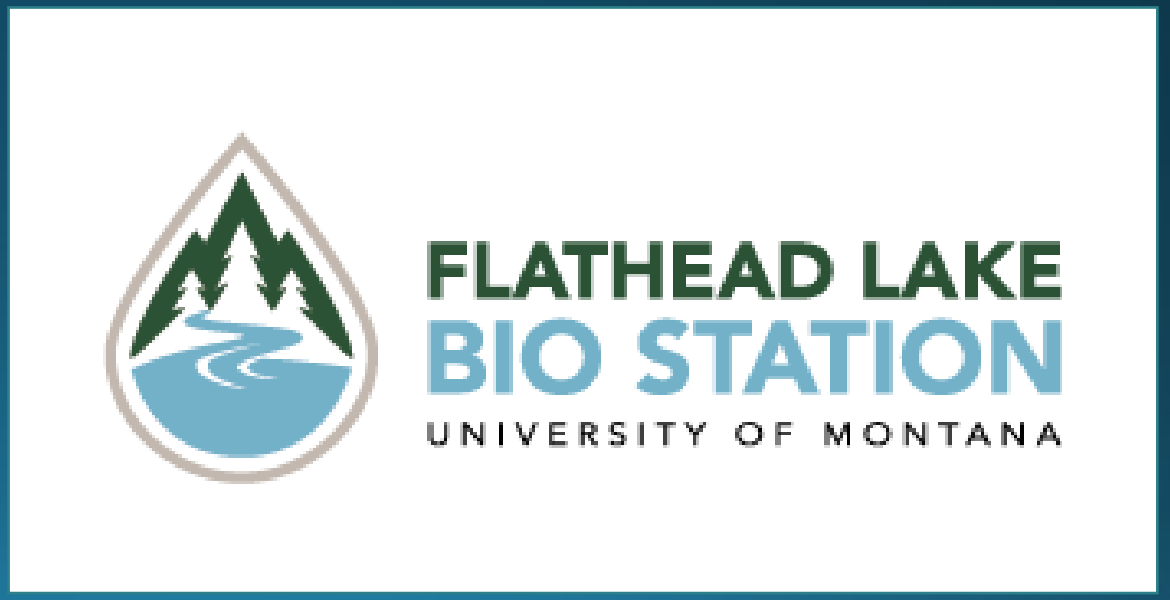
Monitoring Montana Waters

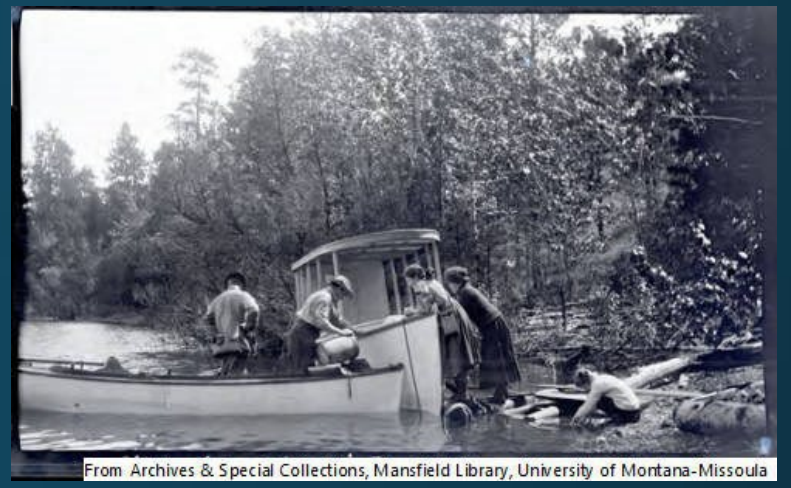
Third Year of Operation

Jared Glass and Rachel Malison



FLBS Background

- University of Montana's Flathead Lake Biological Station: Established 1899, by Dr. Morton J Elrod
- Celebrating 125 years next year
- Moved to Yellow Bay: 1908
- Hub for freshwater research:
  - Long-term lake monitoring
  - Aquatic invasive species
  - Published research in ecology, microbiology, limnology
- Summer field ecology courses for students
- K-12 education and outreach programs
  - ~1,000 students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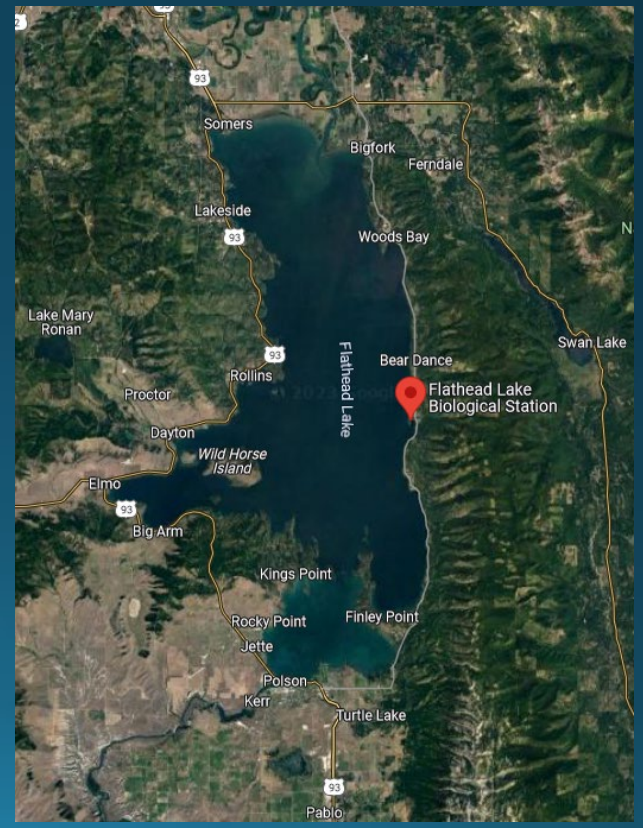


AmeriCorps

- AmeriCorps started in 1993
  - National and Community Service Trust Act
- Increase and support national service
  - Make a hands on difference to their country
- National chapters
  - Vista
  - Trail crews
  - National Civilian Community Corps
- Multiple state chapters
  - Montana Conservation Corps

Big Sky Watershed Corps

MONTANA CONSERVATION CORPS
Tools for Living. Experience for Life.

- Under Montana Conservation Corps
  - Only program to require an undergraduate degree
- Placed with a host site
  - Increase capacity
