



Volunteer Water Monitoring Survey: 2024 Volunteer Statewide Report

Bridget Warrenfeltz, Sarah P. Church, W. Adam Sigler

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Volunteer Water Monitoring Survey

2024 Volunteer Statewide Report

Prepared May 2025 by:

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Introduction

Volunteer monitoring is widely recognized as a tool for engaging the public in science and enhancing stewardship outcomes across resource types and scientific disciplines. Volunteer water monitoring programs (VWMP) have been active in Montana for at least 20 years, and there are more than 30 active programs across the state. The State of Montana relies on volunteer collected water quality data for many aspects of water management. Because of this reliance, VWMP managers need to understand what motivates their volunteers to participate in VWMPs and the efficacy of their monitoring trainings. Information on volunteers has traditionally been collected through exit surveys. Our team partnered with VWMPs in Montana to develop a standardized statewide online volunteer monitor survey, designed to be administered by Montana VWMPs repeatedly over time. Our initial survey, which was developed and implemented in 2021, includes questions to understand the following: motivations for volunteering; program-specific training efficacy; learning outcomes; general perceptions of watershed knowledge; whether and with whom respondents talk with about volunteering; and trust in scientists. The survey was re-administered in 2022 and 2024 using the same questions. This report summarizes the findings of the 2024 survey.

1. Data collection and analysis

We developed this survey in collaboration with three Montana volunteer water monitoring program managers. We adapted many volunteer-specific questions from Church et al. (2019), the trust in scientists questions from Funk et al. (2019), and developed our own questions as a team. The volunteer water monitoring program managers informed the questions related to monitoring training. The survey discussed in this report was deployed for the 2024 volunteer year and administered in October 2024 through February 2025. We generated an anonymous survey link, which was distributed to volunteers through each volunteer water monitoring program manager.

This survey received approval from Montana State University's Institutional Review Board (SC033122-EX). Survey data was analyzed using R statistical software. In the following sections, we use descriptive statistics to report survey data.

2. Results

Volunteer water monitoring program managers distributed the anonymous survey link, thus we do not know the total number of volunteers who received the survey; however, program coordinators estimated surveys were sent to 95 volunteers. We excluded responses where participants answered fewer than 90% of questions, resulting in a total of 44 responses across all volunteer water monitoring programs. With 44 responses, we estimate a total response rate of 46%. In the following pages, the number of responses are question-specific; thus, although we received 44 survey responses total, each question response rate varies. Figures for Likert style questions include the Likert mean in white on each scale item.

2.1. All volunteer water monitoring program results

2.1.1. Program information and demographics

TABLE 1. VOLUNTEER WATER MONITORING PROGRAM RESPONDENTS

Program Name	Count	Percent
<i>Madison Stream Team</i>	7	17.1
<i>Sun River Water Quality Monitoring</i>	1	2.4
<i>Missoula Valley WQD Volunteer Monitoring</i>	6	14.6
<i>Carbon County Resource Council Water Quality Monitoring Program</i>	2	4.9
<i>Ross Fork Volunteer Water Monitoring</i>	4	9.8
<i>Yaak Valley Forest Council Watershed Restoration Program</i>	3	7.3
<i>Northwest Montana Lakes Network</i>	9	22
<i>Whitefish River Long Term Water Monitoring</i>	1	2.4
<i>Gallatin River Task Force Community Water Quality Monitoring Program</i>	6	14.6
<i>Thompson Chain of Lakes Stewardship Coalition</i>	3	7.3

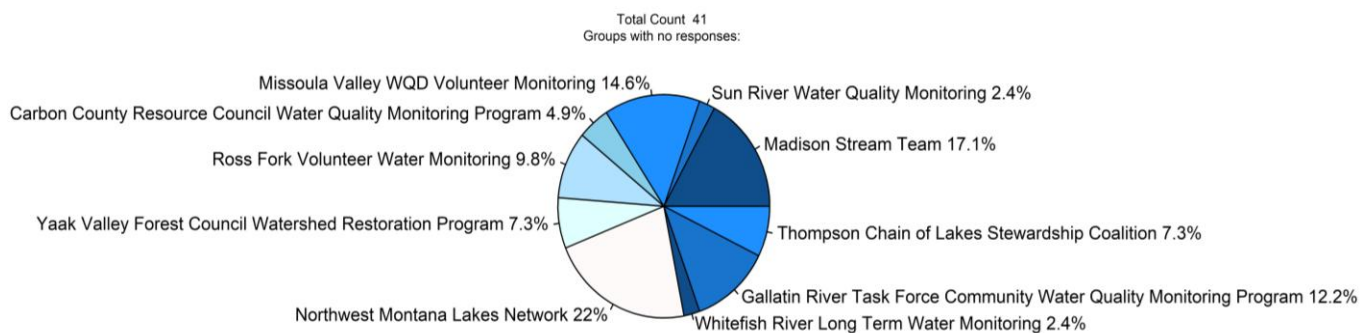


FIGURE 1. VOLUNTEER WATER MONITORING PROGRAM RESPONDENTS

(3 respondents did not specify their monitoring group)

Age

- **Total count (n):** 40
- **Mean:** 59.7
- **Median:** 69.5
- **Standard Deviation:** 18.3

Race

- 90.0% of respondents are white (n=40).

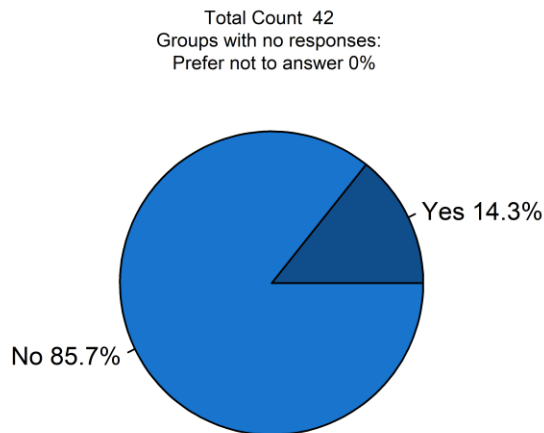


FIGURE 2. RESPONDENT VETERAN STATUS.

