Volunteer Water Monitoring Survey

2021 Volunteer Statewide Survey and Northwest Montana Lakes Network Report

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Suggested Citation

Church, S.P., L.F. Bean, W.A. Sigler (2022). *Volunteer Water Monitoring Survey: 2021 Northwest Montana Lakes Network Report.* People Places Water Lab. Bozeman: Montana State University.

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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 across Montana to develop a standardized statewide online volunteer monitor survey, designed to be administered by Montana VWMPs every year. 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), as well as our own questions. The volunteer water monitoring program managers informed the questions related to monitoring training. This survey was developed 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. Between April and June of 2022, we received 17 responses.

3.1. Northwest Montana Lakes Network Report Results

3.1.1. Demographics – Northwest Montana Lakes Network

- n=15
  0% Students
  0% Active-duty military
  0% Veterans
  60% Male
  40% Female

- n=15
  7% Part-time employment
  33% Full-time employment
  69% Retired

- n=15
  100% Non-Hispanic

- n=15
  86.7% White
  1 responded “human”
  1 responded “mixed”

- n=13
  Median age is 65
  Mean age is 63.8

3.1.2. Overall Northwest Montana Lakes Network results

1. **"How many seasons have you volunteered with the Northwest Montana Lakes Network?** (please enter a number rounded to the nearest year)"
   - n=17
   - median number of seasons is 4
   - mean number of seasons is 6.8
   - range = 1 to 25 years

2. **"Are you planning to volunteer with the Northwest Montana Lakes Network in the future?"**
   - n=17
   - 88.2% Yes
   - 11.8% Unsure

3. **"Please indicate if you recruited someone from the following categories to volunteer with the Northwest Montana Lakes Network in 2021."**

TABLE 1 WHO VOLUNTEER RECRUITED

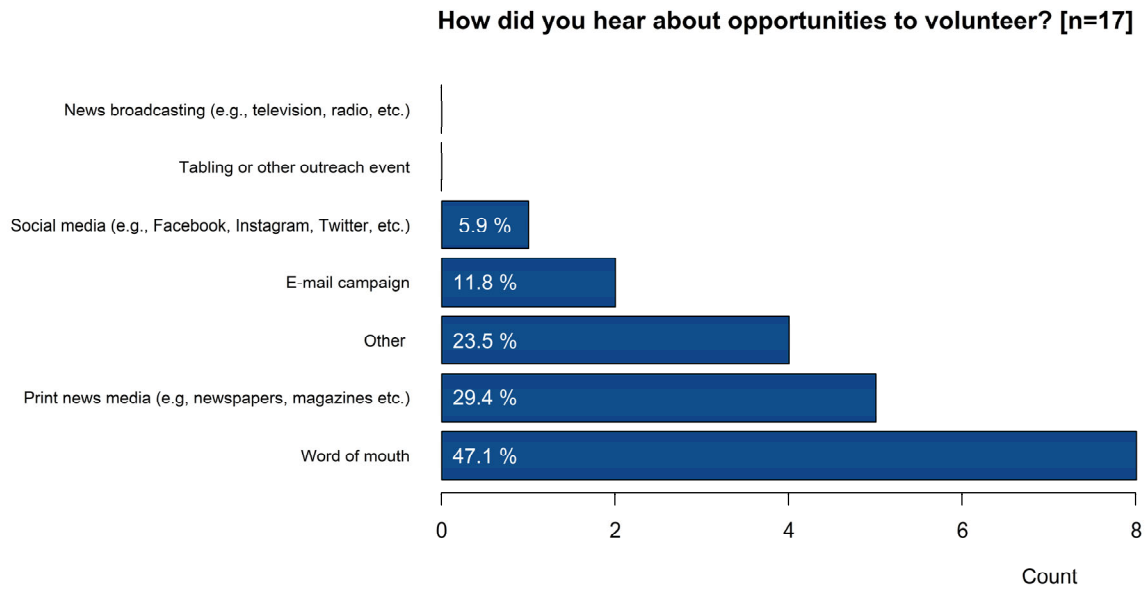
Recruitment Category	Frequency	Yes (%)	No (%)	Unsure (%)
Spouse/significant other	16	18.8%	75.0%	6.3%
Friends	17	17.6%	82.4%	0.0%
Coworker(s)/classmate(s)	16	6.3%	93.8%	0.0%
Children	16	0.0%	100.0%	0.0%
Other	12	0.0%	100.0%	0.0%

