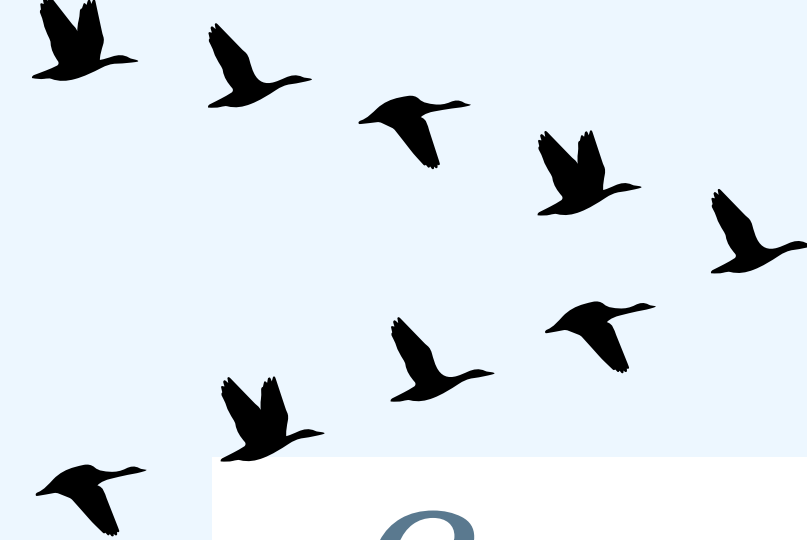




Connecting Lakes and Communities: Understanding Communication Practices of Volunteer Lake Monitors

Sabrina Koetter, MS Candidate, University of Vermont,
Lake Champlain Sea Grant

Advised by: Dr. Anne Jefferson and Dr. Kristine Stepenuck

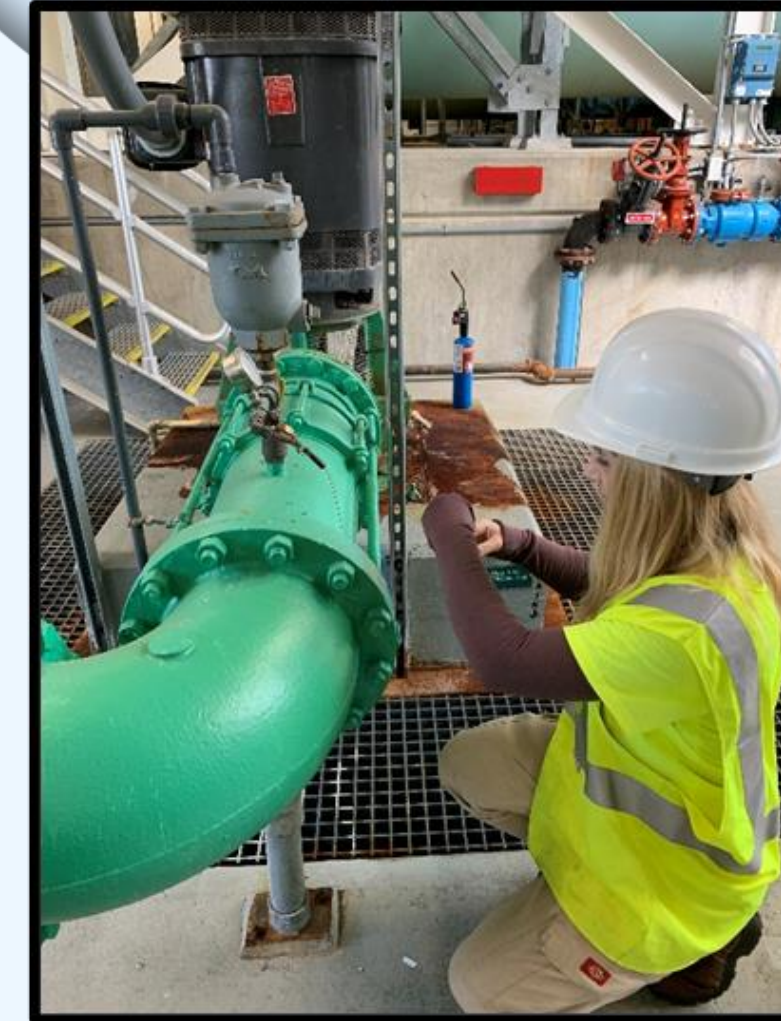


Researcher Background

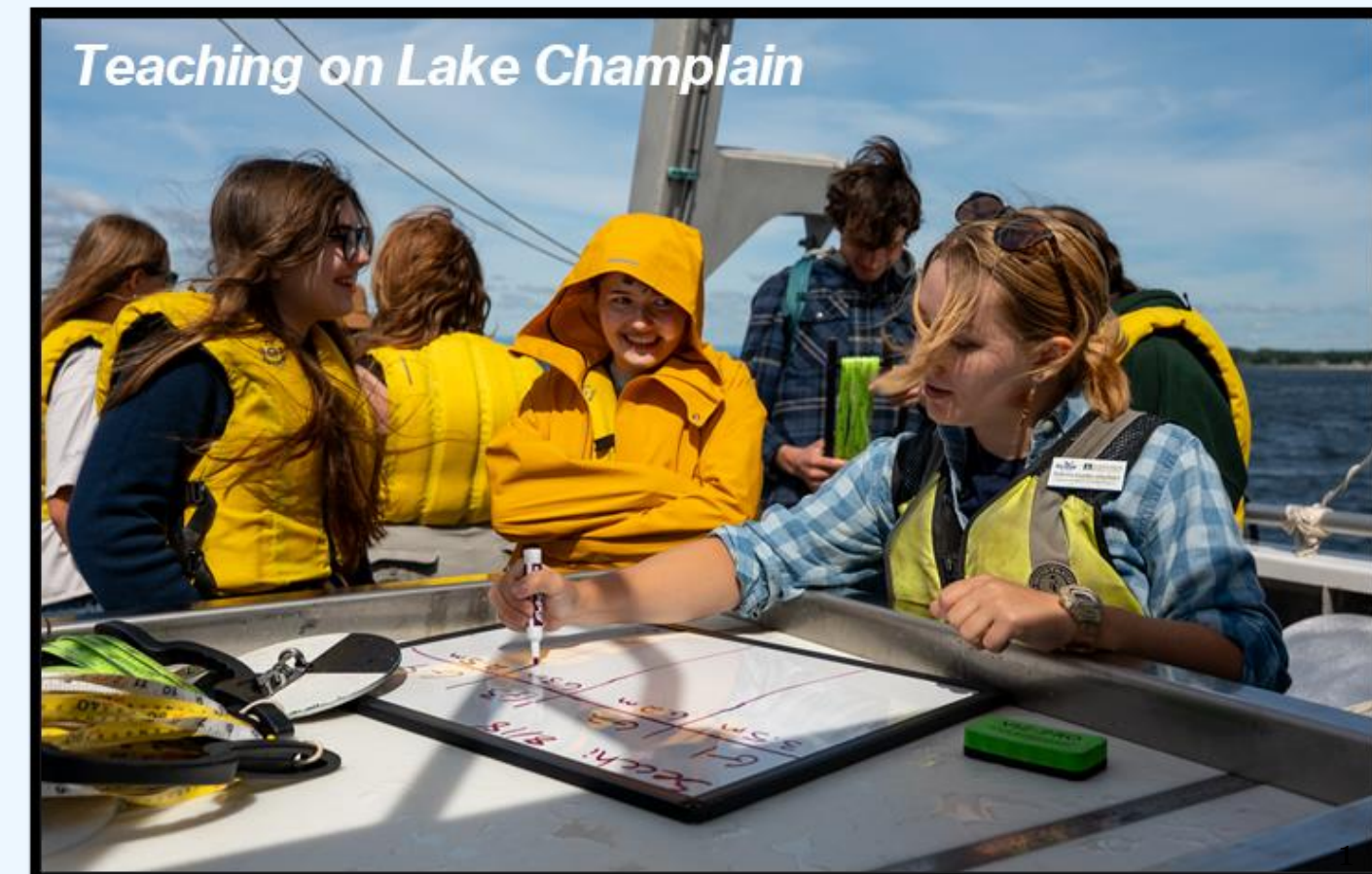
Monitoring tributaries in CT/NY + drinking water in Long Island



Mobile water testing laboratory!



Volcanic lake sampling



Teaching on Lake Champlain

Overview

💧 Introduction

💧 Research Questions

💧 Hypotheses

💧 Methods

💧 Results (Your insights)

💧 Recommendations



History of Volunteer Lake Monitoring



Clean Water
Act, 1972

History of Volunteer Lake Monitoring

Maine (1971) and
Minnesota (1973) -
first states to begin
volunteer lake
monitoring

Clean Water
Act, 1972



History of Volunteer Lake Monitoring

Maine (1971) and
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Clean Water
Act, 1972

Michigan ('74), Vermont
('79), New Hampshire
('79), Illinois ('81) and
New York ('85)