Answer choices that received no responses are listed at the top of the figure under the “Groups with no responses” text.

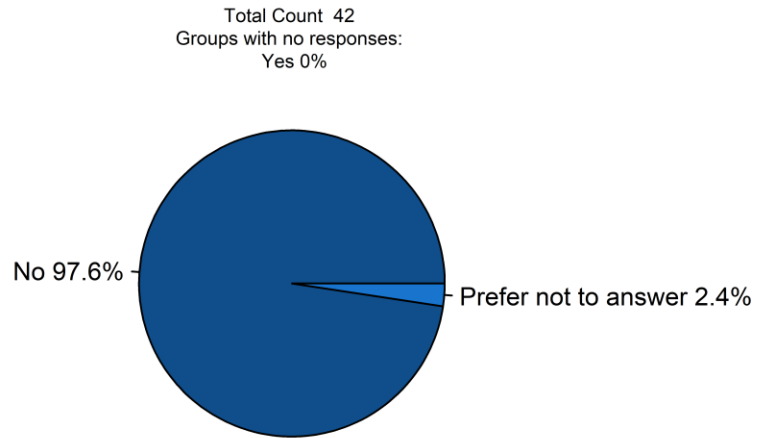


FIGURE 3. RESPONDENT ACTIVE DUTY STATUS

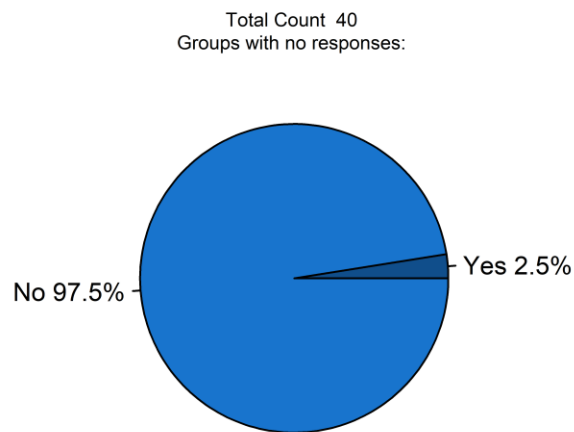


FIGURE 4. RESPONDENT STUDENT STATUS

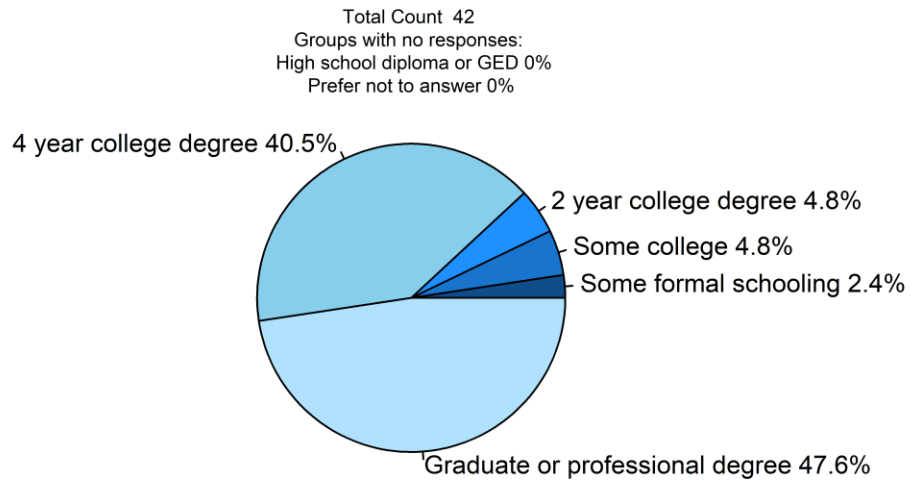


FIGURE 5. RESPONDENT EDUCATION STATUS

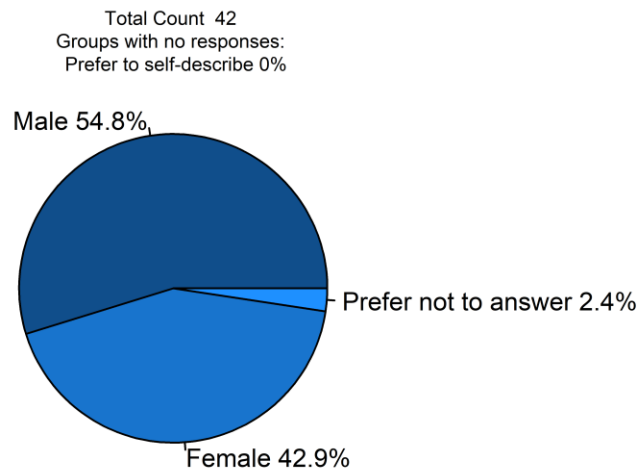


FIGURE 6. RESPONDENT GENDER

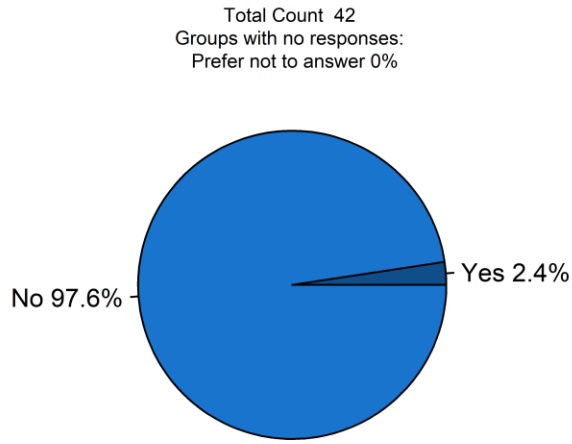


FIGURE 7. RESPONDENT HISPANIC ETHNICITY

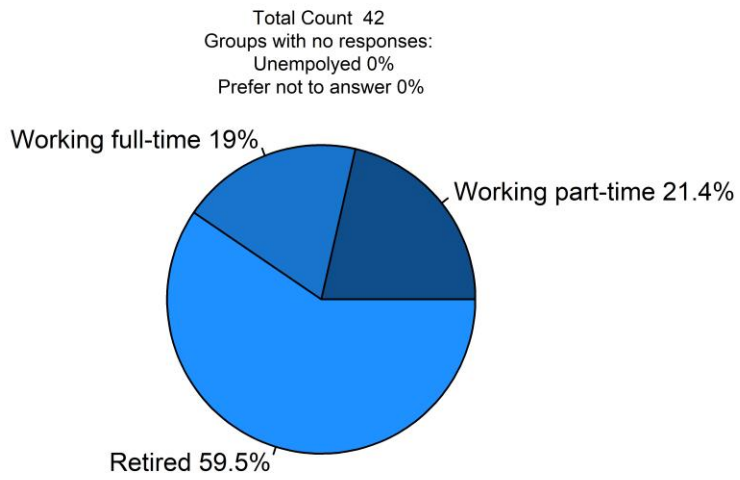


FIGURE 8. RESPONDENT EMPLOYMENT STATUS

2.1.2. Overall results

1. “How many seasons have you volunteered with the [specific VWMP]? (please enter a number rounded to the nearest year)”

- **Total count (n):** 41
- **Mean:** 3.7
- **Median:** 3
- **Standard Deviation:** 5.2

2. “Are you planning to volunteer with the [specific VWMP] in the future?”

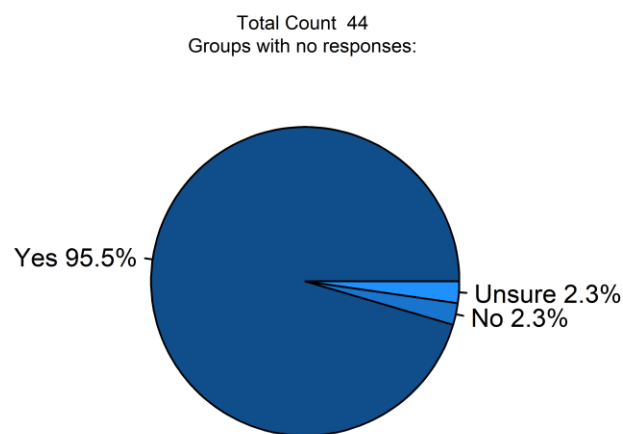


FIGURE 9. FUTURE VOLUNTEER PLANS

3. “Please indicate if you recruited someone from the following categories to volunteer with the [specific VWMP] in 2024.”