4. **"How did you hear about opportunities to volunteer with the Northwest Montana Lakes Network? (select all that apply)"** (includes volunteers who volunteered one season or fewer)
   - n=4
   - 25% Print news media (e.g., newspapers, magazines, etc.)
   - 25% Word of mouth
   - 50% Other (i.e., through work, through a meeting)

5. **"How did you hear about opportunities to volunteer with the Northwest Montana Lakes Network? (select all that apply)"** (includes volunteers who volunteered two or more seasons)
   - n=11
   - 9.1% Social media (e.g., Facebook, Instagram, Twitter, etc.)
   - 18.2% Email campaign
   - 36.4% Print news media (e.g., newspapers, magazines, etc.)
   - 54.5% Word of mouth
   - 27.3% Other (i.e., personally asked)

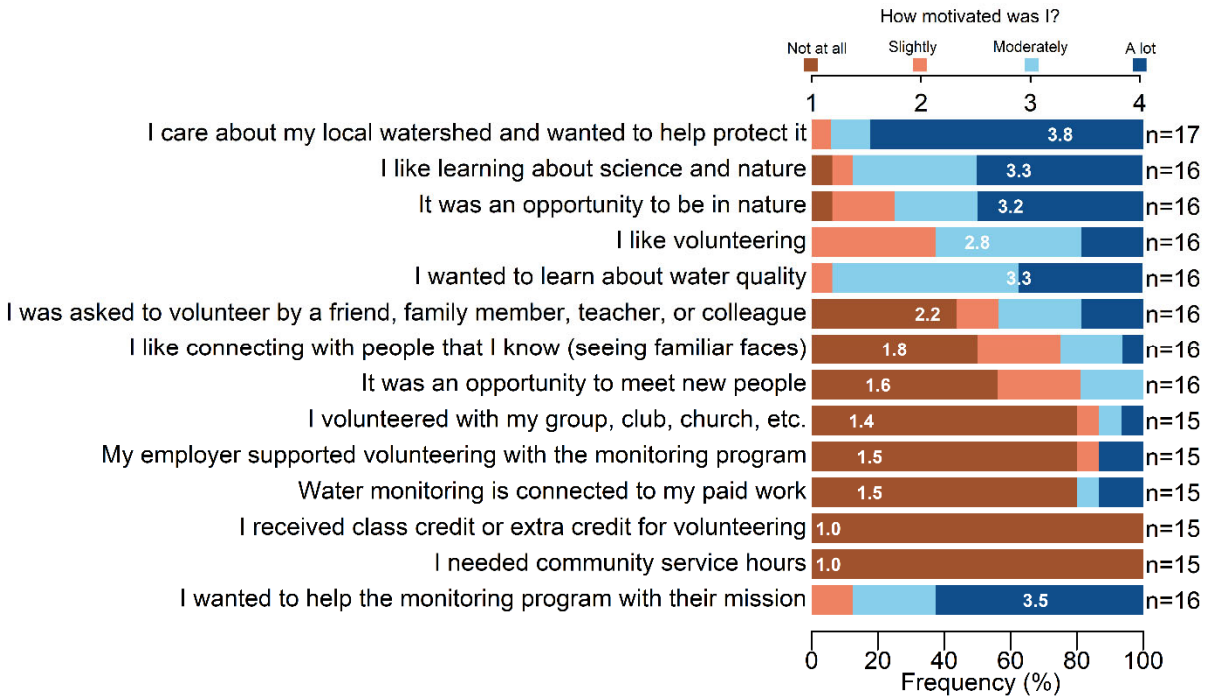
6. **"How did you hear about opportunities to volunteer with the Northwest Montana Lakes Network? (select all that apply)"** (includes all volunteers regardless of how many seasons they had volunteered)

