Volunteer Water Monitoring Survey

2021 Volunteer Statewide Survey Report

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Table of Contents

Tables

Figures

1. 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 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. These results are the beginning of what we hope will be many years of standardized volunteer water monitor surveys across the state.

2. 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. This survey was deployed specifically for the 2021 volunteer year.

We piloted the survey with our volunteer water monitoring program managers and several social scientists in January 2022 and adapted some questions following these experts' feedback. The survey went live in April 2022. 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. In the following sections, we use descriptive statistics to report survey data.

3. 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, we intend to work to track this information in the future. Between April and June of 2022, we received 34 responses. We excluded responses from respondents who answered less than 10 percent of the survey or who did not answer our data check question (Q12.6: Please select strongly disagree for this statement), for a total of 31 responses across all volunteer water monitoring programs.

3.1. All volunteer water monitoring program results

3.1.1. Program information and demographics

TABLE 1 VOLUNTEER WATER MONITORING PROGRAM RESPONDENTS

"Please select which Montana-based volunteer water monitoring program for which you plan to complete this survey." (n=31)	
Volunteer Water Monitoring Program	**Frequency**
Gallatin Stream Teams	5
Missoula Valley Water Quality District	2
Northwest Montana Lakes Network	15
Madison Stream Team	7
Musselshell River Salinity Monitoring Project (n=1)	1
Sun River Watershed Group	1

- n=31
  13% Veterans
  61% Male
- 1 student
- 1 active duty military
- n=28
  57% Retired
  36% Working full-time
  7% Working part-time
- n=30
  100% non-Hispanic
  (1 declined to state)
- n=26
  96% white
  (3 people selected other and wrote in Human, they were removed; 1 responded "mixed")
- n=23
  median age is 65
  mean age is 61
  (5 declined to state)

3.1.2. Overall results

1. **"How many seasons have you volunteered with the [specific VWMP]?** (please enter a number rounded to the nearest year)"
   - n=29
   - median number of seasons is 4
   - mean number of seasons is 5.6
   - range = 1 to 25 years

2. **"Are you planning to volunteer with the [specific VWMP] in the future?"**
   - n=29
   - 90% Yes
   - 10% Unsure

3. **"Please indicate if you recruited someone from the following categories to volunteer with the [specific VWMP] in 2021."**

TABLE 2 WHO VOLUNTEER RECRUITED

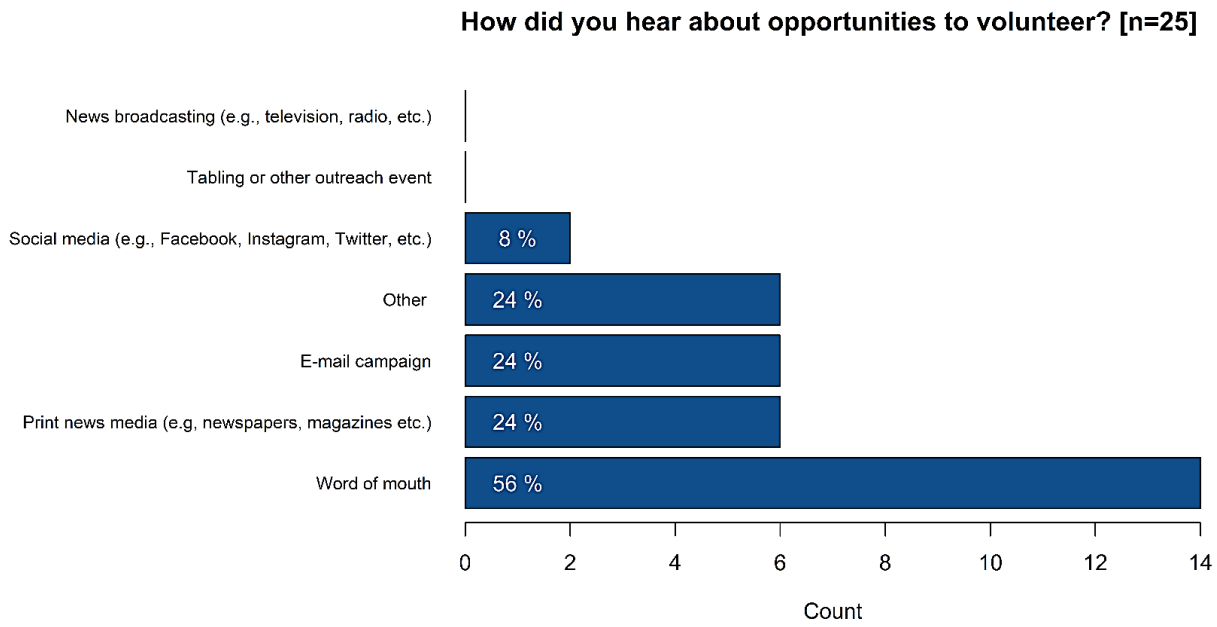
Recruitment Category	Number of Respondents	*Yes*	*No*	*Unsure*
Friend(s)	n=29	13.79%	86.21%	0.00%
Coworker(s)/classmate(s)	n=28	10.71%	89.3%	0.00%
Spouse/significant other	n=28	10.71%	85.7%	3.57%
Children	n=28	3.57%	96.4%	0.00%
Other	n=21	0.00%	100.0%	0.00%

4. **"How did you hear about opportunities to volunteer with the [specific VWMP]? (select all that apply"** (includes volunteers who volunteered one season or fewer)
   - n=7
   - 14% Print news media (e.g., newspapers, magazines, etc.)
   - 14% Social media (e.g., Facebook, Instagram, Twitter, etc.)
   - 29% Word of mouth
   - 43% Other (i.e., through work, through a meeting)

5. **"How did you hear about opportunities to volunteer with the [specific VWMP]? (select all that apply"** (includes volunteers who volunteered two or more seasons)
   - n=22
   - 5% Social media (e.g., Facebook, Instagram, Twitter, etc.)
   - 23% Print news media (e.g., newspapers, magazines, etc.)
   - 27% Email campaign
   - 32% Other (i.e., library board, meeting, organization, personally asked)
   - 36% Word of mouth