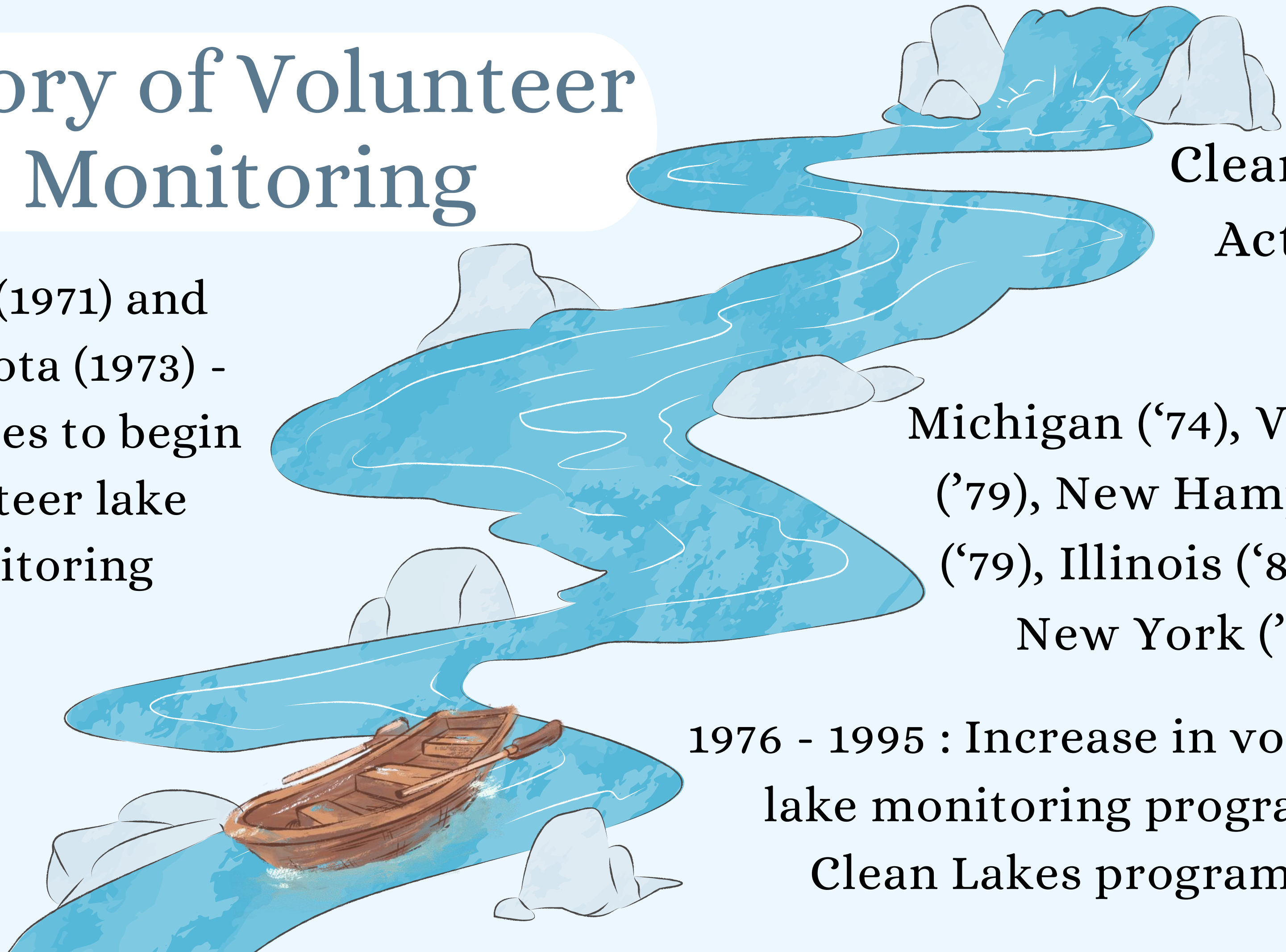
History of Volunteer Lake Monitoring

Maine (1971) and
Minnesota (1973) -
first states to begin
volunteer lake
monitoring

Clean Water
Act, 1972

Michigan ('74), Vermont
('79), New Hampshire
('79), Illinois ('81) and
New York ('85)

1976 - 1995 : Increase in volunteer
lake monitoring programs,
Clean Lakes program \$



Today - What We Know

Your data are reliable and used in research and management

(Albus et al., 2020; Gamble et al., 2026)

You can gain knowledge through volunteer science activities

(Stepenuck & Green, 2015; Bonney et al., 2016)

Volunteer water monitors communicate with others about their experiences and knowledge

(Overdevest et al., 2004, Church et al., 2016)



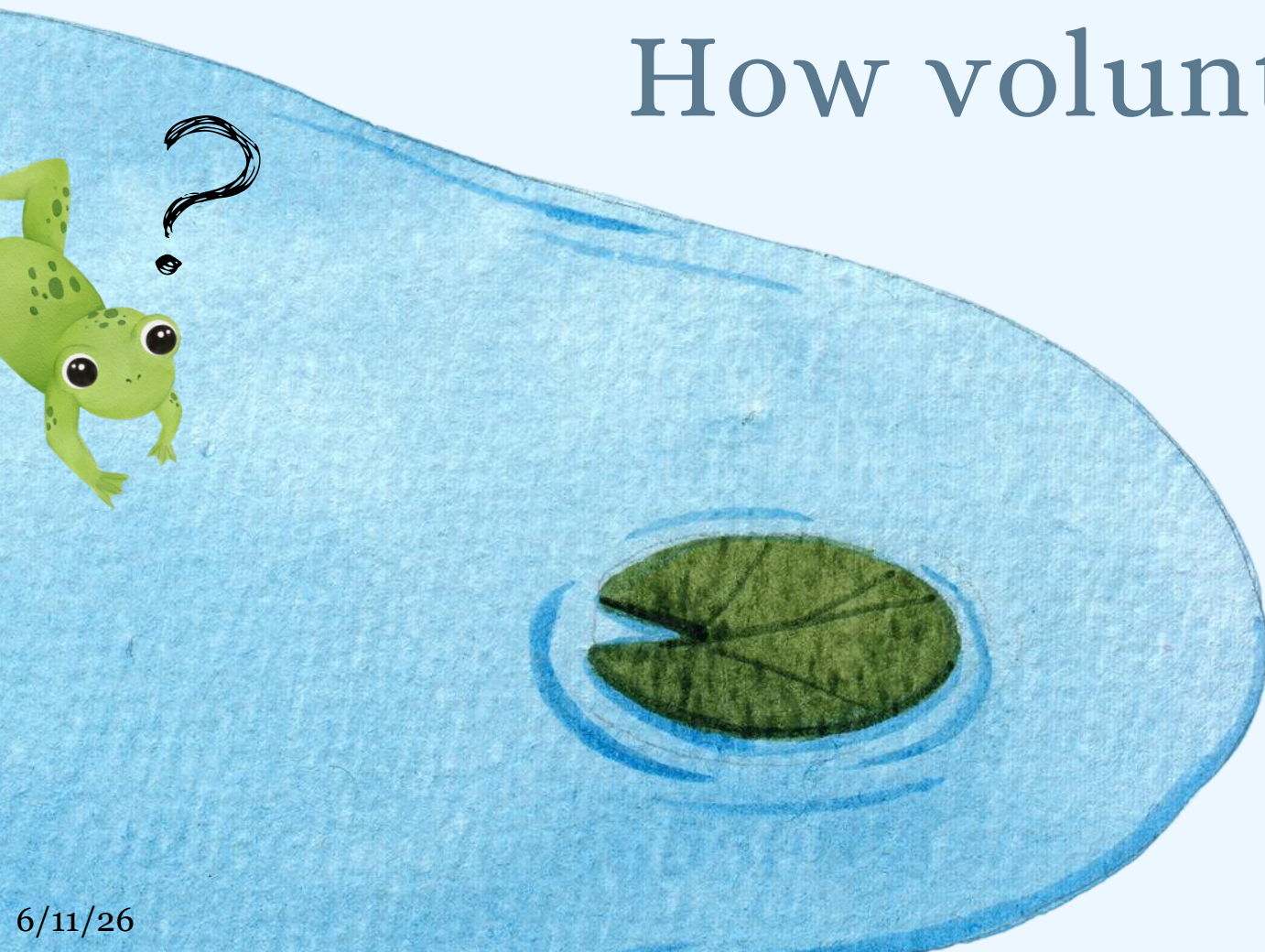
What We Don't Know

The types of communication monitors are engaged in

How monitors feel about sharing lake science with others

How volunteer monitors believe communication can be improved or better supported

The role of lake associations related to lake monitoring communications



Participating Lake Monitoring Programs

Minnesota Citizens Lake Monitoring Program

Vermont Lay Monitoring Program



Lake Stewards of Maine!

New York Citizens Statewide Lake Assessment Program

Overview

- 💧 Introduction
- 💧 **Research Questions**
- 💧 Hypotheses
- 💧 Methods
- 💧 Results (Your insights)
- 💧 Recommendations

Research Questions

1. What are the ways volunteer lake monitors communicate about lake monitoring?
2. What are barriers to communication for lake monitors?
3. Is there a relationship between communication and lake association membership?