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 Northwest Montana Lakes Network in 2021:"** (includes all volunteers regardless of how many seasons they had volunteered)

FIGURE 2 MOTIVATIONS FOR VOLUNTEERING



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

8. **"You indicated that you are not planning on volunteering with the Northwest Montana Lakes Network 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

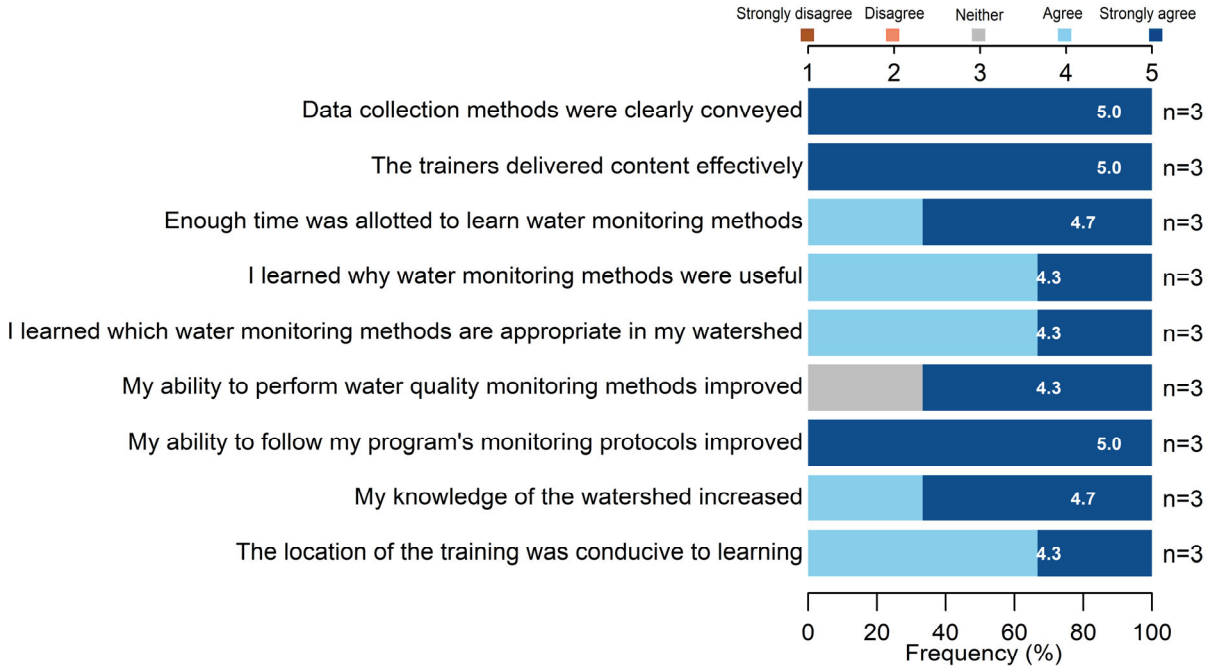
9. **"Do you have any suggestions to improve the volunteer experience with the Northwest Montana Lakes Network?"** *Answers below are verbatim (names have been removed).*
    - Sponsor more parties.
    - None.
    - I believe they have a great program, great leadership, and a willingness to come out in the field to help train and answer questions.
    - 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.

10. **"Have you ever participated in a training related to the Northwest Montana Lakes Network?"**
    - n=17
    - 70.6% Yes
    - 29.4% No

11. **"Did you participate in a training related to the Northwest Montana Lakes Network in 2021?"**
    - n=17
    - 17.6% Yes
    - 82.4% No

12. **"How much do you disagree or agree with the following statements about the training(s) you had with the Northwest Montana Lakes Network in 2021?"** (includes only volunteers who participated in a training in 2021)

FIGURE 3 EFFICACY OF VOLUNTEER TRAINING IN 2021



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

13. **"Do you have any suggestions to make the Northwest Montana Lakes Network trainings better?"** *Answers below are verbatim (names have been removed).*
    - 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.