TABLE 2. WHO VOLUNTEERS RECRUITED

Recruitment Category	Total Count (n)	Yes (%)	No (%)	Unsure (%)
<i>Friend(s)</i>	36	30.6	69.4	0.0
<i>Coworkers/Classmates</i>	34	23.5	73.5	2.9
<i>Spouse/significant other</i>	34	29.4	70.6	0.0
<i>Children</i>	33	12.1	84.8	3.0
<i>Other</i>	25	8.0	88.0	4.0

4. “How did you hear about opportunities to volunteer with the [specific VWMP]”? (select all that apply)” (includes all volunteers regardless of how many seasons they had volunteered)

TABLE 3. HOW VOLUNTEERS HEARD ABOUT VWMP OPPORTUNITIES

	Total count (n)	Count	%
<i>Meeting</i>	43	13	30.2
<i>Tabling or other outreach event</i>	43	0	0.0
<i>Word of mouth</i>	43	18	41.9
<i>E-mail campaign</i>	43	4	9.3
<i>News broadcasting</i>	43	0	0.0
<i>Print news media</i>	43	8	18.6
<i>Social media</i>	43	1	2.3
<i>Other (please specify):</i>	43	11	25.6

5. “Please indicate how much each of the following statements motivated you to volunteer with the [specific VWMP] in 2024” (includes all volunteers regardless of how many seasons they had volunteered)