- 10 ½ month service term
- ~50 members
- Hands on experience and training
  - BDA, AIS, GIS, Water Quality

About MMW

- Program through Flathead Lake Biological Station
- Launched in 2021
- Philanthropically funded

Rachel Malison:
Program Leader

Jared Glass:
BSWC Member

Tom Bansak:
Oversight Committee

Erin Sexton:
Oversight Committee

Goal of MMW

- Increase the capacity of water quality monitoring in Montana

Guidance

Funding

Training

Guidance

- Applicants must submit
  - Sample and Analysis Plans (SAP)
  - Application on MMW website
  - Application due on March 1st, Funding Status: April 1st
- MMW provides assistance
  - Writing SAPs
    - Helps with location, timing, analyte selection
    - Standard Operating Procedures (SOP)
    - Goals and objective planning
  - Data Management
    - Data analysis
    - Upload to MT EQuIS Database (requirement for program)

Funding

- Analyses and Gear Funding
  - Up to $7,000 per year for lab analyses
  - Samples analyzed at Freshwater Research Lab
  - Shipping cost covered
  - 50% cost match: volunteer time, mileage, money spent
  - Ex: TN/TP, E.Coli, TSS, Nitrate+Nitrite
- $1,500 per 3 years gear funding
  - Assistance with purchasing WQ monitoring gear
  - 100% cash match
  - Ex: YSI probe