Overview

- 💧 Introduction
- 💧 Research Questions
- 💧 **Hypotheses**
- 💧 Methods
- 💧 Results (Your insights)
- 💧 Recommendations

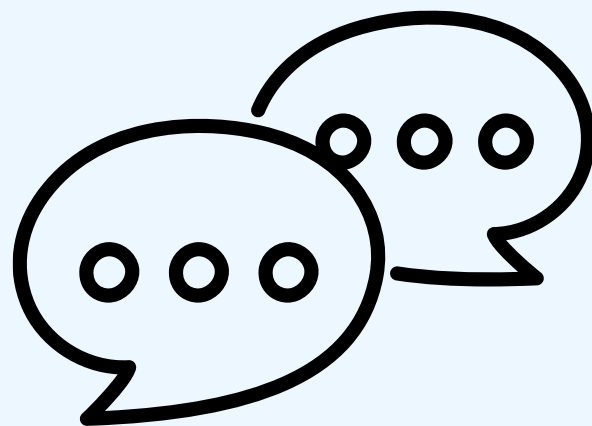


Hypotheses - Lake Associations

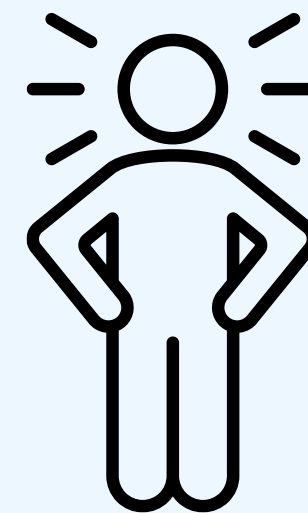
Lake Association Membership



**Communication
Frequency**



**Communication
Competency**



Overview

💧 Introduction

💧 Research Questions

💧 Hypotheses

💧 **Methods**

💧 Results (Your insights)

💧 Recommendations



Mixed Methods

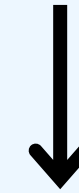
Quantitative Methods



Survey + Stats



Qualitative Methods



**Focus groups + open-ended survey questions,
thematic coding**

Integrated Results



Overview

- 💧 Introduction
- 💧 Research Questions
- 💧 Hypotheses
- 💧 Methods
- 💧 **Results** (Your insights)
- 💧 Recommendations



Survey Response Data

Program	Complete survey responses	Response rate (%)
Lake Stewards of Maine	63	16%
Minnesota Citizen Lake Monitoring Program	273	27%
New York Citizens Statewide Lake Assessment Program	55	9%
Vermont Lay Monitoring Program	52	61%
Total	443	21%



Respondent Demographics

Highly Educated

45% of respondents held graduate or professional degrees and 34% held Bachelor's degrees

Science and Education Fields

20% Educational Services,
17 % Science and Technical Services

Retired, Average Age = 67

71% of respondents were retired
Range: 18 - 90 years old

10 Years as a Lake Monitor

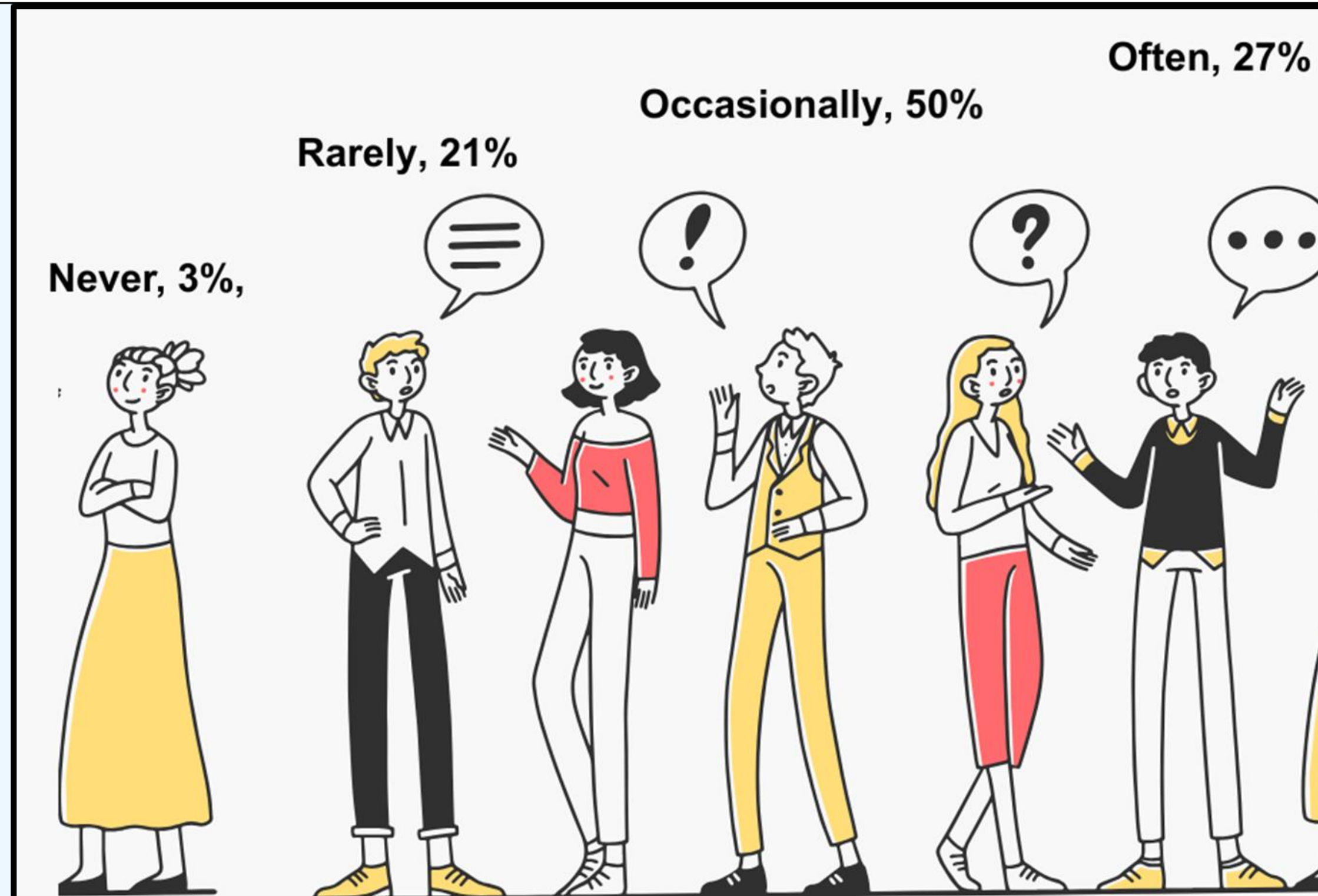
10 years was the average time spent as a lake monitor
Range: first year monitors - 55 years

Majority Male

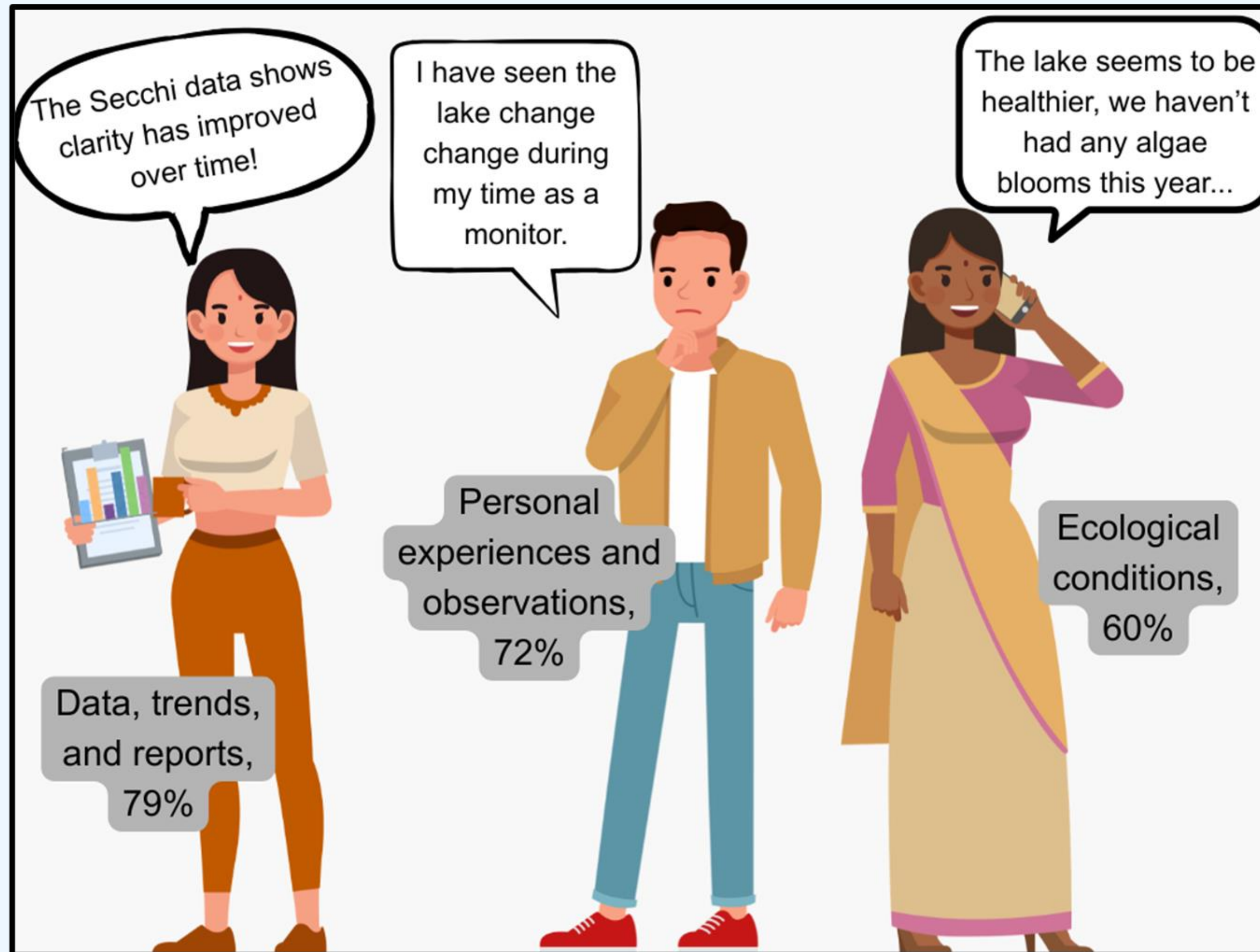
64% males, 34% female

Results: How do Lake Monitors Communicate?