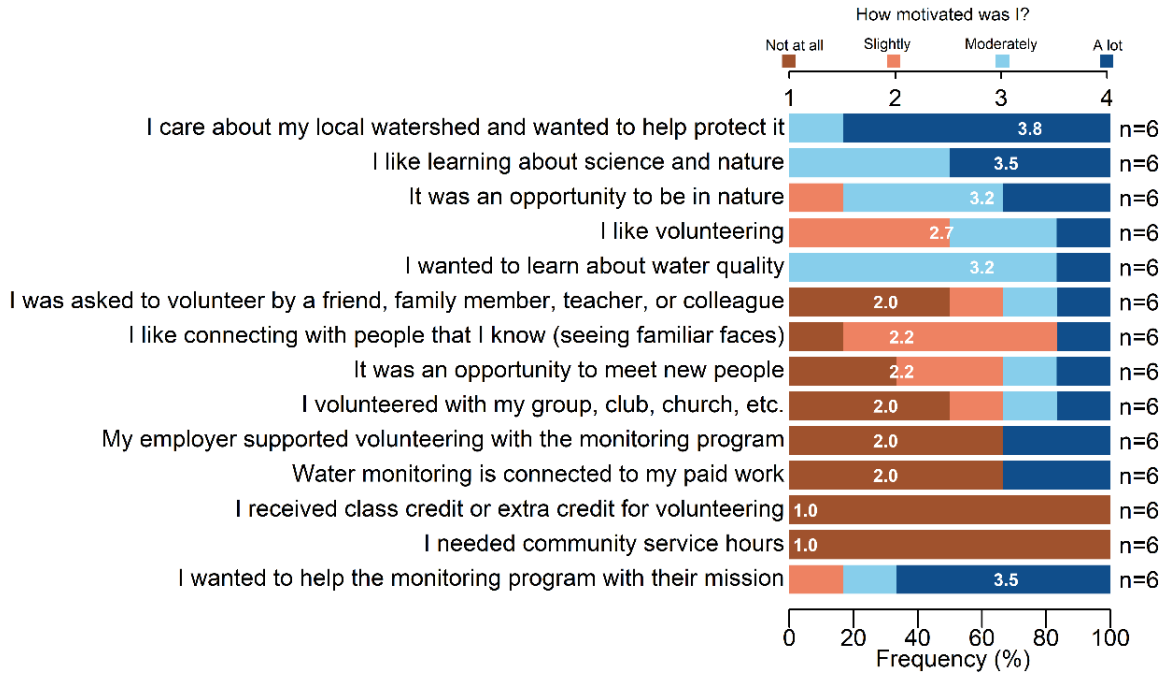
6. **"How did you hear about opportunities to volunteer with the [specific VWMP]? (select all that apply"** (includes all volunteers regardless of how many seasons they had volunteered)

FIGURE 1 HOW VOLUNTEERS HEARD ABOUT VOLUNTEERING FOR THEIR VWMP



7. **"Please indicate how much each of the following statements motivated you to volunteer with the [specific VWMP] in 2021:"** (includes volunteers who volunteered one or fewer seasons)

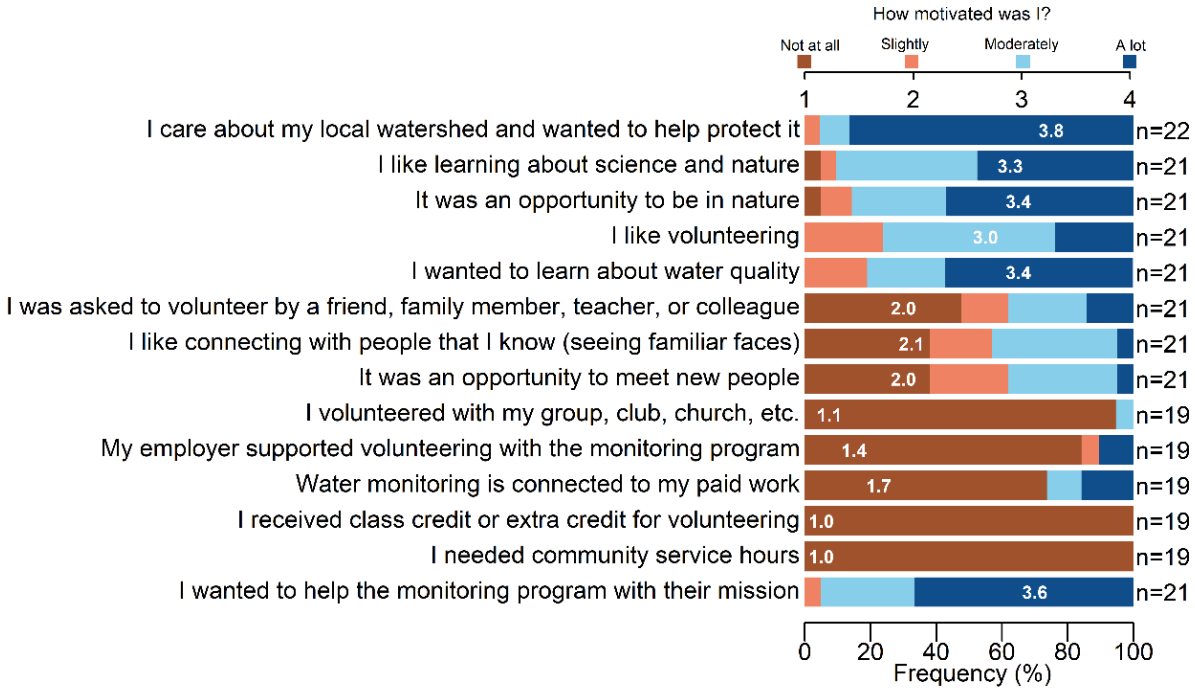
FIGURE 2 MOTIVATIONS TO VOLUNTEER – HAD VOLUNTEERED ONE OR FEWER SEASONS



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

8. **"Please indicate how much each of the following statements motivated you to volunteer with the [specific VWMP] in 2021:"** (includes volunteers who volunteered more than one season)