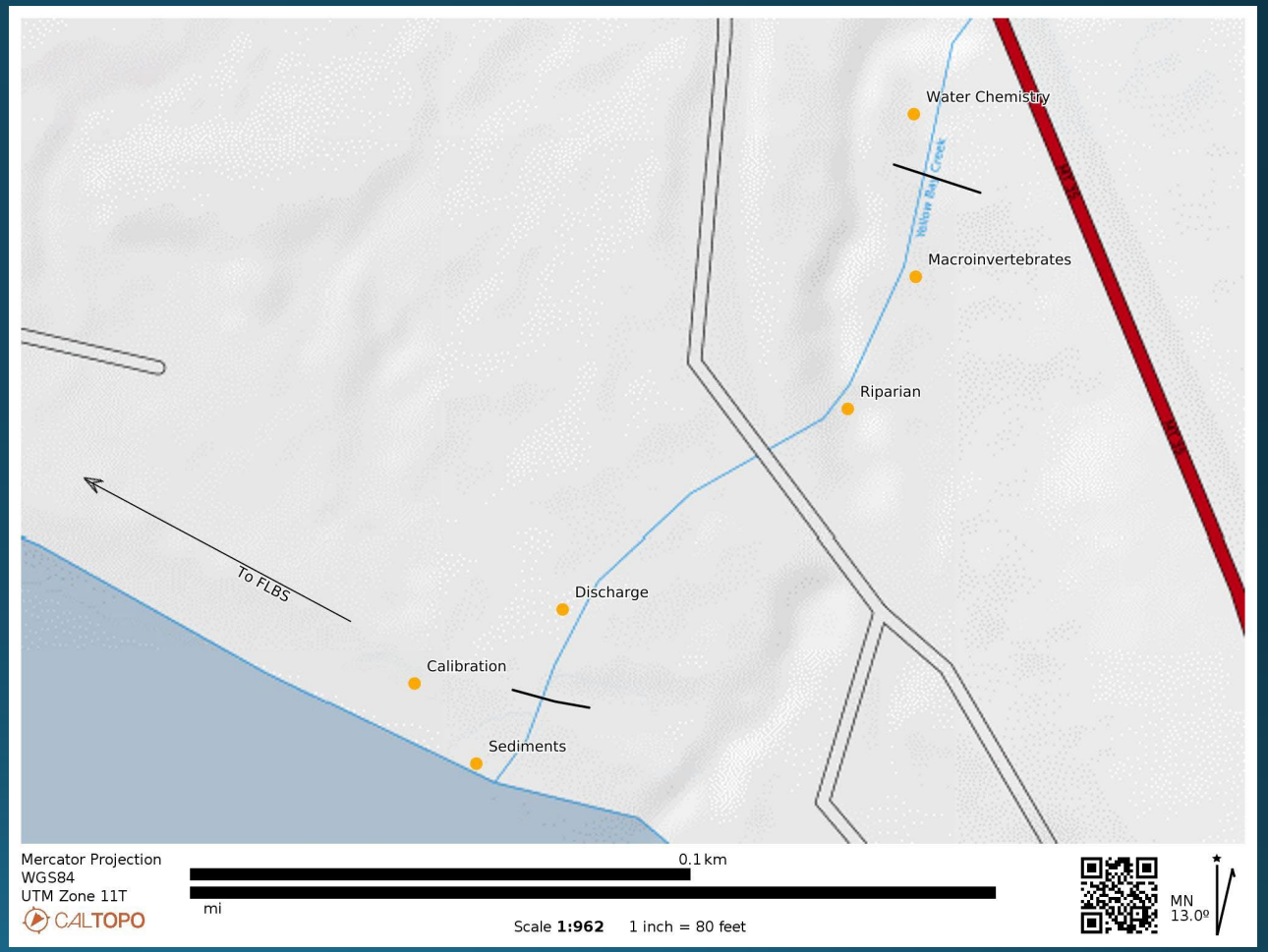
Training

- MMW offers on-the-ground training for funded groups.
  - Groups trained in 2023, Yaak Valley Forest Council, Bitterroot River Protection Association, Flathead River Alliance
  - Follow SOP's together for included sampling equipment and grab samples
    - Unfiltered and Filtered grab sample training
    - Run through the entire process: labeling, sampling, filling out COC, packing coolers

Water Quality Workshop

- Biannual/Triannual Water Quality Training Event
- Partnered with DEQ, MSU Extension
  - 2-3 day event
  - 6 stations with optional sessions
    - Water Chemistry, Macros, Riparian, Discharge, Water meter calibration, Sediments
    - How to start a group, Rating curves
  - ~35 volunteers from 24 groups/organizations

Workshop Cont.