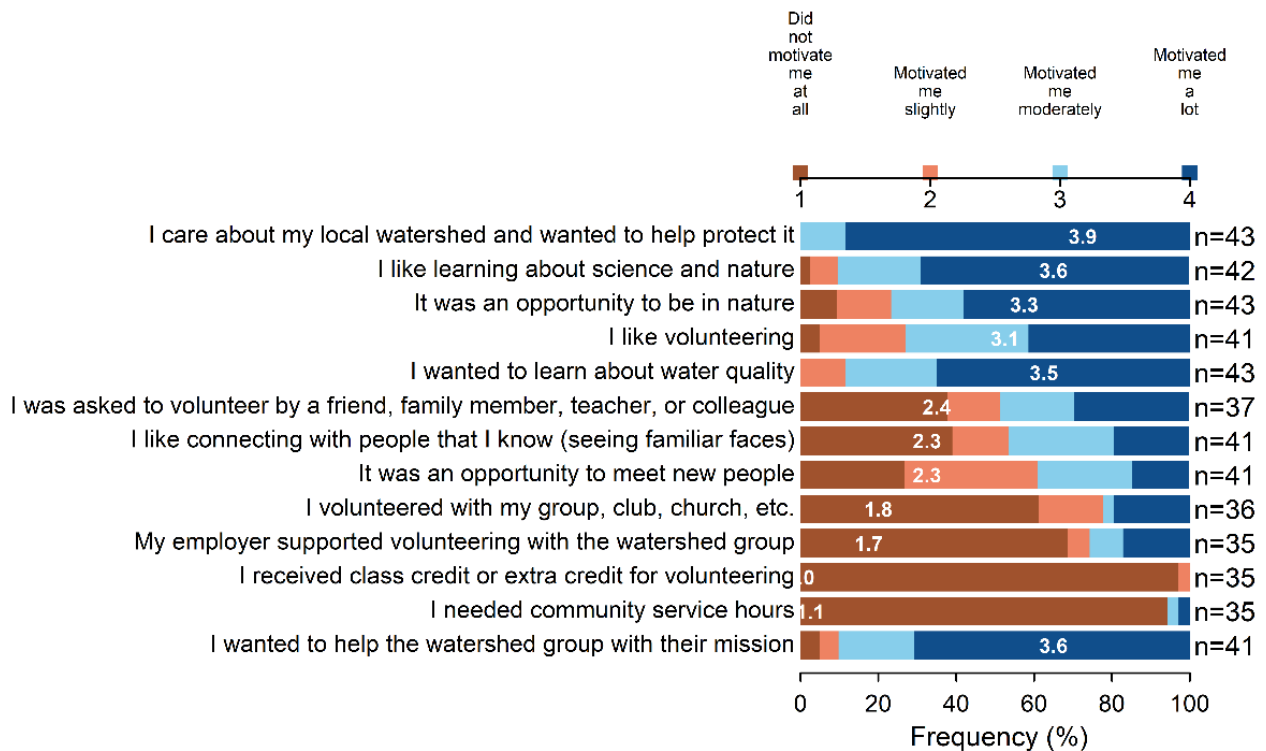


FIGURE 10. MOTIVATIONS TO VOLUNTEER

1=did not motivate me at all; 2= motivated me slightly, 3= motivated me moderately, 4 motivated me a lot

6. **“You indicated that you are not planning on volunteering with the [specific VWMP] in the future. Why have you decided not to volunteer with this program in the future? (select all that apply)”**

- “I moved away from the watershed” n=2

7. **“Do you have any suggestions to improve the volunteer experience with the [specific VWMP]?”** *Answers below are verbatim (names have been removed).*

- Summary analysis of data and more public outreach would be an improvement
- No
- n/a
- [specific VWMP] and [VWMP coordinator] did an excellent job!
- No, everything seems fine.
- NA
- Keep [VWMP coordinator] on full time!
- No
- Interest locally is declining. We need to find ways to motivate community members to get/stay involved. Remind volunteers that being out on local streams is both enjoyable and an opportunity to learn/observe more.
- This is a good program which would benefit from greater funding to allow for monitoring of more water quality parameters.
- It would be easier for me if we could be more flexible on the days that we could volunteer. But I understand that probably doesn't work.
- I would like to go monitor some of the other streams that I have not been to.
- No
- No. It has been rewarding.
- None so far; I'm a newbie.
- Nope
- No
- No
- Summary the health of our respective lake; what do the annual sampling results indicate?
- Add more training about AIS.
- No
- No
- More partners/volunteers & more test sites
- More projects!
- Improve recognition of monitoring team
- It went really well, particularly outreach events
- None
- Reach out to get volunteers through classes at MSU that teach topics similar to this. I wish I had heard about this earlier
- Scheduling dates to go out on Fridays!

8. “Have you ever participated in a training related to the [specific VWMP]?”

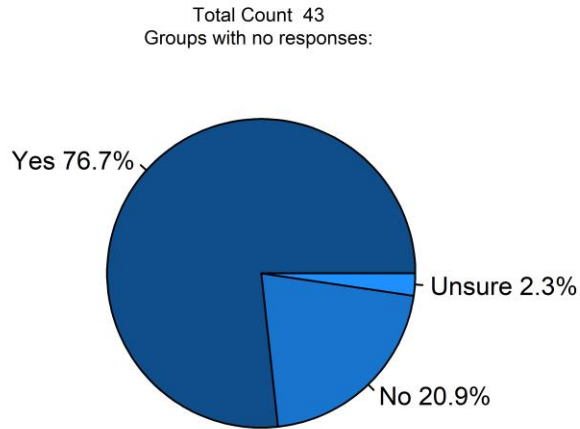


FIGURE 11. PARTICIPATION IN PAST TRAINING

9. “Did you participate in a training related to the [specific VWMP] in 2024?”

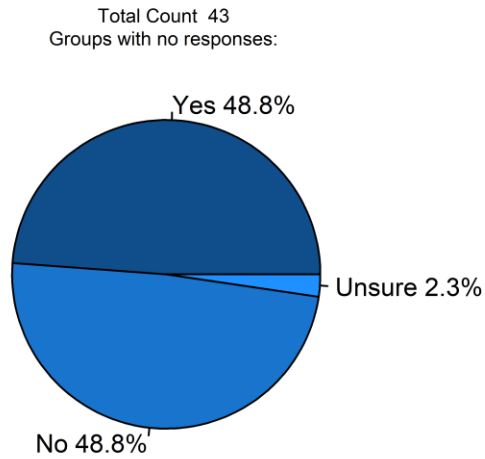


FIGURE 12. PARTICIPATION IN 2024 TRAINING

10. “How much do you disagree or agree with the following statements about the training(s) you had with the [specific VWMP] in 2024?” (includes only volunteers who participated in a training in 2024)