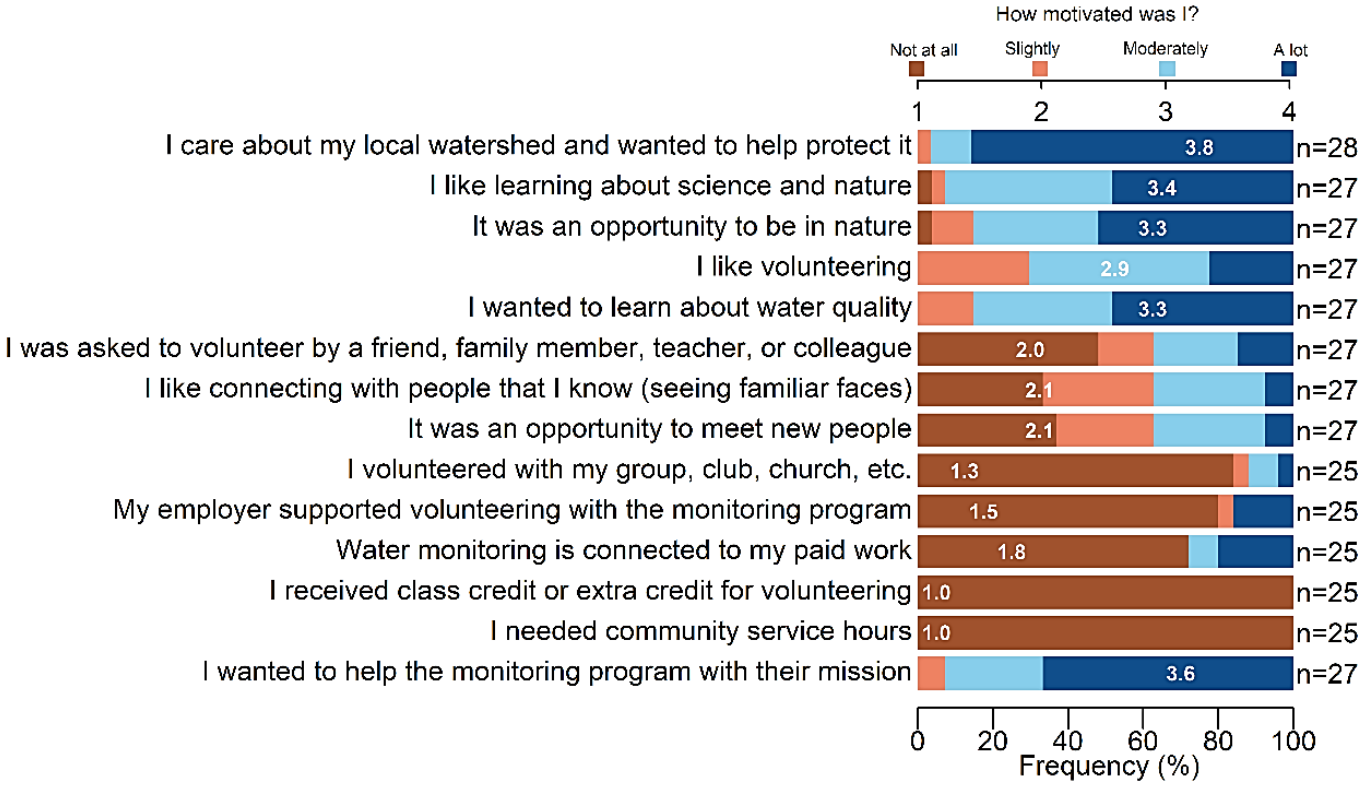
FIGURE 3 MOTIVATIONS TO VOLUNTEER – HAD VOLUNTEERED MORE THAN ONE SEASON



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

9. **"Please indicate how much each of the following statements motivated you to volunteer with the [specific VWMP] in 2021:"** (includes all volunteers regardless of how many seasons they had volunteered)

FIGURE 4 MOTIVATIONS TO VOLUNTEER – ALL VOLUNTEERS



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

10. **"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)"**
    - No responses, one response removed, accidental selection

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

- Pay [program manager] more.
- No. It works well, is predictable and rewarding.
- Sponsor more parties.
- It was occasionally hard to devote a whole day to monitoring during the work week.
- None.
- I believe they have a great program, great leadership, and a willingness to come out in the field to help train and answer questions.
- The [program name] has gone through great changes since I started. It used to have lots of people monitoring lots of streams. From the acquired data many streams were removed from the program because there were no negative human caused impacts to their quality. Like everything else in life it has not stayed the same. The experience now is different but still good.
- Very well organized as it is. A bit more training in all phases of the monitoring might be useful for some of the first year volunteers. However, that comes with numerous logistical and time constraints. Overall, the program does a good job of meeting project objectives. Few improvements are needed--good diversity of interests in the program.
- Engage other Organizations and Nonprofits as well as schools.
- It would be helpful to have more indoor conversation and briefing about expectations and benefits.
- Give more notice of upcoming site visits so scheduling can be changed/rearranged. Add a couple more streams to geographically diversify the experience.
- It is all going well, why change?
- No.
- No it is working out great. [Program manager] is wonderful to work with. The new website works better also. It makes me put in the data that day. I used to wait and type up everything I did for months at one time because of the website. Now it is fast and much more efficient.
- I think [program name] does a great job with the volunteer experience, keep up the good work!
- Not at this time.
- I have been monitoring [body of water] for almost 30 years, I believe that water is one of the most critical natural resource challenges the world faces and yet when there have been issues with my [body of water] I wonder if it makes a difference.

12. "Have you ever participated in a training related to the [specific VWMP]?"