Water Chemistry & Macroinvertebrates

Riparian Areas

Water Meter Calibration

Discharge and Sediments

2023 Funded Groups

- Third year of operation: Funded 10 groups for lab and gear support
  - Big Hole River Foundation: *Divide, Montana*
  - Bitterroot River Protection Association: *Stevensville, Montana*
  - Missoula Valley Watershed Group: *Missoula, Montana*
  - Rock Creek Watershed Group and Carbon County Resource Council: *Red Lodge, Montana*
  - Yaak Valley Forest Council: *Troy, Montana*
  - Clearwater Resource Council: *Seeley Lake, Montana*
  - Kootenai Watershed Allies: *Troy, Montana*
  - Flathead River Allies: *Columbia Falls, Montana* (New group for 2023)
  - Flathead Lakers, Swim guide: *Polson, Montana*
  - Little Bitterroot Lake Association

2023 Funded Groups.

Big Hole River Foundation

Big Hole river foundation is conducting long-term water quality monitoring of the Big Hole River. This is their 3rd year of funding with MMW. In 2023 we are supporting half of all the laboratory analyses of water samples collected by BHRF and helped BHRF expand their monitoring efforts to include new analytes.

Clearwater Resource Council

The Clearwater Resource Council (CRC) facilitates efforts to enhance, conserve, sustain, and protect the aquatic resources of the Clearwater Valley. In 2008 CRC initiated community-based lake monitoring and in 2013 they began facilitating stream monitoring in collaboration with the Southwest Crown Collaborative. Funding assistance from MMW in 2023 is supporting and expanding the analysis of multiple parameters in streams and lakes from the Clearwater Basin.

Flathead Lakers Swim Guide

MMW is supporting the efforts of the Flathead Lakers who are continuing sampling efforts for the yearly swim guide. This work ensures that recreation opportunities are safe for

Bitterroot River Protection Association

Bitterroot Protection Association's Mission is to protect, preserve and enhance the water quality and quantity in the Bitterroot River Watershed. As a part of that effort, they are the lead organization in a community-based water quality monitoring cooperative. Funding from MMW in 2023 is supporting the continued monitoring efforts that are part of their Sapphire Front project.

Kootenai Watershed Allies

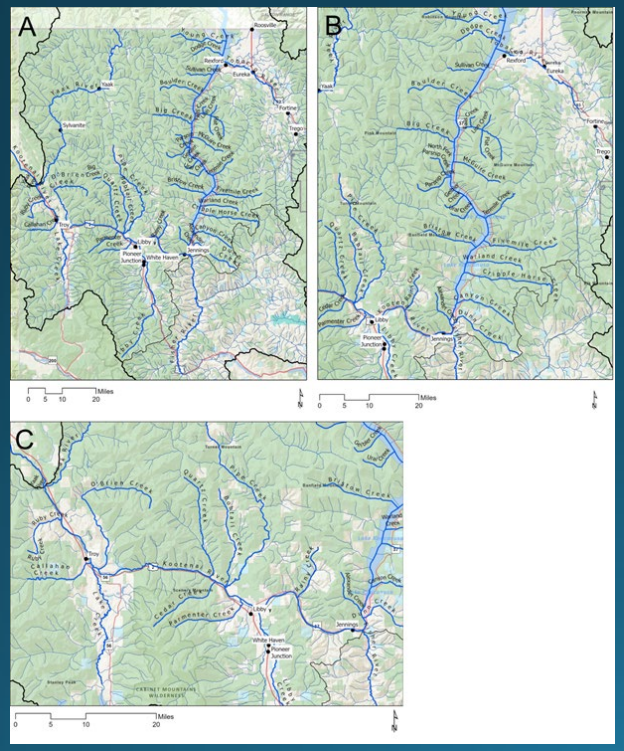
Kootenai Watershed Allies formed in 2022 and is continuing monitoring efforts in 2023. This group is focused on monitoring Selenium and nutrients on tributaries of the Kootenai River and Koocanusa Reservoir. MMW is supporting the group by providing laboratory funding for the parameters being measured.