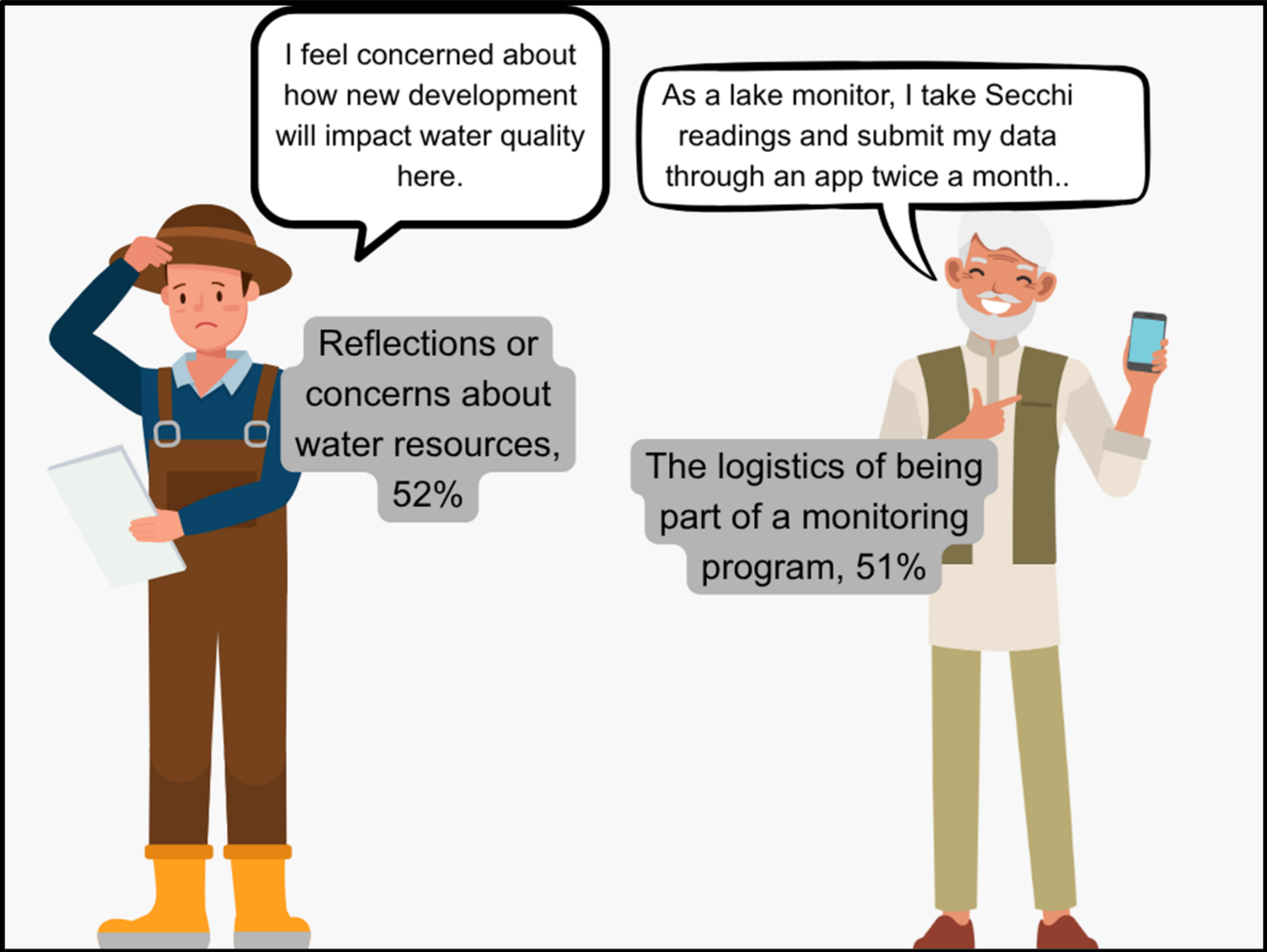
In the last year, how often did you talk to others about lake monitoring, water quality, or other water-related information?



Types of Information Shared



Types of Information Shared



Focus Groups

Why share data, reports and trends with others?

1) Sharing the data answers questions and keeps others informed

Focus Groups

Quotes from LSM monitors

1) Sharing the data answers questions and keeps others informed



For property owners and people using the lakes, the condition of the water is the most immediate thing that they see...**But it's better, so it's really important that information gets out.**

I agree... most people are concerned about the water quality because they know that if we do have any kind of issues, their property values are going to go down. **I think it's the most commonly asked question...**



Focus Groups

Why share data, reports and trends with others?

1) Sharing the data answers questions and keeps others informed

2) Data can influence policies and management

Focus Groups

Quote from LSM monitor

2) Data can influence policies and management

Getting involved and having the data...That **has been so powerful in getting other communities to think about ordinance...**



Focus Groups

Why share data, reports and trends with others?

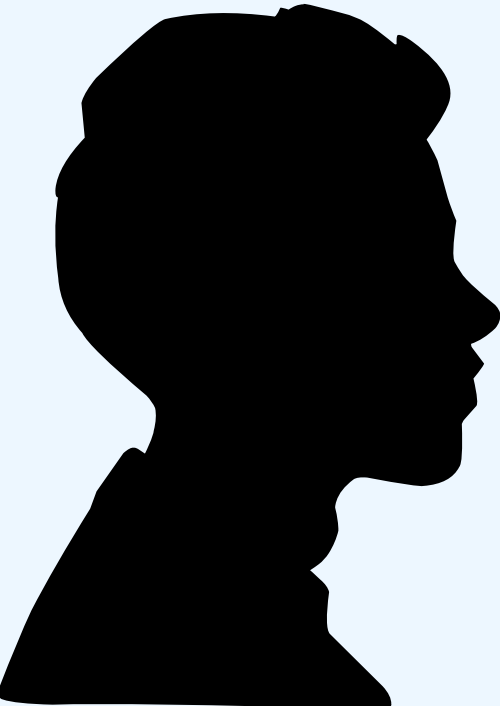
1) Sharing the data answers questions and keeps others informed

2) Data can influence policies and management

3) Data can influence lake residents' behaviors

Focus Groups

Quote from LSM monitor



You start to see a positive trend, let everybody know! Because they'll keep doing whatever it was that you were doing...

3) Data can influence lake residents' behaviors

You see a negative trend, let everybody know so that we can figure out first what it is, and then what are some of the things that we can do about it.

Audiences



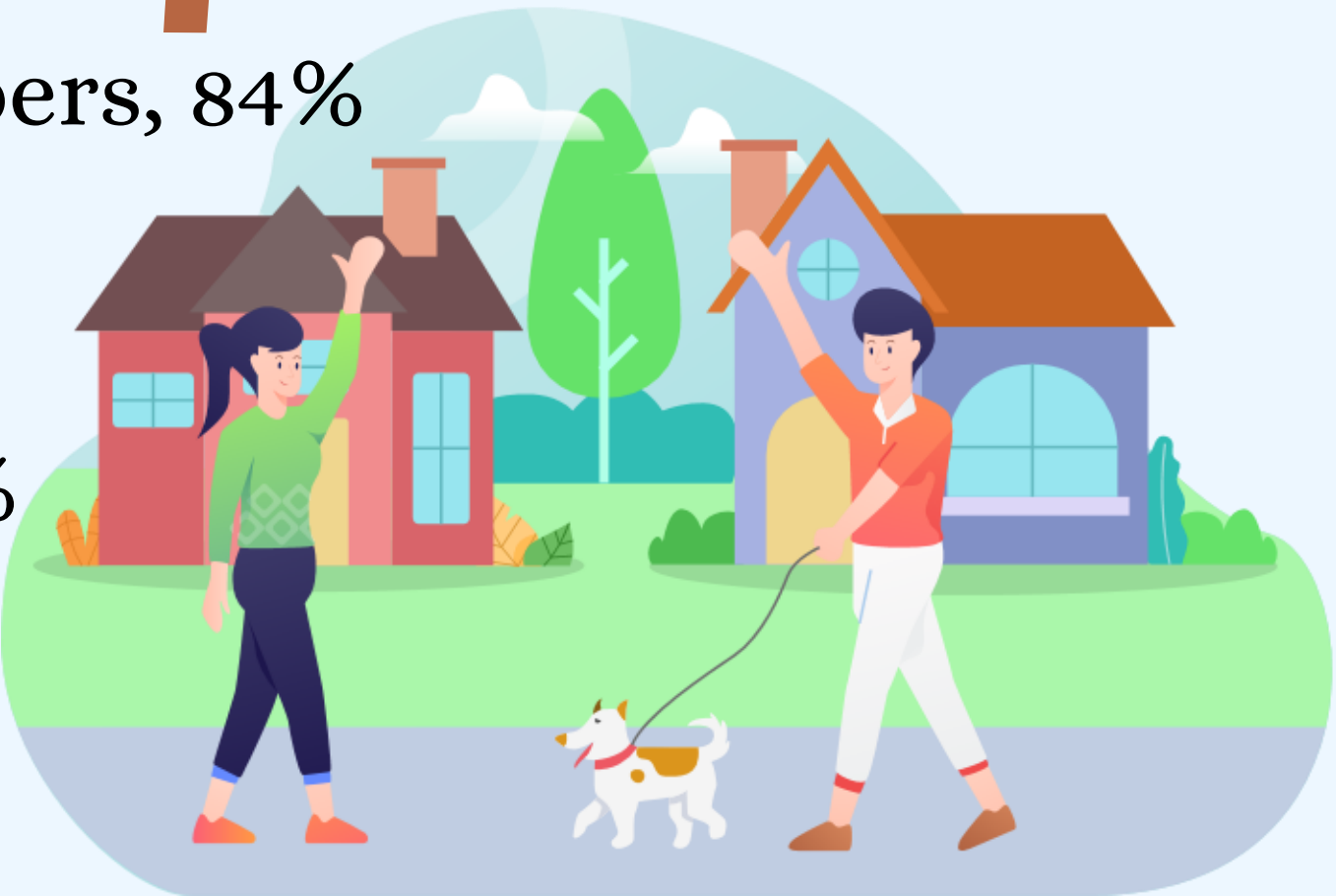
Family members, 84%



Friends, 83%



Land or homeowners within watershed, 40%



Neighbors 71%



Lake association or watershed groups, 40%

Focus Groups

Additional themes
from focus group
discussions on lake
monitor
communications

1.

