



Big Hole Watershed Committee

Monthly Meeting Minutes

November 16, 2022 – 6:00 pm at the Divide Grange
Zoom option also provided

In Attendance

In-person: Pedro Marques, BHWC; Tana Nulph, BHWC; Ben LaPorte, BHWC; Tom Bowler, Resident; Betty Bowler, Resident; John Reinhardt, Rancher/BHWC; Charlie Ivor, Elkhorn Ranch; Ron Breitmeyer, MBMG; Jenna Dohman, MBMG; Ann Hanson, MBMG; Jim Hagenbarth, Rancher/BHWC; Craig Fellin, Big Hole Lodge; Ginette Abdo, MBMG; Jim Dennehy, BSB Water/BHWC; Jim Keenan, BSB Water; Steve Luebeck, Sportsman/BHWC; Lacy Decker, BLM; and Randy Smith, Rancher/BHWC.

Zoom: Diane Hutton, Resident/BHWC; Alex Mcalister; Lisa Anderson; Healing Waters Lodge; Peter Frick, and Rancher/BHWC.

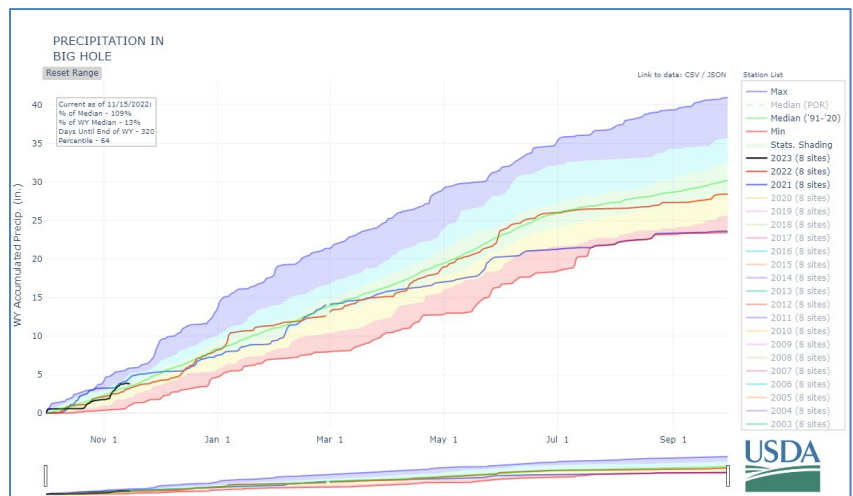
Meeting Minutes

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 Nulph, BHWC Associate Director, at tnulph@bhwc.org or (406) 267-3421 to suggest additions or corrections.

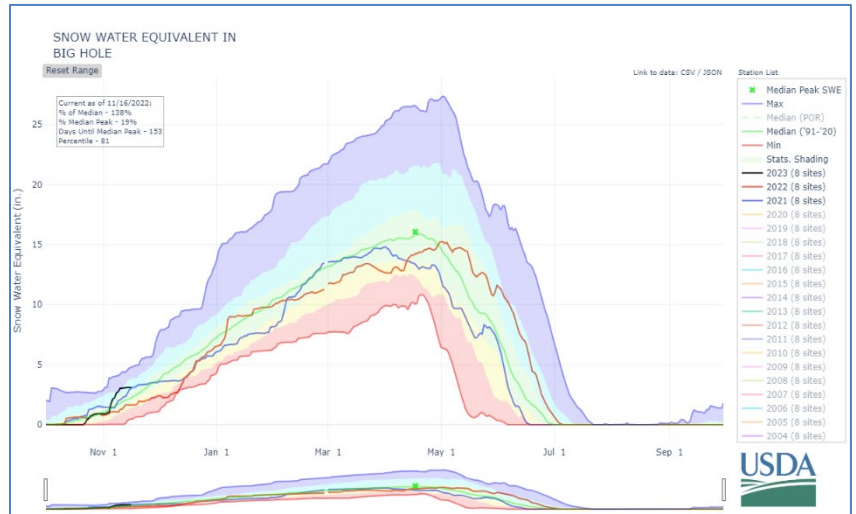
Reports

Streamflow and Snowpack Report – Matt Norberg, Department of Natural Resources and Conservation