14. **"Please indicate whether you performed the following tasks with the Northwest Montana Lakes Network in 2021:"**

TABLE 2 WATER MONITORING TASKS COMPLETED IN 2021

Task	Yes	No	Don't remember/unsure
Filling out datasheets (n=14)	92.9%	7.1%	0.0%
Conducting a visual assessment for algae (n=14)	78.6%	21.4%	0.0%
Aquatic invasive species identification (n=14)	71.4%	21.4%	0.0%
Lake turbidity measurement with a secchi disk (n=14)	92.9%	7.1%	0.0%
Lake water temperature measurement (n=14)	92.9%	7.1%	0.0%
Other (please specify) (n=5): *plankton tow, observed waterfowl, AIS monitoring*	100%	0.0%	0.0%

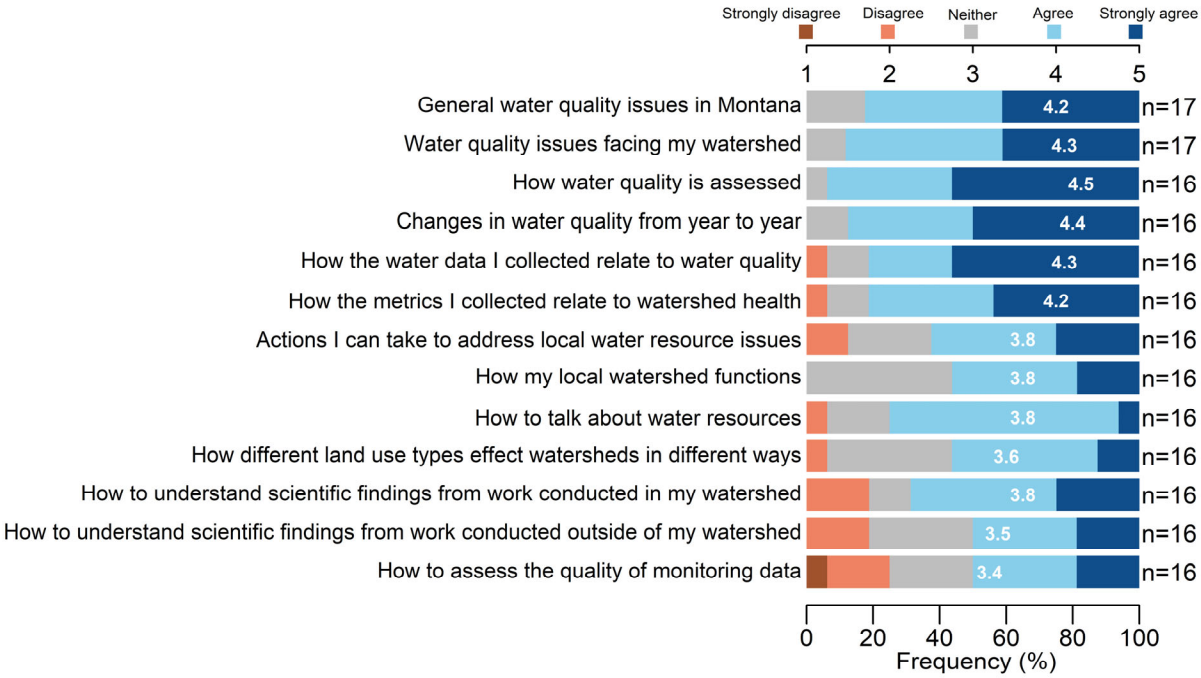
15. **"You indicated you performed the following tasks with the Northwest Montana Lakes Network in 2021. For each task listed below, please indicate which statements provided in the columns apply to you. More than one statement may apply."**

TABLE 3 CONFIDENCE IN PERFORMING WATER MONITORING TASKS IN 2021

Task	I felt confident performing this task	I have received formal training on this task	I feel that I need more training on this task
Filling out datasheets (n=13)	23.1%	53.8%	0.0%
Conducting a visual assessment for algae (n=11)	63.6%	9.1%	36.4%
Aquatic invasive species identification (n=9)	44.4%	22.2%	55.6%
Lake turbidity measurement with a secchi disk (n=13)	92.3%	15.4%	7.7%
Lake water temperature measurement (n=13)	100.0%	15.4%	0.0%
Other (n=1): *plankton tow*	0.0%	100.0%	100.0%