Work with
agencies or
organizations

2.

Connect
virtually
with lake
community

3.

Engage with
neighbors

4.

Provide
opportunities
for guest
speakers

5.

Create
additional
resources

6.

Participate
in lake
associations

Focus Groups

As we're planning a **new website** for **our association**, there's definitely going to be a section there that is all of the water quality data... and links to Lake Stewards [of Maine] who maintain archives of that data, **so that people get answers to their questions.**"

Quote from LSM
monitor

2.

Connect
virtually
with lake
community

Create
additional
resources

5.

Participate
in lake
associations

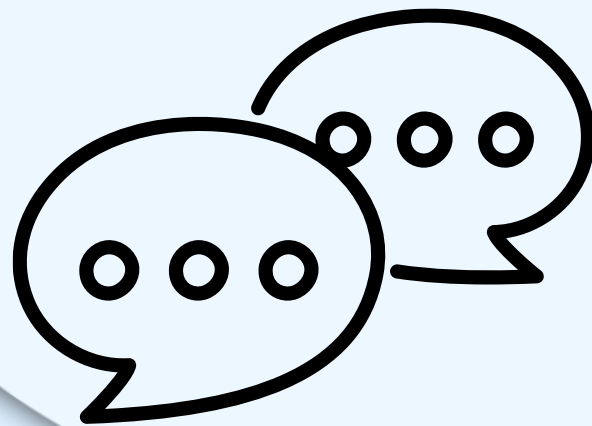
6.

Hypotheses - Lake Associations

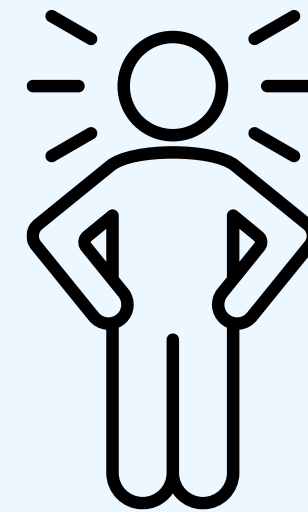
Lake Association Membership



**Communication
Frequency**



**Communication
Competency**

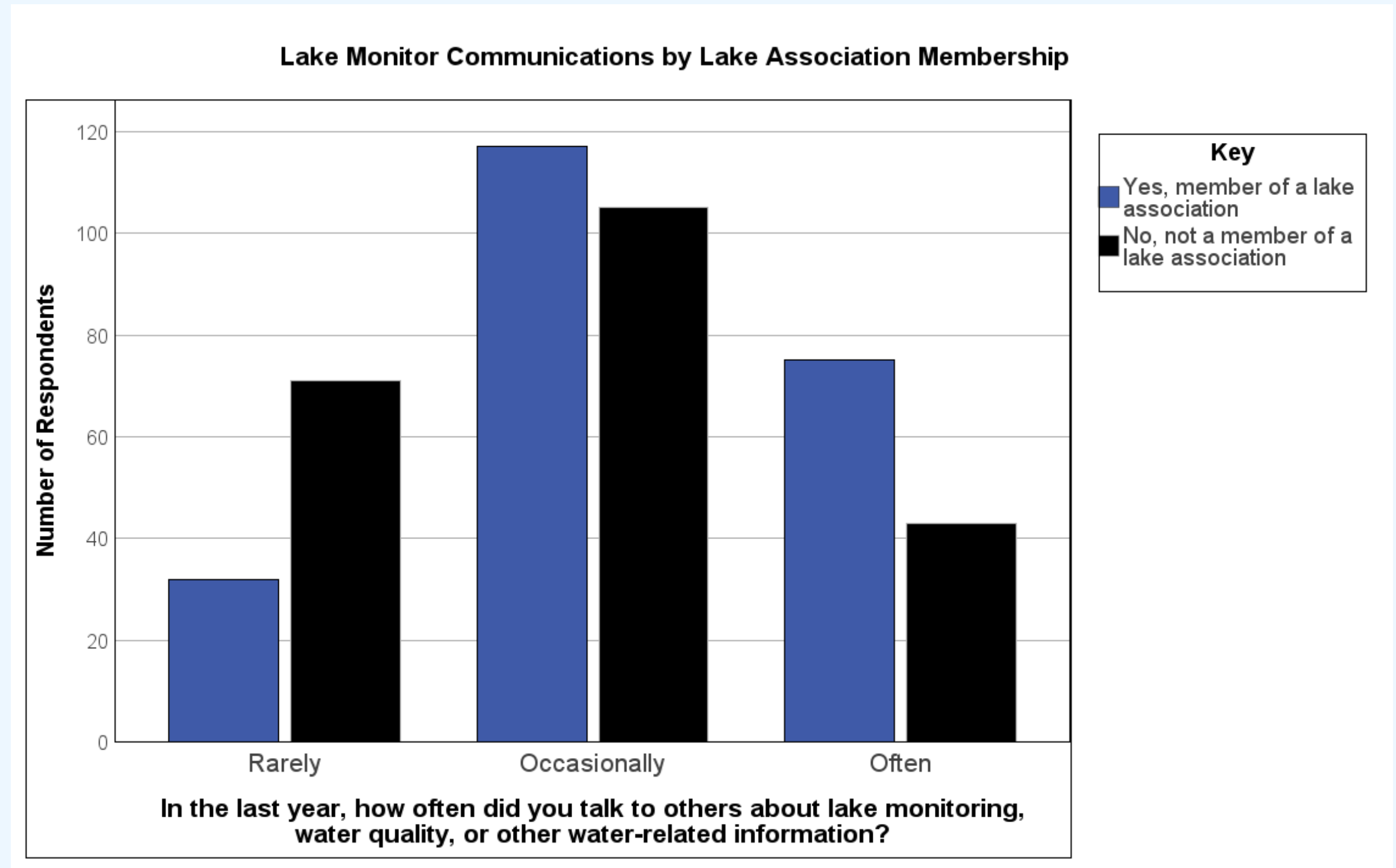
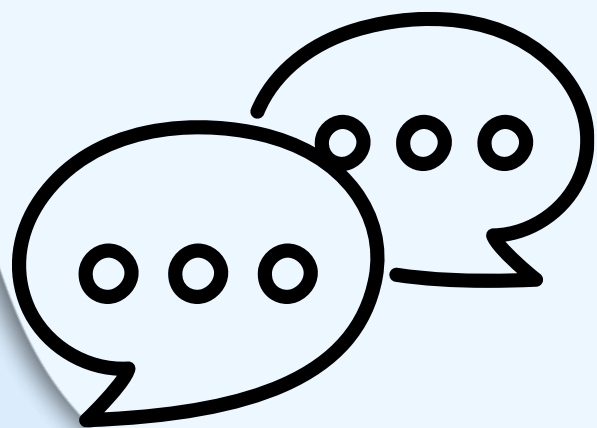


Lake Association Members Communicate More

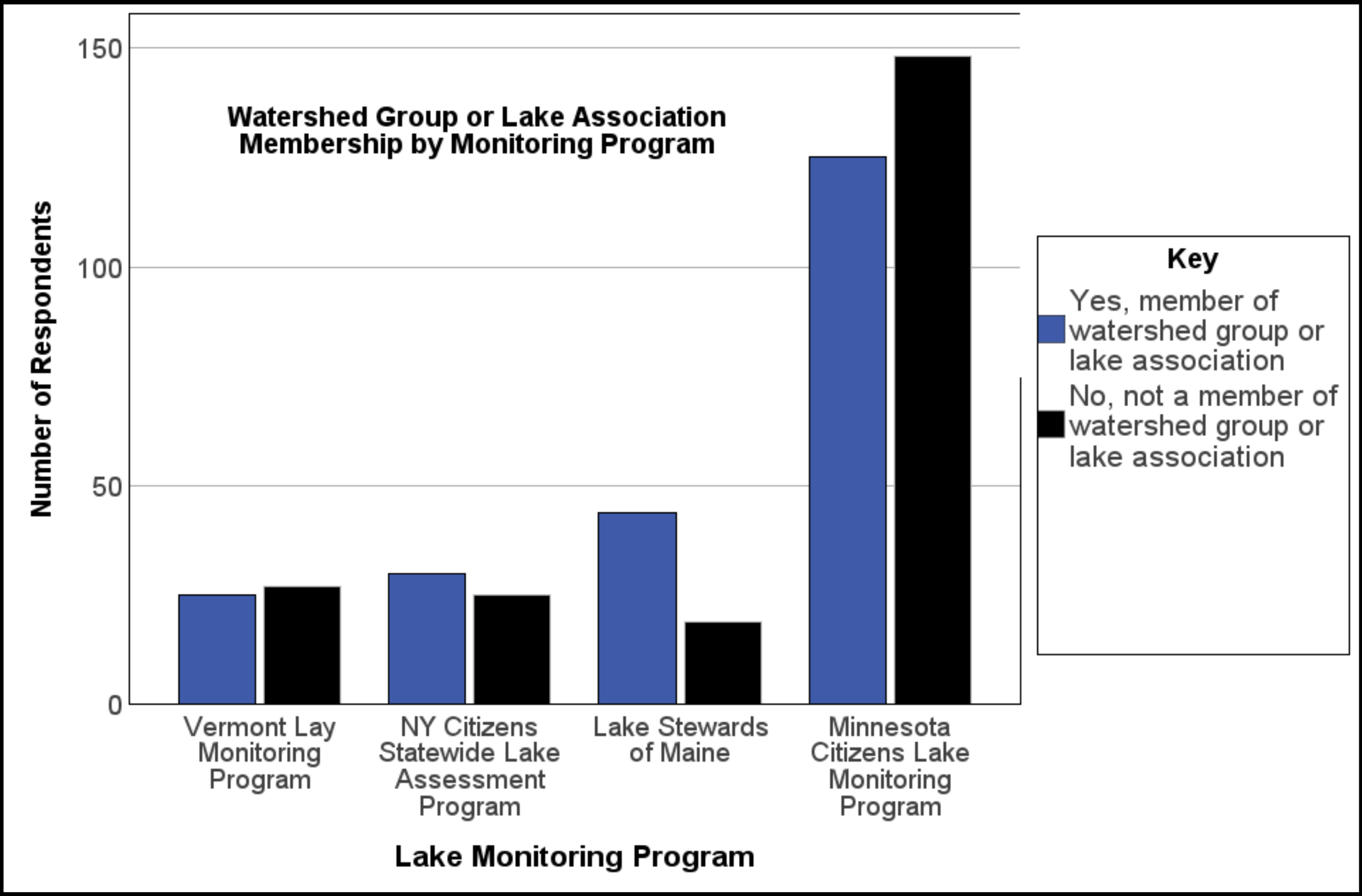
Lake Association Membership



Communication Frequency



LSM had highest ratio of lake association members to non-members compared to other programs