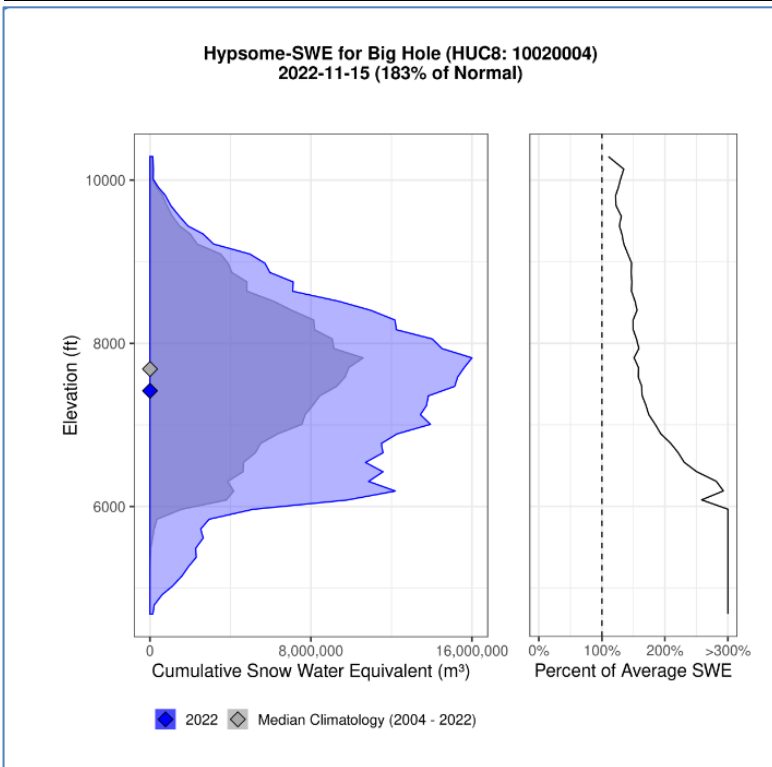
- *Streamflows:* All stream gages on the Big Hole River are either reporting ice conditions or are in seasonal status. Recent cold weather patterns have caused ice-up on the river.
- *Precipitation:* Precipitation in the Big Hole is currently slightly above median values (109%). This is tracking better than last year but slightly below WY2021. It's still very early in the year and these percentages can be misleading, however we are finally seeing some moisture in the basin.



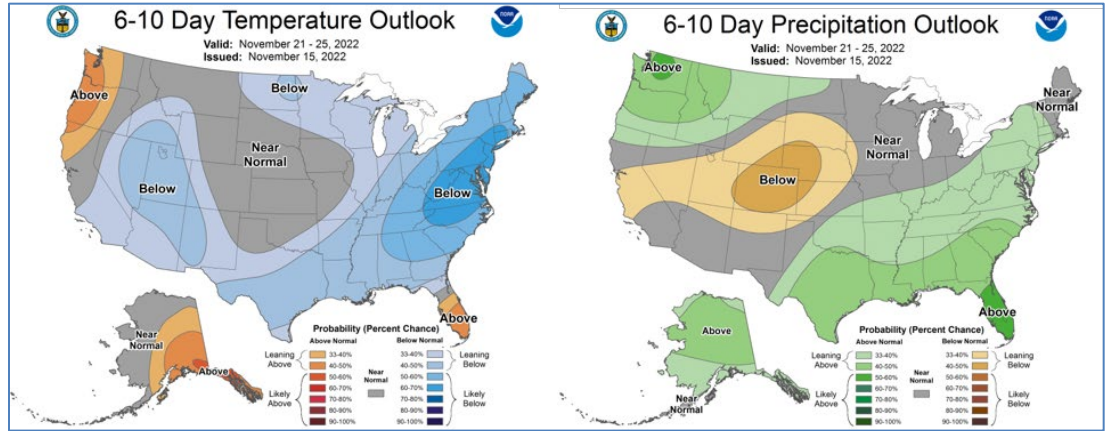
- Snowpack:** Snowpack in the Big Hole is currently 138% of median. The end of October and November to date have been favorable in terms of snowpack accumulation. Again, these percentages can be misleading, especially this time of year. Mid-elevation data can skew these numbers, but it's nice to see snow on the ground. For example, Calvert Creek (elev. 6430) is currently reporting 1.4 inches of SWE and the median value for November 16 is 0.4 inches of SWE which is 350%. The higher elevation sites are also reporting higher than normal values but are not as inflated as the lower elevation sites.



