



Big Hole Watershed Committee

Monthly Meeting Minutes

June 19, 2024 – 7:00 pm at the Divide Grange
Zoom option also provided

In Attendance

In-person: Pedro Marques, BHWC; Tana Lynch, BHWC; Ben LaPorte, BHWC; Tom Bowler, Resident; Betty Bowler, Resident; Steve Luebeck, Sportsman/BHWC; Jim Griffin, Resident; JM Peck, Rancher/BHWC; Craig Fellin, Big Hole Lodge; John Reinhardt, Rancher/BHWC; Jim Hagenbarth, Rancher/BHWC; Dean Peterson, Rancher/BHWC; Roy Morris, GGTU/BHWC; Erik Kalsta, Rancher/BHWC; Katelin Killoy, MFWP; Kaitlin Boren, DNRC; Chris Edington, MTU; Megan Moran, MTU; Emily Downing, IWJV; Kim Giannone, UMW; Liz Jones, Rancher/BHWC; Mary Sutherland, MBMG; Ginette Abdo, MBMG; Jenna Dohman, MBMG; Luke Lutz, MFWP; Mark Kambich, Rancher/BHWC; Diana Peterson; and a Wild Rockies Field Institute Restoration Ecology course.

Zoom: None. The WIFI was down in the Grange Hall, so we were unable to provide a Zoom option for this meeting.

Meeting Minutes

BHWC monthly meetings are held at the Divide Grange with a virtual (Zoom) option provided thanks to Southern Montana Telephone Company, who donated the internet service. Meeting minutes and recordings are available at <https://bhwc.org/monthly-meetings/> (scroll down for meeting minutes archive). Printed copies are available during in-person meetings. Contact Tana Lynch, BHWC Associate Director, at tlynch@bhwc.org or (406) 267-3421 to suggest additions or corrections.

Reports

Streamflow and Snowpack Report – Kaitlin Boren, Department of Natural Resources and Conservation

- *Streamflows: (June 19th)*

- Wisdom (06024450): 204 cfs
- Mudd Creek (06024540): 979 cfs
- Maiden Rock (06025250): 1,730 cfs
- Melrose (06025500): 1,650 cfs

Glen (06026210): 1,610 cfs

- Hamilton Ditch (06026420): 1,340 cfs
- Stream And Gage Explorer (StAGE): <https://gis.dnrc.mt.gov/apps/stage/>

- *Snow Water Equivalent (SWE): 24% of median*

Hypsometric-SWE for Big Hole (HUC-8: 10020004): 64% of normal

- Hypsometric-SWE is a way to evaluate snowpack distribution on a watershed scale level. It evaluates the relationship between the cumulative snow water equivalent in m³ and

elevations through a comparison of a particular day's median values to the SNODAS period of record (2004-present).

- *Precipitation*: Currently 85% of median.
- *Outlook*: The 8-14 day outlook predicts below normal temperatures and slightly above normal precipitation.
- *Seasonal Outlook*: ENSO-neutral conditions are present. La Nina is favorite to develop during July and-September in the Northern hemisphere and persisi into the 2024-20205 winter (85% chance during November-January).
- *U.S. Drought Monitor*: The Big Hole watershed is currently in moderate drought.