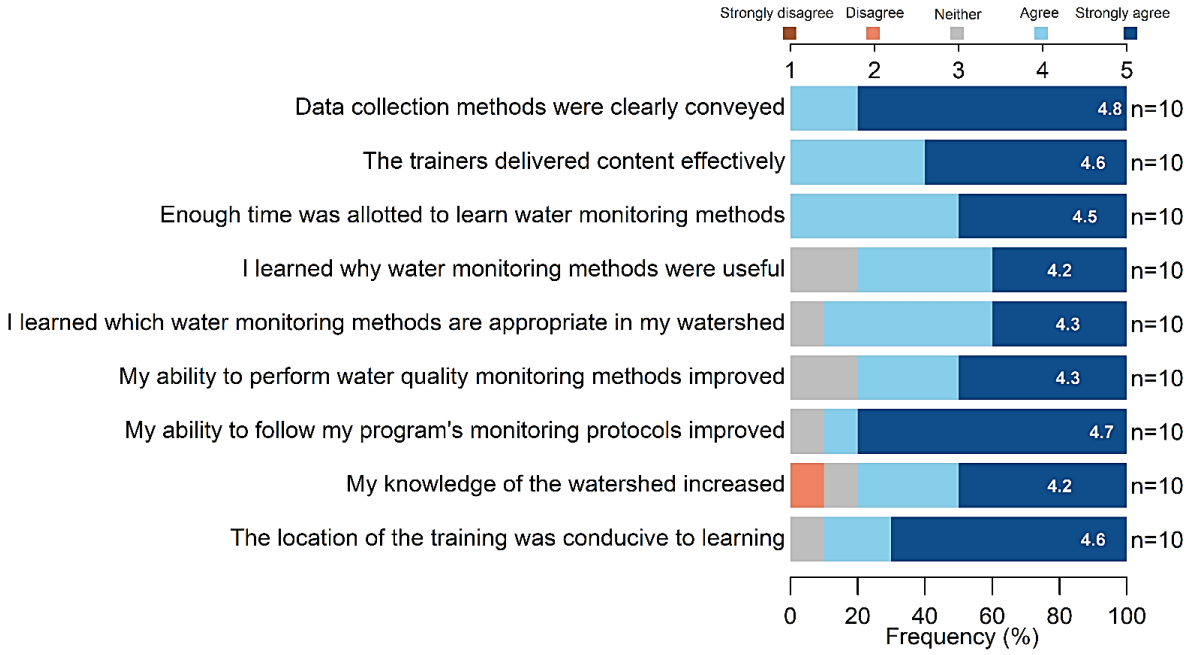
- n=28
- 82% Yes
- 18% No

13. "Did you participate in a training related to the [specific VWMP] in 2021?"

- n=29
- 38% Yes
- 62% No

14. "How much do you disagree or agree with the following statements about the training(s) you had with the [specific VWMP] in 2021?" (includes only volunteers who participated in a training in 2021)

FIGURE 5 EFFICACY OF TRAINING - ALL

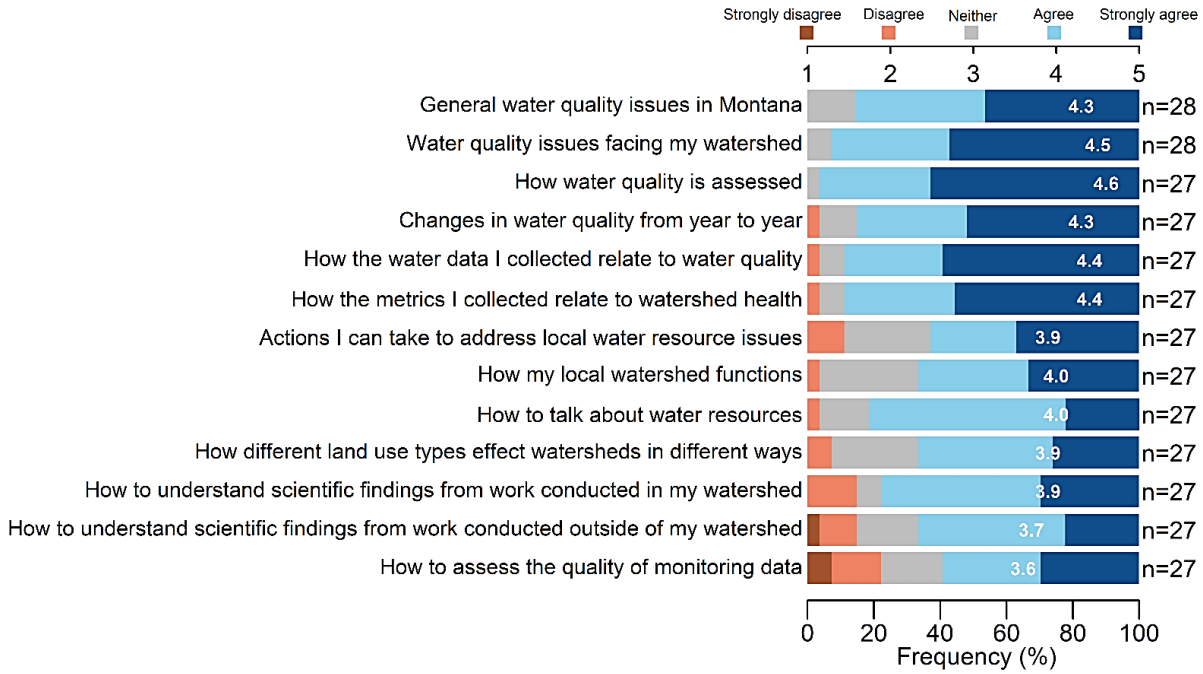


1=strongly disagree, 2=somewhat disagree, 3=neither agree nor disagree, 4=somewhat agree, 5=strongly agree