16. **“Please indicate how much you disagree or agree with the following statements. Because of participating in the Northwest Montana Lakes Network, I have a better understanding of the following:”**

FIGURE 4 INCREASED UNDERSTANDING DUE TO VOLUNTEERING

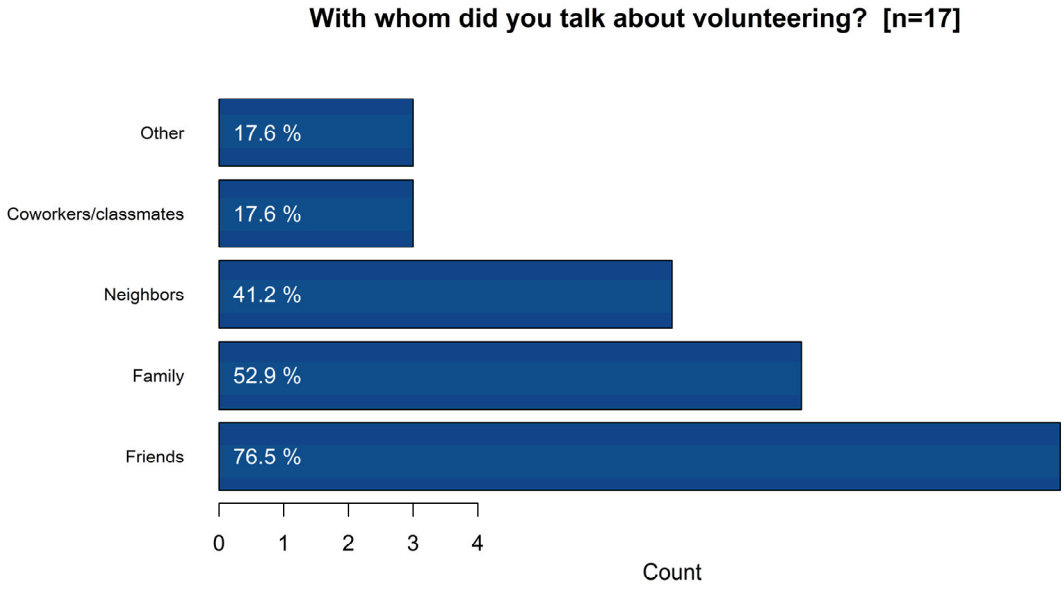


1=strongly disagree, 2=somewhat disagree, 3=neither agree nor disagree, 4=somewhat agree, 5=strongly agree

17. **"Did you talk with anyone about your participation with the Northwest Montana Lakes Network in 2021?"**
    - n=15
    - 100% Yes

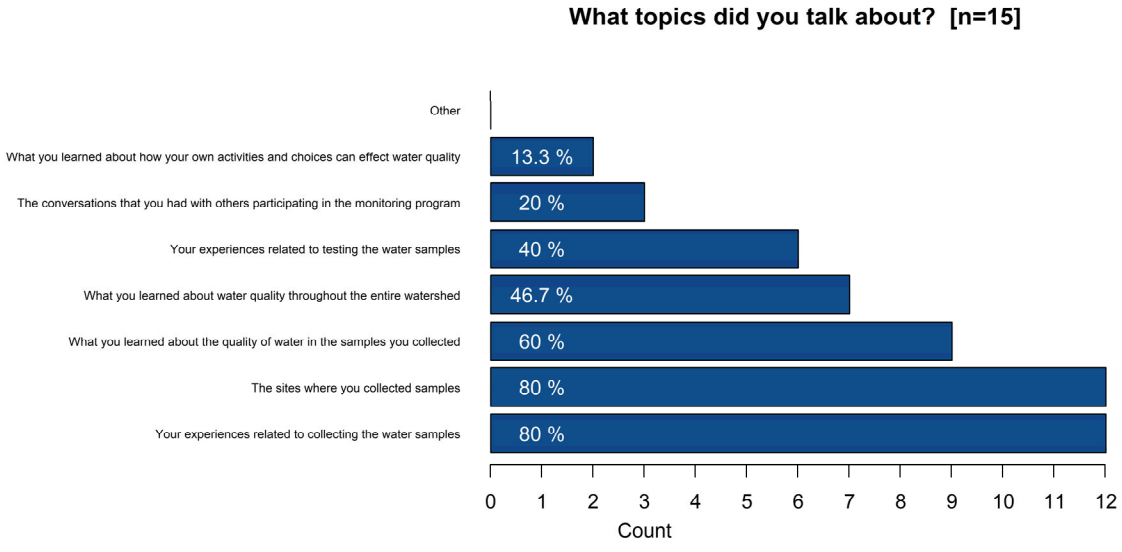
18. **"With whom did you talk about volunteering? (select all that apply)"** (includes respondents who selected "yes" for "Did you talk with anyone about your participation with the Northwest Montana Lakes Network")