Director's Report – Pedro Marques, Executive Director

- Proposals:
 - DNRC Planning Grant (\$50,000) to evaluate potential for high meadow storage – SECURED
 - Cinnabar Foundation grant for general capacity (\$6,000) – SECURED
 - High Stakes Foundation grant for general capacity (\$15,000) – SECURED
 - Montana Film Office grant (\$15,000) for film on Smith-Sage Springs project – SECURED
- Outreach:
 - ABCW Ranch golf course being built near the Notch. Causing a lot of concern. This is what's actually going on:
 - Water right change of use = 3 million gallons/day less consumptive use (at least)
 - Links-style, all walking course (no carts or asphalt or concrete paths)
 - Selected native grasses use 30% less water/fertilizer
 - No use of river bottom and future conservation easement planned for entire river bottom
 - Hot water springs returned to groundwater to decrease summer river temps
 - No members, no investors, no real estate for sale
 - Future employer for guides during low water years
 - FWP Murphy Rights
 - Priority date of July 1, 1985
 - **“Objective of a Call:** The objective of making a water right call is to maximize the amount of habitat available to fish and other aquatic life under low flow conditions.”
 - State's position is to exempt Big Hole from calls due to voluntary DMP
 - ROOM FOR IMPROVEMENT IN VOLUNTARY REPORTING!!!
 - FWP wants to get a better sense of water contributions in the Big Hole, particularly in the CCAA, similar to the reporting that occurs on the Blackfoot River. We are aware of the privacy concerns, but it would be good if we could give them some information.
- Showed drone imagery at Moose Creek (in the Highlands)

Steering Committee Report – Jim Hagenbarth, Chair; Dean Peterson, Vice-Chair; Steve Luebeck, Treasurer; and Roy Morris, Secretary

- The Steering Committee is pleased with the progress BHC is making.

Communications and Wildlife Report – Tana Lynch, Associate Director

- Communications:

- Events:
 - June 20 – Elk Discussion/Dinner
 - 4-8 pm at Alder Fire Hall
 - Madison Valley Ranchlands Group
 - Western Landowners Alliance
 - July 12-14 – Montana Folk Festival
 - BHWC will be partnering with BSB County Water Utility Dept. to host a display this year
 - Highlighting the link between Butte’s water and the Big Hole, BSB’s upcoming projects, and the importance of water conservation
 - Filling station for water bottles
 - July 17th – Wildlife Speaker Series
 - Grizzly Bears
 - Presenter Cecily Costello, FWP
 - 6 pm at Divide Grange
 - Potluck



- Main dish: Elk burgers donated by Brian Wheeler!
- Drink, buns, fixin’s donated by board members
- Guests bring sides or desserts

- Publications:
 - [Ripples of Change: The Impactful Work of the Big Hole Watershed Committee](#)
 - International Business Times, May 31st
 - [Conifer Encroachment: The Big Hole Watershed Committee's Innovative Solutions for Sustainable Ecosystems](#)
 - MSN, June 15th
 - [FWP Director, Governor Celebrate Encouraging Trout Counts in the Big Hole River](#)
 - FWP, June 13th
 - [Big Hole: Trout Numbers Better Than Last Year But Still Below Average](#)
 - Montana Standard, June 13th
 - BHWC Summer newsletter back from printer, hitting PO Boxes

- Wildlife Program Update:

- Carcass Removal and Composting
 - March-May
 - Big Hole and Sage Creek (CVA)
 - New driver, Justin Cottingham – Justin did an awesome job this year!!
 - 2024 total:
 - 73 carcasses (relatively low number of carcasses, likely due to the mild winter – this is a good thing!)
 - 14 producers (increased participation!)
- Upper Big Hole Range Rider – planned
 - July-September
- LLB funding secured (\$21,000), additional \$28,500 requested

- America the Beautiful Challenge and RCPP funding still pending contracting
 - Update from Erik Kalsta on RCPP – setting up, looks like they will be able to contract with community-based organizations and not just individual producers. Range Rider funding will be available at the individual producer level.