15. **"Do you have any suggestions to make the [specific VWMP] trainings better?"** *Answers below are verbatim (names have been removed).*
    - Overall thought the training was quite helpful. Perhaps a little more time or opportunity to fill out demo forms directly as a form of practice.
    - I like the group/round robin training sections with experts. I would like to hear more about the big picture- where the information goes, why it is important, how the program started. [Program manager] is awesome and so knowledgeable, but it's not really [their] style to convey enthusiasm/importance of the program. Maybe someone else could frame that part. It is useful to learn the methods again each year, even though [program manager] is always there to ensure quality.
    - I have received many training sessions in the past years. The training I had last year was for a specific type of sampling that we had not done before. I really don't think a need more training unless it's something new.
    - Substantial amount of material is presented in a relatively short amount of time. Reviews of procedures at monitoring sites are always useful, but some on-the- job learning is expected within the time constraints that the program operates under.
    - Keep up the good work!
    - More focused time needed- especially with regard to what impact if any will monitoring have on stream health.
    - Nope. [Program manager] is doing great job.
    - I liked the smaller training sessions and timing options of last year's training. Overall I think the training is a good balance of information for new folks and a good refresher for returning volunteers and/or folks who are more familiar with hydrology.

16. "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 6 INFLUENCE OF VOLUNTEERING ON INCREASED UNDERSTANDING - ALL



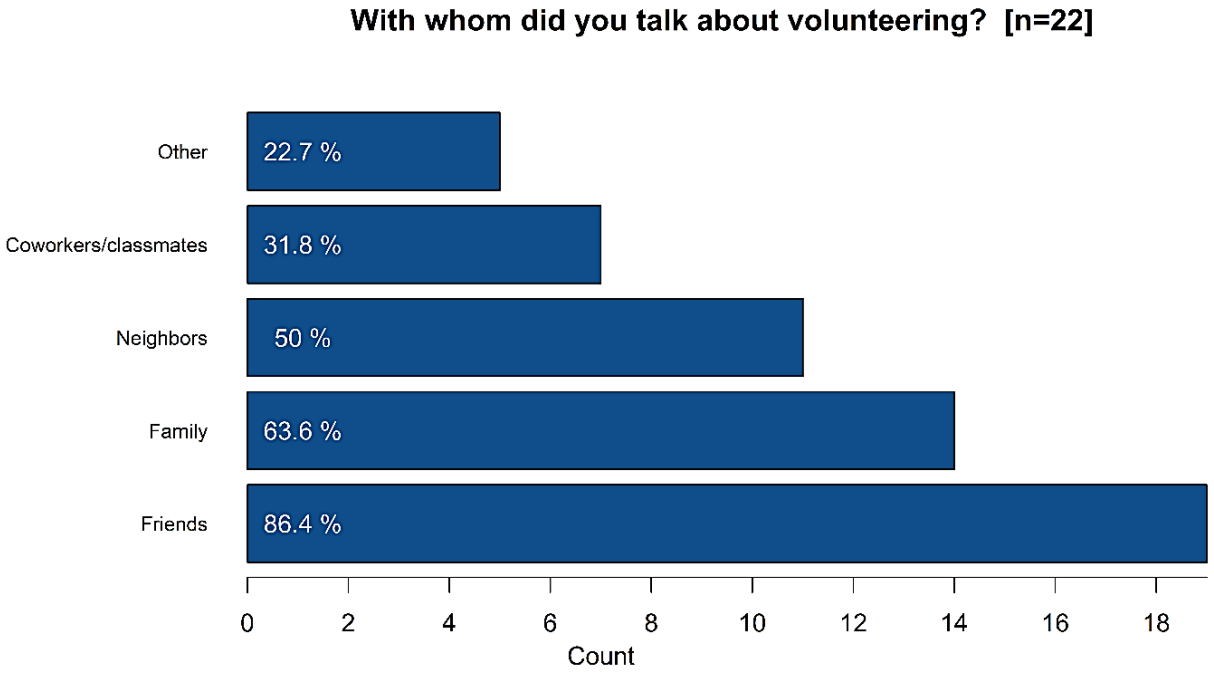
1=strongly disagree, 2=somewhat disagree, 3=neither agree nor disagree, 4=somewhat agree, 5=strongly agree

17. "Did you talk with anyone about your participation with the [specific VWMP] in 2021?"

- n=26
- 96% Yes
- 4% Can't remember/unsure

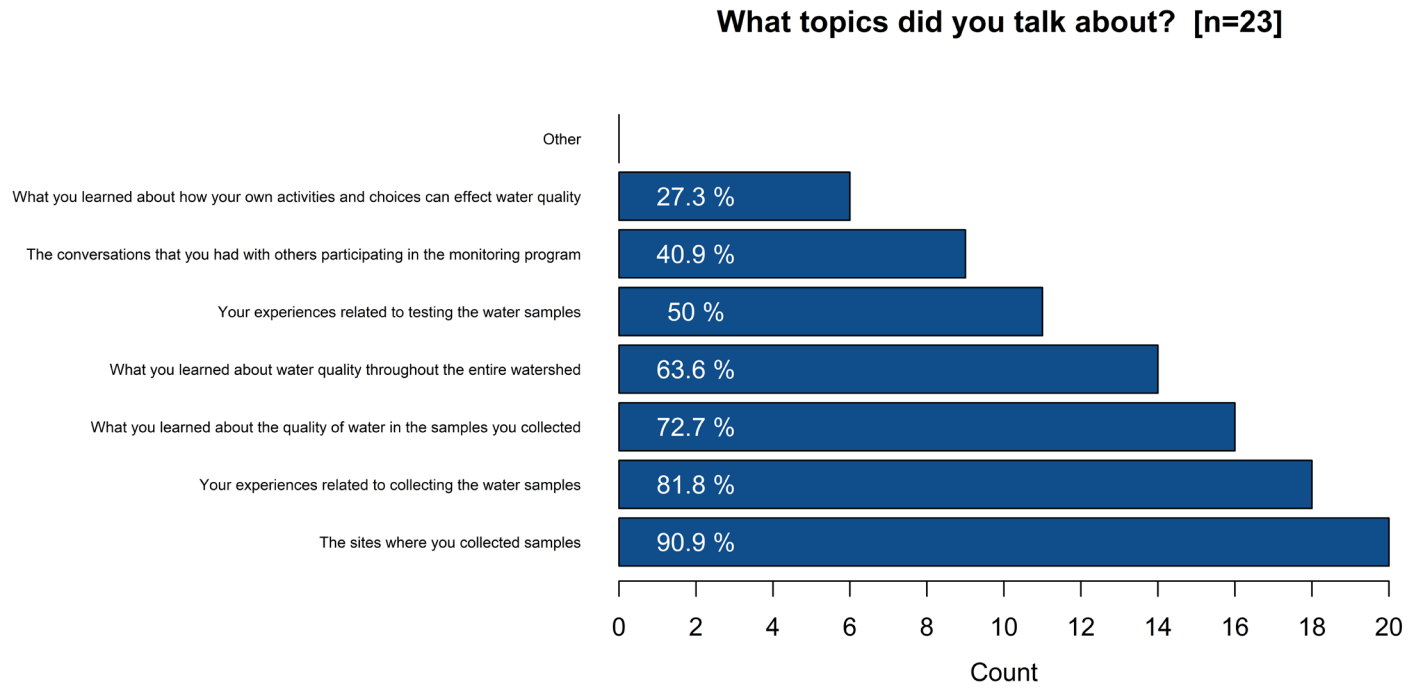
18. With whom did you talk about volunteering? (select all that apply)" (includes respondents who selected "yes" for "Did you talk with anyone about your participation with the [specific VWMP]")