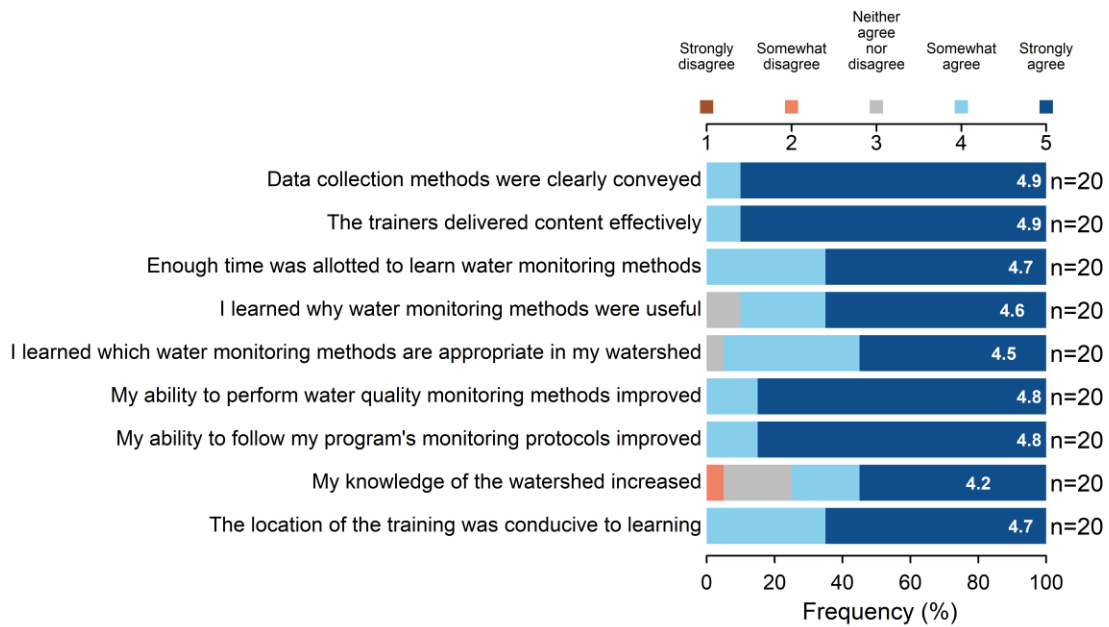


FIGURE 13. EFFICACY OF TRAINING

1=strongly disagree, 2=somewhat disagree, 3=neither agree nor disagree, 4=somewhat agree, 5=strongly agree

11. “Do you have any suggestions to make the [specific VWMP] trainings better?” *Answers below are verbatim (names have been removed).*

- No, having a returner/veteran on each team was very helpful.
- Training was on initial sampling of the year. Many volunteers were unable to attend that single session, so a second session later in the year would be advisable.
- I liked the hands-on and getting to see different plants & critters in real life. That's always helpful.
- No - trainers came to lake, we took them and vols out into the lake where we were all trained at once. Worked very well!
- More time to discuss the 'why' of sampling and more sampling time would allow for a more sustainable speed
- For subsequent years have briefed training for returning testers for a refresher
- Great
- None
- Experience helps, so I believe my performance improved on the second and third date during the year.

12. “Please indicate how much you disagree or agree with the following statements. Because of participating in [specific VWMP], I have a better understanding of the following:”

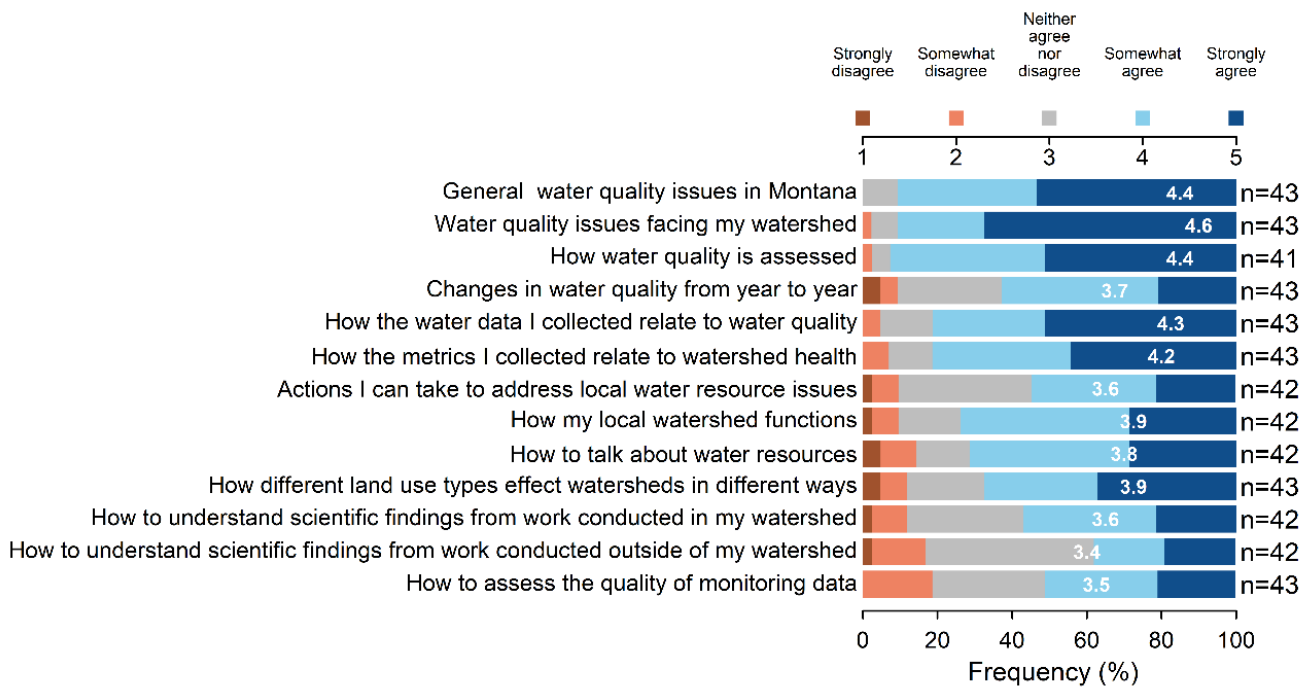


FIGURE 14. INFLUENCE OF VOLUNTEERING ON INCREASED UNDERSTANDING

1=strongly disagree, 2=somewhat disagree, 3=neither agree nor disagree, 4=somewhat agree, 5=strongly agree

13. “Did you talk with anyone about your participation with the [specific VWMP] in 2024?”