Flathead River Allies

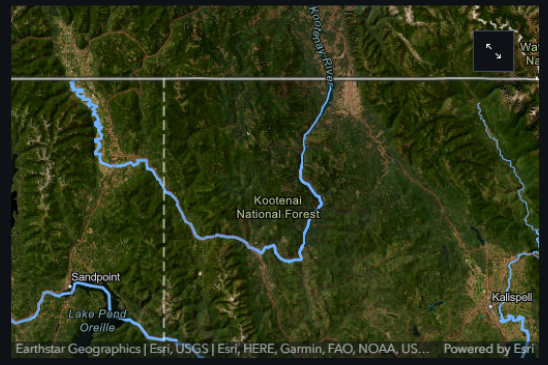
Flathead River Alliance was formed in 2019 to support and enhance the Three Forks of the Flathead River. FRA is newly funded by MMW in 2023 and they will be collecting nutrient samples from throughout the Three Forks.

Kootenai Watershed Allies

- Started monitoring 2022
- Mainstem and tributaries of Kootenai



Overview of Kootenai Sub Basin

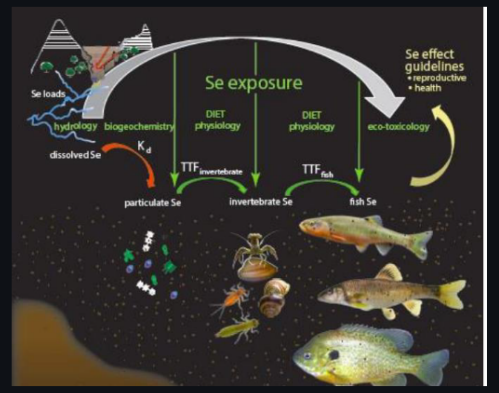


Koocanusa Reservoir and Kootenai River Map

The Kootenai River and Lake Koocanusa run through North-Western Montana from the border of SE British Columbia to Idaho. The Kootenai River runs for 485 miles and covers 9 million acres. Land use in Montana along the reservoir and river is forestry and agriculture with a history of mining in the area (Lincoln Conservation District). Water quality concerns in the area are associated with selenium leaching from mining efforts in British Columbia. The Kootenai region is a predominant region for fish and wildlife habitats. Various species in the area are threatened or endangered. MMW is covering costs for laboratory analysis for the group in 2022.

Selenium Bioaccumulation

Selenium exposure causes bioaccumulation to occur within the polluted ecosystem. Bioaccumulation is an ecological phenomenon in which a toxic substance, selenium, in this case, works it's way through the food web. Selenium is leached in the water where it dissolves and exists as particulates (Kelly & Sullivan). These particulates are consumed by invertebrates who cannot excrete the toxins. The toxins are then consumed by fish in the Kootenai that eat the invertebrates. This causes a build up of selenium in the tissue of the fish, which leads to health and reproductive issues (Kelly & Sullivan).



Invertebrate to Fish Model by USGS 2017

Big Hole River Foundation

- Started 2020
- Long-term Water Quality Monitoring
  - TN/TP, NOx, TSS, SRP
- Macroinvertebrate Collection

Flathead Lakers

- Swim guide
  - Measuring E.Coli
  - 16 different sites

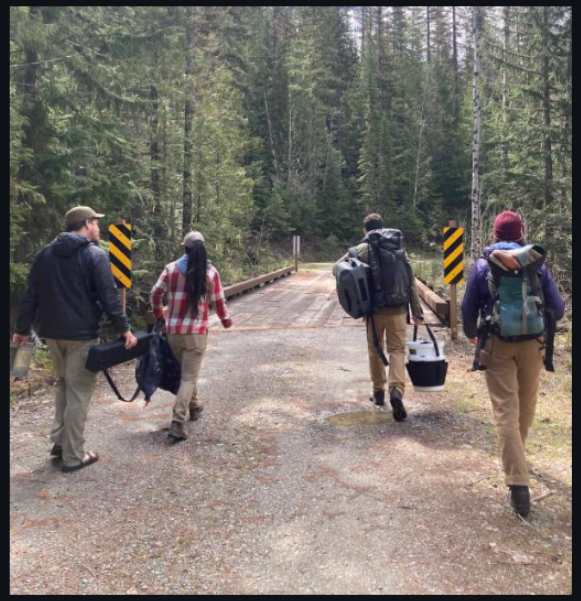
Flathead River Alliance

- Flathead River Alliance
  - Based out of Columbia Falls, Montana
  - Non-profit formed in 2019
  - Mission is to support and enhance the Three Forks of the Flathead River
  - MMW assisted with
    - Developing a SAP/SOP
    - Training volunteers