FIGURE 7 WHO VOLUNTEERS TALKED WITH ABOUT VOLUNTEERING - ALL



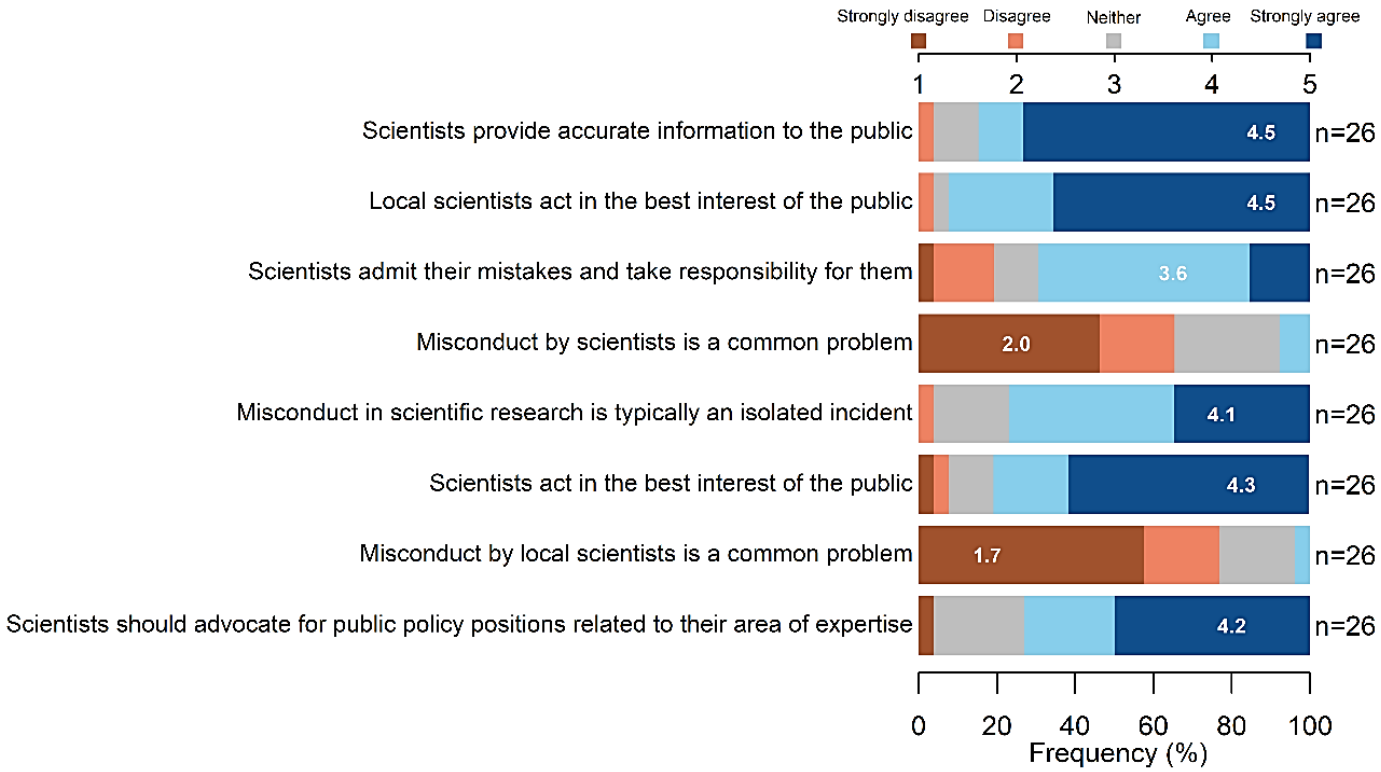
19. "When discussing the [specific VWMP], what topics did you talk about? (select all that apply)" (includes respondents who selected "yes" for "Did you talk with anyone about your participation with the [specific VWMP]")

FIGURE 8 TOPICS SPOKEN ABOUT RELATED TO THEIR VWMP



20. "Please indicate how much you disagree or agree with the following broad statements about scientists:

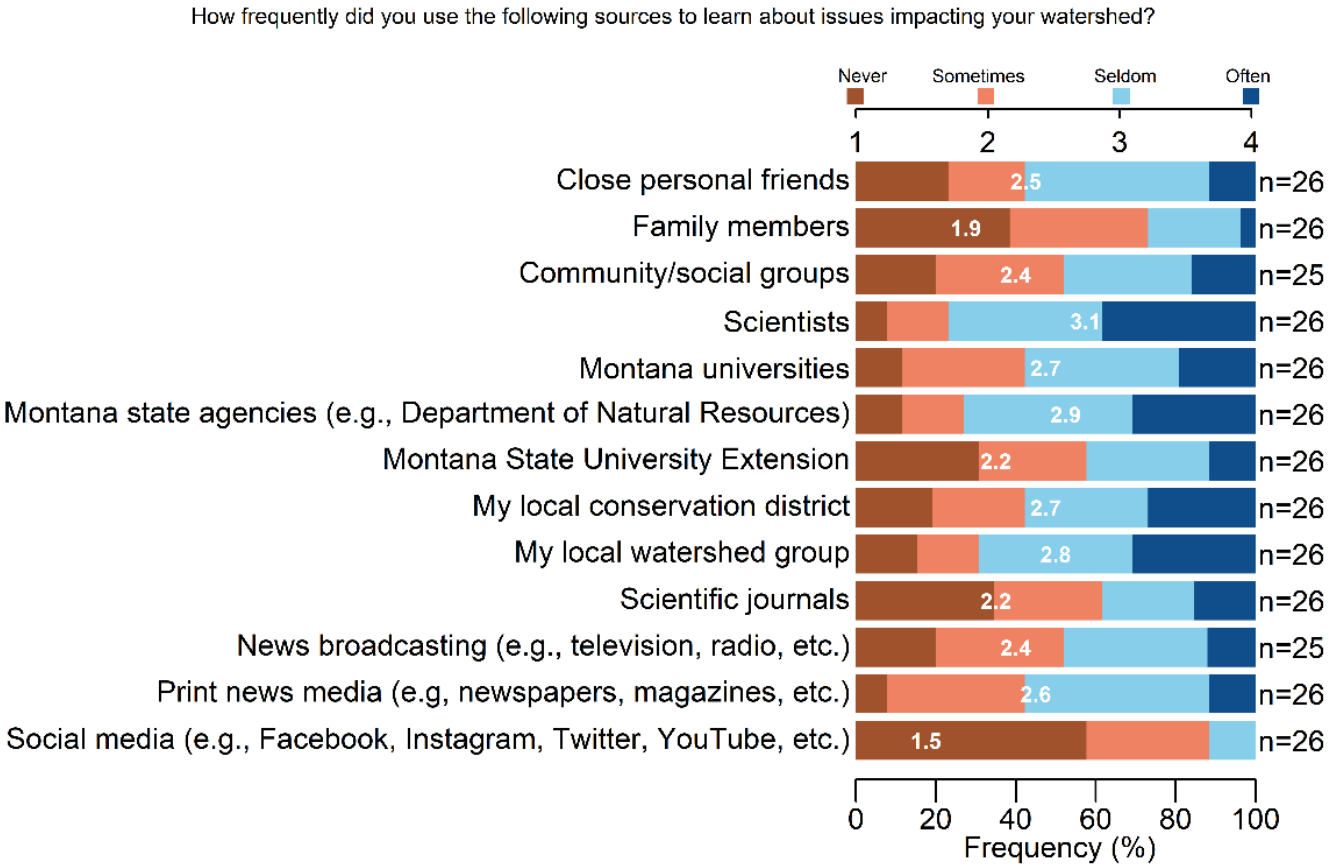
FIGURE 9 PERCEPTIONS OF SCIENTISTS



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

21. "In 2021, how frequently did you use the following sources to learn about issues impacting your local watershed?"