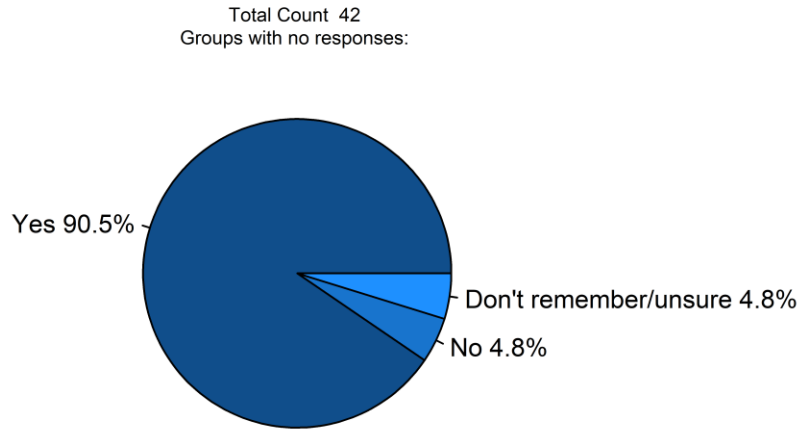


FIGURE 15. DISCUSSION OF VWMP PARTICIPATION

14. With whom did you talk about volunteering? (select all that apply)” (includes respondents who selected “yes” for “Did you talk with anyone about your participation with the [specific VWMP]”)

TABLE 4. WHO VOLUNTEERS TALKED WITH ABOUT VOLUNTEERING

	Total count (n)	Count	%
<i>Friends</i>	35	31	88.6
<i>Coworkers/Classmates</i>	35	10	28.6
<i>Neighbors</i>	35	20	57.1
<i>Family</i>	35	23	65.7
<i>Other</i>	35	4	11.4

15. “When discussing the [specific VWMP], what topics did you talk about? (select all that apply)” (includes respondents who selected “yes” for “Did you talk with anyone about your participation with the [specific VWMP]”)

TABLE 5. TOPICS SPOKEN ABOUT RELATED TO THEIR VWMP

	Total count (n)	Count	%
<i>Your experiences related to collecting the water samples</i>	37	34	91.9
<i>The sites where you collected samples</i>	37	30	81.1
<i>Your experiences related to testing the water samples</i>	37	22	59.5
<i>What you learned about the quality of water in the samples you collected</i>	37	21	56.8
<i>What you learned about water quality throughout the entire watershed</i>	37	19	51.4
<i>The conversations that you had with others participating in VWMP</i>	37	15	40.5
<i>What you learned about how your own activities and choices can affect water quality</i>	37	13	35.1
<i>Other</i>	37	1	2.7

16. “Does anyone you spoke with about the VWMP generally have different opinions than yourself about environmental issues?”

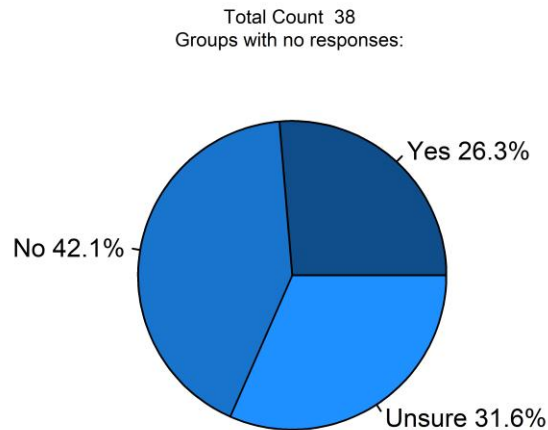


FIGURE 16. DIFFERENT OPINIONS AMONG WHO VOLUNTEERS TALKED WITH

17. “Please indicate how much you disagree or agree with the following broad statements about scientists:”

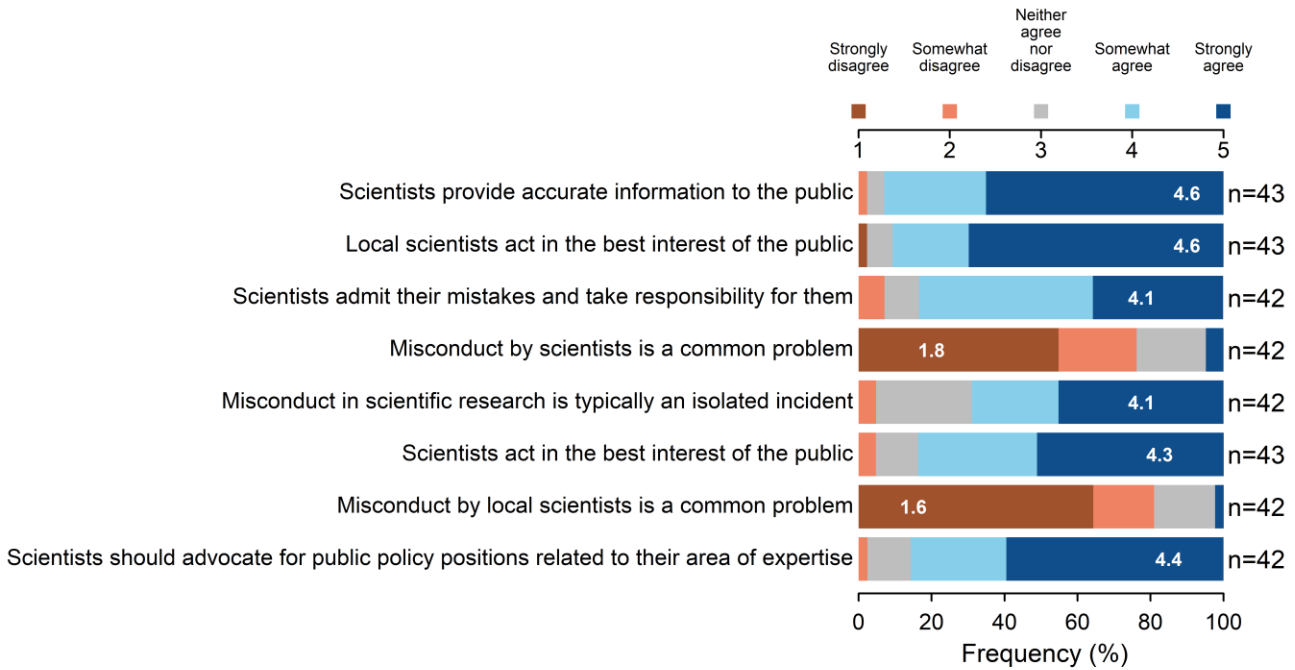


FIGURE 17. PERCEPTIONS OF SCIENTISTS

1=strongly disagree, 2=somewhat disagree, 3=neither agree nor disagree, 4=somewhat agree, 5=strongly agree

18. “In 2024, how frequently did you use the following sources to learn about issues impacting your local watershed?”