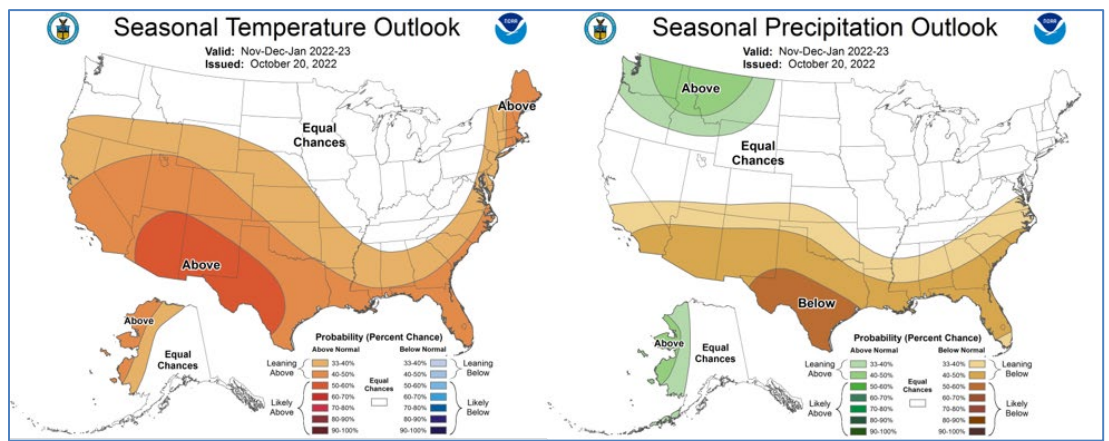
Site	Elevation	SWE (current)	% median (NRCS 1991-2020)
Bloody Dick	7600 ft	2.5 in	179%
Darkhorse Lake	8945 ft	5.6 in	117%
Moose Creek	6200 ft	3.1 in	258%
Saddle Mtn.	7940 ft	4.9 in	169%
Calvert Creek	6430 ft	1.4 in	350%
Barker Lakes	8250 ft	2.5 in	96%
Basin Creek	7180 ft	1.9 in	127%
Mule Creek	8300 ft	2.7 in	112%



- **Outlook:** The 6–10-day outlook predicts average to slightly below average temperatures and slightly above average precipitation.



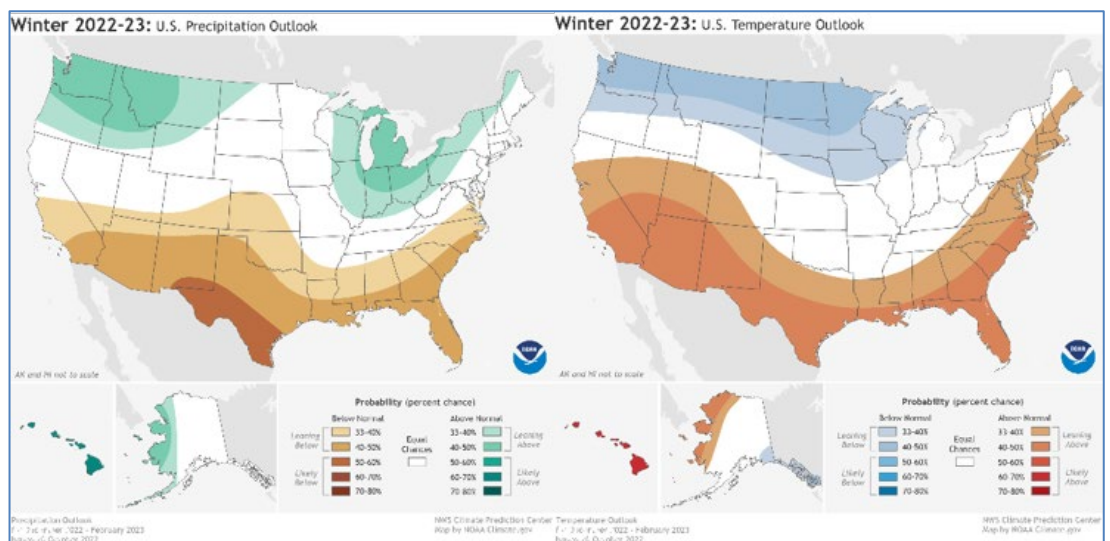
- **Seasonal Outlook:** The three-month outlook (Nov. Dec. Jan) predicts equal chances of normal temperatures and slightly above normal chances for average precipitation.