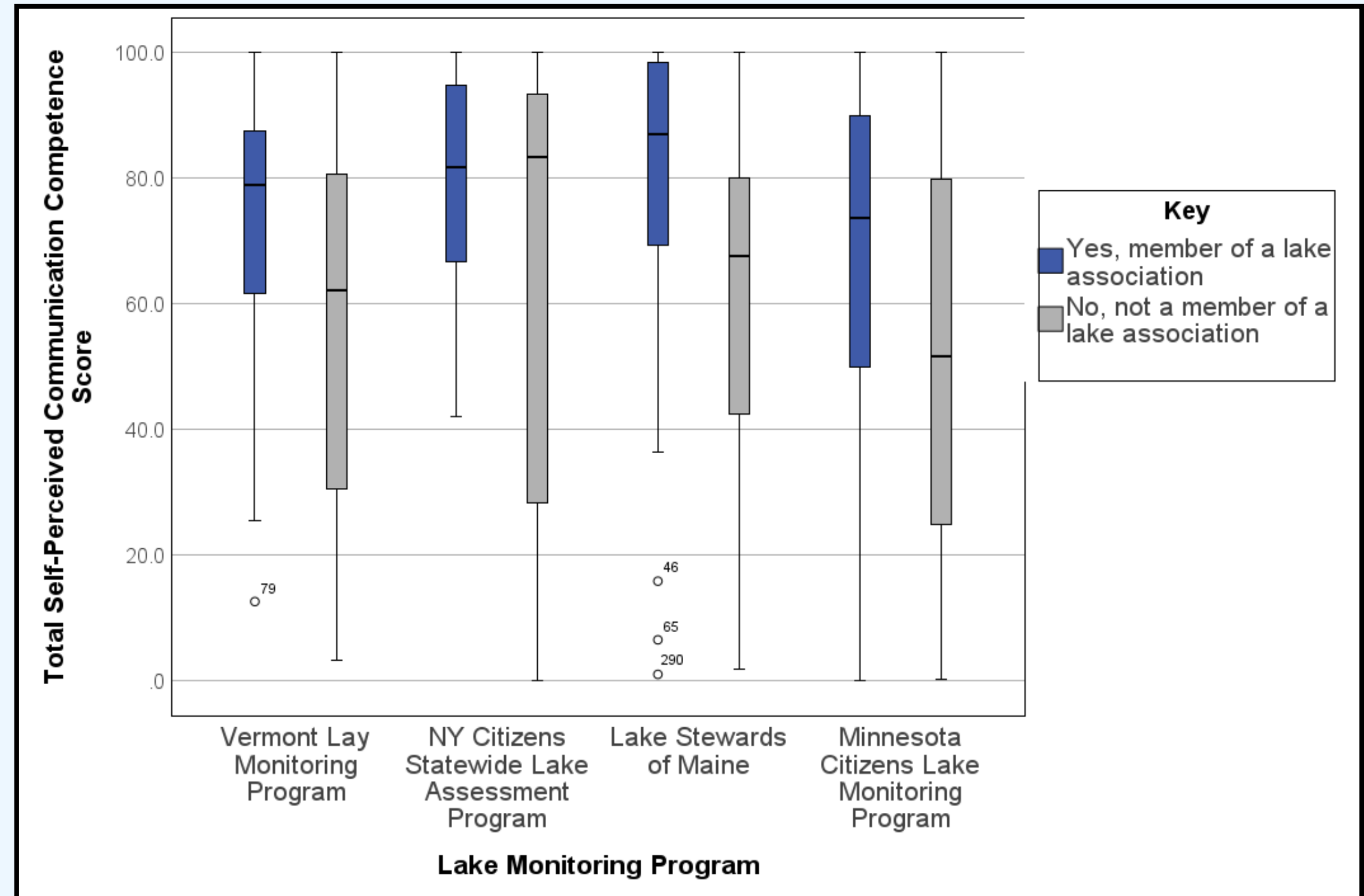
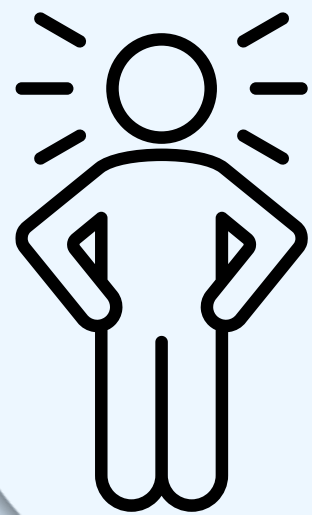


Lake Association Members Report Higher Communication Competence

Lake Association
Membership

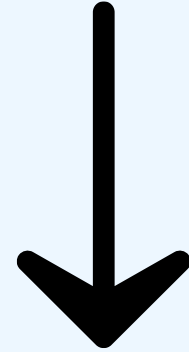


Communication
Competency

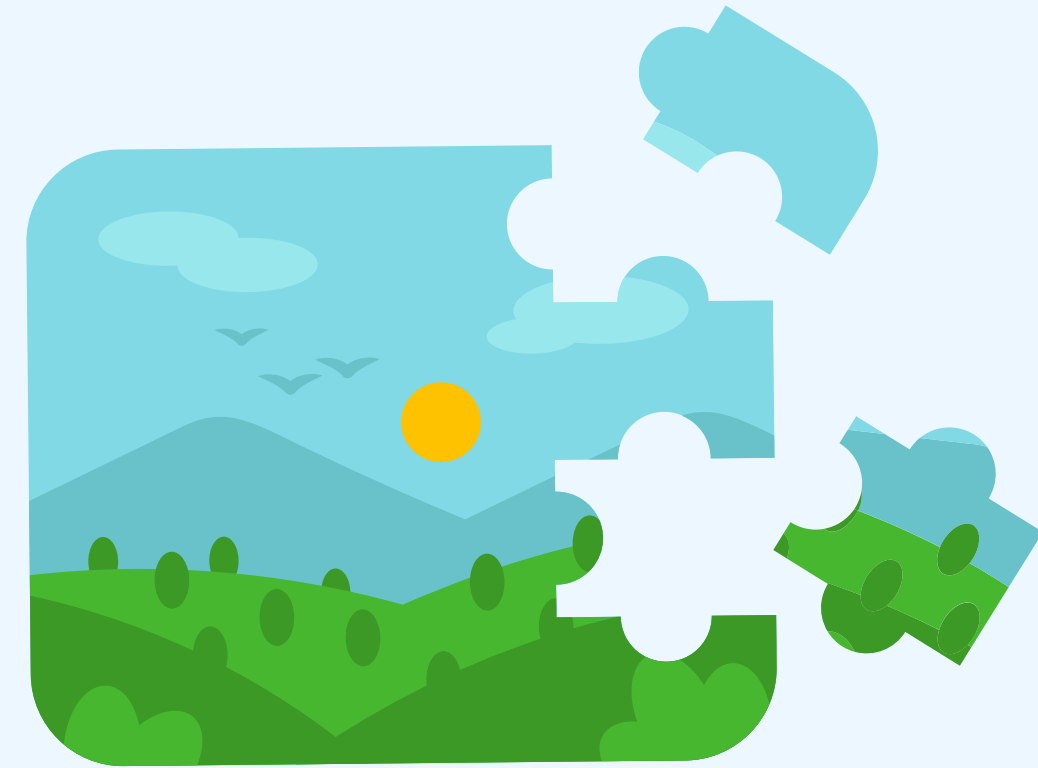


Communication Challenges

- Issues related to public engagement
 - Lack of engaged community
 - Concerns about negative reputations



- Ambiguity regarding responsibilities
 - Who to contact for various lake-related issues
 - Enforcement



Communication Challenges



Difficulties with program provided data/reports

- Lack of updated data
- Difficulty understanding and translating reports
- Lack of additional data (beyond Secchi)

Communication Challenges



What would help you communicate about lake monitoring?