Building Capacity

- Outreach Materials 2023
  - How Do We Monitor
- Reaching out to new groups
- Updated Story Maps
- Continue to grow the program
- MMW Website
  - Blogs
  - Resources
  - Photos

Joining a Watershed Group



Yaak Valley Forest Council During 2022 MMW Training

Montana has watershed groups located throughout the state. If you are interested in monitoring in your region it's a smart idea to connect with these groups.

1. Explore different watershed groups in the MWCC Watershed Directory
2. Find groups in your region or the region of interest for monitoring
3. See contact information or the website to determine if the group has a WQ monitoring team
4. If so, contact the team leader to volunteer with the team
5. If not, also contact the group, it is often easier to start a program with an established group
   a. Research your watershed and water quality issues
   b. Plan a meeting to discuss potential monitoring, MMW can join to facilitate
   c. Use MMW's website and our highlighted resources to work on starting a group
   d. Determine site and analyte selection based on the goals and objectives of your group (MMW can help) - Link to FRL Analytes page
   e. Apply for MMW and or MT DEQ volunteer water quality funding by filling out the Sample Analysis Plan and Application by March 1st of the upcoming year.

Check out a KPAX news clip describing the importance of water quality monitoring and how MMW can help

MMW Website Content

Here you will find pdfs of website content, as well as links for applications and forms.

Website Content:

Volunteer Monitoring

- Getting Started with MMW

Important Dates

- How Are Water Resources Protected In Montana
- Starting a Volunteer Monitoring Program
- Standard Operating Procedures (SOP)
- Field Gear Guide
- 2023 SAP Template

Helpful Links

Montana Department of Environmental Quality (MT DEQ) **Volunteer Monitoring Support Program** supports volunteer monitoring in several ways:

- Financial support, such as our Volunteer Monitoring Lab Analysis Program;
- Technical support, such as trainings and guidance documents;
- Administering volunteer monitoring opportunities; and
- Forming partnerships with other entities in the state that also support volunteer monitoring

The MT DEQ's **Water Resources Seminar** is another great resource to utilize. There are several videos on the website on a variety of subjects related to water quality.

MSU Extension Water Quality Program (MSUEWQ) offers the Data Hub. It provides storage and visualization of surface water data and photos collected by citizen scientists and groups across Montana. Contact Adam Sigler, the Extension Associate Specialist with questions or email **ExtensionWater@montana.edu**

Collaborators and Partners

MMW isn't the first program of its kind in the state. Montana Department of Environmental Quality (DEQ), the Montana State University Extension Water Quality Program (MSUEWQ) and the Montana Watershed Coordination Council (MWCC) have provided training and resources to citizen-led monitoring groups for over a decade. The MMW program will work closely with these partners to complement existing efforts and amplify statewide collaborative water monitoring efforts. This **flyer** outlines different monitoring support programs available from FLBS-MMW, DEQ, MSUEWQ and the Whitefish Lake Institute.

2023 updates

- Attended 1st annual Water Quality Rotunda
  - State Capital, Helena, MT
  - Provided information to policy makers
- Kootenai Forest Fair
  - Libby, MT

What's Next?

- Continuing to expand east
- Supporting more groups
- More outreach and training materials
- Continue to plan additional workshops and training events
- Engaging in the Pesticide Stewardship Partnership Program (PSPP)

Additional FLBS Projects

- Development and building of erosion wave model
  - Shows how wave motion causes erosion
  - K-12 Education
- Assisted in annual open house
  - Speaking about MMW, Nyack aquifer
- Helped collect water samples
  - Flathead Lake Monitoring Program
  - Research over 24 hours on the Jessie B.


Thank you!