- **ENSO Alert System Status (from NOAA):** La Niña Advisory
- **Synopsis:** There is a 76% chance

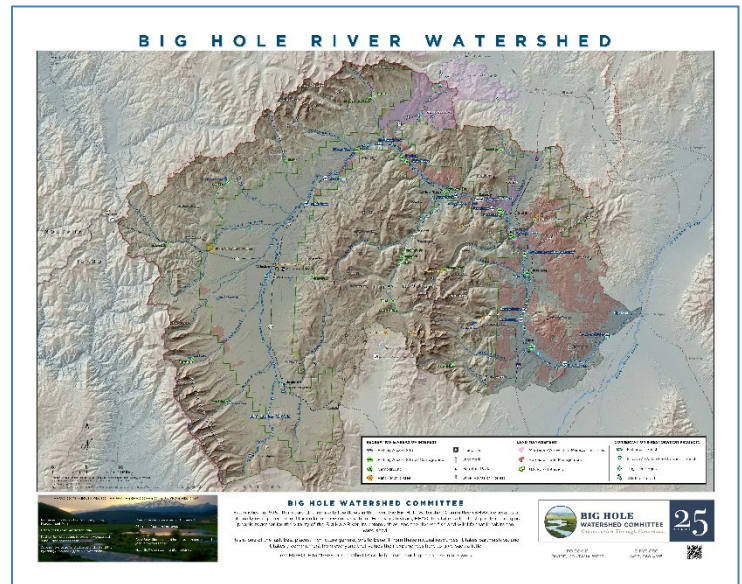
of La Niña during the Northern Hemisphere winter (December-February) 2022-23, with a transition to ENSO-neutral favored in February-April 2023 (57% chance).

- **US Winter Outlook:** NOAA issues October 20, 2022
 - NOAA issued a Winter Outlook for October 2022 through February 2023. Here is the link to the article: <https://www.noaa.gov/news-release/us-winter-outlook-warmer-drier-south-with-ongoing-la-nina>.



Director's Report – Pedro Marques, Executive Director

- Litigants coming again
- Stream Gage Network Funding in Governor's Budget:
 - FY '24: \$831,598; FY '25: \$629,453
 - Buildout of State-owned network of 100 gages
- USFS Leadership Meeting – managing for water
- Speaking engagements
 - National Adaptation Conference 10/26
 - Albany County, WY Stockgrowers 11/1
 - UM Natural Resources Conflict Resolution 11/14
 - NGO leadership meeting 11/15



Steering Committee Report – Jim Hagenbarth, Vice-Chair; Roy Morris, Secretary

- The steering committee had nothing to report. They will be meeting November 17th.