Restoration Report – Ben LaPorte, Program Manager

- Anaconda Uplands (NRDP and MFWP)
 - Modified brush layers at California Creek with YEP and Montana Tech
 - *Do these include a seeding component?*
 - *Yes, they do.*
 - Cabbage Gulch restoration
 - Other side of the Divide
 - 14 remnant beaver dams plugged
 - 150 feet of new stream channel alignment constructed
 - 2-step pool sequences to facilitate fish passage
 - Thank you to the WRFI crew who helped complete this work!
- East Pioneers Conifer Encroachment
 - *Comment: This is a really impressive project. It's a small reach, but it's gone from basically no water to probably tens of thousands of gallons of water stored there. I was just through there two days ago, and it's very apparent.*
 - *It would be great to quantify this and may help BHWC secure additional grant funding.*
 - *MBMG staff said it wouldn't be that difficult to do.*
- Other Happenings:
 - NRDP, DEQ, EPA tour of the Anaconda Uplands
 - Mount Haggin culvert project planning
 - Wise River spring creek project fully funded!

New Business

- Idaho is a conjunctive water state, meaning surface and ground water rights can call on each other. Surface rights holders are senior to the groundwater rights (wells). Big canals in the Twin Falls area have large surface water rights. Big canal companies by Twin Falls are using ALL of their water rights by installing turbines in the canals; they use what they need to irrigate, sell the rest to Idaho Power, and make money by generating power. The lesson here is to pay attention to changes in water rights.

Break – 10 minutes

Meeting Topic:

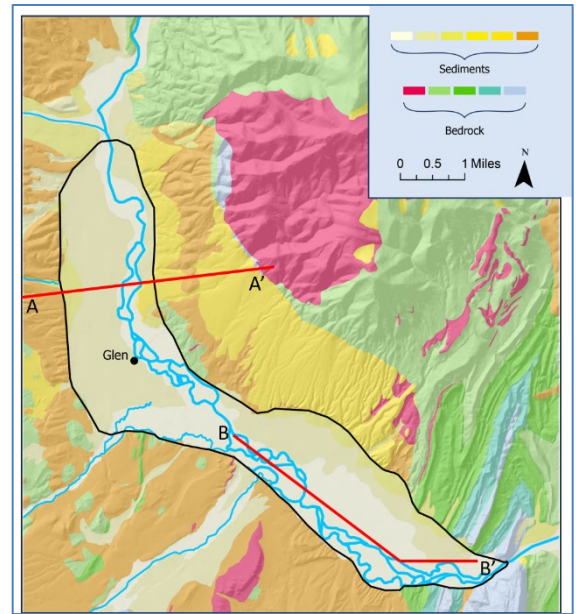
Ground Water Study near Glen

Influences on Water Supply and Temperature in the Big Hole River

Presented by: Jenna Dohman, Montana Bureau of Mines and Geology

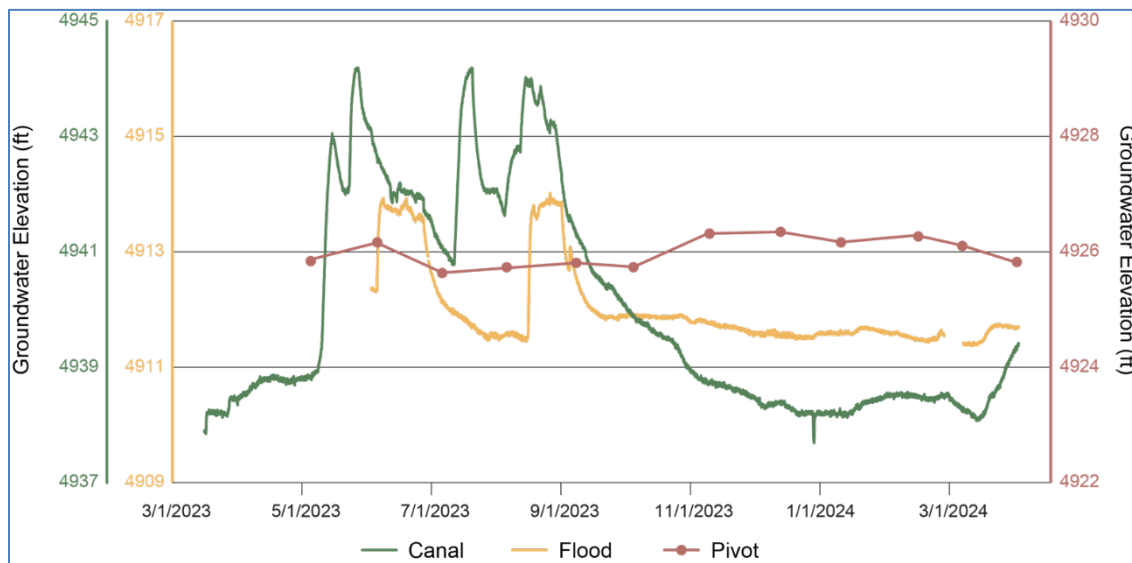
Others working on project: Ann Hanson, Todd Myse, Mary Sutherland, and Tyler Storey