Social Connection

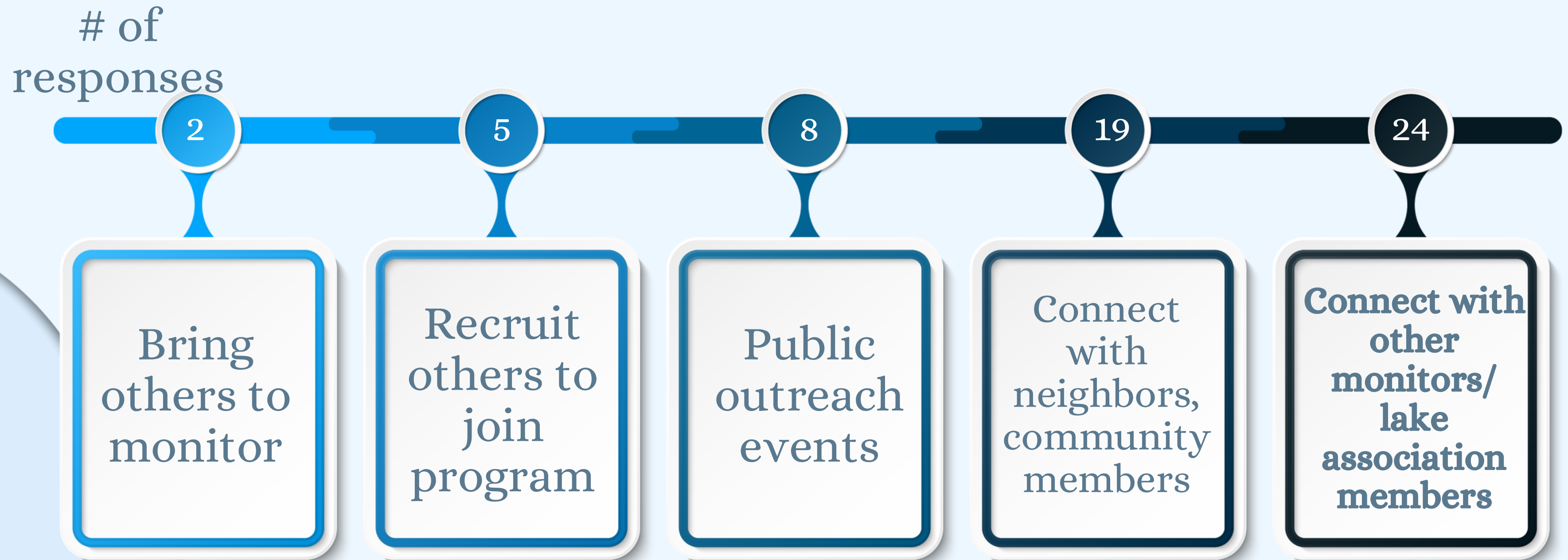
Skill-building

Education

Resource access

Recommendations From Monitors

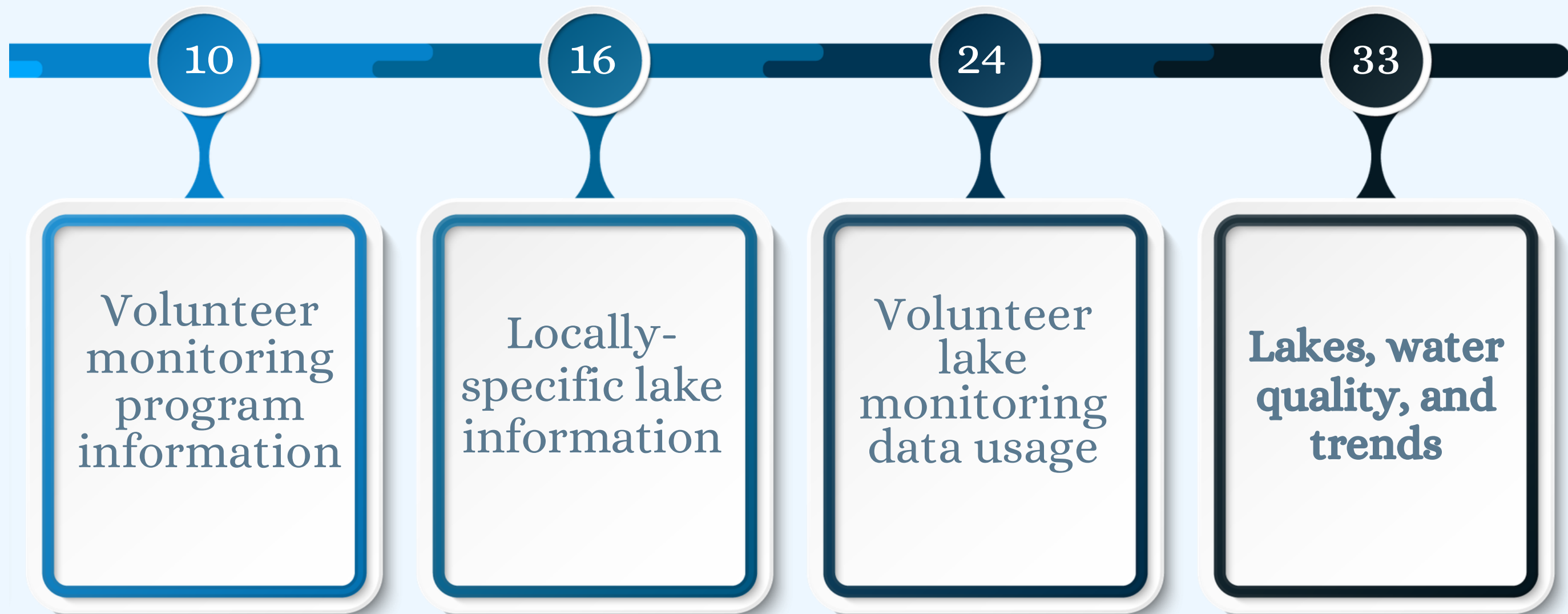
Social Connection



Recommendations From Monitors

Education

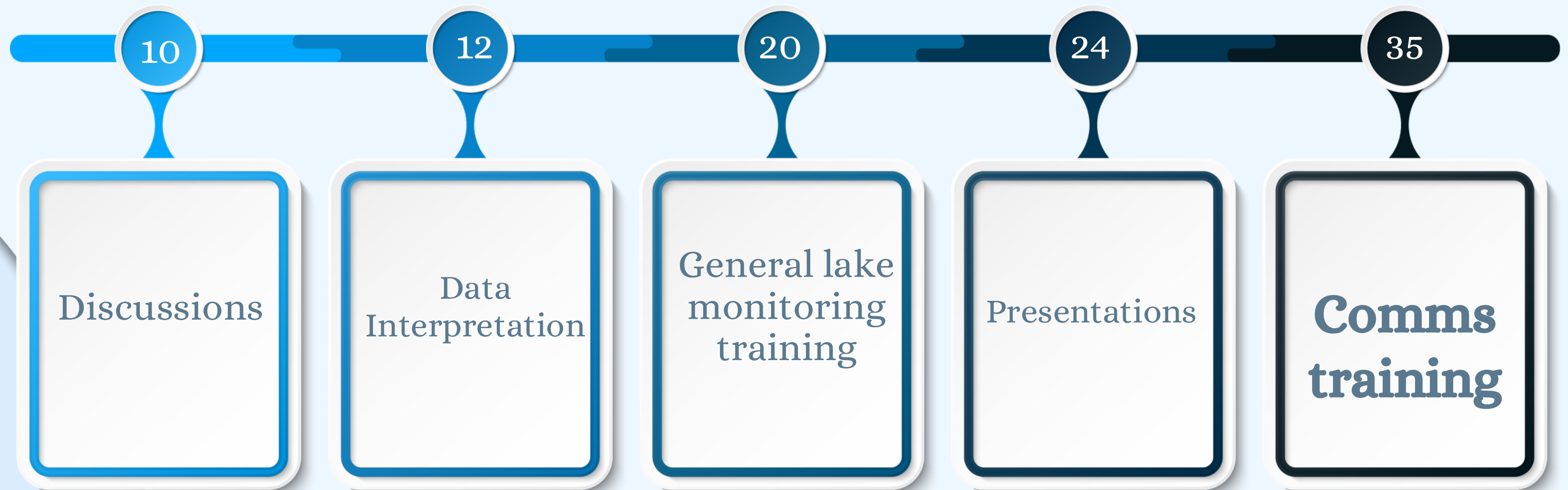
of
responses



Recommendations From Monitors

Skill-building

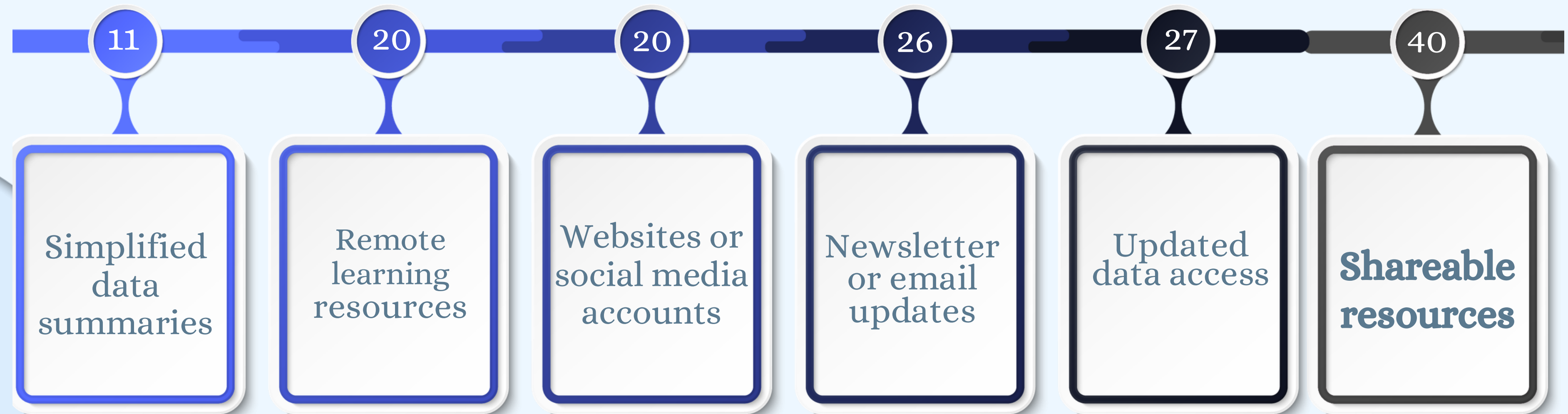
of
responses



Recommendations From Monitors

Resource Access

of
responses



Recommendations For Program Coordinators

Empower volunteers as communicators

Provide space for discussion, opportunities for social engagement between monitors (like this conference!)