Communications and Wildlife Report – Tana Nulph, Associate Director

- Outreach and communications
 - Fall 2022 newsletter
 - Social media
 - BRIDGE training through Patagonia
 - Personas
 - YouTube end-screens/video editing
 - 2023 monthly meetings
 - Annual Drought Review meeting (December)
- Finances and Fundraising
 - Grants
 - Patagonia - \$10,000 (secured)
 - DNRC RDGP Planning (Elkhorn) - \$50,000 secured
 - DNRC RDGP Planning (Water Storage) - not funded
 - MWCC Capacity (application in-progress)
 - Donations
 - 2022: >\$50,000
 - Last 30 days: ~ \$500
 - Coming up: Fall newsletter, Annual Appeal
 - Watershed maps
 - 41 maps generated >\$2,500
 - Directly to Conservation Fund!
- Wildlife
 - 2023 carass removal
 - Season: March 1 – May 30
 - Available to all Big Hole Valley ranches/residents

- Carcasses hauled to Wisdom composte site – lease fee \$150
- Contributions:
 - Dump truck (Red Rock Lakes NWR)
 - Tractor (John Jackson)
 - Wood Chips (Tash T. Diamond Post & Pole)

Restoration Report – Ben LaPorte, Program Manager

- *Elkhorn Mine and Mill:*
 - Soils characterization report is complete
 - Estimated 110,084 cubic yards of tailings and waste rock across the site
 - Prioritized excavation and removal of polygons
 - Gives a foundation for action alternatives and removal design
 - Successful RDGP planning grant = 30% removal design (\$50,000)
 - Incorporates Montana BioAgriculture into design alternatives and reclamation
- *Other Happenings:*
 - 2022 monthly Wise River monitoring complete
 - Final report underway for Upper French Gulch Fish Passage
 - RRGL—Pennington Bridge project grant ranked 7th
 - Design and permit 3 restoration projects near Pennington Brige
 - Reactive relic channel
 - Streambank stabilization/restoration
 - New diversion structure
 - Future project planning

New Business

- BLM Recreation:
 - Upgrades at BLM Maidenrock FAS.
 - To include: road work, improved boat ramp, better parking (24 vehicle/trailer sites, 15 vehicle-only sites), 6 improved campsites with fire rings and picnic tables.
 - Great American Outdoors Act funding
 - NEPA is in-progress – expect drat by end of December.
 - Questions? Contact Lacy Decker at Dillon BLM Office
 - Watershed assessments: Upper Big Hole, Horse Prairie in 2023
 - Land health assessments: Highlands, Upper Ruby in 2024
- PFAS – per- and polyfluoroalkyl substances – on EPA’s radar
 - Affect water quality
 - Sludge from sediment ponds/gray water, military/fire retardant
 - EPA to do analysis to study extent of PFAS and decide how to regulate
 - Test for 26 different PFAS, measured in parts per trillion
 - More information: <https://www.epa.gov/pfas/pfas-explained>

Break – 10 minutes

Meeting Topic: **Lower Big Hole River (Glen) Groundwater Investigation**

*Presented by: Ginette Abdo and Ron Breitmeyer
Montana Bureau of Mines and Geology*

Groundwater Investigation Program (GWIP) Background

- Addresses specific groundwater questions across Montana
- Designed to support science-based management in Montana
- Answer locally identified questions; crucial for water management
- Understanding impacts and lack of impacts (both are equally important)
- Provide information so aquifers can be managed, not just used

GWIP Project Areas

- Land use changes from irrigated agricultural to residential
- Effects on stream flow due to increased groundwater withdrawals
- Changes in water quality due to increased subdivisions
- Impacts to groundwater and surface water from changing irrigation methods
- Effects of drought on water resources

Upper Jefferson River – Waterloo area Groundwater Investigation

- Proposed by Jefferson River Watershed Council
- Investigated the effects of irrigation practices on Willow Springs and Parsons Slough
- Groundwater model to simulate changes to groundwater and surface water
- Modeling the influence of irrigation and canal leakage on the Jefferson River
 - Lining the Parrot and Creeklyn canals – 18 cfs reduction in streamflow to the Jefferson River
 - Converting 5 flood irrigated fields to pivot irrigation – 13 cfs reduction in streamflow to the Jefferson River

Beaverhead River – Dillon area Groundwater Investigation

- Is groundwater drawdown and stream depletion occurring due to high-capacity irrigation pumping from aquifers?
 - 20% of river flow in 2010 was irrigation related recharge = canal seepage and field irrigation
 - Groundwater modeling showed that we can offset the effects of pumping on the river by running the canals longer than the period of use.