Purpose: Determine the hydrogeologic influences that most affect water supply and temperature on the lower Big Hole River near Glen.



Water Supply in the Big Hole

- Study area (see map to right)
- Monitoring Network (meat & potatoes of the study!)
 - Surface-water monitoring
 - Stage and discharge at 16 sites
 - Canal seepage
 - Water chemistry at 11 sites
 - Groundwater monitoring
 - Water levels at 47 wells
 - Water chemistry at 16 wells
- Aquifer Tests
 - O’Keefe Drilling drilled into aquifer to take soil samples to see what they’re working with.
 - Pump into wells for 72 hours, monitor water levels during that period. Then shut the pump off and continue to monitor.
 - Clay layers were observed in northern part of study area, causing disconnect between shallow and deep wells.
 - All locations were highly transmissive (water moves through really quickly).
 - In the southern part of the study area, good communication between deep and shallow wells was observed.
- Preliminary Findings
 - GW-SW Connection:
 - River and shallow ground water are interconnected.
 - Irrigation Impacts:
 - Irrigation type influences the amount of groundwater recharge. (see graph, below)

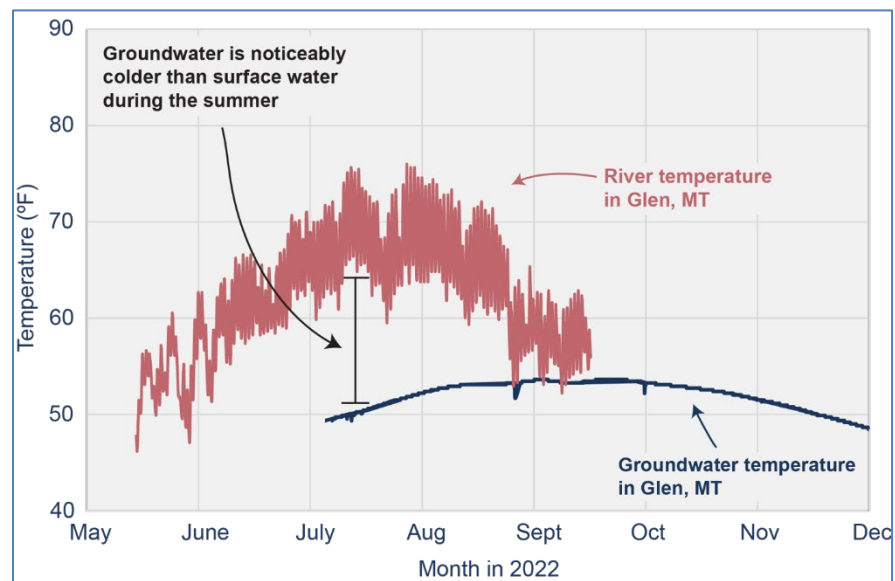
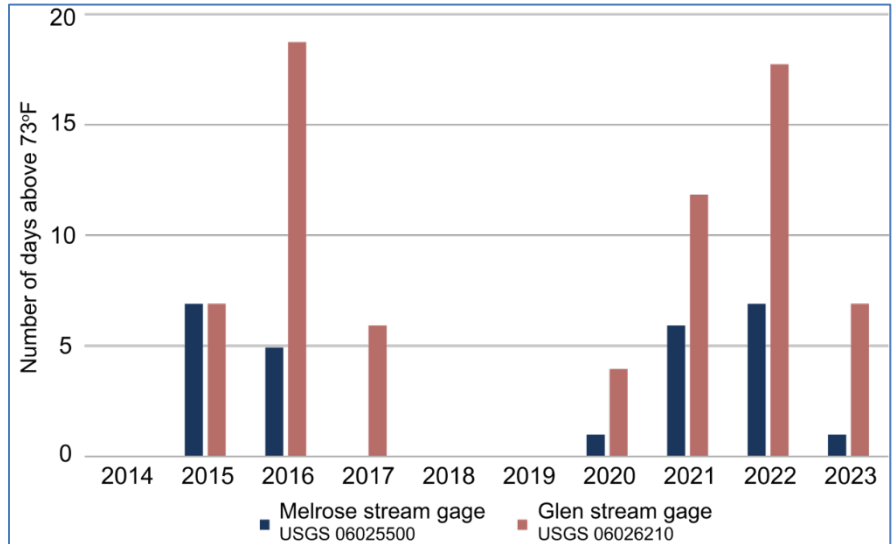