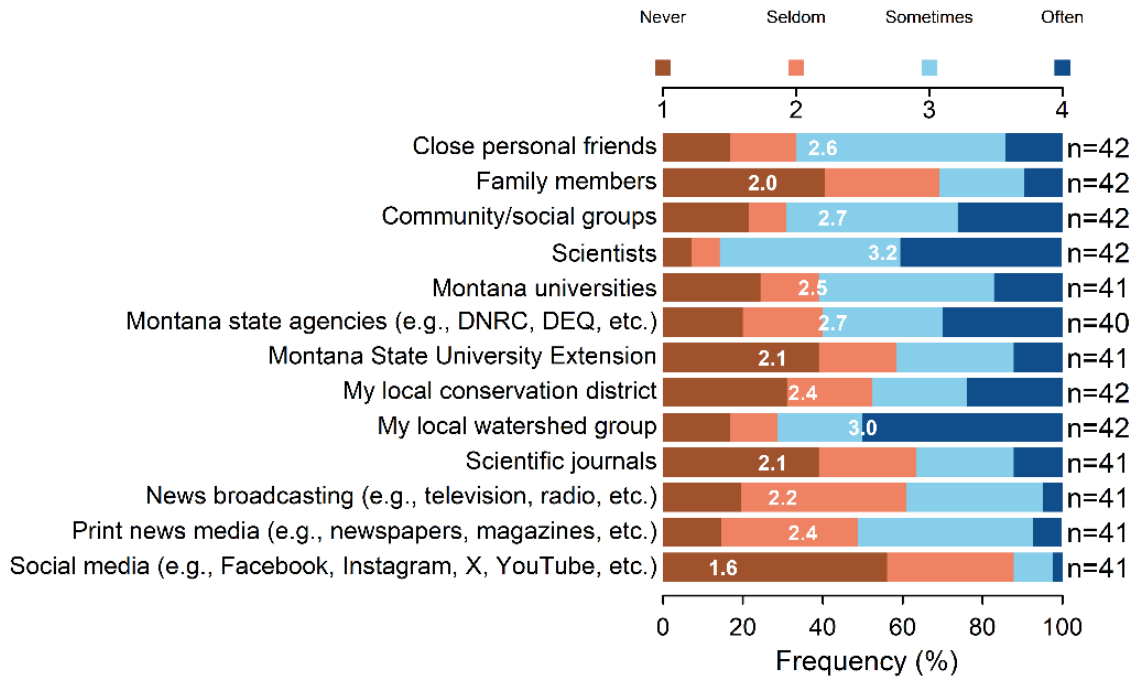


FIGURE 18. FREQUENCY OF INFORMATION USED

1=never, 2=seldom, 3=sometimes, 4=often

19. “Please indicate how much you trust the following sources to accurately communicate scientific information in general.”

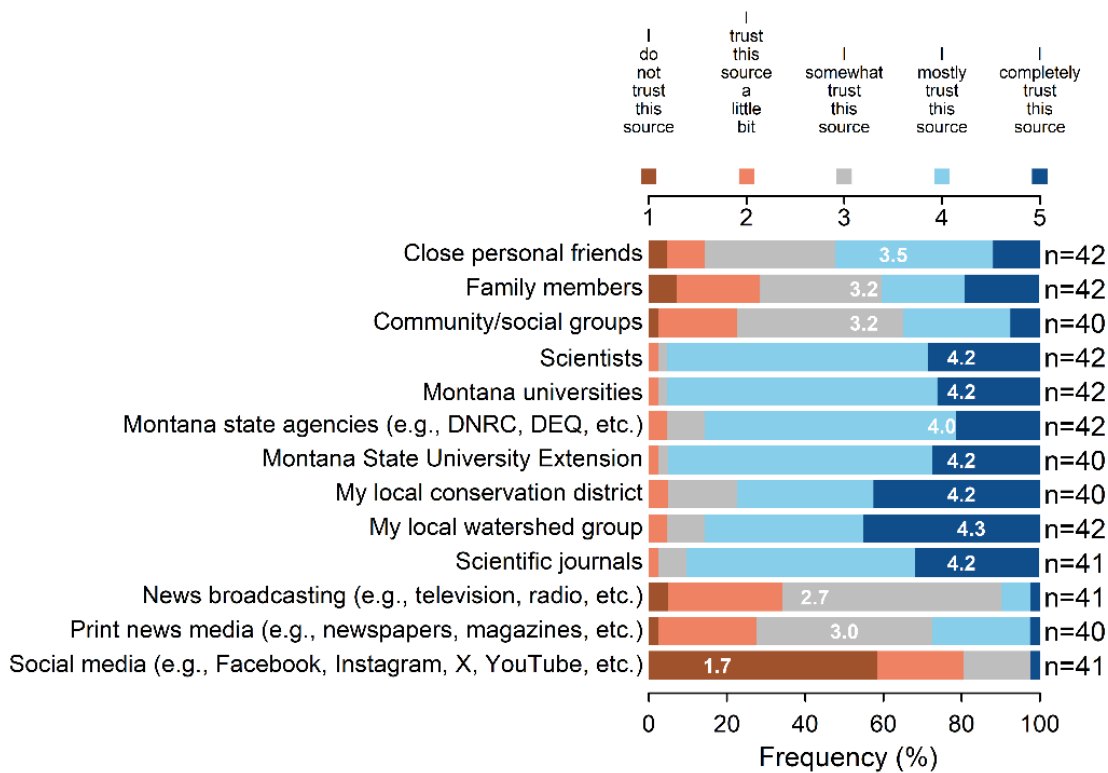


FIGURE 19. TRUST IN INFORMATION

1=I do not trust this source at all, 2=I trust this source a little bit, 3=I somewhat trust this source, 4=I mostly trust this source, 5=I completely trust this source