FIGURE 5 PEOPLE WITH WHOM VOLUNTEERS SPOKE WITH ABOUT VOLUNTEERING



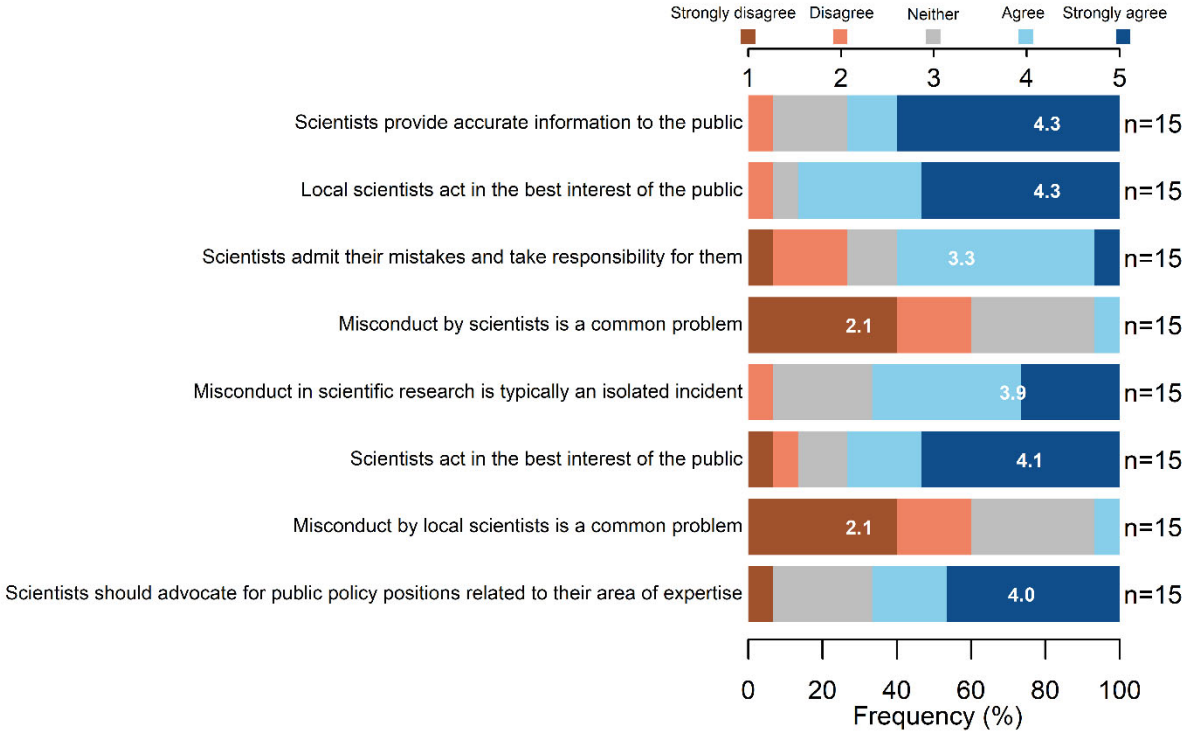
19. **"When discussing the Northwest Montana Lakes Network, what topics did you talk about? (select all that apply)"** (includes respondents who selected "yes" for "Did you talk with anyone about your participation with the Northwest Montana Lakes Network")