- Preliminary Conclusions:
 - Shallow subsurface water is highly transmissive.
 - River and shallow groundwater are strongly interconnected.

- More groundwater recharge results from flood irrigation and canal leakage than from pivot irrigation.
- Future work (this is an ongoing study):
 - Continuing groundwater and surface-water monitoring.
 - Analyzing aquifer test data.
 - Developing a groundwater flow model to run predictive scenarios.
 - Developing a groundwater budget.

Elevated Temperatures in the Big Hole

- Why groundwater matters: Groundwater is noticeably colder than surface water during the summer.
- Temperature Study:
 - Bi-monthly river floats during low-flow conditions to monitor groundwater inputs
 - Handheld thermal infrared camera
 - Temperature loggers
 - Thermal visualization of groundwater discharge:
 - Diffuse flow (across several meters of streambank)
 - Discrete flow (point discharge)
 - Visual indicators of groundwater discharge:



- Iron precipitate: Forms as iron in water becomes oxidized due to moving from low-oxygen to high-oxygen environment or iron-oxidizing bacteria.
- Biofilm – also produced by iron-oxidizing bacteria.

- Preliminary Findings:

- Flowpath matters:

- Pockets of groundwater discharge
- Flows are small compared to the river! Meaning groundwater is likely not having a major impact on river temperature.