Return data reports to monitors with sharing for wider audiences in mind



Recommendations For Program Coordinators

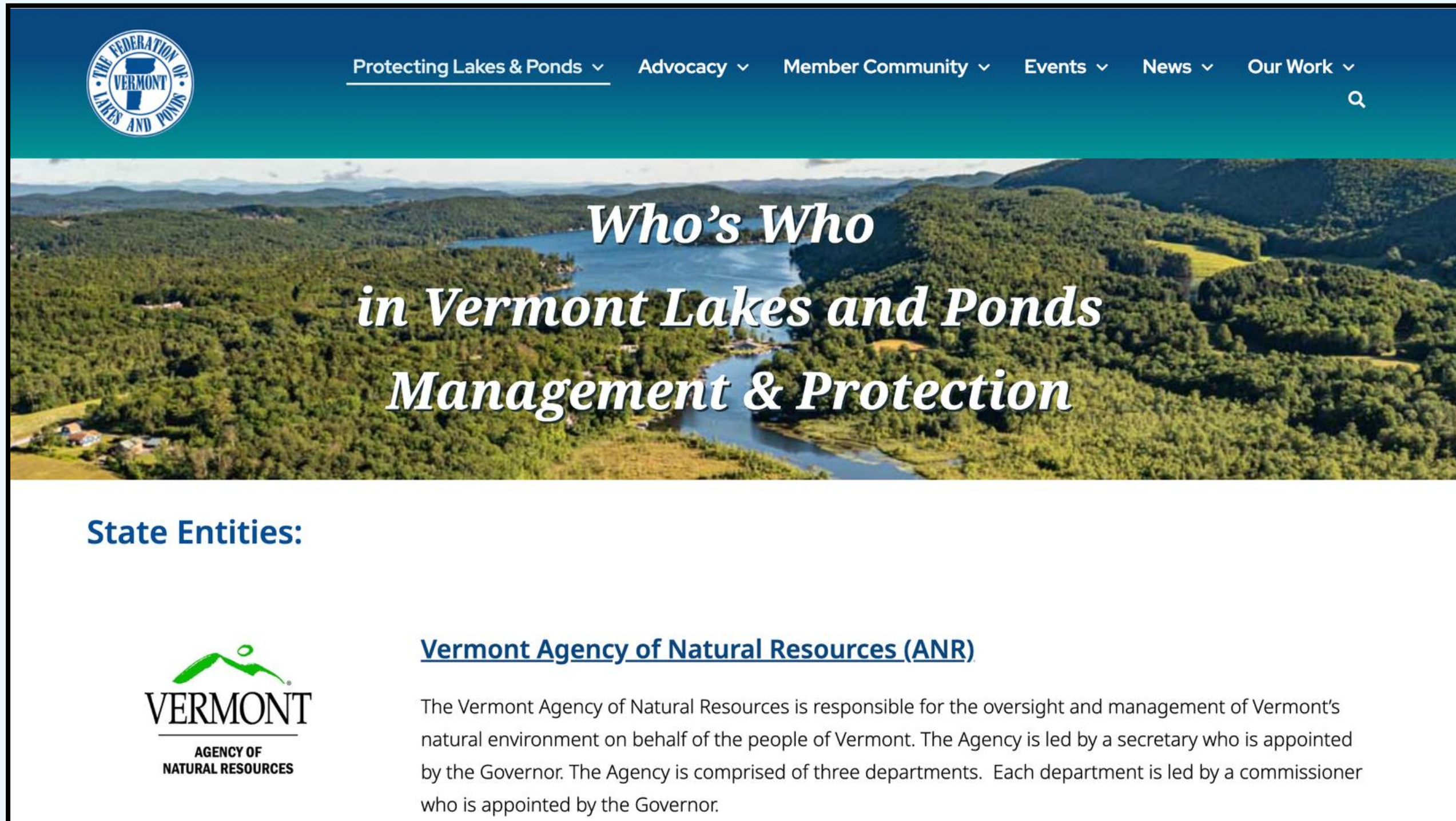


Offer and encourage communications training
(67% of respondents had not received any
communications training!)

Organize sampling teams to increase social connection +
reduce barriers for interested participants

Provide clear guidance to manage ambiguity:
Who should monitors reach out to with enforcement
issues or other questions?

Example from VT Federation of Lakes and Ponds



The screenshot shows the website of the Vermont Federation of Lakes and Ponds. The header is dark blue with the organization's logo on the left and a navigation menu on the right. The main content area features a large aerial photograph of a lake surrounded by green forest. Overlaid on the photo is the title 'Who's Who in Vermont Lakes and Ponds Management & Protection'. Below the photo, the section 'State Entities:' is followed by the logo of the Vermont Agency of Natural Resources (ANR) and a paragraph of text describing the agency's role.

THE FEDERATION OF VERMONT LAKES AND PONDS

[Protecting Lakes & Ponds](#) ▾ [Advocacy](#) ▾ [Member Community](#) ▾ [Events](#) ▾ [News](#) ▾ [Our Work](#) ▾

*Who's Who
in Vermont Lakes and Ponds
Management & Protection*

State Entities:

**VERMONT**
AGENCY OF
NATURAL RESOURCES

[Vermont Agency of Natural Resources \(ANR\)](#)

The Vermont Agency of Natural Resources is responsible for the oversight and management of Vermont's natural environment on behalf of the people of Vermont. The Agency is led by a secretary who is appointed by the Governor. The Agency is comprised of three departments. Each department is led by a commissioner who is appointed by the Governor.

Similar resource coming soon from LSM for Maine contacts!



Recommendations for Monitors

Communication about lake monitoring is something YOU can uniquely provide for your community

Continue to tell your stories!

Integrate data with storytelling:
Evidence-based + your personal
experiences = Compelling and memorable

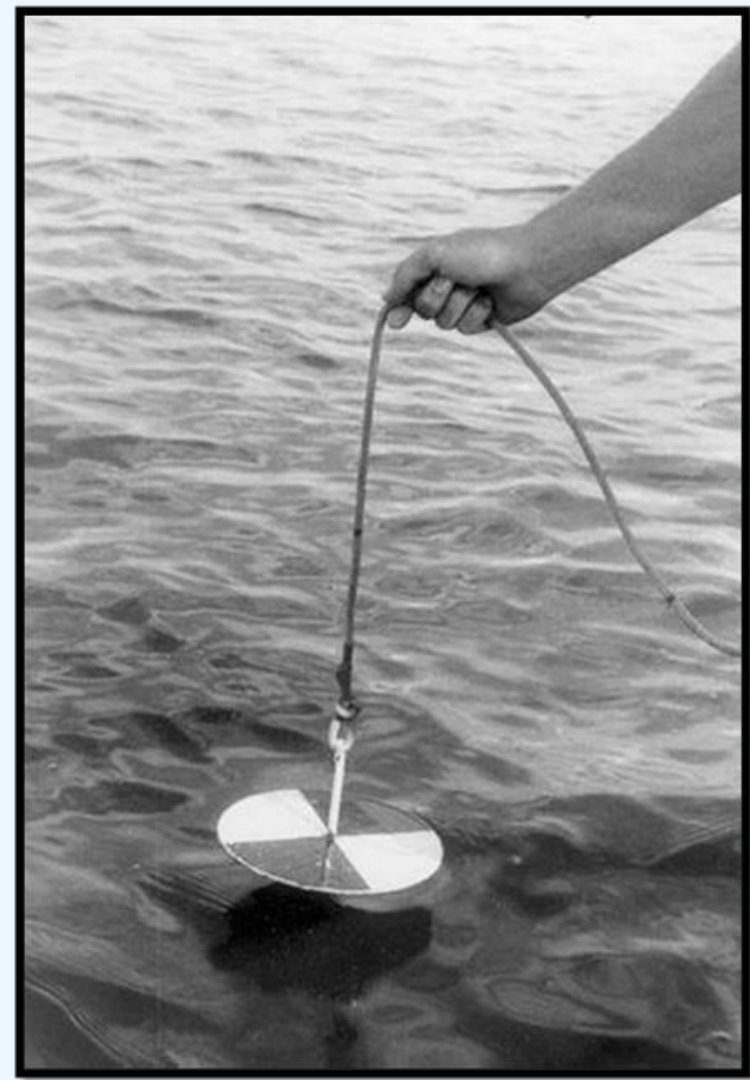
Connect with others!

Form or join a lake association



Key Takeaways

1. Monitors act as informal science communicators, especially while at the lake or monitoring
2. Communication happens most often through trusted social networks and close contacts
3. Lake associations act as hubs or infrastructure for lake monitoring communications



Key Takeaways

4. Share data because they believe it can improve understanding, influence policy and lake residents' behaviors

5. Challenges include interpretation barriers, enforcement/ reputation concerns, data issues

6. Recommendations include communication and data interpretation trainings, resource templates, opportunities for social connection



What's Next?

MS Defense: August 25th, 9am - 11am



Publications!

Resources with your
recommendations + main findings



Thank you!

Many thanks to the volunteers for their dedication & taking part in this research

Thanks to:

VT LMP: Mark Mitchell

NY CSLAP: Alene Onion and Nancy Mueller

MN CLMP: Waverly Reibel and Kirstin Stutzman

LSM: Alison Cooney and Tristan Taber

WI CLMN: Paul Skawinski

Thanks to Lake Stewards of Maine and organizers for hosting this conference and the opportunity to share!

Questions?

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