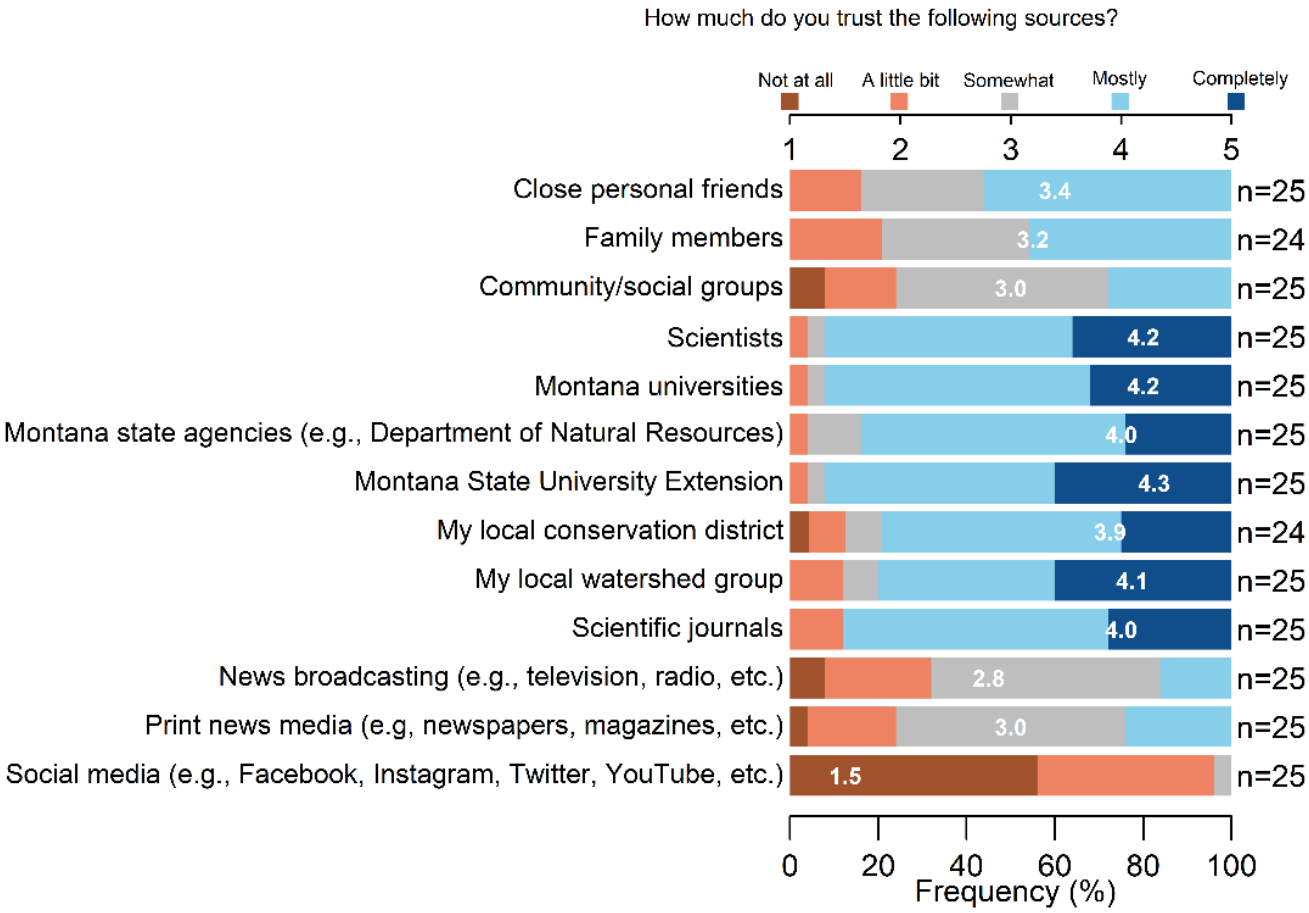
FIGURE 10 FREQUENCY OF INFORMATION USED



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

22. "Please indicate how much you trust the following sources to accurately communicate scientific information in general"

FIGURE 11 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

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

- Increased population growth and inadequate protections for watershed.
- Shoreline development, potential for nutrient and chemical leaching. Over-use of public access site. Potential for invasive species.
- It's not a single issue: volume and timing of water, human population growth, and pollution all must be addressed for example.
- Potential invasive species issues.
- Increased algae and weed growth, mostly due to increasing temperatures and the lack of an outlet stream on [name of waterbody removed].
- The largest water quality issue facing the [name of waterbody removed] watershed is rising temperature due to drought, water demand, and climate change, and nitrate contamination from septic systems and agricultural runoff.
- Invasive species. Human pollution. Drought
- Impacts from global warming and AIS.
- We are concerned about invasive species getting a foothold in the area. We are also concerned about the impacts of wake boats.
- Water being diverted from streams and rivers for irrigation without considering the needs of aquatic life. Not zoning properly to keep people from removing riparian vegetation and land improvement that deteriorates water quality.
- Our growing dependence on a finite resource as we see increased development (landscaping, lawns, gardening, golf courses, etc.). Altering a dry, semi-arid ecosystem with the addition of water-dependent plants.
- Drought which may be caused by climate change. Impacts of irrigation use and livestock. Rapid residential development and the resulting wells and septic systems.
- Political and economic concerns have relegated scientific data to a secondary consideration. Uninhibited pro-growth policies, concerted efforts to ignore environmental protections, and accelerated usage of the limited water resources leave the watershed highly vulnerable to increased pollution inputs, degraded riparian habitat, and subsequent degradation of a suite of critical water quality parameters. Physical changes in temperature and stream hydraulics depress aquatic populations, facilitate invasive species expansion, and diminish our appreciation of an irreplaceable resource.
- Invasive species. Human pollution. Drought
- Impact from the increasing human population. More people typically means more fertilizer use, more resource use, more building (which can impact sediment). Also, the seemingly warming climate and long term drought impact water temperatures which can directly impact everything and everyone who relies on the water for survival.
- Lack of water.
- Misuse and over consumption. Needs to be more focus on a collaborative approach to resource management.
- Poor understanding of critical issues with regard the quality and quality of surface water on the part of local town and county officials and the unwillingness to do anything about these issues such as better land use regulations and public education of these critical issues.
- The largest impacts on our local watershed are sedimentation and temperature impairments within the rivers and streams. With drought becoming a severe problem,

temperatures will likely rise in the waterways as there is limited water supply entering the river.

- It varies. In some it is sedimentation e.g. [name of waterbody removed]. In some it is Ag/grazing impacts and in at least one other, pathogen.
- 1) Climate change. 2) Population (rapid, unmanaged growth).
- Users impacting the channel with personal modifications creating turbidity.
- Septic leachate. Recreational overuse.
- Today on [name removed] the water level keeps on going down. How can you fix that?
- Growth, a bit of a blanket statement, but the massive growth [name of geographical area removed] is experiencing is a huge challenge for water quality in the watershed. Development removes natural components of the ecosystem and has a large effect on storm water runoff, which in turn affects water quality in streams. The change in land use and development of previously natural areas also has a large effect on erosion, nutrient flows and loads, and the flows and quality of streams.
- Too much demand for too little water

24. "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)." (n=29)

TABLE 3 ACTIONS TAKEN TO PROTECT WATER QUALITY

Practices	**I made this change before 2021** (count)	**I made this change during 2021** (count)
Implemented integrated pest management practices to reduce pesticide use	19	1
Reduced fertilizer use	16	1
Properly disposed of household waste (e.g. batteries, light bulbs, hazardous chemicals, oils and fats, etc.)	23	0
Attended a public meeting related to natural resource planning/management	15	3
Submitted a public comment related to natural resource planning/management	15	1
Properly disposed of pet waste	17	0
Properly disposed of used motor oil and antifreeze	22	0
Directed downspouts away from a paved surface	18	0
Decreased the amount of chemical products used in my house that go down the drain	20	1
Reduced storm water runoff from my property	12	0
Reduced runoff of other contaminants in storm water from my property (e.g., sediment, deicer, etc.)	12	0
Volunteered for another water quality related project	15	2

4. Citations

Church, S.P., Payne, L.B., Peel, S. and Prokopy, L.S., 2019. Beyond water data: benefits to volunteers and to local water from a citizen science program. *Journal of Environmental Planning and Management*, *62*(2), pp.306-326.

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