FIGURE 6 TOPICS VOLUNTEERS SPOKE WITH PEOPLE ABOUT



20. **"Please indicate how much you disagree or agree with the following <u>broad statements about scientists</u>:**

FIGURE 7 ATTITUDES AND 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 <u>use</u> the following sources to learn about issues impacting your local watershed?"**

TABLE 4 USE OF INFORMATION SOURCES

Information source used	n	Never	Seldom	Sometimes	Often
Scientists	15	13.3%	20.0%	40.0%	26.7%
Montana state agencies (e.g., Department of Environmental Quality, etc.)	15	13.3%	13.3%	53.3%	20.0%
My local watershed group	15	26.7%	20.0%	33.3%	20.0%
Print news media (e.g., newspapers, magazines, etc.)	15	6.7%	26.7%	53.3%	13.3%
Montana universities	15	13.3%	40.0%	33.3%	13.3%
My local conservation district	15	26.7%	33.3%	26.7%	13.3%
Scientific journals	15	40.0%	20.0%	26.7%	13.3%
Community/social groups	14	21.4%	35.7%	35.7%	7.1%
Close personal friends	15	26.7%	20.0%	46.7%	6.7%
News broadcasting (e.g., television, radio, etc.)	15	20.0%	33.3%	40.0%	6.7%
Montana State University Extension	15	40.0%	26.7%	26.7%	6.7%
Family members	15	46.7%	26.7%	20.0%	6.7%
Social media (e.g., Facebook, Instagram, Twitter, YouTube, etc.)	15	53.3%	33.3%	13.3%	0.0%

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

22. **"Please indicate how much you <u>trust</u> the following sources to accurately communicate scientific information in general."**

TABLE 5 TRUST IN INFORMATION SOURCES

Information source trusted	n	Do not	A little bit	Somewhat	Completely
Montana state agencies (e.g., Department of Environmental Quality, etc.)	14	0.0%	7.1%	14.3%	71.4%
Scientists	14	0.0%	7.1%	7.1%	71.4%
Montana universities	14	0.0%	7.1%	7.1%	64.3%
My local conservation district	13	7.7%	15.4%	15.4%	61.5%
Montana State University Extension	14	0.0%	7.1%	7.1%	57.1%
Scientific journals	14	0.0%	21.4%	0.0%	57.1%
My local watershed group	14	0.0%	21.4%	14.3%	50.0%
Close personal friends	14	0.0%	21.4%	35.7%	42.9%
Family members	14	0.0%	21.4%	42.9%	35.7%
News broadcasting (e.g., television, radio, etc.)	14	14.3%	7.1%	64.3%	14.3%
Community/social groups	14	14.3%	21.4%	50.0%	14.3%
Print news media (e.g., newspapers, magazines, etc.)	14	7.1%	7.1%	78.6%	7.1%
Social media (e.g., Facebook, Instagram, Twitter, YouTube, etc.)	14	64.3%	28.6%	7.1%	0.0%

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).*
    - Shoreline development, potential for nutrient and chemical leaching. Over-use of public access site. Potential for invasive species.
    - 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].
    - Human pollution.
    - 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.
    - Invasive species.
    - 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=12)

TABLE 6 ACTIONS TAKE 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	11	0
Reduced fertilizer use	10	0
Properly disposed of household waste (e.g. batteries, light bulbs, hazardous chemicals, oils and fats, etc.)	12	0
Attended a public meeting related to natural resource planning/management	8	1
Submitted a public comment related to natural resource planning/management	7	0
Properly disposed of pet waste	10	0
Properly disposed of used motor oil and antifreeze	12	0
Directed downspouts away from a paved surface	10	0
Decreased the amount of chemical products used in my house that go down the drain	12	0
Reduced storm water runoff from my property	8	0
Reduced runoff of other contaminants in storm water from my property (e.g., sediment, deicer, etc.)	7	0
Volunteered for another water quality related project	6	0

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.

Funk, C., Hefferon, M., Kennedy, B. and Johnson, C., 2019. Trust and mistrust in Americans' views of scientific experts. *Pew Research Center*, *2*, pp.1-96.