, NISAR retrievals won't tell us as much information about how much water we have. But before the spring, it has the potential to tell us how much water we have and potentially when melt starts. Otto noted that hopefully he can leverage some of the NISAR data to identify when the snow surface is getting wet and when melt is occurring for use in model validation. That is where he sees the most promise.
- Christina Morrisett asked about siting the vertical component of station sensors and ensuring they don't get buried by snow. For the sites co-located with SnoTel sites, Otto will use SnoTel max depth range to ensure sensors are higher than the maximum depth recorded. Otto also noted that you can always opt for a higher tower, 15 to 20 ft high.
    - Eric Jackson added that these sensors look like we've come a long way from the pole with the tick marks.

- Rob Van Kirk shared that when he joined Otto Lang in the field scoping out all of these sites, the difference in sensor height was notable. At Grand Targhee, SnoTel sensors were 10+ ft off the ground whereas sensors at Salt River Summit were only 6 ft. Looking at the existing infrastructure of SnoTel sites is really informative.

Community Building and Wrap Up

- Rob Van Kirk announced the recent passing of Ed Clark, former Board Chair for Fremont-Madison Irrigation District and an instrumental person in the formation of the Henry's Fork Watershed Council.
- Tom Jacobsen (University of Idaho Extension) announced a Farm Stress Management workshop in Ashton, ID at the Community Center on November 12 at 6pm. Dinner will be served, thanks to the Fremont County Farm Bureau. The workshop will provide tools for how to manage the stress that comes with uncertainty of agriculture.
- Mike Rasmussen reminded the Council that Henry's Lake is a private reservoir owned by three canal companies and is not controlled by the U.S. Bureau of Reclamation.
- Christina Morrisett announced that the next Henry's Fork Watershed Council meeting is on Tuesday, November 18. The agenda will include a presentation from Rob Van Kirk on the water year summary, Jack McLaren on water quality monitoring of Island Park Reservoir, Hazen & Sawyer on a deepwater oxygenation feasibility study of Island Park Reservoir, and possibly the U.S. Forest Service on their Island Park Fuels Reduction project (originally scheduled for today's meeting).
    - Rob Van Kirk added that the Hazen & Sawyer project was funded by a Friends of Reservoirs grant to the Henry's Fork Foundation.
- Christina Morrisett announced that the Watershed Council annual conference will take place in December and the theme will be development. Christina invited the Council to reach out if they have individuals, projects, ideas they would like to hear more about related to the development theme so Christina and Aaron Dalling can begin inviting speakers and crafting the agenda accordingly.
- Kara Cafferty shared that the Department of Energy just put out an Energy Water Call for white papers. If people are interested in partnering, please reach out to Kara.
- Christina Morrisett noted that the Council agenda is already scheduling out as far as February, which is exciting, and welcomes more volunteer presenters or suggestions for talks. Christina emphasized that the Watershed Council is here to serve the information and coordination needs of watershed stakeholders.
- Eric Jackson shared about attending the groundbreaking ceremony for a powerhouse at INL. Eric noted that we use a lot of water for energy and there was a lot of excitement for the energy house. He noted that this was one of hundreds powerhouses a company from California seeks to build across the country. This one building that will start construction in November and will take two years to build. This one site is projected to produce enough energy for 75,000

homes. Energy generated will be added to the western states electric grid. Eric hopes this project will help address the energy crisis and ease how much energy we get from water.

- Kathy Lynch invited Council members to attend the Community Connections event hosted by the Snake River Headwaters Group in Jackson, WY on Wednesday, October 15. The event will feature a film screening about the local fishery and a conversation with members of the SRHWG steering committee members about issues of concern on the Snake River near Jackson. A Zoom option is available. Kathy also noted how the Headwaters Group is new, created in 2023, and looks to the Henry's Fork Watershed Council for inspiration. https://www.snakeriverheadwaters.org/events/watershedconnections
    - Christina Morrisett offered to connect folks in the room with the link/email after the meeting.
- Aaron Dalling adjourned the meeting.