Virginia City Groundwater Investigation

- Proposed by Ruby Watershed Council
- Concern over water availability and quality associated with their public water supplies derived from two springs.
 - Determined the recharge area of Spring 1 and Spring 2
 - Hydrogeologic framework of the springs as it relates to the potential effects of residential and commercial development on Virginia City's springs
 - Proposed alternative water sources as a backup should spring 1 and/or 2 go offline

- Presently providing technical information to help city and county planning efforts to protect the springs recharge areas.

Lower Big Hole River (Glen) Groundwater Investigation

- Project introduction:
 - Proposed by the Big Hole Watershed Committee in 2021 to improve knowledge of how groundwater/surface water interactions in the lower Big Hole affect river temperatures
 - The Big Hole River supports an important recreational economy
 - Irrigated agriculture has the potential to supply groundwater recharge which can help the river by:
 - Mitigating temperature changes
 - Supporting late-season flows
 - This study will improve knowledge of how water moves within the hydrogeological system and how irrigation practices can affect irrigation recharge
- Project area:
 - Extends from approximately Kalsta Bridge at the north (upstream) to the notch at the downstream end
 - Area is bounded by USGS stream gages on the Big Hole which assists in our efforts
 - Current plan is to focus on the main Big Hole valley'
 - Some data collection may be needed in some of the main tributary systems
- General project approach and timeline:
 - Research background/existing data
 - Collect new data
 - Measure water levels in wells
 - Install new wells where needed
 - Measure stream and ditch flows
 - Measure/image stream temperatures, install head monitoring in the Big Hole and irrigation ditches/canals
 - Develop models and water budget
 - Water budget – accounting for water in and water out of the system
 - Conceptual – understanding and estimation of flows of the local hydrology
 - Numerical – quantitative, detailed simulation of groundwater flow calibrated to match collected data
 - Scenario simulations
 - Using numerical model, simulate potential effects on groundwater recharge associated with different irrigation strategies
 - Prepare and publish reports
- Data collection:
 - Groundwater monitoring
 - Surface water monitoring
 - Thermal imaging
 - Drilling/well installation
- Groundwater levels
 - We use these data to understand how the groundwater system changes over time
 - Provides insight to recharge process
 - Data are used to calibrate models
- Surface water monitoring

- Collect state and flow data
 - Data allows us to estimate amount of water exchanging between surface water and groundwater
 - Allows us to better constrain our groundwater models
 - Helps us to develop a better water budget for the study area
- Thermal imagery
 - Will be used to identify areas of groundwater inflow to the river
 - Can be used as a check against our model results
 - Allows us to visualize processes we cannot see
 - Generally:
 - Groundwater is cooler than surface water during the summer
 - Groundwater is warmer than surface water during the winter
 - Use thermal differences to identify areas of groundwater discharge during low flow.
- Groundwater modeling:
 - Mathematical simulation of groundwater system
 - Can help us calculate pieces of water budget that are hard to measure
 - Helps us understand flow paths in the groundwater system
 - Allows us to simulate scenarios and test the effects of changes in the system
- Questions?
 - Ron Breitmeyer, Project Lead/Hydrogeologist
 - 406-496-4866
 - rbreitmeyer@mtech.edu
 - Jenna Dohman, Hydrogeologist
 - 406-496-4379
 - jdohman@mtech.edu
 - Ann Hanson, Hydrogeologist
 - 406-496-4653
 - ahanson@mtech.edu
 - GWIP: Montana Bureau of Mines and Geology – Ground Water Investigation Program
 - <http://www.mbmge.mtech.edu/waterenvironment/GWIP/main.asp>

Upcoming Meetings

- February 15, 2023: **Water Storage Opportunities in the Big Hole Watershed**
 - 6:00* pm at the Divide Grange/Zoom
 - *Note the time change from 7:00 to 6:00 pm to account for the shorter winter days!*

Adjourn