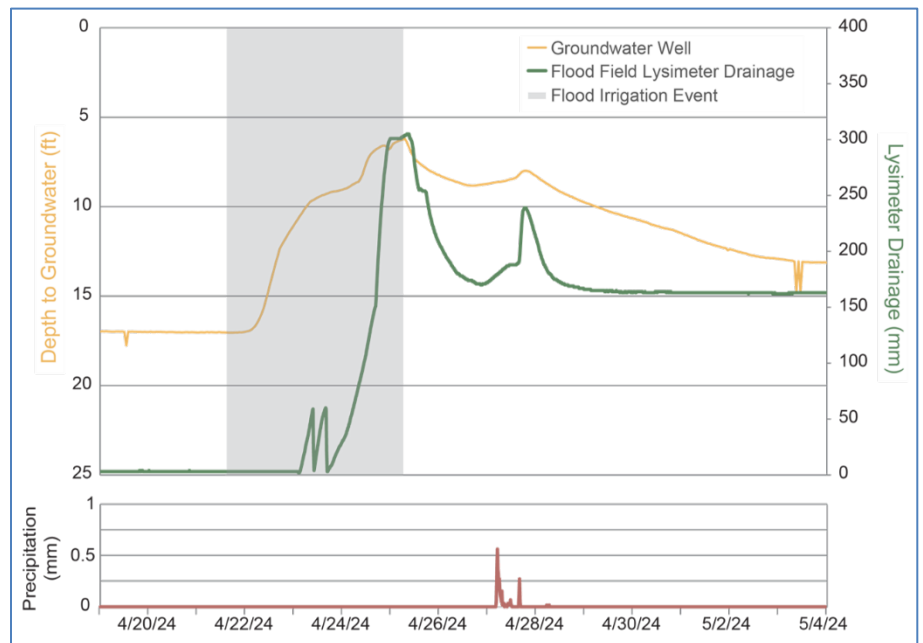
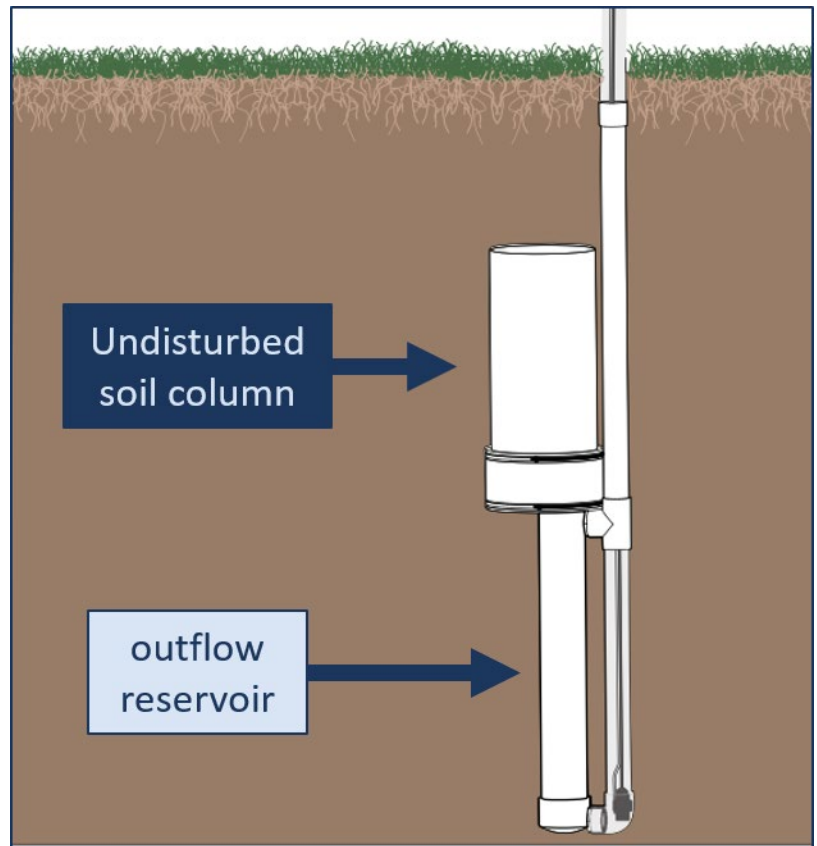
- Surface water inputs:

- Tributary/canal returns:
 - The tributary was consistently colder than the river.

- Only one surface water site was warmer than the river.
- Ponded canal releases were similar to or cooler than the river temperature.
- Again, flows are small compared to the river!

- Solar radiation:

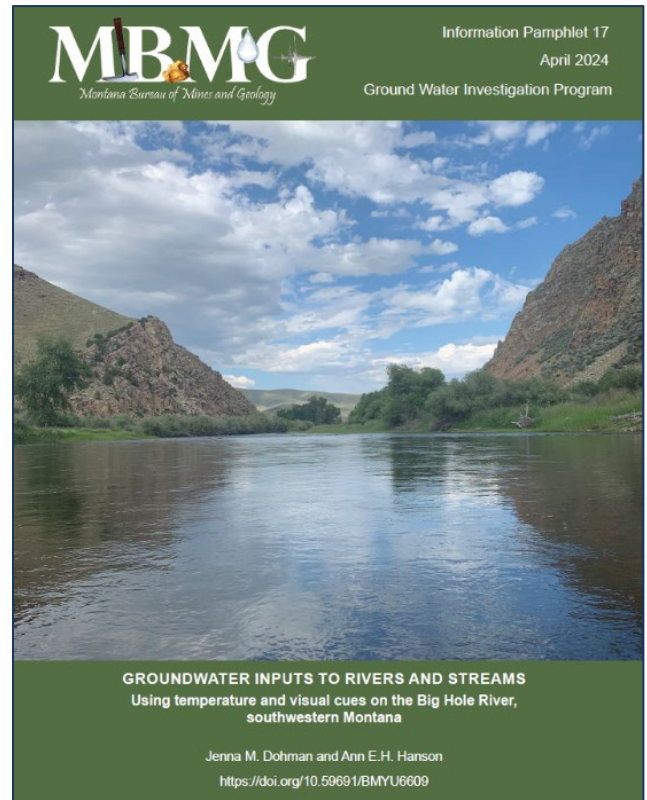
- River temperature increase is directly related to solar radiation.
- This section is highly braided, so there is more surface area and the river is shallower, which means it “gets baked” by the sun more than other parts of the river.



- Preliminary Conclusions:

- Groundwater discharge is a cooling source, unless it warms up before returning to the river – flowpath matters!

- Canals were not observed to be sources of warm water inputs to the river.
- Solar radiation is warming the river.
- Future Work:
 - Continuing temperature surveys
 - Measuring depth and surface area of the Big Hole River
 - Quantifying surface-water inflows
- Irrigation Recharge: How much groundwater recharge results from flood irrigation vs. pivot irrigation?
 - Lysimeter installation (see photo, right)
 - Recharge and irrigation type
- Thanks to:
 - Landowners in Glen and Melrose
 - Big Hole Watershed Committee
- Want to see more thermal videos?
 - Point your phone camera at the QR code to the right or visit <https://tiny.cc/mbmgthermal>
- Questions?
 - Contact jdohman@mtech.edu



Discussion

- *How do you manage your return surface flow?*
 - *We return a lot of water to the river, because we're a sub-flood system. We measure one weir every day during irrigation season and one every week. So, we know how much of our water right we're NOT using (returning to the river), but we should also know how much surface water in those two culverts (one above and one below the ranch crossing the Interstate).*
 - *MBMG can measure culvert flow but would have to look at the site. Jim Hagenbarth will follow up with them.*
- *Are you seeing a lot of fertilizer in your water chemistry samples?*
 - *We aren't really looking at fertilizer as part of this projects, so I can't really speak to that.*
- *When you see groundwater discharge, is it primarily from fields that are flood irrigated?*
 - *You would expect that, but it's more complicated than that, and flood and pivot-irrigated fields are often right next to each other so it's not as simple as if one side of the river was flood irrigated and the other side pivot.*
- *If we wanted to have this study replicated in the Melrose area, would it be the same study, or would the approach be different? Have there been any lessons learned through this study that would change the way the study is done?*
 - *The big difference would be the narrowness of the channel and that it's less braided. But down there, we would want to get a better idea of surface water input/volume coming in and out. Would probably be based more on physical flow than on temperature.*
- *Are you comparing any of this new data from these wells with the long-term dataset that MBMG has?*
 - *We haven't looked at it in that way.*

Upcoming Meetings

- *BHWC does not meet in July.*
- Wednesday, July 17, 2024: **Annual Wildlife Speaker Series event: Grizzly Bears**
 - 6:00 PM at the Divide Grange Hall
- Wednesday, August 21, 2024: **BHWC Monthly Meeting: Ecological Benefits of Flood Irrigation**
 - 7:00 PM at the Divide Grange Hall

Adjourn