20. “In 2-3 sentences, please summarize the largest water quality issue facing your local watershed.” *Answers below are verbatim (names have been removed).*

- Greater human activity from population growth and associated development
- Increasing withdrawals contributes to declining water quality and diminished flows. Inadequate sewage treatment (septic systems) contributes to declining water quality
- n/a
- Development and septic systems are big. Old infrastructure and the need for public education of landowners.
- Temperature is an issue, and algae can be thick in late summer months.
- Landowners infringing on public water rights.
- Pollution in Moore Creek.
- Concentrated recreational use along the banks of the rivers; increased housing density and nonpoint source pollution.
- There are several issues but in the case of the Madison they tend to be tributary specific. e.g. Moore Creek has the most impairments, and several have metals contamination issues. A few have temperature issues....
- Development new streams and wetlands, loosing floodplain storage/capacity coupled with the hydrologic effects of climate change.
- Climate change increasing water temperatures.
- Water quality degradation due to subdivision/septic development in the riparian zones of Rock Creek and its tributaries.
- In my opinion, the greatest water quality issue is climate change and rising stream temperatures.
- Urban development. Pets. Climate change.
- Poorly regulated septic systems, lack of enforcement, lack of support from local government
- Nitrates and phosphorus are increasing. The cause is exurban expansion. There is little no urgency concerning this problem.
- 1 population growth 2 AIS [aquatic invasive species].
- I really don't know.
- Old septic systems.
- Mussels, septic leachate, fertilizers. invasive plants.
- Homeowners' septic systems. Protection of the 20 foot no touch shoreline. Invasive species
- Too many people.
- Increase in users: over-development, over-sized boats, shoreline erosion, increased risk of AIS [aquatic invasive species].
- Overuse by people, resulting in garbage, shore erosion, turbidity increase, risk of AIS [aquatic invasive species] introduction.
- Rising water temperatures due to global warming, and excessive weed growth.
- Warming temperatures are producing more algae growth. Nearby extensive logging is producing more run-off into the lake and the population growth in our valley brings more users whose ethics on use of natural lakes produced more litter, fishing lines caught in trees, cut down trees and sins and poop and toilet paper. This is new, just since COVID.
- Septic pollution, runoff from fire impacted forests and runoff from lawns and agriculture are the biggest issue, along with lakeside disturbances for construction of homes.

- Development, County Commissioners do not require thorough EA's prior to approving land use. No zoning. Science not respected by community. Personal freedom and property owners rights are above science-based solutions.
- Many of the homes in the TCL area are old with grandfathered septic systems. The status of these systems is unknown and may be impacting the water quality of the lakes. Also, some people have lawns that they fertilize which could be an issue. Then, of course, there is the low lake levels and the introduction of non-native fish both of which compound any water quality issues that may be present.
- Water quality impacts from riverside land development (subdivisions, logging, road building). Sedimentation from mass failures. Threat of AIS [aquatic invasive species].
- I believe the primary threat to my local watershed is water temperature increase and sedimentation from logging and road building. In addition, sedimentation from the many poorly functioning road crossing structures on existing old roads.
- Rapid, extensive growth in the area with very little restrictions or limitations and little knowledge of baseline ground water and surface water and impacts of growth on these
- Riparian health issues and runoff.
- We would like to recruit more volunteers.
- The population growth in our area through wastewater and runoff is adding pollution to our aquifers, streams and river. Most visitors and residents do not understand the damage that this is doing to the river and all the life that depend on clean water. Many in this population also do not understand how their use of water is wasteful and unsustainable. Our community needs training and incentives that will modify behaviors and develop new habits.
- Toxins and waste entering the watershed due to human activity. This also includes nitrogen and phosphorus from fertilizer and wastewater. This leads to problems such as an increase in E. Coli and algae in the water.
- Pollution of streams.
- The largest water quality issue facing my local watershed (the Gallatin) is an excess amount of nutrients in the watershed, that sometimes causes widespread algal blooms. There is not a confirmed source for the excess nutrients, however, I believe that development in the Big Sky area does play a role, as well as climate change.

21. “The following are examples of changes you could make at home, in your daily routines, or at work to try to help improve water quality in your community. Please indicate whether you have made any of the following changes (select all that apply).”

TABLE 5. ACTIONS TAKEN TO PROTECT WATER QUALITY

	Total count (n)	Not applicable to my household (%)	I have not made this change (%)	I had already made this change (%)	I made this change as a result of volunteering (%)
<i>Implemented integrated pest management practices to reduce pesticide use</i>	41	31.7	9.8	53.7	4.9
<i>Reduced fertilizer use</i>	41	31.7	7.3	56.1	4.9
<i>Properly disposed of household waste (e.g. batteries, light bulbs, hazardous chemicals, oils and fats, etc.)</i>	41	2.4	4.9	90.2	2.4
<i>Attended a public meeting related to natural resource planning/management</i>	40	2.5	22.5	50.0	25.0
<i>Submitted a public comment related to natural resource planning/management</i>	39	10.3	35.9	28.2	25.6
<i>Properly disposed of pet waste</i>	41	48.8	2.4	48.8	0.0
<i>Properly disposed of used motor oil and antifreeze</i>	41	22.0	2.4	75.6	0.0
<i>Directed downspouts away from a paved surface</i>	41	48.8	9.8	41.5	0.0
<i>Decreased the amount of chemical products used in my house that go down the drain</i>	41	9.8	17.1	70.7	2.4
<i>Reduced storm water runoff from my property</i>	40	65	7.5	27.5	0.0
<i>Reduced runoff of other contaminants in storm water from my property (e.g., sediment, de-icer, etc.)</i>	41	51.2	14.6	34.1	0.0
<i>Volunteered for another water quality related project</i>	39	10.3	43.6	15.4	30.8
<i>Tested my well water</i>	40	40.0	15.0	40.0	5.0

3. Citations

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